



FCC RF Test Report

APPLICANT : Hewlett Packard Enterprise Company
EQUIPMENT : Wireless Access Point
BRAND NAME : aruba
MODEL NAME : APIN0207
FCC ID : Q9DAPIN0207
STANDARD : FCC Part 15 Subpart E §15.407
CLASSIFICATION : (NII) Unlicensed National Information Infrastructure

The product was received on Apr. 27, 2016 and testing was completed on Jul. 20, 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



SPORTON INTERNATIONAL INC.

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR671301C	Rev. 01	Initial issue of report	Sep. 08, 2016
FR671301C	Rev. 02	Revising the Normal Voltage for POE in section 1.9	Sep. 23, 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	≤ 30 dBm	Pass	-
3.3	15.407(a)	Power Spectral Density	≤ 17 dBm	Pass	-
3.4	15.407(b)	Unwanted Emissions	$\leq -17, -27$ dBm &15.209(a)	Pass	Under limit 0.17 dB at 5149.850 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 13.50 dB at 0.166 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

Hewlett Packard Enterprise Company
3000 Hanover Street, Palo Alto, CA 94304

1.2 Manufacturer

Hewlett Packard Enterprise Company
3000 Hanover Street, Palo Alto, CA 94304

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Wireless Access Point
Brand Name	aruba
Model Name	APIN0207
FCC ID	Q9DAPIN0207
S/N	DX0000017 (for RF Conducted and Radiation) DX0000061 (for Conduction)
EUT supports Radios application	WLAN 11a/b/g/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 Bluetooth v4.0 LE
SW Version	6.5.1.0 build 55812
EUT Stage	Identical Prototype

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

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification			
Tx/Rx Channel Frequency Range		5180 MHz ~ 5240 MHz	
Maximum Output Power <Non-TXBF Modes>		<5180 MHz ~ 5240 MHz> MIMO <Ant. Port 1+2> 802.11a : 21.00 dBm / 0.1259 W 802.11n HT20 : 21.25 dBm / 0.1334 W 802.11n HT40 : 21.28 dBm / 0.1343 W 802.11ac VHT20: 21.04 dBm / 0.1271 W 802.11ac VHT40: 21.05 dBm / 0.1274 W 802.11ac VHT80: 17.41 dBm / 0.0551 W	
Maximum Output Power <TXBF Modes>		<5180 MHz ~ 5240 MHz> MIMO <Ant. Port 1+2> 802.11n HT20 : 20.96 dBm / 0.1247 W 802.11n HT40 : 21.11 dBm / 0.1291 W 802.11ac VHT20: 20.93 dBm / 0.1239 W 802.11ac VHT40: 21.02 dBm / 0.1265 W 802.11ac VHT80: 17.31 dBm / 0.0538 W	
99% Occupied Bandwidth <Non-TXBF Modes>		802.11a : 18.50 MHz 802.11n HT20 : 19.45 MHz 802.11n HT40 : 36.90 MHz 802.11ac VHT20 : 19.50 MHz 802.11ac VHT40 : 37.10 MHz 802.11ac VHT80 : 75.96 MHz	
99% Occupied Bandwidth <TXBF Modes>		802.11n HT20 : 18.85 MHz 802.11n HT40 : 36.70 MHz 802.11ac VHT20 : 19.05 MHz 802.11ac VHT40 : 36.70 MHz 802.11ac VHT80 : 75.60 MHz	
Type of Modulation		802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)	
Antenna Type		PIFA Antenna	
Antenna Gain		Antenna 1: 4.50 dBi Antenna 2: 4.50 dBi	
Antenna Function Description			
		802.11 a/n/ac MIMO	Ant. 1 V Ant. 2 V

1.5 Modification of EUT

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

1.6 Specification of Accessory

Specification of Accessory				
AC Adapter	Brand Name	CUI INC	Model Name	EMSA120300
	Power Rating	I/P: 100-240Vac, 1A, O/P: 12Vdc, 1.5A		
Power over Ethernet (POE) DC Power	Brand Name	PowerDsine	Model Name	PD-3501G/AC
	Power Rating	I/P: 100-240Vac, 0.43A, O/P: 57Vdc, 600mA		

1.7 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 1 st 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.		
	03CH10-HY		

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

1.8 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 v01r03
- ♦ FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ♦ 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.

1.9 Test Condition

Normal Voltage	DC 12V for Adapter DC 57V for POE
Normal Temperature	25°C
Extreme Temperature	0°C and 50°C

Note: The test temperature was between 0°C ~ 50°C by manufacturer requested.



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.

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 2.2.

2.1 Carrier Frequency and 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 Test Mode

Final test mode of conducted test items and radiated spurious emissions are considering the modulation and worse data rates as below table.

<Non-TXBF Modes>

Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20	MCS8
802.11n HT40	MCS8
802.11ac VHT20	MCS0, Nss = 2
802.11ac VHT40	MCS0, Nss = 2
802.11ac VHT80	MCS0, Nss = 2

Note: EUT does not support 802.11ac Nss = 1 for non-TXBF modes.

<TXBF Modes>

Modulation	Data Rate
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT20	MCS0, Nss = 1
802.11ac VHT40	MCS0, Nss = 1
802.11ac VHT80	MCS0, Nss = 1

Test Cases	
AC Conducted Emission	Mode 1 : Bluetooth Link + WLAN (5GHz) Link + LAN Link + AC Adapter Mode 2 : Bluetooth Link + WLAN (5GHz) Link + LAN Link + PoE Adapter
Remark: The worst case of conducted emission is mode 1; only the test data of it was reported.	

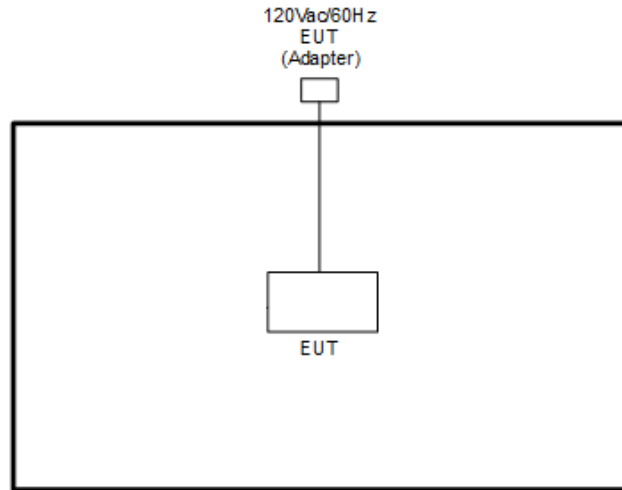


Ch. #		Band I : 5150-5250 MHz	Band I : 5150-5250 MHz	Band I : 5150-5250 MHz
		802.11a	802.11n HT20	802.11n HT40
L	Low	36	36	38
M	Middle	44	44	-
H	High	48	48	46

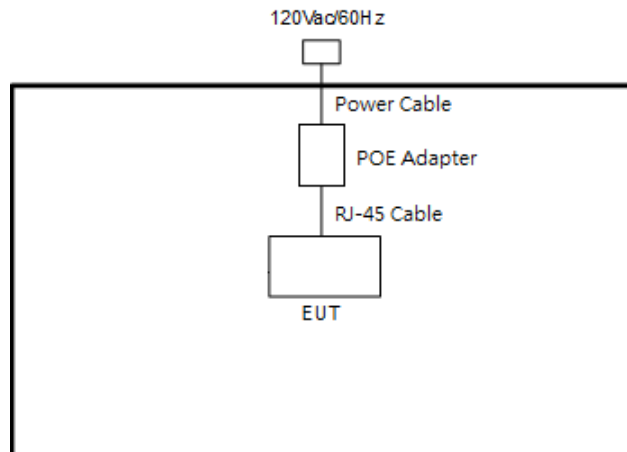
Ch. #		Band I : 5150-5250 MHz	Band I : 5150-5250 MHz	Band I : 5150-5250 MHz
		802.11ac VHT20	802.11ac VHT40	802.11ac VHT80
L	Low	36	38	-
M	Middle	44	-	42
H	High	48	46	-

2.3 Connection Diagram of Test System

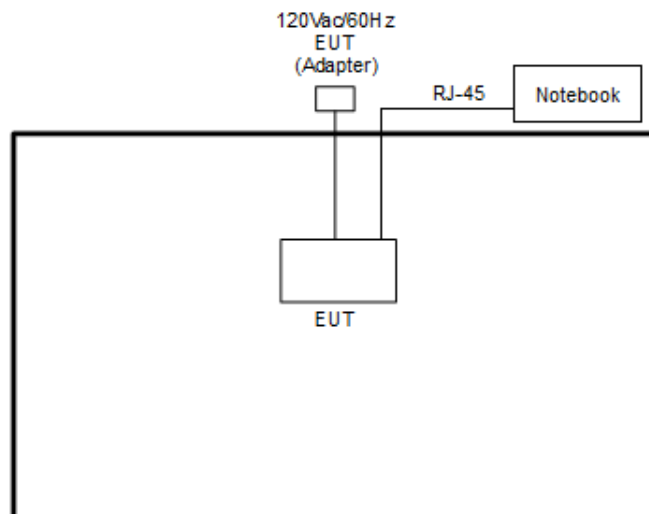
<WLAN Tx Non-TXBF Mode with AC Adapter>



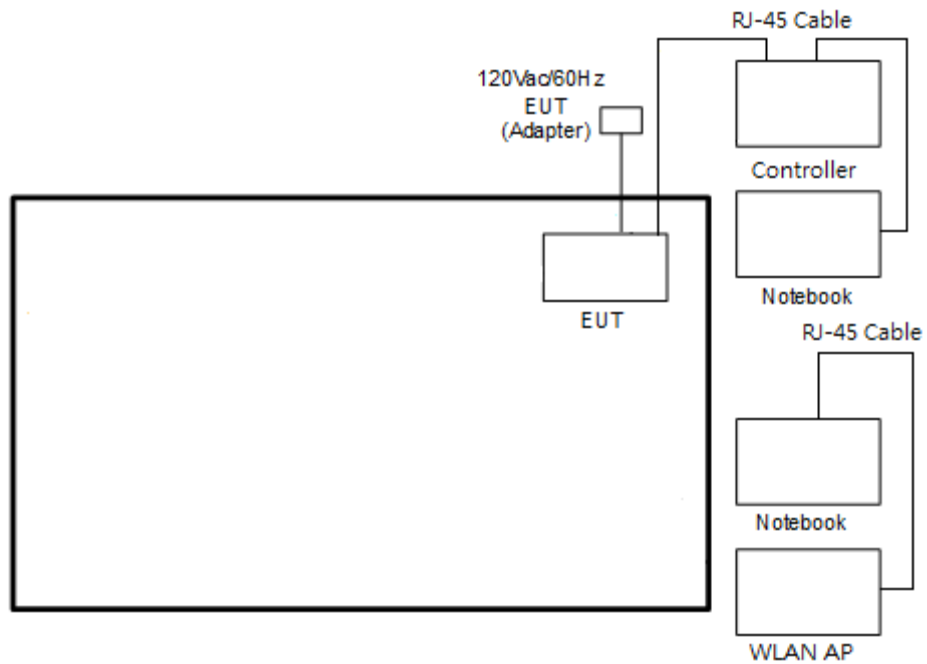
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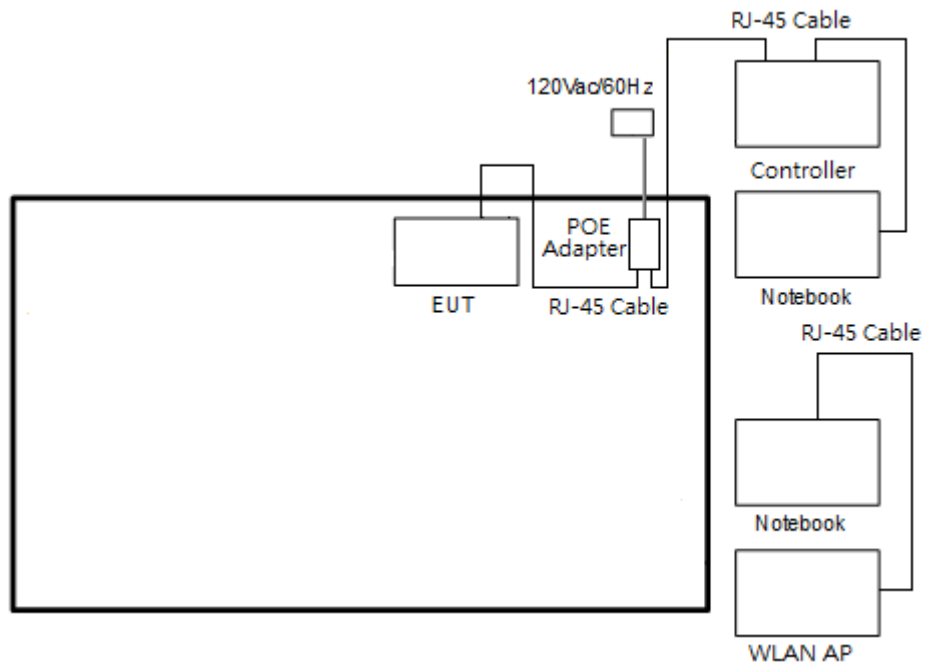
<WLAN Tx TXBF Mode>



<AC Conducted Emission with AC Adapter Mode>



<AC Conducted Emission with PoE Adapter Mode>



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Notebook	DELL	P20G	FCC DoC/ Contains FCC ID: QDS-BRCM1051	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 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.	Notebook	Lenovo	80Q7	PPD-QCNFA435	N/A	AC I/P: Unshielded, 1.2 m DC O/P: Shielded, 1.8 m
4.	PoE	Microsemi	PD-3501G	FCC DoC	N/A	Unshielded, 1.2 m
5.	Controller	ARUBA	ARCN7030	Verification	N/A	Unshielded, 1.2 m
6.	WLAN AP	ARUBA	APIN0207	N/A	N/A	Unshielded, 1.6 m

2.5 EUT Operation Test Setup

For Non-TXBF modes, programmed RF utility, "MTool(Version: 2.0.3.2)" installed in the notebook make the EUT provide functions like channel selection and power level for continuous transmitting and receiving signals.

For WLAN MIMO TXBF modes, the EUT was tested under normal operation and link to another EUT with power, modulation modes and data rates controlled by engineer mode command lines. The iperf software tool was used to make EUT continuous transmitting signals.

2.6 Measurement Results Explanation Example

For all conducted test items:

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

Example:

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

Offset = RF cable loss + attenuator factor.

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

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

$$= 4.2 + 10 = 14.2 \text{ (dB)}$$

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.

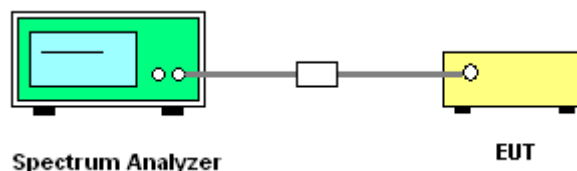
3.1.2 Measuring Instruments

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 v01r03. Section C) Emission bandwidth
2. Set RBW = approximately 1% of the emission bandwidth.
3. Set the VBW > RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
7. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1MHz and set the Video bandwidth (VBW) $\geq 3 * \text{RBW}$.
8. Measure and record the results in the test report.

3.1.4 Test Setup

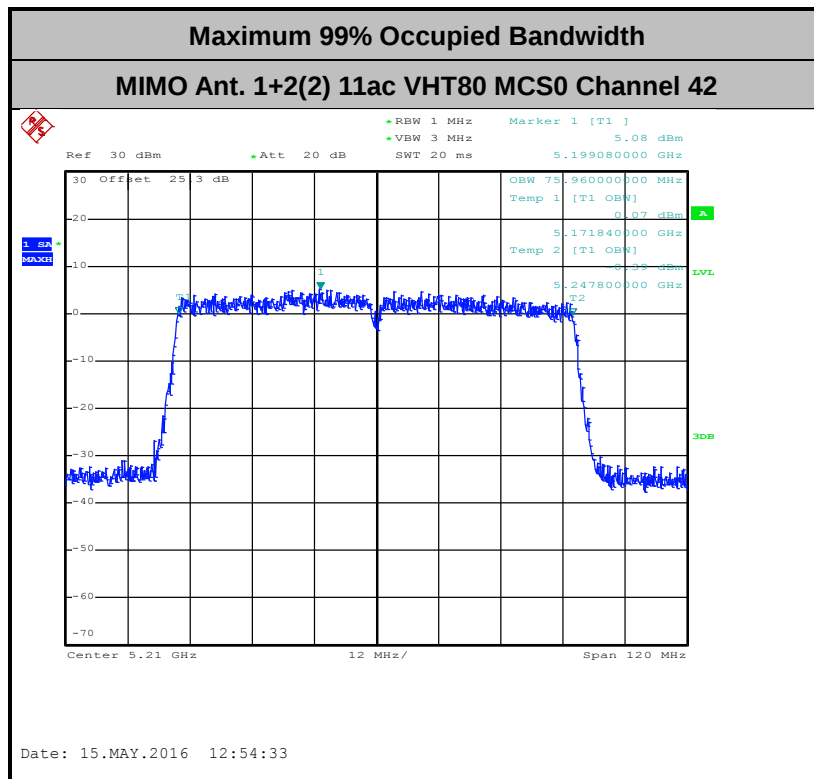
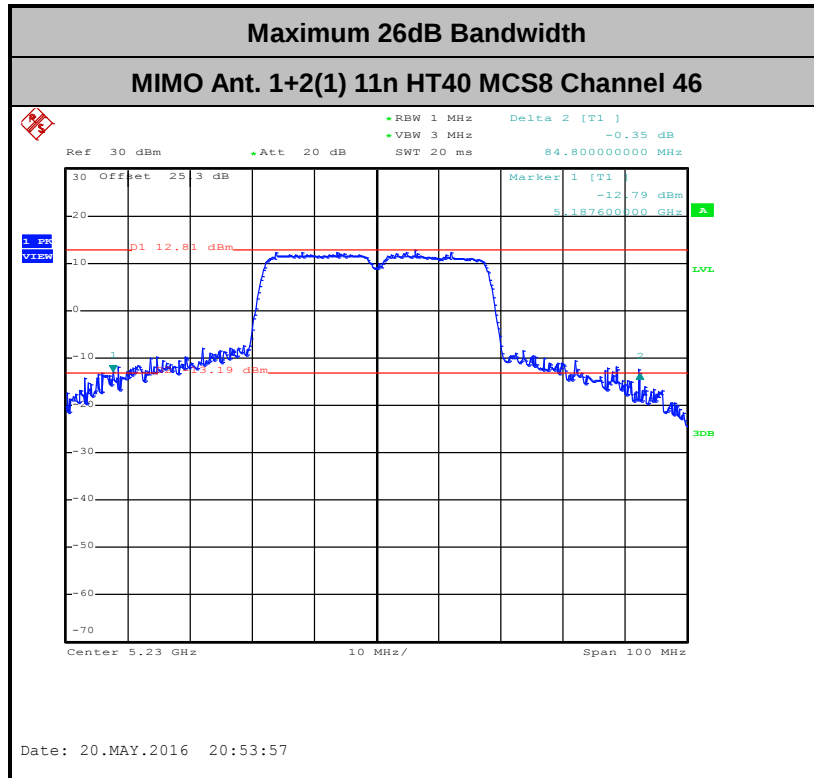


3.1.5 Test Result of 26dB & 99% Occupied Bandwidth

Please refer to Appendix A.

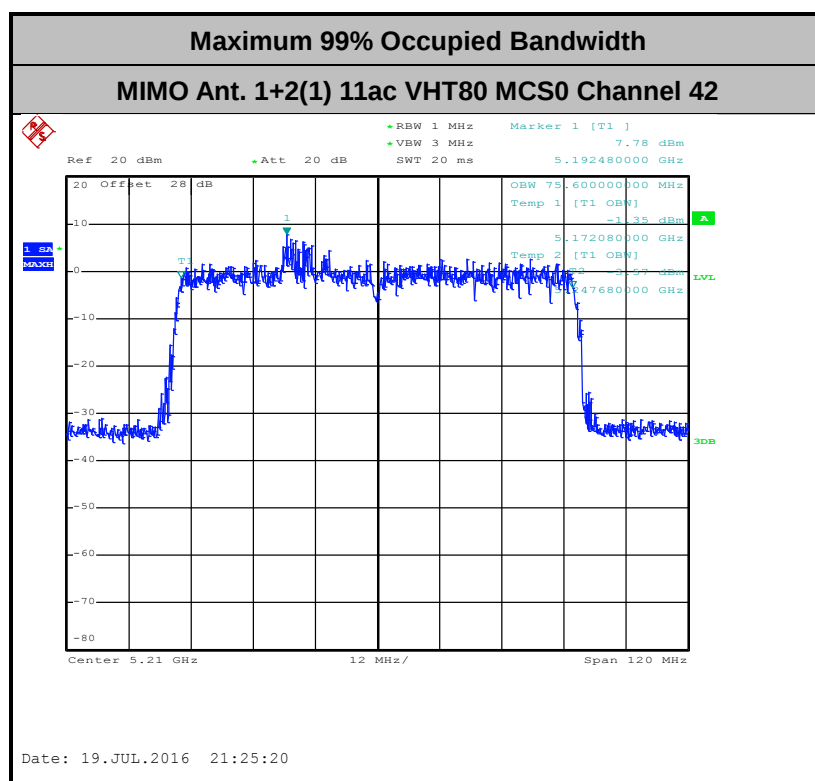
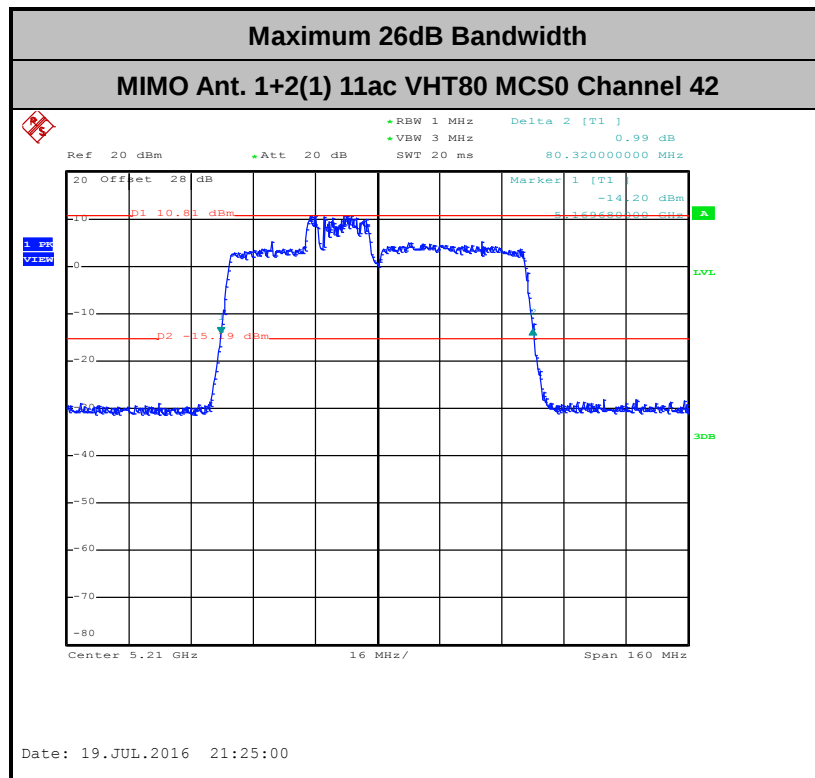


< Non-TXBF Modes>



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

<TXBF Modes>



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 an indoor access point operating in the band 5.15-5.25 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

Non-TXBF modes

The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r03 for Non-TXBF modes.

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.

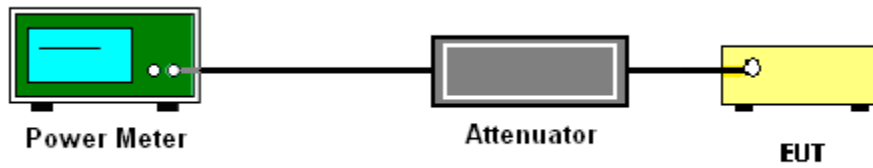
TXBF modes

The testing follows Method PM-G of FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r03 for TXBF modes.

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

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

3.2.4 Test Setup



3.2.5 Test Result of Maximum Conducted Output Power

Please refer to Appendix A.



3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm 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 v01r03.

Section F) Maximum power spectral density.

Non-TXBF modes

Method SA-2

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

- Measure the duty cycle.
- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 1 MHz.
- Set VBW $\geq$ 3 MHz.
- Number of points in sweep $\geq$ 2 Span / RBW.
- Sweep time = auto.
- Detector = RMS
- Trace average at least 100 traces in power averaging mode.
- Add $10 \log(1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times. For example, add $10 \log(1/0.25) = 6$ dB if the duty cycle is 25 percent.

TXBF modes

Method SA-3

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

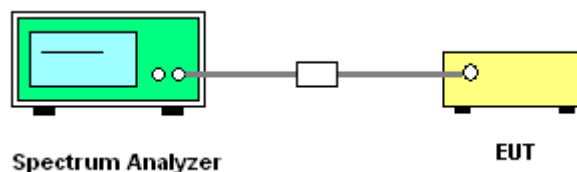
- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 1 MHz.
- Set VBW $\geq$ 3 MHz
- Number of points in sweep $\geq$ 2 Span / RBW.
- Sweep time $\leq$ (number of points in sweep) $\times$ T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
- Detector = power averaging (rms).
- Trace mode = max hold.
- Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.

1. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
2. Each plot has already offset with cable loss, and attenuator loss. Measure the PSD and record it.
3. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

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

The total final Power Spectral Density is from a device with all 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, output 3 and output 4 to obtain the value for the first frequency bin of the summed spectrum.

3.3.4 Test Setup

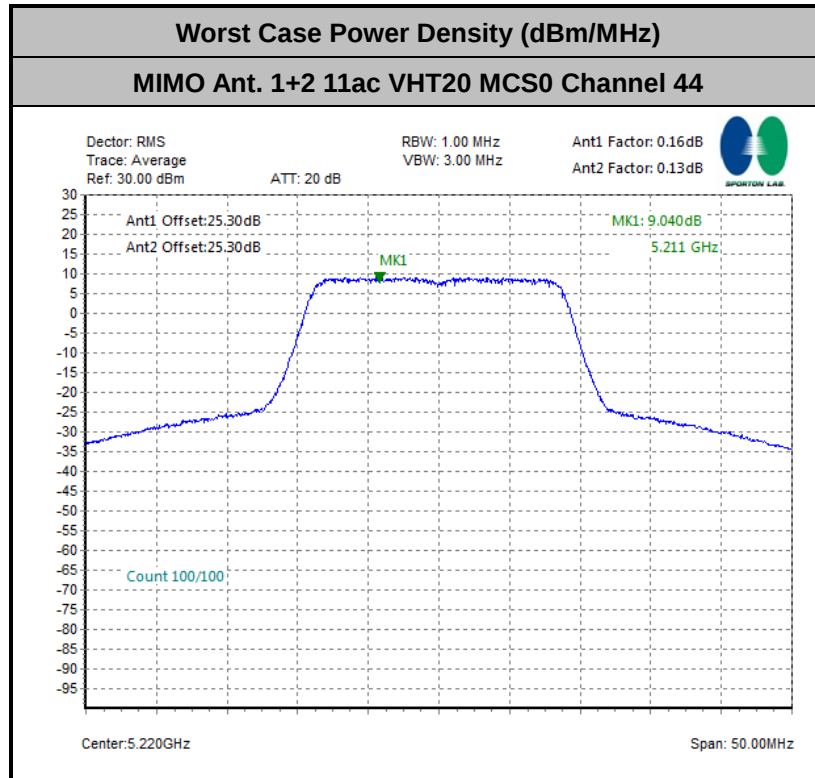


3.3.5 Test Result of Power Spectral Density

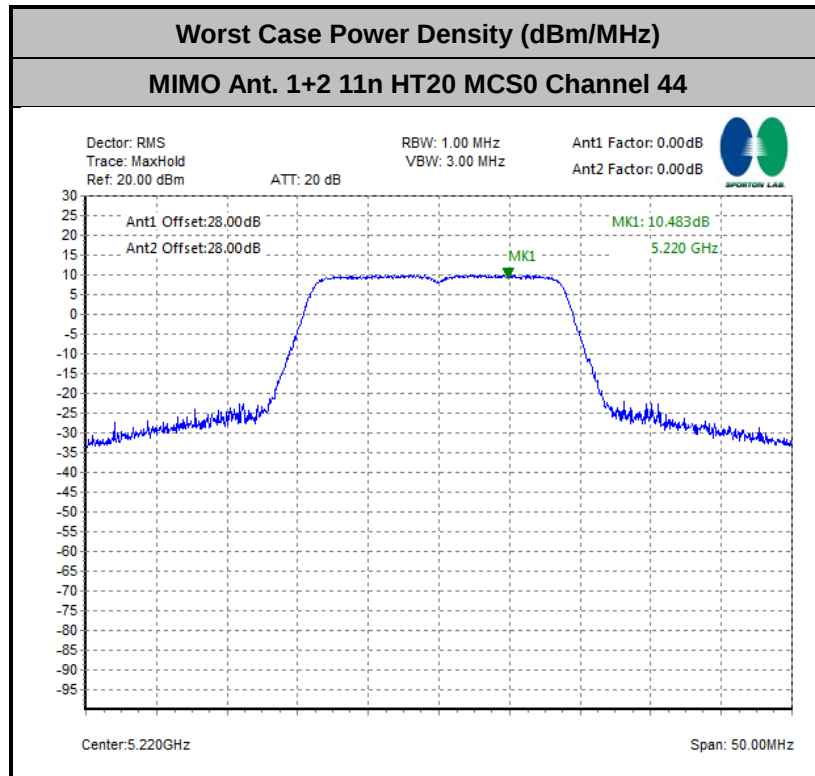
Please refer to Appendix A.



<Non-TXBF Modes>



<TXBF Modes>



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 Part 15.205.

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 Part 15.205 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.

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

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

- (3) KDB789033 D02 v01r03 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 v01r03.
Section G) Unwanted emissions measurement.

(1) Procedure for Unwanted Emissions Measurements Below 1000MHz

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

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

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

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

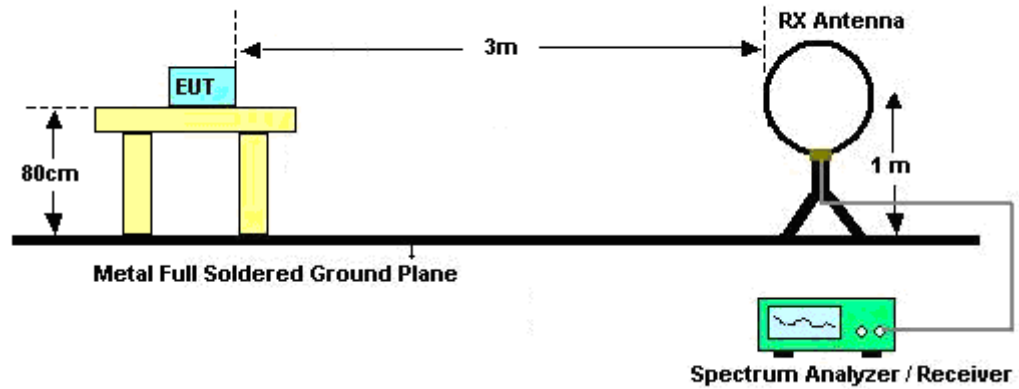
- RBW = 1 MHz
- VBW = 10 Hz, when duty cycle is no less than 98 percent.
- VBW $\geq$ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.



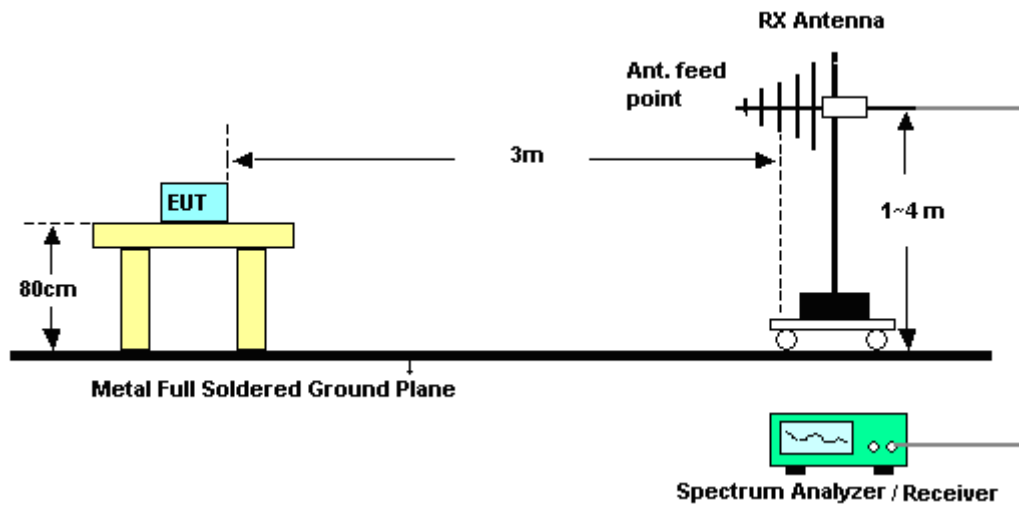
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband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

3.4.4 Test Setup

For radiated emissions below 30MHz

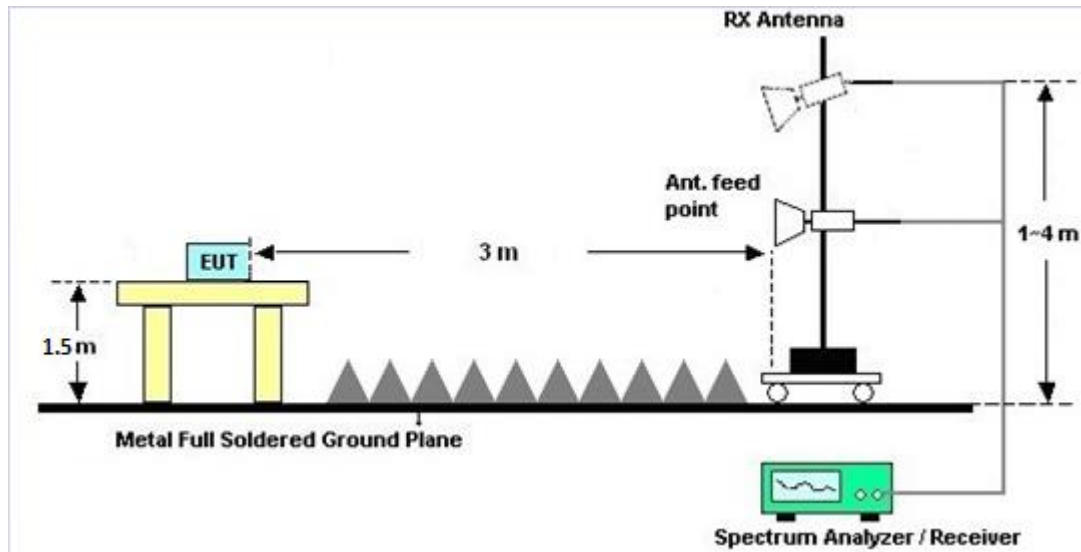


For radiated emissions from 30MHz to 1GHz

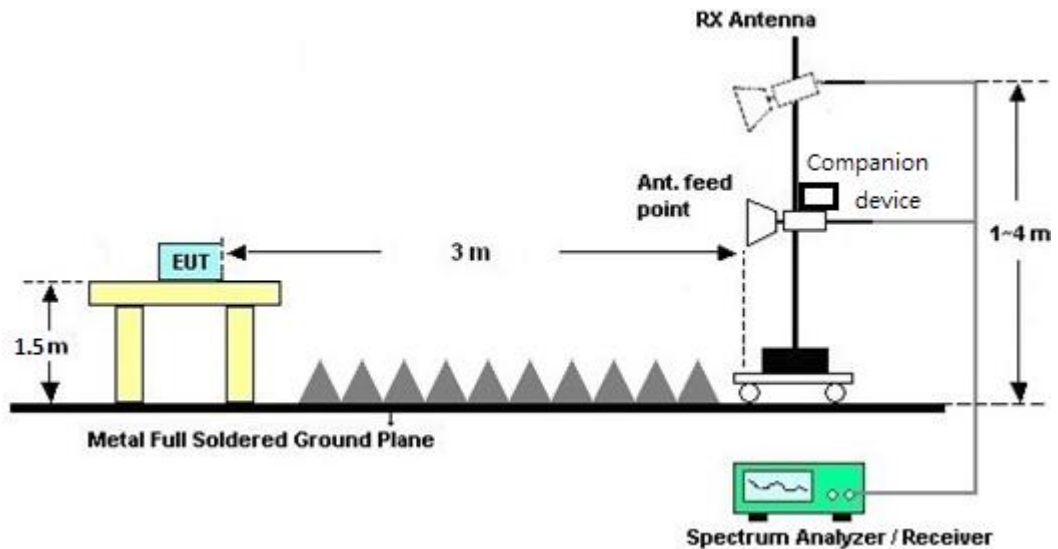


For radiated emissions above 1GHz

Non-TXBF mode



TXBF mode





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 (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

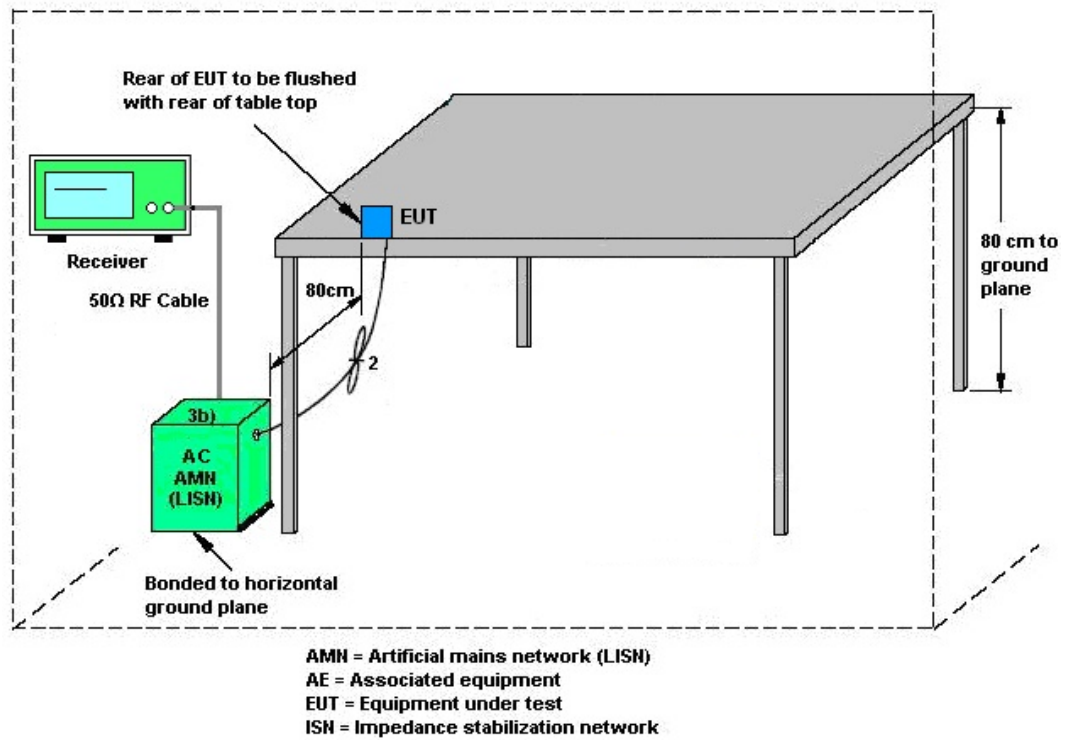
3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

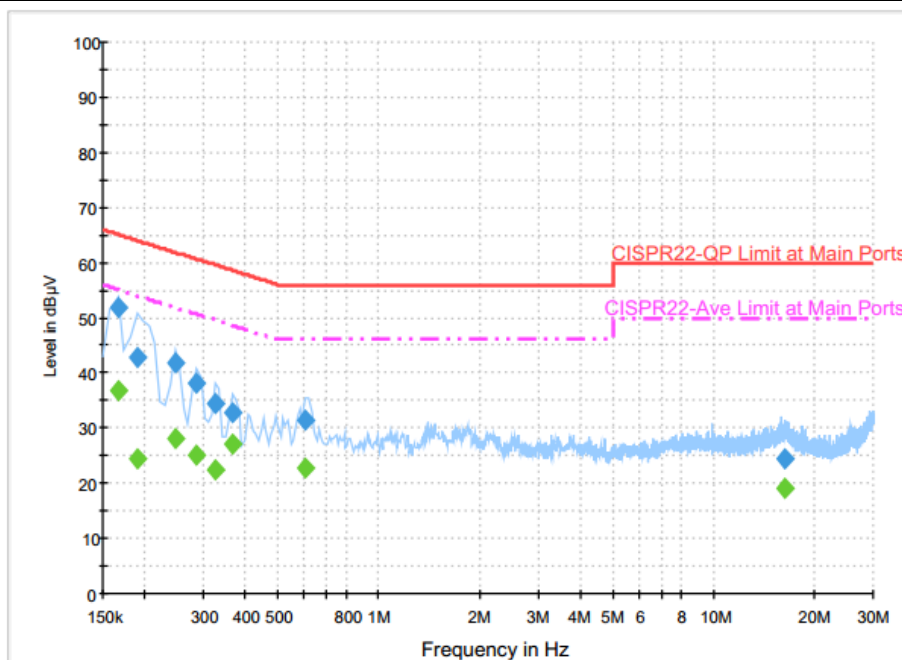
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.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

3.5.4 Test Setup



3.5.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	21~22°C
Test Engineer :	Derreck Chen	Relative Humidity :	51~52%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	Bluetooth Link + WLAN (5GHz) Link + LAN Link + AC Adapter		



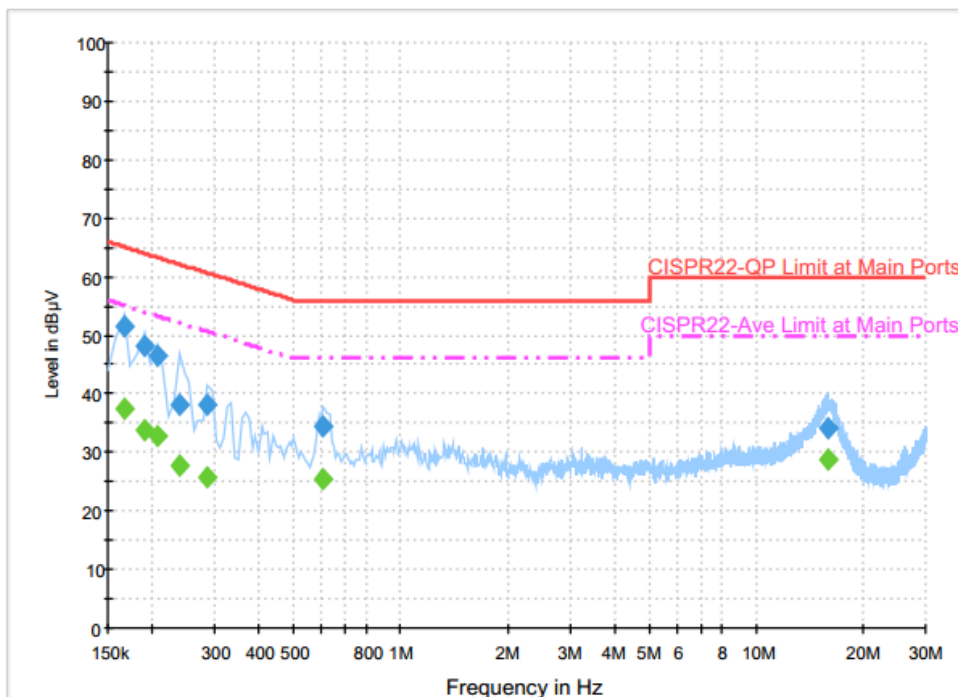
Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	51.7	Off	L1	19.6	13.5	65.2
0.190000	42.7	Off	L1	19.6	21.3	64.0
0.246000	41.8	Off	L1	19.6	20.1	61.9
0.286000	38.2	Off	L1	19.6	22.4	60.6
0.326000	34.4	Off	L1	19.6	25.2	59.6
0.366000	32.8	Off	L1	19.6	25.8	58.6
0.606000	31.6	Off	L1	19.6	24.4	56.0
16.390000	24.4	Off	L1	19.8	35.6	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	36.6	Off	L1	19.6	18.6	55.2
0.190000	24.3	Off	L1	19.6	29.7	54.0
0.246000	28.1	Off	L1	19.6	23.8	51.9
0.286000	24.9	Off	L1	19.6	25.7	50.6
0.326000	22.3	Off	L1	19.6	27.3	49.6
0.366000	27.0	Off	L1	19.6	21.6	48.6
0.606000	22.8	Off	L1	19.6	23.2	46.0
16.390000	18.9	Off	L1	19.8	31.1	50.0

Test Mode :	Mode 1	Temperature :	21~22°C
Test Engineer :	Derreck Chen	Relative Humidity :	51~52%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	Bluetooth Link + WLAN (5GHz) Link + LAN Link + AC Adapter		


Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	51.6	Off	N	19.6	13.6	65.2
0.190000	48.3	Off	N	19.6	15.7	64.0
0.206000	46.4	Off	N	19.6	17.0	63.4
0.238000	38.0	Off	N	19.6	24.2	62.2
0.286000	38.2	Off	N	19.6	22.4	60.6
0.606000	34.3	Off	N	19.6	21.7	56.0
15.926000	34.0	Off	N	19.9	26.0	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	37.3	Off	N	19.6	17.9	55.2
0.190000	33.9	Off	N	19.6	20.1	54.0
0.206000	32.8	Off	N	19.6	20.6	53.4
0.238000	27.9	Off	N	19.6	24.3	52.2
0.286000	25.9	Off	N	19.6	24.7	50.6
0.606000	25.3	Off	N	19.6	20.7	46.0
15.926000	28.8	Off	N	19.9	21.2	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.

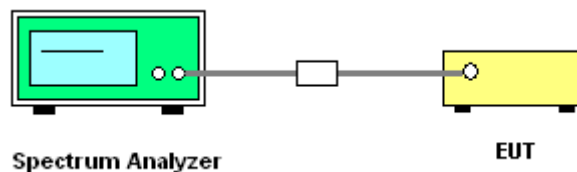
3.6.2 Measuring Instruments

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.



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

Non-TXBF modes

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 $N_{ANT} \leq 4$.

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

The EUT 802.11a mode 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

			DG for Power	DG for PSD	Power Limit Reduction	PSD Limit Reduction
	Ant 1 (dBi)	Ant 2 (dBi)	(dBi)	(dBi)	(dB)	(dB)
Band I (a)	4.50	4.50	4.50	7.51	0.00	1.51

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

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

The EUT 802.11n/ac mode does not support 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

			DG for Power	DG for PSD	Power Limit Reduction	PSD Limit Reduction
	Ant 1 (dBi)	Ant 2 (dBi)	(dBi)	(dBi)	(dB)	(dB)
Band I (n/ac)	4.50	4.50	4.50	4.50	0.00	0.00

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

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

TXBF modes

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For beamforming transmissions, directional gain is calculated as

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$$

where

Each antenna is driven by no more than one spatial stream;

N_{SS} = the number of independent spatial streams of data;

N_{ANT} = the total number of antennas

$g_{j,k} = 10^{G_k/20}$ if the k th antenna is being fed by spatial stream j , or zero if it is not;
 G_k is the gain in dBi of the k th antenna.

The EUT supports beamforming for 802.11 n/ac modes.

The directional gain calculation is following F)2)e)ii) of KDB 662911 D01 v02r01.

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

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

			DG for Power	DG for PSD	Power Limit Reduction	PSD Limit Reduction
	Ant 1 (dBi)	Ant 2 (dBi)	(dBi)	(dBi)	(dB)	(dB)
Band I (n/ac)	4.50	4.50	7.51	7.51	1.51	1.51

Power Limit Reduction = $DG(\text{Power}) - 6\text{dBi}$, (min = 0)

PSD Limit Reduction = $DG(\text{PSD}) - 6\text{dBi}$, (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	Apr. 27, 2016 ~ Jul. 19, 2016	Aug. 11, 2016	Conducted (TH05-HY)
Power Sensor	Anritsu	MA2411B	1126017	300MHz~40GHz	Aug. 12, 2015	Apr. 27, 2016 ~ Jul. 19, 2016	Aug. 11, 2016	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	13I00030SN O31	9kHz~6GHz	Sep. 17, 2015	Apr. 27, 2016 ~ Jul. 19, 2016	Sep. 16, 2016	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	13I00030SN O32	9kHz~6GHz	Sep. 17, 2015	Apr. 27, 2016 ~ Jul. 19, 2016	Sep. 16, 2016	Conducted (TH05-HY)
Spectrum Analyzer	Rohde & Schwarz	FSP40	100057	9kHz~40GHz	Nov. 23, 2015	Apr. 27, 2016 ~ Jul. 19, 2016	Nov. 22, 2016	Conducted (TH05-HY)
Temperature Chamber	ESPEC	SU-241	92003713	-30℃ ~95℃	Jun. 15, 2015	Apr. 27, 2016 ~ May 23, 2016	Jun. 14, 2016	Conducted (TH05-HY)
Temperature Chamber	ESPEC	SU-241	92003713	-30℃ ~95℃	Jun. 06, 2016	Jun. 06, 2016 ~ Jul. 19, 2016	Jun. 05, 2017	Conducted (TH05-HY)
Programmable Power Supply	GW Instek	PSS-2005	GEO821763	N/A	Nov. 13, 2015	Apr. 27, 2016 ~ Jul. 19, 2016	Nov. 12, 2016	Conducted (TH05-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Sep. 02, 2015	May 06, 2016 ~ Jul. 20, 2016	Sep. 01, 2016	Radiation (03CH10-HY)
Bilog Antenna	TESEQ	CBL 6111D	35413	30MHz~1GHz	Jan. 13, 2016	May 06, 2016 ~ Jul. 20, 2016	Jan. 12, 2017	Radiation (03CH10-HY)
Horn Antenna	SCHWARZBECK	BBHA 9120 D	9120D-1325	1GHz ~ 18GHz	Sep. 30, 2015	May 06, 2016 ~ Jul. 20, 2016	Sep. 29, 2016	Radiation (03CH10-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA917057 6	18GHz ~ 40GHz	Apr. 15, 2016	May 06, 2016 ~ Jul. 20, 2016	Apr. 14, 2017	Radiation (03CH10-HY)
Amplifier	SONOMA	310N	187311	9kHz~1GHz	Nov. 16, 2015	May 06, 2016 ~ Jul. 20, 2016	Nov. 15, 2016	Radiation (03CH10-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1902246	1GHz~18GHz	Nov. 16, 2015	May 06, 2016 ~ Jul. 20, 2016	Nov. 15, 2016	Radiation (03CH10-HY)
Preamplifier	Keysight	83017A	MY53270078	1GHz~26.5GHz	Nov. 13, 2015	May 06, 2016 ~ Jul. 20, 2016	Nov. 12, 2016	Radiation (03CH10-HY)
Preamplifier	MITEQ	JS44-1800400 0-33-8P	1840917	18GHz ~ 40GHz	Jun. 02, 2015	May 06, 2016 ~ May 31, 2016	Jun. 01, 2016	Radiation (03CH10-HY)
Preamplifier	MITEQ	JS44-1800400 0-33-8P	1840917	18GHz ~ 40GHz	Jun. 14, 2016	Jun. 14, 2016 ~ Jul. 20, 2016	Jun. 13, 2017	Radiation (03CH10-HY)
EMI Test Receiver	Keysight	N9038A(MXE)	MY55420170	N/A	Mar. 10, 2016	May 06, 2016 ~ Jul. 20, 2016	Mar. 09, 2017	Radiation (03CH10-HY)
Spectrum Analyzer	Keysight	N9010A	MY54200485	10Hz ~ 44GHz	Oct. 15, 2015	May 06, 2016 ~ Jul. 20, 2016	Oct. 14, 2016	Radiation (03CH10-HY)
Antenna Mast	EMEC	AM-BS-4500-B	N/A	1~4m	N/A	May 06, 2016 ~ Jul. 20, 2016	N/A	Radiation (03CH10-HY)
Turn Table	EMEC	TT 2200	N/A	0~360 Degree	N/A	May 06, 2016 ~ Jul. 20, 2016	N/A	Radiation (03CH10-HY)
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Apr. 27, 2016	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100724	9kHz~7GHz	Aug. 26, 2015	Apr. 27, 2016	Aug. 25, 2016	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Dec. 02, 2015	Apr. 27, 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
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Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	5.50
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Appendix A. Conducted Test Results

<Non-TXBF Modes>

Test Engineer:	Luffy Lin / Bill Kuo	Temperature:	21~25	°C
Test Date:	2016/04/27~2016/07/19	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)		Note
					Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	36	5180	18.30	17.95	25.42	23.16	-	-	22.54	-	
11a	6Mbps	2	44	5220	18.30	18.20	32.40	26.76	-	-	22.60	-	
11a	6Mbps	2	48	5240	18.50	18.10	30.48	25.20	-	-	22.58	-	
HT20	MCS8	2	36	5180	18.95	18.90	23.28	24.48	-	-	22.76	-	
HT20	MCS8	2	44	5220	19.45	19.20	42.72	38.40	-	-	22.83	-	
HT20	MCS8	2	48	5240	19.40	19.05	42.24	38.04	-	-	22.80	-	
HT40	MCS8	2	38	5190	36.70	36.60	41.70	41.40	-	-	23.01	-	
HT40	MCS8	2	46	5230	36.90	36.70	84.80	56.20	-	-	23.01	-	
VHT20	MCS0	2	36	5180	18.95	18.85	24.30	23.20	-	-	22.75	-	
VHT20	MCS0	2	44	5220	19.50	18.95	41.52	36.96	-	-	22.78	-	
VHT20	MCS0	2	48	5240	19.45	19.00	41.04	37.44	-	-	22.79	-	
VHT40	MCS0	2	38	5190	36.50	36.70	41.60	41.40	-	-	23.01	-	
VHT40	MCS0	2	46	5230	37.10	36.80	76.00	62.60	-	-	23.01	-	
VHT80	MCS0	2	42	5210	75.84	75.96	82.24	81.92	-	-	23.01	-	

TEST RESULTS DATA
Average Power Table

FCC Band I																
Mod.	Data Rate	NTx	CH.	Freq. (MHz)	Setting	Duty Factor (dB)		Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)			Pass/Fail
						Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2		
11a	6Mbps	2	36	5180	65	0.24	0.24	16.56	16.51	19.55	30.00	4.50			Pass	
11a	6Mbps	2	44	5220	74	0.24	0.24	17.86	18.10	21.00	30.00	4.50			Pass	
11a	6Mbps	2	48	5240	74	0.24	0.24	17.66	18.12	20.91	30.00	4.50			Pass	
HT20	MCS8	2	36	5180	63	0.45	0.43	15.98	16.07	19.04	30.00	4.50			Pass	
HT20	MCS8	2	44	5220	75	0.45	0.43	18.11	18.36	21.25	30.00	4.50			Pass	
HT20	MCS8	2	48	5240	75	0.45	0.43	17.88	18.17	21.04	30.00	4.50			Pass	
HT40	MCS8	2	38	5190	59	0.80	0.80	15.14	14.75	17.96	30.00	4.50			Pass	
HT40	MCS8	2	46	5230	75	0.80	0.80	18.21	18.33	21.28	30.00	4.50			Pass	
VHT20	MCS0	2	36	5180	63	0.16	0.13	15.57	15.82	18.70	30.00	4.50			Pass	
VHT20	MCS0	2	44	5220	74	0.16	0.13	17.95	18.11	21.04	30.00	4.50			Pass	
VHT20	MCS0	2	48	5240	74	0.16	0.13	17.77	18.06	20.92	30.00	4.50			Pass	
VHT40	MCS0	2	38	5190	59	0.27	0.27	14.78	14.73	17.76	30.00	4.50			Pass	
VHT40	MCS0	2	46	5230	74	0.27	0.27	18.02	18.07	21.05	30.00	4.50			Pass	
VHT80	MCS0	2	42	5210	60	0.51	0.48	14.40	14.40	17.41	30.00	4.50			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
					Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	36	5180	0.24	0.24			7.14	15.49	7.51			Pass
11a	6Mbps	2	44	5220	0.24	0.24			8.74	15.49	7.51			Pass
11a	6Mbps	2	48	5240	0.24	0.24			8.72	15.49	7.51			Pass
HT20	MCS8	2	36	5180	0.45	0.43			6.59	17.00	4.50			Pass
HT20	MCS8	2	44	5220	0.45	0.43			8.10	17.00	4.50			Pass
HT20	MCS8	2	48	5240	0.45	0.43			8.65	17.00	4.50			Pass
HT40	MCS8	2	38	5190	0.80	0.80			2.22	17.00	4.50			Pass
HT40	MCS8	2	46	5230	0.80	0.80			5.65	17.00	4.50			Pass
VHT20	MCS0	2	36	5180	0.16	0.13			6.57	17.00	4.50			Pass
VHT20	MCS0	2	44	5220	0.16	0.13			9.04	17.00	4.50			Pass
VHT20	MCS0	2	48	5240	0.16	0.13			8.66	17.00	4.50			Pass
VHT40	MCS0	2	38	5190	0.27	0.27			2.48	17.00	4.50			Pass
VHT40	MCS0	2	46	5230	0.27	0.27			5.86	17.00	4.50			Pass
VHT80	MCS0	2	42	5210	0.51	0.48			-1.19	17.00	4.50			Pass

TEST RESULTS DATA
Frequency Stability

Band I										
Mod.	Data Rate	N _{TX}	CH.	Freq. (MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stability (ppm)	Temperature (°C)	Voltage (V)	Note
11a	6Mbps	1	36	5180	5179.900	-0.100	-19.31	20	11.4	
11a	6Mbps	1	36	5180	5179.950	-0.050	-9.65	20	12.6	
11a	6Mbps	1	36	5180	5179.950	-0.050	-9.65	20	12	
11a	6Mbps	1	36	5180	5180.000	0.000	0.00	0	12	
11a	6Mbps	1	36	5180	5179.900	-0.100	-19.31	50	12	



<TXBF Modes>

Test Engineer:	Derek Hsu / PH Yang	Temperature:	21~25	°C
Test Date:	2016/07/13~2016/07/19	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)		Note
					Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	
HT20	MCS0	2	36	5180	18.85	18.85	23.30	22.80	-	-	22.75	-	
HT20	MCS0	2	44	5220	18.75	18.75	23.10	22.80	-	-	22.73	-	
HT20	MCS0	2	48	5240	18.80	18.85	23.40	23.00	-	-	22.74	-	
HT40	MCS0	2	38	5190	36.70	36.70	41.76	41.40	-	-	23.01	-	
HT40	MCS0	2	46	5230	36.70	36.60	40.68	41.40	-	-	23.01	-	
VHT20	MCS0	2	36	5180	19.05	18.90	23.30	23.10	-	-	22.76	-	
VHT20	MCS0	2	44	5220	18.80	19.00	23.30	23.10	-	-	22.74	-	
VHT20	MCS0	2	48	5240	18.80	19.00	23.20	23.40	-	-	22.74	-	
VHT40	MCS0	2	38	5190	36.70	36.70	40.95	40.86	-	-	23.01	-	
VHT40	MCS0	2	46	5230	36.60	36.70	46.80	40.50	-	-	23.01	-	
VHT80	MCS0	2	42	5210	75.60	75.60	80.32	80.32	-	-	23.01	-	

TEST RESULTS DATA
Average Power Table

FCC Band I													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Setting	Average Conducted Power (dBm)			FCC Conducted Power Limit (dBm)		DG (dBi)		Pass/Fail
						Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
HT20	MCS0	2	36	5180	63	15.50	16.20	18.87	28.49		7.51		Pass
HT20	MCS0	2	44	5220	74	17.80	18.10	20.96	28.49		7.51		Pass
HT20	MCS0	2	48	5240	75	17.60	18.10	20.87	28.49		7.51		Pass
HT40	MCS0	2	38	5190	59	14.60	15.10	17.87	28.49		7.51		Pass
HT40	MCS0	2	46	5230	75	17.90	18.30	21.11	28.49		7.51		Pass
VHT20	MCS0	2	36	5180	61	15.20	16.30	18.80	28.49		7.51		Pass
VHT20	MCS0	2	44	5220	73	17.50	18.30	20.93	28.49		7.51		Pass
VHT20	MCS0	2	48	5240	73	17.30	18.30	20.84	28.49		7.51		Pass
VHT40	MCS0	2	38	5190	57	15.00	14.60	17.81	28.49		7.51		Pass
VHT40	MCS0	2	46	5230	73	17.70	18.30	21.02	28.49		7.51		Pass
VHT80	MCS0	2	42	5210	58	14.20	14.40	17.31	28.49		7.51		Pass

TEST RESULTS DATA
Power Spectral Density

FCC Band I												
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Power Density (dBm/MHz)			Average PSD Limit (dBm/MHz)		DG (dBi)		Pass /Fail
					Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
HT20	MCS0	2	36	5180			7.70	15.49		7.51		Pass
HT20	MCS0	2	44	5220			10.48	15.49		7.51		Pass
HT20	MCS0	2	48	5240			10.15	15.49		7.51		Pass
HT40	MCS0	2	38	5190			6.50	15.49		7.51		Pass
HT40	MCS0	2	46	5230			9.75	15.49		7.51		Pass
VHT20	MCS0	2	36	5180			7.03	15.49		7.51		Pass
VHT20	MCS0	2	44	5220			9.77	15.49		7.51		Pass
VHT20	MCS0	2	48	5240			9.61	15.49		7.51		Pass
VHT40	MCS0	2	38	5190			5.91	15.49		7.51		Pass
VHT40	MCS0	2	46	5230			9.72	15.49		7.51		Pass
VHT80	MCS0	2	42	5210			6.30	15.49		7.51		Pass



Appendix B. Radiated Spurious Emission

Test Engineer :	Tsung Lee/Karl Hou/Wilson Wu/Stan Hsieh	Temperature :	23~25°C
		Relative Humidity :	42~47%

<Non-TXBF Modes with AC Adapter>

Band 1 - 5150~5250MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 36 5180MHz		5145.65	58.02	-15.98	74	50.67	31.98	7.94	32.57	257	179	P	H
		5147.9	50.94	-3.06	54	43.59	31.98	7.94	32.57	257	179	A	H
	*	5182	111.61	-	-	104.25	32.02	7.91	32.57	257	179	P	H
	*	5182	105.53	-	-	98.17	32.02	7.91	32.57	257	179	A	H
													H
													H
		5136.8	61.39	-12.61	74	54.06	31.96	7.94	32.57	172	183	P	V
		5149.85	53.83	-0.17	54	46.48	31.98	7.94	32.57	172	183	A	V
	*	5178	114.87	-	-	107.51	32.02	7.91	32.57	172	183	P	V
	*	5178	108.41	-	-	101.05	32.02	7.91	32.57	172	183	A	V
													V
802.11a CH 44 5220MHz		5145.65	55.93	-18.07	74	48.58	31.98	7.94	32.57	184	178	P	H
		5010.05	47.88	-6.12	54	40.61	31.82	8.02	32.57	184	178	A	H
	*	5222	113.94	-	-	106.44	32.06	8.01	32.57	184	178	P	H
	*	5222	105.45	-	-	97.95	32.06	8.01	32.57	184	178	A	H
		5354.4	51.99	-22.01	74	44.11	32.22	8.23	32.57	184	178	P	H
		5429.86	45.14	-8.86	54	37.1	32.32	8.29	32.57	184	178	A	H
		5144.9	55.7	-18.3	74	48.35	31.98	7.94	32.57	202	181	P	V
		5147.6	48.63	-5.37	54	41.28	31.98	7.94	32.57	202	181	A	V
	*	5222	115.56	-	-	108.06	32.06	8.01	32.57	202	181	P	V
	*	5222	107.25	-	-	99.75	32.06	8.01	32.57	202	181	A	V
		5374.31	52.21	-21.79	74	44.25	32.24	8.29	32.57	202	181	P	V
		5429.97	46.6	-7.4	54	38.56	32.32	8.29	32.57	202	181	A	V



802.11a CH 48 5240MHz		5147	54.07	-19.93	74	46.72	31.98	7.94	32.57	195	178	P	H
		5029.25	47.42	-6.58	54	40.13	31.84	8.02	32.57	195	178	A	H
	*	5242	113.63	-	-	105.98	32.1	8.12	32.57	195	178	P	H
	*	5242	105.97	-	-	98.32	32.1	8.12	32.57	195	178	A	H
		5352.31	51.87	-22.13	74	43.99	32.22	8.23	32.57	195	178	P	H
		5450.87	44.52	-9.48	54	36.46	32.34	8.29	32.57	195	178	A	H
		5133.8	53.99	-20.01	74	46.66	31.96	7.94	32.57	215	182	P	V
		5029.25	47.73	-6.27	54	40.44	31.84	8.02	32.57	215	182	A	V
	*	5239	115.26	-	-	107.74	32.08	8.01	32.57	215	182	P	V
	*	5239	106.87	-	-	99.35	32.08	8.01	32.57	215	182	A	V
		5350.44	52.22	-21.78	74	44.34	32.22	8.23	32.57	215	182	P	V
		5450.87	46.09	-7.91	54	38.03	32.34	8.29	32.57	215	182	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+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 36 5180MHz		10360	44.67	-29.33	74	56.13	39.69	11.96	63.11	100	0	P	H
		15540	40.76	-33.24	74	48.15	38.04	14.76	60.19	100	0	P	H
													H
													H
		10360	44.46	-29.54	74	55.92	39.69	11.96	63.11	100	0	P	V
		15540	41.25	-32.75	74	48.64	38.04	14.76	60.19	100	0	P	V
													V
													V
802.11a CH 44 5220MHz		10440	43.92	-30.08	74	55.15	39.79	12.03	63.05	100	0	P	H
		15660	41.45	-32.55	74	48.98	37.85	14.79	60.17	100	0	P	H
													H
													H
		10440	43.1	-30.9	74	54.33	39.79	12.03	63.05	100	0	P	V
		15660	41.13	-32.87	74	48.66	37.85	14.79	60.17	100	0	P	V
													V
													V
802.11a CH 48 5240MHz		10480	46.48	-27.52	74	57.56	39.87	12.06	63.01	100	0	P	H
		15720	40.46	-33.54	74	48.07	37.74	14.81	60.16	100	0	P	H
													H
													H
		10480	47.09	-26.91	74	58.17	39.87	12.06	63.01	100	0	P	V
		15720	40.75	-33.25	74	48.36	37.74	14.81	60.16	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+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 36 5180MHz		5149.1	57.4	-16.6	74	50.05	31.98	7.94	32.57	180	186	P	H
		5150	49.46	-4.54	54	42.11	31.98	7.94	32.57	180	186	A	H
	*	5178	110.07	-	-	102.71	32.02	7.91	32.57	180	186	P	H
	*	5178	102.23	-	-	94.87	32.02	7.91	32.57	180	186	A	H
													H
													H
		5149.85	59.48	-14.52	74	52.13	31.98	7.94	32.57	182	184	P	V
		5149.7	53.14	-0.86	54	45.79	31.98	7.94	32.57	182	184	A	V
	*	5178	112.66	-	-	105.3	32.02	7.91	32.57	182	184	P	V
	*	5178	105.75	-	-	98.39	32.02	7.91	32.57	182	184	A	V
													V
													V
802.11n HT20 CH 44 5220MHz		5149.4	57.09	-16.91	74	49.74	31.98	7.94	32.57	182	177	P	H
		5148.8	47.07	-6.93	54	39.72	31.98	7.94	32.57	182	177	A	H
	*	5222	113.21	-	-	105.71	32.06	8.01	32.57	182	177	P	H
	*	5222	104.35	-	-	96.85	32.06	8.01	32.57	182	177	A	H
		5353.74	51.17	-22.83	74	43.29	32.22	8.23	32.57	182	177	P	H
		5429.31	43.95	-10.05	54	35.91	32.32	8.29	32.57	182	177	A	H
		5144	56.59	-17.41	74	49.24	31.98	7.94	32.57	181	187	P	V
		5146.85	48.99	-5.01	54	41.64	31.98	7.94	32.57	181	187	A	V
	*	5218	113.41	-	-	105.91	32.06	8.01	32.57	181	187	P	V
	*	5218	105.74	-	-	98.24	32.06	8.01	32.57	181	187	A	V
		5428.98	51.41	-22.59	74	43.37	32.32	8.29	32.57	181	187	P	V
		5428.87	44.64	-9.36	54	36.6	32.32	8.29	32.57	181	187	A	V



802.11n HT20 CH 48 5240MHz		5148.05	53.59	-20.41	74	46.24	31.98	7.94	32.57	197	177	P	H
		5030	45.92	-8.08	54	38.63	31.84	8.02	32.57	197	177	A	H
	*	5242	112.94	-	-	105.29	32.1	8.12	32.57	197	177	P	H
	*	5242	104.25	-	-	96.6	32.1	8.12	32.57	197	177	A	H
		5351.43	51.13	-22.87	74	43.25	32.22	8.23	32.57	197	177	P	H
		5450.1	43.9	-10.1	54	35.84	32.34	8.29	32.57	197	177	A	H
		5138	54.3	-19.7	74	46.97	31.96	7.94	32.57	187	187	P	V
		5029.85	46.48	-7.52	54	39.19	31.84	8.02	32.57	187	187	A	V
	*	5238	113.47	-	-	105.95	32.08	8.01	32.57	187	187	P	V
	*	5238	104.96	-	-	97.44	32.08	8.01	32.57	187	187	A	V
		5353.74	51.83	-22.17	74	43.95	32.22	8.23	32.57	187	187	P	V
		5450.1	44.21	-9.79	54	36.15	32.34	8.29	32.57	187	187	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+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 36 5180MHz		10360	45.02	-28.98	74	56.48	39.69	11.96	63.11	100	0	P	H
		15540	41.18	-32.82	74	48.57	38.04	14.76	60.19	100	0	P	H
													H
													H
		10360	44.49	-29.51	74	55.95	39.69	11.96	63.11	100	0	P	V
		15540	40.81	-33.19	74	48.2	38.04	14.76	60.19	100	0	P	V
													V
													V
802.11n HT20 CH 44 5220MHz		10440	46.75	-27.25	74	57.98	39.79	12.03	63.05	100	0	P	H
		15660	41.96	-32.04	74	49.49	37.85	14.79	60.17	100	0	P	H
													H
													H
		10440	47.55	-26.45	74	58.78	39.79	12.03	63.05	100	0	P	V
		15660	42.12	-31.88	74	49.65	37.85	14.79	60.17	100	0	P	V
													V
													V
802.11n HT20 CH 48 5240MHz		10480	45.74	-28.26	74	56.82	39.87	12.06	63.01	100	0	P	H
		15720	40.74	-33.26	74	48.35	37.74	14.81	60.16	100	0	P	H
													H
													H
		10480	47.44	-26.56	74	58.52	39.87	12.06	63.01	100	0	P	V
		15720	40.78	-33.22	74	48.39	37.74	14.81	60.16	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 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)
802.11n HT40 CH 38 5190MHz		5149.7	57	-17	74	49.65	31.98	7.94	32.57	228	180	P	H
		5147.45	49.84	-4.16	54	42.49	31.98	7.94	32.57	228	180	A	H
	*	5188	106.15	-	-	98.79	32.02	7.91	32.57	228	180	P	H
	*	5188	98.81	-	-	91.45	32.02	7.91	32.57	228	180	A	H
		5370.9	50.01	-23.99	74	42.05	32.24	8.29	32.57	228	180	P	H
		5352.53	42.43	-11.57	54	34.55	32.22	8.23	32.57	228	180	A	H
		5149.7	64.11	-9.89	74	56.76	31.98	7.94	32.57	176	186	P	V
		5145.2	52.94	-1.06	54	45.59	31.98	7.94	32.57	176	186	A	V
	*	5188	108.77	-	-	101.41	32.02	7.91	32.57	176	186	P	V
	*	5188	101.81	-	-	94.45	32.02	7.91	32.57	176	186	A	V
		5368.26	50.08	-23.92	74	42.12	32.24	8.29	32.57	176	186	P	V
		5352.09	42.77	-11.23	54	34.89	32.22	8.23	32.57	176	186	A	V
802.11n HT40 CH 46 5230MHz		5136.5	55.89	-18.11	74	48.56	31.96	7.94	32.57	175	179	P	H
		5136.35	47.63	-6.37	54	40.3	31.96	7.94	32.57	175	179	A	H
	*	5228	111.34	-	-	103.82	32.08	8.01	32.57	175	179	P	H
	*	5228	103.38	-	-	95.86	32.08	8.01	32.57	175	179	A	H
		5351.43	53.35	-20.65	74	45.47	32.22	8.23	32.57	175	179	P	H
		5350.22	44.79	-9.21	54	36.91	32.22	8.23	32.57	175	179	A	H
		5144.15	57.92	-16.08	74	50.57	31.98	7.94	32.57	234	186	P	V
		5148.95	49.12	-4.88	54	41.77	31.98	7.94	32.57	234	186	A	V
	*	5228	110.9	-	-	103.38	32.08	8.01	32.57	234	186	P	V
	*	5228	103.17	-	-	95.65	32.08	8.01	32.57	234	186	A	V
		5359.79	53.13	-20.87	74	45.25	32.22	8.23	32.57	234	186	P	V
		5351.54	45.93	-8.07	54	38.05	32.22	8.23	32.57	234	186	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+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 HT40 CH 38 5190MHz		10380	46.31	-27.69	74	57.73	39.71	11.96	63.09	100	0	P	H
		15570	41.12	-32.88	74	48.55	37.99	14.77	60.19	100	0	P	H
													H
													H
		10380	45.66	-28.34	74	57.08	39.71	11.96	63.09	100	0	P	V
		15570	41.14	-32.86	74	48.57	37.99	14.77	60.19	100	0	P	V
													V
													V
802.11n HT40 CH 46 5230MHz		10460	45.87	-28.13	74	57.06	39.82	12.03	63.04	100	0	P	H
		15690	41.93	-32.07	74	49.49	37.8	14.8	60.16	100	0	P	H
													H
													H
		10460	48.32	-25.68	74	59.51	39.82	12.03	63.04	100	0	P	V
		15690	41.5	-32.5	74	49.06	37.8	14.8	60.16	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+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)
802.11ac VHT80 CH 42 5210MHz		5055.95	56.11	-17.89	74	48.81	31.88	7.99	32.57	162	178	P	H
		5149.85	50.84	-3.16	54	43.49	31.98	7.94	32.57	162	178	A	H
	*	5212	102.9	-	-	95.4	32.06	8.01	32.57	162	178	P	H
	*	5212	98.09	-	-	90.59	32.06	8.01	32.57	162	178	A	H
		5358.47	54.05	-19.95	74	46.17	32.22	8.23	32.57	162	178	P	H
		5354.95	47.35	-6.65	54	39.47	32.22	8.23	32.57	162	178	A	H
		5138.15	57.58	-16.42	74	50.25	31.96	7.94	32.57	174	190	P	V
		5148.05	53.67	-0.33	54	46.32	31.98	7.94	32.57	174	190	A	V
	*	5208	104.48	-	-	96.98	32.06	8.01	32.57	174	190	P	V
	*	5208	100.73	-	-	93.23	32.06	8.01	32.57	174	190	A	V
		5351.1	54.82	-19.18	74	46.94	32.22	8.23	32.57	174	190	P	V
		5373.1	47.95	-6.05	54	39.99	32.24	8.29	32.57	174	190	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+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)
802.11ac VHT80 CH 42 5210MHz		10420	45.4	-28.6	74	56.7	39.77	12	63.07	100	0	P	H
		15630	42.65	-31.35	74	50.16	37.88	14.78	60.17	100	0	P	H
													H
													H
		10420	47.61	-26.39	74	58.91	39.77	12	63.07	100	0	P	V
		15630	41.3	-32.7	74	48.81	37.88	14.78	60.17	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average 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	Peak or Average
H/V	Horizontal or Vertical



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		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. 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”.



<TXBF Modes with AC Adapter>

Band 1 5150~5250MHz

WIFI 802.11n HT20 (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)
802.11n HT20 CH 36 5180MHz		5150	57.92	-16.08	74	50.57	31.98	7.94	32.57	189	178	P	H
		5150	46.26	-7.74	54	38.91	31.98	7.94	32.57	189	178	A	H
	*	5180	109.92	-	-	102.56	32.02	7.91	32.57	189	178	P	H
	*	5180	101.49	-	-	94.13	32.02	7.91	32.57	189	178	A	H
													H
													H
		5150	57.89	-16.11	74	50.54	31.98	7.94	32.57	217	181	P	V
		5150	50.85	-3.15	54	43.5	31.98	7.94	32.57	217	181	A	V
	*	5180	110.62	-	-	103.26	32.02	7.91	32.57	217	181	P	V
	*	5180	103.19	-	-	95.83	32.02	7.91	32.57	217	181	A	V
													V
													V
802.11n HT20 CH 44 5220MHz		5146.38	54.59	-19.41	74	47.24	31.98	7.94	32.57	221	180	P	H
		5143.78	46.43	-7.57	54	39.08	31.98	7.94	32.57	221	180	A	H
	*	5218	112.79	-	-	105.29	32.06	8.01	32.57	221	180	P	H
	*	5218	105.2	-	-	97.7	32.06	8.01	32.57	221	180	A	H
		5386.8	51.82	-22.18	74	43.84	32.26	8.29	32.57	221	180	P	H
		5429.04	44.26	-9.74	54	36.22	32.32	8.29	32.57	221	180	A	H
		5146.9	57.37	-16.63	74	50.02	31.98	7.94	32.57	185	184	P	V
		5148.2	48.82	-5.18	54	41.47	31.98	7.94	32.57	185	184	A	V
	*	5218	114.11	-	-	106.61	32.06	8.01	32.57	185	184	P	V
	*	5218	106.38	-	-	98.88	32.06	8.01	32.57	185	184	A	V
		5374.32	52.05	-21.95	74	44.09	32.24	8.29	32.57	185	184	P	V
		5429.04	44.48	-9.52	54	36.44	32.32	8.29	32.57	185	184	A	V



802.11n HT20 CH 48 5240MHz		5029.9	54.04	-19.96	74	46.75	31.84	8.02	32.57	211	181	P	H
		5029.64	47.8	-6.2	54	40.51	31.84	8.02	32.57	211	181	A	H
	*	5240	116.11	-	-	108.59	32.08	8.01	32.57	211	181	P	H
	*	5240	109.19	-	-	101.67	32.08	8.01	32.57	211	181	A	H
		5450.88	52.12	-21.88	74	44.06	32.34	8.29	32.57	211	181	P	H
		5450.16	46.38	-7.62	54	38.32	32.34	8.29	32.57	211	181	A	H
		5029.38	55.73	-18.27	74	48.44	31.84	8.02	32.57	191	195	P	V
		5029.9	49.46	-4.54	54	42.17	31.84	8.02	32.57	191	195	A	V
	*	5240	113.68	-	-	106.16	32.08	8.01	32.57	191	195	P	V
	*	5240	108.09	-	-	100.57	32.08	8.01	32.57	191	195	A	V
		5449.44	52.09	-21.91	74	44.03	32.34	8.29	32.57	191	195	P	V
		5450.4	46.43	-7.57	54	38.37	32.34	8.29	32.57	191	195	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+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 36 5180MHz		10360	46.08	-27.92	74	51.28	39.69	11.96	56.85	100	0	P	H
		15540	42.48	-31.52	74	46.06	38.04	14.76	56.38	100	0	P	H
													H
													H
		10360	45.5	-28.5	74	50.7	39.69	11.96	56.85	100	0	P	V
		15540	42.25	-31.75	74	45.83	38.04	14.76	56.38	100	0	P	V
													V
													V
802.11n HT20 CH 44 5220MHz		10440	45.24	-28.76	74	50.25	39.79	12.03	56.83	100	0	P	H
		15660	42.17	-31.83	74	45.84	37.85	14.79	56.31	100	0	P	H
													H
													H
		10440	47.01	-26.99	74	52.02	39.79	12.03	56.83	100	0	P	V
		15660	42.15	-31.85	74	45.82	37.85	14.79	56.31	100	0	P	V
													V
													V
802.11n HT20 CH 48 5240MHz		10480	46.91	-27.09	74	51.79	39.87	12.06	56.81	100	0	P	H
		15720	40.97	-33.03	74	44.69	37.74	14.81	56.27	100	0	P	H
													H
													H
		10480	48.23	-25.77	74	53.11	39.87	12.06	56.81	100	0	P	V
		15720	42.07	-31.93	74	45.79	37.74	14.81	56.27	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 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)
802.11n HT40 CH 38 5190MHz		5144.04	55.17	-18.83	74	47.82	31.98	7.94	32.57	218	175	P	H
		5150	45.63	-8.37	54	38.28	31.98	7.94	32.57	218	175	A	H
	*	5190	103.53	-	-	96.17	32.02	7.91	32.57	218	175	P	H
	*	5190	98.03	-	-	90.67	32.02	7.91	32.57	218	175	A	H
		5350.56	48.84	-25.16	74	40.96	32.22	8.23	32.57	218	175	P	H
		5352.72	40.68	-13.32	54	32.8	32.22	8.23	32.57	218	175	A	H
		5146.12	57.69	-16.31	74	50.34	31.98	7.94	32.57	190	171	P	V
		5149.5	49.34	-4.66	54	41.99	31.98	7.94	32.57	190	171	A	V
	*	5190	106.03	-	-	98.67	32.02	7.91	32.57	190	171	P	V
	*	5190	100.9	-	-	93.54	32.02	7.91	32.57	190	171	A	V
		5444.4	47.74	-26.26	74	39.7	32.32	8.29	32.57	190	171	P	V
		5354.64	41.26	-12.74	54	33.38	32.22	8.23	32.57	190	171	A	V
802.11n HT40 CH 46 5230MHz		5149.5	54.28	-19.72	74	46.93	31.98	7.94	32.57	188	179	P	H
		5148.46	45.67	-8.33	54	38.32	31.98	7.94	32.57	188	179	A	H
	*	5230	107.08	-	-	99.56	32.08	8.01	32.57	188	179	P	H
	*	5230	103.92	-	-	96.4	32.08	8.01	32.57	188	179	A	H
		5357.76	53.01	-20.99	74	45.13	32.22	8.23	32.57	188	179	P	H
		5350.56	45.1	-8.9	54	37.22	32.22	8.23	32.57	188	179	A	H
		5148.72	58.03	-15.97	74	50.68	31.98	7.94	32.57	218	185	P	V
		5149.24	50.04	-3.96	54	42.69	31.98	7.94	32.57	218	185	A	V
	*	5230	111.75	-	-	104.23	32.08	8.01	32.57	218	185	P	V
	*	5230	104.91	-	-	97.39	32.08	8.01	32.57	218	185	A	V
		5362.08	53.13	-20.87	74	45.17	32.24	8.29	32.57	218	185	P	V
		5351.28	45.87	-8.13	54	37.99	32.22	8.23	32.57	218	185	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+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 HT40 CH 38 5190MHz		10380	45.36	-28.64	74	50.54	39.71	11.96	56.85	100	0	P	H
		15570	42.05	-31.95	74	45.65	37.99	14.77	56.36	100	0	P	H
													H
													H
		10380	47.38	-26.62	74	52.56	39.71	11.96	56.85	100	0	P	V
		15570	41.69	-32.31	74	45.29	37.99	14.77	56.36	100	0	P	V
													V
													V
802.11n HT40 CH 46 5230MHz		10460	47.49	-26.51	74	52.46	39.82	12.03	56.82	100	0	P	H
		15690	41.69	-32.31	74	45.38	37.8	14.8	56.29	100	0	P	H
													H
													H
		10460	46.94	-27.06	74	51.91	39.82	12.03	56.82	100	0	P	V
		15690	42.35	-31.65	74	46.04	37.8	14.8	56.29	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+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)
802.11ac VHT80 CH 42 5210MHz		5065.78	54.98	-19.02	74	47.68	31.88	7.99	32.57	225	179	P	H
		5056.16	45.16	-8.84	54	37.86	31.88	7.99	32.57	225	179	A	H
	*	5210	101.13	-	-	93.63	32.06	8.01	32.57	225	179	P	H
	*	5210	96.49	-	-	88.99	32.06	8.01	32.57	225	179	A	H
		5353.68	51.68	-22.32	74	43.8	32.22	8.23	32.57	225	179	P	H
		5351.04	44.95	-9.05	54	37.07	32.22	8.23	32.57	225	179	A	H
		5150	58.31	-15.69	74	50.96	31.98	7.94	32.57	193	180	P	V
		5141.7	49.27	-4.73	54	41.92	31.98	7.94	32.57	193	180	A	V
	*	5210	99.85	-	-	92.35	32.06	8.01	32.57	193	180	P	V
	*	5210	95.69	-	-	88.19	32.06	8.01	32.57	193	180	A	V
		5351.52	54	-20	74	46.12	32.22	8.23	32.57	193	180	P	V
		5356.8	45.58	-8.42	54	37.7	32.22	8.23	32.57	193	180	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+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)
802.11ac VHT80 CH 42 5210MHz		10420	46.18	-27.82	74	51.24	39.77	12	56.83	100	0	P	H
		15630	42.09	-31.91	74	45.75	37.88	14.78	56.32	100	0	P	H
													H
													H
		10420	45.73	-28.27	74	50.79	39.77	12	56.83	100	0	P	V
		15630	42.87	-31.13	74	46.53	37.88	14.78	56.32	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Worst case with AC Adapter

Emission below 1GHz

WIFI 802.11a (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+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a LF		30	23.65	-16.35	40	29.72	26.1	0.65	32.82	-	-	P	H
		81.84	17.62	-22.38	40	35.35	14.02	0.93	32.68	-	-	P	H
		125.04	20.25	-23.25	43.5	33.68	17.9	1.33	32.66	-	-	P	H
		433.7	26.93	-19.07	46	34.7	22.94	2.16	32.87	-	-	P	H
		615.7	26.85	-19.15	46	31.59	25.66	2.62	33.02	-	-	P	H
		936.3	31.59	-14.41	46	30.57	29.64	3.29	31.91	100	57	P	H
													H
													H
													H
													H
													H
													H
		31.08	25.98	-14.02	40	32.61	25.54	0.65	32.82	-	-	P	V
		81.57	27.02	-12.98	40	44.76	14.02	0.93	32.69	100	68	P	V
		96.69	26.31	-17.19	43.5	41.8	16.01	1.14	32.64	-	-	P	V
		433.7	25	-21	46	32.77	22.94	2.16	32.87	-	-	P	V
		722.1	27.35	-18.65	46	30.66	26.84	2.82	32.97	-	-	P	V
		944	31.51	-14.49	46	30.2	29.85	3.29	31.83	-	-	P	V
													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	Peak or Average
H/V	Horizontal or Vertical



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		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. 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”.



<Non-TXBF Modes with PoE Adapter>

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+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 36 5180MHz		5141.9	57.23	-16.77	74	49.88	31.98	7.94	32.57	255	201	P	H
		5149.7	50.3	-3.7	54	42.95	31.98	7.94	32.57	255	201	A	H
	*	5178	110.79	-	-	103.43	32.02	7.91	32.57	255	201	P	H
	*	5178	104.97	-	-	97.61	32.02	7.91	32.57	255	201	A	H
													H
													H
		5149.85	63.03	-10.97	74	55.68	31.98	7.94	32.57	185	172	P	V
		5150	53.36	-0.64	54	46.01	31.98	7.94	32.57	185	172	A	V
	*	5181	114.03	-	-	106.67	32.02	7.91	32.57	185	172	P	V
	*	5181	107.74	-	-	100.38	32.02	7.91	32.57	185	172	A	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 802.11a (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 36 5180MHz		10360	43.56	-30.44	74	55.02	39.69	11.96	63.11	100	0	P	H
		15540	41.86	-32.14	74	49.25	38.04	14.76	60.19	100	0	P	H
													H
													H
		10360	46.24	-27.76	74	57.7	39.69	11.96	63.11	100	0	P	V
		15540	42.09	-31.91	74	49.48	38.04	14.76	60.19	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 802.11a (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)
802.11a LF		73.74	33.94	-6.06	40	52.65	13.07	0.93	32.71	-	-	P	H
		81.57	34.15	-5.85	40	51.89	14.02	0.93	32.69	100	0	P	H
		197.94	32.22	-11.28	43.5	47.55	15.92	1.48	32.73	-	-	P	H
		374.9	30.3	-15.7	46	39.17	21.81	2.13	32.81	-	-	P	H
		624.8	31.01	-14.99	46	35.66	25.75	2.62	33.02	-	-	P	H
		943.3	31.39	-14.61	46	30.09	29.85	3.29	31.84	-	-	P	H
													H
													H
													H
													H
													H
													H
													H
		31.62	35.98	-4.02	40	43.17	24.98	0.65	32.82	-	-	P	V
		40.8	36.76	-3.24	40	48.97	19.94	0.65	32.8	103	124	P	V
		73.74	32.18	-7.82	40	50.89	13.07	0.93	32.71	-	-	P	V
		374.9	28.29	-17.71	46	37.16	21.81	2.13	32.81	-	-	P	V
		624.8	32.41	-13.59	46	37.06	25.75	2.62	33.02	-	-	P	V
		873.3	30.76	-15.24	46	31.36	28.7	3.16	32.46	-	-	P	V
													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	Peak or Average
H/V	Horizontal or Vertical



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		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
CH 01													
2412MHz		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. 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 :	Tsung Lee/Karl Hou/Wilson Wu/Stan Hsieh	Temperature :	23~25°C
		Relative Humidity :	42~47%

Note symbol

-L	Low channel location
-R	High channel location



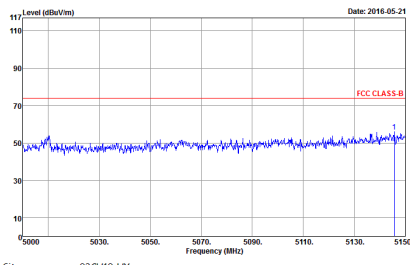
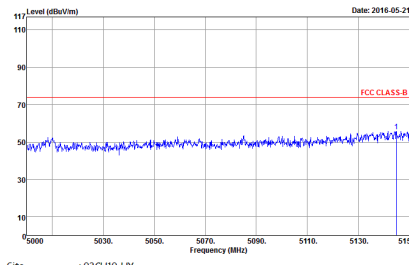
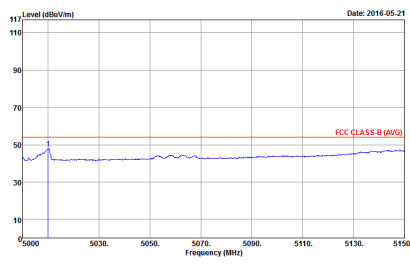
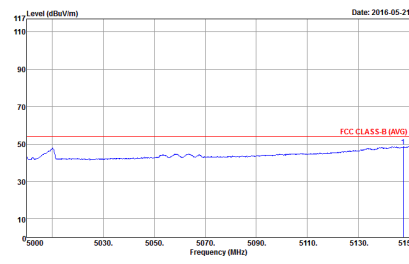
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Band 1 - 5150~5250MHz

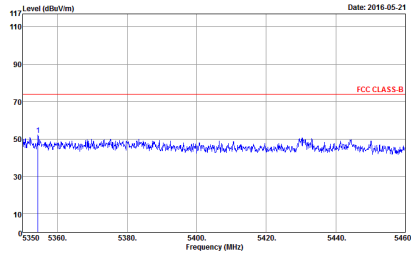
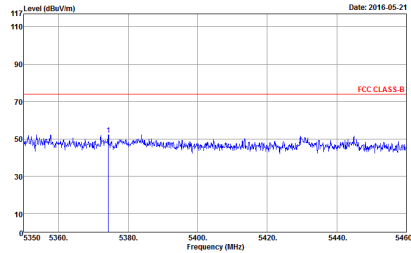
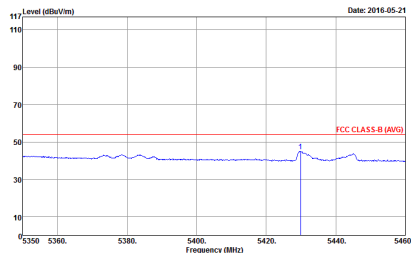
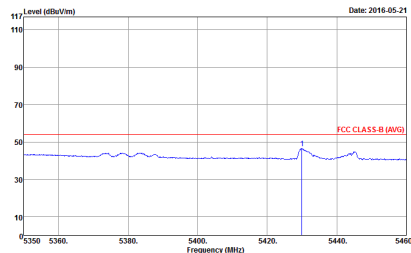
WIFI 802.11a (Band Edge @ 3m)

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH36 5180MHz	
1+2	Horizontal	Vertical
Peak	Level (dBuV/m) vs Frequency (MHz) for Horizontal polarization. The plot shows a noisy baseline around 50 dBuV/m with a red line indicating the FCC CLASS-B limit at approximately 75 dBuV/m. A peak is marked at 5180 MHz. Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL Detector : Peak	Level (dBuV/m) vs Frequency (MHz) for Vertical polarization. The plot shows a noisy baseline around 50 dBuV/m with a red line indicating the FCC CLASS-B limit at approximately 75 dBuV/m. A peak is marked at 5180 MHz. Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL Detector : Peak
Avg.	Level (dBuV/m) vs Frequency (MHz) for Horizontal polarization. The plot shows a smooth average curve rising from 45 dBuV/m to 55 dBuV/m, with a red line indicating the FCC CLASS-B (AVG) limit at approximately 65 dBuV/m. Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL Detector : Peak	Level (dBuV/m) vs Frequency (MHz) for Vertical polarization. The plot shows a smooth average curve rising from 45 dBuV/m to 55 dBuV/m, with a red line indicating the FCC CLASS-B (AVG) limit at approximately 65 dBuV/m. Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL Detector : Peak

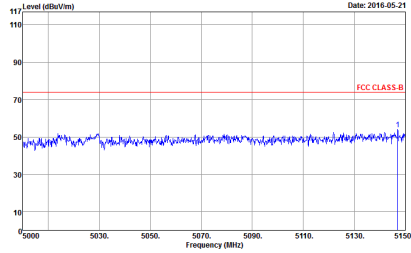
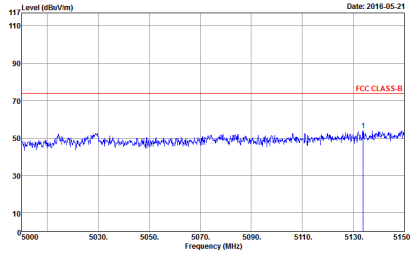
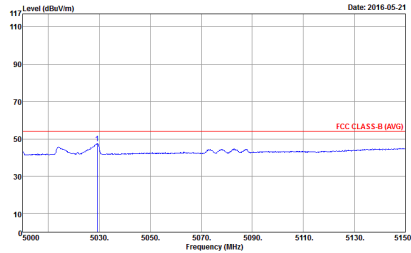
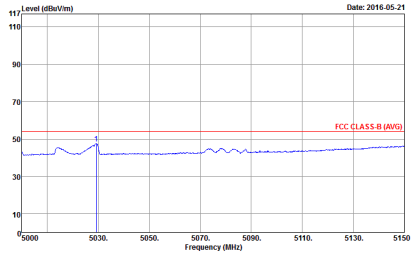


WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH44 5220MHz - L	
1+2	Horizontal	Vertical
Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL Detector : Peak RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL Detector : Peak RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL Detector : Peak RBW:1000.000KHz VBW:1.000KHz SWT:Auto	 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL Detector : Peak RBW:1000.000KHz VBW:1.000KHz SWT:Auto



WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH44 5220MHz - R	
1+2	Horizontal	Vertical
Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak	 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak



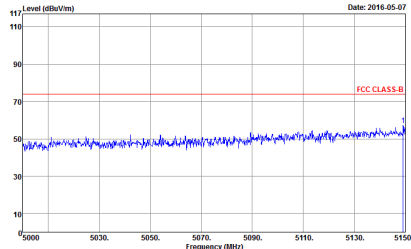
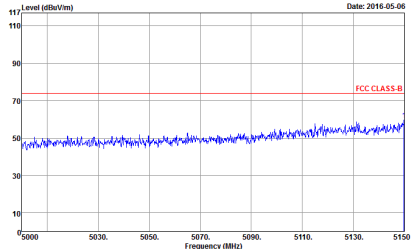
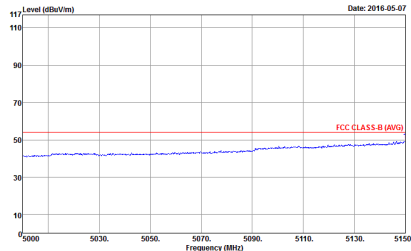
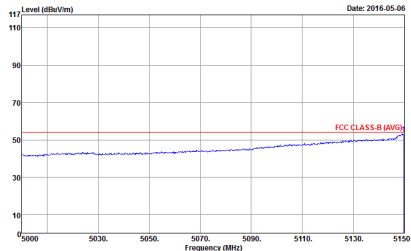
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH48 5240MHz - L	
1+2	Horizontal	Vertical
Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak	 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak



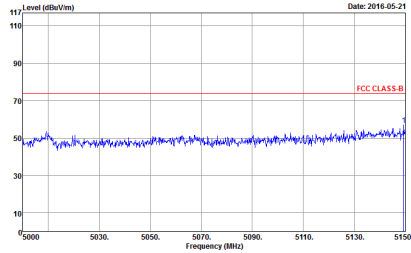
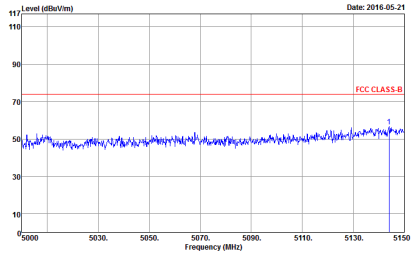
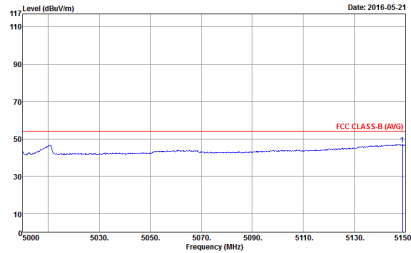
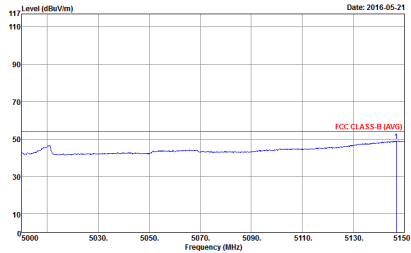
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH48 5240MHz - R	
1+2	Horizontal	Vertical
Peak	Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak	Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:1.000KHz SWT:Auto Detector : Peak



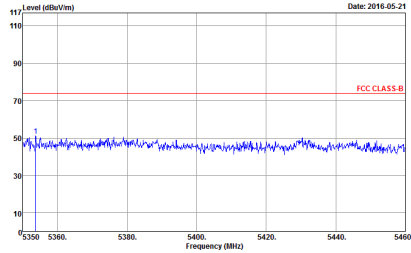
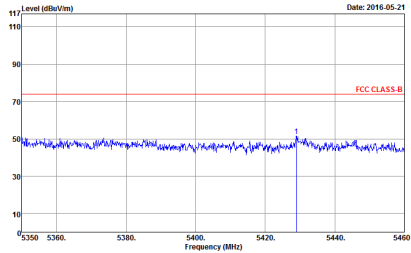
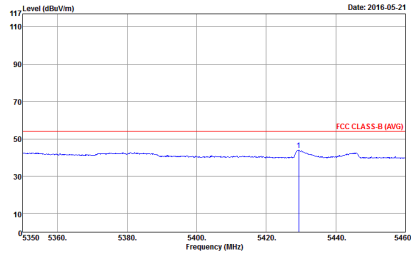
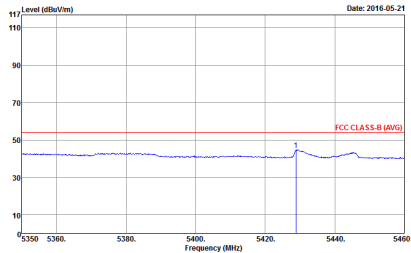
Band 1 5150~5250MHz
WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH36 5180MHz	
1+2	Horizontal	Vertical
Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak	 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak

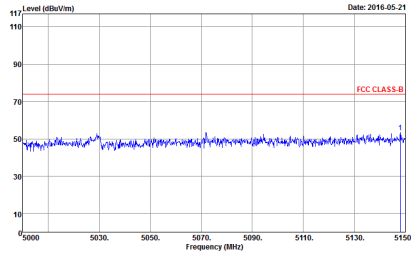
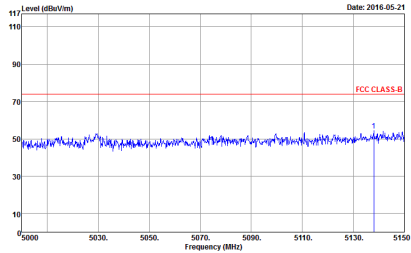
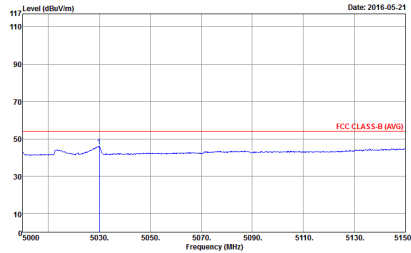
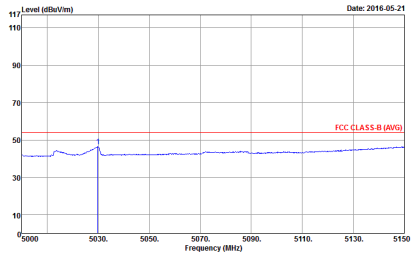


WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH44 5220MHz - L	
1+2	Horizontal	Vertical
Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak	 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak



WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH44 5220MHz - R	
1+2	Horizontal	Vertical
Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL Detector : Peak RBW:1000.000KHz VBW:3000.000KHz SWT:Auto	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL Detector : Peak RBW:1000.000KHz VBW:3000.000KHz SWT:Auto
Avg.	 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL Detector : Peak RBW:1000.000KHz VBW:3.000KHz SWT:Auto	 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL Detector : Peak RBW:1000.000KHz VBW:3.000KHz SWT:Auto



WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH48 5240MHz - L	
1+2	Horizontal	Vertical
Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak	 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak



WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH48 5240MHz - R	
1+2	Horizontal	Vertical
Peak	Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak	Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak



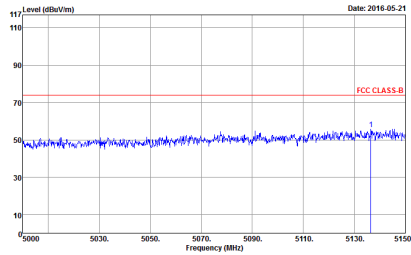
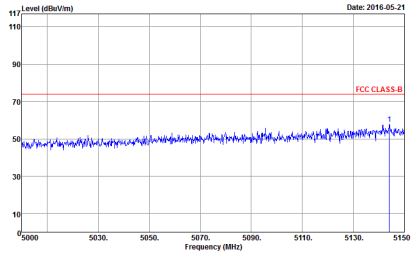
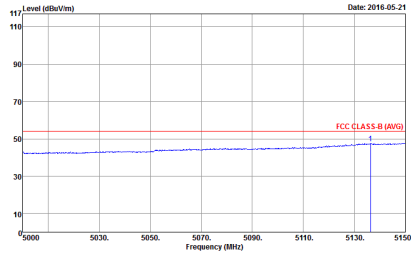
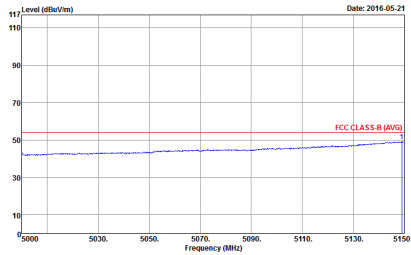
Band 1 5150~5250MHz
WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH38 5190MHz - L	
1+2	Horizontal	Vertical
Peak	117 Level (dBuV/m) Date: 2016-05-07 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	117 Level (dBuV/m) Date: 2016-05-07 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	117 Level (dBuV/m) Date: 2016-05-07 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak	117 Level (dBuV/m) Date: 2016-05-07 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak

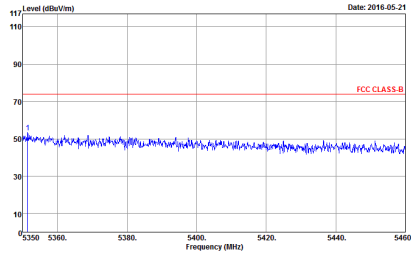
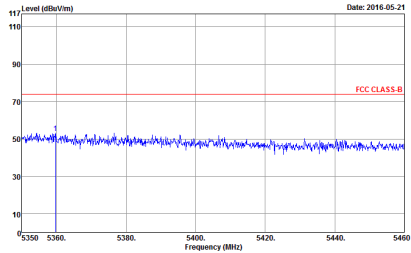
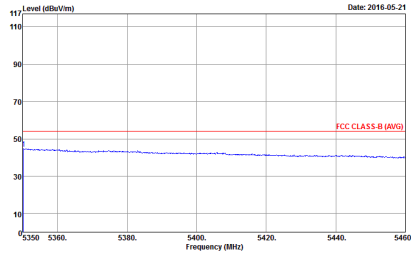
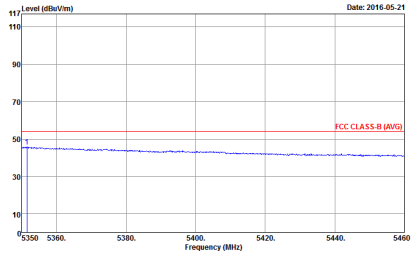


WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH38 5190MHz - R	
1+2	Horizontal	Vertical
Peak	Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak	Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak



WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH46 5230MHz - L	
1+2	Horizontal	Vertical
Peak	The plot shows the frequency spectrum for the horizontal polarization. The y-axis is Level (dBuV/m) from 10 to 117, and the x-axis is Frequency (MHz) from 5000 to 5150. A red line indicates the FCC CLASS-B limit at approximately 72 dBuV/m. The blue trace shows the measured signal, which is mostly below 50 dBuV/m with a small peak near 5130 MHz. Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	The plot shows the frequency spectrum for the vertical polarization. The y-axis is Level (dBuV/m) from 10 to 117, and the x-axis is Frequency (MHz) from 5000 to 5150. A red line indicates the FCC CLASS-B limit at approximately 72 dBuV/m. The blue trace shows the measured signal, which is mostly below 50 dBuV/m with a small peak near 5130 MHz. Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	The plot shows the average frequency spectrum for the horizontal polarization. The y-axis is Level (dBuV/m) from 10 to 117, and the x-axis is Frequency (MHz) from 5000 to 5150. A red line indicates the FCC CLASS-B (AVG) limit at approximately 55 dBuV/m. The blue trace shows the average measured signal, which is mostly below 45 dBuV/m with a small peak near 5130 MHz. Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak	The plot shows the average frequency spectrum for the vertical polarization. The y-axis is Level (dBuV/m) from 10 to 117, and the x-axis is Frequency (MHz) from 5000 to 5150. A red line indicates the FCC CLASS-B (AVG) limit at approximately 55 dBuV/m. The blue trace shows the average measured signal, which is mostly below 45 dBuV/m with a small peak near 5130 MHz. Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak



WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH46 5230MHz - R	
1+2	Horizontal	Vertical
Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak	 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak



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

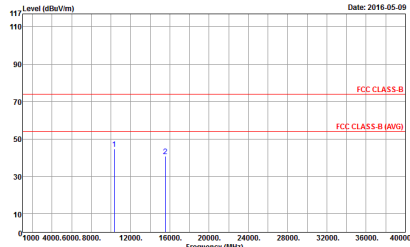
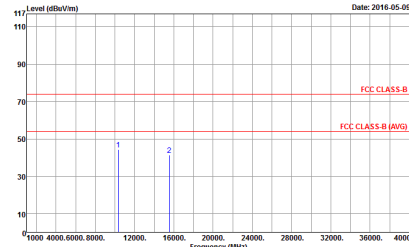
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH42 5210MHz - L	
1+2	Horizontal	Vertical
Peak	Level (dBuV/m) Date: 2016-05-07 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Level (dBuV/m) Date: 2016-05-07 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	Level (dBuV/m) Date: 2016-05-07 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:10.000KHz SWT:Auto Detector : Peak	Level (dBuV/m) Date: 2016-05-07 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:10.000KHz SWT:Auto Detector : Peak



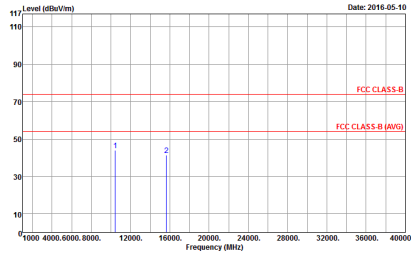
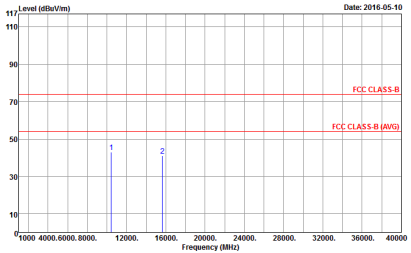
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH42 5210MHz - R	
1+2	Horizontal	Vertical
Peak	Level (dBuV/m) vs Frequency (MHz) plot for Horizontal polarization. The y-axis ranges from 10 to 117 dBuV/m, and the x-axis ranges from 5350 to 5460 MHz. A red line indicates the FCC CLASS-B limit at approximately 70 dBuV/m. The blue trace shows the measured signal, which is mostly below the limit, with a small peak around 5360 MHz. Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Level (dBuV/m) vs Frequency (MHz) plot for Vertical polarization. The y-axis ranges from 10 to 117 dBuV/m, and the x-axis ranges from 5350 to 5460 MHz. A red line indicates the FCC CLASS-B limit at approximately 70 dBuV/m. The blue trace shows the measured signal, which is mostly below the limit, with a small peak around 5360 MHz. Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	Level (dBuV/m) vs Frequency (MHz) plot for Horizontal polarization. The y-axis ranges from 10 to 117 dBuV/m, and the x-axis ranges from 5350 to 5460 MHz. A red line indicates the FCC CLASS-B (AVG) limit at approximately 50 dBuV/m. The blue trace shows the averaged signal, which is mostly below the limit, with a small peak around 5360 MHz. Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:10.000KHz SWT:Auto Detector : Peak	Level (dBuV/m) vs Frequency (MHz) plot for Vertical polarization. The y-axis ranges from 10 to 117 dBuV/m, and the x-axis ranges from 5350 to 5460 MHz. A red line indicates the FCC CLASS-B (AVG) limit at approximately 50 dBuV/m. The blue trace shows the averaged signal, which is mostly below the limit, with a small peak around 5360 MHz. Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:10.000KHz SWT:Auto Detector : Peak



Band 1 - 5150~5250MHz
WIFI 802.11a (Harmonic @ 3m)

WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11a CH36 5180MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL Detector : Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL Detector : Peak



WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11a CH44 5220MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL Detector : Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL Detector : Peak



WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11a CH48 5240MHz	
1+2	Horizontal	Vertical
Peak Avg.	Level (dBuV/m) Date: 2016-05-10 Frequency (GHz) Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL Detector : Peak	Level (dBuV/m) Date: 2016-05-10 Frequency (GHz) Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL Detector : Peak



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

WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11n HT20 CH36 5180MHz	
1+2	Horizontal	Vertical
Peak Avg.	Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL Detector : Peak	Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL Detector : Peak



WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11n HT20 CH44 5220MHz	
1+2	Horizontal	Vertical
Peak Avg.	Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL Detector : Peak	Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL Detector : Peak



WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11n HT20 CH48 5240MHz	
1+2	Horizontal	Vertical
Peak Avg.	Level (dBuV/m) Date: 2016-05-10 Frequency (MHz) Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL Detector : Peak	Level (dBuV/m) Date: 2016-05-10 Frequency (MHz) Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL Detector : Peak



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

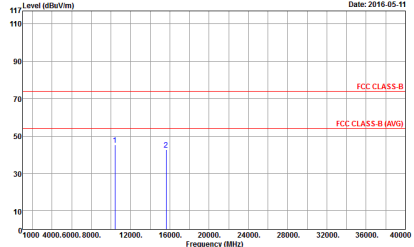
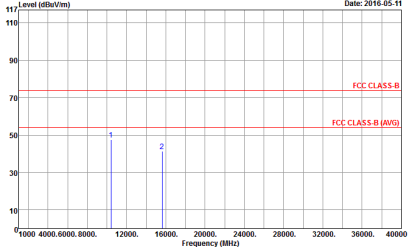
WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11n HT40 CH38 5190MHz	
1+2	Horizontal	Vertical
Peak Avg.	Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL Detector : Peak	Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL Detector : Peak



WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11n HT40 CH46 5230MHz	
1+2	Horizontal	Vertical
Peak Avg.	Level (dBuV/m) Date: 2016-05-10 Frequency (MHz) Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL Detector : Peak	Level (dBuV/m) Date: 2016-05-10 Frequency (MHz) Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL Detector : Peak



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

WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11ac VHT80 CH42 5210MHz	
1+2	Horizontal	Vertical
Peak Avg.	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL Detector : Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL Detector : Peak



<TXBF Modes with AC Adapter>

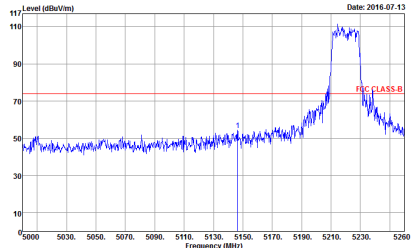
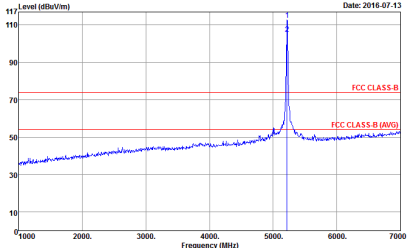
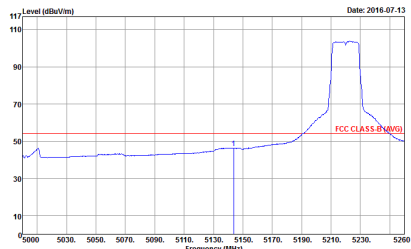
Band 1 5150~5250MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

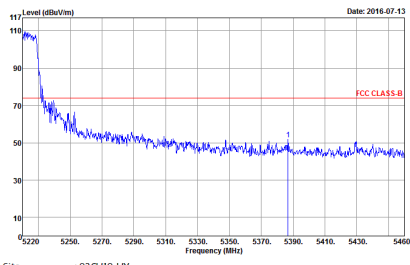
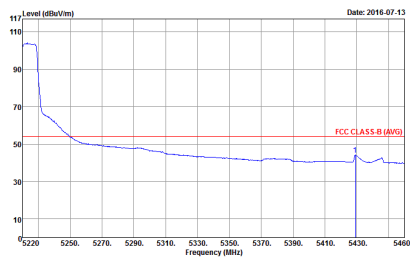
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH36 5180MHz	
1	Horizontal	Fundamental
Peak	Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak	



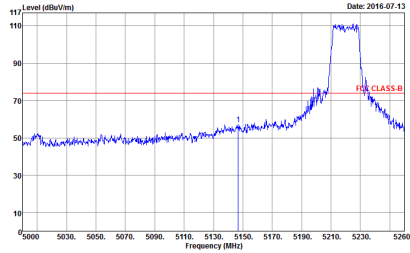
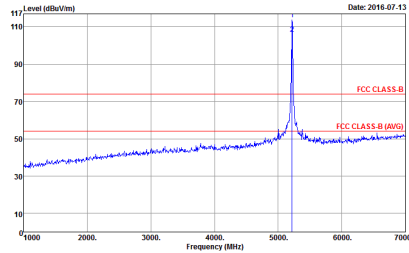
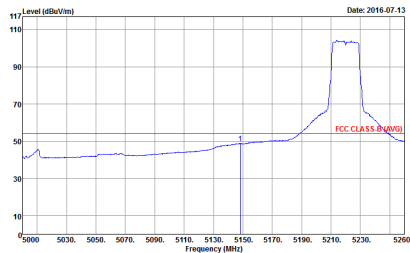
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH36 5180MHz	
1	Vertical	Fundamental
Peak	Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak	

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH44 5220MHz - L	
1	Horizontal	Fundamental
Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak	

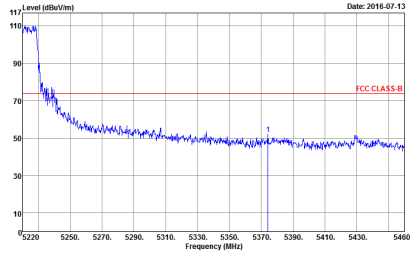
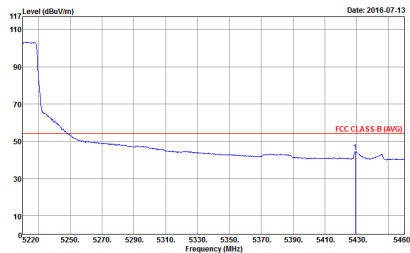


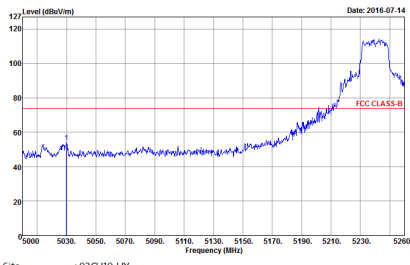
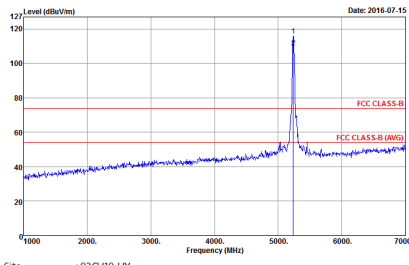
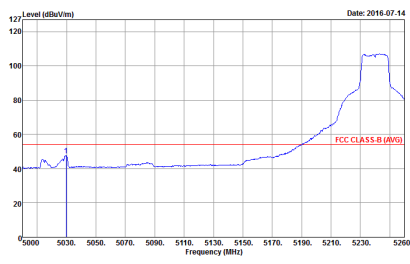
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH44 5220MHz - R	
1	Horizontal	Fundamental
Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	
Avg.	 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak	

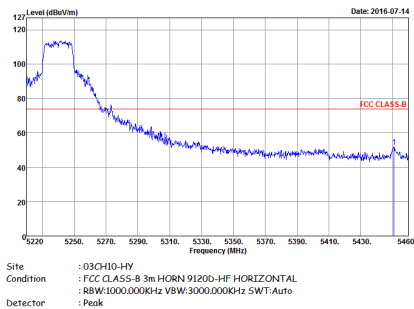
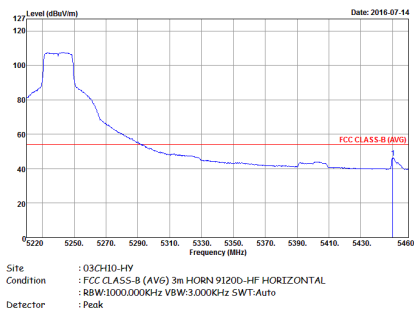


WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH44 5220MHz - L	
1	Vertical	Fundamental
Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak	



WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH44 5220MHz - R	
1	Vertical	Fundamental
Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	
Avg.	 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak	

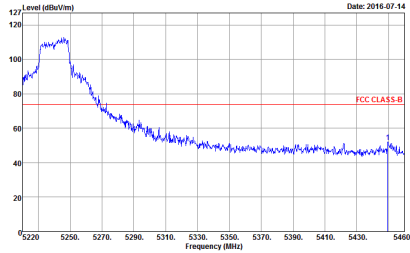
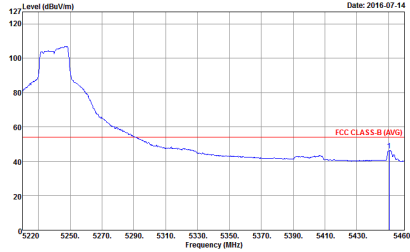
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH48 5240MHz - L	
1	Horizontal	Fundamental
Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL Detector : Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL Detector : Peak
Avg.	 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL Detector : Peak	

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH48 5240MHz - R	
1	Horizontal	Fundamental
Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	
Avg.	 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak	



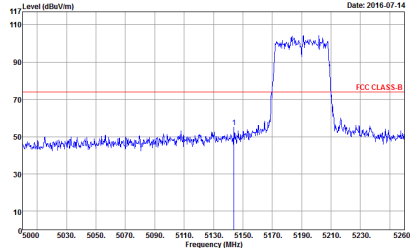
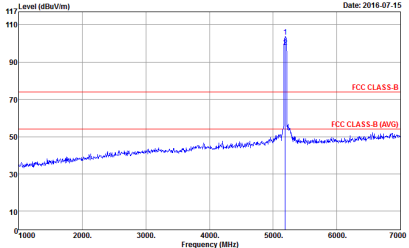
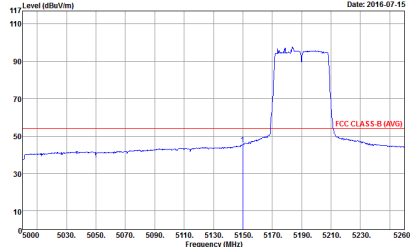
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH48 5240MHz - L	
1	Vertical	Fundamental
Peak	Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak	



WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT20 CH48 5240MHz - R	
1	Vertical	Fundamental
Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	
Avg.	 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak	



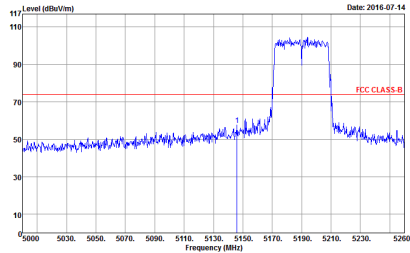
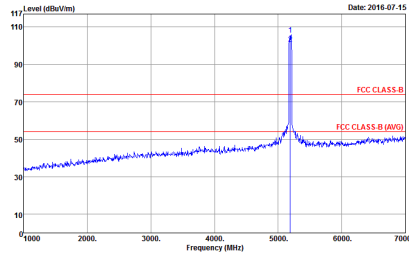
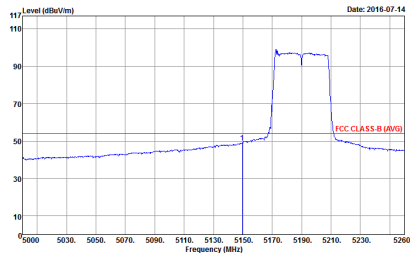
Band 1 5150~5250MHz
WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH38 5190MHz - L	
1	Horizontal	Fundamental
Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak	



WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH38 5190MHz - R	
1	Horizontal	Fundamental
Peak	Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	
Avg.	Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak	

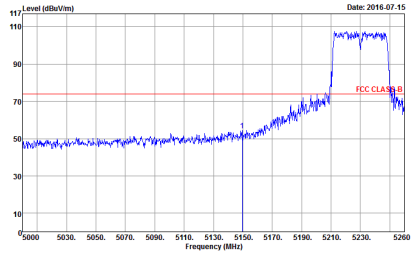
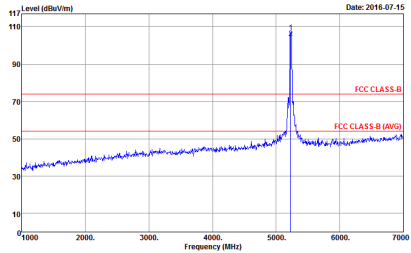
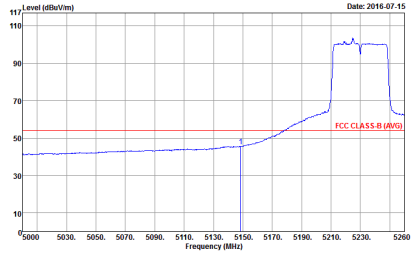


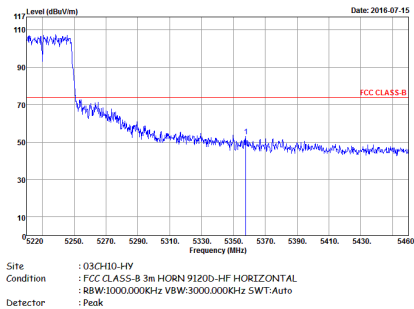
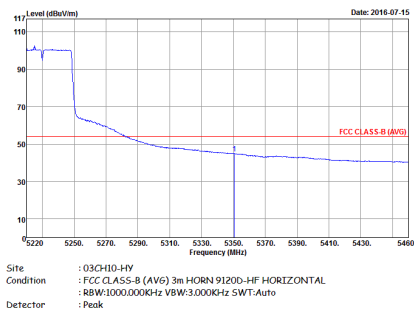
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH38 5190MHz - L	
1	Vertical	Fundamental
Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak	



WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH38 5190MHz - R	
1	Vertical	Fundamental
Peak	Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	
Avg.	Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak	



WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH46 5230MHz - L	
1	Horizontal	Fundamental
Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak	

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



WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH46 5230MHz - L	
1	Vertical	Fundamental
Peak	Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak	

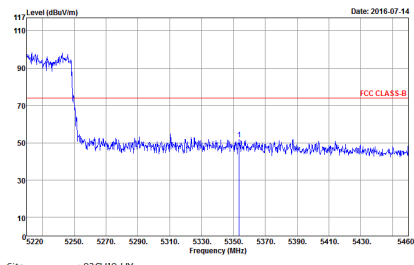
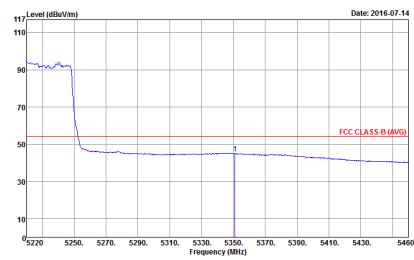


WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11n HT40 CH46 5230MHz - R	
1	Vertical	Fundamental
Peak	Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	
Avg.	Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak	



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	Fundamental
Peak	Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak	

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH42 5210MHz - R	
1	Horizontal	Fundamental
Peak	 Date: 2016-07-14 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	
Avg.	 Date: 2016-07-14 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak	



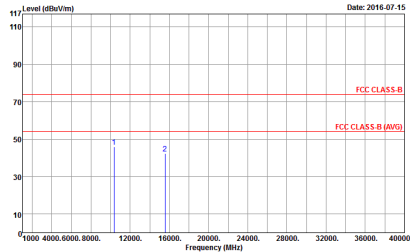
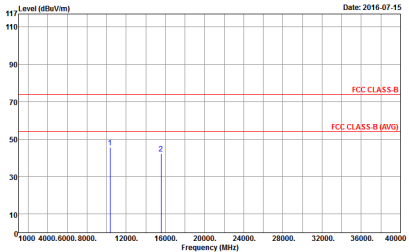
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH42 5210MHz - L	
1	Vertical	Fundamental
Peak	Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak
Avg.	Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak	



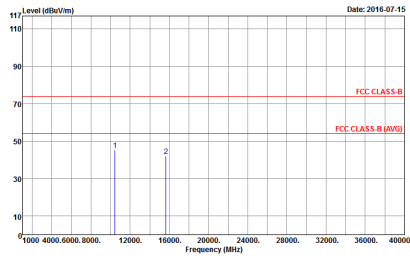
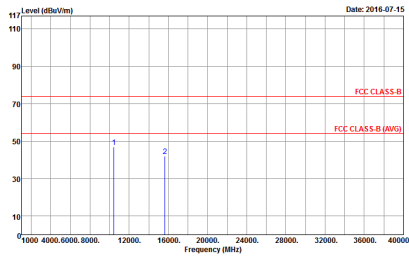
WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH42 5210MHz - R	
1	Vertical	Fundamental
Peak	Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak	
Avg.	Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3.000KHz SWT:Auto Detector : Peak	



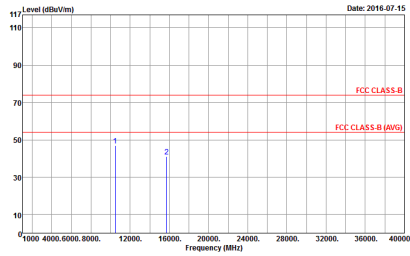
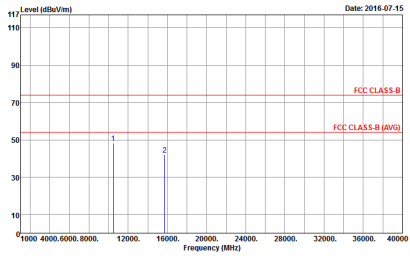
Band 1 5150~5250MHz
WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11n HT20 CH36 5180MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL Detector : Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL Detector : Peak



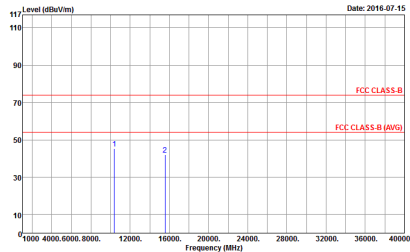
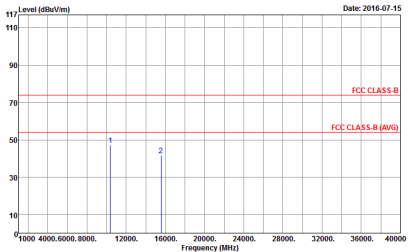
WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11n HT20 CH44 5220MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL Detector : Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL Detector : Peak



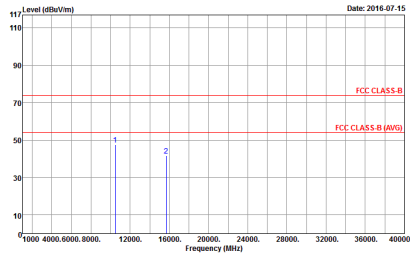
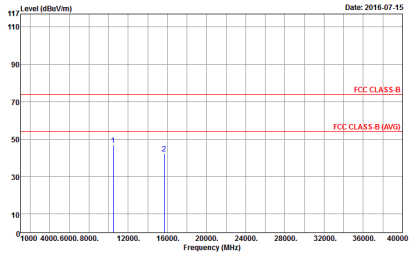
WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11n HT20 CH48 5240MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL Detector : Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL Detector : Peak



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

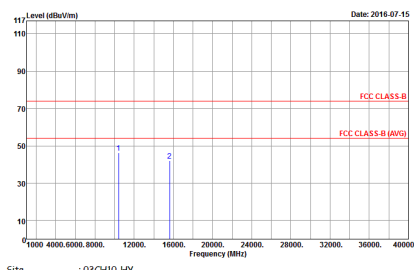
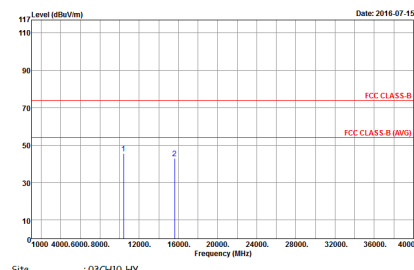
WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11n HT40 CH38 5190MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL Detector : Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL Detector : Peak



WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11n HT40 CH46 5230MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL Detector : Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL Detector : Peak



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

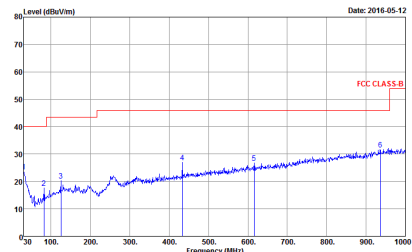
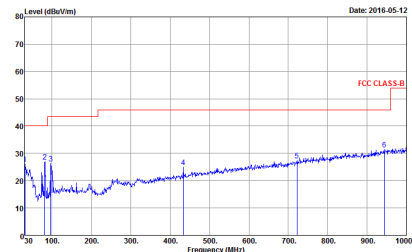
WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11ac VHT80 CH42 5210MHz	
1	Horizontal	Vertical
Peak Avg.	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL Detector : Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL Detector : Peak



Worst case with AC Adapter

Emission below 1GHz

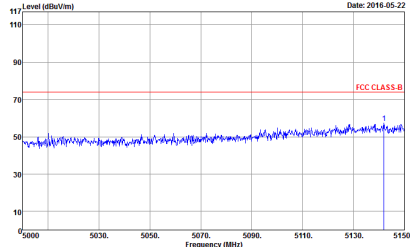
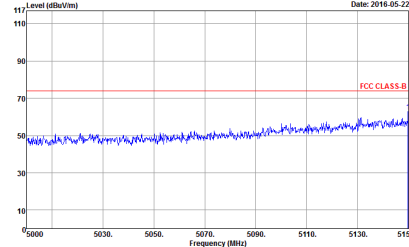
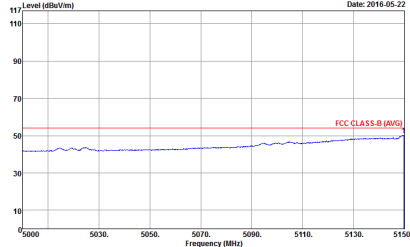
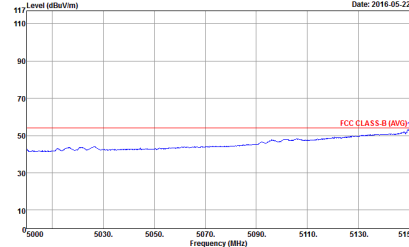
5GHz WIFI 802.11a (LF)

WIFI	5GHz WIFI	
ANT	802.11a LF	
1+2	Horizontal	Vertical
QP / Peak	 Site : 03CH10-HV Condition : FCC CLASS-B 3m BL-LO6 6111D-LF HORIZONTAL Detector : Peak	 Site : 03CH10-HV Condition : FCC CLASS-B 3m BL-LO6 6111D-LF VERTICAL Detector : Peak

< Non-TXBF Modes with PoE Adapter >

Band 1 - 5150~5250MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI	Band 1 5150~5250MHz Band Edge @ 3m	
ANT	802.11a CH36 5180MHz	
1+2	Horizontal	Vertical
Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL Detector : Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL Detector : Peak
Avg.	 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF HORIZONTAL Detector : Peak	 Site : 03CH10-HY Condition : FCC CLASS-B (AVG) 3m HORN 9120D-HF VERTICAL Detector : Peak

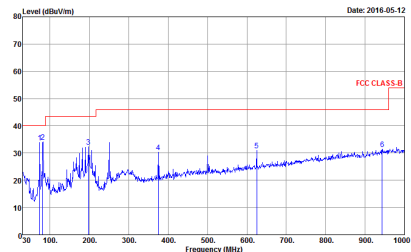
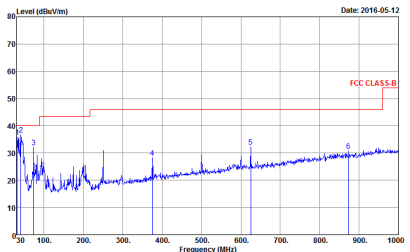


Band 1 - 5150~5250MHz
WIFI 802.11a (Harmonic @ 3m)

WIFI	Band 1 5150~5250MHz Harmonic @ 3m	
ANT	802.11a CH36 5180MHz	
1+2	Horizontal	Vertical
Peak Avg.	Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF HORIZONTAL Detector : Peak	Site : 03CH10-HY Condition : FCC CLASS-B 3m HORN 9120D-HF VERTICAL Detector : Peak



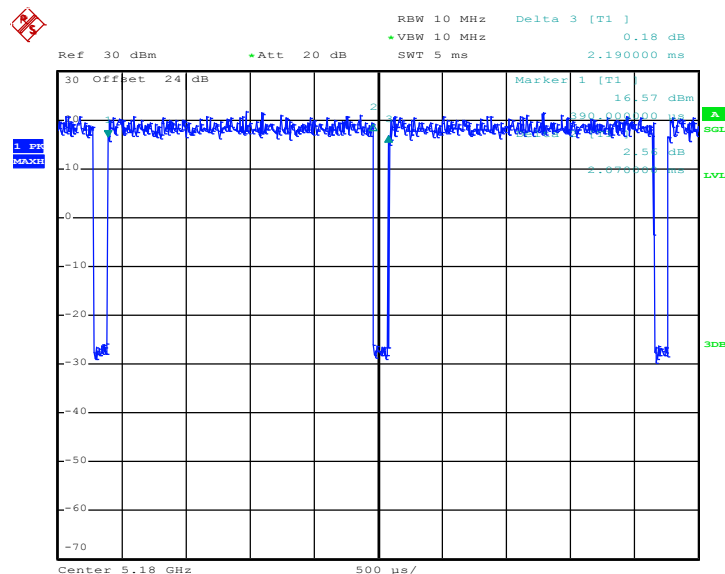
Emission below 1GHz
5GHz WIFI 802.11a (LF)

WIFI	5GHz WIFI	
ANT	802.11a LF	
1+2	Horizontal	Vertical
QP / Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m BI-LOG 6111D-LF HORIZONTAL Detector : Peak	 Site : 03CH10-HY Condition : FCC CLASS-B 3m BI-LOG 6111D-LF VERTICAL Detector : Peak

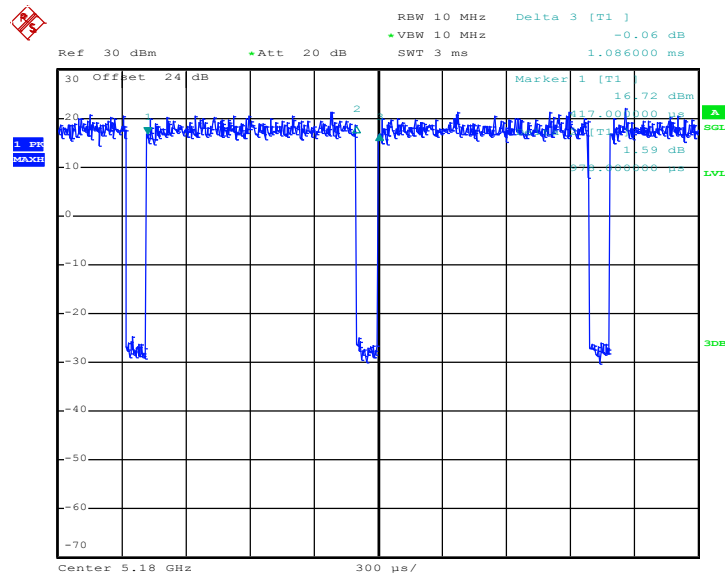
Appendix D. Duty Cycle Plots

<Non-TXBF Modes>

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
1+2	802.11a for Ant. 1	94.52	2070	0.48	1kHz
1+2	802.11a for Ant. 2	94.52	2070	0.48	1kHz
1+2	5GHz 802.11n HT20 for Ant. 1	90.06	978	1.02	3kHz
1+2	5GHz 802.11n HT20 for Ant. 2	90.61	984	1.02	3kHz
1+2	5GHz 802.11n HT40 for Ant. 1	83.22	496	2.02	3kHz
1+2	5GHz 802.11n HT40 for Ant. 2	83.22	496	2.02	3kHz
1+2	5GHz 802.11ac VHT80 for Ant. 1	88.89	256	3.91	10kHz
1+2	5GHz 802.11ac VHT80 for Ant. 2	89.51	256	3.91	10kHz

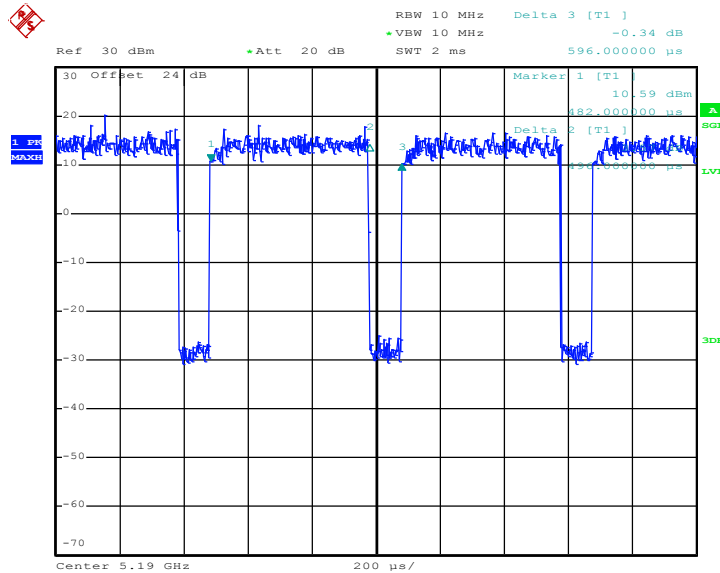
MIMO <Ant. 1+2(1)>
802.11a


Date: 27.APR.2016 18:57:35

802.11n HT20


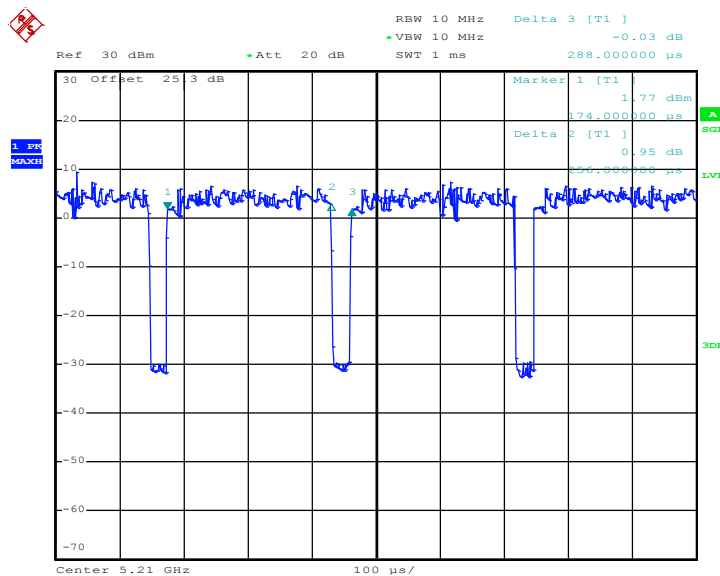
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802.11n HT40

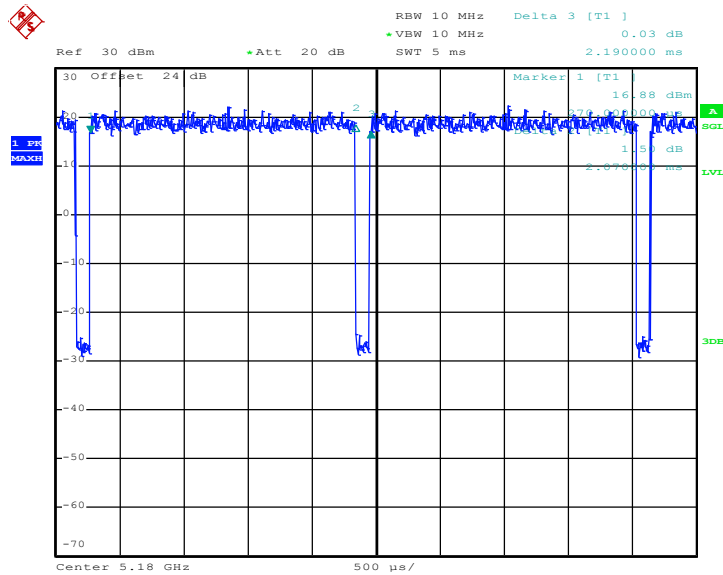


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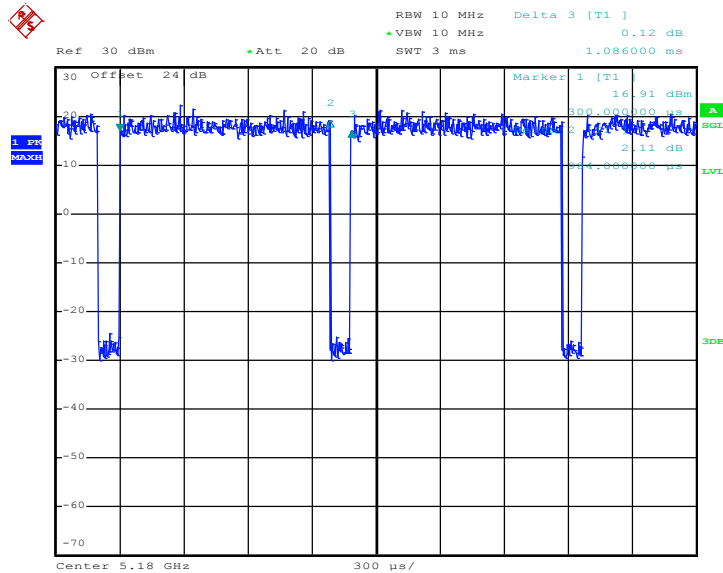
802.11ac VHT80



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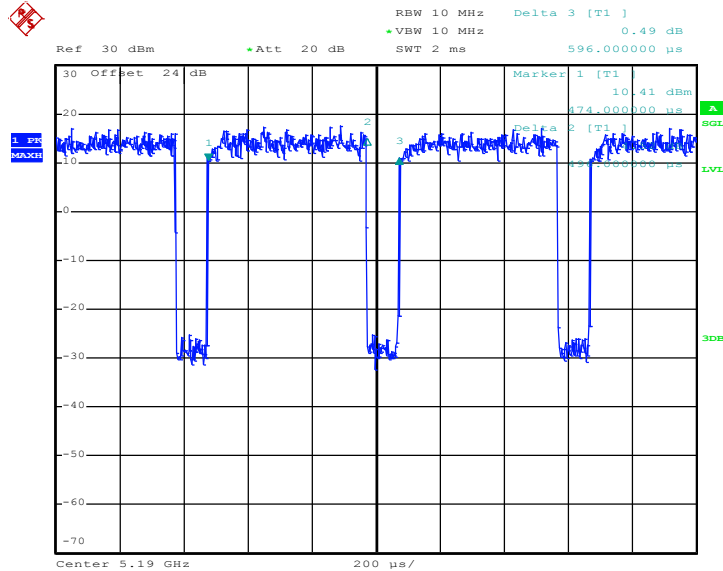
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802.11a


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802.11n HT20


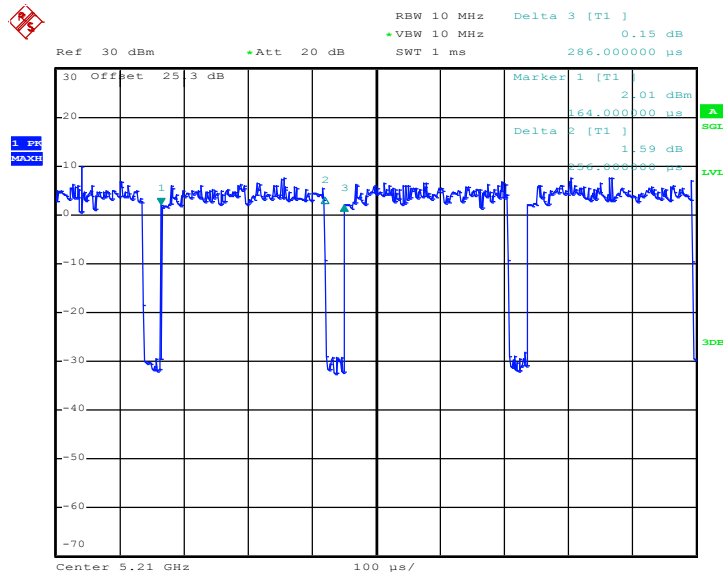
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802.11n HT40



Date: 27.APR.2016 19:05:30

802.11ac VHT80

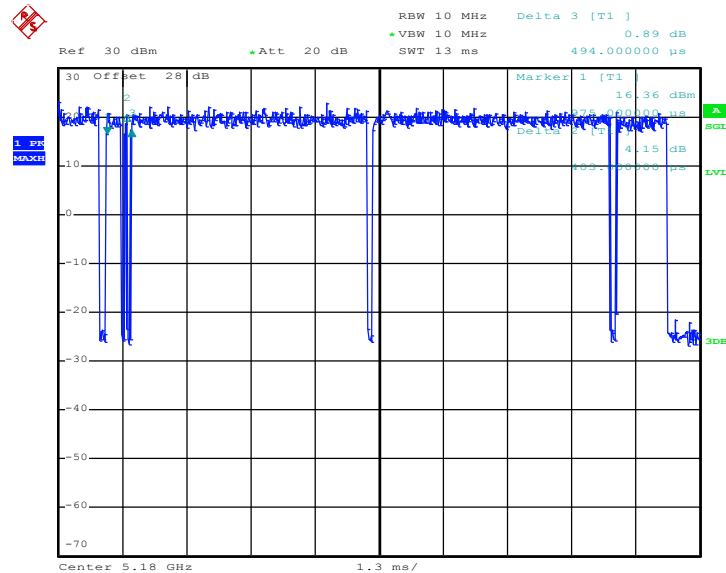


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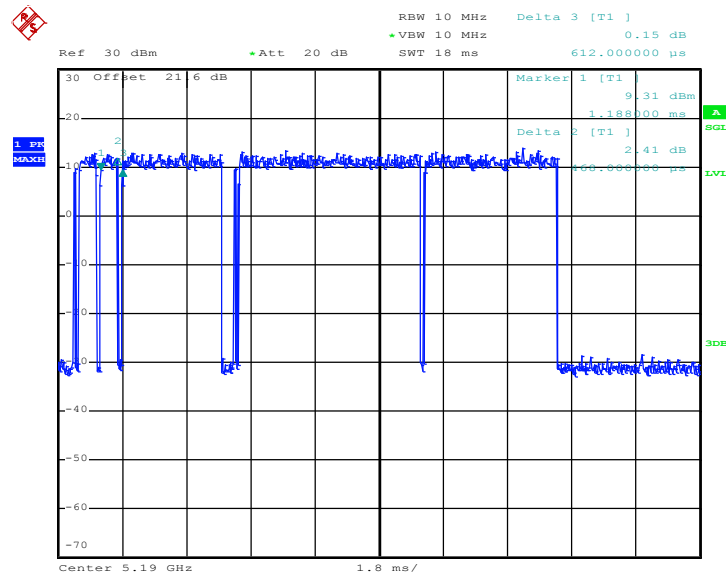
<TXBF Modes>

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
1+2	5GHz 802.11n HT20	97.87	403	2.48	3kHz
1+2	5GHz 802.11n HT40	97.29	468	2.14	3kHz
1+2	5GHz 802.11ac VHT80	97.71	870	1.15	3kHz

Note *: Duty cycle is not a constant value during the continuous beamforming transmission.

MIMO <Ant. 1+2>
802.11n HT20


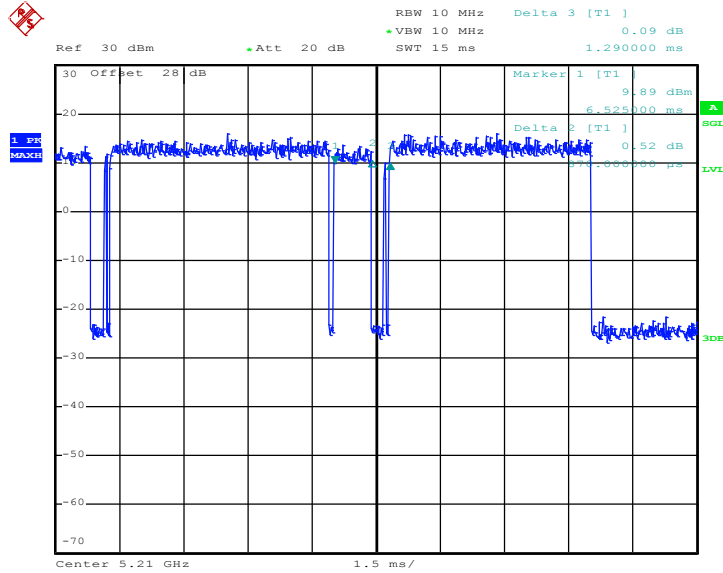
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802.11n HT40


Date: 20.JUL.2016 14:36:42



802.11ac VHT80



Date: 19.JUL.2016 16:30:40