RF TEST REPORT

Report No.:	SET2019-12045
Product Name:	Overhead projector
FCC ID:	X3XL-12W
IC:	8804A- L12W
Model No. :	L-12W
Applicant:	ELMO Company, Limited
Address:	1-3-4, Shioya-cho, Minami-ku, Nagoya-city Aichi, 457-0078,Japan.
Dates of Testing:	08/26/2019 — 09/11/2019
Issued by:	CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd.
Lab Location:	Building 28/29, East of Shigu, Xili Industrial Zone, Xili Road, Nanshan District, Shenzhen, Guangdong, China.
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Test Report

Product Name.....:	Overhead projector
Brand Name.....:	ELMO
Trade Name.....:	ELMO
Applicant.....:	ELMO Company, Limited
Applicant Address.....:	1-3-4, Shioya-cho, Minami-ku, Nagoya-city Aichi, 457-0078, Japan.
Manufacturer .....:	ELMO Company, Limited
Manufacturer Address .....:	1-3-4, Shioya-cho, Minami-ku, Nagoya-city Aichi, 457-0078, Japan..
Test Standards.....:	47 CFR Part 15 Subpart C IC RSS-Gen(Issue 5, April 2018) IC RSS-247(Issue 2, Feb. 2017)
Test Result .....:	PASS
Tested by .....:	Shallwe Yang 2019.09.26 Shallwe Yang, Test Engineer
Reviewed by .....:	Chris You 2019.09.26 Chris You, Senior Engineer
Approved by .....:	Shuangwen Zhang 2019.09.26 Shuangwen Zhang, Manager

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Change History		
Issue	Date	Reason for change
1.0	2019.09.26	First edition

1. General Information

1.1. EUT Description

EUT Type	Overhead projector
Hardware Version	RA
Software Version	0.6.4
EUT supports Radios application	WLAN2.4GHz 802.11b/g/n (HT20/HT40)
Frequency Range	802.11b/g/n-20MHz: 2.412GHz - 2.462GHz 802.11n-40MHz: 2.422GHz - 2.452GHz
Channel Number	802.11b/g/n-20MHz: 11 802.11n-40MHz: 7
Bit Rate of Transmitter	802.11b: 11/5.5/2/1 Mbps 802.11g: 54/48/36/24/18/12/9/6 Mbps 802.11n : up to 135 Mbps
Modulation Type	DSSS (802.11b), OFDM (802.11g/n)
MIMO	Not support
Antenna Type	Internal
Antenna Gain	5.22dBi

Note 1: The EUT is a Overhead projector, it contain WIFI operating at 2.4GHz ISM band; it supports 802.11b, 802.11g, 802.11n and they are all tested in this report.

Note 2: The frequencies allocated is F (MHz) =2412+5*(n-1) (1<=n<=11). The lowest, middle, highest channel numbers of the EUT used and tested in this report are separately 1ch (2412MHz), 6ch(2437MHz), 11ch(2462MHz) for 802.11b/g/n-20MHz., and 3ch(2422MHz), 6ch(2437MHz), 9ch(2452MHz) for 802.11n-40MHz.

Note 3: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

Note 4: The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.

1.2. Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart C (WiFi, 2.4GHz ISM band radiators) for the EUT FCC Certification:

No.	Identity	Document Title
1	47 CFR Part 15 Subpart C 2017	Radio Frequency Devices
2	ANSI C63.10 2013	American National Standard for Testing Unlicensed Wireless Devices
3	RSS-Gen (Issue 5, April 2018)	General Requirements for Compliance of Radio Apparatus
4	RSS-247 (Issue 2, Feb. 2017)	Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

Test detailed items/section required by FCC rules and results are as below:

No.	Section in CFR 47	IC Rules	Description	Result
1	15.203	RSS-247, 5.4	Antenna Requirement	PASS
2	15.247(b)	RSS-247, 5.4	Peak Output Power	PASS
3	15.247(a)	RSS-GEN, 6.7 RSS-247, 5.2	6dB and 99% Occupy Bandwidth	PASS
4	15.247(d)	RSS-247, 5.5	Conducted Band Edges and Spurious Emission	PASS
5	15.247(e)	RSS-247, 5.2	Power spectral density (PSD)	PASS
6	15.207	RSS-GEN, 8.8	Conducted Emission	PASS
7	15.209 15.205 15.247(d)	RSS-247, 5.5	Radiated Band Edges and Spurious Emission	PASS

The tests of Conducted Emission and Radiated Emission were performed according to the method of measurements prescribed in ANSI C63.10-2013.

These RF tests were performed according to the method of measurements prescribed in KDB558074 D01 v05r02.

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. Investigation has been done on all the possible configurations for searching the worst cases. The following table is a list of the test modes shown in this test report.

There are two bandwidth systems:

For 20MHz bandwidth systems, use Channel 1~ Channel 11

For 40MHz bandwidth systems, use Channel 3~ Channel 9

Channel No.	Frequency	Channel No.	Frequency	Channel No.	Frequency
1	2412MHz	5	2432MHz	9	2452MHz
2	2417MHz	6	2437MHz	10	2457MHz
3	2422MHz	7	2442MHz	11	2462MHz
4	2427MHz	8	2447MHz		

Test Items	Mode	Data Rate	Channel
Peak Conducted Output Power Power Spectral Density 6dB Bandwidth Conducted and Spurious Emission Radiated and Spurious Emission	11b/DSSS	1 Mbps	1/6/11
	11g/OFDM	6 Mbps	1/6/11
	11n(20MHz)/OFDM	MCS 0	1/6/11
	11n(40MHz)/OFDM	MCS 0	3/6/9
Band Edge	11b/DSSS	1 Mbps	1/11
	11g/OFDM	6 Mbps	1/11
	11n(20MHz)/OFDM	MCS 0	1/11
	11n(40MHz)/OFDM	MCS 0	3/9

1.3. Table for Supporting Units

No.	Equipment	Brand Name	Model Name	Manufacturer	Serial No.	Note
1	Notebook	DELL	PP11L	DELL	H5914A03	FCC DOC

1.4. Facilities and Accreditations

1.4.1. Facilities

FCC-Registration No.: CN5031

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. 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 our files. Designation Number: CN5031, valid time is until December 31, 2019.

ISED Registration: 11185A-1

CAB identifier: CN0064

CCIC Southern Electronic Product Testing (Shenzhen) Co., Ltd. EMC Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No. 11185A-1 on Aug. 04, 2016, valid time is until Dec. 31, 2019.

NVLAP Lab Code: 201008-0

CCIC-SET is a third party testing organization accredited by NVLAP according to ISO/IEC 17025. The accreditation certificate number is 201008-0.

1.4.2. Test Environment Conditions

During the measurement, the environmental conditions were within the listed ranges:

Temperature (°C):	15°C - 35°C
Relative Humidity (%):	30% -60%
Atmospheric Pressure (kPa):	86KPa-106KPa

2. 47 CFR Part 15C Requirements

2.1. Antenna requirement

2.1.1. Applicable Standard

According to FCC 15.203, 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 shall be considered sufficient to comply with the provisions of this section.

And according to FCC 47 CFR Section 15.247(c), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

2.1.2. Antenna Information

Antenna Category: Internal Antenna

A internal Antenna was soldered to the antenna port of EUT via an adaptor cable, can't be removed.

Antenna General Information:

No.	EUT	Ant. Type	Gain(dBi)
1	Overhead projector	Internal	5.22

2.1.3. Result: comply

The EUT has a permanently and irreplaceable attached antenna. Please refer to the EUT internal photos.

2.2. Maximum Conducted Output Power

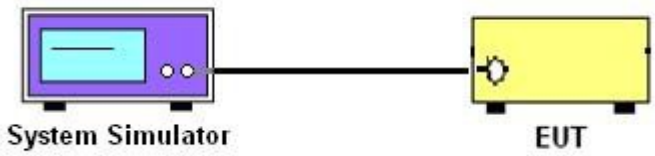
2.2.1. Limit of Peak Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna of directional gain greater than 6dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

2.2.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.2.3. Test Setup



2.2.4. Test Procedures

1. The testing follows the Measurement Procedure of ANSI C63.10:2013.

2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.

3. Set to the maximum power setting and enable the EUT transmit continuously.

4. Measure the conducted output power and record the results in the test report.

2.2.5. Test Result

Please refer to Appendix A for detail

2.3. 6dB and 99% Occupy Bandwidth

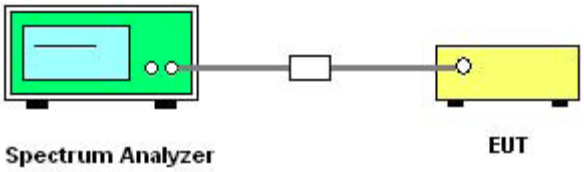
2.3.1. Limit of 6dB Bandwidth

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

2.3.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.3.3. Test Setup



2.3.4. Test Procedures

1. The testing follows FCC KDB558074 D01 v05r02.

2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.

3. Set to the maximum power setting and enable the EUT transmit continuously.

4. For 6dB bandwidth, make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz.Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6dB bandwidth must be greater than 500 kHz.

5. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 30 kHz and set the Video bandwidth (VBW) = 100 kHz.

6. Measure and record the results in the test report.

2.3.5. Test Results of 6dB Bandwidth

Please refer to Appendix A for detail

2.4. Conducted Band Edges and Spurious Emissions

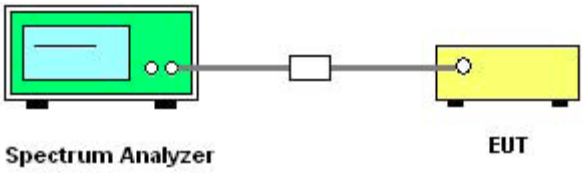
2.4.1. Limit of Conducted Band Edges and Spurious Emissions

All harmonics/spurious must be at least 20 dB down from the highest emission level within the authorized band.

2.4.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.4.3. Test Setup



2.4.4. Test Procedure

1. The testing follows FCC KDB558074 D01 v05r02.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

2.4.5. Test Results of Conducted Band Edges

Please refer to Appendix A for detail

2.5. Power spectral density (PSD)

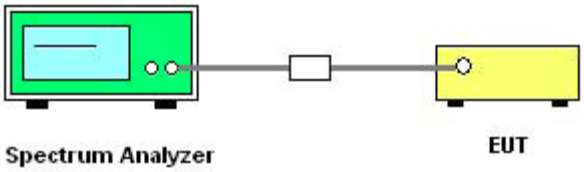
2.5.1. Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

2.5.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.5.3. Test Setup



2.5.4. Test Procedures

1. The testing follows Measurement Procedure 10.2 Method PKPSD of FCC KDB558074 D01 v05r02.

2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.

3. Set to the maximum power setting and enable the EUT transmit continuously.

4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)

5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.

6. Measure and record the results in the test report.

7. The Measured power density (dBm)/ 100kHz is a reference level and used as 20dBc down limit line for Conducted Band Edges and Conducted Spurious Emission.

2.5.5. Test Results of Power spectral density

Please refer to Appendix A for detail

2.6. Radiated Band Edge and Spurious Emission

2.6.1. Limit of Radiated Band Edges and Spurious Emission

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

Note: Wireless charger configuration was evaluated.

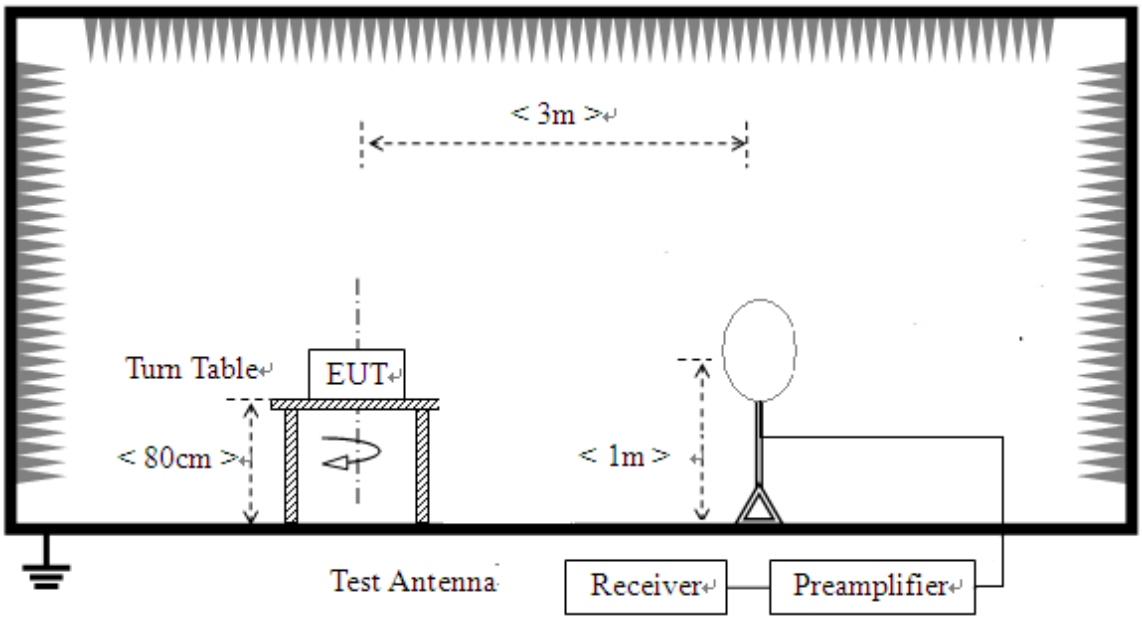
Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

2.6.2. Measuring Instruments

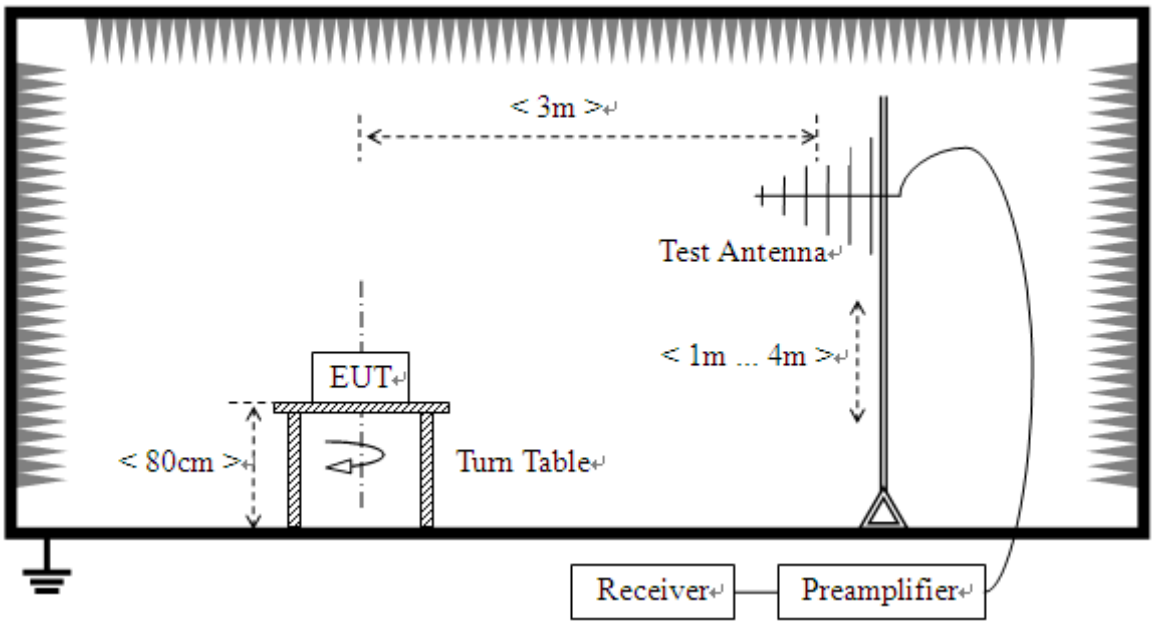
The measuring equipment is listed in the section 3 of this test report.

2.6.3. Test Setup

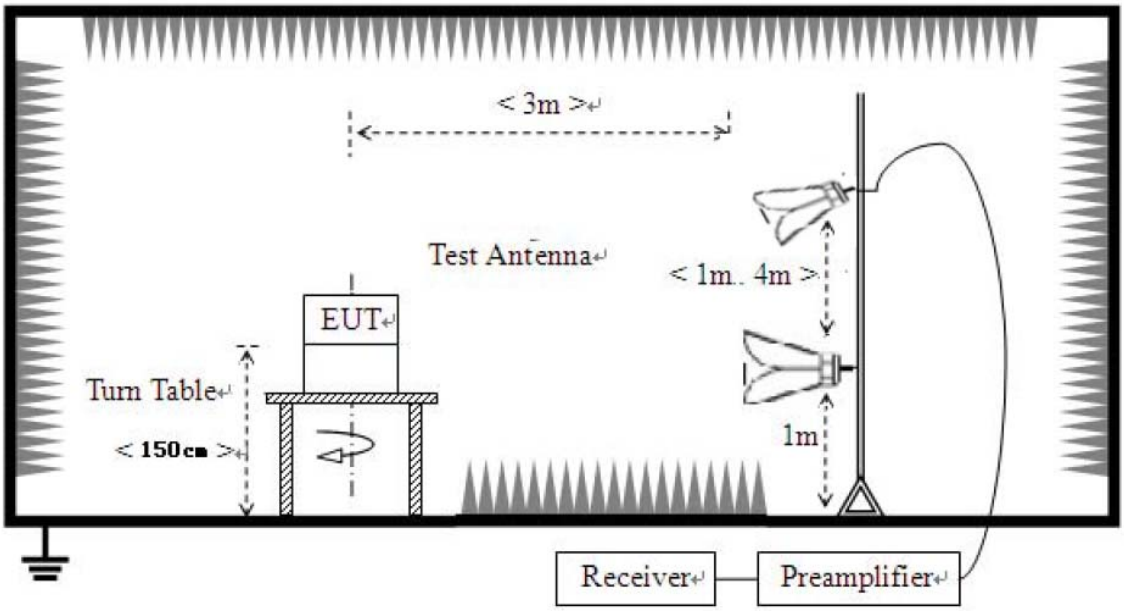
For radiated emissions from 9 KHz to 30 MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



2.6.4. Test Procedures

1. The EUT was placed on the top of a rotating table 0.8m for below 1GHz/1.5m for above 1GHz above the ground at a 3 meters semi-anechoic chamber. 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. Height of receiving antenna 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 rotatable 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 lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported.
   Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
7. For the radiated emission test above 1GHz:
   Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

NOTE:

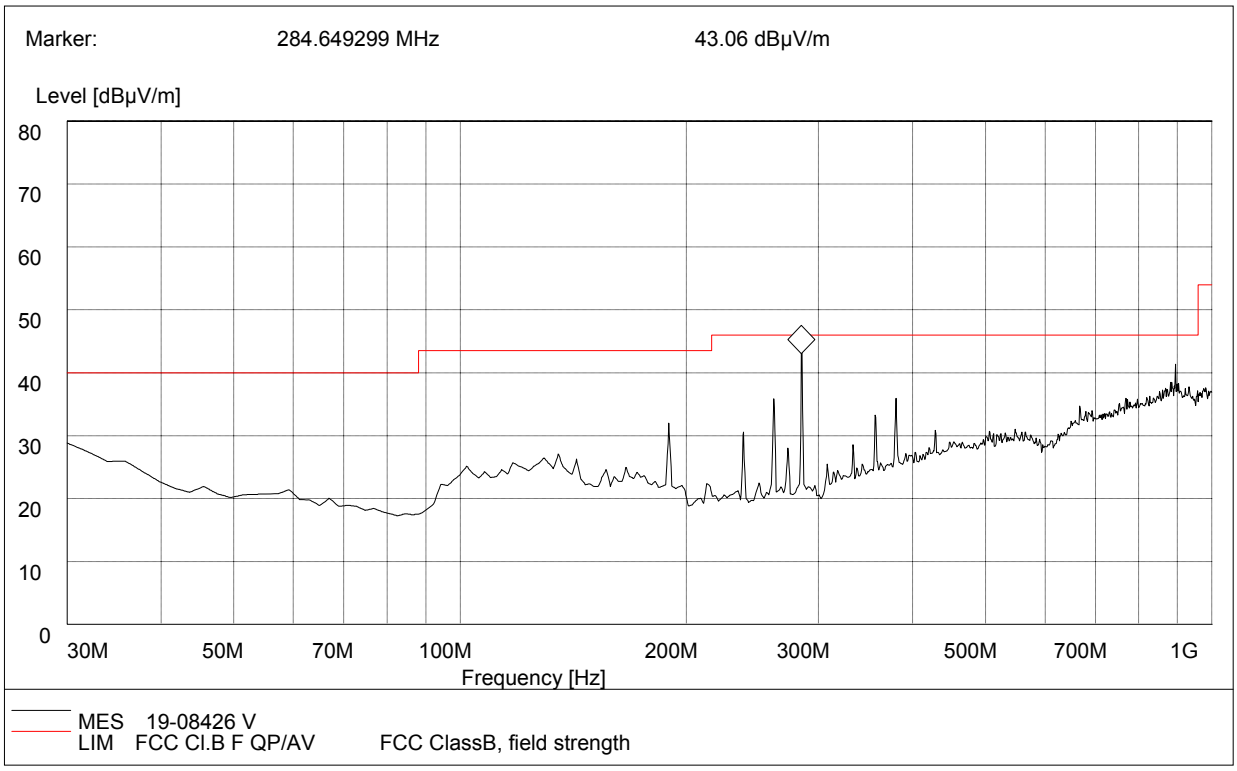
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is≥ 1/T (Duty cycle < 98%) or 10Hz(Duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.
4. All radiated emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

2.6.5. Test Results of Radiated Band Edge and Spurious Emission

For 9 kHz to 30MHz

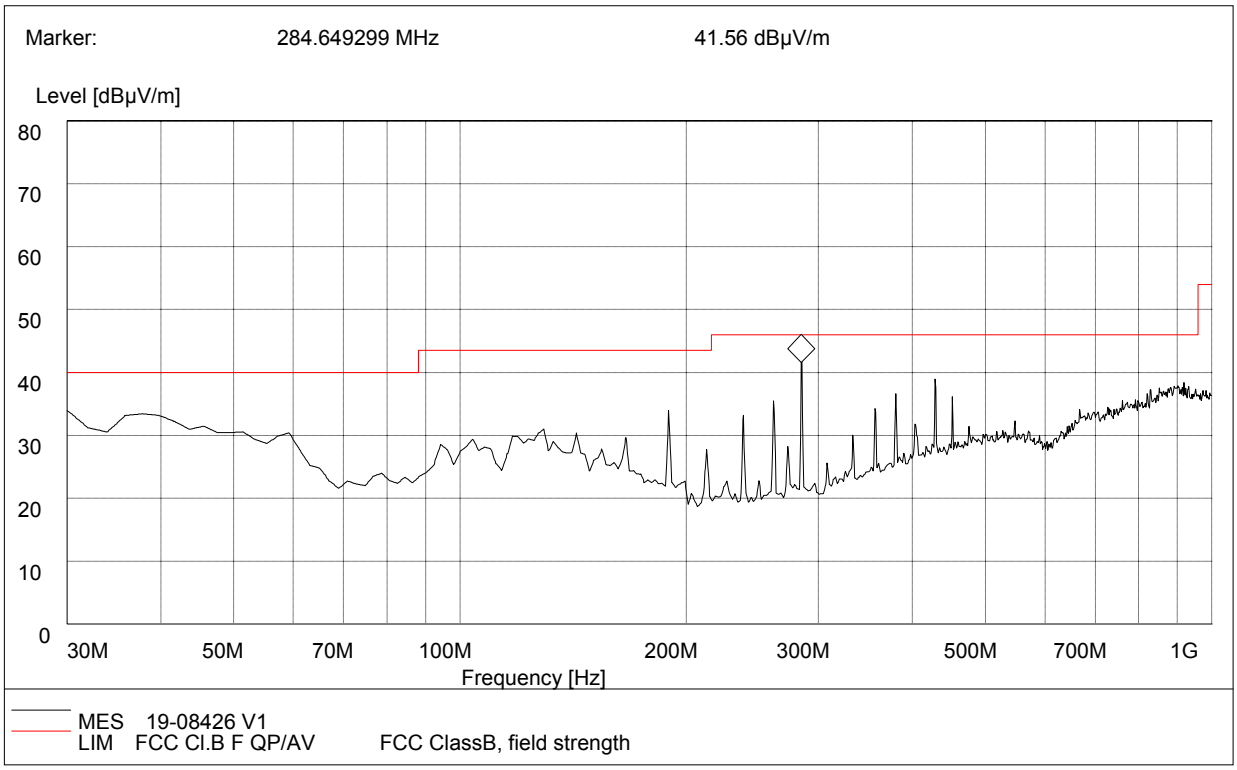
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

For 30MHz to 1000 MHz



30MHz to 1GHz, Antenna Vertical

Frequency (MHz)	QuasiPeak (dB µ V/m)	Bandwidth (kHz)	Cor. Factor	Antenna height (cm)	Limit (dB µ V/m)	Antenna	Verdict
284.65	43.06	120.000	28.87	150.0	46.0	Vertical	Pass



30MHz to 1GHz, Antenna Horizontal

Frequency (MHz)	QuasiPeak (dB µ V/m)	Bandwidth (kHz)	Cor. Factor	Antenna height (cm)	Limit (dB µ V/m)	Antenna	Verdict
284.65	41.56	120.000	28.87	150.0	46.0	Horizontal	Pass

For 1GHz to 25 GHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（802.11b_2412MHz）												
No.	Fre. (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	2390.00	54.25	PK	74.00	-19.75	1.60	110.00	52.95	5.20	28.60	32.50	1.30
2	2390.00	42.93	AV	54.00	-11.07	1.60	110.00	41.63	5.20	28.60	32.50	1.30
3	4824.00	51.62	PK	74.00	-22.38	1.60	110.00	45.22	7.40	30.40	31.40	6.40
4	4824.00	41.48	AV	54.00	-12.52	1.60	110.00	35.08	7.40	30.40	31.40	6.40
5	7236.00	52.36	PK	74.00	-21.64	1.60	110.00	41.86	11.50	31.20	32.20	10.50
6	7236.00	41.82	AV	54.00	-12.18	1.60	110.00	31.32	11.50	31.20	32.20	10.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（802.11b_2412MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	2390.00	49.65	PK	74.00	-24.35	1.50	180.00	48.35	5.20	28.60	32.50	1.30
2	2390.00	39.42	AV	54.00	-14.58	1.50	180.00	38.12	5.20	28.60	32.50	1.30
3	4824.00	52.14	PK	74.00	-21.86	1.50	180.00	45.74	7.40	30.40	31.40	6.40
4	4824.00	41.94	AV	54.00	-12.06	1.50	180.00	35.54	7.40	30.40	31.40	6.40
5	7236.00	52.22	PK	74.00	-21.78	1.50	180.00	41.72	11.50	31.20	32.20	10.50
6	7236.00	42.10	AV	54.00	-11.90	1.50	180.00	31.60	11.50	31.20	32.20	10.50

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（802.11b_2437MHz）												
No.	Fre. (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	4874.00	48.95	PK	74.00	-25.05	1.50	180.00	42.55	6.70	30.40	31.30	6.40
2	4874.00	38.90	AV	54.00	-15.10	1.50	180.00	32.50	6.70	30.40	31.30	6.40
3	7311.00	50.64	PK	74.00	-23.36	1.50	180.00	39.84	11.80	31.20	32.20	10.80
4	7311.00	40.94	AV	54.00	-13.06	1.50	180.00	30.14	11.80	31.20	32.20	10.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（802.11b_2437MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	4874.00	50.62	PK	74.00	-23.38	1.50	200.00	44.22	6.70	30.40	31.30	6.40
2	4874.00	40.41	AV	54.00	-13.59	1.50	200.00	34.01	6.70	30.40	31.30	6.40
3	7311.00	52.34	PK	74.00	-21.66	1.50	200.00	41.54	11.80	31.20	32.20	10.80
4	7311.00	42.54	AV	54.00	-11.46	1.50	200.00	31.74	11.80	31.20	32.20	10.80

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（802.11b_2462MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	2483.50	51.47	PK	74.00	-22.53	1.50	120.00	49.87	5.30	28.70	32.40	1.60
2	2483.50	41.35	AV	54.00	-12.65	1.50	120.00	39.75	5.30	28.70	32.40	1.60
3	4924.00	52.22	PK	74.00	-21.78	1.50	120.00	46.52	6.70	30.50	31.50	5.70
4	4924.00	42.40	AV	54.00	-11.60	1.50	120.00	36.70	6.70	30.50	31.50	5.70
5	7386.00	54.68	PK	74.00	-19.32	1.50	120.00	43.88	11.80	31.20	32.20	10.80
6	7386.00	44.73	AV	54.00	-9.27	1.50	120.00	33.93	11.80	31.20	32.20	10.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（802.11b_2462MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	2483.50	52.98	PK	74.00	-21.02	1.50	180.00	51.38	5.30	28.70	32.40	1.60
2	2483.50	42.66	AV	54.00	-11.34	1.50	180.00	41.06	5.30	28.70	32.40	1.60
3	4924.00	53.62	PK	74.00	-20.38	1.50	180.00	47.92	6.70	30.50	31.50	5.70
4	4924.00	43.48	AV	54.00	-10.52	1.50	180.00	37.78	6.70	30.50	31.50	5.70
5	7386.00	53.70	PK	74.00	-20.30	1.50	180.00	42.90	11.80	31.20	32.20	10.80
6	7386.00	43.92	AV	54.00	-10.08	1.50	180.00	33.12	11.80	31.20	32.20	10.80

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（802.11g_2412MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	2390.00	52.62	PK	74.00	-21.38	1.50	110.00	51.32	5.20	28.60	32.50	1.30
2	2390.00	42.70	AV	54.00	-11.30	1.50	110.00	41.40	5.20	28.60	32.50	1.30
3	4824.00	51.95	PK	74.00	-22.05	1.50	110.00	45.55	7.40	30.40	31.40	6.40
4	4824.00	42.20	AV	54.00	-11.80	1.50	110.00	35.80	7.40	30.40	31.40	6.40
5	7236.00	51.47	PK	74.00	-22.53	1.50	110.00	40.97	11.50	31.20	32.20	10.50
6	7236.00	41.65	AV	54.00	-12.35	1.50	110.00	31.15	11.50	31.20	32.20	10.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（802.11g_2412MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	2390.00	53.62	PK	74.00	-20.38	1.50	180.00	52.32	5.20	28.60	32.50	1.30
2	2390.00	43.30	AV	54.00	-10.70	1.50	180.00	42.00	5.20	28.60	32.50	1.30
3	4824.00	52.48	PK	74.00	-21.52	1.50	180.00	46.08	7.40	30.40	31.40	6.40
4	4824.00	42.84	AV	54.00	-11.16	1.50	180.00	36.44	7.40	30.40	31.40	6.40
5	7236.00	52.19	PK	74.00	-21.81	1.50	180.00	41.99	11.50	31.20	32.20	10.20
6	7236.00	42.21	AV	54.00	-11.79	1.50	180.00	32.01	11.50	31.20	32.20	10.20

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（802.11g_2437MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	4874.00	50.62	PK	74.00	-23.38	1.50	190.00	44.82	6.70	30.40	31.30	5.80
2	4874.00	41.55	AV	54.00	-12.45	1.50	190.00	35.75	6.70	30.40	31.30	5.80
3	7311.00	51.17	PK	74.00	-22.83	1.50	190.00	40.37	11.80	31.20	32.20	10.80
4	7311.00	42.00	AV	54.00	-12.00	1.50	190.00	31.20	11.80	31.20	32.20	10.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（802.11g_2437MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	4874.00	52.64	PK	74.00	-21.36	1.50	190.00	46.84	6.70	30.40	31.30	5.80
2	4874.00	44.49	AV	54.00	-9.51	1.50	190.00	38.69	6.70	30.40	31.30	5.80
3	7311.00	53.22	PK	74.00	-20.78	1.50	190.00	42.42	11.80	31.20	32.20	10.80
4	7311.00	43.97	AV	54.00	-10.03	1.50	190.00	33.17	11.80	31.20	32.20	10.80

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（802.11g_2462MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	2483.50	53.02	PK	74.00	-20.98	1.50	200.00	51.42	5.30	28.70	32.40	1.60
2	2483.50	42.97	AV	54.00	-11.03	1.50	200.00	41.37	5.30	28.70	32.40	1.60
3	4924.00	54.32	PK	74.00	-19.68	1.50	200.00	48.62	6.70	30.50	31.50	5.70
4	4924.00	45.22	AV	54.00	-8.78	1.50	200.00	39.52	6.70	30.50	31.50	5.70
5	7386.00	50.98	PK	74.00	-23.02	1.50	200.00	40.18	11.80	31.20	32.20	10.80
6	7386.00	42.53	AV	54.00	-11.47	1.50	200.00	31.73	11.80	31.20	32.20	10.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（802.11g_2462MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	2483.50	51.65	PK	74.00	-22.35	1.50	290.00	50.05	5.30	28.70	32.40	1.60
2	2483.50	41.44	AV	54.00	-12.56	1.50	290.00	39.84	5.30	28.70	32.40	1.60
3	4924.00	52.02	PK	74.00	-21.98	1.50	290.00	46.32	6.70	30.50	31.50	5.70
4	4924.00	41.72	AV	54.00	-12.28	1.50	290.00	36.02	6.70	30.50	31.50	5.70
5	7386.00	52.28	PK	74.00	-21.72	1.50	290.00	41.48	11.80	31.20	32.20	10.80
6	7386.00	43.08	AV	54.00	-10.92	1.50	290.00	32.28	11.80	31.20	32.20	10.80

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（802.11n20_2412MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	2390.00	57.69	PK	74.00	-16.31	1.50	120.00	56.39	5.20	28.60	32.50	1.30
2	2390.00	45.58	AV	54.00	-8.42	1.50	120.00	44.28	5.20	28.60	32.50	1.30
3	4824.00	51.62	PK	74.00	-22.38	1.50	120.00	45.22	7.40	30.40	31.40	6.40
4	4824.00	41.63	AV	54.00	-12.37	1.50	120.00	35.23	7.40	30.40	31.40	6.40
5	7236.00	52.06	PK	74.00	-21.94	1.50	120.00	41.56	11.50	31.20	32.20	10.50
6	7236.00	42.05	AV	54.00	-11.95	1.50	120.00	31.55	11.50	31.20	32.20	10.50

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（802.11n20_2412MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	2390.00	56.90	PK	74.00	-17.10	1.60	190.00	55.60	5.20	28.60	32.50	1.30
2	2390.00	43.83	AV	54.00	-10.17	1.60	190.00	42.53	5.20	28.60	32.50	1.30
3	4824.00	50.24	PK	74.00	-23.76	1.60	190.00	43.84	7.40	30.40	31.40	6.40
4	4824.00	41.89	AV	54.00	-12.11	1.60	190.00	35.49	7.40	30.40	31.40	6.40
5	7236.00	52.04	PK	74.00	-21.96	1.60	190.00	41.54	11.50	31.20	32.20	10.50
6	7236.00	42.01	AV	54.00	-11.99	1.60	190.00	31.51	11.50	31.20	32.20	10.50

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（802.11n20_2437MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	4874.00	51.33	PK	74.00	-22.67	1.50	120.00	45.53	6.70	30.40	31.30	5.80
2	4874.00	41.08	AV	54.00	-12.92	1.50	120.00	35.28	6.70	30.40	31.30	5.80
3	7311.00	51.89	PK	74.00	-22.11	1.50	120.00	41.09	11.80	31.20	32.20	10.80
4	7311.00	41.57	AV	54.00	-12.43	1.50	120.00	30.77	11.80	31.20	32.20	10.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（802.11n20_2437MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	4874.00	51.09	PK	74.00	-22.91	1.60	280.00	44.69	6.70	31.20	31.50	6.40
2	4874.00	42.82	AV	54.00	-11.18	1.60	280.00	36.42	6.70	31.20	31.50	6.40
3	7311.00	52.10	PK	74.00	-21.90	1.60	280.00	41.30	11.80	31.20	32.20	10.80
4	7311.00	42.52	AV	54.00	-11.48	1.60	280.00	31.72	11.80	31.20	32.20	10.80

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（802.11n20_2462MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	2483.50	54.57	PK	74.00	-19.43	1.50	150.00	52.97	5.30	28.70	32.40	1.60
2	2483.50	41.22	AV	54.00	-12.78	1.50	150.00	39.62	5.30	28.70	32.40	1.60
3	4924.00	51.78	PK	74.00	-22.22	1.50	150.00	46.08	6.70	30.50	31.50	5.70
4	4924.00	40.43	AV	54.00	-13.57	1.50	150.00	34.73	6.70	30.50	31.50	5.70
5	7386.00	52.00	PK	74.00	-22.00	1.50	150.00	41.20	11.80	31.20	32.20	10.80
6	7386.00	43.75	AV	54.00	-10.25	1.50	150.00	32.95	11.80	31.20	32.20	10.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（802.11n20_2462MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	2483.50	53.37	PK	74.00	-20.63	1.60	190.00	51.77	5.30	28.70	32.40	1.60
2	2483.50	43.72	AV	54.00	-10.28	1.60	190.00	42.12	5.30	28.70	32.40	1.60
3	4924.00	51.99	PK	74.00	-22.01	1.60	190.00	46.29	6.70	30.50	31.50	5.70
4	4924.00	43.60	AV	54.00	-10.40	1.60	190.00	37.90	6.70	30.50	31.50	5.70
5	7386.00	52.03	PK	74.00	-21.97	1.60	190.00	41.23	11.80	31.20	32.20	10.80
6	7386.00	43.21	AV	54.00	-10.79	1.60	190.00	32.41	11.80	31.20	32.20	10.80

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（802.11n40_2422MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	2390.00	60.44	PK	74.00	-13.56	1.60	310.00	59.14	5.20	28.60	32.50	1.30
2	2390.00	51.46	AV	54.00	-2.54	1.60	310.00	50.16	5.20	28.60	32.50	1.30
3	4844.00	53.21	PK	74.00	-20.79	1.60	310.00	46.81	7.40	30.40	31.40	6.40
4	4844.00	45.07	AV	54.00	-8.93	1.60	310.00	38.67	7.40	30.40	31.40	6.40
5	7266.00	53.62	PK	74.00	-20.38	1.60	310.00	43.12	11.50	31.20	32.20	10.50
6	7266.00	44.08	AV	54.00	-9.92	1.60	310.00	33.58	11.50	31.20	32.20	10.50

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（802.11n40_2422MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	2390.00	61.11	PK	74.00	-12.89	1.60	180.00	59.81	5.20	28.60	32.50	1.30
2	2390.00	49.06	AV	54.00	-4.94	1.60	180.00	47.76	5.20	28.60	32.50	1.30
3	4824.00	51.03	PK	74.00	-22.97	1.60	180.00	44.63	7.40	30.40	31.40	6.40
4	4824.00	42.74	AV	54.00	-11.26	1.60	180.00	36.34	7.40	30.40	31.40	6.40
5	7266.00	51.99	PK	74.00	-22.01	1.60	180.00	41.49	11.50	31.20	32.20	10.50
6	7266.00	43.64	AV	54.00	-10.36	1.60	180.00	33.14	11.50	31.20	32.20	10.50

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（802.11n40_2437MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	4874.00	52.36	PK	74.00	-21.64	1.50	210.00	45.96	6.70	31.20	31.50	6.40
2	4874.00	43.93	AV	54.00	-10.07	1.50	210.00	37.53	6.70	31.20	31.50	6.40
3	7311.00	52.49	PK	74.00	-21.51	1.50	210.00	41.69	11.80	31.20	32.20	10.80
4	7311.00	44.29	AV	54.00	-9.71	1.50	210.00	33.49	11.80	31.20	32.20	10.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（802.11n40_2437MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	4874.00	51.67	PK	74.00	-22.33	1.50	100.00	45.27	6.70	31.20	31.50	6.40
2	4874.00	43.44	AV	54.00	-10.56	1.50	100.00	37.04	6.70	31.20	31.50	6.40
3	7311.00	52.64	PK	74.00	-21.36	1.50	100.00	41.84	11.80	31.20	32.20	10.80
4	7311.00	44.56	AV	54.00	-9.44	1.50	100.00	33.76	11.80	31.20	32.20	10.80

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（802.11n40_2452MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	2483.50	62.12	PK	74.00	-11.88	1.70	160.00	60.52	5.30	28.70	32.40	1.60
2	2483.50	50.11	AV	54.00	-3.89	1.70	160.00	48.51	5.30	28.70	32.40	1.60
3	4904.00	51.30	PK	74.00	-22.70	1.70	160.00	45.60	6.70	30.50	31.50	5.70
4	4904.00	43.18	AV	54.00	-10.82	1.70	160.00	37.48	6.70	30.50	31.50	5.70
5	7356.00	52.00	PK	74.00	-22.00	1.70	160.00	41.20	11.80	31.20	32.20	10.80
6	7356.00	41.70	AV	54.00	-12.30	1.70	160.00	30.90	11.80	31.20	32.20	10.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（802.11n40_2452MHz）												
No.	Frequency (MHz)	Emssion Level (dBuV/m)		Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV/m)	Cab. Loss (dB)	Ant. Factor (dB)	Pre. Amp. (dB)	Cor. Factor (dB/m)
1	2483.50	62.34	PK	74.00	-11.66	1.60	80.00	60.74	5.30	28.70	32.40	1.60
2	2483.50	49.49	AV	54.00	-4.51	1.60	80.00	47.89	5.30	28.70	32.40	1.60
3	4904.00	51.04	PK	74.00	-22.96	1.60	80.00	45.34	6.70	30.50	31.50	5.70
4	4904.00	42.69	AV	54.00	-11.31	1.60	80.00	36.99	6.70	30.50	31.50	5.70
5	7356.00	52.31	PK	74.00	-21.69	1.60	80.00	41.51	11.80	31.20	32.20	10.80
6	7356.00	44.32	AV	54.00	-9.68	1.60	80.00	33.52	11.80	31.20	32.20	10.80

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
   － Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level － Limit value

2.7. Conducted Emission

2.7.1. Limit of Conducted Emission

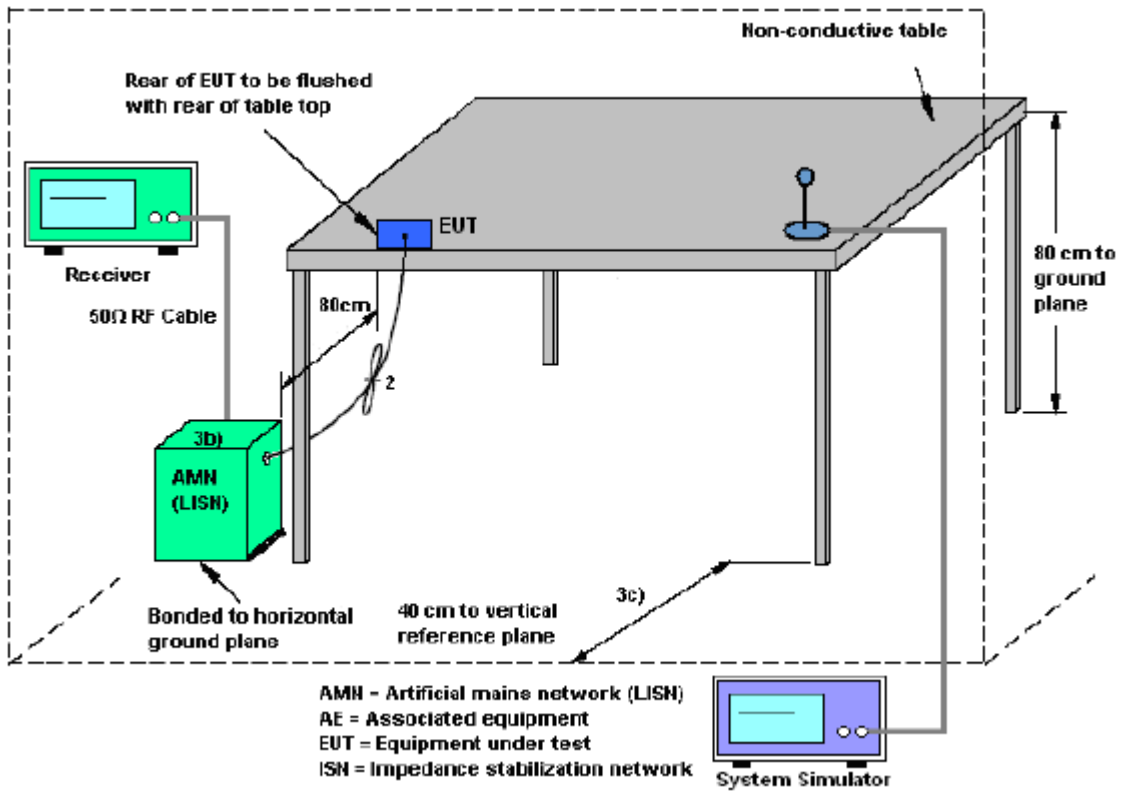
For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency range (MHz)	Conducted Limit (dBμV)	
	Quai-peak	Average
0.15 - 0.50	66 to 56	56 to 46
0.50 - 5	56	46
5 - 30	60	50

2.7.2. Measuring Instruments

The measuring equipment is listed in the section 3 of this test report.

2.7.3. Test Setup

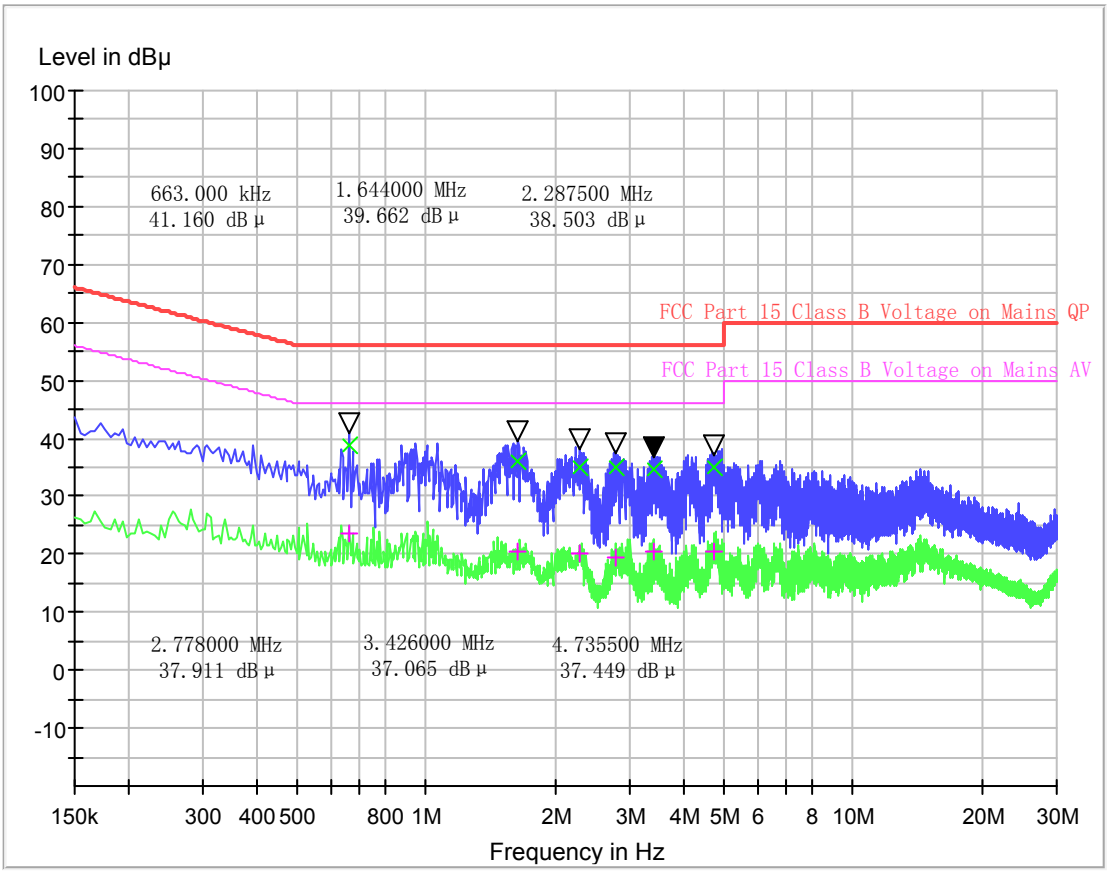


2.7.4. Test Procedures

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 micrometry 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 (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

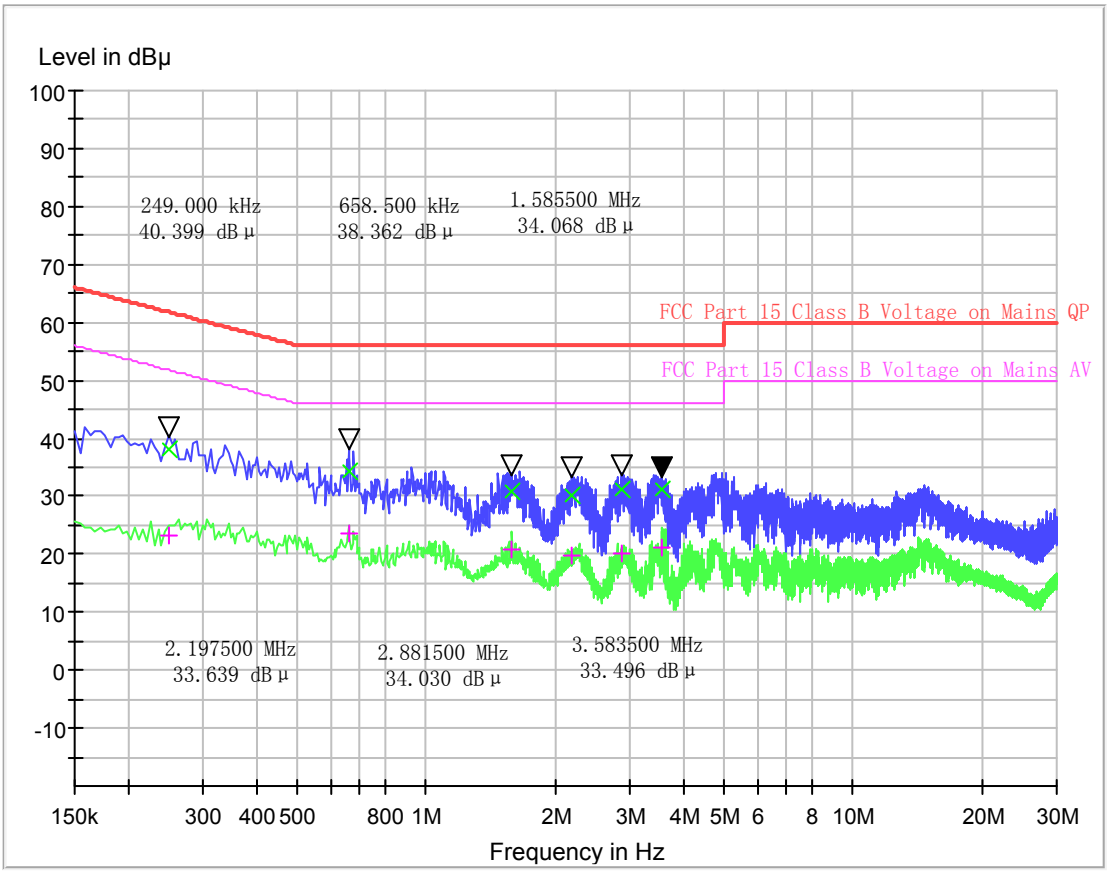
2.7.5. Test Results of Conducted Emission

1. The EUT configuration of the emission tests is WLAN Link + USB Cable (Charging from Adapter)



(Plot A: L Phase)

Conducted Disturbance at Mains Terminals							
L Test Data							
QP					AV		
Frequency (MHz)	Limits (dBµV)	Measurement Value (dBµV)	Cable Loss (dB)	Cor. Factor (dB)	Frequency (MHz)	Limits (dBµV)	Measurement Value (dBµV)
0.663000	56.0	38.67	0.1	20.1	0.663000	46.0	23.42
1.644000	56.0	35.91	0.2	20.2	1.644000	46.0	20.62
2.287500	56.0	34.85	0.5	20.5	2.287500	46.0	20.04
2.778000	56.0	35.11	0.5	20.5	2.778000	46.0	19.32
3.426000	56.0	34.62	0.2	20.2	3.426000	46.0	20.58
4.735500	56.0	35.06	0.1	20.1	4.735500	46.0	20.59



(Plot B: N Phase)

Conducted Disturbance at Mains Terminals							
N Test Data							
QP					AV		
Frequency (MHz)	Limits (dBµV)	Measurement Value (dBµV)	Cable Loss (dB)	Cor. Factor (dB)	Frequency (MHz)	Limits (dBµV)	Measurement Value (dBµV)
0.249000	61.8	38.14	0.10	20.1	0.249000	51.8	23.13
0.658500	56.0	34.35	0.2	20.2	0.658500	46.0	23.68
1.585500	56.0	30.95	0.5	20.5	1.585500	46.0	20.78
2.197500	56.0	30.29	0.5	20.5	2.197500	46.0	19.92
2.881500	56.0	31.15	0.2	20.2	2.881500	46.0	20.06
3.583500	56.0	31.16	0.2	20.2	3.583500	46.0	21.26

Test Result: PASS

3. List of measuring equipment

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	EMI TEST RECEIVER	R&S	ESW26	A180502935	2018.11.1	2019.10.31
2	Power Meter	R&S	NRP-Z31	102872	2019.5.5	2020.05.04
3	TURNTABLE	ETS	2088	2149	N/A	N/A
4	ANTENNA MAST	ETS	2075	2346	N/A	N/A
5	EMI TEST Software	R&S	ESK1	N/A	N/A	N/A
6	Horn antenna (18GHz~26.5GHz)	AR	AT4002A	305753	2017.11.10	2020.11.09
7	Amplifer	MILMEGA	80RF1000-250	A140901925	2017.10.09	2020.10.08
8	JS amplifer	AR	25S1G4AM1	A0304248	2017.10.09	2020.10.08
9	High pass filter	Compliance Direction systems	BSU-6	34202	2018.11.11	2019.11.10
13	Horn Antenna	ShwarzBeck	9120D	1012	2018.11.11	2019.11.10
14	Horn Antenna	ShwarzBeck	BBHA9170	25841	2018.11.11	2019.11.10
15	ULTRA-BROADBAND ANTENNA	R&S	HL562	A0304224	2017.07.14	2020.07.13
16	Passive Loop Antenna	R&S	HFH2-Z2	100047	2019.04.26	2022.04.25
17	Temperature chamber	Dongguan gaoda instrument CO.LTD	GD-7005-100	130130101	2019.04.22	2020.04.21
18	Spectrum Analyzer	Keysight	N9030A	A160702554	2018.11.15	2019.11.14
19	Power Supply	R&S	NGMO1	101037	2019.08.03	2020.08.02
20	EMI TEST RECEIVER	KEYSIGHT	ESR3	A181103297	2018.09.14	2019.09.13
21	LISN	ROHDE&SCHWARZ	ENV216	A140701847	2018.12.10	2019.12.10
22	Cable	MATCHING PAD	W7	/	2019.01.02	2020.01.01

Appendix A

RF Output Power

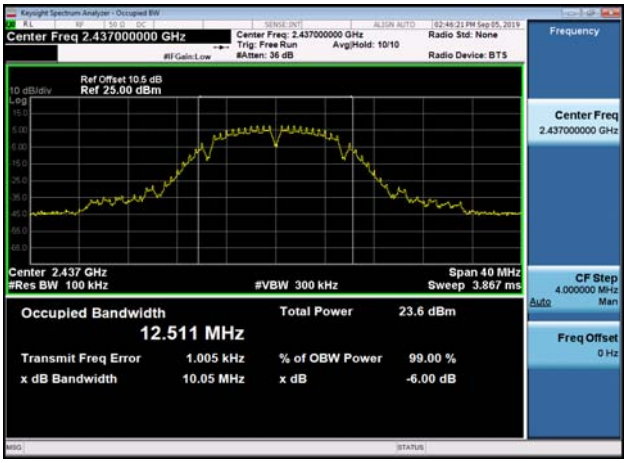
Test Result and Data

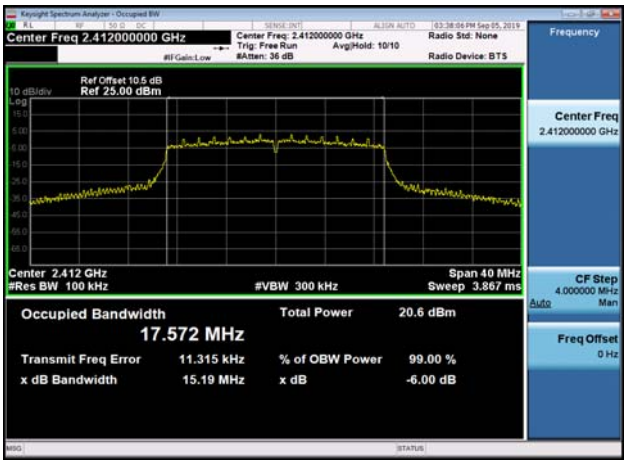
Conducted Output Peak Power				
Mode	Test Frequency (MHz)	Max Conducted Output Power (dBm)	Limit (dBm)	Result
802.11b	2412	15.97	30	Pass
802.11b	2437	16.20	30	Pass
802.11b	2462	16.48	30	Pass
802.11g	2412	12.81	30	Pass
802.11g	2437	13.98	30	Pass
802.11g	2462	13.23	30	Pass
802.11n (HT20)	2412	12.88	30	Pass
802.11n (HT20)	2437	13.26	30	Pass
802.11n (HT20)	2462	13.28	30	Pass
802.11n (HT40)	2422	10.51	30	Pass
802.11n (HT40)	2437	10.06	30	Pass
802.11n (HT40)	2452	10.66	30	Pass

6dB and 99% Occupied Bandwidth

Test Result and Data

	WLAN Occupied 6dB Bandwidth			
Mode	Test Frequency (MHz)	Occupied Bandwidth (MHz)	Limit (KHz)	Result
802.11b	2412	10.05	500	Pass
802.11b	2437	10.05	500	Pass
802.11b	2462	10.05	500	Pass
802.11g	2412	15.18	500	Pass
802.11g	2437	15.19	500	Pass
802.11g	2462	15.37	500	Pass
802.11n (HT20)	2412	15.19	500	Pass
802.11n (HT20)	2437	15.18	500	Pass
802.11n (HT20)	2462	15.18	500	Pass
802.11n (HT40)	2422	35.25	500	Pass
802.11n (HT40)	2437	35.25	500	Pass
802.11n (HT40)	2452	35.25	500	Pass

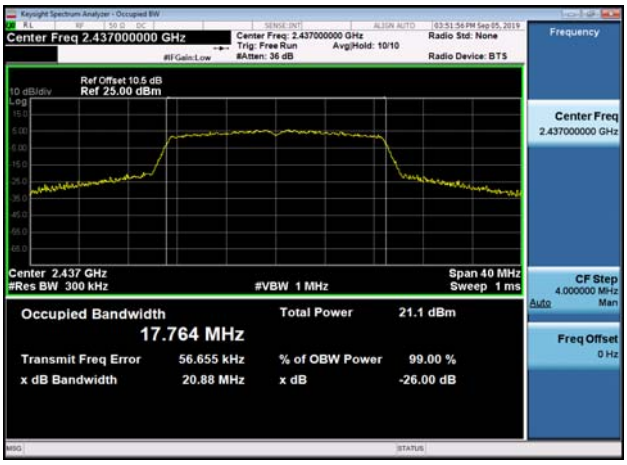
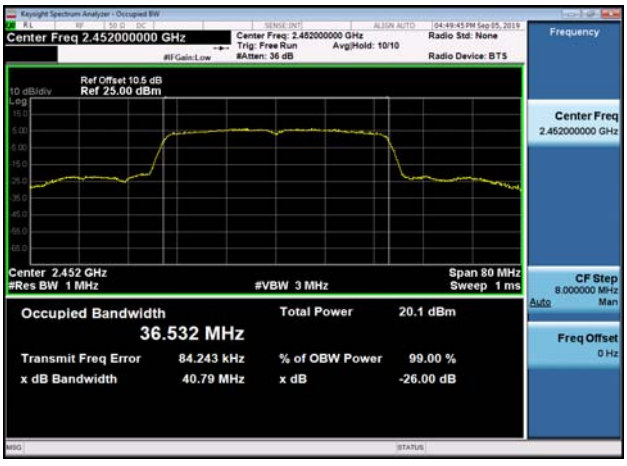
6dB Bandwidth-802.11b,2412MHz	6dB Bandwidth-802.11b,2437MHz
	
6dB Bandwidth-802.11b,2462MHz	**6dB Bandwidth-802.11g,2412MHz**
	
6dB Bandwidth-802.11g,2437MHz	**6dB Bandwidth-802.11g,2462MHz**
	

6dB Bandwidth-802.11n(HT20),2412MHz	6dB Bandwidth-802.11n(HT20),2437MHz
	
6dB Bandwidth-802.11n(HT20),2462MHz	6dB Bandwidth-802.11n(HT40),2422MHz
	
6dB Bandwidth-802.11n(HT40),2437MHz	6dB Bandwidth-802.11n(HT40),2452MHz
	

99% BandWidth
Test Result and Data

WLAN 99% Occupied Bandwidth			
Mode	Test Frequency (MHz)	99% Occupied Bandwidth (MHz)	Result
802.11b	2412	12.549	Reported Only
802.11b	2437	12.559	
802.11b	2462	12.590	
802.11g	2412	16.908	
802.11g	2437	17.040	
802.11g	2462	16.848	
802.11n (HT20)	2412	17.802	
802.11n (HT20)	2437	17.764	
802.11n (HT20)	2462	17.749	
802.11n (HT40)	2422	36.572	
802.11n (HT40)	2437	36.831	
802.11n (HT40)	2452	36.532	

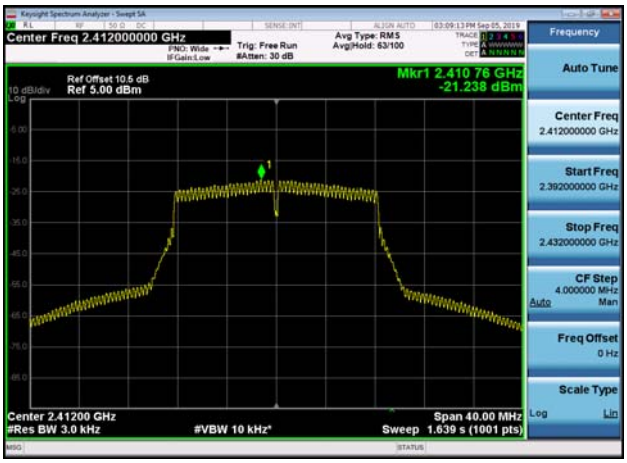
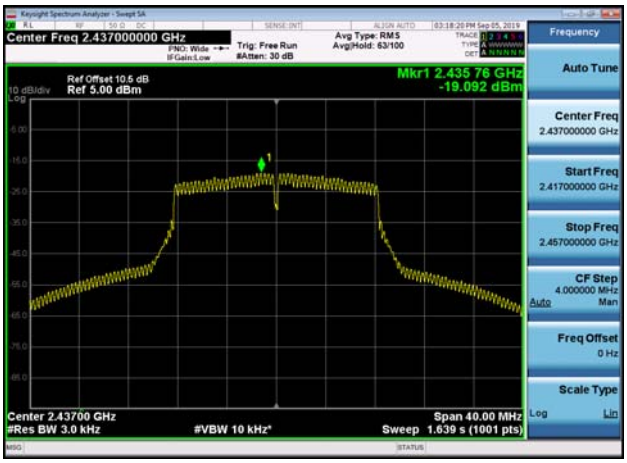
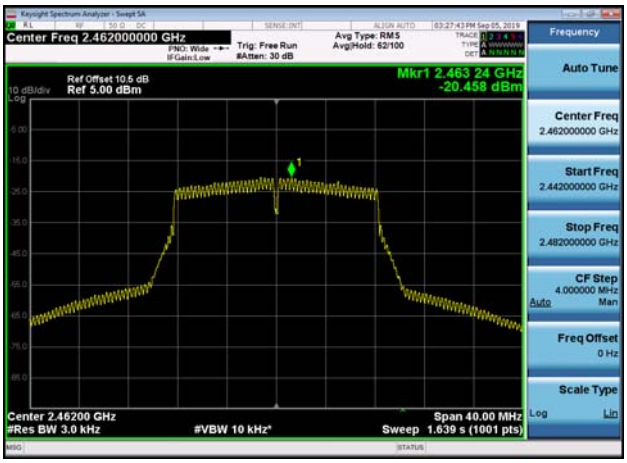
99% Bandwidth-802.11b,2412MHz	99% Bandwidth-802.11b,2437MHz
	
99% Bandwidth-802.11b,2462MHz	99% Bandwidth-802.11g,2412MHz
	
99% Bandwidth-802.11g,2437MHz	99% Bandwidth-802.11g,2462MHz
	

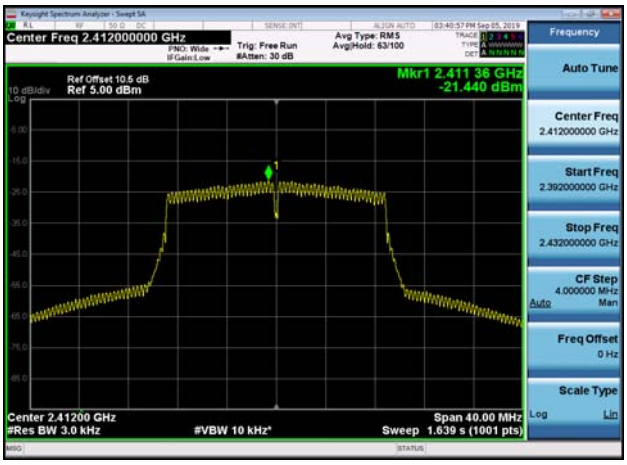
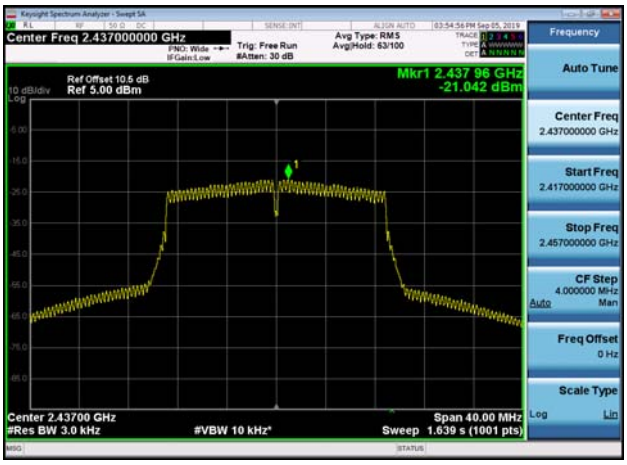
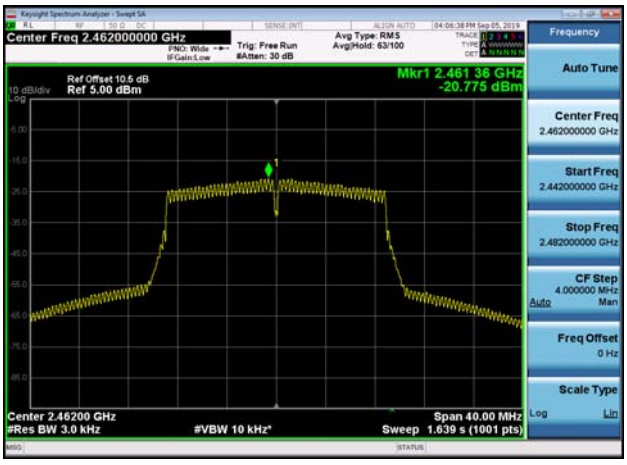
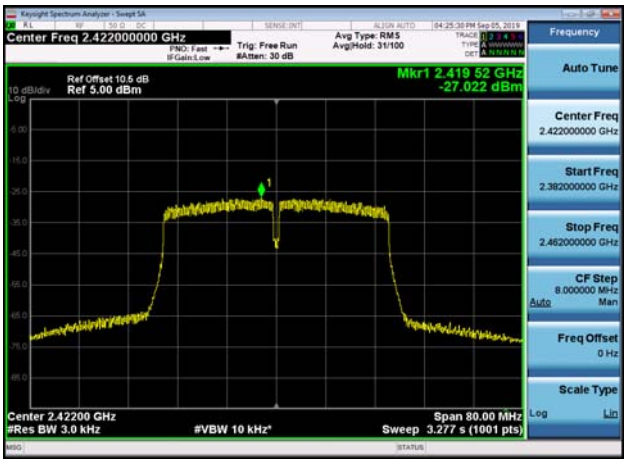
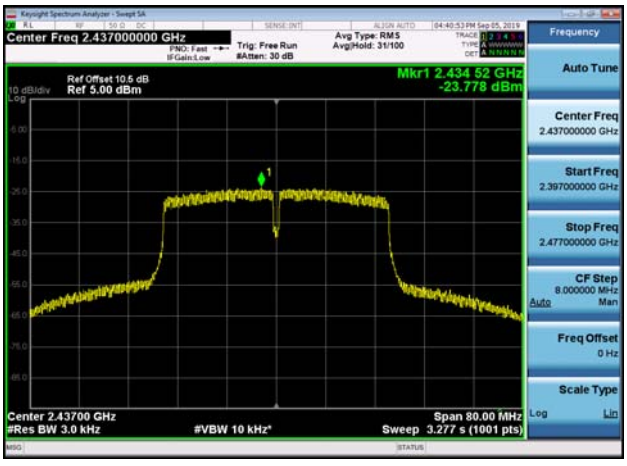
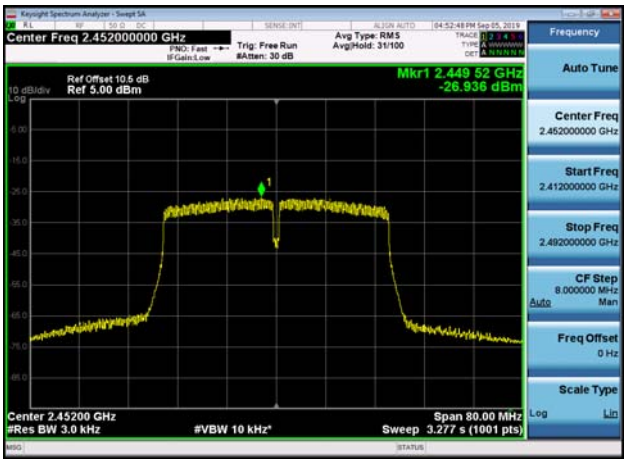
99% Bandwidth-802.11n(HT20),2412MHz	99% Bandwidth-802.11n(HT20),2437MHz
	
99% Bandwidth-802.11n(HT20),2462MHz	99% Bandwidth-802.11n(HT40),2422MHz
	
99% Bandwidth-802.11n(HT40),2437MHz	99% Bandwidth-802.11n(HT40),2452MHz
	

Power Spectral Density

Test Result and Data

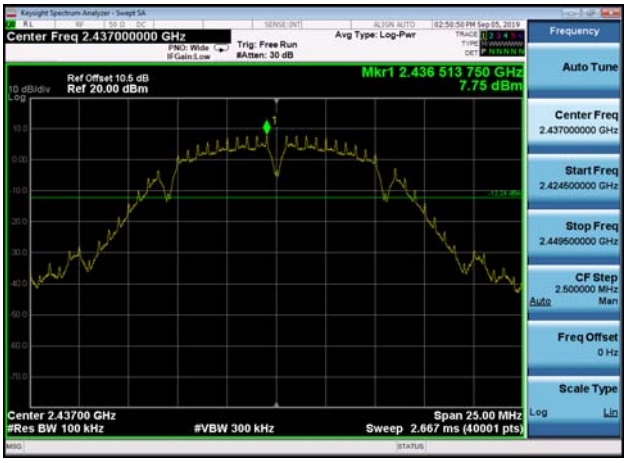
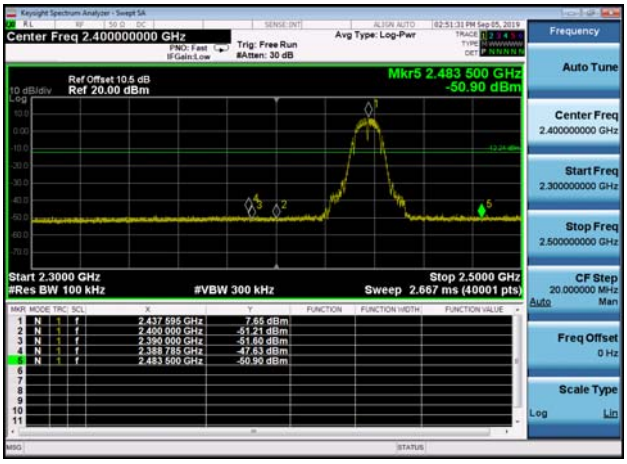
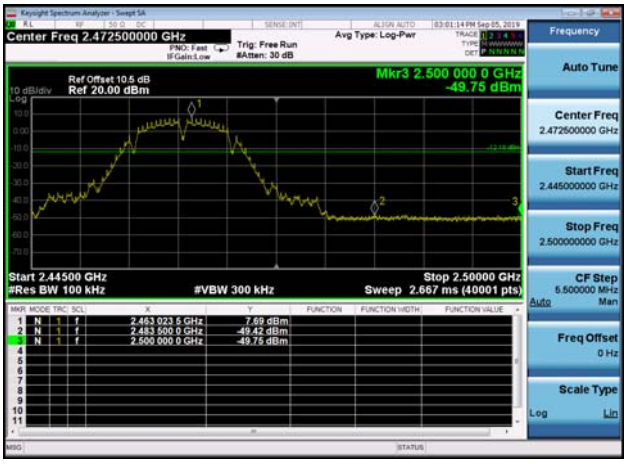
Power Spectral Density					
Mode	Test Frequency (MHz)	PSD (dBm/3KHz)	RBW (kHz)	Limit (dBm/3KHz)	Result
802.11b	2412	-16.330	3	8	Pass
802.11b	2437	-16.319	3	8	Pass
802.11b	2462	-16.210	3	8	Pass
802.11g	2412	-21.238	3	8	Pass
802.11g	2437	-19.092	3	8	Pass
802.11g	2462	-20.458	3	8	Pass
802.11n (HT20)	2412	-21.440	3	8	Pass
802.11n (HT20)	2437	-21.027	3	8	Pass
802.11n (HT20)	2462	-20.775	3	8	Pass
802.11n (HT40)	2422	-27.022	3	8	Pass
802.11n (HT40)	2437	-23.778	3	8	Pass
802.11n (HT40)	2452	-26.936	3	8	Pass

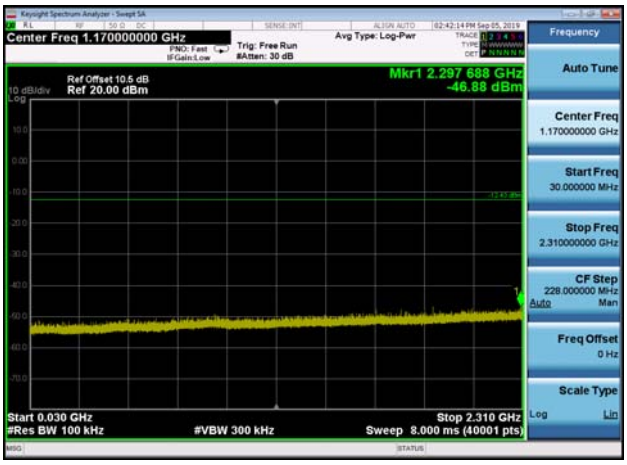
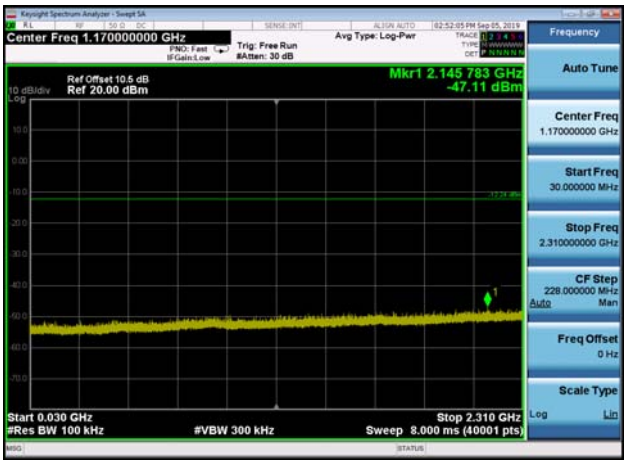
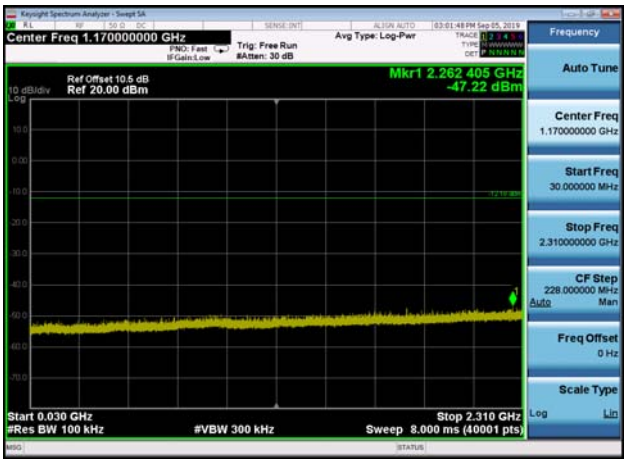
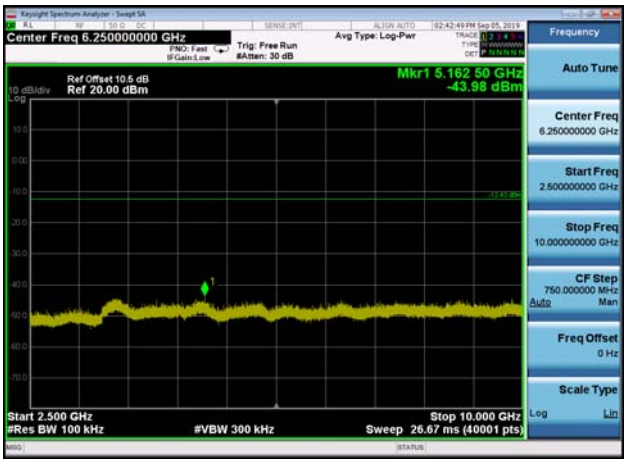
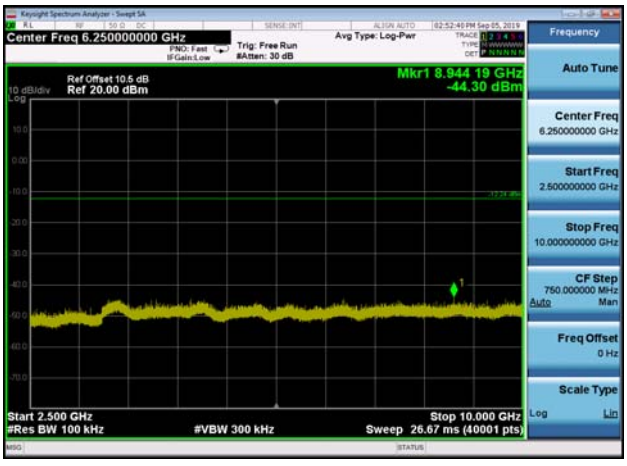
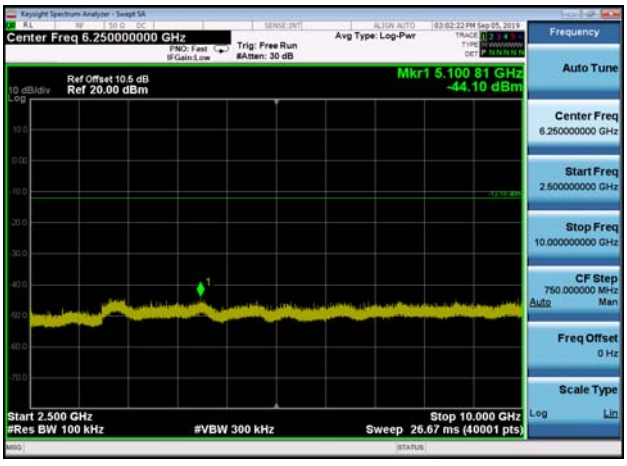
Power spectral density-802.11b ,2412MHz	Power spectral density-802.11b ,2437MHz
	
Power spectral density-802.11b ,2462MHz	Power spectral density-802.11g ,2412MHz
	
Power spectral density-802.11g ,2437MHz	Power spectral density-802.11g ,2462MHz
	

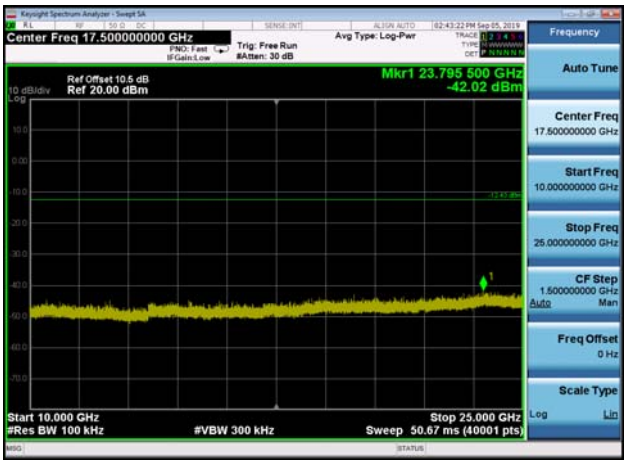
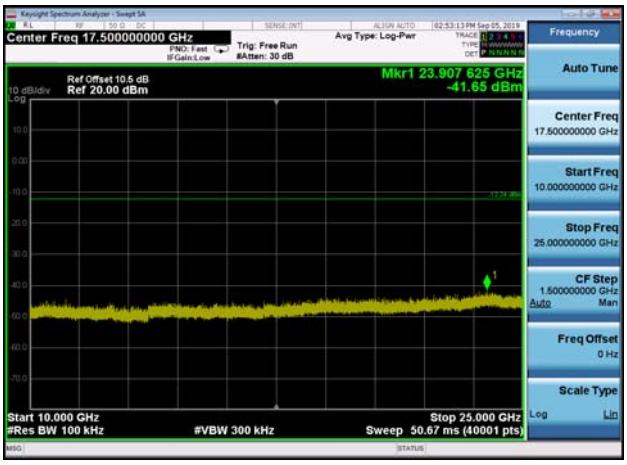
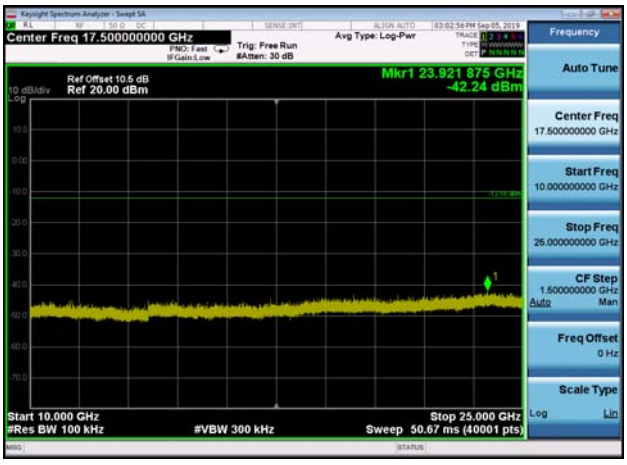
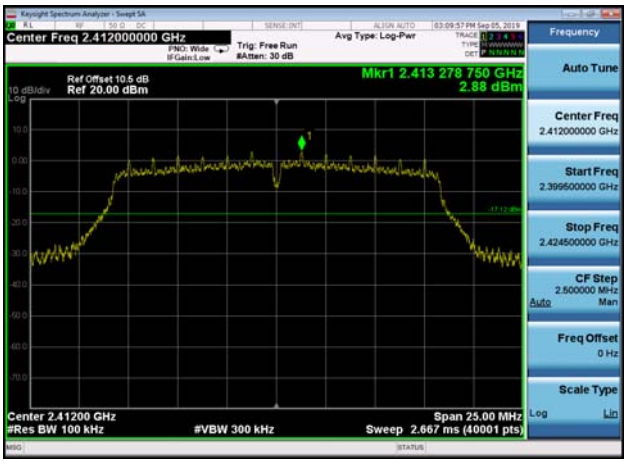
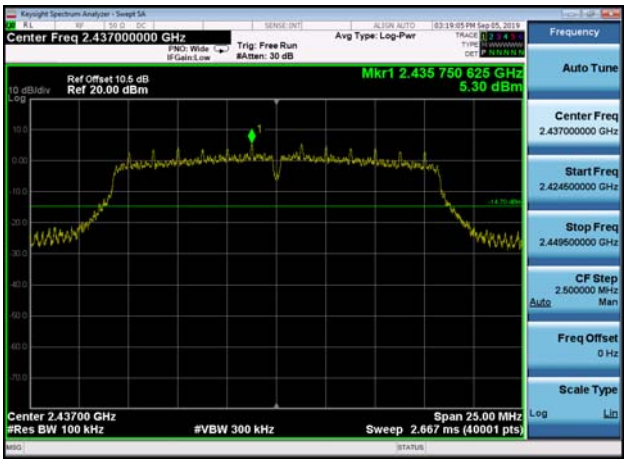
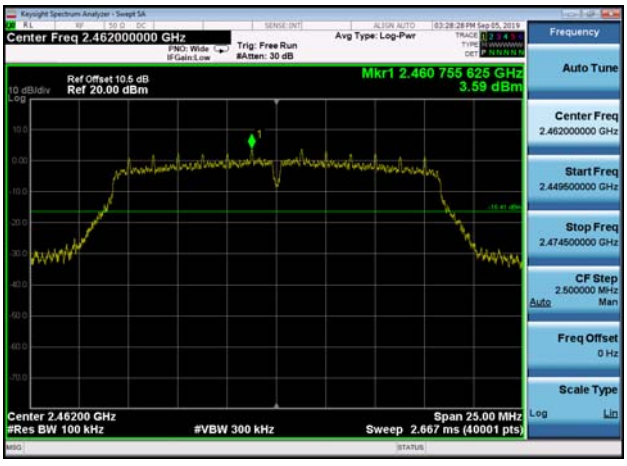
Power spectral density-802.11n(HT20) ,2412MHz	Power spectral density-802.11n(HT20) ,2437MHz
	
Power spectral density-802.11n(HT20) ,2462MHz	Power spectral density-802.11n(HT40) ,2422MHz
	
Power spectral density-802.11n(HT40) ,2437MHz	Power spectral density-802.11n(HT40) ,2452MHz
	

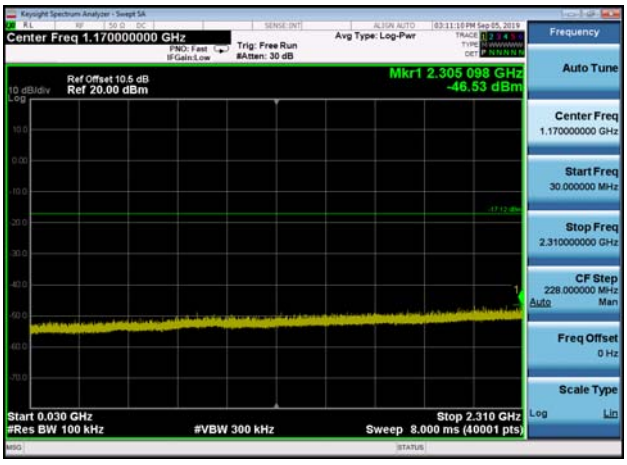
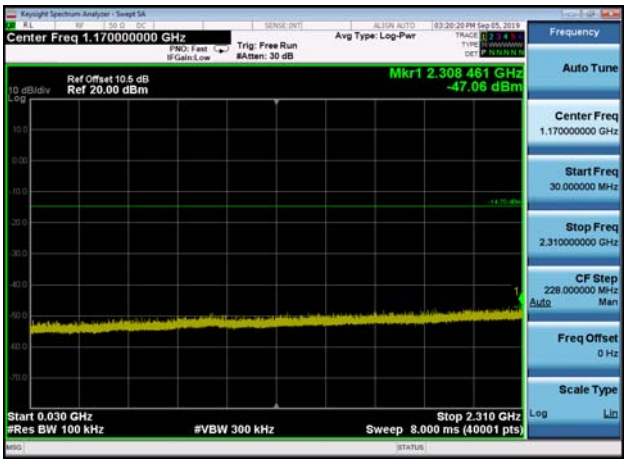
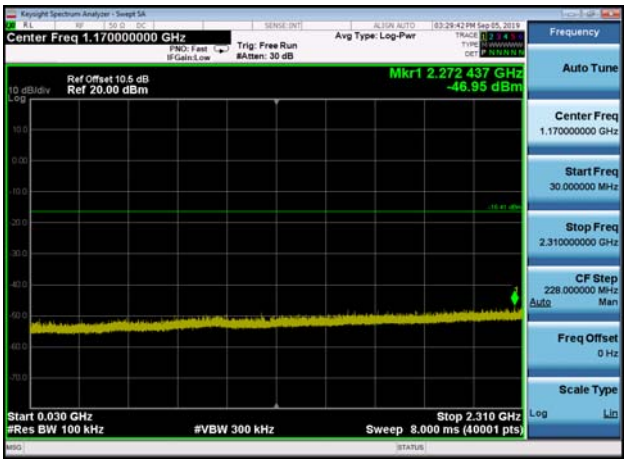
Conducted Band Edges and Spurious Emissions

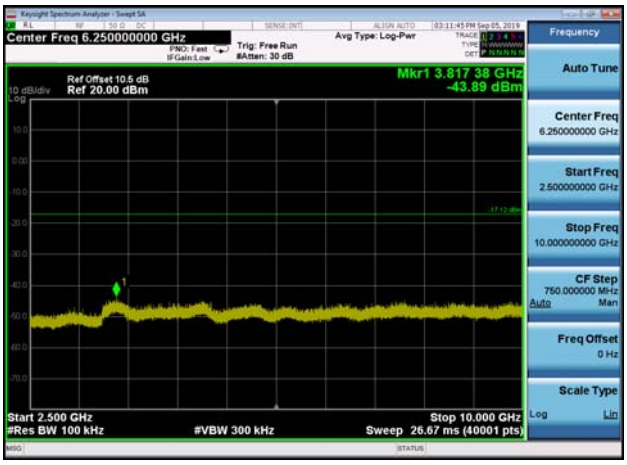
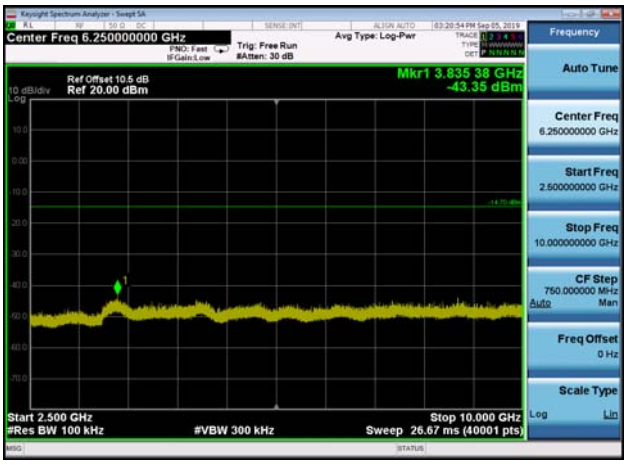
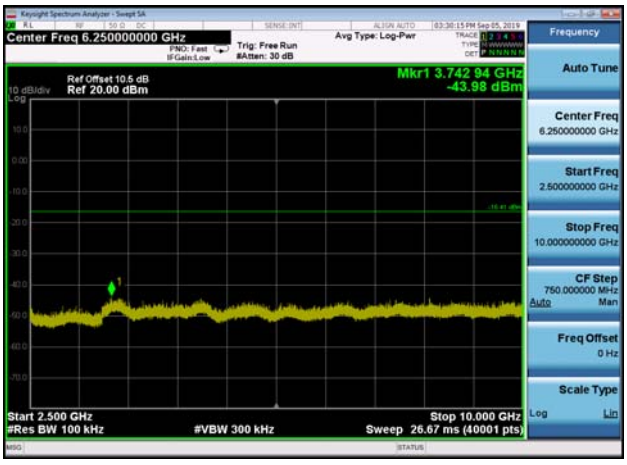
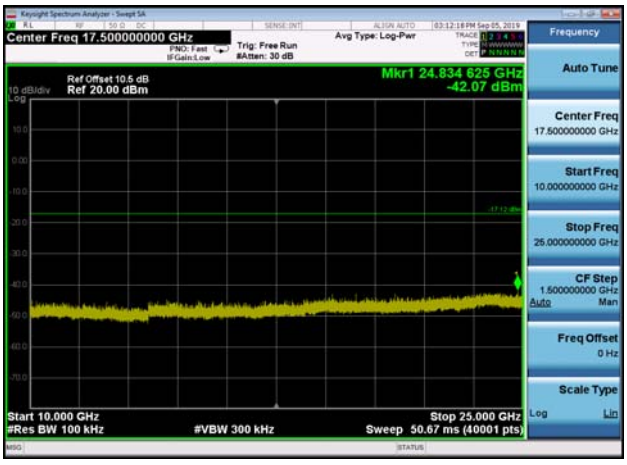
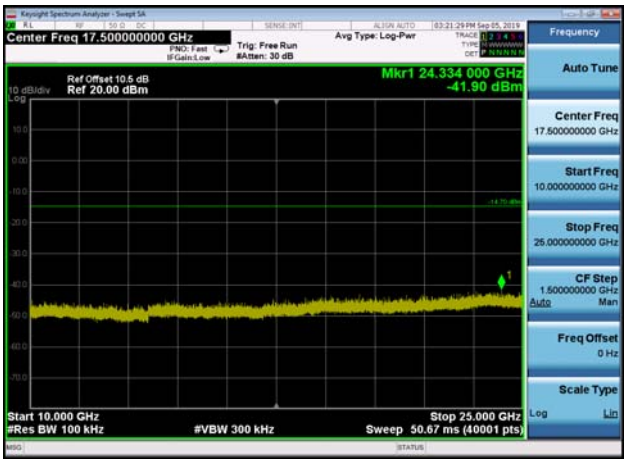
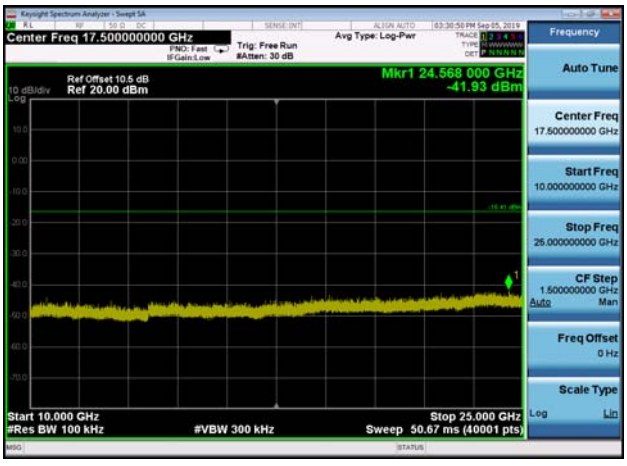
Test Result and Data

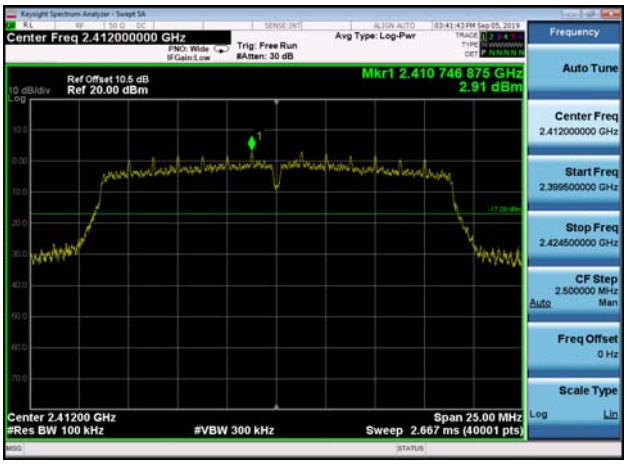
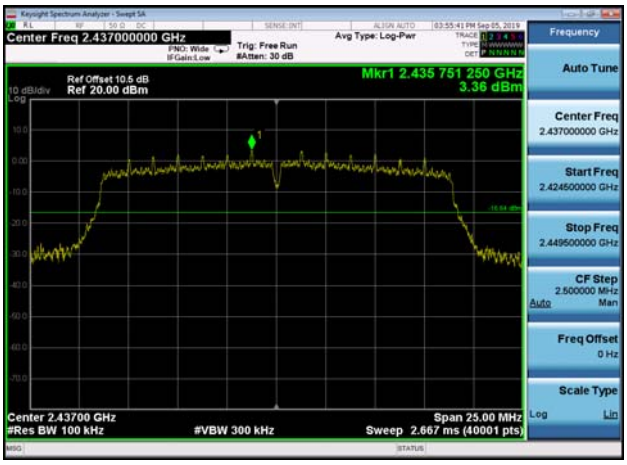
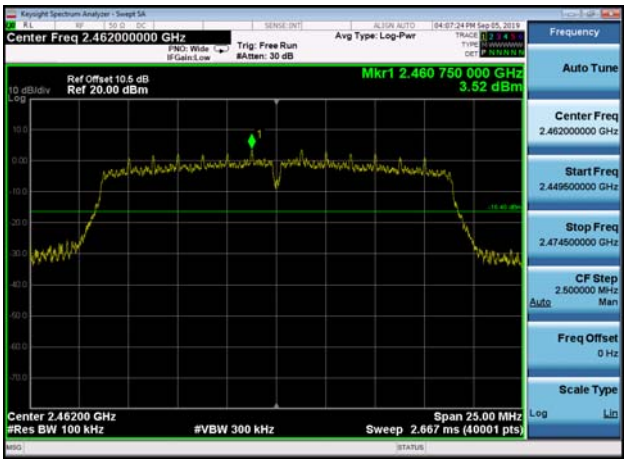
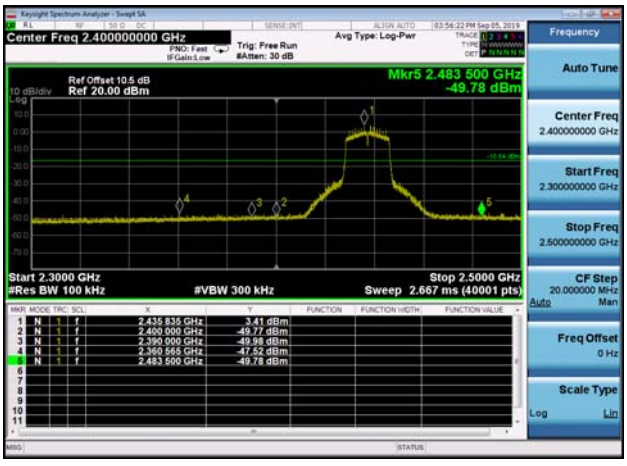
,Plot 1,Reference Level-802.11b ,2412MHz	,Plot 1,Reference Level-802.11b ,2437MHz
	
,Plot 1,Reference Level-802.11b ,2462MHz	,Plot 2,Band Edge-802.11b,2412MHz
	
,Plot 2,Band Edge-802.11b,2437MHz	,Plot 2,Band Edge-802.11b,2462MHz
	

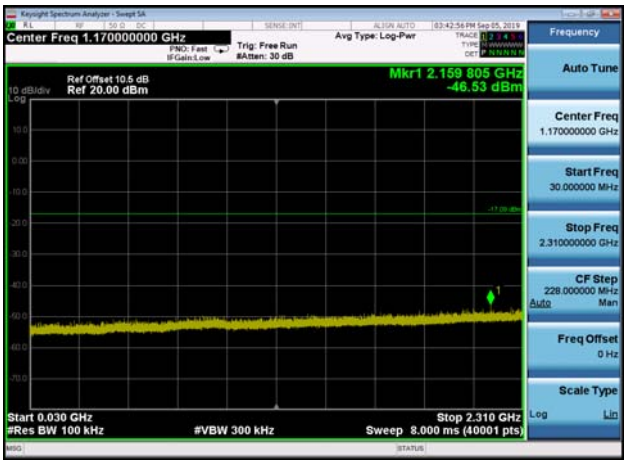
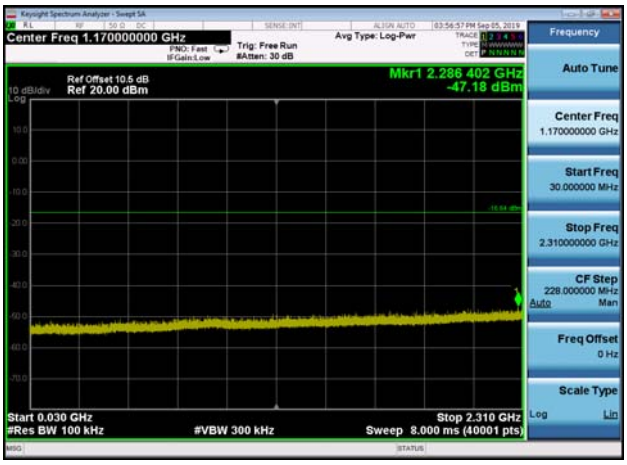
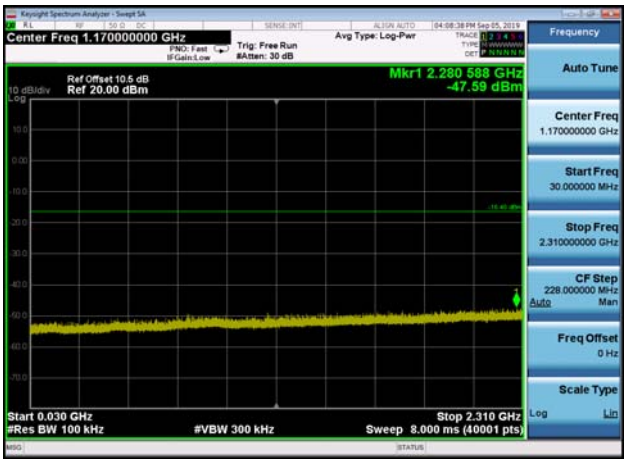
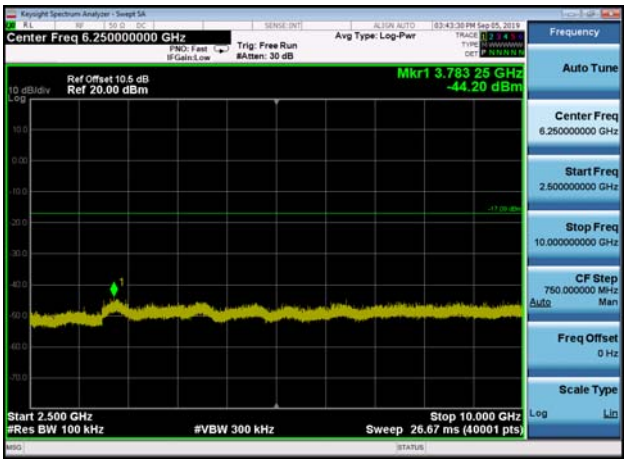
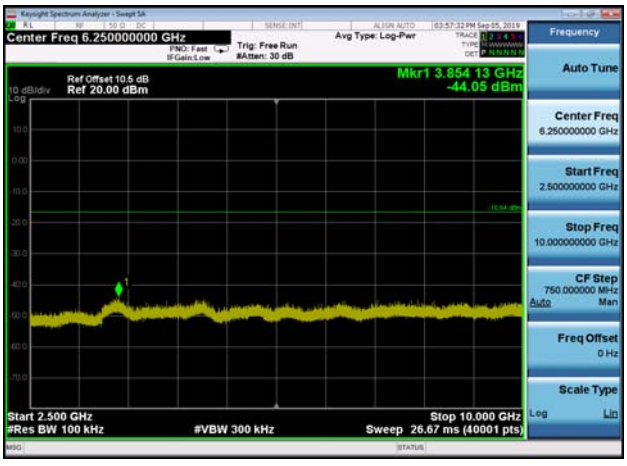
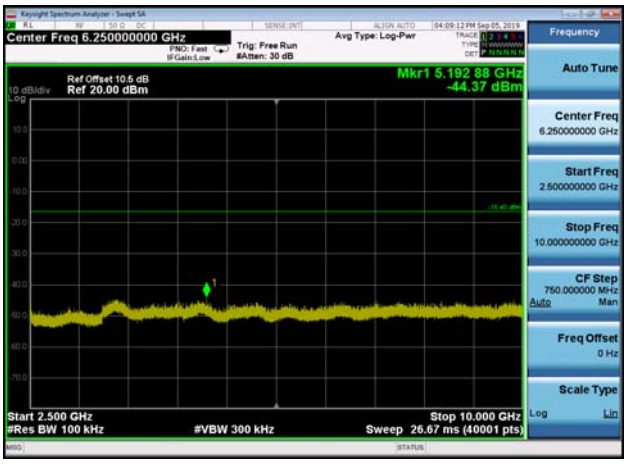
,Plot 3,30MHz~2310MHz-802.11b,2412MHz	,Plot 3,30MHz~2310MHz-802.11b,2437MHz
	
,Plot 3,30MHz~2310MHz-802.11b,2462MHz	,Plot 4,2500MHz~10000MHz-802.11b ,2412MHz
	
,Plot 4,2500MHz~10000MHz-802.11b ,2437MHz	,Plot 4,2500MHz~10000MHz-802.11b ,2462MHz
	

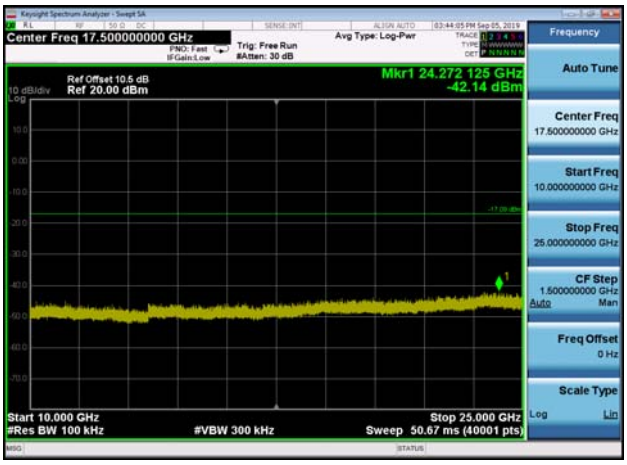
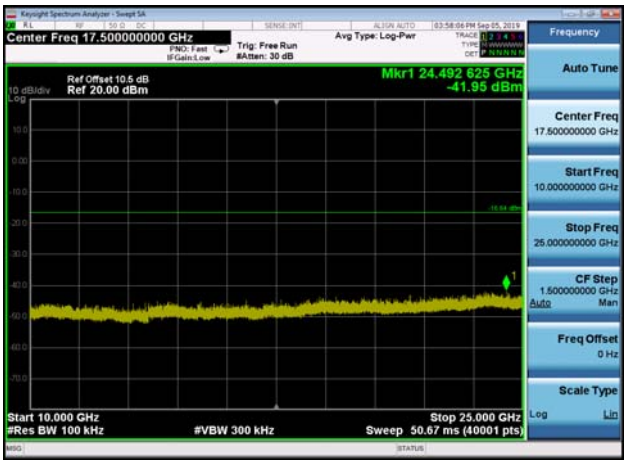
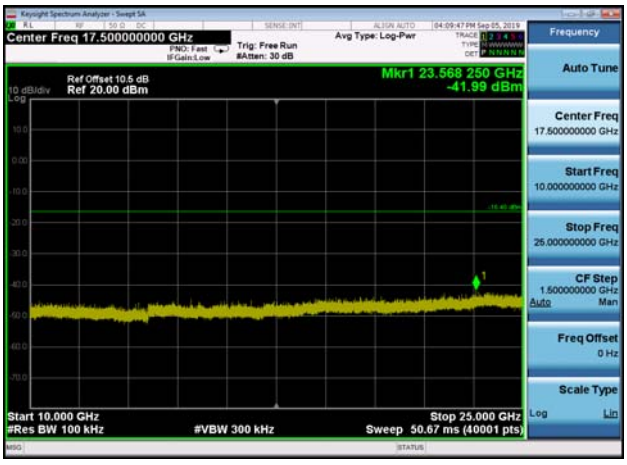
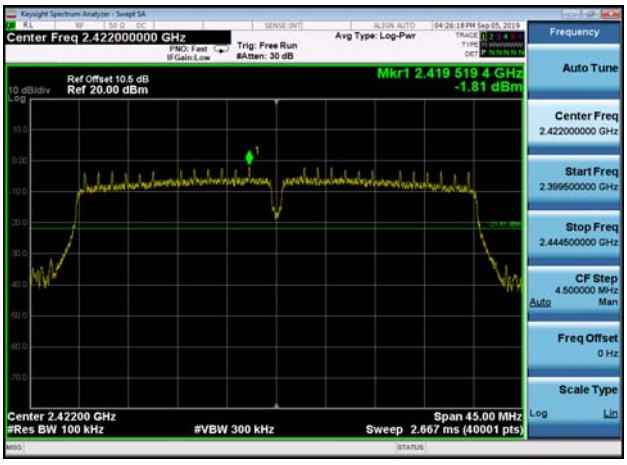
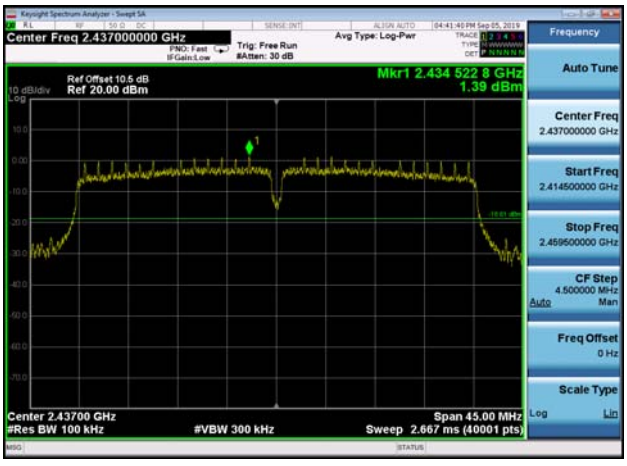
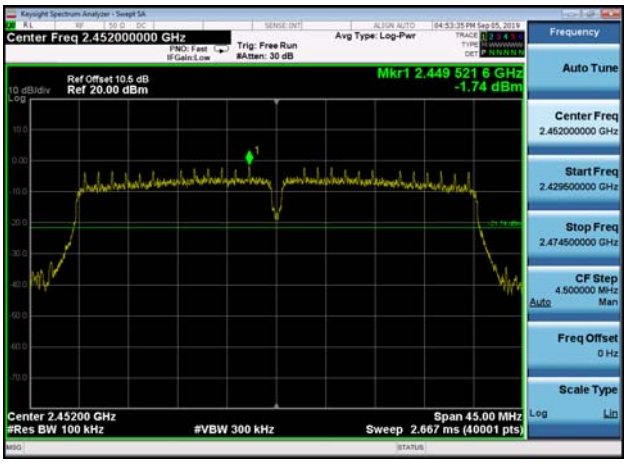
,Plot 5,10000MHz~25000MHz-802.11b ,2412MHz	,Plot 5,10000MHz~25000MHz-802.11b ,2437MHz
	
,Plot 5,10000MHz~25000MHz-802.11b ,2462MHz	,Plot 1,Reference Level-802.11g ,2412MHz
	
,Plot 1,Reference Level-802.11g ,2437MHz	,Plot 1,Reference Level-802.11g ,2462MHz
	

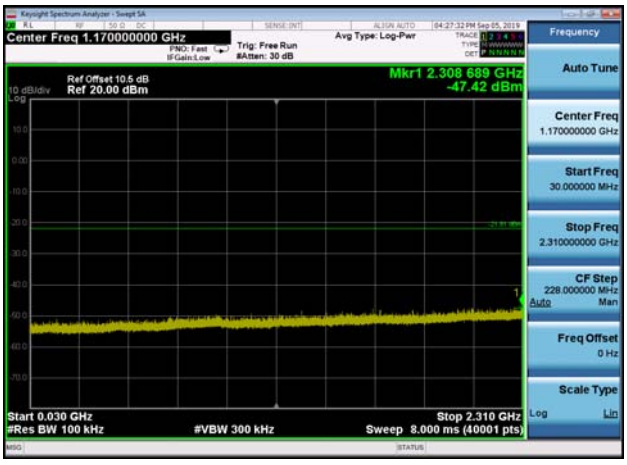
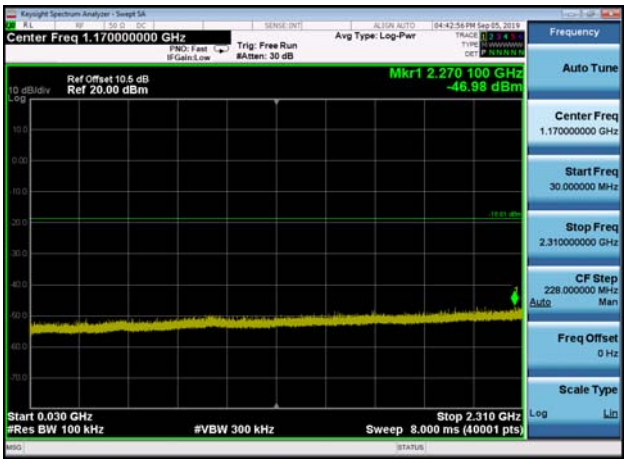
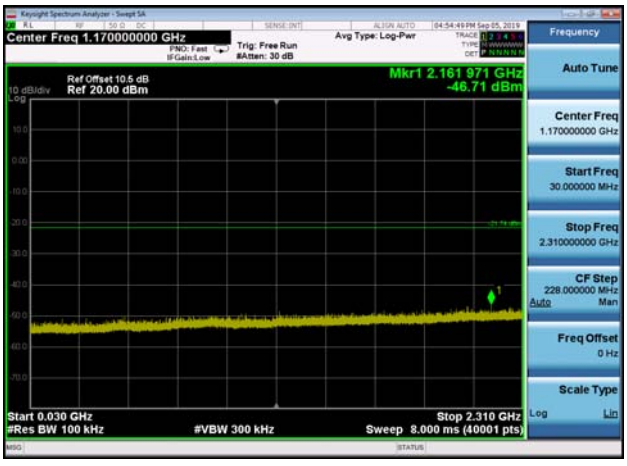
,Plot 2,Band Edge-802.11g,2412MHz	,Plot 2,Band Edge-802.11g,2437MHz
	
,Plot 2,Band Edge-802.11g,2462MHz	,Plot 3,30MHz~2310MHz-802.11g,2412MHz
	
,Plot 3,30MHz~2310MHz-802.11g,2437MHz	,Plot 3,30MHz~2310MHz-802.11g,2462MHz
	

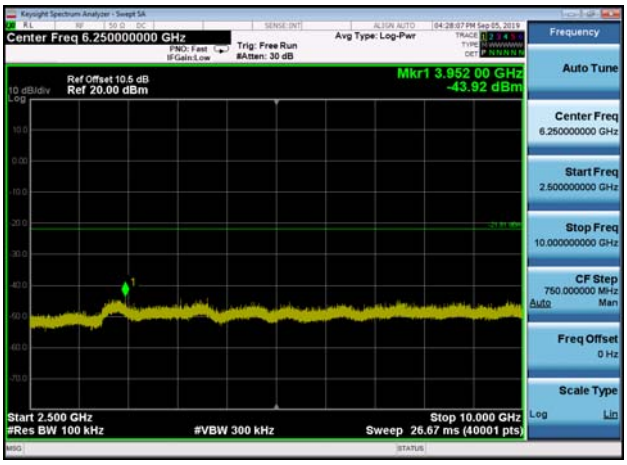
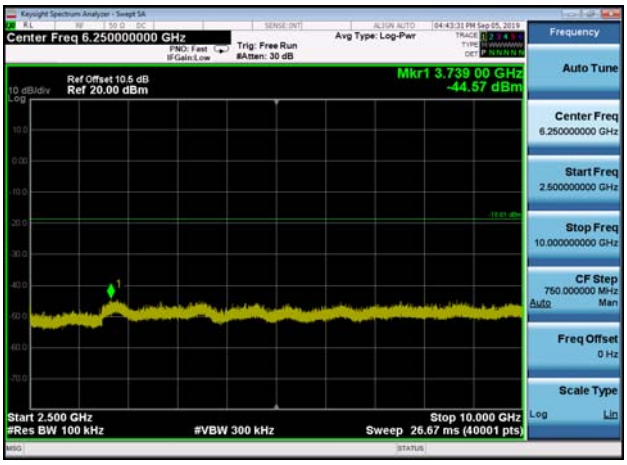
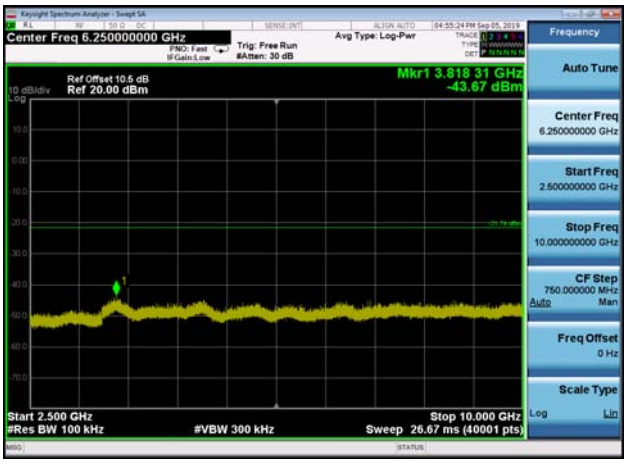
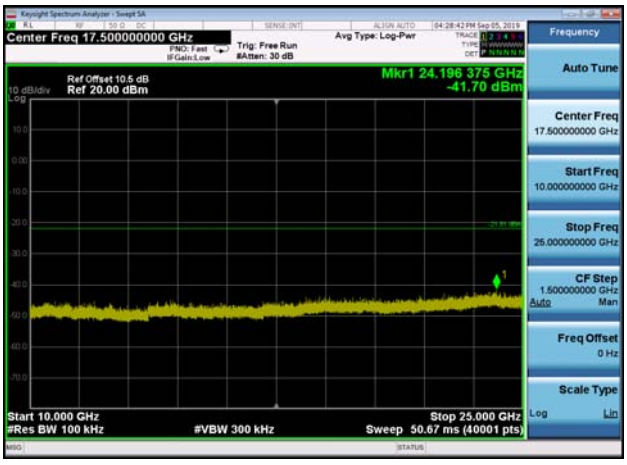
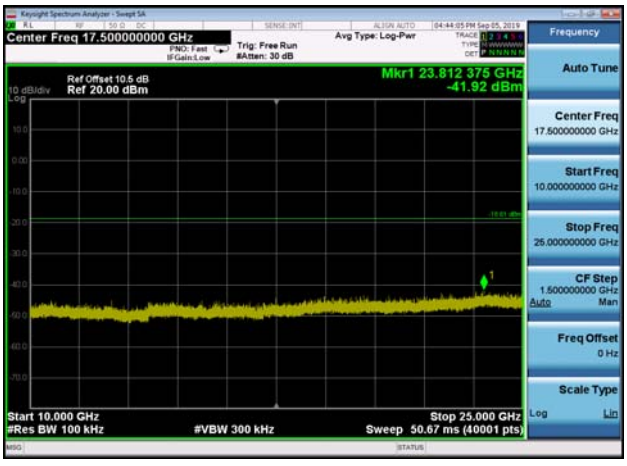
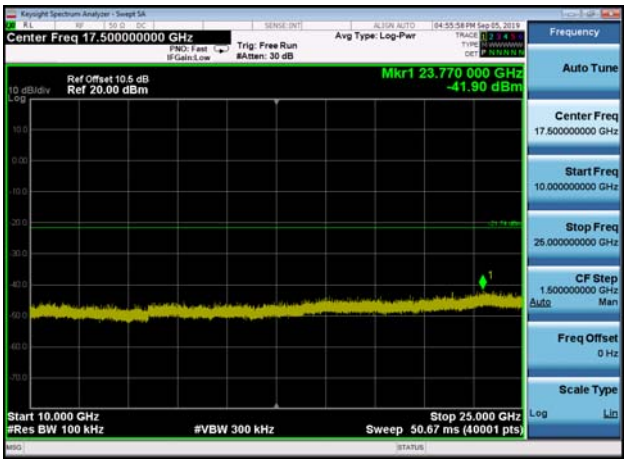
,Plot 4,2500MHz~10000MHz-802.11g ,2412MHz	,Plot 4,2500MHz~10000MHz-802.11g ,2437MHz
	
,Plot 4,2500MHz~10000MHz-802.11g ,2462MHz	,Plot 5,10000MHz~25000MHz-802.11g ,2412MHz
	
,Plot 5,10000MHz~25000MHz-802.11g ,2437MHz	,Plot 5,10000MHz~25000MHz-802.11g ,2462MHz
	

,Plot 1,Reference Level-802.11n(HT20) ,2412MHz	,Plot 1,Reference Level-802.11n(HT20) ,2437MHz
	
,Plot 1,Reference Level-802.11n(HT20) ,2462MHz	,Plot 2,Band Edge-802.11n(HT20) ,2412MHz
	
,Plot 2,Band Edge-802.11n(HT20) ,2437MHz	,Plot 2,Band Edge-802.11n(HT20) ,2462MHz
	

,Plot 3,30MHz~2310MHz-802.11n(HT20) ,2412MHz	,Plot 3,30MHz~2310MHz-802.11n(HT20) ,2437MHz
	
,Plot 3,30MHz~2310MHz-802.11n(HT20) ,2462MHz	,Plot 4,2500MHz~10000MHz-802.11n(HT20),2412MHz
	
,Plot 4,2500MHz~10000MHz-802.11n(HT20),2437MHz	,Plot 4,2500MHz~10000MHz-802.11n(HT20),2462MHz
	

,Plot 5,10000MHz~25000MHz-802.11n(HT20),2412MHz	,Plot 5,10000MHz~25000MHz-802.11n(HT20),2437MHz
	
,Plot 5,10000MHz~25000MHz-802.11n(HT20),2462MHz	,Plot 1,Reference Level-802.11n(HT40),2422MHz
	
,Plot 1,Reference Level-802.11n(HT40),2437MHz	,Plot 1,Reference Level-802.11n(HT40),2452MHz
	

,Plot 2,Band Edge-802.11n(HT40) ,2422MHz	,Plot 2,Band Edge-802.11n(HT40) ,2437MHz
	
,Plot 2,Band Edge-802.11n(HT40) ,2452MHz	,Plot 3,30MHz~2310MHz-802.11n(HT40) ,2422MHz
	
,Plot 3,30MHz~2310MHz-802.11n(HT40) ,2437MHz	,Plot 3,30MHz~2310MHz-802.11n(HT40) ,2452MHz
	

,Plot 4,2500MHz~10000MHz-802.11n(HT40),2422MHz	,Plot 4,2500MHz~10000MHz-802.11n(HT40),2437MHz
	
,Plot 4,2500MHz~10000MHz-802.11n(HT40),2452MHz	,Plot 5,10000MHz~25000MHz-802.11n(HT4 0),2422MHz
	
,Plot 5,10000MHz~25000MHz-802.11n(HT4 0),2437MHz	,Plot 5,10000MHz~25000MHz-802.11n(HT4 0),2452MHz
	

****END OF REPORT****