

# FCC TEST REPORT

**Product Name:** LP-M0 Series Industrial IoT module  
**Trade Mark:** LP SENSOR TECHNOLOGY  
**Model No.:** LP-M01  
**Add. Model No.:** N/A  
**Report Number:** 2210132087RFC-1  
**Test Standards:** FCC 47 CFR Part 15 Subpart C  
**FCC ID:** 2A8PY-MIOW001  
**Test Result:** PASS  
**Date of Issue:** February 2, 2023

Prepared for:

**LP SENSOR TECHNOLOGY LLC**  
**149 Silverado, Irvine, CA, 92618**

Prepared by:

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UTTR-RF-FCCPART15.249-V1.1

## Version

| Version No. | Date             | Description |
|-------------|------------------|-------------|
| V1.0        | February 2, 2023 | Original    |

DRAFT

## Shenzhen UnionTrust Quality and Technology Co., Ltd.

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UTTR-RF-FCCPART15.249-V1.1

## CONTENTS

|                                                       |           |
|-------------------------------------------------------|-----------|
| <b>1. GENERAL INFORMATION</b>                         | <b>4</b>  |
| 1.1 CLIENT INFORMATION                                | 4         |
| 1.2 EUT INFORMATION                                   | 4         |
| 1.2.1 GENERAL DESCRIPTION OF EUT                      | 4         |
| 1.2.2 DESCRIPTION OF ACCESSORIES                      | 4         |
| 1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD | 4         |
| 1.4 OTHER INFORMATION                                 | 5         |
| 1.5 DESCRIPTION OF SUPPORT UNITS                      | 5         |
| 1.6 TEST LOCATION                                     | 6         |
| 1.7 TEST FACILITY                                     | 6         |
| 1.8 DEVIATION FROM STANDARDS                          | 6         |
| 1.9 ABNORMALITIES FROM STANDARD CONDITIONS            | 6         |
| 1.10 OTHER INFORMATION REQUESTED BY THE CUSTOMER      | 6         |
| 1.11 MEASUREMENT UNCERTAINTY                          | 7         |
| <b>2. TEST SUMMARY</b>                                | <b>8</b>  |
| <b>3. EQUIPMENT LIST</b>                              | <b>9</b>  |
| <b>4. TEST CONFIGURATION</b>                          | <b>10</b> |
| 4.1 ENVIRONMENTAL CONDITIONS FOR TESTING              | 10        |
| 4.1.1 NORMAL OR EXTREME TEST CONDITIONS               | 10        |
| 4.1.2 RECORD OF NORMAL ENVIRONMENT AND TEST SAMPLE    | 10        |
| 4.2 TEST CHANNELS                                     | 10        |
| 4.3 EUT TEST STATUS                                   | 10        |
| 4.4 TEST SETUP                                        | 11        |
| 4.4.1 FOR RADIATED EMISSIONS TEST SETUP               | 11        |
| 4.4.2 FOR CONDUCTED EMISSIONS TEST SETUP              | 12        |
| 4.4.3 FOR CONDUCTED EMISSIONS TEST SETUP              | 13        |
| 4.5 SYSTEM TEST CONFIGURATION                         | 13        |
| 4.6 DUTY CYCLE                                        | 14        |
| <b>5. RADIO TECHNICAL REQUIREMENTS SPECIFICATION</b>  | <b>16</b> |
| 5.1 REFERENCE DOCUMENTS FOR TESTING                   | 16        |
| 5.2 ANTENNA REQUIREMENT                               | 16        |
| 5.3 RADIATED EMISSION                                 | 16        |
| 5.4 20dB OCCUPIED BANDWIDTH                           | 33        |
| 5.5 CONDUCTED EMISSION                                | 35        |
| APPENDIX 1 PHOTOS OF TEST SETUP                       | 36        |
| APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS       | 36        |

## 1. GENERAL INFORMATION

### 1.1 CLIENT INFORMATION

|                                 |                                  |
|---------------------------------|----------------------------------|
| <b>Applicant:</b>               | LP SENSOR TECHNOLOGY LLC         |
| <b>Address of Applicant:</b>    | 149 Silverado, Irvine, CA, 92618 |
| <b>Manufacturer:</b>            | LP SENSOR TECHNOLOGY LLC         |
| <b>Address of Manufacturer:</b> | 149 Silverado, Irvine, CA, 92618 |

### 1.2 EUT INFORMATION

#### 1.2.1 General Description of EUT

#### 1.2.2 Description of Accessories

None.

### 1.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD

|                                                    |                                                                     |
|----------------------------------------------------|---------------------------------------------------------------------|
| <b>Frequency Band:</b>                             | 902 MHz to 915 MHz                                                  |
| <b>Frequency Range:</b>                            | 902 MHz to 915 MHz                                                  |
| <b>Modulation Technique:</b>                       | General 915MHz Technique                                            |
| <b>Type of Modulation:</b>                         | LoRa                                                                |
| <b>Number of Channels:</b>                         | 63 channels for 125kHz Bandwidth<br>8 channels for 500kHz Bandwidth |
| <b>Channel Separation:</b>                         | 200kHz for 125kHz Bandwidth<br>1.6MHz for 500kHz Bandwidth          |
| <b>Antenna Type:</b>                               | Rod Antenna                                                         |
| <b>Antenna Gain:</b><br>(Provided by the customer) | 4 dBi                                                               |
| <b>Maximum Field Strength:</b>                     | 93.78 dBμV/m                                                        |
| <b>Normal Test Voltage:</b>                        | 30 VDC                                                              |

## 1.4 OTHER INFORMATION

Channel List for 125kHz Bandwidth

| Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) |
|-------------|-----------------|-------------|-----------------|-------------|-----------------|-------------|-----------------|
| 1           | 902.5           | 17          | 905.7           | 33          | 908.9           | 49          | 912.1           |
| 2           | 902.7           | 18          | 905.9           | 34          | 909.1           | 50          | 912.3           |
| 3           | 902.9           | 19          | 906.1           | 35          | 909.3           | 51          | 912.5           |
| 4           | 903.1           | 20          | 906.3           | 36          | 909.5           | 52          | 912.7           |
| 5           | 903.3           | 21          | 906.5           | 37          | 909.7           | 53          | 912.9           |
| 6           | 903.5           | 22          | 906.7           | 38          | 909.9           | 54          | 913.1           |
| 7           | 903.7           | 23          | 906.9           | 39          | 910.1           | 55          | 913.3           |
| 8           | 903.9           | 24          | 907.1           | 40          | 910.3           | 56          | 913.5           |
| 9           | 904.1           | 25          | 907.3           | 41          | 910.5           | 57          | 913.7           |
| 10          | 904.3           | 26          | 907.5           | 42          | 910.7           | 58          | 913.9           |
| 11          | 904.5           | 27          | 907.7           | 43          | 910.9           | 59          | 914.1           |
| 12          | 904.7           | 28          | 907.9           | 44          | 911.1           | 60          | 914.3           |
| 13          | 904.9           | 29          | 908.1           | 45          | 911.3           | 61          | 914.5           |
| 14          | 905.1           | 30          | 908.3           | 46          | 911.5           | 62          | 914.7           |
| 15          | 905.3           | 31          | 908.5           | 47          | 911.7           | 63          | 914.9           |
| 16          | 905.5           | 32          | 908.7           | 48          | 911.9           | --          | ---             |

Channel List for 500kHz Bandwidth

| Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) | Channel No. | Frequency (MHz) |
|-------------|-----------------|-------------|-----------------|-------------|-----------------|-------------|-----------------|
| 1           | 903.0           | 3           | 906.2           | 5           | 909.4           | 7           | 912.6           |
| 2           | 904.6           | 4           | 907.8           | 6           | 911.0           | 8           | 914.2           |

## 1.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested with associated equipment below.

### 1) Support Equipment

| Description | Manufacturer | Model No.     | Serial Number | Supplied by |
|-------------|--------------|---------------|---------------|-------------|
| Notebook    | DELL         | Latitude 3400 | 16238087894   | UnionTrust  |
| Mouse       | DELL         | MS111         | CN-011D3V-738 | UnionTrust  |
| DC Source   | Agilent      | 66319B        | MY43000795    | UnionTrust  |

### 2) Support Cable

| Cable No. | Description    | Connector  | Length     | Supplied by |
|-----------|----------------|------------|------------|-------------|
| 1         | Antenna Cable  | SMA        | 0.30 Meter | UnionTrust  |
| 2         | DC Power Cable | Detachable | 1.5 Meter  | UnionTrust  |

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## 1.6 TEST LOCATION

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### **Shenzhen UnionTrust Quality and Technology Co., Ltd.**

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## 1.7 TEST FACILITY

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The test facility is recognized, certified, or accredited by the following organizations:

### **CNAS-Lab Code: L9069**

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

### **A2LA-Lab Certificate No.: 4312.01**

Shenzhen UnionTrust Quality and Technology Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

### **ISED Wireless Device Testing Laboratories**

CAB identifier: CN0032

### **FCC Accredited Lab.**

Designation Number: CN1194

Test Firm Registration Number: 259480

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## 1.8 DEVIATION FROM STANDARDS

None.

## 1.9 ABNORMALITIES FROM STANDARD CONDITIONS

None.

## 1.10 OTHER INFORMATION REQUESTED BY THE CUSTOMER

None.

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### 1.11 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .

| No. | Item                            | Measurement Uncertainty |
|-----|---------------------------------|-------------------------|
| 1   | Conducted emission 9KHz-150KHz  | $\pm 3.8$ dB            |
| 2   | Conducted emission 150KHz-30MHz | $\pm 3.4$ dB            |
| 3   | Radiated emission 9KHz-30MHz    | $\pm 4.9$ dB            |
| 4   | Radiated emission 30MHz-1GHz    | $\pm 4.7$ dB            |
| 5   | Radiated emission 1GHz-18GHz    | $\pm 5.1$ dB            |
| 6   | Radiated emission 18GHz-26GHz   | $\pm 5.2$ dB            |
| 7   | Radiated emission 26GHz-40GHz   | $\pm 5.2$ dB            |

## 2. TEST SUMMARY

| FCC 47 CFR Part 15 Subpart C Test Cases                                                                                                                                                                                                                                                    |                                                               |                  |            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|------------------|------------|
| Test Item                                                                                                                                                                                                                                                                                  | Test Requirement                                              | Test Method      | Result     |
| Antenna Requirement                                                                                                                                                                                                                                                                        | FCC 47 CFR Part 15 Subpart C Section 15.203                   | ANSI C63.10-2013 | PASS       |
| Conducted Emission                                                                                                                                                                                                                                                                         | FCC 47 CFR Part 15 Subpart C Section 15.207                   | ANSI C63.10-2013 | N/A(Note2) |
| Radiated Emission                                                                                                                                                                                                                                                                          | FCC 47 CFR Part 15 Subpart C Section 15.249 (a)/15.209/15.205 | ANSI C63.10-2013 | PASS       |
| 20dB Occupied Bandwidth                                                                                                                                                                                                                                                                    | FCC 47 CFR Part 15 Subpart C Section 15.215 (c)               | ANSI C63.10-2013 | PASS       |
| <b>Note:</b><br>1) N/A: In this whole report not applicable.<br>2) This EUT is powered by DC power from systems or DC 12V from External Battery Supply.                                                                                                                                    |                                                               |                  |            |
| <b>Disclaimer and Explanations:</b><br>The declared of product specification and data (e.g., antenna gain, RF specification, etc) for EUT presented in the report are provided by the customer, and the customer takes all the responsibilities for the accuracy of product specification. |                                                               |                  |            |

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### 3. EQUIPMENT LIST

| Radiated Emission Test Equipment List |                                         |               |            |                            |             |               |
|---------------------------------------|-----------------------------------------|---------------|------------|----------------------------|-------------|---------------|
| Used                                  | Equipment                               | Manufacturer  | Model No.  | Serial Number              | Cal. date   | Cal. Due date |
| <input checked="" type="checkbox"/>   | 3M Chamber & Accessory Equipment        | ETS-LINDGREN  | 3M         | Euroshiedpn-CT001270-1317  | 22-Jan-2021 | 21-Jan-2024   |
| <input checked="" type="checkbox"/>   | Receiver                                | R&S           | ESIB26     | 100114                     | 3-Nov-2022  | 2-Nov-2023    |
| <input type="checkbox"/>              | Loop Antenna                            | ETS-LINDGREN  | 6502       | 00202525                   | 11-Nov-2021 | 10-Nov-2023   |
| <input checked="" type="checkbox"/>   | Broadband Antenna                       | ETS-LINDGREN  | 3142E      | 00201566                   | 11-Nov-2021 | 10-Nov-2023   |
| <input checked="" type="checkbox"/>   | 6dB Attenuator                          | Talent        | RA6A5-N-18 | 18103001                   | 11-Nov-2021 | 10-Nov-2023   |
| <input checked="" type="checkbox"/>   | Preamplifier                            | HP            | 8447F      | 2805A02960                 | 1-Nov-2022  | 31-Oct-2023   |
| <input type="checkbox"/>              | Horn Antenna                            | ETS-LINDGREN  | 3117       | 00164202                   | 11-Nov-2021 | 10-Nov-2023   |
| <input checked="" type="checkbox"/>   | Horn Antenna (Pre-amplifier)            | ETS-LINDGREN  | 3117-PA    | 00201874                   | 17-Apr-2022 | 16-Apr-2024   |
| <input checked="" type="checkbox"/>   | Pre-amplifier                           | ETS-LINDGREN  | 00118385   | 00201874                   | 1-Nov-2022  | 31-Oct-2023   |
| <input type="checkbox"/>              | Horn Antenna                            | ETS-LINDGREN  | 3116C      | 00200180                   | 17-Apr-2022 | 16-Apr-2024   |
| <input type="checkbox"/>              | Pre-amplifier                           | ETS-LINDGREN  | 00118384   | 00202652                   | 17-Nov-2020 | 16-Nov-2022   |
| <input type="checkbox"/>              | Band Rejection Filter (2400MHz~2500MHz) | Micro-Tronics | BRM50702   | G248                       | 2-Nov-2022  | 1-Nov-2023    |
| <input checked="" type="checkbox"/>   | Multi device Controller                 | ETS-LINDGREN  | 7006-001   | 00160105                   | N/A         | N/A           |
| <input checked="" type="checkbox"/>   | Test Software                           | Audix         | e3         | Software Version: 9.160323 |             |               |

| RF Conducted Test Equipment List    |                   |              |           |               |             |               |
|-------------------------------------|-------------------|--------------|-----------|---------------|-------------|---------------|
| Used                                | Equipment         | Manufacturer | Model No. | Serial Number | Cal. date   | Cal. Due date |
| <input checked="" type="checkbox"/> | Spectrum analyzer | R&S          | FSV40-N   | 101653        | 15-Apr-2022 | 14-Apr-2023   |

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## 4. TEST CONFIGURATION

### 4.1 ENVIRONMENTAL CONDITIONS FOR TESTING

#### 4.1.1 Normal or Extreme Test Conditions

| Environment Parameter                                           | Selected Values During Tests |               |                       |
|-----------------------------------------------------------------|------------------------------|---------------|-----------------------|
| Test Condition                                                  | Ambient                      |               |                       |
|                                                                 | Temperature (°C)             | Voltage (VDC) | Relative Humidity (%) |
| NT/NV                                                           | +15 to +35                   | 30            | 20 to 75              |
| <b>Remark:</b><br>1) NV: Normal Voltage; NT: Normal Temperature |                              |               |                       |

#### 4.1.2 Record of Normal Environment and Test Sample

| Test Item               | Temp. (°C) | Relative Humidity (%) | Pressure (kPa) | Sample No.           | Tested by |
|-------------------------|------------|-----------------------|----------------|----------------------|-----------|
| Conducted Emission      | N/A        | N/A                   | N/A            | N/A                  | N/A       |
| Radiated Emission       | 25.2       | 50.0                  | 100.2          | S20221009613-ZJA03/3 | Yana Zeng |
| 20dB Occupied Bandwidth | 24.4       | 48.9                  | 99.9           | S20221009613-ZJA02/3 | Rain Wang |

## 4.2 TEST CHANNELS

| Type of Modulation         | Tx/Rx Frequency        | Test RF Channel Lists |            |            |
|----------------------------|------------------------|-----------------------|------------|------------|
| LoRa<br>(Bandwidth=125kHz) | 902.5 MHz to 914.9 MHz | Lowest(L)             | Middle(M)  | Highest(H) |
|                            |                        | Channel 1             | Channel 31 | Channel 63 |
|                            |                        | 902.5 MHz             | 908.5 MHz  | 914.9 MHz  |

| Type of Modulation         | Tx/Rx Frequency        | Test RF Channel Lists |           |            |
|----------------------------|------------------------|-----------------------|-----------|------------|
| LoRa<br>(Bandwidth=500kHz) | 903.0 MHz to 914.2 MHz | Lowest(L)             | Middle(M) | Highest(H) |
|                            |                        | Channel 1             | Channel 5 | Channel 8  |
|                            |                        | 903.0 MHz             | 909.4 MHz | 914.2 MHz  |

## 4.3 EUT TEST STATUS

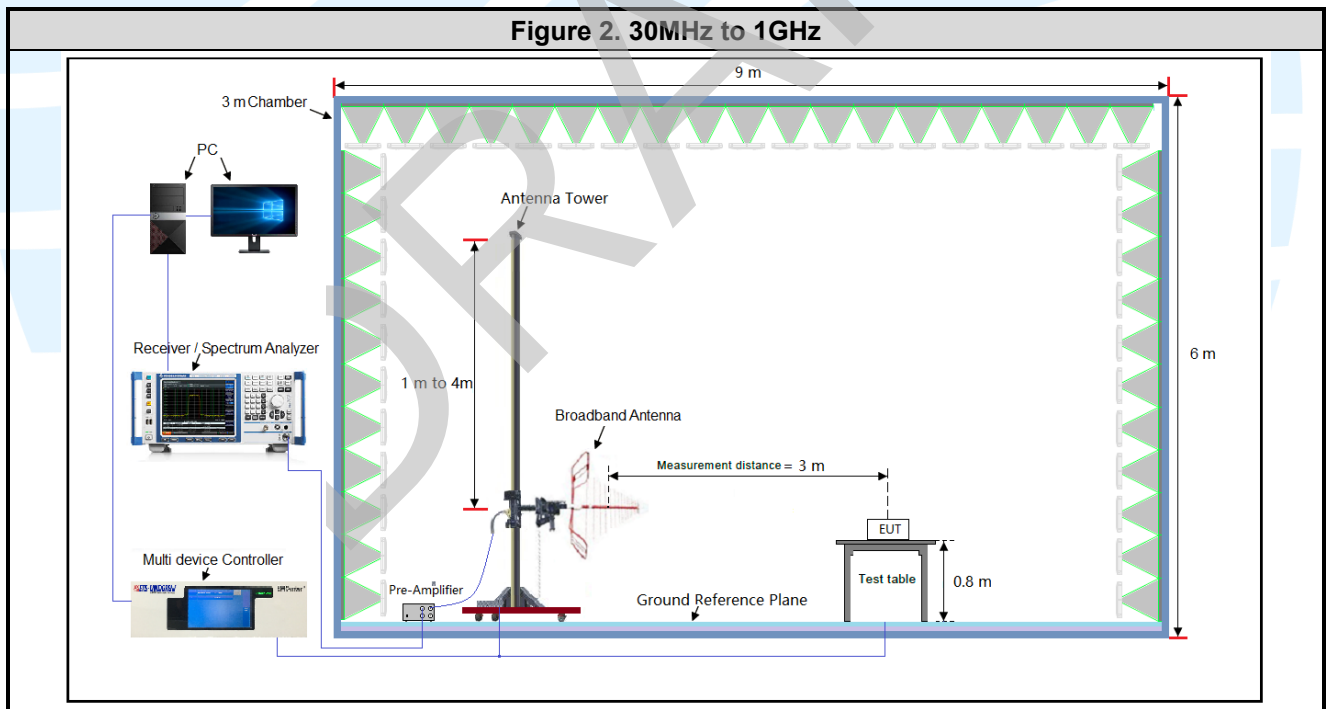
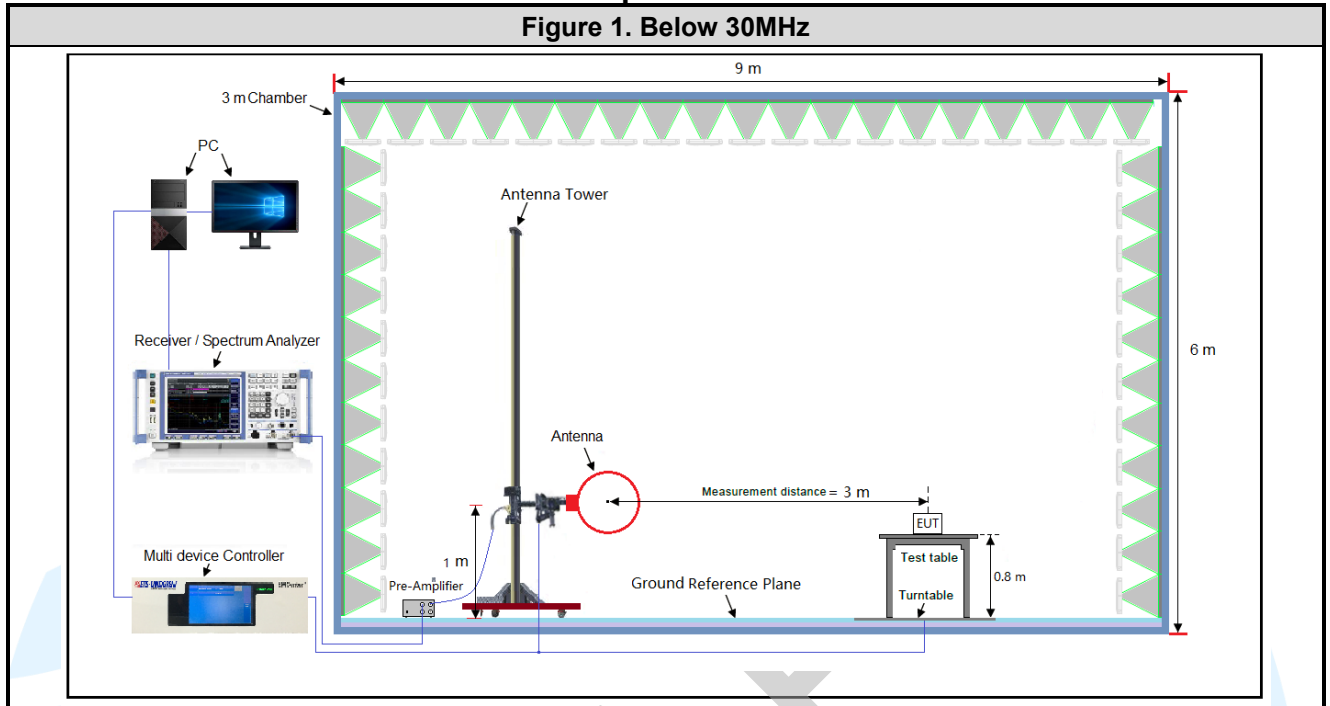
| Modulation Mode | Tx Function | Description                                                            |
|-----------------|-------------|------------------------------------------------------------------------|
| LoRa            | 1Tx         | Keep the EUT in continuously transmitting with modulation test single. |

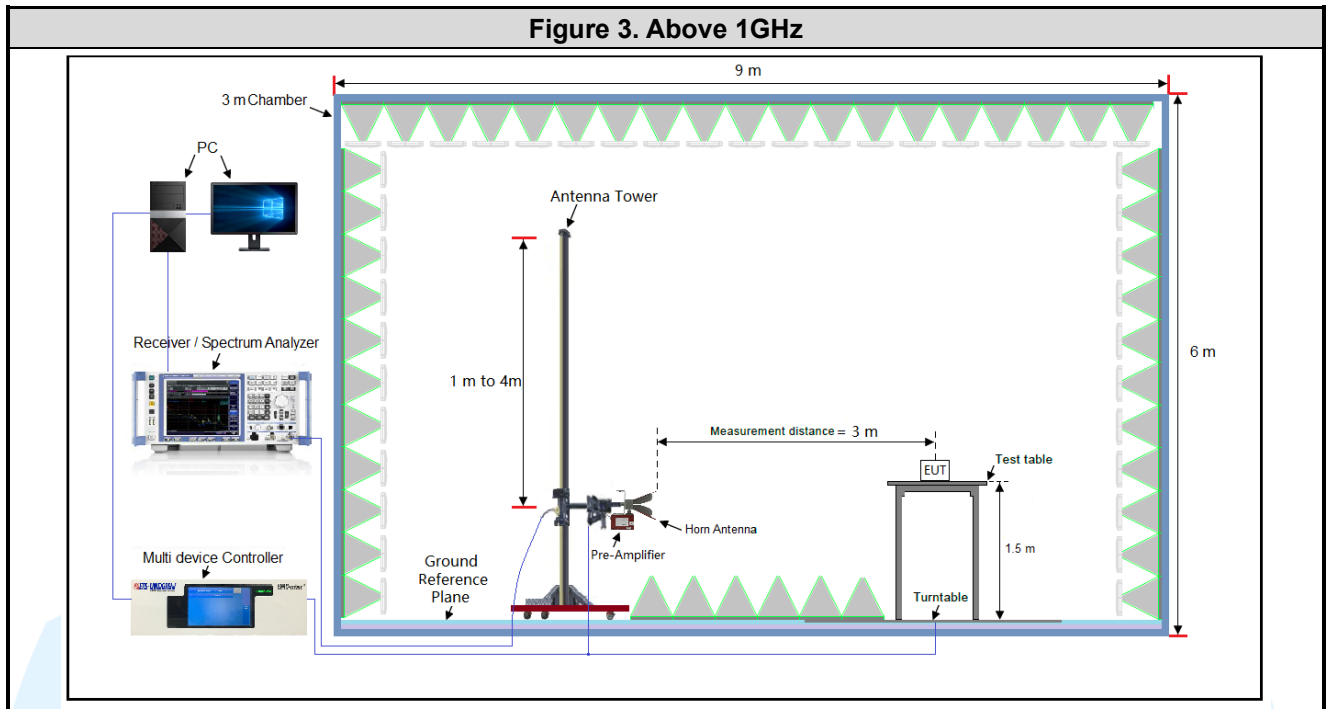
| Power Setting (Provided by the customer) |                  |                  |  |
|------------------------------------------|------------------|------------------|--|
| Channel                                  | 125kHz Bandwidth | 500kHz Bandwidth |  |
| L                                        | -1               | -1               |  |
| M                                        | -1               | -1               |  |
| H                                        | -1               | -1               |  |

| Test Software (Provided by the customer)       |
|------------------------------------------------|
| Test software name: lpm01SettingTool_V2.02.exe |

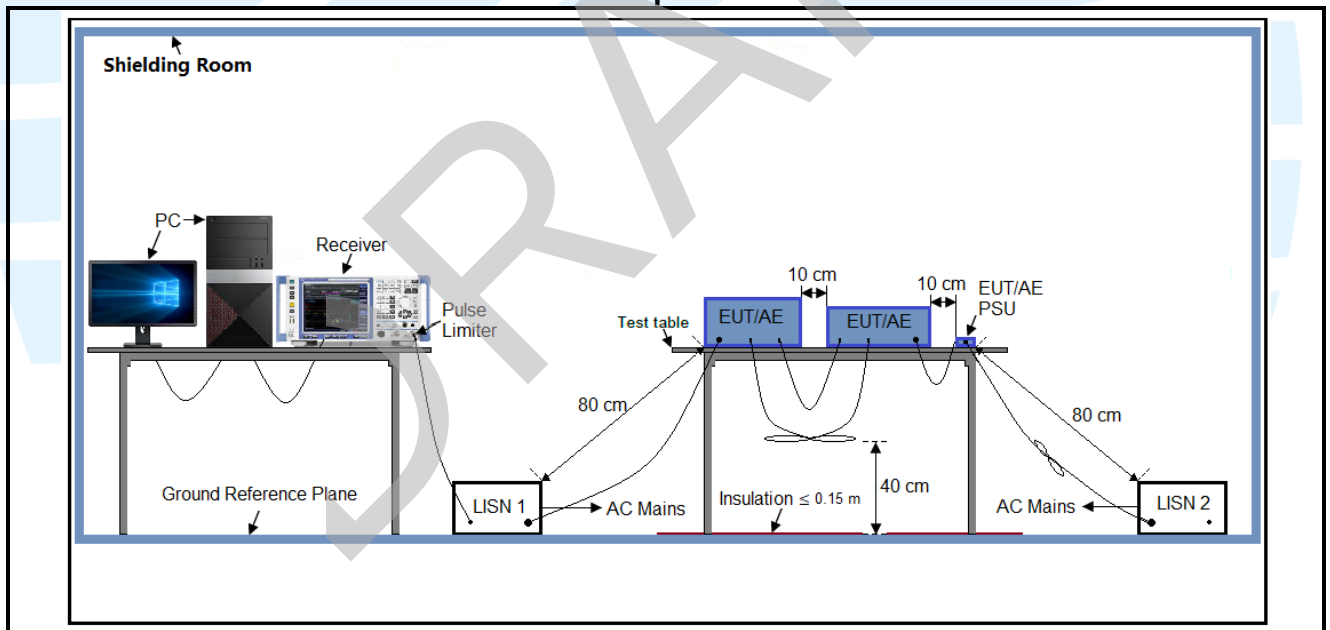
## 4.4 TEST SETUP

### 4.4.1 For Radiated Emissions test setup

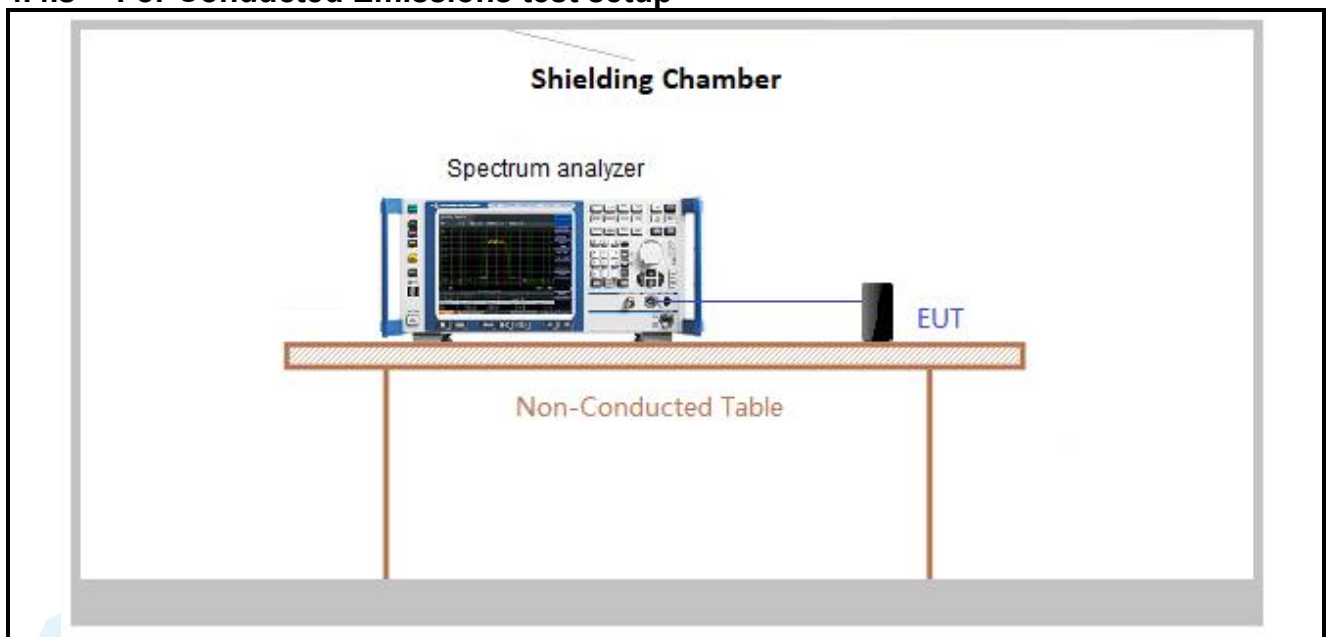




#### 4.4.2 For Conducted Emissions test setup



#### 4.4.3 For Conducted Emissions test setup



### 4.5 SYSTEM TEST CONFIGURATION

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, radiated emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario. It was powered by a 30Vdc DC Power. Only the worst case data were recorded in this test report.

The signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance. Therefore, all final radiated testing was performed with the EUT in orientation.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

Radiated emission measurement were performed from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

## 4.6 DUTY CYCLE

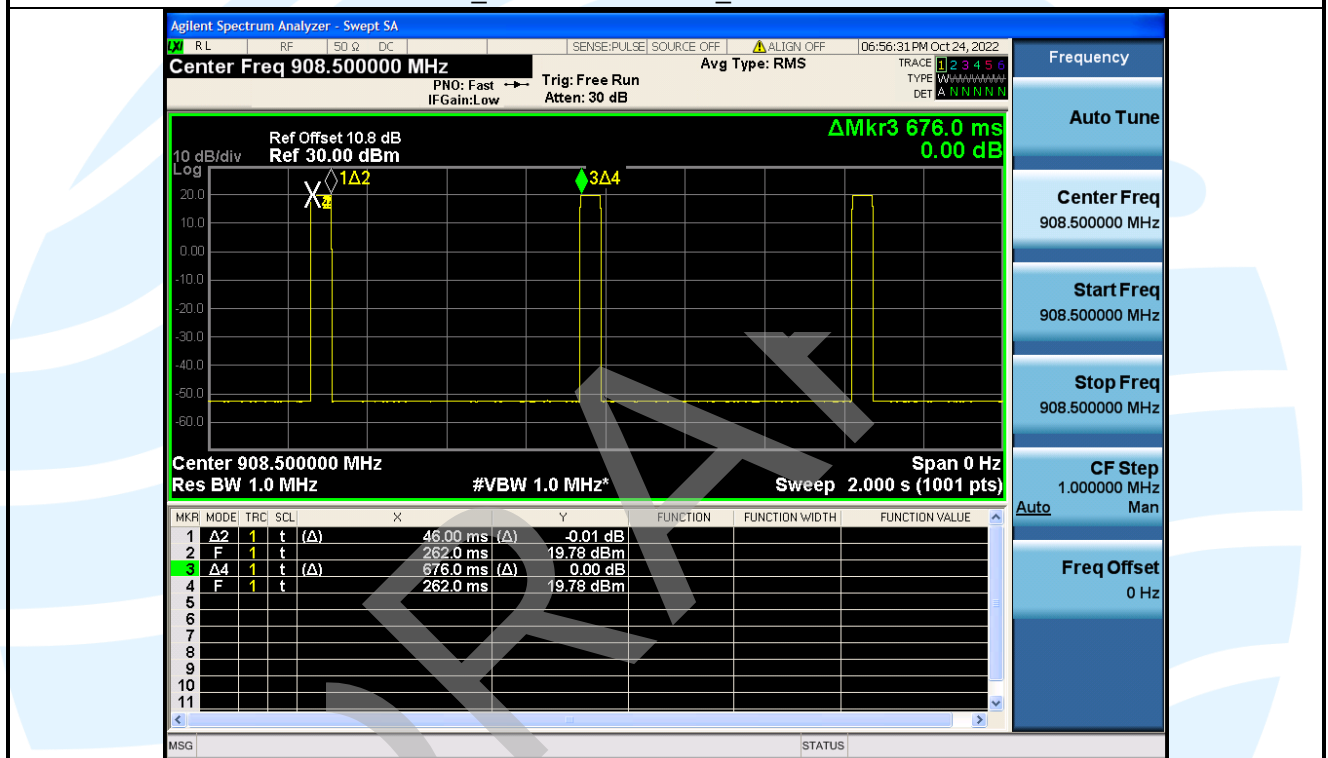
| Type of Modulation | Bandwidth (kHz) | On Time (msec) | Period (msec) | Duty Cycle (linear) | Duty Cycle (%) | Average Factor (dB) |
|--------------------|-----------------|----------------|---------------|---------------------|----------------|---------------------|
| LoRa               | 125             | 46             | 676           | 0.068               | 6.80           | -23.34              |
|                    | 500             | 10.5           | 564           | 0.019               | 1.86           | -34.60              |

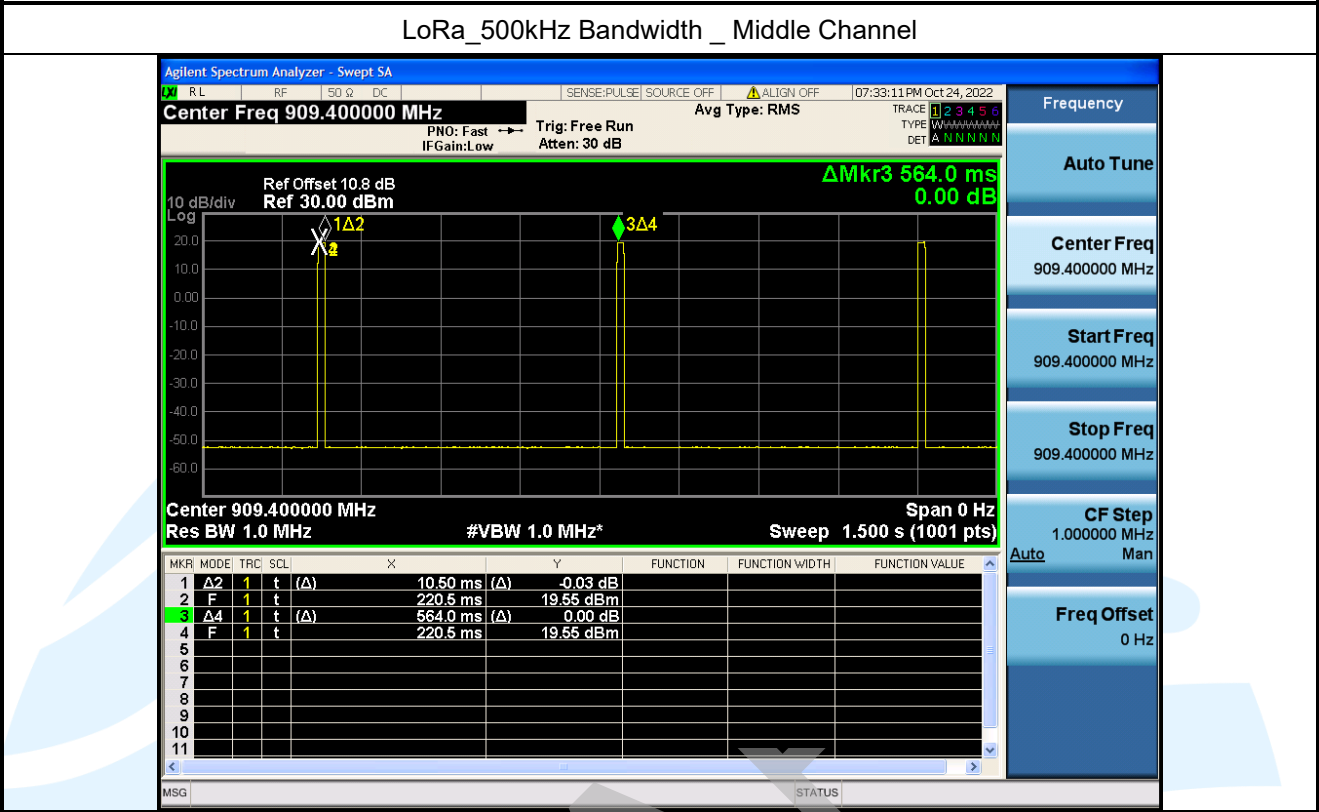
**Remark:**

- 1) Duty cycle= On Time/ Period;
- 2) Duty Cycle factor =  $10 * \log (1/ \text{Duty cycle})$ ;
- 3) Average factor =  $20 \log_{10} \text{Duty Cycle}$ .

**The test plot as follows**

LoRa\_125kHz Bandwidth \_ Middle Channel





## 5. RADIO TECHNICAL REQUIREMENTS SPECIFICATION

### 5.1 REFERENCE DOCUMENTS FOR TESTING

| No. | Identity           | Document Title                                                     |
|-----|--------------------|--------------------------------------------------------------------|
| 1   | FCC 47 CFR Part 15 | Radio Frequency Devices                                            |
| 2   | ANSI C63.10-2013   | American National Standard for Testing Unlicensed Wireless Devices |

### 5.2 ANTENNA REQUIREMENT

| Standard Requirement                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>15.203 Requirement:</b><br>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, 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. |
| <b>EUT Antenna:</b><br>The EUT has a permanently and irreplaceable attached antenna. The gain of the antenna is 4 dBi.                                                                                                                                                                                                                                                                                                                                                           |

### 5.3 RADIATED EMISSION

**Test Requirement:** FCC 47 CFR Part 15.205, 15.209 and 15.249

**Test Method:** ANSI C63.10-2013 Section 6.6.4.3

**Receiver Setup:**

| Frequency           | Detector   | RBW     | VBW     | Remark     |
|---------------------|------------|---------|---------|------------|
| 0.009 MHz-0.090 MHz | Peak       | 10 kHz  | 30 KHz  | Peak       |
| 0.009 MHz-0.090 MHz | Average    | 10 kHz  | 30 KHz  | Average    |
| 0.090 MHz-0.110 MHz | Quasi-peak | 10 kHz  | 30 KHz  | Quasi-peak |
| 0.110 MHz-0.490 MHz | Peak       | 10 kHz  | 30 KHz  | Peak       |
| 0.110 MHz-0.490 MHz | Average    | 10 kHz  | 30 KHz  | Average    |
| 0.490 MHz -30 MHz   | Quasi-peak | 10 kHz  | 30 kHz  | Quasi-peak |
| 30 MHz-1 GHz        | Quasi-peak | 100 kHz | 300 KHz | Quasi-peak |
| Above 1 GHz         | Peak       | 1 MHz   | 3 MHz   | Peak       |
|                     | Peak       | 1 MHz   | 10 Hz   | Average    |

**Limits:**

**Field strength of the fundamental signal**

As per 47 CFR Part 15.249(a), except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

| Fundamental frequency | Field strength of fundamental (millivolts/meter) | Field strength of harmonics (microvolts/meter) |
|-----------------------|--------------------------------------------------|------------------------------------------------|
| 902-928 MHz           | 50                                               | 500                                            |
| 2400-2483.5 MHz       | 50                                               | 500                                            |
| 5725-5875 MHz         | 50                                               | 500                                            |
| 24.0-24.25 GHz        | 250                                              | 2500                                           |

As per 47 CFR Part 15.249(c), Field strength limits are specified at a distance of 3 meters.

#### Spurious Emissions

47 CFR Part 15.249(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.

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| Frequency           | Field strength (microvolt/meter) | Limit (dBμV/m) | Remark     | Measurement distance (m) |
|---------------------|----------------------------------|----------------|------------|--------------------------|
| 0.009 MHz-0.490 MHz | 2400/F(kHz)                      | --             | --         | 300                      |
| 0.490 MHz-1.705 MHz | 24000/F(kHz)                     | --             | --         | 30                       |
| 1.705 MHz-30 MHz    | 30                               | --             | --         | 30                       |
| 30 MHz-88 MHz       | 100                              | 40.0           | Quasi-peak | 3                        |
| 88 MHz-216 MHz      | 150                              | 43.5           | Quasi-peak | 3                        |
| 216 MHz-960 MHz     | 200                              | 46.0           | Quasi-peak | 3                        |
| 960MHz-1GHz         | 500                              | 54.0           | Quasi-peak | 3                        |
| Above 1 GHz         | 500                              | 54.0           | Average    | 3                        |

**Remark:**

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

**Test Setup:** Refer to section 4.4.1 for details.

**Test Procedures:**

1. From 30 MHz to 1GHz test procedure as below:
  - 1) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
  - 2) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
  - 3) The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
  - 4) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rota table table was turned from 0 degrees to 360 degrees to find the maximum reading.
  - 5) The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
  - 6) If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
2. Above 1GHz test procedure as below:
  - 1) Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber and change form table 0.8 meter to 1.5 meter (Above 18GHz the distance is 1 meter and table is 1.5 meter).
  - 2) Test the EUT in the lowest channel, middle channel, the Highest channel
  - 3) The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the Y axis positioning which it is worse case.
  - 4) Repeat above procedures until all frequencies measured was complete.

**Equipment Used:** Refer to section 3 for details.

**Test Result:** Pass

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The measurement data as follows:

For 125kHz Bandwidth:

#### Field Strength of the Fundamental Signal and Bandedge

| No.                      | Frequency (MHz) | Reading (dBμV/m) | Correction factor (dB) | Result (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector | Antenna Polaxis |
|--------------------------|-----------------|------------------|------------------------|-----------------|----------------|-------------|----------|-----------------|
| Lowest Channel_902.5MHz  |                 |                  |                        |                 |                |             |          |                 |
| 1                        | 902.50          | 84.02            | 4.31                   | 88.33           | 94.00          | -5.67       | QP       | Horizontal      |
| 2                        | 902.00          | 25.89            | 4.31                   | 30.20           | 46.00          | -15.80      | QP       | Horizontal      |
| 3                        | 902.50          | 89.39            | 4.31                   | 93.70           | 94.00          | -0.30       | QP       | Vertical        |
| 4                        | 902.00          | 27.99            | 4.31                   | 32.30           | 46.00          | -13.70      | QP       | Vertical        |
| Middle Channel_908.5MHz  |                 |                  |                        |                 |                |             |          |                 |
| 1                        | 908.50          | 83.37            | 4.35                   | 87.72           | 94.00          | -6.28       | QP       | Horizontal      |
| 2                        | 908.50          | 88.89            | 4.35                   | 93.24           | 94.00          | -0.76       | QP       | Vertical        |
| Highest Channel_914.9MHz |                 |                  |                        |                 |                |             |          |                 |
| 1                        | 914.90          | 82.89            | 4.39                   | 87.28           | 94.00          | -6.72       | QP       | Horizontal      |
| 2                        | 928.00          | 23.41            | 4.39                   | 27.80           | 46.00          | -18.20      | QP       | Horizontal      |
| 3                        | 914.90          | 89.39            | 4.39                   | 93.78           | 94.00          | -0.22       | QP       | Vertical        |
| 4                        | 928.00          | 24.00            | 4.39                   | 28.39           | 46.00          | -17.61      | QP       | Vertical        |

For 500kHz Bandwidth:

#### Field Strength of the Fundamental Signal and Bandedge

| No.                      | Frequency (MHz) | Reading (dBμV/m) | Correction factor (dB) | Result (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector | Antenna Polaxis |
|--------------------------|-----------------|------------------|------------------------|-----------------|----------------|-------------|----------|-----------------|
| Lowest Channel_903.0MHz  |                 |                  |                        |                 |                |             |          |                 |
| 1                        | 903.00          | 82.86            | 4.31                   | 87.17           | 94.00          | -6.83       | QP       | Horizontal      |
| 2                        | 902.00          | 30.12            | 4.31                   | 34.43           | 46.00          | -11.57      | QP       | Horizontal      |
| 3                        | 903.00          | 88.93            | 4.31                   | 93.24           | 94.00          | -0.76       | QP       | Vertical        |
| 4                        | 902.00          | 32.09            | 4.31                   | 36.40           | 46.00          | -9.60       | QP       | Vertical        |
| Middle Channel_909.4MHz  |                 |                  |                        |                 |                |             |          |                 |
| 1                        | 909.40          | 83.76            | 4.36                   | 88.12           | 94.00          | -5.88       | QP       | Horizontal      |
| 2                        | 909.40          | 88.69            | 4.36                   | 93.05           | 94.00          | -0.95       | QP       | Vertical        |
| Highest Channel_914.2MHz |                 |                  |                        |                 |                |             |          |                 |
| 1                        | 914.20          | 78.44            | 4.39                   | 82.83           | 94.00          | -11.17      | QP       | Horizontal      |
| 2                        | 928.00          | 26.05            | 4.39                   | 30.44           | 46.00          | -15.56      | QP       | Horizontal      |
| 3                        | 914.20          | 87.98            | 4.39                   | 92.37           | 94.00          | -1.63       | QP       | Vertical        |
| 4                        | 928.00          | 25.37            | 4.39                   | 29.76           | 46.00          | -16.24      | QP       | Vertical        |

Remark:

1. Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result - Limit

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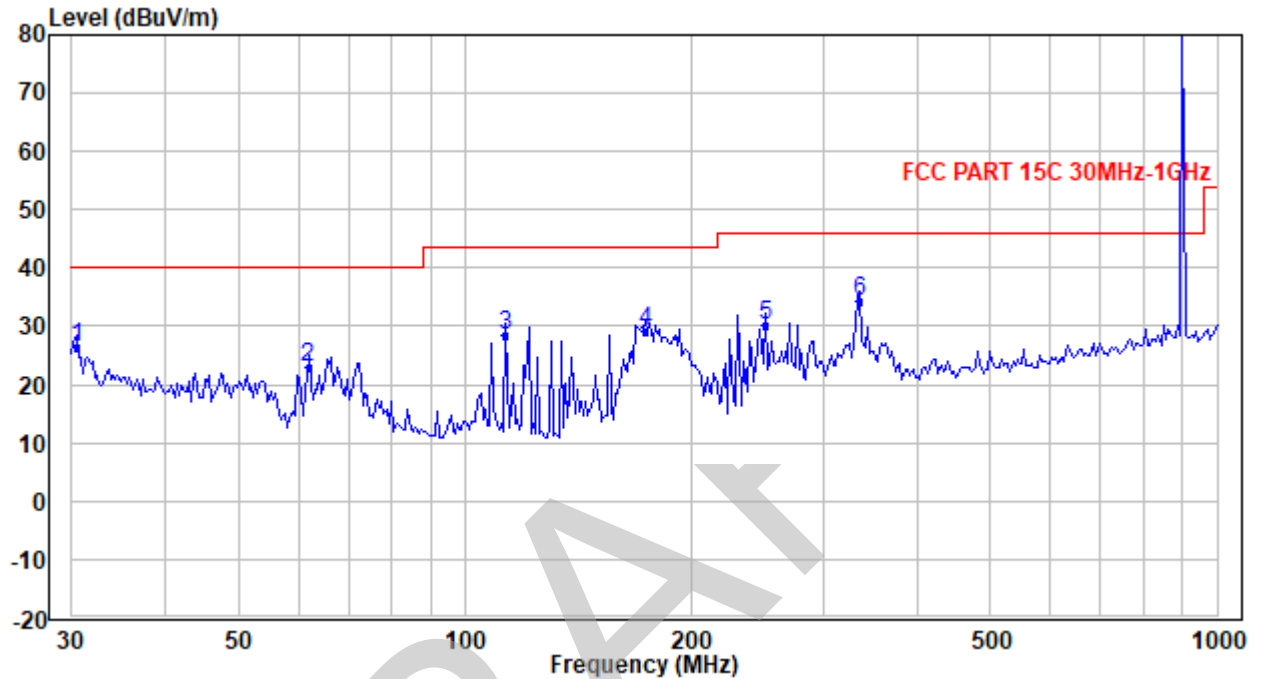
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**Radiated Emission Test Data (9 kHz ~ 30 MHz):**

The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

**Radiated Emission Test Data (30 MHz ~ 1 GHz):**
**Lowest Channel for 125kHz Bandwidth**
**Horizontal**


| No. | Frequency (MHz) | Reading (dBuV) | Correction factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|--------------------------|-----------------|----------------|-------------|--------|
| 1   | 30.425          | 30.75          | -4.46                    | 26.29           | 40.00          | -13.71      | QP     |
| 2   | 61.868          | 40.49          | -17.51                   | 22.98           | 40.00          | -17.02      | QP     |
| 3   | 113.220         | 44.26          | -15.92                   | 28.34           | 43.50          | -15.16      | QP     |
| 4   | 173.815         | 40.48          | -11.41                   | 29.07           | 43.50          | -14.43      | QP     |
| 5   | 250.486         | 39.15          | -8.82                    | 30.33           | 46.00          | -15.67      | QP     |
| 6   | 334.126         | 39.86          | -5.69                    | 34.17           | 46.00          | -11.83      | QP     |

**Remark:**

1. Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result - Limit

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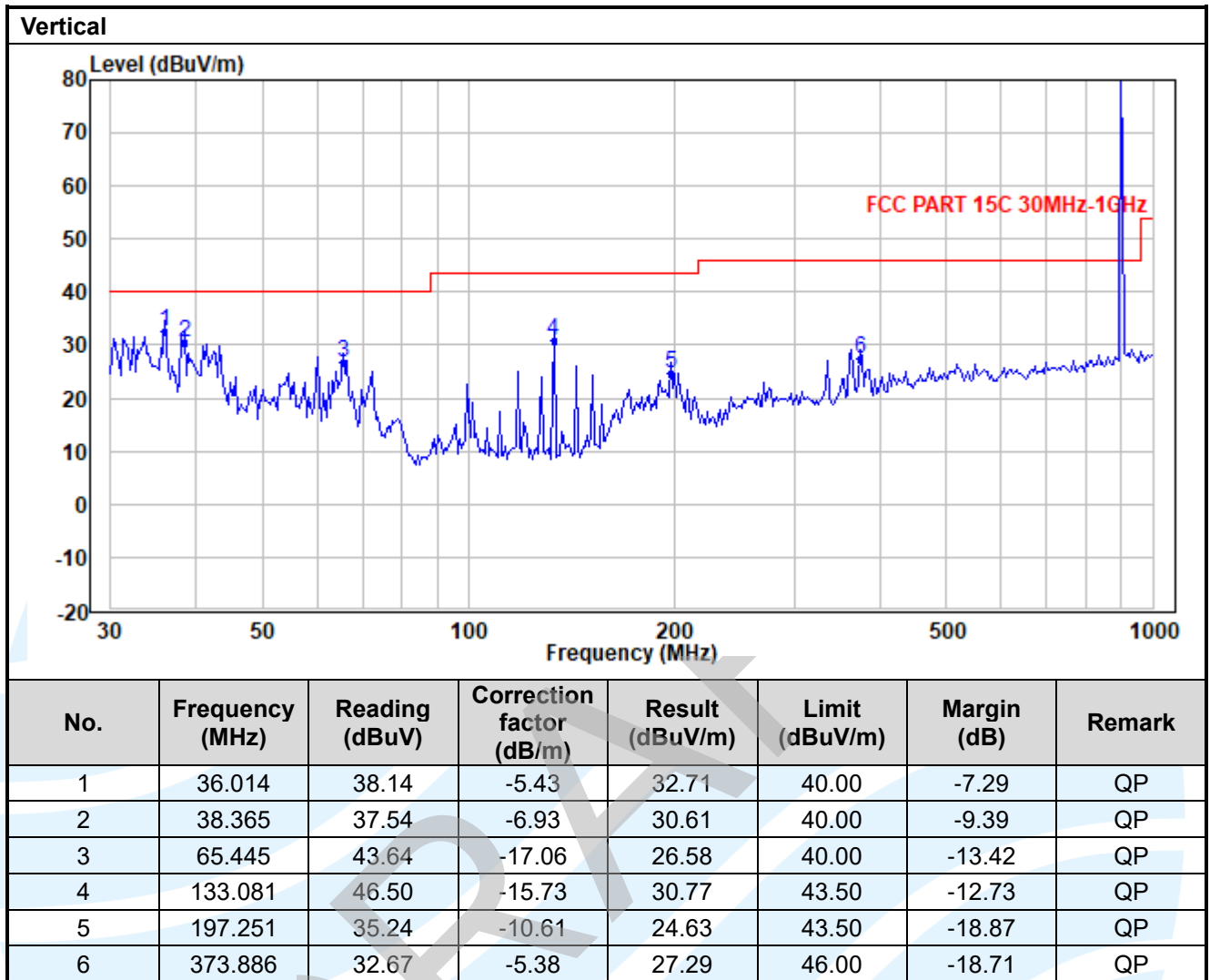
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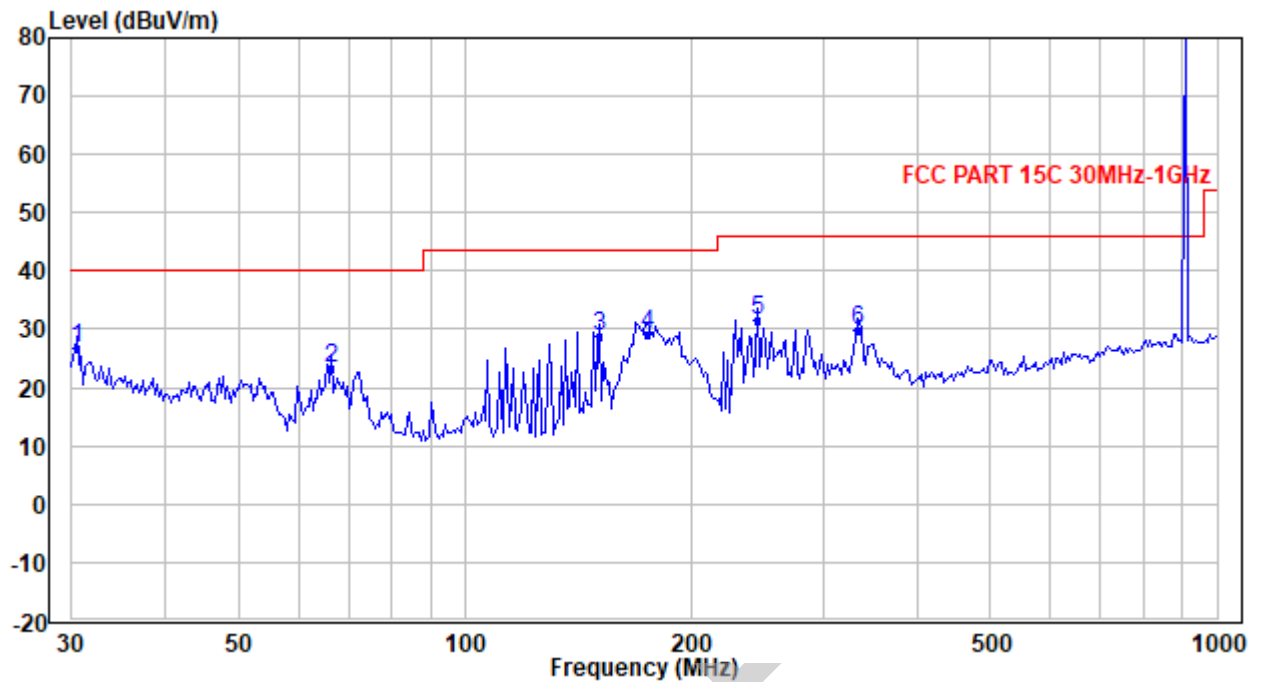


Remark:

1. Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result – Limit

### Middle Channel for 125kHz Bandwidth

#### Horizontal



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|--------------------------|-----------------|----------------|-------------|--------|
| 1   | 30.425          | 31.31          | -4.46                    | 26.85           | 40.00          | -13.15      | QP     |
| 2   | 66.371          | 40.67          | -17.20                   | 23.47           | 40.00          | -16.53      | QP     |
| 3   | 151.025         | 43.74          | -15.01                   | 28.73           | 43.50          | -14.77      | QP     |
| 4   | 175.040         | 39.96          | -10.68                   | 29.28           | 43.50          | -14.22      | QP     |
| 5   | 245.261         | 40.48          | -8.79                    | 31.69           | 46.00          | -14.31      | QP     |
| 6   | 331.786         | 35.52          | -5.72                    | 29.80           | 46.00          | -16.20      | QP     |

#### Remark:

1. Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result - Limit

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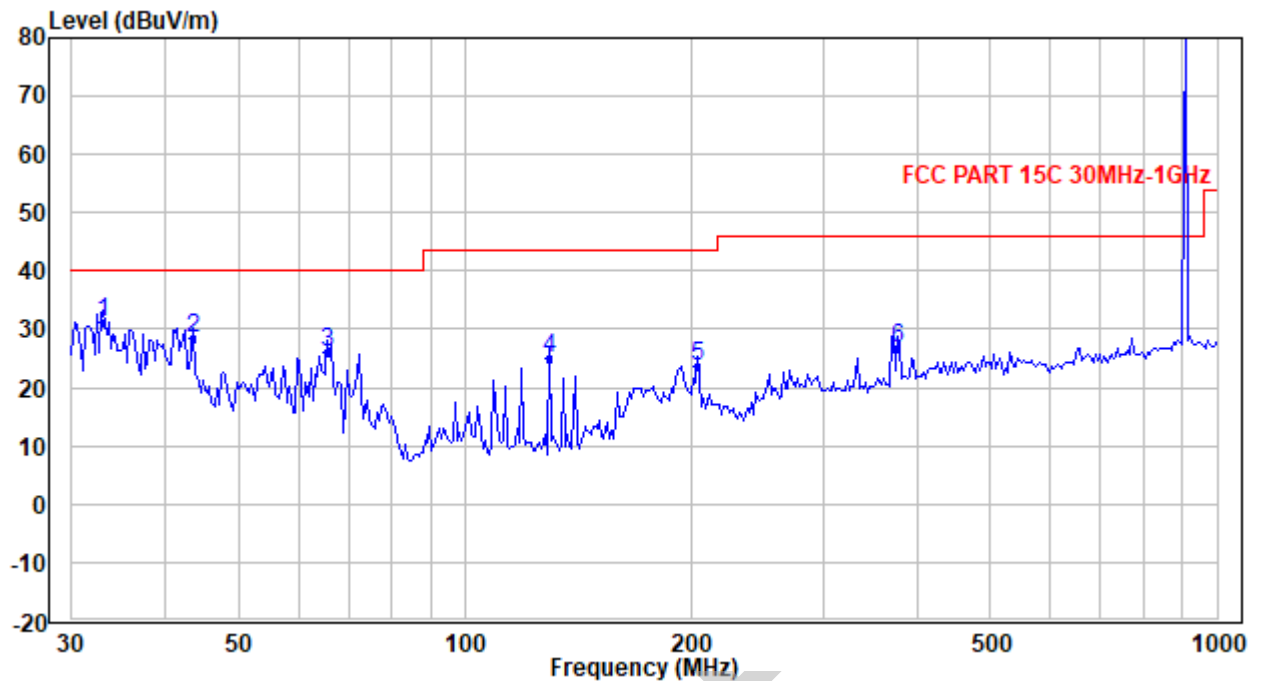
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## Vertical



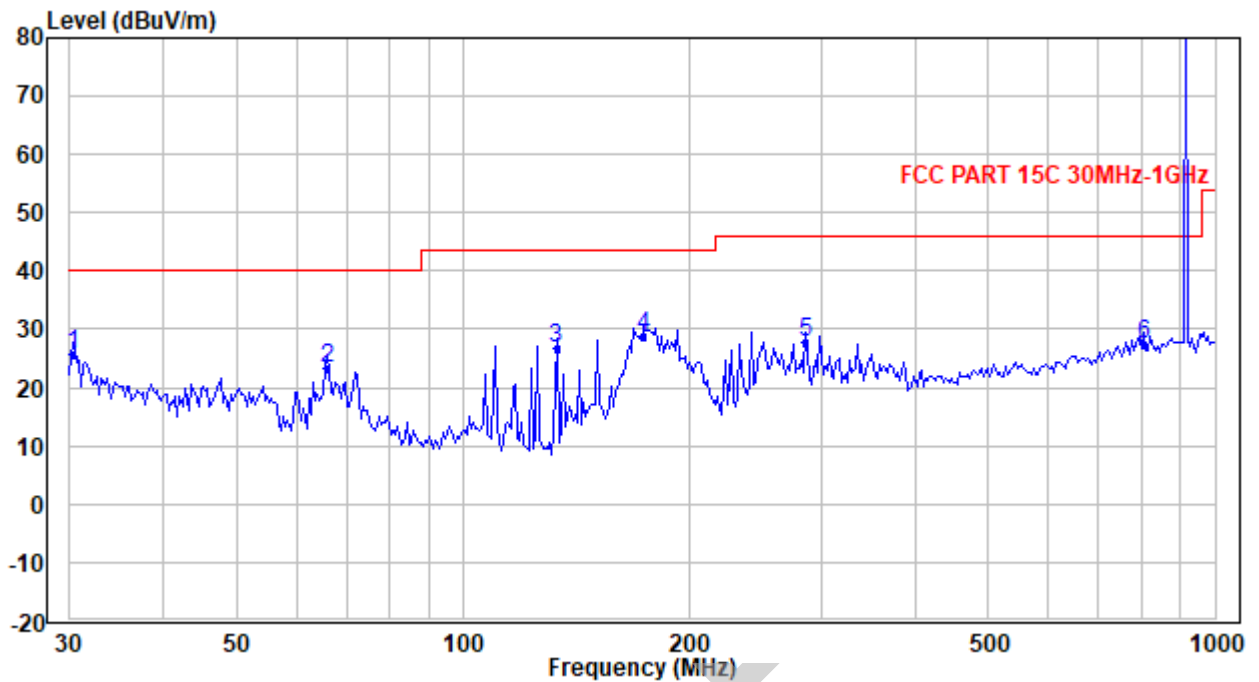
| No. | Frequency (MHz) | Reading (dBuV) | Correction factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|--------------------------|-----------------|----------------|-------------|--------|
| 1   | 33.101          | 36.06          | -4.83                    | 31.23           | 40.00          | -8.77       | QP     |
| 2   | 43.538          | 38.45          | -10.12                   | 28.33           | 40.00          | -11.67      | QP     |
| 3   | 65.445          | 43.14          | -17.06                   | 26.08           | 40.00          | -13.92      | QP     |
| 4   | 129.392         | 40.73          | -15.69                   | 25.04           | 43.50          | -18.46      | QP     |
| 5   | 204.305         | 34.29          | -10.76                   | 23.53           | 43.50          | -19.97      | QP     |
| 6   | 376.523         | 32.10          | -5.26                    | 26.84           | 46.00          | -19.16      | QP     |

## Remark:

1. Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result - Limit

### Highest Channel for 125kHz Bandwidth

#### Horizontal

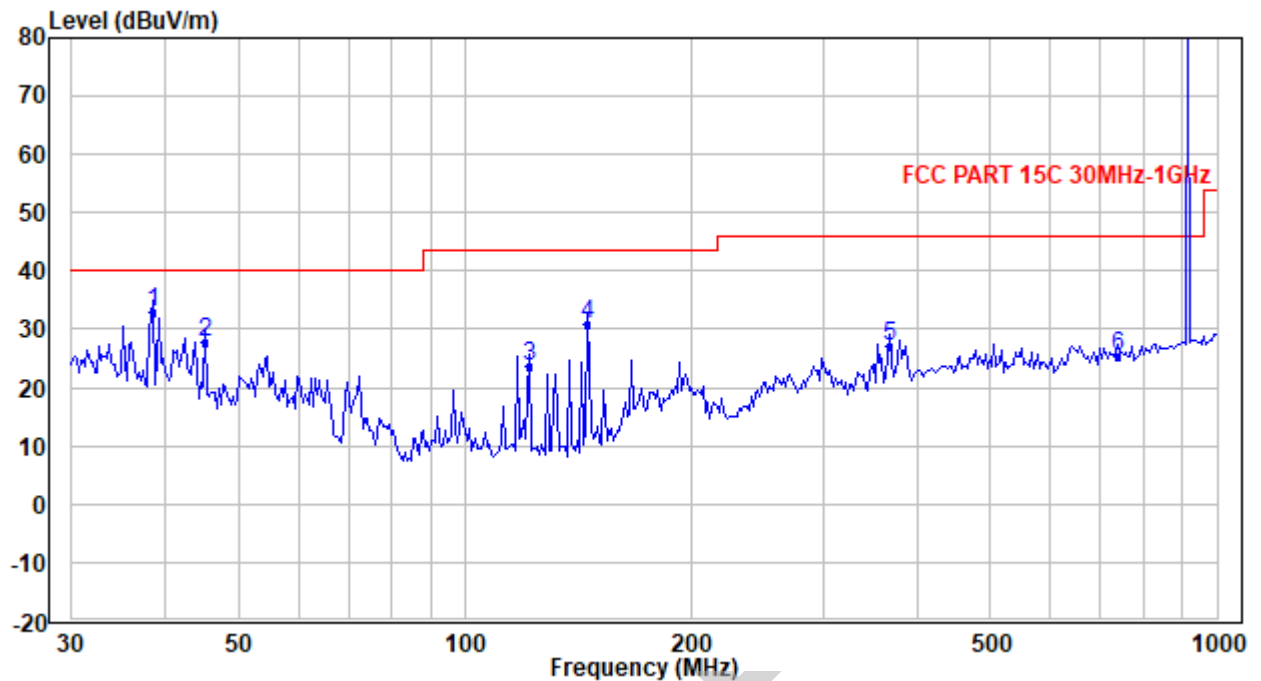


| No. | Frequency (MHz) | Reading (dBuV) | Correction factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|--------------------------|-----------------|----------------|-------------|--------|
| 1   | 30.212          | 30.02          | -4.42                    | 25.60           | 40.00          | -14.40      | QP     |
| 2   | 65.907          | 40.59          | -17.15                   | 23.44           | 40.00          | -16.56      | QP     |
| 3   | 133.081         | 42.33          | -15.73                   | 26.60           | 43.50          | -16.90      | QP     |
| 4   | 173.815         | 40.06          | -11.41                   | 28.65           | 43.50          | -14.85      | QP     |
| 5   | 286.265         | 34.72          | -7.09                    | 27.63           | 46.00          | -18.37      | QP     |
| 6   | 804.252         | 24.77          | 2.60                     | 27.37           | 46.00          | -18.63      | QP     |

#### Remark:

1. Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result - Limit

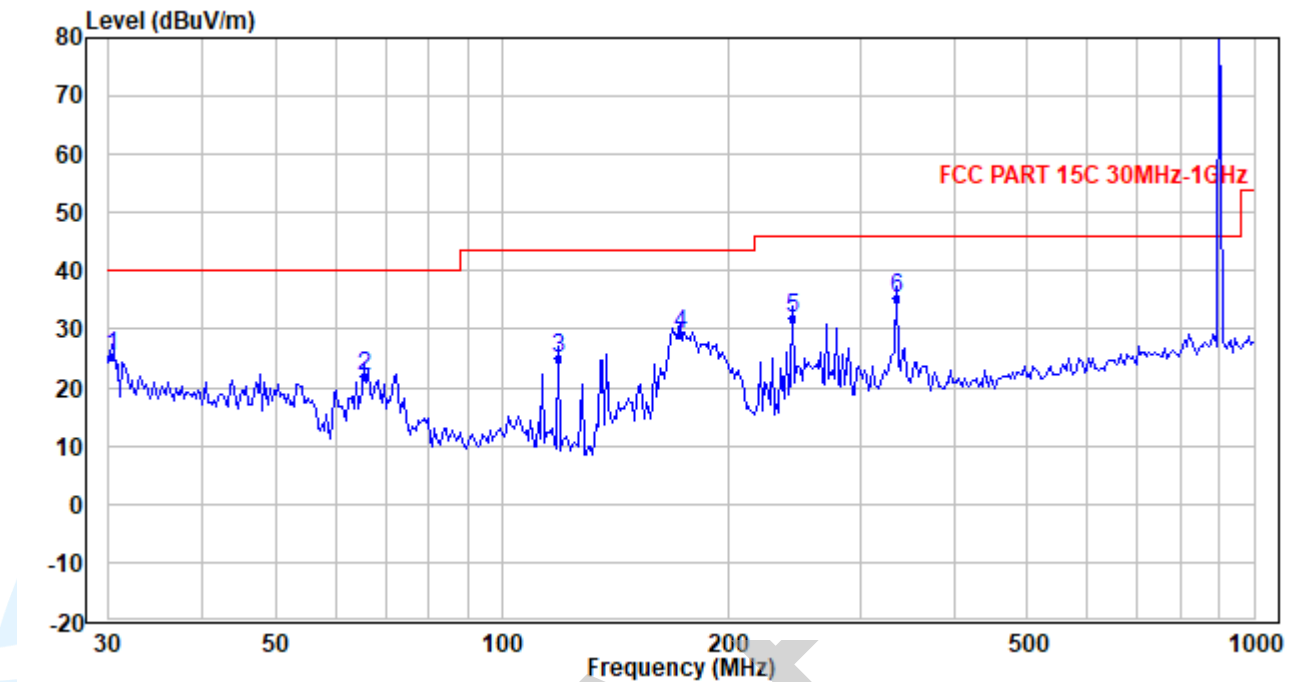
## Vertical



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|--------------------------|-----------------|----------------|-------------|--------|
| 1   | 38.365          | 40.01          | -6.93                    | 33.08           | 40.00          | -6.92       | QP     |
| 2   | 45.095          | 39.22          | -11.32                   | 27.90           | 40.00          | -12.10      | QP     |
| 3   | 121.462         | 39.43          | -15.89                   | 23.54           | 43.50          | -19.96      | QP     |
| 4   | 145.811         | 46.52          | -15.62                   | 30.90           | 43.50          | -12.60      | QP     |
| 5   | 366.087         | 32.09          | -5.11                    | 26.98           | 46.00          | -19.02      | QP     |
| 6   | 739.214         | 23.38          | 2.00                     | 25.38           | 46.00          | -20.62      | QP     |

## Remark:

1. Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result - Limit

**Radiated Emission Test Data (30 MHz ~ 1 GHz):**
**Lowest Channel for 500kHz Bandwidth**
**Horizontal**


| No. | Frequency (MHz) | Reading (dBuV) | Correction factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|--------------------------|-----------------|----------------|-------------|--------|
| 1   | 30.212          | 29.87          | -4.42                    | 25.45           | 40.00          | -14.55      | QP     |
| 2   | 65.445          | 38.98          | -17.06                   | 21.92           | 40.00          | -18.08      | QP     |
| 3   | 118.929         | 40.74          | -15.67                   | 25.07           | 43.50          | -18.43      | QP     |
| 4   | 172.598         | 40.37          | -11.33                   | 29.04           | 43.50          | -14.46      | QP     |
| 5   | 243.543         | 40.87          | -8.88                    | 31.99           | 46.00          | -14.01      | QP     |
| 6   | 334.126         | 41.05          | -5.69                    | 35.36           | 46.00          | -10.64      | QP     |

**Remark:**

1. Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result - Limit

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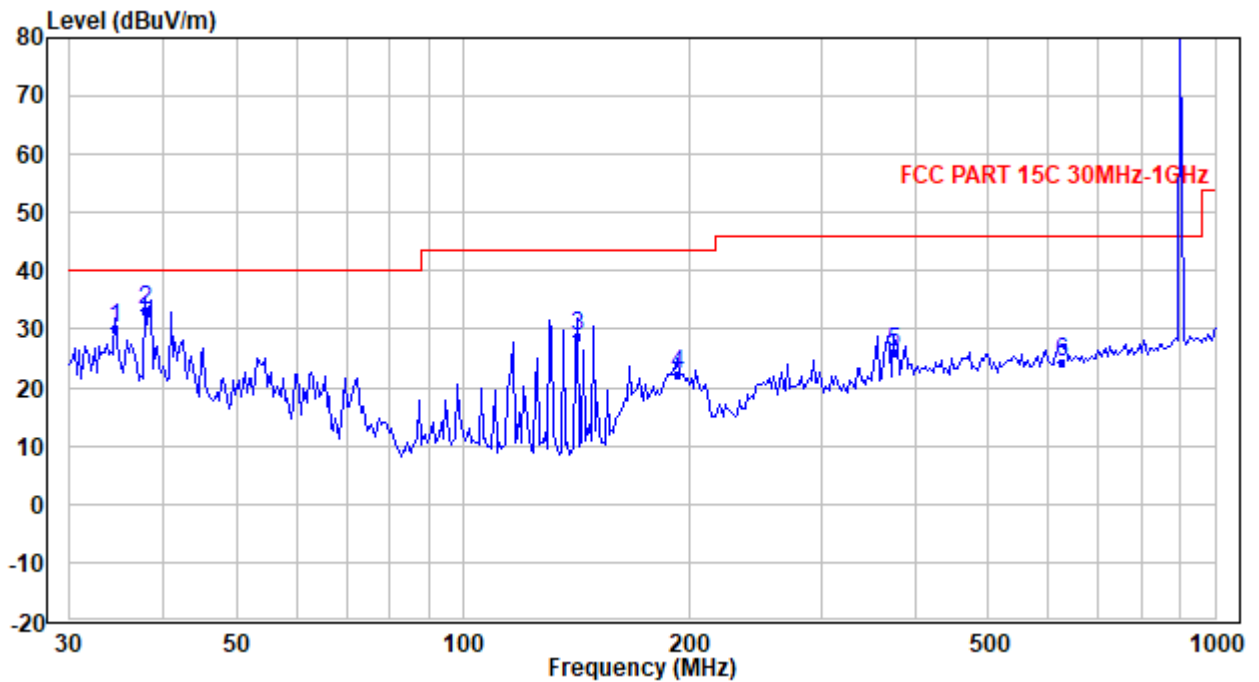
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# Vertical



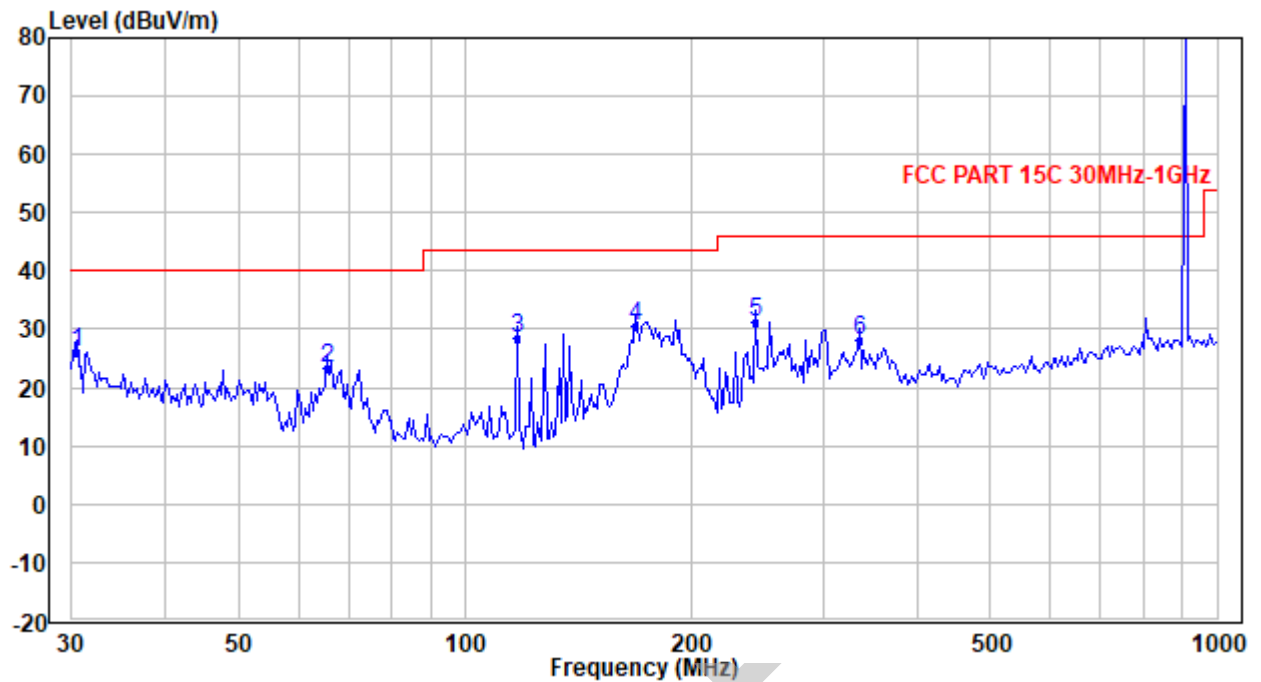
| No. | Frequency (MHz) | Reading (dBuV) | Correction factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|--------------------------|-----------------|----------------|-------------|--------|
| 1   | 34.527          | 34.61          | -4.60                    | 30.01           | 40.00          | -9.99       | QP     |
| 2   | 37.830          | 39.74          | -6.53                    | 33.21           | 40.00          | -6.79       | QP     |
| 3   | 141.769         | 44.51          | -15.59                   | 28.92           | 43.50          | -14.58      | QP     |
| 4   | 193.137         | 32.51          | -10.36                   | 22.15           | 43.50          | -21.35      | QP     |
| 5   | 373.886         | 31.54          | -5.38                    | 26.16           | 46.00          | -19.84      | QP     |
| 6   | 624.490         | 24.71          | -0.26                    | 24.45           | 46.00          | -21.55      | QP     |

## Remark:

1. Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result - Limit

### Middle Channel for 500kHz Bandwidth

#### Horizontal

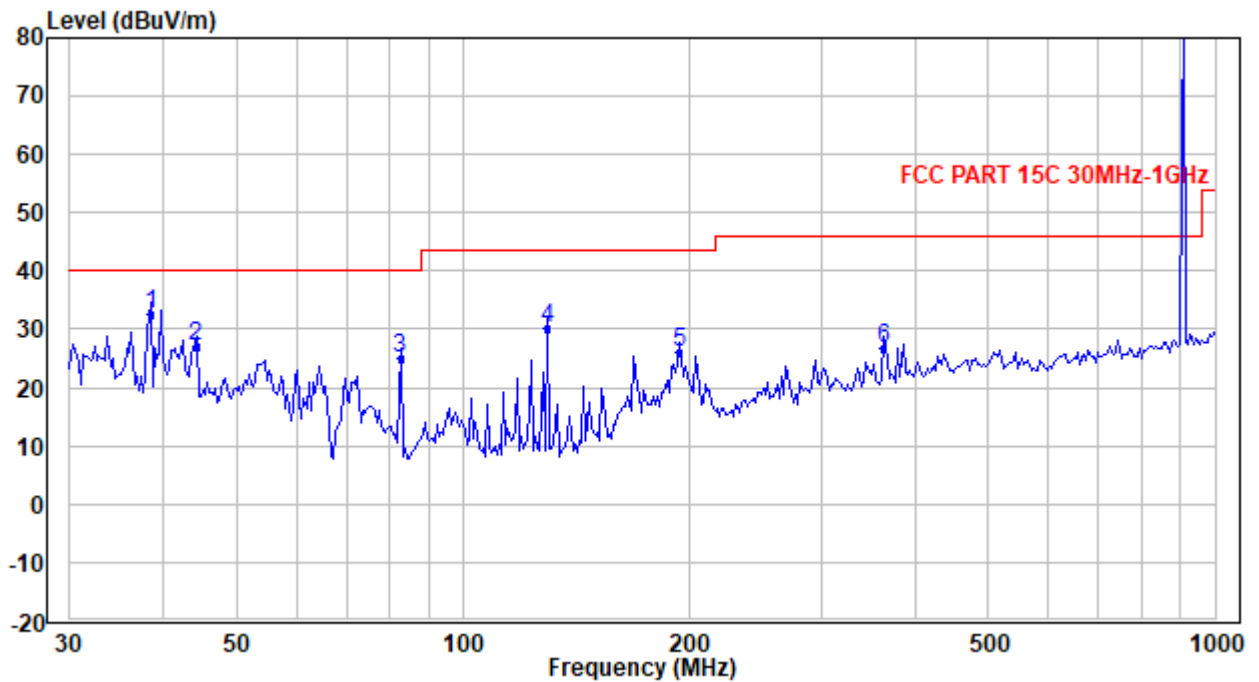


| No. | Frequency (MHz) | Reading (dBuV) | Correction factor (dB/m ) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|---------------------------|-----------------|----------------|-------------|--------|
| 1   | 30.425          | 30.42          | -4.46                     | 25.96           | 40.00          | -14.04      | QP     |
| 2   | 65.445          | 40.28          | -17.06                    | 23.22           | 40.00          | -16.78      | QP     |
| 3   | 117.269         | 44.37          | -15.91                    | 28.46           | 43.50          | -15.04      | QP     |
| 4   | 168.997         | 42.22          | -11.75                    | 30.47           | 43.50          | -13.03      | QP     |
| 5   | 243.543         | 40.18          | -8.88                     | 31.30           | 46.00          | -14.70      | QP     |
| 6   | 334.126         | 33.96          | -5.69                     | 28.27           | 46.00          | -17.73      | QP     |

#### Remark:

1. Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result – Limit

# Vertical



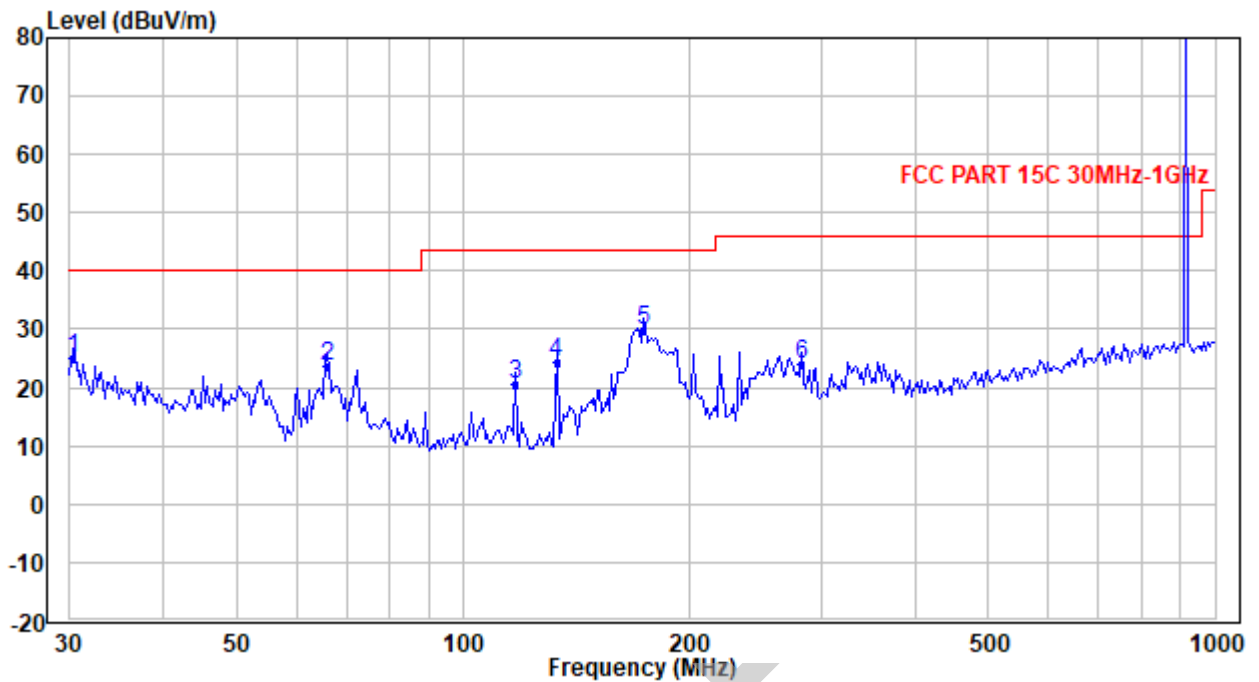
| No. | Frequency (MHz) | Reading (dBuV) | Correction factor (dB/m ) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|---------------------------|-----------------|----------------|-------------|--------|
| 1   | 38.365          | 39.57          | -6.93                     | 32.64           | 40.00          | -7.36       | QP     |
| 2   | 44.154          | 37.62          | -10.66                    | 26.96           | 40.00          | -13.04      | QP     |
| 3   | 82.526          | 42.18          | -17.28                    | 24.90           | 40.00          | -15.10      | QP     |
| 4   | 129.392         | 45.81          | -15.69                    | 30.12           | 43.50          | -13.38      | QP     |
| 5   | 194.499         | 36.40          | -10.48                    | 25.92           | 43.50          | -17.58      | QP     |
| 6   | 363.523         | 31.65          | -5.02                     | 26.63           | 46.00          | -19.37      | QP     |

## Remark:

1. Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result – Limit

### Highest Channel for 500kHz Bandwidth

#### Horizontal



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor (dB/m ) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|---------------------------|-----------------|----------------|-------------|--------|
| 1   | 30.212          | 29.28          | -4.42                     | 24.86           | 40.00          | -15.14      | QP     |
| 2   | 65.907          | 40.81          | -17.15                    | 23.66           | 40.00          | -16.34      | QP     |
| 3   | 117.269         | 36.50          | -15.91                    | 20.59           | 43.50          | -22.91      | QP     |
| 4   | 133.081         | 40.18          | -15.73                    | 24.45           | 43.50          | -19.05      | QP     |
| 5   | 173.815         | 41.18          | -11.41                    | 29.77           | 43.50          | -13.73      | QP     |
| 6   | 282.270         | 31.22          | -7.26                     | 23.96           | 46.00          | -22.04      | QP     |

#### Remark:

1. Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result – Limit

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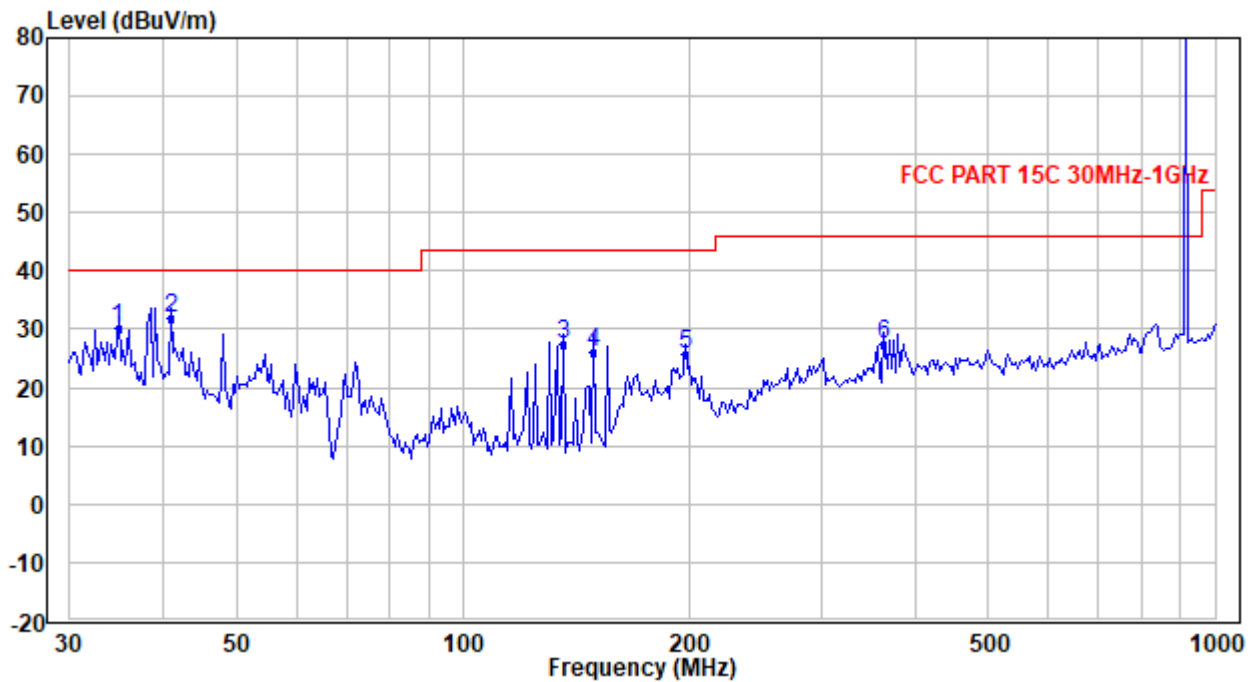
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UTTR-RF-FCCPART15.249-V1.1

# Vertical



| No. | Frequency (MHz) | Reading (dBuV) | Correction factor (dB/m ) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Remark |
|-----|-----------------|----------------|---------------------------|-----------------|----------------|-------------|--------|
| 1   | 34.770          | 34.50          | -4.43                     | 30.07           | 40.00          | -9.93       | QP     |
| 2   | 40.870          | 40.03          | -8.29                     | 31.74           | 40.00          | -8.26       | QP     |
| 3   | 135.916         | 42.92          | -15.61                    | 27.31           | 43.50          | -16.19      | QP     |
| 4   | 148.917         | 41.40          | -15.30                    | 26.10           | 43.50          | -17.40      | QP     |
| 5   | 197.251         | 36.19          | -10.61                    | 25.58           | 43.50          | -17.92      | QP     |
| 6   | 363.523         | 32.56          | -5.02                     | 27.54           | 46.00          | -18.46      | QP     |

## Remark:

1. Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result – Limit

| Radiated Emission Test Data (Above 1GHz): |                 |                  |                        |                 |                |             |          |                 |
|-------------------------------------------|-----------------|------------------|------------------------|-----------------|----------------|-------------|----------|-----------------|
| Lowest Channel for 125kHz Bandwidth:      |                 |                  |                        |                 |                |             |          |                 |
| No.                                       | Frequency (MHz) | Reading (dBμV/m) | Correction factor (dB) | Result (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector | Antenna Polaxis |
| 1                                         | 1328.205        | 56.92            | -13.10                 | 43.82           | 74.00          | -30.18      | Peak     | Horizontal      |
| 2                                         | 1664.628        | 51.61            | -11.53                 | 40.08           | 74.00          | -33.92      | Peak     | Horizontal      |
| 3                                         | 2396.630        | 52.63            | -8.28                  | 44.35           | 74.00          | -29.65      | Peak     | Horizontal      |
| 4                                         | 1804.412        | 50.92            | -10.62                 | 40.30           | 74.00          | -33.70      | Peak     | Vertical        |
| 5                                         | 2388.912        | 54.73            | -8.32                  | 46.41           | 74.00          | -27.59      | Peak     | Vertical        |
| 6                                         | 2709.125        | 54.95            | -7.52                  | 47.43           | 74.00          | -26.57      | Peak     | Vertical        |
| 7                                         | 3598.275        | 47.63            | -4.36                  | 43.27           | 74.00          | -30.73      | Peak     | Vertical        |
| Middle Channel for 125kHz Bandwidth:      |                 |                  |                        |                 |                |             |          |                 |
| No.                                       | Frequency (MHz) | Reading (dBμV/m) | Correction factor (dB) | Result (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector | Antenna Polaxis |
| 1                                         | 2388.912        | 59.85            | -8.32                  | 51.53           | 74.00          | -22.47      | Peak     | Horizontal      |
| 2                                         | 3152.564        | 54.36            | -6.13                  | 48.23           | 74.00          | -25.77      | Peak     | Horizontal      |
| 3                                         | 4080.593        | 50.17            | -3.10                  | 47.07           | 74.00          | -26.93      | Peak     | Horizontal      |
| 4                                         | 1197.958        | 57.16            | -13.49                 | 43.67           | 74.00          | -30.33      | Peak     | Vertical        |
| 5                                         | 1816.089        | 52.52            | -10.55                 | 41.97           | 74.00          | -32.03      | Peak     | Vertical        |
| 6                                         | 2396.630        | 56.01            | -8.28                  | 47.73           | 74.00          | -26.27      | Peak     | Vertical        |
| Highest Channel for 125kHz Bandwidth:     |                 |                  |                        |                 |                |             |          |                 |
| No.                                       | Frequency (MHz) | Reading (dBμV/m) | Correction factor (dB) | Result (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector | Antenna Polaxis |
| 1                                         | 1323.928        | 56.51            | -13.11                 | 43.40           | 74.00          | -30.60      | Peak     | Horizontal      |
| 2                                         | 1659.268        | 53.17            | -11.57                 | 41.60           | 74.00          | -32.40      | Peak     | Horizontal      |
| 3                                         | 2396.630        | 59.17            | -8.28                  | 50.89           | 74.00          | -23.11      | Peak     | Horizontal      |
| 4                                         | 1197.958        | 57.10            | -13.49                 | 43.61           | 74.00          | -30.39      | Peak     | Vertical        |
| 5                                         | 1827.842        | 54.83            | -10.48                 | 44.35           | 74.00          | -29.65      | Peak     | Vertical        |
| 6                                         | 2396.630        | 59.30            | -8.28                  | 51.02           | 74.00          | -22.98      | Peak     | Vertical        |
| Lowest Channel for 500kHz Bandwidth:      |                 |                  |                        |                 |                |             |          |                 |
| No.                                       | Frequency (MHz) | Reading (dBμV/m) | Correction factor (dB) | Result (dBμV/m) | Limit (dBμV/m) | Margin (dB) | Detector | Antenna Polaxis |
| 1                                         | 1323.928        | 57.26            | -13.11                 | 44.15           | 74.00          | -29.85      | Peak     | Horizontal      |
| 2                                         | 2396.630        | 58.01            | -8.28                  | 49.73           | 74.00          | -24.27      | Peak     | Horizontal      |
| 3                                         | 2427.750        | 60.00            | -8.16                  | 51.84           | 74.00          | -22.16      | Peak     | Horizontal      |
| 4                                         | 1159.936        | 56.94            | -13.58                 | 43.36           | 74.00          | -30.64      | Peak     | Vertical        |
| 5                                         | 1804.412        | 54.03            | -10.62                 | 43.41           | 74.00          | -30.59      | Peak     | Vertical        |
| 6                                         | 2396.630        | 58.65            | -8.28                  | 50.37           | 74.00          | -23.63      | Peak     | Vertical        |

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| Middle Channel for 500kHz Bandwidth:  |                 |                        |                        |                       |                      |             |          |                 |
|---------------------------------------|-----------------|------------------------|------------------------|-----------------------|----------------------|-------------|----------|-----------------|
| No.                                   | Frequency (MHz) | Reading (dB $\mu$ V/m) | Correction factor (dB) | Result (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Margin (dB) | Detector | Antenna Polaxis |
| 1                                     | 1328.205        | 56.49                  | -13.10                 | 43.39                 | 74.00                | -30.61      | Peak     | Horizontal      |
| 2                                     | 1664.628        | 52.59                  | -11.53                 | 41.06                 | 74.00                | -32.94      | Peak     | Horizontal      |
| 3                                     | 2388.912        | 56.18                  | -8.32                  | 47.86                 | 74.00                | -26.14      | Peak     | Horizontal      |
| 4                                     | 1197.958        | 56.71                  | -13.49                 | 43.22                 | 74.00                | -30.78      | Peak     | Vertical        |
| 5                                     | 1816.089        | 55.24                  | -10.55                 | 44.69                 | 74.00                | -29.31      | Peak     | Vertical        |
| 6                                     | 2396.630        | 55.78                  | -8.28                  | 47.50                 | 74.00                | -26.50      | Peak     | Vertical        |
| Highest Channel for 500kHz Bandwidth: |                 |                        |                        |                       |                      |             |          |                 |
| No.                                   | Frequency (MHz) | Reading (dB $\mu$ V/m) | Correction factor (dB) | Result (dB $\mu$ V/m) | Limit (dB $\mu$ V/m) | Margin (dB) | Detector | Antenna Polaxis |
| 1                                     | 1328.205        | 57.48                  | -13.10                 | 44.38                 | 74.00                | -29.62      | Peak     | Horizontal      |
| 2                                     | 1664.628        | 55.23                  | -11.53                 | 43.70                 | 74.00                | -30.30      | Peak     | Horizontal      |
| 3                                     | 2396.630        | 56.37                  | -8.28                  | 48.09                 | 74.00                | -25.91      | Peak     | Horizontal      |
| 4                                     | 1194.100        | 56.88                  | -13.50                 | 43.38                 | 74.00                | -30.62      | Peak     | Vertical        |
| 5                                     | 1659.268        | 54.76                  | -11.57                 | 43.19                 | 74.00                | -30.81      | Peak     | Vertical        |
| 6                                     | 2388.912        | 55.96                  | -8.32                  | 47.64                 | 74.00                | -26.36      | Peak     | Vertical        |

#### Remark:

1. Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain, the value was added to Original Receiver Reading by the software automatically.
2. Result = Reading + Correct Factor.
3. Margin = Result - Limit
4. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. So, only the peak measurements were shown in the report.

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## 5.4 20DB OCCUPIED BANDWIDTH

**Test Requirement:** FCC 47 CFR Part 15.215  
**Test Method:** ANSI C63.10-2013  
**Test Setup:** Refer to section 4.4.3 for details.  
**Limits:** N/A  
**Equipment Used:** Refer to section 3 for details.  
**Test Result:** Pass  
**The measurement procedure shall be as follows:**

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

Use the following spectrum analyzer settings:

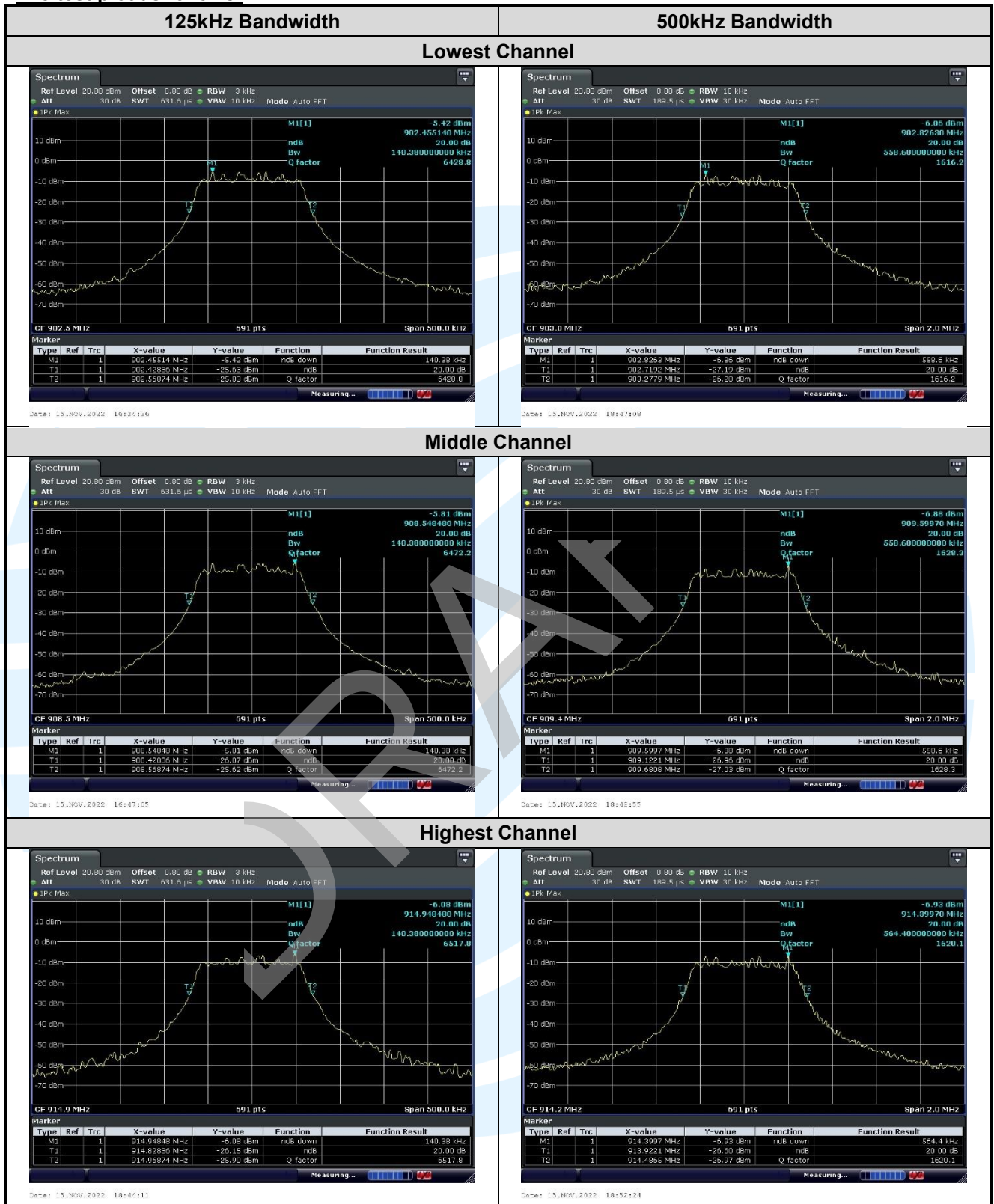
- Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel
- RBW  $\geq$  1% of the 20 dB bandwidth
- VBW  $\geq$  RBW
- Sweep = auto;
- Detector function = peak
- Trace = max hold
- All the trace to stabilize, use the marker-to-peak function to set the marker to the peak of the emission, use the marker-delta function to measure and record the 20dB down bandwidth of the emission.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

**Test Result:** Pass  
**The measurement data as follows:**

| Bandwidth | Test Channel | Test Frequency (MHz) | 20 dB Bandwidth (kHz) |
|-----------|--------------|----------------------|-----------------------|
| 125kHz    | Lowest       | 902.5                | 140.38                |
|           | Middle       | 908.5                | 140.38                |
|           | Highest      | 914.9                | 140.38                |
| 500kHz    | Lowest       | 903.0                | 558.60                |
|           | Middle       | 909.4                | 558.60                |
|           | Highest      | 914.2                | 564.40                |

The test plot as follows:



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## 5.5 CONDUCTED EMISSION

**Test Requirement:** FCC 47 CFR Part 15.207

**Test Method:** ANSI C63.10-2013 Section 6.2

**Limits:**

| Frequency range<br>(MHz) | Limits (dB(μV)) |          |
|--------------------------|-----------------|----------|
|                          | Quasi-peak      | Average  |
| 0,15 to 0,50             | 66 to 56        | 56 to 46 |
| 0,50 to 5                | 56              | 46       |
| 5 to 30                  | 60              | 50       |

**Remark:**

1. The lower limit shall apply at the transition frequencies.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz.

**Test Setup:** Refer to section 4.4.2 for details.

**Test Procedures:**

- 1) The Product was placed on a nonconductive table 0.8 m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).
- 2) The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.
- 3) For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

**Equipment Used:** Refer to section 3 for details.

**Test Result:** N/A.

The product is powered by a DC Power from systems or external battery, not applicable for this test item.

## APPENDIX 1 PHOTOS OF TEST SETUP

See test photos attached in Appendix 1 for the actual connections between Product and support equipment.

## APPENDIX 2 PHOTOS OF EUT CONSTRUCTIONAL DETAILS

Refer to Appendix 2 for EUT external and internal photos.

\*\*\* End of Report \*\*\*

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The test report is effective only with both signature and specialized stamp. The result(s) shown in this report refer only to the sample(s) tested. Without written approval of UnionTrust, this report can't be reproduced except in full.

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