

## FCC PART 15C

## TEST REPORT

For

### Rosslare Enterprises Ltd

Flat 5,9/F., Wing Fat Industrial Bldg.12 Wang Tai Rd.Kowloon Bay, Kowloon, Hong Kong

**FCC ID: GCD-MD12X**

|                                                                                                                                                                                                                                                                               |                                                     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| <b>Report Type:</b><br>Original Report                                                                                                                                                                                                                                        | <b>Product Name:</b><br>OEM Proximity Reader Module |
| <b>Report Number:</b> RDG171206003-00                                                                                                                                                                                                                                         |                                                     |
| <b>Report Date:</b> 2017-12-20<br>Jerry Zhang                                                                                                                                                                                                                                 |                                                     |
| <b>Reviewed By:</b> EMC Manager <i>Jerry Zhang</i>                                                                                                                                                                                                                            |                                                     |
| <b>Test Laboratory:</b> Bay Area Compliance Laboratories Corp. (Dongguan)<br>No.69 Pulongcun, Puxinhu Industry Area,<br>Tangxia, Dongguan, Guangdong, China<br>Tel: +86-769-86858888<br>Fax: +86-769-86858891<br><a href="http://www.baclcorp.com.cn">www.baclcorp.com.cn</a> |                                                     |

**Note:** This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. (Dongguan).

## **TABLE OF CONTENTS**

|                                                                 |           |
|-----------------------------------------------------------------|-----------|
| <b>GENERAL INFORMATION.....</b>                                 | <b>3</b>  |
| PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) .....        | 3         |
| OBJECTIVE .....                                                 | 3         |
| RELATED SUBMITTAL(S)/GRANT(S).....                              | 3         |
| TEST METHODOLOGY .....                                          | 3         |
| MEASUREMENT UNCERTAINTY .....                                   | 4         |
| TEST FACILITY .....                                             | 4         |
| <b>SUMMARY OF TEST RESULTS .....</b>                            | <b>5</b>  |
| <b>SYSTEM TEST CONFIGURATION .....</b>                          | <b>6</b>  |
| JUSTIFICATION .....                                             | 6         |
| EUT EXERCISE SOFTWARE .....                                     | 6         |
| SUPPORT CABLE LIST AND DETAILS .....                            | 6         |
| BLOCK DIAGRAM OF TEST SETUP .....                               | 7         |
| <b>FCC§15.203 - ANTENNA REQUIREMENT.....</b>                    | <b>8</b>  |
| APPLICABLE STANDARD .....                                       | 8         |
| ANTENNA CONNECTED CONSTRUCTION .....                            | 8         |
| <b>FCC §15.207 – AC LINE CONDUCTED EMISSION .....</b>           | <b>9</b>  |
| EUT SETUP .....                                                 | 9         |
| EMI TEST RECEIVER SETUP.....                                    | 9         |
| TEST EQUIPMENT LIST AND DETAILS.....                            | 10        |
| TEST PROCEDURE .....                                            | 10        |
| CORRECTED AMPLITUDE & MARGIN CALCULATION .....                  | 10        |
| TEST RESULTS SUMMARY .....                                      | 11        |
| TEST DATA .....                                                 | 11        |
| <b>FCC§15.205 &amp; §15.209 - RADIATED EMISSIONS TEST .....</b> | <b>14</b> |
| APPLICABLE STANDARD .....                                       | 14        |
| EUT SETUP .....                                                 | 14        |
| EMI TEST RECEIVER SETUP.....                                    | 14        |
| CORRECTED AMPLITUDE & MARGIN CALCULATION .....                  | 15        |
| TEST EQUIPMENT LIST AND DETAILS.....                            | 15        |
| TEST RESULTS SUMMARY .....                                      | 15        |
| TEST DATA .....                                                 | 15        |

---

## GENERAL INFORMATION

---

### Product Description for Equipment Under Test (EUT)

The **Rosslare Enterprises Ltd** 's product, model number: **MD12W (FCC ID: GCD-MD12X)** (the "EUT") in this report was a **OEM Proximity Reader Module** , which was measured approximately: 2.3cm (D) x 0.9 cm (H), rated input voltage: DC 5V.

*Note: The series product, model MD12W, MD12C are electrically identical, we selected all model for fully testing, the details was explained in the attached letter.*

*\*All measurement and test data in this report was gathered from production sample serial number: 171206003-1(MD12W), 171206003-2(MD12C), (Assigned by BACL,Dongguan). The EUT was received on 2017-12-06.*

### Objective

This Type approval report is prepared on behalf of **Rosslare Enterprises Ltd** in accordance with Part 2, Subpart J, and Part 15, Subparts A and C of the Federal Communications Commission's rules.

The objective is to determine the compliance of the EUT with FCC rules, sec 15.203, 15.205, 15.207, 15.209.

### Related Submittal(s)/Grant(s)

N/A

### Test Methodology

All measurements detailed in this Test Report were performed in accordance with ANSI C63.10-2013 "American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices".

All emissions measurement was performed and Bay Area Compliance Laboratories Corp. (Dongguan). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

**Measurement Uncertainty**

| Parameter                         | Measurement Uncertainty                                                                                                                   |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Occupied Channel Bandwidth        | ±5 %                                                                                                                                      |
| radiated Emissions                | 9kHz~30MHz: 4.12dB<br>30M~200MHz: 4.58 dB for Horizontal, 4.59 dB for Vertical<br>200M~1GHz: 4.83 dB for Horizontal, 5.85 dB for Vertical |
| Temperature                       | ±1 °C                                                                                                                                     |
| Humidity                          | ±5%                                                                                                                                       |
| DC and low frequency voltages     | ±0.4%                                                                                                                                     |
| Duty Cycle                        | 1%                                                                                                                                        |
| AC Power Lines Conducted Emission | 3.12 dB (150 kHz to 30 MHz)                                                                                                               |

**Test Facility**

The Test site used by Bay Area Compliance Laboratories Corp. (Dongguan) to collect test data is located on the No.69 Pulongcun, Puxinhu Industry Area, Tangxia, Dongguan, Guangdong, China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No. : 897218, the FCC Designation No. : CN1220.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062D.

**SUMMARY OF TEST RESULTS**

| FCC Rules       | Description of Test        | Result     |
|-----------------|----------------------------|------------|
| §15.203         | Antenna Requirement        | Compliance |
| §15.207         | AC Line Conducted Emission | Compliance |
| §15.209 §15.205 | Radiated Emission Test     | Compliance |

## SYSTEM TEST CONFIGURATION

### Justification

The system was configured for testing in a test mode.

### EUT Exercise Software

No software used in test.

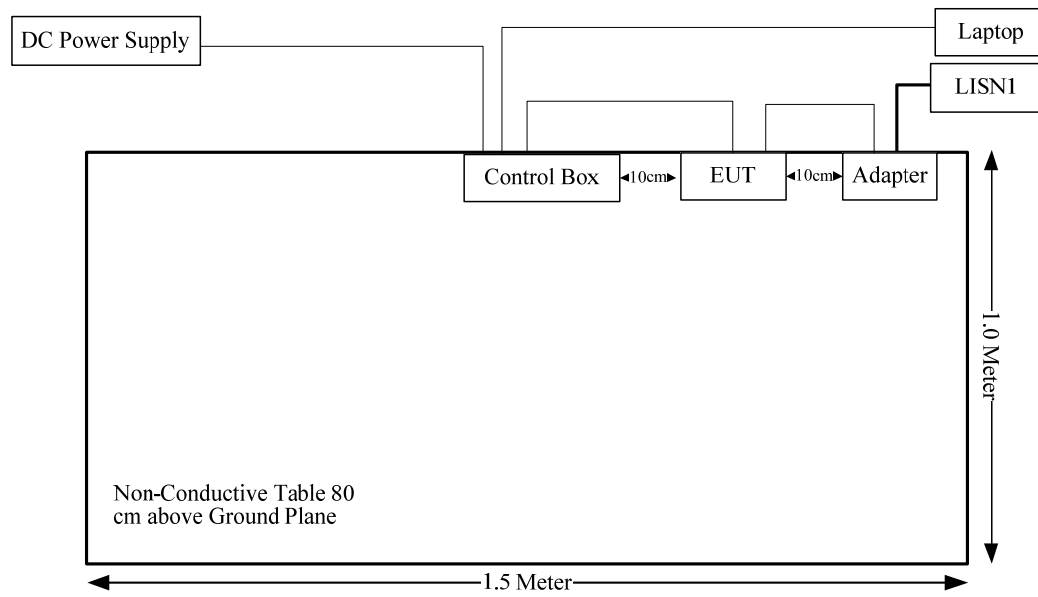
### Support Equipment List and Details

| Manufacturer   | Description     | Model    | Serial Number    |
|----------------|-----------------|----------|------------------|
| CFOMAX         | Adapter         | ACC07C02 | V043660704256144 |
| DELL           | Laptop          | PP11L    | QDS-BRCM1017     |
| Rosslare       | Control box     | N/A      | N/A              |
| Pro instrument | DC Power Supply | pps3300  | N/A              |

### Support Cable List and Details

| Cable Description | Shielding Type | Ferrite Core | Length (m) | From Port   | To     |
|-------------------|----------------|--------------|------------|-------------|--------|
| USB Cable         | Yes            | No           | 0.5        | Adapter     | EUT    |
| RJ45 Cable        | Yes            | No           | 10         | Control Box | Laptop |
| Conductor Cable   | Yes            | No           | 0.3        | Control Box | EUT    |

# Block Diagram of Test Setup



---

## **FCC§15.203 - ANTENNA REQUIREMENT**

---

### **Applicable Standard**

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.

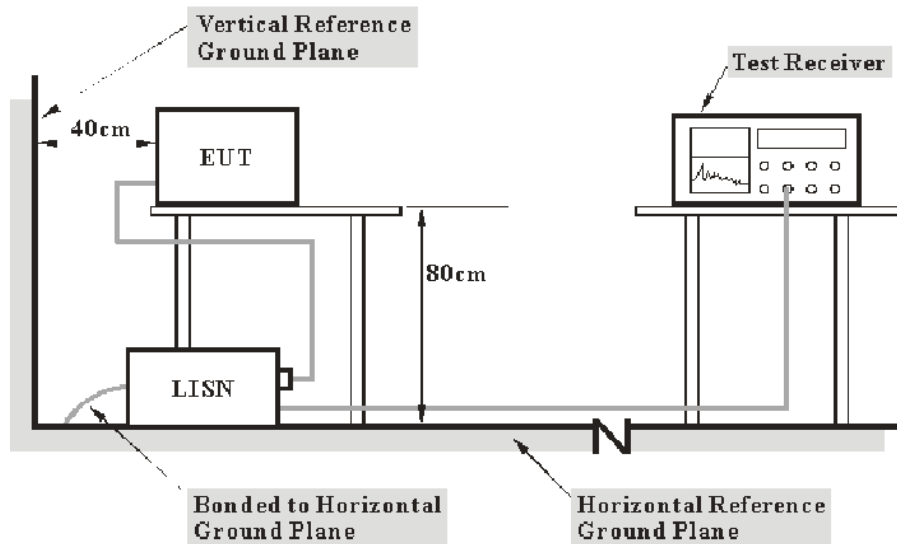
### **Antenna Connected Construction**

The EUT has one internal antenna arrangement, which was permanently attached and fulfill the requirement of this section. Please refer to the EUT photos.

**Result:** Compliance.

## FCC §15.207 – AC LINE CONDUCTED EMISSION

### EUT Setup



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

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The adapter was connected to the main LISN with an AC 120V/60Hz power source.

### EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

| Frequency Range  | IF B/W |
|------------------|--------|
| 150 kHz – 30 MHz | 9 kHz  |

**Test Equipment List and Details**

| Manufacturer | Description        | Model   | Serial Number | Calibration Date | Calibration Due Date |
|--------------|--------------------|---------|---------------|------------------|----------------------|
| R&S          | EMI Test Receiver  | ESCS 30 | 830245/006    | 2017-12-08       | 2018-12-08           |
| R&S          | L.I.S.N            | ESH2-Z5 | 892107/021    | 2017-09-01       | 2018-09-01           |
| R&S          | Two-line V-network | ENV 216 | 3560.6550.12  | 2017-12-08       | 2018-12-08           |
| N/A          | Coaxial Cable      | 2m      | C0200/01      | 2017-09-05       | 2018-09-05           |
| R&S          | Test Software      | EMC32   | Version8.53.0 | N/A              | N/A                  |

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

**Test Procedure**

During the conducted emission test, the adapter was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak and average detection mode.

According FCC publication number 174176, for a device with a permanent antenna operating at or below 30 MHz, the measurements done with a suitable dummy load, in lieu of the permanent antenna under the following conditions: (1) perform the AC line conducted tests with the permanent antenna to determine compliance with the Section 15.207 limits outside the transmitter's fundamental emission band; (2) retest with a dummy load in lieu of the permanent antenna to determine compliance with the Section 15.207 limits within the transmitter's fundamental emission band.

**Corrected Amplitude & Margin Calculation**

The basic equation is as follows:

$$V_C = V_R + A_C + VDF$$

Herein,

$V_C$ : corrected voltage amplitude

$V_R$ : reading voltage amplitude

$A_C$ : attenuation caused by cable loss

VDF: voltage division factor of AMN or ISN

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

$$\text{Margin} = \text{Limit} - \text{Corrected Amplitude}$$

### Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.207.

### Test Data

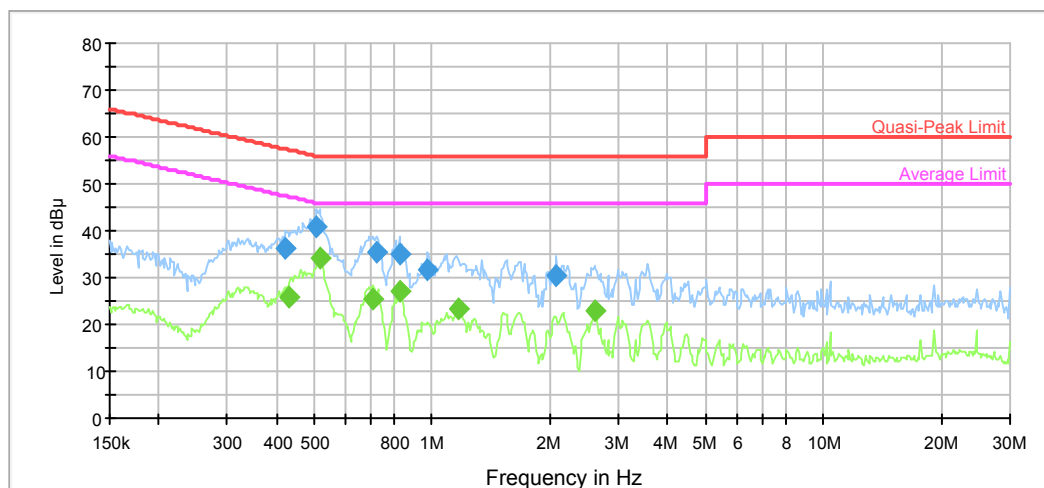
#### Environmental Conditions

|                           |           |
|---------------------------|-----------|
| <b>Temperature:</b>       | 25.1 °C   |
| <b>Relative Humidity:</b> | 35 %      |
| <b>ATM Pressure:</b>      | 101.2 kPa |

*The testing was performed by Alex Xiao on 2017-12-13.*

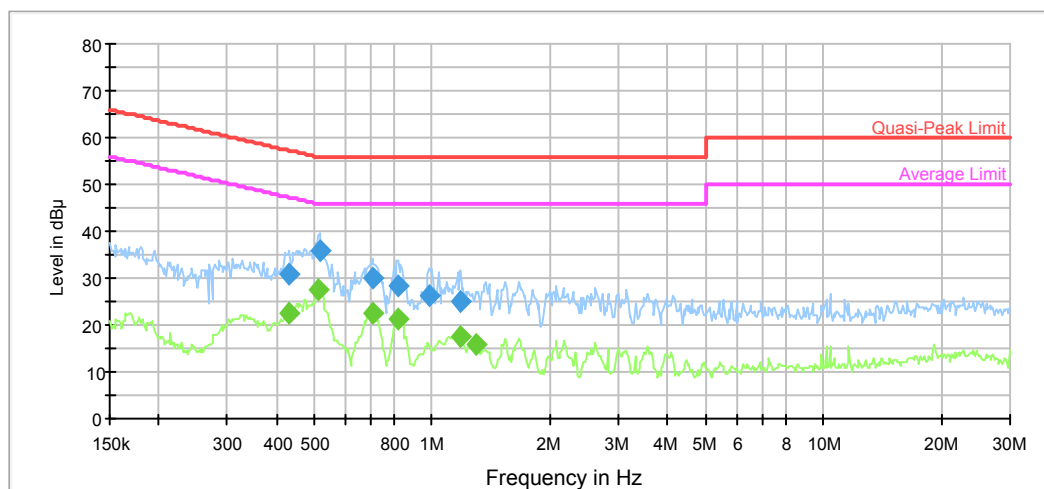
Test Mode: Transmitting(MD12C was the worst)

AC 120V, 60 Hz, Line:



| Frequency (MHz) | Quasi Peak (dBμV) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) | Comment    |
|-----------------|-------------------|-----------------|------|------------|-------------|--------------|------------|
| 0.422630        | 36.3              | 9.000           | L1   | 10.0       | 21.1        | 57.4         | Compliance |
| 0.507637        | 40.8              | 9.000           | L1   | 9.9        | 15.2        | 56.0         | Compliance |
| 0.720803        | 35.4              | 9.000           | L1   | 9.8        | 20.6        | 56.0         | Compliance |
| 0.825364        | 34.8              | 9.000           | L1   | 9.8        | 21.2        | 56.0         | Compliance |
| 0.975701        | 31.6              | 9.000           | L1   | 9.8        | 24.4        | 56.0         | Compliance |
| 2.080018        | 30.4              | 9.000           | L1   | 9.7        | 25.6        | 56.0         | Compliance |

| Frequency (MHz) | Average (dBμV) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) | Comment    |
|-----------------|----------------|-----------------|------|------------|-------------|--------------|------------|
| 0.429420        | 26.0           | 9.000           | L1   | 9.9        | 21.3        | 47.3         | Compliance |
| 0.515791        | 34.1           | 9.000           | L1   | 9.9        | 11.9        | 46.0         | Compliance |
| 0.709407        | 25.3           | 9.000           | L1   | 9.8        | 20.7        | 46.0         | Compliance |
| 0.831967        | 26.9           | 9.000           | L1   | 9.8        | 19.1        | 46.0         | Compliance |
| 1.162648        | 23.3           | 9.000           | L1   | 9.8        | 22.7        | 46.0         | Compliance |
| 2.599932        | 23.0           | 9.000           | L1   | 9.8        | 23.0        | 46.0         | Compliance |

**AC120 V, 60 Hz, Neutral:**

| Frequency (MHz) | Quasi Peak (dBμV) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) | Comment    |
|-----------------|-------------------|-----------------|------|------------|-------------|--------------|------------|
| 0.429420        | 30.9              | 9.000           | N    | 9.9        | 26.4        | 57.3         | Compliance |
| 0.515791        | 35.7              | 9.000           | N    | 9.9        | 20.3        | 56.0         | Compliance |
| 0.703777        | 29.8              | 9.000           | N    | 9.8        | 26.2        | 56.0         | Compliance |
| 0.818813        | 28.5              | 9.000           | N    | 9.8        | 27.5        | 56.0         | Compliance |
| 0.983506        | 26.1              | 9.000           | N    | 9.8        | 29.9        | 56.0         | Compliance |
| 1.181325        | 25.0              | 9.000           | N    | 9.8        | 31.0        | 56.0         | Compliance |

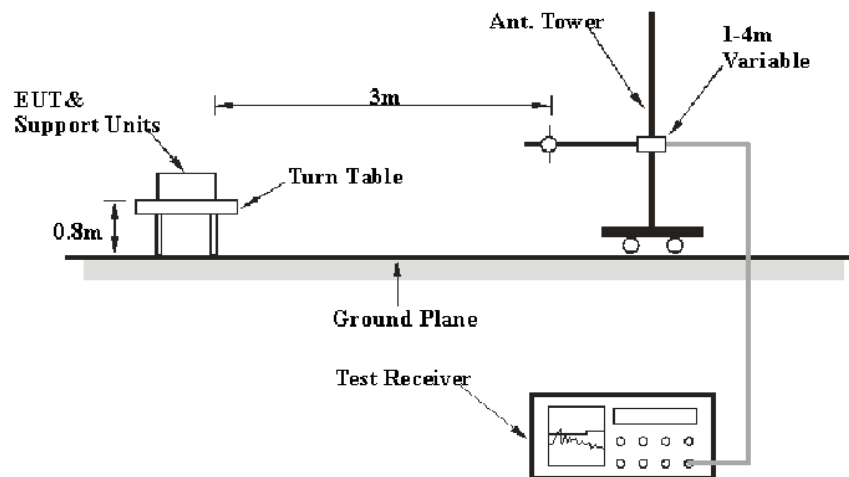
| Frequency (MHz) | Average (dBμV) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) | Comment    |
|-----------------|----------------|-----------------|------|------------|-------------|--------------|------------|
| 0.429420        | 22.7           | 9.000           | N    | 9.9        | 24.6        | 47.3         | Compliance |
| 0.511698        | 27.3           | 9.000           | N    | 9.9        | 18.7        | 46.0         | Compliance |
| 0.703777        | 22.7           | 9.000           | N    | 9.8        | 23.3        | 46.0         | Compliance |
| 0.818813        | 21.2           | 9.000           | N    | 9.8        | 24.8        | 46.0         | Compliance |
| 1.181325        | 17.3           | 9.000           | N    | 9.8        | 28.7        | 46.0         | Compliance |
| 1.289541        | 15.8           | 9.000           | N    | 9.8        | 30.2        | 46.0         | Compliance |

## FCC§15.205 & §15.209 - RADIATED EMISSIONS TEST

### Applicable Standard

FCC Part 15.205, 15.209

### EUT Setup



The radiated emission tests were performed in the 3-meter chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC Part Subpart C limits.

The spacing between the peripherals was 10 cm.

### EMI Test Receiver Setup

The system was investigated from 9 kHz to 1 GHz.

During the radiated emission test, the EMI test Receiver was set with the following configurations:

| Frequency Range   | RBW     | Video B/W | Detector |
|-------------------|---------|-----------|----------|
| 9 kHz – 150 kHz   | 200 Hz  | 1 kHz     | QP       |
| 150 kHz – 30 MHz  | 9 kHz   | 30 kHz    | QP       |
| 30 MHz – 1000 MHz | 120 kHz | 300 kHz   | QP       |

## Corrected Amplitude & Margin Calculation

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

$$\text{Corr. Ampl.} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

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

$$\text{Margin} = \text{Limit} - \text{Corr. Ampl.}$$

## Test Equipment List and Details

| Manufacturer   | Description       | Model | Serial Number | Calibration Date | Calibration Due Date |
|----------------|-------------------|-------|---------------|------------------|----------------------|
| R&S            | EMI Test Receiver | ESCI  | 100224        | 2017-09-01       | 2018-09-01           |
| Sunol Sciences | Antenna           | JB3   | A060611-1     | 2017-11-10       | 2020-11-10           |
| HP             | Amplifier         | 8447D | 2727A05902    | 2017-09-05       | 2018-09-05           |
| EMCO           | Passive Loop      | 6512  | 9706-1206     | 2017-03-05       | 2020-03-05           |
| Unknown        | Coaxial Cable     | 4m    | C0400/01      | 2016-09-05       | 2018-09-05           |
| Unknown        | Coaxial Cable     | 10m   | C1000/01      | 2016-09-05       | 2018-09-05           |

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Dongguan) attests that all calibrations have been performed, traceable to National Primary Standards and International System of Units (SI).

## Test Results Summary

According to the data in the following table, the EUT complied with the FCC Part 15.209.

## Test Data

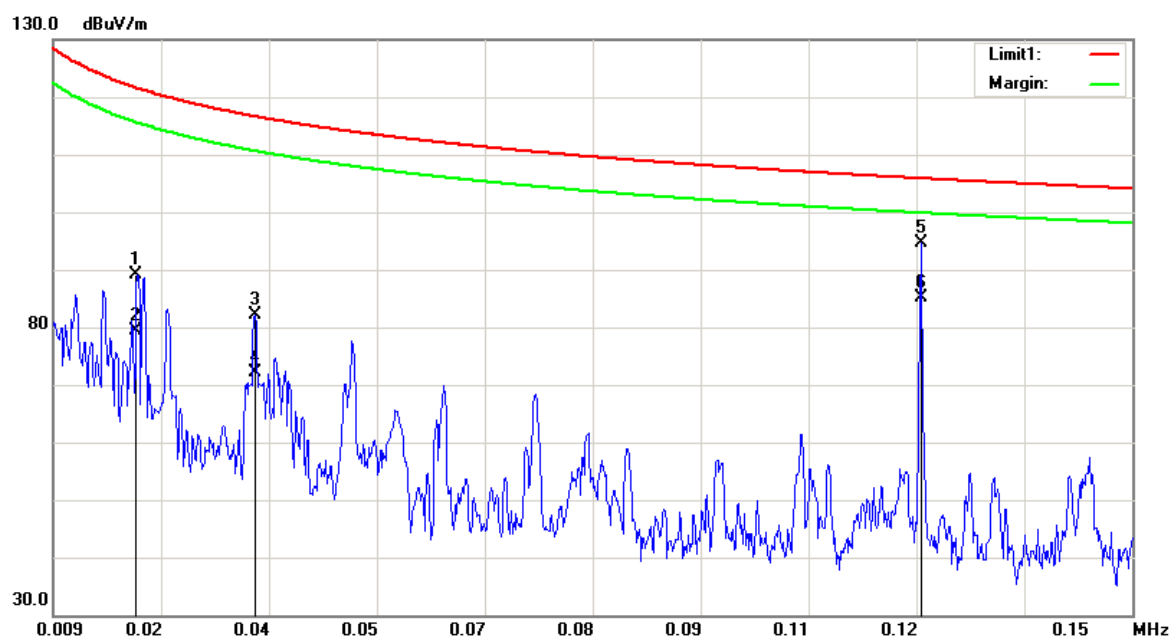
### Environmental Conditions

|                    |           |
|--------------------|-----------|
| Temperature:       | 26.3 °C   |
| Relative Humidity: | 29.8 %    |
| ATM Pressure:      | 101.3 kPa |

\* The testing was performed by Blake Yang on 2017-12-14.

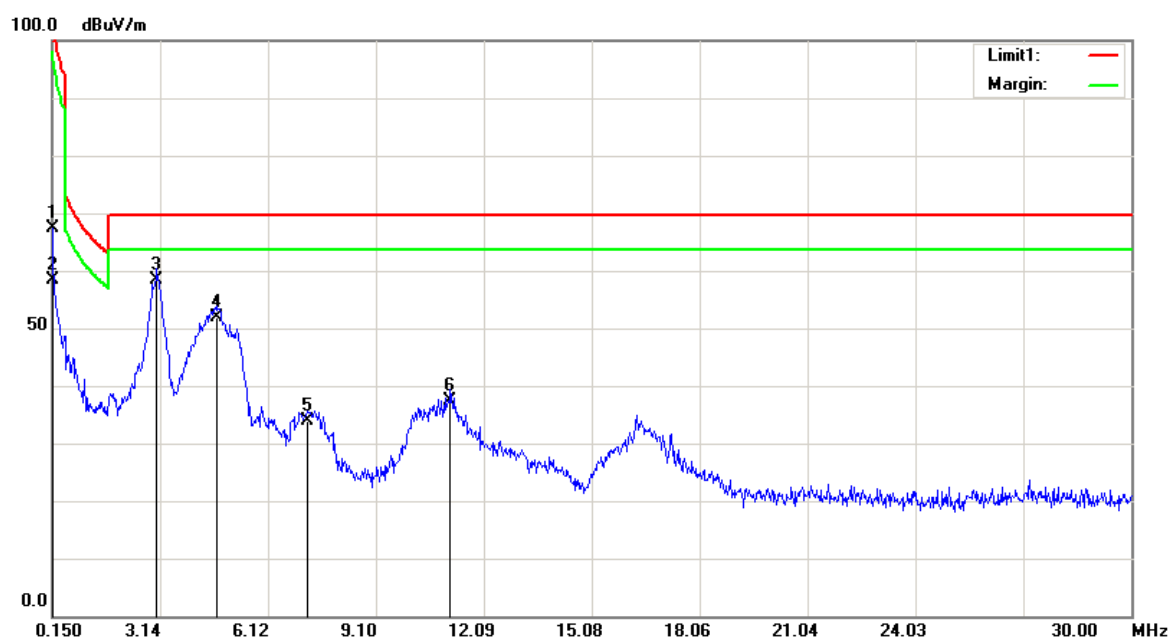
Test mode: Transmitting(MD12C was the worst)

1) 9 kHz~150 kHz:

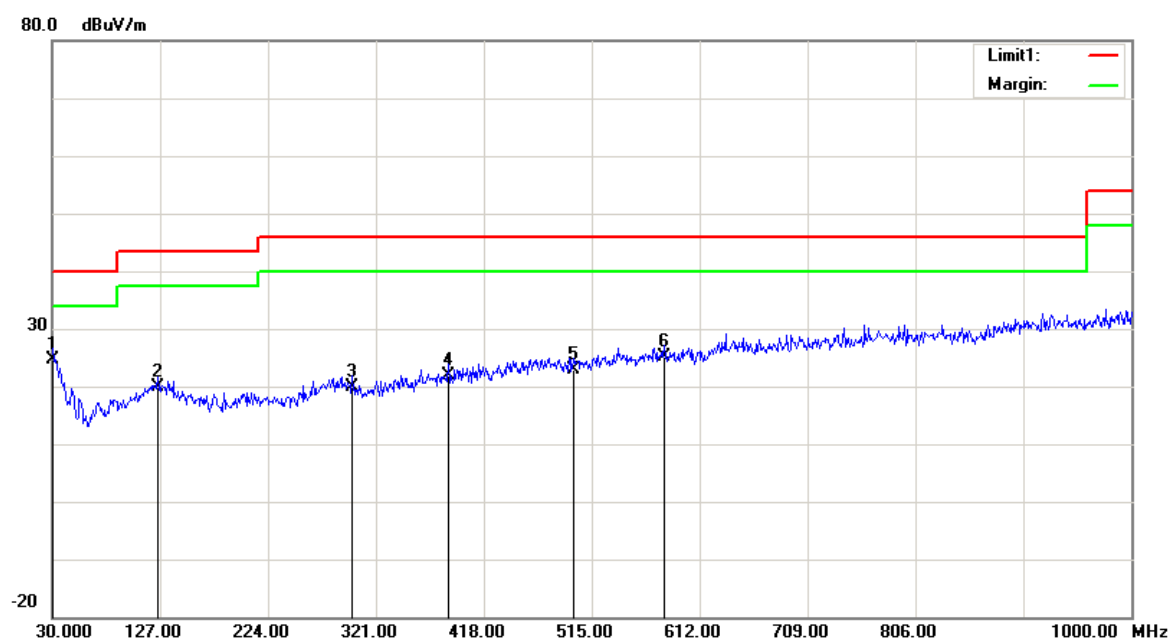


| No. | Frequency (MHz) | Receiver Reading (dBμV) | Detector | Correction Factor (dB/m) | Cord. Amp. (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
|-----|-----------------|-------------------------|----------|--------------------------|---------------------|----------------|-------------|
| 1   | 0.0200          | 6.10                    | peak     | 83.07                    | 89.17               | 121.58         | 32.41       |
| 2   | 0.0200          | -3.77                   | AVG      | 83.07                    | 79.30               | 121.58         | 42.28       |
| 3   | 0.0354          | 4.94                    | peak     | 77.10                    | 82.04               | 116.62         | 34.58       |
| 4   | 0.0354          | -5.00                   | AVG      | 77.10                    | 72.10               | 116.62         | 44.52       |
| 5   | 0.1223          | 29.70                   | peak     | 64.87                    | 94.57               | 105.85         | 11.28       |
| 6   | 0.1223          | 20.33                   | AVG      | 64.87                    | 85.20               | 105.85         | 20.65       |

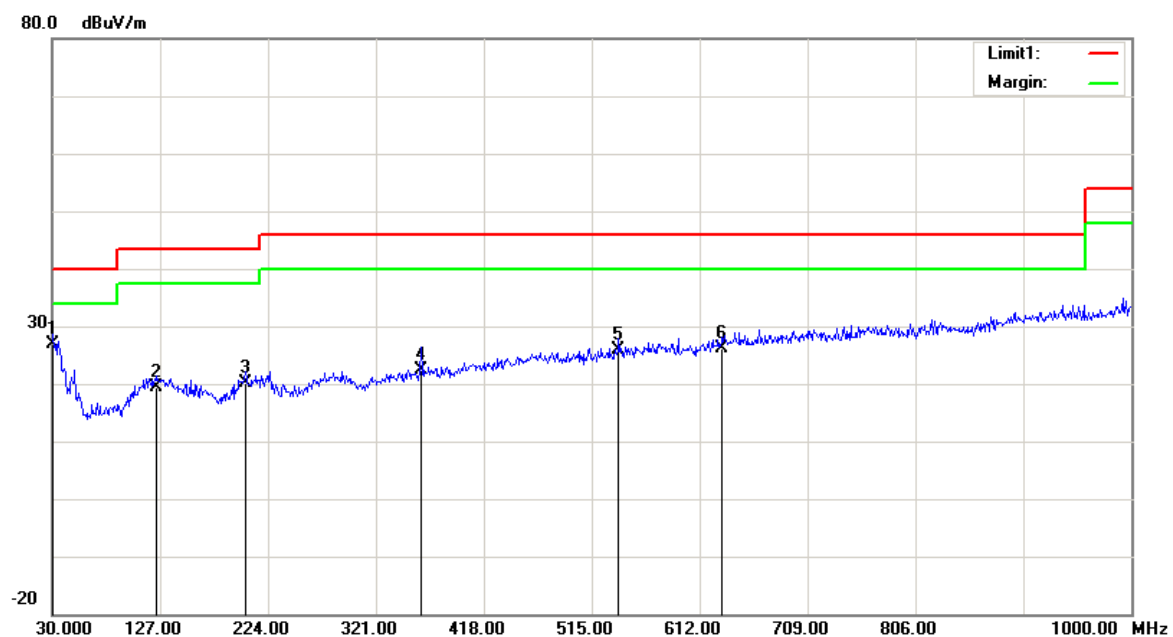
2) 150kHz ~30MHz:



| No. | Frequency (MHz) | Receiver Reading (dBμV) | Detector | Correction Factor (dB/m) | Cord. Amp. (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
|-----|-----------------|-------------------------|----------|--------------------------|---------------------|----------------|-------------|
| 1   | 0.1500          | 3.87                    | peak     | 63.60                    | 67.47               | 104.08         | 36.61       |
| 2   | 0.1500          | -5.30                   | AVG      | 63.60                    | 58.30               | 104.08         | 45.78       |
| 3   | 3.0455          | 19.90                   | QP       | 38.50                    | 58.40               | 69.54          | 11.14       |
| 4   | 4.7171          | 16.15                   | QP       | 35.65                    | 51.80               | 69.54          | 17.74       |
| 5   | 7.2244          | 0.36                    | QP       | 33.44                    | 33.80               | 69.54          | 35.74       |
| 6   | 11.1646         | 5.17                    | QP       | 32.13                    | 37.30               | 69.54          | 32.24       |

**Horizontal**

| No. | Frequency (MHz) | Receiver Reading (dBμV) | Detector | Correction Factor (dB/m) | Cord. Amp. (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
|-----|-----------------|-------------------------|----------|--------------------------|---------------------|----------------|-------------|
| 1   | 30.9700         | 24.35                   | QP       | 0.35                     | 24.70               | 40.00          | 15.30       |
| 2   | 125.0600        | 24.63                   | QP       | -4.83                    | 19.80               | 43.50          | 23.70       |
| 3   | 299.6600        | 24.25                   | QP       | -4.35                    | 19.90               | 46.00          | 26.10       |
| 4   | 385.9900        | 24.48                   | QP       | -2.58                    | 21.90               | 46.00          | 24.10       |
| 5   | 498.5100        | 24.00                   | QP       | -1.10                    | 22.90               | 46.00          | 23.10       |
| 6   | 579.9900        | 24.47                   | QP       | 0.73                     | 25.20               | 46.00          | 20.80       |

**Vertical**

\*\*\*\*\* END OF REPORT \*\*\*\*\*