

# FCC Test Report

**Applicant** : **Drift innovation Ltd**

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**Address** : **The Light Box Unit 125, 111 Power Road,  
London, W4 5PY, United Kingdom**

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**Product Name** : **X5**

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**Report Date** : **Nov. 15, 2023**

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**Shenzhen Anbotek Compliance Laboratory Limited**



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# TEST REPORT

Applicant : Drift innovation Ltd  
Manufacturer : Driftsee Creative Co., Ltd  
Product Name : X5  
Test Model No. : FD9967  
Reference Model No. : N/A  
Trade Mark : N/A  
Rating(s) : Input: 5V $\overline{=}$  2A( with DC 3.7V, 1500mAh battery\*2 inside)  
Test Standard(s) : **FCC Part15 Subpart E, Paragraph 15.407**  
Test Method(s) : **ANSI C63.10: 2020**  
**KDB 789033 D02 General UNII Test Procedures New Rules v02r01**

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC Part 15 Subpart E requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

Date of Receipt

Aug. 22, 2023

Date of Test

Aug. 22~Sept. 28, 2023

Prepared By

*Tu Tu Hong*

(TuTu Hong)

Approved & Authorized Signer

*Edward Pan*

(Edward Pan)



## Revision History

| Report Version | Description     | Issued Date   |
|----------------|-----------------|---------------|
| R00            | Original Issue. | Nov. 15, 2023 |
|                |                 |               |
|                |                 |               |



## 1. General Information

### 1.1. Client Information

|              |   |   |
|--------------|---|---|
| Applicant    | : | Drift innovation Ltd  |
| Address      | : | The Light Box Unit 125, 111 Power Road, London, W4 5PY, United Kingdom                              |
| Manufacturer | : | Driftsee Creative Co., Ltd  |
| Address      | : | RM813, YangGuang YueHai building, Keji South 1st Road, Nanshan District, Shenzhen, GuangDong, China |
| Factory      | : | Driftsee Creative Co., Ltd  |
| Address      | : | RM813, YangGuang YueHai building, Keji South 1st Road, Nanshan District, Shenzhen, GuangDong, China |

### 1.2. Description of Device (EUT)

|                         |   |  |
|-------------------------|---|--|
| Product Name            | : | X5   |
| Test Model No.          | : | FD9967   |
| Reference Model No.     | : | N/A  |
| Trade Mark              | : | N/A  |
| Test Power Supply       | : | AC 120V, 60Hz for adapter/DC 3.7V battery inside   |
| Test Sample No.         | : | 1-2-1(Normal Sample), 1-2-2(Engineering Sample)  |
| Adapter                 | : | N/A  |
| <b>RF Specification</b> |   |  |
| Operation Mode          | : | <input checked="" type="checkbox"/> a <input checked="" type="checkbox"/> n(HT20) <input checked="" type="checkbox"/> n(HT40) <input checked="" type="checkbox"/> ac(VHT20)<br><input checked="" type="checkbox"/> ac(VHT40) <input checked="" type="checkbox"/> ac(VHT80) <input type="checkbox"/> ac(VHT160) <input type="checkbox"/> ax(HEW20)<br><input type="checkbox"/> ax(HEW40) <input type="checkbox"/> ax(HEW80) <input type="checkbox"/> ax(HEW160) |
| Operation Frequency     | : | <input type="checkbox"/> Wi-Fi 5.2G: 5150~5250MHz <input type="checkbox"/> Wi-Fi 5.3G: 5250~5350MHz<br><input type="checkbox"/> Wi-Fi 5.6G: 5470~5725MHz <input checked="" type="checkbox"/> Wi-Fi 5.8G: 5725~5850MHz  |
| Number of Channel       | : | <input checked="" type="checkbox"/> 5 Channels for 20MHz bandwidth (5745MHz ~ 5825MHz)<br><input checked="" type="checkbox"/> 2 Channels for 40MHz bandwidth (5755MHz ~ 5795MHz)<br><input checked="" type="checkbox"/> 1 Channels for 80MHz bandwidth (5775MHz)   |
| Modulation Type         | : | <input checked="" type="checkbox"/> 802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK)<br><input checked="" type="checkbox"/> 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM)<br><input checked="" type="checkbox"/> 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)<br><input type="checkbox"/> 802.11ax: OFDMA(BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)   |
| Antenna Type            | : | PCB antenna  |



|                    |   |         |
|--------------------|---|---------|
| Antenna Gain(Peak) | : | 3.11dBi |
|--------------------|---|---------|

**Remark:** 1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual. 2) All of the RF specification are provided by customer.



### 1.3. Auxiliary Equipment Used During Test

| Description | Rating(s)  |
|-------------|--|
| Adapter     | Model: MDY-11-EX<br>Input: 100-240VAC,50-60Hz, 0.7A<br>Output: 5V= 3A,9V= 3A,12V= 2.25A,20V= 1.35A,11V= 3A |

### 1.4. Description of Test Modes

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

| Frequency Band | Mode                              | Test channel | Frequency (MHz) |
|----------------|-----------------------------------|--------------|-----------------|
| 5.8GHz         | OFDM<br>802.11a/n(HT20) /ac(HT20) | CH 149       | 5745MHz         |
|                |                                   | CH 157       | 5785MHz         |
|                |                                   | CH 165       | 5825MHz         |
|                | OFDM<br>802.11n(HT40)/ac(HT40)    | CH 151       | 5755MHz         |
|                |                                   | CH 159       | 5795MHz         |
|                |                                   | CH 155       | 5775MHz         |

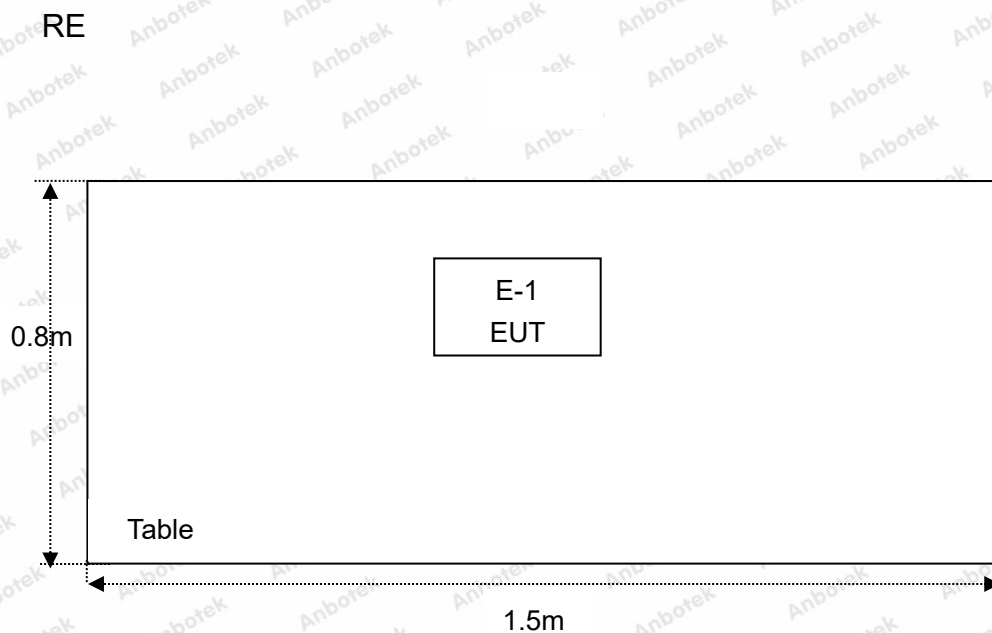
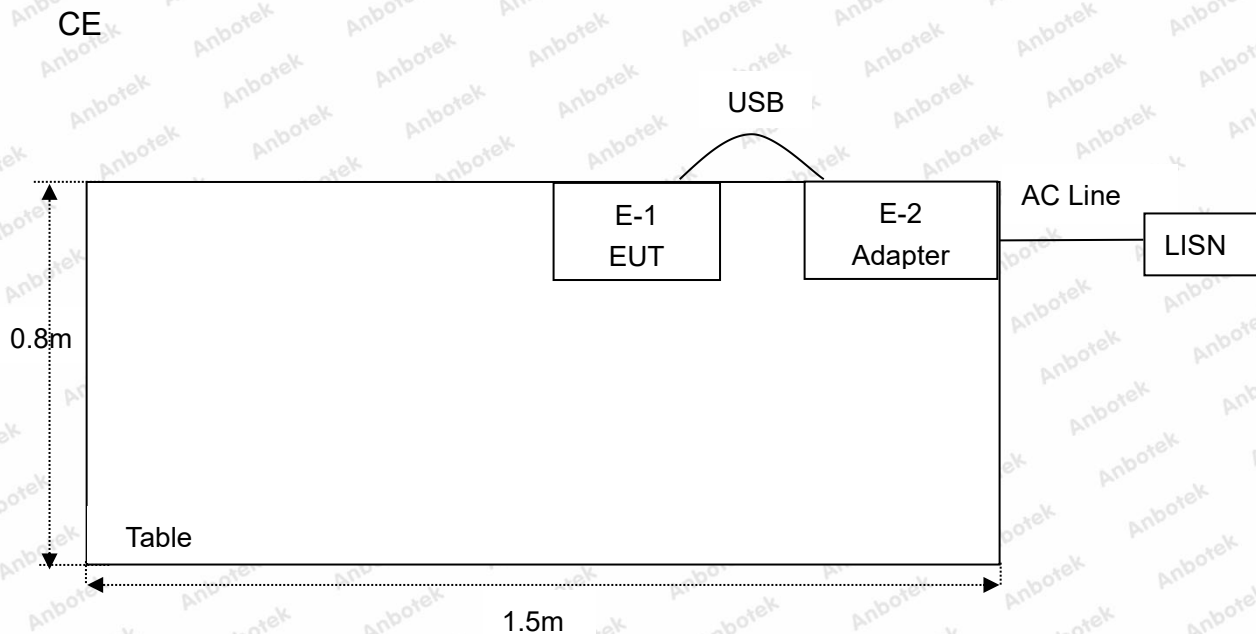
Note:

1. The measurements are performed at the highest, middle, lowest available channels.
2. The EUT has been tested as an independent unit. And Continual Transmitting in maximum power.
3. For the relevant Conducted Measurement, the temporary antenna connector is used during the measurement. Antenna Connector Impedance: 50Ω, Cable Loss: 1.0 dB
4. The EUT was programmed to be in continuously transmitting mode.





## 1.5. Description Of Test Setup



**1.6. Test Equipment List**

| Item | Equipment   | Manufacturer    | Model No.         | Serial No.   | Last Cal.     | Cal. Interval |
|------|---|-----------------|-------------------|--------------|---------------|---------------|
| 1.   | L.I.S.N.<br>Artificial Mains<br>Network           | Rohde & Schwarz | ENV216            | 100055       | Oct. 23, 2022 | 1 Year        |
| 2.   | Three Phase V-type<br>Artificial Power<br>Network | CYBERTEK        | EM5040DT          | E215040DT001 | Jul. 05, 2023 | 1 Year        |
| 3.   | EMI Test Receiver                                 | Rohde & Schwarz | ESCI              | 100627       | Oct. 13, 2022 | 1 Year        |
| 4.   | EMI Test Receiver                                 | Rohde & Schwarz | ESR26             | 101481       | Oct. 23, 2022 | 1 Year        |
| 5.   | MXA Spectrum<br>Analysis                          | Agilent         | N9020A            | MY51170037   | Oct. 13, 2022 | 1 Year        |
| 6.   | EMI Preamplifier                                  | SKET Electronic | LNPA-0118G<br>-45 | SKET-PA-002  | Oct. 13, 2022 | 1 Year        |
| 7.   | Double Ridged Horn<br>Antenna                     | SCHWARZBECK     | BBHA<br>9120D     | 02555        | Oct. 16, 2022 | 3 Year        |
| 8.   | Bilog Broadband<br>Antenna                        | Schwarzbeck     | VULB9163          | 345          | Oct. 23, 2022 | 3 Year        |
| 9.   | Loop Antenna                                      | Schwarzbeck     | FMZB1519B         | 00053        | Oct. 23, 2022 | 1 Year        |
| 10.  | Horn Antenna                                      | A-INFO          | LB-180400-<br>KF  | J211060628   | Oct. 23, 2022 | 1 Year        |
| 11.  | Pre-amplifier                                     | SONOMA          | 310N              | 186860       | Oct. 23, 2022 | 1 Year        |
| 12.  | EMI Test Software<br>EZ-EMC                       | SHURPLE         | N/A               | N/A          | N/A           | N/A           |
| 13.  | MXA Spectrum<br>Analysis                          | KEYSIGHT        | N9020A            | MY53280032   | Oct. 13, 2022 | 1 Year        |
| 14.  | MXG RF Vector<br>Signal Generator                 | Agilent         | N5182A            | MY48180656   | Oct. 13, 2022 | 1 Year        |
| 15.  | Signal Generator                                  | Agilent         | E4421B            | MY41000743   | Oct. 13, 2022 | 1 Year        |
| 16.  | DC Power Supply                                   | IVYTECH         | IV3605            | 1804D360510  | Oct. 22, 2022 | 1 Year        |
| 17.  | Constant<br>Temperature<br>Humidity Chamber       | ZHONGJIAN       | ZJ-KHWS80<br>B    | N/A          | Oct. 19, 2022 | 1 Year        |
| 18.  | Power Meter                                       | Agilent         | N1914A            | MY50001102   | Oct.26, 2022  | 1 Year        |



### 1.7. Measurement Uncertainty

| Parameter   | Uncertainty   |
|---|---|
| Conducted emissions (AMN 150kHz~30MHz)  | 3.8dB   |
| Occupied Bandwidth  | 925Hz   |
| Conducted Output Power  | 0.76dB  |
| Conducted Spurious Emission   | 1.24dB  |
| Radiated spurious emissions (Below 30MHz)   | 3.53dB  |
| Radiated spurious emissions (30MHz~1GHz)  | Horizontal: 3.92dB; Vertical: 4.52dB                      |
| Radiated spurious emissions (above 1GHz)  | 1G-6GHz: 4.78dB;<br>6G-18GHz: 4.88dB<br>18G-40GHz: 5.68dB |
| The measurement uncertainty and decision risk evaluated according to AB/WI-RF-F-032.<br>This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2. |   |

### 1.8. Description of Test Facility

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

#### FCC-Registration No.: 434132

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No. 434132.

#### ISED-Registration No.: 8058A

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (ISED) Innovation, Science and Economic Development Canada. The acceptance letter from the ISED is maintained in our files. Registration 8058A.

#### Test Location

Shenzhen Anbotek Compliance Laboratory Limited.

1/F, Building D, Sogood Science and Technology Park, Sanwei community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.



**1.9. Disclaimer**

1. The test report is invalid if not marked with the signatures of the persons responsible for preparing and approving the test report.
2. The test report is invalid if there is any evidence and/or falsification.
3. The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein.
4. This document may not be altered or revised in any way unless done so by Anbotek and all revisions are duly noted in the revisions section.
5. Content of the test report, in part or in full, cannot be used for publicity and/or promotional purposes without prior written approval from the laboratory.
6. The authenticity of the information provided by the customer is the responsibility of the customer and the laboratory is not responsible for its authenticity.

The laboratory is only responsible for the data released by the laboratory, except for the part provided by the applicant.



## 2. Summary of Test Results

| Standard  | Test Type                                   | Result |
|---|---|--------|
| 15.207 & 15.407(b)  | Conducted Emission                          | PASS   |
| 15.205 & 15.209   | Spurious Emission                           | PASS   |
| 15.407(b)   | Band Edge                                   | PASS   |
| 15.407(a) & 2.1049  | 26dB Bandwidth & 99% Occupied Bandwidth     | PASS   |
| 15.407(e)   | Minimum 6dB bandwidth (5.725-5.85GHz band ) | PASS   |
| 15.407(a)   | Maximum Conducted Output Power              | PASS   |
| 15.407(a)   | Peak Power Spectral Density                 | PASS   |
| 15.407(g)   | Frequency Stability                         | PASS   |
| 15.203  | Antenna Requirement                         | PASS   |
| <b>Remark:</b> "N/A" is an abbreviation for Not Applicable. |   |        |



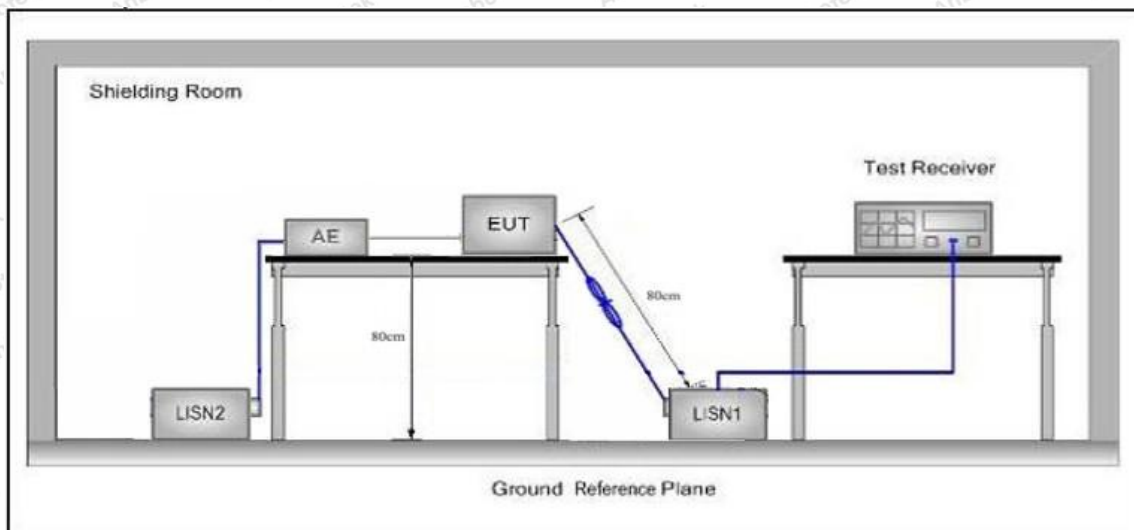
## 3. Conducted Emission Test

### 3.1. Test Standard and Limit

| Test Standard | FCC Part15 Section 15.207 & 15.407(b) |                                |               |
|---------------|---------------------------------------|--------------------------------|---------------|
|               | Frequency                             | Maximum RF Line Voltage (dBuV) |               |
|               |                                       | Quasi-peak Level               | Average Level |
| Test Limit    | 150kHz~500kHz                         | 66 ~ 56 *                      | 56 ~ 46 *     |
|               | 500kHz~5MHz                           | 56                             | 46            |
|               | 5MHz~30MHz                            | 60                             | 50            |

**Remark:** (1) \*Decreasing linearly with logarithm of the frequency.  
 (2) The lower limit shall apply at the transition frequency.

### 3.2. Test Setup



### 3.3. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.10: 2020 on Conducted Emission Measurement.

The bandwidth of test receiver (ESCI) set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

### 3.4. Test Data

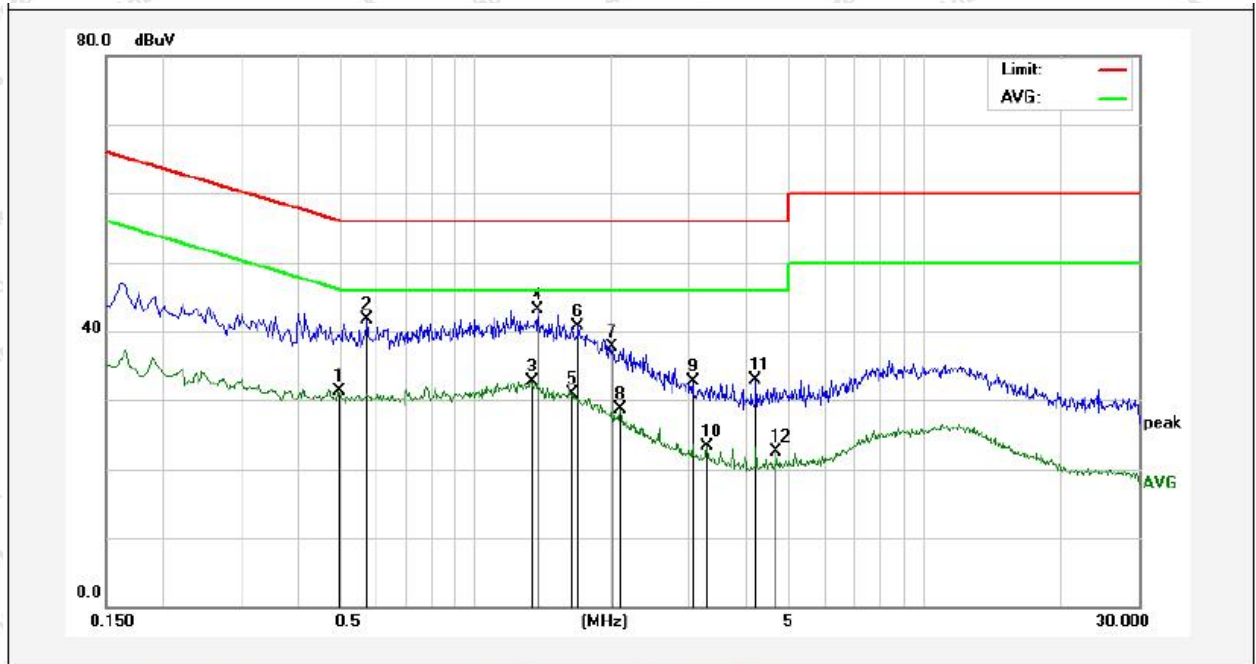
During the test, pre-scan all modes, only the worst case is recorded in the report.

AC conducted emission pre-test at both at AC 120V/60Hz and AC 240V/60Hz modes, recorded worst case AC 120V/60Hz.



### Conducted Emission Test Data

Test Site: 1# Shielded Room  
 Operating Condition: 802.11ac(HT20) 5745MHz  
 Test Specification: AC 120V, 60Hz for adapter  
 Comment: Live Line  
 Temp.(°C)/Hum.(%RH): 22.1°C/52%RH

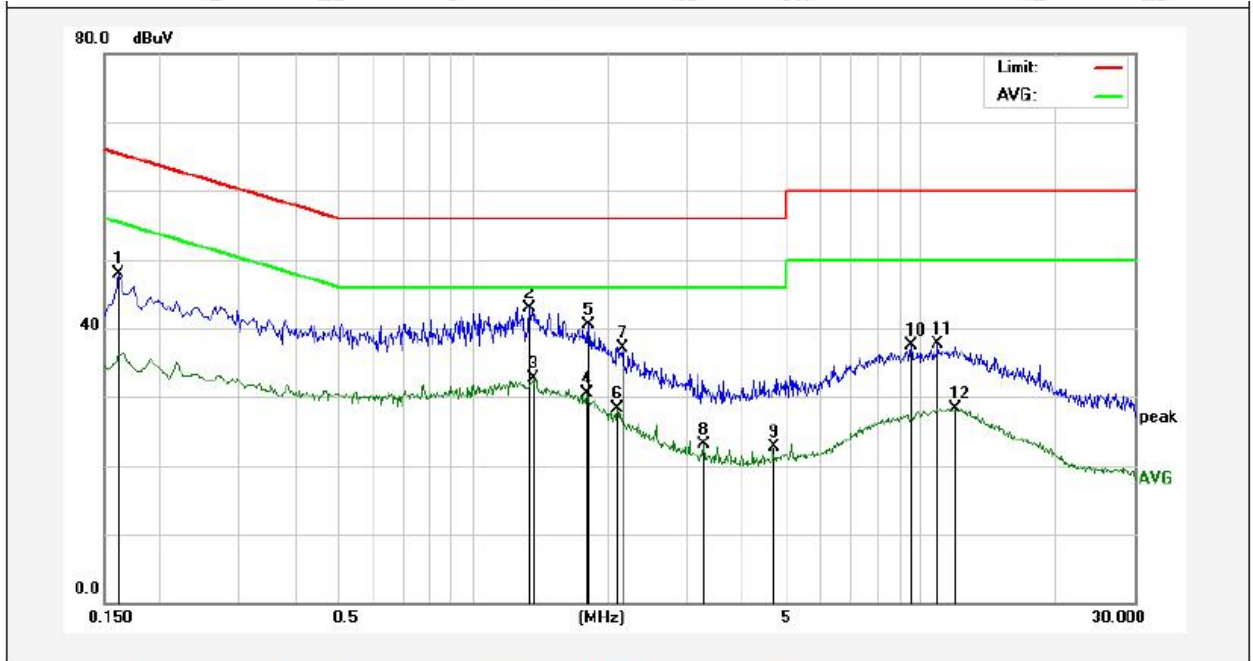


| No. | Freq. (MHz) | Reading (dBuV) | Factor (dB) | Result (dBuV) | Limit (dBuV) | Over Limit (dB) | Detector | Remark |
|-----|-------------|----------------|-------------|---------------|--------------|-----------------|----------|--------|
| 1   | 0.4940      | 11.37          | 19.85       | 31.22         | 46.10        | -14.88          | AVG      |        |
| 2   | 0.5740      | 21.82          | 19.86       | 41.68         | 56.00        | -14.32          | QP       |        |
| 3   | 1.3340      | 12.84          | 19.84       | 32.68         | 46.00        | -13.32          | AVG      |        |
| 4   | 1.3779      | 23.19          | 19.84       | 43.03         | 56.00        | -12.97          | QP       |        |
| 5   | 1.6380      | 11.03          | 19.84       | 30.87         | 46.00        | -15.13          | AVG      |        |
| 6   | 1.6900      | 20.81          | 19.84       | 40.65         | 56.00        | -15.35          | QP       |        |
| 7   | 2.0180      | 17.91          | 19.83       | 37.74         | 56.00        | -18.26          | QP       |        |
| 8   | 2.1099      | 8.86           | 19.83       | 28.69         | 46.00        | -17.31          | AVG      |        |
| 9   | 3.0500      | 12.86          | 19.84       | 32.70         | 56.00        | -23.30          | QP       |        |
| 10  | 3.2820      | 3.50           | 19.84       | 23.34         | 46.00        | -22.66          | AVG      |        |
| 11  | 4.2180      | 13.01          | 19.84       | 32.85         | 56.00        | -23.15          | QP       |        |
| 12  | 4.6900      | 2.74           | 19.85       | 22.59         | 46.00        | -23.41          | AVG      |        |



### Conducted Emission Test Data

Test Site: 1# Shielded Room  
 Operating Condition: 802.11ac(HT20) 5745MHz  
 Test Specification: AC 120V, 60Hz for adapter  
 Comment: Neutral Line  
 Temp.(°C)/Hum.(%RH): 22.1°C/52%RH



| No. | Freq. (MHz) | Reading (dBUV) | Factor (dB) | Result (dBUV) | Limit (dBUV) | Over Limit (dB) | Detector | Remark |
|-----|-------------|----------------|-------------|---------------|--------------|-----------------|----------|--------|
| 1   | 0.1620      | 28.00          | 19.83       | 47.83         | 65.36        | -17.53          | QP       |        |
| 2   | 1.3340      | 23.04          | 19.84       | 42.88         | 56.00        | -13.12          | QP       |        |
| 3   | 1.3660      | 12.84          | 19.84       | 32.68         | 46.00        | -13.32          | AVG      |        |
| 4   | 1.7980      | 10.57          | 19.84       | 30.41         | 46.00        | -15.59          | AVG      |        |
| 5   | 1.8140      | 20.61          | 19.84       | 40.45         | 56.00        | -15.55          | QP       |        |
| 6   | 2.1099      | 8.39           | 19.83       | 28.22         | 46.00        | -17.78          | AVG      |        |
| 7   | 2.1580      | 17.18          | 19.83       | 37.01         | 56.00        | -18.99          | QP       |        |
| 8   | 3.2820      | 3.18           | 19.84       | 23.02         | 46.00        | -22.98          | AVG      |        |
| 9   | 4.6860      | 2.94           | 19.85       | 22.79         | 46.00        | -23.21          | AVG      |        |
| 10  | 9.5420      | 17.46          | 19.96       | 37.42         | 60.00        | -22.58          | QP       |        |
| 11  | 10.9220     | 17.76          | 20.02       | 37.78         | 60.00        | -22.22          | QP       |        |
| 12  | 11.9540     | 8.32           | 20.06       | 28.38         | 50.00        | -21.62          | AVG      |        |





## 4. Radiation Spurious Emission and Band Edge

### 4.1. Test Standard and Limit

| Radiated Spurious Emission |                                      |                                  |  |            |                          |
|----------------------------|--------------------------------------|----------------------------------|--|------------|--------------------------|
| Test Standard              | FCC Part15 C Section 15.205 & 15.209 |                                  |  |            |                          |
| Test Limit                 | Frequency (MHz)                      | Field strength (microvolt/meter) | Limit (dBuV/m)   | Remark     | Measurement distance (m) |
|                            | 0.009MHz~0.490MHz                    | 2400/F(kHz)                      | -  | -          | 300                      |
|                            | 0.490MHz-1.705MHz                    | 24000/F(kHz)                     | -  | -          | 30                       |
|                            | 1.705MHz-30MHz                       | 30                               | -  | -          | 30                       |
|                            | 30MHz~88MHz                          | 100                              | 40.0   | Quasi-peak | 3                        |
|                            | 88MHz~216MHz                         | 150                              | 43.5   | Quasi-peak | 3                        |
|                            | 216MHz~960MHz                        | 200                              | 46.0   | Quasi-peak | 3                        |
|                            | 960MHz~1000MHz                       | 500                              | 54.0   | Quasi-peak | 3                        |
|                            | Above 1000MHz                        | 500                              | 54.0   | Average    | 3                        |
|                            |                                      | -                                | 68.2   | Peak       | 3                        |
| Band Edge                  |                                      |                                  |  |            |                          |
| Test Standard              | 15.407(b)                            |                                  |  |            |                          |
| Test Limit                 | Operating Band                       | Frequency                        | EIRP Limit   |            | Remark                   |
|                            | 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                        | Above 1GHz                       | -27dBm/MHz(68.2dBuV/m)@3m                                |            | Peak                     |
|                            |                                      | 1GHz-5.65GHz                     | -27*dBm/MHz to 10dBm/MHz (68.2* dBuV/m to 105.6dBuV/m)   |            | Peak                     |
|                            |                                      | 5.65GHz-5.7GHz                   | 10*dBm/MHz to 15.6dBm/MHz (105.6*dBuV/m to 110.8dBuV/m)  |            | Peak                     |
|                            |                                      | 5.7GHz-5.72GHz                   | 15.6*dBm/MHz to 27dBm/MHz (110.8dBuV/m to* 122.2dBuV/m)  |            | Peak                     |
|                            |                                      | 5.72GHz-5.725GHz                 | 27dBm/MHz to 15.6*dBm/MHz (122.2dBuV/m to 110.8* dBuV/m) |            | Peak                     |



|  |                   |   |      |
|--|-------------------|---|------|
|  | 5.85GHz-5.855GHz  | 15.6dBm/MHz to 10*dBm/MHz<br>(110.8dBuV/m to 105.6* dBuV/m) | Peak |
|  | 5.855GHz-5.875GHz | 10dBm/MHz to -27*dBm/MHz<br>(105.6dBuV/m to 68.2* dBuV/m)   | Peak |
|  | 5.875GHz-5.925GHz | -27 dBm/MHz(68.2dBuV/m)@3m                                  | Peak |

**Remark:**

(1)The lower limit shall apply at the transition frequency.

(2) 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

(3)Above 1GHz limit: $E[dBuV/m] = EIRP[dBm] + 95.2 = 68.2 dBuV/m$ , for  $EIRP[dBm] = -27dBm$ .

## 4.2. Test Setup

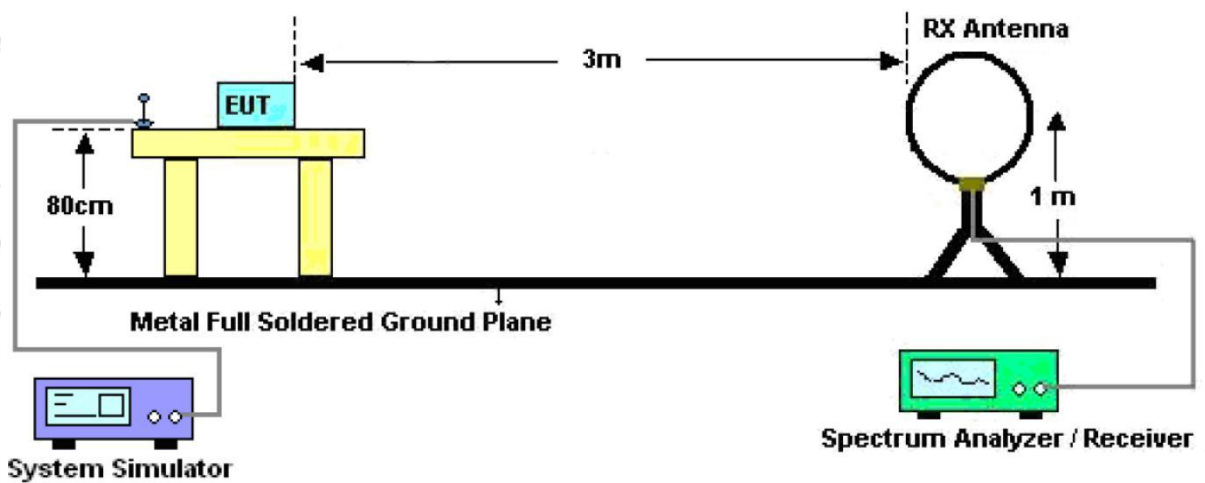


Figure 1. Below 30MHz



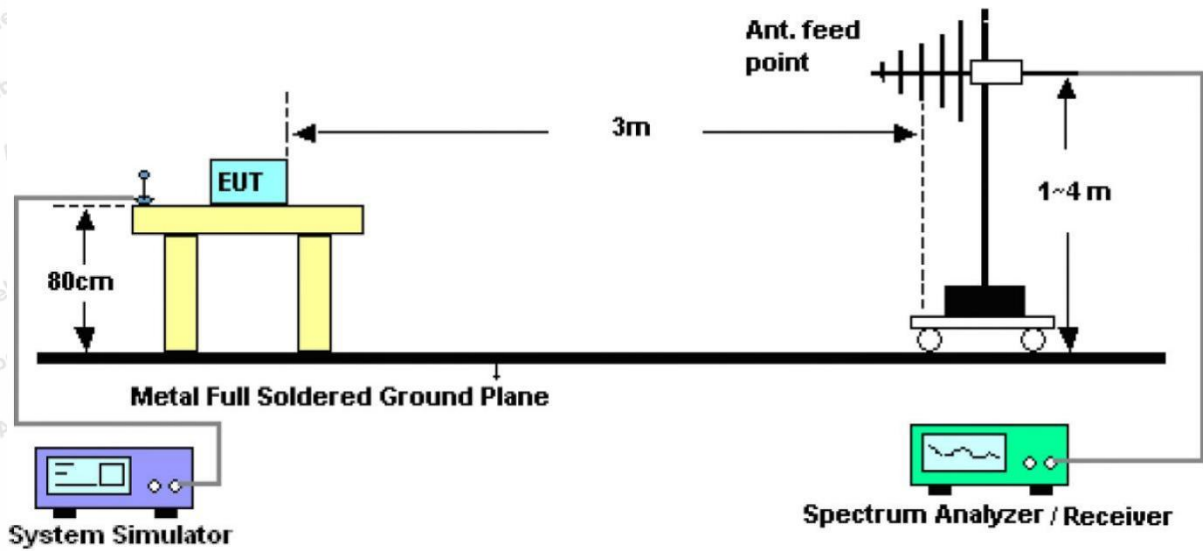


Figure 2. 30MHz to 1GHz

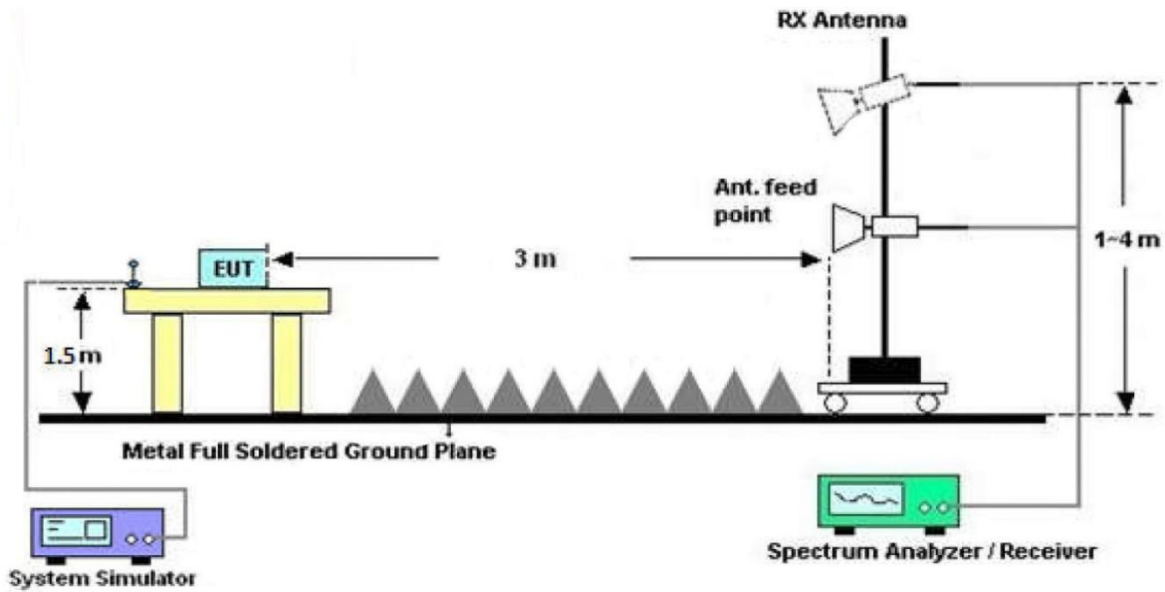


Figure 3. Above 1 GHz

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

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

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

For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for



maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

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

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

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

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

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

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

For above 1GHz, Set the spectrum analyzer as:

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

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

### 4.3. Test Data

#### PASS

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

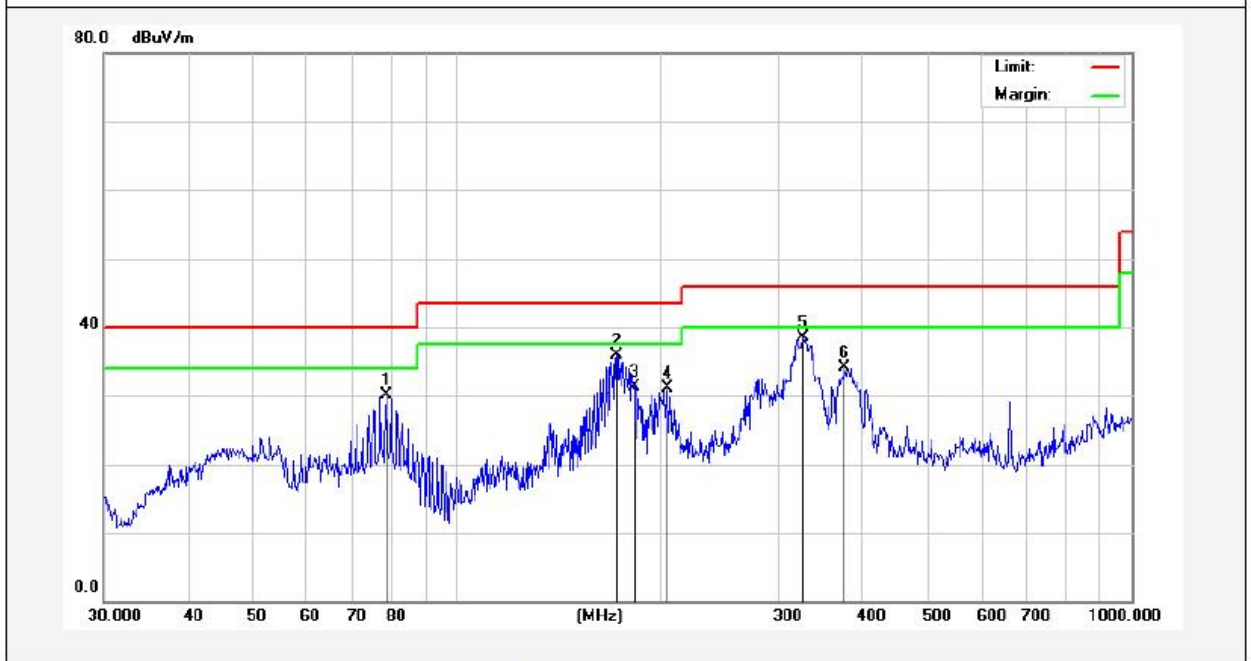
The test results of 9kHz-30MHz was attenuated more than 20dB below the permissible limits, so the results don't record in the report.

During the test, pre-scan all the modes, only the worst case is recorded in the report.



### Test Results (30~1000MHz)

Test Mode: 802.11ac(HT20) 5745MHz  
 Power Source: DC 3.7V Battery inside  
 Polarization: Vertical  
 Temp.(°C)/Hum.(%RH): 24.8°C/41%RH

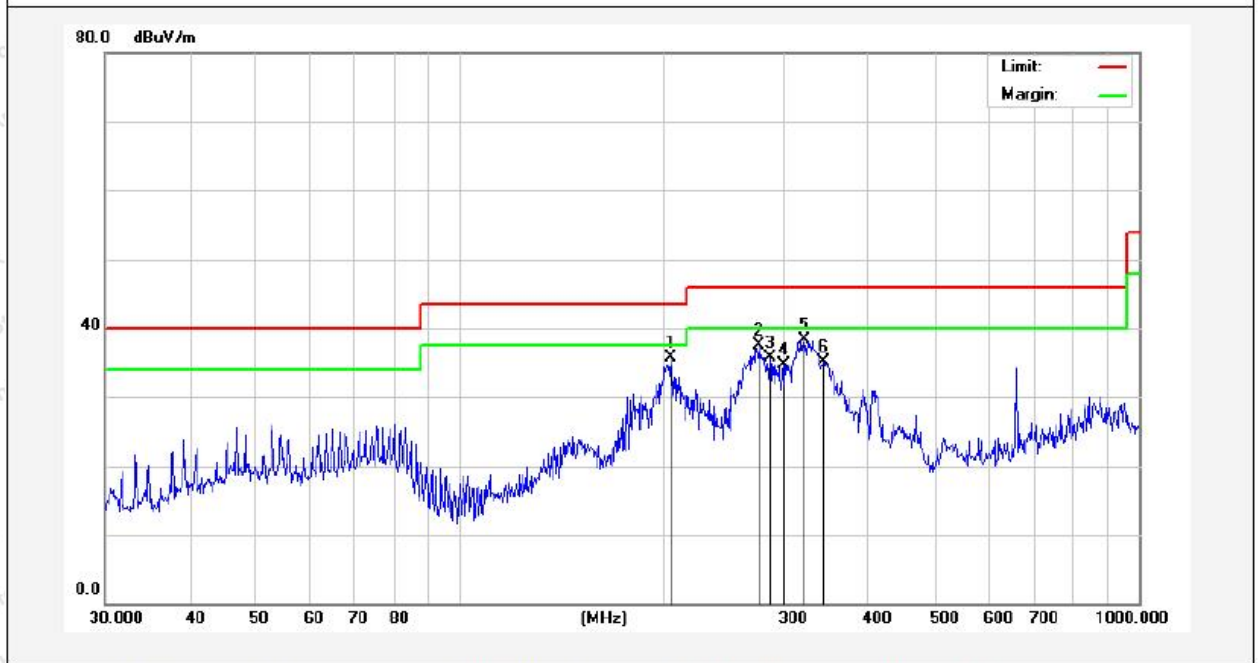


| No. | Freq. (MHz) | Reading (dBuV) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|----------------|---------------|-----------------|----------------|-----------------|----------|-------------|--------------|--------|
| 1   | 78.6888     | 49.66          | -19.46        | 30.20           | 40.00          | -9.80           | QP       |             |              |        |
| 2   | 172.5988    | 56.85          | -20.99        | 35.86           | 43.50          | -7.64           | QP       |             |              |        |
| 3   | 183.2005    | 51.82          | -20.45        | 31.37           | 43.50          | -12.13          | QP       |             |              |        |
| 4   | 205.6750    | 50.48          | -19.46        | 31.02           | 43.50          | -12.48          | QP       |             |              |        |
| 5   | 325.5957    | 54.12          | -15.62        | 38.50           | 46.00          | -7.50           | QP       |             |              |        |
| 6   | 375.9384    | 48.72          | -14.71        | 34.01           | 46.00          | -11.99          | QP       |             |              |        |



**Test Results (30~1000MHz)**

Test Mode: 802.11ac(HT20) 5745MHz  
 Power Source: DC 3.7V Battery inside  
 Polarization: Horizontal  
 Temp.(°C)/Hum.(%RH): 24.8°C/41%RH



| No. | Freq. (MHz) | Reading (dBuV) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Detector | Height (cm) | degree (deg) | Remark |
|-----|-------------|----------------|---------------|-----------------|----------------|-----------------|----------|-------------|--------------|--------|
| 1   | 204.2375    | 58.04          | -22.26        | 35.78           | 43.50          | -7.72           | QP       |             |              |        |
| 2   | 275.1569    | 56.78          | -19.32        | 37.46           | 46.00          | -8.54           | QP       |             |              |        |
| 3   | 285.9778    | 54.15          | -18.37        | 35.78           | 46.00          | -10.22          | QP       |             |              |        |
| 4   | 299.3158    | 51.91          | -17.22        | 34.69           | 46.00          | -11.31          | QP       |             |              |        |
| 5   | 321.0605    | 55.01          | -16.67        | 38.34           | 46.00          | -7.66           | QP       |             |              |        |
| 6   | 343.1800    | 51.26          | -16.15        | 35.11           | 46.00          | -10.89          | QP       |             |              |        |



## Test Results (Above 1000MHz)

| Test Mode: IEEE 802.11ac(HT20) |                |               |                 |                |                 |              |          |
|--------------------------------|----------------|---------------|-----------------|----------------|-----------------|--------------|----------|
| Test channel: Low CH           |                |               |                 |                |                 |              |          |
| Frequency (MHz)                | Reading (dBuV) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Over limit (dB) | Antenna Pol. | Detector |
| 11490.000                      | 28.48          | 23.36         | 51.84           | 68.20          | -16.36          | V            | Peak     |
| 17235.000                      | 29.79          | 31.97         | 61.76           | 68.20          | -6.44           | V            | Peak     |
| 11490.000                      | 28.88          | 23.36         | 52.24           | 68.20          | -15.96          | H            | Peak     |
| 17235.000                      | 30.03          | 31.97         | 62.00           | 68.20          | -6.20           | H            | Peak     |
| 11490.000                      | 17.74          | 23.36         | 41.10           | 54.00          | -12.90          | V            | AVG      |
| 17235.000                      | 18.46          | 31.97         | 50.43           | 54.00          | -3.57           | V            | AVG      |
| 11490.000                      | 17.91          | 23.36         | 41.27           | 54.00          | -12.73          | H            | AVG      |
| 17235.000                      | 18.01          | 31.97         | 49.98           | 54.00          | -4.02           | H            | AVG      |
| Test channel: Middle CH        |                |               |                 |                |                 |              |          |
| Frequency (MHz)                | Reading (dBuV) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Over limit (dB) | Antenna Pol. | Detector |
| 11570.000                      | 29.06          | 23.42         | 52.48           | 68.20          | -15.72          | V            | Peak     |
| 17355.000                      | 29.67          | 32.18         | 61.85           | 68.20          | -6.35           | V            | Peak     |
| 11570.000                      | 29.08          | 23.42         | 52.50           | 68.20          | -15.70          | H            | Peak     |
| 17355.000                      | 30.12          | 32.18         | 62.30           | 68.20          | -5.90           | H            | Peak     |
| 11570.000                      | 19.006         | 23.42         | 42.43           | 54.00          | -11.57          | V            | AVG      |
| 17355.000                      | 18.785         | 32.18         | 50.96           | 54.00          | -3.04           | V            | AVG      |
| 11570.000                      | 18.896         | 23.42         | 42.32           | 54.00          | -11.68          | H            | AVG      |
| 17355.000                      | 18.388         | 32.18         | 50.57           | 54.00          | -3.43           | H            | AVG      |
| Test channel: High CH          |                |               |                 |                |                 |              |          |
| Frequency (MHz)                | Reading (dBuV) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Over limit (dB) | Antenna Pol. | Detector |
| 11650.000                      | 28.57          | 23.49         | 52.06           | 68.20          | -16.14          | V            | Peak     |
| 17475.000                      | 29.91          | 32.39         | 62.30           | 68.20          | -5.90           | V            | Peak     |
| 11650.000                      | 28.82          | 23.49         | 52.31           | 68.20          | -15.89          | H            | Peak     |
| 17475.000                      | 29.73          | 32.39         | 62.12           | 68.20          | -6.08           | H            | Peak     |
| 11650.000                      | 18.08          | 23.49         | 41.57           | 54.00          | -12.43          | V            | AVG      |
| 17475.000                      | 18.58          | 32.39         | 50.97           | 54.00          | -3.03           | V            | AVG      |
| 11650.000                      | 18.08          | 23.49         | 41.57           | 54.00          | -12.43          | H            | AVG      |
| 17475.000                      | 18.36          | 32.39         | 50.75           | 54.00          | -3.25           | H            | AVG      |

## Remark:

1. During the test, pre-scan the 802.11a, 802.11n(HT20), ac(HT20), n(HT40), ac(HT40), ac(HT80) mode, and found the 802.11ac(HT20) mode is worse case, the report only record this mode.
2. Result = Reading + Factor



**Radiated Band Edge:**

| Test Mode: IEEE 802.11a |                |               |                 |                |                 |              |          |
|-------------------------|----------------|---------------|-----------------|----------------|-----------------|--------------|----------|
| Test channel: Lowest    |                |               |                 |                |                 |              |          |
| Frequency (MHz)         | Reading (dBuV) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Over limit (dB) | Antenna Pol. | Detector |
| 5725.00                 | 37.96          | 16.37         | 54.33           | 74.00          | -19.67          | H            | Peak     |
| 5725.00                 | 39.26          | 16.37         | 55.63           | 74.00          | -18.37          | V            | Peak     |
| 5725.00                 | 28.88          | 16.70         | 45.58           | 54.00          | -8.42           | H            | AVG      |
| 5725.00                 | 29.97          | 16.70         | 46.67           | 54.00          | -7.33           | V            | AVG      |
| Test channel: Highest   |                |               |                 |                |                 |              |          |
| Frequency (MHz)         | Reading (dBuV) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Over limit (dB) | Antenna Pol. | Detector |
| 5850.00                 | 38.86          | 17.21         | 56.07           | 68.20          | -12.13          | H            | Peak     |
| 5850.00                 | 39.19          | 17.21         | 56.40           | 68.20          | -11.80          | V            | Peak     |
| 5850.00                 | 28.89          | 17.21         | 46.10           | 54.00          | -7.90           | H            | AVG      |
| 5850.00                 | 28.94          | 17.21         | 46.15           | 54.00          | -7.85           | V            | AVG      |

Remark: 1. Result = Reading + Factor

| Test Mode: IEEE 802.11n(HT20) |                |               |                 |                |                 |              |          |
|-------------------------------|----------------|---------------|-----------------|----------------|-----------------|--------------|----------|
| Test channel: Lowest          |                |               |                 |                |                 |              |          |
| Frequency (MHz)               | Reading (dBuV) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Over limit (dB) | Antenna Pol. | Detector |
| 5725.00                       | 37.91          | 16.37         | 54.28           | 74.00          | -19.72          | H            | Peak     |
| 5725.00                       | 38.43          | 16.37         | 54.80           | 74.00          | -19.20          | V            | Peak     |
| 5725.00                       | 27.48          | 16.70         | 44.18           | 54.00          | -9.82           | H            | AVG      |
| 5725.00                       | 27.95          | 16.70         | 44.65           | 54.00          | -9.35           | V            | AVG      |
| Test channel: Highest         |                |               |                 |                |                 |              |          |
| Frequency (MHz)               | Reading (dBuV) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Over limit (dB) | Antenna Pol. | Detector |
| 5850.00                       | 37.10          | 17.21         | 54.31           | 68.20          | -13.89          | H            | Peak     |
| 5850.00                       | 37.77          | 17.21         | 54.98           | 68.20          | -13.22          | V            | Peak     |
| 5850.00                       | 27.31          | 17.21         | 44.52           | 54.00          | -9.48           | H            | AVG      |
| 5850.00                       | 28.22          | 17.21         | 45.43           | 54.00          | -8.57           | V            | AVG      |

Remark: 1. Result = Reading + Factor





| Test Mode: IEEE 802.11n(HT40) |                |               |                 |                |                 |              |          |
|-------------------------------|----------------|---------------|-----------------|----------------|-----------------|--------------|----------|
| Test channel: Lowest          |                |               |                 |                |                 |              |          |
| Frequency (MHz)               | Reading (dBuV) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Over limit (dB) | Antenna Pol. | Detector |
| 5725.00                       | 37.49          | 16.37         | 53.86           | 74.00          | -20.14          | H            | Peak     |
| 5725.00                       | 38.31          | 16.37         | 54.68           | 74.00          | -19.32          | V            | Peak     |
| 5725.00                       | 26.87          | 16.70         | 43.57           | 54.00          | -10.43          | H            | AVG      |
| 5725.00                       | 28.28          | 16.70         | 44.98           | 54.00          | -9.02           | V            | AVG      |
| Test channel: Highest         |                |               |                 |                |                 |              |          |
| Frequency (MHz)               | Reading (dBuV) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Over limit (dB) | Antenna Pol. | Detector |
| 5850.00                       | 37.85          | 17.05         | 54.90           | 68.20          | -13.30          | H            | Peak     |
| 5850.00                       | 38.29          | 17.05         | 55.34           | 68.20          | -12.86          | V            | Peak     |
| 5850.00                       | 28.00          | 17.05         | 45.05           | 54.00          | -8.95           | H            | AVG      |
| 5850.00                       | 29.15          | 17.05         | 46.20           | 54.00          | -7.80           | V            | AVG      |

Remark: 1. Result =Reading + Factor

| Test Mode: IEEE 802.11ac(HT20) |                |               |                 |                |                 |              |          |
|--------------------------------|----------------|---------------|-----------------|----------------|-----------------|--------------|----------|
| Test channel: Lowest           |                |               |                 |                |                 |              |          |
| Frequency (MHz)                | Reading (dBuV) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Over limit (dB) | Antenna Pol. | Detector |
| 5725.00                        | 37.17          | 16.37         | 53.54           | 74.00          | -20.46          | H            | Peak     |
| 5725.00                        | 37.43          | 16.37         | 53.80           | 74.00          | -20.20          | V            | Peak     |
| 5725.00                        | 28.15          | 16.70         | 44.85           | 54.00          | -9.15           | H            | AVG      |
| 5725.00                        | 28.86          | 16.70         | 45.56           | 54.00          | -8.44           | V            | AVG      |
| Test channel: Highest          |                |               |                 |                |                 |              |          |
| Frequency (MHz)                | Reading (dBuV) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Over limit (dB) | Antenna Pol. | Detector |
| 5850.00                        | 37.91          | 17.21         | 55.12           | 68.20          | -13.08          | H            | Peak     |
| 5850.00                        | 38.84          | 17.21         | 56.05           | 68.20          | -12.15          | V            | Peak     |
| 5850.00                        | 27.83          | 17.21         | 45.04           | 54.00          | -8.96           | H            | AVG      |
| 5850.00                        | 28.82          | 17.21         | 46.03           | 54.00          | -7.97           | V            | AVG      |

Remark: 1. Result =Reading + Factor



| Test Mode: IEEE 802.11ac(HT40) |                |               |                 |                |                 |              |          |
|--------------------------------|----------------|---------------|-----------------|----------------|-----------------|--------------|----------|
| Test channel: Lowest           |                |               |                 |                |                 |              |          |
| Frequency (MHz)                | Reading (dBuV) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Over limit (dB) | Antenna Pol. | Detector |
| 5725.00                        | 36.14          | 16.37         | 52.51           | 74.00          | -21.49          | H            | Peak     |
| 5725.00                        | 37.72          | 16.37         | 54.09           | 74.00          | -19.91          | V            | Peak     |
| 5725.00                        | 27.43          | 16.70         | 44.13           | 54.00          | -9.87           | H            | AVG      |
| 5725.00                        | 28.14          | 16.70         | 44.84           | 54.00          | -9.16           | V            | AVG      |
| Test channel: Highest          |                |               |                 |                |                 |              |          |
| Frequency (MHz)                | Reading (dBuV) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Over limit (dB) | Antenna Pol. | Detector |
| 5850.00                        | 37.51          | 17.21         | 54.72           | 68.20          | -13.48          | H            | Peak     |
| 5850.00                        | 38.26          | 17.21         | 55.47           | 68.20          | -12.73          | V            | Peak     |
| 5850.00                        | 27.49          | 17.21         | 44.70           | 54.00          | -9.30           | H            | AVG      |
| 5850.00                        | 27.05          | 17.21         | 44.26           | 54.00          | -9.74           | V            | AVG      |

Remark: 1. Result =Reading + Factor

| Test Mode: IEEE 802.11ac(HT80) |                |               |                 |                |                 |              |          |
|--------------------------------|----------------|---------------|-----------------|----------------|-----------------|--------------|----------|
| Test channel: Lowest           |                |               |                 |                |                 |              |          |
| Frequency (MHz)                | Reading (dBuV) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Over limit (dB) | Antenna Pol. | Detector |
| 5725.00                        | 35.44          | 16.37         | 51.81           | 74.00          | -22.19          | H            | Peak     |
| 5725.00                        | 36.91          | 16.37         | 53.28           | 74.00          | -20.72          | V            | Peak     |
| 5725.00                        | 26.35          | 16.70         | 43.05           | 54.00          | -10.95          | H            | AVG      |
| 5725.00                        | 27.03          | 16.70         | 43.73           | 54.00          | -10.27          | V            | AVG      |
| Test channel: Highest          |                |               |                 |                |                 |              |          |
| Frequency (MHz)                | Reading (dBuV) | Factor (dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Over limit (dB) | Antenna Pol. | Detector |
| 5850.00                        | 37.30          | 17.21         | 54.51           | 68.20          | -13.69          | H            | Peak     |
| 5850.00                        | 37.68          | 17.21         | 54.89           | 68.20          | -13.31          | V            | Peak     |
| 5850.00                        | 27.60          | 17.21         | 44.81           | 54.00          | -9.19           | H            | AVG      |
| 5850.00                        | 28.08          | 17.21         | 45.29           | 54.00          | -8.71           | V            | AVG      |

Remark: 1. Result =Reading + Factor

Conducted Measurement:

Please refer to Appendix E of the Appendix Test Data.

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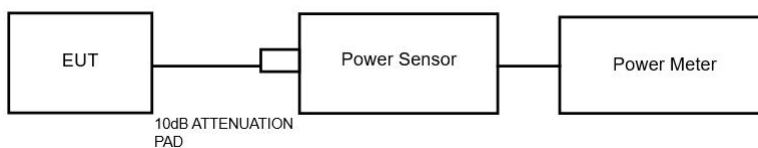


## 5. Maximum conducted output power Test

### 5.1. Test Standard and Limit

| Test Standard   | FCC Part15 C Section 15.407(a)  |   |
|-----------------|---|---|
| Test Limit      | 5.15 - 5.25GHz  | 1) Outdoor AP<br>The maximum conducted output power (Pout) shall not exceed the lesser of 1W (30dBm). if $GT_x > 6dBi$ , then $P_{out} = 30 - (GT_x - 6)$ . e.i.r.p. at any elevation angle above 30 degrees $\leq 125mW$ (21dBm) |
|                 |   | 2) Indoor AP<br>The maximum conducted output power (Pout) shall not exceed the lesser of 1W (30dBm). if $GT_x > 6dBi$ , then $P_{out} = 30 - (GT_x - 6)$ .  |
|                 |   | 3) Point-to-point AP<br>The maximum conducted output power (Pout) shall not exceed the lesser of 1W (30dBm). if $GT_x > 23dBi$ , then $P_{out} = 30 - (GT_x - 23)$ .  |
|                 |   | 4) Client devices<br>The maximum conducted output power (Pout) shall not exceed the lesser of 250W (23.98dBm). if $GT_x > 6dBi$ , then $P_{out} = 24 - (GT_x - 6)$ .  |
|                 |   | 5.25 - 5.35GHz  |
| 5.47- 5.725GHz  | The maximum conducted output power (Pout) shall not exceed the lesser of 250mW (23.98dBm) or $11dBm + 10 \log B$ , where B is the 26dB emission bandwidth in MHz. if $GT_x > 6dBi$ , then $P_{out} = 24 - (GT_x - 6)$ . |   |
| 5.725 - 5.85GHz | 1) Point-to-multipoint systems (P2M)<br>The maximum conducted output power (Pout) shall not exceed the lesser of 1W (30dBm). if $GT_x > 6dBi$ , then $P_{out} = 30 - (GT_x - 6)$ .                                      |   |
|                 | 2) Point-to-point systems (P2P)<br>The maximum conducted output power (Pout) shall not exceed the lesser of 1W (30dBm).   |   |

### 5.2. Test Setup



### 5.3. Test Procedure

1. The Transmitter output (antenna port) was connected to the power meter.



2. Turn on the EUT and power meter and then record the power value.
3. Repeat above procedures on all channels needed to be tested.

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

#### 5.4. Test Data

Pass

Please refer to Appendix C of the Appendix Test Data.

#### Additional test for duty cycle.

Please refer to Appendix B of the Appendix Test Data.

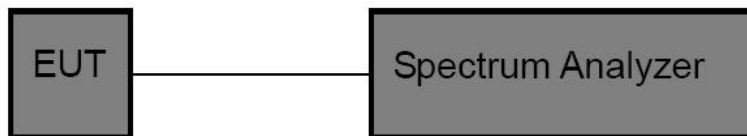


## 6. 26dB Bandwidth & 99% Occupied Bandwidth Test

### 6.1. Test Standard

|               |   |
|---------------|---|
| Test Standard | FCC Part15 C Section 15.407(a) & 2.1049 |
| Test Limit    | N/A                                     |

### 6.2. Test Setup



### 6.3. Test Procedure

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as:
  - 26 dB & 99% bandwidth**
  - RBW = approximately 1% of the emission bandwidth;
  - Set the VBW > RBW;
  - Detector= Peak
  - Trace mode= Max hold.
  - Sweep- auto couple.
4. Measure the maximum width of the emission that is 26dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer.
5. Repeat until all the rest channels are investigated.

### 6.4. Test Data

Pass

Please refer to Appendix A1&A2 of the Appendix Test Data.

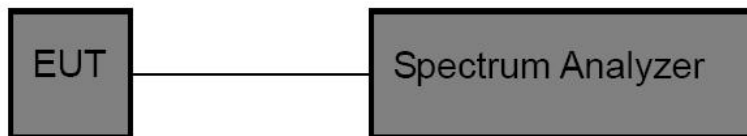


## 7. Minimum 6dB bandwidth Test

### 7.1. Test Standard

|               |                                |
|---------------|--------------------------------|
| Test Standard | FCC Part15 C Section 15.407(e) |
| Test Limit    | $\geq 500$ kHz                 |

### 7.2. Test Setup



### 7.3. Test Procedure

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

4. Set the spectrum analyzer as:

#### 6 dB bandwidth

RBW = approximately 1% of the emission bandwidth;  
 Set the VBW > RBW;  
 Detector= Peak  
 Trace mode= Max hold.  
 Sweep- auto couple.

4. Measure the maximum width of the emission that is 6dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer.
5. Repeat until all the rest channels are investigated.

### 7.4. Test Data

Pass

Please refer to Appendix A3 of the Appendix Test Data.

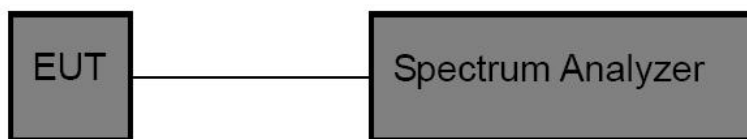


## 8. Power Spectral Density Test

### 8.1. Test Standard and Limit

| Test Standard | FCC Part15 C Section 15.407(a) |  |
|---------------|--------------------------------|--|
| Test Limit    | 5.15 - 5.25GHz                 | 1) Outdoor AP<br>The peak power spectral density (PSD) shall not exceed the lesser of 17dBm/MHz. if $GT_x > 6\text{dBi}$ , then $PSD = 17 - (GT_x - 6)$ .<br>2) Indoor AP<br>The peak power spectral density (PSD) shall not exceed the lesser of 17dBm/MHz. if $GT_x > 6\text{dBi}$ , then $PSD = 17 - (GT_x - 6)$ .<br>3) Point-to-point AP<br>The peak power spectral density (PSD) shall not exceed the lesser of 17dBm/MHz. if $GT_x > 23\text{dBi}$ , then $PSD = 17 - (GT_x - 23)$ .<br>4) Client devices<br>The peak power spectral density (PSD) shall not exceed the lesser of 11dBm/MHz. if $GT_x > 6\text{dBi}$ , then $PSD = 11 - (GT_x - 6)$ . |
|               | 5.25 - 5.35GHz                 | The peak power spectral density (PSD) shall not exceed the lesser of 11dBm/MHz. if $GT_x > 6\text{dBi}$ , then $PSD = 11 - (GT_x - 6)$ .   |
|               | 5.47- 5.725GHz                 | The peak power spectral density (PSD) shall not exceed the lesser of 11dBm/MHz. if $GT_x > 6\text{dBi}$ , then $PSD = 11 - (GT_x - 6)$ .   |
|               | 5.725 - 5.85GHz                | 1) Point-to-multipoint systems (P2M)<br>The peak power spectral density (PSD) shall not exceed the lesser of 30dBm/500kHz. if $GT_x > 6\text{dBi}$ , then $PSD = 30 - (GT_x - 6)$ .<br>2) Point-to-point systems (P2P)<br>The peak power spectral density (PSD) shall not exceed the lesser of 30dBm/500kHz.   |

### 8.2. Test Setup



### 8.3. Test Procedure

For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz).

1. The EUT is directly connected to the spectrum analyzer;
2. Set RBW =1MHz;



3. Set VBW  $\geq$  3 RBW=3MHz;
3. Set the span to encompass the entire emissions bandwidth (EBW) of the signal;
5. Detector=RMS;
6. Sweep time= auto couple;
7. Trace mode=max. hold;

#### 8.4. Test Data

Pass

Please refer to Appendix D of the Appendix Test Data.



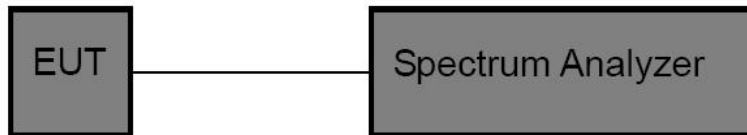


## 9. Frequency Stability

### 9.1. Test Standard and Limit

|               |   |
|---------------|---|
| Test Standard | FCC Part15 Section 15.407(g)  |
| Test Limit    | The frequency tolerance shall be maintained within the band of operation frequency over a temperature variation of 0 degrees to 35 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. |

### 9.2. Test Setup



### 9.3. Test Procedure

The EUT was placed inside the environmental test chamber and powered by nominal AC/DC voltage. b. Turn the EUT on and couple its output to a spectrum analyzer. c. Turn the EUT off and set the chamber to the highest temperature specified. d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize. e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature. f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

### 9.4. Test Data

Pass

Please to see the following pages.



| Test Mode: 5.8G |         |                 |                  |               |                          |              |              |      |
|-----------------|---------|-----------------|------------------|---------------|--------------------------|--------------|--------------|------|
| Mode            | TX Type | Frequency (MHz) | Temperature (°C) | Voltage (VDC) | Measured Frequency (MHz) | Limit        | Verdict      |      |
| 802.11a         | SISO    | 5745            | 20               | 3.15          | 5745.01                  | 5737 to 5753 | Pass         |      |
|                 |         |                 |                  | 3.70          | 5745.06                  | 5737 to 5753 | Pass         |      |
|                 |         |                 |                  | 4.26          | 5745.06                  | 5737 to 5753 | Pass         |      |
|                 |         |                 | -30              | 3.15          | 5745.01                  | 5737 to 5753 | Pass         |      |
|                 |         |                 |                  | -20           | 3.70                     | 5745.02      | 5725 to 5850 | Pass |
|                 |         |                 |                  |               | 3.70                     | 5745.12      | 5725 to 5850 | Pass |
|                 |         |                 | 0                | 3.70          | 5745.09                  | 5725 to 5850 | Pass         |      |
|                 |         |                 |                  | 10            | 3.70                     | 5745.12      | 5725 to 5850 | Pass |
|                 |         |                 | 30               | 3.70          | 5745.09                  | 5725 to 5850 | Pass         |      |
|                 |         |                 | 40               | 3.70          | 5745.10                  | 5725 to 5850 | Pass         |      |
|                 |         | 50              | 3.70             | 5745.01       | 5737 to 5753             | Pass         |              |      |
|                 |         | 5785            | 20               | 3.15          | 5785.01                  | 5777 to 5793 | Pass         |      |
|                 |         |                 |                  | 3.70          | 5785.04                  | 5777 to 5793 | Pass         |      |
|                 |         |                 |                  | 4.26          | 5785.09                  | 5777 to 5793 | Pass         |      |
|                 |         |                 | -30              | 3.15          | 5785.10                  | 5777 to 5793 | Pass         |      |
|                 |         |                 |                  | -20           | 3.70                     | 5785.04      | 5725 to 5850 | Pass |
|                 |         |                 |                  |               | 3.70                     | 5785.05      | 5725 to 5850 | Pass |
|                 |         |                 | 0                | 3.70          | 5785.10                  | 5725 to 5850 | Pass         |      |
|                 |         |                 |                  | 10            | 3.70                     | 5785.03      | 5725 to 5850 | Pass |
|                 |         |                 | 30               | 3.70          | 5785.09                  | 5725 to 5850 | Pass         |      |
|                 |         |                 | 40               | 3.70          | 5785.12                  | 5725 to 5850 | Pass         |      |
|                 |         | 50              | 3.70             | 5785.11       | 5777 to 5793             | Pass         |              |      |
|                 |         | 5825            | 20               | 3.15          | 5825.12                  | 5817 to 5833 | Pass         |      |
|                 |         |                 |                  | 3.70          | 5825.10                  | 5817 to 5833 | Pass         |      |
|                 |         |                 |                  | 4.26          | 5825.05                  | 5817 to 5833 | Pass         |      |
|                 |         |                 | -30              | 3.15          | 5825.08                  | 5817 to 5833 | Pass         |      |
|                 |         |                 |                  | -20           | 3.70                     | 5825.05      | 5725 to 5850 | Pass |
|                 |         |                 |                  |               | 3.70                     | 5825.06      | 5725 to 5850 | Pass |
|                 |         |                 | 0                | 3.70          | 5825.12                  | 5725 to 5850 | Pass         |      |
|                 |         |                 |                  | 10            | 3.70                     | 5825.10      | 5725 to 5850 | Pass |
| 30              | 3.70    |                 | 5825.01          | 5725 to 5850  | Pass                     |              |              |      |
| 40              | 3.70    |                 | 5825.05          | 5725 to 5850  | Pass                     |              |              |      |
| 50              | 3.70    | 5825.08         | 5817 to 5833     | Pass          |                          |              |              |      |
| 802.11n (HT20)  | SISO    | 5745            | 20               | 3.15          | 5745.07                  | 5737 to 5753 | Pass         |      |
|                 |         |                 |                  | 3.70          | 5745.07                  | 5737 to 5753 | Pass         |      |
|                 |         |                 |                  | 4.26          | 5745.04                  | 5737 to 5753 | Pass         |      |
|                 |         |                 | -30              | 3.15          | 5745.04                  | 5737 to 5753 | Pass         |      |



|                   |      |         |              |              |         |              |              |      |
|-------------------|------|---------|--------------|--------------|---------|--------------|--------------|------|
|                   |      |         | -20          | 3.70         | 5745.06 | 5725 to 5850 | Pass         |      |
|                   |      |         | -10          | 3.70         | 5745.07 | 5725 to 5850 | Pass         |      |
|                   |      |         | 0            | 3.70         | 5745.12 | 5725 to 5850 | Pass         |      |
|                   |      |         | 10           | 3.70         | 5745.10 | 5725 to 5850 | Pass         |      |
|                   |      |         | 30           | 3.70         | 5745.03 | 5725 to 5850 | Pass         |      |
|                   |      |         | 40           | 3.70         | 5745.01 | 5725 to 5850 | Pass         |      |
|                   |      |         | 50           | 3.70         | 5745.00 | 5737 to 5753 | Pass         |      |
|                   |      | 5785    | 20           | 3.15         | 5785.00 | 5777 to 5793 | Pass         |      |
|                   |      |         |              | 3.70         | 5785.03 | 5777 to 5793 | Pass         |      |
|                   |      |         |              | 4.26         | 5785.10 | 5777 to 5793 | Pass         |      |
|                   |      |         | -30          | 3.15         | 5785.06 | 5777 to 5793 | Pass         |      |
|                   |      |         | -20          | 3.70         | 5785.09 | 5725 to 5850 | Pass         |      |
|                   |      |         | -10          | 3.70         | 5785.02 | 5725 to 5850 | Pass         |      |
|                   |      |         | 0            | 3.70         | 5785.03 | 5725 to 5850 | Pass         |      |
|                   |      |         | 10           | 3.70         | 5785.06 | 5725 to 5850 | Pass         |      |
|                   |      |         | 30           | 3.70         | 5785.03 | 5725 to 5850 | Pass         |      |
|                   |      |         | 40           | 3.70         | 5785.11 | 5725 to 5850 | Pass         |      |
|                   |      |         | 50           | 3.70         | 5785.07 | 5777 to 5793 | Pass         |      |
|                   |      |         | 5825         | 20           | 3.15    | 5825.00      | 5817 to 5833 | Pass |
|                   |      |         |              |              | 3.70    | 5825.07      | 5817 to 5833 | Pass |
|                   |      |         |              |              | 4.26    | 5825.06      | 5817 to 5833 | Pass |
| -30               | 3.15 | 5825.08 |              | 5817 to 5833 | Pass    |              |              |      |
| -20               | 3.70 | 5825.12 |              | 5725 to 5850 | Pass    |              |              |      |
| -10               | 3.70 | 5825.11 |              | 5725 to 5850 | Pass    |              |              |      |
| 0                 | 3.70 | 5825.04 |              | 5725 to 5850 | Pass    |              |              |      |
| 10                | 3.70 | 5825.02 |              | 5725 to 5850 | Pass    |              |              |      |
| 30                | 3.70 | 5825.06 |              | 5725 to 5850 | Pass    |              |              |      |
| 40                | 3.70 | 5825.08 |              | 5725 to 5850 | Pass    |              |              |      |
| 50                | 3.70 | 5825.13 | 5817 to 5833 | Pass         |         |              |              |      |
| 802.11n<br>(HT40) | SISO | 5755    | 20           | 3.15         | 5755.01 | 5739 to 5771 | Pass         |      |
|                   |      |         |              | 3.70         | 5755.09 | 5739 to 5771 | Pass         |      |
|                   |      |         |              | 4.26         | 5755.08 | 5739 to 5771 | Pass         |      |
|                   |      |         | -30          | 3.15         | 5755.11 | 5739 to 5771 | Pass         |      |
|                   |      |         | -20          | 3.70         | 5755.01 | 5725 to 5850 | Pass         |      |
|                   |      |         | -10          | 3.70         | 5755.10 | 5725 to 5850 | Pass         |      |
|                   |      |         | 0            | 3.70         | 5755.08 | 5725 to 5850 | Pass         |      |
|                   |      |         | 10           | 3.70         | 5755.02 | 5725 to 5850 | Pass         |      |
|                   |      |         | 30           | 3.70         | 5755.12 | 5725 to 5850 | Pass         |      |
|                   |      |         | 40           | 3.70         | 5755.08 | 5725 to 5850 | Pass         |      |
| 50                | 3.70 | 5755.11 | 5739 to 5771 | Pass         |         |              |              |      |



|      |      |     |      |         |              |         |              |      |
|------|------|-----|------|---------|--------------|---------|--------------|------|
| 5795 | SISO | 20  | 3.15 | 5795.02 | 5779 to 5811 | Pass    |              |      |
|      |      |     | 3.70 | 5795.02 | 5779 to 5811 | Pass    |              |      |
|      |      |     | 4.26 | 5795.03 | 5779 to 5811 | Pass    |              |      |
|      |      | -30 | SISO | -20     | 3.15         | 5795.01 | 5779 to 5811 | Pass |
|      |      |     |      |         | 3.70         | 5795.06 | 5725 to 5850 | Pass |
|      |      |     |      |         | 3.70         | 5795.06 | 5725 to 5850 | Pass |
|      |      |     |      |         | 3.70         | 5795.11 | 5725 to 5850 | Pass |
|      |      |     |      |         | 3.70         | 5795.02 | 5725 to 5850 | Pass |
|      |      |     |      |         | 3.70         | 5795.00 | 5725 to 5850 | Pass |
|      |      |     |      |         | 3.70         | 5795.00 | 5725 to 5850 | Pass |
| 5745 | SISO | 20  | 3.15 | 5745.04 | 5737 to 5753 | Pass    |              |      |
|      |      |     | 3.70 | 5745.03 | 5737 to 5753 | Pass    |              |      |
|      |      |     | 4.26 | 5745.09 | 5737 to 5753 | Pass    |              |      |
|      |      | -30 | SISO | -20     | 3.15         | 5745.07 | 5737 to 5753 | Pass |
|      |      |     |      |         | 3.70         | 5745.00 | 5725 to 5850 | Pass |
|      |      |     |      |         | 3.70         | 5745.01 | 5725 to 5850 | Pass |
|      |      |     |      |         | 3.70         | 5745.06 | 5725 to 5850 | Pass |
|      |      |     |      |         | 3.70         | 5745.10 | 5725 to 5850 | Pass |
|      |      |     |      |         | 3.70         | 5745.09 | 5725 to 5850 | Pass |
|      |      |     |      |         | 3.70         | 5745.10 | 5725 to 5850 | Pass |
| 5785 | SISO | 20  | 3.15 | 5785.10 | 5777 to 5793 | Pass    |              |      |
|      |      |     | 3.70 | 5785.04 | 5777 to 5793 | Pass    |              |      |
|      |      |     | 4.26 | 5785.10 | 5777 to 5793 | Pass    |              |      |
|      |      | -30 | SISO | -20     | 3.15         | 5785.09 | 5777 to 5793 | Pass |
|      |      |     |      |         | 3.70         | 5785.07 | 5725 to 5850 | Pass |
|      |      |     |      |         | 3.70         | 5785.07 | 5725 to 5850 | Pass |
|      |      |     |      |         | 3.70         | 5785.02 | 5725 to 5850 | Pass |
|      |      |     |      |         | 3.70         | 5785.05 | 5725 to 5850 | Pass |
|      |      |     |      |         | 3.70         | 5785.03 | 5725 to 5850 | Pass |
|      |      |     |      |         | 3.70         | 5785.01 | 5725 to 5850 | Pass |
| 5825 | SISO | 20  | 3.15 | 5825.04 | 5817 to 5833 | Pass    |              |      |
|      |      |     | 3.70 | 5825.01 | 5817 to 5833 | Pass    |              |      |
|      |      |     | 4.26 | 5825.06 | 5817 to 5833 | Pass    |              |      |
|      |      | -30 | SISO | -20     | 3.15         | 5825.03 | 5817 to 5833 | Pass |
|      |      |     |      |         | 3.70         | 5825.10 | 5725 to 5850 | Pass |
|      |      |     |      |         | 3.70         | 5825.01 | 5725 to 5850 | Pass |
|      |      |     |      |         | 3.70         | 5825.10 | 5725 to 5850 | Pass |



|                     |      |         |              |              |              |              |      |
|---------------------|------|---------|--------------|--------------|--------------|--------------|------|
|                     |      |         | 10           | 3.70         | 5825.02      | 5725 to 5850 | Pass |
|                     |      |         | 30           | 3.70         | 5825.02      | 5725 to 5850 | Pass |
|                     |      |         | 40           | 3.70         | 5825.09      | 5725 to 5850 | Pass |
|                     |      |         | 50           | 3.70         | 5825.02      | 5817 to 5833 | Pass |
| 802.11ac<br>(VHT40) | SISO | 5755    | 20           | 3.15         | 5755.05      | 5739 to 5771 | Pass |
|                     |      |         |              | 3.70         | 5755.01      | 5739 to 5771 | Pass |
|                     |      |         |              | 4.26         | 5755.01      | 5739 to 5771 | Pass |
|                     |      |         | -30          | 3.15         | 5755.09      | 5739 to 5771 | Pass |
|                     |      |         | -20          | 3.70         | 5755.01      | 5725 to 5850 | Pass |
|                     |      |         | -10          | 3.70         | 5755.08      | 5725 to 5850 | Pass |
|                     |      |         | 0            | 3.70         | 5755.09      | 5725 to 5850 | Pass |
|                     |      |         | 10           | 3.70         | 5755.09      | 5725 to 5850 | Pass |
|                     |      |         | 30           | 3.70         | 5755.00      | 5725 to 5850 | Pass |
|                     |      |         | 40           | 3.70         | 5755.05      | 5725 to 5850 | Pass |
|                     |      | 50      | 3.70         | 5755.08      | 5739 to 5771 | Pass         |      |
|                     |      | 5795    | 20           | 3.15         | 5795.01      | 5779 to 5811 | Pass |
|                     |      |         |              | 3.70         | 5795.10      | 5779 to 5811 | Pass |
|                     |      |         |              | 4.26         | 5795.01      | 5779 to 5811 | Pass |
|                     |      |         | -30          | 3.15         | 5795.12      | 5779 to 5811 | Pass |
|                     |      |         | -20          | 3.70         | 5795.02      | 5725 to 5850 | Pass |
|                     |      |         | -10          | 3.70         | 5795.12      | 5725 to 5850 | Pass |
|                     |      |         | 0            | 3.70         | 5795.05      | 5725 to 5850 | Pass |
|                     |      |         | 10           | 3.70         | 5795.06      | 5725 to 5850 | Pass |
|                     |      |         | 30           | 3.70         | 5795.13      | 5725 to 5850 | Pass |
| 40                  | 3.70 |         | 5795.11      | 5725 to 5850 | Pass         |              |      |
| 50                  | 3.70 | 5795.06 | 5779 to 5811 | Pass         |              |              |      |
| 802.11ac<br>(VHT80) | SISO | 5775    | 20           | 3.15         | 5775.08      | 5743 to 5807 | Pass |
|                     |      |         |              | 3.70         | 5775.04      | 5743 to 5807 | Pass |
|                     |      |         |              | 4.26         | 5775.03      | 5743 to 5807 | Pass |
|                     |      |         | -30          | 3.15         | 5775.06      | 5743 to 5807 | Pass |
|                     |      |         | -20          | 3.70         | 5775.11      | 5725 to 5850 | Pass |
|                     |      |         | -10          | 3.70         | 5775.13      | 5725 to 5850 | Pass |
|                     |      |         | 0            | 3.70         | 5775.06      | 5725 to 5850 | Pass |
|                     |      |         | 10           | 3.70         | 5775.03      | 5725 to 5850 | Pass |
|                     |      |         | 30           | 3.70         | 5775.08      | 5725 to 5850 | Pass |
|                     |      |         | 40           | 3.70         | 5775.09      | 5725 to 5850 | Pass |
| 50                  | 3.70 | 5775.09 | 5743 to 5807 | Pass         |              |              |      |



## 10. Antenna Requirement

### 10.1. Test Standard and Requirement

|               |   |
|---------------|---|
| Test Standard | FCC Part15 Section 15.203 /15.407   |
| Requirement   | <p>1) 15.203 requirement:<br/>An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.</p> <p>2) 15.407 requirement:<br/>if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.</p> |

### 10.2. Antenna Connected Construction

The antenna is a PCB Antenna which permanently attached, and the best case gain of the 3.11dBi. It complies with the standard requirement.



## APPENDIX I -- TEST SETUP PHOTOGRAPH

Please refer to separated files Appendix I -- Test Setup Photograph

## APPENDIX II -- EXTERNAL PHOTOGRAPH

Please refer to separated files Appendix II -- External Photograph

## APPENDIX III -- INTERNAL PHOTOGRAPH

Please refer to separated files Appendix III -- Internal Photograph

----- End of Report -----

