

 Celltech Testing and Engineering Services Lab	<u>Date(s) of Evaluation</u> Nov. 1-2, 2012	<u>Test Report Serial No.</u> 101712AXI-T1202S	<u>Test Report Revision No.</u> Rev. 1.3 (4th Release)	 Test Lab Certificate No. 2470.01
	<u>Test Report Issue Date</u> Dec. 20, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	




## DECLARATION OF COMPLIANCE - SAR RF EXPOSURE EVALUATION (FCC/IC)

<b>Test Lab Information</b>	<b>Name</b>	CELLTECH LABS INC.				
	<b>Address</b>	21-364 Lougheed Road, Kelowna, B.C. V1X 7R8 Canada				
<b>Test Lab Accreditation(s)</b>	<b>A2LA</b>	ISO/IEC 17025:2005 (A2LA Test Lab Certificate No. 2470.01)				
<b>Applicant Information</b>	<b>Name</b>	VERTEX STANDARD USA INC.				
	<b>Address</b>	8000 West Sunrise Blvd. Ft. Lauderdale, FL 33322, USA				
<b>Application Type(s)</b>	<b>FCC</b>	TCB Certification		<b>IC</b>	CB Certification	
<b>Standard(s) Applied</b>	<b>FCC</b>	47 CFR §2.1093		<b>IC</b>	Health Canada Safety Code 6	
<b>Procedure(s) Applied</b>	<b>FCC</b>	OET Bulletin 65, Supplement C		<b>FCC</b>	KDB 447498 D01v05	
	<b>FCC</b>	KDB 643646 D01v01		<b>IC</b>	RSS-102 Issue 4	
	<b>IEEE</b>	1528-2003		<b>IEC</b>	62209-1:2005, 62209-2:2010	
<b>Device Classification(s)</b>	<b>FCC</b>	Licensed Non-Broadcast Transmitter Held to Face (TNF) - FCC Part 90				
	<b>IC</b>	Land Mobile Radio Transmitter/Receiver (27.41-960 MHz) - RSS-119 Issue 10				
<b>Device Identifier(s)</b>	<b>FCC ID:</b>	AXI11134720		<b>IC</b>	10239A-11134720	
<b>Device Model(s)</b>	EVX-531-G7-5					
<b>Device Model(s) Tested</b>	EVX-531-G7-5 (S/N: 212B010073)					
<b>Test Sample Revision No.s</b>	<b>Hardware</b>	C		<b>Firmware</b>	CPU: Ver.0.01.00.56 - DSP: Ver.0.01.00.30	
<b>Date of Sample Receipt</b>	Oct. 17, 2012		<b>Date(s) of SAR Evaluations</b>		Nov. 1-2, 2012	
<b>Device Description</b>	Portable FM UHF Push-To-Talk (PTT) Radio Transceiver					
<b>Transmit Frequency Range</b>	<b>FCC</b>	450.0 - 512.0 MHz				
	<b>IC</b>	450.0 - 470.0 MHz				
<b>Manuf. Rated Output Power</b>	5 Watts (Conducted)			<b>Manuf. Tolerance Specification</b>	+/- 10%	
<b>Antenna Type(s) Tested</b>	See manufacturer's accessory listing (Section 7.0)					
<b>Battery Type(s) Tested</b>	Li-ion	7.4 V	1350mAh	P/N: FNB-V133LIU	a	
	Li-ion	7.4 V	2250 mAh	P/N: FNB-V134LIU	b	
<b>Body-worn Accessories Tested</b>	Belt-Clip (contains metal)				P/N: BA1251500	1
<b>Audio Accessories Tested</b>	See manufacturer's accessory listing (Section 7.0)					
<b>Max. SAR Level(s) Evaluated</b>	Face-held	2.75 W/kg	1g	50% PTT duty cycle	Occupational / Controlled Exposure	
	Body-worn	4.14 W/kg	1g	50% PTT duty cycle	Occupational / Controlled Exposure	
<b>FCC Spatial Peak SAR Limit</b>	Head/Body	8.0 W/kg	1g	50% PTT duty cycle	Occupational / Controlled Exposure	
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 Safety Code 6 for the Occupational / Controlled Exposure environment. The device was tested in accordance with the measurement procedures specified in FCC OET Bulletin 65, Supplement C (Edition 01-01), Industry Canada RSS-102 Issue 4, IEEE Standard 1528-2003 and IEC International Standard 62209-1:2005. All measurements were performed in accordance with the 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.						
<b>Test Report Approved By</b>			<b>Mike Meaker</b>	<b>Engineering Technologist</b>	<b>Celltech Labs Inc.</b>	

<b>Applicant:</b>	Vertex Standard USA Inc.	<b>FCC ID:</b>	AXI11134720	<b>IC ID:</b>	10239A-11134720	
<b>DUT Type:</b>	Portable UHF PTT Radio Transceiver	<b>Models:</b>	EVX-531-G7-5	450 - 512 MHz		
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	<u>Date(s) of Evaluation</u> Nov. 1-2, 2012	<u>Test Report Serial No.</u> 101712AXI-T1202S	<u>Test Report Revision No.</u> Rev. 1.3 (4th Release)	 
	<u>Test Report Issue Date</u> Dec. 20, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Test Lab Certificate No. 2470.01

REVISION HISTORY			
REVISION NO.	DESCRIPTION	IMPLEMENTED BY	RELEASE DATE
1.0	Initial Release	Mike Meaker	Nov. 6, 2012
1.1	2 <sup>nd</sup> release - removed logo from footer	Mike Meaker	Nov. 9, 2012
1.2	3 <sup>rd</sup> release - Changed battery model numbers to add a "U" at the end of both	Mike Meaker	Dec. 18, 2012
1.3	4 <sup>th</sup> release - Changed battery model numbers so that that both "U" and no "U" endings are included.	Mike Meaker	Dec. 20, 2012

TEST REPORT SIGN-OFF			
DEVICE TESTED BY	REPORT PREPARED BY	QA REVIEW BY	REPORT APPROVED BY
Mike Meaker	Mike Meaker	Mike Meaker	Mike Meaker

<b>Applicant:</b>	<b>Vertex Standard USA Inc.</b>	<b>FCC ID:</b>	<b>AXI11134720</b>	<b>IC ID:</b>	<b>10239A-11134720</b>	
<b>DUT Type:</b>	<b>Portable UHF PTT Radio Transceiver</b>	<b>Models:</b>	<b>EVX-531-G7-5</b>	<b>450 - 512 MHz</b>		
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## 1.0 INTRODUCTION

This measurement report demonstrates that the Vertex Standard USA Inc. Model: EVX-531-G7-5 Portable UHF PTT Radio Transceiver FCC ID: AXI11134720 complies with the SAR (Specific Absorption Rate) RF exposure requirements of 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 measurement procedures described in FCC OET Bulletin 65, Supplement C 01-01 (see reference [3]), IC RSS-102 Issue 4 (see reference [4]), IEEE Standard 1528-2003 (see reference [5]) and IEC Standard 62209-1:2005 (see reference [6]) 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 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 head 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 a controller with a built in VME-bus computer.

## 3.0 RF CONDUCTED OUTPUT POWER MEASUREMENTS




### MEASURED RF CONDUCTED OUTPUT POWER LEVELS

Radio Model	Test Frequency	Mode	dBm	Watts	Method
EVX-531-G7-5	450.0 MHz	CW	37.0	5.4	Average Conducted
	460.0 MHz	CW	37.0	5.5	Average Conducted
	463.3 MHz	CW	37.0	5.5	Average Conducted
	470.0 MHz	CW	37.0	5.5	Average Conducted
	476.6 MHz	CW	37.0	5.4	Average Conducted
	484.0 MHz	CW	37.0	5.4	Average Conducted
	490.0 MHz	CW	37.0	5.3	Average Conducted
	498.0 MHz	CW	37.0	5.2	Average Conducted
	512.0 MHz	CW	37.0	5.2	Average Conducted

#### Notes

- The test channels were selected in accordance with the procedures specified in FCC KDB 447498 Section 6) c) (see reference [8]).
- The RF conducted output power levels of the DUT were measured by Celltech prior to the SAR evaluations using a Gigatronics 8652A Universal Power Meter at the external antenna connector of the radio in accordance with FCC 47 CFR §2.1046 (see reference [14]) and IC RSS-Gen (see reference [15]).

<b>Applicant:</b>	Vertex Standard USA Inc.	<b>FCC ID:</b>	AXI11134720	<b>IC ID:</b>	10239A-11134720	
<b>DUT Type:</b>	Portable UHF PTT Radio Transceiver	<b>Models:</b>	EVX-531-G7-5	<b>450 - 512 MHz</b>		
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#### 4.0 SAR PROBE CALIBRATION & MEASUREMENT FREQUENCIES



The following procedures are recommended for measurements at 150 MHz - 3 GHz to minimize probe calibration and tissue dielectric parameter discrepancies. In general, SAR measurements below 300 MHz should be within  $\pm 50$  MHz of the probe calibration frequency. At 300 MHz to 3 GHz, measurements should be within  $\pm 100$  MHz of the probe calibration frequency. Measurements exceeding 50% of these intervals,  $\pm 25$  MHz  $< 300$  MHz and  $\pm 50$  MHz  $\geq 300$  MHz, require additional steps (per FCC KDB 450824 D01v01r01, SAR Probe Calibration and System Verification Considerations for Measurements at 150 MHz - 3 GHz - see reference [10]).

Probe Calibration Freq.	Device Measurement Freq.	Frequency Interval	$\pm 50$ MHz ( $\geq 300$ MHz)
450 MHz	460.0 MHz	10.0 MHz	$< 50$ MHz <sup>1</sup>
	463.3 MHz	13.3 MHz	$< 50$ MHz <sup>1</sup>
	470.0 MHz	20.0 MHz	$< 50$ MHz <sup>1</sup>
	490.0 MHz	40.0 MHz	$< 50$ MHz <sup>1</sup>
1. The probe calibration and measurement frequency interval is $< 50$ MHz; therefore the additional steps were not required.			

#### 5.0 NO. OF TEST CHANNELS ( $N_c$ )

Antenna Part No.	Antenna Freq. Range	Test Freq. Range	$N_c$	Test Frequencies (MHz)
1 ATU-16D	450 - 470 MHz	450 - 470 MHz	3	450.0, 460.0, 470.0
2 ATU-16DS	450 - 490 MHz	450 - 490 MHz	4	450.0, 463.3, 476.6, 490.0
3 ATU-16F	470 - 520 MHz	470 - 512 MHz	4	470.0, 484.0, 498.0, 512.0
Note: The number of test channels ( $N_c$ ) were calculated in accordance with the procedures specified in FCC KDB 447498 Section 4.1) 6) (see reference [8]).				

<b>Applicant:</b>	<b>Vertex Standard USA Inc.</b>	<b>FCC ID:</b>	<b>AXI11134720</b>	<b>IC ID:</b>	<b>10239A-11134720</b>	
<b>DUT Type:</b>	<b>Portable UHF PTT Radio Transceiver</b>	<b>Models:</b>	<b>EVX-531-G7-5</b>	<b>450 - 512 MHz</b>		
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## 6.0 MANUFACTURER'S DISCLOSED ACCESSORY LISTING

Accessory ID # for Test Report	ACCESSORY CATEGORY: ANTENNA			
	Part Number	Description	SAR Evaluation	
1	ATU-16D	Detachable (450-470 MHz)	Yes	
2	ATU-16DS	Detachable (450-490 MHz)	Yes	
3	ATU-16F	Detachable (470-520 MHz)	Yes	
Accessory ID # for Test Report	ACCESSORY CATEGORY: BATTERY			
	Part Number	Description	SAR Evaluation	
a	FNB-V133LI / FNB-V133LIU	Li-ion (7.4V, 1350mAh)	Yes	
b	FNB-V134LI / FNB-V134LIU	Li-ion (7.4V, 2250mAh)	Yes	
Accessory ID # for Test Report	ACCESSORY CATEGORY: BODY-WORN			
	Part Number	Description	SAR Evaluation	
1	BA1251500	Belt-clip (contains metal)	Yes	
Accessory ID # for Test Report	ACCESSORY CATEGORY: AUDIO			
	Part Number	Description	Audio Accessory Grouping	SAR Evaluation
G1a	MH-360S	Compact Speaker-Mic	Group 1	Yes
G1b	MH-450S	Standard Speaker-Mic		No <sup>1</sup>
G2a	MH-81A4B	Light duty VOX headset	Group 2	Yes
G3a	MH-37A4B	Earpiece mic	Group 3	Yes

Manufacturer's disclosed accessory listing information provided by Vertex Standard USA Inc.

Notes:

1. Audio accessories not evaluated for SAR in accordance with the procedures and provisions of FCC KDB 643646 D01v01r01 Page 10 Section 1).

<b>Applicant:</b>	<b>Vertex Standard USA Inc.</b>	<b>FCC ID:</b>	<b>AXI11134720</b>	<b>IC ID:</b>	<b>10239A-11134720</b>	
<b>DUT Type:</b>	<b>Portable UHF PTT Radio Transceiver</b>	<b>Models:</b>	<b>EVX-531-G7-5</b>	<b>450 - 512 MHz</b>		
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## 7.0 FLUID DIELECTRIC PARAMETERS

FLUID DIELECTRIC PARAMETERS						
Date: 11/01/2012		Frequency: 450 MHz			Tissue: Body	
Freq	Test e	Test s	Target e	Target s	Deviation Permittivity	Deviation Conductivity
0.350	56.77	0.82	56.7	0.94	0.12%	-12.77%
0.360	56.87	0.82	56.7	0.94	0.30%	-12.77%
0.370	56.19	0.83	56.7	0.94	-0.90%	-11.70%
0.380	56.5	0.84	56.7	0.94	-0.35%	-10.64%
0.390	56.72	0.85	56.7	0.94	0.04%	-9.57%
0.400	56.18	0.84	56.7	0.94	-0.92%	-10.64%
0.410	55.74	0.87	56.7	0.94	-1.69%	-7.45%
0.420	55.94	0.87	56.7	0.94	-1.34%	-7.45%
0.430	55.9	0.89	56.7	0.94	-1.41%	-5.32%
0.440	55.73	0.89	56.7	0.94	-1.71%	-5.32%
0.450	55.17	0.9	56.7	0.94	-2.70%	-4.26%
0.460	55.5	0.91	56.7	0.94	-2.12%	-3.19%
0.4633*	55.4	0.91	56.7	0.94	-2.29%	-3.19%
0.470	55.33	0.91	56.7	0.94	-2.42%	-3.19%
0.480	54.73	0.91	56.7	0.94	-3.47%	-3.19%
0.490	54.84	0.91	56.7	0.94	-3.28%	-3.19%
0.500	54.8	0.92	56.7	0.94	-3.35%	-2.13%
0.510	54.34	0.94	56.7	0.94	-4.16%	0.00%
0.520	54.5	0.95	56.7	0.94	-3.88%	1.06%
0.530	53.99	0.98	56.7	0.94	-4.78%	4.26%
0.540	54.2	0.96	56.7	0.94	-4.41%	2.13%
0.550	54.45	0.98	56.7	0.94	-3.97%	4.26%

\*interpolated using DASY4 software



Test Date	Fluid Type	Ambient Temperature	Fluid Temperature	Fluid Depth	Atmospheric Pressure	Relative Humidity	$\rho$ (Kg/m <sup>3</sup> )
Nov 1	450 Body	22.0°C	21.6°C	≥ 15 cm	101.1 kPa	32%	1000

FLUID DIELECTRIC PARAMETERS						
Date: 11/02/2012		Frequency: 450 MHz			Tissue: Head	
Freq	Test_e	Test_s	Target_e	Target_s	Deviation Permittivity	Deviation Conductivity
0.350	47.29	0.78	43.5	0.87	8.71%	-10.34%
0.360	46.52	0.79	43.5	0.87	6.94%	-9.20%
0.370	46.34	0.79	43.5	0.87	6.53%	-9.20%
0.380	46.71	0.81	43.5	0.87	7.38%	-6.90%
0.390	46.5	0.82	43.5	0.87	6.90%	-5.75%
0.400	45.64	0.82	43.5	0.87	4.92%	-5.75%
0.410	45.34	0.82	43.5	0.87	4.23%	-5.75%
0.420	45.47	0.83	43.5	0.87	4.53%	-4.60%
0.430	45.06	0.85	43.5	0.87	3.59%	-2.30%
0.440	44.99	0.85	43.5	0.87	3.43%	-2.30%
0.450	44.34	0.87	43.5	0.87	1.93%	0.00%
0.460	44.82	0.87	43.5	0.87	3.03%	0.00%
0.4633*	44.8	0.877	43.5	0.87	2.99%	0.80%
0.470	44.65	0.89	43.5	0.87	2.64%	2.30%
0.480	44.02	0.89	43.5	0.87	1.20%	2.30%
0.490	43.82	0.89	43.5	0.87	0.74%	2.30%
0.500	43.76	0.9	43.5	0.87	0.60%	3.45%
0.510	43.5	0.91	43.5	0.87	0.00%	4.60%
0.520	43.49	0.93	43.5	0.87	-0.02%	6.90%
0.530	43.61	0.93	43.5	0.87	0.25%	6.90%
0.540	43.01	0.94	43.5	0.87	-1.13%	8.05%
0.550	42.93	0.95	43.5	0.87	-1.31%	9.20%

\*interpolated using DASy4 software

Test Date	Fluid Type	Ambient Temperature	Fluid Temperature	Fluid Depth	Atmospheric Pressure	Relative Humidity	$\rho$ (Kg/m <sup>3</sup> )
Nov 2	450 Head	23.0°C	21.9°C	≥ 15 cm	101.1 kPa	32%	1000



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## 8.0 SAR MEASUREMENT SUMMARY

Table 1				FACE-HELD SAR EVALUATION RESULTS															
C	Test Date(s): Nov. 2, 2012			1		2		3		4		5		6		7		8	
R	Antenna Tested	Test Freq. (MHz)	Cond. Pwr (W)	SAR W/kg 1g						SAR W/kg 1g									
				Default Battery (a)						Battery (b)									
				100% ptt d/f		50% ptt d/f		Drift (dB)		50%+droop		100% ptt d/f		50% ptt d/f		Drift dB		50%+droop	
1	ANT. 1	450.0	5.4	N/A						N/A									
2																			
3																			
4	ANT. 2	470.0	5.5	N/A						N/A									
5																			
6																			
7	ANT. 2	450.0	5.4	N/A						N/A									
8																			
9																			
10	ANT. 3	463.3	5.5	F2	4.78	2.39	-0.893	2.94	N/A										
11																			
		476.6	5.4	N/A						N/A									
		490.0	5.3	N/A						N/A									
	ANT. 3	470.0	5.5	F3	4.73	2.37	-0.789	2.84	N/A										
		484.0	5.4	N/A						N/A									
		498.0	5.2	N/A						N/A									
		512.0	5.2	N/A						N/A									
SAR LIMITS				HEAD				SPATIAL PEAK				RF EXPOSURE CATEGORY							
FCC 47 CFR 2.1093				Health Canada Safety Code 6				8.0 W/kg				1g averaging				Occupational / Controlled			
Notes																			
Test Mode = CW (Unmodulated Continuous Wave)										Phantom = Barski Planar Phantom									
Battery		Front of DUT Distance to Planar Phantom (see Appendix D)						Antenna Distance to Planar Phantom (see Appendix D)											
a		2.5 cm						3.9 cm				n/a				n/a			
b		2.5 cm						3.9 cm				3.9 cm				3.9 cm			
C = Column; R = Row				F1-Fx (F = Face) denotes the corresponding Face SAR Plot # as shown in Appendix A															

### Test Procedures applied in accordance with FCC KDB 643646 D01v01 (see reference [9])

1. For face-held configuration, the highest capacity battery was selected as the default battery (battery "b").
2. The SAR evaluations commenced at the highest output power channel per antenna and frequency range.
3. When the head SAR of an antenna tested on the highest output power channel using the default battery is  $\leq 3.5$  W/kg (50% PTT duty factor), testing of all other required channels is not necessary.
4. When the SAR for all antennas tested using the default battery is  $\leq 4.0$  W/kg, test additional batteries using the antenna and channel configuration that resulted in the highest SAR.
5. When test reduction applies, the slots for such configurations are denoted with N/A (Not Applicable).

Applicant:	Vertex Standard USA Inc.	FCC ID:	AXI11134720	IC ID:	10239A-11134720	
DUT Type:	Portable UHF PTT Radio Transceiver	Models:	EVX-531-G7-5	450 - 512 MHz		
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Table 2				BODY-WORN SAR EVALUATION RESULTS															
C	Test Date(s): Nov. 1, 2012			1		2		3		4		5		6		7		8	
R	Antenna Tested	Test Freq. (MHz)	Cond. Pwr (W)	SAR W/kg 1g						SAR W/kg 1g									
				Default Battery (a)						Battery (b)									
				Default Body-worn Acc. (1)						Default Body-worn Acc. (1)									
				Default Audio Acc. (G2a)						Default Audio Acc. (G2a)									
				100% ptt d/f		50% ptt d/f		Drift (dB)		50%+droop		100% ptt d/f		50% ptt d/f		Drift dB		50%+droop	
1	ANT. 1	450.0	5.4	N/A						N/A									
2		460.0	5.5	B1	7.49	3.75	-0.867	4.57	N/A										
3		470.0	5.5	N/A						N/A									
4	ANT. 2	450.0	5.4	N/A						N/A									
5		463.3	5.5	B2	7.34	3.67	-1.02	4.64	N/A										
6		476.6	5.4	N/A						N/A									
7	ANT. 3	490.0	5.3	B3	8.28	4.14	-0.720	4.89	B5	8.03	4.02	-1.06	5.13						
8		470.0	5.5	B4	6.88	3.44	-0.768	4.11	N/A										
9		484.0	5.4	N/A						N/A									
10		498.0	5.2	N/A						N/A									
11		512.0	5.2	N/A						N/A									
SAR LIMITS				HEAD				SPATIAL PEAK				RF EXPOSURE CATEGORY							
FCC 47 CFR 2.1093		Health Canada Safety Code 6		8.0 W/kg				1g averaging				Occupational / Controlled							
Notes																			
Test Mode = CW (Unmodulated Continuous Wave)									Phantom = Barski Planar Phantom										
Battery		Back of DUT Distance to Planar Phantom (see Appendix D)		Antenna Distance to Planar Phantom (see Appendix D)															
a		1.8 cm		2.7 cm				2.7 cm				2.7 cm							
b		2.0 cm		n/a				2.9 cm				n/a							
C = Column; R = Row				F1-Fx (F = Face) denotes the corresponding Face SAR Plot # as shown in Appendix A															

Test Procedures applied in accordance with FCC KDB 643646 D01v01 (see reference [9])													
1. For body-worn configuration, the thinnest standard battery was selected as the default battery (battery "a").													
2. The SAR evaluations commenced at the highest output power channel per antenna and frequency range.													
3. When the SAR of an antenna tested on the highest output power channel using the default battery is $\leq 3.5$ W/kg (50% PTT duty factor), testing of all other required channels is not necessary.													
3. When the SAR of an antenna tested on the highest output power channel using the default battery is $> 3.5$ W/kg and $\leq 4.0$ W/kg, testing on the required immediately adjacent channels is not necessary, but other channels must still be considered.													
5. When the highest SAR of an antenna tested with the thinnest (default) battery is $> 4.0$ W/kg and $\leq 6.0$ W/kg, test additional batteries with the default body-worn and audio accessory on the channel that resulted in the highest SAR for that antenna.													
5. Audio accessory (G2a) was selected as the default audio accessory based on preliminary evaluations with the most conservative SAR.													
6. When test reduction applies, the slots for such configurations are denoted with N/A (Not Applicable).													

Applicant:	Vertex Standard USA Inc.	FCC ID:	AXI11134720	IC ID:	10239A-11134720	
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TABLE 3		ADDITIONAL AUDIO ACC'S SAR EVALUATION RESULTS							
C	Test Date(s): Nov. 1, 2012					1		2	
R	Antenna Tested	Audio Accessory Grouping	Audio Accessory ID	Test Frequency (MHz)	Conducted Power (W)	1g SAR (W/kg)			
						Battery (a)			
						Body-worn Acc. (1)			
						Plot #	100% ptt d/f	50% ptt d/f	
1	ANT. 2	G1	G1a	490.0	5.3	A1	8.10	4.05	
2							-0.878	4.96	
3		G3	G3a	490.0	5.3	A2	8.25	4.13	
4							-0.904	5.08	
SAR LIMITS				BODY	SPATIAL PEAK	RF EXPOSURE CATEGORY			
FCC 47 CFR 2.1093		Health Canada Safety Code 6		8.0 W/kg		1g average		Occupational / Controlled	
Notes									
Test Mode = CW (Unmodulated Continuous Wave)				DUT Distance to Phantom		Antenna Distance to Phantom			
Phantom = Barski Planar Phantom				1.8 cm		2.7 cm			
C = Column; R = Row									
Audio accessories do not contain any built-in radiating element									

Applicant:	Vertex Standard USA Inc.	FCC ID:	AXI11134720	IC ID:	10239A-11134720	
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## 9.0 SAR SCALING (TUNE-UP TOLERANCE)

SAR LEVELS SCALED TO MANUFACTURER'S TUNE-UP TOLERANCE								
Test Config.	Freq. (MHz)	Plot	Antenna	Battery	Conducted Power (W)	SAR Level 1g (W/kg)	Scale to 5.5 W (5 W + 10%)	Scaled SAR 1g (W/kg)
Body-worn	490	B3	2	a	5.3	4.14	+0.2 dB	4.34

Notes:

1. Only the highest SAR value per frequency is scaled.
2. Test frequencies that are not listed do not require SAR scaling.
3. The scaled SAR levels are below the FCC/IC Occupational SAR Limit of 8.0 W/kg.

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<b>DUT Type:</b>	<b>Portable UHF PTT Radio Transceiver</b>		<b>Models:</b>	<b>EVX-531-G7-5</b>	<b>450 - 512 MHz</b>	
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## 10.0 SAR TEST REDUCTION PROCEDURES APPLIED (FCC KDB 643646)

- a. Face-held Configuration - Default Battery Selection per FCC KDB 643646, Page 2, Section 1) A): *"When multiple standard batteries are supplied with a radio, the battery with the highest capacity is considered the default battery for making head SAR measurements."*
- b. Body-worn Configuration - Default Battery and Body-worn Accessory Selection per FCC KDB 643646, Page 5, Section 1) A): *"Start by testing a PTT radio with the thinnest battery and a standard (default) body-worn accessory that are both supplied with the radio and, if applicable, a default audio accessory....."*
- c. Body-worn Configuration - Default Audio Accessory Selection - According to the manufacturer, the radio is not supplied to the end user with a standard default audio accessory (as referenced in FCC KDB 643646, Page 4, Section "Body SAR Test Considerations for Body-worn Accessories"); therefore the procedures described in note (f) below were applied in order to establish the default audio accessory.
- d. Body-worn Configuration - Selection of Remaining Default Audio Accessories by Category - the Remaining Default Audio Accessories by Category were selected based on the guidance provided in FCC KDB 643646, Section "Body SAR Test Considerations for Audio Accessories without Built-in Antenna", Page 10: *"For audio accessories with similar construction and operating requirements, test only the audio accessory within the group that is expected to result in the highest SAR, with respect to changes in RF characteristics and exposure conditions for the combination. If it is unclear which audio accessory within a group of similar accessories is expected to result in the highest SAR, good engineering judgment and preliminary testing should be applied to select the accessory that is expected to result in the highest SAR."* Please refer to note (i) below for the procedure implemented to establish the Default Audio Accessory by Category (Grouping). The Remaining Default Audio Accessories by Category were evaluated on the highest SAR channel and antenna combination from the Default Audio Accessory
- e. Body-worn Configuration - Selection of Additional Audio Accessories by Category - the Additional Audio Accessories by Category were selected based on the guidance provided in FCC KDB 643646, Section "Body SAR Test Considerations for Audio Accessories without Built-in Antenna", Page 10.
- f. According to the manufacturer, all the optional audio accessories can be used with any accessory combination (antenna, battery & body-worn accessory). Therefore, in order to determine the default audio accessory (in accordance with FCC KDB 643646, Page 4, footnote 8), preliminary SAR evaluations (area scans with belt-clip and thinnest battery) were performed by Celltech with all of the optional audio accessories connected to the radio consecutively in order to select the audio accessory expected to result in the highest SAR level for the final compliance evaluations.

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## 11.0 DETAILS OF SAR EVALUATION

- The number of test frequencies and the test channels evaluated for SAR were selected in accordance with the procedures described in FCC KDB 447498 (see reference [8]).
- The DUT was evaluated for SAR in accordance with the procedures described in FCC KDB 643646 D01v01 (see reference [9]).
- Each SAR evaluation was performed with a fully charged battery. The radio was switched off for a five minute cooldown period between the area and zoom scan evaluations.
- The SAR droop of the DUT was measured by the DASY4 system for the duration of the SAR evaluations. The measured SAR droop was added to the measured SAR levels to report scaled SAR levels as shown in the SAR test data tables. A SAR-versus-Time power droop evaluation was performed (see Appendix A).
- The fluid temperature was measured prior to and after the SAR evaluations. The fluid temperature remained within  $\pm 2^{\circ}\text{C}$  during the SAR evaluations.
- The dielectric parameters of the simulated tissue mixtures were measured prior to the SAR evaluations using a Dielectric Probe Kit and a Network Analyzer (see Appendix C).
- The DUT was tested at the maximum conducted output power level preset by the manufacturer 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.

## 12.0 SAR EVALUATION PROCEDURES

- 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.
  - For body-worn and face-held devices a planar phantom was used.
- 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:
- 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.
- 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:
- 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 from 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 F). The extrapolation was based on trivariate quadratics computed from the previously calculated 3D interpolated points nearest the phantom surface.
- 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).
- A zoom scan volume of 30 mm x 30 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  $\geq 800$  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.

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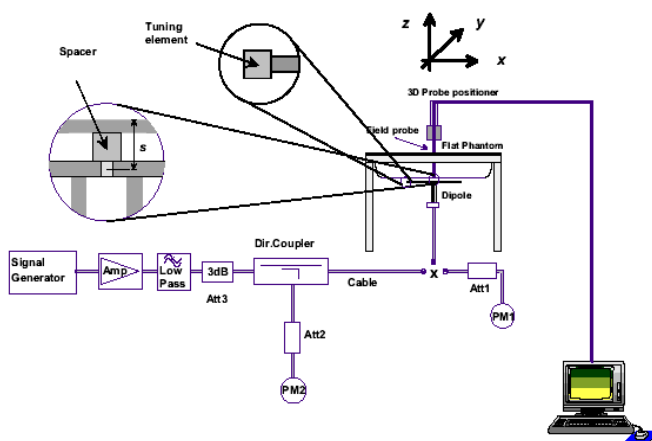
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## 13.0 SYSTEM PERFORMANCE CHECK

Prior to the SAR evaluations, system checks were performed with a planar phantom and SPEAG 450 MHz dipole (see Appendix B) in accordance with the procedures described in IEEE Standard 1528-2003 (see reference [5]) and IEC Standard 62209-1:2005 (see reference [6]). The dielectric parameters of the simulated tissue mixture were measured prior to the system performance check using a Dielectric Probe Kit and a Network Analyzer (see Appendix C for measured fluid dielectric parameters). A forward power of 398 mW was applied to the dipole and the system was verified to a tolerance of  $\pm 10\%$  from the SAR system manufacturer's dipole calibration target SAR value (see Appendix E for system manufacturer's dipole calibration procedures).

### SYSTEM PERFORMANCE CHECK EVALUATIONS

Test Date	Equiv. Tissue	SAR 1g (W/kg)			Dielectric Constant $\epsilon_r$			Conductivity $\sigma$ (mho/m)			$\rho$ (Kg/m <sup>3</sup> )	Amb. Temp. (°C)	Fluid Temp. (°C)	Fluid Depth (cm)	Humid. (%)	Barom. Press. (kPa)
	Freq. (MHz)	SPEAG Target	Meas.	Dev.	SPEAG Target	Meas.	Dev.	SPEAG Target	Meas.	Dev.						
Nov 1	Body 450	1.81 $\pm 10\%$	1.78	-1.6%	56.7 $\pm 5\%$	56.2	-0.9%	0.94 $\pm 5\%$	0.90	-4.2%	1000	22.0	21.6	$\geq 15$	32	101.1
Nov 2	Head 450	1.87 $\pm 10\%$	1.89	+1.1%	43.5 $\pm 5\%$	44.3	+1.8%	0.87 $\pm 5\%$	0.87	0.0%	1000	23.0	21.9	$\geq 15$	32	101.1
Notes	1.	The target SAR values are the measured values from the SAR system manufacturer's dipole calibration (see Appendix E).														
	2.	The target dielectric parameters are the nominal values from the SAR system manufacturer's dipole calibration (see Appendix E).														
	3.	The fluid temperature was measured prior to and after the system performance check evaluations. The fluid temperature remained within $\pm 2^\circ\text{C}$ during the system performance check evaluations.														
	4.	The dielectric parameters of the simulated tissue mixture were measured prior to the system performance check using a Dielectric Probe Kit and a Network Analyzer (see Appendix C).														



System Performance Check Measurement Setup (IEEE Standard 1528-2003)



SPEAG 450 MHz Validation Dipole Setup

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## 14.0 SIMULATED EQUIVALENT TISSUES



The simulated equivalent tissue recipes in the table below are derived from the SAR system manufacturer's suggested recipes in the DASY4 manual (see references [11] and [12]) in accordance with the procedures and requirements specified in IEEE Standard 1528-2003 (see reference [5]) and IEC Standard 62209-1:2005 (see reference [6]). The ingredient percentage may have been adjusted minimally in order to achieve the appropriate target dielectric parameters within the specified tolerance.

SIMULATED TISSUE MIXTURES		
INGREDIENT	450 MHz HEAD	450 MHz BODY
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 %

## 15.0 SAR LIMITS

SAR RF EXPOSURE LIMITS			
FCC 47 CFR 2.1093	Health Canada Safety Code 6	(General Population / Uncontrolled Exposure)	(Occupational / Controlled Exposure)
Spatial Average (averaged over the whole body)		0.08 W/kg	0.4 W/kg
Spatial Peak (averaged over any 1 g of tissue)		1.6 W/kg	8.0 W/kg
Spatial Peak (hands/wrists/feet/ankles averaged over 10 g)		4.0 W/kg	20.0 W/kg
The Spatial Average value of the SAR averaged over the whole body.			
The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.			
The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.			
Uncontrolled environments are defined as locations where there is potential exposure of individuals who have no knowledge or control of their potential exposure.			
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.			






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## 16.0 ROBOT SYSTEM SPECIFICATIONS

<u>Specifications</u>	
<b>Positioner</b>	Stäubli Unimation Corp. Robot Model: RX60L
<b>Repeatability</b>	0.02 mm
<b>No. of axis</b>	6
<u>Data Acquisition Electronic (DAE) System</u>	
<u>Cell Controller</u>	
<b>Processor</b>	AMD Athlon XP 2400+
<b>Clock Speed</b>	2.0 GHz
<b>Operating System</b>	Windows XP Professional
<u>Data Converter</u>	
<b>Features</b>	Signal Amplifier, multiplexer, A/D converter, and control logic
<b>Software</b>	Measurement Software: DASY4, V4.7 Build 80
	Postprocessing Software: SEMCAD, V1.8 Build 171
<b>Connecting Lines</b>	Optical downlink for data and status info., Optical uplink for commands and clock
<u>DASY4 Measurement Server</u>	
<b>Function</b>	Real-time data evaluation for field measurements and surface detection
<b>Hardware</b>	PC/104 166MHz Pentium CPU; 32 MB chipdisk; 64 MB RAM
<b>Connections</b>	COM1, COM2, DAE, Robot, Ethernet, Service Interface
<u>E-Field Probe</u>	
<b>Model</b>	ET3DV6
<b>Serial No.</b>	1590
<b>Construction</b>	Triangular core fiber optic detection system
<b>Frequency</b>	10 MHz to 6 GHz
<b>Linearity</b>	±0.2 dB (30 MHz to 3 GHz)
<u>Phantom</u>	
<b>Type</b>	Barski Planar Phantom
<b>Shell Material</b>	Fiberglass
<b>Thickness</b>	2.0 ±0.1 mm
<b>Volume</b>	Approx. 70 liters

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## 17.0 PROBE SPECIFICATION (ET3DV6)

Construction:	Symmetrical design with triangular core; Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, glycol)
Calibration:	In air from 10 MHz to 2.5 GHz In head simulating tissue at frequencies of 900 MHz and 1.8 GHz (accuracy $\pm 8\%$ )
Frequency:	10 MHz to $> 6$ GHz; Linearity: $\pm 0.2$ dB (30 MHz to 3 GHz)
Directivity:	$\pm 0.2$ dB in head tissue (rotation around probe axis) $\pm 0.4$ dB in head tissue (rotation normal to probe axis)
Dynamic Range:	5 $\mu$ W/g to $> 100$ mW/g; Linearity: $\pm 0.2$ dB
Surface Detect:	$\pm 0.2$ 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

## 18.0 BARSKI PLANAR PHANTOM

The Barski Planar Phantom is a fiberglass shell phantom with a 2.0 mm ( $\pm 0.2$ mm) thick device measurement area at the center of the phantom for SAR evaluations of devices with a larger surface area than the planar section of the SAM phantom. The planar phantom is integrated in a wooden table. The planar phantom was used for the DUT SAR evaluations and the system performance check evaluations. See Appendix G for dimensions and specifications of the Barski Planar Phantom.



Barski Planar Phantom




## 19.0 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  $65^\circ$ . 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. For evaluations of larger devices a Plexiglas platform is attached to the device holder.



Device Holder

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## 20.0 TEST EQUIPMENT LIST

TEST EQUIPMENT		ASSET NO.	SERIAL NO.	DATE CALIBRATED	CALIBRATION INTERVAL
USED	DESCRIPTION				
x	Schmid & Partner DASY4 System	-	-	-	-
x	-DASY4 Measurement Server	00158	1078	CNR	CNR
x	-Robot	00046	599396-01	CNR	CNR
x	-DAE4	00019	353	19-Apr-12	Biennial
x	-ET3DV6 E-Field Probe	00017	1590	24-Apr-12	Annual
x	-D450V3 Validation Dipole	00221	1068	27-Apr-12	Triennial
x	-Barski Planar Phantom	00155	03-01	CNR	CNR
x	HP 85070C Dielectric Probe Kit	00033	none	CNR	CNR
x	Gigatronics 8652A Power Meter	00007	1835272	03-May-12	Biennial
x	Gigatronics 80701A Power Sensor	00014	1833542	03-May-12	Biennial
x	Gigatronics 80334A Power Sensor	-	1837001	03-May-12	Biennial
x	HP 8753ET Network Analyzer	00134	US39170292	26-Apr-12	Biennial
x	Rohde & Schwarz SMR20 Signal Generator	00006	100104	02-May-12	Biennial
x	Amplifier Research 5S1G4 Power Amplifier	00106	26235	CNR	CNR
Abbr.	CNR = Calibration Not Required				

<b>Applicant:</b>	<b>Vertex Standard USA Inc.</b>	<b>FCC ID:</b>	<b>AXI11134720</b>	<b>IC ID:</b>	<b>10239A-11134720</b>	
<b>DUT Type:</b>	<b>Portable UHF PTT Radio Transceiver</b>	<b>Models:</b>	<b>EVX-531-G7-5</b>	<b>450 - 512 MHz</b>		
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	<u>Test Report Issue Date</u> Dec. 20, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	
Test Lab Certificate No. 2470.01				

## 21.0 MEASUREMENT UNCERTAINTIES

UNCERTAINTY BUDGET FOR DEVICE EVALUATION (FCC - IEEE 1528-2003)									
Uncertainty Component	IEEE 1528 Section	Uncertainty Value $\pm\%$	Probability Distribution	Divisor	ci 1g	ci 10g	Uncertainty Value $\pm\%$ (1g)	Uncertainty Value $\pm\%$ (10g)	V <sub>i</sub> or V <sub>eff</sub>
<b>Measurement System</b>									
Probe Calibration (450 MHz)	E.2.1	6.70	Normal	1	1	1	6.70	6.70	$\infty$
Axial Isotropy	E.2.2	4.7	Rectangular	1.732050808	0.7	0.7	1.9	1.9	$\infty$
Hemispherical Isotropy	E.2.2	9.6	Rectangular	1.732050808	0.7	0.7	3.9	3.9	$\infty$
Boundary Effect	E.2.3	1	Rectangular	1.732050808	1	1	0.6	0.6	$\infty$
Linearity	E.2.4	4.7	Rectangular	1.732050808	1	1	2.7	2.7	$\infty$
System Detection Limits	E.2.5	1	Rectangular	1.732050808	1	1	0.6	0.6	$\infty$
Readout Electronics	E.2.6	0.3	Normal	1	1	1	0.3	0.3	$\infty$
Response Time	E.2.7	0.8	Rectangular	1.732050808	1	1	0.5	0.5	$\infty$
Integration Time	E.2.8	2.6	Rectangular	1.732050808	1	1	1.5	1.5	$\infty$
RF Ambient Conditions	E.6.1	3	Rectangular	1.732050808	1	1	1.7	1.7	$\infty$
Probe Positioner Mechanical Tolerance	E.6.2	0.4	Rectangular	1.732050808	1	1	0.2	0.2	$\infty$
Probe Positioning wrt Phantom Shell	E.6.3	2.9	Rectangular	1.732050808	1	1	1.7	1.7	$\infty$
Extrapolation, interpolation & integration algorithms for max. SAR evaluation	E.5	1	Rectangular	1.732050808	1	1	0.6	0.6	$\infty$
<b>Test Sample Related</b>									
Test Sample Positioning	E.4.2	2.9	Normal	1	1	1	2.9	2.9	12
Device Holder Uncertainty	E.4.1	3.6	Normal	1	1	1	3.6	3.6	8
SAR Drift Measurement	6.6.2	0	Rectangular	1.732050808	1	1	0.0	0.0	$\infty$
<b>Phantom and Tissue Parameters</b>									
Phantom Uncertainty	E.3.1	4	Rectangular	1.732050808	1	1	2.3	2.3	$\infty$
Liquid Conductivity (target)	E.3.2	5	Rectangular	1.732050808	0.64	0.43	1.8	1.2	$\infty$
Liquid Conductivity (measured)	E.3.3	3.19	Normal	1	0.64	0.43	2.0	1.4	$\infty$
Liquid Permittivity (target)	E.3.2	5	Rectangular	1.732050808	0.6	0.49	1.7	1.4	$\infty$
Liquid Permittivity (measured)	E.3.3	3.28	Normal	1	0.6	0.49	2.0	1.6	$\infty$
<b>Combined Standard Uncertainty</b>			<b>RSS</b>				<b>11.02</b>	<b>10.73</b>	
<b>Expanded Uncertainty (95% Confidence Interval)</b>			<b>k=2</b>				<b>22.04</b>	<b>21.45</b>	
Measurement Uncertainty Table in accordance with IEEE Standard 1528-2003									

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2

<b>Applicant:</b>	<b>Vertex Standard USA Inc.</b>	<b>FCC ID:</b>	<b>AXI11134720</b>	<b>IC ID:</b>	<b>10239A-11134720</b>	
<b>DUT Type:</b>	<b>Portable UHF PTT Radio Transceiver</b>	<b>Models:</b>	<b>EVX-531-G7-5</b>	<b>450 - 512 MHz</b>		
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	Test Report Issue Date Dec. 20, 2012	Description of Test(s) Specific Absorption Rate	RF Exposure Category Occupational (Controlled)	



Test Lab Certificate No. 2470.01

UNCERTAINTY BUDGET FOR DEVICE EVALUATION (IC - IEC 62209-2:2010)									
Source of Uncertainty	IEC 62209-2 Section	Tolerance / Uncertainty $\pm\%$	Probability Distribution	Divisor	ci 1g	ci 10g	Standard Uncertainty $\pm\%$ (1g)	Standard Uncertainty $\pm\%$ (10g)	$V_i$ or $V_{eff}$
<b>Measurement System</b>									
Probe Calibration (450 MHz)	7.2.2.1	6.7	Normal	1	1	1	6.7	6.7	$\infty$
Isotropy	7.2.2.2	4.7	Rectangular	1.732050808	1	1	2.7	2.7	$\infty$
Boundary Effect	7.2.2.6	1	Rectangular	1.732050808	1	1	0.6	0.6	$\infty$
Linearity	7.2.2.3	4.7	Rectangular	1.732050808	1	1	2.7	2.7	$\infty$
Detection Limits	7.2.2.5	1	Rectangular	1.732050808	1	1	0.6	0.6	$\infty$
Readout Electronics	7.2.2.7	0.3	Normal	1	1	1	0.3	0.3	$\infty$
Response Time	7.2.2.8	0.8	Rectangular	1.732050808	1	1	0.5	0.5	$\infty$
Integration Time	7.2.2.9	2.6	Rectangular	1.732050808	1	1	1.5	1.5	$\infty$
RF Ambient Conditions	7.2.4.5	3	Rectangular	1.732050808	1	1	1.7	1.7	$\infty$
Probe Positioner Mechanical Restrictions	7.2.3.1	0.4	Rectangular	1.732050808	1	1	0.2	0.2	$\infty$
Probe Positioning wrt Phantom Shell	7.2.3.3	2.9	Rectangular	1.732050808	1	1	1.7	1.7	$\infty$
Post-processing	7.2.5	1	Rectangular	1.732050808	1	1	0.6	0.6	$\infty$
<b>Test Sample Related</b>									
Test Sample Positioning	7.2.3.4.3	2.9	Normal	1	1	1	2.9	2.9	12
Device Holder Uncertainty	7.2.3.4.2	3.6	Normal	1	1	1	3.6	3.6	8
Drift of Output Power (meas. SAR drift)	7.2.2.10	0	Rectangular	1.732050808	1	1	0.0	0.0	$\infty$
<b>Phantom and Tissue Parameters</b>									
Phantom Uncertainty	7.2.3.2	4	Rectangular	1.732050808	1	1	2.3	2.3	$\infty$
SAR Correction Algorithm for deviations in permittivity and conductivity	7.2.4.3	1.2	Normal	1	1	0.81	1.2	0.97	$\infty$
Liquid Conductivity (measured)	7.2.4.3	3.19	Normal	1	0.78	0.71	2.5	2.3	$\infty$
Liquid Permittivity (measured)	7.2.4.3	3.28	Normal	1	0.23	0.26	0.8	0.9	$\infty$
Liquid Permittivity - temp. uncertainty	7.2.4.4	0.27	Rectangular	1.732050808	0.78	0.71	0.1	0.1	$\infty$
Liquid Conductivity - temp. uncertainty	7.2.4.4	0.84	Rectangular	1.732050808	0.23	0.26	0.1	0.1	$\infty$
<b>Combined Standard Uncertainty</b>	<b>7.3.1</b>		<b>RSS</b>				<b>10.20</b>	<b>10.13</b>	
<b>Expanded Uncertainty (95% Confidence Interval)</b>	<b>7.3.2</b>		<b>k=2</b>				<b>20.39</b>	<b>20.25</b>	

Measurement Uncertainty Table in accordance with International Standard IEC 62209-2:2010

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2

<b>Applicant:</b>	<b>Vertex Standard USA Inc.</b>	<b>FCC ID:</b>	<b>AXI11134720</b>	<b>IC ID:</b>	<b>10239A-11134720</b>	
<b>DUT Type:</b>	<b>Portable UHF PTT Radio Transceiver</b>	<b>Models:</b>	<b>EVX-531-G7-5</b>	<b>450 - 512 MHz</b>		
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	<u>Test Report Issue Date</u> Dec. 20, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Test Lab Certificate No. 2470.01

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- [2] Health Canada - "Limits of Human Exposure to Radiofrequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz", Safety Code 6: 1999.
- [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.
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- [15] Industry Canada - "General Requirements and Information for the Certification of Radiocommunication Equipment", Radio Standards Specification RSS-Gen Issue 3: December 2010.

<b>Applicant:</b>	<b>Vertex Standard USA Inc.</b>	<b>FCC ID:</b>	<b>AXI11134720</b>	<b>IC ID:</b>	<b>10239A-11134720</b>	
<b>DUT Type:</b>	<b>Portable UHF PTT Radio Transceiver</b>	<b>Models:</b>	<b>EVX-531-G7-5</b>	<b>450 - 512 MHz</b>		
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Test Lab Certificate No. 2470.01

## APPENDIX A - SAR MEASUREMENT PLOTS

<b>Applicant:</b>	<b>Vertex Standard USA Inc.</b>	<b>FCC ID:</b>	<b>AXI11134720</b>	<b>IC ID:</b>	<b>10239A-11134720</b>	
<b>DUT Type:</b>	<b>Portable UHF PTT Radio Transceiver</b>	<b>Models:</b>	<b>EVX-531-G7-5</b>	<b>450 - 512 MHz</b>		
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Test Lab Certificate No. 2470.01

## Face SAR Plot F1

Date Tested: 11/02/2012

**DUT: Vertex: EVX-531-G7-5; Type: UHF PTT Radio Transceiver; Serial: 212B010073**

Program Notes: Ambient Temp: 23.0C; Fluid Temp: 21.9C; Barometric Pressure: 101.1 kPa; Humidity: 32%

Procedure Notes:

Communication System: UHF 450-512

Frequency: 460 MHz; Duty Cycle: 1:1

Medium: HSL450 Medium parameters used:  $f = 460 \text{ MHz}$ ;  $\sigma = 0.87 \text{ mho/m}$ ;  $\epsilon_r = 44.8$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1590; ConvF(7.54, 7.54, 7.54); Calibrated: 24/04/2012
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: Barski Industries; Type: Fiberglass Planar; Serial: 03-01
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Batt b - 16D - 460MHz/Area Scan (7x19x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (measured) = 6.10 mW/g

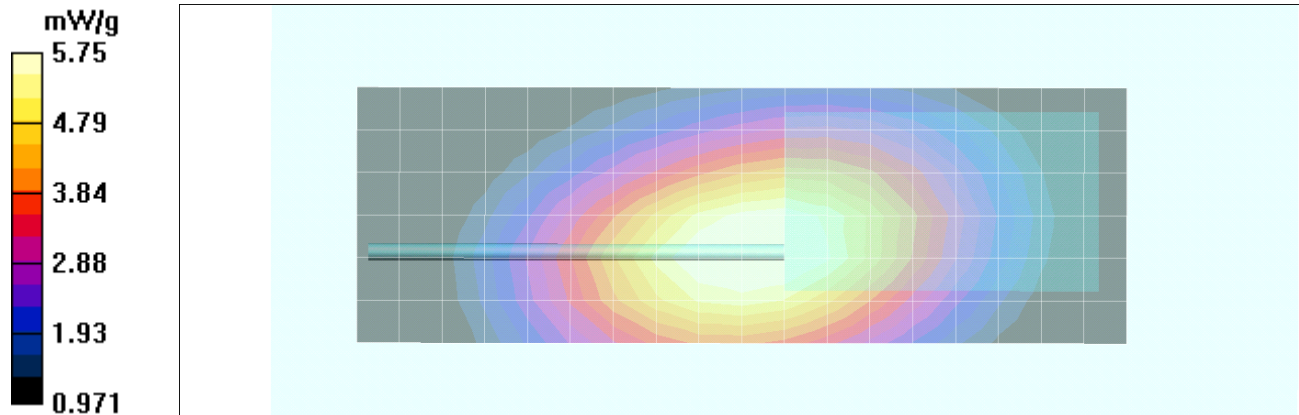
**Batt b - 16D - 460MHz/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=7.5\text{mm}$ ,  $dy=7.5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 82.5 V/m; Power Drift = -0.709 dB

Peak SAR (extrapolated) = 7.57 W/kg

**SAR(1 g) = 5.49 mW/g; SAR(10 g) = 4.04 mW/g**

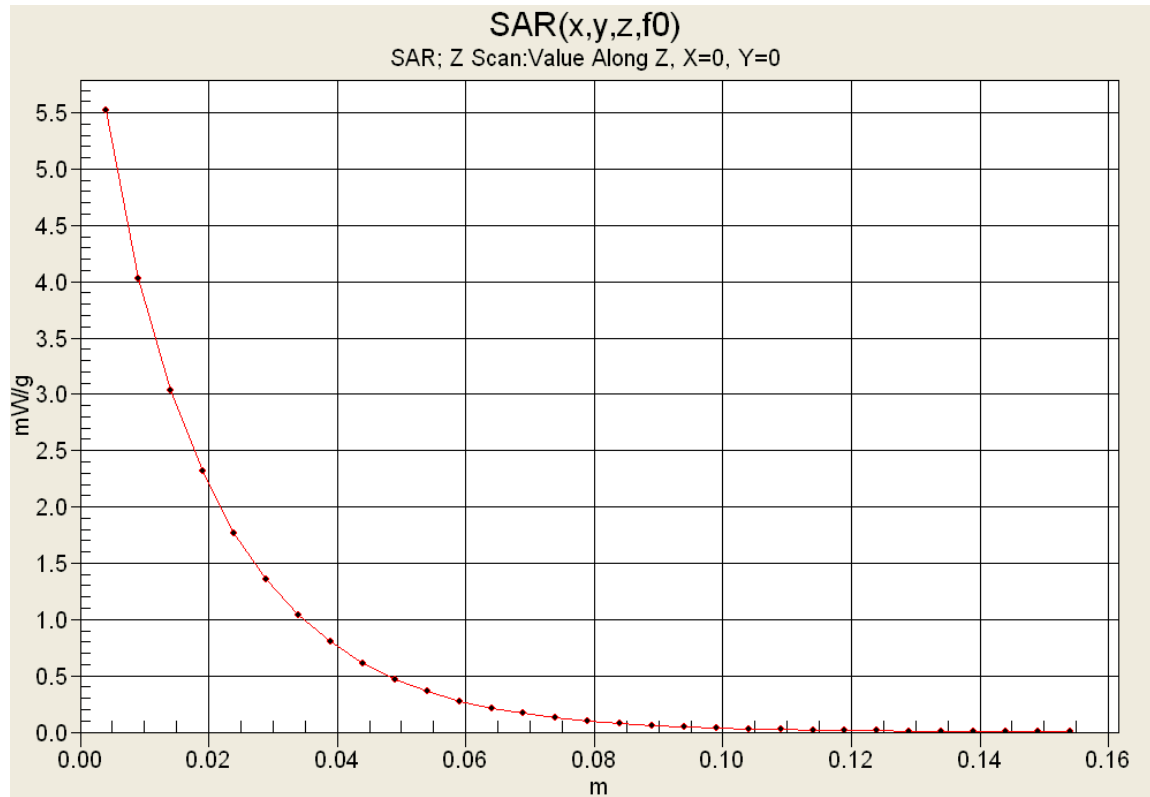
Maximum value of SAR (measured) = 5.75 mW/g





<b>Applicant:</b>	Vertex Standard USA Inc.	<b>FCC ID:</b>	AXI11134720	<b>IC ID:</b>	10239A-11134720	
<b>DUT Type:</b>	Portable UHF PTT Radio Transceiver	<b>Models:</b>	EVX-531-G7-5	<b>450 - 512 MHz</b>		
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## Z-Axis Scan



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Test Lab Certificate No. 2470.01

## Face SAR Plot F2

Date Tested: 11/02/2012

**DUT: Vertex: EVX-531-G7-5; Type: UHF PTT Radio Transceiver; Serial: 212B010073**

Program Notes: Ambient Temp: 23.0C; Fluid Temp: 21.9C; Barometric Pressure: 101.1 kPa; Humidity: 32%

Procedure Notes:

Communication System: UHF 450-512

Frequency: 463.3 MHz; Duty Cycle: 1:1

Medium: HSL450 Medium parameters used (interpolated):  $f = 463.3$  MHz;  $\sigma = 0.877$  mho/m;  $\epsilon_r = 44.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

- Probe: ET3DV6 - SN1590; ConvF(7.54, 7.54, 7.54); Calibrated: 24/04/2012
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: Barski Industries; Type: Fiberglass Planar; Serial: 03-01
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Batt b - 16DS - 463.3MHz/Area Scan (7x19x1):** Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 5.39 mW/g

**Batt b - 16DS - 463.3MHz/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

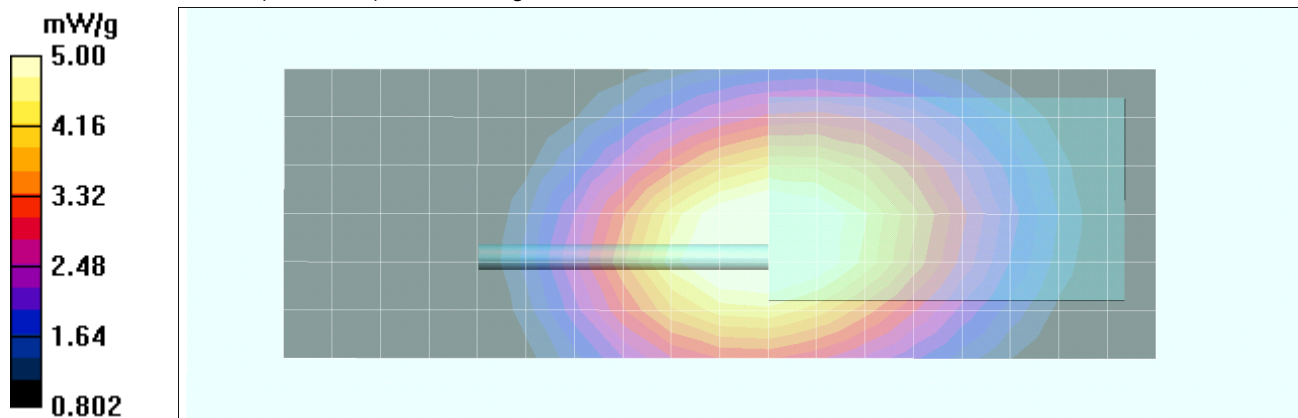
Reference Value = 79.3 V/m; Power Drift = -0.893 dB

Peak SAR (extrapolated) = 6.61 W/kg



**SAR(1 g) = 4.78 mW/g; SAR(10 g) = 3.5 mW/g**

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 5.00 mW/g



<b>Applicant:</b>	Vertex Standard USA Inc.	<b>FCC ID:</b>	AXI11134720	<b>IC ID:</b>	10239A-11134720	
<b>DUT Type:</b>	Portable UHF PTT Radio Transceiver	<b>Models:</b>	EVX-531-G7-5	<b>450 - 512 MHz</b>		
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## Face SAR Plot F3

Date Tested: 11/02/2012

**DUT: Vertex: EVX-531-G7-5; Type: UHF PTT Radio Transceiver; Serial: 212B010073**

Program Notes: Ambient Temp: 23.0C; Fluid Temp: 21.9C; Barometric Pressure: 101.1 kPa; Humidity: 32%

Procedure Notes:

Communication System: UHF 450-512

Frequency: 470 MHz; Duty Cycle: 1:1

Medium: HSL450 Medium parameters used:  $f = 470 \text{ MHz}$ ;  $\sigma = 0.89 \text{ mho/m}$ ;  $\epsilon_r = 44.6$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1590; ConvF(7.54, 7.54, 7.54); Calibrated: 24/04/2012
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: Barski Industries; Type: Fiberglass Planar; Serial: 03-01
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Batt b - 16F - 470MHz/Area Scan (7x19x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (measured) = 5.23 mW/g

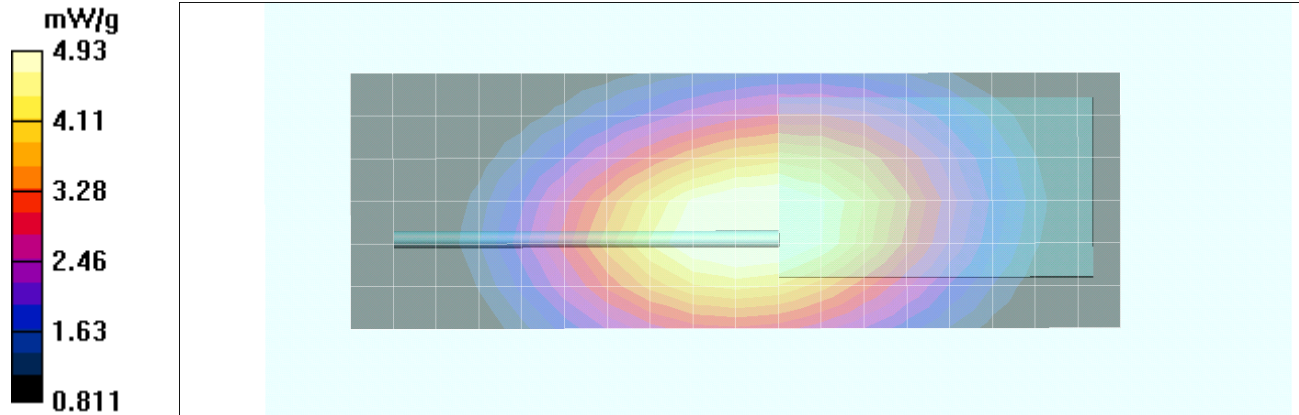
**Batt b - 16F - 470MHz/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=7.5\text{mm}$ ,  $dy=7.5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 77.0 V/m; Power Drift = -0.789 dB



Peak SAR (extrapolated) = 6.55 W/kg

**SAR(1 g) = 4.73 mW/g; SAR(10 g) = 3.47 mW/g**

Maximum value of SAR (measured) = 4.93 mW/g



<b>Applicant:</b>	Vertex Standard USA Inc.	<b>FCC ID:</b>	AXI11134720	<b>IC ID:</b>	10239A-11134720	
<b>DUT Type:</b>	Portable UHF PTT Radio Transceiver	<b>Models:</b>	EVX-531-G7-5	450 - 512 MHz		
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	<u>Test Report Issue Date</u> Dec. 20, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Test Lab Certificate No. 2470.01

## Face SAR Plot F4

Date Tested: 11/02/2012

**DUT: Vertex: EVX-531-G7-5; Type: UHF PTT Radio Transceiver; Serial: 212B010073**

Program Notes: Ambient Temp: 23.0C; Fluid Temp: 21.9C; Barometric Pressure: 101.1 kPa; Humidity: 32%

Procedure Notes:

Communication System: UHF 450-512

Frequency: 460 MHz; Duty Cycle: 1:1

Medium: HSL450 Medium parameters used:  $f = 460 \text{ MHz}$ ;  $\sigma = 0.87 \text{ mho/m}$ ;  $\epsilon_r = 44.8$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1590; ConvF(7.54, 7.54, 7.54); Calibrated: 24/04/2012
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: Barski Industries; Type: Fiberglass Planar; Serial: 03-01
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Batt a - 16D - 460MHz/Area Scan (7x19x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (measured) = 5.55 mW/g

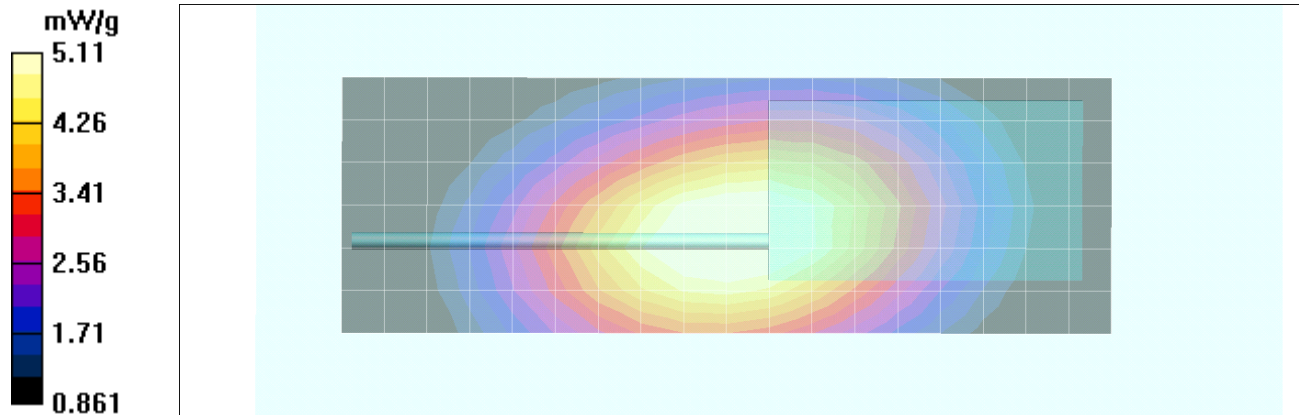
**Batt a - 16D - 460MHz/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=7.5\text{mm}$ ,  $dy=7.5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 79.1 V/m; Power Drift = -0.843 dB



Peak SAR (extrapolated) = 6.70 W/kg

**SAR(1 g) = 4.86 mW/g; SAR(10 g) = 3.58 mW/g**

Maximum value of SAR (measured) = 5.11 mW/g



<b>Applicant:</b>	Vertex Standard USA Inc.	<b>FCC ID:</b>	AXI11134720	<b>IC ID:</b>	10239A-11134720	
<b>DUT Type:</b>	Portable UHF PTT Radio Transceiver	<b>Models:</b>	EVX-531-G7-5	450 - 512 MHz		
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	<u>Test Report Issue Date</u> Dec. 20, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Test Lab Certificate No. 2470.01

## Body SAR Plot B1

Date Tested: 11/01/2012

**DUT: Vertex: EVX-531-G7-5; Type: UHF PTT Radio Transceiver; Serial: 212B010073**

Program Notes: Ambient Temp: 22.0C; Fluid Temp: 21.6C; Barometric Pressure: 101.1 kPa; Humidity: 32%

Procedure Notes:

Communication System: UHF 450-512

Frequency: 460 MHz; Duty Cycle: 1:1

Medium: M450 Medium parameters used:  $f = 460 \text{ MHz}$ ;  $\sigma = 0.91 \text{ mho/m}$ ;  $\epsilon_r = 55.5$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1590; ConvF(7.93, 7.93, 7.93); Calibrated: 24/04/2012
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: Barski Industries; Type: Fiberglass Planar; Serial: 03-01
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**MH-81A4B - Batt a - 16D - 460MHz/Area Scan (7x19x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (measured) = 8.18 mW/g

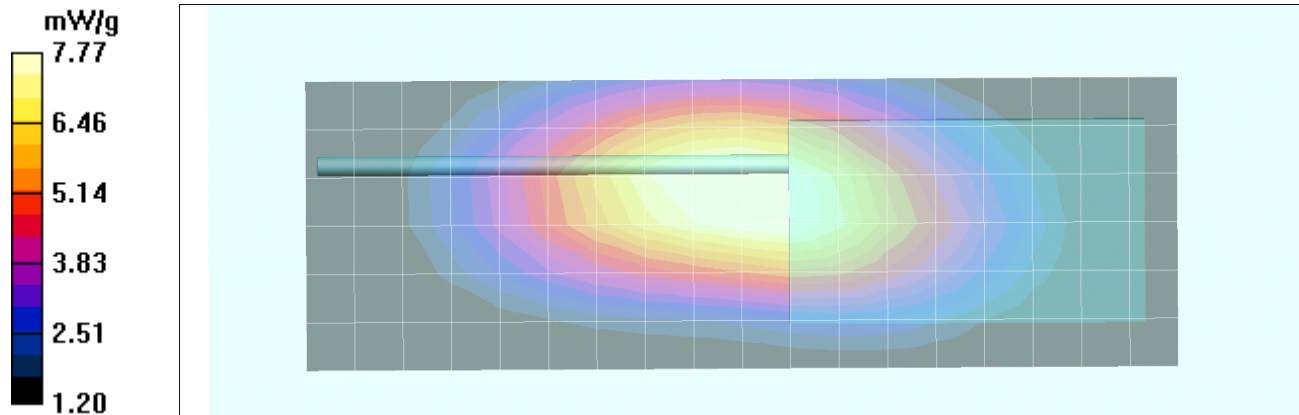
**MH-81A4B - Batt a - 16D - 460MHz/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=7.5\text{mm}$ ,  $dy=7.5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 93.4 V/m; Power Drift = -0.408 dB

Peak SAR (extrapolated) = 10.8 W/kg



**SAR(1 g) = 7.49 mW/g; SAR(10 g) = 5.4 mW/g**

Maximum value of SAR (measured) = 7.77 mW/g



<b>Applicant:</b>	Vertex Standard USA Inc.	<b>FCC ID:</b>	AXI11134720	<b>IC ID:</b>	10239A-11134720	
<b>DUT Type:</b>	Portable UHF PTT Radio Transceiver	<b>Models:</b>	EVX-531-G7-5	450 - 512 MHz		
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	<u>Test Report Issue Date</u> Dec. 20, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Test Lab Certificate No. 2470.01

## Body SAR Plot B2

Date Tested: 11/01/2012

**DUT: Vertex: EVX-531-G7-5; Type: UHF PTT Radio Transceiver; Serial: 212B010073**

Program Notes: Ambient Temp: 22.0C; Fluid Temp: 21.6C; Barometric Pressure: 101.1 kPa; Humidity: 32%

Procedure Notes:

Communication System: UHF 450-512

Frequency: 463.3 MHz; Duty Cycle: 1:1

Medium: M450 Medium parameters used (interpolated):  $f = 463.3$  MHz;  $\sigma = 0.91$  mho/m;  $\epsilon_r = 55.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

- Probe: ET3DV6 - SN1590; ConvF(7.93, 7.93, 7.93); Calibrated: 24/04/2012
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: Barski Industries; Type: Fiberglass Planar; Serial: 03-01
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**MH-81A4B - Batt a - 16DS - 463.3MHz/Area Scan (7x19x1):** Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 8.25 mW/g

**MH-81A4B - Batt a - 16DS - 463.3MHz/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

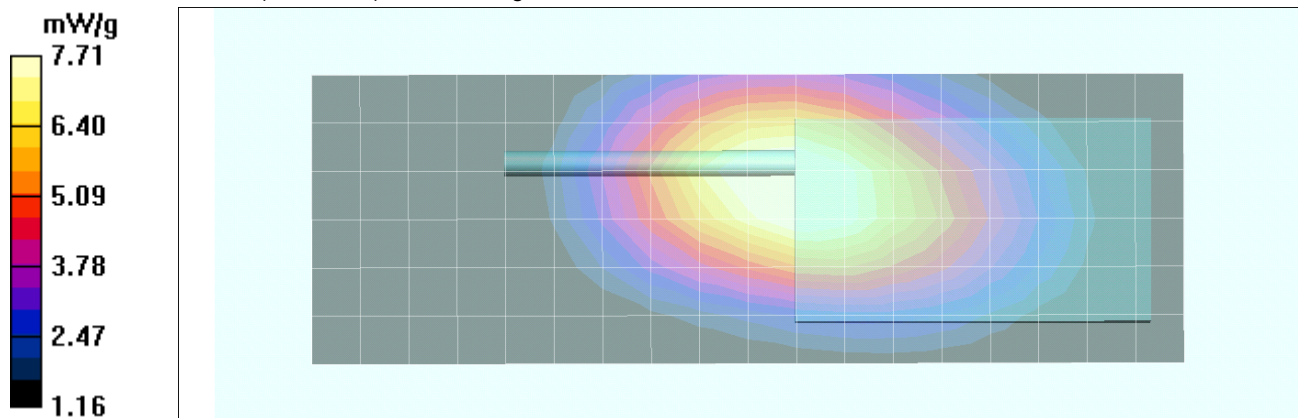
Reference Value = 92.4 V/m; Power Drift = -0.454 dB

Peak SAR (extrapolated) = 10.6 W/kg



**SAR(1 g) = 7.34 mW/g; SAR(10 g) = 5.26 mW/g**

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 7.71 mW/g



<b>Applicant:</b>	Vertex Standard USA Inc.	<b>FCC ID:</b>	AXI11134720	<b>IC ID:</b>	10239A-11134720	
<b>DUT Type:</b>	Portable UHF PTT Radio Transceiver	<b>Models:</b>	EVX-531-G7-5	<b>450 - 512 MHz</b>		
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	<u>Test Report Issue Date</u> Dec. 20, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

## Body SAR Plot B3

Date Tested: 11/01/2012

**DUT: Vertex: EVX-531-G7-5; Type: UHF PTT Radio Transceiver; Serial: 212B010073**

Program Notes: Ambient Temp: 22.0C; Fluid Temp: 21.6C; Barometric Pressure: 101.1 kPa; Humidity: 32%

Procedure Notes:

Communication System: UHF 450-512

Frequency: 490 MHz; Duty Cycle: 1:1

Medium: M450 Medium parameters used:  $f = 490 \text{ MHz}$ ;  $\sigma = 0.91 \text{ mho/m}$ ;  $\epsilon_r = 54.8$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1590; ConvF(7.93, 7.93, 7.93); Calibrated: 24/04/2012
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: Barski Industries; Type: Fiberglass Planar; Serial: 03-01
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**MH-81A4B - Batt a - 16DS - 490MHz/Area Scan (7x19x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (measured) = 8.81 mW/g

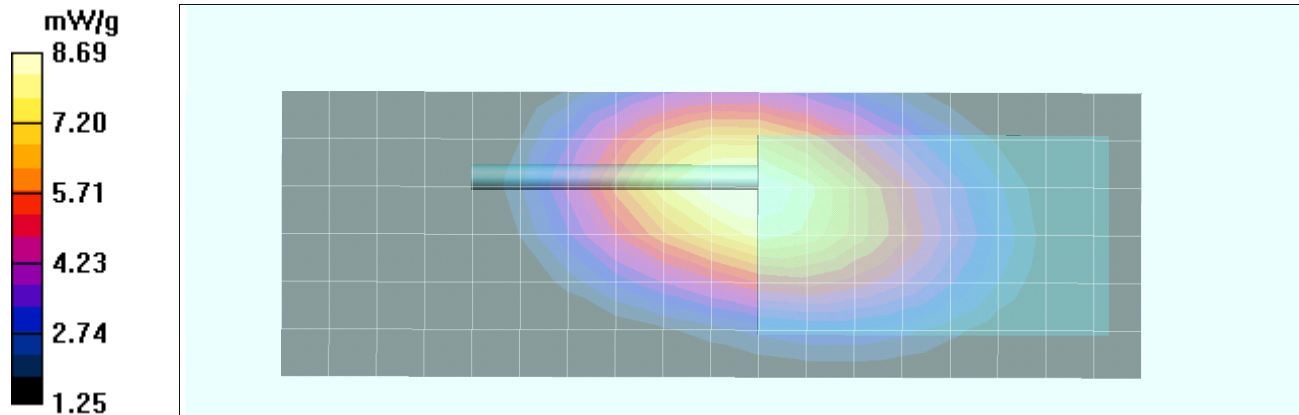
**MH-81A4B - Batt a - 16DS - 490MHz/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=7.5\text{mm}$ ,  $dy=7.5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 98.4 V/m; Power Drift = -0.562 dB

Peak SAR (extrapolated) = 12.0 W/kg

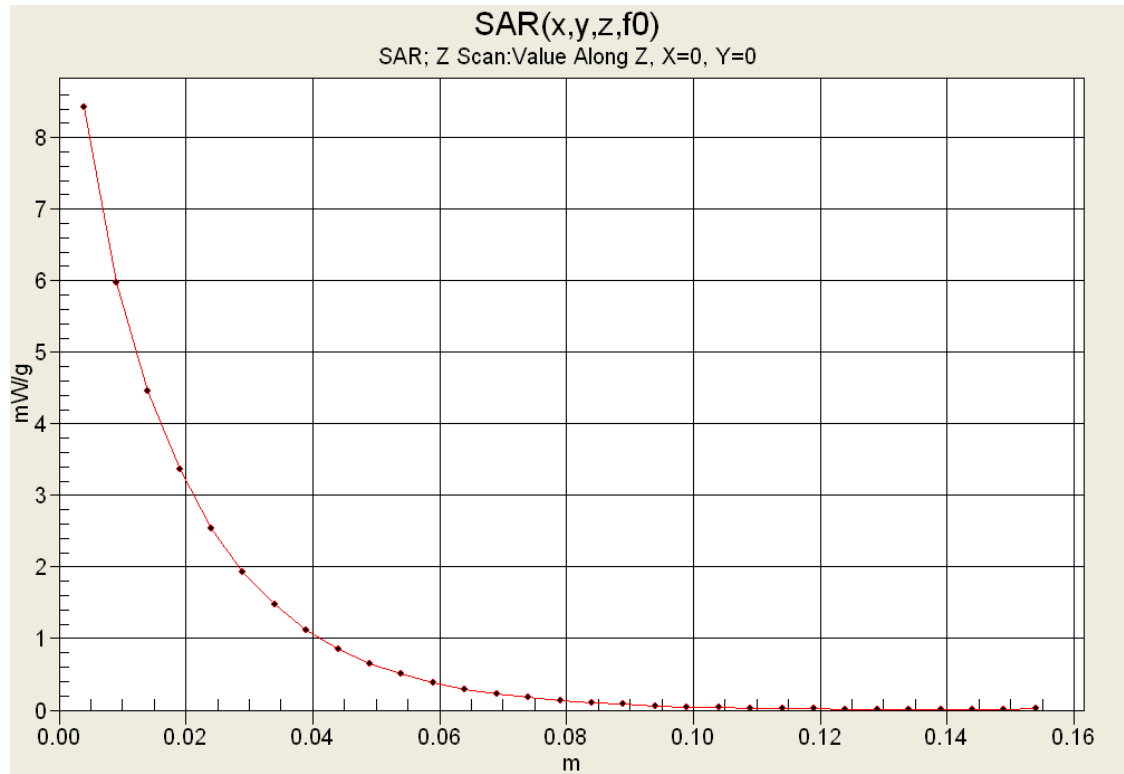
**SAR(1 g) = 8.28 mW/g; SAR(10 g) = 5.95 mW/g**

Maximum value of SAR (measured) = 8.69 mW/g

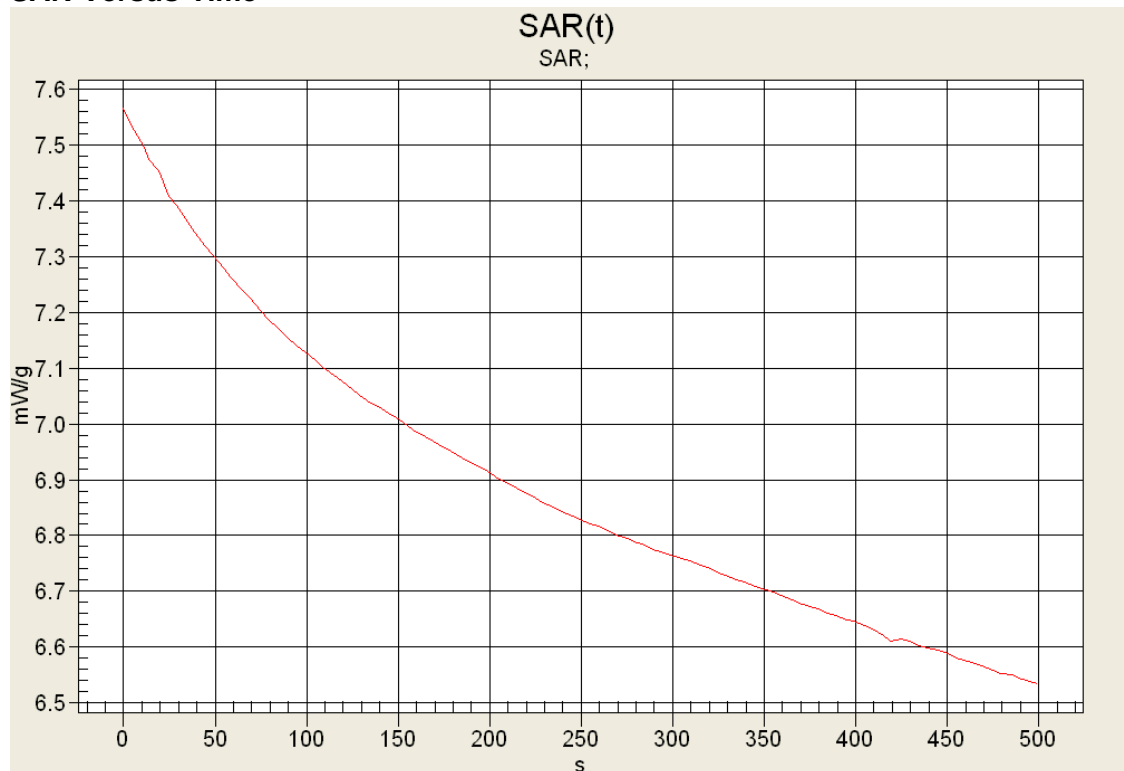


<b>Applicant:</b>	Vertex Standard USA Inc.	<b>FCC ID:</b>	AXI11134720	<b>IC ID:</b>	10239A-11134720	
<b>DUT Type:</b>	Portable UHF PTT Radio Transceiver	<b>Models:</b>	EVX-531-G7-5	<b>450 - 512 MHz</b>		
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## Z-Axis Scan



## SAR-Versus-Time





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	<u>Test Report Issue Date</u> Dec. 20, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Test Lab Certificate No. 2470.01

## Body SAR Plot B4

Date Tested: 11/01/2012

**DUT: Vertex: EVX-531-G7-5; Type: UHF PTT Radio Transceiver; Serial: 212B010073**

Program Notes: Ambient Temp: 22.0C; Fluid Temp: 21.6C; Barometric Pressure: 101.1 kPa; Humidity: 32%

Procedure Notes:

Communication System: UHF 450-512

Frequency: 470 MHz; Duty Cycle: 1:1

Medium: M450 Medium parameters used:  $f = 470$  MHz;  $\sigma = 0.91$  mho/m;  $\epsilon_r = 55.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

- Probe: ET3DV6 - SN1590; ConvF(7.93, 7.93, 7.93); Calibrated: 24/04/2012
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: Barski Industries; Type: Fiberglass Planar; Serial: 03-01
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**MH-81A4B - Batt a - 16F - 470MHz/Area Scan (7x19x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 7.13 mW/g

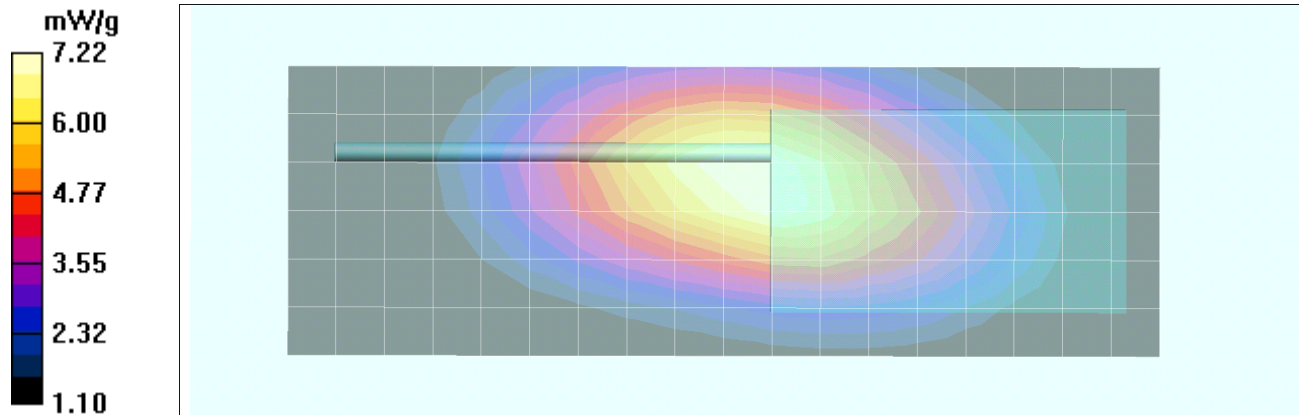
**MH-81A4B - Batt a - 16F - 470MHz/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 90.7 V/m; Power Drift = -0.499 dB



Peak SAR (extrapolated) = 9.89 W/kg

**SAR(1 g) = 6.88 mW/g; SAR(10 g) = 4.98 mW/g**

Maximum value of SAR (measured) = 7.22 mW/g



<b>Applicant:</b>	Vertex Standard USA Inc.	<b>FCC ID:</b>	AXI11134720	<b>IC ID:</b>	10239A-11134720	
<b>DUT Type:</b>	Portable UHF PTT Radio Transceiver	<b>Models:</b>	EVX-531-G7-5	<b>450 - 512 MHz</b>		
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	<u>Test Report Issue Date</u> Dec. 20, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

## Body SAR Plot B5

Date Tested: 11/01/2012

**DUT: Vertex: EVX-531-G7-5; Type: UHF PTT Radio Transceiver; Serial: 212B010073**

Program Notes: Ambient Temp: 22.0C; Fluid Temp: 21.6C; Barometric Pressure: 101.1 kPa; Humidity: 32%

Procedure Notes:

Communication System: UHF 450-512

Frequency: 490 MHz; Duty Cycle: 1:1

Medium: M450 Medium parameters used:  $f = 490 \text{ MHz}$ ;  $\sigma = 0.91 \text{ mho/m}$ ;  $\epsilon_r = 54.8$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1590; ConvF(7.93, 7.93, 7.93); Calibrated: 24/04/2012
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: Barski Industries; Type: Fiberglass Planar; Serial: 03-01
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**MH-81A4B - Batt b - 16DS - 490MHz/Area Scan (7x19x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (measured) = 8.95 mW/g

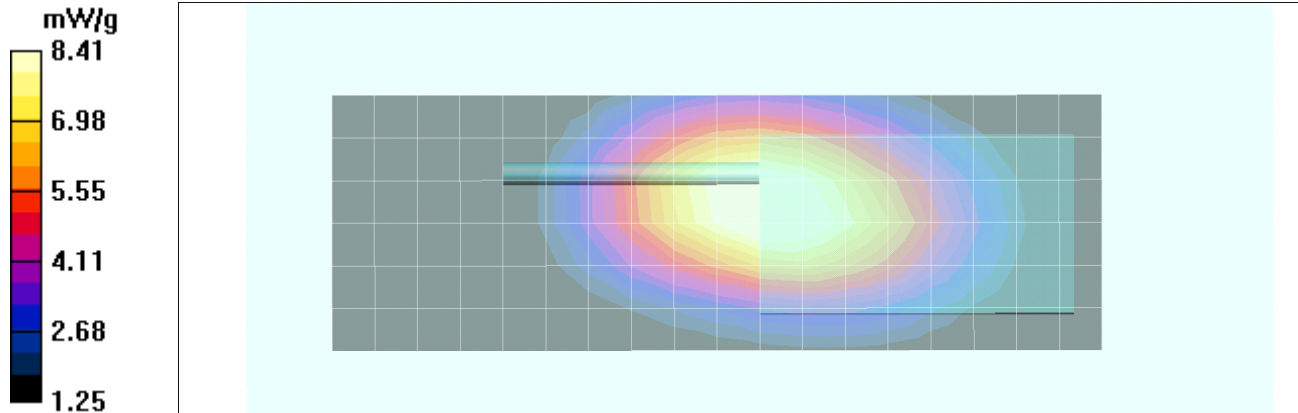
**MH-81A4B - Batt b - 16DS - 490MHz/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=7.5\text{mm}$ ,  $dy=7.5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 99.3 V/m; Power Drift = -0.518 dB



Peak SAR (extrapolated) = 11.6 W/kg

**SAR(1 g) = 8.03 mW/g; SAR(10 g) = 5.76 mW/g**

Maximum value of SAR (measured) = 8.41 mW/g



<b>Applicant:</b>	Vertex Standard USA Inc.	<b>FCC ID:</b>	AXI11134720	<b>IC ID:</b>	10239A-11134720	
<b>DUT Type:</b>	Portable UHF PTT Radio Transceiver	<b>Models:</b>	EVX-531-G7-5	<b>450 - 512 MHz</b>		
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	<u>Test Report Issue Date</u> Dec. 20, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Test Lab Certificate No. 2470.01

## Body SAR Plot A1

Date Tested: 11/01/2012

**DUT: Vertex: EVX-531-G7-5; Type: UHF PTT Radio Transceiver; Serial: 212B010073**

Program Notes: Ambient Temp: 22.0C; Fluid Temp: 21.6C; Barometric Pressure: 101.1 kPa; Humidity: 32%

Procedure Notes:

Communication System: UHF 450-512

Frequency: 490 MHz; Duty Cycle: 1:1

Medium: M450 Medium parameters used:  $f = 490 \text{ MHz}$ ;  $\sigma = 0.91 \text{ mho/m}$ ;  $\epsilon_r = 54.8$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1590; ConvF(7.93, 7.93, 7.93); Calibrated: 24/04/2012
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: Barski Industries; Type: Fiberglass Planar; Serial: 03-01
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**MH-360S - Batt a - 16DS - 490MHz/Area Scan (7x19x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (measured) = 8.79 mW/g

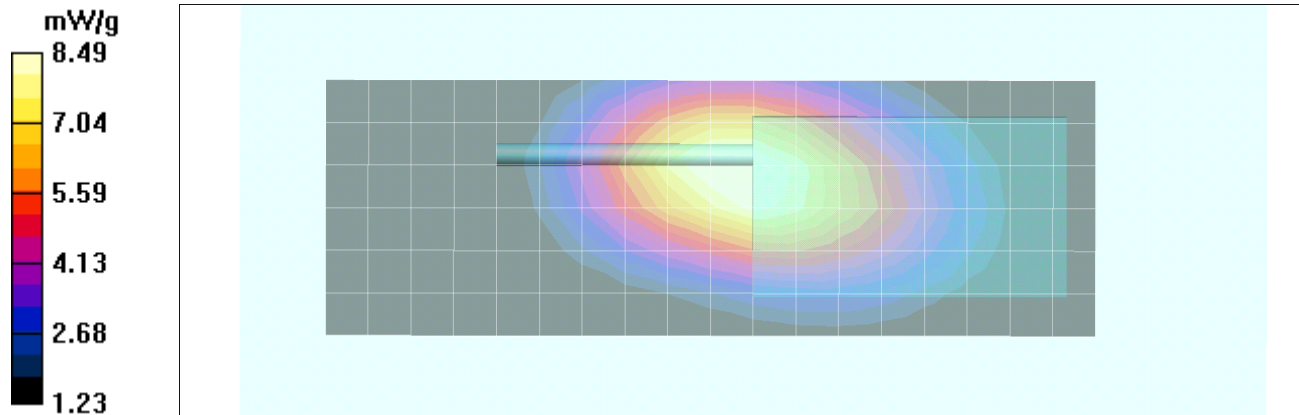
**MH-360S - Batt a - 16DS - 490MHz/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=7.5\text{mm}$ ,  $dy=7.5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 97.9 V/m; Power Drift = -0.539 dB



Peak SAR (extrapolated) = 11.7 W/kg

**SAR(1 g) = 8.1 mW/g; SAR(10 g) = 5.82 mW/g**

Maximum value of SAR (measured) = 8.49 mW/g



<b>Applicant:</b>	Vertex Standard USA Inc.	<b>FCC ID:</b>	AXI11134720	<b>IC ID:</b>	10239A-11134720	
<b>DUT Type:</b>	Portable UHF PTT Radio Transceiver	<b>Models:</b>	EVX-531-G7-5	450 - 512 MHz		
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	<u>Test Report Issue Date</u> Dec. 20, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Test Lab Certificate No. 2470.01

## Body SAR Plot A2

Date Tested: 11/01/2012

**DUT: Vertex: EVX-531-G7-5; Type: UHF PTT Radio Transceiver; Serial: 212B010073**

Program Notes: Ambient Temp: 22.0C; Fluid Temp: 21.6C; Barometric Pressure: 101.1 kPa; Humidity: 32%

Procedure Notes:

Communication System: UHF 450-512

Frequency: 490 MHz; Duty Cycle: 1:1

Medium: M450 Medium parameters used:  $f = 490 \text{ MHz}$ ;  $\sigma = 0.91 \text{ mho/m}$ ;  $\epsilon_r = 54.8$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1590; ConvF(7.93, 7.93, 7.93); Calibrated: 24/04/2012
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: Barski Industries; Type: Fiberglass Planar; Serial: 03-01
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**MH-37A4B - Batt a - 16DS - 490MHz/Area Scan (7x19x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (measured) = 9.06 mW/g

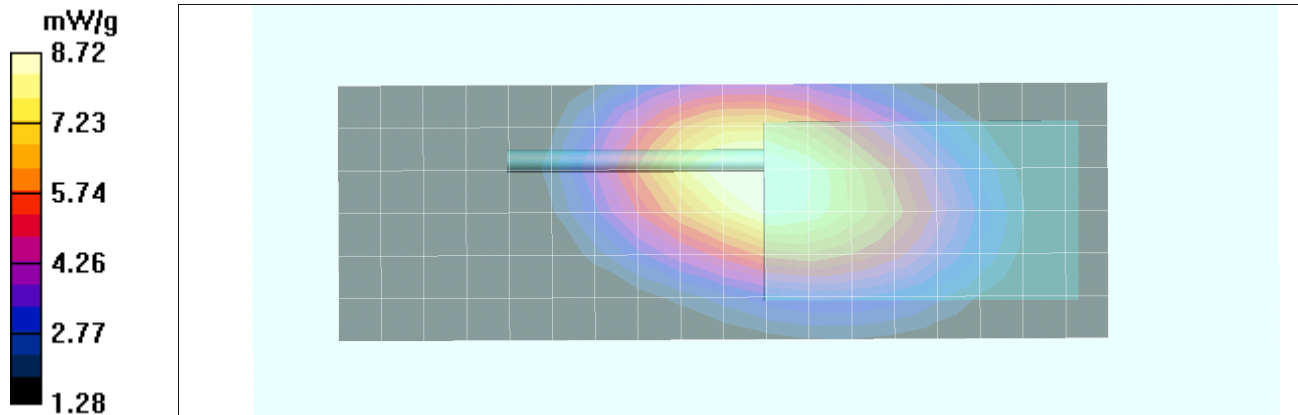
**MH-37A4B - Batt a - 16DS - 490MHz/Zoom Scan (5x5x7)/Cube 0:** Measurement grid:  $dx=7.5\text{mm}$ ,  $dy=7.5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 98.1 V/m; Power Drift = -0.469 dB



Peak SAR (extrapolated) = 12.0 W/kg

**SAR(1 g) = 8.25 mW/g; SAR(10 g) = 5.9 mW/g**

Maximum value of SAR (measured) = 8.72 mW/g





<b>Applicant:</b>	Vertex Standard USA Inc.	<b>FCC ID:</b>	AXI11134720	<b>IC ID:</b>	10239A-11134720	
<b>DUT Type:</b>	Portable UHF PTT Radio Transceiver	<b>Models:</b>	EVX-531-G7-5	450 - 512 MHz		
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	<u>Test Report Issue Date</u> Dec. 20, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Test Lab Certificate No. 2470.01

## APPENDIX B - SYSTEM PERFORMANCE CHECK PLOTS

<b>Applicant:</b>	<b>Vertex Standard USA Inc.</b>	<b>FCC ID:</b>	<b>AXI11134720</b>	<b>IC ID:</b>	<b>10239A-11134720</b>	
<b>DUT Type:</b>	<b>Portable UHF PTT Radio Transceiver</b>	<b>Models:</b>	<b>EVX-531-G7-5</b>	<b>450 - 512 MHz</b>		
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	<u>Test Report Issue Date</u> Dec. 20, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Test Lab Certificate No. 2470.01

## System Performance Check - 450 MHz Body

Date Tested: 11/01/2012

**DUT: Dipole 450 MHz; Type: D450V3; Serial: 1068; Calibrated: 04/27/2012**

Program Notes: Ambient Temp: 22C; Fluid Temp: 21.6C; Barometric Pressure: 101.1 kPa; Humidity: 32%

Procedure Notes:

Communication System: CW

Frequency: 450 MHz; Duty Cycle: 1:1

Medium: M450 Medium parameters used:  $f = 450 \text{ MHz}$ ;  $\sigma = 0.90 \text{ mho/m}$ ;  $\epsilon_r = 56.2$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1590; ConvF(7.93, 7.93, 7.93); Calibrated: 24/04/2012
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: Barski Industries; Type: Fiberglass Planar; Serial: 03-01
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Body d=15mm Pin=398mW/Area Scan (6x11x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (measured) = 1.74 mW/g

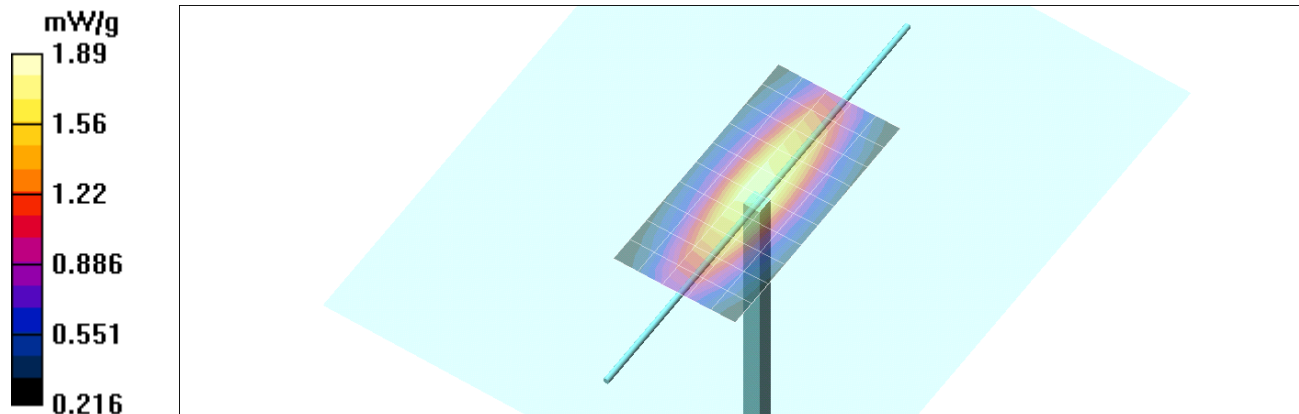
**Body d=15mm Pin=398mW/Zoom Scan (7x7x7)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 46.4 V/m; Power Drift = 0.001 dB

Peak SAR (extrapolated) = 2.84 W/kg

**SAR(1 g) = 1.78 mW/g; SAR(10 g) = 1.18 mW/g**



Maximum value of SAR (measured) = 1.89 mW/g



<b>Applicant:</b>	Vertex Standard USA Inc.	<b>FCC ID:</b>	AXI11134720	<b>IC ID:</b>	10239A-11134720	
<b>DUT Type:</b>	Portable UHF PTT Radio Transceiver	<b>Models:</b>	EVX-531-G7-5	450 - 512 MHz		
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	<u>Date(s) of Evaluation</u> Nov. 1-2, 2012	<u>Test Report Serial No.</u> 101712AXI-T1202S	<u>Test Report Revision No.</u> Rev. 1.3 (4th Release)	
	<u>Test Report Issue Date</u> Dec. 20, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Test Lab Certificate No. 2470.01

## System Performance Check - 450 MHz Head

Date Tested: 11/02/2012

**DUT: Dipole 450 MHz; Type: D450V3; Serial: 1068; Calibrated: 04/27/2012**

Program Notes: Ambient Temp: 23.0C; Fluid Temp: 21.9C; Barometric Pressure: 101.1 kPa; Humidity: 32%

Procedure Notes:

Communication System: CW

Frequency: 450 MHz; Duty Cycle: 1:1

Medium: HSL450 Medium parameters used:  $f = 450 \text{ MHz}$ ;  $\sigma = 0.87 \text{ mho/m}$ ;  $\epsilon_r = 44.3$ ;  $\rho = 1000 \text{ kg/m}^3$

- Probe: ET3DV6 - SN1590; ConvF(7.54, 7.54, 7.54); Calibrated: 24/04/2012
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn353; Calibrated: 19/04/2012
- Phantom: Barski Industries; Type: Fiberglass Planar; Serial: 03-01
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Head d=15mm Pin=398mW/Area Scan (6x11x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$

Maximum value of SAR (measured) = 1.88 mW/g

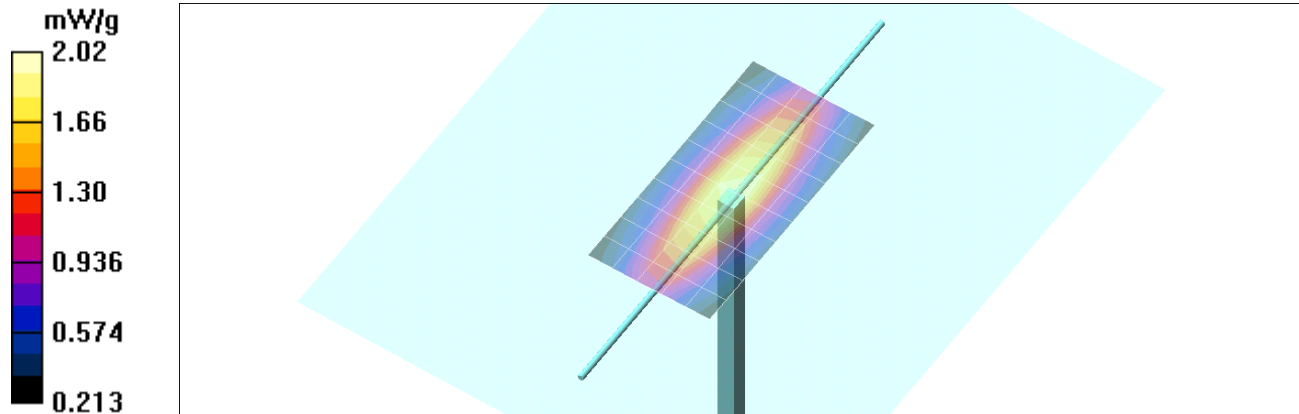
**Head d=15mm Pin=398mW/Zoom Scan (7x7x7)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 48.8 V/m; Power Drift = 0.004 dB

Peak SAR (extrapolated) = 2.97 W/kg



**SAR(1 g) = 1.89 mW/g; SAR(10 g) = 1.26 mW/g**

Maximum value of SAR (measured) = 2.02 mW/g

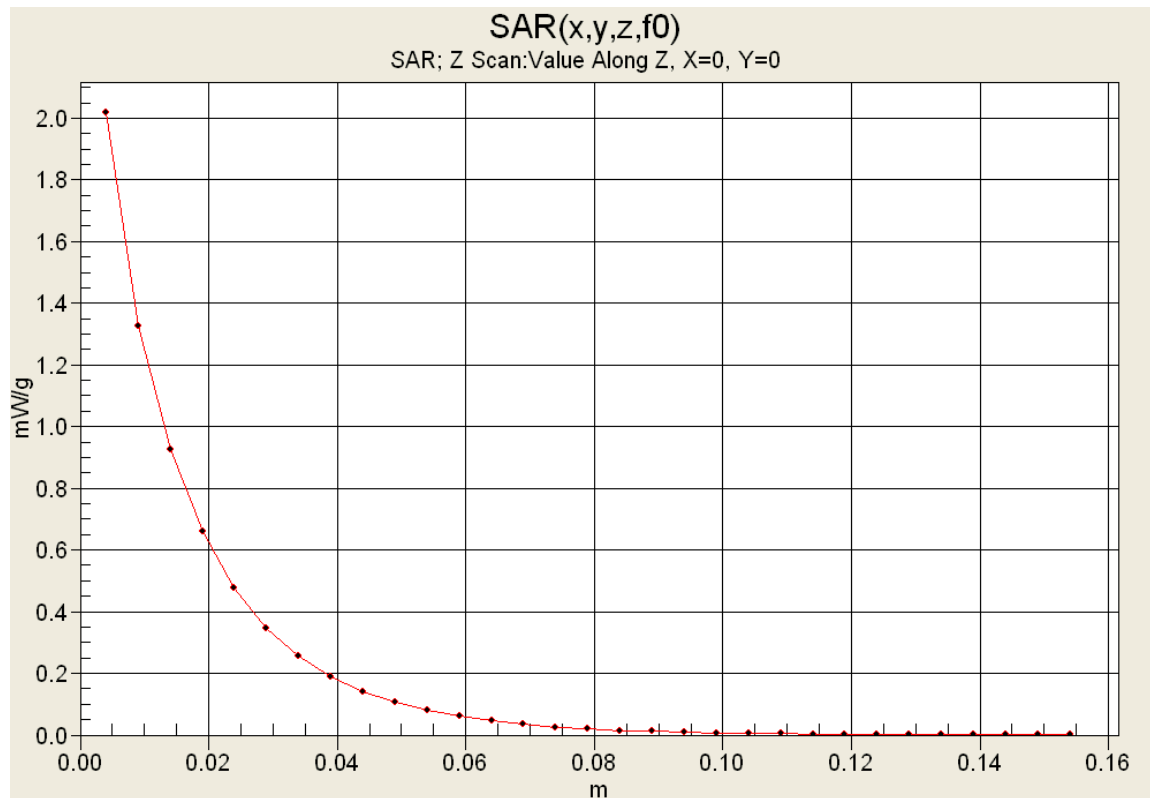


<b>Applicant:</b>	Vertex Standard USA Inc.	<b>FCC ID:</b>	AXI11134720	<b>IC ID:</b>	10239A-11134720	
<b>DUT Type:</b>	Portable UHF PTT Radio Transceiver	<b>Models:</b>	EVX-531-G7-5	<b>450 - 512 MHz</b>		
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	<u>Test Report Issue Date</u> Dec. 20, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	
Test Lab Certificate No. 2470.01				

## Z-Axis Scan





Applicant:	Vertex Standard USA Inc.	FCC ID:	AXI11134720	IC ID:	10239A-11134720	
DUT Type:	Portable UHF PTT Radio Transceiver		Models:	EVX-531-G7-5	450 - 512 MHz	
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	<u>Date(s) of Evaluation</u> Nov. 1-2, 2012	<u>Test Report Serial No.</u> 101712AXI-T1202S	<u>Test Report Revision No.</u> Rev. 1.3 (4th Release)	
	<u>Test Report Issue Date</u> Dec. 20, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Test Lab Certificate No. 2470.01

## APPENDIX C - MEASURED FLUID DIELECTRIC PARAMETERS

<b>Applicant:</b>	<b>Vertex Standard USA Inc.</b>	<b>FCC ID:</b>	<b>AXI11134720</b>	<b>IC ID:</b>	<b>10239A-11134720</b>	
<b>DUT Type:</b>	<b>Portable UHF PTT Radio Transceiver</b>	<b>Models:</b>	<b>EVX-531-G7-5</b>	<b>450 - 512 MHz</b>		
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	<u>Date(s) of Evaluation</u> Nov. 1-2, 2012	<u>Test Report Serial No.</u> 101712AXI-T1202S	<u>Test Report Revision No.</u> Rev. 1.3 (4th Release)	
	<u>Test Report Issue Date</u> Dec. 20, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Test Lab Certificate No. 2470.01

### 450 MHz Body



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Celltech Labs Inc.  
Test Result for UIM Dielectric Parameter  
01/Nov/2012  
Freq      Frequency(GHz)  
FCC\_eB FCC Limits for Body Epsilon  
FCC\_sB FCC Limits for Body Sigma  
Test\_e    Epsilon of UIM  
Test\_s    Sigma of UIM

\*\*\*\*\*

Freq	FCC_eB	FCC_sB	Test_e	Test_s
0.3500	57.70	0.93	56.77	0.82
0.3600	57.60	0.93	56.87	0.82
0.3700	57.50	0.93	56.19	0.83
0.3800	57.40	0.93	56.50	0.84
0.3900	57.30	0.93	56.72	0.85
0.4000	57.20	0.93	56.18	0.84
0.4100	57.10	0.93	55.74	0.87
0.4200	57.00	0.94	55.94	0.87
0.4300	56.90	0.94	55.90	0.89
0.4400	56.80	0.94	55.73	0.89
0.4500	56.70	0.94	55.17	0.90
0.4600	56.66	0.94	55.50	0.91
0.4700	56.62	0.94	55.33	0.91
0.4800	56.58	0.94	54.73	0.91
0.4900	56.54	0.94	54.84	0.91
0.5000	56.51	0.94	54.80	0.92
0.5100	56.47	0.94	54.34	0.94
0.5200	56.43	0.95	54.50	0.95
0.5300	56.39	0.95	53.99	0.98
0.5400	56.35	0.95	54.20	0.96
0.5500	56.31	0.95	54.45	0.98

<b>Applicant:</b>	<b>Vertex Standard USA Inc.</b>	<b>FCC ID:</b>	<b>AXI11134720</b>	<b>IC ID:</b>	<b>10239A-11134720</b>	
<b>DUT Type:</b>	<b>Portable UHF PTT Radio Transceiver</b>	<b>Models:</b>	<b>EVX-531-G7-5</b>	<b>450 - 512 MHz</b>		
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	<u>Date(s) of Evaluation</u> Nov. 1-2, 2012	<u>Test Report Serial No.</u> 101712AXI-T1202S	<u>Test Report Revision No.</u> Rev. 1.3 (4th Release)	
	<u>Test Report Issue Date</u> Dec. 20, 2012	<u>Description of Test(s)</u> Specific Absorption Rate	<u>RF Exposure Category</u> Occupational (Controlled)	

Test Lab Certificate No. 2470.01

### 450 MHz Head

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Celltech Labs Inc  
Test Result for UIM Dielectric Parameter  
02/Nov/2012

Freq Frequency(GHz)

FCC\_eHFCC OET 65 Supplement C (June 2001) Limits for Head Epsilon

FCC\_sHFCC OET 65 Supplement C (June 2001) Limits for Head Sigma

Test\_e Epsilon of UIM

Test\_s Sigma of UIM

\*\*\*\*\*

Freq	FCC_eHF	FCC_sH	Test_e	Test_s
0.3500	44.70	0.87	47.29	0.78
0.3600	44.58	0.87	46.52	0.79
0.3700	44.46	0.87	46.34	0.79
0.3800	44.34	0.87	46.71	0.81
0.3900	44.22	0.87	46.50	0.82
0.4000	44.10	0.87	45.64	0.82
0.4100	43.98	0.87	45.34	0.82
0.4200	43.86	0.87	45.47	0.83
0.4300	43.74	0.87	45.06	0.85
0.4400	43.62	0.87	44.99	0.85
0.4500	43.50	0.87	44.34	0.87
0.4600	43.45	0.87	44.82	0.87
0.4700	43.40	0.87	44.65	0.89
0.4800	43.34	0.87	44.02	0.89
0.4900	43.29	0.87	43.82	0.89
0.5000	43.24	0.87	43.76	0.90
0.5100	43.19	0.87	43.50	0.91
0.5200	43.14	0.88	43.49	0.93
0.5300	43.08	0.88	43.61	0.93
0.5400	43.03	0.88	43.01	0.94
0.5500	42.98	0.88	42.93	0.95

<b>Applicant:</b>	<b>Vertex Standard USA Inc.</b>	<b>FCC ID:</b>	<b>AXI11134720</b>	<b>IC ID:</b>	<b>10239A-11134720</b>	
<b>DUT Type:</b>	<b>Portable UHF PTT Radio Transceiver</b>	<b>Models:</b>	<b>EVX-531-G7-5</b>	<b>450 - 512 MHz</b>		
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