FCC PART 15 SUBPART C,
ISED RSS-210, ISSUE 9, AUGUST 2016

TEST AND MEASUREMENT REPORT

For

South Pacific Electronics Ltd

P.O. Box 9417, Nadi Airport, Nadi, Fiji

FCC ID: OHKMCT915B
IC: 3367A-MCT915B

Report Type:	**Product Type:**
Original Report	Hand Held Transmitter

Prepared By:	Harry Zhao Test Engineer
Report Number:	R1805318-249
Report Date:	2019-05-13
Reviewed By:	Frank Wang RF Engineer
	Bay Area Compliance Laboratories Corp. 1274 Anvilwood Avenue, Sunnyvale, CA 94089, USA Tel: (408) 732-9162, Fax: (408) 732-9164

ACCREDITED
CERTIFICATE #3297.02

Note: This test report was 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 test report **shall not** be used by the customer to claim product certification, approval, or endorsement by A2LA or any agency of the United States Government or any foreign government.

* This test report may contain data and test methods that are not covered by BACL's scope of accreditation as of the test report date shown above. These items are marked within the test report text with an asterisk "*"

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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R1805318-249	Original Report	2019-05-13

1 General Description

1.1 Product Description for Equipment Under Test (EUT)

This test and measurement report was prepared on behalf of *South Pacific Electronics Ltd.* and their product model: *MCT91503 (*FCC ID: OHKMCT915B, IC: 3367A-MCT915B) or the "EUT" as referred to in this report. It is a Hand Held Transmitter.

1.2 Mechanical Description of EUT

The EUT measures approximately 60 mm (L) x 38 mm (W) x 10 mm (H) and weighs approximately 0.029 kg.

The test data gathered are from typical production sample, serial number: R1805318-01 assigned by BACL.

1.3 Objective

This report is prepared on behalf of *South Pacific Electronics Ltd*, in accordance with Part 2, Subpart J, and Part 15, Subparts B and C of the Federal Communication Commission's rules and ISED RSS-210 Issue 9, AUG 2016.

The objective is to determine compliance with FCC Part 15.249 and ISED RSS-210 rules for AC Conducted Emissions, Antenna Requirements, Occupied Bandwidth, and Radiated Spurious Emissions.

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 C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

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 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 3279.02),*** 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 3279.03)*** 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 and Fixed Radio Services;
  4 All Scope 4-Licensed Maritime and 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 3279.01)*** 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 and 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 - ISEDC) 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 System Test Configuration

2.1 Justification

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

The EUT was tested in a testing mode to represent worst-case results during the final qualification test.

2.2 EUT Exercise Software

No software was used for testing.

2.3 Equipment Modifications

N/A

2.4 Local Support Equipment

No local support equipment was used for testing.

2.5 Support Equipment

No support equipment was used for testing.

2.6 Interface Ports and Cabling

No interface ports and cabling were used for testing.

3 Summary of Test Results

Results reported relate only to the product tested.

FCC & ISED Rules	Description of Test	Results
FCC §15.203 ISED RSS-Gen §8.3	Antenna Requirement	Compliant
FCC §15.207 IC RSS-Gen §8.8	AC Line Conducted Emissions	Not Applicable*
FCC §2.1053, §15.205, §15.209, §15.249 (a) ISED RSS-210	Radiated Spurious Emissions	Compliant
FCC §15.215 ISED RSS-Gen §6.6	Emission Bandwidth	Compliant

*: EUT is battery powered, the AC line Conducted Emissions is not required.

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

4.1 Applicable Standards

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

The antenna used by the EUT is a PCB antenna.

5 FCC §15.209, §15.249(a) & ISED RSS-210 - Spurious Radiated Emissions

5.1 Applicable Standards

As per FCC §15.35(d): Unless otherwise specified, on any frequency or frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function. Unless otherwise specified, measurements above 1000 MHz shall be performed using a minimum resolution bandwidth of 1 MHz.

As Per FCC §15.205(a) and RSS-Gen except as show in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 – 0.110 0.495 – 0.505 2.1735 – 2.1905 4.125 – 4.128 4.17725 – 4.17775 4.20725 – 4.20775 6.215 – 6.218 6.26775 – 6.26825 6.31175 – 6.31225 8.291 – 8.294 8.362 – 8.366 8.37625 – 8.38675 8.41425 – 8.41475 12.29 – 12.293 12.51975 – 12.52025 12.57675 – 12.57725 13.36 – 13.41	16.42 – 16.423 16.69475 – 16.69525 25.5 – 25.67 37.5 – 38.25 73 – 74.6 74.8 – 75.2 108 – 121.94 123 – 138 149.9 – 150.05 156.52475 – 156.52525 156.7 – 156.9 162.0125 –167.17 167.72 – 173.2 240 – 285 322 – 335.4 399.9 – 410 608 – 614	960 – 1240 1300 – 1427 1435 – 1626.5 1645.5 – 1646.5 1660 – 1710 1718.8 – 1722.2 2200 – 2300 2310 – 2390 2483.5 – 2500 2690 – 2900 3260 – 3267 3.332 – 3.339 3 3458 – 3 358 3.600 – 4.400	4. 5 – 5. 15 5. 35 – 5. 46 7.25 – 7.75 8.025 – 8.5 9.0 – 9.2 9.3 – 9.5 10.6 – 12.7 13.25 – 13.4 14.47 – 14.5 15.35 – 16.2 17.7 – 21.4 22.01 – 23.12 23.6 – 24.0 31.2 – 31.8 36.43 – 36.5 Above 38.6

As per FCC §15.209(a): 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 (micro volts/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.

As per FCC §15.249(a) and RSS-210 Annex 2 section A2.9: Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Frequency (MHz)	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
902-928	50	500
2400-2483.5	50	500
5725-5875	50	500
24000-24250	250	2500

5.2 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 FCC 15 Subpart C limits.

The spacing between the peripherals was 10 centimeters.

External I/O cables were draped along the edge of the test table and bundle when necessary.

5.3 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 3 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.

The spectrum analyzer or receiver was set as:

Below 1000 MHz:

RBW = 100 kHz / VBW = 300 kHz / Sweep = Auto

Above 1000 MHz:

(1) Peak: RBW = 1MHz / VBW = 1MHz / Sweep = Auto
(2) Average: RBW = 1/T Hz / Sweep = Auto

5.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude (CA) is calculated by adding the Antenna Factor (AF), the Cable Loss (CL), the Attenuator Factor (Atten) and subtracting the Amplifier Gain (Ga) to indicated Amplitude (Ai) reading. The basic equation is as follows:

CA = Ai + AF + CL + Atten – Ga

For example, a corrected amplitude of 40.3 dBuV/m = Indicated Reading (32.5 dBuV) + Antenna Factor (+23.5dB) + Cable Loss (3.7 dB) + Attenuator (10 dB) - Amplifier Gain (29.4 dB)
The "**Margin**" column of the following data tables indicates the degree of compliance within 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

5.5 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Rohde and Schwarz	Receiver, EMI Test	ESCI 1166.5950.03	100338	2018-07-05	2 years
Agilent	Analyzer, Spectrum	E4446A	US44300386	2018-06-01	1 year
Sunol Science Corp	System Controller	SC99V	011003-1	N/R	N/R
Sunol Sciences	Antenna, Biconi-Log	JB1	A013105-3	2018-02-26	2 years
EMCO	Antenna, Horn	3115	9511-4627	2018-03-28	2 years
Agilent	Amplifier, Pre	8449D	2944A10187	2018-04-02	1 year
Insulated Wire INC	2.92mm (M) X2, 1501 Armor Neoprene, 396"	KPS-1501AN-3960-KPS	DC 1807	2018-03-13	1 year
-	SMA cable	-	C0002	Each time[1]	N/A
-	N-Type Cable	-	C00012	Each time[1]	N/A
-	N-Type Cable	-	C00014	Each time[1]	N/A
HP	Pre-Amplifier	8449B	3147A00400	2018-02-02	1 year
Vasona	Test software	V6.0 build 11	10400213	N/R	N/R

Note[1]: cable included in the test set-up will be checked each time before testing.
Statement of Traceability: BACL *attests that all calibrations have been performed per the A2LA requirements, traceable to NIST.*

5.6 Test Environmental Conditions

Temperature:	20-22 ºC
Relative Humidity:	42-50 %
ATM Pressure:	102.7 kPa

The testing was performed by Harry Zhao on 2018-11-19 and 2018-11-26 in 5m chamber 3.

5.7 Summary of Test Results

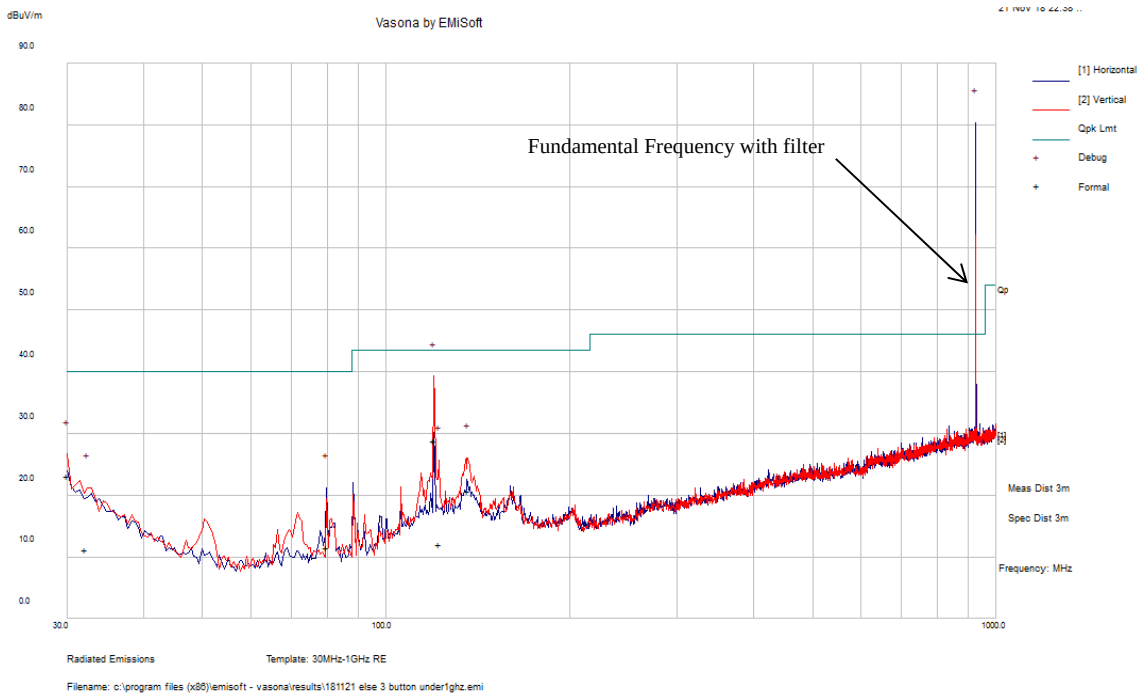
According to the data hereinafter, the EUT complied with FCC Title 47, Part 15C and ISED RSS-210 standard's radiated emissions limits, and had the worst margin of:

Mode: Transmitting		
Margin (dB)	**Frequency (MHz)**	**Polarization (Horizontal/Vertical)**
-2.35	4604.042	Horizontal

Please refer to the following table and plots for specific test result details

5.8 Radiated Emissions Test Results

1) 30 MHz – 1 GHz Worst Case on Low Channel (915.27788 MHz), measured at 3 meters



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)	Comment
119.9715	28.84	128	V	87	43.5	-14.66	QP
30	23.18	100	V	294	40	-16.82	QP
136.3565	20.69	124	V	62	43.5	-22.81	QP
122.2155	12.06	226	V	186	43.5	-31.44	QP
32.2145	11.15	286	V	237	40	-28.85	QP
80.00025	11.56	108	H	167	40	-28.44	QP

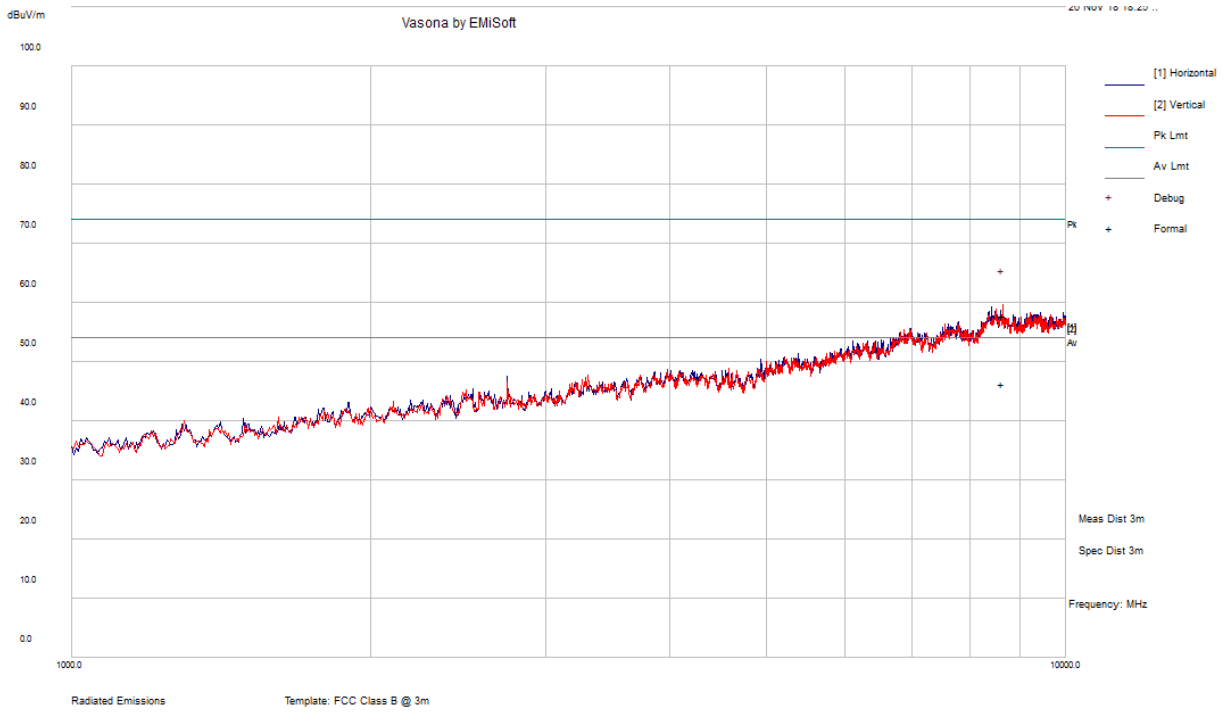
2) 900 MHz –25 GHz Measured at 3 meters

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
915.27788 MHz											
915.2779	78.40	306	100	H	29.60	2.33	20.449	89.88	114.00	-24.12	PK
915.2779	78.20	306	100	H	29.60	2.33	20.449	89.68	94.00	-4.32	AV
915.2779	66.95	169	151	V	29.60	2.33	20.449	78.43	114.00	-35.57	PK
915.2779	66.78	169	151	V	29.60	2.33	20.449	78.26	94.00	-15.74	AV
902	28.14	306	100	H	29.60	2.33	20.449	39.62	74.00	-34.38	PK
902	18.62	306	100	H	29.60	2.33	20.449	30.10	54.00	-23.90	AV
902	29.14	169	151	V	29.60	2.33	20.449	40.62	74.00	-33.38	PK
902	18.60	169	151	V	29.60	2.33	20.449	30.08	54.00	-23.92	AV
1830.556	47.48	0	100	H	27.28	4.26	32.077	46.94	74.00	-27.06	PK
1830.556	37.35	0	100	H	27.28	4.26	32.077	36.81	54.00	-17.19	AV
1830.556	49.71	140	230	V	27.28	4.26	32.077	49.17	74.00	-24.83	PK
1830.556	43.09	140	230	V	27.28	4.26	32.077	42.55	54.00	-11.45	AV
2745.834	53.01	269	268	H	29.20	5.56	32.413	55.36	74.00	-18.64	PK
2745.834	49.09	269	268	H	29.20	5.56	32.413	51.44	54.00	-2.56	AV
2745.834	49.54	355	100	V	29.14	5.56	32.413	51.83	74.00	-22.17	PK
2745.834	43.55	355	100	V	29.14	5.56	32.413	45.84	54.00	-8.16	AV
3661.112	46.20	213	275	H	31.85	6.51	32.638	51.93	74.00	-22.07	PK
3661.112	38.97	213	275	H	31.85	6.51	32.638	44.70	54.00	-9.30	AV
3661.112	45.97	0	100	V	31.79	6.51	32.638	51.63	74.00	-22.37	PK
3661.112	39.33	0	100	V	31.79	6.51	32.638	44.99	54.00	-9.01	AV
4576.389	49.56	263	242	H	32.29	7.22	32.993	56.07	74.00	-17.93	PK
4576.389	44.57	263	242	H	32.29	7.22	32.993	51.08	54.00	-2.92	AV
4576.389	46.73	0	100	V	32.24	7.22	32.993	53.19	74.00	-20.81	PK
4576.389	36.73	0	100	V	32.24	7.22	32.993	43.19	54.00	-10.81	AV

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
920.8084 MHz											
920.8084	78.41	306	100	H	29.60	2.33	20.449	89.89	114.00	-24.11	PK
920.8084	78.13	306	100	H	29.60	2.33	20.449	89.61	94.00	-4.39	AV
920.8084	62.70	142	148	V	29.60	2.33	20.449	74.18	114.00	-39.82	PK
920.8084	62.34	142	148	V	29.60	2.33	20.449	73.82	94.00	-20.18	AV
1841.617	47.86	0	100	H	27.28	4.26	32.077	47.32	74.00	-26.68	PK
1841.617	38.38	0	100	H	27.28	4.26	32.077	37.84	54.00	-16.16	AV
1841.617	50.39	114	192	V	27.28	4.26	32.077	49.85	74.00	-24.15	PK
1841.617	43.25	114	192	V	27.28	4.26	32.077	42.71	54.00	-11.29	AV
2762.425	52.22	282	267	H	29.20	5.56	32.413	54.57	74.00	-19.43	PK
2762.425	48.65	282	267	H	29.20	5.56	32.413	51.00	54.00	-3.00	AV
2762.425	50.50	279	288	V	29.14	5.56	32.413	52.79	74.00	-21.21	PK
2762.425	44.86	279	288	V	29.14	5.56	32.413	47.15	54.00	-6.85	AV
3683.234	47.17	281	231	H	32.24	6.51	32.638	53.29	74.00	-20.71	PK
3683.234	40.82	231	281	H	32.24	6.51	32.638	46.94	54.00	-7.06	AV
3683.234	47.94	100	255	V	32.14	6.51	32.638	53.95	74.00	-20.05	PK
3683.234	41.67	100	255	V	32.14	6.51	32.638	47.68	54.00	-6.32	AV
4604.042	49.55	218	275	H	32.29	7.22	32.993	56.06	74.00	-17.94	PK
4604.042	45.14	218	275	H	32.29	7.22	32.993	51.65	54.00	-2.35	AV
4604.042	47.38	40	169	V	32.24	7.22	32.993	53.84	74.00	-20.16	PK
4604.042	39.94	40	169	V	32.24	7.22	32.993	46.40	54.00	-7.60	AV

Frequency (MHz)	S.A. Reading (dBµV)	Turntable Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
926.0308 MHz											
926.0308	79.38	300	100	H	29.60	2.33	20.449	90.86	114.00	-23.14	PK
926.0308	79.14	300	100	H	29.60	2.33	20.449	90.62	94.00	-3.38	AV
926.0308	69.52	191	143	V	29.60	2.33	20.449	81.00	114.00	-33.00	PK
926.0308	69.34	191	143	V	29.60	2.33	20.449	80.82	94.00	-13.18	AV
928	28.48	306	100	H	29.60	2.33	20.449	39.96	74.00	-34.04	PK
928	18.78	306	100	H	29.60	2.33	20.449	30.26	54.00	-23.74	AV
928	29.04	191	143	V	29.60	2.33	20.449	40.52	74.00	-33.48	PK
928	18.42	191	143	V	29.60	2.33	20.449	29.90	54.00	-24.10	AV
1852.062	47.82	0	266	H	27.28	4.26	32.077	47.28	74.00	-26.72	PK
1852.062	37.97	0	266	H	27.28	4.26	32.077	37.43	54.00	-16.57	AV
1852.062	50.16	99	219	V	27.28	4.26	32.077	49.62	74.00	-24.38	PK
1852.062	42.99	99	219	V	27.28	4.26	32.077	42.45	54.00	-11.55	AV
2778.092	51.97	284	240	H	29.26	5.56	32.413	54.38	74.00	-19.62	PK
2778.092	48.07	284	240	H	29.26	5.56	32.413	50.48	54.00	-3.52	AV
2778.092	49.97	280	260	V	29.22	5.56	32.413	52.34	74.00	-21.66	PK
2778.092	43.40	280	260	V	29.22	5.56	32.413	45.77	54.00	-8.23	AV
3704.123	46.40	225	247	H	32.24	6.51	32.638	52.52	74.00	-21.48	PK
3704.123	39.73	225	247	H	32.24	6.51	32.638	45.85	54.00	-8.15	AV
3704.123	48.16	103	252	V	32.14	6.51	32.638	54.17	74.00	-19.83	PK
3704.123	41.84	103	252	V	32.14	6.51	32.638	47.85	54.00	-6.15	AV
4630.154	48.83	260	253	H	32.37	7.22	32.993	55.42	74.00	-18.58	PK
4630.154	44.79	260	253	H	32.37	7.22	32.993	51.38	54.00	-2.62	AV
4630.154	46.38	320	281	V	32.16	7.22	32.993	52.77	74.00	-21.23	PK
4630.154	39.95	320	281	V	32.16	7.22	32.993	46.34	54.00	-7.66	AV

1 GHz-18 GHz


dBuV/m
Vasona by EMiSoft
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
1000.0
10000.0
[1] Horizontal
[2] Vertical
Pk Lmt
Av Lmt
Debug
Formal
Pk
[2]
Av
Meas Dist 3m
Spec Dist 3m
Frequency: MHz
Radiated Emissions
Template: FCC Class B @ 3m

6 FCC §15.215 (c) & ISED RSS-Gen §6.6 - Emission Bandwidth

6.1 Applicable Standards

As per FCC §15.215 (c),

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. In the case of intentional radiators operating under the provisions of subpart E, the emission bandwidth may span across multiple contiguous frequency bands identified in that subpart. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

As per ISED RSS-Gen §6.6,

The emission bandwidth (×dB) is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated × dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3× the resolution bandwidth.
When the occupied bandwidth limit is not stated in the applicable RSS or reference measurement method, the transmitted signal bandwidth shall be reported as the 99% emission bandwidth, as calculated or measured.

6.2 Measurement Procedure

The transmitter shall be operated at its maximum carrier power measured under normal test conditions.

The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.

The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) shall be approximately 3×RBW.

Note: Video averaging is not permitted.

A peak, or peak hold, may be used in place of the sampling detector as this may produce a wider bandwidth than the actual bandwidth (worst-case measurement). Use of a peak hold may be necessary to determine the occupied bandwidth if the device is not transmitting continuously.

The trace data points are recovered and are directly summed in linear power level terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points (starting at the highest frequency, at the right side of the span, and going down in frequency). This frequency is then recorded.

The difference between the two recorded frequencies is the 99% occupied bandwidth.

6.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date	Calibration Interval
Agilent	Analyzer, Spectrum	E4446A	US44300386	2018-06-01	1 year
EMCO	Antenna, Horn	3115	9511-4627	2018-03-28	2 years
-	RF Cable	-	-	Each time[1]	N/A
Agilent	Amplifier, Pre	8449D	2944A10187	2018-04-02	1 year

Note[1]: cable included in the test set-up will be checked each time before testing.
Statement of Traceability: BACL Corp. *attests that all calibrations have been performed per the A2LA requirements, traceable to the NIST.*

6.4 Test Environmental Conditions

Temperature:	22º C
Relative Humidity:	42 %
ATM Pressure:	102.7 KPa

The testing was performed by Harry Zhao on 2018-11-29 in RF site.

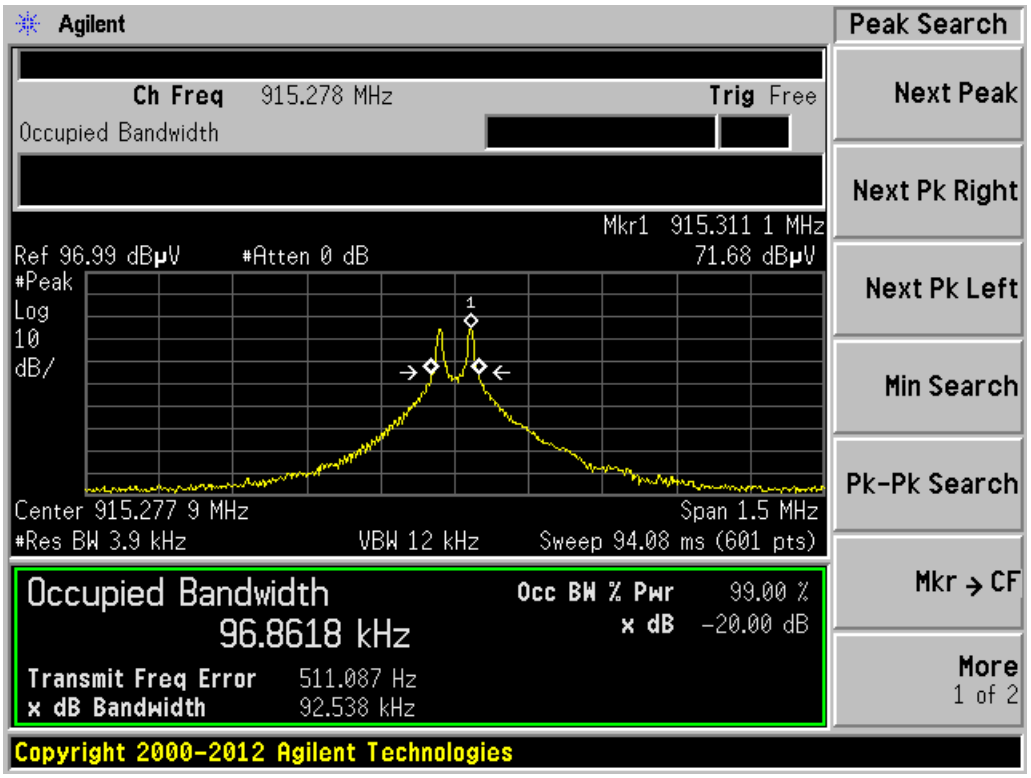
6.5 Test Results

Frequency Range (MHz)	Frequency (MHz)	99% OBW (kHz)	20 dB Bandwidth
902-928	915.27788	96.8618	Within the 902-928 MHz frequency band
	920.8084	96.4845	Within the 902-928 MHz frequency band
	926.0308	96.5177	Within the 902-928 MHz frequency band

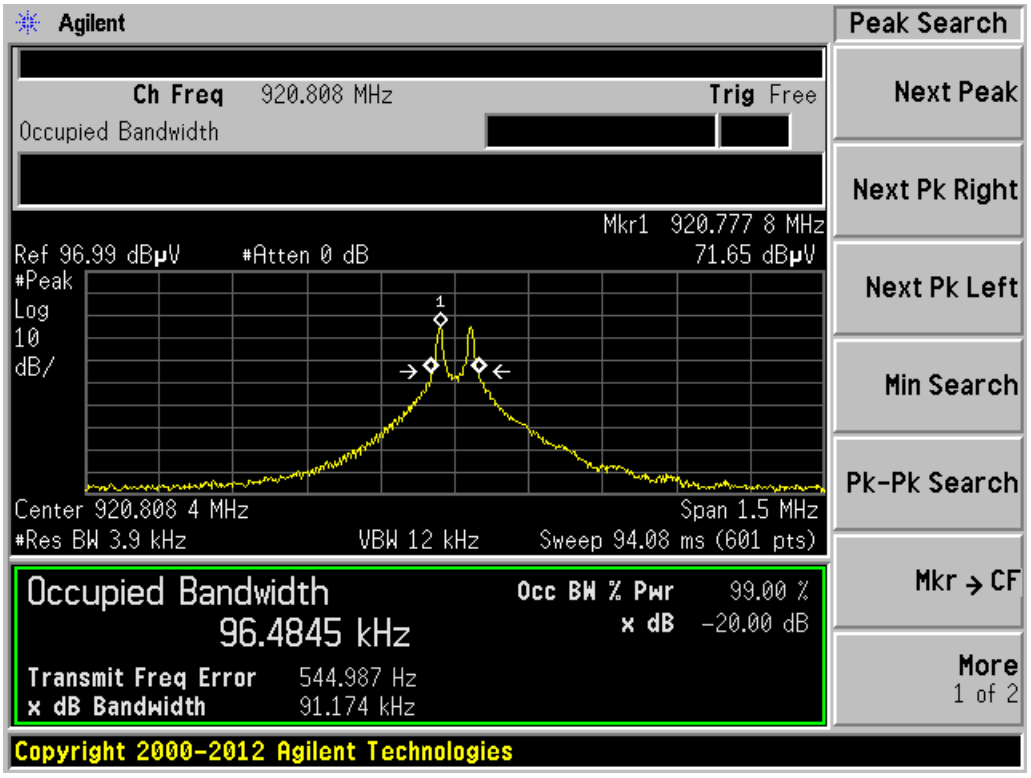
Please refer to the following plots for detailed test results.

99% Occupied Bandwidth & 20 dB bandwidth

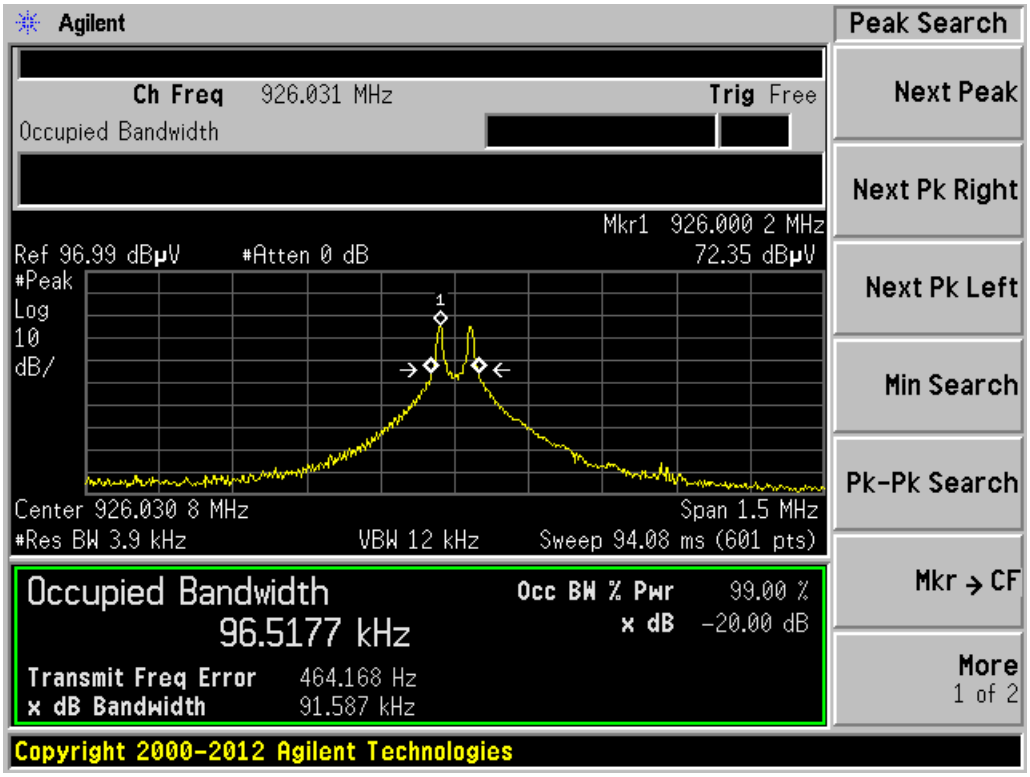
915.27788 MHz



920.8084 MHz



926.0308 MHz


Agilent
Peak Search
Ch Freq 926.031 MHz
Trig Free
Occupied Bandwidth
Next Peak
Next Pk Right
Mkr1 926.000 2 MHz
Ref 96.99 dBµV
#Atten 0 dB
72.35 dBµV
#Peak
Log
10
dB/
Next Pk Left
Min Search
Pk-Pk Search
Center 926.030 8 MHz
Span 1.5 MHz
#Res BW 3.9 kHz
VBW 12 kHz
Sweep 94.08 ms (601 pts)
Occupied Bandwidth
96.5177 kHz
Occ BW % Pwr 99.00 %
x dB -20.00 dB
Mkr → CF
Transmit Freq Error 464.168 Hz
x dB Bandwidth 91.587 kHz
More
1 of 2
Copyright 2000-2012 Agilent Technologies

7 Appendix A - FCC & IC Equipment Labeling Requirements

7.1 FCC ID Label Requirements

As per FCC §2.925,

(a) Each equipment covered in an application for equipment authorization shall bear a nameplate or label listing the following:

(1) FCC Identifier consisting of the two elements in the exact order specified in §2.926. The FCC Identifier shall be preceded by the term FCC ID in capital letters on a single line, and shall be of a type size large enough to be legible without the aid of magnification.

Example: FCC ID: XXX123

Where: XXX—Grantee Code, 123—Equipment Product Code

As per FCC §15.19,

(a) In addition to the requirements in part 2 of this chapter, a device subject to certification, or verification shall be labeled as follows:

(3) All other devices shall bear the following statement in a conspicuous location on the device:
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

(4) Where a device is constructed in two or more sections connected by wires and marketed together, the statement specified above is required to be affixed only to the main control unit. If the EUT is integrated within another device then a label affixed to the host shall also state, "Contains FCC ID: XXXXXX"

(5) When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (a) of this section on it, the information required by this paragraph shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed. However, the FCC identifier or the unique identifier, as appropriate, must be displayed on the device.

7.2 IC Label Requirements

As per IC RSP-100 Section3.1, the certification number shall appear as follows:

IC: XXXXXX-YYYYYYYY

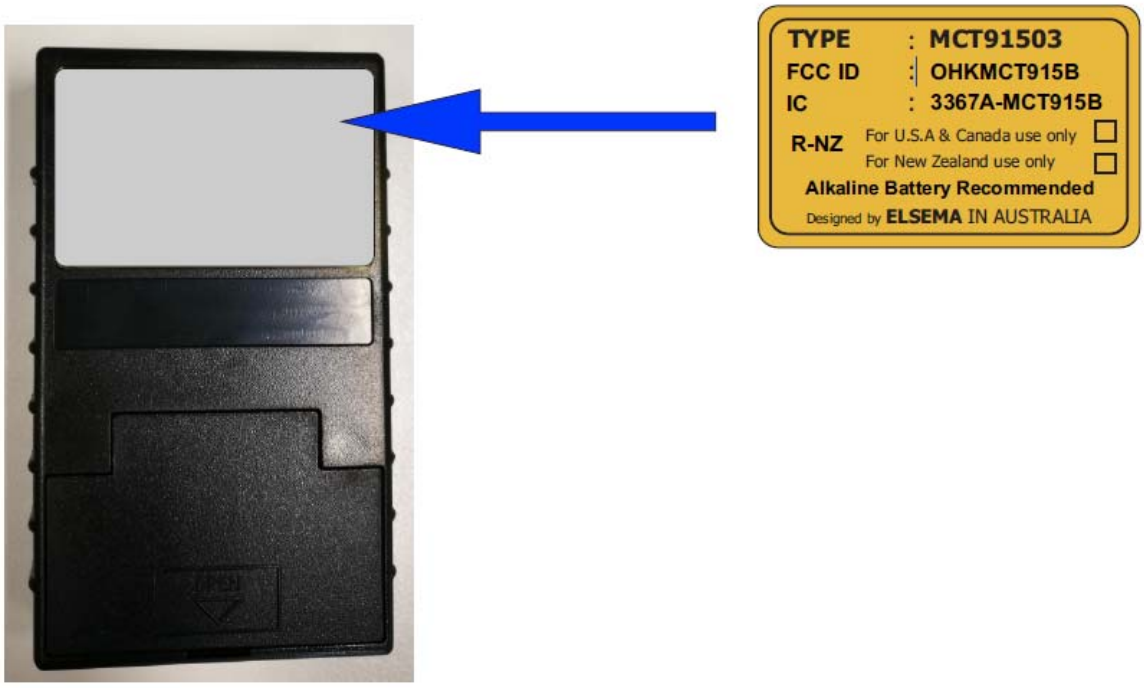
Where:

- The letters "IC:" indicate that this is an Innovation, Science and Economic Development Canada's certification number, but they are not part of the certification number. XXXXXXYYYYYYYYYY is the ISED certification number.
- XXXXXX is the CN assigned by Innovation, Science and Economic Development Canada. Newly assigned CNs will be made up of five numeric characters (e.g. "20001") whereas existing CNs may consist of up to five numeric characters followed by an alphabetic character (e.g. "21A" or "15589J").
- YYYYYYYYYY is the Unique Product Number (UPN) assigned by the applicant, made up of a maximum of 11 alphanumeric characters.
- The CN and UPN are limited to capital alphabetic characters (A-Z) and numerals (0-9) only. The use of punctuation marks or other symbols, including "wildcard" characters, is not permitted.
- The HVIN may contain punctuation marks or symbols but they shall not represent any indeterminate ("wildcard") characters.

As per RSS-Gen §2.1 Equipment Labeling:

The application for equipment certification shall be submitted in accordance with Industry Canada's Radio Standards Procedure RSP-100, Radio Equipment Certification Procedure which sets out the requirements for certification and labelling of radio apparatus. RSP-100 shall be used in conjunction with RSS-Gen and other Radio Standards Specifications (RSSs) specifically applicable to the type of radio apparatus for which certification is sought.

7.3 FCC ID & IC Label Contents and Location



8 Appendix B Test Setup and EUT Photos

Please see attachments:

Annex A – EUT Test Setup Photographs
Annex B – Internal Photographs
Annex C – External Photographs

9 Appendix C (Informative) - 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.

President and CEO
For the Accreditation Council
Certificate Number 3297.02
Valid to September 30, 2020

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

--- END OF REPORT ---