



FCC TEST REPORT

**Test report
On Behalf of
International Communications Corporation
For
Wi-Fi 6 1800Mbps Router
Model No.: ResiRouterWF6
FCC ID: 2ABFZ-RESIROUTERWF6**

Prepared For : International Communications Corporation
11801 Pierce St., 2nd FL Riverside, California 92505 United States

Prepared By : Shenzhen HUAKE Testing Technology Co., Ltd.
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Date of Test: Dec. 02, 2021 ~ Dec. 14, 2021

Date of Report: Dec. 14, 2021

Report Number: HK2112024710-1E



TEST RESULT CERTIFICATION

Applicant's name: International Communications Corporation
Address: 11801 Pierce St., 2nd FL Riverside, California 92505 United States
Manufacture's Name.....: Shenzhen Yunlink Technology Co., Ltd.
Address: B3 Building, Anle Industrial Zone, Hangcheng Road, Gushu,
Xixiang, Bao'an, Shenzhen, China
Product description
Trade Mark: ResiRouter
Product name.....: Wi-Fi 6 1800Mbps Router
Model and/or type reference : ResiRouterWF6
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: Dec. 02, 2021 ~ Dec. 14, 2021
Date of Issue.....: Dec. 14, 2021
Test Result.....: Pass

Testing Engineer :

(Gary Qian)

Technical Manager :

(Eden Hu)

Authorized Signatory :

(Jason Zhou)



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**** Modified History ****

Revision	Description	Issued Data	Remark
Revision 1.0	Initial Test Report Release	Dec. 14, 2021	Jason Zhou



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	§15.247(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. INFORMATION OF THE TEST LABORATORY

Shenzhen HUAKE Testing Technology Co., Ltd.
Add.: 1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping,
Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Testing Laboratory Authorization:

A2LA Accreditation Code is 4781.01.
FCC Designation Number is CN1229.
Canada IC CAB identifier is CN0045.
CNAS Registration Number is L9589.



1.3. MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expanded 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 1800Mbps Router
Model Name:	ResiRouterWF6
Serial Model:	N/A
Model Difference:	N/A
Trade Mark:	ResiRouter
FCC ID:	2ABFZ-RESIROUTERWF6
Antenna Type:	Internal Antenna
Antenna Gain:	Antenna 1:3dBi Antenna 2:3dBi MIMO: 6.01dBi
Operation frequency:	802.11b/g/n20: 2412~2462MHz 802.11n40: 2422~2452MHz TX ac 20: 2412~2462MHz TX ac 40: 2422~2452MHz 802.11ax HT20: 2412~2462MHz 802.11ax HT40: 2422~2452MHz
Number of Channels:	802.11b/g/n20: 11CH 802.11n40: 7CH TX ac 20: 11CH TX ac 40: 7CH 802.11ax HT20: 11CH 802.11ax HT40: 7CH
Modulation Type:	CCK/OFDM/DBPSK/DAPSK
Power Source:	POE IN: 48V, 05A DC IN:12V, 1A
Power Rating:	POE IN: 48V, 05A DC IN:12V, 1A
Hardware Version:	V1.2
Software Version:	V2.0
Note: 1.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. This device supports self-defined ac mode.	



2.2. CARRIER FREQUENCY OF CHANNELS

Channel List for 802.11b/ 802.11g/ 802.11n (HT20)/ TX ac 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) / TX ac 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)
/TX ac HT20/802.11ax HT20**

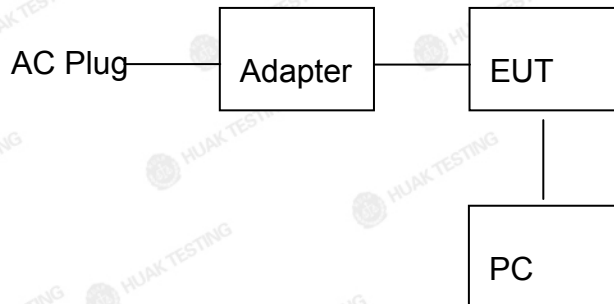
Low Channel: 2412MHz
Middle Channel: 2437MHz
High Channel: 2462MHz

The mode is used: Transmitting mode for 802.11n (HT40)/TX ac HT40/ 802.11ax HT40
Low Channel: 2422MHz
Middle Channel: 2437MHz
High Channel: 2452MHz

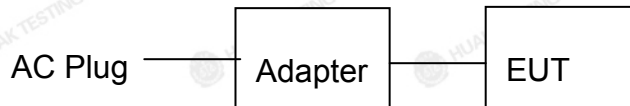


2.4. DESCRIPTION OF TEST SETUP

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



Operation of EUT during Above1GHz Radiation testing:



PC information

Model: TP00067A

Input: DC 20V, 2.25~3.25A

Output: 5VDC, 0.5A

Adapter information

Model: GRT-POE15-480050

Input: AC100-240V, 50/60Hz, 0.8A

Output: 48V, 500mA

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%)
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.	

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.

Mode	Data rate
802.11b	1Mbps
802.11g	6Mbps
802.11n(H20)/ax HT20/ TX ac HT20	6.5Mbps
802.11n(H40)/ax HT40/ TX ac HT40	13.5Mbps

Final Test Mode:

Operation mode:	Keep the EUT in continuous transmitting with modulation
-----------------	---

1. For WIFI function, the engineering test program was provided and enabled to make EUT continuous transmit/receive.

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)/ax HT20/ TX ac HT20, 13.5Mbps for 802.11n(H40)/ax HT40/ TX ac HT40. Duty cycle setting during the transmission is 98.5% with maximum power setting for all modulations.



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><tr><th rowspan="2">Frequency range (MHz)</th><th colspan="2">Limit (dBuV)</th></tr><tr><th>Quasi-peak</th><th>Average</th></tr><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></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:	Reference Plane Remark E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m														
Test Mode:	Charging + transmitting with modulation														
Test Procedure:	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

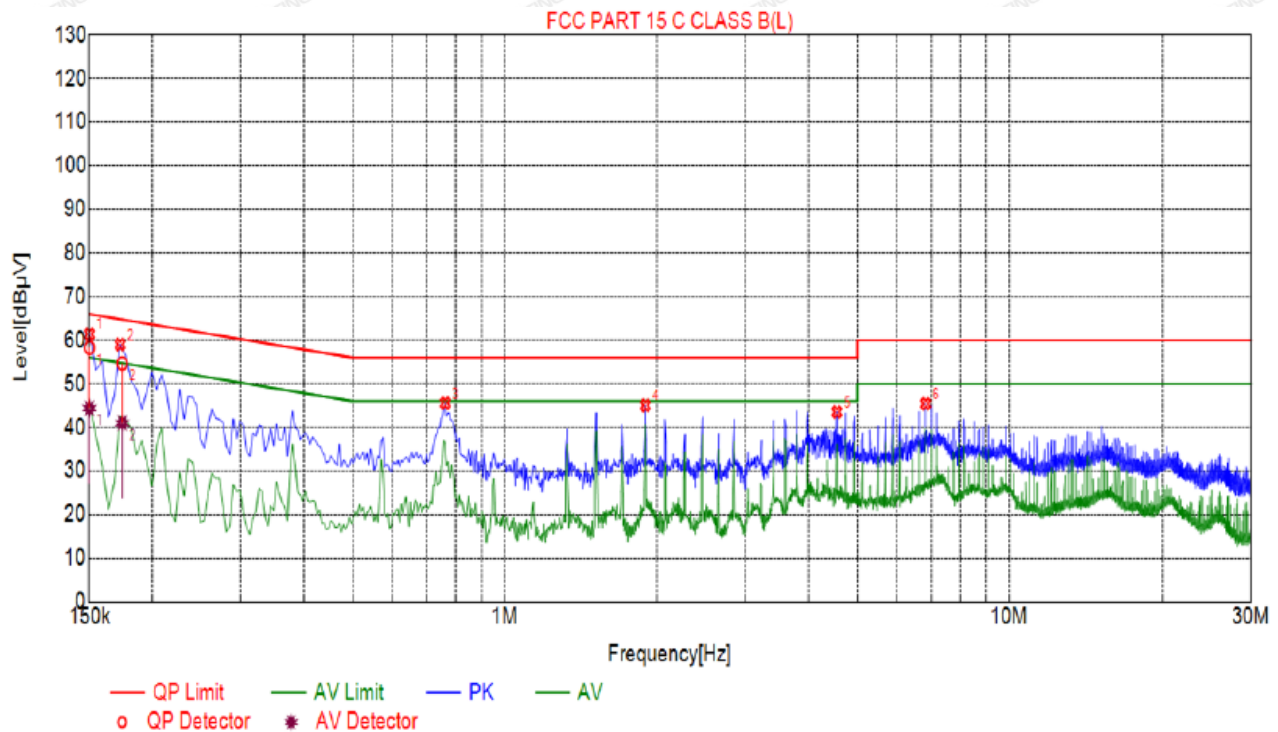
Conducted Emission Shielding Room Test Site (843)					
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Receiver	R&S	ESCI 7	HKE-010	Dec. 09, 2021	Dec. 08, 2022
LISN	R&S	ENV216	HKE-002	Dec. 09, 2021	Dec. 08, 2022
Conducted test software	Tonscend	TS+ Rev 2.5.0.0	HKE-081	N/A	N/A

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

Test Specification: Line



Suspected List

NO.	Freq. [MHz]	Level [dBμV]	Factor [dB]	Limit [dBμV]	Margin [dB]	Reading [dBμV]	Detector	Type
1	0.1500	61.40	20.03	66.00	4.60	41.37	PK	L
2	0.1725	59.02	20.04	64.84	5.82	38.98	PK	L
3	0.7620	45.57	20.05	56.00	10.43	25.52	PK	L
4	1.9005	45.04	20.14	56.00	10.96	24.90	PK	L
5	4.5555	43.53	20.25	56.00	12.47	23.28	PK	L
6	6.8370	45.43	20.20	60.00	14.57	25.23	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	0.1500	20.03	58.30	66.00	7.70	38.27	44.40	56.00	11.60	24.37	L
2	0.1742	20.04	54.67	64.76	10.09	34.63	41.01	54.76	13.75	20.97	L

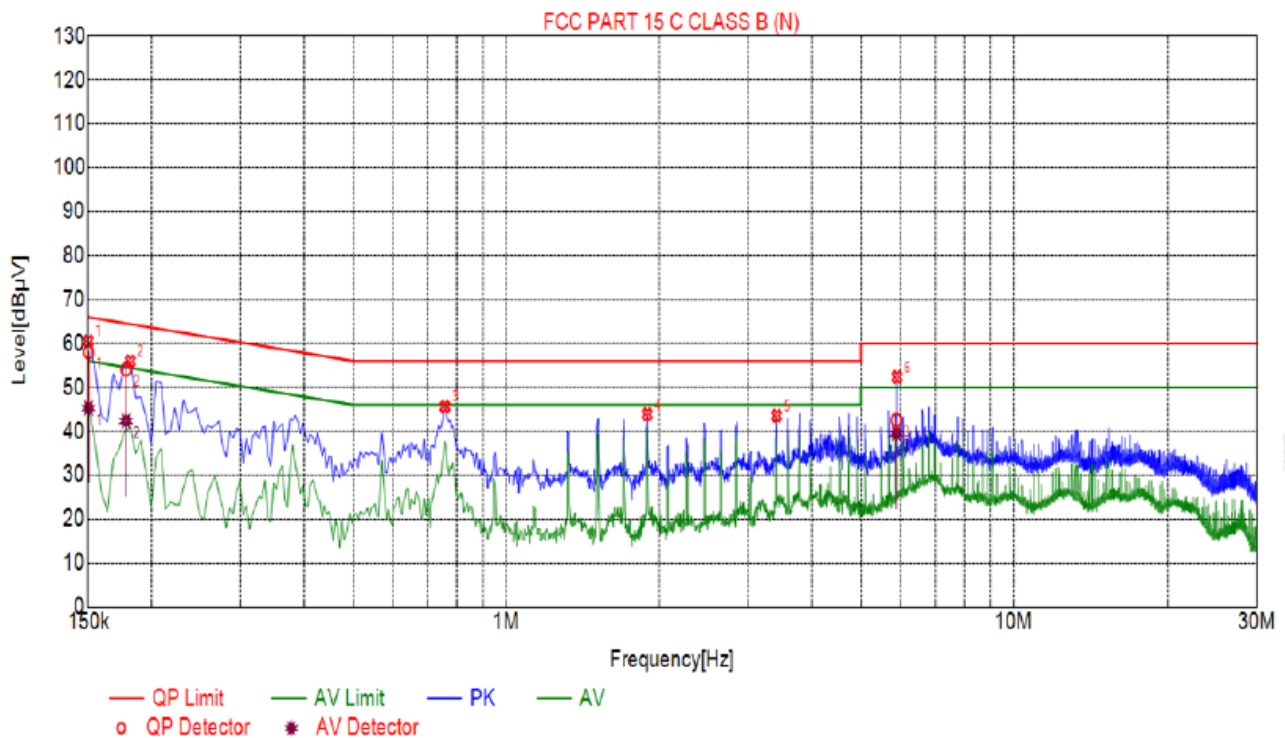
Remark: Margin = Limit – Level

Correction factor = Cable lose + 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	0.1500	60.54	20.03	66.00	5.46	40.51	PK	N
2	0.1815	55.93	20.06	64.42	8.49	35.87	PK	N
3	0.7575	45.58	20.06	56.00	10.42	25.52	PK	N
4	1.8960	43.85	20.14	56.00	12.15	23.71	PK	N
5	3.4125	43.53	20.24	56.00	12.47	23.29	PK	N
6	5.8965	52.37	20.23	60.00	7.63	32.14	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	0.1501	20.03	58.06	66.00	7.94	38.03	45.32	56.00	10.68	25.29	N
2	0.1779	20.05	54.10	64.59	10.49	34.05	42.35	54.59	12.24	22.30	N
3	5.8768	20.24	42.57	60.00	17.43	22.33	39.46	50.00	10.54	19.22	N

Remark: Margin = Limit – Level

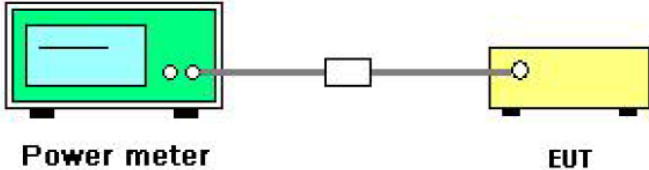
Correction factor = Cable lose + LISN insertion loss

Level=Test receiver reading + correction factor



4.2. MAXIMUM CONDUCTED OUTPUT POWER

4.2.1. Test Specification

Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Test Method:	KDB 558074
Limit:	30dBm
Test Setup:	 The diagram illustrates the test setup. On the left is a green rectangular box labeled 'Power meter'. A line connects it to a small white square labeled 'Attenuator'. Another line connects the attenuator to a yellow rectangular box labeled 'EUT' (Equipment Under Test).
Test Mode:	Transmitting mode with modulation
Test Procedure:	1. The testing follows the Measurement Procedure of FCC KDB 558074 D01 15.247 Meas Guidance v05r02. 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 Peak output power and record the results in the test report.
Test Result:	PASS

4.2.2. Test Instruments

RF Test Room					
Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Power meter	Agilent	E4419B	HKE-085	Dec. 09, 2021	Dec. 08, 2022
Power Sensor	Agilent	E9300A	HKE-086	Dec. 09, 2021	Dec. 08, 2022
RF cable	Times	1-40G	HKE-034	Dec. 09, 2021	Dec. 08, 2022
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Dec. 09, 2021	Dec. 08, 2022

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	dBm
TX 802.11b Mode					
CH01	2412	16.10	16.71	/	30
CH06	2437	15.94	14.76	/	30
CH11	2462	16.51	15.81	/	30
TX 802.11g Mode					
CH01	2412	15.75	14.52	/	30
CH06	2437	13.75	15.51	/	30
CH11	2462	14.15	15.53	/	30
TX 802.11n20 Mode					
CH01	2412	13.76	15.52	17.74	30
CH06	2437	13.21	15.44	17.48	30
CH11	2462	14.04	13.31	16.70	30
TX 802.11n40 Mode					
CH03	2422	14.67	15.18	17.94	30
CH06	2437	14.48	14.23	17.37	30
CH09	2452	14.66	14.14	17.42	30
TX ac HT20 Mode					
CH01	2412	13.33	11.74	15.62	30
CH06	2437	13.32	11.56	15.54	30
CH11	2462	13.22	11.95	15.64	30
TX ac HT40 Mode					
CH03	2422	13.99	12.47	16.31	30
CH06	2437	14.18	12.16	16.30	30
CH09	2452	13.98	12.47	16.30	30

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802.11ax HT20 Mode					
CH01	2412	14.07	14.85	17.49	30
CH06	2437	14.12	15.72	18.00	30
CH11	2462	14.44	15.79	18.18	30
802.11ax HT40 Mode					
CH03	2422	14.63	15.25	17.96	30
CH06	2437	14.45	16.09	18.36	30
CH09	2452	14.74	16.08	18.47	30
Note: This product supports antenna 1 and antenna 2 launch, but only support 802.11 n/TX ac/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:	 Spectrum Analyzer EUT
Test Mode:	Transmitting mode with modulation
Test Procedure:	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	Dec. 09, 2021	Dec. 08, 2022
RF Cable (9KHz-26.5GHz)	Tonscend	170660	N/A	Dec. 09, 2021	Dec. 08, 2022
RF automatic control unit	Tonscend	JS0806-2	HKE-060	Dec. 09, 2021	Dec. 08, 2022

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

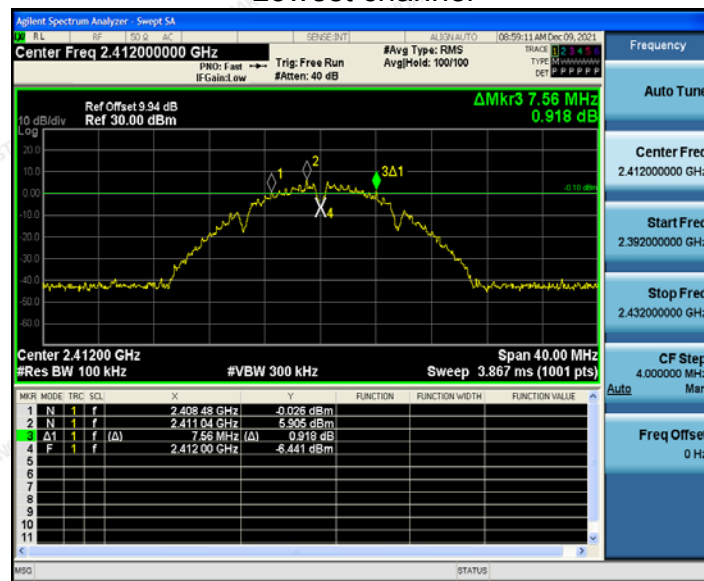
Test channel	6dB Emission Bandwidth (MHz)							
	802.11b	802.11g	802.11n (H20)	802.11n (H40)	TX ac (H20)	TX ac (H40)	802.11ax (H20)	802.11ax (H40)
Lowest	7.56	16.28	17.28	36.40	17.52	35.68	17.00	37.84
Middle	7.52	15.92	15.04	35.68	17.12	35.84	19.04	37.60
Highest	8.08	16.04	16.88	34.64	16.72	35.68	18.36	37.76
Limit:	>500KHz							
Test Result:	PASS							

Test plots as follows:

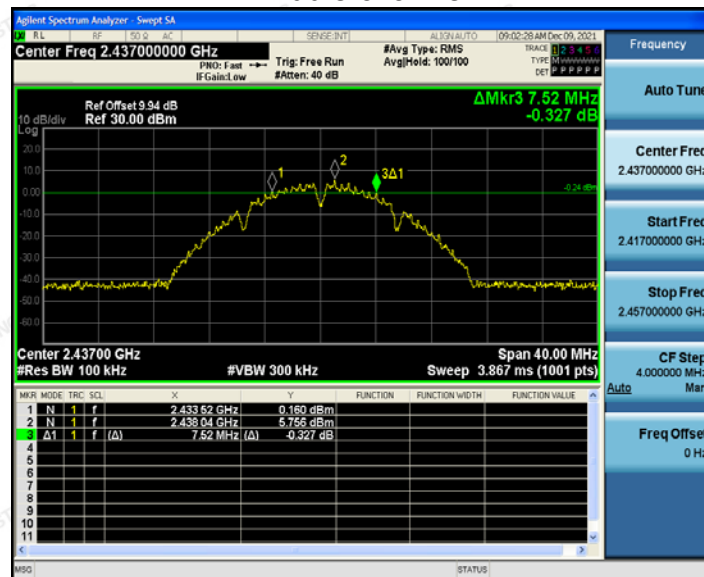


802.11b Modulation

Lowest channel



Middle channel



Highest channel



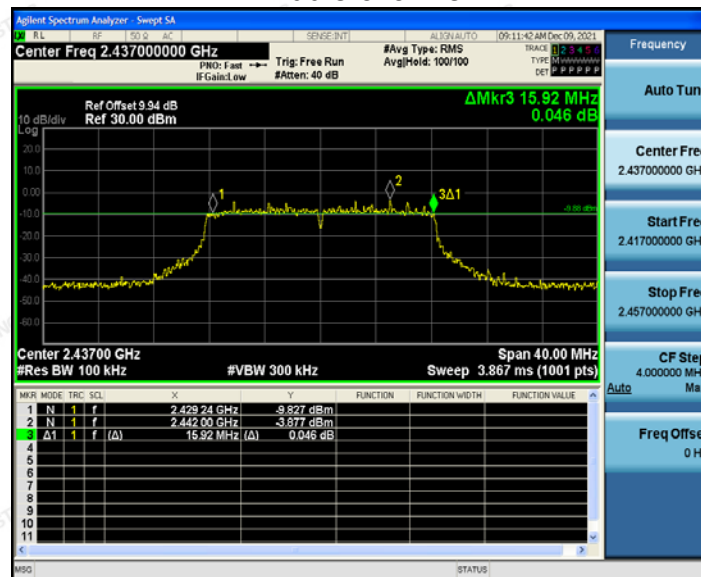
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802.11g Modulation

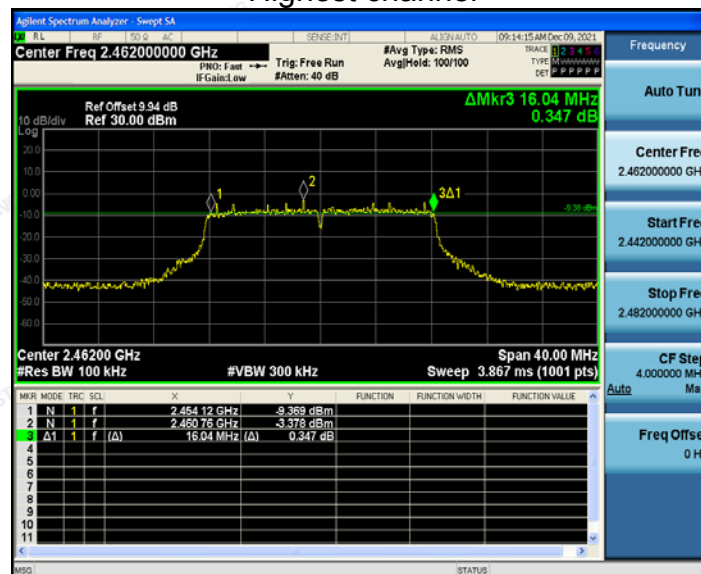
Lowest channel



Middle channel



Highest channel



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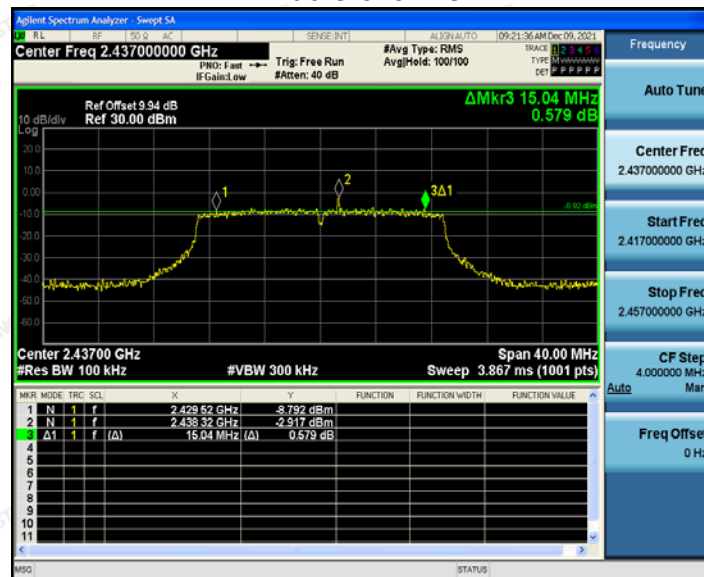


802.11n (HT20) Modulation

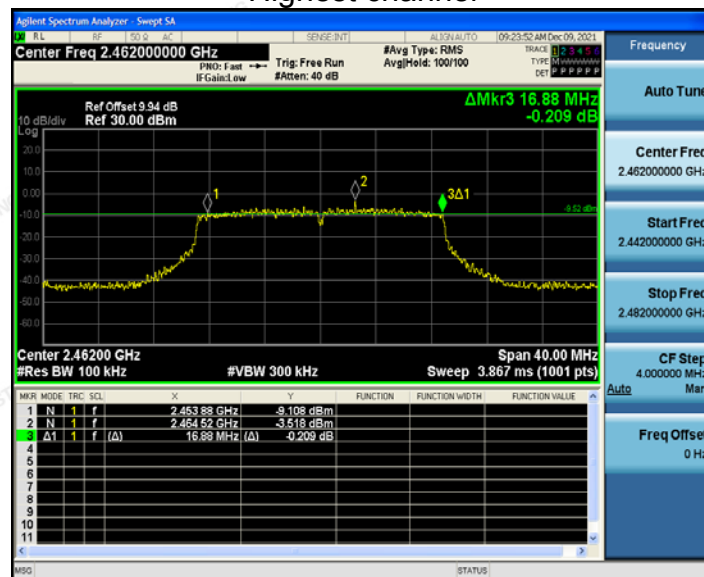
Lowest channel



Middle channel



Highest channel

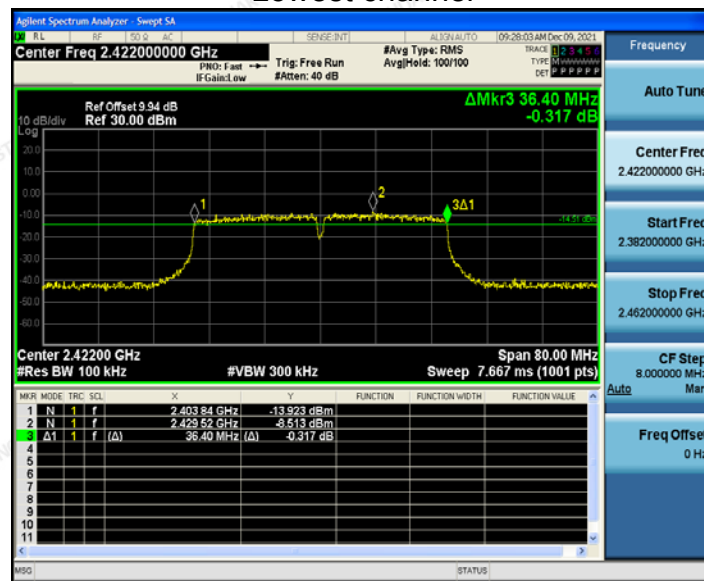


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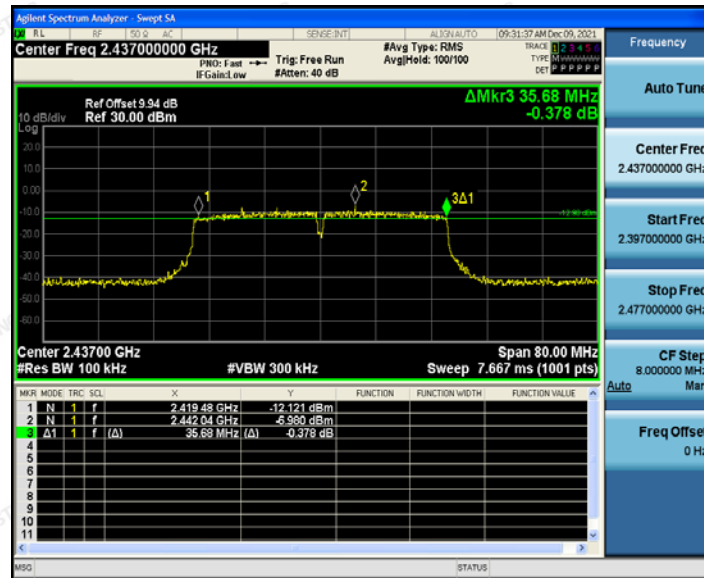


802.11n (HT40) Modulation

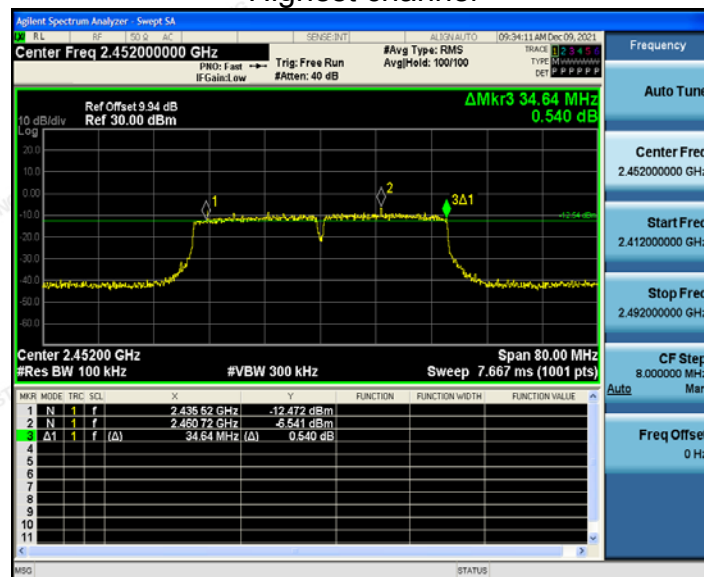
Lowest channel



Middle channel



Highest channel

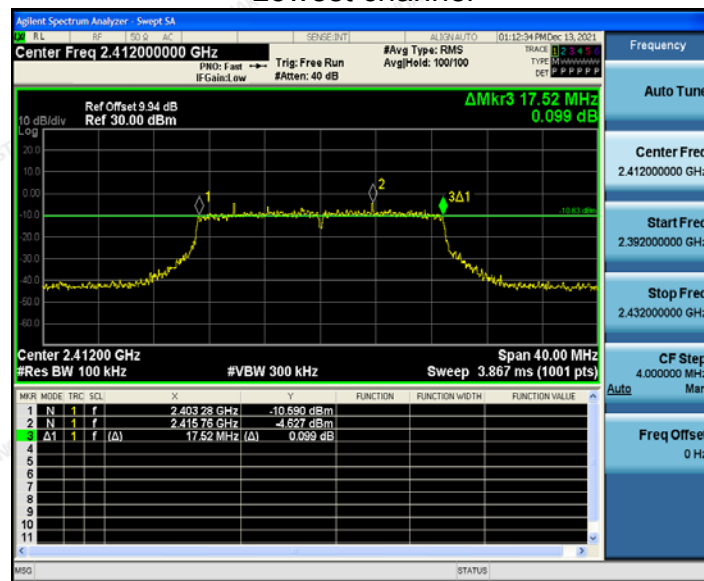


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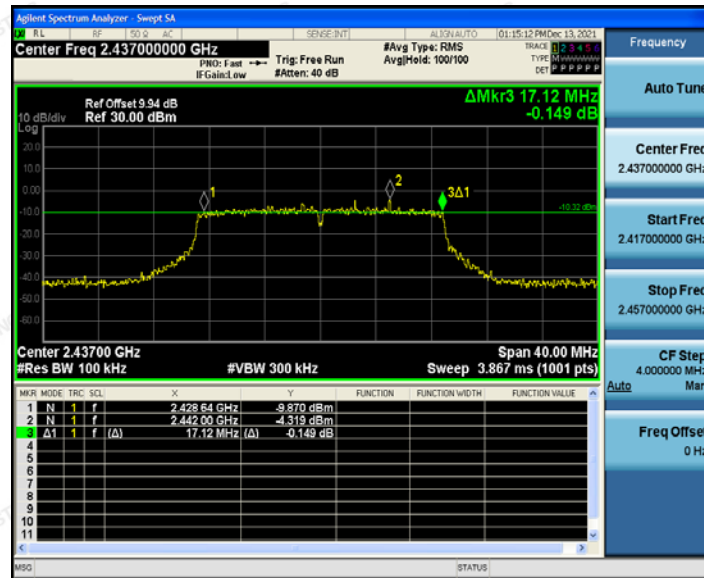


TX ac (HT20) Modulation

Lowest channel



Middle channel



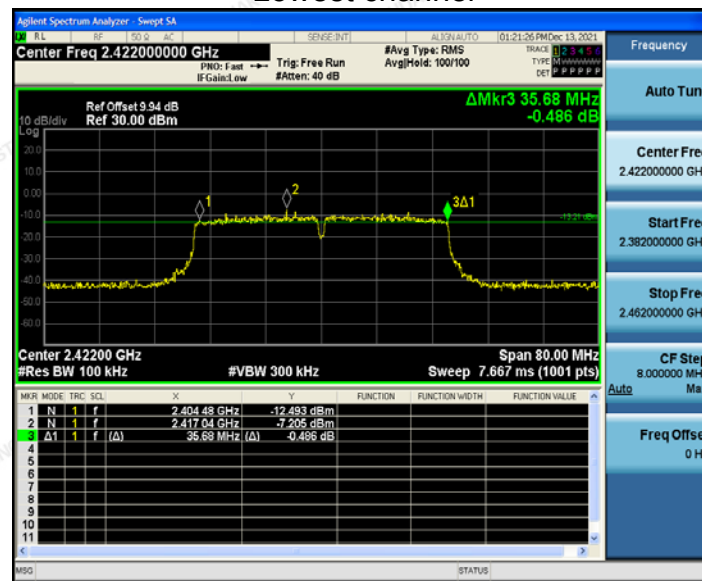
Highest channel



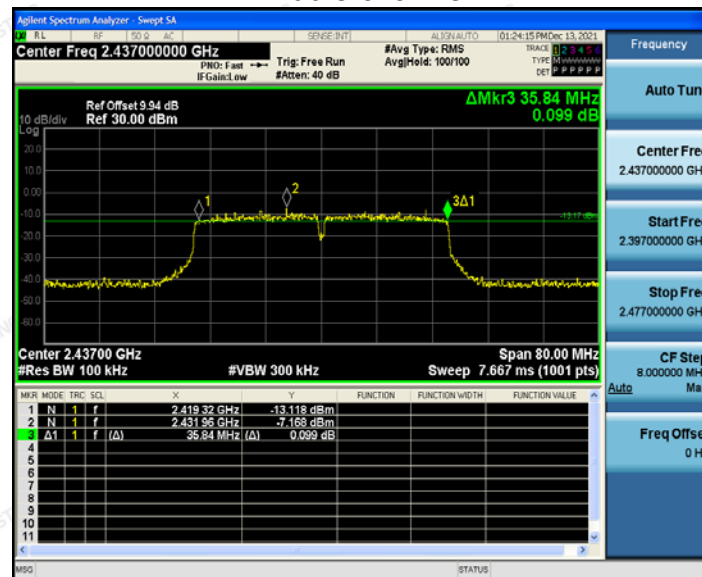
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TX ac (HT40) Modulation

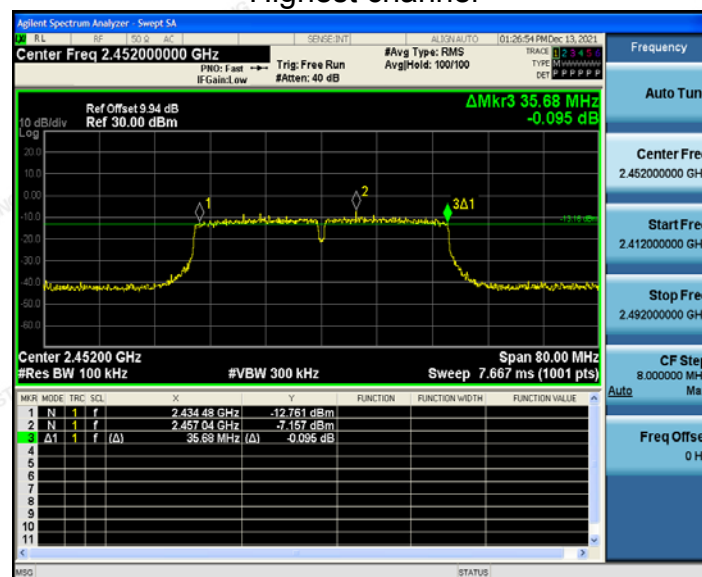
Lowest channel



Middle channel



Highest channel



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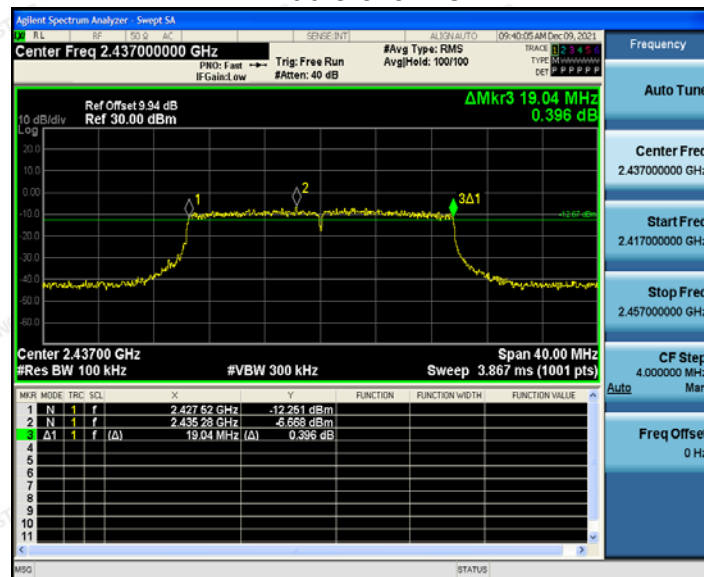


802.11ax (HT20) Modulation

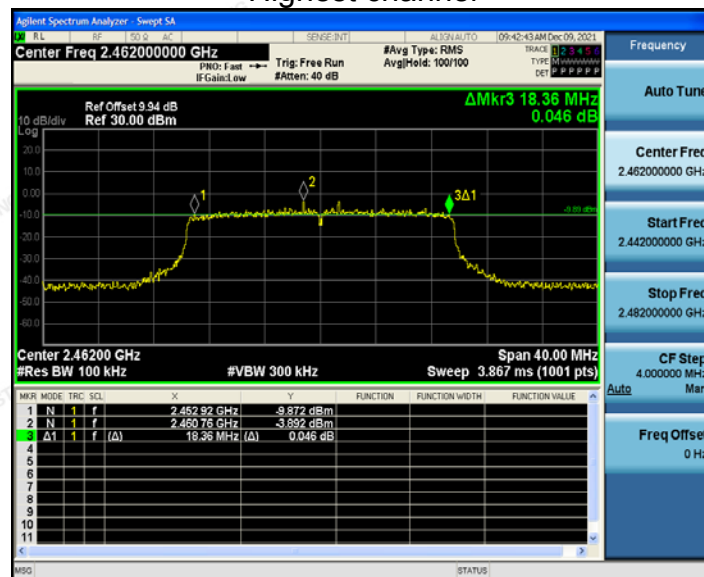
Lowest channel



Middle channel



Highest channel

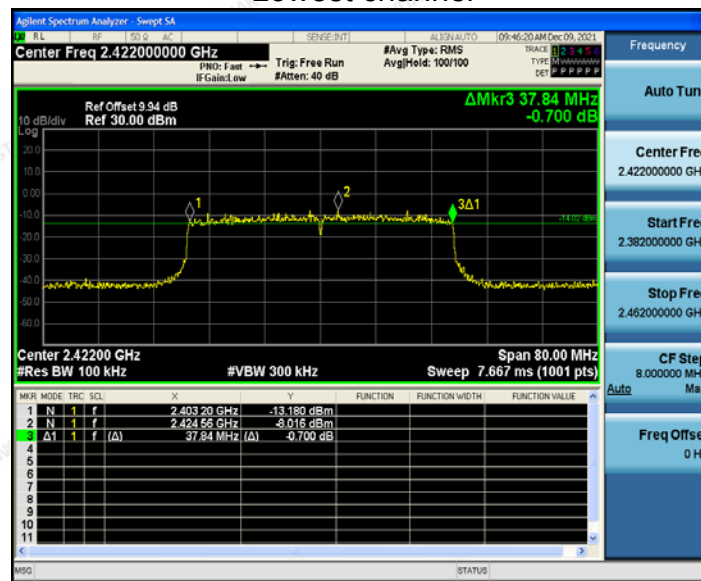


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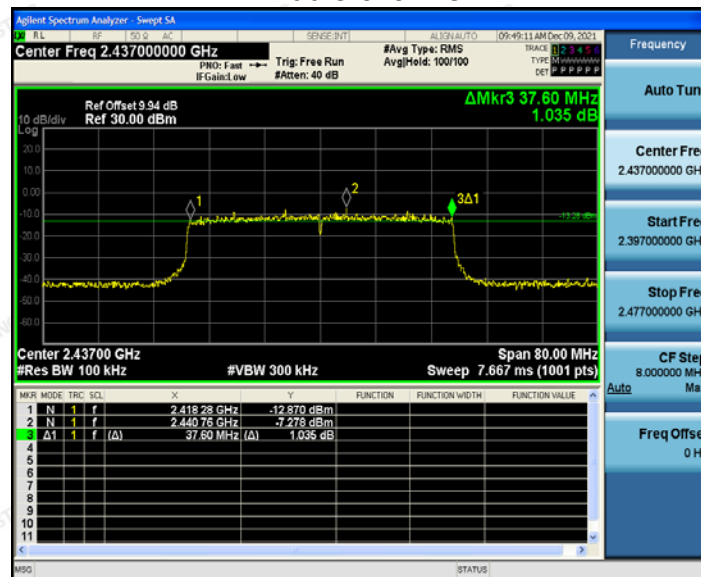


802.11ax (HT40) Modulation

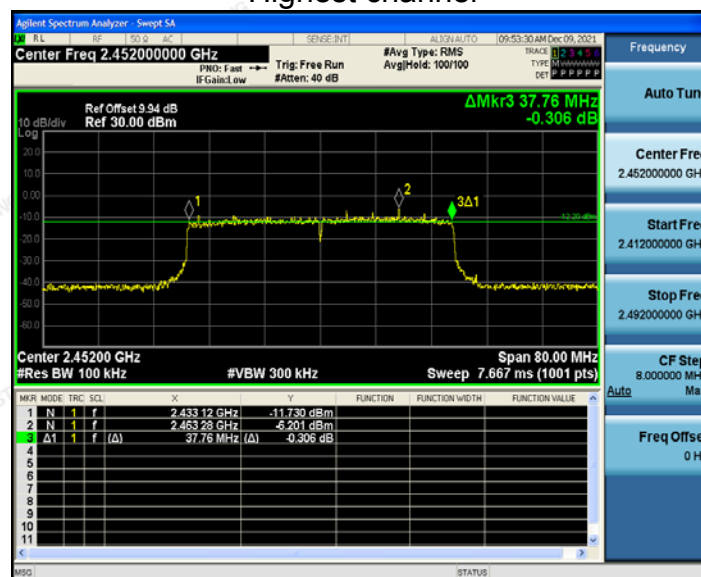
Lowest channel



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)	TX ac (HT20)	TX ac (HT40)	802.11ax (HT20)	802.11ax (HT40)
Lowest	7.08	15.64	17.56	36.32	16.72	35.04	18.52	37.20
Middle	7.56	15.64	16.88	36.32	17.60	35.60	17.40	37.52
Highest	7.56	15.56	16.28	35.84	17.16	36.40	18.64	37.36
Limit:	>500KHz							
Test Result:	PASS							

Test plots as follows:



802.11b Modulation

Lowest channel



Middle channel



Highest channel



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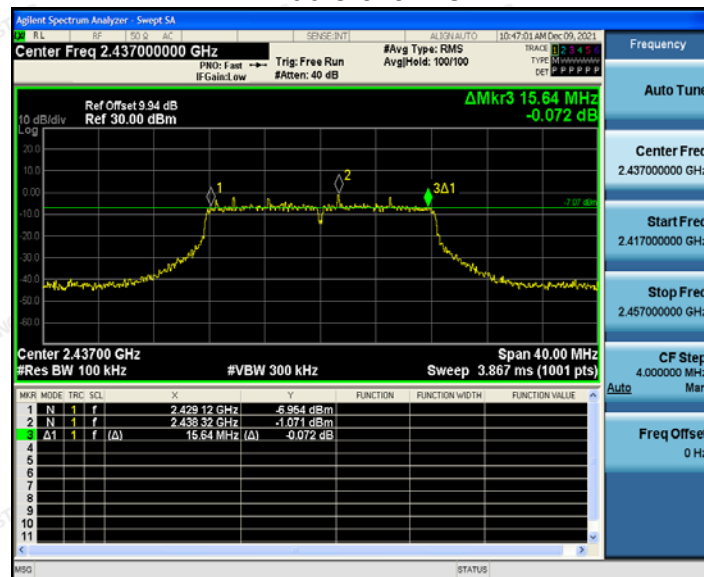


802.11g Modulation

Lowest channel



Middle channel



Highest channel



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802.11n (HT20) Modulation

Lowest channel



Middle channel



Highest channel

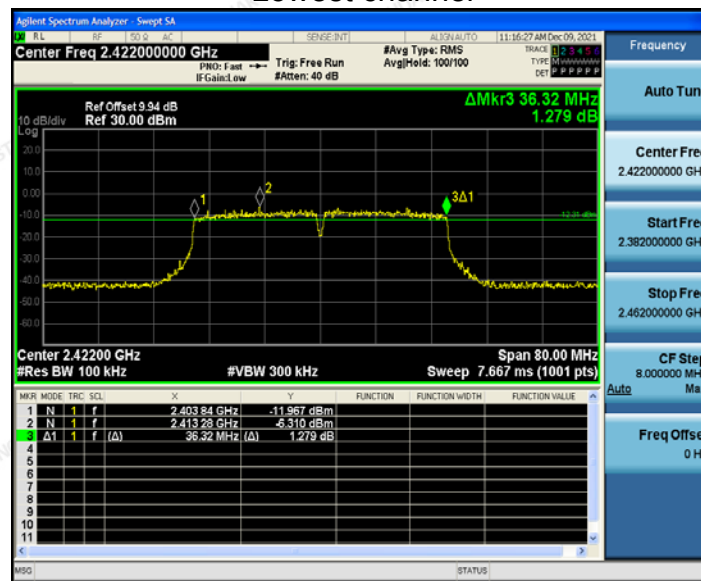


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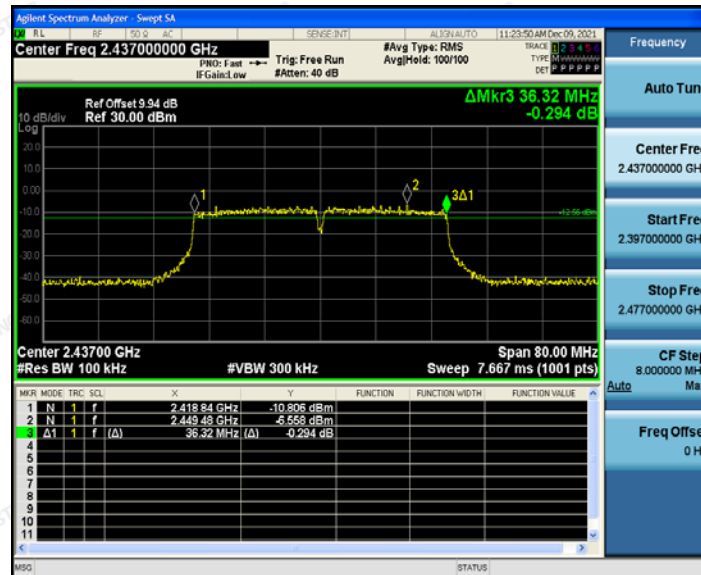


802.11n (HT40) Modulation

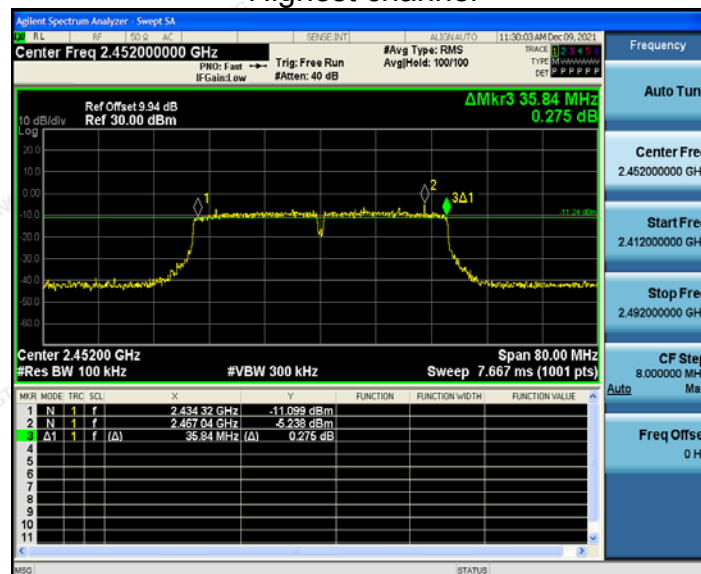
Lowest channel



Middle channel



Highest channel



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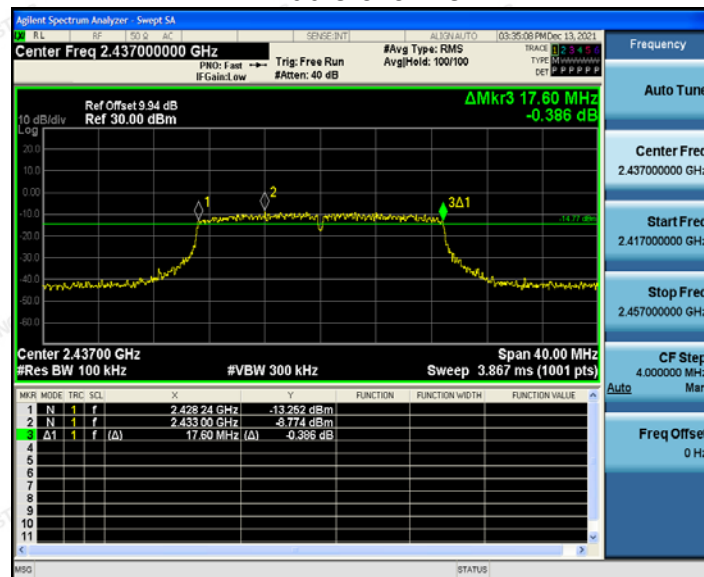


TX ac(HT20) Modulation

Lowest channel



Middle channel



Highest channel

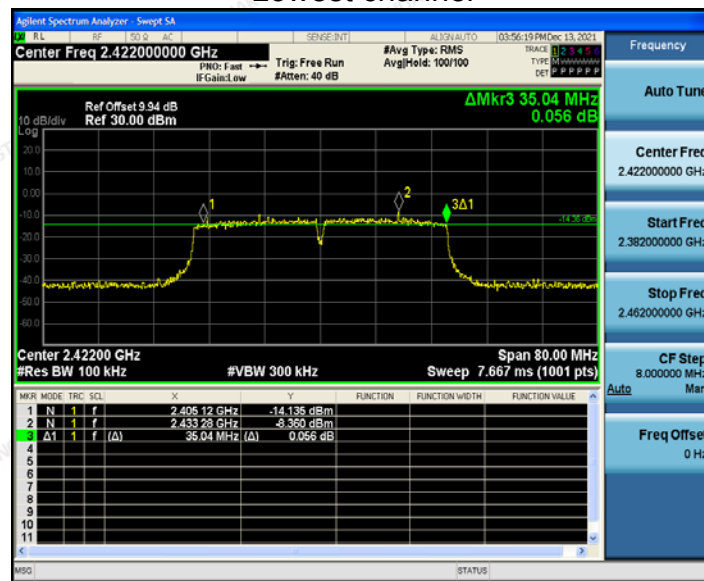


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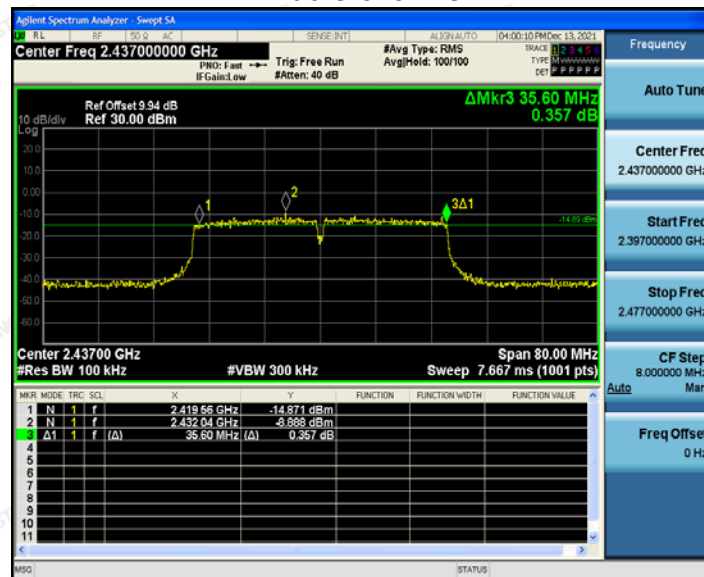


TX ac (HT40) Modulation

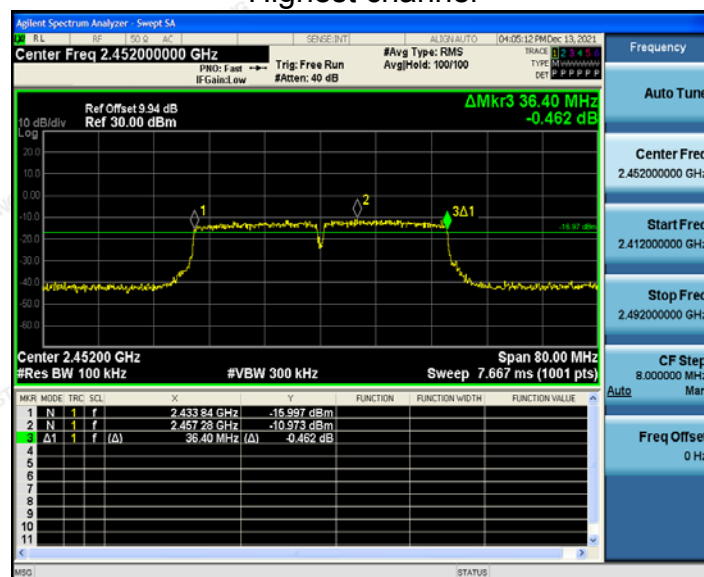
Lowest channel



Middle channel



Highest channel

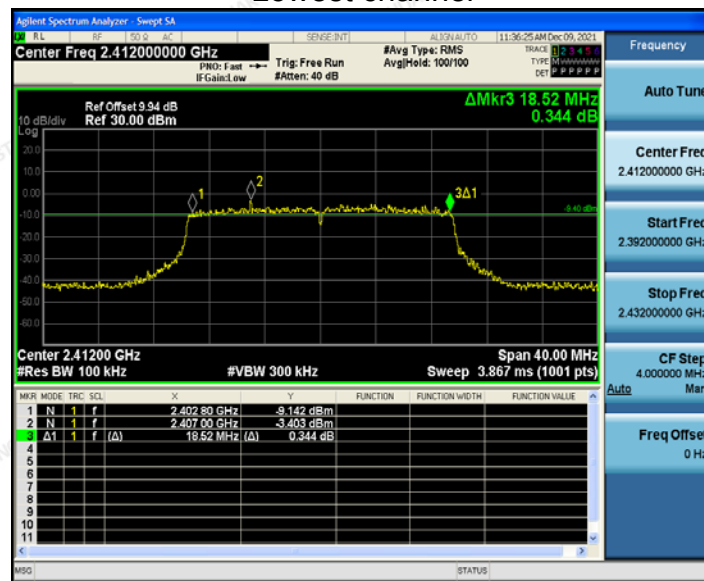


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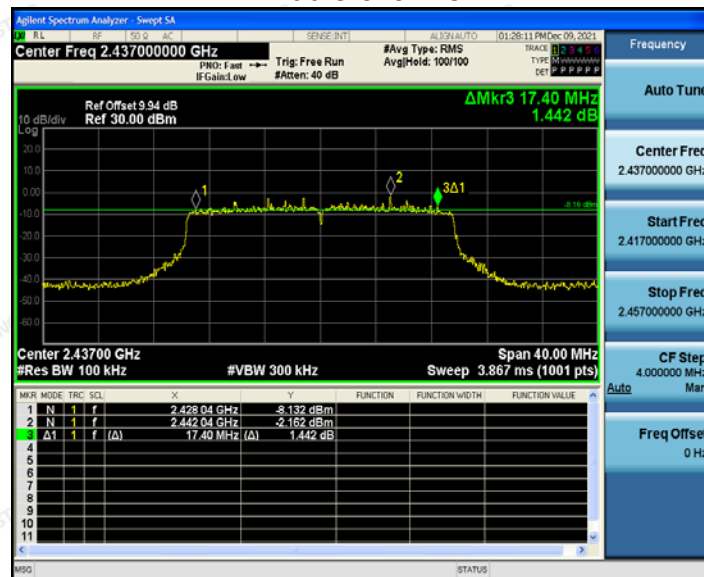


802.11ax (HT20) Modulation

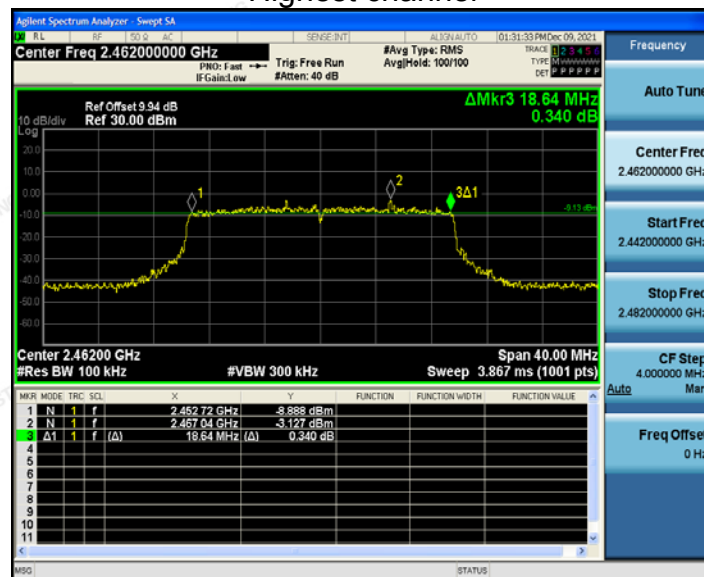
Lowest channel



Middle channel



Highest channel

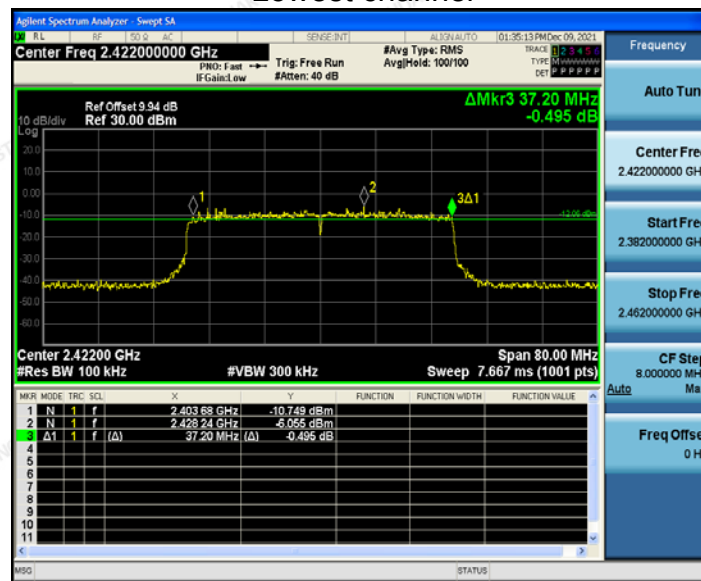


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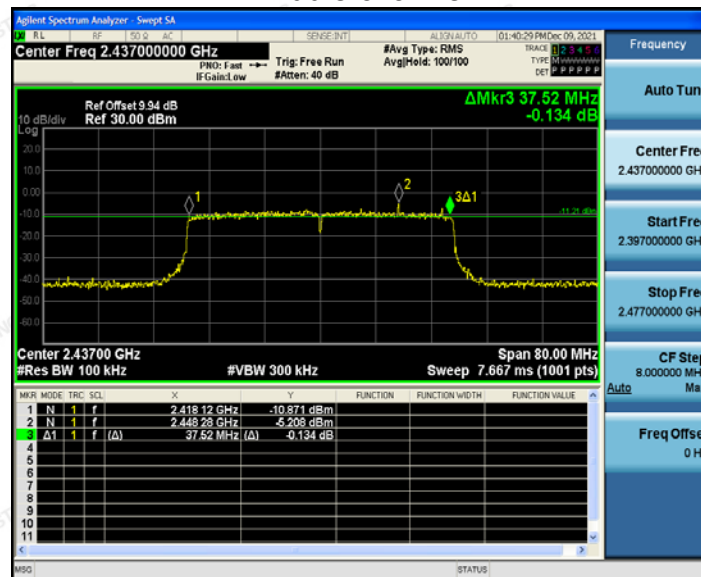


802.11ax (HT40) Modulation

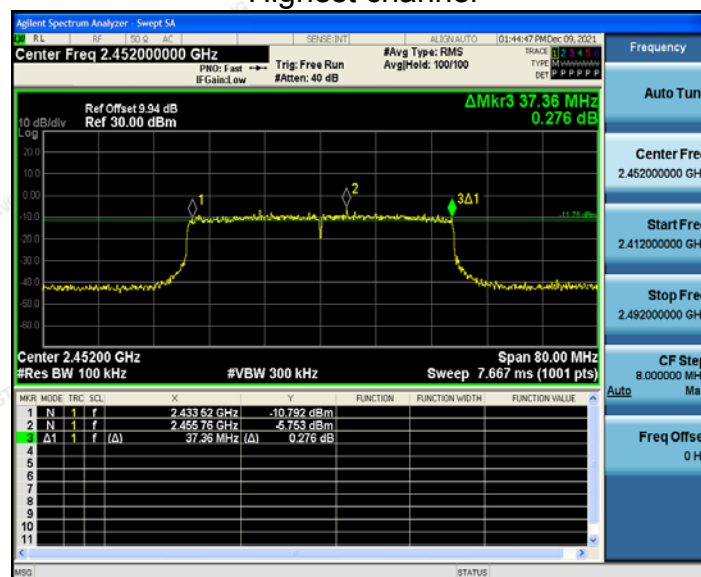
Lowest channel



Middle channel



Highest channel



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