



**Shenzhen CTA Testing Technology Co., Ltd.**  
Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai  
Street, Bao'an District, Shenzhen, China

**TEST REPORT**  
**FCC PART 15 C(15.249)**

**Report Reference No.....: CTA22040500101**

**FCC ID.....: 2A566-T-15**

Compiled by

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Date of issue.....: Apr. 05, 2022

Kevin Liu  
Eric Wang

**Testing Laboratory Name .....: Shenzhen CTA Testing Technology Co., Ltd.**

Address.....: Room 106, Building 1, Yibaolai Industrial Park, Qiaotou  
Community, Fuhai Street, Bao'an District, Shenzhen, China

**Applicant's name .....: ENPING SHANGGE ELECTRONIC CO.,LTD.**

Address .....: No. F12 Civilian and Foreign Capital Industry Area, Enping City,  
Guangdong, China

Standard .....: **FCC CFR 47 PART 15 C(15.249)**  
**ANSI C63.10-2013**

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**Test item description .....: WIRELESS MICROPHONE TRANSMITTER**

Trade Mark .....: SGPRO

**Manufacturer.....: ENPING SHANGGE ELECTRONIC CO.,LTD.**

Model/Type reference.....: T-15

Listed Models .....: TR-15,S-15,MIC-15,RT-15,BM-15,BM-15D,SG-15,T-8,T-9,t-10,MIC-  
8,MIC-9,MIC-10,S-8,S-9,S-10,X-12,C-12

Modulation .....: GFSK

Frequency.....: 902.4-927.6MHz

Ratings .....: DC 3.7V From Battery and DC 5V From External

Result.....: **PASS**

## TEST REPORT

Equipment under Test : WIRELESS MICROPHONE TRANSMITTER

Model /Type : T-15

Listed Models : TR-15,S-15,MIC-15,RT-15,BM-15,BM-15D,SG-15,T-8,T-9,t-10,MIC-8,MIC-9,MIC-10,S-8,S-9,S-10,X-12,C-12

**Applicant** : **ENPING SHANGGE ELECTRONIC CO.,LTD.**

Address : No. F12 Civilian and Foreign Capital Industry Area, Enping City, Guangdong, China

**Manufacturer** : **ENPING SHANGGE ELECTRONIC CO.,LTD.**

Address : No. F12 Civilian and Foreign Capital Industry Area, Enping City, Guangdong, China

|                     |             |
|---------------------|-------------|
| <b>Test Result:</b> | <b>PASS</b> |
|---------------------|-------------|

The test report merely corresponds to the test sample.  
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

## Contents

|           |                                                         |                  |
|-----------|---------------------------------------------------------|------------------|
| <b>1.</b> | <b><u>..TEST STANDARDS.....</u></b>                     | <b><u>4</u></b>  |
| <b>2.</b> | <b><u>..SUMMARY.....</u></b>                            | <b><u>5</u></b>  |
| 2.1.      | General Remarks                                         | 5                |
| 2.2.      | Product Description                                     | 5                |
| 2.3.      | Equipment Under Test                                    | 5                |
| 2.4.      | Short description of the Equipment under Test (EUT)     | 5                |
| 2.5.      | EUT operation mode                                      | 6                |
| 2.6.      | Block Diagram of Test Setup                             | 6                |
| 2.7.      | Modifications                                           | 6                |
| <b>3.</b> | <b><u>..TEST ENVIRONMENT .....</u></b>                  | <b><u>7</u></b>  |
| 3.1.      | TEST FACILITY                                           | 7                |
| 3.2.      | Test Facility                                           | 7                |
| 3.3.      | Environmental conditions                                | 7                |
| 3.4.      | Summary of measurement results                          | 8                |
| 3.5.      | Statement of the measurement uncertainty                | 8                |
| 3.6.      | Equipments Used during the Test                         | 9                |
| <b>4.</b> | <b><u>..TEST CONDITIONS AND RESULTS.....</u></b>        | <b><u>10</u></b> |
| 4.1.      | AC Power Conducted Emission .....                       | 10               |
| 4.2.      | 20dB bandwidth and Occupied Bandwidth Measurement ..... | 20               |
| 4.3.      | Antenna Requirement.....                                | 22               |
| <b>5.</b> | <b><u>..TEST SETUP PHOTOS OF THE EUT .....</u></b>      | <b><u>23</u></b> |
| <b>6.</b> | <b><u>PHOTOS OF THE EUT .....</u></b>                   | <b><u>24</u></b> |

## **1. TEST STANDARDS**

The tests were performed according to following standards:

**FCC Rules Part 15.249:** Operation within the bands 902 - 928 MHz, 2400 - 2483.5 MHz, 5725 - 5875 MHz, and 24.0 - 24.25 GHz.

**ANSI C63.10:2013 :** American National Standard for Testing Unlicensed Wireless Devices

**ANSI C63.4: 2014:** –American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40GHz  
Range of 9 kHz to 40GHz

## 2. SUMMARY

### 2.1. General Remarks

|                                |   |               |
|--------------------------------|---|---------------|
| Date of receipt of test sample | : | Mar. 22, 2022 |
|                                |   |               |
| Testing commenced on           | : | Mar. 22, 2022 |
|                                |   |               |
| Testing concluded on           | : | Apr. 05, 2022 |

### 2.2. Product Description

|                                                               |                                                                      |
|---------------------------------------------------------------|----------------------------------------------------------------------|
| Name of EUT                                                   | WIRELESS MICROPHONE TRANSMITTER                                      |
| Model Number                                                  | T-15                                                                 |
| Power supply:                                                 | DC 3.7V From Battery and DC 5V From external circuit                 |
| Adapter information<br>(Auxiliary test supplied by test Lab ) | Model: EP-TA20CBC<br>Input:AC 100-240V 50/60Hz<br>Output:DC 5V 2A    |
| Testing sample ID:                                            | CTA220405001-1# (Engineer sample)<br>CTA220405001-2# (Normal sample) |
| Operation frequency:                                          | 902.4-927.6MHz                                                       |
| Modulation:                                                   | GFSK                                                                 |
| Antenna Type:                                                 | External antenna                                                     |
| Antenna Gain:                                                 | 0dBi(Max)                                                            |

### 2.3. Equipment Under Test

#### Power supply system utilised

|                      |   |                                                                   |                                   |
|----------------------|---|-------------------------------------------------------------------|-----------------------------------|
| Power supply voltage | : | <input type="radio"/> 230V / 50 Hz                                | <input type="radio"/> 120V / 60Hz |
|                      |   | <input type="radio"/> 12 V DC                                     | <input type="radio"/> 24 V DC     |
|                      |   | <input checked="" type="radio"/> Other (specified in blank below) |                                   |

DC 3.7V From Battery and DC 5V From external circuit

### 2.4. Short description of the Equipment under Test (EUT)

This is a WIRELESS MICROPHONE TRANSMITTER

For more details, refer to the user's manual of the EUT.

## 2.5. EUT operation mode

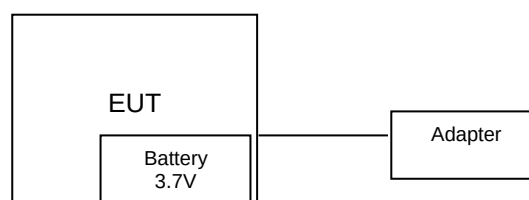
The Applicant use Key to control the EUT for staying in continuous transmitting and receiving mode for testing .There is 64 channels provided to the EUT. Channel Low, Mid and High was selected to test.

| Channel   | Frequency(MHz) | Channel   | Frequency(MHz) |
|-----------|----------------|-----------|----------------|
| <b>01</b> | <b>902.4</b>   | 33        | 915.2          |
| 02        | 902.8          | 34        | 915.6          |
| 03        | 903.2          | 35        | 916.0          |
| 04        | 903.6          | 36        | 916.4          |
| 05        | 904.0          | 37        | 916.8          |
| 06        | 904.4          | 38        | 917.2          |
| 07        | 904.8          | 39        | 917.6          |
| 08        | 905.2          | 40        | 918.0          |
| 09        | 905.6          | 41        | 918.4          |
| 10        | 906.0          | 42        | 918.8          |
| 11        | 906.4          | 43        | 919.2          |
| 12        | 906.8          | 44        | 919.6          |
| 13        | 907.2          | 45        | 920.0          |
| 14        | 907.6          | 46        | 920.4          |
| 15        | 908.0          | 47        | 920.8          |
| 16        | 908.4          | 48        | 921.2          |
| 17        | 908.8          | 49        | 921.6          |
| 18        | 909.2          | 50        | 922.0          |
| 19        | 909.6          | 51        | 922.4          |
| 20        | 910.0          | 52        | 922.8          |
| 21        | 910.4          | 53        | 923.2          |
| 22        | 910.8          | 54        | 923.6          |
| 23        | 911.2          | 55        | 924.0          |
| 24        | 911.6          | 56        | 924.4          |
| 25        | 912.0          | 57        | 924.8          |
| 26        | 912.4          | 58        | 925.2          |
| 27        | 912.8          | 59        | 925.6          |
| 28        | 913.2          | 60        | 926.0          |
| 29        | 913.6          | 61        | 926.4          |
| 30        | 914.0          | 62        | 926.8          |
| 31        | 914.4          | 63        | 927.2          |
| 32        | <b>914.8</b>   | <b>64</b> | <b>927.6</b>   |

Test frequency:

| Channel | Frequency (MHz) |
|---------|-----------------|
| 01      | 902.4           |
| 32      | 914.8           |
| 64      | 927.6           |

## 2.6. Block Diagram of Test Setup



## 2.7. Modifications

No modifications were implemented to meet testing criteria

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### 3. TEST ENVIRONMENT

#### 3.1. TEST FACILITY

Test Firm : Shenzhen CTA Testing Technology Co., Ltd.

Address Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community,  
Fuhai Street, Bao'an District, Shenzhen, China

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.4:2014 and CISPR 16-1-4:2010 SVSWR requirement for radiated emission above 1GHz.

#### 3.2. Test Facility

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

**FCC-Registration No.: 517856 Designation Number: CN1318**

Shenzhen CTA Testing Technology Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

**A2LA-Lab Cert. No.: 6534.01**

Shenzhen CTA Testing Technology Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

The 3m-Semi anechoic test site fulfils CISPR 16-1-4 according to ANSI C63.10 and CISPR 16-1-4:2010.

#### 3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Radiated Emission:

|                       |              |
|-----------------------|--------------|
| Temperature:          | 25 ° C       |
|                       |              |
| Humidity:             | 45 %         |
|                       |              |
| Atmospheric pressure: | 950-1050mbar |

Conducted testing:

|                       |              |
|-----------------------|--------------|
| Temperature:          | 25 ° C       |
|                       |              |
| Humidity:             | 44 %         |
|                       |              |
| Atmospheric pressure: | 950-1050mbar |

AC Conducted Emission:

|                       |              |
|-----------------------|--------------|
| Temperature:          | 25 ° C       |
|                       |              |
| Humidity:             | 44 %         |
|                       |              |
| Atmospheric pressure: | 950-1050mbar |

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### 3.4. Summary of measurement results

| FCC PART 15.249    |                               |      |
|--------------------|-------------------------------|------|
| FCC Part 15.249(a) | Field Strength of Fundamental | PASS |
| FCC Part 15.209    | Spurious Emission             | PASS |
| FCC Part 15.209    | Band edge                     | PASS |
| FCC Part 15.215(c) | 20dB bandwidth                | PASS |
| FCC Part 15.207    | Conducted Emission            | PASS |
| FCC Part 15.203    | Antenna Requirement           | PASS |

### 3.5. Statement of the measurement uncertainty

Measurement Uncertainty

Conducted Emission Expanded Uncertainty = 2.23dB, k=2

Radiated emission expanded uncertainty(9kHz-30MHz) = 3.08dB, k=2

Radiated emission expanded uncertainty(30MHz-1000MHz) = 4.42dB, k=2

Radiated emission expanded uncertainty(Above 1GHz) = 4.06dB, k=2

### 3.6. Equipments Used during the Test

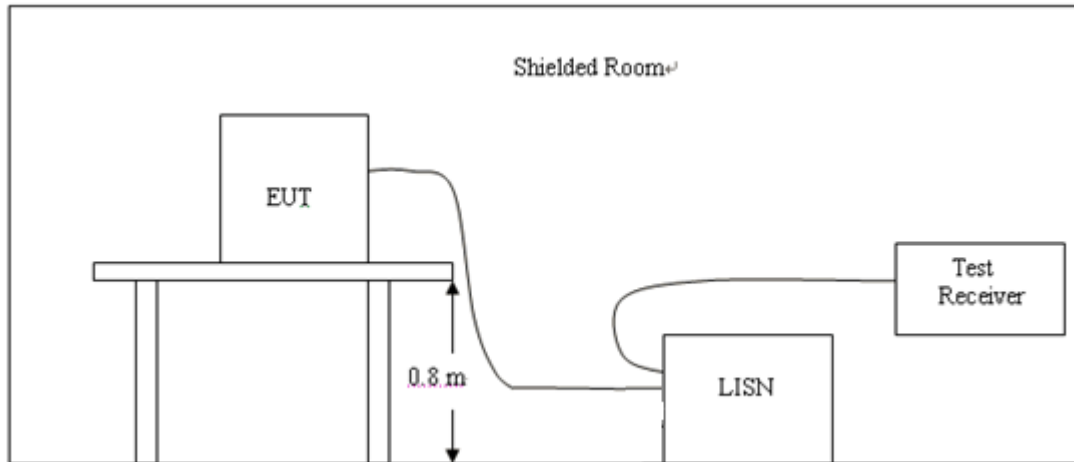
| Test Equipment                 | Manufacturer           | Model No.   | Equipment No. | Calibration Date | Calibration Due Date |
|--------------------------------|------------------------|-------------|---------------|------------------|----------------------|
| LISN                           | R&S                    | ENV216      | CTA-308       | 2021/08/06       | 2022/08/05           |
| LISN                           | R&S                    | ENV216      | CTA-314       | 2021/08/06       | 2022/08/05           |
| EMI Test Receiver              | R&S                    | ESPI        | CTA-307       | 2021/08/06       | 2022/08/05           |
| EMI Test Receiver              | R&S                    | ESCI        | CTA-306       | 2021/08/06       | 2022/08/05           |
| Spectrum Analyzer              | Agilent                | N9020A      | CTA-301       | 2021/08/06       | 2022/08/05           |
| Spectrum Analyzer              | R&S                    | FSP         | CTA-337       | 2021/08/06       | 2022/08/05           |
| Vector Signal generator        | Agilent                | N5182A      | CTA-305       | 2021/08/06       | 2022/08/05           |
| Analog Signal Generator        | R&S                    | SML03       | CTA-304       | 2021/08/06       | 2022/08/05           |
| Universal Radio Communication  | CMW500                 | R&S         | CTA-302       | 2021/08/06       | 2022/08/05           |
| Temperature and humidity meter | Chigo                  | ZG-7020     | CTA-326       | 2021/08/06       | 2022/08/05           |
| Ultra-Broadband Antenna        | Schwarzbeck            | VULB9163    | CTA-310       | 2021/08/07       | 2022/08/06           |
| Horn Antenna                   | Schwarzbeck            | BBHA 9120D  | CTA-309       | 2021/08/07       | 2022/08/06           |
| Loop Antenna                   | Zhinan                 | ZN30900C    | CTA-311       | 2021/08/07       | 2022/08/06           |
| Horn Antenna                   | Beijing Hangwei Dayang | OBH100400   | CTA-336       | 2021/08/06       | 2022/08/05           |
| Amplifier                      | Schwarzbeck            | BBV 9745    | CTA-312       | 2021/08/06       | 2022/08/05           |
| Amplifier                      | Taiwan chengyi         | EMC051845B  | CTA-313       | 2021/08/06       | 2022/08/05           |
| Directional coupler            | NARDA                  | 4226-10     | CTA-303       | 2021/08/06       | 2022/08/05           |
| High-Pass Filter               | XingBo                 | XBLBQ-GTA18 | CTA-402       | 2021/08/06       | 2022/08/05           |
| High-Pass Filter               | XingBo                 | XBLBQ-GTA27 | CTA-403       | 2021/08/06       | 2022/08/05           |
| Automated filter bank          | Tonscend               | JS0806-F    | CTA-404       | 2021/08/06       | 2022/08/05           |
| Power Sensor                   | Agilent                | U2021XA     | CTA-405       | 2021/08/06       | 2022/08/05           |
| Amplifier                      | Schwarzbeck            | BBV9719     | CTA-406       | 2021/08/06       | 2022/08/05           |

Note: The Cal.Interval was one year.

## 4. TEST CONDITIONS AND RESULTS

### 4.1. AC Power Conducted Emission

#### TEST CONFIGURATION



#### TEST PROCEDURE

- 1, The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10.
- 2, Support equipment, if needed, was placed as per ANSI C63.10.
- 3, All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
- 4, If a EUT received DC power from the USB Port of Notebook PC, the PC's adapter received power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
- 5, All support equipments received AC power from a second LISN, if any.
- 6, The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
- 7, Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.

#### AC Power Conducted Emission Limit

For intentional device, according to RSS-Gen 8.8 AC Power Conducted Emission Limits is as following :

| Frequency range (MHz) | Limit (dBuV) |           |
|-----------------------|--------------|-----------|
|                       | Quasi-peak   | Average   |
| 0.15-0.5              | 66 to 56*    | 56 to 46* |
| 0.5-5                 | 56           | 46        |
| 5-30                  | 60           | 50        |

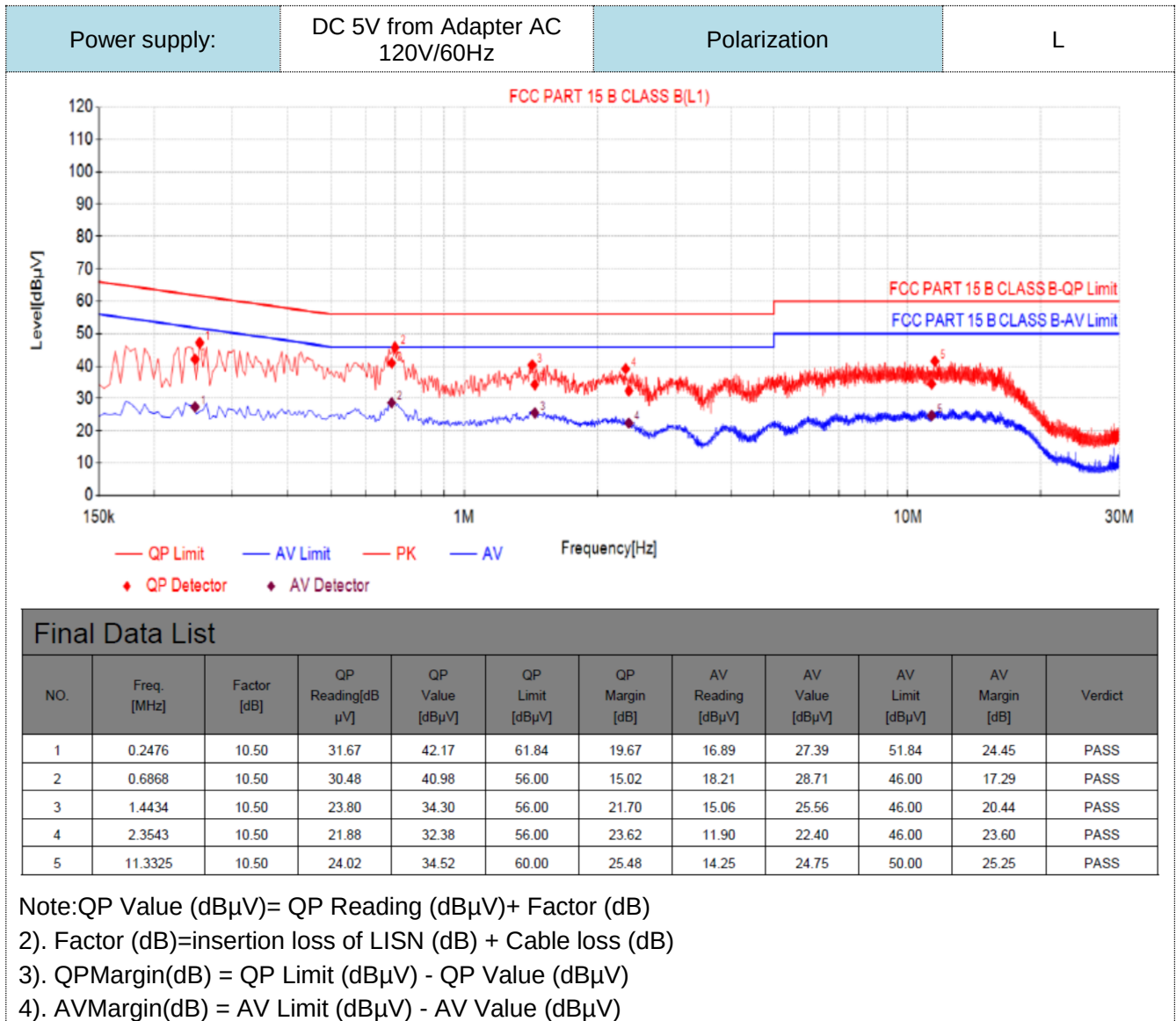
\* Decreases with the logarithm of the frequency.

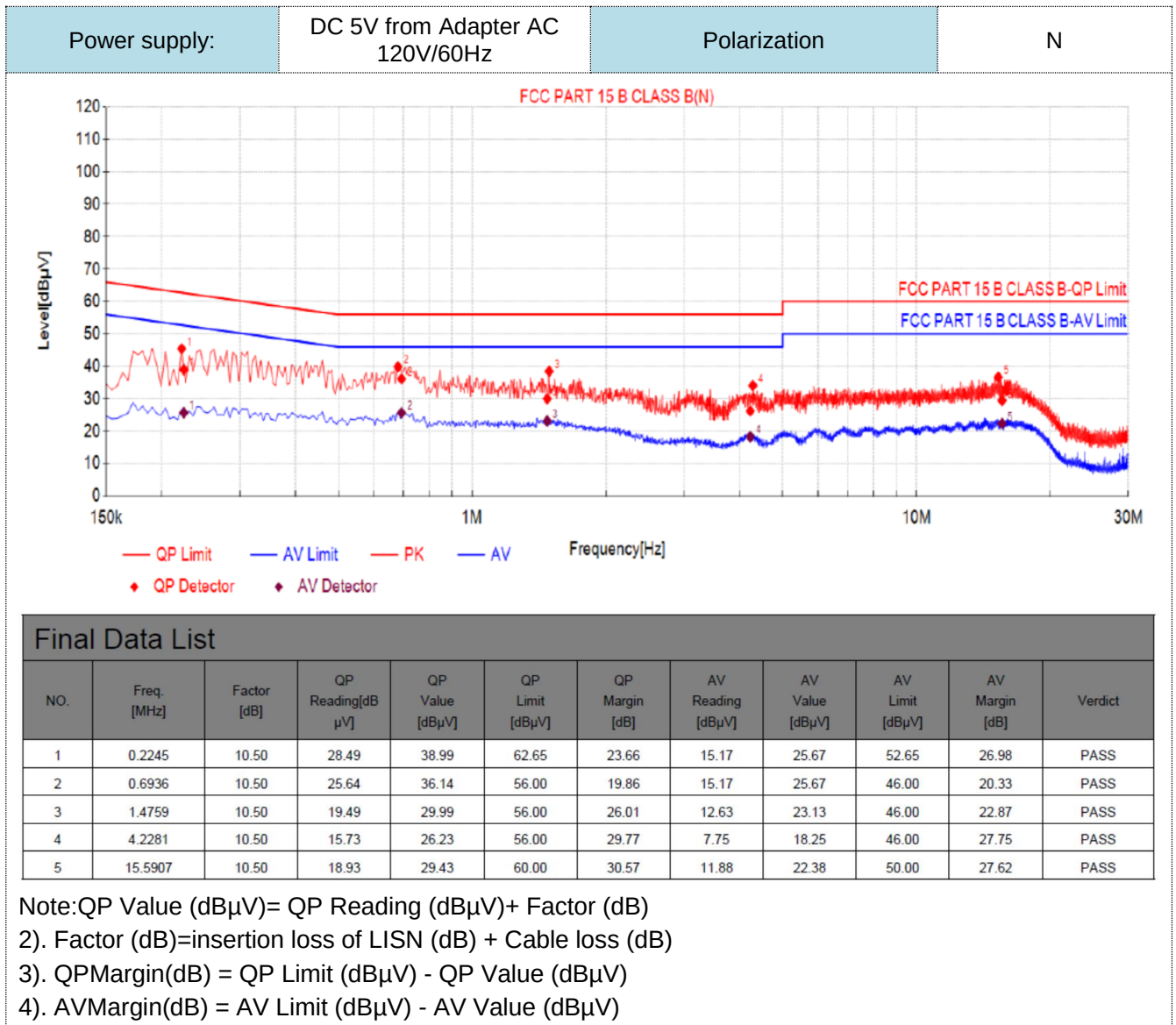
#### TEST RESULTS

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1. Both 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz power supply have been tested, only the worst result of 120 VAC, 60 Hz was reported as below:

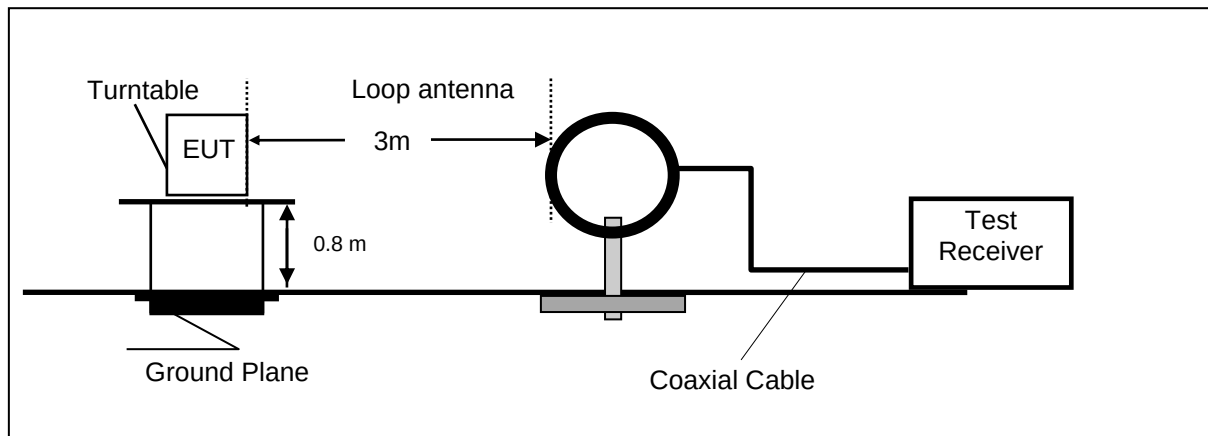




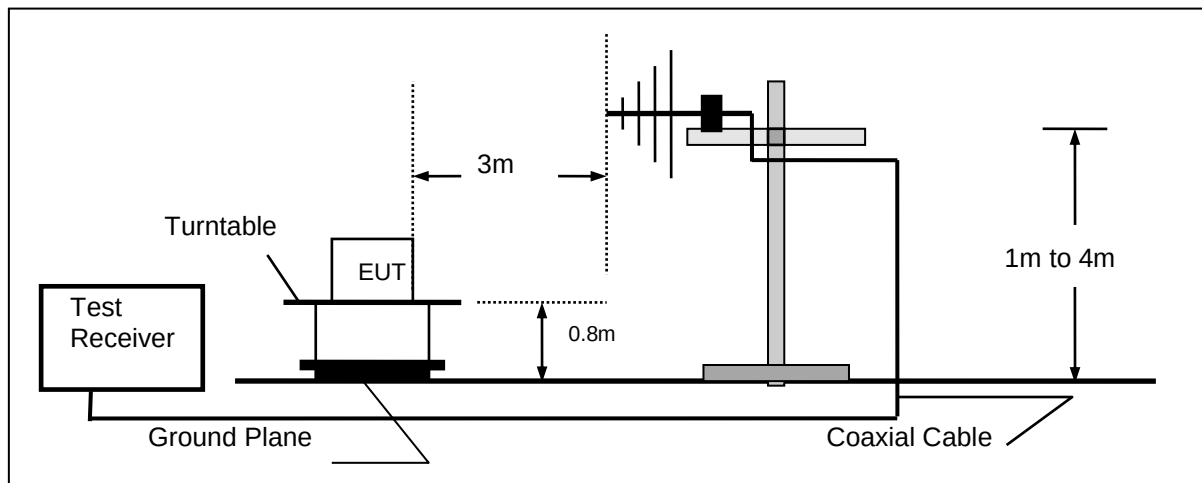
## Radiated Emission and Band Edges

**TEST CONFIGURATION**

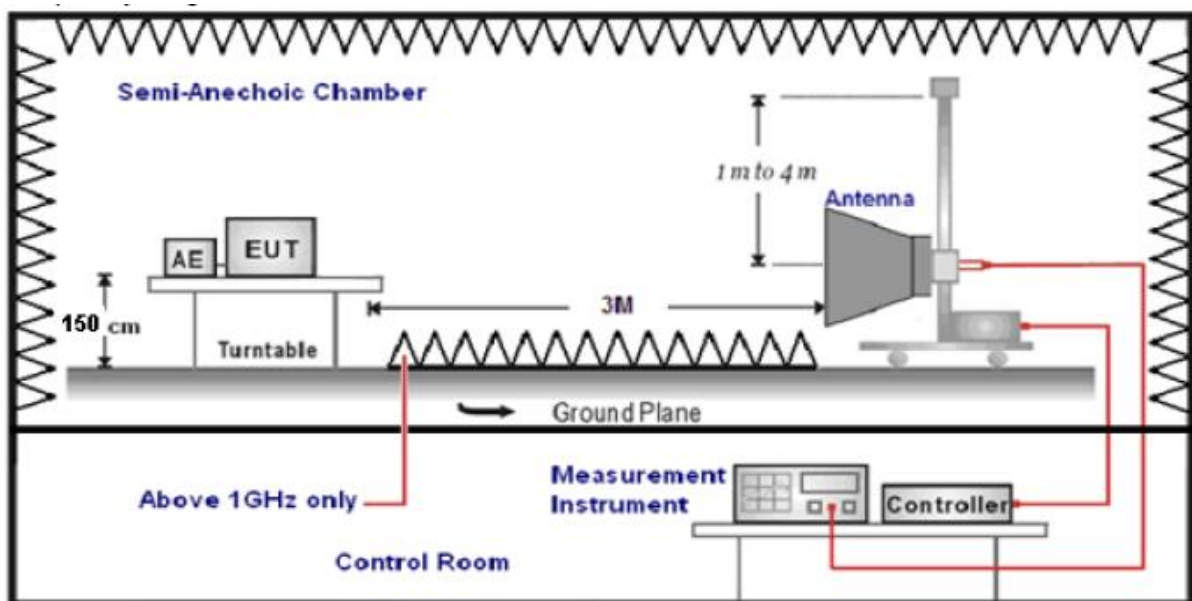
Frequency range 9 KHz – 30MHz



Frequency range 30MHz – 1000MHz



Frequency range above 1GHz-25GHz



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**TEST PROCEDURE**

1. The EUT was placed on a turn table which is 0.8m above ground plane when testing frequency range 9 KHz –25GHz.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0°C to 360°C to acquire the highest emissions from EUT.
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.
5. The EUT minimum operation frequency was 26MHz and maximum operation frequency was 1910MHz.so radiated emission test frequency band from 9KHz to 25GHz.
6. The distance between test antenna and EUT as following table states:

| Test Frequency range | Test Antenna Type          | Test Distance |
|----------------------|----------------------------|---------------|
| 9KHz-30MHz           | Active Loop Antenna        | 3             |
| 30MHz-1GHz           | Ultra-Broadband Antenna    | 3             |
| 1GHz-18GHz           | Double Ridged Horn Antenna | 3             |
| 18GHz-25GHz          | Horn Antenna               | 1             |

7. Setting test receiver/spectrum as following table states:

| Test Frequency range | Test Receiver/Spectrum Setting                                                                            | Detector |
|----------------------|-----------------------------------------------------------------------------------------------------------|----------|
| 9KHz-150KHz          | RBW=200Hz/VBW=3KHz, Sweep time=Auto                                                                       | QP       |
| 150KHz-30MHz         | RBW=9KHz/VBW=100KHz, Sweep time=Auto                                                                      | QP       |
| 30MHz-1GHz           | RBW=120KHz/VBW=1000KHz, Sweep time=Auto                                                                   | QP       |
| 1GHz-40GHz           | Peak Value: RBW=1MHz/VBW=3MHz,<br>Sweep time=Auto<br>Average Value: RBW=1MHz/VBW=10Hz,<br>Sweep time=Auto | Peak     |

**Field Strength Calculation**

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

|                           |                                            |
|---------------------------|--------------------------------------------|
| Where FS = Field Strength | CL = Cable Attenuation Factor (Cable Loss) |
| RA = Reading Amplitude    | AG = Amplifier Gain                        |
| AF = Antenna Factor       |                                            |

$$\text{Transd}=AF +CL-AG$$

**RADIATION LIMIT**

According FCC 15.249, the field strength of emissions from intentional radiators operated within 902MHz-928 MHz shall not exceed 94dBμV/m (50mV/m):

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 FCC 15.209, whichever is the lesser attenuation.

In addition, radiated emissions which fall in the restricted bands, as defined in FCC 15.205, must also comply with the radiated emission limits specified in FCC 15.205.

Radiated emission limits

| Frequency (MHz) | Distance (Meters) | Radiated (dBμV/m)                          | Radiated (μV/m)       |
|-----------------|-------------------|--------------------------------------------|-----------------------|
| 0.009-0.49      | 3                 | $20\log(2400/F(\text{KHz}))+40\log(300/3)$ | $2400/F(\text{KHz})$  |
| 0.49-1.705      | 3                 | $20\log(24000/F(\text{KHz}))+40\log(30/3)$ | $24000/F(\text{KHz})$ |
| 1.705-30        | 3                 | $20\log(30)+40\log(30/3)$                  | 30                    |
| 30-88           | 3                 | 40.0                                       | 100                   |
| 88-216          | 3                 | 43.5                                       | 150                   |
| 216-960         | 3                 | 46.0                                       | 200                   |

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|           |   |      |     |
|-----------|---|------|-----|
| Above 960 | 3 | 54.0 | 500 |
|-----------|---|------|-----|

**TEST RESULTS**

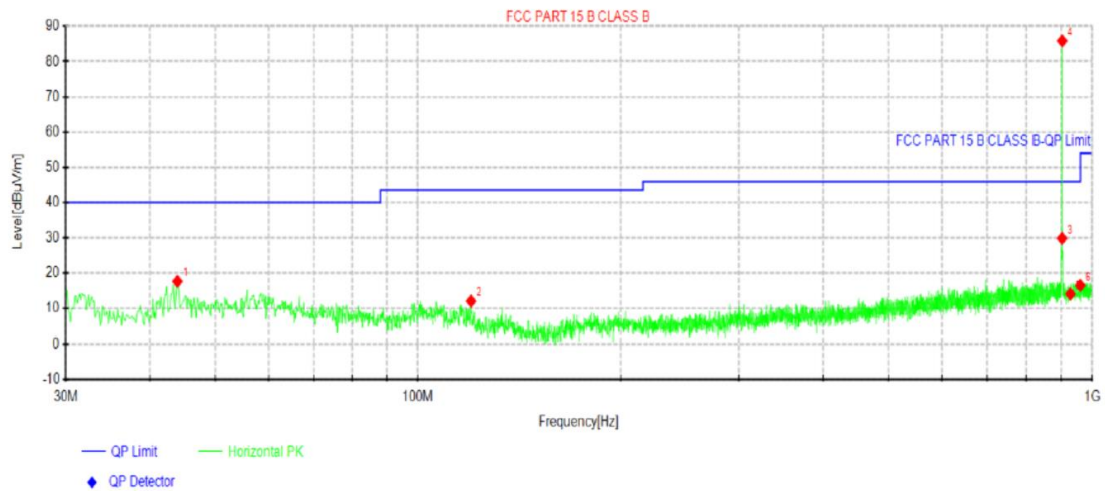
Remark:

1. This test was performed with EUT in X, Y, Z position and the worse case was found when EUT in X position.
2. Radiated emission test from 9 KHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9 KHz to 30MHz and not recorded in this report.

**For 30MHz-1GHz**

## Low Channel 01

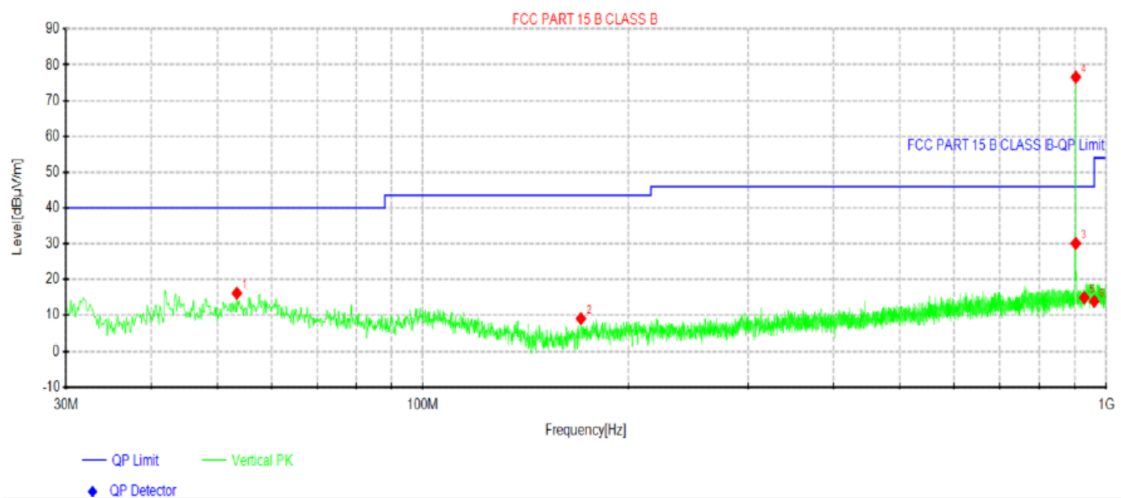
## Horizontal



## Suspected Data List

| NO. | Freq. [MHz] | Reading [dBμV] | Level [dBμV/m] | Factor [dB/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity   |
|-----|-------------|----------------|----------------|---------------|----------------|-------------|-------------|-----------|------------|
| 1   | 43.9438     | 34.23          | 17.63          | -16.60        | 40.00          | 22.37       | 100         | 20        | Horizontal |
| 2   | 119.967     | 32.37          | 12.08          | -20.29        | 43.50          | 31.42       | 100         | 70        | Horizontal |
| 3   | 902.000     | 39.08          | 29.89          | -9.19         | 46.00          | 16.11       | 100         | 20        | Horizontal |
| 4   | 902.393     | 95.09          | 85.90          | -9.19         | 94.00          | 8.10        | 100         | 70        | Horizontal |
| 5   | 928.000     | 23.12          | 14.10          | -9.02         | 46.00          | 31.90       | 100         | 10        | Horizontal |
| 6   | 960.000     | 25.54          | 16.49          | -9.05         | 54.00          | 37.51       | 100         | 70        | Horizontal |

## Vertical



## Suspected Data List

| NO. | Freq. [MHz] | Reading [dBμV] | Level [dBμV/m] | Factor [dB/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
|-----|-------------|----------------|----------------|---------------|----------------|-------------|-------------|-----------|----------|
| 1   | 53.4012     | 32.92          | 16.13          | -16.79        | 40.00          | 23.87       | 100         | 70        | Vertical |
| 2   | 170.528     | 30.03          | 9.02           | -21.01        | 43.50          | 34.48       | 100         | 60        | Vertical |
| 3   | 902.000     | 39.28          | 30.09          | -9.19         | 46.00          | 15.91       | 100         | 30        | Vertical |
| 4   | 902.393     | 85.76          | 76.57          | -9.19         | 94.00          | 17.43       | 100         | 80        | Vertical |
| 5   | 928.000     | 23.94          | 14.92          | -9.02         | 46.00          | 31.08       | 100         | 40        | Vertical |
| 6   | 960.000     | 22.94          | 13.89          | -9.05         | 54.00          | 40.11       | 100         | 40        | Vertical |

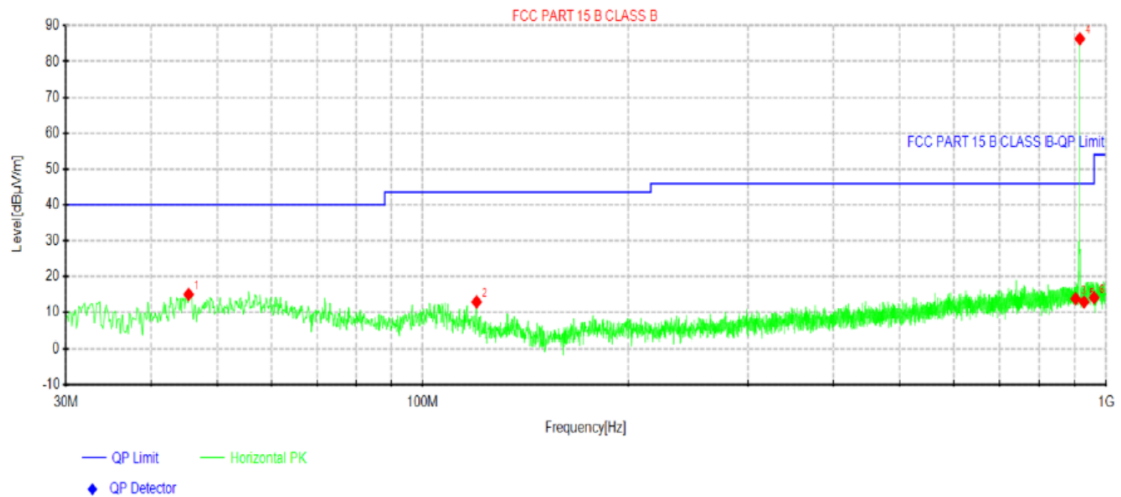
Note:1). Level (dBμV/m) = Reading (dBμV) + Factor (dB/m)

2). Factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)

3). Margin (dB) = Limit (dBμV/m) - Level (dBμV/m)

## Mid Channel 32

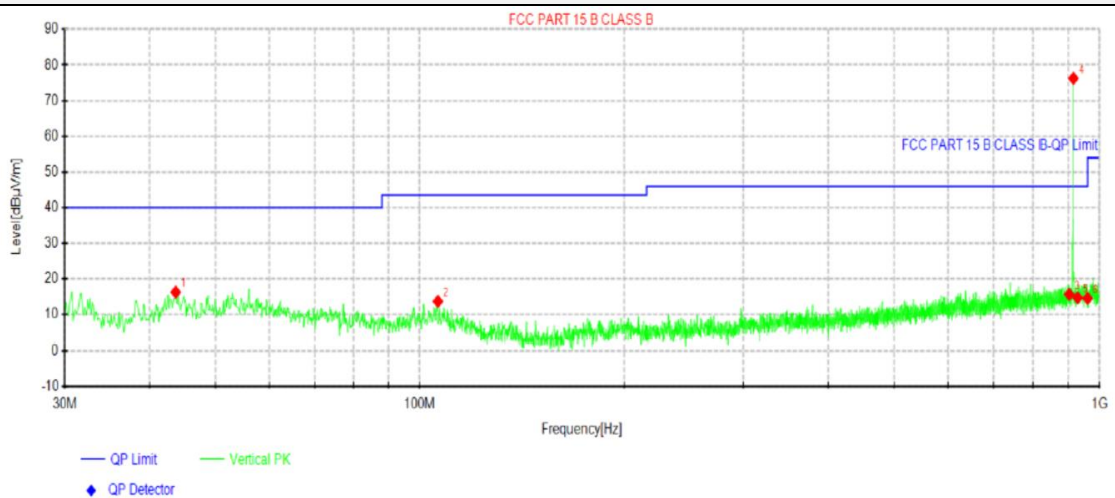
## Horizontal



## Suspected Data List

| NO. | Freq. [MHz] | Reading [dBμV] | Level [dBμV/m] | Factor [dB/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity   |
|-----|-------------|----------------|----------------|---------------|----------------|-------------|-------------|-----------|------------|
| 1   | 45.3988     | 31.44          | 15.02          | -16.42        | 40.00          | 24.98       | 100         | 30        | Horizontal |
| 2   | 119.967     | 33.20          | 12.91          | -20.29        | 43.50          | 30.59       | 100         | 30        | Horizontal |
| 3   | 902.000     | 23.02          | 13.83          | -9.19         | 46.00          | 32.17       | 100         | 30        | Horizontal |
| 4   | 914.761     | 95.59          | 86.39          | -9.20         | 94.00          | 7.61        | 100         | 10        | Horizontal |
| 5   | 928.000     | 21.93          | 12.91          | -9.02         | 46.00          | 33.09       | 100         | 70        | Horizontal |
| 6   | 960.000     | 23.16          | 14.11          | -9.05         | 54.00          | 39.89       | 100         | 40        | Horizontal |

## Vertical



## Suspected Data List

| NO. | Freq. [MHz] | Reading [dBμV] | Level [dBμV/m] | Factor [dB/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
|-----|-------------|----------------|----------------|---------------|----------------|-------------|-------------|-----------|----------|
| 1   | 43.7012     | 32.90          | 16.27          | -16.63        | 40.00          | 23.73       | 100         | 80        | Vertical |
| 2   | 106.387     | 32.38          | 13.71          | -18.67        | 43.50          | 29.79       | 100         | 30        | Vertical |
| 3   | 902.000     | 24.88          | 15.69          | -9.19         | 46.00          | 30.31       | 100         | 30        | Vertical |
| 4   | 914.761     | 85.46          | 76.26          | -9.20         | 94.00          | 17.74       | 100         | 20        | Vertical |
| 5   | 928.000     | 23.73          | 14.71          | -9.02         | 46.00          | 31.29       | 100         | 40        | Vertical |
| 6   | 960.000     | 23.60          | 14.55          | -9.05         | 54.00          | 39.45       | 100         | 30        | Vertical |

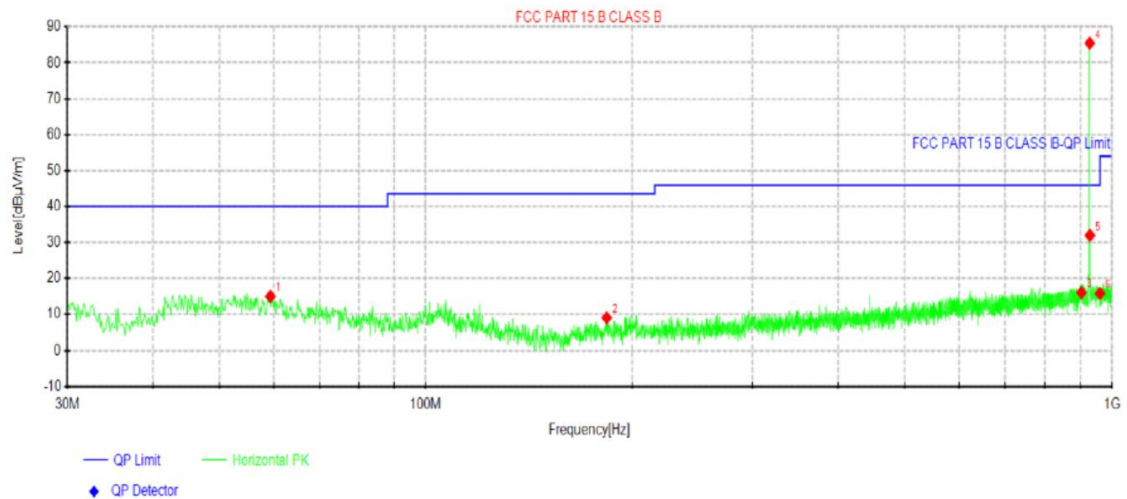
Note:1). Level (dBμV/m) = Reading (dBμV) + Factor (dB/m)

2). Factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)

3). Margin (dB) = Limit (dBμV/m) - Level (dBμV/m)

## High Channel 64

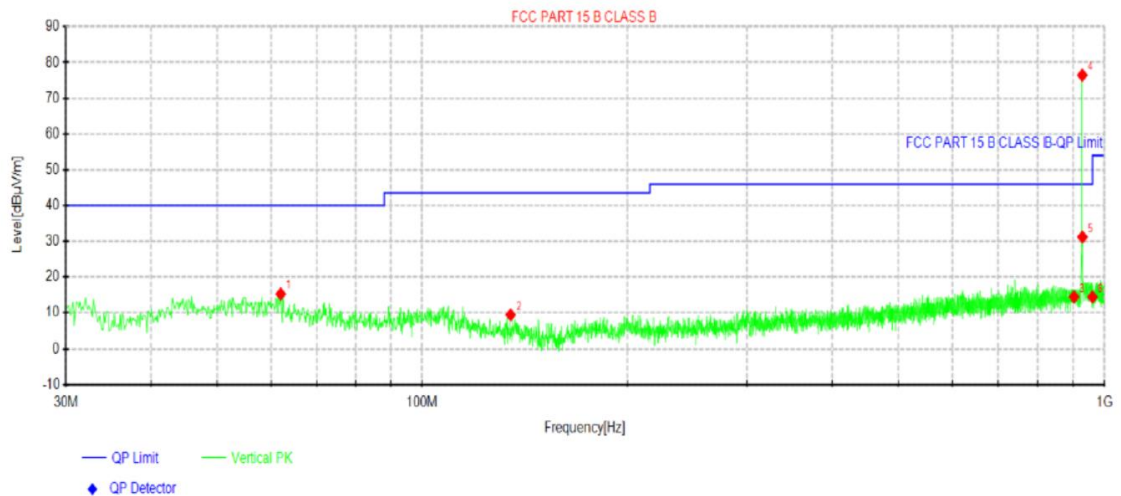
## Horizontal



Suspected Data List

| NO. | Freq. [MHz] | Reading [dBμV] | Level [dBμV/m] | Factor [dB/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity   |
|-----|-------------|----------------|----------------|---------------|----------------|-------------|-------------|-----------|------------|
| 1   | 59.3425     | 33.05          | 14.98          | -18.07        | 40.00          | 25.02       | 100         | 70        | Horizontal |
| 2   | 183.745     | 29.27          | 8.97           | -20.30        | 43.50          | 34.53       | 100         | 30        | Horizontal |
| 3   | 902.000     | 25.21          | 16.02          | -9.19         | 46.00          | 29.98       | 100         | 50        | Horizontal |
| 4   | 927.613     | 94.55          | 85.52          | -9.03         | 94.00          | 8.48        | 100         | 60        | Horizontal |
| 5   | 928.000     | 41.00          | 31.98          | -9.02         | 46.00          | 14.02       | 100         | 60        | Horizontal |
| 6   | 960.000     | 24.84          | 15.79          | -9.05         | 54.00          | 38.21       | 100         | 70        | Horizontal |

## Vertical



Suspected Data List

| NO. | Freq. [MHz] | Reading [dBμV] | Level [dBμV/m] | Factor [dB/m] | Limit [dBμV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
|-----|-------------|----------------|----------------|---------------|----------------|-------------|-------------|-----------|----------|
| 1   | 62.01       | 33.99          | 15.24          | -18.75        | 40.00          | 24.76       | 100         | 10        | Vertical |
| 2   | 134.881     | 30.92          | 9.37           | -21.55        | 43.50          | 34.13       | 100         | 50        | Vertical |
| 3   | 902.000     | 23.62          | 14.43          | -9.19         | 46.00          | 31.57       | 100         | 50        | Vertical |
| 4   | 927.613     | 85.47          | 76.44          | -9.03         | 94.00          | 17.56       | 100         | 60        | Vertical |
| 5   | 928.000     | 40.23          | 31.21          | -9.02         | 46.00          | 14.79       | 100         | 10        | Vertical |
| 6   | 960.000     | 23.45          | 14.40          | -9.05         | 54.00          | 39.60       | 100         | 50        | Vertical |

Note:1). Level (dBμV/m) = Reading (dBμV) + Factor (dB/m)

2). Factor (dB/m) = Antenna Factor (dB/m) + Cable loss (dB) - Pre Amplifier gain (dB)

3). Margin (dB) = Limit (dBμV/m) - Level (dBμV/m)

For 1GHz to 25GHz

Low:

| Frequency(MHz): |                         |    | 902.4          |             | Polarity:        |                       | HORIZONTAL        |                    |                          |
|-----------------|-------------------------|----|----------------|-------------|------------------|-----------------------|-------------------|--------------------|--------------------------|
| Frequency (MHz) | Emission Level (dBuV/m) |    | Limit (dBuV/m) | Margin (dB) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor (dB) | Pre-amplifier (dB) | Correction Factor (dB/m) |
| 1804.80         | 46.16                   | PK | 74             | 27.84       | 58.46            | 25.48                 | 3.56              | 41.34              | -12.30                   |
| 1804.80         | 37.52                   | AV | 54             | 16.48       | 49.82            | 25.48                 | 3.56              | 41.34              | -12.30                   |
| 2707.20         | 42.27                   | PK | 74             | 31.73       | 51.47            | 28.3                  | 4.53              | 42.03              | -9.20                    |
| 2707.20         | 33.72                   | AV | 54             | 20.28       | 42.92            | 28.3                  | 4.53              | 42.03              | -9.20                    |

| Frequency(MHz): |                         |    | 902.4          |             | Polarity:        |                       | VERTICAL          |                    |                          |
|-----------------|-------------------------|----|----------------|-------------|------------------|-----------------------|-------------------|--------------------|--------------------------|
| Frequency (MHz) | Emission Level (dBuV/m) |    | Limit (dBuV/m) | Margin (dB) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor (dB) | Pre-amplifier (dB) | Correction Factor (dB/m) |
| 1804.80         | 47.13                   | PK | 74             | 26.87       | 59.43            | 25.48                 | 3.56              | 41.34              | -12.30                   |
| 1804.80         | 37.85                   | AV | 54             | 16.15       | 50.15            | 25.48                 | 3.56              | 41.34              | -12.30                   |
| 2707.20         | 42.91                   | PK | 74             | 31.09       | 52.11            | 28.3                  | 4.53              | 42.03              | -9.20                    |
| 2707.20         | 34.39                   | AV | 54             | 19.61       | 43.59            | 28.3                  | 4.53              | 42.03              | -9.20                    |

Mid:

| Frequency(MHz): |                         |    | 914.80         |             | Polarity:        |                       | HORIZONTAL        |                    |                          |
|-----------------|-------------------------|----|----------------|-------------|------------------|-----------------------|-------------------|--------------------|--------------------------|
| Frequency (MHz) | Emission Level (dBuV/m) |    | Limit (dBuV/m) | Margin (dB) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor (dB) | Pre-amplifier (dB) | Correction Factor (dB/m) |
| 1829.60         | 47.15                   | PK | 74             | 26.85       | 59.42            | 25.53                 | 3.56              | 41.36              | -12.27                   |
| 1829.60         | 36.66                   | AV | 54             | 17.34       | 48.93            | 25.53                 | 3.56              | 41.36              | -12.27                   |
| 2744.40         | 42.95                   | PK | 74             | 31.05       | 52.11            | 28.38                 | 4.52              | 42.06              | -9.16                    |
| 2744.40         | 34.60                   | AV | 54             | 19.40       | 43.76            | 28.38                 | 4.52              | 42.06              | -9.16                    |

| Frequency(MHz): |                         |    | 914.80         |             | Polarity:        |                       | VERTICAL          |                    |                          |
|-----------------|-------------------------|----|----------------|-------------|------------------|-----------------------|-------------------|--------------------|--------------------------|
| Frequency (MHz) | Emission Level (dBuV/m) |    | Limit (dBuV/m) | Margin (dB) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor (dB) | Pre-amplifier (dB) | Correction Factor (dB/m) |
| 1829.60         | 48.25                   | PK | 74             | 25.75       | 60.52            | 25.53                 | 3.56              | 41.36              | -12.27                   |
| 1829.60         | 37.00                   | AV | 54             | 17.00       | 49.27            | 25.53                 | 3.56              | 41.36              | -12.27                   |
| 2744.40         | 43.52                   | PK | 74             | 30.48       | 52.68            | 28.38                 | 4.52              | 42.06              | -9.16                    |
| 2744.40         | 34.75                   | AV | 54             | 19.25       | 43.91            | 28.38                 | 4.52              | 42.06              | -9.16                    |

High:

| Frequency(MHz): |                         |    | 927.60         |             | Polarity:        |                       | HORIZONTAL        |                    |                          |
|-----------------|-------------------------|----|----------------|-------------|------------------|-----------------------|-------------------|--------------------|--------------------------|
| Frequency (MHz) | Emission Level (dBuV/m) |    | Limit (dBuV/m) | Margin (dB) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor (dB) | Pre-amplifier (dB) | Correction Factor (dB/m) |
| 1855.20         | 47.04                   | PK | 74             | 26.96       | 59.32            | 25.57                 | 3.57              | 41.42              | -12.28                   |
| 1855.20         | 36.39                   | AV | 54             | 17.61       | 48.67            | 25.57                 | 3.57              | 41.42              | -12.28                   |
| 2782.80         | 43.38                   | PK | 74             | 30.62       | 52.53            | 28.42                 | 4.53              | 42.1               | -9.15                    |
| 2782.80         | 33.16                   | AV | 54             | 20.84       | 42.31            | 28.42                 | 4.53              | 42.1               | -9.15                    |

| Frequency(MHz): |                         |    | 927.60         |             | Polarity:        |                       | VERTICAL          |                    |                          |
|-----------------|-------------------------|----|----------------|-------------|------------------|-----------------------|-------------------|--------------------|--------------------------|
| Frequency (MHz) | Emission Level (dBuV/m) |    | Limit (dBuV/m) | Margin (dB) | Raw Value (dBuV) | Antenna Factor (dB/m) | Cable Factor (dB) | Pre-amplifier (dB) | Correction Factor (dB/m) |
| 1855.20         | 47.64                   | PK | 74             | 26.36       | 59.92            | 25.57                 | 3.57              | 41.42              | -12.28                   |
| 1855.20         | 37.15                   | AV | 54             | 16.85       | 49.43            | 25.57                 | 3.57              | 41.42              | -12.28                   |
| 2782.80         | 43.62                   | PK | 74             | 30.38       | 52.77            | 28.42                 | 4.53              | 42.1               | -9.15                    |
| 2782.80         | 33.53                   | AV | 54             | 20.47       | 42.68            | 28.42                 | 4.53              | 42.1               | -9.15                    |

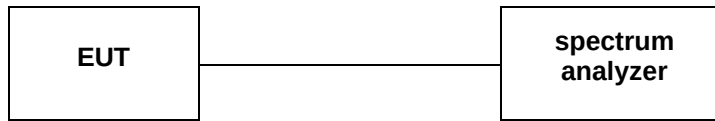
Shenzhen CTA Testing Technology Co., Ltd.

Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, China

Tel:+86-755 2322 5875 E-mail:cta@cta-test.cn Web:http://www.cta-test.cn

## 4.2. 20dB bandwidth and Occupied Bandwidth Measurement

### TEST CONFIGURATION



### TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 30KHz RBW and 100KHz VBW.

The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

Occupied Bandwidth is defined as the average power emitted out-of-band below its lower frequency limit or above the upper frequency limit is each equal to 0.5% of the total average power of a given emission.

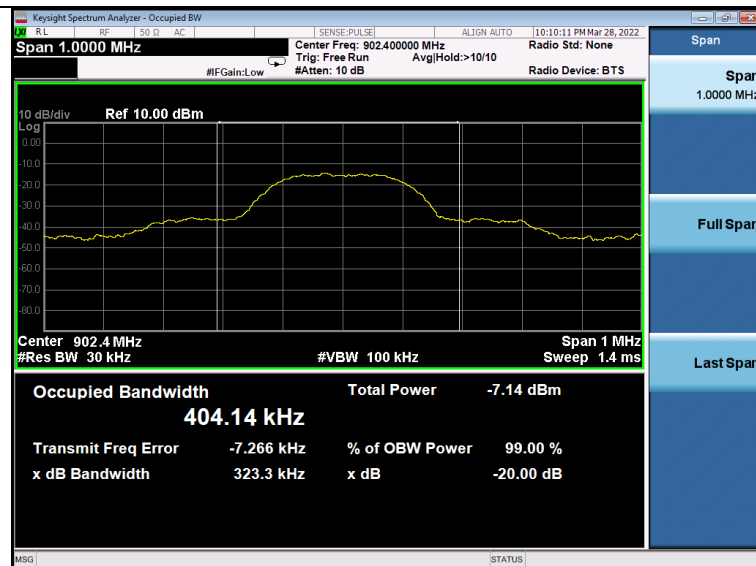
### LIMIT

N/A

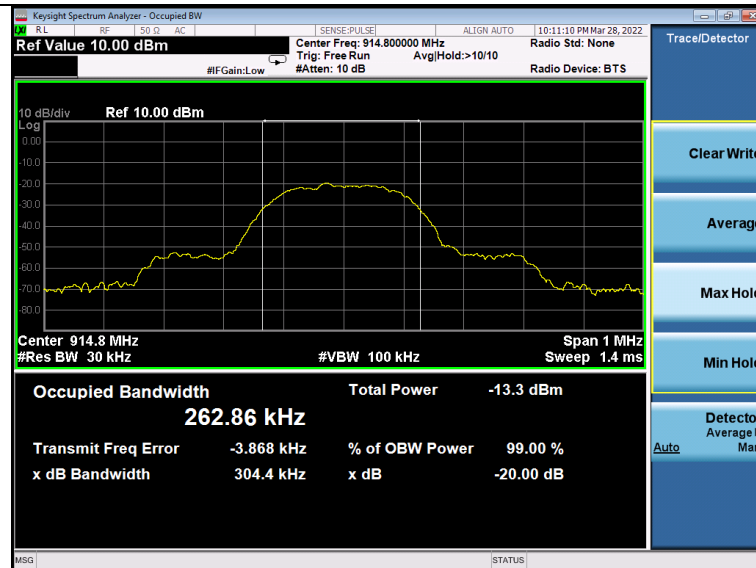
### TEST RESULTS

| Modulation | Channel | 20dB bandwidth (kHz) | Result |
|------------|---------|----------------------|--------|
| GFSK       | CH01    | 323.3                | Pass   |
|            | CH32    | 304.4                |        |
|            | CH64    | 299.9                |        |

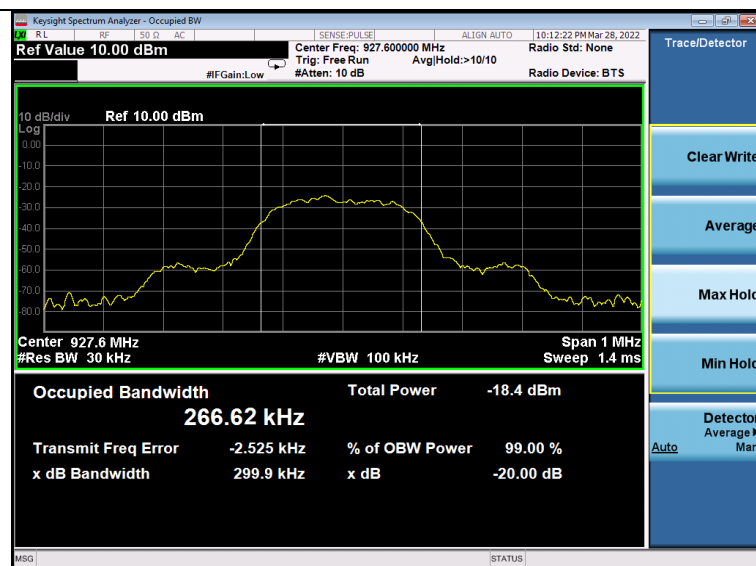
Note: 1.The test results including the cable lose.



CH01



CH32



CH64

### 4.3. Antenna Requirement

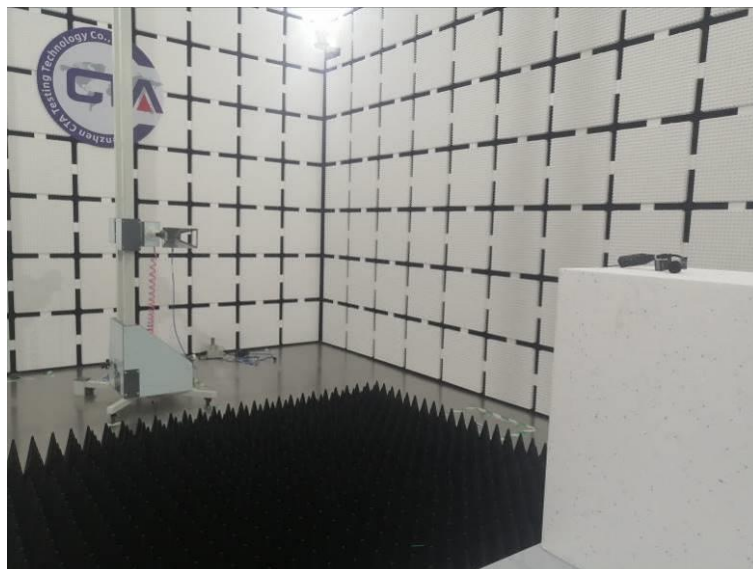
#### Standard Applicable

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 directional gains of antenna used for transmitting is 0.00 dBi.

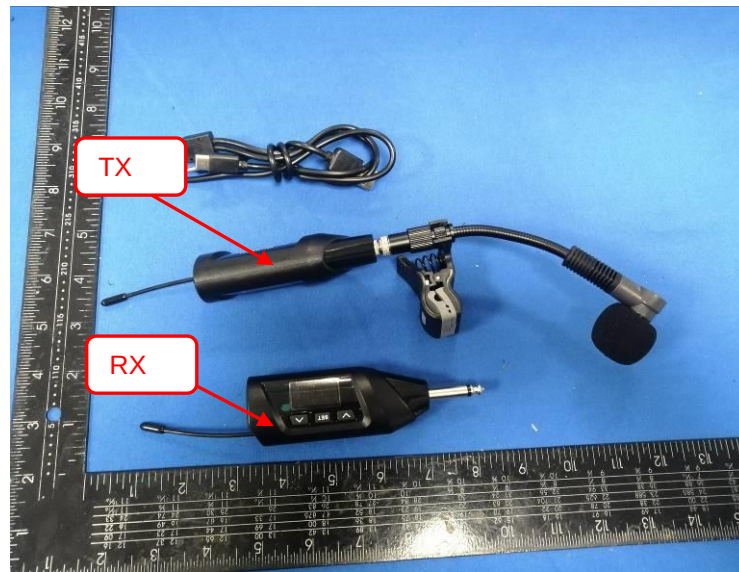
## 5. Test Setup Photos of the EUT



**Shenzhen CTA Testing Technology Co., Ltd.**

Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, China  
Tel:+86-755 2322 5875 E-mail:cta@cta-test.cn Web:http://www.cta-test.cn

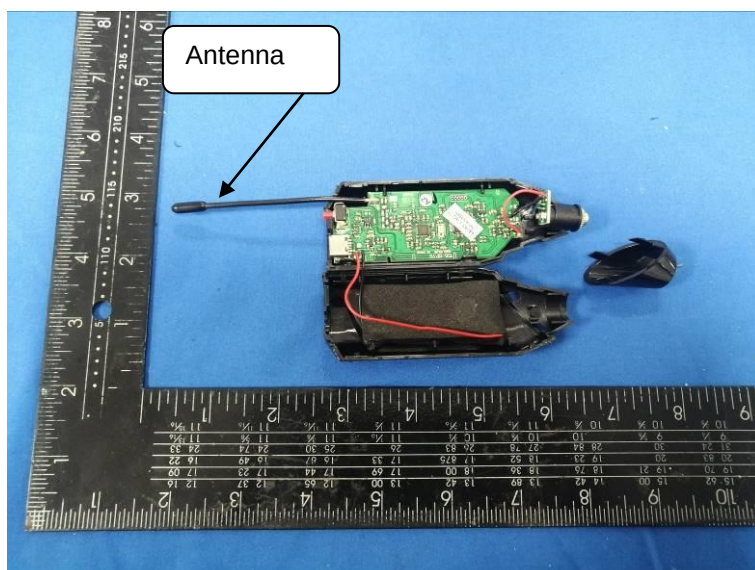
## 6. Photos of the EUT

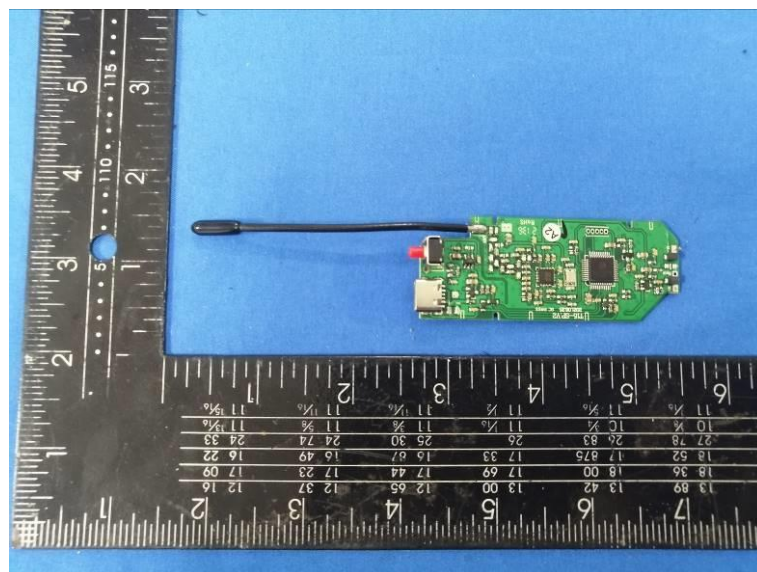
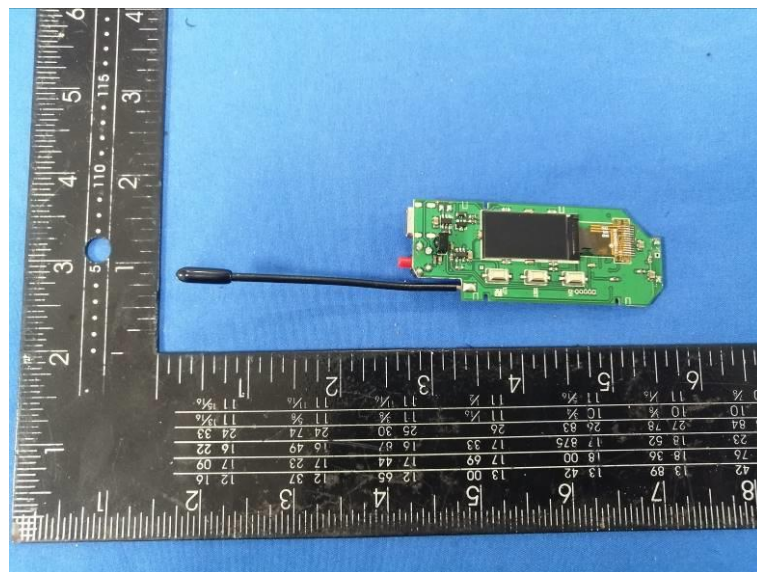
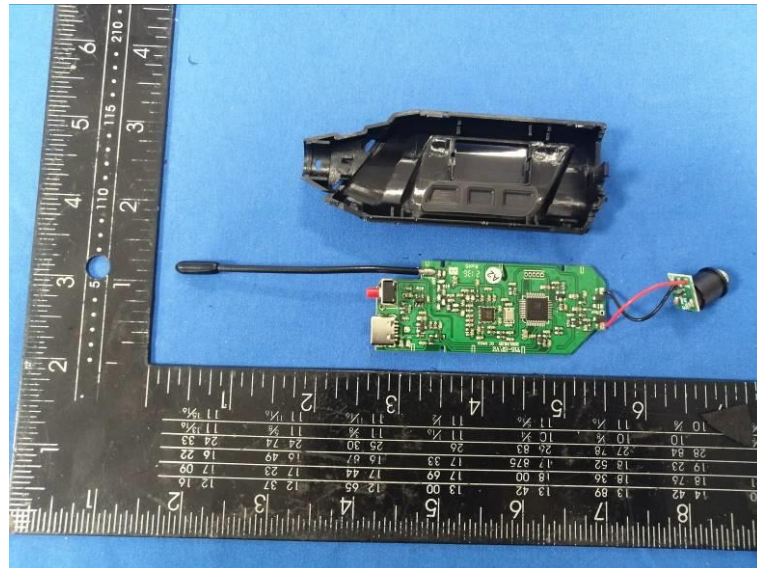


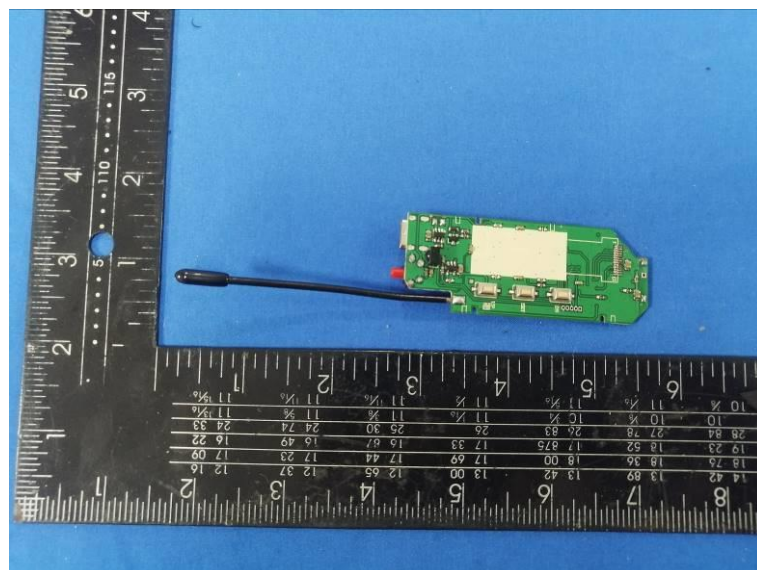
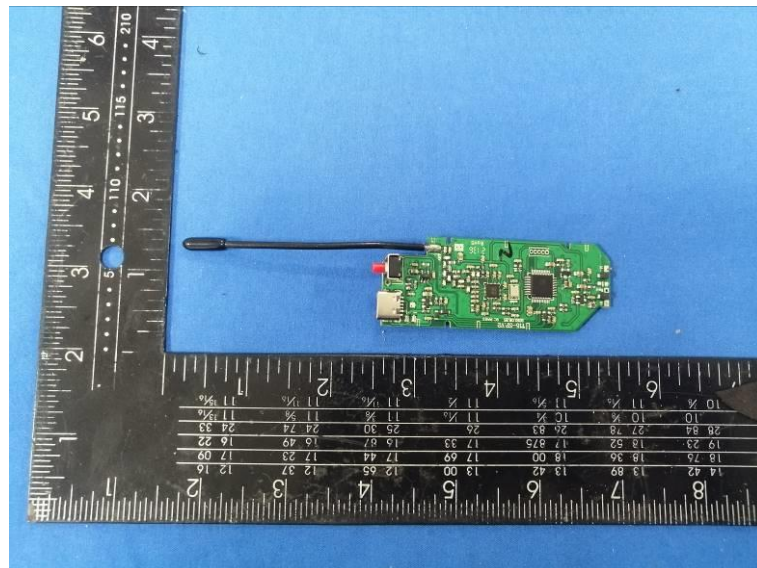
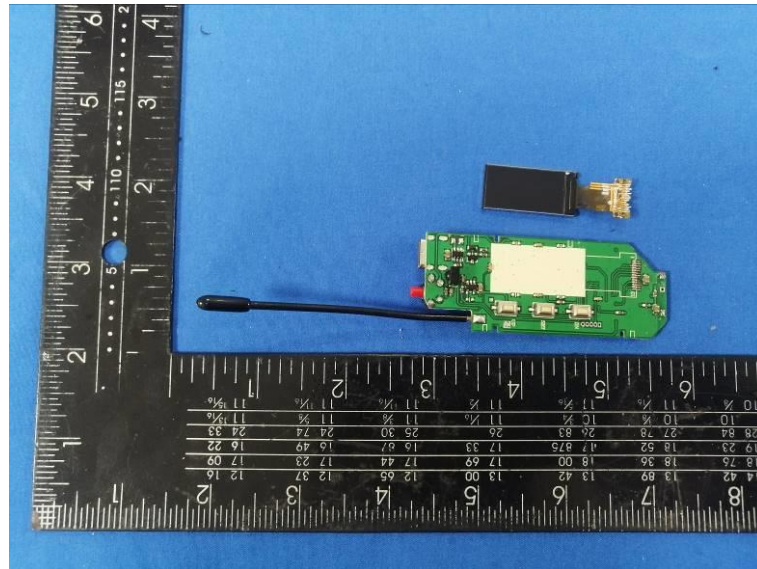
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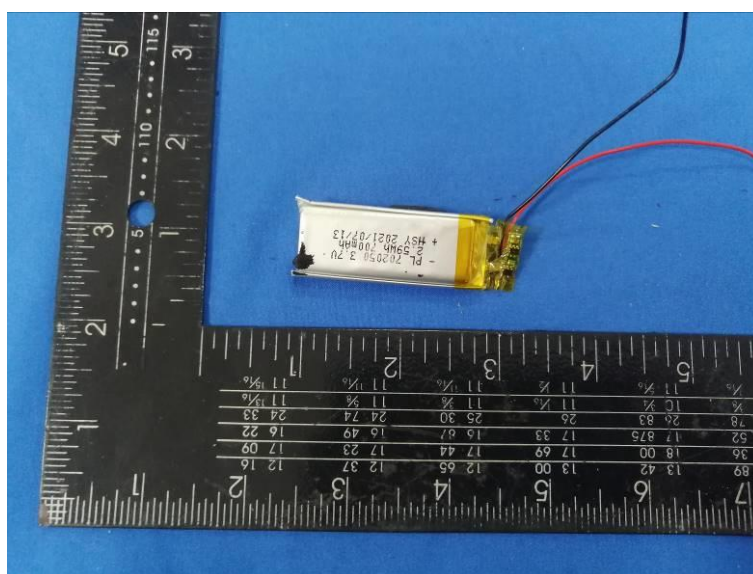
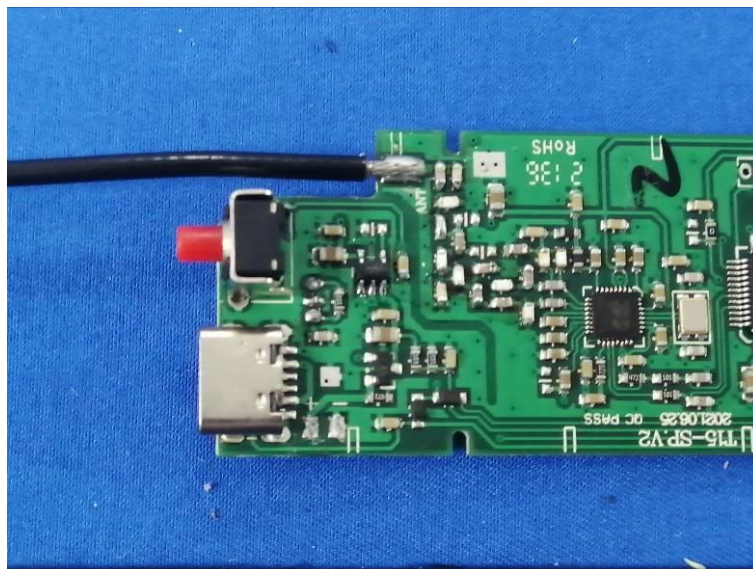
Room 106, Building 1, Yibaolai Industrial Park, Qiaotou Community, Fuhai Street, Bao'an District, Shenzhen, China  
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.....End of Report.....