



Test report No. : 4789804203-US-R0-V0  
Page : 1 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

## **RADIO TEST REPORT**

**Product** : 802.11ac/a/n 2T2R Wifi USB Module  
**Model Name** : WUBT-236ACN(BT)[MN]  
**FCC ID** : ZZ6-WUBT236ACNBT  
**Test Regulation** : FCC 47 CFR Part 15 Subpart E (Section 15.407)  
**Received Date** : Feb. 17, 2021  
**Test Date** : Feb. 18, 2021 ~ Mar. 5, 2021  
**Issued Date** : Apr. 8, 2021  
  
**Applicant** : Varex Imaging Corporation  
1678 South Pioneer Road, Salt Lake City, Utah 84104,  
USA  
  
**Issued By** : Underwriters Laboratories Taiwan Co., Ltd.  
Building B and Building E, No. 372-7, Sec. 4, Zhongxing  
Rd., Zhudong Township, Hsinchu County, Taiwan



The results reported herein have been performed in accordance with the laboratory's terms of accreditation. This report shall not be reproduced except in full without the written approval of the Laboratory. The results in this report are responsible of the test sample(s) provided by the client only and are not to be used to indicate applicability to other similar products.

### **Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 2 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

## REVISION HISTORY

**Original Test Report No.: 4789804203-US-R0-V0**

[illegible]

**Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



## Table of Contents

|                                                                 |           |
|-----------------------------------------------------------------|-----------|
| <b>1. Attestation of Test Results .....</b>                     | <b>4</b>  |
| <b>2. Summary of Test Results .....</b>                         | <b>5</b>  |
| <b>3. Test Methodology and Reference Procedures.....</b>        | <b>6</b>  |
| <b>4. Facilities and Accreditation .....</b>                    | <b>6</b>  |
| <b>5. Measurement Uncertainty .....</b>                         | <b>7</b>  |
| <b>6. Equipment under Test .....</b>                            | <b>8</b>  |
| 6.1. Description of EUT .....                                   | 8         |
| 6.2. Channel List .....                                         | 10        |
| 6.3. Test Condition.....                                        | 11        |
| 6.4. Description of Available Antennas .....                    | 11        |
| 6.5. Test Mode Applicability and Tested Channel Detail.....     | 12        |
| 6.6. Duty cycle .....                                           | 13        |
| <b>7. Test Equipment.....</b>                                   | <b>14</b> |
| <b>8. Description of Test Setup.....</b>                        | <b>16</b> |
| <b>9. Test Results.....</b>                                     | <b>18</b> |
| 9.1. 6dB Bandwidth .....                                        | 18        |
| 9.2. 26dB Bandwidth .....                                       | 21        |
| 9.3. Occupied Bandwidth.....                                    | 24        |
| 9.4. Conducted Output Power.....                                | 29        |
| 9.5. Power Spectral Density .....                               | 33        |
| 9.6. Frequency Stability .....                                  | 41        |
| 9.7. Radiated Spurious Emission .....                           | 43        |
| 9.8. AC Power Line Conducted Emission .....                     | 69        |
| <b>Appendix I Radiated Band Edge and OOB Measurement.....</b>   | <b>75</b> |
| <b>Appendix II Radiated Spurious Emission Measurement .....</b> | <b>85</b> |



Test report No. : 4789804203-US-R0-V0  
Page : 4 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

## 1. Attestation of Test Results

**APPLICANT:** Varex Imaging Corporation  
1678 South Pioneer Road, Salt Lake City, Utah 84104, USA

**MANUFACTURER:** Varex Imaging Corporation  
1678 South Pioneer Road, Salt Lake City, Utah 84104, USA

**EUT DESCRIPTION:** 802.11ac/a/n 2T2R Wifi USB Module

**BRAND:** Varex Imaging Corporation

**MODEL:** WUBT-236ACN(BT)[MN]

**SAMPLE STAGE:** Engineering Sample

**DATE of TESTED:** Feb. 18, 2021 ~ Mar. 5, 2021

| APPLICABLE STANDARDS                          |              |
|-----------------------------------------------|--------------|
| STANDARD                                      | Test Results |
| FCC 47 CFR PART 15 Subpart E (Section 15.407) | PASS         |

Underwriters Laboratories Taiwan Co., Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by Underwriters Laboratories Taiwan Co., Ltd. based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Underwriters Laboratories Taiwan Co., Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Underwriters Laboratories Taiwan Co., Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Prepared By:

Sally Lu  
Project Handler

Date : Apr. 8, 2021

Approved and Authorized By:

Mike Cai  
Engineer Project Associate

Date : Apr. 8, 2021

### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



## 2. Summary of Test Results

| Summary of Test Results    |                                                 |           |
|----------------------------|-------------------------------------------------|-----------|
| FCC Clause                 | Test Items                                      | Result    |
| 15.407(e)                  | 6dB Bandwidth                                   | PASS      |
| 15.403(i)                  | 26dB Bandwidth                                  | PASS      |
| 2.1049                     | Occupied Bandwidth                              | See Note2 |
| 15.407(a)(1)               | Conducted Output Power                          | PASS      |
| 15.407(a)(1)               | Power Spectral Density                          | PASS      |
| 15.407(g)                  | Frequency Stability                             | PASS      |
| 15.407(b)<br>(1/4(i/ii)/6) | Radiated Emissions and<br>Band Edge Measurement | PASS      |
| 15.407(b)(6)               | AC Power Conducted Emission                     | PASS      |
| 15.203                     | Antenna Requirement                             | PASS      |

Note:

1. For the Radiated Band Edge and OOB test plots were recorded in Appendix I, the Radiated Emissions test plots were recorded in Appendix II.
2. The Occupied Bandwidth was reference only.

### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 6 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

### 3. Test Methodology and Reference Procedures

The tests documented in this report were performed in accordance with 47 CFR FCC Part 2, KDB 789033 D02 General UNII Test Procedure New Rules v02r01, KDB414788 D01 Radiated Test Site v01r01, ANSI C63.10-2013 and KDB 662911 D01 Multiple Transmitter Output v02r01.

### 4. Facilities and Accreditation

|                                  |                                                                                                                                                                                                                                                                                                                                 |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Test Location</b>             | Underwriters Laboratories Taiwan Co., Ltd.                                                                                                                                                                                                                                                                                      |
| <b>Address</b>                   | Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan                                                                                                                                                                                                                           |
| <b>Accreditation Certificate</b> | Underwriters Laboratories Taiwan Co., Ltd. is accredited by TAF, Laboratory Code 3398. The full scope of accreditation can be viewed at <a href="http://accreditation.taftw.org.tw/taf/public/basic/viewApplyItems.action?unitNo=3398">http://accreditation.taftw.org.tw/taf/public/basic/viewApplyItems.action?unitNo=3398</a> |

#### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



## 5. Measurement Uncertainty

For statement of conformity, accuracy method (Section 8.2.4 and 8.2.5 of ISO Guide 98-4) was applied as decision rule for measurement in this test report.

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor  $k=2$ .

| Test Item                                      | Measurement Frequency Range | K | U(dB) |
|------------------------------------------------|-----------------------------|---|-------|
| Conducted disturbance at mains terminals ports | 0.15MHz ~ 30MHz             | 2 | 1.5   |
| RF Conducted                                   | 9 kHz - 40GHz               | 2 | 1.0   |
| Radiated disturbance below 30MHz               | 9 kHz - 30 MHz              | 2 | 1.9   |
| Radiated disturbance below 1 GHz               | 30MHz ~ 1GHz                | 2 | 5.4   |
| Radiated disturbance above 1GHz                | 1GHz ~ 40GHz                | 2 | 4.7   |

### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



## 6. Equipment under Test

### 6.1. Description of EUT

|                             |                                                                        |                                                 |
|-----------------------------|------------------------------------------------------------------------|-------------------------------------------------|
| <b>Product</b>              | 802.11ac/a/n 2T2R Wifi USB Module                                      |                                                 |
| <b>Brand Name</b>           | Varex Imaging Corporation                                              |                                                 |
| <b>Model Name</b>           | WUBT-236ACN(BT)[MN]                                                    |                                                 |
| <b>Operating Frequency</b>  | 5180 ~ 5240 MHz<br>5745 ~ 5825 MHz                                     |                                                 |
| <b>Modulation</b>           | 256QAM, 64QAM, 16QAM, QPSK, BPSK                                       |                                                 |
| <b>Transfer Rate</b>        | 802.11a: up to 54 Mbps<br>802.11n: up to MCS15<br>802.11ac: up to MCS9 |                                                 |
| <b>Number of Channel</b>    | 5180 ~ 5240 MHz                                                        | 4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) |
|                             |                                                                        | 2 for 802.11n (HT40), 802.11 ac (VHT40)         |
|                             |                                                                        | 1 for 802.11ac (VHT80)                          |
|                             | 5745 ~ 5825 MHz                                                        | 5 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) |
|                             |                                                                        | 2 for 802.11n (HT40), 802.11 ac (VHT40)         |
|                             |                                                                        | 1 for 802.11ac (VHT80)                          |
| <b>Maximum Output Power</b> | 5180 ~ 5240 MHz: 17.34 dBm<br>5745 ~ 5825 MHz: 16.84 dBm               |                                                 |
| <b>Normal Voltage</b>       | Host: 19Vdc from Adapter<br>EUT: 5Vdc from Host                        |                                                 |
| <b>S/N</b>                  | E162061                                                                |                                                 |
| <b>Software Version</b>     | N/A                                                                    |                                                 |

### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Note:

1. The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and two receivers.

| Modulation Mode  | Tx,Rx Function |
|------------------|----------------|
| 802.11a          | 1TX,1RX        |
| 802.11n (HT20)   | 2TX,2RX        |
| 802.11n (HT40)   | 2TX,2RX        |
| 802.11ac (VHT20) | 2TX,2RX        |
| 802.11ac (VHT40) | 2TX,2RX        |
| 802.11ac (VHT80) | 2TX,2RX        |

\* The modulation and bandwidth are similar for 802.11n mode for HT20 / HT40 and 802.11ac mode for VHT20 / VHT40, therefore investigated worst case to representative mode in test report.

2. The EUT is WLAN module inside the X-ray Detector, Host information as below:

| Product                | Brand                     | Model    | Description                                 |
|------------------------|---------------------------|----------|---------------------------------------------|
| Digital Image Receptor | Varex Imaging Corporation | 4336W-G5 | S/N: A07S03-0202<br>Size: 460 x 384 x 16 mm |

3. The X-ray Detector contains following accessory devices.

| Product                                                       | Brand       | Model             | Description                                                      |
|---------------------------------------------------------------|-------------|-------------------|------------------------------------------------------------------|
| Adapter                                                       | XP power    | AHM85PS19-XG1714B | AC input : 100 – 240V ~1.0A<br>50/60Hz,<br>DC output: 19V, 4.47A |
| Battery                                                       | Accutronics | VB-200            | 15.4V/ 3.43Ah                                                    |
| Tether Cable (USB Type C to RJ45 and DC jack cable (Y cable)) | BizLink     | 117G0-073100-R1   | Shielded, 2m                                                     |
| 3 Bay Battery charger                                         | Great Batch | 35205 REV G       | Input:19Vdc 4.5A Output:<br>16.8Vdc, 1.4A                        |
| Power cable for battery charger                               | N/A         | N/A               | Non-Shielded, 1.8m                                               |
| Power supply for battery charger                              | XP Power    | AHM85PS19         | 85W, 19V, 4.47A                                                  |

4. The above EUT information is declared by manufacturer and for more detailed features description, please refer the manufacturer's or user's manual.

**Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



## 6.2. Channel List

### FOR 5180 ~ 5240MHz

4 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

| Channel | Frequency | Channel | Frequency |
|---------|-----------|---------|-----------|
| 36      | 5180 MHz  | 44      | 5220 MHz  |
| 40      | 5200 MHz  | 48      | 5240 MHz  |

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

| Channel | Frequency | Channel | Frequency |
|---------|-----------|---------|-----------|
| 38      | 5190 MHz  | 46      | 5230 MHz  |

1 channel is provided for 802.11ac (VHT80):

| Channel | Frequency |
|---------|-----------|
| 42      | 5210MHz   |

### FOR 5745 ~ 5825MHz:

5 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

| Channel | Frequency | Channel | Frequency |
|---------|-----------|---------|-----------|
| 149     | 5745MHz   | 161     | 5805MHz   |
| 153     | 5765MHz   | 165     | 5825MHz   |
| 157     | 5785MHz   | -       | -         |

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

| Channel | Frequency | Channel | Frequency |
|---------|-----------|---------|-----------|
| 151     | 5755MHz   | 159     | 5795MHz   |

1 channel is provided for 802.11ac (VHT80):

| Channel | Frequency |
|---------|-----------|
| 155     | 5775MHz   |

## Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



### 6.3. Test Condition

| Test Item                          | Test Site No. | Environmental Condition | Input Power    | Test Date                   | Tested by    |
|------------------------------------|---------------|-------------------------|----------------|-----------------------------|--------------|
| Antenna Port Conducted Measurement | SR4           | 22~26°C / 63~68%RH      | 19Vdc          | Feb. 18, 2021 ~ Mar 5, 2021 | Patrick Kuan |
| Radiated Spurious Emission         | 966-2         | 23~25°C / 64~68%RH      | 120Vac / 60 Hz | Feb. 18, 2021 ~ Mar 5, 2021 | Patrick Kuan |
| AC power Line Conducted Emission   | SR1           | 22~26°C / 63~68%RH      | 120Vac / 60 Hz | Feb. 18, 2021 ~ Mar 5, 2021 | Patrick Kuan |

FCC Test Firm Registration Number: 498077

### 6.4. Description of Available Antennas

| Ant. No. | Transmitter Circuit | Brand Name   | Model Name | Ant. Type   | Frequency (MHz) | Maximum Gain (dBi) |
|----------|---------------------|--------------|------------|-------------|-----------------|--------------------|
| 1        | Chain (0)+(1)       | Perkin Elmer | XRpad CBSA | PCB Antenna | 4910-5090       | 5.3                |
|          |                     |              |            |             | 5150-5350       | 5.6                |
|          |                     |              |            |             | 5470-5725       | 6.1                |
|          |                     |              |            |             | 5725-5850       | 5.9                |
| 2        | Chain (0)+(1)       | Perkin Elmer | XRpad CBSA | PCB Antenna | 4910-5090       | 5.3                |
|          |                     |              |            |             | 5150-5350       | 5.6                |
|          |                     |              |            |             | 5470-5725       | 6.1                |
|          |                     |              |            |             | 5725-5850       | 5.9                |

Note: The above antenna information was provided from customer and for more detailed features description, please refer the manufacturer's specification or user's manual.

### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



## 6.5. Test Mode Applicability and Tested Channel Detail

- 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).
- For below 1 GHz radiated emission and AC power line conducted emission have performed all modes of operation were investigated and the worst-case emissions are reported.
- For Antenna Port Conducted Measurement, this item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- The fundamental of the EUT was investigated in three orthogonal axes X-Y/Y-Z/X-Z, it was determined that X axis was worst-case. Therefore, all final radiated testing was performed with the EUT in X-Z axis.
- For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel), parallel and perpendicular are the worst orientations, therefore testing was performed on these two orientations only.
- For AC power line conducted emissions, the pre-scan has been determined by AC power 120Vac/60Hz

| Test item                          | Mode             | Frequency Band (MHz) | Modulation Technology | Available Channel | Test Channel  | Data Rate |
|------------------------------------|------------------|----------------------|-----------------------|-------------------|---------------|-----------|
| Radiated Emissions (Above 1GHz)    | 802.11a          | 5180-5240            | OFDM                  | 36 to 48          | 36, 44, 48    | 6Mbps     |
|                                    | 802.11ac (VHT20) |                      | OFDM                  | 36 to 48          | 36, 44, 48    | MCS0      |
|                                    | 802.11ac (VHT40) |                      | OFDM                  | 38 to 46          | 38, 46        | MCS0      |
|                                    | 802.11ac (VHT80) |                      | OFDM                  | 42                | 42            | MCS0      |
|                                    | 802.11a          | 5745-5825            | OFDM                  | 149 to 165        | 149, 157, 165 | 6Mbps     |
|                                    | 802.11ac (VHT20) |                      | OFDM                  | 149 to 165        | 149, 157, 165 | MCS0      |
|                                    | 802.11ac (VHT40) |                      | OFDM                  | 151 to 159        | 151, 159      | MCS0      |
|                                    | 802.11ac (VHT80) |                      | OFDM                  | 155               | 155           | MCS0      |
| Radiated Emissions (Below 1GHz)    | 802.11ac (VHT20) | 5180-5240            | OFDM                  | 36 to 48          | 48            | MCS0      |
| AC Power Line Conducted Emission   | 802.11ac (VHT20) | 5180-5240            | OFDM                  | 36 to 48          | 48            | MCS0      |
| Antenna Port Conducted Measurement | 802.11a          | 5180-5240            | OFDM                  | 36 to 48          | 36, 44, 48    | 6Mbps     |
|                                    | 802.11ac (VHT20) |                      | OFDM                  | 36 to 48          | 36, 44, 48    | MCS0      |
|                                    | 802.11ac (VHT40) |                      | OFDM                  | 38 to 46          | 38, 46        | MCS0      |
|                                    | 802.11ac (VHT80) |                      | OFDM                  | 42                | 42            | MCS0      |
|                                    | 802.11a          | 5745-5825            | OFDM                  | 149 to 165        | 149, 157, 165 | 6Mbps     |
|                                    | 802.11ac (VHT20) |                      | OFDM                  | 149 to 165        | 149, 157, 165 | MCS0      |
|                                    | 802.11ac (VHT40) |                      | OFDM                  | 151 to 159        | 151, 159      | MCS0      |
|                                    | 802.11ac (VHT80) |                      | OFDM                  | 155               | 155           | MCS0      |

### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

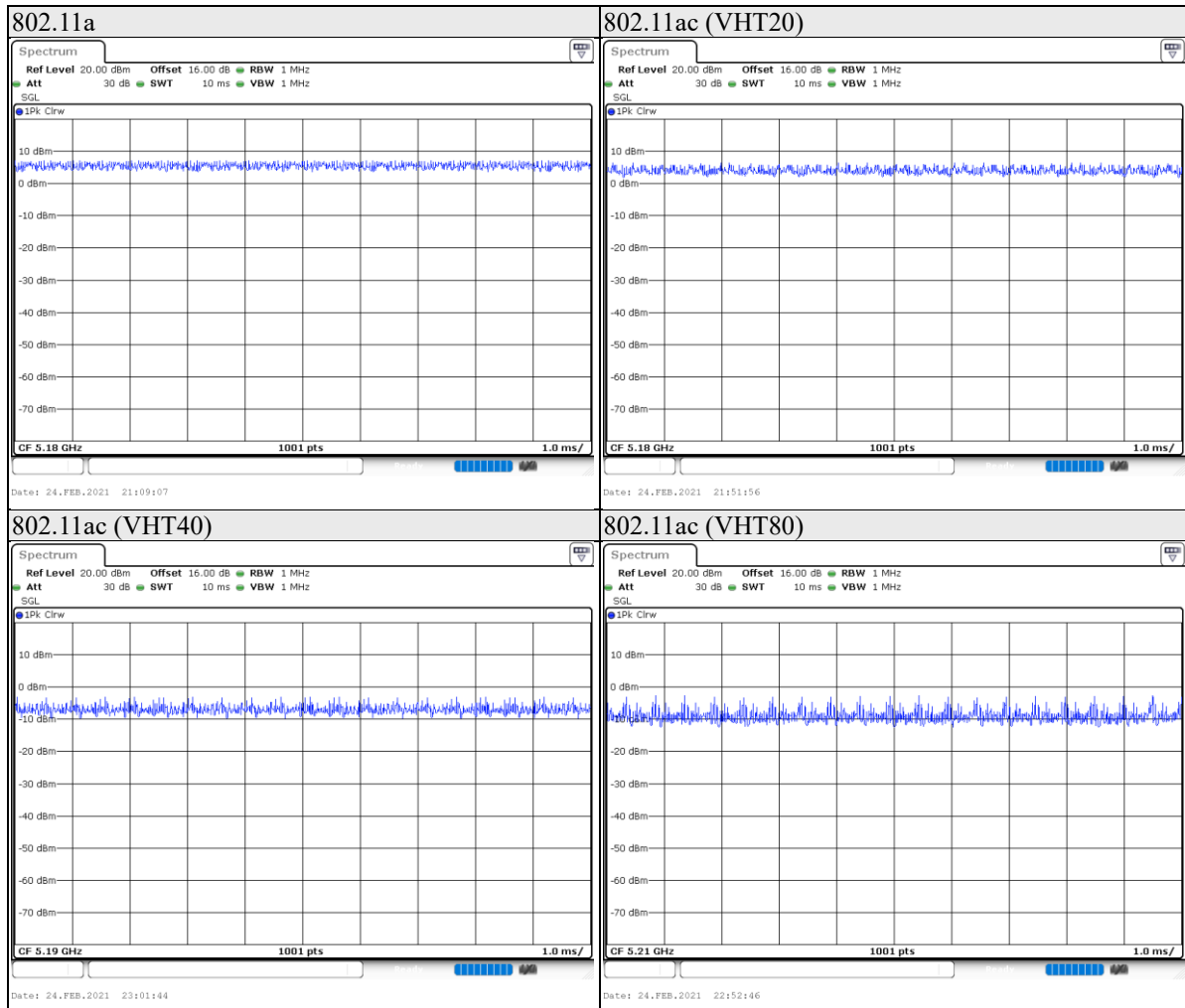
Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



## 6.6. Duty cycle

Duty cycle of test signal is 100 %, duty factor is not required.





Test report No. : 4789804203-US-R0-V0  
Page : 14 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

## 7. Test Equipment

| Test Equipment List                          |                    |                         |                     |            |              |
|----------------------------------------------|--------------------|-------------------------|---------------------|------------|--------------|
| Equipment                                    | Manufacturer       | Model No.               | Serial No.          | Cal. Date  | Expired date |
| Radiated Spurious Emission                   |                    |                         |                     |            |              |
| Spectrum Analyzer                            | Keysight           | N9010A                  | MY56070827          | 2020/11/11 | 2021/11/10   |
| EMI Test Receiver                            | Rohde & Schwarz    | ESR7                    | 101754              | 2020/12/11 | 2021/12/10   |
| Loop Antenna                                 | ETS lindgren       | 6502                    | 00213440            | 2020/12/25 | 2021/12/24   |
| Trilog-Broadband Antenna with 5dB Attenuator | Schwarzbeck & EMCI | VULB 9168 & N-6-05      | 774 & AT-N0538      | 2021/1/13  | 2022/1/12    |
| Horn Antenna (1-18 GHz)                      | Schwarzbeck        | BBHA 9120 D             | 01690               | 2020/12/30 | 2021/12/29   |
| Horn Antenna (18-40 GHz)                     | Schwarzbeck        | BBHA 9170               | 781                 | 2020/12/30 | 2021/12/29   |
| Preamplifier (30-1000 MHz)                   | EMCI               | EMC330E                 | 980405              | 2020/6/9   | 2021/6/8     |
| Preamplifier (1-18 GHz)                      | EMCI               | EMC051835BE             | 980406              | 2021/2/3   | 2022/2/2     |
| Preamplifier (18-40GHz)                      | EMCI               | EMC184040SEE            | 980426              | 2020/5/19  | 2021/5/18    |
| Cables                                       | Hanyitek           | K1K50-UP0264-K1K50-2500 | 170214-4 & 170425-2 | 2020/7/2   | 2021/7/1     |
| Cables                                       | Hanyitek           | K1K50-UP0264-K1K50-2500 | 170214-1 & 170214-2 | 2021/1/7   | 2022/1/6     |

### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 15 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

| Test Equipment List                 |                 |                  |                          |            |              |
|-------------------------------------|-----------------|------------------|--------------------------|------------|--------------|
| Equipment                           | Manufacturer    | Model No.        | Serial No.               | Cal. Date  | Expired date |
| Antenna Port Conducted Measurement  |                 |                  |                          |            |              |
| Spectrum Analyzer                   | Keysight        | N9010A           | MY56070834               | 2020/11/6  | 2021/11/5    |
| Pulse Power Sensor                  | Anritsu         | MA2411B          | 1531202                  | 2020/12/21 | 2021/12/20   |
| Power Meter                         | Anritsu         | ML2495A          | 1645002                  | 2020/12/21 | 2021/12/20   |
| Temperature & Humidity Test Chamber | GIANT FORCE     | GTH-150-40-CP-AR | MAA1701-010              | 2020/3/23  | 2021/3/22    |
| AC power Line Conducted Emission    |                 |                  |                          |            |              |
| EMI Test Receiver                   | Rohde & Schwarz | ESR7             | 101753                   | 2020/11/17 | 2021/11/16   |
| Two-Line V-Network                  | Rohde & Schwarz | ENV216           | 102136                   | 2020/8/19  | 2021/8/18    |
| Impuls-Begrenzer Pulse Limiter      | Rohde & Schwarz | ESH3-Z2          | 102219-Qt                | 2020/8/12  | 2021/8/11    |
| Cables                              | TITAN           | CFD200           | T0732ACFD2002<br>0A300-1 | 2020/9/1   | 2021/8/31    |

| UL Software                      |                     |         |
|----------------------------------|---------------------|---------|
| Description                      | Name                | Version |
| Radiated measurement             | EZ EMC              | 1.1.4.2 |
| Conducted measurement            | Keysight.TestSystem | 1.0.0.0 |
| AC power Line Conducted Emission | EZ EMC              | 1.1.4.2 |

**Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 16 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

## 8. Description of Test Setup

### Support Equipment

| ID | Equipment       | Brand Name | Model Name | S/N     | Remark |
|----|-----------------|------------|------------|---------|--------|
| A  | Laptop          | Lenovo     | T430       | PBE38AK | N/A    |
| B  | RJ-45 connector | N/A        | N/A        | N/A     | N/A    |

### I/O Cables

| ID | Equipment            | Brand Name | Model Name | Length (m) | Remark |
|----|----------------------|------------|------------|------------|--------|
| 1  | USB cable            | AWM        | 20276      | 10         | N/A    |
| 2  | 2 meter Tether cable | BizLink    | N/A        | 2          | N/A    |
| 3  | Power cord           | Baohing    | C1         | 1.8        | N/A    |

### **Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

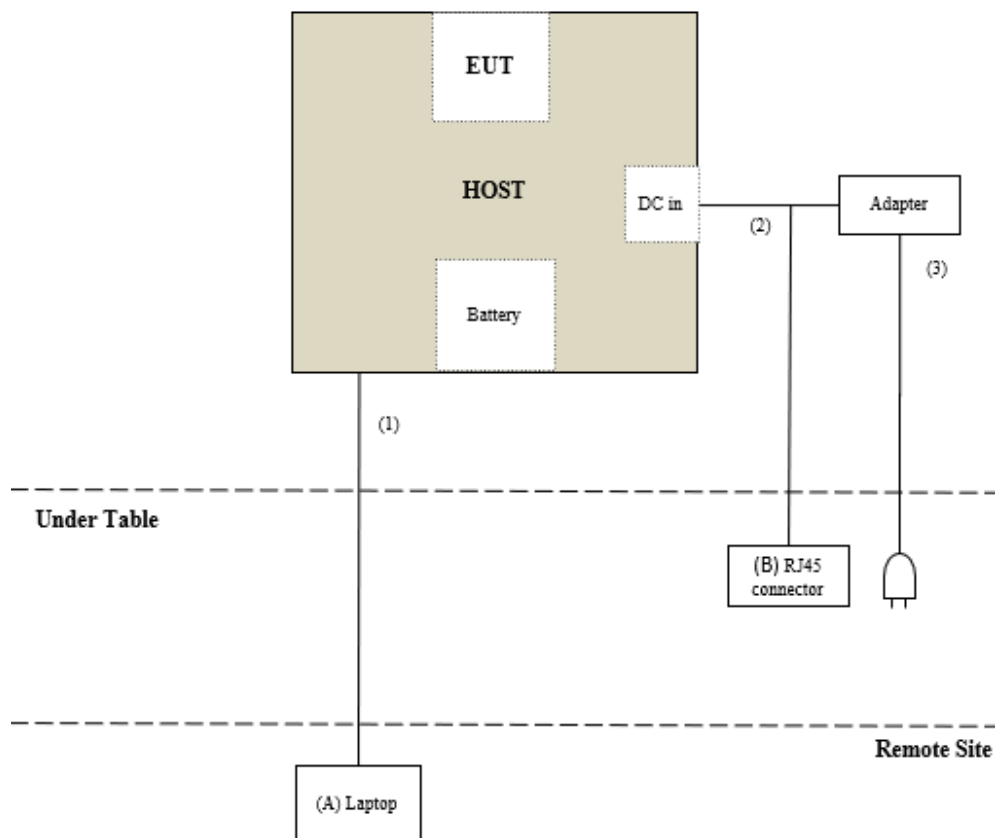
Doc No: 17-EM-F0878 / 5.0



## Test Setup

Controlled using a bespoke application (Win7\_MP\_Kit\_RTL11ac\_8822BU\_USB\_v6.01\_20190218) on a test laptop. The application was used to enable a continuous transmission mode and to select the test channels, data rates, modulation schemes and power setting as required.

## Setup Diagram for Test



## **Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



## 9. Test Results

### 9.1. 6dB Bandwidth

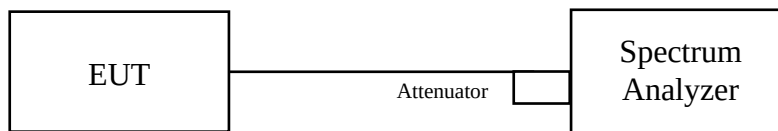
#### Requirements

The minimum 6 dB bandwidth shall be at least 500 kHz.

#### Test procedure

- Set resolution bandwidth (RBW) = 100kHz
- Set the video bandwidth (VBW)  $\geq 3 \times$  RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

#### Test Setup



The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

#### **Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



## Test Data

### 802.11a

| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) | Minimum Limit (MHz) | Pass / Fail |
|---------|-----------------|----------------------|---------------------|-------------|
| 149     | 5745            | 16.50                | 0.5                 | PASS        |
| 157     | 5785            | 16.46                | 0.5                 | PASS        |
| 165     | 5825            | 16.46                | 0.5                 | PASS        |

### 802.11ac (VHT20)

| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) |         | Minimum Limit (MHz) | Pass / Fail |
|---------|-----------------|----------------------|---------|---------------------|-------------|
|         |                 | Chain 0              | Chain 1 |                     |             |
| 149     | 5745            | 17.62                | 17.58   | 0.5                 | PASS        |
| 157     | 5785            | 17.62                | 17.58   | 0.5                 | PASS        |
| 165     | 5825            | 17.62                | 17.58   | 0.5                 | PASS        |

### 802.11ac (VHT40)

| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) |         | Minimum Limit (MHz) | Pass / Fail |
|---------|-----------------|----------------------|---------|---------------------|-------------|
|         |                 | Chain 0              | Chain 1 |                     |             |
| 151     | 5755            | 36.52                | 36.44   | 0.5                 | PASS        |
| 159     | 5795            | 36.44                | 36.44   | 0.5                 | PASS        |

### 802.11ac (VHT80)

| Channel | Frequency (MHz) | 6 dB Bandwidth (MHz) |         | Minimum Limit (MHz) | Pass / Fail |
|---------|-----------------|----------------------|---------|---------------------|-------------|
|         |                 | Chain 0              | Chain 1 |                     |             |
| 155     | 5775            | 75.92                | 75.76   | 0.5                 | PASS        |

## Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

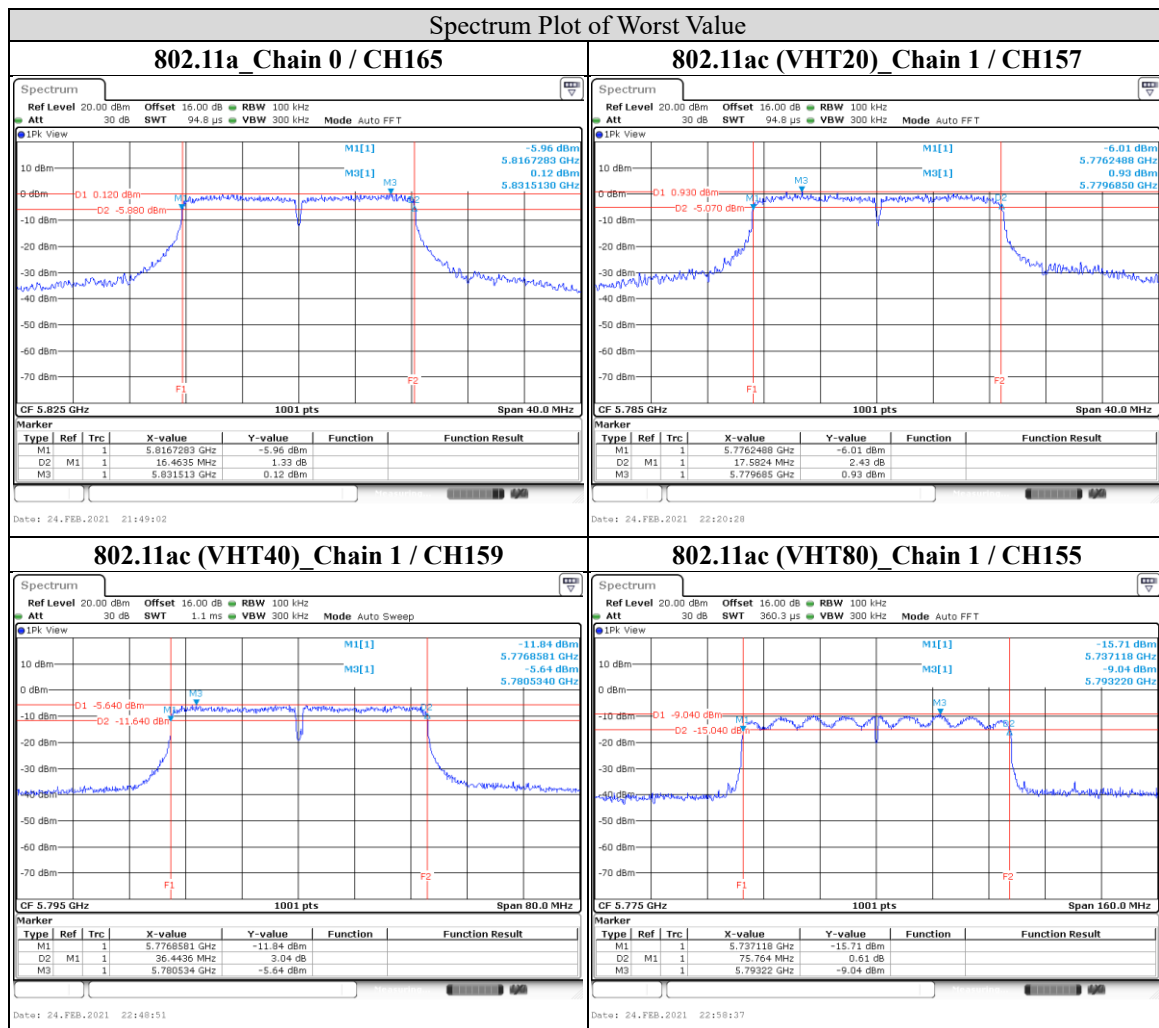
Telephone :+886-2-7737-3000

Facsimile (FAX) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 20 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT



## Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948

Doc No: 17-EM-F0878 / 5.0

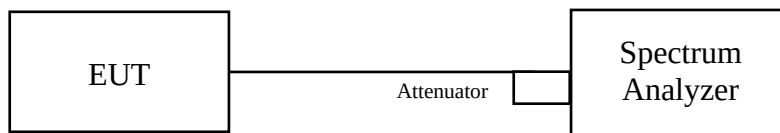


## 9.2. 26dB Bandwidth

### Test procedure

- Set RBW = approximately 1% of the emission bandwidth.
- Set the VBW > RBW.
- Detector = Peak.
- Trace mode = max hold.
- Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

### Test Setup



The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

### **Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



## **Test Data**

### **802.11a**

| Channel | Channel Frequency (MHz) | 26 dB Bandwidth (MHz) |
|---------|-------------------------|-----------------------|
| 36      | 5180                    | 20.94                 |
| 44      | 5220                    | 20.90                 |
| 48      | 5240                    | 20.78                 |

### **802.11ac (VHT20)**

| Channel | Channel Frequency (MHz) | 26 dB Bandwidth (MHz) |         |
|---------|-------------------------|-----------------------|---------|
|         |                         | Chain 0               | Chain 1 |
| 36      | 5180                    | 21.74                 | 21.22   |
| 44      | 5220                    | 21.58                 | 21.14   |
| 48      | 5240                    | 21.06                 | 21.10   |

### **802.11ac (VHT40)**

| Channel | Channel Frequency (MHz) | 26 dB Bandwidth (MHz) |         |
|---------|-------------------------|-----------------------|---------|
|         |                         | Chain 0               | Chain 1 |
| 38      | 5190                    | 44.12                 | 43.48   |
| 46      | 5230                    | 43.88                 | 43.56   |

### **802.11ac (VHT80)**

| Channel | Channel Frequency (MHz) | 26 dB Bandwidth (MHz) |         |
|---------|-------------------------|-----------------------|---------|
|         |                         | Chain 0               | Chain 1 |
| 42      | 5210                    | 83.60                 | 83.12   |

## **Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

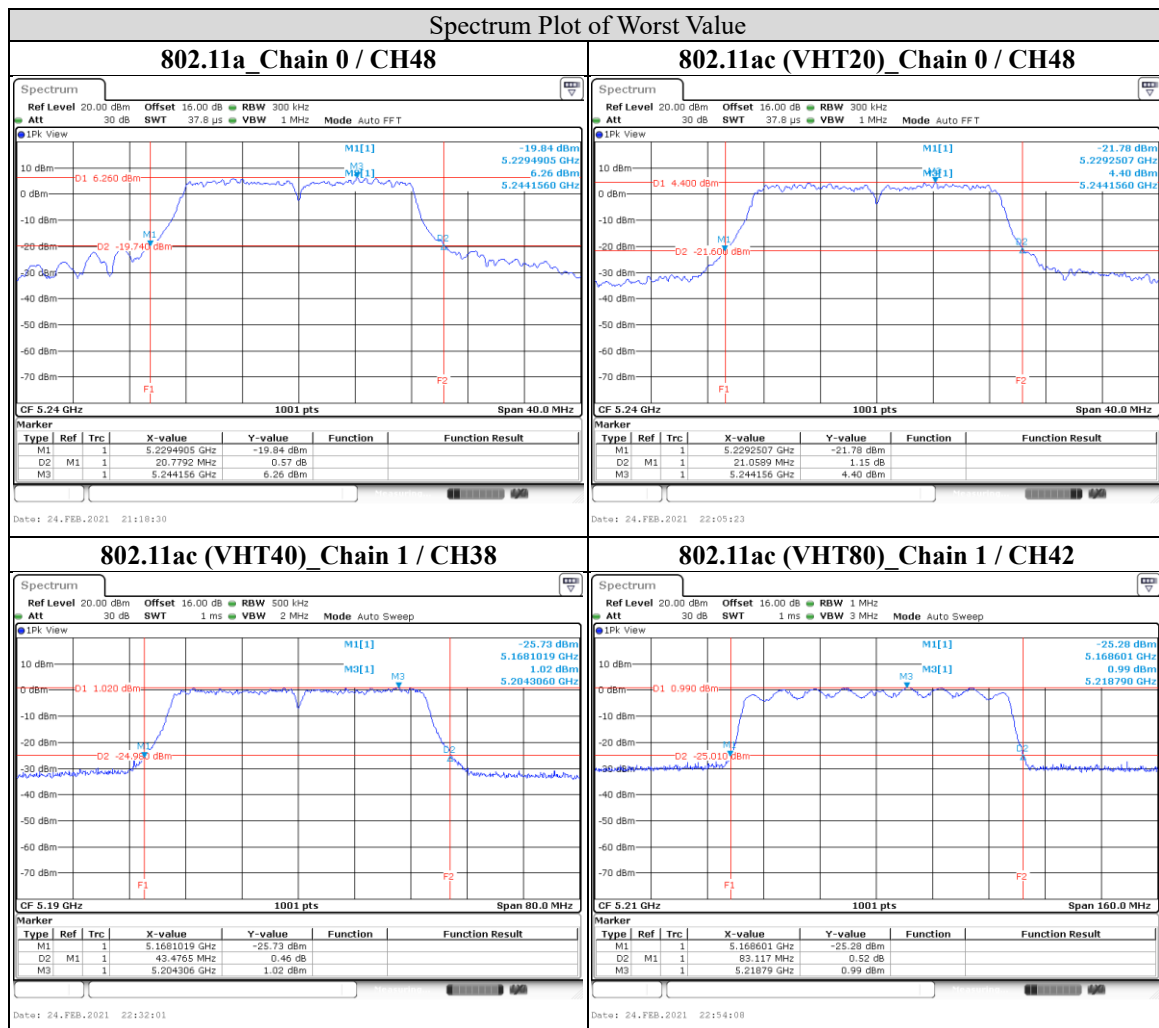
Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 23 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT



**Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948

Doc No: 17-EM-F0878 / 5.0

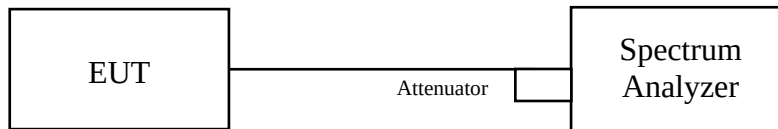


### 9.3. Occupied Bandwidth

#### Test procedure

- Set center frequency to the nominal EUT channel center frequency.
- Set span = 1.5 times to 5.0 times the OBW.
- Set RBW = 1% to 5% of the OBW
- Set VBW  $\geq 3 \times$  RBW
- Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
- Use the 99% power bandwidth function of the instrument (if available).
- If the instrument does not have a 99% power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

#### Test Setup



The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

#### **Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



## Test Data

### 802.11a

| Channel | Channel Frequency (MHz) | Occupied Bandwidth (MHz) |
|---------|-------------------------|--------------------------|
| 36      | 5180                    | 16.70                    |
| 44      | 5220                    | 16.70                    |
| 48      | 5240                    | 16.74                    |
| 149     | 5745                    | 16.70                    |
| 157     | 5785                    | 16.74                    |
| 165     | 5825                    | 16.66                    |

### 802.11ac (VHT20)

| Channel | Channel Frequency (MHz) | Occupied Bandwidth (MHz) |         |
|---------|-------------------------|--------------------------|---------|
|         |                         | Chain 0                  | Chain 1 |
| 36      | 5180                    | 17.74                    | 17.66   |
| 44      | 5220                    | 17.70                    | 17.70   |
| 48      | 5240                    | 17.70                    | 17.66   |
| 149     | 5745                    | 17.78                    | 17.70   |
| 157     | 5785                    | 17.74                    | 17.74   |
| 165     | 5825                    | 17.74                    | 17.66   |

### 802.11ac (VHT40)

| Channel | Channel Frequency (MHz) | Occupied Bandwidth (MHz) |         |
|---------|-------------------------|--------------------------|---------|
|         |                         | Chain 0                  | Chain 1 |
| 38      | 5190                    | 36.76                    | 36.60   |
| 46      | 5230                    | 36.76                    | 36.68   |
| 151     | 5755                    | 36.68                    | 36.60   |
| 159     | 5795                    | 36.84                    | 36.60   |

### 802.11ac (VHT80)

| Channel | Channel Frequency (MHz) | Occupied Bandwidth (MHz) |         |
|---------|-------------------------|--------------------------|---------|
|         |                         | Chain 0                  | Chain 1 |
| 42      | 5210                    | 75.76                    | 75.44   |
| 155     | 5775                    | 75.60                    | 75.44   |

## **Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

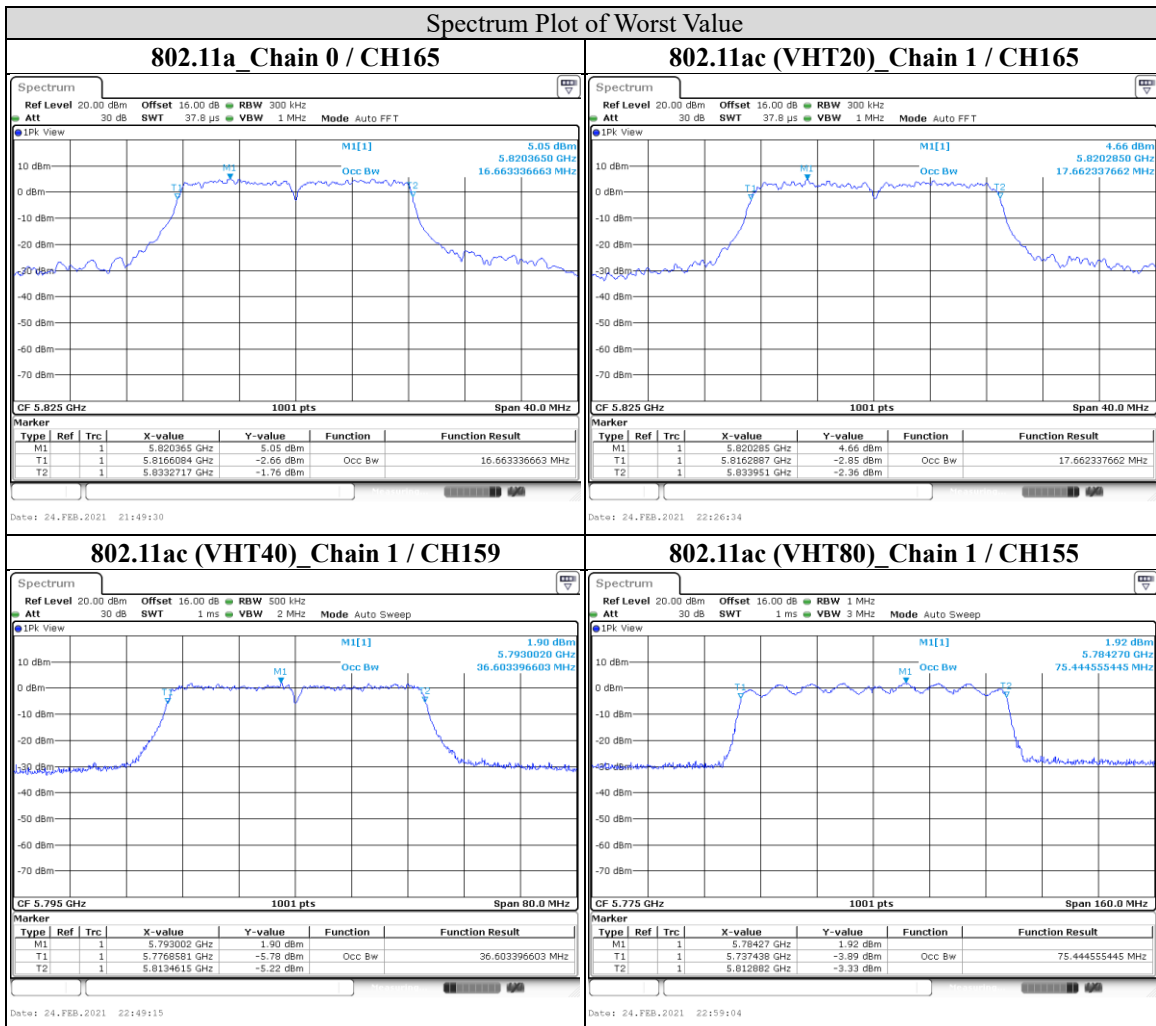
Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 26 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT



**Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

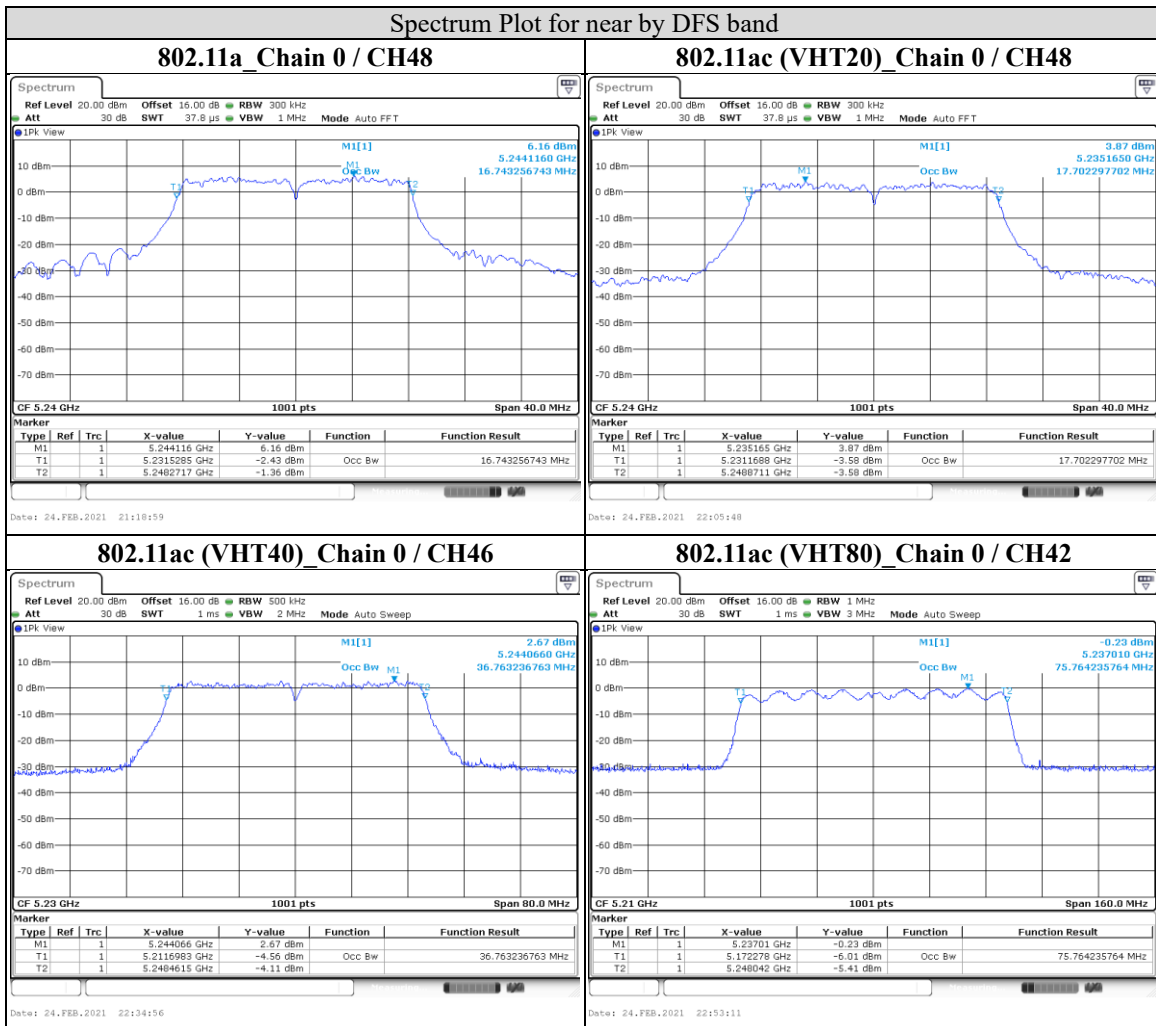
Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 27 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT



Note: The observed T2 is all <5250 MHz, so in nearby DFS band channels no need for DFS function

## Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

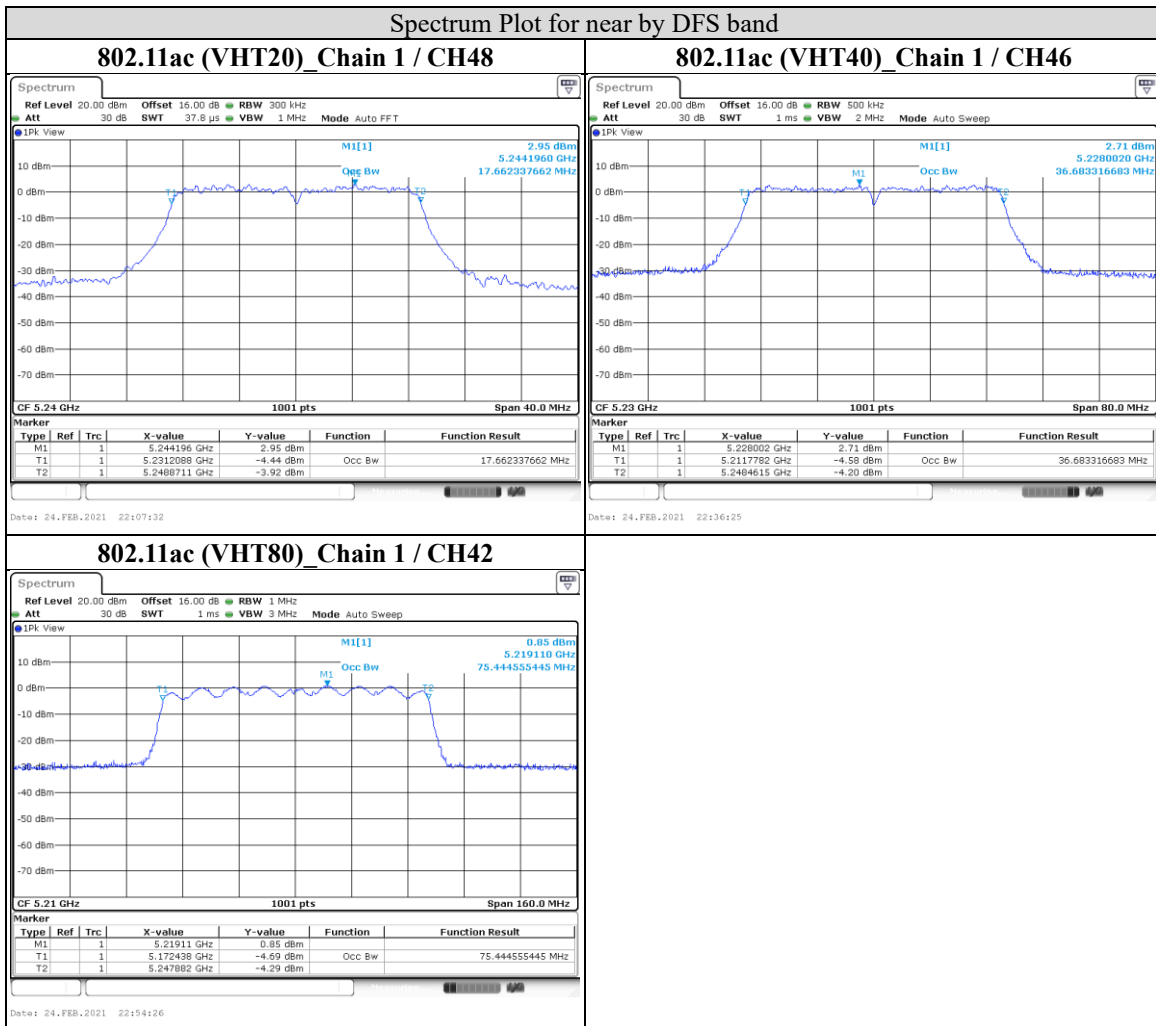
Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 28 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT



Note: The observed T2 is all <5250 MHz, so in nearby DFS band channels no need for DFS function

### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



## 9.4. Conducted Output Power

### Requirements

| Operation Band | EUT Category |                                   | Limit                                                                                                                                                                                |
|----------------|--------------|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| U-NII-1        |              | Outdoor Access Point              | 1 Watt (30 dBm)<br>Max. e.i.r.p $\leq$ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon<br>If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$ |
|                |              | Fixed point-to-point Access Point | 1 Watt (30 dBm)<br>If $G_{TX} > 23$ dBi, then $P_{Out} = 30 - (G_{TX} - 23)$                                                                                                         |
|                |              | Indoor Access Point               | 1 Watt (30 dBm)<br>If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$                                                                                                           |
|                | √            | Client device                     | 250mW (24 dBm)<br>If $G_{TX} > 6$ dBi, then $P_{Out} = 24 - (G_{TX} - 6)$                                                                                                            |
| U-NII-3        | √            |                                   | For Point-to-multipoint systems (P2M): 1 Watt (30 dBm). If $G_{TX} > 6$ dBi, then $P_{Out} = 30 - (G_{TX} - 6)$<br>For Point-to-point systems (P2P): 1 Watt (30 dBm)                 |

Note:

- $P_{Out}$  = maximum conducted output power in dBm,
- $G_{TX}$  = the maximum transmitting antenna directional gain in dBi.
- Directional Gain =  $G_{ant} + 10 \log(N_{ant})$  dBi.

$N_{ant}$ : Number of Transmit Antennas

$G_1, G_2, \dots, G_n$ : Gain of Individual Antennas (Same for Each Antenna)

- B is the 26 dB emission bandwidth in megahertz

Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for  $N_{ANT} \leq 4$ ;

Array Gain = 0 dB (i.e., no array gain) for channel widths  $\geq 40$  MHz for any  $N_{ANT}$ ;

Array Gain =  $5 \log(N_{ANT}/N_{SS})$  dB or 3 dB, whichever is less for 20-MHz channel widths with  $N_{ANT} \geq 5$ .

For power measurements on all other devices: Array Gain =  $10 \log(N_{ANT}/N_{SS})$  dB.

### **Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



## Test Procedure

### **For Average Power Measurement**

#### **Test method PM-G**

##### **For 802.11a, 802.11ac (VHT20), 802.11ac (VHT40)**

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst and set the detector to AVERAGE. Duty factor is not added to measured value.

#### **Test method SA-1**

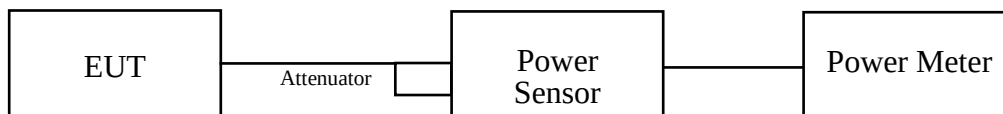
##### **For 802.11ac (VHT80)**

- Set span to encompass the entire 26 dB EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
- Set sweep trigger\*.
- Set RBW = 1 MHz.
- Set VBW  $\geq$  3 MHz
- Number of points in sweep  $\geq$  2 Span / RBW.
- Sweep time  $\leq$  (number of points in sweep) \* T
- Using emission bandwidth to determine the frequency span for integration the channel bandwidth.
- Detector = RMS.
- Trace mode = max hold.
- Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.

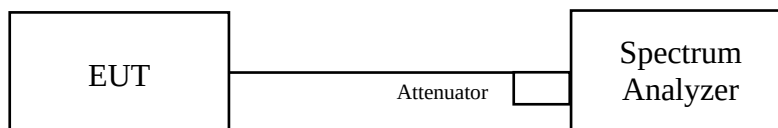
\* If transmit duty cycle < 98%, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle  $\geq$  98%, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to “free run.”

## Test Setup

### **For Average Power Measurement**



The loss between RF output port of the EUT and the input port of the Power Meter has been taken into consideration.



The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

## **Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



## Test Data

### 802.11a

| Channel | Channel Frequency (MHz) | Total Power (mW) | Total Power (dBm) | Power Limit (dBm) | Pass/Fail |
|---------|-------------------------|------------------|-------------------|-------------------|-----------|
| 36      | 5180                    | 33.729           | 15.28             | 23.98             | PASS      |
| 44      | 5220                    | 33.497           | 15.25             | 23.98             | PASS      |
| 48      | 5240                    | 33.497           | 15.25             | 23.98             | PASS      |
| 149     | 5745                    | 33.963           | 15.31             | 30                | PASS      |
| 157     | 5785                    | 34.834           | 15.42             | 30                | PASS      |
| 165     | 5825                    | 33.729           | 15.28             | 30                | PASS      |

### 802.11ac (VHT20)

| Channel | Channel Frequency (MHz) | Maximum Conducted Power (dBm) |         | Total Power (mW) | Total Power (dBm) | Power Limit (dBm) | Pass/Fail |
|---------|-------------------------|-------------------------------|---------|------------------|-------------------|-------------------|-----------|
|         |                         | Chain 0                       | Chain 1 |                  |                   |                   |           |
| 36      | 5180                    | 14.29                         | 14.21   | 53.211           | 17.26             | 23.98             | PASS      |
| 44      | 5220                    | 14.28                         | 14.02   | 52               | 17.16             | 23.98             | PASS      |
| 48      | 5240                    | 14.26                         | 14.00   | 51.761           | 17.14             | 23.98             | PASS      |
| 149     | 5745                    | 13.72                         | 13.89   | 48.084           | 16.82             | 30                | PASS      |
| 157     | 5785                    | 13.71                         | 13.81   | 47.534           | 16.77             | 30                | PASS      |
| 165     | 5825                    | 13.72                         | 13.88   | 47.973           | 16.81             | 30                | PASS      |

Note:

For UNII-1 Band, the directional gain = 5.6 dBi < 6 dBi, so the power limit shall not be reduced.

For UNII-3 Band, the directional gain = 5.9 dBi < 6 dBi, so the power limit shall not be reduced.

## **Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



#### 802.11ac (VHT40)

| Channel | Channel Frequency (MHz) | Maximum Conducted Power (dBm) |         | Total Power (mW) | Total Power (dBm) | Power Limit (dBm) | Pass/Fail |
|---------|-------------------------|-------------------------------|---------|------------------|-------------------|-------------------|-----------|
|         |                         | Chain 0                       | Chain 1 |                  |                   |                   |           |
| 38      | 5190                    | 11.71                         | 11.91   | 30.339           | 14.82             | 23.98             | PASS      |
| 46      | 5230                    | 14.43                         | 14.23   | 54.2             | 17.34             | 23.98             | PASS      |
| 151     | 5755                    | 13.73                         | 13.82   | 47.753           | 16.79             | 30                | PASS      |
| 159     | 5795                    | 13.80                         | 13.86   | 48.306           | 16.84             | 30                | PASS      |

Note:

For UNII-1 Band, the directional gain = 5.6 dBi < 6 dBi, so the power limit shall not be reduced.

For UNII-3 Band, the directional gain = 5.9 dBi < 6 dBi, so the power limit shall not be reduced.

#### 802.11ac (VHT80)

| Channel | Channel Frequency (MHz) | Maximum Conducted Power (dBm) |         | Total Power (mW) | Total Power (dBm) | Power Limit (dBm) | Pass/Fail |
|---------|-------------------------|-------------------------------|---------|------------------|-------------------|-------------------|-----------|
|         |                         | Chain 0                       | Chain 1 |                  |                   |                   |           |
| 42      | 5210                    | 11.04                         | 11.39   | 26.485           | 14.23             | 23.98             | PASS      |
| 155     | 5775                    | 11.43                         | 11.42   | 27.797           | 14.44             | 30                | PASS      |

Note:

For UNII-1 Band, the directional gain = 5.6 dBi < 6 dBi, so the power limit shall not be reduced.

For UNII-3 Band, the directional gain = 5.9 dBi < 6 dBi, so the power limit shall not be reduced.

#### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



## 9.5. Power Spectral Density

### Requirements

| Operation Band | EUT Category |                                   | Limit                                                                                                                                                           |
|----------------|--------------|-----------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| U-NII-1        |              | Outdoor Access Point              | 17dBm/ MHz<br>If $G_{TX} > 6$ dBi, then $PSD = 17 - (G_{TX} - 6)$                                                                                               |
|                |              | Fixed point-to-point Access Point | 17dBm/ MHz<br>If $G_{TX} > 23$ dBi, then $PSD = 17 - (G_{TX} - 23)$                                                                                             |
|                |              | Indoor Access Point               | 17dBm/ MHz<br>If $G_{TX} > 6$ dBi, then $PSD = 17 - (G_{TX} - 6)$                                                                                               |
|                | √            | Client device                     | 11dBm/ MHz<br>If $G_{TX} > 6$ dBi, then $PSD = 11 - (G_{TX} - 6)$                                                                                               |
| U-NII-3        |              | √                                 | For Point-to-multipoint systems (P2M):<br>30dBm/ 500kHz. If $G_{TX} > 6$ dBi, then $PSD = 30 - (G_{TX} - 6)$<br>For Point-to-point systems (P2P): 30dBm/ 500kHz |

Note:

1. PSD = power spectral density that he same method as used to determine the conducted output power shall be used to determine the power spectral density. And power spectral density in dBm/MHz
2.  $G_{TX}$  = the maximum transmitting antenna directional gain in dBi.
3. Directional Gain =  $G_{ant} + 10 \log (N_{ant})$  dBi.

$N_{ant}$ : Number of Transmit Antennas

$G_1, G_2, \dots, G_n$ : Gain of Individual Antennas (Same for Each Antenna)

### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

Facsimile (FAX ) : +886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



## **Test procedure**

### **For U-NII-1 band:**

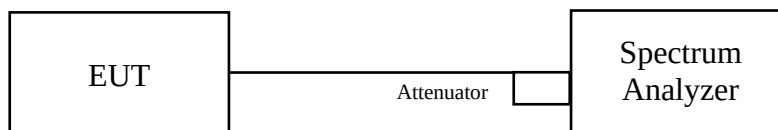
#### **Using method SA-1**

- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 1 MHz, Set VBW  $\geq 3$  RBW, Detector = RMS
- Sweep time = auto, trigger set to “free run”.
- Trace average at least 100 traces in power averaging mode.
- Record the max value

### **For U-NII-3 band:**

- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 300 kHz, Set VBW  $\geq 1$  MHz, Detector = RMS
- Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
- Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where  $BWCF = 10\log(500 \text{ kHz}/300\text{kHz})$
- Sweep time = auto, trigger set to “free run”.
- Trace average at least 100 traces in power averaging mode.
- Record the max value

## **Test Setup**



The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

## **Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



## Test Data

### 802.11a

| Channel | Frequency (MHz) | PSD w/o duty factor (dBm/MHz) | Total PSD with duty factor (dBm/MHz) | PSD Maximum Limit (dBm/MHz) | Pass/Fail |
|---------|-----------------|-------------------------------|--------------------------------------|-----------------------------|-----------|
| 36      | 5180            | 3.64                          | 3.64                                 | 11                          | PASS      |
| 44      | 5220            | 3.90                          | 3.90                                 | 11                          | PASS      |
| 48      | 5240            | 3.99                          | 3.99                                 | 11                          | PASS      |

**NOTE:** Refer to section 6.6 for duty cycle spectrum plot.

### 802.11ac (VHT20)

| Channel | Frequency (MHz) | PSD w/o duty factor (dBm/MHz) |         | Total PSD with duty factor (dBm/MHz) | PSD Maximum Limit (dBm/MHz) | Pass/Fail |
|---------|-----------------|-------------------------------|---------|--------------------------------------|-----------------------------|-----------|
|         |                 | Chain 0                       | Chain 1 |                                      |                             |           |
| 36      | 5180            | 1.08                          | 1.71    | 4.42                                 | 8.39                        | PASS      |
| 44      | 5220            | 2.74                          | 1.47    | 5.16                                 | 8.39                        | PASS      |
| 48      | 5240            | 1.79                          | 1.15    | 4.49                                 | 8.39                        | PASS      |

**Note:**

- Method a) of power density measurement of KDB 662911 is using for calculating total power density.  
Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- Directional gain = 8.61 dBi > 6 dBi, so the limit shall be reduced.
- Refer to section 6.6 for duty cycle spectrum plot.

## **Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



#### 802.11ac (VHT40)

| Channel | Frequency (MHz) | PSD w/o duty factor (dBm/MHz) |         | Total PSD with duty factor (dBm/MHz) | PSD Maximum Limit (dBm/MHz) | Pass/Fail |
|---------|-----------------|-------------------------------|---------|--------------------------------------|-----------------------------|-----------|
|         |                 | Chain 0                       | Chain 1 |                                      |                             |           |
| 38      | 5190            | -4.58                         | -3.06   | -0.74                                | 8.39                        | PASS      |
| 46      | 5230            | -1.83                         | -1.61   | 1.29                                 | 8.39                        | PASS      |

**Note:**

1. Method a) of power density measurement of KDB 662911 is using for calculating total power density.  
Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 8.61 dBi > 6 dBi, so the limit shall be reduced.
3. Refer to section 6.6 for duty cycle spectrum plot.

#### 802.11ac (VHT80)

| Channel | Frequency (MHz) | PSD w/o duty factor (dBm/MHz) |         | Total PSD with duty factor (dBm/MHz) | PSD Maximum Limit (dBm/MHz) | Pass/Fail |
|---------|-----------------|-------------------------------|---------|--------------------------------------|-----------------------------|-----------|
|         |                 | Chain 0                       | Chain 1 |                                      |                             |           |
| 42      | 5210            | -8.05                         | -6.59   | -4.25                                | 8.39                        | PASS      |

**Note:**

1. Method a) of power density measurement of KDB 662911 is using for calculating total power density.  
Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 8.61 dBi > 6 dBi, so the limit shall be reduced.
3. Refer to section 6.6 for duty cycle spectrum plot.

#### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

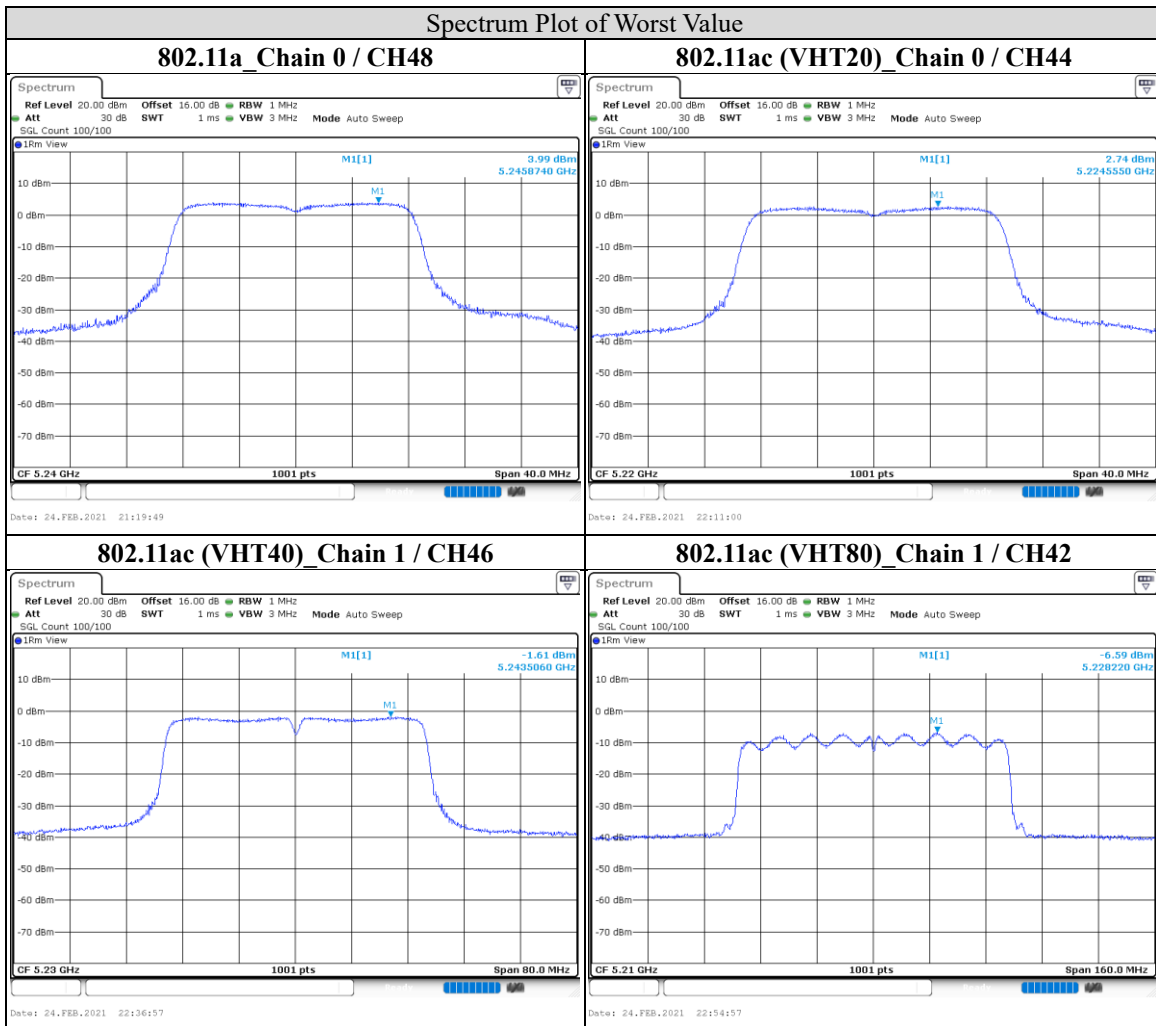
Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 37 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT



**Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



## For U-NII-3 Band

### 802.11a

| Channel | Frequency (MHz) | Total PSD w/o BWCF (dBm/300 kHz) | Total PSD with BWCF (dBm/500 kHz) | Total PSD with Duty Factor (dBm/500 kHz) | Limit (dBm/500 kHz) | Pass / Fail |
|---------|-----------------|----------------------------------|-----------------------------------|------------------------------------------|---------------------|-------------|
| 149     | 5745            | -1.03                            | 1.19                              | 1.19                                     | 30                  | PASS        |
| 157     | 5785            | -1.31                            | 0.91                              | 0.91                                     | 30                  | PASS        |
| 165     | 5825            | -1.92                            | 0.30                              | 0.3                                      | 30                  | PASS        |

#### Note:

1. Refer to section 6.6 for duty cycle spectrum plot.
2. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where  $BWCF = 10\log(500 \text{ kHz}/300\text{kHz})$ .

### 802.11ac (VHT20)

| Channel | Frequency (MHz) | PSD w/o duty factor (dBm/300 kHz) |         | Total PSD w/o BWCF (dBm/300 kHz) | Total PSD with BWCF (dBm/500 kHz) | Total PSD with Duty Factor (dBm/500 kHz) | Limit (dBm/500 kHz) | Pass / Fail |
|---------|-----------------|-----------------------------------|---------|----------------------------------|-----------------------------------|------------------------------------------|---------------------|-------------|
|         |                 | Chain 0                           | Chain 1 |                                  |                                   |                                          |                     |             |
| 149     | 5745            | -2.19                             | -2.77   | 0.54                             | 2.76                              | 2.76                                     | 27.09               | PASS        |
| 157     | 5785            | -2.04                             | -2.16   | 0.91                             | 3.13                              | 3.13                                     | 27.09               | PASS        |
| 165     | 5825            | -2.04                             | -2.49   | 0.75                             | 2.97                              | 2.97                                     | 27.09               | PASS        |

#### Note:

1. Directional gain = 8.91 dBi > 6 dBi, so the limit shall be reduced.
2. Refer to section 6.6 for duty cycle spectrum plot.
3. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where  $BWCF = 10\log(500 \text{ kHz}/300\text{kHz})$ .

## Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



#### 802.11ac (VHT40)

| Channel | Frequency (MHz) | PSD w/o duty factor (dBm/300 kHz) |         | Total PSD w/o BWCF (dBm/300 kHz) | Total PSD with BWCF (dBm/500 kHz) | Total PSD with Duty Factor (dBm/500 kHz) | Limit (dBm/500 kHz) | Pass / Fail |
|---------|-----------------|-----------------------------------|---------|----------------------------------|-----------------------------------|------------------------------------------|---------------------|-------------|
|         |                 | Chain 0                           | Chain 1 |                                  |                                   |                                          |                     |             |
| 151     | 5755            | -7.64                             | -7.61   | -4.61                            | -2.39                             | -2.39                                    | 27.09               | PASS        |
| 159     | 5795            | -8.41                             | -7.85   | -5.11                            | -2.89                             | -2.89                                    | 27.09               | PASS        |

**Note:**

1. Directional gain = 8.91 dBi > 6 dBi , so the limit shall be reduced.
2. Refer to section 6.6 for duty cycle spectrum plot.
3. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where  $BWCF = 10\log(500 \text{ kHz}/300\text{kHz})$ .

#### 802.11ac (VHT80)

| Channel | Frequency (MHz) | PSD w/o duty factor (dBm/300 kHz) |         | Total PSD w/o BWCF (dBm/300 kHz) | Total PSD with BWCF (dBm/500 kHz) | Total PSD with Duty Factor (dBm/500 kHz) | Limit (dBm/500 kHz) | Pass / Fail |
|---------|-----------------|-----------------------------------|---------|----------------------------------|-----------------------------------|------------------------------------------|---------------------|-------------|
|         |                 | Chain 0                           | Chain 1 |                                  |                                   |                                          |                     |             |
| 155     | 5775            | -11.56                            | -11.28  | -8.41                            | -6.19                             | -6.19                                    | 27.09               | PASS        |

**Note:**

1. Directional gain = 8.91 dBi > 6 dBi , so the limit shall be reduced.
2. Refer to section 6.6 for duty cycle spectrum plot.
3. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where  $BWCF = 10\log(500 \text{ kHz}/300\text{kHz})$ .

#### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

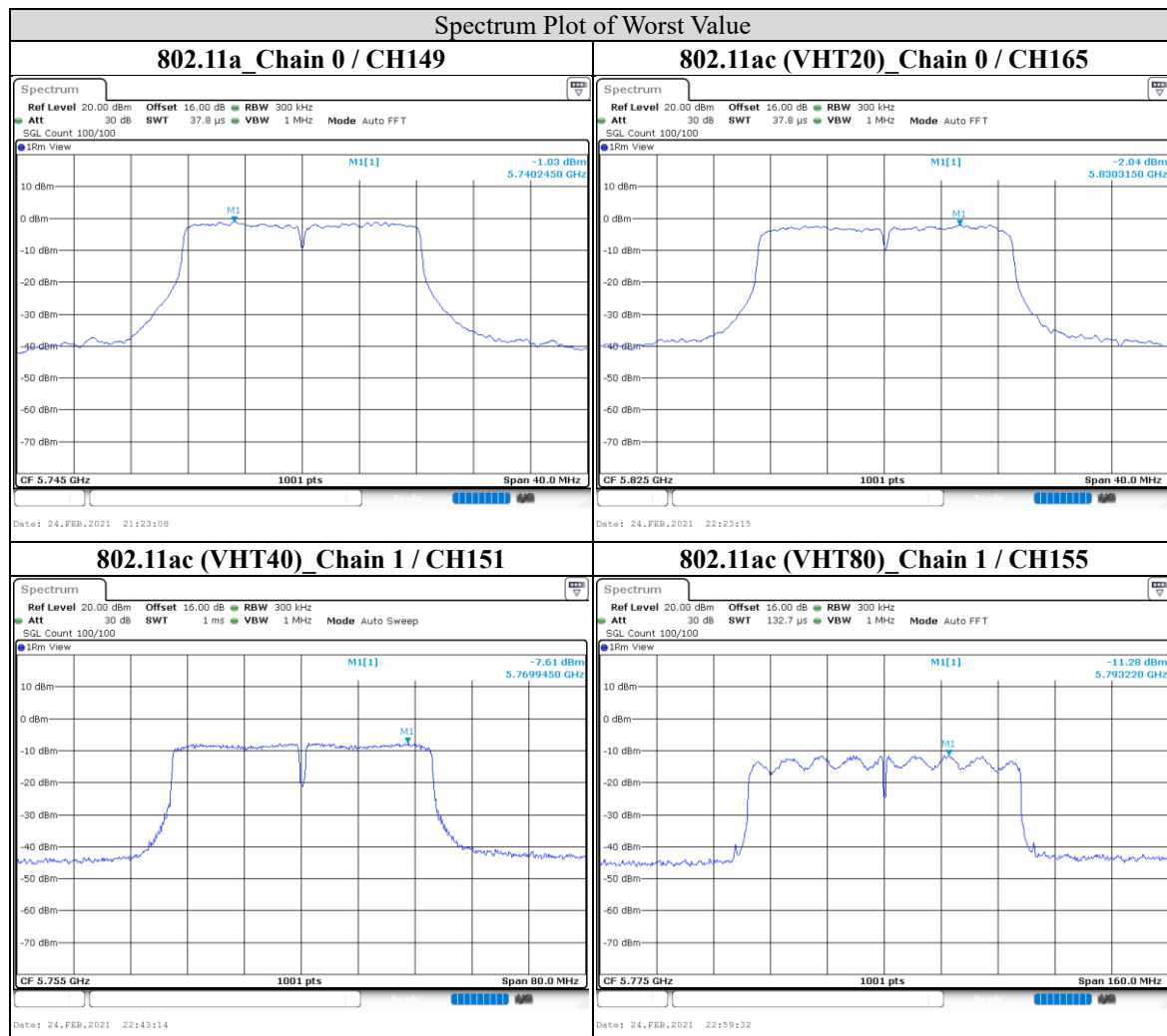
Telephone : +886-2-7737-3000

Facsimile (FAX ) : +886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 40 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT



**Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



## 9.6. Frequency Stability

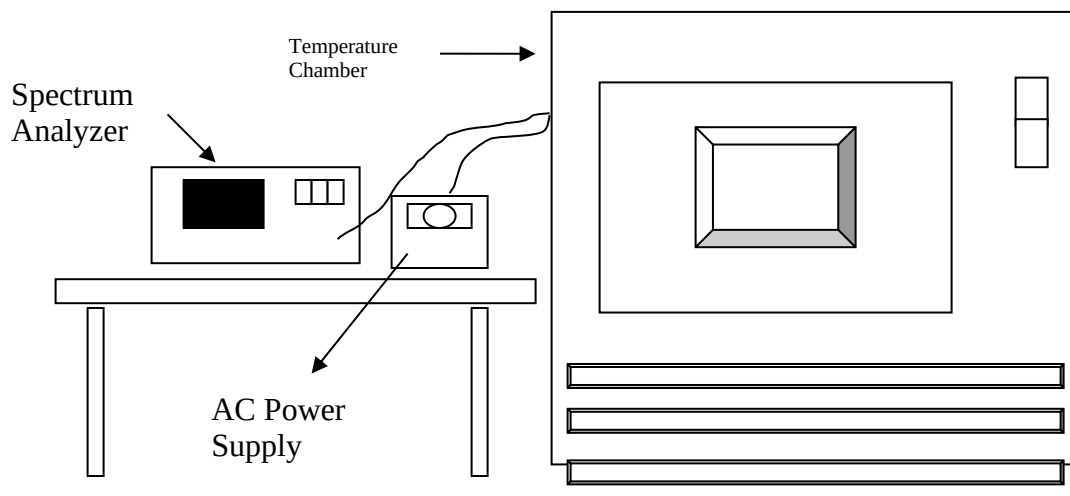
### Requirements

The frequency of the carrier signal shall be maintained within band of operation.

### Test procedure

- The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
- Turn the EUT on and couple its output to a spectrum analyzer.
- Turn the EUT off and set the chamber to the highest temperature specified.
- Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 Minutes.
- Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
- 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.

### Test Setup



### **Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



## Test Data

| Frequency Stability Versus Temp. |                          |                                |                      |                                |                      |                                |                      |                                |                      |
|----------------------------------|--------------------------|--------------------------------|----------------------|--------------------------------|----------------------|--------------------------------|----------------------|--------------------------------|----------------------|
| Operating Frequency: 5180 MHz    |                          |                                |                      |                                |                      |                                |                      |                                |                      |
| TEMP.<br>(°C)                    | Power<br>Supply<br>(Vac) | 0 Minute                       |                      | 2 Minute                       |                      | 5 Minute                       |                      | 10 Minute                      |                      |
|                                  |                          | Measured<br>Frequency<br>(MHz) | Freq. Drift<br>(ppm) | Measured<br>Frequency<br>(MHz) | Freq. Drift<br>(ppm) | Measured<br>Frequency<br>(MHz) | Freq. Drift<br>(ppm) | Measured<br>Frequency<br>(MHz) | Freq. Drift<br>(ppm) |
| 50                               | 120                      | 5180.0017                      | 0.33                 | 5180.0023                      | 0.44                 | 5180.0019                      | 0.37                 | 5179.9995                      | -0.10                |
| 40                               | 120                      | 5179.9764                      | -4.56                | 5179.9777                      | -4.31                | 5179.9775                      | -4.34                | 5179.9746                      | -4.90                |
| 30                               | 120                      | 5179.9975                      | -0.48                | 5179.9985                      | -0.29                | 5179.9993                      | -0.14                | 5180                           | 0.00                 |
| 20                               | 120                      | 5180.0025                      | 0.48                 | 5179.9982                      | -0.35                | 5179.9986                      | -0.27                | 5179.9982                      | -0.35                |
| 10                               | 120                      | 5179.9773                      | -4.38                | 5179.9802                      | -3.82                | 5179.9792                      | -4.02                | 5179.9803                      | -3.80                |
| 0                                | 120                      | 5180.0071                      | 1.37                 | 5180.0068                      | 1.31                 | 5180.0073                      | 1.41                 | 5180.0038                      | 0.73                 |
| -10                              | 120                      | 5180.0219                      | 4.23                 | 5180.0193                      | 3.73                 | 5180.0218                      | 4.21                 | 5180.0179                      | 3.46                 |
| -20                              | 120                      | 5179.9775                      | -4.34                | 5179.978                       | -4.25                | 5179.9795                      | -3.96                | 5179.9816                      | -3.55                |
| -30                              | 120                      | 5179.9762                      | -4.59                | 5179.9754                      | -4.75                | 5179.9782                      | -4.21                | 5179.9751                      | -4.81                |
| -40                              | 120                      | 5179.9919                      | -1.56                | 5179.9895                      | -2.03                | 5179.9916                      | -1.62                | 5179.9924                      | -1.47                |
| TEMP.<br>(°C)                    | Power<br>Supply<br>(Vac) | 0 Minute                       |                      | 2 Minute                       |                      | 5 Minute                       |                      | 10 Minute                      |                      |
|                                  |                          | Measured<br>Frequency<br>(MHz) | Freq. Drift<br>(ppm) | Measured<br>Frequency<br>(MHz) | Freq. Drift<br>(ppm) | Measured<br>Frequency<br>(MHz) | Freq. Drift<br>(ppm) | Measured<br>Frequency<br>(MHz) | Freq. Drift<br>(ppm) |
| 20                               | 138                      | 5180.0034                      | 0.66                 | 5179.9986                      | -0.27                | 5179.999                       | -0.19                | 5179.9986                      | -0.27                |
| 20                               | 120                      | 5180.0025                      | 0.48                 | 5179.9982                      | -0.35                | 5179.9986                      | -0.27                | 5179.9982                      | -0.35                |
| 20                               | 102                      | 5180.0027                      | 0.52                 | 5179.999                       | -0.19                | 5179.9976                      | -0.46                | 5179.9972                      | -0.54                |

## Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



## 9.7. Radiated Spurious Emission

### Requirements

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table.

| Frequency(MHz) | Field strength<br>(microvolts/meter) | Measurement distance<br>(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 1000MHz, 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 20dB under any condition of modulation.

### **Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 44 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

#### Limits of unwanted emission out of the restricted bands

| Applicable To                                                                                                                                                                                                                                                                                                                                    |                 | Limit                                                                                                                               |                                                                                                                                         |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| 789033 D02 General UNII Test Procedure New Rules v02r01                                                                                                                                                                                                                                                                                          |                 | Field Strength at 3m                                                                                                                |                                                                                                                                         |
|                                                                                                                                                                                                                                                                                                                                                  |                 | PK:74 (dBμV/m)                                                                                                                      | AV:54 (dBμV/m)                                                                                                                          |
| Frequency Band                                                                                                                                                                                                                                                                                                                                   | Applicable To   | EIRP Limit                                                                                                                          | Equivalent Field Strength at 3m                                                                                                         |
| 5150~5250 MHz                                                                                                                                                                                                                                                                                                                                    | 15.407(b)(1)    | PK:-27 (dBm/MHz)                                                                                                                    | PK:68.2(dBμV/m)                                                                                                                         |
| 5250~5350 MHz                                                                                                                                                                                                                                                                                                                                    | 15.407(b)(2)    |                                                                                                                                     |                                                                                                                                         |
| 5470~5725 MHz                                                                                                                                                                                                                                                                                                                                    | 15.407(b)(3)    |                                                                                                                                     |                                                                                                                                         |
| 5725~5850 MHz                                                                                                                                                                                                                                                                                                                                    | 15.407(b)(4)(i) | PK:-27 (dBm/MHz) <sup>*1</sup><br>PK:10 (dBm/MHz) <sup>*2</sup><br>PK:15.6 (dBm/MHz) <sup>*3</sup><br>PK:27 (dBm/MHz) <sup>*4</sup> | PK: 68.2(dBμV/m) <sup>*1</sup><br>PK:105.2 (dBμV/m) <sup>*2</sup><br>PK: 110.8(dBμV/m) <sup>*3</sup><br>PK:122.2 (dBμV/m) <sup>*4</sup> |
| <p>*1 beyond 75 MHz or more above of the band edge.<br/> *2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.<br/> *3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.<br/> *4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.</p> |                 |                                                                                                                                     |                                                                                                                                         |

#### Note:

The following formula is used to convert the effective isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3} \mu\text{V/m, where P is the eirp (Watts).}$$

#### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



## **Test Procedures**

[For 9 kHz ~ 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. For measurement below 30MHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

NOTE:

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

[For above 30 MHz]

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) 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. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
- f. The test-receiver system was set to peak and average detects 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.

## **Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Note:

- The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
- 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 1GHz.
- The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is  $\geq 1/T$  (Duty cycle < 98%) or 10Hz (Duty cycle  $\geq 98\%$ ) for Average detection (AV) at frequency above 1GHz.

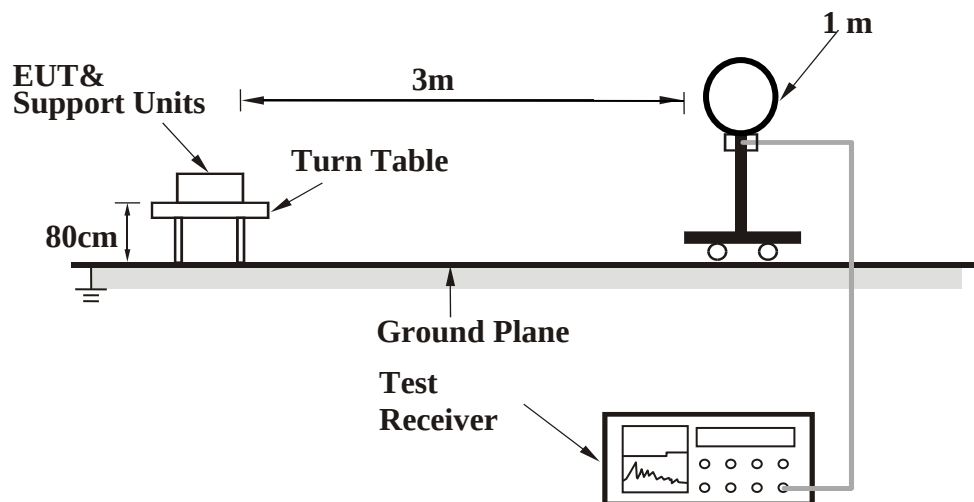
| Configuration    | Average |       |
|------------------|---------|-------|
|                  | RBW     | VBW   |
| 802.11a          | 1MHz    | 10 Hz |
| 802.11ac (VHT20) |         |       |
| 802.11ac (VHT40) |         |       |
| 802.11ac (VHT80) |         |       |

Note: Refer to section 6.6 for duty cycle.

- All modes of operation were investigated (includes all external accessories) and the worst-case emissions are reported.

### Test Setup

<Frequency Range 9 kHz ~ 30 MHz>



### **Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

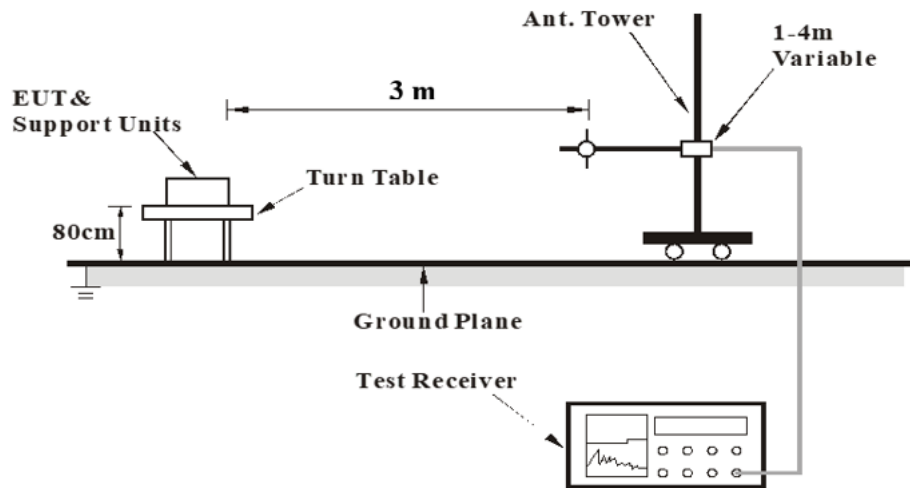
Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948

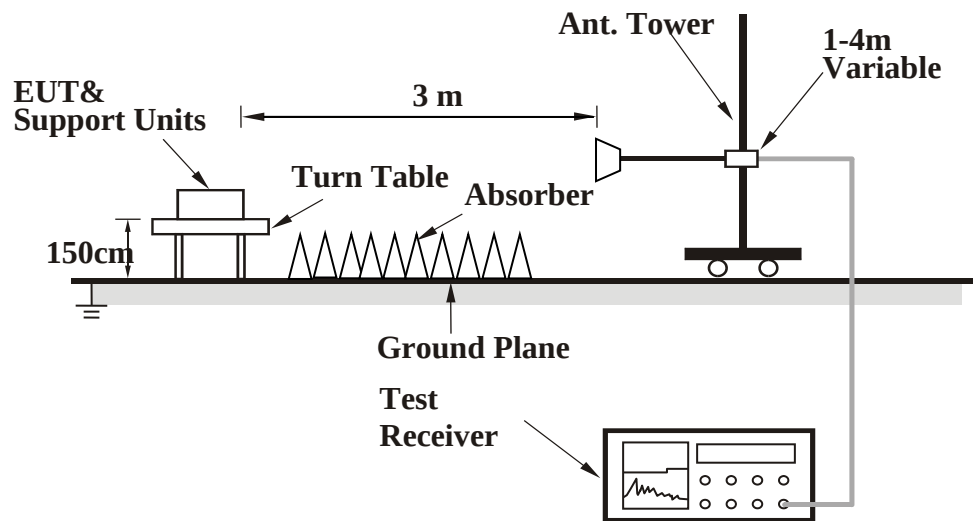
Doc No: 17-EM-F0878 / 5.0



<Frequency Range 30 MHz ~ 1 GHz >



<Frequency Range above 1 GHz>



For the actual test configuration, please refer to the Setup Configurations.

**Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



## Test Data

### Above 1GHz Data

#### 802.11a

| EUT Test Condition |            | Measurement Detail |                |
|--------------------|------------|--------------------|----------------|
| Channel            | Channel 36 | Frequency Range    | 1 GHz ~ 40 GHz |

| Antenna Polarity & Test Distance: Horizontal at 3 m |           |          |         |          |          |        |         |
|-----------------------------------------------------|-----------|----------|---------|----------|----------|--------|---------|
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| -                                                   | 10360     | 31.47    | 17.39   | 48.86    | 68.2     | -19.34 | Peak    |
| -                                                   | 5150      | 32.65    | 13.39   | 46.04    | 54       | -7.96  | Average |
| @                                                   | 5180      | 84.21    | 13.36   | 97.57    | -        | -      | Average |
| -                                                   | 5144.9    | 43.42    | 13.39   | 56.81    | 74       | -17.19 | Peak    |
| @                                                   | 5180      | 92.98    | 13.36   | 106.34   | -        | -      | Peak    |
| Antenna Polarity & Test Distance: Vertical at 3 m   |           |          |         |          |          |        |         |
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| -                                                   | 10360     | 30.71    | 17.39   | 48.1     | 68.2     | -20.1  | Peak    |
| -                                                   | 5102.6    | 30.42    | 13.43   | 43.85    | 54       | -10.15 | Average |
| @                                                   | 5180      | 72.98    | 13.36   | 86.34    | -        | -      | Average |
| -                                                   | 5130.2    | 42.83    | 13.41   | 56.24    | 74       | -17.76 | Peak    |
| @                                                   | 5180      | 82.24    | 13.36   | 95.6     | -        | -      | Peak    |

#### Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. The other emission levels were very low against the limit.

## Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 49 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

| EUT Test Condition |            | Measurement Detail |                |
|--------------------|------------|--------------------|----------------|
| Channel            | Channel 44 | Frequency Range    | 1 GHz ~ 40 GHz |

| Antenna Polarity & Test Distance: Horizontal at 3 m |           |          |         |          |          |        |         |
|-----------------------------------------------------|-----------|----------|---------|----------|----------|--------|---------|
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| -                                                   | 10440     | 30.83    | 17.63   | 48.46    | 68.2     | -19.74 | Peak    |
| -                                                   | 5111.6    | 30.02    | 13.42   | 43.44    | 54       | -10.56 | Average |
| @                                                   | 5220      | 80.56    | 13.29   | 93.85    | -        | -      | Average |
| -                                                   | 5051.9    | 42.82    | 13.27   | 56.09    | 74       | -17.91 | Peak    |
| @                                                   | 5220      | 91.69    | 13.29   | 104.98   | -        | -      | Peak    |
| Antenna Polarity & Test Distance: Vertical at 3 m   |           |          |         |          |          |        |         |
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| -                                                   | 10440     | 31.38    | 17.63   | 49.01    | 68.2     | -19.19 | Peak    |
| -                                                   | 5108      | 30.03    | 13.42   | 43.45    | 54       | -10.55 | Average |
| @                                                   | 5220      | 73.84    | 13.29   | 87.13    | -        | -      | Average |
| -                                                   | 5017.7    | 42.73    | 12.91   | 55.64    | 74       | -18.36 | Peak    |
| @                                                   | 5220      | 83.05    | 13.29   | 96.34    | -        | -      | Peak    |

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. The other emission levels were very low against the limit.

### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 50 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

| EUT Test Condition |            | Measurement Detail |                |
|--------------------|------------|--------------------|----------------|
| Channel            | Channel 48 | Frequency Range    | 1 GHz ~ 40 GHz |

| Antenna Polarity & Test Distance: Horizontal at 3 m |           |          |         |          |          |        |         |
|-----------------------------------------------------|-----------|----------|---------|----------|----------|--------|---------|
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| -                                                   | 10480     | 31.04    | 17.69   | 48.73    | 68.2     | -19.47 | Peak    |
| -                                                   | 5073.2    | 30.14    | 13.35   | 43.49    | 54       | -10.51 | Average |
| @                                                   | 5240      | 80.77    | 13.23   | 94       | -        | -      | Average |
| -                                                   | 5099.9    | 42.44    | 13.43   | 55.87    | 74       | -18.13 | Peak    |
| @                                                   | 5240      | 90.63    | 13.23   | 103.86   | -        | -      | Peak    |
| Antenna Polarity & Test Distance: Vertical at 3 m   |           |          |         |          |          |        |         |
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| -                                                   | 10480     | 31.72    | 17.69   | 49.41    | 68.2     | -18.79 | Peak    |
| -                                                   | 5096.9    | 30       | 13.42   | 43.42    | 54       | -10.58 | Average |
| @                                                   | 5240      | 73.43    | 13.23   | 86.66    | -        | -      | Average |
| -                                                   | 5068.7    | 42.44    | 13.33   | 55.77    | 74       | -18.23 | Peak    |
| @                                                   | 5240      | 82.7     | 13.23   | 95.93    | -        | -      | Peak    |

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. The other emission levels were very low against the limit.

## Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 51 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

| EUT Test Condition |             | Measurement Detail |                |
|--------------------|-------------|--------------------|----------------|
| Channel            | Channel 149 | Frequency Range    | 1 GHz ~ 40 GHz |

| Antenna Polarity & Test Distance: Horizontal at 3 m |           |          |         |          |          |        |         |
|-----------------------------------------------------|-----------|----------|---------|----------|----------|--------|---------|
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| *                                                   | 11490     | 29.71    | 19.02   | 48.73    | 74       | -25.27 | Peak    |
| -                                                   | 5569.5    | 40.66    | 13.9    | 54.56    | 68.2     | -13.64 | Peak    |
| -                                                   | 5725      | 54.07    | 14.13   | 68.2     | 122.2    | -54    | Peak    |
| @                                                   | 5745      | 81.82    | 14.23   | 96.05    | -        | -      | Average |
| @                                                   | 5745      | 91.21    | 14.23   | 105.44   | -        | -      | Peak    |
| Antenna Polarity & Test Distance: Vertical at 3 m   |           |          |         |          |          |        |         |
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| *                                                   | 11490     | 30.35    | 19.02   | 49.37    | 74       | -24.63 | Peak    |
| -                                                   | 5628      | 40.73    | 13.96   | 54.69    | 68.2     | -13.51 | Peak    |
| -                                                   | 5725      | 45.74    | 14.13   | 59.87    | 122.2    | -62.33 | Peak    |
| @                                                   | 5745      | 75.61    | 14.23   | 89.84    | -        | -      | Average |
| @                                                   | 5745      | 84.4     | 14.23   | 98.63    | -        | -      | Peak    |

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. " \* ": The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 52 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

| EUT Test Condition |             | Measurement Detail |                |
|--------------------|-------------|--------------------|----------------|
| Channel            | Channel 157 | Frequency Range    | 1 GHz ~ 40 GHz |

| Antenna Polarity & Test Distance: Horizontal at 3 m |           |          |         |          |          |        |         |
|-----------------------------------------------------|-----------|----------|---------|----------|----------|--------|---------|
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| *                                                   | 11570     | 30.19    | 18.88   | 49.07    | 74       | -24.93 | Peak    |
| -                                                   | 5610      | 41.04    | 13.98   | 55.02    | 68.2     | -13.18 | Peak    |
| -                                                   | 5659.5    | 41.22    | 13.95   | 55.17    | 75.26    | -20.09 | Peak    |
| @                                                   | 5785      | 75.86    | 14.43   | 90.29    | -        | -      | Average |
| @                                                   | 5785      | 89.43    | 14.43   | 103.86   | -        | -      | Peak    |
| -                                                   | 5892.5    | 40.66    | 14.89   | 55.55    | 92.21    | -36.66 | Peak    |
| -                                                   | 5988      | 41.1     | 15.08   | 56.18    | 68.2     | -12.02 | Peak    |
| Antenna Polarity & Test Distance: Vertical at 3 m   |           |          |         |          |          |        |         |
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| *                                                   | 11570     | 30.67    | 18.88   | 49.55    | 74       | -24.45 | Peak    |
| -                                                   | 5562.5    | 41.25    | 13.88   | 55.13    | 68.2     | -13.07 | Peak    |
| -                                                   | 5685.5    | 40.55    | 13.99   | 54.54    | 94.5     | -39.96 | Peak    |
| @                                                   | 5785      | 74.34    | 14.43   | 88.77    | -        | -      | Average |
| @                                                   | 5785      | 82.99    | 14.43   | 97.42    | -        | -      | Peak    |
| -                                                   | 5862.5    | 42.1     | 14.78   | 56.88    | 108.7    | -51.82 | Peak    |
| -                                                   | 5953.5    | 41.22    | 14.97   | 56.19    | 68.2     | -12.01 | Peak    |

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. " \* ": The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 53 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

| EUT Test Condition |             | Measurement Detail |                |
|--------------------|-------------|--------------------|----------------|
| Channel            | Channel 165 | Frequency Range    | 1 GHz ~ 40 GHz |

| Antenna Polarity & Test Distance: Horizontal at 3 m |           |          |         |          |          |        |         |
|-----------------------------------------------------|-----------|----------|---------|----------|----------|--------|---------|
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| *                                                   | 11650     | 30.25    | 18.63   | 48.88    | 74       | -25.12 | Peak    |
| @                                                   | 5825      | 80.89    | 14.63   | 95.52    | -        | -      | Average |
| @                                                   | 5825      | 89.23    | 14.63   | 103.86   | -        | -      | Peak    |
| -                                                   | 5910.5    | 41.06    | 14.92   | 55.98    | 78.9     | -22.92 | Peak    |
| -                                                   | 5983.5    | 40.68    | 15.06   | 55.74    | 68.2     | -12.46 | Peak    |
| Antenna Polarity & Test Distance: Vertical at 3 m   |           |          |         |          |          |        |         |
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| *                                                   | 11650     | 29.61    | 18.63   | 48.24    | 74       | -25.76 | Peak    |
| @                                                   | 5825      | 73.05    | 14.63   | 87.68    | -        | -      | Average |
| @                                                   | 5825      | 83.37    | 14.63   | 98       | -        | -      | Peak    |
| -                                                   | 5870.5    | 40.82    | 14.81   | 55.63    | 106.46   | -50.83 | Peak    |
| -                                                   | 5927      | 40.73    | 14.93   | 55.66    | 68.2     | -12.54 | Peak    |

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. " \* ": The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 54 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

### 802.11ac (VHT20)

| EUT Test Condition |            | Measurement Detail |                |
|--------------------|------------|--------------------|----------------|
| Channel            | Channel 36 | Frequency Range    | 1 GHz ~ 40 GHz |

| Antenna Polarity & Test Distance: Horizontal at 3 m |           |          |         |          |          |        |         |
|-----------------------------------------------------|-----------|----------|---------|----------|----------|--------|---------|
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| -                                                   | 10360     | 30.97    | 17.39   | 48.36    | 68.2     | -19.84 | Peak    |
| -                                                   | 5149.7    | 30.34    | 13.39   | 43.73    | 54       | -10.27 | Average |
| @                                                   | 5180      | 79.11    | 13.36   | 92.47    | -        | -      | Average |
| -                                                   | 5150      | 43.59    | 13.39   | 56.98    | 74       | -17.02 | Peak    |
| @                                                   | 5180      | 89.53    | 13.36   | 102.89   | -        | -      | Peak    |
| Antenna Polarity & Test Distance: Vertical at 3 m   |           |          |         |          |          |        |         |
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| -                                                   | 10360     | 31.26    | 17.39   | 48.65    | 68.2     | -19.55 | Peak    |
| -                                                   | 5150      | 30.25    | 13.39   | 43.64    | 54       | -10.36 | Average |
| @                                                   | 5180      | 78.79    | 13.36   | 92.15    | -        | -      | Average |
| -                                                   | 5147      | 42.8     | 13.39   | 56.19    | 74       | -17.81 | Peak    |
| @                                                   | 5180      | 88.45    | 13.36   | 101.81   | -        | -      | Peak    |

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. The other emission levels were very low against the limit.

### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 55 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

| EUT Test Condition |            | Measurement Detail |                |
|--------------------|------------|--------------------|----------------|
| Channel            | Channel 44 | Frequency Range    | 1 GHz ~ 40 GHz |

| Antenna Polarity & Test Distance: Horizontal at 3 m |           |          |         |          |          |        |         |
|-----------------------------------------------------|-----------|----------|---------|----------|----------|--------|---------|
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| -                                                   | 10440     | 31.24    | 17.63   | 48.87    | 68.2     | -19.33 | Peak    |
| -                                                   | 5066.3    | 30.19    | 13.32   | 43.51    | 54       | -10.49 | Average |
| @                                                   | 5220      | 80.63    | 13.29   | 93.92    | -        | -      | Average |
| -                                                   | 5095.7    | 42.29    | 13.42   | 55.71    | 74       | -18.29 | Peak    |
| @                                                   | 5220      | 90.22    | 13.29   | 103.51   | -        | -      | Peak    |
| Antenna Polarity & Test Distance: Vertical at 3 m   |           |          |         |          |          |        |         |
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| -                                                   | 10440     | 31.62    | 17.63   | 49.25    | 68.2     | -18.95 | Peak    |
| -                                                   | 5080.4    | 30.16    | 13.36   | 43.52    | 54       | -10.48 | Average |
| @                                                   | 5220      | 79.65    | 13.29   | 92.94    | -        | -      | Average |
| -                                                   | 5145.5    | 42.37    | 13.39   | 55.76    | 74       | -18.24 | Peak    |
| @                                                   | 5220      | 88.6     | 13.29   | 101.89   | -        | -      | Peak    |

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. The other emission levels were very low against the limit.

### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 56 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

| EUT Test Condition |            | Measurement Detail |                |
|--------------------|------------|--------------------|----------------|
| Channel            | Channel 48 | Frequency Range    | 1 GHz ~ 40 GHz |

| Antenna Polarity & Test Distance: Horizontal at 3 m |           |          |         |          |          |        |         |
|-----------------------------------------------------|-----------|----------|---------|----------|----------|--------|---------|
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| -                                                   | 10480     | 33.3     | 17.69   | 50.99    | 68.2     | -17.21 | Peak    |
| -                                                   | 5068.1    | 30.24    | 13.33   | 43.57    | 54       | -10.43 | Average |
| @                                                   | 5240      | 80.3     | 13.23   | 93.53    | -        | -      | Average |
| -                                                   | 5056.4    | 42.35    | 13.29   | 55.64    | 74       | -18.36 | Peak    |
| @                                                   | 5240      | 89.49    | 13.23   | 102.72   | -        | -      | Peak    |
| Antenna Polarity & Test Distance: Vertical at 3 m   |           |          |         |          |          |        |         |
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| -                                                   | 10480     | 30.9     | 17.69   | 48.59    | 68.2     | -19.61 | Peak    |
| -                                                   | 5113.7    | 30.12    | 13.41   | 43.53    | 54       | -10.47 | Average |
| @                                                   | 5240      | 79.77    | 13.23   | 93       | -        | -      | Average |
| -                                                   | 5131.1    | 42.55    | 13.41   | 55.96    | 74       | -18.04 | Peak    |
| @                                                   | 5240      | 88.99    | 13.23   | 102.22   | -        | -      | Peak    |

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. The other emission levels were very low against the limit.

### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 57 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

| EUT Test Condition |             | Measurement Detail |                |
|--------------------|-------------|--------------------|----------------|
| Channel            | Channel 149 | Frequency Range    | 1 GHz ~ 40 GHz |

| Antenna Polarity & Test Distance: Horizontal at 3 m |           |          |         |          |          |        |         |
|-----------------------------------------------------|-----------|----------|---------|----------|----------|--------|---------|
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| *                                                   | 11490     | 30.22    | 19.02   | 49.24    | 74       | -24.76 | Peak    |
| -                                                   | 5609.5    | 41.26    | 13.98   | 55.24    | 68.2     | -12.96 | Peak    |
| -                                                   | 5724.5    | 57.11    | 14.13   | 71.24    | 121.06   | -49.82 | Peak    |
| @                                                   | 5745      | 81.8     | 14.23   | 96.03    | -        | -      | Average |
| @                                                   | 5745      | 91.86    | 14.23   | 106.09   | -        | -      | Peak    |
| Antenna Polarity & Test Distance: Vertical at 3 m   |           |          |         |          |          |        |         |
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| *                                                   | 11490     | 30.82    | 19.02   | 49.84    | 74       | -24.16 | Peak    |
| -                                                   | 5643.5    | 41.29    | 13.94   | 55.23    | 68.2     | -12.97 | Peak    |
| -                                                   | 5724.5    | 51.97    | 14.13   | 66.1     | 121.06   | -54.96 | Peak    |
| @                                                   | 5745      | 79.96    | 14.23   | 94.19    | -        | -      | Average |
| @                                                   | 5745      | 89.44    | 14.23   | 103.67   | -        | -      | Peak    |

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. " \* ": The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 58 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

| EUT Test Condition |             | Measurement Detail |                |
|--------------------|-------------|--------------------|----------------|
| Channel            | Channel 157 | Frequency Range    | 1 GHz ~ 40 GHz |

| Antenna Polarity & Test Distance: Horizontal at 3 m |           |          |         |          |          |        |         |
|-----------------------------------------------------|-----------|----------|---------|----------|----------|--------|---------|
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| *                                                   | 11570     | 30.83    | 18.88   | 49.71    | 74       | -24.29 | Peak    |
| -                                                   | 5539.5    | 41.46    | 13.82   | 55.28    | 68.2     | -12.92 | Peak    |
| -                                                   | 5673.5    | 40.69    | 13.97   | 54.66    | 85.63    | -30.97 | Peak    |
| @                                                   | 5785      | 82.34    | 14.43   | 96.77    | -        | -      | Average |
| @                                                   | 5785      | 91.57    | 14.43   | 106      | -        | -      | Peak    |
| -                                                   | 5896      | 41.66    | 14.9    | 56.56    | 89.62    | -33.06 | Peak    |
| -                                                   | 6024.5    | 41.2     | 15.15   | 56.35    | 68.2     | -11.85 | Peak    |
| Antenna Polarity & Test Distance: Vertical at 3 m   |           |          |         |          |          |        |         |
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| *                                                   | 11570     | 30.6     | 18.88   | 49.48    | 74       | -24.52 | Peak    |
| -                                                   | 5554.5    | 41.13    | 13.85   | 54.98    | 68.2     | -13.22 | Peak    |
| -                                                   | 5660      | 41.35    | 13.95   | 55.3     | 75.63    | -20.33 | Peak    |
| @                                                   | 5785      | 78.51    | 14.43   | 92.94    | -        | -      | Average |
| @                                                   | 5785      | 88.59    | 14.43   | 103.02   | -        | -      | Peak    |
| -                                                   | 5883.5    | 40.87    | 14.86   | 55.73    | 98.89    | -43.16 | Peak    |
| -                                                   | 5952      | 41.82    | 14.96   | 56.78    | 68.2     | -11.42 | Peak    |

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. " \* ": The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 59 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

| EUT Test Condition |             | Measurement Detail |                |
|--------------------|-------------|--------------------|----------------|
| Channel            | Channel 165 | Frequency Range    | 1 GHz ~ 40 GHz |

| Antenna Polarity & Test Distance: Horizontal at 3 m |           |          |         |          |          |        |         |
|-----------------------------------------------------|-----------|----------|---------|----------|----------|--------|---------|
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| *                                                   | 11650     | 29.86    | 18.63   | 48.49    | 74       | -25.51 | Peak    |
| @                                                   | 5825      | 82       | 14.63   | 96.63    | -        | -      | Average |
| @                                                   | 5825      | 91.17    | 14.63   | 105.8    | -        | -      | Peak    |
| -                                                   | 5850.5    | 46.3     | 14.76   | 61.06    | 121.06   | -60    | Peak    |
| -                                                   | 5998.5    | 40.87    | 15.11   | 55.98    | 68.2     | -12.22 | Peak    |
| Antenna Polarity & Test Distance: Vertical at 3 m   |           |          |         |          |          |        |         |
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| *                                                   | 11650     | 29.96    | 18.63   | 48.59    | 74       | -25.41 | Peak    |
| @                                                   | 5825      | 76.62    | 14.63   | 91.25    | -        | -      | Average |
| @                                                   | 5825      | 86.12    | 14.63   | 100.75   | -        | -      | Peak    |
| -                                                   | 5857      | 40.9     | 14.78   | 55.68    | 110.24   | -54.56 | Peak    |
| -                                                   | 5961.5    | 40.96    | 14.99   | 55.95    | 68.2     | -12.25 | Peak    |

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. " \* ": The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 60 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

### 802.11ac (VHT40)

| EUT Test Condition |            | Measurement Detail |                |
|--------------------|------------|--------------------|----------------|
| Channel            | Channel 38 | Frequency Range    | 1 GHz ~ 40 GHz |

| Antenna Polarity & Test Distance: Horizontal at 3 m |           |          |         |          |          |        |         |
|-----------------------------------------------------|-----------|----------|---------|----------|----------|--------|---------|
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| -                                                   | 10380     | 32.27    | 17.49   | 49.76    | 68.2     | -18.44 | Peak    |
| -                                                   | 5149.7    | 31.61    | 13.39   | 45       | 54       | -9     | Average |
| @                                                   | 5190      | 73.94    | 13.36   | 87.3     | -        | -      | Average |
| -                                                   | 5144.3    | 42.87    | 13.39   | 56.26    | 74       | -17.74 | Peak    |
| @                                                   | 5190      | 84.17    | 13.36   | 97.53    | -        | -      | Peak    |
| Antenna Polarity & Test Distance: Vertical at 3 m   |           |          |         |          |          |        |         |
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| -                                                   | 10380     | 30.93    | 17.49   | 48.42    | 68.2     | -19.78 | Peak    |
| -                                                   | 5150      | 33.98    | 13.39   | 47.37    | 54       | -6.63  | Average |
| @                                                   | 5190      | 73.52    | 13.36   | 86.88    | -        | -      | Average |
| -                                                   | 5148.2    | 44.29    | 13.38   | 57.67    | 74       | -16.33 | Peak    |
| @                                                   | 5190      | 83.85    | 13.36   | 97.21    | -        | -      | Peak    |

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. The other emission levels were very low against the limit.

### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 61 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

| EUT Test Condition |            | Measurement Detail |                |
|--------------------|------------|--------------------|----------------|
| Channel            | Channel 46 | Frequency Range    | 1 GHz ~ 40 GHz |

| Antenna Polarity & Test Distance: Horizontal at 3 m |           |          |         |          |          |        |         |
|-----------------------------------------------------|-----------|----------|---------|----------|----------|--------|---------|
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| -                                                   | 10460     | 30.76    | 17.66   | 48.42    | 68.2     | -19.78 | Peak    |
| -                                                   | 5072.6    | 30.28    | 13.35   | 43.63    | 54       | -10.37 | Average |
| @                                                   | 5230      | 76.73    | 13.26   | 89.99    | -        | -      | Average |
| -                                                   | 5147.9    | 41.79    | 13.38   | 55.17    | 74       | -18.83 | Peak    |
| @                                                   | 5230      | 85.81    | 13.26   | 99.07    | -        | -      | Peak    |
| Antenna Polarity & Test Distance: Vertical at 3 m   |           |          |         |          |          |        |         |
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| -                                                   | 10460     | 30.78    | 17.66   | 48.44    | 68.2     | -19.76 | Peak    |
| -                                                   | 5112.2    | 30.23    | 13.42   | 43.65    | 54       | -10.35 | Average |
| @                                                   | 5230      | 76.28    | 13.26   | 89.54    | -        | -      | Average |
| -                                                   | 5118.8    | 42.24    | 13.41   | 55.65    | 74       | -18.35 | Peak    |
| @                                                   | 5230      | 85.81    | 13.26   | 99.07    | -        | -      | Peak    |

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. The other emission levels were very low against the limit.

### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 62 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

| EUT Test Condition |             | Measurement Detail |                |
|--------------------|-------------|--------------------|----------------|
| Channel            | Channel 151 | Frequency Range    | 1 GHz ~ 40 GHz |

| Antenna Polarity & Test Distance: Horizontal at 3 m |           |          |         |          |          |        |         |
|-----------------------------------------------------|-----------|----------|---------|----------|----------|--------|---------|
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| *                                                   | 11510     | 31.39    | 19.03   | 50.42    | 74       | -23.58 | Peak    |
| -                                                   | 5595      | 40.56    | 13.97   | 54.53    | 68.2     | -13.67 | Peak    |
| -                                                   | 5725      | 49.68    | 14.13   | 63.81    | 122.2    | -58.39 | Peak    |
| @                                                   | 5755      | 77.52    | 14.27   | 91.79    | -        | -      | Average |
| @                                                   | 5755      | 86.08    | 14.27   | 100.35   | -        | -      | Peak    |
| Antenna Polarity & Test Distance: Vertical at 3 m   |           |          |         |          |          |        |         |
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| *                                                   | 11510     | 30.53    | 19.03   | 49.56    | 74       | -24.44 | Peak    |
| -                                                   | 5576.5    | 41.04    | 13.92   | 54.96    | 68.2     | -13.24 | Peak    |
| -                                                   | 5717      | 42.86    | 14.09   | 56.95    | 109.96   | -53.01 | Peak    |
| @                                                   | 5755      | 75.1     | 14.27   | 89.37    | -        | -      | Average |
| @                                                   | 5755      | 83.42    | 14.27   | 97.69    | -        | -      | Peak    |

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. " \* ": The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 63 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

| EUT Test Condition |             | Measurement Detail |                |
|--------------------|-------------|--------------------|----------------|
| Channel            | Channel 159 | Frequency Range    | 1 GHz ~ 40 GHz |

| Antenna Polarity & Test Distance: Horizontal at 3 m |           |          |         |          |          |        |         |
|-----------------------------------------------------|-----------|----------|---------|----------|----------|--------|---------|
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| *                                                   | 11590     | 30.68    | 18.84   | 49.52    | 74       | -24.48 | Peak    |
| -                                                   | 5554.5    | -0.79    | 56.12   | 55.33    | 68.2     | -12.87 | Peak    |
| -                                                   | 5686.5    | -0.86    | 56.28   | 55.42    | 95.24    | -39.82 | Peak    |
| @                                                   | 5795      | 76.79    | 14.48   | 91.27    | -        | -      | Average |
| @                                                   | 5795      | 85.63    | 14.48   | 100.11   | -        | -      | Peak    |
| -                                                   | 5888.5    | 41.26    | 14.88   | 56.14    | 95.18    | -39.04 | Peak    |
| -                                                   | 5998.5    | 40.61    | 15.11   | 55.72    | 68.2     | -12.48 | Peak    |
| Antenna Polarity & Test Distance: Vertical at 3 m   |           |          |         |          |          |        |         |
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| *                                                   | 11590     | 29.93    | 18.84   | 48.77    | 74       | -25.23 | Peak    |
| -                                                   | 5556.5    | -0.47    | 56.12   | 55.65    | 68.2     | -12.55 | Peak    |
| -                                                   | 5714.5    | -0.82    | 56.37   | 55.55    | 109.26   | -53.71 | Peak    |
| @                                                   | 5795      | 71.66    | 14.48   | 86.14    | -        | -      | Average |
| @                                                   | 5795      | 83.06    | 14.48   | 97.54    | -        | -      | Peak    |
| -                                                   | 5852.5    | 40.75    | 14.76   | 55.51    | 116.5    | -60.99 | Peak    |
| -                                                   | 6007      | 40.83    | 15.12   | 55.95    | 68.2     | -12.25 | Peak    |

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. " \* ": The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 64 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

### 802.11ac (VHT80)

| EUT Test Condition |            | Measurement Detail |                |
|--------------------|------------|--------------------|----------------|
| Channel            | Channel 42 | Frequency Range    | 1 GHz ~ 40 GHz |

| Antenna Polarity & Test Distance: Horizontal at 3 m |           |          |         |          |          |        |         |
|-----------------------------------------------------|-----------|----------|---------|----------|----------|--------|---------|
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| -                                                   | 10420     | 31.86    | 17.6    | 49.46    | 68.2     | -18.74 | Peak    |
| -                                                   | 5147.3    | 34.17    | 13.43   | 47.6     | 54       | -6.4   | Average |
| @                                                   | 5210      | 73.61    | 13.36   | 86.97    | -        | -      | Average |
| -                                                   | 5144      | 45.77    | 13.43   | 59.2     | 74       | -14.8  | Peak    |
| @                                                   | 5210      | 83.42    | 13.36   | 96.78    | -        | -      | Peak    |
| Antenna Polarity & Test Distance: Vertical at 3 m   |           |          |         |          |          |        |         |
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| -                                                   | 10420     | 31.65    | 17.6    | 49.25    | 68.2     | -18.95 | Peak    |
| -                                                   | 5145.5    | 34.64    | 13.43   | 48.07    | 54       | -5.93  | Average |
| @                                                   | 5210      | 71.27    | 13.36   | 84.63    | -        | -      | Average |
| -                                                   | 5130.5    | 44.79    | 13.44   | 58.23    | 74       | -15.77 | Peak    |
| @                                                   | 5210      | 80.07    | 13.36   | 93.43    | -        | -      | Peak    |

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. The other emission levels were very low against the limit.

### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 65 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

| EUT Test Condition |             | Measurement Detail |                |
|--------------------|-------------|--------------------|----------------|
| Channel            | Channel 155 | Frequency Range    | 1 GHz ~ 40 GHz |

| Antenna Polarity & Test Distance: Horizontal at 3 m |           |          |         |          |          |        |         |
|-----------------------------------------------------|-----------|----------|---------|----------|----------|--------|---------|
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| *                                                   | 11550     | 30.74    | 18.93   | 49.67    | 74       | -24.33 | Peak    |
| -                                                   | 5571      | 41.12    | 13.95   | 55.07    | 68.2     | -13.13 | Peak    |
| -                                                   | 5721.5    | 45.77    | 14.16   | 59.93    | 114.22   | -54.29 | Peak    |
| @                                                   | 5775      | 74.28    | 14.44   | 88.72    | -        | -      | Average |
| @                                                   | 5775      | 82.9     | 14.44   | 97.34    | -        | -      | Peak    |
| Antenna Polarity & Test Distance: Vertical at 3 m   |           |          |         |          |          |        |         |
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark  |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |         |
| *                                                   | 11550     | 30.43    | 18.93   | 49.36    | 74       | -24.64 | Peak    |
| -                                                   | 5616.5    | 40.91    | 14.03   | 54.94    | 68.2     | -13.26 | Peak    |
| -                                                   | 5706.5    | 41.21    | 14.09   | 55.3     | 107.02   | -51.72 | Peak    |
| @                                                   | 5775      | 69.36    | 14.44   | 83.8     | -        | -      | Average |
| @                                                   | 5775      | 77.7     | 14.44   | 92.14    | -        | -      | Peak    |

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. "@": Fundamental Frequency.
5. " \* ": The peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.
6. The other emission levels were very low against the limit.

### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



#### 9 kHz ~ 30 MHz Data:

For 9 kHz to 30 MHz radiated emission have performed all modes of operation were investigated. The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

No non-compliance noted:

#### **KDB 414788 D01 OATS and Chamber Correlation Justification**

- Base on FCC 15.31 (f) (2): measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field.
- OATs and chamber correlation testing had been performed and chamber measured test results is the worst case test result.

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30m open area test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.

#### **Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



## 30 MHz ~ 1 GHz Data

### 802.11ac (VHT20)

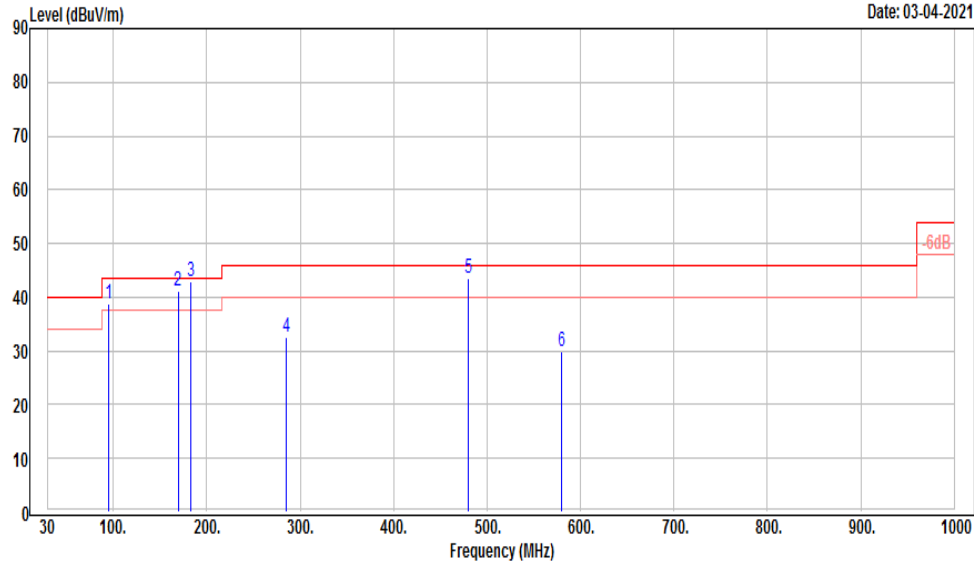
| EUT Test Condition |            | Measurement Detail |                |
|--------------------|------------|--------------------|----------------|
| Channel            | Channel 48 | Frequency Range    | 30 MHz ~ 1 GHz |

### Horizontal

Data: 37

File: D:\E3 Test Data\Project\Sparklan\_4789804203\_4336W\Harmonic\Sparklan\_4789804203\_4336W\_5G(B1&B4)\_Harmonic\_Print.EM6

Date: 03-04-2021

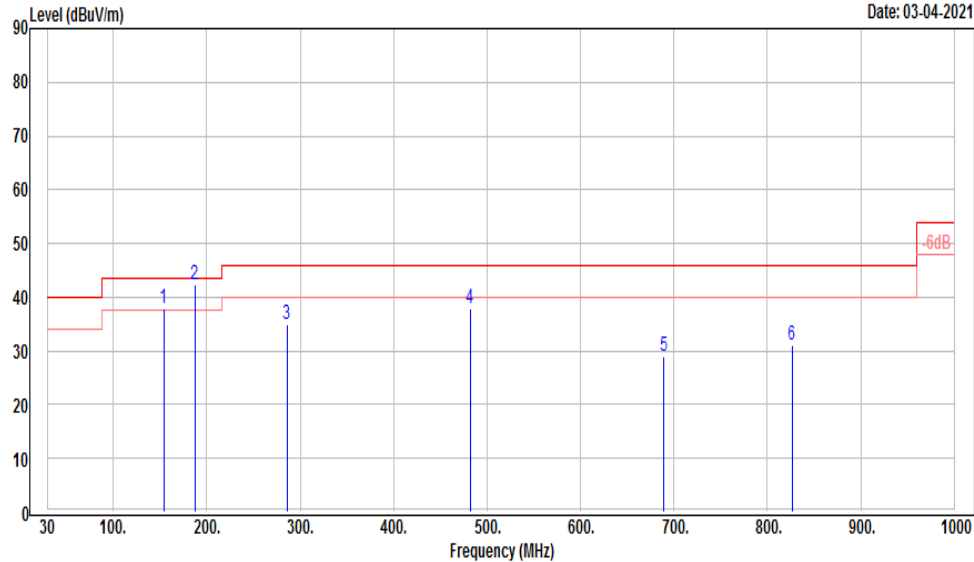


### Vertical

Data: 38

File: D:\E3 Test Data\Project\Sparklan\_4789804203\_4336W\Harmonic\Sparklan\_4789804203\_4336W\_5G(B1&B4)\_Harmonic\_Print.EM6

Date: 03-04-2021



### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 68 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

| Antenna Polarity & Test Distance: Horizontal at 3 m |           |          |         |          |          |        |        |
|-----------------------------------------------------|-----------|----------|---------|----------|----------|--------|--------|
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |        |
| *                                                   | 94.99     | 56.4     | -17.64  | 38.76    | 43.5     | -4.74  | Peak   |
| -                                                   | 169.68    | 53.1     | -11.98  | 41.12    | 43.5     | -2.38  | QP     |
| -                                                   | 183.26    | 56.5     | -13.48  | 43.02    | 43.5     | -0.48  | QP     |
| *                                                   | 285.11    | 43.55    | -11.01  | 32.54    | 46       | -13.46 | Peak   |
| *                                                   | 480.08    | 48.77    | -5.38   | 43.39    | 46       | -2.61  | Peak   |
| *                                                   | 579.99    | 33.16    | -3.16   | 30       | 46       | -16    | Peak   |
| Antenna Polarity & Test Distance: Vertical at 3 m   |           |          |         |          |          |        |        |
| Notation                                            | Frequency | Reading  | Correct | Result   | Limit    | Margin | Remark |
|                                                     | (MHz)     | (dBuV/m) | dB/m    | (dBuV/m) | (dBuV/m) | (dB)   |        |
| *                                                   | 154.16    | 49.78    | -11.77  | 38.01    | 43.5     | -5.49  | Peak   |
| *                                                   | 187.14    | 56.24    | -14.02  | 42.22    | 43.5     | -1.28  | Peak   |
| *                                                   | 286.08    | 46.02    | -10.99  | 35.03    | 46       | -10.97 | Peak   |
| *                                                   | 482.02    | 43.27    | -5.36   | 37.91    | 46       | -8.09  | Peak   |
| *                                                   | 689.6     | 30.25    | -1.11   | 29.14    | 46       | -16.86 | Peak   |
| *                                                   | 826.37    | 29.9     | 1.27    | 31.17    | 46       | -14.83 | Peak   |

Remarks:

1. Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
2. Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
3. Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
4. The peak result complies with QP limit, QP result is deemed to comply with QP limit.
5. The other emission levels were very low against the limit.

**Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



## 9.8. AC Power Line Conducted Emission

### Requirements

| Frequency (MHz) | Conducted limit (dBμV) |         |
|-----------------|------------------------|---------|
|                 | Quasi-peak             | Average |
| 0.15 - 0.5      | 66 - 56                | 56 - 46 |
| 0.50 - 5.0      | 56                     | 46      |
| 5.0 - 30        | 60                     | 50      |

Note:

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

### Test Procedures

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

### **Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

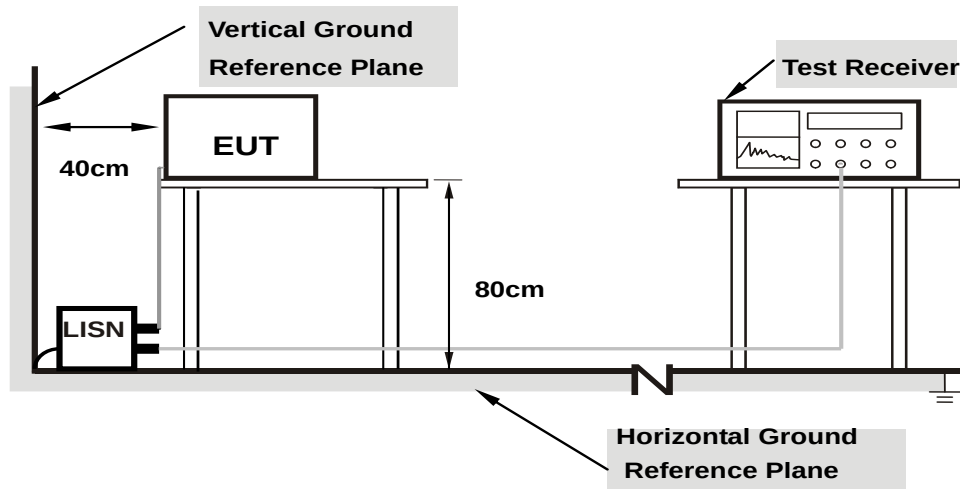
Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



## Test Setup



**Note: 1.Support units were connected to second LISN.**

For the actual test configuration, please refer to the Setup Configurations.

## **Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0

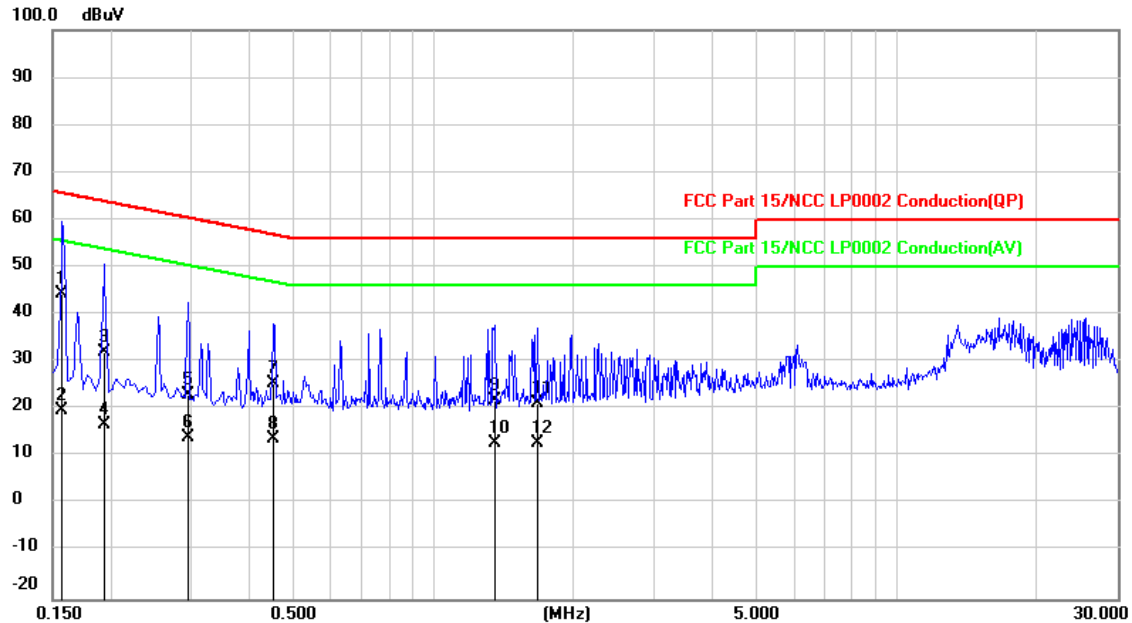


## Test Data

### 802.11ac (VHT20)

| EUT Test Condition |            | Measurement Detail |                  |
|--------------------|------------|--------------------|------------------|
| Channel            | Channel 48 | Frequency Range    | 150 kHz ~ 30 MHz |

### Phase of Power : Line (L)



## Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 72 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

| No. | Frequency | Reading | Correct | Result | Limit  | Margin | Remark |
|-----|-----------|---------|---------|--------|--------|--------|--------|
|     | (MHz)     | (dBuV)  | dB      | (dBuV) | (dBuV) | (dB)   |        |
| 1   | 0.1580    | 24.87   | 19.54   | 44.41  | 65.57  | -21.16 | QP     |
| 2   | 0.1580    | 0.09    | 19.54   | 19.63  | 55.57  | -35.94 | AVG    |
| 3   | 0.1940    | 12.54   | 19.53   | 32.07  | 63.86  | -31.79 | QP     |
| 4   | 0.1940    | -2.73   | 19.53   | 16.80  | 53.86  | -37.06 | AVG    |
| 5   | 0.2940    | 3.40    | 19.53   | 22.93  | 60.41  | -37.48 | QP     |
| 6   | 0.2940    | -5.46   | 19.53   | 14.07  | 50.41  | -36.34 | AVG    |
| 7   | 0.4500    | 5.85    | 19.51   | 25.36  | 56.88  | -31.52 | QP     |
| 8   | 0.4500    | -5.90   | 19.51   | 13.61  | 46.88  | -33.27 | AVG    |
| 9   | 1.3580    | 2.28    | 19.54   | 21.82  | 56.00  | -34.18 | QP     |
| 10  | 1.3580    | -6.69   | 19.54   | 12.85  | 46.00  | -33.15 | AVG    |
| 11  | 1.6740    | 1.70    | 19.55   | 21.25  | 56.00  | -34.75 | QP     |
| 12  | 1.6740    | -6.68   | 19.55   | 12.87  | 46.00  | -33.13 | AVG    |

Remarks:

1. Result value (dBuV) = Reading value (dBuV) + Correction Factor (dB)
2. Margin(dB) = Result value (dBuV) - Limit value (dBuV)
3. Correction Factor(dB) = Insertion loss(dB) + Cable loss(dB)
4. The other emission levels were very low against the limit.

**Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

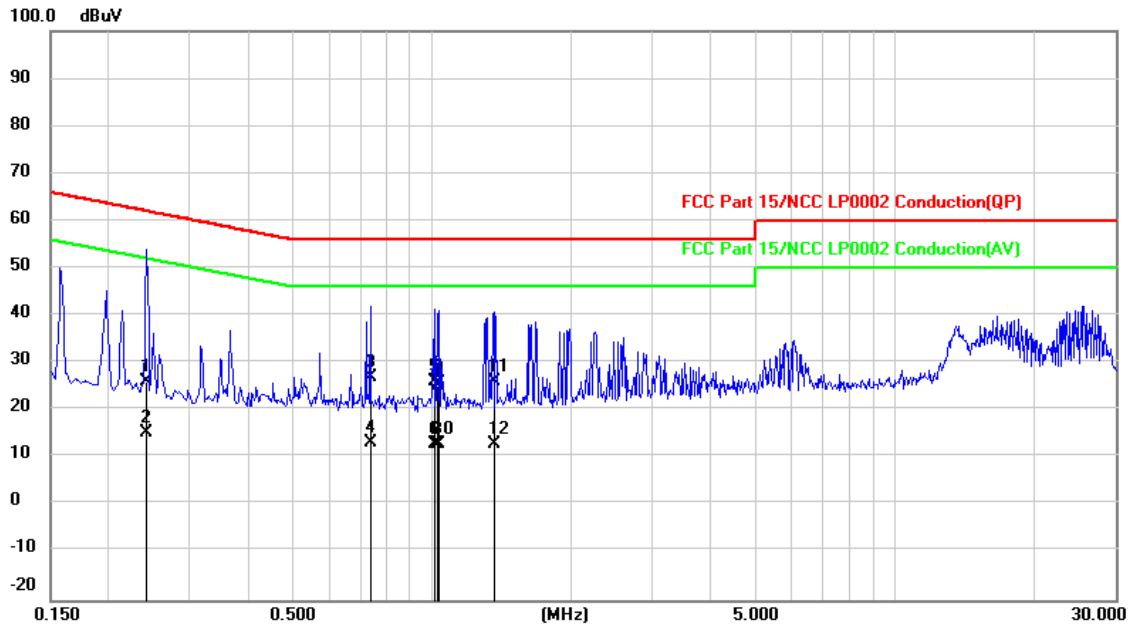
Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



### Phase of Power : Neutral (N)



### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

Facsimile (FAX ) : +886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 74 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

| No. | Frequency | Reading | Correct | Result | Limit  | Margin | Remark |
|-----|-----------|---------|---------|--------|--------|--------|--------|
|     | (MHz)     | (dBuV)  | dB      | (dBuV) | (dBuV) | (dB)   |        |
| 1   | 0.2420    | 6.54    | 19.53   | 26.07  | 62.03  | -35.96 | QP     |
| 2   | 0.2420    | -4.32   | 19.53   | 15.21  | 52.03  | -36.82 | AVG    |
| 3   | 0.7380    | 7.45    | 19.52   | 26.97  | 56.00  | -29.03 | QP     |
| 4   | 0.7380    | -6.42   | 19.52   | 13.10  | 46.00  | -32.90 | AVG    |
| 5   | 1.0180    | 6.60    | 19.53   | 26.13  | 56.00  | -29.87 | QP     |
| 6   | 1.0180    | -6.78   | 19.53   | 12.75  | 46.00  | -33.25 | AVG    |
| 7   | 1.0300    | 5.71    | 19.53   | 25.24  | 56.00  | -30.76 | QP     |
| 8   | 1.0300    | -6.79   | 19.53   | 12.74  | 46.00  | -33.26 | AVG    |
| 9   | 1.0380    | 6.11    | 19.53   | 25.64  | 56.00  | -30.36 | QP     |
| 10  | 1.0380    | -6.75   | 19.53   | 12.78  | 46.00  | -33.22 | AVG    |
| 11  | 1.3660    | 6.56    | 19.53   | 26.09  | 56.00  | -29.91 | QP     |
| 12  | 1.3660    | -6.65   | 19.53   | 12.88  | 46.00  | -33.12 | AVG    |

Remarks:

1. Result value (dBuV) = Reading value (dBuV) + Correction Factor (dB)
2. Margin(dB) = Result value (dBuV) - Limit value (dBuV)
3. Correction Factor(dB) = Insertion loss(dB) + Cable loss(dB)
4. The other emission levels were very low against the limit.

**Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

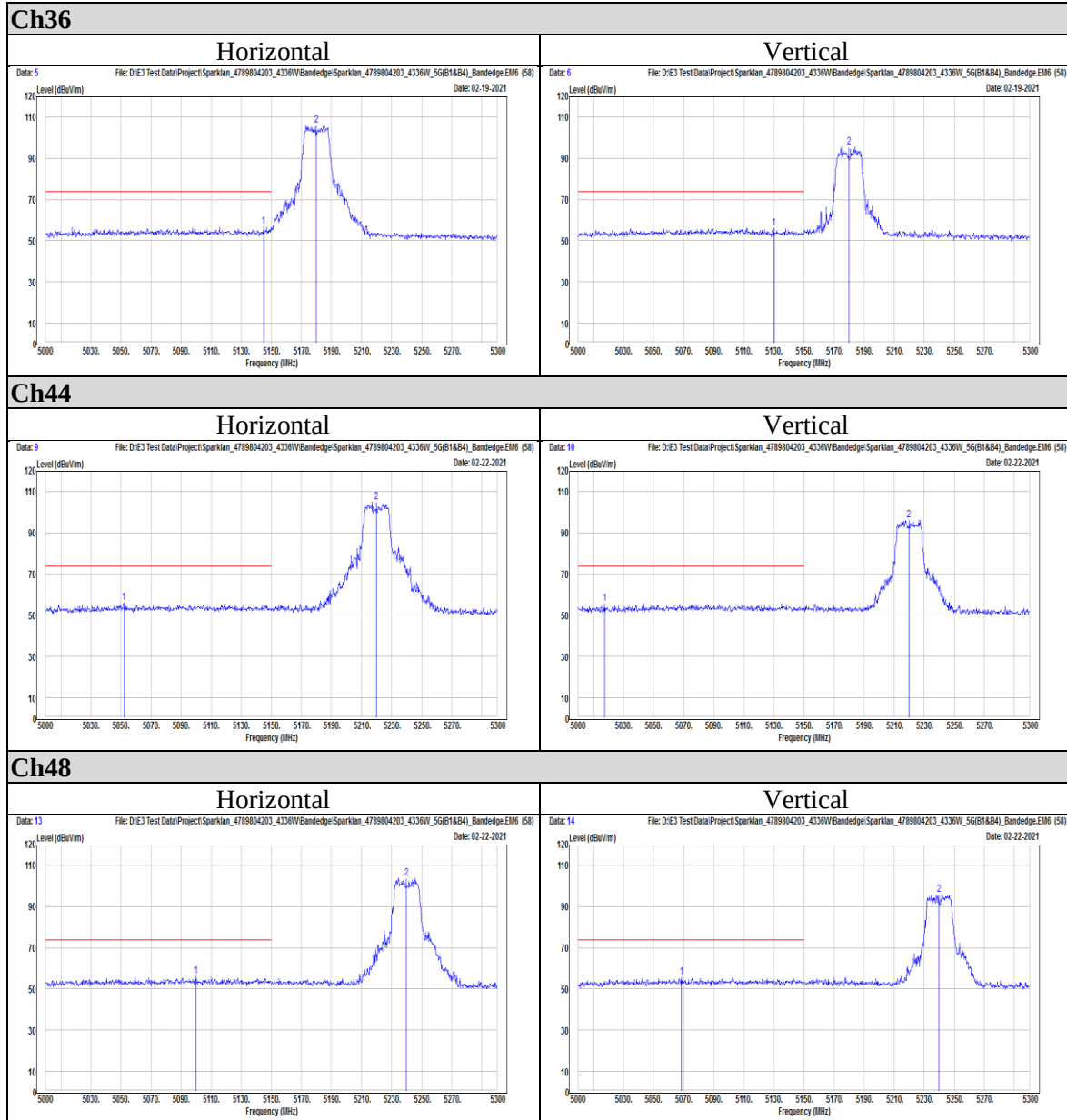
Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



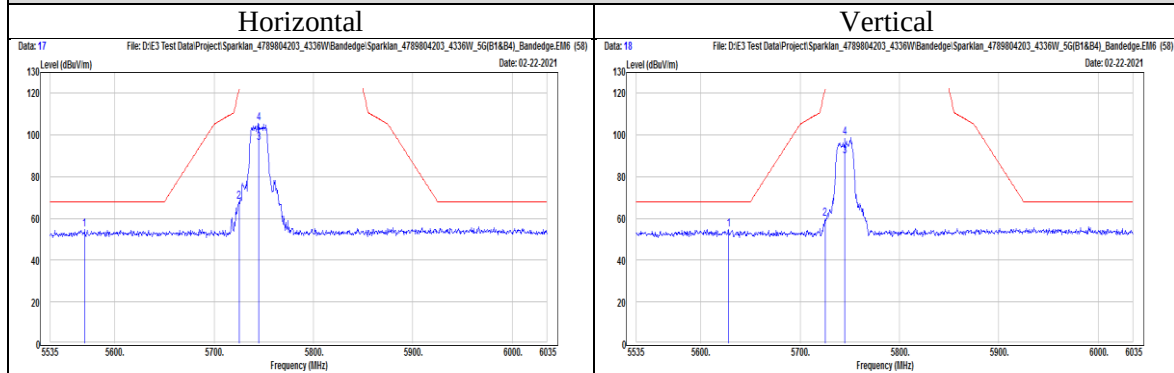
## Appendix I Radiated Band Edge and OOB Measurement

### 802.11a Peak

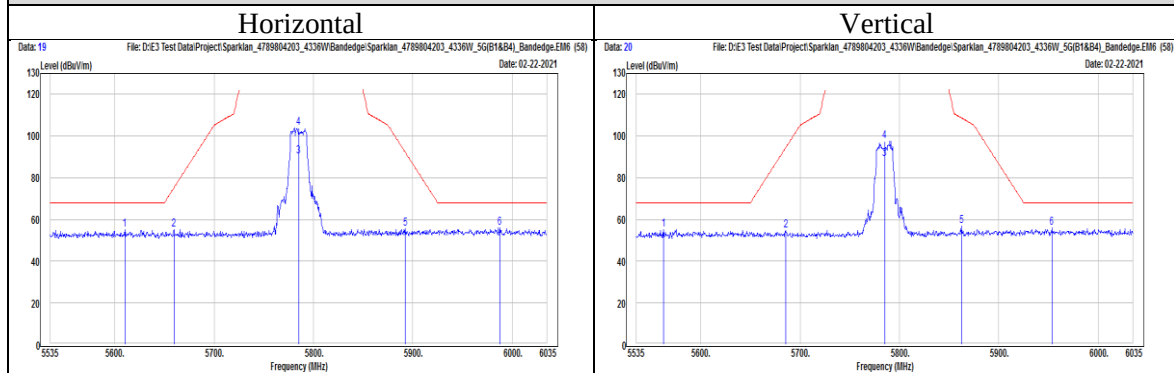




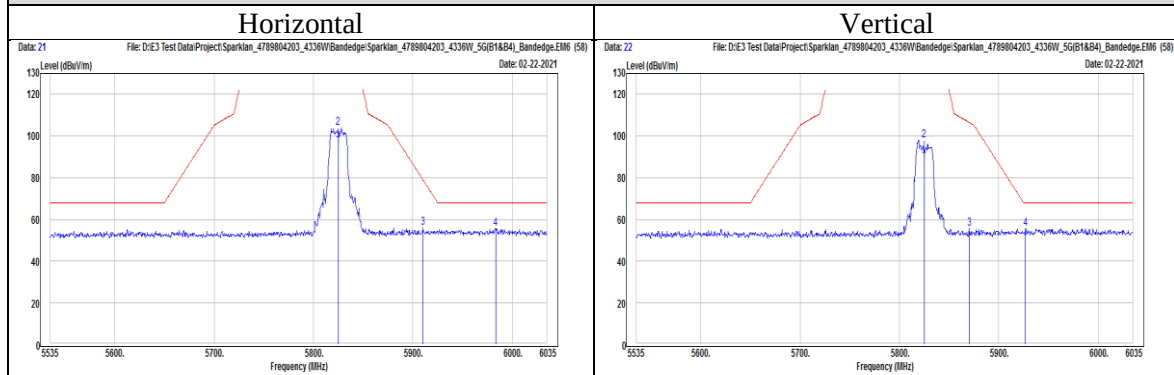
### Ch149



### Ch157

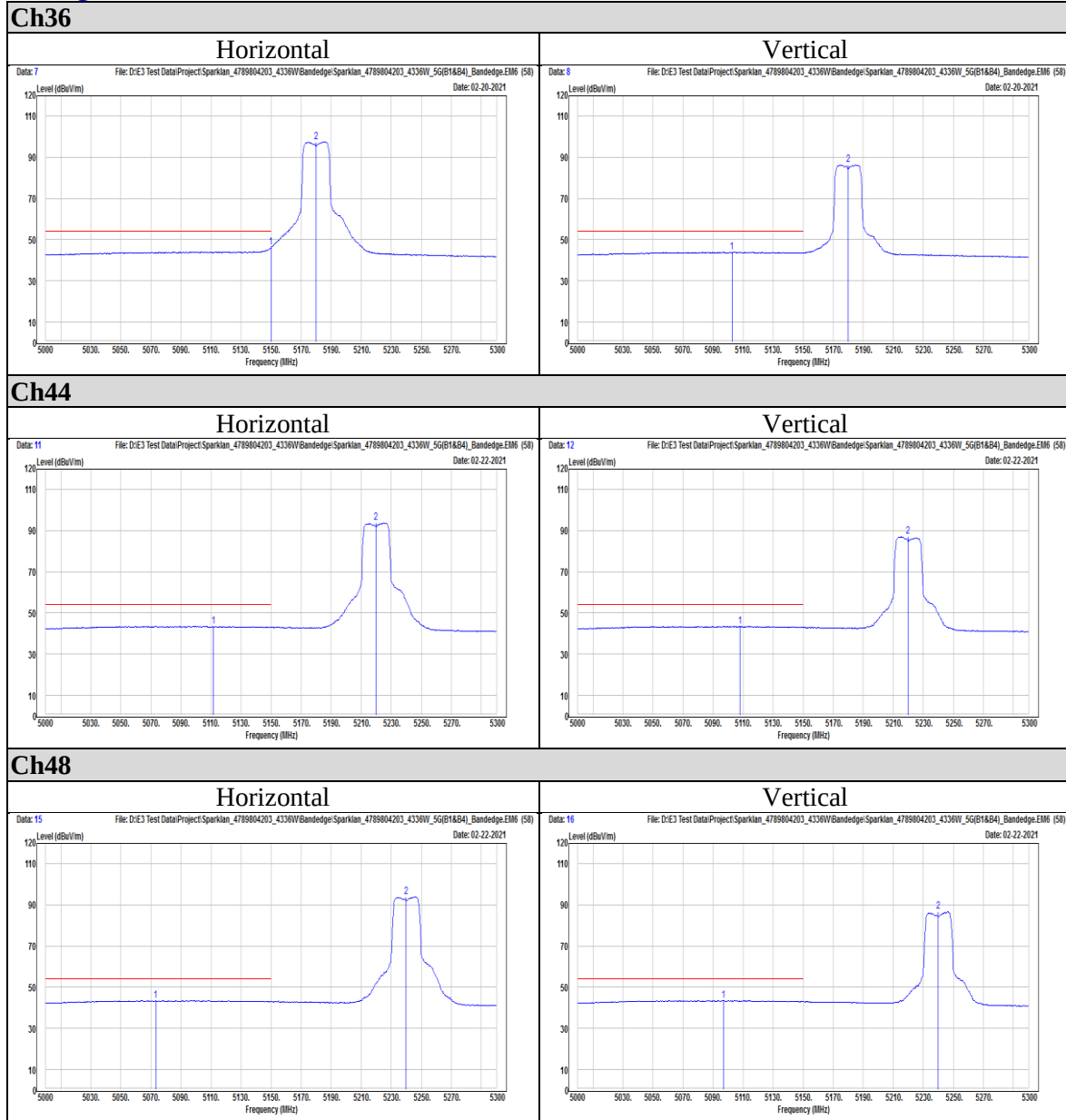


### Ch165





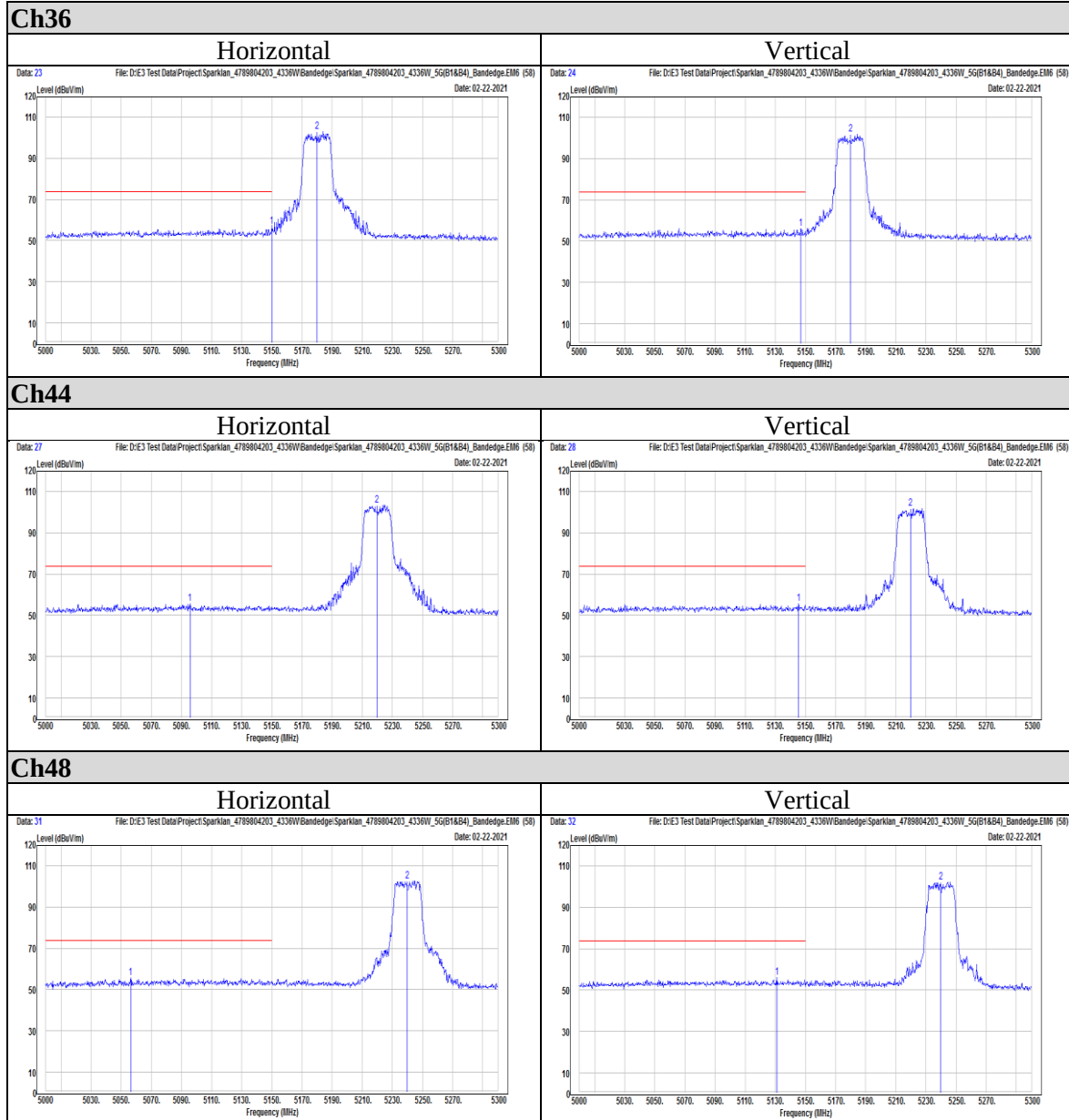
## Average





Test report No. : 4789804203-US-R0-V0  
Page : 78 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

## 802.11ac (VHT20) Peak



**Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

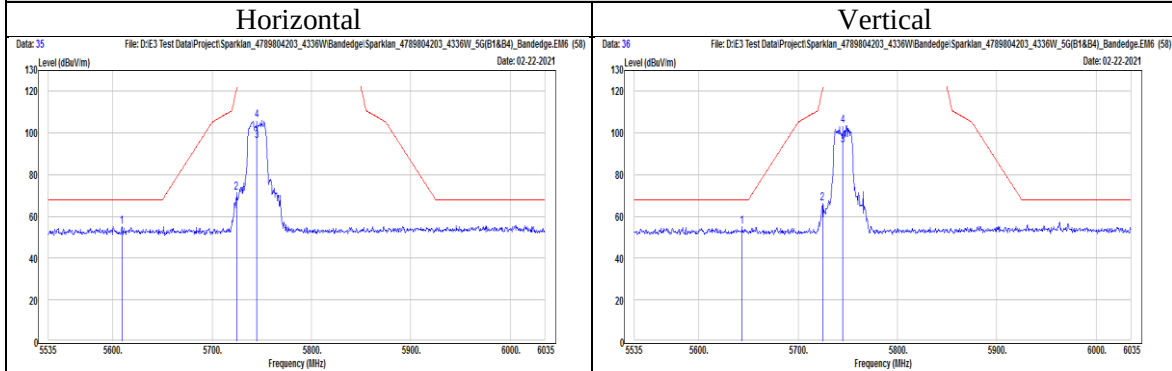
Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948

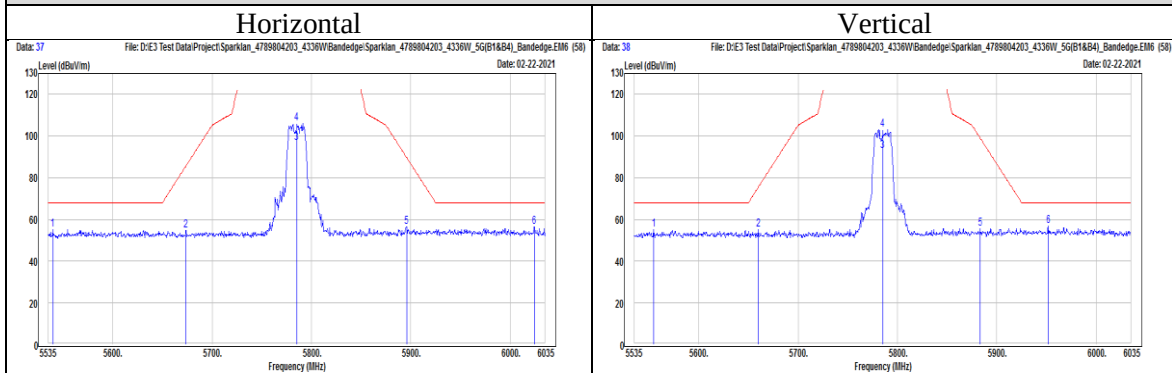
Doc No: 17-EM-F0878 / 5.0



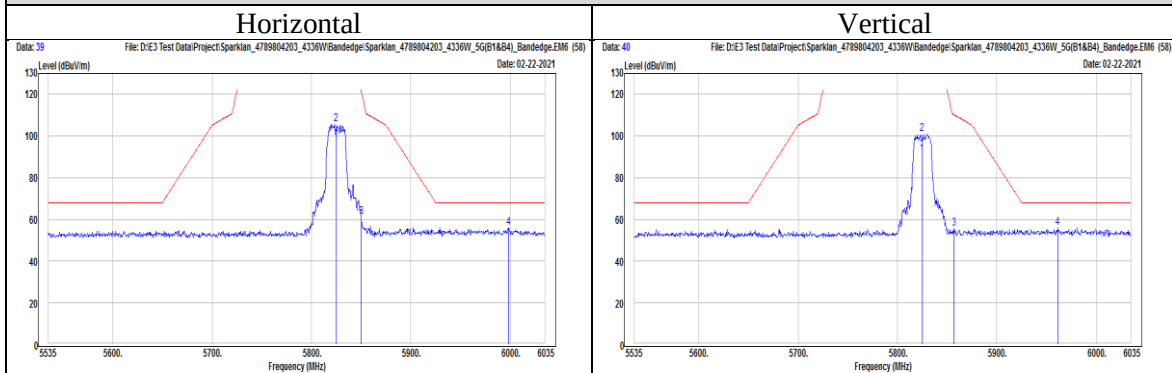
### Ch149



### Ch157

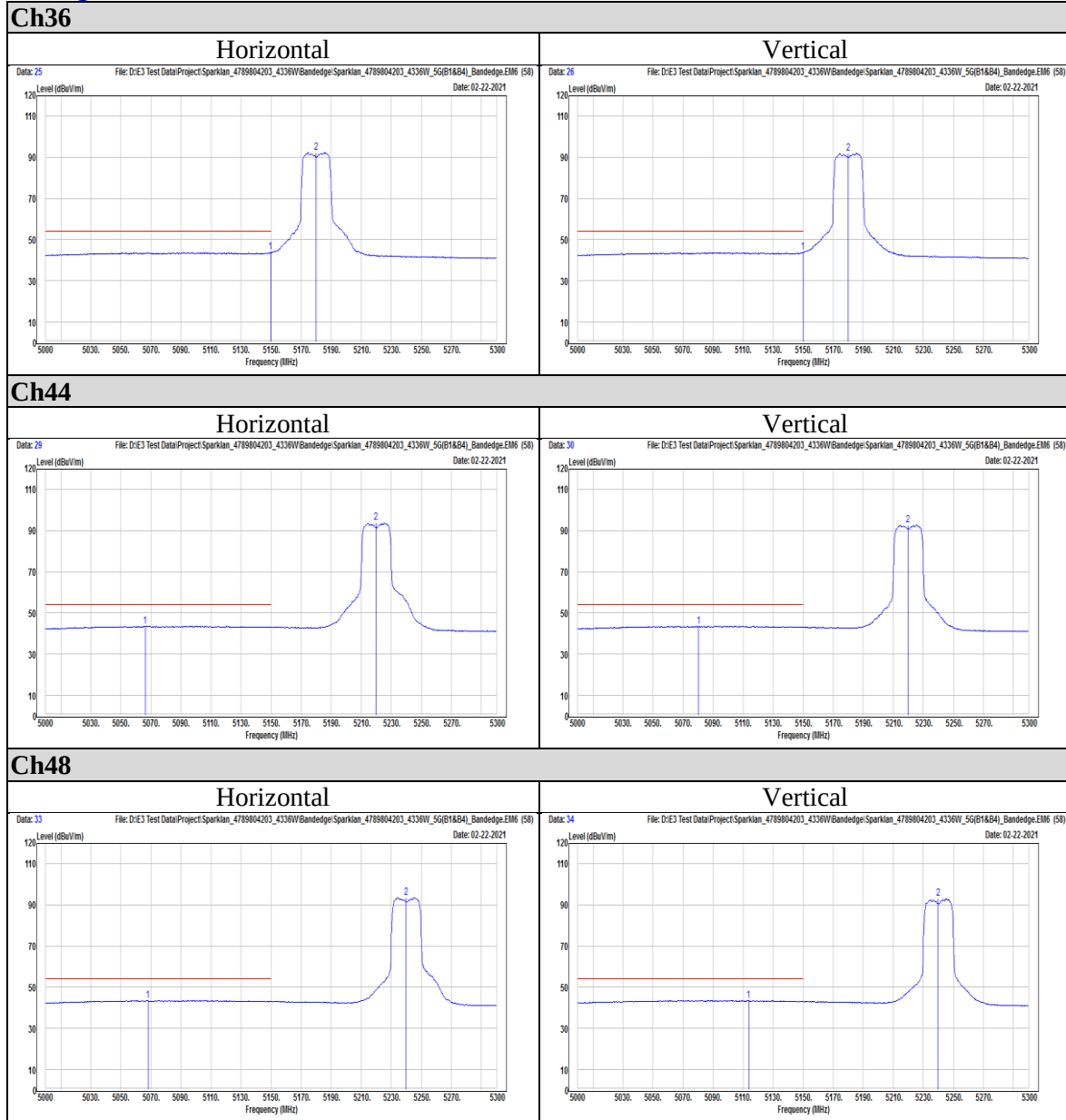


### Ch165



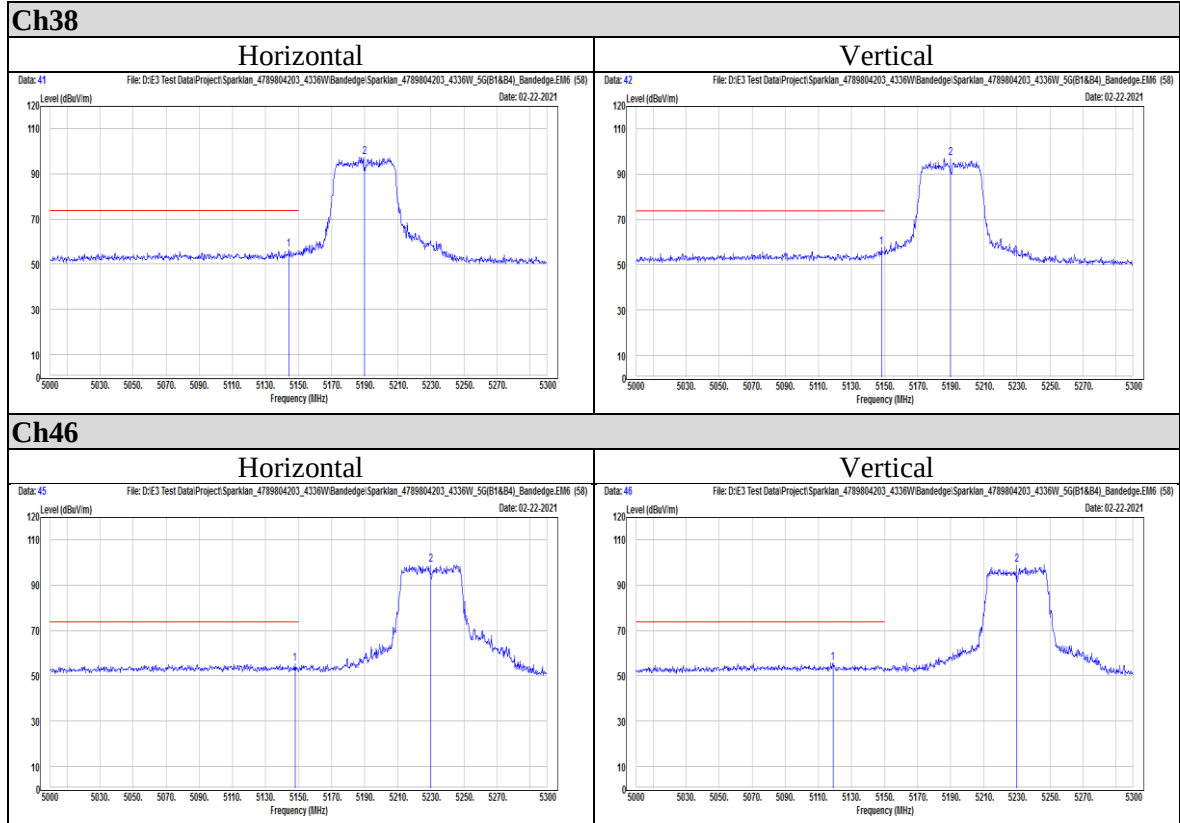


## Average





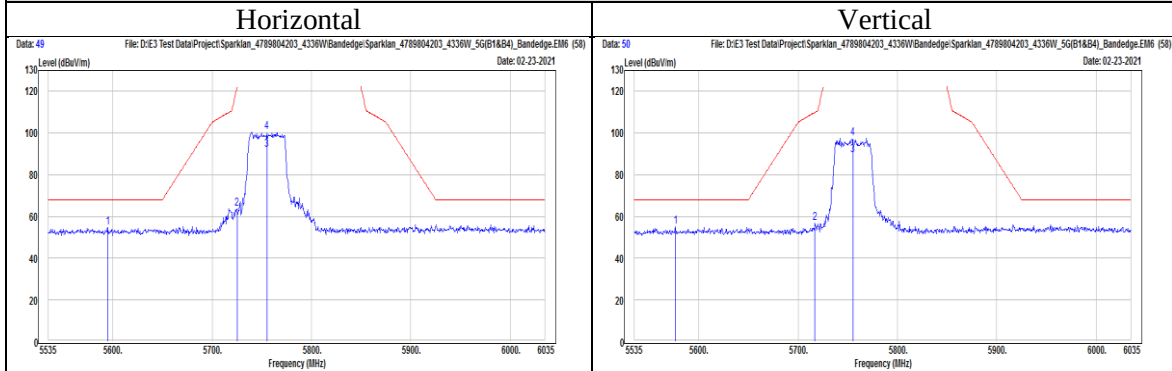
802.11ac (VHT40)  
Peak



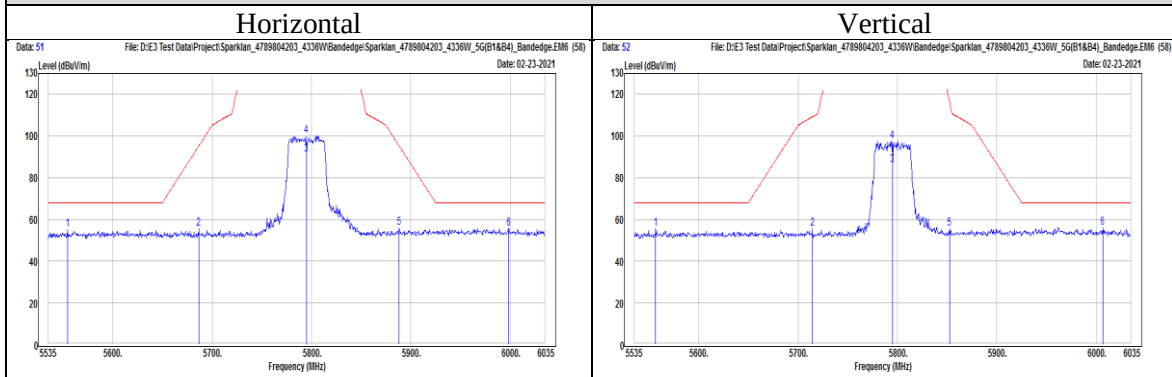


Test report No. : 4789804203-US-R0-V0  
Page : 82 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

### Ch151



### Ch159



### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

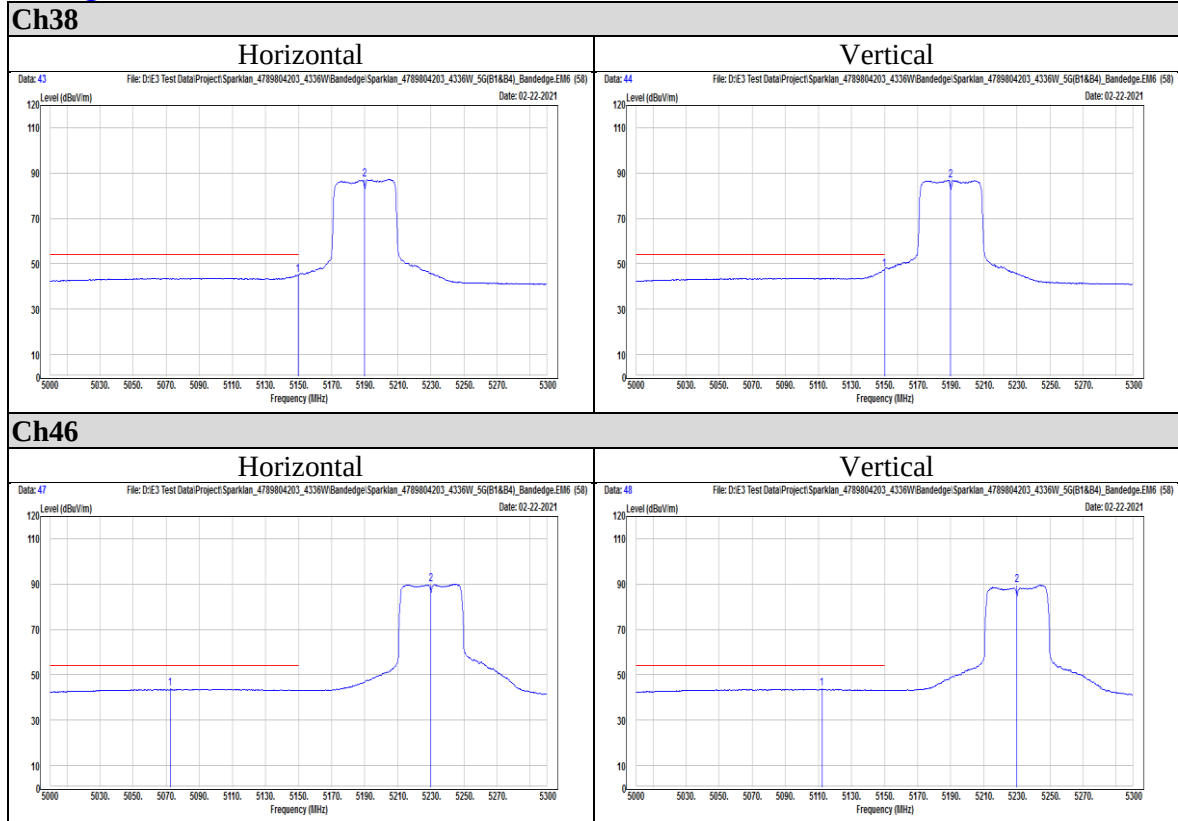
Telephone :+886-2-7737-3000

Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



## Average



## Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

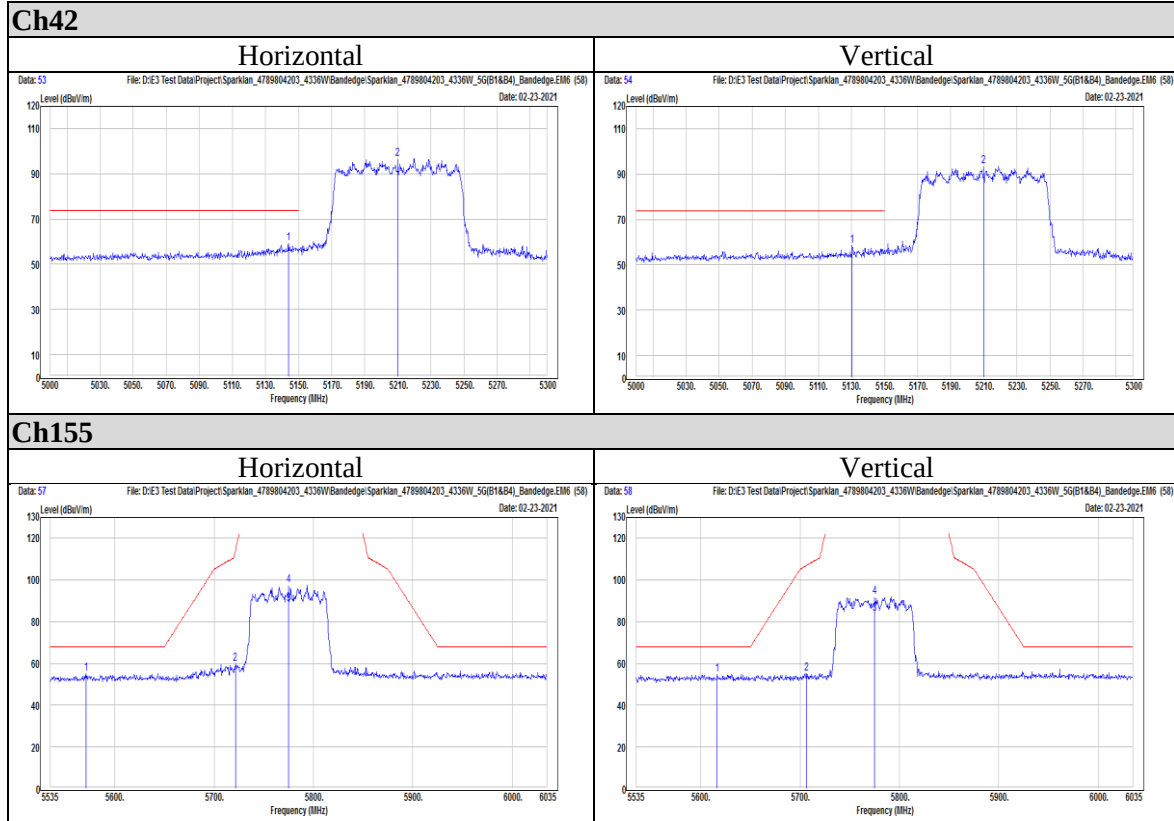
Telephone : +886-2-7737-3000

Facsimile (FAX ) : +886-3-583-7948

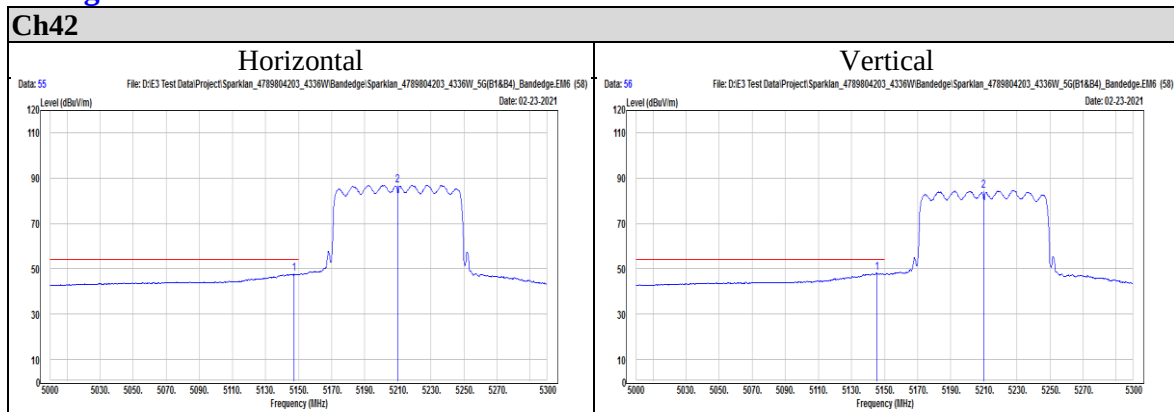
Doc No: 17-EM-F0878 / 5.0



## 802.11ac (VHT80) Peak



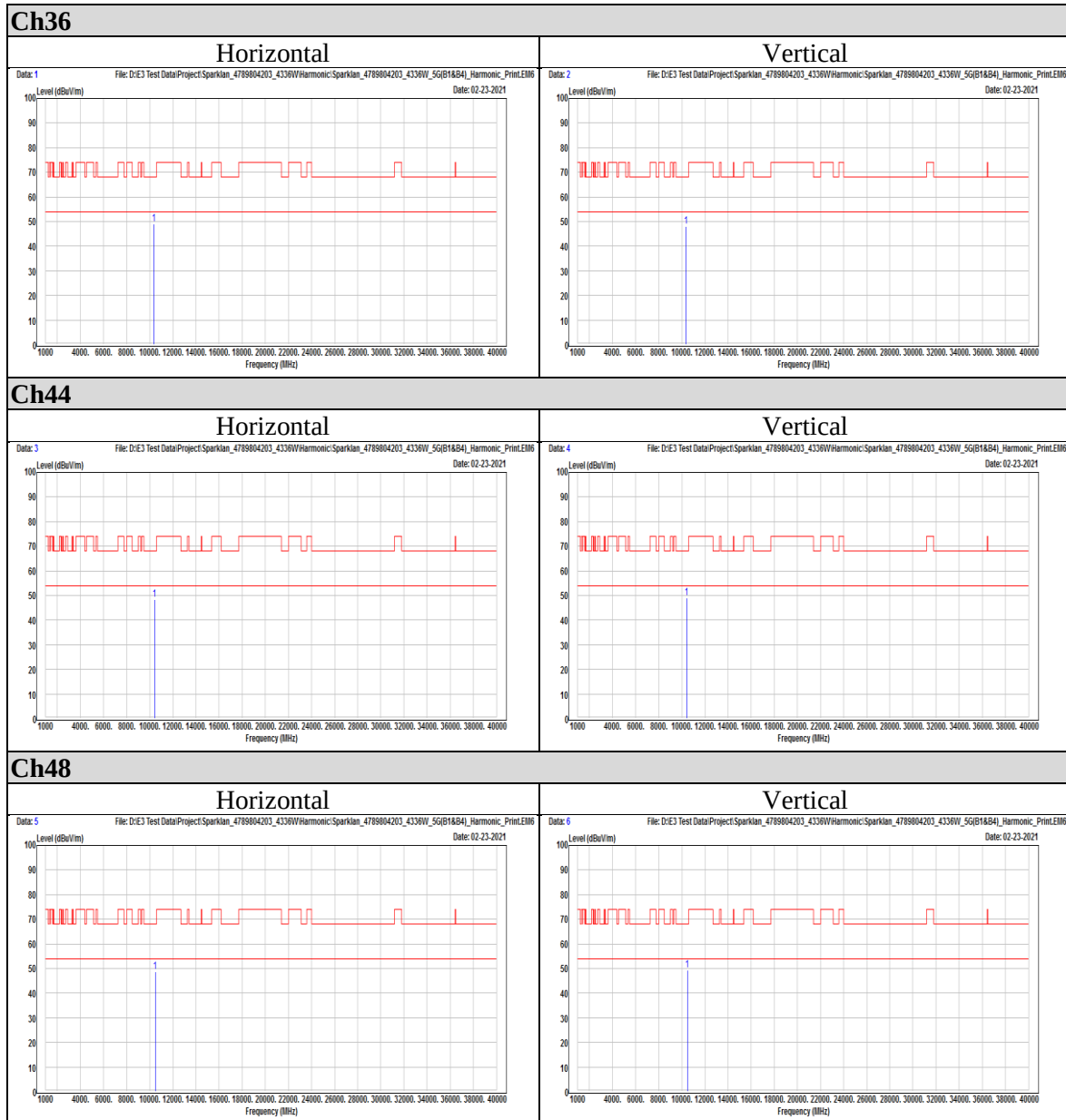
## Average





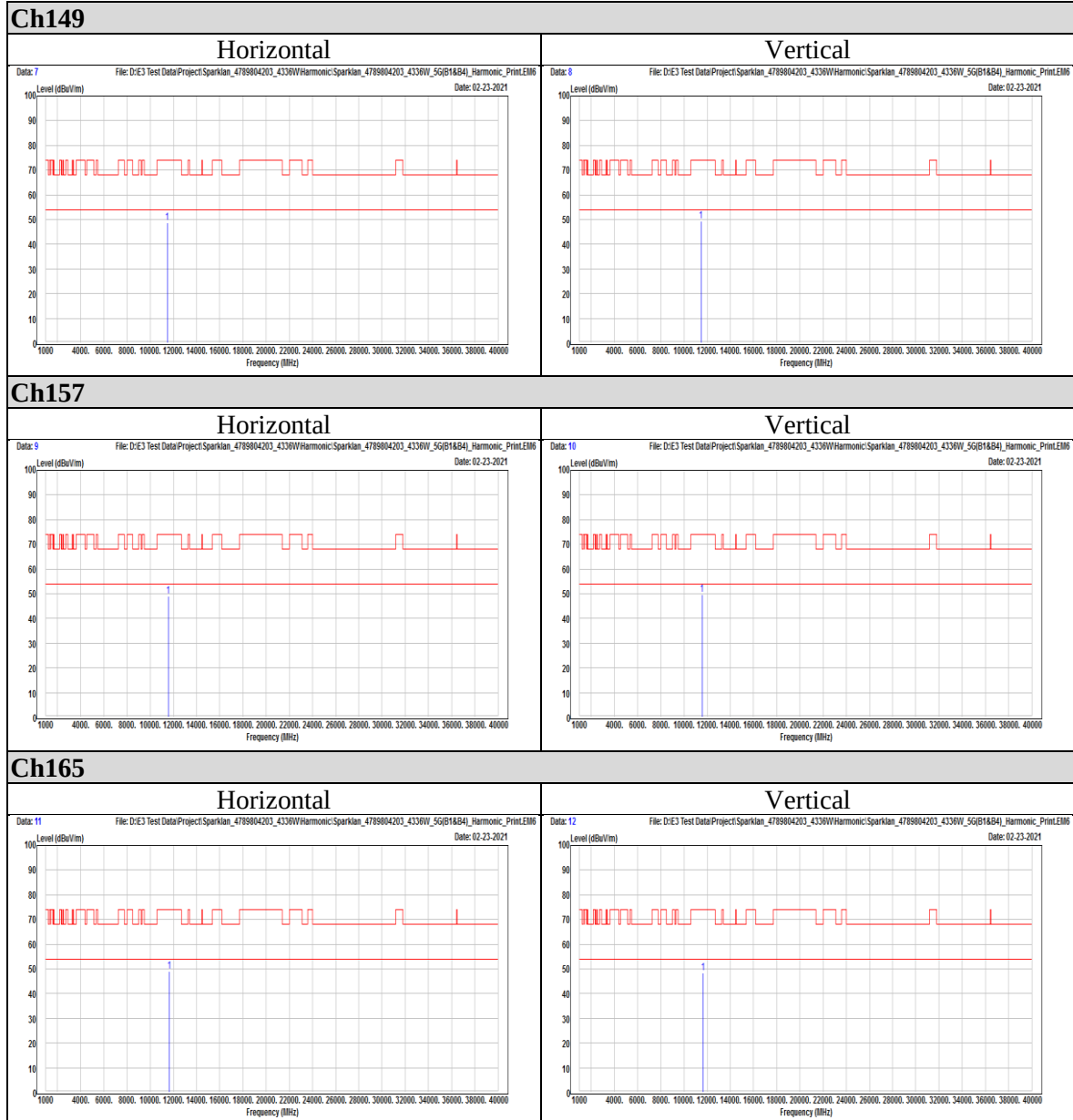
## Appendix II Radiated Spurious Emission Measurement

### 802.11a





Test report No. : 4789804203-US-R0-V0  
Page : 86 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT



**Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

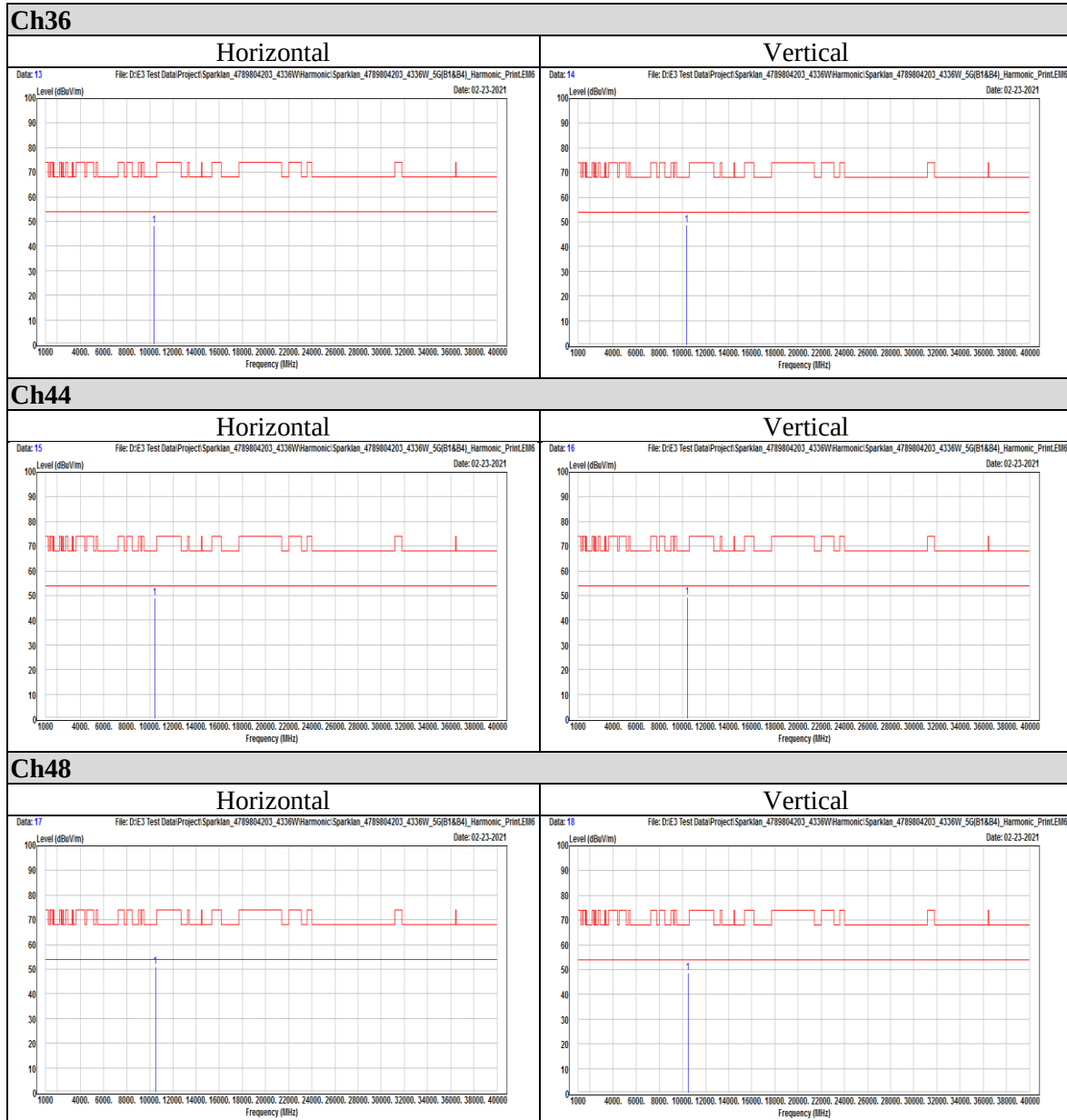
Facsimile (FAX) : +886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 87 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

## 802.11ac (VHT20)



### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

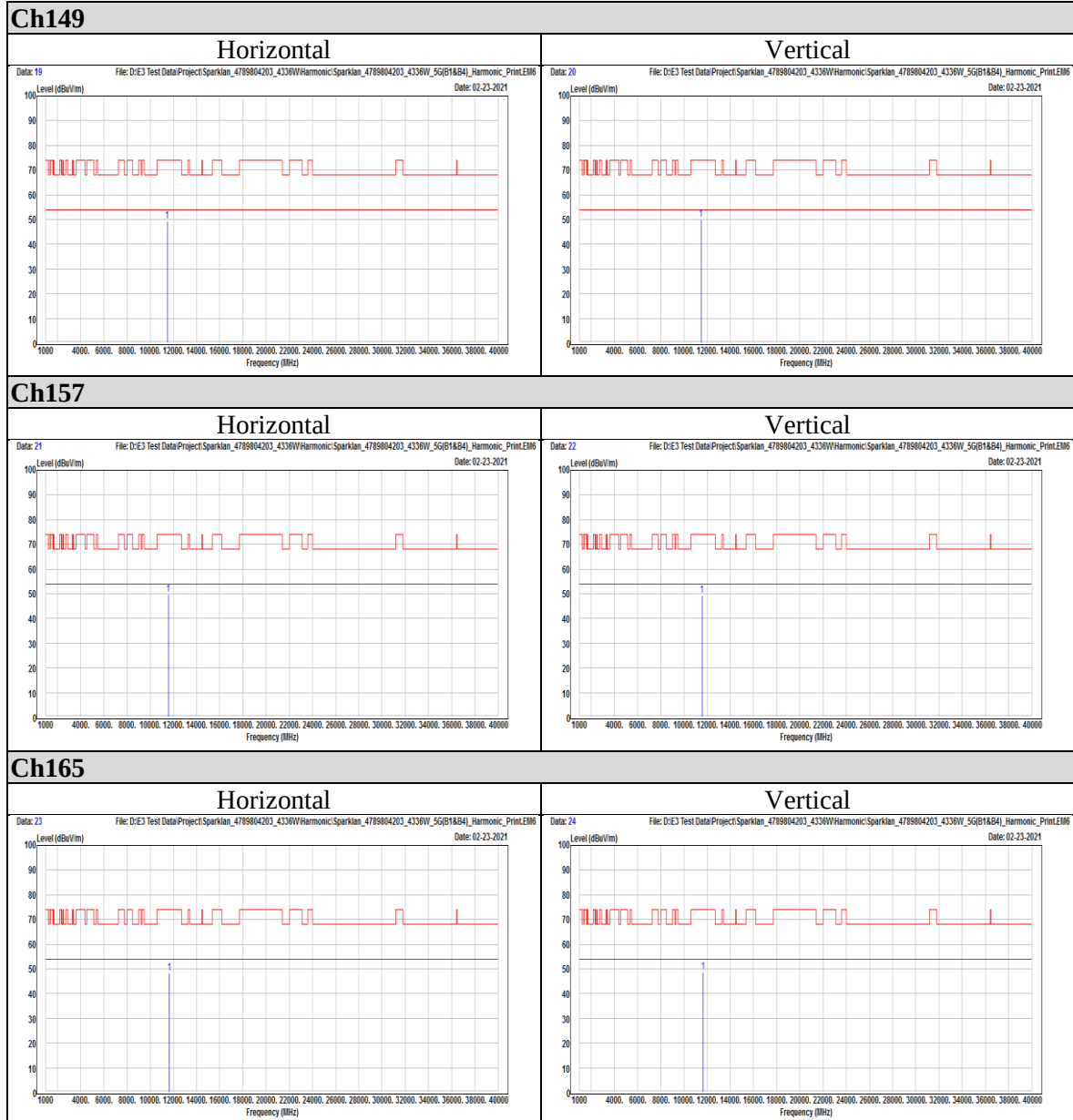
Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 88 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT



**Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

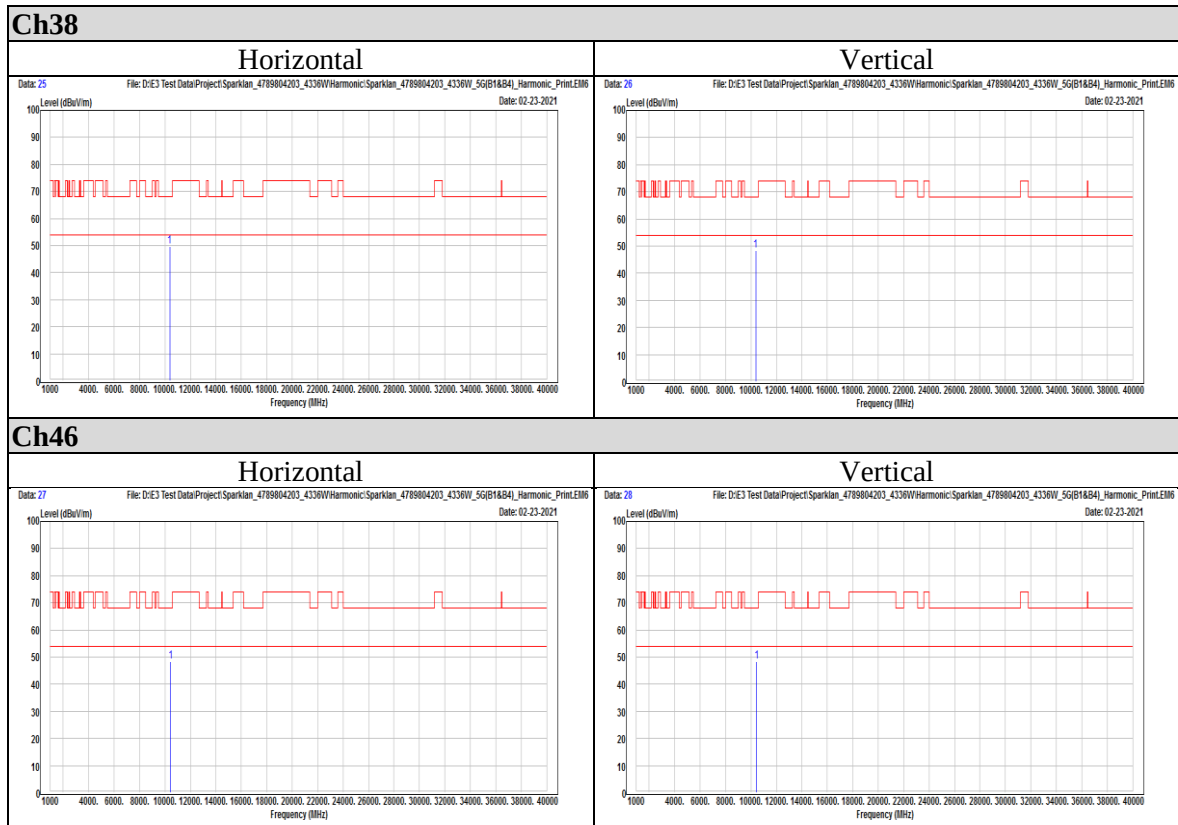
Facsimile (FAX) : +886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 89 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

## 802.11ac (VHT40)



### Underwriters Laboratories Taiwan Co., Ltd.

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

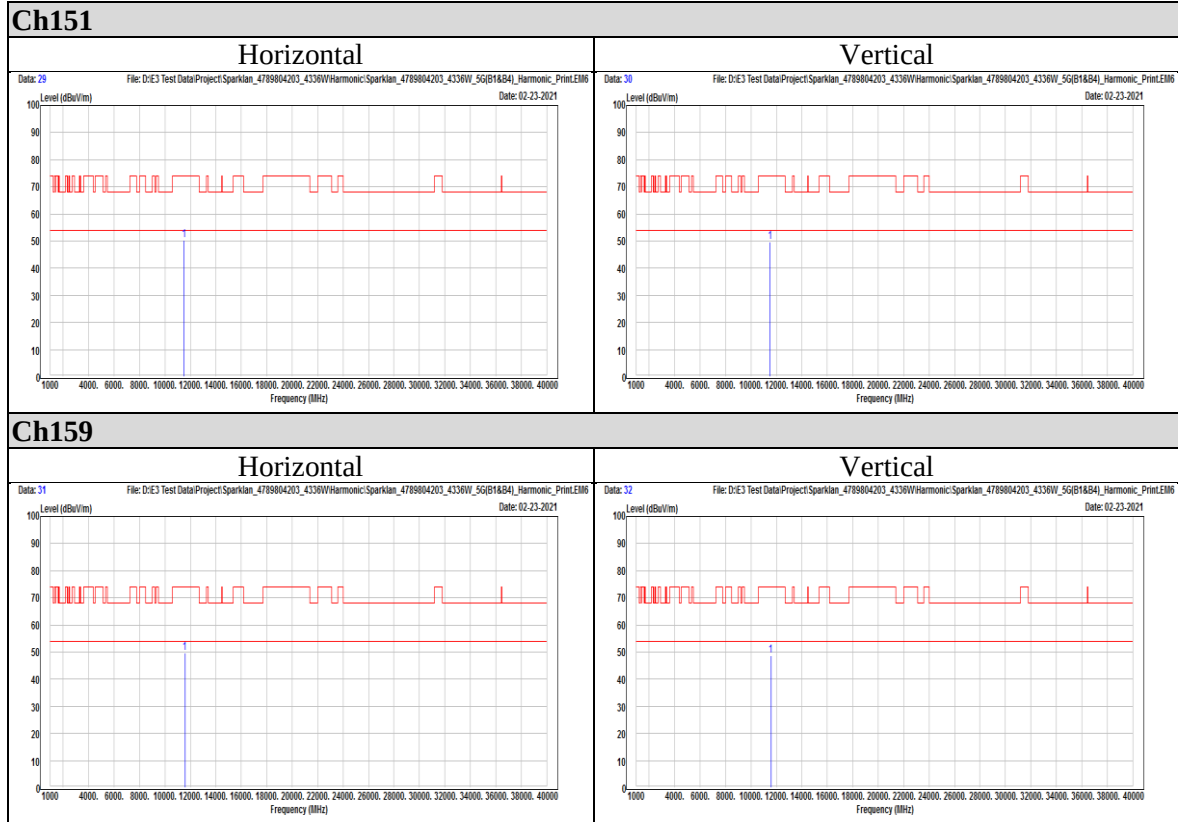
Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 90 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT



**Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone :+886-2-7737-3000

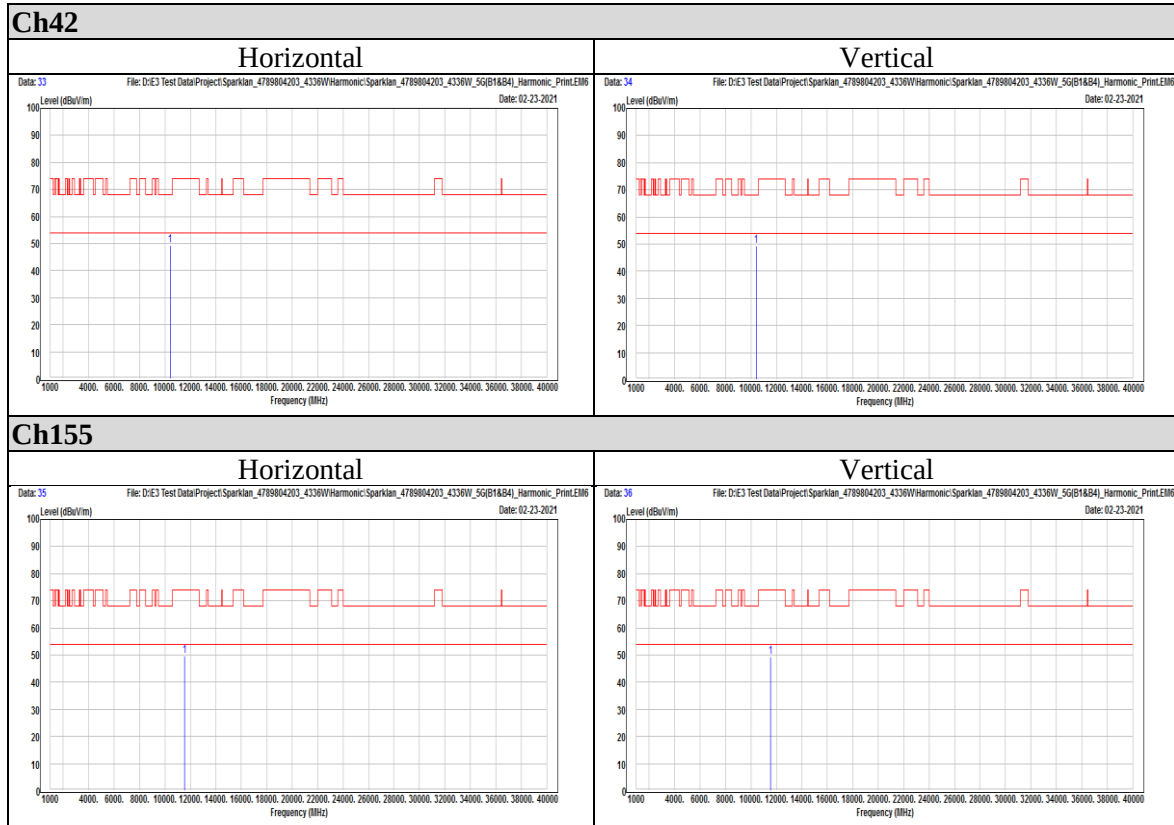
Facsimile (FAX ) :+886-3-583-7948

Doc No: 17-EM-F0878 / 5.0



Test report No. : 4789804203-US-R0-V0  
Page : 91 of 91  
Issued date : Apr. 8, 2021  
FCC ID : ZZ6-WUBT236ACNBT

## 802.11ac (VHT80)



**END OF REPORT**

**Underwriters Laboratories Taiwan Co., Ltd.**

Building B and Building E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Telephone : +886-2-7737-3000

Facsimile (FAX) : +886-3-583-7948

Doc No: 17-EM-F0878 / 5.0