# Variant FCC Test Report

| | |
|---|---|
| **Report No.:** | RFBAYS-WTW-P20110319A-2 |
| **FCC ID:** | W23-WMU62XX |
| **Test Model:** | WMU6202 |
| **Series Model:** | WMU6203, WMU6204, WMU6205, WMU6206, WMU6207 |
| **Received Date:** | Apr. 14, 2021 |
| **Test Date:** | Apr. 22 ~ Apr. 27, 2021 |
| **Issued Date:** | May 14, 2021 |
| **Applicant:** | jjPlus Corporation |
| **Address:** | 15F-7, No. 2, Jianba Road, Zhonghe Dist., New Taipei City, Taiwan (R.O.C.) |
| **Issued By:** | Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch<br>Lin Kou Laboratories |
| **Lab Address:** | No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan |
| **Test Location:** | B2F., No.215, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan |
| **FCC Registration / Designation Number:** | 427177 / TW0011 |

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## Table of Contents

**Release Control Record** ..... **3**

**1 Certificate of Conformity** ..... **4**

**2 Summary of Test Results** ..... **5**

2.1 Measurement Uncertainty ..... 5
2.2 Modification Record ..... 5

**3 General Information** ..... **6**

3.1 General Description of EUT ..... 6
3.2 Description of Test Modes ..... 8
3.2.1 Test Mode Applicability and Tested Channel Detail ..... 9
3.3 Description of Support Units ..... 10
3.3.1 Configuration of System under Test ..... 10
3.4 General Description of Applied Standards and References ..... 10

**4 Test Types and Results** ..... **11**

4.1 Radiated Emission and Bandedge Measurement ..... 11
4.1.1 Limits of Radiated Emission and Bandedge Measurement ..... 11
4.1.2 Test Instruments ..... 12
4.1.3 Test Procedures ..... 13
4.1.4 Deviation from Test Standard ..... 14
4.1.5 Test Set Up ..... 14
4.1.6 EUT Operating Conditions ..... 15
4.1.7 Test Results ..... 16

**5 Pictures of Test Arrangements** ..... **30**

**Annex A- Band Edge Measurement** ..... **31**

**Appendix – Information of the Testing Laboratories** ..... **43**

## Release Control Record

| Issue No. | Description | Date Issued |
|---|---|---|
| RFBAYS-WTW-P20110319A-2 | Original Release | May 14, 2021 |

## 1 Certificate of Conformity

**Product:** 11ac 2T2R WIFI & BT Module

**Brand:** jjPlus

**Test Model:** WMU6202

**Series Model:** WMU6203, WMU6204, WMU6205, WMU6206, WMU6207

**Sample Status:** wifi module

**Applicant:** jjPlus Corporation

**Test Date:** Apr. 22 ~ Apr. 27, 2021

**Standards:** 47 CFR FCC Part 15, Subpart C (Section 15.247)
ANSI C63.10:2013

This report is issued as a supplementary report to BV CPS report no.: RF181127C08-2. This report shall be used by combining with its original report.

**Prepared by :** _____ , **Date:** May 14, 2021
Gina Liu / Specialist

**Approved by :** _____ , **Date:** May 14, 2021
Dylan Chiou / Senior Project Engineer

## 2 Summary of Test Results

| 47 CFR FCC Part 15, Subpart C (Section 15.247) | | | |
|---|---|---|---|
| **FCC Clause** | **Test Item** | **Result** | **Remarks** |
| 15.207 | AC Power Conducted Emission | N/A | Refer to Note |
| 15.205 / 15.209 / 15.247(d) | Radiated Emissions and Band Edge Measurement | Pass | Meet the requirement of limit.<br>Minimum passing margin is -5.12 dB at 2483.5 MHz. |
| 15.247(d) | Antenna Port Emission | N/A | Refer to Note |
| 15.247(a)(2) | 6 dB Bandwidth | N/A | Refer to Note |
| --- | Occupied Bandwidth Measurement | N/A | Refer to Note |
| 15.247(b) | Conducted power | N/A | Refer to Note |
| 15.247(e) | Power Spectral Density | N/A | Refer to Note |
| 15.203 | Antenna Requirement | Pass | Antenna connector is U.FLx2 not a standard connector. |

Note:

1. Only Radiated Emissions test was performed for this addendum. Refer to original report for other test data.
2. For 2.4G band compliance with rule 15.247(d) of the band-edge items, the test plots were recorded in Annex A. Test Procedures refer to report 4.1.3.
3. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

### 2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

| Measurement | Frequency | Expanded Uncertainty (k=2) (±) |
|---|---|---|
| Radiated Emissions up to 1 GHz | 9 kHz ~ 30 MHz | 3.04 dB |
| | 30 MHz ~ 200 MHz | 2.0153 dB |
| | 200 MHz ~ 1000 MHz | 2.0224 dB |
| Radiated Emissions above 1 GHz | 1 GHz ~ 18 GHz | 1.0121 dB |
| | 18 GHz ~ 40 GHz | 1.1508 dB |

### 2.2 Modification Record

There were no modifications required for compliance.

## 3 General Information

### 3.1 General Description of EUT

| | |
|---|---|
| **Product** | 11ac 2T2R WIFI & BT Module |
| **Brand** | jjPlus |
| **Test Model** | WMU6202 |
| **Series Model** | WMU6203, WMU6204, WMU6205, WMU6206, WMU6207 |
| **Status of EUT** | wifi module |
| **Power Supply Rating** | 3.3 Vdc (host equipment) |
| **Modulation Type** | CCK, DQPSK, DBPSK for DSSS<br>64QAM, 16QAM, QPSK, BPSK for OFDM |
| **Modulation Technology** | DSSS, OFDM |
| **Transfer Rate** | 802.11b: 11.0 / 5.5 / 2.0 / 1.0 Mbps<br>802.11g: 54.0 / 48.0 / 36.0 / 24.0 / 18.0 / 12.0 / 9.0 / 6.0 Mbps<br>802.11n: up to 300.0 Mbps |
| **Operating Frequency** | 2412 ~ 2462 MHz |
| **Number of Channel** | 11 for 802.11b, 802.11g, 802.11n (HT20)<br>7 for 802.11n (HT40) |
| **Antenna Type** | Refer to Note |
| **Antenna Connector** | Refer to Note |
| **Accessory Device** | N/A |
| **Data Cable Supplied** | N/A |

Note:

1. This report is prepared for FCC class II permissive change. This report is issued as a supplementary report to BV CPS report no. RF181127C08-2. The difference compared with original report is adding new Antennas. Therefore, only Radiated Emissions re-test and recorded in this report.
2. The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and two receivers.

| Modulation Mode | Tx Function |
|---|---|
| **802.11b** | 1TX |
| **802.11g** | 1TX |
| **802.11n (HT20)** | 2TX |
| **802.11n (HT40)** | 2TX |

3. All models and antennas are listed as below.

| Test Mode | Model | RF Chip | RF Design | Interface | Antenna type | Antenna connector |
|---|---|---|---|---|---|---|
| v | WMU6202 | RTL8822BU | The Same | mPCIe | Dipole<br>PIFA | U.FLx2 |
| | WMU6203 | | | M.2 | | MHF4 |
| | WMU6204 | | | USB Type-A | | U.FLx2 |
| | WMU6205 | | | 4Pin Wafer | | U.FLx2 |
| | WMU6206 | | | USB Type-A | PCB Antenna x2 | none (like solder) |
| | WMU6207 | | | 4Pin Wafer | | none (like solder) |

*The difference Models are pre-tested, because the connector and interface are difference with difference Model, and selected the worst Model for testing.

4. The antennas information is listed as below. (New antenna is marked in boldface.)

| Antenna Type | Brand | Model | Antenna Gain (dBi) | | |
|---|---|---|---|---|---|
| | | | BT | 2.4G | 5G |
| Dipole | LYNwave | AOA160-221020-000000 | 3.0 | 3.0 | 2.0 |
| | LYNwave | AOA160-221034-000000 | 3.0 | 3.0 | 3.0 |
| | LYNwave | AOA160-221050-000000 | 5.0 | 5.0 | 5.0 |
| PCB | N/A | N/A | 3.6 | 3.6 | 5.3 |
| | N/A | N/A | 3.6 | 3.6 | 4.7 |
| **PIFA** | **SINBON** | **A9706632** | **4.1** | **4.1** | **3.5** |
| | **SINBON** | **A9706633** | **4.8** | **4.8** | **4.1** |

5. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.
6. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

### 3.2 Description of Test Modes

11 channels are provided for 802.11b, 802.11g and 802.11n (HT20):

| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---|---|---|---|
| 1 | 2412 | 7 | 2442 |
| 2 | 2417 | 8 | 2447 |
| 3 | 2422 | 9 | 2452 |
| 4 | 2427 | 10 | 2457 |
| 5 | 2432 | 11 | 2462 |
| 6 | 2437 | | |

7 channels are provided for 802.11n (HT40):

| Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---|---|---|---|
| 3 | 2422 | 7 | 2442 |
| 4 | 2427 | 8 | 2447 |
| 5 | 2432 | 9 | 2452 |
| 6 | 2437 | | |

### 3.2.1 Test Mode Applicability and Tested Channel Detail

| EUT Configure Mode | Applicable To | | Description |
|---|---|---|---|
| | RE≥1G | RE<1G | |
| - | √ | √ | - |

Where **RE≥1G:** Radiated Emission above 1 GHz **RE<1G:** Radiated Emission below 1 GHz
**NOTE:** "-"means no effect.

**Radiated Emission Test (Above 1 GHz):**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

| EUT Configure Mode | Mode | Available Channel | Tested Channel | Modulation Technology | Modulation Type | Data Rate (Mbps) |
|---|---|---|---|---|---|---|
| - | 802.11b | 1 to 11 | 1, 6, 11 | DSSS | DBPSK | 1.0 |
| - | 802.11g | 1 to 11 | 1, 6, 11 | OFDM | BPSK | 6.0 |
| - | 802.11n (HT20) | 1 to 11 | 1, 6, 11 | OFDM | BPSK | 6.5 |
| - | 802.11n (HT40) | 3 to 9 | 3, 6, 9 | OFDM | BPSK | 13.5 |

**Radiated Emission Test (Below 1 GHz):**

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

| EUT Configure Mode | Mode | Available Channel | Tested Channel | Modulation Technology | Modulation Type | Data Rate (Mbps) |
|---|---|---|---|---|---|---|
| - | 802.11g | 1 to 11 | 11 | OFDM | BPSK | 6.0 |

**Test Condition:**

| Applicable To | Environmental Conditions | Input Power | Tested by |
|---|---|---|---|
| RE≥1G | 25 deg. C, 65 % RH | 120 Vac, 60 Hz | Charles Hsiao |
| RE<1G | 25 deg. C, 65 % RH | 120 Vac, 60 Hz | Karl Lee |

## 3.3 Description of Support Units

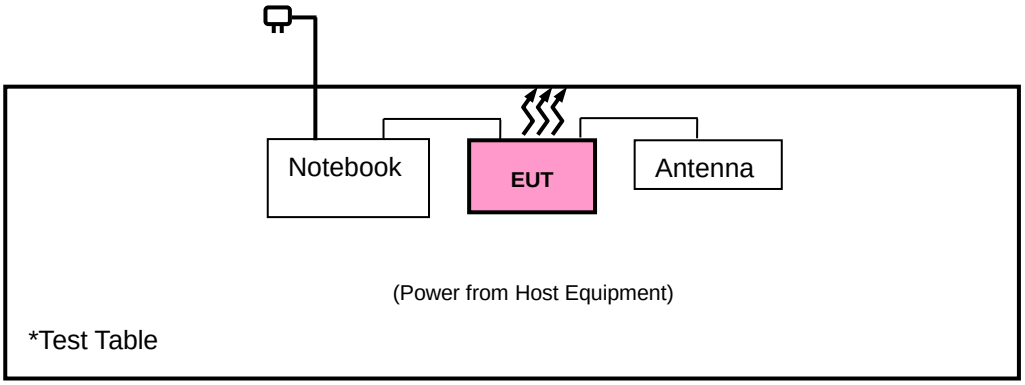
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| No. | Product | Brand | Model No. | Serial No. | FCC ID |
|---|---|---|---|---|---|
| A. | Notebook | DELL | E6420 | D3T96R1 | N/A |

| No. | Signal Cable Description of The Above Support Units |
|---|---|
| 1. | N/A |

Note:
1. All power cords of the above support units are non-shielded (1.8m).

### 3.3.1 Configuration of System under Test




## 3.4 General Description of Applied Standards and References

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards and references:

**Test Standard:**

**FCC Part 15, Subpart C (15.247)**
ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

**References Test Guidance:**

**KDB 558074 D01 Meas Guidance v05r02**
**KDB 662911 D01 Multiple Transmitter Output v02r01**

All test items have been performed as a reference to the above KDB test guidance.

# 4 Test Types and Results

## 4.1 Radiated Emission and Bandedge Measurement

### 4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20 dB below the highest level of the desired power:

| Frequencies (MHz) | Field Strength (microvolts/meter) | Measurement Distance (meters) |
|---|---|---|
| 0.009 ~ 0.490 | 2400/F (kHz) | 300 |
| 0.490 ~ 1.705 | 24000/F (kHz) | 30 |
| 1.705 ~ 30.0 | 30 | 30 |
| 30 ~ 88 | 100 | 3 |
| 88 ~ 216 | 150 | 3 |
| 216 ~ 960 | 200 | 3 |
| Above 960 | 500 | 3 |

**NOTE**:

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

4.1.2 Test Instruments

| Description & Manufacturer | Model No. | Serial No. | Date of Calibration | Due Date of Calibration |
|---|---|---|---|---|
| Test Receiver<br>Agilent Technologies | N9038A | MY52260177 | Aug. 24, 2020 | Aug. 23, 2021 |
| Spectrum Analyzer<br>ROHDE & SCHWARZ | FSU43 | 101261 | Apr. 12, 2021 | Apr. 11, 2022 |
| HORN Antenna<br>ETS-Lindgren | 3117 | 00143293 | Nov. 22, 2020 | Nov. 21, 2021 |
| BILOG Antenna<br>SCHWARZBECK | VULB 9168 | 9168-616 | Nov. 09, 2020 | Nov. 08, 2021 |
| HORN Antenna<br>SCHWARZBECK | BBHA 9170 | 9170-480 | Nov. 22, 2020 | Nov. 21, 2021 |
| Fixed Attenuator<br>Mini-Circuits | MDCS18N-10 | MDCS18N-10-01 | Apr. 13, 2021 | Apr. 12, 2022 |
| Loop Antenna | EM-6879 | 269 | Sep. 17, 2020 | Sep. 16, 2021 |
| MXG Vector signal generator<br>Agilent | N5182B | MY53050430 | Nov. 25, 2020 | Nov. 24, 2021 |
| Preamplifier<br>Agilent | 310N | 187226 | Jun. 17, 2020 | Jun. 16, 2021 |
| Preamplifier<br>Agilent | 83017A | MY39501357 | Jun. 17, 2020 | Jun. 16, 2021 |
| Preamplifier<br>EMCI | EMC 184045 | 980116 | Oct. 07, 2020 | Oct. 06, 2021 |
| Power Meter<br>Anritsu | ML2495A | 1012010 | Sep. 01, 2020 | Aug. 31, 2021 |
| Power Sensor<br>Anritsu | MA2411B | 1315050 | Sep. 01, 2020 | Aug. 31, 2021 |
| RF signal cable<br>ETS-LINDGREN | 5D-FB | Cable-CH1-01(RFC-SMS-100-SMS-120+RFC-SMS-100-SMS-400) | Jun. 17, 2020 | Jun. 16, 2021 |
| RF signal cable<br>ETS-LINDGREN | 8D-FB | Cable-CH1-02(RFC-SMS-100-SMS-24) | Jun. 17, 2020 | Jun. 17, 2021 |
| Boresight Antenna Fixture | FBA-01 | FBA-SIP01 | NA | NA |
| Software<br>BV ADT | E3<br>8.130425b | NA | NA | NA |
| Antenna Tower<br>MF | NA | NA | NA | NA |

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in HsinTien Chamber 1.

### 4.1.3 Test Procedures

**For Radiated Emission below 30 MHz**

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

**Note:**

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9 kHz at frequency below 30 MHz.

**For Radiated Emission above 30 MHz**

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30 MHz ~ 1 GHz) / 1.5 meters (for above 1 GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
f. The test-receiver system was set to peak and average detected function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

**Note:**

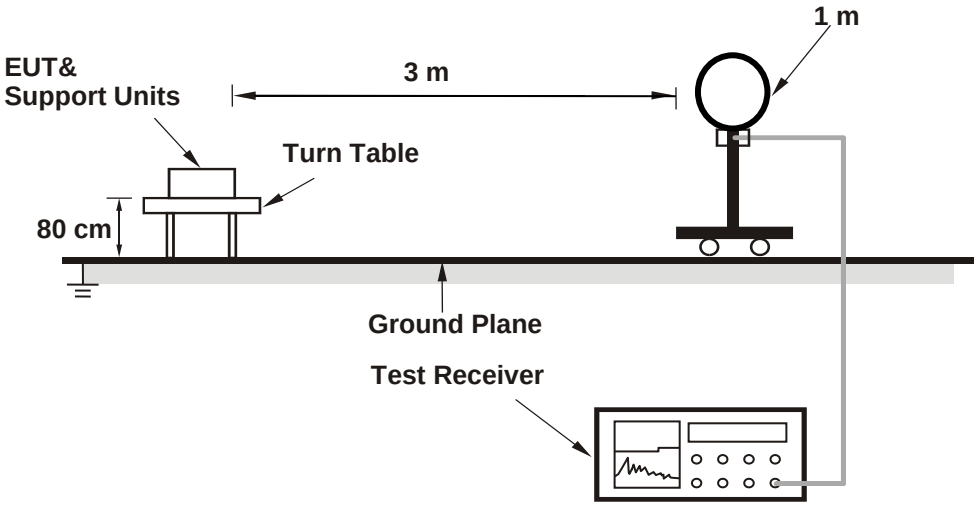
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) or Peak detection (PK) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98 %) or 10 Hz (Duty cycle ≥ 98 %) for Average detection (AV) at frequency above 1 GHz. (11b: RBW = 1 MHz, VBW =300 Hz ; 11g: RBW = 1 MHz, VBW = 1 kHz ;
4. 11n (HT20): RBW = 1 MHz, VBW = 3 kHz ; 11n (HT40): RBW = 1 MHz, VBW = 10 kHz)
5. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

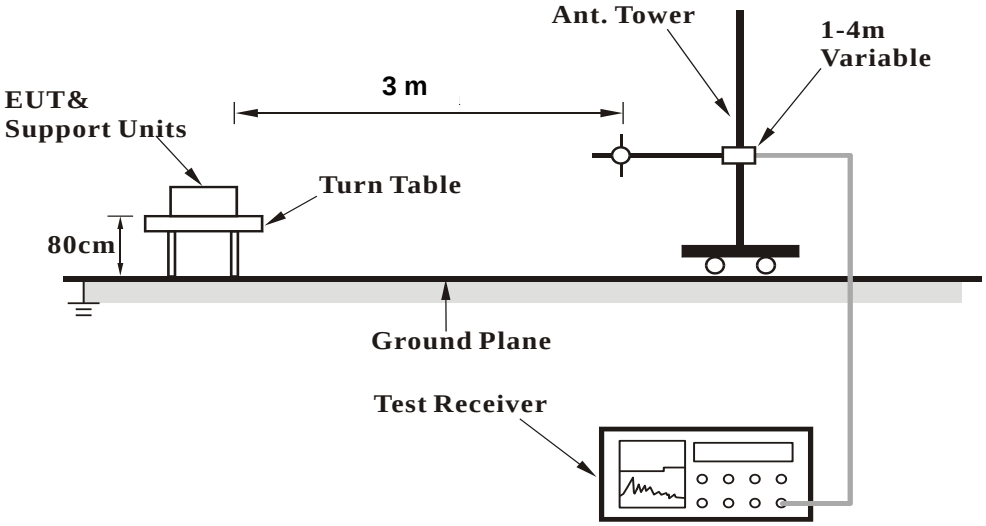
No deviation.

4.1.5 Test Set Up

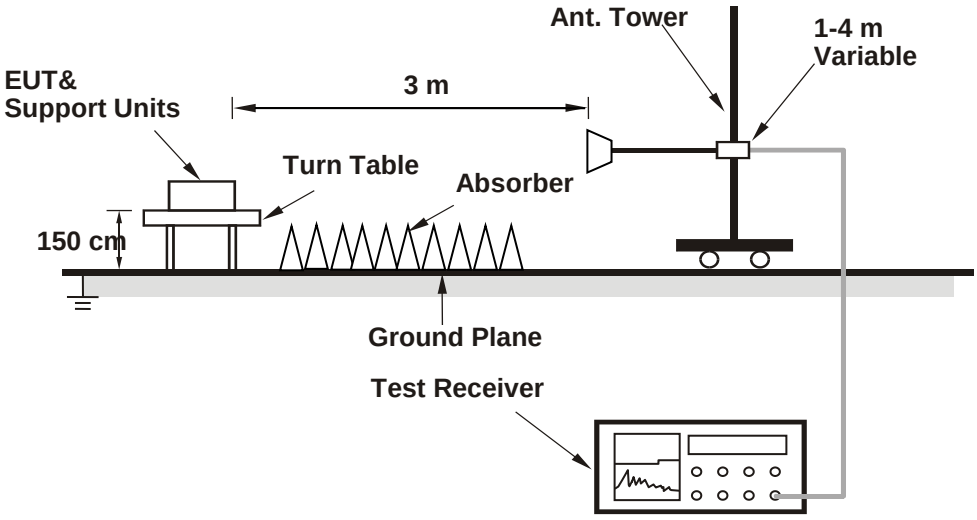
**<Radiated Emission below 30 MHz>**




**<Radiated Emission 30 MHz to 1 GHz>**



**<Radiated Emission above 1 GHz>**




For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT Operating Conditions

a. Placed the EUT on a testing table.
b. Use the software to control the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

**Above 1 GHz Data：**

**802.11b**

| EUT Test Condition | | Measurement Detail | |
|---|---|---|---|
| **Channel** | Channel 1 | **Frequency Range** | 1 GHz ~ 25 GHz |
| **Input Power** | 120 Vac, 60 Hz | **Detector Function** | Peak (PK)<br>Average (AV) |
| **Environmental Conditions** | 25 deg. C, 65 % RH | **Tested By** | Charles Hsiao |

| Antenna Polarity & Test Distance: Horizontal at 3 m | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Frequency (MHz)** | **Emission Level (dBuV/m)** | **Read Level (dBuV)** | **Factor (dB/m)** | **Limit (dBuV/m)** | **Margin (dB)** | **Antenna Height (cm)** | **Table Angle (Degree)** | **Remark** |
| 2390 | 40.74 | 36.24 | 4.5 | 54 | -13.26 | 299 | 234 | Average |
| 2390 | 51.79 | 47.29 | 4.5 | 74 | -22.21 | 299 | 234 | Peak |
| 2412 | 94.78 | 90.23 | 4.55 | | | 299 | 234 | Average |
| 2412 | 97.81 | 93.26 | 4.55 | | | 299 | 234 | Peak |
| 4824 | 42.74 | 32.45 | 10.29 | 54 | -11.26 | 271 | 136 | Average |
| 4824 | 48.94 | 38.65 | 10.29 | 74 | -25.06 | 271 | 136 | Peak |
| **Antenna Polarity & Test Distance: Vertical at 3 m** | | | | | | | | |
| **Frequency (MHz)** | **Emission Level (dBuV/m)** | **Read Level (dBuV)** | **Factor (dB/m)** | **Limit (dBuV/m)** | **Margin (dB)** | **Antenna Height (cm)** | **Table Angle (Degree)** | **Remark** |
| 2390 | 41.83 | 37.33 | 4.5 | 54 | -12.17 | 236 | 85 | Average |
| 2390 | 52.6 | 48.1 | 4.5 | 74 | -21.4 | 236 | 85 | Peak |
| 2412 | 96.59 | 92.04 | 4.55 | | | 236 | 85 | Average |
| 2412 | 99.22 | 94.67 | 4.55 | | | 236 | 85 | Peak |
| 4824 | 42.19 | 31.9 | 10.29 | 54 | -11.81 | 162 | 228 | Average |
| 4824 | 48.71 | 38.42 | 10.29 | 74 | -25.29 | 162 | 228 | Peak |

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2412 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

| EUT Test Condition | | Measurement Detail | |
|---|---|---|---|
| **Channel** | Channel 6 | **Frequency Range** | 1 GHz ~ 25 GHz |
| **Input Power** | 120 Vac, 60 Hz | **Detector Function** | Peak (PK)<br>Average (AV) |
| **Environmental Conditions** | 25 deg. C, 65 % RH | **Tested By** | Charles Hsiao |

| Antenna Polarity & Test Distance: Horizontal at 3 m | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Frequency (MHz)** | **Emission Level (dBuV/m)** | **Read Level (dBuV)** | **Factor (dB/m)** | **Limit (dBuV/m)** | **Margin (dB)** | **Antenna Height (cm)** | **Table Angle (Degree)** | **Remark** |
| 2390 | 40.69 | 36.19 | 4.5 | 54 | -13.31 | 299 | 234 | Average |
| 2390 | 52.93 | 48.43 | 4.5 | 74 | -21.07 | 299 | 234 | Peak |
| 2437 | 94.95 | 90.36 | 4.59 | | | 299 | 234 | Average |
| 2437 | 97.88 | 93.29 | 4.59 | | | 299 | 234 | Peak |
| 2483.5 | 41.61 | 36.95 | 4.66 | 54 | -12.39 | 299 | 234 | Average |
| 2483.5 | 52.47 | 47.81 | 4.66 | 74 | -21.53 | 299 | 234 | Peak |
| 4874 | 43.49 | 33.28 | 10.21 | 54 | -10.51 | 126 | 90 | Average |
| 4874 | 49.99 | 39.78 | 10.21 | 74 | -24.01 | 126 | 90 | Peak |
| **Antenna Polarity & Test Distance: Vertical at 3 m** | | | | | | | | |
| **Frequency (MHz)** | **Emission Level (dBuV/m)** | **Read Level (dBuV)** | **Factor (dB/m)** | **Limit (dBuV/m)** | **Margin (dB)** | **Antenna Height (cm)** | **Table Angle (Degree)** | **Remark** |
| 2390 | 40.67 | 36.17 | 4.5 | 54 | -13.33 | 236 | 85 | Average |
| 2390 | 52.37 | 47.87 | 4.5 | 74 | -21.63 | 236 | 85 | Peak |
| 2437 | 96.35 | 91.76 | 4.59 | | | 236 | 85 | Average |
| 2437 | 99.02 | 94.43 | 4.59 | | | 236 | 85 | Peak |
| 2483.5 | 41.42 | 36.76 | 4.66 | 54 | -12.58 | 236 | 85 | Average |
| 2483.5 | 52.37 | 47.71 | 4.66 | 74 | -21.63 | 236 | 85 | Peak |
| 4874 | 42.04 | 31.83 | 10.21 | 54 | -11.96 | 116 | 294 | Average |
| 4874 | 48.27 | 38.06 | 10.21 | 74 | -25.73 | 116 | 294 | Peak |

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2437 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

| EUT Test Condition | | Measurement Detail | |
|---|---|---|---|
| **Channel** | Channel 11 | **Frequency Range** | 1 GHz ~ 25 GHz |
| **Input Power** | 120 Vac, 60 Hz | **Detector Function** | Peak (PK)<br>Average (AV) |
| **Environmental Conditions** | 25 deg. C, 65 % RH | **Tested By** | Charles Hsiao |

| Antenna Polarity & Test Distance: Horizontal at 3 m | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Frequency (MHz)** | **Emission Level (dBuV/m)** | **Read Level (dBuV)** | **Factor (dB/m)** | **Limit (dBuV/m)** | **Margin (dB)** | **Antenna Height (cm)** | **Table Angle (Degree)** | **Remark** |
| 2462 | 96.75 | 92.13 | 4.62 | | | 299 | 234 | Average |
| 2462 | 99.76 | 95.14 | 4.62 | | | 299 | 234 | Peak |
| 2483.5 | 42.05 | 37.39 | 4.66 | 54 | -11.95 | 299 | 234 | Average |
| 2483.5 | 53.84 | 49.18 | 4.66 | 74 | -20.16 | 299 | 234 | Peak |
| 4924 | 42.75 | 32.5 | 10.25 | 54 | -11.25 | 206 | 38 | Average |
| 4924 | 50 | 39.75 | 10.25 | 74 | -24 | 206 | 38 | Peak |
| **Antenna Polarity & Test Distance: Vertical at 3 m** | | | | | | | | |
| **Frequency (MHz)** | **Emission Level (dBuV/m)** | **Read Level (dBuV)** | **Factor (dB/m)** | **Limit (dBuV/m)** | **Margin (dB)** | **Antenna Height (cm)** | **Table Angle (Degree)** | **Remark** |
| 2462 | 97.84 | 93.22 | 4.62 | | | 236 | 85 | Average |
| 2462 | 100.8 | 96.18 | 4.62 | | | 236 | 85 | Peak |
| 2483.5 | 42.07 | 37.41 | 4.66 | 54 | -11.93 | 236 | 85 | Average |
| 2483.5 | 53.11 | 48.45 | 4.66 | 74 | -20.89 | 236 | 85 | Peak |
| 4924 | 42.53 | 32.28 | 10.25 | 54 | -11.47 | 151 | 178 | Average |
| 4924 | 48.81 | 38.56 | 10.25 | 74 | -25.19 | 151 | 178 | Peak |

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2462 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

## 802.11g

| EUT Test Condition | | Measurement Detail | |
|---|---|---|---|
| **Channel** | Channel 1 | **Frequency Range** | 1 GHz ~ 25 GHz |
| **Input Power** | 120 Vac, 60 Hz | **Detector Function** | Peak (PK)<br>Average (AV) |
| **Environmental Conditions** | 25 deg. C, 65 % RH | **Tested By** | Charles Hsiao |

| Antenna Polarity & Test Distance: Horizontal at 3 m | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Frequency (MHz)** | **Emission Level (dBuV/m)** | **Read Level (dBuV)** | **Factor (dB/m)** | **Limit (dBuV/m)** | **Margin (dB)** | **Antenna Height (cm)** | **Table Angle (Degree)** | **Remark** |
| 2390 | 42.4 | 37.9 | 4.5 | 54 | -11.6 | 299 | 234 | Average |
| 2390 | 54.15 | 49.65 | 4.5 | 74 | -19.85 | 299 | 234 | Peak |
| 2412 | 91.72 | 87.17 | 4.55 | | | 299 | 234 | Average |
| 2412 | 98.04 | 93.49 | 4.55 | | | 299 | 234 | Peak |
| 4824 | 41.63 | 31.34 | 10.29 | 54 | -12.37 | 129 | 68 | Average |
| 4824 | 47.85 | 37.56 | 10.29 | 74 | -26.15 | 129 | 68 | Peak |
| **Antenna Polarity & Test Distance: Vertical at 3 m** | | | | | | | | |
| **Frequency (MHz)** | **Emission Level (dBuV/m)** | **Read Level (dBuV)** | **Factor (dB/m)** | **Limit (dBuV/m)** | **Margin (dB)** | **Antenna Height (cm)** | **Table Angle (Degree)** | **Remark** |
| 2390 | 42.68 | 38.18 | 4.5 | 54 | -11.32 | 236 | 85 | Average |
| 2390 | 55.42 | 50.92 | 4.5 | 74 | -18.58 | 236 | 85 | Peak |
| 2412 | 92.58 | 88.03 | 4.55 | | | 236 | 85 | Average |
| 2412 | 99.53 | 94.98 | 4.55 | | | 236 | 85 | Peak |
| 4824 | 42.24 | 31.95 | 10.29 | 54 | -11.76 | 161 | 205 | Average |
| 4824 | 48.6 | 38.31 | 10.29 | 74 | -25.4 | 161 | 205 | Peak |

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2412 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

| EUT Test Condition | | Measurement Detail | |
|---|---|---|---|
| **Channel** | Channel 6 | **Frequency Range** | 1 GHz ~ 25 GHz |
| **Input Power** | 120 Vac, 60 Hz | **Detector Function** | Peak (PK)<br>Average (AV) |
| **Environmental Conditions** | 25 deg. C, 65 % RH | **Tested By** | Charles Hsiao |

| Antenna Polarity & Test Distance: Horizontal at 3 m | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Frequency (MHz)** | **Emission Level (dBuV/m)** | **Read Level (dBuV)** | **Factor (dB/m)** | **Limit (dBuV/m)** | **Margin (dB)** | **Antenna Height (cm)** | **Table Angle (Degree)** | **Remark** |
| 2390 | 40.62 | 36.12 | 4.5 | 54 | -13.38 | 299 | 234 | Average |
| 2390 | 51.93 | 47.43 | 4.5 | 74 | -22.07 | 299 | 234 | Peak |
| 2437 | 92.39 | 87.8 | 4.59 | | | 299 | 234 | Average |
| 2437 | 99.17 | 94.58 | 4.59 | | | 299 | 234 | Peak |
| 2483.5 | 41.53 | 36.87 | 4.66 | 54 | -12.47 | 299 | 234 | Average |
| 2483.5 | 53.34 | 48.68 | 4.66 | 74 | -20.66 | 299 | 234 | Peak |
| 4874 | 41.95 | 31.74 | 10.21 | 54 | -12.05 | 101 | 157 | Average |
| 4874 | 48.14 | 37.93 | 10.21 | 74 | -25.86 | 101 | 157 | Peak |
| **Antenna Polarity & Test Distance: Vertical at 3 m** | | | | | | | | |
| **Frequency (MHz)** | **Emission Level (dBuV/m)** | **Read Level (dBuV)** | **Factor (dB/m)** | **Limit (dBuV/m)** | **Margin (dB)** | **Antenna Height (cm)** | **Table Angle (Degree)** | **Remark** |
| 2390 | 40.62 | 36.12 | 4.5 | 54 | -13.38 | 236 | 85 | Average |
| 2390 | 52.38 | 47.88 | 4.5 | 74 | -21.62 | 236 | 85 | Peak |
| 2437 | 94.47 | 89.88 | 4.59 | | | 236 | 85 | Average |
| 2437 | 101.28 | 96.69 | 4.59 | | | 236 | 85 | Peak |
| 2483.5 | 41.42 | 36.76 | 4.66 | 54 | -12.58 | 236 | 85 | Average |
| 2483.5 | 52.54 | 47.88 | 4.66 | 74 | -21.46 | 236 | 85 | Peak |
| 4874 | 42.37 | 32.16 | 10.21 | 54 | -11.63 | 263 | 149 | Average |
| 4874 | 48.67 | 38.46 | 10.21 | 74 | -25.33 | 263 | 149 | Peak |

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2437 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

| EUT Test Condition | | Measurement Detail | |
|---|---|---|---|
| **Channel** | Channel 11 | **Frequency Range** | 1 GHz ~ 25 GHz |
| **Input Power** | 120 Vac, 60 Hz | **Detector Function** | Peak (PK)<br>Average (AV) |
| **Environmental Conditions** | 25 deg. C, 65 % RH | **Tested By** | Charles Hsiao |

| Antenna Polarity & Test Distance: Horizontal at 3 m | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Frequency (MHz)** | **Emission Level (dBuV/m)** | **Read Level (dBuV)** | **Factor (dB/m)** | **Limit (dBuV/m)** | **Margin (dB)** | **Antenna Height (cm)** | **Table Angle (Degree)** | **Remark** |
| 2462 | 94.57 | 89.95 | 4.62 | | | 299 | 234 | Average |
| 2462 | 101.17 | 96.55 | 4.62 | | | 299 | 234 | Peak |
| 2483.5 | 47.48 | 42.82 | 4.66 | 54 | -6.52 | 299 | 234 | Average |
| 2483.5 | 63.4 | 58.74 | 4.66 | 74 | -10.6 | 299 | 234 | Peak |
| 4924 | 42.19 | 31.94 | 10.25 | 54 | -11.81 | 121 | 176 | Average |
| 4924 | 48.57 | 38.32 | 10.25 | 74 | -25.43 | 121 | 176 | Peak |
| **Antenna Polarity & Test Distance: Vertical at 3 m** | | | | | | | | |
| **Frequency (MHz)** | **Emission Level (dBuV/m)** | **Read Level (dBuV)** | **Factor (dB/m)** | **Limit (dBuV/m)** | **Margin (dB)** | **Antenna Height (cm)** | **Table Angle (Degree)** | **Remark** |
| 2462 | 95.67 | 91.05 | 4.62 | | | 236 | 85 | Average |
| 2462 | 102.82 | 98.2 | 4.62 | | | 236 | 85 | Peak |
| **2483.5** | **48.88** | **44.22** | **4.66** | **54** | **-5.12** | **236** | **85** | **Average** |
| 2483.5 | 63.08 | 58.42 | 4.66 | 74 | -10.92 | 236 | 85 | Peak |
| 4924 | 42.37 | 32.12 | 10.25 | 54 | -11.63 | 131 | 72 | Average |
| 4924 | 49.08 | 38.83 | 10.25 | 74 | -24.92 | 131 | 72 | Peak |

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2462 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

## 802.11n (HT20)

| EUT Test Condition | | Measurement Detail | |
|---|---|---|---|
| **Channel** | Channel 1 | **Frequency Range** | 1 GHz ~ 25 GHz |
| **Input Power** | 120 Vac, 60 Hz | **Detector Function** | Peak (PK)<br>Average (AV) |
| **Environmental Conditions** | 25 deg. C, 65 % RH | **Tested By** | Charles Hsiao |

| Antenna Polarity & Test Distance: Horizontal at 3 m | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Frequency (MHz)** | **Emission Level (dBuV/m)** | **Read Level (dBuV)** | **Factor (dB/m)** | **Limit (dBuV/m)** | **Margin (dB)** | **Antenna Height (cm)** | **Table Angle (Degree)** | **Remark** |
| 2390 | 41.11 | 36.61 | 4.5 | 54 | -12.89 | 219 | 73 | Average |
| 2390 | 51.89 | 47.39 | 4.5 | 74 | -22.11 | 219 | 73 | Peak |
| 2412 | 93.68 | 89.13 | 4.55 | | | 219 | 73 | Average |
| 2412 | 100.07 | 95.52 | 4.55 | | | 219 | 73 | Peak |
| 4824 | 42.29 | 32 | 10.29 | 54 | -11.71 | 129 | 235 | Average |
| 4824 | 48.42 | 38.13 | 10.29 | 74 | -25.58 | 129 | 235 | Peak |
| **Antenna Polarity & Test Distance: Vertical at 3 m** | | | | | | | | |
| **Frequency (MHz)** | **Emission Level (dBuV/m)** | **Read Level (dBuV)** | **Factor (dB/m)** | **Limit (dBuV/m)** | **Margin (dB)** | **Antenna Height (cm)** | **Table Angle (Degree)** | **Remark** |
| 2390 | 41.15 | 36.65 | 4.5 | 54 | -12.85 | 133 | 348 | Average |
| 2390 | 53.04 | 48.54 | 4.5 | 74 | -20.96 | 133 | 348 | Peak |
| 2412 | 92.84 | 88.29 | 4.55 | | | 133 | 348 | Average |
| 2412 | 99.84 | 95.29 | 4.55 | | | 133 | 348 | Peak |
| 4824 | 41.95 | 31.66 | 10.29 | 54 | -12.05 | 161 | 197 | Average |
| 4824 | 48.27 | 37.98 | 10.29 | 74 | -25.73 | 161 | 197 | Peak |

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2412 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

| EUT Test Condition | | Measurement Detail | |
|---|---|---|---|
| **Channel** | Channel 6 | **Frequency Range** | 1 GHz ~ 25 GHz |
| **Input Power** | 120 Vac, 60 Hz | **Detector Function** | Peak (PK)<br>Average (AV) |
| **Environmental Conditions** | 25 deg. C, 65 % RH | **Tested By** | Charles Hsiao |

| Antenna Polarity & Test Distance: Horizontal at 3 m | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Frequency (MHz)** | **Emission Level (dBuV/m)** | **Read Level (dBuV)** | **Factor (dB/m)** | **Limit (dBuV/m)** | **Margin (dB)** | **Antenna Height (cm)** | **Table Angle (Degree)** | **Remark** |
| 2390 | 40.52 | 36.02 | 4.5 | 54 | -13.48 | 250 | 320 | Average |
| 2390 | 51.66 | 47.16 | 4.5 | 74 | -22.34 | 250 | 320 | Peak |
| 2437 | 93.57 | 88.98 | 4.59 | | | 250 | 320 | Average |
| 2437 | 100.03 | 95.44 | 4.59 | | | 250 | 320 | Peak |
| 2483.5 | 41.09 | 36.43 | 4.66 | 54 | -12.91 | 250 | 320 | Average |
| 2483.5 | 51.81 | 47.15 | 4.66 | 74 | -22.19 | 250 | 320 | Peak |
| 4874 | 41.68 | 31.47 | 10.21 | 54 | -12.32 | 304 | 182 | Average |
| 4874 | 47.94 | 37.73 | 10.21 | 74 | -26.06 | 304 | 182 | Peak |
| **Antenna Polarity & Test Distance: Vertical at 3 m** | | | | | | | | |
| **Frequency (MHz)** | **Emission Level (dBuV/m)** | **Read Level (dBuV)** | **Factor (dB/m)** | **Limit (dBuV/m)** | **Margin (dB)** | **Antenna Height (cm)** | **Table Angle (Degree)** | **Remark** |
| 2390 | 40.7 | 36.2 | 4.5 | 54 | -13.3 | 133 | 348 | Average |
| 2390 | 52.31 | 47.81 | 4.5 | 74 | -21.69 | 133 | 348 | Peak |
| 2437 | 92.59 | 88 | 4.59 | | | 133 | 348 | Average |
| 2437 | 99.38 | 94.79 | 4.59 | | | 133 | 348 | Peak |
| 2483.5 | 41.13 | 36.47 | 4.66 | 54 | -12.87 | 133 | 348 | Average |
| 2483.5 | 52.95 | 48.29 | 4.66 | 74 | -21.05 | 133 | 348 | Peak |
| 4874 | 42.19 | 31.98 | 10.21 | 54 | -11.81 | 223 | 14 | Average |
| 4874 | 48.48 | 38.27 | 10.21 | 74 | -25.52 | 223 | 14 | Peak |

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2437 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

| EUT Test Condition | | Measurement Detail | |
|---|---|---|---|
| **Channel** | Channel 11 | **Frequency Range** | 1 GHz ~ 25 GHz |
| **Input Power** | 120 Vac, 60 Hz | **Detector Function** | Peak (PK)<br>Average (AV) |
| **Environmental Conditions** | 25 deg. C, 65 % RH | **Tested By** | Charles Hsiao |

| Antenna Polarity & Test Distance: Horizontal at 3 m | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Frequency (MHz)** | **Emission Level (dBuV/m)** | **Read Level (dBuV)** | **Factor (dB/m)** | **Limit (dBuV/m)** | **Margin (dB)** | **Antenna Height (cm)** | **Table Angle (Degree)** | **Remark** |
| 2462 | 92.63 | 88.01 | 4.62 | | | 202 | 320 | Average |
| 2462 | 99.07 | 94.45 | 4.62 | | | 202 | 320 | Peak |
| 2483.5 | 41.92 | 37.26 | 4.66 | 54 | -12.08 | 202 | 320 | Average |
| 2483.5 | 54.42 | 49.76 | 4.66 | 74 | -19.58 | 202 | 320 | Peak |
| 4924 | 42.59 | 32.34 | 10.25 | 54 | -11.41 | 247 | 243 | Average |
| 4924 | 48.72 | 38.47 | 10.25 | 74 | -25.28 | 247 | 243 | Peak |
| **Antenna Polarity & Test Distance: Vertical at 3 m** | | | | | | | | |
| **Frequency (MHz)** | **Emission Level (dBuV/m)** | **Read Level (dBuV)** | **Factor (dB/m)** | **Limit (dBuV/m)** | **Margin (dB)** | **Antenna Height (cm)** | **Table Angle (Degree)** | **Remark** |
| 2462 | 91.15 | 86.53 | 4.62 | | | 133 | 348 | Average |
| 2462 | 98.1 | 93.48 | 4.62 | | | 133 | 348 | Peak |
| 2483.5 | 42.65 | 37.99 | 4.66 | 54 | -11.35 | 133 | 348 | Average |
| 2483.5 | 55.48 | 50.82 | 4.66 | 74 | -18.52 | 133 | 348 | Peak |
| 4924 | 41.34 | 31.09 | 10.25 | 54 | -12.66 | 137 | 250 | Average |
| 4924 | 47.73 | 37.48 | 10.25 | 74 | -26.27 | 137 | 250 | Peak |

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2462 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

## 802.11n (HT40)

| EUT Test Condition | | Measurement Detail | |
|---|---|---|---|
| **Channel** | Channel 3 | **Frequency Range** | 1 GHz ~ 25 GHz |
| **Input Power** | 120 Vac, 60 Hz | **Detector Function** | Peak (PK)<br>Average (AV) |
| **Environmental Conditions** | 25 deg. C, 65 % RH | **Tested By** | Charles Hsiao |

| Antenna Polarity & Test Distance: Horizontal at 3 m | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Frequency (MHz)** | **Emission Level (dBuV/m)** | **Read Level (dBuV)** | **Factor (dB/m)** | **Limit (dBuV/m)** | **Margin (dB)** | **Antenna Height (cm)** | **Table Angle (Degree)** | **Remark** |
| 2390 | 48.6 | 44.1 | 4.5 | 54 | -5.4 | 231 | 73 | Average |
| 2390 | 60.01 | 55.51 | 4.5 | 74 | -13.99 | 231 | 73 | Peak |
| 2422 | 91.55 | 86.99 | 4.56 | | | 219 | 72 | Average |
| 2422 | 98.35 | 93.79 | 4.56 | | | 219 | 72 | Peak |
| 2483.5 | 41.5 | 36.84 | 4.66 | 54 | -12.5 | 231 | 73 | Average |
| 2483.5 | 52.35 | 47.69 | 4.66 | 74 | -21.65 | 231 | 73 | Peak |
| 4844 | 41.87 | 31.64 | 10.23 | 54 | -12.13 | 139 | 74 | Average |
| 4844 | 48.11 | 37.88 | 10.23 | 74 | -25.89 | 139 | 74 | Peak |
| **Antenna Polarity & Test Distance: Vertical at 3 m** | | | | | | | | |
| **Frequency (MHz)** | **Emission Level (dBuV/m)** | **Read Level (dBuV)** | **Factor (dB/m)** | **Limit (dBuV/m)** | **Margin (dB)** | **Antenna Height (cm)** | **Table Angle (Degree)** | **Remark** |
| 2390 | 46.74 | 42.24 | 4.5 | 54 | -7.26 | 133 | 348 | Average |
| 2390 | 59.47 | 54.97 | 4.5 | 74 | -14.53 | 133 | 348 | Peak |
| 2422 | 90.84 | 86.28 | 4.56 | | | 133 | 348 | Average |
| 2422 | 97.61 | 93.05 | 4.56 | | | 133 | 348 | Peak |
| 2483.5 | 41.56 | 36.9 | 4.66 | 54 | -12.44 | 133 | 348 | Average |
| 2483.5 | 52.57 | 47.91 | 4.66 | 74 | -21.43 | 133 | 348 | Peak |
| 4844 | 42.26 | 32.03 | 10.23 | 54 | -11.74 | 228 | 172 | Average |
| 4844 | 48.47 | 38.24 | 10.23 | 74 | -25.53 | 228 | 172 | Peak |

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2422 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

| EUT Test Condition | | Measurement Detail | |
|---|---|---|---|
| **Channel** | Channel 6 | **Frequency Range** | 1 GHz ~ 25 GHz |
| **Input Power** | 120 Vac, 60 Hz | **Detector Function** | Peak (PK)<br>Average (AV) |
| **Environmental Conditions** | 25 deg. C, 65 % RH | **Tested By** | Charles Hsiao |

| Antenna Polarity & Test Distance: Horizontal at 3 m | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Frequency (MHz)** | **Emission Level (dBuV/m)** | **Read Level (dBuV)** | **Factor (dB/m)** | **Limit (dBuV/m)** | **Margin (dB)** | **Antenna Height (cm)** | **Table Angle (Degree)** | **Remark** |
| 2390 | 43.43 | 38.93 | 4.5 | 54 | -10.57 | 250 | 320 | Average |
| 2390 | 55 | 50.5 | 4.5 | 74 | -19 | 250 | 320 | Peak |
| 2437 | 92.84 | 88.25 | 4.59 | | | 250 | 320 | Average |
| 2437 | 99.81 | 95.22 | 4.59 | | | 250 | 320 | Peak |
| 2483.5 | 41.93 | 37.27 | 4.66 | 54 | -12.07 | 250 | 320 | Average |
| 2483.5 | 53.24 | 48.58 | 4.66 | 74 | -20.76 | 250 | 320 | Peak |
| 4874 | 41.96 | 31.75 | 10.21 | 54 | -12.04 | 247 | 106 | Average |
| 4874 | 48.2 | 37.99 | 10.21 | 74 | -25.8 | 247 | 106 | Peak |
| **Antenna Polarity & Test Distance: Vertical at 3 m** | | | | | | | | |
| **Frequency (MHz)** | **Emission Level (dBuV/m)** | **Read Level (dBuV)** | **Factor (dB/m)** | **Limit (dBuV/m)** | **Margin (dB)** | **Antenna Height (cm)** | **Table Angle (Degree)** | **Remark** |
| 2390 | 44.1 | 39.6 | 4.5 | 54 | -9.9 | 133 | 348 | Average |
| 2390 | 55.33 | 50.83 | 4.5 | 74 | -18.67 | 133 | 348 | Peak |
| 2437 | 91.5 | 86.91 | 4.59 | | | 133 | 348 | Average |
| 2437 | 98.33 | 93.74 | 4.59 | | | 133 | 348 | Peak |
| 2483.5 | 43.59 | 38.93 | 4.66 | 54 | -10.41 | 133 | 348 | Average |
| 2483.5 | 56.48 | 51.82 | 4.66 | 74 | -17.52 | 133 | 348 | Peak |
| 4874 | 41.46 | 31.25 | 10.21 | 54 | -12.54 | 165 | 199 | Average |
| 4874 | 47.72 | 37.51 | 10.21 | 74 | -26.28 | 165 | 199 | Peak |

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2437 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

| EUT Test Condition | | Measurement Detail | |
|---|---|---|---|
| **Channel** | Channel 9 | **Frequency Range** | 1 GHz ~ 25 GHz |
| **Input Power** | 120 Vac, 60 Hz | **Detector Function** | Peak (PK)<br>Average (AV) |
| **Environmental Conditions** | 25 deg. C, 65 % RH | **Tested By** | Charles Hsiao |

| Antenna Polarity & Test Distance: Horizontal at 3 m | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Frequency (MHz)** | **Emission Level (dBuV/m)** | **Read Level (dBuV)** | **Factor (dB/m)** | **Limit (dBuV/m)** | **Margin (dB)** | **Antenna Height (cm)** | **Table Angle (Degree)** | **Remark** |
| 2390 | 41.13 | 36.63 | 4.5 | 54 | -12.87 | 202 | 320 | Average |
| 2390 | 52.44 | 47.94 | 4.5 | 74 | -21.56 | 202 | 320 | Peak |
| 2452 | 90.84 | 86.24 | 4.6 | | | 202 | 320 | Average |
| 2452 | 97.06 | 92.46 | 4.6 | | | 202 | 320 | Peak |
| 2483.5 | 44.92 | 40.26 | 4.66 | 54 | -9.08 | 202 | 320 | Average |
| 2483.5 | 57.3 | 52.64 | 4.66 | 74 | -16.7 | 202 | 320 | Peak |
| 4904 | 42.46 | 32.32 | 10.14 | 54 | -11.54 | 204 | 173 | Average |
| 4904 | 48.59 | 38.45 | 10.14 | 74 | -25.41 | 204 | 173 | Peak |
| **Antenna Polarity & Test Distance: Vertical at 3 m** | | | | | | | | |
| **Frequency (MHz)** | **Emission Level (dBuV/m)** | **Read Level (dBuV)** | **Factor (dB/m)** | **Limit (dBuV/m)** | **Margin (dB)** | **Antenna Height (cm)** | **Table Angle (Degree)** | **Remark** |
| 2390 | 40.99 | 36.49 | 4.5 | 54 | -13.01 | 133 | 348 | Average |
| 2390 | 52.47 | 47.97 | 4.5 | 74 | -21.53 | 133 | 348 | Peak |
| 2452 | 89.87 | 85.27 | 4.6 | | | 133 | 348 | Average |
| 2452 | 96.15 | 91.55 | 4.6 | | | 133 | 348 | Peak |
| 2483.5 | 46.46 | 41.8 | 4.66 | 54 | -7.54 | 133 | 348 | Average |
| 2483.5 | 58.33 | 53.67 | 4.66 | 74 | -15.67 | 133 | 348 | Peak |
| 4904 | 42.61 | 32.47 | 10.14 | 54 | -11.39 | 216 | 107 | Average |
| 4904 | 48.86 | 38.72 | 10.14 | 74 | -25.14 | 216 | 107 | Peak |

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2452 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

### 9 kHz ~ 30 MHz Data:

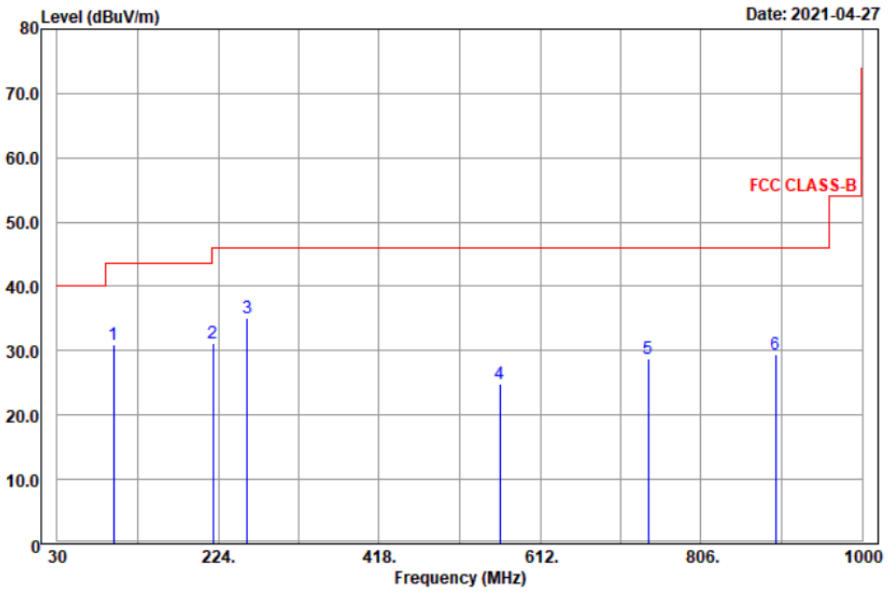
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

### 30 MHz ~ 1 GHz Worst-Case Data:

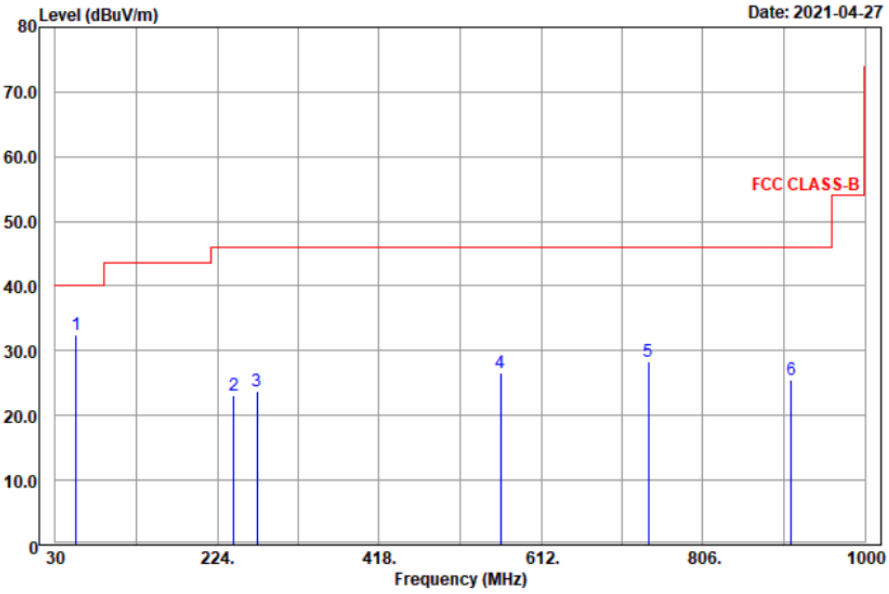
### 802.11g

| EUT Test Condition | | Measurement Detail | |
|---|---|---|---|
| **Channel** | Channel 11 | **Frequency Range** | 30 MHz ~ 1 GHz |
| **Input Power** | 120 Vac, 60 Hz | **Detector Function** | Peak (PK)<br>Quasi-peak (QP) |
| **Environmental Conditions** | 25 deg. C, 65 % RH | **Tested By** | Karl Lee |

**Horizontal**




**Vertical**



| Antenna Polarity & Test Distance: Horizontal at 3 m | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | Emission Level (dBuV/m) | Read Level (dBuV) | Factor (dB/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (cm) | Table Angle (Degree) | Remark |
| 98.31 | 30.93 | 48.39 | -17.46 | 43.5 | -12.57 | 121 | 214 | Peak |
| 217.65 | 31.13 | 49.05 | -17.92 | 46 | -14.87 | 105 | 285 | Peak |
| 259.23 | 35.16 | 51.85 | -16.69 | 46 | -10.84 | 166 | 196 | Peak |
| 563.9 | 24.83 | 36.13 | -11.3 | 46 | -21.17 | 105 | 226 | Peak |
| 742.4 | 28.67 | 37.21 | -8.54 | 46 | -17.33 | 193 | 26 | Peak |
| 895.7 | 29.39 | 35.38 | -5.99 | 46 | -16.61 | 124 | 166 | Peak |
| **Antenna Polarity & Test Distance: Vertical at 3 m** | | | | | | | | |
| Frequency (MHz) | Emission Level (dBuV/m) | Read Level (dBuV) | Factor (dB/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (cm) | Table Angle (Degree) | Remark |
| 54.57 | 32.37 | 47.8 | -15.43 | 40 | -7.63 | 157 | 17 | Peak |
| 243.57 | 23.14 | 40.11 | -16.97 | 46 | -22.86 | 105 | 162 | Peak |
| 271.92 | 23.74 | 40.26 | -16.52 | 46 | -22.26 | 124 | 17 | Peak |
| 563.9 | 26.55 | 37.85 | -11.3 | 46 | -19.45 | 199 | 262 | Peak |
| 741 | 28.33 | 36.87 | -8.54 | 46 | -17.67 | 105 | 288 | Peak |
| 911.8 | 25.6 | 31.35 | -5.75 | 46 | -20.4 | 127 | 44 | Peak |

Remarks:

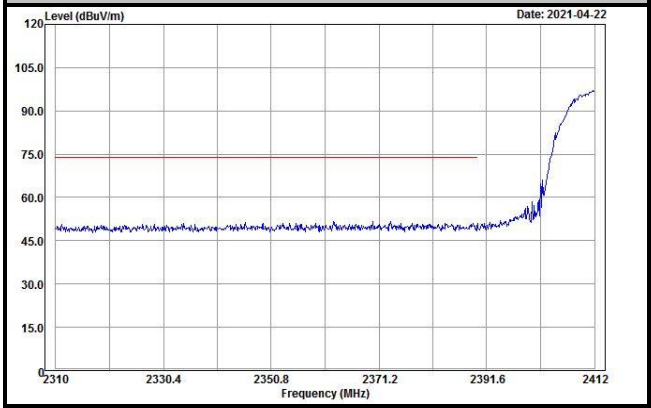
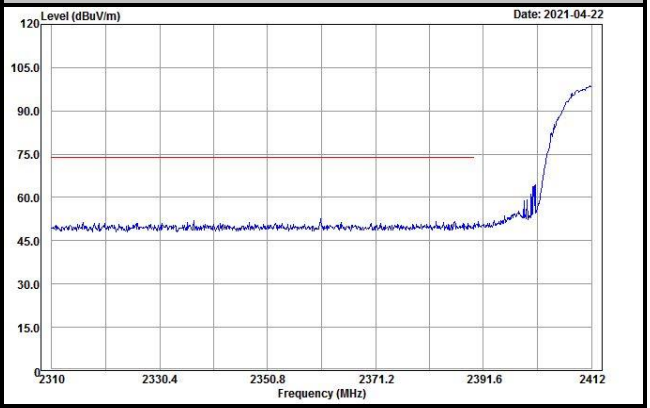
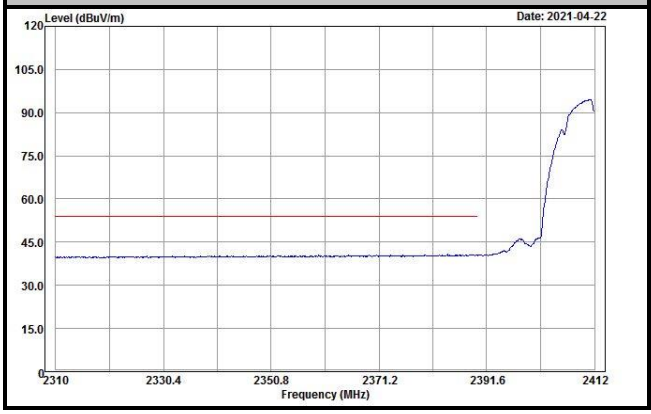
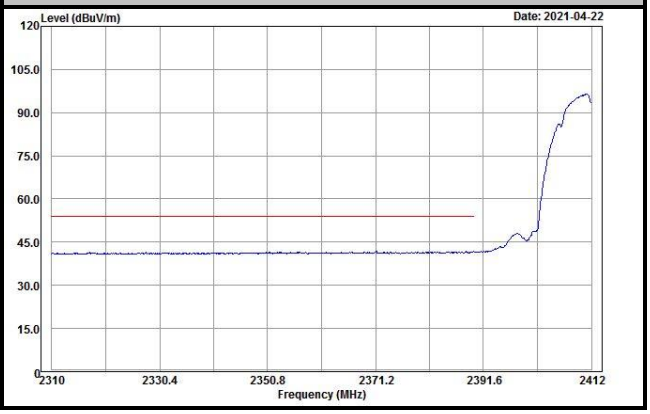
1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value.
2. The emission levels of other frequencies were very low against the limit.

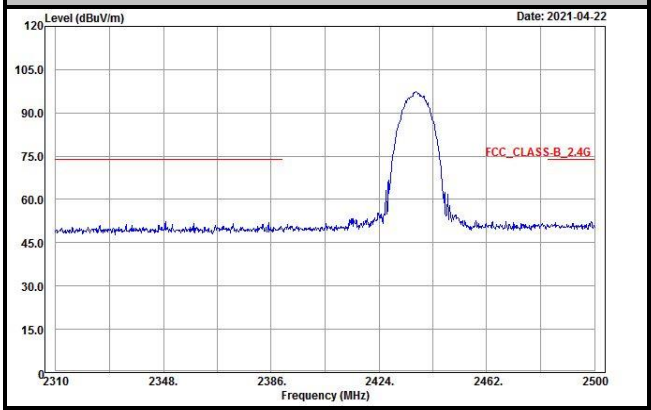
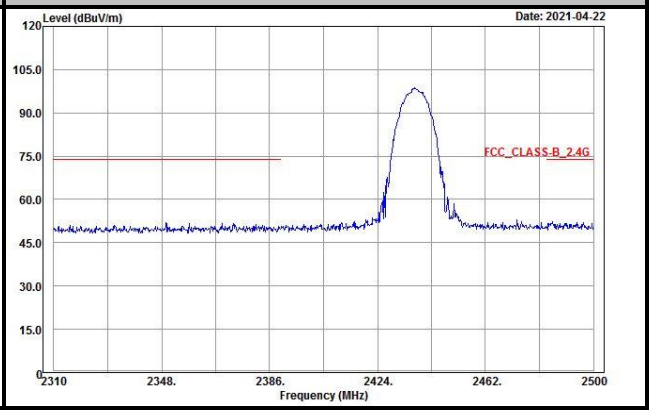
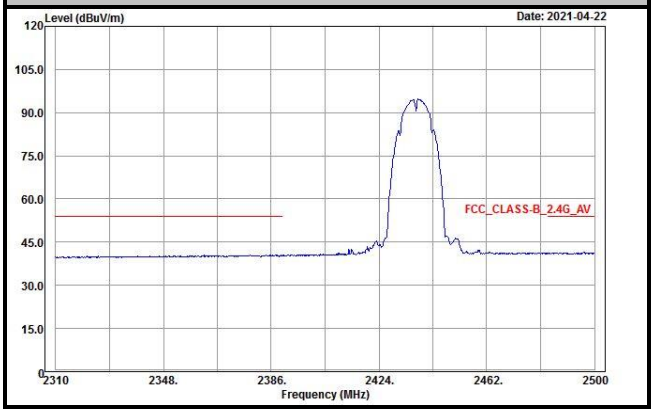
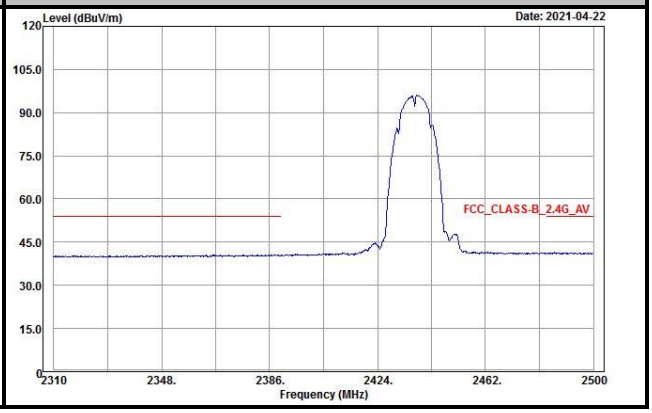
## 5 Pictures of Test Arrangements

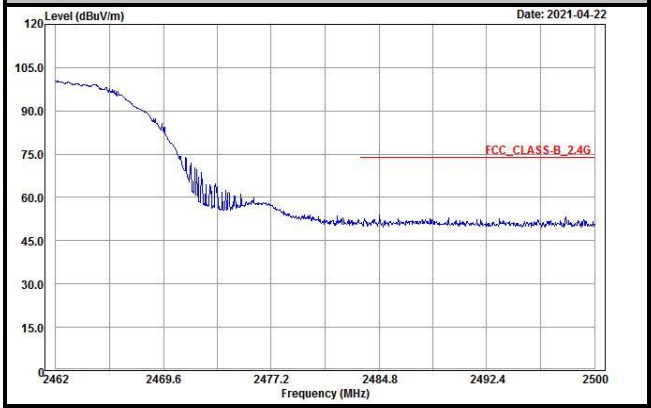
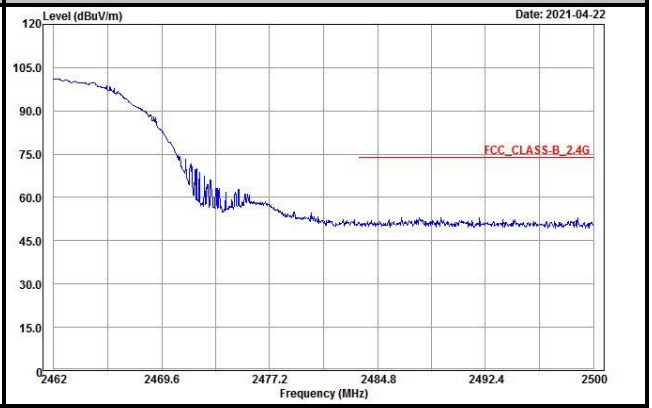
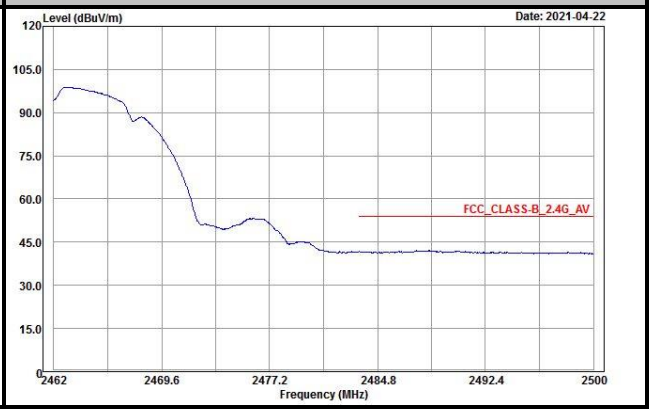
Please refer to the attached file (Test Setup Photo).

## Annex A- Band Edge Measurement

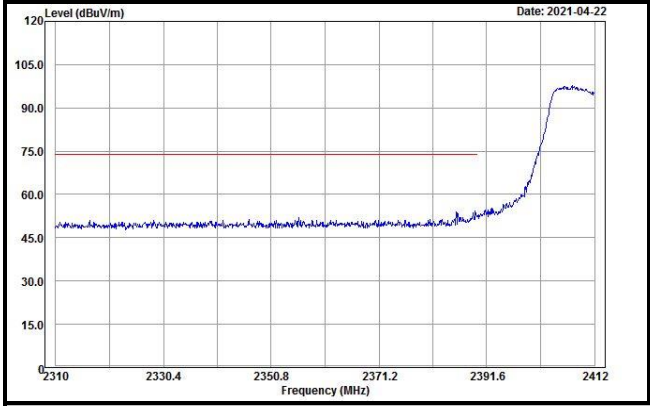
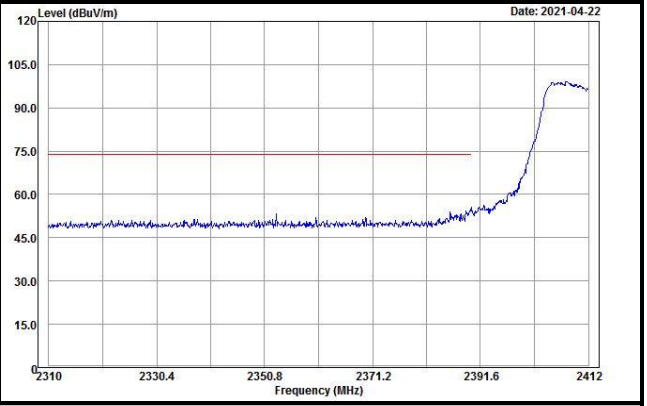
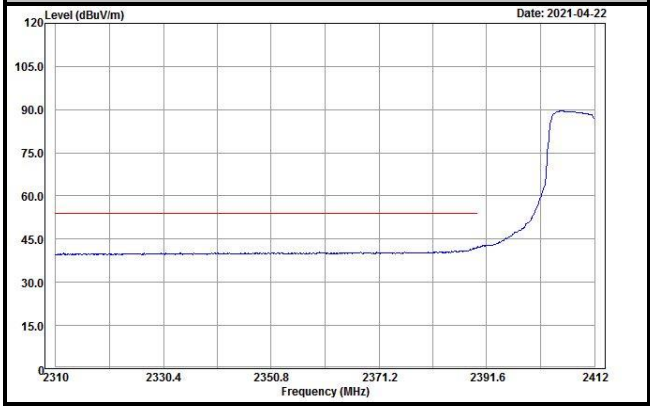
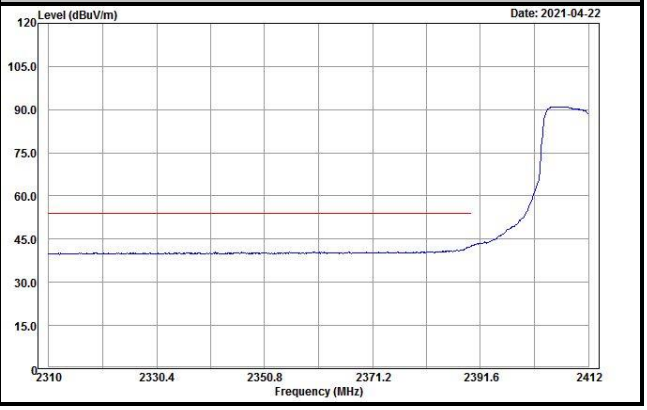
### 802.11b

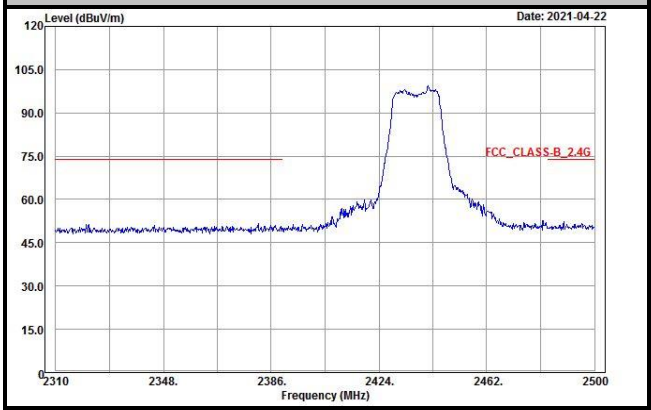
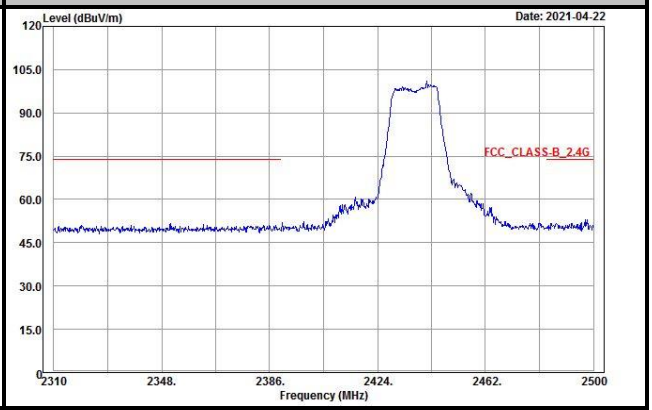
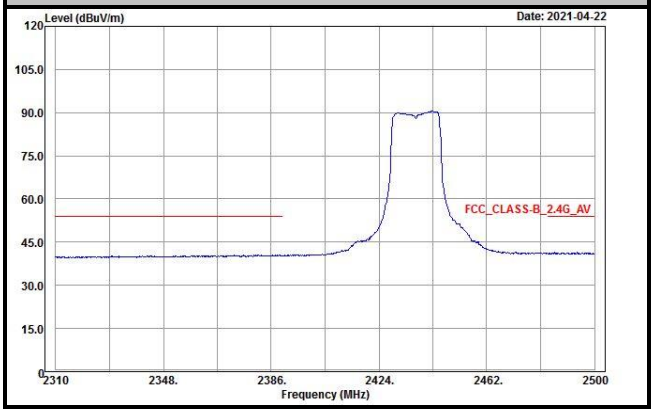
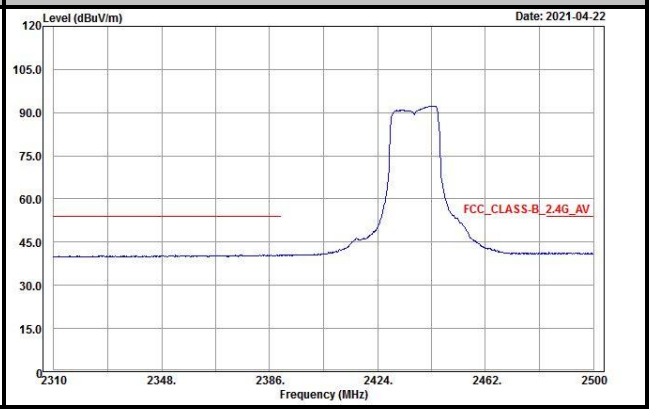
| Ch 1 | |
|---|---|
| Peak | |
| Horizontal | Vertical |
|  |  |
| Average | |
| Horizontal | Vertical |
|  |  |

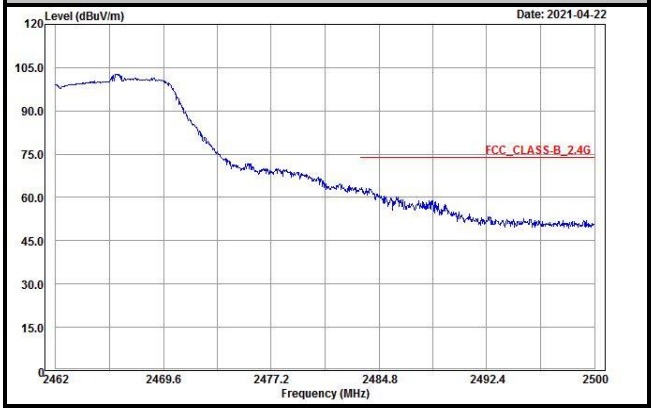
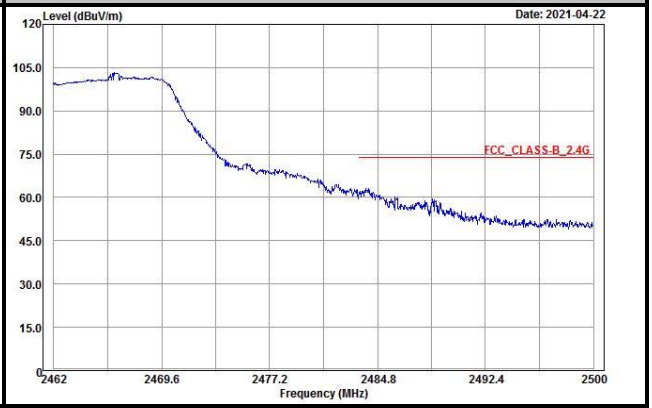
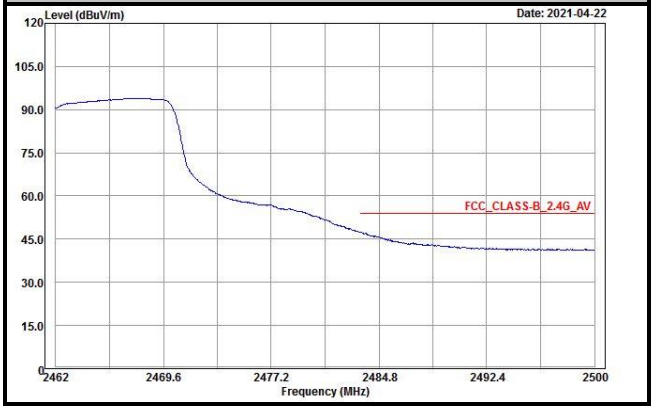
| Ch 6 | |
|---|---|
| **Peak** | |
| **Horizontal** | **Vertical** |
|  |  |
| **Average** | |
| **Horizontal** | **Vertical** |
|  |  |

| Ch 11 | |
|---|---|
| **Peak** | |
| **Horizontal** | **Vertical** |
|  |  |
| **Average** | |
| **Horizontal** | **Vertical** |
| |  |

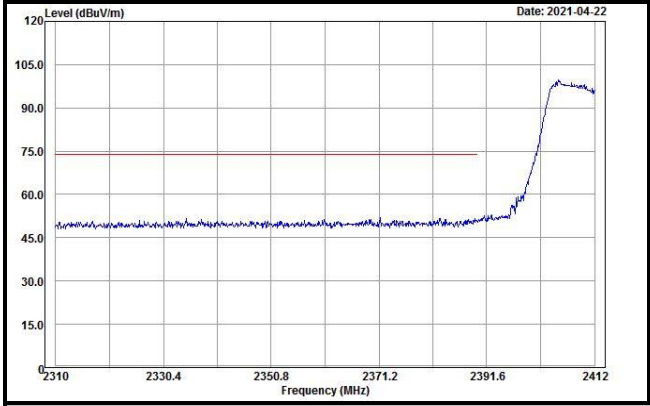
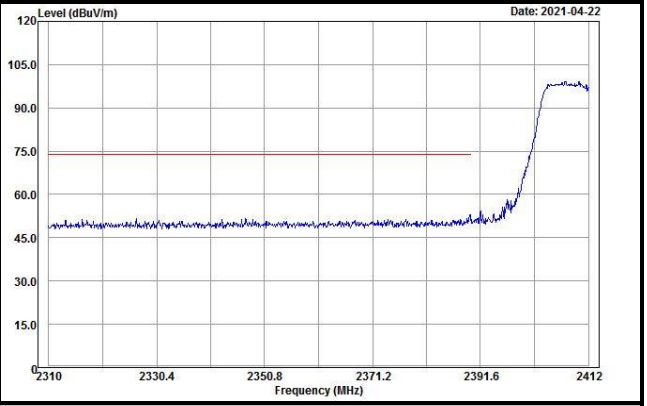
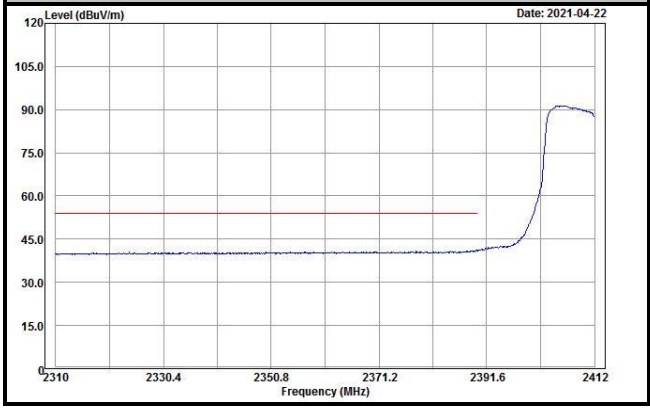
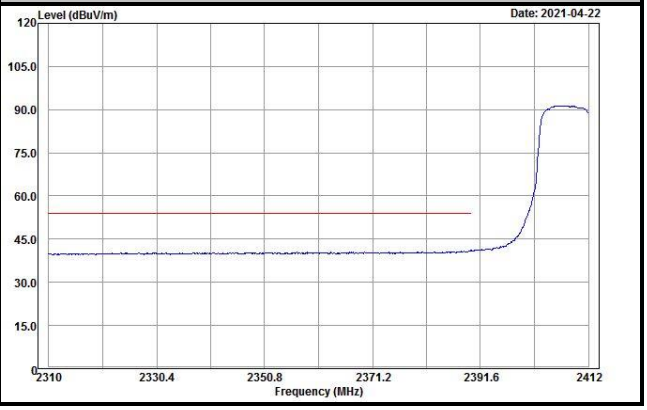
## 802.11g

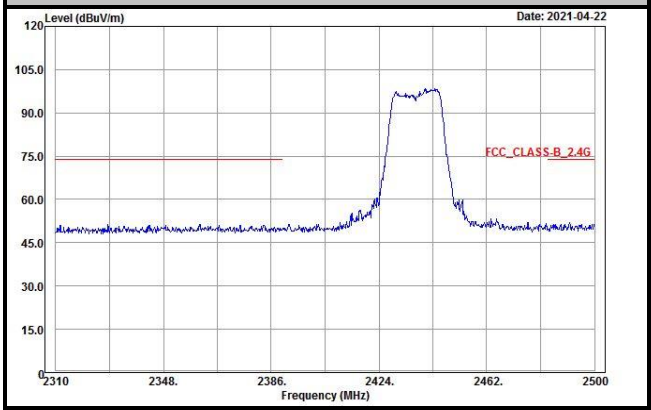
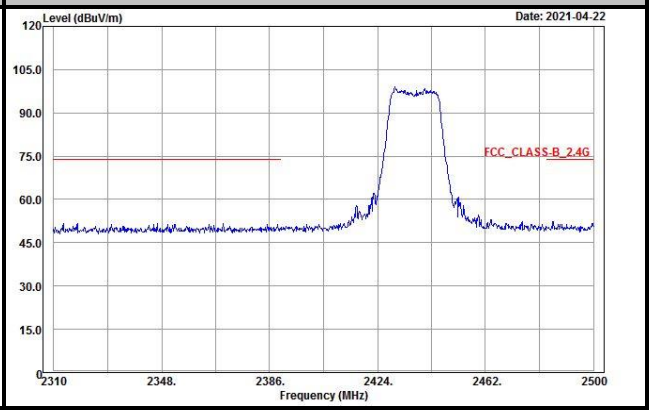
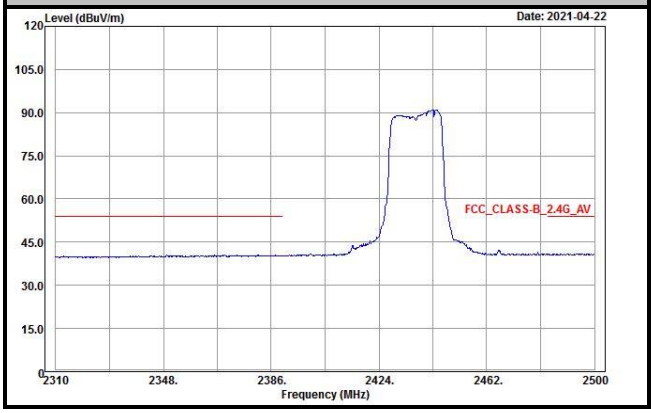
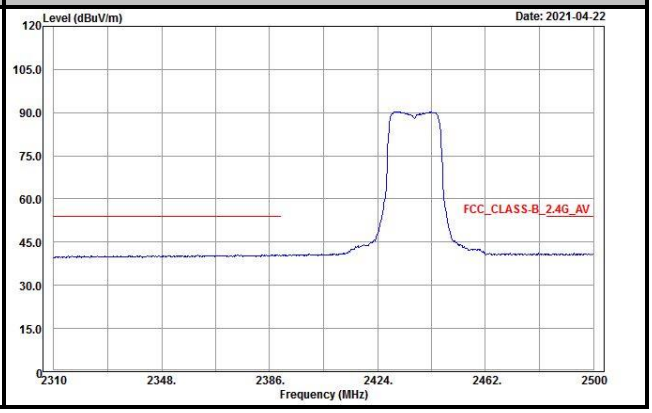
| Ch 1 | |
|---|---|
| **Peak** | |
| **Horizontal** | **Vertical** |
|  |  |
| **Average** | |
| **Horizontal** | **Vertical** |
|  |  |

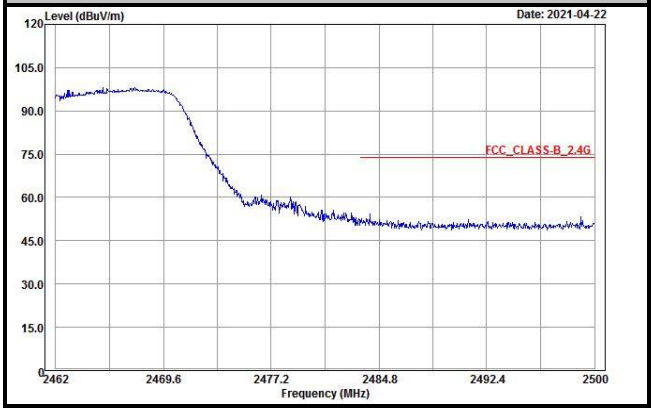
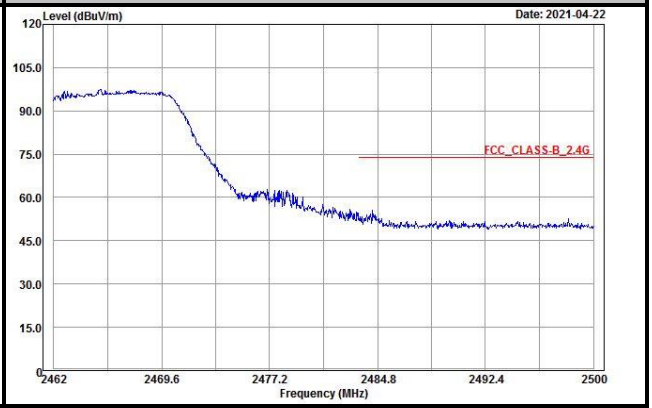
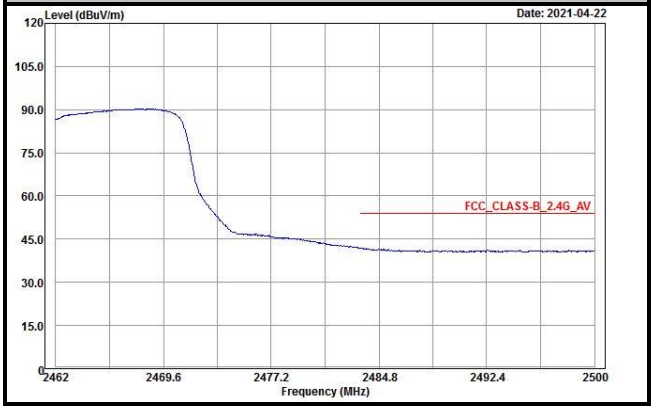
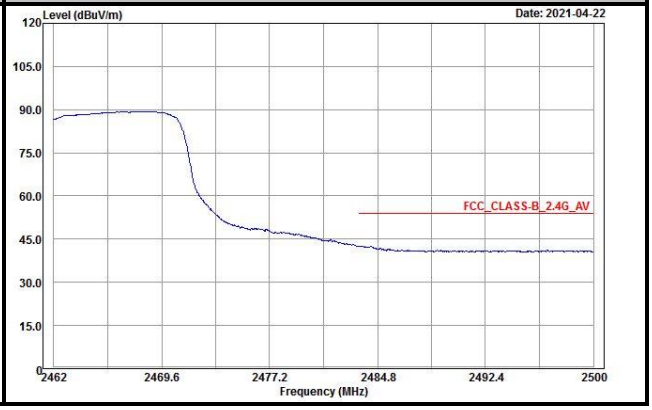
| Ch 6 | |
|---|---|
| **Peak** | |
| **Horizontal** | **Vertical** |
|  |  |
| **Average** | |
| **Horizontal** | **Vertical** |
|  |  |

| Ch 11 | |
|---|---|
| **Peak** | |
| **Horizontal** | **Vertical** |
|  |  |
| **Average** | |
| **Horizontal** | **Vertical** |
|  | |

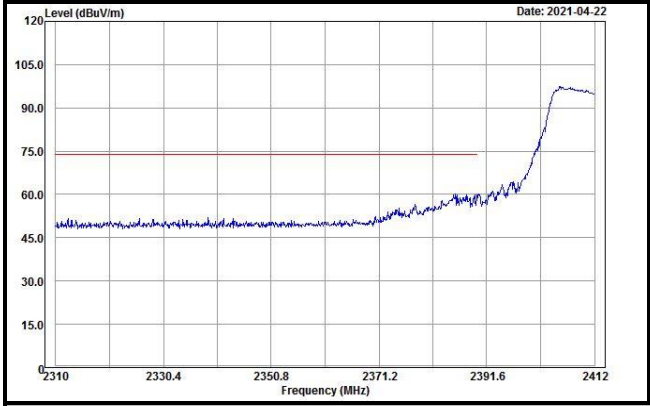
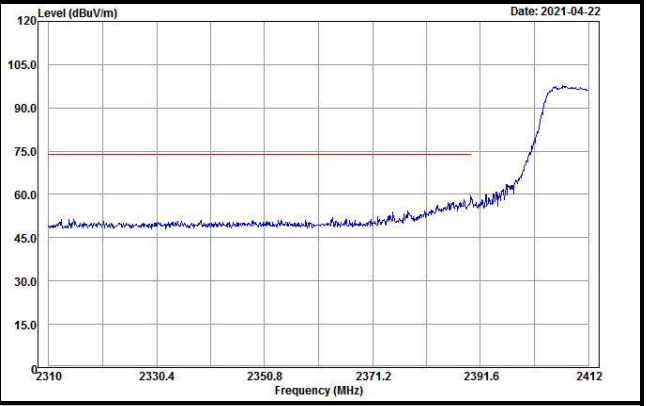
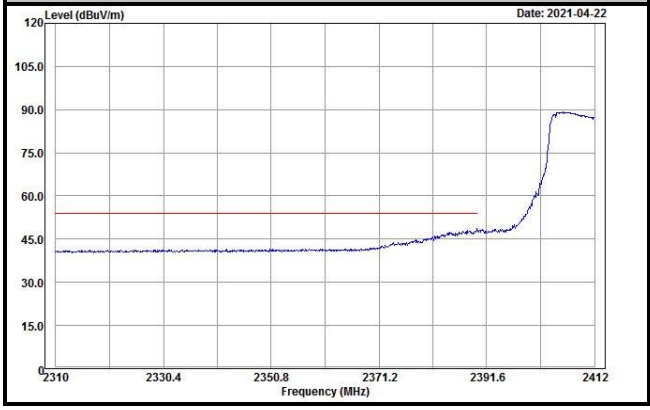
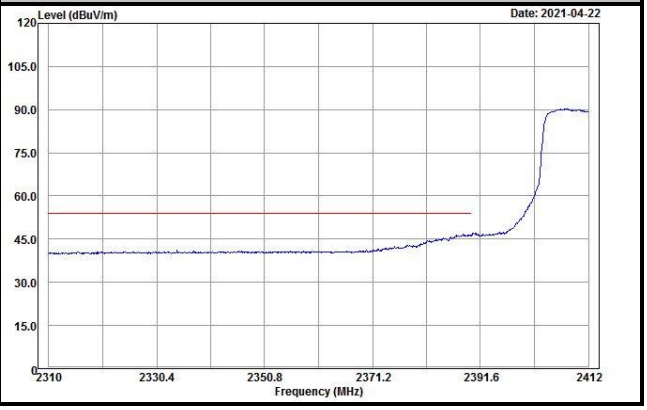
## 802.11n (HT20)

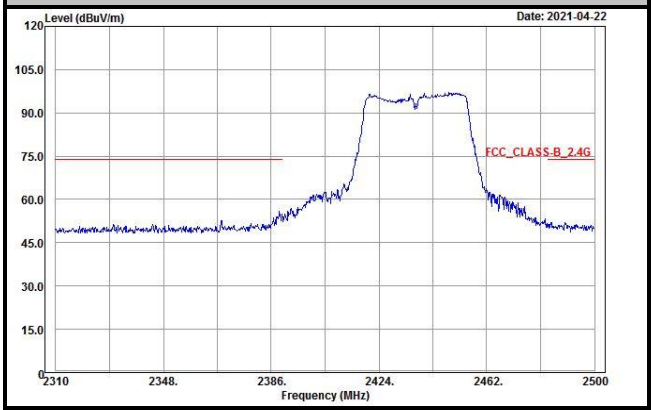
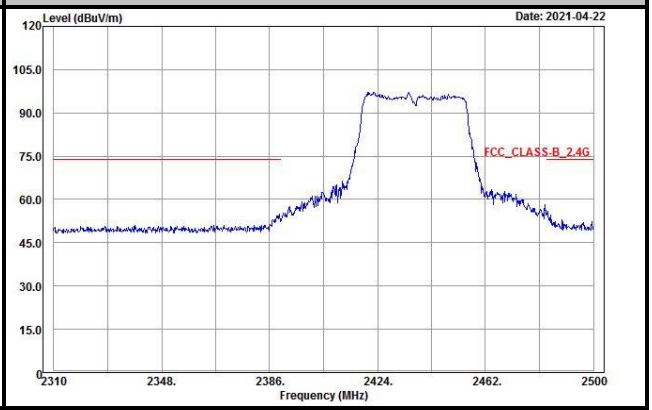
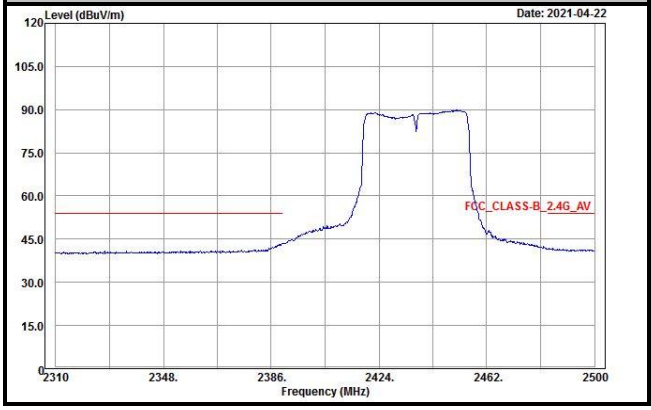
| Ch 1 | |
|---|---|
| **Peak** | |
| **Horizontal** | **Vertical** |
|  |  |
| **Average** | |
| **Horizontal** | **Vertical** |
|  |  |

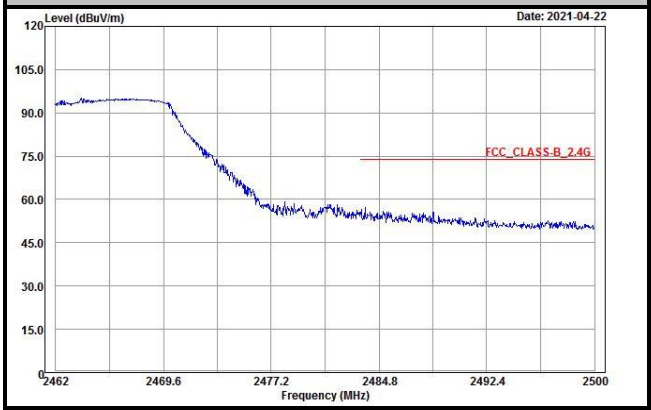
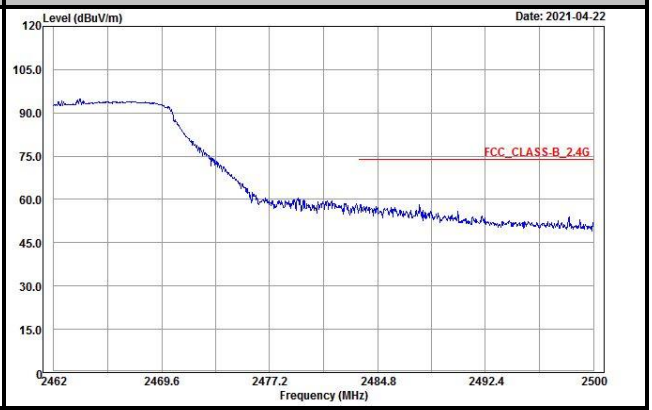
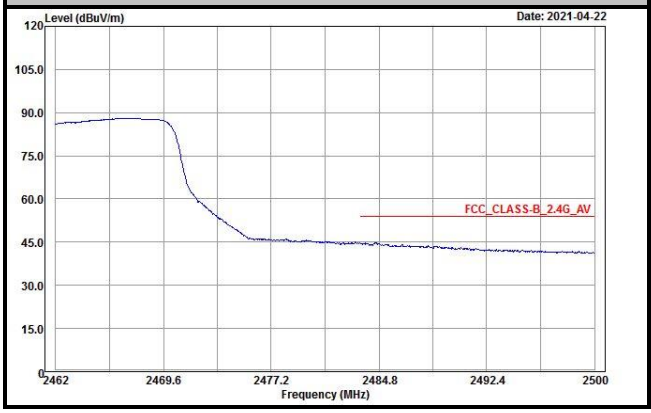
| Ch 6 | |
|---|---|
| **Peak** | |
| **Horizontal** | **Vertical** |
|  |  |
| **Average** | |
| **Horizontal** | **Vertical** |
|  |  |

| Ch 11 | |
|---|---|
| **Peak** | |
| **Horizontal** | **Vertical** |
|  |  |
| **Average** | |
| **Horizontal** | **Vertical** |
|  |  |

## 802.11n (HT40)

| Ch 3 | |
|---|---|
| **Peak** | |
| **Horizontal** | **Vertical** |
|  |  |
| **Average** | |
| **Horizontal** | **Vertical** |
|  |  |

| Ch 6 | |
|---|---|
| **Peak** | |
| **Horizontal** | **Vertical** |
|   |   |
| **Average** | |
| **Horizontal** | **Vertical** |
|   | |

| Ch 9 | |
|---|---|
| **Peak** | |
| **Horizontal** | **Vertical** |
|  |  |
| **Average** | |
| **Horizontal** | **Vertical** |
|  | |

## Appendix – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:


**Lin Kou EMC/RF Lab**
Tel: 886-2-26052180
Fax: 886-2-26051924

**Hsin Chu EMC/RF/Telecom Lab**
Tel: 886-3-6668565
Fax: 886-3-6668323

**Hwa Ya EMC/RF/Safety Lab**
Tel: 886-3-3183232
Fax: 886-3-3270892

**Email:** service.adt@tw.bureauveritas.com
**Web Site:** www.bureauveritas-adt.com


The address and road map of all our labs can be found in our web site also.

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