

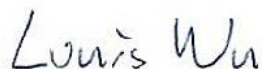
# FCC RADIO TEST REPORT

**FCC ID** : TYM-J100  
**Equipment** : Wireless Module  
**Brand Name** : AVAYA  
**Model name** : J100  
**Marketing Name** : J100 Wireless Module  
**Applicant** : AVAYA  
250 Sidney Street, Belleville, Ontario, K8P  
3Z3, Canada  
**Manufacturer** : Wistron Corporation  
21th Fl., 88, Sec.1, Hsin Tai Wu Rd., Hsichih,  
Taipei Hsien 221, Taiwan, R.O.C.  
**Standard** : FCC Part 15 Subpart E §15.407

The product was received on Aug. 05, 2019 and testing was started from Sep. 16, 2019 and completed on Sep. 26, 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 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, Taiwan (R.O.C.)



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## History of this test report

Report No.	Version	Description	Issued Date
FR980514E	01	Initial issue of report	Nov. 08, 2019

## Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.403 (i)	6dB & 26dB Bandwidth	Pass	-
3.1	2.1049	99% Occupied Bandwidth	Reporting only	-
3.2	15.407 (a)	Maximum Conducted Output Power	Pass	-
3.3	15.407 (a)	Power Spectral Density	Pass	-
3.4	15.407(b)	Unwanted Emissions	Pass	Under limit 2.35 dB at 5649.600 MHz
3.5	15.207	AC Conducted Emission	Pass	Under limit 12.97 dB at 0.830 MHz
3.6	15.407 (c)	Automatically Discontinue Transmission	Pass	-
3.7	15.203 & 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: Yimin Ho**



# 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: Chip Antenna Bluetooth: Chip Antenna

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

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

Test Site	SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory	
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855	
Test Site No.	Sporton Site No.	
	03CH13-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.
- ♦ ANSI C63.10-2013

**Remark:** All test items were verified and recorded according to the standards and without any deviation during the test.

## 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).
- 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.
2. The above Frequency and Channel in "<sup>#</sup>" were 802.11ac VHT80.

## 2.2 Test Mode

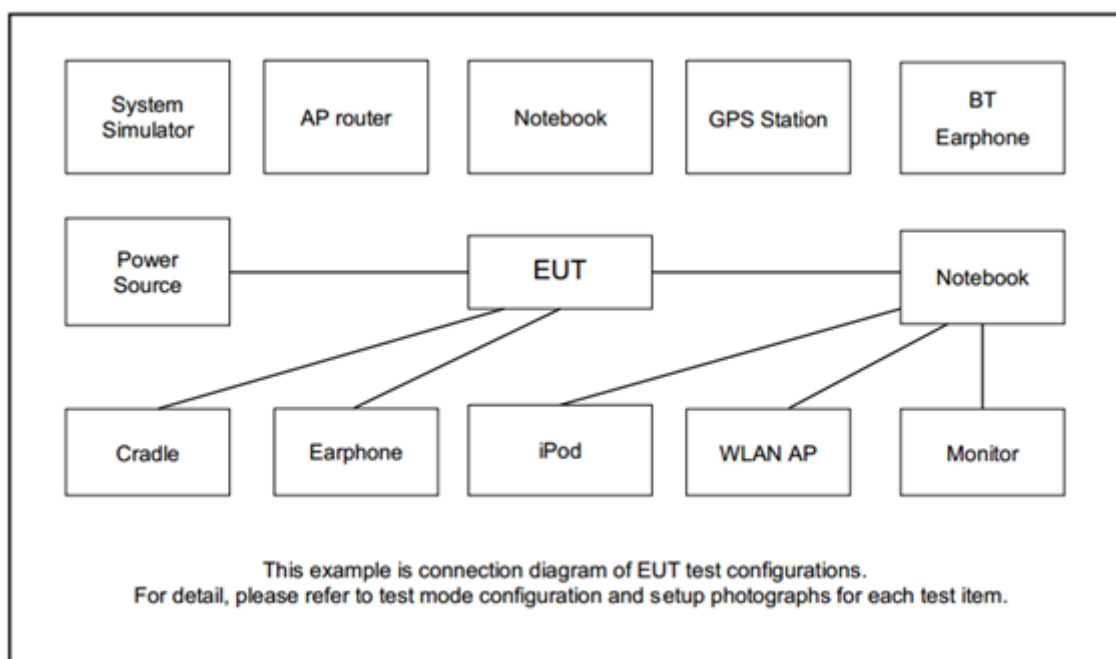
Final test modes are considering the modulation and worse data rates as below table.

Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT20 (Covered by HT20)	MCS0
802.11ac VHT40 (Covered by HT40)	MCS0
802.11ac VHT80	MCS0

Test Cases	
AC Conducted Emission	Mode 1 : WLAN 5GHz Tx

Ch. #		Band IV : 5725-5850 MHz			
		802.11a	802.11n HT20	802.11n HT40	802.11ac VHT80
L	Low	149	149	151	-
M	Middle	157	157	-	155
H	High	165	165	159	-

## 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.	Adapter	Phihong	PSAC12R-050	N/A	N/A	N/A
2.	Fixture	DELL	N/A	N/A	N/A	N/A
3.	Notebook	DELL	Latitude E5480	FCC DoC	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	Notebook	DELL	Latitude E3340	FCC DoC/ Contains FCC ID: PD97260NGU	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 “cmd” was installed in Notebook 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.

## 2.6 Measurement Results Explanation Example

**For all conducted test items:**

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example :

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

*Offset = RF cable loss + attenuator factor.*

Following shows an offset computation example with cable loss 4.2 dB and 10dB attenuator.

$$\begin{aligned}
 \text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)}. \\
 &= 4.2 + 10 = 14.2 \text{ (dB)}
 \end{aligned}$$



### 3 Test Result

#### 3.1 6dB and 26dB and 99% Occupied Bandwidth Measurement

##### 3.1.1 Description of 6dB and 26dB and 99% Occupied Bandwidth

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

26dB and 99% Occupied bandwidth are reporting only.

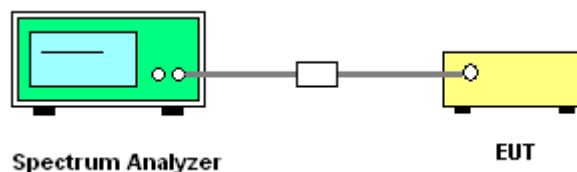
##### 3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

##### 3.1.3 Test Procedures

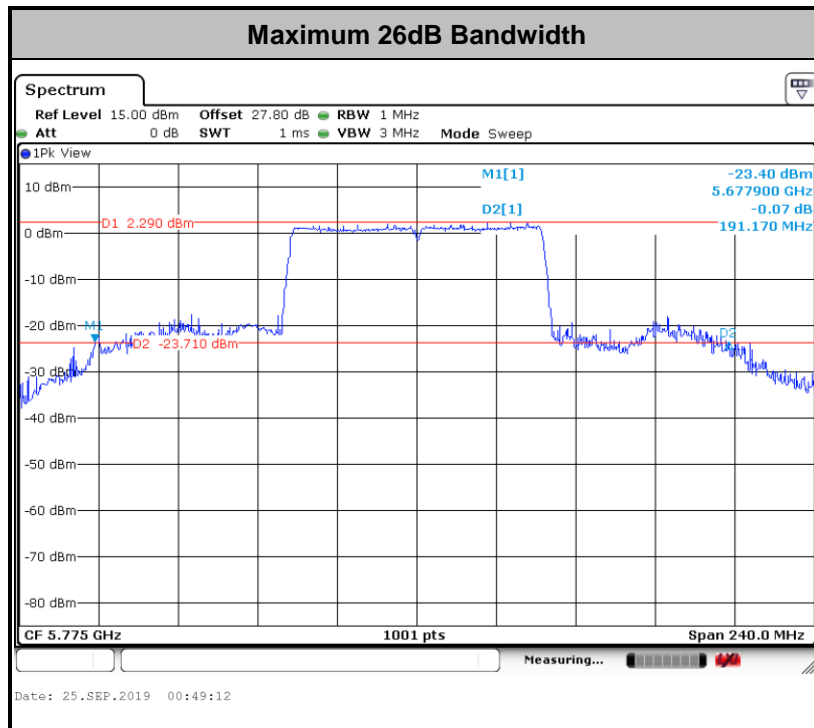
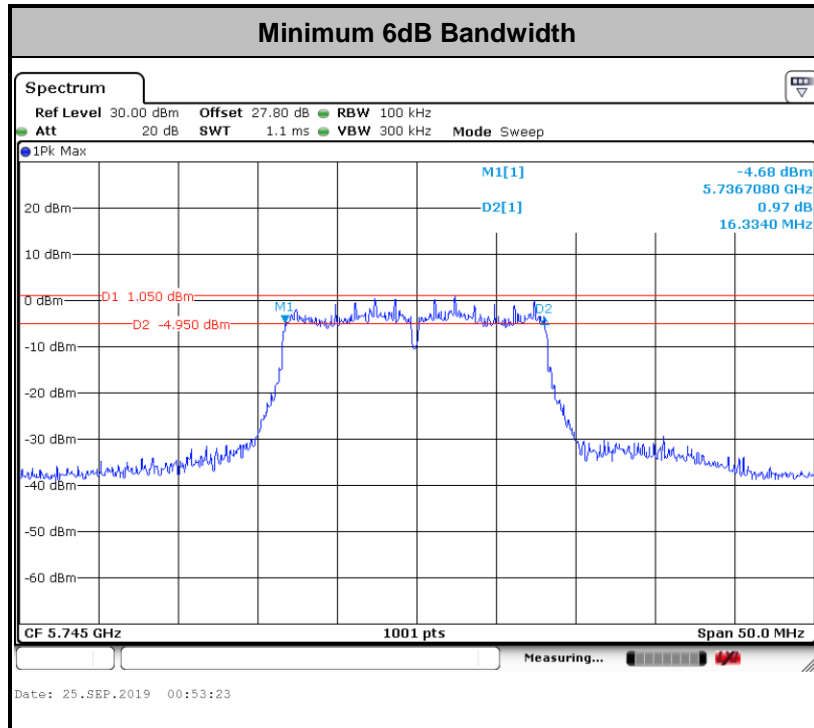
1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.  
Section C) Emission bandwidth for the band 5.725-5.85GHz
2. Set RBW = 100kHz.
3. Set the VBW  $\geq 3 \times$  RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is 6 dB down from the peak of the emission.
7. Measure and record the results in the test report.

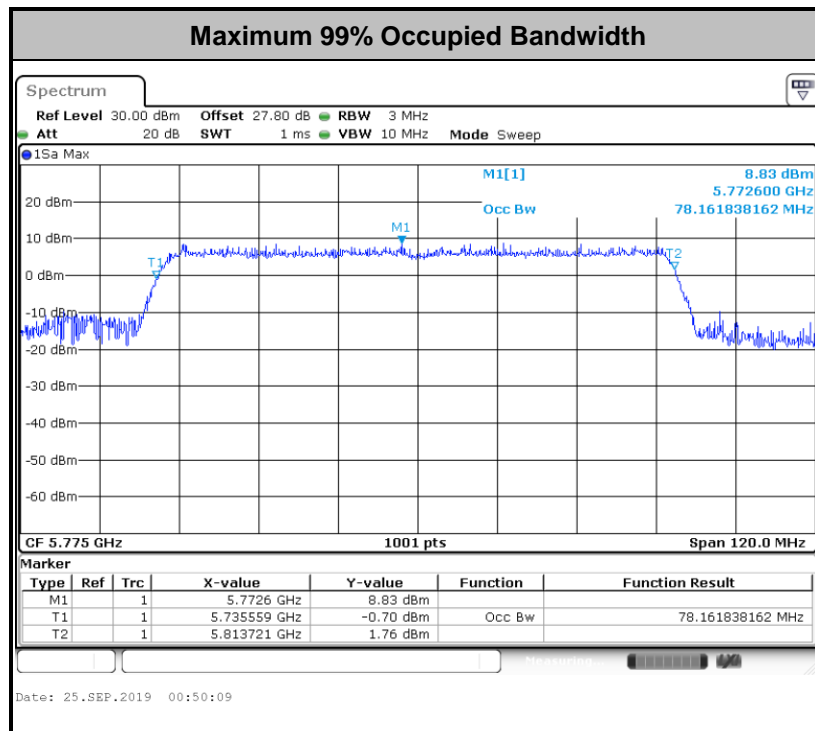
##### 3.1.4 Test Setup



##### 3.1.5 Test Result of 6dB and 26dB and 99% Occupied Bandwidth

Please refer to Appendix A.





**Note:** The occupied channel bandwidth is maintained within the band of operation for all of the modulations.

## **3.2 Maximum Conducted Output Power Measurement**

### **3.2.1 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.

### **3.2.2 Measuring Instruments**

See list of measuring equipment of this test report.

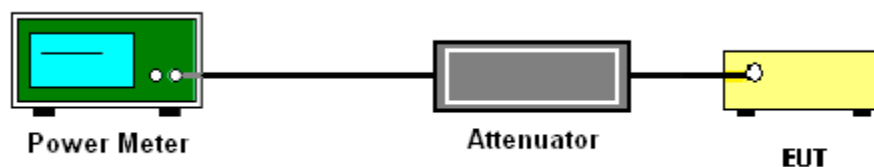
### **3.2.3 Test Procedures**

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.

### **3.2.4 Test Setup**



### **3.2.5 Test Result of Maximum Conducted Output Power**

Please refer to Appendix A.



### **3.3 Power Spectral Density Measurement**

#### **3.3.1 Limit of Power Spectral Density**

For the band 5.725–5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.

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.

#### **3.3.2 Measuring Instruments**

See list of measuring equipment of this test report.

#### **3.3.3 Test Procedures**

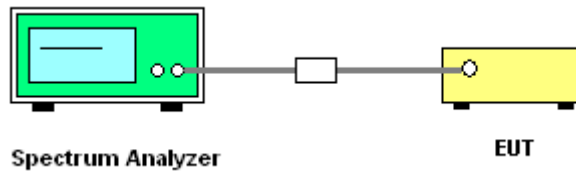
The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.  
Section F) Maximum power spectral density.

##### **# Method SA-3 #**

(power averaging (rms) detection with max hold):

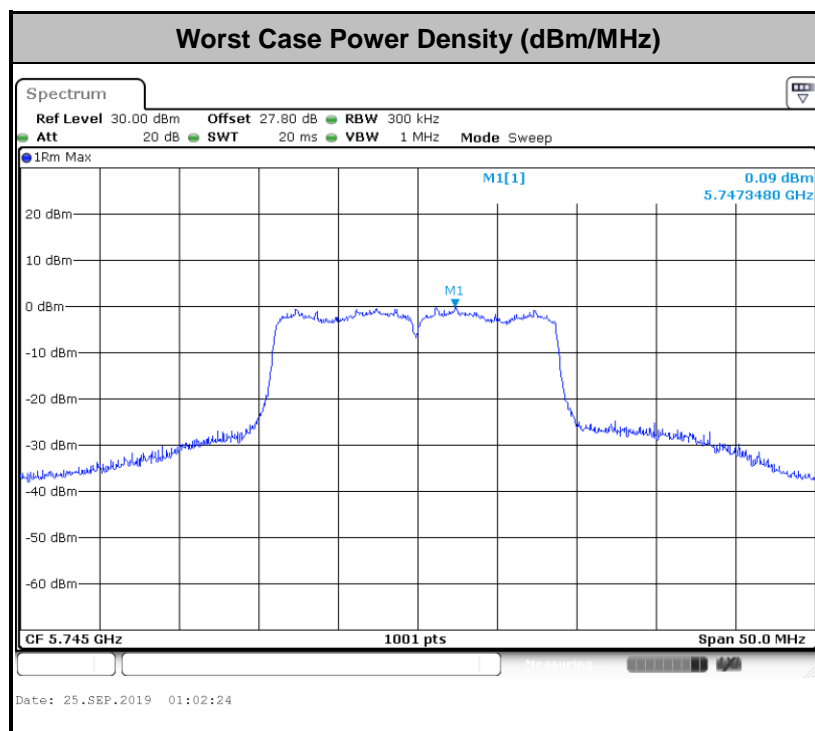
- Set span to encompass the entire emission bandwidth (EBW) of the signal.
  - Set RBW = 300 kHz.
  - Set VBW  $\geq$  1 MHz.
  - Number of points in sweep  $\geq$  2 Span / RBW.
  - Sweep time  $\leq$  (number of points in sweep)  $\times$  T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
  - Detector = power averaging (rms).
  - Trace mode = max hold.
  - Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.
- 
1. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
  2. Each plot has already offset with cable loss, and attenuator loss. Measure the PPSD and record it.

### 3.3.4 Test Setup



### 3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.



### 3.4 Unwanted Emissions Measurement

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

#### 3.4.1 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.

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

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.

### 3.4.2 Measuring Instruments

See list of measuring equipment of this test report.

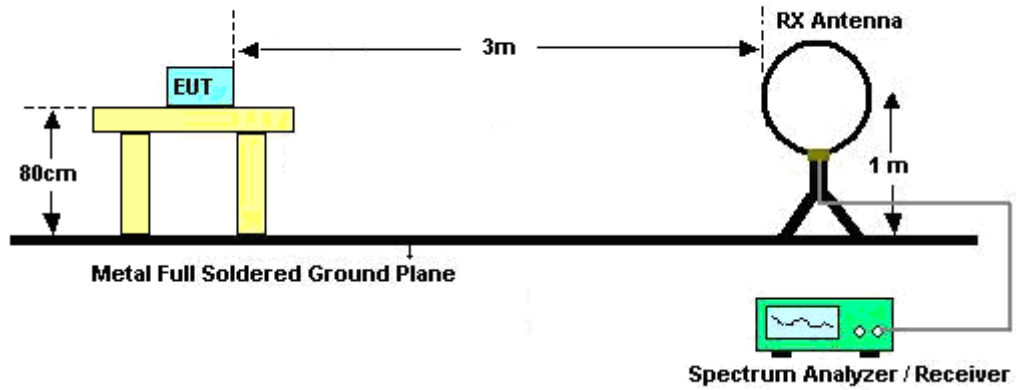
### 3.4.3 Test Procedures

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  $\geq$  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  $\geq$  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 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.

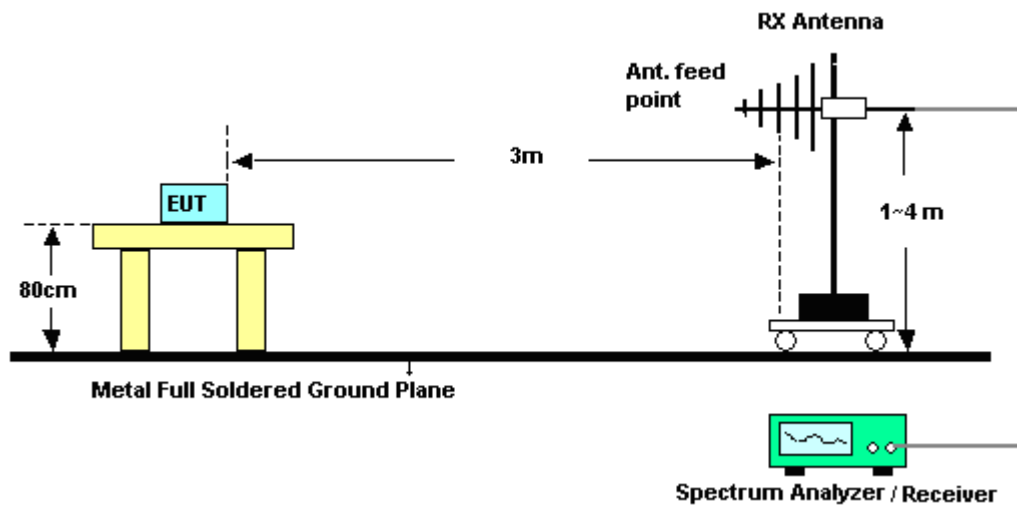


### 3.4.4 Test Setup

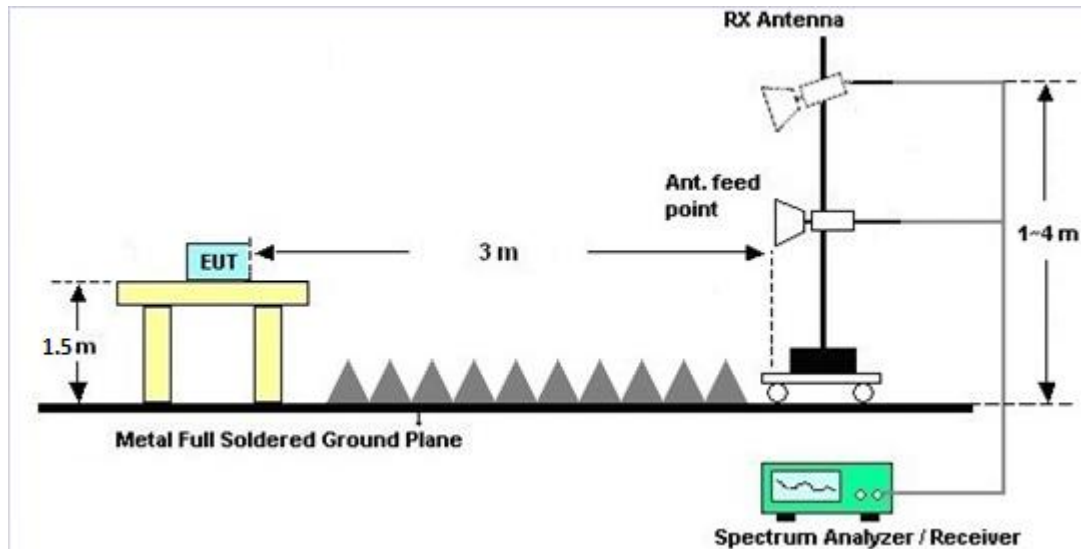
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



### 3.4.5 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.

### 3.4.6 Test Result of Radiated Band Edges

Please refer to Appendix C and D.

### 3.4.7 Duty Cycle

Please refer to Appendix E.

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

Please refer to Appendix C and D.

### 3.5 AC Conducted Emission Measurement

#### 3.5.1 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.

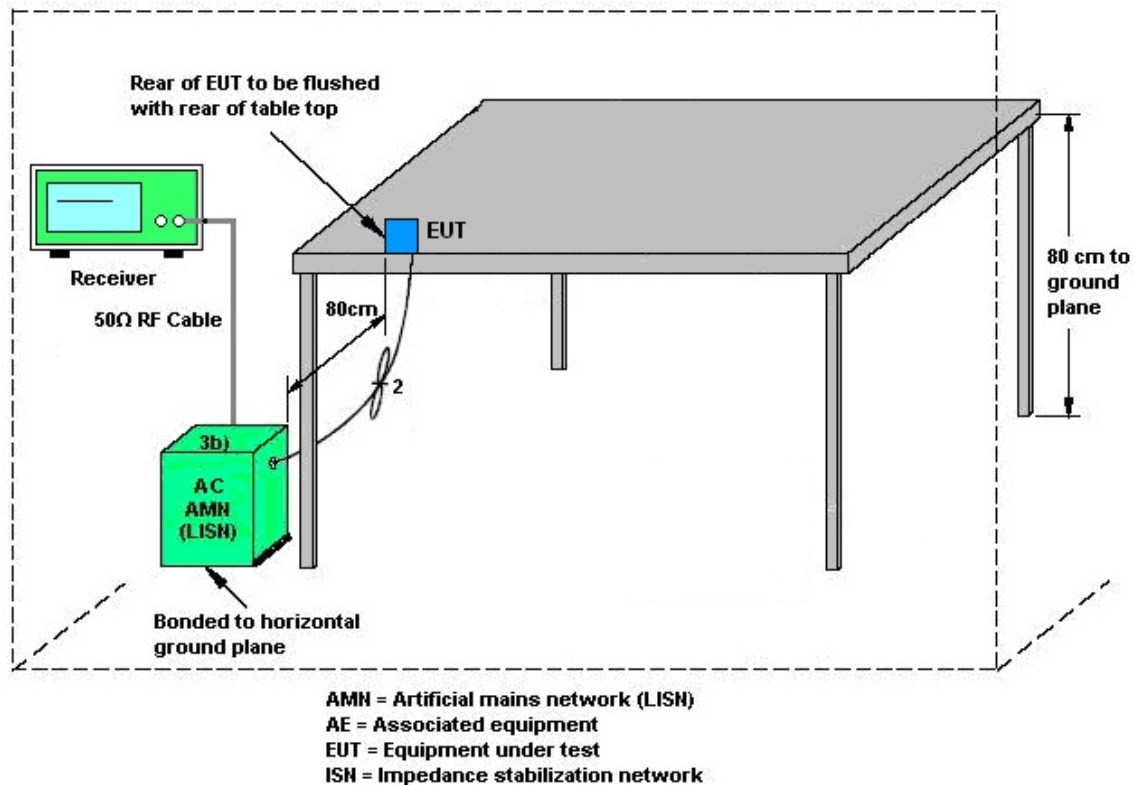
#### 3.5.2 Measuring Instruments

See list of measuring equipment of this test report.

#### 3.5.3 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 should 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.

### 3.5.4 Test Setup



### 3.5.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

## **3.6 Automatically Discontinue Transmission**

### **3.6.1 Limit of Automatically Discontinue Transmission**

The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signaling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization to describe how this requirement is met.

### **3.6.2 Measuring Instruments**

See list of measuring equipment of this test report.

### **3.6.3 Test Result of Automatically Discontinue Transmission**

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.



## **3.7 Antenna Requirements**

### **3.7.1 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.

### **3.7.2 Antenna Anti-Replacement Construction**

An embedded-in antenna design is used.

### **3.7.3 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	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100488	9 kHz~30 MHz	Jan. 07, 2019	Sep. 18, 2019~ Sep. 21, 2019	Jan. 06, 2020	Radiation (03CH13-HY)
Bilog Antenna	TESEQ	CBL 6111D& 00800N1D01 N-06	40103 & 07	30MHz~1GHz	Apr. 30, 2019	Sep. 18, 2019~ Sep. 21, 2019	Apr. 29, 2020	Radiation (03CH13-HY)
Horn Antenna	SCHWARZBE CK	BBHA 9120 D	9120D-124 1	1GHz~18GHz	Jul. 02, 2019	Sep. 18, 2019~ Sep. 21, 2019	Jul. 01, 2020	Radiation (03CH13-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1590074	1GHz~18GHz	May 20, 2019	Sep. 18, 2019~ Sep. 21, 2019	May 19, 2020	Radiation (03CH13-HY)
Preamplifier	Keysight	83017A	MY532701 47	1GHz~26.5GHz	Mar. 15, 2019	Sep. 18, 2019~ Sep. 21, 2019	Mar. 14, 2020	Radiation (03CH13-HY)
Amplifier	SONOMA	310N	187282	9kHz~1GHz	Dec. 18, 2018	Sep. 18, 2019~ Sep. 21, 2019	Dec. 17, 2019	Radiation (03CH13-HY)
Preamplifier	EMEC	EM18G40G	060715	18GHz~40GHz	Dec. 06, 2018	Sep. 18, 2019~ Sep. 21, 2019	Dec. 04, 2018	Radiation (03CH13-HY)
Spectrum Analyzer	Keysight	N9010A	MY553705 26	10Hz~44GHz	Mar. 19, 2019	Sep. 18, 2019~ Sep. 21, 2019	Mar. 18, 2020	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 126E	0030/126E	30M-18G	Feb. 13, 2019	Sep. 18, 2019~ Sep. 21, 2019	Feb. 12, 2020	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	804793/4	30M-18G	Feb. 13, 2019	Sep. 18, 2019~ Sep. 21, 2019	Feb. 12, 2020	Radiation (03CH13-HY)
RF Cable	HUBER + SUHNER	SUCOFLEX 104	MY24961/ 4	30M-18G	Feb. 13, 2019	Sep. 18, 2019~ Sep. 21, 2019	Feb. 12, 2020	Radiation (03CH13-HY)
Spectrum Analyzer	Keysight	N9010A	MY553705 26	10Hz~44GHz	Mar. 19, 2019	Sep. 18, 2019~ Sep. 21, 2019	Mar. 18, 2020	Radiation (03CH13-HY)
Antenna Mast	EMEC	AM-BS-4500- B	N/A	1m~4m	N/A	Sep. 18, 2019~ Sep. 21, 2019	N/A	Radiation (03CH13-HY)
Software	AUDIX	E3 6.2009-8-24c	RK-001124	N/A	N/A	Sep. 18, 2019~ Sep. 21, 2019	N/A	Radiation (03CH13-HY)
Turn Table	EMEC	TT2000	N/A	0~360 Degree	N/A	Sep. 18, 2019~ Sep. 21, 2019	N/A	Radiation (03CH13-HY)
EMI Test Receiver	Keysight	N9038A (MXE)	MY541300 85	20Hz ~ 8.4GHz	Nov. 01, 2018	Sep. 18, 2019~ Sep. 21, 2019	Oct. 31, 2019	Radiation (03CH13-HY)
Filter	Wainwright	WLKS1200-1 2SS	SN2	1.2GHz Low Pass Filter	Mar. 22, 2019	Sep. 18, 2019~ Sep. 21, 2019	Mar. 21, 2020	Radiation (03CH13-HY)
Filter	Woken	WHKX8-5272. 5-6750-18000 -40ST	SN5	6.75G Highpass	Mar.13, 2019	Sep. 18, 2019~ Sep. 21, 2019	Mar. 12, 2020	Radiation (03CH13-HY)
Power Sensor	DARE	RPR3006W	13I00030S NO32	9kHz~6GHz	Dec. 03, 2018	Sep. 16, 2019~ Sep. 25, 2019	Dec. 02, 2019	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSV40	101397	10Hz~40GHz	Nov. 13, 2018	Sep. 16, 2019~ Sep. 25, 2019	Nov. 12, 2019	Conducted (TH05-HY)
Switch Box & RF Cable	Burgeon	ETF-058	EC120838 2	N/A	Mar. 27, 2019	Sep. 16, 2019~ Sep. 25, 2019	Mar. 26, 2020	Conducted (TH05-HY)



Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Sep. 26, 2019	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESR3	102388	9kHz~3.6GHz	Nov. 12, 2018	Sep. 26, 2019	Nov. 11, 2019	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Nov. 14, 2018	Sep. 26, 2019	Nov. 13, 2019	Conduction (CO05-HY)
Software	Rohde & Schwarz	EMC32 V10.30	N/A	N/A	N/A	Sep. 26, 2019	N/A	Conduction (CO05-HY)
LF Cable	HUBER + SUHNER	RG-214/U	LF01	N/A	Dec. 31, 2018	Sep. 26, 2019	Dec. 30, 2019	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Dec. 31, 2018	Sep. 26, 2019	Dec. 30, 2019	Conduction (CO05-HY)



## 5 Uncertainty of Evaluation

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

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	2.2
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### Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	4.9
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### Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	5.4
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### Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ( $U = 2Uc(y)$ )	4.3
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**Appendix A. Test Result of Conducted Test Items**

Test Engineer:	Derek Hsu	Temperature:	21~25	°C
Test Date:	2019/09/16~2019/09/25	Relative Humidity:	51~54	%
TX Tool	DutApiClass	TX Tool Version	2.0.0.96	

**TEST RESULTS DATA**  
**6dB and 26dB EBW and 99% OBW**

Band IV												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)		26dB Bandwidth (MHz)		6 dB Bandwidth (MHz)		6 dB Bandwidth Min. Limit (MHz)	Pass/Fail
					Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2		
11a	6Mbps	1	149	5745	16.83	-	30.77	-	16.33	-	0.5	Pass
11a	6Mbps	1	157	5785	16.88	-	29.07	-	16.33	-	0.5	Pass
11a	6Mbps	1	165	5825	16.98	-	31.82	-	16.33	-	0.5	Pass
HT20	MCS0	1	149	5745	18.03	-	37.96	-	17.03	-	0.5	Pass
HT20	MCS0	1	157	5785	17.93	-	37.46	-	17.53	-	0.5	Pass
HT20	MCS0	1	165	5825	17.88	-	37.16	-	17.03	-	0.5	Pass
HT40	MCS0	1	151	5755	37.06	-	64.62	-	35.25	-	0.5	Pass
HT40	MCS0	1	159	5795	36.96	-	64.98	-	35.51	-	0.5	Pass
VHT80	MCS0	1	155	5775	78.16	-	191.17	-	76.24	-	0.5	Pass

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

Band IV												
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	12.40	-		30.00	-	2.40	-	Pass
11a	6Mbps	1	157	5785	12.50	-		30.00	-	2.40	-	Pass
11a	6Mbps	1	165	5825	12.80	-		30.00	-	2.40	-	Pass
HT20	MCS0	1	149	5745	13.00	-		30.00	-	2.40	-	Pass
HT20	MCS0	1	157	5785	13.10	-		30.00	-	2.40	-	Pass
HT20	MCS0	1	165	5825	13.00	-		30.00	-	2.40	-	Pass
HT40	MCS0	1	151	5755	12.20	-		30.00	-	2.40	-	Pass
HT40	MCS0	1	159	5795	12.30	-		30.00	-	2.40	-	Pass
VHT20	MCS0	1	149	5745	12.90	-		30.00	-	2.40	-	Pass
VHT20	MCS0	1	157	5785	13.00	-		30.00	-	2.40	-	Pass
VHT20	MCS0	1	165	5825	12.90	-		30.00	-	2.40	-	Pass
VHT40	MCS0	1	151	5755	12.10	-		30.00	-	2.40	-	Pass
VHT40	MCS0	1	159	5795	12.20	-		30.00	-	2.40	-	Pass
VHT80	MCS0	1	155	5775	11.30	-		30.00	-	2.40	-	Pass

**TEST RESULTS DATA**  
**Power Spectral Density**

Band IV														
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	10log (500kHz /RBW) Factor (dB)		Average Power Density (dBm/500kHz)			Average PSD Limit (dBm/500kHz)		DG (dBi)		Pass /Fail
					Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	1	149	5745	2.22	-	1.24	-		30.00	-	2.40	-	Pass
11a	6Mbps	1	157	5785	2.22	-	1.06	-		30.00	-	2.40	-	Pass
11a	6Mbps	1	165	5825	2.22	-	2.06	-		30.00	-	2.40	-	Pass
HT20	MCS0	1	149	5745	2.22	-	2.31	-		30.00	-	2.40	-	Pass
HT20	MCS0	1	157	5785	2.22	-	1.84	-		30.00	-	2.40	-	Pass
HT20	MCS0	1	165	5825	2.22	-	1.83	-		30.00	-	2.40	-	Pass
HT40	MCS0	1	151	5755	2.22	-	-2.06	-		30.00	-	2.40	-	Pass
HT40	MCS0	1	159	5795	2.22	-	-1.97	-		30.00	-	2.40	-	Pass
VHT80	MCS0	1	155	5775	2.22	-	-5.87	-		30.00	-	2.40	-	Pass

Note: PSD Sum = Max PSD(Ant. 1, Ant. 2) + 10 log (n)



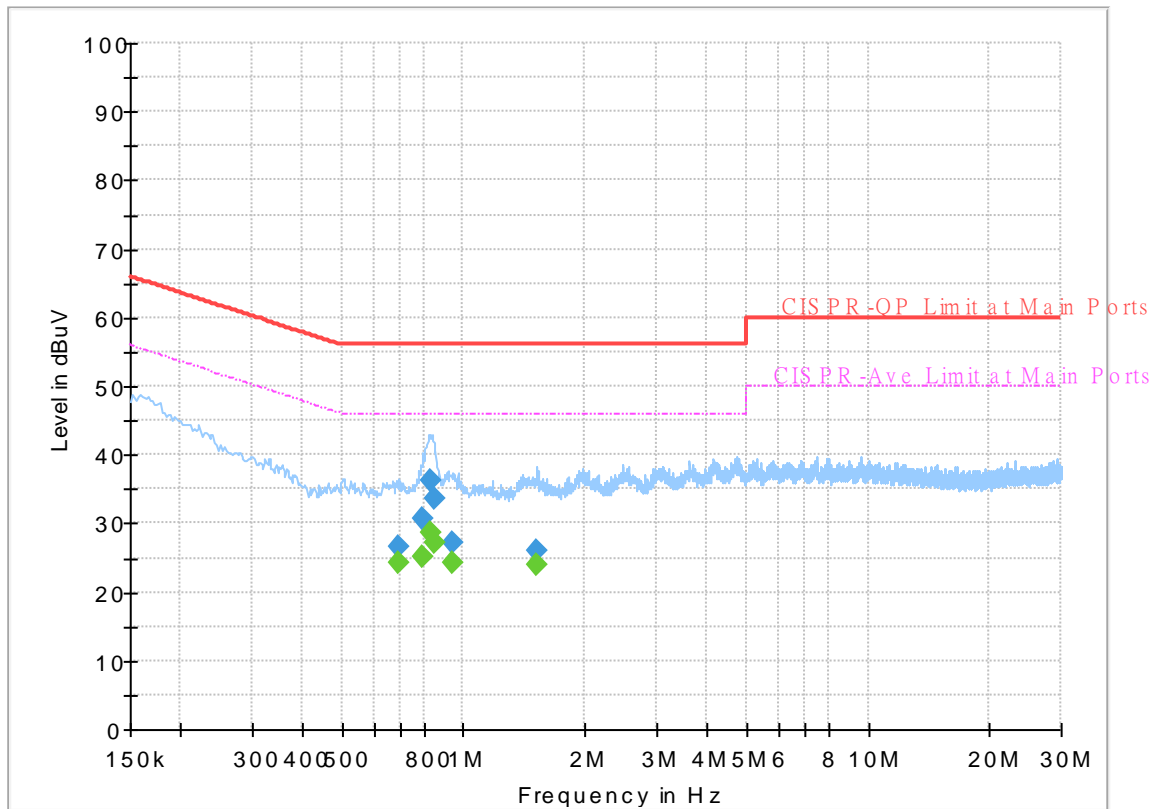
## Appendix B. AC Conducted Emission Test Results

Test Engineer :	Howard Lin	Temperature :	25.9~26.4℃
		Relative Humidity :	52.8~53.2%

## EUT Information

Report NO : 980514  
Test Mode : Mode 1  
Test Voltage : 120Vac/60Hz  
Phase : Line

Full Spectrum



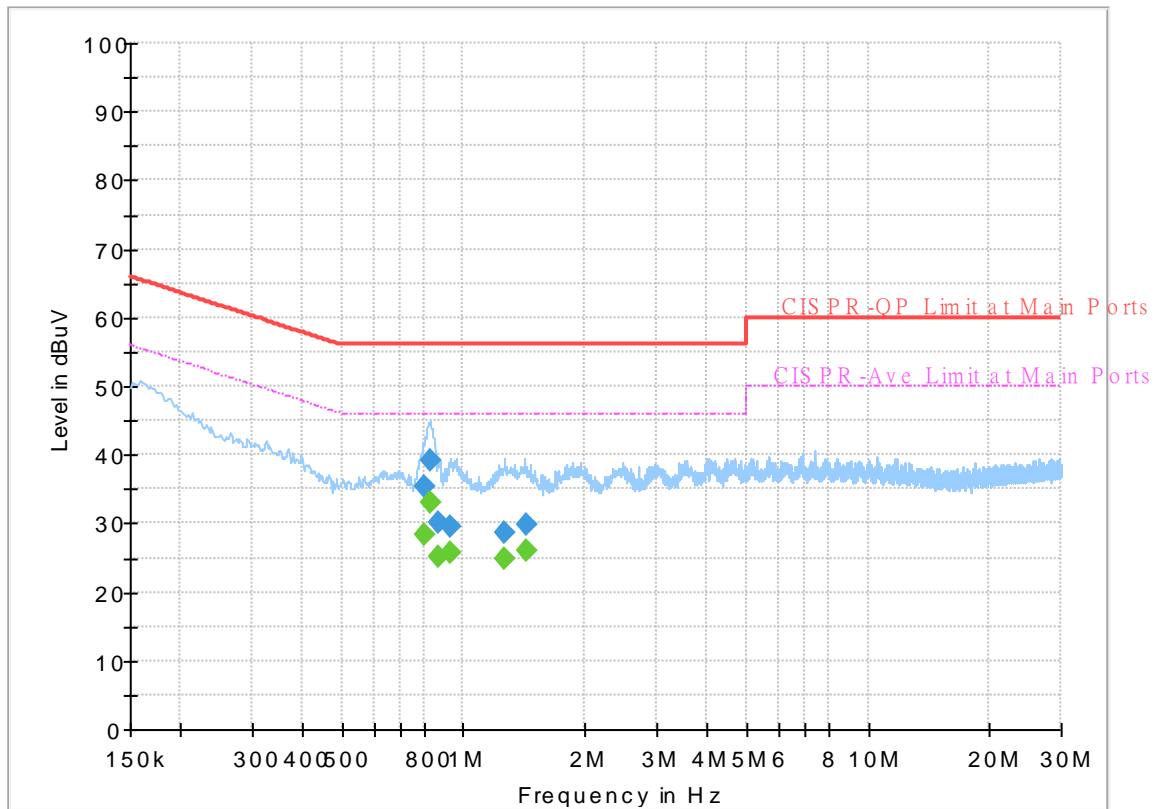
## Final\_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.692250	---	24.35	46.00	21.65	L1	OFF	19.4
0.692250	26.50	---	56.00	29.50	L1	OFF	19.4
0.795750	---	25.25	46.00	20.75	L1	OFF	19.4
0.795750	30.85	---	56.00	25.15	L1	OFF	19.4
0.827250	---	28.79	46.00	17.21	L1	OFF	19.5
0.827250	36.29	---	56.00	19.71	L1	OFF	19.5
0.845250	---	27.16	46.00	18.84	L1	OFF	19.5
0.845250	33.72	---	56.00	22.28	L1	OFF	19.5
0.944250	---	24.30	46.00	21.70	L1	OFF	19.5
0.944250	27.28	---	56.00	28.72	L1	OFF	19.5
1.518000	---	23.97	46.00	22.03	L1	OFF	19.5
1.518000	25.95	---	56.00	30.05	L1	OFF	19.5

## EUT Information

Report NO : 980514  
Test Mode : Mode 1  
Test Voltage : 120Vac/60Hz  
Phase : Neutral

Full Spectrum



## Final\_Result

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.804750	---	28.38	46.00	17.62	N	OFF	19.5
0.804750	35.25	---	56.00	20.75	N	OFF	19.5
0.829500	---	33.03	46.00	12.97	N	OFF	19.5
0.829500	39.14	---	56.00	16.86	N	OFF	19.5
0.870000	---	25.11	46.00	20.89	N	OFF	19.5
0.870000	30.25	---	56.00	25.75	N	OFF	19.5
0.926250	---	25.78	46.00	20.22	N	OFF	19.5
0.926250	29.65	---	56.00	26.35	N	OFF	19.5
1.263750	---	24.77	46.00	21.23	N	OFF	19.5
1.263750	28.65	---	56.00	27.35	N	OFF	19.5
1.432500	---	26.09	46.00	19.91	N	OFF	19.5
1.432500	29.71	---	56.00	26.29	N	OFF	19.5





## Appendix C. Radiated Spurious Emission

Test Engineer :	Ryan Lin, J.C. Liang and Wilson Wu	Temperature :	21.5~23.5°C
		Relative Humidity :	46.5~49.5%

## Band 4 - 5725~5850MHz

## WIFI 802.11a (Band Edge @ 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 )
802.11a CH 149 5745MHz		5636	48.78	-19.42	68.2	40.2	31.8	6.33	29.55	377	102	P	H
		5695.4	51.52	-50.29	101.81	42.73	31.98	6.36	29.55	377	102	P	H
		5719.8	64.61	-46.13	110.74	55.71	32.08	6.37	29.55	377	102	P	H
		5724.6	70.23	-51.06	121.29	61.31	32.1	6.37	29.55	377	102	P	H
	*	5745	106.58	-	-	97.57	32.18	6.38	29.55	377	102	P	H
	*	5745	98.92	-	-	89.91	32.18	6.38	29.55	377	102	A	H
													H
													H
		5609	48.8	-19.4	68.2	40.23	31.8	6.32	29.55	300	325	P	V
		5685	49.17	-44.96	94.13	40.43	31.94	6.35	29.55	300	325	P	V
		5718	62.33	-47.91	110.24	53.44	32.07	6.37	29.55	300	325	P	V
		5723.8	66.77	-52.69	119.46	57.85	32.1	6.37	29.55	300	325	P	V
	*	5745	104.24	-	-	95.23	32.18	6.38	29.55	300	325	P	V
	*	5745	97.25	-	-	88.24	32.18	6.38	29.55	300	325	A	V
													V
													V



# FCC RADIO TEST REPORT

Report No. : FR980514E

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 )
802.11a CH 157 5785MHz		5645.4	50.68	-17.52	68.2	42.09	31.8	6.34	29.55	388	101	P	H
		5690.4	49.88	-48.24	98.12	41.11	31.96	6.36	29.55	388	101	P	H
		5717.6	51.04	-59.09	110.13	42.15	32.07	6.37	29.55	388	101	P	H
		5724.2	50.29	-70.09	120.38	41.37	32.1	6.37	29.55	388	101	P	H
	*	5785	106.3	-	-	97.2	32.27	6.39	29.56	388	101	P	H
	*	5785	98.47	-	-	89.37	32.27	6.39	29.56	388	101	A	H
		5852	50.37	-67.27	117.64	41.08	32.41	6.44	29.56	388	101	P	H
		5857.2	49.91	-60.27	110.18	40.59	32.43	6.45	29.56	388	101	P	H
		5876.2	50.46	-53.85	104.31	41.06	32.5	6.46	29.56	388	101	P	H
		5932.2	49.81	-18.39	68.2	40.2	32.66	6.51	29.56	388	101	P	H
													H
													H
		5632.4	48.33	-19.87	68.2	39.75	31.8	6.33	29.55	298	325	P	V
		5660.4	48.38	-27.54	75.92	39.75	31.84	6.34	29.55	298	325	P	V
		5719.6	49.99	-60.7	110.69	41.09	32.08	6.37	29.55	298	325	P	V
		5724.4	48.33	-72.5	120.83	39.41	32.1	6.37	29.55	298	325	P	V
	*	5785	104.06	-	-	94.96	32.27	6.39	29.56	298	325	P	V
	*	5785	96.95	-	-	87.85	32.27	6.39	29.56	298	325	A	V
		5850.6	49.87	-70.96	120.83	40.59	32.4	6.44	29.56	298	325	P	V
		5859.2	49.74	-59.88	109.62	40.41	32.44	6.45	29.56	298	325	P	V
		5880.2	50.24	-51.1	101.34	40.82	32.52	6.46	29.56	298	325	P	V
		5945.2	48.48	-19.72	68.2	38.83	32.69	6.52	29.56	298	325	P	V
													V
													V



# FCC RADIO TEST REPORT

Report No. : FR980514E

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 )
802.11a CH 165 5825MHz	*	5825	106.35	-	-	97.14	32.35	6.42	29.56	400	100	P	H
	*	5825	99.06	-	-	89.85	32.35	6.42	29.56	400	100	A	H
		5850.2	63.79	-57.95	121.74	54.51	32.4	6.44	29.56	400	100	P	H
		5856.2	62.14	-48.32	110.46	52.84	32.42	6.44	29.56	400	100	P	H
		5878.8	50.65	-51.73	102.38	41.23	32.52	6.46	29.56	400	100	P	H
		5939	49.55	-18.65	68.2	39.92	32.68	6.51	29.56	400	100	P	H
													H
													H
	*	5825	103.86	-	-	94.65	32.35	6.42	29.56	295	271	P	V
	*	5825	96.02	-	-	86.81	32.35	6.42	29.56	295	271	A	V
		5850.4	61.62	-59.67	121.29	52.34	32.4	6.44	29.56	295	271	P	V
		5859	59.19	-50.49	109.68	49.86	32.44	6.45	29.56	295	271	P	V
		5876.4	50.49	-53.67	104.16	41.08	32.51	6.46	29.56	295	271	P	V
		5927.8	49.14	-19.06	68.2	39.54	32.66	6.5	29.56	295	271	P	V
													V
													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 802.11a (Harmonic @ 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 )
<b>802.11a CH 149 5745MHz</b>		11490	52.69	-21.31	74	58.63	39.9	10.46	56.3	352	177	P	H
		11490	48.34	-5.66	54	54.28	39.9	10.46	56.3	352	177	A	H
		17235	54.4	-13.8	68.2	58.08	39.94	12.95	56.57	100	0	P	H
													H
		11490	49.67	-24.33	74	55.61	39.9	10.46	56.3	100	0	P	V
		17235	57.06	-11.14	68.2	60.74	39.94	12.95	56.57	100	0	P	V
													V
													V
<b>802.11a CH 157 5785MHz</b>		11570	53.28	-20.72	74	59.25	39.83	10.5	56.3	350	180	P	H
		11570	48.16	-5.84	54	54.13	39.83	10.5	56.3	350	180	A	H
		17355	53.61	-14.59	68.2	57.01	40.33	13.08	56.81	100	0	P	H
													H
		11570	48.83	-25.17	74	54.8	39.83	10.5	56.3	100	0	P	V
		17355	57.43	-10.77	68.2	60.83	40.33	13.08	56.81	100	0	P	V
													V
													V
<b>802.11a CH 165 5825MHz</b>		11650	53	-21	74	59.21	39.55	10.54	56.3	350	180	P	H
		11650	49.53	-4.47	54	55.74	39.55	10.54	56.3	350	180	A	H
		17475	57.33	-10.87	68.2	60.34	40.83	13.21	57.05	100	0	P	H
													H
		11650	49.29	-24.71	74	55.5	39.55	10.54	56.3	100	0	P	V
		17475	58.65	-9.55	68.2	61.66	40.83	13.21	57.05	100	0	P	V
													V
													V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**Band 4 5725~5850MHz**  
**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 )
802.11n HT20 CH 149 5745MHz		5602.4	51.11	-17.09	68.2	42.54	31.8	6.32	29.55	399	99	P	H
		5699	67.35	-37.11	104.46	58.54	32	6.36	29.55	399	99	P	H
		5720	75.7	-35.1	110.8	66.8	32.08	6.37	29.55	399	99	P	H
		5724.6	80.06	-41.23	121.29	71.14	32.1	6.37	29.55	399	99	P	H
	*	5745	107.37	-	-	98.36	32.18	6.38	29.55	399	99	P	H
	*	5745	99.77	-	-	90.76	32.18	6.38	29.55	399	99	A	H
													H
													H
		5642.4	50.95	-17.25	68.2	42.36	31.8	6.34	29.55	295	269	P	V
		5697	59.14	-43.85	102.99	50.34	31.99	6.36	29.55	295	269	P	V
		5719.6	69.33	-41.36	110.69	60.43	32.08	6.37	29.55	295	269	P	V
		5723.4	74.19	-44.36	118.55	65.28	32.09	6.37	29.55	295	269	P	V
	*	5745	105.36	-	-	96.35	32.18	6.38	29.55	295	269	P	V
	*	5745	97.55	-	-	88.54	32.18	6.38	29.55	295	269	A	V
													V
													V



# FCC RADIO TEST REPORT

Report No. : FR980514E

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 )
802.11n HT20 CH 157 5785MHz		5648.8	49.9	-18.3	68.2	41.31	31.8	6.34	29.55	400	103	P	H
		5688.6	49.99	-46.8	96.79	41.23	31.95	6.36	29.55	400	103	P	H
		5717	53.2	-56.76	109.96	44.31	32.07	6.37	29.55	400	103	P	H
		5725	56.84	-65.36	122.2	47.92	32.1	6.37	29.55	400	103	P	H
	*	5785	107.78	-	-	98.68	32.27	6.39	29.56	400	103	P	H
	*	5785	99.84	-	-	90.74	32.27	6.39	29.56	400	103	A	H
		5852.8	53.13	-62.69	115.82	43.84	32.41	6.44	29.56	400	103	P	H
		5857	52.49	-57.75	110.24	43.17	32.43	6.45	29.56	400	103	P	H
		5919	51.04	-21.58	72.62	41.46	32.64	6.5	29.56	400	103	P	H
		5944.6	49.78	-18.42	68.2	40.13	32.69	6.52	29.56	400	103	P	H
													H
													H
		5627.8	48.84	-19.36	68.2	40.26	31.8	6.33	29.55	360	139	P	V
		5677.6	49.04	-39.62	88.66	40.33	31.91	6.35	29.55	360	139	P	V
		5715.6	50.29	-59.28	109.57	41.41	32.06	6.37	29.55	360	139	P	V
		5723.8	50.64	-68.82	119.46	41.72	32.1	6.37	29.55	360	139	P	V
	*	5785	102.18	-	-	93.08	32.27	6.39	29.56	360	139	P	V
	*	5785	94.17	-	-	85.07	32.27	6.39	29.56	360	139	A	V
		5853.2	48.98	-65.92	114.9	39.69	32.41	6.44	29.56	360	139	P	V
		5863.6	49.75	-58.64	108.39	40.41	32.45	6.45	29.56	360	139	P	V
		5877.6	49.73	-53.54	103.27	40.32	32.51	6.46	29.56	360	139	P	V
		5927	50.13	-18.07	68.2	40.54	32.65	6.5	29.56	360	139	P	V
													V
													V



# FCC RADIO TEST REPORT

Report No. : FR980514E

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 )
802.11n HT20 CH 165 5825MHz	*	5825	105.73	-	-	96.52	32.35	6.42	29.56	399	103	P	H
	*	5825	98.54	-	-	89.33	32.35	6.42	29.56	399	103	A	H
		5850.4	67.08	-54.21	121.29	57.8	32.4	6.44	29.56	399	103	P	H
		5863.2	62.26	-46.24	108.5	52.92	32.45	6.45	29.56	399	103	P	H
		5893.8	51.92	-39.33	91.25	42.42	32.58	6.48	29.56	399	103	P	H
		5949.8	49.47	-18.73	68.2	39.81	32.7	6.52	29.56	399	103	P	H
													H
													H
	*	5825	100.17	-	-	90.96	32.35	6.42	29.56	377	58	P	V
	*	5825	92.11	-	-	82.9	32.35	6.42	29.56	377	58	A	V
		5850.2	59.67	-62.07	121.74	50.39	32.4	6.44	29.56	377	58	P	V
		5857.6	55.64	-54.43	110.07	46.32	32.43	6.45	29.56	377	58	P	V
		5882.2	50.6	-49.25	99.85	41.16	32.53	6.47	29.56	377	58	P	V
		5938.6	48.84	-19.36	68.2	39.21	32.68	6.51	29.56	377	58	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 802.11n HT20 (Harmonic @ 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 )
802.11n HT20 CH 149 5745MHz		11490	53.34	-20.66	74	59.28	39.9	10.46	56.3	325	185	P	H
		11490	49.06	-4.94	54	55	39.9	10.46	56.3	325	185	A	H
		17235	56.31	-11.89	68.2	59.99	39.94	12.95	56.57	100	0	P	H
													H
		11490	49.27	-24.73	74	55.21	39.9	10.46	56.3	100	0	P	V
		17235	58.52	-9.68	68.2	62.2	39.94	12.95	56.57	100	0	P	V
													V
													V
802.11n HT20 CH 157 5785MHz		11570	52.42	-21.58	74	58.39	39.83	10.5	56.3	337	186	P	H
		11570	48.57	-5.43	54	54.54	39.83	10.5	56.3	337	186	A	H
		17355	55.1	-13.1	68.2	58.5	40.33	13.08	56.81	100	0	P	H
													H
		11570	48.82	-25.18	74	54.79	39.83	10.5	56.3	100	0	P	V
		17355	57.8	-10.4	68.2	61.2	40.33	13.08	56.81	100	0	P	V
													V
													V
802.11n HT20 CH 165 5825MHz		11650	53.81	-20.19	74	60.02	39.55	10.54	56.3	334	186	P	H
		11650	49.82	-4.18	54	56.03	39.55	10.54	56.3	334	186	A	H
		17483	53.9	-14.3	68.2	56.9	40.85	13.22	57.07	100	0	P	H
													H
		11650	49.4	-24.6	74	55.61	39.55	10.54	56.3	100	0	P	V
		17483	58.45	-9.75	68.2	61.45	40.85	13.22	57.07	100	0	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 802.11n HT40 (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 )
802.11n HT40 CH 151 5755MHz		5639.4	57.49	-10.71	68.2	48.9	31.8	6.34	29.55	382	103	P	H
		5691	69.14	-29.42	98.56	60.37	31.96	6.36	29.55	382	103	P	H
		5720	79.31	-31.49	110.8	70.41	32.08	6.37	29.55	382	103	P	H
		5720.6	78.36	-33.81	112.17	69.46	32.08	6.37	29.55	382	103	P	H
	*	5755	103.83	-	-	94.8	32.21	6.38	29.56	382	103	P	H
	*	5755	96.71	-	-	87.68	32.21	6.38	29.56	382	103	A	H
		5854.6	57.04	-54.67	111.71	47.74	32.42	6.44	29.56	382	103	P	H
		5858.4	55.69	-54.16	109.85	46.37	32.43	6.45	29.56	382	103	P	H
		5875.6	53.18	-51.57	104.75	43.78	32.5	6.46	29.56	382	103	P	H
		5935	51.4	-16.8	68.2	41.78	32.67	6.51	29.56	382	103	P	H
													H
													H
		5639	52.06	-16.14	68.2	43.47	31.8	6.34	29.55	361	135	P	V
		5699.8	63.26	-41.79	105.05	54.45	32	6.36	29.55	361	135	P	V
		5720	73.06	-37.74	110.8	64.16	32.08	6.37	29.55	361	135	P	V
		5724.6	70.08	-51.21	121.29	61.16	32.1	6.37	29.55	361	135	P	V
	*	5755	98.32	-	-	89.29	32.21	6.38	29.56	361	135	P	V
	*	5755	91.18	-	-	82.15	32.21	6.38	29.56	361	135	A	V
		5852.4	49.9	-66.83	116.73	40.61	32.41	6.44	29.56	361	135	P	V
		5864.4	49.74	-58.43	108.17	40.39	32.46	6.45	29.56	361	135	P	V
		5918.8	50.6	-22.17	72.77	41.02	32.64	6.5	29.56	361	135	P	V
		5926.6	49.7	-18.5	68.2	40.11	32.65	6.5	29.56	361	135	P	V
													V
													V



# FCC RADIO TEST REPORT

Report No. : FR980514E

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 )
802.11n HT40 CH 159 5795MHz		5617	50.63	-17.57	68.2	42.05	31.8	6.33	29.55	387	102	P	H
		5700	58.37	-46.83	105.2	49.56	32	6.36	29.55	387	102	P	H
		5719.4	60.49	-50.14	110.63	51.59	32.08	6.37	29.55	387	102	P	H
		5720.4	61.81	-49.9	111.71	52.91	32.08	6.37	29.55	387	102	P	H
	*	5795	102.36	-	-	93.23	32.29	6.4	29.56	387	102	P	H
	*	5795	95.21	-	-	86.08	32.29	6.4	29.56	387	102	A	H
		5852	57.95	-59.69	117.64	48.66	32.41	6.44	29.56	387	102	P	H
		5866.2	58.69	-48.97	107.66	49.34	32.46	6.45	29.56	387	102	P	H
		5885.2	55.17	-42.46	97.63	45.72	32.54	6.47	29.56	387	102	P	H
		5948.8	50.17	-18.03	68.2	40.51	32.7	6.52	29.56	387	102	P	H
													H
													H
		5630.8	50.58	-17.62	68.2	42	31.8	6.33	29.55	361	140	P	V
		5699.6	53.31	-51.6	104.91	44.5	32	6.36	29.55	361	140	P	V
		5718.4	54.19	-56.16	110.35	45.3	32.07	6.37	29.55	361	140	P	V
		5722	53.69	-61.67	115.36	44.78	32.09	6.37	29.55	361	140	P	V
	*	5795	97.17	-	-	88.04	32.29	6.4	29.56	361	140	P	V
	*	5795	89.44	-	-	80.31	32.29	6.4	29.56	361	140	A	V
		5852.4	53.37	-63.36	116.73	44.08	32.41	6.44	29.56	361	140	P	V
		5866.4	52.6	-55.01	107.61	43.24	32.47	6.45	29.56	361	140	P	V
		5914	51.1	-25.21	76.31	41.54	32.63	6.49	29.56	361	140	P	V
		5926.6	49.9	-18.3	68.2	40.31	32.65	6.5	29.56	361	140	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 802.11n HT40 (Harmonic @ 3m)**

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preampl 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 )
802.11n HT40 CH 151 5755MHz		11510	53.08	-20.92	74	59.02	39.89	10.47	56.3	334	185	P	H
		11510	48.78	-5.22	54	54.72	39.89	10.47	56.3	334	185	A	H
		17265	54.66	-13.54	68.2	58.34	39.97	12.98	56.63	100	0	P	H
													H
		11510	49.43	-24.57	74	55.37	39.89	10.47	56.3	100	0	P	V
		17265	53.68	-14.52	68.2	57.36	39.97	12.98	56.63	100	0	P	V
													V
													V
802.11n HT40 CH 159 5795MHz		11590	52.22	-21.78	74	58.2	39.81	10.51	56.3	351	183	P	H
		11590	48.57	-5.43	54	54.55	39.81	10.51	56.3	351	183	A	H
		17385	50.94	-17.26	68.2	54.19	40.51	13.11	56.87	100	0	P	H
													H
		11590	48.37	-25.63	74	54.35	39.81	10.51	56.3	100	0	P	V
		17385	54.28	-13.92	68.2	57.53	40.51	13.11	56.87	100	0	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 802.11ac VHT80 (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 )
802.11ac VHT80 CH 155 5775MHz		5649.6	65.85	-2.35	68.2	57.26	31.8	6.34	29.55	376	105	P	H
		5697.6	78.58	-24.85	103.43	69.78	31.99	6.36	29.55	376	105	P	H
		5704.4	78.61	-27.82	106.43	69.78	32.02	6.36	29.55	376	105	P	H
		5720.4	76.02	-35.69	111.71	67.12	32.08	6.37	29.55	376	105	P	H
	*	5775	98.61	-	-	89.53	32.25	6.39	29.56	376	105	P	H
	*	5775	91.55	-	-	82.47	32.25	6.39	29.56	376	105	A	H
		5852	75.21	-42.43	117.64	65.92	32.41	6.44	29.56	376	105	P	H
		5856.2	74.33	-36.13	110.46	65.03	32.42	6.44	29.56	376	105	P	H
		5875	66.97	-38.23	105.2	57.57	32.5	6.46	29.56	376	105	P	H
		5931.6	54.81	-13.39	68.2	45.2	32.66	6.51	29.56	376	105	P	H
													H
													H
		5641.6	60.87	-7.33	68.2	52.28	31.8	6.34	29.55	362	141	P	V
		5699.4	70.83	-33.93	104.76	62.02	32	6.36	29.55	362	141	P	V
		5706.4	73.51	-33.48	106.99	64.67	32.03	6.36	29.55	362	141	P	V
		5720.6	69.51	-42.66	112.17	60.61	32.08	6.37	29.55	362	141	P	V
	*	5775	93.46	-	-	84.38	32.25	6.39	29.56	362	141	P	V
	*	5775	86.3	-	-	77.22	32.25	6.39	29.56	362	141	A	V
		5850	69.38	-52.82	122.2	60.1	32.4	6.44	29.56	362	141	P	V
		5859.4	67.27	-42.3	109.57	57.94	32.44	6.45	29.56	362	141	P	V
		5875	63.67	-41.53	105.2	54.27	32.5	6.46	29.56	362	141	P	V
		5927	50.95	-17.25	68.2	41.36	32.65	6.5	29.56	362	141	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 802.11ac VHT80 (Harmonic @ 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 )
802.11ac VHT80 CH 155 5775MHz		11550	51.08	-22.92	74	57.04	39.85	10.49	56.3	358	185	P	H
		11550	48.54	-5.46	54	54.5	39.85	10.49	56.3	358	185	A	H
		17325	48.4	-19.8	68.2	51.96	40.15	13.04	56.75	100	0	P	H
													H
		11550	49.55	-24.45	74	55.51	39.85	10.49	56.3	100	0	P	V
		17325	49.46	-18.74	68.2	53.02	40.15	13.04	56.75	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

## Emission below 1GHz

## 5GHz WIFI 802.11ac VHT80 (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)
5GHz 802.11ac  VHT80  LF		134.76	35.53	-7.97	43.5	49.42	17.3	1	32.19	100	0	P	H
		167.74	33.69	-9.81	43.5	49.24	15.5	1.11	32.16	-	-	P	H
		239.52	29.48	-16.52	46	43.46	16.85	1.31	32.14	-	-	P	H
		412.18	29.83	-16.17	46	38.29	21.93	1.77	32.16	-	-	P	H
		600.36	30.53	-15.47	46	35.44	25.21	2.12	32.24	-	-	P	H
		900.09	33.35	-12.65	46	33.45	28.7	2.61	31.41	-	-	P	H
													H
													H
													H
													H
													H
													H
		41.64	29.55	-10.45	40	42.81	18.51	0.52	32.29	100	0	P	V
		134.76	32.36	-11.14	43.5	46.25	17.3	1	32.19	-	-	P	V
		261.83	26.73	-19.27	46	37.85	19.66	1.37	32.15	-	-	P	V
		431.58	26.88	-19.12	46	34.94	22.33	1.77	32.16	-	-	P	V
		600.36	31.06	-14.94	46	35.97	25.21	2.12	32.24	-	-	P	V
		955.38	34.15	-11.85	46	31.81	30.61	2.67	30.94	-	-	P	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”.**



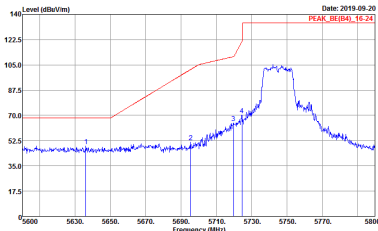
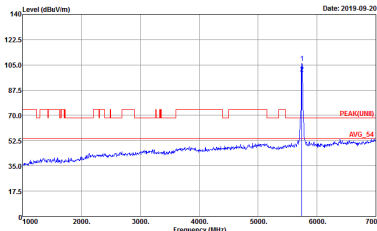


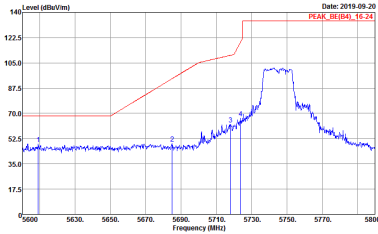
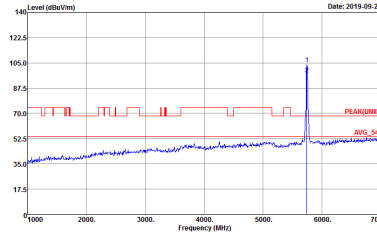
## Appendix D. Radiated Spurious Emission Plots

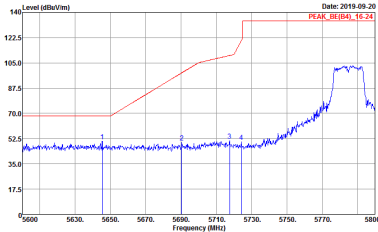
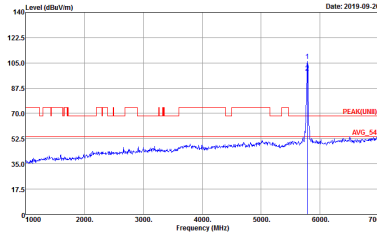
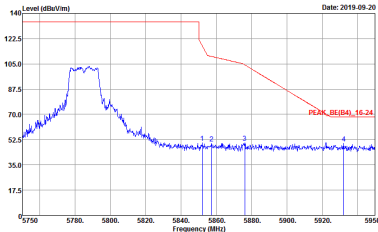
Test Engineer :	Ryan Lin, J.C. Liang and Wilson Wu	Temperature :	21.5~23.5°C
		Relative Humidity :	46.5~49.5%

## Band 4 - 5725~5850MHz

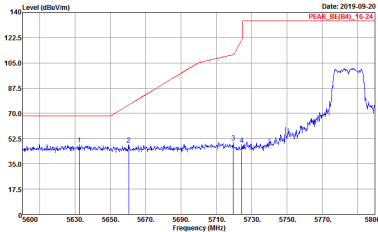
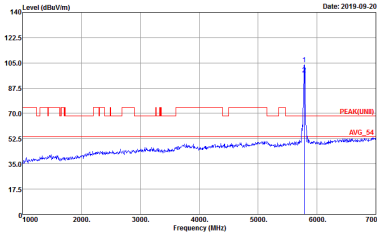
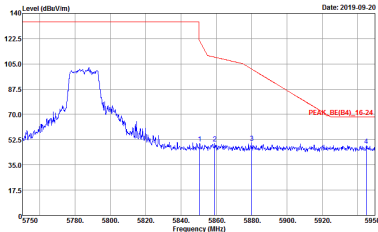
## WIFI 802.11a (Band Edge @ 3m)

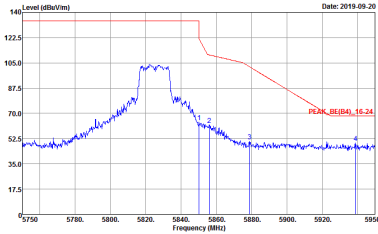
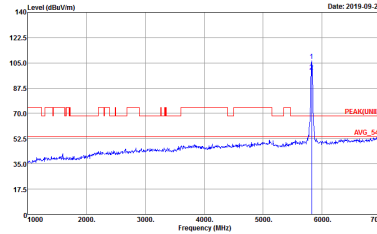
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
1	Horizontal	Fundamental
Peak	 <p>Site Condition : 03CH13-4HY : PEAK_BE(84)_16-24 3m HORN_91200_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Site Condition : 03CH13-4HY : PEAK(UNII) 3m HORN_91200_1241 HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>

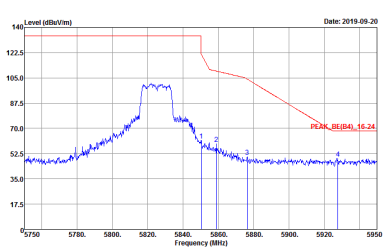
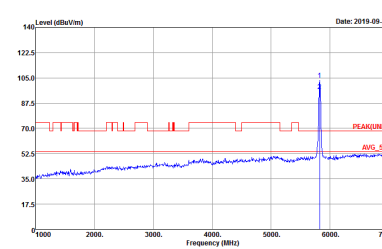
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
1	Vertical	Fundamental
Peak	 <p>Site : 03CH13-HY Condition : PEAK_BE(94)_16-24 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Site : 03CH13-HY Condition : PEAK(FUND) 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
1	Horizontal	Fundamental
Peak	 <p>Site : 03CH13-HY Condition : PEAK_BE[84]_16-24 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Site : 03CH13-HY Condition : PEAK[UNIT] 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Peak	 <p>Site : 03CH13-HY Condition : PEAK_BE[84]_16-24 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	Left blank



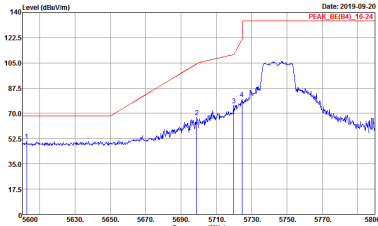
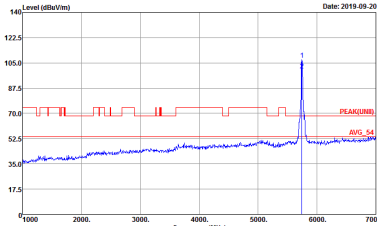
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
1	Vertical	Fundamental
Peak	 <p>Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Site : 03CH13-HY Condition : PEAK(FUND) 3m HORN_91200_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Peak	 <p>Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	Left blank

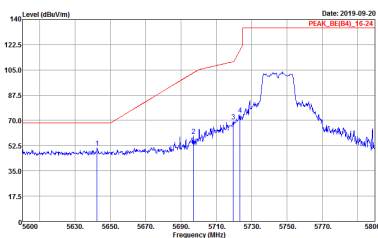
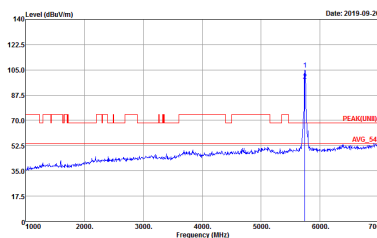
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
1	Horizontal	Fundamental
Peak	 <p>Site : 03CH13-HY Condition : PEAK_BE(94)_16-24 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Site : 03CH13-HY Condition : PEAK(FUND) 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
1	Vertical	Fundamental
Peak	 <p>Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Site : 03CH13-HY Condition : PEAK_FUND(B4)_16-24 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>

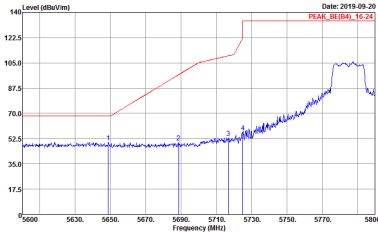
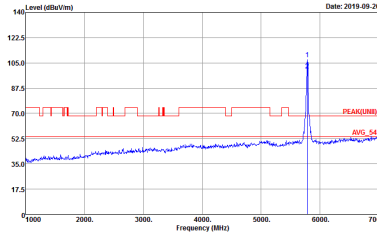
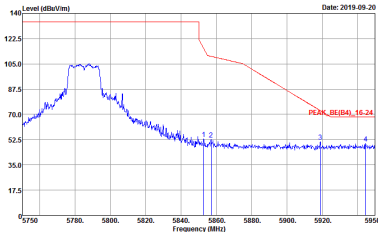


Band 4 5725~5850MHz  
WIFI 802.11n HT20 (Band Edge @ 3m)

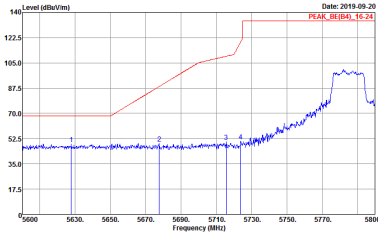
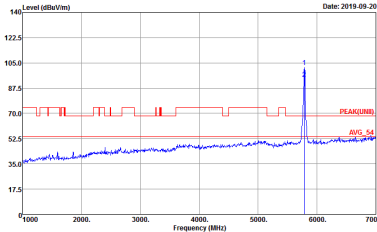
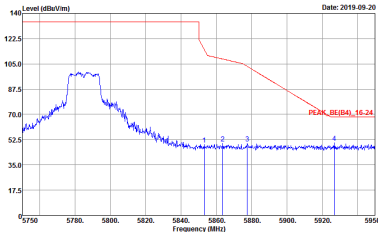
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1	Horizontal	Fundamental
Peak	 <p>Site Condition : 03CH13-HY : PEAK_BE(B4)_16-24 3m HORN_91200_1241 HORIZONTAL : RBW:1000.0000Hz VBW:3000.0000Hz SWT:Auto</p>	 <p>Site Condition : 03CH13-HY : PEAK(UNIT) 3m HORN_91200_1241 HORIZONTAL : RBW:1000.0000Hz VBW:3000.0000Hz SWT:Auto</p>

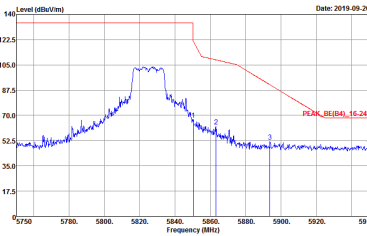
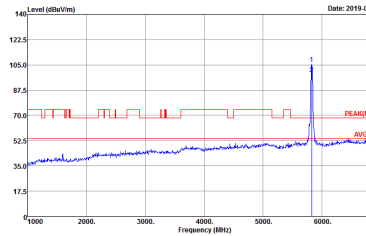
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1	Vertical	Fundamental
Peak	 <p>Site : 03CH13-HY Condition : PEAK_BE(94)_16-24 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Site : 03CH13-HY Condition : PEAK(FUND) 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>

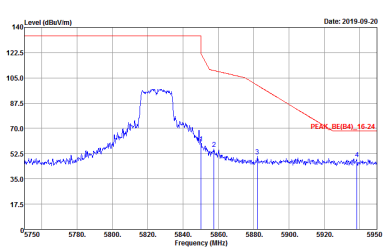
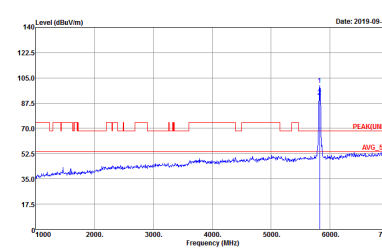


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1	Horizontal	Fundamental
Peak	 <p>Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Site : 03CH13-HY Condition : PEAK(LINE) 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Peak	 <p>Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	Left blank

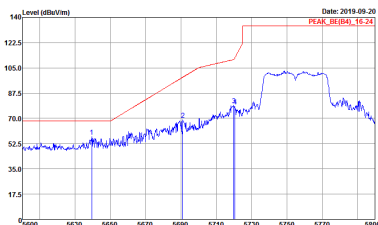
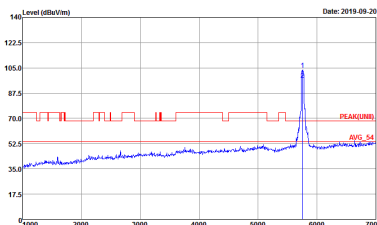
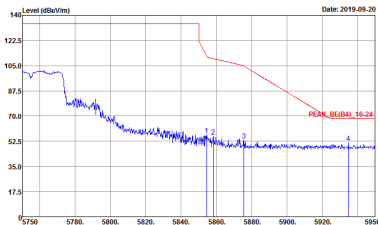


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1	Vertical	Fundamental
Peak	<div><p>Site : 03CH13-HY Condition : PEAK_BE[84]_16-24 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	<div><p>Site : 03CH13-HY Condition : PEAK[UNIT] 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>
Peak	<div><p>Site : 03CH13-HY Condition : PEAK_BE[84]_16-24 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p></div>	Left blank

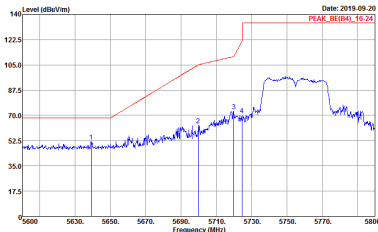
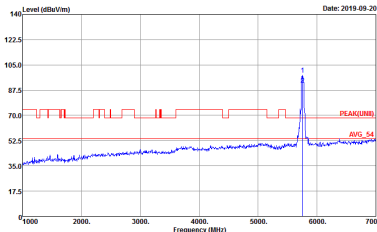
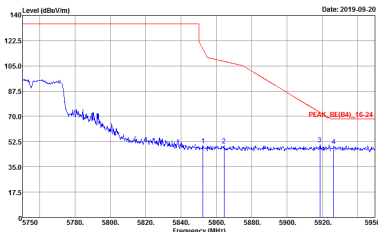
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1	Horizontal	Fundamental
Peak	 <p>Site : 03CH13-HY Condition : PEAK_BE(94)_16-24 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Site : 03CH13-HY Condition : PEAK(FUND) 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>

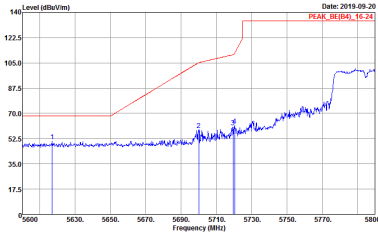
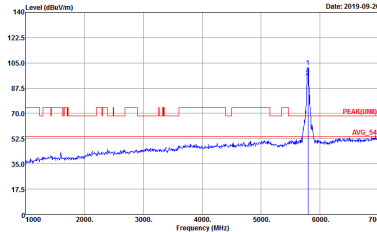
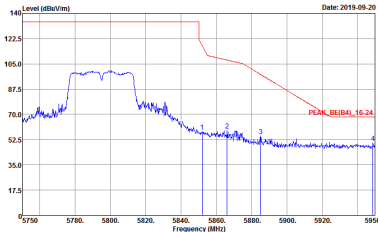
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1	Vertical	Fundamental
Peak	 <p>Site : 03CH13-HY Condition : PEAK_BES(4)_16-24 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Site : 03CH13-HY Condition : PEAK_BES(4)_16-24 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>

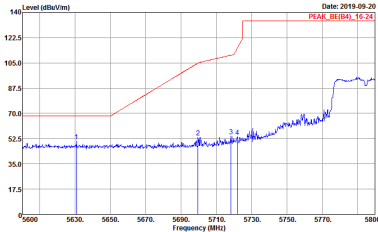
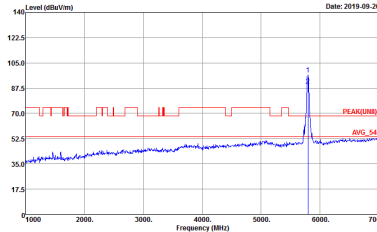
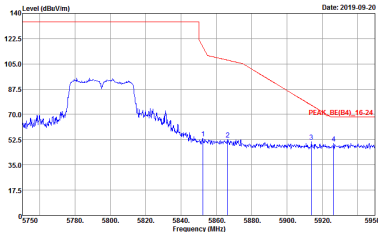
**Band 4 5725~5850MHz**  
**WIFI 802.11n HT40 (Band Edge @ 3m)**

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1	Horizontal	Fundamental
Peak	 <p>Site Condition : 03CH13-HY  : PEAK_BE(84)_16-24 3m HORN_91200_1241 HORIZONTAL  : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Site Condition : 03CH13-HY  : PEAK(UNIT) 3m HORN_91200_1241 HORIZONTAL  : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
	 <p>Site Condition : 03CH13-HY  : PEAK_BE(84)_16-24 3m HORN_91200_1241 HORIZONTAL  : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto  Detector : Peak  Project : 980514  Mode : 15  Power : 15</p>	Left blank



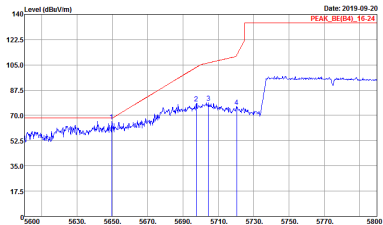
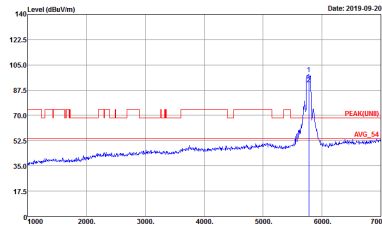
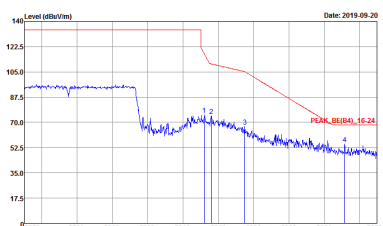
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1	Vertical	Fundamental
Peak	 <p>Site : 03CH13-HY Condition : PEAK_BE(84)_16-24 3m HORN_91200_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Site : 03CH13-HY Condition : PEAK_BE(84)_16-24 3m HORN_91200_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Peak	 <p>Site : 03CH13-HY Condition : PEAK_BE(84)_16-24 3m HORN_91200_1241 VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	Left blank

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1	Horizontal	Fundamental
Peak	 <p>Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Site : 03CH13-HY Condition : PEAK(LINE) 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Peak	 <p>Site : 03CH13-HY Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	Left blank

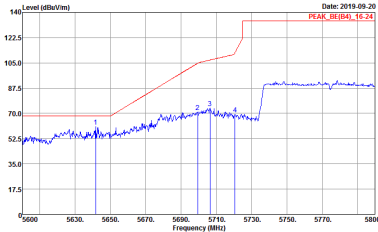
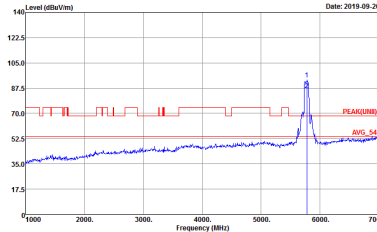
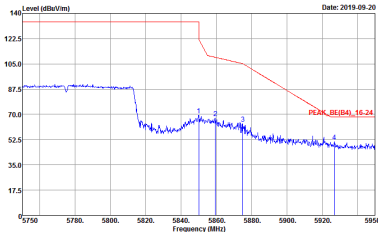
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1	Vertical	Fundamental
Peak	 <p>Site : 03CH13-HY Condition : PEAK_BE[84]_16-24 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	 <p>Site : 03CH13-HY Condition : PEAK[UNIT] 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>
Peak	 <p>Site : 03CH13-HY Condition : PEAK_BE[84]_16-24 3m HORN_91200_1241 VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto</p>	Left blank



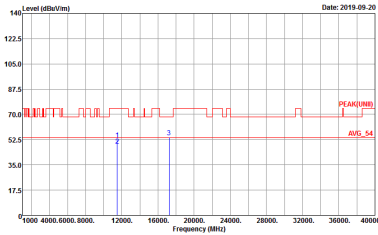
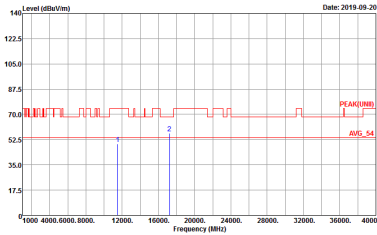
**Band 4 5725~5850MHz**  
**WIFI 802.11ac VHT80 (Band Edge @ 3m)**

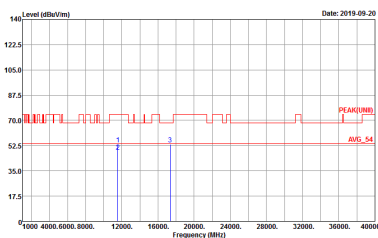
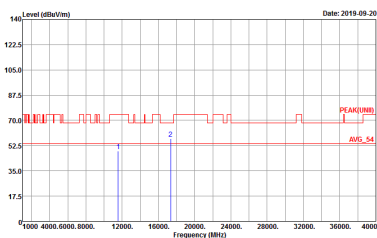
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1	Horizontal	Fundamental
Peak	 <p>Site : 03CH13-HY  Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 HORIZONTAL  Detector : Peak</p>	 <p>Site : 03CH13-HY  Condition : PEAK(UMB) 3m HORN_91200_1241 HORIZONTAL  Detector : Peak</p>
	 <p>Site : 03CH13-HY  Condition : PEAK_BE(B4)_16-24 3m HORN_91200_1241 HORIZONTAL  Detector : Peak</p>	Left blank

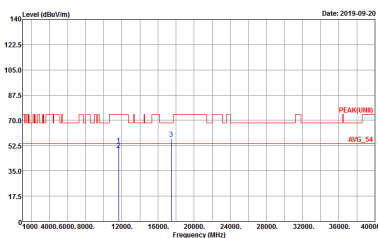
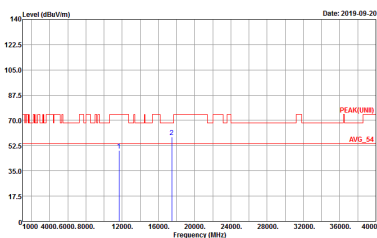


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1	Vertical	Fundamental
Peak	<div><p>Site : 03CH13-HY Condition : PEAK_BE(84)_16-24 3m HORN_91200_1241 VERTICAL Detector : Peak</p></div>	<div><p>Site : 03CH13-HY Condition : PEAK(UNIT) 3m HORN_91200_1241 VERTICAL Detector : Peak</p></div>
Peak	<div><p>Site : 03CH13-HY Condition : PEAK_BE(84)_16-24 3m HORN_91200_1241 VERTICAL Detector : Peak</p></div>	Left blank

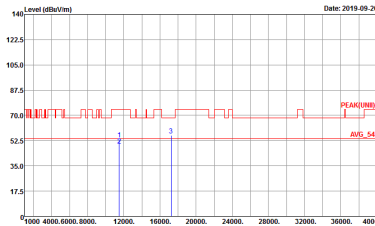
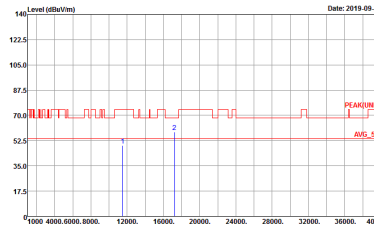
**Band 4 - 5725~5850MHz**  
**WIFI 802.11a (Harmonic @ 3m)**

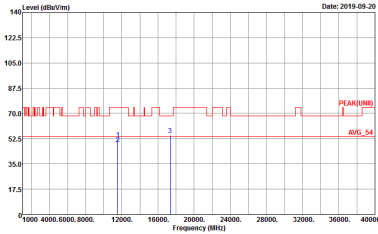
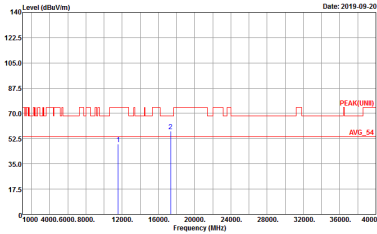
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH149 5745MHz	
1	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH13-HY  Condition : PEAK(UNIT) 3m HORN_91200_1241 HORIZONTAL  Detector : Peak</p>	 <p>Site : 03CH13-HY  Condition : PEAK(UNIT) 3m HORN_91200_1241 VERTICAL  Detector : Peak</p>

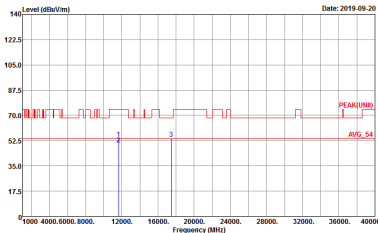
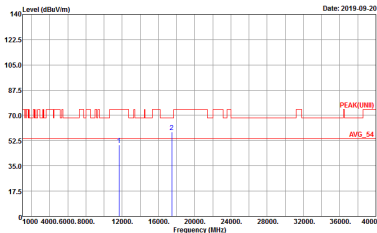
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH157 5785MHz	
1	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH13-HY Condition : PEAK(UNIT) 3m HORN_91200_1241 HORIZONTAL Detector : Peak</p>	 <p>Site : 03CH13-HY Condition : PEAK(UNIT) 3m HORN_91200_1241 VERTICAL Detector : Peak</p>

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH165 5825MHz	
1	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH13-HY Condition : PEAK(UNIT) 3m HORN_91200_1241 HORIZONTAL Detector : Peak</p>	 <p>Site : 03CH13-HY Condition : PEAK(UNIT) 3m HORN_91200_1241 VERTICAL Detector : Peak</p>

**Band 4 5725~5850MHz**  
**WIFI 802.11n HT20 (Harmonic @ 3m)**

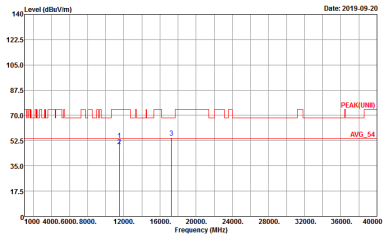
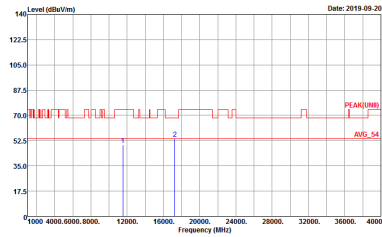
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH13-HY  Condition : PEAK(UNIT) 3m HORN_91200_1241 HORIZONTAL  Detector : Peak</p>	 <p>Site : 03CH13-HY  Condition : PEAK(UNIT) 3m HORN_91200_1241 VERTICAL  Detector : Peak</p>

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1	Horizontal	Vertical
<b>Peak</b>  <b>Avg.</b>	 <p>Site : 03CH13-HY Condition : PEAK(UNIT) 3m HORN_91200_1241 HORIZONTAL Detector : Peak</p>	 <p>Site : 03CH13-HY Condition : PEAK(UNIT) 3m HORN_91200_1241 VERTICAL Detector : Peak</p>

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH13-HY Condition : PEAK(UM) 3m HORN_91200_1241 HORIZONTAL Detector : Peak</p>	 <p>Site : 03CH13-HY Condition : PEAK(UM) 3m HORN_91200_1241 VERTICAL Detector : Peak</p>



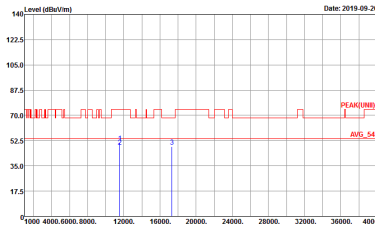
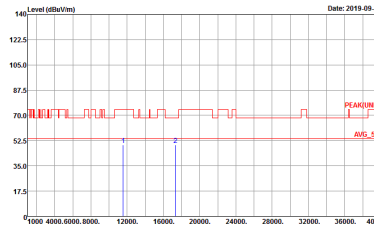
**Band 4 5725~5850MHz**  
**WIFI 802.11n HT40 (Harmonic @ 3m)**

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH13-HY  Condition : PEAK(UNIT) 3m HORN_91200_1241 HORIZONTAL  Detector : Peak</p>	 <p>Site : 03CH13-HY  Condition : PEAK(UNIT) 3m HORN_91200_1241 VERTICAL  Detector : Peak</p>

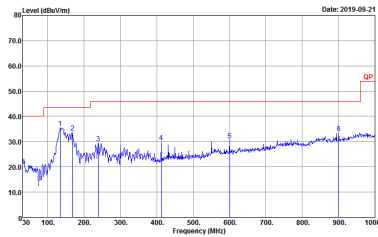
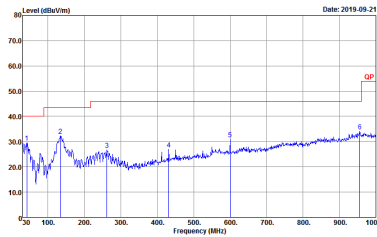


WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH13-HY Condition : PEAK(UNIT) 3m HORN_91200_1241 HORIZONTAL Detector : Peak</p>	<p>Site : 03CH13-HY Condition : PEAK(UNIT) 3m HORN_91200_1241 VERTICAL Detector : Peak</p>

**Band 4 5725~5850MHz**  
**WIFI 802.11ac VHT80 (Harmonic @ 3m)**

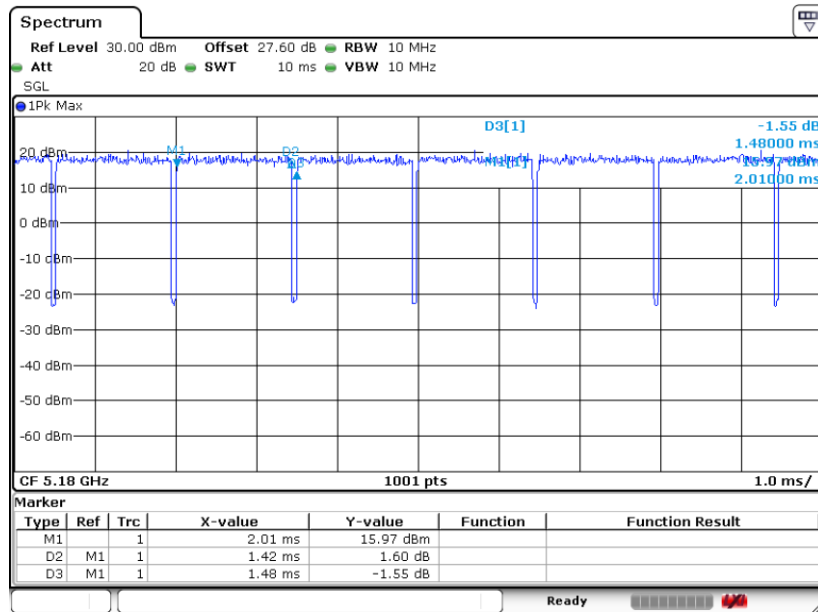
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH13-HY  Condition : PEAK(UNIT) 3m HORN_91200_1241 HORIZONTAL  Detector : Peak</p>	 <p>Site : 03CH13-HY  Condition : PEAK(UNIT) 3m HORN_91200_1241 VERTICAL  Detector : Peak</p>

**Emission below 1GHz**  
**5GHz WIFI 802.11ac VHT80 (LF)**

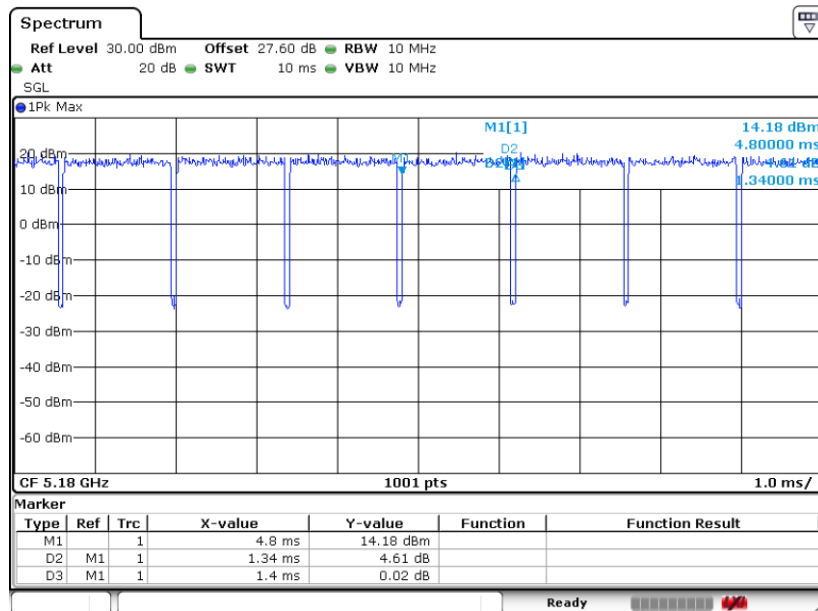
WIFI	5GHz 5725~5850MHz	
ANT	802.11ac VHT80 LF	
1	Horizontal	Vertical
<b>QP / Peak</b>	 <p>Site : 03CH13-HY  Condition : QP 3m BILOB_40103 HORIZONTAL  Detector : Peak</p>	 <p>Site : 03CH13-HY  Condition : QP 3m BILOB_40103 VERTICAL  Detector : Peak</p>

## Appendix E. Duty Cycle Plots

Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting	Duty Factor(dB)
802.11a	95.95	1420	0.70	1kHz	0.18
5GHz 802.11n HT20	95.71	1340	0.75	1kHz	0.19
5GHz 802.11n HT40	91.74	666	1.50	3kHz	0.37
5GHz 802.11ac VHT20	95.74	1350	0.74	1kHz	0.19
5GHz 802.11ac VHT40	92.47	675	1.48	3kHz	0.34
5GHz 802.11ac VHT80	85.13	332	3.01	10kHz	0.70

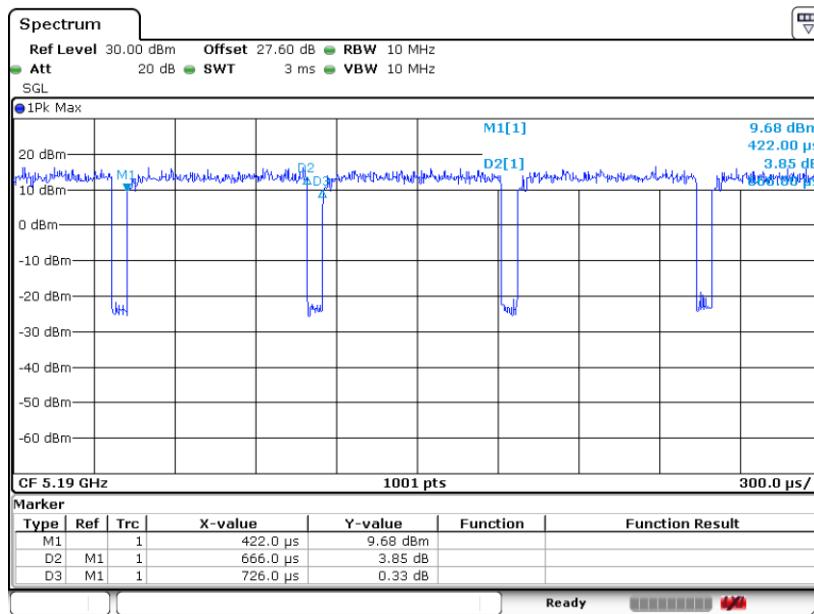
**802.11a**

Date: 16.SEP.2019 22:14:39

**802.11n HT20**

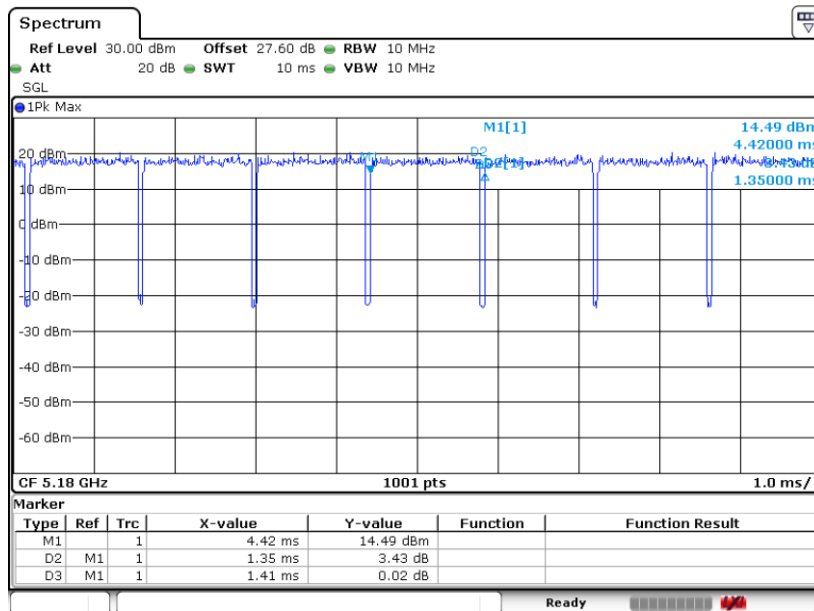
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### 802.11n HT40

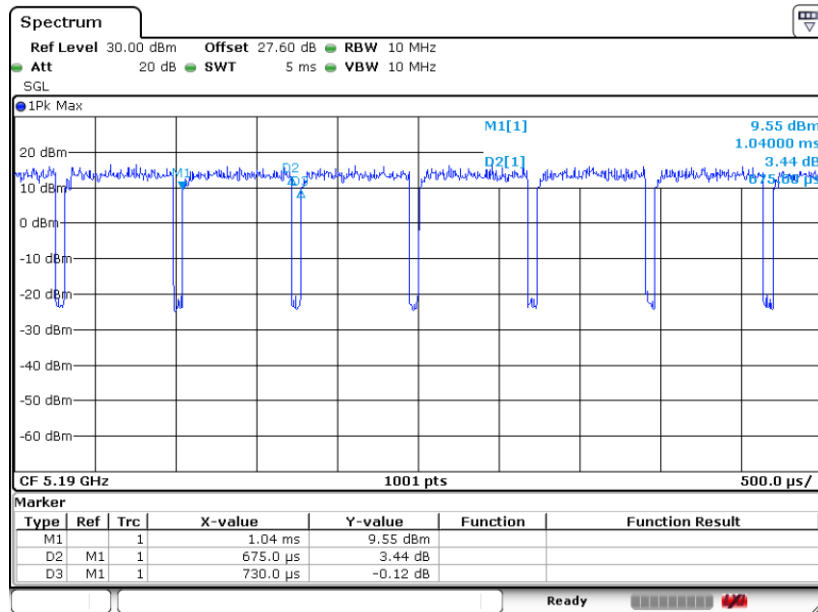


Date: 16.SEP.2019 23:30:07

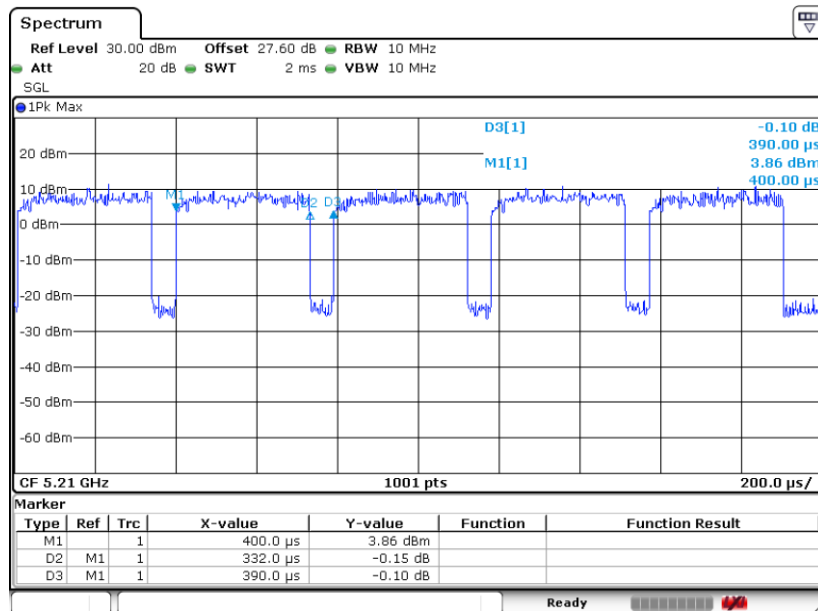
### 802.11ac VHT20



Date: 16.SEP.2019 23:41:31

**802.11ac VHT40**

Date: 16.SEP.2019 23:44:49

**802.11ac VHT80**

Date: 16.SEP.2019 23:52:48