



# FCC TEST REPORT

## FCC ID: 2BG5G-B200

|                                                                                                                     |   |                      |
|---------------------------------------------------------------------------------------------------------------------|---|----------------------|
| Product                                                                                                             | : | Deadbolt             |
| Model Name                                                                                                          | : | B200                 |
| Brand                                                                                                               | : | Desloc               |
| Report No.                                                                                                          | : | PTC24060712601E-FC02 |
| <b>Prepared for</b>                                                                                                 |   |                      |
| Zhejiang Desman Intelligent Technology Co., LTD                                                                     |   |                      |
| Floor 1-3, Building 1, No.7 Jianghui South Road, Binjiang District, Hangzhou City, Zhejiang Province, China, 310051 |   |                      |
| <b>Prepared by</b>                                                                                                  |   |                      |
| Precise Testing & Certification Co., Ltd.                                                                           |   |                      |
| Building 1, No. 6, Tongxin Road, Dongcheng Street, Dongguan, Guangdong, China                                       |   |                      |



## 1 TEST RESULT CERTIFICATION

Applicant's name : Zhejiang Desman Intelligent Technology Co., LTD  
Address : Floor 1-3, Building 1, No.7 Jianghui South Road, Binjiang District,  
Hangzhou City, Zhejiang Province, China, 310051  
Manufacture's name : ShenZhen Zaifengda Technology Co.,LTD  
Address : FuDiGang 2nd Industrial estate 1-2PingDong community, PingDi Street,  
LongGang District, Shenzhen, China  
Product name : Deadbolt  
Model name : B200  
Standards : FCC Part15 Subpart C, Paragraph 15.225  
Test procedure : ANSI C63.10: 2013  
Test Date : Jun. 14, 2024 to Jul. 04, 2024  
Date of Issue : Jul. 04, 2024  
Test Result : Pass

This device described above has been tested by PTC, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

This report shall not be reproduced except in full, without the written approval of PTC, this document may be altered or revised by PTC, personal only, and shall be noted in the revision of the document.

Test Engineer:

A handwritten signature in black ink, appearing to read 'Jack Zhou'.

Jack zhou / Engineer

Technical Manager:

A handwritten signature in black ink, appearing to read 'Simon Pu'.

Simon Pu / Manager



## Contents

|                                                       | Page      |
|-------------------------------------------------------|-----------|
| <b>1 TEST RESULT CERTIFICATION.....</b>               | <b>2</b>  |
| <b>2 TEST SUMMARY.....</b>                            | <b>5</b>  |
| 2.1 TEST SITE.....                                    | 6         |
| <b>3 GENERAL INFORMATION.....</b>                     | <b>7</b>  |
| 3.1 GENERAL DESCRIPTION OF E.U.T. ....                | 7         |
| 3.2 CHANNEL LIST .....                                | 8         |
| <b>4 EQUIPMENT DURING TEST.....</b>                   | <b>9</b>  |
| 4.1 EQUIPMENTS LIST .....                             | 9         |
| 4.2 MEASUREMENT UNCERTAINTY .....                     | 11        |
| 4.3 DESCRIPTION OF SUPPORT UNITS.....                 | 11        |
| <b>5 CONDUCTED EMISSION.....</b>                      | <b>12</b> |
| 5.1 E.U.T. OPERATION.....                             | 12        |
| 5.2 EUT SETUP .....                                   | 12        |
| 5.3 TEST SET-UP (BLOCK DIAGRAM OF CONFIGURATION)..... | 12        |
| 5.4 MEASUREMENT PROCEDURE.....                        | 12        |
| 5.5 CONDUCTED EMISSION LIMIT .....                    | 13        |
| 5.6 MEASUREMENT DESCRIPTION.....                      | 13        |
| 5.7 CONDUCTED EMISSION TEST RESULT .....              | 13        |
| <b>6 RADIATED EMISSION AND BAND EDGE.....</b>         | <b>16</b> |
| 6.1 TEST STANDARD AND LIMIT .....                     | 16        |
| 6.2 TEST SETUP.....                                   | 17        |
| 6.3 TEST PROCEDURE.....                               | 18        |
| 6.4 TEST DATA .....                                   | 19        |
| <b>7 20DB BANDWIDTH AND 99% BANDWIDTH.....</b>        | <b>23</b> |
| 7.1 TEST STANDARD AND LIMIT .....                     | 23        |
| 7.2 TEST SETUP.....                                   | 23        |
| 7.3 TEST PROCEDURE.....                               | 23        |
| 7.4 TEST DATA .....                                   | 24        |
| <b>8 FREQUENCY TOLERANCE.....</b>                     | <b>26</b> |
| 8.1 TEST STANDARD AND LIMIT .....                     | 26        |
| 8.2 TEST SETUP.....                                   | 26        |



8.3 TEST PROCEDURE..... 26

8.4 TEST RESULT ..... 27

**9 TEST SETUP PHOTOGRAPH ..... 28**

**10 EUT PHOTOGRAPH..... 30**



## 2 Test Summary

| Standard Section                                            | Test Item                     | Result |
|-------------------------------------------------------------|-------------------------------|--------|
| 15.207                                                      | Conducted Emission            | PASS   |
| 15.225(e)                                                   | Frequency Stability Tolerance | PASS   |
| 15.225(a)                                                   | In-band Fundamental Emission  | PASS   |
| 15.225(b)                                                   | In-band Spurious Emission     | PASS   |
| 15.225(c)                                                   | In-band Spurious Emission     | PASS   |
| 15.225(d)<br>15.209                                         | Out-of-band Spurious Emission | PASS   |
| 15.215(c)                                                   | 20dB Bandwidth                | PASS   |
| <b>Remark:</b> "N/A" is an abbreviation for Not Applicable. |                               |        |

Remark:N/A



Report No.: PTC24060712601E-FC02

## 2.1 Test Site

Precise Testing & Certification Co., Ltd.

Address: Building 1, No. 6, Tongxin Road, Dongcheng Street, Dongguan, Guangdong, China

FCC Registration Number: 790290

A2LA Certificate No.: 4408.01

IC Registration Number: 12191A

FCC Designation Number: CN1219



### 3 General Information

#### 3.1 General Description of E.U.T.

|                      |   |                                           |
|----------------------|---|-------------------------------------------|
| Product Name         | : | Deadbolt                                  |
| Model Name           | : | B200                                      |
| Additional model     | : | N/A                                       |
| Operation Frequency  | : | NFC_13.56MHz                              |
| Modulation           | : | ASK                                       |
| Number of Channels   | : | 1 channel                                 |
| Antenna installation | : | NFC_FPCB Antenna                          |
| Antenna Gain         | : | 0 dBi                                     |
| Power supply         | : | Input: 4.5-6V 200mA                       |
| Hardware Version     | : | SN-9274-4-1                               |
| Software Version     | : | 6.4.39.240506                             |
| Test sample No.      | : | PTC24060712601E-1/2, PTC24060712601E-2/2. |



### 3.2 Channel List

The EUT has been tested under its typical operating condition. Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting. Only the worst case data were reported.

The EUT has been associated with peripherals pursuant to ANSI C63.10-2013 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: radiation (9 KHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

The details of test channels and bandwidth were for RF conductive measurement.

Channel List:

| Ch. | Frequency[MHz] |
|-----|----------------|
| 01  | 13.56          |

Note:

1. EUT used the new batteries during test.



## 4 Equipment During Test

### 4.1 Equipments List

RF Conducted Test

| Name of Equipment   | Manufacturer | Model    | Serial No.    | Characteristics | Last Calibration | Calibration Interval |
|---------------------|--------------|----------|---------------|-----------------|------------------|----------------------|
| MXG Signal Analyzer | Agilent      | N9020A   | SER MY5111038 | 10Hz-26.5GHz    | Aug.17, 2023     | 1 Year               |
| Coaxial Cable       | CDS          | 79254    | 46107086      | 10Hz-30GHz      | Aug.17, 2023     | 1 Year               |
| Power Meter         | Anritsu      | ML2495A  | 0949003       | 300MHz-40GHz    | Aug.17, 2023     | 1 Year               |
| Power Sensor        | Anritsu      | MA2411B  | 0917017       | 300MHz-40GHz    | Aug.17, 2023     | 1 Year               |
| Test S/W            | Tonscend     | JS1120-3 | /             | /               | /                | /                    |

Remark: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

Radiated Emissions(Test Frequency from 9KHz-18GHz)

| Name of Equipment            | Manufacturer  | Model        | Serial No.       | Characteristics | Last Calibration | Calibration Interval |
|------------------------------|---------------|--------------|------------------|-----------------|------------------|----------------------|
| EMI Test Receiver            | Rohde&Schwarz | ESPI7        | 101671           | 9KHz-7GHz       | Aug. 17,2023     | 1 Year               |
| Loop Antenna                 | Schwarzbeck   | FMZB 1519    | 192              | 9 KHz -30MHz    | Aug. 17,2023     | 1 Year               |
| Bilog Antenna                | SCHWARZBECK   | VULB9160     | 9160-3355        | 25MHz-2GHz      | Aug. 17,2023     | 1 Year               |
| Preamplifier (low frequency) | SCHWARZBECK   | BBV 9475     | 9745-0013        | 1MHz-1GHz       | Aug. 17,2023     | 1 Year               |
| Cable                        | IMRO          | AK-9515E(9m) | Cable-L          | 9KHz-3GHz       | Aug. 17,2023     | 1 Year               |
| Spectrum Analyzer            | Rohde&Schwarz | FSV40        | 6625-01-588-5515 | 9KHz-40GHz      | Aug. 17,2023     | 1 Year               |
| Horn Antenna                 | SCHWARZBECK   | 9120D        | 9120D-1246       | 1GHz-18GHz      | Aug. 17,2023     | 1 Year               |
| Power Amplifier              | ZHINAN        | ZN3380C      | 15002            | 1GHz-26.5GHz    | Aug. 17,2023     | 1 Year               |



Report No.: PTC24060712601E-FC02

|              |             |           |           |              |               |        |
|--------------|-------------|-----------|-----------|--------------|---------------|--------|
| Horn Antenna | SCHWARZBECK | BBHA 9170 | 9170-1066 | 15GHz-40GHz  | Jul. 19, 2023 | 1 Year |
| Amplifier    | SCHWARZBECK | BBV 9721  | 9721-205  | 18GHz-40GHz  | Jul. 19, 2023 | 1 Year |
| Cable        | H+S         | CBL-26    | N/A       | 1GHz-26.5GHz | Aug. 17,2023  | 1 Year |
| RF Cable     | R&S         | R204      | R21X      | 1GHz-40GHz   | Aug. 17,2023  | 1 Year |
| Test S/W     | Tonscend    | TS+       | /         | /            | /             | /      |

Conducted Emissions

| Name of Equipment        | Manufacturer    | Model   | Serial No.             | Characteristics | Calibration Date | Calibration Interval |
|--------------------------|-----------------|---------|------------------------|-----------------|------------------|----------------------|
| EMI Test Receiver        | Rohde&Schwarz   | ESCI    | 101417                 | 9KHz-3GHz       | Aug. 17, 2023    | 1 Year               |
| Artificial Mains Network | Rohde&Schwarz   | ENV216  | 102453                 | 9KHz-300MHz     | Aug. 17, 2023    | 1 Year               |
| Artificial Mains Network | Rohde&Schwarz   | ENV216  | 101342                 | 9KHz-300MHz     | Aug. 17, 2023    | 1 Year               |
| Limiter                  | R&S             | ESH3-Z2 | 0357.8810.54-102808-NB | 0Hz-30MHz       | Aug. 16,2023     | 1 Year               |
| RF Switch                | DIAMOND ANTENNA | CX-210  | /                      | 0.09MHz-6GHz    | Mar. 24,2024     | 1 Year               |
| Test S/W                 | Tonscend        | JS32-CE | /                      | /               | /                | /                    |



## 4.2 Measurement Uncertainty

| Parameter                          | Uncertainty              |
|------------------------------------|--------------------------|
| RF output power, conducted         | $\pm 1.0\text{dB}$       |
| Power Spectral Density, conducted  | $\pm 2.2\text{dB}$       |
| Radio Frequency                    | $\pm 1 \times 10^{-6}$   |
| Bandwidth                          | $\pm 1.5 \times 10^{-6}$ |
| Time                               | $\pm 2\%$                |
| Duty Cycle                         | $\pm 2\%$                |
| Temperature                        | $\pm 1^\circ\text{C}$    |
| Humidity                           | $\pm 5\%$                |
| DC and low frequency voltages      | $\pm 3\%$                |
| Conducted Emissions (150kHz~30MHz) | $\pm 3.64\text{dB}$      |
| Radiated Emission(30MHz~1GHz)      | $\pm 5.03\text{dB}$      |
| Radiated Emission(1GHz~25GHz)      | $\pm 4.74\text{dB}$      |
| Radiated Emission(9KHz~30MHz)      | $\pm 3.15\text{dB}$      |

## 4.3 Description of Support Units

|           |           |            |
|-----------|-----------|------------|
| Equipment | Model No. | Series No. |
| N/A       | N/A       | N/A        |

## 5 Conducted Emission

|                  |                                     |
|------------------|-------------------------------------|
| Test Requirement | : FCC CFR 47 Part 15 Section 15.207 |
| Test Method      | : ANSI C63.10: 2013                 |
| Test Result      | : PASS                              |
| Frequency Range  | : 150kHz to 30MHz                   |
| Class/Severity   | : Class B                           |

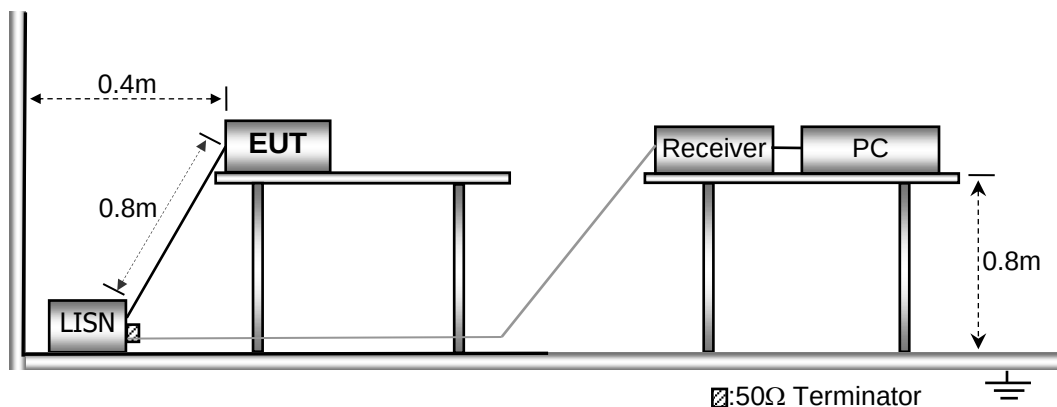
### 5.1 E.U.T. Operation

Operating Environment :

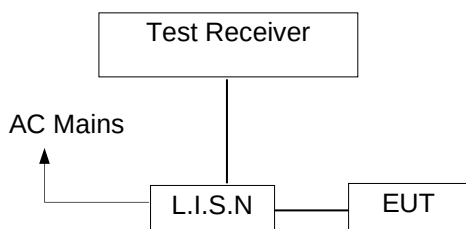
|                      |            |
|----------------------|------------|
| Temperature          | : 25.5 °C  |
| Humidity             | : 51 % RH  |
| Atmospheric Pressure | : 101.2kPa |

### 5.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10:2013.



### 5.3 Test SET-UP (Block Diagram of Configuration)



### 5.4 Measurement Procedure

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.



3. Repeat above procedures until all frequency measured was complete.

## 5.5 Conducted Emission Limit

### Conducted Emission

#### Frequency(MHz)

#### Quasi-peak

#### Average

0.15-0.5

66-56

56-46

0.5-5.0

56

46

5.0-30.0

60

50

#### Note:

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

## 5.6 Measurement Description

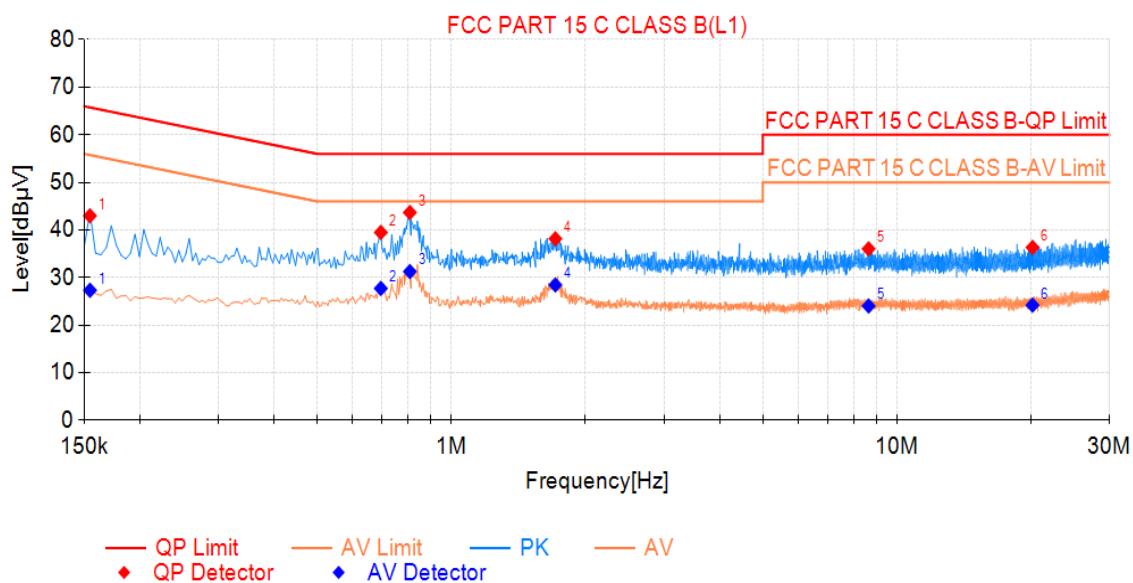
The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

## 5.7 Conducted Emission Test Result

Pass.

All the modulation modes were tested the data of the worst mode (AC 120V/60Hz, GFSK TX 2402MHz) are recorded in the following pages and the others modulation methods do not exceed the limits.

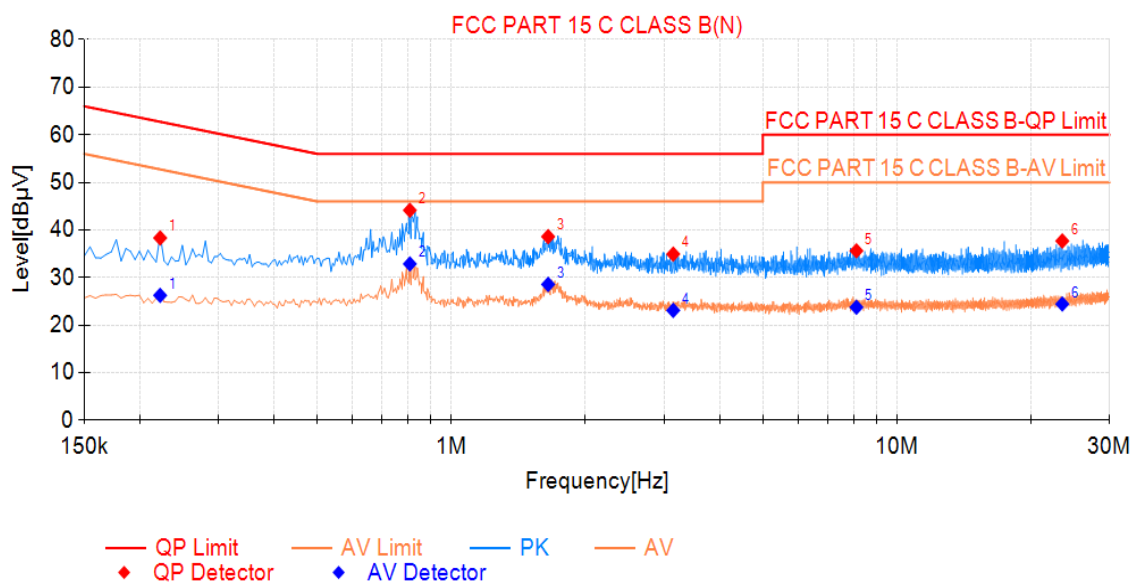
Line-AC 120V/60Hz



### Final Data List

| NO. | Freq. [MHz] | QP Value [dBμV] | QP Limit [dBμV] | QP Margin [dB] | AV Value [dBμV] | AV Limit [dBμV] | AV Margin [dB] | Verdict |
|-----|-------------|-----------------|-----------------|----------------|-----------------|-----------------|----------------|---------|
| 1   | 0.222       | 38.33           | 62.74           | 24.41          | 26.27           | 52.74           | 26.47          | PASS    |
| 2   | 0.807       | 44.14           | 56.00           | 11.86          | 32.88           | 46.00           | 13.12          | PASS    |
| 3   | 1.649       | 38.61           | 56.00           | 17.39          | 28.57           | 46.00           | 17.43          | PASS    |
| 4   | 3.147       | 34.93           | 56.00           | 21.07          | 23.10           | 46.00           | 22.90          | PASS    |
| 5   | 8.111       | 35.62           | 60.00           | 24.38          | 23.77           | 50.00           | 26.23          | PASS    |
| 6   | 23.501      | 37.69           | 60.00           | 22.31          | 24.45           | 50.00           | 25.55          | PASS    |

Neutral-AC 120V/60Hz



### Final Data List

| NO. | Freq. [MHz] | QP Value [dBμV] | QP Limit [dBμV] | QP Margin [dB] | AV Value [dBμV] | AV Limit [dBμV] | AV Margin [dB] | Verdict |
|-----|-------------|-----------------|-----------------|----------------|-----------------|-----------------|----------------|---------|
| 1   | 0.155       | 42.99           | 65.75           | 22.76          | 27.34           | 55.75           | 28.41          | PASS    |
| 2   | 0.695       | 39.48           | 56.00           | 16.52          | 27.72           | 46.00           | 18.28          | PASS    |
| 3   | 0.807       | 43.68           | 56.00           | 12.32          | 31.28           | 46.00           | 14.72          | PASS    |
| 4   | 1.712       | 38.17           | 56.00           | 17.83          | 28.45           | 46.00           | 17.55          | PASS    |
| 5   | 8.637       | 36.04           | 60.00           | 23.96          | 24.04           | 50.00           | 25.96          | PASS    |
| 6   | 20.153      | 36.35           | 60.00           | 23.65          | 24.21           | 50.00           | 25.79          | PASS    |

Note: QP Margin[dB]= QP Limit[dBμV]- QP Value[dBμV], AV Margin[dB]= AV Limit[dBμV]- AV Value[dBμV].



## 6 Radiated Emission and Band Edge

### 6.1 Test Standard and Limit

15.225 (a) The field strength of any emission within the band 13.553-13.567 M shall not exceed 15,848 microvolts/meter at 30 meters.

15.225 (b) With in the bands 13.410-13.553 M and 13.567-13.710 Mt, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.

15.225 (c) With in the bands 13.110-13.410 M and 13.710-14.010 M, the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.

15.225 (d) The Field Strength of any emissions appearing outside of the 13.110-14.010 M band shall not exceed the general radiated emission limits in 15.209.

| Test Standard                                                                                                                                                                                                                                                                                                                                              | FCC Part15 C Section 15.209 |                                     |                   |            |                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------------|-------------------|------------|-----------------------------|
| Test Limit                                                                                                                                                                                                                                                                                                                                                 | Frequency<br>(MHz)          | Field strength<br>(microvolt/meter) | Limit<br>(dBuV/m) | Remark     | Measurement<br>distance (m) |
|                                                                                                                                                                                                                                                                                                                                                            | 0.009MHz~0.490MHz           | 2400/F(kHz)                         | -                 | -          | 300                         |
|                                                                                                                                                                                                                                                                                                                                                            | 0.490MHz-1.705MHz           | 24000/F(kHz)                        | -                 | -          | 30                          |
|                                                                                                                                                                                                                                                                                                                                                            | 1.705MHz-30MHz              | 30                                  | -                 | -          | 30                          |
|                                                                                                                                                                                                                                                                                                                                                            | 30MHz~88MHz                 | 100                                 | 40.0              | Quasi-peak | 3                           |
|                                                                                                                                                                                                                                                                                                                                                            | 88MHz~216MHz                | 150                                 | 43.5              | Quasi-peak | 3                           |
|                                                                                                                                                                                                                                                                                                                                                            | 216MHz~960MHz               | 200                                 | 46.0              | Quasi-peak | 3                           |
|                                                                                                                                                                                                                                                                                                                                                            | 960MHz~1000MHz              | 500                                 | 54.0              | Quasi-peak | 3                           |
|                                                                                                                                                                                                                                                                                                                                                            | Above 1000MHz               | 500                                 | 54.0              | Average    | 3                           |
|                                                                                                                                                                                                                                                                                                                                                            |                             | -                                   | 74.0              | Peak       | 3                           |
| <b>Remark:</b><br>(1)The lower limit shall apply at the transition frequency.<br>(2) 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device. |                             |                                     |                   |            |                             |

## 6.2 Test Setup

Figure 1. Below 30MHz

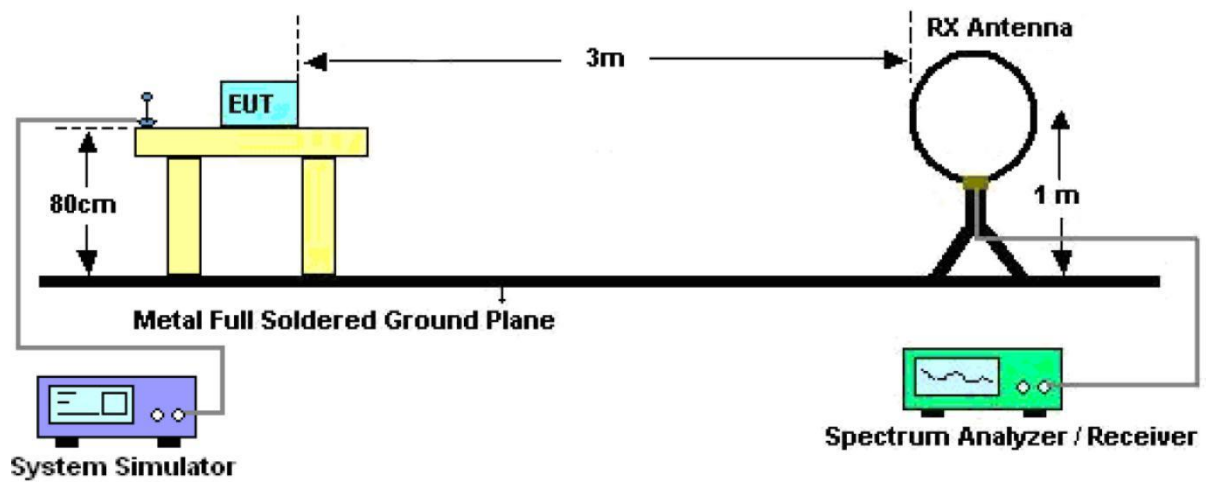


Figure 2. 30MHz to 1GHz

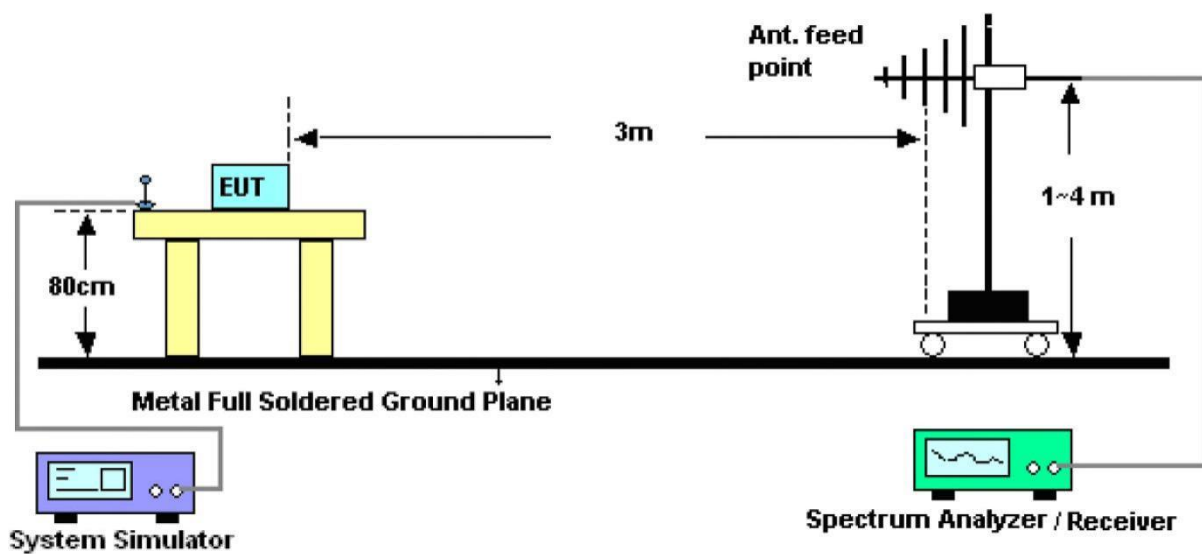
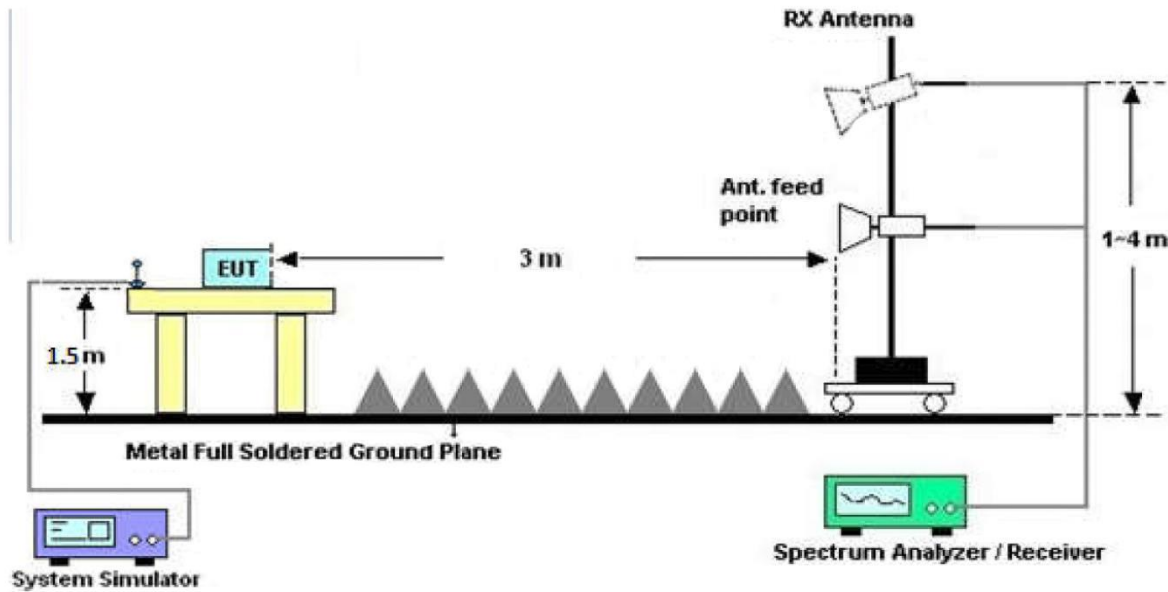


Figure 3. Above 1 GHz



### 6.3 Test Procedure

For below 1GHz: The EUT is placed on a turntable, which is 0.8m above the ground plane.

For above 1GHz: The EUT is placed on a turntable, which is 1.5m above the ground plane.

The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Rotated the EUT through three orthogonal axes to determine the maximum emissions, both horizontal and vertical polarization of the antenna are set on test. The EUT is tested in 9\*6\*6 Chamber. The device is evaluated in xyz orientation.

For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

For 9kHz to 150kHz, Set the spectrum analyzer as:

RBW = 200Hz, VBW =1kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.



For 150kHz to 30MHz, Set the spectrum analyzer as:

RBW = 9KHz, VBW =30kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 30MHz to 1000MHz, Set the spectrum analyzer as:

RBW = 100kHz, VBW =300kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For above 1GHz,Set the spectrum analyzer as:

RBW =1MHz, VBW =1MHz, Detector= Peak, Trace mode= Max hold, Sweep- auto couple.

RBW =1MHz, VBW =10Hz, Detector= Average, Trace mode= Max hold, Sweep- auto couple.

## 6.4 Test Data

### PASS

During the test, Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the X-axis is the worst case.

### Test results for fundamental

#### 15.225(a)13.553-13.567MHz

| Freq. | QP Reading | Antenn a Factor | Amp.+ Cable | Distance Factor | Result   | Limit    | Margin | Polarity | Verdict |
|-------|------------|-----------------|-------------|-----------------|----------|----------|--------|----------|---------|
| [MHz] | [dBμV]     | [dB/m]          | [dB]        | [dB]            | [dBμV/m] | [dBμV/m] | [dB]   |          |         |
| 13.56 | 50.13      | 21              | -30.05      | 40              | 1.08     | 84       | 82.92  | Face-on  | PASS    |
| 13.56 | 59.72      | 21              | -30.05      | 40              | 10.67    | 84       | 73.33  | Face-off | PASS    |

### Note:

1. Face-on=Parallel, Face-off= Perpendicular.
- 2.Factors(dB)= Antenna factor(dB/m)+ Cable loss(dB)+ or Amp. gain(dB) + or  $F_d$ (dB)
- 3.Result = QP Reading + Cable loss + Amp gain + Ant, factor - Distance factor

**Test results for in-band & out-band(9 kHz to 30 MHz):**

| Freq. | QP Reading | Antenn a Factor | Amp.+ Cable | Distance Factor | Result   | Limit    | Margin | Polarity | Verdict |
|-------|------------|-----------------|-------------|-----------------|----------|----------|--------|----------|---------|
| [MHz] | [dBμV]     | [dB/m]          | [dB]        | [dB]            | [dBμV/m] | [dBμV/m] | [dB]   |          |         |
| 13.35 | 39.62      | 21              | -30.05      | 40              | -9.43    | 40.5     | 49.93  | Face-on  | PASS    |
| 13.55 | 45.71      | 21              | -30.05      | 40              | -3.34    | 50.5     | 53.84  | Face-on  | PASS    |
| 13.67 | 42.73      | 21              | -30.05      | 40              | -6.32    | 50.5     | 56.82  | Face-on  | PASS    |
| 13.77 | 40.93      | 21              | -30.05      | 40              | -8.12    | 40.5     | 48.62  | Face-on  | PASS    |
| 13.14 | 34.31      | 21              | -30.05      | 40              | -14.74   | 40.5     | 55.24  | Face-off | PASS    |
| 13.55 | 35.63      | 21              | -30.05      | 40              | -13.42   | 50.5     | 63.92  | Face-off | PASS    |
| 13.65 | 42.73      | 21              | -30.05      | 40              | -6.32    | 50.5     | 56.82  | Face-off | PASS    |
| 13.77 | 40.93      | 21              | -30.05      | 40              | -8.12    | 40.5     | 48.62  | Face-off | PASS    |

**Note:**

1. Face-on=Parallel, Face-off= Perpendicular.
- 2.Factors(dB)= Antenna factor(dB/m)+ Cable loss(dB)+ or Amp. gain(dB) + or  $F_d$ (dB)
- 3.Result = QP Reading + Cable loss + Amp gain + Ant, factor - Distance factor

**Test results(9kHz to 30MHz):**

| Freq. | QP Reading | Antenn a Factor | Amp.+ Cable | Distance Factor | Result   | Limit    | Margin | Polarity | Verdict |
|-------|------------|-----------------|-------------|-----------------|----------|----------|--------|----------|---------|
| [MHz] | [dBμV]     | [dB/m]          | [dB]        | [dB]            | [dBμV/m] | [dBμV/m] | [dB]   |          |         |
| 7.03  | 34.31      | 20.4            | -31.10      | 40              | -16.39   | 29.5     | 45.89  | Face-on  | PASS    |
| 25.81 | 35.65      | 22.8            | -30.05      | 40              | -11.6    | 29.5     | 41.10  | Face-on  | PASS    |
| 7.03  | 32.92      | 20.4            | -31.10      | 40              | -17.78   | 29.5     | 47.28  | Face-off | PASS    |
| 25.81 | 33.12      | 22.8            | -30.05      | 40              | -14.13   | 29.5     | 43.63  | Face-off | PASS    |

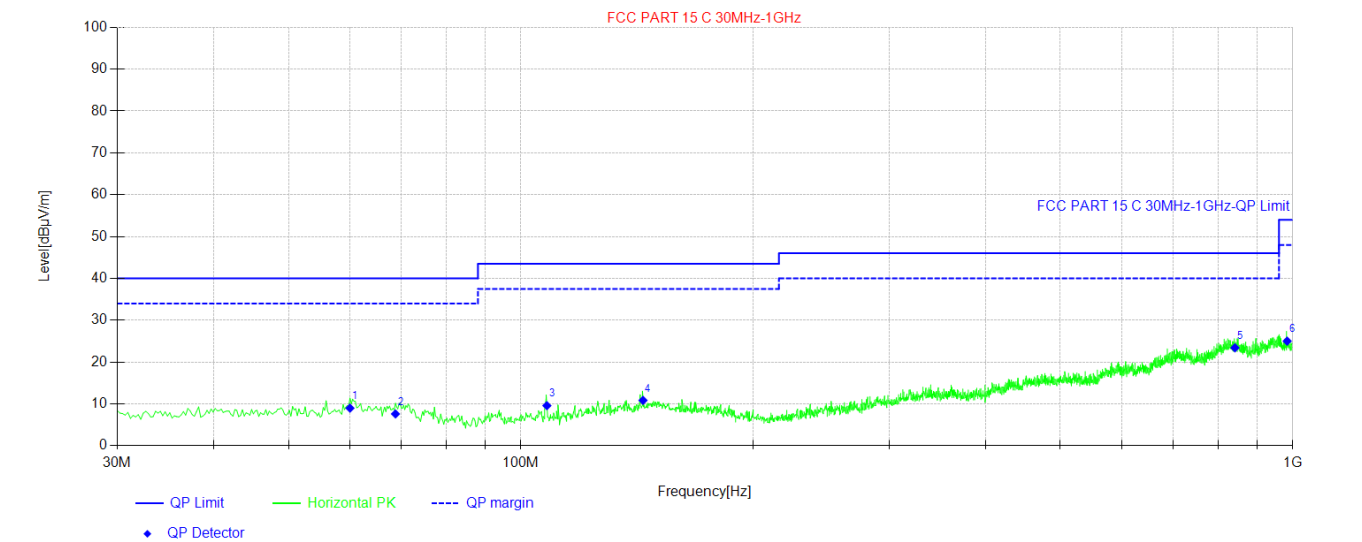
**Note:**

1. Face-on=Parallel, Face-off= Perpendicular.
- 2.Factors(dB)= Antenna factor(dB/m)+ Cable loss(dB)+ or Amp. gain(dB) + or  $F_d$ (dB)
- 3.Result = QP Reading + Cable loss + Amp gain + Ant, factor - Distance factor



Test results(Below 1 000 MHz):

Test plot for Horizontal

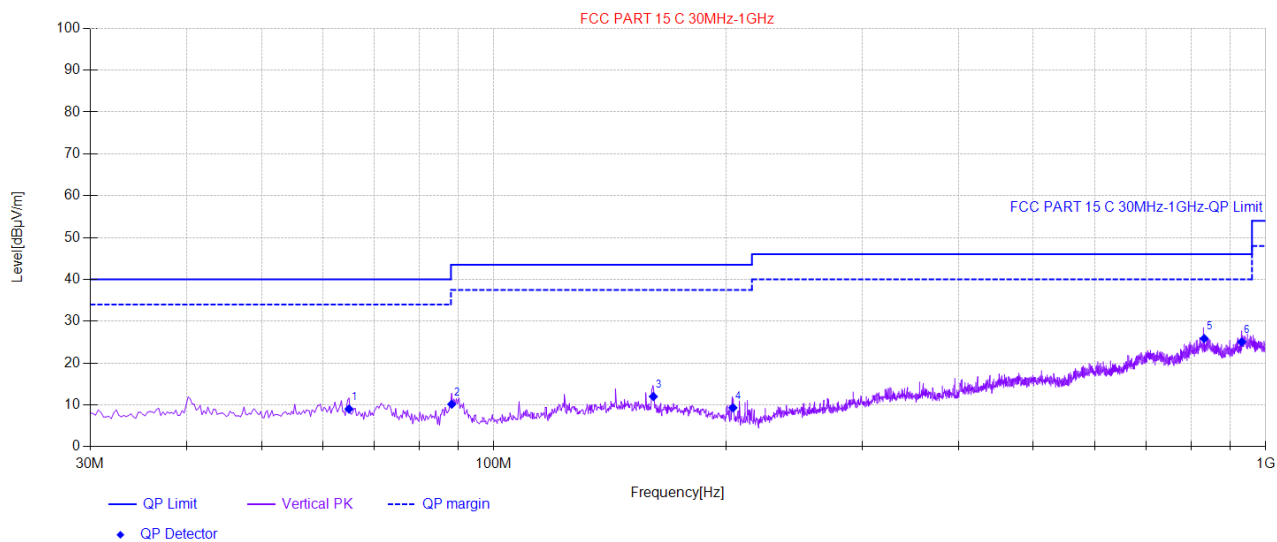


| Final Data List[QP] |             |                     |             |                   |                   |                |            |         |
|---------------------|-------------|---------------------|-------------|-------------------|-------------------|----------------|------------|---------|
| NO.                 | Freq. [MHz] | QP Reading [dBμV/m] | Factor [dB] | QP Value [dBμV/m] | QP Limit [dBμV/m] | QP Margin [dB] | Polarity   | Verdict |
| 1                   | 60.07       | 26.68               | -17.68      | 9.00              | 40.00             | 31.00          | Horizontal | PASS    |
| 2                   | 68.80       | 26.54               | -18.93      | 7.61              | 40.00             | 32.39          | Horizontal | PASS    |
| 3                   | 108.09      | 28.84               | -19.25      | 9.59              | 43.50             | 33.91          | Horizontal | PASS    |
| 4                   | 143.98      | 27.12               | -16.27      | 10.85             | 43.50             | 32.65          | Horizontal | PASS    |
| 5                   | 841.65      | 26.32               | -2.91       | 23.41             | 46.00             | 22.59          | Horizontal | PASS    |
| 6                   | 983.51      | 26.7                | -1.69       | 25.01             | 54.00             | 28.99          | Horizontal | PASS    |

Remark:Emission Level=Reading+Cable Loss+ANT Factor-AMP Factor



## Test plot for Vertical



| Final Data List[QP] |                |                        |                |                      |                      |                   |          |         |
|---------------------|----------------|------------------------|----------------|----------------------|----------------------|-------------------|----------|---------|
| NO.                 | Freq.<br>[MHz] | QP Reading<br>[dBμV/m] | Factor<br>[dB] | QP Value<br>[dBμV/m] | QP Limit<br>[dBμV/m] | QP Margin<br>[dB] | Polarity | Verdict |
| 1                   | 64.92          | 27.17                  | -18.15         | 9.02                 | 40.00                | 30.98             | Vertical | PASS    |
| 2                   | 88.20          | 31.07                  | -20.91         | 10.16                | 43.50                | 33.34             | Vertical | PASS    |
| 3                   | 160.95         | 28.82                  | -16.82         | 12.00                | 43.50                | 31.50             | Vertical | PASS    |
| 4                   | 204.12         | 28.62                  | -19.30         | 9.32                 | 43.50                | 34.18             | Vertical | PASS    |
| 5                   | 832.43         | 28.93                  | -3.06          | 25.87                | 46.00                | 20.13             | Vertical | PASS    |
| 6                   | 930.89         | 27.56                  | -2.50          | 25.06                | 46.00                | 20.94             | Vertical | PASS    |

Remark: Emission Level = Reading + Cable Loss + ANT Factor - AMP Factor

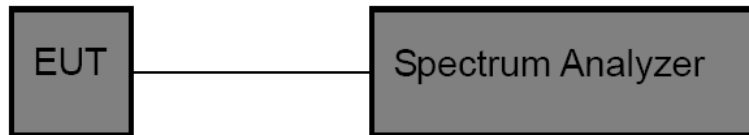


## 7 20dB Bandwidth and 99% Bandwidth

### 7.1 Test Standard and Limit

|               |                             |
|---------------|-----------------------------|
| Test Standard | FCC Part15 C Section 15.249 |
|---------------|-----------------------------|

### 7.2 Test Setup



### 7.3 Test Procedure

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as:  
RBW =1% to 5% of the OBW, VBW $\geq$ 3\*RBW,  
Detector= Average  
Trace mode= Max hold.  
Sweep- auto couple.
4. Mark the peak frequency and –20dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.



Report No.: PTC24060712601E-FC02

## 7.4 Test Data

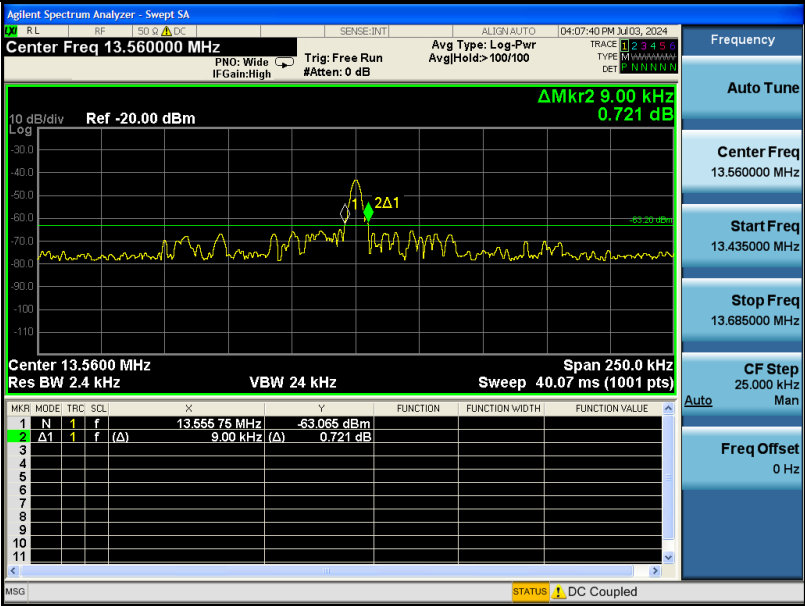
Test Item : 20dB Bandwidth  
Test Voltage : DC 6V  
Test Result : PASS

Test Mode : TX  
Temperature : 22.4°C  
Humidity : 55%RH

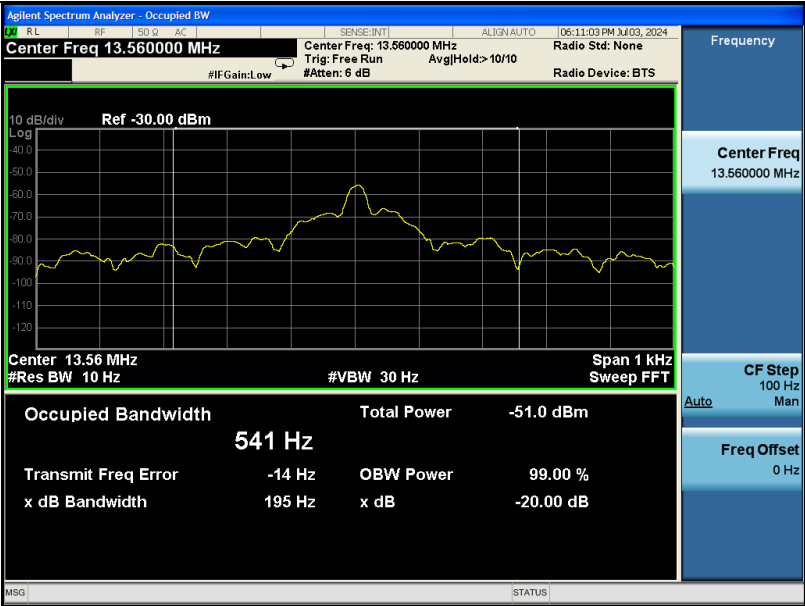
| Frequency(MHz) | Frequency Range   |        | Limit(MHz) | 20dB Bandwidth(MHz) | 99% Bandwidth(MHz) |
|----------------|-------------------|--------|------------|---------------------|--------------------|
| 13.56          | Lowest Frequency  | 13.435 | 13.110     | 0.009               | 0.0005             |
|                | Highest Frequency | 13.685 | 14.010     |                     |                    |



Test Graphs:



20dB Bandwidth



Occupied Bandwidth

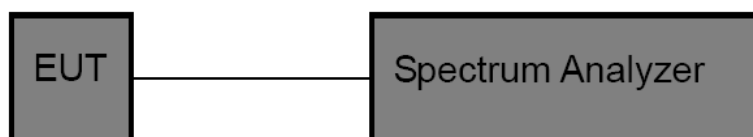


## 8 Frequency tolerance

### 8.1 Test Standard and Limit

15.225 (e) The frequency tolerance of the carrier signal shall be maintained within  $\pm 0.01$  % of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85 % to 115 % of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

### 8.2 Test Setup



### 8.3 Test Procedure

ANSI C63.10-2013-Section 6.8.1



## 8.4 Test Result

| Voltage   | Voltage | TEMP    | Maintaining time | Measure frequency | Frequency deviation | Deviation |
|-----------|---------|---------|------------------|-------------------|---------------------|-----------|
| [%]       | [V]     | [°C]    |                  | [Hz]              | [Hz]                | [%]       |
| 100       | 6       | 20(ref) | Startup          | 13559640          | -360                | -0.002655 |
|           |         |         | 2 minutes        | 13559640          | -360                | -0.002652 |
|           |         |         | 5 minutes        | 13559641          | -359                | -0.002651 |
|           |         |         | 10 minutes       | 13559640          | -360                | -0.002658 |
|           |         | -20     | Startup          | 13560111          | 111                 | 0.000819  |
|           |         |         | 2 minutes        | 13560111          | 111                 | 0.000821  |
|           |         |         | 5 minutes        | 13560111          | 111                 | 0.000822  |
|           |         |         | 10 minutes       | 13560111          | 111                 | 0.000818  |
|           |         | -10     | Startup          | 13560113          | 113                 | 0.000833  |
|           |         |         | 2 minutes        | 13560113          | 113                 | 0.000836  |
|           |         |         | 5 minutes        | 13560114          | 114                 | 0.000837  |
|           |         |         | 10 minutes       | 13560114          | 114                 | 0.000841  |
|           |         | 0       | Startup          | 13560090          | 90                  | 0.000664  |
|           |         |         | 2 minutes        | 13560090          | 90                  | 0.000661  |
|           |         |         | 5 minutes        | 13560089          | 89                  | 0.000659  |
|           |         |         | 10 minutes       | 13560089          | 89                  | 0.000657  |
|           |         | 10      | Startup          | 13560080          | 80                  | 0.000590  |
|           |         |         | 2 minutes        | 13560080          | 80                  | 0.000591  |
|           |         |         | 5 minutes        | 13560081          | 81                  | 0.000594  |
|           |         |         | 10 minutes       | 13560080          | 80                  | 0.000592  |
|           |         | 30      | Startup          | 13560023          | 23                  | 0.000170  |
|           |         |         | 2 minutes        | 13560023          | 23                  | 0.000167  |
|           |         |         | 5 minutes        | 13560023          | 23                  | 0.000169  |
|           |         |         | 10 minutes       | 13560023          | 23                  | 0.000168  |
|           |         | 40      | Startup          | 13560013          | 13                  | 0.000096  |
|           |         |         | 2 minutes        | 13560013          | 13                  | 0.000093  |
|           |         |         | 5 minutes        | 13560013          | 13                  | 0.000099  |
|           |         |         | 10 minutes       | 13560013          | 13                  | 0.000096  |
|           |         | 50      | Startup          | 13560003          | 3                   | 0.000022  |
|           |         |         | 2 minutes        | 13560003          | 3                   | 0.000022  |
|           |         |         | 5 minutes        | 13560004          | 4                   | 0.000026  |
|           |         |         | 10 minutes       | 13560003          | 3                   | 0.000024  |
| End Point | 6.60    | 20      | Startup          | 13559870          | -130                | -0.000959 |
|           |         |         | 2 minutes        | 13559870          | -130                | -0.000962 |
|           |         |         | 5 minutes        | 13559870          | -130                | -0.000961 |
|           |         |         | 10 minutes       | 13559870          | -130                | -0.000957 |
| 115       | 5.6     | 20      | Startup          | 13559760          | -240                | -0.001770 |
|           |         |         | 2 minutes        | 13559760          | -240                | -0.001770 |
|           |         |         | 5 minutes        | 13559759          | -241                | -0.001774 |
|           |         |         | 10 minutes       | 13559760          | -240                | -0.001770 |

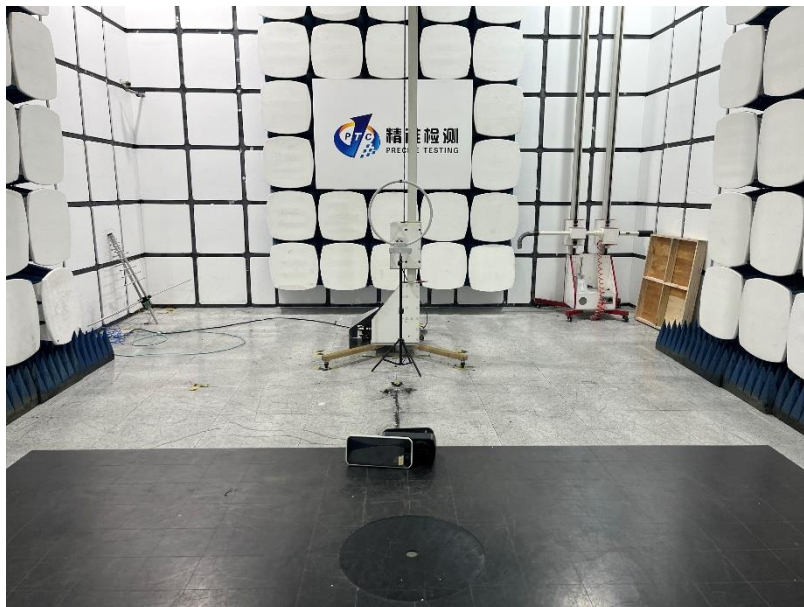
## 9 TEST SETUP PHOTOGRAPH

### CONDUCTED EMISSION TEST



### RADIATED EMISSION TEST

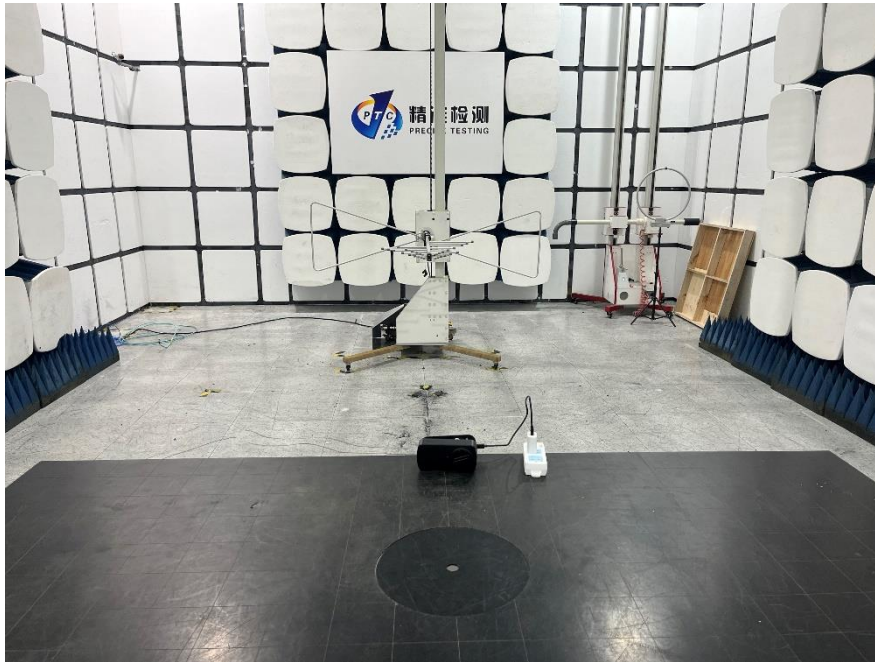
Test Frequency From 9kHz to 30MHz





Report No.: PTC24060712601E-FC02

Test frequency from 30MHz to 1GHz



## 10 EUT PHOTOGRAPH



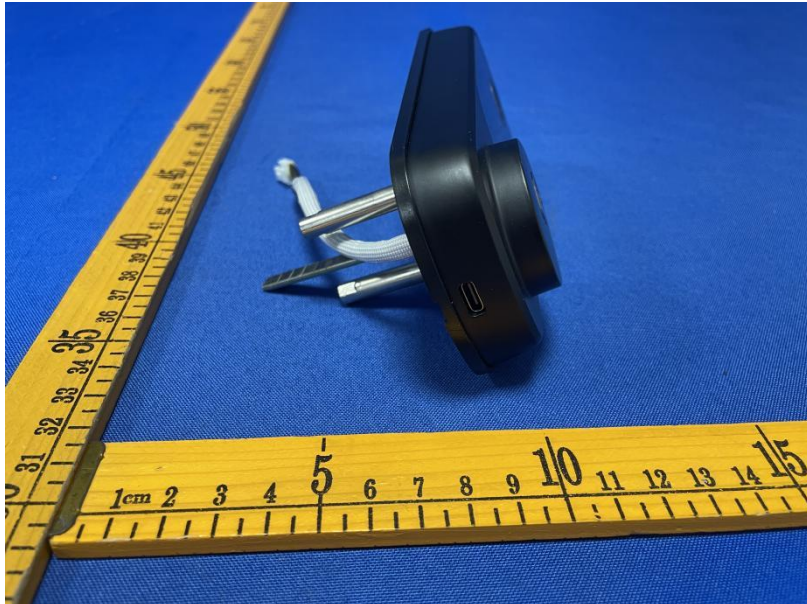
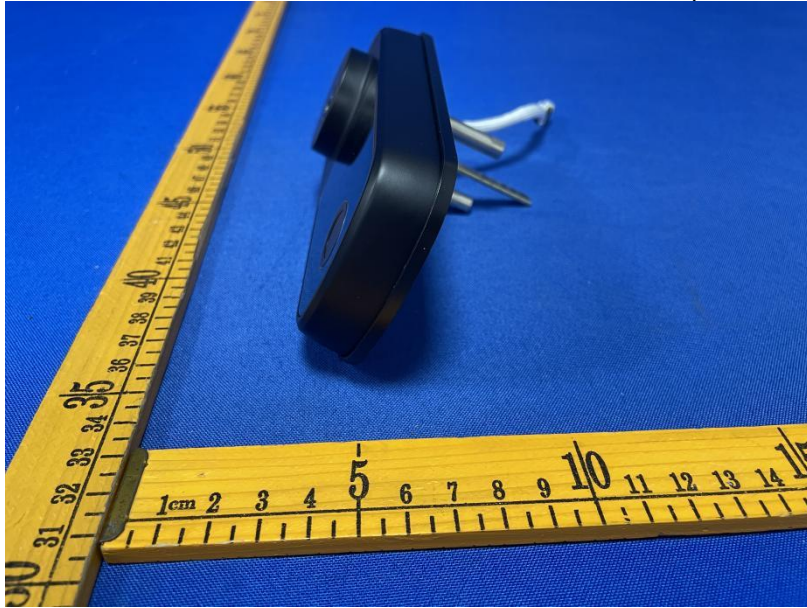


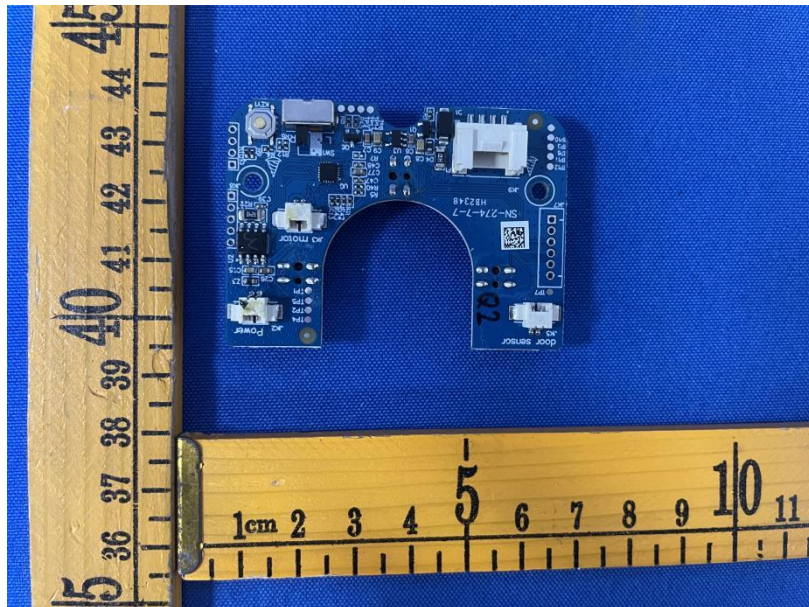


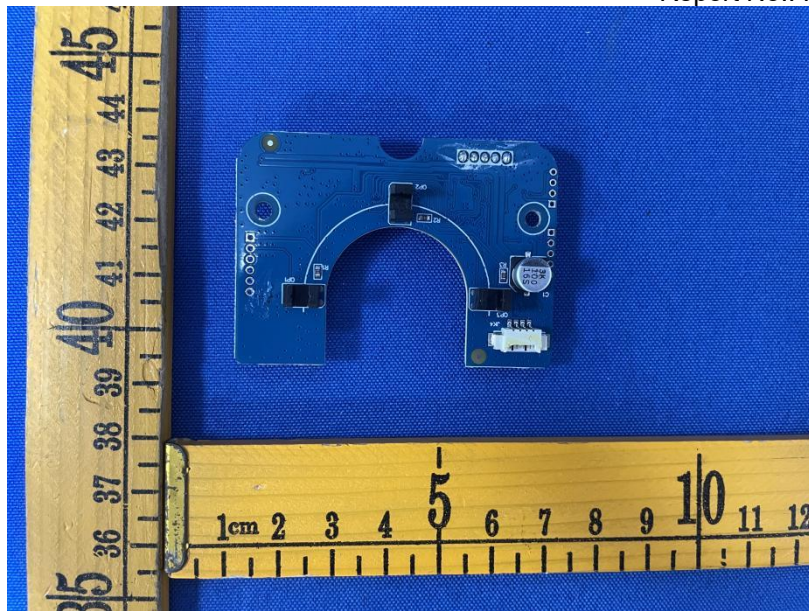


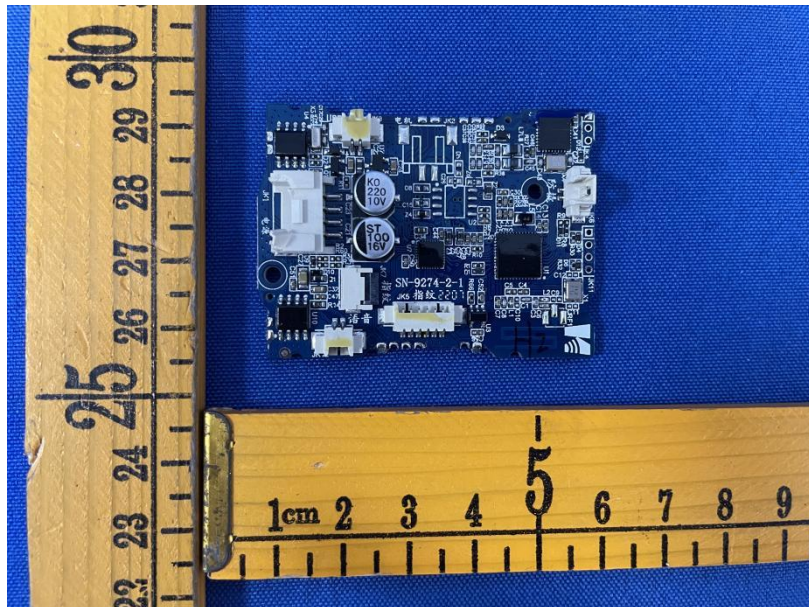


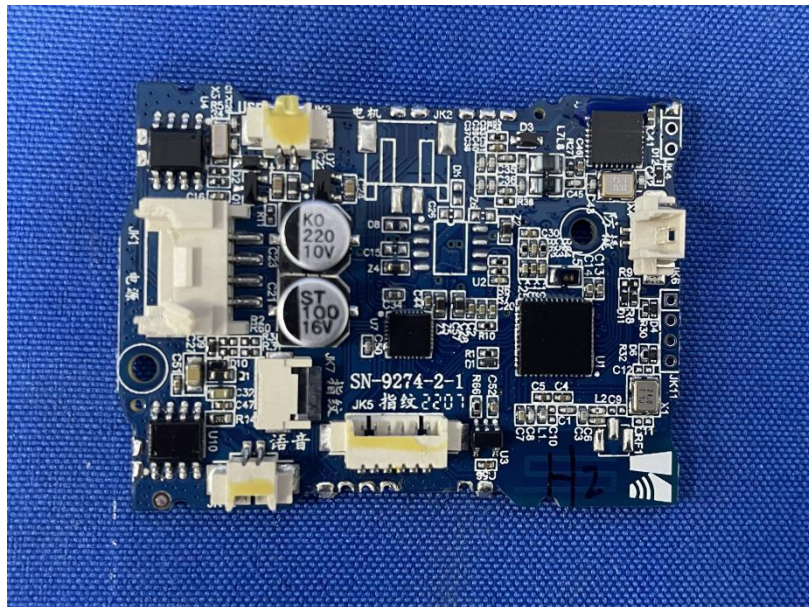
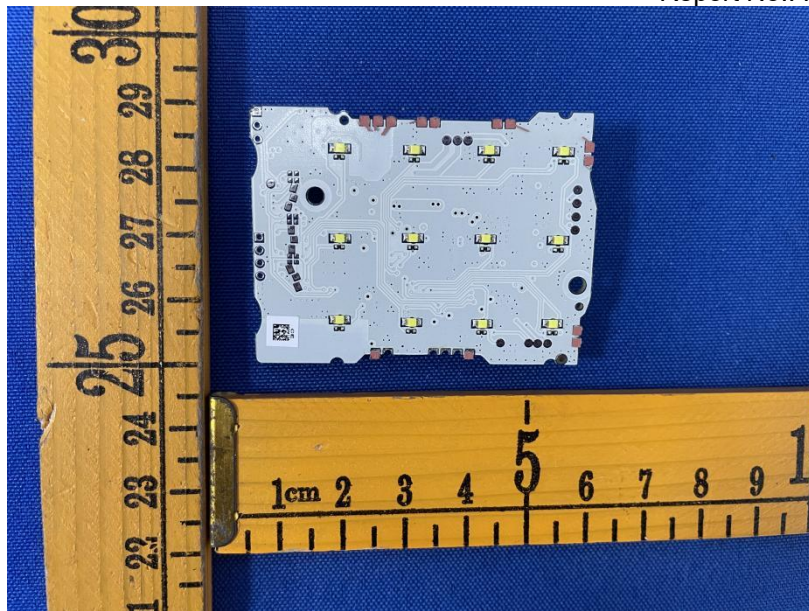


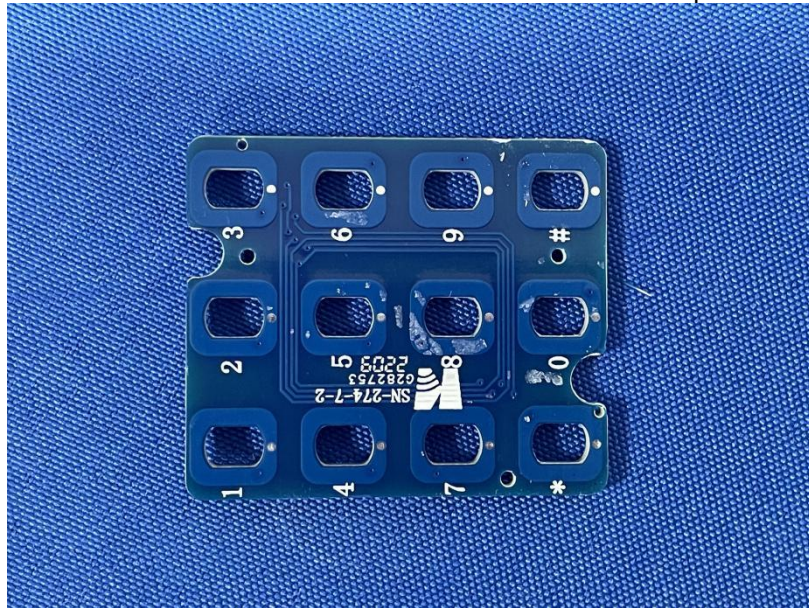












\*\*\*\*\*THE END REPORT\*\*\*\*\*