

# MEASUREMENT REPORT

## FCC PART 15.247 WLAN 802.11b/g/n/ax

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**FCC ID:** 2ALJ3AP30X

**Applicant:** HAN Networks Co., Ltd.

**Application Type:** Certification

**Product:** HAN Access Point

**Model No.:** AP301

**Brand Name:** HAN NETWORKS; HANNETWORKS

**FCC Classification:** Digital Transmission System (DTS)

**FCC Rule Part(s):** Part 15 Subpart C (Section 15.247)

**Test Procedure(s):** ANSI C63.10-2013

**Receive Date** August 25, 2020

**Test Date:** October 17 ~ December 18, 2020

**Tested By** : *Fran Chen*  
( Fran Chen )

**Reviewed By** : *Paddy Chen*  
( Paddy Chen )

**Approved By** : *Chenz Ker*  
( Chenz Ker )



The test results relate only to the samples tested.

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2013. Test results reported herein relate only to the item(s) tested.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Taiwan) Co., Ltd.

## Revision History

| Report No.    | Version | Description     | Issue Date | Note  |
|---------------|---------|-----------------|------------|-------|
| 2010TW0002-UE | V1.0    | Original Report | 2020-12-19 | Valid |
|               |         |                 |            |       |

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## §2.1033 General Information

|                                 |                                                                                                                                |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>Applicant</b>                | HAN Networks Co., Ltd.                                                                                                         |
| <b>Applicant Address</b>        | 101-A16, 1st Floor, Building 3, No.9 compound, Yongfeng Road, Haidian District, Beijing, P.R. China                            |
| <b>Manufacturer</b>             | HAN Networks Co., Ltd.                                                                                                         |
| <b>Manufacturer Address</b>     | 101-A16, 1st Floor, Building 3, No.9 compound, Yongfeng Road, Haidian District, Beijing, P.R. China                            |
| <b>Test Site</b>                | MRT Technology (Taiwan) Co., Ltd                                                                                               |
| <b>Test Site Address</b>        | No. 38, Fuxing Second Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C)                                                     |
| <b>MRT FCC Registration No.</b> | 291082                                                                                                                         |
| <b>FCC Rule Part(s)</b>         | Part 15.247                                                                                                                    |
| <b>Model No.</b>                | AP301                                                                                                                          |
| <b>Test Device Serial No.:</b>  | #1 <input type="checkbox"/> Production <input checked="" type="checkbox"/> Pre-Production <input type="checkbox"/> Engineering |

### Test Facility / Accreditations

1. MRT facility is an FCC registered (Reg. No. 291082) test facility with the site description report on file and is designated by the FCC as an Accredited Test Firm.
2. MRT facility is an IC registered (MRT Reg. No. 21723) test laboratory with the site description on file at Industry Canada.
3. MRT Lab is accredited to ISO 17025 by the Taiwan Accreditation Foundation (TAF Cert. No. 3261) in EMC, Telecommunications and Radio testing for FCC (Designation Number: TW3261), Industry Taiwan, EU and TELEC Rules.

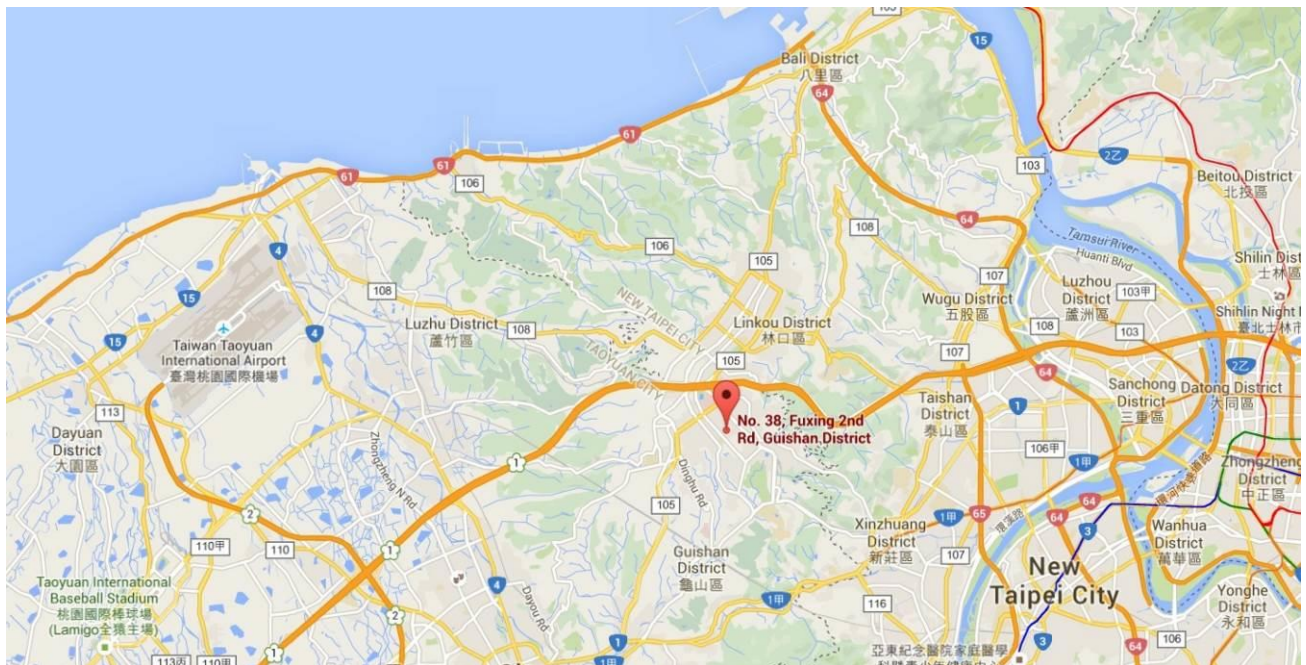
## 1. INTRODUCTION

### 1.1. Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Innovation, Science and Economic Development Canada and Certification and Engineering Bureau.

### 1.2. MRT Test Location

The map below shows the location of the MRT LABORATORY, its proximity to the Taoyuan City. These measurement tests were conducted at the MRT Technology (Taiwan) Co., Ltd. Facility located at No.38, Fuxing 2nd Rd., Guishan Dist., Taoyuan City 33377, Taiwan (R.O.C).



## 2. PRODUCT INFORMATION

### 2.1. Feature of Equipment under Test

|                        |                               |
|------------------------|-------------------------------|
| Product Name:          | HAN Access Point              |
| Model No.:             | AP301                         |
| Wi-Fi Specification:   | 802.11a/b/g/n/ac/ax           |
| Operating Temperature: | 0 ~ 50 °C                     |
| Power Type:            | PoE input or AC adapter input |
| Operating Environment: | Indoor Use                    |

### 2.2. Product Specification Subjective to this Report

|                     |                                                                                                                                                  |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Frequency Range:    | 802.11b/g/n-HT20/VHT20/ax-HE20: 2412 ~ 2462 MHz<br>802.11n-HT40/VHT40/ax-HE40: 2422 ~ 2452 MHz                                                   |
| Channel Number:     | 802.11b/g/n-HT20/VHT20/ax-HE20: 11<br>802.11n-HT40/VHT40/ax-HE40: 7                                                                              |
| Type of Modulation: | 802.11b: DSSS; 802.11g/n/VHT: OFDM; 802.11ax: OFDMA                                                                                              |
| Data Rate:          | 802.11b: 1/2/5.5/11Mbps<br>802.11g: 6/9/12/18/24/36/48/54Mbps<br>802.11n: up to 300Mbps<br>802.11VHT: up to 400Mbps<br>802.11ax: up to 573.5Mbps |

Note: For other features of this EUT, test report will be issued separately.

### 2.3. Working Frequencies for this report

802.11b/g/n-HT20/VHT20/ax-HE20

| Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---------|-----------|---------|-----------|---------|-----------|
| 01      | 2412 MHz  | 02      | 2417 MHz  | 03      | 2422 MHz  |
| 04      | 2427 MHz  | 05      | 2432 MHz  | 06      | 2437 MHz  |
| 07      | 2442 MHz  | 08      | 2447 MHz  | 09      | 2452 MHz  |
| 10      | 2457 MHz  | 11      | 2462 MHz  | --      | --        |

802.11n-HT40/VHT40/ax-HE40

| Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---------|-----------|---------|-----------|---------|-----------|
| 03      | 2422 MHz  | 04      | 2427 MHz  | 05      | 2432 MHz  |
| 06      | 2437 MHz  | 07      | 2442 MHz  | 08      | 2447 MHz  |
| 09      | 2452 MHz  | --      | --        | --      | --        |

### 2.4. Description of Available Antennas

| Antenna Type                                                 | Frequency Band (GHz) | T <sub>x</sub> Paths | Bandwidth (MHz) | Max Peak Gain (dBi) |       | CDD Directional Gain (dBi) |      | Beamforming Directional Gain (dBi) |
|--------------------------------------------------------------|----------------------|----------------------|-----------------|---------------------|-------|----------------------------|------|------------------------------------|
|                                                              |                      |                      |                 | Ant 0               | Ant 1 | Power                      | PSD  |                                    |
| Wi-Fi Internal Antenna List (2.4GHz 2*2 MIMO, 5GHz 2*2 MIMO) |                      |                      |                 |                     |       |                            |      |                                    |
| PIFA                                                         | 2412 ~ 2462          | 2                    | 20, 40          | 3.20                | 3.30  | 3.30                       | 6.31 | 6.31                               |
| Antenna                                                      | 5150 ~ 5850          | 2                    | 20, 40, 80      | 3.10                | 3.30  | 3.30                       | 6.31 | 6.31                               |

Note 1: The EUT supports Cyclic Delay Diversity (CDD) technology for 802.11a/b/g/n/ac/ax and it is correlated.

If all antennas have the same gain,  $G_{ANT}$ , Directional gain =  $G_{ANT}$  + Array Gain, where Array Gain is as follows.

- For power spectral density (PSD) measurements on all devices,  
Array Gain =  $10 \log (N_{ANT} / N_{SS})$  dB = 3.01;
- For power measurements on IEEE 802.11 devices,  
Array Gain = 0 dB for  $N_{ANT} \leq 4$ ;

If antenna gains are not equal, Directional gain may be calculated by using the formulas applicable to equal gain antennas with  $G_{ANT}$  set equal to the gain of the antenna having the highest gain.

Note 2: The EUT also supports Beamforming mode, and the Beamforming support 802.11n/ac/ax, not include 802.11a/b/g. The directional gain =  $G_{ANT}$  + Array Gain (3.01dBi).

Note 3: Antenna type and antenna gain are provided by the manufacturer.

## 2.5. Test Mode

|           |                                          |
|-----------|------------------------------------------|
| Test Mode | Mode 1: Transmit by 802.11b (1Mbps)      |
|           | Mode 2: Transmit by 802.11g (6Mbps)      |
|           | Mode 3: Transmit by 802.11n-HT20 (MCS0)  |
|           | Mode 4: Transmit by 802.11n-HT40 (MCS0)  |
|           | Mode 5: Transmit by VHT20 (MCS0)         |
|           | Mode 6: Transmit by VHT40 (MCS0)         |
|           | Mode 7: Transmit by 802.11ax-HE20 (MCS0) |
|           | Mode 8: Transmit by 802.11ax-HE40 (MCS0) |

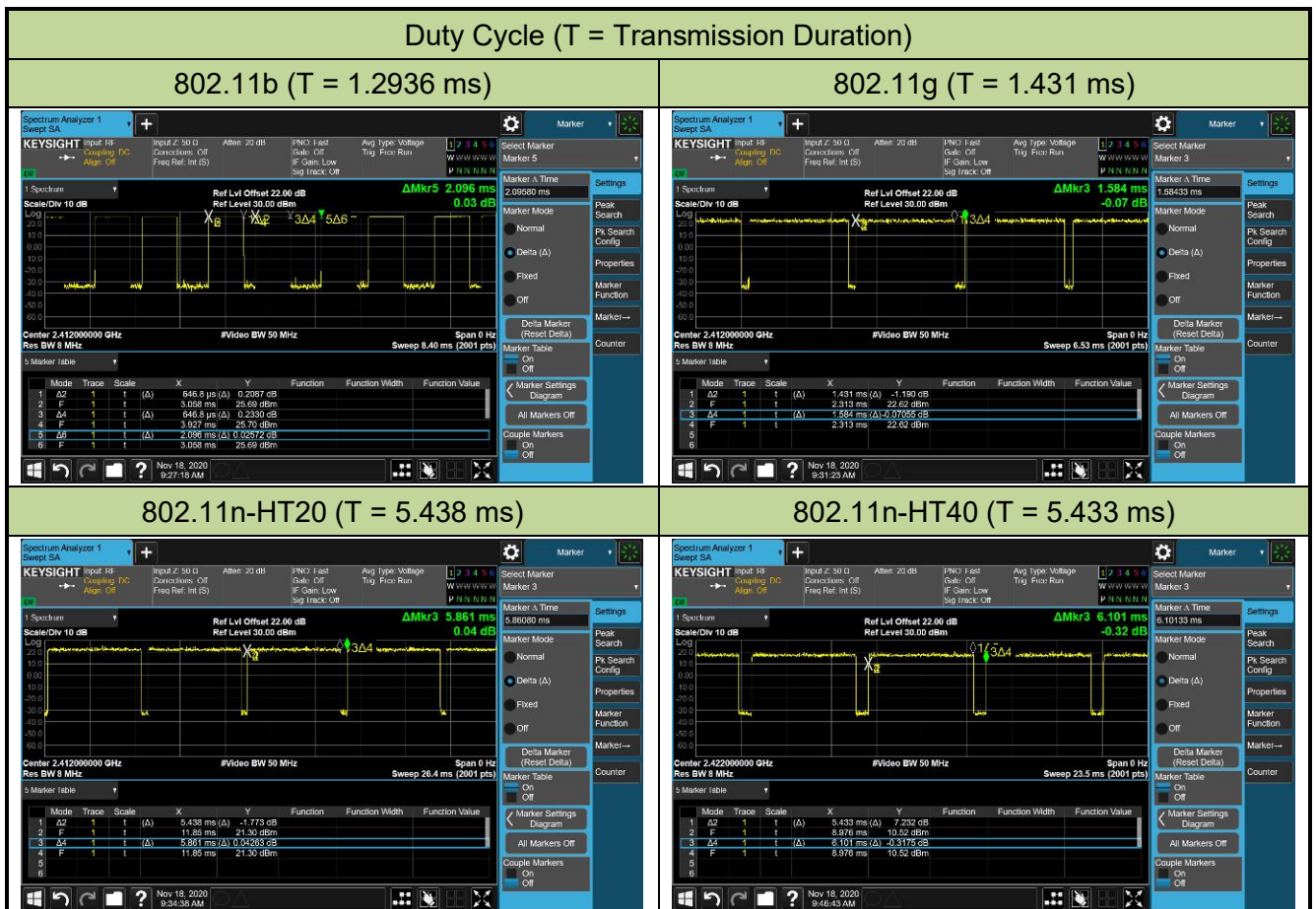
## 2.6. Test Software

The test utility software used during testing was “QSPR”, and the version was “v50-00186”.

## 2.7. Duty Cycle

2.4GHz WLAN (DTS) operation is possible in 20MHz, and 40MHz channel bandwidths. The maximum achievable duty cycles for all modes were determined based on measurements performed on a spectrum analyzer in zero-span mode with RBW = 8MHz, VBW = 50MHz, and detector = peak. The RBW and VBW were both greater than 50/T, where T is the minimum transmission duration, and the number of sweep points across T was greater than 100. The duty cycles are as follows:

| Test Mode    | Duty Cycle | Test Mode     | Duty Cycle |
|--------------|------------|---------------|------------|
| 802.11b      | 61.72%     | 802.11VHT20   | 94.61%     |
| 802.11g      | 90.34%     | 802.11VHT40   | 95.87%     |
| 802.11n-HT20 | 92.78%     | 802.11ax-HE20 | 95.63%     |
| 802.11n-HT40 | 89.05%     | 802.11ax-HE40 | 95.66%     |





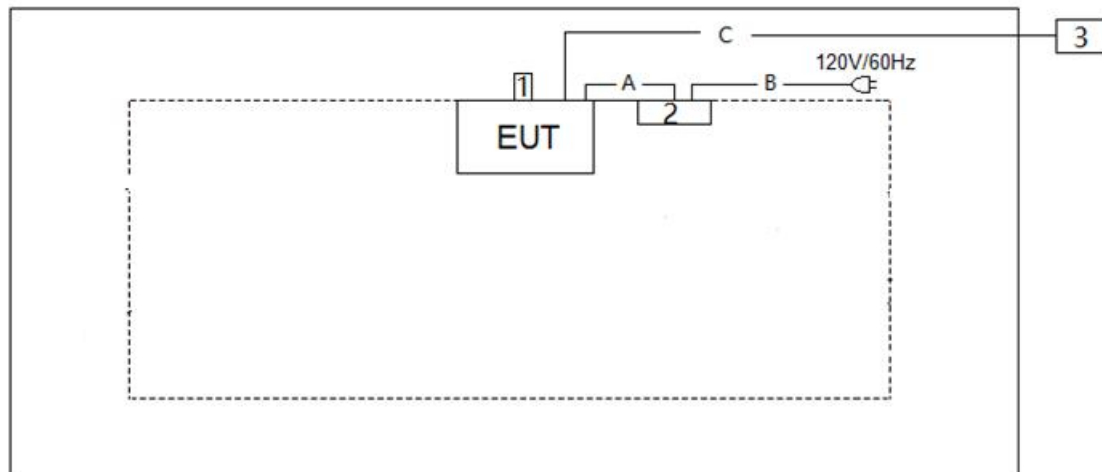
## 2.8. EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

## 2.9. Configuration of Tested System

This device was tested per the guidance ANSI C63.10:2013 was used to reference the appropriate EUT setup for radiated emissions testing and AC line conducted testing.

Connection Diagram



| Cable Type |             | Cable Description    |
|------------|-------------|----------------------|
| A          | Power Cable | Non-Shielding, 1.5m  |
| B          | Power Cable | Non-Shielding, 1.5m  |
| C          | LAN Cable   | Non-Shielding, > 10m |

## 2.10. Test System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

| Product | Manufacturer | Model No. | Serial No.   |
|---------|--------------|-----------|--------------|
| 1       | USB Dongle   | SanDisk   | BL161025264V |
| 2       | AC Adapter   | DELTA     | ADP-30HR B   |
| 3       | Notebook     | ASUS      | PRO45V       |

### 3. ANTENNA REQUIREMENTS

#### **Excerpt from §15.203 of the FCC Rules/Regulations:**

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

- The antenna of the device is **permanently attached**.
- There are no provisions for connection to an external antenna.

#### **Conclusion:**

The unit complies with the requirement of §15.203.

#### 4. TEST EQUIPMENT CALIBRATION DATE

##### Radiated Disturbance-AC1:

| Instrument                 | Manufacturer | Type No.                  | Asset No.   | Cali. Interval | Cali. Due Date |
|----------------------------|--------------|---------------------------|-------------|----------------|----------------|
| Broadband TRILOG Antenna   | SCHWARZBECK  | VULB 9162                 | MRTTWA00001 | 1 year         | 2021/10/5      |
| Active Loop Antenna        | SCHWARZBECK  | FMZB 1519B                | MRTTWA00002 | 1 year         | 2021/4/27      |
| Broadband Hornantenna      | SCHWARZBECK  | BBHA 9120D                | MRTTWA00003 | 1 year         | 2021/4/24      |
| Breitband Hornantenna      | SCHWARZBECK  | BBHA 9170                 | MRTTWA00004 | 1 year         | 2021/4/24      |
| Broadband Preamplifier     | SCHWARZBECK  | BBV 9718                  | MRTTWA00005 | 1 year         | 2021/4/24      |
| Broadband Amplifier        | SCHWARZBECK  | BBV 9721                  | MRTTWA00006 | 1 year         | 2021/4/24      |
| Signal Analyzer            | R&S          | FSV40                     | MRTTWA00007 | 1 year         | 2021/3/24      |
| EMI Test Receiver          | R&S          | ESR3                      | MRTTWA00009 | 1 year         | 2021/3/25      |
| EXA Signal Analyzer        | KEYSIGHT     | N9010A                    | MRTTWA00012 | 1 year         | 2021/10/14     |
| EXA Signal Analyzer        | KEYSIGHT     | N9010B                    | MRTTWA00074 | 1 year         | 2021/7/14      |
| Antenna Cable              | HUBERSUHNER  | SF106                     | MRTTWE00010 | 1 year         | 2021/6/16      |
| Temperature/Humidity Meter | TFA          | 35.1078.10.IT             | MRTTWA00032 | 1 year         | 2021/5/29      |
| Cable                      | Rosnol       | K1K50-UP0264-K1<br>K50-4M | MRTTWE00012 | 1 year         | 2021/6/21      |

##### Conducted Emissions-SR2:

| Instrument                 | Manufacturer | Type No.                    | Asset No.   | Cali. Interval | Cali. Due Date |
|----------------------------|--------------|-----------------------------|-------------|----------------|----------------|
| Two-Line V-Network         | R&S          | ENV216                      | MRTTWA00019 | 1 year         | 2021/3/26      |
| Two-Line V-Network         | R&S          | ENV216                      | MRTTWA00020 | 1 year         | 2021/4/24      |
| 8-Wire ISN (T8-Cat6)       | R&S          | ENY81 CA6                   | MRTTWA00017 | 1 year         | 2021/5/25      |
| 8-Wire ISN (T8)            | R&S          | ENY81                       | MRTTWA00018 | 1 year         | 2021/5/25      |
| 8-Wire ISN                 | TESEQ        | CDN ST08AS                  | MRTTWA00083 | 1 year         | 2021/9/2       |
| EMI Test Receiver          | R&S          | ESR3                        | MRTTWA00045 | 1 year         | 2021/5/26      |
| Conducted Cable            | Rosnol       | N1C50-RG400-B1C<br>50-500CM | MRTTWE00013 | 1 year         | 2021/6/21      |
| Temperature/Humidity Meter | TFA          | 35.1078.10.IT               | MRTTWA00033 | 1 year         | 2021/5/28      |

## Conducted Test Equipment-SR2:

| Instrument                                 | Manufacturer | Type No.      | Asset No.   | Cali. Interval | Cali. Due Date |
|--------------------------------------------|--------------|---------------|-------------|----------------|----------------|
| X-Series USB Peak and Average Power Sensor | KEYSIGHT     | U2021XA       | MRTTWA00014 | 1 year         | 2021/4/24      |
| X-Series USB Peak and Average Power Sensor | KEYSIGHT     | U2021XA       | MRTTWA00015 | 1 year         | 2021/3/26      |
| Wideband Radio Communication Taster        | R&S          | CMW 500       | MRTTWA00041 | 1 year         | 2021/1/7       |
| EXA Signal Analyzer                        | KEYSIGHT     | N9010A        | MRTTWA00012 | 1 year         | 2021/10/14     |
| EXA Signal Analyzer                        | KEYSIGHT     | N9010B        | MRTTWA00074 | 1 year         | 2021/7/14      |
| Attenuator                                 | MVE          | 20dB          | MRTSUE06547 | N/A            | N/A            |
| Signal Analyzer                            | R&S          | FSV40         | MRTTWA00007 | 1 year         | 2021/3/24      |
| Temperature & Humidity Chamber             | TEN BILLION  | TTH-B3UP      | MRTTWA00036 | 1 year         | 2021/6/9       |
| Temperature/Humidity Meter                 | TFA          | 35.1078.10.IT | MRTTWA00033 | 1 year         | 2021/5/28      |

| Software | Version   | Function          |
|----------|-----------|-------------------|
| e3       | 9.160520a | EMI Test Software |

## 5. MEASUREMENT UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k = 2$ .

|                                                                                                                                                                                                                      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Conducted Emission- Power Line</b>                                                                                                                                                                                |
| Measuring Uncertainty for a Level of Confidence of 95% ( $U=2U_c(y)$ ):<br>150kHz~30MHz: $\pm 2.53\text{dB}$                                                                                                         |
| <b>Radiated Spurious Emission</b>                                                                                                                                                                                    |
| Measuring Uncertainty for a Level of Confidence of 95% ( $U=2U_c(y)$ ):<br>9kHz~30MHz: $\pm 3.92\text{dB}$<br>30MHz~1GHz: $\pm 4.25\text{dB}$<br>1GHz~18GHz: $\pm 4.40\text{dB}$<br>18GHz~40GHz: $\pm 4.45\text{dB}$ |
| <b>Frequency Error</b>                                                                                                                                                                                               |
| Measuring Uncertainty for a Level of Confidence of 95% ( $U=2U_c(y)$ ): $\pm 78.4\text{Hz}$                                                                                                                          |
| <b>Conducted Power</b>                                                                                                                                                                                               |
| Measuring Uncertainty for a Level of Confidence of 95% ( $U=2U_c(y)$ ): $\pm 0.84\text{dB}$                                                                                                                          |
| <b>Conducted Spurious Emission</b>                                                                                                                                                                                   |
| Measuring Uncertainty for a Level of Confidence of 95% ( $U=2U_c(y)$ ): $\pm 2.65\text{dB}$                                                                                                                          |
| <b>Occupied Bandwidth</b>                                                                                                                                                                                            |
| Measuring Uncertainty for a Level of Confidence of 95% ( $U=2U_c(y)$ ): 3.3%                                                                                                                                         |
| <b>Temp. / Humidity</b>                                                                                                                                                                                              |
| Measuring Uncertainty for a Level of Confidence of 95% ( $U=2U_c(y)$ ): $\pm 0.82^\circ\text{C}$ / $\pm 3\%$                                                                                                         |
| <b>DC Voltage</b>                                                                                                                                                                                                    |
| Measuring Uncertainty for a Level of Confidence of 95% ( $U=2U_c(y)$ ): $\pm 0.3\%$                                                                                                                                  |

## 6. TEST RESULT

### 6.1. Summary

| FCC Section(s)   | Test Description                                                   | Test Limit                                                                     | Test Condition | Test Result | Reference         |
|------------------|--------------------------------------------------------------------|--------------------------------------------------------------------------------|----------------|-------------|-------------------|
| 15.247(a)(2)     | 6dB Bandwidth                                                      | $\geq 500\text{kHz}$                                                           | Conducted      | Pass        | Section 6.2       |
| 15.247(b)(3)     | Output Power                                                       | $\leq 30\text{dBm}$                                                            |                | Pass        | Section 6.3       |
| 15.247(e)        | Power Spectral Density                                             | $\leq 8\text{dBm}/3\text{kHz}$                                                 |                | Pass        | Section 6.4       |
| 15.247(d)        | Band Edge / Out-of-Band Emissions                                  | $\leq 30\text{dBc}$ (Average) or<br>$\leq 20\text{dBc}$ (Peak)                 |                | Pass        | Section 6.5       |
| 15.205<br>15.209 | General Field Strength<br>(Restricted Bands and Radiated Emission) | Emissions in restricted bands must meet the radiated limits detailed in 15.209 | Radiated       | Pass        | Section 6.6 & 6.7 |
| 15.207           | AC Conducted Emissions<br>150kHz - 30MHz                           | < FCC 15.207 limits                                                            | Line Conducted | Pass        | Section 6.8       |

#### Notes:

- The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
- Output power test was verified over all data rates of each mode, and then choose the maximum power output (low data rate) for final test of each channel.
- Test Items "6dB Bandwidth" & "Band Edge / Out-of-Band Emissions" have been assessed MIMO transmission, and showed the worst test data in this report.
- The power setting of CDD & Beamforming mode is same. For 802.11n/VHT/ax uses worst case beamforming mode in the test report. The test results shown in the following sections represent the worst case emissions.
- For 2417MHz, 2427MHz, 2447MHz and 2457MHz Radiated bandedge testing, we choose Low and high channel worst Polarity Vertical in this report.

## 6.2. 6dB Bandwidth Measurement

### 6.2.1. Test Limit

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

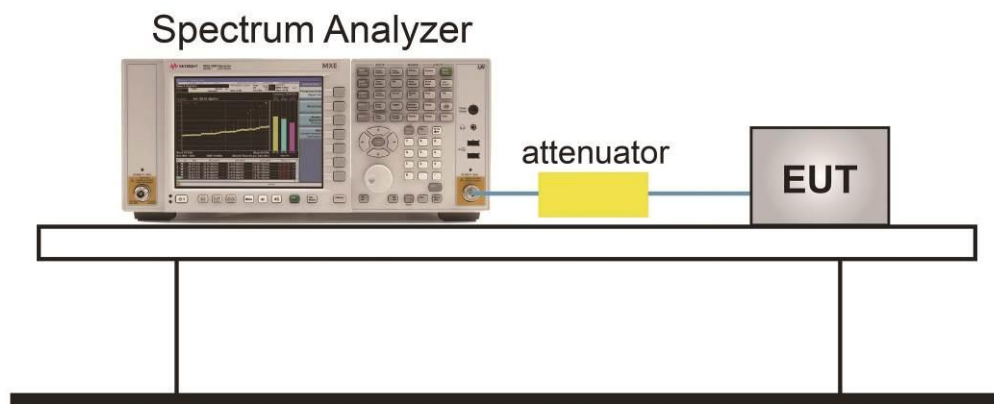
### 6.2.2. Test Procedure used

ANSI C63.10-2013 - Section 11.8.

### 6.2.3. Test Setting

1. The Spectrum's automatic bandwidth measurement capability was used to perform the 6dB bandwidth measurement. The "X" dB bandwidth parameter was set to  $X = 6$ . The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. Set RBW = 100 kHz
3.  $VBW \geq 3 \times RBW$
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize

### 6.2.4. Test Setup



### 6.2.5. Test Result

|               |                         |           |            |
|---------------|-------------------------|-----------|------------|
| Product       | HAN Access Point, AP301 | Test Site | SR2        |
| Test Engineer | Eric Lin                | Test Date | 2020/11/18 |
| Test Item     | 6dB Bandwidth           |           |            |

| Test Mode     | Data Rate/<br>MCS | Channel No. | Frequency<br>(MHz) | 6dB Bandwidth<br>(MHz) | Limit<br>(MHz) | Result |
|---------------|-------------------|-------------|--------------------|------------------------|----------------|--------|
| 802.11b       | 1Mbps             | 01          | 2412               | 8.06                   | ≥ 0.5          | Pass   |
| 802.11b       | 1Mbps             | 06          | 2437               | 8.07                   | ≥ 0.5          | Pass   |
| 802.11b       | 1Mbps             | 11          | 2462               | 8.07                   | ≥ 0.5          | Pass   |
| 802.11g       | 6Mbps             | 01          | 2412               | 15.09                  | ≥ 0.5          | Pass   |
| 802.11g       | 6Mbps             | 06          | 2437               | 13.87                  | ≥ 0.5          | Pass   |
| 802.11g       | 6Mbps             | 11          | 2462               | 15.09                  | ≥ 0.5          | Pass   |
| 802.11n-HT20  | MCS0              | 01          | 2412               | 13.88                  | ≥ 0.5          | Pass   |
| 802.11n-HT20  | MCS0              | 06          | 2437               | 15.07                  | ≥ 0.5          | Pass   |
| 802.11n-HT20  | MCS0              | 11          | 2462               | 14.97                  | ≥ 0.5          | Pass   |
| 802.11n-HT40  | MCS0              | 03          | 2422               | 33.89                  | ≥ 0.5          | Pass   |
| 802.11n-HT40  | MCS0              | 06          | 2437               | 35.00                  | ≥ 0.5          | Pass   |
| 802.11n-HT40  | MCS0              | 09          | 2452               | 35.11                  | ≥ 0.5          | Pass   |
| VHT20         | MCS0              | 01          | 2412               | 13.87                  | ≥ 0.5          | Pass   |
| VHT20         | MCS0              | 06          | 2437               | 15.06                  | ≥ 0.5          | Pass   |
| VHT20         | MCS0              | 11          | 2462               | 15.09                  | ≥ 0.5          | Pass   |
| VHT40         | MCS0              | 03          | 2422               | 35.09                  | ≥ 0.5          | Pass   |
| VHT40         | MCS0              | 06          | 2437               | 33.88                  | ≥ 0.5          | Pass   |
| VHT40         | MCS0              | 09          | 2452               | 35.09                  | ≥ 0.5          | Pass   |
| 802.11ax-HE20 | MCS0              | 01          | 2412               | 15.03                  | ≥ 0.5          | Pass   |
| 802.11ax-HE20 | MCS0              | 06          | 2437               | 15.10                  | ≥ 0.5          | Pass   |
| 802.11ax-HE20 | MCS0              | 11          | 2462               | 13.86                  | ≥ 0.5          | Pass   |
| 802.11ax-HE40 | MCS0              | 03          | 2422               | 33.88                  | ≥ 0.5          | Pass   |
| 802.11ax-HE40 | MCS0              | 06          | 2437               | 33.92                  | ≥ 0.5          | Pass   |
| 802.11ax-HE40 | MCS0              | 09          | 2452               | 33.48                  | ≥ 0.5          | Pass   |

Note: The Data only show the max power Antenna Port in the test report.

## 802.11b 6dB Bandwidth

### Channel 01 (2412MHz)



### Channel 06 (2437MHz)



### Channel 11 (2462MHz)

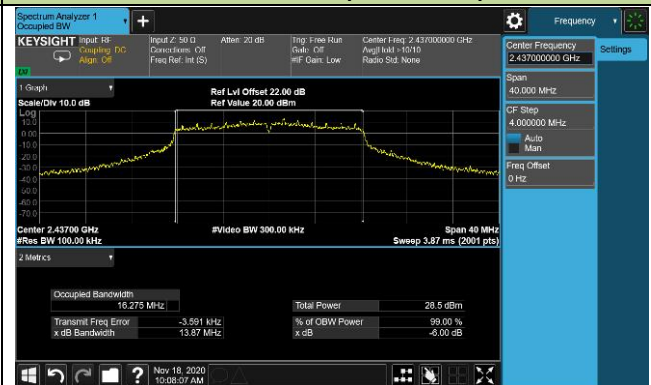


## 802.11g 6dB Bandwidth

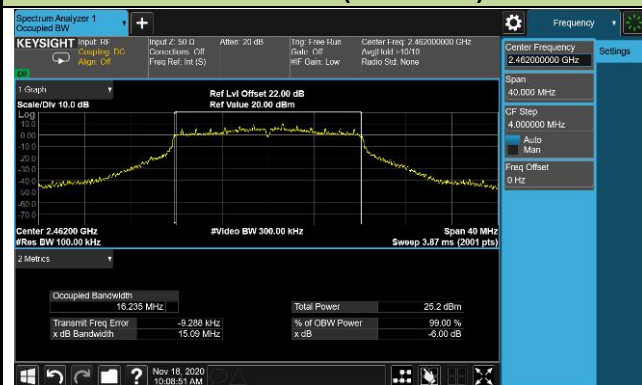
### Channel 01 (2412MHz)



### Channel 06 (2437MHz)



### Channel 11 (2462MHz)



## 802.11n-HT20 6dB Bandwidth

### Channel 01 (2412MHz)



### Channel 06 (2437MHz)



### Channel 11 (2462MHz)

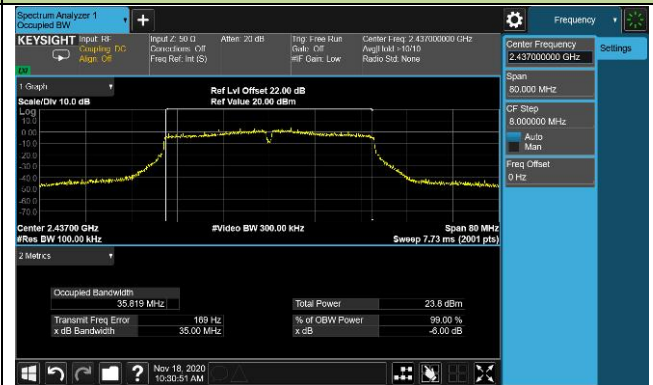


## 802.11n-HT40 6dB Bandwidth

### Channel 03 (2422MHz)



### Channel 06 (2437MHz)



### Channel 09 (2452MHz)



## VHT20 6dB Bandwidth

### Channel 01 (2412MHz)



### Channel 06 (2437MHz)



### Channel 11 (2462MHz)

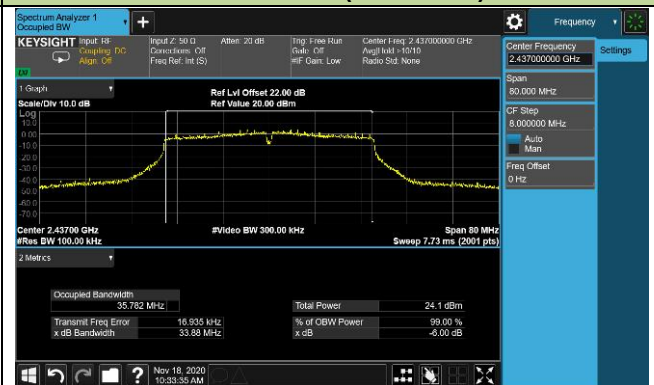


## VHT40 6dB Bandwidth

### Channel 03 (2422MHz)



### Channel 06 (2437MHz)



### Channel 09 (2452MHz)



## 802.11ax-HE20 6dB Bandwidth

### Channel 01 (2412MHz)



### Channel 06 (2437MHz)



### Channel 11 (2462MHz)



## 802.11ax-HE40 6dB Bandwidth

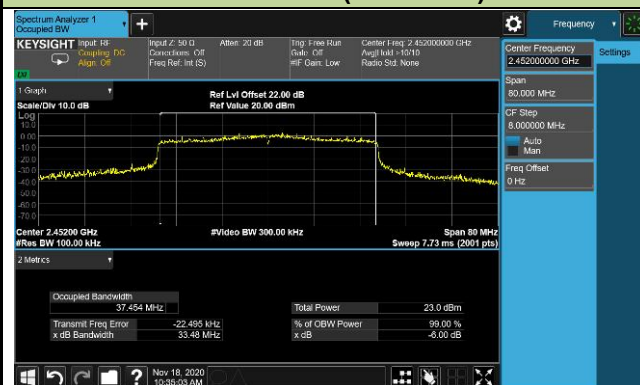
### Channel 03 (2422MHz)



### Channel 06 (2437MHz)



### Channel 09 (2452MHz)



### 6.3. Output Power Measurement

#### 6.3.1. Test Limit

The maximum out power shall be less 1 Watt (30dBm).

The conducted output power limit specified in paragraph FCC Part 15.247(b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs FCC Part 15.247(b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

#### 6.3.2. Test Procedure Used

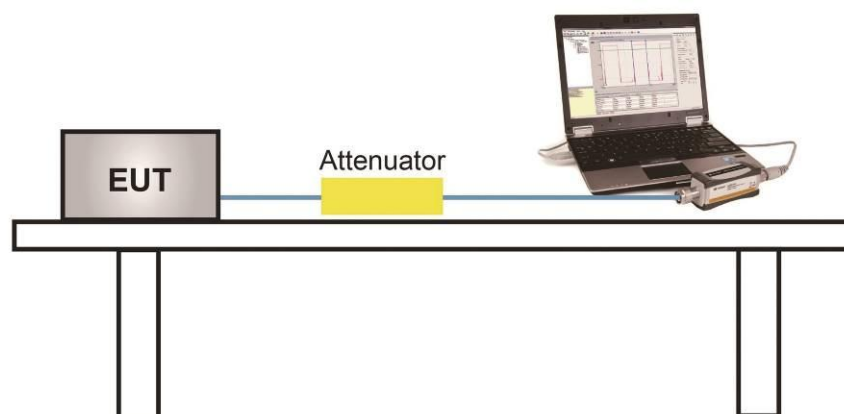
ANSI C63.10-2013 - Section 11.9.2.3

#### 6.3.3. Test Setting

##### **Method AVGPM-G (Measurement using a gated RF average-reading power meter)**

Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since this measurement is made only during the ON time of the transmitter, no duty cycle correction is required.

#### 6.3.4. Test Setup



### 6.3.5. Test Result of Output Power

Power output test was verified over all data rates of each mode shown as below, and then choose the maximum power output (gray marker) for final test of each channel.

Output power at various data rates for Ant 0 / Ant 0+1 port:

| Test Mode | Bandwidth (MHz) | Channel No. | Frequency (MHz) | Data Rate/ MCS | Average Power (dBm) |
|-----------|-----------------|-------------|-----------------|----------------|---------------------|
| 802.11b   | 20              | 6           | 2437            | 1Mbps          | 22.53               |
|           |                 |             |                 | 5.5Mbps        | 22.48               |
|           |                 |             |                 | 11Mbps         | 22.40               |
| 802.11g   | 20              | 6           | 2437            | 6Mbps          | 20.97               |
|           |                 |             |                 | 24Mbps         | 20.89               |
|           |                 |             |                 | 54Mbps         | 20.81               |
| 802.11n   | 20              | 6           | 2437            | MCS0           | 21.15               |
|           |                 |             |                 | MCS3           | 21.09               |
|           |                 |             |                 | MCS7           | 21.02               |
| 802.11n   | 40              | 6           | 2437            | MCS0           | 16.06               |
|           |                 |             |                 | MCS3           | 16.00               |
|           |                 |             |                 | MCS7           | 15.94               |
| VHT       | 20              | 6           | 2437            | MCS0           | 21.63               |
|           |                 |             |                 | MCS4           | 21.55               |
|           |                 |             |                 | MCS9           | 21.48               |
| VHT       | 40              | 6           | 2437            | MCS0           | 16.49               |
|           |                 |             |                 | MCS4           | 16.41               |
|           |                 |             |                 | MCS9           | 16.33               |
| 802.11ax  | 20              | 6           | 2437            | MCS0           | 20.10               |
|           |                 |             |                 | MCS5           | 20.01               |
|           |                 |             |                 | MCS11          | 19.95               |
| 802.11ax  | 40              | 6           | 2437            | MCS0           | 16.23               |
|           |                 |             |                 | MCS5           | 16.15               |
|           |                 |             |                 | MCS11          | 16.08               |

|               |                         |           |                       |
|---------------|-------------------------|-----------|-----------------------|
| Product       | HAN Access Point, AP301 | Test Site | SR2                   |
| Test Engineer | Eric Lin                | Test Date | 2020/11/18~2020/12/18 |
| Test Item     | Output Power            |           |                       |

| Test Mode | Data Rate/MCS | Channel No. | Freq. (MHz) | Ant 0 Average Power (dBm) | Ant 1 Average Power (dBm) | Total Average Power (dBm) | Limit (dBm) | Result |
|-----------|---------------|-------------|-------------|---------------------------|---------------------------|---------------------------|-------------|--------|
| 11b       | 1Mbps         | 01          | 2412        | 21.03                     | 20.89                     | 23.97                     | ≤ 29.69     | Pass   |
| 11b       | 1Mbps         | 06          | 2437        | 22.53                     | 21.57                     | 25.09                     | ≤ 29.69     | Pass   |
| 11b       | 1Mbps         | 10          | 2457        | 21.32                     | 21.57                     | 24.46                     | ≤ 29.69     | Pass   |
| 11b       | 1Mbps         | 11          | 2462        | 20.47                     | 20.98                     | 23.74                     | ≤ 29.69     | Pass   |
| 11g       | 6Mbps         | 01          | 2412        | 19.43                     | 18.97                     | 22.22                     | ≤ 29.69     | Pass   |
| 11g       | 6Mbps         | 02          | 2417        | 19.24                     | 18.95                     | 22.11                     | ≤ 29.69     | Pass   |
| 11g       | 6Mbps         | 06          | 2437        | 20.97                     | 19.81                     | 23.44                     | ≤ 29.69     | Pass   |
| 11g       | 6Mbps         | 10          | 2457        | 20.67                     | 20.58                     | 23.64                     | ≤ 29.69     | Pass   |
| 11g       | 6Mbps         | 11          | 2462        | 18.88                     | 18.36                     | 21.64                     | ≤ 29.69     | Pass   |
| 11n-HT20  | MCS0          | 01          | 2412        | 17.03                     | 16.83                     | 19.94                     | ≤ 29.69     | Pass   |
| 11n-HT20  | MCS0          | 02          | 2417        | 19.27                     | 19.03                     | 22.16                     | ≤ 29.69     | Pass   |
| 11n-HT20  | MCS0          | 06          | 2437        | 21.15                     | 21.75                     | 24.47                     | ≤ 29.69     | Pass   |
| 11n-HT20  | MCS0          | 10          | 2457        | 20.95                     | 21.04                     | 24.01                     | ≤ 29.69     | Pass   |
| 11n-HT20  | MCS0          | 11          | 2462        | 19.91                     | 18.61                     | 22.32                     | ≤ 29.69     | Pass   |
| 11n-HT40  | MCS0          | 03          | 2422        | 14.07                     | 14.01                     | 17.05                     | ≤ 29.69     | Pass   |
| 11n-HT40  | MCS0          | 04          | 2427        | 15.64                     | 15.83                     | 18.75                     | ≤ 29.69     | Pass   |
| 11n-HT40  | MCS0          | 06          | 2437        | 16.06                     | 16.19                     | 19.14                     | ≤ 29.69     | Pass   |
| 11n-HT40  | MCS0          | 08          | 2447        | 16.14                     | 16.32                     | 19.24                     | ≤ 29.69     | Pass   |
| 11n-HT40  | MCS0          | 09          | 2452        | 15.15                     | 15.24                     | 18.21                     | ≤ 29.69     | Pass   |
| VHT20     | MCS0          | 01          | 2412        | 18.08                     | 16.73                     | 20.47                     | ≤ 29.69     | Pass   |
| VHT20     | MCS0          | 02          | 2417        | 19.45                     | 19.26                     | 22.37                     | ≤ 29.69     | Pass   |
| VHT20     | MCS0          | 06          | 2437        | 21.63                     | 20.37                     | 24.06                     | ≤ 29.69     | Pass   |
| VHT20     | MCS0          | 10          | 2457        | 20.14                     | 20.00                     | 23.08                     | ≤ 29.69     | Pass   |
| VHT20     | MCS0          | 11          | 2462        | 17.76                     | 16.98                     | 20.40                     | ≤ 29.69     | Pass   |
| VHT40     | MCS0          | 03          | 2422        | 14.33                     | 13.81                     | 17.09                     | ≤ 29.69     | Pass   |
| VHT40     | MCS0          | 04          | 2427        | 16.42                     | 16.25                     | 19.35                     | ≤ 29.69     | Pass   |
| VHT40     | MCS0          | 06          | 2437        | 16.49                     | 16.23                     | 19.37                     | ≤ 29.69     | Pass   |
| VHT40     | MCS0          | 08          | 2447        | 16.36                     | 16.32                     | 19.35                     | ≤ 29.69     | Pass   |
| VHT40     | MCS0          | 09          | 2452        | 15.23                     | 15.10                     | 18.18                     | ≤ 29.69     | Pass   |

| Test Mode | Data Rate/<br>MCS | Channel No. | Freq. (MHz) | Ant 0 Average Power (dBm) | Ant 1 Average Power (dBm) | Total Average Power (dBm) | Limit (dBm) | Result |
|-----------|-------------------|-------------|-------------|---------------------------|---------------------------|---------------------------|-------------|--------|
| 11ax-HE20 | MCS0              | 01          | 2412        | 17.55                     | 17.96                     | 20.77                     | ≤ 29.69     | Pass   |
| 11ax-HE20 | MCS0              | 02          | 2417        | 18.03                     | 18.22                     | 21.14                     | ≤ 29.69     | Pass   |
| 11ax-HE20 | MCS0              | 06          | 2437        | 20.10                     | 20.91                     | 23.53                     | ≤ 29.69     | Pass   |
| 11ax-HE20 | MCS0              | 10          | 2457        | 19.14                     | 19.03                     | 22.10                     | ≤ 29.69     | Pass   |
| 11ax-HE20 | MCS0              | 11          | 2462        | 17.70                     | 16.87                     | 20.32                     | ≤ 29.69     | Pass   |
| 11ax-HE40 | MCS0              | 03          | 2422        | 14.74                     | 14.31                     | 17.54                     | ≤ 29.69     | Pass   |
| 11ax-HE40 | MCS0              | 04          | 2427        | 15.03                     | 15.32                     | 18.19                     | ≤ 29.69     | Pass   |
| 11ax-HE40 | MCS0              | 06          | 2437        | 16.23                     | 15.65                     | 18.96                     | ≤ 29.69     | Pass   |
| 11ax-HE40 | MCS0              | 08          | 2447        | 15.46                     | 15.83                     | 18.66                     | ≤ 29.69     | Pass   |
| 11ax-HE40 | MCS0              | 09          | 2452        | 15.43                     | 15.73                     | 18.59                     | ≤ 29.69     | Pass   |

Note 1: Total Average Power (dBm) =  $10 \cdot \log [10^{(\text{Ant 0 Average Power} / 10)} + 10^{(\text{Ant 1 Average Power} / 10)}]$  (dBm).

Note 2: Power Limit= 30dBm-(6.31-6) dBi= 29.69dBm.

## **6.4. Power Spectral Density Measurement**

### **6.4.1. Test Limit**

The maximum permissible power spectral density is 8dBm in any 3 kHz band.

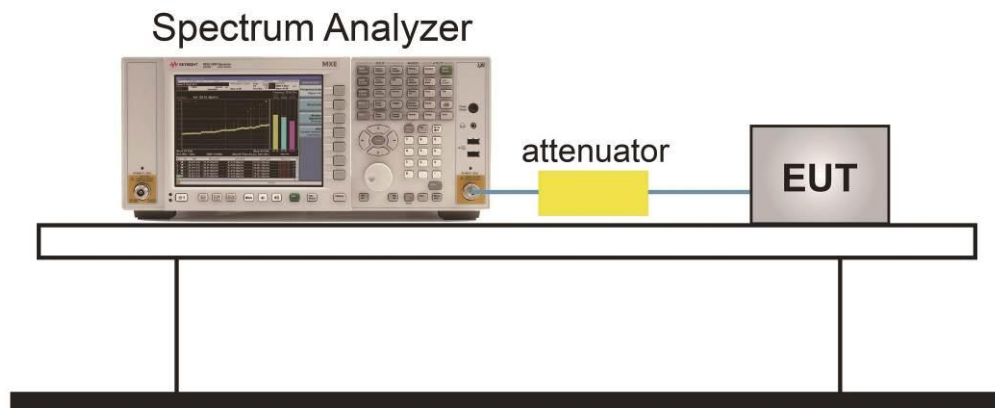
### **6.4.2. Test Procedure Used**

ANSI C63.10 Section 11.10.6

### **6.4.3. Test Setting**

1. Measure the duty cycle (x) of the transmitter output signal
2. Set instrument center frequency to DTS channel center frequency.
3. Set span to at least 1.5 times the OBW.
4. RBW = 10kHz
5. VBW = 30kHz
6. Detector = RMS
7. Ensure that the number of measurement points in the sweep  $\geq 2 \times \text{span/RBW}$ .
8. Sweep time = auto couple
9. Don't use sweep triggering. Allow sweep to "free run".
10. Employ trace averaging (RMS) mode over a minimum of 100 traces.
11. Use the peak marker function to determine the maximum amplitude level.
12. Add  $10 \log (1/x)$ , where x is the duty cycle measured in step (a), to the measured PSD to compute the average PSD during the actual transmission time.

#### 6.4.4. Test Setup



### 6.4.5. Test Result

|               |                         |           |            |
|---------------|-------------------------|-----------|------------|
| Product       | HAN Access Point, AP301 | Test Site | SR2        |
| Test Engineer | Eric Lin                | Test Date | 2020/11/18 |
| Test Item     | Power Spectral Density  |           |            |

| Test Mode | Data Rate/<br>MCS | Channel No. | Freq. (MHz) | Ant 0 AVGPDS (dBm / 10kHz) | Ant 1 AVGPDS (dBm / 10kHz) | Duty Cycle (%) | Total Peak PSD (dBm / 10kHz) | Limit (dBm / 3kHz) | Result |
|-----------|-------------------|-------------|-------------|----------------------------|----------------------------|----------------|------------------------------|--------------------|--------|
| 11b       | 1Mbps             | 01          | 2412        | -5.37                      | -5.50                      | 61.72          | -0.33                        | ≤ 7.69             | Pass   |
| 11b       | 1Mbps             | 06          | 2437        | -5.16                      | -5.22                      | 61.72          | -0.08                        | ≤ 7.69             | Pass   |
| 11b       | 1Mbps             | 11          | 2462        | -5.57                      | -5.42                      | 61.72          | -0.39                        | ≤ 7.69             | Pass   |
| 11g       | 6Mbps             | 01          | 2412        | -8.02                      | -9.53                      | 90.34          | -5.26                        | ≤ 7.69             | Pass   |
| 11g       | 6Mbps             | 06          | 2437        | -5.77                      | -6.47                      | 90.34          | -2.65                        | ≤ 7.69             | Pass   |
| 11g       | 6Mbps             | 11          | 2462        | -8.93                      | -8.93                      | 90.34          | -5.48                        | ≤ 7.69             | Pass   |
| 11n-HT20  | MCS0              | 01          | 2412        | -9.78                      | -9.96                      | 92.78          | -6.53                        | ≤ 7.69             | Pass   |
| 11n-HT20  | MCS0              | 06          | 2437        | -6.55                      | -6.90                      | 92.78          | -3.39                        | ≤ 7.69             | Pass   |
| 11n-HT20  | MCS0              | 11          | 2462        | -8.56                      | -9.06                      | 92.78          | -5.46                        | ≤ 7.69             | Pass   |
| 11n-HT40  | MCS0              | 03          | 2422        | -14.88                     | -15.56                     | 89.05          | -11.69                       | ≤ 7.69             | Pass   |
| 11n-HT40  | MCS0              | 06          | 2437        | -13.90                     | -14.75                     | 89.05          | -10.79                       | ≤ 7.69             | Pass   |
| 11n-HT40  | MCS0              | 09          | 2452        | -15.05                     | -15.30                     | 89.05          | -11.66                       | ≤ 7.69             | Pass   |
| VHT20     | MCS0              | 01          | 2412        | -9.09                      | -9.92                      | 94.61          | -6.23                        | ≤ 7.69             | Pass   |
| VHT20     | MCS0              | 06          | 2437        | -6.28                      | -6.76                      | 94.61          | -3.26                        | ≤ 7.69             | Pass   |
| VHT20     | MCS0              | 11          | 2462        | -9.39                      | -10.51                     | 94.61          | -6.66                        | ≤ 7.69             | Pass   |
| VHT40     | MCS0              | 03          | 2422        | -15.35                     | -15.33                     | 95.87          | -12.15                       | ≤ 7.69             | Pass   |
| VHT40     | MCS0              | 06          | 2437        | -13.62                     | -14.44                     | 95.87          | -10.82                       | ≤ 7.69             | Pass   |
| VHT40     | MCS0              | 09          | 2452        | -14.33                     | -15.16                     | 95.87          | -11.53                       | ≤ 7.69             | Pass   |
| 11ax-HE20 | MCS0              | 01          | 2412        | -11.73                     | -11.19                     | 95.63          | -8.25                        | ≤ 7.69             | Pass   |
| 11ax-HE20 | MCS0              | 06          | 2437        | -7.78                      | -8.25                      | 95.63          | -4.81                        | ≤ 7.69             | Pass   |
| 11ax-HE20 | MCS0              | 11          | 2462        | -11.49                     | -11.56                     | 95.63          | -8.32                        | ≤ 7.69             | Pass   |
| 11ax-HE40 | MCS0              | 03          | 2422        | -16.43                     | -16.87                     | 95.66          | -13.44                       | ≤ 7.69             | Pass   |
| 11ax-HE40 | MCS0              | 06          | 2437        | -16.05                     | -16.04                     | 95.66          | -12.84                       | ≤ 7.69             | Pass   |
| 11ax-HE40 | MCS0              | 09          | 2452        | -16.03                     | -16.45                     | 95.66          | -13.03                       | ≤ 7.69             | Pass   |

Note 1: When EUT duty cycle < 98%, Total AVGPDS =  $10 \cdot \log \{10^{(\text{Ant 0 AVGPDS}/10)} + 10^{(\text{Ant 1 AVGPDS}/10)}\} + 10 \cdot \log (1/\text{duty cycle})$ .

Note 2: PSD Limit= 8dBm/3kHz-(6.31-6) dBi=7.69dBm/3kHz.

## 802.11b PSD - Ant 0 / Ant 0 + 1

## Channel 01 (2412MHz)



## Channel 06 (2437MHz)

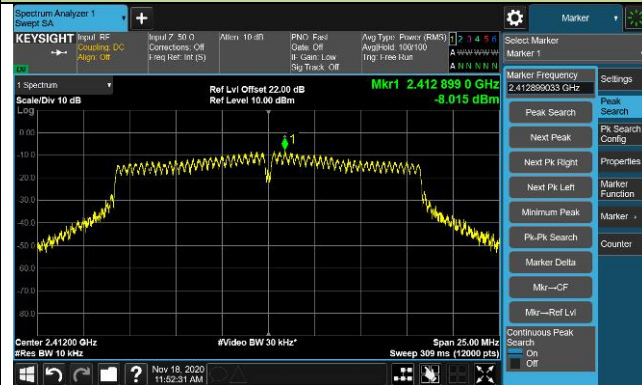


## Channel 11 (2462MHz)



## 802.11g PSD - Ant 0 / Ant 0 + 1

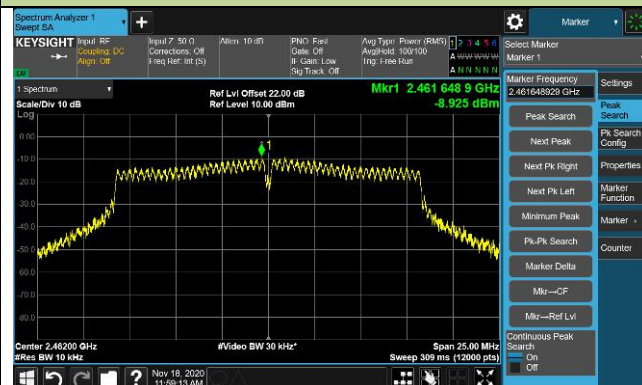
## Channel 01 (2412MHz)



## Channel 06 (2437MHz)

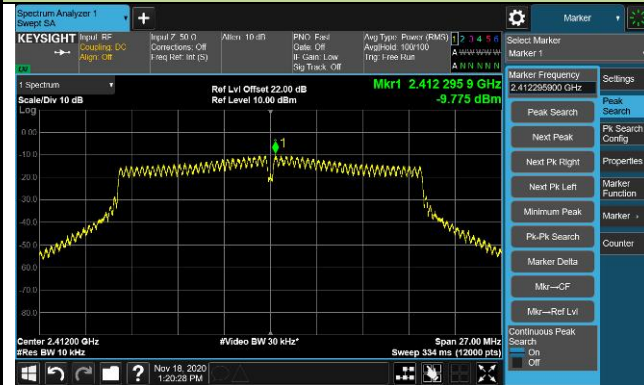


## Channel 11 (2462MHz)



## 802.11n-HT20 PSD - Ant 0 / Ant 0 + 1

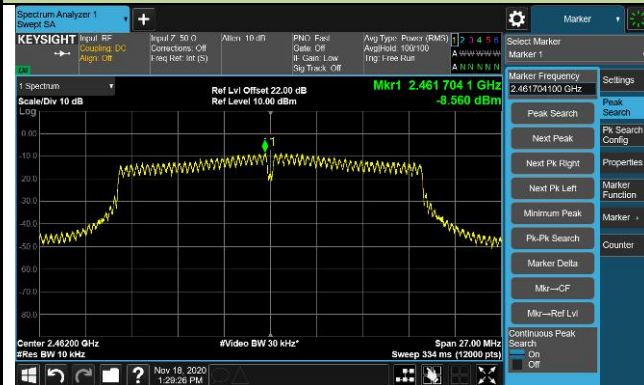
## Channel 01 (2412MHz)



## Channel 06 (2437MHz)



## Channel 11 (2462MHz)

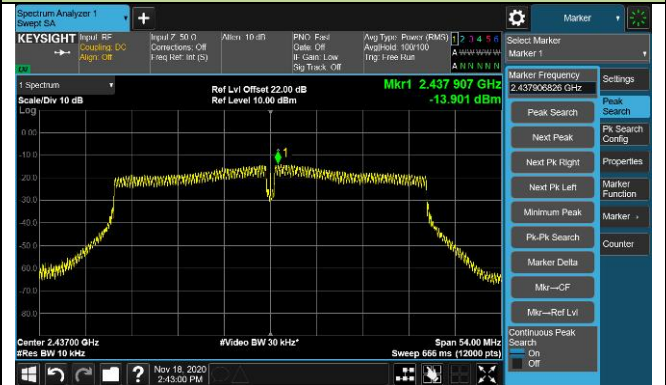


## 802.11n-HT40 PSD - Ant 0 / Ant 0 + 1

## Channel 03 (2422MHz)



## Channel 06 (2437MHz)

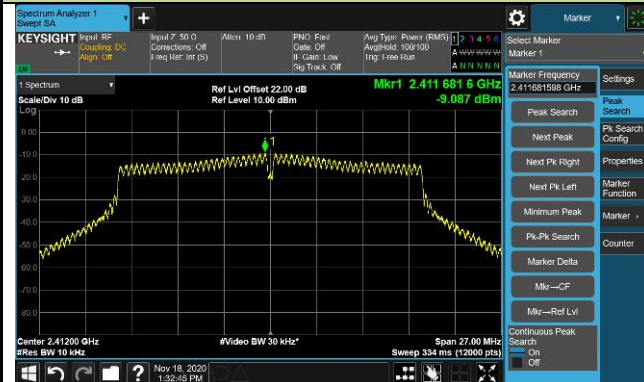


## Channel 09 (2452MHz)



## VHT20 PSD - Ant 0 / Ant 0 + 1

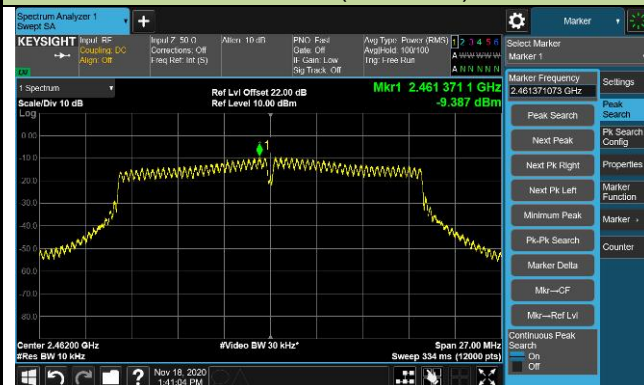
## Channel 01 (2412MHz)



## Channel 06 (2437MHz)

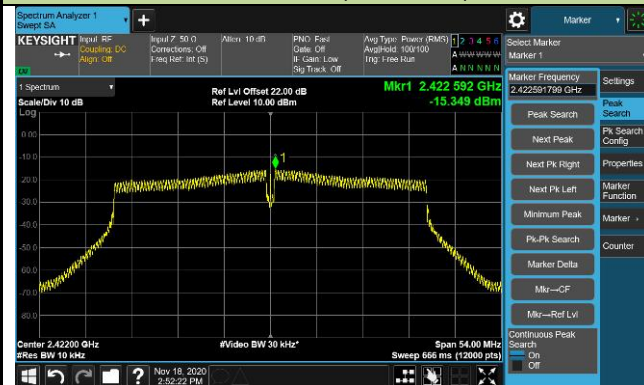


## Channel 11 (2462MHz)

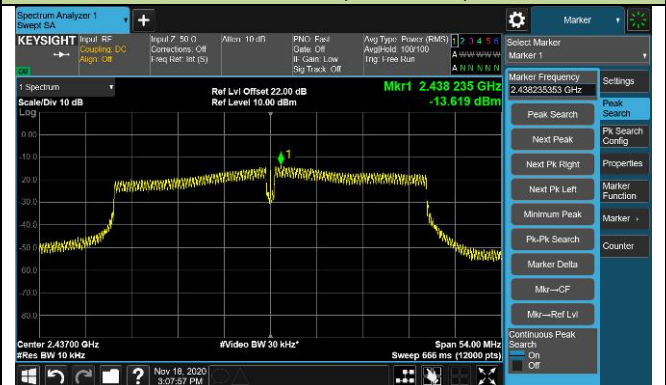


## VHT40 PSD - Ant 0 / Ant 0 + 1

## Channel 03 (2422MHz)



## Channel 06 (2437MHz)

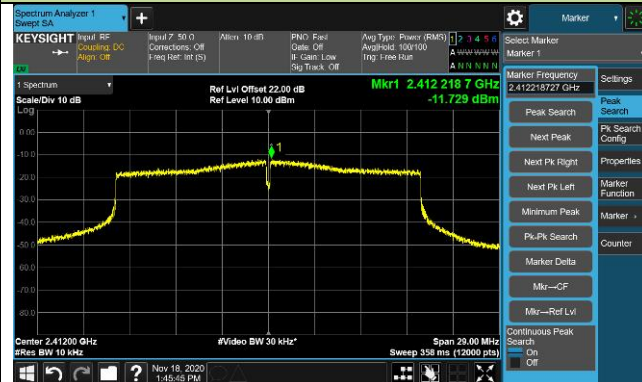


## Channel 09 (2452MHz)



## 802.11ax-HE20 PSD - Ant 0 / Ant 0 + 1

## Channel 01 (2412MHz)



## Channel 06 (2437MHz)



## Channel 11 (2462MHz)



## 802.11ax-HE40 PSD - Ant 0 / Ant 0 + 1

## Channel 03 (2422MHz)



## Channel 06 (2437MHz)



## Channel 09 (2452MHz)



## 802.11b PSD - Ant 1 / Ant 0 + 1

## Channel 01 (2412MHz)



## Channel 06 (2437MHz)



## Channel 11 (2462MHz)



## 802.11g PSD - Ant 1 / Ant 0 + 1

## Channel 01 (2412MHz)



## Channel 06 (2437MHz)



## Channel 11 (2462MHz)



## 802.11n-HT20 PSD - Ant 1 / Ant 0 + 1

## Channel 01 (2412MHz)



## Channel 06 (2437MHz)

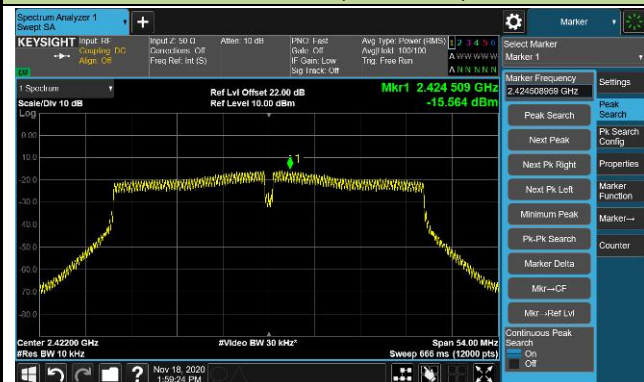


## Channel 11 (2462MHz)



## 802.11n-HT40 PSD - Ant 1 / Ant 0 + 1

## Channel 03 (2422MHz)



## Channel 06 (2437MHz)



## Channel 09 (2452MHz)



## VHT20 PSD - Ant 1 / Ant 0 + 1

## Channel 01 (2412MHz)



## Channel 06 (2437MHz)



## Channel 11 (2462MHz)



## VHT40 PSD - Ant 1 / Ant 0 + 1

## Channel 03 (2422MHz)



## Channel 06 (2437MHz)



## Channel 09 (2452MHz)



## 802.11ax-HE20 PSD - Ant 1 / Ant 0 + 1

## Channel 01 (2412MHz)



## Channel 06 (2437MHz)



## Channel 11 (2462MHz)



## 802.11ax-HE40 PSD - Ant 1 / Ant 0 + 1

## Channel 03 (2422MHz)



## Channel 06 (2437MHz)



## Channel 09 (2452MHz)



## **6.5. Conducted Band Edge and Out-of-Band Emissions**

### **6.5.1. Test Limit**

The limit for out-of-band spurious emissions at the band edge is 30dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100 kHz bandwidth per the PSD procedure.

### **6.5.2. Test Procedure Used**

ANSI C63.10 Section 11.11

### **6.5.3. Test Setting**

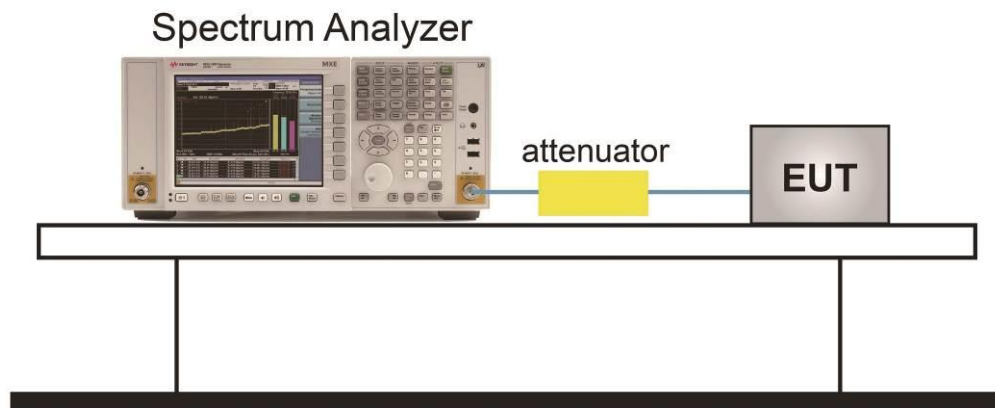
#### **Reference level measurement**

1. Set instrument center frequency to DTS channel center frequency
2. Set the span to  $\geq 1.5$  times the DTS bandwidth
3. Set the RBW = 100 kHz
4. Set the VBW  $\geq 3 \times$  RBW
5. Detector = peak
6. Sweep time = auto couple
7. Trace mode = max hold
8. Allow trace to fully stabilize

#### **Emission level measurement**

1. Set the center frequency and span to encompass frequency range to be measured
2. RBW = 100kHz
3. VBW = 300kHz
4. Detector = Peak
5. Trace mode = max hold
6. Sweep time = auto couple
7. The trace was allowed to stabilize

#### 6.5.4. Test Setup



### 6.5.5. Test Result

|               |                                               |           |            |
|---------------|-----------------------------------------------|-----------|------------|
| Product       | HAN Access Point, AP301                       | Test Site | SR2        |
| Test Engineer | Eric Lin                                      | Test Date | 2020/11/18 |
| Test item     | Conducted Band Edge and Out-of-Band Emissions |           |            |

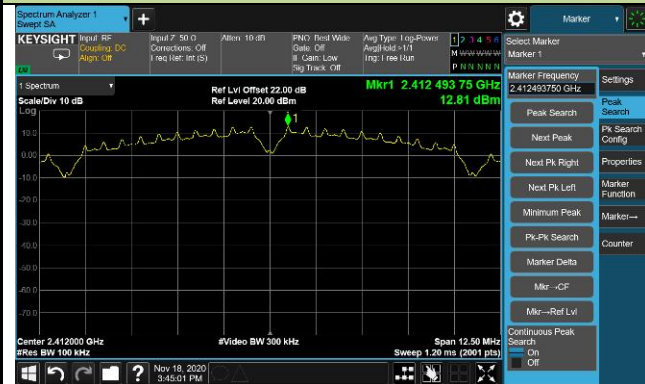
| Test Mode | Data Rate (Mbps) | Channel No. | Frequency (MHz) | Limit | Result |
|-----------|------------------|-------------|-----------------|-------|--------|
| 11b       | 1Mbps            | 01          | 2412            | 30dBc | Pass   |
| 11b       | 1Mbps            | 06          | 2437            | 30dBc | Pass   |
| 11b       | 1Mbps            | 11          | 2462            | 30dBc | Pass   |
| 11g       | 6Mbps            | 01          | 2412            | 30dBc | Pass   |
| 11g       | 6Mbps            | 06          | 2437            | 30dBc | Pass   |
| 11g       | 6Mbps            | 11          | 2462            | 30dBc | Pass   |
| 11n-HT20  | MCS0             | 01          | 2412            | 30dBc | Pass   |
| 11n-HT20  | MCS0             | 06          | 2437            | 30dBc | Pass   |
| 11n-HT20  | MCS0             | 11          | 2462            | 30dBc | Pass   |
| 11n-HT40  | MCS0             | 03          | 2422            | 30dBc | Pass   |
| 11n-HT40  | MCS0             | 06          | 2437            | 30dBc | Pass   |
| 11n-HT40  | MCS0             | 09          | 2452            | 30dBc | Pass   |
| VHT20     | MCS0             | 01          | 2412            | 30dBc | Pass   |
| VHT20     | MCS0             | 06          | 2437            | 30dBc | Pass   |
| VHT20     | MCS0             | 11          | 2462            | 30dBc | Pass   |
| VHT40     | MCS0             | 03          | 2422            | 30dBc | Pass   |
| VHT40     | MCS0             | 06          | 2437            | 30dBc | Pass   |
| VHT40     | MCS0             | 09          | 2452            | 30dBc | Pass   |
| 11ax-HE20 | MCS0             | 01          | 2412            | 30dBc | Pass   |
| 11ax-HE20 | MCS0             | 06          | 2437            | 30dBc | Pass   |
| 11ax-HE20 | MCS0             | 11          | 2462            | 30dBc | Pass   |
| 11ax-HE40 | MCS0             | 03          | 2422            | 30dBc | Pass   |
| 11ax-HE40 | MCS0             | 06          | 2437            | 30dBc | Pass   |
| 11ax-HE40 | MCS0             | 09          | 2452            | 30dBc | Pass   |

Note: The Data only show the max power Antenna Port in the test report.

## 802.11b Out-of-Band Emissions

### Channel 01 (2412MHz)

#### 100kHz PSD reference Level



#### Low Band Edge



#### Spurious Emission



### Channel 06 (2437MHz)

#### 100kHz PSD reference Level



#### Spurious Emission



## Channel 11 (2462MHz)

### 100kHz PSD reference Level



### High Band Edge



### Spurious Emission



## 802.11g Out-of-Band Emissions

## Channel 01 (2412MHz)

## 100kHz PSD reference Level



## Low Band Edge



## Spurious Emission



## Channel 06 (2437MHz)

## 100kHz PSD reference Level



## Spurious Emission



# Channel 11 (2462MHz)

## 100kHz PSD reference Level



## High Band Edge



## Spurious Emission

