



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. 28, 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



Testing Laboratory
1190

SPORTON INTERNATIONAL INC.

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SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.403(i)	6dB, 26dB and 99% Occupied Bandwidth	> 500kHz	Pass	-
3.2	15.407(a)	Maximum Conducted Output Power	≤ 30 dBm	Pass	-
3.3	15.407(a)	Power Spectral Density	≤ 30 dBm/500kHz	Pass	-
3.4	15.407(b)	Unwanted Emissions	15.407(b)(4)(i) & 15.209(a)	Pass	Under limit 4.03 dB at 31.620 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	5745 MHz ~ 5825 MHz						
Maximum Output Power <Non-TXBF Modes>	MIMO <Ant. Port 1+2> 802.11a : 21.31 dBm / 0.1352 W 802.11n HT20 : 21.20 dBm / 0.1318 W 802.11n HT40 : 21.34 dBm / 0.1361 W 802.11ac VHT20: 21.10 dBm / 0.1288 W 802.11ac VHT40: 21.25 dBm / 0.1334 W 802.11ac VHT80: 21.00 dBm / 0.1259 W						
Maximum Output Power <TXBF Modes>	MIMO <Ant. Port 1+2> 802.11n HT20 : 21.11 dBm / 0.1291 W 802.11n HT40 : 21.11 dBm / 0.1291 W 802.11ac VHT20: 21.07 dBm / 0.1279 W 802.11ac VHT40: 21.07 dBm / 0.1279 W 802.11ac VHT80: 20.91 dBm / 0.1233 W						
99% Occupied Bandwidth <Non-TXBF Modes>	802.11a : 18.60 MHz 802.11n HT20 : 19.05 MHz 802.11n HT40 : 36.80 MHz 802.11ac VHT20 : 19.25 MHz 802.11ac VHT40 : 36.70 MHz 802.11ac VHT80 : 75.84 MHz						
99% Occupied Bandwidth <TXBF Modes>	802.11n HT20 : 18.80 MHz 802.11n HT40 : 36.80 MHz 802.11ac VHT20 : 19.00 MHz 802.11ac VHT40 : 36.80 MHz 802.11ac VHT80 : 75.72 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	<table border="1"> <thead> <tr> <th></th> <th>Ant. 1</th> <th>Ant. 2</th> </tr> </thead> <tbody> <tr> <td>802.11 a/n/ac MIMO</td> <td>V</td> <td>V</td> </tr> </tbody> </table>		Ant. 1	Ant. 2	802.11 a/n/ac MIMO	V	V
	Ant. 1	Ant. 2					
802.11 a/n/ac MIMO	V	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 (X 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)
5725-5850 MHz Band 4 (U-NII-3)	149	5745	157	5785
	151	5755	159	5795
	153	5765	161	5805
	155	5775	165	5825

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



2.2 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

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.	

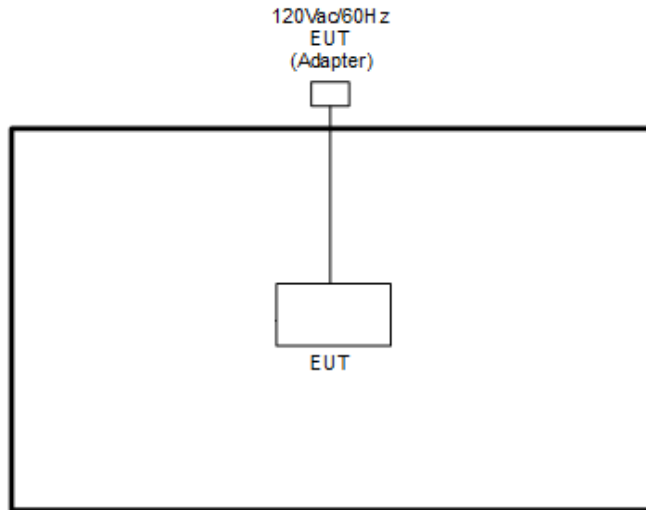


Ch. #		Band IV : 5725-5850 MHz		
		802.11a	802.11n HT20	802.11n HT40
L	Low	149	149	151
M	Middle	157	157	-
H	High	165	165	159

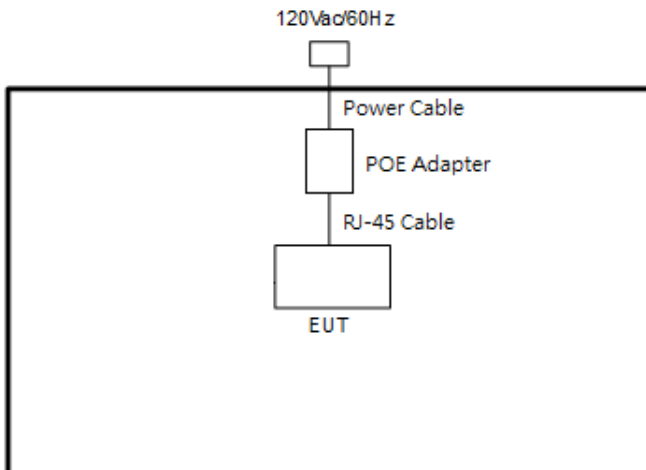
Ch. #		Band IV : 5725-5850 MHz		
		802.11ac VHT20	802.11ac VHT40	802.11ac VHT80
L	Low	149	151	-
M	Middle	157	-	155
H	High	165	159	-

2.3 Connection Diagram of Test System

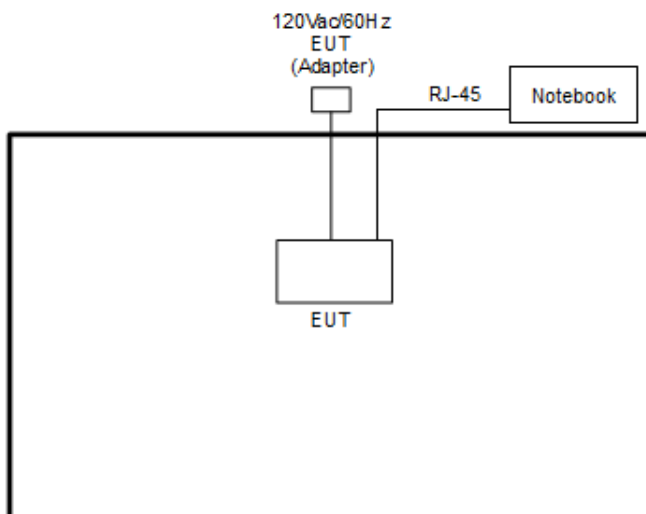
<WLAN Tx Non-TXBF Mode with AC Adapter>



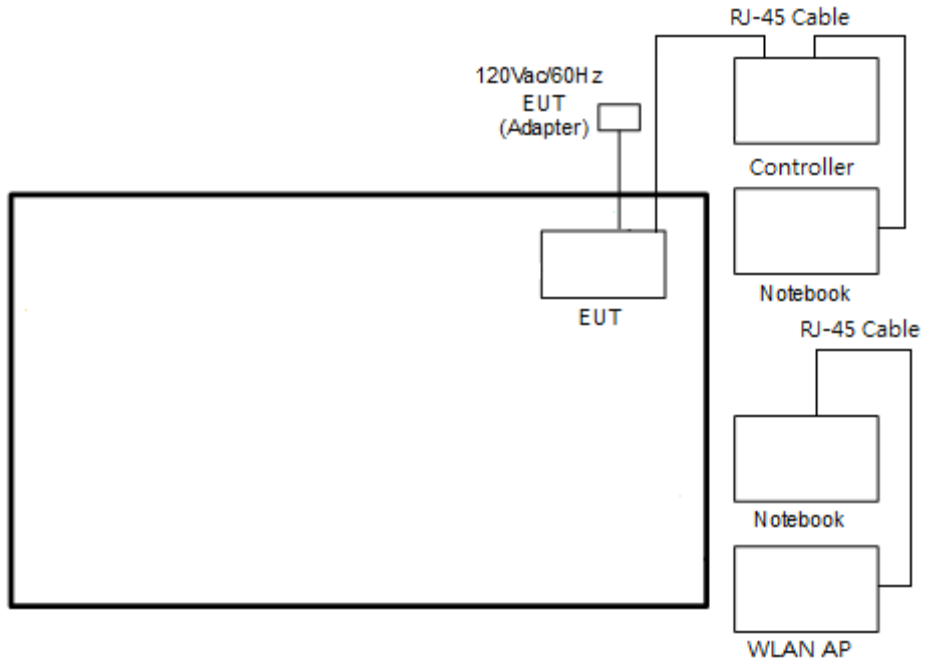
<WLAN Tx Non-TXBF Mode with PoE Adapter>



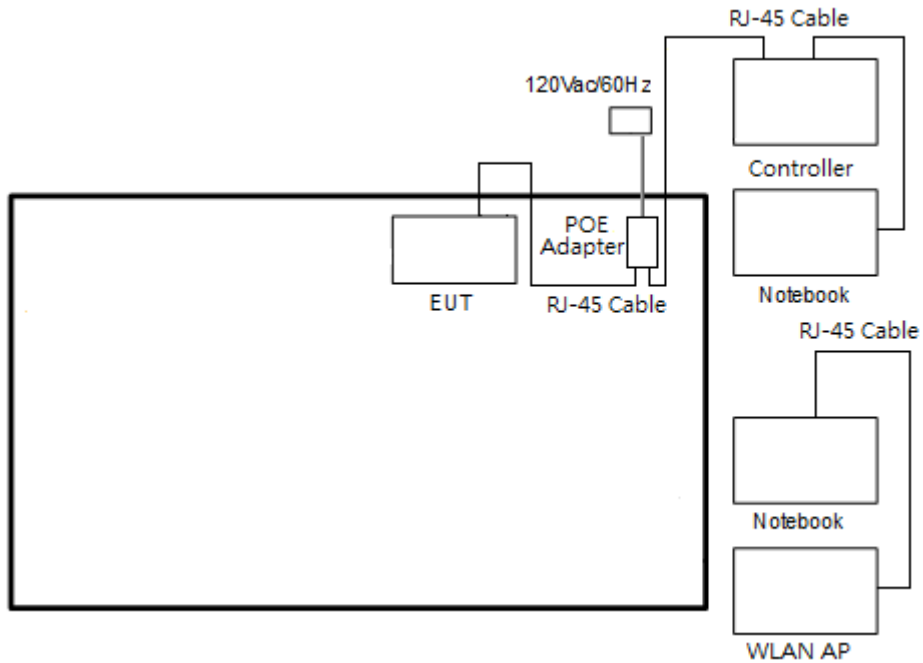
<WLAN Tx TXBF Mode>



<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	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
2.	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
3.	AP Router	ARUBA	RFQ-207	N/A	N/A	Unshielded, 1.6 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" 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 6dB and 26dB and 99% Occupied Bandwidth Measurement

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

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

26dB and 99% Occupied bandwidth are reporting only.

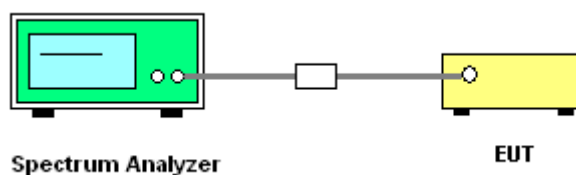
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r03. Section C) Emission bandwidth for the band 5.725-5.85GHz
2. Set RBW = 100kHz.
3. Set the VBW $\geq 3 \times$ RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is 6 dB down from the peak of the emission.
7. Measure and record the results in the test report.

3.1.4 Test Setup

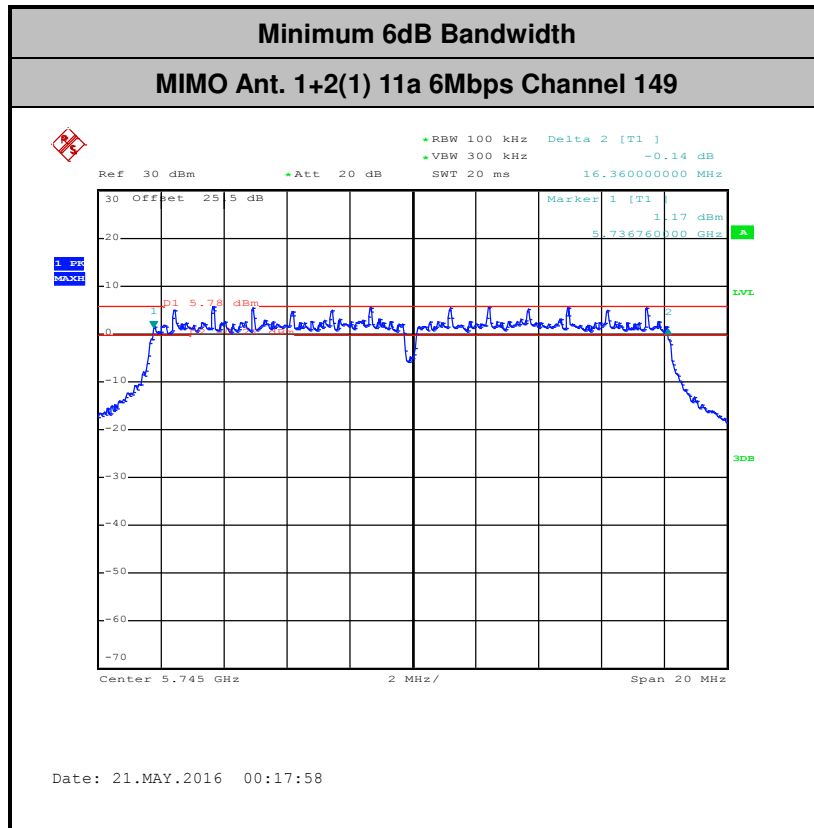


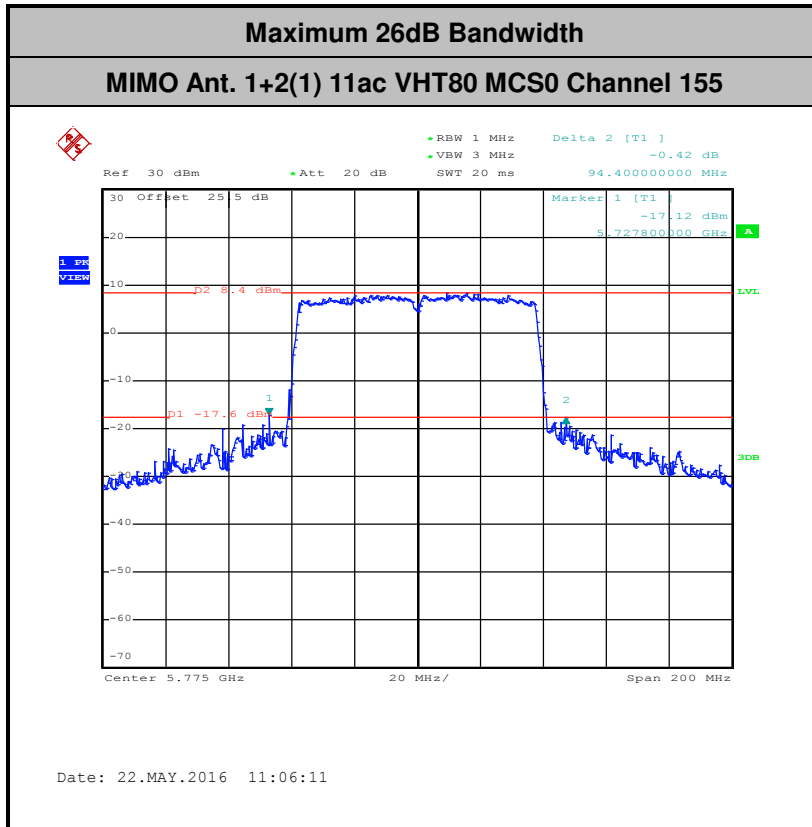
3.1.5 Test Result of 6dB Bandwidth

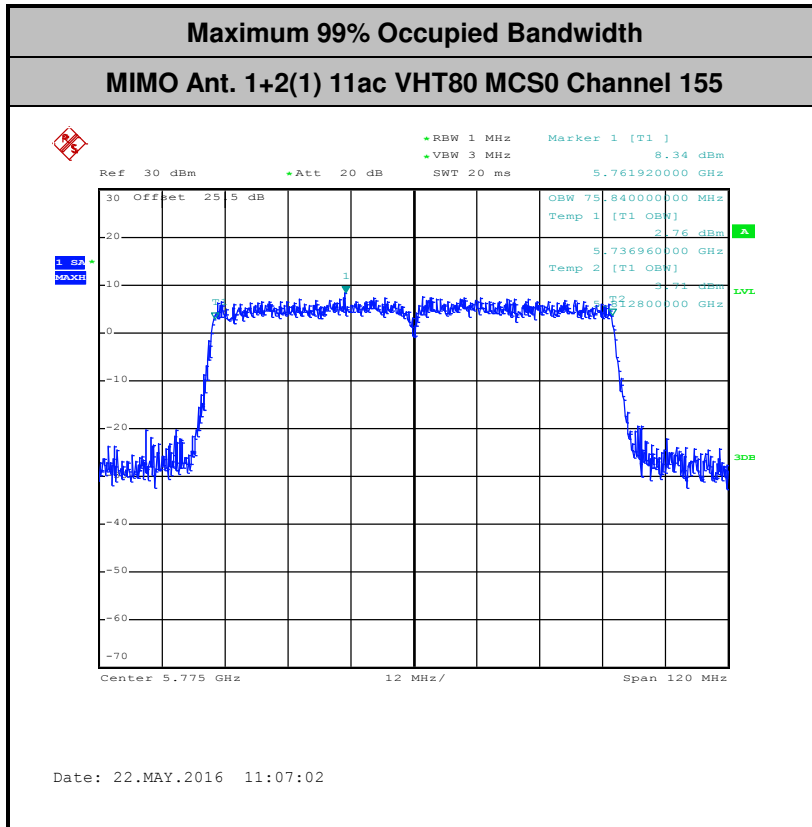
Please refer to Appendix A.



<Non TXBF Modes>



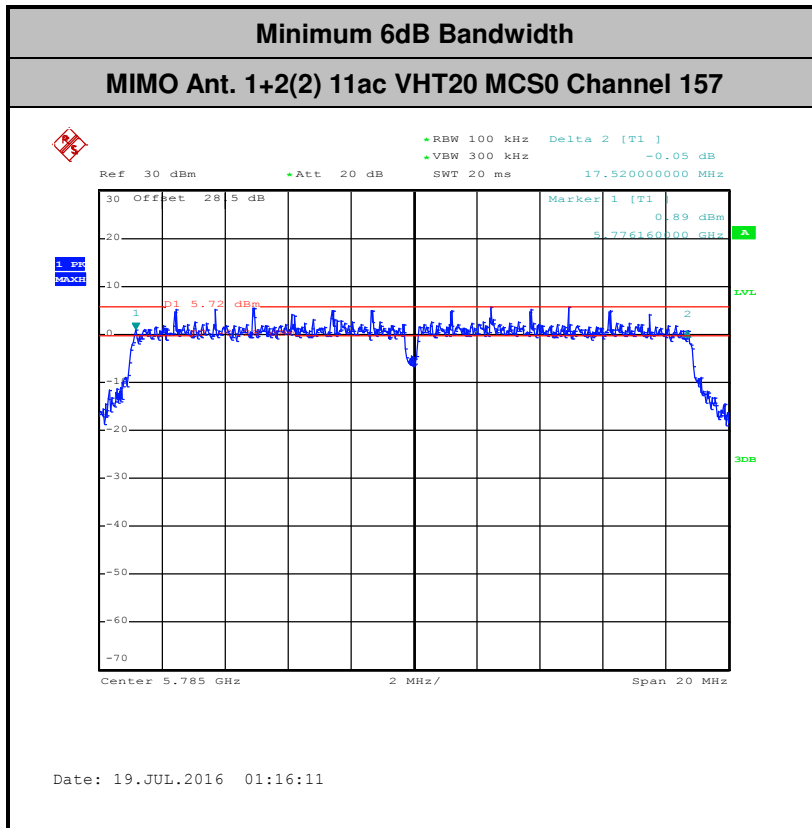


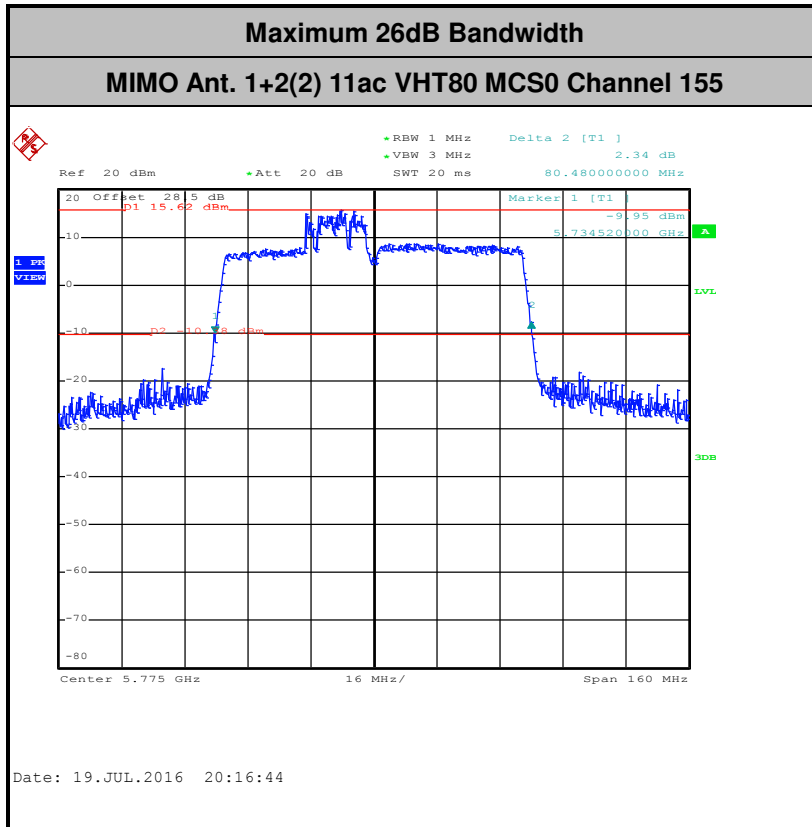


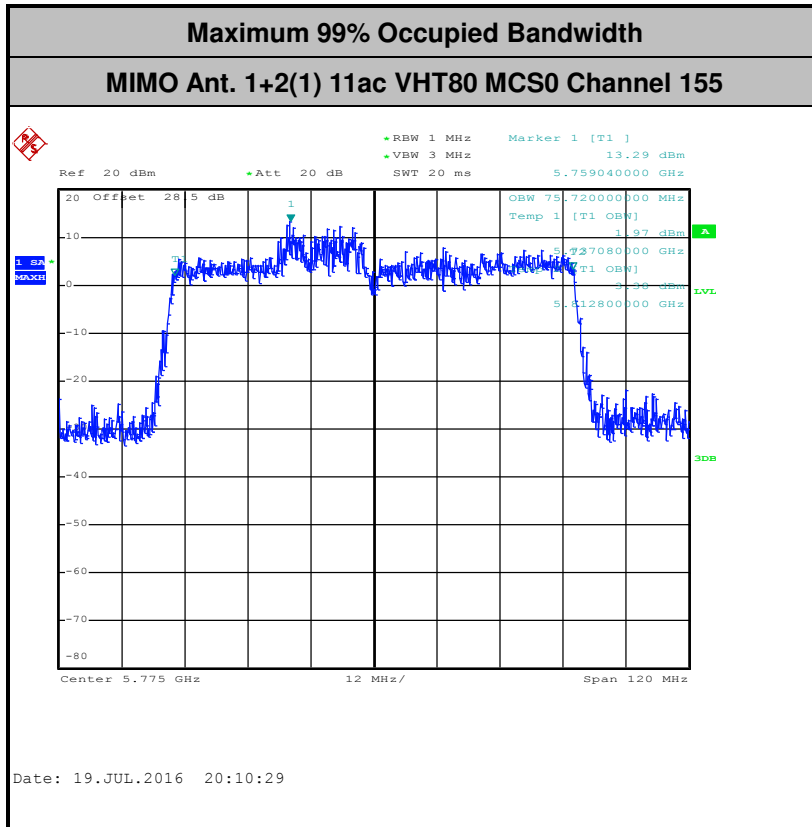
Note: The occupied channel bandwidth is maintained within the band of operation for all of the modulations.



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

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

3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

Non-TXBF modes

The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r03.

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.

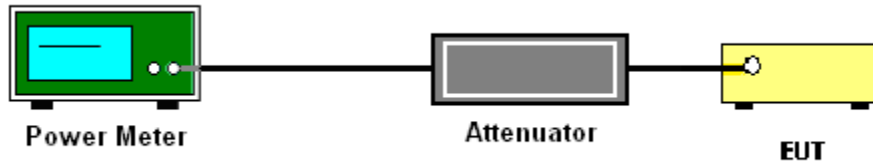
TXBF modes

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 continuously with a consistent duty cycle at its maximum power control level.
3. Measure the average power of the transmitter
4. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

3.2.4 Test Setup



3.2.5 Test Result of Maximum Conducted Output Power

Please refer to Appendix A.



3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

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

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

3.3.2 Measuring Instruments

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).

1. The testing follows Method SA-2 of FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r03.
 - Measure the duty cycle.
 - Set span to encompass the entire emission bandwidth (EBW) of the signal.
 - Set RBW = 300 kHz.
 - Set VBW \geq 1 MHz.
 - Number of points in sweep \geq 2 Span / RBW.
 - Sweep time = auto.
 - Detector = RMS
 - Trace average at least 100 traces in power averaging mode.
 - Add $10 \log(500\text{kHz}/\text{RBW})$ to the test result.
 - Add $10 \log(1/x)$, where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times. For example, add $10 \log(1/0.25) = 6$ dB if the duty cycle is 25 percent.

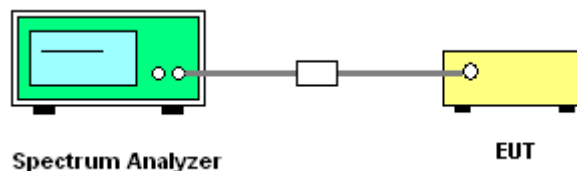
TXBF modes**# Method SA-3 #**

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

- Set span to encompass the entire emission bandwidth (EBW) of the signal.
 - Set RBW = 300 kHz.
 - Set VBW \geq 1 MHz.
 - Number of points in sweep \geq 2 Span / RBW.
 - Sweep time \leq (number of points in sweep) \times T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
 - Detector = power averaging (rms).
 - Trace mode = max hold.
 - Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.
1. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
 2. Each plot has already offset with cable loss, and attenuator loss. Measure the PPSD and record it.
 3. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

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

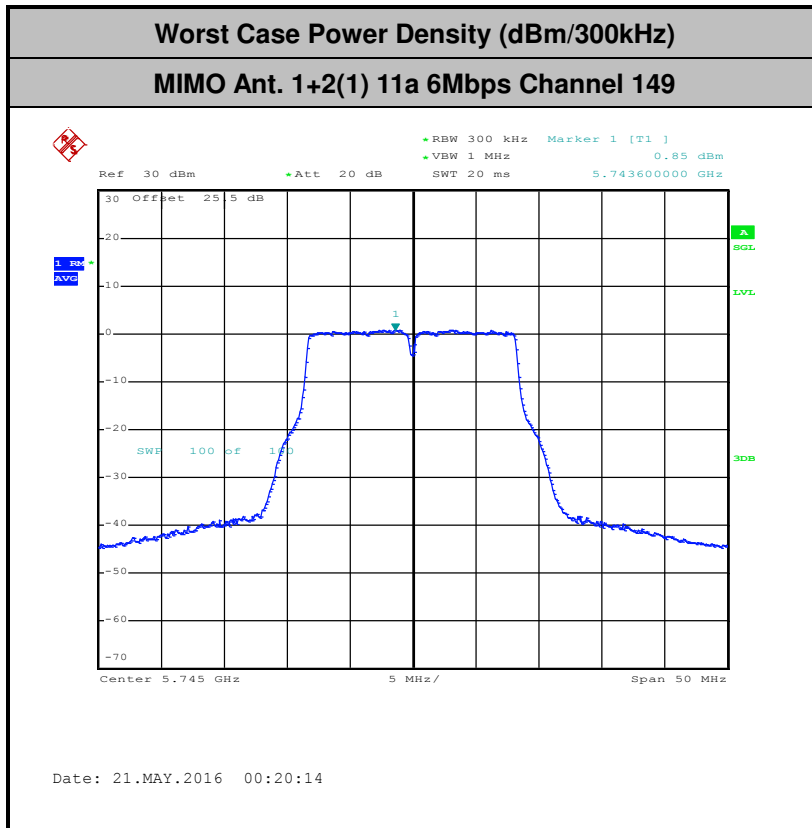
The total final Power Spectral Density is from a device with 2 transmitter outputs. The spectrum measurements of the individual outputs are all performed with the same span and number of points, the spectrum value in the first spectral bin of output 1 is summed with that in the first spectral bin of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

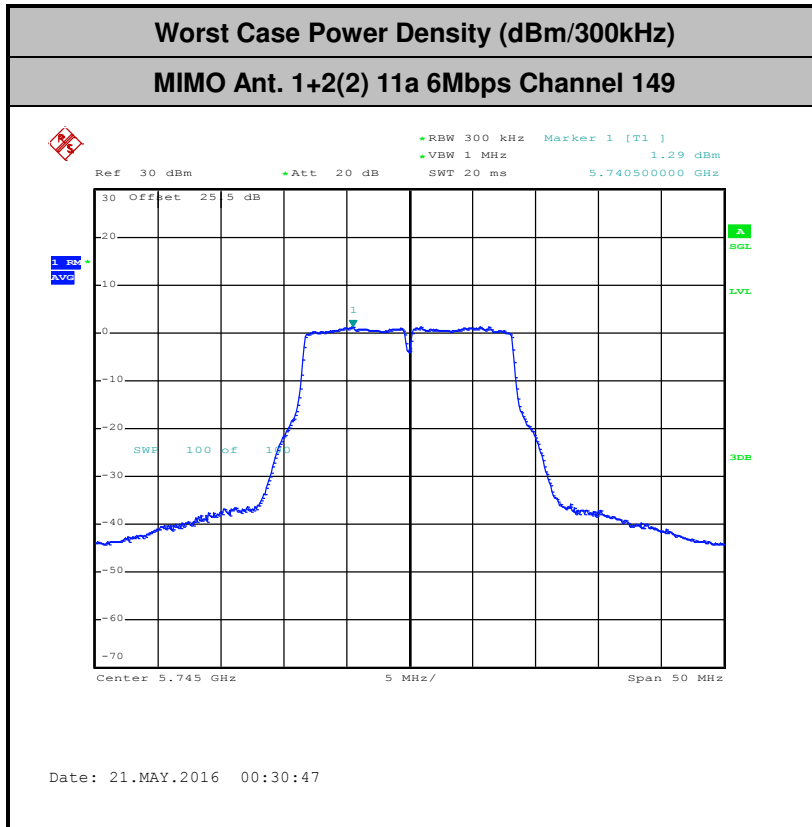
3.3.4 Test Setup**3.3.5 Test Result of Power Spectral Density**

Please refer to Appendix A.



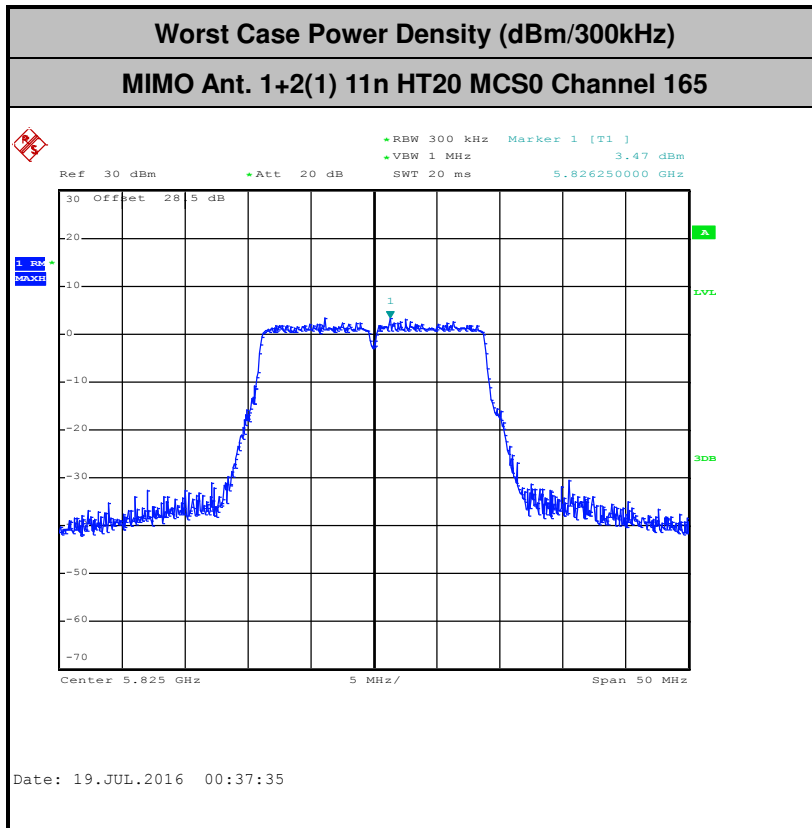
<Non-TXBF Modes>

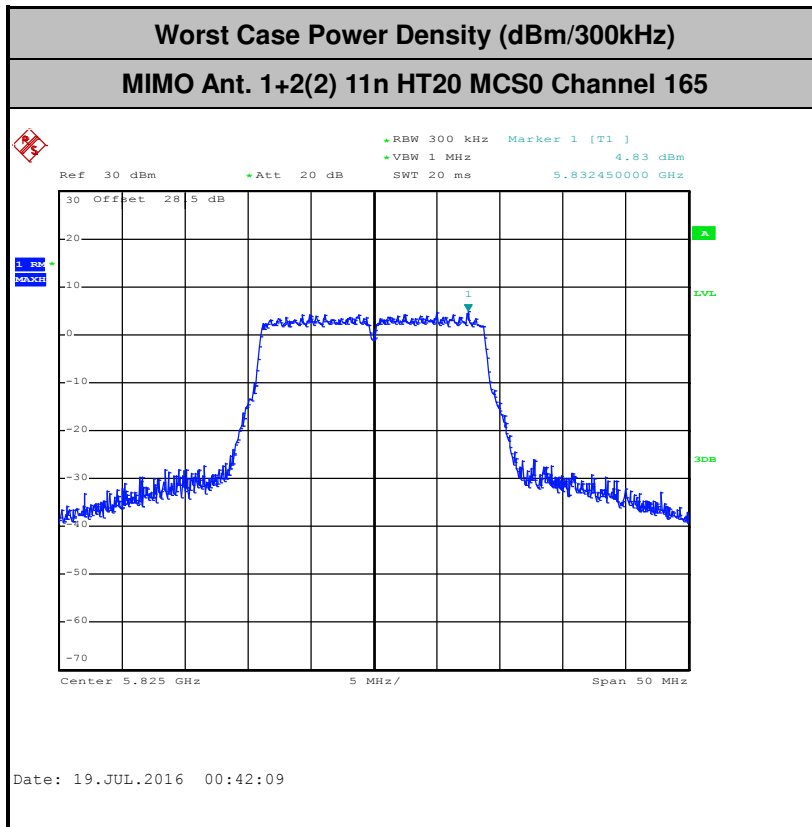






<TXBF Modes>







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 Part15.205.

3.4.1 Limit of Unwanted Emissions

(1) For transmitters operating in the 5.725-5.85 GHz band:

15.407(b)(4)(i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

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

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

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

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

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

(3) KDB 789033 D02 General UNII Test Procedures New Rules 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.

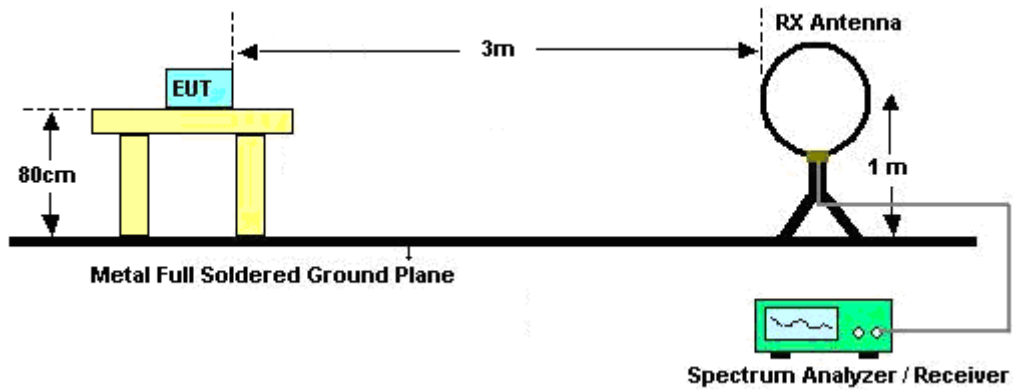
3.4.3 Test Procedures

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.

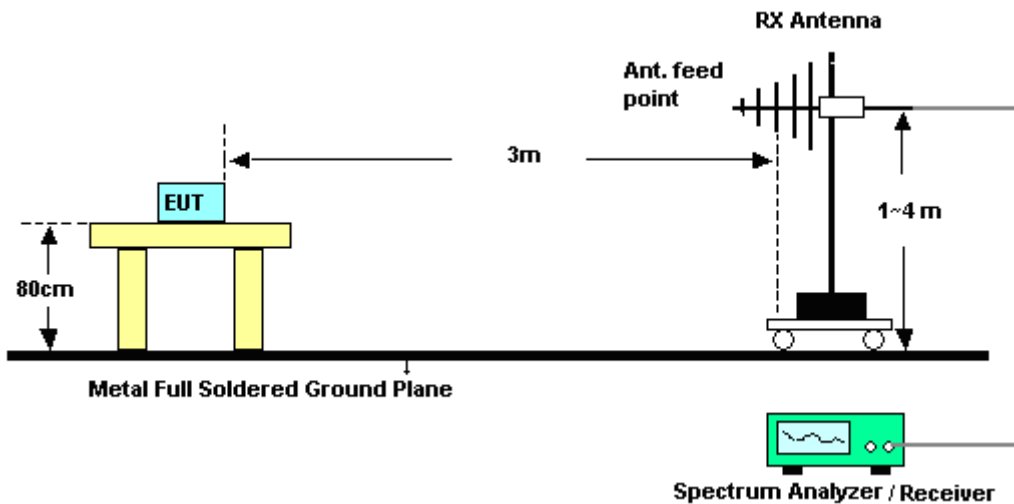
- 7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

3.4.4 Test Setup

For radiated emissions below 30MHz

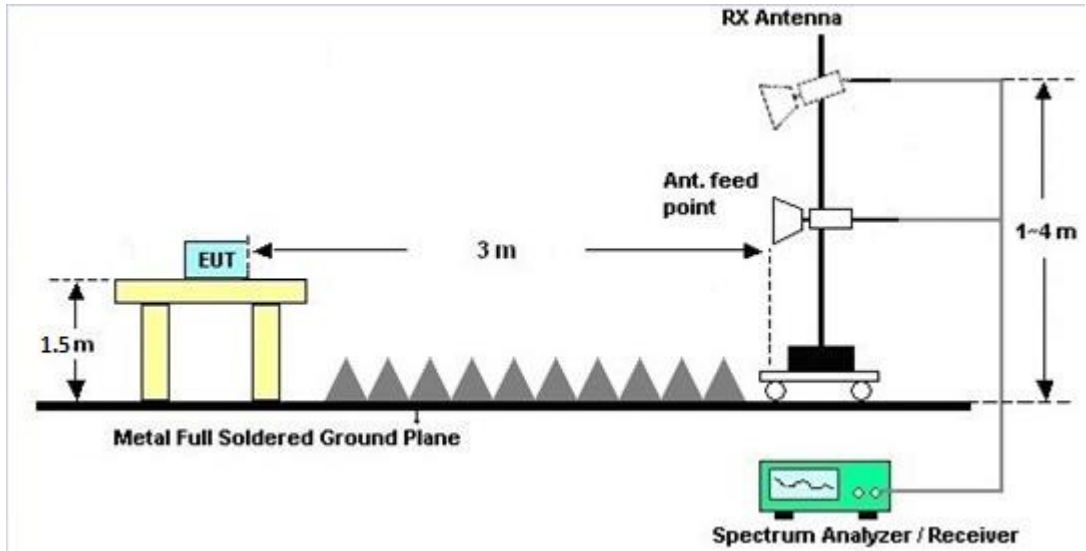


For radiated emissions from 30MHz to 1GHz

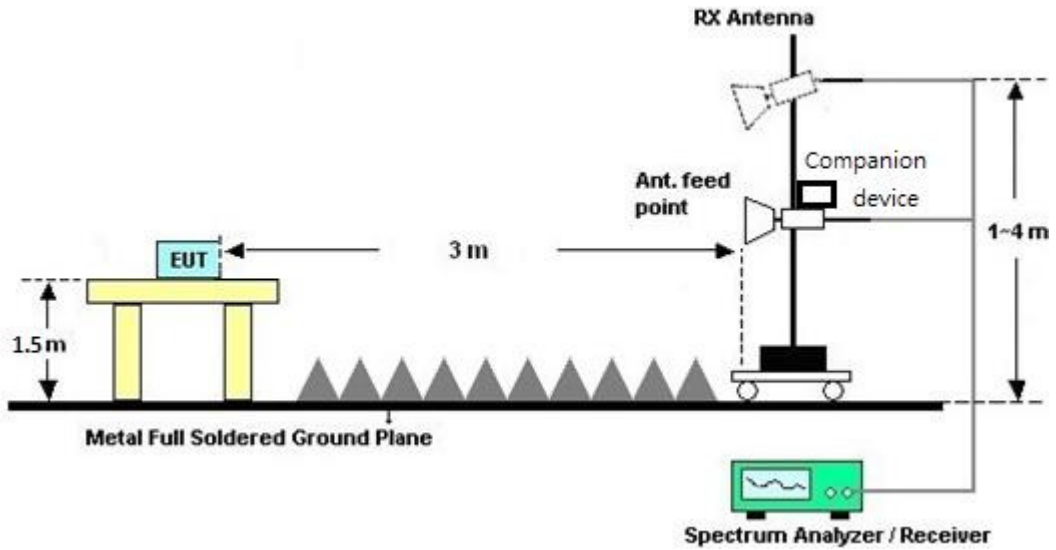


For radiated emissions above 1GHz

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.

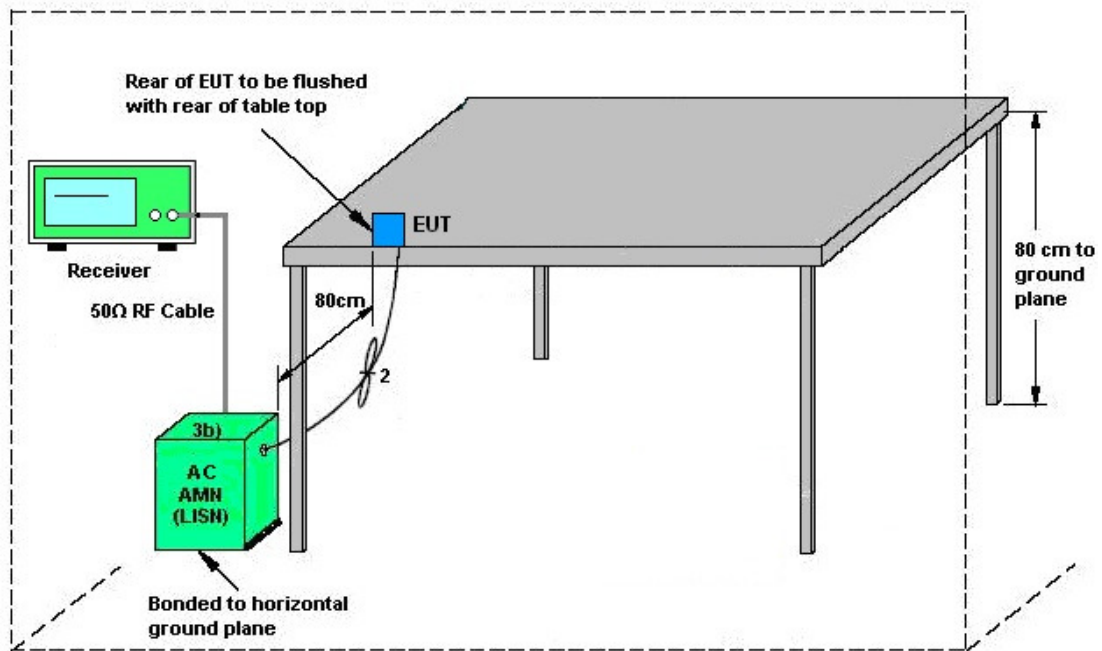
3.5.2 Measuring Instruments

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

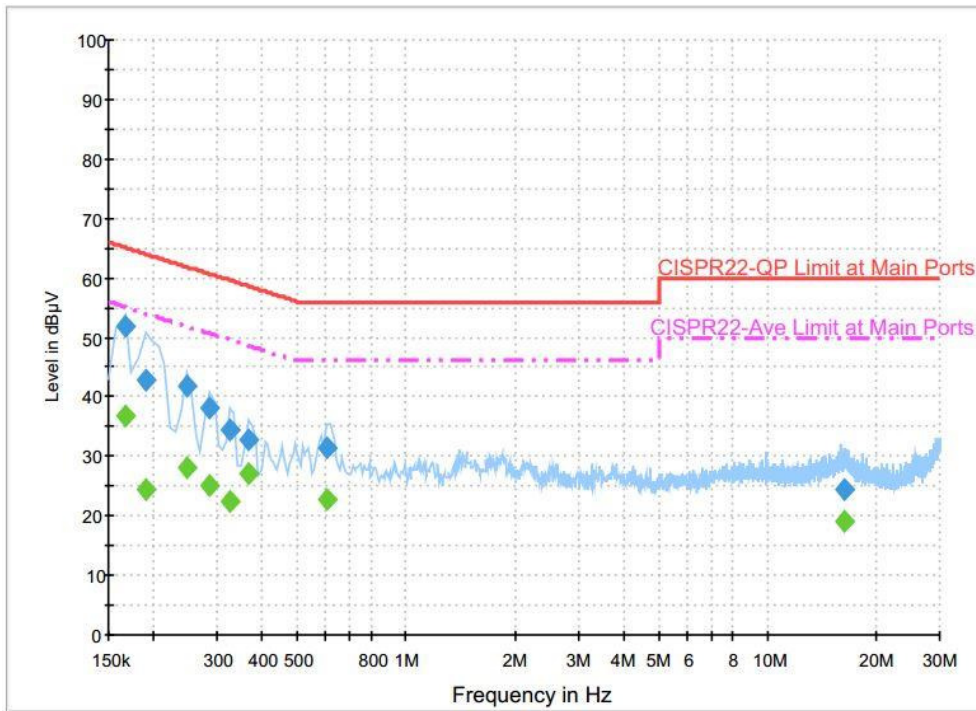


AMN = Artificial mains network (LISN)
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network



3.5.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	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

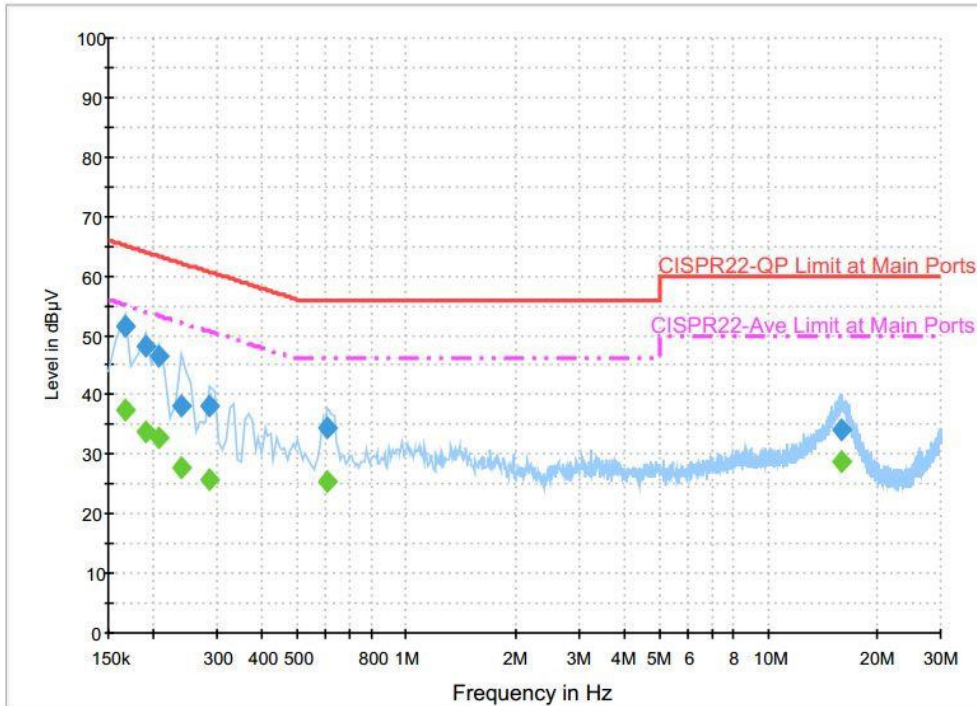
Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.166000	51.7	Off	L1	19.6	13.5	65.2
0.190000	42.7	Off	L1	19.6	21.3	64.0
0.246000	41.8	Off	L1	19.6	20.1	61.9
0.286000	38.2	Off	L1	19.6	22.4	60.6
0.326000	34.4	Off	L1	19.6	25.2	59.6
0.366000	32.8	Off	L1	19.6	25.8	58.6
0.606000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

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

Directional gain = $G_{ANT} + \text{Array Gain}$, 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

	Ant 1 (dBi)	Ant 2 (dBi)	DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
Band IV (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

	Ant 1 (dBi)	Ant 2 (dBi)	DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
Band IV (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 Mode

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 802.11ac modes.

The directional gain calculation is following F2)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 IV (n/ac)	4.50	4.50	7.51	7.51	1.51	1.51

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

$$PSD\ Limit\ Reduction = DG(PSD) - 6dBi, (min = 0)$$



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Power Meter	Anritsu	ML2495A	1132003	300MHz~40GHz	Aug. 12, 2015	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	13100030SNO 31	9kHz~6GHz	Sep. 17, 2015	Apr. 27, 2016 ~ Jul. 19, 2016	Sep. 16, 2016	Conducted (TH05-HY)
Power Sensor	DARE	RPR3006W	13100030SNO 32	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)
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)
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	BBHA9170576	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)



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:	2016/4/27~2016/5/22	Relative Humidity:	51~54	%

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

Band IV													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)		26dB Bandwidth (MHz)		6 dB Bandwidth (MHz)		6 dB Bandwidth Min. Limit (MHz)		Pass/Fail
					Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	149	5745	18.60	18.25	24.96	24.84	16.36	16.36	0.5		Pass
11a	6Mbps	2	157	5785	18.20	18.15	24.72	24.72	16.36	16.36	0.5		Pass
11a	6Mbps	2	165	5825	18.40	18.10	25.44	23.76	16.40	16.40	0.5		Pass
HT20	MCS8	2	149	5745	19.00	19.05	33.60	37.44	17.60	17.64	0.5		Pass
HT20	MCS8	2	157	5785	19.05	18.95	34.80	25.44	17.64	17.64	0.5		Pass
HT20	MCS8	2	165	5825	19.05	19.00	32.76	33.36	17.64	17.64	0.5		Pass
HT40	MCS8	2	151	5755	36.80	36.60	52.56	46.80	36.40	36.40	0.5		Pass
HT40	MCS8	2	159	5795	36.80	36.70	51.36	43.20	36.40	36.40	0.5		Pass
VHT20	MCS0	2	149	5745	19.25	18.95	28.20	31.32	17.60	17.64	0.5		Pass
VHT20	MCS0	2	157	5785	19.00	18.95	36.24	35.88	17.64	17.64	0.5		Pass
VHT20	MCS0	2	165	5825	19.15	19.00	31.92	30.48	17.64	17.64	0.5		Pass
VHT40	MCS0	2	151	5755	36.70	36.70	51.36	56.40	36.40	36.40	0.5		Pass
VHT40	MCS0	2	159	5795	36.70	36.70	52.56	60.24	36.40	36.40	0.5		Pass
VHT80	MCS0	2	155	5775	75.84	75.84	94.40	82.00	76.16	76.48	0.5		Pass

TEST RESULTS DATA
Average Power Table

Band IV															
Mod.	Data Rate	N _{Tx}	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	149	5745	70	0.24	0.24	18.32	18.27	21.31	30.00	4.50		Pass	
11a	6Mbps	2	157	5785	70	0.24	0.24	18.13	17.98	21.07	30.00	4.50		Pass	
11a	6Mbps	2	165	5825	70	0.24	0.24	18.01	17.87	20.96	30.00	4.50		Pass	
HT20	MCS8	2	149	5745	70	0.45	0.43	18.21	18.16	21.20	30.00	4.50		Pass	
HT20	MCS8	2	157	5785	70	0.45	0.43	18.14	17.98	21.07	30.00	4.50		Pass	
HT20	MCS8	2	165	5825	71	0.45	0.43	18.13	17.95	21.05	30.00	4.50		Pass	
HT40	MCS8	2	151	5755	70	0.80	0.80	18.44	18.22	21.34	30.00	4.50		Pass	
HT40	MCS8	2	159	5795	70	0.80	0.80	18.22	18.06	21.15	30.00	4.50		Pass	
VHT20	MCS0	2	149	5745	70	0.16	0.13	18.18	18.01	21.10	30.00	4.50		Pass	
VHT20	MCS0	2	157	5785	70	0.16	0.13	18.01	17.94	20.98	30.00	4.50		Pass	
VHT20	MCS0	2	165	5825	71	0.16	0.13	18.07	17.93	21.01	30.00	4.50		Pass	
VHT40	MCS0	2	151	5755	70	0.27	0.27	18.34	18.15	21.25	30.00	4.50		Pass	
VHT40	MCS0	2	159	5795	70	0.27	0.27	18.15	18.00	21.08	30.00	4.50		Pass	
VHT80	MCS0	2	155	5775	71	0.51	0.48	18.06	17.91	21.00	30.00	4.50		Pass	

TEST RESULTS DATA
Power Spectral Density

Band IV																
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)		10log (500kHz /RBW) Factor (dB)		Average Power Density (dBm/500kHz)			Average PSD Limit (dBm/500kHz)		DG (dBi)		Pass /Fail
					Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
11a	6Mbps	2	149	5745	0.24	0.24	2.22				6.76	28.49		7.51		Pass
11a	6Mbps	2	157	5785	0.24	0.24	2.22				6.52	28.49		7.51		Pass
11a	6Mbps	2	165	5825	0.24	0.24	2.22				6.24	28.49		7.51		Pass
HT20	MCS8	2	149	5745	0.45	0.43	2.22				6.41	30.00		4.50		Pass
HT20	MCS8	2	157	5785	0.45	0.43	2.22				6.02	30.00		4.50		Pass
HT20	MCS8	2	165	5825	0.45	0.43	2.22				5.97	30.00		4.50		Pass
HT40	MCS8	2	151	5755	0.80	0.80	2.22				3.40	30.00		4.50		Pass
HT40	MCS8	2	159	5795	0.80	0.80	2.22				3.27	30.00		4.50		Pass
VHT20	MCS0	2	149	5745	0.16	0.13	2.22				6.10	30.00		4.50		Pass
VHT20	MCS0	2	157	5785	0.16	0.13	2.22				5.60	30.00		4.50		Pass
VHT20	MCS0	2	165	5825	0.16	0.13	2.22				5.91	30.00		4.50		Pass
VHT40	MCS0	2	151	5755	0.27	0.27	2.22				3.34	30.00		4.50		Pass
VHT40	MCS0	2	159	5795	0.27	0.27	2.22				2.92	30.00		4.50		Pass
VHT80	MCS0	2	155	5775	0.51	0.48	2.22				0.62	30.00		4.50		Pass

TEST RESULTS DATA
Frequency Stability

Band IV										
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Center Frequency (MHz)	Frequency Deviation (MHz)	Frequency Stability (ppm)	Temperature (°C)	Voltage (V)	Note
11a	6Mbps	1	149	5745	5744.900	-0.100	-17.41	20	11.4	
11a	6Mbps	1	149	5745	5744.900	-0.100	-17.41	20	12.6	
11a	6Mbps	1	149	5745	5744.900	-0.100	-17.41	20	12	
11a	6Mbps	1	149	5745	5745.000	0.000	0.00	0	12	
11a	6Mbps	1	149	5745	5744.900	-0.100	-17.41	50	12	



<TXBF Modes>

Test Engineer:	Derek Hsu, PH Yang	Temperature:	21~25	°C
Test Date:	2016/7/13~2016/07/19	Relative Humidity:	51~54	%

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

Band IV													
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	99% Bandwidth (MHz)		26dB Bandwidth (MHz)		6 dB Bandwidth (MHz)		6 dB Bandwidth Min. Limit (MHz)		Pass/Fail
					Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2	
HT20	MCS0	2	149	5745	18.55	18.80	29.40	35.70	17.56	17.58	0.5		Pass
HT20	MCS0	2	157	5785	18.65	18.70	33.04	32.13	17.56	17.56	0.5		Pass
HT20	MCS0	2	165	5825	18.65	18.65	23.82	23.73	17.56	17.56	0.5		Pass
HT40	MCS0	2	151	5755	36.70	36.80	40.08	40.89	35.00	35.60	0.5		Pass
HT40	MCS0	2	159	5795	36.60	36.80	54.75	40.32	35.68	35.40	0.5		Pass
VHT20	MCS0	2	149	5745	18.80	18.85	24.58	26.76	17.58	17.58	0.5		Pass
VHT20	MCS0	2	157	5785	18.90	18.80	27.66	25.86	17.56	17.52	0.5		Pass
VHT20	MCS0	2	165	5825	18.70	19.00	23.63	27.00	17.56	17.58	0.5		Pass
VHT40	MCS0	2	151	5755	36.70	36.80	41.40	40.86	35.68	35.76	0.5		Pass
VHT40	MCS0	2	159	5795	36.60	36.60	41.58	40.68	35.76	35.60	0.5		Pass
VHT80	MCS0	2	155	5775	75.72	75.60	80.16	80.48	73.76	75.04	0.5		Pass

TEST RESULTS DATA
Average Power Table

Band IV													
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	149	5745	70	18.00	18.20	21.11	28.49	28.49	7.51	7.51	Pass
HT20	MCS0	2	157	5785	70	17.90	17.70	20.81	28.49	28.49	7.51	7.51	Pass
HT20	MCS0	2	165	5825	71	17.90	17.70	20.81	28.49	28.49	7.51	7.51	Pass
HT40	MCS0	2	151	5755	70	18.00	18.20	21.11	28.49	28.49	7.51	7.51	Pass
HT40	MCS0	2	159	5795	70	18.00	17.70	20.86	28.49	28.49	7.51	7.51	Pass
VHT20	MCS0	2	149	5745	68	17.70	18.40	21.07	28.49	28.49	7.51	7.51	Pass
VHT20	MCS0	2	157	5785	68	17.20	18.30	20.80	28.49	28.49	7.51	7.51	Pass
VHT20	MCS0	2	165	5825	69	17.10	18.10	20.64	28.49	28.49	7.51	7.51	Pass
VHT40	MCS0	2	151	5755	68	17.80	18.30	21.07	28.49	28.49	7.51	7.51	Pass
VHT40	MCS0	2	159	5795	68	17.50	18.10	20.82	28.49	28.49	7.51	7.51	Pass
VHT80	MCS0	2	155	5775	70	17.90	17.90	20.91	28.49	28.49	7.51	7.51	Pass

TEST RESULTS DATA
Power Spectral Density

Band IV														
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	10log (500kHz /RBW) Factor (dB)		Average Power Density (dBm/500kHz)			Average PSD Limit (dBm/500kHz)		DG (dBi)		Pass /Fail
					Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2	
HT20	MCS0	2	149	5745	2.22					9.88	28.49	7.51		Pass
HT20	MCS0	2	157	5785	2.22					9.34	28.49	7.51		Pass
HT20	MCS0	2	165	5825	2.22					10.06	28.49	7.51		Pass
HT40	MCS0	2	151	5755	2.22					8.89	28.49	7.51		Pass
HT40	MCS0	2	159	5795	2.22					7.32	28.49	7.51		Pass
VHT20	MCS0	2	149	5745	2.22					9.73	28.49	7.51		Pass
VHT20	MCS0	2	157	5785	2.22					8.54	28.49	7.51		Pass
VHT20	MCS0	2	165	5825	2.22					9.65	28.49	7.51		Pass
VHT40	MCS0	2	151	5755	2.22					9.05	28.49	7.51		Pass
VHT40	MCS0	2	159	5795	2.22					7.86	28.49	7.51		Pass
VHT80	MCS0	2	155	5775	2.22					8.72	28.49	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 4 - 5725~5850MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI Ant.	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)	
802.11a CH 149 5745MHz		5647.2	50.68	-17.62	68.3	42.56	32.48	8.27	32.63	392	212	P	H	
		5700	56.49	-48.81	105.3	48.33	32.51	8.3	32.65	392	212	P	H	
		5719	66.39	-44.23	110.62	58.22	32.53	8.3	32.66	392	212	P	H	
		5724.4	73.66	-47.27	120.93	65.46	32.53	8.33	32.66	392	212	P	H	
	*	5747	112.37	-	-	104.17	32.54	8.33	32.67	392	212	P	H	
	*	5747	107	-	-	98.8	32.54	8.33	32.67	392	212	A	H	
														H
														H
			5645	54.22	-14.08	68.3	46.1	32.48	8.27	32.63	289	238	P	V
			5690.8	60.87	-37.65	98.52	52.71	32.51	8.3	32.65	289	238	P	V
			5719.8	75.48	-35.36	110.84	67.31	32.53	8.3	32.66	289	238	P	V
			5723.6	77.69	-41.42	119.11	69.49	32.53	8.33	32.66	289	238	P	V
	*		5747	116.58	-	-	108.38	32.54	8.33	32.67	289	238	P	V
	*		5747	110.97	-	-	102.77	32.54	8.33	32.67	289	238	A	V
														V
													V	



WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)	
802.11a CH 157 5785MHz		5617.8	49.65	-18.65	68.3	41.57	32.47	8.23	32.62	400	37	P	H	
		5699.2	51.7	-53.01	104.71	43.54	32.51	8.3	32.65	400	37	P	H	
		5718.4	54.46	-55.99	110.45	46.29	32.53	8.3	32.66	400	37	P	H	
		5721.8	52.14	-62.87	115.01	43.94	32.53	8.33	32.66	400	37	P	H	
	*	5783	112.5	-	-	104.26	32.57	8.35	32.68	400	37	P	H	
	*	5783	105.4	-	-	97.16	32.57	8.35	32.68	400	37	A	H	
		5851.2	53.25	-66.31	119.56	44.91	32.61	8.43	32.7	400	37	P	H	
		5863.4	53.45	-55.1	108.55	45.11	32.62	8.43	32.71	400	37	P	H	
		5881.4	51.65	-48.9	100.55	43.26	32.63	8.47	32.71	400	37	P	H	
		5933.8	49.44	-18.86	68.3	41	32.66	8.51	32.73	400	37	P	H	
														H
														H
			5619	51.36	-16.94	68.3	43.28	32.47	8.23	32.62	329	239	P	V
			5699.2	55.48	-49.23	104.71	47.32	32.51	8.3	32.65	329	239	P	V
			5719.8	59.15	-51.69	110.84	50.98	32.53	8.3	32.66	329	239	P	V
			5722.2	57.75	-58.17	115.92	49.55	32.53	8.33	32.66	329	239	P	V
	*		5787	117.46	-	-	109.21	32.58	8.35	32.68	329	239	P	V
	*		5787	109.37	-	-	101.12	32.58	8.35	32.68	329	239	A	V
			5854	58.35	-54.83	113.18	50	32.62	8.43	32.7	329	239	P	V
			5859.6	57.47	-52.14	109.61	49.13	32.62	8.43	32.71	329	239	P	V
		5877.8	54.82	-48.4	103.22	46.47	32.63	8.43	32.71	329	239	P	V	
		5927.4	50.48	-17.82	68.3	42.04	32.66	8.51	32.73	329	239	P	V	
													V	
													V	



WiFi Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)	
802.11a CH 165 5825MHz	*	5827	112.24	-	-	103.94	32.6	8.39	32.69	400	242	P	H	
	*	5827	105.23	-	-	96.93	32.6	8.39	32.69	400	242	A	H	
		5850.8	63.64	-56.84	120.48	55.3	32.61	8.43	32.7	400	242	P	H	
		5858.4	57.25	-52.7	109.95	48.91	32.62	8.43	32.71	400	242	P	H	
		5877	53.96	-49.85	103.81	45.61	32.63	8.43	32.71	400	242	P	H	
		5938.4	50.32	-17.98	68.3	41.89	32.66	8.51	32.74	400	242	P	H	
														H
														H
	*	5827	116.02	-	-	107.72	32.6	8.39	32.69	336	237	P	V	
	*	5827	109.58	-	-	101.28	32.6	8.39	32.69	336	237	A	V	
		5851.2	69.25	-50.31	119.56	60.91	32.61	8.43	32.7	336	237	P	V	
		5856	67.15	-43.47	110.62	58.8	32.62	8.43	32.7	336	237	P	V	
		5876.4	59.14	-45.12	104.26	50.79	32.63	8.43	32.71	336	237	P	V	
		5926.2	51.33	-16.97	68.3	42.89	32.66	8.51	32.73	336	237	P	V	
														V
														V
													V	
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.													



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

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 149 5745MHz		11490	45.48	-28.52	74	55.69	40.01	12.58	62.8	100	0	P	H
		17233	43.84	-24.46	68.3	47.32	41.05	15.61	60.14	100	0	P	H
													H
													H
		11490	47.02	-26.98	74	57.23	40.01	12.58	62.8	100	0	P	V
		17233	44.32	-23.98	68.3	47.8	41.05	15.61	60.14	100	0	P	V
													V
													V
802.11a CH 157 5785MHz		11570	45.5	-28.5	74	55.7	39.88	12.66	62.74	100	0	P	H
		17353	45.51	-22.79	68.3	48.59	41.38	15.75	60.21	100	0	P	H
													H
													H
		11570	46.29	-27.71	74	56.49	39.88	12.66	62.74	100	0	P	V
		17353	44.57	-23.73	68.3	47.65	41.38	15.75	60.21	100	0	P	V
													V
													V
802.11a CH 165 5825MHz		11650	45.05	-28.95	74	55.26	39.75	12.73	62.69	100	0	P	H
		17473	44.48	-23.82	68.3	47.17	41.71	15.88	60.28	100	0	P	H
													H
													H
		11650	46.81	-27.19	74	57.02	39.75	12.73	62.69	100	0	P	V
		17473	45.46	-22.84	68.3	48.15	41.71	15.88	60.28	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



Band 4 5725~5850MHz
WIFI 802.11n 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 149 5745MHz		5644.8	51.69	-16.61	68.3	43.57	32.48	8.27	32.63	400	210	P	H	
		5693	55.75	-44.39	100.14	47.59	32.51	8.3	32.65	400	210	P	H	
		5716.8	65.36	-44.65	110.01	57.2	32.52	8.3	32.66	400	210	P	H	
		5722.6	71.24	-45.59	116.83	63.04	32.53	8.33	32.66	400	210	P	H	
	*	5746	112.18	-	-	103.98	32.54	8.33	32.67	400	210	P	H	
	*	5746	104.63	-	-	96.43	32.54	8.33	32.67	400	210	A	H	
														H
														H
			5650	53.67	-14.63	68.3	45.54	32.49	8.27	32.63	275	237	P	V
			5685.2	59.97	-34.41	94.38	51.81	32.51	8.3	32.65	275	237	P	V
			5717	70.85	-39.21	110.06	62.69	32.52	8.3	32.66	275	237	P	V
			5722.8	76.46	-40.83	117.29	68.26	32.53	8.33	32.66	275	237	P	V
	*		5746	115.44	-	-	107.24	32.54	8.33	32.67	275	237	P	V
	*		5746	108.9	-	-	100.7	32.54	8.33	32.67	275	237	A	V
														V
														V



WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)	
802.11n HT20 CH 157 5785MHz		5630.4	50.12	-18.18	68.3	42.05	32.47	8.23	32.63	386	240	P	H	
		5697.4	52.71	-50.67	103.38	44.55	32.51	8.3	32.65	386	240	P	H	
		5712.2	54.78	-53.94	108.72	46.62	32.52	8.3	32.66	386	240	P	H	
		5724.99	53.28	-69	122.28	45.08	32.53	8.33	32.66	386	240	P	H	
	*	5787	110.36	-	-	102.11	32.58	8.35	32.68	386	240	P	H	
	*	5787	103.49	-	-	95.24	32.58	8.35	32.68	386	240	A	H	
		5851.6	52.85	-65.8	118.65	44.51	32.61	8.43	32.7	386	240	P	H	
		5867.8	52.35	-54.96	107.31	44.01	32.62	8.43	32.71	386	240	P	H	
		5877.4	51.14	-52.38	103.52	42.79	32.63	8.43	32.71	386	240	P	H	
		5936.4	49.44	-18.86	68.3	41.01	32.66	8.51	32.74	386	240	P	H	
														H
														H
			5621.8	52.82	-15.48	68.3	44.74	32.47	8.23	32.62	345	239	P	V
			5699.8	55.21	-49.94	105.15	47.05	32.51	8.3	32.65	345	239	P	V
			5712.4	57.35	-51.42	108.77	49.19	32.52	8.3	32.66	345	239	P	V
			5724	56.87	-63.15	120.02	48.67	32.53	8.33	32.66	345	239	P	V
	*		5787	115.47	-	-	107.22	32.58	8.35	32.68	345	239	P	V
	*		5787	107.8	-	-	99.55	32.58	8.35	32.68	345	239	A	V
			5850.4	55.98	-65.41	121.39	47.64	32.61	8.43	32.7	345	239	P	V
			5855.4	55.69	-55.1	110.79	47.34	32.62	8.43	32.7	345	239	P	V
		5885.6	52.27	-45.16	97.43	43.89	32.63	8.47	32.72	345	239	P	V	
		5942.8	50.79	-17.51	68.3	42.35	32.67	8.51	32.74	345	239	P	V	
													V	
													V	



WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)	
802.11n HT20 CH 165 5825MHz	*	5824	110.67	-	-	102.37	32.6	8.39	32.69	399	239	P	H	
	*	5824	103.36	-	-	95.06	32.6	8.39	32.69	399	239	A	H	
		5850.8	66.12	-54.36	120.48	57.78	32.61	8.43	32.7	399	239	P	H	
		5856.4	59.33	-51.18	110.51	50.98	32.62	8.43	32.7	399	239	P	H	
		5886.4	54.45	-42.39	96.84	46.07	32.63	8.47	32.72	399	239	P	H	
		5938	49.74	-18.56	68.3	41.31	32.66	8.51	32.74	399	239	P	H	
														H
														H
	*	5824	114.77	-	-	106.47	32.6	8.39	32.69	340	239	P	V	
	*	5824	107.56	-	-	99.26	32.6	8.39	32.69	340	239	A	V	
		5852	69.07	-48.67	117.74	60.73	32.61	8.43	32.7	340	239	P	V	
		5859	67.12	-42.66	109.78	58.78	32.62	8.43	32.71	340	239	P	V	
		5891.6	57.1	-35.88	92.98	48.71	32.64	8.47	32.72	340	239	P	V	
		5929.4	51.33	-16.97	68.3	42.89	32.66	8.51	32.73	340	239	P	V	
														V
													V	
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.													



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

WIFI Ant. 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 149 5745MHz		11490	37.68	-36.32	74	47.89	40.01	12.58	62.8	100	0	P	H	
		17235	34.5	-33.8	68.3	37.93	41.05	15.66	60.14	100	0	P	H	
													H	
													H	
			11490	40.71	-33.29	74	50.92	40.01	12.58	62.8	100	0	P	V
			17235	36.37	-31.93	68.3	39.8	41.05	15.66	60.14	100	0	P	V
														V
802.11n HT20 CH 157 5785MHz		11570	39.05	-34.95	74	49.25	39.88	12.66	62.74	100	0	P	H	
		17355	33.52	-34.78	68.3	36.56	41.38	15.79	60.21	100	0	P	H	
													H	
													H	
			11570	40.97	-33.03	74	51.17	39.88	12.66	62.74	100	0	P	V
			17355	35.53	-32.77	68.3	38.57	41.38	15.79	60.21	100	0	P	V
														V
802.11n HT20 CH 165 5825MHz		11650	38.61	-35.39	74	48.82	39.75	12.73	62.69	100	0	P	H	
		17475	33.05	-35.25	68.3	35.69	41.71	15.93	60.28	100	0	P	H	
													H	
													H	
			11650	40.5	-33.5	74	50.71	39.75	12.73	62.69	100	0	P	V
			17475	34.44	-33.86	68.3	37.08	41.71	15.93	60.28	100	0	P	V
														V
Remark	1. No other spurious found.													
	2. All results are PASS against Peak and Average limit line.													



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

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5649.8	52.59	-15.71	68.3	44.46	32.49	8.27	32.63	387	216	P	H
		5699.2	63.96	-40.75	104.71	55.8	32.51	8.3	32.65	387	216	P	H
		5715.8	77.12	-32.61	109.73	68.96	32.52	8.3	32.66	387	216	P	H
		5720	72.26	-38.64	110.9	64.09	32.53	8.3	32.66	387	216	P	H
	*	5757	109.26	-	-	101.04	32.56	8.33	32.67	387	216	P	H
	*	5757	102.56	-	-	94.34	32.56	8.33	32.67	387	216	A	H
		5850.4	52.93	-68.46	121.39	44.59	32.61	8.43	32.7	387	216	P	H
		5860.6	51.96	-57.37	109.33	43.62	32.62	8.43	32.71	387	216	P	H
		5882.4	51.14	-48.66	99.8	42.75	32.63	8.47	32.71	387	216	P	H
		5930.6	50.16	-18.14	68.3	41.72	32.66	8.51	32.73	387	216	P	H
802.11n													H
HT40													H
CH 151		5626	54.48	-13.82	68.3	46.4	32.47	8.23	32.62	298	239	P	V
5755MHz		5699.8	67.83	-37.32	105.15	59.67	32.51	8.3	32.65	298	239	P	V
		5713	76.87	-32.07	108.94	68.71	32.52	8.3	32.66	298	239	P	V
		5724.2	76.62	-43.86	120.48	68.42	32.53	8.33	32.66	298	239	P	V
	*	5753	113.76	-	-	105.54	32.56	8.33	32.67	298	239	P	V
	*	5753	106.38	-	-	98.16	32.56	8.33	32.67	298	239	A	V
		5854.99	55.72	-55.2	110.92	47.37	32.62	8.43	32.7	298	239	P	V
		5859.6	56.84	-52.77	109.61	48.5	32.62	8.43	32.71	298	239	P	V
		5875.2	53.58	-51.57	105.15	45.23	32.63	8.43	32.71	298	239	P	V
		5949.2	50.34	-17.96	68.3	41.9	32.67	8.51	32.74	298	239	P	V
													V
													V



WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5639.8	50.22	-18.08	68.3	42.14	32.48	8.23	32.63	386	240	P	H
		5689.8	52.06	-45.72	97.78	43.9	32.51	8.3	32.65	386	240	P	H
		5714	55.66	-53.56	109.22	47.5	32.52	8.3	32.66	386	240	P	H
		5720.4	56.48	-55.33	111.81	48.31	32.53	8.3	32.66	386	240	P	H
	*	5793	108.69	-	-	100.44	32.58	8.35	32.68	386	240	P	H
	*	5793	100.88	-	-	92.63	32.58	8.35	32.68	386	240	A	H
		5852.8	57.6	-58.32	115.92	49.26	32.61	8.43	32.7	386	240	P	H
		5855.01	58.82	-52.08	110.9	50.47	32.62	8.43	32.7	386	240	P	H
		5885.2	53.13	-44.6	97.73	44.75	32.63	8.47	32.72	386	240	P	H
		5936.6	52.21	-16.09	68.3	43.78	32.66	8.51	32.74	386	240	P	H
802.11n													H
HT40													H
CH 159		5644	53.08	-15.22	68.3	44.96	32.48	8.27	32.63	297	238	P	V
5795MHz		5690.8	58.4	-40.12	98.52	50.24	32.51	8.3	32.65	297	238	P	V
		5720	60.62	-50.28	110.9	52.45	32.53	8.3	32.66	297	238	P	V
		5722.2	60.76	-55.16	115.92	52.56	32.53	8.33	32.66	297	238	P	V
	*	5797	112.45	-	-	104.2	32.58	8.35	32.68	297	238	P	V
	*	5797	105.61	-	-	97.36	32.58	8.35	32.68	297	238	A	V
		5850.2	64.59	-57.25	121.84	56.25	32.61	8.43	32.7	297	238	P	V
		5861	64.05	-45.17	109.22	55.71	32.62	8.43	32.71	297	238	P	V
		5875.8	58.86	-45.85	104.71	50.51	32.63	8.43	32.71	297	238	P	V
		5938.2	51.6	-16.7	68.3	43.17	32.66	8.51	32.74	297	238	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



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

WIFI Ant. 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 151 5755MHz		11510	38.52	-35.48	74	48.74	40	12.58	62.8	100	0	P	H
		17265	35.01	-33.29	68.3	38.36	41.15	15.66	60.16	100	0	P	H
													H
													H
		11510	40.48	-33.52	74	50.7	40	12.58	62.8	100	0	P	V
		17265	35.17	-33.13	68.3	38.52	41.15	15.66	60.16	100	0	P	V
													V
													V
802.11n HT40 CH 159 5795MHz		11590	39.48	-34.52	74	49.71	39.84	12.66	62.73	100	0	P	H
		17385	34.13	-34.17	68.3	37.1	41.47	15.79	60.23	100	0	P	H
													H
													H
		11590	40.9	-33.1	74	51.13	39.84	12.66	62.73	100	0	P	V
		17385	33.89	-34.41	68.3	36.86	41.47	15.79	60.23	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



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

WIFI Ant. 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)	
		5636.8	56.58	-11.72	68.3	48.5	32.48	8.23	32.63	392	211	P	H	
		5699.4	68.59	-36.27	104.86	60.43	32.51	8.3	32.65	392	211	P	H	
		5704	71.8	-34.62	106.42	63.63	32.52	8.3	32.65	392	211	P	H	
		5722.4	71.32	-45.05	116.37	63.12	32.53	8.33	32.66	392	211	P	H	
	*	5773	105.45	-	-	97.2	32.57	8.35	32.67	392	211	P	H	
	*	5773	98.63	-	-	90.38	32.57	8.35	32.67	392	211	A	H	
		5850.01	66.74	-55.54	122.28	58.4	32.61	8.43	32.7	392	211	P	H	
		5869.8	66.15	-40.6	106.75	57.81	32.62	8.43	32.71	392	211	P	H	
		5875.8	59.03	-45.68	104.71	50.68	32.63	8.43	32.71	392	211	P	H	
		5941.2	54.06	-14.24	68.3	45.62	32.67	8.51	32.74	392	211	P	H	
802.11ac VHT80 CH 155 5775MHz													H	
													H	
			5636.6	60.82	-7.48	68.3	52.74	32.48	8.23	32.63	313	240	P	V
			5699.2	71.93	-32.78	104.71	63.77	32.51	8.3	32.65	313	240	P	V
			5710.2	74.2	-33.96	108.16	66.04	32.52	8.3	32.66	313	240	P	V
			5723	74.32	-43.42	117.74	66.12	32.53	8.33	32.66	313	240	P	V
		*	5777	110.74	-	-	102.49	32.57	8.35	32.67	313	240	P	V
		*	5777	102.73	-	-	94.48	32.57	8.35	32.67	313	240	A	V
			5850.2	72.46	-49.38	121.84	64.12	32.61	8.43	32.7	313	240	P	V
			5857.8	66.91	-43.2	110.11	58.57	32.62	8.43	32.71	313	240	P	V
			5875.8	64.14	-40.57	104.71	55.79	32.63	8.43	32.71	313	240	P	V
			5931.4	55.78	-12.52	68.3	47.34	32.66	8.51	32.73	313	240	P	V
														V
														V
	Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



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

WIFI Ant. 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 155 5775MHz		11550	38.66	-35.34	74	48.89	39.91	12.62	62.76	100	0	P	H	
		17325	34.89	-33.41	68.3	38.04	41.29	15.75	60.19	100	0	P	H	
													H	
													H	
			11550	40.04	-33.96	74	50.27	39.91	12.62	62.76	100	0	P	V
			17325	34.45	-33.85	68.3	37.6	41.29	15.75	60.19	100	0	P	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

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

For Peak Limit @ 2390MHz:

- 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)
- Over Limit(dB)
= Level(dBμV/m) – Limit Line(dBμV/m)
= 55.45(dBμV/m) – 74(dBμV/m)
= -18.55(dB)

For Average Limit @ 2390MHz:

- 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)
- 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 4 5725~5850MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)	
802.11n HT20 CH 149 5745MHz		5648.2	52.61	-15.69	68.3	44.49	32.48	8.27	32.63	400	224	P	H	
		5693.4	57.83	-42.6	100.43	49.67	32.51	8.3	32.65	400	224	P	H	
		5720	67.48	-43.42	110.9	59.31	32.53	8.3	32.66	400	224	P	H	
		5724.8	72.63	-49.21	121.84	64.43	32.53	8.33	32.66	400	224	P	H	
	*	5745	111.31	-	-	103.11	32.54	8.33	32.67	400	224	P	H	
	*	5745	103.79	-	-	95.59	32.54	8.33	32.67	400	224	A	H	
														H
														H
			5626.8	54.02	-14.28	68.3	45.94	32.47	8.23	32.62	301	241	P	V
			5699.6	58.94	-46.07	105.01	50.78	32.51	8.3	32.65	301	241	P	V
			5719.2	71.86	-38.82	110.68	63.69	32.53	8.3	32.66	301	241	P	V
			5724.6	76.21	-45.18	121.39	68.01	32.53	8.33	32.66	301	241	P	V
		*	5745	115.56	-	-	107.36	32.54	8.33	32.67	301	241	P	V
		*	5745	107.82	-	-	99.62	32.54	8.33	32.67	301	241	A	V
													V	
													V	



WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)	
802.11n HT20 CH 157 5785MHz		5624.4	49.77	-18.53	68.3	41.69	32.47	8.23	32.62	400	218	P	H	
		5697.8	51.49	-52.19	103.68	43.33	32.51	8.3	32.65	400	218	P	H	
		5714.8	53.74	-55.71	109.45	45.58	32.52	8.3	32.66	400	218	P	H	
		5722.6	54.17	-62.66	116.83	45.97	32.53	8.33	32.66	400	218	P	H	
	*	5785	110.13	-	-	101.89	32.57	8.35	32.68	400	218	P	H	
	*	5785	101.74	-	-	93.5	32.57	8.35	32.68	400	218	A	H	
		5851.6	53.3	-65.35	118.65	44.96	32.61	8.43	32.7	400	218	P	H	
		5858.8	51.99	-57.84	109.83	43.65	32.62	8.43	32.71	400	218	P	H	
		5890.8	50.58	-42.99	93.57	42.19	32.64	8.47	32.72	400	218	P	H	
		5945.2	48.18	-20.12	68.3	39.74	32.67	8.51	32.74	400	218	P	H	
														H
														H
			5631.8	52.26	-16.04	68.3	44.19	32.47	8.23	32.63	280	235	P	V
			5697.4	55.76	-47.62	103.38	47.6	32.51	8.3	32.65	280	235	P	V
			5715.6	59.5	-50.17	109.67	51.34	32.52	8.3	32.66	280	235	P	V
			5724.6	59.08	-62.31	121.39	50.88	32.53	8.33	32.66	280	235	P	V
	*		5785	115.02	-	-	106.78	32.57	8.35	32.68	280	235	P	V
	*		5785	106	-	-	97.76	32.57	8.35	32.68	280	235	A	V
			5851.6	58.11	-60.54	118.65	49.77	32.61	8.43	32.7	280	235	P	V
			5870	56.46	-50.24	106.7	48.12	32.62	8.43	32.71	280	235	P	V
		5877.4	55.1	-48.42	103.52	46.75	32.63	8.43	32.71	280	235	P	V	
		5948	52.66	-15.64	68.3	44.22	32.67	8.51	32.74	280	235	P	V	
													V	
													V	



WiFi Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)	
802.11n HT20 CH 165 5825MHz	*	5824	110.23	-	-	101.93	32.6	8.39	32.69	400	214	P	H	
	*	5824	101.18	-	-	92.88	32.6	8.39	32.69	400	214	A	H	
		5850.2	65.82	-56.02	121.84	57.48	32.61	8.43	32.7	400	214	P	H	
		5855.8	62.73	-47.95	110.68	54.38	32.62	8.43	32.7	400	214	P	H	
		5880.4	54.21	-47.08	101.29	45.86	32.63	8.43	32.71	400	214	P	H	
		5945.6	50.32	-17.98	68.3	41.88	32.67	8.51	32.74	400	214	P	H	
														H
														H
	*	5825	115.08	-	-	106.78	32.6	8.39	32.69	318	240	P	V	
	*	5825	105.46	-	-	97.16	32.6	8.39	32.69	318	240	A	V	
		5850.6	70.35	-50.58	120.93	62.01	32.61	8.43	32.7	318	240	P	V	
		5855.6	67.94	-42.79	110.73	59.59	32.62	8.43	32.7	318	240	P	V	
		5879.6	59.97	-41.91	101.88	51.62	32.63	8.43	32.71	318	240	P	V	
		5944.6	52.66	-15.64	68.3	44.22	32.67	8.51	32.74	318	240	P	V	
														V
													V	
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.													



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

WIFI Ant. 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 149 5745MHz		11490	44.52	-29.48	74	48.23	40.01	12.58	56.3	100	0	P	H	
		17232	44.68	-23.62	68.3	43.75	41.05	15.61	55.73	100	0	P	H	
													H	
													H	
			11490	46.68	-27.32	74	50.39	40.01	12.58	56.3	100	0	P	V
			17232	45.03	-23.27	68.3	44.1	41.05	15.61	55.73	100	0	P	V
														V
802.11n HT20 CH 157 5785MHz		11570	45.19	-28.81	74	48.94	39.88	12.66	56.29	100	0	P	H	
		17352	44.93	-23.37	68.3	43.69	41.38	15.75	55.89	100	0	P	H	
													H	
													H	
			11570	47.74	-26.26	74	51.49	39.88	12.66	56.29	100	0	P	V
			17352	45.81	-22.49	68.3	44.57	41.38	15.75	55.89	100	0	P	V
														V
802.11n HT20 CH 165 5825MHz		11650	46.41	-27.59	74	50.2	39.75	12.73	56.27	100	0	P	H	
		17472	46.88	-21.42	68.3	45.34	41.71	15.88	56.05	100	0	P	H	
													H	
													H	
			11650	46.84	-27.16	74	50.63	39.75	12.73	56.27	100	0	P	V
			17472	45.9	-22.4	68.3	44.36	41.71	15.88	56.05	100	0	P	V
														V
Remark	1. No other spurious found.													
	2. All results are PASS against Peak and Average limit line.													



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

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5649.2	52.96	-15.34	68.3	44.84	32.48	8.27	32.63	400	224	P	H
		5695.6	59.2	-42.86	102.06	51.04	32.51	8.3	32.65	400	224	P	H
		5716.8	72.92	-37.09	110.01	64.76	32.52	8.3	32.66	400	224	P	H
		5720.4	69.67	-42.14	111.81	61.5	32.53	8.3	32.66	400	224	P	H
	*	5755	108.34	-	-	100.12	32.56	8.33	32.67	400	224	P	H
	*	5755	100	-	-	91.78	32.56	8.33	32.67	400	224	A	H
		5853.2	52.49	-62.51	115	44.15	32.61	8.43	32.7	400	224	P	H
		5871.2	50.63	-55.73	106.36	42.28	32.63	8.43	32.71	400	224	P	H
		5914.2	49.88	-26.39	76.27	41.49	32.65	8.47	32.73	400	224	P	H
		5938	49.25	-19.05	68.3	40.82	32.66	8.51	32.74	400	224	P	H
802.11n													H
HT40													H
CH 151		5647.8	56.22	-12.08	68.3	48.1	32.48	8.27	32.63	330	236	P	V
5755MHz		5695.2	66.28	-35.48	101.76	58.12	32.51	8.3	32.65	330	236	P	V
		5719.8	76.27	-34.57	110.84	68.1	32.53	8.3	32.66	330	236	P	V
		5724.99	81.19	-41.09	122.28	72.99	32.53	8.33	32.66	330	236	P	V
	*	5755	113.8	-	-	105.58	32.56	8.33	32.67	330	236	P	V
	*	5755	104.96	-	-	96.74	32.56	8.33	32.67	330	236	A	V
		5851.2	56.58	-62.98	119.56	48.24	32.61	8.43	32.7	330	236	P	V
		5861.8	55.88	-53.11	108.99	47.54	32.62	8.43	32.71	330	236	P	V
		5881	54.58	-46.26	100.84	46.23	32.63	8.43	32.71	330	236	P	V
		5925	51.75	-16.55	68.3	43.31	32.66	8.51	32.73	330	236	P	V
													V
													V



WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5645.4	51.1	-17.2	68.3	42.98	32.48	8.27	32.63	400	238	P	H
		5693.8	54.28	-46.45	100.73	46.12	32.51	8.3	32.65	400	238	P	H
		5719.8	54.8	-56.04	110.84	46.63	32.53	8.3	32.66	400	238	P	H
		5724.99	56.25	-66.03	122.28	48.05	32.53	8.33	32.66	400	238	P	H
	*	5795	109.22	-	-	100.97	32.58	8.35	32.68	400	238	P	H
	*	5795	101.53	-	-	93.28	32.58	8.35	32.68	400	238	A	H
		5850.8	58.95	-61.53	120.48	50.61	32.61	8.43	32.7	400	238	P	H
		5860.6	57.64	-51.69	109.33	49.3	32.62	8.43	32.71	400	238	P	H
		5880.8	57.87	-43.12	100.99	49.52	32.63	8.43	32.71	400	238	P	H
		5925.2	50.5	-17.8	68.3	42.06	32.66	8.51	32.73	400	238	P	H
802.11n													H
HT40													H
CH 159		5632.2	52.51	-15.79	68.3	44.44	32.47	8.23	32.63	327	245	P	V
5795MHz		5697.6	55.96	-47.57	103.53	47.8	32.51	8.3	32.65	327	245	P	V
		5713.8	57.12	-52.05	109.17	48.96	32.52	8.3	32.66	327	245	P	V
		5723	57.92	-59.82	117.74	49.72	32.53	8.33	32.66	327	245	P	V
	*	5795	111.49	-	-	103.24	32.58	8.35	32.68	327	245	P	V
	*	5795	104.47	-	-	96.22	32.58	8.35	32.68	327	245	A	V
		5853.2	63.18	-51.82	115	54.84	32.61	8.43	32.7	327	245	P	V
		5855.2	60.49	-50.35	110.84	52.14	32.62	8.43	32.7	327	245	P	V
		5875.6	57.45	-47.4	104.85	49.1	32.63	8.43	32.71	327	245	P	V
		5935.8	52.21	-16.09	68.3	43.78	32.66	8.51	32.74	327	245	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



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

WIFI Ant. 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 151 5755MHz		11510	44.81	-29.19	74	48.53	40	12.58	56.3	100	0	P	H
		17268	44.31	-23.99	68.3	43.27	41.15	15.66	55.77	100	0	P	H
													H
													H
		11510	47.6	-26.4	74	51.32	40	12.58	56.3	100	0	P	V
		17268	45.1	-23.2	68.3	44.06	41.15	15.66	55.77	100	0	P	V
													V
													V
802.11n HT40 CH 159 5795MHz		11590	45.11	-28.89	74	48.89	39.84	12.66	56.28	100	0	P	H
		17388	46.33	-21.97	68.3	45.01	41.47	15.79	55.94	100	0	P	H
													H
													H
		11590	46.2	-27.8	74	49.98	39.84	12.66	56.28	100	0	P	V
		17388	45.43	-22.87	68.3	44.11	41.47	15.79	55.94	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												



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

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)	
		5641.6	56.92	-11.38	68.3	48.8	32.48	8.27	32.63	400	231	P	H	
		5690.2	63.68	-34.39	98.07	55.52	32.51	8.3	32.65	400	231	P	H	
		5717.2	71.65	-38.47	110.12	63.49	32.52	8.3	32.66	400	231	P	H	
		5722	69.65	-45.81	115.46	61.45	32.53	8.33	32.66	400	231	P	H	
	*	5773	106.5	-	-	98.25	32.57	8.35	32.67	400	231	P	H	
	*	5773	101.97	-	-	93.72	32.57	8.35	32.67	400	231	A	H	
		5853.4	63.6	-50.95	114.55	55.26	32.61	8.43	32.7	400	231	P	H	
		5860	62.29	-47.21	109.5	53.95	32.62	8.43	32.71	400	231	P	H	
		5877.8	57.22	-46	103.22	48.87	32.63	8.43	32.71	400	231	P	H	
		5929	54.28	-14.02	68.3	45.84	32.66	8.51	32.73	400	231	P	H	
802.11ac VHT80 CH 155 5775MHz													H	
													H	
			5647.8	58.08	-10.22	68.3	49.96	32.48	8.27	32.63	280	242	P	V
			5699.8	68.89	-36.26	105.15	60.73	32.51	8.3	32.65	280	242	P	V
			5717.4	75.76	-34.41	110.17	67.6	32.52	8.3	32.66	280	242	P	V
			5723.6	74.05	-45.06	119.11	65.85	32.53	8.33	32.66	280	242	P	V
		*	5773	109.58	-	-	101.33	32.57	8.35	32.67	280	242	P	V
		*	5773	104.85	-	-	96.6	32.57	8.35	32.67	280	242	A	V
			5850.8	68.99	-51.49	120.48	60.65	32.61	8.43	32.7	280	242	P	V
			5856.8	67.16	-43.24	110.4	58.81	32.62	8.43	32.7	280	242	P	V
			5878.6	62.12	-40.51	102.63	53.77	32.63	8.43	32.71	280	242	P	V
			5931	55.88	-12.42	68.3	47.44	32.66	8.51	32.73	280	242	P	V
														V
														V
	Remark	1. No other spurious found.												
		2. All results are PASS against Peak and Average limit line.												



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

WIFI Ant. 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 155 5775MHz		11550	45.09	-28.91	74	48.85	39.91	12.62	56.29	100	0	P	H	
		17328	44.85	-23.45	68.3	43.65	41.29	15.75	55.84	100	0	P	H	
													H	
													H	
			11550	47.48	-26.52	74	51.24	39.91	12.62	56.29	100	0	P	V
			17328	45.36	-22.94	68.3	44.16	41.29	15.75	55.84	100	0	P	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

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

For Peak Limit @ 2390MHz:

- 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)
- Over Limit(dB)
= Level(dBμV/m) – Limit Line(dBμV/m)
= 55.45(dBμV/m) – 74(dBμV/m)
= -18.55(dB)

For Average Limit @ 2390MHz:

- 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)
- 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 4 5725~5850MHz

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 155 5775MHz		5649.6	58.12	-10.18	68.3	49.99	32.49	8.27	32.63	388	225	P	H	
		5691.4	65.86	-33.1	98.96	57.7	32.51	8.3	32.65	388	225	P	H	
		5710.6	69.59	-38.68	108.27	61.43	32.52	8.3	32.66	388	225	P	H	
		5724.6	73.84	-47.55	121.39	65.64	32.53	8.33	32.66	388	225	P	H	
	*	5773	105.52	-	-	97.27	32.57	8.35	32.67	388	225	P	H	
	*	5773	98.48	-	-	90.23	32.57	8.35	32.67	388	225	A	H	
		5854	63.3	-49.88	113.18	54.95	32.62	8.43	32.7	388	225	P	H	
		5861.4	63.51	-45.6	109.11	55.17	32.62	8.43	32.71	388	225	P	H	
		5876.6	59.43	-44.68	104.11	51.08	32.63	8.43	32.71	388	225	P	H	
		5929	53.72	-14.58	68.3	45.28	32.66	8.51	32.73	388	225	P	H	
														H
			5642.2	60.81	-7.49	68.3	52.69	32.48	8.27	32.63	314	235	P	V
			5695	71.56	-30.05	101.61	63.4	32.51	8.3	32.65	314	235	P	V
			5715.8	76.58	-33.15	109.73	68.42	32.52	8.3	32.66	314	235	P	V
			5723.4	77.71	-40.94	118.65	69.51	32.53	8.33	32.66	314	235	P	V
	*		5773	110.35	-	-	102.1	32.57	8.35	32.67	314	235	P	V
	*		5773	102.76	-	-	94.51	32.57	8.35	32.67	314	235	A	V
			5852.4	71.49	-45.34	116.83	63.15	32.61	8.43	32.7	314	235	P	V
			5860.4	71.94	-37.45	109.39	63.6	32.62	8.43	32.71	314	235	P	V
			5881.8	66.28	-33.97	100.25	57.89	32.63	8.47	32.71	314	235	P	V
		5930.4	56.57	-11.73	68.3	48.13	32.66	8.51	32.73	314	235	P	V	
													V	
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.													



Band 4 5725~5850MHz
WIFI 802.11ac 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 155 5775MHz		11550	43.38	-30.62	74	53.61	39.91	12.62	62.76	100	0	P	H	
		17325	45.54	-22.76	68.3	48.69	41.29	15.75	60.19	100	0	P	H	
													H	
													H	
			11550	44.44	-29.56	74	54.67	39.91	12.62	62.76	100	0	P	V
			17325	44.39	-23.91	68.3	47.54	41.29	15.75	60.19	100	0	P	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	P eak or A verage
H/V	H orizontal or V ertical



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

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b		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

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

For Peak Limit @ 2390MHz:

- 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)
- Over Limit(dB)
= Level(dBμV/m) – Limit Line(dBμV/m)
= 55.45(dBμV/m) – 74(dBμV/m)
= -18.55(dB)

For Average Limit @ 2390MHz:

- 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)
- Over Limit(dB)
= Level(dBμV/m) – Limit Line(dBμV/m)
= 43.54(dBμV/m) – 54(dBμV/m)
= -10.46(dB)

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



Appendix C. Radiated Spurious Emission Plots

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

<Non-TXBF Modes with AC Adapter>

Note symbol

-L	Low channel location
-R	High channel location



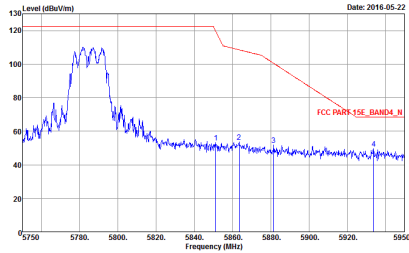
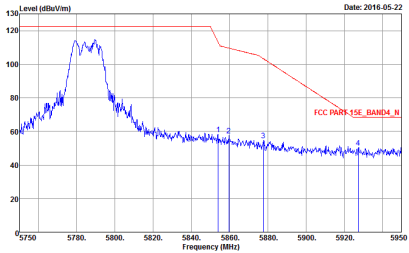
Band 4 - 5725~5850MHz
WIFI 802.11a (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
1+2	Horizontal	Vertical
Peak	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>

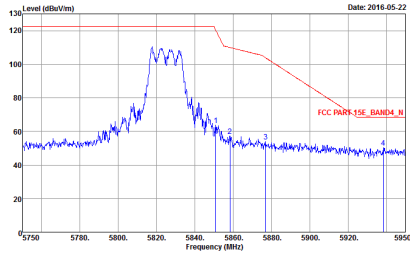
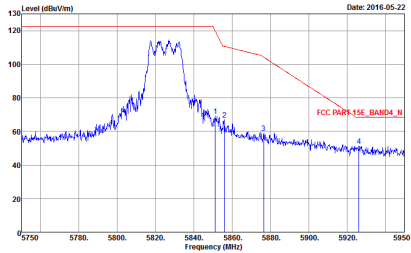


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz - L	
1+2	Horizontal	Vertical
Peak	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL Detector : Peak</p>	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL Detector : Peak</p>



WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz - R	
1+2	Horizontal	Vertical
Peak	 <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	 <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>



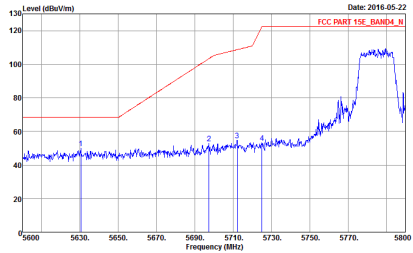
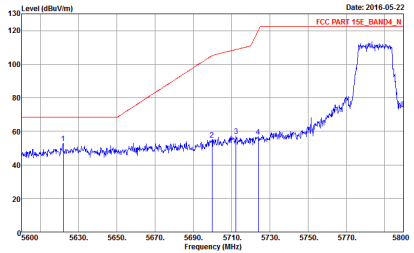
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
1+2	Horizontal	Vertical
Peak	 <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	 <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>



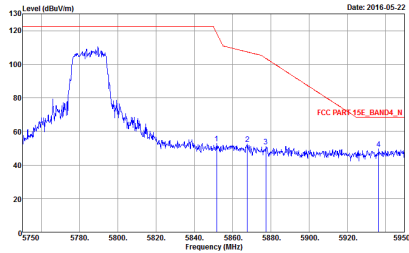
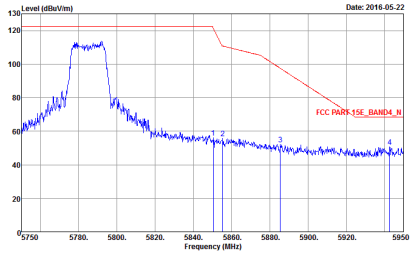
Band 4 5725~5850MHz
WIFI 802.11n HT20 (Band Edge @ 3m)

Table with 3 columns: WIFI, ANT, 1+2. It contains two spectral plots: Horizontal and Vertical. Each plot shows Level (dBuV/m) vs Frequency (MHz) with a peak at approximately 5745 MHz. Includes site and condition details for both plots.

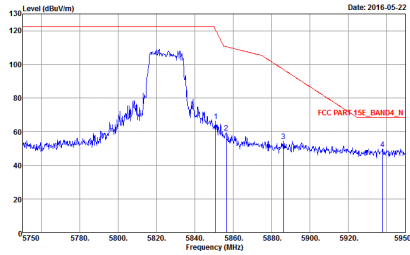
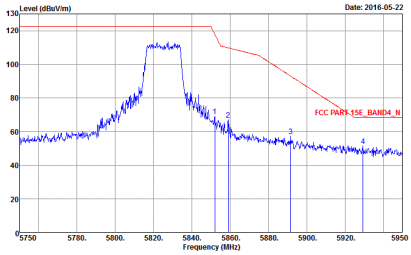


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz - L	
1+2	Horizontal	Vertical
Peak	 <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	 <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>



WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz - R	
1+2	Horizontal	Vertical
Peak	 <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 91200-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	 <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 91200-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>



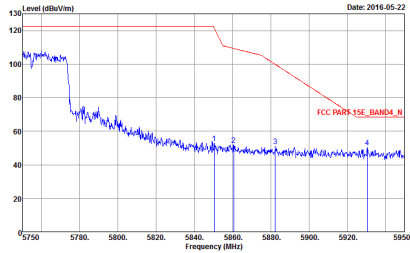
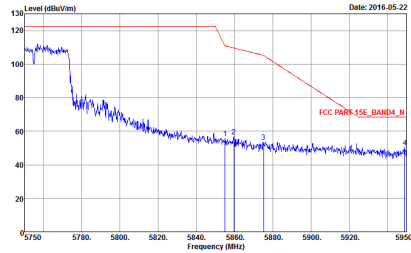
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1+2	Horizontal	Vertical
Peak	 <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	 <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>



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

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz - L	
1+2	Horizontal	Vertical
Peak	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>

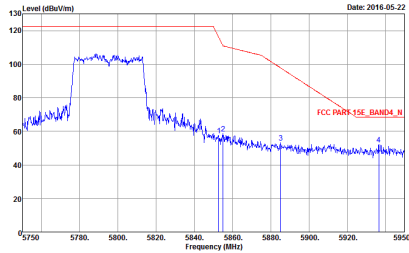
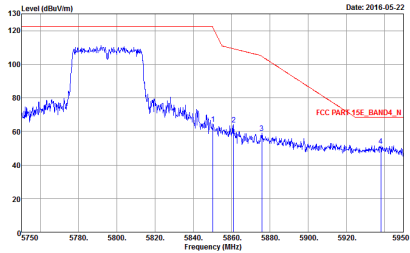


WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz - R	
1+2	Horizontal	Vertical
Peak	 <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 91200-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	 <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 91200-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>



WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz - L	
1+2	Horizontal	Vertical
Peak	<p style="font-size: small;">Date: 2016-05-22 FCC PART 15E_BAND4_N</p> <p style="font-size: x-small;">Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	<p style="font-size: small;">Date: 2016-05-22 FCC PART 15E_BAND4_N</p> <p style="font-size: x-small;">Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>



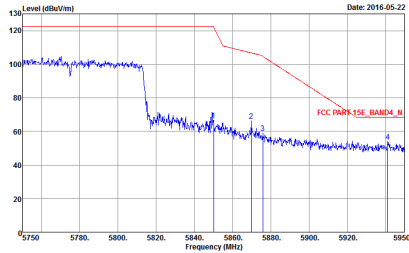
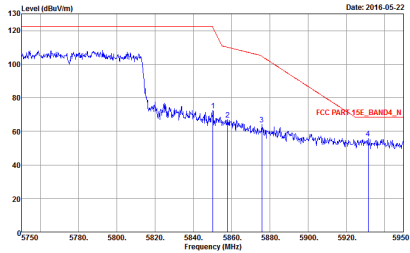
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz - R	
1+2	Horizontal	Vertical
Peak	 <p style="font-size: small;">Date: 2016-05-22</p> <p style="font-size: x-small;">Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	 <p style="font-size: small;">Date: 2016-05-22</p> <p style="font-size: x-small;">Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>



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

Table with 2 columns: Horizontal and Vertical. Row 1: Peak. Each cell contains a spectral plot of Level (dBuV/m) vs Frequency (MHz) for the specified band and antenna configuration.



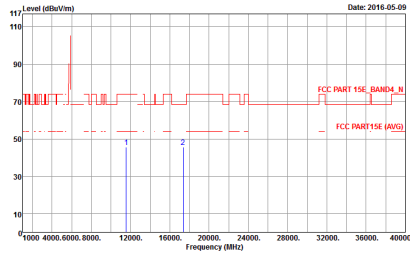
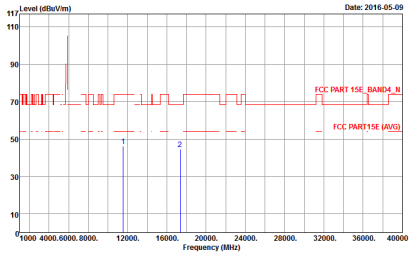
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz - R	
1+2	Horizontal	Vertical
Peak	 <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	 <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>



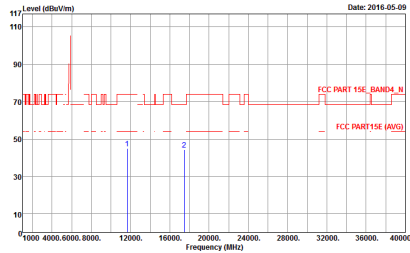
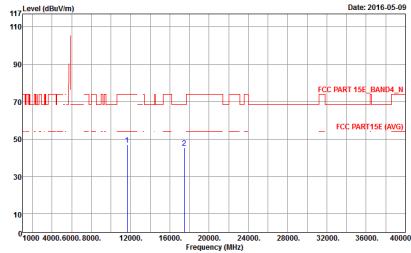
Band 4 - 5725~5850MHz
WIFI 802.11a (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH149 5745MHz	
1+2	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL Detector : Peak</p>	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL Detector : Peak</p>



WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH157 5785MHz	
1+2	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL Detector : Peak</p>	 <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL Detector : Peak</p>



WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH165 5825MHz	
1+2	Horizontal	Vertical
<p>Peak Avg.</p>	 <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL Detector : Peak</p>	 <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL Detector : Peak</p>



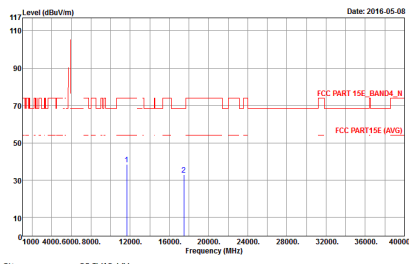
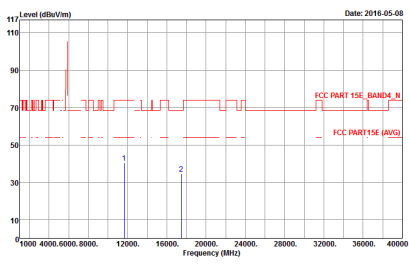
Band 4 5725~5850MHz
WIFI 802.11n HT20 (Harmonic @ 3m)

Table with 2 columns: Horizontal and Vertical. Each column contains a spectral plot showing Level (dBuV/m) vs Frequency (MHz) with FCC Part 15E limits and peak markers.



WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1+2	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL Detector : Peak</p>	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL Detector : Peak</p>



WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1+2	Horizontal	Vertical
Peak Avg.	 <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL Detector : Peak</p>	 <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL Detector : Peak</p>



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

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1+2	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL Detector : Peak</p>	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL Detector : Peak</p>



WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1+2	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL Detector : Peak</p>	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL Detector : Peak</p>

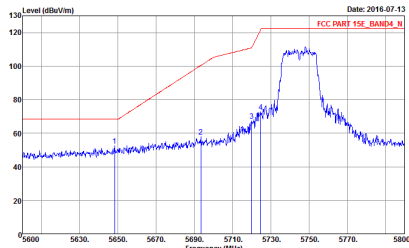
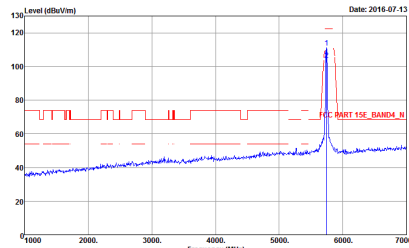


**Band 4 5725~5850MHz
WIFI 802.11ac VHT80 (Harmonic @ 3m)**

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1+2	Horizontal	Vertical
<p>Peak Avg.</p>	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL Detector : Peak</p>	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL Detector : Peak</p>



<TXBF Modes with AC Adapter>
Band 4 5725~5850MHz
WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1	Horizontal	Fundamental
Peak	 <p>Date: 2016-07-13 FCC PART 15E_BAND4_N</p> <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	 <p>Date: 2016-07-13 FCC PART 15E_BAND4_N</p> <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>



WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1	Vertical	Fundamental
Peak	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 91200-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 91200-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>



WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1	Horizontal	Fundamental
Peak	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>
Peak	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	



WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1	Vertical	Fundamental
Peak	<p>Date: 2016-07-13</p> <p>FCC PART 15E_BAND4_N</p> <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 91200-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	<p>Date: 2016-07-13</p> <p>FCC PART 15E_BAND4_N</p> <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 91200-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>
Peak	<p>Date: 2016-07-13</p> <p>FCC PART 15E_BAND4_N</p> <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 91200-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	



WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1	Horizontal	Fundamental
Peak	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 91200-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 91200-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>



WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1	Vertical	Fundamental
Peak	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 91200-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 91200-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>



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

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1	Horizontal	Fundamental
<p align="center">Peak</p>	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>
<p align="center">Peak</p>	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	<p align="center">Left blank</p>



WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1	Vertical	Fundamental
Peak	<p>Date: 2016-07-13</p> <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	<p>Date: 2016-07-13</p> <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>
Peak	<p>Date: 2016-07-13</p> <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	Left blank



WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1	Horizontal	Fundamental
Peak	<p>Date: 2016-07-13</p> <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 91200-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	<p>Date: 2016-07-13</p> <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 91200-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>
Peak	<p>Date: 2016-07-13</p> <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 91200-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	Left blank



WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1	Vertical	Fundamental
Peak	<p>Date: 2016-07-13</p> <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 91200-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	<p>Date: 2016-07-13</p> <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 91200-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>
Peak	<p>Date: 2016-07-13</p> <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 91200-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	Left blank



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

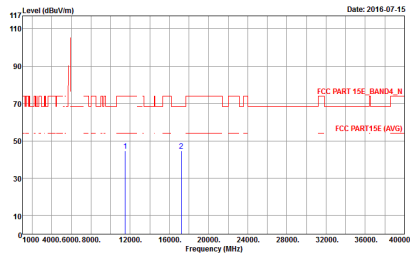
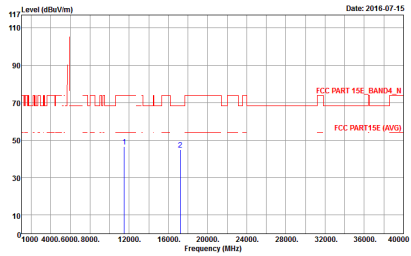
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1	Horizontal	Fundamental
Peak	<p>Date: 2016-07-16 Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	<p>Date: 2016-07-16 Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>
Peak	<p>Date: 2016-07-16 Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	Left blank



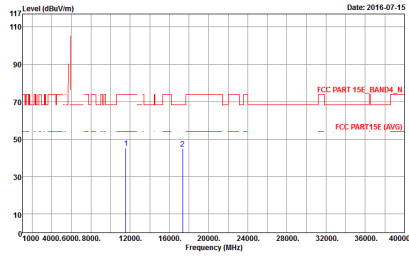
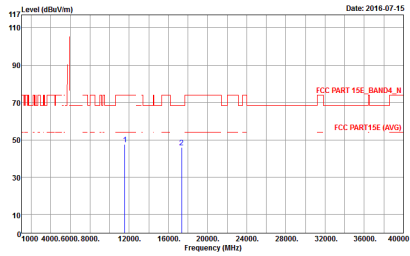
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1	Vertical	Fundamental
Peak	<p>Date: 2016-07-16</p> <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 91200-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	<p>Date: 2016-07-16</p> <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 91200-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>
Peak	<p>Date: 2016-07-16</p> <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 91200-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	Left blank



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

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1	Horizontal	Vertical
<p>Peak Avg.</p>	 <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 91200-HF HORIZONTAL Detector : Peak</p>	 <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 91200-HF VERTICAL Detector : Peak</p>



WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1	Horizontal	Vertical
<p>Peak</p> <p>Avg.</p>	 <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL Detector : Peak</p>	 <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL Detector : Peak</p>



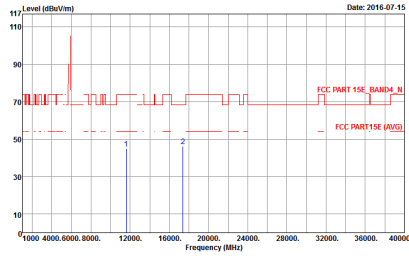
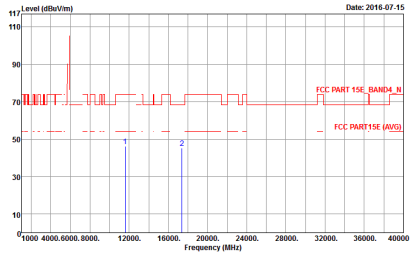
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1	Horizontal	Vertical
<p>Peak</p> <p>Avg.</p>	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL Detector : Peak</p>	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL Detector : Peak</p>



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

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1	Horizontal	Vertical
<p>Peak Avg.</p>	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 91200-HF HORIZONTAL Detector : Peak</p>	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 91200-HF VERTICAL Detector : Peak</p>



WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1	Horizontal	Vertical
<p>Peak</p> <p>Avg.</p>	 <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL Detector : Peak</p>	 <p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL Detector : Peak</p>



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

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1	Horizontal	Vertical
Peak Avg.	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL Detector : Peak</p>	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL Detector : Peak</p>



Worst case with AC Adapter
Emission below 1GHz
5GHz WIFI 802.11ac VHT80 (LF)

WIFI	5GHz 5725~5850MHz	
ANT	802.11ac VHT80 LF	
1+2	Horizontal	Vertical
QP / Peak	<p>Site : 03CH10-HY Condition : FCC CLASS-B 3m BI-LO6 6111D-LF HORIZONTAL Detector : Peak</p>	<p>Site : 03CH10-HY Condition : FCC CLASS-B 3m BI-LO6 6111D-LF VERTICAL Detector : Peak</p>



<Non-TXBF Modes with PoE Adapter>

Band 4 5725~5850MHz

WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz - L	
1+2	Horizontal	Vertical
Peak	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	<p>Site : 03CH10-VY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>



WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz - R	
1+2	Horizontal	Vertical
Peak	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF HORIZONTAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>	<p>Site : 03CH10-HY Condition : FCC PART 15E_BAND4_N 3m HORN 9120D-HF VERTICAL RBW:1000.000KHz VBW:3000.000KHz SWT:Auto Detector : Peak</p>



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

Table with 3 columns: WIFI, ANT, 1+2. It contains two spectral plots: Horizontal and Vertical. Each plot shows Level (dBuV/m) vs Frequency (MHz) with FCC Part 15E limits and test results. Includes site and condition details for each plot.



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

Table with 3 columns: WIFI (5GHz 5725~5850MHz), ANT (802.11ac VHT80 LF), and 1+2 (Horizontal/Vertical). It contains two spectral plots showing Level (dBuV/m) vs Frequency (MHz) for QP / Peak detection. The left plot is for Horizontal orientation and the right for Vertical orientation. Both plots show a blue signal line and a red limit line labeled 'FCC PART 15E_BAND4_N'. The horizontal plot has a peak at approximately 100 MHz, and the vertical plot has a peak at approximately 100 MHz.



Appendix D. Duty Cycle Plots

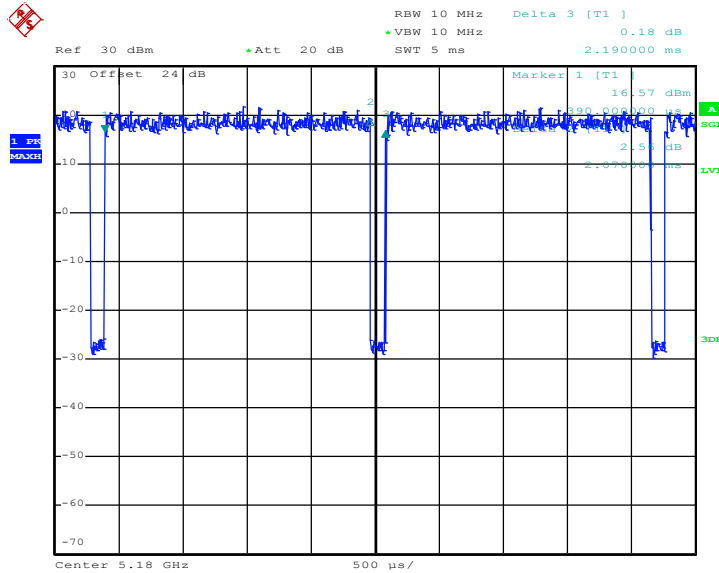
<Non-TXBF Modes>

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



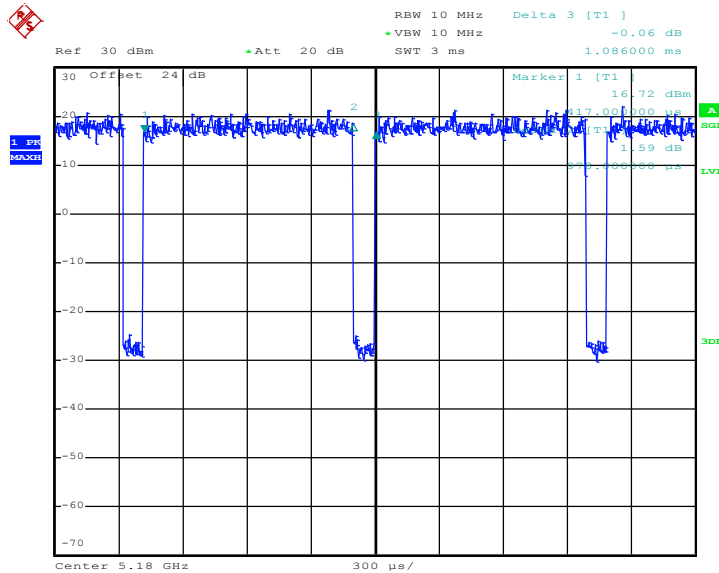
MIMO <Ant. 1+2(1)>

802.11a



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

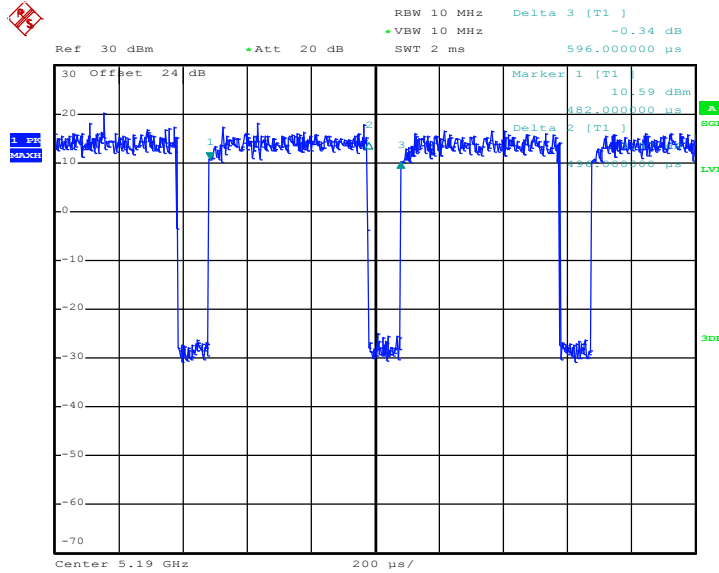
802.11n HT20



Date: 27.APR.2016 19:00:56

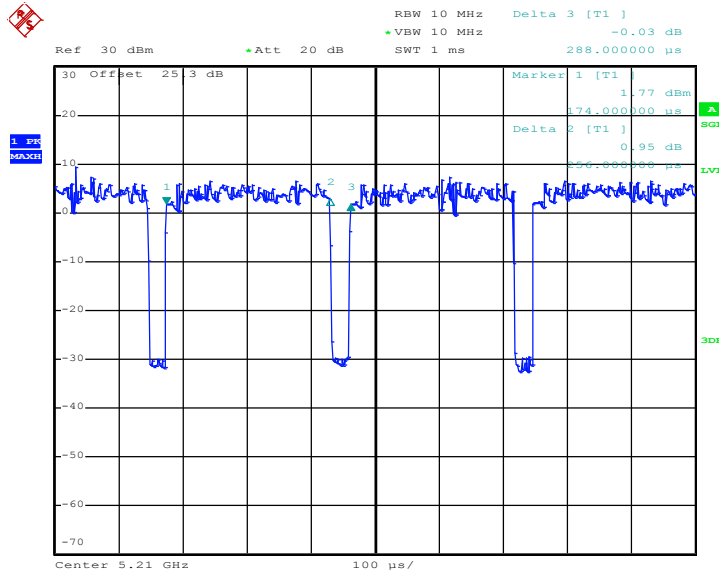


802.11n HT40



Date: 27.APR.2016 19:06:29

802.11ac VHT80

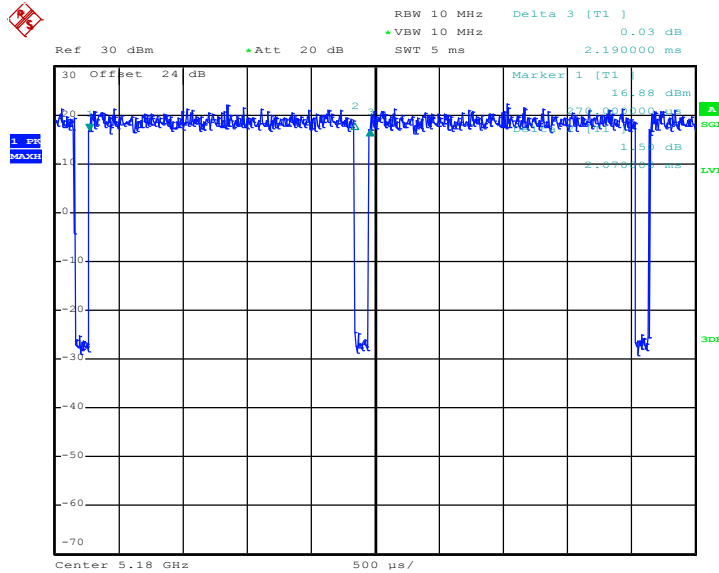


Date: 16.MAY.2016 23:58:13



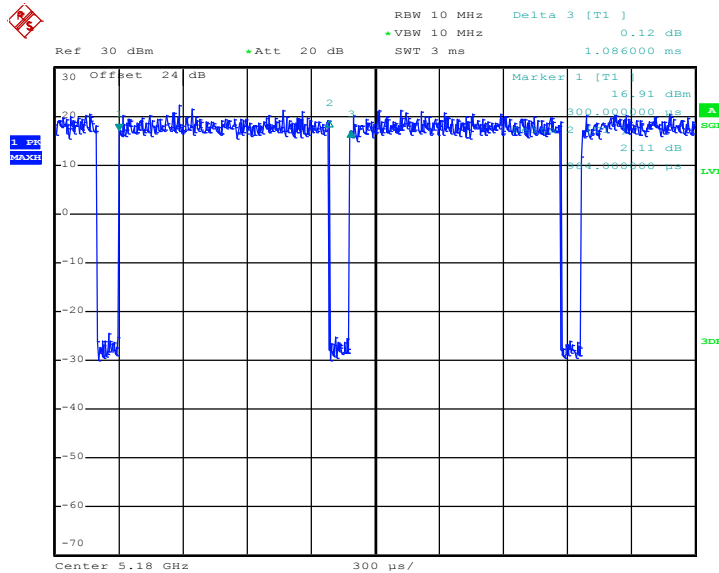
MIMO <Ant. 1+2(2)>

802.11a



Date: 27.APR.2016 18:56:29

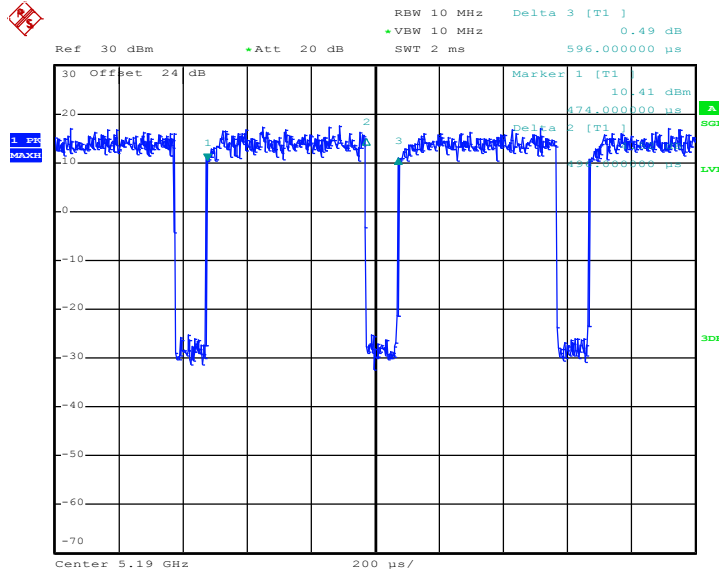
802.11n HT20



Date: 27.APR.2016 19:02:50

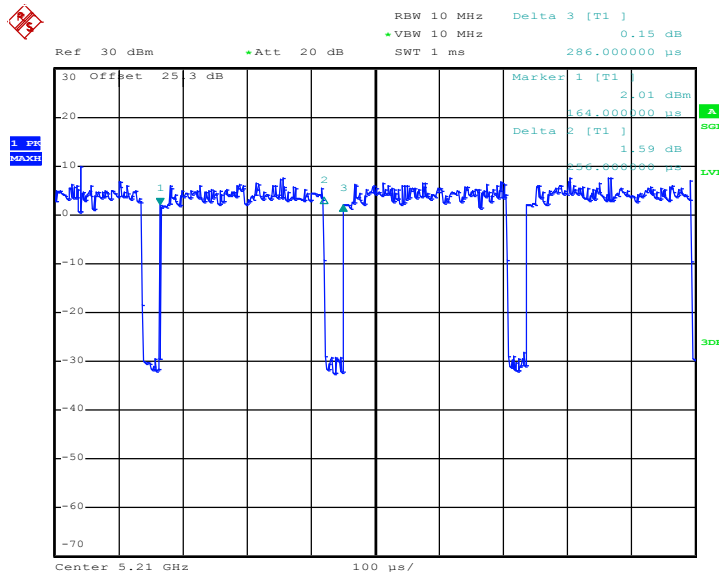


802.11n HT40



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

802.11ac VHT80



Date: 16.MAY.2016 23:55:57



<TXBF Modes>

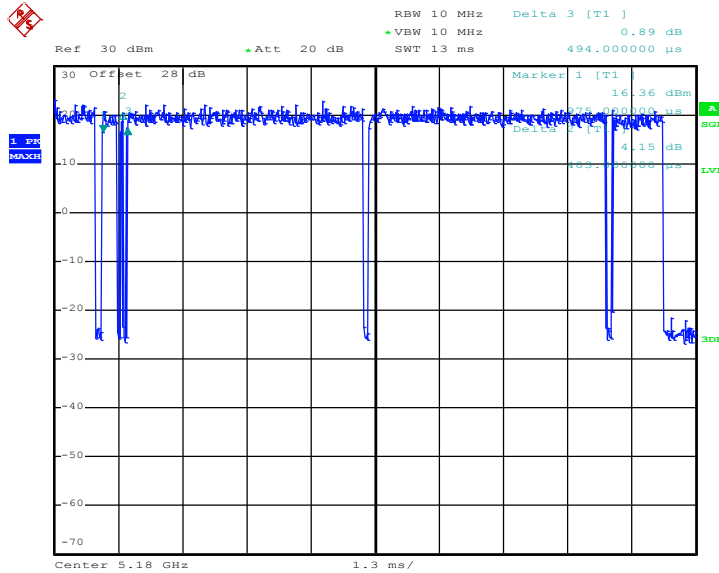
Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
1+2	5GHz 802.11n HT20	97.87	403	2.48	3kHz
1+2	5GHz 802.11n HT40	97.29	468	2.14	3kHz
1+2	5GHz 802.11ac VHT80	97.71	870	1.15	3kHz

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



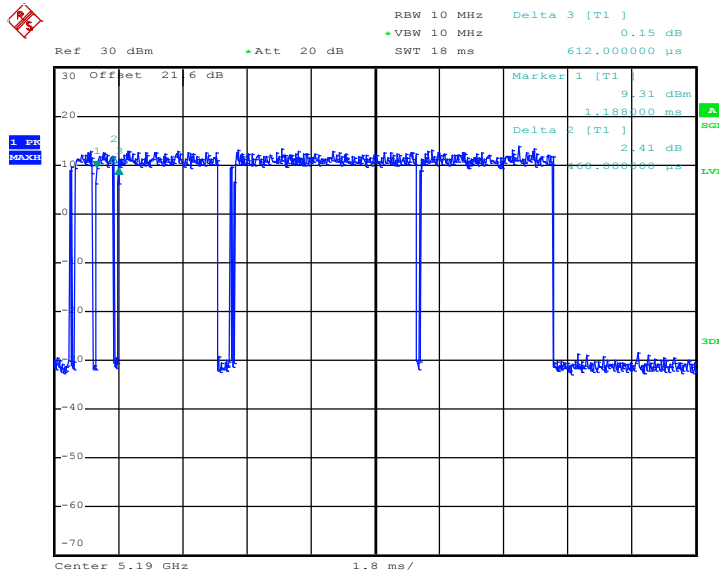
MIMO <Ant. 1+2>

802.11n HT20



Date: 19.JUL.2016 16:15:03

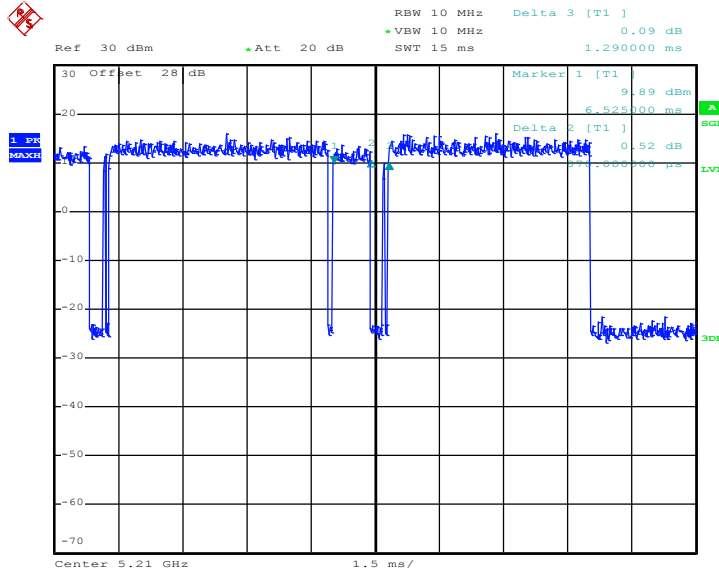
802.11n HT40



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



802.11ac VHT80



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