REPORT No. : SZ21040341W03

TEST REPORT

APPLICANT	:	Realme Chongqing Mobile Telecommunications Corp., Ltd.
PRODUCT NAME	:	Mobile Phone
MODEL NAME	:	RMX3363
BRAND NAME	:	realme
FCC ID	:	2AUYFRMX3363
STANDARD(S)	:	47 CFR Part 15 Subpart C
RECEIPT DATE	:	2021-05-19
TEST DATE	:	2021-05-27 to 2021-06-30
ISSUE DATE	:	2021-07-23

Edited by: Peng Mi (Rapporteur)

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DIRECTORY

Change History		
Version	Date	Reason for change
1.0	2021-07-23	First edition

1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Realme Chongqing Mobile Telecommunications Corp., Ltd.
Applicant Address:	No.178 Yulong Avenue, Yufengshan, Yubei District, Chongqing, China
Manufacturer:	Realme Chongqing Mobile Telecommunications Corp., Ltd.
Manufacturer Address:	No.178 Yulong Avenue, Yufengshan, Yubei District, Chongqing, China

1.2. Equipment Under Test (EUT) Description

Product Name:	Mobile Phone	
Sample No.:	54#	
Hardware Version:	11	
Software Version:	realme UI V2.0	
Modulation Technology:	DSSS, OFDM, OFDMA	
Modulation Type:	Refer to section1.3	
Wireless Technology:	802.11b, 802.11g, 802.11n (HT20), 802.11n (HT40) 802.11ac (VHT20), 802.11ac (VHT40) 802.11ax (HEW20), 802.11ax (HEW40)	
Operating Frequency Range:	2412MHz–2462MHz	
Antenna Type:	PIFA Antenna	
Antenna Gain:	ANT 0: -3.5dBi; ANT 1: -5.0dBi	
Directional Gain:	-0.49dBi$_{\text{Note 2}}$	
Accessory Information:	Battery	
	Brand Name:	realme
	Model No.:	BLP809
	Serial No.:	(N/A, marked #1 by test site)
	Capacity:	Typical: 2150mAh, Rated: 2100mAh
	Rated Voltage:	7.74V
	Charge Limit:	8.90V
	Manufacturer:	SUNWODA Electronic Co., Ltd.

Accessory Information:	AC Adapter 1	
	Brand Name:	realme
	Model No.:	VCA7JAUH
	Serial No.:	(N/A, marked #1 by test site)
	Rated Output:	5V⎓2A; 10V⎓5A
	Rated Input:	100-130V~50/60Hz, 1.8A
	Rated Output:	5V⎓2A; 10V⎓6.5A
	Rated Input:	200-240V~50/60Hz, 1.8A
	Manufacturer:	HUIZHOU GOLDEN LAKE INDUSTRIAL CO., LTD
	AC Adapter 2	
	Brand Name:	realme
	Model No.:	VCA7JDUH
	Serial No.:	(N/A, marked #1 by test site)
	Rated Output:	5V⎓2A; 10V⎓5A
	Rated Input:	100-130V~50/60Hz, 1.8A
	Rated Output:	5V⎓2A; 10V⎓6.5A
	Rated Input:	200-240V~50/60Hz, 1.8A
	Manufacturer:	HUIZHOU GOLDEN LAKE INDUSTRIAL CO., LTD
	AC Adapter 3	
	Brand Name:	realme
	Model No.:	VCA7HAUH
	Serial No.:	(N/A, marked #1 by test site)
	Rated Output:	5V⎓2A; 10V⎓5A
	Rated Input:	100-130V~50/60Hz, 1.8A
	Rated Output:	5V⎓2A; 10V⎓6.5A
	Rated Input:	200-240V~50/60Hz, 1.8A
	Manufacturer:	SHENZHEN HUNTKEY ELECTRIC CO., LTD.
	USB Cable	
	Model No.:	DL129
	Earphone	
	Model No.:	MH156
	Length:	1.2m

Note 1: The EUT supports a MIMO function. Physically, the EUT provides two completed transmitters and two receivers for 802.11n, 802.11ac and 802.11ax modulation mode.

Modulation Mode:	**TX Function**
802.11n	2TX
802.11ac	2TX
802.11ax	2TX

Note 2: According to KDB 662911 D01, the directional gain = G_{ANT} + 10log(N_{ANT}) dBi, where G_{ANT} is the maximum antenna gain in dBi, N_{ANT} is the number of outputs.

Note 3: For conducted test item Conducted Output Power and Power Spectral Density of each modulation mode, we recorded the test result of two antennas separately, for other conducted test items both of the two antennas were tested separately, we only recorded the worst test result (ANT 1) in this report.

Note 4: All radiation test items for 802.11n and 802.11 ax modulation mode operate at MIMO mode during the test. Other modulation mode operate at SISO mode, both of the two antennas were tested separately, we only recorded the worst test result(ANT 1) in this report.

Note 5: We use the dedicated software to control the EUT continuous transmission.

Note 6: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

1.3. Modulation Type and Data Rate of EUT

Mode	Bandwidth (MHz)	Modulation Technology	Modulation Type	Data Rate	RU Size
802.11b	20	DSSS	**DBPSK**	**1**/2/5.5/11Mbps	N/A
			DQPSK		
			CCK		
802.11g	20	OFDM	**BPSK**	**6**/9/12/18/24/36/48/54 Mbps	N/A
			QPSK		
			16QAM		
			64QAM		
802.11n	20/40 (HT20/40)	OFDM	**BPSK**	**MCS0**~MCS7	N/A
			QPSK		
			16QAM		
			64QAM		
802.11ac	20/40 (VHT20/40)	OFDM	**BPSK**	**MSC0**~MCS9	NA
			QPSK		
			16QAM		
			64QAM		
			256QAM		
802.11ax	20/40 (HEW20/40)	OFDMA	**BPSK**	**MSC0**~MCS13	26/52/106/ 242/484
			QPSK		
			16QAM		
			64QAM		
			256QAM		
			1024QAM		
			4096QAM		

Note1: The worst-case mode (bold face) in all data rates has been determined during the pre-scan, only the test data of the worst-case were recorded in this report.

1.4. The Channel Number and Frequency

Test Mode	Channel	Frequency (MHz)	Channel	Frequency (MHz)
802.11b/g/n(HT20)/ ac(VHT20)/ ax(HEW20)	**1**	**2412**	8	2447
	2	2417	9	2452
	3	2422	10	2457
	4	2427	**11**	**2462**
	5	2432		
	6	**2437**		
	7	2442		
Test Mode	**Channel**	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**
802.11n (HT40)/ ac(VHT40) ax(HEW40)	**3**	**2422**	8	2447
	4	2427	**9**	**2452**
	5	2432		
	6	**2437**		
	7	2442		

Note 1: The black bold channels were selected for test.

1.5. Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart C for the EUT FCC ID Certification:

No.	Identity	Document Title
1	47 CFR Part 15	Radio Frequency Devices

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

No.	Section	Description	Test Date	Test Engineer	Result	Method determination /Remark
1	15.203	Antenna Requirement	N/A	N/A	PASS	No deviation
2	N/A	Duty Cycle of Test Signal	Jun 08&12, 2021	Su Xiaoxian	PASS	No deviation
3	15.247(b)	Maximum Conducted Output Power	Jun 16, 2021	Su Xiaoxian	PASS	No deviation
4	15.247(a)	Bandwidth	Jun 12, 2021	Su Xiaoxian	PASS	No deviation
5	15.247(d)	Conducted Spurious Emission and Band Edge	Jun 12, 2021	Su Xiaoxian	PASS	No deviation
6	15.247(e)	Power Spectral Density (PSD)	Jun 12, 2021	Su Xiaoxian	PASS	No deviation
7	15.207	Conducted Emission	May 27, 2021	Wu Runfeng	PASS	No deviation
8	15.247(d)	Restricted Frequency Bands	Jun 06 to 09, 2021	Huang Zhiye	PASS	No deviation
9	15.209, 15.247(d)	Radiated Emission	Jun 04 to 08, 2021	Huang Zhiye	PASS	No deviation

Note 1: The tests were performed according to the method of measurements prescribed in ANSIC63.10-2013, KDB558074 D01 v05r02 and KDB662911 D01 v02r01.

Note 2: The path loss during the RF test is calibrated to correct the results by the offset setting in the test equipments. The ref offset 11.5dB contains two parts that cable loss 1.5dB and Attenuator 10dB.

Note 3: Additions to, deviation, or exclusions from the method shall be judged in the "method determination" column of add, deviate or exclude from the specific method shall be explained in the "Remark" of the above table.
Note 4: When the test result is a critical value, we will use the measurement uncertainty give the judgment result based on the 95% confidence intervals.

1.6. Environmental Conditions

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

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

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.

2.1.2. Test Result: Compliant

Inside of the EUT has a PIFA antenna coupled with the metal shrapnel. Please refer to the EUT internal photos.

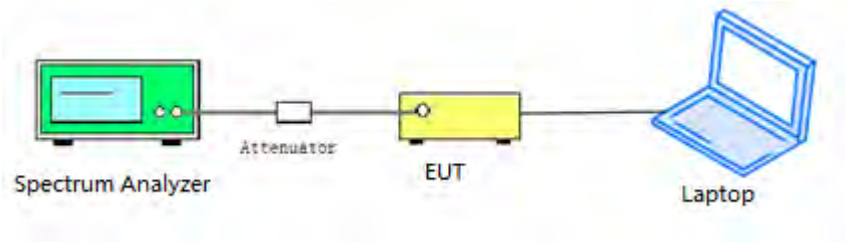
2.2. Duty Cycle of Test Signal

2.2.1. Requirement

Preferably, all measurements of maximum conducted (average) output power will be performed with the EUT transmitting continuously (i.e., with a duty cycle of greater than or equal to 98%). When continuous operation cannot be realized, then the use of sweep triggering/signal gating techniques can be used to ensure that measurements are made only during transmissions at the maximum power control level. Such sweep triggering/signal gating techniques will require knowledge of the minimum transmission duration (T) over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation. Sweep triggering/signal gating techniques can then be used if the measurement/sweep time of the analyzer can be set such that it does not exceed T at any time that data are being acquired (i.e., no transmitter OFF-time is to be considered).
When continuous transmission cannot be achieved and sweep triggering/signal gating cannot be implemented, alternative procedures are provided that can be used to measure the average power; however, they will require an additional measurement of the transmitter duty cycle (D). Within this subclause, the duty cycle refers to the fraction of time over which the transmitter is ON and is transmitting at its maximum power control level. The duty cycle is considered to be constant if variations are less than ±2%; otherwise, the duty cycle is considered to be nonconstant.

2.2.2. Test Description

Test Setup:



ANSI C63.10 2013 Clause 11.6 was used in order to prove compliance.

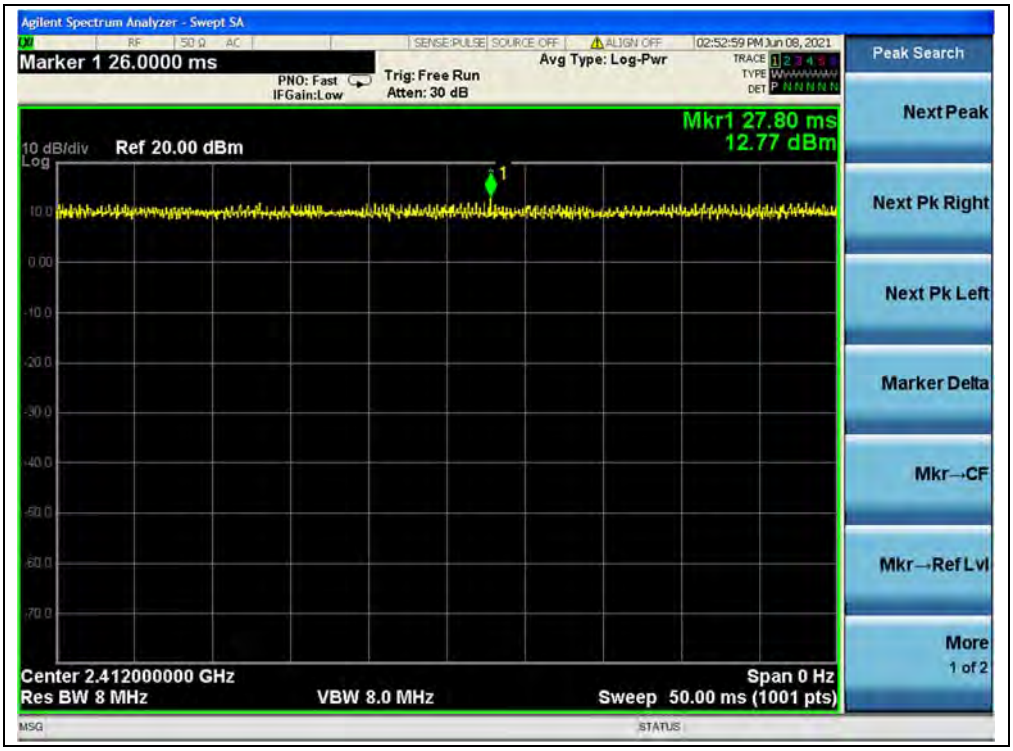
2.2.3. Test Result

A.Test Verdict:

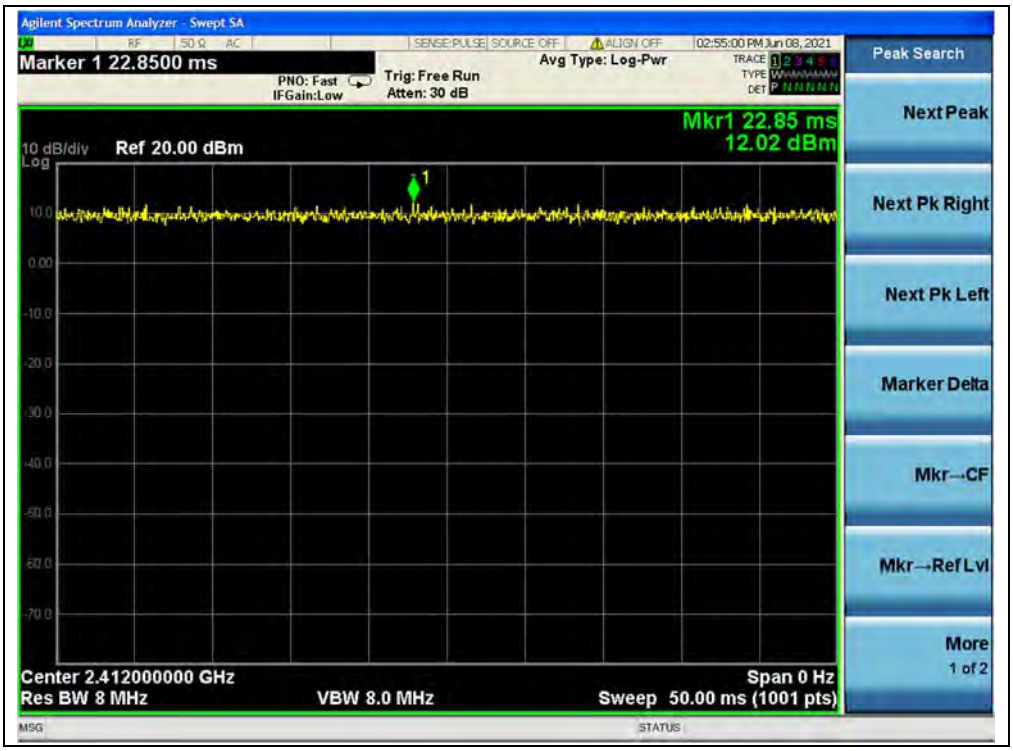
Test Mode	Duty Cycle (%) (D)	Duty Factor (10*lg[1/D])
802.11b	100.00	0.00
802.11g	100.00	0.00
802.11n (HT20)	100.00	0.00
802.11n (HT40)	100.00	0.00
802.11ac (VHT20)	100.00	0.00
802.11ac (VHT40)	100.00	0.00
802.11ax (HEW20)	100.00	0.00
802.11ax (HEW20) RU26	100.00	0.00
802.11ax (HEW20) RU52	100.00	0.00
802.11ax (HEW20) RU106	100.00	0.00
802.11ax (HEW40)	100.00	0.00

B.Test Plot:

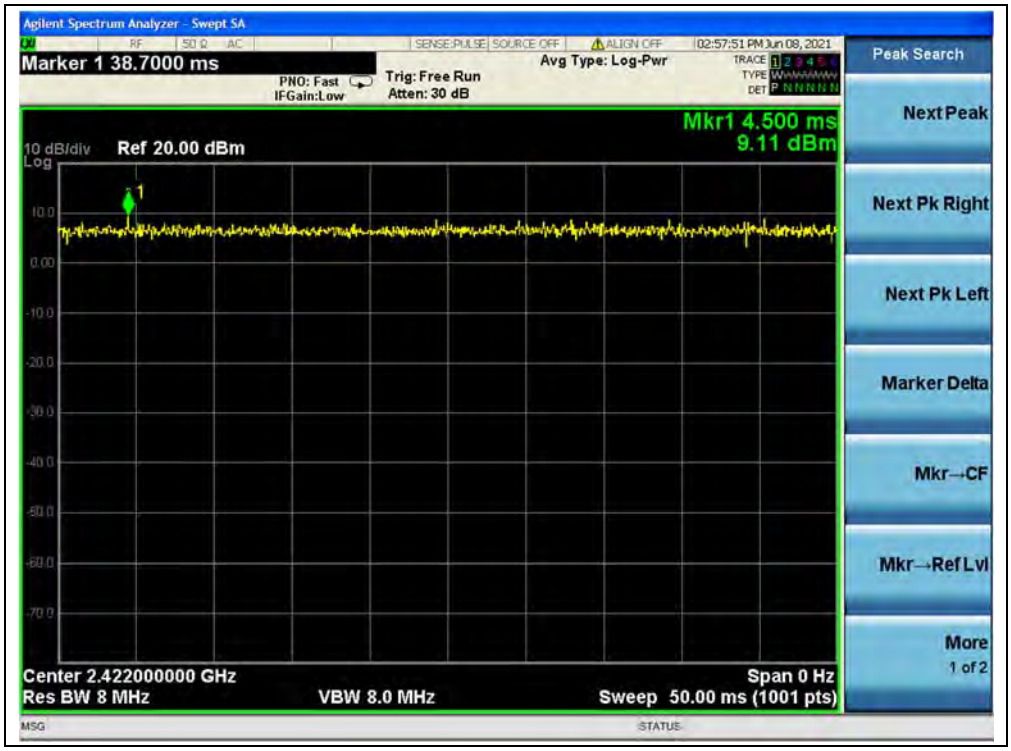
(Channel 1, 802.11b)



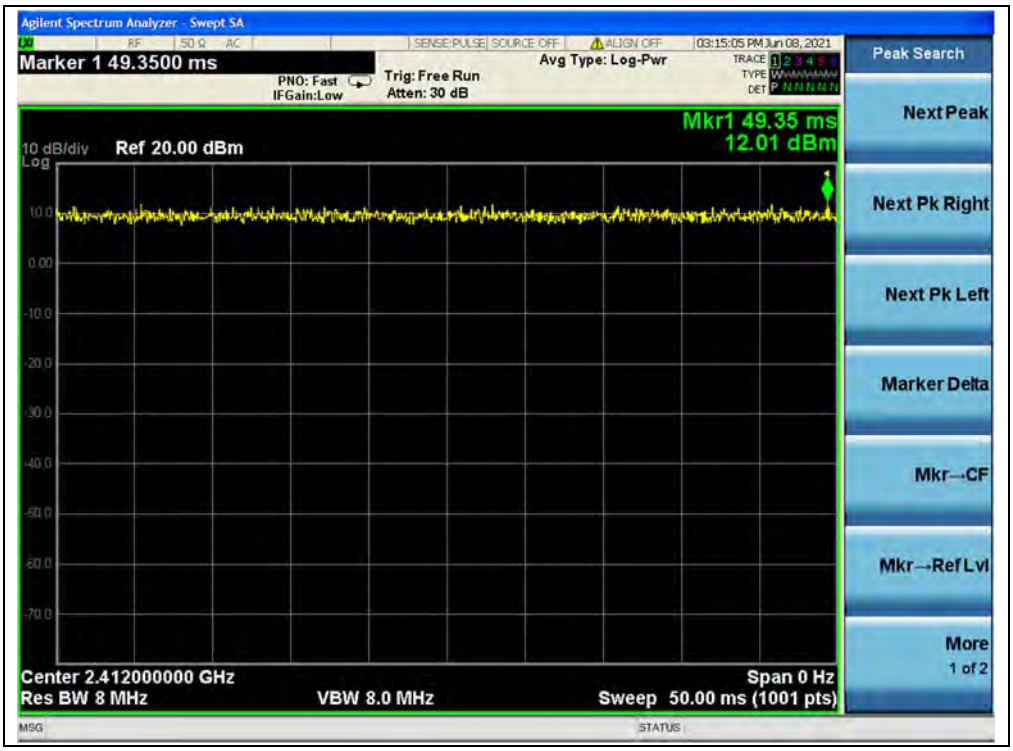
(Channel 1, 802.11g)



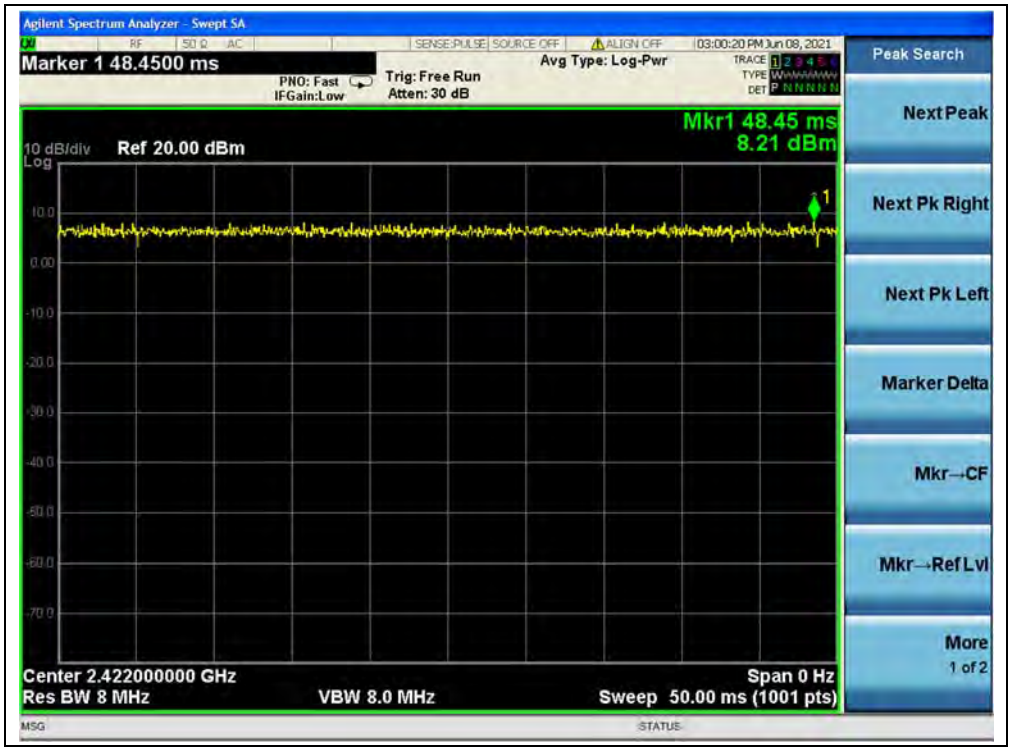
(Channel 1, 802.11n (HT20))



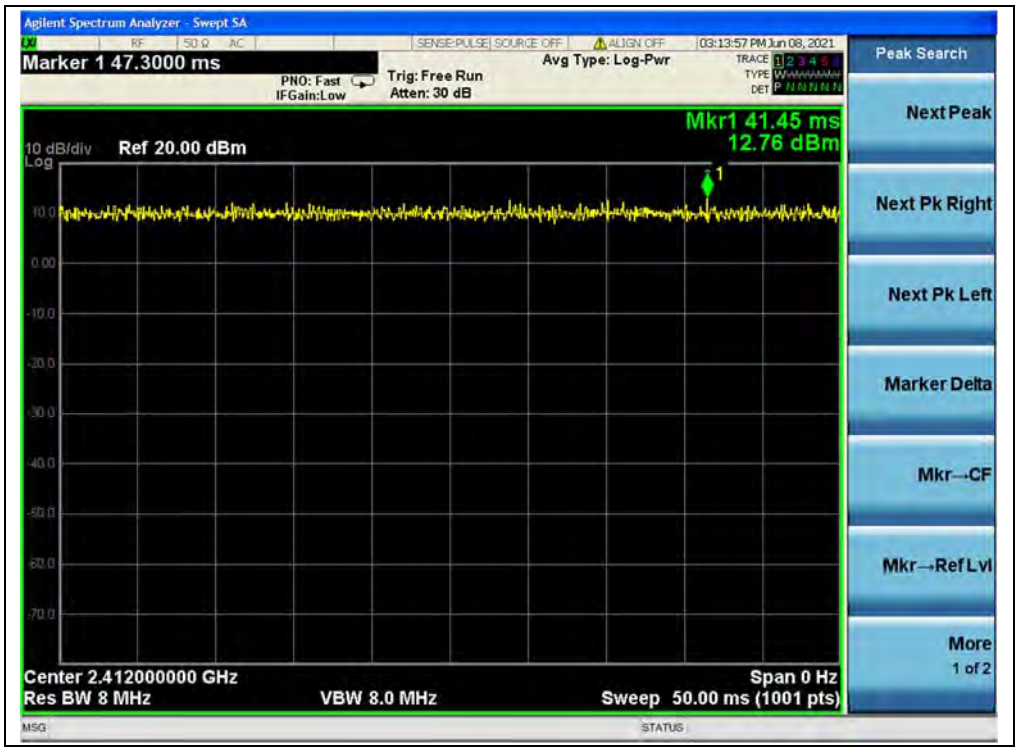
(Channel 3, 802.11n (HT40))



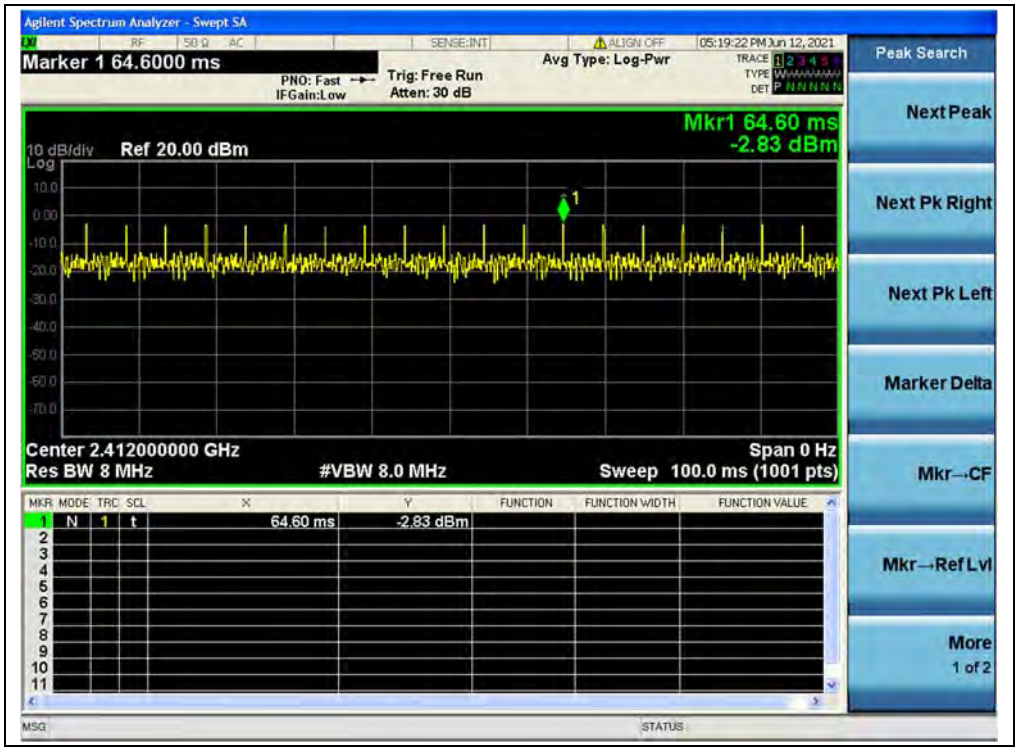
(Channel 1, 802.11ac (VHT20))



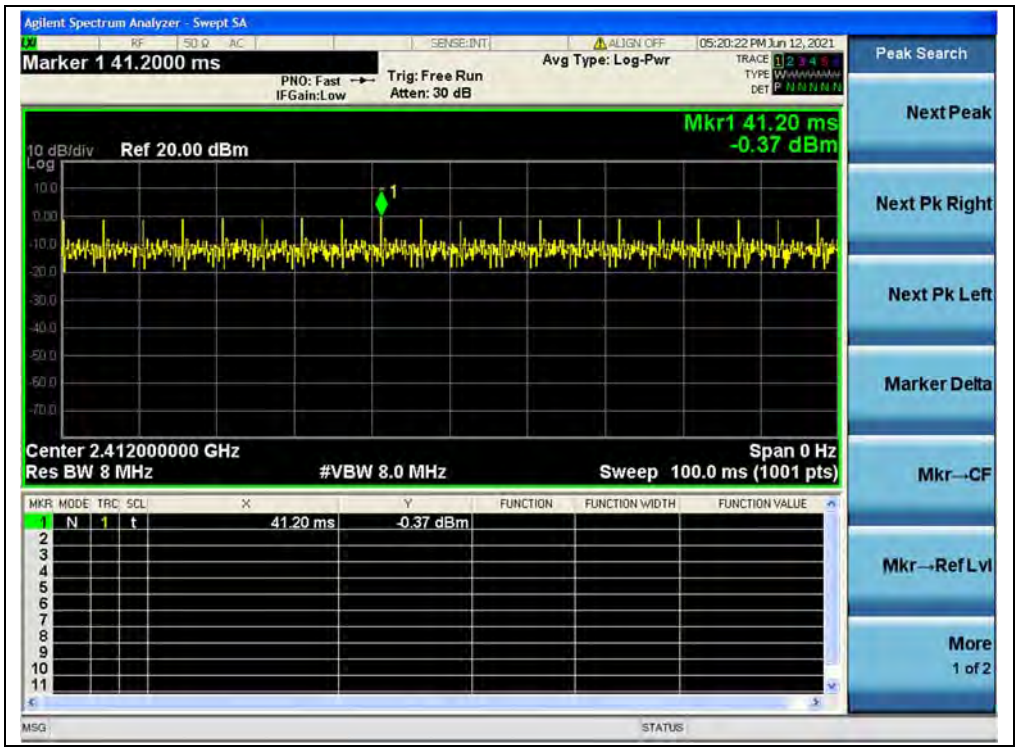
(Channel 3, 802.11ac (VHT40))



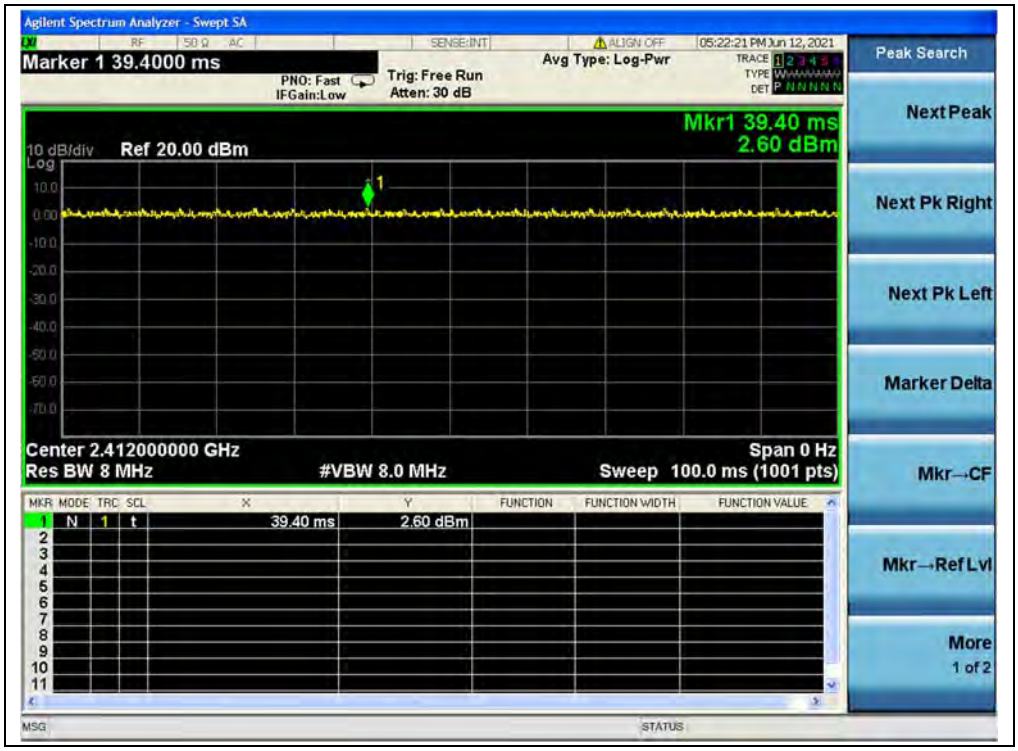
(Channel 1, 802.11ax (HEW20))



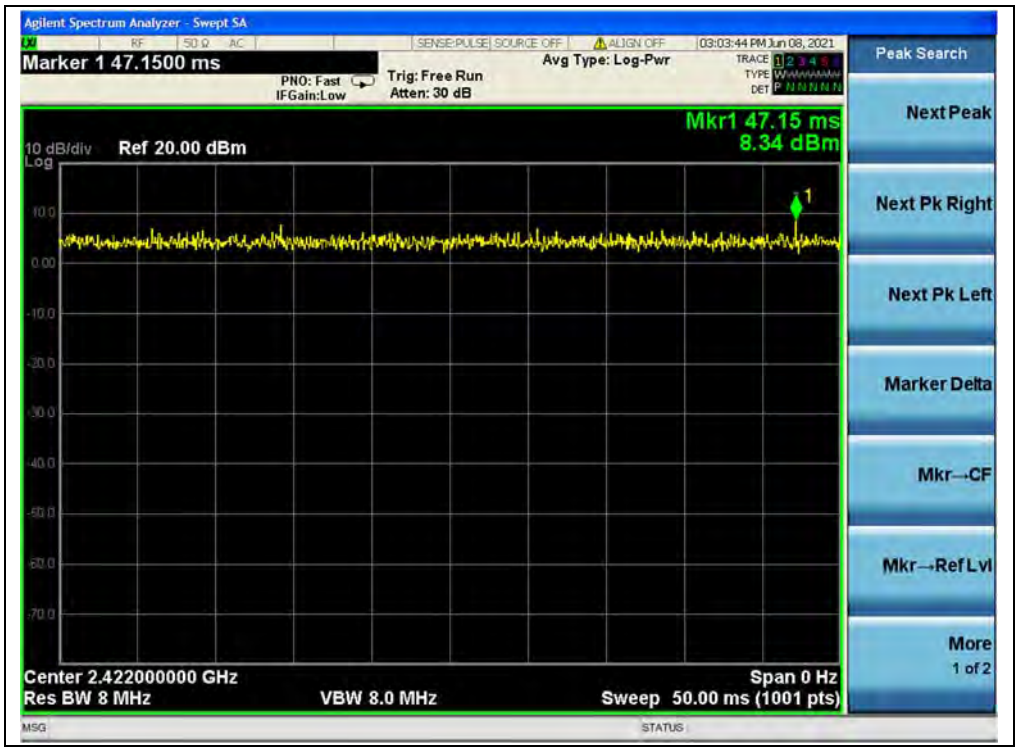
(Channel 1, 802.11ax (HEW20) RU26)



(Channel 1, 802.11ax (HEW20) RU52)



(Channel 1, 802.11ax (HEW20) RU106)



(Channel 3, 802.11ax (HEW40))

2.3. Maximum Conducted Output Power

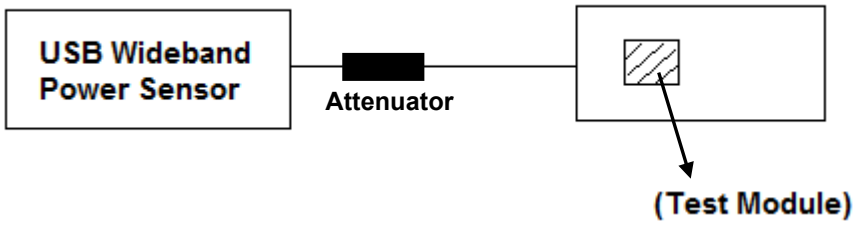
2.3.1. Requirement

According to FCC section 15.247(b)(3), For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: The maximum conducted output power of the intentional radiator shall not exceed1 Watt.

2.3.2. Test Description

The measured output power was calculated by the reading of the USB Wideband Power Sensor and calibration.

Test Setup:



The EUT (Equipment under the test) which is coupled to the USB Wideband Power Sensor; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

2.3.3. Test Result

Maximum Peak Conducted Output Power

802.11b Mode

Channel	Frequency (MHz)	Measured Peak Power				Limit (dBm)		Verdict
		ANT 0		ANT 1				
		dBm	W	dBm	W	dBm	W	
1	2412	19.11	0.081	17.41	0.055	30	1	PASS
6	2437	19.15	0.082	17.13	0.052			PASS
11	2462	19.04	0.080	17.21	0.053			PASS

802.11g Mode

Channel	Frequency (MHz)	Measured Peak Power				Limit (dBm)		Verdict
		ANT 0		ANT 1				
		dBm	W	dBm	W	dBm	W	
1	2412	21.91	0.155	20.79	0.120	30	1	PASS
6	2437	21.81	0.152	20.66	0.116			PASS
11	2462	**22.01**	**0.159**	20.59	0.115			PASS

802.11n (HT20) Mode

Channel	Frequency (MHz)	Measured Peak Power (dBm)		Total Power (dBm)	Total Power (W)	Limit		Verdict
		ANT 0	ANT 1			dBm	W	
1	2412	21.53	20.51	24.07	0.255	30	1	PASS
6	2437	21.41	20.35	23.93	0.247			PASS
11	2462	21.75	20.22	24.07	0.255			PASS
Note: Directional gain = -3.5dBi +10log(2) = -0.49dBi＜6dBi, so the power limit is 1W(30dBm).								

802.11n (HT40) Mode

Channel	Frequency (MHz)	Measured Peak Power (dBm)		Total Power (dBm)	Total Power (W)	Limit		Verdict
		ANT 0	ANT 1			dBm	W	
3	2422	20.11	19.09	22.65	0.184	30	1	PASS
6	2437	20.23	18.91	22.62	0.183			PASS
9	2452	20.41	18.54	22.58	0.181			PASS
Note: Directional gain = -3.5dBi +10log(2) = -0.49dBi＜6dBi, so the power limit is 1W(30dBm).								

802.11ac (VHT20) Mode

Channel	Frequency (MHz)	Measured Peak Power (dBm)		Total Power (dBm)	Total Power (W)	Limit		Verdict
		ANT 0	ANT 1			dBm	W	
1	2412	21.56	19.53	23.67	0.233	30	1	PASS
6	2437	21.33	19.15	23.38	0.218			PASS
11	2462	21.88	18.32	23.46	0.222			PASS
Note: Directional gain = -3.5dBi +10log(2) = -0.49dBi＜6dBi, so the power limit is 1W(30dBm).								

802.11ac (VHT40) Mode

Channel	Frequency (MHz)	Measured Peak Power (dBm)		Total Power (dBm)	Total Power (W)	Limit		Verdict
		ANT 0	ANT 1			dBm	W	
3	2422	20.01	**19.53**	22.79	0.190	30	1	PASS
6	2437	20.47	18.87	22.76	0.189			PASS
9	2452	20.01	18.89	22.50	0.178			PASS
Note: Directional gain = -3.5dBi +10log(2) = -0.49dBi＜6dBi, so the power limit is 1W(30dBm).								

802.11ax (HEW20) Mode

Channel	Frequency (MHz)	Measured Peak Power (dBm)		Total Power (dBm)	Total Power (W)	Limit		Verdict
		ANT 0	ANT 1			dBm	W	
1	2412	23.13	21.07	**25.24**	**0.334**	30	1	PASS
6	2437	22.91	20.91	25.04	0.319			PASS
11	2462	23.31	20.15	25.02	0.318			PASS
Note: Directional gain = -3.5dBi +10log(2) = -0.49dBi＜6dBi, so the power limit is 1W(30dBm).								

802.11ax (HEW20) RU26 Mode

Channel	Frequency (MHz)	Measured Peak Power (dBm)		Total Power (dBm)	Total Power (W)	Limit		Verdict
		ANT 0	ANT 1			dBm	W	
1	2412	12.90	12.31	15.68	0.037	30	1	PASS
6	2437	13.07	11.83	15.56	0.036			PASS
11	2462	13.91	11.34	15.80	0.038			PASS
Note: Directional gain = -3.5dBi +10log(2) = -0.49dBi＜6dBi, so the power limit is 1W(30dBm).								

802.11ax (HEW20) RU52 Mode

Channel	Frequency (MHz)	Measured Peak Power (dBm)		Total Power (dBm)	Total Power (W)	Limit		Verdict
		ANT 0	ANT 1			dBm	W	
1	2412	16.06	14.89	18.51	0.071	30	1	PASS
6	2437	16.52	15.43	19.03	0.080			PASS
11	2462	16.61	15.51	19.08	0.081			PASS
Note: Directional gain = -3.5dBi +10log(2) = -0.49dBi＜6dBi, so the power limit is 1W(30dBm).								

802.11ax (HEW20) RU106 Mode

Channel	Frequency (MHz)	Measured Peak Power (dBm)		Total Power (dBm)	Total Power (W)	Limit		Verdict
		ANT 0	ANT 1			dBm	W	
1	2412	18.50	17.24	20.93	0.124	30	1	PASS
6	2437	18.75	16.98	20.97	0.125			PASS
11	2462	18.94	17.44	**21.27**	**0.134**			PASS
Note: Directional gain = -3.5dBi +10log(2) = -0.49dBi＜6dBi, so the power limit is 1W(30dBm).								

802.11ax (HEW40) Mode

Channel	Frequency (MHz)	Measured Peak Power (dBm)		Total Power (dBm)	Total Power (W)	Limit		Verdict
		ANT 0	ANT 1			dBm	W	
3	2422	20.19	18.93	**22.62**	**0.183**	30	1	PASS
6	2437	20.21	18.62	22.50	0.178			PASS
9	2452	20.32	18.59	22.55	0.180			PASS
Note: Directional gain = -3.5dBi +10log(2) = -0.49dBi＜6dBi, so the power limit is 1W(30dBm).								

Maximum Average Conducted Output Power

802.11b Mode

Frequency (MHz)	Average Power							Limit		Verdict
	Measured		Duty Factor	Duty factor Calculated						
	ANT 0	ANT 1		ANT 0		ANT 1				
	dBm	dBm		dBm	W	dBm	W	dBm	W	
2412	16.37	14.44	0.00	16.37	0.043	14.44	0.028	30	1	PASS
2437	16.50	14.63		16.50	0.045	14.63	0.029			PASS
2462	16.35	14.46		16.35	0.043	14.46	0.028			PASS

802.11g Mode

Frequency (MHz)	Average Power							Limit		Verdict
	Measured		Duty Factor	Duty factor Calculated						
	ANT 0	ANT 1		ANT 0		ANT 1				
	dBm	dBm		dBm	W	dBm	W	dBm	W	
2412	15.36	14.19	0.00	15.36	0.034	14.19	0.026	30	1	PASS
2437	15.33	13.94		15.33	0.034	13.94	0.025			PASS
2462	15.43	14.02		15.43	0.035	14.02	0.025			PASS

802.11n (HT20) Mode

Frequency (MHz)	Average Power					Limit		Verdict
	Measured		Duty Factor	Total Power with Duty Factor				
	ANT 0	ANT 1						
	dBm	dBm		dBm	W	dBm	W	
2412	14.99	13.87	0.00	**17.48**	**0.056**	30	1	PASS
2437	15.01	13.58		17.32	0.054			PASS
2462	15.15	13.69		17.48	0.056			PASS
Note: Directional gain = -3.5dBi +10log(2) = -0.49dBi＜6dBi, so the power limit is 1W(30dBm).								

802.11n (HT40) Mode

Frequency (MHz)	Average Power					Limit		Verdict
	Measured		Duty Factor	Total Power with Duty Factor				
	ANT 0	ANT 1						
	dBm	dBm		dBm	W	dBm	W	
2422	14.71	13.50	0.00	17.16	0.052	30	1	PASS
2437	14.77	13.23		17.08	0.051			PASS
2452	14.95	13.22		17.16	0.052			PASS
Note: Directional gain = -3.5dBi +10log(2) = -0.49dBi＜6dBi, so the power limit is 1W(30dBm).								

802.11ac (VHT20) Mode

Frequency (MHz)	Average Power					Limit		Verdict
	Measured		Duty Factor	Total Power with Duty Factor				
	ANT 0	ANT 1						
	dBm	dBm		dBm	W	dBm	W	
2412	14.92	13.07	0.00	17.08	0.051	30	1	PASS
2437	14.94	12.78		16.99	0.050			PASS
2462	15.16	12.74		17.16	0.052			PASS
Note: Directional gain = -3.5dBi +10log(2) = -0.49dBi＜6dBi, so the power limit is 1W(30dBm).								

802.11ac (VHT40) Mode

Frequency (MHz)	Average Power					Limit		Verdict
	Measured		Duty Factor	Total Power with Duty Factor				
	ANT 0	ANT 1						
	dBm	dBm		dBm	W	dBm	W	
2422	14.69	13.66	0.00	**17.24**	**0.053**	30	1	PASS
2437	14.75	13.43		17.16	0.052			PASS
2452	14.51	13.46		16.99	0.050			PASS
Note: Directional gain = -3.5dBi +10log(2) = -0.49dBi＜6dBi, so the power limit is 1W(30dBm).								

802.11ax (HEW20) Mode

Frequency (MHz)	Average Power					Limit		Verdict
	Measured		Duty Factor	Total Power with Duty Factor				
	ANT 0	ANT 1						
	dBm	dBm		dBm	W	dBm	W	
2412	15.19	13.23	0.00	17.32	0.054	30	1	PASS
2437	15.21	13.11		17.32	0.054			PASS
2462	15.39	13.00		**17.40**	**0.055**			PASS
Note: Directional gain = -3.5dBi +10log(2) = -0.49dBi＜6dBi, so the power limit is 1W(30dBm).								

802.11ax (HEW20) RU26 Mode

Frequency (MHz)	Average Power					Limit		Verdict
	Measured		Duty Factor	Total Power with Duty Factor				
	ANT 0	ANT 1						
	dBm	dBm		dBm	W	dBm	W	
2412	3.09	2.29	0.00	6.02	0.004	30	1	PASS
2437	3.57	2.60		6.02	0.004			PASS
2462	3.96	2.69		6.02	0.004			PASS
Note: Directional gain = -3.5dBi +10log(2) = -0.49dBi＜6dBi, so the power limit is 1W(30dBm).								

802.11ax (HEW20) RU52 Mode

Frequency (MHz)	Average Power					Limit		Verdict
	Measured		Duty Factor	Total Power with Duty Factor				
	ANT 0	ANT 1						
	dBm	dBm		dBm	W	dBm	W	
2412	5.81	4.72	0.00	8.45	0.007	30	1	PASS
2437	6.30	5.38		9.03	0.008			PASS
2462	6.44	5.57		9.03	0.008			PASS
Note: Directional gain = -3.5dBi +10log(2) = -0.49dBi＜6dBi, so the power limit is 1W(30dBm).								

802.11ax (HEW20) RU106 Mode

Frequency (MHz)	Average Power					Limit		Verdict
	Measured		Duty Factor	Total Power with Duty Factor				
	ANT 0	ANT 1						
	dBm	dBm		dBm	W	dBm	W	
2412	9.01	8.02	0.00	11.46	0.014	30	1	PASS
2437	9.41	7.95		11.76	0.015			PASS
2462	9.62	8.42		12.04	0.016			PASS
Note: Directional gain = -3.5dBi +10log(2) = -0.49dBi＜6dBi, so the power limit is 1W(30dBm).								

802.11ax (HEW40) Mode

Frequency (MHz)	Average Power					Limit		Verdict
	Measured		Duty Factor	Total Power with Duty Factor				
	ANT 0	ANT 1						
	dBm	dBm		dBm	W	dBm	W	
2422	14.69	13.67	0.00	**17.24**	**0.053**	30	1	PASS
2437	14.77	12.90		16.90	0.049			PASS
2452	14.93	12.88		17.08	0.051			PASS
Note: Directional gain = -3.5dBi +10log(2) = -0.49dBi＜6dBi, so the power limit is 1W(30dBm).								

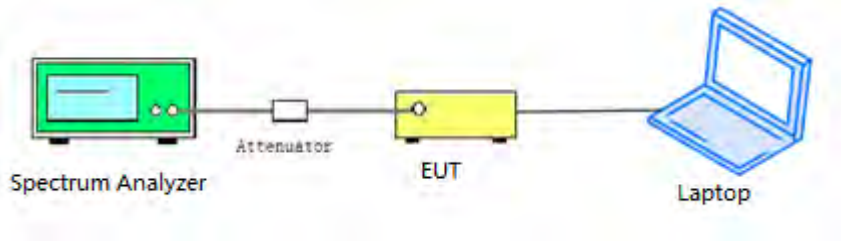
2.4. Bandwidth

2.4.1. Requirement

According to FCC section 15.247(a) (2), Systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

2.4.2. Test Description

Test Setup:



The EUT is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW.

2.4.3. Test Procedure

KDB 558074 Section 8.2 was used in order to prove compliance.

2.4.4. Test Result

802.11b Mode

A.Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits(kHz)	Result
1	2412	8.070	≥500	PASS
6	2437	8.075	≥500	PASS
11	2462	8.044	≥500	PASS

B.Test Plot:

(Channel 1, 802.11b)

(Channel 6, 802.11b)

(Channel 11, 802.11b)

802.11g Mode

A.Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits(kHz)	Result
1	2412	15.10	≥500	PASS
6	2437	15.08	≥500	PASS
11	2462	15.02	≥500	PASS

B.Test Plot:

(Channel 1, 802.11g)

(Channel 6, 802.11g)

(Channel 11, 802.11g)

802.11n (HT20) Mode

A.Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits(kHz)	Result
1	2412	15.18	≥500	PASS
6	2437	15.13	≥500	PASS
11	2462	14.94	≥500	PASS

B.Test Plot:

(Channel 1, 802.11n (HT20))

(Channel 6, 802.11n (HT20))

(Channel 11, 802.11n (HT20))

802.11n (HT40) Mode

A.Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits(kHz)	Result
3	2422	34.41	≥500	PASS
6	2437	34.05	≥500	PASS
9	2452	35.67	≥500	PASS

B.Test Plot:

(Channel 3, 802.11n (HT40))

(Channel 6, 802.11n (HT40))

(Channel 9, 802.11n (HT40))

802.11ac (VHT20) Mode

A.Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits(kHz)	Result
1	2412	13.86	≥500	PASS
6	2437	15.07	≥500	PASS
11	2462	13.83	≥500	PASS

B.Test Plot:

(Channel 1, 802.11ac (VHT20))

(Channel 6, 802.11ac (VHT20))

(Channel 11, 802.11ac (VHT20))

802.11ac (VHT40) Mode

A.Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits(kHz)	Result
3	2422	35.31	≥500	PASS
6	2437	35.09	≥500	PASS
9	2452	35.33	≥500	PASS

B.Test Plot:

(Channel 3, 802.11ac (VHT40))

(Channel 6, 802.11ac (VHT40))

(Channel 9, 802.11ac (VHT40))

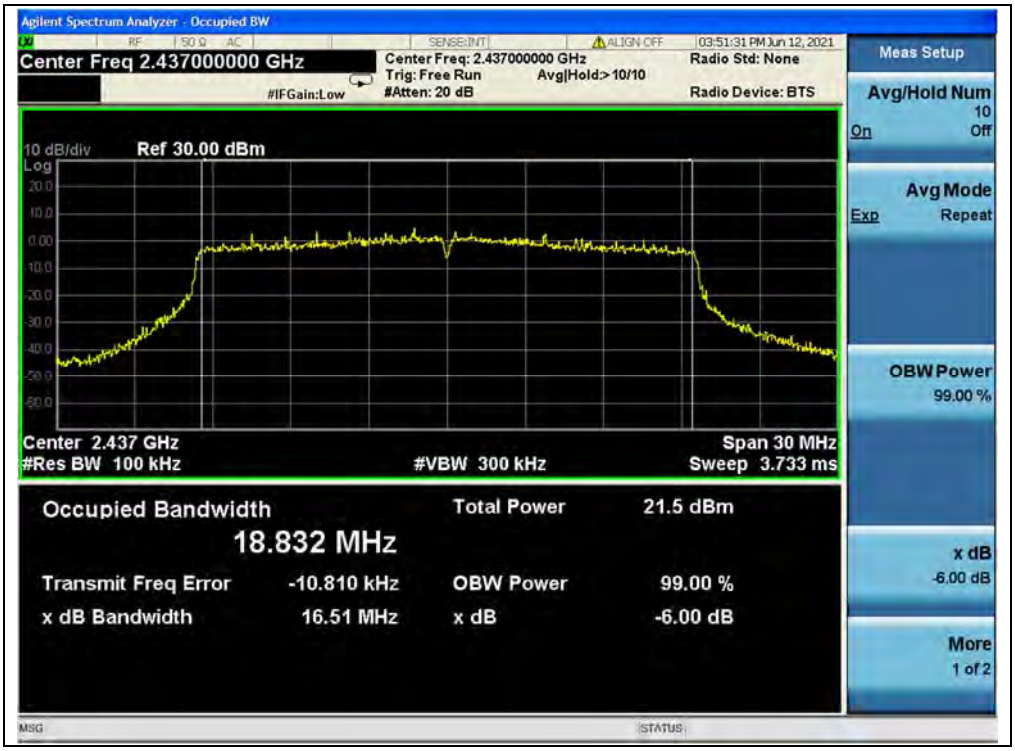
802.11ax (HEW20) Mode

A.Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits(kHz)	Result
1	2412	15.39	≥500	PASS
6	2437	16.51	≥500	PASS
11	2462	14.62	≥500	PASS

B.Test Plot:

(Channel 3, 802.11ax (HEW20))



(Channel 6, 802.11ax (HEW20))

(Channel 9, 802.11ax (HEW20))

802.11ax (HEW20) RU26 Mode

A.Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits(kHz)	Result
1	2412	2.068	≥500	PASS
6	2437	2.115	≥500	PASS
11	2462	2.097	≥500	PASS

B.Test Plot:

(Channel 3, 802.11ax (HEW20) RU26)

(Channel 6, 802.11ax (HEW20) RU26)

(Channel 9, 802.11ax (HEW20) RU26)

802.11ax (HEW20)(RU52) Mode

A.Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits(kHz)	Result
1	2412	17.06	≥500	PASS
6	2437	17.08	≥500	PASS
11	2462	17.08	≥500	PASS

B.Test Plot:

(Channel 3, 802.11ax (HEW20) RU52)

(Channel 6, 802.11ax (HEW20) RU52)

(Channel 9, 802.11ax (HEW20) RU52)

802.11ax (HEW20) RU106 Mode

A.Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits(kHz)	Result
1	2412	18.12	≥500	PASS
6	2437	17.07	≥500	PASS
11	2462	17.13	≥500	PASS

B.Test Plot:

(Channel 3, 802.11ax (HEW20) RU106)

(Channel 6, 802.11ax (HEW20) RU106)

(Channel 9, 802.11ax (HEW20) RU106)

802.11ax (HEW40) Mode

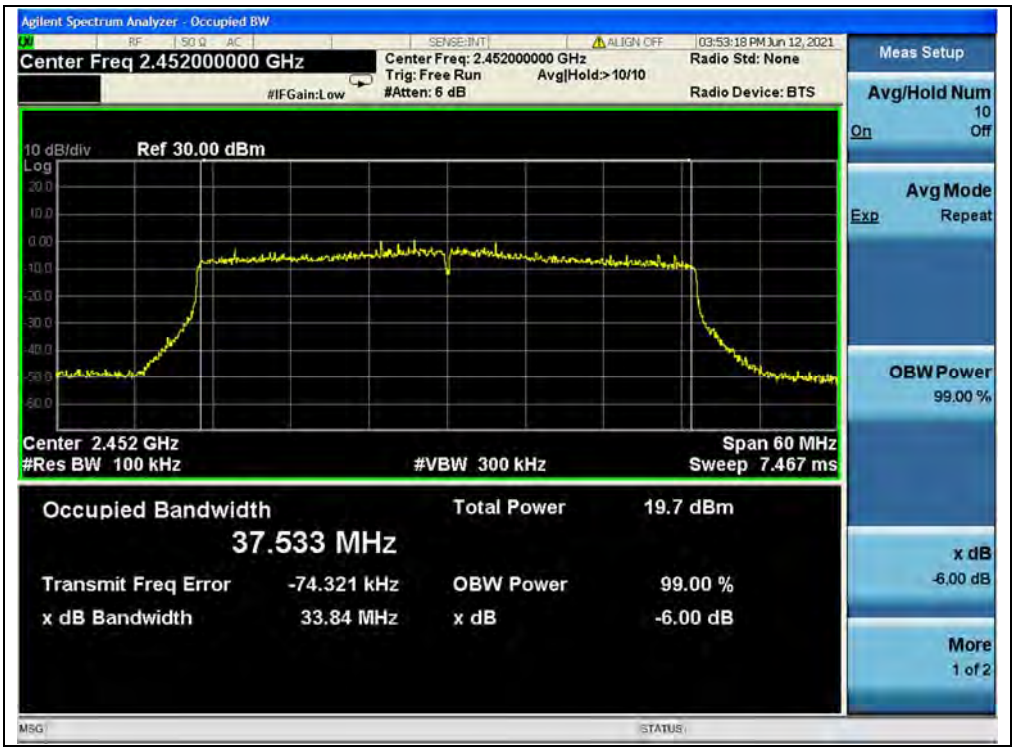
A.Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits(kHz)	Result
3	2422	34.65	≥500	PASS
6	2437	34.94	≥500	PASS
9	2452	33.84	≥500	PASS

B.Test Plot:

(Channel 3, 802.11ax (HEW40))

(Channel 6, 802.11ax (HEW40))



(Channel 9, 802.11ax (HEW40))

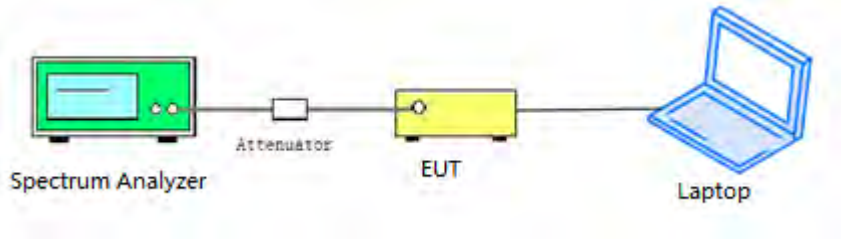
2.5. Conducted Spurious Emissions and Band Edge

2.5.1. Requirement

According to FCC section 15.247(c), in any 100kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

2.5.2. Test Description

Test Setup:



The EUT is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. In order to make an accurate measurement, set the span greater than RBW.

2.5.3. Test Procedure

KDB 558074 Section 8.5 and 8.7 was used in order to prove compliance.

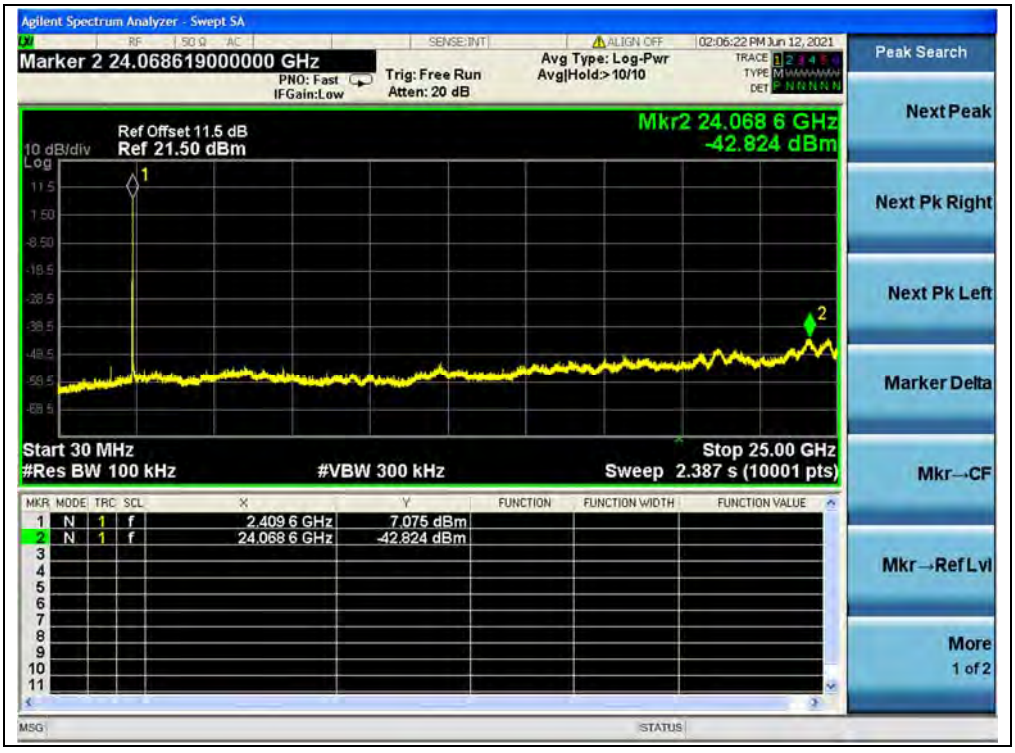
2.5.4. Test Result

802.11b Mode

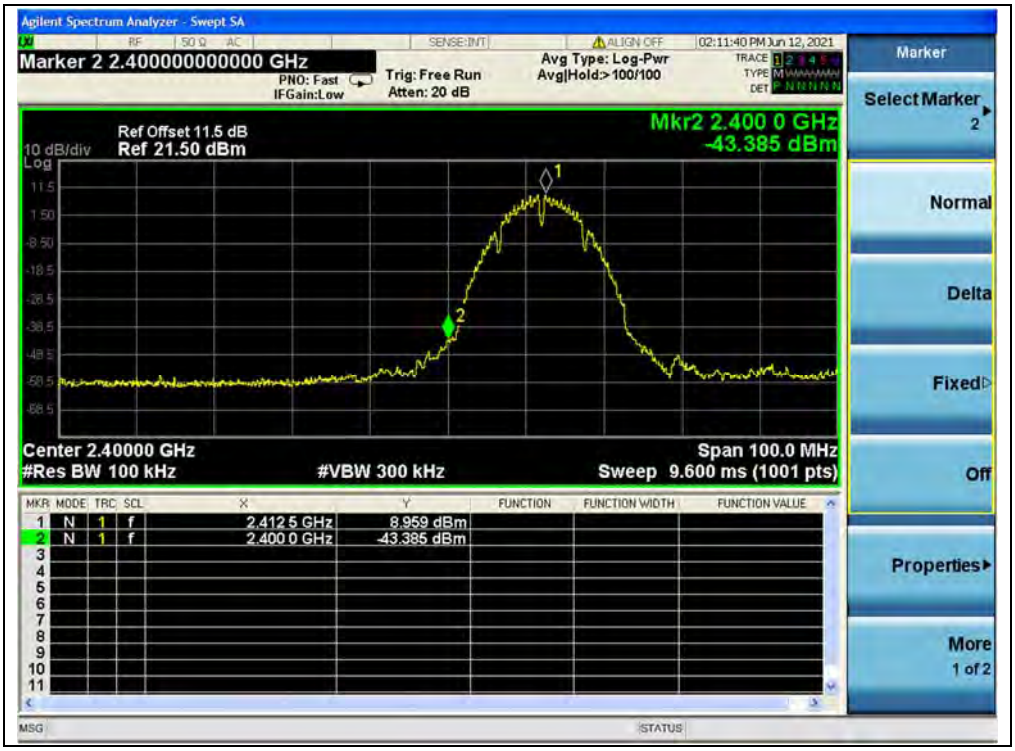
A.Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-42.82	7.08	-12.92	PASS
6	2437	-42.69	7.32	-12.68	PASS
11	2462	-42.36	7.69	-12.31	PASS

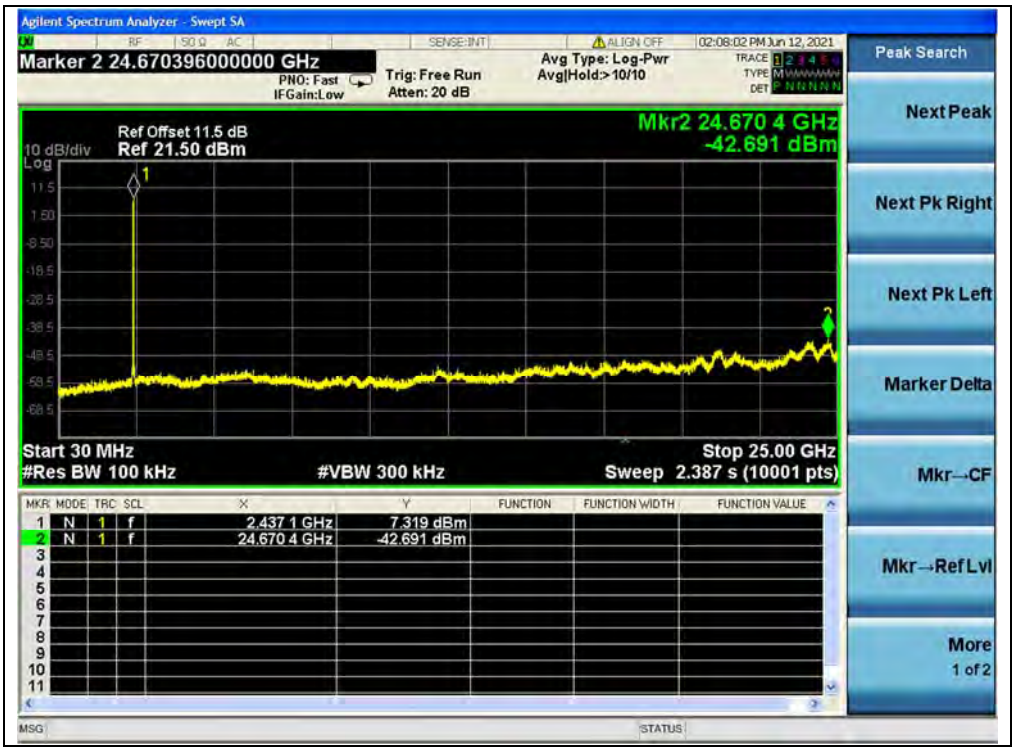
B.Test Plot:



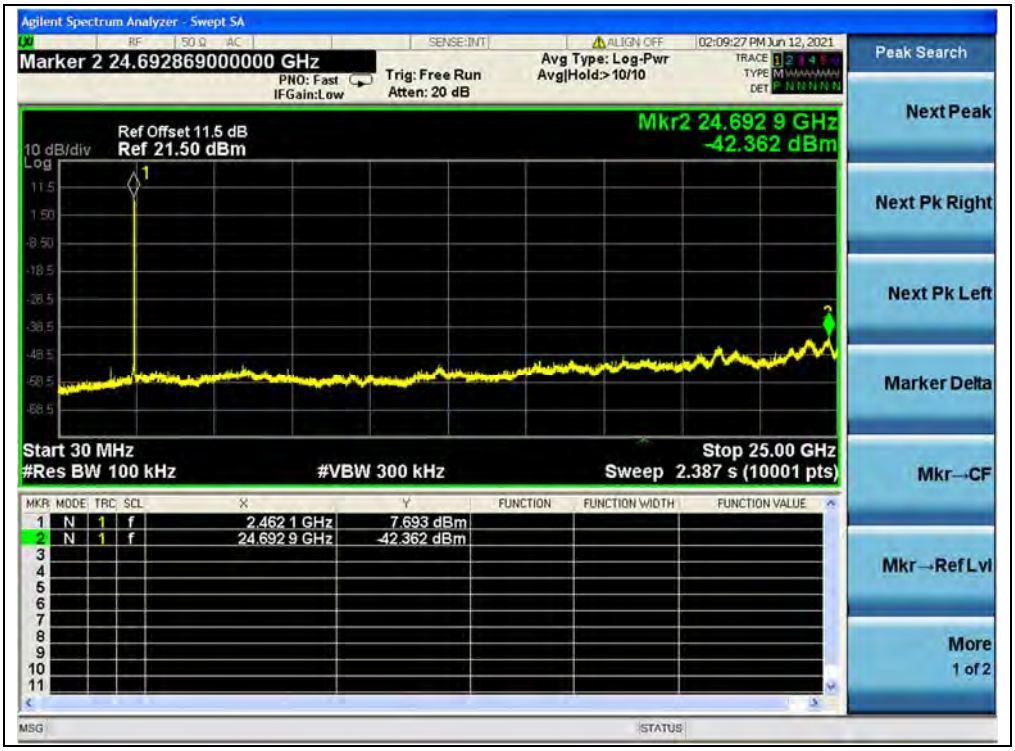
(30MHz to 25GHz, Channel 1, 802.11b)



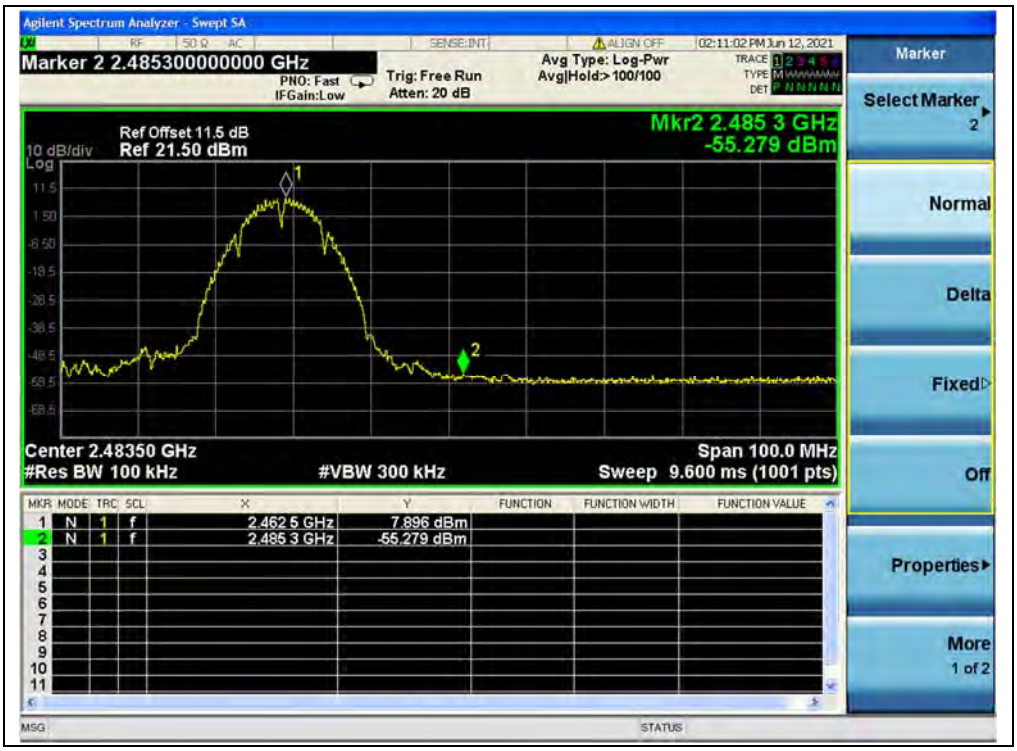
(Band Edge, Channel 1, 802.11b)



(30MHz to 25GHz, Channel 6, 802.11b)



(30MHz to 25GHz, Channel 11, 802.11b)



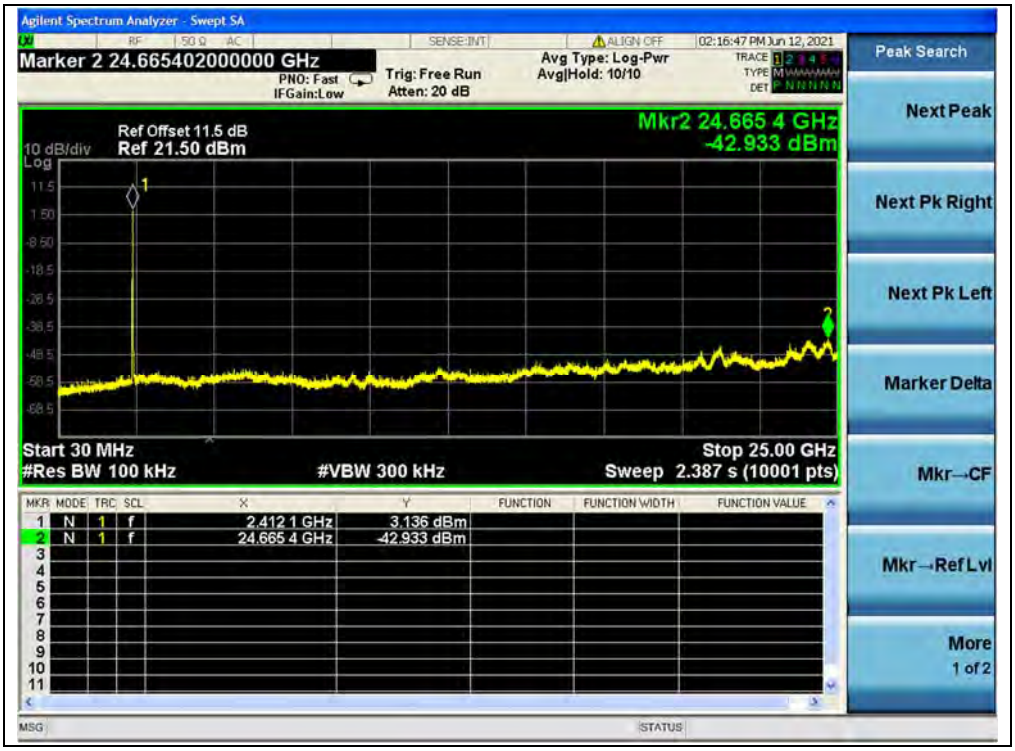
(Band Edge, Channel 11, 802.11b)

802.11g Mode

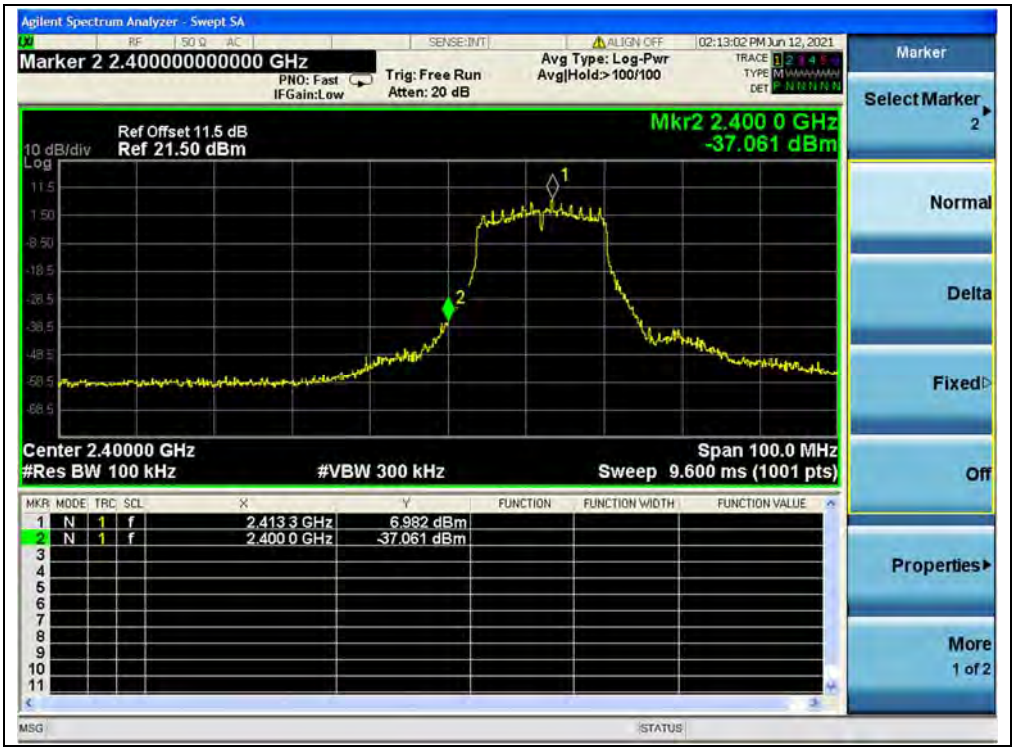
A.Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-42.93	3.14	-16.86	PASS
6	2437	-42.65	2.78	-17.22	PASS
11	2462	-42.85	4.65	-15.35	PASS

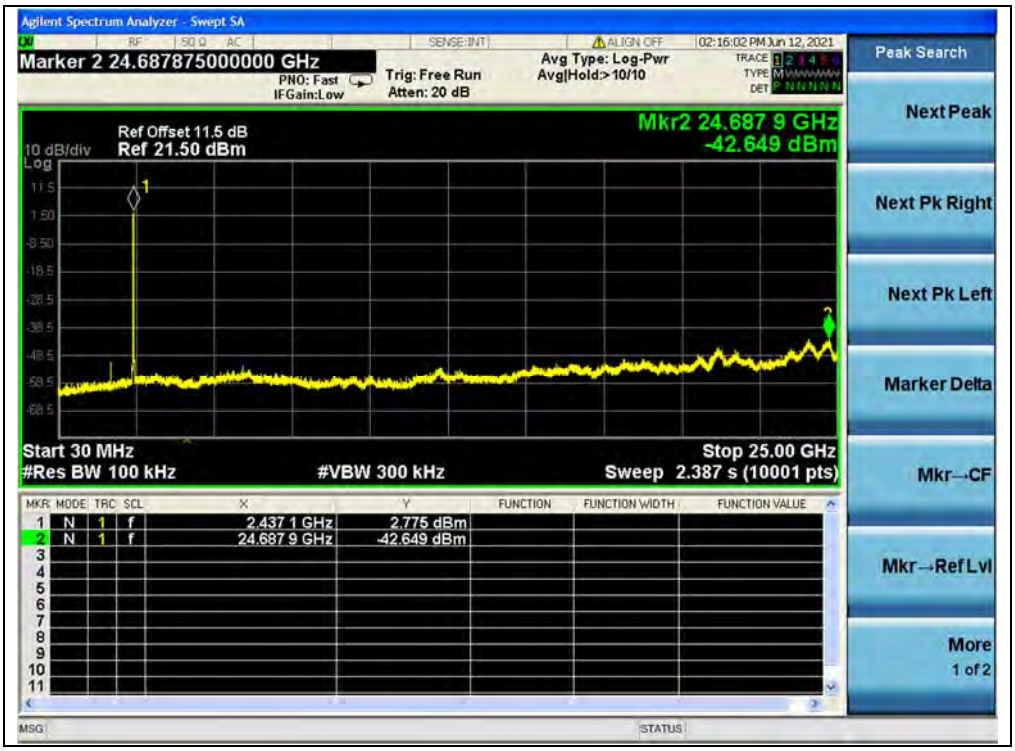
B.Test Plot:



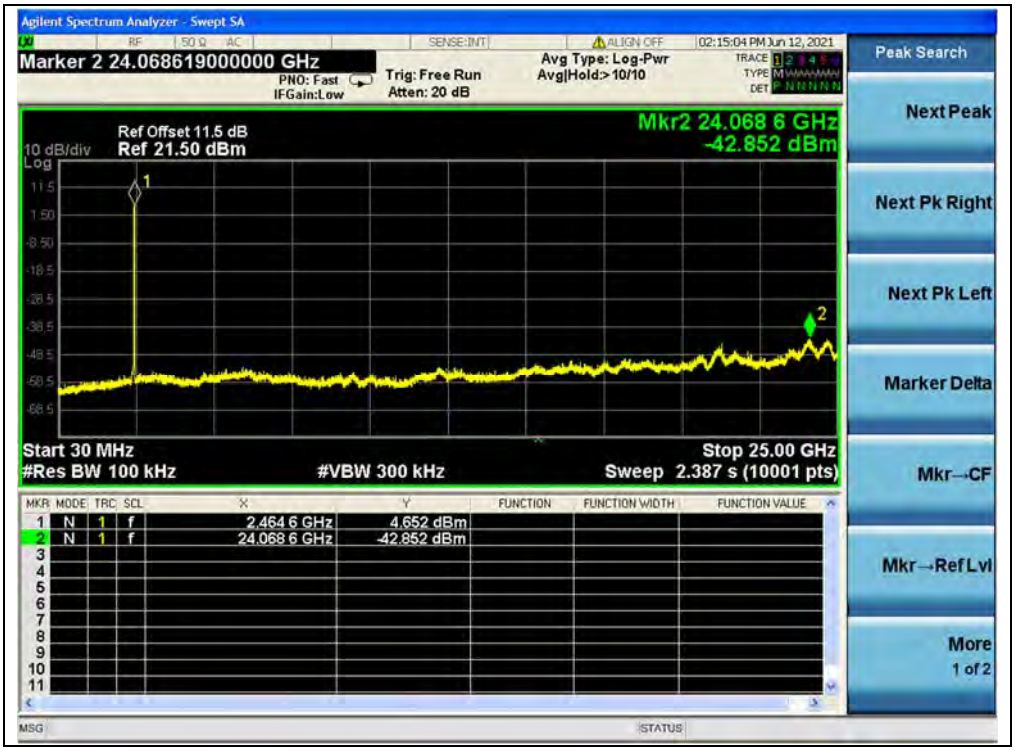
(30MHz to 25GHz, Channel 1, 802.11g)



(Band Edge, Channel 1, 802.11g)



(30MHz to 25GHz, Channel 6, 802.11g)



(30MHz to 25GHz, Channel 11, 802.11g)

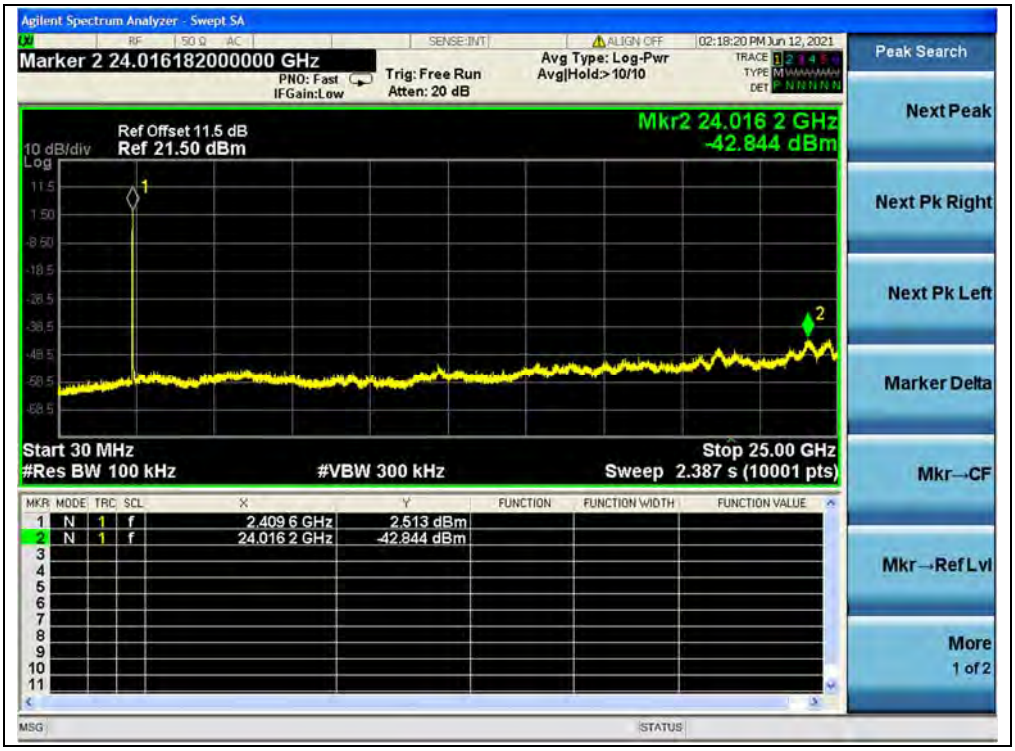
(Band Edge, Channel 11, 802.11g)

802.11n (HT20) Mode

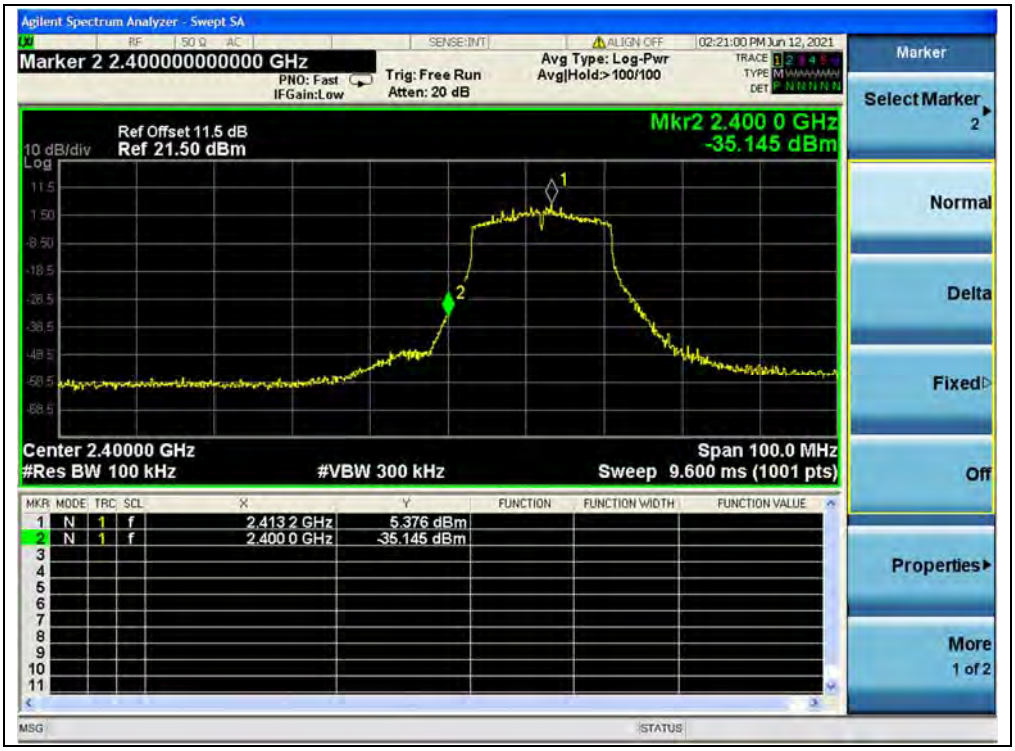
A.Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-42.84	2.51	-17.49	PASS
6	2437	-43.06	2.67	-17.33	PASS
11	2462	-43.17	2.04	-17.96	PASS

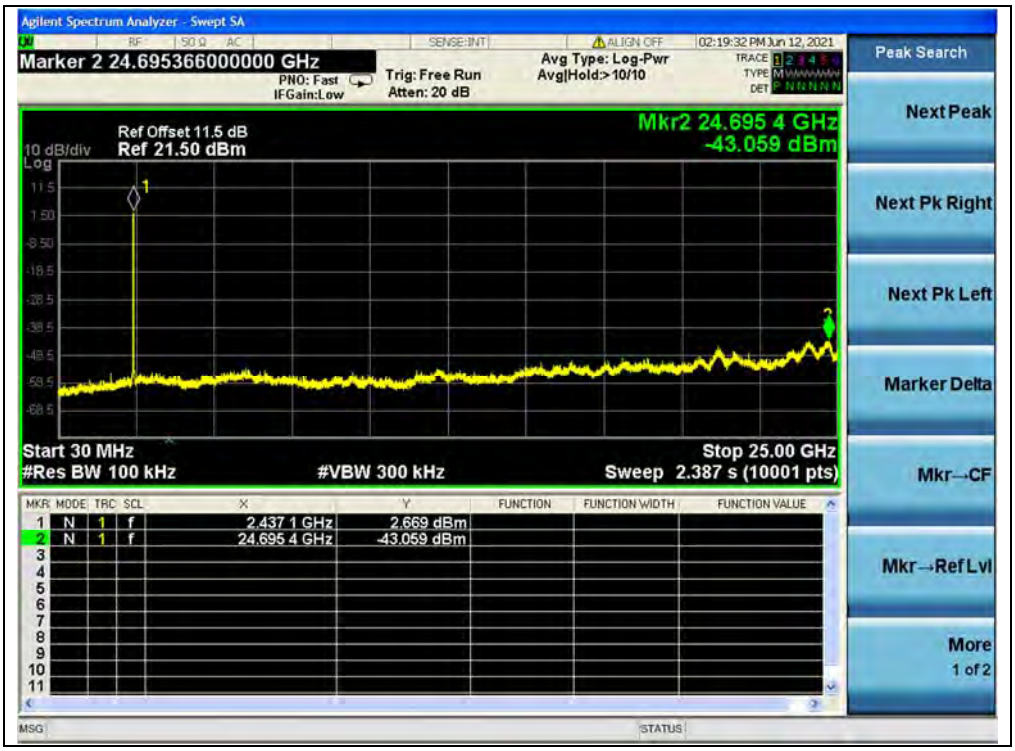
B.Test Plot:



(30MHz to 25GHz, Channel 1, 802.11n (HT20))



(Band Edge, Channel 1, 802.11n (HT20))



(30MHz to 25GHz, Channel 6, 802.11n (HT20))

(30MHz to 25GHz, Channel 11, 802.11n (HT20))

(Band Edge, Channel 11, 802.11n (HT20))

802.11n (HT40) Mode

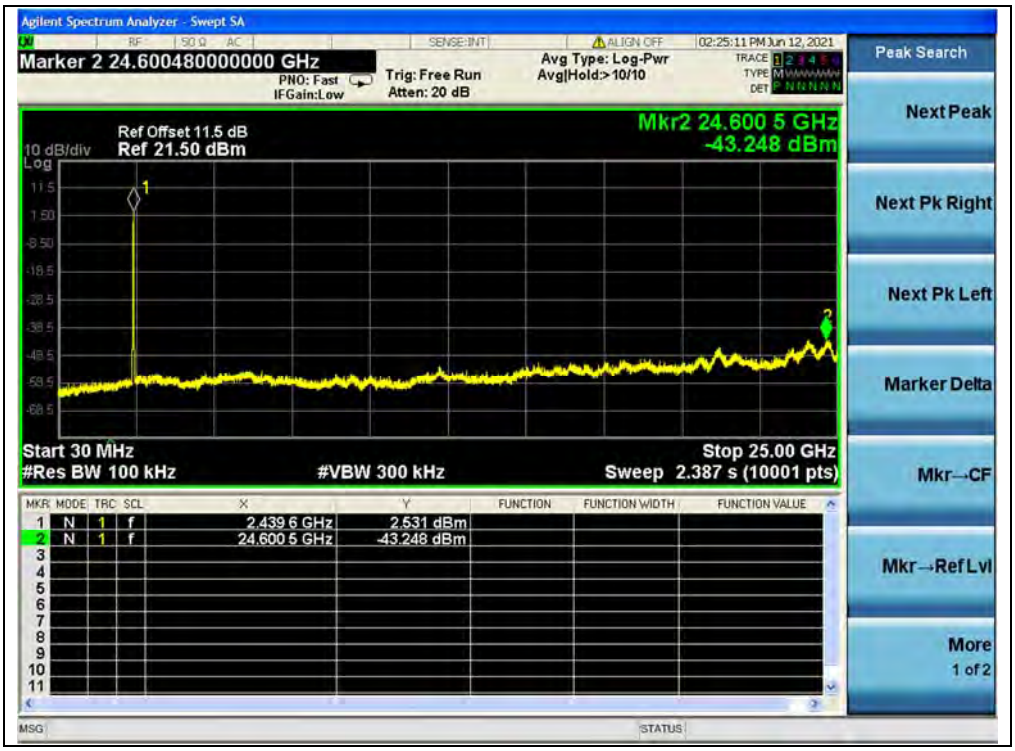
A.Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
3	2422	-42.99	-0.47	-20.47	PASS
6	2437	-43.25	2.53	-17.47	PASS
9	2452	-42.51	-0.56	-20.56	PASS

B.Test Plot:

(30MHz to 25GHz, Channel 3, 802.11n (HT40))

(Band Edge, Channel 3, 802.11n (HT40))



(30MHz to 25GHz, Channel 6, 802.11n (HT40))

(30MHz to 25GHz, Channel 9, 802.11n (HT40))

(Band Edge, Channel 11, 802.11n (HT40))

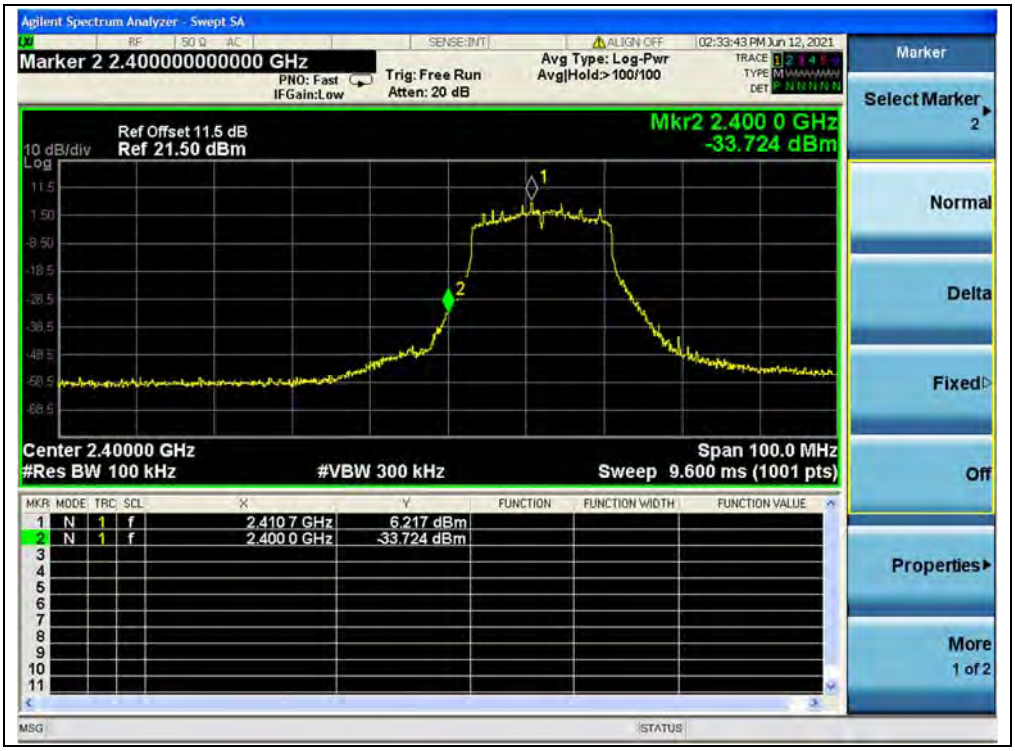
802.11ac (VHT20) Mode

A.Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-42.95	2.35	-17.65	PASS
6	2437	-42.98	1.93	-18.07	PASS
11	2462	-43.15	2.69	-17.31	PASS

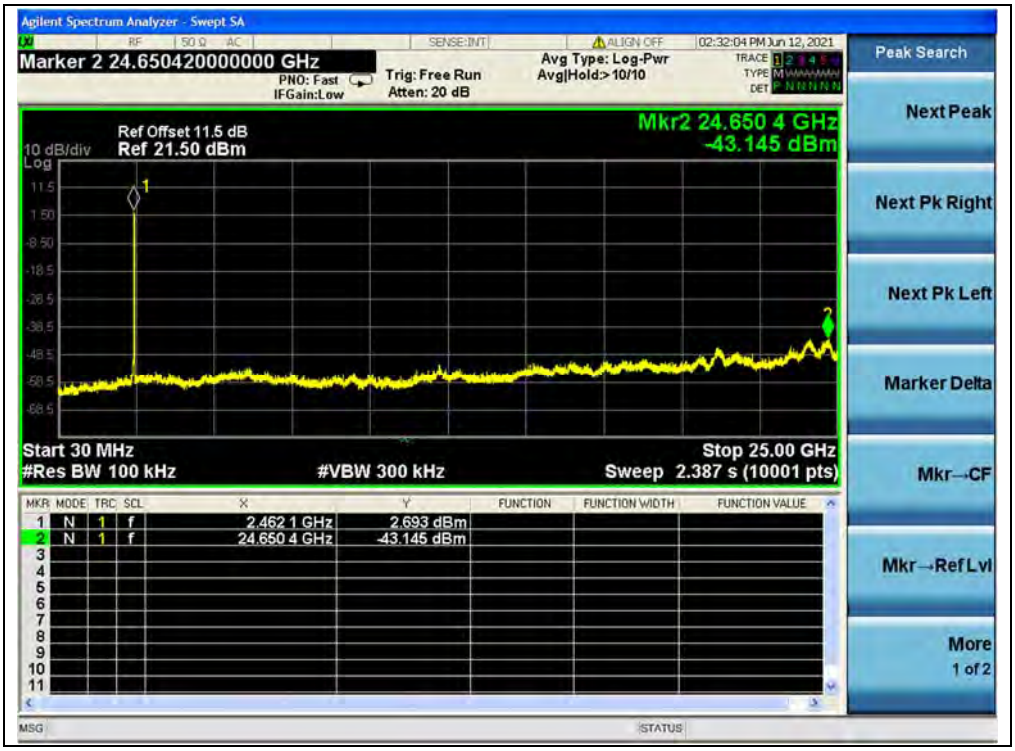
B.Test Plot:

(30MHz to 25GHz, Channel 1, 802.11ac (VHT20))

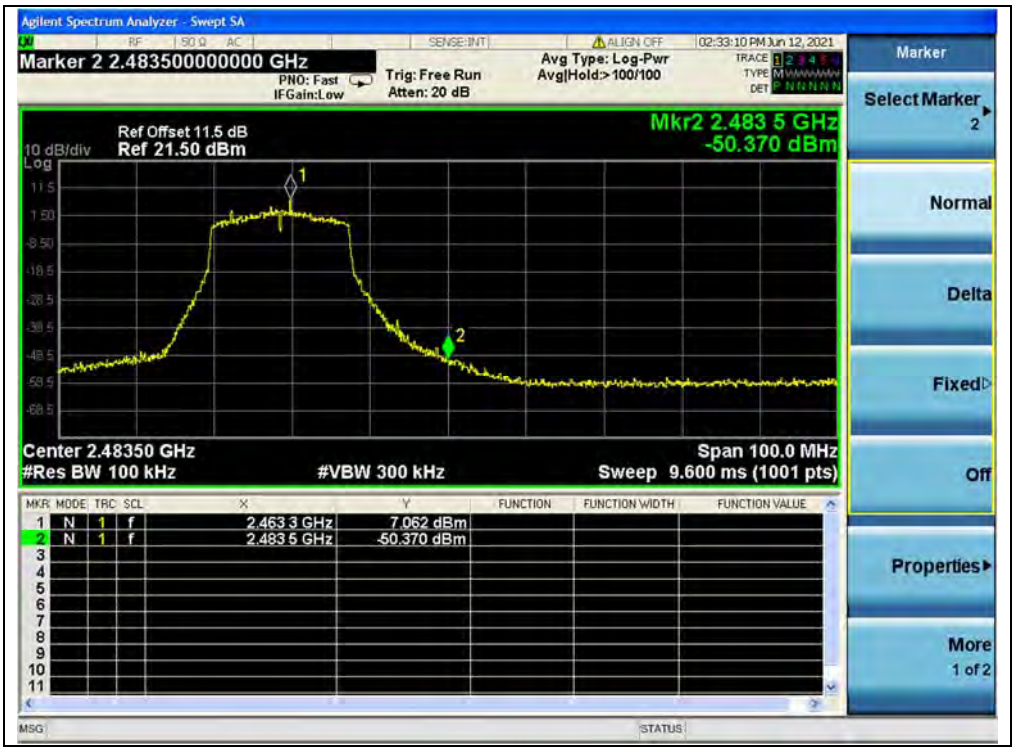


(Band Edge, Channel 1, 802.11ac (VHT20))

(30MHz to 25GHz, Channel 6, 802.11ac (VHT20))



(30MHz to 25GHz, Channel 11, 802.11ac (VHT20))



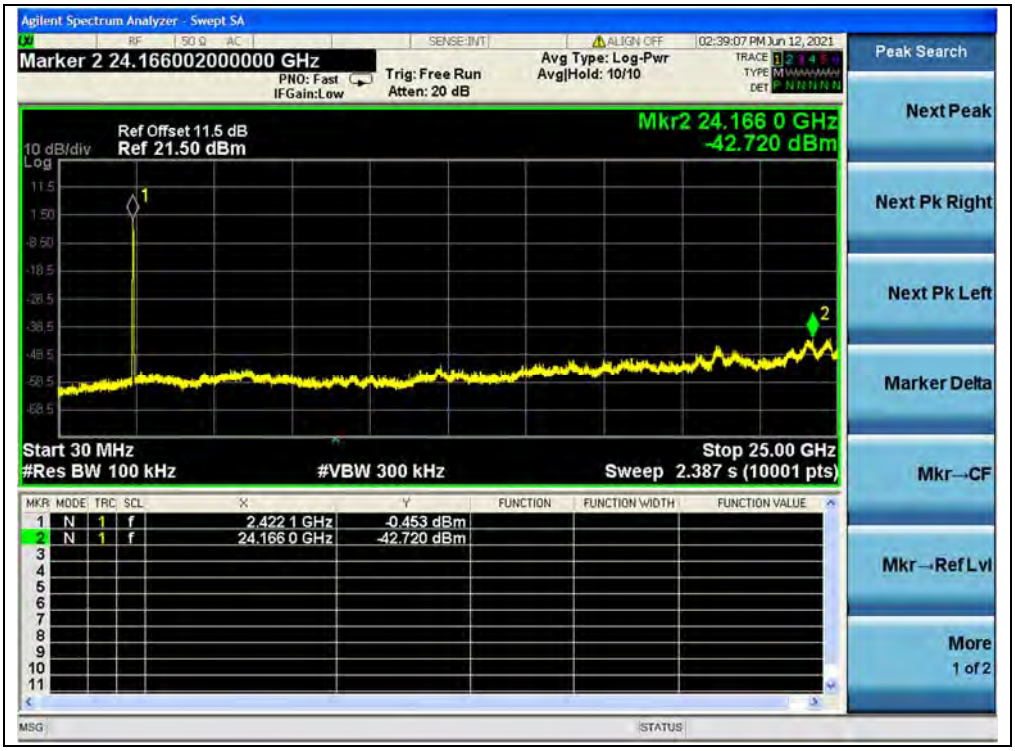
(Band Edge, Channel 11, 802.11ac (VHT20))

802.11ac (VHT40) Mode

A.Test Verdict:

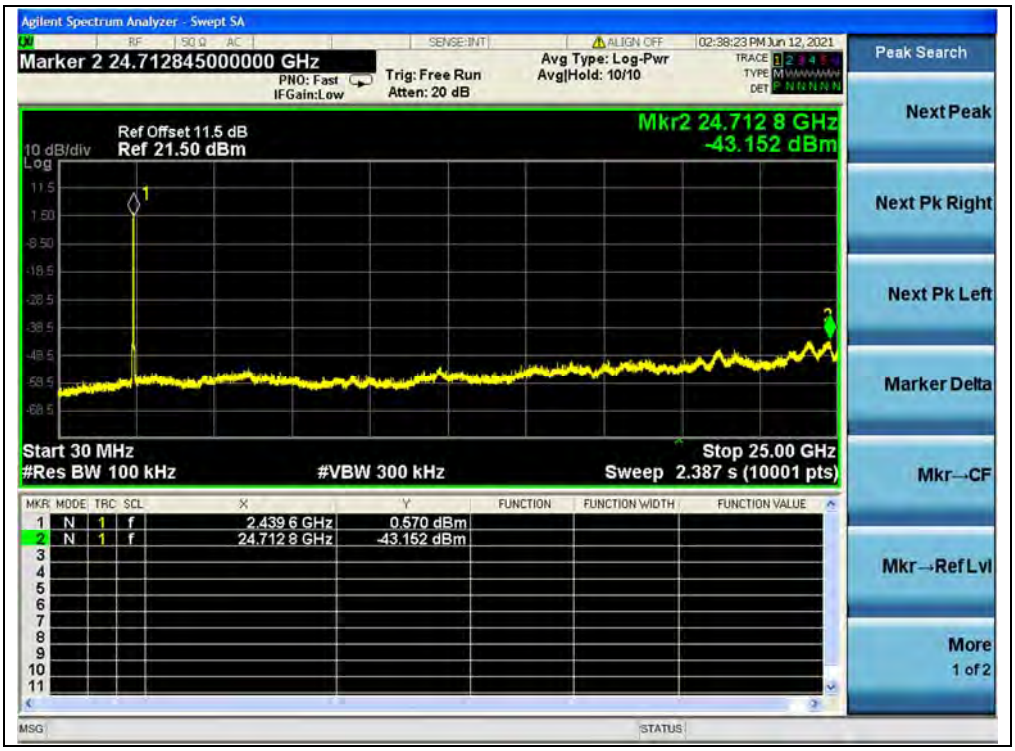
Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
3	2422	-42.72	-0.45	-20.45	PASS
6	2437	-43.15	0.57	-19.43	PASS
9	2452	-42.76	-1.17	-21.17	PASS

B.Test Plot:



(30MHz to 25GHz, Channel 3, 802.11ac (VHT40))

(Band Edge, Channel 3, 802.11ac (VHT40))



(30MHz to 25GHz, Channel 6, 802.11ac (VHT40))

(30MHz to 25GHz, Channel 9, 802.11ac (VHT40))

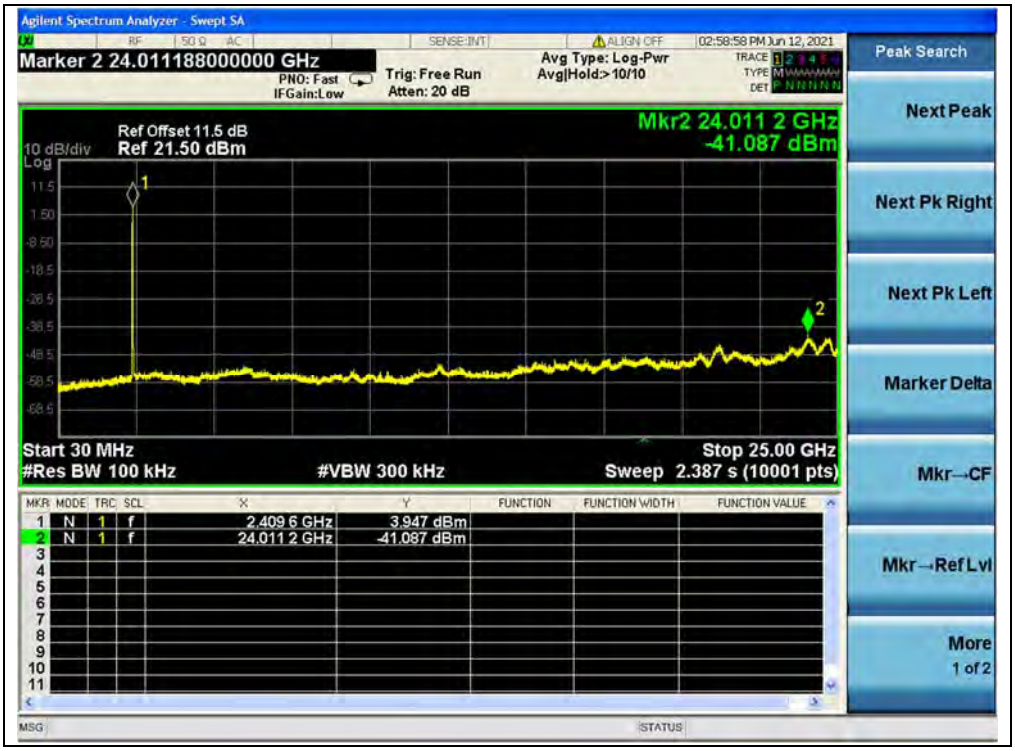
(Band Edge, Channel 11, 802.11ac (VHT40))

802.11ax (HEW20) Mode

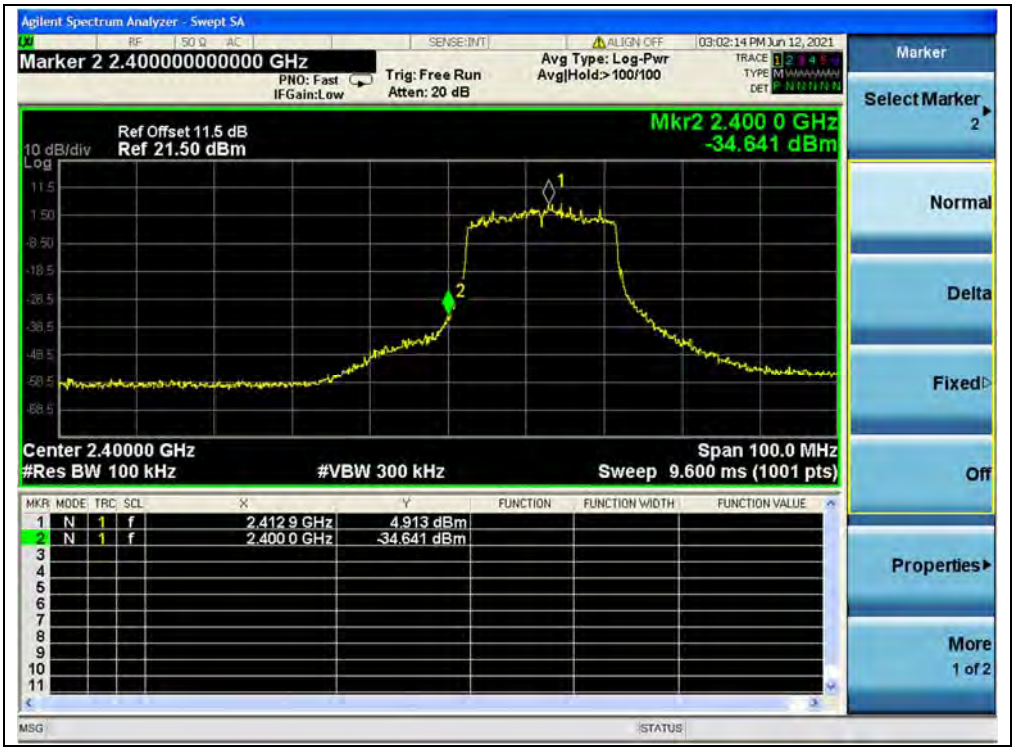
A.Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-41.09	3.95	-16.05	PASS
6	2437	-43.12	2.16	-17.84	PASS
11	2462	-42.75	3.62	-16.38	PASS

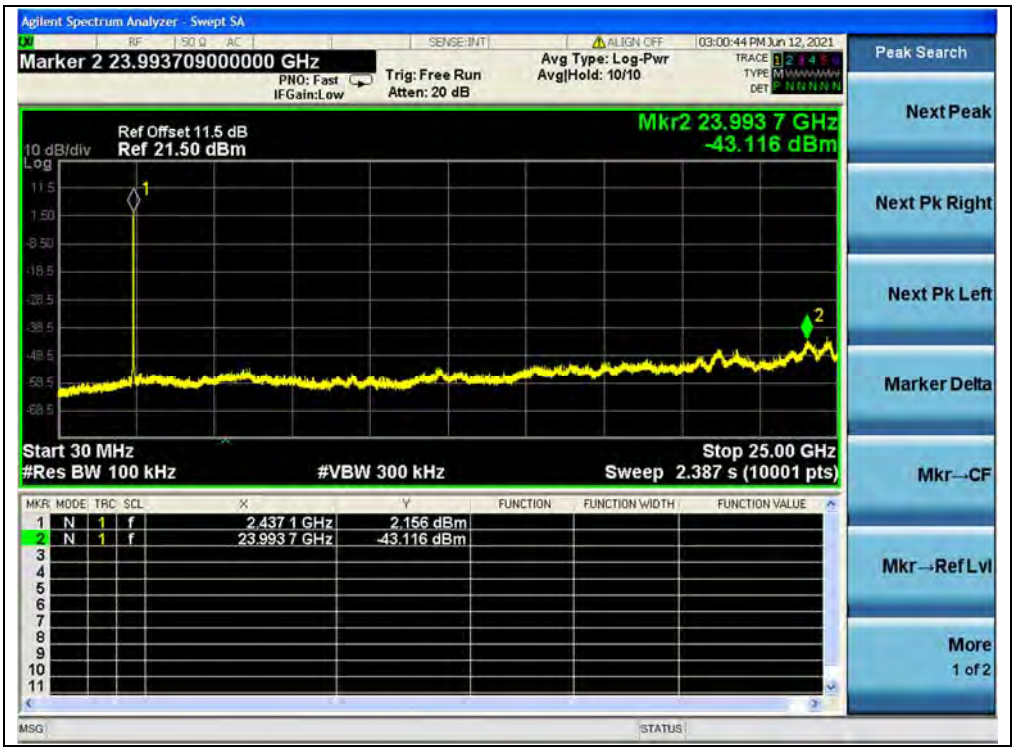
B.Test Plot:



(30MHz to 25GHz, Channel 1, 802.11ax (HEW20))

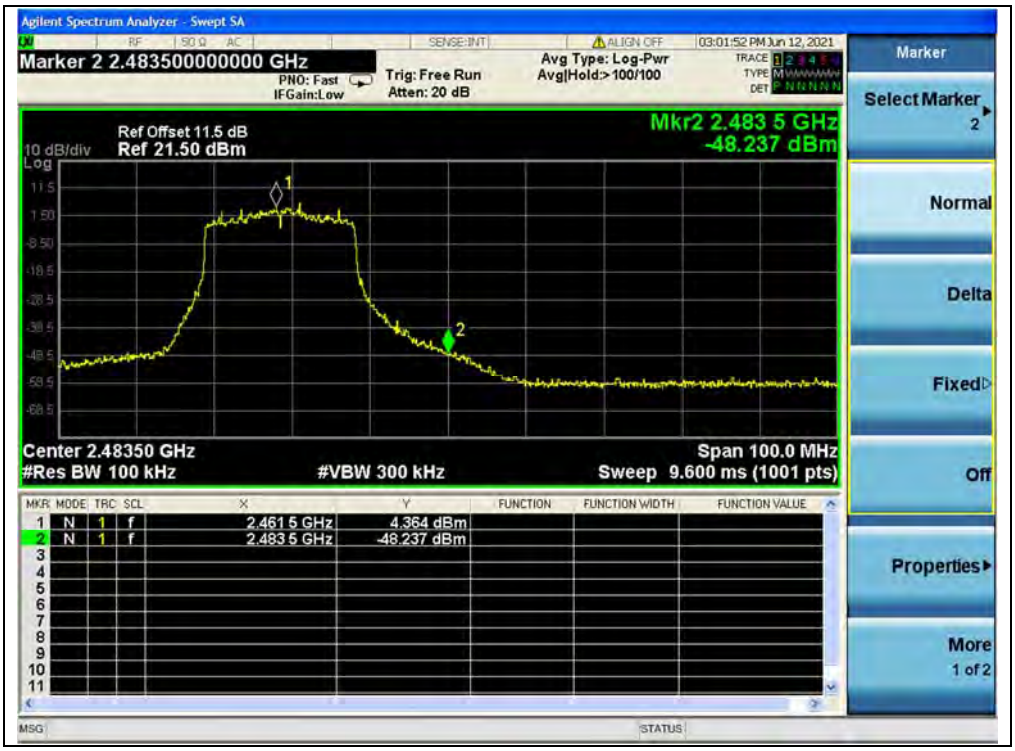


(Band Edge, Channel 1, 802.11ax (HEW20))



(30MHz to 25GHz, Channel 6, 802.11ax (HEW20))

(30MHz to 25GHz, Channel 11, 802.11ax (HEW20))



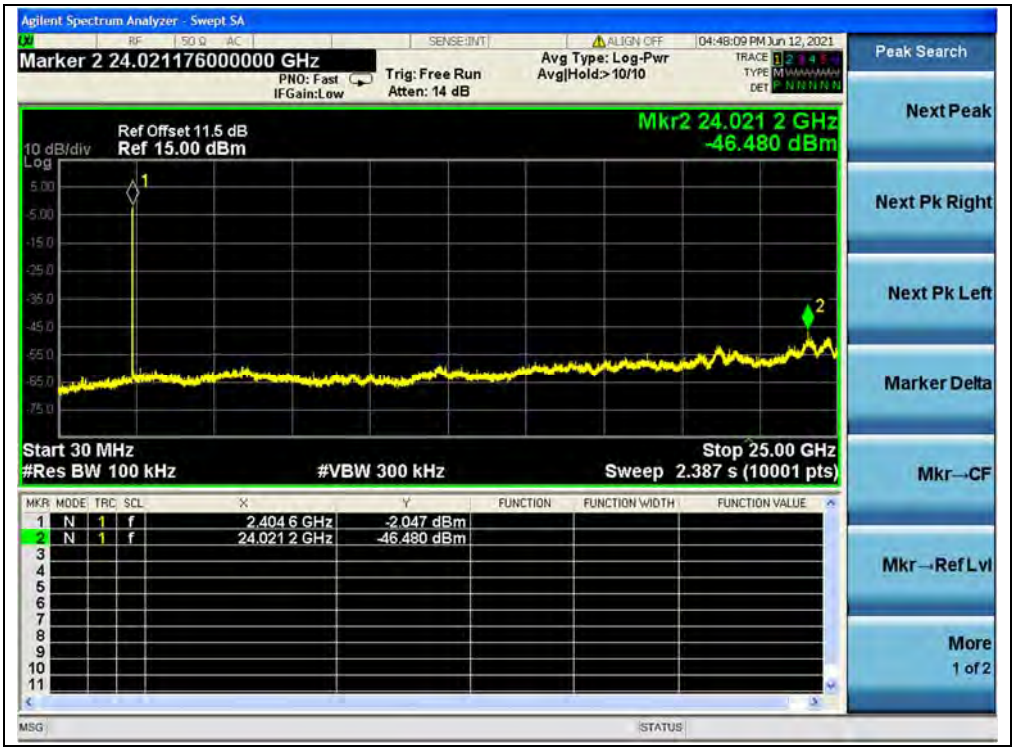
(Band Edge, Channel 11, 802.11ax (HEW20))

802.11ax (HEW20) RU26 Mode

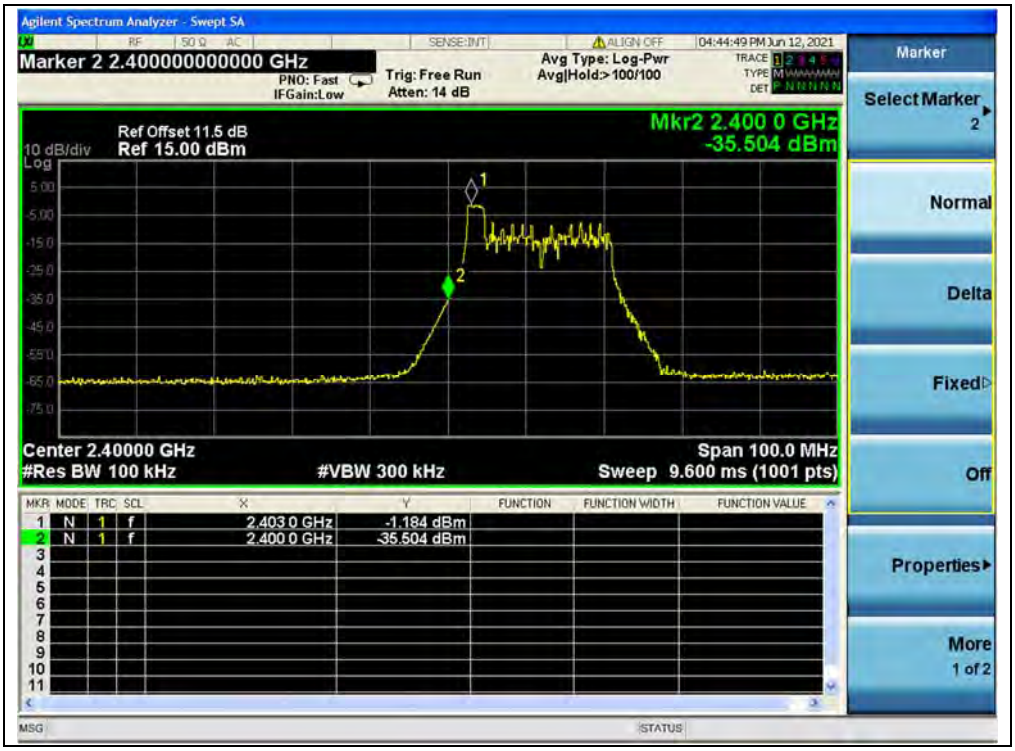
A.Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-46.48	-2.05	-22.05	PASS
6	2437	-48.98	-1.33	-21.33	PASS
11	2462	-49.05	-1.14	-21.14	PASS

B.Test Plot:



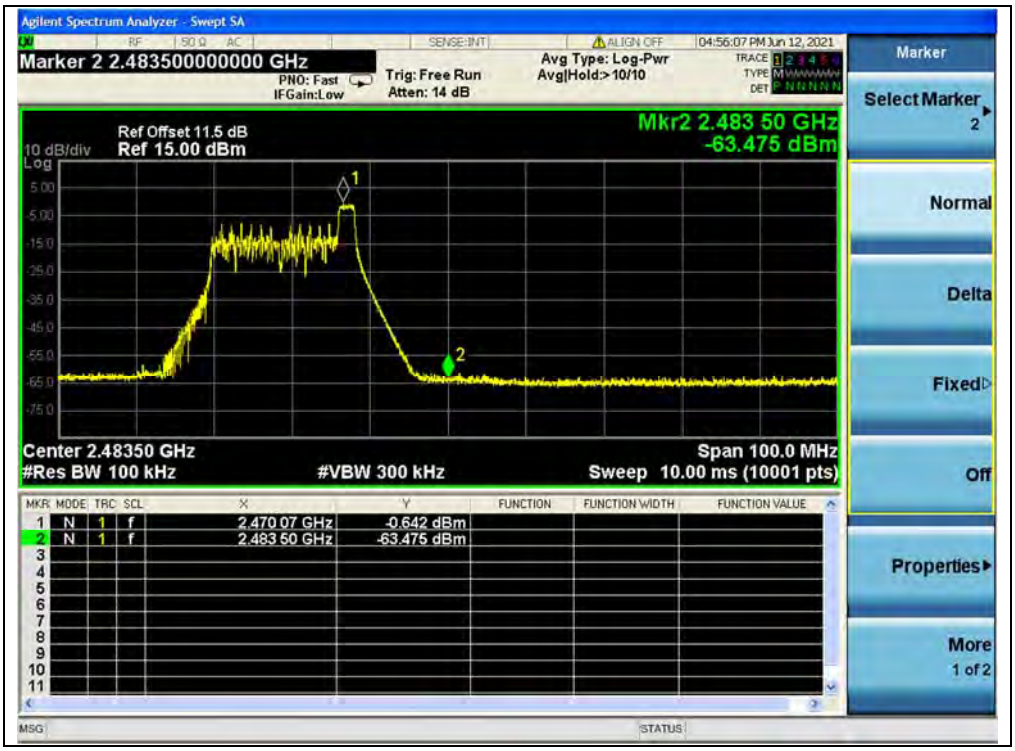
(30MHz to 25GHz, Channel 1, 802.11ax (HEW20) RU26)



(Band Edge, Channel 1, 802.11ax (HEW20) RU26)

(30MHz to 25GHz, Channel 6, 802.11ax (HEW20) RU26)

(30MHz to 25GHz, Channel 11, 802.11ax (HEW20) RU26)



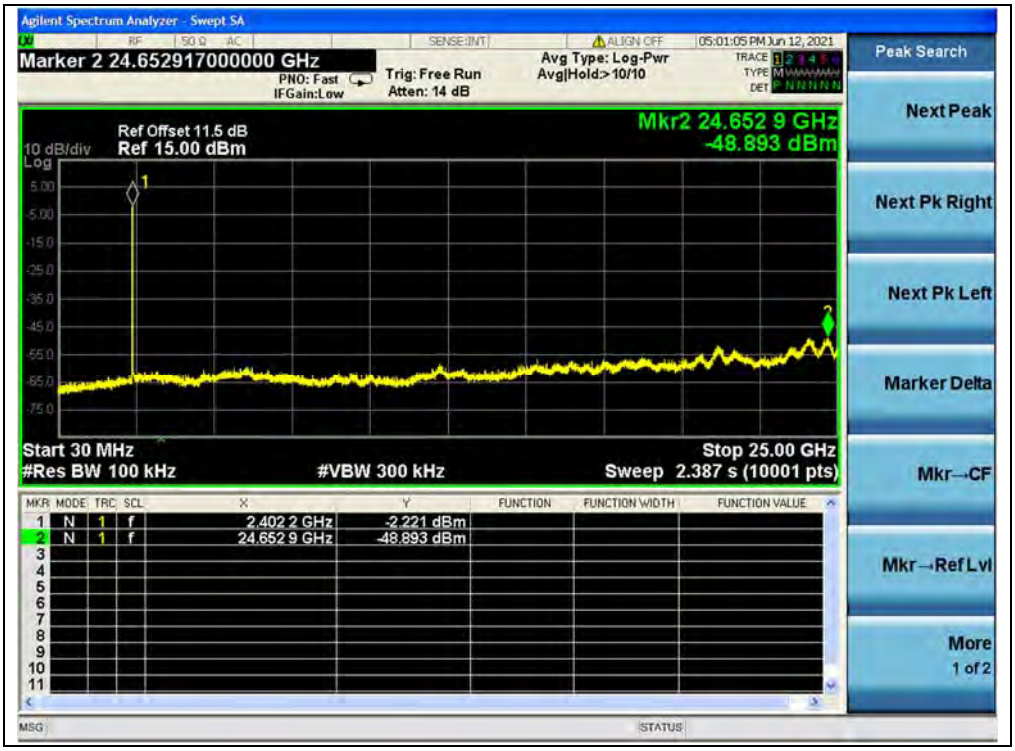
(Band Edge, Channel 11, 802.11ax (HEW20) RU26)

802.11ax (HEW20) RU52 Mode

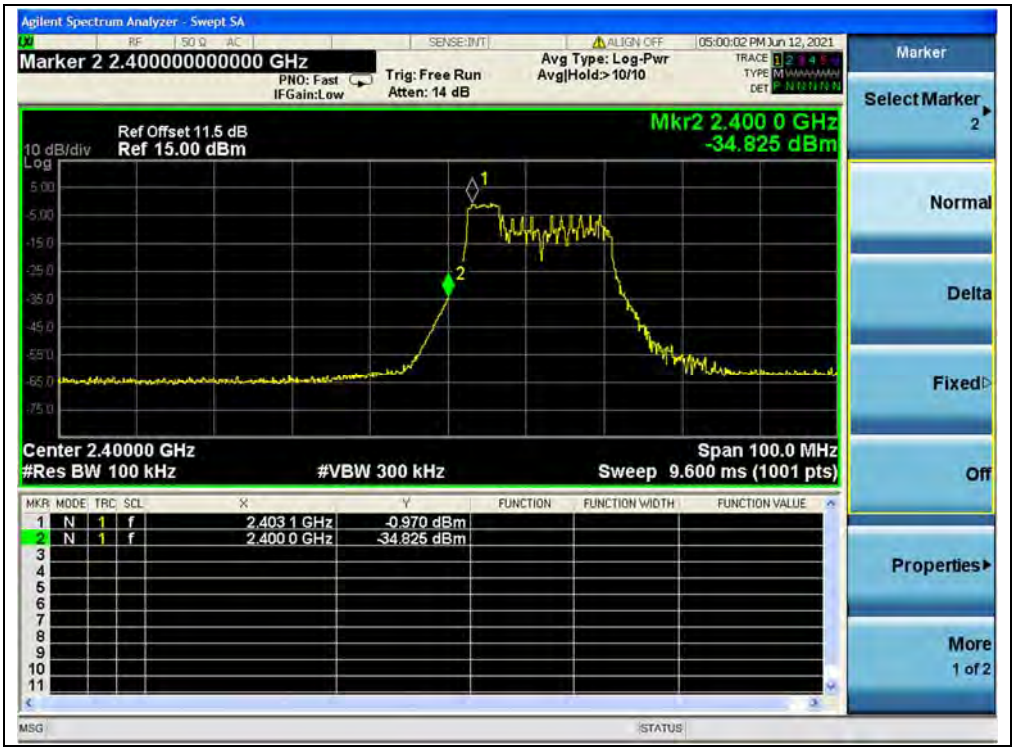
A.Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-48.89	-2.22	-22.22	PASS
6	2437	-49.06	-1.78	-21.78	PASS
11	2462	-48.25	-1.41	-21.41	PASS

B.Test Plot:

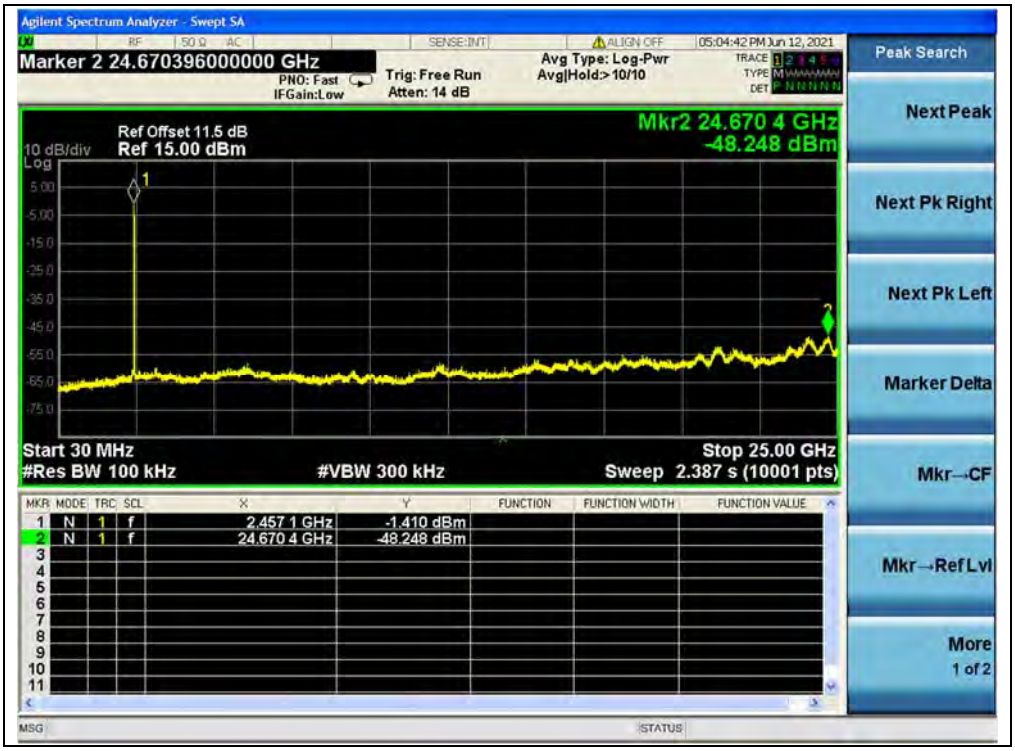


(30MHz to 25GHz, Channel 1, 802.11ax (HEW20) RU52)



(Band Edge, Channel 1, 802.11ax (HEW20) RU52)

(30MHz to 25GHz, Channel 6, 802.11ax (HEW20) RU52)



(30MHz to 25GHz, Channel 11, 802.11ax (HEW20) RU52)

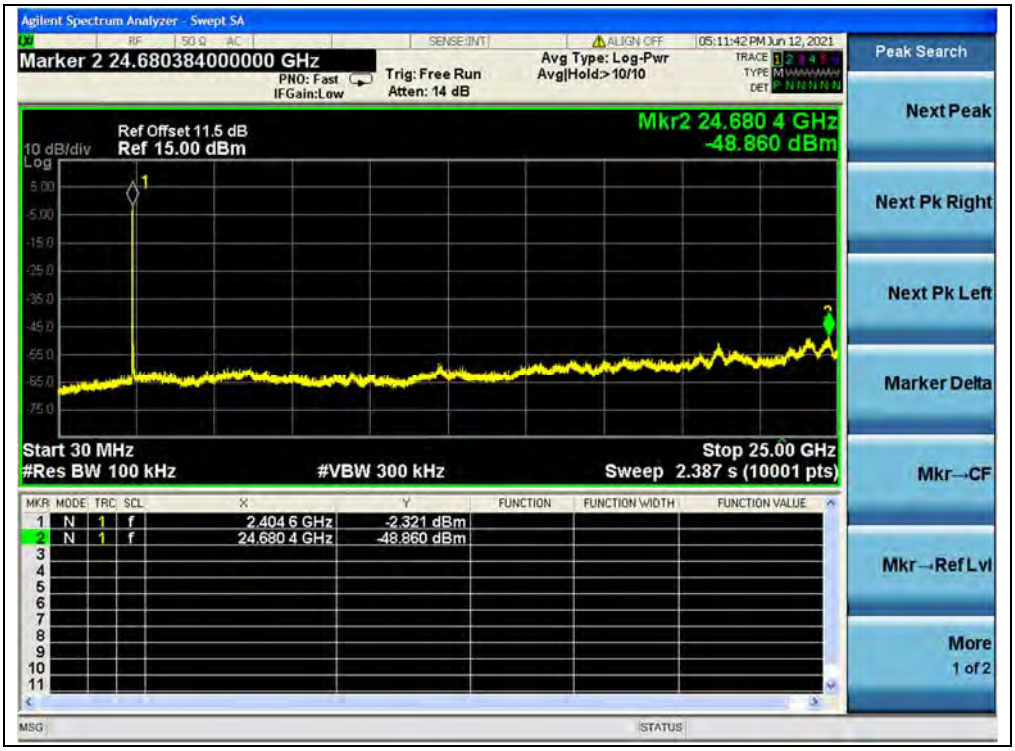
(Band Edge, Channel 11, 802.11ax (HEW20) RU52)

802.11ax (HEW20) RU106 Mode

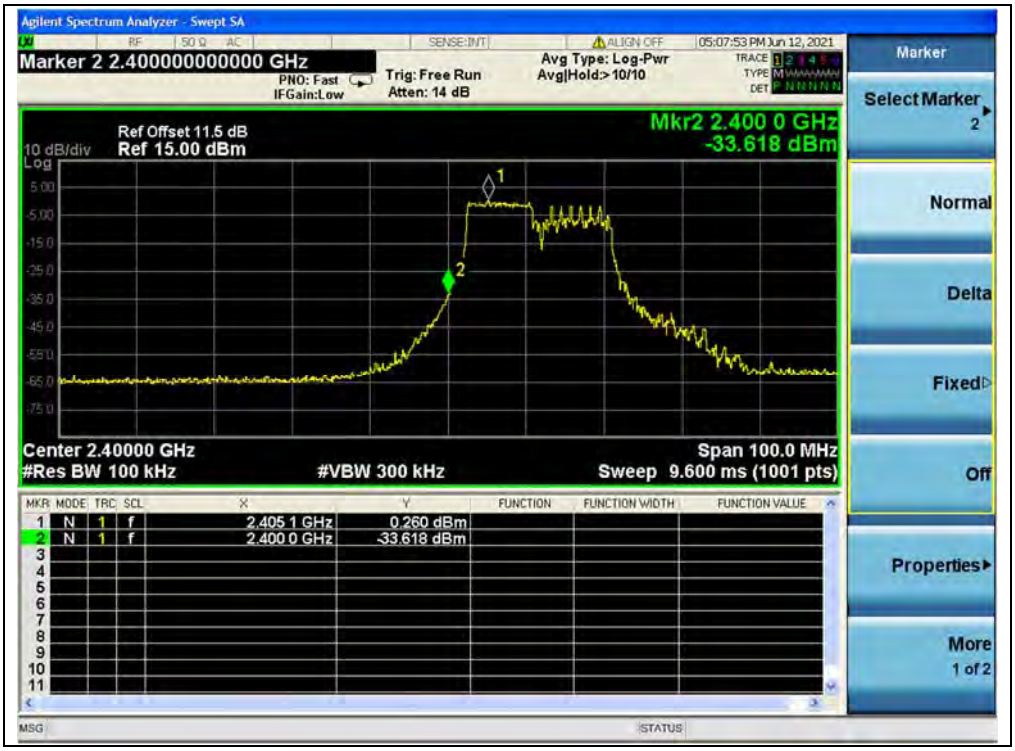
A.Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-48.86	-2.32	-22.32	PASS
6	2437	-46.89	-0.34	-20.34	PASS
11	2462	-47.98	-0.25	-20.25	PASS

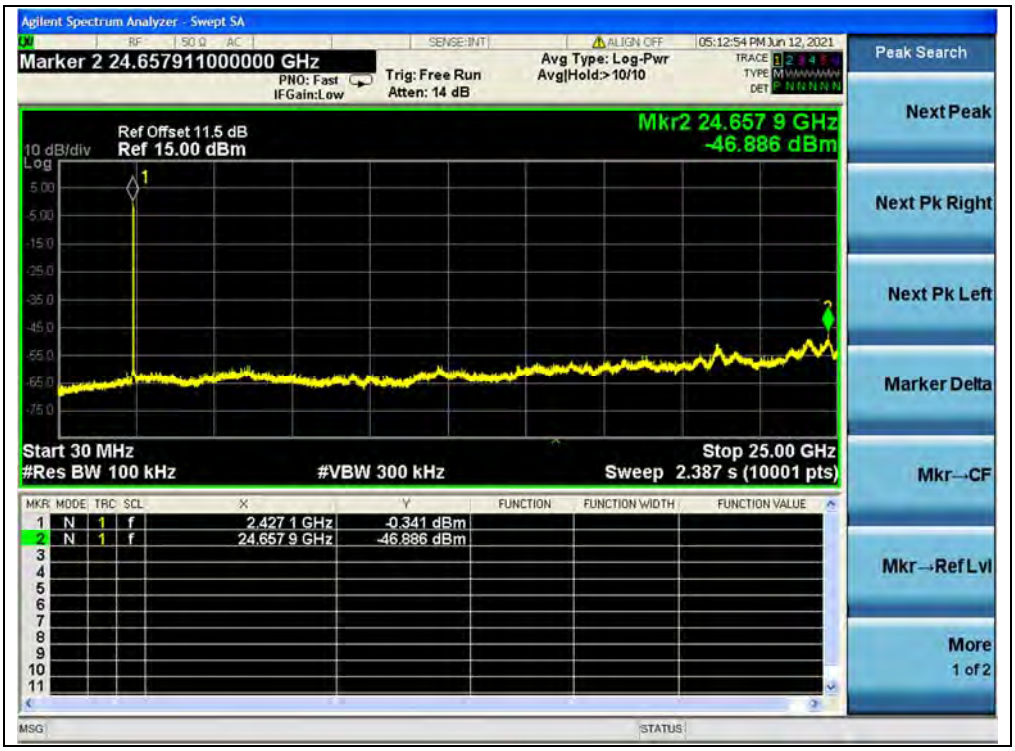
B.Test Plot:



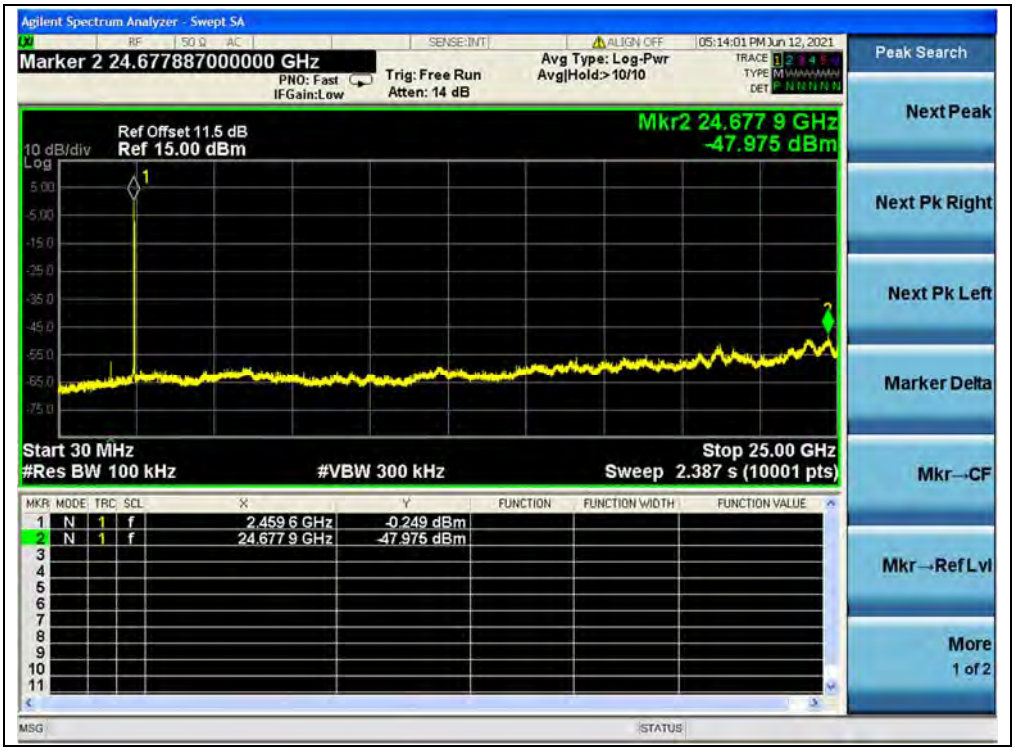
(30MHz to 25GHz, Channel 1, 802.11ax (HEW20) RU106)



(Band Edge, Channel 1, 802.11ax (HEW20) RU106)



(30MHz to 25GHz, Channel 6, 802.11ax (HEW20) RU106)



(30MHz to 25GHz, Channel 11, 802.11ax (HEW20) RU106)

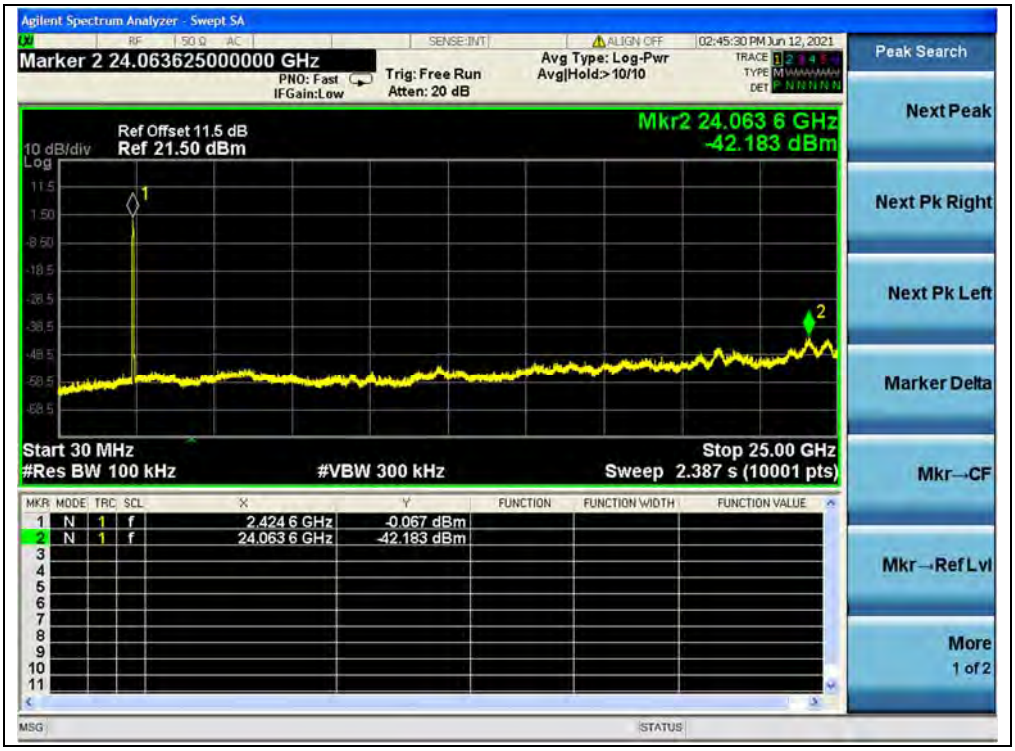
(Band Edge, Channel 11, 802.11ax (HEW20) RU106)

802.11ax (HEW40) Mode

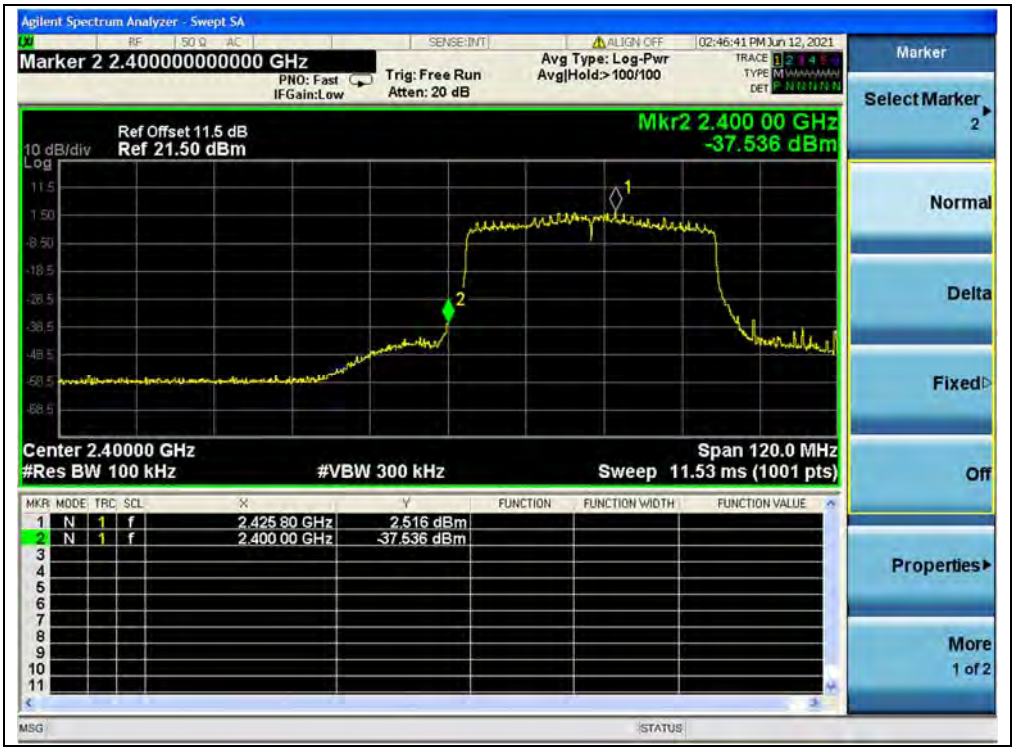
A.Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
3	2422	-42.18	-0.07	-20.07	PASS
6	2437	-42.38	0.51	-19.49	PASS
9	2452	-43.12	1.86	-18.14	PASS

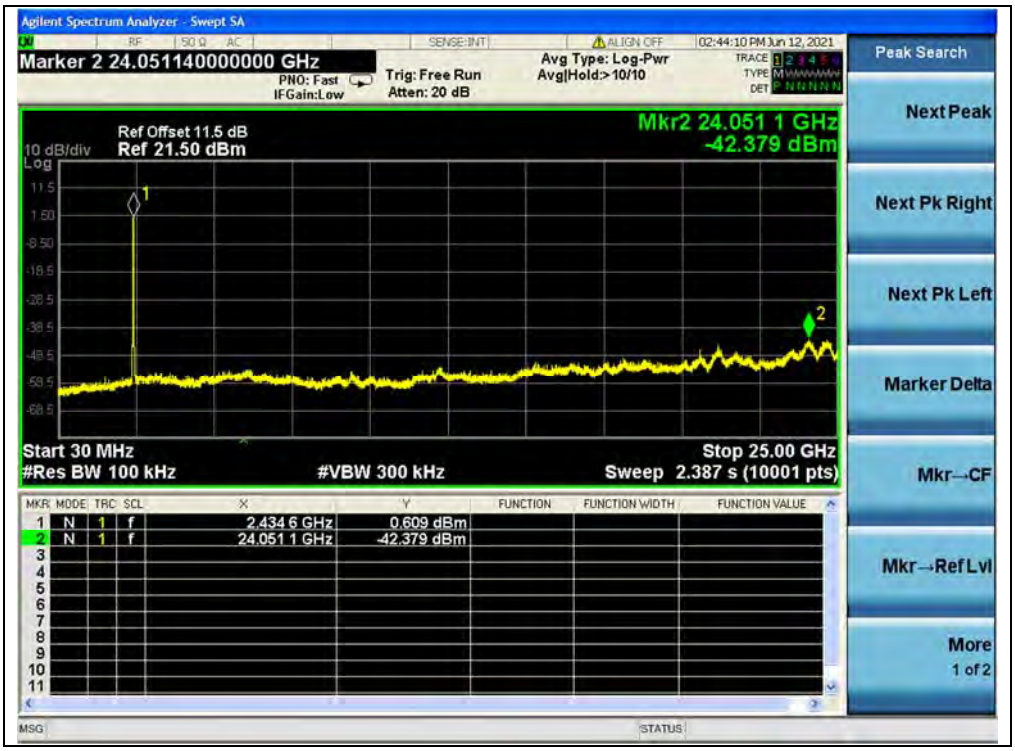
B.Test Plot:



(30MHz to 25GHz, Channel 3, 802.11ax (HEW40))



(Band Edge, Channel 3, 802.11ax (HEW40))



(30MHz to 25GHz, Channel 6, 802.11ax (HEW40))

(30MHz to 25GHz, Channel 9, 802.11ax (HEW40))

(Band Edge, Channel 11, 802.11ax (HEW40))

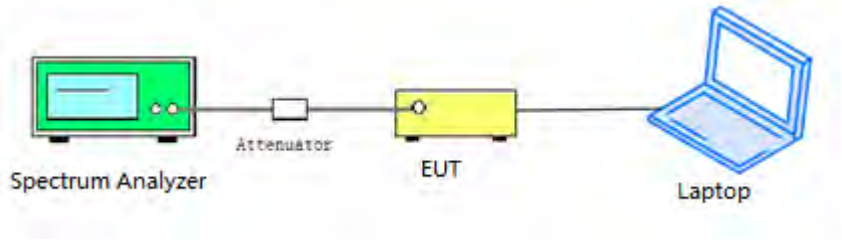
2.6. Power Spectral Density

2.6.1. Requirement

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

2.6.2. Test Description

Test Setup:



The EUT is coupled to the Spectrum Analyzer; the RF load attached to the EUT antenna terminal is 50Ohm; the path loss as the factor is calibrated to correct the reading.

2.6.3. Test Procedure

KDB 558074 Section 8.4 was used in order to prove compliance.

2.6.4. Test Result

802.11b Mode

A.Test Verdict:

Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)		Limit (dBm/3kHz)	Verdict
		ANT 0	ANT 1		
1	2412	-6.62	-6.52	8	PASS
6	2437	-5.93	-6.19	8	PASS
11	2462	-5.63	-6.76	8	PASS

B.Test Plot:

(Channel 1, 802.11b, ANT 0)

(Channel 6, 802.11b, ANT 0)

(Channel 11, 802.11b, ANT 0)

(Channel 1, 802.11b, ANT 1)

(Channel 6, 802.11b, ANT 1)

(Channel 11, 802.11b, ANT 1)

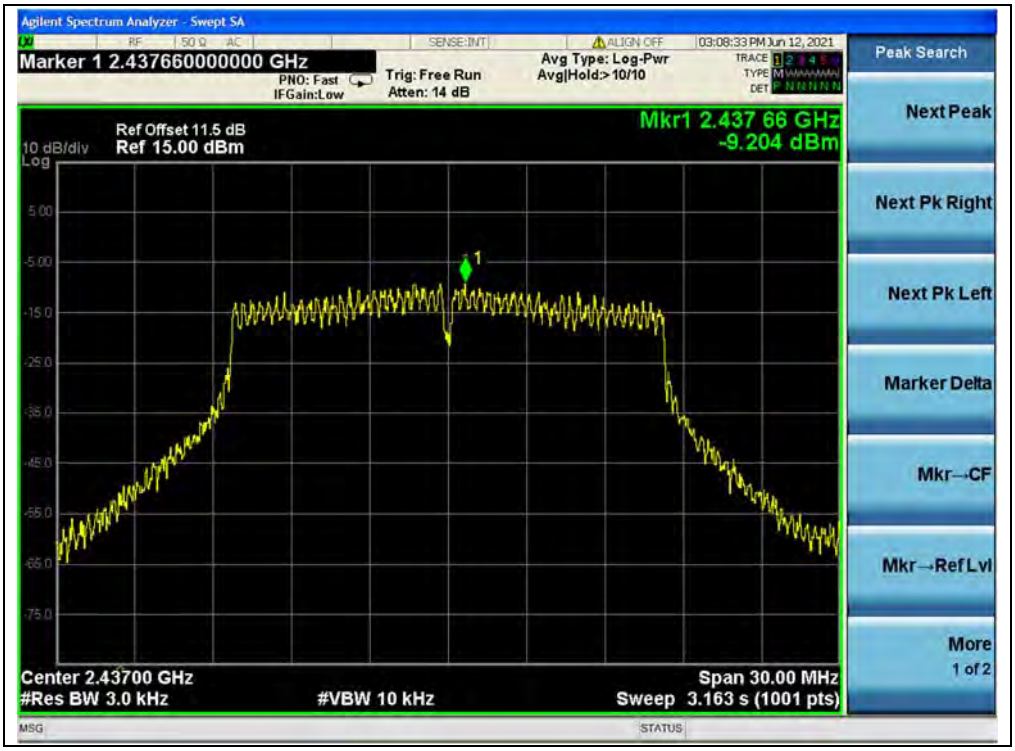
802.11g Mode

A.Test Verdict:

Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)		Limit (dBm/3kHz)	Verdict
		ANT 0	ANT 1		
1	2412	-8.08	-9.81	8	PASS
6	2437	-9.20	-8.43	8	PASS
11	2462	-8.47	-9.11	8	PASS

B.Test Plot:

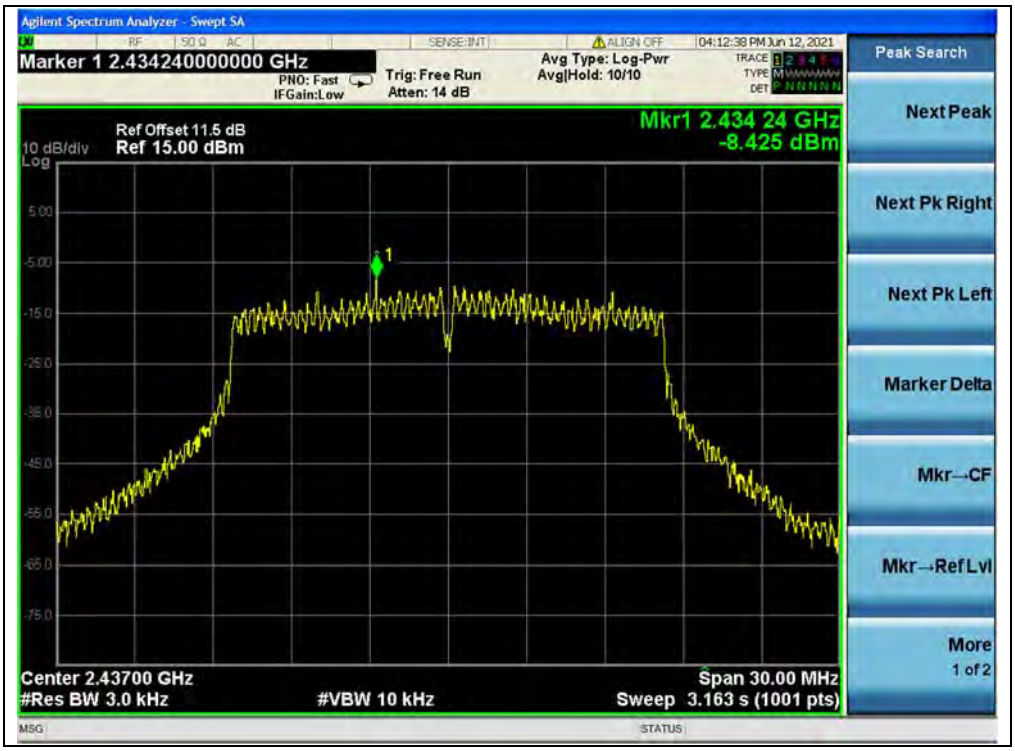
(Channel 1, 802.11g, ANT 0)



(Channel 6, 802.11g, ANT 0)

(Channel 11, 802.11g, ANT 0)

(Channel 1, 802.11g, ANT 1)



(Channel 6, 802.11g, ANT 1)

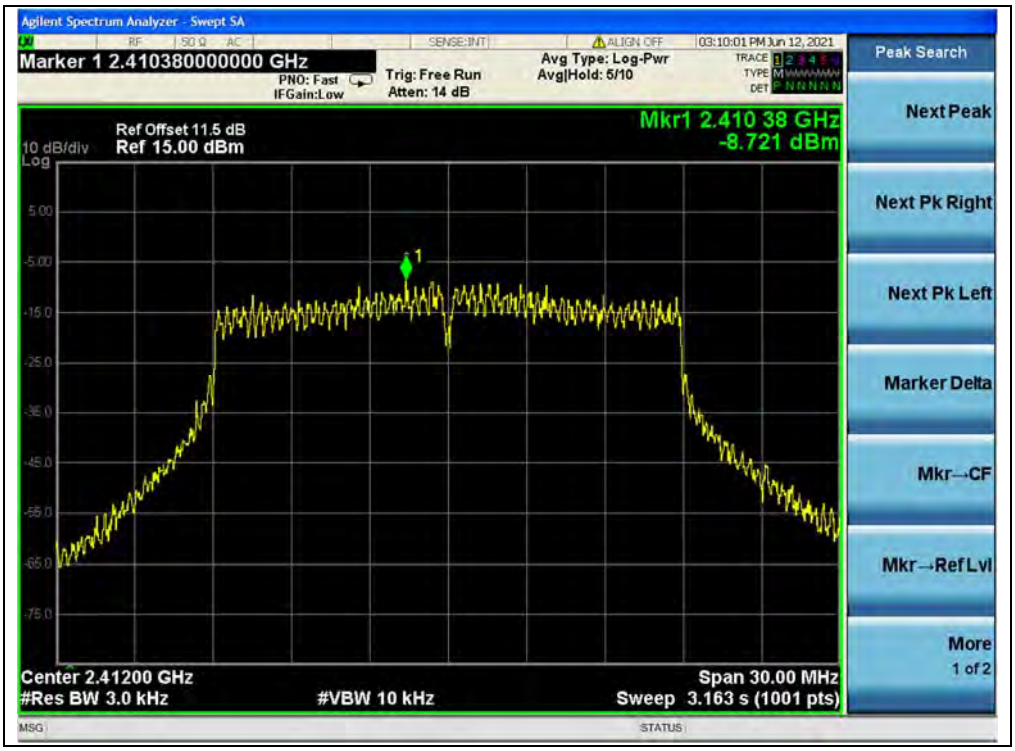
(Channel 11, 802.11g, ANT 1)

802.11n (HT20) Mode

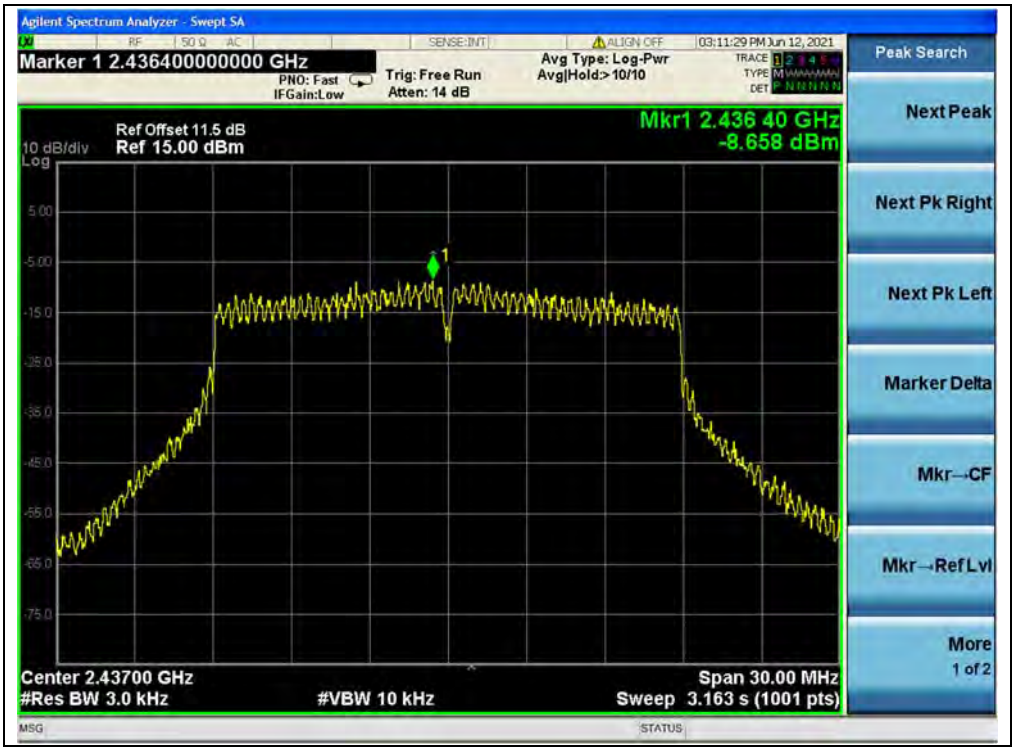
A.Test Verdict:

Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)		Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
		ANT 0	ANT 1			
1	2412	-8.72	-8.23	-5.46	8	PASS
6	2437	-8.66	-8.30	-5.47	8	PASS
11	2462	-8.40	-7.74	-5.05	8	PASS
Note: Directional gain = -3.5dBi +10log(2) = -0.49dBi＜6dBi, so the power density limit is 8 dBm/3kHz.						

B.Test Plot:



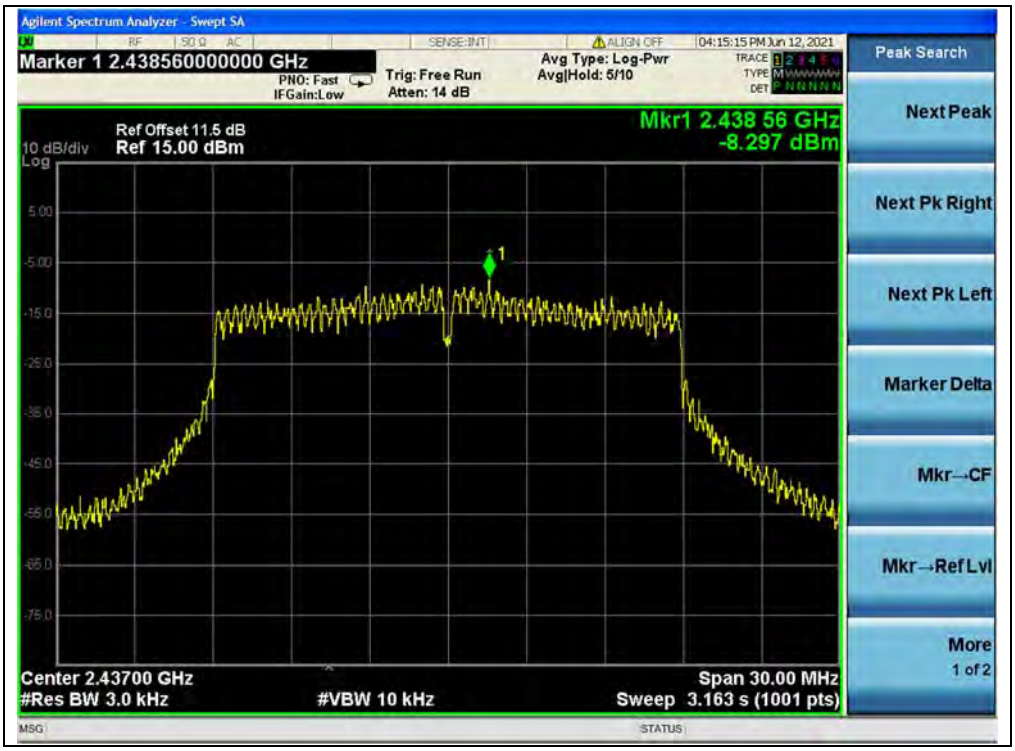
(Channel 1, 802.11n (HT20), ANT 0)



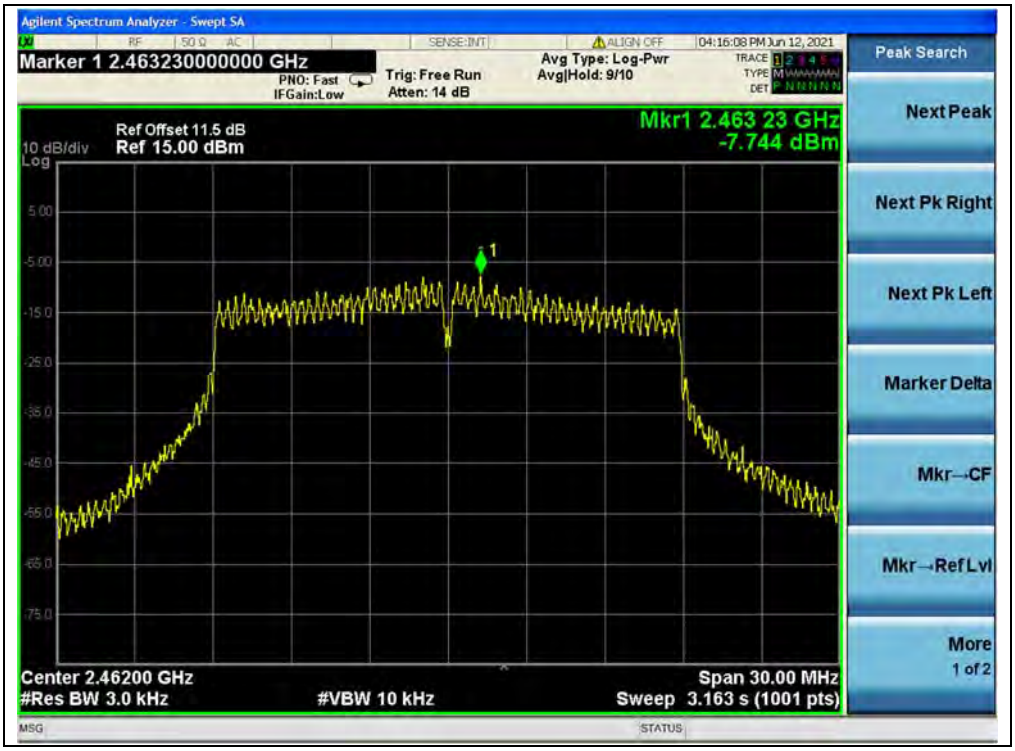
(Channel 6, 802.11n (HT20), ANT 0)

(Channel 11, 802.11n (HT20), ANT 0)

(Channel 1, 802.11n (HT20), ANT 1)



(Channel 6, 802.11n (HT20), ANT 1)



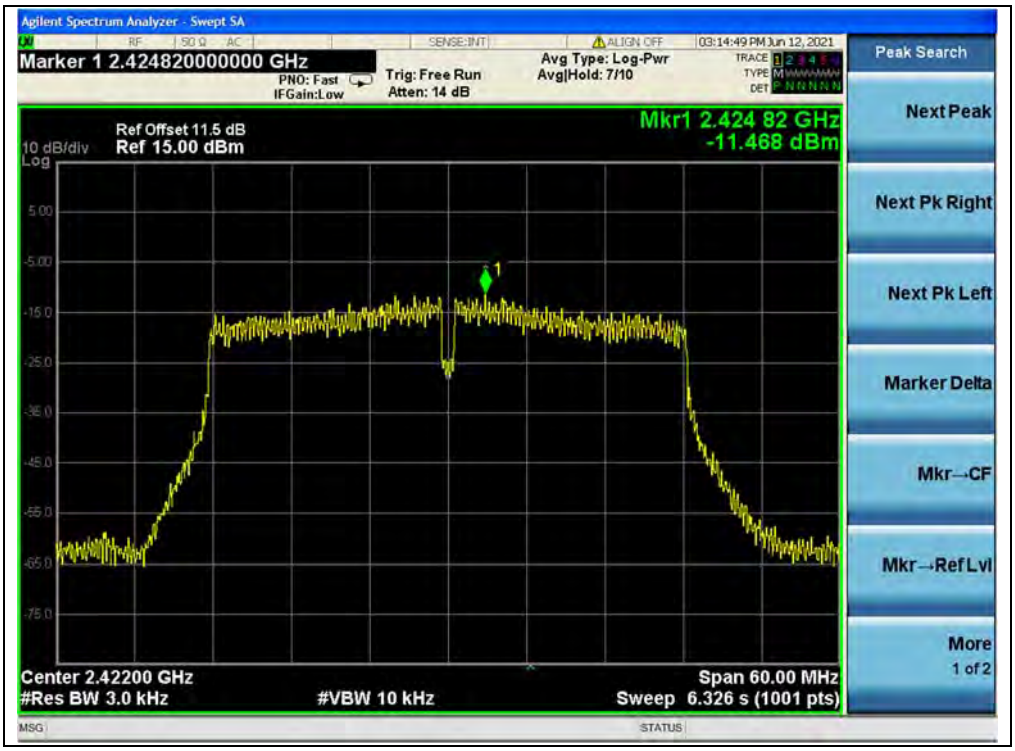
(Channel 11, 802.11n (HT20), ANT 1)

802.11n (HT40) Mode

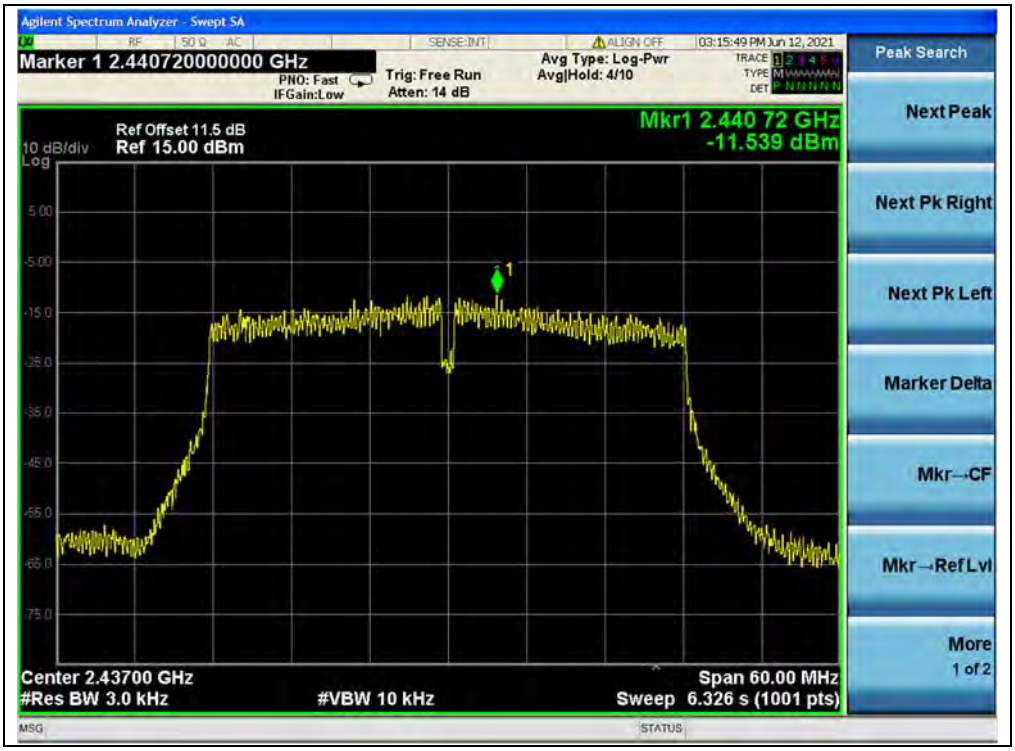
A.Test Verdict:

Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)		Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
		ANT 0	ANT 1			
3	2422	-11.47	-11.59	-8.52	8	PASS
6	2437	-11.54	-11.64	-8.58	8	PASS
9	2452	-12.33	-12.08	-9.19	8	PASS
Note: Directional gain = -3.5dBi +10log(2) = -0.49dBi＜6dBi, so the power density limit is 8 dBm/3kHz.						

B.Test Plot:



(Channel 3, 802.11n (HT40), ANT 0)



(Channel 6, 802.11n (HT40), ANT 0)

(Channel 9, 802.11n (HT40), ANT 0)