

	Test Report Serial No.:	112211AMW-T1134-E80V	Test Report Issue Date:	December 13, 2011
	Measurement Date(s):	November 25-29, 2011	Test Report Revision No.:	Rev. 1.1 (2nd Release)
	Rule Part(s) Applied:	FCC 47 CFR §2, §80	Industry Canada RSS-182 Issue 4, RSS-Gen Issue 3	
	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

DECLARATION OF COMPLIANCE		FCC PART 80		IC RSS-182 (Issue 4)	
Test Lab Information	Name	CELLTECH LABS INCORPORATED			
	Address	21-364 Lougheed Road, Kelowna, British Columbia V1X 7R8 Canada			
Test Site Registration No.(s)	FCC	Accredited Site (ISO 17025:2005 - A2LA Test Lab Certificate No. 2470.01)			
	IC	3874A-1			
Applicant Information	Name	UNIDEN AMERICA CORPORATION			
	Address	4700 Amon Carter Boulevard, Fort Worth, Texas 76155 United States			
Standard(s) & Procedure(s)	FCC	47 CFR Part 2; Part 80			
	IC	RSS-182 Issue 4; RSS-Gen Issue 3			
	ANSI	TIA/EIA-603-C-2004 C63.4-2003			
Device Classification(s)	FCC	Licensed Non-Broadcast Transmitter Held to Face (TNF)			47 CFR §80
	IC	Maritime Radio Transmitter/Receiver in the Band 156-162.5 MHz			RSS-182 Issue 4
RF Exposure Category	FCC/IC	General Population / Uncontrolled			
Application Type(s)	FCC/IC	New Certification			
Device Identifier(s)	FCC ID:	AMWUT639			
	IC:	513C-UT639			
Device Under Test (DUT)	Portable Push-To-Talk (PTT) VHF Marine Radio Transceiver				
Date of Sample Receipt	November 22, 2011				
Date(s) of Evaluation	November 25-29, 2011				
Device Model(s)	MHS050				
Test Sample Serial No.(s)	UT639BK (Identical Prototype)				
Hardware Revision No.	EPP Stage				
Firmware Revision No.	EPP Stage				
Transmit Frequency Range(s)	156.025 - 157.425 MHz (VHF Marine Band)				
Manuf. Rated Output Power	2.5 Watts Conducted $\pm$ 0.2 W) – Hi Power				
	0.7 Watts Conducted $\pm$ 0.1 W) – Lo Power				
Max. RF Output Power Tested	2.6 Watts Conducted				
Modulation Type(s)	FM				
Emission Designator(s)	14K4F3E				
Antenna Type(s) Tested	Permanent (Non-detachable) -1 dBi Gain				
Power Source(s) Tested	Ni-MH Battery Pack (4.8V, 700mAh) Model: BP38				
<p>This wireless device has demonstrated compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in FCC 47 CFR Rule Parts 2 and Part 80; Industry Canada RSS-182 Issue 4 and RSS-Gen Issue 3; ANSI TIA/EIA-603-C-2004 and ANSI C63.4-2003.</p> <p>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.</p> <p>The results and statements contained in this report pertain only to the device(s) evaluated.</p> <p>This test report shall not be reproduced partially, or in full, without the prior written approval of Celltech Labs Inc.</p>					
Test Report Approved By		Sean Johnston	Lab Manager	Celltech Labs Inc.	

Applicant:	Uniden America Corporation	FCC ID:	AMWUT639	IC:	513C-UT639	
DUT Type:	Portable VHF PTT Marine Radio Transceiver	Model:	MHS050	Freq.:	156.025-157.425 MHz	
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	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

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## TEST SUMMARY


### Referenced Standard(s): FCC CFR Title 47 Parts 2, 80

Appendix	Description of Test	Procedure Reference	Limit Reference	Test Start	Test End	Result
A	RF Output Power	ANSI/TIA/EIA-603-C	\$2.1046, §80.215	25-Nov-11	25-Nov-11	Pass
B	Spurious Emissions at the antenna terminals (Conducted)	ANSI/TIA/EIA-603-C	\$2.1051, 80.211	25-Nov-11	25-Nov-11	Pass
C	Modulation Limiting	ANSI/TIA/EIA-603-C	\$2.1047, §80.213	25-Nov-11	25-Nov-11	Pass
D	Audio Frequency Response	ANSI/TIA/EIA-603-C	\$2.1047, §80.213	25-Nov-11	25-Nov-11	Pass
E	Low-Pass Filter Response	ANSI/TIA/EIA-603-C	\$2.1047, §80.213	25-Nov-11	25-Nov-11	Pass
F	Occupied Bandwidth and Emission Mask	ANSI/TIA/EIA-603-C	\$2.1049, §80.211	25-Nov-11	25-Nov-11	Pass
G	Radiated TX Spurious Emissions	ANSI/TIA/EIA-603-C	\$2.1053	28-Nov-11	28-Nov-11	Pass
H	Frequency Stability	ANSI/TIA/EIA-603-C	\$2.1055, §80.209	29-Nov-11	29-Nov-11	Pass

### Referenced Standard(s): Industry Canada RSS-182 Issue 4

Appendix	Description of Test	Procedure Reference	Limit Reference	Test Start	Test End	Result
A	Transmitter Output power	RSS-Gen 4.8 RSS-182 4.3	RSS-182 6.2	25-Nov-11	25-Nov-11	Pass
B	Spurious Emissions at the antenna terminals (Conducted)	RSS-Gen 4.9 RSS-182 4.4	RSS-182 6.3	25-Nov-11	25-Nov-11	Pass
C	Modulation Limiting	ANSI/TIA/EIA-603-C	RSS-182	25-Nov-11	25-Nov-11	Pass
D	Audio Frequency Response	ANSI/TIA/EIA-603-C	RSS-182	25-Nov-11	25-Nov-11	Pass
E	Low-Pass Filter Response	ANSI/TIA/EIA-603-C	RSS-182	25-Nov-11	25-Nov-11	Pass
F	Occupied Bandwidth and Emission Mask	RSS-Gen 4.6.1	RSS-182	25-Nov-11	25-Nov-11	Pass
G	Radiated TX Spurious Emissions	RSS-Gen 4.9 RSS-182 4.4	RSS-182 6.3	28-Nov-11	28-Nov-11	Pass
H	Frequency Stability	RSS-Gen 4.7 RSS-182 4.2	RSS-182 6.1	29-Nov-11	29-Nov-11	Pass

Applicant:	Uniden America Corporation	FCC ID:	AMWUT639	IC:	513C-UT639	
DUT Type:	Portable VHF PTT Marine Radio Transceiver	Model:	MHS050	Freq.:	156.025-157.425 MHz	
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	Rule Part(s) Applied:	FCC 47 CFR §2, §80	Industry Canada RSS-182 Issue 4, RSS-Gen Issue 3	
	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

### REVISION LOG

Revision	Description	Implemented By	Implementation Date
1.0	1st Release	Jon Hughes	December 09, 2011
1.1	2nd Release Corrected Emission Designator (Page 1, Page 20 - Section F.6)	Sean Johnston	December 13, 2011

### TEST REPORT SIGN-OFF

Test Report Prepared By	Date	QA Review By	Date
Sean Johnston	November 28, 2011	Jon Hughes	December 09, 2011

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	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

## 1.0 SCOPE

This report outlines the measurements made and results collected during electromagnetic emissions testing of the Uniden America Corporation Model: MHS050 Portable Push-To-Talk (PTT) VHF Marine Radio Transceiver (FCC ID: AMWUT639 / IC: 513C-UT639). The measurement results were applied against the applicable EMC requirements and limits outlined in the technical rules and regulations set forth in the Federal Communication's Commission Code of Federal Regulations Title 47 Part 2 and Part 80; and Industry Canada Radio Standards Specification RSS-182 Issue 4 and RSS-Gen Issue 3.


## 2.0 REFERENCES


### 2.1 Normative References

ANSI/ISO 17025:2005	General Requirements for competence of testing and calibration laboratories
IEEE/ANSI C63.4:2003	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
ANSI/TIA/EIA-603-C:2004	Land Mobile FM or PM Communication Equipment Measurement and Performance Standards
CFR Title 47 Part 2	Code of Federal Regulations Title 47: Telecommunication Part 2: Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
CFR Title 47 Part 80	Code of Federal Regulations Title 47: Telecommunication Part 80: Station in the Maritime Services
IC Spectrum Management & Telecommunications Policy	Radio Standards Specification RSS-182 Issue 4 - Maritime Radio Transmitters and Receivers in the Band 156-162.5 MHz RSS-Gen Issue 3 - General Requirements and Information for the Certification of Radiocommunication Equipment

## 3.0 PASS/FAIL CRITERIA

Unless otherwise noted in the Appendices, the pass/fail criteria is the limit set forth in the reference standards. The DUT is considered to have passed the requirements if the data collected during the described measurement procedure is no greater than the specified limits as defined. The pass/fail statements made in this report only apply to the unit tested.

Applicant:	Uniden America Corporation	FCC ID:	AMWUT639	IC:	513C-UT639	
DUT Type:	Portable VHF PTT Marine Radio Transceiver	Model:	MHS050	Freq.:	156.025-157.425 MHz	
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	Rule Part(s) Applied:	FCC 47 CFR §2, §80	Industry Canada RSS-182 Issue 4, RSS-Gen Issue 3	
	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

#### 4.0 FACILITIES AND ACCREDITATIONS

The facilities used in collecting the test results outlined in this report are located at 21-364 Lougheed Road, Kelowna, British Columbia, Canada V1X 7R8. The radiated emissions site conforms to the requirements set forth in ANSI C63.4 and is filed and listed with the FCC as an accredited test facility and Industry Canada under File Number IC 3874A-1.

#### 5.0 GENERAL INFORMATION

##### 5.1 Applicant Information


<b>Company Name</b>	<b>UNIDEN AMERICA CORPORATION</b>
<b>Address</b>	4700 Amon Carter Boulevard
	Fort Worth, Texas 76155
	United States

##### 5.2 DUT Description

<b>Device Type</b>	Portable Push-To-Talk (PTT) VHF Marine Radio Transceiver	
<b>Device Model(s)</b>	MHS050	
<b>Test Sample Serial No.(s)</b>	UT639BK (Identical Prototype)	
<b>Device Identifier(s)</b>	<b>FCC ID:</b>	AMWUT639
	<b>IC:</b>	513C-UT639
<b>Co-located Transmitter(s)</b>	None	
<b>Antenna Type Tested</b>	Permanent (Non-detachable)	
<b>Manuf. Antenna Gain Spec.</b>	-1 dBi	
<b>Power Source Tested</b>	Ni-MH Battery Pack (4.8V, 700mAh) Model: BP38	

##### 5.3 Rule Part(s) & Classification(s)

<b>Rule Part(s) Applied</b>	<b>FCC</b>	47 CFR §2; §80
	<b>IC</b>	RSS-182 Issue 4; RSS-Gen Issue 3
<b>Device Classification(s)</b>	<b>FCC</b>	Licensed Non-Broadcast Transmitter Held to Face (TNF)
	<b>IC</b>	Maritime Radio Transmitter and Receiver in the Band 156-162.5 MHz

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	Rule Part(s) Applied:	FCC 47 CFR §2, §80	Industry Canada RSS-182 Issue 4, RSS-Gen Issue 3	
	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

## 5.4 Mode(s) of Operation Tested

### 5.4.1 PTT Radio Transceiver

#### 5.4.1.1 VHF Marine Band

<b>Transmitter Frequency Range(s)</b>	156.025 - 157.425 MHz
<b>Transmitter Test Channel(s)</b>	156.7 MHz (Channel 14)
<b>Output Power Tested</b>	2.6 Watts Conducted (Hi Power Setting)
<b>Transmitter Test Mode(s)</b>	Enter TX Test Mode (keypad entry) - Select Channel (keypad entry); Continuous Transmit with PTT constantly depressed (Hi power setting)
<b>Modulation Type(s)</b>	FM


## 5.5 Modification(s)

None

## 6.0 RANGE OF OPERATING POWER (FCC §2.1033(c)(6))

TX POWER (HI)@CH14 2.5 W  $\pm$  0.2 W

TX POWER (LO)@CH14 0.7 W  $\pm$  0.1 W

<b>Applicant:</b>	Uniden America Corporation	<b>FCC ID:</b>	AMWUT639	<b>IC:</b>	513C-UT639	
<b>DUT Type:</b>	Portable VHF PTT Marine Radio Transceiver	<b>Model:</b>	MHS050	<b>Freq.:</b>	156.025-157.425 MHz	
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	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

## Appendix A RF Output Power Measurement

### A.1 REFERENCES

<b>Normative Reference Standard</b>	FCC CFR 47 §2.1046, §80.215; IC RSS-182
<b>Procedure Reference</b>	The RF output power measurements were performed in accordance with ANSI TIA/EIA Standard 603.

### A.2 LIMITS

FCC CFR 47 §80.215	Marine utility stations and hand-held portable transmitters: 156-162 MHz–10W
RSS-182 6.2	The output power shall be within $\pm 1.0$ dB of the manufacturers rated power, hand-held portable transmitters 5W (Typical)

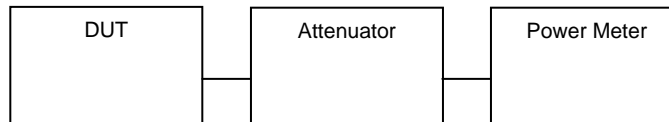
### A.3 ENVIRONMENTAL CONDITIONS

<b>Temperature</b>	25 +/- 5 °C
<b>Humidity</b>	40 +/- 10 %
<b>Barometric Pressure</b>	101 +/- 3 kPa


ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	CAL DUE
00015	HP	E4408B	Spectrum Analyzer	03-May-12
00007	Gigatronics	8652A	Power Meter	04-May-12
00014	Gigatronics	80701A	Power Sensor	04-May-12

### A.4 SETUP DRAWING

Figure A.4-1 - Setup Drawing – RF Output Power





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	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

## A.5 TEST RESULTS

Measured Frequency	Conducted Output Power
(MHz)	(Watts)
156.7 (Ch. 14)	2.6

## FCC Rule Part 2.1033 (C)(8) DC Input into final amplifier

Frequency	Voltage	Current	Power
(MHz)	V	A	W
156.7	4.8	1.22	5.86

## A.6 PASS/FAIL

In reference to the results outlined in A.5, the DUT meets the requirements as stated in the reference standards.

## A.7 SIGN-OFF


I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.




Sean Johnston  
Lab Manager  
Celltech Labs Inc.

Nov 25, 2011

Date

Applicant:	Uniden America Corporation	FCC ID:	AMWUT639	IC:	513C-UT639	
DUT Type:	Portable VHF PTT Marine Radio Transceiver	Model:	MHS050	Freq.:	156.025-157.425 MHz	
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## Appendix B Spurious Emissions at the Antenna Terminal

### B.1 REFERENCES

<b>Normative Reference Standard</b>	FCC CFR 47 §2.1051, §80.211; IC RSS-182
<b>Procedure Reference</b>	The spurious emissions measurements at the antenna terminal were performed in accordance with ANSI TIA/EIA Standard 603.

### B.2 LIMITS

FCC CFR 47 §80.211	$43 + 10 \text{ Log (Po)} = 43 + 10 \text{ Log (2.5)} = 47.0 \text{ dBc}$
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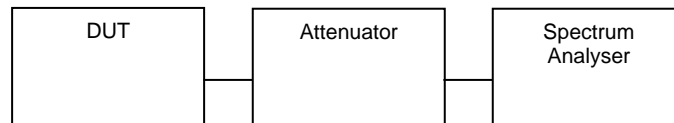
### B.3 ENVIRONMENTAL CONDITIONS

<b>Temperature</b>	25 +/- 5 °C
<b>Humidity</b>	40 +/- 10 %
<b>Barometric Pressure</b>	101 +/- 3 kPa

ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	CAL DUE
00015	HP	E4408B	Spectrum Analyzer	03-May-12

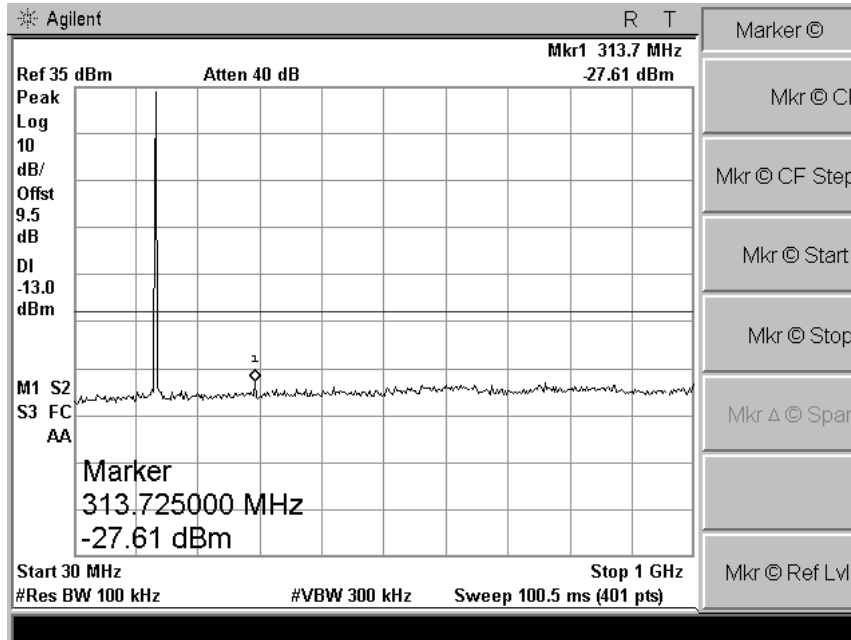
### B.4 SETUP DRAWING

Figure B.4-1 - Setup Drawing – Spurious Emissions at the Antenna Terminal



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	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

## B.5 TEST RESULTS



## B.6 PASS/FAIL

In reference to the results outlined in B.5, the DUT meets the requirements as stated in the reference standards.

## B.7 SIGN-OFF


I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.


*Sean Johnston*

Sean Johnston  
Lab Manager  
Celltech Labs Inc.

Nov 25, 2011

Date

Applicant:	Uniden America Corporation	FCC ID:	AMWUT639	IC:	513C-UT639	
DUT Type:	Portable VHF PTT Marine Radio Transceiver	Model:	MHS050	Freq.:	156.025-157.425 MHz	
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### Appendix C Modulation Characteristics (Modulation Limiting)

#### C.1 REFERENCES

<b>Normative Reference Standard</b>	FCC CFR 47 §2.1047, §80.213; IC RSS-182
<b>Procedure Reference</b>	ANSI TIA-603-C

#### C.2 LIMITS

§2.1047, RSS 182	$\pm 5$ KHz deviation
------------------	-----------------------

#### C.3 ENVIRONMENTAL CONDITIONS

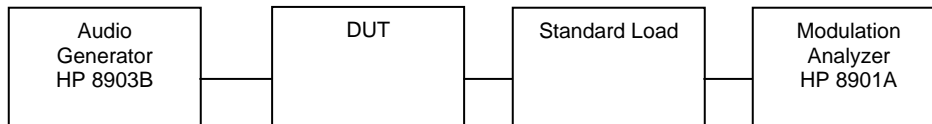
<b>Temperature</b>	25 +/- 5 °C
<b>Humidity</b>	40 +/- 10 %
<b>Barometric Pressure</b>	101 +/- 3 kPa


#### C.4 EQUIPMENT LIST

ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	CAL DUE
00028	HP	8901A	Modulation Analyzer	21Jul12
00027	HP	8903B	Audio Generator/Analyzer	21Jul12

#### C.5 SETUP DRAWING

Figure C.5-1 - Setup Drawing – Modulation Characteristics

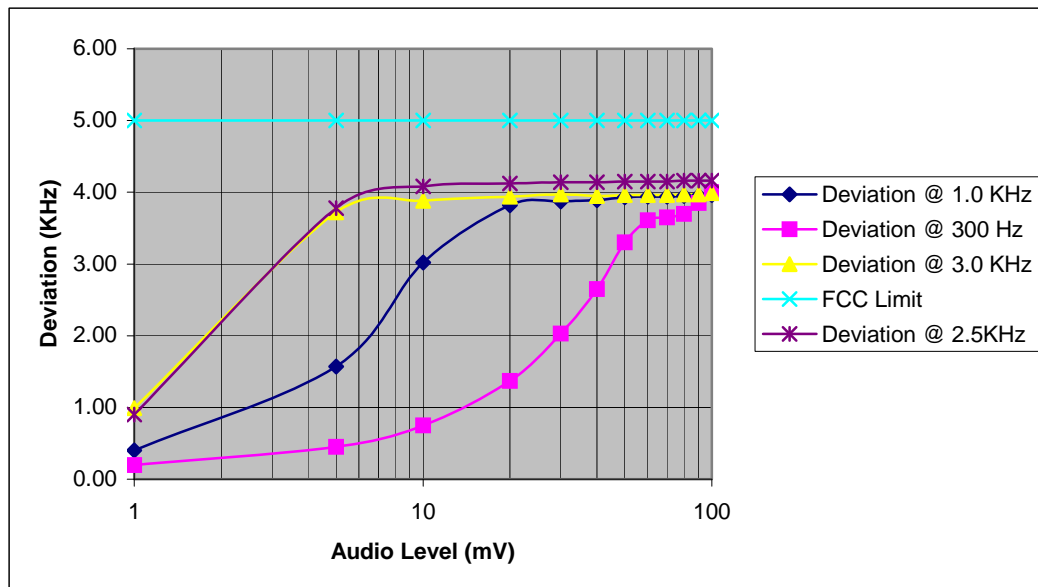


<b>Applicant:</b>	Uniden America Corporation	<b>FCC ID:</b>	AMWUT639	<b>IC:</b>	513C-UT639	
<b>DUT Type:</b>	Portable VHF PTT Marine Radio Transceiver	<b>Model:</b>	MHS050	<b>Freq.:</b>	156.025-157.425 MHz	
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## C.6 TEST RESULTS


### C.6.1

Audio Level	Deviation @ 1.0 KHz	Deviation @ 300 Hz	Deviation @ 3.0 KHz	Deviation @ 2.5 KHz	FCC Limit
mV	[KHz]	[KHz]	[KHz]	[KHz]	[KHz]
1	0.40	0.20	0.99	0.90	5
5	1.57	0.45	3.72	3.78	5
10	3.02	0.75	3.88	4.08	5
20	3.82	1.37	3.94	4.12	5
30	3.87	2.03	3.97	4.14	5
40	3.89	2.65	3.95	4.14	5
50	3.93	3.30	3.96	4.15	5
60	3.94	3.61	3.96	4.15	5
70	3.94	3.65	3.96	4.15	5
80	3.95	3.70	3.97	4.16	5
90	3.95	3.85	3.97	4.16	5
100	3.96	4.00	3.99	4.16	5



## C.7 PASS/FAIL

In reference to the results outlined in C.6.1 the DUT meets the requirements as stated in the reference standards.

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	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

### C.8 SIGN-OFF


I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.




Sean Johnston  
Lab Manager  
Celltech Labs Inc.

Nov 25, 2011

Date

Applicant:	Uniden America Corporation	FCC ID:	AMWUT639	IC:	513C-UT639	
DUT Type:	Portable VHF PTT Marine Radio Transceiver	Model:	MHS050	Freq.:	156.025-157.425 MHz	
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	Test Report Serial No.:	112211AMW-T1134-E80V	Test Report Issue Date:	December 13, 2011
	Measurement Date(s):	November 25-29, 2011	Test Report Revision No.:	Rev. 1.1 (2nd Release)
	Rule Part(s) Applied:	FCC 47 CFR §2, §80	Industry Canada RSS-182 Issue 4, RSS-Gen Issue 3	
	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

## Appendix D Modulation Characteristics (Audio Frequency Response)

### D.1 REFERENCES

<b>Normative Reference Standard</b>	FCC CFR 47 §2.1047, §80.213; IC RSS-182
<b>Procedure Reference</b>	ANSI TIA-603-C

### D.2 LIMITS

§2.1047	a) <i>Voice modulated communication equipment.</i> A curve or equivalent data showing the frequency response of the audio modulating circuit over a range of 100 to 5000 Hz shall be submitted. For equipment required to have an audio low-pass filter, a curve showing the frequency response of the filter or of all circuitry installed between the modulation limiter and the modulated stage shall be submitted.
---------	--

### D.3 ENVIRONMENTAL CONDITIONS

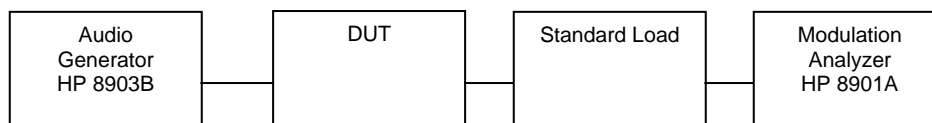
<b>Temperature</b>	25 +/- 5 °C
<b>Humidity</b>	40 +/- 10 %
<b>Barometric Pressure</b>	101 +/- 3 kPa

### D.4 EQUIPMENT LIST

ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	CAL DUE
00028	HP	8901A	Modulation Analyzer	21Jul12
00027	HP	8903B	Audio Generator/Analyzer	21Jul12

### D.5 SETUP DRAWING

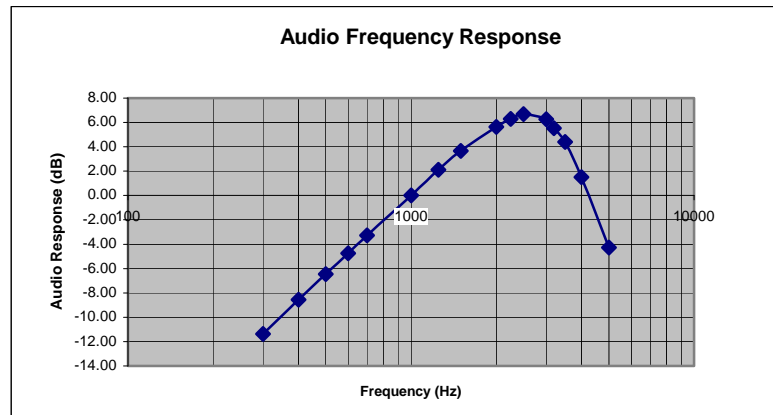
Figure D.5-1 - Setup Drawing – Audio Frequency Response



	Test Report Serial No.:	112211AMW-T1134-E80V	Test Report Issue Date:	December 13, 2011
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	Rule Part(s) Applied:	FCC 47 CFR §2, §80	Industry Canada RSS-182 Issue 4, RSS-Gen Issue 3	
	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

## D.6 TEST RESULTS

Audio Frequency	Deviation
[Hz]	[dB]
300	-11.36
400	-8.57
500	-6.45
600	-4.76
700	-3.27
1000	0.00
1250	2.11
1500	3.66
2000	5.64
2250	6.30
2500	6.70
3000	6.25
3200	5.54
3500	4.40
4000	1.51
5000	-4.28



## D.7 PASS/FAIL

In reference to the results outlined in D.6 the DUT meets the requirements as stated in the reference standards.

## D.8 SIGN-OFF


I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.

*Sean Johnston*


Sean Johnston  
Lab Manager  
Celltech Labs Inc.

Nov 25, 2011

Date

Applicant:	Uniden America Corporation	FCC ID:	AMWUT639	IC:	513C-UT639	
DUT Type:	Portable VHF PTT Marine Radio Transceiver	Model:	MHS050	Freq.:	156.025-157.425 MHz	
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	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

## Appendix E Modulation Characteristics (Low-pass Filter Response)

### E.1 REFERENCES

<b>Normative Reference Standard</b>	FCC CFR 47 §2.1047, §80.213; IC RSS-182
<b>Procedure Reference</b>	ANSI TIA-603-C

### E.2 LIMITS

§80.213	e) Coast station transmitters operated in the 156–162 MHz band must be equipped with an audio low-pass filter. The filter must be installed between the modulation limiter and the modulated radio frequency stage. At frequencies between 3 kHz and 20 kHz it must have an attenuation greater than at 1 kHz by at least $60\log_{10}(f/3)$ dB where “f” is the audio frequency in kilohertz. At frequencies above 20 kHz the attenuation must be at least 50 dB greater than at 1 kHz.
---------	--

### E.3 ENVIRONMENTAL CONDITIONS

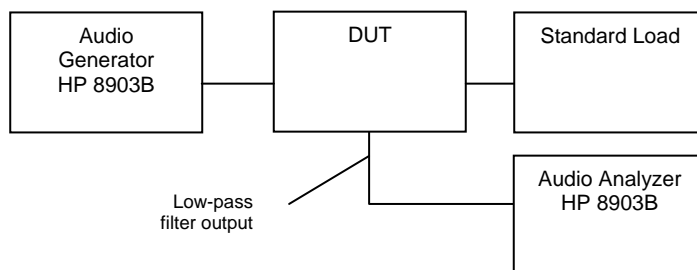
<b>Temperature</b>	25 +/- 5 °C
<b>Humidity</b>	40 +/- 10 %
<b>Barometric Pressure</b>	101 +/- 3 kPa


### E.4 EQUIPMENT LIST

ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	CAL DUE
00027	HP	8903B	Audio Generator/Analyzer	21Jul12

### E.5 SETUP DRAWING

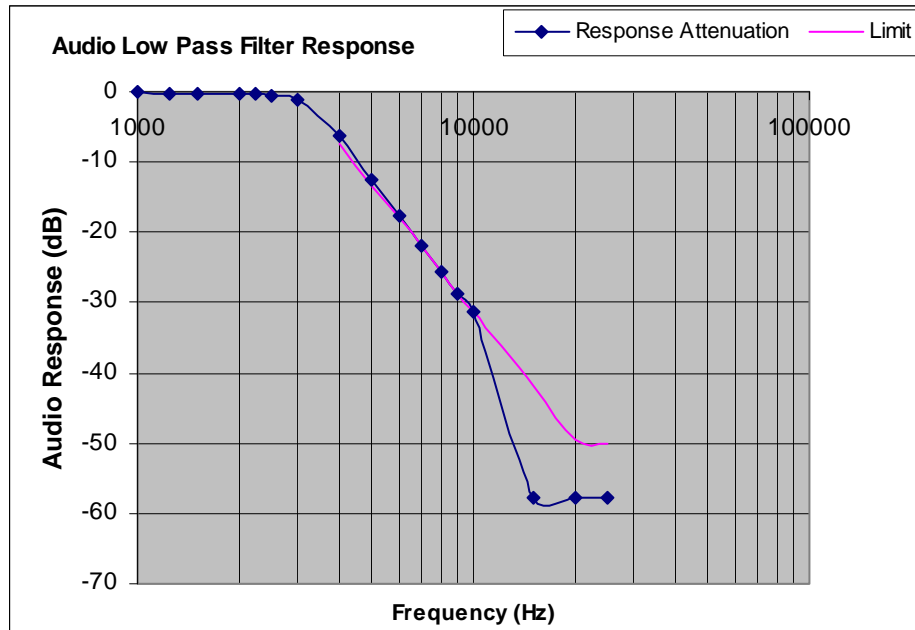
Figure E.5-1 - Setup Drawing – Low-pass Filter Response



<b>Applicant:</b>	Uniden America Corporation	<b>FCC ID:</b>	AMWUT639	<b>IC:</b>	513C-UT639	
<b>DUT Type:</b>	Portable VHF PTT Marine Radio Transceiver	<b>Model:</b>	MHS050	<b>Freq.:</b>	156.025-157.425 MHz	
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	Test Report Serial No.:	112211AMW-T1134-E80V	Test Report Issue Date:	December 13, 2011
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	Rule Part(s) Applied:	FCC 47 CFR §2, §80	Industry Canada RSS-182 Issue 4, RSS-Gen Issue 3	
	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

## E.6 TEST RESULTS



## E.7 PASS/FAIL

In reference to the results outlined in E.6, the DUT meets the requirements as stated in the reference standards.

## E.8 SIGN-OFF


I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.



Sean Johnston  
Lab Manager  
Celltech Labs Inc.

Nov 25, 2011

Date

Applicant:	Uniden America Corporation	FCC ID:	AMWUT639	IC:	513C-UT639	
DUT Type:	Portable VHF PTT Marine Radio Transceiver	Model:	MHS050	Freq.:	156.025-157.425 MHz	
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	Rule Part(s) Applied:	FCC 47 CFR §2, §80	Industry Canada RSS-182 Issue 4, RSS-Gen Issue 3	
	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

## Appendix F Occupied Bandwidth and Emission Mask

### F.1 REFERENCES

<b>Normative Reference Standard</b>	FCC CFR 47 §2.1049, §80.211; IC RSS-182
<b>Procedure Reference / Description</b>	Occupied bandwidth was performed by connecting the output of the DUT to the input of a spectrum analyzer.

### F.2 LIMITS

§80.211	<p>1) On any frequency removed from the assigned frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: At least 25 dB;</p> <p>(2) On any frequency removed from the assigned frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: At least 35 dB; and</p> <p>(3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43 plus <math>10\log_{10}(\text{mean power in watts})</math> dB.</p>
RSS-182	The nominal authorized channel bandwidth for voice is 16 kHz, for data an authorized bandwidth of 20 KHz is permitted.

### F.3 ENVIRONMENTAL CONDITIONS

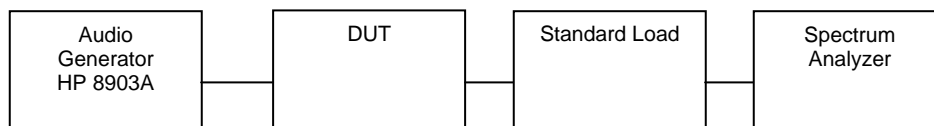
<b>Temperature</b>	25 +/- 5 °C
<b>Humidity</b>	40 +/- 10 %
<b>Barometric Pressure</b>	101 +/- 3 kPa

### F.4 EQUIPMENT LIST

ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	CAL DUE
00051	HP	8566B	Spectrum Analyzer RF Section	03-May-12
00047	HP	85685A	RF Preselector	05-May-12
00027	HP	8903B	Audio Generator/Analyzer	21-Jul-12

### F.5 SETUP DRAWING

Figure F.5-1 - Setup Drawing – Occupied Bandwidth & Emission Mask



	Test Report Serial No.:	112211AMW-T1134-E80V	Test Report Issue Date:	December 13, 2011
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	Rule Part(s) Applied:	FCC 47 CFR §2, §80	Industry Canada RSS-182 Issue 4, RSS-Gen Issue 3	
	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

## F.6 EMISSION DESIGNATOR

2.1033(c) (4) Type(s) of Emission: 14K4F3E

$B_n = 2M + 2DK$

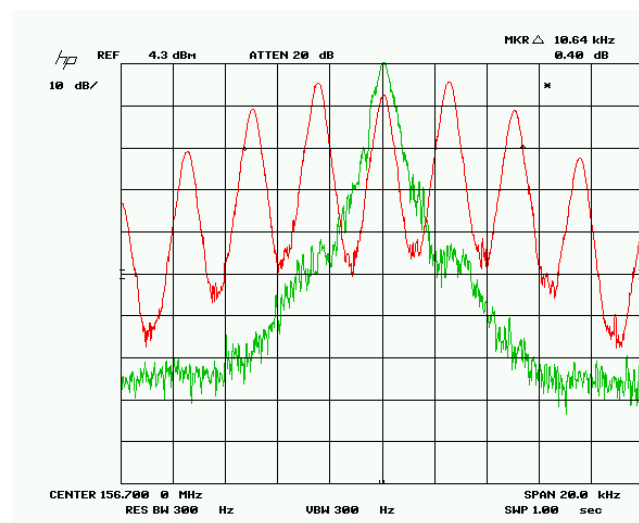
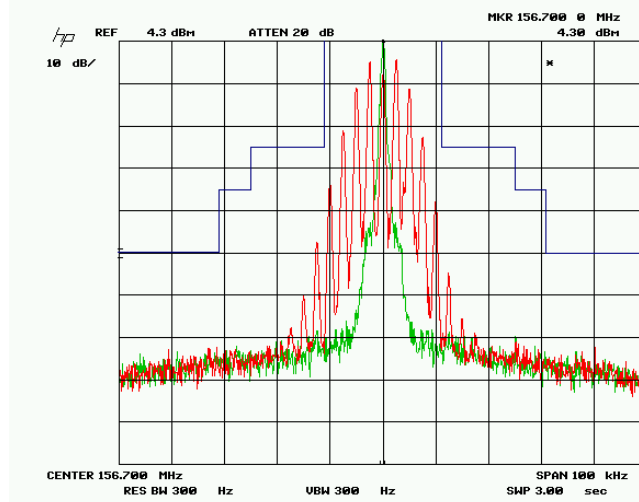
$M = 3000$


$D = 4200$


$B_n = 2(3000) + 2(4200) = 14.4K$

## F.7 TEST RESULTS

### F.7.1 Occupied Bandwidth Emission Mask



Applicant:	Uniden America Corporation	FCC ID:	AMWUT639	IC:	513C-UT639	
DUT Type:	Portable VHF PTT Marine Radio Transceiver	Model:	MHS050	Freq.:	156.025-157.425 MHz	
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	Test Report Serial No.:	112211AMW-T1134-E80V	Test Report Issue Date:	December 13, 2011
	Measurement Date(s):	November 25-29, 2011	Test Report Revision No.:	Rev. 1.1 (2nd Release)
	Rule Part(s) Applied:	FCC 47 CFR §2, §80	Industry Canada RSS-182 Issue 4, RSS-Gen Issue 3	
	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

**Note:**

The asterisk appears on the occupied bandwidth plots (Section F.7.1) and emission mask plots (Section F.7.2) due to a plotter emulator program used to capture data. During the read process an asterisk appears on the SA screen indicating a data transfer. This is different from an un-calibrated measurement, as indicated in the plots below. Auto sweep time selected for measurements.

### F.8 PASS/FAIL

In reference to the results outlined in F.7, the DUT meets the requirements as stated in the reference standards.

### F.9 SIGN-OFF


I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.




Sean Johnston  
Lab Manager  
Celltech Labs Inc.

Nov 25, 2011

Date

Applicant:	Uniden America Corporation	FCC ID:	AMWUT639	IC:	513C-UT639	
DUT Type:	Portable VHF PTT Marine Radio Transceiver	Model:	MHS050	Freq.:	156.025-157.425 MHz	
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	Rule Part(s) Applied:	FCC 47 CFR §2, §80	Industry Canada RSS-182 Issue 4, RSS-Gen Issue 3	
	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

## Appendix G Radiated Spurious Emissions - TX

### G.1 REFERENCES

<b>Normative Reference Standard</b>	FCC CFR 47 §2.1053; IC RSS-182
<b>Procedure Reference</b>	The transmitter spurious emissions were measured in accordance with TIA/EIA Standard 603 using the substitution method on a 3-meter open area test site (OATS).

### G.2 LIMITS


§2.1053 & RSS-182	Emissions must be at least $43 + 10 \log_{10}(P)$ dB below the mean power output of the transmitter.
-------------------	--


### G.3 ENVIRONMENTAL CONDITIONS

<b>Temperature</b>	25 +/- 5 °C
<b>Humidity</b>	40 +/- 10 %
<b>Barometric Pressure</b>	101 +/- 3 kPa

### G.4 EQUIPMENT LIST

ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	CAL DUE
00072	EMCO	2075	Mini-mast	n/a
00073	EMCO	2080	Turn Table	n/a
00071	EMCO	2090	Multi-Device Controller	n/a
00015	HP	E4408B	Spectrum Analyzer	03-May-12
00050	Chase	CBL-6111A	Bilog Antenna	03-May-13
00055	EMCO	3121C	Dipole Antenna	27-Aug-12
00034	ETS	3115	Double Ridged Guide Horn	29-May-12
00035	ETS	3115	Double Ridged Guide Horn	29-May-12
00051	HP	8566B	Spectrum Analyzer RF Section	03-May-12
00049	HP	85650A	Quasi-peak Adapter	06-May-12
00047	HP	85685A	RF Preselector	05-May-12
00006	R & S	SMR 20	Signal Generator (10MHz-40GHz)	30-Apr-12
00114	Amplifier Research	DC7154	Directional Coupler (0.8-4.2 GHz)	n/a
00078	Pasternack	PE2214-20	Directional Coupler (1-18 GHz)	n/a
00106	Amplifier Research	5S1G4	Power Amplifier (5W, 800MHz-4.2GHz)	n/a
00041	Amplifier Research	10W1000C	Power Amplifier (0.5 - 1 GHz)	n/a
00007	Gigatronics	8652A	Power Meter	04-May-12
00014	Gigatronics	80701A	Power Sensor	04-May-12

<b>Applicant:</b>	Uniden America Corporation	<b>FCC ID:</b>	AMWUT639	<b>IC:</b>	513C-UT639	
<b>DUT Type:</b>	Portable VHF PTT Marine Radio Transceiver	<b>Model:</b>	MHS050	<b>Freq.:</b>	156.025-157.425 MHz	
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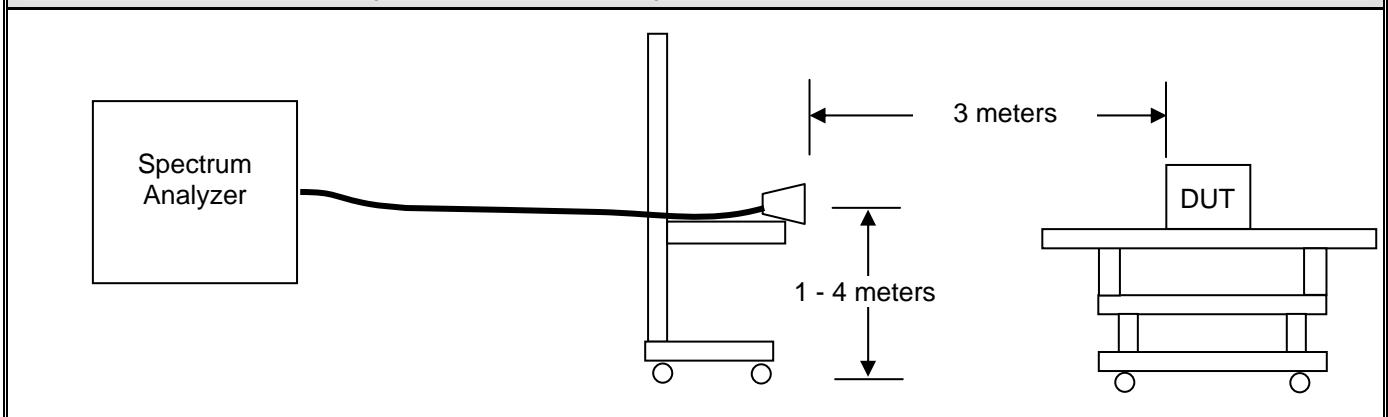
	Test Report Serial No.:	112211AMW-T1134-E80V	Test Report Issue Date:	December 13, 2011
	Measurement Date(s):	November 25-29, 2011	Test Report Revision No.:	Rev. 1.1 (2nd Release)
	Rule Part(s) Applied:	FCC 47 CFR §2, §80	Industry Canada RSS-182 Issue 4, RSS-Gen Issue 3	
	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	


## G.5 MEASUREMENT EQUIPMENT SETUP


MEASUREMENT EQUIPMENT CONNECTIONS	For the field strength measurements, the measurement equipment was connected as shown in G.6. A number of antennas were used to cover the applicable frequency range tested. The ranges in which each antenna was used are as follows. For the final substitutions, the DUT was replaced with the appropriate antenna and fed from a CW signal source sufficient to replicate the received field strength of the emission being investigated.		
	Frequency Range	RX Antenna	TX Antenna
	30 MHz - 1GHz	Bilog	Dipole
	1 GHz - 18 GHz	ETS 3115 Horn	ETS 3115 Horn
MEASUREMENT EQUIPMENT SETTINGS	For measuring the radiated field strength of the fundamental, the spectrum analyzer was set to the following settings:		
	RBW	VBW	Detector
	MHz	MHz	
	1	3	Peak

## G.6 SETUP DRAWING

Figure G.6-1 - Setup Drawing – Radiated TX Spurious Emissions



Applicant:	Uniden America Corporation	FCC ID:	AMWUT639	IC:	513C-UT639	
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	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

## G.7 TEST RESULTS

**TX: 156.7 MHz**

**Measured Output Power: 2.6 W, Limit:  $43+10\log(W)=47.1\text{dBc}$**

Emissions (MHz)	Attenuation (dBc)	Limit (dBc)	Margin (dB)
156.7	-	-	-
313.4	67.2	47.1	20.1
470.1	51.3	47.1	4.2
626.8	74.2	47.1	27.1
783.5	53.8	47.1	6.7
940.2	60.9	47.1	13.8

Note(s):

1. DUT antenna replaced with non-radiating load.
2. Measured ERP Carrier Level (dBm) = Power Applied to Antenna (dBm) + Antenna Gain (dBd)
3. The DUT was measured in 3 orientations with respect to the receive antenna and the orientation with the highest Radiated Power results is shown (Vertical Polarization).

## G.8 PASS/FAIL

In reference to the results outlined in G.7 the DUT meets the requirements as stated in the reference standards.

## G.9 SIGN-OFF


I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.




Sean Johnston  
Lab Manager  
Celltech Labs Inc.

Nov 28, 2011

Date


Applicant:	Uniden America Corporation	FCC ID:	AMWUT639	IC:	513C-UT639	
DUT Type:	Portable VHF PTT Marine Radio Transceiver	Model:	MHS050	Freq.:	156.025-157.425 MHz	
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	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

#### G.10 TEST SETUP PHOTOGRAPH



Applicant:	Uniden America Corporation	FCC ID:	AMWUT639	IC:	513C-UT639	
DUT Type:	Portable VHF PTT Marine Radio Transceiver	Model:	MHS050	Freq.:	156.025-157.425 MHz	
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## Appendix H Frequency Stability

### H.1 REFERENCES

<b>Normative Reference Standard</b>	FCC CFR 47 §2.1055, §80.209; IC RSS-182
<b>Procedure Reference / Description</b>	§2.1055(a)(2) The frequency stability shall be measured with variation of ambient temperature as follows: (1) From -20° to +50° centigrade for equipment to be licensed for use in the Maritime Services under part 80

### H.2 LIMITS

§80.209 & RSS-182	Band 156-162 MHz (ii) Ship Station = 10.0 ppm
-------------------	---

### H.3 ENVIRONMENTAL CONDITIONS

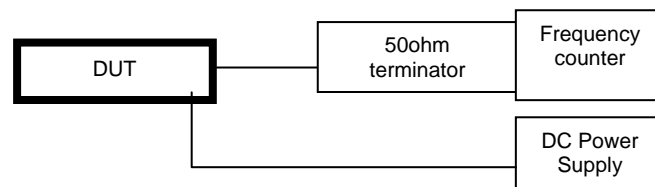
<b>Temperature</b>	25 +/- 5 °C
<b>Humidity</b>	40 +/- 10 %
<b>Barometric Pressure</b>	101 +/- 3 kPa

### H.4 EQUIPMENT LIST

ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	CAL DUE
na	ESPEC	ECT-2	Heater/Refrigerator	na
0003	HP	53181A	Frequency Counter	09-Apr-12
na	HP	E3611A	DC Power Supply	na
00207	VWR	na	Temperature Humidity Monitor	09-Apr-12

### H.5 SETUP DRAWING

Figure H.5-1 - Setup Drawing – Frequency Stability



	Test Report Serial No.:	112211AMW-T1134-E80V	Test Report Issue Date:	December 13, 2011
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	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

## H.6 TEST RESULTS

Temperature (degrees C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Deviation (%)	Frequency tolerance with reference to value @ 20 °C (ppm)
-20	156.70000	156.6999840	-0.000010%	-0.31269936
-10	156.70000	156.6999770	-0.000015%	-0.357370697
0	156.70000	156.6999910	-0.000006%	-0.268028023
10	156.70000	156.6999780	-0.000014%	-0.350989077
20	156.70000	156.7000330	0.000021%	0
30	156.70000	156.7000290	0.000019%	-0.025526478
40	156.70000	156.7000080	0.000005%	-0.15954049
50	156.70000	156.7000110	0.000007%	-0.140395631

Voltage (V)	Frequency (MHz)	%Deviation	PPM to reference
6.8 (Battery end point)	156.7000340	0.000022%	0.2170
8.9	156.7000350	0.000022%	0.2234

## H.7 PASS/FAIL

In reference to the results outlined in H.6 the DUT meets the requirements as stated in the reference standards.

## H.8 SIGN-OFF


I attest to the accuracy of the data. All measurements reported herein were performed by me and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements.




Sean Johnston  
Lab Manager  
Celltech Labs Inc.


Nov 29, 2011

Date

Applicant:	Uniden America Corporation	FCC ID:	AMWUT639	IC:	513C-UT639	
DUT Type:	Portable VHF PTT Marine Radio Transceiver	Model:	MHS050	Freq.:	156.025-157.425 MHz	
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END OF DOCUMENT

Applicant:	Uniden America Corporation	FCC ID:	AMWUT639	IC:	513C-UT639	
DUT Type:	Portable VHF PTT Marine Radio Transceiver	Model:	MHS050	Freq.:	156.025-157.425 MHz	
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