FCC Report (WIFI)

Applicant:	FN-LINK TECHNOLOGY LIMITED
Address of Applicant:	No. 8, Litong Road, Liuyang Economic Development Zone, Liuyang, China
Manufacturer/ Factory:	FN-LINK TECHNOLOGY LIMITED
Address of Manufacturer/ Factory:	No. 8, Litong Road, Liuyang Economic Development Zone, Liuyang, China

Equipment Under Test (EUT)

Product Name:	Wi-Fi Dual-band 2X2 11ac +Bluetooth V4.2 Module
Model No.:	6222D-UUB
Trade Mark:	FN-LINK
FCC ID:	2AATL-6222D-UUB
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.247
Date of sample receipt:	June 19, 2018
Date of Test:	June 19, 2018~ July 11, 2018
Date of report issued:	July 12, 2018
Test Result :	PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Robinson Lo
Laboratory Manager

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

2 Version

Version No.	Date	Description
00	*July 12, 2018*	*Original*

Prepared By: ***Date:*** *July 12, 2018*

Project Engineer

Check By: ***Date:*** *July 12, 2018*

Reviewer

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203/15.247 (c)	Pass
AC Power Line Conducted Emission	15.207	Pass
Conducted Peak Output Power	15.247 (b)(3)	Pass
Channel Bandwidth	15.247 (a)(2)	Pass
Power Spectral Density	15.247 (e)	Pass
Band Edge	15.247(d)	Pass
Spurious Emission	15.205/15.209	Pass

Remark: Test according to ANSI C63.10:2013.

Pass: The EUT complies with the essential requirements in the standard.

Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	9kHz ~ 30MHz	± 4.34dB	(1)
Radiated Emission	30MHz ~ 1000MHz	± 4.24dB	(1)
Radiated Emission	1GHz ~ 26.5GHz	± 4.68dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	± 3.45dB	(1)
Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.			

5 General Information

5.1 General Description of EUT

Product Name:	Wi-Fi Dual-band 2X2 11ac +Bluetooth V4.2 Module	
Model No.:	6222D-UUB	
Serial No.:	FN6222DUUB00001	
Test sample(s) ID:	GTS201806000179-1	
Sample(s) Status	Engineer sample	
Hardware version:	1.0	
Software version:	1.0	
Channel numbers:	802.11b/802.11g /802.11n(HT20): 11 802.11n(HT40):7	
Channel separation:	5MHz	
Modulation technology:	802.11b: Direct Sequence Spread Spectrum (DSSS) 802.11g/802.11n(H20)/802.11n(HT40): Orthogonal Frequency Division Multiplexing (OFDM)	
Antenna Type:	Chain A	PIFA Antenna
	Chain B	PIFA Antenna
Antenna gain:	Chain A	WiFi 2.4G: 3.15dBi WiFi 5G Band 1: 3.79dBi WiFi 5G Band 2A: 3.83dBi WiFi 5G Band 2C: 4.14dBi WiFi 5G Band 3: 4.25dBi
	Chain B	WiFi 2.4G: 3.15dBi WiFi 5G Band 1: 3.79dBi WiFi 5G Band 2A: 3.83dBi WiFi 5G Band 2C: 4.14dBi WiFi 5G Band 3: 4.25dBi
Directional gain	WiFi 2.4G: 6.16dBi	
Maximum Peak Power	STBC_Chain 0+1	IEEE 802.11b: 20.75dBm
	MIMO_Chain 0+1	IEEE 802.11g: 24.74dBm
	MIMO_Chain 0+1	IEEE 802.11n-HT20: 24.14dBm IEEE 802.11n-HT40: 23.32dBm
Power supply:	DC 3.3V	

Operation Frequency each of channel							
IEEE 802.11b, IEEE 802.11g, IEEE 802.11n-HT20							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz
3	2422MHz	6	2437MHz	9	2452MHz		
IEEE 802.11n-HT40							
		4	2427MHz	7	2442MHz		
		5	2432MHz	8	2447MHz		
3	2422MHz	6	2437MHz	9	2452MHz		

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Test channel	**Frequency (MHz)**	
	802.11b/802.11g/802.11n(HT20)	802.11n(HT40)
Lowest channel	2412MHz	2422MHz
Middle channel	2437MHz	2437MHz
Highest channel	2462MHz	2452MHz

5.2 Test mode

Transmitting mode	Keep the EUT in continuously transmitting mode

Remark: During the test, the dutycycle >98%, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.

We have verified the construction and function in typical operation. All the test modes were carried out with the EUT in transmitting operation, which was shown in this test report and defined as follows:

Pre-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.

Mode	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)
Data rate	1Mbps	6Mbps	6.5Mbps	13Mbps

Keep the EUT in continuously transmitting or receiving with modulation test single.

Mode	802.11b	802.11g	802.11n(HT20)	802.11n(HT40)
TX/RX Function	2TX/2RX	2TX/2RX	2TX/2RX	2TX/2RX

5.3 Description of Support Units

Manufacturer	Description	Model	Serial Number
IBM Thinkpad	Notebook PC	2374	L3-G0686
Fn-link	Auxiliary PCB	N/A	N/A

5.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

● **FCC —Registration No.: 381383**

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. Registration 381383, January 08, 2018.

● **Industry Canada (IC) —Registration No.: 9079A-2**

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 9079A-2, August 15, 2016.

5.5 Test Location

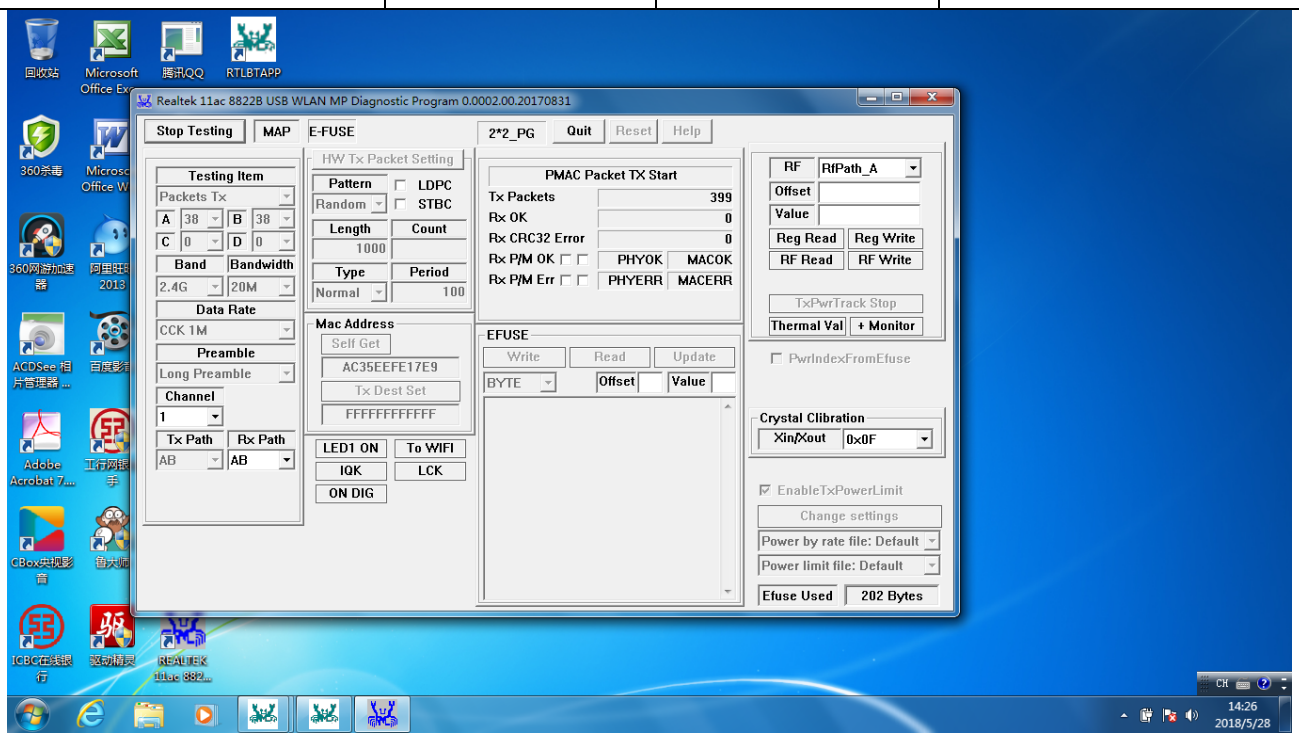
All tests were performed at:

Global United Technology Services Co., Ltd.
Address: No. 301-309, 3/F., Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102
Tel: 0755-27798480
Fax: 0755-27798960

5.6 Additional Instructions

EUT Software Settings:

Mode	Special software is used. The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.		
Test Software Name	Realtek 11ac 8822B USB WLAN MP Diagnostic Program 0.0002.00.20170831		
Mode	Channel	Frequency (MHz)	Software Set
802.11b/g/n(HT20)(HT40)	CH1	2412	TX level : default
	CH6	2437	
	CH11	2462	



6 Test Instruments list

Radiated Emission:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	July. 03 2015	July. 02 2020
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June. 27 2018	June. 26 2019
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 27 2018	June. 26 2019
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June. 27 2018	June. 26 2019
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 27 2018	June. 26 2019
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 27 2018	June. 26 2019
9	Coaxial Cable	GTS	N/A	GTS211	June. 27 2018	June. 26 2019
10	Coaxial cable	GTS	N/A	GTS210	June. 27 2018	June. 26 2019
11	Coaxial Cable	GTS	N/A	GTS212	June. 27 2018	June. 26 2019
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 27 2018	June. 26 2019
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	June. 27 2018	June. 26 2019
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 27 2018	June. 26 2019
15	Band filter	Amindeon	82346	GTS219	June. 27 2018	June. 26 2019
16	Power Meter	Anritsu	ML2495A	GTS540	June. 27 2018	June. 26 2019
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 27 2018	June. 26 2019
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	June. 27 2018	June. 26 2019
19	Splitter	Agilent	11636B	GTS237	June. 27 2018	June. 26 2019
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 27 2018	June. 26 2019

Conducted Emission						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	May.16 2014	May.15 2019
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 27 2018	June. 26 2019
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 27 2018	June. 26 2019
4	Artificial Mains Network	SCHWARZBECK MESS	NSLK8127	GTS226	June. 27 2018	June. 26 2019
5	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Thermo meter	KTJ	TA328	GTS233	June. 27 2018	June. 26 2019
8	Absorbing clamp	Elektronik-Feinmechanik	MDS21	GTS229	June. 27 2018	June. 26 2019

General used equipment:						
Item	**Test Equipment**	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal.Date (mm-dd-yy)**	**Cal.Due date (mm-dd-yy)**
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	June. 27 2018	June. 26 2019
2	Barometer	ChangChun	DYM3	GTS255	June. 27 2018	June. 26 2019

7 Test results and Measurement Data

7.1 Antenna requirement

Standard requirement:	FCC Part15 C Section 15.203 /247(c)

15.203 requirement:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

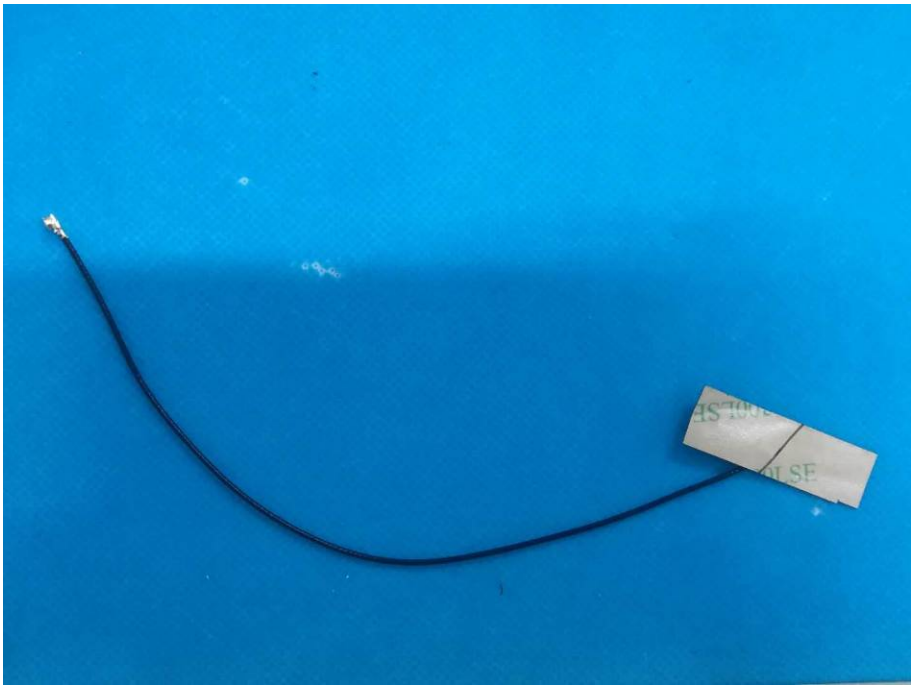
15.247(c) (1)(i) requirement:

(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

EUT Antenna:

Frequency range and Max Gain:

2400MHz~2483.5MHz: 3.15dBi, Directional gain: 6.16dBi.
5150MHz~5250MHz: 3.79dBi, Directional gain: 6.80dBi.
5250MHz~5350MHz: 3.88dBi, Directional gain: 6.89dBi.
5470MHz~5725MHz: 4.14dBi, Directional gain: 7.15dBi.
5725MHz~5850MHz: 4.27dBi, Directional gain: 7.28dBi.



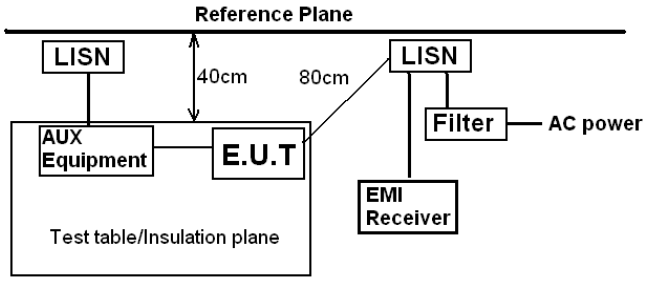
7.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207
Test Method:	ANSI C63.10:2013
Test Frequency Range:	150KHz to 30MHz
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto
Limit:	

Frequency range (MHz)	Limit (dBuV)	
	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.

Test setup:



Remark:
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m

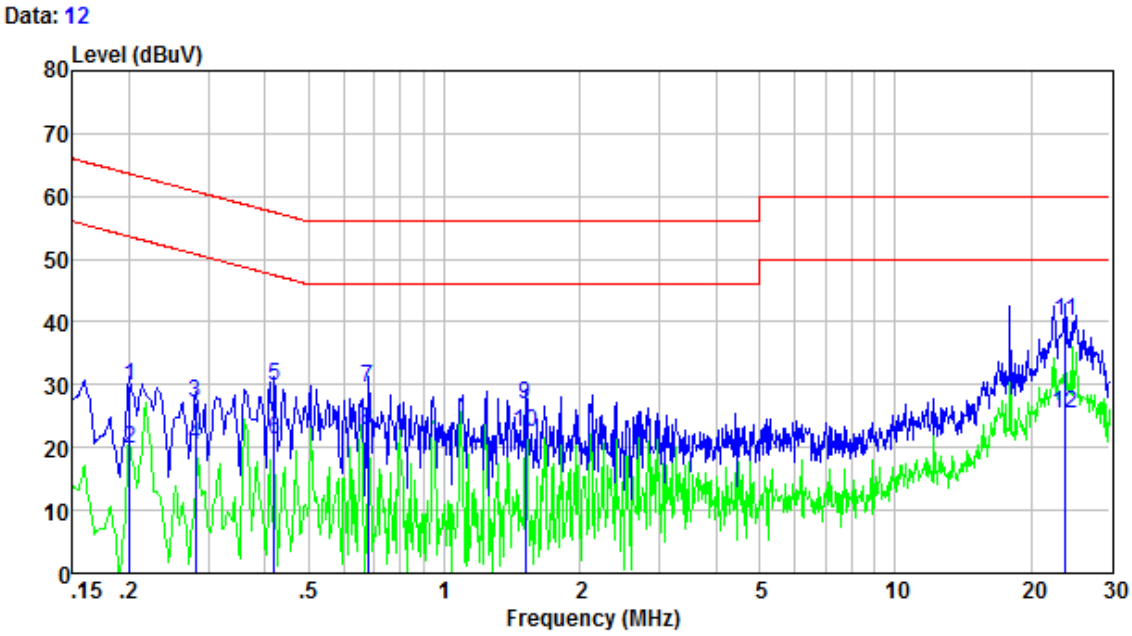
Test procedure:

1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.
2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).
3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement.

Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

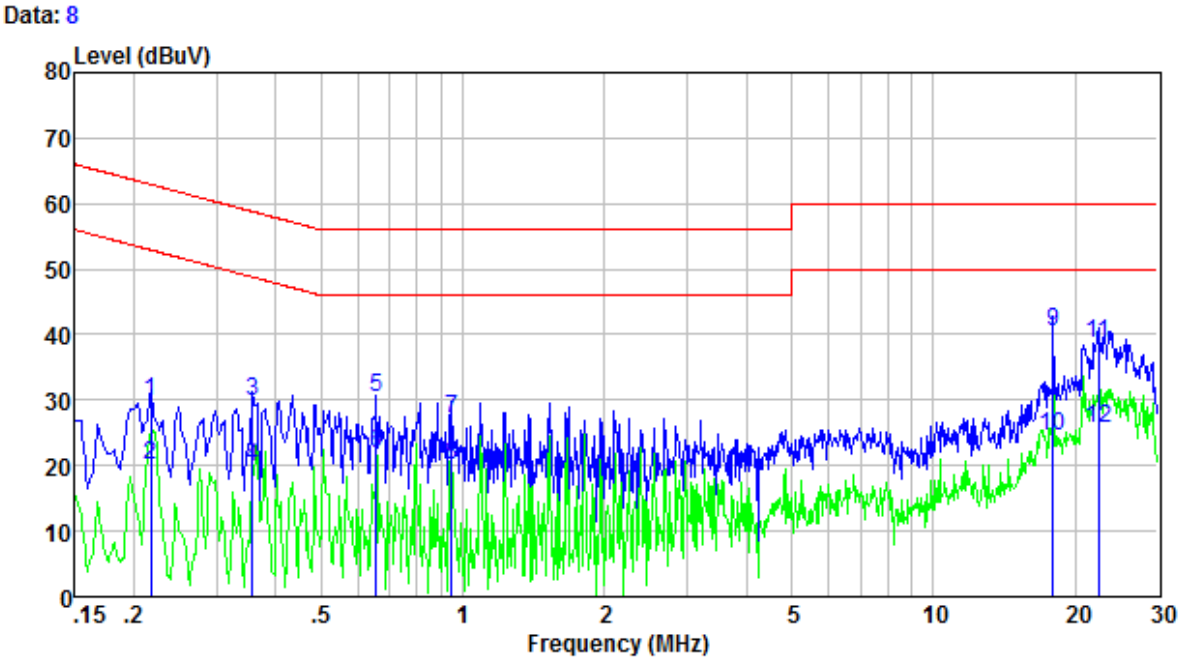
Measurement data

Line:



Freq MHz	Reading level dBuV	LISN/ISN factor dB	Cable loss dB	level dBuV	Limit level dBuV	Over limit dB	Remark
0.201	20.30	9.56	0.01	29.87	63.58	-33.71	QP
0.201	10.10	9.56	0.01	19.67	53.58	-33.91	Average
0.280	17.70	9.57	0.01	27.28	60.81	-33.53	QP
0.280	10.80	9.57	0.01	20.38	50.81	-30.43	Average
0.419	20.10	9.58	0.02	29.70	57.46	-27.76	QP
0.419	11.70	9.58	0.02	21.30	47.46	-26.16	Average
0.675	19.90	9.59	0.03	29.52	56.00	-26.48	QP
0.675	13.20	9.59	0.03	22.82	46.00	-23.18	Average
1.511	17.20	9.59	0.03	26.82	56.00	-29.18	QP
1.511	12.70	9.59	0.03	22.32	46.00	-23.68	Average
23.888	30.40	9.85	0.04	40.29	60.00	-19.71	QP
23.888	15.60	9.85	0.04	25.49	50.00	-24.51	Average

Neutral:

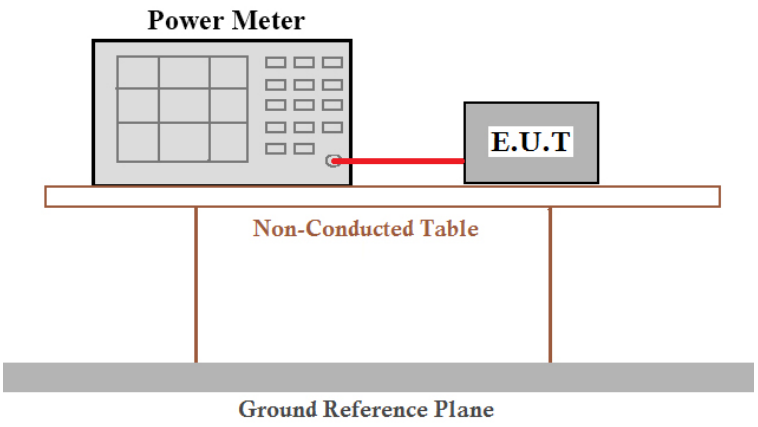


Freq MHz	Reading level dBuV	LISN/ISN factor dB	Cable loss dB	level dBuV	Limit level dBuV	Over limit dB	Remark
0.217	20.30	9.58	0.01	29.89	62.92	-33.03	QP
0.217	10.50	9.58	0.01	20.09	52.92	-32.83	Average
0.358	20.29	9.62	0.02	29.93	58.78	-28.85	QP
0.358	10.09	9.62	0.02	19.73	48.78	-29.05	Average
0.654	20.69	9.64	0.03	30.36	56.00	-25.64	QP
0.654	12.29	9.64	0.03	21.96	46.00	-24.04	Average
0.948	17.50	9.65	0.04	27.19	56.00	-28.81	QP
0.948	10.40	9.65	0.04	20.09	46.00	-25.91	Average
17.944	30.60	9.93	0.05	40.58	60.00	-19.42	QP
17.944	14.60	9.93	0.05	24.58	50.00	-25.42	Average
22.416	28.60	9.93	0.05	38.58	60.00	-21.42	QP
22.416	15.60	9.93	0.05	25.58	50.00	-24.42	Average

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level =Receiver Read level + LISN Factor + Cable Loss
4. *If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.*

7.3 Conducted Peak Output Power

Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	KDB558074 D01 DTS Meas Guidance V04 KDB662911 D01 Multiple Transmitter Output v02r01
Limit:	30dBm
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

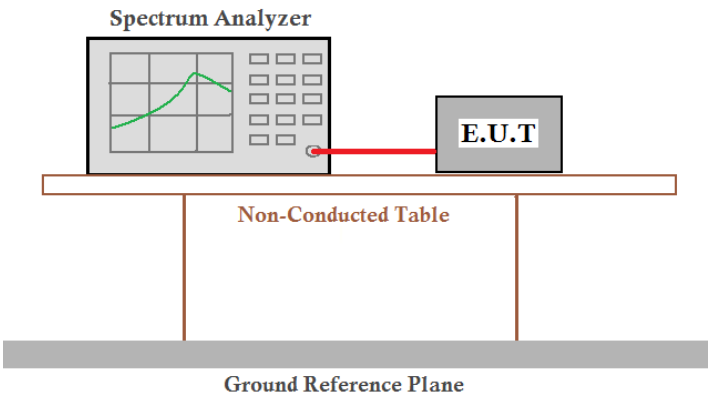
Mode	Channel/ Frequency (MHz)	Maximum peak conducted power(dBm)				
		Chain A	Chain B	Total power Chain A+B	Limit (dBm)	Pass/Fail
IEEE 802.11b (STBC)	1(2412)	17.30	17.76	20.55	29.84	Pass
	6(2437)	17.53	17.80	20.68	29.84	Pass
	11(2462)	17.85	17.62	20.75	29.84	Pass
IEEE 802.11g (MIMO)	1(2412)	21.03	21.81	24.45	29.84	Pass
	6(2437)	21.22	21.70	24.48	29.84	Pass
	11(2462)	21.88	21.57	24.74	29.84	Pass
IEEE 802.11n-HT20 (MIMO)	1(2412)	20.52	21.62	24.12	29.84	Pass
	6(2437)	20.39	21.76	24.14	29.84	Pass
	11(2462)	20.77	21.46	24.14	29.84	Pass
IEEE 802.11n-HT40 (MIMO)	3(2422)	19.00	19.21	22.12	29.84	Pass
	6(2437)	19.93	20.17	23.06	29.84	Pass
	9(2452)	20.49	20.12	23.32	29.84	Pass

Remark:

1. Total (Chain A+B) = $10*\log[(10^{\text{Chain 0/10}})+(10^{\text{Chain 1/10}})]$
2. Directional gain and the maximum peak conducted power limit see table below:

Frequency Band (MHz)	Chain A Antenna Gain (dBi)	Chain B Antenna Gain (dBi)	Correlated Chains Directional gain (dBi)	Peak Power Limit (dBm)
2400~2483.5	3.15	3.15	6.16	29.84
Basic methodology with N_{ANT} transmit antennas, each with the same directional gain G_{ANT} dBi, being driven by N_{ANT} transmitter outputs of equal power. Directional gain is to be computed as follows: If any transmit signals are correlated with each other, Directional gain = G ANT + 10 log(N_{ANT}) dBi				

7.4 Channel Bandwidth

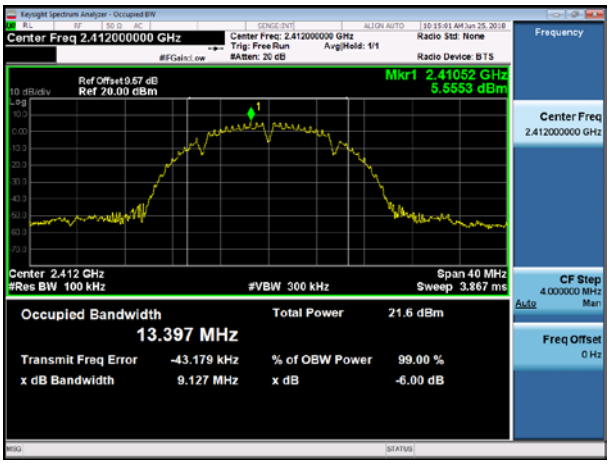
Test Requirement:	FCC Part15 C Section 15.247 (a)(2)
Test Method:	KDB558074 D01 DTS Meas Guidance V04
Limit:	>500KHz
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

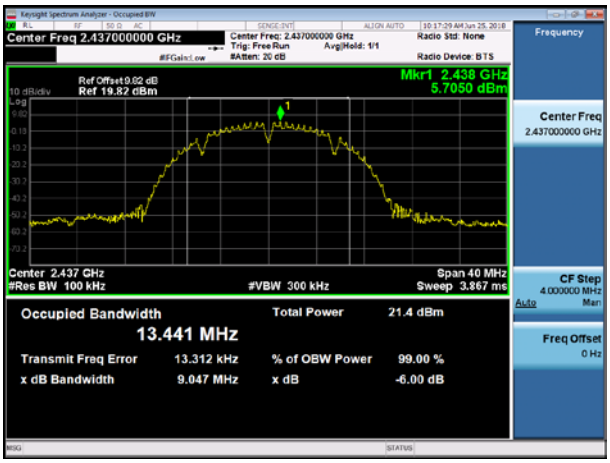
Mode	Channel/ Frequency(MHz)	6dB Bandwidth(MHz)	99% Bandwidth(MHz)	6dB Bandwidth Limit	Pass/Fail
IEEE 802.11b STBC_ChainA	1(2412)	9.127	13.397	>500KHz	Pass
	6(2437)	9.047	13.441	>500KHz	Pass
	11(2462)	9.113	13.510	>500KHz	Pass
IEEE 802.11g MIMO_ChainA	1(2412)	16.34	16.373	>500KHz	Pass
	6(2437)	16.33	16.366	>500KHz	Pass
	11(2462)	16.33	16.375	>500KHz	Pass
IEEE 802.11n-HT20 MIMO_Chain A	1(2412)	16.75	17.523	>500KHz	Pass
	6(2437)	16.90	17.530	>500KHz	Pass
	11(2462)	16.45	17.521	>500KHz	Pass
IEEE 802.11n-HT40 MIMO_Chain A	3(2422)	35.79	36.076	>500KHz	Pass
	6(2437)	35.87	36.076	>500KHz	Pass
	9(2452)	35.58	36.069	>500KHz	Pass

Test plot as follows:

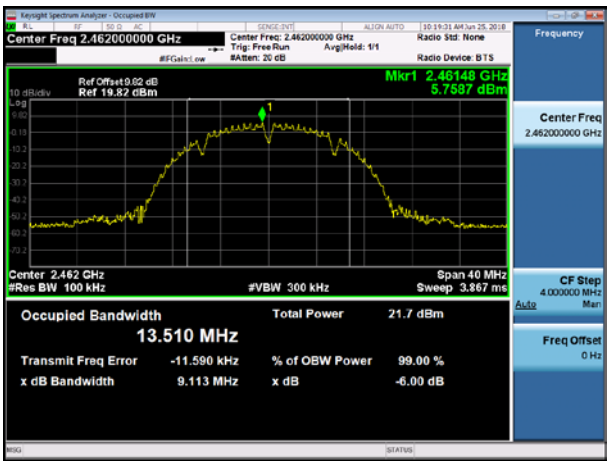
Test mode:	802.11b



Lowest channel

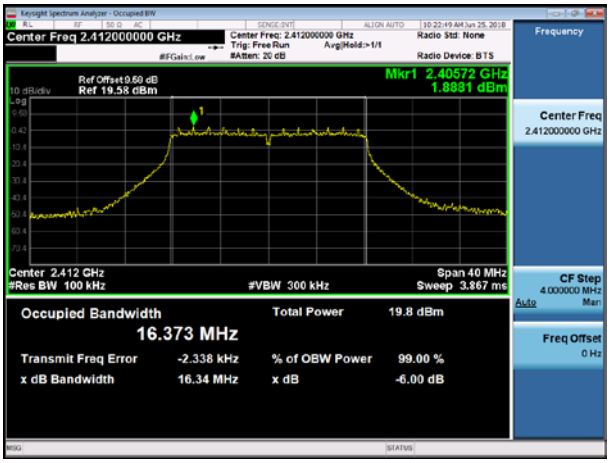


Middle channel

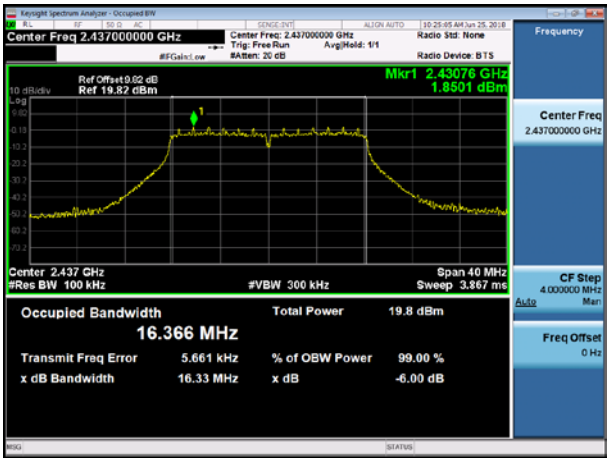


Highest channel

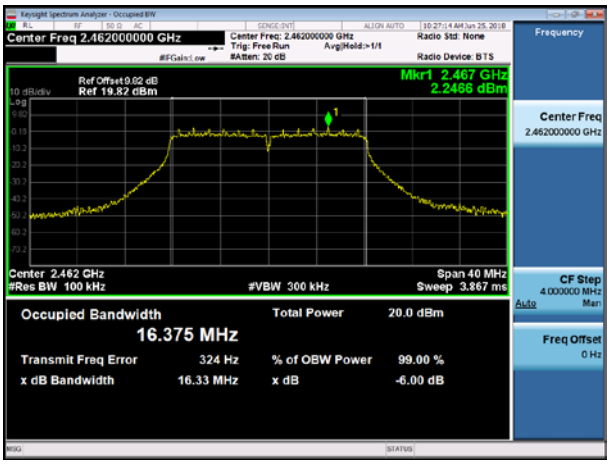
Test mode:	802.11g



Lowest channel

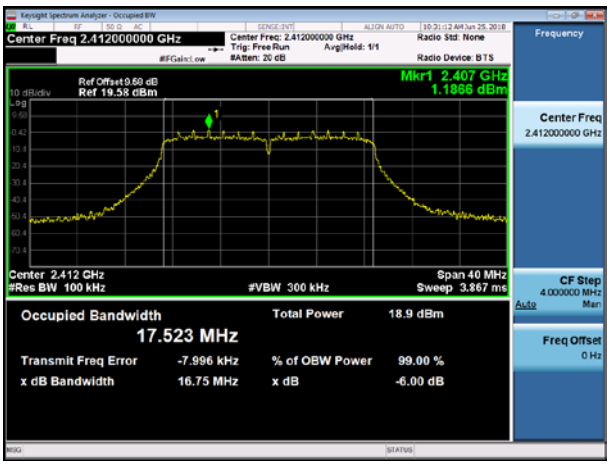


Middle channel

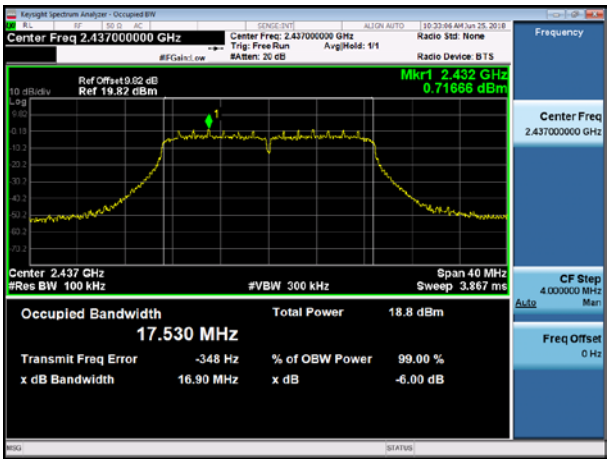


Highest channel

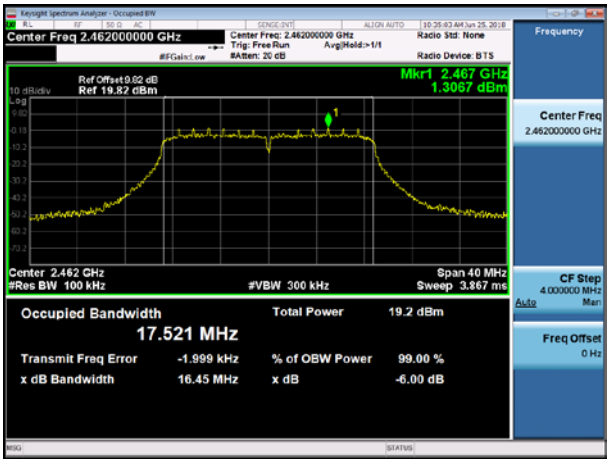
Test mode:	802.11n(HT20)



Lowest channel

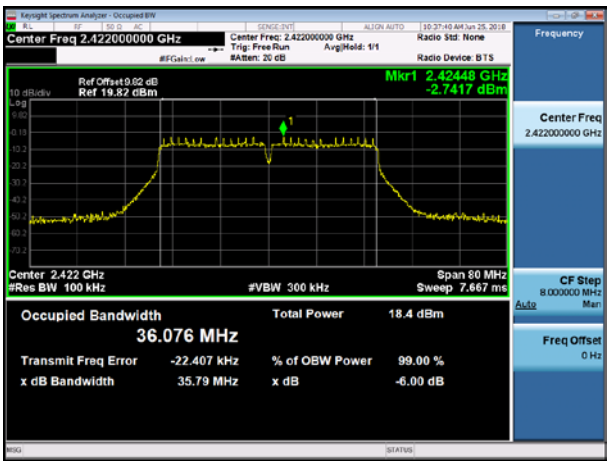


Middle channel

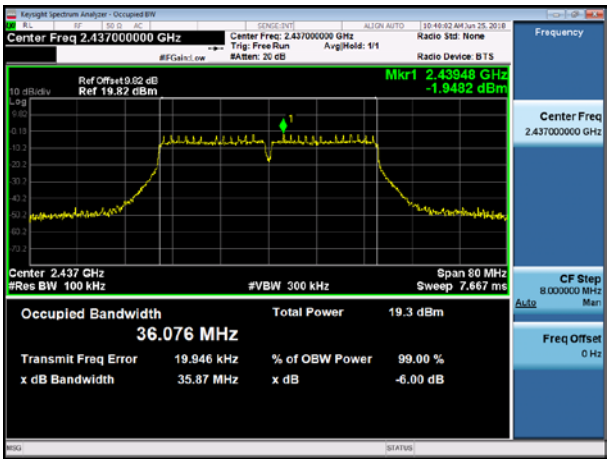


Highest channel

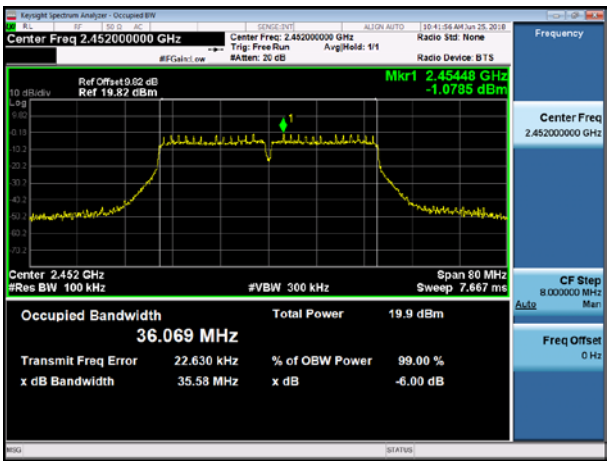
Test mode:	802.11n(HT40)



Lowest channel

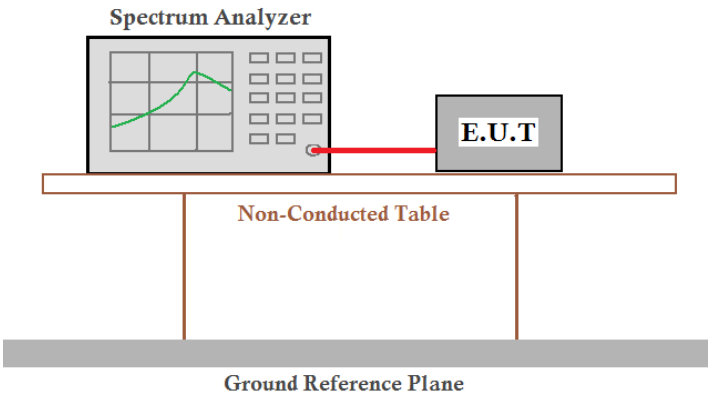


Middle channel



Highest channel

7.5 Power Spectral Density

Test Requirement:	FCC Part15 C Section 15.247 (e)
Test Method:	KDB558074 D01 DTS Meas Guidance V04 KDB662911 D01 Multiple Transmitter Output v02r01
Limit:	8dBm/3kHz
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement Data

Mode	Channel/ Frequency (MHz)	Power spectral density (dBm)				
		Chain A	Chain B	Total power Chain A+B	Limit@3kHz (dBm)	Pass/Fail
IEEE 802.11b (STBC)	1(2412)	-8.984	-8.361	-5.651	7.84	Pass
	6(2437)	-8.403	-8.163	-5.271	7.84	Pass
	11(2462)	-8.378	-8.405	-5.381	7.84	Pass
IEEE 802.11g (MIMO)	1(2412)	-11.021	-11.268	-8.132	7.84	Pass
	6(2437)	-11.245	-10.541	-7.868	7.84	Pass
	11(2462)	-10.958	-10.152	-7.526	7.84	Pass
IEEE 802.11n-HT20 (MIMO)	1(2412)	-10.998	-12.301	-8.591	7.84	Pass
	6(2437)	-11.501	-10.623	-8.030	7.84	Pass
	11(2462)	-10.894	-11.605	-8.225	7.84	Pass
IEEE 802.11n-HT40 (MIMO)	3(2422)	-16.198	-15.427	-12.785	7.84	Pass
	6(2437)	-15.656	-15.298	-12.463	7.84	Pass
	9(2452)	-16.045	-15.428	-12.715	7.84	Pass

Remark:

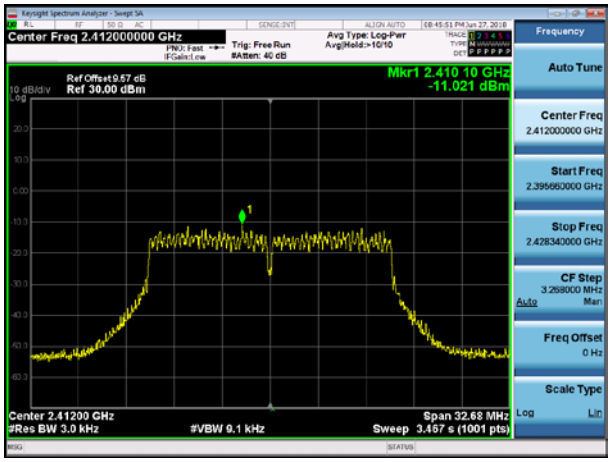
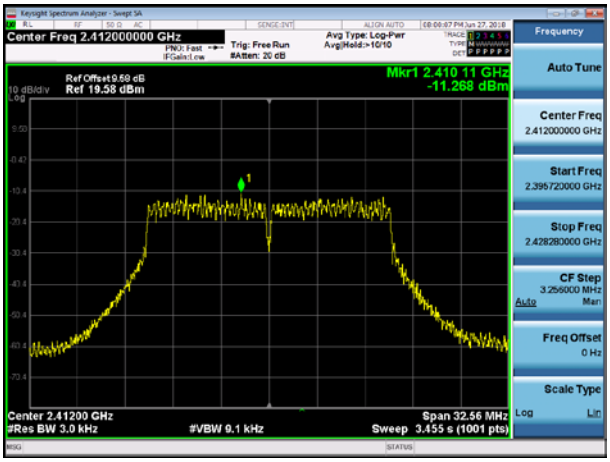
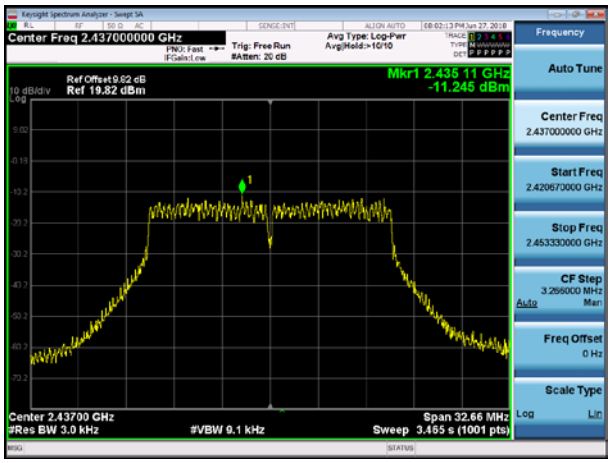
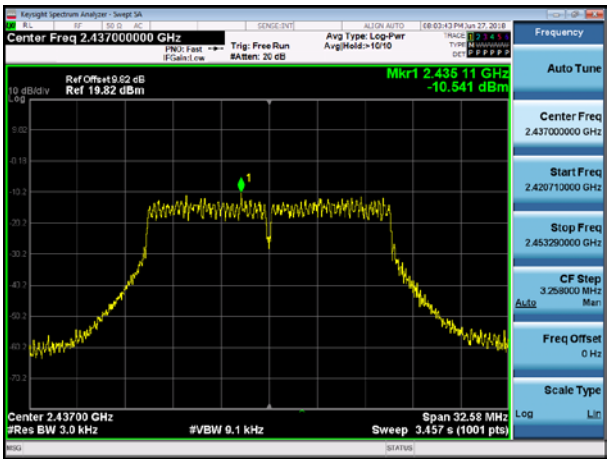
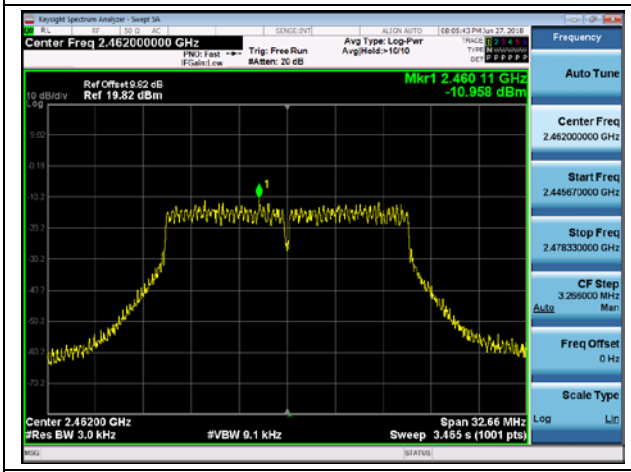
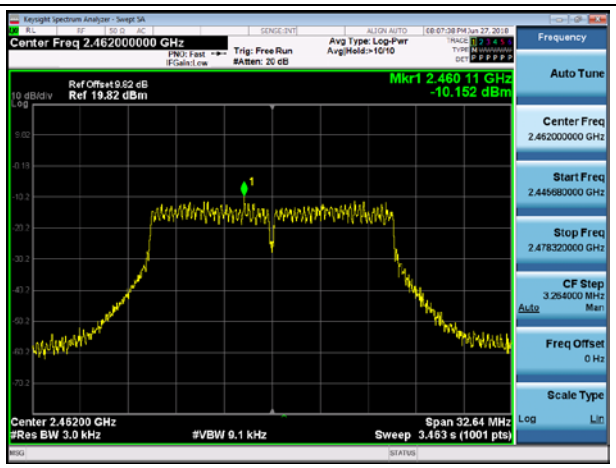
3. Total (Chain 0+1) = $10*\log[(10^{\text{Chain 0/10}})+(10^{\text{Chain 1/10}})]$

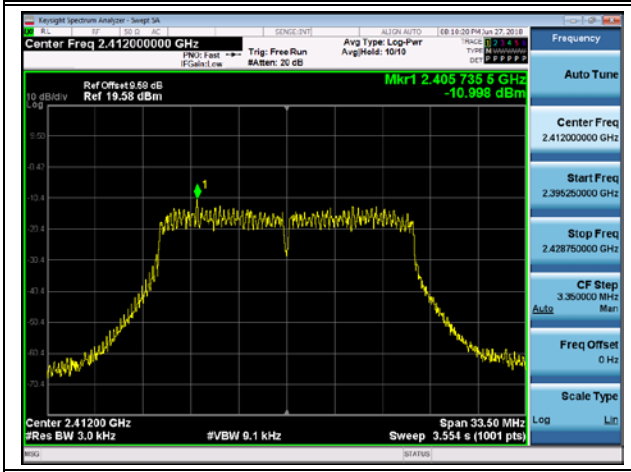
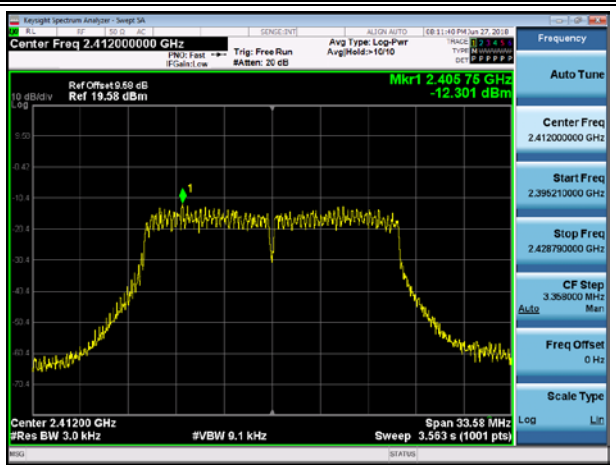
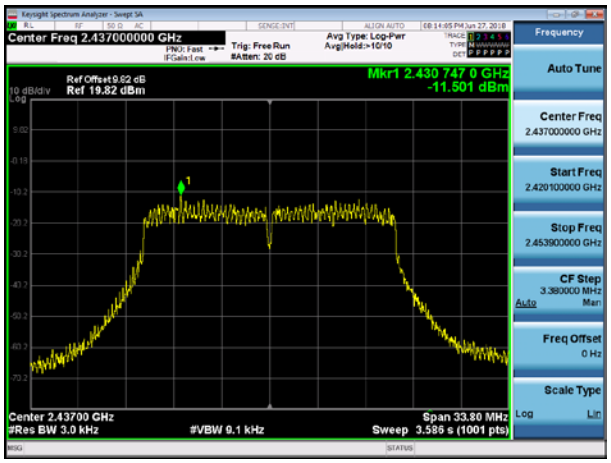
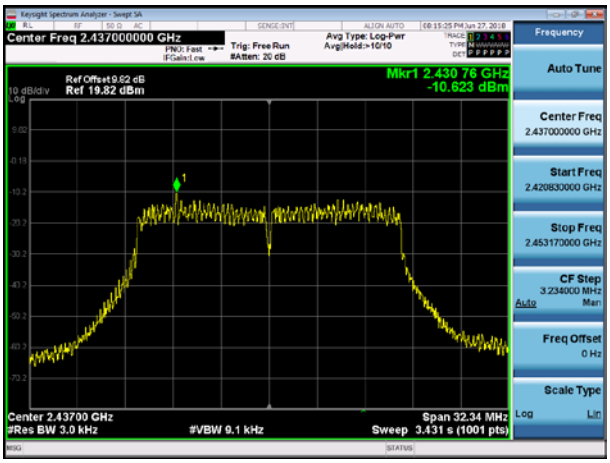
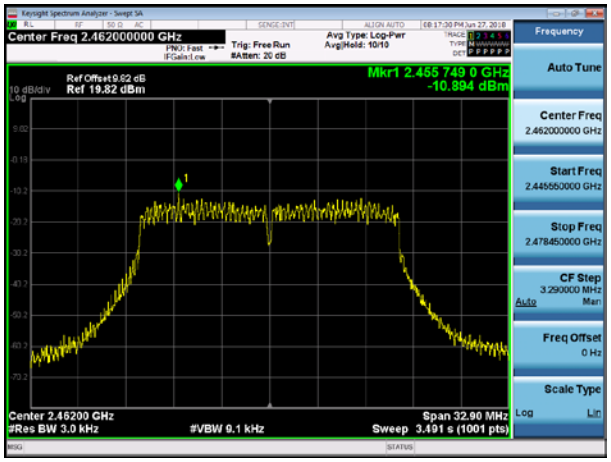
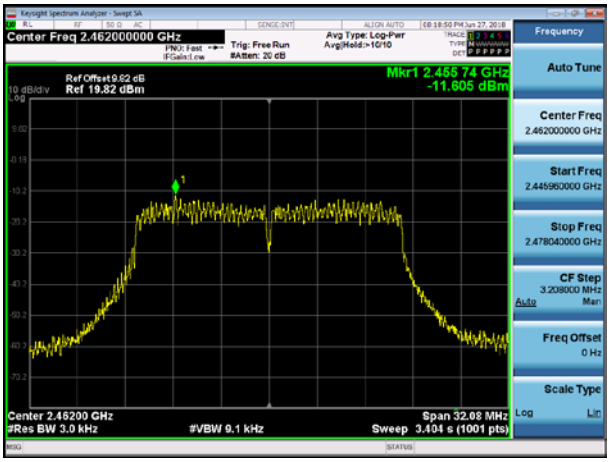
4. Directional gain and the maximum peak conducted power limit see table below:

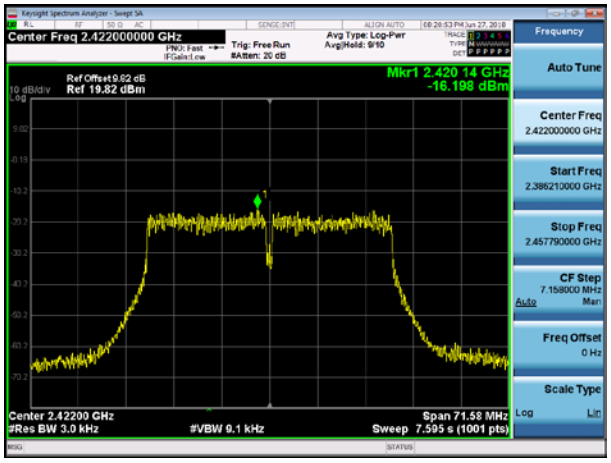
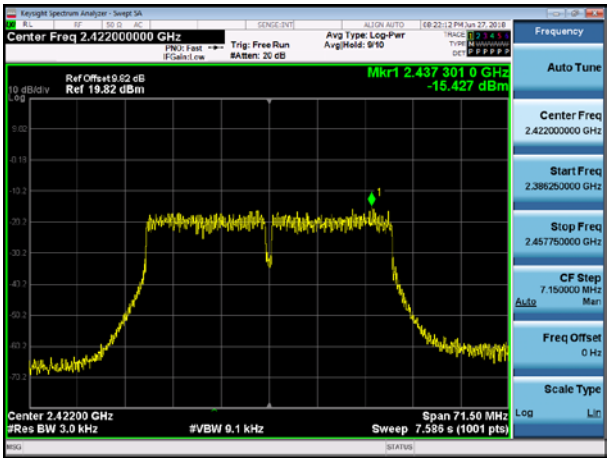
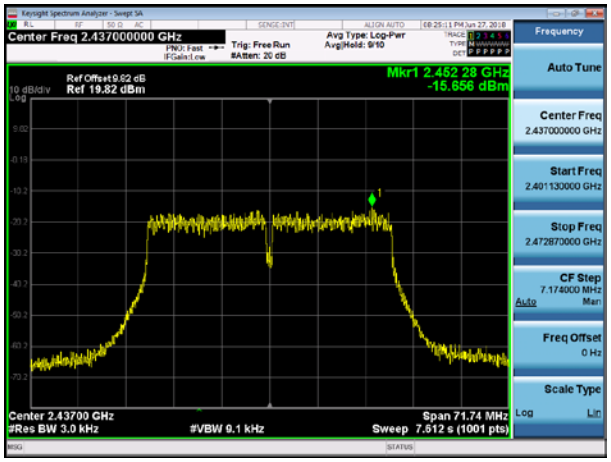
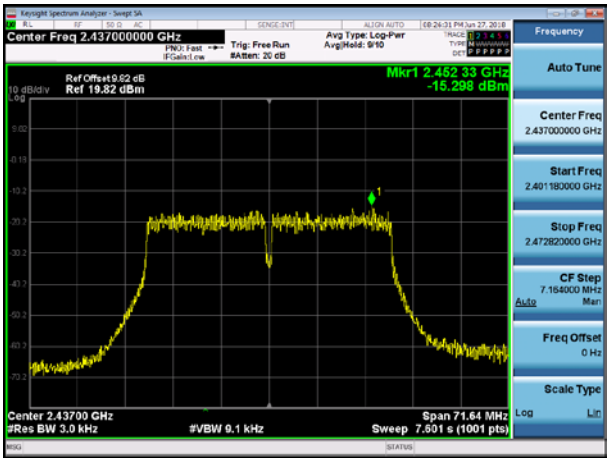
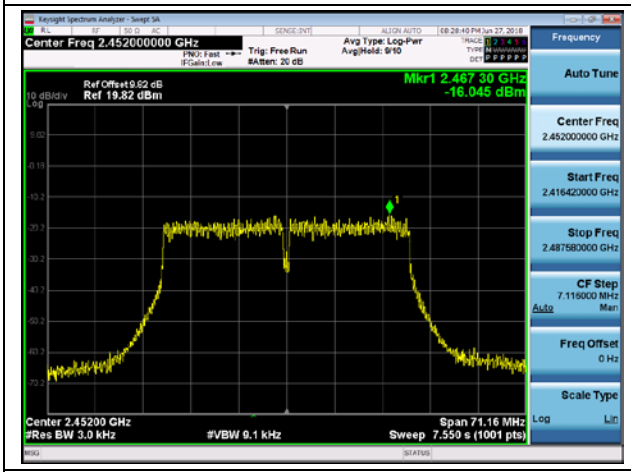
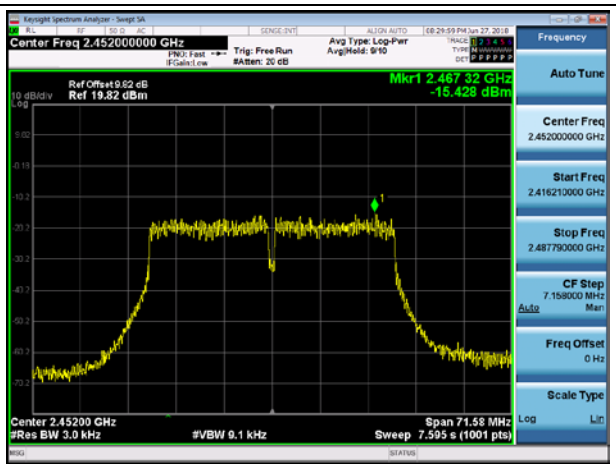
Frequency Band (MHz)	Chain 0 Antenna Gain (dBi)	Chain 1 Antenna Gain (dBi)	Correlated Chains Directional gain (dBi)	Peak Power Limit (dBm)
2400~2483.5	3.15	3.15	6.16	7.84
Basic methodology with N_{ANT} transmit antennas, each with the same directional gain G_{ANT} dBi, being driven by N_{ANT} transmitter outputs of equal power. Directional gain is to be computed as follows: If any transmit signals are correlated with each other, Directional gain = G ANT + 10 log(N_{ANT}) dBi				

Test plot as follows:

Test mode:	802.11b
STBC_Chain A	STBC_Chain B
Lowest channel	
Middle channel	
Highest channel	
Test mode:	802.11g

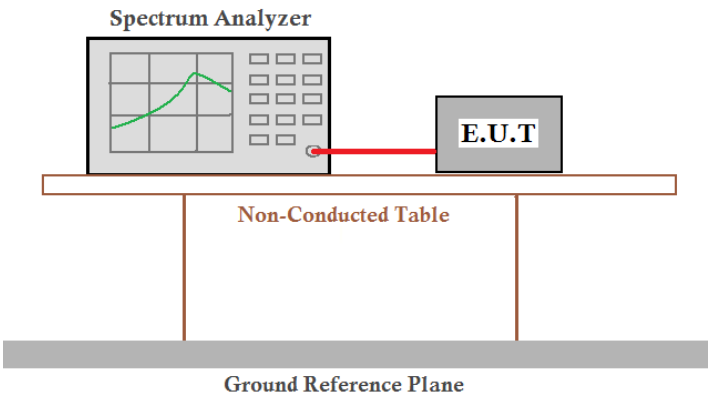
MIMO_Chain A	MIMO_Chain B
	
Lowest channel	
	
Middle channel	
	
Highest channel	

Test mode:	802.11n(HT20)
MIMO_Chain A	MIMO_Chain B
	
Lowest channel	
	
Middle channel	
	
Highest channel	

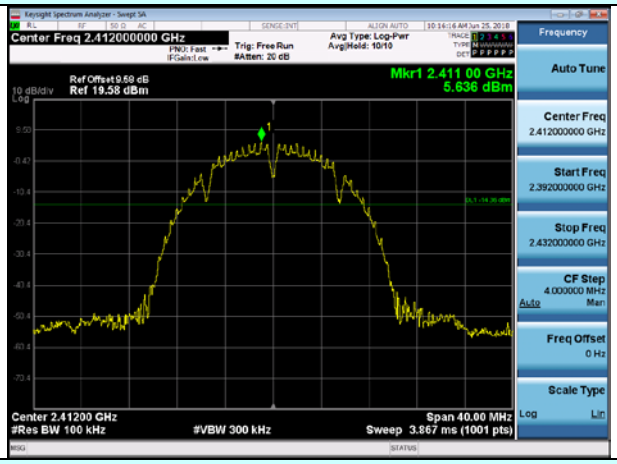
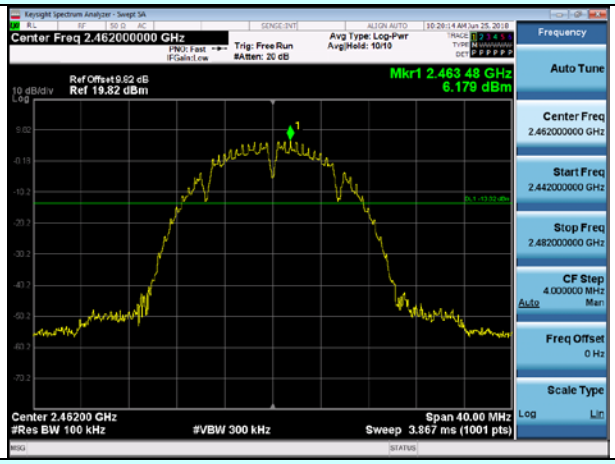
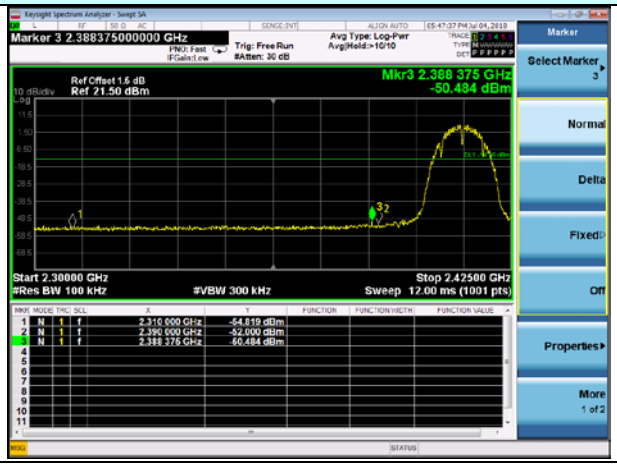
Test mode:	802.11n(HT40)
MIMO_Chain A	MIMO_Chain B
	
Lowest channel	
	
Middle channel	
	
Highest channel	

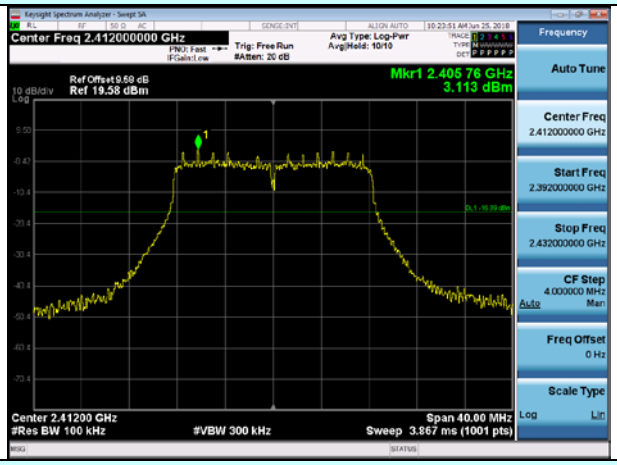
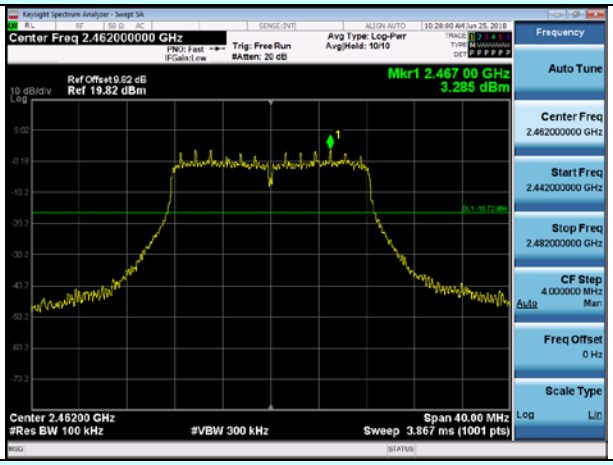
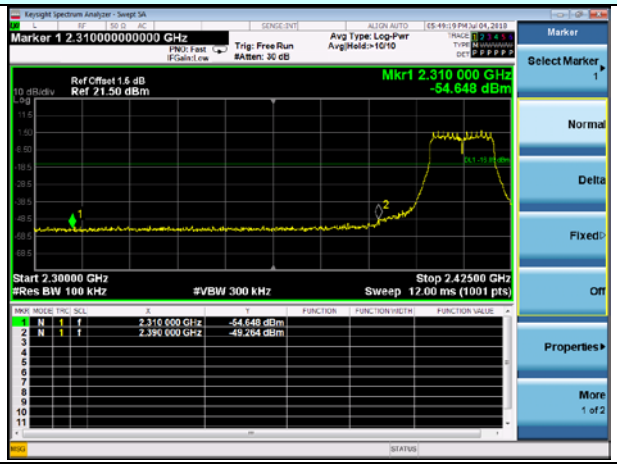
7.6 Band edges

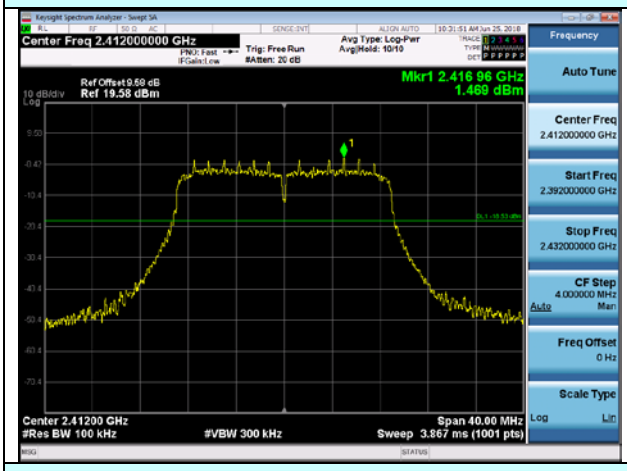
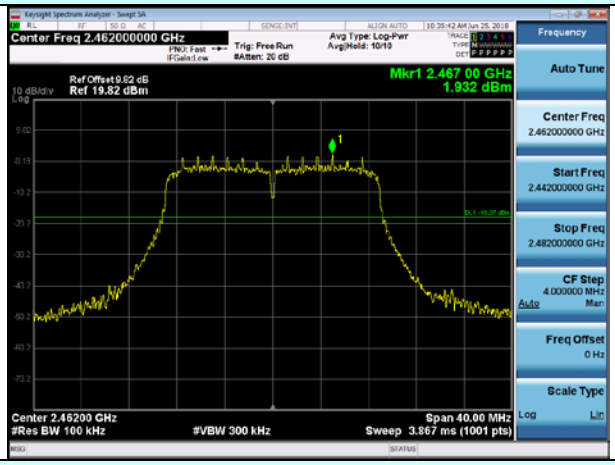
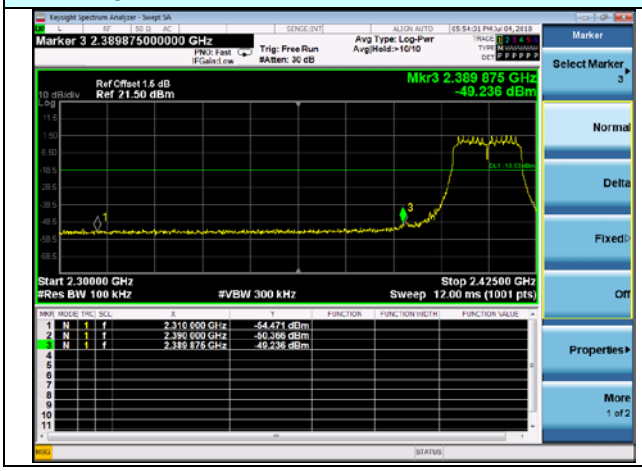
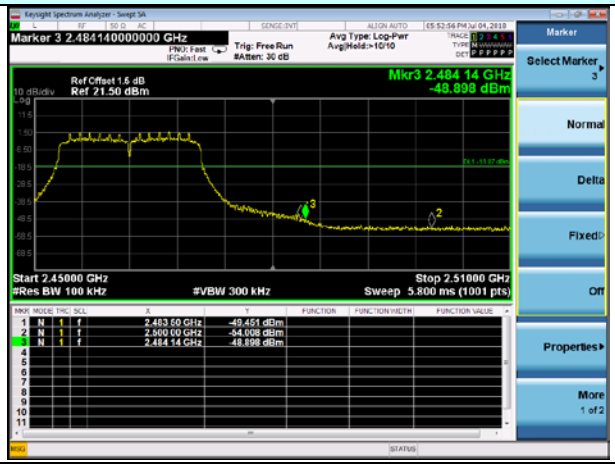
7.6.1 Conducted Emission Method

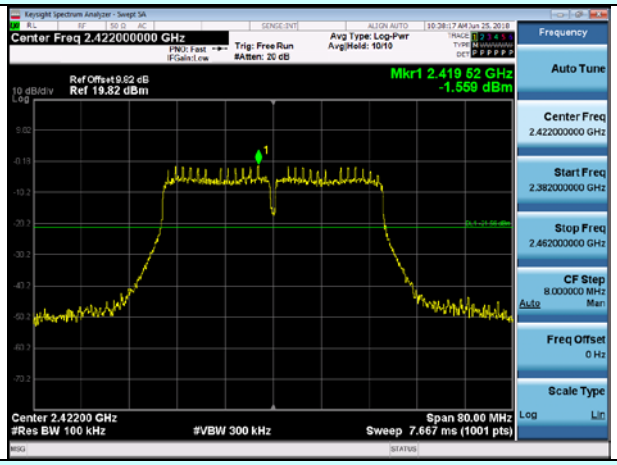
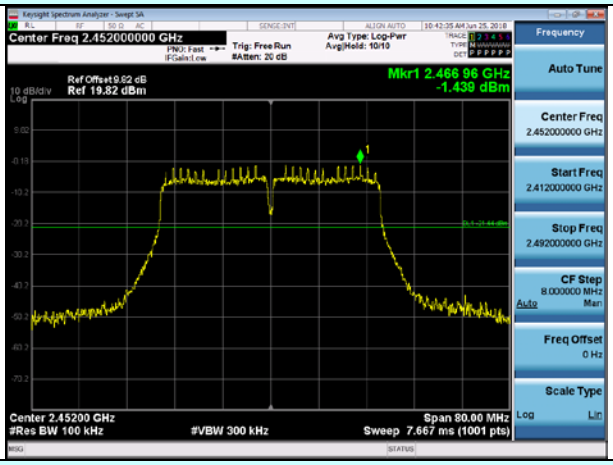
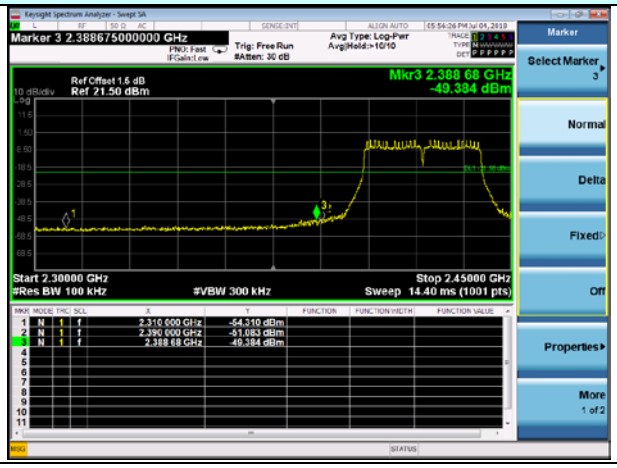
Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	KDB558074 D01 DTS Meas Guidance V04 KDB662911 D01 Multiple Transmitter Output v02r01
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details
Test results:	Pass

Test plot as follows:

Test mode:	802.11b(STBC_Chain1)
Reference Level- Lowest channel	Reference Level- Highest channel
	
Bandedge Emission- Lowest channel	Bandedge Emission- Highest channel
	

Test mode:	802.11g(MIMO_Chain1)
Reference Level- Lowest channel	Reference Level- Highest channel
	
Bandedge Emission- Lowest channel	Bandedge Emission- Highest channel
	

Test mode:	802.11n-HT20(MIMO_Chain1)
Reference Level- Lowest channel	Reference Level- Highest channel
	
Bandedge Emission- Lowest channel	Bandedge Emission- Highest channel
	

Test mode:	802.11n-HT40(MIMO_Chain1)
Reference Level- Lowest channel	Reference Level- Highest channel
	
Bandedge Emission- Lowest channel	Bandedge Emission- Highest channel
	

7.6.2 Radiated Emission Method

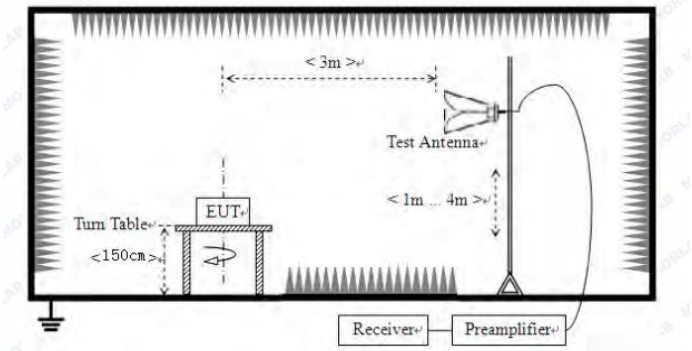
Test Requirement:	FCC Part15 C Section 15.209 and 15.205
Test Method:	ANSI C63.10:2013
Test Frequency Range:	All of the restrict bands were tested, only the worst band's (2310MHz to 2500MHz) data was showed.
Test site:	Measurement Distance: 3m
Receiver setup:	

Frequency	Detector	RBW	VBW	Value
Above 1GHz	Peak	1MHz	3MHz	Peak
	Average	1MHz	3MHz	Average

Limit:

Frequency	Limit (dBuV/m @3m)	Value
Above 1GHz	54.00	Average
	74.00	Peak

Test setup:



Test Procedure:

1. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
7. The radiation measurements are performed in X, Y, Z axis positioning. And found the Y axis positioning which it is worse case, only the test worst case mode is recorded in the report.

Test Instruments:	Refer to section 6.0 for details

Test mode:	Refer to section 5.2 for details
Test results:	Pass

Measurement data:

Remark: The pre-test were performed on lowest, middle and highest frequencies, only the worst case's (lowest and highest frequencies) data was showed.

Test mode:	802.11b_STBC_Chain A+B	Test channel:	Lowest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2310.00	49.39	26.91	3.56	35.87	43.99	74.00	-30.01	Horizontal
2390.00	49.07	27.11	3.64	36.08	43.74	74.00	-30.26	Horizontal
2310.00	49.28	26.91	3.56	35.87	43.88	74.00	-30.12	Vertical
2390.00	51.49	27.11	3.64	36.08	46.16	74.00	-27.84	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2310.00	37.00	26.91	3.56	35.87	31.60	54.00	-22.40	Horizontal
2390.00	37.16	27.11	3.64	36.08	31.83	54.00	-22.17	Horizontal
2310.00	38.71	26.91	3.56	35.87	31.60	54.00	-20.69	Vertical
2390.00	40.04	27.11	3.64	36.08	34.71	54.00	-19.29	Vertical

Test mode:	802.11b_STBC_Chain A+B	Test channel:	Highest

Peak value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	50.84	27.36	3.68	36.33	45.55	74.00	-28.45	Horizontal
2500.00	50.65	27.40	3.68	36.37	45.36	74.00	-28.64	Horizontal
2483.50	51.28	27.36	3.68	36.33	45.99	74.00	-28.01	Vertical
2500.00	50.93	27.40	3.68	36.37	45.64	74.00	-28.36	Vertical

Average value:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2483.50	37.24	27.36	3.68	36.33	31.95	54.00	-22.05	Horizontal
2500.00	36.98	27.40	3.68	36.37	31.69	54.00	-22.31	Horizontal
2483.50	40.32	27.36	3.68	36.33	35.03	54.00	-18.97	Vertical
2500.00	38.88	27.40	3.68	36.37	33.59	54.00	-20.41	Vertical

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*