



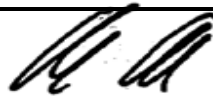
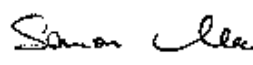
**FCC PART 74, SUBPART H
ISED C RSS-123, ISSUE 4, AUGUST 2019
TEST AND MEASUREMENT REPORT**

For

Lectrosonics, Inc.

581 Laser Road NE, Rio Rancho, NM 87124, USA

**FCC ID: DBZSMWB79
IC: 8024A-SMWB79**

Report Type: Original Report	Product Type: Body-worn Wireless Microphone Transmitter
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Report Number: R2005263-74	
Report Issue Date: 2020-07-15	
Reviewed By: Simon Ma RF Supervisor 	
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Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. This report **must not** be used by the customer to claim product certification, approval, or endorsement by A2LA*, NIST, or any agency of the Federal Government.

* This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk “*” (Rev2)

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R2005263-74	Original Report	2020-07-15

1 General Description

1.1 Product Description for Equipment Under Test (EUT)

This test report has been compiled on behalf of *Lectrosonics, Inc.* and their product model: *SMWB/E07-941* and *SMDWB/E07-941*, FCC ID: DBZSMWB79; IC: 8024A-SMWB79, which henceforth is referred to as the EUT (Equipment Under Test). The EUT is a body-worn wireless microphone transmitter. The EUT operates in the frequency range: 941.525-951.975 MHz, 953.025-956.225 MHz, and 956.475-959.825 MHz. SMWB/E07-941 and SMDWB/E07-941 are electrically identical; SMWB/E07-941 was selected for formal testing. Please refer to manufacturer DoS in Annex E of this report.

1.2 Mechanical Description of EUT

The (EUT) measures approximately:

SMWB/E07-941: 60.096mm (L) x 49.632mm (W) x 16.307mm (H) and weighs approximately 90.72 grams.

SMDWB/E07-941: 60.096mm (L) x 62.865mm (W) x 16.307mm (H) and weighs approximately 113.40 grams.

The data gathered are from the typical production sample provided by the Lectrosonics, Inc. with serial number: 5 and 6.

1.3 Objective

The following test report was prepared on behalf of *Lectrosonics, Inc.* in accordance with Part 74, Subparts H of the Federal Communications Commission rules and ISEDC RSS-123, Issue 4, August 2019.

The objective was to determine compliance with Part 74 of the FCC Rules, and ISED RSS-123 Issue 4, limits for RF output power, Modulation characteristics, Emission bandwidth, Field strength of spurious radiation and Frequency stability for low power auxiliary stations operating in the bands other than those allocated for TV broadcasting.

1.4 Related Submittal(s)/Grant(s)

N/A

1.5 Test Methodology

All measurements contained in this report were conducted in accordance with ANSI/TIA-603-E-2016, FCC KDB 971168 D01 Power Meas License Digital Systems v03r01, and EN 300 422-1 v1.4.2 Electromagnetic compatibility and Radio Spectrum Matters; Wireless microphones in the 25MHz to 3GHz frequency range.

All tests were performed at Bay Area Compliance Laboratories Corp.

1.6 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Parameter	Measurement uncertainty
Occupied Channel Bandwidth	±5 %
RF output power, conducted	±0.57 dB
Power Spectral Density, conducted	±1.48dB
Unwanted Emissions, conducted	±1.57dB
All emissions, radiated	±4.0 dB
AC power line Conducted Emission	±2.0 dB
Temperature	±2 ° C
Humidity	±5 %
DC and low frequency voltages	±1.0 %
Time	±2 %
Duty Cycle	±3 %

1.7 Test Facility Registrations

BACLs test facilities that are used to perform Radiated and Conducted Emissions tests are currently recognized by the Federal Communications Commission as Accredited with NIST Designation Number US1129.

BACL's test facilities that are used to perform Radiated and Conducted Emissions tests are currently registered with Innovation, Science and Economic development Canada under Registration Numbers: 3062A-1, 3062A-2, and 3062A-3.

BACL is a Chinese Taipei Bureau of Standards Metrology and Inspection (BSMI) validated Conformity Assessment Body (CAB), under Appendix B, Phase I Procedures of the APEC Mutual Recognition Arrangement (MRA). BACL's BSMI Lab Code Number is: SL2-IN-E-1002R

BACL's test facilities that are used to perform AC Line Conducted Emissions, Telecommunications Line Conducted Emissions, Radiated Emissions from 30 MHz to 1 GHz, and Radiated Emissions from 1 GHz to 6 GHz are currently recognized as Accredited in accordance with the Voluntary Control Council for Interference [VCCI] Article 15 procedures under Registration Number A-0027.

1.8 Test Facility Accreditations

Bay Area Compliance Laboratories Corp. (BACL) is:

A- An independent, 3rd-Party, Commercial Test Laboratory accredited to ISO/IEC 17025:2005 by A2LA (Test Laboratory Accreditation Certificate Number 3297.02), in the fields of: Electromagnetic Compatibility and Telecommunications. Unless noted by an Asterisk (*) in the Compliance Matrix (See Section 3 of this Test Report), BACL's ISO/IEC 17025:2005 Scope of Accreditation includes all of the Test Method Standards and/or the Product Family Standards detailed in this Test Report..

BACL's ISO/IEC 17025:2005 Scope of Accreditation includes a comprehensive suite of EMC Emissions, EMC Immunity, Radio, RF Exposure, Safety and wireline Telecommunications test methods applicable to a wide range of product categories. These product categories include Central Office Telecommunications Equipment [including NEBS - Network Equipment Building Systems], Unlicensed and Licensed Wireless and RF devices,

Information Technology Equipment (ITE); Telecommunications Terminal Equipment (TTE); Medical Electrical Equipment; Industrial, Scientific and Medical Test Equipment; Professional Audio and Video Equipment; Industrial and Scientific Instruments and Laboratory Apparatus; Cable Distribution Systems, and Energy Efficient Lighting.

B- A Product Certification Body accredited to ISO/IEC 17065:2012 by A2LA (Product Certification Body

- - For the USA (Federal Communications Commission):

- 1- All Unlicensed radio frequency devices within FCC Scopes A1, A2, A3, and A4;
- 2- All Licensed radio frequency devices within FCC Scopes B1, B2, B3, and B4;
- 3- All Telephone Terminal Equipment within FCC Scope C.

- For the Canada (Innovation, Science and Economic development Canada - ISED):

- 1- All Scope 1-Licence-Exempt Radio Frequency Devices;
- 2- All Scope 2-Licensed Personal Mobile Radio Services;
- 3- All Scope 3-Licensed General Mobile & Fixed Radio Services;
- 4- All Scope 4-Licensed Maritime & Aviation Radio Services;
- 5- All Scope 5-Licensed Fixed Microwave Radio Services
- 6- All Broadcasting Technical Standards (BETS) in the Category I Equipment Standards List.

For Singapore (Infocomm Media Development Authority - IMDA):

- 1 All Line Terminal Equipment: All Technical Specifications for Line Terminal Equipment – Table 1 of IMDA MRA Recognition Scheme: 2011, Annex 2
2. All Radio-Communication Equipment: All Technical Specifications for Radio-Communication Equipment – Table 2 of IMDA MRA Recognition Scheme: 2011, Annex 2

- For the Hong Kong Special Administrative Region:

- 1 All Radio Equipment, per KHCA 10XX-series Specifications;
- 2 All GMDSS Marine Radio Equipment, per HKCA 12XX-series Specifications;
- 3 All Fixed Network Equipment, per HKCA 20XX-series Specifications.

- For Japan:

- 1 MIC Telecommunication Business Law (Terminal Equipment):
 - All Scope A1 - Terminal Equipment for the Purpose of Calls;
 - All Scope A2 - Other Terminal Equipment
- 2 Radio Law (Radio Equipment):
 - All Scope B1 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 1 of the Radio Law
 - All Scope B2 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 2 of the Radio Law
 - All Scope B3 - Specified Radio Equipment specified in Article 38-2-2, paragraph 1, item 3 of the Radio Law

C- A Product Certification Body accredited to ISO/IEC 17065:2012 by A2LA (Product Certification Body Accreditation Certificate Number 3297.01) to certify Products to USA's Environmental Protection Agency (EPA) ENERGY STAR Product Specifications for:

- 1 Electronics and Office Equipment:
 - for Telephony (ver. 3.0)
 - for Audio/Video (ver. 3.0)
 - for Battery Charging Systems (ver. 1.1)
 - for Set-top Boxes & Cable Boxes (ver. 4.1)
 - for Televisions (ver. 6.1)
 - for Computers (ver. 6.0)
 - for Displays (ver. 6.0)
 - for Imaging Equipment (ver. 2.0)
 - for Computer Servers (ver. 2.0)
- 2 Commercial Food Service Equipment
 - for Commercial Dishwashers (ver. 2.0)

- for Commercial Ice Machines (ver. 2.0)
- for Commercial Ovens (ver. 2.1)
- for Commercial Refrigerators and Freezers
- 3 Lighting Products
 - For Decorative Light Strings (ver. 1.5)
 - For Luminaires (including sub-components) and Lamps (ver. 1.2)
 - For Compact Fluorescent Lamps (CFLs) (ver. 4.3)
 - For Integral LED Lamps (ver. 1.4)
- 4 Heating, Ventilation, and AC Products
 - for Residential Ceiling Fans (ver. 3.0)
 - for Residential Ventilating Fans (ver. 3.2)
- 5 Other
 - For Water Coolers (ver. 3.0)

D. A NIST Designated Phase-I and Phase-II Conformity Assessment Body (CAB) for the following economies and regulatory authorities under the terms of the stated MRAs/Treaties:

- Australia: ACMA (Australian Communication and Media Authority) – APEC Tel MRA -Phase I;
- Canada: (Innovation, Science and Economic development Canada - ISED) Foreign Certification Body – FCB – APEC Tel MRA -Phase I & Phase II;
- Chinese Taipei (Republic of China – Taiwan):
 - o BSMI (Bureau of Standards, Metrology and Inspection) APEC Tel MRA -Phase I;
 - o NCC (National Communications Commission) APEC Tel MRA -Phase I;
- European Union:
 - o EMC Directive 2014/30/EU US-EU EMC & Telecom MRA CAB (NB)
 - o Radio Equipment (RE) Directive 2014/53/EU US-EU EMC & Telecom MRA CAB (NB)
 - o Low Voltage Directive (LVD) 2014/35/EU
- Hong Kong Special Administrative Region: (Office of the Telecommunications Authority – OFTA) APEC Tel MRA -Phase I & Phase II
- Israel – US-Israel MRA Phase I
- Republic of Korea (Ministry of Communications - Radio Research Laboratory) APEC Tel MRA -Phase I
- Singapore: (Infocomm Media Development Authority - IMDA) APEC Tel MRA -Phase I & Phase II;
- Japan: VCCI - Voluntary Control Council for Interference US-Japan Telecom Treaty VCCI Side Letter
- USA:
 - o ENERGY STAR Recognized Test Laboratory – US EPA
 - o Telecommunications Certification Body (TCB) – US FCC;
 - o Nationally Recognized Test Laboratory (NRTL) – US OSHA
- Vietnam: APEC Tel MRA -Phase I;

2 EUT Test Configuration

2.1 Justification

The EUT was configured for testing according to ANSI/TIA-603-E-2016, ANSI C63.26-2015, and KDB 971168 D01 v03r01.

2.2 EUT Exercise Software

None

2.3 Special Equipment

There were no special accessories were required, included, or intended for use with EUT during these tests.

2.4 Equipment Modifications

None

2.5 Local Support Equipment

None

2.6 Interface Ports and Cables

None

3 Summary of Test Results

FCC & ISEDC Rules	Descriptions of Test	Result (s)
FCC §2.1093 ISEDC RSS-102	RF exposure	Compliant ¹
FCC §74.861(d)(1) ISEDC RSS-123 §8.2	RF output power	Compliant
FCC §2.1047 ISEDC RSS-123 §8.1	Modulation characteristics	Compliant
FCC §2.1049 FCC §74.861(d)(4)(i) ISEDC RSS-123 §8.2 & § 8.3	Operating bandwidth & Emission mask	Compliant
FCC §2.1051 FCC §74.861(d)(4)(i) ISEDC RSS-123 §8.3	Spurious emissions at the antenna port	Compliant
FCC §2.1053 FCC §74.861(d)(4)(i) ISEDC RSS-123 §8.3	Field strength of spurious emissions	Compliant
FCC §2.1055 ISEDC RSS-123 §8.2	Frequency Stability	Compliant

Note¹: Please refer to report R2005263-20

4 FCC §2.1093 & ISEDC RSS-102 - RF Exposure

Please refer to R2005263-20 for SAR test results.

5 FCC §74.861(d)(1) & ISEDC RSS-123 §8.2 -RF Output Power

5.1 Applicable Standards

According to FCC §74.861 (d) For low power auxiliary stations operating in the bands other than those allocated for TV broadcasting, the following technical requirements are imposed.

(1) For all bands except the 1435-1525 MHz band, the maximum transmitter power which will be authorized is 1 watt. In the 1435-1525 MHz band, the maximum transmitter power which will be authorized is 250 milliwatts. Licensees may accept the manufacturer's power rating; however, it is the licensee's responsibility to observe specified power limits.

According to ISEDC RSS-123 §8.2 the device shall meet the transmit power/e.r.p., authorized bandwidth and frequency stability limits for its operating bands as specified in table 1.

Table 1 — Frequency bands, transmit power/e.r.p., authorized bandwidths and frequency stability limits

Frequency band (MHz)	Transmit power (W)	e.r.p. (W)	Authorized bandwidth (kHz)	Frequency stability ($\pm$ ppm)
26.10-26.48	--	1	200	50
88-107.5	--	1	200	50
150-174	0.05	--	54	50
450-451	--	1	200	50
455-456	--	1	200	50
941.5-952	1	--	200	20
953-959.85	1	--	200	20
6930-6955	1	--	600	10
7100-7125	1	--	600	10

5.2 Test Procedure

KDB 971168 D01 v03r01

5.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Interval
Rhode & Schwarz	Signal Analyzer	FSV40	1321.3008K3 9-101203-UW	2019-08-06	1 year
-	20dB attenuator	-	-	Each time ¹	N/A
-	RF Cable	-	-	Each time ¹	N/A

Note¹: attenuator and cable included in the test set-up will be checked each time before testing.

Statement of Traceability: *BACL Corp.* attests that all of the calibrations on the equipment items listed above were traceable to NIST or to another internationally recognized National Metrology Institute (NMI), and were compliant with A2LA Policy P102 (dated 02 October 2018) "A2LA Policy on Metrological Traceability".

5.4 Test Environmental Conditions

Temperature:	22 °C
Relative Humidity:	45 %
ATM Pressure:	101.2 kPa

The testing was performed by Christopher Casteel on 2020-05-28 at RF site.

5.5 Test Results

SMWB/E07-941:

Channel	Frequency (MHz)	Conducted Output Power (dBm) EUT Power Setting			Limits (dBm)	Rated Power (dBm)
		25 mW	50 mW	100 mW		
Low	941.525	13.98	16.88	19.85	24	14/17/20
Middle	953.025	14.00	16.68	19.82	24	14/17/20
High	959.825	13.85	16.65	19.40	24	14/17/20

SMDWB/E07-941:

Channel	Frequency (MHz)	Conducted Output Power (dBm) EUT Power Setting			Limits (dBm)	Rated Power (dBm)
		25 mW	50 mW	100 mW		
Low	941.525	13.82	16.38	19.58	24	14/17/20
Middle	953.025	13.53	16.37	19.44	24	14/17/20
High	959.825	13.36	16.25	19.26	24	14/17/20

6 FCC §2.1049, §74.861(d)(4)(i) & RSS-123 §8.2, §8.3-Occupied Bandwidth & Emission Mask

6.1 Applicable Standards

FCC §2.1049

According to FCC §74.861 (d) (4) (i):

(4)(i) For the 653-657 MHz, 941.5-944 MHz, 944-952 MHz, 952.850-956.250 MHz, 956.45-959.85 MHz, 1435-1525 MHz, 6875-6900 MHz and 7100-7125 MHz bands, analog emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in section 8.3.1.2 of the European Telecommunications Institute Standard ETSI EN 300 422-1 v1.4.2 (2011-08), Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless microphones in the 25 MHz to 3 GHz frequency range; Part 1: Technical characteristics and methods of measurement. Beyond one megahertz below and above the carrier frequency, emissions shall comply with the limits specified in section 8.4 of ETSI EN 300 422-1 v1.4.2 (2011-08).

According to ISED RSS123 §8.2:

Table 1 — Frequency bands, transmit power/e.r.p., authorized bandwidths and frequency stability limits

Frequency band (MHz)	Transmit power (W)	e.r.p. (W)	Authorized bandwidth (kHz)	Frequency stability (± ppm)
26.10-26.48	--	1	200	50
88-107.5	--	1	200	50
150-174	0.05	--	54	50
450-451	--	1	200	50
455-456	--	1	200	50
941.5-952	1	--	200	20
953-959.85	1	--	200	20
6930-6955	1	--	600	10
7100-7125	1	--	600	10

According to ISED RSS123 §8.3 Clause c. devices operating in frequency bands 941.5-952 MHz, 953-959.85 MHz, 6930-6955 MHz and 7100-7125 MHz shall have the transmitter's unwanted emissions meet the requirements in sections 8.3 and 8.4 of ETSI EN 300 422-1.

6.2 Test Procedure

The OBW is according to KDB 971168 D01 v03r01

The Emission mask is according to sections 8.3 of ETSI EN 300 422-1 V1.4.2 (2011-08).

6.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Interval
Rohde & Schwarz	Spectrum Analyzer	FSQ26	200749	2019-11-07	2 years
HP	RF Communications Test Set	8920A	3438A05338	2019-01-09	18 months
HP	Modulation Analyzer	8901A	2026A00847	2020-01-24	1 year
Krohn-Hite	Active Dual Channel Filter	3940	3212	2019-10-24	1 year
Agilent	Function Generator	33220A	MY43004878	2019-01-09	2 years
HP	TIMS	4934A	3737U15141	2019-01-18	2 years
-	20dB attenuator	-	-	Each time ¹	N/A
-	RF Cable	-	-	Each time ¹	N/A

Note¹: attenuator and cable included in the test set-up will be checked each time before testing.

Statement of Traceability: *BACL Corp.* attests that all of the calibrations on the equipment items listed above were traceable to NIST or to another internationally recognized National Metrology Institute (NMI), and were compliant with A2LA Policy P102 (dated 02 October 2018) "A2LA Policy on Metrological Traceability".

6.4 Test Environmental Conditions

Temperature:	22 °C
Relative Humidity:	45 %
ATM Pressure:	101.2 kPa

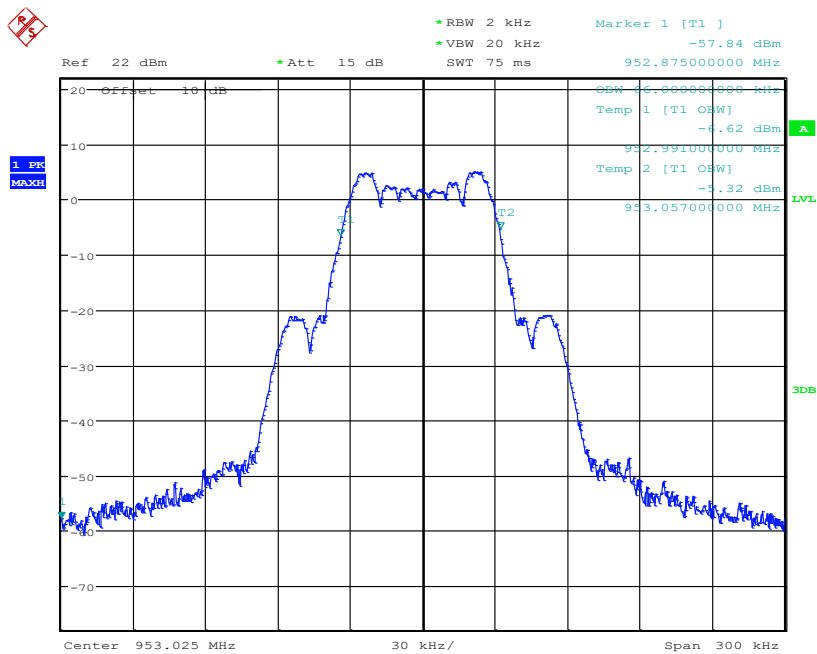
The testing was performed by Christopher Casteel on 2020-05-28 at RF site.

6.5 Test Results

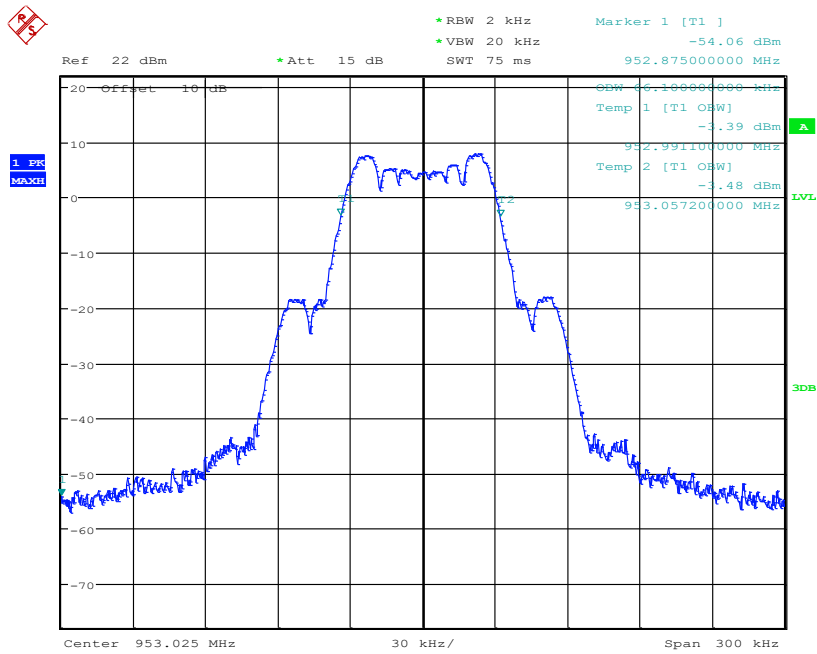
Center Frequency (MHz)	Power Setting (mW)	99% Bandwidth (kHz)	Limit (kHz)	Result
953.025	25	66.0	200	Pass
953.025	50	66.1	200	Pass
953.025	100	66.4	200	Pass

Please refer to the following plots for detailed test results

25 mW, 99% OBW



50 mW, 99% OBW



1. PSC
MAGX31

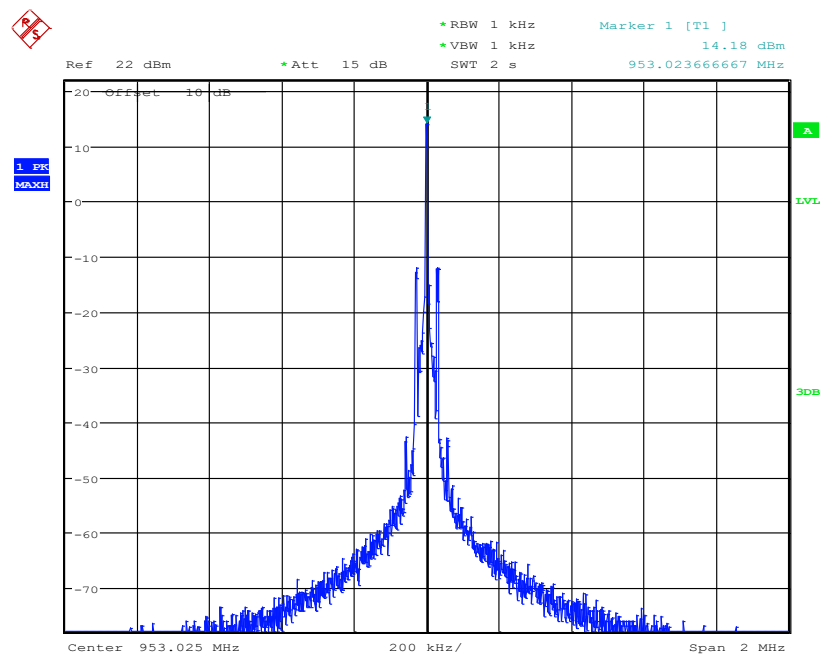
Ref 22 dBm *Att 15 dB *RBW 2 kHz *VBW 20 kHz SWT 75 ms

Marker 1 [T1]
952.990000000 MHz
Temp 1 [T1 OSW]
-0.48 dBm

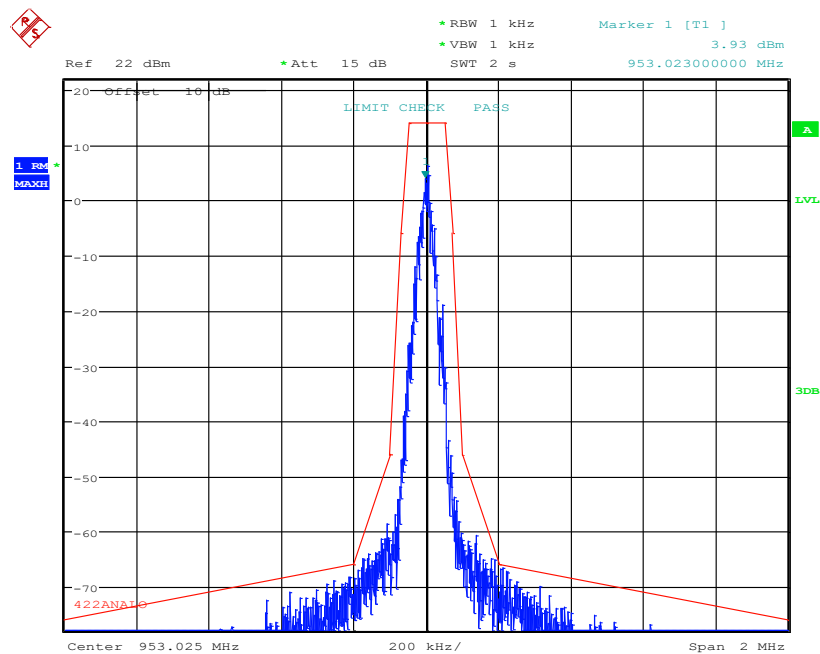
Marker 2 [T2]
953.057300000 MHz
Temp 2 [T1 OSW]
-0.64 dBm

Center 953.025 MHz 30 kHz/ Span 300 kHz

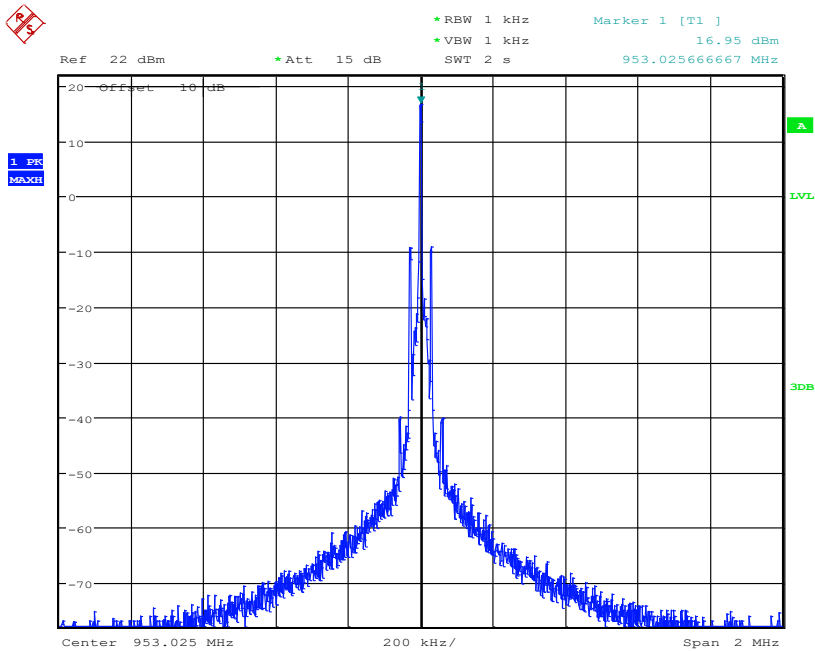
25 mW, Emission Mask Reference Level



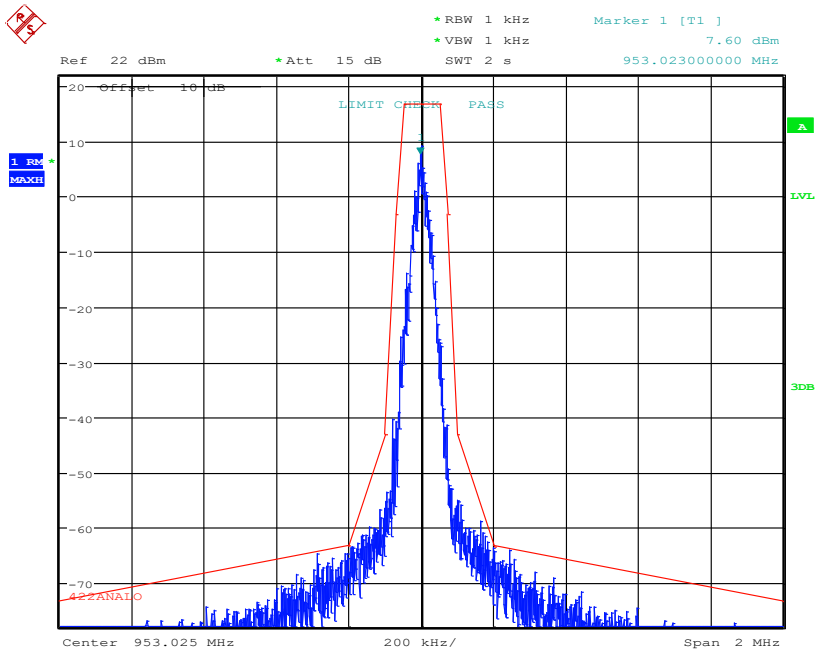
25 mW, Emission Mask



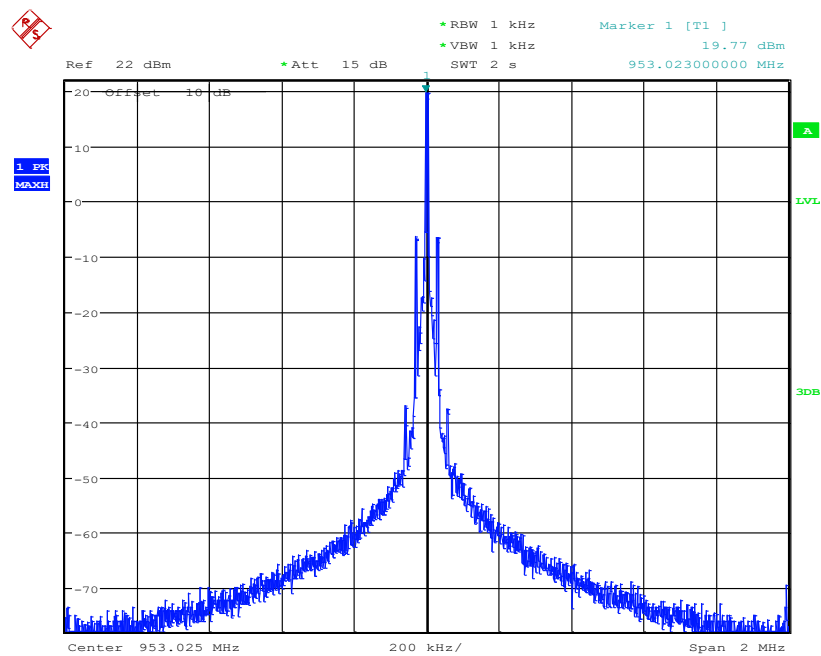
50 mW, Emission Mask Reference Level



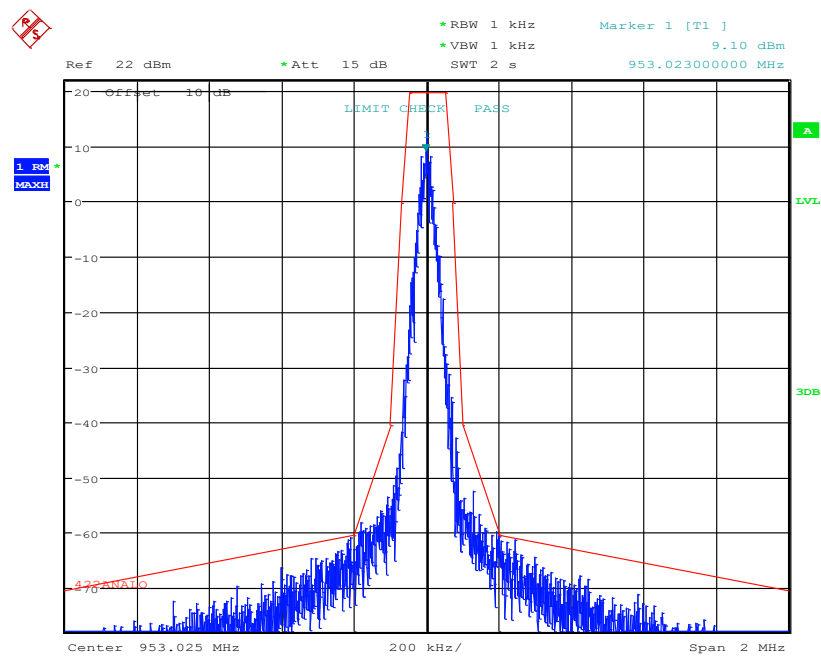
50 mW, Emission Mask



100 mW, Emission Mask Reference Level



100 mW, Emission Mask



7 FCC §74.861(d)(4)(i) & RSS-123 §8.3-Conducted Spurious Emissions at Antenna Port

7.1 Applicable Standards

According to FCC §74.861 (d) (4) (i):

For the 653-657 MHz, 941.5-944 MHz, 944-952 MHz, 952.850-956.250 MHz, 956.45-959.85 MHz, 1435-1525 MHz, 6875-6900 MHz and 7100-7125 MHz bands, analog emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in section 8.3.1.2 of the European Telecommunications Institute Standard ETSI EN 300 422-1 v1.4.2 (2011-08), Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless microphones in the 25 MHz to 3 GHz frequency range; Part 1: Technical characteristics and methods of measurement. Beyond one megahertz below and above the carrier frequency, emissions shall comply with the limits specified in section 8.4 of ETSI EN 300 422-1 v1.4.2 (2011-08).

According to RSS-123 §8.3 Clause c. devices operating in frequency bands 941.5-952 MHz, 953-959.85 MHz, 6930-6955 MHz and 7100-7125 MHz shall have the transmitter's unwanted emissions meet the requirements in sections 8.3 and 8.4 of ETSI EN 300 422-1

7.2 Test Procedure

KDB 971168 D01 v03r01 and ETSI EN 300 422-1 V1.4.2 (2011-08).

7.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Interval
Rhode & Schwarz	Signal Analyzer	FSV40	1321.3008K39-101203-UW	2019-08-06	1 year
-	20dB attenuator	-	-	Each time ¹	N/A
-	RF Cable	-	-	Each time ¹	N/A

Note¹: attenuator and cable included in the test set-up will be checked each time before testing.

Statement of Traceability: **BACL Corp.** attests that all of the calibrations on the equipment items listed above were traceable to NIST or to another internationally recognized National Metrology Institute (NMI), and were compliant with A2LA Policy P102 (dated 02 October 2018) "A2LA Policy on Metrological Traceability".

7.4 Test Environmental Conditions

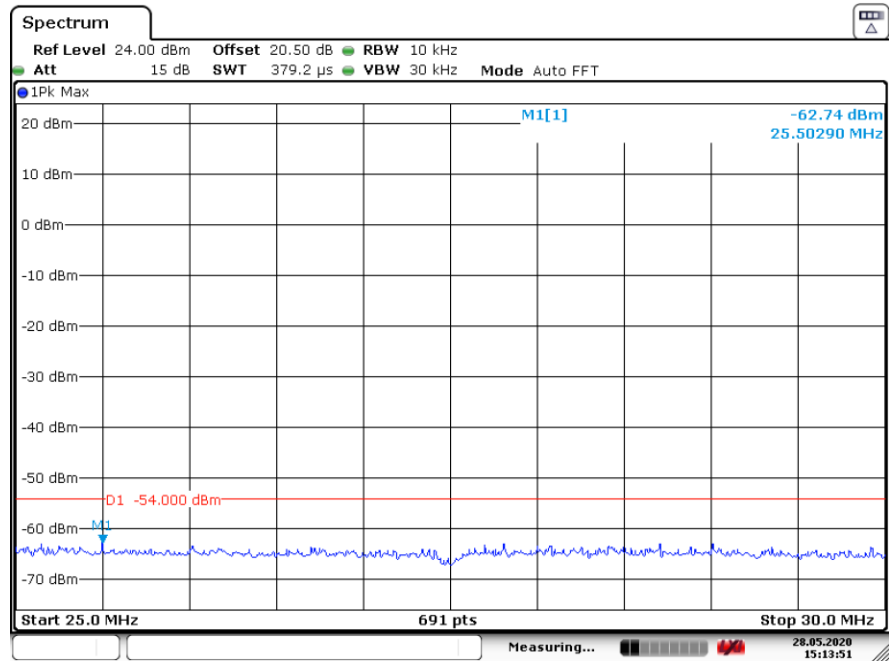
Temperature:	22 °C
Relative Humidity:	45 %
ATM Pressure:	101.2 kPa

The testing was performed by Christopher Casteel on 2020-05-28 at RF site.

7.5 Test Results

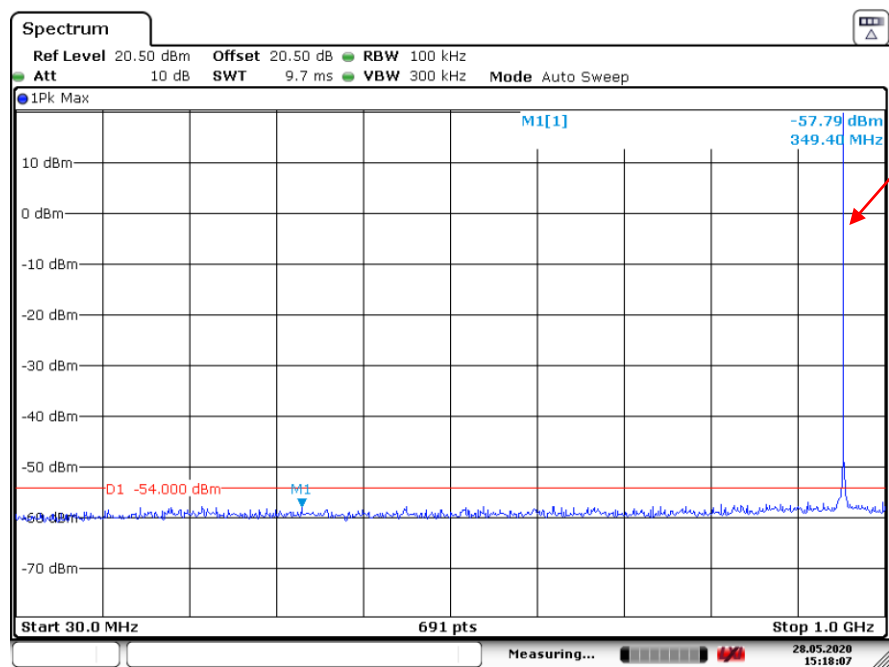
953.025 MHz, 100 mW, Spurious Emission

25 MHz to 30 MHz



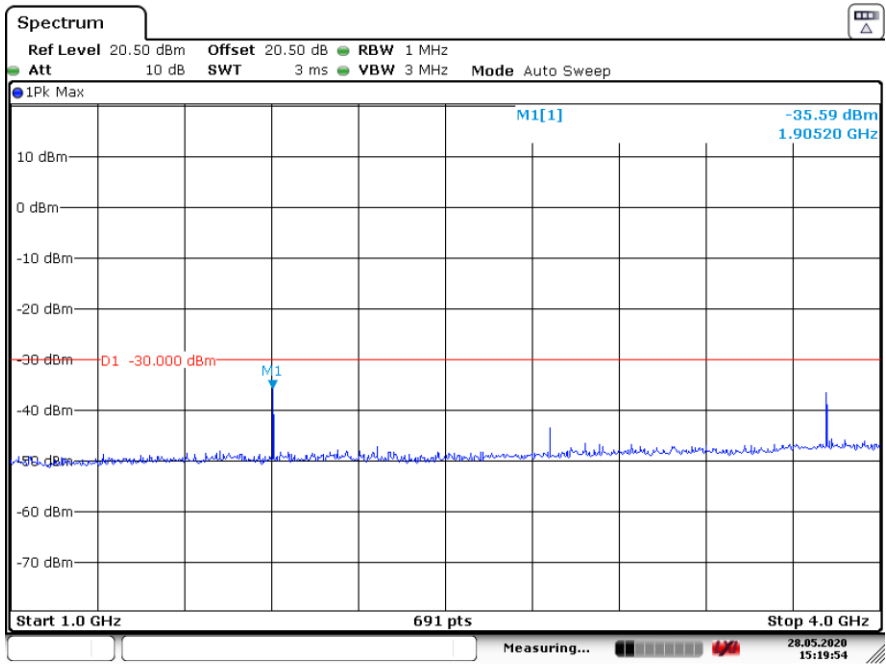
Date: 28 MAY 2020 15:13:51

30 MHz to 1 GHz



Date: 28 MAY 2020 15:18:08

Above 1 GHz



Date: 28 MAY 2020 15:19:54

8 FCC §74.861(d)(4)(i) & RSS-123 §8.3-Field Strength of Spurious Radiation

8.1 Applicable Standards

According to FCC §74.861 (d) (4) (i):

For the 653-657 MHz, 941.5-944 MHz, 944-952 MHz, 952.850-956.250 MHz, 956.45-959.85 MHz, 1435-1525 MHz, 6875-6900 MHz and 7100-7125 MHz bands, analog emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in section 8.3.1.2 of the European Telecommunications Institute Standard ETSI EN 300 422-1 v1.4.2 (2011-08), Electromagnetic compatibility and Radio spectrum Matters (ERM); Wireless microphones in the 25 MHz to 3 GHz frequency range; Part 1: Technical characteristics and methods of measurement. Beyond one megahertz below and above the carrier frequency, emissions shall comply with the limits specified in section 8.4 of ETSI EN 300 422-1 v1.4.2 (2011-08).

According to RSS-123 §8.3 Clause c. devices operating in frequency bands 941.5-952 MHz, 953-959.85 MHz, 6930-6955 MHz and 7100-7125 MHz shall have the transmitter's unwanted emissions meet the requirements in sections 8.3 and 8.4 of ETSI EN 300 422-1

8.2 Test Procedure

KDB 971168 D01 v03r01 and ETSI EN 300 422-1 V1.4.2 (2011-08).

8.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Interval
HP	Spectrum Analyzer	E4446A	US44300386	2019-08-24	1 year
Sunol Science Corp	System Controller	SC99V	011003-1	N/R	N/A
Sunol Sciences	Biconi-Log Antenna	JB3	A020106-2	2019-11-20	2 years
HP	Pre Amplifier	8447D	2443A04374	2019-08-13	1 year
Agilent	Pre-Amplifier	8449B	3147A00400	2020-02-27	1 year
MDP Digital	Times Microwave LMR 400 UltraFex Coaxial Cable 35'	LMR400UF	BACL1904161	2020-05-21	1 year
Sunol Sciences	Horn Antenna	DRH-118	A052704	2019-04-02	2 years
ETS Lindgren	Horn Antenna	3117	00218973	2019-02-13	2 years
IW Microwave	150 Series 2.92mm Cable	KPS1501AN-3780-KPS	DC 1925	2019-09-11	1 year
-	RF Cable	-	-	Each time ¹	N/A
Keysight Technologies	Vector Signal Generator	N5182B	MY51350070	2020-02-11	1 year
COM-POWER	Dipole Antenna	AD-100	721033DB1, 2, 3, 4	2019-03-06	2 years

Note¹: cable included in the test set-up will be checked each time before testing.

Statement of Traceability: **BACL Corp.** attests that all of the calibrations on the equipment items listed above were traceable to NIST or to another internationally recognized National Metrology Institute (NMI), and were compliant with A2LA Policy P102 (dated 02 October 2018) "A2LA Policy on Metrological Traceability".

8.4 Test Environmental Conditions

Temperature:	22 °C
Relative Humidity:	40 %
ATM Pressure:	101.0 kPa

The testing was performed by Matthew Riego de Dios on 2020-05-28 at 5 meter chamber 3.

8.5 Test Results

TX at the maximum output power:

Freq. (MHz)	S.A. Amp. (dBμV)	Table Azimuth (Degrees)	Test Antenna		Substitution				Absolute Level (dBm)	Limit (dBm)	Margin (dB)
			Height (cm)	Polar (H/V)	Freq. (MHz)	S.G. Level (dBm)	Antenna Gain (dBi/dBd)	Cable Loss (dB)			
Low Channel 941.525 MHz Power Setting: 100 mW											
890	37.22	0	100	H	890	-57.01	3.6	0.21	-53.62	-36	-17.62
890	36.71	0	100	V	890	-54.22	3.6	0.21	-50.83	-36	-14.83
1883.05	54.9	9	162	H	1883.05	-47.97	8.137	0.27	-40.103	-30	-10.103
1883.05	54.21	355	160	V	1883.05	-48.93	8.137	0.27	-41.063	-30	-11.063
3766.1	52.33	0	201	H	3766.1	-46.27	9.157	4.36	-41.473	-30	-11.473
3766.1	48.79	309	145	V	3766.1	-49.67	9.157	4.36	-44.873	-30	-14.873
Middle Channel 953.025 MHz Power Setting: 100 mW											
890	37.15	0	100	H	890	-57.08	3.6	0.21	-53.69	-36	-17.69
890	37.1	0	100	V	890	-53.83	3.6	0.21	-50.44	-36	-14.44
1906.05	55.47	355	170	H	1906.05	-49.48	8.137	0.43	-41.773	-30	-11.773
1906.05	54.07	16	147	V	1906.05	-51.53	8.137	0.43	-43.823	-30	-13.823
3812.1	53.47	0	218	H	3812.1	-44.9	8.986	4.09	-40.004	-30	-10.004
3812.1	48.89	322	179	V	3812.1	-49.5	8.986	4.09	-44.604	-30	-14.604
High Channel 959.825 MHz Power Setting: 100 mW											
890	37.59	0	100	H	890	-56.64	3.6	0.21	-53.25	-36	-17.25
890	36.76	0	100	V	890	-54.17	3.6	0.21	-50.78	-36	-14.78
1919.65	54.21	312	196	H	1919.65	-49.73	8.137	0.54	-42.133	-30	-12.133
1919.65	53.09	12	136	V	1919.65	-50.78	8.137	0.54	-43.183	-30	-13.183
3839.3	52.6	352	184	H	3839.3	-43.69	9.033	3.42	-38.077	-30	-8.077
3839.3	48.2	16	287	V	3839.3	-48.16	9.033	3.42	-42.547	-30	-12.547

9 FCC §2.1055 & RSS-123 §8.2 -Frequency Stability

9.1 Applicable Standards

According to §2.1055 and RSS-123 §8.2 the device shall meet the transmit power/e.r.p., authorized bandwidth and frequency stability limits for its operating bands as specified in table 1.

Table 1 — Frequency bands, transmit power/e.r.p., authorized bandwidths and frequency stability limits

Frequency band (MHz)	Transmit power (W)	e.r.p. (W)	Authorized bandwidth (kHz)	Frequency stability ($\pm$ ppm)
26.10-26.48	--	1	200	50
88-107.5	--	1	200	50
150-174	0.05	--	54	50
450-451	--	1	200	50
455-456	--	1	200	50
941.5-952	1	--	200	20
953-959.85	1	--	200	20
6930-6955	1	--	600	10
7100-7125	1	--	600	10

9.2 Test Procedure

According to FCC 2.1055, (a) the frequency stability shall be measured with variation of ambient temperature as follows:

- (1) From -30° to $+50^{\circ}$ centigrade for all equipment except that specified in paragraphs (a) (2) and (3) of this section.
- (2) From -20° to $+50^{\circ}$ centigrade for equipment to be licensed for use in the Maritime Services under part 80 of this chapter, except for Class A, B, and S Emergency Position Indicating Radio beacons (EPIRBs), and equipment to be licensed for use above 952 MHz at operational fixed stations in all services, stations in the Local Television Transmission Service and Point-to-Point Microwave Radio Service under part 21 of this chapter, equipment licensed for use aboard aircraft in the Aviation Services under part 87 of this chapter, and equipment authorized for use in the Family Radio Service under part 95 of this chapter.
- (3) From 0° to $+50^{\circ}$ centigrade for equipment to be licensed for use in the Radio Broadcast Services under part 73 of this chapter.

(b) Frequency measurements shall be made at the extremes of the specified temperature range and at intervals of not more than 10° centigrade through the range. A period of time sufficient to stabilize all of the components of the oscillator circuit at each temperature level shall be allowed prior to frequency measurement. The short term transient effects on the frequency of the transmitter due to keying (except for broadcast transmitters) and any heating element cycling normally occurring at each ambient temperature level also shall be shown. Only the portion or portions of the transmitter containing the frequency determining and stabilizing circuitry need be subjected to the temperature variation test.

(d) The frequency stability shall be measured with variation of primary supply voltage as follows:

(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

(3) The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided. Effects on frequency of transmitter keying (except for broadcast transmitters) and any heating element cycling at the nominal supply voltage and at each extreme also shall be shown.

If an unmodulated carrier is not available, the measurement method shall be described in the test report.

9.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Interval
Rhode & Schwarz	Signal Analyzer	FSV40	1321.3008K3 9-101203-UW	2019-08-06	1 year
Tenney	Environmental Chamber	TUJR	2744-06	2019-03-26	18 months
-	20dB attenuator	-	-	Each time ¹	N/A
-	RF Cable	-	-	Each time ¹	N/A

Note¹: cable and attenuator included in the test set-up will be checked each time before testing.

Statement of Traceability: *BACL Corp. attests that all of the calibrations on the equipment items listed above were traceable to NIST or to another internationally recognized National Metrology Institute (NMI), and were compliant with A2LA Policy P102 (dated 02 October 2018) "A2LA Policy on Metrological Traceability".*

9.4 Test Environmental Conditions

Temperature:	23 °C
Relative Humidity:	43 %
ATM Pressure:	101.1 kPa

The testing was performed by Christopher Casteel on 2020-05-28 at RF site.

9.5 Test Results

953.025 MHz:

Varying temperature:

Temperature (°C)	Left Frequency (MHz)	Right Frequency (MHz)	Center Frequency (MHz)	Channel Frequency (MHz)	Frequency Tolerance (ppm)	Limits (ppm)
-20	-	-	-	-	-	-
-10	-	-	-	-	-	-
0	953.021527	953.032815	953.02717	953.025	2.278	20
10	953.018922	953.034262	953.02659	953.025	1.670	20
20	953.01979	953.030789	953.02529	953.025	0.304	20
30	953.017764	953.03021	953.02399	953.025	-1.063	20
40	953.017475	953.028763	953.02312	953.025	-1.974	20
50	953.017185	953.029052	953.02312	953.025	-1.974	20

Note: the EUT shut off at temperature at -10 °C

Varying supply voltage:

Voltage	Left Frequency (MHz)	Right Frequency (MHz)	Center Frequency (MHz)	Channel Frequency (MHz)	Frequency Tolerance (ppm)	Limits (ppm)
1.275 V	953.018922	953.029631	953.02428	953.025	-0.759	20
1.725 V	953.015159	953.032815	953.02399	953.025	-1.063	20

10 FCC §2.1047 & RSS-123 §8.1-Modulation Characteristic

10.1 Applicable Standards

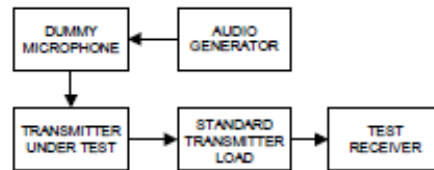
According to FCC §2.1047(a):

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. 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.

According to ISED RSS-123 §8.1 Equipment employing frequency modulation (FM) shall have the frequency deviation not exceed ± 75 kHz.

10.2 Test Procedure

Modulation Characteristic:



- a) Connect the equipment as illustrated.
- b) Adjust the transmitter per the manufacturer's procedure for full rated system deviation.
- c) Set the test receiver to measure peak positive deviation. Set the audio bandwidth for ≤ 0.25 Hz to $\geq 15,000$ Hz. Turn the de-emphasis function off.
- d) Apply a 1000 Hz modulating signal to the transmitter from the audio frequency generator, and adjust the level to obtain 60% of full rated system deviation.
- e) Increase the level from the audio frequency generator by 20 dB in one step (rise time between the 10% and 90% points shall be 0.1 second maximum).
- f) Measure both the instantaneous and steady-state deviation at and after the time of increasing the audio input level.
- g) With the level from the audio frequency generator held constant at the level obtained in step e), slowly vary the audio frequency from 300 Hz to 3000 Hz and observe the steady-state deviation. Record the maximum deviation.
- h) Set the test receiver to measure peak negative deviation and repeat steps d) through g).
- i) The values recorded in steps g) and h) are the modulation limiting.

Audio Frequency Response

- a) Connect the equipment as illustrated.
- b) Set the test receiver to measure peak positive deviation. Set the audio bandwidth for ≤ 50 Hz to $\geq 15,000$ Hz. Turn the de-emphasis function off.
- c) Adjust the transmitter per the manufacturer's procedure for full rated system deviation.
- d) Apply a 1000 Hz tone and adjust the audio frequency generator to produce 20% of the rated system deviation.
- e) Set the test receiver to measure rms deviation and record the deviation reading as DEV_{FREQ}
- f) Set the audio frequency generator to the desired test frequency between 300 Hz and 3000 Hz.
- g) Record the test receiver deviation reading as DEV_{FREQ} .
- h) Calculate the audio frequency response at the present frequency as:

$$audio\ frequency\ response = 20 \log_{10} \left(\frac{DEV_{FREQ}}{DEV_{REF}} \right)$$

- i) Repeat steps f) through h) for all the desired test frequencies.

10.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Interval
HP	RF Communications Test Set	8920A	3438A05338	2019-01-09	18 months
HP	Modulation Analyzer	8901A	2026A00847	2020-01-24	1 year
-	RF Cable	-	-	-	Each time ¹

Note¹: cable included in the test set-up will be checked each time before testing.

Statement of Traceability: *BACL Corp.* attests that all of the calibrations on the equipment items listed above were traceable to NIST or to another internationally recognized National Metrology Institute (NMI), and were compliant with A2LA Policy P102 (dated 02 October 2018) "A2LA Policy on Metrological Traceability".

10.4 Test Environmental Conditions

Temperature:	23 °C
Relative Humidity:	36 %
ATM Pressure:	101.4 kPa

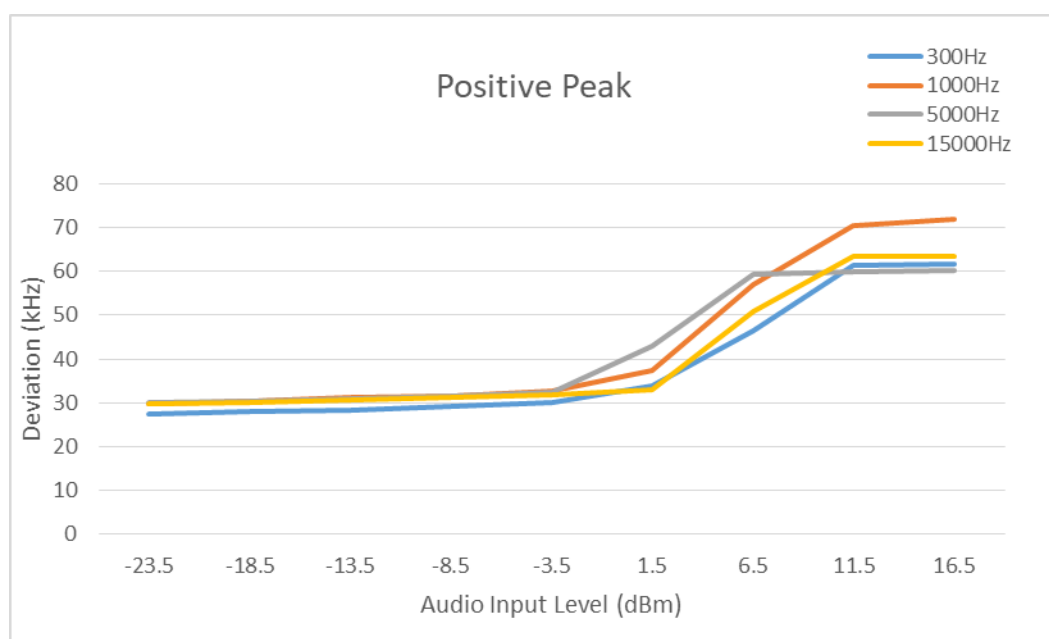
The testing was performed by Zhao Zhao on 2020-06-01 at RF site.

10.5 Test Results

MODULATION LIMITING

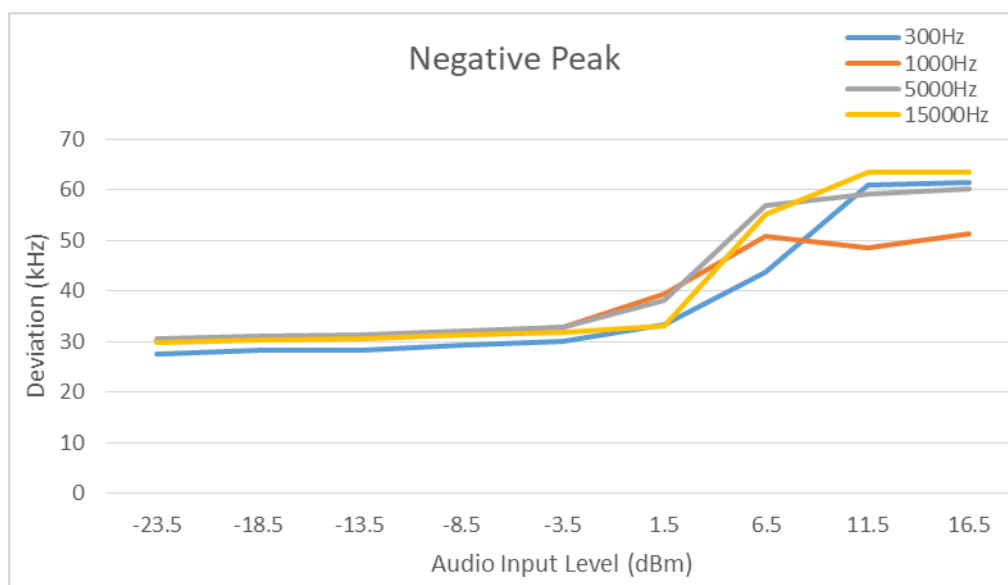
Carrier Frequency: 953.025 MHz, Peak Positive

AF Level (dBm)	AF Frequency (Hz)/Peak Deviation (kHz)				Limit (kHz)
	300 Hz	1000 Hz	5000 Hz	15000 Hz	
16.5	61.6	71.8	60.3	63.4	±75
11.5	61.5	70.4	59.8	63.5	±75
6.5	46.5	57.1	59.3	50.7	±75
1.5	33.9	37.5	42.8	33.1	±75
-3.5	30.01	32.56	32.5	31.92	±75
-8.5	29.11	31.66	31.64	31.28	±75
-13.5	28.40	31.09	31.07	30.53	±75
-18.5	27.9	30.24	30.33	30.14	±75
-23.5	27.4	29.8	30.03	29.84	±75



Carrier Frequency: 953.025MHz, Peak Negative

AF Level (dBm)	AF Frequency (Hz)/Peak Deviation (kHz)				Limit (kHz)
	300 Hz	1000 Hz	5000 Hz	15000 Hz	
16.5	61.4	51.4	60.1	63.5	±75
11.5	61.0	48.6	59.1	63.5	±75
6.5	43.7	50.8	56.9	55.1	±75
1.5	33.44	39.4	38.27	33.2	±75
-3.5	30.09	32.8	32.94	31.9	±75
-8.5	29.32	31.67	32.03	31.2	±75
-13.5	28.40	30.98	31.32	30.65	±75
-18.5	28.17	30.55	31.02	30.25	±75
-23.5	27.59	30.16	30.49	29.92	±75



Audio Frequency Response, Middle Channel

AF Frequency (Hz)	Frequency Deviation (kHz)	AF Response (dB)
300	13.48	-0.945
400	13.88	-0.691
500	14.22	-0.481
600	14.39	-0.378
700	14.41	-0.366
800	14.55	-0.282
900	14.9	-0.075
1000	15.03	0
1500	16.35	0.731
2000	16.62	0.873
2500	16.23	0.667
3000	16.65	0.889

Note: AF Response = $20 \cdot \log(\text{Frequency Deviation} / \text{Frequency Deviation of 1 kHz})$

11 Annex A - EUT Test Setup Photographs

Please refer to the attachment

12 Annex B - EUT External Photographs

Please refer to the attachment

13 Annex C - EUT Internal Photographs

Please refer to the attachment

14 Annex D (Informative) – Manufacturer Declaration of Similarity



P.O. Box 15900 - Rio Rancho, NM - 87174 - USA
Phone: (800)821-1121 or (505)892-4501 - Fax: (505)892-6243
web: www.lectrosonics.com - email: sales@lectrosonics.com

DECLARATION OF SIMILARITY

July 6, 2020

To:

FEDERAL COMMUNICATIONS COMMISSIONS
Authorization and Evaluation Division
7435 Oakland Mills Road
Columbia, MD 21046

Innovation, Science and Economic Development Canada
Certification and Engineering Bureau
P.O. Box 11490, Station 'H'
3701 Carling Ave., Building 94
Ottawa, Ontario K2H 8S2
Canada

Dear Sir or Madam:

We *Lectrosonics, Inc.* hereby declare that product: model: *SMDWB/E07-941* is electrically identical with the same electromagnetic emissions and electromagnetic compatibility characteristics as model: *SMWB/E07-941* tested by BACL, the results of which are featured in BACL project: *R2005263*.

A description of the differences between the tested model and those that are declared similar are as follows:

The *SMWB/E07-941* model is powered by one AA battery; the *SMDWB/E07-941* model is powered by two AA batteries wired in parallel. Because it uses only one battery, the width of the *SMWB/E07-941* case is truncated by 13 mm on one side but the layout of connectors and controls is identical in both products.

Please contact me should there be need for any additional clarification or information.

Best Regards,

Robert Cummings, V.P. Engineering
Lectrosonics, Inc.
581 Laser Rd.
Rio Rancho, NM 87124

15 Annex E (Normative) - A2LA Electrical Testing Certificate



Accredited Laboratory

A2LA has accredited

BAY AREA COMPLIANCE LABORATORIES CORP.

Sunnyvale, CA

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 General requirements for the competence of testing and calibration laboratories. This laboratory also meets A2LA R222 - Specific Requirements EPA ENERGY STAR Accreditation Program. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).



Presented this 2nd day of October 2018.

A blue ink signature of the Vice President, Accreditation Services.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 3297.02
Valid to September 30, 2020
Revised June 5, 2019

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

Please follow the web link below for a full ISO 17025 scope

<https://www.a2la.org/scopepdf/3297-02.pdf>

--- END OF REPORT ---