M. Flom Associates, Inc. - Global Compliance Center
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May 20, 2003

Federal Communications Commission
Via Electronic Filing
Attention: Richard Fabina

Applicant: Vertex Standard Co., Ltd.
Equipment: FCC ID: K66HX470SA
Reference: SAR Report

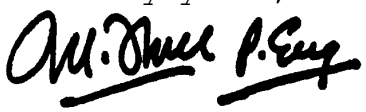
Richard:

This SAR Report, originally submitted simultaneously with FCC ID: K66HX470S EA168547 contains test information relating to the MURS function. The Applicant respectively requests, in order to avoid any further delays in the Certification process, that the Commission ignores any reference to the MURS Test Information contained in the SAR report presently submitted. Deletion of the MURS function entails a software change only.

This will greatly assist the Applicant to avoid any further (already high) expenses. Revising the SAR report could engender a further delay of 7-10 days or more. This would greatly damage its already reduced marketing/sales period.

Your kind attention is greatly appreciated.

Sincerely yours,



Morton Flom, P. Eng., President
M. Flom Associates, Inc.

DECLARATION OF COMPLIANCE
SAR EVALUATION

Test Lab

CELLTECH RESEARCH INC.
Testing and Engineering Lab
1955 Moss Court
Kelowna, B.C.
Canada V1Y 9L3
Phone: 250-448-7047
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Applicant Information

VERTEX STANDARD CO., LTD.
4-8-8, Nakameguro, Meguro-Ku
Tokyo 153-8644, Japan

Rule Part(s):	**FCC 47 CFR §2.1093; IC RSS-102 Issue 1 (Provisional)**
Test Procedure(s):	**FCC OET Bulletin 65, Supplement C (01-01)**
Device Type:	**Portable VHF/UHF Marine/MURS/FRS PTT Radio Transceiver**
FCC ID:	**K66HX470S**
Model(s):	**HX470S**
Modulation:	**FM (VHF/UHF)**
Tx Frequency Range(s):	**151.82 - 154.60 MHz (MURS)** **156.05 - 157.425 MHz (Marine)** **462.5625 - 467.7125 MHz (FRS)**
RF Output Power Tested:	**5.15 Watts Conducted (Marine)** **1.95 Watts Conducted (MURS)** **0.505 Watts Conducted (FRS)**
Antenna Type(s):	**Whip**
Battery Type(s):	**7.4V Lithium-Ion**
Body-Worn Accessories:	**Belt-Clip, Lapel-Clip Speaker-Microphone (CMP460)**
Max. SAR Measured:	**0.575 W/kg - Face-held (50% duty cycle, Marine Band)** **0.820 W/kg - Body-worn (50% duty cycle, Marine Band)**

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 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 General Population / Uncontrolled Exposure environment.

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.

Russell W. Pipe
Senior Compliance Technologist
Celltech Research Inc.

TABLE OF CONTENTS

1.0 INTRODUCTION

This measurement report demonstrates that the Vertex Standard Co., Ltd. Model: HX470S Portable VHF/UHF Marine/MURS/FRS PTT Radio Transceiver FCC ID: K66HX470S complies with the 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 General Population / Uncontrolled 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 product, 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.

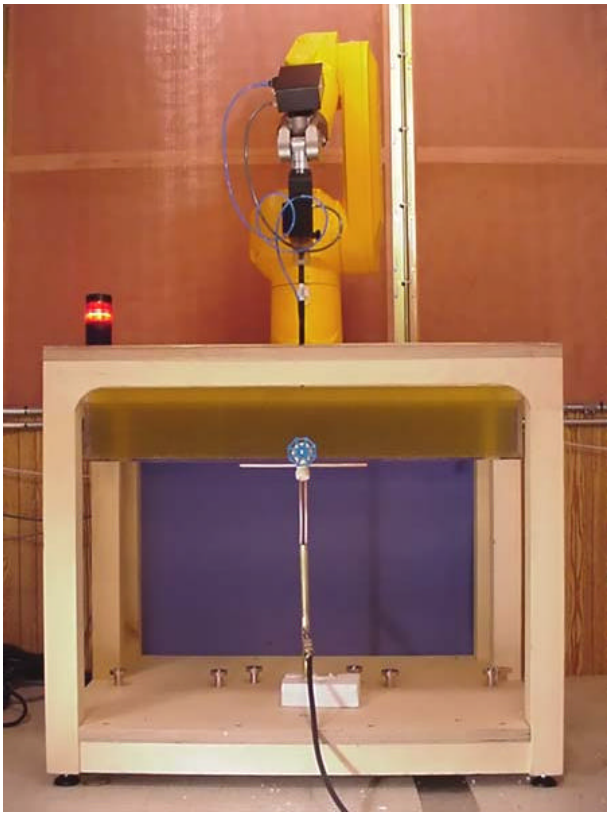
2.0 DESCRIPTION of Device Under Test (DUT)

Rule Part(s)	FCC 47 CFR §2.1093; IC RSS-102 Issue 1 (Provisional)
Test Procedure(s)	FCC OET Bulletin 65, Supplement C (01-01)
Device Type	Portable VHF/UHF Marine/MURS/FRS PTT Radio Transceiver
FCC ID	K66HX470S
Model(s)	HX470S
Serial No.	Pre-production
Modulation	FM (VHF/UHF)
Tx Frequency Range	151.82 - 154.60 MHz (MURS) 156.05 - 157.425 MHz (Marine) 462.5625 - 467.7125 MHz (FRS)
RF Output Power Tested	5.15 Watts Conducted (Marine) 1.95 Watts Conducted (MURS) 0.505 Watts Conducted (FRS)
Battery Type(s)	7.4V Lithium-Ion
Antenna Type(s)	Whip (Length: 184 mm)
Body-Worn Accessories Tested	Belt-Clip, Lapel-Clip Speaker-Microphone (CMP460)

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 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 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 small planar phantom



DASY3 SAR Measurement System with validation phantom

4.0 MEASUREMENT SUMMARY

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.

SAR EVALUATION RESULTS

Freq. (MHz)	Chan.	Band	Mode	RF Conducted Power (Watts)		Battery Type	Accessory Type	Separation Distance (cm)	Fluid Type	SAR (W/kg)	
				Before	After					100% Duty Cycle	50% Duty Cycle
156.80	16	Marine	CW	5.15	4.90	Lithium-ion	(Face-Held)	2.5	Brain	1.15	0.575
151.90	03	MURS	CW	1.95	1.97	Lithium-ion	(Face-Held)	2.5	Brain	0.331	0.166
467.5625	08	FRS	CW	0.505	0.500	Lithium-ion	(Face-Held)	2.5	Brain	0.448	0.224
156.80	16	Marine	CW	5.15	4.91	Lithium-ion	Belt-Clip Speaker-Mic	2.5	Body	1.64	0.820
151.90	03	MURS	CW	1.95	1.88	Lithium-ion	Belt-Clip Speaker-Mic	2.5	Body	0.472	0.236
467.5625	08	FRS	CW	0.505	0.500	Lithium-ion	Belt-Clip Speaker-Mic	2.5	Body	0.480	0.240

ANSI / IEEE C95.1 1992 - SAFETY LIMIT
Spatial Peak - Uncontrolled Exposure / General Population
BRAIN & BODY: 1.6 W/kg / (averaged over 1 gram)

Fluid Type	Brain 150MHz		Body 150MHz		Brain 450MHz		Body 450MHz	
	Target	Measured	Target	Measured	Target	Measured	Target	Measured
Dielectric Constant	**52.3** (+/- 5%)	54.2	**61.9** (+/- 5%)	60.0	**43.5** (+/- 5%)	43.6	**56.7** (+/- 5%)	57.8
Conductivity	**0.76** (+/- 5%)	0.78	**0.80** (+/- 5%)	0.82	**0.87** (+/- 5%)	0.86	**0.94** (+/- 5%)	0.93
Ambient Temperature	23.3 °C		23.3 °C		23.3 °C		23.3 °C	
Fluid Temperature	22.3 °C		22.3 °C		22.3 °C		22.3 °C	
Fluid Depth	≥ 15 cm		≥ 15 cm		≥ 15 cm		≥ 15 cm	
Atmospheric Pressure	101.0 kPa		101.0 kPa		101.0 kPa		101.0 kPa	
Relative Humidity	45 %		45 %		45 %		45 %	

Note(s):

1. The transmission band of the DUT is less than 10 MHz, therefore mid channel data only is reported (per FCC OET Bulletin 65, Supplement C, Edition 01-01 - see reference [3]).
2. The ambient and fluid temperatures were measured prior to, and during, the fluid dielectric parameter check and the SAR evaluation. The temperatures listed in the table above were consistent for all measurement periods.
3. The dielectric properties of the simulated fluids were verified prior to the evaluation using an 85070C Dielectric Probe Kit and an 8753E Network Analyzer (see Appendix E for printout of measured fluid dielectric parameters).

5.0 DETAILS OF SAR EVALUATION

The Vertex Standard Co., Ltd. Model: HX470S Portable VHF/UHF Marine/MURS/FRS PTT Radio Transceiver FCC ID: K66HX470S was found to be compliant for localized Specific Absorption Rate (Uncontrolled Exposure) based on the test provisions and conditions described below. The detailed test setup photographs are shown in Appendix F.

1. The DUT was evaluated 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 side of the DUT and the outer surface of the planar phantom for the duration of the tests.
2. The DUT was evaluated in a body-worn configuration with the back of the device placed parallel to the outer surface of the planar phantom. The attached belt-clip was positioned touching the planar phantom and provided a 2.5 cm separation distance between the back of the DUT and the outer surface of the planar phantom. The DUT was evaluated for body-worn SAR with the lapel-clip speaker-microphone accessory connected.
3. The DUT was evaluated for SAR at maximum power with no turn-on delay.
4. The conducted power levels were measured before and after each test according to the procedures described in FCC §2.1046. If the conducted power level measured after each test varied more than 5% from the initial power level, the DUT was retested. Any unusual anomalies over the course of the test also warranted a re-evaluation.
5. The DUT was tested in unmodulated continuous transmit operation (Continuous Wave mode at 100% duty cycle) with the transmit key constantly depressed. The 50% duty cycle compensation reported for this push-to-talk device assumes a transmit/receive cycle of equal time base.
6. The location of the maximum spatial SAR distribution (Hot Spot) was determined relative to the device and its antenna.
7. The DUT was tested with a fully charged battery.

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 in accordance with FCC OET Bulletin 65, Supplement C (Edition 01-01) 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 DASY3 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 20mm x 20mm.

c. Based on the area scan data, the area of maximum absorption was determined by spline interpolation. Around this point, a volume of 40 x 40 x 35 mm (fine resolution volume scan, zoom scan) was assessed by measuring 5 x 5 x 7 points.

d. The 1g and 10g spatial peak SAR was determined as follows:

1. The first step was an extrapolation 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 1.3 mm (see probe calibration document in Appendix D). The extrapolation was based on a least square algorithm [W. Gander, Computermathematik, p.168-180] (see reference [6]). Through the points in the first 3 cm in all z-axis, polynomials of the fourth order were calculated. This polynomial was then used to evaluate the points between the surface and the probe tip.

2. The next step used 3D-spline interpolation to get all points within the measured volume in a 1mm grid (35000 points). The 3D-spline is composed of three one-dimensional splines with the "Not a knot" condition [W. Gander, Computermathematik, p.141-150] (x, y and z -direction) [Numerical Recipes in C, Second Edition, p.123ff] (see reference [6]).

3. The maximal interpolated value was searched with a straightforward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1g or 10g) were computed using the 3D-spline interpolation algorithm. 8000 points (20x20x20) were interpolated to calculate the average.

EVALUATION PROCEDURES (Cont.)

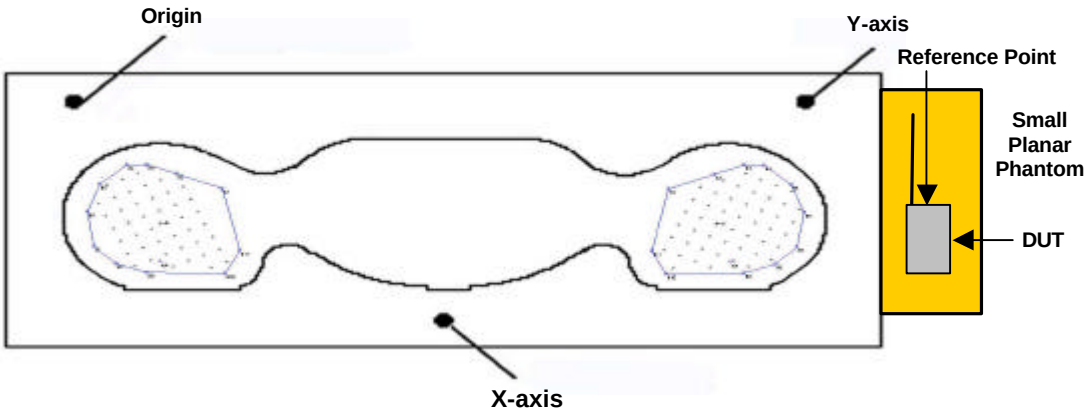


Figure 1. Phantom Reference Point & DUT Positioning
Face-held Configuration

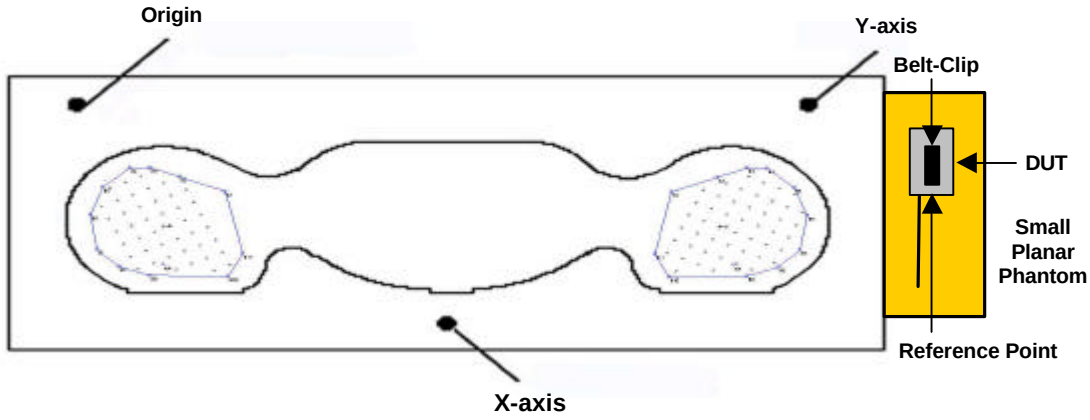


Figure 2. Phantom Reference Point & DUT Positioning
Body-worn Configuration

7.0 SYSTEM PERFORMANCE CHECK

Prior to the evaluation a system check was performed with a planar phantom using a 300MHz dipole and a 450MHz dipole respectively (see Appendix C for system validation procedures). The dielectric parameters of the simulated tissue fluids were measured prior to the system check using an 85070C Dielectric Probe Kit and an 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 check test plots).

SYSTEM PERFORMANCE CHECK											
Test Date	Equiv. Tissue	SAR 1g (W/kg)		Dielectric Constant e_r		Conductivity s (mho/m)		r (Kg/m^3)	Ambient Temp.	Fluid Temp.	Fluid Depth
		IEE Target	Measured	IEEE Target	Measured	IEEE Target	Measured				
01/30/03	300MHz (Brain)	**0.75 ±10%**	0.720	**45.3 ±5%**	45.5	**0.87 ±5%**	0.88	1000	23.3 °C	22.3 °C	≥ 15 cm
01/30/03	450MHz (Brain)	**1.23 ±10%**	1.20	**43.5 ±5%**	43.6	**0.87 ±5%**	0.86	1000	23.3 °C	22.3 °C	≥ 15 cm

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.

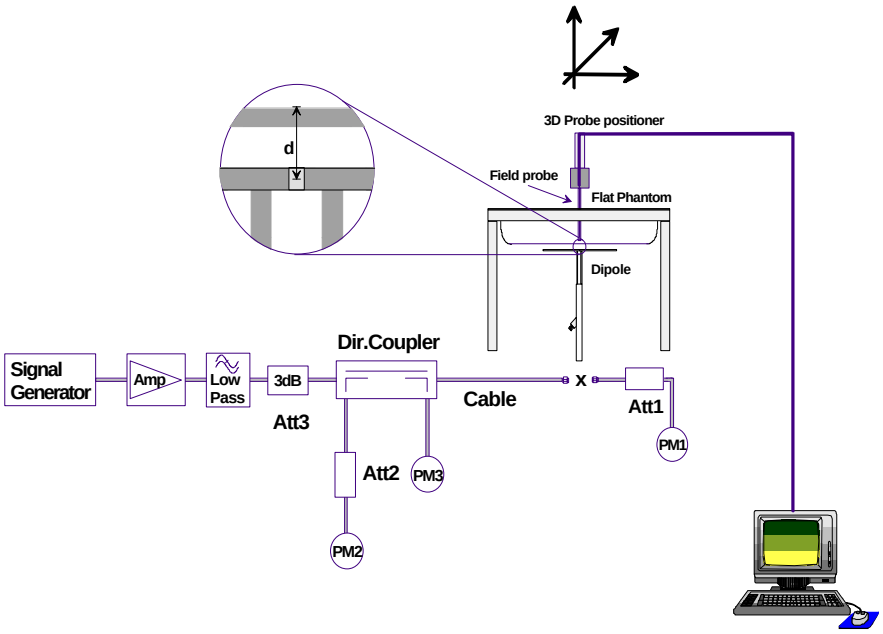


Figure 3. System Check Setup Diagram

300MHz System Check Setup Photograph

450MHz System Check Setup Photograph

8.0 SIMULATED TISSUES

The 150MHz, 300MHz, and 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 according to standardized procedures, and measured for dielectric parameters (permittivity and conductivity).

TISSUE MIXTURES (%)					
INGREDIENT	**300MHz Brain (System Check)**	**150MHz Brain (DUT Evaluation)**	**150MHz Body (DUT Evaluation)**	**450MHz Brain (System Check & DUT Evaluation)**	**450MHz Body (DUT Evaluation)**
Water	37.56	38.35	46.6	38.56	52.00
Sugar	55.32	55.5	49.7	56.32	45.65
Salt	5.95	5.15	2.6	3.95	1.75
HEC	0.98	0.9	1.0	0.98	0.50
Bactericide	0.19	0.1	0.1	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:	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:	Planar Phantom (Small)
Shell Material:	Plexiglas
Bottom Thickness:	2.0 mm ± 0.1mm
Dimensions:	36.5cm (L) x 22.5cm (W) x 20.3cm (H); Back Plane: 25.3cm (H)

Validation Phantom (for devices £ 450MHz)

Type:	Large Planar Phantom
Shell Material:	Plexiglas
Bottom Thickness:	6.2 mm ± 0.1mm
Dimensions:	83.5 cm (L) x 36.9 cm (W) x 21.8 cm (H)

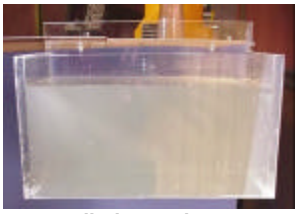
11.0 PROBE SPECIFICATION (ET3DV6)

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)
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

12.0 SMALL PLANAR PHANTOM

The small planar phantom is constructed of Plexiglas material with a 2.0mm shell thickness for face-held and body-worn SAR evaluations. The small planar phantom is mounted onto the outside left head section of the DASY3 system.



Small Planar Phantom

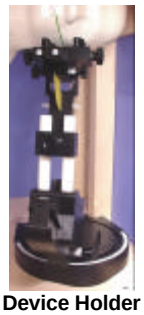
13.0 LARGE PLANAR PHANTOM

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

Large Planar Phantom

14.0 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

15.0 TEST EQUIPMENT LIST

SAR MEASUREMENT SYSTEM		
EQUIPMENT	**SERIAL NO.**	**CALIBRATION DATE**
DASY3 System	-	-
-Robot	599396-01	N/A
-ET3DV6 E-Field Probe	1590	April 2002
-300MHz Validation Dipole	135	Oct 2002
-450MHz Validation Dipole	136	Oct 2002
-900MHz Validation Dipole	054	June 2001
-1800MHz Validation Dipole	247	June 2001
-2450MHz Validation Dipole	150	Oct 2002
-SAM Phantom V4.0C	N/A	N/A
-Small Planar Phantom	N/A	N/A
-Large Planar Phantom	N/A	N/A
85070C Dielectric Probe Kit	N/A	N/A
Gigatronics 8652A Power Meter	1835272	Feb 2002
-Power Sensor 80701A	1833535	Feb 2002
-Power Sensor 80701A	1833542	Mar 2002
E4408B Spectrum Analyzer	US39240170	Nov 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

16.0 MEASUREMENT UNCERTAINTIES

Error Description	Uncertainty Value ±%	Probability Distribution	Divisor	c_i 1g	Standard Uncertainty ±% (1g)	v_i or v_{eff}
Measurement System						
Probe calibration	± 4.8	Normal	1	1	± 4.8	∞
Axial isotropy of the probe	± 4.7	Rectangular	√3	$(1-c_p)$	± 1.9	∞
Spherical isotropy of the probe	± 9.6	Rectangular	√3	(c_p)	± 3.9	∞
Spatial resolution	± 0.0	Rectangular	√3	1	± 0.0	∞
Boundary effects	± 5.5	Rectangular	√3	1	± 3.2	∞
Probe linearity	± 4.7	Rectangular	√3	1	± 2.7	∞
Detection limit	± 1.0	Rectangular	√3	1	± 0.6	∞
Readout electronics	± 1.0	Normal	1	1	± 1.0	∞
Response time	± 0.8	Rectangular	√3	1	± 0.5	∞
Integration time	± 1.4	Rectangular	√3	1	± 0.8	∞
RF ambient conditions	± 3.0	Rectangular	√3	1	± 1.7	∞
Mech. constraints of robot	± 0.4	Rectangular	√3	1	± 0.2	∞
Probe positioning	± 2.9	Rectangular	√3	1	± 1.7	∞
Extrapolation & integration	± 3.9	Rectangular	√3	1	± 2.3	∞
Test Sample Related						
Device positioning	± 6.0	Normal	√3	1	± 6.7	12
Device holder uncertainty	± 5.0	Normal	√3	1	± 5.9	8
Power drift	± 5.0	Rectangular	√3		± 2.9	∞
Phantom and Setup						
Phantom uncertainty	± 4.0	Rectangular	√3	1	± 2.3	∞
Liquid conductivity (target)	± 5.0	Rectangular	√3	0.6	± 1.7	∞
Liquid conductivity (measured)	± 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					± **13.7**	
Expanded Uncertainty (k=2) (95% Confidence Level)					± **27.5**	

Measurement Uncertainty Table in accordance with IEEE Std 1528 (Draft - 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 Standards Coordinating Committee 34, Std 1528-200X, “DRAFT Recommended Practice for Determining the Spatial-Peak Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques”.

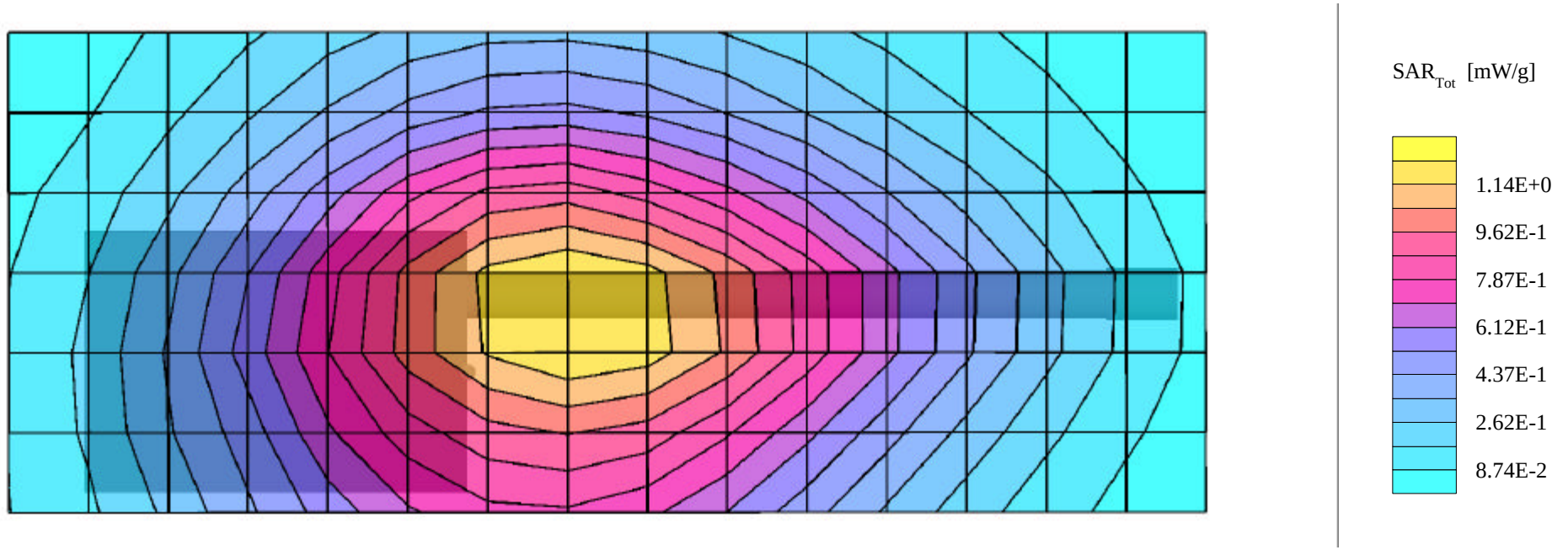
[6] W. Gander, *Computermathematick*, Birkhaeuser, Basel: 1992.

APPENDIX A - SAR MEASUREMENT DATA

Vertex Standard Co., Ltd. FCC ID: K66HX470S

Small Planar Phantom; Planar Section; Position: (90°,180°)
Probe: ET3DV6 - SN1590; ConvF(9.40,9.40,9.40); Crest factor: 1.0
150 MHz Brain : σ = 0.78 mho/m ε_r = 54.2 ρ = 1.00 g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.22 dB
SAR (1g): 1.15 mW/g, SAR (10g): 0.867 mW/g

Face-Held SAR at 2.5cm Separation Distance
Vertex HX470S VHF/UHF Marine/MURS/FRS Radio Transceiver
7.4V Lithium-Ion Battery
Continuous Wave Mode
Marine Band Mid Channel [156.80 MHz]
Conducted Power: 5.15 Watts
Ambient temp. 23.3°C; Fluid temp. 22.3°C
Date Tested: January 30, 2003

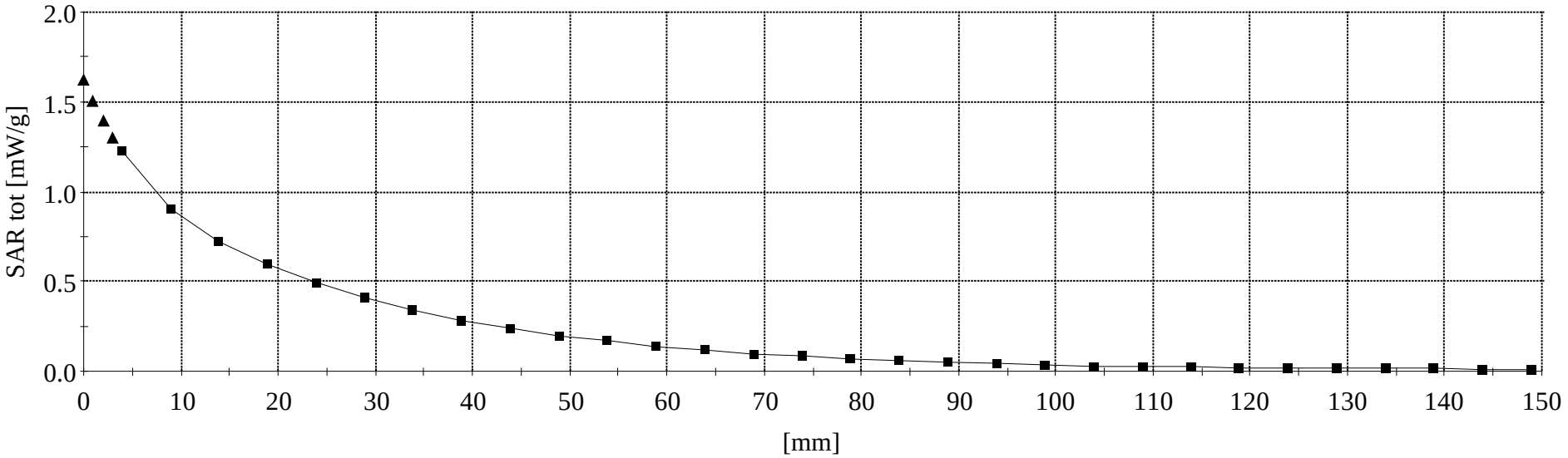


Vertex Standard Co., Ltd. FCC ID: K66HX470S

Small Planar Phantom; Planar Section
Probe: ET3DV6 - SN1590; ConvF(9.40,9.40,9.40); Crest factor: 1.0
150 MHz Brain : σ = 0.78 mho/m ε_r = 54.2 ρ = 1.00 g/cm^3

Z-Axis Extrapolation at Peak SAR Location

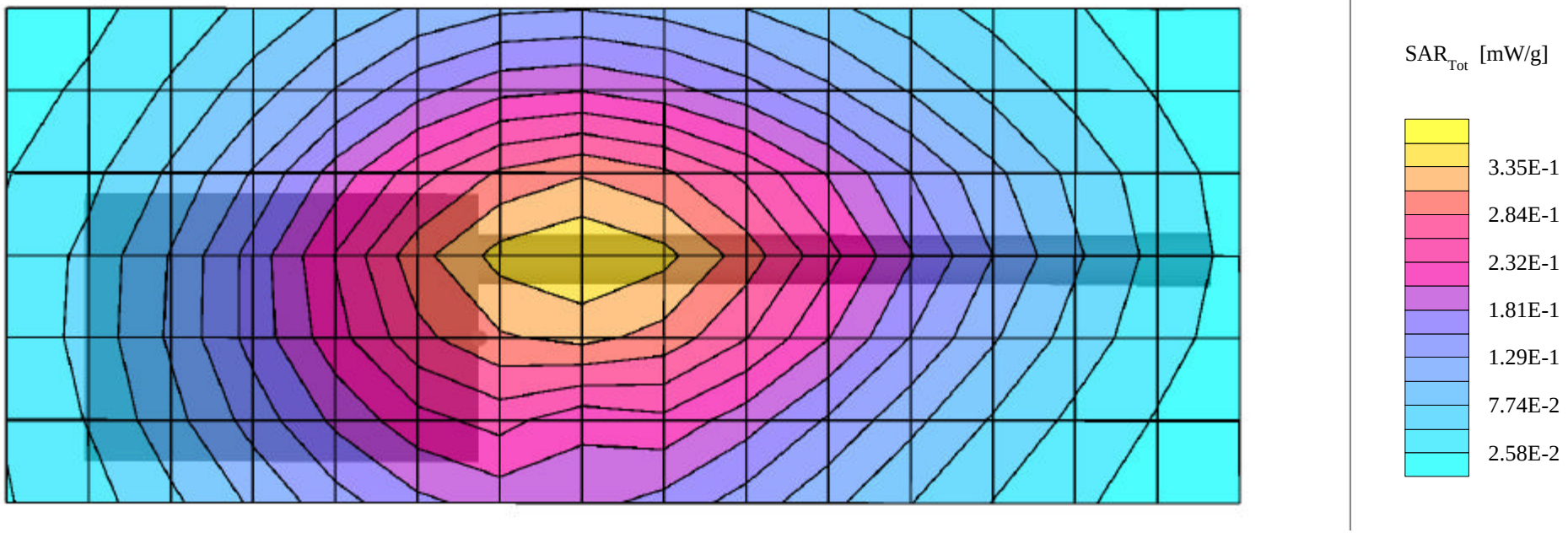
Face-Held SAR at 2.5cm Separation Distance
Vertex HX470S VHF/UHF Marine/MURS/FRS Radio Transceiver
7.4V Lithium-Ion Battery
Continuous Wave Mode
Marine Band Mid Channel [156.80 MHz]
Conducted Power: 5.15 Watts
Ambient temp. 23.3°C; Fluid temp. 22.3°C
Date Tested: January 30, 2003



Vertex Standard Co., Ltd. FCC ID: K66HX470S

Small Planar Phantom; Planar Section; Position: (90°,180°)
Probe: ET3DV6 - SN1590; ConvF(9.40,9.40,9.40); Crest factor: 1.0
150 MHz Brain : σ = 0.78 mho/m ε_r = 54.2 ρ = 1.00 g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: 0.04 dB
SAR (1g): 0.331 mW/g, SAR (10g): 0.250 mW/g

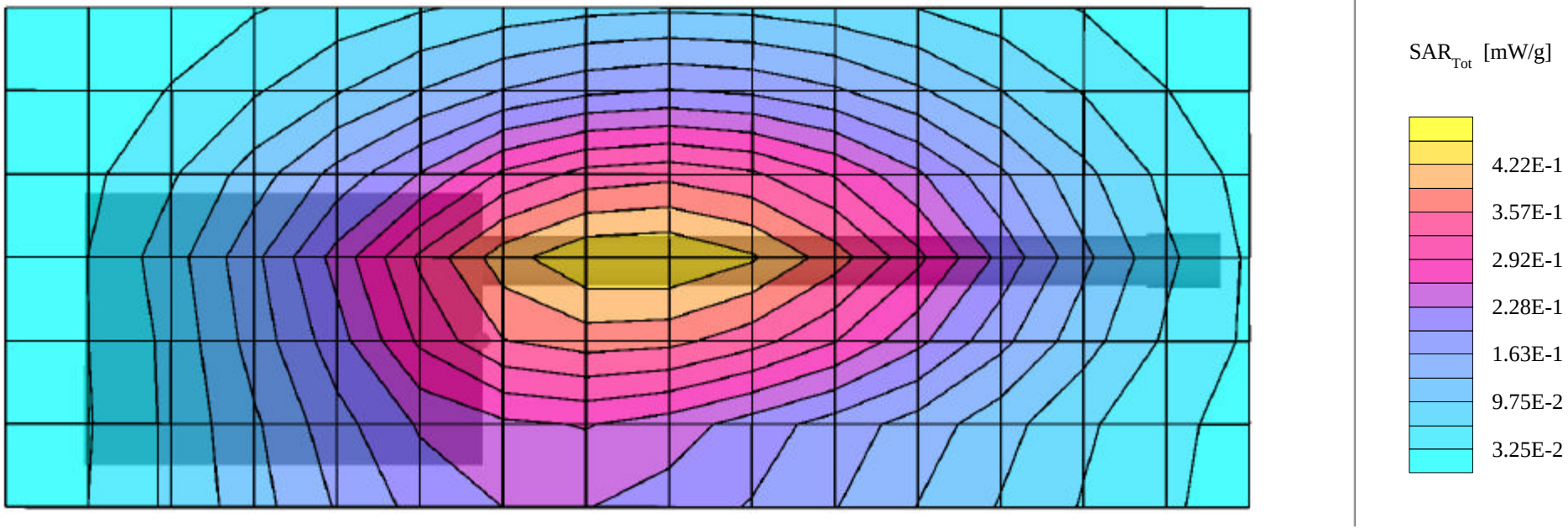
Face-Held SAR at 2.5cm Separation Distance
Vertex HX470S VHF/UHF Marine/MURS/FRS Radio Transceiver
7.4V Lithium-Ion Battery
Continuous Wave Mode
MURS Mid Channel [151.90 MHz]
Conducted Power: 1.95 Watts
Ambient temp. 23.3°C; Fluid temp. 22.3°C
Date Tested: January 30, 2003



Vertex Standard Co., Ltd. FCC ID: K66HX470S

Small Planar Phantom; Planar Section; Position: (90°,180°)
Probe: ET3DV6 - SN1590; ConvF(7.80,7.80,7.80); Crest factor: 1.0
450 MHz Brain: σ = 0.86 mho/m ε_r = 43.6 ρ = 1.00 g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.04 dB
SAR (1g): 0.448 mW/g, SAR (10g): 0.314 mW/g

Face-Held SAR at 2.5cm Separation Distance
Vertex HX470S VHF/UHF Marine/MURS/FRS Radio Transceiver
7.4V Lithium-Ion Battery
Continuous Wave Mode
FRS Band Mid Channel [467.5625 MHz]
Conducted Power: 0.505 Watts
Ambient temp. 23.3°C; Fluid temp. 23.9°C
Date Tested: January 30, 2003

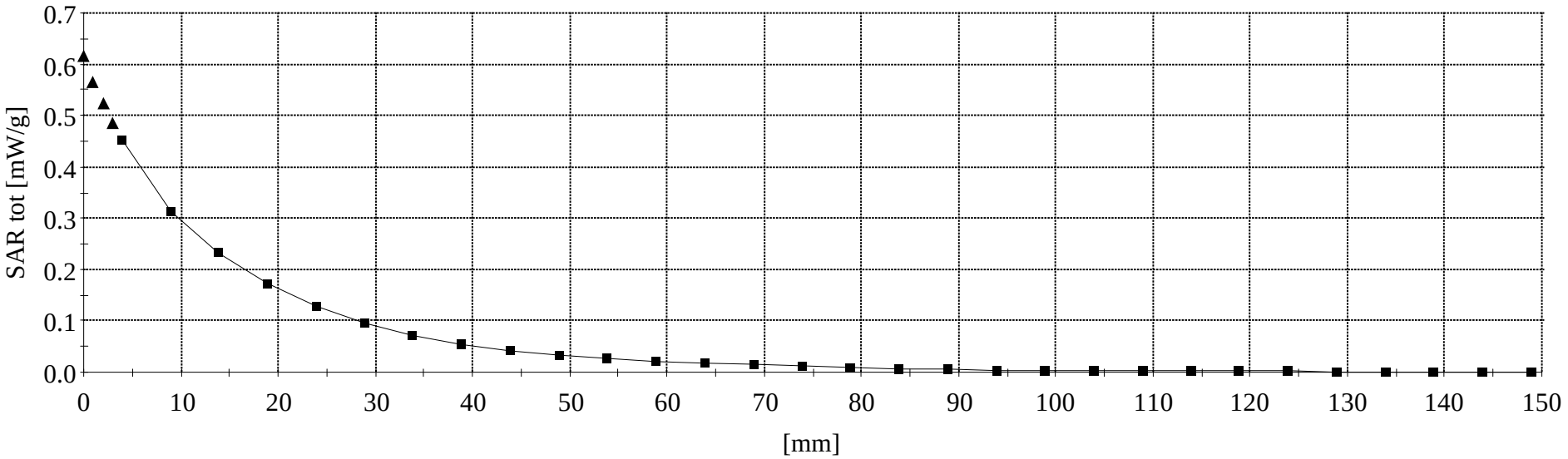


Vertex Standard Co., Ltd. FCC ID: K66HX470S

Small Planar Phantom; Planar Section
Probe: ET3DV6 - SN1590; ConvF(7.80,7.80,7.80); Crest factor: 1.0
450 MHz Brain: σ = 0.86 mho/m ε_r = 43.6 ρ = 1.00 g/cm^3

Z-Axis Extrapolation at Peak SAR Location

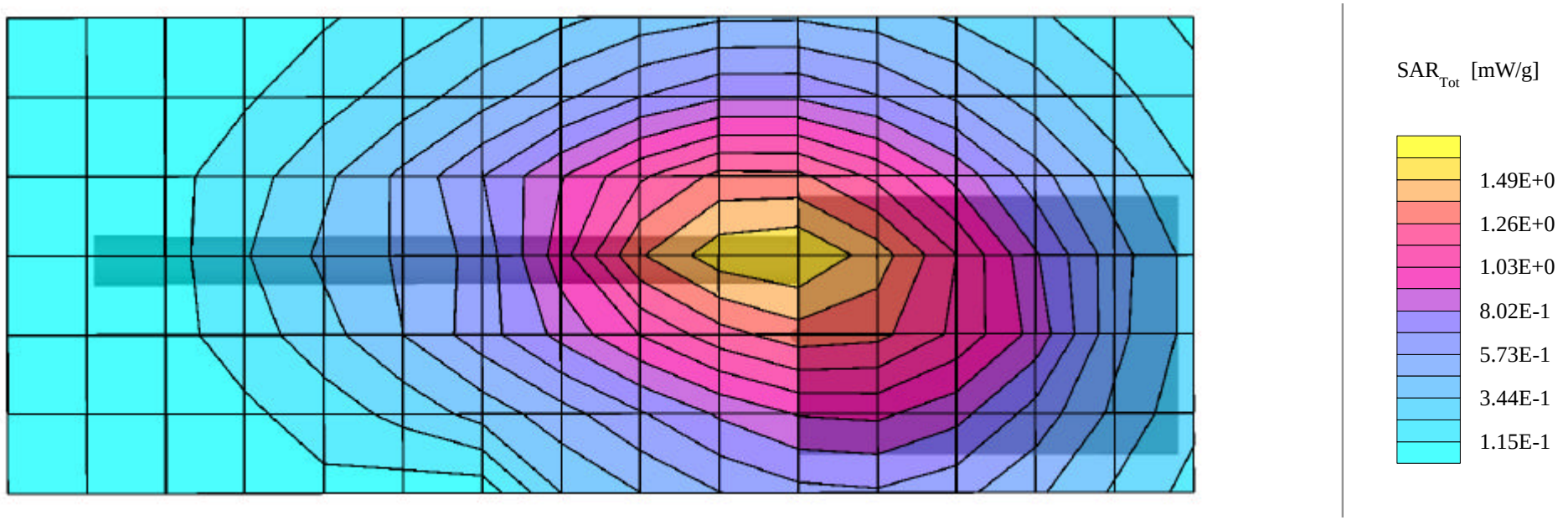
Face-Held SAR at 2.5cm Separation Distance
Vertex HX470S VHF/UHF Marine/MURS/FRS Radio Transceiver
7.4V Lithium-Ion Battery
Continuous Wave Mode
FRS Band Mid Channel [467.5625 MHz]
Conducted Power: 0.505 Watts
Ambient temp. 23.3°C; Fluid temp. 23.9°C
Date Tested: January 30, 2003



Vertex Standard Co., Ltd. FCC ID: K66HX470S

Small Planar Phantom; Planar Section; Position: (270°,180°)
Probe: ET3DV6 - SN1590; ConvF(9.10,9.10,9.10); Crest factor: 1.0
150 MHz Muscle: σ = 0.82 mho/m ε_r = 60.0 ρ = 1.00 g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.21 dB
SAR (1g): 1.64 mW/g, SAR (10g): 1.22 mW/g

Body-Worn SAR with Belt-Clip & Lapel-Clip Speaker-Microphone
2.5cm Belt-Clip Separation Distance to Planar Phantom
Vertex HX470S VHF/UHF Marine/MURS/FRS Radio Transceiver
7.4V Lithium-Ion Battery
Continuous Wave Mode
Marine Band Mid Channel [156.80 MHz]
Conducted Power: 5.15 Watts
Ambient temp. 23.3°C; Fluid temp. 22.3°C
Date Tested: January 30, 2003

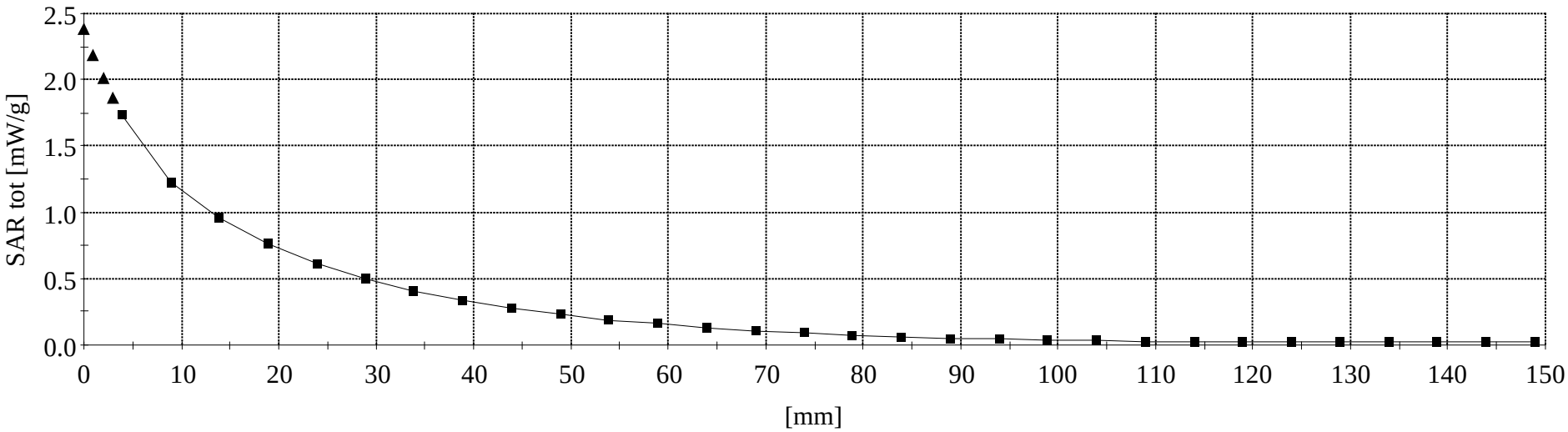


Vertex Standard Co., Ltd. FCC ID: K66HX470S

Small Planar Phantom; Planar Section
Probe: ET3DV6 - SN1590; ConvF(9.10,9.10,9.10); Crest factor: 1.0
150 MHz Muscle: σ = 0.82 mho/m ε_r = 60.0 ρ = 1.00 g/cm^3

Z-Axis Extrapolation at Peak SAR Location

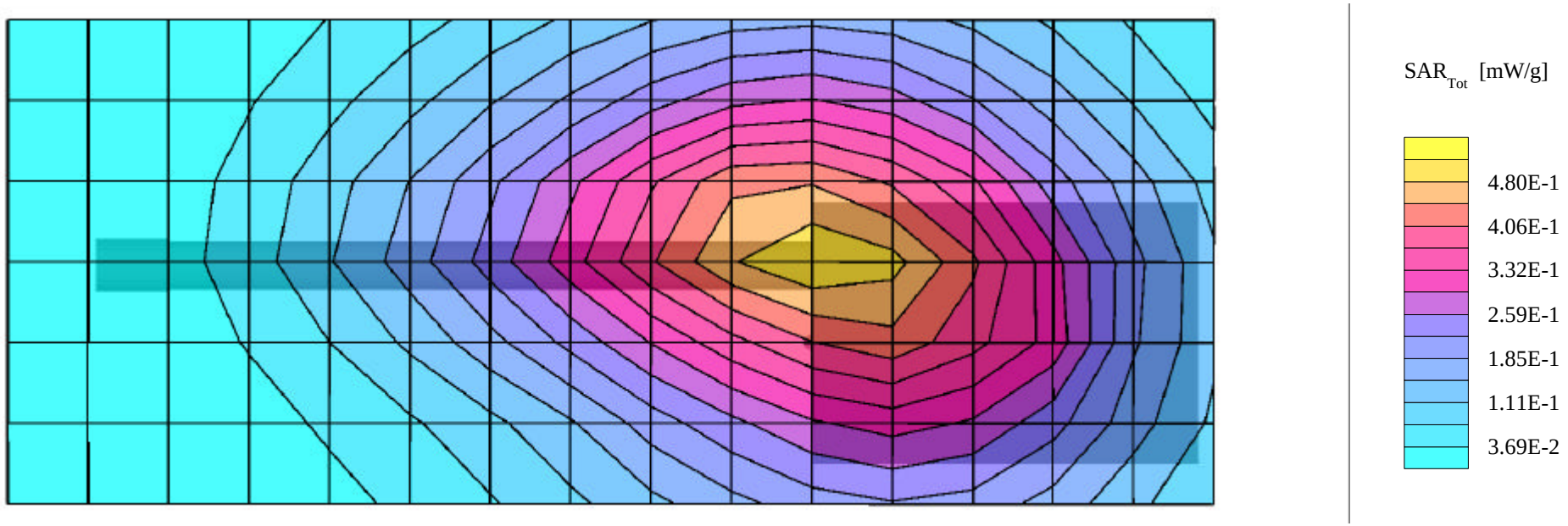
Body-Worn SAR with Belt-Clip & Lapel-Clip Speaker-Microphone
2.5cm Belt-Clip Separation Distance to Planar Phantom
Vertex HX470S VHF/UHF Marine/MURS/FRS Radio Transceiver
7.4V Lithium-Ion Battery
Continuous Wave Mode
Marine Band Mid Channel [156.80 MHz]
Conducted Power: 5.15 Watts
Ambient temp. 23.3°C; Fluid temp. 22.3°C
Date Tested: January 30, 2003



Vertex Standard Co., Ltd. FCC ID: K66HX470S

Small Planar Phantom; Planar Section; Position: (270°,180°)
Probe: ET3DV6 - SN1590; ConvF(9.10,9.10,9.10); Crest factor: 1.0
150 MHz Muscle: σ = 0.82 mho/m ε_r = 60.0 ρ = 1.00 g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.16 dB
SAR (1g): 0.472 mW/g, SAR (10g): 0.353 mW/g

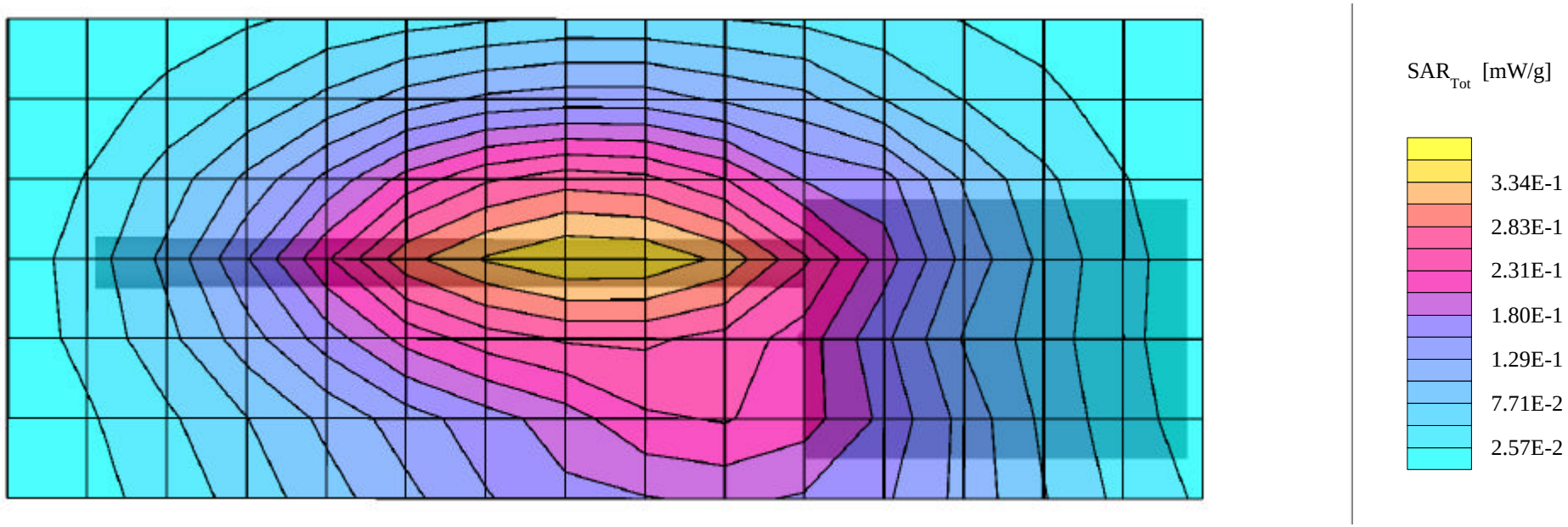
Body-Worn SAR with Belt-Clip & Lapel-Clip Speaker-Microphone
2.5cm Belt-Clip Separation Distance to Planar Phantom
Vertex HX470S VHF/UHF Marine/MURS/FRS Radio Transceiver
7.4V Lithium-Ion Battery
Continuous Wave Mode
MURS Band Mid Channel [151.90 MHz]
Conducted Power: 1.95 Watts
Ambient temp. 23.3°C; Fluid temp. 22.3°C
Date Tested: January 30, 2003



Vertex Standard Co., Ltd. FCC ID: K66HX470S

Small Planar Phantom; Planar Section; Position: (270°,180°)
Probe: ET3DV6 - SN1590; ConvF(7.90,7.90,7.90); Crest factor: 1.0
450 MHz Muscle: σ = 0.93 mho/m ε_r = 57.8 ρ = 1.00 g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.04 dB
SAR (1g): 0.480 mW/g, SAR (10g): 0.340 mW/g

Body-Worn SAR with Belt-Clip & Lapel-Clip Speaker-Microphone
2.5cm Belt-Clip Separation Distance to Planar Phantom
Vertex HX470S VHF/UHF Marine/MURS/FRS Radio Transceiver
7.4V Lithium-Ion Battery
Continuous Wave Mode
FRS Band Mid Channel [467.5625 MHz]
Conducted Power: 0.505 Watts
Ambient temp. 23.3°C; Fluid temp. 22.3°C
Date Tested: January 30, 2003

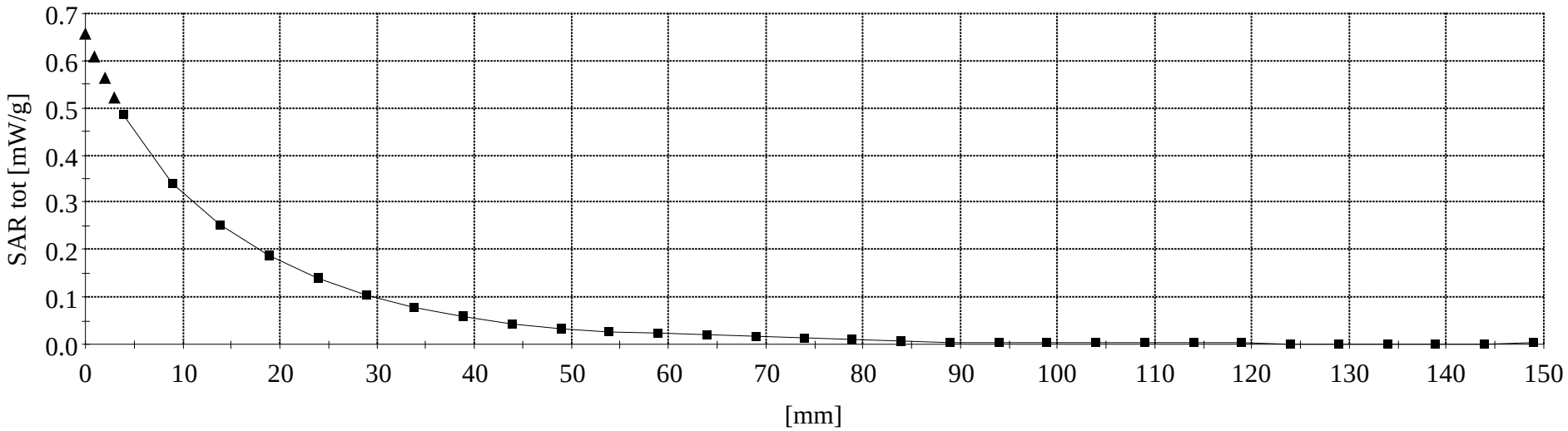


Vertex Standard Co., Ltd. FCC ID: K66HX470S

Small Planar Phantom; Planar Section
Probe: ET3DV6 - SN1590; ConvF(7.90,7.90,7.90); Crest factor: 1.0
450 MHz Muscle: σ = 0.93 mho/m ε_r = 57.8 ρ = 1.00 g/cm^3

Z-Axis Extrapolation at Peak SAR Location

Body-Worn SAR with Belt-Clip & Lapel-Clip Speaker-Microphone
2.5cm Belt-Clip Separation Distance to Planar Phantom
Vertex HX470S VHF/UHF Marine/MURS/FRS Radio Transceiver
7.4V Lithium-Ion Battery
Continuous Wave Mode
FRS Band Mid Channel [467.5625 MHz]
Conducted Power: 0.505 Watts
Ambient temp. 23.3°C; Fluid temp. 22.3°C
Date Tested: January 30, 2003



APPENDIX B - SYSTEM CHECK DATA

System Performance Check - 300MHz Dipole

Large Planar Phantom; Planar Section

Probe: ET3DV6 - SN1590; ConvF(8.20,8.20,8.20); Crest factor: 1.0; 300MHz Brain: σ = 0.88 mho/m ε_r = 45.5 ρ = 1.00 g/cm^3

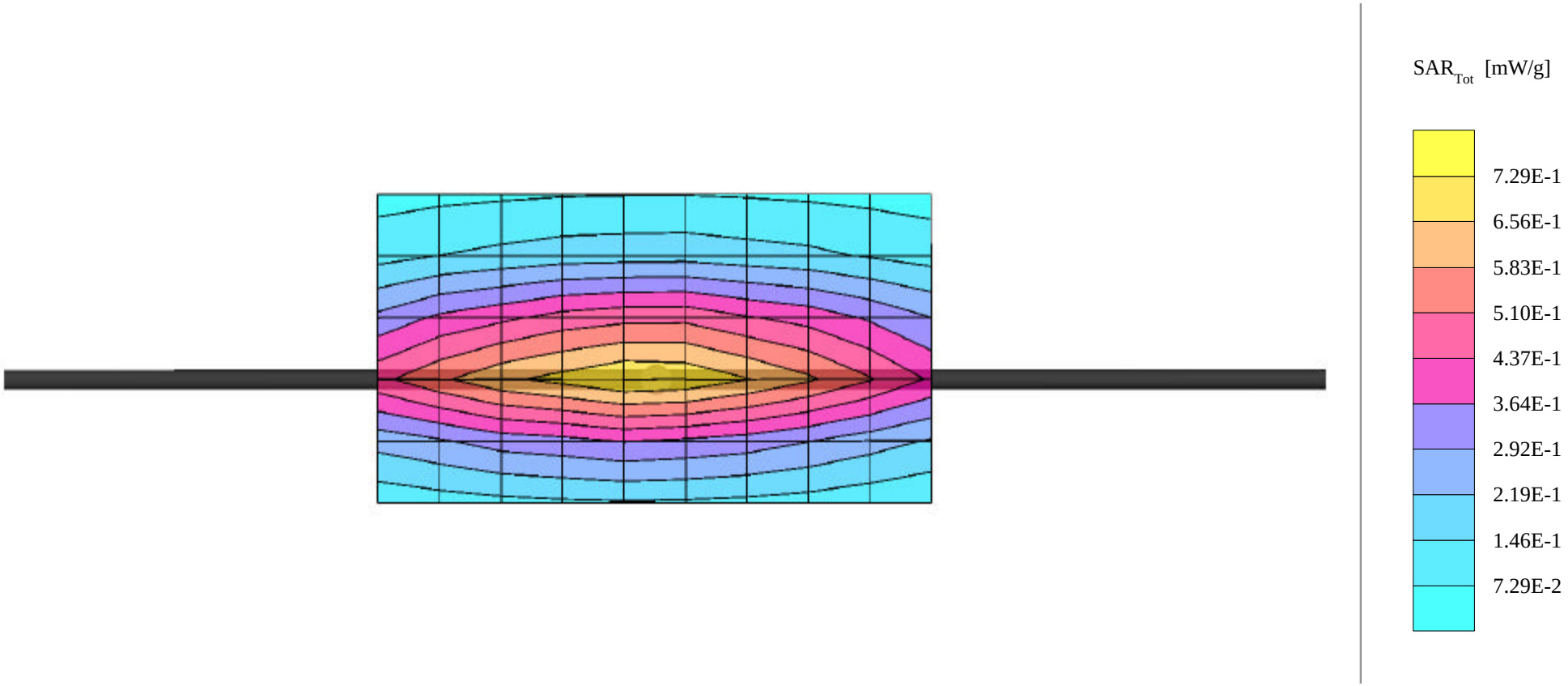
Cube 5x5x7: Peak: 1.16 mW/g, SAR (1g): 0.720 mW/g, SAR (10g): 0.473 mW/g, (Worst-case extrapolation)

Penetration depth: 12.2 (10.4, 14.8) [mm]; Powerdrift: 0.02 dB

Ambient temp. 23.3°C; Fluid temp. 22.3°C

Forward Conducted Power: 250 mW

Test Date: January 30, 2003



System Performance Check - 450MHz Dipole

Large Planar Phantom; Planar Section

Probe: ET3DV6 - SN1590; ConvF(7.80,7.80,7.80); Crest factor: 1.0; 450MHz Brain: σ = 0.86 mho/m ε_r = 43.6 ρ = 1.00 g/cm^3

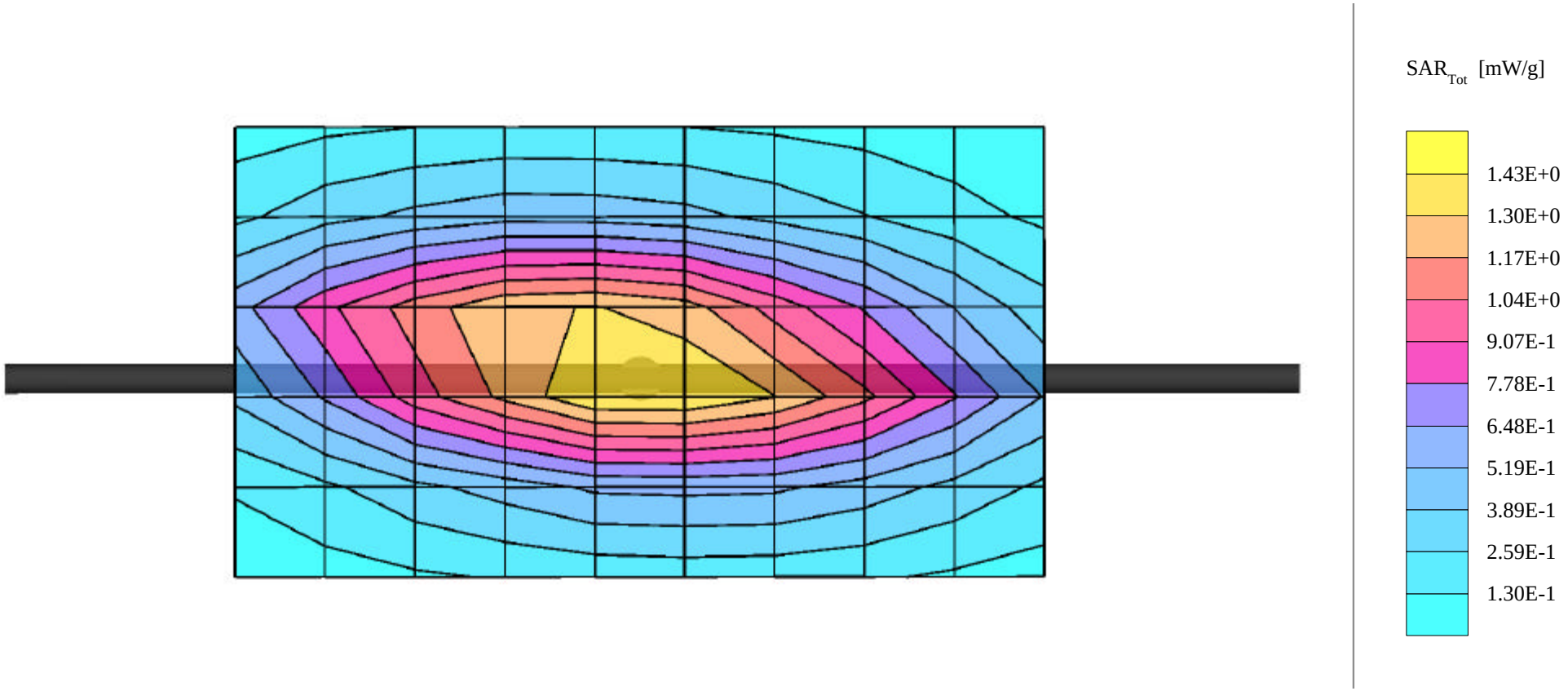
Cube 5x5x7: Peak: 1.92 mW/g, SAR (1g): 1.20 mW/g, SAR (10g): 0.783 mW/g, (Worst-case extrapolation)

Penetration depth: 12.1 (10.4, 14.1) [mm]; Powerdrift: -0.03 dB

Ambient temp. 23.3°C; Fluid temp. 22.3°C

Forward Conducted Power: 250 mW

Test Date: January 30, 2003



APPENDIX C - SYSTEM VALIDATION