FCC RF Test Report

APPLICANT	:	**Horton L.L.C.**
EQUIPMENT	:	**Tablet**
MODEL NAME	:	**SR87MC**
FCC ID	:	**2AE26-1229**
STANDARD	:	**FCC Part 15 Subpart E §15.407**
CLASSIFICATION	:	**(NII) Unlicensed National Information Infrastructure**

The testing was completed on Feb. 22, 2016. We, SPORTON INTERNATIONAL 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 INC., the test report shall not be reproduced except in full.

Reviewed by: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager

Testing Laboratory 1190

SPORTON INTERNATIONAL INC.
No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR561042-04D	Rev. 01	Initial issue of report	Mar. 03, 2016

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	2.1049 15.403(i)	26dB & 99% Bandwidth	-	Pass	-
3.2	15.407(a)	Maximum Conducted Output Power	FCC ≤ 24 dBm (depend on band)	Pass	-
3.3	15.407(a)	Power Spectral Density	FCC ≤ 11 dBm (depend on band)	Pass	-
3.4	15.407(b)	Unwanted Emissions	≤ -17, -27 dBm (depend on band)&15.209(a)	Pass	Under limit 0.51 dB at 5149.250 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 11.60 dB at 0.454 MHz
3.6	15.407(g)	Frequency Stability	Within Operation Band	Pass	-
3.7	15.407(c)	Automatically Discontinue Transmission	Discontinue Transmission	Pass	-
3.8	15.203 & 15.407(a)	Antenna Requirement	N/A	Pass	-

1 General Description

1.1 Applicant

Horton L.L.C.
1 North Water Street, 10th Floor
Mobile, Alabama, 36602

1.2 Product Feature of Equipment Under Test

Product Feature	
Equipment	Tablet
Model Name	SR87MC
FCC ID	2AE26-1229
EUT supports Radios application	WLAN 11b/g/n HT20 WLAN 11a/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 Bluetooth v4.1 EDR/LE

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

1.3 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Frequency Range	5180 MHz ~ 5240 MHz
Maximum Output Power to Antenna	802.11a : 20.33 dBm / 0.1079 W 802.11n HT20 : 20.31 dBm / 0.1074 W 802.11n HT40 : 20.35 dBm / 0.1084 W 802.11ac VHT20 : 20.30 dBm / 0.1072 W 802.11ac VHT40 : 20.33 dBm / 0.1079 W 802.11ac VHT80 : 11.22 dBm / 0.0132 W
99% Occupied Bandwidth	802.11a : 18.40 MHz 802.11n HT20 : 19.25 MHz 802.11n HT40 : 37.50 MHz 802.11ac VHT20: 19.20 MHz 802.11ac VHT40 : 37.20 MHz 802.11ac VHT80 : 75.36 MHz
Antenna Type	Fixied Internal Antenna with gain 5.90 dBi
Type of Modulation	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)

1.4 Modification of EUT

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

1.5 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1022 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.		
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978		
Test Site No.	**Sporton Site No.**		
	TH02-HY	CO05-HY	03CH07-HY

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

1.6 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 v01r01
- FCC KDB 644545 D03 Guidance for IEEE 802 11ac New Rules v01
- ANSI C63.10-2013

Remark:

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

2 Test Configuration of Equipment Under Test

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conducted emission (150 kHz to 30 MHz) and radiated 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.

The final configuration from all the combinations and the worst-case data rates were investigated by measuring the maximum power across all the data rates and modulation modes under section 2.2.

Based on the worst configuration found above, the RF power setting is set individually to meet FCC compliance limit for the final conducted and radiated tests shown in section 2.3.

2.1 Carrier Frequency Channel

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

Note: The above Frequency and Channel in boldface were 802.11n HT40.

2.2 Pre-Scanned RF Power

Preliminary tests were performed in different data rate and data rate associated with the highest power were chosen for full test in the following tables.

5GHz 802.11a mode								
Data Rate (MHz)	6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
Avg. Power (dBm)	20.33	20.32	20.31	20.30	20.32	20.29	20.31	20.32

5GHz 802.11n HT20 mode								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Avg. Power (dBm)	20.31	20.29	20.30	20.30	20.28	20.28	20.29	20.30

5GHz 802.11n HT40mode								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Avg. Power (dBm)	20.35	20.33	20.34	20.34	20.32	20.34	20.19	20.09

5GHz 802.11ac VHT20 mode									
Data Rate (MHz)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8
Avg. Power (dBm)	20.30	20.26	20.28	20.28	20.28	20.27	20.29	20.27	20.29

5GHz 802.11ac VHT40 mode										
Data Rate (MHz)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	MCS 9
Avg. Power (dBm)	20.33	20.18	20.26	20.30	20.31	20.31	20.15	20.23	20.07	20.03

5GHz 802.11ac VHT80 mode										
Data Rate (MHz)	MCS 0	MCS 1	MCS 2	MCS 3	MCS 4	MCS 5	MCS 6	MCS 7	MCS 8	MCS 9
Avg. Power (dBm)	11.22	11.10	11.21	11.21	11.20	11.21	11.10	11.18	11.00	11.11

2.3 Test Mode

Final test mode of conducted test items and radiated spurious emissions are considering the modulation and worse data rates from the power table described in section 2.2.

Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT20	MCS0
802.11ac VHT40	MCS0
802.11ac VHT80	MCS0

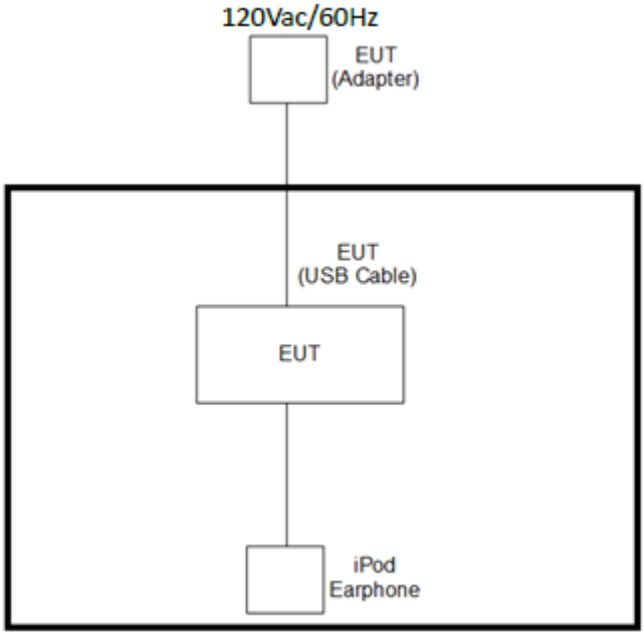
Test Cases	
AC Conducted Emission	Mode 1 : Bluetooth Link + WLAN (5GHz) Link + MPEG4 + Earphone + MicroSD Card + USB Cable (Charging from Adapter)

Ch. #		Band I：5150-5250 MHz	Band I：5150-5250 MHz	Band I：5150-5250 MHz
		802.11a	802.11n HT20	802.11n HT40
L	Low	36	36	38
M	Middle	44	44	-
H	High	48	48	46

Ch. #		Band I：5150-5250 MHz		
		802.11ac VHT20	802.11ac VHT40	802.11ac VHT80
L	Low	36	38	-
M	Middle	44	-	42
H	High	48	46	-

2.4 Connection Diagram of Test System

<WLAN Tx Mode>



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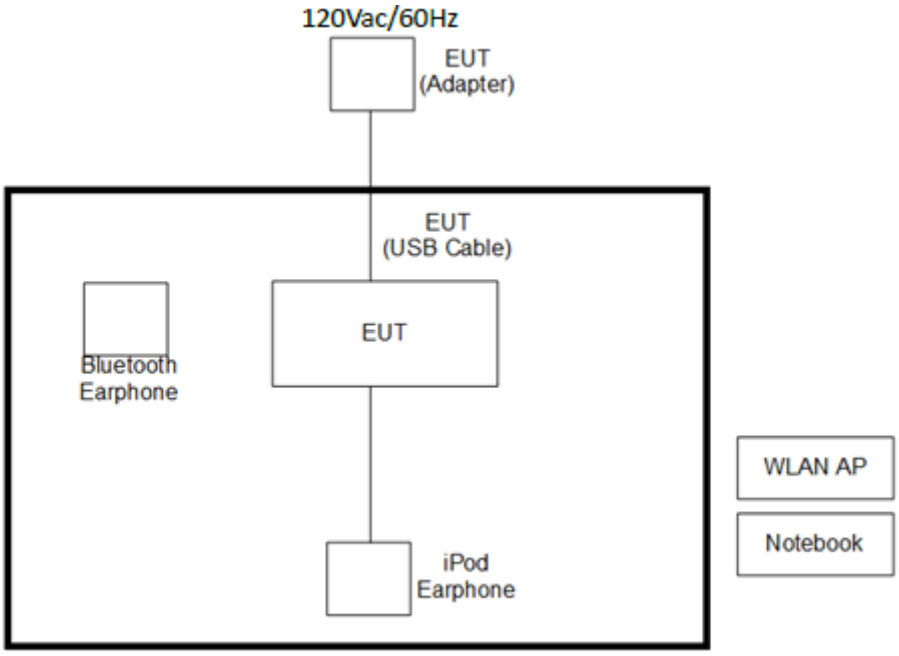


2.5 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Bluetooth Earphone	Sony Ericsson	MW600	PY7DDA-2029	N/A	N/A
2.	WLAN AP	D-Link	DIR-865L	KA2IR865LA1	N/A	Unshielded, 1.8 m
3.	Notebook	DELL	Latitude E6320	FCC DoC/ Contains FCC ID: QDS-BRCM1054	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	iPod Earphone	Apple	N/A	Verification	Unshielded, 1.0 m	N/A
5.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A

2.6 EUT Operation Test Setup

For WLAN function, programmed RF utility, installed in the notebook make the EUT provide functions like channel selection and power level for continuous transmitting and receiving signals.

2.7 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.

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

= 4.2 + 10 = 14.2 (dB)

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.

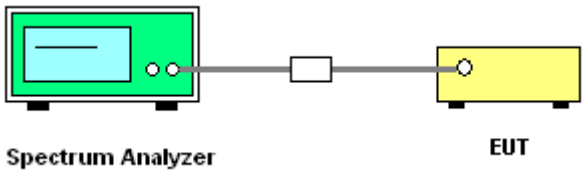
3.1.2 Measuring Instruments

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 v01r01. 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) ≥ 3 * RBW.
8. Measure and record the results in the test report.

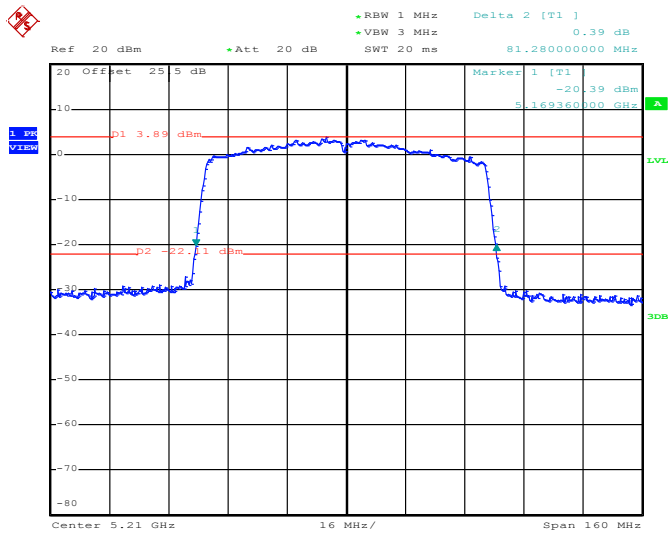
3.1.4 Test Setup



3.1.5 Test Result of 26dB & 99% Occupied Bandwidth Plots

Please refer to Appendix A.

Maximum 26dB Bandwidth



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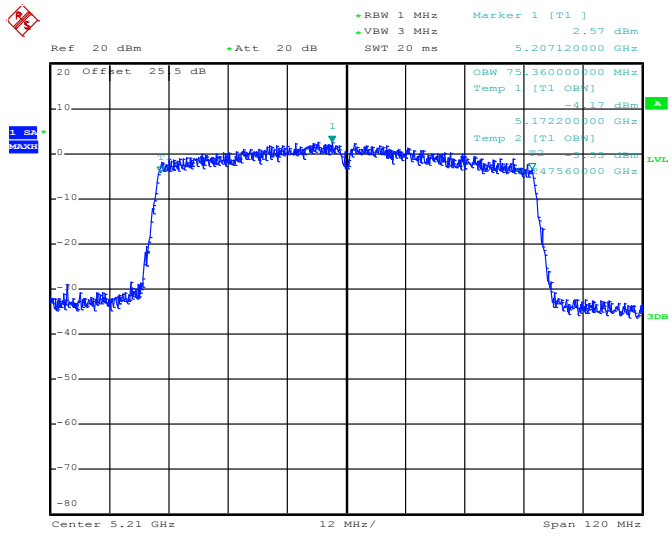
Maximum 99% Occupied Bandwidth



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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.

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

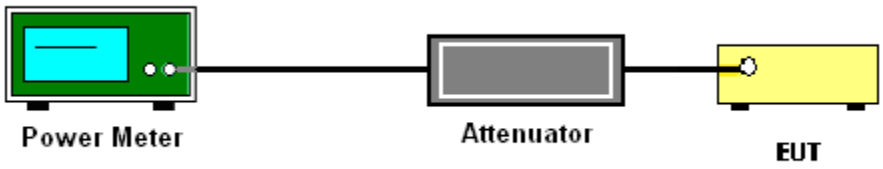
The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r01.

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.

3.2.4 Test Setup

For normal channel:



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.

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

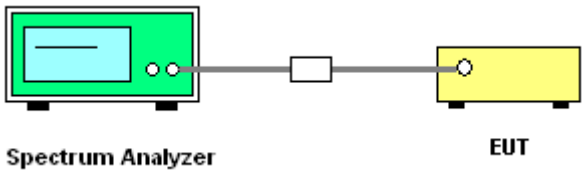
The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r01. Section F) Maximum power spectral density.

 # Method SA-2 #

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

1. The testing follows Method SA-2 of FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r01.
   - Measure the duty cycle.
   - Set span to encompass the entire emission bandwidth (EBW) of the signal.
   - Set RBW = 1 MHz.
   - Set VBW ≥ 3 MHz.
   - Number of points in sweep ≥ 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.
2. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
3. Each plot has already offset with cable loss, and attenuator loss. Measure the PPSD and record it.

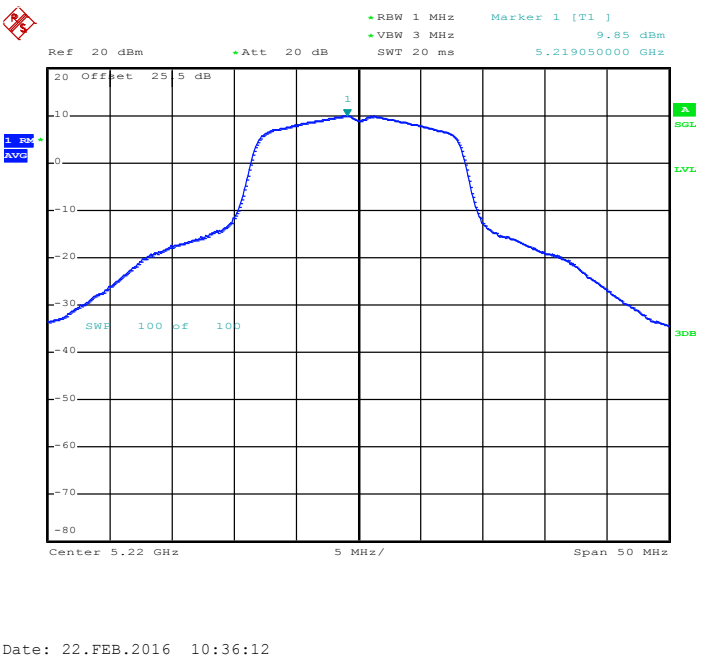
3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

Worst Case Power Spectral Density(dBm/MHz)



Note: Average Power Density (dB) = Measured value+ Duty Factor

3.4 Unwanted Radiated Emission Measurement

This section as specified in FCC Part 15.407(b) is to measure unwanted emissions through radiated measurement for band edge spurious emissions and out of band emissions measurement. The unwanted emissions shall comply with 15.407(b)(1) to (6), and restricted bands per FCC Part15.205.

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.

(2) Unwanted spurious emissions fallen in restricted bands per FCC Part15.205 shall comply with the general field strength limits set forth in § 15.209 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.

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

EIRP (dBm)	Field Strength at 3m (dBμV/m)
-17	78.3
- 27	68.3

(3) KDB789033 D02 v01r01 G)2)c) As specified in 15.407(b), emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz (or -17 dBm/MHz as specified in 15.407(b)(4)). However, an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit.

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 v01r01. Section G) Unwanted emissions measurement.

(1) Procedure for Unwanted Emissions Measurements Below 1000MHz

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

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

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

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

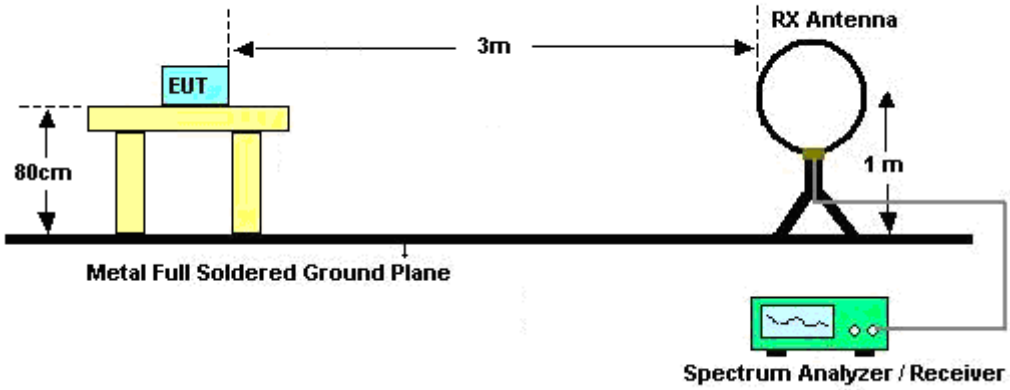
- RBW = 1 MHz
- VBW = 10 Hz, when duty cycle is no less than 98 percent.
- VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

Band	Duty Cycle(%)	T(μs)	1/T(kHz)	VBW Setting
802.11a	98.79	-	-	10Hz
802.11n HT20	99.22	-	-	10Hz
802.11n HT40	97.88	1850	0.540540541	1kHz
802.11n VHT20	98.96	-	-	10Hz
802.11n VHT40	97.37	1850	0.540540541	1kHz
802.11n VHT80	95.65	880	1.136363636	3kHz

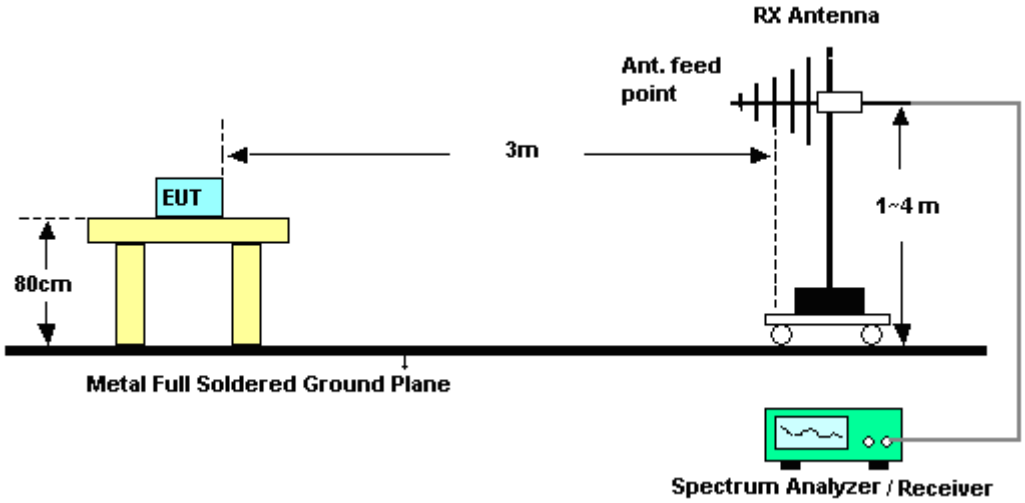
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband 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

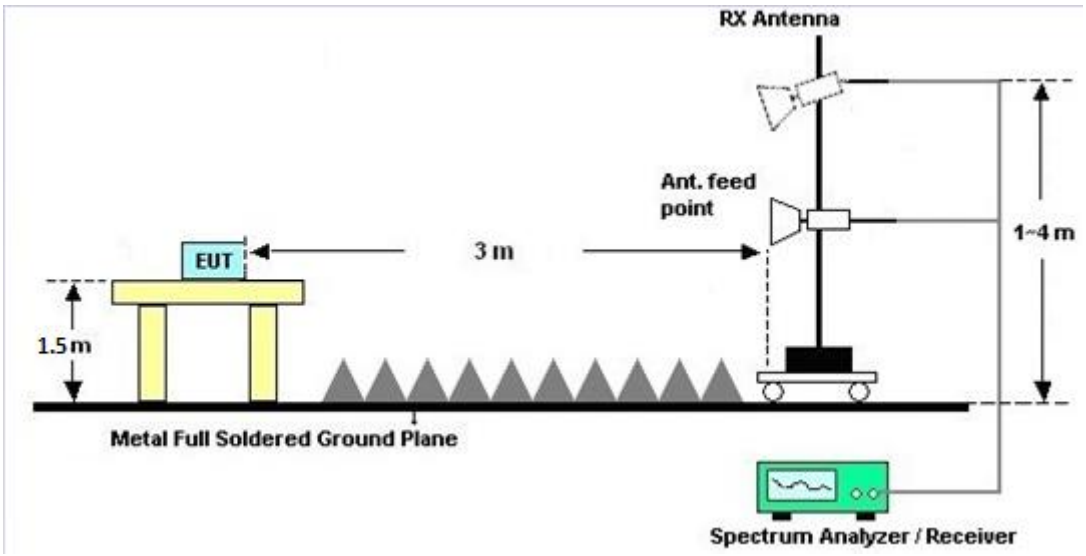
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

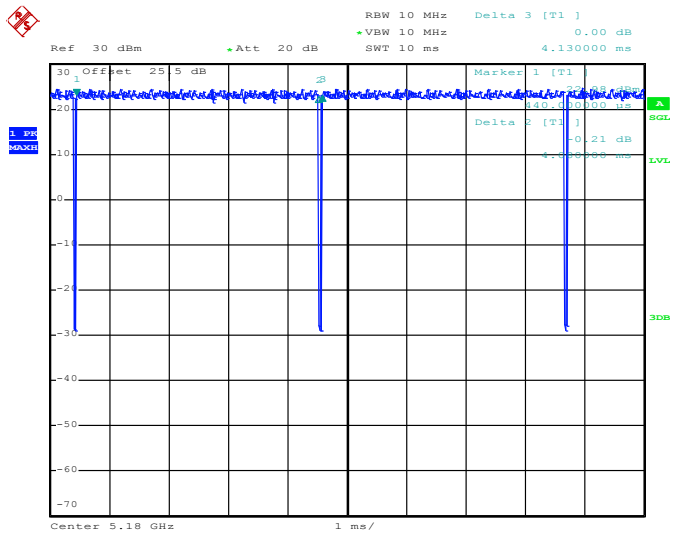
The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

3.4.6 Test Result of Radiated Band Edges

Please refer to Appendix B and C.

3.4.7 Duty Cycle

802.11a



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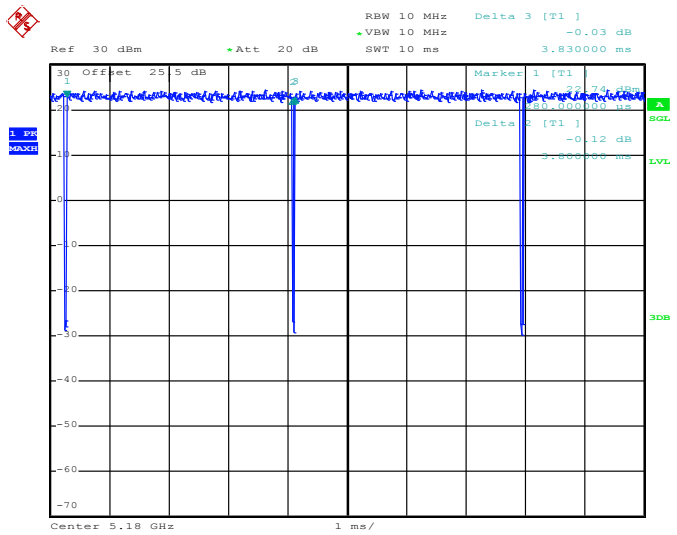
802.11n HT20



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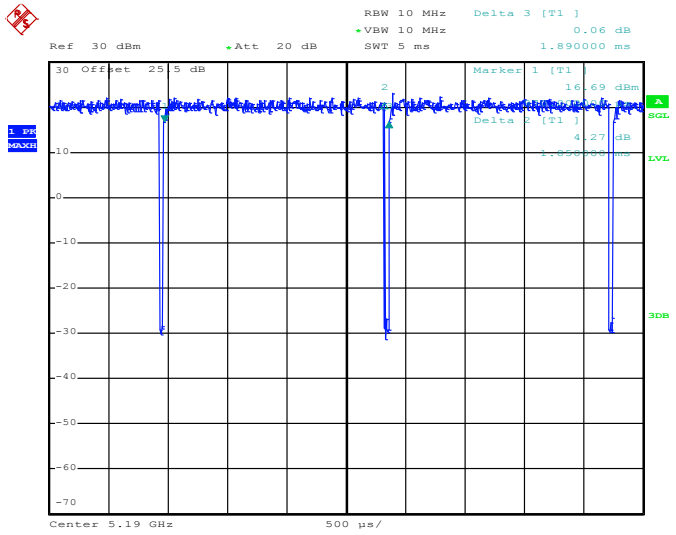
802.11n HT40



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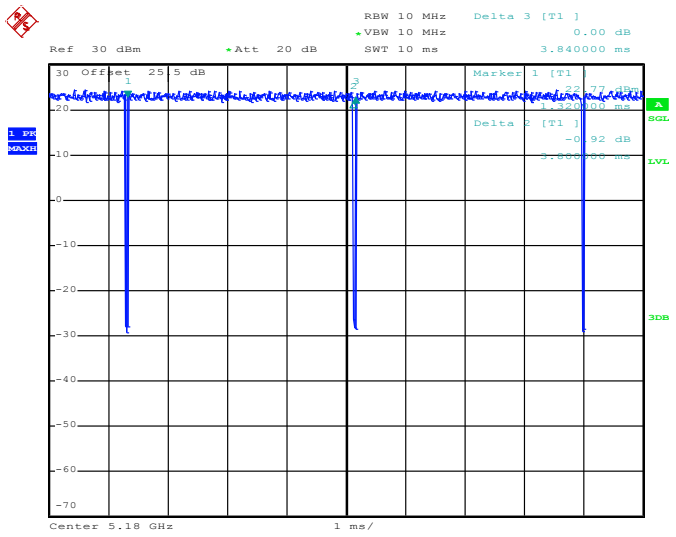
802.11ac VHT20



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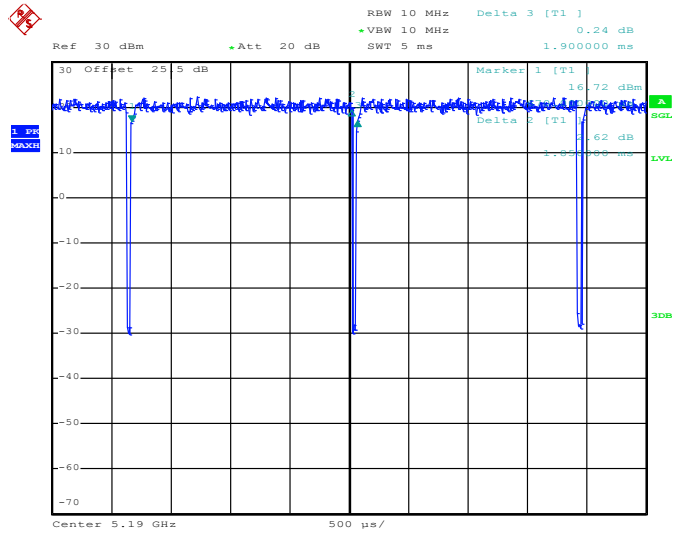
802.11ac VHT40



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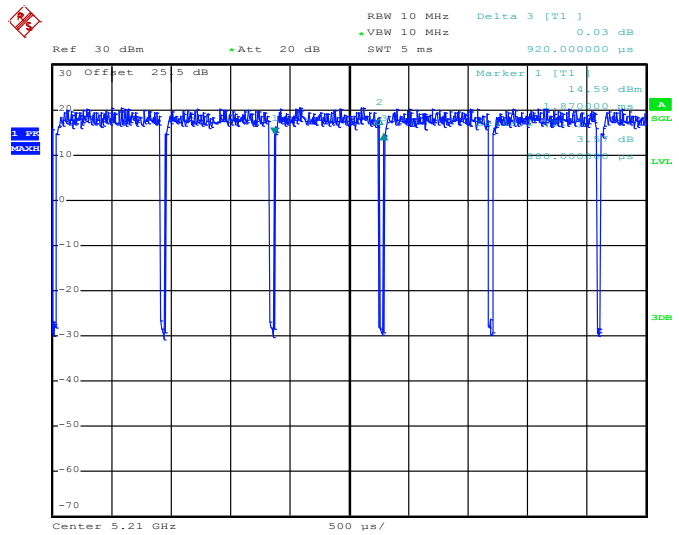
802.11ac VHT80



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

Please refer to Appendix B and 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.

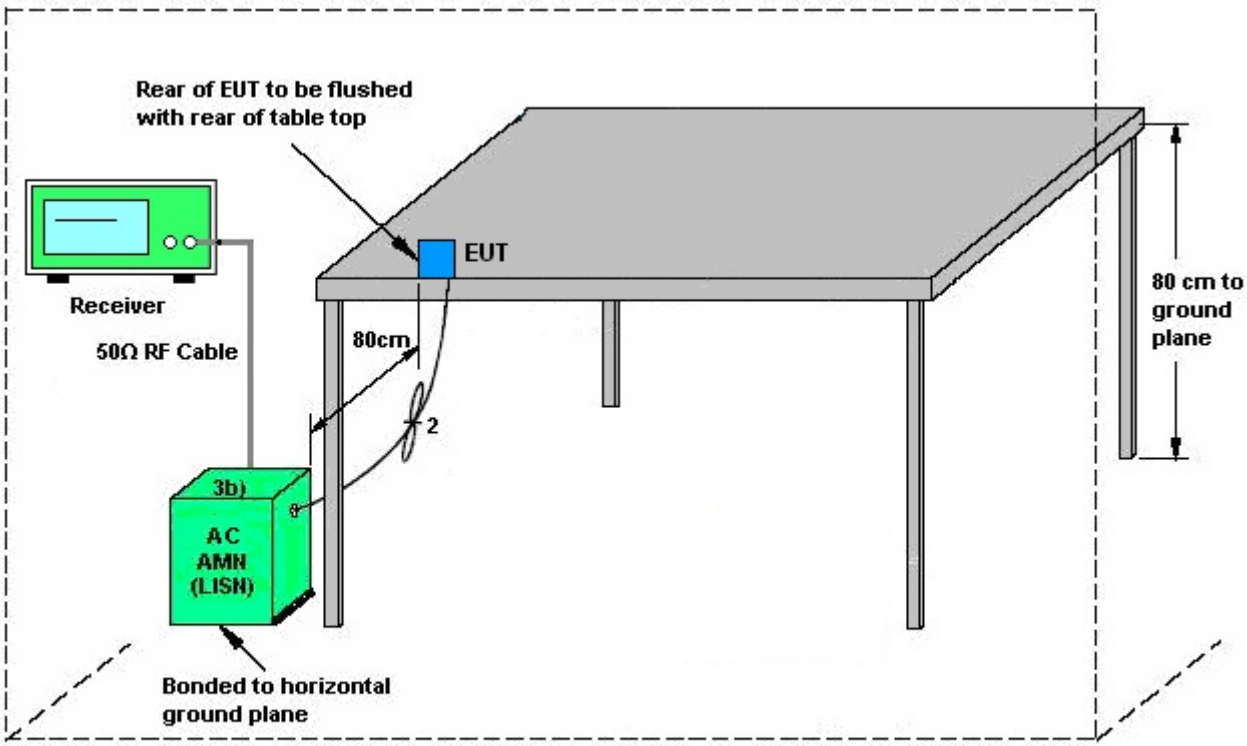
3.5.2 Measuring Instruments

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.

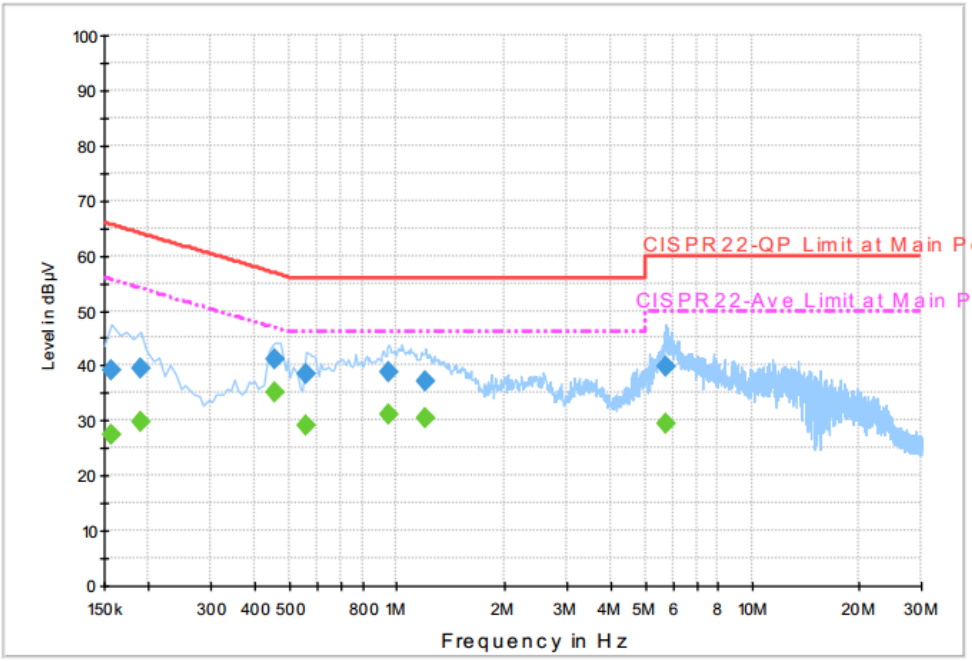
3.5.4 Test Setup



AMN = Artificial mains network (LISN)
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network

3.5.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	22~23℃
Test Engineer :	Derreck Chen	Relative Humidity :	52~53%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	Bluetooth Link + WLAN (5GHz) Link + MPEG4 + Earphone + MicroSD Card + USB Cable (Charging from Adapter)		



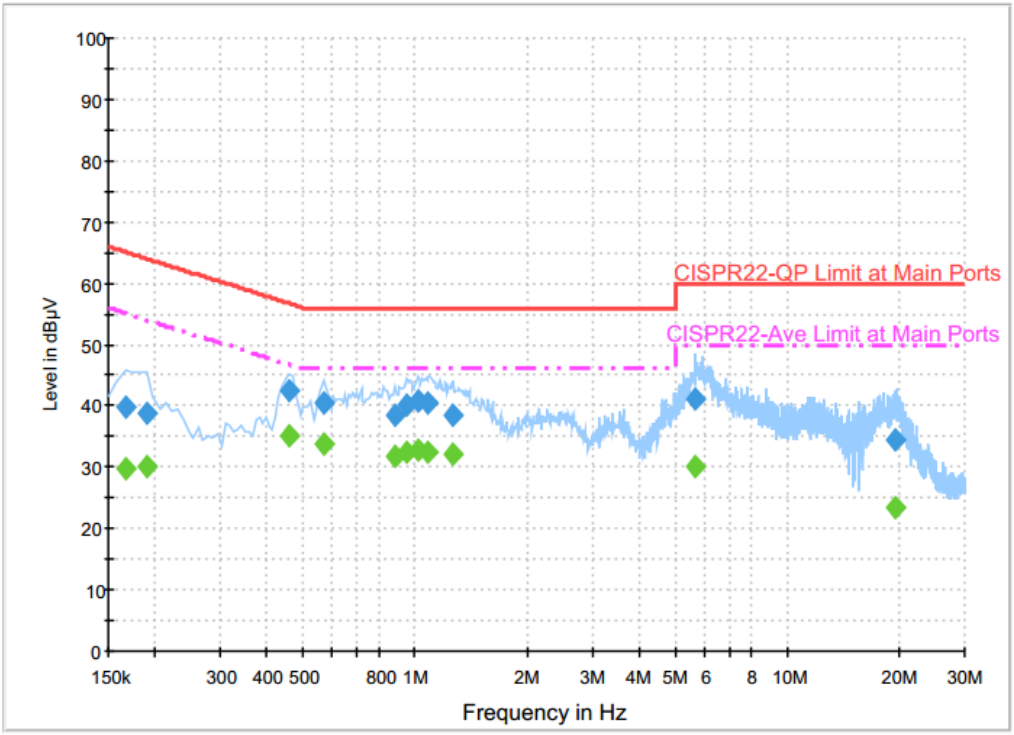
Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	39.3	Off	L1	19.6	26.3	65.6
0.190000	39.5	Off	L1	19.6	24.5	64.0
0.454000	41.3	Off	L1	19.6	15.5	56.8
0.558000	38.4	Off	L1	19.6	17.6	56.0
0.950000	38.8	Off	L1	19.6	17.2	56.0
1.206000	37.1	Off	L1	19.6	18.9	56.0
5.742000	39.7	Off	L1	19.7	20.3	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	27.4	Off	L1	19.6	28.2	55.6
0.190000	29.7	Off	L1	19.6	24.3	54.0
0.454000	35.2	Off	L1	19.6	11.6	46.8
0.558000	29.2	Off	L1	19.6	16.8	46.0
0.950000	31.0	Off	L1	19.6	15.0	46.0
1.206000	30.5	Off	L1	19.6	15.5	46.0
5.742000	29.5	Off	L1	19.7	20.5	50.0

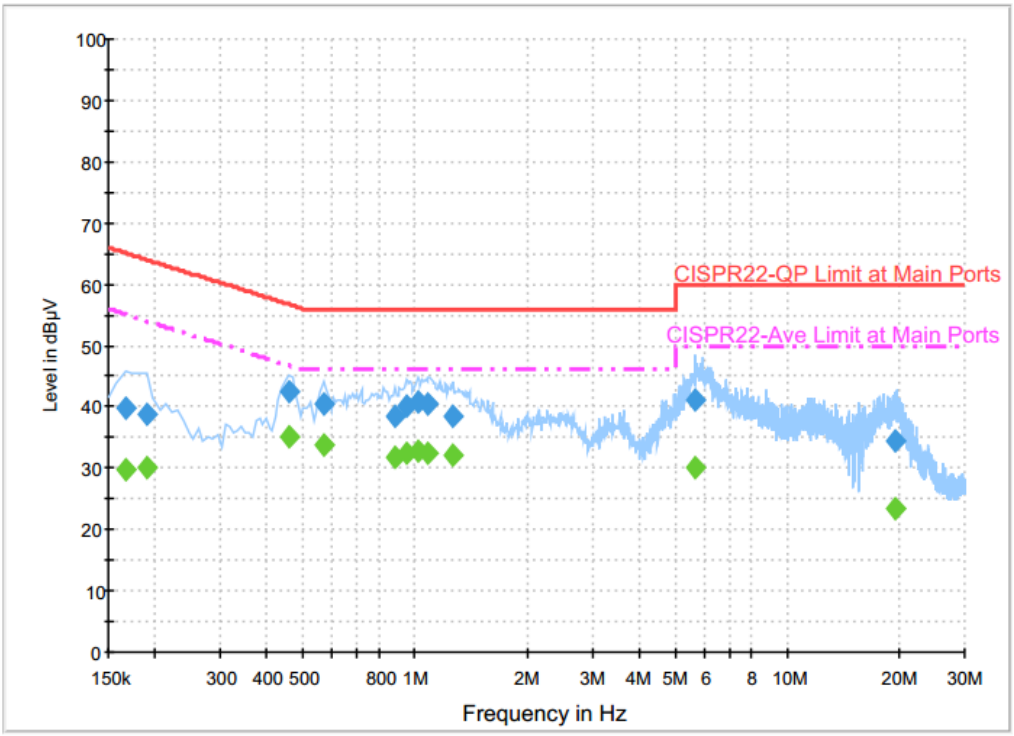
Test Mode :	Mode 1	Temperature :	22~23℃
Test Engineer :	Derreck Chen	Relative Humidity :	52~53%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	Bluetooth Link + WLAN (5GHz) Link + MPEG4 + Earphone + MicroSD Card + USB Cable (Charging from Adapter)		



Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	39.8	Off	N	19.6	25.4	65.2
0.190000	38.9	Off	N	19.6	25.1	64.0
0.462000	42.3	Off	N	19.6	14.4	56.7
0.566000	40.5	Off	N	19.6	15.5	56.0
0.886000	38.5	Off	N	19.6	17.5	56.0
0.950000	40.2	Off	N	19.6	15.8	56.0
1.022000	40.9	Off	N	19.6	15.1	56.0
1.086000	40.4	Off	N	19.6	15.6	56.0
1.270000	38.5	Off	N	19.6	17.5	56.0
5.670000	41.2	Off	N	19.7	18.8	60.0
19.470000	34.5	Off	N	20.0	25.5	60.0

Test Mode :	Mode 1	Temperature :	22~23℃
Test Engineer :	Derreck Chen	Relative Humidity :	52~53%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	Bluetooth Link + WLAN (5GHz) Link + MPEG4 + Earphone + MicroSD Card + USB Cable (Charging from Adapter)		



Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	29.8	Off	N	19.6	25.4	55.2
0.190000	30.2	Off	N	19.6	23.8	54.0
0.462000	35.0	Off	N	19.6	11.7	46.7
0.566000	33.6	Off	N	19.6	12.4	46.0
0.886000	31.9	Off	N	19.6	14.1	46.0
0.950000	32.4	Off	N	19.6	13.6	46.0
1.022000	32.9	Off	N	19.6	13.1	46.0
1.086000	32.6	Off	N	19.6	13.4	46.0
1.270000	32.2	Off	N	19.6	13.8	46.0
5.670000	30.0	Off	N	19.7	20.0	50.0
19.470000	23.5	Off	N	20.0	26.5	50.0

3.6 Frequency Stability Measurement

3.6.1 Limit of Frequency Stability

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

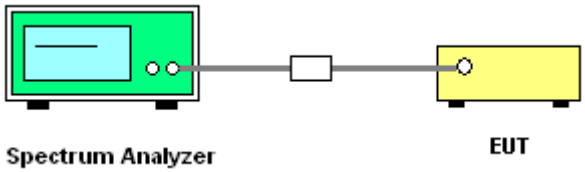
3.6.2 Measuring Instruments

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

3.6.3 Test Procedures

1. To ensure emission at the band edge is maintained within the authorized band, those values shall be measured by radiation emissions at upper and lower frequency points, and finally compensated by frequency deviation as procedures below.
2. The EUT was operated at the maximum output power, and connected to the spectrum analyzer, which is set to maximum hold function and peak detector. The peak value of the power envelope was measured and noted. The upper and lower frequency points were respectively measured relatively 10dB lower than the measured peak value.
3. The frequency deviation was calculated by adding the upper frequency point and the lower frequency point divided by two. Those detailed values of frequency deviation are provided in table below.

3.6.4 Test Setup



3.6.5 Test Result of Frequency Stability

Please refer to Appendix A.

The frequency band 5180-5240MHz which was verified by testing against other standard is less than 20 ppm which is sufficient to maintain the signal within the 5150-5250MHz band.

3.7 Automatically Discontinue Transmission

3.7.1 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.

3.7.2 Measuring Instruments

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

3.7.3 Test Result of Automatically Discontinue Transmission

EUT is verified this characteristic during the function check of normal sample associated with an access point:

A. Information start: make EUT supply information to the access point.

B. Information stop: stop supplying information to the access point.

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving.

C. Information start: make EUT supply information to the access point again.

The EUT can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or 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.

5180MHz

Note : The control / signalling information during the period B is precluded.

3.8 Antenna Requirements

3.8.1 Standard Applicable

According to FCC 47 CFR Section 15.407(a)(1)(2) ,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.

3.8.2 Antenna Anti-Replacement Construction

Non-standard antenna connector is used.

3.8.3 Antenna Gain

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

4 List of Measuring Equipments

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Power Meter	Anritsu	ML2495A	1036004	300MHz~40GHz	Jul. 29, 2015	Feb. 16, 2016 ~ Feb. 22, 2016	Jul. 28, 2016	Conducted (TH02-HY)
Power Sensor	Anritsu	MA2411B	1027253	300MHz~40GHz	Jul. 29, 2015	Feb. 16, 2016 ~ Feb. 22, 2016	Jul. 28, 2016	Conducted (TH02-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100055	9kHz~40GHz	Jun. 18, 2015	Feb. 16, 2016 ~ Feb. 22, 2016	Jun. 17, 2016	Conducted (TH02-HY)
Temperature Chamber	ESPEC	SU-241	92003713	-30℃ ~95℃	Jun. 15, 2015	Feb. 16, 2016 ~ Feb. 22, 2016	Jun. 14, 2016	Conducted (TH02-HY)
Bilog Antenna	TESEQ	CBL 6111D	35419	30MHz to 1GHz	Jan. 13, 2016	Feb. 18, 2016 ~ Feb. 20, 2016	Jan. 12, 2017	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 21, 2015	Feb. 18, 2016 ~ Feb. 20, 2016	Aug. 20, 2016	Radiation (03CH07-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Sep. 02, 2015	Feb. 18, 2016 ~ Feb. 20, 2016	Sep. 01, 2016	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-00101800-30-10P	1590075	1GHz ~ 18GHz	Apr. 20, 2015	Feb. 18, 2016 ~ Feb. 20, 2016	Apr. 19, 2016	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz-1000MHz	Mar. 12, 2015	Feb. 18, 2016 ~ Feb. 20, 2016	Mar. 11, 2016	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1GHz~ 26.5GHz	Oct. 19, 2015	Feb. 18, 2016 ~ Feb. 20, 2016	Oct. 18, 2016	Radiation (03CH07-HY)
Spectrum Analyzer	Agilent	N9010A	MY53470118	10Hz~44GHz	Mar. 03, 2015	Feb. 18, 2016 ~ Feb. 20, 2016	Mar. 02, 2016	Radiation (03CH07-HY)
Controller	ChainTek	Chaintek 3000	N/A	Control Turn table	N/A	Feb. 18, 2016 ~ Feb. 20, 2016	N/A	Radiation (03CH07-HY)
Controller	Max-Full	MF7802	MF780208368	Control Ant Mast	N/A	Feb. 18, 2016 ~ Feb. 20, 2016	N/A	Radiation (03CH07-HY)
Antenna Mast	Max-Full	MFA520BS	N/A	1m~4m	N/A	Feb. 18, 2016 ~ Feb. 20, 2016	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 degree	N/A	Feb. 18, 2016 ~ Feb. 20, 2016	N/A	Radiation (03CH07-HY)
Loop Cable	Rohde & Schwarz	N/A	N/A	9KHz~30MHz	Dec. 03, 2015	Feb. 18, 2016 ~ Feb. 20, 2016	Dec. 02, 2016	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170251	18GHz- 40GHz	Oct. 12, 2015	Feb. 18, 2016 ~ Feb. 20, 2016	Oct. 11, 2016	Radiation (03CH07-HY)
Preamplifier	MITEQ	JS44-18004000-33-8P	1840917	18GHz ~ 40GHz	Jun. 02, 2015	Feb. 18, 2016 ~ Feb. 20, 2016	Jun. 01, 2016	Radiation (03CH07-HY)
EMI Test Receiver	Agilent Technologies	N9038A(MXE)	MY53290045	20MHz~8.4GHz	Feb. 01, 2016	Feb. 18, 2016 ~ Feb. 20, 2016	Jan. 31, 2017	Radiation (03CH07-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Feb. 18, 2016	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100724	9kHz~7GHz	Aug. 26, 2015	Feb. 18, 2016	Aug. 25, 2016	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Dec. 02, 2015	Feb. 18, 2016	Dec. 01, 2016	Conduction (CO05-HY)
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100851	N/A	Jan. 08, 2016	Feb. 18, 2016	Jan. 07, 2017	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))	**2.26**

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

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.50**

Appendix A. Conducted Test Results

Report Number : FR561042-04D

Test Engineer:	An Wu / Derek Hsu	Temperature:	21~25	°C
Test Date:	2016/02/16 ~ 2016/02/22	Relative Humidity:	51~54	%

TEST RESULTS DATA
26dB and 99% OBW

Band I										
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)		
11a	6Mbps	1	36	5180	17.65	24.90	-	22.47		
11a	6Mbps	1	44	5220	18.30	35.20	-	22.62		
11a	6Mbps	1	48	5240	18.40	35.20	-	22.65		
HT20	MCS0	1	36	5180	18.15	26.20	-	22.59		
HT20	MCS0	1	44	5220	19.20	41.00	-	22.83		
HT20	MCS0	1	48	5240	19.25	39.40	-	22.84		
HT40	MCS0	1	38	5190	36.10	42.30	-	23.01		
HT40	MCS0	1	46	5230	37.50	70.56	-	23.01		
VHT20	MCS0	1	36	5180	18.10	25.60	-	22.58		
VHT20	MCS0	1	44	5220	19.15	41.20	-	22.82		
VHT20	MCS0	1	48	5240	19.20	39.30	-	22.83		
VHT40	MCS0	1	38	5190	36.10	41.94	-	23.01		
VHT40	MCS0	1	46	5230	37.20	70.92	-	23.01		
VHT80	MCS0	1	42	5210	75.36	81.28	-	23.01		

TEST RESULTS DATA
Average Power Table

FCC Band I										
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	Duty Factor (dB)	Average Conducted Power (dBm)	FCC Conducted Power Limit (dBm)	DG (dBi)		Pass/Fail
11a	6Mbps	1	36	5180	0.05	18.10	24.00	5.90		Pass
11a	6Mbps	1	44	5220	0.05	20.33	24.00	5.90		Pass
11a	6Mbps	1	48	5240	0.05	20.32	24.00	5.90		Pass
HT20	MCS0	1	36	5180	0.03	17.41	24.00	5.90		Pass
HT20	MCS0	1	44	5220	0.03	20.31	24.00	5.90		Pass
HT20	MCS0	1	48	5240	0.03	20.30	24.00	5.90		Pass
HT40	MCS0	1	38	5190	0.09	14.34	24.00	5.90		Pass
HT40	MCS0	1	46	5230	0.09	20.35	24.00	5.90		Pass
VHT20	MCS0	1	36	5180	0.05	17.25	24.00	5.90		Pass
VHT20	MCS0	1	44	5220	0.05	20.30	24.00	5.90		Pass
VHT20	MCS0	1	48	5240	0.05	20.25	24.00	5.90		Pass
VHT40	MCS0	1	38	5190	0.12	14.32	24.00	5.90		Pass
VHT40	MCS0	1	46	5230	0.12	20.33	24.00	5.90		Pass
VHT80	MCS0	1	42	5210	0.19	11.22	24.00	5.90		Pass

TEST RESULTS DATA
Power Spectral Density

FCC Band I										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)	Average Power Density (dBm/MHz)	Average PSD Limit (dBm/MHz)	DG (dBi)	-	Pass/Fail
11a	6Mbps	1	36	5180	0.05	8.24	11.00	5.90		Pass
11a	6Mbps	1	44	5220	0.05	9.90	11.00	5.90		Pass
11a	6Mbps	1	48	5240	0.05	9.65	11.00	5.90		Pass
HT20	MCS0	1	36	5180	0.03	7.35	11.00	5.90		Pass
HT20	MCS0	1	44	5220	0.03	9.44	11.00	5.90		Pass
HT20	MCS0	1	48	5240	0.03	9.26	11.00	5.90		Pass
HT40	MCS0	1	38	5190	0.09	1.23	11.00	5.90		Pass
HT40	MCS0	1	46	5230	0.09	6.45	11.00	5.90		Pass
VHT20	MCS0	1	36	5180	0.05	7.27	11.00	5.90		Pass
VHT20	MCS0	1	44	5220	0.05	9.47	11.00	5.90		Pass
VHT20	MCS0	1	48	5240	0.05	9.22	11.00	5.90		Pass
VHT40	MCS0	1	38	5190	0.12	1.28	11.00	5.90		Pass
VHT40	MCS0	1	46	5230	0.12	6.41	11.00	5.90		Pass
VHT80	MCS0	1	42	5210	0.19	-5.25	11.00	5.90		Pass

TEST RESULTS DATA
Frequency Stability

Band I										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stablility (ppm)	Temperature (°C)	Voltage (V)	Note
11a	6Mbps	1	36	5180	5180.050	0.050	9.65	20	3.4	
11a	6Mbps	1	36	5180	5180.000	0.000	0.00	20	4.2	
11a	6Mbps	1	36	5180	5180.000	0.000	0.00	20	3.7	
11a	6Mbps	1	36	5180	5180.050	0.050	9.65	0	3.7	
11a	6Mbps	1	36	5180	5180.025	0.025	4.83	35	3.7	

Appendix B. Radiated Spurious Emission

Test Engineer :	James Chiu, Jesse Wang, and Ken Wu	Temperature :	21~24°C
		Relative Humidity :	50~54%

Band 1 - 5150~5250MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable 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 36 5180MHz		5146.1	63.43	-10.57	74	52.83	34.61	11.21	35.22	100	171	P	H
		5150	53.46	-0.54	54	42.86	34.61	11.21	35.22	100	171	A	H
	*	5180	112.71	-	-	102.06	34.66	11.21	35.22	100	171	P	H
	*	5180	105.49	-	-	94.84	34.66	11.21	35.22	100	171	A	H
													H
													H
		5149.85	59.98	-14.02	74	49.38	34.61	11.21	35.22	194	232	P	V
		5150	49.53	-4.47	54	38.93	34.61	11.21	35.22	194	232	A	V
	*	5180	109.56	-	-	98.91	34.66	11.21	35.22	194	232	P	V
	*	5180	102.3	-	-	91.65	34.66	11.21	35.22	194	232	A	V
													V
													V
802.11a CH 44 5220MHz		5069.9	57.86	-16.14	74	47.44	34.49	11.14	35.21	100	169	P	H
		5097.8	48.58	-5.42	54	38.12	34.54	11.14	35.22	100	169	A	H
	*	5220	113.33	-	-	102.6	34.7	11.25	35.22	100	169	P	H
	*	5220	105.18	-	-	94.45	34.7	11.25	35.22	100	169	A	H
		5449.66	56.48	-17.52	74	44.8	35.03	11.89	35.24	100	169	P	H
		5458.35	48.34	-5.66	54	36.66	35.03	11.89	35.24	100	169	A	H
		5096.45	54.49	-19.51	74	44.03	34.54	11.14	35.22	192	229	P	V
		5123.75	45	-9	54	34.45	34.59	11.18	35.22	192	229	A	V
	*	5220	110.13	-	-	99.4	34.7	11.25	35.22	192	229	P	V
	*	5220	103.52	-	-	92.79	34.7	11.25	35.22	192	229	A	V
		5456.81	53.44	-20.56	74	41.76	35.03	11.89	35.24	192	229	P	V
		5424.03	44.49	-9.51	54	32.86	34.98	11.89	35.24	192	229	A	V

802.11a CH 48 5240MHz		5108.3	57.11	-16.89	74	46.59	34.56	11.18	35.22	102	172	P	H
		5111.15	48.34	-5.66	54	37.82	34.56	11.18	35.22	102	172	A	H
	*	5240	114	-	-	103.11	34.73	11.38	35.22	102	172	P	H
	*	5240	105.18	-	-	94.29	34.73	11.38	35.22	102	172	A	H
		5439.98	56.35	-17.65	74	44.69	35.01	11.89	35.24	102	172	P	H
		5455.93	48.11	-5.89	54	36.43	35.03	11.89	35.24	102	172	A	H
		5076.2	53.91	-20.09	74	43.46	34.52	11.14	35.21	199	222	P	V
		5103.95	44.96	-9.04	54	34.46	34.54	11.18	35.22	199	222	A	V
	*	5240	109.66	-	-	98.77	34.73	11.38	35.22	199	222	P	V
	*	5240	103.6	-	-	92.71	34.73	11.38	35.22	199	222	A	V
		5354.18	52.98	-21.02	74	41.56	34.89	11.76	35.23	199	222	P	V
		5357.04	43.9	-10.1	54	32.48	34.89	11.76	35.23	199	222	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 1 5150~5250MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 36 5180MHz		10360	41.8	-32.2	74	47.32	37.22	17.17	59.91	100	0	P	H
		15546	54.97	-19.03	74	52.85	40.36	19.63	57.87	200	186	P	H
		15546	43.84	-10.16	54	41.72	40.36	19.63	57.87	200	186	A	H
													H
		10360	42.53	-31.47	74	48.05	37.22	17.17	59.91	100	0	P	V
		15540	52.88	-21.12	74	50.81	40.34	19.61	57.88	100	177	P	V
		15540	43.6	-10.4	54	41.53	40.34	19.61	57.88	100	177	A	V
													V
802.11a CH 44 5220MHz		10440	43.26	-30.74	74	48.68	37.26	17.17	59.85	100	0	P	H
		15660	56.29	-17.71	74	53.93	40.49	19.68	57.81	200	185	P	H
		15660	46.38	-7.62	54	44.02	40.49	19.68	57.81	200	185	A	H
													H
		10440	43.66	-30.34	74	49.08	37.26	17.17	59.85	100	0	P	V
		15660	54.39	-19.61	74	52.03	40.49	19.68	57.81	100	189	P	V
		15660	44.85	-9.15	54	42.49	40.49	19.68	57.81	100	189	A	V
													V
802.11a CH 48 5240MHz		10480	43.42	-30.58	74	48.77	37.29	17.17	59.81	100	0	P	H
		15720	56.02	-17.98	74	53.49	40.57	19.73	57.77	200	187	P	H
		15720	46.24	-7.76	54	43.71	40.57	19.73	57.77	200	187	A	H
													H
		10480	43.83	-30.17	74	49.18	37.29	17.17	59.81	100	0	P	V
		15714	49.85	-24.15	74	47.32	40.57	19.73	57.77	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 1 5150~5250MHz

WIFI 802.11n HT20 (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)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5146.85	65.78	-8.22	74	55.18	34.61	11.21	35.22	100	167	P	H
		5150	53.16	-0.84	54	42.56	34.61	11.21	35.22	100	167	A	H
	*	5180	112.21	-	-	101.56	34.66	11.21	35.22	100	167	P	H
	*	5180	106.71	-	-	96.06	34.66	11.21	35.22	100	167	A	H
802.11n													H
HT20													H
CH 36		5147.75	58.54	-15.46	74	47.94	34.61	11.21	35.22	184	225	P	V
5180MHz		5150	48.12	-5.88	54	37.52	34.61	11.21	35.22	184	225	A	V
	*	5180	107.92	-	-	97.27	34.66	11.21	35.22	184	225	P	V
	*	5180	100.57	-	-	89.92	34.66	11.21	35.22	184	225	A	V
													V
													V
		5100.65	57.58	-16.42	74	47.08	34.54	11.18	35.22	100	170	P	H
		5098.4	48.44	-5.56	54	37.98	34.54	11.14	35.22	100	170	A	H
	*	5220	113.61	-	-	102.88	34.7	11.25	35.22	100	170	P	H
	*	5220	104.72	-	-	93.99	34.7	11.25	35.22	100	170	A	H
802.11n		5454.61	56.49	-17.51	74	44.81	35.03	11.89	35.24	100	170	P	H
HT20		5458.46	48.53	-5.47	54	36.85	35.03	11.89	35.24	100	170	A	H
CH 44		5104.85	54.12	-19.88	74	43.62	34.54	11.18	35.22	192	229	P	V
5220MHz		5124.05	44.7	-9.3	54	34.15	34.59	11.18	35.22	192	229	A	V
	*	5220	109.92	-	-	99.19	34.7	11.25	35.22	192	229	P	V
	*	5220	100.69	-	-	89.96	34.7	11.25	35.22	192	229	A	V
		5360.01	52.92	-21.08	74	41.5	34.89	11.76	35.23	192	229	P	V
		5423.15	44.11	-9.89	54	32.48	34.98	11.89	35.24	192	229	A	V

802.11n HT20 CH 48 5240MHz		5084	57.41	-16.59	74	46.96	34.52	11.14	35.21	102	171	P	H
		5111.3	48.42	-5.58	54	37.9	34.56	11.18	35.22	102	171	A	H
	*	5240	113.86	-	-	102.97	34.73	11.38	35.22	102	171	P	H
	*	5240	107.03	-	-	96.14	34.73	11.38	35.22	102	171	A	H
		5456.37	57.58	-16.42	74	45.9	35.03	11.89	35.24	102	171	P	H
		5454.28	48.55	-5.45	54	36.87	35.03	11.89	35.24	102	171	A	H
		5135.45	54.82	-19.18	74	44.27	34.59	11.18	35.22	200	223	P	V
		5102.75	44.55	-9.45	54	34.05	34.54	11.18	35.22	200	223	A	V
	*	5240	109.79	-	-	98.9	34.73	11.38	35.22	200	223	P	V
	*	5240	101.01	-	-	90.12	34.73	11.38	35.22	200	223	A	V
		5359.57	53.18	-20.82	74	41.76	34.89	11.76	35.23	200	223	P	V
		5355.5	43.54	-10.46	54	32.12	34.89	11.76	35.23	200	223	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 1 5150~5250MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		10360	41.82	-32.18	74	47.34	37.22	17.17	59.91	100	0	P	H
		15540	49.96	-24.04	74	47.89	40.34	19.61	57.88	100	0	P	H
802.11n													H
HT20													H
CH 36		10360	43.1	-30.9	74	48.62	37.22	17.17	59.91	100	0	P	V
5180MHz		15540	53.59	-20.41	74	51.52	40.34	19.61	57.88	176	178	P	V
		15540	41.8	-12.2	54	39.73	40.34	19.61	57.88	176	178	A	V
													V
		10440	42.12	-31.88	74	47.54	37.26	17.17	59.85	100	0	P	H
		15654	57.77	-16.23	74	55.41	40.49	19.68	57.81	200	188	P	H
802.11n		15654	45.63	-8.37	54	43.27	40.49	19.68	57.81	200	188	A	H
HT20													H
CH 44		10440	43.16	-30.84	74	48.58	37.26	17.17	59.85	100	0	P	V
5220MHz		15660	56.69	-17.31	74	54.33	40.49	19.68	57.81	174	178	P	V
		15660	44.78	-9.22	54	42.42	40.49	19.68	57.81	174	178	A	V
													V
		10480	42.21	-31.79	74	47.56	37.29	17.17	59.81	100	0	P	H
		15720	57.31	-16.69	74	54.78	40.57	19.73	57.77	200	188	P	H
802.11n		15720	45.77	-8.23	54	43.24	40.57	19.73	57.77	200	188	A	H
HT20													H
CH 48		10480	43.57	-30.43	74	48.92	37.29	17.17	59.81	100	0	P	V
5240MHz		15726	55.02	-18.98	74	52.49	40.57	19.73	57.77	100	178	P	V
		15726	44.44	-9.56	54	41.91	40.57	19.73	57.77	100	178	A	V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 1 5150~5250MHz

WIFI 802.11n HT40 (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)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5150	63.39	-10.61	74	52.79	34.61	11.21	35.22	102	168	P	H
		5150	53.38	-0.62	54	42.78	34.61	11.21	35.22	102	168	A	H
	*	5190	104.95	-	-	94.26	34.66	11.25	35.22	102	168	P	H
	*	5190	97.74	-	-	87.05	34.66	11.25	35.22	102	168	A	H
802.11n		5438.88	54.55	-19.45	74	42.89	35.01	11.89	35.24	102	168	P	H
HT40		5437.23	46.65	-7.35	54	34.99	35.01	11.89	35.24	102	168	A	H
CH 38		5146.85	55.35	-18.65	74	44.75	34.61	11.21	35.22	199	204	P	V
5190MHz		5149.55	48.34	-5.66	54	37.74	34.61	11.21	35.22	199	204	A	V
	*	5190	100.46	-	-	89.77	34.66	11.25	35.22	199	204	P	V
	*	5190	92.3	-	-	81.61	34.66	11.25	35.22	199	204	A	V
		5427.22	50.45	-23.55	74	38.82	34.98	11.89	35.24	199	204	P	V
		5442.18	42.22	-11.78	54	30.56	35.01	11.89	35.24	199	204	A	V
		5150	60.61	-13.39	74	50.01	34.61	11.21	35.22	103	170	P	H
		5150	52.73	-1.27	54	42.13	34.61	11.21	35.22	103	170	A	H
	*	5230	110.56	-	-	99.67	34.73	11.38	35.22	103	170	P	H
	*	5230	102.75	-	-	91.86	34.73	11.38	35.22	103	170	A	H
802.11n		5448.89	58.13	-15.87	74	46.45	35.03	11.89	35.24	103	170	P	H
HT40		5449	50.51	-3.49	54	38.83	35.03	11.89	35.24	103	170	A	H
CH 46		5141.6	53.89	-20.11	74	43.29	34.61	11.21	35.22	200	218	P	V
5230MHz		5149.55	46.37	-7.63	54	35.77	34.61	11.21	35.22	200	218	A	V
	*	5230	105.42	-	-	94.53	34.73	11.38	35.22	200	218	P	V
	*	5230	96.48	-	-	85.59	34.73	11.38	35.22	200	218	A	V
		5433.93	52.68	-21.32	74	41.02	35.01	11.89	35.24	200	218	P	V
		5414.13	43.84	-10.16	54	32.21	34.98	11.89	35.24	200	218	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 1 5150~5250MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		10380	41.39	-32.61	74	46.88	37.23	17.17	59.89	100	0	P	H
		15570	43.51	-30.49	74	41.36	40.38	19.63	57.86	100	0	P	H
802.11n													H
HT40													H
CH 38		10380	41.83	-32.17	74	47.32	37.23	17.17	59.89	100	0	P	V
5190MHz		15570	44.84	-29.16	74	42.69	40.38	19.63	57.86	100	0	P	V
													V
													V
		10460	43.19	-30.81	74	48.59	37.27	17.17	59.84	100	0	P	H
		15690	49.93	-24.07	74	47.49	40.53	19.7	57.79	100	0	P	H
802.11n													H
HT40													H
CH 46		10460	43.31	-30.69	74	48.71	37.27	17.17	59.84	100	0	P	V
5230MHz		15690	48.14	-25.86	74	45.7	40.53	19.7	57.79	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 1 5150~5250MHz

WIFI 802.11ac VHT80 (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)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11ac VHT80 CH 42 5210MHz		5149.4	60.49	-13.51	74	49.89	34.61	11.21	35.22	100	170	P	H
		5149.25	53.49	-0.51	54	42.89	34.61	11.21	35.22	100	170	A	H
	*	5210	100.33	-	-	89.6	34.7	11.25	35.22	100	170	P	H
	*	5210	92	-	-	81.27	34.7	11.25	35.22	100	170	A	H
		5434.37	54	-20	74	42.34	35.01	11.89	35.24	100	170	P	H
		5427.44	46.04	-7.96	54	34.41	34.98	11.89	35.24	100	170	A	H
		5148.2	55.48	-18.52	74	44.88	34.61	11.21	35.22	202	230	P	V
		5150	49.2	-4.8	54	38.6	34.61	11.21	35.22	202	230	A	V
	*	5210	95.55	-	-	84.82	34.7	11.25	35.22	202	230	P	V
	*	5210	87.03	-	-	76.3	34.7	11.25	35.22	202	230	A	V
		5441.19	51	-23	74	39.34	35.01	11.89	35.24	202	230	P	V
		5457.69	42.96	-11.04	54	31.28	35.03	11.89	35.24	202	230	A	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 1 5150~5250MHz

WIFI 802.11ac VHT80 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		10420	42.31	-31.69	74	47.76	37.25	17.17	59.87	100	0	P	H
		15630	43.74	-30.26	74	41.41	40.47	19.68	57.82	100	0	P	H
802.11ac													H
VHT80													H
CH 42		10420	42.23	-31.77	74	47.68	37.25	17.17	59.87	100	0	P	V
5210MHz		15630	43.75	-30.25	74	41.42	40.47	19.68	57.82	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

WIFI 802.11ac VHT80 (LF @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable 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 LF		30	27.38	-12.62	40	31.81	26	1.07	31.5	100	0	P	H
		92.37	28.28	-15.22	43.5	42.74	15.36	1.28	31.1			P	H
		189.57	30.8	-12.7	43.5	44.53	15.5	1.87	31.1			P	H
		376.3	23.63	-22.37	46	30.31	21.84	2.5	31.02			P	H
		588.4	27.74	-18.26	46	29.81	25.22	3.36	30.65			P	H
		847.4	32.59	-13.41	46	30.22	28.66	4.1	30.39			P	H
													H
													H
													H
													H
													H
													H
		30	29.24	-10.76	40	33.67	26	1.07	31.5	100	0	P	V
		92.1	24.23	-19.27	43.5	38.69	15.36	1.28	31.1			P	V
		192.27	27.48	-16.02	43.5	41.11	15.6	1.87	31.1			P	V
		552	27.44	-18.56	46	30.36	24.63	3.24	30.79			P	V
		804	32	-14	46	30.63	27.78	3.9	30.31			P	V
		968.5	34.35	-19.65	54	30.37	30.24	4.07	30.33			P	V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Note symbol

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

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

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable 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)
802.11b CH 01 2412MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Level(dBμV/m) =

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

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

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

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

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

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

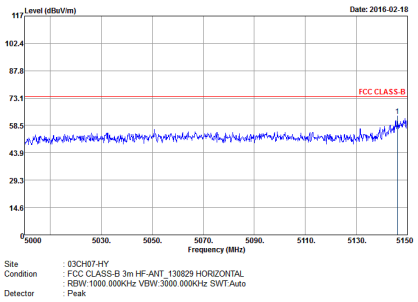
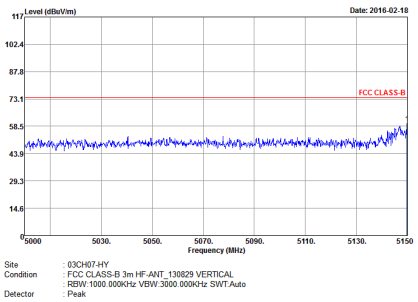
Both peak and average measured complies with the limit line, so test result is "PASS".

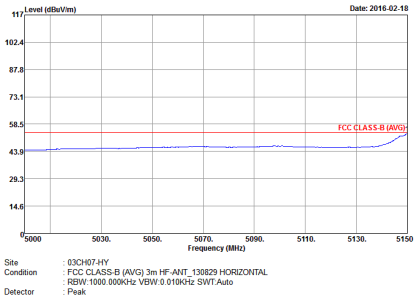
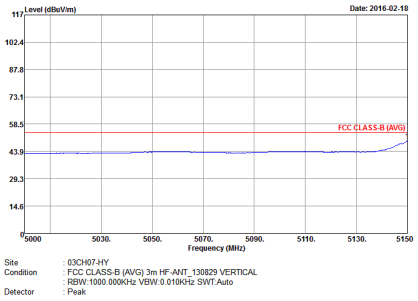
Appendix C. Radiated Spurious Emission

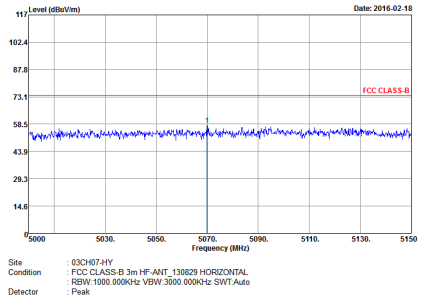
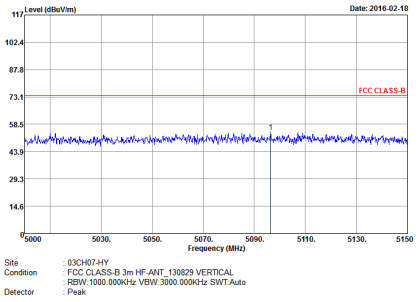
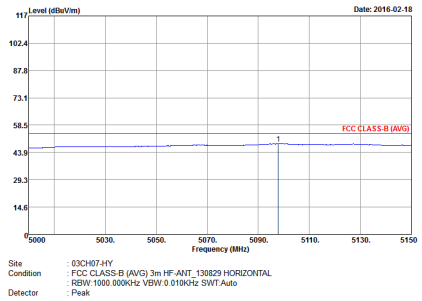
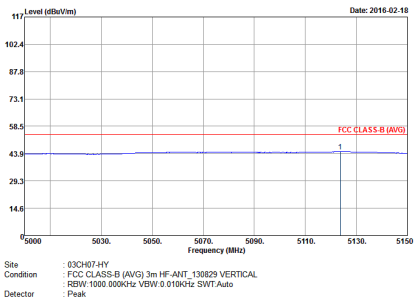
Test Engineer :	James Chiu, Jesse Wang, and Ken Wu	**Temperature :**	21~24°C
		Relative Humidity :	50~54%

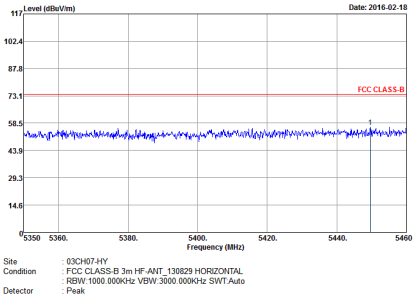
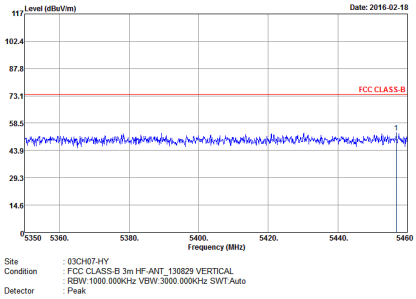
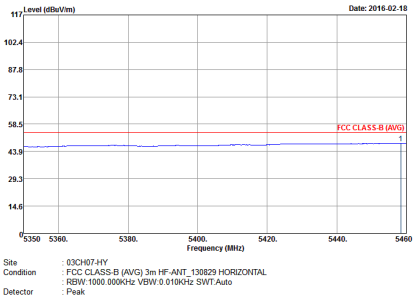
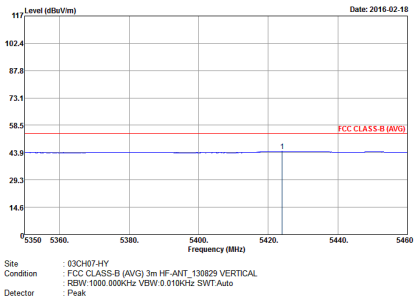
Band 1 - 5150~5250MHz

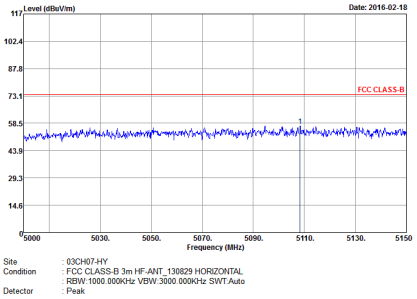
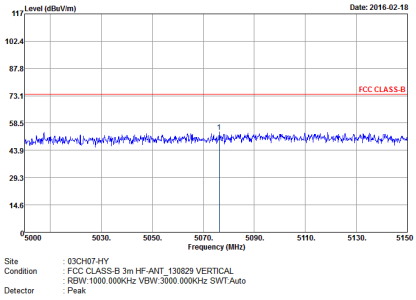
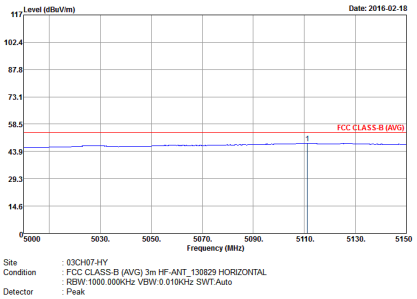
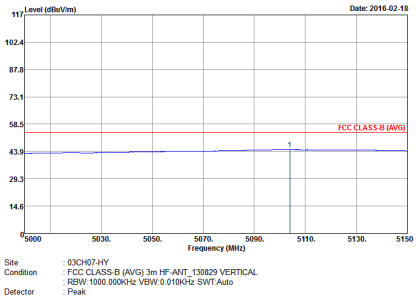
WIFI 802.11a (Band Edge @ 3m)

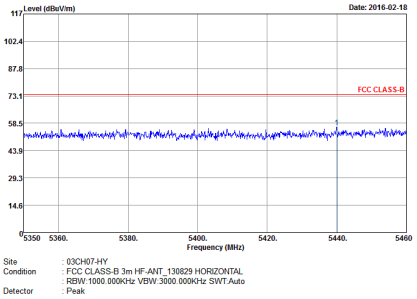
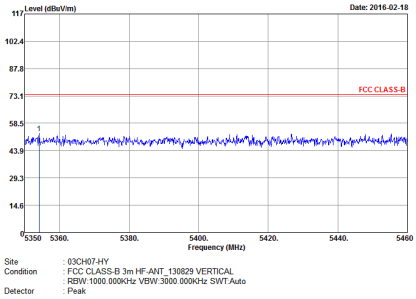
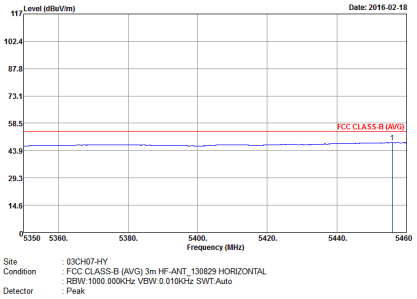
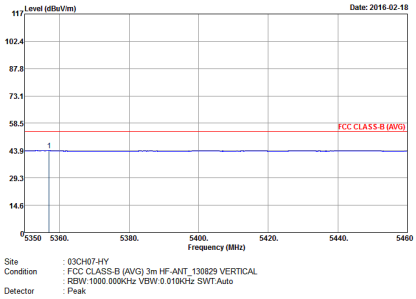
WIFI	**Band 1 5150~5250MHz Band Edge @ 3m**	
ANT	**802.11a CH36 5180MHz**	
1	**Horizontal**	**Vertical**
Peak		

Avg.	 Level (dBuV/m) Date: 2016-02-18 117 102.4 87.8 73.1 58.5 43.9 29.3 14.6 0 FCC CLASS-B (AVG) 5000 5030. 5050. 5070. 5090. 5110. 5130. 5150 Frequency (MHz) Site : 03CH07-HY Condition : FCC CLASS-B (AVG) 3m HF-ANT_130829 HORIZONTAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak	 Level (dBuV/m) Date: 2016-02-18 117 102.4 87.8 73.1 58.5 43.9 29.3 14.6 0 FCC CLASS-B (AVG) 5000 5030. 5050. 5070. 5090. 5110. 5130. 5150 Frequency (MHz) Site : 03CH07-HY Condition : FCC CLASS-B (AVG) 3m HF-ANT_130829 VERTICAL : RBW:1000.000KHz VBW:0.010KHz SWT:Auto Detector : Peak

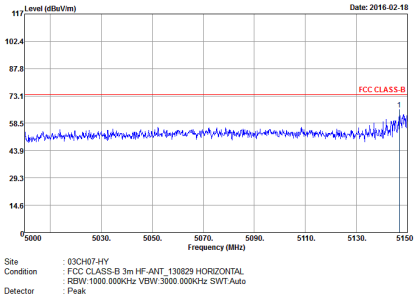
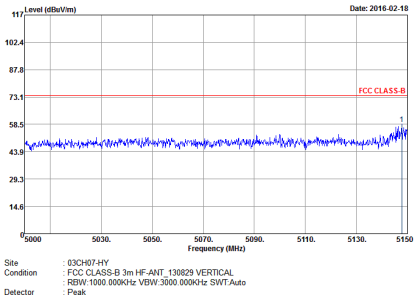
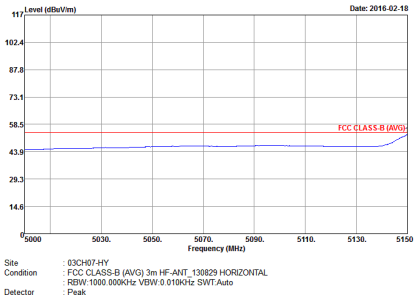
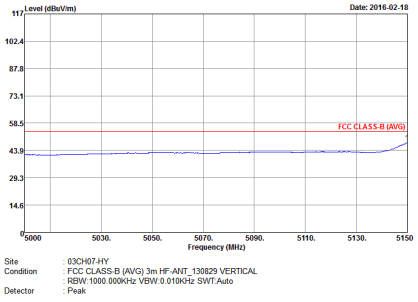
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH44 5220MHz - L	
1	Horizontal	Vertical
Peak		
Avg.		

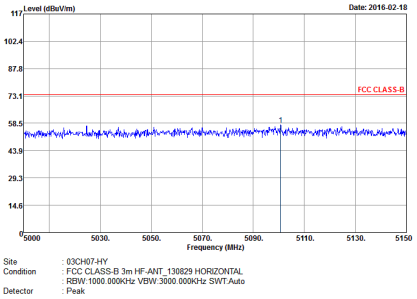
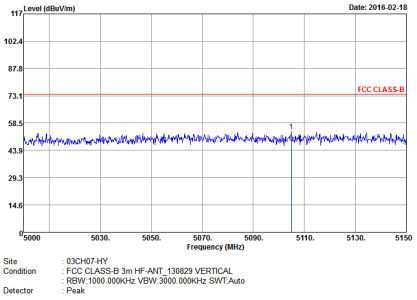
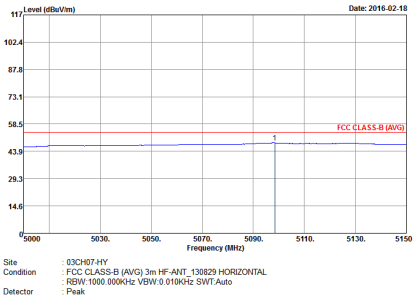
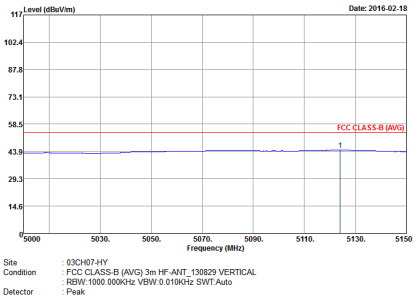
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH44 5220MHz - R	
1	Horizontal	Vertical
Peak		
Avg.		

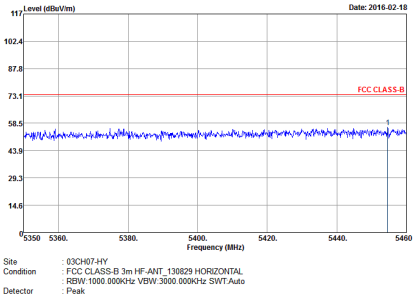
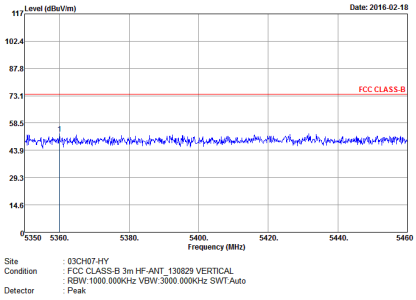
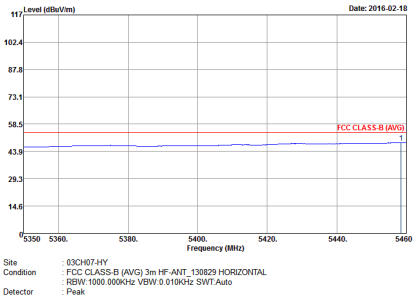
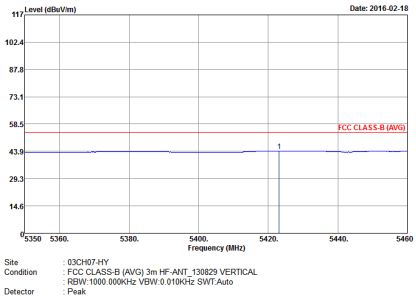
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH48 5240MHz - L	
1	Horizontal	Vertical
Peak		
Avg.		

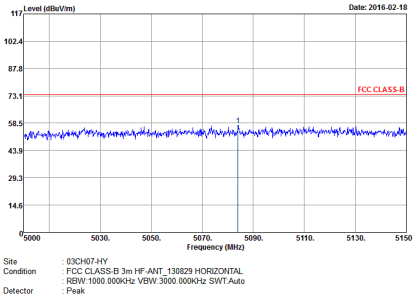
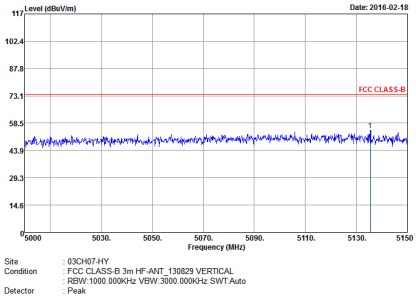
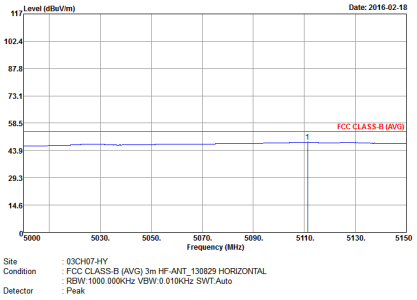
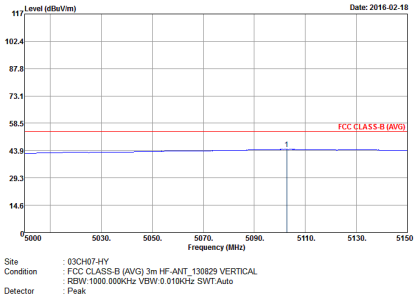
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH48 5240MHz - R	
1	Horizontal	Vertical
Peak		
Avg.		

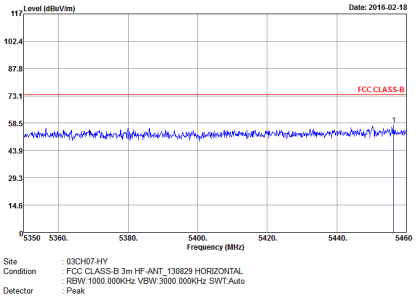
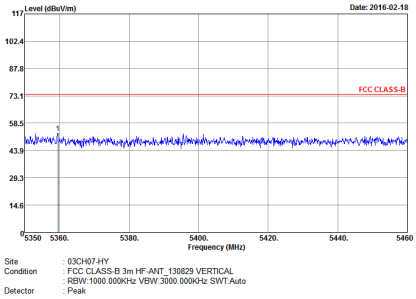
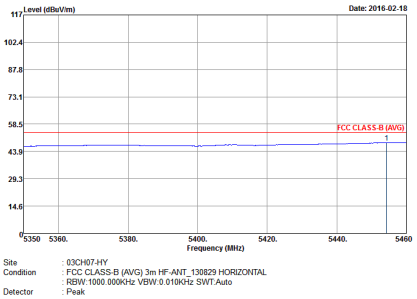
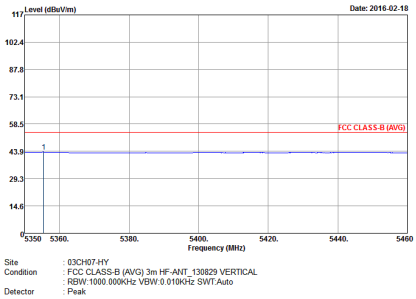
Band 1 5150~5250MHz
WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH36 5180MHz	
1	Horizontal	Vertical
Peak		
Avg.		

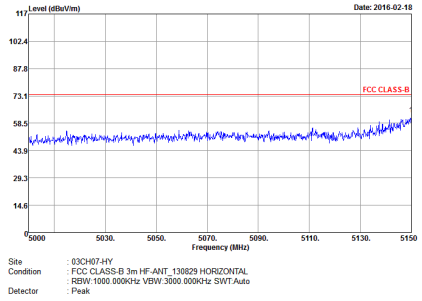
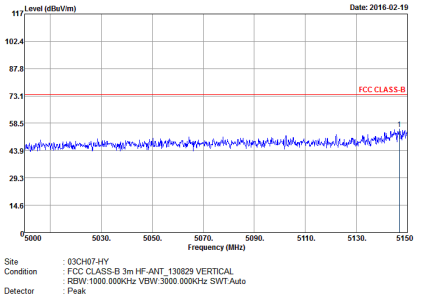
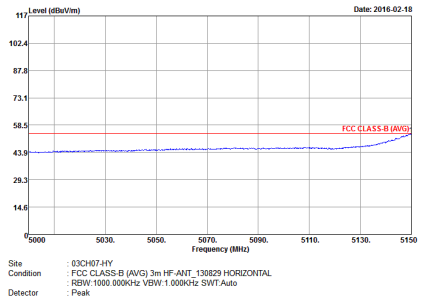
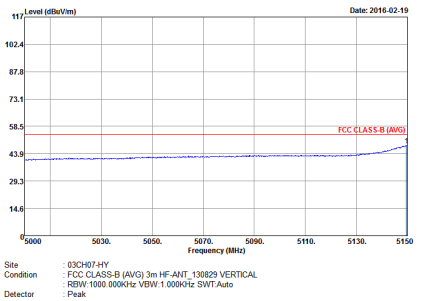
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH44 5220MHz - L	
1	Horizontal	Vertical
Peak		
Avg.		

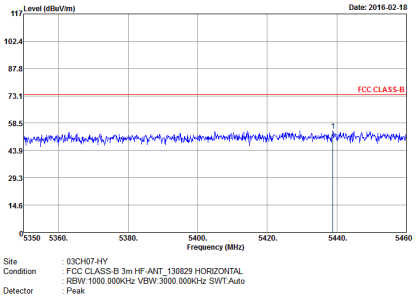
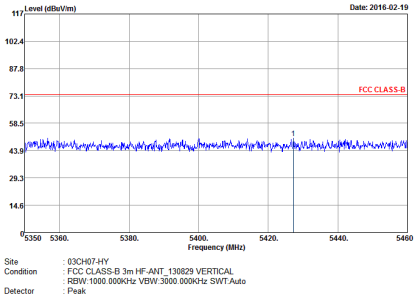
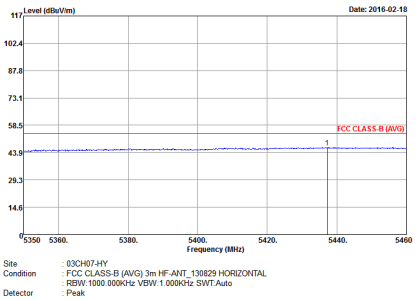
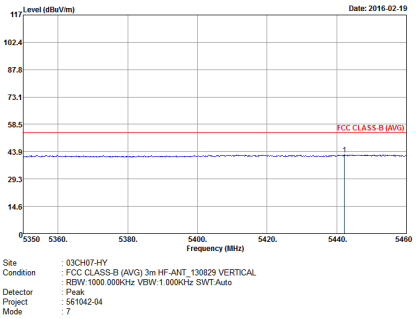
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH44 5220MHz - R	
1	Horizontal	Vertical
Peak		
Avg.		

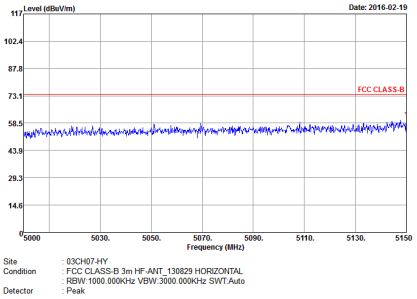
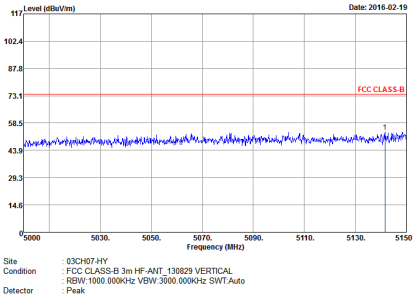
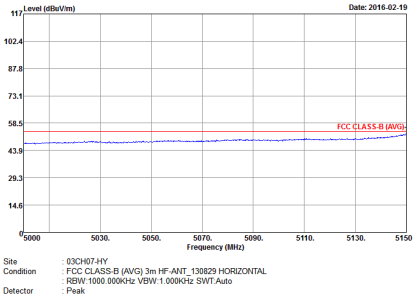
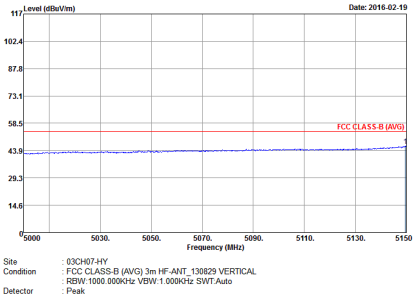
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH48 5240MHz - L	
1	Horizontal	Vertical
Peak		
Avg.		

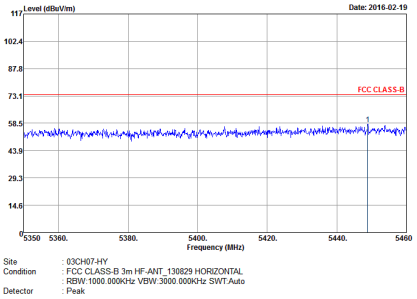
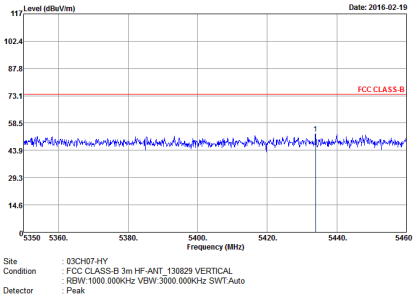
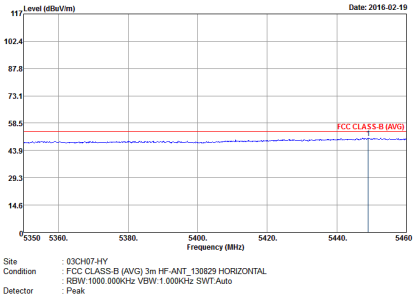
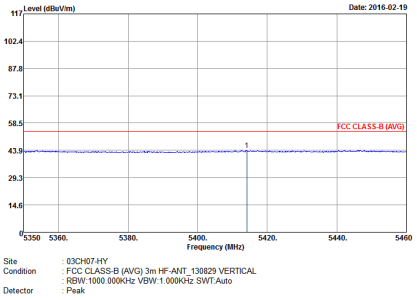
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH48 5240MHz - R	
1	Horizontal	Vertical
Peak		
Avg.		

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

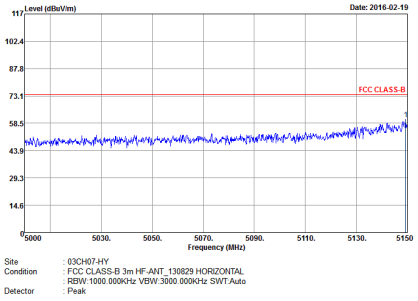
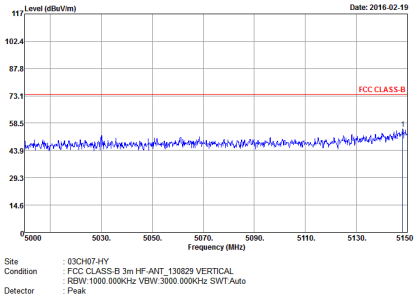
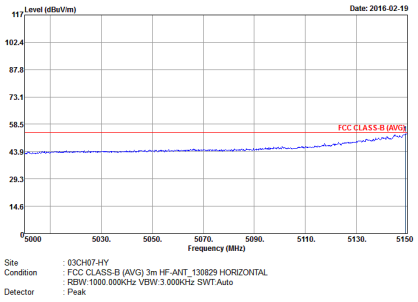
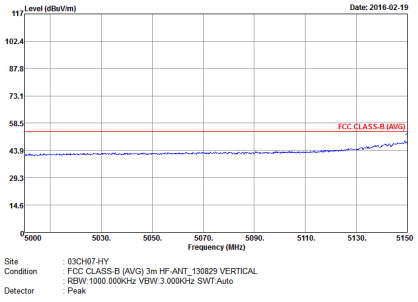
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH38 5190MHz - L	
1	Horizontal	Vertical
Peak		
Avg.		

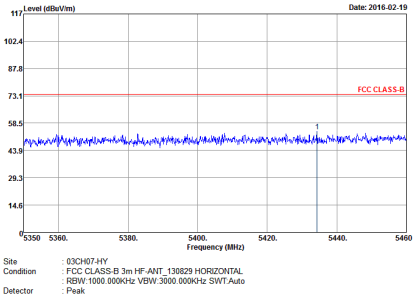
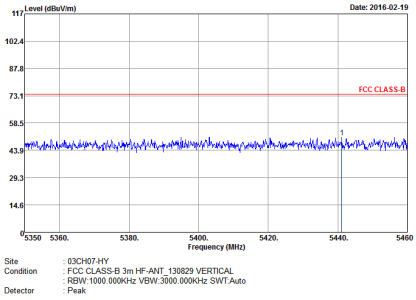
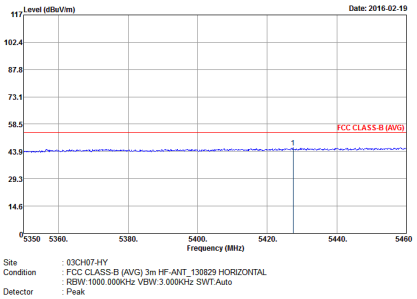
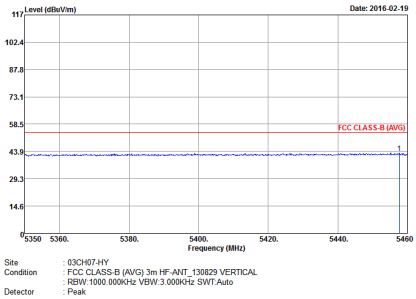
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH38 5190MHz - R	
1	Horizontal	Vertical
Peak		
Avg.		

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH46 5230MHz - L	
1	Horizontal	Vertical
Peak		
Avg.		

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH46 5230MHz - R	
1	Horizontal	Vertical
Peak		
Avg.		

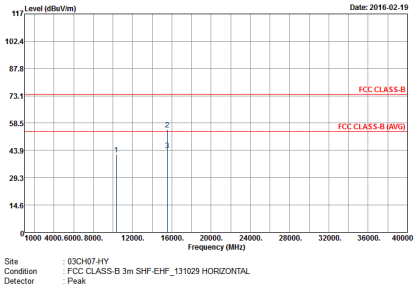
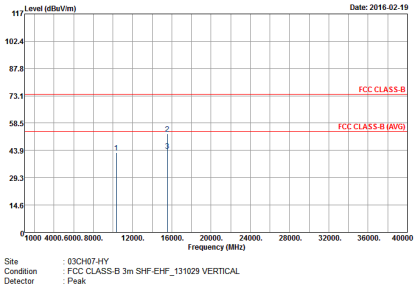
Band 1 5150~5250MHz
WIFI 802.11ac VHT80 (Band Edge @ 3m)

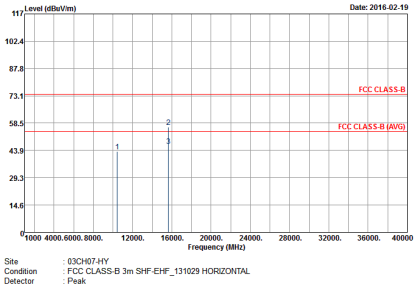
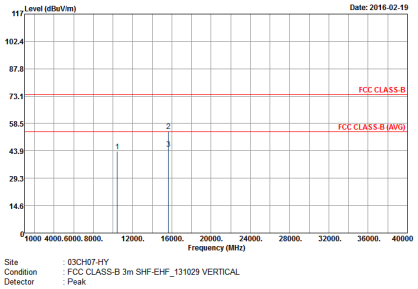
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH42 5210MHz - L	
1	Horizontal	Vertical
Peak		
Avg.		

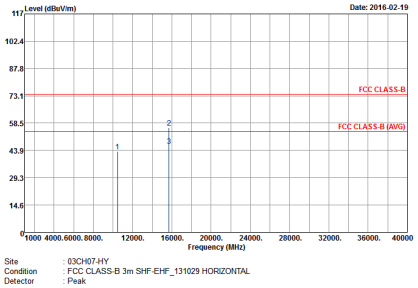
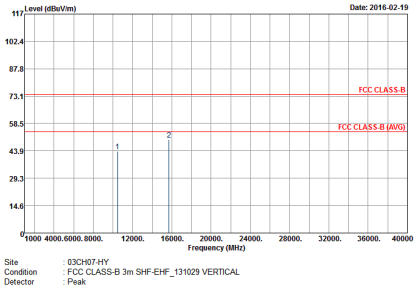
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH42 5210MHz - R	
1	Horizontal	Vertical
Peak		
Avg.		

Band 1 - 5150~5250MHz

WIFI 802.11a (Harmonic @ 3m)

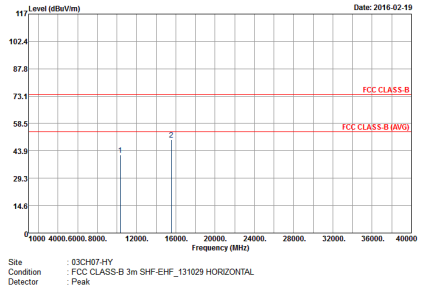
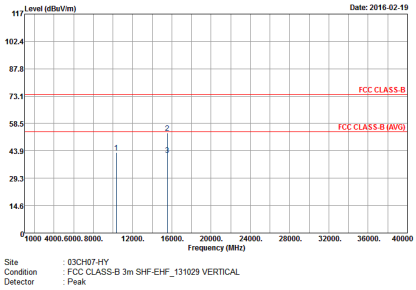
WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11a CH36 5180MHz	
1	Horizontal	Vertical
Peak Avg.		

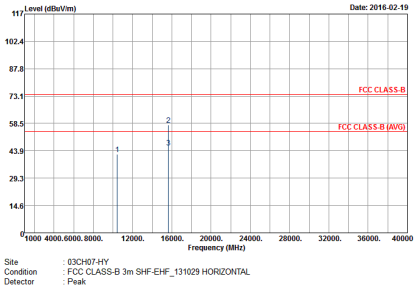
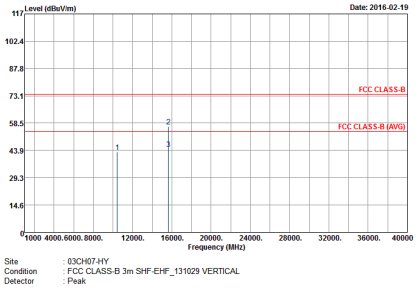
WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11a CH44 5220MHz	
1	Horizontal	Vertical
Peak Avg.		

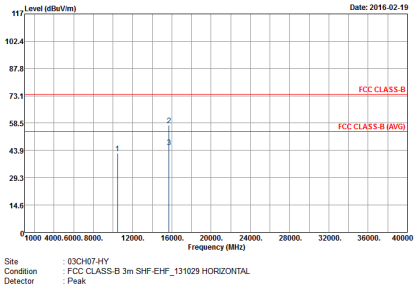
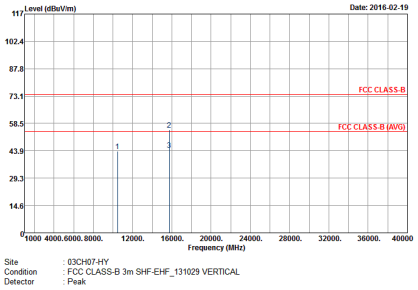
WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11a CH48 5240MHz	
1	Horizontal	Vertical
Peak Avg.		

Band 1 5150~5250MHz

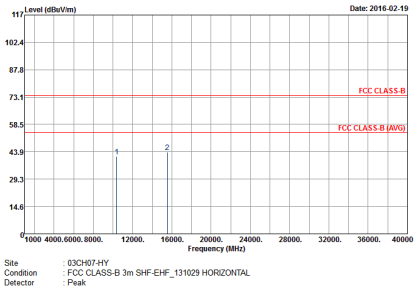
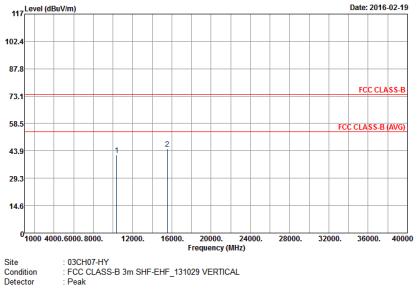
WIFI 802.11n HT20 (Harmonic @ 3m)

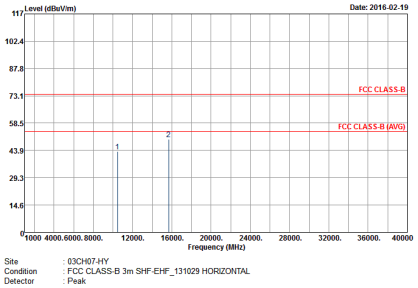
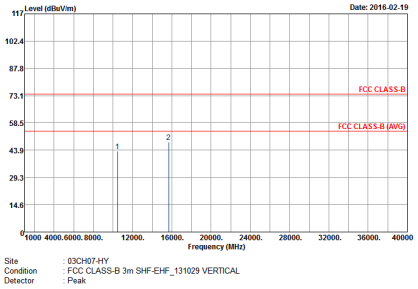
WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11n HT20 CH36 5180MHz	
1	Horizontal	Vertical
Peak Avg.		

WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11n HT20 CH44 5220MHz	
1	Horizontal	Vertical
Peak Avg.		

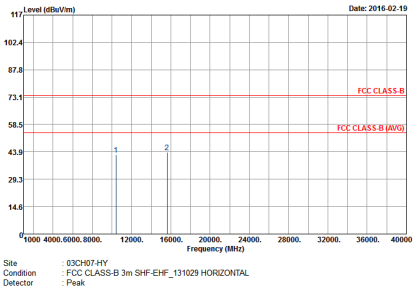
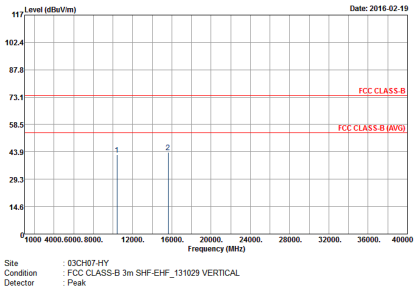
WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11n HT20 CH48 5240MHz	
1	Horizontal	Vertical
Peak Avg.		

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

WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11n HT40 CH38 5190MHz	
1	Horizontal	Vertical
Peak Avg.		

WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11n HT40 CH46 5230MHz	
1	Horizontal	Vertical
Peak Avg.		

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

WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11ac VHT80 CH42 5210MHz	
1	Horizontal	Vertical
Peak Avg.		

Emission below 1GHz

5GHz WIFI 802.11ac VHT80 (LF)

WIFI	5GHz WIFI	
ANT	802.11ac VHT80 LF	
1	Horizontal	Vertical
QP / Peak