



# FCC RF Test Report

**APPLICANT** : Lenovo (Shanghai) Electronics Technology Co., Ltd.  
**EQUIPMENT** : Portable Tablet Computer  
**BRAND NAME** : Lenovo  
**MODEL NAME** : Lenovo YT-J706F  
**FCC ID** : O57YTJ706F  
**STANDARD** : FCC Part 15 Subpart E §15.407  
**CLASSIFICATION** : (NII) Unlicensed National Information Infrastructure  
**TEST DATE(S)** : Apr. 22, 2021 ~ May 07, 2021

We, Sporton International (Kunshan) Inc., 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 report apply exclusively to the tested model / sample. Without written approval of Sporton International (Kunshan) Inc., the test report shall not be reproduced except in full.

Reviewed by: Jason Jia / Supervisor

Approved by: Alex Wang / Manager



**Sporton International (Kunshan) Inc.**

**No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300  
People's Republic of China**



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### SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	2.1049 & 15.403(i)	26dB & 99% Bandwidth	-	N/A	Report only
3.2	15.407(a)	Maximum Conducted Output Power	≤ 24 dBm	Pass	-
3.3	15.407(a)	Power Spectral Density	≤ 11 dBm	Pass	-
3.4	15.407(b)	Unwanted Emissions	15.407(b) & 15.209(a)	Pass	Under limit 3.05 dB at 5459.760 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 6.58 dB at 0.150 MHz
3.6	15.407(c)	Automatically Discontinue Transmission	Discontinue Transmission	Pass	-
3.7	15.203 & 15.407(a)	Antenna Requirement	N/A	N/A	-

<b>Declaration of Conformity:</b>
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
<b>Comments and Explanations:</b>
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.



# 1 General Description

## 1.1 Applicant

Lenovo (Shanghai) Electronics Technology Co., Ltd.

Section 304-305, Building No. 4, # 222, Meiyue Road, China (Shanghai) Pilot Free Trade Zone

## 1.2 Manufacturer

Lenovo PC HK Limited

23/F, Lincoln House, Taikoo Place 979 King's Road, Quarry Bay, Hong Kong, P.R.China

## 1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Portable Tablet Computer
Brand Name	Lenovo
Model Name	Lenovo YT-J706F
FCC ID	O57YTJ706F
EUT supports Radios application	WLAN 2.4GHz 802.11b/g/n HT20/HT40 WLAN 5GHz 802.11a/n HT20/HT40 WLAN 5GHz 802.11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE
HW Version	Lenovo Tablet YT-J706F
SW Version	YT-J706F_RF01_210408
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.



### 1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
<b>Tx/Rx Frequency Range</b>	5180 MHz ~ 5240 MHz 5260 MHz ~ 5320 MHz 5500 MHz ~ 5720 MHz
<b>Maximum Output Power to Antenna</b>	<p><b>&lt;MIMO Ant.1+2&gt;</b></p> <p><b>&lt;5180 MHz ~ 5240 MHz&gt;</b>  802.11a : 20.54 dBm / 0.1132 W  802.11n HT20 : 19.63 dBm / 0.0918 W  802.11n HT40 : 19.69 dBm / 0.0931 W  802.11ac VHT20 : 19.60 dBm / 0.0912 W  802.11ac VHT40 : 19.68 dBm / 0.0929 W  802.11ac VHT80 : 12.51 dBm / 0.0178 W</p> <p><b>&lt;5260 MHz ~ 5320 MHz&gt;</b>  802.11a : 20.58 dBm / 0.1143 W  802.11n HT20 : 19.62 dBm / 0.0916 W  802.11n HT40 : 19.66 dBm / 0.0925 W  802.11ac VHT20 : 19.57 dBm / 0.0906 W  802.11ac VHT40 : 19.63 dBm / 0.0918 W  802.11ac VHT80 : 12.47 dBm / 0.0177 W</p> <p><b>&lt;5500 MHz ~ 5720 MHz &gt;</b>  802.11a : 20.73 dBm / 0.1183 W  802.11n HT20 : 19.78 dBm / 0.0951 W  802.11n HT40 : 19.98 dBm / 0.0995 W  802.11ac VHT20 : 19.73 dBm / 0.0940 W  802.11ac VHT40 : 19.90 dBm / 0.0977 W  802.11ac VHT80 : 19.68 dBm / 0.0929 W</p>
<b>99% Occupied Bandwidth</b>	<p><b>&lt;MIMO Ant.1+2&gt;</b></p> <p><b>&lt;5180 MHz ~ 5240 MHz&gt;</b>  802.11a : 17.88 MHz  802.11n HT20 : 18.58 MHz  802.11n HT40 : 36.56 MHz  802.11ac VHT80 : 75.64 MHz</p> <p><b>&lt;5260 MHz ~ 5320 MHz&gt;</b>  802.11a : 17.88 MHz  802.11n HT20 : 18.48 MHz  802.11n HT40 : 37.06 MHz  802.11ac VHT80 : 76.48 MHz</p> <p><b>&lt;5500 MHz ~ 5720 MHz &gt;</b>  802.11a : 17.83 MHz  802.11n HT20 : 18.53 MHz  802.11n HT40 : 36.66 MHz  802.11ac VHT80 : 75.64 MHz</p>
<b>Antenna Type / Gain</b>	<p><b>&lt;5180 MHz ~ 5240 MHz &gt;</b>  &lt;Ant. 1&gt; : PIFA Antenna with gain -4.20 dBi  &lt;Ant. 2&gt; : PIFA Antenna with gain -4.70 dBi</p> <p><b>&lt;5260 MHz ~ 5320 MHz &gt;</b>  &lt;Ant. 1&gt; : PIFA Antenna with gain -4.30 dBi  &lt;Ant. 2&gt; : PIFA Antenna with gain -4.80 dBi</p> <p><b>&lt;5500 MHz ~ 5720 MHz &gt;</b>  &lt;Ant. 1&gt; : PIFA Antenna with gain -4.00 dBi  &lt;Ant. 2&gt; : PIFA Antenna with gain -4.50 dBi</p>
<b>Type of Modulation</b>	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)



	802.11ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)
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**Note:**

1. For 802.11n HT20 / ac VHT20 and 802.11n HT40 / ac VHT40 mode, the whole testing have assessed only 802.11n HT20/ HT40 by referring to the higher conducted power.
2. For SISO & MIMO mode, the whole testing has assessed only MIMO mode by referring to their higher conducted power.

### 1.5 Modification of EUT

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

### 1.6 Testing Location

Sporton International (Kunshan) Inc. is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

<b>Test Firm</b>	Sporton International (Kunshan) Inc.		
<b>Test Site Location</b>	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158 FAX : +86-512-57900958		
<b>Test Site No.</b>	<b>Sporton Site No.</b>	<b>FCC Designation No.</b>	<b>FCC Test Firm Registration No.</b>
	CO01-KS 03CH05-KS TH01-KS	CN1257	314309

### 1.7 Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH05-KS	AUDIX	E3	6.2009-8-24a1
2.	CO01-KS	AUDIX	E3	6.2009-8-24



## 1.8 Applicable Standards

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

- ♦ 47 CFR Part 15 Subpart E
- ♦ FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
- ♦ FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ♦ ANSI C63.10-2013

### **Remark:**

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

## 2 Test Configuration of Equipment Under Test

- 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 (X plane) 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)
5180-5240 MHz (U-NII-1)	36	5180	44	5220
	38*	5190	46*	5230
	40	5200	48	5240
	42 <sup>#</sup>	5210		

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

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5500-5720 MHz (U-NII-2C)	100	5500	112	5560
	102*	5510	116	5580
	104	5520	132	5660
	106 <sup>#</sup>	5530	134*	5670
	108	5540	136	5680
	110*	5550	140	5700



Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
TDWR Channel	118*	5590	124	5620
	120	5600	126*	5630
	122 <sup>#</sup>	5610	128	5640

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
Straddle Channel	138 <sup>#</sup>	5690	144	5720
	142*	5710		

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.

### MIMO Mode

Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT80	MCS0

Test Cases	
AC Conducted Emission	Mode 1 : Bluetooth Link + WLAN Link(5G) + USB Cable 1(Charging from Adapter 1) + Battery1
Remark: For Radiated Test Cases, The tests were performed with Adapter 1, Battery 1 and USB Cable 1.	



Ch. #		5180-5240 MHz	5260-5320 MHz	5500-5720MHz
		802.11a	802.11a	802.11a
L	Low	36	52	100
M	Middle	44	60	116
H	High	48	64	140
Straddle		-	-	144

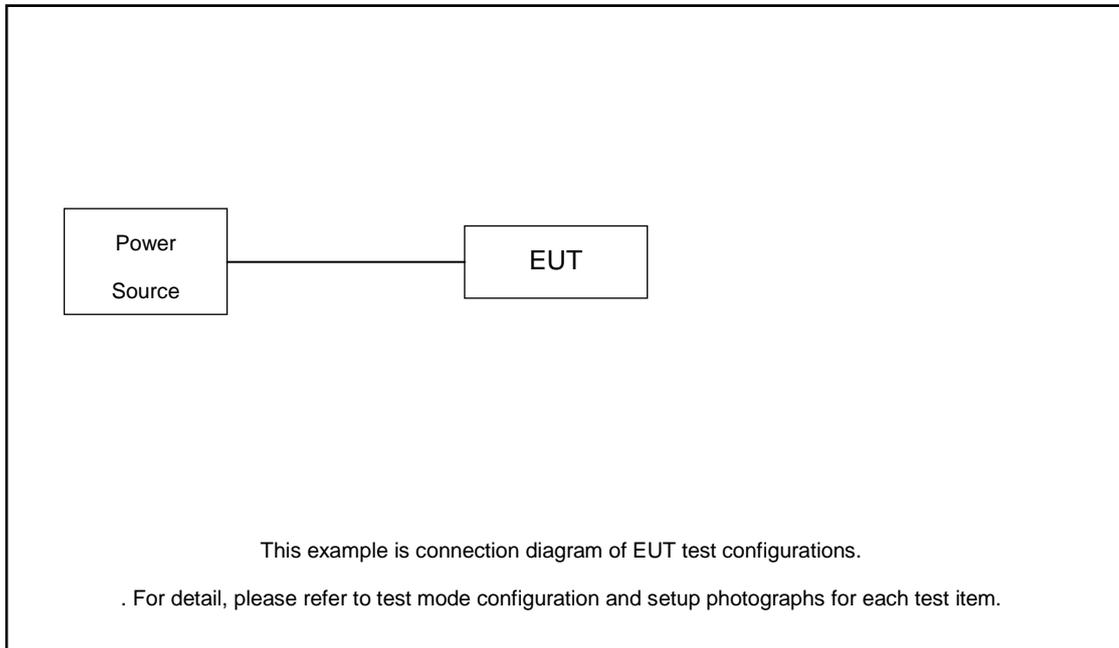
Ch. #		5180-5240 MHz	5260-5320 MHz	5500-5720MHz
		802.11n HT20	802.11n HT20	802.11n HT20
L	Low	36	52	100
M	Middle	44	60	116
H	High	48	64	140
Straddle		-	-	144

Ch. #		5180-5240 MHz	5260-5320 MHz	5500-5720MHz
		802.11n HT40	802.11n HT40	802.11n HT40
L	Low	38	54	102
M	Middle	-	-	110
H	High	46	62	134
Straddle		-	-	142

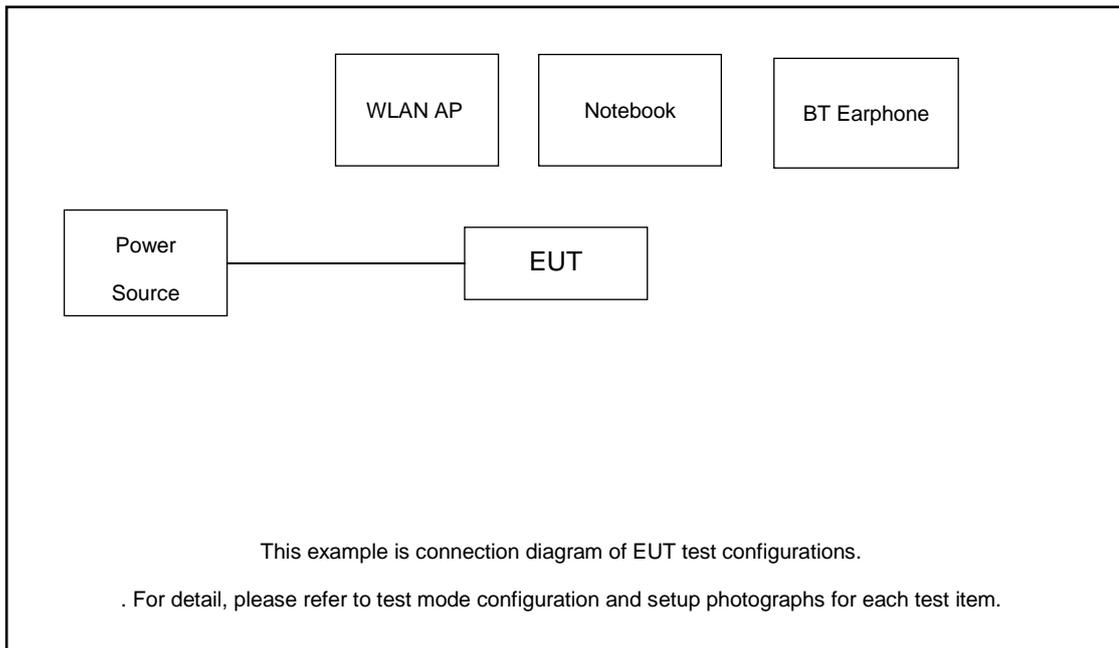
Ch. #		5180-5240 MHz	5260-5320 MHz	5500-5720MHz
		802.11ac VHT80	802.11ac VHT80	802.11ac VHT80
L	Low	-	-	106
M	Middle	42	58	-
H	High	-	-	122
Straddle		-	-	138

## 2.3 Connection Diagram of Test System

For Radiated Emission



For Conducted Emission



## 2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Bluetooth Earphone	Lenovo	LBH308	N/A	N/A	N/A
2.	WLAN AP	D-link	DIR-655	KA21R655B1	N/A	Unshielded, 1.8m
3.	Notebook	Lenovo	G480	QDS-BRCM1050I	N/A	AC I/P: Unshielded, 1.8 m DC O/P: Shielded, 1.8 m

## 2.5 EUT Operation Test Setup

For WLAN RF test items, an engineering test program was provided and enabled to make EUT continuous transmit/receive.

For AC power line conducted emissions, the EUT was set to connect with the WLAN AP under large package sizes transmission.

## 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.

*Offset = RF cable loss.*

Following shows an offset computation example with cable loss 7.5 dB.

$$\begin{aligned} \text{Offset(dB)} &= \text{RF cable loss(dB)}. \\ &= 7.5 \text{ (dB)} \end{aligned}$$

### 3 Test Result

#### 3.1 26dB & 99% Occupied Bandwidth Measurement

##### 3.1.1 Description of 26dB & 99% Occupied Bandwidth

This section is for reporting purpose only.

There is no restriction limits for bandwidth.

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

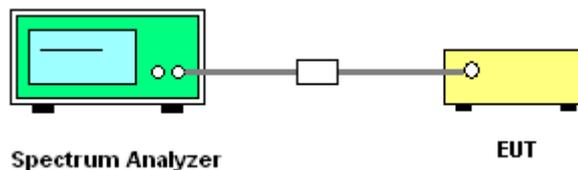
##### 3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 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
2. Set RBW = approximately 1% of the emission bandwidth.
3. Set the VBW > RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
7. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1MHz and set the Video bandwidth (VBW)  $\geq 3 * RBW$ .
8. Measure and record the results in the test report.

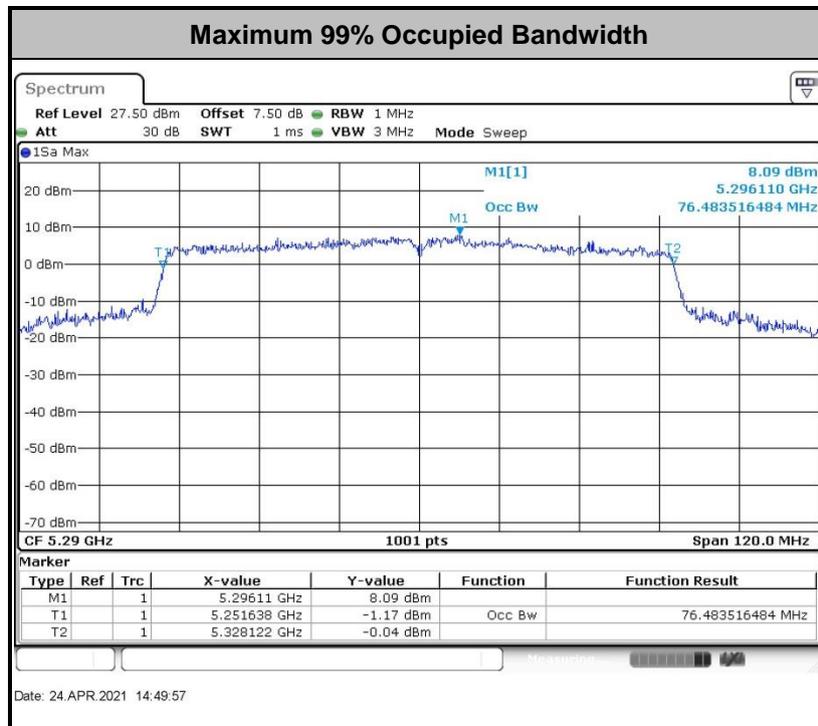
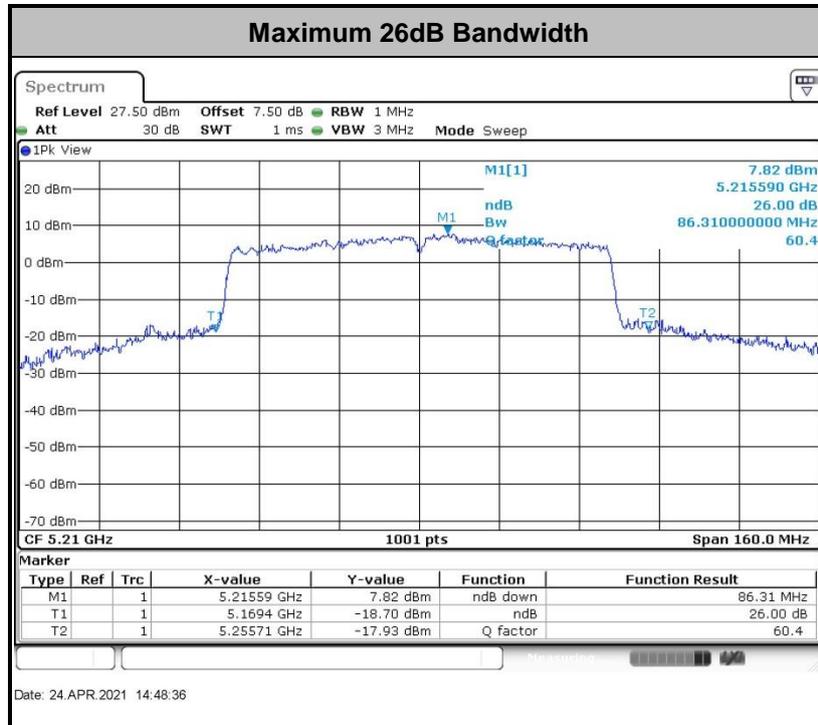
##### 3.1.4 Test Setup





### 3.1.5 Test Result of 26dB & 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

<FCC 14-30 CFR 15.407>

For mobile and portable client devices in the 5.15–5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW.

For the 5.25–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or  $11 \text{ dBm} + 10 \log B$ , where B is the 26 dB emission bandwidth in megahertz.

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

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

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

### 3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

### 3.2.3 Test Procedures

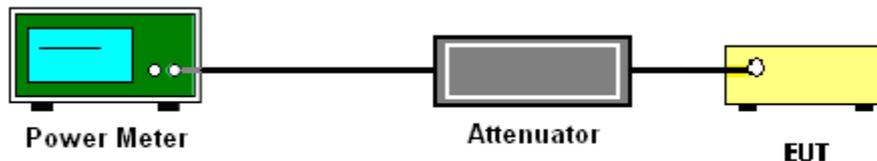
The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

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

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

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

### 3.2.4 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

<FCC 14-30 CFR 15.407>

For mobile and portable client devices in the 5.15–5.25 GHz band, the maximum power spectral density shall not exceed 11dBm in any 1 megahertz band.

For the 5.25–5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

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

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

#### 3.3.2 Measuring Instruments

The measuring equipment is listed in the section 4 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-2 #

(trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).

- Measure the duty cycle.
- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 1 MHz.
- Set VBW  $\geq$  3 MHz.
- Number of points in sweep  $\geq$  2 Span / RBW.
- Sweep time = auto.
- Detector = RMS
- Trace average at least 100 traces in power averaging mode.
- Add  $10 \log(1/x)$ , where x is the duty cycle, to the measured power in order to compute the

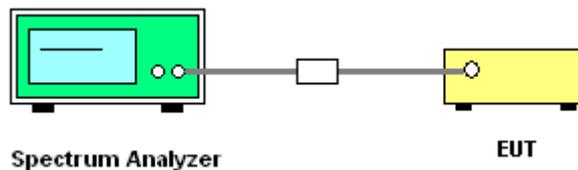
average power during the actual transmission times. For example, add  $10 \log(1/0.25) = 6$  dB if the duty cycle is 25 percent.

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. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

Method (a): Measure and sum the spectra across the outputs.

The total final Power Spectral Density is from a device with 2 transmitter outputs. The spectrum measurements of the individual outputs are all performed with the same span and number of points, the spectrum value in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 to obtain the value for the first frequency bin of the summed spectrum.

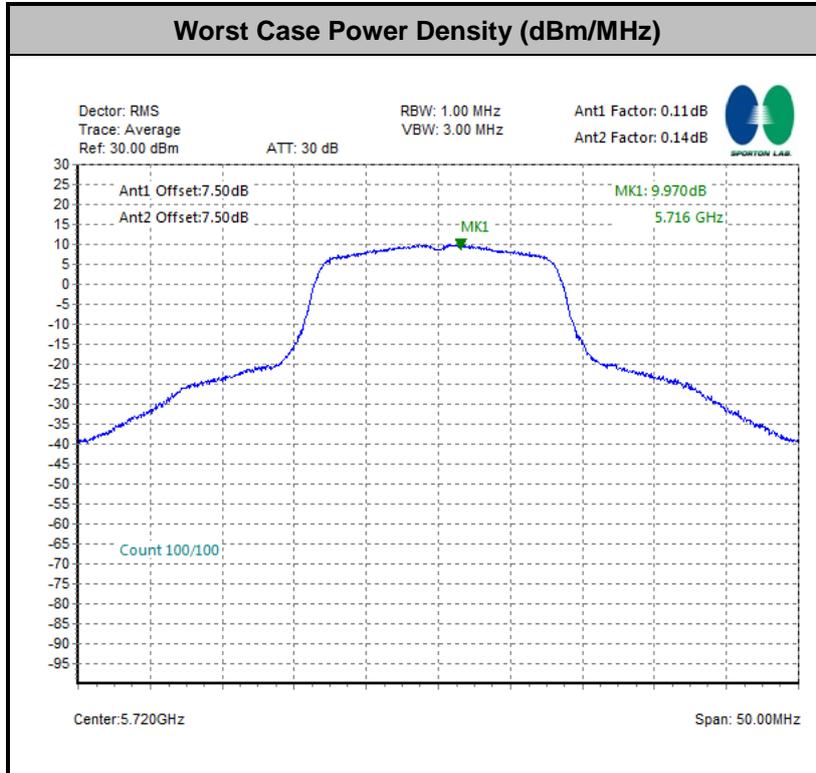
### 3.3.4 Test Setup





### 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 5150-5250 MHz band: all emissions outside of the 5150-5350 MHz band shall not exceed an EIRP of -27dBm/MHz.

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

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

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

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



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

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

$$EIRP = E_{Meas} + 20\log (d_{Meas}) - 104.7$$

where

EIRP is the equivalent isotropically radiated power, in dBm

$E_{Meas}$  is the field strength of the emission at the measurement distance, in dBμV/m

$d_{Meas}$  is the measurement distance, in m

### 3.4.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

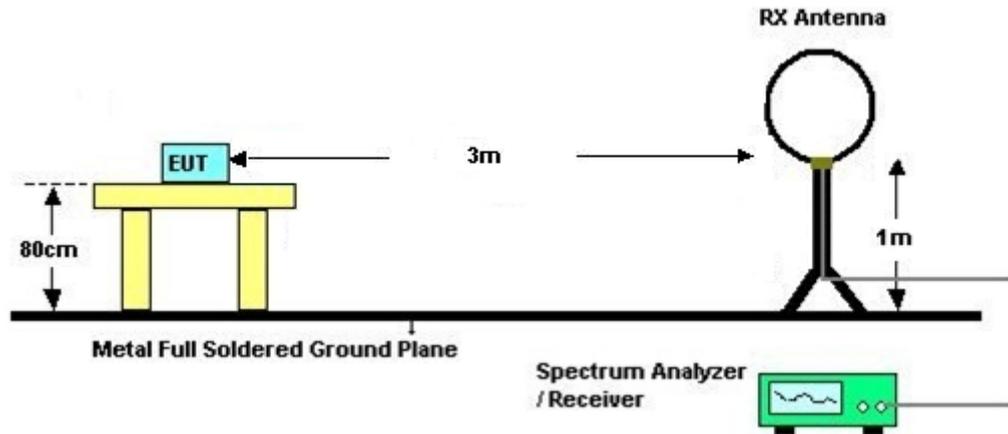


### 3.4.3 Test Procedures

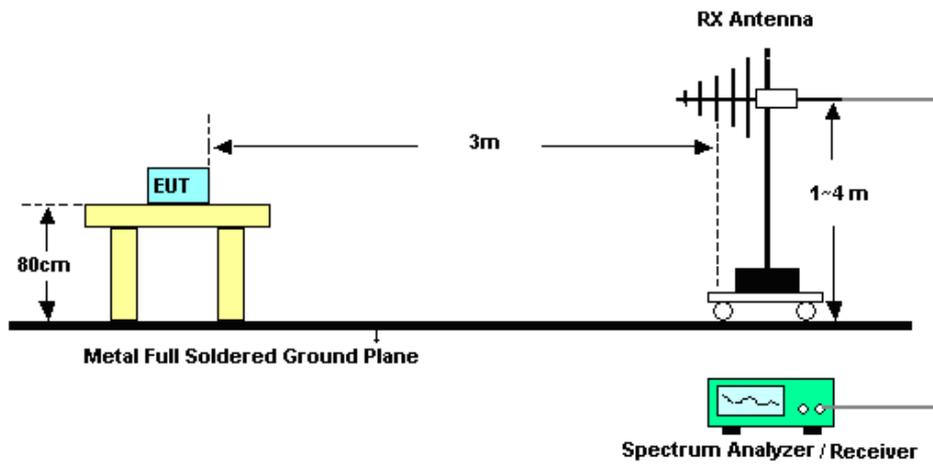
1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section G) Unwanted emissions measurement.
  - (1) Procedure for Unwanted Emissions Measurements Below 1000MHz
    - RBW = 120 kHz
    - VBW = 300 kHz
    - Detector = Peak
    - Trace mode = max hold
  - (2) Procedure 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 peak 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

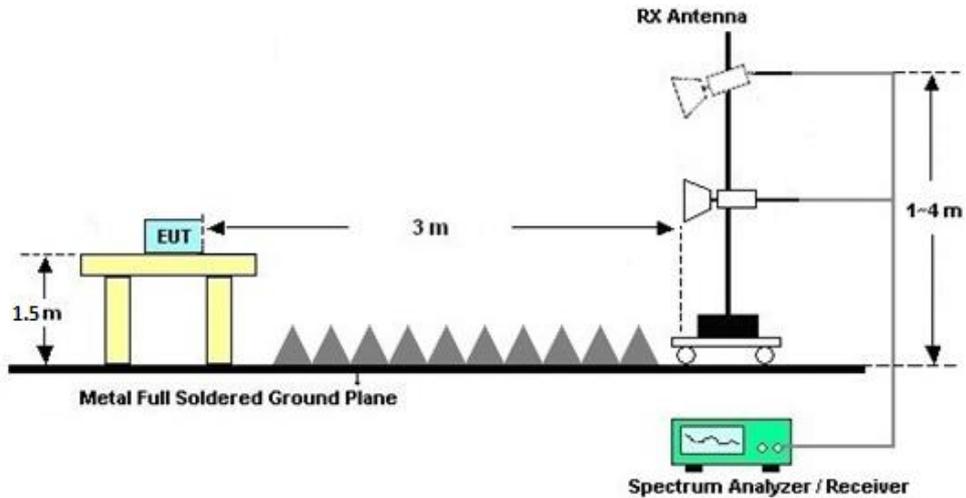
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

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

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

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

Please refer to Appendix C.

### 3.4.7 Duty Cycle

Please refer to Appendix D.

### 3.4.8 Test Result of Radiated Spurious Emissions (30MHz ~ 10th Harmonic or 40GHz, whichever is lower)

Please refer to Appendix C.



### 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 (dBµV)	
	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.

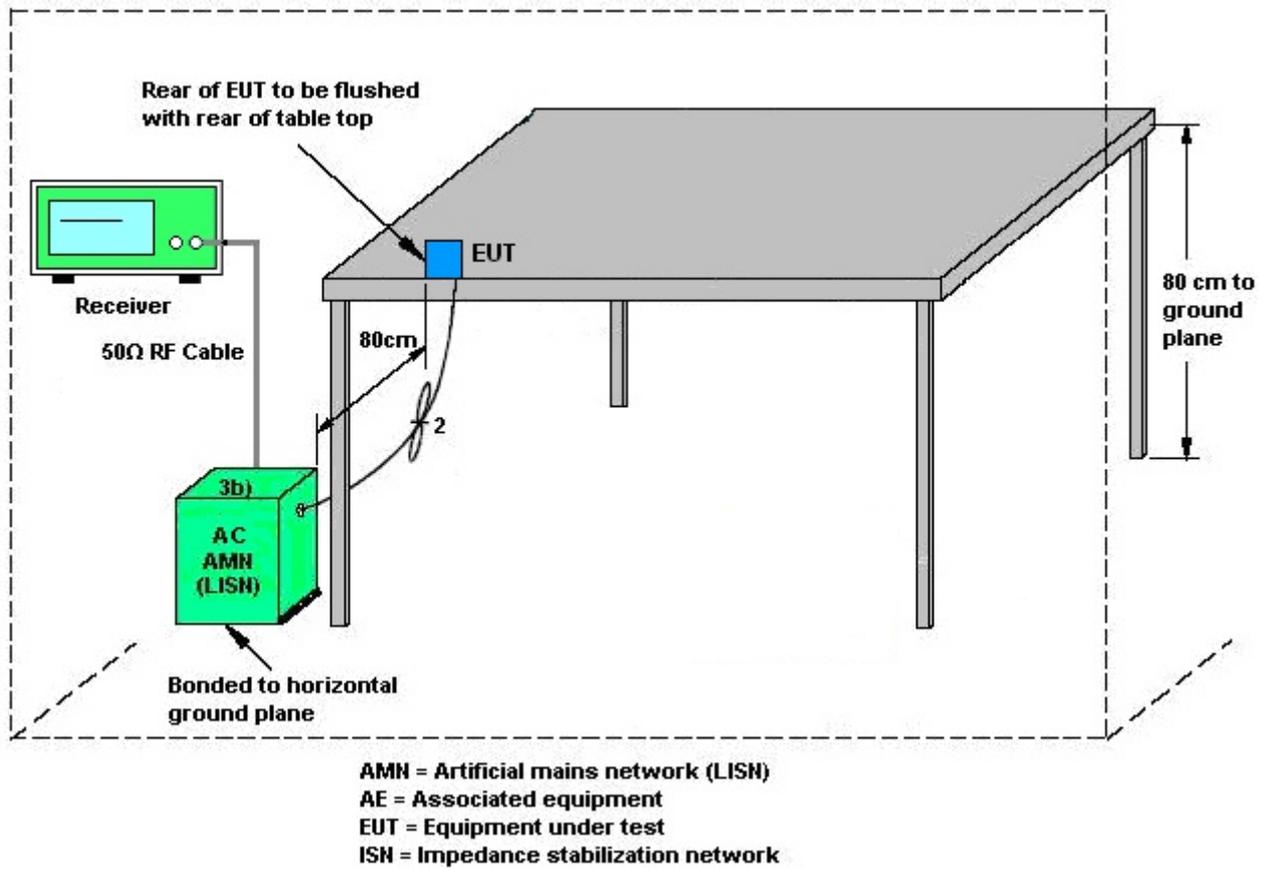
#### 3.5.2 Measuring Instruments

The measuring equipment is listed in the section 4 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**

The measuring equipment is listed in the section 4 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

<CDD Modes >

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

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

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

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

For power measurements on IEEE 802.11 devices,

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

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

The EUT supports CDD mode.

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

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

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

The directional gain "DG" is calculated as following table.

<b>&lt;CDD Modes&gt;</b>						
	<b>Chain Port 0 Ant 1 (dBi)</b>	<b>Chain Port 1 Ant 2 (dBi)</b>	<b>DG for Power (dBi)</b>	<b>DG for PSD (dBi)</b>	<b>Power Limit Reduction (dB)</b>	<b>PSD Limit Reduction (dB)</b>
<b>UNII 1</b>	-4.20	-4.70	-4.20	-1.44	0.00	0.00
<b>UNII 2A</b>	-4.30	-4.80	-4.30	-1.54	0.00	0.00
<b>UNII 2C</b>	-4.00	-4.50	-4.00	-1.24	0.00	0.00

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

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



## 4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Nov. 01, 2020	Apr. 24, 2021	Oct. 31, 2021	Conducted (TH01-KS)
Pulse Power Sensor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 07, 2021	Apr. 24, 2021	Jan. 06, 2022	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 07, 2021	Apr. 24, 2021	Jan. 06, 2022	Conducted (TH01-KS)
EMI Test Receiver	Keysight	N9038A	MY56400004	3Hz~8.5GHz; Max 30dBm	Oct. 17, 2020	May 07, 2021	Oct. 16, 2021	Radiation (03CH05-KS)
EXA Spectrum Analyzer	Keysight	N9010A	MY55150244	10Hz~44G, MAX 30dB	Apr. 13, 2021	May 07, 2021	Apr. 12, 2022	Radiation (03CH05-KS)
Loop Antenna	R&S	HFH2-Z2	100321	9kHz~30MHz	Nov. 01, 2020	May 07, 2021	Oct. 31, 2021	Radiation (03CH05-KS)
Bilog Antenna	TeseQ	CBL6111D	49922	30MHz~1GHz	May 30, 2020	May 07, 2021	May 29, 2021	Radiation (03CH05-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00218652	1GHz~18GHz	Apr. 24, 2021	May 07, 2021	Apr. 23, 2022	Radiation (03CH05-KS)
SHF-EHF Horn	Com-power	AH-840	101115	18GHz~40GHz	Nov. 10, 2020	May 07, 2021	Nov. 09, 2021	Radiation (03CH05-KS)
Amplifier	SONOMA	310N	187289	9KHz~1GHz	Apr. 13, 2021	May 07, 2021	Apr. 12, 2022	Radiation (03CH05-KS)
Amplifier	MITEQ	EM18G40GGA	060728	18~40GHz	Jan. 07, 2021	May 07, 2021	Jan. 06, 2022	Radiation (03CH05-KS)
high gain Amplifier	MITEQ	AMF-7D-00101800-30-10P	2012228	1Ghz~18Ghz	Oct. 17, 2020	May 07, 2021	Oct. 16, 2021	Radiation (03CH05-KS)
Amplifier	Keysight	83017A	MY53270316	500MHz~26.5GHz	Oct. 17, 2020	May 07, 2021	Oct. 16, 2021	Radiation (03CH05-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	May 07, 2021	NCR	Radiation (03CH05-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	May 07, 2021	NCR	Radiation (03CH05-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	May 07, 2021	NCR	Radiation (03CH05-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	Apr. 21, 2021	Apr. 22, 2021	Apr. 20, 2022	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Oct. 17, 2020	Apr. 22, 2021	Oct. 16, 2021	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060105	9kHz~30MHz	Apr. 13, 2021	Apr. 22, 2021	Apr. 12, 2022	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 17, 2020	Apr. 22, 2021	Oct. 16, 2021	Conduction (CO01-KS)

NCR: No Calibration Required



## 5 Uncertainty of Evaluation

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.10-2013. All the measurement uncertainty value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.94dB
---------------------------------------------------------------------	--------

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.0dB
---------------------------------------------------------------------	-------

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.0dB
---------------------------------------------------------------------	-------

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.0dB
---------------------------------------------------------------------	-------



## **Appendix A. Conducted Test Results**

Test Engineer:	weller liu	Temperature:	21~25	°C
Test Date:	2021/4/24	Relative Humidity:	51~54	%

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

U-NII-1													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)		26 dB Bandwidth (MHz)		IC 99% Bandwidth Power Limit (dBm)		IC 99% Bandwidth EIRP Limit (dBm)		Note
					Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	36	5180	17.68	17.58	21.13	21.08	-	-	-	-	
11a	6Mbps	2	44	5220	17.53	17.88	21.13	27.92	-	-	-	-	
11a	6Mbps	2	48	5240	17.58	17.83	21.28	25.57	-	-	-	-	
HT20	MCS0	2	36	5180	18.48	17.98	27.82	21.08	-	-	-	-	
HT20	MCS0	2	44	5220	18.28	18.58	21.63	28.22	-	-	-	-	
HT20	MCS0	2	48	5240	18.28	18.48	21.73	27.57	-	-	-	-	
HT40	MCS0	2	38	5190	36.16	36.56	41.27	41.99	-	-	-	-	
HT40	MCS0	2	46	5230	36.26	36.56	41.72	45.32	-	-	-	-	
VHT80	MCS0	2	42	5210	75.64	75.52	86.31	81.68	-	-	-	-	

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

U-NII-1														
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)		Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail
					Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	36	5180	0.11	0.14	15.56	15.22	18.40	24.00		-4.20		Pass
11a	6Mbps	2	44	5220	0.11	0.14	17.56	17.50	20.54	24.00		-4.20		Pass
11a	6Mbps	2	48	5240	0.11	0.14	17.59	17.42	20.52	24.00		-4.20		Pass
HT20	MCS0	2	36	5180	0.15	0.12	15.28	15.38	18.34	24.00		-4.20		Pass
HT20	MCS0	2	44	5220	0.15	0.12	16.66	16.58	19.63	24.00		-4.20		Pass
HT20	MCS0	2	48	5240	0.15	0.12	16.67	16.56	19.62	24.00		-4.20		Pass
HT40	MCS0	2	38	5190	0.29	0.27	12.65	12.34	15.51	24.00		-4.20		Pass
HT40	MCS0	2	46	5230	0.29	0.27	16.77	16.59	19.69	24.00		-4.20		Pass
VHT20	MCS0	2	36	5180	0.14	0.15	15.20	15.37	18.30	24.00		-4.20		Pass
VHT20	MCS0	2	44	5220	0.14	0.15	16.58	16.57	19.59	24.00		-4.20		Pass
VHT20	MCS0	2	48	5240	0.14	0.15	16.62	16.56	19.60	24.00		-4.20		Pass
VHT40	MCS0	2	38	5190	0.31	0.29	12.63	12.31	15.48	24.00		-4.20		Pass
VHT40	MCS0	2	46	5230	0.31	0.29	16.76	16.58	19.68	24.00		-4.20		Pass
VHT80	MCS0	2	42	5210	0.56	0.56	9.59	9.40	12.51	24.00		-4.20		Pass

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

U-NII-1														
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)		Average Power Density (dBm/MHz)			Average PSD Limit (dBm/MHz)		DG (dBi)		Pass /Fail
					Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	36	5180	0.11	0.14			8.63	11.00			-1.44	Pass
11a	6Mbps	2	44	5220	0.11	0.14			9.44	11.00			-1.44	Pass
11a	6Mbps	2	48	5240	0.11	0.14			9.65	11.00			-1.44	Pass
HT20	MCS0	2	36	5180	0.15	0.12			8.27	11.00			-1.44	Pass
HT20	MCS0	2	44	5220	0.15	0.12			8.44	11.00			-1.44	Pass
HT20	MCS0	2	48	5240	0.15	0.12			8.47	11.00			-1.44	Pass
HT40	MCS0	2	38	5190	0.29	0.27			2.79	11.00			-1.44	Pass
HT40	MCS0	2	46	5230	0.29	0.27			5.29	11.00			-1.44	Pass
VHT80	MCS0	2	42	5210	0.56	0.56			-3.50	11.00			-1.44	Pass

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

U-NII-2A															
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)		26 dB Bandwidth (MHz)		IC 99% Bandwidth Power Limit (dBm)		IC 99% Bandwidth EIRP Limit (dBm)		FCC 26dB Bandwidth Power Limit (dBm)		Note
					Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	52	5260	17.53	17.68	21.28	23.48	23.44		29.44		23.98		
11a	6Mbps	2	60	5300	17.48	17.88	21.23	26.12	23.43		29.43		23.98		
11a	6Mbps	2	64	5320	17.53	17.73	21.48	23.98	23.44		29.44		23.98		
HT20	MCS0	2	52	5260	18.18	18.38	21.63	25.57	23.60		29.60		23.98		
HT20	MCS0	2	60	5300	18.28	18.48	21.78	28.12	23.62		29.62		23.98		
HT20	MCS0	2	64	5320	18.18	18.23	21.48	28.02	23.60		29.60		23.98		
HT40	MCS0	2	54	5270	36.26	37.06	41.63	41.72	23.98		30.00		23.98		
HT40	MCS0	2	62	5310	36.26	36.16	41.36	41.18	23.98		30.00		23.98		
VHT80	MCS0	2	58	5290	75.28	76.48	79.92	81.68	23.98		30.00		23.98		

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

U-NII-2A															
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)		Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail
					Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2		
11a	6Mbps	2	52	5260	0.11	0.14	17.74	17.39	20.58	23.98		-4.30	26.99	Pass	
11a	6Mbps	2	60	5300	0.11	0.14	17.68	17.38	20.54	23.98		-4.30	26.99	Pass	
11a	6Mbps	2	64	5320	0.11	0.14	16.13	15.68	18.92	23.98		-4.30	26.99	Pass	
HT20	MCS0	2	52	5260	0.15	0.12	16.61	16.46	19.55	23.98		-4.30	26.99	Pass	
HT20	MCS0	2	60	5300	0.15	0.12	16.68	16.54	19.62	23.98		-4.30	26.99	Pass	
HT20	MCS0	2	64	5320	0.15	0.12	15.93	15.75	18.85	23.98		-4.30	26.99	Pass	
HT40	MCS0	2	54	5270	0.29	0.27	16.76	16.53	19.66	23.98		-4.30	26.99	Pass	
HT40	MCS0	2	62	5310	0.29	0.27	13.57	13.09	16.35	23.98		-4.30	26.99	Pass	
VHT20	MCS0	2	52	5260	0.14	0.15	16.56	16.46	19.52	23.98		-4.30	26.99	Pass	
VHT20	MCS0	2	60	5300	0.14	0.15	16.61	16.51	19.57	23.98		-4.30	26.99	Pass	
VHT20	MCS0	2	64	5320	0.14	0.15	15.81	15.69	18.76	23.98		-4.30	26.99	Pass	
VHT40	MCS0	2	54	5270	0.31	0.29	16.73	16.51	19.63	23.98		-4.30	26.99	Pass	
VHT40	MCS0	2	62	5310	0.31	0.29	13.48	13.05	16.28	23.98		-4.30	26.99	Pass	
VHT80	MCS0	2	58	5290	0.56	0.56	9.78	9.11	12.47	23.98		-4.30	26.99	Pass	

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

U-NII-2A														
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)		Average Power Density (dBm/MHz)			Average PSD Limit (dBm/MHz)		DG (dBi)		Pass /Fail
					Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	52	5260	0.11	0.14			9.67	11.00		-1.54		Pass
11a	6Mbps	2	60	5300	0.11	0.14			9.34	11.00		-1.54		Pass
11a	6Mbps	2	64	5320	0.11	0.14			9.08	11.00		-1.54		Pass
HT20	MCS0	2	52	5260	0.15	0.12			8.66	11.00		-1.54		Pass
HT20	MCS0	2	60	5300	0.15	0.12			8.64	11.00		-1.54		Pass
HT20	MCS0	2	64	5320	0.15	0.12			8.58	11.00		-1.54		Pass
HT40	MCS0	2	54	5270	0.29	0.27			5.75	11.00		-1.54		Pass
HT40	MCS0	2	62	5310	0.29	0.27			4.07	11.00		-1.54		Pass
VHT80	MCS0	2	58	5290	0.56	0.56			-3.57	11.00		-1.54		Pass

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

U-NII-2C															
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)		26 dB Bandwidth (MHz)		IC 99% Bandwidth Power Limit (dBm)		IC 99% Bandwidth EIRP Limit (dBm)		FCC 26dB Bandwidth Power Limit (dBm)		Note
					Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	100	5500	17.58	17.68	21.18	22.23	23.45		29.45		23.98		
11a	6Mbps	2	116	5580	17.68	17.68	21.38	22.63	23.47		29.47		23.98		
11a	6Mbps	2	140	5700	17.73	17.73	23.98	25.57	23.49		29.49		23.98		
11a	6Mbps	2	144	5720	17.83	17.48	22.28	21.48	23.43		29.43		23.98		
HT20	MCS0	2	100	5500	18.03	18.43	21.13	21.58	23.56		29.56		23.98		
HT20	MCS0	2	116	5580	18.38	18.28	25.48	21.83	23.62		29.62		23.98		
HT20	MCS0	2	140	5700	18.48	18.38	27.77	25.57	23.64		29.64		23.98		
HT20	MCS0	2	144	5720	18.53	18.28	22.13	21.43	23.62		29.62		23.98		
HT40	MCS0	2	102	5510	36.36	36.36	41.36	42.26	23.98		30.00		23.98		
HT40	MCS0	2	110	5550	36.66	36.16	42.08	41.72	23.98		30.00		23.98		
HT40	MCS0	2	134	5670	36.66	36.36	41.90	42.08	23.98		30.00		23.98		
HT40	MCS0	2	142	5710	36.56	36.56	42.53	41.54	23.98		30.00		23.98		
VHT80	MCS0	2	106	5530	75.40	75.52	80.88	81.68	23.98		30.00		23.98		
VHT80	MCS0	2	122	5610	75.52	75.64	83.28	82.00	23.98		30.00		23.98		
VHT80	MCS0	2	138	5690	75.52	75.28	81.68	81.04	23.98		30.00		23.98		

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

U-NII-2C															
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)		Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		EIRP Power Limit (dBm)	Pass/Fail
					Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2		
11a	6Mbps	2	100	5500	0.11	0.14	15.59	15.47	18.54	23.98		-4.00	26.99	Pass	
11a	6Mbps	2	116	5580	0.11	0.14	17.72	17.72	20.73	23.98		-4.00	26.99	Pass	
11a	6Mbps	2	140	5700	0.11	0.14	15.58	15.39	18.50	23.98		-4.00	26.99	Pass	
11a	6Mbps	2	144	5720	0.11	0.14	17.75	17.62	20.70	23.98		-4.00	26.99	Pass	
HT20	MCS0	2	100	5500	0.15	0.12	15.60	15.47	18.55	23.98		-4.00	26.99	Pass	
HT20	MCS0	2	116	5580	0.15	0.12	16.71	16.76	19.74	23.98		-4.00	26.99	Pass	
HT20	MCS0	2	140	5700	0.15	0.12	14.00	13.89	16.95	23.98		-4.00	26.99	Pass	
HT20	MCS0	2	144	5720	0.15	0.12	16.79	16.75	19.78	23.98		-4.00	26.99	Pass	
HT40	MCS0	2	102	5510	0.29	0.27	14.64	14.31	17.49	23.98		-4.00	26.99	Pass	
HT40	MCS0	2	110	5550	0.29	0.27	16.87	16.78	19.84	23.98		-4.00	26.99	Pass	
HT40	MCS0	2	134	5670	0.29	0.27	16.96	16.98	19.98	23.98		-4.00	26.99	Pass	
HT40	MCS0	2	142	5710	0.29	0.27	16.87	16.81	19.85	23.98		-4.00	26.99	Pass	
VHT20	MCS0	2	100	5500	0.14	0.15	15.48	15.42	18.46	23.98		-4.00	26.99	Pass	
VHT20	MCS0	2	116	5580	0.14	0.15	16.66	16.74	19.71	23.98		-4.00	26.99	Pass	
VHT20	MCS0	2	140	5700	0.14	0.15	13.92	13.87	16.91	23.98		-4.00	26.99	Pass	
VHT20	MCS0	2	144	5720	0.14	0.15	16.73	16.70	19.73	23.98		-4.00	26.99	Pass	
VHT40	MCS0	2	102	5510	0.31	0.29	14.59	14.24	17.43	23.98		-4.00	26.99	Pass	
VHT40	MCS0	2	110	5550	0.31	0.29	16.84	16.77	19.81	23.98		-4.00	26.99	Pass	
VHT40	MCS0	2	134	5670	0.31	0.29	16.92	16.87	19.90	23.98		-4.00	26.99	Pass	
VHT40	MCS0	2	142	5710	0.31	0.29	16.87	16.81	19.85	23.98		-4.00	26.99	Pass	
VHT80	MCS0	2	106	5530	0.56	0.56	9.68	9.29	12.50	23.98		-4.00	26.99	Pass	
VHT80	MCS0	2	122	5610	0.56	0.56	16.69	16.64	19.68	23.98		-4.00	26.99	Pass	
VHT80	MCS0	2	138	5690	0.56	0.56	16.73	16.59	19.67	23.98		-4.00	26.99	Pass	

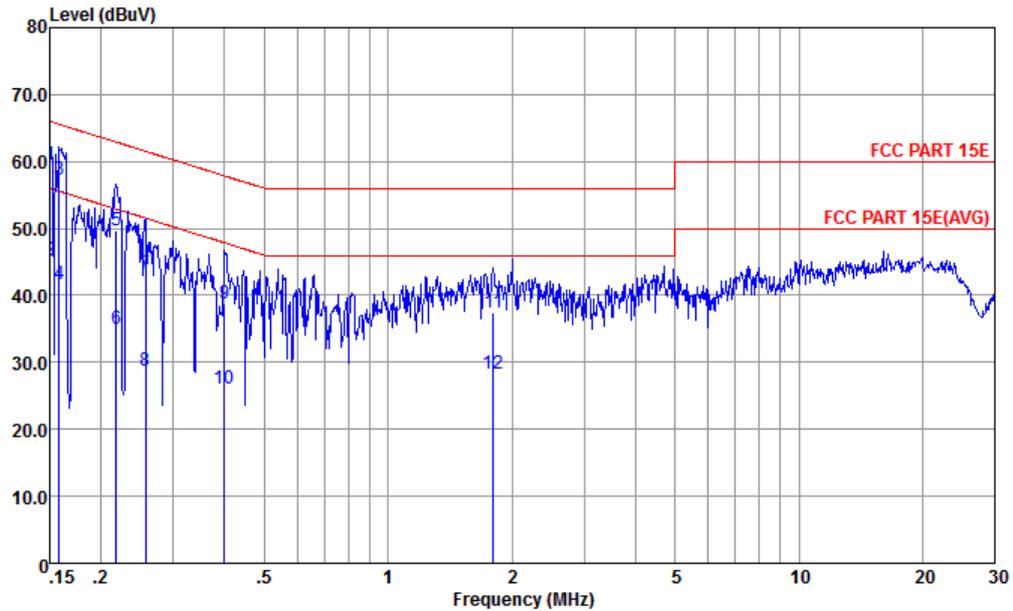
**TEST RESULTS DATA**  
**Power Spectral Density**

U-NII-2C														
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)		Average Power Density (dBm/MHz)			Average PSD Limit (dBm/MHz)		DG (dBi)		Pass /Fail
					Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	100	5500	0.11	0.14			8.91	11.00			-1.24	Pass
11a	6Mbps	2	116	5580	0.11	0.14			9.84	11.00			-1.24	Pass
11a	6Mbps	2	140	5700	0.11	0.14			8.15	11.00			-1.24	Pass
11a	6Mbps	2	144	5720	0.11	0.14			9.97	11.00			-1.24	Pass
HT20	MCS0	2	100	5500	0.15	0.12			8.58	11.00			-1.24	Pass
HT20	MCS0	2	116	5580	0.15	0.12			8.81	11.00			-1.24	Pass
HT20	MCS0	2	140	5700	0.15	0.12			6.55	11.00			-1.24	Pass
HT20	MCS0	2	144	5720	0.15	0.12			8.93	11.00			-1.24	Pass
HT40	MCS0	2	102	5510	0.29	0.27			4.92	11.00			-1.24	Pass
HT40	MCS0	2	110	5550	0.29	0.27			5.66	11.00			-1.24	Pass
HT40	MCS0	2	134	5670	0.29	0.27			5.77	11.00			-1.24	Pass
HT40	MCS0	2	142	5710	0.29	0.27			5.71	11.00			-1.24	Pass
VHT80	MCS0	2	106	5530	0.56	0.56			-3.63	11.00			-1.24	Pass
VHT80	MCS0	2	122	5610	0.56	0.56			2.48	11.00			-1.24	Pass
VHT80	MCS0	2	138	5690	0.56	0.56			2.68	11.00			-1.24	Pass



## Appendix B. AC Conducted Emission Test Results

Test Engineer :	Amos Zhang	Temperature :	25.3~26.2°C
		Relative Humidity :	38~40%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		

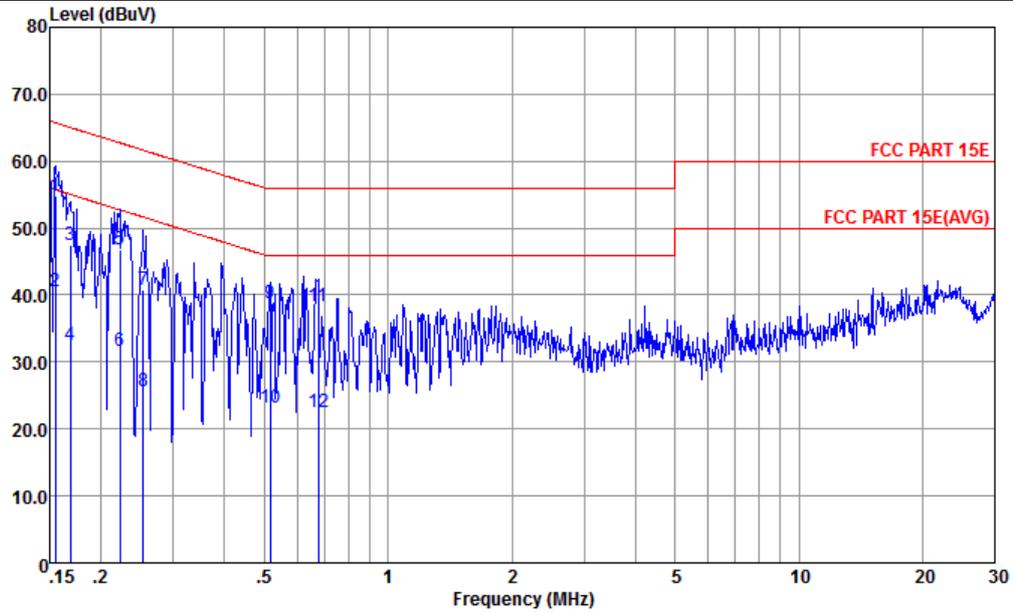


Site : CO01-KS  
 Condition : FCC PART 15E TWO-LISN-CN02-L LINE

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1 *	0.150	59.42	-6.58	66.00	39.30	9.64	10.48	QP
2	0.150	45.32	-10.68	56.00	25.20	9.64	10.48	Average
3	0.158	57.30	-8.26	65.56	37.20	9.64	10.46	QP
4	0.158	41.70	-13.86	55.56	21.60	9.64	10.46	Average
5	0.217	49.79	-13.13	62.92	29.80	9.64	10.35	QP
6	0.217	34.89	-18.03	52.92	14.90	9.64	10.35	Average
7	0.256	43.27	-18.29	61.56	23.30	9.64	10.33	QP
8	0.256	28.77	-22.79	51.56	8.80	9.64	10.33	Average
9	0.400	38.81	-19.05	57.86	18.89	9.65	10.27	QP
10	0.400	26.11	-21.75	47.86	6.19	9.65	10.27	Average
11	1.800	37.33	-18.67	56.00	17.20	9.90	10.23	QP
12	1.800	28.23	-17.77	46.00	8.10	9.90	10.23	Average



Test Engineer :	Amos Zhang	Temperature :	25.3~26.2°C
		Relative Humidity :	38~40%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-KS  
 Condition : FCC PART 15E TWO-LISN-CN02-N NEUTRAL

	Freq	Level	Over	Limit	Read	LISN	Cable	Remark
	MHz	dBuV	Limit	Line	Level	Factor	Loss	
			dB	dBuV	dBuV	dB	dB	
1 *	0.155	54.77	-10.97	65.74	34.49	9.81	10.47	QP
2	0.155	40.57	-15.17	55.74	20.29	9.81	10.47	Average
3	0.169	47.47	-17.56	65.03	27.20	9.84	10.43	QP
4	0.169	32.47	-22.56	55.03	12.20	9.84	10.43	Average
5	0.222	46.82	-15.92	62.74	26.60	9.87	10.35	QP
6	0.222	31.72	-21.02	52.74	11.50	9.87	10.35	Average
7	0.253	40.77	-20.87	61.64	20.61	9.83	10.33	QP
8	0.253	25.67	-25.97	51.64	5.51	9.83	10.33	Average
9	0.516	38.86	-17.14	56.00	18.89	9.73	10.24	QP
10	0.516	23.26	-22.74	46.00	3.29	9.73	10.24	Average
11	0.675	38.26	-17.74	56.00	18.29	9.73	10.24	QP
12	0.675	22.56	-23.44	46.00	2.59	9.73	10.24	Average

Note:

- Level(dBμV) = Read Level(dBμV) + LISN Factor(dB) + Cable Loss(dB)
- Over Limit(dB) = Level(dBμV) – Limit Line(dBμV)



### Appendix C. Radiated Spurious Emission

#### UNII 1 - 5150~5250MHz

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

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Path Loss	Preamplifier Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
1+2		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
802.11a CH 36 5180MHz		5149.76	60.4	-13.6	74	45.19	34.62	11.2	30.61	111	180	P	H
		5150	50.42	-3.58	54	35.21	34.62	11.2	30.61	111	180	A	H
	*	5182	113.19	-	-	97.9	34.67	11.24	30.62	111	180	P	H
		5182	105.98	-	-	90.69	34.67	11.24	30.62	111	180	A	H
		5135.36	58.32	-15.68	74	43.15	34.6	11.18	30.61	290	80	P	V
		5149.44	48.23	-5.77	54	33.02	34.62	11.2	30.61	290	80	A	V
	*	5176	107.25	-	-	91.96	34.67	11.24	30.62	290	80	P	V
		5176	100.15	-	-	84.86	34.67	11.24	30.62	290	80	A	V



UNII 1 5150~5250MHz  
WIFI 802.11a (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)
802.11a CH 36 5180MHz		10360	45.41	-22.89	68.3	52.25	37.59	16.25	60.68	100	360	P	H
		10360	43.36	-24.94	68.3	50.2	37.59	16.25	60.68	100	360	P	V
802.11a CH 44 5220MHz		10440	44.36	-23.94	68.3	51.07	37.65	16.3	60.66	300	0	P	H
		10440	47.79	-20.51	68.3	54.5	37.65	16.3	60.66	300	0	P	V
802.11a CH 48 5240MHz		10480	45.19	-23.11	68.3	51.81	37.69	16.34	60.65	100	360	P	H
		10480	46.29	-22.01	68.3	52.91	37.69	16.34	60.65	100	360	P	V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



UNII 1 5150~5250MHz
WIFI 802.11n HT20 (Band Edge @ 3m)

Table with 14 columns: 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). Rows include frequencies 5148.48, 5150, 5176, 5182 and levels ranging from 48.22 to 111.5.



**UNII 1 5150~5250MHz**  
**WIFI 802.11n HT20 (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)
802.11n HT20 CH 36 5180MHz		10360	46.09	-22.21	68.3	52.93	37.59	16.25	60.68	300	0	P	H
		10360	44.13	-24.17	68.3	50.97	37.59	16.25	60.68	300	0	P	V
802.11n HT20 CH 44 5220MHz		10440	44.28	-24.02	68.3	50.99	37.65	16.3	60.66	300	0	P	H
		10440	45.3	-23	68.3	52.01	37.65	16.3	60.66	300	0	P	V
802.11n HT20 CH 48 5240MHz		10480	45.15	-23.15	68.3	51.77	37.69	16.34	60.65	300	0	P	H
		10480	46.42	-21.88	68.3	53.04	37.69	16.34	60.65	300	0	P	V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



UNII 1 5150~5250MHz
WIFI 802.11n HT40 (Band Edge @ 3m)

Table with 14 columns: 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). Rows include test results for 802.11n HT40 CH 38 5190MHz and a Remark section.



UNII 1 5150~5250MHz
WIFI 802.11n HT40 (Harmonic @ 3m)

Table with 14 columns: 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). Rows include test results for 10380 MHz and 10460 MHz channels.



**UNII 1 5150~5250MHz**  
**WIFI 802.11ac VHT80 (Band Edge @ 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 )
802.11ac VHT80 CH 42 5210MHz		5148.64	59.73	-14.27	74	44.52	34.62	11.2	30.61	100	198	P	H
		5148.8	50.84	-3.16	54	35.63	34.62	11.2	30.61	100	198	A	H
	*	5224	99.89	-	-	84.54	34.7	11.28	30.63	100	198	P	H
		5224	93.14	-	-	77.79	34.7	11.28	30.63	100	198	A	H
		5396.04	56.29	-17.71	74	40.79	34.7	11.49	30.69	100	198	P	H
		5383.8	47.59	-6.41	54	32.11	34.7	11.47	30.69	100	198	A	H
		5137.44	57.62	-16.38	74	42.45	34.6	11.18	30.61	302	87	P	V
		5107.52	48.67	-5.33	54	33.53	34.58	11.16	30.6	302	87	A	V
	*	5212	94.54	-	-	79.19	34.7	11.28	30.63	302	87	P	V
		5212	87.48	-	-	72.13	34.7	11.28	30.63	302	87	A	V
		5385.96	56.59	-17.41	74	41.11	34.7	11.47	30.69	302	87	P	V
		5392.98	47.58	-6.42	54	32.1	34.7	11.47	30.69	302	87	A	V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



UNII 1 5150~5250MHz
WIFI 802.11ac VHT80 (Harmonic @ 3m)

Table with 14 columns: 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). It contains two rows of test data and a Remark section.



UNII 2A - 5250~5350MHz
WIFI 802.11a (Band Edge @ 3m)

Table with 14 columns: 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). Rows include test results for 802.11a CH 64 5320MHz and a Remark section.



UNII 2A 5250~5350MHz

WIFI 802.11a (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)
802.11a		10520	46.9	-21.4	68.3	53.48	37.71	16.36	60.65	100	360	P	H
CH 52 5260MHz		10520	46.08	-22.22	68.3	52.66	37.71	16.36	60.65	100	360	P	V
802.11a		10600	45.78	-28.22	74	52.24	37.74	16.43	60.63	100	360	P	H
CH 60 5300MHz		10600	46.33	-27.67	74	52.79	37.74	16.43	60.63	100	360	P	V
802.11a		10640	45.18	-28.82	74	51.59	37.76	16.45	60.62	100	360	P	H
CH 64 5320MHz		10640	44	-30	74	50.41	37.76	16.45	60.62	100	360	P	V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**UNII 2A 5250~5350MHz  
WIFI 802.11n HT20 (Band Edge @ 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)
802.11n HT20 CH 64 5320MHz		5352.2	62.79	-11.21	74	47.34	34.7	11.43	30.68	135	193	P	H
		5350	50.48	-3.52	54	35.03	34.7	11.43	30.68	135	193	A	H
	*	5320	112.06	-	-	96.64	34.7	11.39	30.67	135	193	P	H
		5320	105.29	-	-	89.87	34.7	11.39	30.67	135	193	A	H
		5355.5	57.77	-16.23	74	42.32	34.7	11.43	30.68	292	86	P	V
		5351.7	47.52	-6.48	54	32.07	34.7	11.43	30.68	292	86	A	V
	*	5320	107.16	-	-	91.74	34.7	11.39	30.67	292	86	P	V
		5320	99.68	-	-	84.26	34.7	11.39	30.67	292	86	A	V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**UNII 2A 5250~5350MHz**  
**WIFI 802.11n HT20 (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)
802.11n HT20 CH 52 5260MHz		10520	44.72	-23.58	68.3	51.3	37.71	16.36	60.65	100	360	P	H
		10520	44.94	-23.36	68.3	51.52	37.71	16.36	60.65	100	360	P	V
802.11n HT20 CH 60 5300MHz		10600	45.06	-28.94	74	51.52	37.74	16.43	60.63	100	360	P	H
		10600	46.05	-27.95	74	52.51	37.74	16.43	60.63	100	360	P	V
802.11n HT20 CH 64 5320MHz		10640	44.56	-29.44	74	50.97	37.76	16.45	60.62	100	360	P	H
		10640	43.72	-30.28	74	50.13	37.76	16.45	60.62	100	360	P	V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**UNII 2A 5250~5350MHz  
WIFI 802.11n HT40 (Band Edge @ 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)
802.11n HT40 CH 62 5310MHz		5107.68	57.72	-16.28	74	42.58	34.58	11.16	30.6	100	194	P	H
		5102.72	48.36	-5.64	54	33.27	34.55	11.14	30.6	100	194	A	H
	*	5308	106.68	-	-	91.27	34.7	11.38	30.67	100	194	P	H
		5308	99.95	-	-	84.54	34.7	11.38	30.67	100	194	A	H
		5353.1	59.49	-14.51	74	44.04	34.7	11.43	30.68	100	194	P	H
		5350	50.14	-3.86	54	34.69	34.7	11.43	30.68	100	194	A	H
		5121.44	58.16	-15.84	74	43.02	34.58	11.16	30.6	307	90	P	V
		5100.96	48.12	-5.88	54	33.03	34.55	11.14	30.6	307	90	A	V
	*	5308	100.79	-	-	85.38	34.7	11.38	30.67	307	90	P	V
		5308	93.66	-	-	78.25	34.7	11.38	30.67	307	90	A	V
		5362.2	56.96	-17.04	74	41.5	34.7	11.45	30.69	307	90	P	V
		5350.7	47.61	-6.39	54	32.16	34.7	11.43	30.68	307	90	A	V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



UNII 2A 5250~5350MHz
WIFI 802.11n HT40 (Harmonic @ 3m)

Table with 14 columns: 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). Rows include data for 802.11n HT40 CH 54 at 10540MHz and 802.11n HT40 CH 62 at 10620MHz.

Remark
1. No other spurious found.
2. All results are PASS against Peak and Average limit line.



**UNII 2A 5250~5350MHz**  
**WIFI 802.11ac VHT80 (Band Edge @ 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)
802.11ac VHT80 CH 58 5290MHz		5116.32	57.65	-16.35	74	42.51	34.58	11.16	30.6	100	195	P	H
		5103.68	48.75	-5.25	54	33.66	34.55	11.14	30.6	100	195	A	H
	*	5302	100.8	-	-	85.38	34.7	11.38	30.66	100	195	P	H
		5302	93.74	-	-	78.32	34.7	11.38	30.66	100	195	A	H
		5356.4	58.98	-15.02	74	43.53	34.7	11.43	30.68	100	195	P	H
		5351.5	50.5	-3.5	54	35.05	34.7	11.43	30.68	100	195	A	H
		5122.24	57.86	-16.14	74	42.72	34.58	11.16	30.6	311	84	P	V
		5101.44	48.61	-5.39	54	33.52	34.55	11.14	30.6	311	84	A	V
	*	5284	95.03	-	-	79.62	34.7	11.36	30.65	311	84	P	V
		5284	87.53	-	-	72.12	34.7	11.36	30.65	311	84	A	V
		5385.3	56.96	-17.04	74	41.48	34.7	11.47	30.69	311	84	P	V
		5386.9	47.76	-6.24	54	32.28	34.7	11.47	30.69	311	84	A	V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



UNII 2A 5250~5350MHz
WIFI 802.11ac VHT80 (Harmonic @ 3m)

Table with 14 columns: 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). Contains two data rows and a Remark section.



**UNII 2C - 5470~5725MHz**  
**WIFI 802.11a (Band Edge @ 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 )
802.11a CH 100 5500MHz		5457.36	59.83	-14.17	74	44.32	34.7	11.53	30.72	118	191	P	H
		5465.2	62.82	-5.48	68.3	47.29	34.7	11.55	30.72	118	191	P	H
		5459.76	50.95	-3.05	54	35.44	34.7	11.53	30.72	118	191	A	H
	*	5494	114.05	-	-	98.52	34.7	11.56	30.73	118	191	P	H
		5494	106.97	-	-	91.44	34.7	11.56	30.73	118	191	A	H
		5444.56	57.54	-16.46	74	42.03	34.7	11.52	30.71	326	265	P	V
		5464.88	57.3	-11	68.3	41.77	34.7	11.55	30.72	326	265	P	V
		5459.12	47.94	-6.06	54	32.43	34.7	11.53	30.72	326	265	A	V
	*	5500	106.23	-	-	90.68	34.7	11.58	30.73	326	265	P	V
	5500	99.51	-	-	83.96	34.7	11.58	30.73	326	265	A	V	
802.11a CH 140 5700MHz		5727.88	65.12	-3.18	68.3	49.02	35.08	11.84	30.82	100	191	P	H
	*	5698	114.13	-	-	98.17	34.97	11.79	30.8	100	191	P	H
		5698	106.45	-	-	90.49	34.97	11.79	30.8	100	191	A	H
		5725.32	59.41	-8.89	68.3	43.31	35.08	11.84	30.82	378	301	P	V
	*	5704	106.57	-	-	90.53	35.03	11.82	30.81	378	301	P	V
	5704	99.48	-	-	83.44	35.03	11.82	30.81	378	301	A	V	
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



UNII 2C - 5470~5725MHz

WIFI 802.11a (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)
802.11a CH 100 5500MHz		11000	44.69	-29.31	74	50.62	37.9	16.71	60.54	100	360	P	H
		11000	43.33	-30.67	74	49.26	37.9	16.71	60.54	100	360	P	V
802.11a CH 116 5580MHz		11160	45.46	-28.54	74	51.13	38	16.83	60.5	100	360	P	H
		11160	45.47	-28.53	74	51.14	38	16.83	60.5	100	360	P	V
802.11a CH 140 5700MHz		11400	44	-30	74	49.3	38.14	17.01	60.45	100	360	P	H
		11400	45.53	-28.47	74	50.83	38.14	17.01	60.45	100	360	P	V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**UNII 2C - 5470~5725MHz**  
**WIFI 802.11n HT20 (Band Edge @ 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 )
802.11n HT20 CH 100 5500MHz		5459.92	59.92	-14.08	74	44.41	34.7	11.53	30.72	117	192	P	H
		5469.68	61.14	-7.16	68.3	45.61	34.7	11.55	30.72	117	192	P	H
		5459.92	50.77	-3.23	54	35.26	34.7	11.53	30.72	117	192	A	H
	*	5500	112.38	-	-	96.83	34.7	11.58	30.73	117	192	P	H
		5500	105.53	-	-	89.98	34.7	11.58	30.73	117	192	A	H
		5458.16	56.71	-17.29	74	41.2	34.7	11.53	30.72	379	266	P	V
		5468.24	57.01	-11.29	68.3	41.48	34.7	11.55	30.72	379	266	P	V
		5459.92	47.97	-6.03	54	32.46	34.7	11.53	30.72	379	266	A	V
	*	5500	105.73	-	-	90.18	34.7	11.58	30.73	379	266	P	V
	5500	98.71	-	-	83.16	34.7	11.58	30.73	379	266	A	V	
802.11n HT20 CH 140 5700MHz		5725	64.81	-3.49	68.3	48.71	35.08	11.84	30.82	100	190	P	H
	*	5698	111.25	-	-	95.29	34.97	11.79	30.8	100	190	P	H
		5698	103.85	-	-	87.89	34.97	11.79	30.8	100	190	A	H
		5728.92	57.31	-10.99	68.3	41.21	35.08	11.84	30.82	318	52	P	V
	*	5698	103.25	-	-	87.29	34.97	11.79	30.8	318	52	P	V
	5698	96.36	-	-	80.4	34.97	11.79	30.8	318	52	A	V	
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**UNII 2C - 5470~5725MHz**  
**WIFI 802.11n HT20 (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)
802.11n HT20 CH 100 5500MHz		11000	43.41	-30.59	74	49.34	37.9	16.71	60.54	100	360	P	H
		11000	44.12	-29.88	74	50.05	37.9	16.71	60.54	100	360	P	V
802.11n HT20 CH 116 5580MHz		11160	43.83	-30.17	74	49.5	38	16.83	60.5	100	360	P	H
		11160	43.3	-30.7	74	48.97	38	16.83	60.5	100	360	P	V
802.11n HT20 CH 140 5700MHz		11400	44.73	-29.27	74	50.03	38.14	17.01	60.45	300	0	P	H
		11400	44.01	-29.99	74	49.31	38.14	17.01	60.45	300	0	P	V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**UNII 2C - 5470~5725MHz**  
**WIFI 802.11n HT40 (Band Edge @ 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)
802.11n HT40 CH 102 5510MHz		5442.64	59.9	-14.1	74	44.39	34.7	11.52	30.71	100	192	P	H
		5469.04	62	-6.3	68.3	46.47	34.7	11.55	30.72	100	192	P	H
		5455.92	50.81	-3.19	54	35.3	34.7	11.53	30.72	100	192	A	H
	*	5512	110.12	-	-	94.57	34.7	11.58	30.73	100	192	P	H
		5512	103.01	-	-	87.46	34.7	11.58	30.73	100	192	A	H
		5734.76	57.79	-10.51	68.3	41.6	35.14	11.87	30.82	100	192	P	H
		5437.04	57.42	-16.58	74	41.91	34.7	11.52	30.71	303	82	P	V
		5464.24	58.26	-10.04	68.3	42.73	34.7	11.55	30.72	303	82	P	V
		5458.96	48.36	-5.64	54	32.85	34.7	11.53	30.72	303	82	A	V
	*	5512	102.07	-	-	86.52	34.7	11.58	30.73	303	82	P	V
		5512	94.78	-	-	79.23	34.7	11.58	30.73	303	82	A	V
	5733.96	58.05	-10.25	68.3	41.95	35.08	11.84	30.82	303	82	P	V	
802.11n HT40 CH 134 5670MHz		5457.2	57.43	-16.57	74	41.92	34.7	11.53	30.72	100	193	P	H
		5467.6	56.54	-11.76	68.3	41.01	34.7	11.55	30.72	100	193	P	H
		5458.8	47.98	-6.02	54	32.47	34.7	11.53	30.72	100	193	A	H
	*	5662	110.73	-	-	94.91	34.86	11.74	30.78	100	193	P	H
		5662	103.44	-	-	87.62	34.86	11.74	30.78	100	193	A	H
		5726.76	64.9	-3.4	68.3	48.8	35.08	11.84	30.82	100	193	P	H
		5417.52	56.4	-17.6	74	40.89	34.7	11.51	30.7	400	298	P	V
		5460.24	56.25	-12.05	68.3	40.74	34.7	11.53	30.72	400	298	P	V
		5452.88	47.56	-6.44	54	32.04	34.7	11.53	30.71	400	298	A	V
	*	5674	104.55	-	-	88.65	34.92	11.77	30.79	400	298	P	V
	5674	96.93	-	-	81.03	34.92	11.77	30.79	400	298	A	V	
	5729.8	57.94	-10.36	68.3	41.84	35.08	11.84	30.82	400	298	P	V	
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**UNII 2C - 5470~5725MHz**  
**WIFI 802.11n HT40 (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 )
802.11n HT40 CH 102 5510MHz		11020	42.91	-31.09	74	48.82	37.91	16.72	60.54	100	360	P	H
		11020	43.97	-30.03	74	49.88	37.91	16.72	60.54	100	360	P	V
802.11n HT40 CH 110 5550MHz		11100	43.28	-30.72	74	49.06	37.96	16.78	60.52	100	360	P	H
		11100	42.95	-31.05	74	48.73	37.96	16.78	60.52	100	360	P	V
802.11n HT40 CH 134 5670MHz		11340	44.67	-29.33	74	50.08	38.1	16.96	60.47	100	360	P	H
		11340	43.28	-30.72	74	48.69	38.1	16.96	60.47	100	360	P	V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**UNII 2C - 5470~5725MHz**  
**WIFI 802.11ac VHT80 (Band Edge @ 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)
802.11ac VHT80 CH 106 5530MHz		5453.52	58.11	-15.89	74	42.59	34.7	11.53	30.71	110	193	P	H
		5468.88	59.66	-8.64	68.3	44.13	34.7	11.55	30.72	110	193	P	H
		5457.84	50.46	-3.54	54	34.95	34.7	11.53	30.72	110	193	A	H
	*	5536	102.03	-	-	86.46	34.7	11.61	30.74	110	193	P	H
		5536	94.63	-	-	79.06	34.7	11.61	30.74	110	193	A	H
		5729.08	57.43	-10.87	68.3	41.33	35.08	11.84	30.82	110	193	P	H
		5449.36	57.38	-16.62	74	41.86	34.7	11.53	30.71	288	78	P	V
		5469.52	56.79	-11.51	68.3	41.26	34.7	11.55	30.72	288	78	P	V
		5458.32	48.05	-5.95	54	32.54	34.7	11.53	30.72	288	78	A	V
	*	5524	93.58	-	-	78.02	34.7	11.6	30.74	288	78	P	V
		5524	86.21	-	-	70.65	34.7	11.6	30.74	288	78	A	V
	5733.96	57.25	-11.05	68.3	41.15	35.08	11.84	30.82	288	78	P	V	
802.11ac VHT80 CH 122 5610MHz		5426.16	58.74	-15.26	74	43.23	34.7	11.51	30.7	113	191	P	H
		5466.48	59.64	-8.66	68.3	44.11	34.7	11.55	30.72	113	191	P	H
		5458.96	50.51	-3.49	54	35	34.7	11.53	30.72	113	191	A	H
	*	5602	108.81	-	-	93.2	34.7	11.67	30.76	113	191	P	H
		5602	101.03	-	-	85.42	34.7	11.67	30.76	113	191	A	H
		5731.16	60.45	-7.85	68.3	44.35	35.08	11.84	30.82	113	191	P	H
		5386.16	56.87	-17.13	74	41.39	34.7	11.47	30.69	390	295	P	V
		5469.84	56.22	-12.08	68.3	40.69	34.7	11.55	30.72	390	295	P	V
		5457.68	48.27	-5.73	54	32.76	34.7	11.53	30.72	390	295	A	V
	*	5608	100.65	-	-	85.05	34.7	11.67	30.77	390	295	P	V
	5608	93.56	-	-	77.96	34.7	11.67	30.77	390	295	A	V	
	5732.6	57.54	-10.76	68.3	41.44	35.08	11.84	30.82	390	295	P	V	
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**UNII 2C 5470~5725MHz**  
**WIFI 802.11ac VHT80 (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)
802.11ac VHT80 CH 106 5530MHz		11060	42.67	-31.33	74	48.5	37.94	16.76	60.53	100	360	P	H
		11060	43.38	-30.62	74	49.21	37.94	16.76	60.53	100	360	P	V
802.11ac VHT80 CH 122 5610MHz		11220	44.64	-29.36	74	50.23	38.03	16.87	60.49	300	0	P	H
		11220	44.57	-29.43	74	50.16	38.03	16.87	60.49	300	0	P	V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



**UNII 2C - Straddle Channel**  
**WIFI 802.11a (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 )
802.11a CH 144 5720MHz	*	5716	113.68	-	-	97.64	35.03	11.82	30.81	100	201	P	H
		5716	106.49	-	-	90.45	35.03	11.82	30.81	100	201	A	H
	*	5716	106.93	-	-	90.89	35.03	11.82	30.81	377	306	P	V
		5716	100.01	-	-	83.97	35.03	11.82	30.81	377	306	A	V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



UNII 2C - Straddle Channel
WIFI 802.11a (Harmonic @ 3m)

Table with 14 columns: 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). It contains two rows of test data and a 'Remark' section with two points.



UNII 2C - Straddle Channel
WIFI 802.11n HT20 (Band Edge @ 3m)

Table with 14 columns: 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). Rows include test results for 802.11n HT20 and CH 144 5720MHz, and a Remark section.



UNII 2C - Straddle Channel
WIFI 802.11n HT20 (Harmonic @ 3m)

Table with 14 columns: 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). It contains two rows of test data and a 'Remark' section with two points.



**UNII 2C - Straddle Channel  
WIFI 802.11n HT40 (Band Edge @ 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 )
802.11n	*	5710	110.4	-	-	94.36	35.03	11.82	30.81	111	196	P	H
HT40		5710	103.66	-	-	87.62	35.03	11.82	30.81	111	196	A	H
CH 142	*	5710	102.28	-	-	86.24	35.03	11.82	30.81	366	288	P	V
5710MHz		5710	95.45	-	-	79.41	35.03	11.82	30.81	366	288	A	V
<b>Remark</b>	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



UNII 2C - Straddle Channel
WIFI 802.11n HT40 (Harmonic @ 3m)

Table with 14 columns: 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). It contains two rows of test data and a 'Remark' section with two points.



UNII 2C - Straddle Channel
WIFI 802.11ac VHT80 (Band Edge @ 3m)

Table with 14 columns: 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). Rows include 802.11ac VHT80 and CH 138 5690MHz with various test parameters and a Remark section at the bottom.



UNII 2C - Straddle Channel
WIFI 802.11ac VHT80 (Harmonic @ 3m)

Table with 14 columns: 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). It contains two rows of test data and a 'Remark' section with two points.



Emission below 1GHz

WIFI 802.11a (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+2		( MHz )	( dBμV/m )	( dB )	( dBμV/m )	( dBμV )	( dB/m )	( dB )	( dB )	( cm )	( deg )	( P/A )	( H/V )
802.11a LF		30	19.88	-20.12	40	26.13	25.14	0.81	32.2	-	-	P	H
		167.74	23.33	-20.17	43.5	36.6	16.57	2.26	32.1	-	-	P	H
		208.48	19.29	-24.21	43.5	33.63	15.26	2.52	32.12	-	-	P	H
		459.71	21.12	-24.88	46	26.22	23.39	3.75	32.24	-	-	P	H
		631.4	23.27	-22.73	46	24.77	26.37	4.37	32.24	-	-	P	H
		753.62	26.3	-19.7	46	25.34	28.49	4.77	32.3	152	64	P	H
		38.73	32.43	-7.57	40	43.09	20.44	1.04	32.14	147	25	P	V
		48.43	30.55	-9.45	40	46.09	15.46	1.2	32.2	-	-	P	V
		66.86	22.85	-17.15	40	41.36	12.24	1.39	32.14	-	-	P	V
		79.47	22.01	-17.99	40	39.32	13.35	1.54	32.2	-	-	P	V
		170.65	20.09	-23.41	43.5	33.46	16.45	2.28	32.1	-	-	P	V
		751.68	25.52	-20.48	46	24.54	28.51	4.77	32.3	-	-	P	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+2		( 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)

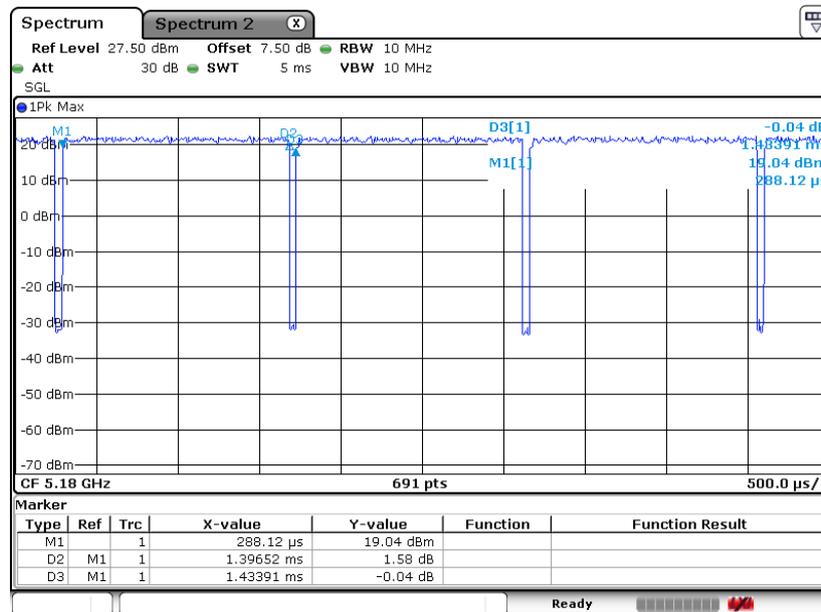
Both peak and average measured complies with the limit line, so test result is “PASS”.



## Appendix D. Duty Cycle Plots

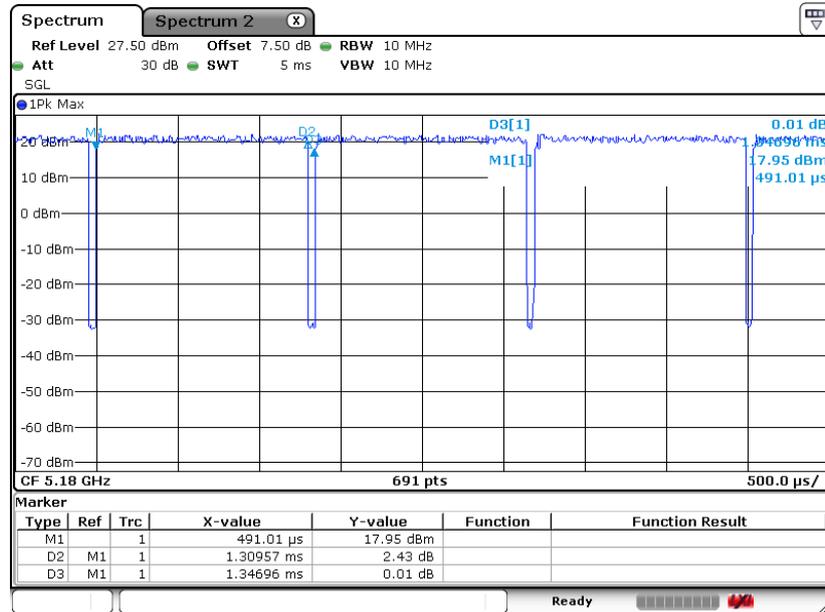
Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11a Ant 1+2	97.39	1.397	0.716	0.75kHz
802.11n HT20 Ant 1+2	97.22	1.310	0.763	0.82kHz
802.11n HT40 Ant 1+2	93.97	0.650	1.538	1.6kHz
802.11ac VHT80 Ant 1+2	87.84	0.323	3.096	3.3kHz

### 802.11a

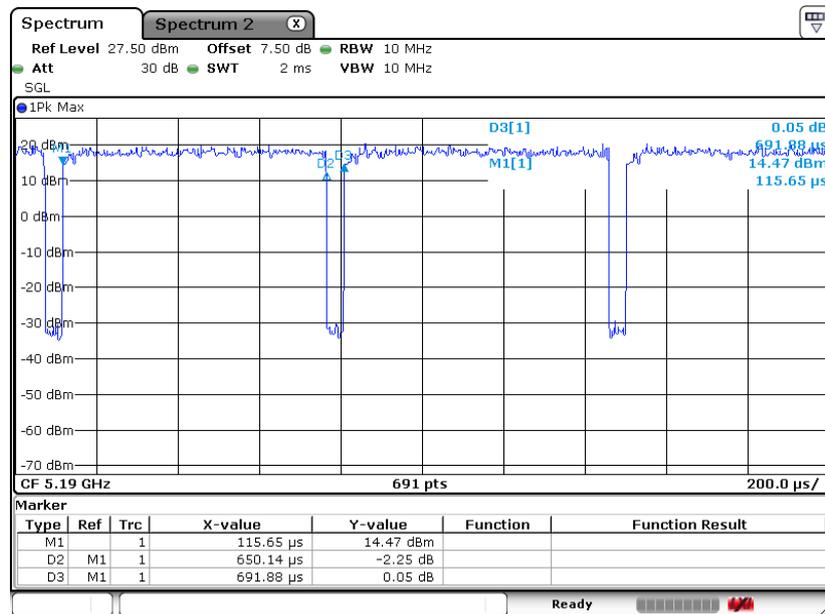




802.11n HT20



802.11n HT40





802.11ac VHT80

