# RF TEST REPORT

SIEMIC
A Bureau Veritas Group Company

Report No.: FCC_IC_RF_SL18072603-LEC-006A1 Rev 3.0
Supersede Report No.: FCC_IC_RF_SL18072603-LEC-006A1 Rev 2.0

| | |
|---|---|
| Applicant | Lectrosonics, Inc |
| Product Name | Synthesized VHF IFB Transmitter |
| FCC Model No. | IFBT4-VHF |
| IC Model No. | IFBT4/E07-VHF |
| Test Standard | FCC part 74H<br>RSS-210 Issue 9 |
| Test Method | KDB 971168 v03r01<br>ANSI/TIA-603-E 2016<br>ANSI C63.10-2013<br>ANSI C63.26-2015 |
| FCC ID | DBZIFBT4VHFA |
| IC | 8024A- IFBT4VHFA |
| Date of test | 08/18/2018 - 08/25/2018 |
| Issue Date | 09/25/2018 |
| Test Result | Pass Fail |
| Equipment complied with the specification | [ x ] |
| Equipment did not comply with the specification | [ ] |

| | |
|---|---|
| Deon Dai | Chen Ge |
| Test Engineer | Engineer Reviewer |

This test report may be reproduced in full only
Test result presented in this test report is applicable to the tested sample only

Issued By:
SIEMIC Laboratories
775 Montague Expressway, Milpitas, 95035 CA

ACCREDITED
TESTING CERT # 2742-01

# Laboratory Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.


In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

## Accreditations for Conformity Assessment

| Country/Region | Accreditation Body | Scope |
| --- | --- | --- |
| USA | FCC, A2LA | EMC , RF/Wireless , Telecom |
| Canada | IC, A2LA, NIST | EMC, RF/Wireless , Telecom |
| Taiwan | BSMI , NCC , NIST | EMC, RF, Telecom , Safety |
| Hong Kong | OFTA , NIST | RF/Wireless ,Telecom |
| Australia | NATA, NIST | EMC, RF, Telecom , Safety |
| Korea | KCC/RRA, NIST | EMI, EMS, RF , Telecom, Safety |
| Japan | VCCI, JATE, TELEC, RFT | EMI, RF/Wireless, Telecom |
| Mexico | NOM, COFETEL, Caniety | Safety, EMC , RF/Wireless, Telecom |
| Europe | A2LA, NIST | EMC, RF, Telecom , Safety |
| Israel | MOC, NIST | EMC, RF, Telecom, Safety |

## Accreditations for Product Certifications

| Country | Accreditation Body | Scope |
| --- | --- | --- |
| USA | FCC TCB, NIST | EMC , RF , Telecom |
| Canada | IC FCB , NIST | EMC , RF , Telecom |
| Singapore | iDA, NIST | EMC , RF , Telecom |
| EU | NB | EMC & R&TTE Directive |
| Japan | MIC (RCB 208) | RF , Telecom |
| HongKong | OFTA (US002) | RF , Telecom |

## CONTENTS

# 1 Report Revision History

| Report No. | Report Version | Description | Issue Date |
| --- | --- | --- | --- |
| FCC_RF_SL18072603-LEC-006A1 | Original | NONE | 08/29/2018 |
| FCC_IC_RF_SL18072603-LEC-006A1 Rev 1.0 | Rev 1.0 | Updated per reviewer | 08/31/2018 |
| FCC_IC_RF_SL18072603-LEC-006A1 Rev 2.0 | Rev 2.0 | Updated per reviewer | 09/11/2018 |
| FCC_IC_RF_SL18072603-LEC-006A1 Rev 3.0 | Rev 3.0 | Updated per reviewer | 09/25/2018 |
| | | | |

## 2 Executive Summary

The purpose of this test program was to demonstrate compliance of following product

Company: Lectrosonics, Inc.
Product: Synthesized VHF IFB Transmitter
Model: IFBT4-VHF

against the current Stipulated Standards. The specified model product stated above has demonstrated compliance with the Stipulated Standard listed on 1st page.

## 3 Customer information

| | |
|---|---|
| Applicant Name | Lectrosonics, Inc. |
| Applicant Address | 581 Laser Road, N.E., P.O. Box 15900, Rio Rancho, NM 87124, United States of America |
| Manufacturer Name | Lectrosonics, Inc. |
| Manufacturer Address | 581 Laser Road, N.E., P.O. Box 15900, Rio Rancho, NM 87124, United States of America |

## 4 Test site information

| | |
|---|---|
| Lab performing tests | SIEMIC Laboratories |
| Lab Address | 775 Montague Expressway, Milpitas, CA 95035 |
| FCC Test Site No. | 881796 |
| IC Test Site No. | 4842D-2 |
| VCCI Test Site No. | A0133 |

## 5 Modification

| Index | Item | Description | Note |
|---|---|---|---|
| 1 | - | - | - |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

# 6 EUT Information

## 6.1 EUT Description

| | |
| --- | --- |
| Product Name | Synthesized VHF IFB Transmitter |
| Model No. | IFBT4-VHF |
| Trade Name | Lectrosonic, Inc. |
| Serial No. | N/A |
| Input Power | 12VDC |
| Power Adapter Manu/Model | ITE Power Supply: GT-46060-0812 |
| Power Adapter SN | NWR9QE500CLPNR6BG3086 |
| Hardware version | N/A |
| Software version | N/A |
| Date of EUT received | 07/12/2018 |
| Operating Frequencies | TX (174.100MHz-215.775MHz) |
| Port/Connectors | - |
| Remark | N/A |

## 6.2 Radio Description

| Item | VHF |
| --- | --- |
| Operating Band /Radio Type | VHF band |
| Modulation | FM |
| Antenna Type | External dipole antenna |
| Antenna Gain | 2.15 dBi |
| Frequency TX(MHz) | 174.100 - 215.775 |

## 6.3 EUT test modes/configuration Description

| Final Test Mode | | Note |
| --- | --- | --- |
| Final_test_mode_1 | Continuous transmission | - |
| Remark: NONE | | |

# 7 Supporting Equipment/Software and cabling Description

## 7.1 Supporting Equipment

| Item | Supporting Equipment Description | Model | Serial Number | Manufacturer | Note |
| --- | --- | --- | --- | --- | --- |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

## 7.2 Test Software Description

| Test Item | Software | Description |
| --- | --- | --- |
| - | - | - |
| | | |
| | | |
| | | |
| | | |

# 8 Test Summary

| Emissions | | | |
| --- | --- | --- | --- |
| Test Item | Test standard | Test Method/Procedure | Pass / Fail |
| AC Conducted Emission | 15.207(a), RSS Gen 8.8 | ANSI C63.10-2013<br>RSS Gen Issue 4: 2014 | Pass |
| Transmitter Power Output | FCC part74, RSS-210 | KDB 971168 v03r01<br>ANSI/TIA-603-E 2016<br>ANSI C63.10-2013<br>ANSI C63.26-2015 | Pass |
| Frequency Stability | FCC part74, RSS-210 | KDB 971168 v03r01<br>ANSI/TIA-603-E 2016<br>ANSI C63.10-2013<br>ANSI C63.26-2015 | Pass |
| Modulation Characteristics | FCC part74, RSS-210 | KDB 971168 v03r01<br>ANSI/TIA-603-E 2016<br>ANSI C63.10-2013<br>ANSI C63.26-2015 | Pass |
| Occupied Bandwidth and Emission Mask | FCC part74, RSS-210 | KDB 971168 v03r01<br>ANSI/TIA-603-E 2016<br>ANSI C63.10-2013<br>ANSI C63.26-2015 | Pass |
| Spurious Emissions at Antenna Terminal | FCC part74, RSS-210 | KDB 971168 v03r01<br>ANSI/TIA-603-E 2016<br>ANSI C63.10-2013<br>ANSI C63.26-2015 | Pass |
| Field Strength of Spurious Radiated | FCC part74, RSS-210 | KDB 971168 v03r01<br>ANSI/TIA-603-E 2016<br>ANSI C63.10-2013<br>ANSI C63.26-2015 | Pass |

# 9 Measurement Uncertainty

## 9.1 Radiated Emissions (30MHz to 1GHz)

The test is to measure the radiated emissions of the EUT.
Some error sources that can contribute to the total uncertainty:

- Uncertainty of the receiver
- Uncertainty of the antenna
- Uncertainty of cables
- Uncertainty due to the mismatches
- NSA Calibration
- Etc., details see the below table

| Source of Uncertainty | Value (dB) | Probability Distribution | Division | Sensitivity Coefficient | Expanded Uncertainty |
|---|---|---|---|---|---|
| Receiver Reading | 0.12 | Rectangular | 1.732 | 1 | 0.069284 |
| Cable Insertion Loss | 0.21 | Normal | 2 | 1 | 0.105 |
| Filter Insertion Loss | 0.25 | Normal | 2 | 1 | 0.125 |
| Antenna Factor | 0.65 | Normal | 2 | 1 | 0.325 |
| Receiver CW accuracy | 0.5 | Rectangular | 1.732 | 1 | 0.2886836 |
| Pulse Amplitude Response | 1.5 | Rectangular | 1.732 | 1 | 0.86605081 |
| PRF Response | 1.5 | Rectangular | 1.732 | 1 | 0.86605081 |
| Mismatch Filter - Receiver | 0.25 | U-Shape | 1.414 | 1 | 0.1768033 |
| NSA Calibration | 4.0 | U-Shape | 1.414 | 1 | 2.8288543 |
| Combined Standard Uncertainty | | | | | 3.0059131 |
| Expanded Uncertainty (K=2) | | | | | 6.0118262 |

The total derived measurement uncertainty is +/- 6.00 dB.

## 9.2 Radiated Emissions (1GHz to 40GHz)

The test is to measure the radiated emissions of the EUT.

Some error sources that can contribute to the total uncertainty:

- Uncertainty of the receiver
- Uncertainty of the antenna
- Uncertainty of cables
- Uncertainty due to the mismatches
- VSWR Calibration
- Etc., details see the below table

| Source of Uncertainty | Value (dB) | Probability Distribution | Division | Sensitivity Coefficient | Expanded Uncertainty |
|---|---|---|---|---|---|
| Receiver Reading | 0.12 | Rectangular | 1.732 | 1 | 0.0692840 |
| Cable Insertion Loss | 0.21 | Normal | 2 | 1 | 0.1050000 |
| Filter Insertion Loss | 0.25 | Normal | 2 | 1 | 0.1250000 |
| Antenna Factor | 0.65 | Normal | 2 | 1 | 0.3250000 |
| Receiver CW accuracy | 0.5 | Rectangular | 1.732 | 1 | 0.2886836 |
| Pulse Amplitude Response | 1.5 | Rectangular | 1.732 | 1 | 0.8660508 |
| PRF Response | 1.5 | Rectangular | 1.732 | 1 | 0.8660508 |
| Mismatch Filter - Receiver | 0.25 | U-Shape | 1.414 | 1 | 0.1768033 |
| VSWR Calibration | 2.0 | U-Shape | 1.414 | 1 | 1.4144272 |
| Combined Standard Uncertainty | | | | | 4.2363 |
| Expanded Uncertainty (K=2) | | | | | 8.4726 |

The total derived measurement uncertainty is +/- 8.47 dB.

## 9.3 RF conducted measurement

The test is to measure the RF output power from the EUT.

Some error sources that can contribute to the total uncertainty:

- Uncertainty of the Reference Level Uncertainty
- Uncertainty of variable attenuators
- Uncertainty of cables
- Uncertainty due to the mismatches

| Source of Uncertainty | Value (dB) | Probability Distribution | Division | Sensitivity Coefficient | Expanded Uncertainty |
| --- | --- | --- | --- | --- | --- |
| Reference Level | 0.12 | Rectangular | 1.732 | 1 | 0.069284 |
| Cable Insertion Loss | 0.21 | Normal | 2 | 1 | 0.105 |
| Attenuator | 0.25 | Normal | 2 | 1 | 0.125 |
| Mismatch | 0.25 | U-Shape | 1.414 | 1 | 0.1768033 |
| Combined Standard Uncertainty | | | | | 0.476087 |
| Expanded Uncertainty (K=2) | | | | | 0.952174 |

The total derived measurement uncertainty is +/- 0.95 dB.

# 10 Measurements, examination and derived results

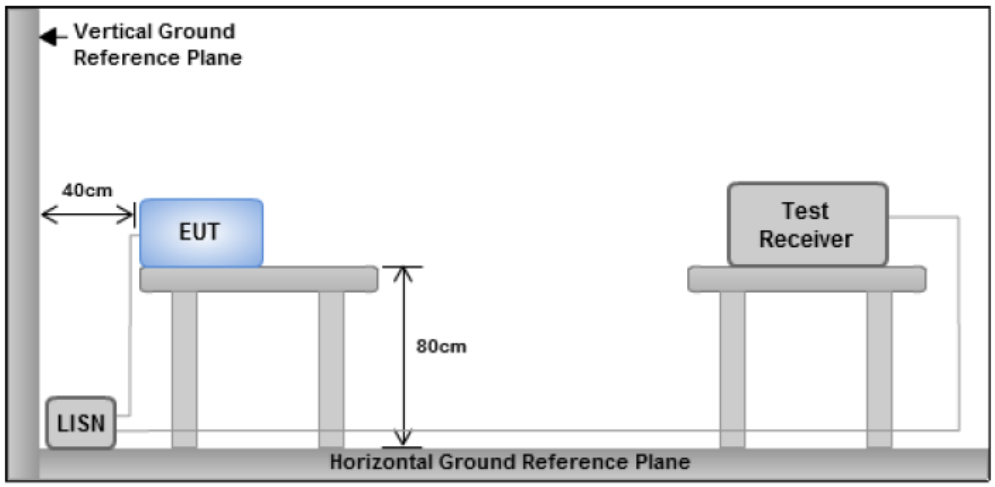
## 10.1 Conducted Emissions

Conducted Emission Limit

| Frequency ranges (MHz) | Limit (dBuV) | |
|---|---|---|
| | QP | Average |
| 0.15 ~ 0.5 | 66 – 56 | 56 – 46 |
| 0.5 ~ 5 | 56 | 46 |
| 5 ~ 30 | 60 | 50 |

| Spec | Item | Requirement | Applicable |
|---|---|---|---|
| FCC 15.207 RSS-GEN Section 8.8 | a) | For Low-power radio-frequency devices that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 µH/50 ohms line impedance stabilization network (LISN). The lower limit applies at the boundary between the frequency ranges. | ☒ |

Test Setup




Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

Procedure

- The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table, as shown in Annex B.
- The power supply for the EUT was fed through a 50Ω/50µH EUT LISN, connected to filtered mains.
- The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable.
- All other supporting equipment was powered separately from another main supply.

| | |
|---|---|
| Remark | EUT was tested at 120VAC, 60Hz |
| Result | ☒ Pass ☐ Fail |

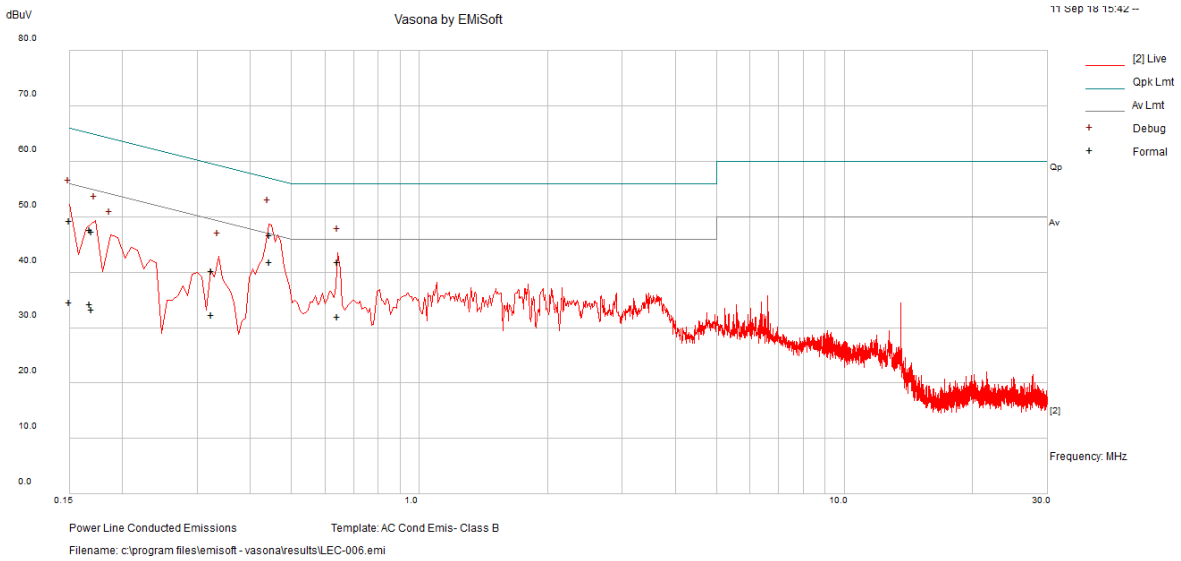
Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by Deon Dai at Conducted Emission test site.

## Conducted Emission Test Results

| | | | | |
|---|---|---|---|---|
| Test specification: | Conducted Emissions | | | |
| Environmental Conditions: | Temp(°C): | 21 | Result: | ☒ Pass ☐ Fail |
| | Humidity (%): | 42 | | |
| | Atmospheric(mbar): | 1021 | | |
| Mains Power: | 120Vac, 60Hz | | | |
| Tested by: | Deon Dai | | | |
| Test Date: | 09/11/2018 | | | |
| Remarks | AC Power Live | | | |

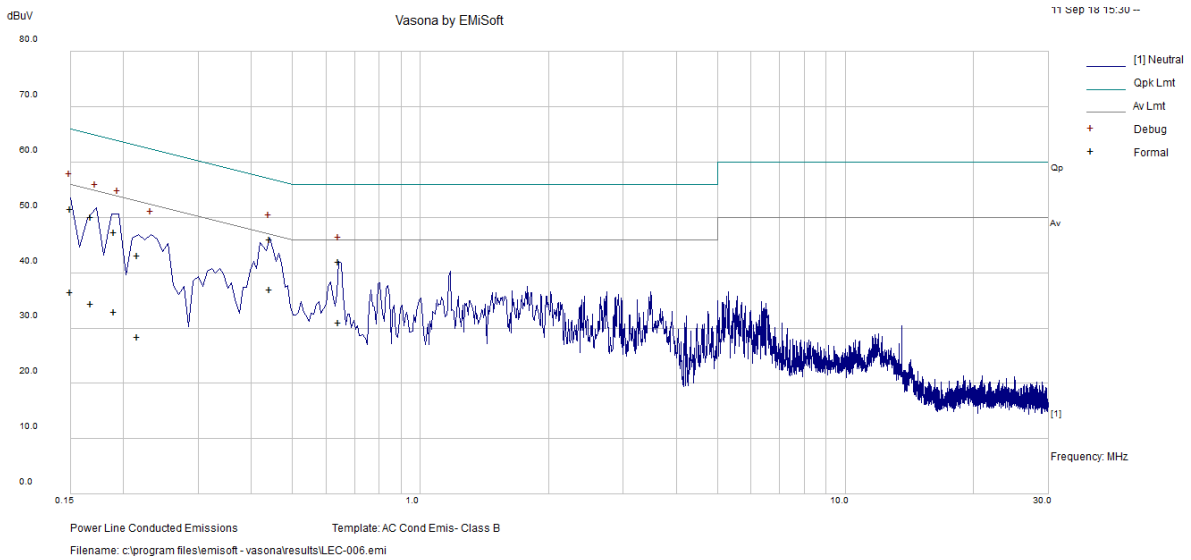



Live Plot at 120Vac, 60Hz

| Frequency (MHz) | Raw (dBuV) | Cable Loss (dB) | Factors (dB) | Level (dBuV) | Measurement Type | Line / Neutral | Limit (dBuV) | Margin (dB) | Pass /Fail |
|---|---|---|---|---|---|---|---|---|---|
| 0.45 | 37.36 | 9.33 | 0.04 | 46.73 | Quasi Peak | Live | 56.96 | -10.23 | Pass |
| 0.64 | 32.5 | 9.33 | 0.05 | 41.87 | Quasi Peak | Live | 56 | -14.13 | Pass |
| 0.15 | 39.96 | 9.33 | 0.05 | 49.34 | Quasi Peak | Live | 65.98 | -16.64 | Pass |
| 0.17 | 38.36 | 9.33 | 0.05 | 47.74 | Quasi Peak | Live | 65.04 | -17.31 | Pass |
| 0.32 | 30.93 | 9.32 | 0.04 | 40.29 | Quasi Peak | Live | 59.6 | -19.31 | Pass |
| 0.17 | 38.06 | 9.33 | 0.05 | 47.43 | Quasi Peak | Live | 64.98 | -17.55 | Pass |
| 0.45 | 32.55 | 9.33 | 0.04 | 41.92 | Average | Live | 46.96 | -5.05 | Pass |
| 0.64 | 22.65 | 9.33 | 0.05 | 32.03 | Average | Live | 46 | -13.97 | Pass |
| 0.15 | 25.19 | 9.33 | 0.05 | 34.57 | Average | Live | 55.98 | -21.42 | Pass |
| 0.17 | 24.88 | 9.33 | 0.05 | 34.26 | Average | Live | 55.04 | -20.79 | Pass |
| 0.32 | 22.9 | 9.32 | 0.04 | 32.27 | Average | Live | 49.6 | -17.33 | Pass |
| 0.17 | 23.91 | 9.33 | 0.05 | 33.29 | Average | Live | 54.98 | -21.69 | Pass |

## Conducted Emission Test Results

| Test specification: | Conducted Emissions | | | |
|---|---|---|---|---|
| Environmental Conditions: | Temp(°C): | 21 | Result: | ☒ Pass ☐ Fail |
| | Humidity (%): | 42 | | |
| | Atmospheric(mbar): | 1021 | | |
| Mains Power: | 120Vac, 60Hz | | | |
| Tested by: | Deon Dai | | | |
| Test Date: | 09/11/2018 | | | |
| Remarks | AC Power, Neutral | | | |

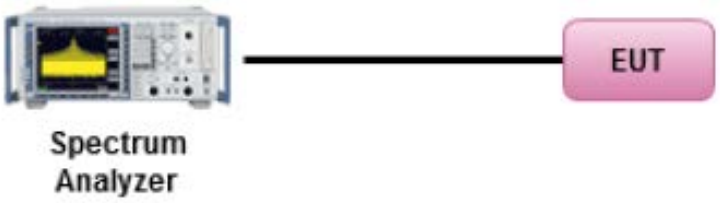



Neutral Plot at 120Vac, 60Hz

| Frequency (MHz) | Raw (dBuV) | Cable Loss (dB) | Factors (dB) | Level (dBuV) | Measurement Type | Line / Neutral | Limit (dBuV) | Margin (dB) | Pass /Fail |
|---|---|---|---|---|---|---|---|---|---|
| 0.44 | 36.71 | 9.33 | 0.04 | 46.07 | Quasi Peak | Neutral | 56.99 | -10.92 | Pass |
| 0.15 | 42.18 | 9.33 | 0.05 | 51.55 | Quasi Peak | Neutral | 65.99 | -14.44 | Pass |
| 0.17 | 40.76 | 9.33 | 0.05 | 50.13 | Quasi Peak | Neutral | 65.06 | -14.92 | Pass |
| 0.19 | 38.09 | 9.32 | 0.04 | 47.45 | Quasi Peak | Neutral | 64.01 | -16.55 | Pass |
| 0.64 | 32.65 | 9.33 | 0.05 | 42.03 | Quasi Peak | Neutral | 56 | -13.97 | Pass |
| 0.22 | 33.83 | 9.32 | 0.04 | 43.19 | Quasi Peak | Neutral | 62.97 | -19.78 | Pass |
| 0.44 | 27.63 | 9.33 | 0.04 | 36.99 | Average | Neutral | 46.99 | -10 | Pass |
| 0.15 | 27.19 | 9.33 | 0.05 | 36.56 | Average | Neutral | 55.99 | -19.43 | Pass |
| 0.17 | 25.09 | 9.33 | 0.05 | 34.46 | Average | Neutral | 55.06 | -20.59 | Pass |
| 0.19 | 23.66 | 9.32 | 0.04 | 33.02 | Average | Neutral | 54.01 | -20.99 | Pass |
| 0.64 | 21.65 | 9.33 | 0.05 | 31.03 | Average | Neutral | 46 | -14.97 | Pass |
| 0.22 | 19.13 | 9.32 | 0.04 | 28.49 | Average | Neutral | 52.97 | -24.48 | Pass |

## 10.2 Transmitter Power Output

Requirement(s):

<table>
<tr><td>Spec</td><td>Requirement</td><td>Applicable</td></tr>
<tr><td rowspan="2">FCC part74(e)<br>RSS-210</td><td>FCC §74.861 (e) :(1) The power may not exceed the following values.<br>(i) 54-72, 76-88, and 174-216 MHz bands: 50 mW EIRP<br>(ii) 470-608 and 614-698: 250 mW conducted power.</td><td>☒</td></tr>
<tr><td>RSS-210 Issue 9 August 2016 G3.1 Table G1
<table>
<tr><th>Freq Bands (MHz)</th><th>Transmit e.i.r.p (mW)</th><th>Authorized Bandwidth (kHz)</th><th>Freq Stability (ppm)</th></tr>
<tr><td>54-72<br>76-88<br>174-216</td><td>50</td><td>200</td><td>± 50</td></tr>
<tr><td>470-608<br>614-698</td><td>250</td><td>200</td><td>± 50</td></tr>
</table></td><td>☒</td></tr>
<tr><td>Test Setup</td><td colspan="2"> 
</td></tr>
<tr><td>Procedure</td><td colspan="2">Connect the EUT to spectrum analyzer and set the spectrum analyzer as follow:<br>-Center frequency: channel frequency under test;<br>- Resolution BandWidth (RBW): 1 MHz;<br>- Video BandWidth (VBW): ⩾1MHz;<br>- Detector: Peak hold;<br>- Span: 1MHz<br>Max hold the trace and record the peak value once the trace stabilized.</td></tr>
<tr><td>Test Date</td><td>08/24/2018</td><td>Environmental condition<br>Temperature 24°C<br>Relative Humidity 48%<br>Atmospheric Pressure 1009mbar</td></tr>
<tr><td>Remark</td><td colspan="2">NONE</td></tr>
<tr><td>Result</td><td colspan="2">☒ Pass ☐ Fail</td></tr>
</table>

Test Data ☐ Yes (See below) ☒ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by *Deon Dai* at *RF test site*.

E.I.R.P measurement results

| Type | Freq (MHz) | CH | Conducted power (dBm) | Antenna Gain (dBi) | E.I.R.P (dBm) | Limit (dBm) | Result |
|---|---|---|---|---|---|---|---|
| E.I.R.P | 174.10 | Low | 14.28 | 2.15 | 16.43 | 16.98 | Pass |
| | 195.10 | Mid | 14.57 | 2.15 | 16.72 | 16.98 | Pass |
| | 215.75 | High | 14.29 | 2.15 | 16.44 | 16.98 | Pass |


Output power –174.1MHz


Output power – 195.1MHz


Output power - 215.75MHz

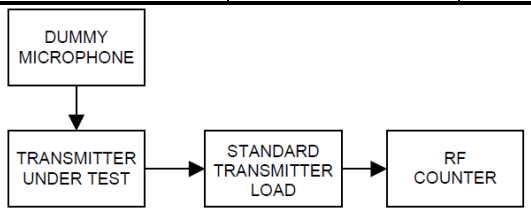
## 10.3 Frequency Stability

Requirement(s):

| Spec | Requirement | Applicable |
|---|---|---|
| FCC part74(e) RSS-210 | FCC §74.861(e) :(4) The frequency tolerance of the transmitter shall be 0.005 percent. | ☒ |
| | RSS-210 Issue 9 August 2016 G3.1 Table G1 | ☒ |

| Freq Bands (MHz) | Transmit e.i.r.p (mW) | Authorized Bandwidth (kHz) | Freq Stability (ppm) |
|---|---|---|---|
| 54-72<br>76-88<br>174-216 | 50 | 200 | ± 50 |
| 470-608<br>614-698 | 250 | 200 | ± 50 |

Test Setup




Procedure

According ANSI/TIA-603-E 2016 Section 2.2.2
-Connect the equipment as illustrated.
-Operate the equipment in standby conditions for 15 minutes before proceeding.
- Record the carrier frequency of the transmitter as $MCF_{MHz}$
-Calculate the ppm frequency error by the following:
ppm error =( $MCF_{MHz}$ / $ACF_{MHz}$-1)*$10^6$
where
$MCF_{MHz}$ is the Measured Carrier Frequency in MHz
$ACF_{MHz}$ is the Assigned Carrier Frequency in MHz
-The value recorded in step d) is the carrier frequency stability.

According RSS GEN issue 5 April 2018 section 6.11:
-The reference temperature for radio transmitters is +20°C (+68°F).
-A hand-held device that is only capable of operating using internal batteries shall be tested at the battery's nominal voltage, and again at the battery's operating end-point voltage, which shall be specified by the equipment manufacturer. For this test, either a battery or an external power supply can be used.
-The operating carrier frequency shall be set up in accordance with the manufacturer's published operation and instruction manual prior to the commencement of these tests. No adjustment of any frequency-determining circuit element shall be made subsequent to this initial set-up.

| Test Date | 08/19/2018 | Environmental condition | Temperature 24°C<br>Relative Humidity 48%<br>Atmospheric Pressure 1009mbar |
|---|---|---|---|
| Remark | NONE | | |
| Result | ☒ Pass ☐ Fail | | |

Test Data ☐ Yes (See below) ☒ N/A

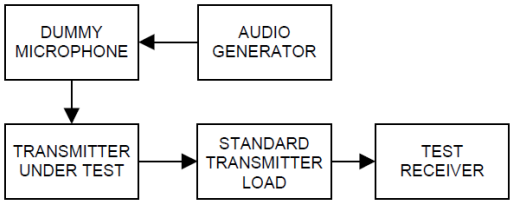
Test Plot ☒ Yes (See below) ☐ N/A

Test was done by *Deon Dai* at *RF test site*.

| Type | Temperature | Voltage | Nominal Frequency (MHz) | Measured Frequency (MHz) | Measured frequency Error (PPM) | Limit (PPM) |
|---|---|---|---|---|---|---|
| Frequency Stability | -20 | Vnorm | 195.1 | 195.10008 | 0.41005 | ±50 |
| | -10 | Vnorm | 195.1 | 195.09993 | -0.35879 | ±50 |
| | 0 | Vnorm | 195.1 | 195.09991 | -0.46130 | ±50 |
| | 10 | Vnorm | 195.1 | 195.10004 | 0.20502 | ±50 |
| | 20 | Vmin | 195.1 | 195.09992 | -0.41005 | ±50 |
| | | Vnorm | 195.1 | 195.10003 | 0.15377 | ±50 |
| | | Vmax | 195.1 | 195.09991 | -0.46130 | ±50 |
| | 30 | Vnorm | 195.1 | 195.09993 | -0.35879 | ±50 |
| | 40 | Vnorm | 195.1 | 195.10006 | 0.30753 | ±50 |
| | 50 | Vnorm | 195.1 | 195.09993 | -0.35879 | ±50 |

## 10.4 Modulation Characteristics

Requirement(s):

| Spec | Requirement | Applicable |
|---|---|---|
| FCC part74H<br>RSS-210 | FCC §74.861 (e) (3): A maximum deviation of ±75 kHz is permitted when frequency modulation is employed. | ☒ |
| | RSS-210 Issue 9 August 2016 G.3.5.2<br>Equipment employing frequency measurement (FM) modulation shall have a frequency deviation that does not exceed ±75 kHz | ☒ |
| Test Setup |  | |
| Procedure | According ANSI/TIA-603-E 2016 Section 2.2.3<br>a. Connect the equipment as illustrated.<br>b. Adjust the transmitter per the manufacturer's procedure for full rated system deviation.<br>c. Set the test receiver to measure peak positive deviation. Set the audio bandwidth for ⩽0.25 Hz to ⩾15,000 Hz. Turn the de-emphasis function off.<br>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.<br>e. Increase the level from the audio frequency generator by 20 dB in one step<br>(rise time between the 10% and 90% points shall be 0.1 second maximum).<br>f. Measure both the instantaneous and steady-state deviation at and after the time of increasing the audio input level.<br>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 3000Hz and observe the steady-state deviation. Record the maximum deviation.<br>h. Set the test receiver to measure peak negative deviation and repeat steps d) through g).<br>i. The values recorded in steps g) and h) are the modulation limiting. | |
| Test Date | 08/19/2018 | Environmental condition: Temperature 24°C; Relative Humidity 48%; Atmospheric Pressure 1009mbar |
| Remark | NONE | |
| Result | ☒ Pass ☐ Fail | |

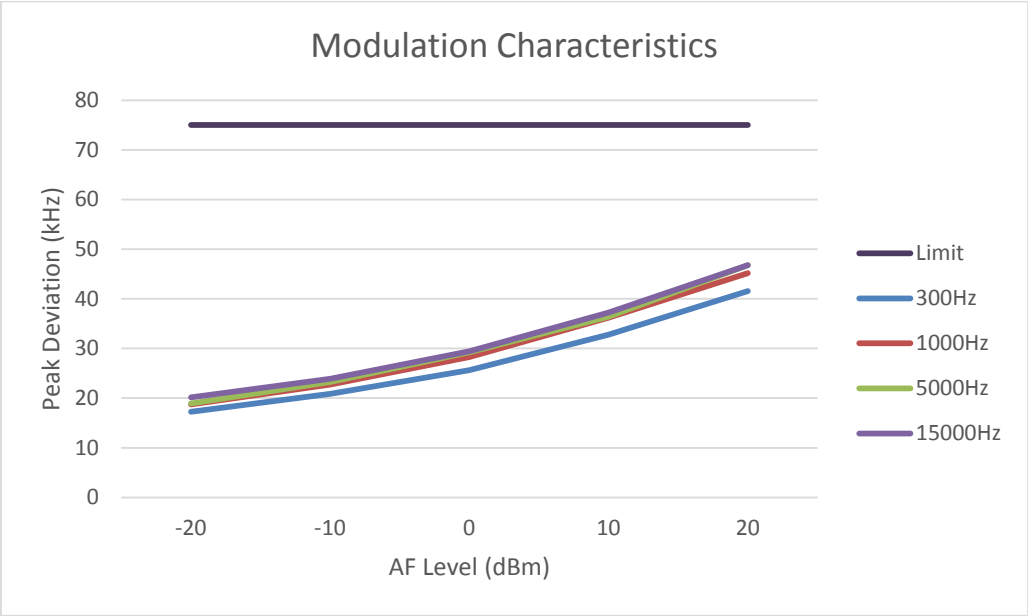
Test Data ☐ Yes (See below) ☒ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by *Deon Dai* at *RF test site*.

## Modulation Characteristics Test results - Middle channel

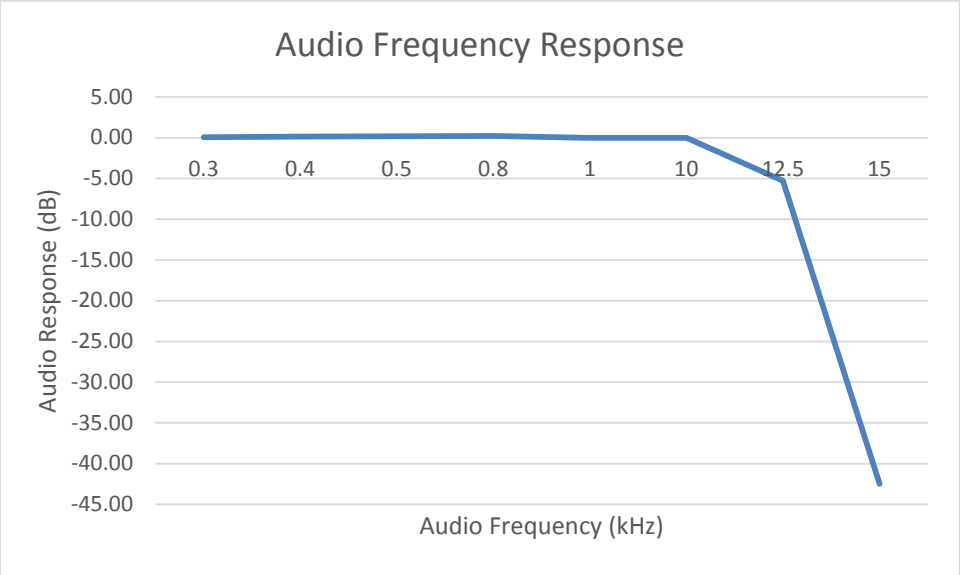
| AF Level | Peak Deviation(kHz) | | | | limit |
|---|---|---|---|---|---|
| | 300Hz | 1000Hz | 5000Hz | 15000Hz | |
| -20 | 17.28 | 18.75 | 18.94 | 20.13 | ±75 |
| -10 | 20.89 | 22.76 | 23.26 | 23.90 | ±75 |
| 0 | 25.63 | 28.29 | 29.24 | 29.45 | ±75 |
| 10 | 32.81 | 36.22 | 36.40 | 37.24 | ±75 |
| 20 | 41.57 | 45.18 | 46.76 | 46.76 | ±75 |



**Audio Frequency Response – Middle Channel**

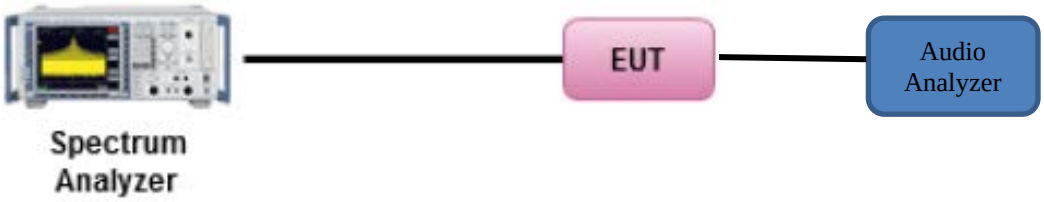
| AF Frequency (kHz) | AF Level (uW) | AF Response (dB) |
| --- | --- | --- |
| 0.3 | 656.24 | 0.05 |
| 0.5 | 511.4 | 0.18 |
| 1.0 | 502.8 | 0 |
| 5.0 | 468.4 | -5.30 |
| 15 | 422.58 | -42.5 |

Note: AF Response=20*log(AF Level of 1kHz/AF Level)



## 10.5 Occupied Bandwidth and Emission Mask

Requirement(s):

<table>
<tr><th>Spec</th><th>Requirement</th><th>Applicable</th></tr>
<tr><td rowspan="2">FCC part74H<br>RSS-210</td><td>FCC §74.861 (e) (5) The operating bandwidth shall not exceed 200 kHz.<br>FCC §74.861 (e) (6) The mean power of emissions shall be attenuated below the mean output power of the transmitter in accordance with the following schedule:<br>(i) On any frequency removed from the operating frequency by more than 50 percent up to and including 100 percent of the authorized bandwidth: at least 25 dB;<br>(ii) On any frequency removed from the operating frequency by more than 100 percent up to and including 250 percent of the authorized bandwidth: at least 35 dB;<br>(iii) On any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth: at least 43 + 10log10 (mean output power in watts) dB.<br>FCC §74.861 (e) (7) 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. Digital emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in section 8.3.2.2 (Figure 4) 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). The requirements of this paragraph (e)(7) shall not apply to applications for certification of equipment in these bands until nine months after release of the Commission's Channel Reassignment Public Notice, as defined in §73.3700(a)(2) of this chapter.</td><td>☒</td></tr>
<tr><td>RSS-210 Issue 9 August 2016 G3.1 Table G1 Occupied bandwidth:<br><table><tr><th>Freq Bands (MHz)</th><th>Transmit e.i.r.p (mW)</th><th>Authorized Bandwidth (kHz)</th><th>Freq Stability (ppm)</th></tr><tr><td>54-72<br>76-88<br>174-216</td><td>50</td><td>200</td><td>± 50</td></tr><tr><td>470-608<br>614-698</td><td>250</td><td>200</td><td>± 50</td></tr></table>The transmitter output spectrum shall be within the mask defined in EN 300 422 Clause 8.3.2.2.</td><td>☒</td></tr>
<tr><td>Test Setup</td><td colspan="2"> 
</td></tr>
<tr><td>Procedure</td><td colspan="2">KDB 971168 D01 Power Meas License Digital Systems v03r01 - Section4<br>Occupied Bandwidth<br>a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency.<br>The frequency span for the spectrum analyzer shall be set wide enough to capture all modulation products.<br>b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1 to 5 % of the anticipated OBW, and the VBW shall be at least 3 times the RBW.<br>c) Set the reference level of the instrument as required to keep the signal from exceeding the maximum input mixer level for linear operation. In general, the peak of the spectral envelope must be at least 10log (OBW / RBW) below the reference level.<br>e) Set the detection mode to peak, and the trace mode to max hold.</td></tr>
</table>

| | | | |
|---|---|---|---|
| | f) Use the 99 % power bandwidth function of the spectrum analyzer (if available) and report the measured bandwidth.<br>Emission Mask<br>EN 300 422 Clause 8.3.2.1 | | |
| Test Date | 08/25/2018 | Environmental condition | Temperature 24°C<br>Relative Humidity 48%<br>Atmospheric Pressure 1009mbar |
| Remark | NONE | | |
| Result | ☒ Pass ☐ Fail | | |

Test Data ☐ Yes (See below) ☒ N/A

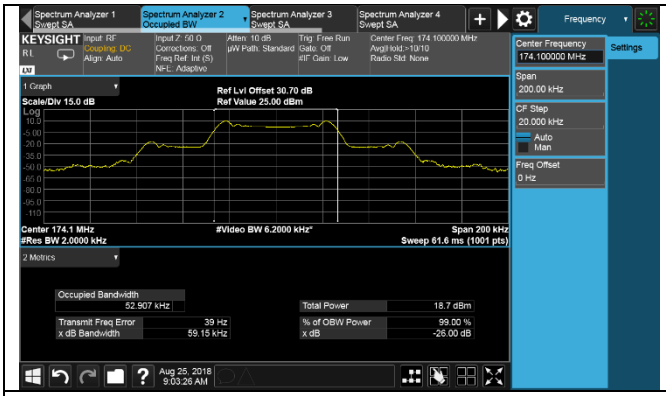
Test Plot ☒ Yes (See below) ☐ N/A

Test was done by *Deon Dai* at *RF test site*.

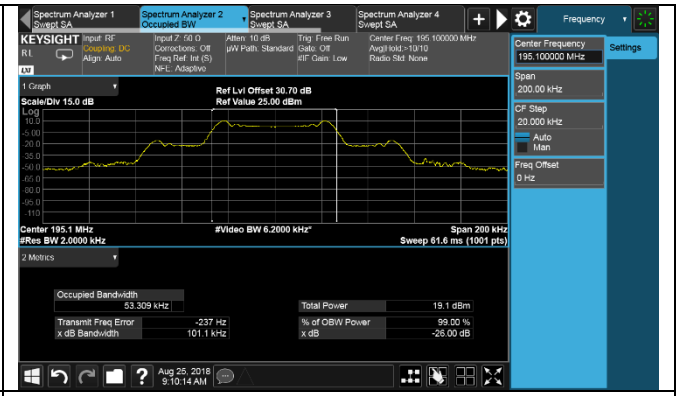
Bandwidth measurement results

| Type | Frequency (MHz) | CH | 99% bandwidth (kHz) | -26 dB Bandwidth (-kHz) | Limit (kHz) |
|---|---|---|---|---|---|
| Occupied bandwidth | 470.1 | Low | 52.91 | 59.15 | 200 |
| | 503.8 | Mid | 53.31 | 101.1 | 200 |
| | 537.5 | High | 54.47 | 98.13 | 200 |

**Bandwidth Measurement test plots**



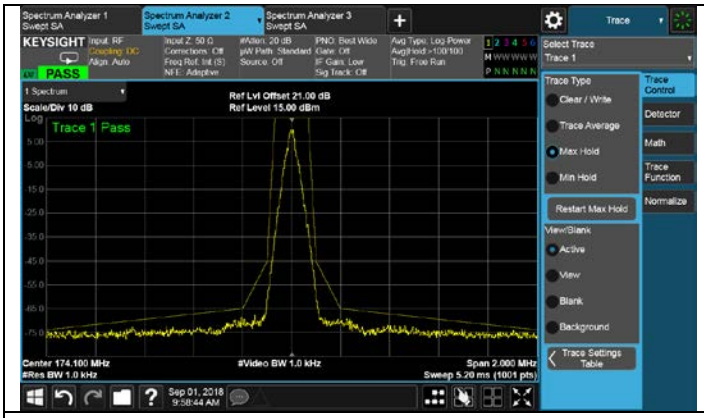

Occupied Bandwidth –174.1MHz



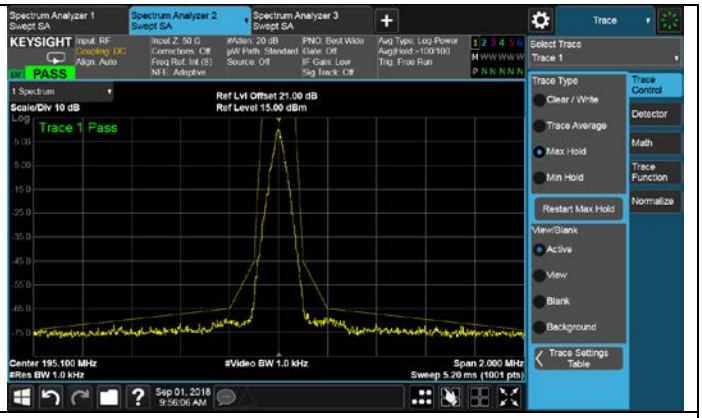

Occupied Bandwidth – 195.1MHz


Occupied Bandwidth - 215.75MHz

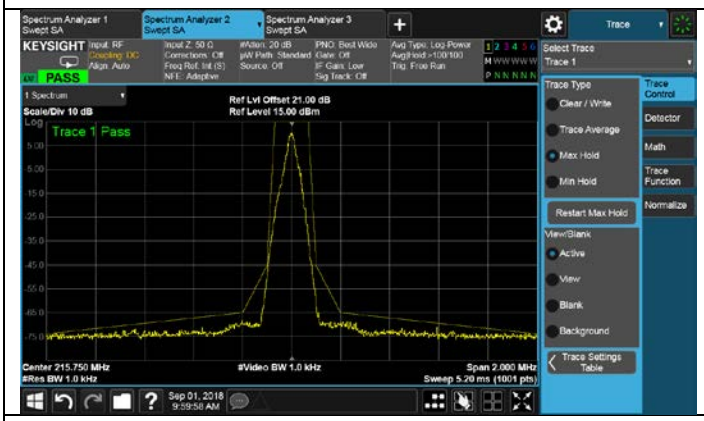
Emission Mask test Plot




Low Channel, Mask



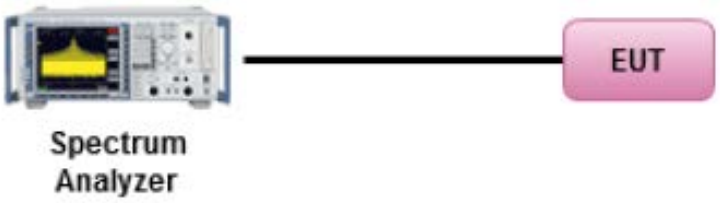

Middle Channel, Mask




High Channel, Mask

## 10.6 Spurious Emissions at Antenna Terminal

Requirement(s):

| Spec | Requirement | Applicable |
|---|---|---|
| FCC part74H<br>RSS-210 | FCC §74.861 (e) (6) (iii)<br>On any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth: at least 43 + 10log10 (mean output power in watts) dB.<br>FCC §74.861 (e) (7)<br>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. Digital emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in section 8.3.2.2 (Figure 4) 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). The requirements of this paragraph (e)(7) shall not apply to applications for certification of equipment in these bands until nine months after release of the Commission's Channel Reassignment Public Notice, as defined in §73.3700(a)(2) of this chapter. | ☒ |
| | Per RSS-210, Annex G, the transmitter unwanted emissions shall meet the requirements of ETSI EN 300 422-1 V1.4.2 (2011-08) section 8.4 | ☒ |
| Test Setup |  | |
| Procedure | a) Connect the equipment as illustrated, with the notch filter by-passed.<br>b) Set the center frequency of the spectrum analyzer to the assigned transmitter frequency, key the transmitter, and set the level of the carrier to the full scale reference line.<br>c) Modulate the transmitter with a 2500 Hz sine wave at an input level 16 dB greater than that necessary to produce 50% of rated system deviation. The input level shall be established at the frequency of maximum response of the Method of Measurement for Transmitters audio modulating circuit.<br>d) Adjust the spectrum analyzer for the following settings:<br>1) Resolution Bandwidth = 10 kHz for spurious emissions below 1 GHz, and 1 MHz for spurious emissions above 1 GHz.<br>2) Video Bandwidth ⩾3 times the resolution bandwidth.<br>3) Sweep Speed ⩽2000 Hz per second.<br>4) Detector Mode = mean or average power.<br>e) Adjust the center frequency of the spectrum analyzer for incremental coverage of the range from:<br>1) The lowest radio frequency generated in the equipment to the carrier frequency minus the test bandwidth (see 1.3.4.4).<br>2) The carrier frequency plus the test bandwidth to a frequency less than 2 times the carrier frequency.<br>f) Record the frequencies and levels of spurious emissions from step e).<br>g) Unkey the transmitter. Replace the transmitter under test with the signal generator and adjust the signal level to reproduce the frequencies and levels of every spurious emission recorded in step f). Record the signal generator levels in dBm.<br>h) Insert the notch filter.<br>i) Adjust the spectrum analyzer for the following settings: | |

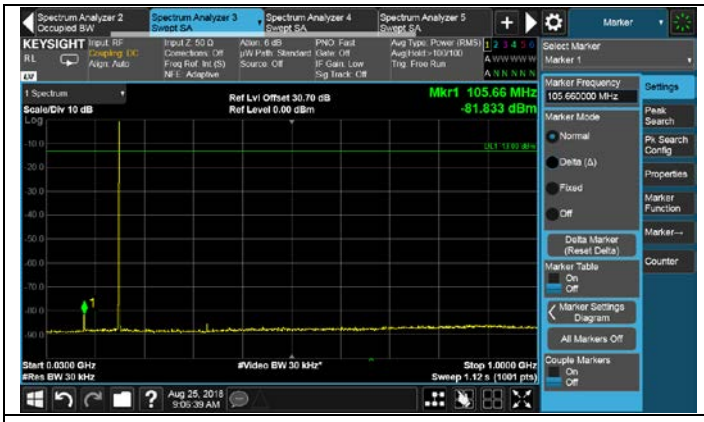
| | | | |
|---|---|---|---|
| | 1) Resolution Bandwidth = 10 kHz for spurious emissions below 1 GHz, and 1 MHz for spurious emissions above 1 GHz.<br>2) Video Bandwidth ≥3 times the resolution bandwidth.<br>3) Sweep Speed ≤2000 Hz per second.<br>4) Detector Mode = mean or average power.<br>j) Key the transmitter. Adjust the center frequency of the spectrum analyzer for incremental coverage of the range from a frequency equal to 2 times the carrier frequency and to the tenth harmonic of the carrier frequency.<br>k) Record the frequencies and levels of spurious emissions from step j).<br>l) Unkey the transmitter. Replace the transmitter under test with the signal generator and adjust the signal level to reproduce the frequencies and levels of every spurious emission recorded in step k). Record the signal generator levels in dBm.<br>m) The levels recorded in steps g) and l) are the absolute levels of conducted spurious emissions in dBm. The conducted spurious attenuation can be calculated by the following:<br>Spurious attenuation (dB) =10 $\log_{10}$(TX Power in watts/0.001)-the levels in steps g) and l) | | |
| Test Date | 08/25/2018 | Environmental condition | Temperature 24°C<br>Relative Humidity 48%<br>Atmospheric Pressure 1009mbar |
| Remark | NONE | | |
| Result | ☒ Pass ☐ Fail | | |

Test Data ☐ Yes (See below) ☒ N/A

Test Plot ☒ Yes (See below) ☐ N/A

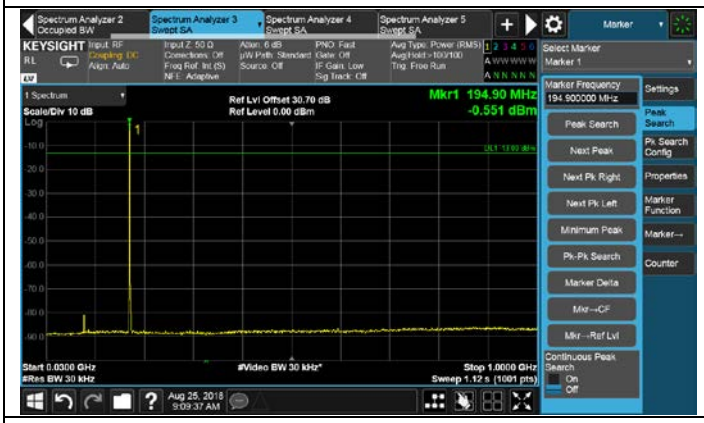
Test was done by *Deon Dai* at *RF test site*.

## Test Plots

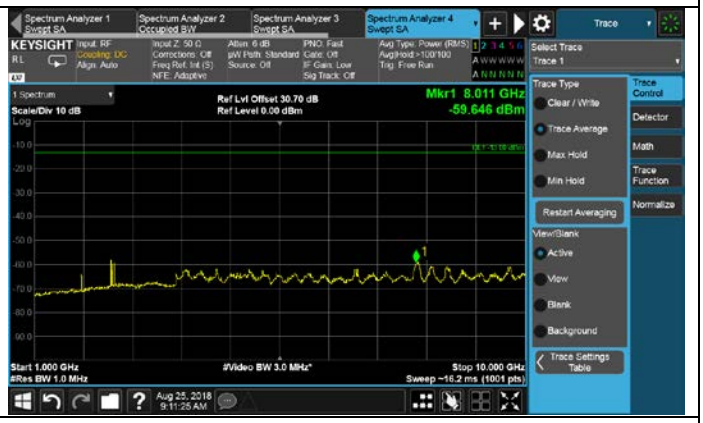



Low CH-Spurious Emission-Low

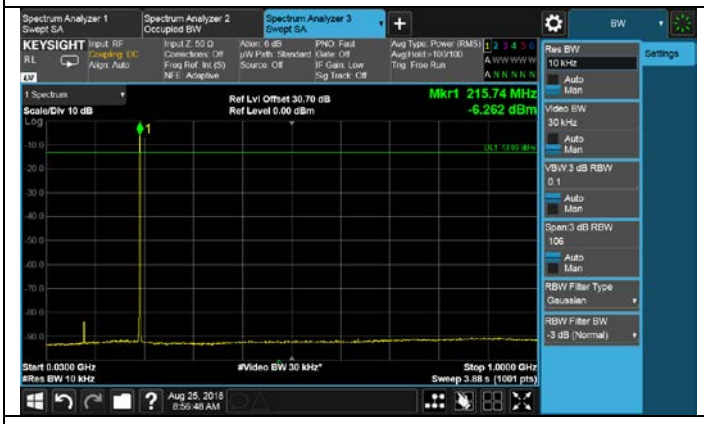

Low CH-Spurious Emission-High




Mid CH-Spurious Emission-Low




Mid CH-Spurious Emission-High

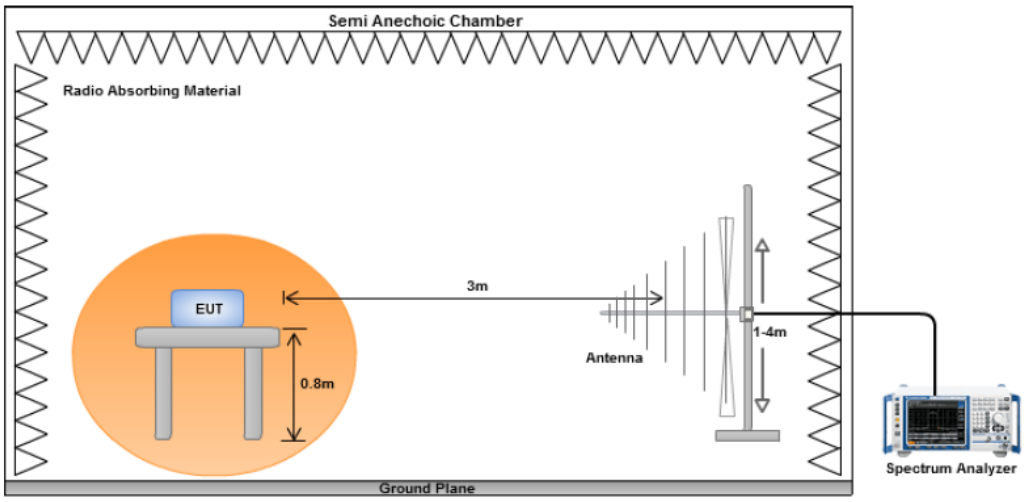


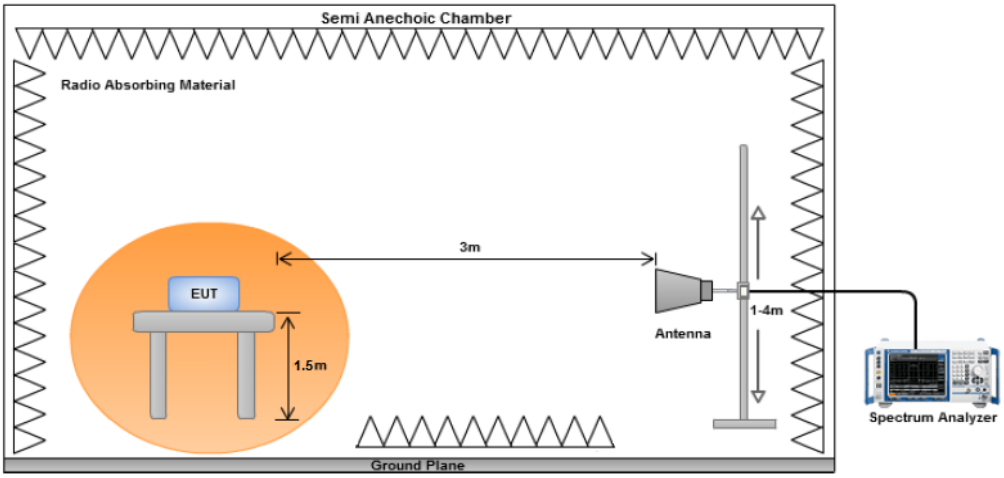

High CH-Spurious Emission-Low


High CH-Spurious Emission-High

## 10.7 Field Strength of Spurious Radiated

Requirement(s):

| Spec | Requirement | Applicable |
|---|---|---|
| FCC part74H<br>RSS-210 | FCC §74.861 (e) (6) (iii)<br>On any frequency removed from the operating frequency by more than 250 percent of the authorized bandwidth: at least 43 + 10log10 (mean output power in watts) dB.<br>FCC §74.861 (e) (7)<br>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. Digital emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in section 8.3.2.2 (Figure 4) 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). The requirements of this paragraph (e)(7) shall not apply to applications for certification of equipment in these bands until nine months after release of the Commission's Channel Reassignment Public Notice, as defined in §73.3700(a)(2) of this chapter. | ☒ |
| | Per RSS-210, Annex G, the transmitter unwanted emissions shall meet the requirements of ETSI EN 300 422-1 V1.4.2 (2011-08) section 8.4 | ☒ |
| Test Setup | Below 1G set up<br>  <br><br>Above 1G set up | |

<table>
<tr><td></td><td colspan="4"> 
</td></tr>
<tr><td>Procedure</td><td colspan="4">Substitution method:<br>1. The EUT was switched on and allowed to warm up to its normal operating condition.<br>2. The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner:<br>a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen.<br>b. The EUT was then rotated to the direction that gave the maximum emission.<br>c. Finally, the antenna height was adjusted to the height that gave the maximum emission.<br>3. Remove the transmitter and replace it with a substitution antenna (the antenna should be half-wavelength for each frequency involved). The centre of the substitution antenna should be approximately at the same location as the centre of the transmitter.<br>4. Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a non-radiating cable. With the antennas at both ends horizontally polarized, and with the signal generator tuned to a particular spurious frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained.<br>5. Steps 4 were repeated for the next frequency point, until all selected frequency points were measured.</td></tr>
<tr><td>Test Date</td><td>08/24/2018</td><td>Environmental condition</td><td>Temperature<br>Relative Humidity<br>Atmospheric Pressure</td><td>24°C<br>48%<br>1009mbar</td></tr>
<tr><td>Remark</td><td colspan="4">EUT was configured to high power setting</td></tr>
<tr><td>Result</td><td colspan="4">☒ Pass ☐ Fail</td></tr>
</table>

Test Data ☐ Yes (See below) ☒ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Test was done by *Deon Dai* at *RF test site*.

## Radiated Emission Test Results

Below 1G
Continue transmit mid channel

| Indicated | | | Test Antenna | | Substituted | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Frequency (MHz) | Raw (dBm) | Degree | Height (cm) | Polarity | Frequency (MHz) | Level (dBm) | Ant Gain (dBi) | Cable Loss (dB) | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
| 390.2 | -60.73 | 254 | 149 | V | 390.2 | -53.95 | 0 | 0.32 | -54.27 | -36 | -18.27 |
| 585.3 | -63.39 | 149 | 152 | V | 585.3 | -57.43 | 0 | 0.45 | -57.88 | -36 | -21.88 |
| 390.2 | -72.63 | 148 | 146 | H | 390.2 | -70.06 | 0 | 0.32 | -70.38 | -36 | -34.38 |
| 585.3 | -74.71 | 236 | 165 | H | 585.3 | -67.76 | 0 | 0.45 | -68.21 | -36 | -32.21 |

Note: Absolute Level (dBm) = Level (dBm) + Ant Gain (dBi) - Cable Loss (dB).

FCC limit is -13dBm, which is higher than RSS limit.

Above 1G

Low CH

| Indicated | | | Test Antenna | | Substituted | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Raw (dBm) | Degree | Height (cm) | Polarity | Frequency (MHz) | Level (dBm) | Ant Gain (dBi) | Cable Loss (dB) | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
| 1044.6 | -53.88 | 146 | 159 | V | 1044.6 | -47.51 | 4.83 | 0.98 | -43.66 | -30 | -13.66 |
| 1218.7 | -57.66 | 165 | 155 | V | 1218.7 | -51.67 | 6.08 | 1.44 | -47.03 | -30 | -17.03 |
| 1044.6 | -55.56 | 159 | 165 | H | 1044.6 | -50.12 | 4.83 | 0.98 | -46.27 | -30 | -16.27 |
| 1218.7 | -59.81 | 257 | 160 | H | 1218.7 | -52.89 | 6.08 | 1.44 | -48.25 | -30 | -18.25 |

Mid CH

| Indicated | | | Test Antenna | | Substituted | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Raw (dBm) | Degree | Height (cm) | Polarity | Frequency (MHz) | Level (dBm) | Ant Gain (dBi) | Cable Loss (dB) | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
| 1170.6 | -51.63 | 99 | 150 | V | 1170.6 | -46.97 | 6.08 | 1.44 | -42.33 | -30 | -12.33 |
| 1365.7 | -52.82 | 154 | 155 | V | 1365.7 | -50.27 | 6.9 | 1.21 | -44.58 | -30 | -14.58 |
| 1170.6 | -54.63 | 184 | 159 | H | 1170.6 | -49.23 | 6.08 | 1.44 | -44.59 | -30 | -14.59 |
| 1365.7 | -54.13 | 244 | 148 | H | 1365.7 | -49.2 | 6.9 | 1.21 | -43.51 | -30 | -13.51 |

High CH

| Indicated | | | Test Antenna | | Substituted | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Raw (dBm) | Degree | Height (cm) | Polarity | Frequency (MHz) | Level (dBm) | Ant Gain (dBi) | Cable Loss (dB) | Absolute Level (dBm) | Limit (dBm) | Margin (dB) |
| 1078.8 | -53.64 | 214 | 149 | V | 1078.8 | -47.94 | 5.27 | 1.15 | -43.82 | -30 | -13.82 |
| 1294.5 | -60.12 | 149 | 156 | V | 1294.5 | -53.47 | 6.56 | 1.24 | -48.15 | -30 | -18.15 |
| 1078.8 | -56.33 | 29 | 148 | H | 1078.8 | -50.78 | 5.27 | 1.15 | -46.66 | -30 | -16.66 |
| 1294.5 | -60.21 | 198 | 198 | H | 1294.5 | -54.81 | 6.56 | 1.24 | -49.49 | -30 | -19.49 |

Note: Absolute Level (dBm) = Level (dBm) + Ant Gain (dBi) - Cable Loss (dB).

FCC limit is -13dBm, which is higher than RSS limit.

# Annex A. TEST INSTRUMENT

| Instrument | Model | Serial # | Cal Date | Cal Cycle | Cal Due | In use |
| --- | --- | --- | --- | --- | --- | --- |
| Radiated Emissions | | | | | | |
| EMI Test Receiver | ESIB 40 | 100179 | 06/03/2018 | 1 Year | 06/03/2019 | ☑ |
| Bi-Log antenna (30MHz~2GHz) | JB1 | A030702 | 03/05/2018 | 1 Year | 03/05/2020 | ☑ |
| Horn Antenna (1-18GHz) | 3115 | 10SL0059 | 11/09/2017 | 1 Year | 11/09/2018 | ☑ |
| Pre-Amplifier | LPA-6-30 | 11140711 | 02/19/2018 | 1 Year | 07/19/2019 | ☑ |
| RF Conducted Measurement | | | | | | |
| Spectrum Analyzer | N9010A | MY51440112 | 10/27/2017 | 1 Year | 10/27/2018 | ☑ |
| Temperature/Humidity Chamber | 1007H | 61201 | 07/31/2018 | 1 Year | 07/31/2019 | ☑ |
| Waveform generator | 33220A | MY50210206 | 09/22/2017 | 1 Year | 09/22/2018 | ☑ |

# Annex B. SIEMIC Accreditation

| Accreditations | Document | Scope / Remark |
|---|---|---|
| ISO 17025 (A2LA) | | Please see the documents for the detailed scope |
| ISO Guide 65 (A2LA) | | Please see the documents for the detailed scope |
| TCB Designation | | A1, A2, A3, A4, B1, B2, B3, B4, C |
| FCC DoC Accreditation | | FCC Declaration of Conformity Accreditation |
| FCC Site Registration | | 3 meter site |
| FCC Site Registration | | 10 meter site |
| IC Site Registration | | 3 meter site |
| IC Site Registration | | 10 meter site |
| EU NB | | Radio & Telecommunications Terminal Equipment:<br>EN45001 – EN ISO/IEC 17025 |
| | | Electromagnetic Compatibility:<br>EN45001 – EN ISO/IEC 17025 |
| Singapore iDA<br>CB(Certification Body) | | Phase I, Phase II |
| Vietnam MIC<br>CAB Accreditation | | Please see the document for the detailed scope |
| HongKong OFCA | | (Phase II) OFCA Foreign Certification Body for Radio and Telecom |
| | | (Phase I) Conformity Assessment Body for Radio and Telecom |
| Industry Canada CAB | | Radio: Scope A – All Radio Standard Specification in Category I |
| | | Telecom: CS-03 Part I, II, V, VI, VII, VIII |

| | | |
|---|---|---|
| Japan Recognized Certification Body Designation | | Radio: A1. Terminal equipment for purpose of calling<br>Telecom: B1. Specified radio equipment specified in Article 38-2, Paragraph 1, Item 1 of the Radio Law |
| Korea CAB Accreditation | | EMI: KCC Notice 2008-39, RRL Notice 2008-3: CA Procedures for EMI<br>KN22: Test Method for EMIEMS: KCC Notice 2008-38, RRL Notice 2008-4: CA Procedures for EMS<br>KN24, KN61000-4-2, -4-3, -4-4, -4-5, -4-6, -4-8, -4-11: Test Method for EMS |
| | | Radio: RRL Notice 2008-26, RRL Notice 2008-2, RRL Notice 2008-10, RRL Notice 2007-49, RRL Notice 2007-20, RRL Notice 2007-21, RRL Notice 2007-80, RRL Notice 2004-68 |
| | | Telecom: President Notice 20664, RRL Notice 2007-30, RRL Notice 2008-7 with attachments 1, 3, 5, 6; President Notice 20664, RRL Notice 2008-7 with attachment 4 |
| Taiwan NCC CAB Recognition | | LP0002, PSTN01, ADSL01, ID0002, IS6100, CNS14336, PLMN07, PLMN01, PLMN08 |
| Taiwan BSMI CAB Recognition | | CNS 13438 |
| Japan VCCI | | R-3083: Radiation 3 meter site<br>C-3421: Main Ports Conducted Interference Measurement<br>T-1597: Telecommunication Ports Conducted Interference Measurement |
| Australia CAB Recognition | | EMC: AS/NZS CISPR 11, AS/NZS CISPR 14.1, AS/NZS CISPR22, AS/NZS 61000.6.3, AS/NZS 61000.6.4 |
| | | Radio communications: AS/NZS 4281, AS/NZS 4268, AS/NZS 4280.1, AS/NZS 4280.2, AS/NZS 4295, AS/NZS 4582, AS/NZS 4583, AS/NZS 4769.1, AS/NZS 4769.2, AS/NZS 4770, AS/NZS 4771 |
| | | Telecommunications: AS/ACIF S002:05, AS/ACIF S003:06, AS/ACIF S004:06 AS/ACIF S006:01, AS/ACIF S016:01, AS/ACIF S031:01, AS/ACIF S038:01, AS/ACIF S040:01, AS/ACIF S041:05, AS/ACIF S043.2:06, AS/ACIF S60950.1 |
| Australia NATA Recognition | | AS/ACIF S002, AS/ACIF S003, AS/ACIF S004, AS/ACIF S006, AS/ACIF S016,AS/ACIF S031, AS/ACIF S038, AS/ACIF S040, AS/ACIF S041, AS/ACIF S043.2 |