# FCC RADIO TEST REPORT

| | | |
|---|---|---|
| **FCC ID** | **:** | **QYL9260NG** |
| **Equipment** | **:** | **WLAN module** |
| **Brand Name** | **:** | **Getac** |
| **Model Name** | **:** | **9260NGW** |
| **Applicant** | **:** | **Getac Technology Corporation.**<br>**5F., Building A, No. 209, Sec. 1, Nangang Rd.,**<br>**Nangang Dist., Taipei City 11568, Taiwan, R.O.C.** |
| **Standard** | **:** | **FCC Part 15 Subpart E §15.407** |

**The product was received on Apr. 09, 2019 and testing was started from Apr. 19, 2019 and completed on May 06, 2019. We, SPORTON INTERNATIONAL INC., EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.**

**The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.**

**The test results in this partial report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.**

**Approved by: Jones Tsai**

***SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory***
*No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)*

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# History of this test report

| Report No. | Version | Description | Issued Date |
|---|---|---|---|
| FR391803-53D | 01 | Initial issue of report | May 29, 2019 |
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# Summary of Test Result

| Report Clause | Ref Std. Clause | Test Items | Result (PASS/FAIL) |
|---|---|---|---|
| 3.1 | 15.407(a) | Maximum Conducted Output Power | Pass |
| 3.2 | 15.407(b) | Unwanted Emissions | Pass |
| 3.3 | 15.203<br>15.407(a) | Antenna Requirement | Pass |

| **Declaration of Conformity:** |
|---|
| The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers. |
| **Comments and Explanations:** |
| The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification. |

**Reviewed by: Wii Chang**
**Report Producer: Aileen Huang**

# 1 General Description

## 1.1 Product Feature of Equipment Under Test

Bluetooth, Wi-Fi 2.4GHz 802.11b/g/n, and Wi-Fi 5GHz 802.11a/n/ac

| Product Specification subjective to this standard | |
|---|---|
| **Antenna Type** | WLAN: PIFA Antenna<br>Bluetooth: PIFA Antenna |

The product was installed into Tablet (Brand Name: Getac, HVIN: F110, F110_G5, F110-Ex) during test, which can be referred the following information:

| Report Sample | Sample 1 | Sample 2 | Sample 3 | Sample 4 | Sample 5 |
|---|---|---|---|---|---|
| **F110 SKU** | **SKU D** | **SKU E** | **SKU F** | **SKU G** | **SKU F** |
| **CPU** | I5-8265U | i7-8565U | i7-8565U | I5-8365U | i7-8565U |
| **DDR** | 4G | 8G | 16G | 16G | 16G |
| **SSD** | 128GB | 256GB | 512GB | 1TB | 512GB |
| **Panel** | AUO<br>HD B116XAN05 | FHD,KD116N11-30 NP-A9 | FHD,KD116N11-30 NP-A9 | FHD,KD116N11-30 NP-A9 | FHD,KD116N11-30 NP-A9 |
| **Digitizer** | Getac | Getac | Getac | not Support | Getac |
| **Option Bay** | RS232+LAN | LAN | BCR | LAN | BCR |
| **Expansion Bay** | SMART CARD or SSD Easily removable + Smart Card | HID RFID | Finger print | not Support | HID RFID |
| **WLAN/BT** | Support(9260NGW) | Support(9260NGW) | Support(9260NGW) | Support(9260NGW) | Support(9260NGW) |
| **WWAN** | not Support | Support(EM7455) | Support(EM7511) | not Support | Support(EM7455) |
| **GPS** | GPS(MC-1010) | GPS(MC-1010) | GPS(MC-1010) | GPS(MC-1010) | GPS(MC-1010) |
| **Webcam FHD** | Support | not Support | not Support | Support | not Support |
| **Rear 8M Camera** | Support | Support | Support | Support | Support |
| **IR Webcam** | not Support | Support | Support | not Support | Support |
| **RFID** | not Support | Support(OMNIKEY 5127 CK MINI) | not Support | not Support | Support(OMNIKEY 5127 CK MINI) |
| **Default IO (USB 3.0 port)** | Support | Support | Support | Support | Support |
| **Default IO (HDMI)** | Support | Support | Support | not Support | Support |
| **Default IO (Audio)** | Support | Support | Support | Support | Support |
| **Default IO (USB3.1 Type-C Gen 1)** | not Support | not Support | not Support | Support | not Support |
| **Explosion-proof cover** | not Support | not Support | not Support | not Support | Support |

## 1.2 Modification of EUT

No modifications are made to the EUT during all test items.

## 1.3 Testing Location

| | |
|---|---|
| **Test Site** | SPORTON INTERNATIONAL INC. |
| **Test Site Location** | No.52, Huaya 1st Rd., Guishan Dist.,<br>Taoyuan City, Taiwan (R.O.C.)<br>TEL: +886-3-327-3456<br>FAX: +886-3-328-4978 |
| **Test Site No.** | **Sporton Site No.** |
| | TH05-HY |

**Note:** The test site complies with ANSI C63.4 2014 requirement.

| | |
|---|---|
| **Test Site** | SPORTON INTERNATIONAL INC. |
| **Test Site Location** | No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist.,<br>Taoyuan City, Taiwan (R.O.C.)<br>TEL: +886-3-327-0868<br>FAX: +886-3-327-0855 |
| **Test Site No.** | **Sporton Site No.** |
| | 03CH15-HY |

**Note:** The test site complies with ANSI C63.4 2014 requirement.

FCC designation No.: TW1190 and TW0007

## 1.4 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15 Subpart E
- FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
- FCC KDB 414788 D01 Radiated Test Site v01r01.
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ANSI C63.10-2013

**Remark:**

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

# 2 Test Configuration of Equipment Under Test

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Z plane) were recorded in this report.

## 2.1 Carrier Frequency and Channel

| Frequency Band | Channel | Freq. (MHz) | Channel | Freq. (MHz) |
|---|---|---|---|---|
| 5150-5250 MHz Band 1 (U-NII-1) | 36 | 5180 | 44 | 5220 |
| | 38* | 5190 | 46* | 5230 |
| | 40 | 5200 | 48 | 5240 |
| | 42# | 5210 | | |

| Frequency Band | Channel | Freq. (MHz) | Channel | Freq. (MHz) |
|---|---|---|---|---|
| 5250-5350 MHz Band 2 (U-NII-2A) | 52 | 5260 | 60 | 5300 |
| | 54* | 5270 | 62* | 5310 |
| | 56 | 5280 | 64 | 5320 |
| | 58# | 5290 | | |

| Frequency Band | Channel | Freq. (MHz) | Channel | Freq. (MHz) |
|---|---|---|---|---|
| 5470-5725 MHz Band 3 (U-NII-2C) | 100 | 5500 | 112 | 5560 |
| | 102* | 5510 | 116 | 5580 |
| | 104 | 5520 | 132 | 5660 |
| | 106# | 5530 | 134* | 5670 |
| | 108 | 5540 | 136 | 5680 |
| | 110* | 5550 | 140 | 5700 |

| Frequency Band | Channel | Freq. (MHz) | Channel | Freq. (MHz) |
|---|---|---|---|---|
| TDWR Channel | 118* | 5590 | 124 | 5620 |
| | 120 | 5600 | 126* | 5630 |
| | 122# | 5610 | 128 | 5640 |

| Frequency Band | Channel | Freq. (MHz) | Channel | Freq. (MHz) |
|---|---|---|---|---|
| Straddle Channel | 138# | 5690 | 144 | 5720 |
| | 142* | 5710 | | |

| Frequency Band | Channel | Freq. (MHz) | Channel | Freq. (MHz) |
|---|---|---|---|---|
| 5150-5725 MHz 802.11ac VH160 | 50 | 5250 | 114 | 5570 |

**Note:**

1. The above Frequency and Channel in "*" were 802.11n HT40 and 802.11ac VHT40.
2. The above Frequency and Channel in "#" were 802.11ac VHT80.

## 2.2 Test Mode

**Final test modes are considering the modulation and worse data rates as below table.**

**Single Mode**

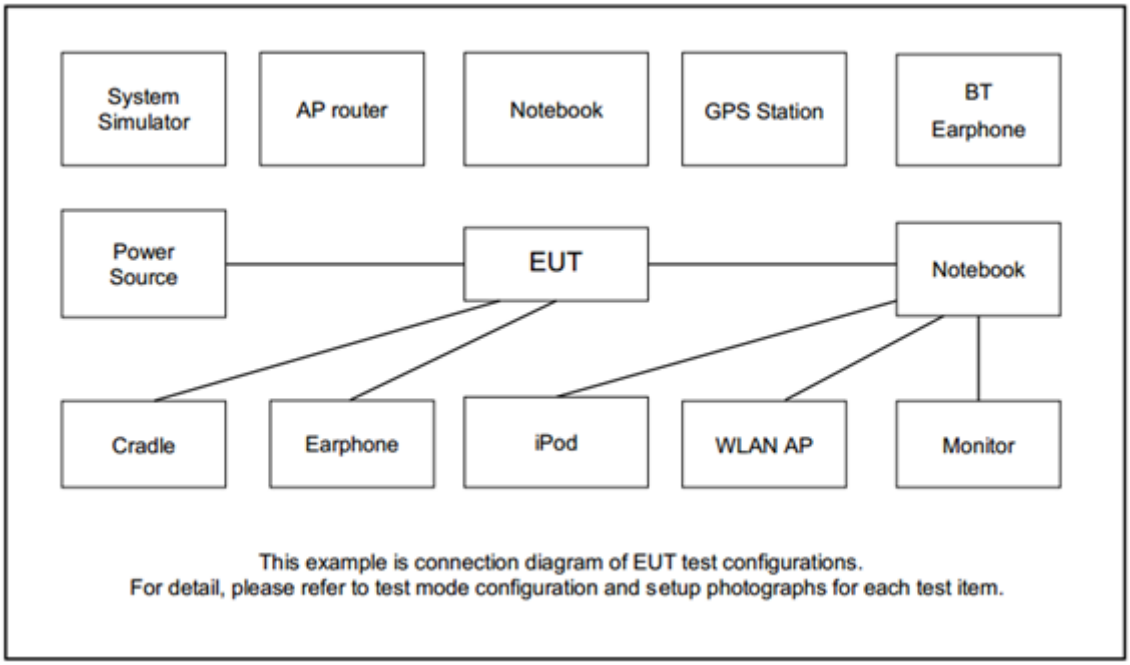
| Modulation | Data Rate |
|---|---|
| 802.11n HT20 | MCS0 |

| Ch. # | | Band II：5250-5350 MHz |
|---|---|---|
| | | 802.11n HT20 |
| L | Low | 52 |

**Remark:**

1. For Radiated Test Cases, the tests were performed with Sample 3.
2. The tests were performed with Battery (Model: BP3S1P2290 A) and Adapter (Model: FSP065-RBBN3).

## 2.3 Connection Diagram of Test System




## 2.4 Support Unit used in test configuration and system

| Item | Equipment | Trade Name | Model Name | FCC ID | Data Cable | Power Cord |
|---|---|---|---|---|---|---|
| 1. | iPod Earphone | Apple | N/A | Verification | Unshielded, 1.0 m | N/A |

## 2.5 EUT Operation Test Setup

The RF test items, utility “DRTU” was installed in Tablet which was programmed in order to make the EUT get into the engineering modes to provide channel selection, power level, data rate and the application type and for continuous transmitting signals.

# 3 Test Result

## 3.1 Maximum Conducted Output Power Measurement

### 3.1.1 Limit of Maximum Conducted Output Power

**<FCC 14-30 CFR 15.407>**

**For the 5.15–5.25 GHz bands:**

■ For mobile and portable client devices in the 5.15–5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW. For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

**For the 5.25–5.725 GHz bands:**

■ The maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz.

For Straddle Channel, according to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, if the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Note that U-NII-2 band, devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

### 3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

### 3.1.3 Test Procedures

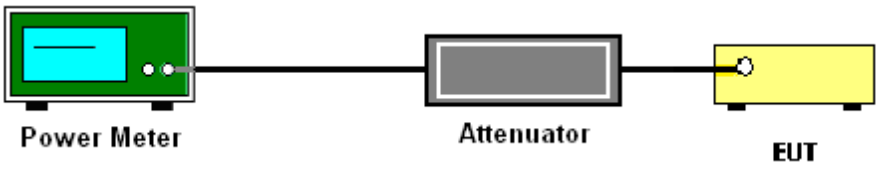
The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

Method PM (Measurement using an RF average power meter):

1. Measurement is performed using a wideband RF power meter.
2. The EUT is configured to transmit continuously with a consistent duty cycle at its maximum power control level.
3. Measure the average power of the transmitter, and the average power is corrected with duty factor, 10 log(1/x), where x is the duty cycle.

For Straddle Channel, according to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, if the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

### 3.1.4 Test Setup




### 3.1.5 Test Result of Maximum Conducted Output Power

Please refer to Appendix A.

## 3.2 Unwanted Emissions Measurement

This section is to measure unwanted emissions through radiated measurement for band edge spurious emissions and out of band emissions measurement.

### 3.2.1 Limit of Unwanted Emissions

(1) For transmitters operating in the 5150-5250 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of –27dBm/MHz.

For transmitters operating in the 5250-5350 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5250-5350 MHz band that generate emissions in the 5150-5250 MHz band must meet all applicable technical requirements for operation in the 5150-5250 MHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5150-5250 MHz band.

For transmitters operating in the 5470-5600 MHz and 5650-5725MHz band: all emissions outside of the 5470-5600 MHz and 5650-5725MHz band shall not exceed an EIRP of -27 dBm/MHz.

(2) Unwanted spurious emissions fallen in restricted bands shall comply with the general field strength limits as below table:

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

**Note:** The following formula is used to convert the EIRP to field strength.

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

| EIRP (dBm) | Field Strength at 3m (dBμV/m) |
|---|---|
| - 27 | 68.3 |

(3) KDB789033 D02 v02r01 G)2)c)

(i) Section 15.407(b)(1) to (b)(3) specify the unwanted emission limits for the U-NII-1 and U-NII-2 bands. As specified, emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz.3

(ii) Section 15.407(b)(4) specifies the unwanted emission limit for the U-NII-3 band. A band emissions mask is specified in Section 15.407(b)(4)(i). The emission limits are in terms of a Peak detector. An alternative to the band emissions mask is specified in Section 15.407(b)(4)(ii). The alternative limits are based on the highest antenna gain specified in the filing. There are also marketing and importation restrictions for the devices using the alternative limit.[4]

**Note 3:** An out-of-band emission that complies with both the average and peak limits of Section 15.209 is not required to satisfy the -27 dBm/MHz peak emission limit.

**Note 4:** Only devices with antenna gains of 10 dBi or less may be approved using the emission limits specified in Section 15.247(d) till March 2, 2018; all other devices operating in this band must use the mask specified in Section 15.407(b)(4)(i).

### 3.2.2 Measuring Instruments

See list of measuring equipment of this test report.

### 3.2.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

Section G) Unwanted emissions measurement.

(1) Procedure for Unwanted Emissions Measurements Below 1000MHz

- RBW = 120 kHz
- VBW = 300 kHz
- Detector = Peak
- Trace mode = max hold

(2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz

- RBW = 1 MHz
- VBW ≥ 3 MHz
- Detector = Peak
- Sweep time = auto
- Trace mode = max hold

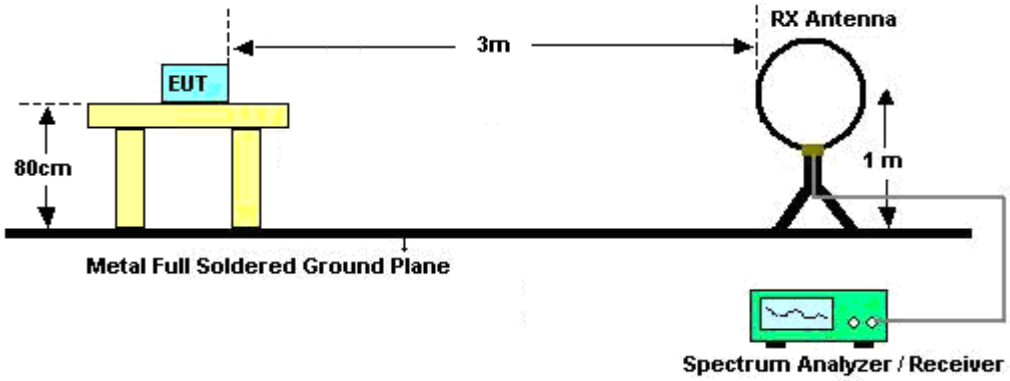
(3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz

- RBW = 1 MHz
- VBW = 10 Hz, when duty cycle is no less than 98 percent.
- VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

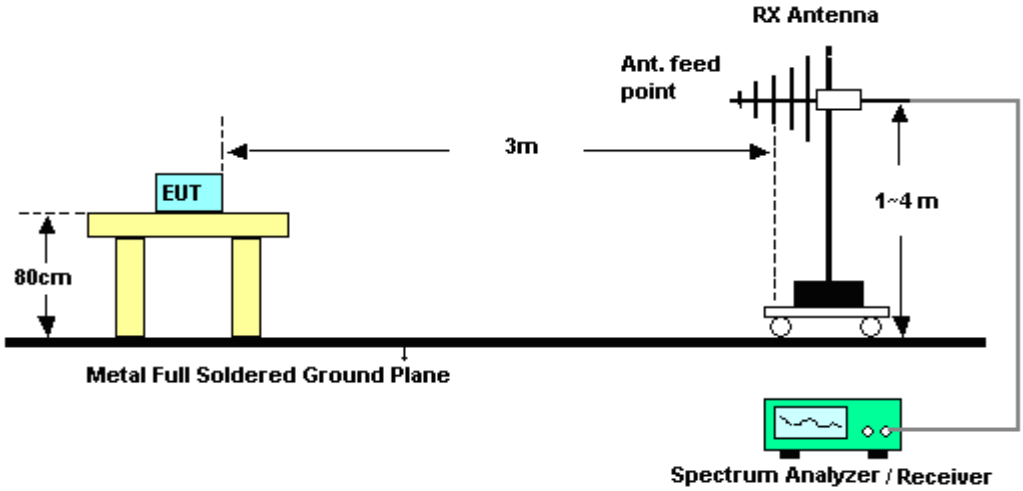
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

### 3.2.4 Test Setup

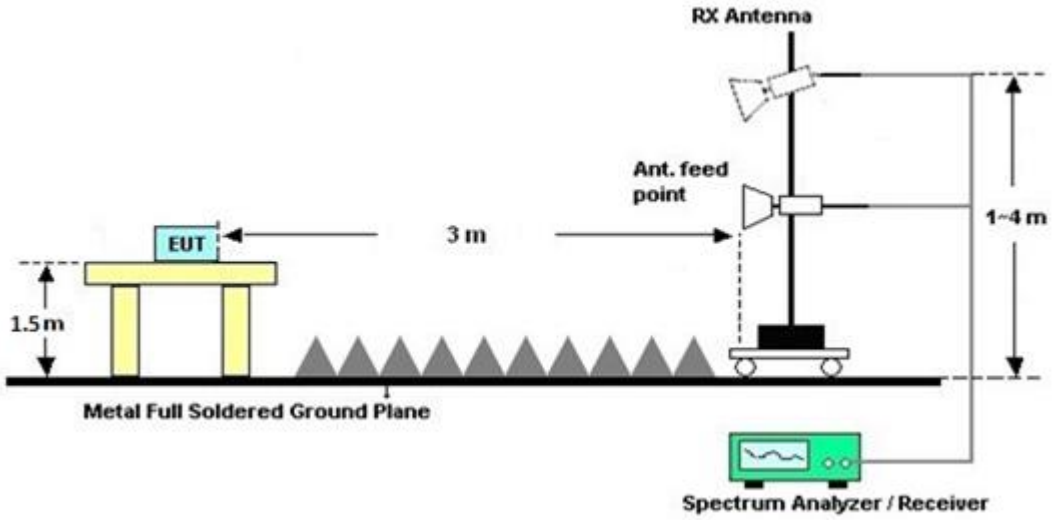
**For radiated emissions below 30MHz**




**For radiated emissions from 30MHz to 1GHz**




**For radiated emissions above 1GHz**



### 3.2.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

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

There is a comparison data of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.

### 3.2.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix B and C.

### 3.2.7 Duty Cycle

Please refer to Appendix D.

### 3.2.8 Test Result of Radiated Spurious Emissions (30MHz ~ 10th Harmonic)

Please refer to Appendix B and C.

# 3.3 Antenna Requirements

## 3.3.1 Standard Applicable

If transmitting antenna directional gain is greater than 6 dBi, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

## 3.3.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

## 3.3.3 Antenna Gain

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

Directional gain = GANT + Array Gain, where Array Gain is as follows.

For power spectral density (PSD) measurements on all devices,

Array Gain = 10 log(NANT/NSS=1) dB.

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4.

Directional gain may be calculated by using the formulas applicable to equal gain antennas with GANT set equal to the gain of the antenna having the highest gain;

The EUT supports CDD mode.

For power, the directional gain GANT is set equal to the antenna having the highest gain, i.e., F)2)f)i).

For PSD, the directional gain calculation is following F)2)f)ii) of KDB 662911 D01 v02r01.

The power and PSD limit should be modified if the directional gain of EUT is over 6 dBi,

The directional gain “DG” is calculated as following table.

**<CDD Modes>**

| | Ant. 1 (dBi) | Ant. 2 (dBi) | DG for Power (dBi) | Power Limit Reduction (dB) |
|---|---|---|---|---|
| **Band I** | 3.55 | 0.58 | 3.55 | 0.00 |
| **Band II** | 3.47 | 0.58 | 3.47 | 0.00 |
| **Band III** | 3.14 | 0.80 | 3.14 | 0.00 |

*Power limit reduction = Composite gain – 6dBi, ( min = 0 )*

*PSD limit reduction = Composite gain + PSD Array gain – 6dBi, ( min = 0 )*

# 4 List of Measuring Equipment

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Test Date | Due Date | Remark |
|---|---|---|---|---|---|---|---|---|
| Power Sensor | DARE | RadiPower | 15I00041SNO09 | 10MHz~6GHz | May 07, 2018 | Apr. 19, 2019~ Apr. 30, 2019 | May 06, 2019 | Conducted (TH05-HY) |
| Spectrum Analyzer | Rohde & Schwarz | FSP40 | 100057 | 9kHz-40GHz | Nov. 21, 2018 | Apr. 19, 2019~ Apr. 30, 2019 | Nov. 20, 2019 | Conducted (TH05-HY) |
| Switch Box & RF Cable | EM | EMSW18 | SW1070903 | N/A | Dec. 19, 2018 | Apr. 19, 2019~ Apr. 30, 2019 | Dec. 18, 2019 | Conducted (TH05-HY) |
| Loop Antenna | Rohde & Schwarz | HFH2-Z2 | 100488 | 9 kHz~30 MHz | Jan. 07, 2019 | May 04, 2019~ May 06, 2019 | Jan. 06, 2020 | Radiation (03CH15-HY) |
| Bilog Antenna | TESEQ | CBL6111D&00802N1D01N-06 | 47020&06 | 30MHz to 1GHz | Oct. 13, 2018 | May 04, 2019~ May 06, 2019 | Oct. 12, 2019 | Radiation (03CH15-HY) |
| Horn Antenna | SCHWARZBECK | BBHA 9120D | 9120D-1620 | 1G~18GHz | Oct. 17, 2018 | May 04, 2019~ May 06, 2019 | Oct. 16, 2019 | Radiation (03CH15-HY) |
| SHF-EHF Horn Antenna | SCHWARZBECK | BBHA 9170 | BBHA9170576 | 18GHz ~ 40GHz | May 08, 2018 | May 04, 2019~ May 06, 2019 | May 07, 2019 | Radiation (03CH15-HY) |
| Amplifier | SONOMA | 310N | 363440 | 9kHz~1GHz | Dec. 28, 2018 | May 04, 2019~ May 06, 2019 | Dec. 27, 2019 | Radiation (03CH15-HY) |
| Preamplifier | Jet-Power | JAP00101800-30-10P | 160118550004 | 1GHz~18GHz | Apr. 25, 2019 | May 04, 2019~ May 06, 2019 | Apr. 24, 2020 | Radiation (03CH15-HY) |
| Preamplifier | Keysight | 83017A | MY53270195 | 1GHz~26.5GHz | Aug. 23, 2018 | May 04, 2019~ May 06, 2019 | Aug. 22, 2019 | Radiation (03CH15-HY) |
| Preamplifier | EMEC | EM18G40G | 060715 | 18GHz ~ 40GHz | Dec. 06, 2018 | May 04, 2019~ May 06, 2019 | Dec. 05, 2019 | Radiation (03CH15-HY) |
| Spectrum Analyzer | Agilent | N9010A | MY53470118 | 10Hz~44GHz | Apr. 18, 2019 | May 04, 2019~ May 06, 2019 | Apr. 17, 2020 | Radiation (03CH15-HY) |
| Antenna Mast | ChainTek | MBS-520-1 | N/A | 1m~4m | N/A | May 04, 2019~ May 06, 2019 | N/A | Radiation (03CH15-HY) |
| Turn Table | ChainTek | T-200-S-1 | N/A | 0~360 Degree | N/A | May 04, 2019~ May 06, 2019 | N/A | Radiation (03CH15-HY) |
| Software | Audix | E3 6.2009-8-24 | RK-000451 | N/A | N/A | May 04, 2019~ May 06, 2019 | N/A | Radiation (03CH15-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 104 | MY36980/4 | 30M-18G | Apr. 15, 2019 | May 04, 2019~ May 06, 2019 | Apr. 14, 2020 | Radiation (03CH15-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 104 | MY9838/4 | 30M-18G | Apr. 15, 2019 | May 04, 2019~ May 06, 2019 | Apr. 14, 2020 | Radiation (03CH15-HY) |
| RF Cable | HUBER + SUHNER | MTJ | 000000-MT18A-100D3210 | 30M-18G | Apr. 15, 2019 | May 04, 2019~ May 06, 2019 | Apr. 14, 2020 | Radiation (03CH15-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 102 | MY2859/2 | 30MHz-40GHz | Mar. 13, 2019 | May 04, 2019~ May 06, 2019 | Mar. 12, 2020 | Radiation (03CH15-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 102 | MY4274/2 | 30MHz-40GHz | Mar. 13, 2019 | May 04, 2019~ May 06, 2019 | Mar. 12, 2020 | Radiation (03CH15-HY) |
| Filter | Wainwright | WHKX8-5872.5-6750-18000-40ST | SN3 | 6.75 GHz Highpass | Sep. 16, 2018 | May 04, 2019~ May 06, 2019 | Sep. 15, 2019 | Radiation (03CH15-HY) |
| Filter | Wainwright | WLK4-1000-1530-8000-40SS | SN11 | 1G Low Pass | Sep. 16, 2018 | May 04, 2019~ May 06, 2019 | Sep. 15, 2019 | Radiation (03CH15-HY) |

# 5 Uncertainty of Evaluation

**Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)**

| | |
|---|---|
| **Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))** | **5.2** |

**Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)**

| | |
|---|---|
| **Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))** | **5.5** |

**Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)**

| | |
|---|---|
| **Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))** | **5.2** |

# Appendix A. Test Result of Conducted Test Items

| | | | | |
|---|---|---|---|---|
| Test Engineer: | Luffy Lin | Temperature: | 21~25 | °C |
| Test Date: | 2019/04/19 ~ 2019/04/30 | Relative Humidity: | 51~54 | % |

## ***TEST RESULTS DATA***
## ***Average Power Table***

| FCC Band I | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Average Conducted Power (dBm) | | | FCC Conducted Power Limit (dBm) | | DG (dBi) | | | Pass/Fail |
| | | | | | Ant 1 | Ant 2 | SUM | Ant 1 | Ant 2 | Ant 1 | Ant 2 | | |
| 11a | 6Mbps | 1 | 36 | 5180 | 15.80 | 15.80 | | 24.00 | 24.00 | 3.55 | 0.58 | | Pass |
| 11a | 6Mbps | 1 | 44 | 5220 | 15.90 | 15.80 | | 24.00 | 24.00 | 3.55 | 0.58 | | Pass |
| 11a | 6Mbps | 1 | 48 | 5240 | 15.80 | 15.80 | | 24.00 | 24.00 | 3.55 | 0.58 | | Pass |
| HT20 | MCS0 | 1 | 36 | 5180 | 15.90 | 15.90 | | 24.00 | 24.00 | 3.55 | 0.58 | | Pass |
| HT20 | MCS0 | 1 | 44 | 5220 | 15.90 | 15.90 | | 24.00 | 24.00 | 3.55 | 0.58 | | Pass |
| HT20 | MCS0 | 1 | 48 | 5240 | 15.80 | 15.90 | | 24.00 | 24.00 | 3.55 | 0.58 | | Pass |
| HT40 | MCS0 | 1 | 38 | 5190 | 15.90 | 15.90 | | 24.00 | 24.00 | 3.55 | 0.58 | | Pass |
| HT40 | MCS0 | 1 | 46 | 5230 | 15.90 | 15.80 | | 24.00 | 24.00 | 3.55 | 0.58 | | Pass |
| VHT20 | MCS0 | 1 | 36 | 5180 | 15.80 | 15.80 | | 24.00 | 24.00 | 3.55 | 0.58 | | Pass |
| VHT20 | MCS0 | 1 | 44 | 5220 | 15.80 | 15.80 | | 24.00 | 24.00 | 3.55 | 0.58 | | Pass |
| VHT20 | MCS0 | 1 | 48 | 5240 | 15.70 | 15.80 | | 24.00 | 24.00 | 3.55 | 0.58 | | Pass |
| VHT40 | MCS0 | 1 | 38 | 5190 | 15.80 | 15.80 | | 24.00 | 24.00 | 3.55 | 0.58 | | Pass |
| VHT40 | MCS0 | 1 | 46 | 5230 | 15.70 | 15.70 | | 24.00 | 24.00 | 3.55 | 0.58 | | Pass |
| VHT80 | MCS0 | 1 | 42 | 5210 | 15.80 | 15.80 | | 24.00 | 24.00 | 3.55 | 0.58 | | Pass |
| VHT160 | MCS0 | 1 | 50 | 5250 | 13.40 | 13.40 | | 24.00 | 24.00 | 3.55 | 0.58 | | Pass |
| HT20 | MCS0 | 2 | 36 | 5180 | 13.20 | 12.70 | 15.97 | 24.00 | | 3.55 | | | Pass |
| HT20 | MCS0 | 2 | 44 | 5220 | 13.20 | 12.70 | 15.97 | 24.00 | | 3.55 | | | Pass |
| HT20 | MCS0 | 2 | 48 | 5240 | 13.20 | 12.70 | 15.97 | 24.00 | | 3.55 | | | Pass |
| HT40 | MCS0 | 2 | 38 | 5190 | 13.30 | 12.60 | 15.97 | 24.00 | | 3.55 | | | Pass |
| HT40 | MCS0 | 2 | 46 | 5230 | 13.20 | 12.60 | 15.92 | 24.00 | | 3.55 | | | Pass |
| VHT20 | MCS0 | 2 | 36 | 5180 | 13.10 | 12.60 | 15.87 | 24.00 | | 3.55 | | | Pass |
| VHT20 | MCS0 | 2 | 44 | 5220 | 13.10 | 12.60 | 15.87 | 24.00 | | 3.55 | | | Pass |
| VHT20 | MCS0 | 2 | 48 | 5240 | 13.10 | 12.60 | 15.87 | 24.00 | | 3.55 | | | Pass |
| VHT40 | MCS0 | 2 | 38 | 5190 | 13.20 | 12.50 | 15.87 | 24.00 | | 3.55 | | | Pass |
| VHT40 | MCS0 | 2 | 46 | 5230 | 13.10 | 12.50 | 15.82 | 24.00 | | 3.55 | | | Pass |
| VHT80 | MCS0 | 2 | 42 | 5210 | 13.10 | 12.70 | 15.91 | 24.00 | | 3.55 | | | Pass |
| VHT160 | MCS0 | 2 | 50 | 5250 | 10.80 | 10.10 | 13.47 | 24.00 | | 3.55 | | | Pass |

## ***TEST RESULTS DATA***
## ***Average Power Table***

| FCC Band II | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Average Conducted Power (dBm) | | | FCC Conducted Power Limit (dBm) | | DG (dBi) | | EIRP Power Limit (dBm) | Pass/Fail |
| | | | | | Ant 1 | Ant 2 | SUM | Ant 1 | Ant 2 | Ant 1 | Ant 2 | | |
| 11a | 6Mbps | 1 | 52 | 5260 | 15.90 | 15.90 | | 23.98 | 23.98 | 3.47 | 0.58 | 30 | Pass |
| 11a | 6Mbps | 1 | 60 | 5300 | 15.90 | 15.90 | | 23.98 | 23.98 | 3.47 | 0.58 | 30 | Pass |
| 11a | 6Mbps | 1 | 64 | 5320 | 15.80 | 15.90 | | 23.98 | 23.98 | 3.47 | 0.58 | 30 | Pass |
| HT20 | MCS0 | 1 | 52 | 5260 | 15.90 | 15.80 | | 23.98 | 23.98 | 3.47 | 0.58 | 30 | Pass |
| HT20 | MCS0 | 1 | 60 | 5300 | 15.90 | 15.90 | | 23.98 | 23.98 | 3.47 | 0.58 | 30 | Pass |
| HT20 | MCS0 | 1 | 64 | 5320 | 15.80 | 15.90 | | 23.98 | 23.98 | 3.47 | 0.58 | 30 | Pass |
| HT40 | MCS0 | 1 | 54 | 5270 | 15.90 | 15.90 | | 23.98 | 23.98 | 3.47 | 0.58 | 30 | Pass |
| HT40 | MCS0 | 1 | 62 | 5310 | 15.40 | 15.40 | | 23.98 | 23.98 | 3.47 | 0.58 | 30 | Pass |
| VHT20 | MCS0 | 1 | 52 | 5260 | 15.80 | 15.60 | | 23.98 | 23.98 | 3.47 | 0.58 | 30 | Pass |
| VHT20 | MCS0 | 1 | 60 | 5300 | 15.80 | 15.70 | | 23.98 | 23.98 | 3.47 | 0.58 | 30 | Pass |
| VHT20 | MCS0 | 1 | 64 | 5320 | 15.70 | 15.80 | | 23.98 | 23.98 | 3.47 | 0.58 | 30 | Pass |
| VHT40 | MCS0 | 1 | 54 | 5270 | 15.80 | 15.80 | | 23.98 | 23.98 | 3.47 | 0.58 | 30 | Pass |
| VHT40 | MCS0 | 1 | 62 | 5310 | 15.30 | 15.30 | | 23.98 | 23.98 | 3.47 | 0.58 | 30 | Pass |
| VHT80 | MCS0 | 1 | 58 | 5290 | 15.90 | 15.80 | | 23.98 | 23.98 | 3.47 | 0.58 | 30 | Pass |
| HT20 | MCS0 | 2 | 52 | 5260 | 13.30 | 12.60 | 15.97 | 23.98 | | 3.47 | | 30 | Pass |
| HT20 | MCS0 | 2 | 60 | 5300 | 13.10 | 12.80 | 15.96 | 23.98 | | 3.47 | | 30 | Pass |
| HT20 | MCS0 | 2 | 64 | 5320 | 13.20 | 12.70 | 15.97 | 23.98 | | 3.47 | | 30 | Pass |
| HT40 | MCS0 | 2 | 54 | 5270 | 13.30 | 12.60 | 15.97 | 23.98 | | 3.47 | | 30 | Pass |
| HT40 | MCS0 | 2 | 62 | 5310 | 12.60 | 12.30 | 15.46 | 23.98 | | 3.47 | | 30 | Pass |
| VHT20 | MCS0 | 2 | 52 | 5260 | 13.20 | 12.50 | 15.87 | 23.98 | | 3.47 | | 30 | Pass |
| VHT20 | MCS0 | 2 | 60 | 5300 | 13.00 | 12.70 | 15.86 | 23.98 | | 3.47 | | 30 | Pass |
| VHT20 | MCS0 | 2 | 64 | 5320 | 13.10 | 12.60 | 15.87 | 23.98 | | 3.47 | | 30 | Pass |
| VHT40 | MCS0 | 2 | 54 | 5270 | 13.20 | 12.50 | 15.87 | 23.98 | | 3.47 | | 30 | Pass |
| VHT40 | MCS0 | 2 | 62 | 5310 | 12.50 | 12.20 | 15.36 | 23.98 | | 3.47 | | 30 | Pass |
| VHT80 | MCS0 | 2 | 58 | 5290 | 13.30 | 12.60 | 15.97 | 23.98 | | 3.47 | | 30 | Pass |

## ***TEST RESULTS DATA***
## ***Average Power Table***

| FCC Band III | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mod. | Data Rate | NTX | CH. | Freq. (MHz) | Average Conducted Power (dBm) | | | FCC Conducted Power Limit (dBm) | | DG (dBi) | | EIRP Power Limit (dBm) | Pass/Fail |
| | | | | | Ant 1 | Ant 2 | SUM | Ant 1 | Ant 2 | Ant 1 | Ant 2 | | |
| 11a | 6Mbps | 1 | 100 | 5500 | 15.90 | 15.90 | | 23.98 | 23.98 | 3.14 | 0.80 | 30 | Pass |
| 11a | 6Mbps | 1 | 116 | 5580 | 15.80 | 15.90 | | 23.98 | 23.98 | 3.14 | 0.80 | 30 | Pass |
| 11a | 6Mbps | 1 | 140 | 5700 | 15.60 | 15.80 | | 23.98 | 23.98 | 3.14 | 0.80 | 30 | Pass |
| HT20 | MCS0 | 1 | 100 | 5500 | 15.90 | 15.90 | | 23.98 | 23.98 | 3.14 | 0.80 | 30 | Pass |
| HT20 | MCS0 | 1 | 116 | 5580 | 15.80 | 15.90 | | 23.98 | 23.98 | 3.14 | 0.80 | 30 | Pass |
| HT20 | MCS0 | 1 | 140 | 5700 | 15.70 | 15.80 | | 23.98 | 23.98 | 3.14 | 0.80 | 30 | Pass |
| HT20 | MCS0 | 1 | 144 | 5720 | 15.80 | 15.70 | | 23.98 | 23.98 | 3.14 | 0.80 | 30 | Pass |
| HT40 | MCS0 | 1 | 102 | 5510 | 15.90 | 15.80 | | 23.98 | 23.98 | 3.14 | 0.80 | 30 | Pass |
| HT40 | MCS0 | 1 | 110 | 5550 | 15.90 | 15.90 | | 23.98 | 23.98 | 3.14 | 0.80 | 30 | Pass |
| HT40 | MCS0 | 1 | 134 | 5670 | 15.90 | 15.80 | | 23.98 | 23.98 | 3.14 | 0.80 | 30 | Pass |
| HT40 | MCS0 | 1 | 142 | 5710 | 15.80 | 15.90 | | 23.98 | 23.98 | 3.14 | 0.80 | 30 | Pass |
| VHT20 | MCS0 | 1 | 100 | 5500 | 15.80 | 15.80 | | 23.98 | 23.98 | 3.14 | 0.80 | 30 | Pass |
| VHT20 | MCS0 | 1 | 116 | 5580 | 15.70 | 15.80 | | 23.98 | 23.98 | 3.14 | 0.80 | 30 | Pass |
| VHT20 | MCS0 | 1 | 140 | 5700 | 15.60 | 15.60 | | 23.98 | 23.98 | 3.14 | 0.80 | 30 | Pass |
| VHT20 | MCS0 | 1 | 144 | 5720 | 15.70 | 15.60 | | 23.98 | 23.98 | 3.14 | 0.80 | 30 | Pass |
| VHT40 | MCS0 | 1 | 102 | 5510 | 15.80 | 15.70 | | 23.98 | 23.98 | 3.14 | 0.80 | 30 | Pass |
| VHT40 | MCS0 | 1 | 110 | 5550 | 15.70 | 15.70 | | 23.98 | 23.98 | 3.14 | 0.80 | 30 | Pass |
| VHT40 | MCS0 | 1 | 134 | 5670 | 15.80 | 15.70 | | 23.98 | 23.98 | 3.14 | 0.80 | 30 | Pass |
| VHT40 | MCS0 | 1 | 142 | 5710 | 15.70 | 15.80 | | 23.98 | 23.98 | 3.14 | 0.80 | 30 | Pass |
| VHT80 | MCS0 | 1 | 106 | 5530 | 15.80 | 15.90 | | 23.98 | 23.98 | 3.14 | 0.80 | 30 | Pass |
| VHT80 | MCS0 | 1 | 122 | 5610 | 15.80 | 15.80 | | 23.98 | 23.98 | 3.14 | 0.80 | 30 | Pass |
| VHT80 | MCS0 | 1 | 138 | 5690 | 15.80 | 15.80 | | 23.98 | 23.98 | 3.14 | 0.80 | 30 | Pass |
| VHT160 | MCS0 | 1 | 114 | 5570 | 13.40 | 13.30 | | 23.98 | 23.98 | 3.14 | 0.80 | 30 | Pass |
| HT20 | MCS0 | 2 | 100 | 5500 | 13.20 | 12.70 | 15.97 | 23.98 | | 3.14 | | 30 | Pass |
| HT20 | MCS0 | 2 | 116 | 5580 | 12.90 | 13.00 | 15.96 | 23.98 | | 3.14 | | 30 | Pass |
| HT20 | MCS0 | 2 | 140 | 5700 | 13.00 | 12.90 | 15.96 | 23.98 | | 3.14 | | 30 | Pass |
| HT20 | MCS0 | 2 | 144 | 5720 | 13.20 | 12.90 | 16.06 | 23.98 | | 3.14 | | 30 | Pass |
| HT40 | MCS0 | 2 | 102 | 5510 | 13.20 | 12.70 | 15.97 | 23.98 | | 3.14 | | 30 | Pass |
| HT40 | MCS0 | 2 | 110 | 5550 | 13.00 | 12.90 | 15.96 | 23.98 | | 3.14 | | 30 | Pass |
| HT40 | MCS0 | 2 | 134 | 5670 | 13.10 | 12.80 | 15.96 | 23.98 | | 3.14 | | 30 | Pass |
| HT40 | MCS0 | 2 | 142 | 5710 | 13.10 | 12.70 | 15.91 | 23.98 | | 3.14 | | 30 | Pass |
| VHT20 | MCS0 | 2 | 100 | 5500 | 13.10 | 12.60 | 15.87 | 23.98 | | 3.14 | | 30 | Pass |
| VHT20 | MCS0 | 2 | 116 | 5580 | 12.80 | 12.90 | 15.86 | 23.98 | | 3.14 | | 30 | Pass |
| VHT20 | MCS0 | 2 | 140 | 5700 | 12.90 | 12.80 | 15.86 | 23.98 | | 3.14 | | 30 | Pass |
| VHT20 | MCS0 | 2 | 144 | 5720 | 13.10 | 12.80 | 15.96 | 23.98 | | 3.14 | | 30 | Pass |
| VHT40 | MCS0 | 2 | 102 | 5510 | 13.10 | 12.60 | 15.87 | 23.98 | | 3.14 | | 30 | Pass |
| VHT40 | MCS0 | 2 | 110 | 5550 | 12.90 | 12.80 | 15.86 | 23.98 | | 3.14 | | 30 | Pass |
| VHT40 | MCS0 | 2 | 134 | 5670 | 13.00 | 12.70 | 15.86 | 23.98 | | 3.14 | | 30 | Pass |
| VHT40 | MCS0 | 2 | 142 | 5710 | 13.00 | 12.60 | 15.81 | 23.98 | | 3.14 | | 30 | Pass |
| VHT80 | MCS0 | 2 | 106 | 5530 | 13.00 | 12.90 | 15.96 | 23.98 | | 3.14 | | 30 | Pass |
| VHT80 | MCS0 | 2 | 122 | 5610 | 13.10 | 12.80 | 15.96 | 23.98 | | 3.14 | | 30 | Pass |
| VHT80 | MCS0 | 2 | 138 | 5690 | 13.00 | 12.90 | 15.96 | 23.98 | | 3.14 | | 30 | Pass |
| VHT160 | MSC0 | 2 | 114 | 5570 | 9.70 | 11.00 | 13.41 | 23.98 | | 3.14 | | 30 | Pass |

# Appendix B. Radiated Spurious Emission

| Test Engineer : | Watt Tseng | Temperature : | 23~26°C |
|---|---|---|---|
| | | Relative Humidity : | 50~57% |

**Band 2 - 5250~5350MHz**

**WIFI 802.11n HT20 (Band Edge @ 3m)**

| WIFI Ant. | Note | Frequency | Level | Over Limit | Limit Line | Read Level | Antenna Factor | Path Loss | Preamp Factor | Ant Pos | Table Pos | Peak Avg. | Pol. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | ( MHz ) | ( dBµV/m ) | ( dB ) | ( dBµV/m ) | (dBµV) | ( dB/m ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) | (P/A) | (H/V) |
| | | 5145.18 | 49.55 | -24.45 | 74 | 38.47 | 31.8 | 9.38 | 30.1 | 151 | 225 | P | H |
| | | 5095.54 | 41.29 | -12.71 | 54 | 30.14 | 31.9 | 9.34 | 30.09 | 151 | 225 | A | H |
| | * | 5260 | 104.48 | - | - | 93.7 | 31.4 | 9.49 | 30.11 | 151 | 225 | P | H |
| | * | 5260 | 96.63 | - | - | 85.85 | 31.4 | 9.49 | 30.11 | 151 | 225 | A | H |
| 802.11n | | 5380.56 | 52.29 | -21.71 | 74 | 41.27 | 31.53 | 9.62 | 30.13 | 151 | 225 | P | H |
| HT20 | | 5456.4 | 42.2 | -11.8 | 54 | 30.9 | 31.7 | 9.74 | 30.14 | 151 | 225 | A | H |
| CH 52 | | 5037.06 | 51.03 | -22.97 | 74 | 40.03 | 31.8 | 9.28 | 30.08 | 204 | 223 | P | V |
| 5260MHz | | 5104.72 | 41.26 | -12.74 | 54 | 30.11 | 31.9 | 9.34 | 30.09 | 204 | 223 | A | V |
| | * | 5260 | 107.71 | - | - | 96.93 | 31.4 | 9.49 | 30.11 | 204 | 223 | P | V |
| | * | 5260 | 99.64 | - | - | 88.86 | 31.4 | 9.49 | 30.11 | 204 | 223 | A | V |
| | | 5454 | 52.66 | -21.34 | 74 | 41.37 | 31.7 | 9.73 | 30.14 | 204 | 223 | P | V |
| | | 5458.56 | 44.22 | -9.78 | 54 | 32.92 | 31.7 | 9.74 | 30.14 | 204 | 223 | A | V |

## Band 2 5250~5350MHz

## WIFI 802.11n HT20 (Harmonic @ 3m)

| WIFI Ant. 1 | Note | Frequency ( MHz ) | Level ( dBµV/m ) | Over Limit ( dB ) | Limit Line ( dBµV/m ) | Read Level (dBµV) | Antenna Factor ( dB/m ) | Path Loss ( dB ) | Preamp Factor ( dB ) | Ant Pos ( cm ) | Table Pos ( deg ) | Peak Avg. (P/A) | Pol. (H/V) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 10520 | 48.19 | -20.01 | 68.2 | 58.3 | 39.63 | 13.9 | 63.64 | 100 | 0 | P | H |
| | | 15780 | 45.45 | -28.55 | 74 | 53.21 | 37.3 | 17.34 | 62.4 | 100 | 0 | P | H |
| 802.11n | | | | | | | | | | | | | H |
| HT20 | | | | | | | | | | | | | H |
| CH 52 | | 10520 | 49.05 | -19.15 | 68.2 | 59.16 | 39.63 | 13.9 | 63.64 | 100 | 0 | P | V |
| 5260MHz | | 15780 | 45.59 | -28.41 | 74 | 53.35 | 37.3 | 17.34 | 62.4 | 100 | 0 | P | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| Remark | 1. No other spurious found.<br>2. All results are PASS against Peak and Average limit line. | | | | | | | | | | | | |

## Emission below 1GHz

## WIFI 802.11n HT20 (LF @ 3m)

| WIFI | Note | Frequency | Level | Over | Limit | Read | Antenna | Path | Preamp | Ant | Table | Peak | Pol. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ant. | | | | Limit | Line | Level | Factor | Loss | Factor | Pos | Pos | Avg. | |
| 1 | | ( MHz ) | ( dBμV/m ) | ( dB ) | ( dBμV/m ) | (dBμV) | ( dB/m ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) | (P/A) | (H/V) |
| 802.11n HT20 LF | | 30.97 | 22.73 | -17.27 | 40 | 29.78 | 24.81 | 0.76 | 32.62 | - | - | P | H |
| | | 98.87 | 22.06 | -21.44 | 43.5 | 37.38 | 15.79 | 1.4 | 32.51 | - | - | P | H |
| | | 216.24 | 19.7 | -26.3 | 46 | 35.15 | 15 | 2.05 | 32.5 | - | - | P | H |
| | | 312.27 | 31.46 | -14.54 | 46 | 42.27 | 19.35 | 2.38 | 32.54 | - | - | P | H |
| | | 870.02 | 32.55 | -13.45 | 46 | 31.36 | 29 | 4.01 | 31.82 | - | - | P | H |
| | | 949.56 | 33.24 | -12.76 | 46 | 29.39 | 30.87 | 4.2 | 31.22 | 100 | 0 | P | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | | | | | | | | | | | | H |
| | | 30 | 23.3 | -16.7 | 40 | 29.97 | 25.2 | 0.75 | 32.62 | - | - | P | V |
| | | 98.87 | 26.93 | -16.57 | 43.5 | 42.25 | 15.79 | 1.4 | 32.51 | - | - | P | V |
| | | 212.36 | 21.6 | -21.9 | 43.5 | 37 | 15.06 | 2.04 | 32.5 | - | - | P | V |
| | | 312.27 | 26.94 | -19.06 | 46 | 37.75 | 19.35 | 2.38 | 32.54 | - | - | P | V |
| | | 449.04 | 30.99 | -15.01 | 46 | 37.68 | 23.08 | 2.79 | 32.56 | - | - | P | V |
| | | 951.5 | 33.48 | -12.52 | 46 | 29.56 | 30.93 | 4.2 | 31.21 | 100 | 0 | P | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |
| | | | | | | | | | | | | | V |

**Remark**

1. No other spurious found.
2. All results are PASS against limit line.

**Note symbol**

| | |
|---|---|
| * | **Fundamental Frequency** which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency. |
| ! | Test result is **over limit** line. |
| P/A | **P**eak or **A**verage |
| H/V | **H**orizontal or **V**ertical |

## A calculation example for radiated spurious emission is shown as below:

| WIFI | Note | Frequency | Level | Over | Limit | Read | Antenna | Path | Preamp | Ant | Table | Peak | Pol. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ant. | | | | Limit | Line | Level | Factor | Loss | Factor | Pos | Pos | Avg. | |
| 1 | | ( MHz ) | ( dBμV/m ) | ( dB ) | ( dBμV/m ) | ( dBμV ) | ( dB/m ) | ( dB ) | ( dB ) | ( cm ) | ( deg ) | (P/A) | (H/V) |
| 802.11b CH 01 2412MHz | | 2390 | 55.45 | -18.55 | 74 | 54.51 | 32.22 | 4.58 | 35.86 | 103 | 308 | P | H |
| | | 2390 | 43.54 | -10.46 | 54 | 42.6 | 32.22 | 4.58 | 35.86 | 103 | 308 | A | H |

1. Path Loss(dB) = Cable loss(dB) + Filter loss(dB) + Attenuator loss(dB)
2. Level(dBμV/m) = Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)
3. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

**For Peak Limit @ 2390MHz:**

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

**For Average Limit @ 2390MHz:**

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Path Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)

= 43.54 (dBμV/m)

2. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

**Both peak and average measured complies with the limit line, so test result is "PASS".**

# Appendix C. Radiated Spurious Emission Plots

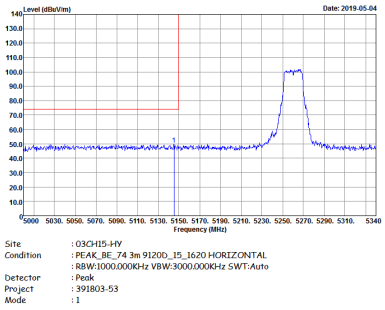
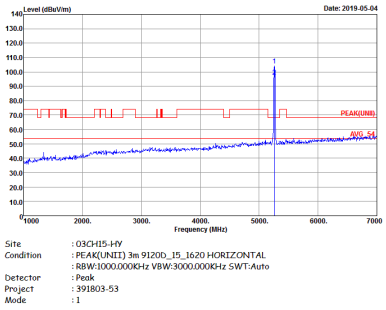
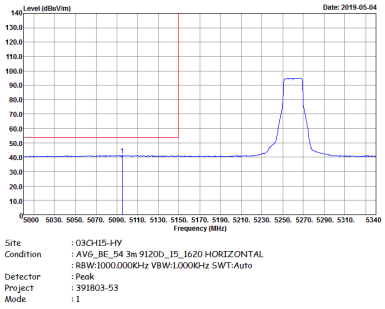
| | | | |
|---|---|---|---|
| **Test Engineer :** | Watt Tseng | **Temperature :** | 23~26°C |
| | | **Relative Humidity :** | 50~57% |

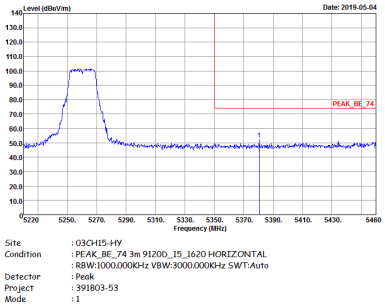
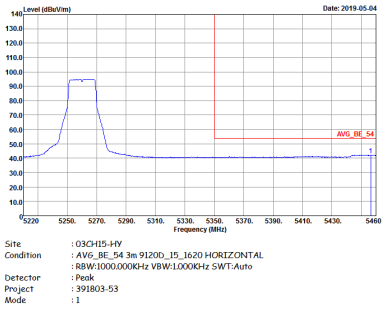
**Note symbol**

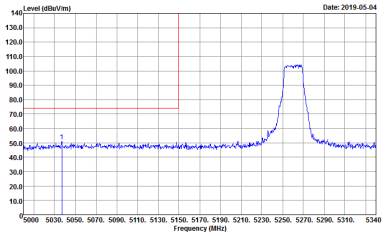
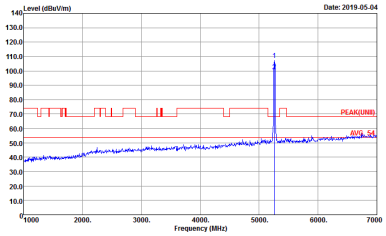
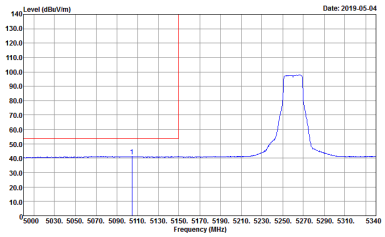
| | |
|---|---|
| -L | **Low channel location** |
| -R | **High channel location** |

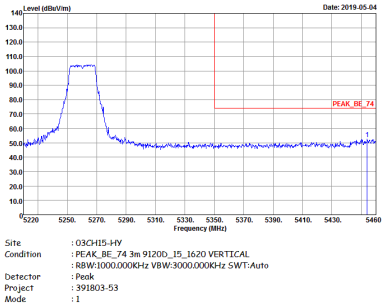
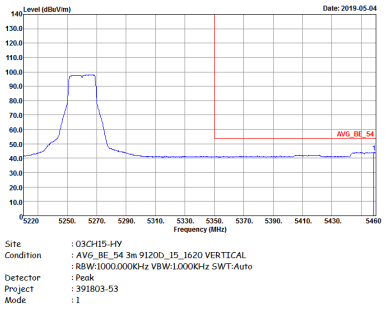
## Band 2 - 5250~5350MHz

## WIFI 802.11n HT20 (Band Edge @ 3m)

| WIFI | Band 2 5250~5350MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11n HT20 CH52 5260MHz - L | |
| 1 | Horizontal | Fundamental |
| Peak |  |  |
| Avg. |  | Left blank |

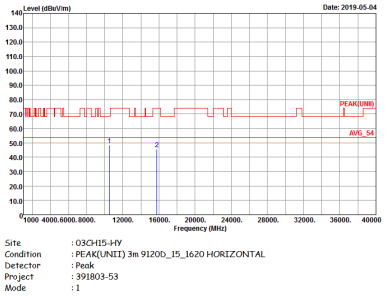
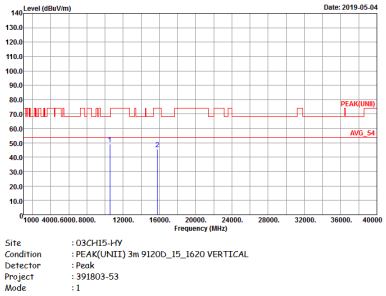
| WIFI | Band 2 5250~5350MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11n HT20 CH52 5260MHz - R | |
| 1 | Horizontal | Fundamental |
| Peak |  | Left blank |
| Avg. |  | Left blank |

| WIFI | Band 2 5250~5350MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11n HT20 CH52 5260MHz - L | |
| 1 | Vertical | Fundamental |
| Peak |  <br>Site : 03CH15-HY<br>Condition : PEAK_BE_74 3m 9120D_15_1620 VERTICAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 391803-53<br>Mode : 1 |  <br>Site : 03CH15-HY<br>Condition : PEAK(UNII) 3m 9120D_15_1620 VERTICAL<br>: RBW:1000.000KHz VBW:3000.000KHz SWT:Auto<br>Detector : Peak<br>Project : 391803-53<br>Mode : 1 |
| Avg. |  <br>Site : 03CH15-HY<br>Condition : AVG_BE_54 3m 9120D_15_1620 VERTICAL<br>: RBW:1000.000KHz VBW:1.000KHz SWT:Auto<br>Detector : Peak<br>Project : 391803-53<br>Mode : 1 | Left blank |

| WIFI | Band 2 5250~5350MHz Band Edge @ 3m | |
|---|---|---|
| ANT | 802.11n HT20 CH52 5260MHz - R | |
| 1 | Vertical | Fundamental |
| Peak |  | Left blank |
| Avg. |  | Left blank |

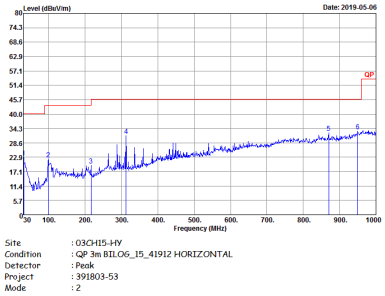
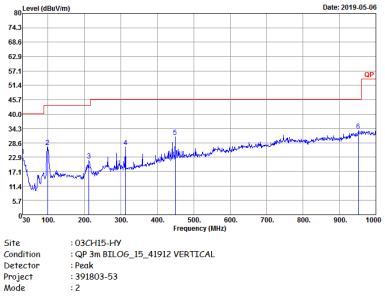
## Band 2 - 5250~5350MHz

## WIFI 802.11n HT20 (Harmonic @ 3m)

| WIFI | Band 2 5250~5350MHz Harmonic @ 3m | |
|---|---|---|
| ANT | 802.11n HT20 CH52 5260MHz | |
| 1 | Horizontal | Vertical |
| Peak<br>Avg. |  |  |

## Emission below 1GHz

## 5GHz WIFI 802.11n HT20 (LF)

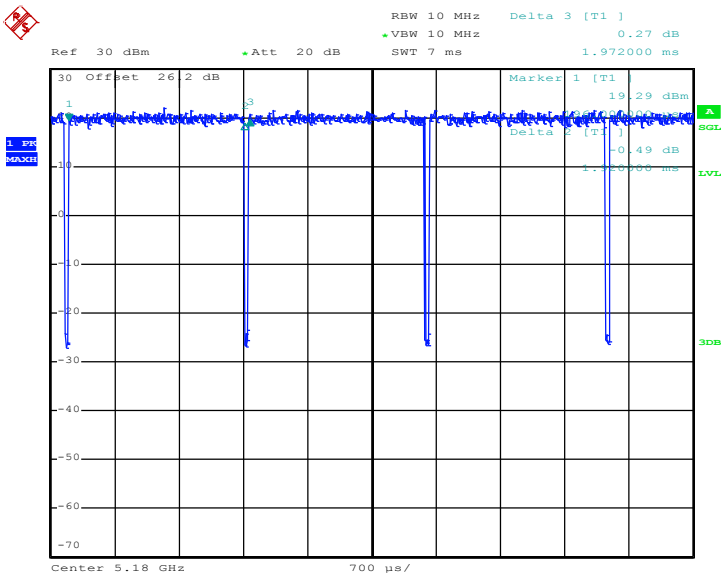
| WIFI | 5GHz WIFI | |
|---|---|---|
| ANT | 802.11n HT20 LF | |
| 1 | Horizontal | Vertical |
| QP / Peak |  |  |

# Appendix D. Duty Cycle Plots

| Antenna | Band | Duty Cycle (%) | T(us) | 1/T(kHz) | VBW Setting | Duty Factor (dB) |
|---|---|---|---|---|---|---|
| 1 | 5GHz 802.11n HT20 | 97.36 | 1920.00 | 0.52 | 1kHz | 0.12 |

**<Ant. 1>**

**802.11n HT20**




Date: 19.APR.2019 18:17:12