



# TEST REPORT

Report No. .... : **CHEW21120195** Report Verification: 

Project No..... : **SHT2106117007**

FCC ID..... : **2AKFL-BX6100**

Applicant's name ..... : **Shenzhen Handheld-Wireless Technology Co., Ltd**

Address..... : East of 4th Floor, Building A, PowerLeader Science&Technology Park, Guanhu Street, Longhua District, Shenzhen, China

Test item description ..... : **Mobile Data Terminal**

Trade Mark ..... : Handheld-Wireless

Model/Type reference..... : BX6100

Listed Model(s) ..... : BX6200, BX6000, X6

Standard ..... : **FCC CFR Title 47 Part 15 Subpart E Section 15.407**

Date of receipt of test sample..... : Nov. 08, 2021

Date of testing..... : Nov. 09, 2021- Dec. 22, 2021

Date of issue..... : Dec. 23, 2021

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

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Testing Laboratory Name ..... : **Shenzhen Huatongwei International Inspection Co., Ltd.**

Address..... : 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

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## 1. TEST STANDARDS AND REPORT VERSION

### 1.1. Test Standards

The tests were performed according to following standards:

- [FCC Rules Part 15.407](#): General technical requirements.
- [ANSI C63.10:2013](#): American National Standard for Testing Unlicensed Wireless Devices
- [KDB789033 D02 v02r01](#): GUIDELINES FOR COMPLIANCE TESTING OF UNLICENSED NATIONAL INFORMATION INFRASTRUCTURE (U-NII) DEVICES PART 15, SUBPART E

### 1.2. Report version

| Revision No. | Date of issue | Description |
|--------------|---------------|-------------|
| N/A          | 2021-12-23    | Original    |
|              |               |             |
|              |               |             |
|              |               |             |
|              |               |             |

## 2. TEST DESCRIPTION

| Report clause | Test Items                                 | Standard Requirement | Result |
|---------------|--------------------------------------------|----------------------|--------|
| 5.1           | Antenna Requirement                        | 15.203/15.247(c)     | PASS   |
| 5.2           | AC Conducted Emission                      | 15.207               | PASS   |
| 5.3           | Maximum Conducted Output Power             | 15.407(a)            | PASS   |
| 5.4           | Maximum Power Spectral Density             | 15.407(a)            | PASS   |
| 5.5           | 26dB Bandwidth and 99% Occupancy bandwidth | 15.407(a)            | PASS   |
| 5.6           | 6dB Bandwidth                              | 15.407(a)            | PASS   |
| 5.7           | Band edge                                  | 15.407(b)            | PASS   |
| 5.8           | Radiated Spurious Emissions                | 15.209               | PASS   |
| 5.9           | Frequency Stability                        | 15.407(g)            | PASS   |

Note:

- The measurement uncertainty is not included in the test result.

### 3. SUMMARY

#### 3.1. Client Information

|               |                                                                                                                      |
|---------------|----------------------------------------------------------------------------------------------------------------------|
| Applicant:    | Shenzhen Handheld-Wireless Technology Co., Ltd                                                                       |
| Address:      | East of 4th Floor, Building A, PowerLeader Science&Technology Park, Guanhu Street, Longhua District, Shenzhen, China |
| Manufacturer: | Shenzhen Handheld-Wireless Technology Co., Ltd                                                                       |
| Address:      | East of 4th Floor, Building A, PowerLeader Science&Technology Park, Guanhu Street, Longhua District, Shenzhen, China |

#### 3.2. Product Description

|                   |                      |
|-------------------|----------------------|
| Name of EUT:      | Mobile Data Terminal |
| Trade Mark:       | Handheld-Wireless    |
| Model No.:        | BX6100               |
| Listed Model(s):  | BX6200, BX6000, X6   |
| Power supply:     | DC 3.8V              |
| Hardware version: | V3.1                 |
| Software version: | Android 10.0         |

#### 3.3. Radio Specification Description

|                            |                                                                                                                                                                                                                                                                                                          |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Support type <sup>*1</sup> | <input checked="" type="checkbox"/> 802.11a <input checked="" type="checkbox"/> 802.11n(HT20) <input checked="" type="checkbox"/> 802.11n(HT40) <input checked="" type="checkbox"/> 802.11ac(HT20) <input checked="" type="checkbox"/> 802.11ac(HT40) <input checked="" type="checkbox"/> 802.11ac(HT80) |
| Function:                  | <input type="checkbox"/> Outdoor AP <input type="checkbox"/> Indoor AP <input type="checkbox"/> Fixed P2P <input checked="" type="checkbox"/> Client                                                                                                                                                     |
| Modulation:                | BPSK, QPSK, 16QAM, 64QAM                                                                                                                                                                                                                                                                                 |
| Operation frequency:       | <input checked="" type="checkbox"/> Band I: 5150MHz~5250MHz<br><input checked="" type="checkbox"/> Band IV: 5725MHz~5850MHz                                                                                                                                                                              |
| Supported Bandwidth        | 20MHz: 802.11ac,802.11n, 802.11a<br>40MHz: 802.11ac,802.11n<br>80MHz: 802.11ac                                                                                                                                                                                                                           |
| Antenna type:              | PIFA antenna                                                                                                                                                                                                                                                                                             |
| Antenna gain:              | 0.5dBi                                                                                                                                                                                                                                                                                                   |

Note:

\*1: only show the RF function associated with this report.

### 3.4. Testing Laboratory Information

|                      |                                                                                                                                                         |                      |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| Laboratory Name      | Shenzhen Huatongwei International Inspection Co., Ltd.                                                                                                  |                      |
| Laboratory Location  | 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China                                                            |                      |
| Connect information: | Phone: 86-755-26715499<br>E-mail: <a href="mailto:cs@szhtw.com.cn">cs@szhtw.com.cn</a><br><a href="http://www.szhtw.com.cn">http://www.szhtw.com.cn</a> |                      |
| Qualifications       | Type                                                                                                                                                    | Accreditation Number |
|                      | FCC                                                                                                                                                     | 762235               |

## 4. TEST CONFIGURATION

### 4.1. Test frequency list

According to section 15.31(m), regards to the operating frequency range over 10 MHz, must select three channels which were tested. The Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, please see the below .

| Band | Test Channel    | 20MHz   |                 | 40MHz   |                 | 80MHz   |                 |
|------|-----------------|---------|-----------------|---------|-----------------|---------|-----------------|
|      |                 | Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
| I    | CH <sub>L</sub> | 36      | 5180            | 38      | 5190            | -       | -               |
|      | CH <sub>M</sub> | 44      | 5220            | -       | -               | 42      | 5210            |
|      | CH <sub>H</sub> | 48      | 5240            | 46      | 5230            | -       | -               |
| IV   | CH <sub>L</sub> | 149     | 5745            | 151     | 5755            | -       | -               |
|      | CH <sub>M</sub> | 157     | 5785            | -       | -               | 155     | 5775            |
|      | CH <sub>H</sub> | 165     | 5825            | 159     | 5795            | -       | -               |

### 4.2. Descriptions of Test mode

Preliminary tests were performed in different data rates, final test modes are considering the modulation and worse data rates as below table.

| Modulation                    | Data rate |
|-------------------------------|-----------|
| 802.11a                       | 6Mbps     |
| 802.11n(HT20)/ 802.11ac(HT20) | MCS0      |
| 802.11n(HT40)/ 802.11ac(HT40) | MCS0      |
| 802.11ac(HT80)                | MCS0      |

### 4.3. Test mode

|                                                                                                                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| For RF test items                                                                                                                                                                                                           |
| The engineering test program was provided and enabled to make EUT continuous transmit.                                                                                                                                      |
| For AC power line conducted emissions:                                                                                                                                                                                      |
| The EUT was set to connect with the WLAN AP under large package sizes transmission.                                                                                                                                         |
| For Radiated spurious emissions test item:                                                                                                                                                                                  |
| The engineering test program was provided and enabled to make EUT continuous transmit.<br>The EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data Recorded in the report. |

#### 4.4. Support unit used in test configuration and system

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

The following peripheral devices and interface cables were connected during the measurement:

| Whether support unit is used? |            |            |           |        |            |
|-------------------------------|------------|------------|-----------|--------|------------|
| ✓ No                          |            |            |           |        |            |
| Item                          | Equipement | Trade Name | Model No. | FCC ID | Power cord |
| 1                             |            |            |           |        |            |
| 2                             |            |            |           |        |            |

#### 4.5. Testing environmental condition

| Type               | Requirement  | Actual   |
|--------------------|--------------|----------|
| Temperature:       | 15~35°C      | 25°C     |
| Relative Humidity: | 25~75%       | 50%      |
| Air Pressure:      | 860~1060mbar | 1000mbar |

#### 4.6. Measurement uncertainty

| Test Item                            | Measurement Uncertainty           |
|--------------------------------------|-----------------------------------|
| AC Conducted Emission (150kHz~30MHz) | 3.00 dB                           |
| Radiated Emission (30MHz~1000MHz)    | 4.36 dB                           |
| Radiated Emissions (1GHz~25GHz)      | 5.10 dB                           |
| Peak Output Power                    | 0.77dB                            |
| Power Spectral Density               | 0.77dB                            |
| Conducted Spurious Emission          | 0.77dB                            |
| 6dB Bandwidth                        | 70Hz for <1GHz<br>130Hz for >1GHz |
| Frequency error                      | 70Hz for <1GHz<br>130Hz for >1GHz |

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=1.96.

#### 4.7. Equipment Used during the Test

| ● Conducted Emission |                     |                    |               |                |               |                           |                           |
|----------------------|---------------------|--------------------|---------------|----------------|---------------|---------------------------|---------------------------|
| Used                 | Test Equipment      | Manufacturer       | Equipment No. | Model No.      | Serial No.    | Last Cal. Date (YY-MM-DD) | Next Cal. Date (YY-MM-DD) |
| ●                    | Shielded Room       | Albatross projects | HTWE0114      | N/A            | N/A           | 2021/9/13                 | 2022/9/12                 |
| ●                    | EMI Test Receiver   | R&S                | HTWE0111      | ESCI           | 101247        | 2021/9/13                 | 2022/9/12                 |
| ●                    | Artificial Mains    | SCHWARZBECK        | HTWE0113      | NNLK 8121      | 573           | 2021/9/13                 | 2022/9/12                 |
| ●                    | Pulse Limiter       | R&S                | HTWE0033      | ESH3-Z2        | 100499        | 2021/9/13                 | 2022/9/12                 |
| ●                    | RF Connection Cable | HUBER+SUHNER       | HTWE0113-02   | ENVIROFLEX 142 | EF-NM-BNCM-2M | 2021/9/13                 | 2022/9/12                 |
| ●                    | Test Software       | R&S                | N/A           | ES-K1          | N/A           | N/A                       | N/A                       |

| ● Radiated emission-6th test site |                         |                    |               |             |            |                           |                           |
|-----------------------------------|-------------------------|--------------------|---------------|-------------|------------|---------------------------|---------------------------|
| Used                              | Test Equipment          | Manufacturer       | Equipment No. | Model No.   | Serial No. | Last Cal. Date (YY-MM-DD) | Next Cal. Date (YY-MM-DD) |
| ●                                 | Semi-Anechoic Chamber   | Albatross projects | HTWE0127      | SAC-3m-02   | C11121     | 2018/09/30                | 2022/09/29                |
| ●                                 | EMI Test Receiver       | R&S                | HTWE0099      | ESCI        | 100900     | 2021/9/14                 | 2022/9/13                 |
| ●                                 | Loop Antenna            | R&S                | HTWE0170      | HFH2-Z2     | 100020     | 2021/04/06                | 2022/04/05                |
| ●                                 | Ultra-Broadband Antenna | SCHWARZBECK        | HTWE0123      | VULB9163    | 538        | 2021/04/06                | 2022/04/05                |
| ●                                 | Pre-Amplifier           | SCHWARZBECK        | HTWE0295      | BBV 9742    | N/A        | 2021/11/5                 | 2022/11/4                 |
| ●                                 | RF Connection Cable     | HUBER+SUHNER       | HTWE0062-01   | N/A         | N/A        | 2021/02/26                | 2022/02/25                |
| ●                                 | RF Connection Cable     | HUBER+SUHNER       | HTWE0062-02   | SUCOFLEX104 | 501184/4   | 2021/02/26                | 2022/02/25                |
| ●                                 | Test Software           | R&S                | N/A           | ES-K1       | N/A        | N/A                       | N/A                       |

| ● Radiated emission-7th test site |                         |                    |               |                   |             |                           |                           |
|-----------------------------------|-------------------------|--------------------|---------------|-------------------|-------------|---------------------------|---------------------------|
| Used                              | Test Equipment          | Manufacturer       | Equipment No. | Model No.         | Serial No.  | Last Cal. Date (YY-MM-DD) | Next Cal. Date (YY-MM-DD) |
| ●                                 | Semi-Anechoic Chamber   | Albatross projects | HTWE0122      | SAC-3m-01         | N/A         | 2018/09/27                | 2022/09/26                |
| ●                                 | Spectrum Analyzer       | R&S                | HTWE0098      | FSP40             | 100597      | 2021/9/13                 | 2022/9/12                 |
| ●                                 | Horn Antenna            | SCHWARZBECK        | HTWE0126      | 9120D             | 1011        | 2020/04/01                | 2023/03/31                |
| ●                                 | Broadband Horn Antenna  | SCHWARZBECK        | HTWE0103      | BBHA9170          | BBHA9170472 | 2020/4/27                 | 2023/4/27                 |
| ●                                 | Pre-amplifier           | CD                 | HTWE0071      | PAP-0102          | 12004       | 2021/11/5                 | 2022/11/4                 |
| ●                                 | Broadband Pre-amplifier | SCHWARZBECK        | HTWE0201      | BBV 9718          | 9718-248    | 2021/03/05                | 2022/03/04                |
| ●                                 | RF Connection Cable     | HUBER+SUHNER       | HTWE0120-01   | 6m 18GHz S Serisa | N/A         | 2021/02/26                | 2022/02/25                |
| ●                                 | RF Connection Cable     | HUBER+SUHNER       | HTWE0120-02   | 6m 3GHz RG Serisa | N/A         | 2021/02/26                | 2022/02/25                |
| ●                                 | RF Connection Cable     | HUBER+SUHNER       | HTWE0120-03   | 6m 3GHz RG Serisa | N/A         | 2021/02/26                | 2022/02/25                |
| ●                                 | RF Connection Cable     | HUBER+SUHNER       | HTWE0120-04   | 6m 3GHz RG Serisa | N/A         | 2021/02/26                | 2022/02/25                |
| ●                                 | RF Connection Cable     | HUBER+SUHNER       | HTWE0121-01   | 6m 18GHz S Serisa | N/A         | 2021/02/26                | 2022/02/25                |
| ●                                 | Test Software           | Audix              | N/A           | E3                | N/A         | N/A                       | N/A                       |

| ● RF Conducted Method |                              |              |           |            |                              |                              |
|-----------------------|------------------------------|--------------|-----------|------------|------------------------------|------------------------------|
| Used                  | Test Equipment               | Manufacturer | Model No. | Serial No. | Last Cal. Date<br>(YY-MM-DD) | Next Cal. Date<br>(YY-MM-DD) |
| ●                     | Signal and spectrum Analyzer | R&S          | FSV40     | 100048     | 2021/9/13                    | 2022/9/12                    |
| ●                     | Spectrum Analyzer            | Agilent      | N9020A    | MY50510187 | 2021/9/13                    | 2022/9/12                    |
| ●                     | Power Meter                  | Anritsu      | ML249A    | N/A        | 2021/9/13                    | 2022/9/12                    |
| ○                     | Radio communication tester   | R&S          | CMW500    | 137688-Lv  | 2021/9/13                    | 2022/9/12                    |

## 5. TEST CONDITIONS AND RESULTS

### 5.1. Antenna Requirement

#### Requirement

##### **FCC CFR Title 47 Part 15 Subpart C Section 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, 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.

#### TEST RESULT

☒ **Passed**      ☐ **Not Applicable**

The antenna type is a PIFA antenna, the directional gain of the antenna less than 6 dBi, please refer to the below antenna photo.



## 5.2. AC Conducted Emission

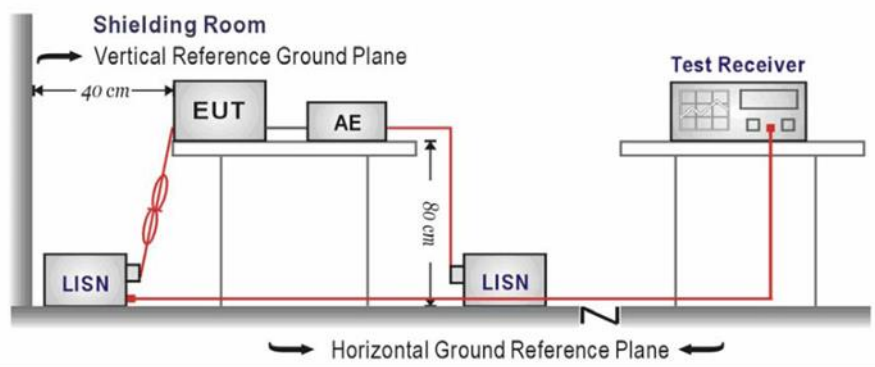
### LIMIT

#### FCC CFR Title 47 Part 15 Subpart C Section 15.207

| 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 CONFIGURATION



### TEST PROCEDURE

1. The EUT was setup according to ANSI C63.10 requirements.
2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment.
4. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
5. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
6. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
7. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
8. During the above scans, the emissions were maximized by cable manipulation.

### TEST MODE:

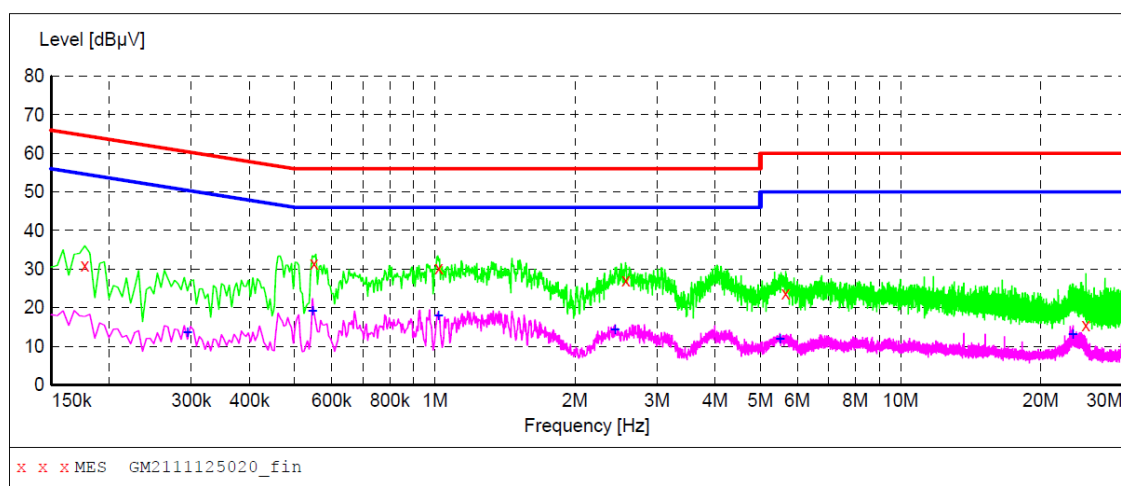
Please refer to the clause 4.3

### TEST RESULT

☒ Passed ☐ Not Applicable

Test Line:

L

**MEASUREMENT RESULT: "GM2111125020\_fin"**

11/12/2021 10:00AM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.177000         | 30.90         | 10.1         | 65            | 33.7         | QP       | L1   | GND |
| 0.550500         | 31.40         | 10.1         | 56            | 24.6         | QP       | L1   | GND |
| 1.018500         | 30.30         | 10.1         | 56            | 25.7         | QP       | L1   | GND |
| 2.571000         | 27.20         | 10.1         | 56            | 28.8         | QP       | L1   | GND |
| 5.662500         | 23.70         | 10.3         | 60            | 36.3         | QP       | L1   | GND |
| 24.994500        | 15.50         | 10.8         | 60            | 44.5         | QP       | L1   | GND |

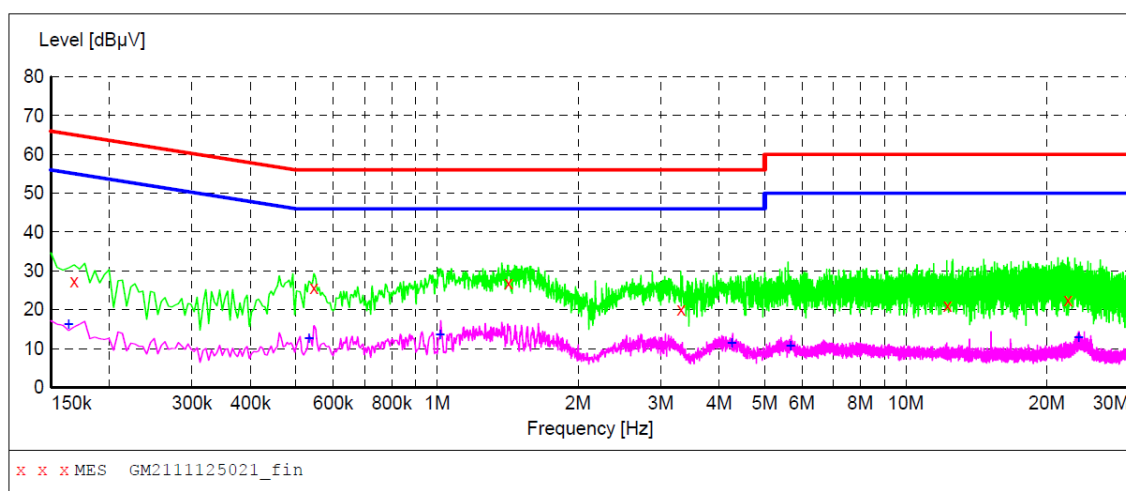
**MEASUREMENT RESULT: "GM2111125020\_fin2"**

11/12/2021 10:00AM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.294000         | 13.50         | 10.1         | 50            | 36.9         | AV       | L1   | GND |
| 0.546000         | 19.10         | 10.1         | 46            | 26.9         | AV       | L1   | GND |
| 1.018500         | 18.00         | 10.1         | 46            | 28.0         | AV       | L1   | GND |
| 2.436000         | 14.20         | 10.1         | 46            | 31.8         | AV       | L1   | GND |
| 5.509500         | 11.80         | 10.3         | 50            | 38.2         | AV       | L1   | GND |
| 23.433000        | 13.10         | 10.8         | 50            | 36.9         | AV       | L1   | GND |

Test Line:

N

**MEASUREMENT RESULT: "GM2111125021\_fin"**

11/12/2021 10:03AM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.168000         | 27.40         | 10.1         | 65            | 37.7         | QP       | N    | GND |
| 0.546000         | 25.70         | 10.1         | 56            | 30.3         | QP       | N    | GND |
| 1.419000         | 26.80         | 10.1         | 56            | 29.2         | QP       | N    | GND |
| 3.318000         | 20.00         | 10.2         | 56            | 36.0         | QP       | N    | GND |
| 12.268500        | 21.00         | 10.5         | 60            | 39.0         | QP       | N    | GND |
| 22.177500        | 22.60         | 10.8         | 60            | 37.4         | QP       | N    | GND |

**MEASUREMENT RESULT: "GM2111125021\_fin2"**

11/12/2021 10:03AM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Detector | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|----------|------|-----|
| 0.163500         | 16.20         | 10.1         | 55            | 39.1         | AV       | N    | GND |
| 0.532500         | 12.70         | 10.1         | 46            | 33.3         | AV       | N    | GND |
| 1.014000         | 13.60         | 10.1         | 46            | 32.4         | AV       | N    | GND |
| 4.249500         | 11.50         | 10.3         | 46            | 34.5         | AV       | N    | GND |
| 5.667000         | 10.60         | 10.3         | 50            | 39.4         | AV       | N    | GND |
| 23.379000        | 12.90         | 10.8         | 50            | 37.1         | AV       | N    | GND |

### 5.3. Maximum Conducted Output Power

#### LIMIT

#### FCC CFR Title 47 Part 15 Subpart E Section 15.407(a):

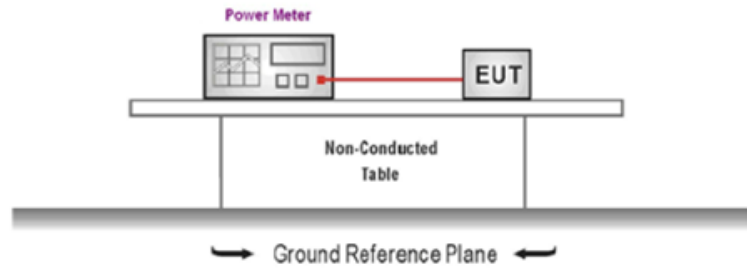
For the 5.15~5.25GHz band:

- Outdoor AP  
The maximum conducted output power ( $P_{out}$ ) shall not exceed the lesser of 1W (30dBm).  
if  $G_{TX} > 6\text{dBi}$ , then  $P_{out} = 30 - (G_{TX} - 6)$ . e.i.r.p. at any elevation angle above 30 degrees  $\leq 125\text{mW}$  (21dBm)
- Indoor AP  
The maximum conducted output power ( $P_{out}$ ) shall not exceed the lesser of 1W (30dBm).  
if  $G_{TX} > 6\text{dBi}$ , then  $P_{out} = 30 - (G_{TX} - 6)$ .
- Point-to-point AP  
The maximum conducted output power ( $P_{out}$ ) shall not exceed the lesser of 1W (30dBm).  
if  $G_{TX} > 23\text{dBi}$ , then  $P_{out} = 30 - (G_{TX} - 23)$ .
- Client devices  
The maximum conducted output power ( $P_{out}$ ) shall not exceed the lesser of 250W (24dBm).  
if  $G_{TX} > 6\text{dBi}$ , then  $P_{out} = 24 - (G_{TX} - 6)$ .

For the 5.725~5.85GHz band:

- Point-to-multipoint systems (P2M)  
The maximum conducted output power ( $P_{out}$ ) shall not exceed the lesser of 1W (30dBm).  
if  $G_{TX} > 6\text{dBi}$ , then  $P_{out} = 30 - (G_{TX} - 6)$ .
- Point-to-point systems (P2P)  
The maximum conducted output power ( $P_{out}$ ) shall not exceed the lesser of 1W (30dBm).

#### TEST CONFIGURATION



#### TEST PROCEDURE

1. The EUT was tested according to KDB789033 Section E-3-b)
2. The maximum conducted output power may be measured using a broadband AVG RF power meter.
3. Average power measurements were performed only when the EUT was transmitting at its maximum power control level using a broadband power meter with a pulse sensor.
4. The power meter implemented triggering and gating capabilities which were set up such that power measurements were recorded only during the ON time of the transmitter.
5. Record the measurement data.

#### 6. TEST MODE:

Please refer to the clause 4.3

#### TEST RESULT

☒ Passed      ☐ Not Applicable

#### TEST Data

Please refer to appendix A on the appendix report

## 5.4. Power Spectral Density

### LIMIT

FCC CFR Title 47 Part 15 Subpart E Section 15.407(a):

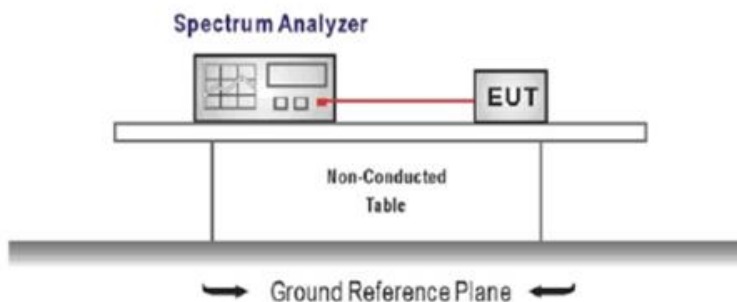
For the 5.15~5.25GHz band:

- Outdoor AP  
The peak power spectral density (PSD) shall not exceed the lesser of 17dBm/MHz.  
if  $G_{TX} > 6\text{dBi}$ , then  $\text{PSD} = 17 - (G_{TX} - 6)$ .
- Indoor AP  
The peak power spectral density (PSD) shall not exceed the lesser of 17dBm/MHz.  
if  $G_{TX} > 6\text{dBi}$ , then  $\text{PSD} = 17 - (G_{TX} - 6)$ .
- Point-to-point AP  
The peak power spectral density (PSD) shall not exceed the lesser of 17dBm/MHz.  
if  $G_{TX} > 23\text{dBi}$ , then  $\text{PSD} = 17 - (G_{TX} - 23)$ .
- Client devices  
The peak power spectral density (PSD) shall not exceed the lesser of 11dBm/MHz.  
if  $G_{TX} > 6\text{dBi}$ , then  $\text{PSD} = 11 - (G_{TX} - 6)$ .

For the 5.725~5.85GHz band:

- Point-to-multipoint systems (P2M)  
The peak power spectral density (PSD) shall not exceed the lesser of 30dBm/500kHz.  
if  $G_{TX} > 6\text{dBi}$ , then  $\text{PSD} = 30 - (G_{TX} - 6)$ .
- Point-to-point systems (P2P)  
The peak power spectral density (PSD) shall not exceed the lesser of 30dBm/500kHz.

### TEST CONFIGURATION



### TEST PROCEDURE

1. According KDB 789033 D02 – Section F
2. Analyzer was setting as follow:  
Center frequency: test channel  
Span was set to encompass the entire emission bandwidth of the signal  
RBW=1MHz for devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz  
RBW=500kHz for devices operating in the band 5.725-5.85 GHz  
VBW  $\geq$  3 RBW  
Number of sweep points  $> 2 \times (\text{span}/\text{RBW})$   
Sweep time = auto  
Detector = Peak  
Trigger was set to free run for all modes, trace was averaged over 100 sweeps
3. The peak search function of the spectrum analyzer was used to find the peak of the spectrum.

**TEST MODE:**

Please refer to the clause 4.3

**TEST RESULT**

☒ **Passed**      ☐ **Not Applicable**

**TEST Data**

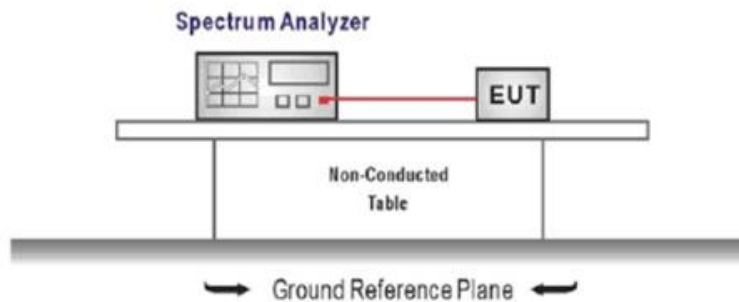
Please refer to appendix B on the appendix report

## 5.5. 26dB bandwidth and 99% Occupancy bandwidth

### LIMIT

The bandwidth at 26dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in KDB 789033 D02 , and at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 26dB bandwidth.

### TEST CONFIGURATION



### TEST PROCEDURE

1. According KDB 789033 D02 – Section C, 26dB bandwidth test as follow
  - a) Set RBW = approximately 1% of the emission bandwidth.
  - b) Set the VBW > RBW.
  - c) Detector = Peak.
  - d) Trace mode = max hold.
  - e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
2. According KDB 789033 D02 – Section D, 99% bandwidth test as follow
  - a). Set center frequency to the nominal EUT channel center frequency.
  - b). Set span = 1.5 times to 5.0 times the OBW.
  - c). Set RBW = 1% to 5% of the OBW
  - d). Set VBW  $\geq 3$  RBW
  - e). Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
  - f). Use the 99% power bandwidth function of the instrument

### TEST MODE:

Please refer to the clause 4.3

### TEST RESULT

☒ Passed ☐ Not Applicable

### TEST Data

Please refer to appendix C and D on the appendix report

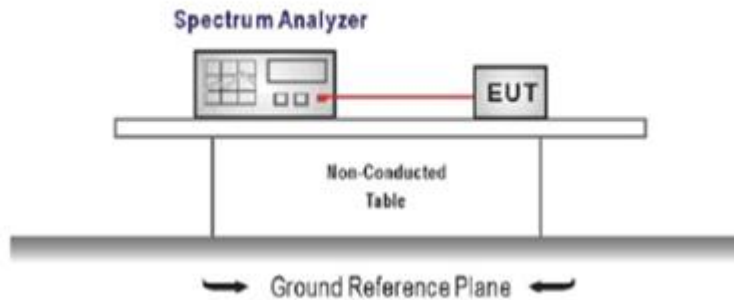
## 5.6. 6dB Bandwidth

### LIMIT

#### **FCC CFR Title 47 Part 15 Subpart E Section 15.407(e)**

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz

### TEST CONFIGURATION



### TEST PROCEDURE

1. Connect the antenna port(s) to the spectrum analyzer input.
2. Configure the spectrum analyzer as shown below (enter all losses between the transmitter output and the spectrum analyzer).  
Center Frequency = test channel center frequency  
Span = 2 x emission bandwidth  
RBW = 100 kHz, VBW  $\geq 3 \times$  RBW  
Sweep time = auto couple  
Detector = Peak  
Trace mode = max hold
3. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter wave form on the spectrum analyzer.
4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission, and record the pertinent measurements.

### TEST MODE:

Please refer to the clause 4.3

### TEST RESULT

☒ Passed ☐ Not Applicable

### TEST Data

Please refer to appendix E on the appendix report

## 5.7. Band edge

### LIMIT

FCC CFR Title 47 Part 15 Subpart E Section 15.407(b)

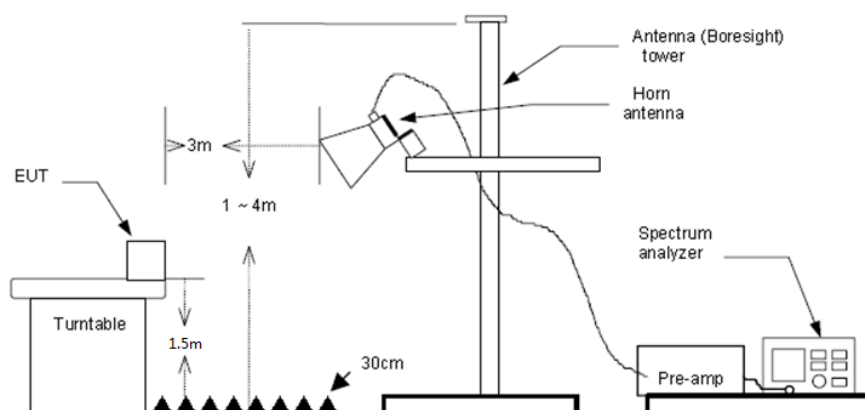
| Un-restricted band emissions above 1GHz |                   |                                                             |       |
|-----------------------------------------|-------------------|-------------------------------------------------------------|-------|
| Operating Band                          | Frequency         | EIRP Limit                                                  | Value |
| 5150-5250MHz                            | Above 1GHz        | -27dBm/MHz(68.2dBuV/m)@3m                                   | Peak  |
| 5250-5350MHz                            | Above 1GHz        | -27dBm/MHz(68.2dBuV/m)@3m                                   | Peak  |
| 5470-5725MHz                            | Above 1GHz        | -27dBm/MHz(68.2dBuV/m)@3m                                   | Peak  |
| 5725-5850 MHz                           | 1GHz-5.65GHz      | -27 dBm/MHz(68.2dBuV/m)@3m                                  | Peak  |
|                                         | 5.65GHz-5.7GHz    | -27*dBm/MHz to 10dBm/MHz<br>(68.2* dBuV/m to 105.6dBuV/m)   | Peak  |
|                                         | 5.7GHz-5.72GHz    | 10*dBm/MHz to 15.6dBm/MHz<br>(105.6*dBuV/m to 110.8dBuV/m)  | Peak  |
|                                         | 5.72GHz-5.725GHz  | 15.6*dBm/MHz to 27dBm/MHz<br>(110.8dBuV/m to* 122.2dBuV/m)  | Peak  |
|                                         | 5.85GHz-5.855GHz  | 27dBm/MHz to 15.6*dBm/MHz<br>(122.2dBuV/m to110.8* dBuV/m)  | Peak  |
|                                         | 5.855GHz-5.875GHz | 15.6dBm/MHz to 10*dBm/MHz<br>(110.8dBuV/m to 105.6* dBuV/m) | Peak  |
|                                         | 5.875GHz-5.925GHz | 10dBm/MHz to -27*dBm/MHz<br>(105.6dBuV/m to 68.2* dBuV/m)   | Peak  |
|                                         | Above 5.925GHz    | -27 dBm/MHz(68.2dBuV/m)@3m                                  | Peak  |

\* Increase/Decreases with the linearly of the frequency.

For emission above 1GHz and in restricted band, according to FCC KDB 789033 D02 General UNII Test Procedure, all emission that complies with both the average and peak limits of Section 15.209 is not required to satisfy the -27 dBm/MHz peak emission limit.  $E[dBuV/m] = EIRP[dBm] + 95.2$ , for  $d = 3$  meters.

### TEST CONFIGURATION

Radiated:



**TEST PROCEDURE**

1. The EUT was setup and tested according to ANSI C63.10:2013 requirements.
2. The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
4. The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.
5. The receiver set as follow:  
RBW=1MHz, VBW=3MHz PEAK detector for Peak value.  
RBW=1MHz, VBW=3MHz RMS detector for Average value.

**TEST MODE:**

Please refer to the clause 4.3

**TEST RESULTS**
☒ Passed
 ☐ Not Applicable
**Radiated Band Edge Test Data**

| Band: I    |                  |                   | Worst mode: 802.11a |             |              |            | Test channel: CH <sub>L</sub> |                 |               |         |  |
|------------|------------------|-------------------|---------------------|-------------|--------------|------------|-------------------------------|-----------------|---------------|---------|--|
| Test value |                  |                   |                     |             |              | Horizontal |                               |                 |               |         |  |
| -----      |                  |                   |                     |             |              |            |                               |                 |               |         |  |
| Mark       | Frequency<br>MHz | Reading<br>dBuV/m | Antenna<br>dB       | Cable<br>dB | Preamp<br>dB | Aux<br>dB  | Level<br>dBuV/m               | Limit<br>dBuV/m | Over<br>limit | Remark  |  |
| 1          | 5148.05          | 41.66             | 32.01               | 8.96        | 35.45        | 10.00      | 57.18                         | 68.20           | -11.02        | Peak    |  |
| 2          | 5150.07          | 39.21             | 32.00               | 8.96        | 35.44        | 10.00      | 54.73                         | 68.20           | -13.47        | Peak    |  |
| -----      |                  |                   |                     |             |              |            |                               |                 |               |         |  |
| Mark       | Frequency<br>MHz | Reading<br>dBuV/m | Antenna<br>dB       | Cable<br>dB | Preamp<br>dB | Aux<br>dB  | Level<br>dBuV/m               | Limit<br>dBuV/m | Over<br>limit | Remark  |  |
| 1          | 5083.25          | 22.26             | 32.20               | 8.91        | 35.45        | 10.00      | 37.92                         | 54.00           | -16.08        | Average |  |
| 2          | 5150.07          | 24.86             | 32.00               | 8.96        | 35.44        | 10.00      | 40.38                         | 54.00           | -13.62        | Average |  |

| Band: I    |                  |                   | Worst mode: 802.11a |             |              |           | Test channel: CH <sub>L</sub> |                 |               |         |  |
|------------|------------------|-------------------|---------------------|-------------|--------------|-----------|-------------------------------|-----------------|---------------|---------|--|
| Test value |                  |                   |                     |             |              | Vertical  |                               |                 |               |         |  |
| -----      |                  |                   |                     |             |              |           |                               |                 |               |         |  |
| Mark       | Frequency<br>MHz | Reading<br>dBuV/m | Antenna<br>dB       | Cable<br>dB | Preamp<br>dB | Aux<br>dB | Level<br>dBuV/m               | Limit<br>dBuV/m | Over<br>limit | Remark  |  |
| 1          | 5147.65          | 41.28             | 32.01               | 8.96        | 35.45        | 10.00     | 56.80                         | 68.20           | -11.40        | Peak    |  |
| 2          | 5150.07          | 40.62             | 32.00               | 8.96        | 35.44        | 10.00     | 56.14                         | 68.20           | -12.06        | Peak    |  |
| -----      |                  |                   |                     |             |              |           |                               |                 |               |         |  |
| Mark       | Frequency<br>MHz | Reading<br>dBuV/m | Antenna<br>dB       | Cable<br>dB | Preamp<br>dB | Aux<br>dB | Level<br>dBuV/m               | Limit<br>dBuV/m | Over<br>limit | Remark  |  |
| 1          | 5083.44          | 22.25             | 32.20               | 8.91        | 35.45        | 10.00     | 37.91                         | 54.00           | -16.09        | Average |  |
| 2          | 5150.07          | 25.12             | 32.00               | 8.96        | 35.44        | 10.00     | 40.64                         | 54.00           | -13.36        | Average |  |

| Band: I    |                  |                   | Worst mode: 802.11a |             |              |            | Test channel: CH <sub>H</sub> |                 |               |         |  |
|------------|------------------|-------------------|---------------------|-------------|--------------|------------|-------------------------------|-----------------|---------------|---------|--|
| Test value |                  |                   |                     |             |              | Horizontal |                               |                 |               |         |  |
| Mark       | Frequency<br>MHz | Reading<br>dBuV/m | Antenna<br>dB       | Cable<br>dB | Preamp<br>dB | Aux<br>dB  | Level<br>dBuV/m               | Limit<br>dBuV/m | Over<br>limit | Remark  |  |
| 1          | 5350.04          | 34.00             | 31.50               | 9.45        | 35.37        | 10.00      | 49.58                         | 68.20           | -18.62        | Peak    |  |
| 2          | 5426.16          | 35.97             | 31.70               | 9.36        | 35.37        | 10.00      | 51.66                         | 68.20           | -16.54        | Peak    |  |
| Mark       | Frequency<br>MHz | Reading<br>dBuV/m | Antenna<br>dB       | Cable<br>dB | Preamp<br>dB | Aux<br>dB  | Level<br>dBuV/m               | Limit<br>dBuV/m | Over<br>limit | Remark  |  |
| 1          | 5350.04          | 21.82             | 31.50               | 9.45        | 35.37        | 10.00      | 37.40                         | 54.00           | -16.60        | Average |  |
| 2          | 5397.30          | 21.84             | 31.69               | 9.39        | 35.31        | 10.00      | 37.61                         | 54.00           | -16.39        | Average |  |

| Band: I    |                  |                   | Worst mode: 802.11a |             |              |           | Test channel: CH <sub>H</sub> |                 |               |         |  |
|------------|------------------|-------------------|---------------------|-------------|--------------|-----------|-------------------------------|-----------------|---------------|---------|--|
| Test value |                  |                   |                     |             |              | Vertical  |                               |                 |               |         |  |
| Mark       | Frequency<br>MHz | Reading<br>dBuV/m | Antenna<br>dB       | Cable<br>dB | Preamp<br>dB | Aux<br>dB | Level<br>dBuV/m               | Limit<br>dBuV/m | Over<br>limit | Remark  |  |
| 1          | 5350.04          | 34.24             | 31.50               | 9.45        | 35.37        | 10.00     | 49.82                         | 68.20           | -18.38        | Peak    |  |
| 2          | 5459.01          | 36.38             | 31.74               | 9.35        | 35.39        | 10.00     | 52.08                         | 68.20           | -16.12        | Peak    |  |
| Mark       | Frequency<br>MHz | Reading<br>dBuV/m | Antenna<br>dB       | Cable<br>dB | Preamp<br>dB | Aux<br>dB | Level<br>dBuV/m               | Limit<br>dBuV/m | Over<br>limit | Remark  |  |
| 1          | 5350.04          | 22.05             | 31.50               | 9.45        | 35.37        | 10.00     | 37.63                         | 54.00           | -16.37        | Average |  |
| 2          | 5401.09          | 22.28             | 31.70               | 9.39        | 35.32        | 10.00     | 38.05                         | 54.00           | -15.95        | Average |  |

| Band: I    |                  | Worst mode: 802.11n(HT40) |               |             |              |           | Test channel: CH <sub>L</sub> |                 |               |         |  |
|------------|------------------|---------------------------|---------------|-------------|--------------|-----------|-------------------------------|-----------------|---------------|---------|--|
| Test value |                  |                           |               |             | Horizontal   |           |                               |                 |               |         |  |
| Mark       | Frequency<br>MHz | Reading<br>dBuV/m         | Antenna<br>dB | Cable<br>dB | Preamp<br>dB | Aux<br>dB | Level<br>dBuV/m               | Limit<br>dBuV/m | Over<br>limit | Remark  |  |
| 1          | 5073.29          | 35.82                     | 32.20         | 8.90        | 35.43        | 10.00     | 51.49                         | 68.20           | -16.71        | Peak    |  |
| 2          | 5150.07          | 44.76                     | 32.00         | 8.96        | 35.44        | 10.00     | 60.28                         | 68.20           | -7.92         | Peak    |  |
| Mark       | Frequency<br>MHz | Reading<br>dBuV/m         | Antenna<br>dB | Cable<br>dB | Preamp<br>dB | Aux<br>dB | Level<br>dBuV/m               | Limit<br>dBuV/m | Over<br>limit | Remark  |  |
| 1          | 5074.68          | 22.36                     | 32.20         | 8.90        | 35.44        | 10.00     | 38.02                         | 54.00           | -15.98        | Average |  |
| 2          | 5150.07          | 26.04                     | 32.00         | 8.96        | 35.44        | 10.00     | 41.56                         | 54.00           | -12.44        | Average |  |

| Band: I    |                  | Worst mode: 802.11n(HT40) |               |             |              |           | Test channel: CH <sub>L</sub> |                 |               |         |  |
|------------|------------------|---------------------------|---------------|-------------|--------------|-----------|-------------------------------|-----------------|---------------|---------|--|
| Test value |                  |                           |               |             | Vertical     |           |                               |                 |               |         |  |
| Mark       | Frequency<br>MHz | Reading<br>dBuV/m         | Antenna<br>dB | Cable<br>dB | Preamp<br>dB | Aux<br>dB | Level<br>dBuV/m               | Limit<br>dBuV/m | Over<br>limit | Remark  |  |
| 1          | 5131.12          | 40.37                     | 32.08         | 8.96        | 35.46        | 10.00     | 55.95                         | 68.20           | -12.25        | Peak    |  |
| 2          | 5150.07          | 44.43                     | 32.00         | 8.96        | 35.44        | 10.00     | 59.95                         | 68.20           | -8.25         | Peak    |  |
| Mark       | Frequency<br>MHz | Reading<br>dBuV/m         | Antenna<br>dB | Cable<br>dB | Preamp<br>dB | Aux<br>dB | Level<br>dBuV/m               | Limit<br>dBuV/m | Over<br>limit | Remark  |  |
| 1          | 5084.64          | 22.20                     | 32.20         | 8.91        | 35.45        | 10.00     | 37.86                         | 54.00           | -16.14        | Average |  |
| 2          | 5150.07          | 27.56                     | 32.00         | 8.96        | 35.44        | 10.00     | 43.08                         | 54.00           | -10.92        | Average |  |

| Band: I    |                  | Worst mode: 802.11n(HT40) |               |             |              |            |                 | Test channel: CH <sub>H</sub> |               |         |  |
|------------|------------------|---------------------------|---------------|-------------|--------------|------------|-----------------|-------------------------------|---------------|---------|--|
| Test value |                  |                           |               |             |              | Horizontal |                 |                               |               |         |  |
| Mark       | Frequency<br>MHz | Reading<br>dBuV/m         | Antenna<br>dB | Cable<br>dB | Preamp<br>dB | Aux<br>dB  | Level<br>dBuV/m | Limit<br>dBuV/m               | Over<br>limit | Remark  |  |
| 1          | 5350.04          | 34.11                     | 31.50         | 9.45        | 35.37        | 10.00      | 49.69           | 68.20                         | -18.51        | Peak    |  |
| 2          | 5396.80          | 36.29                     | 31.69         | 9.39        | 35.31        | 10.00      | 52.06           | 68.20                         | -16.14        | Peak    |  |
| Mark       | Frequency<br>MHz | Reading<br>dBuV/m         | Antenna<br>dB | Cable<br>dB | Preamp<br>dB | Aux<br>dB  | Level<br>dBuV/m | Limit<br>dBuV/m               | Over<br>limit | Remark  |  |
| 1          | 5350.04          | 21.81                     | 31.50         | 9.45        | 35.37        | 10.00      | 37.39           | 54.00                         | -16.61        | Average |  |
| 2          | 5454.67          | 22.18                     | 31.72         | 9.35        | 35.39        | 10.00      | 37.86           | 54.00                         | -16.14        | Average |  |

| Band: I    |                  | Worst mode: 802.11n(HT40) |               |             |              |           |                 | Test channel: CH <sub>H</sub> |               |         |  |
|------------|------------------|---------------------------|---------------|-------------|--------------|-----------|-----------------|-------------------------------|---------------|---------|--|
| Test value |                  |                           |               |             |              | Vertical  |                 |                               |               |         |  |
| Mark       | Frequency<br>MHz | Reading<br>dBuV/m         | Antenna<br>dB | Cable<br>dB | Preamp<br>dB | Aux<br>dB | Level<br>dBuV/m | Limit<br>dBuV/m               | Over<br>limit | Remark  |  |
| 1          | 5350.04          | 33.08                     | 31.50         | 9.45        | 35.37        | 10.00     | 48.66           | 68.20                         | -19.54        | Peak    |  |
| 2          | 5410.70          | 35.85                     | 31.70         | 9.38        | 35.34        | 10.00     | 51.59           | 68.20                         | -16.61        | Peak    |  |
| Mark       | Frequency<br>MHz | Reading<br>dBuV/m         | Antenna<br>dB | Cable<br>dB | Preamp<br>dB | Aux<br>dB | Level<br>dBuV/m | Limit<br>dBuV/m               | Over<br>limit | Remark  |  |
| 1          | 5350.04          | 22.12                     | 31.50         | 9.45        | 35.37        | 10.00     | 37.70           | 54.00                         | -16.30        | Average |  |
| 2          | 5391.50          | 22.02                     | 31.67         | 9.40        | 35.29        | 10.00     | 37.80           | 54.00                         | -16.20        | Average |  |

|            |                  |                   |                            |             |              |           |                 |                               |               |         |  |
|------------|------------------|-------------------|----------------------------|-------------|--------------|-----------|-----------------|-------------------------------|---------------|---------|--|
| Band: I    |                  |                   | Worst mode: 802.11ac(HT80) |             |              |           |                 | Test channel: CH <sub>L</sub> |               |         |  |
| Test value |                  |                   |                            |             | Horizontal   |           |                 |                               |               |         |  |
| Mark       | Frequency<br>MHz | Reading<br>dBuV/m | Antenna<br>dB              | Cable<br>dB | Preamp<br>dB | Aux<br>dB | Level<br>dBuV/m | Limit<br>dBuV/m               | Over<br>limit | Remark  |  |
| 1          | 5146.53          | 49.07             | 32.01                      | 8.96        | 35.45        | 10.00     | 64.59           | 68.20                         | -3.61         | Peak    |  |
| 2          | 5150.04          | 47.73             | 32.00                      | 8.96        | 35.44        | 10.00     | 63.25           | 68.20                         | -4.95         | Peak    |  |
| Mark       | Frequency<br>MHz | Reading<br>dBuV/m | Antenna<br>dB              | Cable<br>dB | Preamp<br>dB | Aux<br>dB | Level<br>dBuV/m | Limit<br>dBuV/m               | Over<br>limit | Remark  |  |
| 1          | 5083.14          | 22.98             | 32.20                      | 8.91        | 35.45        | 10.00     | 38.64           | 54.00                         | -15.36        | Average |  |
| 2          | 5150.04          | 28.07             | 32.00                      | 8.96        | 35.44        | 10.00     | 43.59           | 54.00                         | -10.41        | Average |  |

|            |                  |                   |                            |             |              |           |                 |                               |               |         |  |
|------------|------------------|-------------------|----------------------------|-------------|--------------|-----------|-----------------|-------------------------------|---------------|---------|--|
| Band: I    |                  |                   | Worst mode: 802.11ac(HT80) |             |              |           |                 | Test channel: CH <sub>L</sub> |               |         |  |
| Test value |                  |                   |                            |             | Vertical     |           |                 |                               |               |         |  |
| Mark       | Frequency<br>MHz | Reading<br>dBuV/m | Antenna<br>dB              | Cable<br>dB | Preamp<br>dB | Aux<br>dB | Level<br>dBuV/m | Limit<br>dBuV/m               | Over<br>limit | Remark  |  |
| 1          | 5146.53          | 47.75             | 32.01                      | 8.96        | 35.45        | 10.00     | 63.27           | 68.20                         | -4.93         | Peak    |  |
| 2          | 5150.04          | 45.43             | 32.00                      | 8.96        | 35.44        | 10.00     | 60.95           | 68.20                         | -7.25         | Peak    |  |
| Mark       | Frequency<br>MHz | Reading<br>dBuV/m | Antenna<br>dB              | Cable<br>dB | Preamp<br>dB | Aux<br>dB | Level<br>dBuV/m | Limit<br>dBuV/m               | Over<br>limit | Remark  |  |
| 1          | 5074.47          | 22.89             | 32.20                      | 8.90        | 35.44        | 10.00     | 38.55           | 54.00                         | -15.45        | Average |  |
| 2          | 5150.04          | 29.98             | 32.00                      | 8.96        | 35.44        | 10.00     | 45.50           | 54.00                         | -8.50         | Average |  |

| Band: IV        |                   | Worst mode: 802.11a    |                 |                     |                 |                 |                      | Test channel: CH <sub>L</sub> |            |               |
|-----------------|-------------------|------------------------|-----------------|---------------------|-----------------|-----------------|----------------------|-------------------------------|------------|---------------|
| Frequency (MHz) | Read Level (dBuV) | Antenn a Factor (dB/m) | Cable Loss (dB) | Pream p Factor (dB) | Aux Factor (dB) | Level (dBuV/ m) | Limit Line (dBuV/ m) | Over Limit (dB)               | Test value | Polari zation |
| 5650.00         | 34.24             | 31.90                  | 9.48            | 34.99               | 10.00           | 50.63           | 68.20                | -17.57                        | Vertical   | Peak          |
| 5699.96         | 34.51             | 31.90                  | 9.53            | 34.91               | 10.00           | 51.03           | 105.20               | -54.17                        | Vertical   | Peak          |
| 5719.96         | 39.61             | 31.90                  | 9.55            | 34.88               | 10.00           | 56.18           | 110.80               | -54.62                        | Vertical   | Peak          |
| 5650.00         | 36.02             | 31.90                  | 9.48            | 34.99               | 10.00           | 52.41           | 68.20                | -15.79                        | Horizontal | Peak          |
| 5699.96         | 35.07             | 31.90                  | 9.53            | 34.91               | 10.00           | 51.59           | 105.20               | -53.61                        | Horizontal | Peak          |
| 5719.96         | 41.41             | 31.90                  | 9.55            | 34.88               | 10.00           | 57.98           | 110.80               | -52.82                        | Horizontal | Peak          |
| Band: IV        |                   | Worst mode: 802.11a    |                 |                     |                 |                 |                      | Test channel: CH <sub>H</sub> |            |               |
| Frequency (MHz) | Read Level (dBuV) | Antenn a Factor (dB/m) | Cable Loss (dB) | Pream p Factor (dB) | Aux Factor (dB) | Level (dBuV/ m) | Limit Line (dBuV/ m) | Over Limit (dB)               | Test value | Polari zation |
| 5855.08         | 37.61             | 32.21                  | 9.59            | 34.91               | 10.00           | 54.50           | 110.80               | -56.30                        | Vertical   | Peak          |
| 5875.04         | 33.54             | 32.25                  | 9.58            | 34.97               | 10.00           | 50.40           | 105.20               | -54.80                        | Vertical   | Peak          |
| 5924.99         | 33.91             | 32.35                  | 9.58            | 35.04               | 10.00           | 50.80           | 68.20                | -17.40                        | Vertical   | Peak          |
| 5650.00         | 36.02             | 31.90                  | 9.48            | 34.99               | 10.00           | 52.41           | 68.20                | -15.79                        | Horizontal | Peak          |
| 5699.96         | 35.07             | 31.90                  | 9.53            | 34.91               | 10.00           | 51.59           | 105.20               | -53.61                        | Horizontal | Peak          |
| 5719.96         | 41.41             | 31.90                  | 9.55            | 34.88               | 10.00           | 57.98           | 110.80               | -52.82                        | Horizontal | Peak          |

| Band: IV        |                   | Worst mode: 802.11n(HT40) |                 |                     |                 |                 |                      | Test channel: CH <sub>L</sub> |            |               |
|-----------------|-------------------|---------------------------|-----------------|---------------------|-----------------|-----------------|----------------------|-------------------------------|------------|---------------|
| Frequency (MHz) | Read Level (dBuV) | Antenn a Factor (dB/m)    | Cable Loss (dB) | Pream p Factor (dB) | Aux Factor (dB) | Level (dBuV/ m) | Limit Line (dBuV/ m) | Over Limit (dB)               | Test value | Polariz ation |
| 5855.08         | 35.45             | 32.21                     | 9.59            | 34.91               | 10.00           | 52.34           | 110.80               | -58.46                        | Vertical   | Peak          |
| 5875.04         | 34.30             | 32.25                     | 9.58            | 34.97               | 10.00           | 51.16           | 105.20               | -54.04                        | Vertical   | Peak          |
| 5924.99         | 33.68             | 32.35                     | 9.58            | 35.04               | 10.00           | 50.57           | 68.20                | -17.63                        | Vertical   | Peak          |
| 5650.00         | 34.48             | 31.90                     | 9.48            | 34.99               | 10.00           | 50.87           | 68.20                | -17.33                        | Horizontal | Peak          |
| 5700.01         | 39.29             | 31.90                     | 9.53            | 34.91               | 10.00           | 55.81           | 105.20               | -49.39                        | Horizontal | Peak          |
| 5720.05         | 52.73             | 31.90                     | 9.55            | 34.87               | 10.00           | 69.31           | 110.80               | -41.49                        | Horizontal | Peak          |
| Band: IV        |                   | Worst mode: 802.11n(HT40) |                 |                     |                 |                 |                      | Test channel: CH <sub>H</sub> |            |               |
| Frequency (MHz) | Read Level (dBuV) | Antenn a Factor (dB/m)    | Cable Loss (dB) | Pream p Factor (dB) | Aux Factor (dB) | Level (dBuV/ m) | Limit Line (dBuV/ m) | Over Limit (dB)               | Test value | Polariz ation |
| 5854.94         | 37.29             | 32.21                     | 9.59            | 34.91               | 10.00           | 54.18           | 110.80               | -56.62                        | Vertical   | Peak          |
| 5874.92         | 34.09             | 32.25                     | 9.58            | 34.97               | 10.00           | 50.95           | 105.20               | -54.25                        | Vertical   | Peak          |
| 5924.97         | 34.52             | 32.35                     | 9.58            | 35.04               | 10.00           | 51.41           | 68.20                | -16.79                        | Vertical   | Peak          |
| 5854.94         | 37.29             | 32.21                     | 9.59            | 34.91               | 10.00           | 54.18           | 110.80               | -56.62                        | Horizontal | Peak          |
| 5874.92         | 34.09             | 32.25                     | 9.58            | 34.97               | 10.00           | 50.95           | 105.20               | -54.25                        | Horizontal | Peak          |
| 5924.97         | 34.52             | 32.35                     | 9.58            | 35.04               | 10.00           | 51.41           | 68.20                | -16.79                        | Horizontal | Peak          |

| Band: IV Worst mode: 802.11ac(HT80) Test channel: CH <sub>L</sub> |                   |                       |                 |                          |                 |                |                     |                 |            |              |
|-------------------------------------------------------------------|-------------------|-----------------------|-----------------|--------------------------|-----------------|----------------|---------------------|-----------------|------------|--------------|
| Frequency (MHz)                                                   | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamplifier Factor (dB) | Aux Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Test value | Polarization |
| 5650.00                                                           | 37.74             | 31.90                 | 9.48            | 34.99                    | 10.00           | 54.13          | 68.20               | -14.07          | Vertical   | Peak         |
| 5699.96                                                           | 49.49             | 31.90                 | 9.53            | 34.91                    | 10.00           | 66.01          | 105.20              | -39.19          | Vertical   | Peak         |
| 5720.01                                                           | 54.46             | 31.90                 | 9.55            | 34.87                    | 10.00           | 71.04          | 110.80              | -39.76          | Vertical   | Peak         |
| 5650.00                                                           | 37.74             | 31.90                 | 9.48            | 34.99                    | 10.00           | 54.13          | 68.20               | -14.07          | Horizontal | Peak         |
| 5699.96                                                           | 49.49             | 31.90                 | 9.53            | 34.91                    | 10.00           | 66.01          | 105.20              | -39.19          | Horizontal | Peak         |
| 5720.01                                                           | 54.46             | 31.90                 | 9.55            | 34.87                    | 10.00           | 71.04          | 110.80              | -39.76          | Horizontal | Peak         |
| Band: IV Worst mode: 802.11ac(HT80) Test channel: CH <sub>H</sub> |                   |                       |                 |                          |                 |                |                     |                 |            |              |
| Frequency (MHz)                                                   | Read Level (dBuV) | Antenna Factor (dB/m) | Cable Loss (dB) | Preamplifier Factor (dB) | Aux Factor (dB) | Level (dBuV/m) | Limit Line (dBuV/m) | Over Limit (dB) | Test value | Polarization |
| 5854.98                                                           | 41.40             | 32.21                 | 9.59            | 34.91                    | 10.00           | 58.29          | 110.80              | -52.51          | Vertical   | Peak         |
| 5875.14                                                           | 36.67             | 32.25                 | 9.58            | 34.97                    | 10.00           | 53.53          | 105.20              | -51.67          | Vertical   | Peak         |
| 5925.07                                                           | 33.03             | 32.35                 | 9.58            | 35.04                    | 10.00           | 49.92          | 68.20               | -18.28          | Vertical   | Peak         |
| 5650.00                                                           | 37.48             | 31.90                 | 9.48            | 34.99                    | 10.00           | 53.87          | 68.20               | -14.33          | Horizontal | Peak         |
| 5699.96                                                           | 48.56             | 31.90                 | 9.53            | 34.91                    | 10.00           | 65.08          | 105.20              | -40.12          | Horizontal | Peak         |
| 5720.01                                                           | 53.58             | 31.90                 | 9.55            | 34.87                    | 10.00           | 70.16          | 110.80              | -40.64          | Horizontal | Peak         |

## Remark:

1. Final Level = Receiver Read level + Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.
3. Test 802.11a, 802.11n, 802.11ac mode, all modulations have been tested, only worst case is reported

## 5.8. Radiated Spurious Emissions

### LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.209 and Part 15 Subpart E Section 15.407

| Frequency            | Limit (dBuV/m)    | Value      |
|----------------------|-------------------|------------|
| 0.009 MHz ~0.49 MHz  | 2400/F(kHz) @300m | Quasi-peak |
| 0.49 MHz ~ 1.705 MHz | 24000/F(kHz) @30m | Quasi-peak |
| 1.705 MHz ~30 MHz    | 30 @30m           | Quasi-peak |

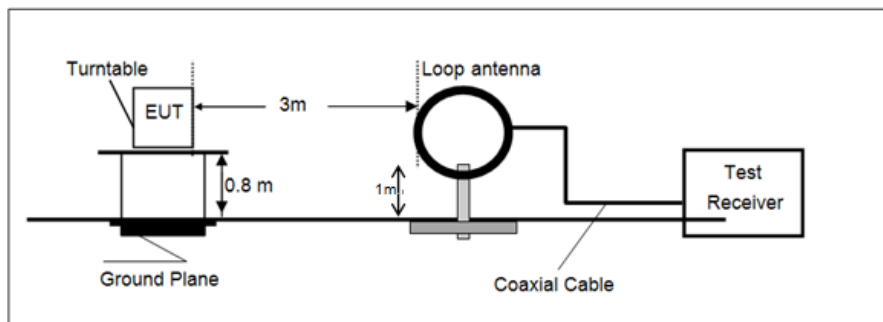
Note: Limit dBuV/m @3m = Limit dBuV/m @300m + 40\*log(300/3)= Limit dBuV/m @300m +80,

Limit dBuV/m @3m = Limit dBuV/m @30m +40\*log(30/3)= Limit dBuV/m @30m + 40.

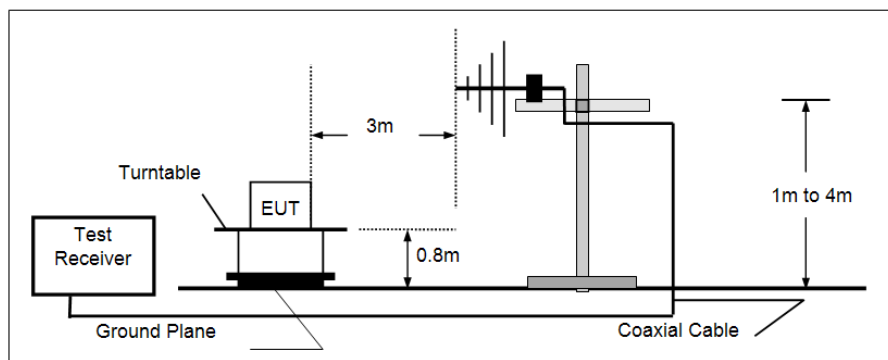
| Unwanted emissions below 1GHz and Restricted band emissions above 1GHz |                    |            |
|------------------------------------------------------------------------|--------------------|------------|
| Frequency                                                              | Limit (dBuV/m @3m) | Value      |
| 30MHz-88MHz                                                            | 40.00              | Quasi-peak |
| 88MHz-216MHz                                                           | 43.50              | Quasi-peak |
| 216MHz-960MHz                                                          | 46.00              | Quasi-peak |
| 960MHz-1GHz                                                            | 54.00              | Quasi-peak |
| Above 1GHz                                                             | 54.00              | Average    |
|                                                                        | 74.00              | Peak       |

### TEST CONFIGURATION

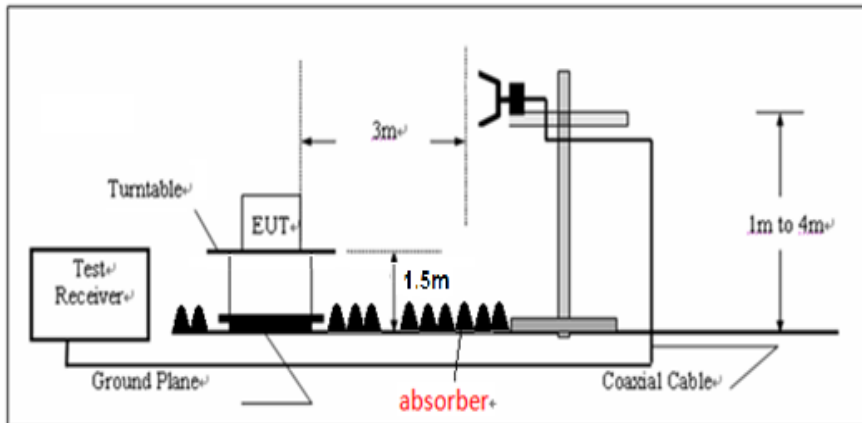
- 9KHz ~30MHz



- 30MHz ~ 1GHz



## ➤ Above 1GHz

**TEST PROCEDURE**

1. The EUT was setup and tested according to ANSI C63.10:2013
2. The EUT is placed on a turn table which is 0.8 meter above ground for below 1 GHz, and 1.5 m for above 1 GHz. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
3. The EUT was set 3 meters from the receiving antenna, which was mounted on the top of a variable height antenna tower.
4. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
5. Set to the maximum power setting and enable the EUT transmit continuously.
6. Use the following spectrum analyzer settings
  - a) Span shall wide enough to fully capture the emission being measured;
  - b) Below 1 GHz:  
RBW=120 kHz, VBW=300 kHz, Sweep=auto, Detector function=peak, Trace=max hold;  
If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
  - c) From 1 GHz to 10<sup>th</sup> harmonic:  
RBW=1MHz, VBW=3MHz Peak detector for Peak value.  
RBW=1MHz, VBW=3MHz RMS detector for Average value.

**TEST MODE:**

Please refer to the clause 4.3

**TEST RESULT**

☒ Passed ☐ Not Applicable

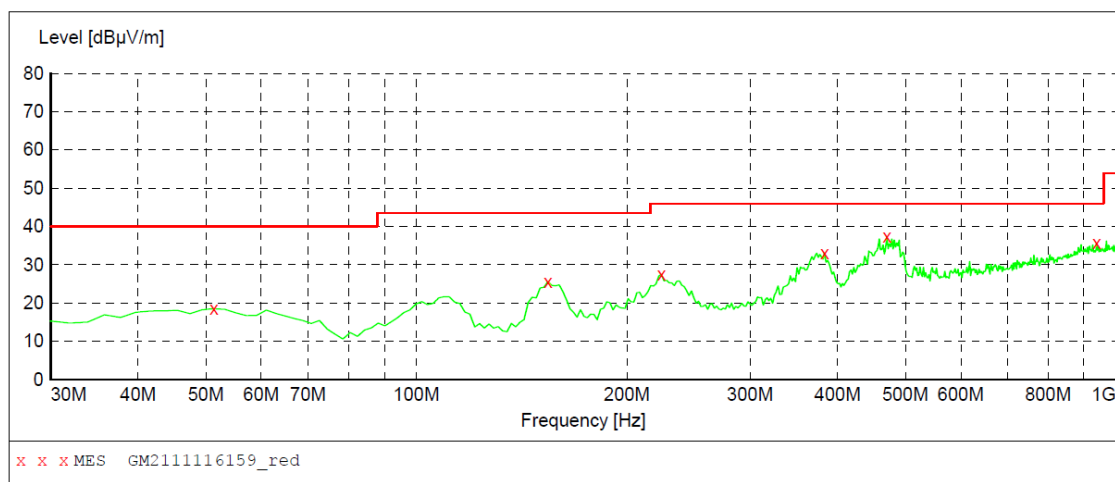
**TEST Data****TEST DATA FOR 9 kHz ~ 30 MHz**

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

**TEST DATA FOR 30MHz-1GHz**

Polarization:

Horizontal

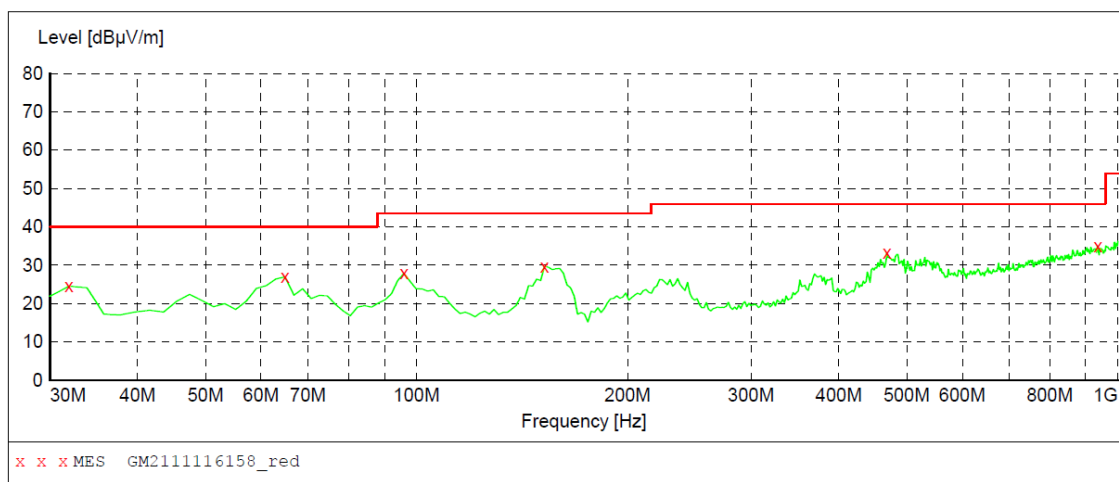
**MEASUREMENT RESULT: "GM2111116159\_red"**

11/12/2021 1:42AM

| Frequency<br>MHz | Level<br>dBμV/m | Transd<br>dB | Limit<br>dBμV/m | Margin<br>dB | Det. | Height<br>cm | Azimuth<br>deg | Polarization |
|------------------|-----------------|--------------|-----------------|--------------|------|--------------|----------------|--------------|
| 51.340000        | 18.50           | -8.8         | 40.0            | 21.5         | QP   | 100.0        | 305.00         | HORIZONTAL   |
| 154.160000       | 25.60           | -13.8        | 43.5            | 17.9         | QP   | 100.0        | 268.00         | HORIZONTAL   |
| 224.000000       | 27.50           | -9.6         | 46.0            | 18.5         | QP   | 100.0        | 88.00          | HORIZONTAL   |
| 383.080000       | 33.10           | -4.7         | 46.0            | 12.9         | QP   | 100.0        | 344.00         | HORIZONTAL   |
| 470.380000       | 37.30           | -2.6         | 46.0            | 8.7          | QP   | 100.0        | 38.00          | HORIZONTAL   |
| 937.920000       | 35.70           | 7.7          | 46.0            | 10.3         | QP   | 100.0        | 268.00         | HORIZONTAL   |

Polarization:

Vertical

**MEASUREMENT RESULT: "GM2111116158\_red"**

11/12/2021 1:40AM

| Frequency<br>MHz | Level<br>dBμV/m | Transd<br>dB | Limit<br>dBμV/m | Margin<br>dB | Det. | Height<br>cm | Azimuth<br>deg | Polarization |
|------------------|-----------------|--------------|-----------------|--------------|------|--------------|----------------|--------------|
| 31.940000        | 24.50           | -12.4        | 40.0            | 15.5         | QP   | 100.0        | 188.00         | VERTICAL     |
| 64.920000        | 27.00           | -11.2        | 40.0            | 13.0         | QP   | 100.0        | 15.00          | VERTICAL     |
| 95.960000        | 27.90           | -11.1        | 43.5            | 15.6         | QP   | 100.0        | 127.00         | VERTICAL     |
| 152.220000       | 29.70           | -13.8        | 43.5            | 13.8         | QP   | 100.0        | 154.00         | VERTICAL     |
| 468.440000       | 33.20           | -2.7         | 46.0            | 12.8         | QP   | 100.0        | 201.00         | VERTICAL     |
| 935.980000       | 35.00           | 7.7          | 46.0            | 11.0         | QP   | 100.0        | 287.00         | VERTICAL     |

Remark:

Transd=Cable lose+ Antenna factor- Pre-amplifier; Margin=Limit -Level

**TEST DATA FOR Above 1GHz**

| Band: I    |                  | Worst mode: 802.11a |               |             |              | Test channel: CH <sub>L</sub> |                 |               |        |
|------------|------------------|---------------------|---------------|-------------|--------------|-------------------------------|-----------------|---------------|--------|
| Test value |                  |                     |               | Horizontal  |              |                               |                 |               |        |
| Mark       | Frequency<br>MHz | Reading<br>dBuV/m   | Antenna<br>dB | Cable<br>dB | Preamp<br>dB | Level<br>dBuV/m               | Limit<br>dBuV/m | Over<br>limit | Remark |
| 1          | 1316.42          | 37.82               | 26.10         | 4.05        | 36.34        | 31.63                         | 68.20           | -36.57        | Peak   |
| 2          | 3570.71          | 36.95               | 29.34         | 6.87        | 36.85        | 36.31                         | 68.20           | -31.89        | Peak   |
| 3          | 8104.56          | 31.94               | 37.18         | 11.21       | 33.33        | 47.00                         | 68.20           | -21.20        | Peak   |
| 4          | 10374.42         | 34.16               | 39.85         | 12.45       | 37.29        | 49.17                         | 68.20           | -19.03        | Peak   |

| Band: I    |                  | Worst mode: 802.11a |               |             |              | Test channel: CH <sub>L</sub> |                 |               |        |
|------------|------------------|---------------------|---------------|-------------|--------------|-------------------------------|-----------------|---------------|--------|
| Test value |                  |                     |               | Vertical    |              |                               |                 |               |        |
| Mark       | Frequency<br>MHz | Reading<br>dBuV/m   | Antenna<br>dB | Cable<br>dB | Preamp<br>dB | Level<br>dBuV/m               | Limit<br>dBuV/m | Over<br>limit | Remark |
| 1          | 1406.50          | 37.98               | 26.10         | 4.18        | 36.61        | 31.65                         | 68.20           | -36.55        | Peak   |
| 2          | 3216.84          | 37.67               | 28.83         | 6.48        | 36.90        | 36.08                         | 68.20           | -32.12        | Peak   |
| 3          | 8104.56          | 32.64               | 37.18         | 11.21       | 33.33        | 47.70                         | 68.20           | -20.50        | Peak   |
| 4          | 10374.42         | 34.37               | 39.85         | 12.45       | 37.29        | 49.38                         | 68.20           | -18.82        | Peak   |

| Band: I    |                  | Worst mode: 802.11a |               |             |              | Test channel: CH <sub>M</sub> |                 |               |        |  |
|------------|------------------|---------------------|---------------|-------------|--------------|-------------------------------|-----------------|---------------|--------|--|
| Test value |                  |                     |               |             | Horizontal   |                               |                 |               |        |  |
| Mark       | Frequency<br>MHz | Reading<br>dBuV/m   | Antenna<br>dB | Cable<br>dB | Preamp<br>dB | Level<br>dBuV/m               | Limit<br>dBuV/m | Over<br>limit | Remark |  |
| 1          | 1353.80          | 38.01               | 26.28         | 4.11        | 36.43        | 31.97                         | 68.20           | -36.23        | Peak   |  |
| 2          | 3160.03          | 38.71               | 28.98         | 6.40        | 37.15        | 36.94                         | 68.20           | -31.26        | Peak   |  |
| 3          | 8022.46          | 32.80               | 37.14         | 10.95       | 33.31        | 47.58                         | 68.20           | -20.62        | Peak   |  |
| 4          | 11486.41         | 31.36               | 40.86         | 12.73       | 36.38        | 48.57                         | 68.20           | -19.63        | Peak   |  |

| Band: I    |                  | Worst mode: 802.11a |               |             |              | Test channel: CH <sub>M</sub> |                 |               |        |  |
|------------|------------------|---------------------|---------------|-------------|--------------|-------------------------------|-----------------|---------------|--------|--|
| Test value |                  |                     |               |             | Vertical     |                               |                 |               |        |  |
| Mark       | Frequency<br>MHz | Reading<br>dBuV/m   | Antenna<br>dB | Cable<br>dB | Preamp<br>dB | Level<br>dBuV/m               | Limit<br>dBuV/m | Over<br>limit | Remark |  |
| 1          | 1303.09          | 37.52               | 26.02         | 4.03        | 36.30        | 31.27                         | 68.20           | -36.93        | Peak   |  |
| 2          | 3104.22          | 38.22               | 29.00         | 6.31        | 37.41        | 36.12                         | 68.20           | -32.08        | Peak   |  |
| 3          | 8063.40          | 32.94               | 37.20         | 11.08       | 33.32        | 47.90                         | 68.20           | -20.30        | Peak   |  |
| 4          | 11254.86         | 32.10               | 40.35         | 12.64       | 36.52        | 48.57                         | 68.20           | -19.63        | Peak   |  |

| Band: I    |                  | Worst mode: 802.11a |               |             |              | Test channel: CH <sub>H</sub> |                 |               |        |
|------------|------------------|---------------------|---------------|-------------|--------------|-------------------------------|-----------------|---------------|--------|
| Test value |                  |                     |               | Horizontal  |              |                               |                 |               |        |
| Mark       | Frequency<br>MHz | Reading<br>dBuV/m   | Antenna<br>dB | Cable<br>dB | Preamp<br>dB | Level<br>dBuV/m               | Limit<br>dBuV/m | Over<br>limit | Remark |
| 1          | 1483.73          | 38.13               | 25.96         | 4.30        | 36.81        | 31.58                         | 68.20           | -36.62        | Peak   |
| 2          | 3184.25          | 37.70               | 28.93         | 6.43        | 37.05        | 36.01                         | 68.20           | -32.19        | Peak   |
| 3          | 8063.40          | 31.95               | 37.20         | 11.08       | 33.32        | 46.91                         | 68.20           | -21.29        | Peak   |
| 4          | 10888.51         | 32.06               | 40.57         | 12.52       | 36.76        | 48.39                         | 68.20           | -19.81        | Peak   |

| Band: I    |                  | Worst mode: 802.11a |               |             |              | Test channel: CH <sub>H</sub> |                 |               |        |
|------------|------------------|---------------------|---------------|-------------|--------------|-------------------------------|-----------------|---------------|--------|
| Test value |                  |                     |               | Vertical    |              |                               |                 |               |        |
| Mark       | Frequency<br>MHz | Reading<br>dBuV/m   | Antenna<br>dB | Cable<br>dB | Preamp<br>dB | Level<br>dBuV/m               | Limit<br>dBuV/m | Over<br>limit | Remark |
| 1          | 1367.66          | 37.50               | 26.23         | 4.13        | 36.46        | 31.40                         | 68.20           | -36.80        | Peak   |
| 2          | 3184.25          | 38.62               | 28.93         | 6.43        | 37.05        | 36.93                         | 68.20           | -31.27        | Peak   |
| 3          | 8063.40          | 33.11               | 37.20         | 11.08       | 33.32        | 48.07                         | 68.20           | -20.13        | Peak   |
| 4          | 10833.22         | 32.87               | 40.40         | 12.51       | 36.81        | 48.97                         | 68.20           | -19.23        | Peak   |

| Band: IV        |                   | Worst mode: 802.11a |                     |                   | Test channel: CH <sub>L</sub> |            |              |
|-----------------|-------------------|---------------------|---------------------|-------------------|-------------------------------|------------|--------------|
| Frequency (MHz) | Read Level (dBuV) | Level (dBuV/m)      | Limit Line (dBuV/m) | Margin Limit (dB) | Factor (dB)                   | Test value | Polarization |
| 1732.91         | 23.35             | 17.35               | 74.00               | 56.65             | -6.00                         | Vertical   | Peak         |
| 3624.66         | 30.26             | 31.74               | 74.00               | 42.26             | 1.48                          | Vertical   | Peak         |
| 5717.63         | 28.08             | 37.03               | 74.00               | 36.97             | 8.95                          | Vertical   | Peak         |
| 7123.22         | 27.97             | 42.53               | 74.00               | 31.47             | 14.56                         | Vertical   | Peak         |
| 1364.25         | 23.58             | 18.00               | 74.00               | 56.00             | -5.58                         | Horizontal | Peak         |
| 3188.44         | 29.78             | 30.56               | 74.00               | 43.44             | 0.78                          | Horizontal | Peak         |
| 5751.41         | 27.81             | 37.01               | 74.00               | 36.99             | 9.20                          | Horizontal | Peak         |
| 7738.63         | 28.82             | 44.20               | 74.00               | 29.80             | 15.38                         | Horizontal | Peak         |

| Band: IV        |                   | Worst mode: 802.11a |                     |                   | Test channel: CH <sub>M</sub> |            |              |
|-----------------|-------------------|---------------------|---------------------|-------------------|-------------------------------|------------|--------------|
| Frequency (MHz) | Read Level (dBuV) | Level (dBuV/m)      | Limit Line (dBuV/m) | Margin Limit (dB) | Factor (dB)                   | Test value | Polarization |
| 1912.09         | 22.55             | 16.86               | 74.00               | 57.14             | -5.69                         | Vertical   | Peak         |
| 4103.47         | 28.18             | 31.45               | 74.00               | 42.55             | 3.27                          | Vertical   | Peak         |
| 6830.94         | 28.79             | 42.27               | 74.00               | 31.73             | 13.48                         | Vertical   | Peak         |
| 7884.03         | 28.93             | 45.08               | 74.00               | 28.92             | 16.15                         | Vertical   | Peak         |
| 1593.38         | 23.02             | 16.78               | 74.00               | 57.22             | -6.24                         | Horizontal | Peak         |
| 2808.03         | 23.64             | 25.60               | 74.00               | 48.40             | 1.96                          | Horizontal | Peak         |
| 4764.41         | 27.31             | 34.12               | 74.00               | 39.88             | 6.81                          | Horizontal | Peak         |
| 6217.00         | 27.52             | 38.42               | 74.00               | 35.58             | 10.90                         | Horizontal | Peak         |

| Band: IV        |                   | Worst mode: 802.11a |                     |                   | Test channel: CH <sub>H</sub> |            |              |
|-----------------|-------------------|---------------------|---------------------|-------------------|-------------------------------|------------|--------------|
| Frequency (MHz) | Read Level (dBuV) | Level (dBuV/m)      | Limit Line (dBuV/m) | Margin Limit (dB) | Factor (dB)                   | Test value | Polarization |
| 1781.38         | 23.64             | 17.78               | 74.00               | 56.22             | -5.86                         | Vertical   | Peak         |
| 4930.38         | 27.32             | 34.70               | 74.00               | 39.30             | 7.38                          | Vertical   | Peak         |
| 7625.53         | 28.50             | 44.26               | 74.00               | 29.74             | 15.76                         | Vertical   | Peak         |
| 9596.59         | 29.60             | 46.73               | 74.00               | 27.27             | 17.13                         | Vertical   | Peak         |
| 1496.44         | 21.84             | 16.21               | 74.00               | 57.79             | -5.63                         | Horizontal | Peak         |
| 4193.06         | 28.77             | 32.55               | 74.00               | 41.45             | 3.78                          | Horizontal | Peak         |
| 5788.13         | 27.89             | 37.35               | 74.00               | 36.65             | 9.46                          | Horizontal | Peak         |
| 7904.59         | 29.35             | 45.65               | 74.00               | 28.35             | 16.30                         | Horizontal | Peak         |

## Remark:

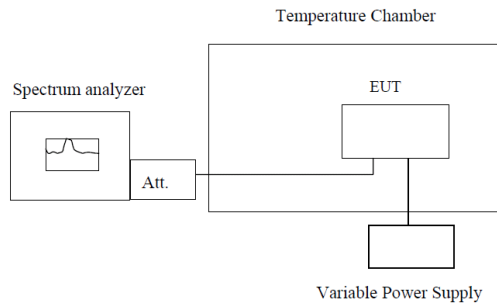
1. Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. The emission levels of other frequencies are very lower than the limit and not show in test report.
3. Measuring frequencies from 1 GHz to 40GHz.
4. Test 802.11a, 802.11n, 802.11ac mode, all modulations have been tested, only worst case is reported

## 5.9. Frequency stability

### LIMIT

Within Operation Band

### TEST CONFIGURATION



Note : Measurement setup for testing on Antenna connector

### TEST PROCEDURE

1. The equipment under test was connected to an external power supply.
2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators.
3. The EUT was placed inside the temperature chamber.
4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency.
5. Turn EUT off and set the chamber temperature to -20°C. After the temperature stabilized for approximately 30 minutes recorded the frequency.
6. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached..

### TEST MODE:

Please refer to the clause 4.3

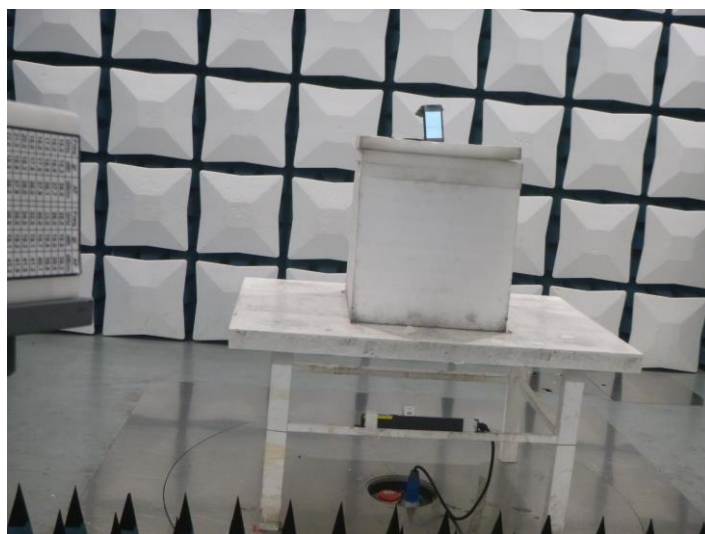
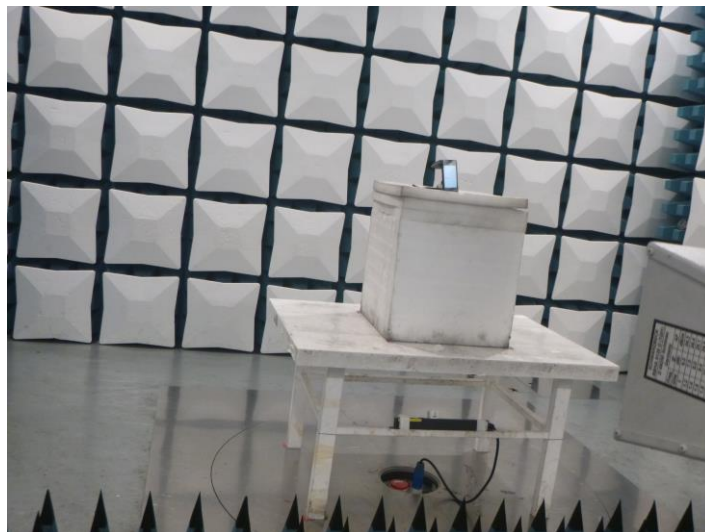
### TEST RESULT

☒ Passed ☐ Not Applicable

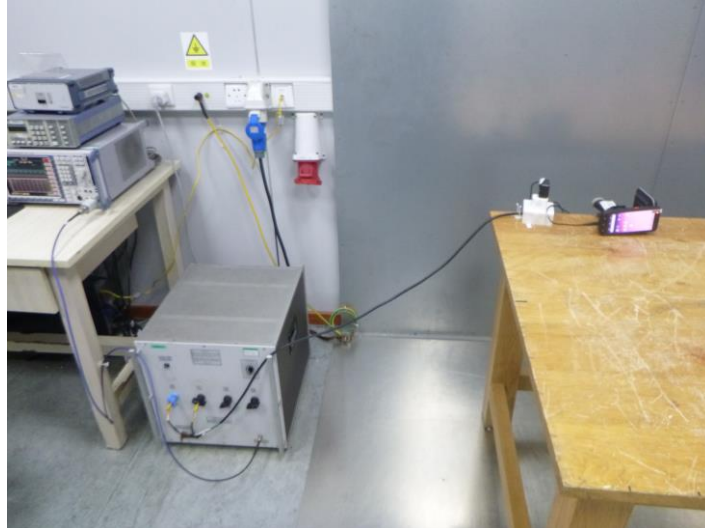
Please refer to appendix F on the appendix report

## 6. TEST SETUP PHOTOS

### Radiated Emission



AC Conducted Emission



## **7. EXTERANAL AND INTERNAL PHOTOS**

Reference to the test report No. : CHTEW21120189

## **8. APPENDIX REPORT**