

	Test Report Serial No.:	091015AMW-T1334E80	Test Report Issue Date:	16 Oct 2015
	Measurement Date(s):	1-7, Oct 2015	Test Report Revision No.:	Rev. 1.1
	Rule Part(s) Applied:	FCC 47 CFR §2, §80	Industry Canada RSS-182.	
	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

DECLARATION OF COMPLIANCE		FCC PART 80	IC RSS-182
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	3001 Gateway Drive, Suite 130, Irving TX, 75063, USA.	
Standard(s) & Procedure(s)	FCC	47 CFR Part 2; Part 80	
	IC	RSS-182, RSS GEN	
	ANSI	TIA/EIA-603-D-2010	C63.4-2009
Device Classification(s)	FCC	Licensed Non-Broadcast Transmitter Held to Face (TNF)	
	IC	Maritime Radio Transceiver	
Application Type(s)	FCC/IC	New Certification	
Device Identifier(s)	FCC ID:	AMWUT653	
	IC:	513C-UT653	
Device Under Test (DUT)	Portable Push-To-Talk (PTT) VHF Marine Radio Transceiver, WX		
Device Model(s)	ATLANTIS150		
Test Sample Serial No.(s)	None (Identical Prototype)		
Transmit Frequency Range(s)	VHF: 156.050 - 157.425 MHz		
Authorized Bandwidth	20kHz (US), 16kHz (Can)		
Manuf. Rated Output Power	VHF: 2.5W / 1W		
Modulation Type(s)	FM		
Emission Designator(s)	VHF: 16K0F3E		
Power Source(s) Tested	Lithium-ion, 4.8 V		
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 Part 2 and Part 80; Industry Canada RSS-182 and RSS-Gen.; ANSI TIA/EIA-603-D-2010 and ANSI C63.4-2009. 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. The results and statements contained in this report pertain only to the device(s) evaluated. This test report shall not be reproduced partially, or in full, without the prior written approval of Celltech Labs Inc.			
Test Report Approved By		Art Voss	Sr. Engr Celltech Labs Inc.

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<u>Section</u>	<u>Description of Test</u>	<u>Procedure Reference</u>	<u>Result</u>
6	Modulation Limiting	ANSI/TIA/EIA-603-D	Pass
7	Audio Frequency Response	ANSI/TIA/EIA-603-D	Pass
8	RF Output Power	ANSI/TIA/EIA-603-D	Pass
9	Spurious Emissions at the antenna terminals (Conducted)	ANSI/TIA/EIA-603-D	Pass
10	Occupied Bandwidth and Emission Mask	ANSI/TIA/EIA-603-D	Pass
11	Radiated TX Spurious Emissions	ANSI/TIA/EIA-603-D	Pass
12	Frequency Stability	ANSI/TIA/EIA-603-D	Pass

Applicant:	Uniden America Corporation	FCC ID:	AMWUT653	IC:	513C-UT653	
DUT Type:	Portable PTT Marine Radio Transceiver			Freq.:	VHF	
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REVISION LOG

Revision	Description	Implemented By	Release Date
1.0	1st Release.	Art Voss	9 Oct 2015
1.1	2nd Release Corrected Address	Art Voss	16 Oct 2015

TEST REPORT SIGN-OFF

Test Report Prepared By	Date	QA Review By	Date
Art Voss	9 Oct 2015	Art Voss	9 Oct 2015

Applicant:	Uniden America Corporation	FCC ID:	AMWUT653	IC:	513C-UT653	
DUT Type:	Portable PTT Marine Radio Transceiver			Freq.:	VHF	
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1.0 SCOPE

This report outlines the results collected during RF radiated and conducted measurements of the Uniden America Corporation Atlantis Marine Radio. The measurement results were applied against the applicable 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; Part 80 and Industry Canada Radio Standards Specification RSS-182; and RSS-210.

2.0 REFERENCES

2.1 Normative References

ANSI/ISO 17025:2005	General Requirements for competence of testing and calibration laboratories
IEEE/ANSI C63.4:2009	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 5 - Maritime Radio Transmitters and Receivers in the Band 156-162.5 MHz RSS-Gen Issue 4 - 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 are 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.

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.

Applicant:	Uniden America Corporation	FCC ID:	AMWUT653	IC:	513C-UT653	
DUT Type:	Portable PTT Marine Radio Transceiver			Freq.:	VHF	
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5.0 MODE(S) OF OPERATION AND FUNCTIONAL DETAIL

VHF Marine Radio Transceiver with WX.

Transmitter Frequency Range(s)	VHF: 156.050 - 157.425 MHz
Transmitter Power	VHF: 2.5W / 1W
Emission Designator(s)	VHF: 16K0F3E
FCC ID: IC ID:	AMWUT653 513C-UT653
Model Numbers:	ATLANTIS150
Modulation Type(s)	FM

Emission Designator(s):

16K0F3E: VHF

$$B_n = 2M + 2DK$$

$$M = 3000$$

$$D = 4.6\text{KHz}$$

$$K = 1$$

$$B_n = 2(3000) + 2(4.6)(1) = 16K0$$

Modification(s):

Test software was provided for continuous transmit.

Applicant:	Uniden America Corporation	FCC ID:	AMWUT653	IC:	513C-UT653	
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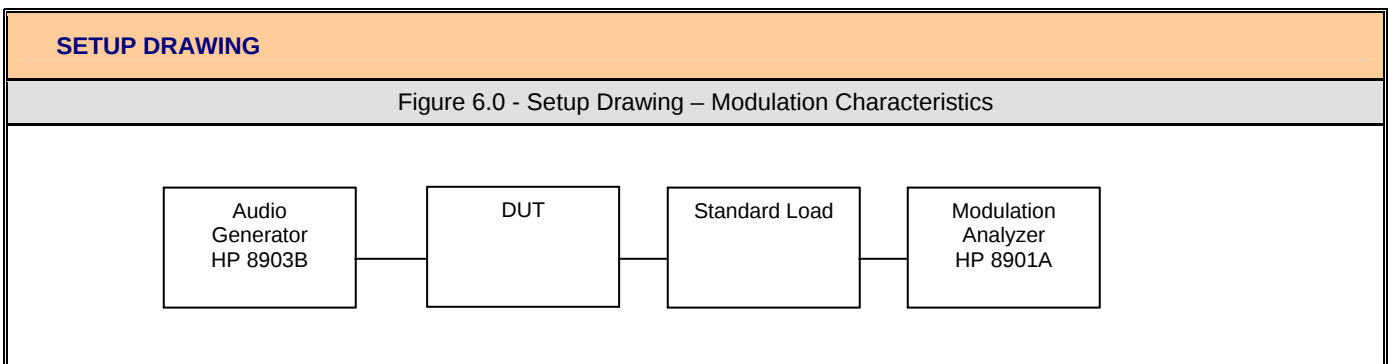
6.0 MODULATION CHARACTERISTICS (MODULATION LIMITING)

REFERENCES	
Normative Reference Standard	FCC CFR 47 §2.1047,
Procedure Reference	ANSI TIA-603-C

LIMITS	
§2.1047(b), RSS 182, 7.3	±5 KHz deviation

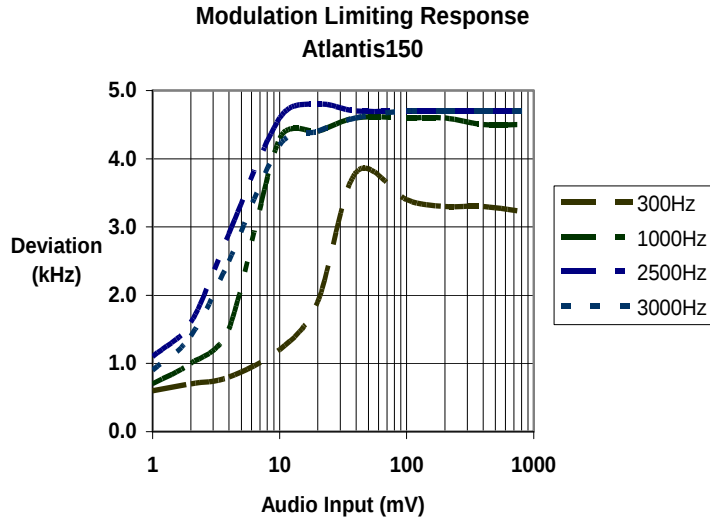
ENVIRONMENTAL CONDITIONS	
Temperature	25 +/- 5 °C
Humidity	40 +/- 10 %
Barometric Pressure	101 +/- 3 kPa

EQUIPMENT LIST				
ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	LAST CAL - CAL DUE
00028	HP	8901A	Modulation Analyzer	22-Dec-14 / 22-Dec-16
00027	HP	8903B	Audio Generator/Analyzer	22-Dec-14 / 22-Dec-16



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Modulation Limiting Response



Measured Modulation Response [Deviation (kHz)]

Freq (Hz)	Audio Input (mV)									
	1	2	4	10	20	40	100	200	400	1000
300	0.6	0.7	0.8	1.2	1.9	3.8	3.4	3.3	3.3	3.2
1000	0.7	1.0	1.5	4.3	4.4	4.6	4.6	4.6	4.5	4.5
2500	1.1	1.6	2.9	4.6	4.8	4.7	4.7	4.7	4.7	4.7
3000	0.9	1.4	2.5	4.2	4.4	4.6	4.7	4.7	4.7	4.7
Audio Frequency @ Maximum Deviation:								2500Hz		
Audio Input @ Maximum Deviation:								20mV		
Maximum Measured Deviation:								4.8kHz		
Result:								Complies		

Applicant:	Uniden America Corporation	FCC ID:	AMWUT653	IC:	513C-UT653	
DUT Type:	Portable PTT Marine Radio Transceiver			Freq.:	VHF	
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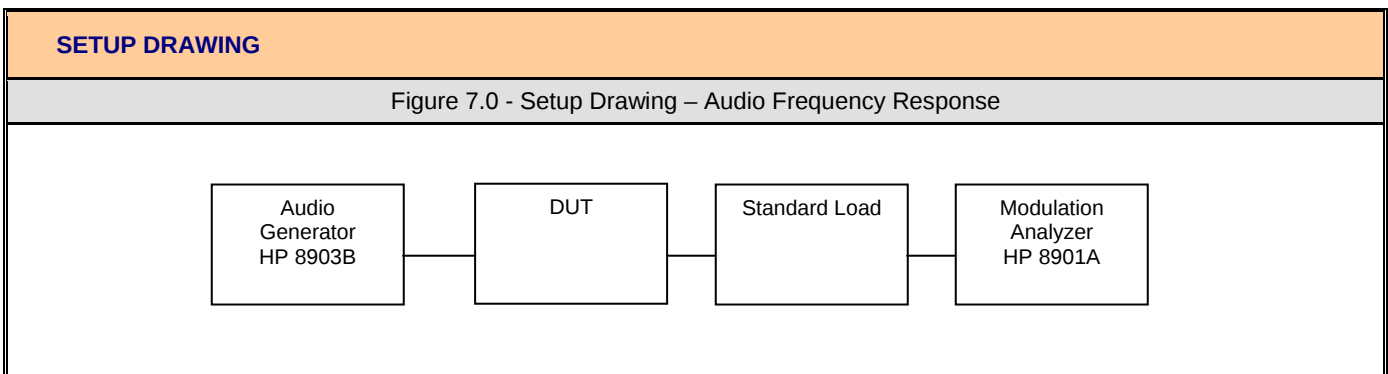
7.0 MODULATION CHARACTERISTICS (AFR, ALPF)

REFERENCES	
Normative Reference Standard	FCC CFR 47 §2.1047, §80.213; IC RSS-182, 7.8
Procedure Reference	ANSI TIA-603-C

LIMITS	
§2.1047(a) §80.213(a)(2), (a)(3)(d) RSS 182 7.8	a) Voice modulated communication equipment. 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.

ENVIRONMENTAL CONDITIONS	
Temperature	25 +/- 5 °C
Humidity	40 +/- 10 %
Barometric Pressure	101 +/- 3 kPa

EQUIPMENT LIST				
ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	LAST CAL - CAL DUE
00028	HP	8901A	Modulation Analyzer	22-Dec-14 / 22-Dec-16
00027	HP	8903B	Audio Generator/Analyzer	22-Dec-14 / 22-Dec-16



Applicant:	Uniden America Corporation	FCC ID:	AMWUT653	IC:	513C-UT653	
DUT Type:	Portable PTT Marine Radio Transceiver			Freq.:	VHF	
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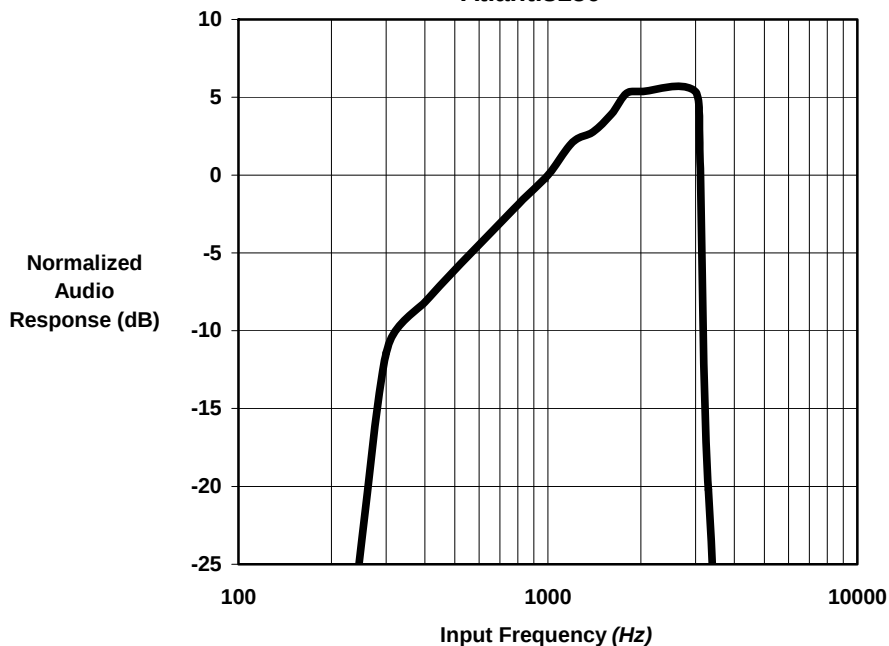
Audio Frequency Response

Measured Audio Response

Freq (Hz)	Audio Response (Deviation)	
	(%)	(dB)*
100	0.014	-33.942
200	0.013	-34.586
300	0.187	-11.428
400	0.272	-8.173
800	0.559	-1.916
1000	0.697	0.000
1200	0.888	2.104
1400	0.959	2.772
1600	1.092	3.900
1800	1.280	5.280
2000	1.295	5.381
3000	1.292	5.361
3100	0.767	0.831
3300	0.068	-20.214
4000	0.013	-34.586
8000	0.013	-34.586

* Normalize to 1000Hz

Audio Frequency Response [Deviation]
Atlantis150



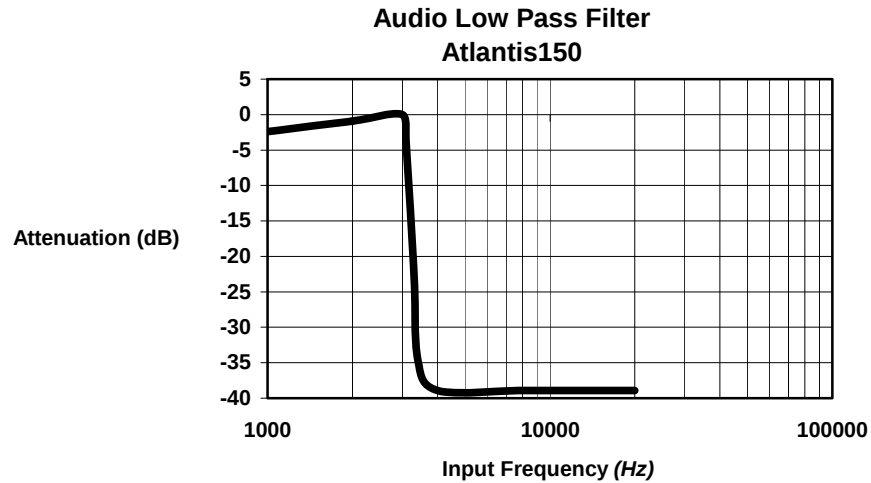
Maximum Modulation Deviation (%): 1.295

Result: Complies

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Audio Low Pass Filter Response

Measured Audio Response	
Freq	Attenuation
(Hz)	(dB)
1000	-2.400
2000	-0.900
3000	0.000
3100	-4.300
3300	-22.500
3400	-34.600
4000	-38.900
8000	-38.900
12000	-38.900
16000	-38.900
20000	-38.900



Cut-Off Frequency @ > -6dB:	3200 Hz
Result:	Complies

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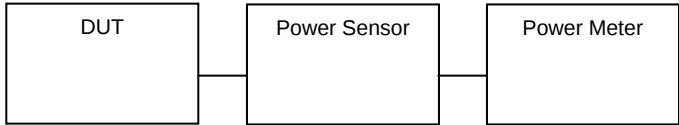
8.0 RF OUTPUT POWER MEASUREMENT

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

LIMITS	
FCC CFR 47 §80.215	10W
RSS-182 7.5	5W Typical

ENVIRONMENTAL CONDITIONS	
Temperature	25 +/- 5 °C
Humidity	40 +/- 10 %
Barometric Pressure	101 +/- 3 kPa

ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	LAST CAL - CAL DUE
00110	Gigatronics	8652A	Power Meter	17-Feb-14 /17-Feb-16
00248	Gigatronics	80334A	Power Sensor	17-Feb-14 /17-Feb-16

SETUP DRAWING
Figure 8.0 - Setup Drawing – RF Output Power
 <pre> graph LR DUT[DUT] --- PS[Power Sensor] PS --- PM[Power Meter] </pre>

Applicant:	Uniden America Corporation	FCC ID:	AMWUT653	IC:	513C-UT653	
DUT Type:	Portable PTT Marine Radio Transceiver			Freq.:	VHF	
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Conducted Power Measurement				
Method of Measurement:				
The RF power is measured with a 50 ohm resistive watt-meter connected at the EUT's RF output connection. A fully charged battery with a nominal battery terminal voltage of 4.8VDC is installed.				
Channel & Frequency	Low Power		High Power	
	Measured (dBm)	Rated (dBm)	Measured (dBm)	Rated (dBm)
Ch 01: 156.050MHz	29.75	30.0 (1.0W)	33.60	34.0 (2.5W)
Ch 19: 156.950MHz	29.48		33.93	
Ch 88: 157.425MHz	30.00		33.66	
Maximum Measured Output Power - Low Power Setting:				30.00 dBm
Maximum Measured Output Power - High Power Setting:				31.00 dBm
Standby Current @ 4.8VDC Nominal Battery Voltage:				40mA
Transmit Current @ 4.8VDC Nominal Battery Voltage:				1020mA
FCC CFR 47 §2.1033(c)(8): Power to Transmitter - High Power Setting				
1020mA - 40mA = 980mA; (980mA)(4.8VDC) = :				4.70W
Result:				Complies

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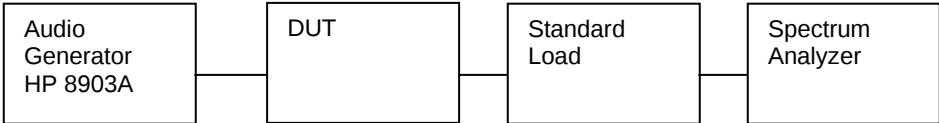
9.0 SPURIOUS EMISSIONS AT THE ANTENNA TERMINAL

REFERENCES	
Normative Reference Standard	FCC CFR 47 §2.1051, §80.211; IC RSS-182
Procedure Reference	The spurious emissions measurements at the antenna terminal were performed in accordance with ANSI TIA/EIA Standard 603. The emission search was performed across all required ranges. The worst case performance has been presented.

LIMITS	
FCC CFR 47 §80.211	43 + 10 Log (Tp)
RSS182, Para. 7.9	

ENVIRONMENTAL CONDITIONS	
Temperature	25 +/- 5 °C
Humidity	40 +/- 10 %
Barometric Pressure	101 +/- 3 kPa

ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	CAL DUE
00065	Pasternack	PE7015-30	30dB attenuator	COU
00027	HP	8903B	Audio Generator/Analyzer	22-Dec-14 / 22-Dec-16
00241	R&S	FSP 40	Spectrum Analyzer	23-Apr-15 / 23-Apr-17

Setup Drawing	
Figure 9.0 - Setup Drawing – Spurious Emissions at the Antenna Terminal	
 <pre> graph LR A[Audio Generator HP 8903A] --- B[DUT] B --- C[Standard Load] C --- D[Spectrum Analyzer] </pre>	

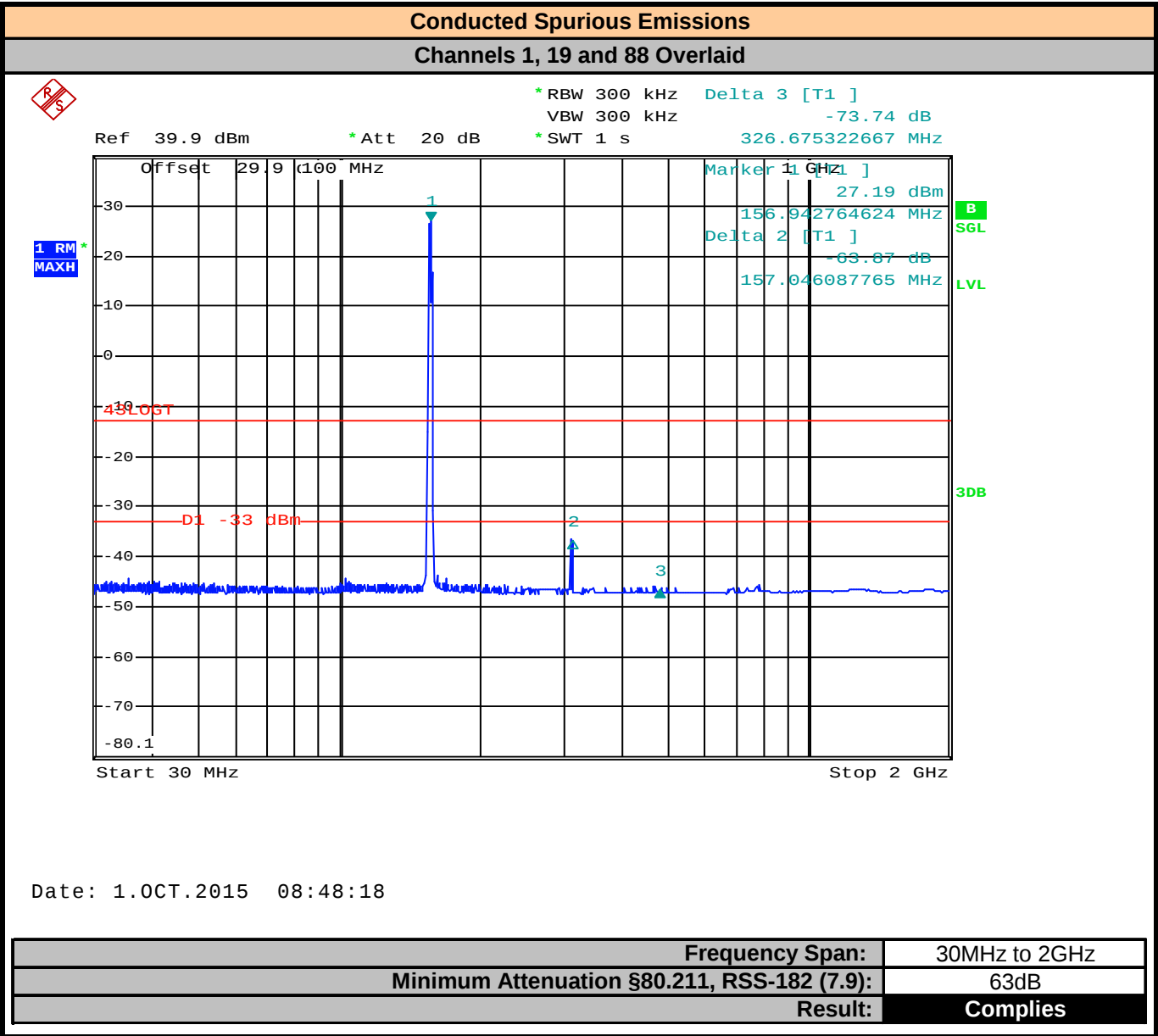
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Conducted Spurious Emissions.

Emission (MHz)	Level (dBm)	Limit (dBm)	Margin (dB)
Part 80; VHF, RSS-182			
313.9	-36.68	-13	-23.68
470.9	-46.55	-13	-33.55
627.8	-47.00	-13	-34.00
>627.8	-47.88	-13	-34.00

NOTE: No Emissions within 20dB of the limit were observed.



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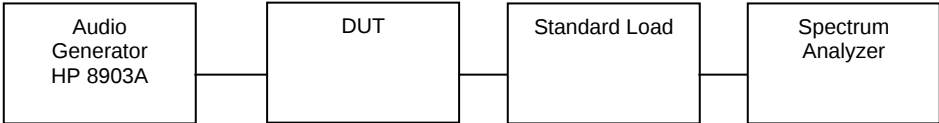
10.0 OCCUPIED BANDWIDTH, EMISSION MASK

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

LIMITS	
§80.211	The nominal authorized channel bandwidth for voice is 16 kHz, for data an authorized bandwidth of 20 KHz is permitted.
RSS-182, 7.9	

ENVIRONMENTAL CONDITIONS	
Temperature	25 +/- 5 °C
Humidity	40 +/- 10 %
Barometric Pressure	101 +/- 3 kPa

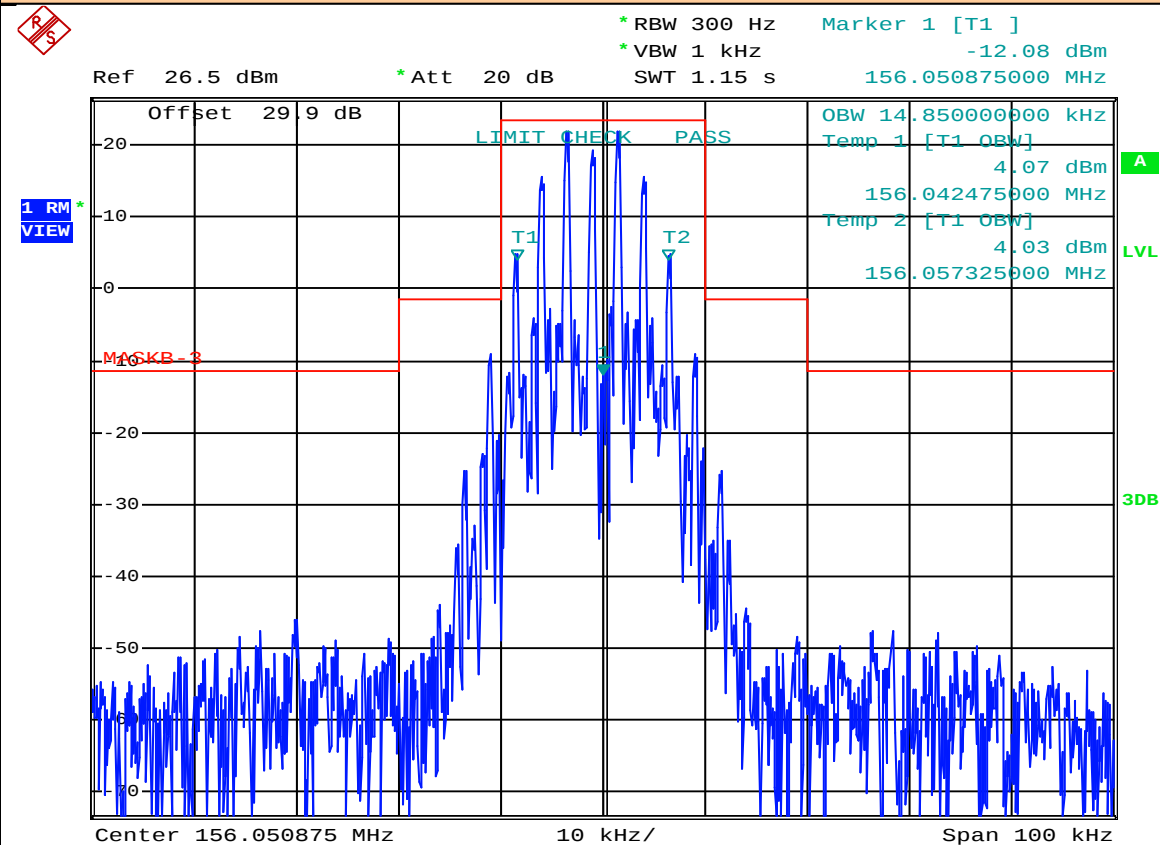
EQUIPMENT LIST				
ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	CAL DUE
00065	Pasternack	PE7015-30	30dB attenuator	COU
00027	HP	8903B	Audio Generator/Analyzer	22-Dec-14 / 22-Dec-16
00241	R&S	FSP 40	Spectrum Analyzer	23-Apr-15 / 23-Apr-17

SETUP DRAWING	
Figure 10.0 - Setup Drawing – Occupied Bandwidth & Emission Mask	
 <pre> graph LR A[Audio Generator HP 8903A] --- B[DUT] B --- C[Standard Load] C --- D[Spectrum Analyzer] </pre>	

Applicant:	Uniden America Corporation	FCC ID:	AMWUT653	IC:	513C-UT653	
DUT Type:	Portable PTT Marine Radio Transceiver			Freq.:	VHF	
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	Test Report Serial No.:	091015AMW-T1334E80	Test Report Issue Date:	16 Oct 2015
	Measurement Date(s):	1-7, Oct 2015	Test Report Revision No.:	Rev. 1.1
	Rule Part(s) Applied:	FCC 47 CFR §2, §80	Industry Canada RSS-182.	
	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

Occupied Bandwidth (Ch 1) w/ Emission Mask



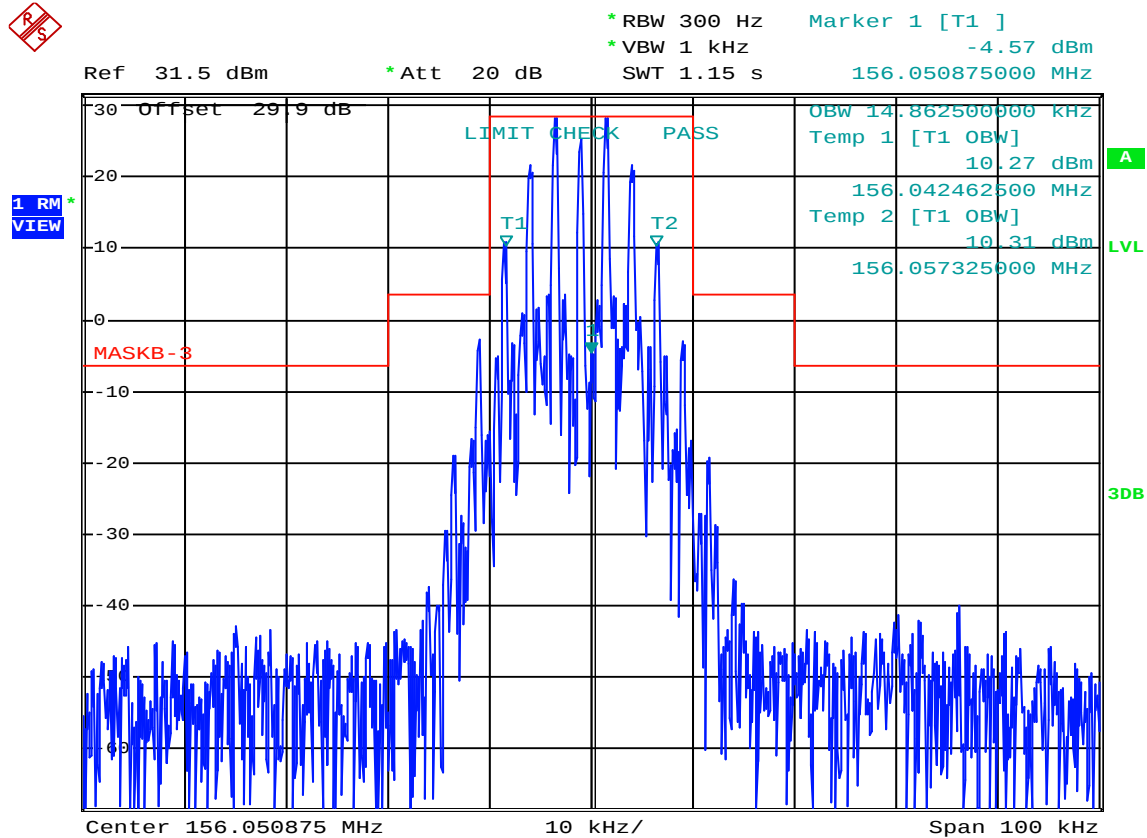
Date: 30.SEP.2015 14:50:13

Channel Frequency: (Ch 1):	156.050MHz
Authorized Bandwidth §80.211, RSS 182 (7.3):	16kHz (20kHz Data)
Measured Occupied Bandwidth (99%) RSS-Gen:	14.85kHz
Result:	Complies

Applicant:	Uniden America Corporation	FCC ID:	AMWUT653	IC:	513C-UT653	
DUT Type:	Portable PTT Marine Radio Transceiver			Freq.:	VHF	
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	Measurement Date(s):	1-7, Oct 2015	Test Report Revision No.:	Rev. 1.1
	Rule Part(s) Applied:	FCC 47 CFR §2, §80	Industry Canada RSS-182.	
	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

Occupied Bandwidth (Ch 1) w/ Emission Mask



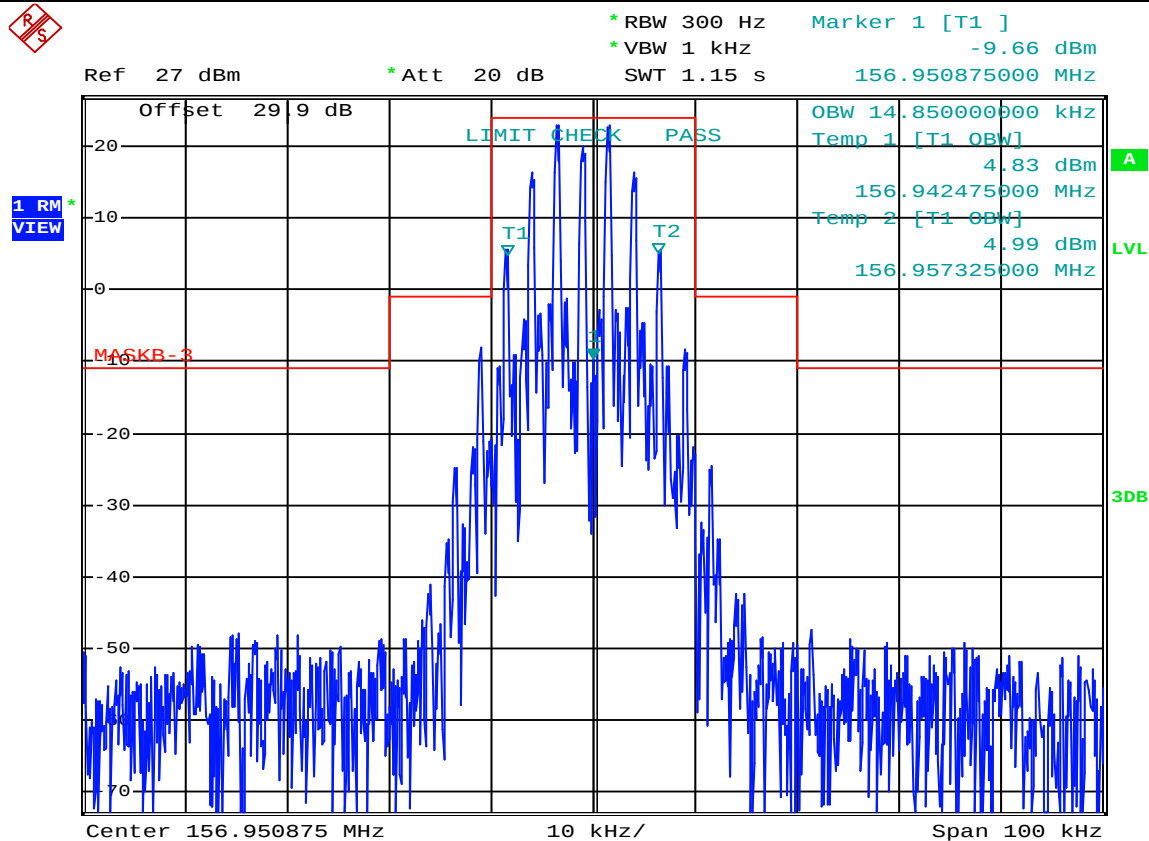
Date: 30.SEP.2015 14:49:44

Channel Frequency: (Ch 1):	156.050MHz
Authorized Bandwidth §80.211, RSS 182 (7.3):	16kHz (20kHz Data)
Measured Occupied Bandwidth (99%) RSS-Gen:	14.86kHz
Result:	Complies

Applicant:	Uniden America Corporation	FCC ID:	AMWUT653	IC:	513C-UT653	
DUT Type:	Portable PTT Marine Radio Transceiver			Freq.:	VHF	
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	Measurement Date(s):	1-7, Oct 2015	Test Report Revision No.:	Rev. 1.1
	Rule Part(s) Applied:	FCC 47 CFR §2, §80	Industry Canada RSS-182.	
	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

Occupied Bandwidth (Ch 19) w/ Emission Mask



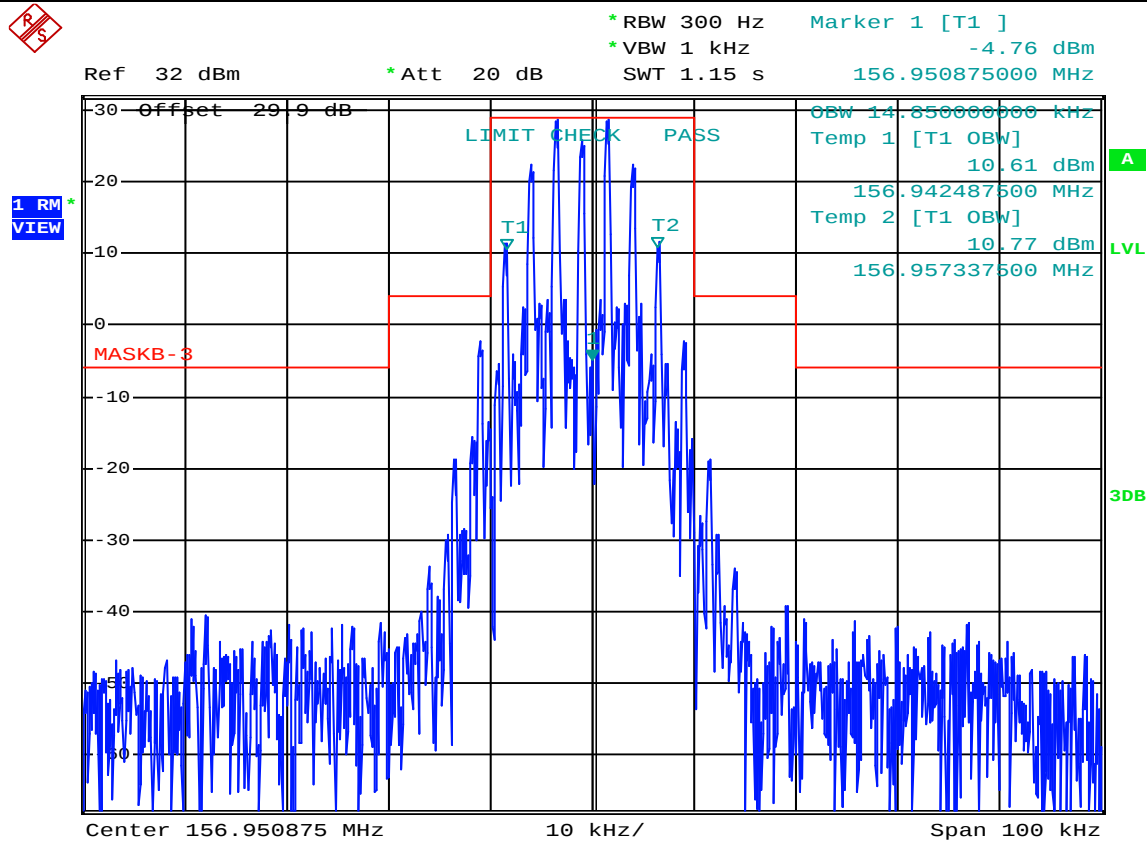
Date: 30.SEP.2015 14:43:21

Channel Frequency: (Ch 19):	156.950MHz
Authorized Bandwidth §80.211, RSS 182 (7.3):	16kHz (20kHz Data)
Measured Occupied Bandwidth (99%) RSS-Gen:	14.85kHz
Result:	Complies

Applicant:	Uniden America Corporation	FCC ID:	AMWUT653	IC:	513C-UT653	
DUT Type:	Portable PTT Marine Radio Transceiver			Freq.:	VHF	
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	Test Report Serial No.:	091015AMW-T1334E80	Test Report Issue Date:	16 Oct 2015
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	Rule Part(s) Applied:	FCC 47 CFR §2, §80	Industry Canada RSS-182.	
	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

Occupied Bandwidth (Ch 19) w/ Emission Mask



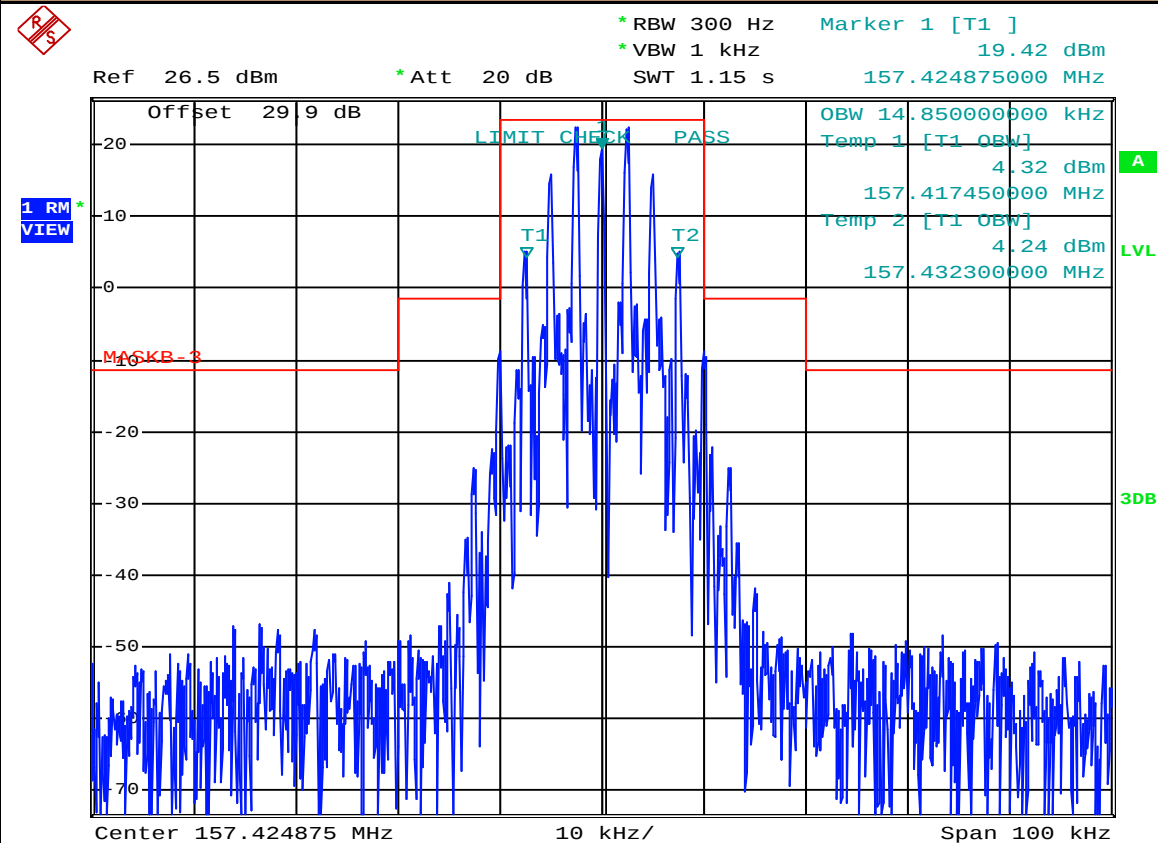
Date: 30.SEP.2015 14:42:12

Channel Frequency: (Ch 19):	156.950MHz
Authorized Bandwidth §80.211, RSS 182 (7.3):	16kHz (20kHz Data)
Measured Occupied Bandwidth (99%) RSS-Gen:	14.85kHz
Result:	Complies

Applicant:	Uniden America Corporation	FCC ID:	AMWUT653	IC:	513C-UT653	
DUT Type:	Portable PTT Marine Radio Transceiver			Freq.:	VHF	
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	Rule Part(s) Applied:	FCC 47 CFR §2, §80	Industry Canada RSS-182.	
	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

Occupied Bandwidth (Ch 88) w/ Emission Mask



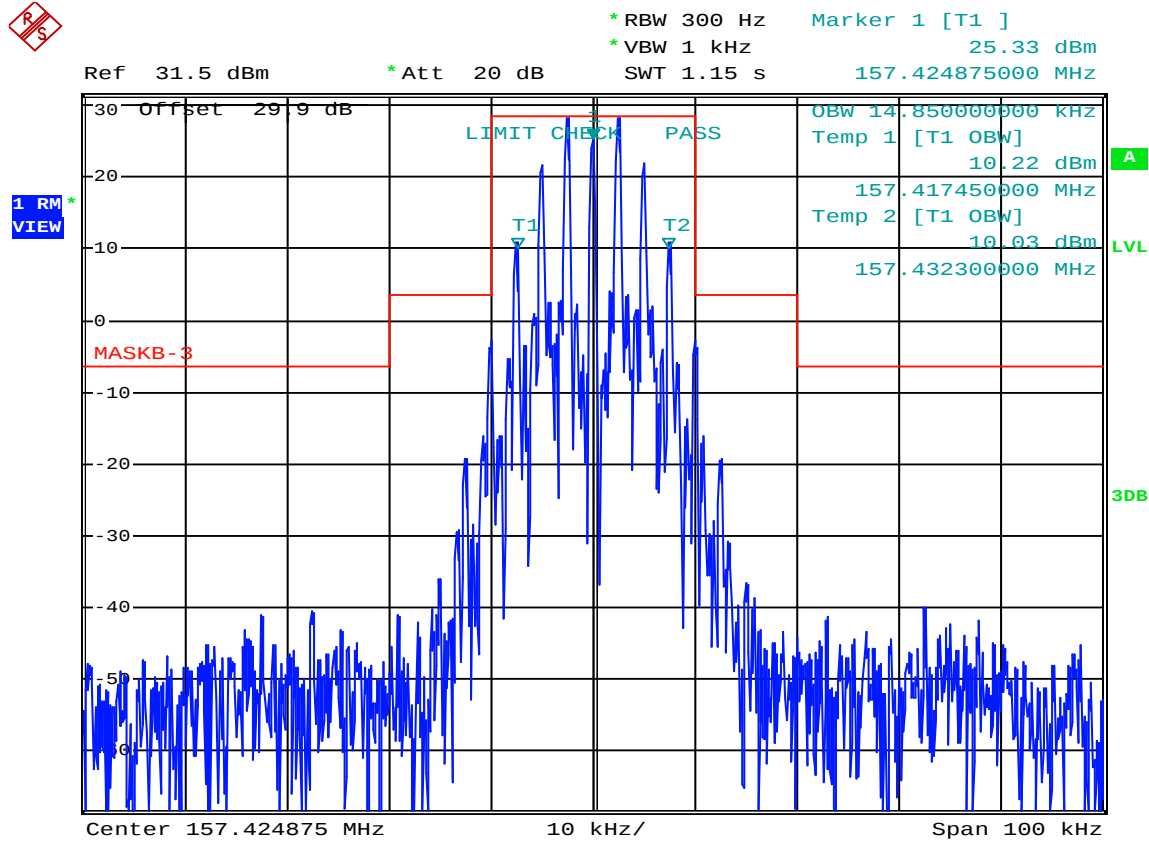
Date: 30.SEP.2015 14:47:44

Channel Frequency: (Ch 88):	157.425MHz
Authorized Bandwidth §80.211, RSS 182 (7.3):	16kHz (20kHz Data)
Measured Occupied Bandwidth (99%) RSS-Gen:	14.85kHz
Result:	Complies

Applicant:	Uniden America Corporation	FCC ID:	AMWUT653	IC:	513C-UT653	
DUT Type:	Portable PTT Marine Radio Transceiver			Freq.:	VHF	
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	Test Report Serial No.:	091015AMW-T1334E80	Test Report Issue Date:	16 Oct 2015
	Measurement Date(s):	1-7, Oct 2015	Test Report Revision No.:	Rev. 1.1
	Rule Part(s) Applied:	FCC 47 CFR §2, §80	Industry Canada RSS-182.	
	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

Occupied Bandwidth (Ch 88) w/ Emission Mask



Date: 30.SEP.2015 14:46:39

Channel Frequency: (Ch 88):	157.425MHz
Authorized Bandwidth §80.211, RSS 182 (7.3):	16kHz (20kHz Data)
Measured Occupied Bandwidth (99%) RSS-Gen:	14.85kHz
Result:	Complies

Applicant:	Uniden America Corporation	FCC ID:	AMWUT653	IC:	513C-UT653	
DUT Type:	Portable PTT Marine Radio Transceiver			Freq.:	VHF	
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	Measurement Date(s):	1-7, Oct 2015	Test Report Revision No.:	Rev. 1.1
	Rule Part(s) Applied:	FCC 47 CFR §2, §80	Industry Canada RSS-182.	
	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

11.0 RADIATED SPURIOUS EMISSIONS - TX

REFERENCES	
Normative Reference Standard	FCC CFR 47 §2.1053; IC RSS-182
Procedure Reference	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).

LIMITS	
§80.211, RSS-182 7.9	Emissions must be at least $43 + 10 \log_{10} (P)$ dB below the mean power output of the transmitter.

ENVIRONMENTAL CONDITIONS	
Temperature	25 +/- 5 °C
Humidity	40 +/- 10 %
Barometric Pressure	101 +/- 3 kPa

Equipment List				
Asset number	Manufacturer	Model	Description	Last cal / Cal due
00072	EMCO	2075	Mini-mast	CNR
00073	EMCO	2080	Turn Table	CNR
00071	EMCO	2090	Multi-Device Controller	CNR
00241	R&S	FSU40	Spectrum Analyzer	23-Apr-15 / 23-Apr-17
00050	Chase	CBL-6111A	Bilog Antenna	25-Apr-2014 / 25-Apr-2016
00054	EMCO	3121C	Dipole Antenna	(first cal cycle) / 30-Apr-16
00034	EMCO	3115	Horn Antenna	6-Dec-12 - 6 Dec-15
00051	HP	8566B	Spectrum Analyzer RF Section	30-Apr-14 / 30-Apr-16
00049	HP	85650A	Quasi-peak Adapter	30-Apr-14 / 30-Apr-16
00047	HP	85685A	RF Preselector	30-Apr-14 / 30-Apr-16
00006	R & S	SMR 20	Signal Generator (10MHz-40GHz)	08-May-14 / 08-May-16
00239	Mini-Ccts	ZFL-1000VH	Amplifier 10MHz-1GHz	Cal on use
00110	Gigatronics	8652A	Power Meter	17-Feb-14 / 17-Feb-16
00248	Gigatronics	80701A	Power Sensor	18-Feb-14 / 18-Feb-16

Applicant:	Uniden America Corporation	FCC ID:	AMWUT653	IC:	513C-UT653	
DUT Type:	Portable PTT Marine Radio Transceiver			Freq.:	VHF	
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	Measurement Date(s):	1-7, Oct 2015	Test Report Revision No.:	Rev. 1.1
	Rule Part(s) Applied:	FCC 47 CFR §2, §80	Industry Canada RSS-182.	
	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

MEASUREMENT EQUIPMENT SETUP

MEASUREMENT EQUIPMENT CONNECTIONS

For the field strength measurements, the measurement equipment was connected as shown in Fig 11.0. 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. Worst case performance is presented.

Frequency Range	RX Antenna	TX Antenna
30 MHz - 1GHz	Bilog	Dipole
1 GHz - 18 GHz	ETS 3115 Horn	ETS 3115 Horn

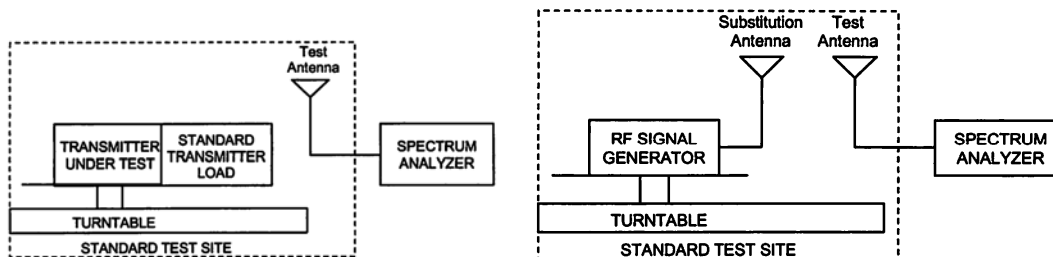
MEASUREMENT EQUIPMENT SETTINGS

Measurement Settings.

RBW	VBW	Detector
MHz	MHz	
10 kHz < 1GHz 1 MHz > 1 GHz	300 kHz < 1 GHz 3 MHz > 1 GHz	Peak

SETUP DRAWING

Figure 11.0 - Setup Drawing – Radiated TX Spurious Emissions



Applicant:	Uniden America Corporation	FCC ID:	AMWUT653	IC:	513C-UT653	
DUT Type:	Portable PTT Marine Radio Transceiver			Freq.:	VHF	
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	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

Radiated Spurious Emissions (Tx) Channel 14

Frequency	Antenna	Emission Level @ 3m	Antenna Factor	Cable Loss	Corrected Emission @ 3m	Substitution Method Correction	Corrected Emission Level	Limit	Margin
(MHz)	Polarization	(dBuV)	(dB)	(dB)	(dBuV/m)	(dB)	(dBm)	(dBm)	(dB)
313.4	H	60.3	13.6	2.8	76.7	-0.2	-20.9	-13.0	7.9
470.1	H	46.7	17.5	3.4	67.6	-1.5	-31.3	-13.0	18.3
626.8	H	52.2	20.5	4.2	76.9	-0.3	-20.8	-13.0	7.8
783.5	H	46.7	22.4	4.9	74.0	0.2	-23.2	-13.0	10.2
940.2	H	34.4	24.6	5.3	64.3	-0.2	-33.3	-13.0	20.3
313.4	V	59.3	13.6	2.8	75.7	0.8	-20.9	-13.0	7.9
470.1	V	41.3	17.5	3.4	62.2	0.4	-34.8	-13.0	21.8
626.8	V	53.5	20.5	4.2	78.2	1.1	-18.1	-13.0	5.1
783.5	V	40.2	22.4	4.9	67.5	-0.8	-30.7	-13.0	17.7
940.2	V	32.0	24.6	5.3	61.9	-0.1	-35.6	-13.0	22.6

Result: **Complies**

Notes

Worst-case emissions shown

The device was searched to the 10th harmonic of the fundamental (156.7 MHz)

Data presented may use a peak detector and compared to quasi-peak limit

All detected emissions have been reported

Applicant:	Uniden America Corporation	FCC ID:	AMWUT653	IC:	513C-UT653	
DUT Type:	Portable PTT Marine Radio Transceiver			Freq.:	VHF	
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	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

Radiated Spurious Emissions (Rx)									
Frequency	Antenna	Emission Level	Antenna	Cable	Corrected	Substitution	Emission	Limit	Margin
(MHz)	Polarization	@ 3m	Factor	Loss	@ 3m	Method	@ 3m	@ 3m	
		(dBuV/m)	(dB)	(dB)	(dBuV/m)	Correction	(dBuV/m)	(dBuV/m)	(dB)
157	H*	9.6	11.6	1.9	23.1	n/a	23.1	43.5	20.4
313	H*	8.2	10.2	2.9	21.3	n/a	21.3	46.0	24.7
627	H*	8.5	20.5	4.2	33.2	n/a	33.2	46.0	12.8
940	H*	6.2	24.6	5.3	36.1	n/a	36.1	46.0	9.9
157	V*	10.8	11.6	1.9	24.3	n/a	24.3	43.5	19.2
313	V*	10.3	10.2	2.9	23.4	n/a	23.4	46.0	22.6
627	V*	9.5	20.5	4.2	34.2	n/a	34.2	46.0	11.8
940	V*	7.1	24.6	5.3	37.0	n/a	37.0	46.0	9.0

Result:								Complies	
---------	--	--	--	--	--	--	--	----------	--

*No emissions found, noise floor measurement

Notes

Worst-case emissions shown

The device was searched to the 10th harmonic of the fundamental (156.7 MHz)

Data presented may use a peak detector and compared to quasi-peak limit

All detected emissions have been reported

Applicant:	Uniden America Corporation	FCC ID:	AMWUT653	IC:	513C-UT653	
DUT Type:	Portable PTT Marine Radio Transceiver			Freq.:	VHF	
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	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

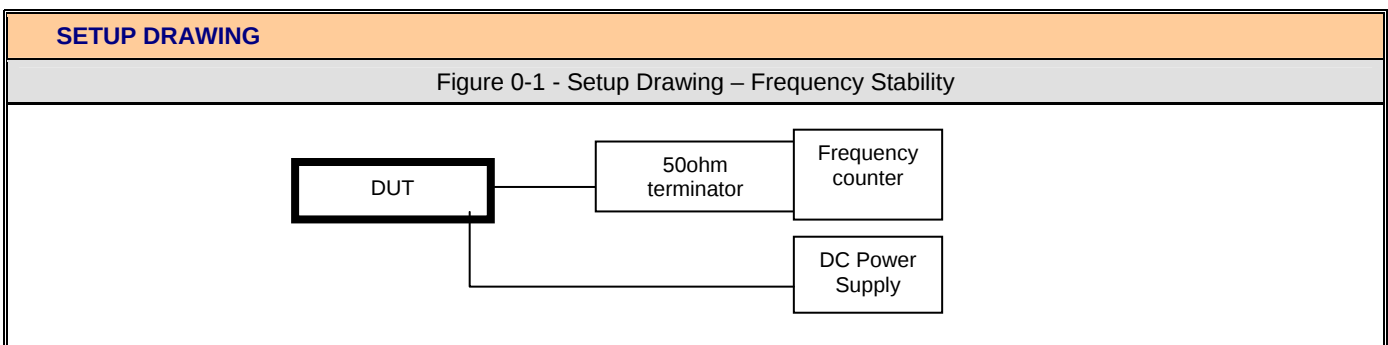
12.0 FREQUENCY STABILITY

REFERENCES	
Normative Reference Standard	FCC CFR 47 §2.1055, §80.209; IC RSS-182.
Procedure Reference / Description	§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

LIMITS	
§80.209 & RSS-182	10 ppm

ENVIRONMENTAL CONDITIONS	
Temperature	25 +/- 5 °C
Humidity	40 +/- 10 %
Barometric Pressure	101 +/- 3 kPa

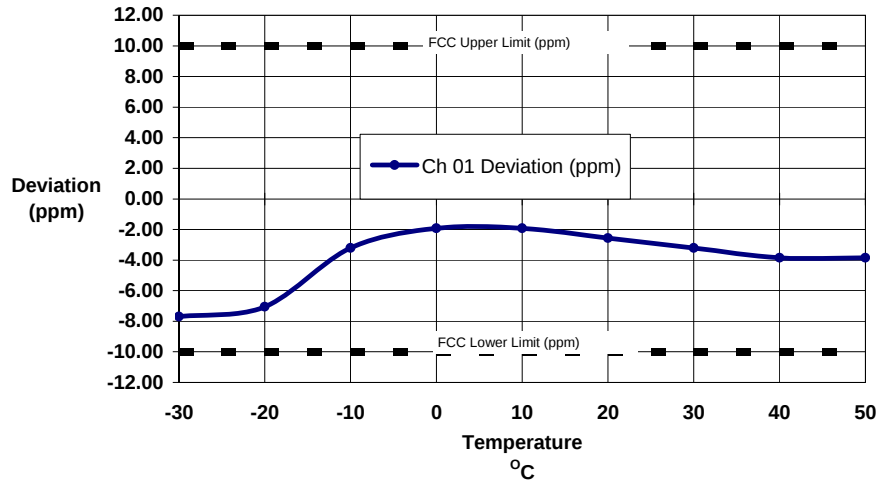
EQUIPMENT LIST				
ASSET NUMBER	MANUFACTURER	MODEL	DESCRIPTION	LAST CAL - CAL DUE
na	ESPEC	ECT-2	Heater/Refrigerator	na
00003	HP	53181A	Frequency Counter	28-Apr-14 - 28-Apr-16
00207	VWR	na	Temperature Humidity Monitor	8-May-14 - 8-May-16



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

Frequency Stability

Nominal Frequency (MHz):	156.050 (Ch 1)
Nominal Battery Voltage (VDC):	4.8
Nominal Temperature (°C):	25



Frequency Stability Measurements (Temperature)

Temp (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Deviation (ppm)
-30	156.0500	156.0488	-7.69
-20	156.0500	156.0489	-7.05
-10	156.0500	156.0495	-3.20
0	156.0500	156.0497	-1.92
10	156.0500	156.0497	-1.92
20	156.0500	156.0496	-2.56
30	156.0500	156.0495	-3.20
40	156.0500	156.0494	-3.84
50	156.0500	156.0494	-3.84
Maximum Deviation (ppm):			-7.69
Maximum Limit (ppm):			+/- 10.00
Result:			Complies

Frequency Stability Measurements (Voltage)

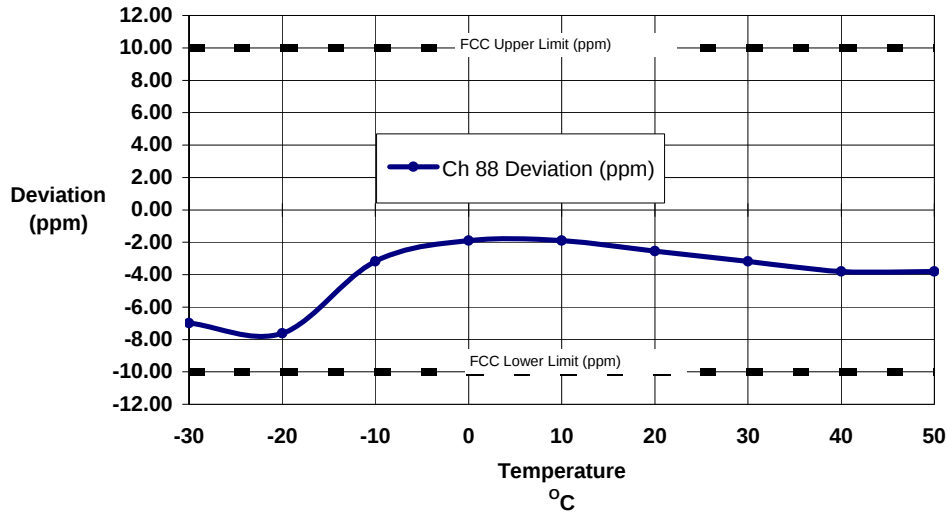
Voltage (VDC)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Deviation (ppm)
4.8 (100%)	156.0500	156.0496	-2.56
4.6 (96%)*	156.0500	156.0495	-3.20
Maximum Deviation (ppm):			-3.20
Maximum Limit (ppm):			+/- 10.00
Result:			Complies

*Below 4.6 VDC Battery Terminal Voltage, the device indicates low battery and inhibits transmitter operation.

	Test Report Serial No.:	091015AMW-T1334E80	Test Report Issue Date:	16 Oct 2015
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	Rule Part(s) Applied:	FCC 47 CFR §2, §80	Industry Canada RSS-182.	
	Test Site Registration(s):	FCC Accredited Site	Industry Canada Test Site Registration No. 3874A-1	

Frequency Stability

Nominal Frequency (MHz):	157.4250 (Ch 88)
Nominal Battery Voltage (VDC):	4.8
Nominal Temperature (°C):	25



Frequency Stability Measurements (Temperature)			
Temp (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Deviation (ppm)
-30	157.4250	157.4239	-6.99
-20	157.4250	157.4238	-7.62
-10	157.4250	157.4245	-3.18
0	157.4250	157.4247	-1.91
10	157.4250	157.4247	-1.91
20	157.4250	157.4246	-2.54
30	157.4250	157.4245	-3.18
40	157.4250	157.4244	-3.81
50	157.4250	157.4244	-3.81
Maximum Deviation (ppm):			-7.62
Maximum Limit (ppm):			+/- 10.00
Result:			Complies

Frequency Stability Measurements (Voltage)			
Voltage (VDC)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Deviation (ppm)
4.8 (100%)	157.4250	157.4246	-2.54
4.6 (96%)*	157.4250	157.4245	-3.18
Maximum Deviation (ppm):			-3.18
Maximum Limit (ppm):			+/- 10.00
Result:			Complies

*Below 4.6 VDC Battery Terminal Voltage, the device indicates low battery and inhibits transmitter operation.

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END OF DOCUMENT

Applicant:	Uniden America Corporation	FCC ID:	AMWUT653	IC:	513C-UT653	
DUT Type:	Portable PTT Marine Radio Transceiver			Freq.:	VHF	
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