



# FCC RADIO TEST REPORT

**FCC ID** : QYLAX201NG  
**Equipment** : WLAN Module  
**Brand Name** : Getac  
**Model Name** : AX201NGW  
**Applicant** : Getac Technology Corporation.  
5F., Building A, No. 209, Sec.1,  
Nangang Rd.,Nangang Dist., Taipei  
City 11568, Taiwan, R.O.C.  
**Standard** : FCC Part 15 Subpart E §15.407

The product was received on Jan. 13, 2021 and testing was started from Feb. 01, 2021 and completed on Mar. 09, 2021. 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 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: Louis Wu

**Sporton International Inc. EMC & Wireless Communications Laboratory**  
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.)



## Table of Contents

History of this test report.....	3
Summary of Test Result.....	4
<b>1 General Description .....</b>	<b>5</b>
1.1 Product Feature of Equipment Under Test.....	5
1.2 Modification of EUT .....	6
1.3 Testing Location .....	6
1.4 Applicable Standards.....	6
<b>2 Test Configuration of Equipment Under Test .....</b>	<b>7</b>
2.1 Carrier Frequency and Channel .....	7
2.2 Test Mode.....	8
2.3 Connection Diagram of Test System.....	9
2.4 Support Unit used in test configuration and system .....	10
2.5 EUT Operation Test Setup .....	10
<b>3 Test Result .....</b>	<b>11</b>
3.1 Maximum Conducted Output Power Measurement .....	11
3.2 Unwanted Emissions Measurement.....	12
3.3 AC Conducted Emission Measurement.....	17
3.4 Antenna Requirements.....	19
<b>4 List of Measuring Equipment.....</b>	<b>20</b>
<b>5 Uncertainty of Evaluation.....</b>	<b>22</b>
<b>Appendix A. Conducted Test Results</b>	
<b>Appendix B. AC Conducted Emission Test Result</b>	
<b>Appendix C. Radiated Spurious Emission</b>	
<b>Appendix D. Radiated Spurious Emission Plots</b>	
<b>Appendix E. Duty Cycle Plots</b>	
<b>Appendix F. Setup Photographs</b>	





## Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
-	15.403(i)	6dB & 26dB Bandwidth	-	See Note
-	2.1049	99% Occupied Bandwidth	-	See Note
3.1	15.407(a)	Maximum Conducted Output Power	Pass	-
-	15.407(a)	Power Spectral Density	-	See Note
3.2	15.407(b)	Unwanted Emissions	Pass	-
3.3	15.207	AC Conducted Emission	Pass	-
-	15.407(c)	Automatically Discontinue Transmission	-	See Note
3.4	15.203 15.407(a)	Antenna Requirement	Pass	-

**Note:** The module (Model: AX201NGW) makes no difference after verifying output power, this report reuses test data from the module report.

**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: Vivian Hsu**



# 1 General Description

## 1.1 Product Feature of Equipment Under Test

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

Product Specification subjective to this standard	
Sample 1	EUT with Host 1
Sample 2	EUT with Host 2
Sample 3	EUT with Host 3
Antenna Type	<b>WLAN:</b> <Main> PIFA Antenna <Aux.> PIFA Antenna <b>Bluetooth:</b> PIFA Antenna

Antenna information		
5725 MHz ~ 5850 MHz	Peak Gain (dBi)	Main: 3.86 Aux.: 0.87

**Remark:** The above EUT's information was declared by manufacturer. Please refer to Comments and Explanations in report summary.

The product was installed into Tablet (Brand Name: Getac, Model Name: F110, F110G6, F110-Ex, F110-621, F110-601) during test, and the host information was recorded in the following table.

Host Information	
Host 1	Host with SKU A
Host 2	Host with SKU B
Host 3	Host with SKU C

SKU	SKU A	SKU B	SKU C
CPU	i3-1115G7 (Non Vpro)	i5-1135G7 (Non Vpro)	i7-1165G7 (Vpro)
DDR	Kingston DDR4-3200 8GB	Kingston DDR4-3200 16GB	Kingston DDR4-3200 32GB
SSD	256GB	512GB	1TB
PANEL	Full HD AUO	Full HD AUO	Full HD AUO
DIGITIZER	EMRright Digitizer	N/A	EMRright Digitizer
OPTION BAY	Micro SD	2D Barcode Reader	RS232 + LAN
Expansion Bay	N/A	Smart Card	Smart Card
Right side option	Finger Print	NXP RFID(PN7462)	Finger Print
WLAN/BT	Intel AX201	Intel AX201	Intel AX201
WWAN(4G)	NA	EM7511	EM7511
GPS/GNS	GPS/GNSS (MC-1010- V2b)	EM7511	EM7511
Rear 8M Camera	Support	Support	Support
Webcam FHD	Support	Not Support	Not Support
IR Webcam	Not Support	Support	Support
USB3.2 Gen2 x 1 Type-A	Support	Support	Support
Type-C (thunder bolt)	Support	Support	Support
Audio/MIC	Support	Support	Support



### 1.2 Modification of EUT

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

### 1.3 Testing Location

<b>Test Site</b>	Sporton International Inc. EMC & Wireless Communications Laboratory
<b>Test Site Location</b>	No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978
<b>Test Site No.</b>	<b>Sporton Site No.</b> TH05-HY, CO05-HY

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

<b>Test Site</b>	Sporton International Inc. Wensan Laboratory
<b>Test Site Location</b>	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
<b>Test Site No.</b>	<b>Sporton Site No.</b> 03CH15-HY (TAF Code: 3786)
<b>Remark</b>	The Radiated Spurious Emission test item subcontracted to Sporton International Inc. Wensan Laboratory.

**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. The TAF code is not including all the FCC KDB listed without accreditation.
3. 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

- a. 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: conduction emission (150 kHz to 30 MHz), 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 (Y Plane for Ant. 1, X Plane for Ant. 2, Z Plane for MIMO Ant. 1+2) were recorded in this report.
  
- b. AC power line Conducted Emission was tested under maximum output power.

### 2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5725-5850 MHz Band 4 (U-NII-3)	149	5745	157	5785
	151*	5755	159*	5795
	153	5765	161	5805
	155 <sup>#</sup>	5775	165	5825

**Note:**

- 1. The above Frequency and Channel in "\*" were 802.11n HT40 and 802.11ac VHT40 and 802.11ax HE40.
- 2. The above Frequency and Channel in "<sup>#</sup>" were 802.11ac VHT80 and 802.11ax HE80.



## 2.2 Test Mode

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

### Single Mode

Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT20	MCS0
802.11ac VHT40	MCS0
802.11ac VHT80	MCS0
802.11ax HE20	MCS0
802.11ax HE40	MCS0
802.11ax HE80	MCS0

### MIMO Mode

Modulation	Data Rate
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT20	MCS0
802.11ac VHT40	MCS0
802.11ac VHT80	MCS0
802.11ax HE20	MCS0
802.11ax HE40	MCS0
802.11ax HE80	MCS0

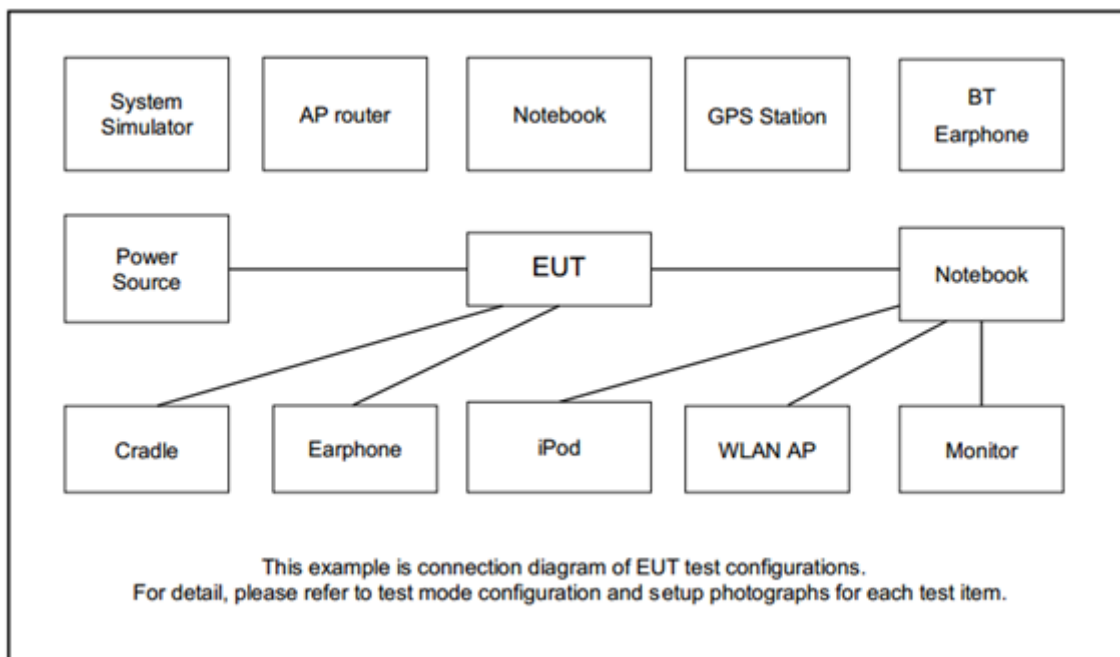


Test Cases	
<b>AC Conducted Emission</b>	Mode 1 :WLAN (5GHz) Link + Bluetooth Link + H-Pattern + Earphone + Adapter for Sample 1 Mode 2 :WLAN (5GHz) Link + Bluetooth Link + H-Pattern + Earphone + Adapter for Sample 2 Mode 3 :WLAN (5GHz) Link + Bluetooth Link + H-Pattern + Earphone + Adapter for Sample 3
<b>Remark:</b> 1. The worst case of conducted emission is mode 3; only the test data of it was reported. 2. For Radiated Test Cases, the tests were performed with Adapter 1, Battery 2 and Sample 2.	

Ch. #		Band IV : 5725-5850 MHz	
		802.11ax HE40	802.11ax HE80
L	Low	151	-
M	Middle	-	155
H	High	-	-

**Remark:** For radiation spurious emission, the final modulation and the worst data rate was reference the max RF conducted power.

### 2.3 Connection Diagram of Test System





## 2.4 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
2.	WLAN AP	ASUS	RT-AC66U	MSQ-RTAC66U	N/A	Unshielded, 1.8 m
3.	iPod Earphone	Apple	N/A	Verification	Unshielded, 1.0 m	N/A
4.	Notebook	Dell	Latitude 3400	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m

## 2.5 EUT Operation Test Setup

The RF test items, utility “DRTU\_Version 12.1947.0-10428” 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

For the band 5.725–5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

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.

##### 3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

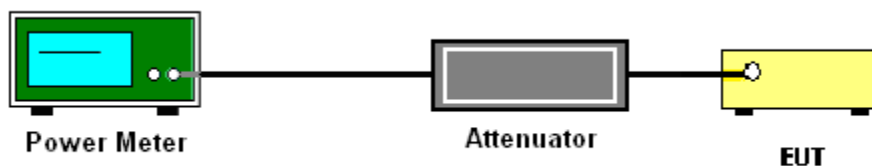
##### 3.1.3 Test Procedures

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

Method PM-G (Measurement using a gated RF average power meter):

1. Measurement is performed using a wideband RF power meter.
2. The EUT is configured to transmit at its maximum power control level.
3. Measure the average power of the transmitter.
4. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

##### 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 5.725-5.85 GHz band:

15.407(b)(4)(i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

(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.

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

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

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

(i) Sections 15.407(b)(1-3) specifies the unwanted emissions limit 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.

(ii) Section 15.407(b)(4) specifies the unwanted emissions limit for the U-NII-3 band. A band emissions mask is specified in Section 15.407(b)(4)(i). The emission limits are based on the use of a peak detector.



### 3.2.2 Measuring Instruments

See list of measuring equipment of this test report.

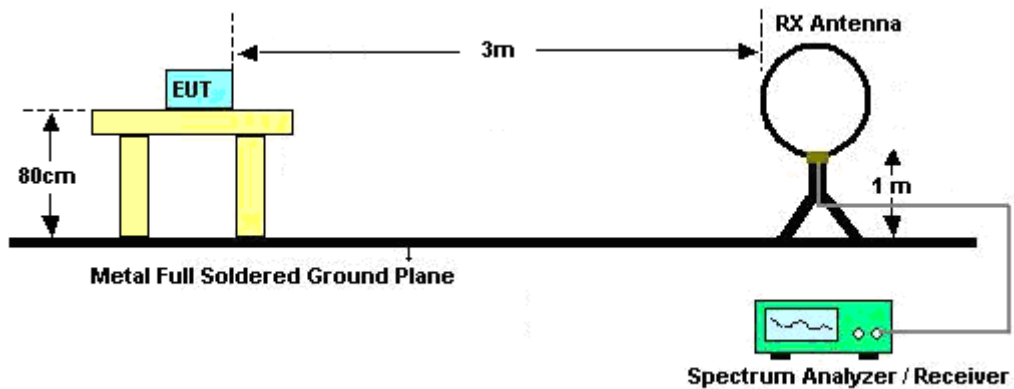
### 3.2.3 Test Procedures

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 1000 MHz
    - 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  $\geq$  3 MHz
    - Detector = Peak
    - Sweep time = auto
    - Trace mode = max hold
  - (3) Procedures for Average Unwanted Emissions Measurements Above 1000 MHz
    - RBW = 1 MHz
    - VBW = 10 Hz, when duty cycle is no less than 98 percent.
    - VBW  $\geq$  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 1 GHz and 1.5 meter for frequency above 1 GHz 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 1 GHz, 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.

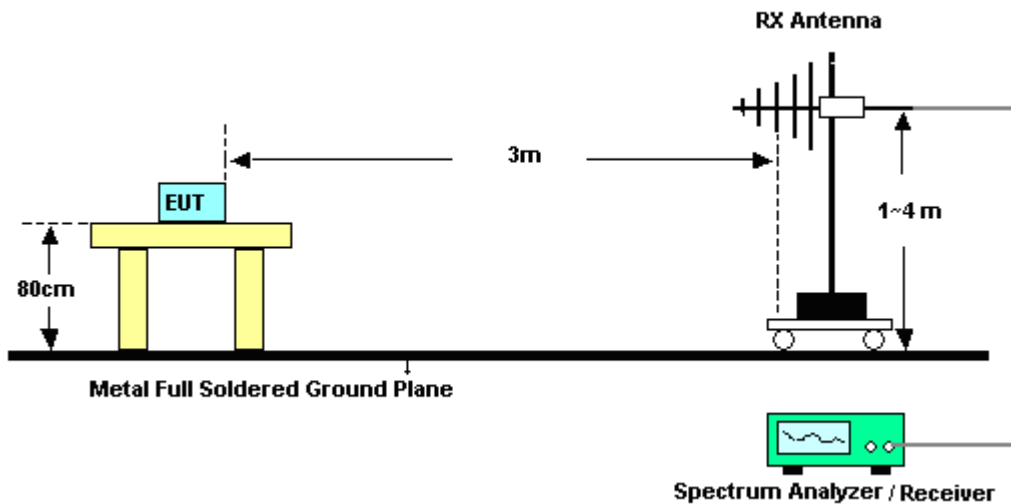
7. For testing above 1 GHz, the emission level of the EUT in peak mode was 20 dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

### 3.2.4 Test Setup

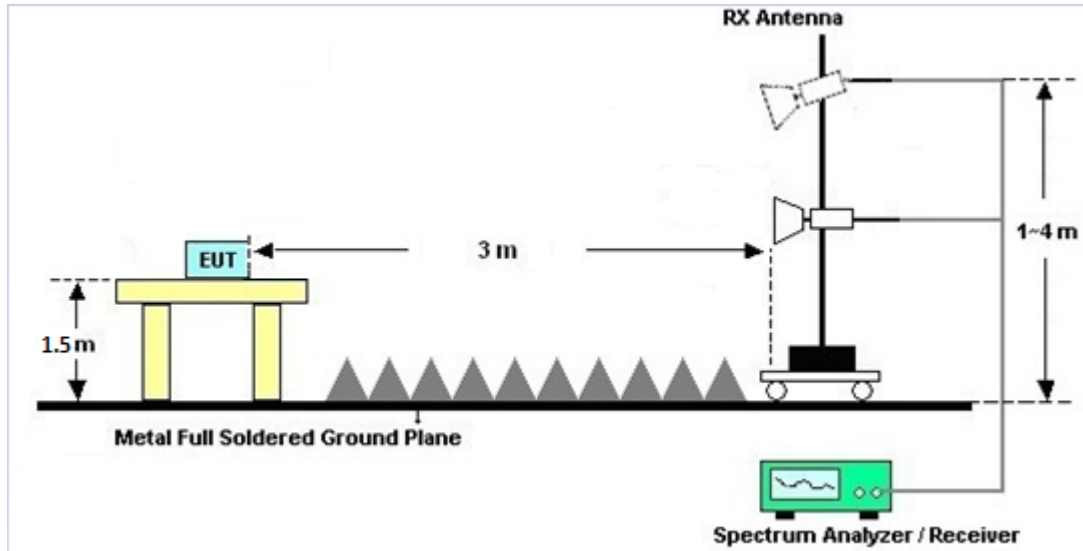
For radiated emissions below 30MHz



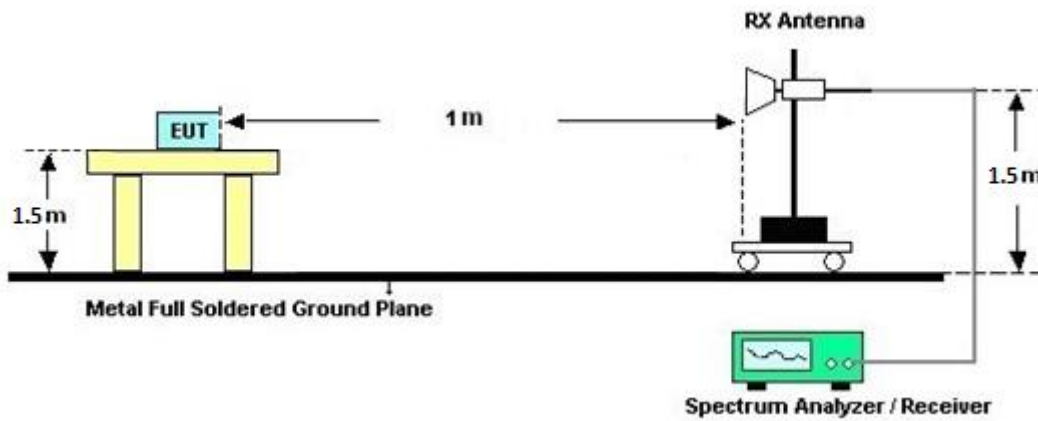
For radiated emissions from 30MHz to 1GHz



For radiated test from 1GHz to 18GHz



For radiated test above 18GHz





### **3.2.5 Test Results of Radiated 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 Band Edges**

Please refer to Appendix C and D.

### **3.2.7 Duty Cycle**

Please refer to Appendix E.

### **3.2.8 Test Result of Unwanted Radiated Emission (30MHz ~ 10th Harmonic)**

Please refer to Appendix C and D.





### 3.3 AC Conducted Emission Measurement

#### 3.3.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of emission (MHz)	Conducted limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\*Decreases with the logarithm of the frequency.

#### 3.3.2 Measuring Instruments

See list of measuring equipment of this test report.

#### 3.3.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN shall be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

### 3.3.4 Test Setup



### 3.3.5 Test Result of AC Conducted Emission

Please refer to Appendix B.



## **3.4 Antenna Requirements**

### **3.4.1 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.

### **3.4.2 Antenna Anti-Replacement Construction**

An embedded-in antenna design is used.

### **3.4.3 Antenna Gain**

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.



## 4 List of Measuring Equipment

Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Jul. 14, 2020	Mar. 06, 2021~ Mar. 09, 2021	Jul. 13, 2021	Radiation (03CH15-HY)
Bilog Antenna	TESEQ	CBL 6111D & 00800N1D01N -06	41912 & 05	30MHz~1GHz	Feb. 08, 2021	Mar. 06, 2021~ Mar. 09, 2021	Feb. 07, 2022	Radiation (03CH15-HY)
Amplifier	SONOMA	310N	363440	9kHz~1GHz	Dec. 28, 2020	Mar. 06, 2021~ Mar. 09, 2021	Dec. 27, 2021	Radiation (03CH15-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-01620	1GHz~18GHz	Nov. 03, 2020	Mar. 06, 2021~ Mar. 09, 2021	Nov. 02, 2021	Radiation (03CH15-HY)
SHF-EHF Horn Antenna	SCHWARZBE CK	BBHA 9170	BBHA917025 1	18GHz~40GHz	Dec. 02, 2020	Mar. 06, 2021~ Mar. 09, 2021	Dec. 01, 2021	Radiation (03CH15-HY)
Preamplifier	Jet-Power	JPA0118-55-3 03	1710001800 055006	1GHz~18GHz	May 07, 2020	Mar. 06, 2021~ Mar. 09, 2021	May 06, 2021	Radiation (03CH15-HY)
Preamplifier	Keysight	83017A	MY53270195	1GHz~26.5GHz	Aug. 21, 2020	Mar. 06, 2021~ Mar. 09, 2021	Aug. 20, 2021	Radiation (03CH15-HY)
Preamplifier	EMEC	EM18G40G	0600789	18-40GHz	Oct. 27, 2020	Mar. 06, 2021~ Mar. 09, 2021	Oct. 26, 2021	Radiation (03CH15-HY)
EMI Test Receiver	Keysight	N9038A(MXE)	MY54130085	20MHz~8.4GHz	Nov. 02, 2020	Mar. 06, 2021~ Mar. 09, 2021	Nov. 01, 2021	Radiation (03CH15-HY)
Spectrum Analyzer	Agilent	E4446A	MY50180136	3Hz~44GHz	May 04, 2020	Mar. 06, 2021~ Mar. 09, 2021	May 03, 2021	Radiation (03CH15-HY)
Antenna Mast	ChainTek	MBS-520-1	N/A	1m~4m	N/A	Mar. 06, 2021~ Mar. 09, 2021	N/A	Radiation (03CH15-HY)
Turn Table	ChainTek	T-200-S-1	N/A	0~360 Degree	N/A	Mar. 06, 2021~ Mar. 09, 2021	N/A	Radiation (03CH15-HY)
Software	Audix	E3 6.2009-8-24(k 5)	RK-000451	N/A	N/A	Mar. 06, 2021~ Mar. 09, 2021	N/A	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104, 102E	MY36980/4, MY9838/4PE ,508405/2E	30MHz~18G	Nov. 16, 2020	Mar. 06, 2021~ Mar. 09, 2021	Nov. 15, 2021	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	505134/2	30MHz-40GHz	Feb. 22, 2021	Mar. 06, 2021~ Mar. 09, 2021	Feb. 21, 2022	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 102	800740/2	30MHz-40GHz	Feb. 22, 2021	Mar. 06, 2021~ Mar. 09, 2021	Feb. 21, 2022	Radiation (03CH15-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY9837/4PE	9kHz~30MHz	Mar. 12, 2020	Mar. 06, 2021~ Mar. 09, 2021	Mar. 11, 2021	Radiation (03CH15-HY)
Filter	Wainwright	WLJ4-1000-15 30-6000-40ST	SN4	1.53GHz Low Pass Filter	Jul. 03, 2020	Mar. 06, 2021~ Mar. 09, 2021	Jul. 02, 2021	Radiation (03CH15-HY)
Filter	Wainwright	WHKX8-5872. 5-6750-18000- 40ST	SN6	6.75GHz High Pass Filter	Jul. 01, 2020	Mar. 06, 2021~ Mar. 09, 2021	Jun. 30, 2021	Radiation (03CH15-HY)



Instrument	Brand Name	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Feb. 03, 2021	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102317	9kHz~3.6GHz	Sep. 11, 2020	Feb. 03, 2021	Sep. 10, 2021	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34913912	N/A	Nov. 18, 2020	Feb. 03, 2021	Nov. 17, 2021	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Nov. 16, 2020	Feb. 03, 2021	Nov. 15, 2021	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Feb. 03, 2021	N/A	Conduction (CO05-HY)
LISN Cable	MVE	RG-400	260260	N/A	Dec. 31, 2020	Feb. 03, 2021	Dec. 30, 2021	Conduction (CO05-HY)
Pulse Limiter	SCHWARZBECK	ESHVTSD 9561-F N3-Z2	109561-F N003730851	9kHz-200MHz	Nov. 02, 2020	Feb. 03, 2021	Nov. 01, 2021	Conduction (CO05-HY)
Hygrometer	Testo	608-H1	34893241	N/A	Mar. 02, 2020	Feb. 01, 2021~ Feb. 19, 2021	Mar. 01, 2021	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	16I00054SN O12	10MHz~6GHz	Dec. 16, 2020	Feb. 01, 2021~ Feb. 19, 2021	Dec. 15, 2021	Conducted (TH05-HY)
Signal Analyzer	Rohde & Schwarz	FSV40	101566	10Hz ~ 40GHz	Jul. 22, 2020	Feb. 01, 2021~ Feb. 19, 2021	Jul. 21, 2021	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz-40GHz	Jan. 21, 2021	Feb. 01, 2021~ Feb. 19, 2021	Jan. 20, 2022	Conducted (TH05-HY)
Switch Box & RF Cable	EM Electronics	EMSW18SE	SW200302	N/A	Mar. 17, 2020	Feb. 01, 2021~ Feb. 19, 2021	Mar. 16, 2021	Conducted (TH05-HY)



## 5 Uncertainty of Evaluation

### Uncertainty of Conducted Emission Measurement (150kHz ~ 30MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	2.3
---	-----

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

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	4.7
---	-----

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

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	5.3
---	-----

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

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	4.9
---	-----

**Appendix A. Test Result of Conducted Test Items**

Test Engineer:	Kai Liao	Temperature:	23.7~25.1	°C
Test Date:	2021/02/01 ~ 02/19	Relative Humidity:	56.3~58.9	%

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

Band IV single antenna												
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	149	5745	14.70	14.50		30.00	30.00	0.87	3.86	Pass
11a	6Mbps	1	157	5785	14.40	14.20		30.00	30.00	0.87	3.86	Pass
11a	6Mbps	1	165	5825	14.50	14.40		30.00	30.00	0.87	3.86	Pass
HT20	MCS0	1	149	5745	14.60	14.40		30.00	30.00	0.87	3.86	Pass
HT20	MCS0	1	157	5785	14.40	14.50		30.00	30.00	0.87	3.86	Pass
HT20	MCS0	1	165	5825	14.40	14.20		30.00	30.00	0.87	3.86	Pass
HT40	MCS0	1	151	5755	14.60	14.60		30.00	30.00	0.87	3.86	Pass
HT40	MCS0	1	159	5795	14.50	14.50		30.00	30.00	0.87	3.86	Pass
VHT20	MCS0	1	149	5745	14.60	14.40		30.00	30.00	0.87	3.86	Pass
VHT20	MCS0	1	157	5785	14.50	14.50		30.00	30.00	0.87	3.86	Pass
VHT20	MCS0	1	165	5825	14.40	14.20		30.00	30.00	0.87	3.86	Pass
VHT40	MCS0	1	151	5755	14.60	14.50		30.00	30.00	0.87	3.86	Pass
VHT40	MCS0	1	159	5795	14.70	14.50		30.00	30.00	0.87	3.86	Pass
VHT80	MCS0	1	155	5775	14.80	14.60		30.00	30.00	0.87	3.86	Pass

Band IV MIMO												
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	
HT20	MCS0	2	149	5745	17.40	17.10	20.26	30.00		3.86		Pass
HT20	MCS0	2	157	5785	17.90	17.60	20.76	30.00		3.86		Pass
HT20	MCS0	2	165	5825	17.50	17.60	20.56	30.00		3.86		Pass
HT40	MCS0	2	151	5755	17.60	17.30	20.46	30.00		3.86		Pass
HT40	MCS0	2	159	5795	18.00	17.60	20.81	30.00		3.86		Pass
VHT20	MCS0	2	149	5745	17.30	17.30	20.31	30.00		3.86		Pass
VHT20	MCS0	2	157	5785	17.90	17.60	20.76	30.00		3.86		Pass
VHT20	MCS0	2	165	5825	17.50	17.60	20.56	30.00		3.86		Pass
VHT40	MCS0	2	151	5755	17.60	17.40	20.51	30.00		3.86		Pass
VHT40	MCS0	2	159	5795	18.00	17.60	20.81	30.00		3.86		Pass
VHT80	MCS0	2	155	5775	16.40	16.30	19.36	30.00		3.86		Pass



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

Band IV single antenna													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config	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	
HE20	MCS0	1	149	5745	Full	14.50	14.30		30.00	30.00	0.87	3.86	Pass
HE20	MCS0	1	149	5745	26/0	14.50	14.30		30.00	30.00	0.87	3.86	Pass
HE20	MCS0	1	157	5785	Full	14.60	14.40		30.00	30.00	0.87	3.86	Pass
HE20	MCS0	1	165	5825	Full	14.40	14.40		30.00	30.00	0.87	3.86	Pass
HE40	MCS0	1	151	5755	Full	14.70	14.20		30.00	30.00	0.87	3.86	Pass
HE40	MCS0	1	159	5795	Full	14.40	14.30		30.00	30.00	0.87	3.86	Pass
HE80	MCS0	1	155	5775	Full	14.40	14.50		30.00	30.00	0.87	3.86	Pass

Band IV MIMO													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config	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	
HE20	MCS0	2	149	5745	Full	17.60	17.40	20.51	30.00	30.00	3.86	3.86	Pass
HE20	MCS0	2	149	5745	26/0	12.10	12.00	15.06	30.00	30.00	3.86	3.86	Pass
HE20	MCS0	2	157	5785	Full	18.00	17.70	20.86	30.00	30.00	3.86	3.86	Pass
HE20	MCS0	2	165	5825	Full	17.60	17.70	20.66	30.00	30.00	3.86	3.86	Pass
HE40	MCS0	2	151	5755	Full	17.70	17.50	20.61	30.00	30.00	3.86	3.86	Pass
HE40	MCS0	2	159	5795	Full	18.10	17.70	20.91	30.00	30.00	3.86	3.86	Pass
HE80	MCS0	2	155	5775	Full	18.00	17.90	20.96	30.00	30.00	3.86	3.86	Pass



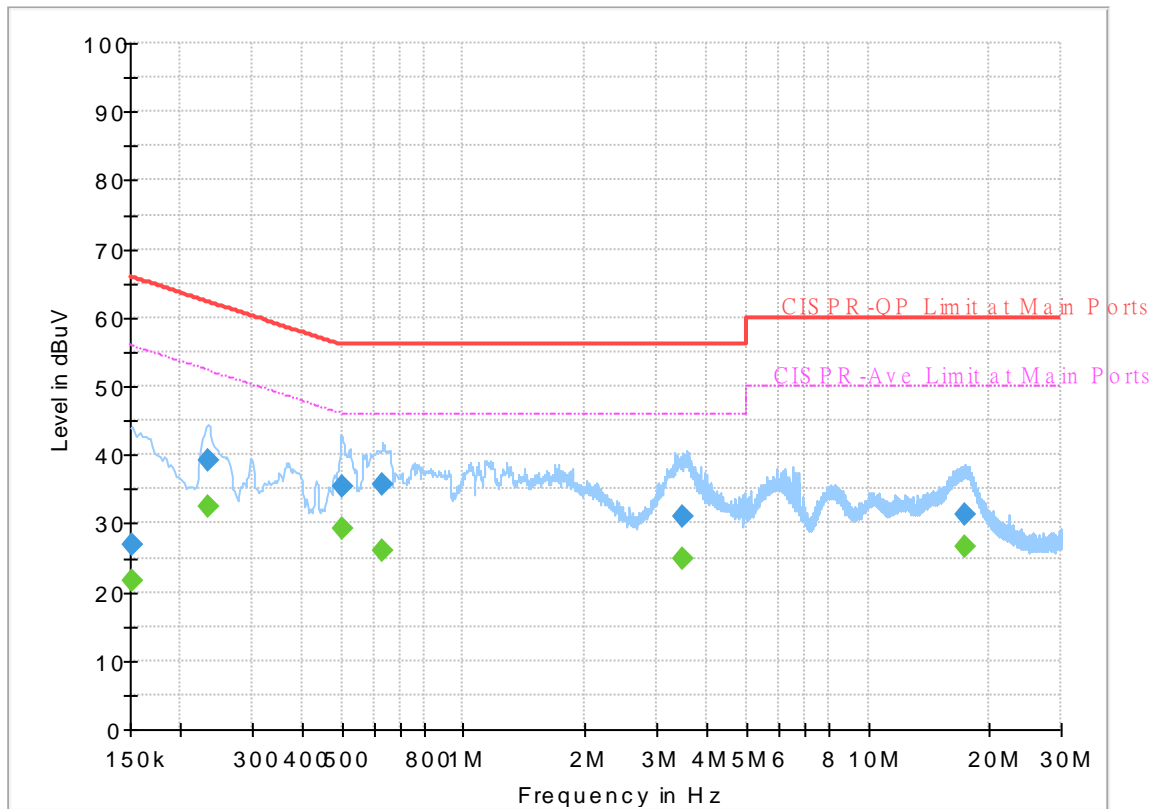
## Appendix B. AC Conducted Emission Test Results

Test Engineer :	Howard Huang	Temperature :	23~26°C
		Relative Humidity :	40~50%

# EUT Information

Report NO : 111325  
 Test Mode : Mode 3  
 Test Voltage : 120Vac/60Hz  
 Phase : Line

Full Spectrum



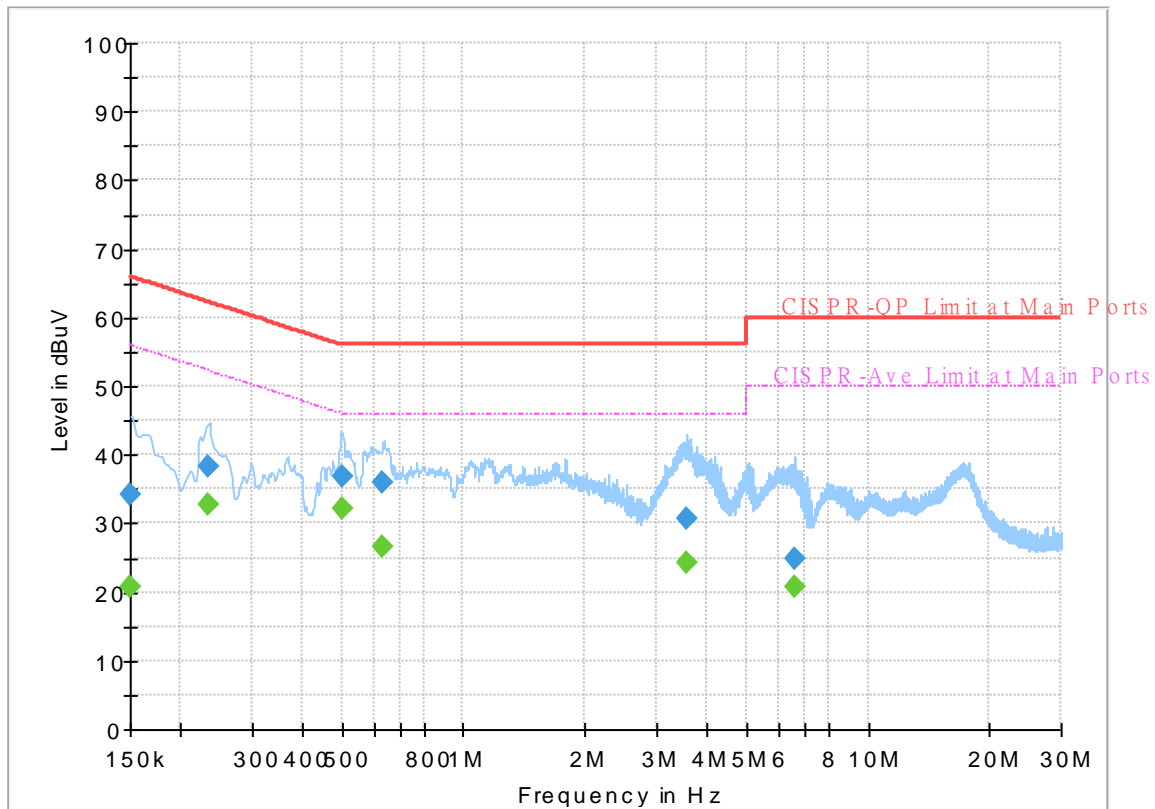
## Final Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.152250	---	21.63	55.88	34.25	L1	OFF	19.7
0.152250	26.91	---	65.88	38.97	L1	OFF	19.7
0.233250	---	32.34	52.33	19.99	L1	OFF	19.7
0.233250	39.07	---	62.33	23.26	L1	OFF	19.7
0.502530	---	29.19	46.00	16.81	L1	OFF	19.9
0.502530	35.46	---	56.00	20.54	L1	OFF	19.9
0.631680	---	25.93	46.00	20.07	L1	OFF	20.0
0.631680	35.65	---	56.00	20.35	L1	OFF	20.0
3.499170	---	24.86	46.00	21.14	L1	OFF	20.0
3.499170	31.09	---	56.00	24.91	L1	OFF	20.0
17.383830	---	26.58	50.00	23.42	L1	OFF	20.0
17.383830	31.41	---	60.00	28.59	L1	OFF	20.0

## EUT Information

Report NO : 111325  
 Test Mode : Mode 3  
 Test Voltage : 120Vac/60Hz  
 Phase : Neutral

Full Spectrum



## Final\_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.150000	---	20.88	56.00	35.12	N	OFF	19.7
0.150000	34.13	---	66.00	31.87	N	OFF	19.7
0.235230	---	32.88	52.26	19.38	N	OFF	19.7
0.235230	38.24	---	62.26	24.02	N	OFF	19.7
0.501540	---	32.04	46.00	13.96	N	OFF	19.9
0.501540	36.82	---	56.00	19.18	N	OFF	19.9
0.632040	---	26.57	46.00	19.43	N	OFF	20.0
0.632040	35.88	---	56.00	20.12	N	OFF	20.0
3.552270	---	24.19	46.00	21.81	N	OFF	20.0
3.552270	30.77	---	56.00	25.23	N	OFF	20.0
6.627750	---	20.83	50.00	29.17	N	OFF	20.0
6.627750	24.86	---	60.00	35.14	N	OFF	20.0



## Appendix C. Radiated Spurious Emission

Test Engineer :	Leo Lee, Mancy Chou and Bigshow Wang	Temperature :	22.8~23.2°C
		Relative Humidity :	44~50%



Band 4 - 5725~5850MHz

WIFI 802.11ax HE40\_Full (Band Edge @ 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)
		5610.6	51.63	-16.57	68.2	39.69	31.62	10.39	30.07	260	127	P	H
		5676	52.63	-34.85	87.48	40.59	31.7	10.46	30.12	260	127	P	H
		5719.6	55.38	-55.31	110.69	43.28	31.74	10.51	30.15	260	127	P	H
		5721.2	56.54	-57	113.54	44.44	31.74	10.51	30.15	260	127	P	H
	*	5755	100.68	-	-	88.5	31.8	10.55	30.17	260	127	P	H
	*	5755	90.44	-	-	78.26	31.8	10.55	30.17	260	127	A	H
		5851.805	50.32	-67.76	118.08	37.92	32	10.64	30.24	260	127	P	H
		5868	52.22	-54.94	107.16	39.78	32.04	10.65	30.25	260	127	P	H
		5886.04	52.4	-44.6	97	39.94	32.07	10.66	30.27	260	127	P	H
		5947.745	52.58	-15.62	68.2	39.99	32.2	10.7	30.31	260	127	P	H
802.11ax													H
HE40 Full													H
CH 151		5628.8	52.69	-15.51	68.2	40.7	31.66	10.41	30.08	100	221	P	V
5755MHz		5695.2	53.39	-48.27	101.66	41.34	31.7	10.48	30.13	100	221	P	V
		5718.8	57.66	-52.8	110.46	45.56	31.74	10.51	30.15	100	221	P	V
		5722.8	58.35	-58.83	117.18	46.23	31.75	10.52	30.15	100	221	P	V
	*	5755	103.03	-	-	90.85	31.8	10.55	30.17	100	221	P	V
	*	5755	92.77	-	-	80.59	31.8	10.55	30.17	100	221	A	V
		5854.47	52.24	-59.77	112.01	39.84	32.01	10.64	30.25	100	221	P	V
		5856.725	51.76	-58.56	110.32	39.36	32.01	10.64	30.25	100	221	P	V
		5886.86	52.41	-43.99	96.4	39.95	32.07	10.66	30.27	100	221	P	V
		5927.655	52.18	-16.02	68.2	39.63	32.16	10.69	30.3	100	221	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz

WIFI 802.11ax HE40\_Full (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 )
802.11ax HE40 Full CH 151 5755MHz		11510	48.95	-25.05	74	54.73	40.09	15.04	60.91	100	0	P	H
		17265	50.11	-18.09	68.2	49.46	40.93	18.5	58.78	100	0	P	H
		18000	59.25	-14.75	74	49.11	49	19.04	57.9	100	107	P	H
		18000	50.08	-3.92	54	39.94	49	19.04	57.9	100	107	A	H
		11510	49.58	-24.42	74	55.36	40.09	15.04	60.91	100	0	P	V
		17265	50.29	-17.91	68.2	49.64	40.93	18.5	58.78	100	0	P	V
		18000	59.75	-14.25	74	49.61	49	19.04	57.9	100	212	P	V
		18000	49.84	-4.16	54	39.7	49	19.04	57.9	100	212	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 - 5725~5850MHz

WIFI 802.11ax HE40\_Full (Band Edge @ 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.		
2		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	(P/A)	(H/V)	
802.11ax HE40 Full CH 151 5755MHz		5643.6	53.98	-14.22	68.2	41.95	31.69	10.43	30.09	100	4	P	H	
		5699.4	60.65	-44.11	104.76	48.59	31.7	10.49	30.13	100	4	P	H	
		5718.2	70.89	-39.41	110.3	58.79	31.74	10.51	30.15	100	4	P	H	
		5723	71.55	-46.09	117.64	59.43	31.75	10.52	30.15	100	4	P	H	
	*	5755	109.18	-	-	97	31.8	10.55	30.17	100	4	P	H	
	*	5755	99.85	-	-	87.67	31.8	10.55	30.17	100	4	A	H	
		5852.42	54.22	-62.46	116.68	41.82	32	10.64	30.24	100	4	P	H	
		5856.725	53.25	-57.07	110.32	40.85	32.01	10.64	30.25	100	4	P	H	
		5922.94	53.13	-16.59	69.72	40.58	32.15	10.69	30.29	100	4	P	H	
		5941.8	52.52	-15.68	68.2	39.95	32.18	10.7	30.31	100	4	P	H	
														H
														H
			5603.8	52.75	-15.45	68.2	40.82	31.61	10.38	30.06	258	195	P	V
			5699.2	56	-48.61	104.61	43.94	31.7	10.49	30.13	258	195	P	V
			5719.2	64.45	-46.13	110.58	52.35	31.74	10.51	30.15	258	195	P	V
			5723	65.86	-51.78	117.64	53.74	31.75	10.52	30.15	258	195	P	V
	*		5755	103.43	-	-	91.25	31.8	10.55	30.17	258	195	P	V
	*		5755	94.17	-	-	81.99	31.8	10.55	30.17	258	195	A	V
			5854.265	51.66	-60.81	112.47	39.26	32.01	10.64	30.25	258	195	P	V
			5866.77	52.15	-55.35	107.5	39.72	32.03	10.65	30.25	258	195	P	V
		5882.35	51.86	-47.88	99.74	39.41	32.06	10.66	30.27	258	195	P	V	
		5938.315	51.76	-16.44	68.2	39.19	32.18	10.7	30.31	258	195	P	V	
													V	
													V	
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.													





Band 4 5725~5850MHz

WIFI 802.11ax HE40\_Full (Harmonic @ 3m)

WIFI Ant. 2	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 )
802.11ax HE40 Full CH 151 5755MHz		11510	49.25	-24.75	74	55.03	40.09	15.04	60.91	100	0	P	H
		17265	50.39	-17.81	68.2	49.74	40.93	18.5	58.78	100	0	P	H
		18000	60.85	-13.15	74	50.71	49	19.04	57.9	100	126	P	H
		18000	50.33	-3.67	54	40.19	49	19.04	57.9	100	126	A	H
		11510	48.73	-25.27	74	54.51	40.09	15.04	60.91	100	0	P	V
		17265	50.1	-18.1	68.2	49.45	40.93	18.5	58.78	100	0	P	V
		18000	60.97	-13.03	74	50.83	49	19.04	57.9	300	203	P	V
		18000	50.65	-3.35	54	40.51	49	19.04	57.9	300	203	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 - 5725~5850MHz

WIFI 802.11ax HE80\_Full (Band Edge @ 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+2		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	(P/A)	(H/V)
		5641.4	61.79	-6.41	68.2	49.77	31.68	10.43	30.09	100	158	P	H
		5691.4	66.26	-32.6	98.86	54.21	31.7	10.48	30.13	100	158	P	H
		5719.2	69.78	-40.8	110.58	57.68	31.74	10.51	30.15	100	158	P	H
		5725	70.21	-51.99	122.2	58.09	31.75	10.52	30.15	100	158	P	H
	*	5775	107.33	-	-	95.15	31.8	10.57	30.19	100	158	P	H
	*	5775	98.14	-	-	85.96	31.8	10.57	30.19	100	158	A	H
		5852.215	66.04	-51.11	117.15	53.64	32	10.64	30.24	100	158	P	H
		5856.93	66.59	-43.67	110.26	54.19	32.01	10.64	30.25	100	158	P	H
		5879.275	59.08	-42.94	102.02	46.62	32.06	10.66	30.26	100	158	P	H
		5927.04	55.23	-12.97	68.2	42.69	32.15	10.69	30.3	100	158	P	H
802.11ax													H
HE80 Full													H
CH 155													
5775MHz		5639.8	57.07	-11.13	68.2	45.06	31.68	10.42	30.09	100	227	P	V
		5697.8	59.45	-44.13	103.58	47.39	31.7	10.49	30.13	100	227	P	V
		5719.8	63.97	-46.77	110.74	51.87	31.74	10.51	30.15	100	227	P	V
		5723.6	65.19	-53.82	119.01	53.07	31.75	10.52	30.15	100	227	P	V
	*	5775	106.36	-	-	94.18	31.8	10.57	30.19	100	227	P	V
	*	5775	97.47	-	-	85.29	31.8	10.57	30.19	100	227	A	V
		5852.83	62.87	-52.88	115.75	50.46	32.01	10.64	30.24	100	227	P	V
		5858.16	64.16	-45.75	109.91	51.75	32.02	10.64	30.25	100	227	P	V
		5876.815	58.42	-45.43	103.85	45.98	32.05	10.65	30.26	100	227	P	V
		5930.935	54.54	-13.66	68.2	41.99	32.16	10.69	30.3	100	227	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz

WIFI 802.11ax HE80\_Full (Harmonic @ 3m)

WIFI Ant. 1+2	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 )
802.11ax HE80 Full CH 155 5775MHz		11550	49.64	-24.36	74	55.49	40.05	15.06	60.96	100	0	P	H
		17325	52.65	-15.55	68.2	51.53	41.28	18.55	58.71	100	0	P	H
		17989	60.84	-13.16	74	50.92	48.8	19.03	57.91	100	136	P	H
		17989	50.82	-3.18	54	40.9	48.8	19.03	57.91	100	136	A	H
		11550	49.92	-24.08	74	55.77	40.05	15.06	60.96	100	0	P	V
		17325	52.12	-16.08	68.2	51	41.28	18.55	58.71	100	0	P	V
		17989	61.42	-12.58	74	51.5	48.8	19.03	57.91	300	241	P	V
		17989	50.95	-3.05	54	41.03	48.8	19.03	57.91	300	241	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Emission above 18GHz

WIFI 802.11ax HE80 Full (SHF @ 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+2		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )	
802.11ax HE80 Full SHF		22818	40.29	-33.71	74	43.36	38.78	12.4	54.25	150	0	P	H	
		34016	43.7	-24.5	68.2	41.91	41.78	17.93	57.92	150	0	P	H	
													H	
													H	
													H	
													H	
													H	
													H	
													H	
													H	
													H	
													H	
													H	
													H	
													H	
													H	
													H	
													H	
			20640	38.07	-35.93	74	42.99	38.7	11.22	54.84	150	0	P	V
			34060	43.58	-24.62	68.2	41.84	41.74	17.96	57.96	150	0	P	V
													V	
													V	
													V	
													V	
													V	
													V	
													V	
													V	
													V	
													V	
													V	
													V	
													V	
													V	
Remark	1. No other spurious found. 2. All results are PASS against limit line.													





**Note symbol**

*	<b>Fundamental Frequency</b> which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is <b>over limit</b> line.
P/A	<b>Peak</b> or <b>Average</b>
H/V	<b>Horizontal</b> or <b>Vertical</b>



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		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		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 D. Radiated Spurious Emission Plots

Test Engineer :	Leo Lee, Mancy Chou and Bigshow Wang	Temperature :	22.8~23.2°C
		Relative Humidity :	44~50%





**Band 4 - 5725~5850MHz**  
**WIFI 802.11ax HE40 Full (Band Edge @ 3m)**

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH151 5755MHz	
1	Horizontal	Fundamental
Peak	<p>Site : 03CH15-HY            Condition : PEAK_BE(B4)_16-24 3m 91200_15_1620 HORIZONTAL            Detector : Peak            Project : 111325</p>	<p>Site : 03CH15-HY            Condition : PEAK(LINE) 3m 91200_15_1620 HORIZONTAL            Detector : Peak            Project : 111325</p>
Peak	<p>Site : 03CH15-HY            Condition : PEAK_BE(B4)_16-24 3m 91200_15_1620 HORIZONTAL            Detector : Peak            Project : 111325</p>	Left blank



WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH151 5755MHz	
1	Vertical	Fundamental
Peak	<p>Site : 03CH15-HY            Condition : PEAK_BE(04)_16-24 3m 91200_15_1620 VERTICAL            Detector : Peak            Project : 111325</p>	<p>Site : 03CH15-HY            Condition : PEAK(UMB) 3m 91200_15_1620 VERTICAL            Detector : Peak            Project : 111325</p>
Peak	<p>Site : 03CH15-HY            Condition : PEAK_BE(04)_16-24 3m 91200_15_1620 VERTICAL            Detector : Peak            Project : 111325</p>	Left blank



**Band 4 - 5725~5850MHz**  
**WIFI 802.11ax HE40 Full (Harmonic @ 3m)**

<b>WIFI</b>	<b>Band 4 5725~5850MHz Harmonic @ 3m</b>	
<b>ANT</b>	<b>802.11ax HE40 Full CH151 5755MHz</b>	
<b>1</b>	<b>Horizontal</b>	<b>Vertical</b>
<b>Peak</b> <b>Avg.</b>	<p>Site : 03CH15-HY          Condition : PEAK(UNIT) 3m 91200_15_1620 HORIZONTAL          Detector : Peak          Project : 111325</p>	<p>Site : 03CH15-HY          Condition : PEAK(UNIT) 3m 91200_15_1620 VERTICAL          Detector : Peak          Project : 111325</p>



**Band 4 - 5725~5850MHz**  
**WIFI 802.11ax HE40 Full (Band Edge @ 3m)**

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH151 5755MHz	
2	Horizontal	Fundamental
Peak	<p>Site : 03CH15-HY            Condition : PEAK_BE(B4)_16-24 3m 91200_15_1620 HORIZONTAL            Detector : Peak            Project : 111325</p>	<p>Site : 03CH15-HY            Condition : PEAK(LINE) 3m 91200_15_1620 HORIZONTAL            Detector : Peak            Project : 111325</p>
Peak	<p>Site : 03CH15-HY            Condition : PEAK_BE(B4)_16-24 3m 91200_15_1620 HORIZONTAL            Detector : Peak            Project : 111325</p>	Left blank



WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ax HE40 Full CH151 5755MHz	
2	Vertical	Fundamental
Peak	<p>Date: 2021.03.09 PEAK_BE(04)_16-24</p> <p>Site : 03CH15-HY Condition : PEAK_BE(04)_16-24 3m 91200_15_1620 VERTICAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Project : 111325</p>	<p>Date: 2021.03.09 PEAK(UNII) 400.0dB</p> <p>Site : 03CH15-HY Condition : PEAK(UNII) 3m 91200_15_1620 VERTICAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Project : 111325</p>
Peak	<p>Date: 2021.03.09 PEAK_BE(04)_16-24</p> <p>Site : 03CH15-HY Condition : PEAK_BE(04)_16-24 3m 91200_15_1620 VERTICAL Detector : RBW:1000.000kHz VBW:3000.000kHz SWT:Auto Project : 111325</p>	Left blank



Band 4 - 5725~5850MHz
WIFI 802.11ax HE40 Full (Harmonic @ 3m)

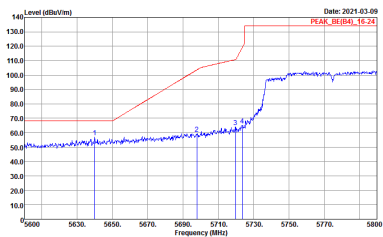
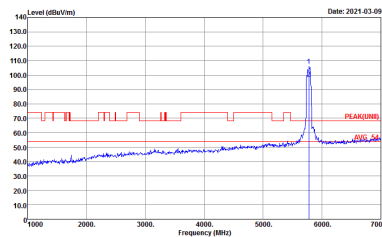
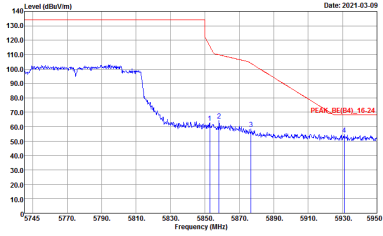
Table with 2 columns: Horizontal and Vertical. Each column contains a graph of Level (dBuV/m) vs Frequency (MHz) and associated test parameters like Site, Condition, Detector, and Project.



**Band 4 - 5725~5850MHz**  
**WIFI 802.11ax HE80 Full (Band Edge @ 3m)**

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ax HE80 Full CH155 5775MHz	
1+2	Horizontal	Fundamental
Peak	<p>Site : 03CH15-HY            Condition : PEAK_BE(B4)_16-24 3m 91200_15_1620 HORIZONTAL            Detector : Peak            Project : 111325</p>	<p>Site : 03CH15-HY            Condition : PEAK(LINE) 3m 91200_15_1620 HORIZONTAL            Detector : Peak            Project : 111325</p>
Peak	<p>Site : 03CH15-HY            Condition : PEAK_BE(B4)_16-24 3m 91200_15_1620 HORIZONTAL            Detector : Peak            Project : 111325</p>	Left blank



WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ax HE80 Full CH155 5775MHz	
1+2	Vertical	Fundamental
Peak	 <p>Date: 2021-03-09 PEAK_BE(84)_16-24</p> <p>Site : 03CH15-HY Condition : PEAK_BE(84)_16-24 3m 91200_15_1620 VERTICAL Detector : Peak Project : 111325</p>	 <p>Date: 2021-03-09 PEAK(LINB) EUS 24</p> <p>Site : 03CH15-HY Condition : PEAK(LINB) 3m 91200_15_1620 VERTICAL Detector : Peak Project : 111325</p>
Peak	 <p>Date: 2021-03-09 PEAK_BE(84)_16-24</p> <p>Site : 03CH15-HY Condition : PEAK_BE(84)_16-24 3m 91200_15_1620 VERTICAL Detector : Peak Project : 111325</p>	Left blank





**Band 4 - 5725~5850MHz**  
**WIFI 802.11ax HE80 Full (Harmonic @ 3m)**

<b>WIFI</b>	<b>Band 4 5725~5850MHz Harmonic @ 3m</b>	
<b>ANT</b>	<b>802.11ax HE80 Full CH155 5775MHz</b>	
<b>1+2</b>	<b>Horizontal</b>	<b>Vertical</b>
<b>Peak</b> <b>Avg.</b>	<p>Site : 03CH15-HY          Condition : PEAK(LINE1) 3m 9120D_15_1620 HORIZONTAL          Detector : Peak          Project : 111325</p>	<p>Site : 03CH15-HY          Condition : PEAK(LINE1) 3m 9120D_15_1620 VERTICAL          Detector : Peak          Project : 111325</p>



Emission above 18GHz  
5GHz WIFI 802.11ax HE80 Full (SHF)

WIFI	5GHz WIFI	
ANT	802.11ax HE80 Full SHF	
1+2	Horizontal	Vertical
QP / Peak	<p>Site : 03CH16-HY Condition : PEAK(LINE) 1m SHF HORN 88H49170576 HORIZONTAL Detector : Peak Project : 111325</p>	<p>Site : 03CH16-HY Condition : PEAK(LINE) 1m SHF HORN 88H49170576 VERTICAL Detector : Peak Project : 111325</p>



Emission below 1GHz  
5GHz WIFI 802.11ax HE80 Full (LF)

WIFI	5GHz WIFI	
ANT	802.11ax HE80 Full LF	
1+2	Horizontal	Vertical
QP / Peak	<p>Site : 03CH15-HY Condition : QP 3m 80LOG_41912_20210208 HORIZONTAL Detector : Peak Project : 111325</p>	<p>Site : 03CH15-HY Condition : QP 3m 80LOG_41912_20210208 VERTICAL Detector : Peak Project : 111325</p>

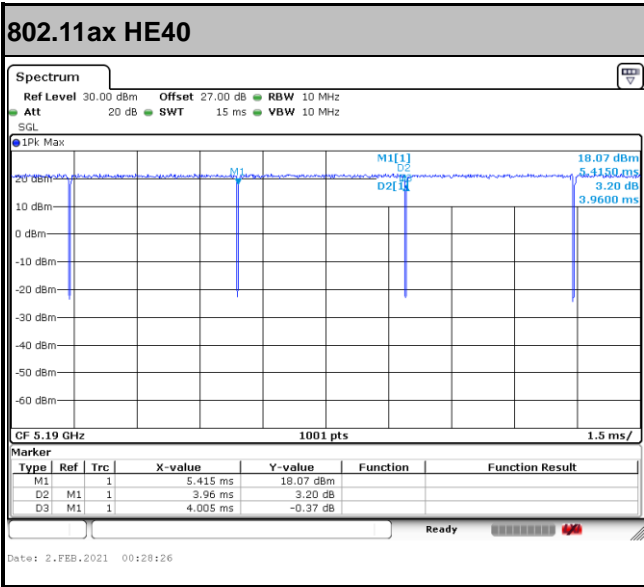


## Appendix E. Duty Cycle Plots

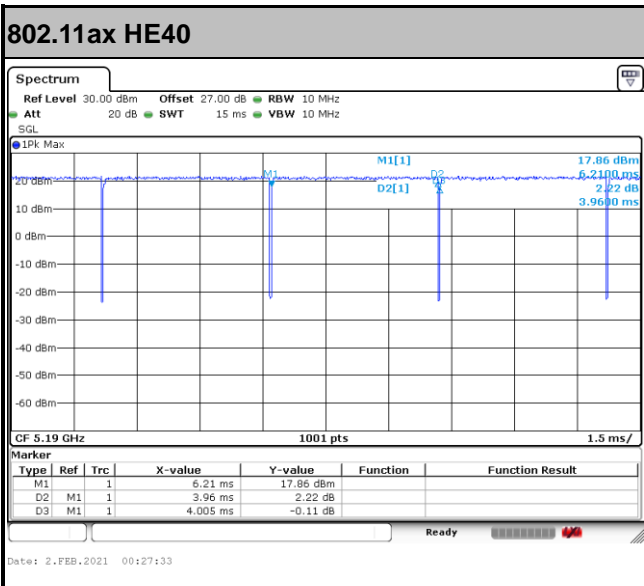
Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting	Duty Factor(dB)
1	5GHz 802.11ax HE40 Full RU	98.88	-	-	10Hz	0.05
2	5GHz 802.11ax HE40 Full RU	98.88	-	-	10Hz	0.05
1+2	5GHz 802.11ax HE80 Full RU for Ant. 1	99.12	-	-	10Hz	0.04
1+2	5GHz 802.11ax HE80 Full RU for Ant. 2	98.99	-	-	10Hz	0.04



<Ant. 1>

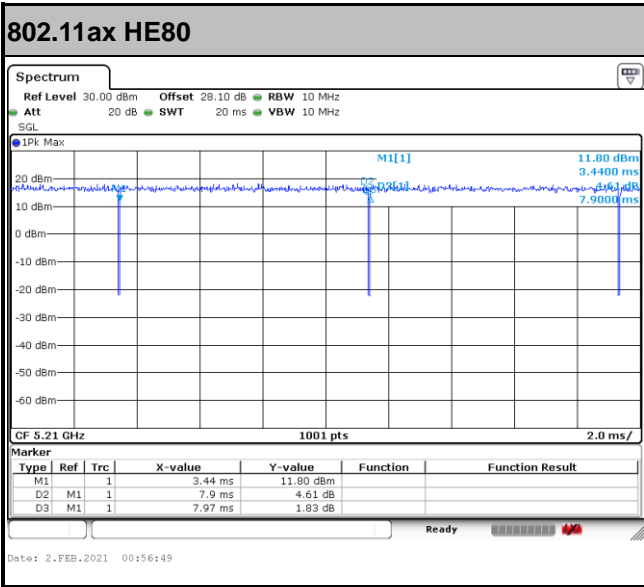


<Ant. 2>





MIMO <Ant. 1>



MIMO <Ant. 2>

