FCC RF Test Report

APPLICANT	:	Ubiquiti Networks, Inc.
EQUIPMENT	:	Mesh Points
BRAND NAME	:	ULABS
MODEL NAME	:	AFi-P-LP
		AFi-P
FCC ID	:	SWX-AFP
STANDARD	:	FCC Part 15 Subpart E §15.407
CLASSIFICATION	:	(NII) Unlicensed National Information Infrastructure

The product was received on Mar. 03, 2016 and testing was completed on Jun. 03, 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.
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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR630314E	Rev. 01	Initial issue of report	Jun. 08, 2016

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.403(i)	6dB, 26dB and 99% Occupied Bandwidth	> 500kHz	Pass	-
3.2	15.407(a)	Maximum Conducted Output Power	≤ 30 dBm	Pass	-
3.3	15.407(a)	Power Spectral Density	≤ 30 dBm/500kHz	Pass	-
3.4	15.407(b)	Unwanted Emissions	≤ -17, -27 dBm/MHz &15.209(a)	Pass	Under limit 0.22 dB at 11590.000 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 20.10 dB at 0.774 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

Ubiquiti Networks, Inc.
12F, No. 105, Song Ren Rd., SinYi District, Taipei 110, Taiwan

1.2 Manufacturer

Ubiquiti Networks, Inc.
12F, No. 105, Song Ren Rd., SinYi District, Taipei 110, Taiwan

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mesh Points
Brand Name	ULABS
Model Name	AFi-P-LP AFi-P
FCC ID	SWX-AFP
EUT supports Radios application	WLAN 11a/b/g/n HT20/HT40 Bluetooth v4.0 EDR/LE
EUT Stage	Production Unit

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

<table>
<tr><th colspan="2">Standards-related Product Specification</th></tr>
<tr><td>Tx/Rx Channel Frequency Range</td><td>5745 MHz ~ 5825 MHz</td></tr>
<tr><td>Maximum Output Power</td><td>MIMO <Ant. Port 1 + 2>
802.11a : 27.24 dBm / 0.5297 W
802.11n HT20 : 27.40 dBm / 0.5495 W
802.11n HT40 : 27.62 dBm / 0.5781 W</td></tr>
<tr><td>99% Occupied Bandwidth</td><td>802.11a : 32.85 MHz
802.11n HT20 : 34.70 MHz
802.11n HT40 : 70.20 MHz</td></tr>
<tr><td>Type of Modulation</td><td>802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM)</td></tr>
<tr><td>Antenna Type</td><td>Main Antenna : PIFA Antenna
Aux. Antenna : PIFA Antenna</td></tr>
<tr><td>Antenna Gain</td><td>Main Antenna : 5.00 dBi
Aux. Antenna : 5.00 dBi</td></tr>
<tr><td>Antenna Function Description</td><td>
<table>
<tr><td></td><td>Chain
Port 1</td><td>Chain
Port 2</td></tr>
<tr><td>802.11 a/n
SISO</td><td>V</td><td>V</td></tr>
<tr><td>802.11 a/n
MIMO</td><td>V</td><td>V</td></tr>
</table>
</td></tr>
</table>

1.5 Modification of EUT

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

1.6 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.**	
	TH05-HY	CO05-HY

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

Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No.58, Aly. 75, Ln. 564, Wenhua 3rd Rd. Guishan Dist, Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-0868 FAX: +886-3-327-0855
Test Site No.	**Sporton Site No.**
	03CH11-HY

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

1.7 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 v01r02
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ANSI C63.10-2013

Remark:

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

2 Test Configuration of Equipment Under Test

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: 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 (Y 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 and Channel

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

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. Final Output Power equals to Measured Output Power adds the duty factor.

MIMO <Ant. 1+2>

5GHz 802.11a mode								
Data Rate (MHz)	6M bps	9M bps	12M bps	18M bps	24M bps	36M bps	48M bps	54M bps
Average Power (dBm)	27.24	27.21	27.15	27.11	27.12	27.12	27.14	27.03

5GHz 802.11n HT20 mode								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Average Power (dBm)	27.40	27.38	27.37	27.35	27.37	27.39	27.36	27.37

5GHz 802.11n HT40 mode								
Data Rate (MHz)	MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
Average Power (dBm)	27.62	27.58	27.55	27.55	27.53	27.51	27.46	27.47

Note: MIMO Ant. 1+2 is a calculated result from sum of the power MIMO Ant. 1 and MIMO Ant. 2.

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.

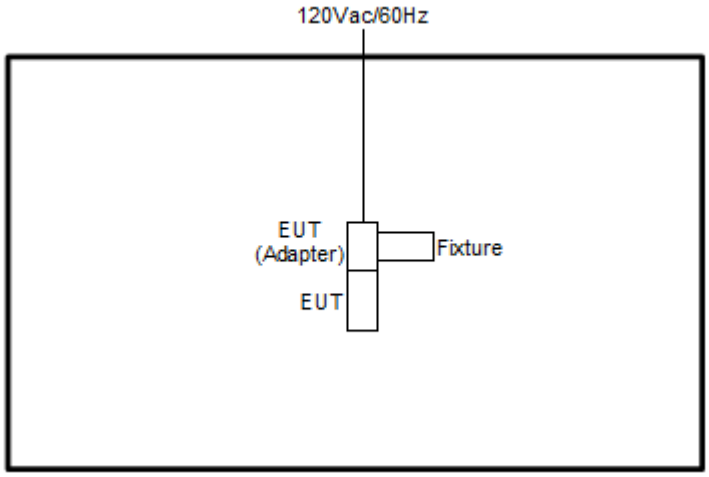
Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0

AC Conducted Emission	Mode 1 ： WLAN (5GHz) Link + Adapter

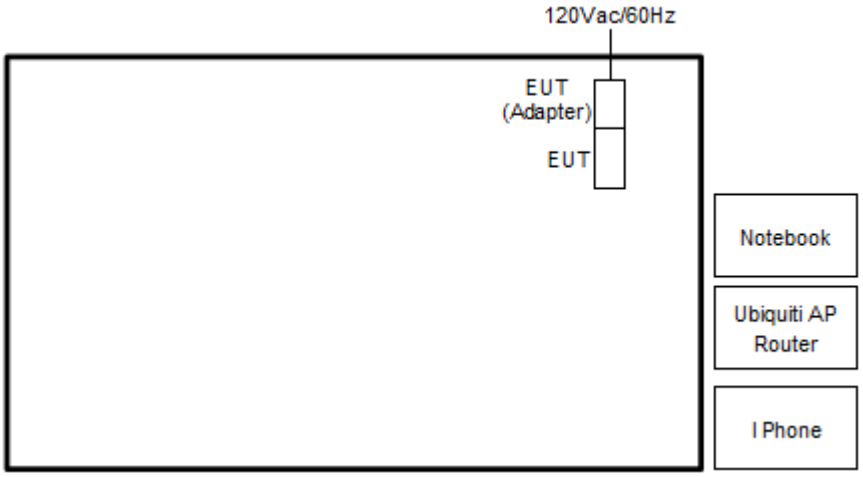
Ch. #		Band IV：5725-5850 MHz		
		802.11a	802.11n HT20	802.11n HT40
L	Low	149	149	151
M	Middle	157	157	-
H	High	165	165	159

2.4 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.5 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Ubiquiti AP Router	Ubiquiti	AFi-R	FCC DoC	N/A	Unshielded, 1.8 m
2.	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
3.	iPhone	Apple	iPhone 6s	FCC DoC	N/A	N/A
4.	Fixture	N/A	N/A	N/A	N/A	N/A

2.6 EUT Operation Test Setup

For WLAN function, programmed RF utility, “artgui.exe” 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 6dB and 26dB and 99% Occupied Bandwidth Measurement

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

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

26dB and 99% Occupied bandwidth are reporting only.

3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

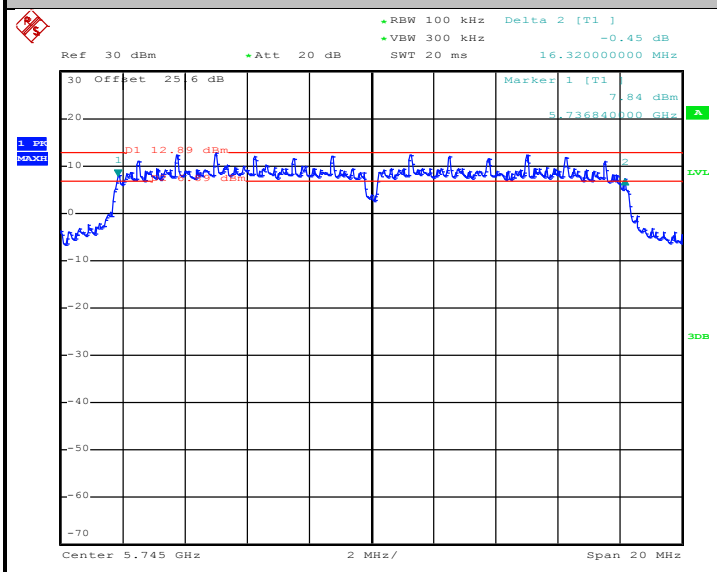
1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r02. Section C) Emission bandwidth for the band 5.725-5.85GHz
2. Set RBW = 100kHz.
3. Set the VBW ≥ 3 x RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is 6 dB down from the peak of the emission.
7. Measure and record the results in the test report.

3.1.4 Test Setup

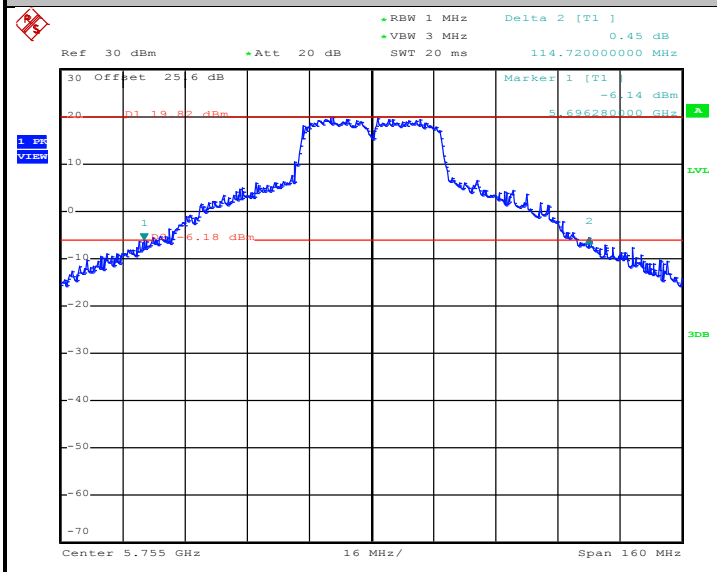
3.1.5 Test Result of 6dB Bandwidth

Please refer to Appendix A.

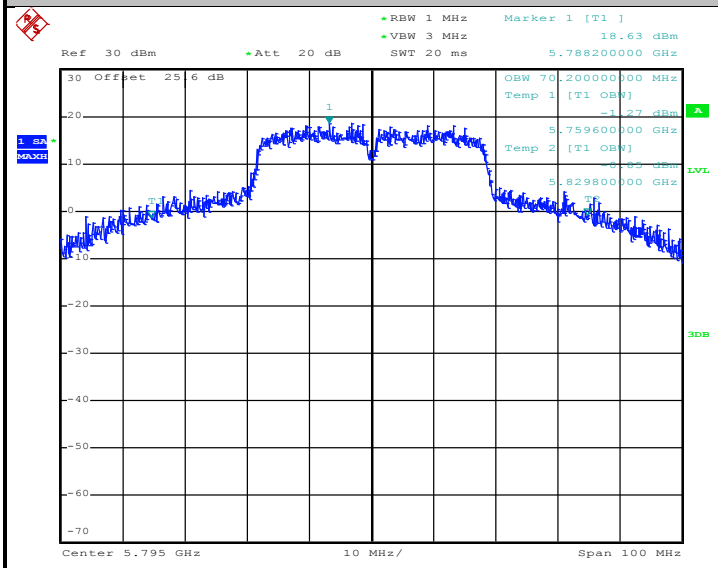
Minimum 6dB Bandwidth



Maximum 26dB Bandwidth



Maximum 99% Occupied Bandwidth



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

3.2 Maximum Conducted Output Power Measurement

3.2.1 Limit of Maximum Conducted Output Power

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

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

3.2.2 Measuring Instruments

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

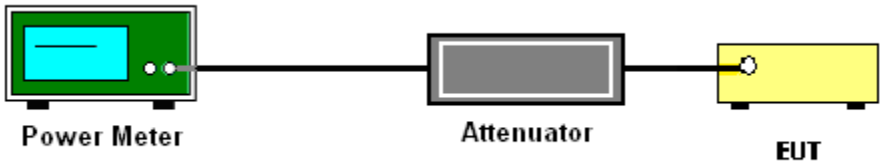
3.2.3 Test Procedures

The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r02.

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



3.2.5 Test Result of Maximum Conducted Output Power

Please refer to Appendix A.

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

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

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

3.3.2 Measuring Instruments

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 v01r02. 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).

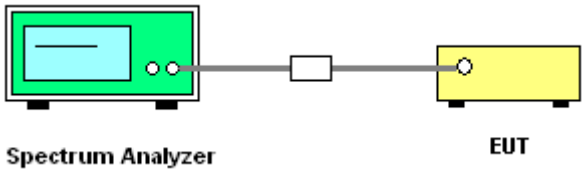
1. The testing follows Method SA-2 of FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r02.
   - Measure the duty cycle.
   - Set span to encompass the entire emission bandwidth (EBW) of the signal.
   - Set RBW = 300 kHz.
   - Set VBW ≥ 1 MHz.
   - Number of points in sweep ≥ 2 Span / RBW.
   - Sweep time = auto.
   - Detector = RMS
   - Trace average at least 100 traces in power averaging mode.
   - Add 10 log(500kHz/RBW) to the test result.
   - 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.
4. 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.

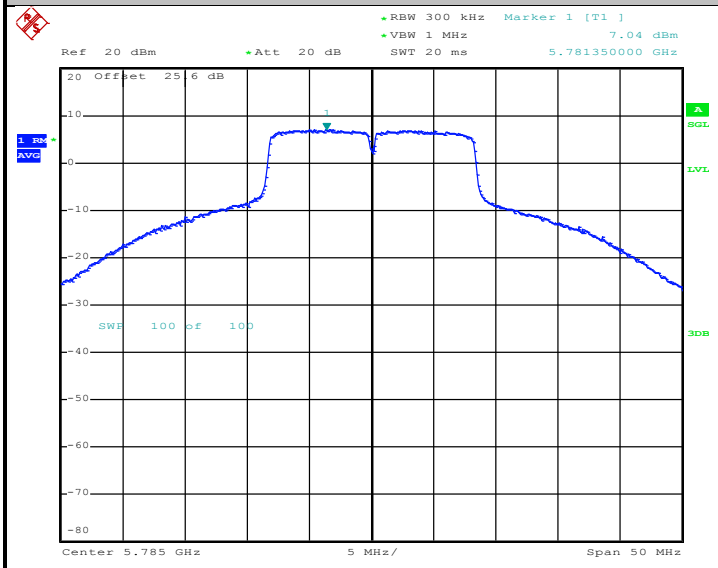
3.3.4 Test Setup



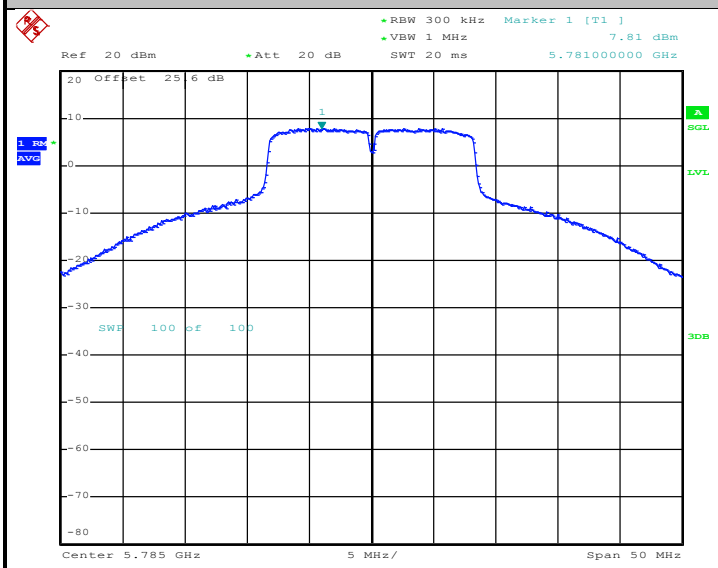
3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

Worst Case Power Density (dBm/300kHz) for MIMO Ant. 1



Worst Case Power Density (dBm/300kHz) for MIMO Ant. 2



3.4 Unwanted Emissions 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 5725-5850 MHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz (78.3dBμV/m); for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz (68.3dBμV/m).

(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.

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

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

(3) KDB 789033 D02 General UNII Test Procedures New Rules v01r02 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 v01r02. Section G) Unwanted emissions measurement.

   (1) Procedure for Unwanted Emissions Measurements Below 1000MHz

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

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

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

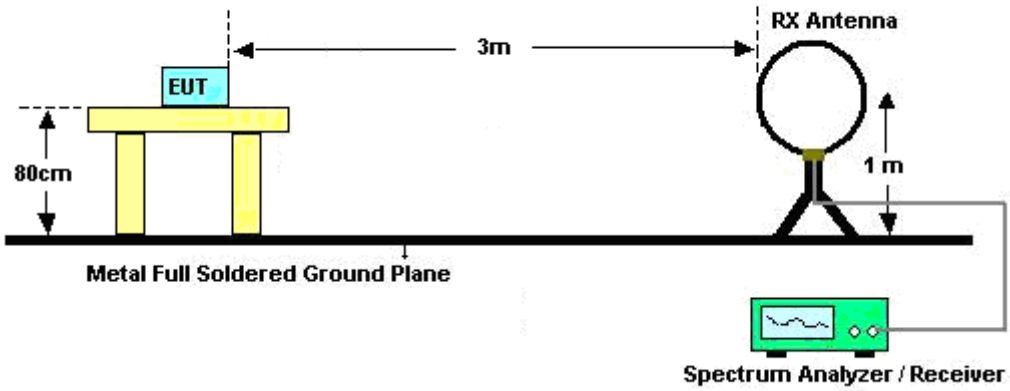
   (3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz

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

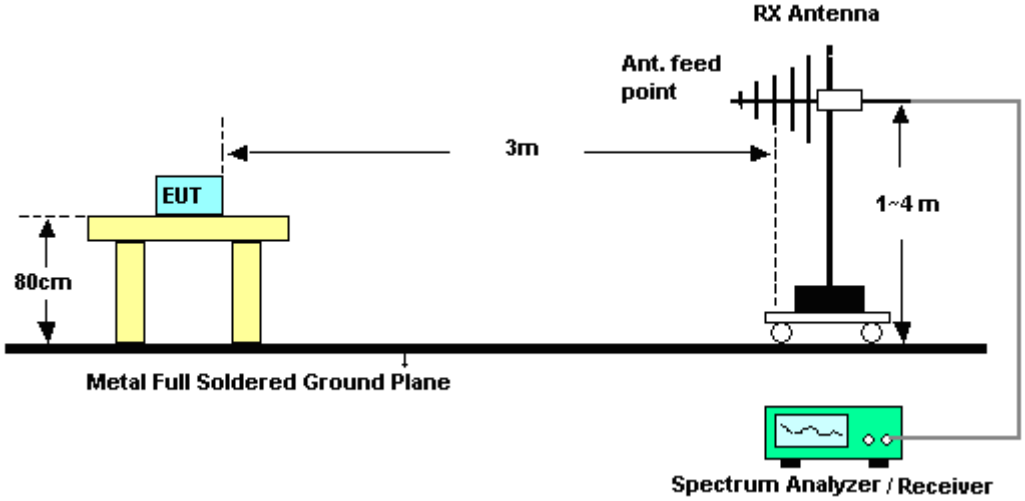
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband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

3.4.4 Test Setup

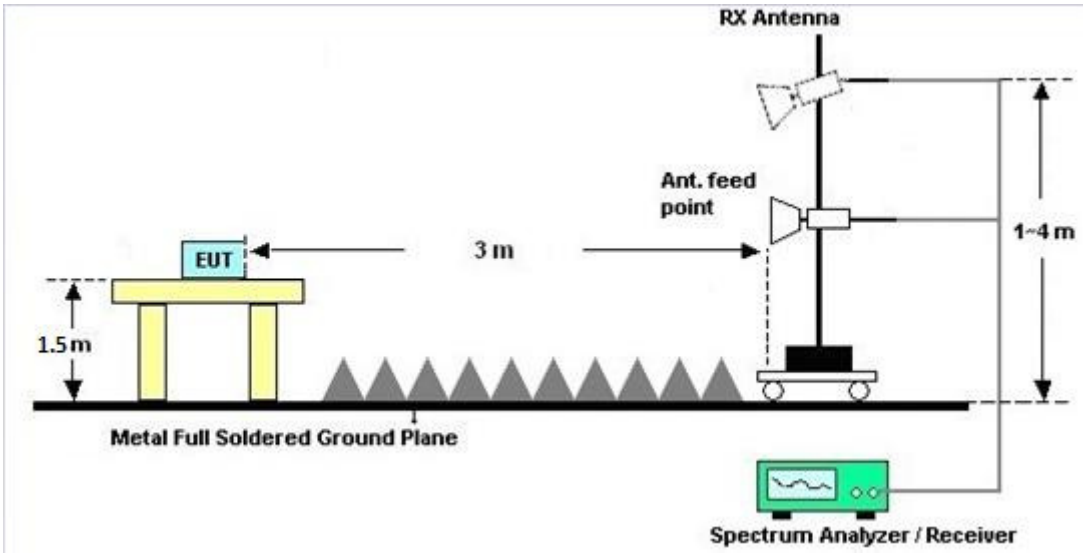
For radiated emissions below 30MHz



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

Please refer to Appendix D.

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.

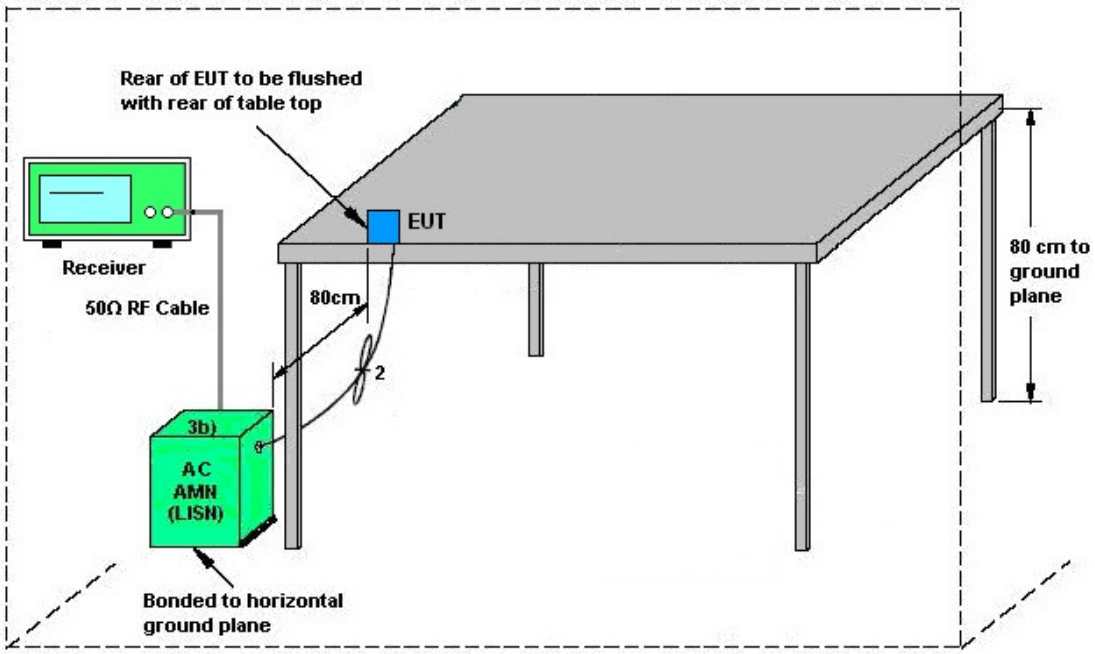
3.5.2 Measuring Instruments

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.

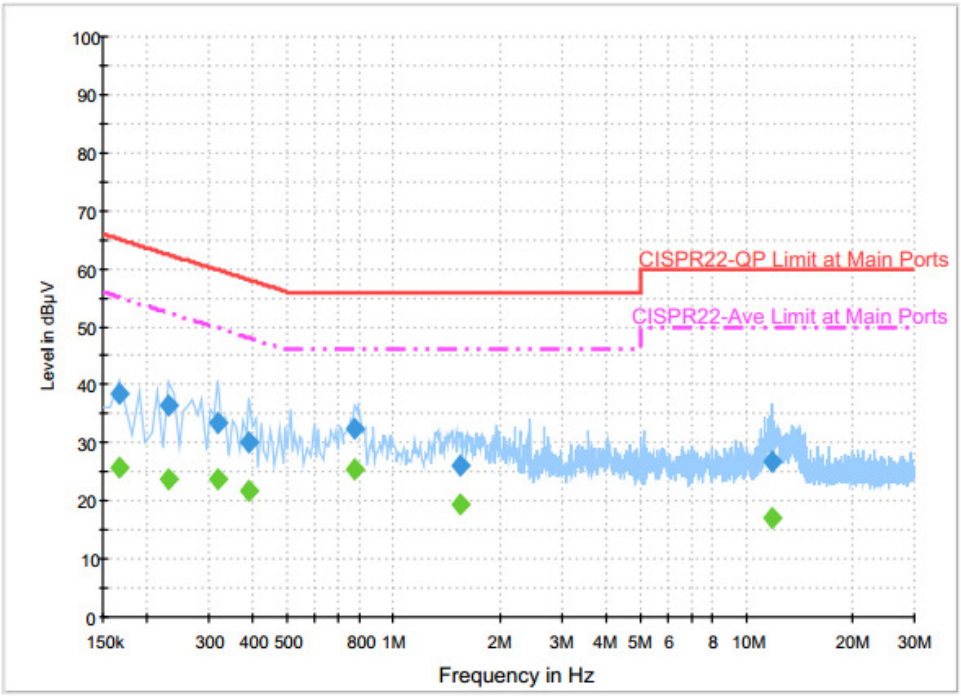
3.5.4 Test Setup



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 :	Kai-Chun Chu	Relative Humidity :	59~60%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN (5GHz) Link + Adapter		



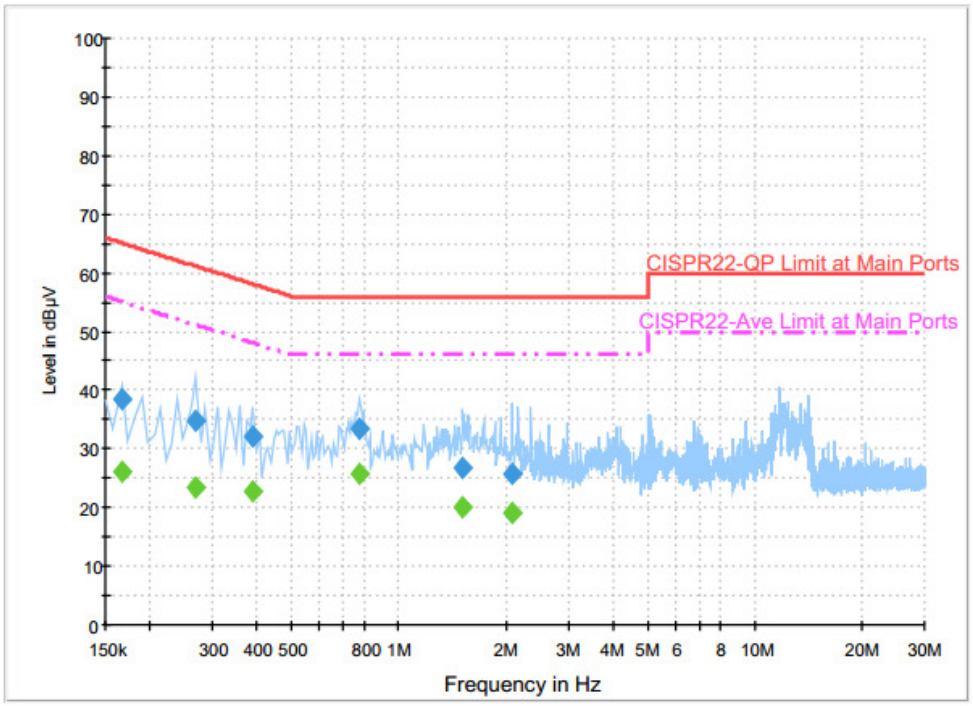
Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	38.3	Off	L1	19.6	26.9	65.2
0.230000	36.5	Off	L1	19.6	25.9	62.4
0.318000	33.6	Off	L1	19.6	26.2	59.8
0.390000	30.0	Off	L1	19.6	28.1	58.1
0.774000	32.5	Off	L1	19.6	23.5	56.0
1.542000	26.0	Off	L1	19.6	30.0	56.0
11.814000	26.6	Off	L1	19.7	33.4	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	25.8	Off	L1	19.6	29.4	55.2
0.230000	23.8	Off	L1	19.6	28.6	52.4
0.318000	23.6	Off	L1	19.6	26.2	49.8
0.390000	21.6	Off	L1	19.6	26.5	48.1
0.774000	25.5	Off	L1	19.6	20.5	46.0
1.542000	19.4	Off	L1	19.6	26.6	46.0
11.814000	17.1	Off	L1	19.7	32.9	50.0

Test Mode :	Mode 1	Temperature :	22~23℃
Test Engineer :	Kai-Chun Chu	Relative Humidity :	59~60%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WLAN (5GHz) Link + Adapter		



Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	38.4	Off	N	19.6	26.8	65.2
0.270000	34.8	Off	N	19.6	26.3	61.1
0.390000	32.1	Off	N	19.6	26.0	58.1
0.774000	33.4	Off	N	19.6	22.6	56.0
1.510000	26.7	Off	N	19.6	29.3	56.0
2.086000	25.8	Off	N	19.5	30.2	56.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	26.1	Off	N	19.6	29.1	55.2
0.270000	23.5	Off	N	19.6	27.6	51.1
0.390000	22.8	Off	N	19.6	25.3	48.1
0.774000	25.9	Off	N	19.6	20.1	46.0
1.510000	20.2	Off	N	19.6	25.8	46.0
2.086000	19.0	Off	N	19.5	27.0	46.0

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.

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

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.

3.8 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

An embedded-in antenna design is used.

3.8.3 Antenna Gain

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

Directional gain = G_{ANT} + Array Gain, where Array Gain is as follows.

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

Array Gain = 10 log(N_{ANT}/N_{SS}=1) dB.

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$.

The EUT supports CDD mode.

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.

	Ant 1 (dBi)	Ant 2 (dBi)	DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
Band IV	5.00	5.00	5.00	8.01	0.00	2.01

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

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

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Power Meter	Anritsu	ML2495A	1132003	300MHz~40GHz	Aug. 12, 2015	Jun. 01, 2016	Aug. 11, 2016	Conducted (TH05-HY)
Power Sensor	Anritsu	MA2411B	1126017	300MHz~40GHz	Aug. 12, 2015	Jun. 01, 2016	Aug. 11, 2016	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100057	9kHz-40GHz	Nov. 23, 2015	Jun. 01, 2016	Nov. 22, 2016	Conducted (TH05-HY)
Temperature Chamber	ESPEC	SH-641	92013720	-40℃ ~90℃	Sep. 08, 2015	Jun. 01, 2016	Sep. 07, 2016	Conducted (TH05-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Sep. 02, 2015	May 30, 2016 ~ Jun. 01, 2016	Sep. 01, 2016	Radiation (03CH11-HY)
Amplifier	SONOMA	310N	187312	9kHz~1GHz	Nov. 20, 2015	May 30, 2016 ~ Jun. 01, 2016	Nov. 19, 2016	Radiation (03CH11-HY)
Bilog Antenna	TESEQ	CBL 6111D	35414	30MHz~1GHz	Nov. 17, 2015	May 30, 2016 ~ Jun. 01, 2016	Nov. 16, 2016	Radiation (03CH11-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1326	1GHz ~ 18GHz	Oct. 08, 2015	May 30, 2016 ~ Jun. 01, 2016	Oct. 07, 2016	Radiation (03CH11-HY)
Preamplifier	Keysight	83017A	MY53270080	1GHz~26.5GHz	Nov. 19, 2015	May 30, 2016 ~ Jun. 01, 2016	Nov. 18, 2016	Radiation (03CH11-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1902247	1GHz~18GHz	Jul. 01, 2015	May 30, 2016 ~ Jun. 01, 2016	Jun. 30, 2016	Radiation (03CH11-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200486	10Hz ~ 44GHZ	Sep. 24, 2015	May 30, 2016 ~ Jun. 01, 2016	Sep. 23, 2016	Radiation (03CH11-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1~4m	N/A	May 30, 2016 ~ Jun. 01, 2016	N/A	Radiation (03CH11-HY)
Turn Table	EMEC	TT 2000	N/A	0~360 Degree	N/A	May 30, 2016 ~ Jun. 01, 2016	N/A	Radiation (03CH11-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz- 40GHz	Nov. 02, 2015	May 30, 2016 ~ Jun. 01, 2016	Nov. 01, 2016	Radiation (03CH11-HY)
Preamplifier	MITEQ	JS44-18004000-33-8P	1840917	18GHz ~ 40GHz	Jun. 02, 2015	May 30, 2016 ~ Jun. 01, 2016	Jun. 01, 2016	Radiation (03CH11-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Apr. 22, 2016	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100724	9kHz~7GHz	Aug. 26, 2015	Apr. 22, 2016	Aug. 25, 2016	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Dec. 02, 2015	Apr. 22, 2016	Dec. 01, 2016	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))	**4.9**

Appendix A. Conducted Test Results

Report Number : FR630314E

Test Engineer:	Bill Kuo	Temperature:	21~25	°C
Test Date:	2016/6/1	Relative Humidity:	51~54	%

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

Band IV													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)		26dB Bandwidth (MHz)		6 dB Bandwidth (MHz)		6 dB Bandwidth Min. Limit (MHz)		Pass/Fail
					Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	149	5745	27.65	32.30	45.12	51.84	16.32	16.32	0.5		Pass
11a	6Mbps	2	157	5785	31.00	32.85	49.12	53.84	16.36	16.32	0.5		Pass
11a	6Mbps	2	165	5825	31.30	30.85	56.80	52.32	16.32	16.32	0.5		Pass
HT20	MCS0	2	149	5745	27.30	33.15	47.68	58.00	17.56	17.56	0.5		Pass
HT20	MCS0	2	157	5785	30.20	32.30	54.64	57.36	17.48	17.58	0.5		Pass
HT20	MCS0	2	165	5825	34.25	34.70	58.24	59.36	17.56	17.32	0.5		Pass
HT40	MCS0	2	151	5755	65.30	69.50	101.12	114.72	36.16	36.32	0.5		Pass
HT40	MCS0	2	159	5795	68.80	70.20	107.36	104.96	36.32	36.40	0.5		Pass

TEST RESULTS DATA
Average Power Table

Band IV															
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	149	5745	0.19	0.16	23.24	24.58	26.97	30.00		5.00			Pass
11a	6Mbps	2	157	5785	0.19	0.16	23.84	24.60	27.24	30.00		5.00			Pass
11a	6Mbps	2	165	5825	0.19	0.16	23.72	24.45	27.11	30.00		5.00			Pass
HT20	MCS0	2	149	5745	0.17	0.20	23.15	24.58	26.93	30.00		5.00			Pass
HT20	MCS0	2	157	5785	0.17	0.20	23.76	24.59	27.20	30.00		5.00			Pass
HT20	MCS0	2	165	5825	0.17	0.20	24.00	24.75	27.40	30.00		5.00			Pass
HT40	MCS0	2	151	5755	0.20	0.20	24.11	25.05	27.62	30.00		5.00			Pass
HT40	MCS0	2	159	5795	0.20	0.20	24.10	24.85	27.50	30.00		5.00			Pass

Report Number : FR630314E

TEST RESULTS DATA
Power Spectral Density

Band IV																
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)		10log (500kHz /RBW) Factor (dB)		Average Power Density (dBm/500kHz)			Average PSD Limit (dBm/500kHz)		DG (dBi)		Pass /Fail
					Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	149	5745	0.19	0.16	2.22				13.15	27.99		8.01		Pass
11a	6Mbps	2	157	5785	0.19	0.16	2.22				13.20	27.99		8.01		Pass
11a	6Mbps	2	165	5825	0.19	0.16	2.22				12.98	27.99		8.01		Pass
HT20	MCS0	2	149	5745	0.17	0.20	2.22				13.16	27.99		8.01		Pass
HT20	MCS0	2	157	5785	0.17	0.20	2.22				12.97	27.99		8.01		Pass
HT20	MCS0	2	165	5825	0.17	0.20	2.22				13.14	27.99		8.01		Pass
HT40	MCS0	2	151	5755	0.20	0.20	2.22				10.50	27.99		8.01		Pass
HT40	MCS0	2	159	5795	0.20	0.20	2.22				10.18	27.99		8.01		Pass

TEST RESULTS DATA
Frequency Stability

Band IV										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stablility (ppm)	Temperature (°C)	Voltage (V)	Note
11a	6Mbps	1	149	5745	5745.000	0.000	0.00	20	108	
11a	6Mbps	1	149	5745	5745.000	0.000	0.00	20	132	
11a	6Mbps	1	149	5745	5745.050	0.050	8.70	20	120	
11a	6Mbps	1	149	5745	5745.000	0.000	0.00	-30	120	
11a	6Mbps	1	149	5745	5745.000	0.000	0.00	50	120	

Appendix B. Radiated Spurious Emission

Test Engineer :	J.C. Liang, Bill Chang, and Ken Wu	Temperature :	18~22°C
		Relative Humidity :	50~53%

Band 4 - 5725~5850MHz

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+2		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 149 5745MHz		5644	54.13	-14.17	68.3	44.79	32.19	10.69	33.54	384	357	P	H
		5699	58.84	-45.72	104.56	49.46	32.27	10.67	33.56	384	357	P	H
		5718.2	73.28	-37.12	110.4	63.89	32.31	10.65	33.57	384	357	P	H
		5724.8	85.39	-36.45	121.84	76	32.31	10.65	33.57	384	357	P	H
		5368	57.8	-16.2	74	48.69	31.84	10.75	33.48	384	357	P	H
		5368	48.17	-5.83	54	39.06	31.84	10.75	33.48	384	357	A	H
	*	5745	120.7	-	-	111.3	32.34	10.63	33.57	384	357	P	H
	*	5745	111.1	-	-	101.7	32.34	10.63	33.57	384	357	A	H
		5632	51.79	-16.51	68.3	42.47	32.17	10.69	33.54	364	360	P	V
		5697.4	53.89	-49.49	103.38	44.51	32.27	10.67	33.56	364	360	P	V
		5714.8	72.76	-36.69	109.45	63.39	32.29	10.65	33.57	364	360	P	V
		5724.4	77.27	-43.66	120.93	67.88	32.31	10.65	33.57	364	360	P	V
	*	5745	116.5	-	-	107.1	32.34	10.63	33.57	364	360	P	V
	*	5745	106.24	-	-	96.84	32.34	10.63	33.57	364	360	A	V
													V
													V

WIFI Ant. 1+2	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 157 5785MHz		5637	54.04	-14.26	68.3	44.7	32.19	10.69	33.54	376	360	P	H
		5651	56.72	-12.32	69.04	47.35	32.22	10.69	33.54	376	360	P	H
		5709.8	54.87	-53.18	108.05	45.5	32.29	10.65	33.57	376	360	P	H
		5722.8	54.32	-62.96	117.28	44.93	32.31	10.65	33.57	376	360	P	H
		5422	57.84	-16.16	74	48.58	31.9	10.84	33.48	376	360	P	H
		5422	49.46	-4.54	54	40.2	31.9	10.84	33.48	376	360	A	H
	*	5785	122.53	-	-	113.12	32.39	10.61	33.59	376	360	P	H
	*	5785	112.11	-	-	102.7	32.39	10.61	33.59	376	360	A	H
		5851	58.42	-61.6	120.02	48.77	32.48	10.78	33.61	376	360	P	H
		5863.2	54.33	-54.27	108.6	44.5	32.51	10.94	33.62	376	360	P	H
		5903.8	54.24	-29.71	83.95	44.2	32.56	11.11	33.63	376	360	P	H
		5937.2	52.69	-15.61	68.3	42.63	32.6	11.11	33.65	376	360	P	H
		5612.6	51.22	-17.08	68.3	41.9	32.14	10.71	33.53	363	360	P	V
		5675	51.75	-35.09	86.84	42.39	32.24	10.67	33.55	363	360	P	V
		5713	52.48	-56.46	108.94	43.11	32.29	10.65	33.57	363	360	P	V
		5724.4	51.64	-69.29	120.93	42.25	32.31	10.65	33.57	363	360	P	V
	*	5785	118.04	-	-	108.63	32.39	10.61	33.59	363	360	P	V
	*	5785	107.85	-	-	98.44	32.39	10.61	33.59	363	360	A	V
		5855	52.98	-57.92	110.9	43.3	32.51	10.78	33.61	363	360	P	V
		5855	52.98	-57.92	110.9	43.3	32.51	10.78	33.61	363	360	P	V
		5903.6	50.63	-33.47	84.1	40.59	32.56	11.11	33.63	363	360	P	V
		5928.2	50.53	-17.77	68.3	40.46	32.6	11.11	33.64	363	360	P	V
													V
													V

WIFI Ant. 1+2	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)
		5404	60.31	-13.69	74	51.04	31.88	10.87	33.48	388	360	P	H
		5404	49.35	-4.65	54	40.08	31.88	10.87	33.48	388	360	A	H
	*	5825	122.63	-	-	112.99	32.46	10.78	33.6	388	360	P	H
	*	5825	112.09	-	-	102.45	32.46	10.78	33.6	388	360	A	H
		5850.8	74.6	-45.88	120.48	64.95	32.48	10.78	33.61	388	360	P	H
		5856.8	70.92	-39.48	110.4	61.24	32.51	10.78	33.61	388	360	P	H
		5881.4	61.46	-39.09	100.55	51.61	32.53	10.94	33.62	388	360	P	H
802.11a		5927.6	52.11	-16.19	68.3	42.04	32.6	11.11	33.64	388	360	P	H
CH 165	*	5825	118.25	-	-	108.61	32.46	10.78	33.6	361	360	P	V
5825MHz	*	5825	107.65	-	-	98.01	32.46	10.78	33.6	361	360	A	V
		5851.4	72.47	-46.64	119.11	62.82	32.48	10.78	33.61	361	360	P	V
		5855.2	65.8	-45.04	110.84	56.12	32.51	10.78	33.61	361	360	P	V
		5879.2	56.16	-46.02	102.18	46.31	32.53	10.94	33.62	361	360	P	V
		5933.8	49.44	-18.86	68.3	39.37	32.6	11.11	33.64	361	360	P	V
													V
													V
													V

Remark

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

Band 4 5725~5850MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI Ant. 1+2	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 149 5745MHz		11490	63.19	-10.81	74	73.43	39.91	15.59	65.74	137	141	P	H
		11490	53.55	-0.45	54	63.79	39.91	15.59	65.74	137	141	A	H
		17235	46.39	-21.91	68.3	50.87	41	18.6	64.08	100	0	P	H
													H
		11490	57.92	-16.08	74	68.16	39.91	15.59	65.74	100	133	P	V
		11490	48.74	-5.26	54	58.98	39.91	15.59	65.74	100	133	A	V
		17235	53.99	-14.31	68.3	58.47	41	18.6	64.08	100	0	P	V
													V
802.11a CH 157 5785MHz		11570	64.4	-9.6	74	74.66	39.76	15.64	65.66	203	138	P	H
		11570	52.65	-1.35	54	62.91	39.76	15.64	65.66	203	138	A	H
		17355	53.32	-14.98	68.3	57.54	41.35	18.65	64.22	100	0	P	H
													H
		11570	62.29	-11.71	74	72.55	39.76	15.64	65.66	100	135	P	V
		11570	51.81	-2.19	54	62.07	39.76	15.64	65.66	100	135	A	V
		17355	56.59	-11.71	68.3	60.81	41.35	18.65	64.22	100	0	P	V
													V
802.11a CH 165 5825MHz		11650	64.75	-9.25	74	75.06	39.62	15.69	65.62	110	138	P	H
		11650	53.3	-0.7	54	63.61	39.62	15.69	65.62	110	138	A	H
		17475	53.35	-14.95	68.3	57.31	41.7	18.7	64.36	100	0	P	H
													H
		11650	62.48	-11.52	74	72.79	39.62	15.69	65.62	100	138	P	V
		11650	52.11	-1.89	54	62.42	39.62	15.69	65.62	100	138	A	V
		17475	53.29	-15.01	68.3	57.25	41.7	18.7	64.36	100	0	P	V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11n HT20 (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)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5602.2	54.78	-13.52	68.3	45.45	32.14	10.71	33.52	384	354	P	H
		5695.4	60.35	-41.56	101.91	50.97	32.27	10.67	33.56	384	354	P	H
		5714.8	71.63	-37.82	109.45	62.26	32.29	10.65	33.57	384	354	P	H
		5724.8	86.54	-35.3	121.84	77.15	32.31	10.65	33.57	384	354	P	H
		5386	56.94	-17.06	74	47.69	31.86	10.87	33.48	384	354	P	H
		5386	48.13	-5.87	54	38.88	31.86	10.87	33.48	384	354	A	H
802.11n	*	5745	120.7	-	-	111.3	32.34	10.63	33.57	384	354	P	H
HT20	*	5745	110.43	-	-	101.03	32.34	10.63	33.57	384	354	A	H
CH 149		5611	51.53	-16.77	68.3	42.21	32.14	10.71	33.53	364	360	P	V
5745MHz		5689.6	53.73	-43.9	97.63	44.35	32.27	10.67	33.56	364	360	P	V
		5718.2	68.87	-41.53	110.4	59.48	32.31	10.65	33.57	364	360	P	V
		5724.6	79.14	-42.25	121.39	69.75	32.31	10.65	33.57	364	360	P	V
	*	5745	116.66	-	-	107.26	32.34	10.63	33.57	364	360	P	V
	*	5745	106.3	-	-	96.9	32.34	10.63	33.57	364	360	A	V
													V
													V

WIFI Ant. 1+2	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)
		5641.6	54.6	-13.7	68.3	45.26	32.19	10.69	33.54	376	360	P	H
		5693.6	55.29	-45.29	100.58	45.91	32.27	10.67	33.56	376	360	P	H
		5719.2	59.88	-50.8	110.68	50.49	32.31	10.65	33.57	376	360	P	H
		5721.6	54.88	-59.67	114.55	45.49	32.31	10.65	33.57	376	360	P	H
		5374	57.96	-16.04	74	48.85	31.84	10.75	33.48	376	360	P	H
		5374	48.89	-5.11	54	39.78	31.84	10.75	33.48	376	360	A	H
	*	5785	121.81	-	-	112.4	32.39	10.61	33.59	376	360	P	H
	*	5785	111.61	-	-	102.2	32.39	10.61	33.59	376	360	A	H
		5852.2	58.9	-58.38	117.28	49.25	32.48	10.78	33.61	376	360	P	H
		5855	55.11	-55.79	110.9	45.43	32.51	10.78	33.61	376	360	P	H
802.11n		5888	52.73	-42.92	95.65	42.86	32.56	10.94	33.63	376	360	P	H
HT20		5944.8	52.07	-16.23	68.3	41.82	32.63	11.27	33.65	376	360	P	H
CH 157		5613.8	51.29	-17.01	68.3	41.97	32.14	10.71	33.53	362	360	P	V
5785MHz		5651.2	51.9	-17.29	69.19	42.53	32.22	10.69	33.54	362	360	P	V
		5716.8	51.1	-58.91	110.01	41.73	32.29	10.65	33.57	362	360	P	V
		5724.2	52.7	-67.78	120.48	43.31	32.31	10.65	33.57	362	360	P	V
	*	5785	119.07	-	-	109.66	32.39	10.61	33.59	362	360	P	V
	*	5785	108.52	-	-	99.11	32.39	10.61	33.59	362	360	A	V
		5852	52.69	-65.05	117.74	43.04	32.48	10.78	33.61	362	360	P	V
		5867.2	52.56	-54.92	107.48	42.73	32.51	10.94	33.62	362	360	P	V
		5883	49.93	-49.43	99.36	40.08	32.53	10.94	33.62	362	360	P	V
		5936.4	50.69	-17.61	68.3	40.63	32.6	11.11	33.65	362	360	P	V
													V
													V

WIFI Ant. 1+2	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)
802.11n HT20 CH 165 5825MHz		5428	58.66	-15.34	74	49.4	31.9	10.84	33.48	383	0	P	H
		5428	49.36	-4.64	54	40.1	31.9	10.84	33.48	383	0	A	H
	*	5825	122.71	-	-	113.07	32.46	10.78	33.6	383	0	P	H
	*	5825	112.69	-	-	103.05	32.46	10.78	33.6	383	0	A	H
		5852	87.44	-30.3	117.74	77.79	32.48	10.78	33.61	383	0	P	H
		5855.6	79.34	-31.39	110.73	69.66	32.51	10.78	33.61	383	0	P	H
		5876.4	67.19	-37.07	104.26	57.34	32.53	10.94	33.62	383	0	P	H
		5932.2	54.86	-13.44	68.3	44.79	32.6	11.11	33.64	383	0	P	H
		5458	55.56	-18.44	74	46.26	31.94	10.84	33.48	377	360	P	V
		5458	48.26	-5.74	54	38.96	31.94	10.84	33.48	377	360	A	V
	*	5825	118.88	-	-	109.24	32.46	10.78	33.6	377	360	P	V
	*	5825	109.23	-	-	99.59	32.46	10.78	33.6	377	360	A	V
		5850.2	79.68	-42.16	121.84	70.03	32.48	10.78	33.61	377	360	P	V
		5863.6	70.05	-38.44	108.49	60.22	32.51	10.94	33.62	377	360	P	V
		5884	57.23	-41.39	98.62	47.39	32.53	10.94	33.63	377	360	P	V
		5938.4	54	-14.3	68.3	43.94	32.6	11.11	33.65	377	360	P	V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI Ant. 1+2	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)
		11490	66.18	-7.82	74	76.42	39.91	15.59	65.74	136	140	P	H
		11490	53.06	-0.94	54	63.3	39.91	15.59	65.74	136	140	A	H
802.11n		17235	49.11	-19.19	68.3	53.59	41	18.6	64.08	100	0	P	H
HT20													H
CH 149		11490	58	-16	74	68.24	39.91	15.59	65.74	100	133	P	V
5745MHz		11490	48.36	-5.64	54	58.6	39.91	15.59	65.74	100	133	A	V
		17235	52.94	-15.36	68.3	57.42	41	18.6	64.08	100	0	P	V
													V
		11570	63.53	-10.47	74	73.79	39.76	15.64	65.66	203	139	P	H
		11570	52.34	-1.66	54	62.6	39.76	15.64	65.66	203	139	A	H
802.11n		17355	50.82	-17.48	68.3	55.04	41.35	18.65	64.22	100	0	P	H
HT20													H
CH 157		11570	60.36	-13.64	74	70.62	39.76	15.64	65.66	100	134	P	V
5785MHz		11570	47.93	-6.07	54	58.19	39.76	15.64	65.66	100	134	A	V
		17355	55.78	-12.52	68.3	60	41.35	18.65	64.22	100	0	P	V
													V
		11650	63.31	-10.69	74	73.62	39.62	15.69	65.62	210	144	P	H
		11650	53.15	-0.85	54	63.46	39.62	15.69	65.62	210	144	A	H
802.11n		17475	53.43	-14.87	68.3	57.39	41.7	18.7	64.36	100	0	P	H
HT20													H
CH 165		11650	63.16	-10.84	74	73.47	39.62	15.69	65.62	100	140	P	V
5825MHz		11650	51.6	-2.4	54	61.91	39.62	15.69	65.62	100	140	A	V
		17475	58.37	-9.93	68.3	62.33	41.7	18.7	64.36	100	0	P	V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI Ant. 1+2	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)
		5646	64.95	-3.35	68.3	55.61	32.19	10.69	33.54	367	360	P	H
		5688	80.38	-16.07	96.45	71	32.27	10.67	33.56	367	360	P	H
		5719.8	89.69	-21.15	110.84	80.3	32.31	10.65	33.57	367	360	P	H
		5723.6	97.37	-21.74	119.11	87.98	32.31	10.65	33.57	367	360	P	H
		5362	56.34	-17.66	74	47.23	31.84	10.75	33.48	367	360	P	H
		5362	49.33	-4.67	54	40.22	31.84	10.75	33.48	367	360	A	H
	*	5755	120	-	-	110.58	32.36	10.63	33.57	367	360	P	H
	*	5755	110.52	-	-	101.1	32.36	10.63	33.57	367	360	A	H
		5852.8	68.83	-47.09	115.92	59.18	32.48	10.78	33.61	367	360	P	H
		5871.2	64.05	-42.31	106.36	54.2	32.53	10.94	33.62	367	360	P	H
802.11n		5876.4	58.86	-45.4	104.26	49.01	32.53	10.94	33.62	367	360	P	H
HT40		5925.2	54.48	-13.82	68.3	44.41	32.6	11.11	33.64	367	360	P	H
CH 151		5644.8	61.89	-6.41	68.3	52.55	32.19	10.69	33.54	381	354	P	V
5755MHz		5698.6	76.63	-27.64	104.27	67.25	32.27	10.67	33.56	381	354	P	V
		5718	90.07	-20.27	110.34	80.68	32.31	10.65	33.57	381	354	P	V
		5720.6	90.76	-21.51	112.27	81.37	32.31	10.65	33.57	381	354	P	V
		5434	54.28	-19.72	74	45	31.92	10.84	33.48	381	354	P	V
		5434	46.93	-7.07	54	37.65	31.92	10.84	33.48	381	354	A	V
	*	5755	116.61	-	-	107.19	32.36	10.63	33.57	381	354	P	V
	*	5755	107.2	-	-	97.78	32.36	10.63	33.57	381	354	A	V
		5851.4	59.48	-59.63	119.11	49.83	32.48	10.78	33.61	381	354	P	V
		5866.8	59.66	-47.93	107.59	49.83	32.51	10.94	33.62	381	354	P	V
		5884	54.24	-44.38	98.62	44.4	32.53	10.94	33.63	381	354	P	V
		5947.2	50.24	-18.06	68.3	39.99	32.63	11.27	33.65	381	354	P	V

WIFI Ant. 1+2	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)
		5638.6	58.82	-9.48	68.3	49.48	32.19	10.69	33.54	396	356	P	H
		5682.4	70.78	-21.53	92.31	61.43	32.24	10.67	33.56	396	356	P	H
		5716.8	77.4	-32.61	110.01	68.03	32.29	10.65	33.57	396	356	P	H
		5724	76.1	-43.92	120.02	66.71	32.31	10.65	33.57	396	356	P	H
		5386	59.64	-14.36	74	50.39	31.86	10.87	33.48	396	356	P	H
		5386	50.4	-3.6	54	41.15	31.86	10.87	33.48	396	356	A	H
	*	5795	121.21	-	-	111.78	32.41	10.61	33.59	396	356	P	H
	*	5795	111.66	-	-	102.23	32.41	10.61	33.59	396	356	A	H
		5851.2	77.2	-42.36	119.56	67.55	32.48	10.78	33.61	396	356	P	H
		5865	78.08	-30.02	108.1	68.25	32.51	10.94	33.62	396	356	P	H
802.11n		5877	72.76	-31.05	103.81	62.91	32.53	10.94	33.62	396	356	P	H
HT40		5926.6	61.74	-6.56	68.3	51.67	32.6	11.11	33.64	396	356	P	H
CH 159		5620.8	53.85	-14.45	68.3	44.52	32.17	10.69	33.53	372	360	P	V
5795MHz		5691.6	67.43	-31.68	99.11	58.05	32.27	10.67	33.56	372	360	P	V
		5715.2	73.8	-35.76	109.56	64.43	32.29	10.65	33.57	372	360	P	V
		5720.8	73.57	-39.15	112.72	64.18	32.31	10.65	33.57	372	360	P	V
		5458	56	-18	74	46.7	31.94	10.84	33.48	372	360	P	V
		5458	49.14	-4.86	54	39.84	31.94	10.84	33.48	372	360	A	V
	*	5795	116.85	-	-	107.42	32.41	10.61	33.59	372	360	P	V
	*	5795	106.53	-	-	97.1	32.41	10.61	33.59	372	360	A	V
		5850.4	76.99	-44.4	121.39	67.34	32.48	10.78	33.61	372	360	P	V
		5855	76.25	-34.65	110.9	66.57	32.51	10.78	33.61	372	360	P	V
		5886	68.62	-28.51	97.13	58.78	32.53	10.94	33.63	372	360	P	V
		5936.2	54.96	-13.34	68.3	44.9	32.6	11.11	33.65	372	360	P	V

Remark

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

Band 4 5725~5850MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI Ant. 1+2	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)
		11510	63.46	-10.54	74	73.65	39.9	15.61	65.7	123	156	P	H
		11510	53.12	-0.88	54	63.31	39.9	15.61	65.7	123	156	A	H
802.11n		17265	51.02	-17.28	68.3	55.42	41.1	18.62	64.12	100	0	P	H
HT40													H
CH 151		11510	60.26	-13.74	74	70.45	39.9	15.61	65.7	100	142	P	V
5755MHz		11510	51.19	-2.81	54	61.38	39.9	15.61	65.7	100	142	A	V
		17265	55.18	-13.12	68.3	59.58	41.1	18.62	64.12	100	0	P	V
													V
		11590	64.39	-9.61	74	74.65	39.73	15.66	65.65	282	138	P	H
		11590	53.78	-0.22	54	64.04	39.73	15.66	65.65	282	138	A	H
802.11n		17385	53.59	-14.71	68.3	57.74	41.45	18.66	64.26	100	0	P	H
HT40													H
CH 159		11590	61.3	-12.7	74	71.56	39.73	15.66	65.65	100	135	P	V
5795MHz		11590	51.49	-2.51	54	61.75	39.73	15.66	65.65	100	135	A	V
		17385	54.34	-13.96	68.3	58.49	41.45	18.66	64.26	100	0	P	V
													V

Remark

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

Emission below 1GHz

5GHz WIFI 802.11n HT40 (LF @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	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)
		125.04	40.76	-2.74	43.5	53.21	17.85	1.48	31.78	313	269	QP	H
		125.04	42.37	-1.13	43.5	54.82	17.85	1.48	31.78	313	269	P	H
		200.1	41.23	-2.27	43.5	55.27	16	1.74	31.78	146	123	QP	H
		200.1	43.18	-0.32	43.5	57.22	16	1.74	31.78	146	123	P	H
	*	250.05	56.27	-	-	67.36	18.7	1.98	31.77	108	140	QP	H
	*	250.05	57.24	-	-	68.33	18.7	1.98	31.77	108	140	P	H
		300	42.84	-3.16	46	52.77	19.7	2.13	31.76			P	H
		374.9	39.31	-6.69	46	47	21.76	2.34	31.79			P	H
		750.1	38.41	-7.59	46	39.07	27.7	3.62	31.98			P	H
													H
5GHz													H
802.11n													H
HT40		156.09	37.53	-5.97	43.5	50.53	17.1	1.68	31.78			P	V
LF		200.1	39.63	-3.87	43.5	53.67	16	1.74	31.78	100	0	P	V
	*	250.05	53.5	-	-	64.59	18.7	1.98	31.77	169	175	QP	V
	*	250.05	53.76	-	-	64.85	18.7	1.98	31.77	169	175	P	V
		300	38.68	-7.32	46	48.61	19.7	2.13	31.76			P	V
		500.2	38.23	-7.77	46	43.07	24.1	2.95	31.89			P	V
		875.4	33.92	-12.08	46	32.57	29.06	3.84	31.55			P	V
													V
													V
													V
													V
													V

Remark

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

Note symbol

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

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

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	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 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".

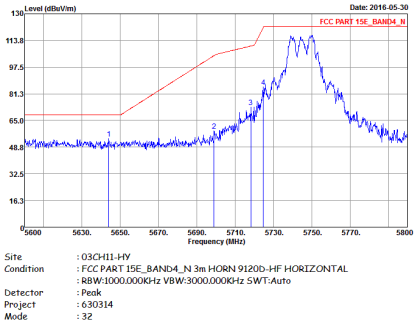
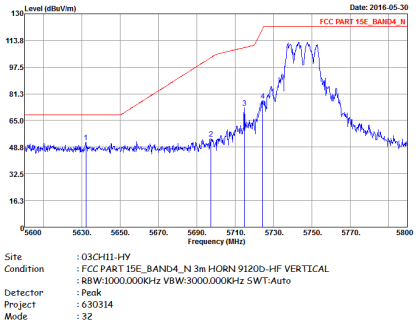
Appendix C. Radiated Spurious Emission Plots

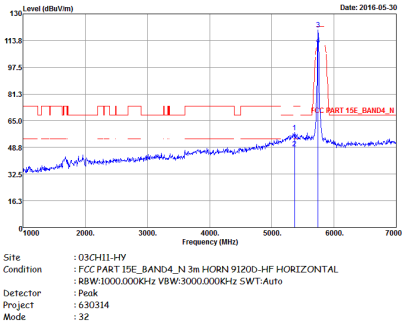
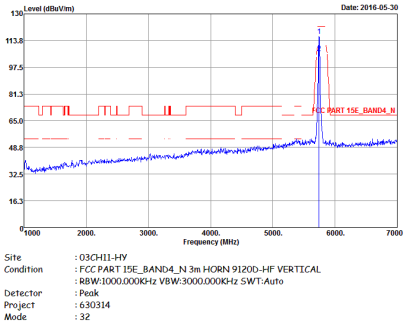
Note symbol

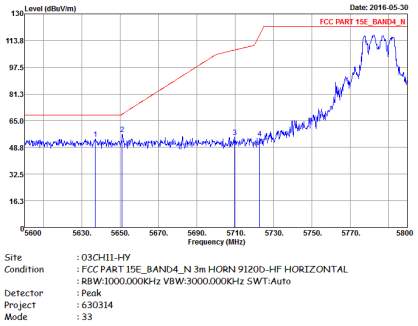
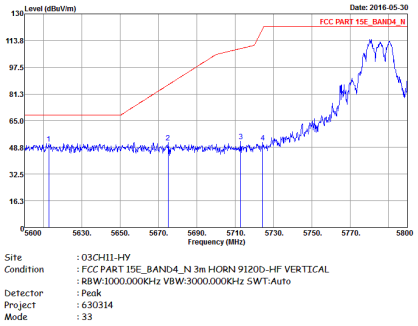
-L	**Low channel location**
-R	**High channel location**

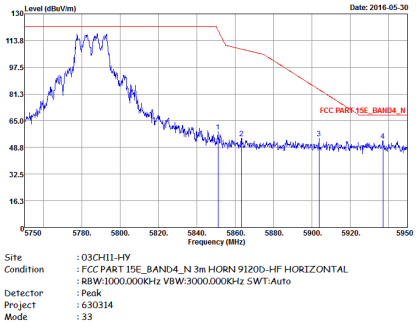
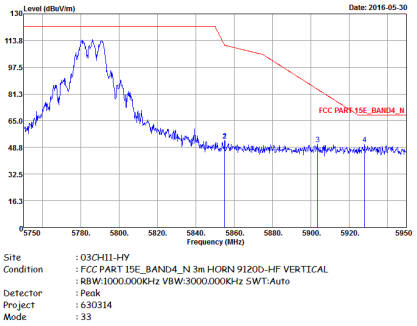
Band 4 - 5725~5850MHz

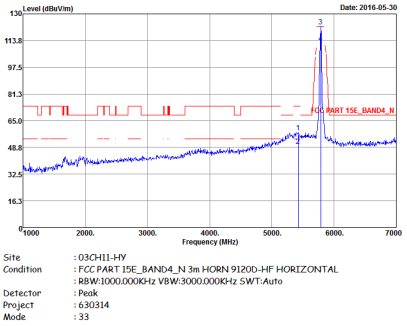
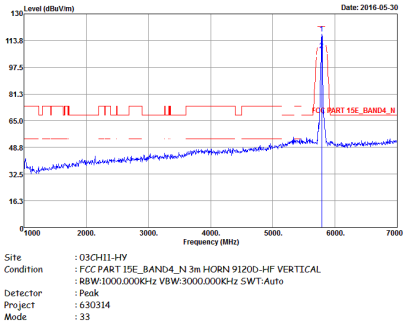
WIFI 802.11a (Band Edge @ 3m)

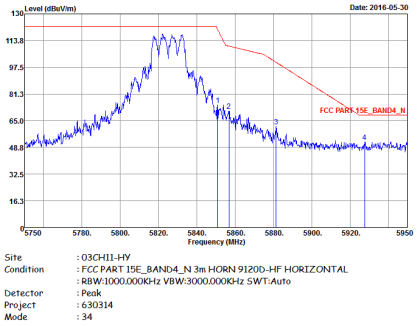
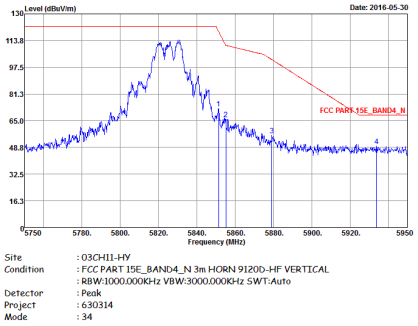
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
1+2	Horizontal	Vertical
Peak		

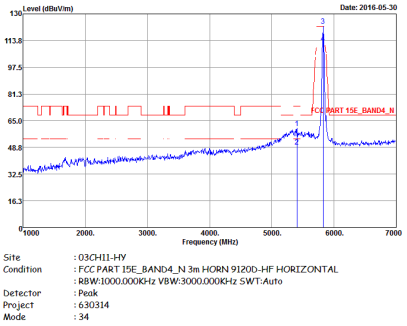
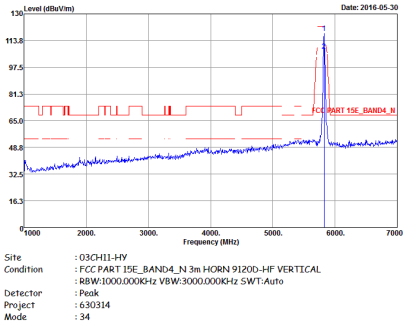
WIFI	Band 4 5725~5850MHz Fundamental @ 3m	
ANT	802.11a CH149 5745MHz	
1+2	Horizontal	Vertical
Peak Avg.		

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz – L	
1+2	Horizontal	Vertical
Peak	 Site : 03CH11-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 630314 Mode : 33	 Site : 03CH11-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 630314 Mode : 33

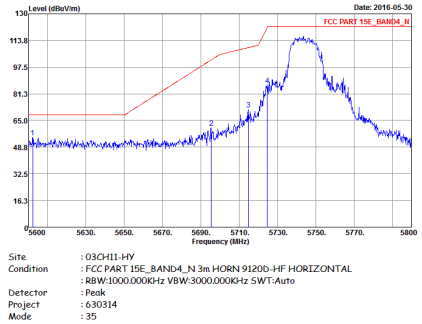
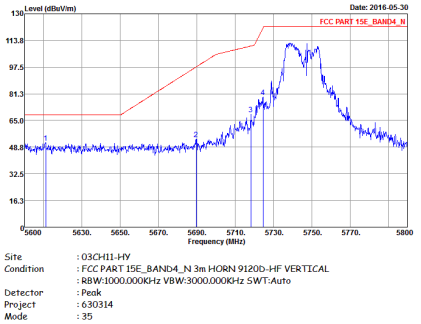
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz – R	
1+2	Horizontal	Vertical
Peak	 Site : 03CH11-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 630314 Mode : 33	 Site : 03CH11-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 630314 Mode : 33

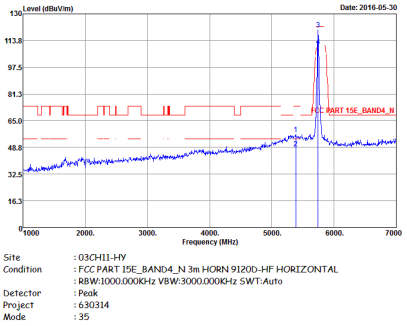
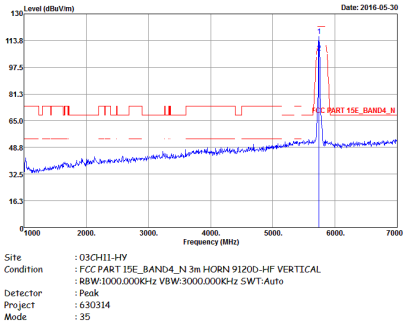
WIFI	Band 4 5725~5850MHz Fundamental @ 3m	
ANT	802.11a CH157 5785MHz	
1+2	Horizontal	Vertical
Peak Avg.		

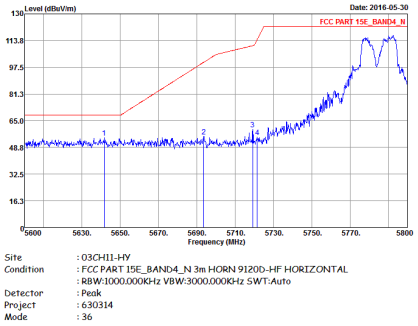
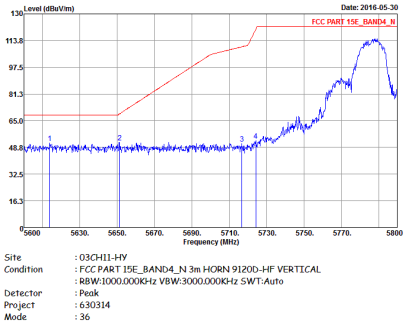
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
1+2	Horizontal	Vertical
Peak		

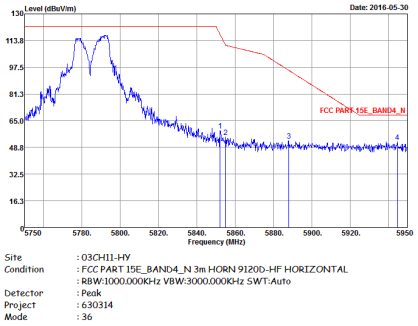
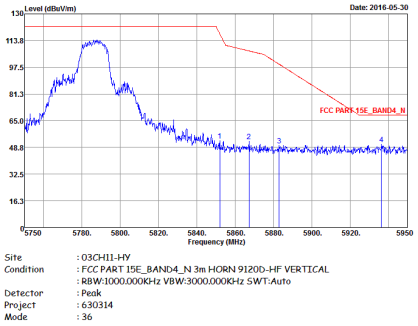
WIFI	Band 4 5725~5850MHz Fundamental @ 3m	
ANT	802.11a CH165 5825MHz	
1+2	Horizontal	Vertical
Peak Avg.		

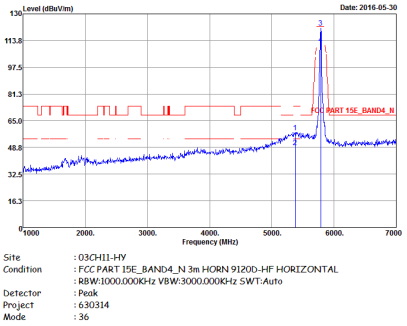
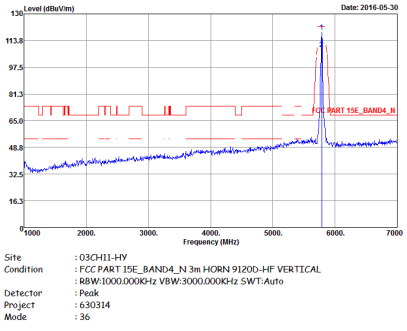
Band 4 5725~5850MHz
WIFI 802.11n HT20 (Band Edge @ 3m)

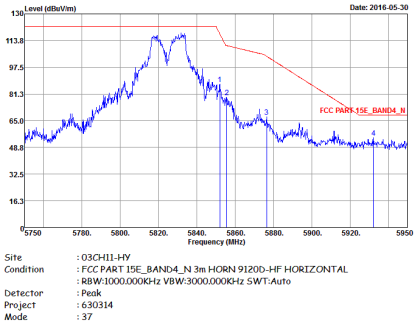
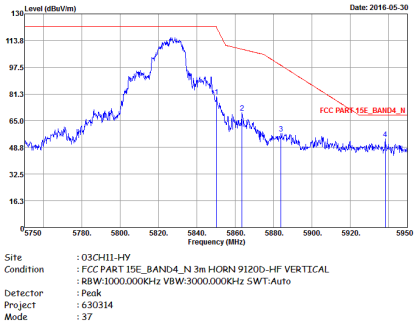
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1+2	Horizontal	Vertical
Peak		

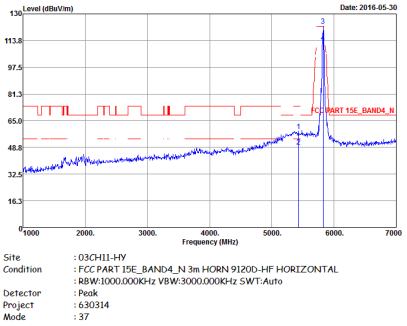
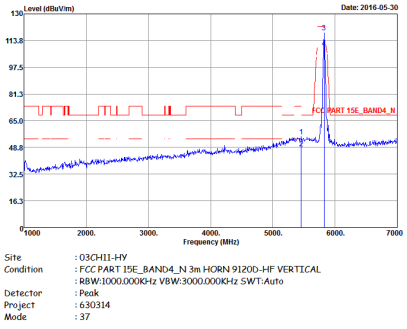
WIFI	Band 4 5725~5850MHz Fundamental @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1+2	Horizontal	Vertical
Peak Avg.		

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz - L	
1+2	Horizontal	Vertical
Peak	 Site : 03CH11-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 630314 Mode : 36	 Site : 03CH11-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 630314 Mode : 36

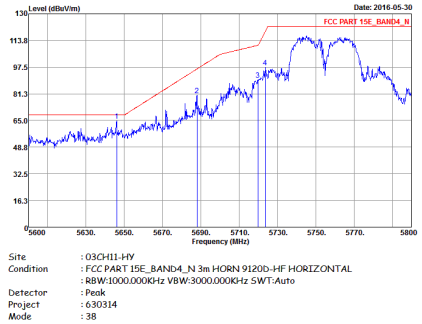
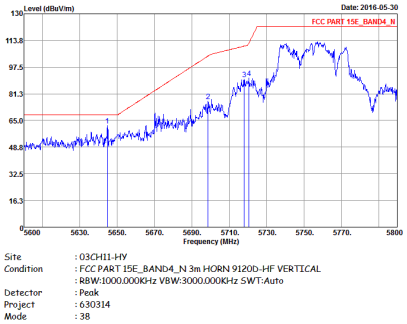
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz - R	
1+2	Horizontal	Vertical
Peak		

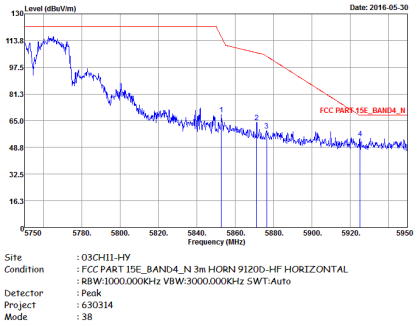
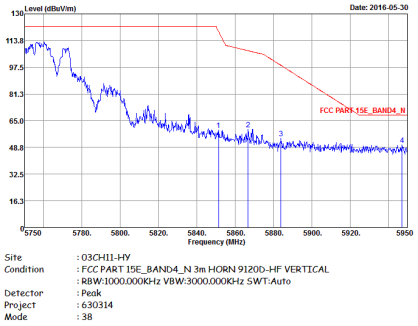
WIFI	Band 4 5725~5850MHz Fundamental @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1+2	Horizontal	Vertical
Peak Avg.		

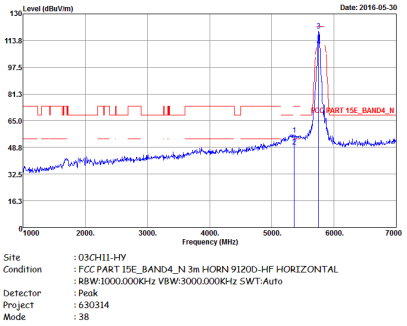
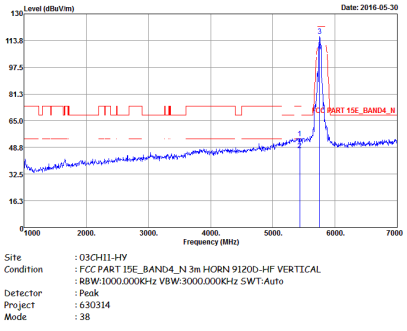
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1+2	Horizontal	Vertical
Peak		

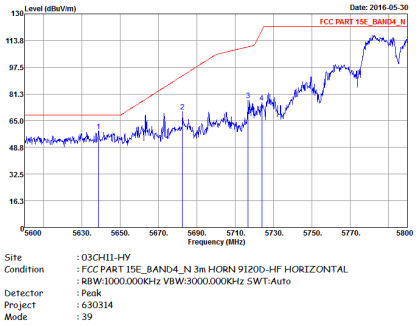
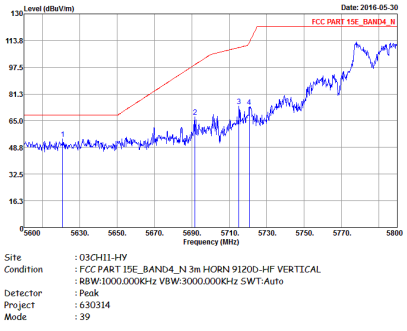
WIFI	Band 4 5725~5850MHz Fundamental @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1+2	Horizontal	Vertical
Peak Avg.		

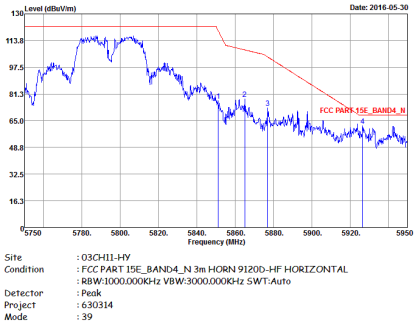
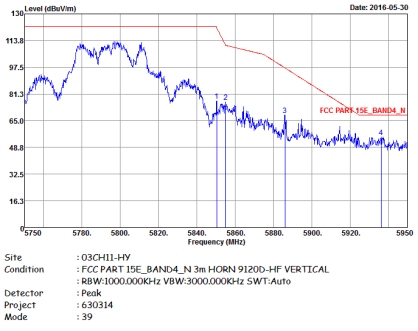
Band 4 5725~5850MHz
WIFI 802.11n HT40 (Band Edge @ 3m)

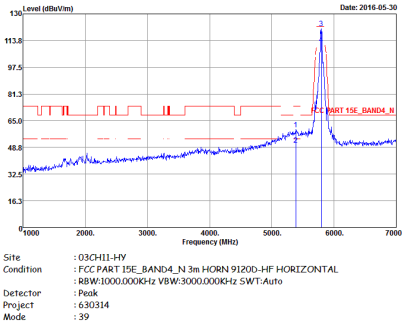
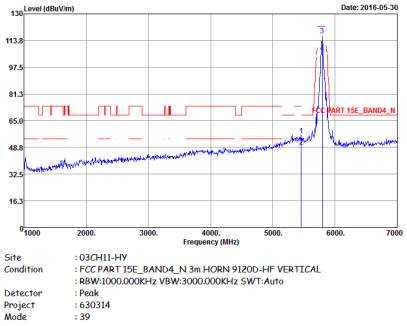
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz - L	
1+2	Horizontal	Vertical
Peak		

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz - R	
1+2	Horizontal	Vertical
Peak	 Site : 03CH11-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 630314 Mode : 38	 Site : 03CH11-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL : RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak Project : 630314 Mode : 38

WIFI	Band 4 5725~5850MHz Fundamental @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1+2	Horizontal	Vertical
Peak Avg.		

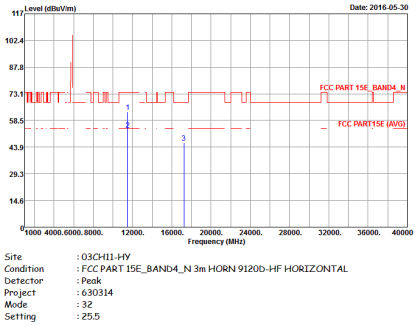
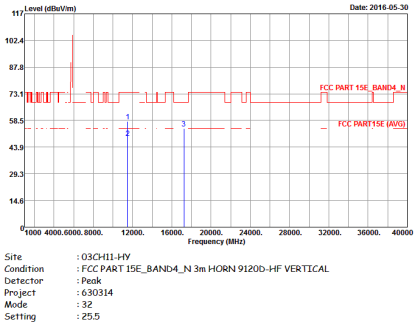
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz - L	
1+2	Horizontal	Vertical
Peak		

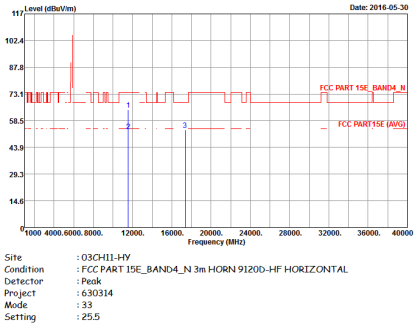
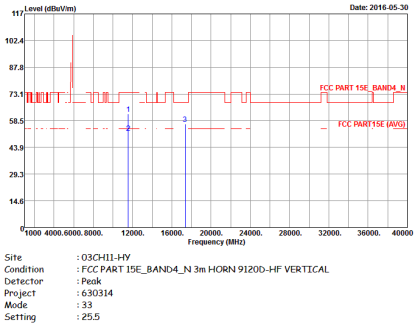
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz - R	
1+2	Horizontal	Vertical
Peak		

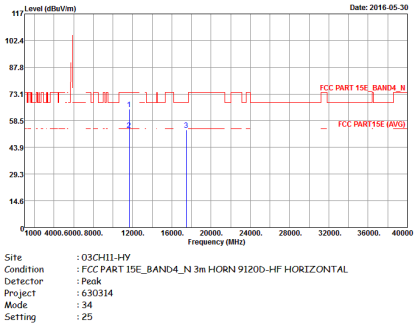
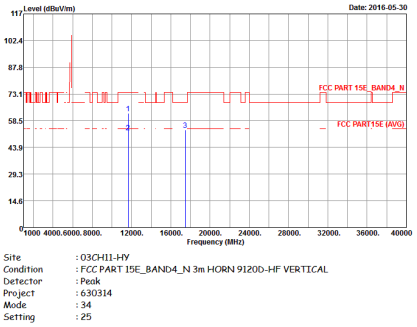
WIFI	Band 4 5725~5850MHz Fundamental @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1+2	Horizontal	Vertical
Peak Avg.		

Band 4 - 5725~5850MHz

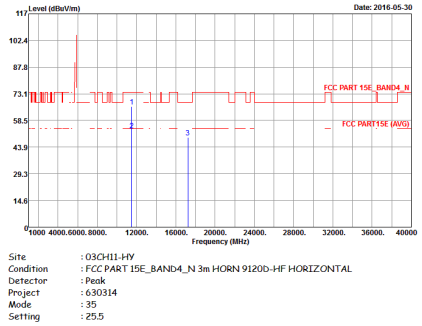
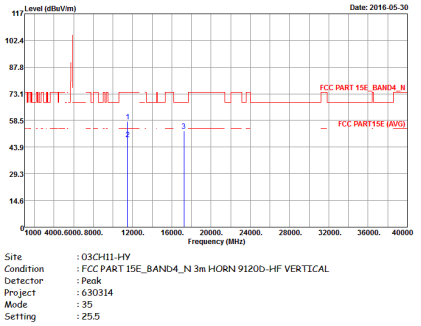
WIFI 802.11a (Harmonic @ 3m)

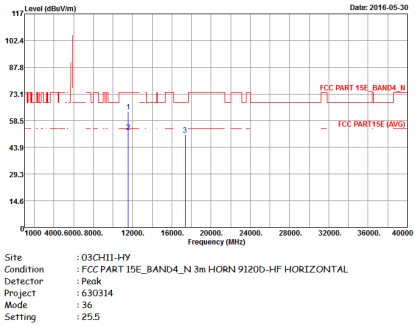
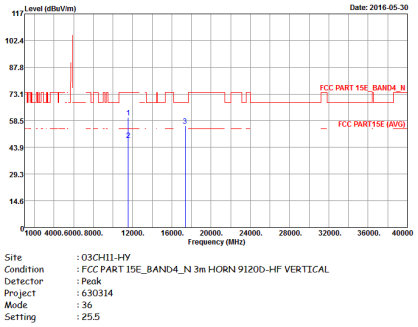
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH149 5745MHz	
1+2	Horizontal	Vertical
Peak Avg.		

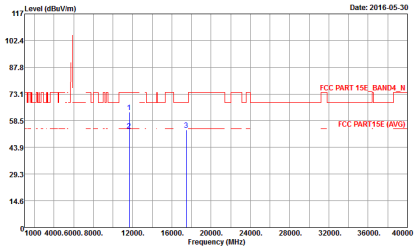
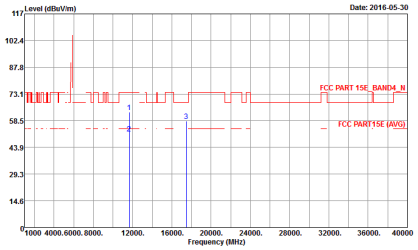
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH157 5785MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH11-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL Detector : Peak Project : 630314 Mode : 33 Setting : 25.5	 Site : 03CH11-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL Detector : Peak Project : 630314 Mode : 33 Setting : 25.5

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH165 5825MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH11-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL Detector : Peak Project : 630314 Mode : 34 Setting : 25	 Site : 03CH11-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL Detector : Peak Project : 630314 Mode : 34 Setting : 25

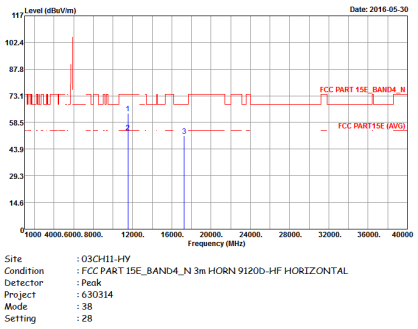
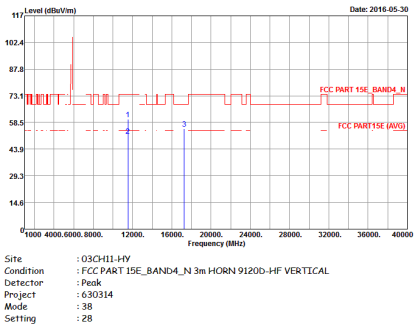
Band 4 5725~5850MHz
WIFI 802.11n HT20 (Harmonic @ 3m)

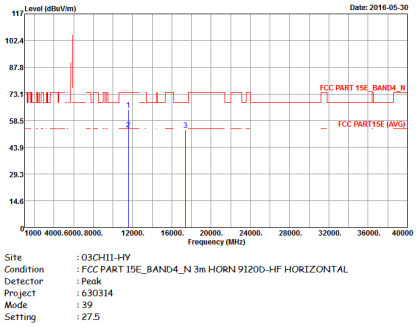
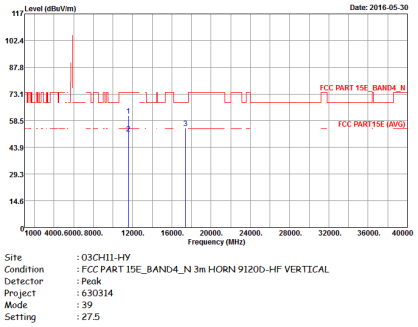
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1+2	Horizontal	Vertical
Peak Avg.		

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH11-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL Detector : Peak Project : 630314 Mode : 36 Setting : 25.5	 Site : 03CH11-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL Detector : Peak Project : 630314 Mode : 36 Setting : 25.5

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH11-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL Detector : Peak Project : 630314 Mode : 37 Setting : 26.5	 Site : 03CH11-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL Detector : Peak Project : 630314 Mode : 37 Setting : 26.5

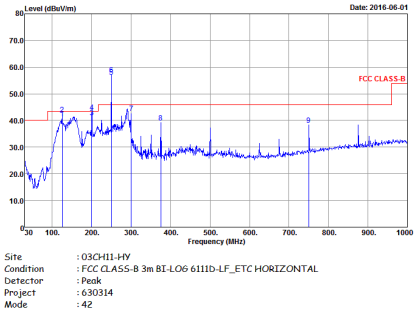
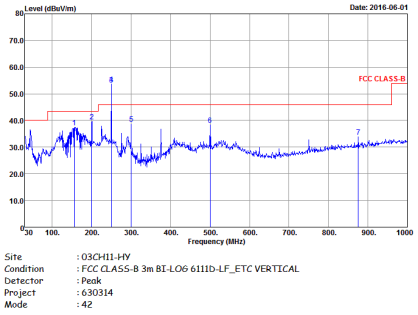
Band 4 5725~5850MHz
WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH11-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL Detector : Peak Project : 630314 Mode : 38 Setting : 28	 Site : 03CH11-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL Detector : Peak Project : 630314 Mode : 38 Setting : 28

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH11-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL Detector : Peak Project : 630314 Mode : 39 Setting : 27.5	 Site : 03CH11-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL Detector : Peak Project : 630314 Mode : 39 Setting : 27.5

Emission below 1GHz

5GHz WIFI 802.11n HT40 (LF)

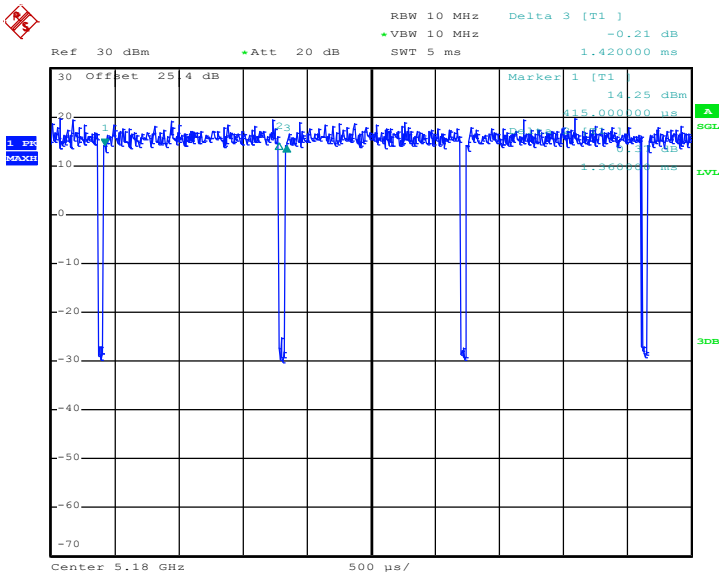
WIFI	5GHz 5725~5850MHz	
ANT	802.11n HT40 LF	
1+2	Horizontal	Vertical
QP / Peak		

Appendix D. Duty Cycle Plots

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
1+2	802.11a for Ant 1	95.77	1360	0.74	1kHz
1+2	802.11a for Ant 2	96.45	1360	0.74	1kHz
1+2	5GHz 802.11n HT20 for Ant 1	96.21	1270	0.79	1kHz
1+2	5GHz 802.11n HT20 for Ant 2	95.49	1270	0.79	1kHz
1+2	5GHz 802.11n HT40 for Ant 1	94.58	628	1.59	3kHz
1+2	5GHz 802.11n HT40 for Ant 2	94.58	628	1.59	3kHz

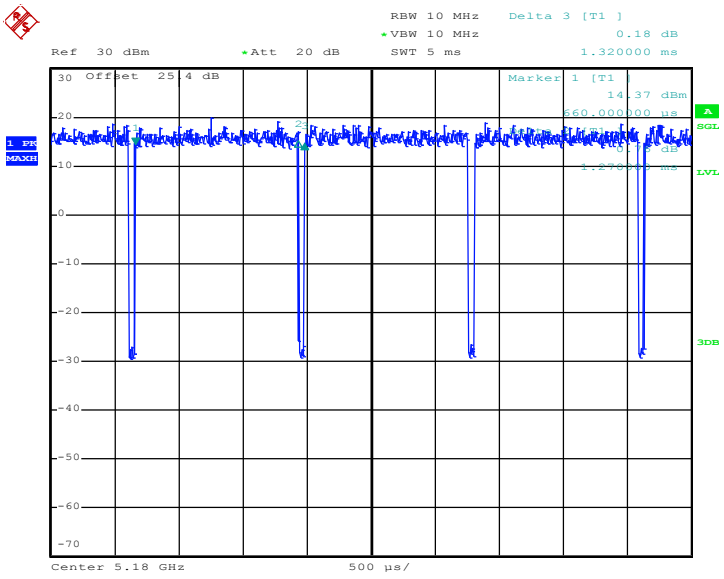
MIMO <Ant. 1+2(1)>

802.11a



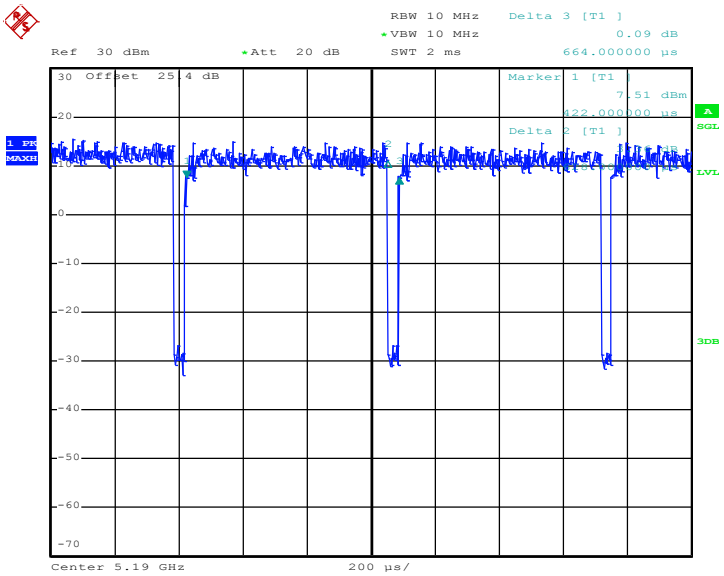
Date: 7.MAR.2016 15:08:05

802.11n HT20



Date: 7.MAR.2016 15:15:09

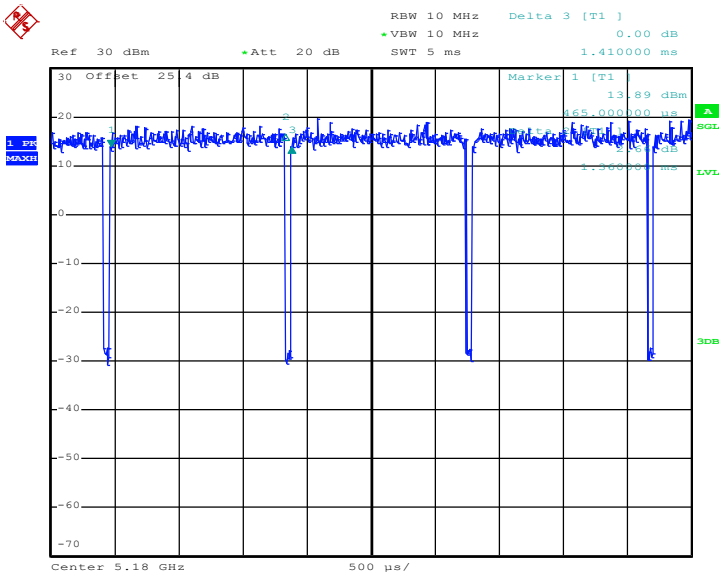
802.11n HT40



Date: 7.MAR.2016 15:18:55

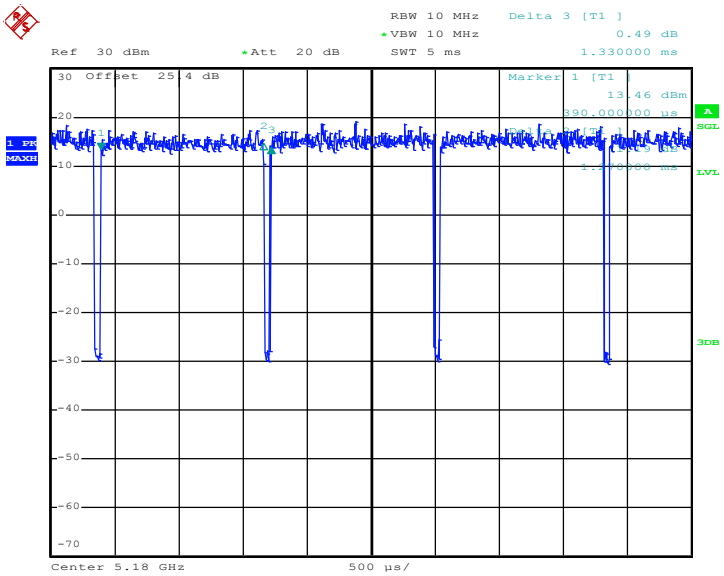
MIMO <Ant. 1+2(2)>

802.11a



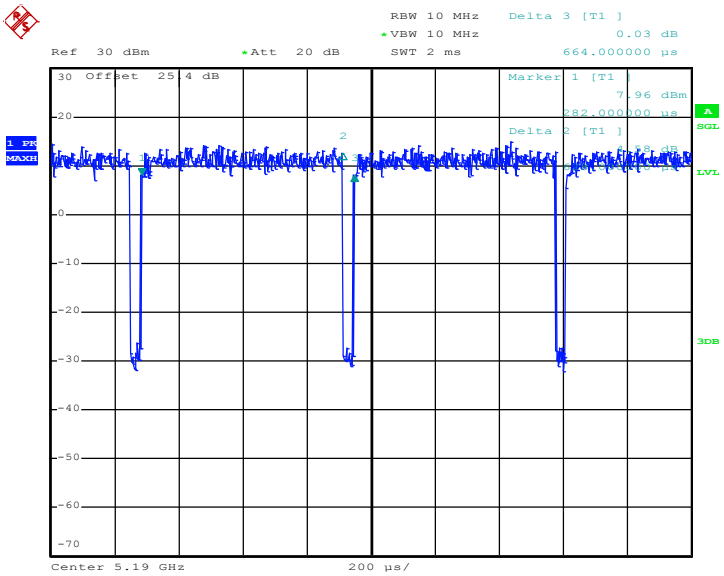
Date: 7.MAR.2016 15:13:05

802.11n HT20



Date: 7.MAR.2016 15:15:52

802.11n HT40



Date: 7.MAR.2016 15:19:34