FCC PART 15, SUBPART C

ISED RSS-210, ISSUE 8, AUGUST 2016

TEST REPORT

For

Communications Specialists, Inc.

426 West Taft Avenue,

Orange, CA 92864, USA

FCC ID: CFXTXR-2
IC: 22317-CFXTXR2

Report Type:	**Product Type:**
Original Report	Ankle/Wrist Homing Transmitter

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Report Number:	R1611033-231
Report Date:	2017-01-13
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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R1611033-231	Original Report	2017-01-13

1 General Information

1.1 Product Description for Equipment Under Test (EUT)

This test and measurement report was prepared on behalf of *Communications Specialists, Inc.* and their product, model: CSTXR.1, FCC ID: CFXTXR-2, IC: 22317-CFXTXR2 or the "EUT" as referred to in this report. The EUT is an Ankle/Wrist Homing Transmitter operating in 433.5 MHz and the 217-220 MHz & 216-217 MHz frequency bands.

1.2 Mechanical Description

The "EUT" measures 25m*m (L) x 25mm (W) x 5mm (H)*, and weighs approximately 5g.

The data gathered are from production sample. Serial number R1611033-1 was assigned by BACL.

1.3 Objective

This report is prepared on behalf of *Communications Specialists, Inc.* in accordance with Part 2, Subpart J, and Part 15, Subparts C of the Federal Communication Commission's rules.

1.4 Related Submittal(s)/Grant(s)

FCC Part 90.217, Equipment TNT with FCC ID: CFXTXR-2
FCC Part 95, Subpart G, Equipment TNT with FCC ID: CFXTXR-2
ISED RSS-210 with IC: 22317-CFXTXR2

1.5 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices. All radiated and conducted emissions measurements were performed at BACL.

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 %
All emissions, radiated	±4.0 dB
Temperature	±2 º C
Humidity	±5 %
DC and low frequency voltages	±1.0 %
Time	±2 %

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 Industry 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 Accreditation Certificate Number 3297.03)*** to certify

- 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 (Industry Canada):
    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 (Info-Communications Development Authority (IDA)):
    1 All Line Terminal Equipment: All Technical Specifications for Line Terminal Equipment – Table 1 of IDA MRA Recognition Scheme: 2011, Annex 2

2. All Radio-Communication Equipment: All Technical Specifications for Radio-Communication Equipment – Table 2 of IDA 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: (Industry Canada - IC) Foreign Certification Body – FCB – APEC Tel MRA -Phase I & Phase II;
- Chinese Taipei (Republic of China – Taiwan):
    - BSMI (Bureau of Standards, Metrology and Inspection) APEC Tel MRA -Phase I;
    - NCC (National Communications Commission) APEC Tel MRA -Phase I;
- European Union:
    - EMC Directive 2014/30/EC US-EU EMC & Telecom MRA CAB
    - Radio & Teleterminal Equipment (R&TTE) Directive 1995/5/EC
      US -EU EMC & Telecom MRA CAB

  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 Development Authority - IDA) APEC Tel MRA -Phase I & Phase II;
- Japan: VCCI - Voluntary Control Council for Interference US-Japan Telecom Treaty VCCI Side Letter-
- USA:
    - ENERGY STAR Recognized Test Laboratory – US EPA
    - Telecommunications Certification Body (TCB) – US FCC;
- Vietnam: APEC Tel MRA -Phase I;

2 System Test Configuration

2.1 Justification

The EUT was configured for testing according to ANSI C63.10-2013.

2.2 EUT Exercise Software

The EUT did not require any software to operate.

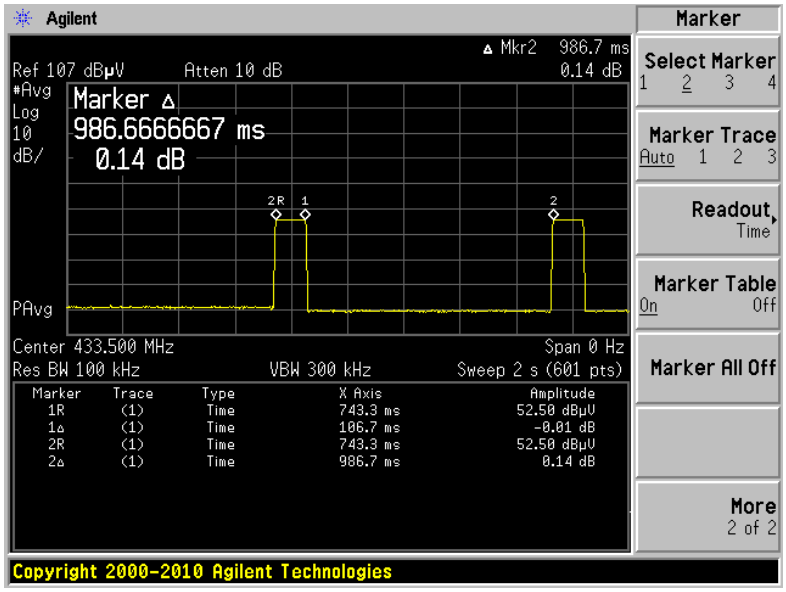
2.3 Duty Cycle Correction Factor

According to RSS- Gen 6.10, When the field strength (or envelope power) is not constant or it is in pulses, and an average detector is specified to be used, the value of field strength or power shall be determined by averaging over one complete pulse train, including blanking intervals within the pulse train, as long as the pulse train does not exceed 0.1 second. In cases where the pulse train exceeds 0.1 second, the average value of field strength or output power shall be determined during a 0.1 second interval during which the field strength or power is at its maximum value.
The exact method of calculating the average field strength shall be submitted with the application for certification or shall be retained in the measurement data file for equipment subject to notification or verification.

On Time (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)
106.7	986.7	10.81	19.32

Duty Cycle = On Time (ms)/ Period (ms) * 100% = 10.81%
Duty Cycle Correction Factor (dB) = 20*log (1/ 0.1081) = 19.32 dB

Please refer to the following plots for details:



2.4 Equipment Modifications

No modifications were made to the EUT.

2.5 Special Accessories

There were no special accessories required or came with the EUT.

2.6 Local Support Equipment

No local support equipment was used with the EUT.

2.7 Interface Ports and Cabling

There were no interface ports or cables that came with the EUT.

3 Summary of Test Results

FCC& ISED Rules	Requirements	Result
FCC §15.203 ISED RSS-Gen §8.3	Antenna Requirement	Compliant
FCC §2.1093 ISED RSS-102	RF Exposure	Compliant
FCC §15.231(a) (1)[1] ISED RSS-210 §A.1.1[2]	Deactivation Time	Compliant
FCC §15.231(b) ISED RSS-Gen 6.13, RSS-210 §A.1.2	Field Strength of Emissions	Compliant
FCC §15.231(c) ISED RSS-Gen 6.6, RSS-210 §A.1.3	Emission Bandwidth	Compliant
FCC §15.207 (a) ISED RSS-Gen §8.8	AC Line Conducted Emissions	Not Applied[3]

Note1: The provisions of this section are restricted to periodic operation within the band 40.66-40.70 MHz and above 70 MHz. Except as shown in paragraph (e) of this section, the intentional radiator is restricted to the transmission of a control signal such as those used with alarm systems, door openers, remote switches, etc. Continuous transmissions, voice, video and the radio control of toys are not permitted. Data is permitted to be sent with a control signal.

Note2: A.1 Momentarily Operated Devices The frequency bands and field strength limits in tables A1 and A2 of this annex are reserved exclusively for the transmission of a control signal, such as that used with alarm systems, door openers, remote switches, etc. Data may be sent with a control signal. Radio control of toys or model aircraft, as well as continuous transmissions, such as voice or video, are not permitted, except as provided in Section A.1.4 below.

Note3: Because the EUT uses button battery, the AC line conducted emissions is not applied.

4 FCC §15.203 & ISED RSS-Gen §8.3 - Antenna Requirement

4.1 Applicable Standard

According to FCC §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

According to ISED RSS-Gen §8.3: Transmitter Antenna

The applicant for equipment certification, as per RSP-100, must provide a list of all antenna types that may be used with the license-exempt transmitter, indicating the maximum permissible antenna gain (in dBi) and the required impedance for each antenna.

License-exempt transmitters that have received equipment certification may operate with different types of antennas. However, it is not permissible to exceed the maximum equivalent isotropically radiated power (e.i.r.p.) limits specified in the applicable standard (RSS) for the license-exempt apparatus.

Testing shall be performed using the highest gain antenna of each combination of license-exempt transmitter and antenna type, with the transmitter output power set at the maximum level. 9 When a measurement at the antenna connector is used to determine RF output power, the effective gain of the device's antenna shall be stated, based on a measurement or on data from the antenna manufacturer.

User manuals for transmitters equipped with detachable antennas shall also contain the following notice in a conspicuous location:

This radio transmitter (identify the device by certification number) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Immediately following the above notice, the manufacturer shall provide a list of all antenna types approved for use with the transmitter, indicating the maximum permissible antenna gain (in dBi).

4.2 Antenna Description

This product has an integral non-tuned loop antenna which is soldered on the PCB board, fulfilling the requirement of this section. And the gain of antenna is -30 dBi.

5 FCC §2.1093 & ISED RSS-102 - RF Exposure

5.1 Applicable Standards

FCC §2.1093 & ISED RSS-102

5.2 Test Results

Refer to the 4.3.1 Standalone SAR test exclusion considerations in 447498 D01 General RF Exposure Guidance V06.

[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)]·[√f(GHz)] =[4.111 x 10^{-6} mW/5mm] · [√0.4335] = 5.4134 x 10^{-7} ≤ 7.5 for 10-g extremity SAR. So the SAR test is excluded.

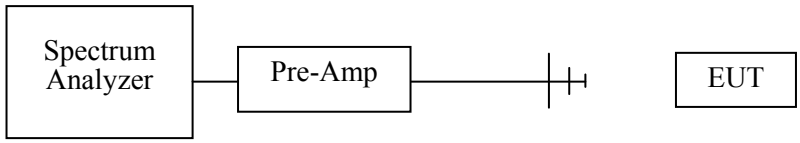
Refer to the RSS-102 section 2.5.1 Exemption Limits for Routine Evaluation. When the frequency is 433.5MHz and separation distance is less than 5mm, the exemption limits is 52 mW. The output power 4.111 x 10^{-6} mW< 52 mW. So the SAR test is excluded.

6 FCC §15.231(a) (1) & ISED RSS-210 §A.1.1 - Deactivation Time

6.1 Applicable Standard

As Per FCC §15.231(a) (1) and RSS-210 §A.1.1, manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

6.2 Test Setup Diagram



6.3 Test Procedure

For the radiated Deactivation Time test, all support equipment power cords were connected to the AC floor outlet.

Setup the test environment like the figure above. Set the spectrum analyzer to RBW=100 kHz, VBW=300 kHz. Set the Spectrum Analyzer in the time domain and set the sweep time as 12 seconds. Insert the battery into the EUT and click one-time sweep at the same time to record the signal in 12 seconds. Mark the first signal pulse and 5 seconds late signal.

6.4 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Interval
Hewlett Packard	Pre-amplifier	8447D	2944A06639	2016-06-26	1 year
Sunol Sciences	Antenna, Biconi-Log	JB3	A020106-2	2015-07-11	2 years
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100044	2015-07-23	2 years
-	SMA cable	-	C0002	Each time[1]	Each time[1]
-	SMA cable	-	C0003	Each time[1]	Each time[1]

[1]*This equipment has been checked and calibrated before each test.*

***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 9 June 2016) "A2LA Policy on Metrological Traceability".

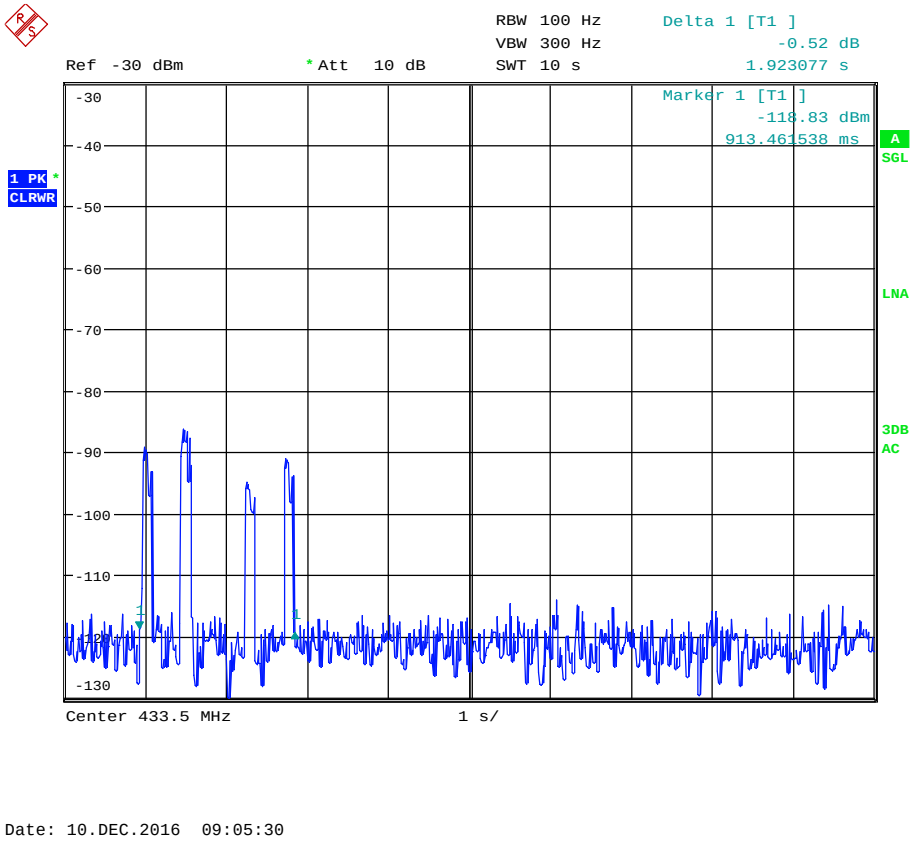
6.5 Test Environmental Conditions

Temperature:	25 °C
Relative Humidity:	56 %
ATM Pressure:	100.8 kPa

The testing was performed by Frank Wang on 2016-12-10 in chamber 5m3.

6.6 Test Result

Pass, please refer to the following plot.



7 FCC §15.231(b), §15.209 & ISED RSS-Gen, RSS-210 §A.1.2 - Field Strength of Emissions

7.1 Applicable Standard

As per FCC §15.231(b) and RSS-210 §A.1.2: In addition to the provisions of FCC§15.205, the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

Fundamental frequency (MHz)	Field strength of fundamental (microvolts/meter)	Field strength of spurious emissions (microvolts/meter)
40.66-40.70	2,250	225
70-130	1,250	125
130-174	1,250 to 3,750**	125 to 375**
174-260	3,750	375
260-470	3,750 to 12,500**	375 to 1,250**
Above 470	12,500	1,250

***Linear interpolations*

As Per FCC §15.209 (a) and RSS-Gen except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (microvolt/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

*** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.*

7.2 Test Setup

The radiated emissions tests were performed in the 5-meter Chamber, using the setup in accordance with ANSI C63.10-2013. The specification used was the FCC Part 15 Subpart C and ISED RSS-210 §A1.2 limits.

The spacing between the peripherals was 10 centimeters.

7.3 Test Procedure

For the radiated emissions test, the EUT host, and all support equipment power cords were connected to the AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

The EUT was set 1 meter away from the testing antenna, which was varied from 1-4 meter, and the EUT was placed on a turntable, which was 0.8 meter and 1.5 meter above the ground plane for below and above 1000 MHz measurements, the table shall be rotated for 360 degrees to find out the highest emission. The receiving antenna's polarity should be changed between horizontal and vertical.

According to §15.231, intentional radiators operating under the provisions of this section shall demonstrate compliance with the limits on the field strength of emission, based on the average value of the measured emissions. As an alternative, compliance with the limits may be based on the use of measurement instrumentation with a CISPR quasi-peak detector.

7.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corrected Amplitude = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7 dB means the emission is 7 dB below the maximum limit. The equation for margin calculation is as follows:

Margin = Corrected Amplitude –Limit

7.5 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Interval
Hewlett Packard	Pre-amplifier	8447D	2944A06639	2016-06-26	1 year
HP	Pre-amplifier	8449B	3147A00400	2016-03-30	1 year
Sunol Sciences	Antenna, Biconi-Log	JB3	A020106-2	2015-07-11	2 years
Sunol Science	System Controller	SC99V	011003-1	N/R	N/R
Sunol Science	Antenna, Horn	DRH-118	A052704-MOD	2015-03-09	2 years
Agilent	Analyzer, Spectrum	E4440A	US45303156	2016-01-19	1 year
-	SMA cable	-	C0002	Each time[1]	Each time[1]
-	N-Type Cable	-	C00013	2016-04-28	1 year
-	N-Type Cable	-	C00014	2016-05-28	1 year
R & S	EMI Test Receiver	ESCI 1166.5950K03	100044	2015-07-23	2 years
IW	Armored High Frequency Cable	DC 1531	KPS-1501A3960KPS	2016-08-05	1 year

[1]*This equipment has been checked and calibrated before each test.*

***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 9 June 2016) "A2LA Policy on Metrological Traceability".

7.6 Test Environmental Conditions

Temperature:	21 °C
Relative Humidity:	56 %
ATM Pressure:	100.8 kPa

The testing was performed by Frank Wang 2016-12-01 in 5 meter chamber 3

7.7 Test Results

(1) Fundamental at 433.5 MHz, Measured at 1 meter

Peak

Freq. (MHz)	S.A. Reading (dBuV)	Test Antenna		Distance Factor (dB)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Reading (dBuV/m)	FCC/ISED		Remark
		Polar (V/H)	Factor (dB/m)					Limit (dBuV/m)	Margin (dB)	
433.5	54.14	H	16.18	9.54	0.76	23.84	37.70	100.81	-63.11	PK
433.5	55.20	V	16.18	9.54	0.76	23.84	38.76	100.81	-62.05	PK

Average

Freq. (MHz)	Cord. Reading (dBuV/m)	Duty Cycle Correction Factor (dB)	Cord. Reading (dBuV/m)	FCC/ISED		Remarks
				Limit (dBuV/m)	Margin (dB)	
433.5	37.70	19.32	18.38	80.81	-62.43	AVE
433.5	38.76	19.32	19.44	80.81	-61.37	AVE

Note: The fundamental signal is too weak to be detected, so 1 meter distance has been selected for measurement. Distance factor = 20*log (3/1) = 9.54 dB and Duty Cycle Correction Factor is 19.32 dB

(2) Spurious Emissions

30 MHz – 1 GHz, Measured at 1 meter

Freq. (MHz)	S.A. Reading (dBuV)	Test Antenna		Distance Factor (dB)	Cable Loss (dB)	Pre-Amp. Gain (dB)	Cord. Reading (dBuV/m)	FCC/ISED		Remark
		Polar (V/H)	Factor (dB/m)					Limit (dBuV/m)	Margin (dB)	
274.054	31.45	H	13.18	9.54	0.57	23.8	11.86	46	-34.14	QP
274.054	30.37	V	13.18	9.54	0.57	23.8	10.78	46	-35.22	QP
320.875	33.58	H	13.86	9.54	0.94	24.3	14.54	46	-31.46	QP
320.875	31.45	V	13.86	9.54	0.94	24.3	13.87	46	-32.13	QP

Note: Distance factor = 20*log (3/1) = 9.54 dB

Above 1 GHz, Measured at 1 meter

All Emissions were on the noise floor level and/or 20 dB below the limit.

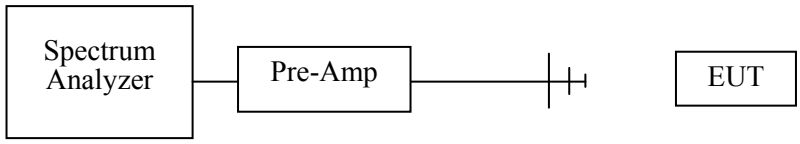
8 FCC §15.231(c) & RSS-210 §A.1.3 - Emissions Bandwidth

8.1 Applicable Standard

As per FCC §15.231(c), the bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

As per ISED RSS-210 §A.1.3, the 99% bandwidth of momentarily operated devices shall be less or equal to 0.25% of the centre frequency for devices operating between 70 MHz and 900 MHz. For devices operating above 900 MHz, the 99% bandwidth shall be less or equal to 0.5% of the centre frequency.

8.2 Test Setup Diagram



8.3 Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Interval
Agilent	Analyzer, Spectrum	E4440A	US45303156	2016-01-19	1 year
Hewlett Packard	Pre-amplifier	8447D	2944A06639	2016-06-26	1 year
-	SMA cable	-	C0002	Each time[1]	Each time[1]

[1]*This equipment has been calibrated before each test.*

***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 9 June 2016) "A2LA Policy on Metrological Traceability".

8.4 Test Environmental Conditions

Temperature:	21° C
Relative Humidity:	55 %
ATM Pressure:	100.8 kPa

The testing was performed by Frank Wang on 2016-12-01 in RF Site.

8.5 Test Result

Fund. Frequency (MHz)	20 dB OBW (kHz)	FCC Limit (kHz)	Result
433.5	2.321	1083.75	Compliant

Note: Limit = Fundamental Frequency x 0.25% = 433.5 MHz × 0.25% = 1083.75 kHz

Fund. Frequency (MHz)	99% OBW (kHz)	IC Limit (kHz)	Result
433.5	2.9769	1083.75	Compliant

Note: Limit = Fundamental Frequency x 0.25% = 433.5 MHz × 0.25% = 1083.75 kHz

Please refer to the following plot for test result details