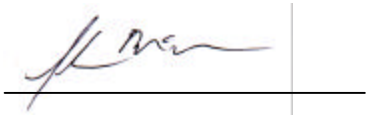
CERTIFICATE OF COMPLIANCE
SAR EVALUATION

Test Lab:	**Applicant Information:**
CELLTECH RESEARCH INC. Testing and Engineering Lab 1955 Moss Court Kelowna, B.C., Canada V1Y 9L3 Phone: 250 - 860-3130 Fax: 250 - 860-3110 e-mail: info@celltechlabs.com web site: www.celltechlabs.com	**RELM WIRELESS CORP.** 7100 Technology Drive West Melbourne, FL 32904

FCC Rule Part(s):	**2.1093; ET Docket 96-326**
FCC ID:	**ARURPU416A**
Model(s):	**RPU416A**
EUT Type:	**Portable UHF PTT Radio Transceiver**
Modulation:	**FM**
Tx Frequency Range:	**450 - 470 MHz**
Rated RF Conducted Power:	**4 Watts**
Antenna Type(s):	**1/4λ Helical**
Battery Type(s):	**NiMH (7.2 VDC, 1100 mAH)**
Body-Worn Accessories:	**1. Belt-Clip** **2. Belt-Holster** **3. Speaker-Microphone**

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

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



Shawn McMillen
General Manager
Celltech Research Inc.

TABLE OF CONTENTS

1.0 INTRODUCTION

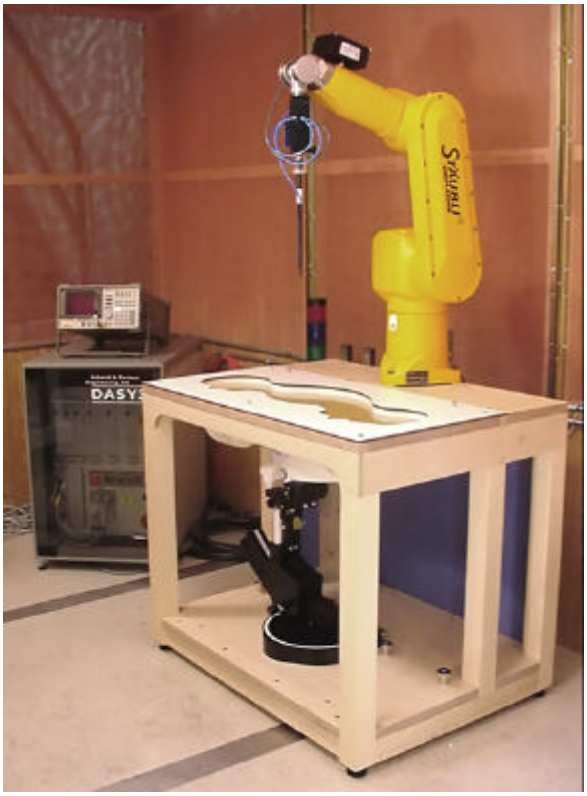
This measurement report shows compliance of the RELM WIRELESS CORP. Model: RPU416A Portable UHF PTT Radio Transceiver FCC ID: ARURPU416A with the regulations and procedures specified in FCC Part 2.1093, ET Docket 96-326 Rules (controlled exposure). The test procedures, as described in American National Standards Institute C95.1-1992 (see reference [1]), and FCC OET Bulletin 65, Supplement C, Edition 01-01 (see reference [2]) were employed. A description of the product and operating configuration, detailed summary of the test results, methodology and procedures used in the evaluation, equipment used, and the various provisions of the rules are included within this test report.

2.0 DESCRIPTION of Equipment Under Test (EUT)

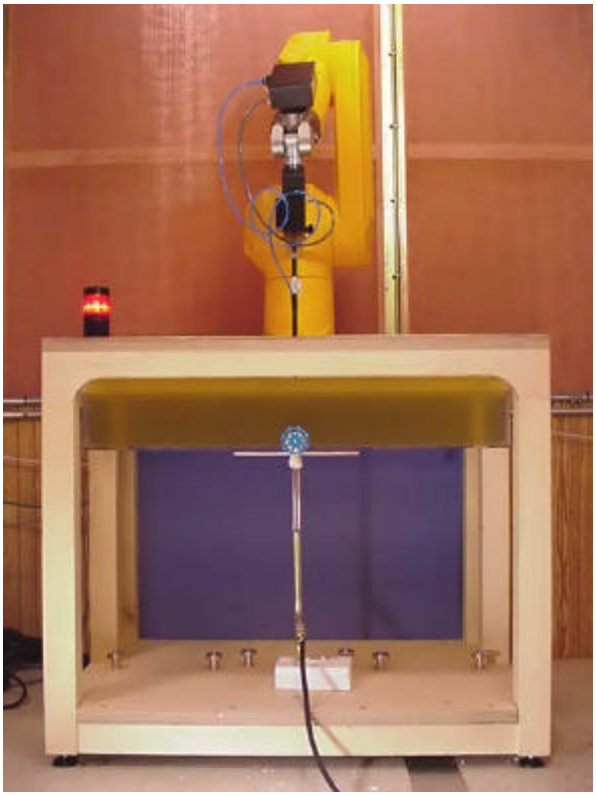
FCC Rule Part(s)	2.1093; ET Docket 96.326
FCC Classification	Licensed Non-Broadcast Transmitter Held to Face (TNF)
EUT Type	Portable UHF PTT Radio Transceiver
FCC ID	ARURPU416A
Model(s)	RPU416A
Serial No.	Pre-production
Modulation	FM
Tx Frequency Range (MHz)	450 - 470 MHz
Rated Conducted Output Power	4.0 Watts
Antenna Type(s)	1/4λ Helical
Antenna Length(s)	129 mm
Battery Type(s)	NiMH (7.2V, 1100mAH)
Body-Worn Accessories	1. Belt-Clip 2. Belt-Holster 3. Speaker-Microphone

3.0 SAR MEASUREMENT SYSTEM

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



DASY3 SAR Measurement System with SAM Phantom



DASY3 SAR Measurement System with Validation Phantom

4.0 MEASUREMENT SUMMARY

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

Face-Held SAR Measurement Results

Freq. (MHz)	Channel	Mode	Cond. Power Before (W)	Cond. Power After (W)	Battery Type	Separation Distance (cm)	SAR 1g (w/kg)	
							100% Duty Cycle	50% Duty Cycle
450.05	Low	CW	4.16	3.98	NiMH	2.5	4.49	2.25
460.50	Mid	CW	4.38	4.24	NiMH	2.5	4.52	2.26
469.95	High	CW	4.31	4.15	NiMH	2.5	4.63	2.32
Mixture Type: Brain (Measured) Dielectric Constant: 44.1 Conductivity: 0.87				**ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak - Controlled Exposure / Occupational BRAIN: 8.0 W/kg (averaged over 1 gram)**				

Notes:

1. The SAR values measured were below the maximum limit of 8.0 w/kg (controlled exposure).
2. The highest face-held SAR value measured was 4.63 w/kg (100% duty cycle, high channel).
3. The EUT was tested for face-held SAR with a 2.5cm separation distance between the front of the EUT and the outer surface of the planar phantom.
4. Ambient TEMPERATURE: 23.9 °C
   Relative HUMIDITY: 31 %
   Atmospheric PRESSURE: 102.12 kPa
   Fluid TEMPERATURE: ≈ 23.0 °C
5. During the entire test the conducted power was maintained to within 5% of the initial conducted power.

MEASUREMENT SUMMARY (Cont.)

Body-Worn SAR Measurement Results

Freq. (MHz)	Channel	Mode	Cond. Power Before (W)	Cond. Power After (W)	Battery Type	Body-Worn Accessory	Separation Distance (cm)	SAR 1g (w/kg)	
								100% Duty Cycle	50% Duty Cycle
450.05	Low	CW	4.16	3.97	NiMH	Belt-Clip	1.3	5.59	2.80
460.50	Mid	CW	4.49	4.32	NiMH	Belt-Clip	1.3	5.94	2.97
469.95	High	CW	4.32	4.30	NiMH	Belt-Clip	1.3	7.37	3.69
450.05	Low	CW	4.08	3.94	NiMH	Belt-Holster	1.0	5.69	2.85
460.50	Mid	CW	4.50	4.31	NiMH	Belt-Holster	1.0	8.08	4.04
469.95	High	CW	4.35	4.27	NiMH	Belt-Holster	1.0	7.62	3.81
Mixture Type: Body (Measured) Dielectric Constant: 58.0 Conductivity: 0.94				**ANSI / IEEE C95.1 1992 - SAFETY LIMIT Spatial Peak - Controlled Exposure / Occupational BODY: 8.0 W/kg (averaged over 1 gram)**					

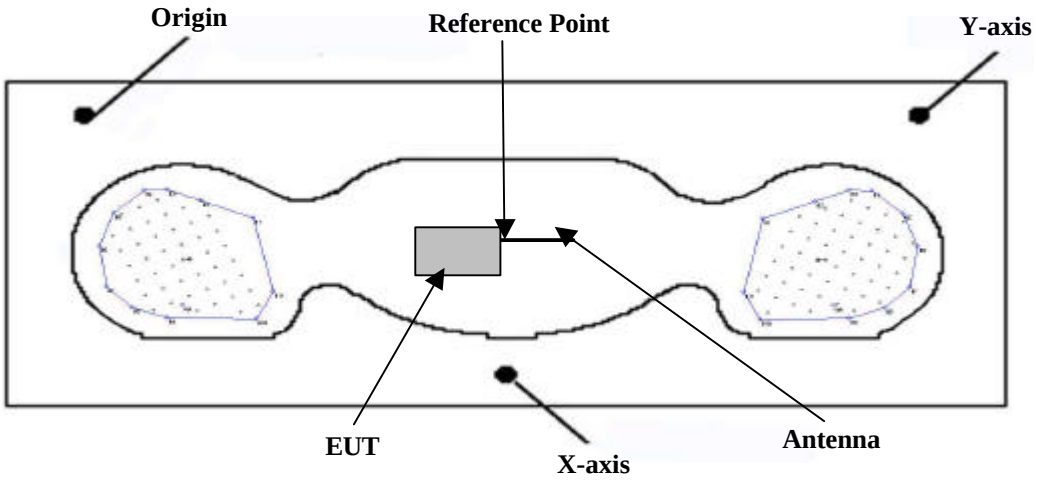
Notes:

1. The SAR values measured were below the maximum limit of 8.0 w/kg (controlled exposure).
2. The highest body-worn SAR value measured was 4.04 w/kg (50% duty cycle, mid-channel, with belt-holster).
3. The EUT was tested for body-worn SAR with the attached belt-clip providing a 1.3 cm separation distance between the back of the EUT and the outer surface of the planar phantom.
4. The EUT was tested for body-worn SAR placed in the belt-holster. The belt-holster provided a 1.0 cm separation distance between the back of the EUT and the outer surface of the planar phantom.
5. Ambient TEMPERATURE: 23.9 °C
   Relative HUMIDITY: 31 %
   Atmospheric PRESSURE: 102.12 kPa
   Fluid TEMPERATURE: ≈ 23.0 °C
6. During the entire test the conducted power was maintained to within 5% of the initial conducted power.

5.0 DETAILS OF SAR EVALUATION

The RELM WIRELESS CORP. Model: RPU416A Portable UHF PTT Radio Transceiver FCC ID: ARURPU416A was found to be compliant for localized Specific Absorption Rate (Controlled Exposure) based on the following test provisions and conditions:

1. The EUT was tested in a face-held configuration with the front of the device placed parallel to the outer surface of the planar phantom. A 2.5 cm separation distance was maintained between the front of the EUT and the outer surface of the planar phantom for the duration of the test.
2. The EUT was tested in a body-worn configuration with the back of the EUT placed parallel to the outer surface of the planar phantom and speaker-microphone accessory connected to the EUT. The attached belt-clip was touching the outer surface of the planar phantom and provided a 1.3 cm separation distance between the back of the EUT and the outer surface of the planar phantom.
3. The EUT was tested in a body-worn configuration with the back of the EUT placed parallel to the outer surface of the planar phantom and speaker-microphone accessory connected to the EUT. The EUT was placed in the belt-holster with the back of the belt-holster touching the outer surface of the planar phantom. The belt-holster provided a 1.0 cm separation distance between the back of the EUT and the outer surface of the planar phantom.
4. The EUT was evaluated for SAR at maximum power and the unit was operated for an appropriate period prior to the evaluation in order to minimize drift. The conducted power levels were checked before and after each test. If the conducted power level dropped more than 5% of the initial power level, then the EUT was retested. Any unusual anomalies over the course of the test also warranted a re-evaluation.
5. The conducted power was measured according to the procedures described in FCC Part 2.1046.
6. The EUT was tested with the transmitter in continuous operation (100% duty cycle) throughout the SAR evaluation. For a push-to-talk device the 50% duty cycle compensation reported assumes a transmit/receive cycle of equal time base.
7. The location of the maximum spatial SAR distribution (Hot Spot) was determined relative to the device and its antenna.
8. The EUT was tested with a fully charged battery.



Phantom Reference Point & DUT Positioning

6.0 EVALUATION PROCEDURES

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

a. (i) The evaluation was performed in the applicable area of the phantom depending on the type of device being tested. For devices held to the ear during normal operation both the left and right ear positions were evaluated at the low, middle, and high frequencies of the band at maximum power, and with the device antenna in both the extended and extracted positions as applicable. The positioning of the ear-held device relative to the SAM phantom was performed in accordance with FCC OET Bulletin 65, Supplement C (Edition 01-01.

(ii) For face-held and body-worn devices a planar phantom was used. Depending on the phantom used for the evaluation, all other phantoms were drained of fluid.

b. The SAR was determined by a pre-defined procedure within the DASY3 software. Upon completion of a reference and optical surface check, the exposed region of the phantom was scanned near the inner surface using uniform grid spacing.

c. A 5x5x7 matrix was performed around the greatest spatial SAR distribution found during the area scan of the applicable exposed region. SAR values were then calculated using a 3-D spline interpolation algorithm and averaged over spatial volumes of 1 and 10 grams.

d. The depth of the simulating tissue in the phantom used for the SAR evaluation and system validation was no less than 15.0cm.

Face-held SAR Test Setup

Body-worn SAR Test Setup

7.0 SAR SAFETY LIMITS

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

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

8.0 SIMULATED TISSUES

The brain and muscle 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 according to standardized procedures, and measured for dielectric parameters (permitivity and conductivity).

TISSUE MIXTURES FOR DIPOLE VALIDATION & EUT EVALUATION		
INGREDIENT	**450MHz Brain Mixture (System Validation & EUT Evaluation)**	**450MHz Body Mixture (EUT Evaluation)**
Water	38.56 %	52.00 %
Sugar	56.32 %	45.65 %
Salt	3.95 %	1.75 %
HEC	0.98 %	0.14 %
Bactericide	0.19 %	0.10 %

9.0 SYSTEM VALIDATION

Prior to the assessment, the system was verified in a planar phantom with a 450MHz dipole. A forward power of 250mW was applied to the dipole and the system was verified to a tolerance of ±10%. The applicable verifications are as follows (see Appendix B for system dipole validation test plot):

Dipole Validation Kit	Target SAR 1g (w/kg)	Measured SAR 1g (w/kg)	Fluid Temperature	Validation Date
450MHz	1.47	1.43	≈23.0 °C	03/14/2002

10.0 TISSUE PARAMETERS

The dielectric parameters of the fluids were verified prior to the SAR evaluation using an 85070C Dielectric Probe Kit and an 8753E Network Analyzer. The dielectric parameters of the fluid are as follows:

TISSUE PARAMETERS - DIPOLE VALIDATION AND EUT EVALUATION			
Equivalent Tissue	**Dielectric Constant** e_r	**Conductivity** s **(mho/m)**	r **(Kg/m^3)**
450MHz Brain (Target)	43.5 ± 5%	0.87 ± 5%	1000
450MHz Brain (Measured: 03/14/02)	44.1	0.87	1000
450MHz Body (Target)	56.7 ±5%	0.94 ±5%	1000
450MHz Body (Measured: 03/14/02)	58.0	0.94	1000

11.0 ROBOT SYSTEM SPECIFICATIONS

Specifications

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

Data Acquisition Electronic (DAE) System

Cell Controller

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

Data Converter

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

PC Interface Card

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

E-Field Probe

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

Evaluation Phantom

Type:	SAM V4.0C
Shell Material:	Fiberglass
Thickness:	2.0 ±0.1 mm
Volume:	Approx. 20 liters
Dimensions:	100cm (L) x 50cm (W)

Validation Phantom (for devices £ 450MHz)

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

12.0 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)
Dynam. Rnge:	5 µW/g to > 100 mW/g; Linearity: ± 0.2 dB
Srfce. Detect.	± 0.2 mm repeatability in air and clear liquids over diffuse reflecting surfaces
Dimensions:	Overall length: 330 mm Tip length: 16 mm Body diameter: 12 mm Tip diameter: 6.8 mm Distance from probe tip to dipole centers: 2.7 mm
Application:	General dosimetry up to 3 GHz Compliance tests of mobile phone


ET3DV6 E-Field Probe

13.0 SAM PHANTOM V4.0C

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


SAM Phantom

14.0 VALIDATION PHANTOM

The validation phantom is a large planar phantom constructed of Plexiglas material with a 6.0 mm shell thickness for SAR validations at and below 450MHz. The large planar phantom is mounted in the DASY3 compact system in place of the SAM phantom.


Large Planar Phantom

15.0 DEVICE HOLDER

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


Device Holder

16.0 TEST EQUIPMENT LIST

SAR MEASUREMENT SYSTEM		
EQUIPMENT	***SERIAL NO.***	***DATE OF CALIBRATION***
DASY3 System -Robot -ET3DV6 E-Field Probe -300MHz Validation Dipole -450MHz Validation Dipole -900MHz Validation Dipole -1800MHz Validation Dipole -2450MHz Validation Dipole -SAM Phantom V4.0C -Small Planar Phantom -Large Planar Phantom	 599396-01 1590 135 136 054 247 150 N/A N/A N/A	 N/A Mar 2001 Oct 2001 Oct 2001 June 2001 June 2001 Oct 2001 N/A N/A N/A
85070C Dielectric Probe Kit	N/A	N/A
Gigatronics 8652A Power Meter -Power Sensor 80701A -Power Sensor 80701A	1835272 1833535 1833542	Feb 2002 Feb 2002 Mar 2002
E4408B Spectrum Analyzer	US39240170	Feb 2002
8594E Spectrum Analyzer	3543A02721	Feb 2002
8753E Network Analyzer	US38433013	Feb 2002
8648D Signal Generator	3847A00611	Feb 2002
5S1G4 Amplifier Research Power Amplifier	26235	N/A

17.0 MEASUREMENT UNCERTAINTIES

Error Description	Uncertainty Value ±%	Probability Distribution	Divisor	c_i 1g	Standard Uncertainty ±% (1g)	v_i or v_{eff}
Measurement System						
Probe calibration	± 4.4	Normal	1	1	± 4.4	∞
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	∞
Extrap. & integration	± 3.9	Rectangular	√3	1	± 2.3	∞
Test Sample Related						
Device positioning	± 6.0	Normal	0.89	1	± 6.7	12
Device holder uncertainty	± 5.0	Normal	0.84	1	± 5.9	8
Power drift	± 5.0	Rectangular	√3		± 2.9	∞
Phantom and Setup						
Phantom uncertainty	± 4.0	Rectangular	√3	1	± 2.3	∞
Liquid conductivity (target)	± 5.0	Rectangular	√3	0.6	± 1.7	∞
Liquid conductivity (measured)	± 10.0	Rectangular	√3	0.6	± 3.5	∞
Liquid permittivity (target)	± 5.0	Rectangular	√3	0.6	± 1.7	∞
Liquid permittivity (measured)	± 5.0	Rectangular	√3	0.6	± 1.7	∞
Combined Standard Uncertainty					**± 13.6**	
Expanded Uncertainty (k=2)					**± 27.1**	

The divisor for device positioning uncertainty and holder uncertainty are based on the procedure defined in IEEE Std 1528 (draft) (see reference [5]), or based on the degrees of freedom for each error source.

For estimation of Device Positioning Uncertainty (divisor=0.89) 12 different devices were used (see last column - i.e. degrees of freedom). The corresponding k_p factor for v_{eff}=12 is 2.23, therefore the divisor is 2/2.23=0.89.

For estimation of Device Holder Uncertainty (divisor=0.84) 8 different devices were used (see last column - i.e. degrees of freedom). The corresponding k_p factor for v_{eff}=8 is 2.37, therefore the divisor is 2/2.37=0.84.

18.0 REFERENCES

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

[2] 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.

[3] Thomas Schmid, Oliver Egger, and Niels Kuster, “Automated E-field scanning system for dosimetric assessments”, IEEE Transaction on Microwave Theory and Techniques, Vol. 44, pp. 105 – 113: January 1996.

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

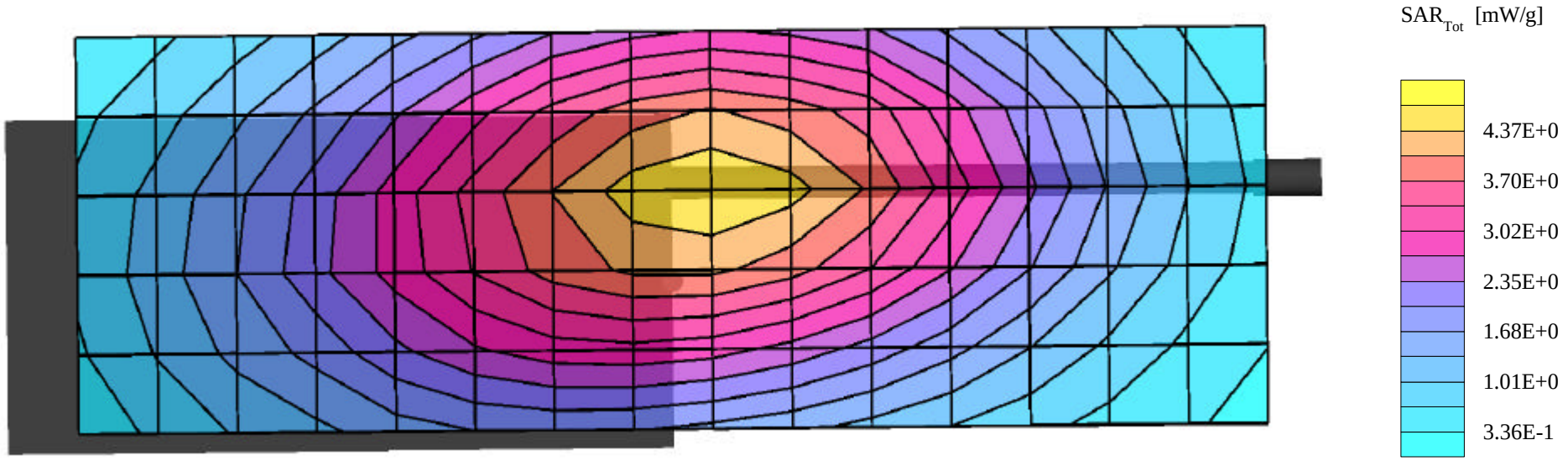
[5] IEEE Standards Coordinating Committee 34, Std. P1528, DRAFT Recommended Practice for Determining the Spatial-Peak Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques: Draft 6.4, December 2001.

APPENDIX A - SAR MEASUREMENT DATA

Relm Wireless Corp. FCC ID: ARURPU416A

SAM Phantom; Flat Section; Position: (90°,90°)
Probe: ET3DV6 - SN1590; ConvF(7.36,7.36,7.36); Crest factor: 1.0
450 MHz Brain: σ = 0.87 mho/m ε_r = 44.1 ρ = 1.00 g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.20 dB
SAR (1g): 4.49 mW/g, SAR (10g): 3.23 mW/g

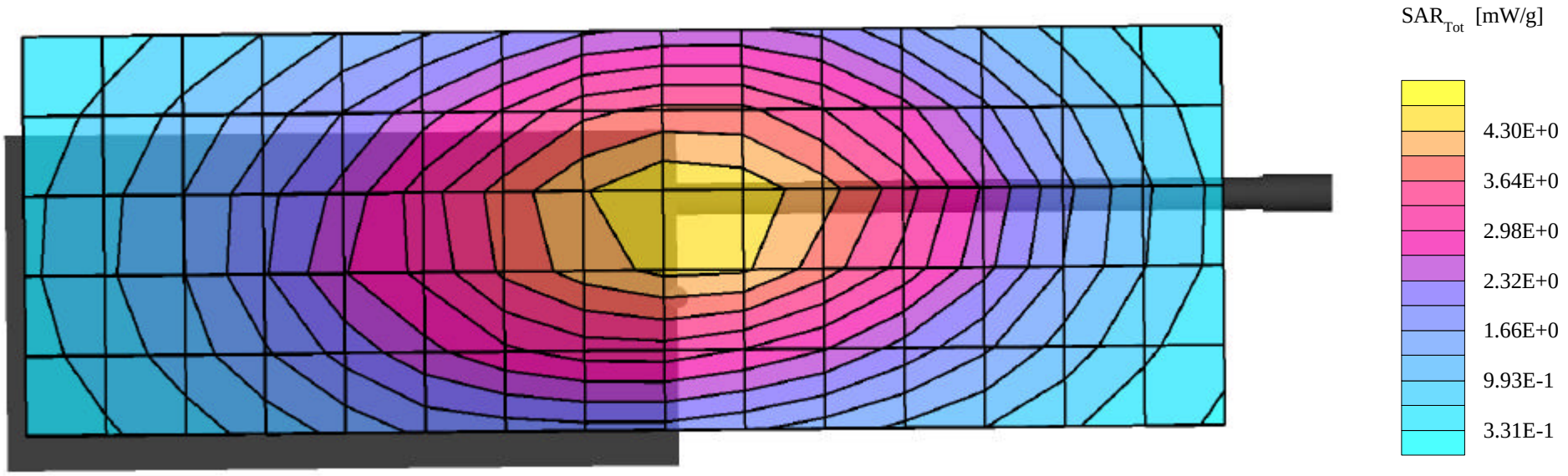
Face-Held SAR at 2.5 cm Separation Distance
UHF PTT Radio Model: RPU416A
Continuous Wave Mode
Low Channel (450.05 MHz)
Conducted Power: 4.16 Watts
Date Tested: March 14, 2002



Relm Wireless Corp. FCC ID: ARURPU416A

SAM Phantom; Flat Section; Position: (90°,90°)
Probe: ET3DV6 - SN1590; ConvF(7.36,7.36,7.36); Crest factor: 1.0
450 MHz Brain: σ = 0.87 mho/m ε_r = 44.1 ρ = 1.00 g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.16 dB
SAR (1g): 4.52 mW/g, SAR (10g): 3.23 mW/g

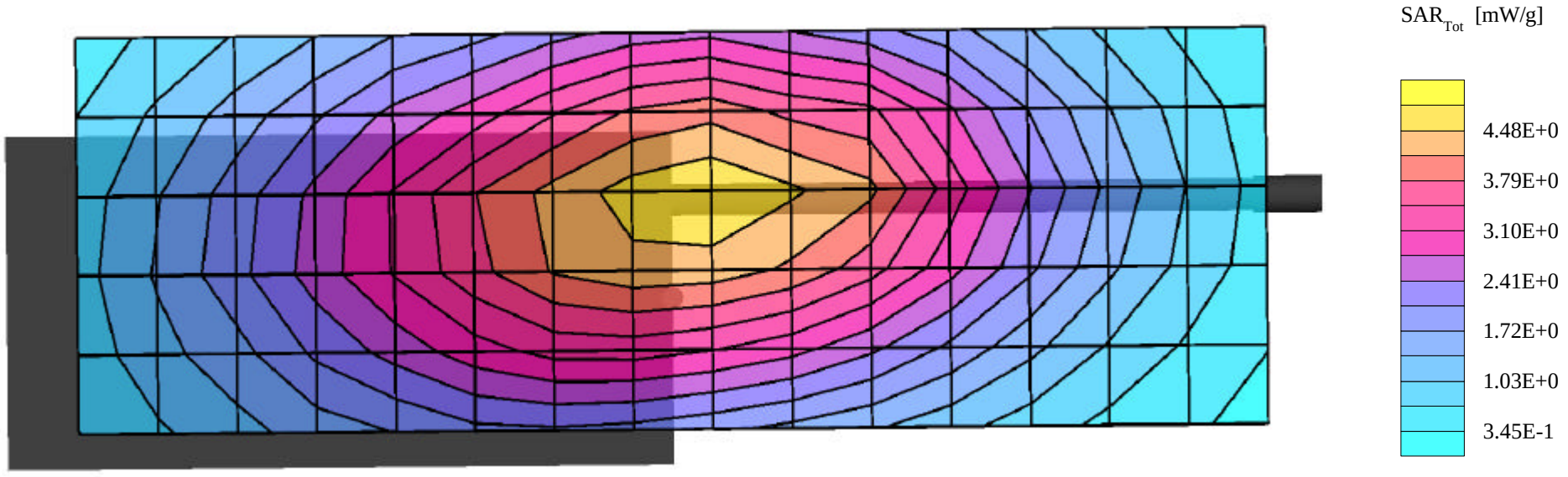
Face-Held SAR at 2.5 cm Separation Distance
UHF PTT Radio Model: RPU416A
Continuous Wave Mode
Mid Channel (460.50 MHz)
Conducted Power: 4.38 Watts
Date Tested: March 14, 2002



Relm Wireless Corp. FCC ID: ARURPU416A

SAM Phantom; Flat Section; Position: (90°,90°)
Probe: ET3DV6 - SN1590; ConvF(7.36,7.36,7.36); Crest factor: 1.0
450 MHz Brain: σ = 0.87 mho/m ε_r = 44.1 ρ = 1.00 g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.17 dB
SAR (1g): 4.63 mW/g, SAR (10g): 3.34 mW/g

Face-Held SAR at 2.5 cm Separation Distance
UHF PTT Radio Model: RPU416A
Continuous Wave Mode
High Channel (469.95 MHz)
Conducted Power: 4.31 Watts
Date Tested: March 14, 2002

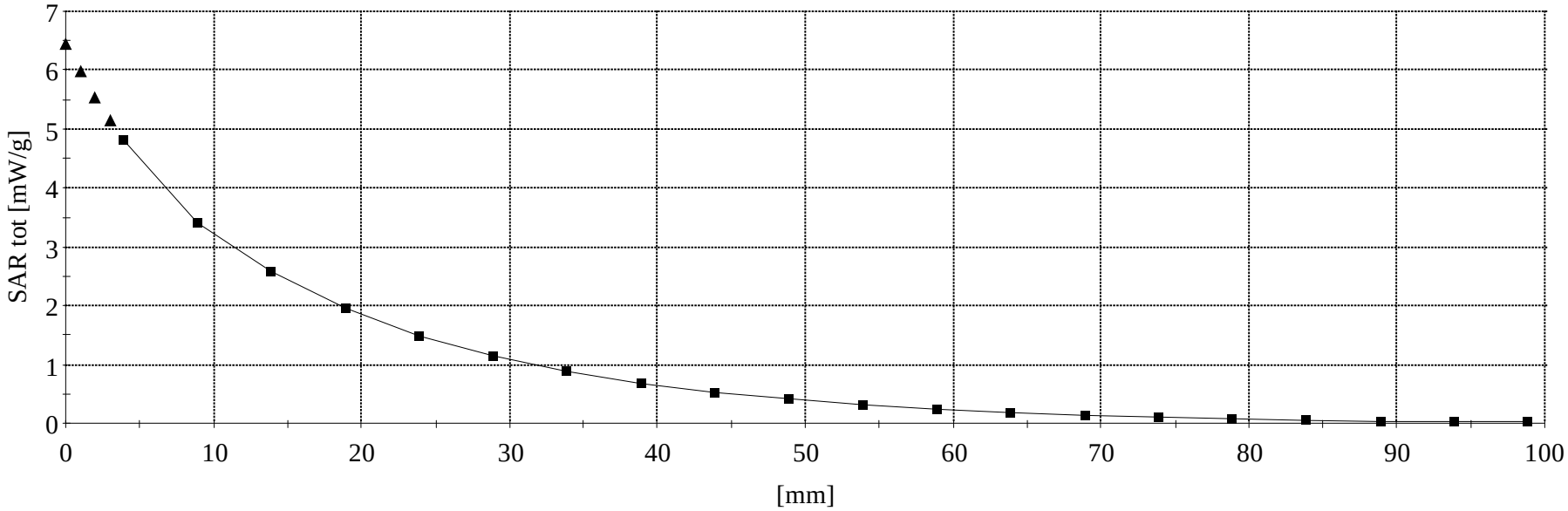


Relm Wireless Corp. FCC ID: ARURPU416A

SAM Phantom; Flat Section
Probe: ET3DV6 - SN1590; ConvF(7.36,7.36,7.36); Crest factor: 1.0;
450 MHz Brain: σ = 0.87 mho/m ε_r = 44.1 ρ = 1.00 g/cm^3

Z-Axis Extrapolation at Peak SAR Location

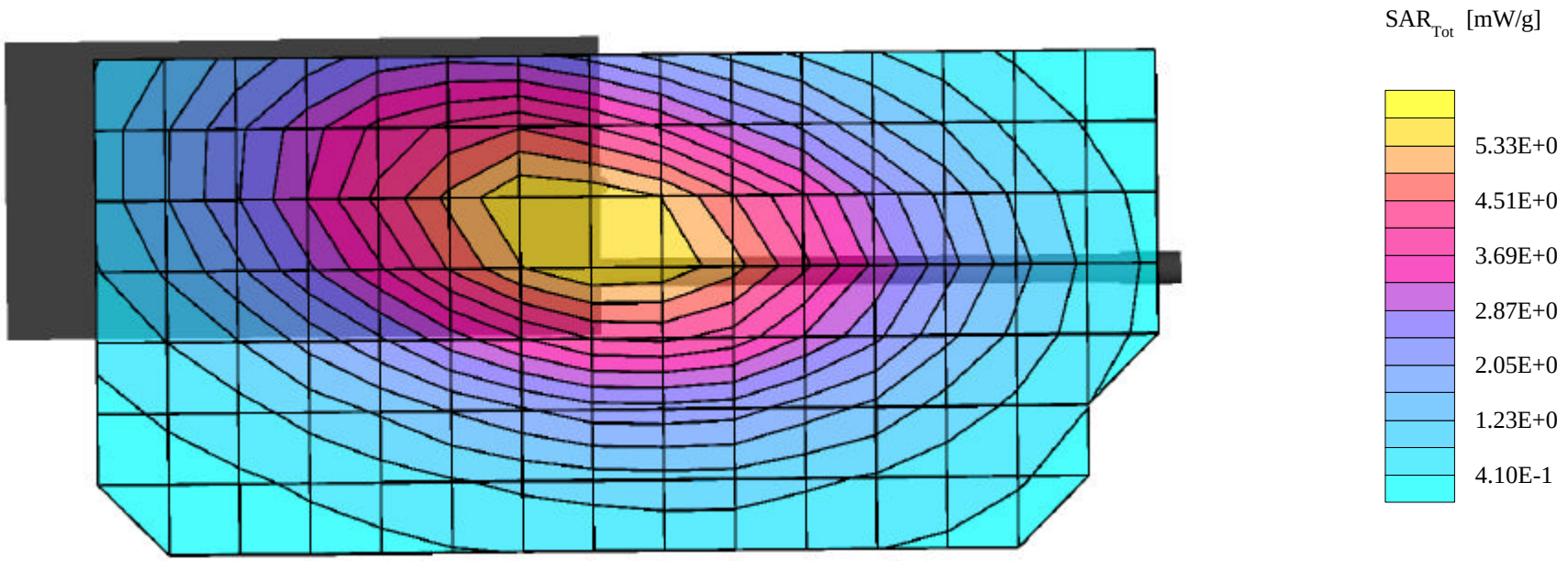
Face SAR at 2.5 cm Separation Distance
UHF PTT Radio Model: RPU416A
Continuous Wave Mode
High Channel (469.95 MHz)
Conducted Power: 4.31 Watts
Date Tested: March 14, 2002



Relm Wireless Corp. FCC ID: ARURPU416A

SAM Phantom; Flat Section; Position: (270°,270°)
Probe: ET3DV6 - SN1590; ConvF(7.23,7.23,7.23); Crest factor: 1.0
450 MHz Muscle: σ = 0.94 mho/m ε_r = 58.0 ρ = 1.00 g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.19 dB
SAR (1g): 5.59 mW/g, SAR (10g): 4.06 mW/g

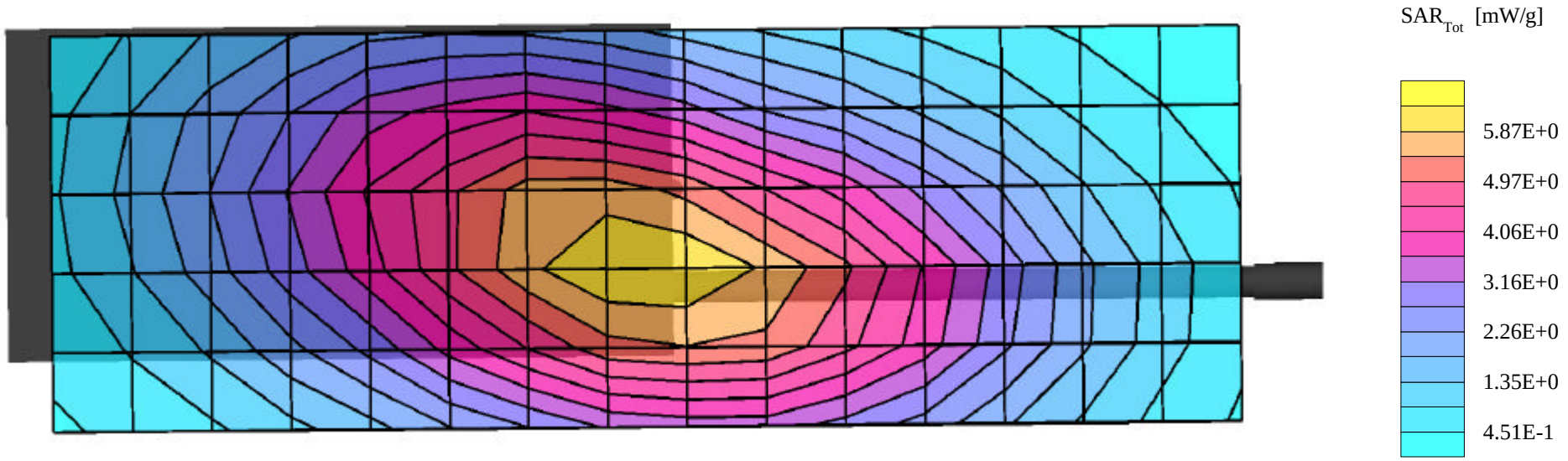
Body-Worn SAR with 1.3 cm Belt-Clip Separation
UHF PTT Radio Model: RPU416A
Continuous Wave Mode
Low Channel (450.05 MHz)
Conducted Power: 4.16 Watts
Date Tested: March 14, 2002



Relm Wireless Corp. FCC ID: ARURPU416A

SAM Phantom; Flat Section; Position: (270°,270°)
Probe: ET3DV6 - SN1590; ConvF(7.23,7.23,7.23); Crest factor: 1.0
450 MHz Muscle: σ = 0.94 mho/m ε_r = 58.0 ρ = 1.00 g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.18 dB
SAR (1g): 5.94 mW/g, SAR (10g): 4.32 mW/g

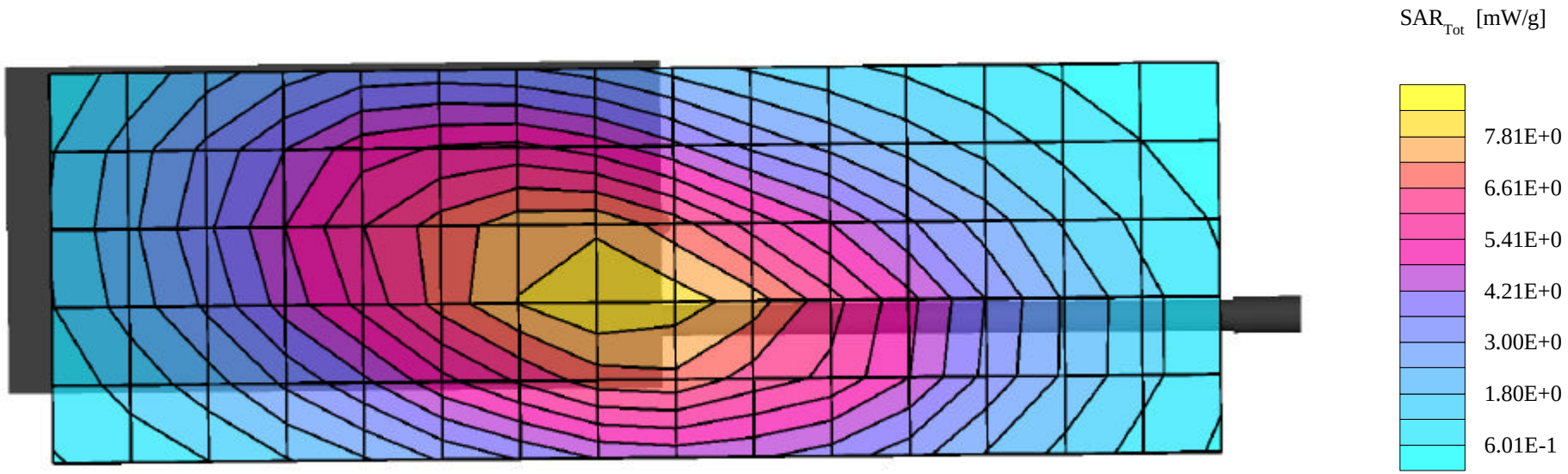
Body-Worn SAR with 1.3 cm Belt-Clip Separation
UHF PTT Radio Model: RPU416A
Continuous Wave Mode
Mid Channel (460.50 MHz)
Conducted Power: 4.49 Watts
Date Tested: March 14, 2002



Relm Wireless Corp. FCC ID: ARURPU416A

SAM Phantom; Flat Section; Position: (270°,270°)
Probe: ET3DV6 - SN1590; ConvF(7.23,7.23,7.23); Crest factor: 1.0
450 MHz Muscle: σ = 0.94 mho/m ε_r = 58.0 ρ = 1.00 g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: 0.00 dB
SAR (1g): 7.37 mW/g, SAR (10g): 5.35 mW/g

Body-Worn SAR with 1.3 cm Belt-Clip Separation
UHF PTT Radio Model: RPU416A
Continuous Wave Mode
High Channel (469.95 MHz)
Conducted Power: 4.32 Watts
Date Tested: March 14, 2002

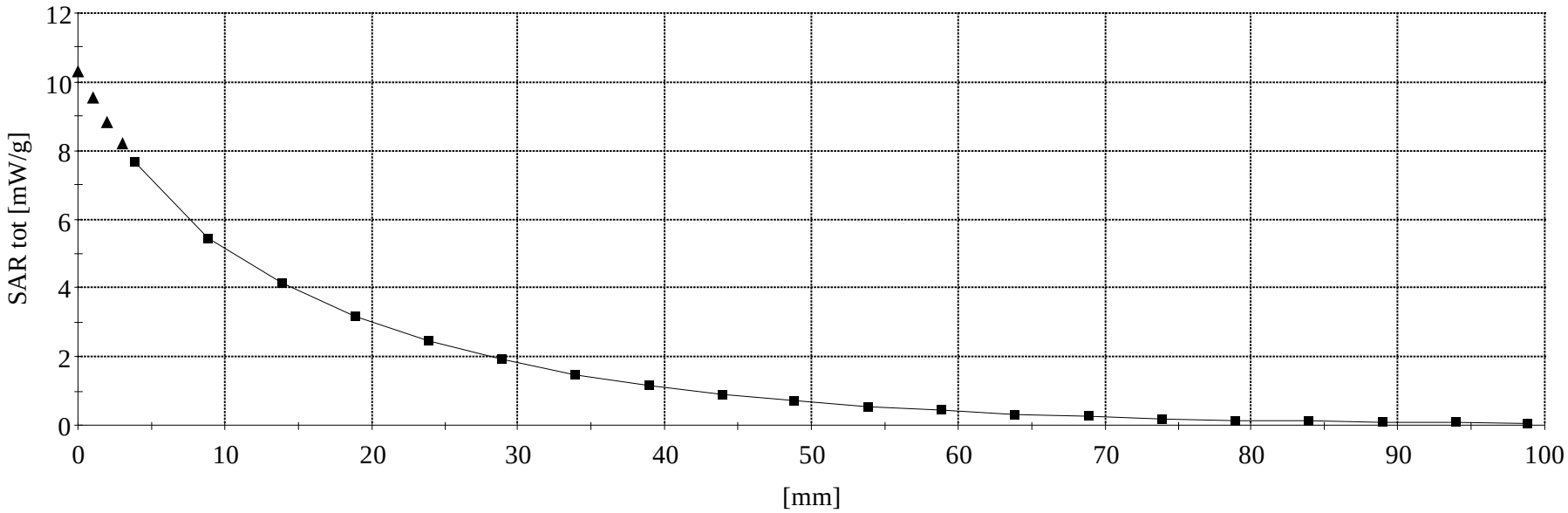


Relm Wireless Corp. FCC ID: ARURPU416A

SAM Phantom; Flat Section
Probe: ET3DV6 - SN1590; ConvF(7.23,7.23,7.23); Crest factor: 1.0;
450 MHz Muscle: σ = 0.94 mho/m ε_r = 58.0 ρ = 1.00 g/cm^3

Z-Axis Extrapolation at Peak SAR Location

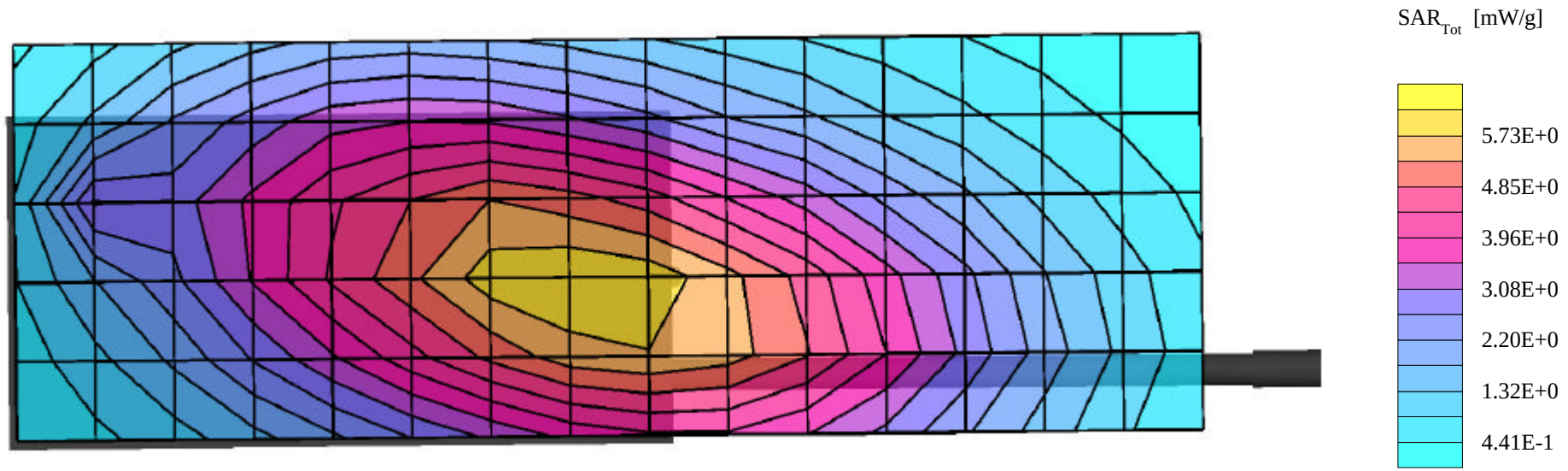
Body-Worn SAR with 1.3 cm Belt-Clip Separation
UHF PTT Radio Model: RPU416A
Continuous Wave Mode
High Channel (469.95 MHz)
Conducted Power: 4.32 Watts
Date Tested: March 14, 2002



Relm Wireless Corp. FCC ID: ARURPU416A

SAM Phantom; Flat Section; Position: (270°,270°)
Probe: ET3DV6 - SN1590; ConvF(7.23,7.23,7.23); Crest factor: 1.0
450 MHz Muscle: σ = 0.94 mho/m ε_r = 58.0 ρ = 1.00 g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.16 dB
SAR (1g): 5.69 mW/g, SAR (10g): 4.13 mW/g

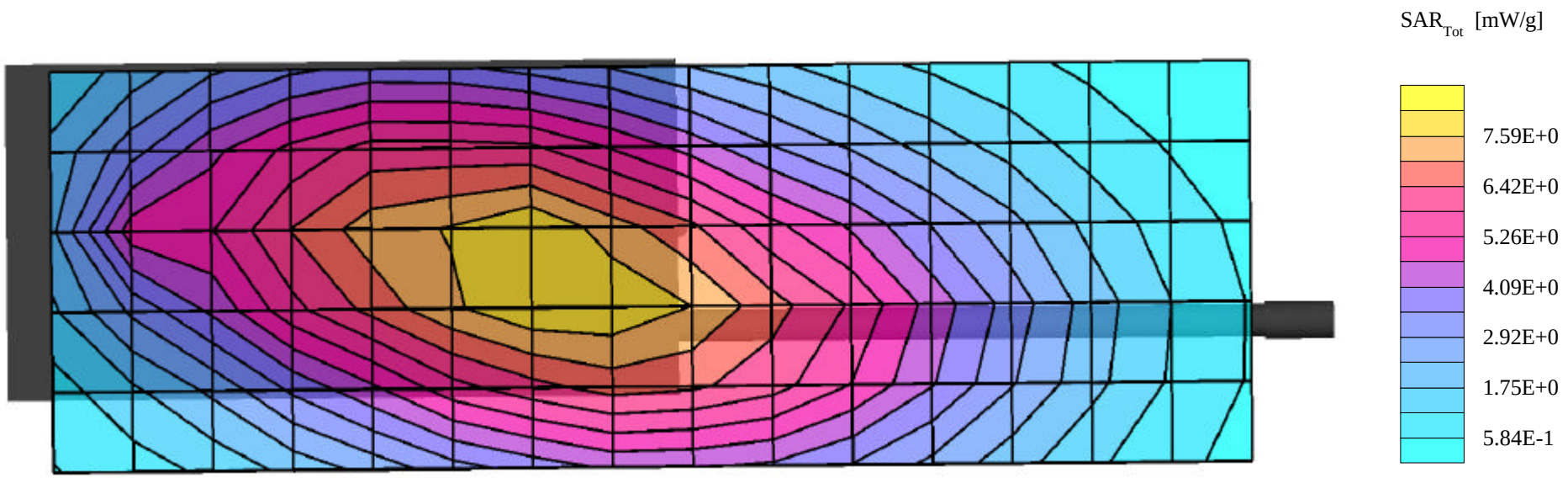
Body-Worn SAR with 1.0 cm Belt-Holster Separation
UHF PTT Radio Model: RPU416A
Continuous Wave Mode
Low Channel (450.05 MHz)
Conducted Power: 4.08 Watts
Date Tested: March 14, 2002



Relm Wireless Corp. FCC ID: ARURPU416A

SAM Phantom; Flat Section; Position: (270°,270°)
Probe: ET3DV6 - SN1590; ConvF(7.23,7.23,7.23); Crest factor: 1.0
450 MHz Muscle: σ = 0.94 mho/m ε_r = 58.0 ρ = 1.00 g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.17 dB
SAR (1g): 8.08 mW/g, SAR (10g): 5.93 mW/g

Body-Worn SAR with 1.0 cm Belt-Holster Separation
UHF PTT Radio Model: RPU416A
Continuous Wave Mode
Mid Channel (460.50 MHz)
Conducted Power: 4.50 Watts
Date Tested: March 14, 2002

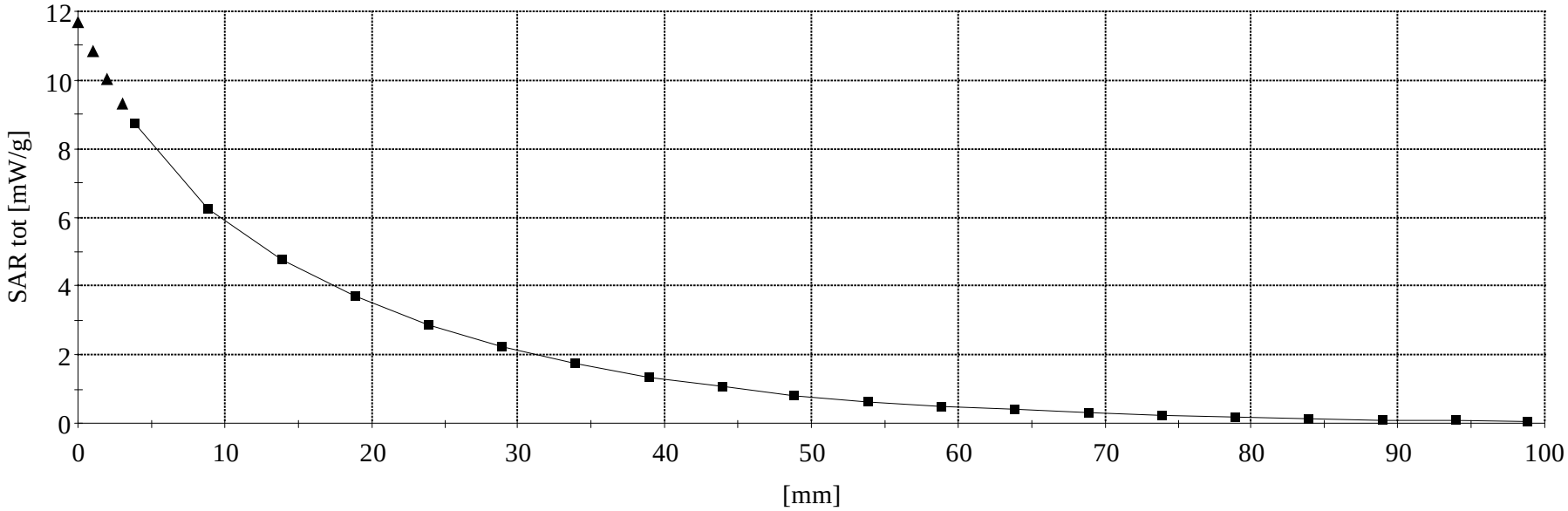


Relm Wireless Corp. FCC ID: ARURPU416A

SAM Phantom; Flat Section
Probe: ET3DV6 - SN1590; ConvF(7.23,7.23,7.23); Crest factor: 1.0;
450 MHz Muscle: σ = 0.94 mho/m ε_r = 58.0 ρ = 1.00 g/cm^3

Z-Axis Extrapolation at Peak SAR Location

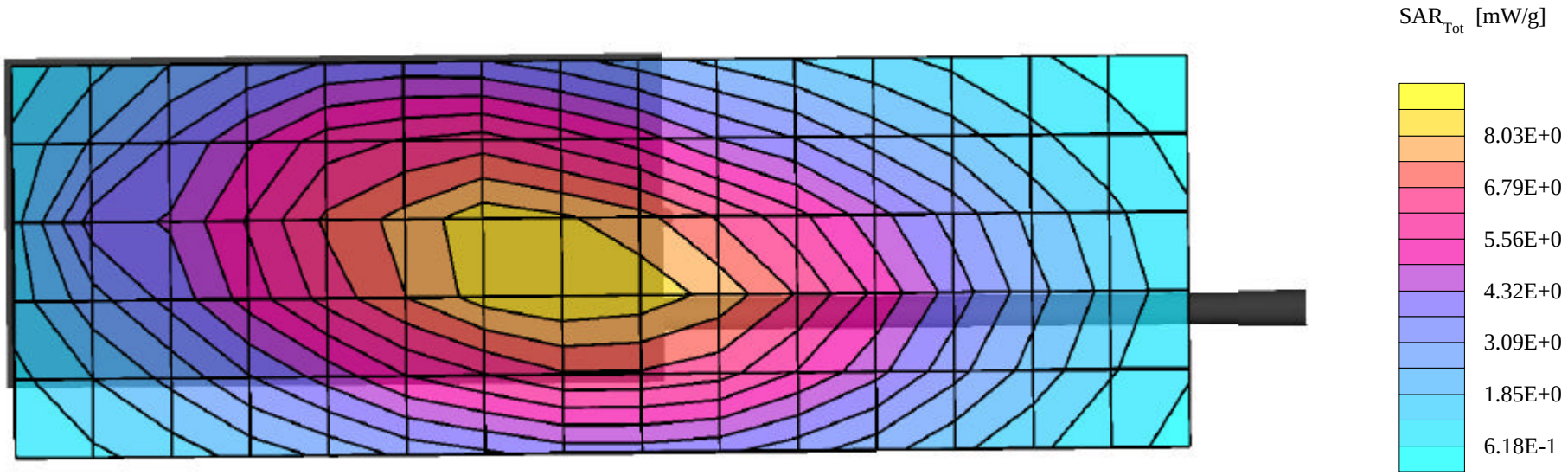
Body-Worn SAR with 1.0 cm Belt-Holster Separation
UHF PTT Radio Model: RPU416A
Continuous Wave Mode
Mid Channel (460.50 MHz)
Conducted Power: 4.50 Watts
Date Tested: March 14, 2002



Relm Wireless Corp. FCC ID: ARURPU416A

SAM Phantom; Flat Section; Position: (270°,270°)
Probe: ET3DV6 - SN1590; ConvF(7.23,7.23,7.23); Crest factor: 1.0
450 MHz Muscle: σ = 0.94 mho/m ε_r = 58.0 ρ = 1.00 g/cm^3
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.05 dB
SAR (1g): 7.62 mW/g, SAR (10g): 5.56 mW/g

Body-Worn SAR with 1.0 cm Belt-Holster Separation
UHF PTT Radio Model: RPU416A
Continuous Wave Mode
High Channel (469.95 MHz)
Conducted Power: 4.35 Watts
Date Tested: March 14, 2002



APPENDIX B - DIPOLE VALIDATION

3/14/02

450MHz Validation Dipole

Large Planar Phantom; Planar Section

Probe: ET3DV6 - SN1590; ConvF(7.36,7.36,7.36); Crest factor: 1.0; 450 MHz Brain: $\sigma = 0.87$ mho/m $\varepsilon_r = 44.1$ $\rho = 1.00$ g/cm^3

Cube 5x5x7: Peak: 2.31 mW/g, SAR (1g): 1.43 mW/g, SAR (10g): 0.945 mW/g, (Worst-case extrapolation)

Penetration depth: 12.9 (11.2, 15.3) [mm]

Powerdrift: -0.00 dB; Conducted Input Power: 250 [mW]

Test Date: March 14, 2002