

# FCC PART 15.247 TEST REPORT

For

## Hexing Electrical Co.,Ltd

1418-5 Moganshan Road Shangcheng Industrial Zone, Hangzhou City, China

**FCC ID: 2AIUZ-MJN901**

|                                                                                                                                                                                                                                                |                                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| <b>Report Type:</b><br>Original Report                                                                                                                                                                                                         | <b>Product Type:</b><br>Single Phase HexNet |
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| <b>Report Number:</b> RKS170123001-00A                                                                                                                                                                                                         |                                             |
| <b>Report Date:</b> 2017-02-10                                                                                                                                                                                                                 |                                             |
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## GENERAL INFORMATION

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

|              |                            |
|--------------|----------------------------|
| Manufacturer | Hexing Electrical Co.,Ltd. |
| Tested Model | MJN901                     |
| Series Model | N/A                        |
| Product Type | Single Phase HexNet        |
| Dimension    | 70 mm(L)×53 mm(W)×25 mm(H) |
| Power input  | DC 12V                     |

*\*All measurement and test data in this report was gathered from production sample serial number: 20170123001 (Assigned by the BACL. The EUT supplied by the applicant was received on 2017-01-23)*

### Objective

This test report is prepared on behalf of Hexing Electrical Co.,Ltd in accordance with Part 2-Subpart J, Part 15-Subparts A, B and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

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

No related submittal(s)/grant(s)

### Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices and DA 00-705 March 30, 2000.

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

**Measurement Uncertainty**

| Item                               |               | Uncertainty |
|------------------------------------|---------------|-------------|
| AC Power Lines Conducted Emissions |               | 3.26 dB     |
| RF conducted test with spectrum    |               | 0.9dB       |
| RF Output Power with Power meter   |               | 0.5dB       |
| Radiated emission                  | 30MHz~1GHz    | 5.91dB      |
|                                    | 1GHz~6GHz     | 4.68dB      |
|                                    | 6 GHz ~18 GHz | 4.92dB      |
|                                    | 18 GHz~40 GHz | 4.88dB      |
| Occupied Bandwidth                 |               | 0.5kHz      |
| Temperature                        |               | 1.0°C       |
| Humidity                           |               | 6%          |

**Test Facility**

The test site used by Bay Area Compliance Laboratories Corp. (Kunshan) to collect test data is located on the No.248 Chenghu Road,Kunshan,Jiangsu province,China.

Test site at Bay Area Compliance Laboratories Corp. (Kunshan) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 06, 2014. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.10-2013.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 815570. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

## SYSTEM TEST CONFIGURATION

### Description of Test Configuration

For LoRa Modulation, 53 channels are provided to testing:

| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|
| 1       | 916.25          | 28      | 921.65          |
| 2       | 916.45          | 29      | 921.85          |
| 3       | 916.65          | 30      | 922.05          |
| 4       | 916.85          | 31      | 922.25          |
| 5       | 917.05          | 32      | 922.45          |
| 6       | 917.25          | 33      | 922.65          |
| 7       | 917.45          | 34      | 922.85          |
| 8       | 917.65          | 35      | 923.05          |
| 9       | 917.85          | 36      | 923.25          |
| 10      | 918.05          | 37      | 923.45          |
| 11      | 918.25          | 38      | 923.65          |
| 12      | 918.45          | 39      | 923.85          |
| 13      | 918.65          | 40      | 924.05          |
| 14      | 918.85          | 41      | 924.25          |
| 15      | 919.05          | 42      | 924.45          |
| 16      | 919.25          | 43      | 924.65          |
| 17      | 919.45          | 44      | 924.85          |
| 18      | 919.65          | 45      | 925.05          |
| 19      | 919.85          | 46      | 925.25          |
| 20      | 920.05          | 47      | 925.45          |
| 21      | 920.25          | 48      | 925.65          |
| 22      | 920.45          | 49      | 925.85          |
| 23      | 920.65          | 50      | 926.05          |
| 24      | 920.85          | 51      | 926.25          |
| 25      | 921.05          | 52      | 926.45          |
| 26      | 921.25          | 53      | 926.65          |
| 27      | 921.45          |         |                 |

EUT was tested with Channel 1, 27 and 53.

## SYSTEM TEST CONFIGURATION

### Description of Test Configuration

The system was configured for testing in an engineering mode which was controlled by the software.

### EUT Exercise Software

HxZBee BZ

The worst case was performed under:

Power level 27

### Special Accessories

No special accessory.

### Equipment Modifications

No modification was made to the EUT tested.

### Support Equipment List and Details

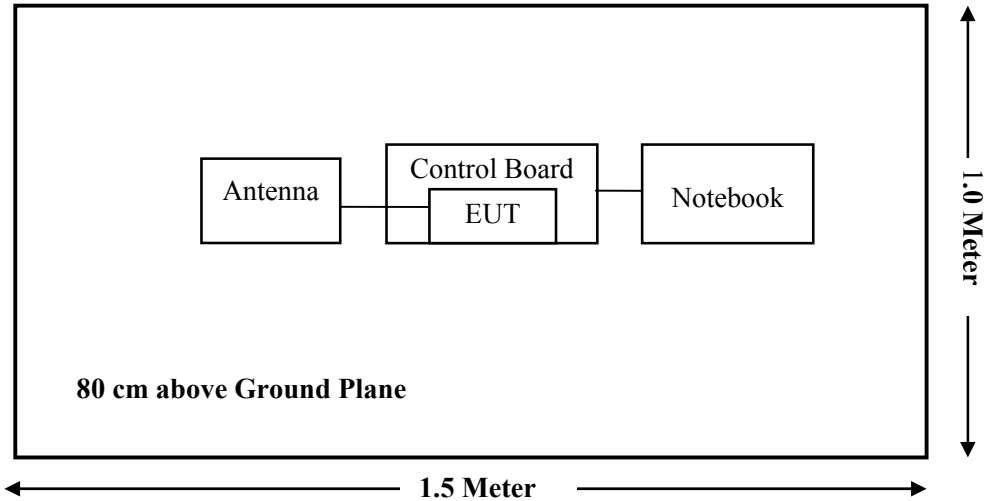
| Manufacturer | Description   | Model | Serial Number |
|--------------|---------------|-------|---------------|
| DELL         | Notebook      | GX620 | D65874152     |
| Hexing       | Control Board | /     | /             |

### External I/O Cable

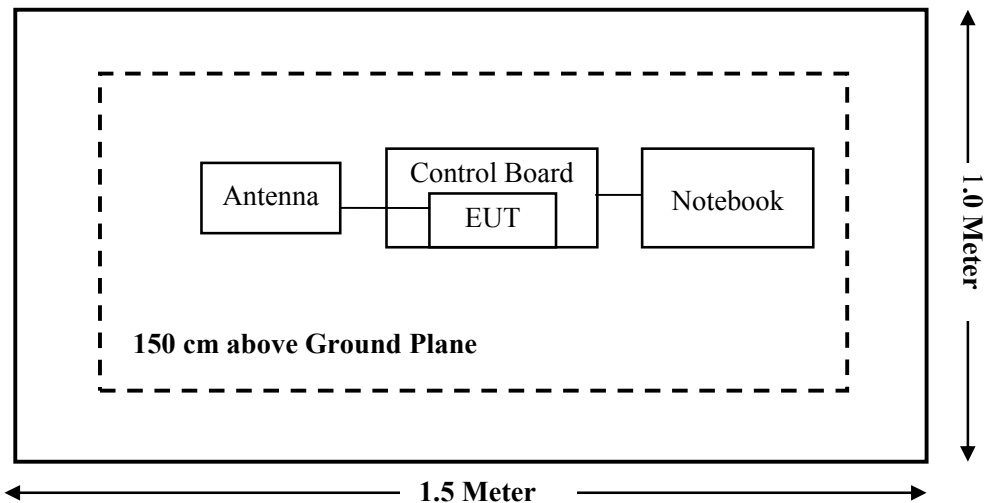
| Cable Description | Shielding Type | Length (m) | From Port     | To       |
|-------------------|----------------|------------|---------------|----------|
| USB Cable         | Unshielding    | 0.8        | Control Board | Notebook |

## Block Diagram of Test Setup

For Radiated Emissions (Below 1GHz):



For Radiated Emissions (Above 1GHz):



**SUMMARY OF TEST RESULTS**

| <b>FCC Rules</b>               | <b>Description of Test</b>         | <b>Result</b> |
|--------------------------------|------------------------------------|---------------|
| §15.247 (i), §1.1310 & §2.1091 | Maximum Permissible Exposure (MPE) | Compliance    |
| §15.203                        | Antenna Requirement                | Compliance    |
| §15.207(a)                     | AC Line Conducted Emissions        | Compliance    |
| §15.205, §15.209 & §15.247(d)  | Radiated Emissions                 | Compliance    |
| §15.247(a)(1)(i)               | 20 dB Emission Bandwidth           | Compliance    |
| §15.247(a)(1)(i)               | Channel Separation Test            | Compliance    |
| §15.247(a)(1)(i)               | Time of Occupancy (Dwell Time)     | Compliance    |
| §15.247(a)(1)(i)               | Quantity of hopping channel Test   | Compliance    |
| §15.247(b)(2)                  | Peak Output Power Measurement      | Compliance    |
| §15.247(d)                     | Band edges                         | Compliance    |

**TEST EQUIPMENT LIST**

| Manufacturer                   | Description                      | Model          | Serial Number | Calibration Date | Calibration Due Date |
|--------------------------------|----------------------------------|----------------|---------------|------------------|----------------------|
| <b>Radiated Emission Test</b>  |                                  |                |               |                  |                      |
| Rohde & Schwarz                | EMI Test Receiver                | ESCI           | 100195        | 2016-11-25       | 2017-11-24           |
| Rohde & Schwarz                | Signal Analyzer                  | FSIQ26         | 100048        | 2016-11-25       | 2017-11-24           |
| Sunol Sciences                 | Broadband Antenna                | JB3            | A090314-2     | 2016-01-09       | 2019-01-08           |
| ETS                            | Horn Antenna                     | 3115           | 6229          | 2016-01-11       | 2019-01-10           |
| ETS-LINDGREN                   | Horn Antenna                     | 3116           | 00084159      | 2016-10-18       | 2019-10-17           |
| Sonoma Instrunent              | Amplifier                        | 330            | 171377        | 2016-12-12       | 2017-12-11           |
| Narda                          | Pre-amplifier                    | AFS42-00101800 | 2001270       | 2016-12-12       | 2017-12-11           |
| R&S                            | Auto test Software               | EMC32          | 100361        | /                | /                    |
| Haojintech                     | Coaxial Cable                    | Cable-1        | 001           | 2016-12-12       | 2017-12-11           |
| Haojintech                     | Coaxial Cable                    | Cable-2        | 002           | 2016-12-12       | 2017-12-11           |
| Haojintech                     | Coaxial Cable                    | Cable-3        | 003           | 2016-12-12       | 2017-12-11           |
| MICRO-COAX                     | Coaxial Cable                    | Cable-4        | 004           | 2016-12-12       | 2017-12-11           |
| MICRO-COAX                     | Coaxial Cable                    | Cable-5        | 005           | 2016-12-12       | 2017-12-11           |
| <b>RF Conducted Test</b>       |                                  |                |               |                  |                      |
| Rohde & Schwarz                | OSP120 Base Unit                 | OSP120         | 101247        | 2016-07-04       | 2017-07-03           |
| BACL                           | EMC32 Version                    | EMC 32         | 09106         | /                | /                    |
| Rohde & Schwarz                | SMBV100A Vector Signal Generator | SMBV100A       | 261558        | 2016-07-04       | 2017-07-03           |
| Rohde & Schwarz                | SMB 100A Signal Generator        | SMB100A        | 110390        | 2016-07-04       | 2017-07-03           |
| Agilent                        | Power Meter                      | N1912A         | MY5000492     | 2016-11-18       | 2017-11-17           |
| Agilent                        | Power Sensor                     | N1921A         | MY54210024    | 2016-11-18       | 2017-11-17           |
| Rohde & Schwarz                | Signal Analyzer                  | FSIQ26         | 836131/009    | 2016-09-21       | 2017-09-20           |
| Hexing Electrical              | RF Cable                         | N/A            | N/A           | 2016-12-29       | 2017-12-28           |
| <b>Conducted Emission Test</b> |                                  |                |               |                  |                      |
| Rohde & Schwarz                | EMI Test Receiver                | ESCS30         | 834115/007    | 2016-11-25       | 2017-11-24           |
| Rohde & Schwarz                | LISN                             | ESH3-Z5        | 862770/011    | 2016-10-10       | 2017-10-09           |
| ROHDE&SCHWARZ                  | LISN                             | ENV216         | 3560655016    | 2016-11-25       | 2017-11-24           |
| Rohde & Schwarz                | CE Test software                 | EMC 32         | 100357        | /                | /                    |
| MICRO-COAX                     | Coaxial Cable                    | Cable-6        | 006           | 2016-09-08       | 2017-09-07           |

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

## FCC§15.247 (i), §1.1310& §2.1091 –MAXIMUM PERMISSIBLE EXPOSURE (MPE)

### Applicable Standard

According to subpart 15.247(i) and subpart §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

| (B) Limits for General Population/Uncontrolled Exposure |                               |                               |                                     |                          |
|---------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| Frequency Range (MHz)                                   | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density (mW/cm <sup>2</sup> ) | Averaging Time (minutes) |
| 0.3-1.34                                                | 614                           | 1.63                          | *(100)                              | 30                       |
| 1.34-30                                                 | 824/f                         | 2.19/f                        | *(180/f <sup>2</sup> )              | 30                       |
| 30-300                                                  | 27.5                          | 0.073                         | 0.2                                 | 30                       |
| 300-1500                                                | /                             | /                             | f/1500                              | 30                       |
| 1500-100,000                                            | /                             | /                             | 1.0                                 | 30                       |

f = frequency in MHz; \* = Plane-wave equivalent power density;  
According to §1.1310 and §2.1091 RF exposure is calculated.

### Calculated Formulary:

Predication of MPE limit at a given distance

$S = PG/4\pi R^2$  = power density (in appropriate units, e.g. mW/cm<sup>2</sup>);

P = power input to the antenna (in appropriate units, e.g., mW);

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor, is normally numeric gain;

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

### Measurement Result

| Modulation | Frequency Range | Antenna Gain |           | Output Power |        | Evaluation Distance | Power Density | MPE Limit |
|------------|-----------------|--------------|-----------|--------------|--------|---------------------|---------------|-----------|
|            | (MHz)           | (dBi)        | (numeric) | (dBm)        | (mW)   |                     |               |           |
| LoRa       | 916.25-926.65   | 3.0          | 2.00      | 28.00        | 630.96 | 20                  | 0.2510        | 0.6108    |

Note: (1) The target output power:

LoRa: Peak power  $27 \pm 1$  dBm, which declared by the Manufacturer.

**Result:** The device meet FCC MPE at 20 cm distance.

**FCC §15.203 – ANTENNA REQUIREMENT**

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**Applicable Standard**

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

**Antenna Information**

The EUT has a RP-SMA connector to attach an external antenna arrangement, which the antenna gain is 3.0 dBi, fulfill the requirement of this section. Please refer to the EUT photos.

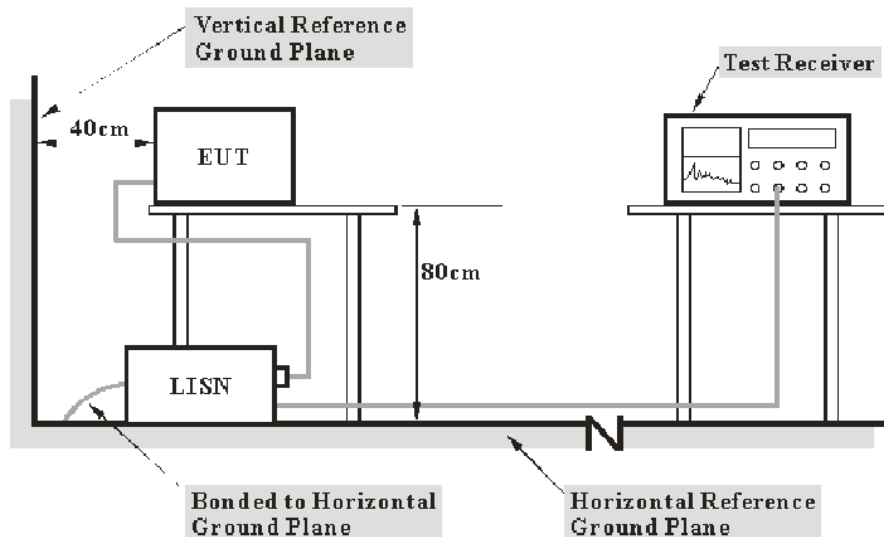
**Result:** Compliance.

## FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

### Applicable Standard

FCC §15.207(a)

### 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 measurement procedure of EUT setup is according with ANSI C63.10-2013. The related limit was specified in FCC Part 15.207.

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

## Corrected Factor & Margin Calculation

The Corrected factor is calculated by adding LISN VDF (Voltage Division Factor), Cable Loss and Transient Limiter Attenuation. The basic equation is as follows:

$$\text{Correction Factor} = \text{LISN VDF} + \text{Cable Loss} + \text{Transient Limiter Attenuation}$$

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

Refer to CISPR16-4-2 and CISPR 16-4-1, the measured level complies with the limit if

$$L_m + U_{(Lm)} \leq L_{\text{lim}} + U_{\text{cispr}}$$

In BACL,  $U_{(Lm)}$  is less than  $U_{\text{cispr}}$ , if  $L_m$  is less than  $L_{\text{lim}}$ , it implies that the EUT complies with the limit.

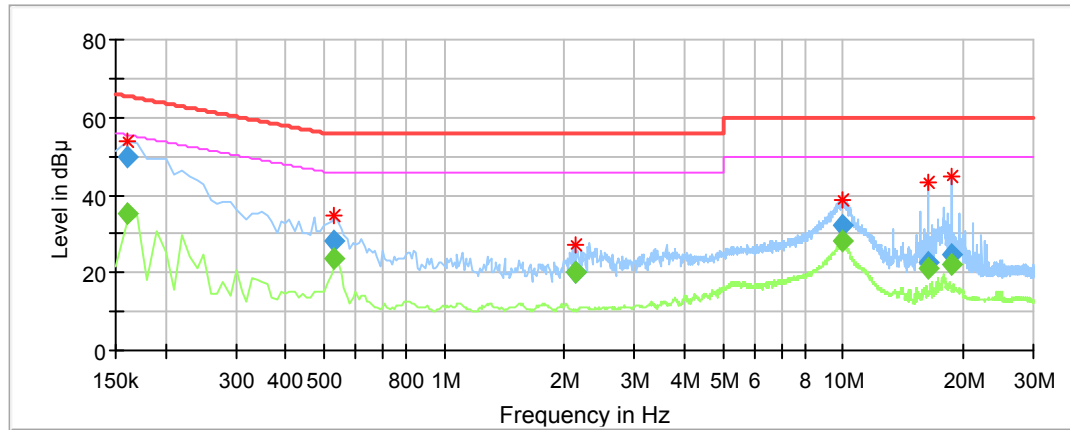
## Test Data

### Environmental Conditions

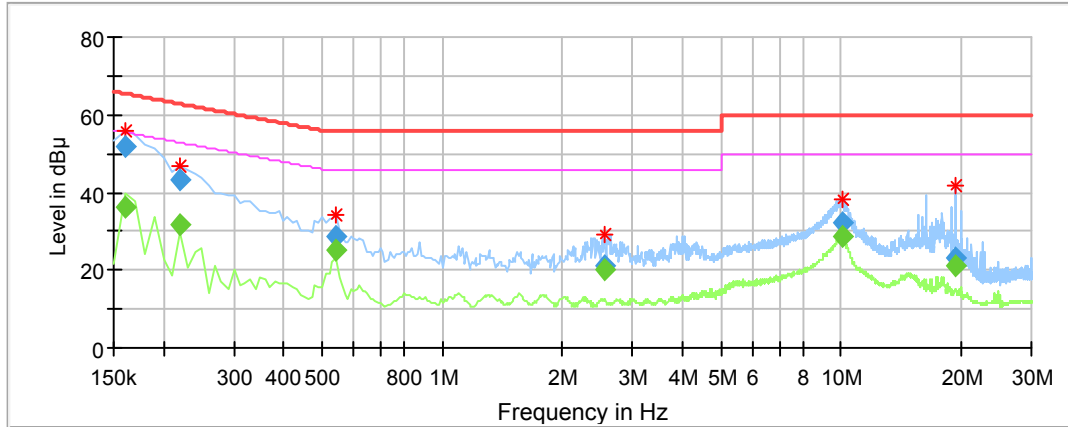
|                    |           |
|--------------------|-----------|
| Temperature:       | 24 °C     |
| Relative Humidity: | 58 %      |
| ATM Pressure:      | 101.3 kPa |

*The testing was performed by Ada Yu on 2017-02-08.*

*EUT operation mode: Transmitting*

**AC 120V/60 Hz, Line**

| Frequency (MHz) | QuasiPeak (dBμV) | Average (dB μ V) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) | Comment    |
|-----------------|------------------|------------------|-----------------|------|------------|-------------|--------------|------------|
| 0.160000        | ---              | 35.44            | 9.000           | L1   | 10.1       | 20.02       | 55.46        | Compliance |
| 0.160000        | 49.76            | ---              | 9.000           | L1   | 10.1       | 15.70       | 65.46        | Compliance |
| 0.530000        | ---              | 23.82            | 9.000           | L1   | 10.1       | 22.18       | 46.00        | Compliance |
| 0.530000        | 28.00            | ---              | 9.000           | L1   | 10.1       | 28.00       | 56.00        | Compliance |
| 2.130000        | ---              | 19.95            | 9.000           | L1   | 9.9        | 26.05       | 46.00        | Compliance |
| 2.130000        | 20.22            | ---              | 9.000           | L1   | 9.9        | 35.78       | 56.00        | Compliance |
| 10.010000       | ---              | 28.07            | 9.000           | L1   | 10.1       | 21.93       | 50.00        | Compliance |
| 10.010000       | 32.45            | ---              | 9.000           | L1   | 10.1       | 27.55       | 60.00        | Compliance |
| 16.340000       | ---              | 21.04            | 9.000           | L1   | 10.3       | 28.96       | 50.00        | Compliance |
| 16.340000       | 22.52            | ---              | 9.000           | L1   | 10.3       | 37.48       | 60.00        | Compliance |
| 18.650000       | ---              | 22.04            | 9.000           | L1   | 10.4       | 27.96       | 50.00        | Compliance |
| 18.650000       | 24.78            | ---              | 9.000           | L1   | 10.4       | 35.22       | 60.00        | Compliance |

**AC 120V/60 Hz, Neutral**

| Frequency (MHz) | QuasiPeak (dBμV) | Average (dB μ V) | Bandwidth (kHz) | Line | Corr. (dB) | Margin (dB) | Limit (dBμV) | Comment    |
|-----------------|------------------|------------------|-----------------|------|------------|-------------|--------------|------------|
| 0.160000        | ---              | 36.37            | 9.000           | N    | 10.1       | 19.09       | 55.46        | Compliance |
| 0.160000        | 51.92            | ---              | 9.000           | N    | 10.1       | 13.54       | 65.46        | Compliance |
| 0.220000        | ---              | 31.54            | 9.000           | N    | 10.1       | 21.28       | 52.82        | Compliance |
| 0.220000        | 43.05            | ---              | 9.000           | N    | 10.1       | 19.77       | 62.82        | Compliance |
| 0.540000        | ---              | 25.02            | 9.000           | N    | 10.1       | 20.98       | 46.00        | Compliance |
| 0.540000        | 28.76            | ---              | 9.000           | N    | 10.1       | 27.24       | 56.00        | Compliance |
| 2.540000        | ---              | 20.17            | 9.000           | N    | 9.9        | 25.83       | 46.00        | Compliance |
| 2.540000        | 20.98            | ---              | 9.000           | N    | 9.9        | 35.02       | 56.00        | Compliance |
| 10.030000       | ---              | 28.43            | 9.000           | N    | 10.0       | 21.57       | 50.00        | Compliance |
| 10.030000       | 32.20            | ---              | 9.000           | N    | 10.0       | 27.80       | 60.00        | Compliance |
| 19.300000       | ---              | 21.07            | 9.000           | N    | 10.1       | 28.93       | 50.00        | Compliance |
| 19.300000       | 23.04            | ---              | 9.000           | N    | 10.1       | 36.96       | 60.00        | Compliance |

**Note:**

- 1) Corr.=LISN VDF (Voltage Division Factor) + Cable Loss
- 2) Corrected Amplitude = Reading + Corr.
- 3) Margin = Limit –Corrected Amplitude

## FCC §15.205, §15.209 & §15.247(d) – RADIATED EMISSIONS

### Applicable Standard

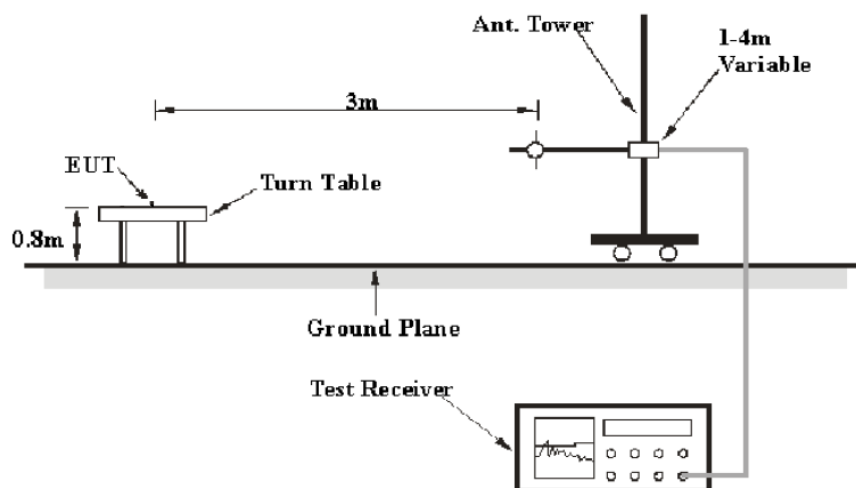
FCC §15.205; §15.209; §15.247(d)

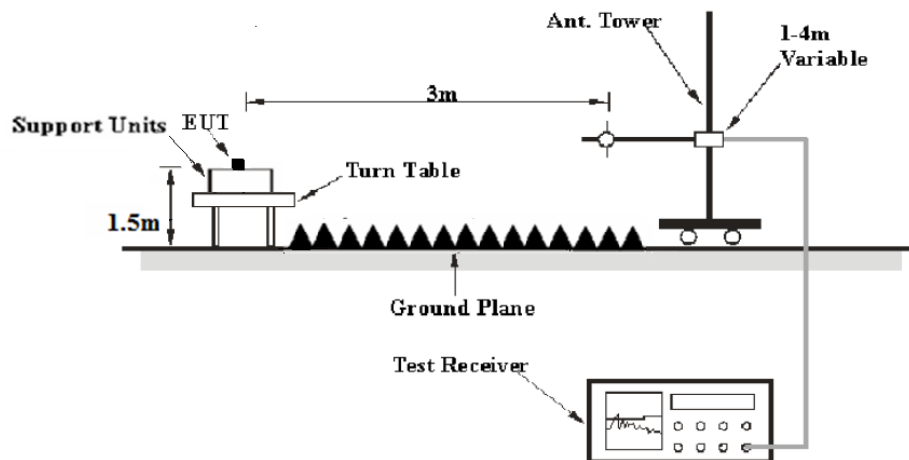
### Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

### EUT Setup

Below 1 GHz:



**Above 1GHz:**

The radiated emission tests were performed in the 3 meters, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209 and FCC 15.247 limits.

**EMI Test Receiver & Spectrum Analyzer Setup**

The system was investigated from 30 MHz to 10 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

| Frequency Range   | RBW     | Video B/W | IF B/W  | Detector |
|-------------------|---------|-----------|---------|----------|
| 30 MHz – 1000 MHz | 120 kHz | 300 kHz   | 120 kHz | QP       |

| Frequency Range | RBW  | Video B/W | Duty cycle | Detector |
|-----------------|------|-----------|------------|----------|
| 1GHz – 10GHz    | 1MHz | 3 MHz     | Any        | PK       |
|                 | 1MHz | 10 Hz     | >98%       | Ave.     |
|                 | 1MHz | 1/T       | <98%       |          |

**Test Procedure**

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

All final data was recorded in Quasi-peak detection mode for frequency range of 30 MHz -1 GHz and peak and Average detection modes for frequencies above 1 GHz.

## Corrected Amplitude & Margin Calculation

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

$$\text{Corrected Amplitude} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

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:

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

## Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Subpart C, section 15.205, 15.209 and 15.247.

Refer to CISPR16-4-2 and CISPR 16-4-1, the measured level complies with the limit if

$$L_m + U_{(L_m)} \leq L_{lim} + U_{cispr}$$

In BACL,  $U_{(L_m)}$  is less than  $+ U_{cispr}$ , if  $L_m$  is less than  $L_{lim}$ , it implies that the EUT complies with the limit.

## Test Data

### Environmental Conditions

|                           |           |
|---------------------------|-----------|
| <b>Temperature:</b>       | 23.8 °C   |
| <b>Relative Humidity:</b> | 56 %      |
| <b>ATM Pressure:</b>      | 101.0 kPa |

*The testing was performed by Ada Yu on 2017-02-06.*

*EUT operation mode: Transmitting*

**30MHz -10 GHz:**

| Frequency<br>(MHz)          | Receiver          |                          | Turntable<br>Degree | Rx Antenna     |                | Corrected<br>Factor<br>(dB) | Corrected<br>Amplitude<br>(dBμV/m) | FCC Part<br>15.247/205/209 |                |
|-----------------------------|-------------------|--------------------------|---------------------|----------------|----------------|-----------------------------|------------------------------------|----------------------------|----------------|
|                             | Reading<br>(dBμV) | Detector<br>(PK/QP/Ave.) |                     | Height<br>(cm) | Polar<br>(H/V) |                             |                                    | Limit<br>(dB μ<br>V/m)     | Margin<br>(dB) |
| Low Channel (916.25 MHz)    |                   |                          |                     |                |                |                             |                                    |                            |                |
| 42.36                       | 28.07             | QP                       | 338                 | 198            | V              | -6.37                       | 21.70                              | 40                         | 18.30          |
| 83.45                       | 35.72             | QP                       | 70                  | 140            | V              | -11.18                      | 24.54                              | 40                         | 15.46          |
| 726.58                      | 24.38             | QP                       | 287                 | 132            | V              | 3.65                        | 28.03                              | 46                         | 17.97          |
| 916.25                      | 99.61             | PK                       | 23                  | 124            | H              | 24.68                       | 124.29                             | /                          | /              |
| 916.25                      | 96.22             | PK                       | 136                 | 209            | V              | 24.68                       | 120.90                             | /                          | /              |
| 902.00                      | 39.66             | PK                       | 92                  | 240            | H              | 24.47                       | 64.13                              | 74                         | 9.87           |
| 902.00                      | 39.07             | PK                       | 141                 | 160            | V              | 24.47                       | 63.54                              | 74                         | 10.46          |
| 1832.50                     | 74.40             | PK                       | 140                 | 184            | H              | -7.88                       | 66.52                              | 74                         | 7.48           |
| 1832.50                     | 69.32             | PK                       | 358                 | 151            | V              | -7.88                       | 61.44                              | 74                         | 12.56          |
| 2748.75                     | 42.38             | PK                       | 4                   | 222            | H              | -4.61                       | 37.77                              | 74                         | 36.23          |
| 2748.75                     | 42.49             | PK                       | 113                 | 241            | V              | -4.61                       | 37.88                              | 74                         | 36.12          |
| Middle Channel (921.45 MHz) |                   |                          |                     |                |                |                             |                                    |                            |                |
| 42.36                       | 27.59             | QP                       | 53                  | 204            | V              | -6.37                       | 21.22                              | 40                         | 18.78          |
| 83.45                       | 36.46             | QP                       | 100                 | 225            | V              | -11.18                      | 25.28                              | 40                         | 14.72          |
| 726.58                      | 25.37             | QP                       | 343                 | 203            | V              | 3.65                        | 29.02                              | 46                         | 16.98          |
| 921.45                      | 95.72             | PK                       | 60                  | 151            | H              | 24.76                       | 120.48                             | /                          | /              |
| 921.45                      | 94.07             | PK                       | 275                 | 217            | V              | 24.76                       | 118.83                             | /                          | /              |
| 1842.90                     | 69.39             | PK                       | 54                  | 243            | H              | -7.83                       | 61.56                              | 74                         | 12.44          |
| 1842.90                     | 67.23             | PK                       | 25                  | 103            | V              | -7.83                       | 59.40                              | 74                         | 14.60          |
| 2764.35                     | 52.68             | PK                       | 194                 | 239            | H              | -4.53                       | 48.15                              | 74                         | 25.85          |
| 2764.35                     | 51.37             | PK                       | 294                 | 247            | V              | -4.53                       | 46.84                              | 74                         | 27.16          |
| High Channel (926.65 MHz)   |                   |                          |                     |                |                |                             |                                    |                            |                |
| 42.36                       | 27.67             | QP                       | 40                  | 205            | V              | -6.37                       | 21.30                              | 40                         | 18.70          |
| 83.45                       | 35.98             | QP                       | 287                 | 192            | V              | -11.18                      | 24.80                              | 40                         | 15.20          |
| 726.58                      | 26.36             | QP                       | 288                 | 219            | V              | 3.65                        | 30.01                              | 46                         | 15.99          |
| 926.65                      | 100.42            | PK                       | 68                  | 178            | H              | 24.84                       | 125.26                             | /                          | /              |
| 926.65                      | 97.61             | PK                       | 17                  | 100            | V              | 24.84                       | 122.45                             | /                          | /              |
| 928.00                      | 40.76             | PK                       | 209                 | 244            | H              | 24.86                       | 65.62                              | 74                         | 8.38           |
| 928.00                      | 40.64             | PK                       | 81                  | 186            | V              | 24.86                       | 65.50                              | 74                         | 8.50           |
| 1853.30                     | 72.37             | PK                       | 19                  | 224            | H              | -7.78                       | 64.59                              | 74                         | 9.41           |
| 1853.30                     | 66.17             | PK                       | 37                  | 224            | V              | -7.78                       | 58.39                              | 74                         | 15.61          |
| 2779.95                     | 65.34             | PK                       | 328                 | 222            | H              | -4.44                       | 60.90                              | 74                         | 13.10          |
| 2779.95                     | 64.31             | PK                       | 137                 | 223            | V              | -4.44                       | 59.87                              | 74                         | 14.13          |

Note: The fundamental test is without Amplifier

| Frequency<br>(MHz)          | Peak<br>Measurement@3m<br>(dBμV/m) | Polar<br>(H/V) | Duty Cycle | Duty Cycle<br>Correction<br>Factor (dB) | Corrected<br>Amplitude<br>(dBμV/m) | FCC Part<br>15.249/205/209 |                |
|-----------------------------|------------------------------------|----------------|------------|-----------------------------------------|------------------------------------|----------------------------|----------------|
|                             |                                    |                |            |                                         |                                    | Limit<br>(dBμV/m)          | Margin<br>(dB) |
| Low Channel (916.25 MHz)    |                                    |                |            |                                         |                                    |                            |                |
| 916.25                      | 124.29                             | H              | 0.1816     | -14.82                                  | 109.47                             | /                          | /              |
| 916.25                      | 120.9                              | V              | 0.1816     | -14.82                                  | 106.08                             | /                          | /              |
| 902.00                      | 64.13                              | H              | 0.1816     | -14.82                                  | 49.31                              | 54                         | 4.69           |
| 902.00                      | 63.54                              | V              | 0.1816     | -14.82                                  | 48.72                              | 54                         | 5.28           |
| 1832.5                      | 66.52                              | H              | 0.1816     | -14.82                                  | 51.70                              | 54                         | 2.30           |
| 1832.5                      | 61.44                              | V              | 0.1816     | -14.82                                  | 46.62                              | 54                         | 7.38           |
| 2748.75                     | 37.77                              | H              | 0.1816     | -14.82                                  | 22.95                              | 54                         | 31.05          |
| 2748.75                     | 37.88                              | V              | 0.1816     | -14.82                                  | 23.06                              | 54                         | 30.94          |
| Middle Channel (921.45 MHz) |                                    |                |            |                                         |                                    |                            |                |
| 921.45                      | 120.48                             | H              | 0.1816     | -14.82                                  | 105.66                             | /                          | /              |
| 921.45                      | 118.83                             | V              | 0.1816     | -14.82                                  | 104.01                             | /                          | /              |
| 1842.9                      | 61.56                              | H              | 0.1816     | -14.82                                  | 46.74                              | 54                         | 7.26           |
| 1842.9                      | 59.40                              | V              | 0.1816     | -14.82                                  | 44.58                              | 54                         | 9.42           |
| 2764.35                     | 48.15                              | H              | 0.1816     | -14.82                                  | 33.33                              | 54                         | 20.67          |
| 2764.35                     | 46.84                              | V              | 0.1816     | -14.82                                  | 32.02                              | 54                         | 21.98          |
| High Channel (926.65 MHz)   |                                    |                |            |                                         |                                    |                            |                |
| 926.65                      | 125.26                             | H              | 0.1816     | -14.82                                  | 110.44                             | /                          | /              |
| 926.65                      | 122.45                             | V              | 0.1816     | -14.82                                  | 107.63                             | /                          | /              |
| 928.00                      | 65.62                              | H              | 0.1816     | -14.82                                  | 50.80                              | 54                         | 3.20           |
| 928.00                      | 65.50                              | V              | 0.1816     | -14.82                                  | 50.68                              | 54                         | 3.32           |
| 1853.3                      | 64.59                              | H              | 0.1816     | -14.82                                  | 49.77                              | 54                         | 4.23           |
| 1853.3                      | 58.39                              | V              | 0.1816     | -14.82                                  | 43.57                              | 54                         | 10.43          |
| 2779.95                     | 60.9                               | H              | 0.1816     | -14.82                                  | 46.08                              | 54                         | 7.92           |
| 2779.95                     | 59.87                              | V              | 0.1816     | -14.82                                  | 45.05                              | 54                         | 8.95           |

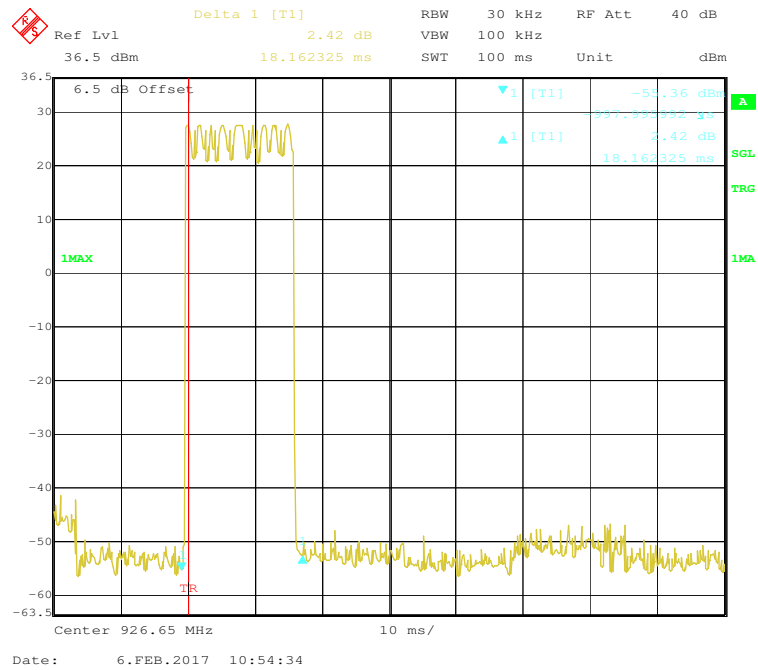
Max Duty cycle = 18.16ms/100ms=0.1816

Duty Cycle Correction Factor = 20\*lg (duty cycle) = -14.82

AV = PK + Duty Cycle Correction Factor

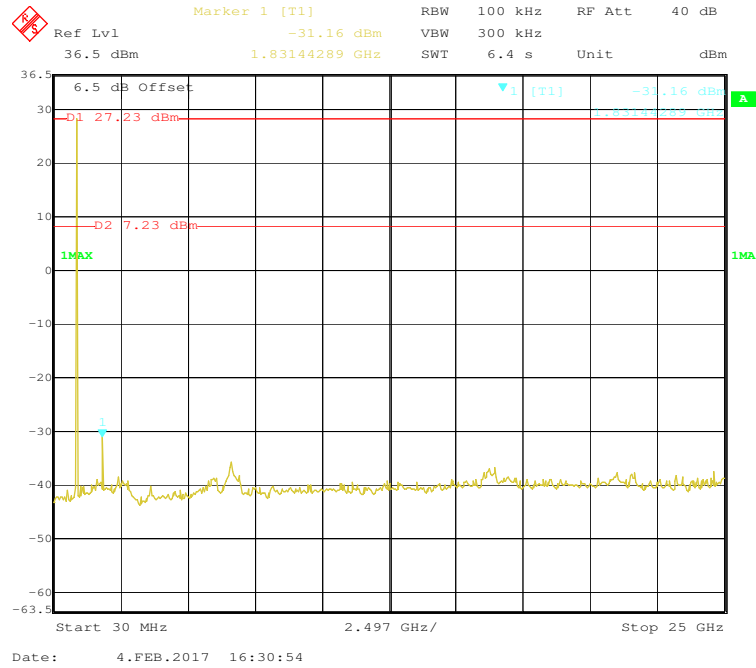
Please refer to following plot for Duty cycle:

**duty cycle**

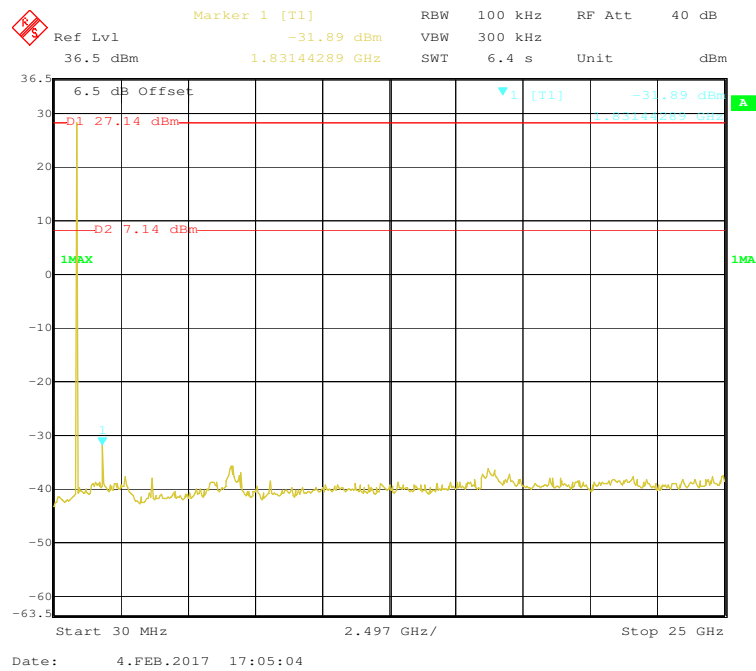


Spurious Emissions at Antenna Port:

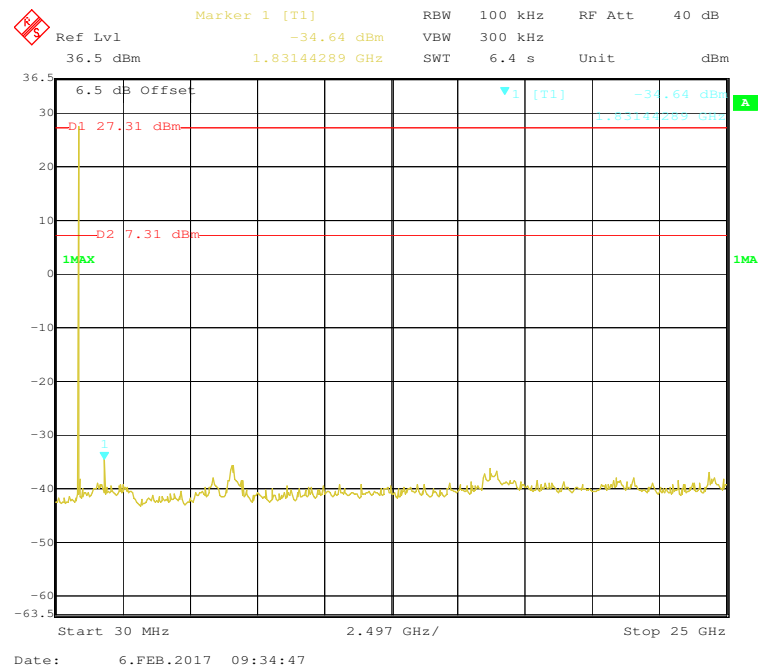
Low Channel



Middle Channel



High Channel



**FCC §15.247(a) (1) (i)-CHANNEL SEPARATION TEST****Applicable Standard**

(i) For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz

**Test Procedure**

1. Set the EUT in transmitting mode, maxhold the channel.
2. Set the adjacent channel of the EUT and maxhold another trace.
3. Measure the channel separation.

**Test Data****Environmental Conditions**

|                           |           |
|---------------------------|-----------|
| <b>Temperature:</b>       | 24.1 °C   |
| <b>Relative Humidity:</b> | 55 %      |
| <b>ATM Pressure:</b>      | 101.0 kPa |

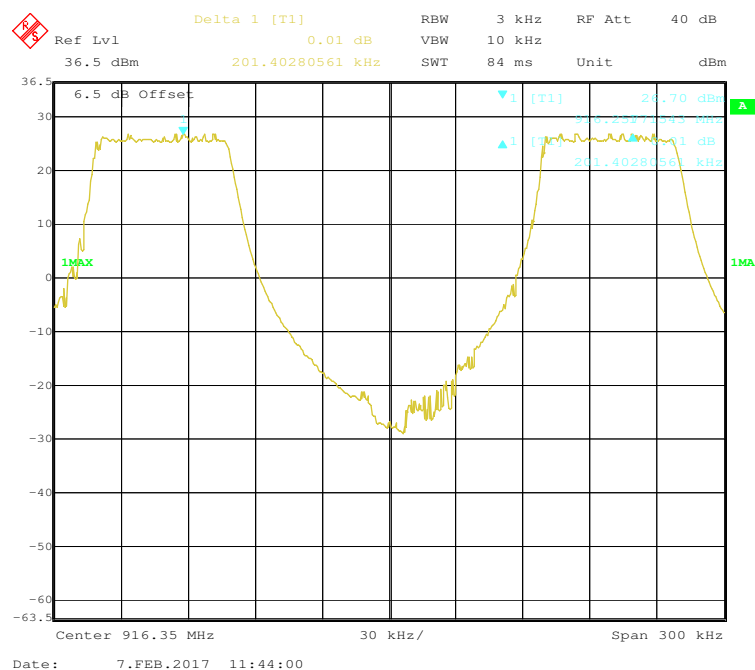
*The testing was performed by Ada Yu on 2017-02-07.*

*EUT operation mode: Transmitting*

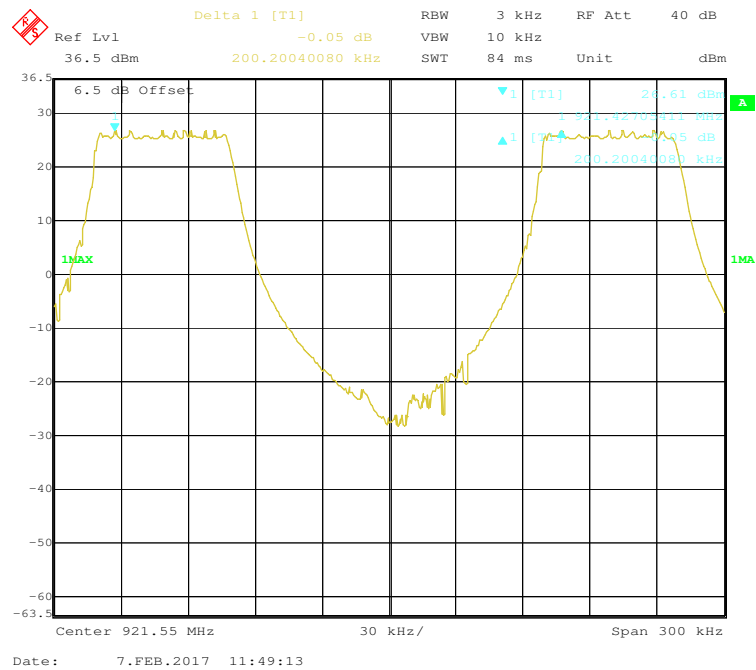
*Test Result: Compliance. Please refer to following tables and plots*

| Modulation | Channel  | Frequency (MHz) | Channel Separation (MHz) | Limit (MHz)    | Result |
|------------|----------|-----------------|--------------------------|----------------|--------|
| LoRa       | Low      | 916.25          | 0.2014                   | $\geq 0.07655$ | Pass   |
|            | Adjacent | 916.45          |                          |                |        |
|            | Middle   | 921.45          | 0.2002                   | $\geq 0.07655$ | Pass   |
|            | Adjacent | 921.65          |                          |                |        |
|            | Adjacent | 926.45          | 0.2002                   | $\geq 0.07525$ | Pass   |
|            | High     | 926.65          |                          |                |        |

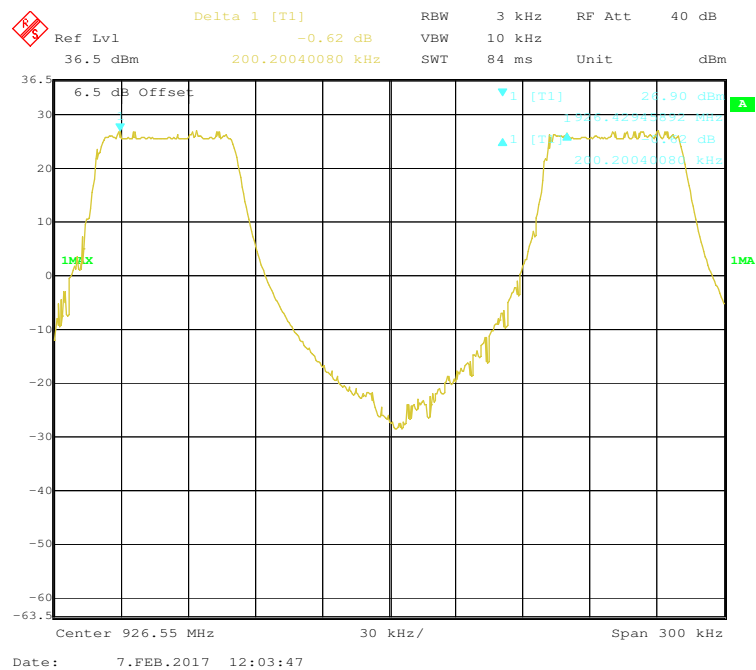
### Low Channel



### Middle Channel



### High Channel



**FCC §15.247(a) (1) (i) – 20 dB EMISSION BANDWIDTH****Applicable Standard**

(i) For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

**Test Procedure**

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

**Test Data****Environmental Conditions**

|                           |           |
|---------------------------|-----------|
| <b>Temperature:</b>       | 24.5 °C   |
| <b>Relative Humidity:</b> | 56 %      |
| <b>ATM Pressure:</b>      | 101.0 kPa |

*The testing was performed by Ada Yu on 2017-02-07*

*EUT operation mode: Transmitting*

*Test Result: Compliance. Please refer to following tables and plots*

| Modulation | Channel | Frequency (MHz) | 20 dB Emission Bandwidth (kHz) | Limit (kHz) |
|------------|---------|-----------------|--------------------------------|-------------|
| LoRa       | Low     | 916.25          | 76.55                          | ≤500        |
|            | Middle  | 921.45          | 76.55                          | ≤500        |
|            | High    | 926.65          | 75.25                          | ≤500        |

Marker 1 [T1] RBW 3 kHz RF Att 40 dB

Ref Lvl 36.5 dBm Unit dBm

6.5 dB Offset

D1 26.68 dBm

D2 6.68 dBm

1MAX

6.12 dBm

916.21132265 MHz

916.21132265 MHz

916.21693387 MHz

916.22254533 MHz

916.22815683 MHz

916.23376833 MHz

916.23937983 MHz

916.24499133 MHz

916.25060283 MHz

916.25621433 MHz

916.26182583 MHz

916.26743733 MHz

916.27304883 MHz

916.27866033 MHz

916.28427183 MHz

916.28988333 MHz

916.29549483 MHz

916.30110633 MHz

916.30671783 MHz

916.31232933 MHz

916.31794083 MHz

916.32355233 MHz

916.32916383 MHz

916.33477533 MHz

916.34038683 MHz

916.34599833 MHz

916.35160983 MHz

916.35722133 MHz

916.36283283 MHz

916.36844433 MHz

916.37405583 MHz

916.37966733 MHz

916.38527883 MHz

916.39089033 MHz

916.39650183 MHz

916.40211333 MHz

916.40772483 MHz

916.41333633 MHz

916.41894783 MHz

916.42455933 MHz

916.43017083 MHz

916.43578233 MHz

916.44139383 MHz

916.44700533 MHz

916.45261683 MHz

916.45822833 MHz

916.46383983 MHz

916.46945133 MHz

916.47506283 MHz

916.48067433 MHz

916.48628583 MHz

916.49189733 MHz

916.49750883 MHz

916.50312033 MHz

916.50873183 MHz

916.51434333 MHz

916.51995483 MHz

916.52556633 MHz

916.53117783 MHz

916.53678933 MHz

916.54240083 MHz

916.54801233 MHz

916.55362383 MHz

916.55923533 MHz

916.56484683 MHz

916.57045833 MHz

916.57606983 MHz

916.58168133 MHz

916.58729283 MHz

916.59290433 MHz

916.59851583 MHz

916.60412733 MHz

916.60973883 MHz

916.61535033 MHz

916.62096183 MHz

916.62657333 MHz

916.63218483 MHz

916.63779633 MHz

916.64340783 MHz

916.64901933 MHz

916.65463083 MHz

916.66024233 MHz

916.66585383 MHz

916.67146533 MHz

916.67707683 MHz

916.68268833 MHz

916.68829983 MHz

916.69391133 MHz

916.69952283 MHz

916.70513433 MHz

916.71074583 MHz

916.71635733 MHz

916.72196883 MHz

916.72758033 MHz

916.73319183 MHz

916.73880333 MHz

916.74441483 MHz

916.75002633 MHz

916.75563783 MHz

916.76124933 MHz

916.76686083 MHz

916.77247233 MHz

916.77808383 MHz

916.78369533 MHz

916.78930683 MHz

916.79491833 MHz

916.80052983 MHz

916.80614133 MHz

916.81175283 MHz

916.81736433 MHz

916.82297583 MHz

916.82858733 MHz

916.83419883 MHz

916.83981033 MHz

916.84542183 MHz

916.85103333 MHz

916.85664483 MHz

916.86225633 MHz

916.86786783 MHz

916.87347933 MHz

916.87909083 MHz

916.88470233 MHz

916.89031383 MHz

916.89592533 MHz

916.90153683 MHz

916.90714833 MHz

916.91275983 MHz

916.91837133 MHz

916.92398283 MHz

916.92959433 MHz

916.93520583 MHz

916.94081733 MHz

916.94642883 MHz

916.95204033 MHz

916.95765183 MHz

916.96326333 MHz

916.96887483 MHz

916.97448633 MHz

916.98009783 MHz

916.98570933 MHz

916.99132083 MHz

916.99693233 MHz

917.00254383 MHz

917.00815533 MHz

917.01376683 MHz

917.01937833 MHz

917.02498983 MHz

917.03060133 MHz

917.03621283 MHz

917.04182433 MHz

917.04743583 MHz

917.05304733 MHz

917.05865883 MHz

917.06427033 MHz

917.06988183 MHz

917.07549333 MHz

917.08110483 MHz

917.08671633 MHz

917.09232783 MHz

917.09793933 MHz

917.10355083 MHz

917.10916233 MHz

917.11477383 MHz

917.12038533 MHz

917.12599683 MHz

917.13160833 MHz

917.13721983 MHz

917.14283133 MHz

917.14844283 MHz

917.15405433 MHz

917.15966583 MHz

917.16527733 MHz

917.17088883 MHz

917.17650033 MHz

917.18211183 MHz

917.18772333 MHz

917.19333483 MHz

917.19894633 MHz

917.20455783 MHz

917.21016933 MHz

917.21578083 MHz

917.22139233 MHz

917.22700383 MHz

917.23261533 MHz

917.23822683 MHz

917.24383833 MHz

917.24944983 MHz

917.25506133 MHz

917.26067283 MHz

917.26628433 MHz

917.27189583 MHz

917.27750733 MHz

917.28311883 MHz

917.28873033 MHz

917.29434183 MHz

917.29995333 MHz

917.30556483 MHz

917.31117633 MHz

917.31678783 MHz

917.32239933 MHz

917.32801083 MHz

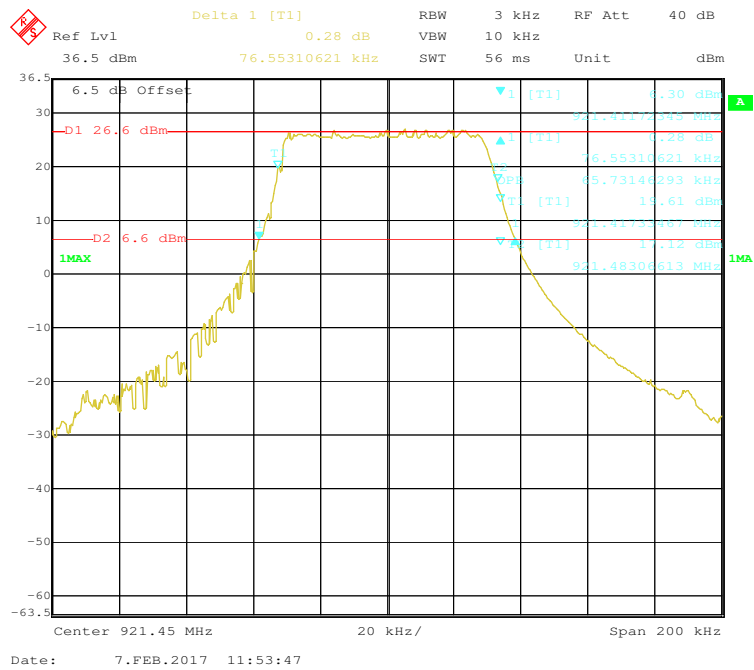
917.33362233 MHz

917.33923383 MHz

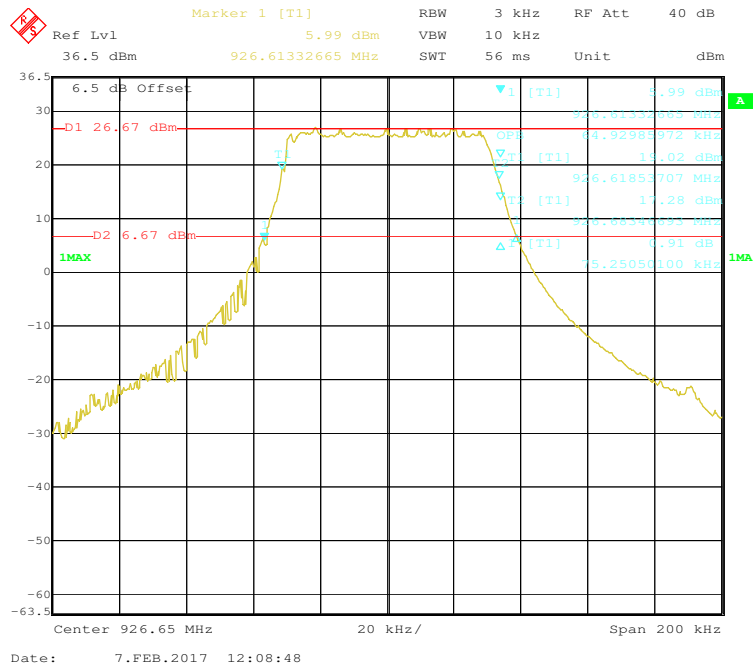
917.34484533 MHz

917.35045683

### Middle Channel



### High Channel



**FCC §15.247(a) (1) (i)-QUANTITY OF HOPPING CHANNEL TEST****Applicable Standard**

(i) For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

**Test Procedure**

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. Set the EUT in hopping mode from first channel to last.
3. By using the max-hold function record the quantity of the channel.

**Test Data****Environmental Conditions**

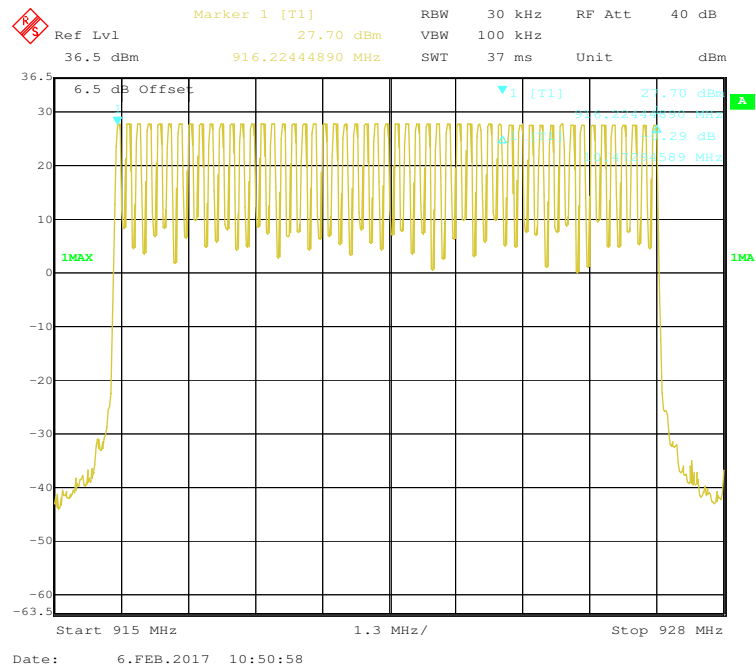
|                           |           |
|---------------------------|-----------|
| <b>Temperature:</b>       | 24 °C     |
| <b>Relative Humidity:</b> | 55 %      |
| <b>ATM Pressure:</b>      | 101.0 kPa |

*The testing was performed by Ada Yu on 2017-02-06*

*EUT operation mode: Transmitting*

*Test Result: Compliance. Please refer to following tables and plots*

| Modulation | Frequency Range (MHz) | Number of Hopping Channel (CH) | Limit (CH) |
|------------|-----------------------|--------------------------------|------------|
| LoRa       | 902~928               | 53                             | $\geq 50$  |

**Number of Hopping Channels**

**FCC §15.247(a) (1) (i) - TIME OF OCCUPANCY (DWELL TIME)****Applicable Standard**

(i) For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

**Test Procedure**

The EUT was worked in channel hopping; Spectrum SPAN was set as 0. Sweep was set as 0.4 X channel no. (s), the quantity of pulse was get from single sweep. In addition, the time of single pulses was tested.

**Test Data****Environmental Conditions**

|                           |           |
|---------------------------|-----------|
| <b>Temperature:</b>       | 24.2 °C   |
| <b>Relative Humidity:</b> | 55 %      |
| <b>ATM Pressure:</b>      | 101.0 kPa |

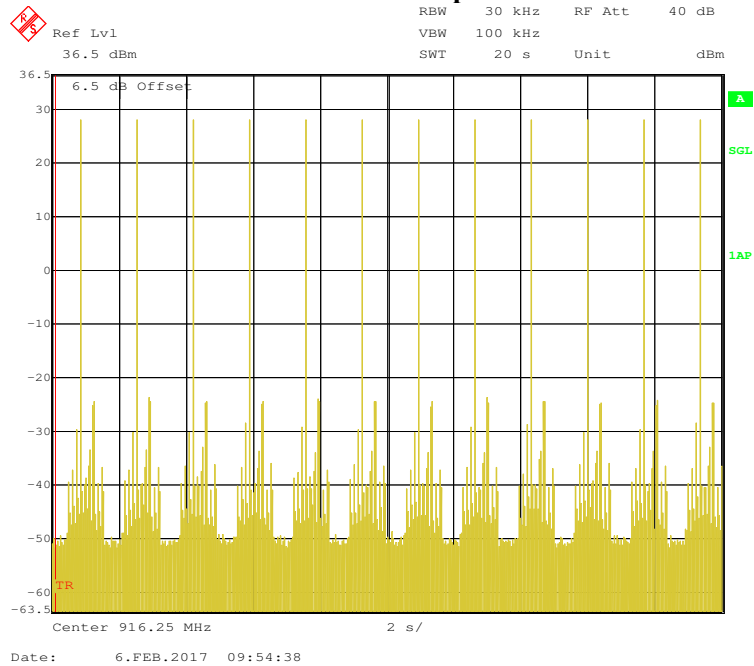
The testing was performed by Ada Yu on 2017-02-06.

EUT operation mode: Transmitting

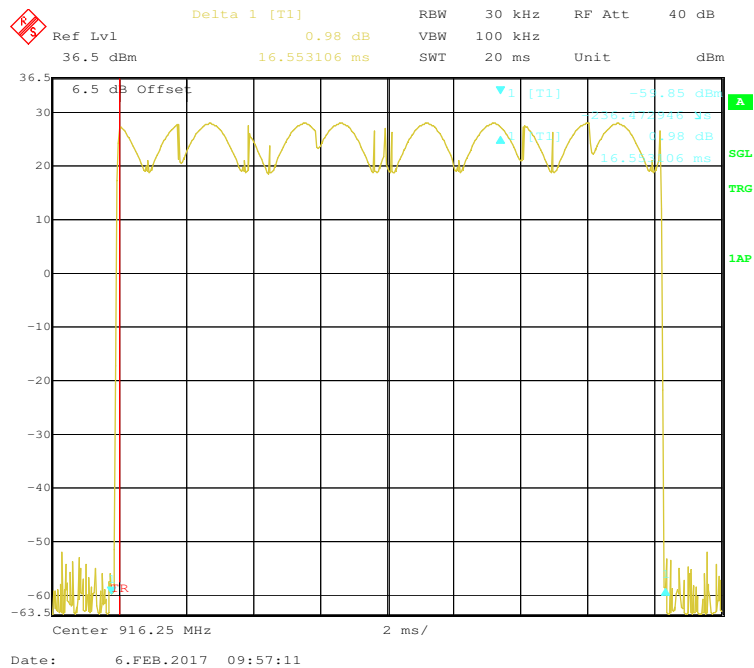
Test Result: Compliance. Please refer to following tables and plots

| Modulation | Channel                           | Pulse Width | Pulse Number | Dwell Time | Limit | Result |
|------------|-----------------------------------|-------------|--------------|------------|-------|--------|
|            |                                   | (ms)        |              | (S)        | (S)   |        |
| LoRa       | Low                               | 16.553      | 12           | 0.199      | ≤0.4  | Pass   |
|            | Middle                            | 16.553      | 12           | 0.199      | ≤0.4  | Pass   |
|            | High                              | 16.553      | 24           | 0.397      | ≤0.4  | Pass   |
|            | Note: Dwell time = Pulse time * N |             |              |            |       |        |

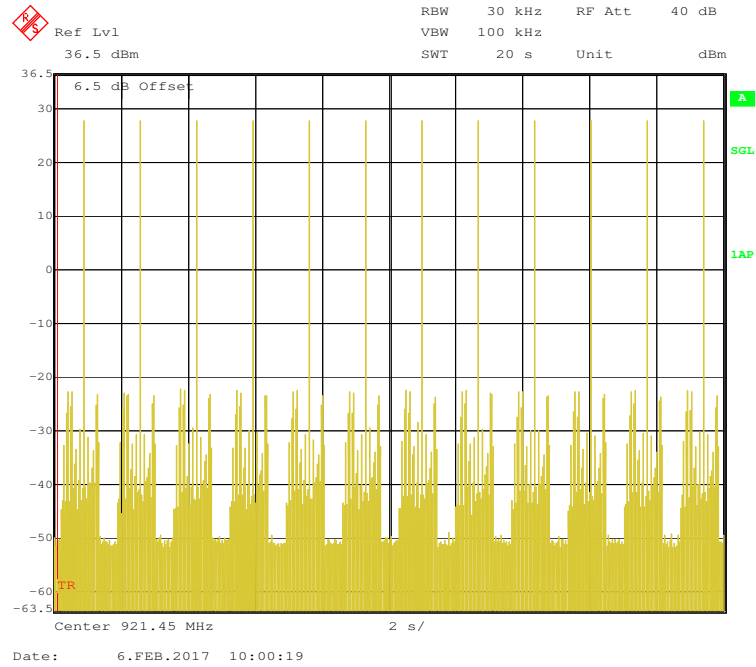
### Low Channel Number of pusles



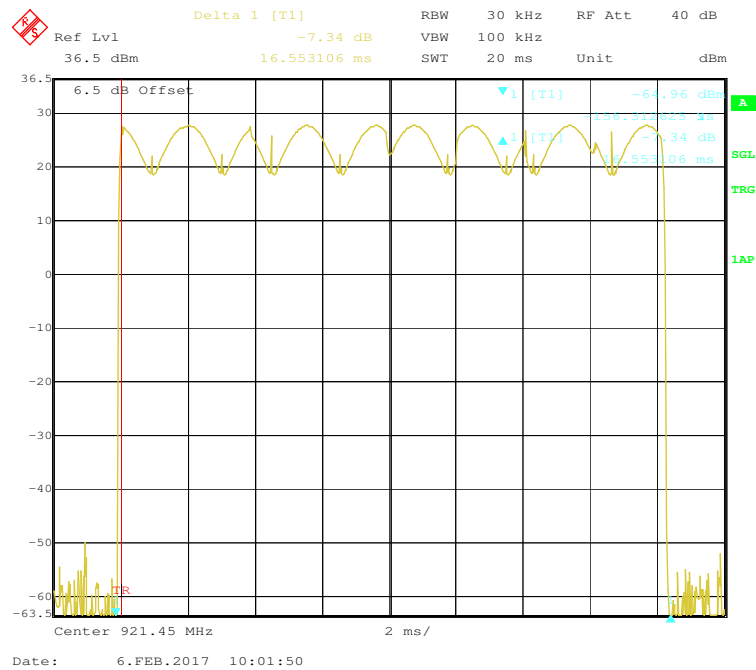
### Single Pusle



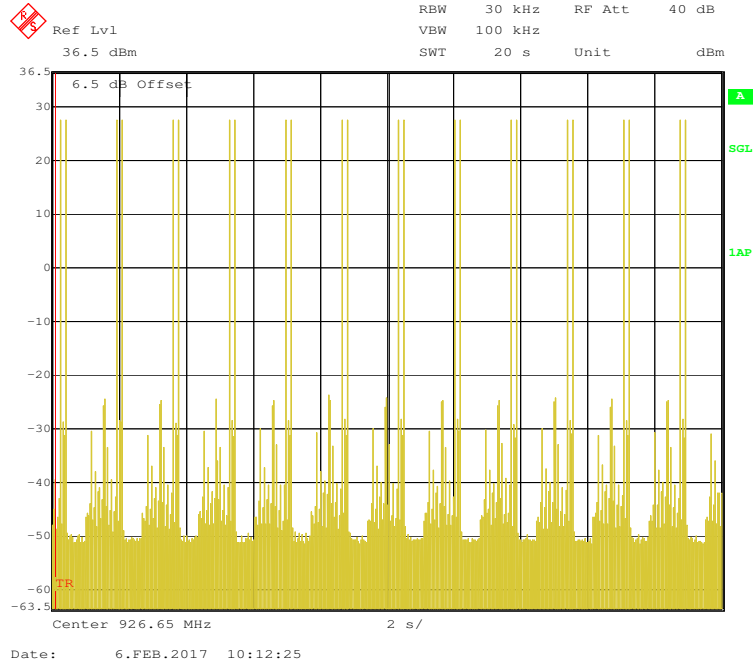
### Middle Channel Number of pusles



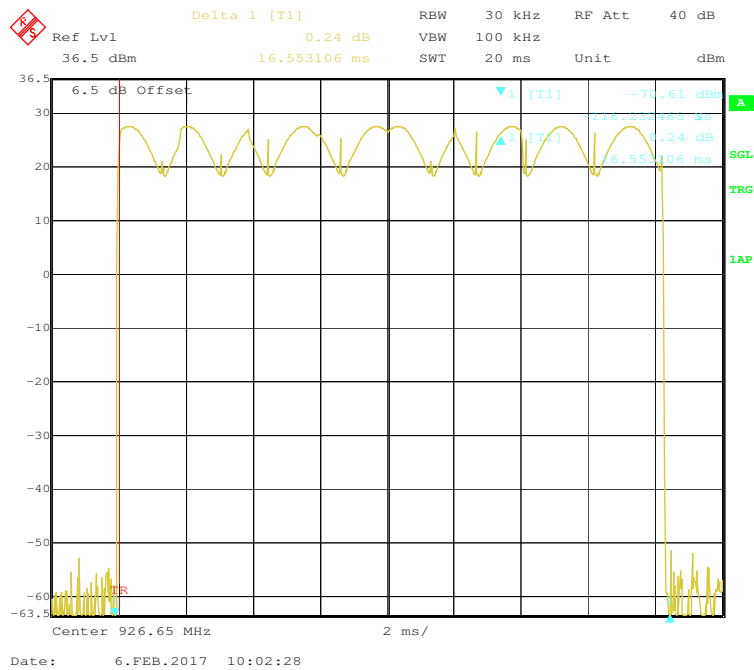
### Single Pusle



# High Channel Number of pusles



# Single Pusle



## **FCC §15.247(b) (2) - PEAK OUTPUT POWER MEASUREMENT**

### **Applicable Standard**

According to §15.247(b) (2), For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.

### **Test Procedure**

1. Place the EUT on a bench and set in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to one test equipment.
3. Add a correction factor to the display.

### **Test Data**

#### **Environmental Conditions**

|                           |           |
|---------------------------|-----------|
| <b>Temperature:</b>       | 25 °C     |
| <b>Relative Humidity:</b> | 55 %      |
| <b>ATM Pressure:</b>      | 101.0 kPa |

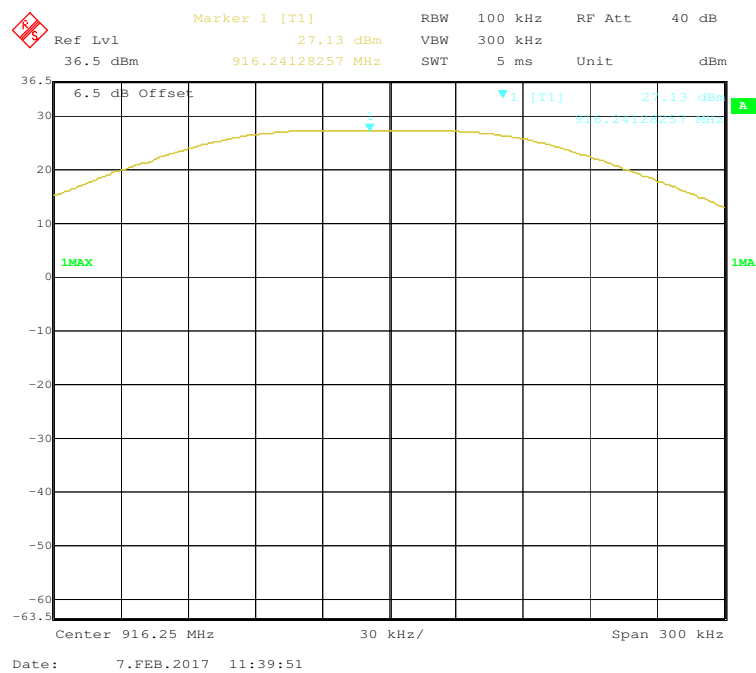
*The testing was performed by Ada Yu on 2017-02-07.*

*EUT operation mode: Transmitting*

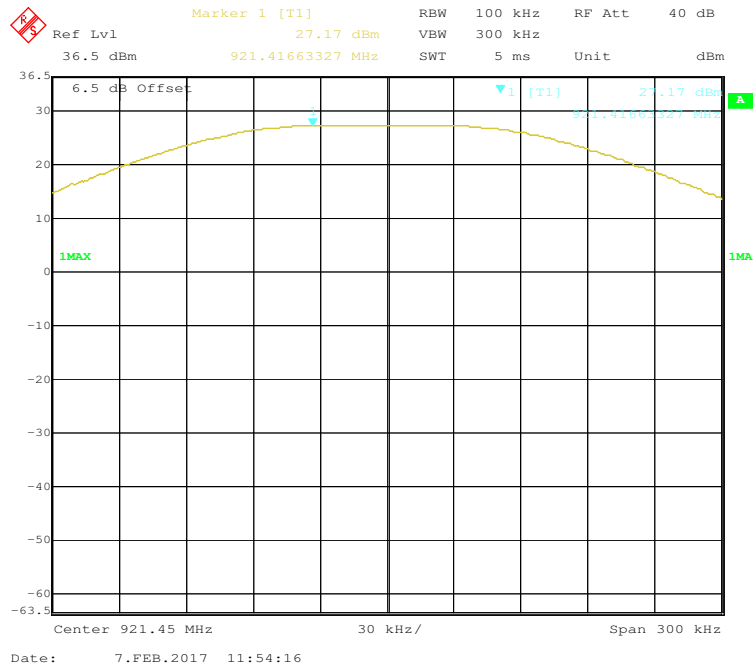
*Test Result: Compliance. Please refer to following tables and plots*

| Modulation | Channel | Frequency (MHz) | Output Power |        | Limit (mW) |
|------------|---------|-----------------|--------------|--------|------------|
|            |         |                 | (dBm)        | (mW)   |            |
| LoRa       | Low     | 916.25          | 27.13        | 516.42 | ≤1000      |
|            | Middle  | 921.45          | 27.17        | 521.19 | ≤1000      |
|            | High    | 926.65          | 27.14        | 517.61 | ≤1000      |

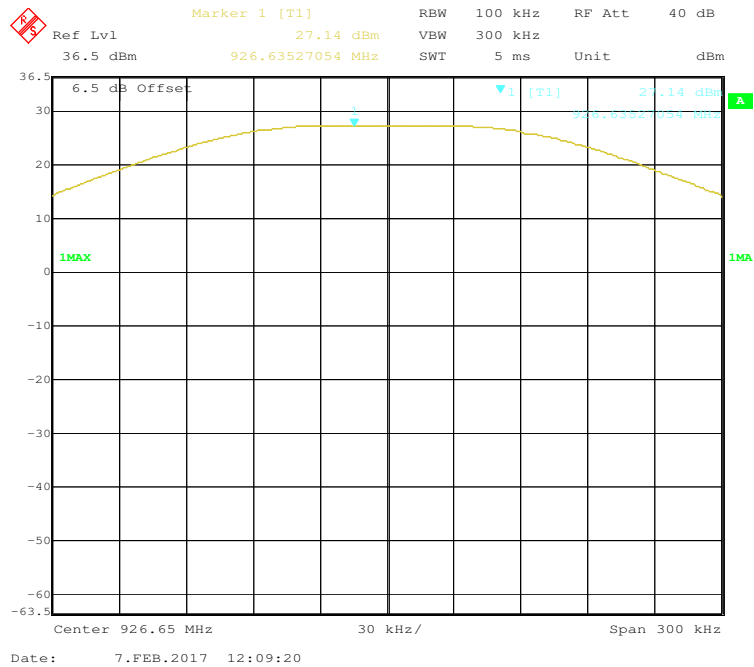
### Low Channel



### Middle Channel



### High Channel



## FCC §15.247(d) - BAND EDGES TESTING

### Applicable Standard

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

### Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Remove the antenna from the EUT and then connect to a low loss RF cable from the antenna port to a EMI test receiver, then turn on the EUT and make it operate in transmitting mode. Then set it to Low Channel and High Channel within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

### Test Data

#### Environmental Conditions

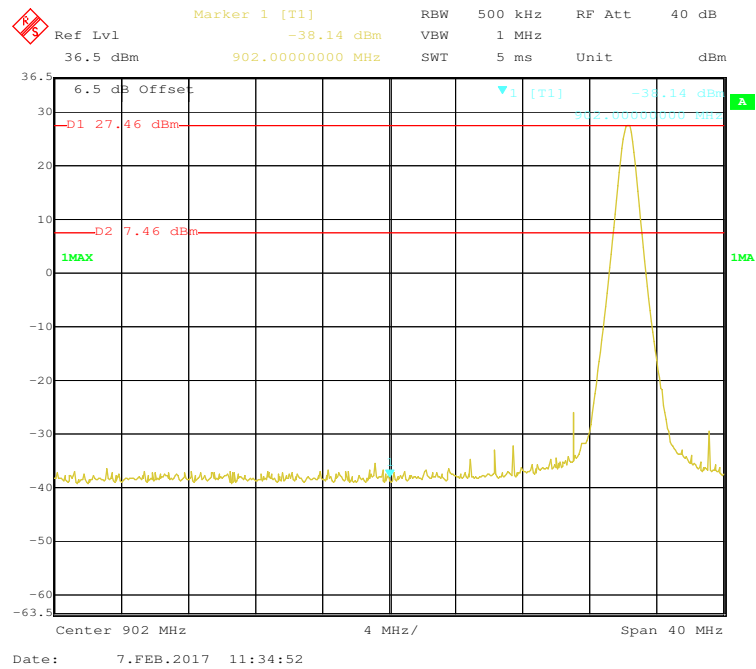
|                    |           |
|--------------------|-----------|
| Temperature:       | 24 °C     |
| Relative Humidity: | 55 %      |
| ATM Pressure:      | 101.0 kPa |

*The testing was performed by Ada Yu on 2017-02-07.*

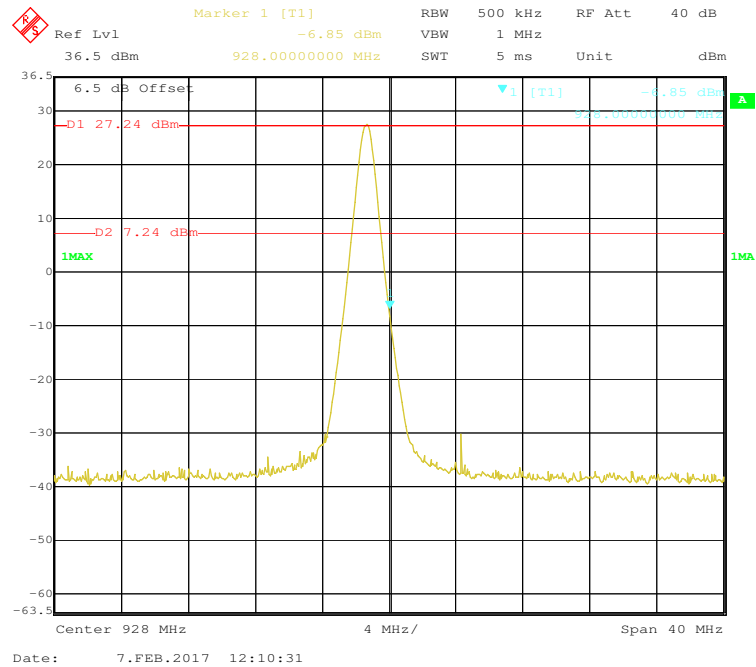
*EUT operation mode: Transmitting*

*Test Result: Compliance. Please refer to following plots.*

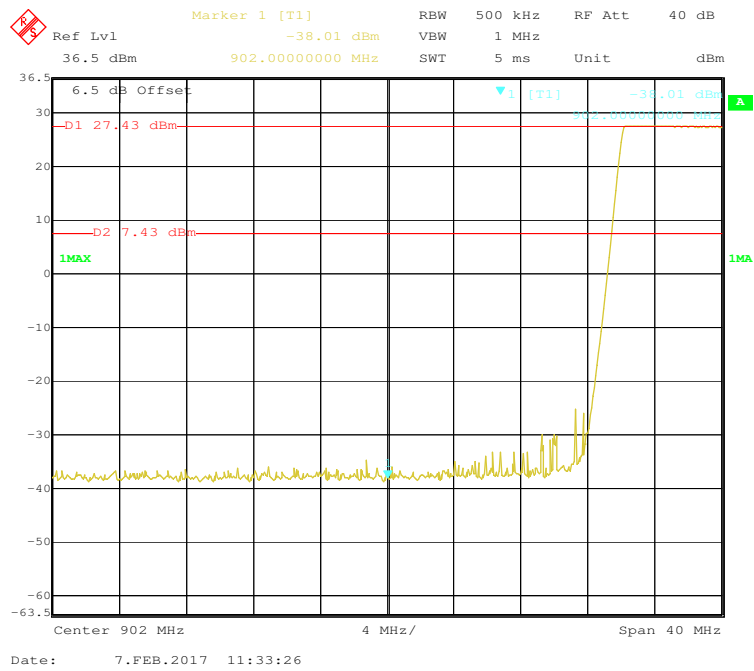
### Band Edge-Left Side



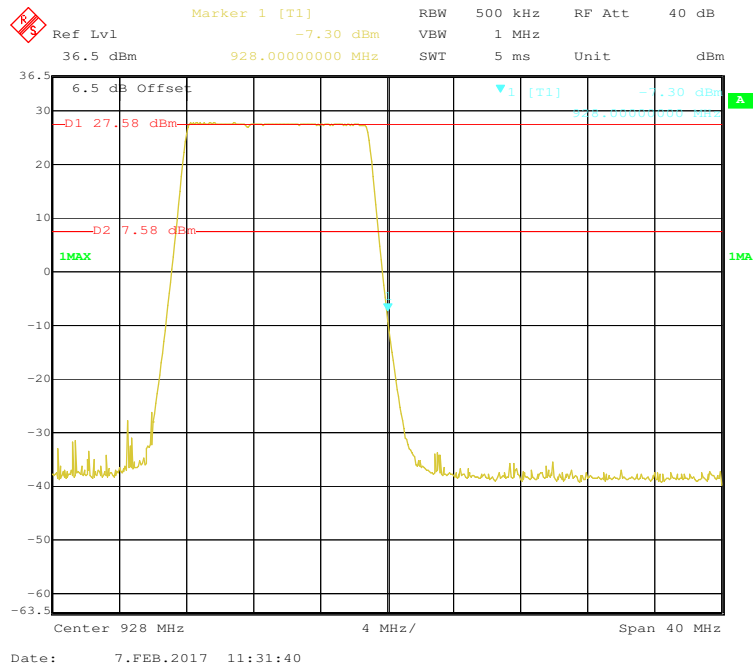
### Band Edge-Right Side



### Band Edge-Left Side (Hopping)



### Band Edge-Right Side (Hopping)



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