RF TEST REPORT

Report No.: SET2019-07582

Product Name: MIGU BOX

FCC ID: 2ATTHMGV2002

Model No. : MGV2002

Applicant: Migu Video Co.,Ltd.

Address: No.636 Qiaoyun Road, Shanghai, China.

Dates of Testing: 06/01/2019 —06/26/2019

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.....: MIGU BOX

Brand Name.....: N.A

Trade Name.....: MIGU

Applicant.....: Migu Video Co.,Ltd.

Applicant Address.....: No.636 Qiaoyun Road, Shanghai, China.

Manufacturer .....: Migu Video Co.,Ltd.

Manufacturer Address .....: No.636 Qiaoyun Road, Shanghai, China.

Test Standards.....: 47 CFR Part 15 Subpart C：Radio Frequency Devices
ANSI C63.10-2013：American National Standard for Testing Unlicensed Wireless Devices
KDB558074 D01 DTS Meas Guidance v05r01

Test Result.....: PASS

Tested by .....: Robin Luo 2019.06.26

Robin Luo, Test Engineer

Reviewed by .....: Chris You 2019.06.26

Chris You, Senior Engineer

Approved by .....: ShuangwenZhang 2019.06.26

ShuangwenZhang, Manager

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Change History		
Issue	Date	Reason for change
1.0	2019.06.26	First edition

1. General Information

1.1. EUT Description

EUT Type	MIGU BOX
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 (SISO) 802.11g: 54/48/36/24/18/12/9/6 Mbps (SISO) 802.11n : up to 300Mbps(MIMO)
Modulation Type	DSSS (802.11b), OFDM (802.11g/n)
MIMO	Support, 2x2MIMO
Antenna Type	Internal
Antenna Gain	Antenna(0): 2dBi Antenna(1): 2dBi

Note 1: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

Note 2: The EUT was programmed to be in continuously transmitting mode and the transmit duty cycle is not less than 98%.

Note 3: The EUT incorporates a MIMO function. Physically, the EUT provides 2 completed transmitters and 2 receivers for 2.4GHz WLAN.

Frequency	Modulation Mode	TX / RX Function
2.4GHz	802.11b	1TX / 1RX
	802.11g	1TX / 1RX
	802.11n (HT20)	1TX / 1RX or 2TX / 2RX
	802.11n (HT40)	1TX / 1RX or 2TX / 2RX

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	KDB Publication 6629911 D01 v02r01	Emission Testing of Transmitters with Multiple Outputs in the same Band(e.g., MIMO, Smart Antenna, etc)

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

No.	Section in CFR 47	Description	Result
1	15.203	Antenna Requirement	PASS
2	15.247(b)	Peak Output Power	PASS
3	15.247(a)	6dB Bandwidth	PASS
4	15.247(d)	Conducted Band Edges and Spurious Emission	PASS
5	15.247(e)	Power spectral density (PSD)	PASS
6	15.207	Conducted Emission	PASS
7	15.209 15.247(d)	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 v05r01.

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

Operating Environment	
Temperature	24℃
Humidity	57 % RH
Atmospheric Pressure	1010 mbar
Test mode:	
Continuously transmitting mode	Keeps the EUT in 100% duty cycle transmitting with modulation in SISO and MIMO mode, duty cycle factor is not required.

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:

Test Items	Mode	Data Rate	Channel
Peak Conducted Output Power Power Spectral Density 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

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation modes or test configuration modes mentioned above was evaluated respectively.

Pretest Test Mode	Description
Mode 1	TX B Mode / CH1, CH6, CH11
Mode 2	TX G Mode / CH1, CH6, CH11
Mode 3	TX N20 Mode / CH1, CH6, CH11
Mode 4	TX N40 Mode / CH3, CH6, CH9
Mode 5	TX Mode

The EUT system operated these modes were found to be the worst case during the pre-scanning test as following:

For Conducted Test	
Final Test Mode	Description
Mode 5	TX Mode

For Radiated Test	
Final Test Mode	Description
Mode 1	TX B Mode / CH1, CH6, CH11
Mode 2	TX G Mode / CH1, CH6, CH11
Mode 3	TX N20 Mode / CH1, CH6, CH11
Mode 4	TX N40 Mode / CH3, CH6, CH9

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:

Antenna	Gain(dBi)
0	2
1	2
0+1	5.01

Note: 1. for 802.11n20/n40 mode, antenna 0, 1 can transmit/receive simultaneously (MIMO mode), for 802.11b/g, both antennas 0, 1 can transmit/receive at single mode (SISO mode)

2. Directional gain = $G_{ANT} + 10 \log(N_{ANT})$ dBi

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

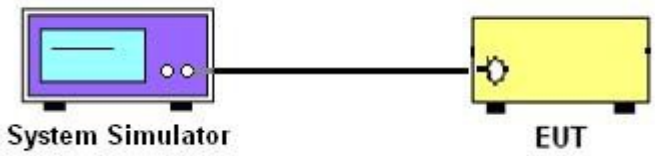
2.2.1. Limit of Peak Output Power

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 Bandwidth

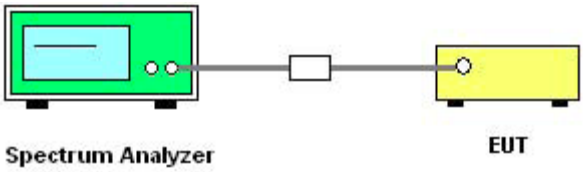
2.3.1. Limit of 6dB Bandwidth

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 v05r01.

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) = 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

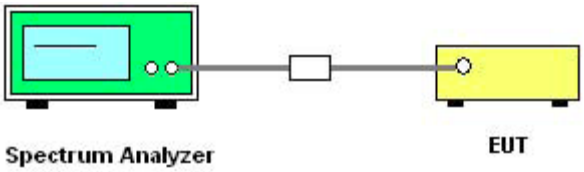
2.4.1. Limit of Conducted Band Edges and Spurious Emissions

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 v05r01.
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)

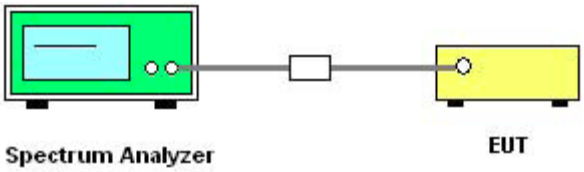
2.5.1. Limit of Power Spectral Density

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 v05r01.

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.

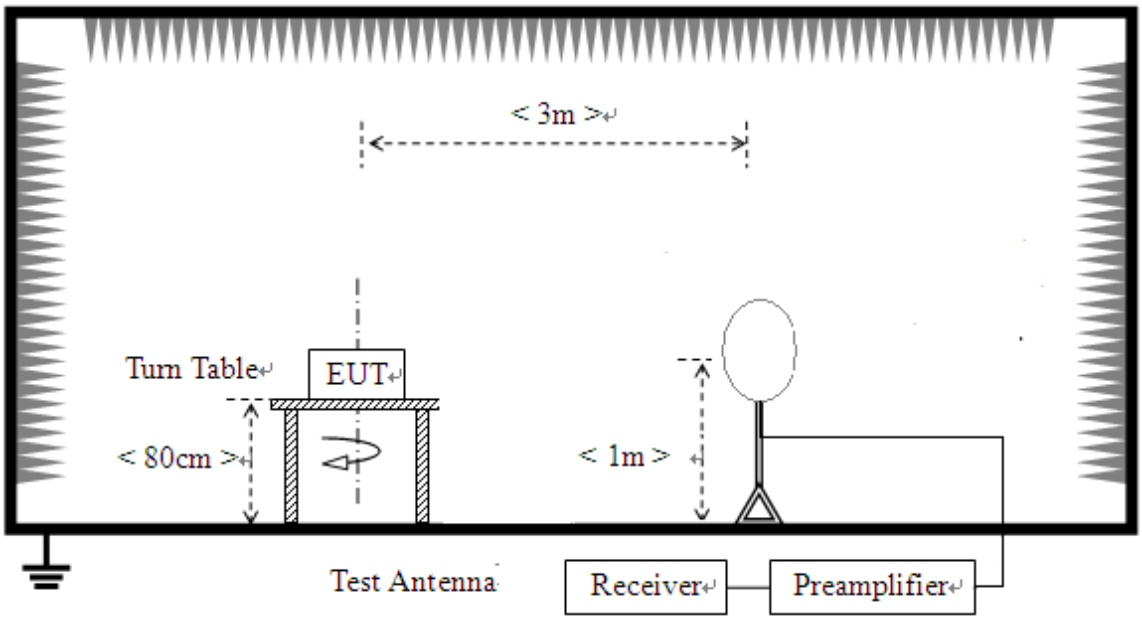
Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
Above 960	500	3

2.6.2. Measuring Instruments

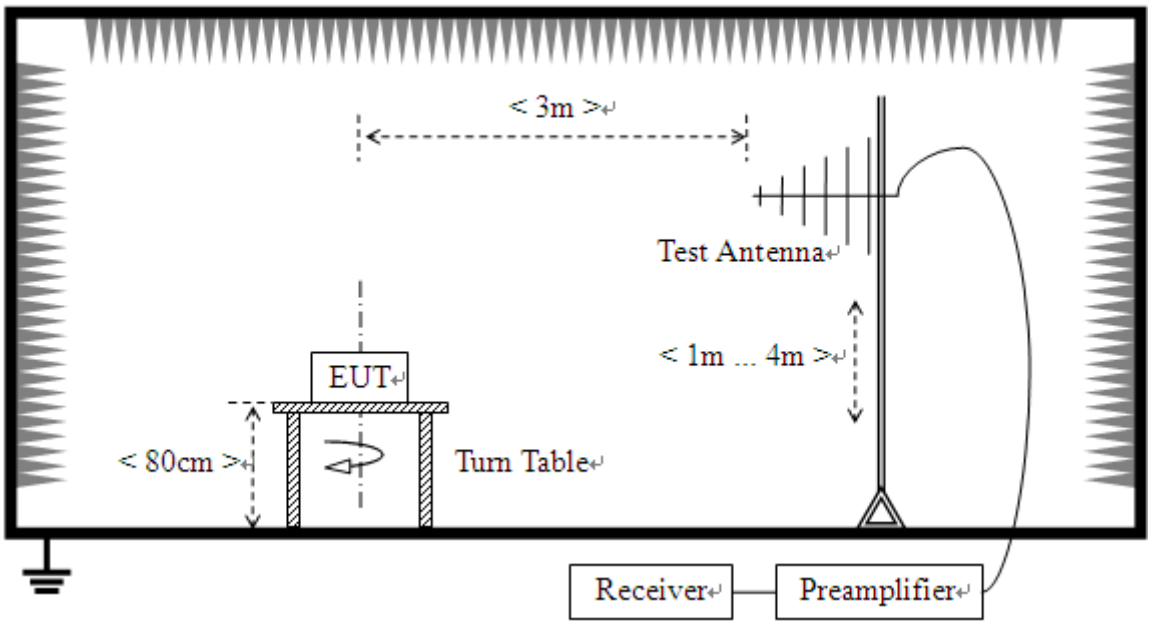
The measuring equipment is listed in the section 3 of this test report.

2.6.3. Test Setup

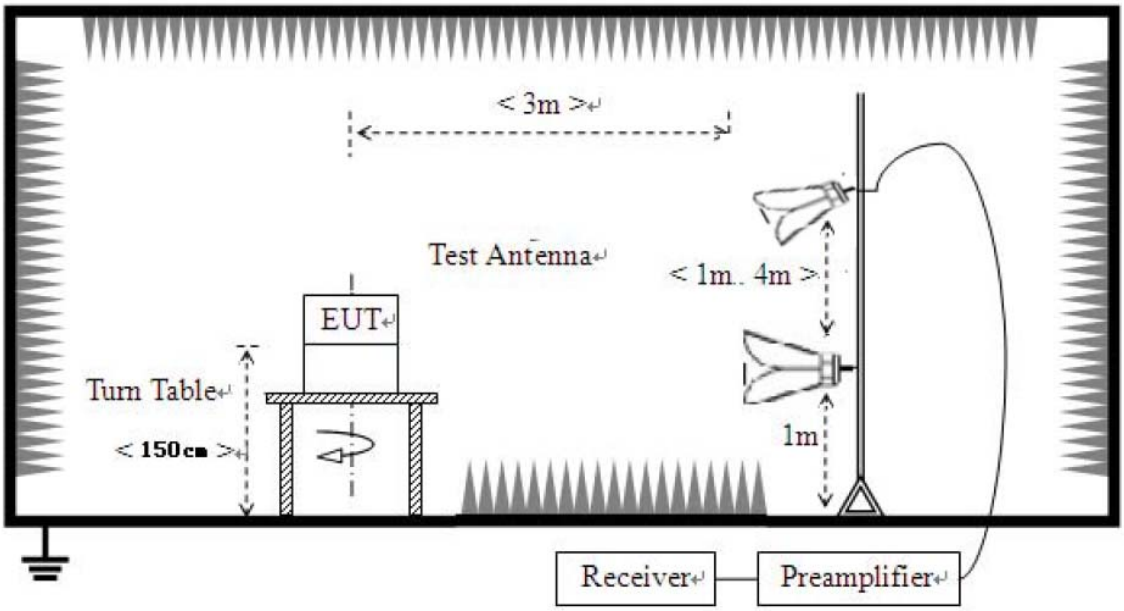
For radiated emissions from 9 KHz to 30 MHz



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:

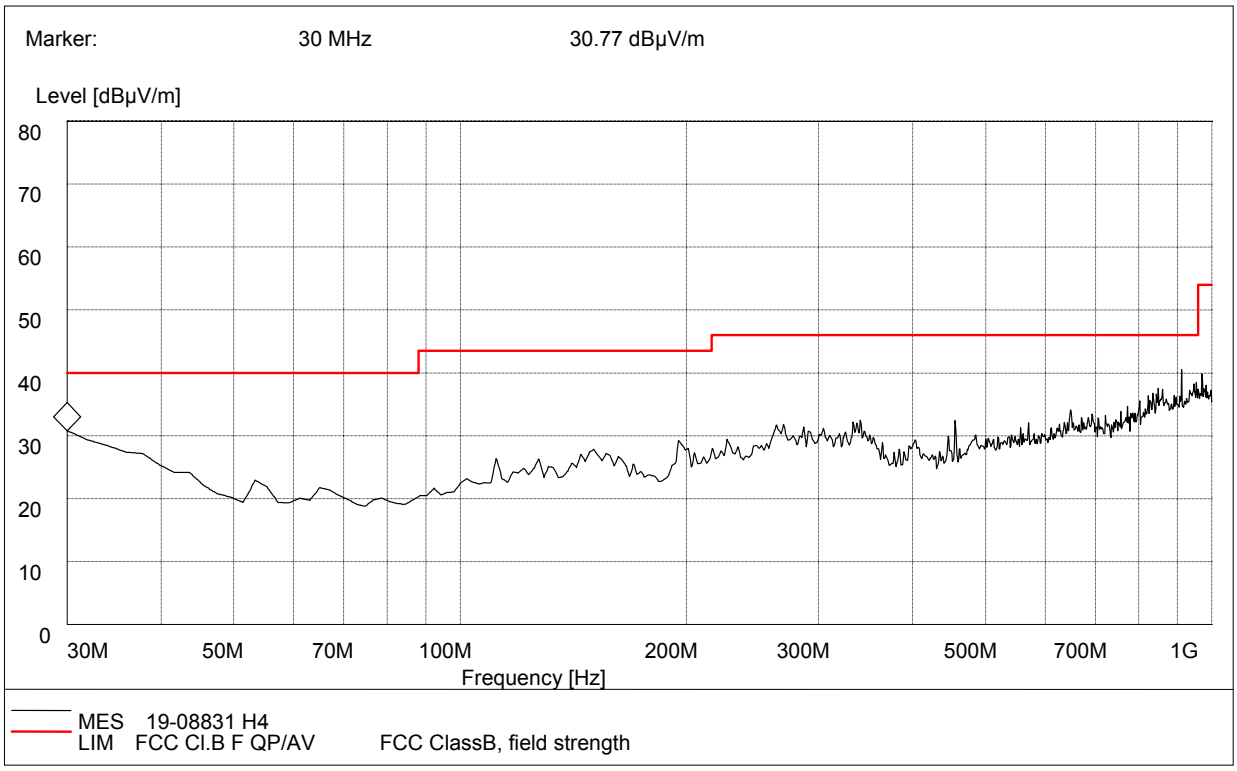
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution 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.
5.Only provide worst-case mode data at report.

2.6.5. Test Results of Radiated Band Edge and Spurious Emission

For 9 kHz to 30MHz

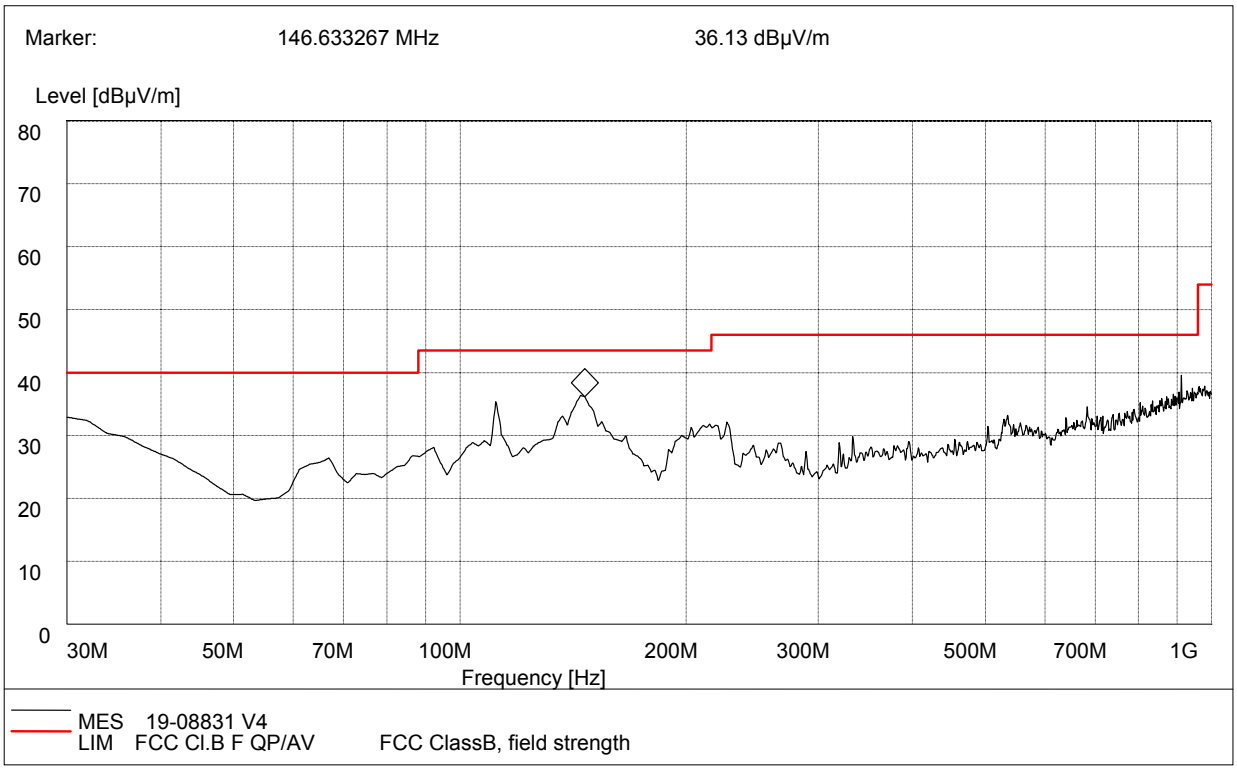
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

For 30MHz to 1000 MHz (MIMO Mode)



30MHz to 1GHz, Antenna Horizontal

Frequency (MHz)	QuasiPeak (dBµV/m)	Bandwidth (kHz)	Antenna height (cm)	Limit (dBµV/m)	Antenna	Verdict
30	30.77	120.000	100.0	40.0	H	Pass



30MHz to 1GHz, Antenna Vertical

Frequency (MHz)	QuasiPeak (dB µ V/m)	Bandwidth (kHz)	Antenna height (cm)	Limit (dB µ V/m)	Antenna	Verdict
146.633	36.13	120.000	100.0	40.0	V	Pass

For 1GHz to 25 GHz

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（802.11b_2412MHz, ANT0）												
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	49.89	PK	74.00	-24.11	1.70	280.00	48.59	5.20	28.60	32.50	1.30
2	2390.00	38.57	AV	54.00	-15.43	1.70	280.00	37.27	5.20	28.60	32.50	1.30
3	4824.00	53.32	PK	74.00	-20.68	1.70	280.00	46.92	7.40	30.40	31.40	6.40
4	4824.00	43.18	AV	54.00	-10.82	1.70	280.00	36.78	7.40	30.40	31.40	6.40
5	7236.00	54.19	PK	74.00	-19.81	1.70	280.00	43.69	11.50	31.20	32.20	10.50
6	7236.00	43.65	AV	54.00	-10.35	1.70	280.00	33.15	11.50	31.20	32.20	10.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（802.11b_2412MHz, ANT0）												
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	48.95	PK	74.00	-25.05	1.50	210.00	47.65	5.20	28.60	32.50	1.30
2	2390.00	37.28	AV	54.00	-16.72	1.50	210.00	35.98	5.20	28.60	32.50	1.30
3	4824.00	52.64	PK	74.00	-21.36	1.50	210.00	46.24	7.40	30.40	31.40	6.40
4	4824.00	42.44	AV	54.00	-11.56	1.50	210.00	36.04	7.40	30.40	31.40	6.40
5	7236.00	54.18	PK	74.00	-19.82	1.50	210.00	43.68	11.50	31.20	32.20	10.50
6	7236.00	44.06	AV	54.00	-9.94	1.50	210.00	33.56	11.50	31.20	32.20	10.50

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（802.11b_2437MHz, ANT0）												
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	51.26	PK	74.00	-22.74	2.00	280.00	44.86	6.70	30.40	31.30	6.40
2	4874.00	41.21	AV	54.00	-12.79	2.00	280.00	34.81	6.70	30.40	31.30	6.40
3	7311.00	52.78	PK	74.00	-21.22	2.00	280.00	41.98	11.80	31.20	32.20	10.80
4	7311.00	43.08	AV	54.00	-10.92	2.00	280.00	32.28	11.80	31.20	32.20	10.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（802.11b_2437MHz, ANT0）												
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	52.35	PK	74.00	-21.65	1.50	220.00	45.95	6.70	30.40	31.30	6.40
2	4874.00	42.14	AV	54.00	-11.86	1.50	220.00	35.74	6.70	30.40	31.30	6.40
3	7311.00	54.48	PK	74.00	-19.52	1.50	220.00	43.68	11.80	31.20	32.20	10.80
4	7311.00	44.68	AV	54.00	-9.32	1.50	220.00	33.88	11.80	31.20	32.20	10.80

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（802.11b_2462MHz, ANT0）												
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	49.85	PK	74.00	-24.15	1.70	280.00	48.25	5.30	28.70	32.40	1.60
2	2483.50	37.95	AV	54.00	-16.05	1.70	280.00	36.35	5.30	28.70	32.40	1.60
3	4924.00	54.84	PK	74.00	-19.16	1.70	280.00	49.14	6.70	30.50	31.50	5.70
4	4924.00	45.02	AV	54.00	-8.98	1.70	280.00	39.32	6.70	30.50	31.50	5.70
5	7386.00	56.97	PK	74.00	-17.03	1.70	280.00	46.17	11.80	31.20	32.20	10.80
6	7386.00	47.02	AV	54.00	-6.98	1.70	280.00	36.22	11.80	31.20	32.20	10.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（802.11b_2462MHz, ANT0）												
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	50.37	PK	74.00	-23.63	1.60	200.00	48.77	5.30	28.70	32.40	1.60
2	2483.50	38.95	AV	54.00	-15.05	1.60	200.00	37.35	5.30	28.70	32.40	1.60
3	4924.00	53.65	PK	74.00	-20.35	1.60	200.00	47.95	6.70	30.50	31.50	5.70
4	4924.00	43.51	AV	54.00	-10.49	1.60	200.00	37.81	6.70	30.50	31.50	5.70
5	7386.00	56.87	PK	74.00	-17.13	1.60	200.00	46.07	11.80	31.20	32.20	10.80
6	7386.00	47.09	AV	54.00	-6.91	1.60	200.00	36.29	11.80	31.20	32.20	10.80

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（802.11g_2412MHz, ANT0）												
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	50.67	PK	74.00	-23.33	1.70	300.00	49.37	5.20	28.60	32.50	1.30
2	2390.00	40.75	AV	54.00	-13.25	1.70	300.00	39.45	5.20	28.60	32.50	1.30
3	4824.00	53.98	PK	74.00	-20.02	1.70	300.00	47.58	7.40	30.40	31.40	6.40
4	4824.00	44.23	AV	54.00	-9.77	1.70	300.00	37.83	7.40	30.40	31.40	6.40
5	7236.00	54.87	PK	74.00	-19.13	1.70	300.00	44.37	11.50	31.20	32.20	10.50
6	7236.00	45.05	AV	54.00	-8.95	1.70	300.00	34.55	11.50	31.20	32.20	10.50

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（802.11g_2412MHz, ANT0）												
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	49.99	PK	74.00	-24.01	1.50	240.00	48.69	5.20	28.60	32.50	1.30
2	2390.00	37.48	AV	54.00	-16.52	1.50	240.00	36.18	5.20	28.60	32.50	1.30
3	4824.00	54.41	PK	74.00	-19.59	1.50	240.00	48.01	7.40	30.40	31.40	6.40
4	4824.00	44.77	AV	54.00	-9.23	1.50	240.00	38.37	7.40	30.40	31.40	6.40
5	7236.00	56.24	PK	74.00	-17.76	1.50	240.00	46.04	11.50	31.20	32.20	10.20
6	7236.00	46.26	AV	54.00	-7.74	1.50	240.00	36.06	11.50	31.20	32.20	10.20

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（802.11g_2437MHz, ANT0）												
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	49.68	PK	74.00	-24.32	1.50	290.00	43.88	6.70	30.40	31.30	5.80
2	4874.00	40.61	AV	54.00	-13.39	1.50	290.00	34.81	6.70	30.40	31.30	5.80
3	7311.00	53.31	PK	74.00	-20.69	1.50	290.00	42.51	11.80	31.20	32.20	10.80
4	7311.00	44.14	AV	54.00	-9.86	1.50	290.00	33.34	11.80	31.20	32.20	10.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（802.11g_2437MHz, ANT0）												
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	52.98	PK	74.00	-21.02	1.40	280.00	47.18	6.70	30.40	31.30	5.80
2	4874.00	44.83	AV	54.00	-9.17	1.40	280.00	39.03	6.70	30.40	31.30	5.80
3	7311.00	54.47	PK	74.00	-19.53	1.40	280.00	43.67	11.80	31.20	32.20	10.80
4	7311.00	45.22	AV	54.00	-8.78	1.40	280.00	34.42	11.80	31.20	32.20	10.80

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（802.11g_2462MHz, ANT0）												
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	52.36	PK	74.00	-21.64	1.20	265.00	50.76	5.30	28.70	32.40	1.60
2	2483.50	41.00	AV	54.00	-13.00	1.20	265.00	39.40	5.30	28.70	32.40	1.60
3	4924.00	53.98	PK	74.00	-20.02	1.20	265.00	48.28	6.70	30.50	31.50	5.70
4	4924.00	44.88	AV	54.00	-9.12	1.20	265.00	39.18	6.70	30.50	31.50	5.70
5	7386.00	54.18	PK	74.00	-19.82	1.20	265.00	43.38	11.80	31.20	32.20	10.80
6	7386.00	45.73	AV	54.00	-8.27	1.20	265.00	34.93	11.80	31.20	32.20	10.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（802.11g_2462MHz, ANT0）												
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	53.32	PK	74.00	-20.68	1.40	260.00	51.72	5.30	28.70	32.40	1.60
2	2483.50	41.09	AV	54.00	-12.91	1.40	260.00	39.49	5.30	28.70	32.40	1.60
3	4924.00	53.56	PK	74.00	-20.44	1.40	260.00	47.86	6.70	30.50	31.50	5.70
4	4924.00	43.26	AV	54.00	-10.74	1.40	260.00	37.56	6.70	30.50	31.50	5.70
5	7386.00	55.19	PK	74.00	-18.81	1.40	250.00	44.39	11.80	31.20	32.20	10.80
6	7386.00	45.99	AV	54.00	-8.01	1.80	250.00	35.19	11.80	31.20	32.20	10.80

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（802.11n20_2412MHz, MIMO）												
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	54.25	PK	74.00	-19.75	1.70	280.00	52.95	5.20	28.60	32.50	1.30
2	2390.00	42.39	AV	54.00	-11.61	1.70	280.00	41.09	5.20	28.60	32.50	1.30
3	4824.00	53.29	PK	74.00	-20.71	1.70	280.00	46.89	7.40	30.40	31.40	6.40
4	4824.00	43.30	AV	54.00	-10.70	1.70	280.00	36.90	7.40	30.40	31.40	6.40
5	7236.00	54.18	PK	74.00	-19.82	1.70	280.00	43.68	11.50	31.20	32.20	10.50
6	7236.00	44.17	AV	54.00	-9.83	1.70	280.00	33.67	11.50	31.20	32.20	10.50

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（802.11n20_2412MHz, MIMO）												
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	53.29	PK	74.00	-20.71	1.60	250.00	51.99	5.20	28.60	32.50	1.30
2	2390.00	40.78	AV	54.00	-13.22	1.60	250.00	39.48	5.20	28.60	32.50	1.30
3	4824.00	53.86	PK	74.00	-20.14	1.60	250.00	47.46	7.40	30.40	31.40	6.40
4	4824.00	45.51	AV	54.00	-8.49	1.60	250.00	39.11	7.40	30.40	31.40	6.40
5	7236.00	54.87	PK	74.00	-19.13	1.60	250.00	44.37	11.50	31.20	32.20	10.50
6	7236.00	42.32	AV	54.00	-11.68	1.60	250.00	31.82	11.50	31.20	32.20	10.50

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（802.11n20_2437MHz, MIMO）												
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	53.28	PK	74.00	-20.72	2.00	320.00	47.48	6.70	30.40	31.30	5.80
2	4874.00	43.03	AV	54.00	-10.97	2.00	320.00	37.23	6.70	30.40	31.30	5.80
3	7311.00	54.19	PK	74.00	-19.81	2.00	320.00	43.39	11.80	31.20	32.20	10.80
4	7311.00	45.83	AV	54.00	-8.17	2.00	320.00	35.03	11.80	31.20	32.20	10.80

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（802.11n20_2437MHz, MIMO）												
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	53.97	PK	74.00	-20.03	1.80	270.00	47.57	6.70	31.20	31.50	6.40
2	4874.00	45.70	AV	54.00	-8.30	1.80	270.00	39.30	6.70	31.20	31.50	6.40
3	7311.00	54.18	PK	74.00	-19.82	1.80	270.00	43.38	11.80	31.20	32.20	10.80
4	7311.00	42.68	AV	54.00	-11.32	1.80	270.00	31.88	11.80	31.20	32.20	10.80

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（802.11n20_2462MHz, MIMO）												
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	55.94	PK	74.00	-18.06	1.50	260.00	54.34	5.30	28.70	32.40	1.60
2	2483.50	43.65	AV	54.00	-10.35	1.50	260.00	42.05	5.30	28.70	32.40	1.60
3	4924.00	52.67	PK	74.00	-21.33	1.50	260.00	46.97	6.70	30.50	31.50	5.70
4	4924.00	41.32	AV	54.00	-12.68	1.50	260.00	35.62	6.70	30.50	31.50	5.70
5	7386.00	54.44	PK	74.00	-19.56	1.50	260.00	43.64	11.80	31.20	32.20	10.80
6	7386.00	46.19	AV	54.00	-7.81	1.50	260.00	35.39	11.80	31.20	32.20	10.80

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（802.11n20_2462MHz, MIMO）												
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	56.94	PK	74.00	-17.06	1.50	220.00	55.34	5.30	28.70	32.40	1.60
2	2483.50	45.19	AV	54.00	-8.81	1.50	220.00	43.59	5.30	28.70	32.40	1.60
3	4924.00	53.48	PK	74.00	-20.52	1.50	220.00	47.78	6.70	30.50	31.50	5.70
4	4924.00	45.09	AV	54.00	-8.91	1.50	220.00	39.39	6.70	30.50	31.50	5.70
5	7386.00	55.94	PK	74.00	-18.06	2.00	220.00	45.14	11.80	31.20	32.20	10.80
6	7386.00	47.12	AV	54.00	-6.88	1.50	220.00	36.32	11.80	31.20	32.20	10.80

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（802.11n40_2422MHz, MIMO）												
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	49.98	PK	74.00	-24.02	1.40	290.00	48.68	5.20	28.60	32.50	1.30
2	2390.00	37.58	AV	54.00	-16.42	1.40	290.00	36.28	5.20	28.60	32.50	1.30
3	4844.00	53.64	PK	74.00	-20.36	1.40	290.00	47.24	7.40	30.40	31.40	6.40
4	4844.00	45.50	AV	54.00	-8.50	1.40	290.00	39.10	7.40	30.40	31.40	6.40
5	7266.00	55.19	PK	74.00	-18.81	1.40	290.00	44.69	11.50	31.20	32.20	10.50
6	7266.00	45.65	AV	54.00	-8.35	1.40	290.00	35.15	11.50	31.20	32.20	10.50

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（802.11n40_2422MHz, MIMO）												
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	52.15	PK	74.00	-21.85	1.50	330.00	50.85	5.20	28.60	32.50	1.30
2	2390.00	41.19	AV	54.00	-12.81	1.50	330.00	39.89	5.20	28.60	32.50	1.30
3	4824.00	53.68	PK	74.00	-20.32	1.50	330.00	47.28	7.40	30.40	31.40	6.40
4	4824.00	45.39	AV	54.00	-8.61	1.50	330.00	38.99	7.40	30.40	31.40	6.40
5	7266.00	52.97	PK	74.00	-21.03	1.50	330.00	42.47	11.50	31.20	32.20	10.50
6	7266.00	44.62	AV	54.00	-9.38	1.50	330.00	34.12	11.50	31.20	32.20	10.50

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（802.11n40_2437MHz, MIMO）												
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	53.69	PK	74.00	-20.31	1.60	270.00	47.29	6.70	31.20	31.50	6.40
2	4874.00	45.26	AV	54.00	-8.74	1.60	270.00	38.86	6.70	31.20	31.50	6.40
3	7311.00	54.74	PK	74.00	-19.26	1.60	270.00	43.94	11.80	31.20	32.20	10.80
4	7311.00	46.54	AV	54.00	-7.46	1.60	270.00	35.74	11.80	31.20	32.20	10.80

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（802.11n40_2437MHz, MIMO）												
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	52.22	PK	74.00	-21.78	1.50	260.00	45.82	6.70	31.20	31.50	6.40
2	4874.00	43.99	AV	54.00	-10.01	1.50	260.00	37.59	6.70	31.20	31.50	6.40
3	7311.00	53.26	PK	74.00	-20.74	1.50	260.00	42.46	11.80	31.20	32.20	10.80
4	7311.00	45.18	AV	54.00	-8.82	1.50	260.00	34.38	11.80	31.20	32.20	10.80

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M（802.11n40_2452MHz, MIMO）												
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	54.44	PK	74.00	-19.56	1.60	330.00	52.84	5.30	28.70	32.40	1.60
2	2483.50	43.17	AV	54.00	-10.83	1.60	330.00	41.57	5.30	28.70	32.40	1.60
3	4904.00	52.68	PK	74.00	-21.32	1.60	330.00	46.98	6.70	30.50	31.50	5.70
4	4904.00	44.56	AV	54.00	-9.44	1.60	330.00	38.86	6.70	30.50	31.50	5.70
5	7356.00	54.10	PK	74.00	-19.90	1.60	330.00	43.30	11.80	31.20	32.20	10.80
6	7356.00	43.80	AV	54.00	-10.20	1.60	330.00	33.00	11.80	31.20	32.20	10.80

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M（802.11n40_2452MHz, MIMO）												
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	53.88	PK	74.00	-20.12	1.50	270.00	52.28	5.30	28.70	32.40	1.60
2	2483.50	42.28	AV	54.00	-11.72	1.50	270.00	40.68	5.30	28.70	32.40	1.60
3	4904.00	53.62	PK	74.00	-20.38	1.50	270.00	47.92	6.70	30.50	31.50	5.70
4	4904.00	45.27	AV	54.00	-8.73	1.50	270.00	39.57	6.70	30.50	31.50	5.70
5	7356.00	54.87	PK	74.00	-19.13	1.50	270.00	44.07	11.80	31.20	32.20	10.80
6	7356.00	46.88	AV	54.00	-7.12	1.50	270.00	36.08	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

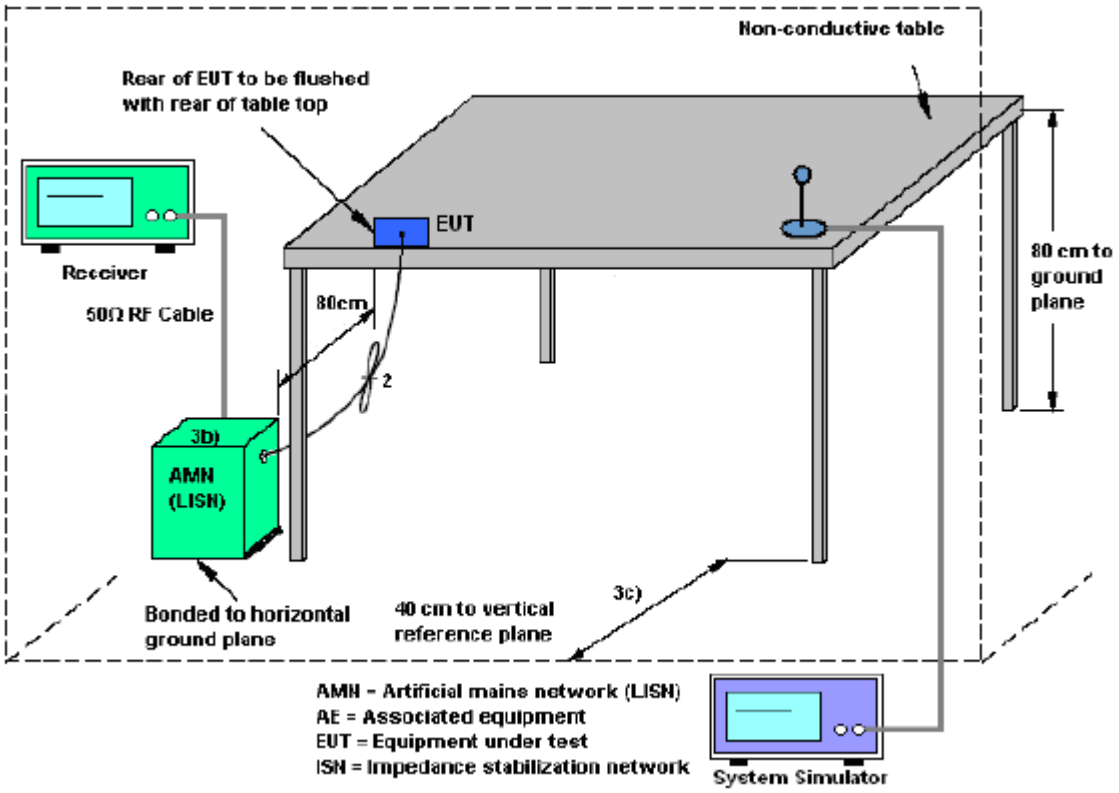
For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

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

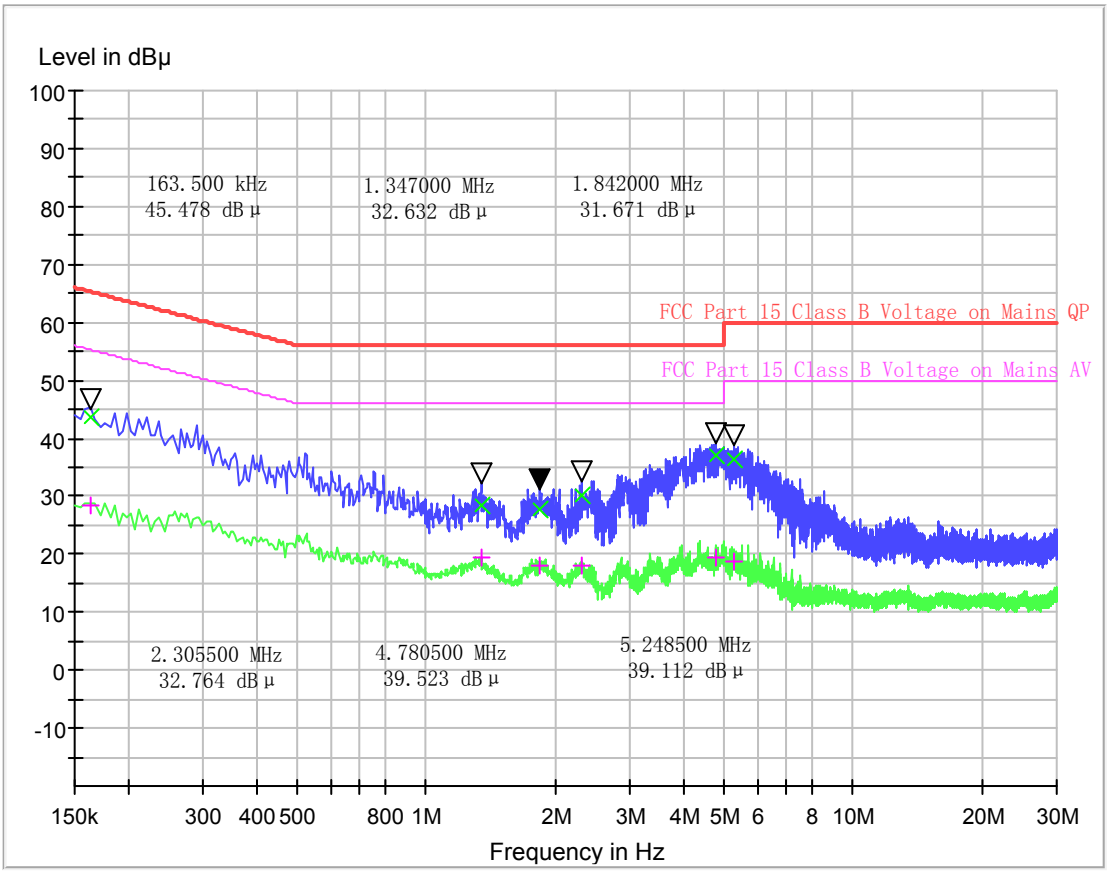


2.7.4. Test Procedures

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.

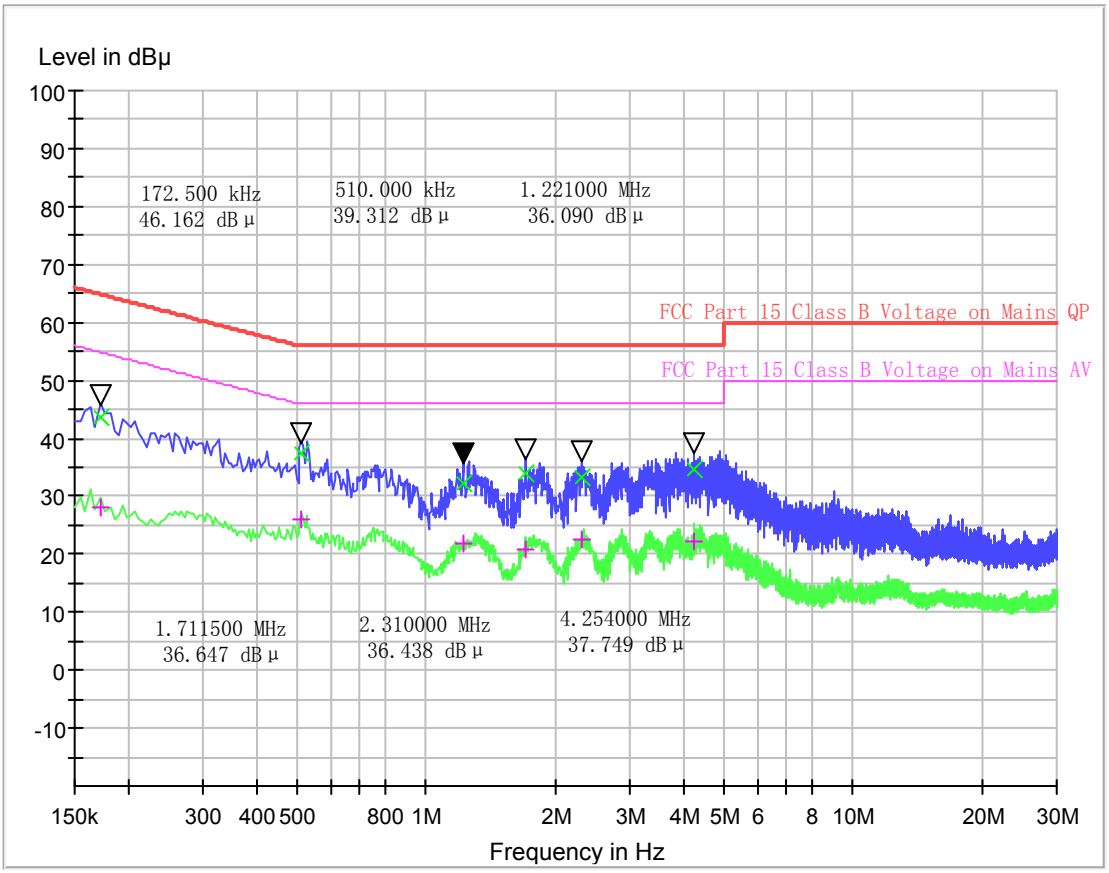
2.7.5. Test Results of Conducted Emission

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)**	**Frequency (MHz)**	**Limits (dBµV)**	**Measurement Value (dBµV)**
0.163500	65.3	43.54	0.163500	55.3	28.32
1.347000	56.0	28.56	1.347000	46.0	19.31
1.842000	56.0	27.73	1.842000	46.0	18.13
2.305500	56.0	30.16	2.305500	46.0	18.00
4.780500	56.0	36.93	4.780500	46.0	19.53
5.248500	60.0	36.26	5.248500	50.0	18.85



(Plot B: N Phase)

Conducted Disturbance at Mains Terminals					
N Test Data					
QP			**AV**		
Frequency (MHz)	**Limits (dBµV)**	**Measurement Value (dBµV)**	**Frequency (MHz)**	**Limits (dBµV)**	**Measurement Value (dBµV)**
0.172500	64.8	43.49	0.172500	54.8	28.05
0.510000	56.0	37.47	0.510000	46.0	26.09
1.221000	56.0	32.18	1.221000	46.0	21.81
1.711500	56.0	33.93	1.711500	46.0	20.90
2.310000	56.0	33.11	2.310000	46.0	22.45
4.254000	56.0	34.47	4.254000	46.0	22.09

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	TURNTABLE	ETS	2088	2149	N/A	N/A
3	ANTENNA MAST	ETS	2075	2346	N/A	N/A
4	EMI TEST Software	R&S	ESK1	N/A	N/A	N/A
5	Horn antenna (18GHz~26.5GHz)	AR	AT4002A	305753	2017.11.10	2020.11.09
6	Amplifer	MILMEGA	80RF1000-250	A140901925	2017.10.09	2020.10.08
7	JS amplifer	AR	25S1G4AM1	A0304248	2017.10.09	2020.10.08
8	High pass filter	Compliance Direction systems	BSU-6	34202	2018.11.11	2019.11.10
9	Horn Antenna	ShwarzBeck	9120D	1012	2018.11.11	2019.11.10
13	Horn Antenna	ShwarzBeck	BBHA9170	25841	2018.11.11	2019.11.10
14	ULTRA-BROADBAND ANTENNA	R&S	HL562	A0304224	2017.07.14	2020.07.13
15	Passive Loop Antenna	R&S	HFH2-Z2	100047	2019.04.26	2022.04.25
16	Temperature chamber	Dongguan gaoda instrument CO.LTD	GD-7005-100	130130101	2019.04.22	2020.04.21
17	Spectrum Analyzer	Keysight	N9030A	A160702554	2018.11.15	2019.11.14
18	Power Supply	R&S	NGMO1	101037	2018.08.06	2019.08.05

The calibration interval was one year.

Appendix A

RF Output Power

Test Result and Data

802.11b Test mode conducted output power

Channel	Frequency (MHz)	Output Power(dBm)		Limits (dBm)	Result
		Ant. 0	Ant. 1		
1	2412	16.25	17.77	30	PASS
6	2437	16.77	17.88	30	PASS
11	2462	17.05	17.89	30	PASS

802.11g Test mode conducted output power

Channel	Frequency (MHz)	Output Power(dBm)		Limits (dBm)	Result
		Ant. 0	Ant. 1		
1	2412	14.66	16.14	30	PASS
6	2437	15.03	16.11	30	PASS
11	2462	15.39	16.26	30	PASS

802.11n-20MHz Test mode conducted output power

Channel	Frequency (MHz)	Output Power(dBm)			Limits (dBm)	Result
		Ant. 0	Ant. 1	Ant. 0+1		
1	2412	10.89	12.06	14.52	30	PASS
6	2437	11.20	12.18	14.73	30	PASS
11	2462	11.49	12.18	14.86	30	PASS

802.11n-40MHz Test mode conducted output power

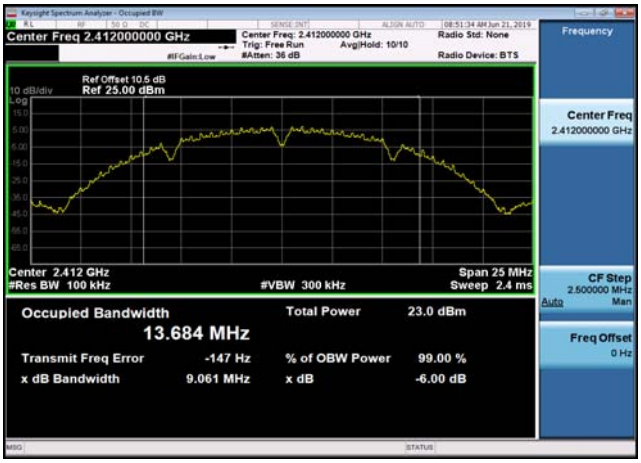
Channel	Frequency (MHz)	Output Power(dBm)			Limits (dBm)	Result
		Ant. 0	Ant. 1	Ant. 0+1		
3	2422	11.22	12.10	14.69	30	PASS
6	2437	11.36	12.17	14.79	30	PASS
9	2452	11.59	12.19	14.91	30	PASS

6dB Bandwidth

Test Result and Data

WLAN Occupied 6dB Bandwidth				
Mode	Test Frequency (MHz)	Ant	Occupied Bandwidth (MHz)	Result
802.11b	2412	Ant0	9.06	Pass
802.11b	2412	Ant1	8.57	Pass
802.11b	2437	Ant0	9.05	Pass
802.11b	2437	Ant1	9.09	Pass
802.11b	2462	Ant0	8.58	Pass
802.11b	2462	Ant1	9.56	Pass
802.11g	2412	Ant0	15.14	Pass
802.11g	2412	Ant1	15.14	Pass
802.11g	2437	Ant0	15.14	Pass
802.11g	2437	Ant1	15.14	Pass
802.11g	2462	Ant0	15.14	Pass
802.11g	2462	Ant1	15.14	Pass
802.11n (HT20)	2412	Ant0	15.14	Pass
802.11n (HT20)	2412	Ant1	15.14	Pass
802.11n (HT20)	2437	Ant0	15.14	Pass
802.11n (HT20)	2437	Ant1	15.14	Pass
802.11n (HT20)	2462	Ant0	15.14	Pass
802.11n (HT20)	2462	Ant1	15.14	Pass
802.11n (HT40)	2422	Ant0	35.15	Pass
802.11n (HT40)	2422	Ant1	35.16	Pass
802.11n (HT40)	2437	Ant0	35.15	Pass
802.11n (HT40)	2437	Ant1	35.16	Pass
802.11n (HT40)	2452	Ant0	35.15	Pass
802.11n (HT40)	2452	Ant1	35.16	Pass

6dB Bandwidth-802.11b,2412MHz,Ant0

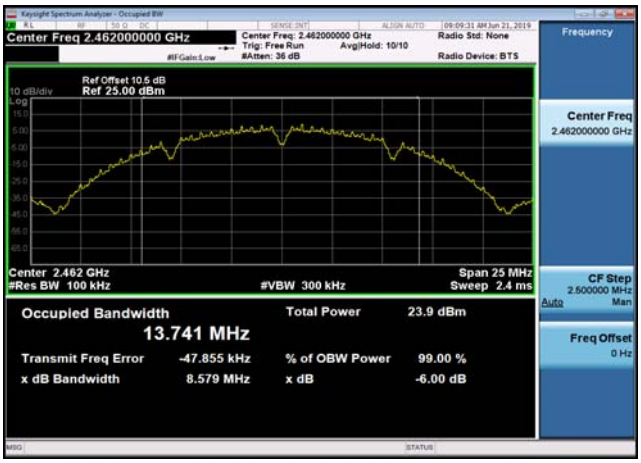


6dB Bandwidth-802.11b,2412MHz,Ant1

6dB Bandwidth-802.11b,2437MHz,Ant0

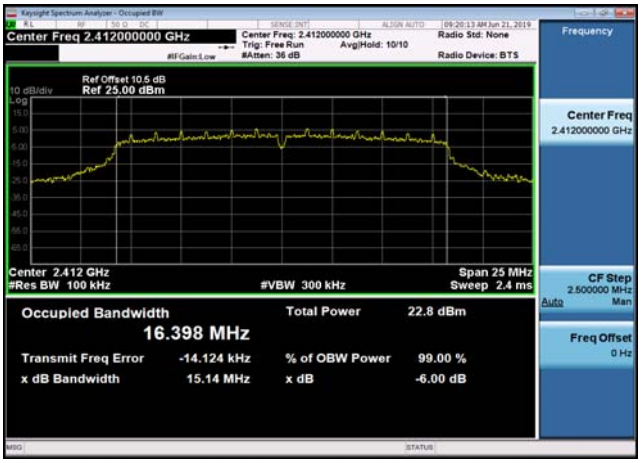
6dB Bandwidth-802.11b,2437MHz,Ant1

6dB Bandwidth-802.11b,2462MHz,Ant0

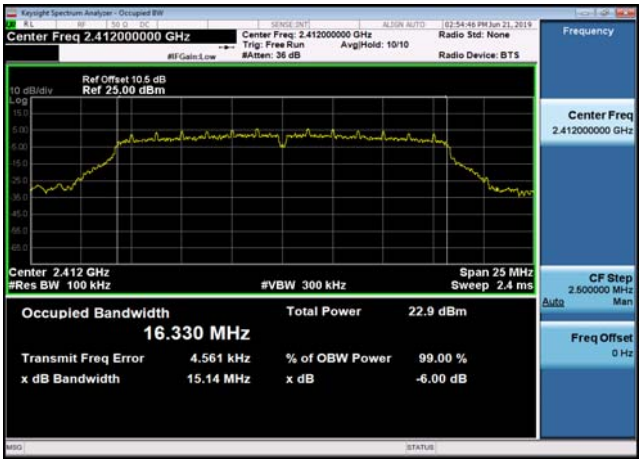


6dB Bandwidth-802.11b,2462MHz,Ant1

6dB Bandwidth-802.11g,2412MHz,Ant0

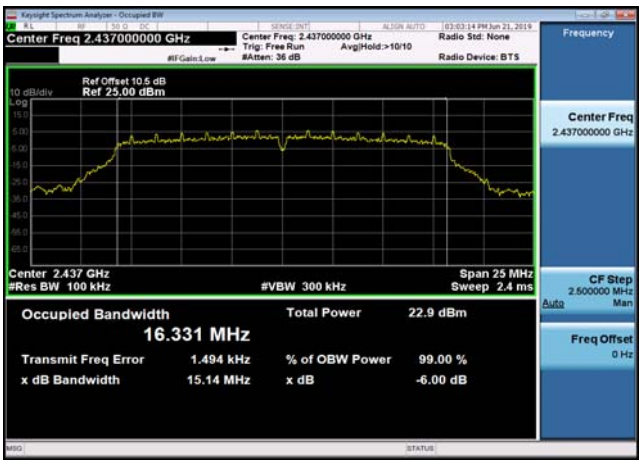


6dB Bandwidth-802.11g,2412MHz,Ant1

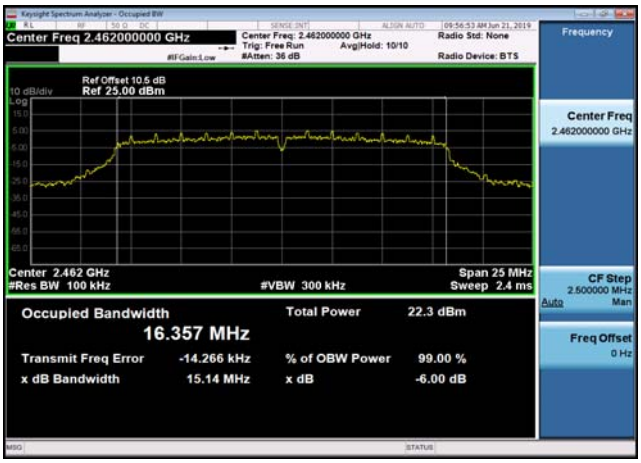


6dB Bandwidth-802.11g,2437MHz,Ant0

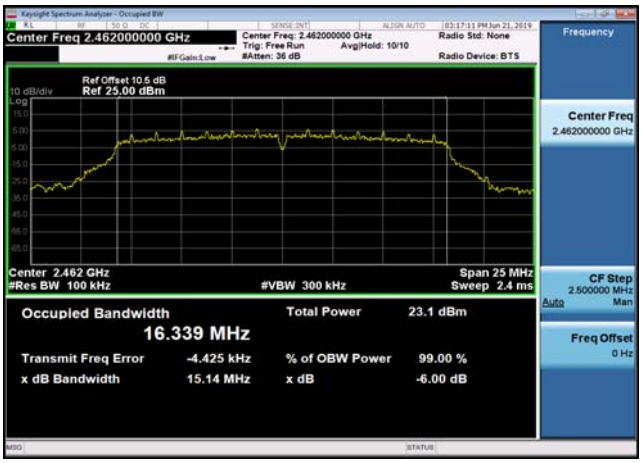
6dB Bandwidth-802.11g,2437MHz,Ant1



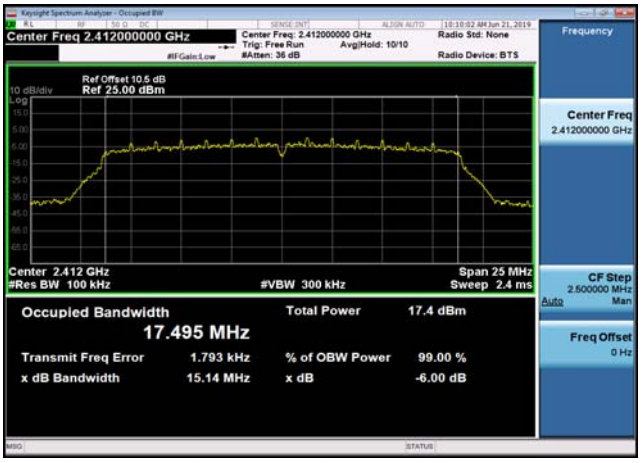
6dB Bandwidth-802.11g,2462MHz,Ant0



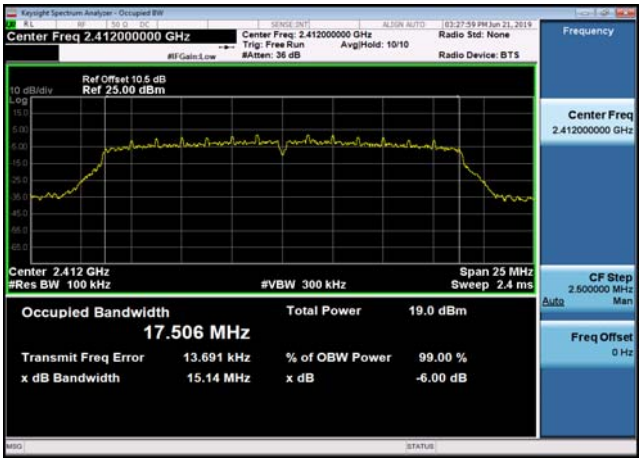
6dB Bandwidth-802.11g,2462MHz,Ant1



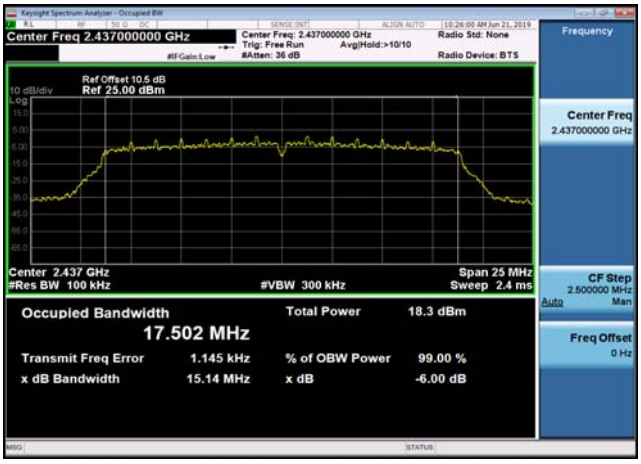
6dB Bandwidth-802.11n(HT20),2412MHz ,Ant0



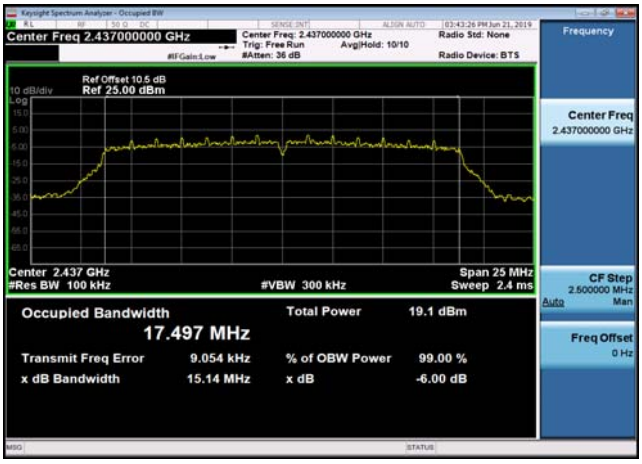
6dB Bandwidth-802.11n(HT20),2412MHz ,Ant1



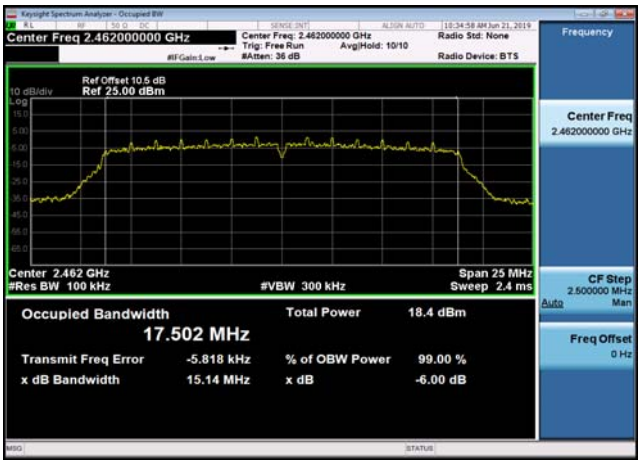
6dB Bandwidth-802.11n(HT20),2437MHz ,Ant0



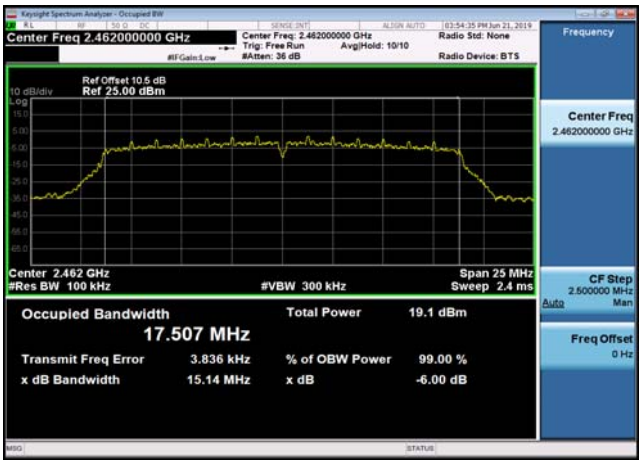
6dB Bandwidth-802.11n(HT20),2437MHz ,Ant1



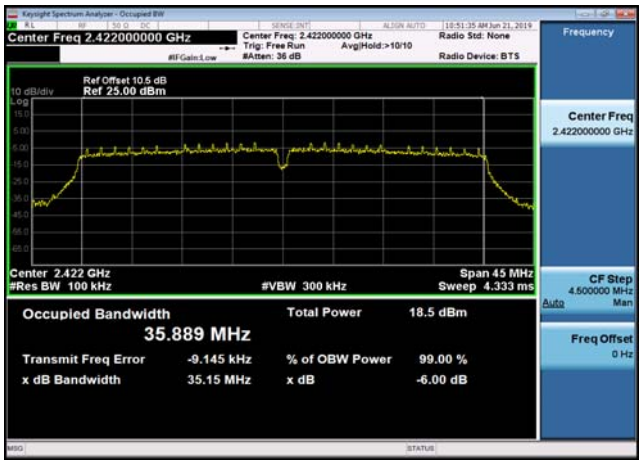
6dB Bandwidth-802.11n(HT20),2462MHz ,Ant0



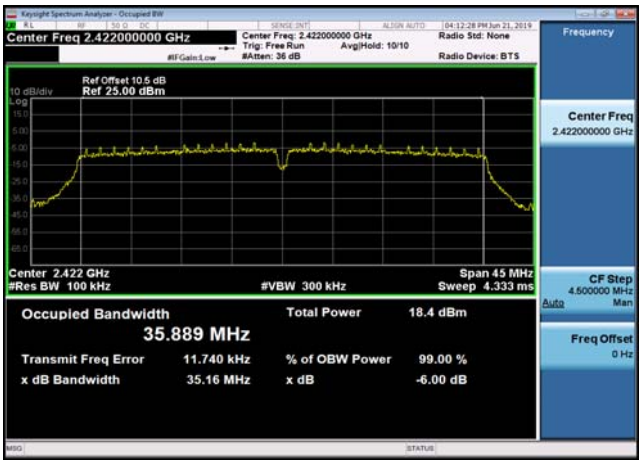
6dB Bandwidth-802.11n(HT20),2462MHz ,Ant1



6dB Bandwidth-802.11n(HT40),2422MHz ,Ant0

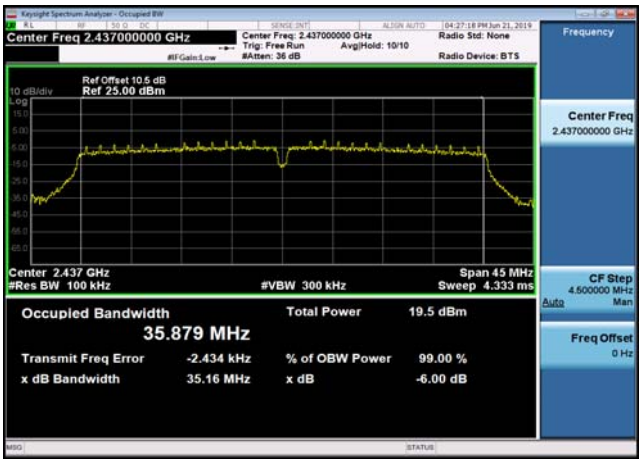


6dB Bandwidth-802.11n(HT40),2422MHz ,Ant1



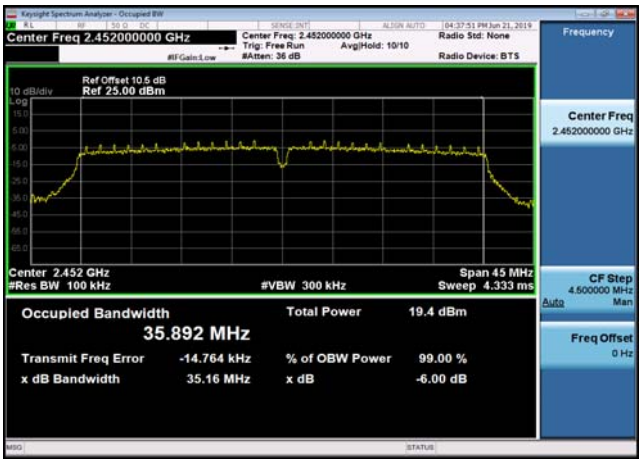
6dB Bandwidth-802.11n(HT40),2437MHz ,Ant0

6dB Bandwidth-802.11n(HT40),2437MHz ,Ant1



6dB Bandwidth-802.11n(HT40),2452MHz ,Ant0

6dB Bandwidth-802.11n(HT40),2452MHz ,Ant1



Power Spectral Density

Test Result and Data

Power Spectral Density						
Mode	Ant	Test Frequency (MHz)	PSD (dBm/3KHz)	RBW (kHz)	Limit (dBm/3KHz)	Result
802.11b	Ant0	2412	-15.848	3	8	Pass
802.11b	Ant1	2412	-13.745	3	8	Pass
802.11b	Ant0	2437	-15.469	3	8	Pass
802.11b	Ant1	2437	-14.389	3	8	Pass
802.11b	Ant0	2462	-15.167	3	8	Pass
802.11b	Ant1	2462	-14.381	3	8	Pass
802.11g	Ant0	2412	-18.954	3	8	Pass
802.11g	Ant1	2412	-17.659	3	8	Pass
802.11g	Ant0	2437	-18.828	3	8	Pass
802.11g	Ant1	2437	-17.672	3	8	Pass
802.11g	Ant0	2462	-18.212	3	8	Pass
802.11g	Ant1	2462	-17.493	3	8	Pass
802.11n (HT20)	Ant0	2412	-23.204	3	8	Pass
802.11n (HT20)	Ant1	2412	-21.958	3	8	Pass
802.11n (HT20)	Ant0	2437	-22.791	3	8	Pass
802.11n (HT20)	Ant1	2437	-21.759	3	8	Pass
802.11n (HT20)	Ant0	2462	-22.524	3	8	Pass
802.11n (HT20)	Ant1	2462	-21.873	3	8	Pass
802.11n (HT40)	Ant0	2422	-25.857	3	8	Pass
802.11n (HT40)	Ant1	2422	-24.959	3	8	Pass
802.11n (HT40)	Ant0	2437	-25.716	3	8	Pass
802.11n (HT40)	Ant1	2437	-25.064	3	8	Pass
802.11n (HT40)	Ant0	2452	-25.463	3	8	Pass
802.11n (HT40)	Ant1	2452	-24.991	3	8	Pass
802.11n (HT20)	MIMO	2412	-19.53	3	8	Pass
802.11n (HT20)		2437	-19.23	3	8	Pass
802.11n (HT20)		2462	-19.18	3	8	Pass
802.11n (HT40)		2422	-22.37	3	8	Pass
802.11n (HT40)		2437	-22.37	3	8	Pass

802.11n (HT40)		2452	-22.21	3	8	Pass

Power spectral density-802.11b ,2412MHz,Ant0

Power spectral density-802.11b ,2412MHz,Ant1

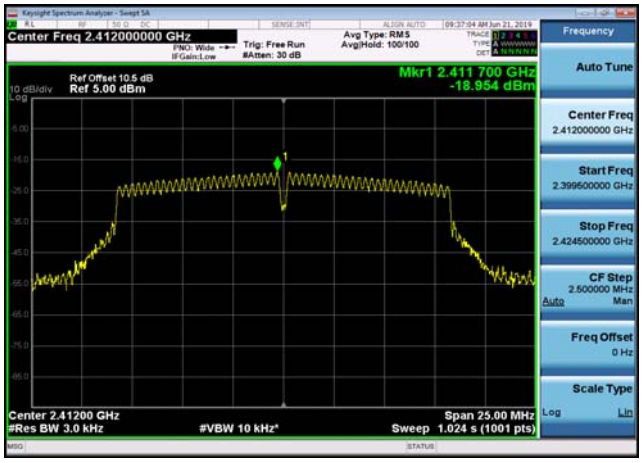
Power spectral density-802.11b ,2437MHz,Ant0

Power spectral density-802.11b ,2437MHz,Ant1

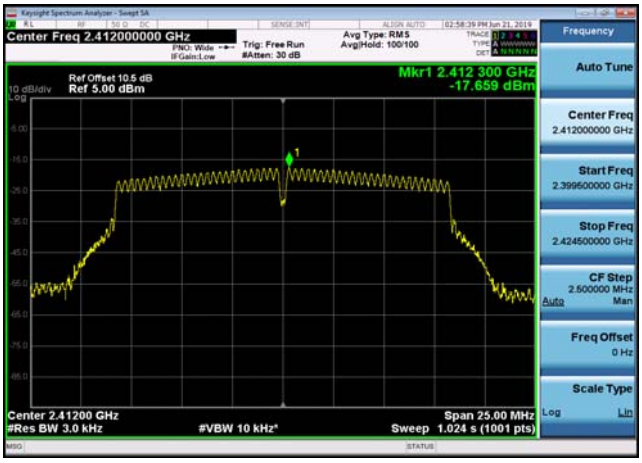
Power spectral density-802.11b ,2462MHz,Ant0

Power spectral density-802.11b ,2462MHz,Ant1

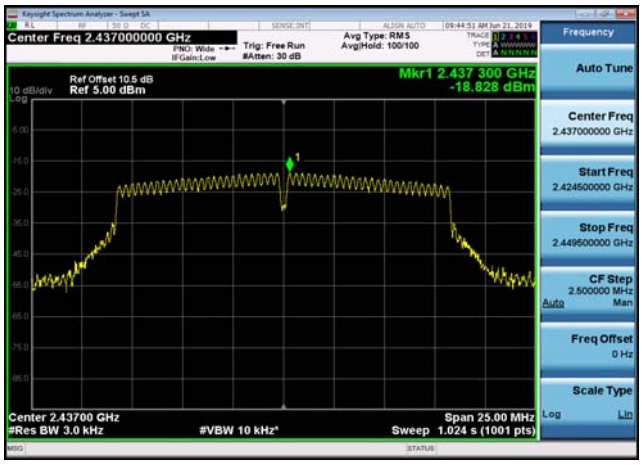
Power spectral density-802.11g ,2412MHz,Ant0



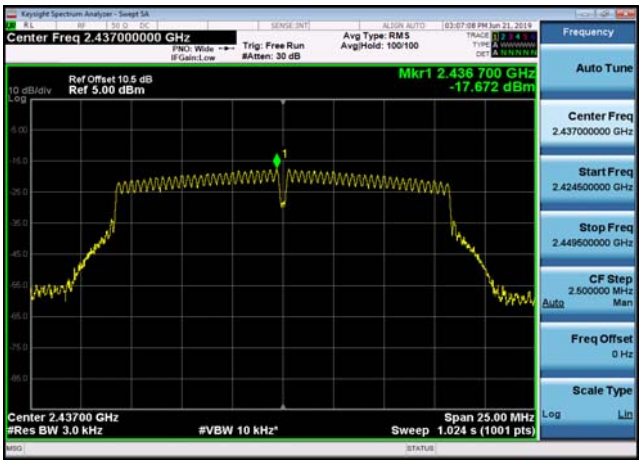
Power spectral density-802.11g ,2412MHz,Ant1



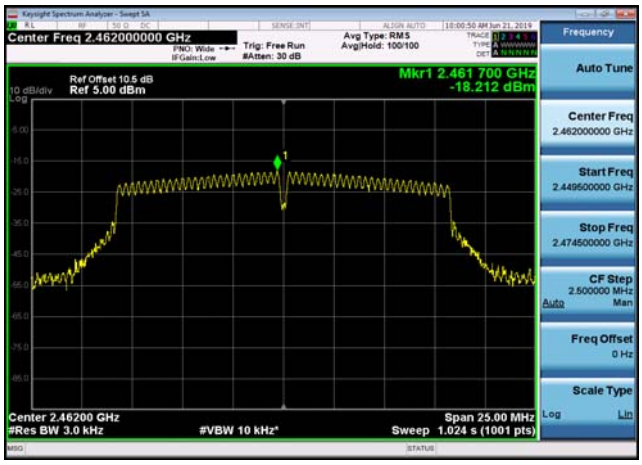
Power spectral density-802.11g ,2437MHz,Ant0



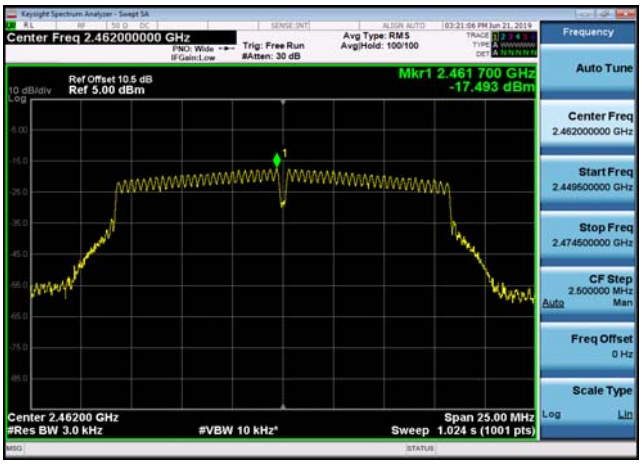
Power spectral density-802.11g ,2437MHz,Ant1



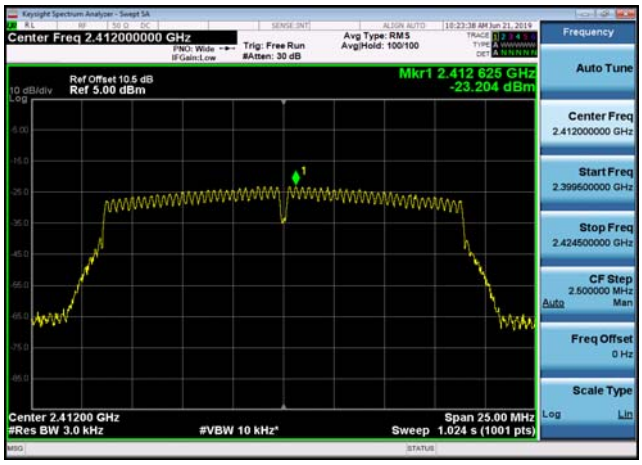
Power spectral density-802.11g ,2462MHz,Ant0



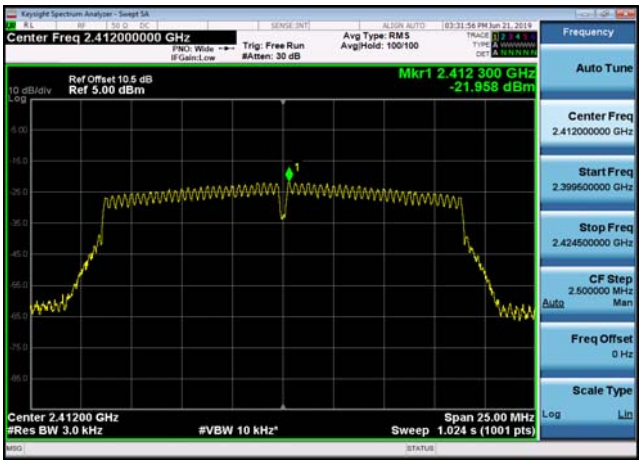
Power spectral density-802.11g ,2462MHz,Ant1



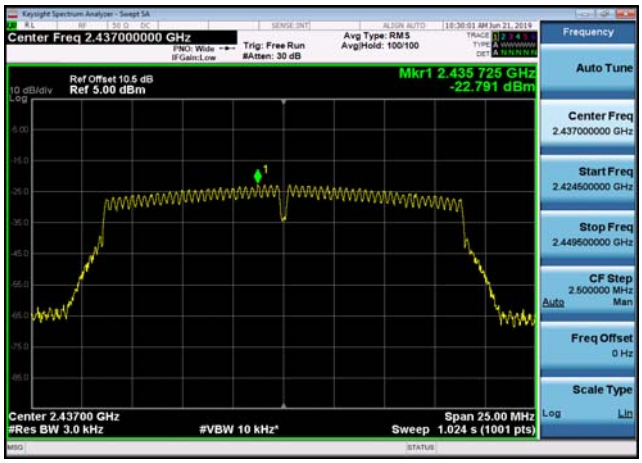
Power spectral density-802.11n(HT20) ,2412MHz,Ant0



Power spectral density-802.11n(HT20) ,2412MHz,Ant1

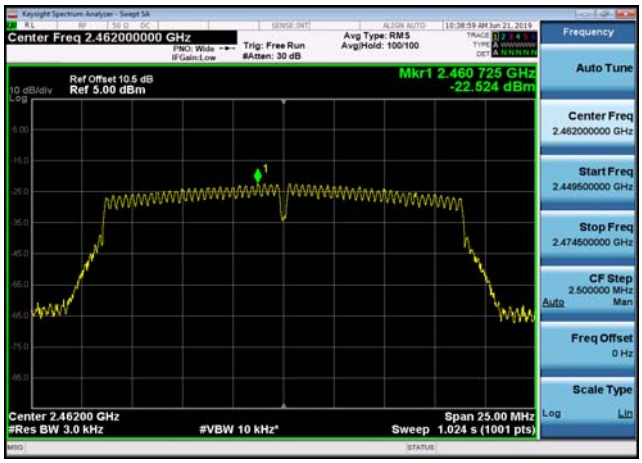


Power spectral density-802.11n(HT20) ,2437MHz,Ant0



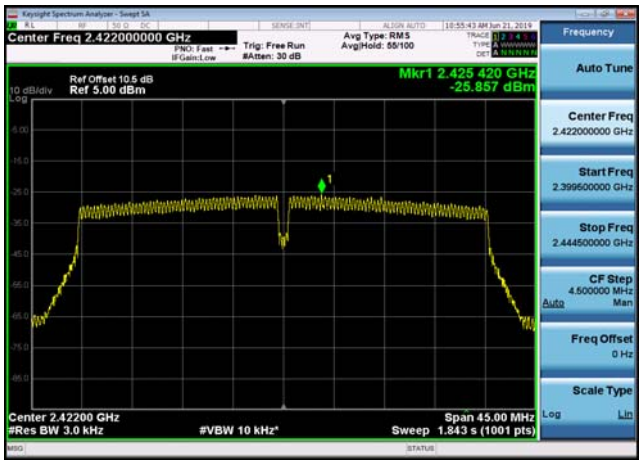
Power spectral density-802.11n(HT20) ,2437MHz,Ant1

Power spectral density-802.11n(HT20) ,2462MHz,Ant0

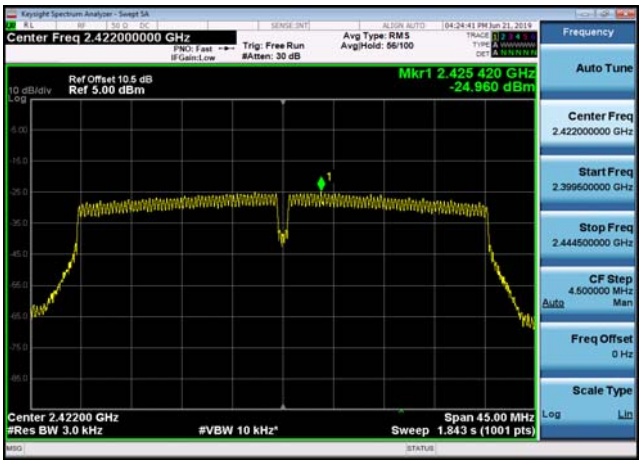


Power spectral density-802.11n(HT20) ,2462MHz,Ant1

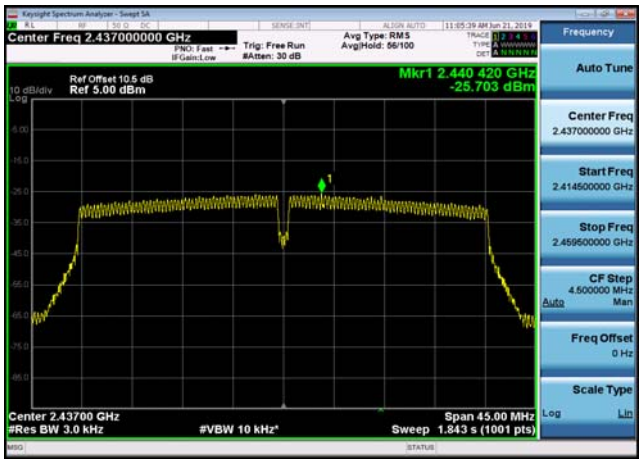
Power spectral density-802.11n(HT40) ,2422MHz,Ant0



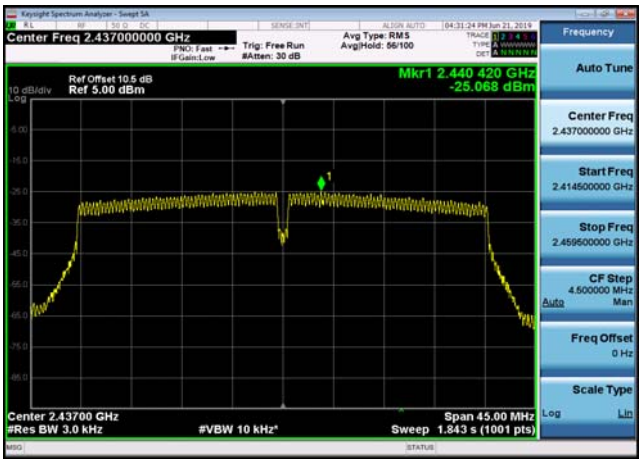
Power spectral density-802.11n(HT40) ,2422MHz,Ant1



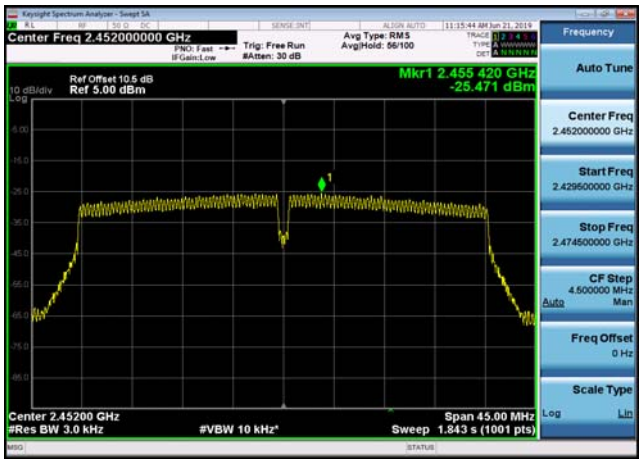
Power spectral density-802.11n(HT40) ,2437MHz,Ant0



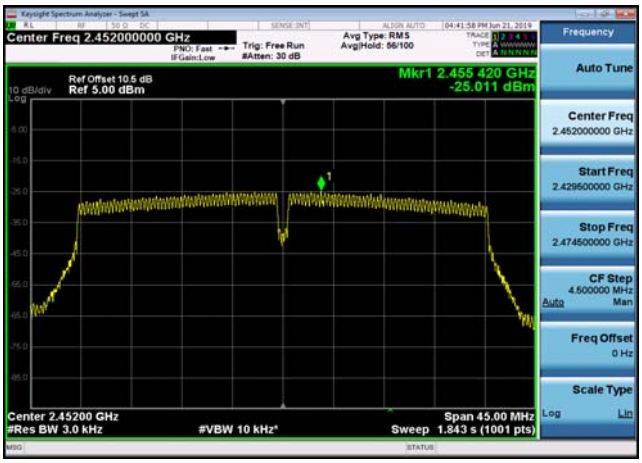
Power spectral density-802.11n(HT40) ,2437MHz,Ant1



Power spectral density-802.11n(HT40) ,2452MHz,Ant0

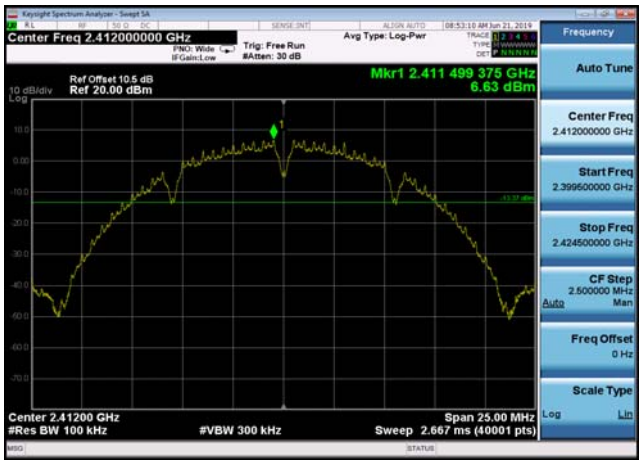
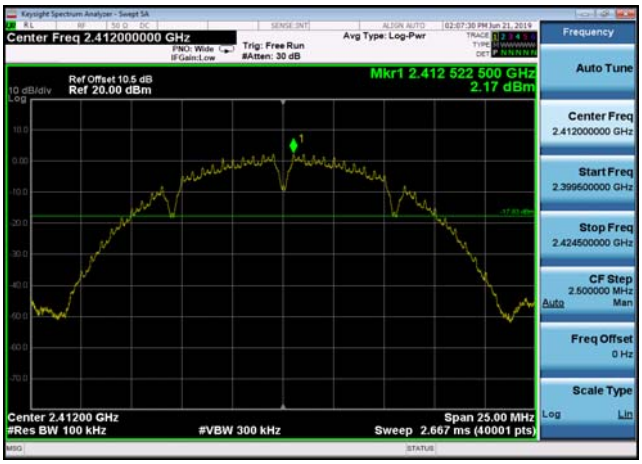
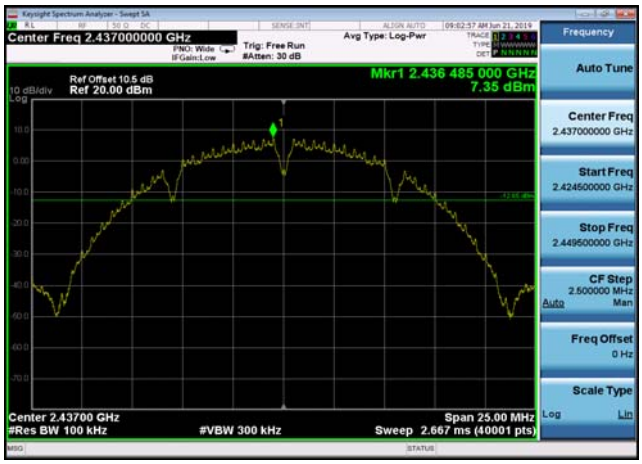
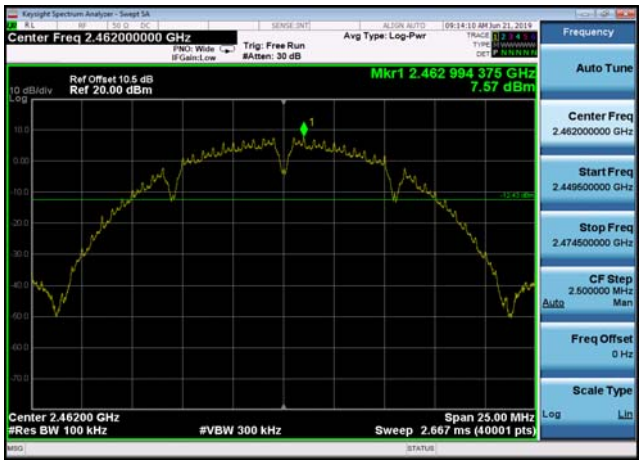


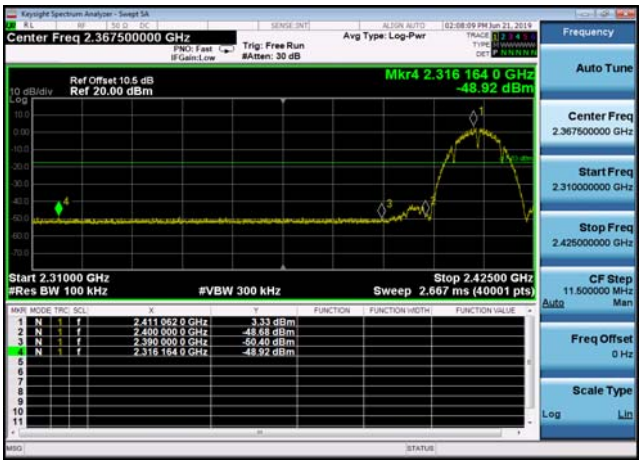
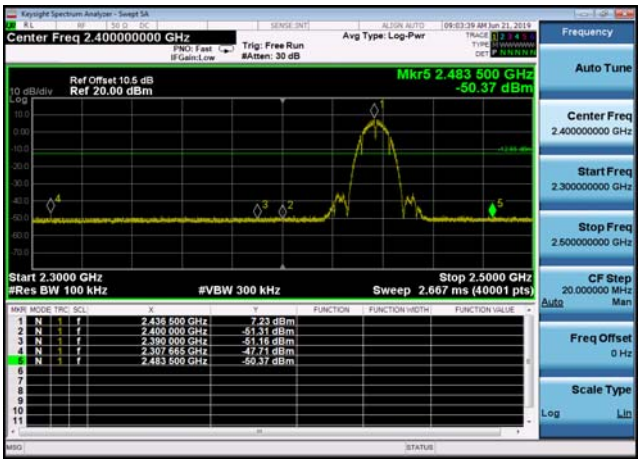
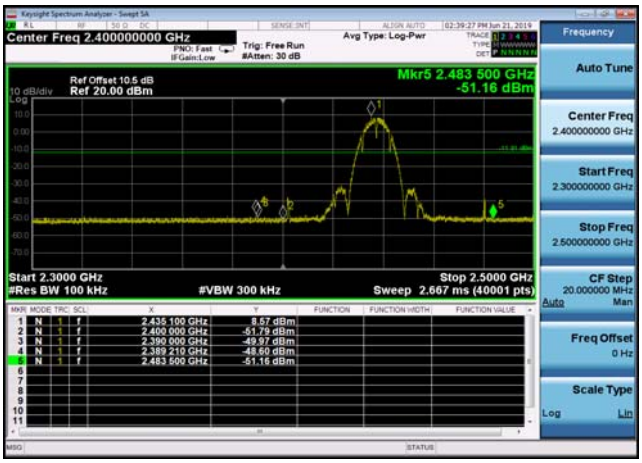
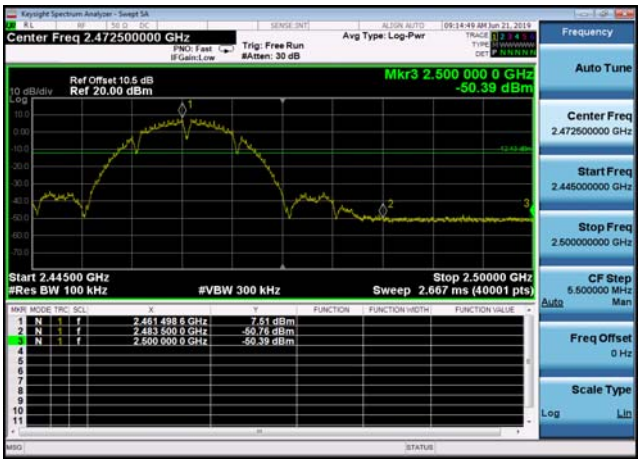
Power spectral density-802.11n(HT40) ,2452MHz,Ant1

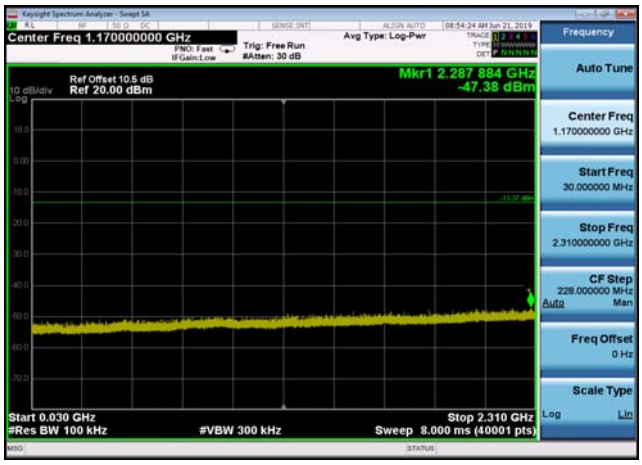
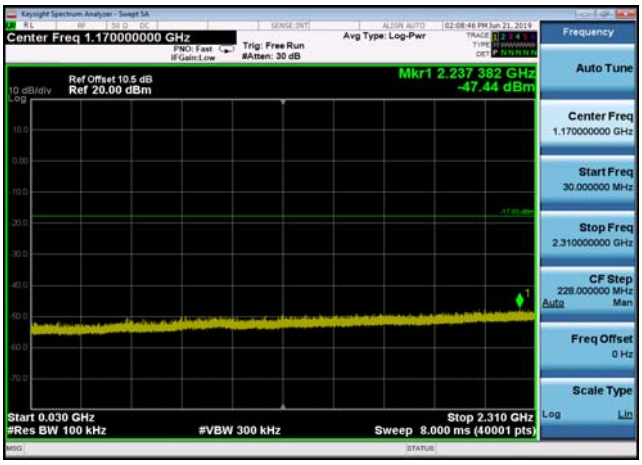
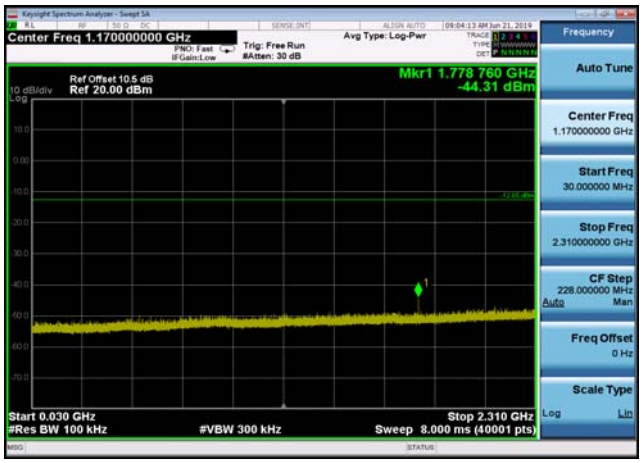
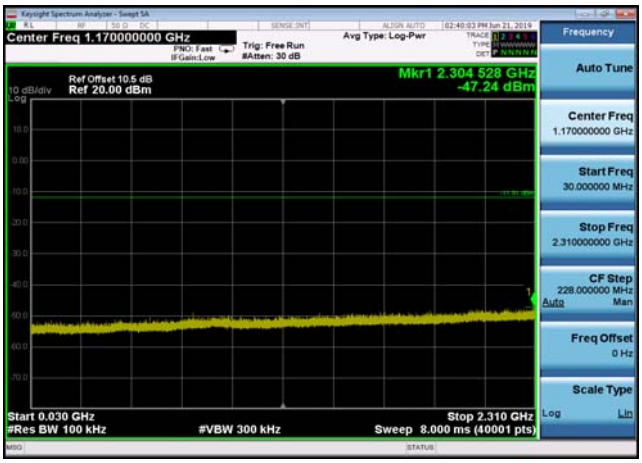
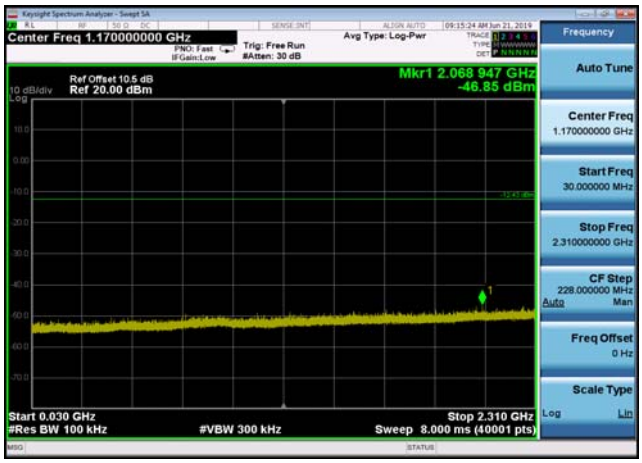
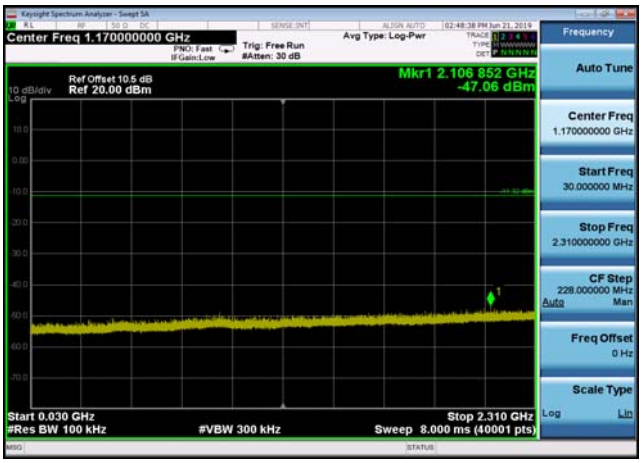


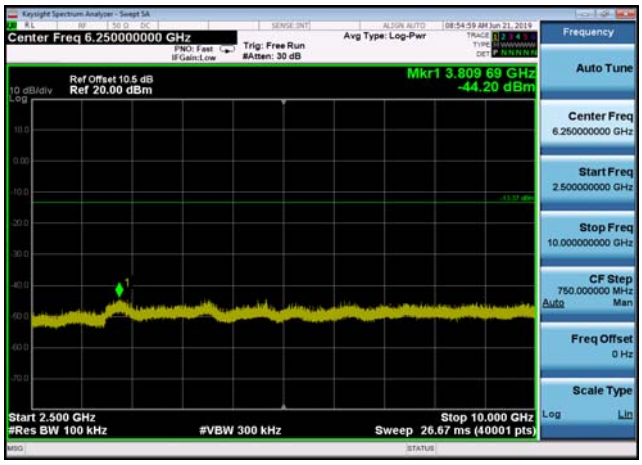
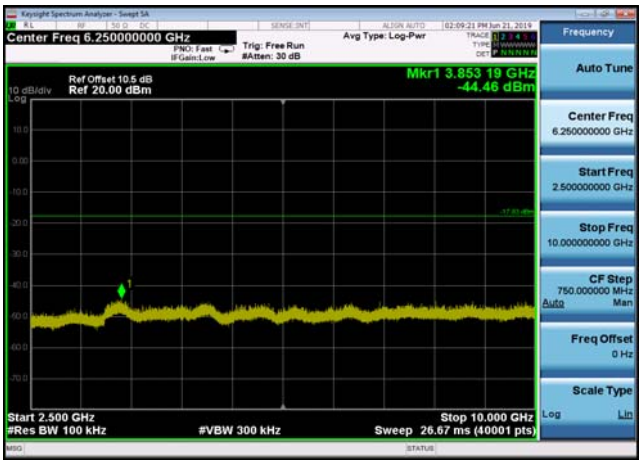
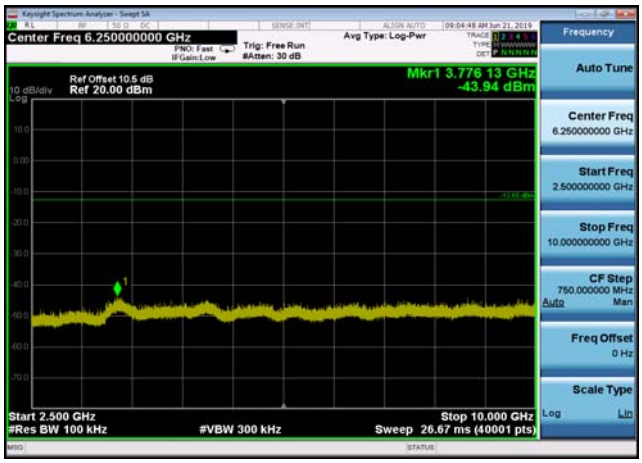
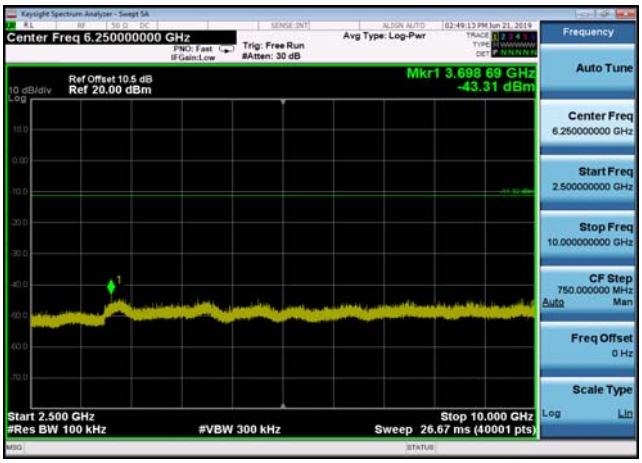
Conducted Band Edges and Spurious Emissions

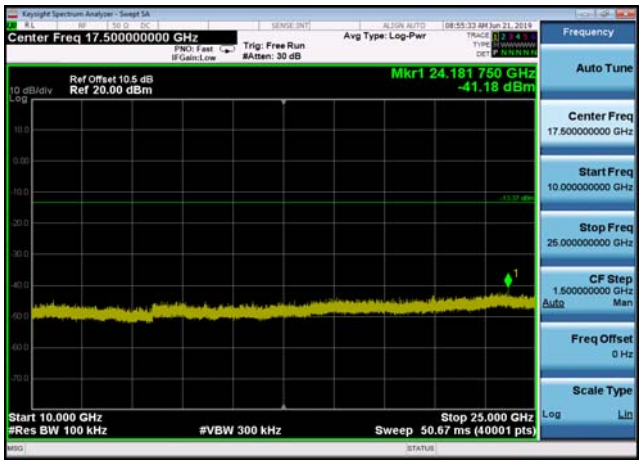
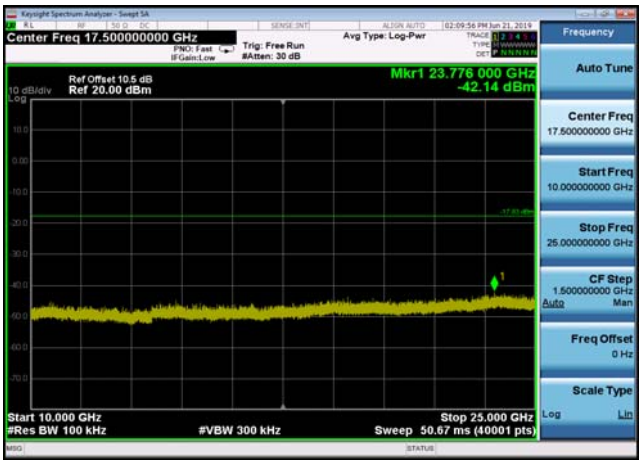
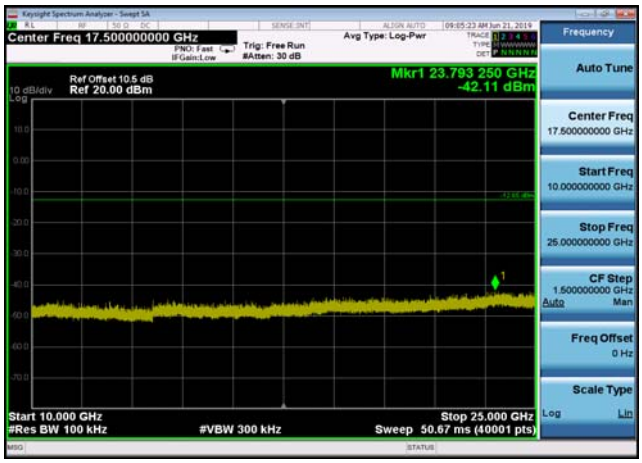
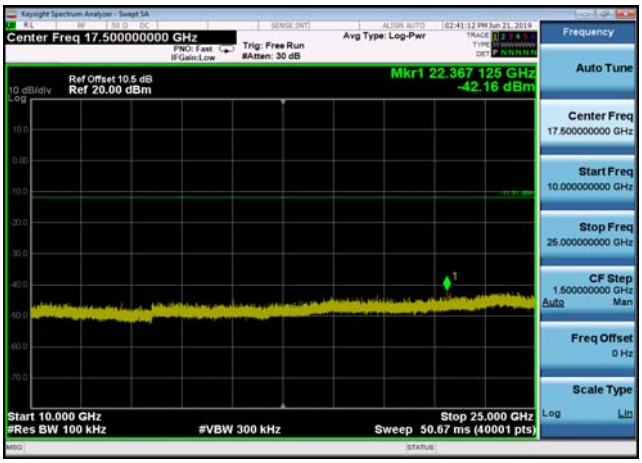
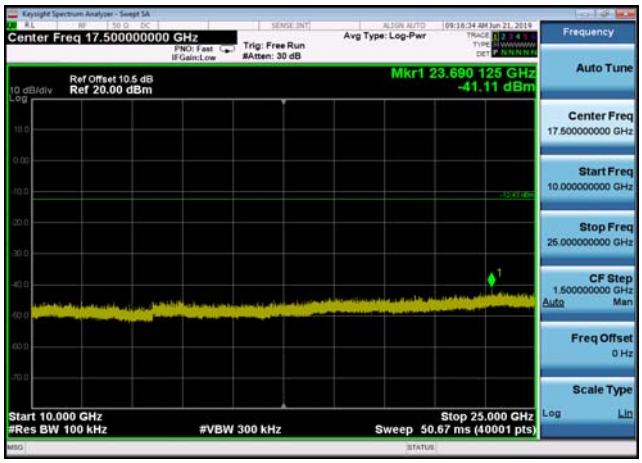
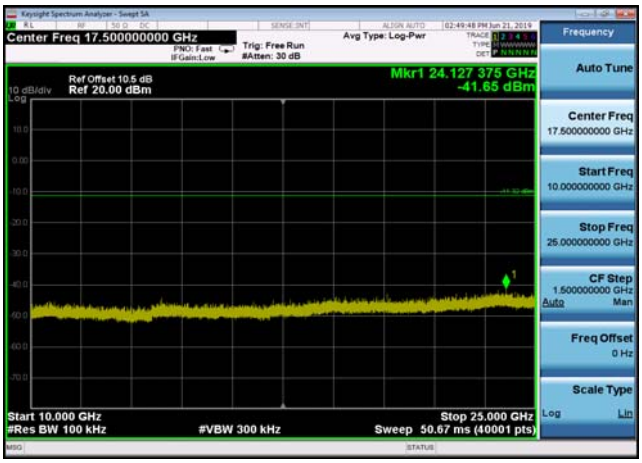
Test Result and Data

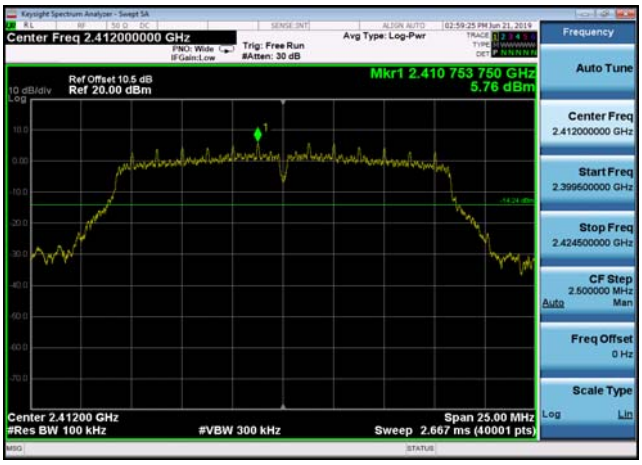
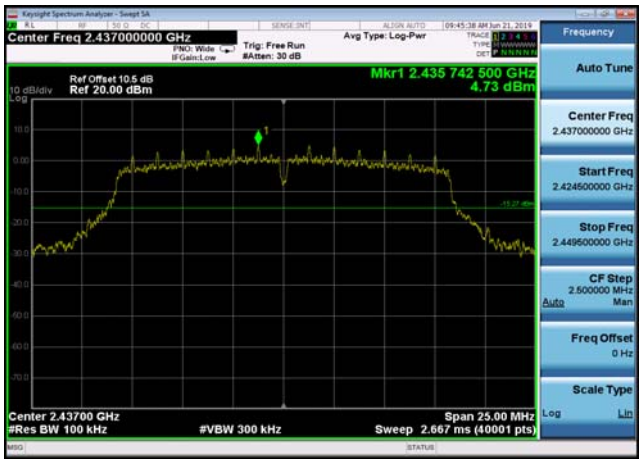
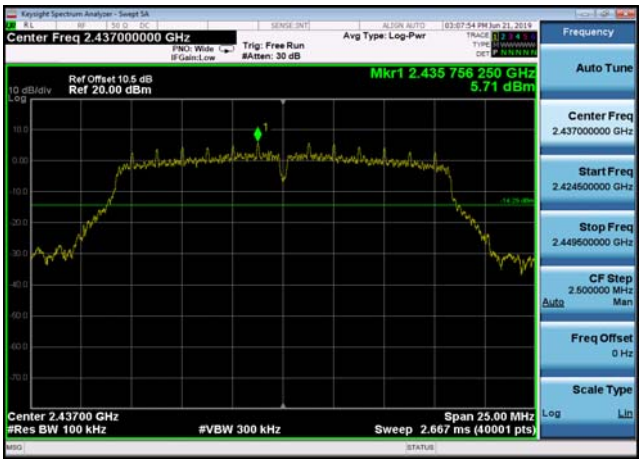
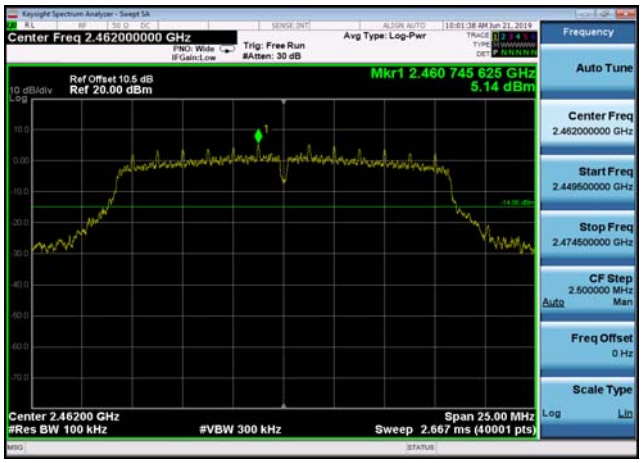
,Plot 1,Reference Level-802.11b ,2412MHz,Ant0	,Plot 1,Reference Level-802.11b ,2412MHz,Ant1
	
,Plot 1,Reference Level-802.11b ,2437MHz,Ant0	,Plot 1,Reference Level-802.11b ,2437MHz,Ant1
	
,Plot 1,Reference Level-802.11b ,2462MHz,Ant0	,Plot 1,Reference Level-802.11b ,2462MHz,Ant1
	

,Plot 2,Band Edge-802.11b,2412MHz ,Ant0	,Plot 2,Band Edge-802.11b,2412MHz ,Ant1
	
,Plot 2,Band Edge-802.11b,2437MHz ,Ant0	,Plot 2,Band Edge-802.11b,2437MHz ,Ant1
	
,Plot 2,Band Edge-802.11b,2462MHz ,Ant0	,Plot 2,Band Edge-802.11b,2462MHz ,Ant1
	

,Plot 3,30MHz~2310MHz-802.11b,2412MHz ,Ant0	,Plot 3,30MHz~2310MHz-802.11b,2412MHz ,Ant1
	
,Plot 3,30MHz~2310MHz-802.11b,2437MHz ,Ant0	,Plot 3,30MHz~2310MHz-802.11b,2437MHz ,Ant1
	
,Plot 3,30MHz~2310MHz-802.11b,2462MHz ,Ant0	,Plot 3,30MHz~2310MHz-802.11b,2462MHz ,Ant1
	

,Plot 4,2500MHz~10000MHz-802.11b ,2412MHz,Ant0	,Plot 4,2500MHz~10000MHz-802.11b ,2412MHz,Ant1
	
,Plot 4,2500MHz~10000MHz-802.11b ,2437MHz,Ant0	,Plot 4,2500MHz~10000MHz-802.11b ,2437MHz,Ant1
	
,Plot 4,2500MHz~10000MHz-802.11b ,2462MHz,Ant0	,Plot 4,2500MHz~10000MHz-802.11b ,2462MHz,Ant1
	

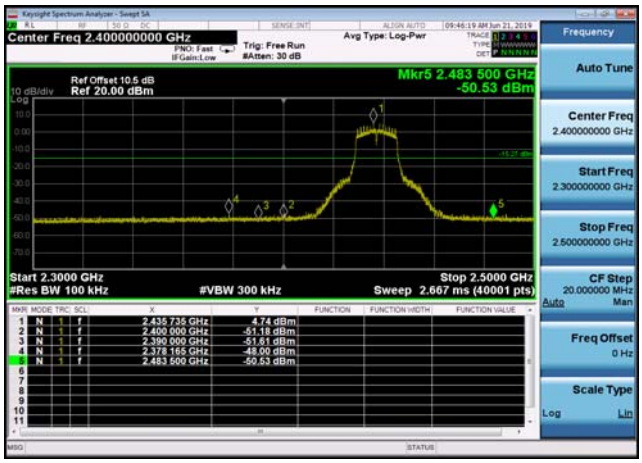
,Plot 5,10000MHz~25000MHz-802.11b ,2412MHz,Ant0	,Plot 5,10000MHz~25000MHz-802.11b ,2412MHz,Ant1
	
,Plot 5,10000MHz~25000MHz-802.11b ,2437MHz,Ant0	,Plot 5,10000MHz~25000MHz-802.11b ,2437MHz,Ant1
	
,Plot 5,10000MHz~25000MHz-802.11b ,2462MHz,Ant0	,Plot 5,10000MHz~25000MHz-802.11b ,2462MHz,Ant1
	

,Plot 1,Reference Level-802.11g ,2412MHz,Ant0	,Plot 1,Reference Level-802.11g ,2412MHz,Ant1
	
,Plot 1,Reference Level-802.11g ,2437MHz,Ant0	,Plot 1,Reference Level-802.11g ,2437MHz,Ant1
	
,Plot 1,Reference Level-802.11g ,2462MHz,Ant0	,Plot 1,Reference Level-802.11g ,2462MHz,Ant1
	

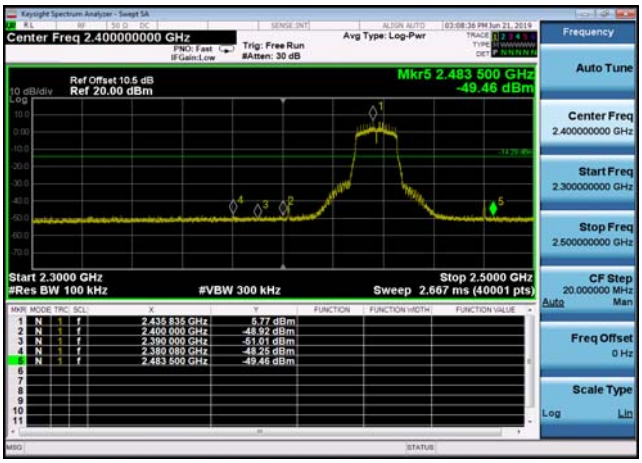
,Plot 2,Band Edge-802.11g,2412MHz
,Ant0

,Plot 2,Band Edge-802.11g,2412MHz
,Ant1

,Plot 2,Band Edge-802.11g,2437MHz
,Ant0

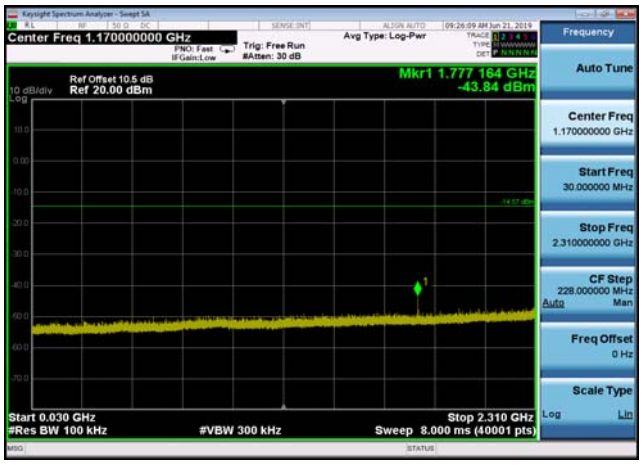
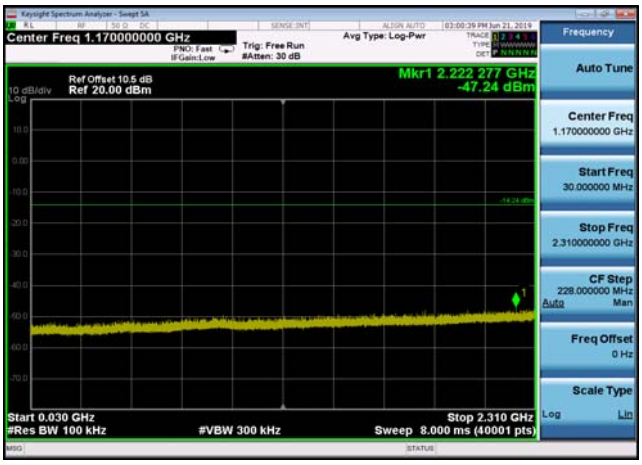
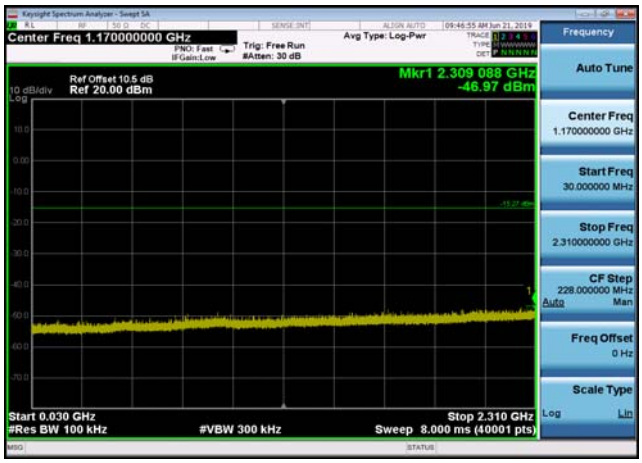
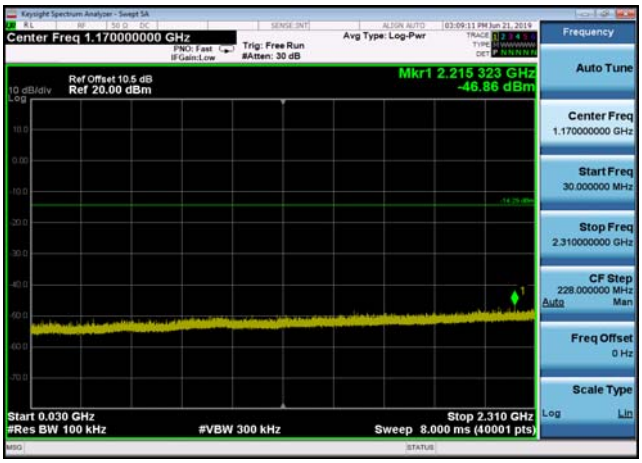
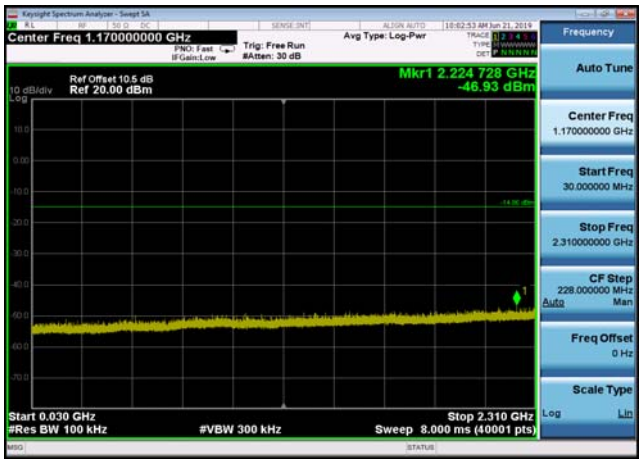
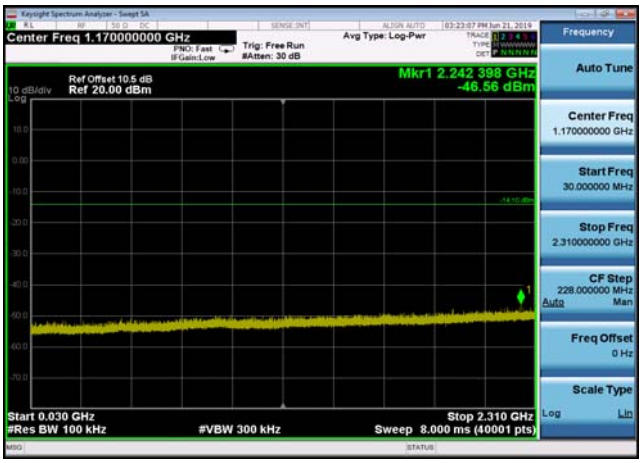


,Plot 2,Band Edge-802.11g,2437MHz
,Ant1



,Plot 2,Band Edge-802.11g,2462MHz
,Ant0

,Plot 2,Band Edge-802.11g,2462MHz
,Ant1

,Plot 3,30MHz~2310MHz-802.11g,2412MHz ,Ant0	,Plot 3,30MHz~2310MHz-802.11g,2412MHz ,Ant1
	
,Plot 3,30MHz~2310MHz-802.11g,2437MHz ,Ant0	,Plot 3,30MHz~2310MHz-802.11g,2437MHz ,Ant1
	
,Plot 3,30MHz~2310MHz-802.11g,2462MHz ,Ant0	,Plot 3,30MHz~2310MHz-802.11g,2462MHz ,Ant1