



FCC TEST REPORT

Test report
On Behalf of
Bowell Technology Co., Ltd
For
Wi-Fi 6 MESH AP
Model No.: AX1800 PRO

FCC ID: 2AVWB-AX1800PRO

Prepared for : Bowei Technology Co., Ltd
2F, Building No. 6C, 1658, Gumei Rd., Xuhui District, Shanghai, China

Prepared By : Shenzhen HUAK Testing Technology Co., Ltd.
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Date of Test: May. 12, 2020 ~ May. 31, 2021
Date of Report: May. 31, 2021
Report Number: HK2105101409-1E



TEST RESULT CERTIFICATION

Applicant's name Bowei Technology Co., Ltd

Address 2F, Building No. 6C, 1658, Gumei Rd., Xuhui District, Shanghai, China

Manufacture's Name Bowei Technology Co., Ltd

Address 2F, Building No. 6C, 1658, Gumei Rd., Xuhui District, Shanghai, China

Product description

Trade Mark: **AZORES**

Product name Wi-Fi 6 MESH AP

Model and/or type reference AX1800 PRO

Standards FCC Rules and Regulations Part 15 Subpart C Section 15.247
ANSI C63.10: 2013

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Date of Test

Date (s) of performance of tests May. 12, 2020 ~ May. 31, 2021

Date of Issue May. 31, 2021

Test Result **Pass**

Testing Engineer : 
(Gary Qian)

Technical Manager : 
(Eden Hu)

Authorized Signatory : 
(Jason Zhou)





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**** Modified History ****

Revison	Description	Issued Data	Remark
Revision 1.0	Initial Test Report Release	May. 31, 2021	Jason Zhou

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1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China



1. Test Result Summary

1.1. TEST PROCEDURES AND RESULTS

Requirement	CFR 47 Section	Result
Antenna requirement	§15.203/§15.247(b)(4)	PASS
AC Power Line Conducted Emission	§15.207	PASS
Conducted Peak Output Power	§15.247 (b)(3)	PASS
6dB Emission Bandwidth	§15.247 (a)(2)	PASS
Power Spectral Density	§15.247 (e)	PASS
Band Edge	1§5.247(d)	PASS
Spurious Emission	§15.205/§15.209	PASS

Note:

1. PASS: Test item meets the requirement.
2. Fail: Test item does not meet the requirement.
3. N/A: Test case does not apply to the test object.
4. The test result judgment is decided by the limit of test standard.

1.2. TEST FACILITY

Test Firm : Shenzhen HUAK Testing Technology Co., Ltd.

Address 1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China



1.3. Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

No.	Item	MU
1	Conducted Emission	$\pm 0.37\text{dB}$
2	RF power, conducted	$\pm 3.35\text{dB}$
3	Spurious emissions, conducted	$\pm 2.20\text{dB}$
4	All emissions, radiated(<1G)	$\pm 3.90\text{dB}$
5	All emissions, radiated(>1G)	$\pm 4.28\text{dB}$
6	Temperature	$\pm 0.1^\circ\text{C}$
7	Humidity	$\pm 1.0\%$



2. EUT Description

2.1. GENERAL DESCRIPTION OF EUT

Equipment	Wi-Fi 6 MESH AP
Model Name	AX1800 PRO
Serial Model	N/A
Model Difference	N/A
Trade Mark	AZORES
FCC ID	2AVWB-AX1800PRO
Antenna Type	Internal Antenna
Antenna Gain	Antenna 1:4.2dBi Antenna 2:4.2dBi MIMO: 7.210dBi
Operation frequency	802.11b/g/n/ac 20:2412~2462MHz 802.11n/ac 40: 2422~2452MHz 802.11ax HT20: 2412~2462MHz 802.11ax HT40: 2422~2452MHz
Number of Channels	802.11b/g/n/ac20: 11CH 802.11n/ac 40: 7CH 802.11ax HT20: 11CH 802.11ax HT40: 7CH
Modulation Type	CCK/OFDM/DBPSK/DAPSK
Power Source	DC 12V from Adapter
Power Rating	DC 12V from Adapter
Hardware Version	V1.0.0
Software Version	LAZV1.0.0R00
Note: The EUT incorporates a MIMO function. Physically, it provides two completed transmitters and receivers(2T2R), two transmit signals are completely correlated, then, Direction gain=GANT + Array Gain(Array Gain=10 log(2) dB for power spectral density; Array Gain=0 for power measurement)	



2.2. Carrier Frequency of Channels

Channel List for 802.11b/802.11g/802.11n (HT20)/ 802.11ac HT20/ 802.11ax HT20							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	04	2427	07	2442	10	2457
02	2417	05	2432	08	2447	11	2462
03	2422	06	2437	09	2452		

Channel List For 802.11n (HT40) / 802.11ac HT40/ 802.11ax HT40							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
--	--	04	2427	07	2442	--	--
--	--	05	2432	08	2447	--	--
03	2422	06	2437	09	2452		

Note:

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

2.3. Operation of EUT during testing

Operating Mode

The mode is used: Transmitting mode for 802.11b/802.11g/802.11n (HT20)/802.11ac HT20/802.11ax HT20

Low Channel: 2412MHz
Middle Channel: 2437MHz
High Channel: 2462MHz

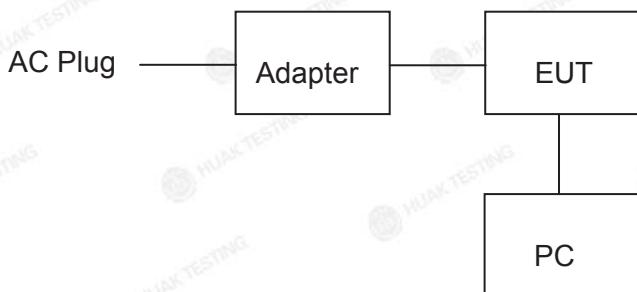
The mode is used: Transmitting mode for 802.11n (HT40)/802.11ac HT40/ 802.11ax HT40

Low Channel: 2422MHz
Middle Channel: 2437MHz
High Channel: 2452MHz



2.4. DESCRIPTION OF TEST SETUP

Operation of EUT during conducted testing and below 1GHz Radiation testing:



Operation of EUT during Above 1GHz Radiation testing:



- PC information
Model: TP00067A
Input: DC 20V, 2.25~3.25A
Output: 5VDC, 0.5A

Adapter information

Adapter 1:
Model: MS-V1500R120-018H0-US
Input: 100-240V~50-60Hz 0.6A max
Output: DC12V 1.5A

Adapter 2:
Model: RD1201500-C55-153MG
Input: 100-240V~50-60Hz 0.6A
Output: DC12V 1.5A

The sample was placed (0.8m below 1GHz, 1.5m above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. The worst case is X position.



3. General Information

3.1. Test environment and mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	56 % RH
Atmospheric Pressure:	1010 mbar
Test Mode:	
Engineering mode:	Keep the EUT in continuous transmitting by select channel and modulations(The value of duty cycle is 98.46%)
<p>The sample was placed (0.8m below 1GHz, 1.5m above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. For the full battery state and The output power to the maximum state.</p>	

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:										
Per-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.										
<table border="1"> <thead> <tr> <th>Mode</th><th>Data rate</th></tr> </thead> <tbody> <tr> <td>802.11b</td><td>1Mbps</td></tr> <tr> <td>802.11g</td><td>6Mbps</td></tr> <tr> <td>802.11n(H20/ac HT20/ax HT20</td><td>6.5Mbps</td></tr> <tr> <td>802.11n(H40)/ac HT40/ax HT40</td><td>13.5Mbps</td></tr> </tbody> </table>	Mode	Data rate	802.11b	1Mbps	802.11g	6Mbps	802.11n(H20/ac HT20/ax HT20	6.5Mbps	802.11n(H40)/ac HT40/ax HT40	13.5Mbps
Mode	Data rate									
802.11b	1Mbps									
802.11g	6Mbps									
802.11n(H20/ac HT20/ax HT20	6.5Mbps									
802.11n(H40)/ac HT40/ax HT40	13.5Mbps									
Final Test Mode:										
Operation mode: Keep the EUT in continuous transmitting with modulation										
<p>1. For WIFI function, the engineering test program was provided and enabled to make EUT continuous transmit/receive.</p> <p>2. According to ANSI C63.10 standards, the test results are both the "worst case" and "worst setup" 1Mbps for 802.11b, 6Mbps for 802.11g, 6.5Mbps for 802.11n(H20)/ac HT20/ax HT20, 13.5Mbps for 802.11(H40)/ac HT40/ax HT40. Duty cycle setting during the transmission is 98.5% with maximum power setting for all modulations.</p>										



3.2. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Equipment	Model No.	Serial No.	FCC ID	Trade Name
/	/	/	/	/

Note:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.
3. For conducted measurements (Output Power, 6dB Emission Bandwidth, Power Spectral Density, Spurious Emissions), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.



4. Test Results and Measurement Data

4.1. Conducted Emission

4.1.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.207														
Test Method:	ANSI C63.10:2013														
Frequency Range:	150 kHz to 30 MHz														
Receiver setup:	RBW=9 kHz, VBW=30 kHz, Sweep time=auto														
Limits:	<table border="1"> <thead> <tr> <th rowspan="2">Frequency range (MHz)</th> <th colspan="2">Limit (dBuV)</th> </tr> <tr> <th>Quasi-peak</th> <th>Average</th> </tr> </thead> <tbody> <tr> <td>0.15-0.5</td> <td>66 to 56*</td> <td>56 to 46*</td> </tr> <tr> <td>0.5-5</td> <td>56</td> <td>46</td> </tr> <tr> <td>5-30</td> <td>60</td> <td>50</td> </tr> </tbody> </table>	Frequency range (MHz)	Limit (dBuV)		Quasi-peak	Average	0.15-0.5	66 to 56*	56 to 46*	0.5-5	56	46	5-30	60	50
Frequency range (MHz)	Limit (dBuV)														
	Quasi-peak	Average													
0.15-0.5	66 to 56*	56 to 46*													
0.5-5	56	46													
5-30	60	50													
Test Setup:	<p>Reference Plane</p> <p>40cm</p> <p>80cm</p> <p>E.U.T</p> <p>AC power</p> <p>Test table/Insulation plane</p> <p>LISN</p> <p>Filter</p> <p>AC power</p> <p>EMI Receiver</p> <p>Remark E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p>														
Test Mode:	Charging + transmitting with modulation														
Test Procedure:	<ol style="list-style-type: none"> 1. The E.U.T is connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement. 														
Test Result:	Pass														



4.1.2. Test Instruments

Conducted Emission Shielding Room Test Site (843)

Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Receiver	R&S	ESR-7	HKE-010	Jun. 18, 2020	Jun. 17, 2021
LISN	R&S	ENV216	HKE-002	Jun. 18, 2020	Jun. 17, 2021
Conducted test software	Tonscend	TS+ Rev 2.5.0.0	HKE-081	N/A	N/A

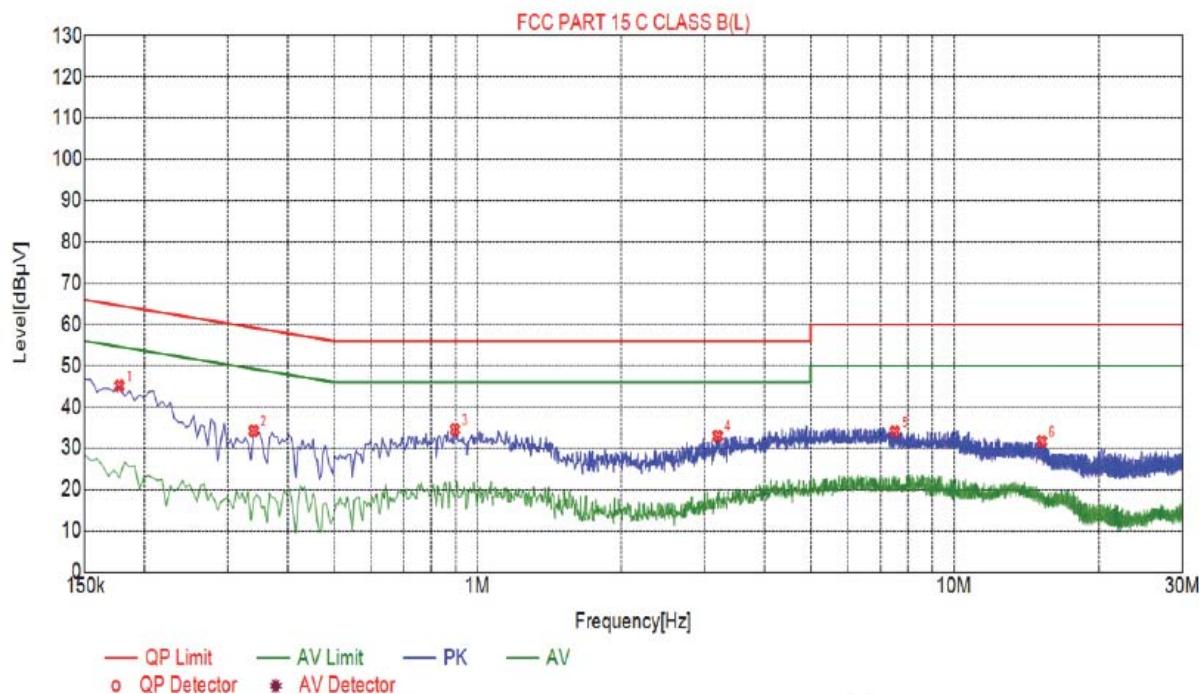
Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).



4.1.3 Test data

Adapter 1:

Test Specification: Line



Suspected List

NO.	Freq. [MHz]	Level [dB μ V]	Factor [dB]	Limit [dB μ V]	Margin [dB]	Reading [dB μ V]	Detector	Type
1	0.1770	45.11	20.05	64.63	19.52	25.06	PK	L
2	0.3390	34.19	20.03	59.23	25.04	14.16	PK	L
3	0.8970	34.53	20.06	56.00	21.47	14.47	PK	L
4	3.1920	32.96	20.23	56.00	23.04	12.73	PK	L
5	7.5165	33.98	20.17	60.00	26.02	13.81	PK	L
6	15.1935	31.64	19.96	60.00	28.36	11.68	PK	L

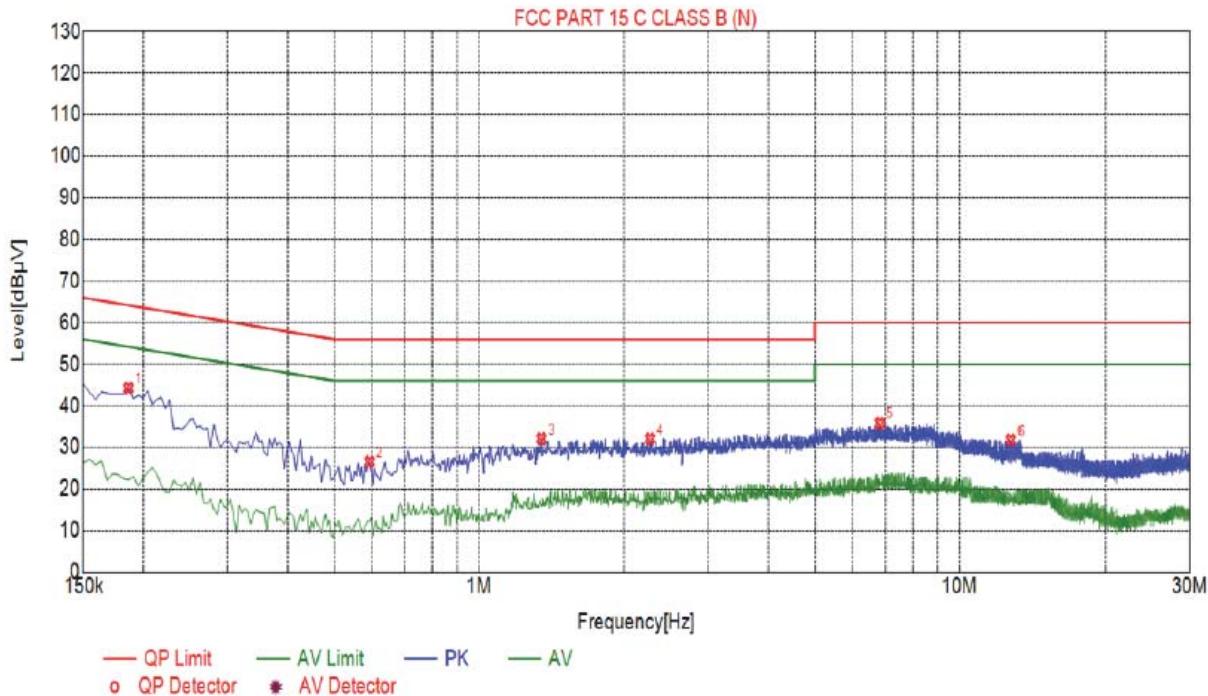
Remark: Margin = Limit – Level

Correction factor = Cable loss + LISN insertion loss

Level=Test receiver reading + correction factor



Test Specification: Neutral



Suspected List

NO.	Freq. [MHz]	Level [dB μ V]	Factor [dB]	Limit [dB μ V]	Margin [dB]	Reading [dB μ V]	Detector	Type
1	0.1860	44.24	20.05	64.21	19.97	24.19	PK	N
2	0.5910	26.50	20.05	56.00	29.50	6.45	PK	N
3	1.3470	32.06	20.10	56.00	23.94	11.96	PK	N
4	2.2695	32.04	20.18	56.00	23.96	11.86	PK	N
5	6.8370	35.83	20.20	60.00	24.17	15.63	PK	N
6	12.7860	31.81	19.97	60.00	28.19	11.84	PK	N

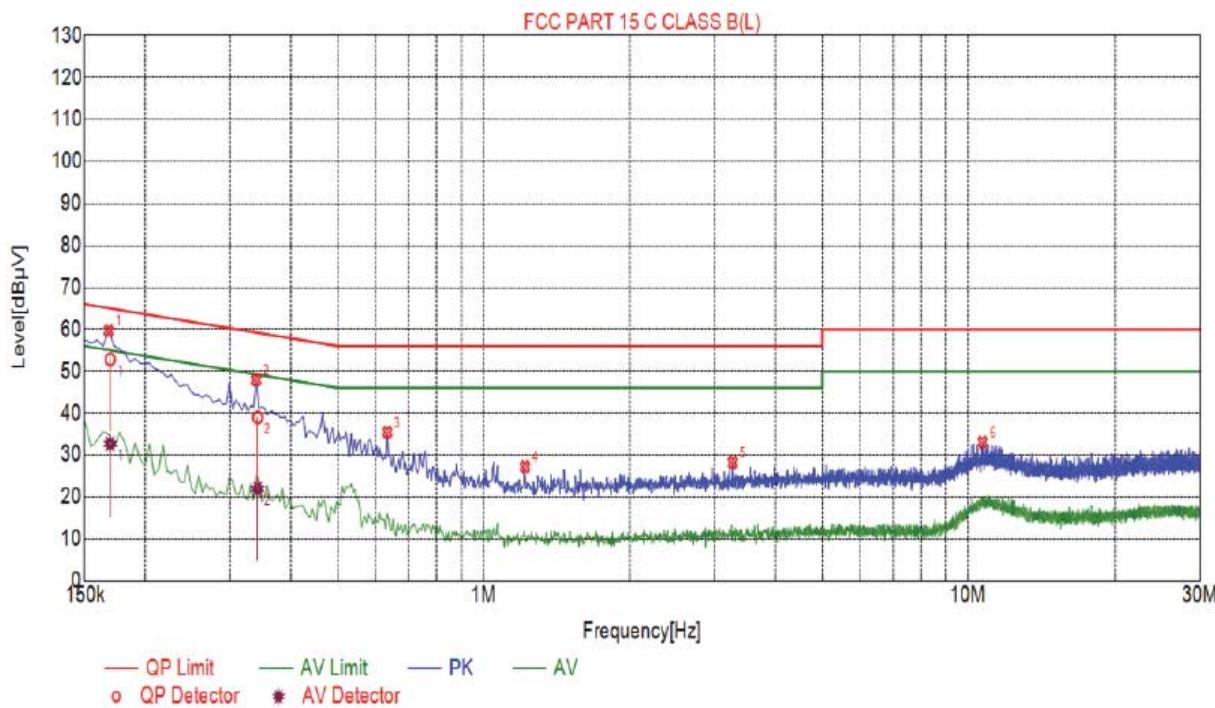
Remark: Margin = Limit – Level

Correction factor = Cable loss + LISN insertion loss

Level=Test receiver reading + correction factor

**Adapter 2:**

Test Specification: Line

**Suspected List**

NO.	Freq. [MHz]	Level [dBμV]	Factor [dB]	Limit [dBμV]	Margin [dB]	Reading [dBμV]	Detector	Type
1	0.1680	59.67	20.01	65.06	5.39	39.66	PK	L
2	0.3390	47.93	20.03	59.23	11.30	27.90	PK	L
3	0.6315	35.41	20.05	56.00	20.59	15.36	PK	L
4	1.2165	27.24	20.09	56.00	28.76	7.15	PK	L
5	3.2685	28.27	20.23	56.00	27.73	8.04	PK	L
6	10.7295	33.06	20.03	60.00	26.94	13.03	PK	L

Final Data List

NO.	Freq. [MHz]	Correction factor[dB]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	QP Reading [dBμV]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	AV Reading [dBμV]	Type
1	0.1693	20.02	52.82	64.99	12.17	32.80	32.68	54.99	22.31	12.66	L
2	0.3412	20.03	38.96	59.17	20.21	18.93	21.98	49.17	27.19	1.95	L

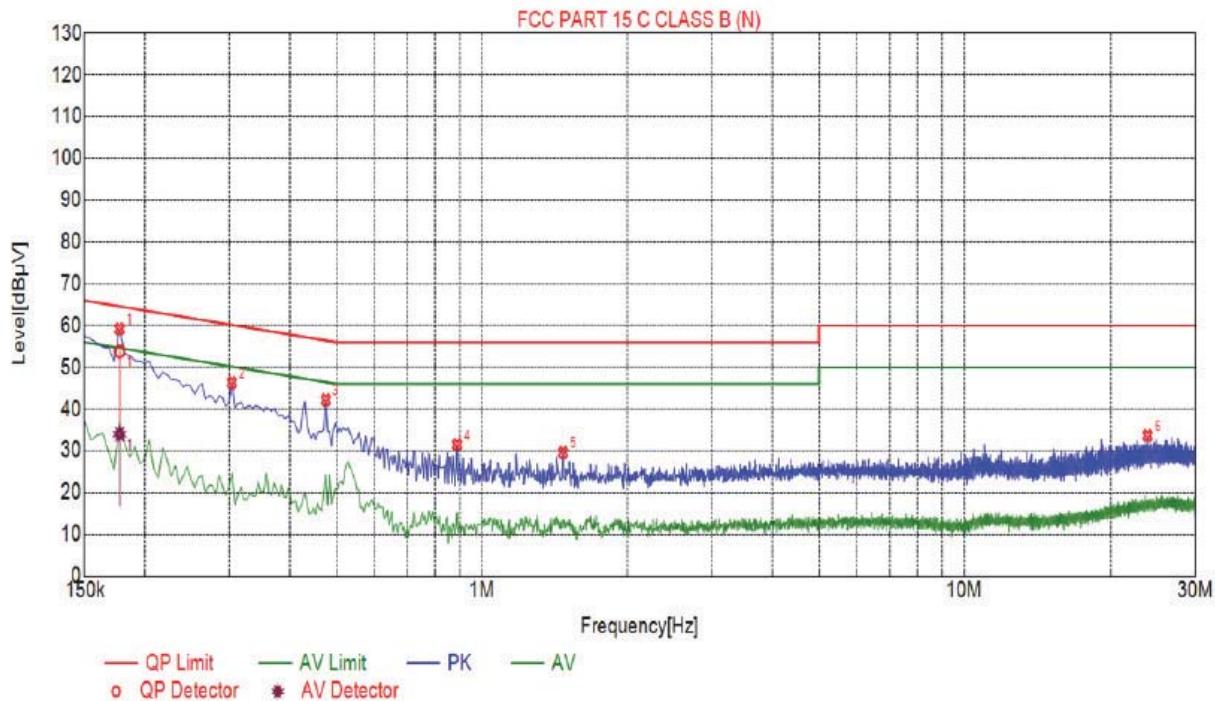
Remark: Margin = Limit – Level

Correction factor = Cable loss + LISN insertion loss

Level=Test receiver reading + correction factor



Test Specification: Neutral



Suspected List

NO.	Freq. [MHz]	Level [dBμV]	Factor [dB]	Limit [dBμV]	Margin [dB]	Reading [dBμV]	Detector	Type
1	0.1770	59.21	20.05	64.63	5.42	39.16	PK	N
2	0.3030	46.30	20.04	60.16	13.86	26.26	PK	N
3	0.4740	42.17	20.04	56.44	14.27	22.13	PK	N
4	0.8880	31.48	20.06	56.00	24.52	11.42	PK	N
5	1.4730	29.56	20.10	56.00	26.44	9.46	PK	N
6	23.8560	33.61	20.22	60.00	26.39	13.39	PK	N

Final Data List

NO.	Freq. [MHz]	Correction factor [dB]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	QP Reading [dBμV]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	AV Reading [dBμV]	Type
1	0.1770	20.05	53.80	64.63	10.83	33.80	33.98	54.63	20.65	13.98	N

Remark: Margin = Limit – Level

Correction factor = Cable loss + LISN insertion loss

Level = Test receiver reading + correction factor

4.2. Maximum Conducted Output Power

4.2.1. Test Specification

4.2.2. Test Instruments

RF Test Room					
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Power meter	Agilent	E4419B	HKE-085	Jun. 18, 2020	Jun. 17, 2021
Power Sensor	Agilent	E9300A	HKE-086	Jun. 18, 2020	Jun. 17, 2021
RF cable	Times	1-40G	HKE-034	Jun. 18, 2020	Jun. 17, 2021
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Jun. 18, 2020	Jun. 17, 2021

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).



4.2.3. Test Data

Test Channel	Frequency	Maximum Peak Conducted Output Power (dBm)			LIMIT
	(MHz)	Antenna port 1	Antenna port 2	MIMO	
TX 802.11b Mode					
CH01	2412	13.45	10.29	/	30
CH06	2437	13.49	10.23	/	30
CH11	2462	13.83	10.62	/	30
TX 802.11g Mode					
CH01	2412	17.79	14.59	/	30
CH06	2437	15.21	14.77	/	30
CH11	2462	15.17	15.02	/	30
TX 802.11n20 Mode					
CH01	2412	14.91	14.79	17.86	30
CH06	2437	14.89	14.91	17.91	30
CH11	2462	14.82	17.54	19.40	30
TX 802.11n40 Mode					
CH03	2422	14.91	17.33	19.30	30
CH06	2437	15.14	17.42	19.44	30
CH09	2452	14.77	17.36	19.27	30
802.11ac HT20 Mode					
CH01	2412	15.39	14.00	17.76	30
CH06	2437	14.95	14.05	17.53	30
CH11	2462	13.90	14.48	17.21	30
802.11ac HT40 Mode					
CH03	2422	14.42	14.38	17.41	30
CH06	2437	14.22	14.27	17.26	30
CH09	2452	14.03	14.10	17.08	30

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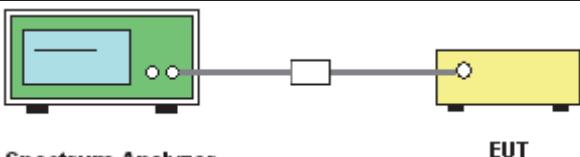
802.11ax HT20 Mode					
CH01	2412	15.63	18.70	20.44	30
CH06	2437	15.60	18.70	20.43	30
CH11	2462	15.98	18.57	20.48	30
802.11ax HT40 Mode					
CH03	2422	16.08	18.81	20.67	30
CH06	2437	15.88	18.61	20.47	30
CH09	2452	16.05	18.55	20.49	30

Note: This product supports antenna 1 and antenna 2 launch, but only support 802.11 n/802.11ac/802.11ax for MIMO mode, not support 802.11 b and 802.11 g for MIMO mode.



4.3. Emission Bandwidth

4.3.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (a)(2)
Test Method:	KDB 558074
Limit:	>500kHz
Test Setup:	 <p style="text-align: center;">Spectrum Analyzer EUT</p>
Test Mode:	Transmitting mode with modulation
Test Procedure:	<ol style="list-style-type: none"> 1. The testing follows FCC KDB Publication No. 558074 D01 15.247 Meas Guidance v05r02. 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. 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. 4. Measure and record the results in the test report.
Test Result:	PASS

4.3.2. Test Instruments

RF Test Room					
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Spectrum analyzer	Agilent	N9020A	HKE-048	Jun. 18, 2020	Jun. 17, 2021
RF Cable (9KHz-26.5GHz)	Tonscend	170660	N/A	Jun. 18, 2020	Jun. 17, 2021
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Jun. 18, 2020	Jun. 17, 2021

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

**4.3.3. Test data****For antenna port 1**

Test channel	6dB Emission Bandwidth (MHz)							
	802.11b	802.11g	802.11n (H20)	802.11n (H40)	802.11ac (H20)	802.11ac (H40)	802.11ax (H20)	802.11ax (H40)
Lowest	7.200	16.360	17.640	36.480	18.920	37.200	18.920	37.840
Middle	7.120	16.400	17.680	36.480	18.920	37.840	18.880	37.760
Highest	7.680	16.360	17.600	36.480	18.880	37.760	18.640	37.680
Limit:	>500khz							
Test Result:	PASS							

Test plots as follows:

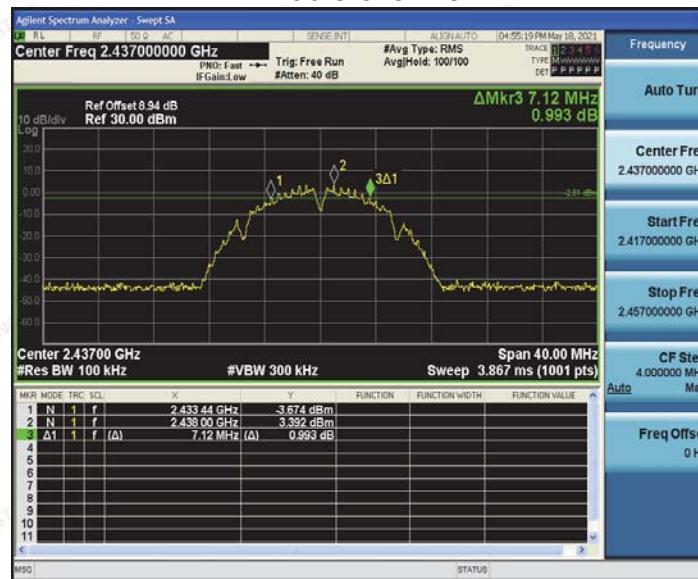


802.11b Modulation

Lowest channel



Middle channel



Highest channel



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802.11g Modulation

Lowest channel



Middle channel



Highest channel



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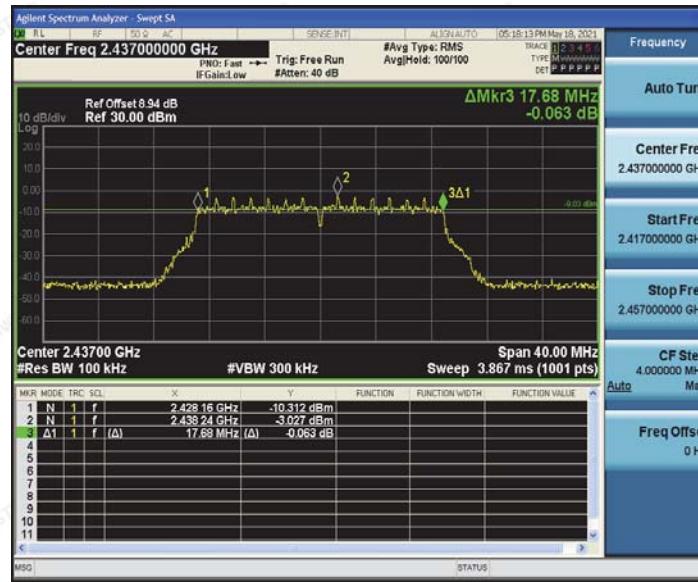


802.11n (HT20) Modulation

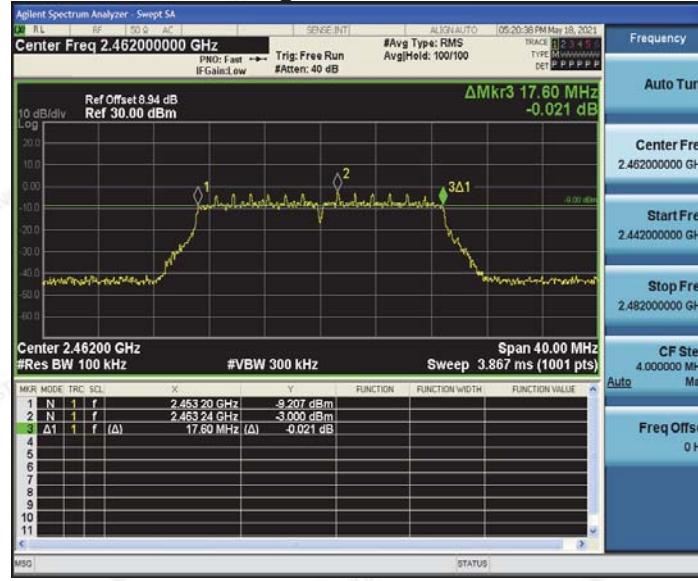
Lowest channel



Middle channel



Highest channel

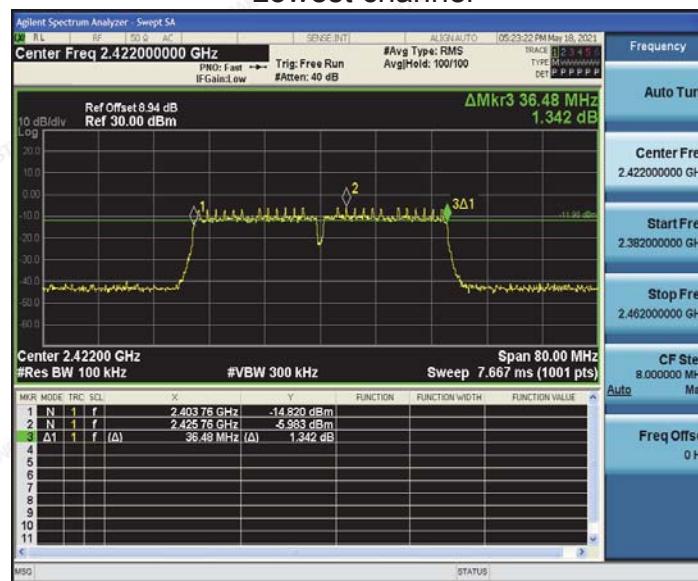


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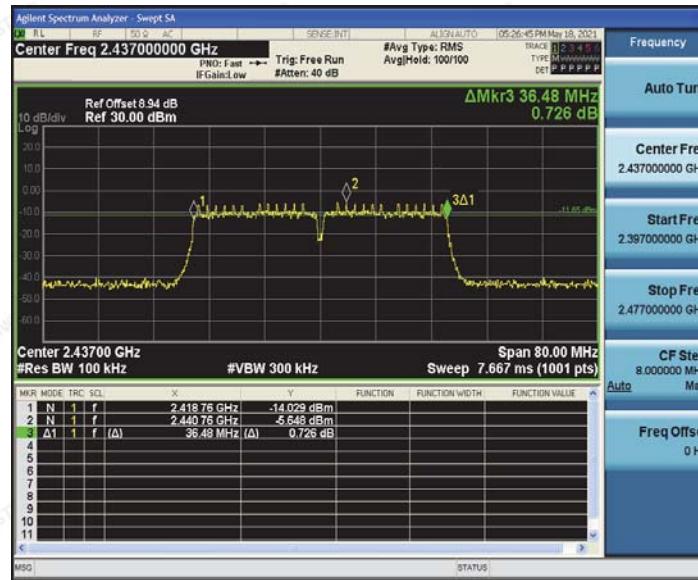


802.11n (HT40) Modulation

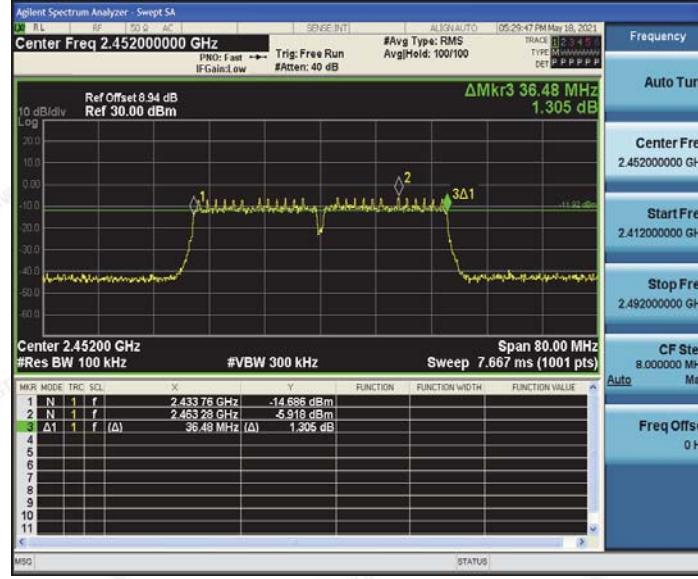
Lowest channel



Middle channel



Highest channel

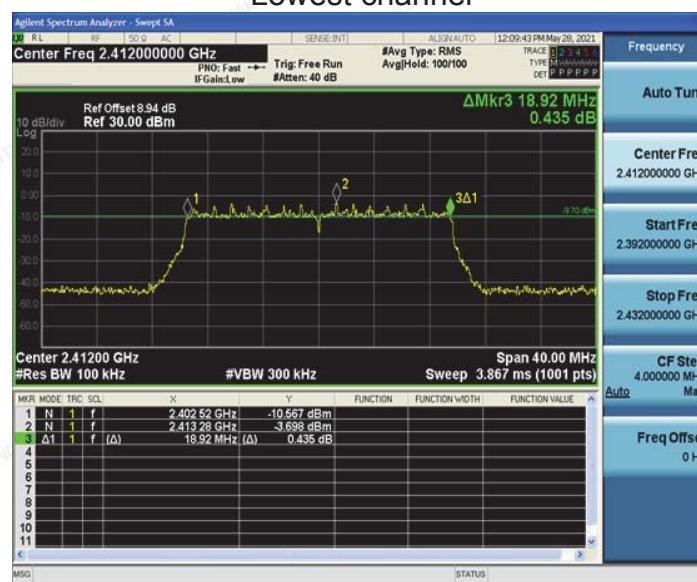


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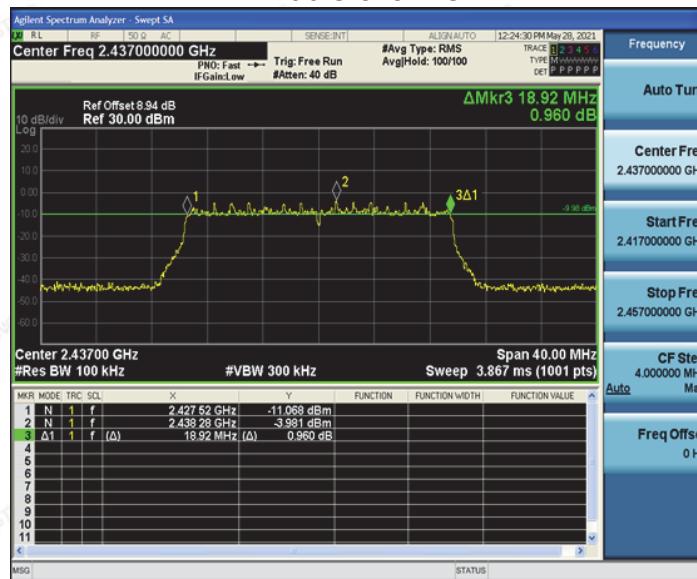


802.11ac (HT20) Modulation

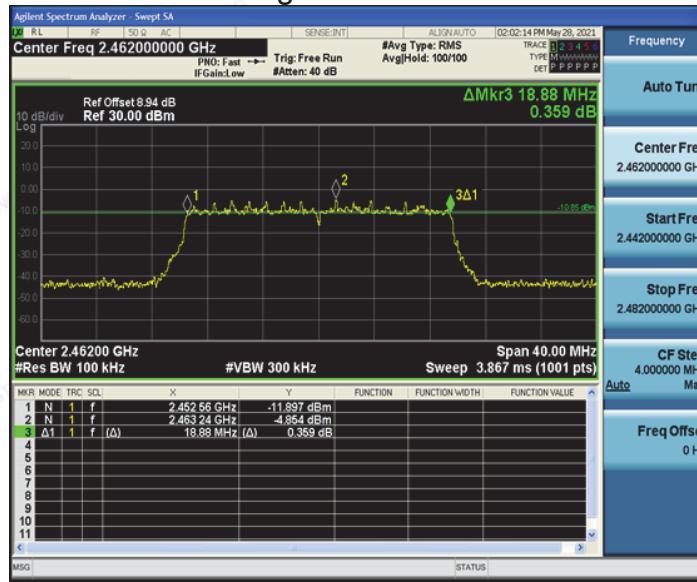
Lowest channel



Middle channel



Highest channel

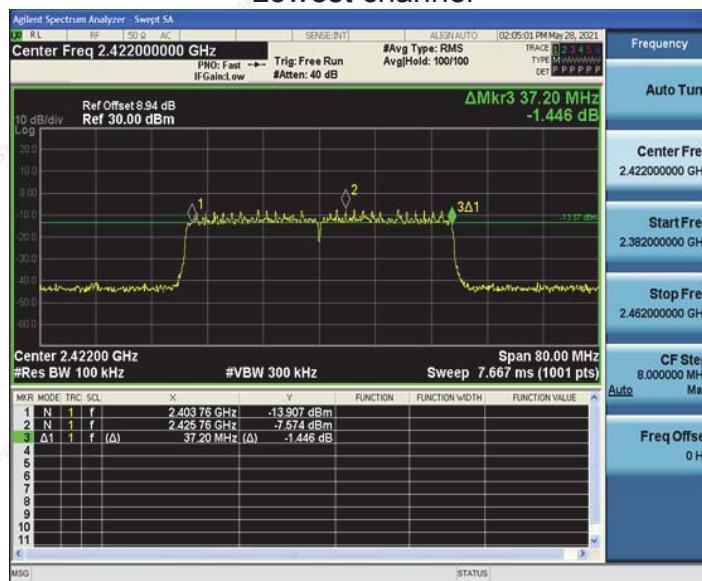


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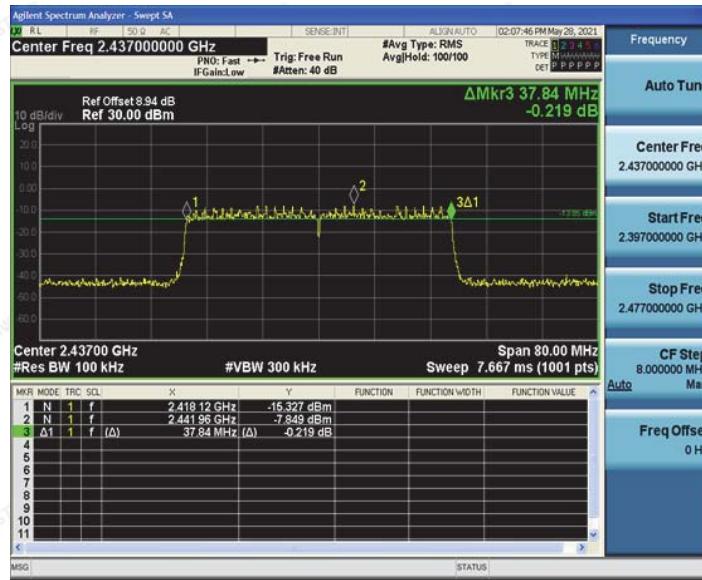


802.11ac (HT40) Modulation

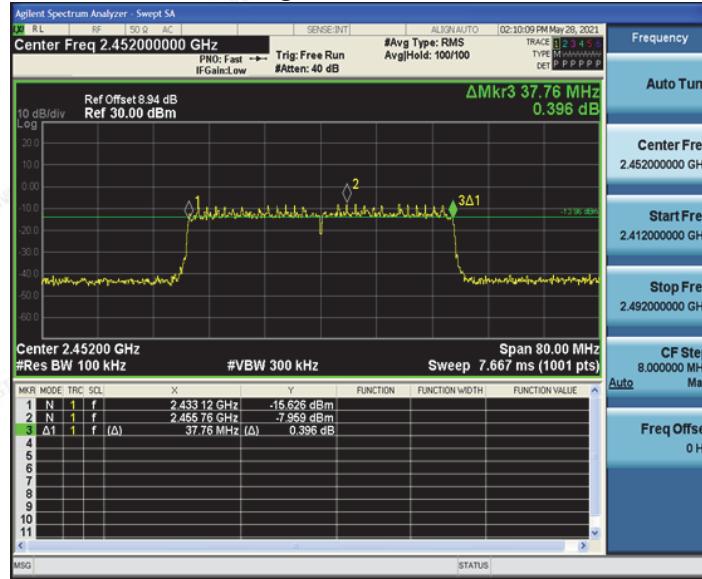
Lowest channel



Middle channel



Highest channel

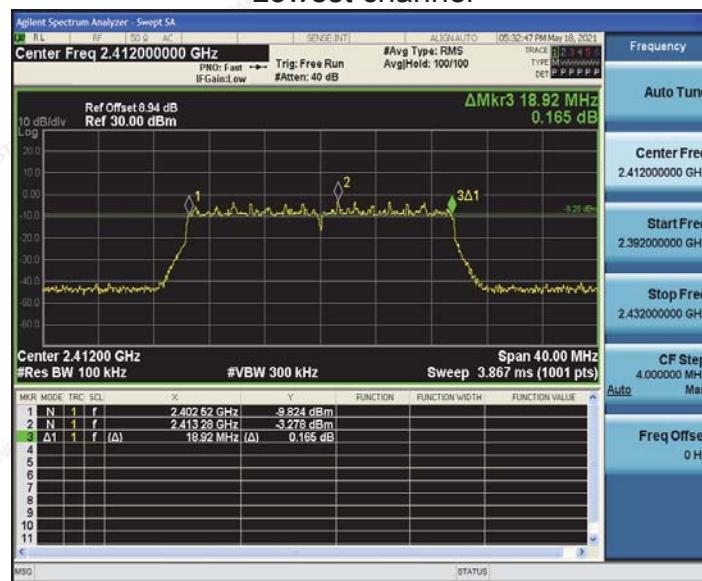


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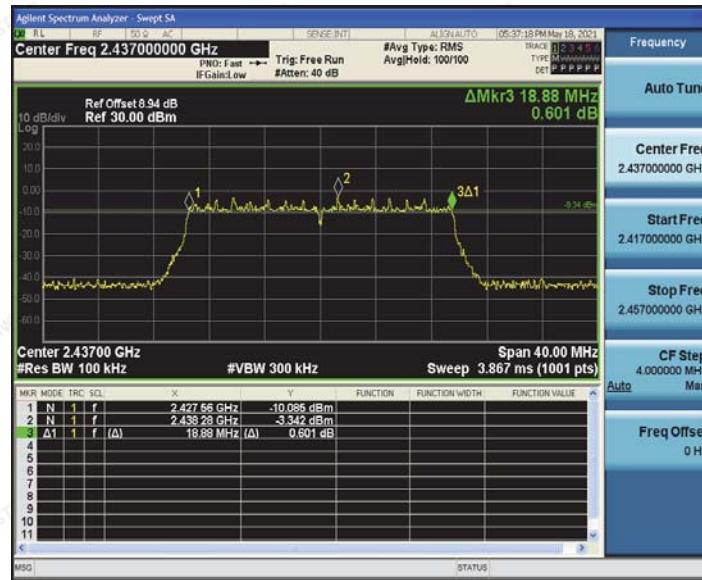


802.11ax (HT20) Modulation

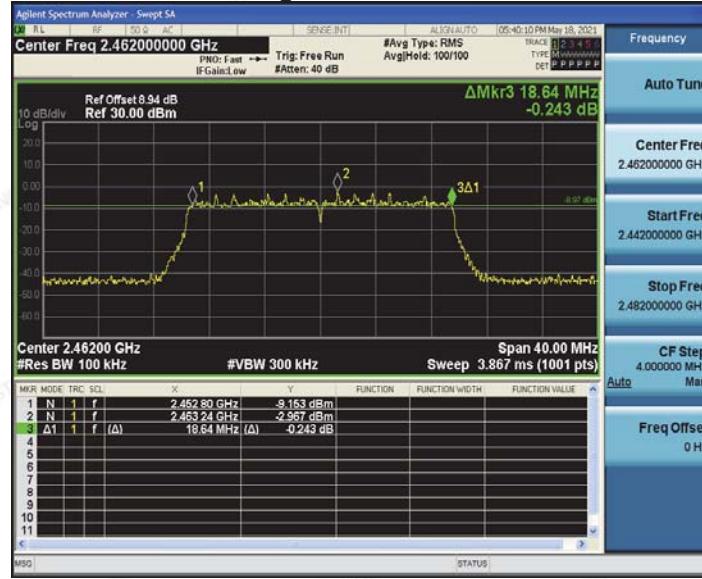
Lowest channel



Middle channel



Highest channel

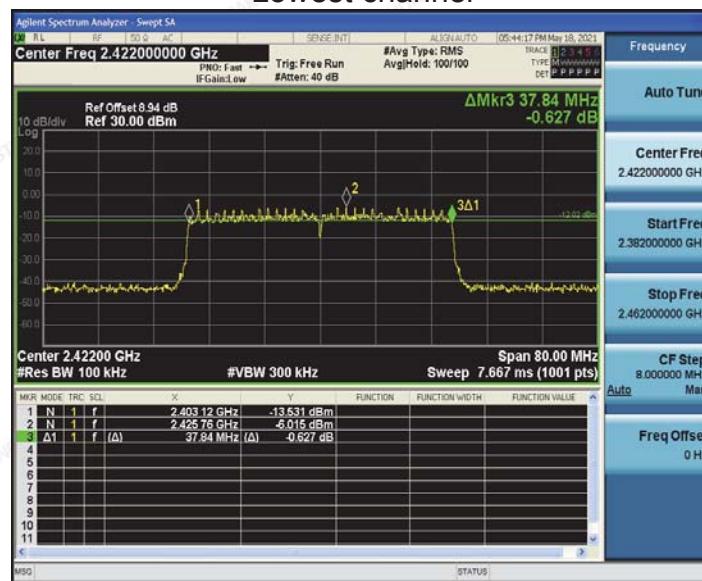


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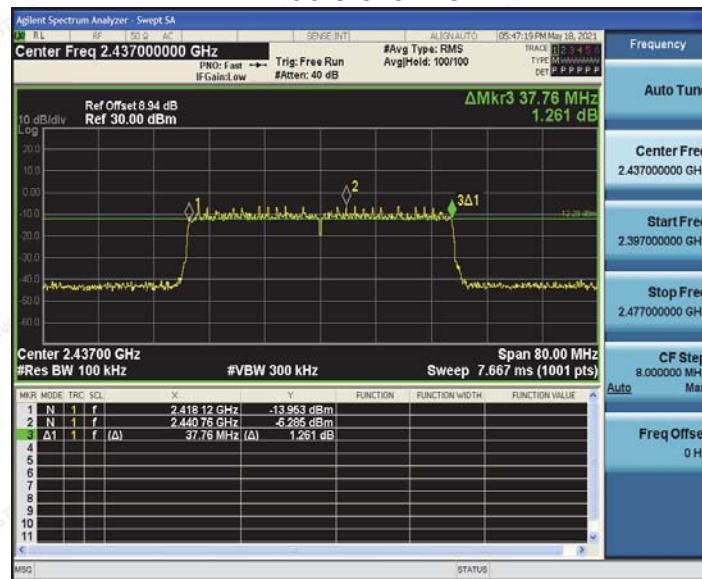


802.11ax (HT40) Modulation

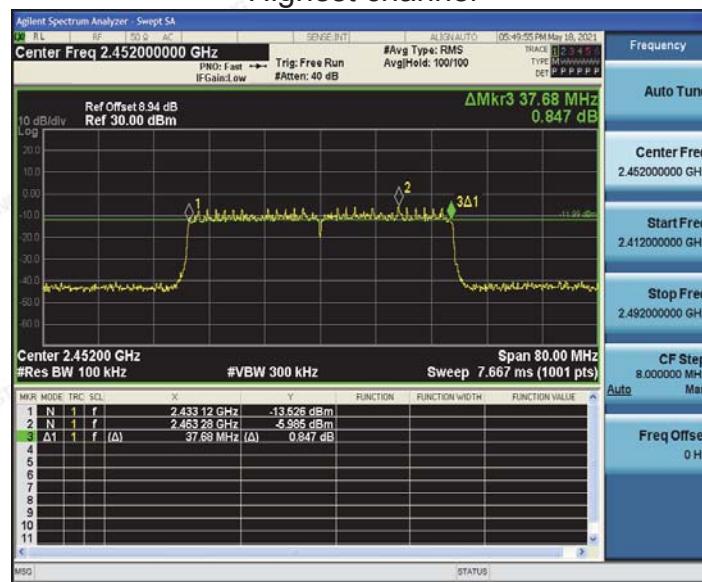
Lowest channel



Middle channel



Highest channel



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**For antenna port 2**

Test channel	6dB Emission Bandwidth (MHz)							
	802.11b	802.11g	802.11n (H20)	802.11n (H40)	802.11ac (HT20)	802.11ac (HT40)	802.11ax (HT20)	802.11ax (HT40)
Lowest	7.120	16.400	17.280	36.480	18.920	37.760	18.960	37.840
Middle	6.640	16.360	17.600	36.480	18.880	37.760	19.040	37.760
Highest	7.120	16.400	17.640	36.080	19.000	37.760	18.800	37.840
Limit:	>500khz							
Test Result:	PASS							

Test plots as follows:



802.11b Modulation

Lowest channel



Middle channel



Highest channel

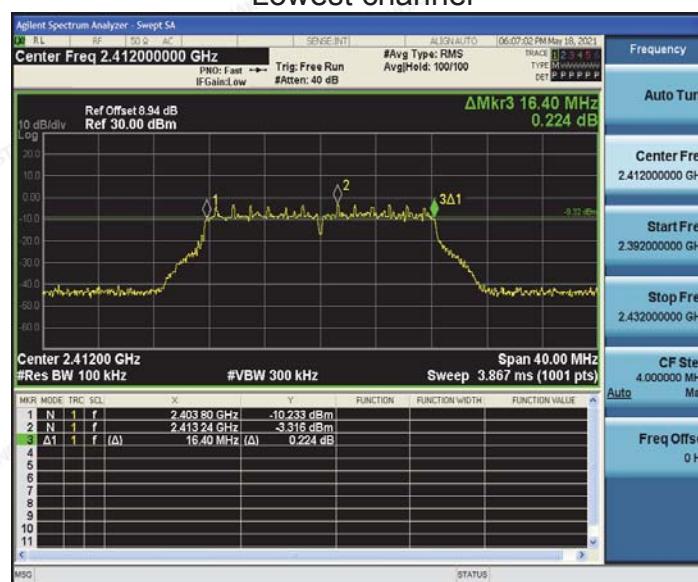


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802.11g Modulation

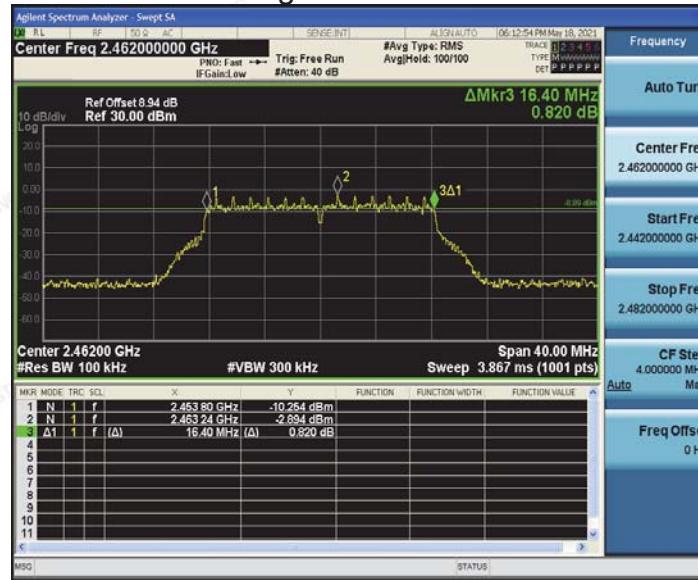
Lowest channel



Middle channel



Highest channel

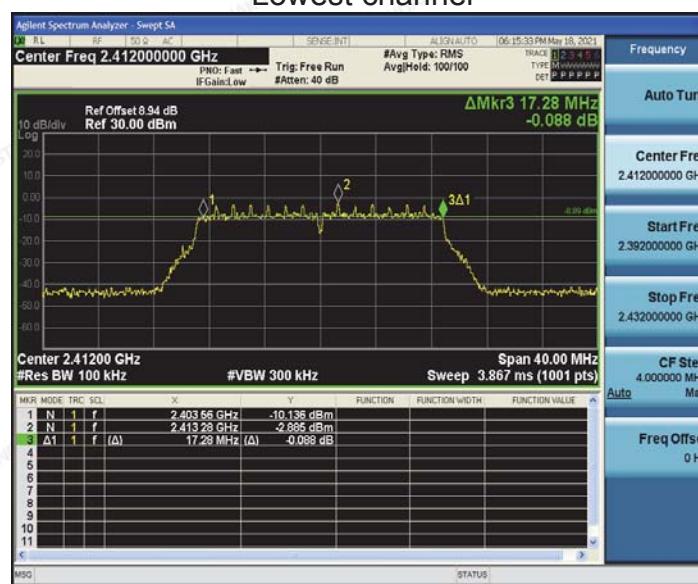


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802.11n (HT20) Modulation

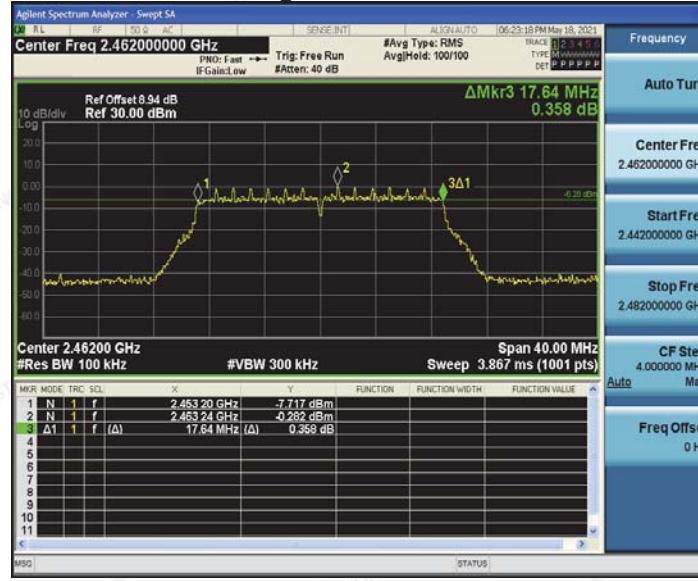
Lowest channel



Middle channel



Highest channel

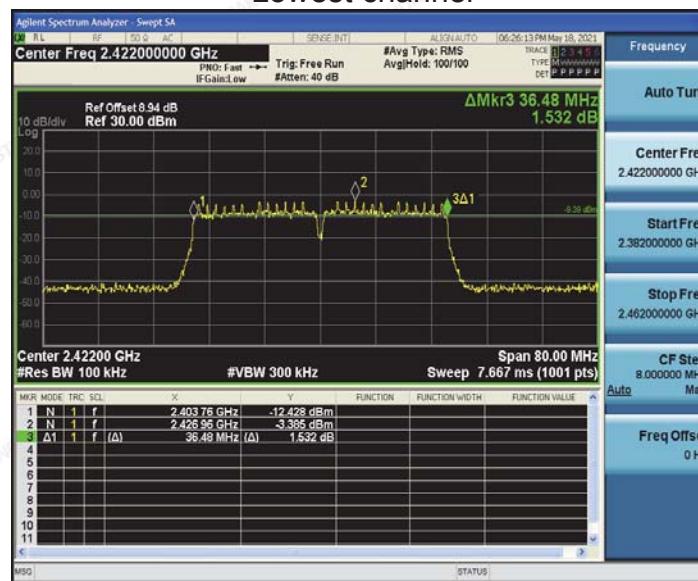


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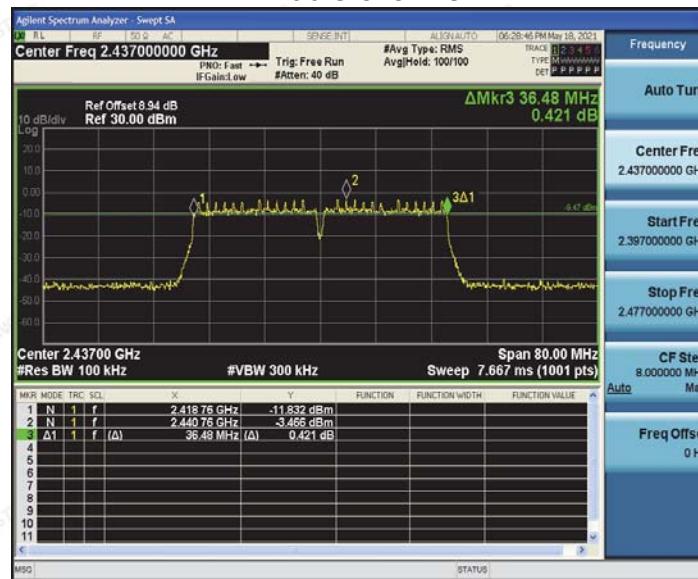


802.11n (HT40) Modulation

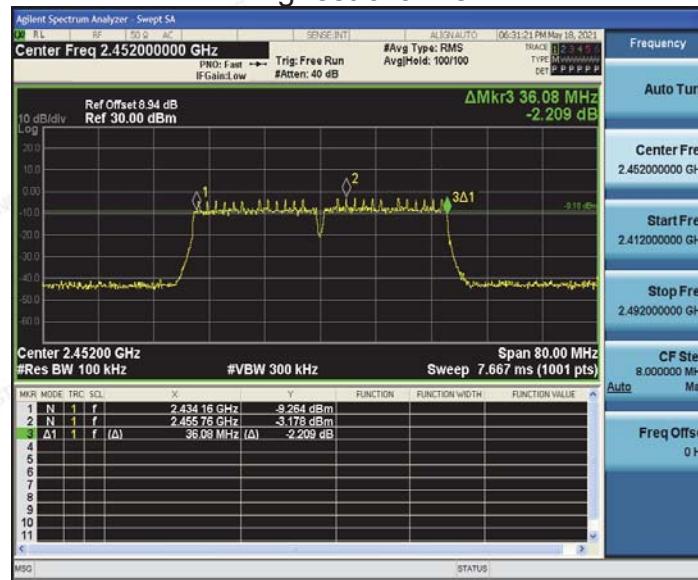
Lowest channel



Middle channel



Highest channel

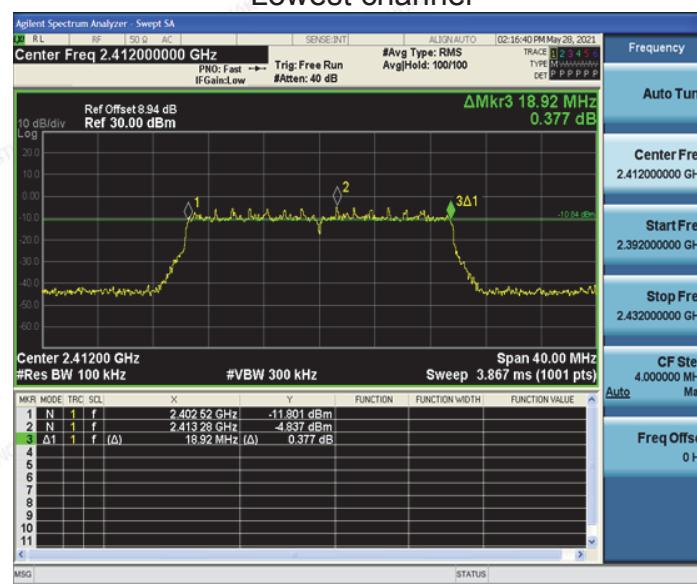


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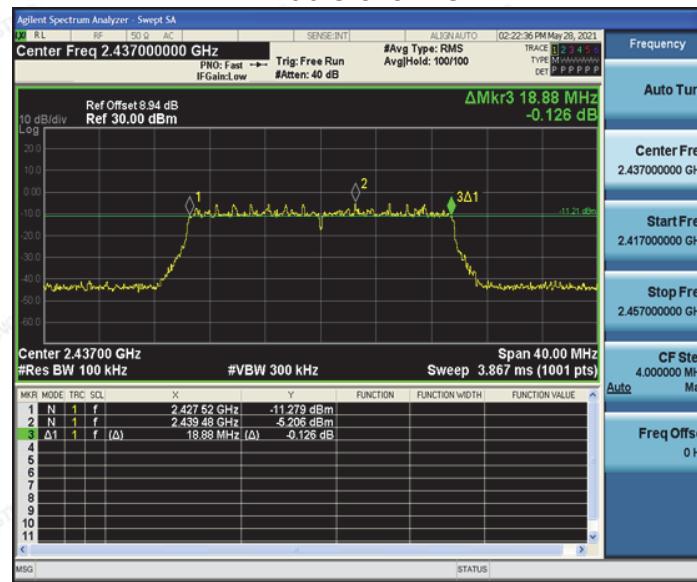


802.11ac(HT20) Modulation

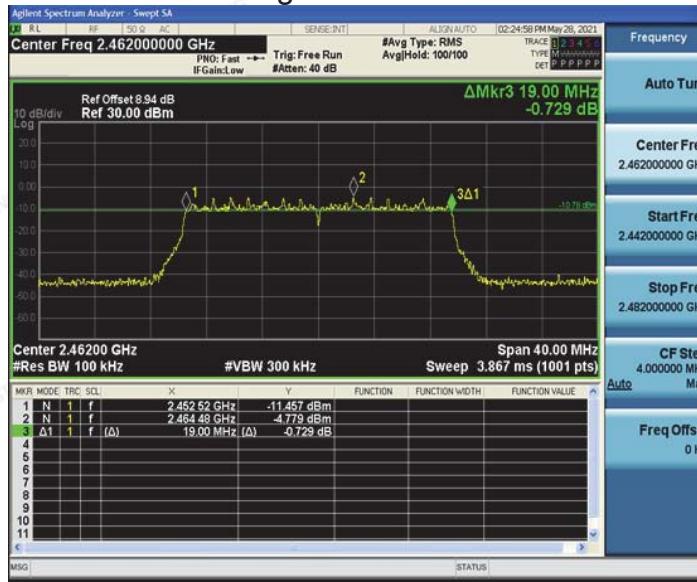
Lowest channel



Middle channel



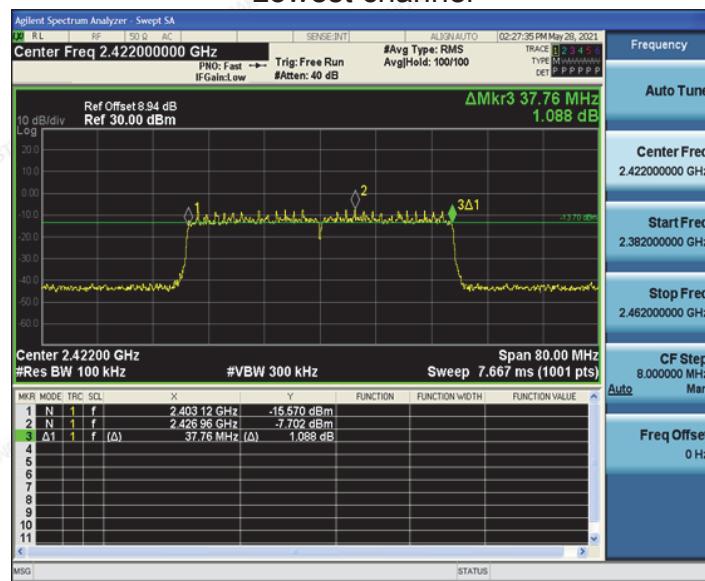
Highest channel



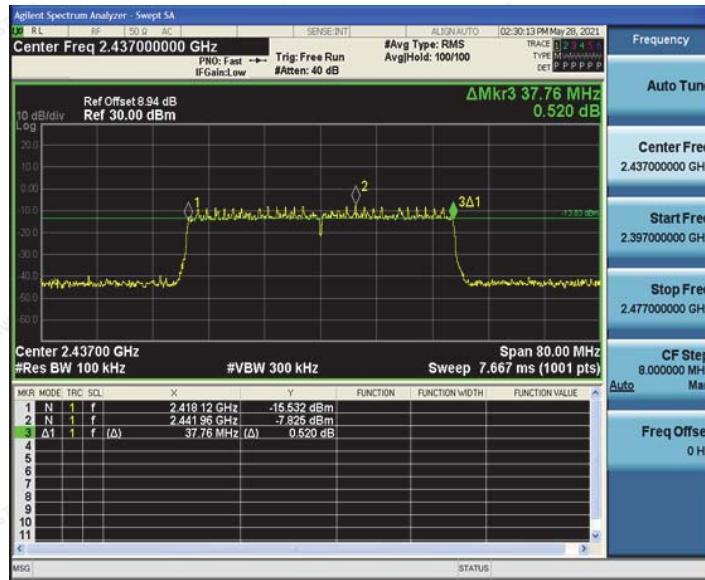
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802.11ac (HT40) Modulation

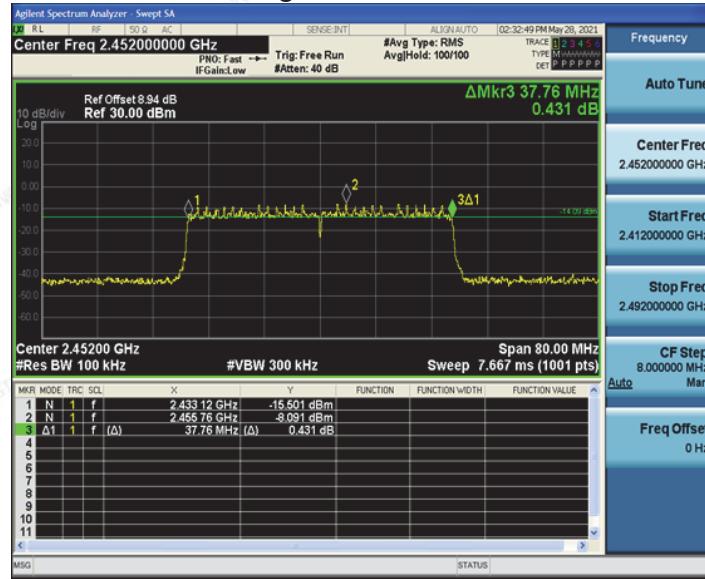
Lowest channel



Middle channel



Highest channel

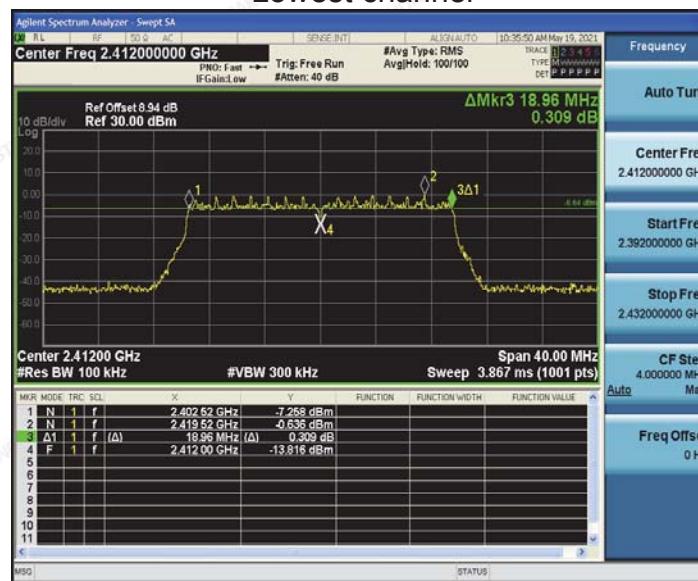


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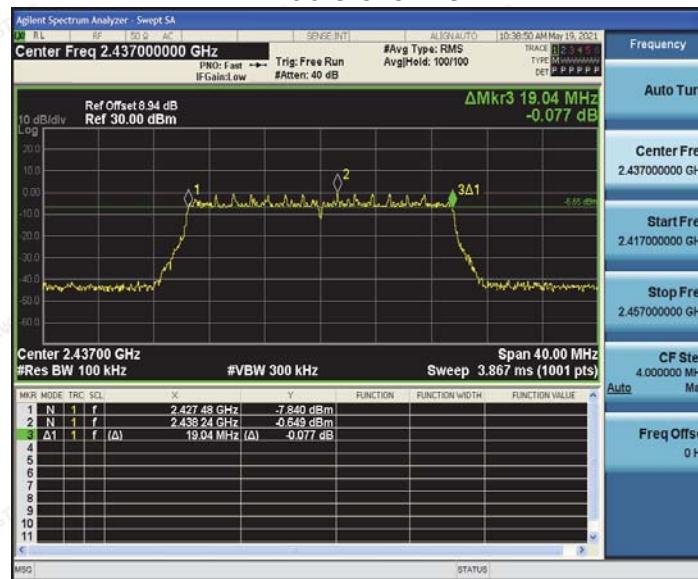


802.11ax (HT20) Modulation

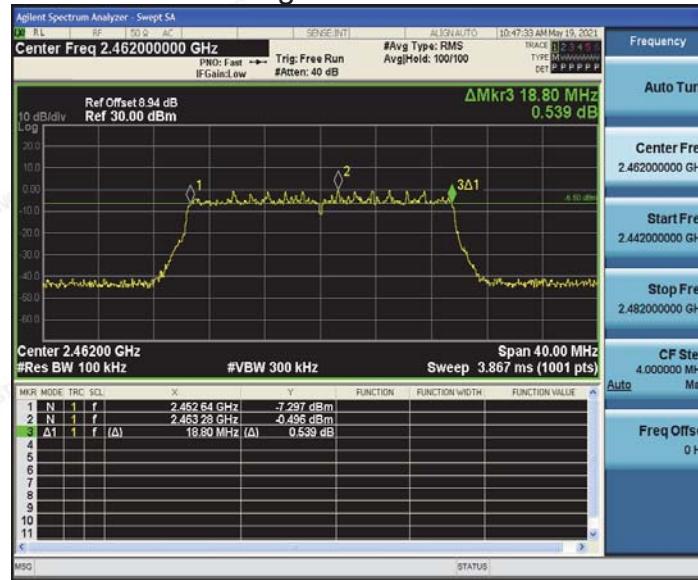
Lowest channel



Middle channel



Highest channel

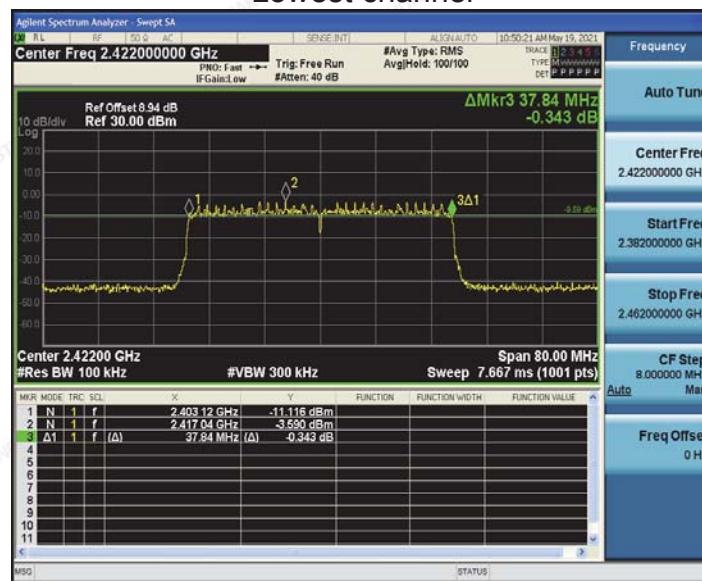


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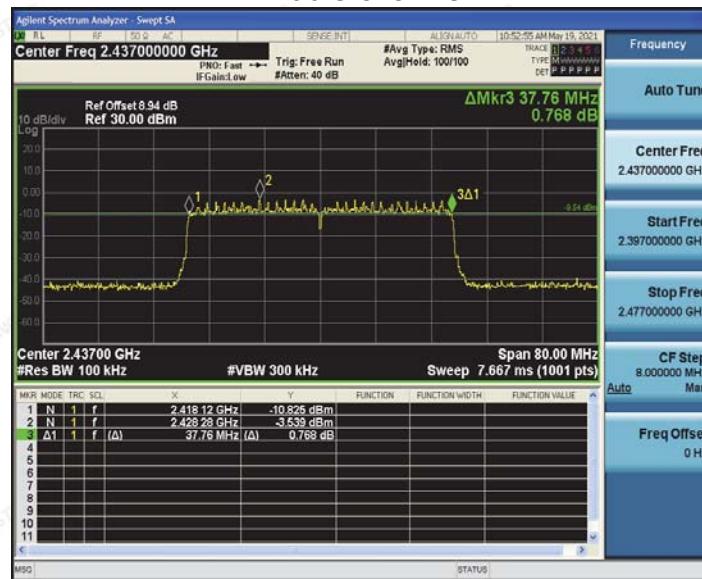


802.11ax (HT40) Modulation

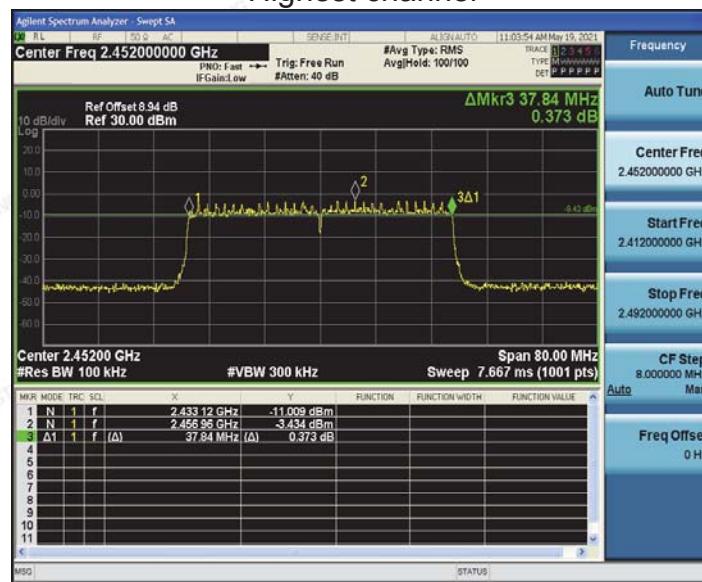
Lowest channel



Middle channel



Highest channel

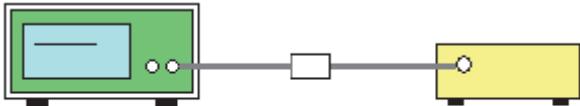


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4.4. Power Spectral Density

4.4.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (e)
Test Method:	KDB 558074
Limit:	The average power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.
Test Setup:	 <p>Spectrum Analyzer EUT</p>
Test Mode:	Transmitting mode with modulation
Test Procedure:	<ol style="list-style-type: none"> 1. The testing follows Measurement procedure 10.2 method PKPSD of FCC KDB Publication No. 558074 D01 15.247 Meas Guidance 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): $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$. Video bandwidth $\text{VBW} \geq 3 \times \text{RBW}$. Set the span to at least 1.5 times the OBW. 5. Detector = Peak, Sweep time = auto couple. 6. Employ trace averaging (Peak) mode over a minimum of 100 traces. Use the peak marker function to determine the maximum power level. 7. Measure and record the results in the test report.
Test Result:	PASS

4.4.2. Test Instruments

RF Test Room					
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Spectrum analyzer	Agilent	N9020A	HKE-048	Jun. 18, 2020	Jun. 17, 2021
RF Cable (9KHz-26.5GHz)	Tonscend	170660	N/A	Jun. 18, 2020	Jun. 17, 2021
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Jun. 18, 2020	Jun. 17, 2021

Note: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to international system unit (SI).

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4.4.3. Test data

For antenna port 1

EUT Set Mode	Channel	Result (dBm/30kHz)	Result (dBm/3kHz)
802.11b	Lowest	-1.2	-11.2
	Middle	-0.47	-10.47
	Highest	-1.23	-11.23
802.11g	Lowest	-5.72	-15.72
	Middle	-8.28	-18.28
	Highest	-8.21	-18.21
802.11n(H20)	Lowest	-7.59	-17.59
	Middle	-7.71	-17.71
	Highest	-7.57	-17.57
802.11n(H40)	Lowest	-10.57	-20.57
	Middle	-10.39	-20.39
	Highest	-10.63	-20.63
802.11ac(H20)	Lowest	-8.97	-18.58
	Middle	-9.37	-18.64
	Highest	-10.32	-18.05
802.11ac(H40)	Lowest	-12.62	-20.68
	Middle	-12.72	-20.8
	Highest	-12.78	-20.83
802.11ax(H20)	Lowest	-8.58	-18.58
	Middle	-8.64	-18.64
	Highest	-8.05	-18.05
802.11ax(H40)	Lowest	-10.68	-20.68
	Middle	-10.8	-20.8
	Highest	-10.83	-20.83
PSD test result (dBm/3kHz)= PSD test result (dBm/30kHz)-10			
limit=8dBm-(direction gain-6dB)=8-(4.2+10log2-6)=6.8dBm			
Limit: 6.8dBm/3kHz (b, g mode limit is 8dBm/3kHz)			
Test Result:	PASS		

Test plots as follows:



802.11b Modulation

Lowest channel



Middle channel



Highest channel

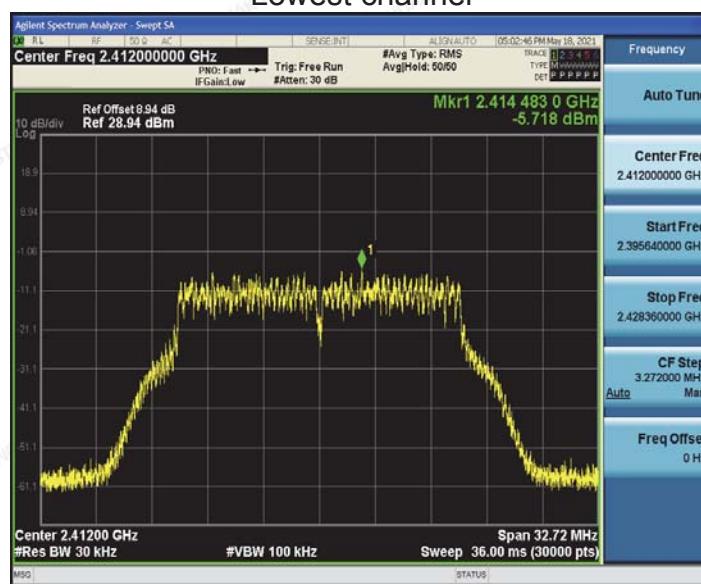


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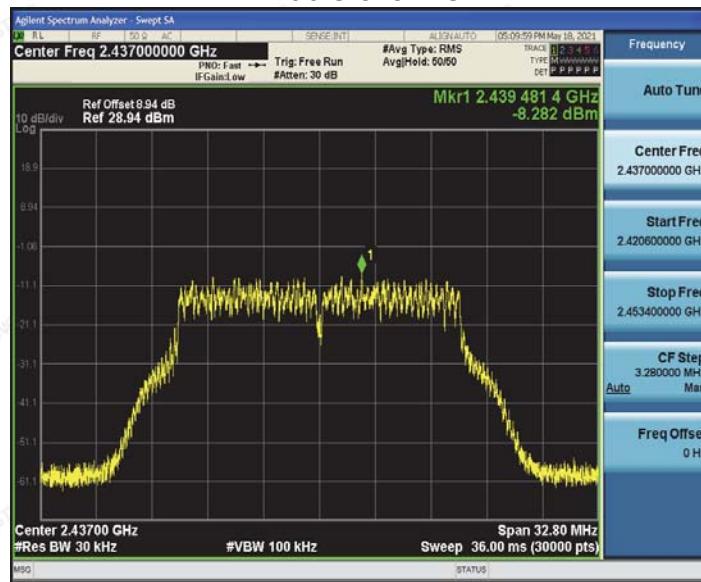


802.11g Modulation

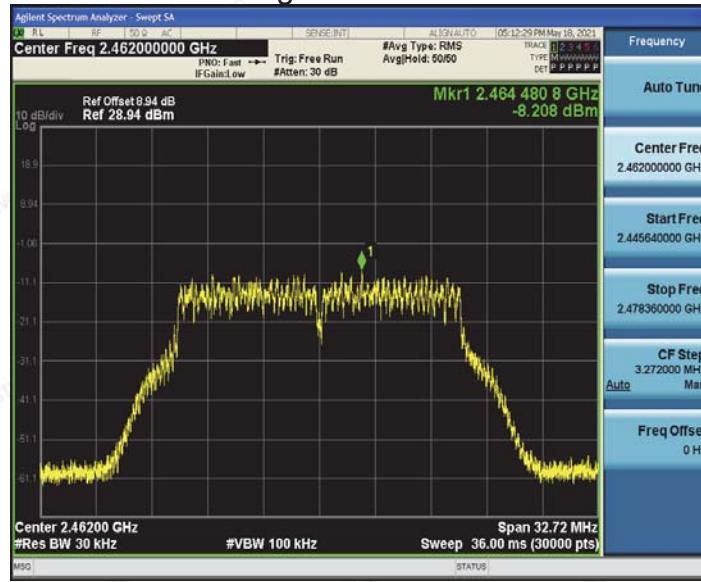
Lowest channel



Middle channel



Highest channel

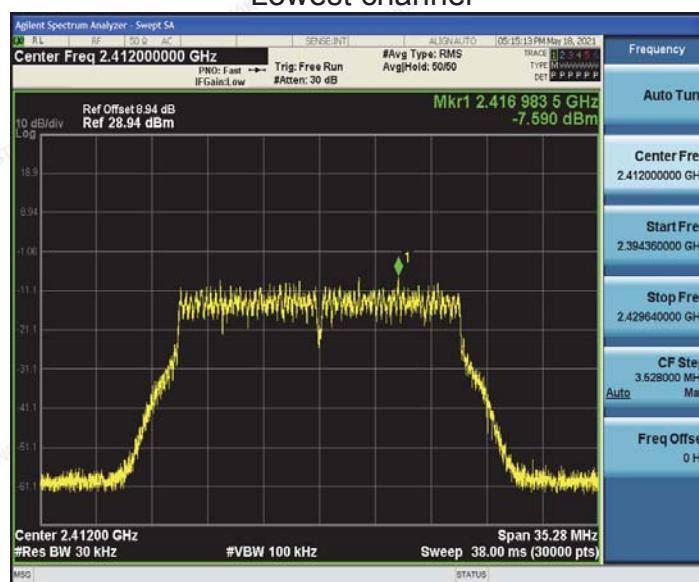


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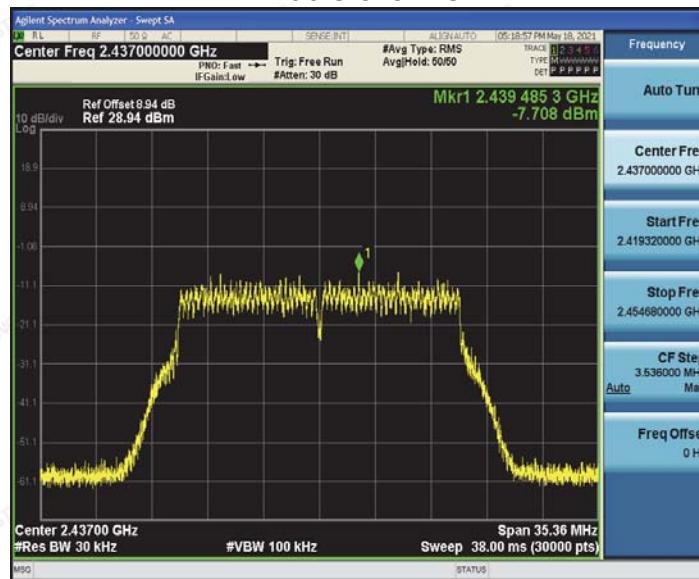


802.11n (HT20) Modulation

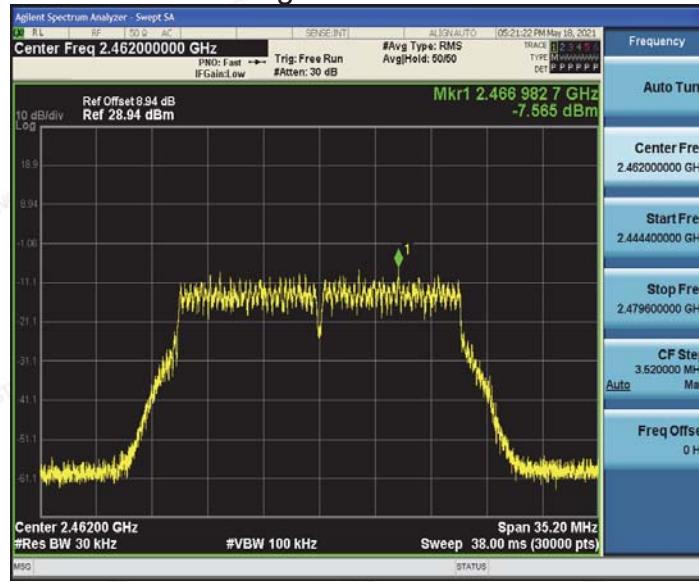
Lowest channel



Middle channel



Highest channel

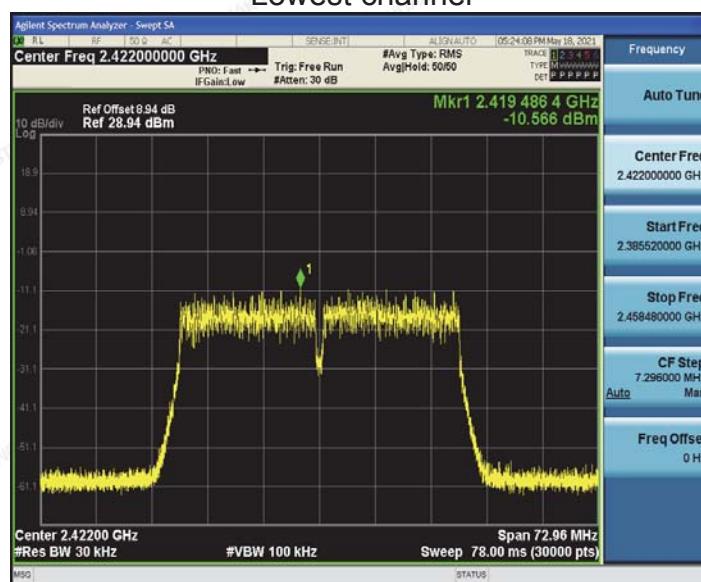


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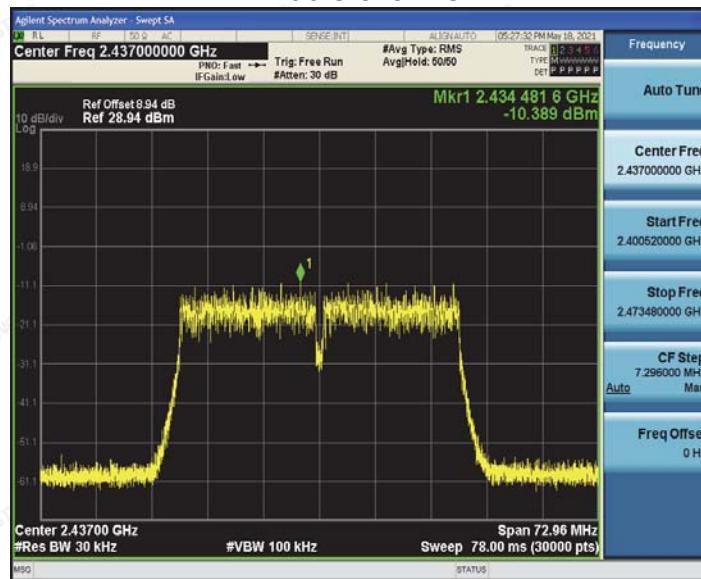


802.11n (HT40) Modulation

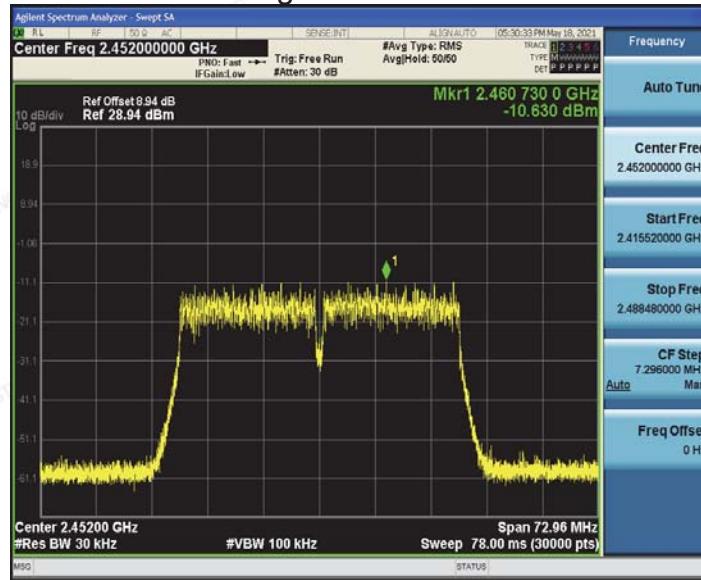
Lowest channel



Middle channel



Highest channel

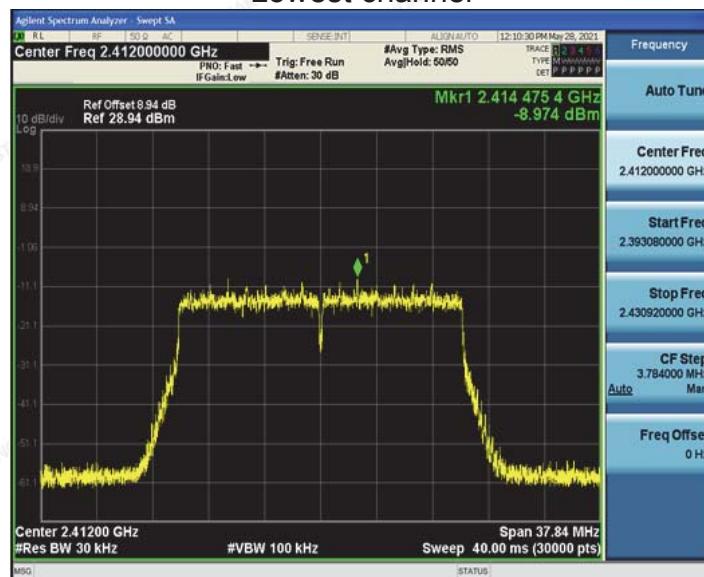


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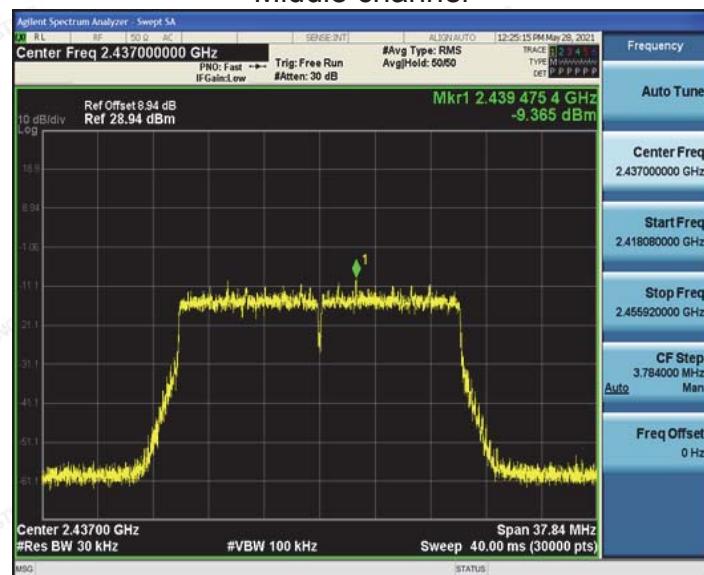


802.11ac(HT20) Modulation

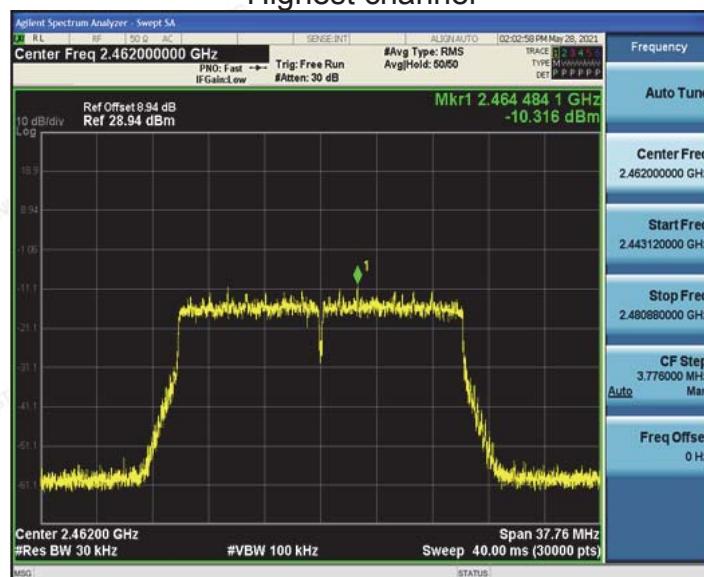
Lowest channel



Middle channel



Highest channel

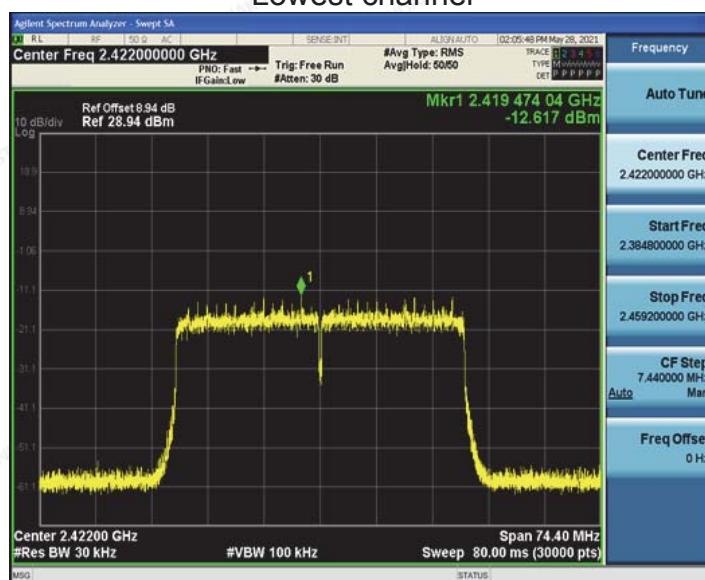


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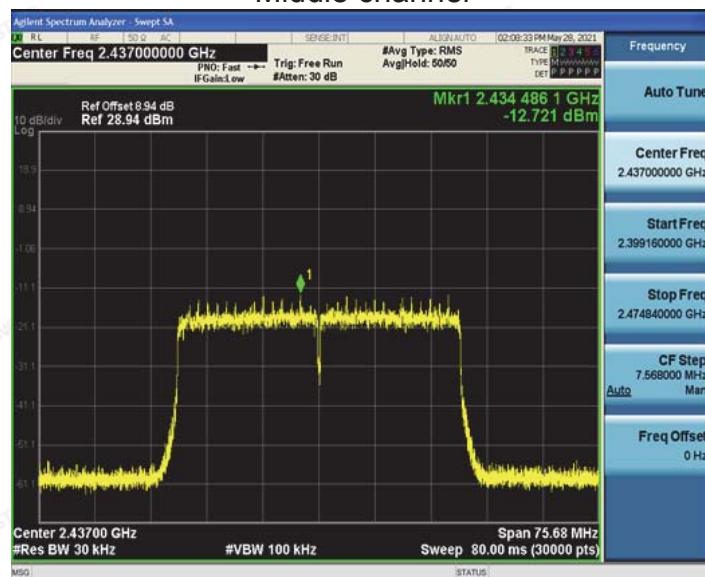


802.11ac (HT40) Modulation

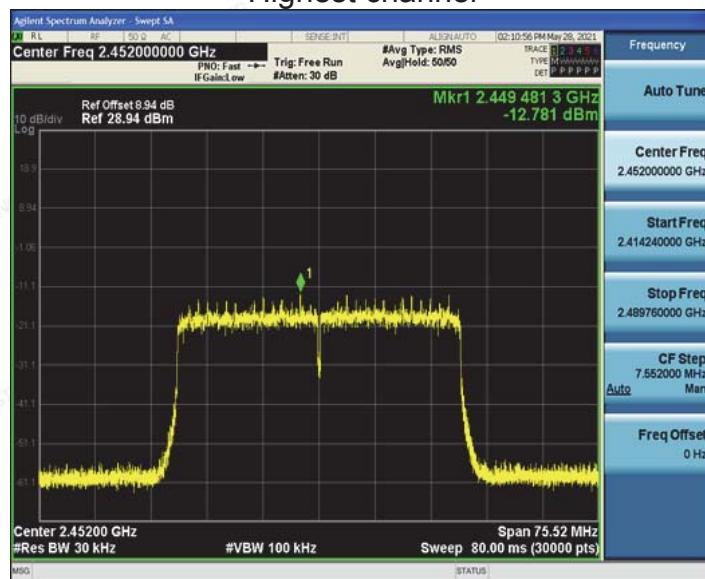
Lowest channel



Middle channel



Highest channel

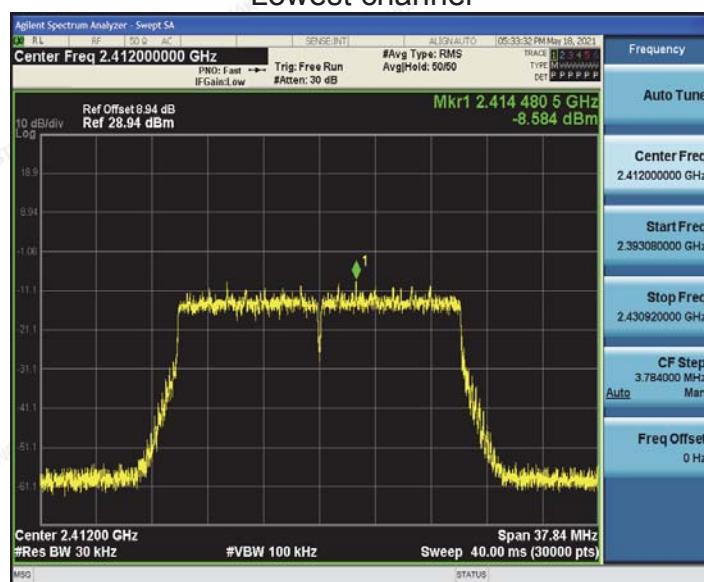


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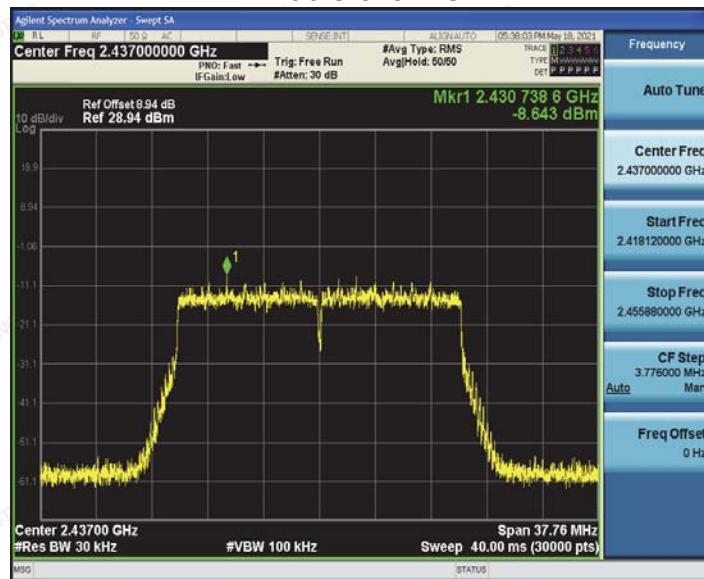


802.11ax(HT20) Modulation

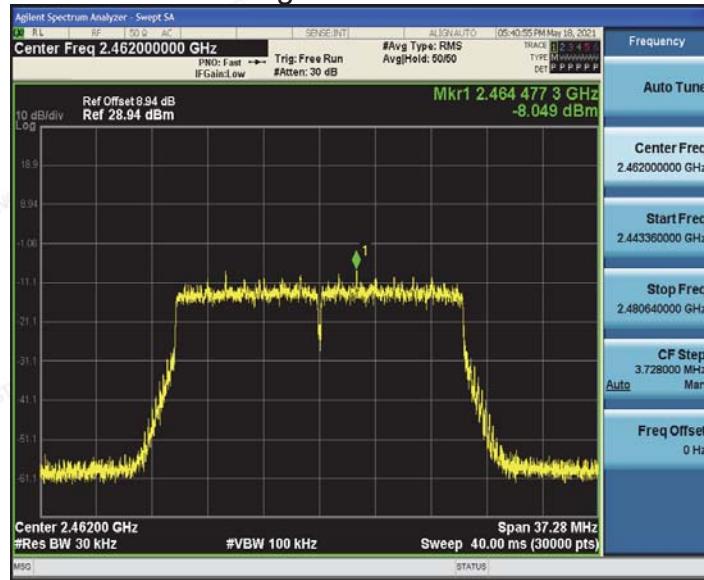
Lowest channel



Middle channel



Highest channel

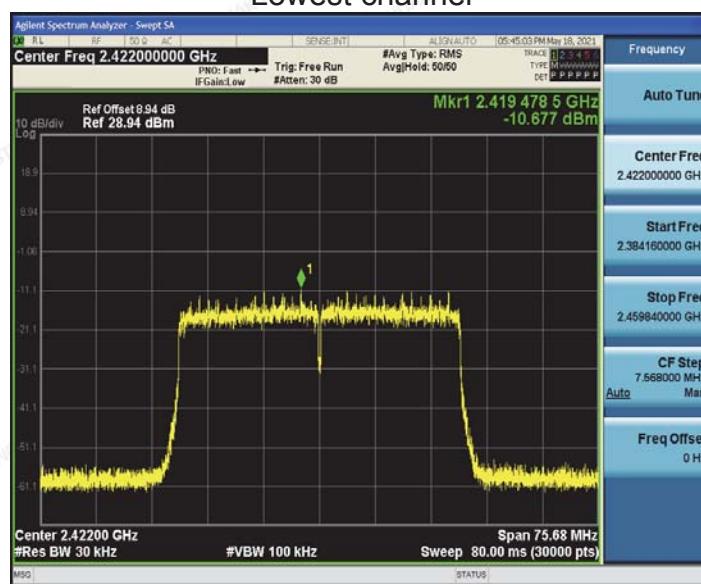


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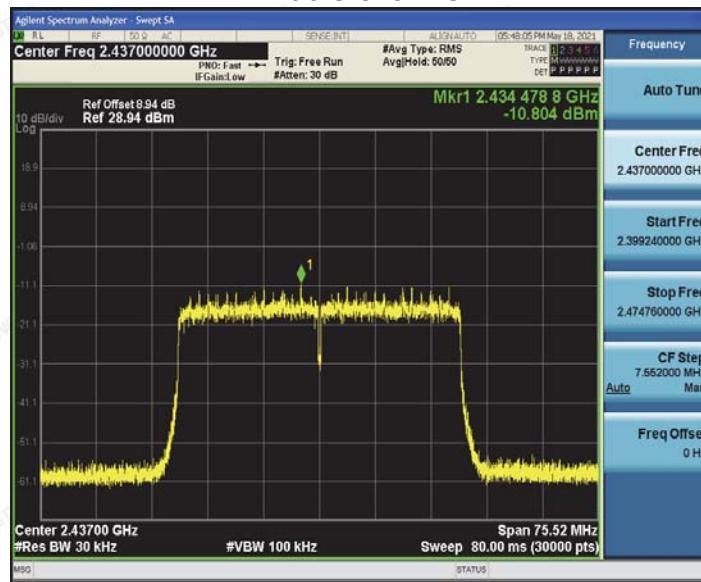


802.11ax (HT40) Modulation

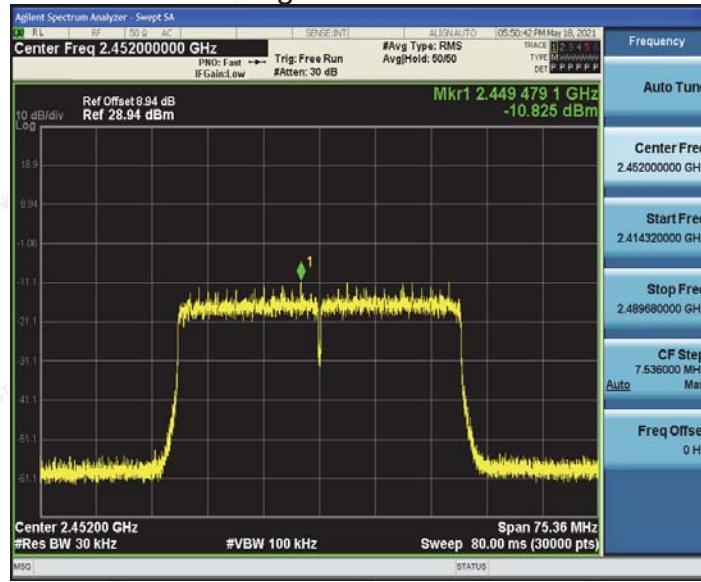
Lowest channel



Middle channel



Highest channel



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For antenna port 2

EUT Set Mode	Channel	Result (dBm/30kHz)	Result (dBm/3kHz)
802.11b	Lowest	-4.31	-14.31
	Middle	-3.94	-13.94
	Highest	-3.98	-13.98
802.11g	Lowest	-8.76	-18.76
	Middle	-9.07	-19.07
	Highest	-8.39	-18.39
802.11n(H20)	Lowest	-7.58	-17.58
	Middle	-7.58	-17.58
	Highest	-4.81	-14.81
802.11n(H40)	Lowest	-7.95	-17.95
	Middle	-8.2	-18.2
	Highest	-7.81	-17.81
802.11ac(H20)	Lowest	-10.24	-15.37
	Middle	-10.26	-15.35
	Highest	-9.75	-15.23
802.11ac(H40)	Lowest	-12.28	-17.72
	Middle	-12.47	-17.96
	Highest	-13.13	-18.05
802.11ax(H20)	Lowest	-5.37	-15.37
	Middle	-5.35	-15.35
	Highest	-5.23	-15.23
802.11ax(H40)	Lowest	-7.72	-17.72
	Middle	-7.96	-17.96
	Highest	-8.05	-18.05
PSD test result (dBm/3kHz)= PSD test result (dBm/30kHz)-10			
limit=8dBm-(direction gain-6dB)=8-(4.2+10log2-6)=6.8dBm			
Limit: 6.8dBm/3kHz (b, g mode limit is 8dBm/3kHz)			
Test Result:		PASS	

Test plots as follows: