

# RF TEST REPORT



Report No.: FCC\_IC\_RF\_SL17080301-SHU-008\_MXC630  
Supersede Report No.: NONE

|   |   |  |
|---|---|--|
| Applicant                                       | : | Shure Incorporated   |
| Product Name                                    | : | 6000 Wired Discussion System   |
| Model No.                                       | : | MXC630   |
| Test Standard                                   | : | FCC 15.225<br>RSS-210 Issue 9: 2016                                    |
| Test Method                                     | : | FCC 15.225<br>ANSI C63.10 2013<br>RSS Gen Issue 4 2014                 |
| FCC ID  | : | DD4MXCNFC1   |
| IC ID   | : | 616A-MXCNFC1   |
| Dates of test                                   | : | 12/12/2017 – 12/15/2017  |
| Issue Date                                      | : | 02/12/2018   |
| Test Result                                     | : | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail |
| Equipment complied with the specification       |   | [X]  |
| Equipment did not comply with the specification |   | [ ]  |

This Test Report is Issued Under the Authority of:

|  |                   |
|--|-------------------|
|  |                   |
| <b>Rachana Khanduri</b>  | <b>Chen Ge</b>    |
| Test Engineer  | Engineer Reviewer |
| This test report may be reproduced in full only<br>Test result presented in this test report is applicable to the tested sample only |                   |

Issued By:

SIEMIC Laboratories  
775 Montague Expressway, Milpitas, CA 95035



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## Laboratory Introduction

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| 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     |
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| 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 & Radio Equipment Directive (RED) |
| Japan     | MIC (RCB 208)      | RF, Telecom                           |
| Hong Kong | OFTA (US002)       | RF, Telecom                           |

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## 1 Report Revision History

| Report No.                          | Report Version | Description | Issue Date |
|-------------------------------------|----------------|-------------|------------|
| FCC_IC_RF_SL17080301-SHU-008_MXC630 | None           | Original    | 02/12/2018 |
|                                     |                |             |            |

## 2 Executive Summary

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

Company: Shure Incorporated  
Product: 6000 Wired Discussion System  
Model: MXC630

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

## 3 Customer information

|                      |   |                                     |
|----------------------|---|-------------------------------------|
| Applicant Name       | : | Shure Incorporated                  |
| Applicant Address    | : | 5800 Touhy Ave, Niles, IL 60714 USA |
| Manufacturer Name    | : | Shure Incorporated                  |
| Manufacturer Address | : | 5800 Touhy Ave, Niles, IL 60714 USA |

## 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 |
|-------|------|-------------|------|
| -     | -    | -           | -    |

## 6 EUT Information

### 6.1 EUT Description

|                           |   |   |
|---------------------------|---|---|
| Product Name              | : | 6000 Wired Discussion System                                    |
| Model No.                 | : | MXC630  |
| Trade Name                | : | SHURE   |
| Serial No.                | : | N/A   |
| Input Power               | : | 3.6VDC  |
| Hardware version          | : | N/A   |
| Software version          | : | N/A   |
| Date of EUT received      | : | 11/12/2017  |
| Equipment Class/ Category | : | DCD   |
| Working Frequencies       | : | 13.56MHz  |
| Port/Connectors           | : | Microphone Connector, RJ45 (input and output), 3.5mm audio jack |

### 6.2 Radio Description

#### Specifications for Radio:

| Radio Type             | RFID                    |
|------------------------|-------------------------|
| Operating Frequency    | 13.56MHz                |
| Modulation             | ASK (13.56MHz)          |
| Channel Spacing        | None                    |
| Antenna Type           | PCB                     |
| Antenna Gain           | -39.9 dBi (NFC Coupler) |
| Antenna Connector Type | N/A                     |

#### Channel List:

| Type | Mode     | Channel No. | Frequency (MHz) | Available (Y/N) |
|------|----------|-------------|-----------------|-----------------|
| RFID | 13.56MHz | 1           | 13.56           | Y               |

### 6.3 EUT test modes/configuration Description

| Mode              | Note   |
|-------------------|--|
| RF test           | EUT is set to continuously transmit at 13.56MHz. |
|                   |  |
|                   |  |
| <b>Note:</b> None |  |

| Test Item  | Operating mode      | Tested antenna port | Test frequencies |
|--|---------------------|---------------------|------------------|
| Antenna Requirement  | N/A                 | -                   | 13.56MHz         |
| Conducted Emissions Voltage                                      | Continuous Transmit | -                   |                  |
| Limit in the band of 13.553 – 13.567 MHz                         | Continuous Transmit | -                   |                  |
| Limit in the band of 13.410 – 13.553 MHz and 13.567 – 13.710 MHz | Continuous Transmit | -                   |                  |
| Limit in the band of 13.110 – 13.410 MHz and 13.710 – 14.010 MHz | Continuous Transmit | -                   |                  |
| Limit outside the band of 13.110 – 14.010 MHz                    | Continuous Transmit | -                   |                  |
| Frequency Stability  | Continuous Transmit | -                   |                  |
| Occupied Bandwidth   | Continuous Transmit | -                   |                  |

**Note:** EUT uses a PCB trace antenna attached to the PCB board. Only radiated measurements were performed during the test.

#### 6.4 EUT Photos – External



EUT with Microphone



EUT – Microphone Detached View



EUT – Top View



EUT – Bottom View

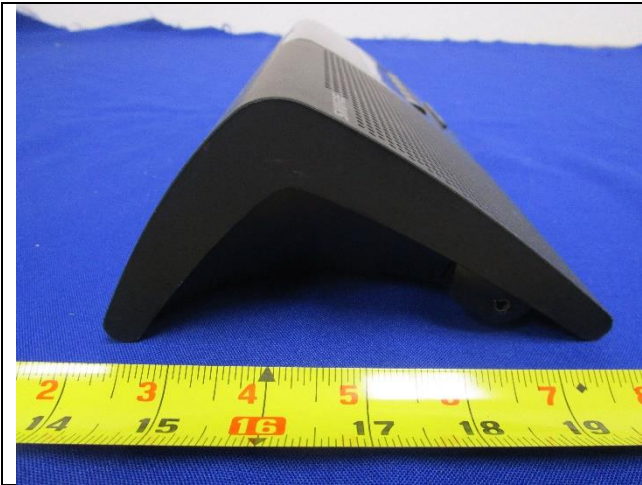


EUT – Front View



EUT – Rear View





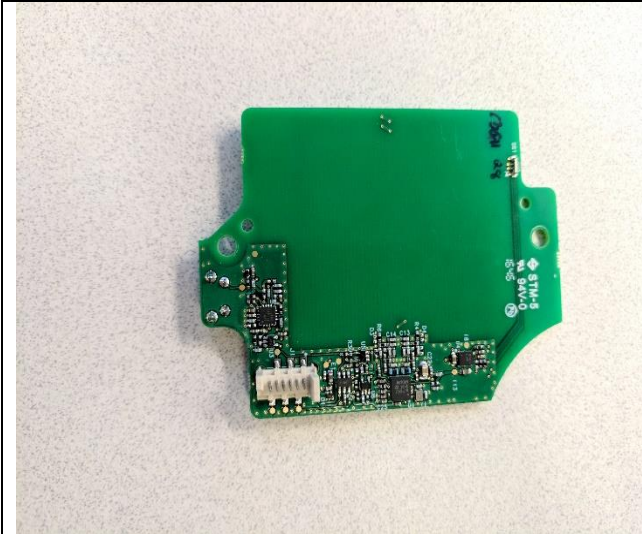
EUT – Left side View



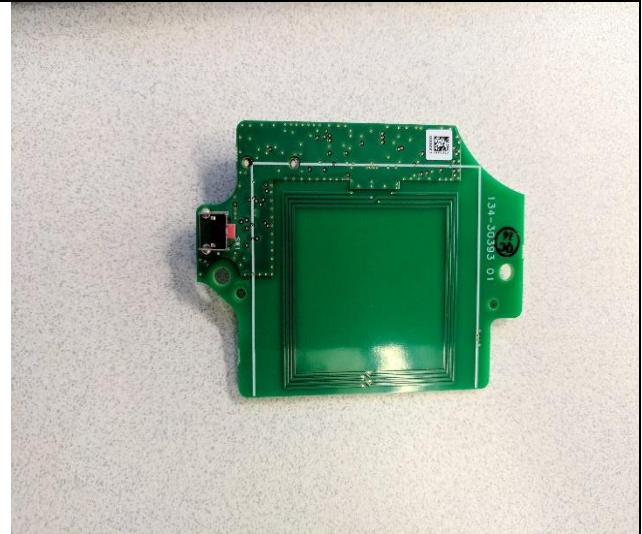
EUT – Right side View

## 6.5 EUT Photos – Internal

Module:



NFC PCBA -Top View



NFC PCBA-Bottom View

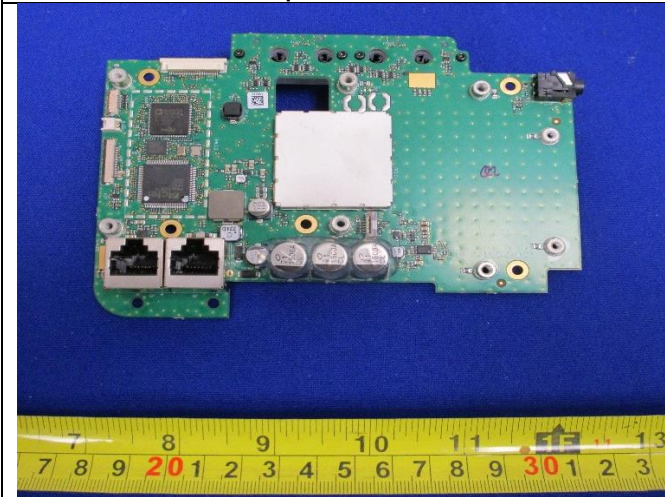
Host:



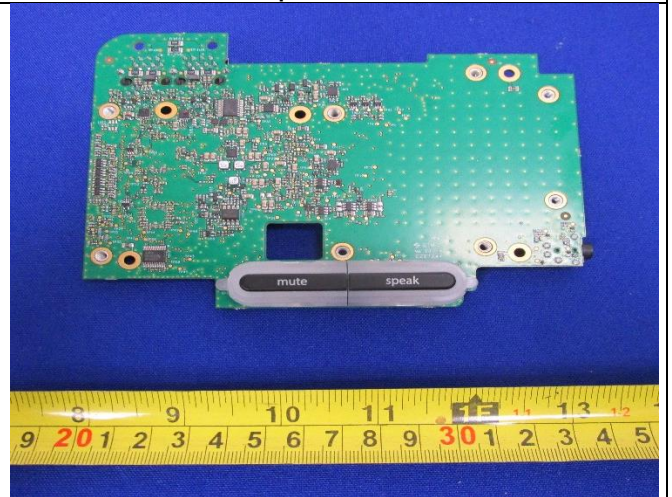
EUT Open Case View 1



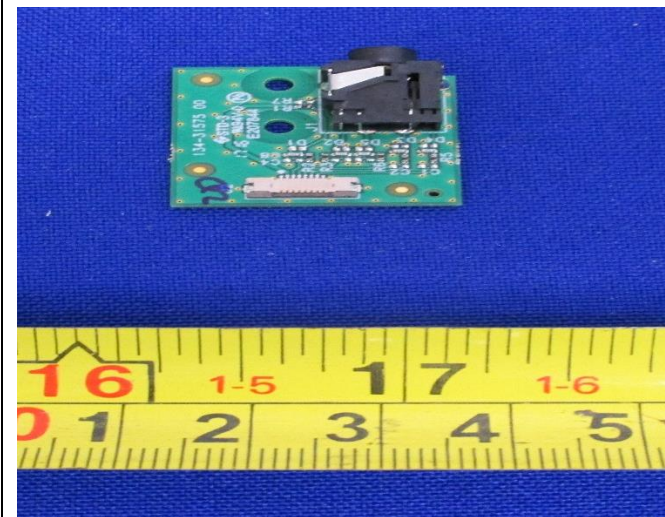
EUT Open Case View 2



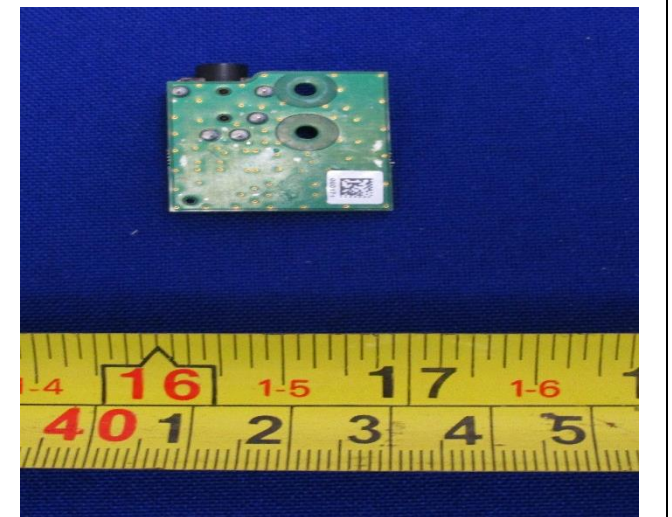
PCB Board 1 Top View



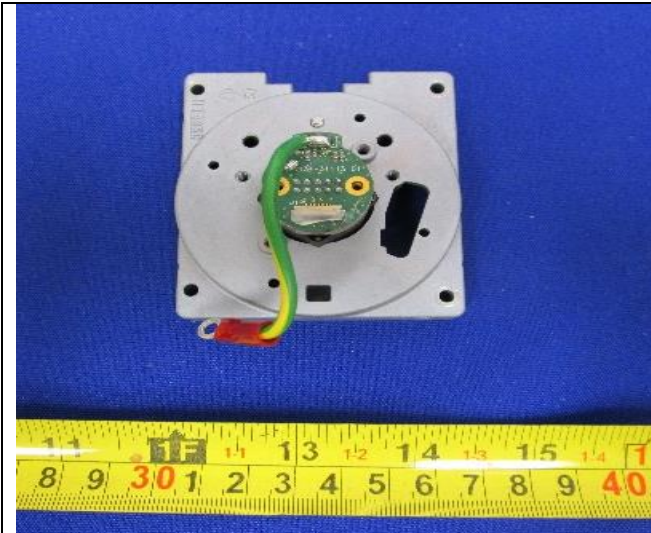
PCB Board 1 Bottom View



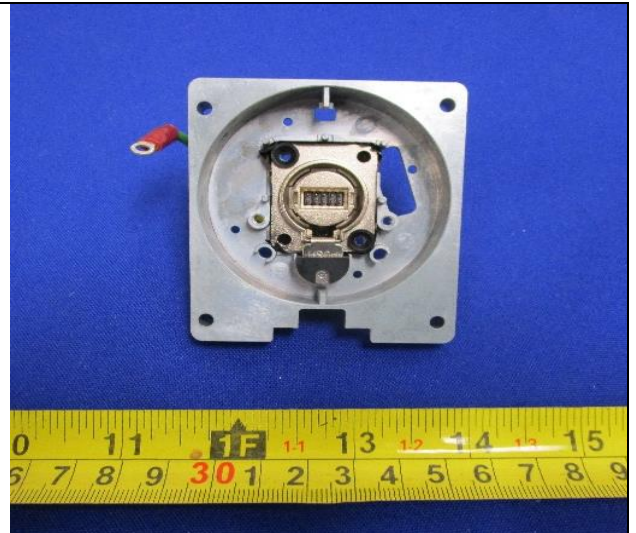
PCB Board 2 Top View



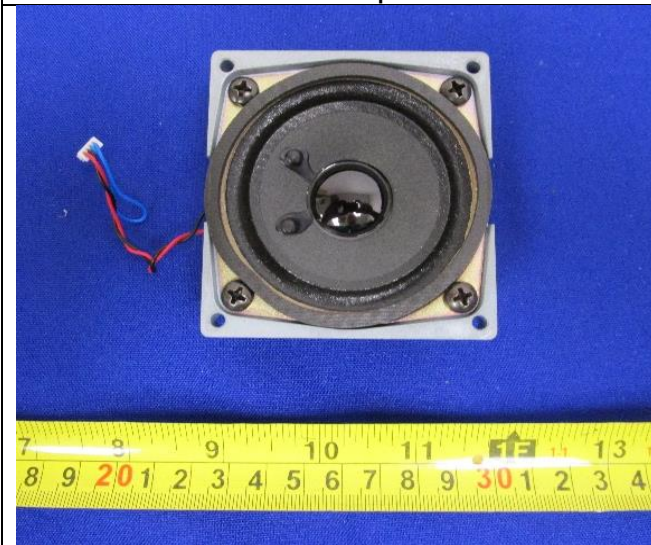
PCB Board 2 Bottom View



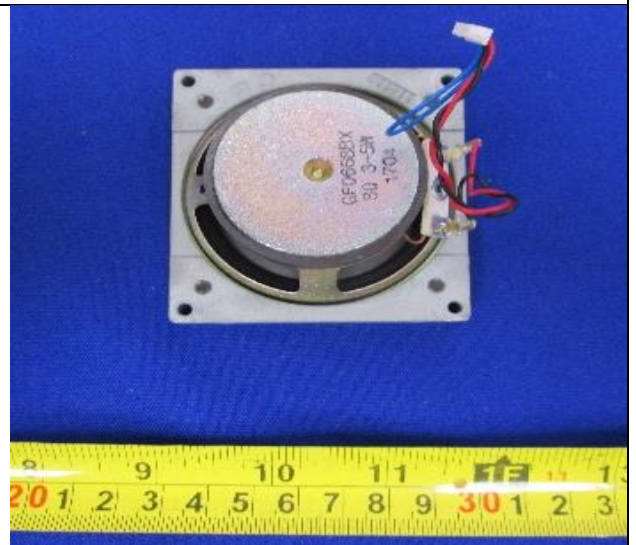
PCB Board 3 Top View



PCB Board 3 Bottom View

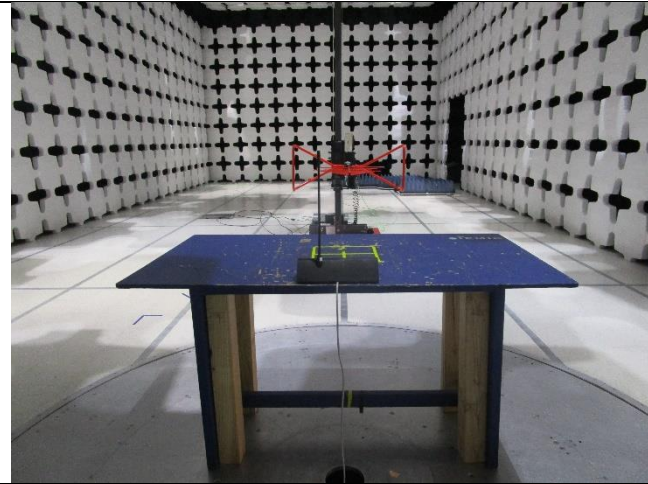


Speaker Top View

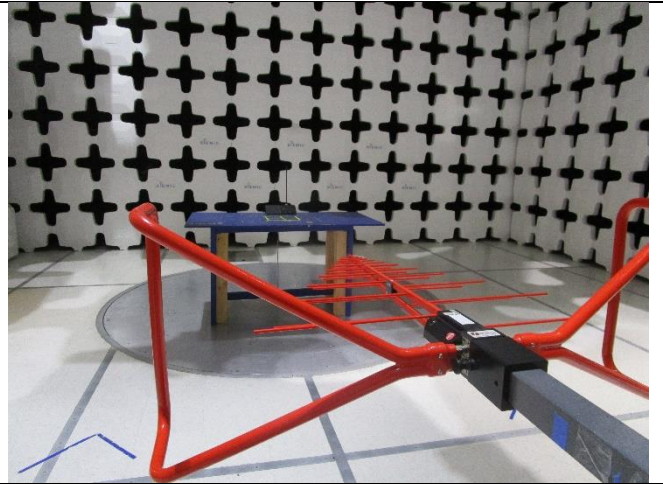


Speaker Bottom View

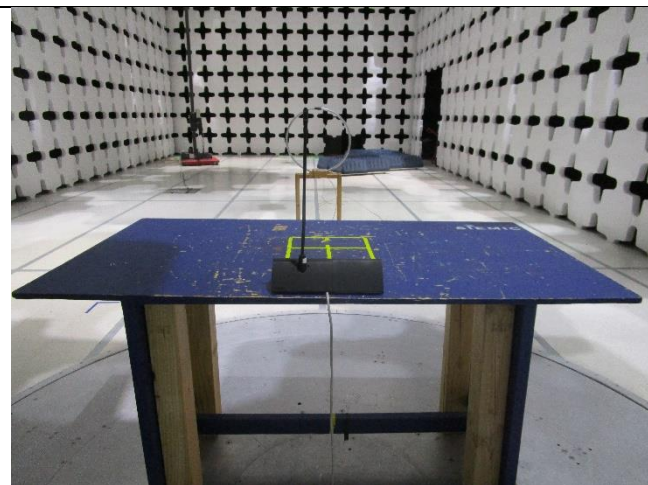
## 6.6 EUT Test Setup Photos



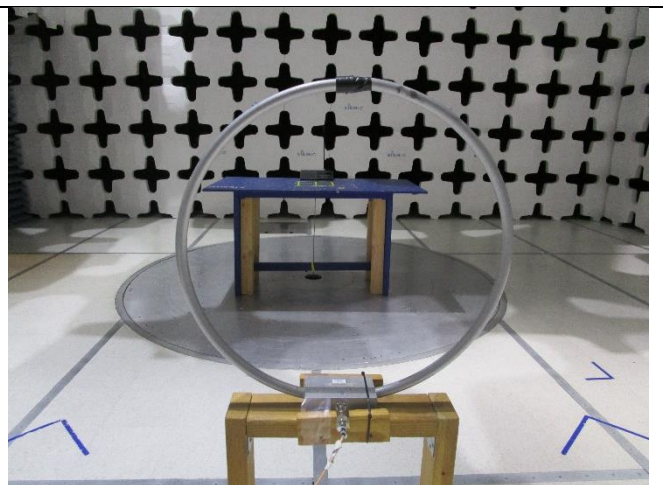
Radiated Emissions (<1GHz) – Front View



Radiated Emissions (<1GHz) – Rear View



Radiated Emissions (<30MHz) – Front View



Radiated Emissions (<30MHz) – Rear View

## 7 Supporting Equipment/Software and cabling Description

### 7.1 Supporting Equipment

| Index | Supporting Equipment Description | Model                | Serial No | Manu  | Note |
|-------|----------------------------------|----------------------|-----------|-------|------|
| 1     | Laptop                           | PP01L Latitude E5440 | F1WPF12   | Dell  | -    |
| 2     | Central Control Unit             | DIS-CCU              | 1723-02D  | SHURE | -    |

### 7.2 Cabling Description

| Name | Connection Start     |          | Connection Stop |          | Length / shielding Info |            | Note |
|------|----------------------|----------|-----------------|----------|-------------------------|------------|------|
|      | From                 | I/O Port | To              | I/O Port | Length (m)              | Shielding  |      |
| RJ45 | Central Control Unit | RJ45     | EUT             | RJ45     | 2                       | Unshielded | -    |

### 7.3 Test Software Description

| Test Item  | Software  | Description   |
|------------|-----------|---|
| RF Testing | Tera Term | Set the EUT to transmit continuously in different test mode |
|            |           |   |

## 8 Test Summary

| Test Item                      | Test standard   |                 | Test Method/Procedure                                      | Pass / Fail                               |
|--------------------------------|---|-----------------|--|---|
| Antenna Requirement            | FCC   | 15.203          | ANSI C63.10 – 2013<br>558074 D01 DTS Meas. Guidance v03r02 | <input checked="" type="checkbox"/> Pass  |
|                                | IC  |                 |  | <input type="checkbox"/> N/A              |
| AC Conducted Emissions Voltage | FCC   | 15.225(a)       | ANSI C63.10 2013<br>RSS Gen. 8.8                           | <input checked="" type="checkbox"/> Pass* |
|                                | IC  | RSS Gen (7.2.2) |  | <input type="checkbox"/> N/A              |
| Remark                         | 1. AC Line tests were performed on the support equipment's power adapter, laptop. |                 |  |   |

| Test Item   | Test standard   |                   | Test Method/Procedure | Pass / Fail      |  |
|---|---|-------------------|-----------------------|------------------|--|
| Limit in the band of 13.553 – 13.567 MHz                            | FCC   | 15.225(a)         | FCC                   | ANSI C63.10 2013 | <input checked="" type="checkbox"/> Pass                                 |
|   | IC  | RSS210(A2.6)      | IC                    | RSS Gen 6.13     | <input type="checkbox"/> N/A   |
| Limit in the band of 13.410 – 13.553 MHz<br>and 13.567 – 13.710 MHz | FCC   | 15.225(b)         | FCC                   | ANSI C63.10 2013 | <input checked="" type="checkbox"/> Pass                                 |
|   | IC  | RSS210(A2.6)      | IC                    | RSS Gen 6.13     | <input type="checkbox"/> N/A   |
| Limit in the band of 13.110 – 13.410 MHz<br>and 13.710 – 14.010 MHz | FCC   | 15.225(c)         | FCC                   | ANSI C63.10 2013 | <input checked="" type="checkbox"/> Pass                                 |
|   | IC  | RSS210(A2.6)      | IC                    | RSS Gen 6.13     | <input type="checkbox"/> N/A   |
| Limit outside the band of<br>13.110 – 14.010 MHz                    | FCC   | 15.225(d), 15.209 | FCC                   | ANSI C63.10 2013 | <input checked="" type="checkbox"/> Pass                                 |
|   | IC  | RSS210(A2.6)      | IC                    | RSS Gen 6.13     | <input type="checkbox"/> N/A   |
| Receiver Spurious Emission  | IC  | -                 | IC                    | RSS Gen 7.1      | <input type="checkbox"/> Pass<br><input checked="" type="checkbox"/> N/A |
| Frequency Stability   | FCC   | 15.225(e)         | FCC                   | -                | <input checked="" type="checkbox"/> Pass*                                |
|   | IC  | RSS210(A2.6)      | IC                    | RSS Gen 6.11     | <input type="checkbox"/> N/A   |
| Occupied Bandwidth  | FCC   | -                 | FCC                   | -                | <input checked="" type="checkbox"/> Pass*                                |
|   | IC  | RSS-210(5.9.1)    | IC                    | RSS Gen 6.6      | <input type="checkbox"/> N/A   |
| Remark  | <ol style="list-style-type: none"> <li>All measurement uncertainties are not taken into consideration for all presented test result.</li> <li>The applicant shall ensure frequency stability by showing that an emission is maintained within the band of operation under all normal operating conditions as specified in the user's manual.</li> <li>Pass* - Please refer to test report FCC_IC_RF_SL17080301-SHU-008_MXC620 test report.</li> </ol> |                   |                       |                  |  |

## 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            |
| <b>Expanded Uncertainty (K=2)</b> |            |                          |          |                         | <b>6.0118262</b>     |

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               |
| <b>Expanded Uncertainty (K=2)</b> |            |                          |          |                         | <b>8.4726</b>        |

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             |
| <b>Expanded Uncertainty (K=2)</b> |            |                          |          |                         | <b>0.952174</b>      |

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

## 10 Measurements, examination and derived results

### 10.1 Antenna Requirement

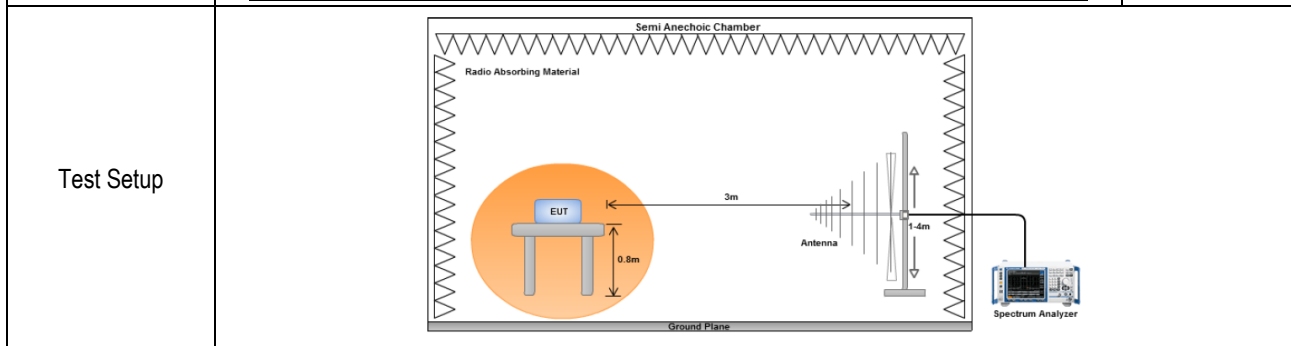
| Spec    | Requirement  | Applicable                          |
|---------|--|-------------------------------------|
| §15.203 | <p>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.</p> <p>Antenna requirement must meet at least one of the following:</p> <p>a) Antenna must be permanently attached to the device.<br/> b) The antenna must use a unique type of connector to attach to the device.<br/> c) Device must be professionally installed. The installer shall be responsible for ensuring that the correct antenna is employed by the device.</p> | <input checked="" type="checkbox"/> |
| Remark  | The NFC antenna is integral to the PCB board permanently to the device which meets the requirement (See Internal Photographs submitted as another Exhibit).  |                                     |
| Result  | <input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL   |                                     |

## 10.2 Radiated Measurements

### 10.2.1 Radiated Measurements 30MHz to 1GHz

**Requirement(s):**

| Spec                             | Requirement   | Applicable            |                       |         |     |          |     |         |     |           |     |   |
|----------------------------------|---|-----------------------|-----------------------|---------|-----|----------|-----|---------|-----|-----------|-----|---|
| 47 CFR §15.225<br>RSS-210 (A2.6) | <p>Operation within the band 13.110–14.010 MHz:</p> <p>(a) The field strength of any emissions within the band 13.553–13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.</p> <p>(b) Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.</p> <p>(c) Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.</p> <p>(d) The field strength of any emissions appearing outside of the 13.110–14.010 MHz band shall not exceed the general radiated emission limits in §15.209.</p> <table border="1"> <thead> <tr> <th>Frequency range (MHz)</th> <th>Field Strength (uV/m)</th> </tr> </thead> <tbody> <tr> <td>30 – 88</td> <td>100</td> </tr> <tr> <td>88 – 216</td> <td>150</td> </tr> <tr> <td>216 960</td> <td>200</td> </tr> <tr> <td>Above 960</td> <td>500</td> </tr> </tbody> </table> | Frequency range (MHz) | Field Strength (uV/m) | 30 – 88 | 100 | 88 – 216 | 150 | 216 960 | 200 | Above 960 | 500 | ☒ |
| Frequency range (MHz)            | Field Strength (uV/m)   |                       |                       |         |     |          |     |         |     |           |     |   |
| 30 – 88                          | 100   |                       |                       |         |     |          |     |         |     |           |     |   |
| 88 – 216                         | 150   |                       |                       |         |     |          |     |         |     |           |     |   |
| 216 960                          | 200   |                       |                       |         |     |          |     |         |     |           |     |   |
| Above 960                        | 500   |                       |                       |         |     |          |     |         |     |           |     |   |



|                  |  |
|------------------|--|
| <b>Procedure</b> | <ol style="list-style-type: none"> <li>The EUT was switched on and allowed to warm up to its normal operating condition.</li> <li>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: <ol style="list-style-type: none"> <li>Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen.</li> <li>The EUT was then rotated to the direction that gave the maximum emission.</li> <li>Finally, the antenna height was adjusted to the height that gave the maximum emission.</li> </ol> </li> <li>A Quasi-peak measurement was then made for that frequency point.</li> <li>Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.</li> </ol> |
|------------------|--|

|                  |  |                                 |  |
|------------------|--|---------------------------------|--|
| <b>Test Date</b> | 12/13/2017   | <b>Environmental conditions</b> | Temperature 20.1°C<br>Relative Humidity 36%<br>Atmospheric Pressure 1026mbar |
| <b>Remark</b>    | -  |                                 |  |
| <b>Result</b>    | <input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail |                                 |  |

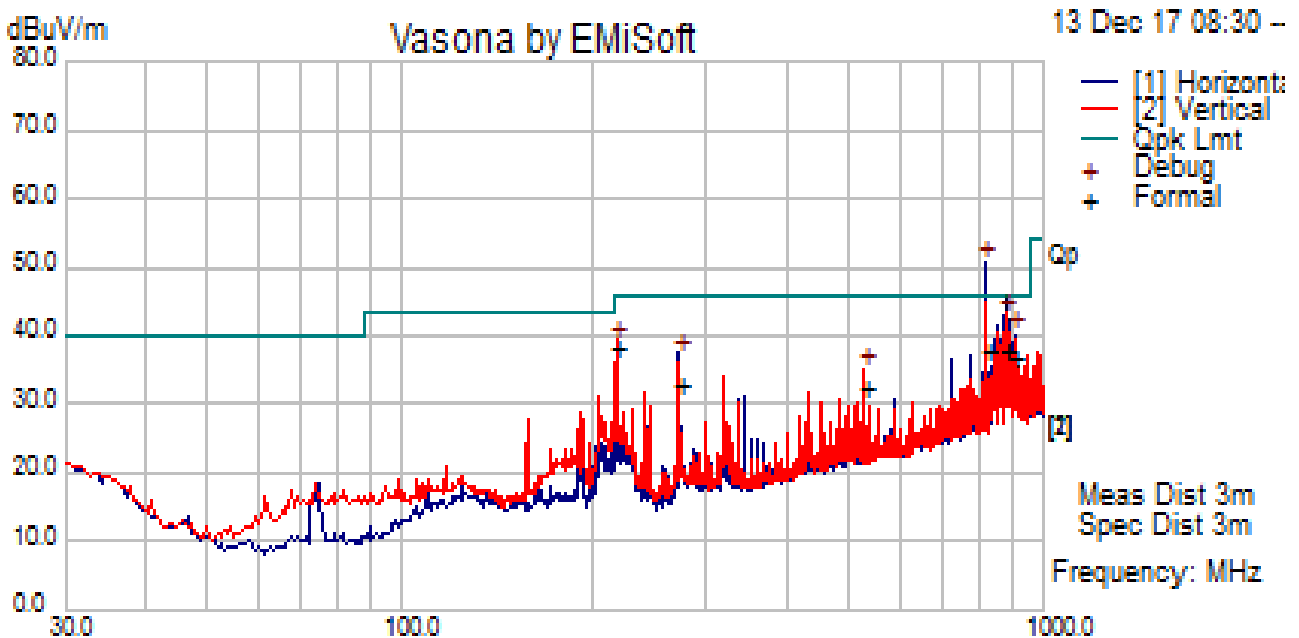
**Test Data**     Yes (See below)       N/A

**Test Plot**     Yes (See below)       N/A

**Test was done by Rachana Khanduri at 10 meter chamber.**

|                     |  |  |   |
|---------------------|--|--|---|
| Test specification: | Radiated Emissions                                   |  |   |
| Mains Power:        | 120VAC, 60Hz   |  | Result: <input checked="" type="checkbox"/> Pass<br><input type="checkbox"/> Fail |
| Tested by:          | Rachana Khanduri                                     |  |   |
| Test Date:          | 12/13/2017   |  |   |
| Remarks:            | <b>f=30MHz – 1000MHz Measurements at 3m distance</b> |  |   |

f=30MHz – 1000MHz plot and 3-meter distance

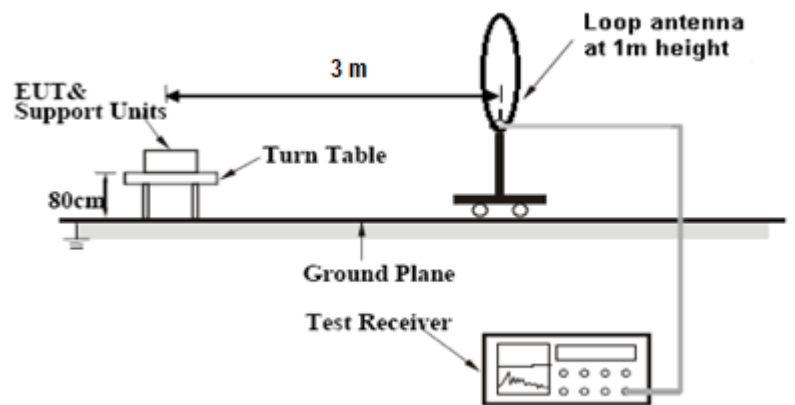


f=30MHz – 1000MHz Measurements

| Frequency MHz | Raw dB $\mu$ V/m | Cable Loss | AF dB  | Level dB $\mu$ V/m | Measurement Type | Pol | Hgt cm | Azt Deg | Limit dB $\mu$ V/m | Margin dB | Pass /Fail |
|---------------|------------------|------------|--------|--------------------|------------------|-----|--------|---------|--------------------|-----------|------------|
| 815.99        | 36.37            | 16.16      | -14.98 | 37.54              | Quasi Max        | V   | 104    | 138     | 46                 | -8.46     | Pass       |
| 872.45        | 35.42            | 16.40      | -14.21 | 37.60              | Quasi Max        | H   | 153    | 157     | 46                 | -8.40     | Pass       |
| 905.22        | 33.46            | 16.66      | -13.41 | 36.71              | Quasi Max        | H   | 254    | 128     | 46                 | -9.29     | Pass       |
| 216.98        | 51.03            | 12.97      | -25.82 | 38.18              | Quasi Max        | V   | 116    | 301     | 46                 | -7.82     | Pass       |
| 271.20        | 42.93            | 13.32      | -23.60 | 32.66              | Quasi Max        | V   | 169    | 307     | 46                 | -13.34    | Pass       |
| 527.99        | 36.06            | 14.81      | -18.72 | 32.15              | Quasi Max        | V   | 266    | 5       | 46                 | -13.85    | Pass       |

## 10.2.2 Radiated Measurements below 30MHz

### Requirement(s):

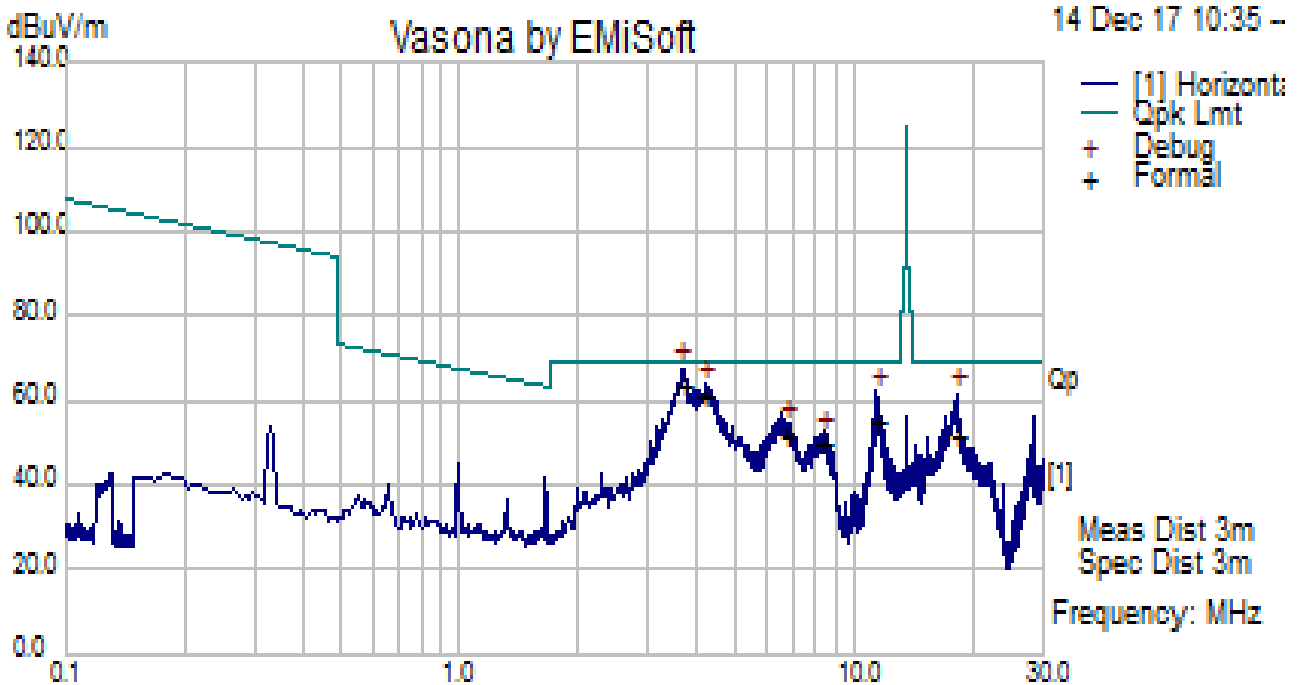
| Spec                             | Requirement  | Applicable  |                          |             |      |  |                   |     |  |                      |          |
|----------------------------------|--|---|--------------------------|-------------|------|--|-------------------|-----|--|----------------------|----------|
| 47 CFR §15.225<br>RSS-210 (A2.6) | <p>Operation within the band 13.110–14.010 MHz</p> <p>(a) The field strength of any emissions within the band 13.553–13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.</p> <p>(b) Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.</p> <p>(c) Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.</p> <p>(d) The field strength of any emissions appearing outside of the 13.110–14.010 MHz band shall not exceed the general radiated emission limits in §15.209.</p> | ☒   |                          |             |      |  |                   |     |  |                      |          |
| Test Setup                       |   |   |                          |             |      |  |                   |     |  |                      |          |
| Procedure                        | <p>For &lt; 30MHz, Radiated emissions were measured according to ANSI C63.10. The EUT was set to transmit at the highest output power.</p> <p>The EUT was set 3 meter away from the measuring antenna. The loop antenna was positioned 1 meter above the ground from the center of the loop. The measuring bandwidth was set to 10 kHz.</p> <p>The limit is converted from microvolt/meter to decibel microvolt/meter.</p>   |   |                          |             |      |  |                   |     |  |                      |          |
| Test Date                        | 12/14/2017   | <table border="1"> <tr> <td>Environmental conditions</td> <td>Temperature</td> <td>22°C</td> </tr> <tr> <td></td> <td>Relative Humidity</td> <td>40%</td> </tr> <tr> <td></td> <td>Atmospheric Pressure</td> <td>1026mbar</td> </tr> </table> | Environmental conditions | Temperature | 22°C |  | Relative Humidity | 40% |  | Atmospheric Pressure | 1026mbar |
| Environmental conditions         | Temperature  | 22°C  |                          |             |      |  |                   |     |  |                      |          |
|                                  | Relative Humidity  | 40%   |                          |             |      |  |                   |     |  |                      |          |
|                                  | Atmospheric Pressure   | 1026mbar  |                          |             |      |  |                   |     |  |                      |          |
| Remark                           | -  |   |                          |             |      |  |                   |     |  |                      |          |
| Result                           | ☒ Pass      ☐ Fail   |   |                          |             |      |  |                   |     |  |                      |          |

Test Data    ☒ Yes (See below)      ☐ N/A

Test Plot    ☒ Yes (See below)      ☐ N/A

Test was done by Rachana Khanduri at 10 meter chamber.

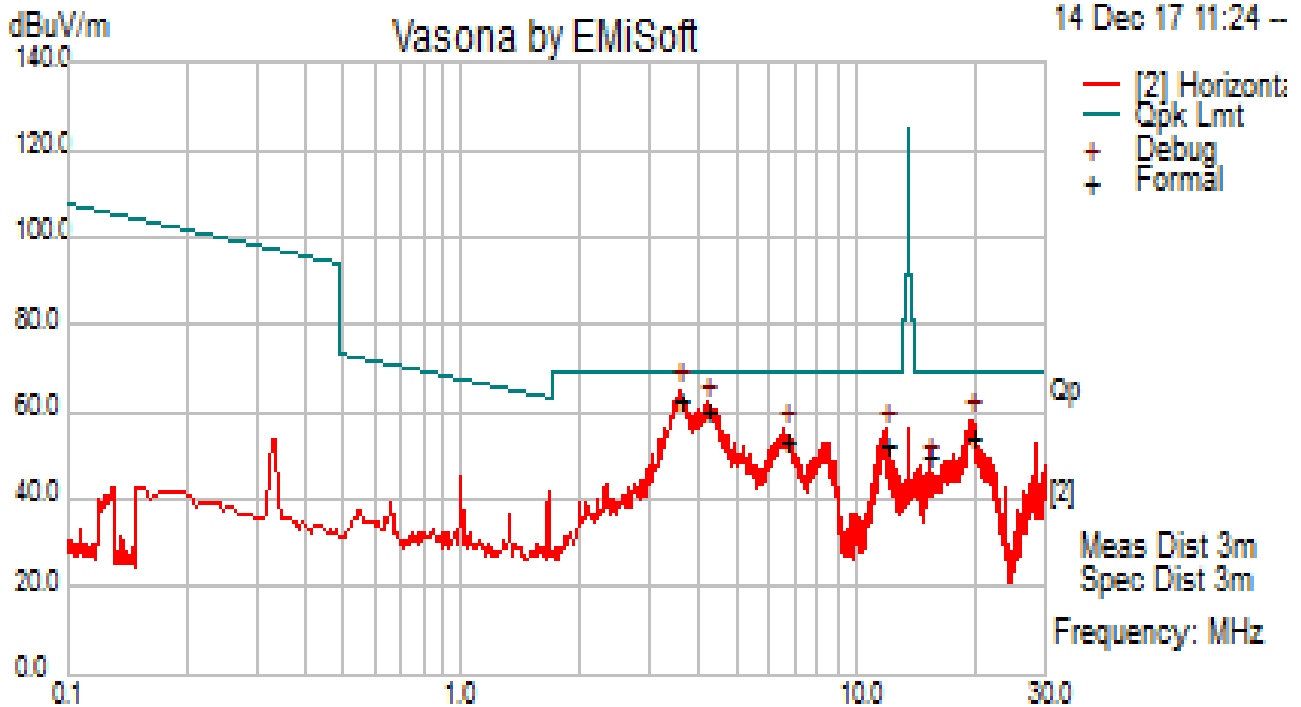
|                     |  |  |   |
|---------------------|--|--|---|
| Test specification: | Radiated Spurious Emissions                          |  |   |
| Mains Power:        | 120VAC, 60Hz   |  | Result: <input checked="" type="checkbox"/> Pass<br><input type="checkbox"/> Fail |
| Tested by:          | Rachana Khanduri                                     |  |   |
| Test Date:          | 12/14/2017   |  |   |
| Remarks:            | f= 100kHz – 30MHz plot, and loop antenna at 0 degree |  |   |



Quasi Max Measurement

| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol (0/90) | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail |
|---------------|----------|------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| 3.65          | 49.99    | 10.35      | 3.37  | 63.71        | Quasi Max        | 0          | 100    | 143     | 69.54        | -5.83     | Pass       |
| 4.17          | 48.21    | 10.38      | 2.59  | 61.18        | Quasi Max        | 0          | 100    | 184     | 69.54        | -8.36     | Pass       |
| 11.41         | 42.49    | 10.63      | 1.59  | 54.71        | Quasi Max        | 0          | 100    | 340     | 69.54        | -14.83    | Pass       |
| 18.22         | 39.48    | 10.75      | 1.17  | 51.40        | Quasi Max        | 0          | 100    | 79      | 69.54        | -18.15    | Pass       |
| 6.68          | 38.75    | 10.50      | 2.24  | 51.49        | Quasi Max        | 0          | 100    | 256     | 69.54        | -18.05    | Pass       |
| 8.33          | 37.57    | 10.60      | 1.81  | 49.98        | Quasi Max        | 0          | 100    | 68      | 69.54        | -19.56    | Pass       |

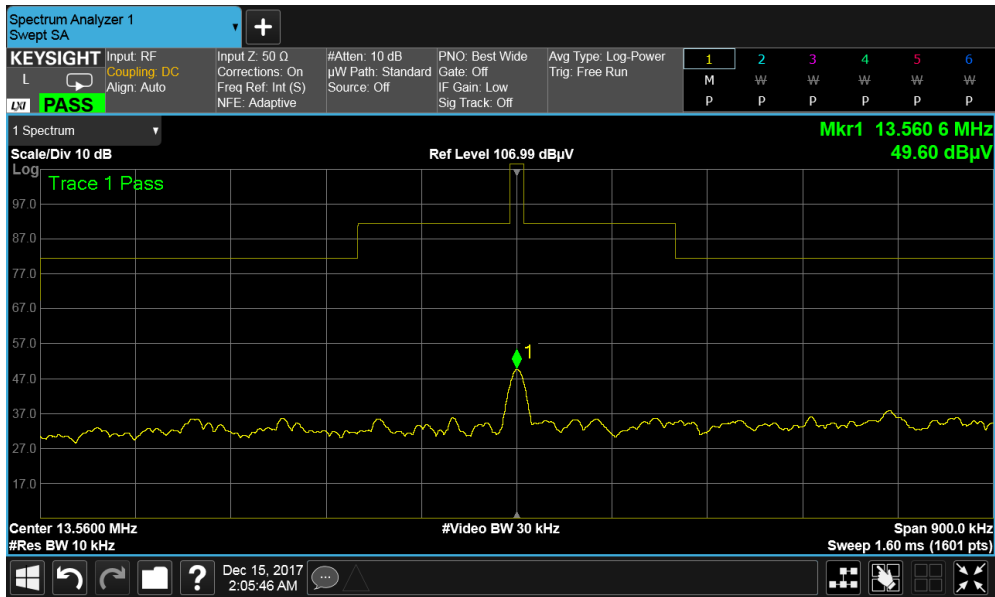
|                     |  |         |   |
|---------------------|--|---------|---|
| Test specification: | Radiated Spurious Emissions                                  |         |   |
| Mains Power:        | 120VAC, 60Hz   | Result: | <input checked="" type="checkbox"/> Pass<br><input type="checkbox"/> Fail |
| Tested by:          | Rachana Khanduri   |         |   |
| Test Date:          | 12/14/2017   |         |   |
| Remarks:            | <b>f= 100kHz – 30MHz plot, and loop antenna at 90 degree</b> |         |   |



**Quasi Max Measurement**

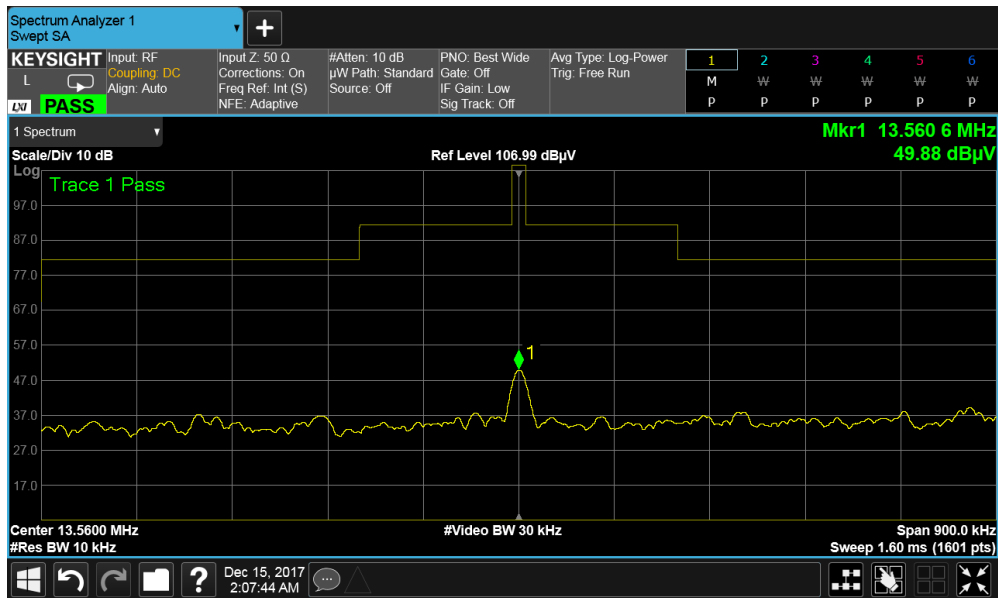
| Frequency MHz | Raw dBuV | Cable Loss | AF dB | Level dBuV/m | Measurement Type | Pol (0/90) | Hgt cm | Azt Deg | Limit dBuV/m | Margin dB | Pass /Fail |
|---------------|----------|------------|-------|--------------|------------------|------------|--------|---------|--------------|-----------|------------|
| 3.57          | 48.47    | 10.34      | 3.50  | 62.31        | Quasi Max        | 90         | 100    | 311     | 69.54        | -7.23     | Pass       |
| 4.16          | 46.99    | 10.38      | 2.60  | 59.97        | Quasi Max        | 90         | 100    | 145     | 69.54        | -9.57     | Pass       |
| 19.71         | 42.24    | 10.80      | 0.96  | 54.00        | Quasi Max        | 90         | 100    | 230     | 69.54        | -15.54    | Pass       |
| 11.88         | 39.91    | 10.64      | 1.59  | 52.14        | Quasi Max        | 90         | 100    | 20      | 69.54        | -17.40    | Pass       |
| 6.59          | 40.06    | 10.49      | 2.25  | 52.80        | Quasi Max        | 90         | 100    | 318     | 69.54        | -16.74    | Pass       |
| 15.26         | 37.86    | 10.70      | 1.64  | 50.20        | Quasi Max        | 90         | 100    | 116     | 69.54        | -19.34    | Pass       |

### Loop Antenna at 0 degree



| Frequency (MHz) | Amplitude (dBµV/m) |
|-----------------|--------------------|
| 13.5606         | 49.60              |

### Loop Antenna at 90 degree



















| Frequency (MHz) | Amplitude (dBµV/m) |
|-----------------|--------------------|
| 13.5606         | 49.88              |










## Annex A. TEST INSTRUMENT

| Instrument                           | Model    | Serial #   | Cal Date   | Cal Cycle | Cal Due    | In use                              |
|--------------------------------------|----------|------------|------------|-----------|------------|-------------------------------------|
| <b>Radiated Emissions</b>            |          |            |            |           |            |                                     |
| Keysight EXA 44GHz Spectrum Analyzer | N9010A   | MY51440112 | 11/08/2017 | 1 Year    | 11/08/2018 | <input checked="" type="checkbox"/> |
| Loop Antenna                         | 6512     | 49120      | 10/14/2017 | 1 Year    | 10/14/2018 | <input checked="" type="checkbox"/> |
| Bi-Log antenna (30MHz~2GHz)          | JB1      | A030702    | 01/13/2017 | 1 Year    | 01/13/2018 | <input checked="" type="checkbox"/> |
| Pre-Amplifier (1-40GHz)              | SAS-474  | 579        | 04/04/2017 | 1 Year    | 04/04/2018 | <input checked="" type="checkbox"/> |
| Preamplifier (100KHz-7GHz)           | LPA-6-30 | 11140711   | 02/09/2017 | 1 Year    | 02/09/2018 | <input checked="" type="checkbox"/> |

## 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                                   |   | <b>Radio Equipment: EN45011:</b><br>EN ISO/IEC 17065                    |
|   |    | <b>Electromagnetic Compatibility:</b><br>EN45011 – EN ISO/IEC 17065     |
| Singapore iDA<br>CB(Certification Body) |   | Phase I, Phase II   |
| Vietnam MIC<br>CAB Accreditation        |    | Please see the document for the detailed scope                          |
| Hong Kong OFCA                          |    | <b>(Phase II)</b> OFCA Foreign Certification Body for Radio and Telecom |
|   |    | <b>(Phase I)</b> Conformity Assessment Body for Radio and Telecom       |
| Industry Canada CAB                     |    | <b>Radio:</b> Scope A – All Radio Standard Specification in Category I  |
|   |    | <b>Telecom:</b> CS-03 Part I, II, V, VI, VII, VIII                      |

|  |   |  |
|--|---|--|
| Japan Recognized Certification<br>Body Designation |    | <p><b>Radio:</b> A1. Terminal equipment for purpose of calling</p> <p><b>Telecom:</b> B1. Specified radio equipment specified in Article 38-2, Paragraph 1, Item 1 of the Radio Law</p>  |
| Korea CAB Accreditation                            |    | <p><b>EMI:</b> KCC Notice 2008-39, RRL Notice 2008-3: CA Procedures for EMI<br/>KN22: Test Method for EMI</p> <p><b>EMS:</b> 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</p>  |
|  |   | <p><b>Radio:</b> 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</p> <p><b>Telecom:</b> 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</p> |
| Taiwan NCC CAB Recognition                         |   | LP0002, PSTN01, ADSL01, ID0002, IS6100, CNS14336, PLMN07, PLMN01, PLMN08   |
| Taiwan BSMI CAB Recognition                        |  | CNS 13438  |
| Japan VCCI   |  | <p>R-3083: Radiation 3 meter site</p> <p>C-3421: Main Ports Conducted Interference Measurement</p> <p>T-1597: Telecommunication Ports Conducted Interference Measuremet</p>  |
| Australia CAB Recognition                          |  | <p><b>EMC:</b> AS/NZS CISPR 11, AS/NZS CISPR 14.1, AS/NZS CISPR22, AS/NZS 61000.6.3, AS/NZS 61000.6.4</p>  |
|  |   | <p><b>Radiocommunications:</b> 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</p>   |
|  |   | <p><b>Telecommunications:</b> 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</p>  |
| 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   |