REPORT No. : SZ22020053W03

TEST REPORT

APPLICANT	:	Reliance Communications LLC
PRODUCT NAME	:	Orbic AirSurf WIFI
MODEL NAME	:	RC141TLWF
BRAND NAME	:	Orbic
FCC ID	:	2ABGH-RC141TLWF
STANDARD(S)	:	47 CFR Part 15 Subpart C
RECEIPT DATE	:	2022-02-09
TEST DATE	:	2022-02-18 to 2022-03-22
ISSUE DATE	:	2022-04-21

Edited by: Peng Mi (Rapporteur)

Approved by: Shen Junsheng (Supervisor)

MORLAB

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DIRECTORY

Change History		
Version	Date	Reason for change
1.0	2022-04-21	First edition

1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Reliance Communications LLC
Applicant Address:	91 Colin Drive, Unit 1, HOLBROOK, New York 11741, United States
Manufacturer:	Reliance Communications LLC
Manufacturer Address:	91 Colin Drive, Unit 1, HOLBROOK, New York 11741, United States

1.2. Equipment Under Test (EUT) Description

Product Name:	Orbic AirSurf WIFI	
Sample No.:	5#	
Hardware Version:	EM_TG819_C_200B_V1.0	
Software Version:	ORB141TLWF_v1.0.1_GEN_WHM	
Modulation Technology:	DSSS, OFDM	
Modulation Type:	Refer to section1.3	
Operating Frequency Range:	802.11b/g/n (HT20): 2412MHz–2472MHz 802.11ax(HEW20): 2412MHz–2472MHz	
Antenna Type:	PIFA Antenna	
Antenna Gain:	ANT 0: -0.14dBi; ANT 1:0.49dBi	
Directional Gain:	3.49dBi Note 3	
Accessory Information:	Battery	
	Brand Name:	N/A
	Model No.:	558663-3S1P
	Serial No.:	N/A
	Capacity:	4830mAh
	Rated Voltage:	11.40V
	Charge Limit:	13.05V
	Manufacturer:	Ganzhou NovelBattery Technology Co., Ltd

Accessory Information:	AC Adapter	
	Brand Name:	N/A
	Model No.:	A330-200325W-M3
	Serial No.:	N/A
	Rated Output:	5.0V⎓3.0A, 9.0V⎓3.0A, 12.0V⎓3.0A, 15.0V⎓3.0A, 20.0V⎓3.25A
	Rated Input:	100-240V~50/60Hz, 1.7A
	Manufacturer:	Dongguan Aohai Technology Co., Ltd.

Note 1: We use the dedicated software to control the EUT continuous transmission.

Note 2: The EUT supports a MIMO function. Physically, the EUT provides two completed transmitters and two receivers for 802.11n and 802.11ax modulation mode. 802.11b and 802.11g only supports diversity and can't transmit simultaneously.

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

Note 3: 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 4: 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 0) in this report.

Note 5: 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(ANT0) in this report.

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	NA
			DQPSK		
			CCK		
802.11g	20	OFDM	**BPSK**	**6**/9/12/18/24/36/48/54Mbps	NA
			QPSK		
			16QAM		
			64QAM		
802.11n	20 (HT20)	OFDM	**BPSK**	**MCS0**~MCS7	NA
			QPSK		
			16QAM		
			64QAM		
802.11ax	20 (HEW20)	OFDMA	**BPSK**	**MSC0**~MCS11	26/52/106/242
			QPSK		
			16QAM		
			64QAM		
			256QAM		
			1024QAM		

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)
802.11 b/g/n(HT20)/ ax(HEW20)	**1**	**2412**	8	2447
	2	2417	9	2452
	3	2422	10	2457
	4	2427	11	2462
	5	2432	12	2467
	6	2437	**13**	**2472**
	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	Feb. 18, 2022	Meng Shurui	PASS	No deviation
3	15.247(b)	Maximum Peak and Average Conducted Output Power	Mar. 10, 2022	Meng Shurui	PASS	No deviation
4	15.247(a)	Bandwidth	Mar. 03, 2022	Meng Shurui	PASS	No deviation
5	15.247(d)	Conducted Spurious Emission and Band Edge	Mar. 03, 2022	Meng Shurui	PASS	No deviation
6	15.247(e)	Power Spectral Density (PSD)	Mar. 03, 2022	Meng Shurui	PASS	No deviation
7	15.207	Conducted Emission	Mar. 08, 2022	Wu Zhaoling	PASS	No deviation
8	15.247(d)	Restricted Frequency Bands	Mar. 10&14&22, 2022	Su Zhan	PASS	No deviation
9	15.209, 15.247(d)	Radiated Emission	Mar. 19, 2022	Lin Jiayong	PASS	No deviation

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

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 11.0dB contains two parts that cable loss 1.0dB 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 I-PEX connector. Please refer to the EUT internal photos.

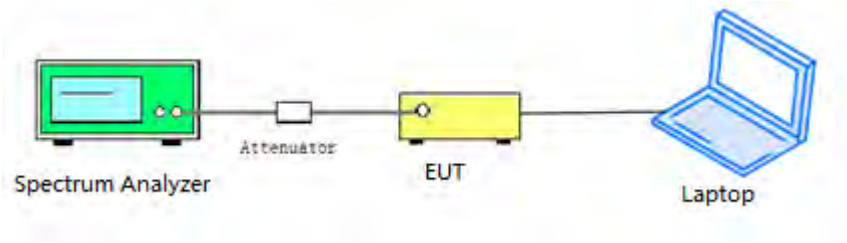
2.2. Duty Cycle of Test Signal

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.

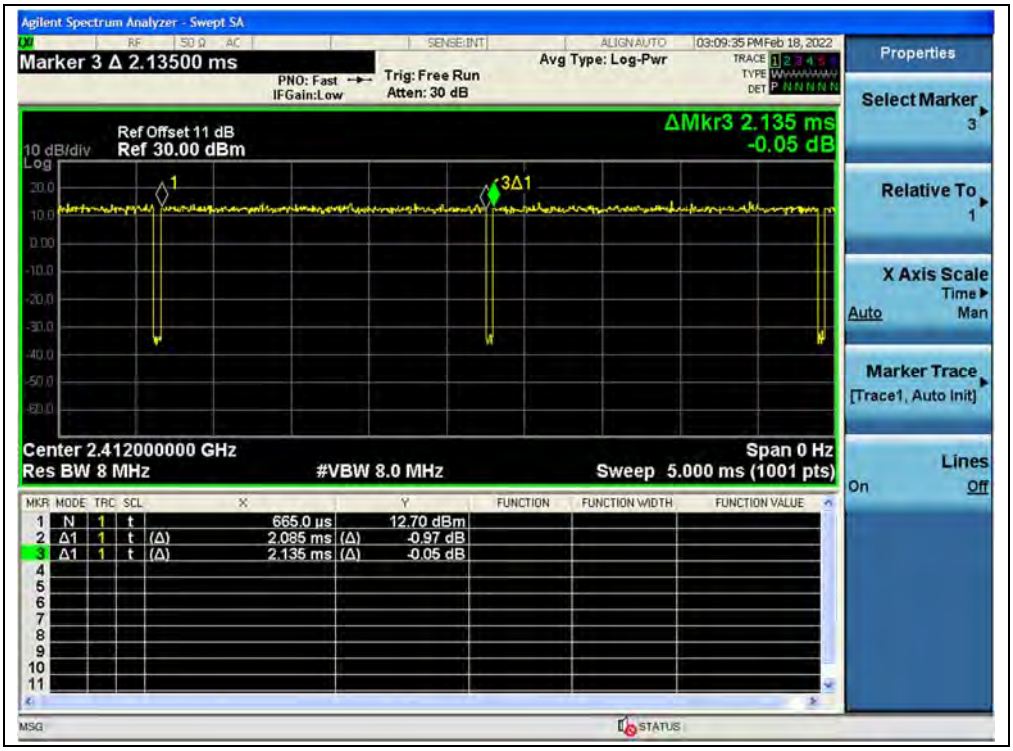
2.2.3.Test Result

A.Test Verdict:

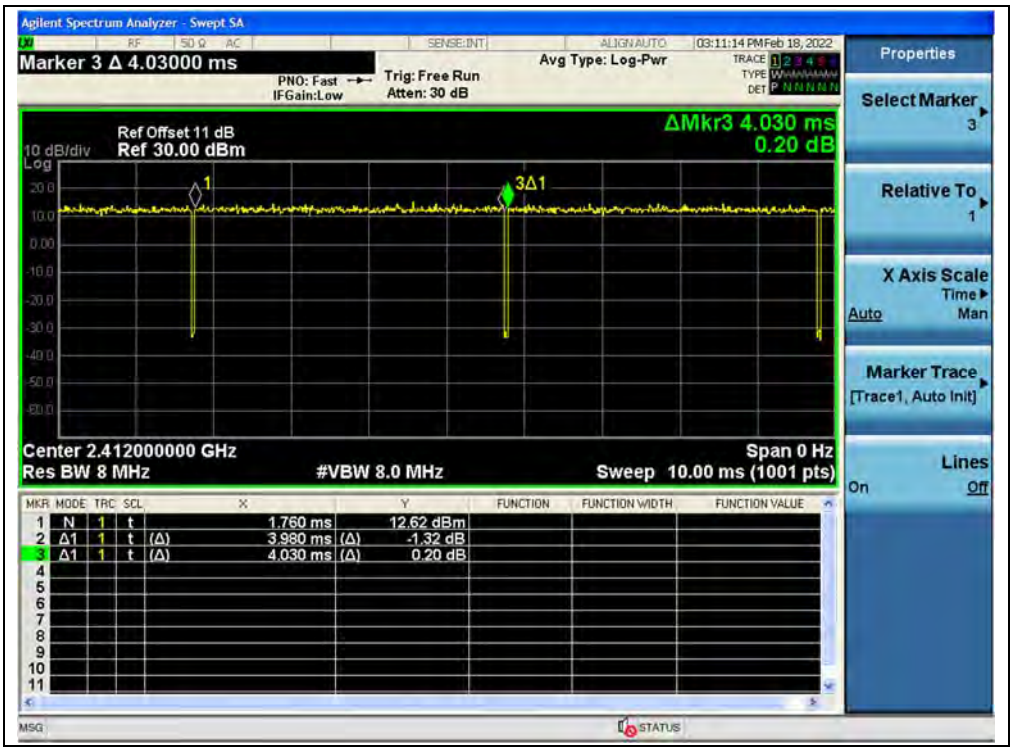
Test Mode	Duty Cycle (%) (D)	Duty Factor (10*lg[1/D])
802.11b	99.46	0.02
802.11g	97.66	0.10
802.11n (HT20)	98.76	0.05
802.11ax (HEW20)	98.75	0.05
802.11ax20 (RU26)	98.48	0.07
802.11ax20 (RU52)	98.48	0.07
802.11ax20 (RU106)	98.48	0.07

B.Test Plot:

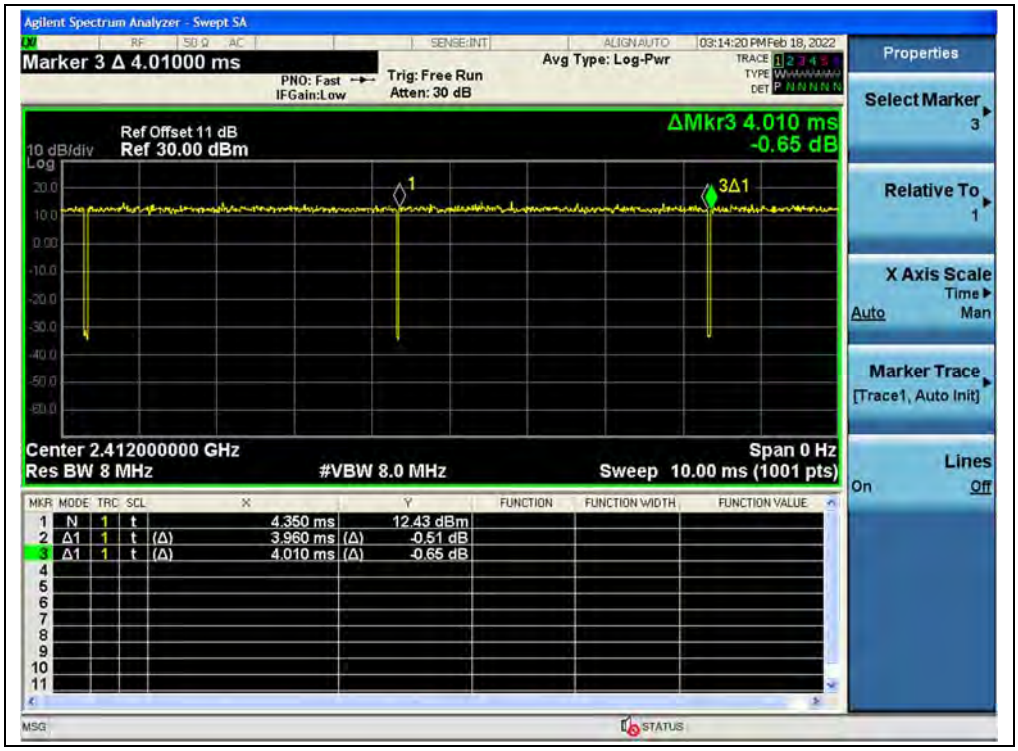
(Channel 1, 802.11b)



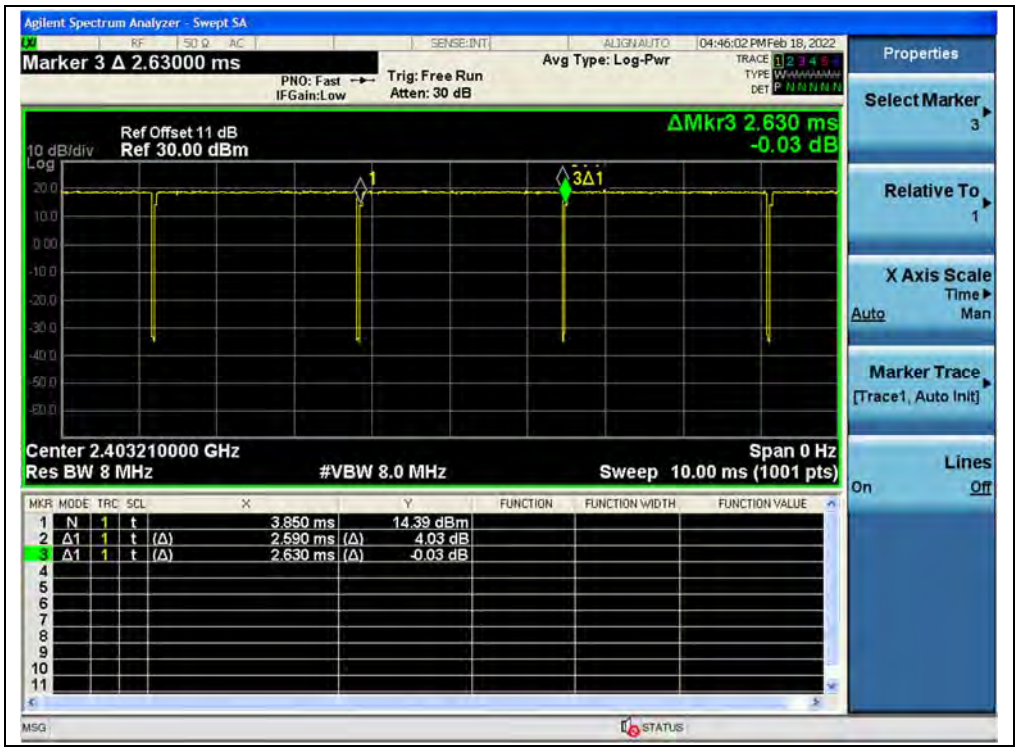
(Channel 1, 802.11g)



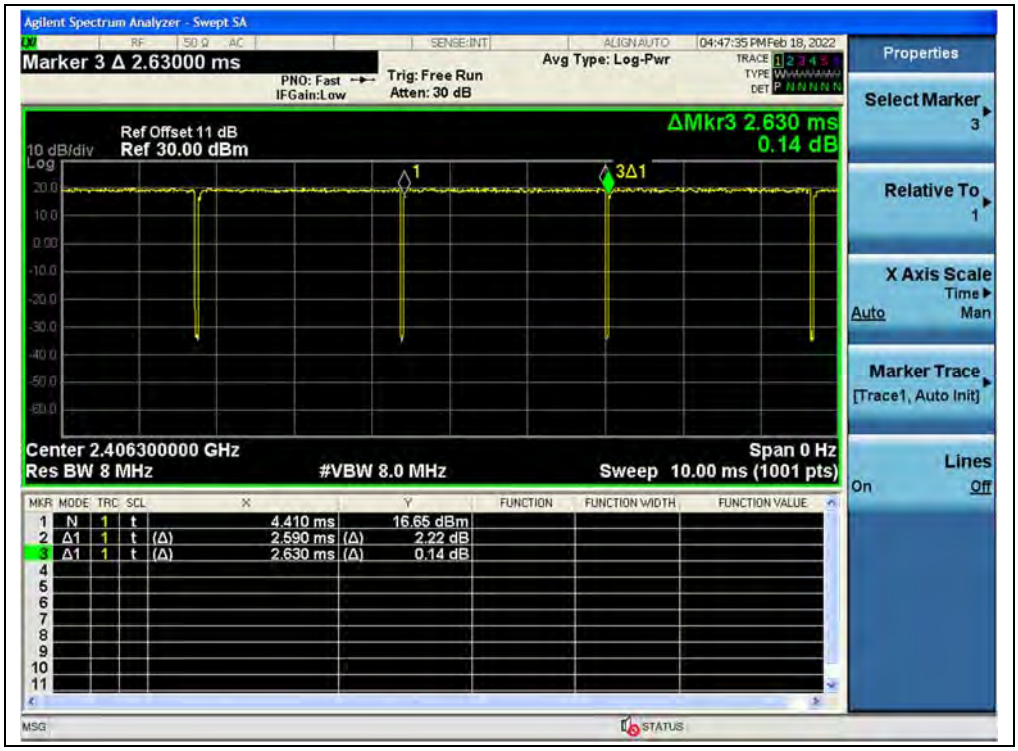
(Channel 1, 802.11n (HT20))



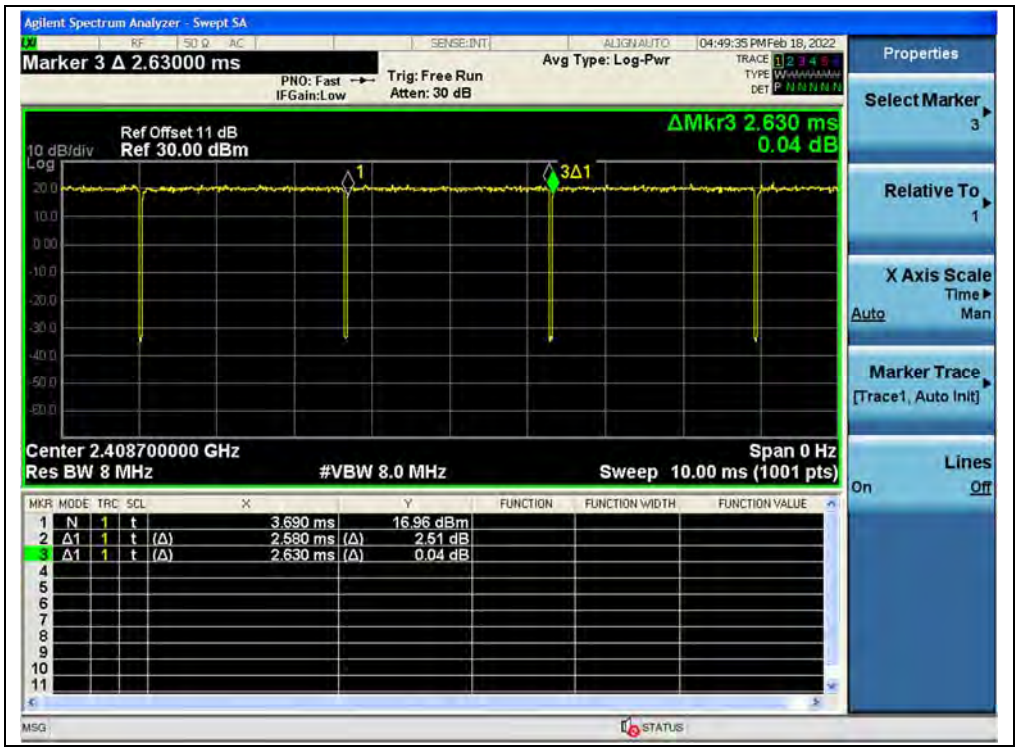
(Channel 1, 802.11ax (HEW20))



(Channel 1, 802.11ax20 (RU26))



(Channel 1, 802.11ax20 (RU52))



(Channel 1, 802.11ax20 (RU106))

2.3. Maximum Peak and Average Conducted Output Power

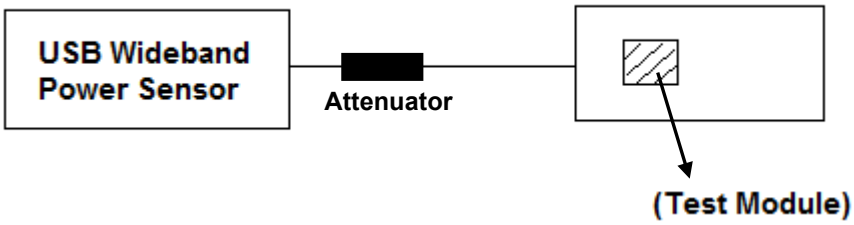
2.3.1.Requirement

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 peak 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	23.85	0.243	23.44	0.221	30	1	PASS
7	2442	**24.04**	**0.254**	**23.96**	**0.249**			PASS
13	2472	21.36	0.137	21.11	0.129			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	21.73	0.149	21.69	0.148	30	1	PASS
7	2442	23.81	0.240	23.40	0.219			PASS
13	2472	22.60	0.182	21.35	0.136			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	21.81	21.97	24.90	0.309	30	1	PASS
7	2442	23.67	23.54	**26.62**	**0.459**			PASS
13	2472	22.65	20.32	24.65	0.292			PASS
Note: Directional gain = 0.48dBi +10log(2) = 3.49dBi＜6dBi, so the power limit is 1W(30dBm).								

802.11ax(HEW20) Test mode

Channel	Frequency (MHz)	Measured Peak Power (dBm)		Total Power (dBm)	Total Power (W)	Limit		Verdict
		ANT 0	ANT 1			dBm	W	
1	2412	21.86	21.63	24.76	0.299	30	1	PASS
7	2442	23.62	23.20	26.42	0.439			PASS
13	2472	21.85	20.46	24.22	0.264			PASS
Note: Directional gain = 0.48dBi +10log(2) = 3.49dBi＜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	22.16	22.32	25.25	0.335	30	1	PASS
7	2442	20.23	19.64	22.94	0.197			PASS
13	2472	17.68	14.75	19.44	0.088			PASS
Note: Directional gain = 0.48dBi +10log(2) = 3.49dBi＜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	22.44	22.40	25.43	0.349	30	1	PASS
7	2442	20.11	19.60	22.88	0.194			PASS
13	2472	18.11	17.71	20.93	0.124			PASS
Note: Directional gain = 0.48dBi +10log(2) = 3.49dBi＜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	22.32	22.38	25.37	0.344	30	1	PASS
7	2442	22.75	22.32	25.55	0.359			PASS
13	2472	18.02	17.10	20.61	0.115			PASS
Note: Directional gain = 0.48dBi +10log(2) = 3.49dBi＜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						
	ANT0	ANT1		ANT0		ANT1				
	dBm	dBm		dBm	W	dBm	W	dBm	W	
2412	19.55	19.87	0.02	19.57	0.091	19.89	0.097	30	1	PASS
2442	20.66	20.42		20.68	0.117	20.44	0.111			PASS
2472	18.72	18.68		18.74	0.075	18.70	0.074			PASS

802.11g Mode

Frequency (MHz)	Average Power							Limit		Verdict
	Measured		Duty Factor	Duty factor Calculated						
	ANT0	ANT1		ANT0		ANT1				
	dBm	dBm		dBm	W	dBm	W	dBm	W	
2412	16.88	16.86	0.10	16.98	0.050	16.96	0.050	30	1	PASS
2442	20.36	20.41		20.46	0.111	20.51	0.112			PASS
2472	12.56	12.45		12.66	0.018	12.55	0.018			PASS

802.11n (HT20) Mode

Frequency (MHz)	Average Power					Limit		Verdict
	Measured		Duty Factor	Total Power with Duty Factor				
	ANT0	ANT1						
	dBm	dBm		dBm	W	dBm	W	
2412	16.89	16.82	0.05	19.91	0.098	30	1	PASS
2442	20.45	20.36		**23.46**	**0.222**			PASS
2472	12.65	12.41		15.56	0.036			PASS
Note: Directional gain = 0.48dBi +10log(2) = 3.49dBi＜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				
	ANT0	ANT1						
	dBm	dBm		dBm	W	dBm	W	
2412	16.66	16.70	0.07	19.78	0.095	30	1	PASS
2442	20.16	20.14		23.22	0.210			PASS
2472	12.56	12.36		15.56	0.036			PASS
Note: Directional gain = 0.48dBi +10log(2) = 3.49dBi＜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				
	ANT0	ANT1						
	dBm	dBm		dBm	W	dBm	W	
2412	18.30	18.68	0.07	21.58	0.144	30	1	PASS
2442	15.71	15.52		18.69	0.074			PASS
2472	6.16	6.18		9.03	0.008			PASS
Note: Directional gain = 0.48dBi +10log(2) = 3.49dBi＜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				
	ANT0	ANT1						
	dBm	dBm		dBm	W	dBm	W	
2412	18.59	18.81	0.07	21.79	0.151	30	1	PASS
2442	16.08	15.78		19.03	0.080			PASS
2472	6.48	6.28		9.54	0.009			PASS
Note: Directional gain = 0.48dBi +10log(2) = 3.49dBi＜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				
	ANT0	ANT1						
	dBm	dBm		dBm	W	dBm	W	
2412	18.64	18.81	0.07	21.82	0.152	30	1	PASS
2442	18.97	18.78		21.96	0.157			PASS
2472	6.67	6.40		9.54	0.009			PASS
Note: Directional gain = 0.48dBi +10log(2) = 3.49dBi＜6dBi, so the power limit is 1W(30dBm).								

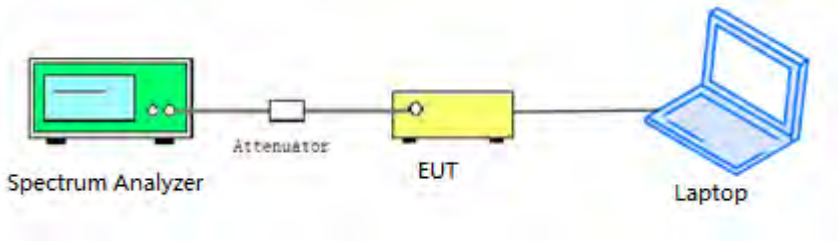
2.4. Bandwidth

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	9.032	≥500	PASS
7	2442	9.010	≥500	PASS
13	2472	8.578	≥500	PASS

B.Test Plot:

(Channel 1, 802.11b)

(Channel 7, 802.11b)

(Channel 13, 802.11b)

802.11g Mode

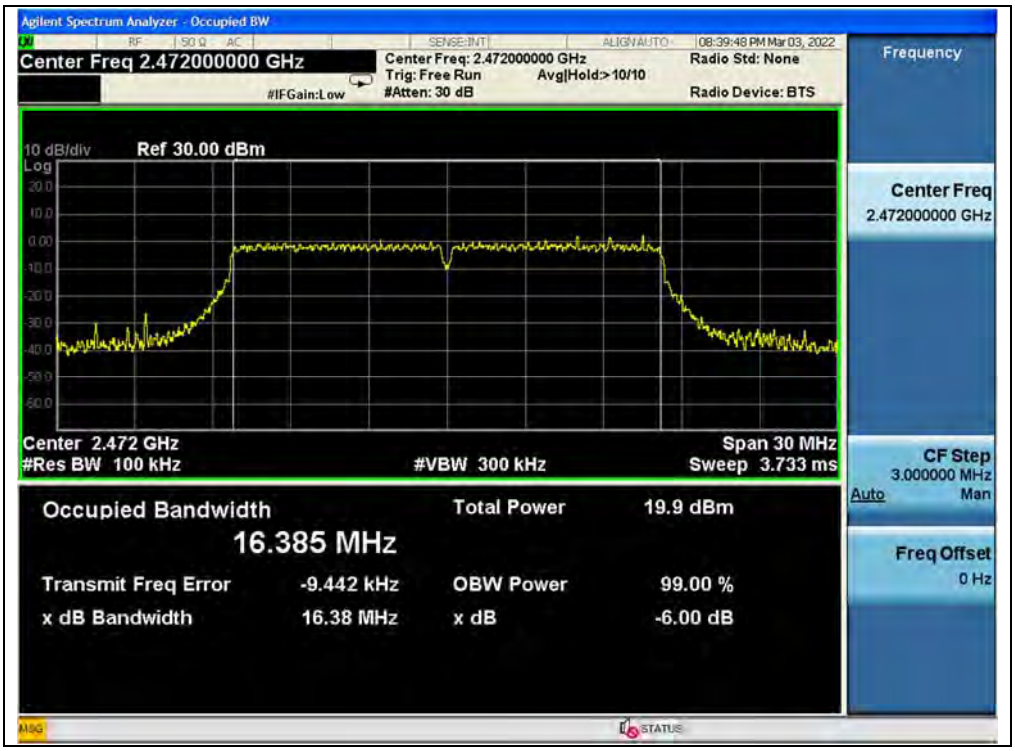
A.Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits(kHz)	Result
1	2412	15.09	≥500	PASS
7	2442	15.11	≥500	PASS
13	2472	16.38	≥500	PASS

B.Test Plot:

(Channel 1, 802.11g)

(Channel 7, 802.11g)



(Channel 13, 802.11g)

802.11n (HT20) Mode

A.Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits(kHz)	Result
1	2412	15.11	≥500	PASS
7	2442	15.87	≥500	PASS
13	2472	17.62	≥500	PASS

B.Test Plot:

(Channel 1, 802.11n (HT20))

(Channel 7, 802.11n (HT20))

(Channel 13, 802.11n (HT20))

802.11ax (HEW20) Mode

A.Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits(kHz)	Result
1	2412	16.79	≥500	PASS
7	2442	18.50	≥500	PASS
13	2472	18.65	≥500	PASS

B.Test Plot:

(Channel 1, 802.11ax (HEW20))

(Channel 7, 802.11ax (HEW20))

(Channel 13, 802.11ax (HEW20))

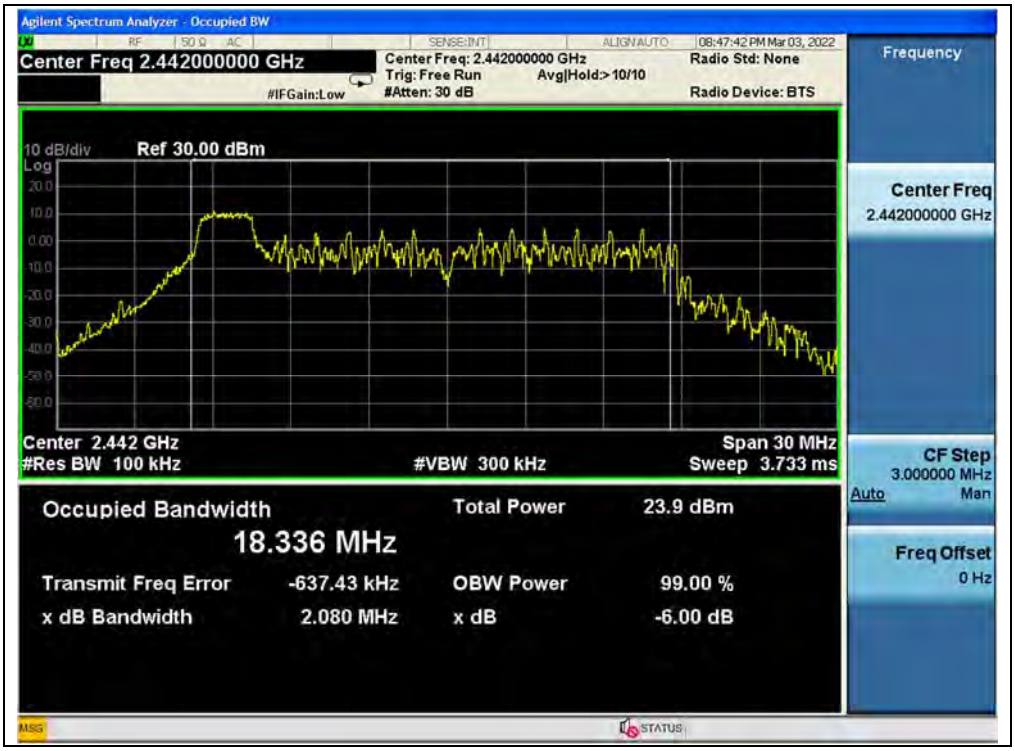
802.11ax (HEW20)(RU26) Mode

A.Test Verdict:

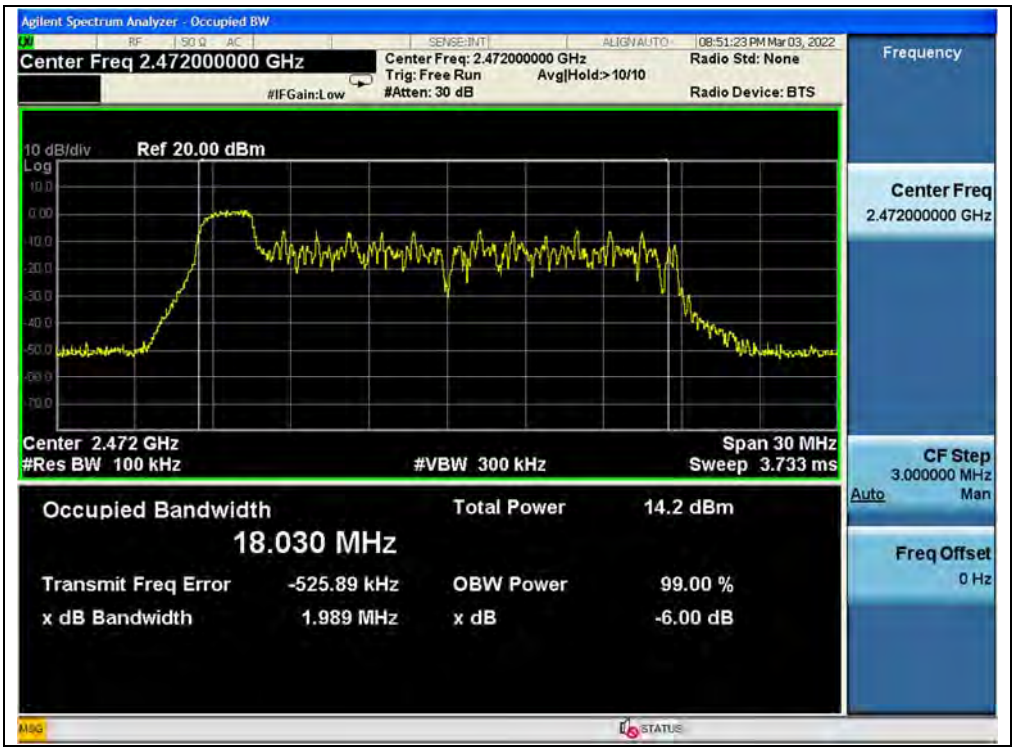
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits(kHz)	Result
1	2412	2.034	≥500	PASS
7	2442	2.080	≥500	PASS
13	2472	1.989	≥500	PASS

B.Test Plot:

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



(Channel 7, 802.11ax (HEW20)(RU26))



(Channel 13, 802.11ax (HEW20)(RU26))

802.11ax (HEW20)(RU52) Mode

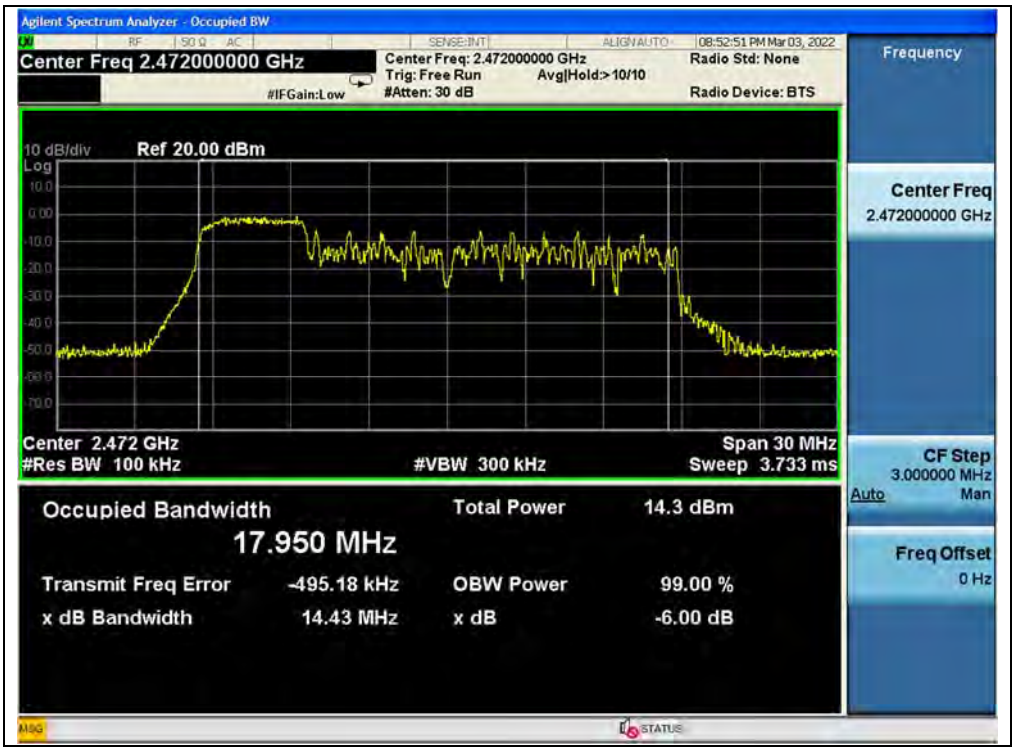
A.Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits(kHz)	Result
1	2412	17.04	≥500	PASS
7	2442	17.03	≥500	PASS
13	2472	14.43	≥500	PASS

B.Test Plot:

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

(Channel 7, 802.11ax (HEW20)(RU52))



(Channel 13, 802.11ax (HEW20)(RU52))

802.11ax (HEW20)(RU106) Mode

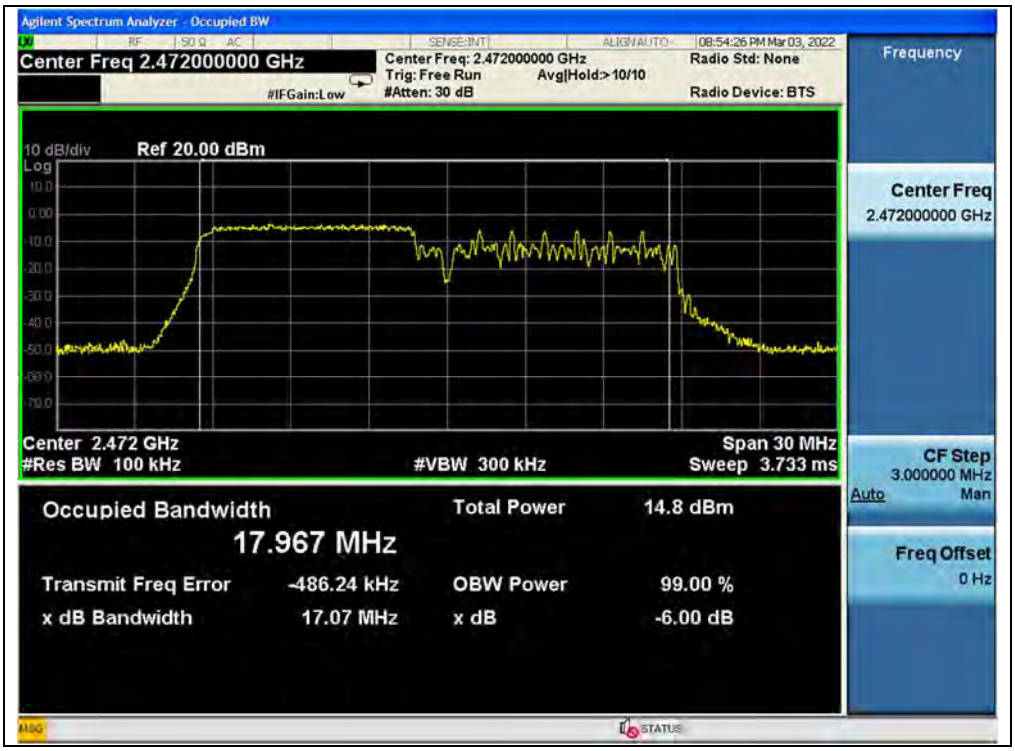
A.Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits(kHz)	Result
1	2412	17.17	≥500	PASS
7	2442	17.13	≥500	PASS
13	2472	17.07	≥500	PASS

B.Test Plot:

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

(Channel 7, 802.11ax (HEW20)(RU106))



(Channel 13, 802.11ax (HEW20)(RU106))

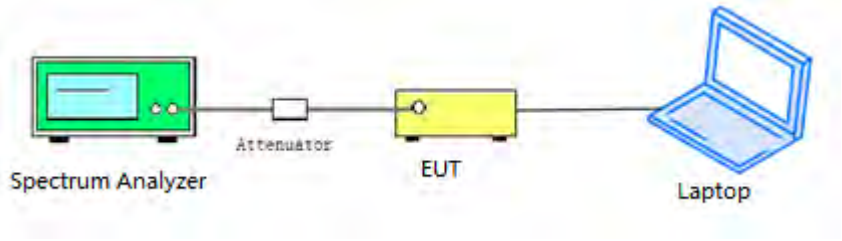
2.5. Conducted Spurious Emissions and Band Edge

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.

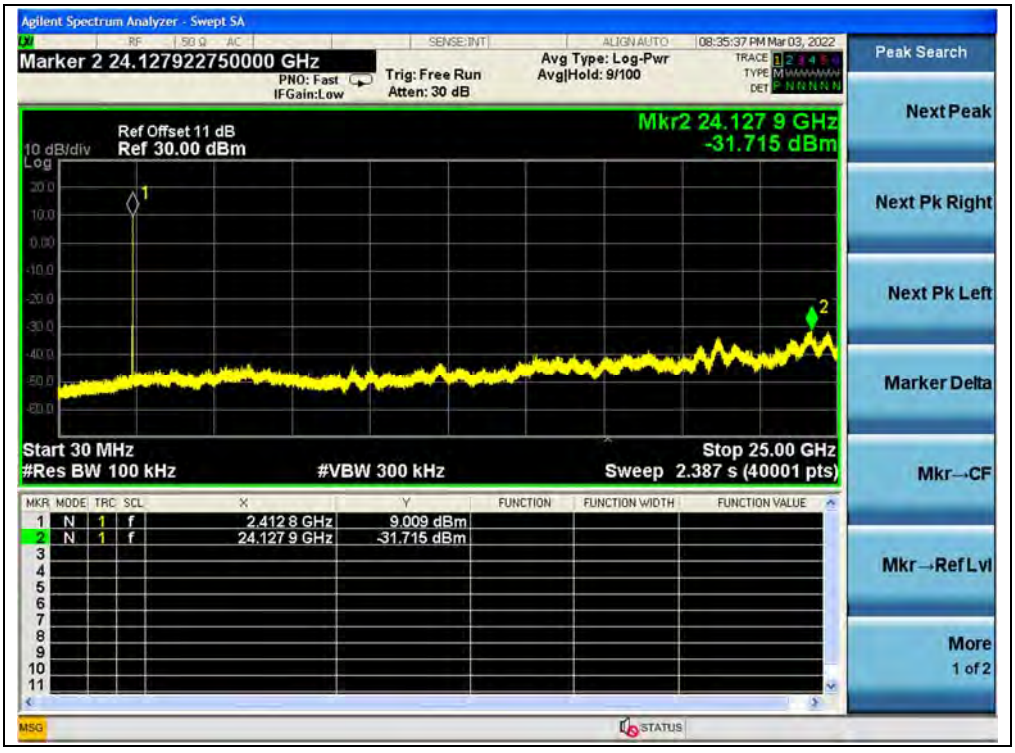
2.5.4.Test Result

802.11b Mode

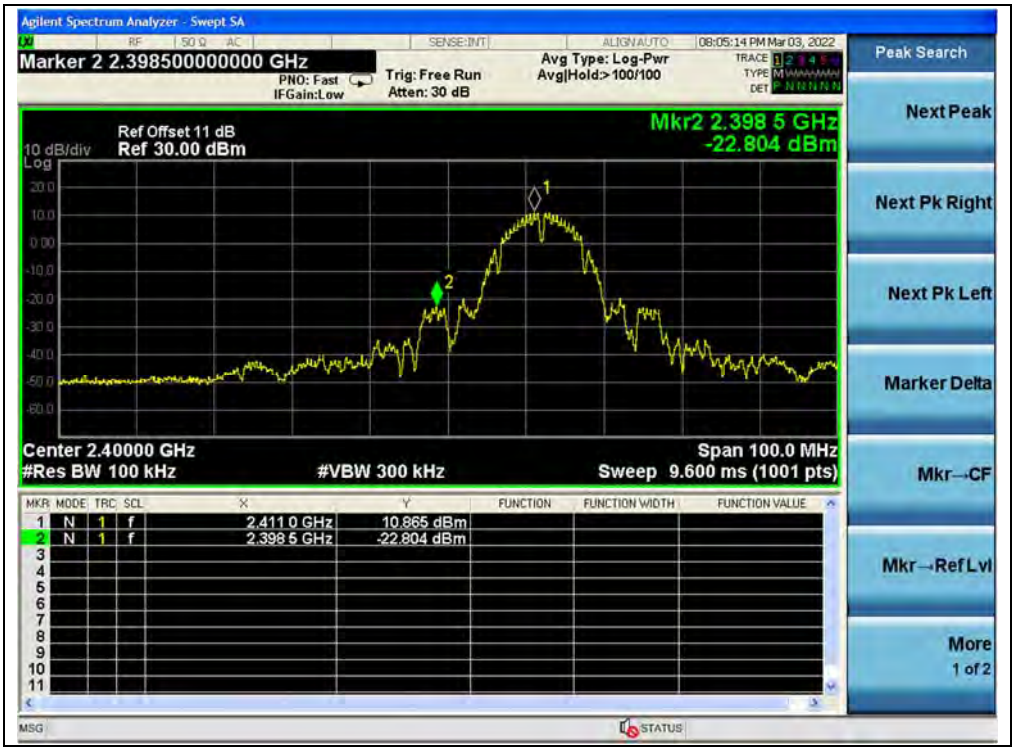
A.Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-31.72	9.01	-10.99	PASS
7	2442	-29.95	10.16	-9.84	PASS
13	2472	-30.87	8.92	-11.08	PASS

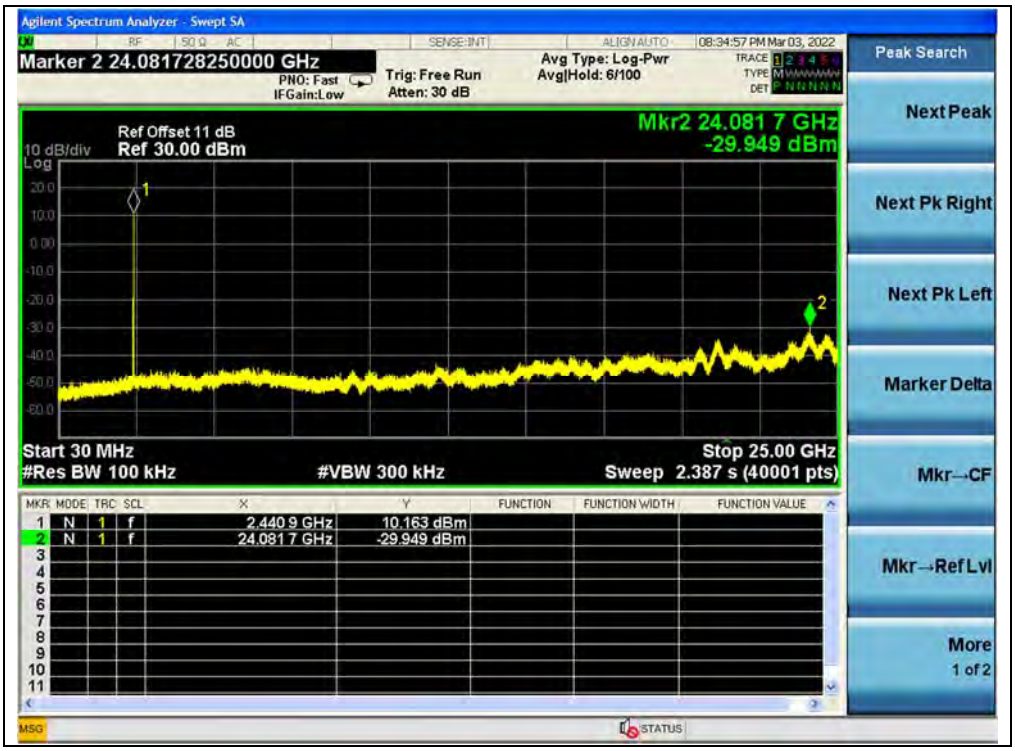
B.Test Plot:



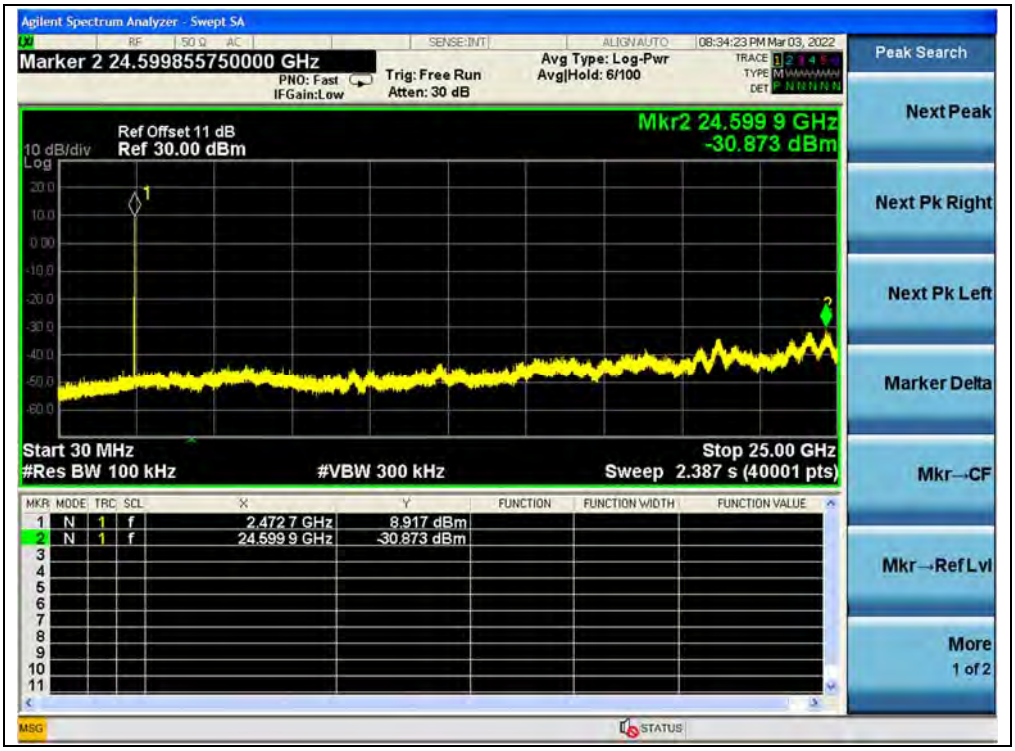
(30MHz to 25GHz, Channel 1, 802.11b)



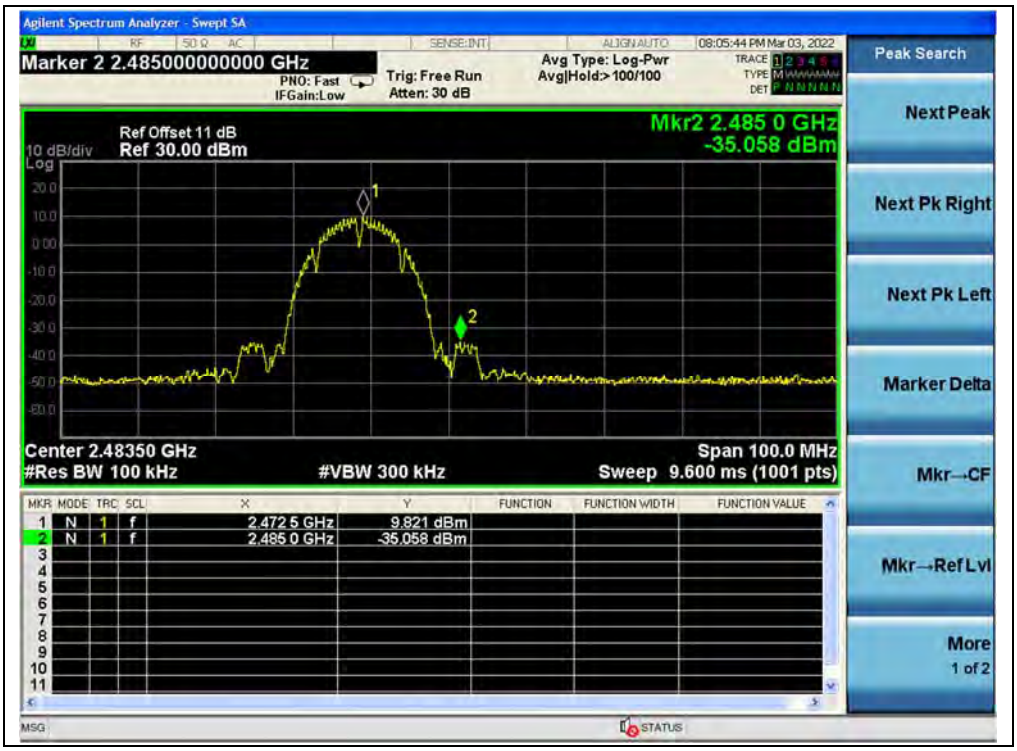
(Band Edge, Channel 1, 802.11b)



(30MHz to 25GHz, Channel 7, 802.11b)



(30MHz to 25GHz, Channel 13, 802.11b)



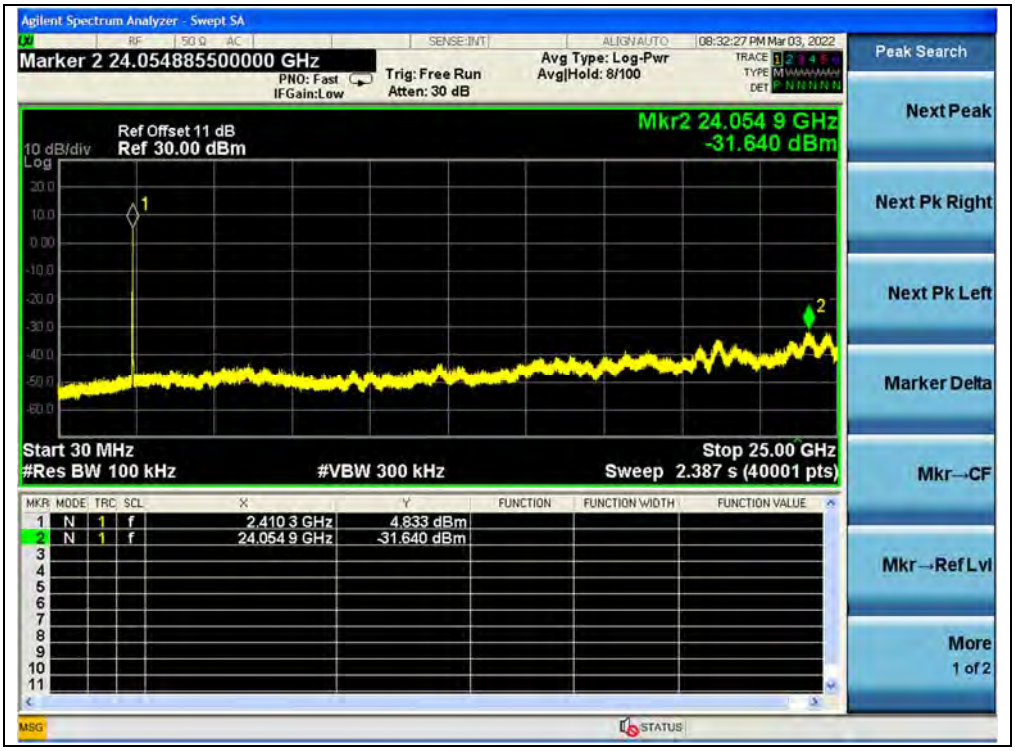
(Band Edge, Channel 13, 802.11b)

802.11g Mode

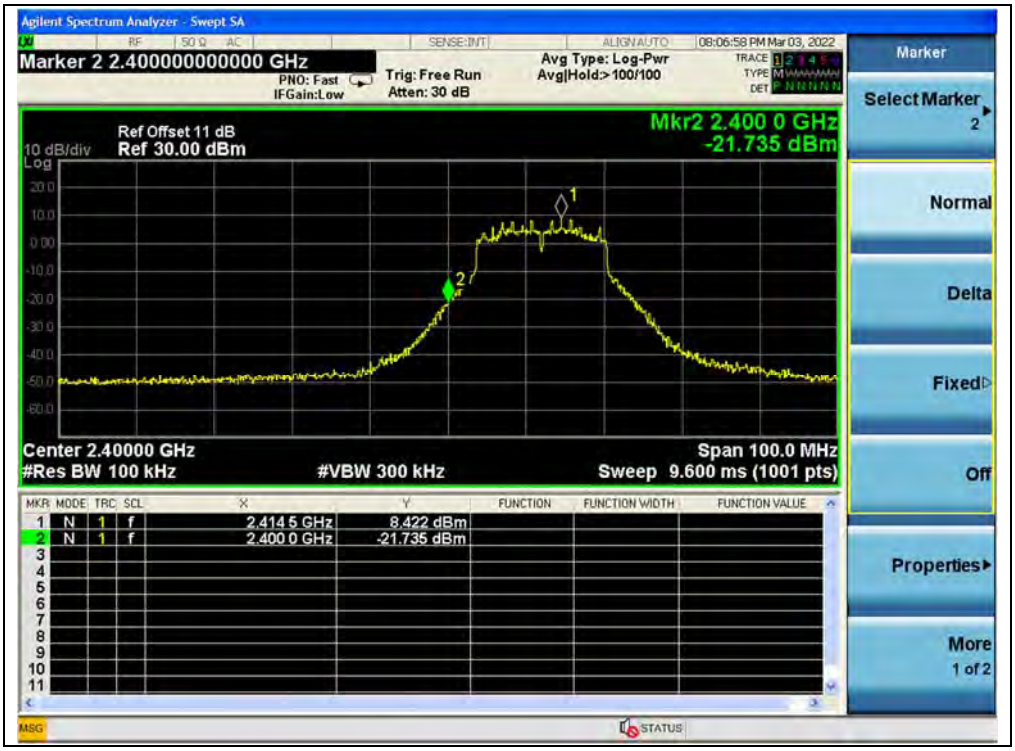
A.Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-31.64	4.83	-15.17	PASS
7	2442	-30.93	5.15	-14.85	PASS
13	2472	-31.48	0.24	-19.76	PASS

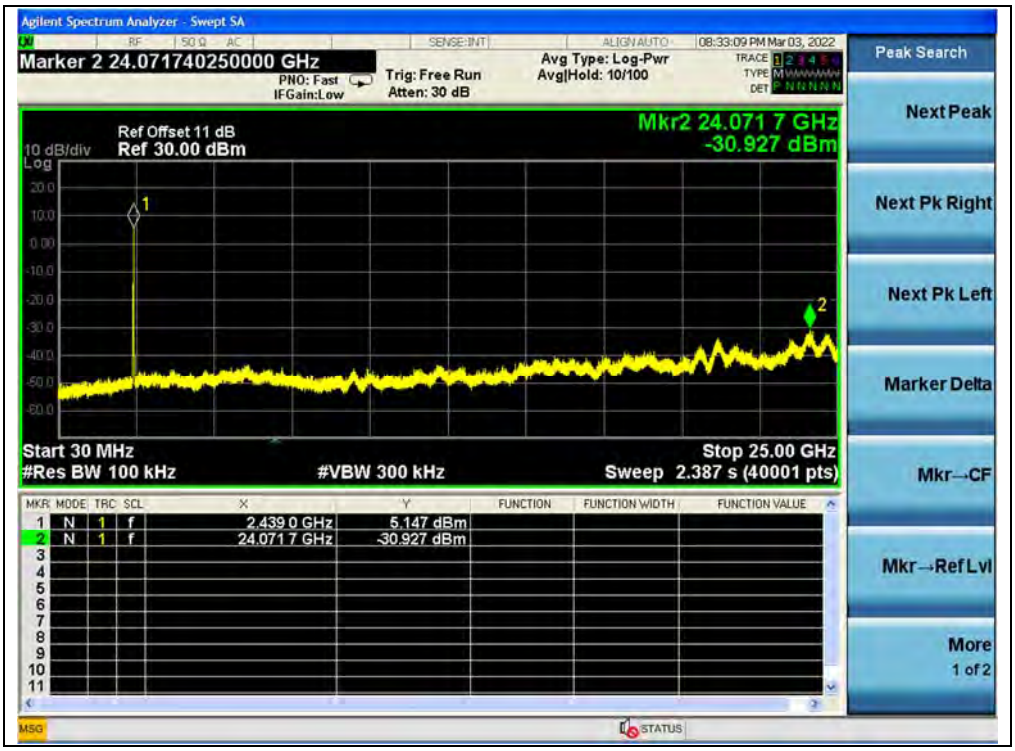
B.Test Plot:



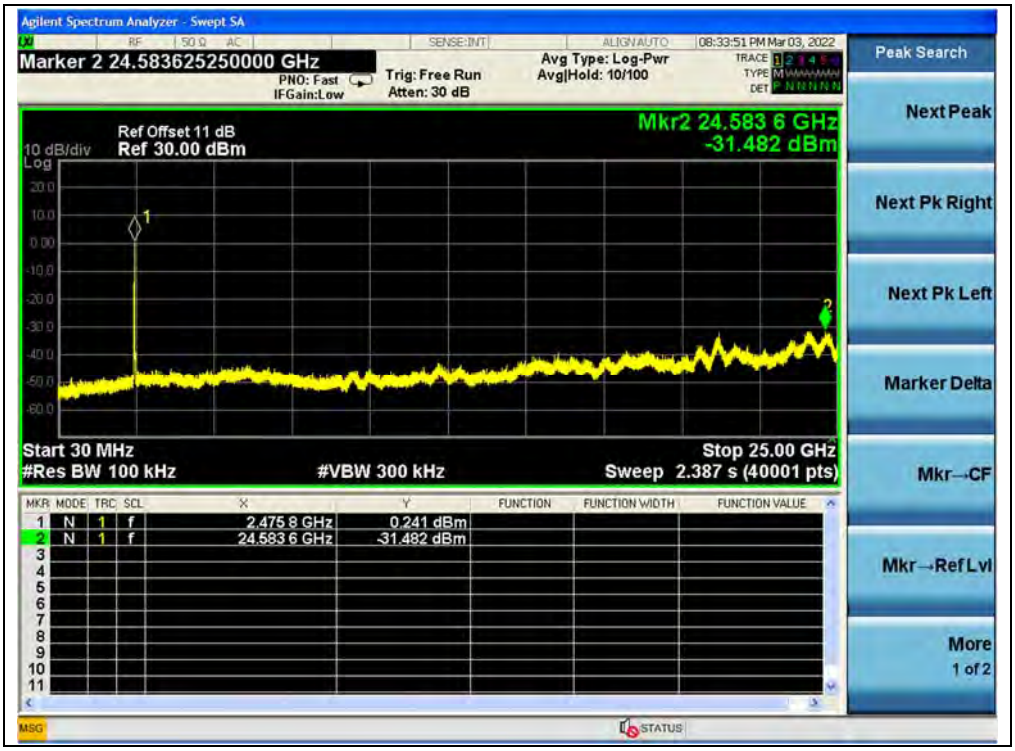
(30MHz to 25GHz, Channel 1, 802.11g)



(Band Edge, Channel 1, 802.11g)



(30MHz to 25GHz, Channel 7, 802.11g)



(30MHz to 25GHz, Channel 13, 802.11g)

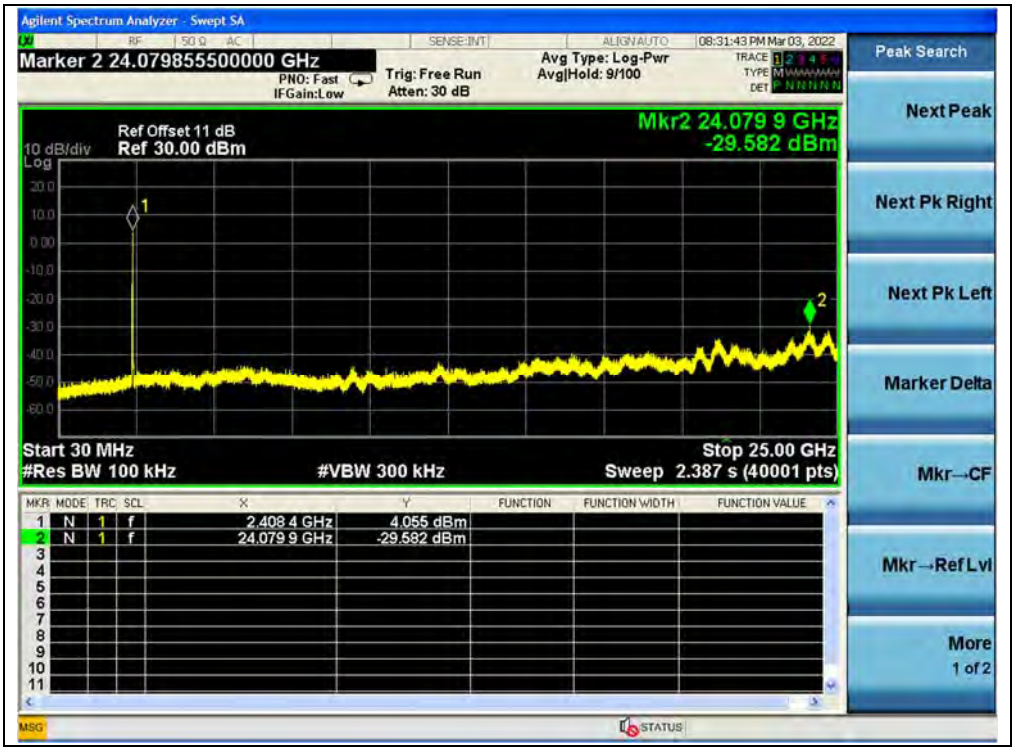
(Band Edge, Channel 13, 802.11g)

802.11n (HT20) Mode

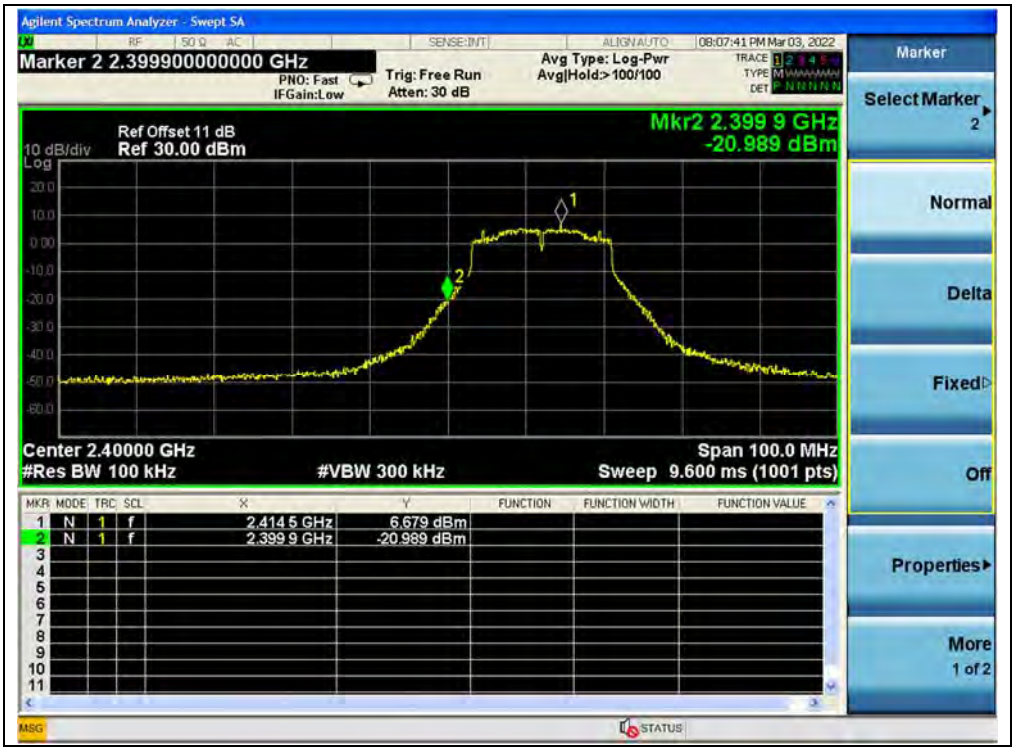
A.Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-29.58	4.06	-15.94	PASS
7	2442	-31.05	5.52	-14.48	PASS
13	2472	-31.27	-0.01	-20.01	PASS

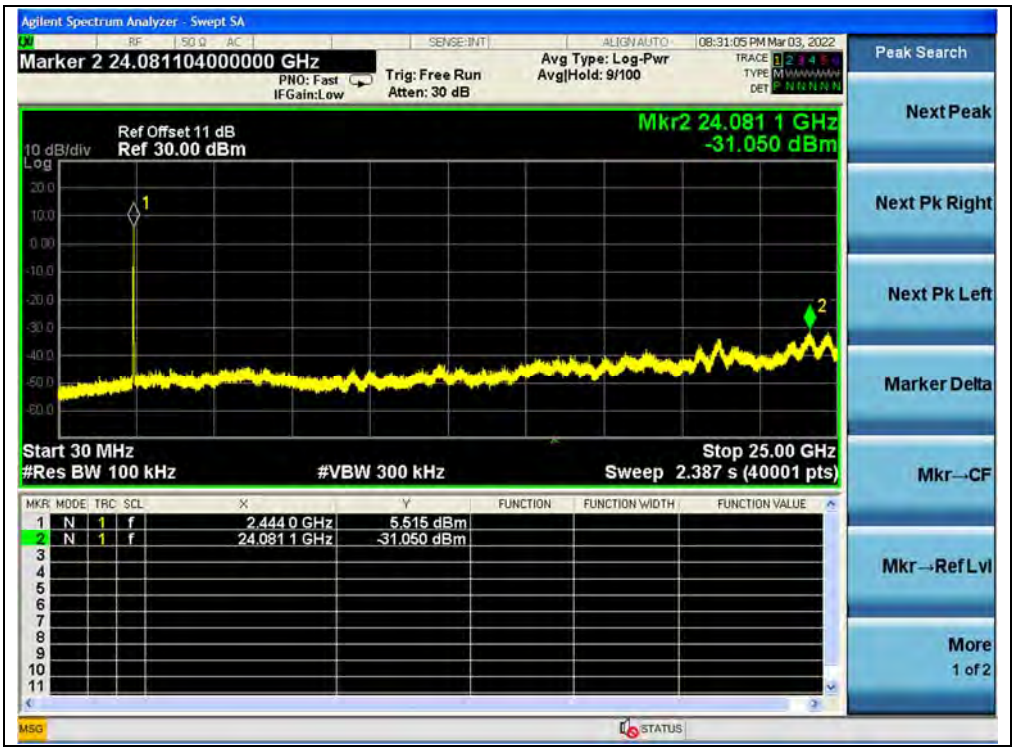
B.Test Plot:



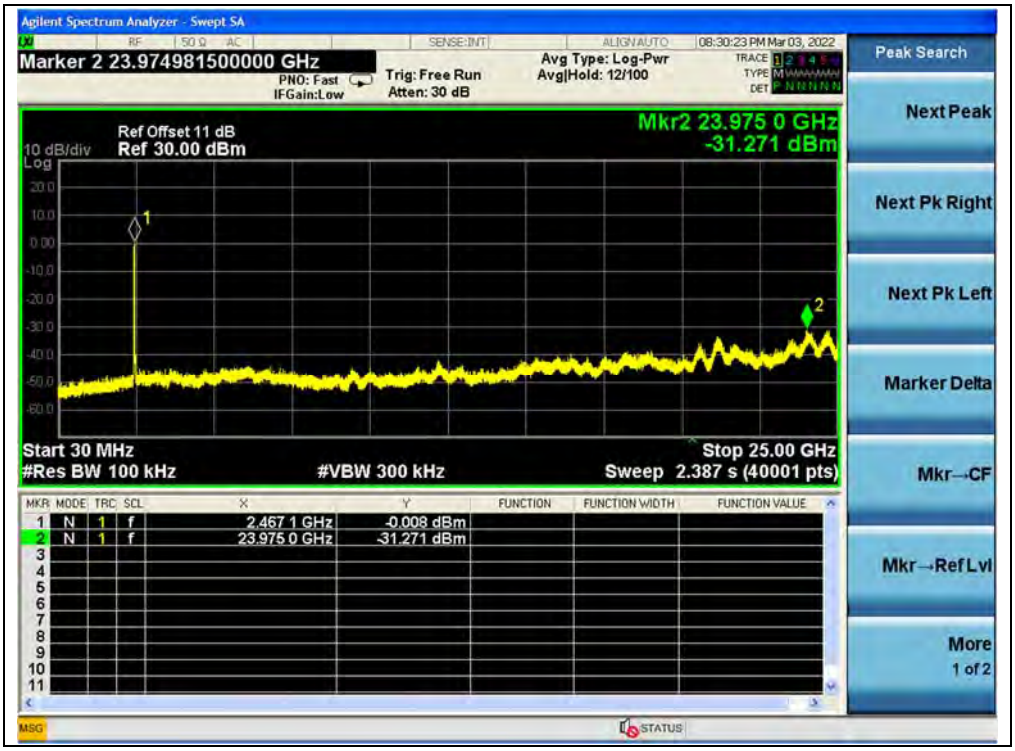
(30MHz to 25GHz, Channel 1, 802.11n (HT20))



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



(30MHz to 25GHz, Channel 7, 802.11n (HT20))



(30MHz to 25GHz, Channel 13, 802.11n (HT20))

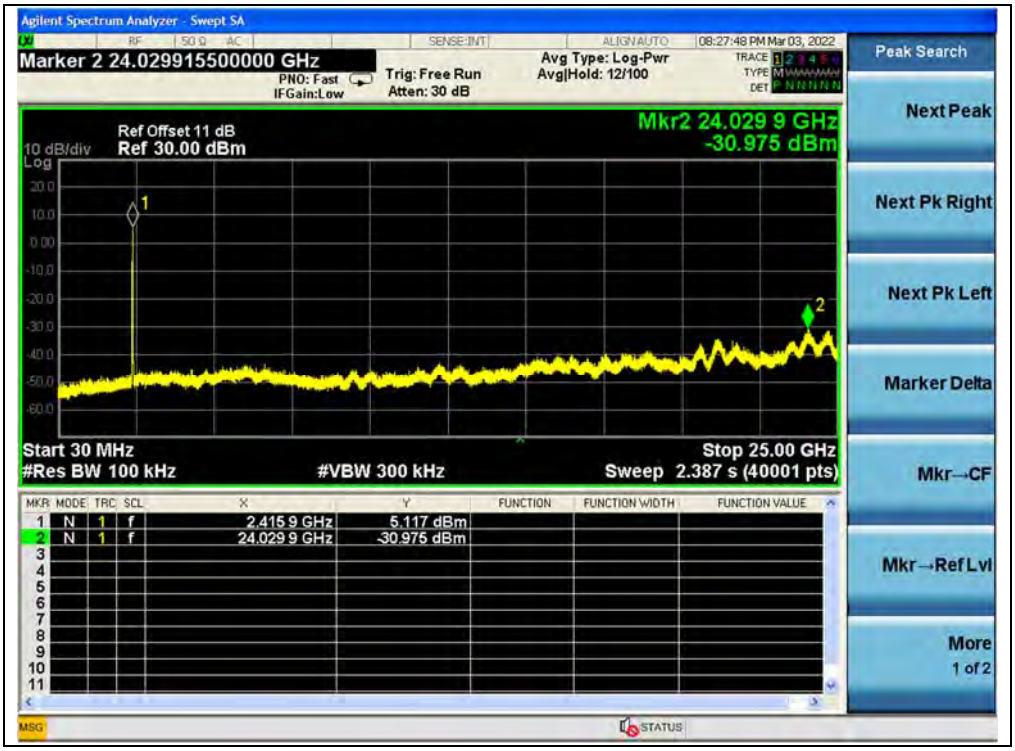
(Band Edge, Channel 13, 802.11n (HT20))

802.11ax (HEW20) Mode

A.Test Verdict:

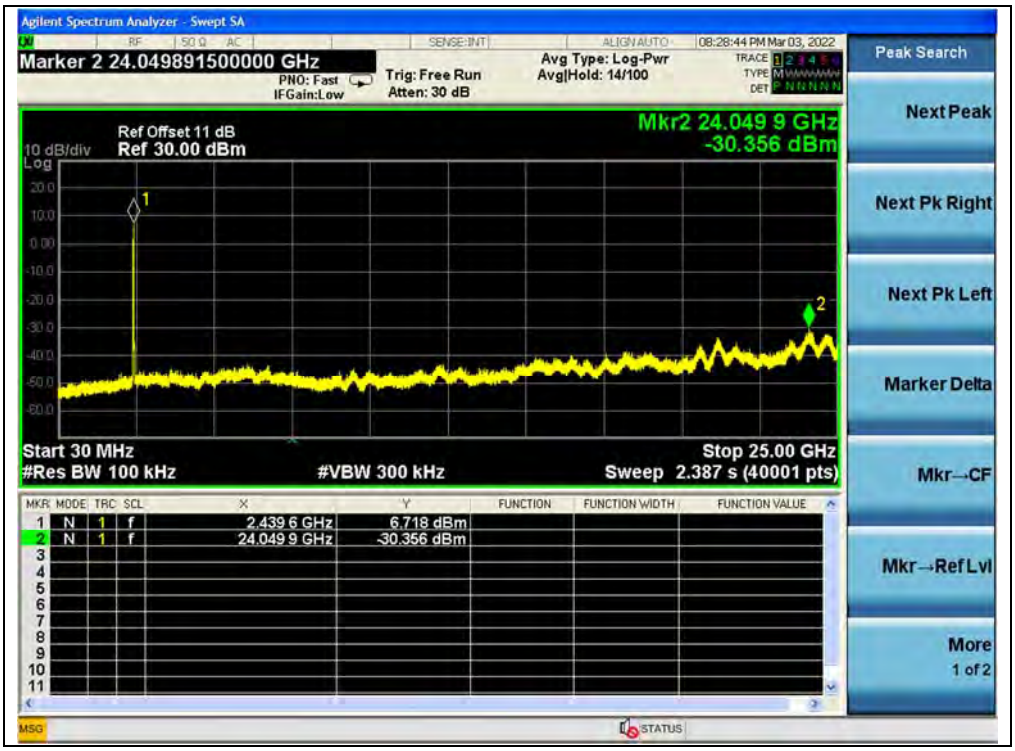
Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-30.98	5.12	-14.88	PASS
7	2442	-30.36	6.72	-13.28	PASS
13	2472	-31.40	0.86	-19.14	PASS

B.Test Plot:

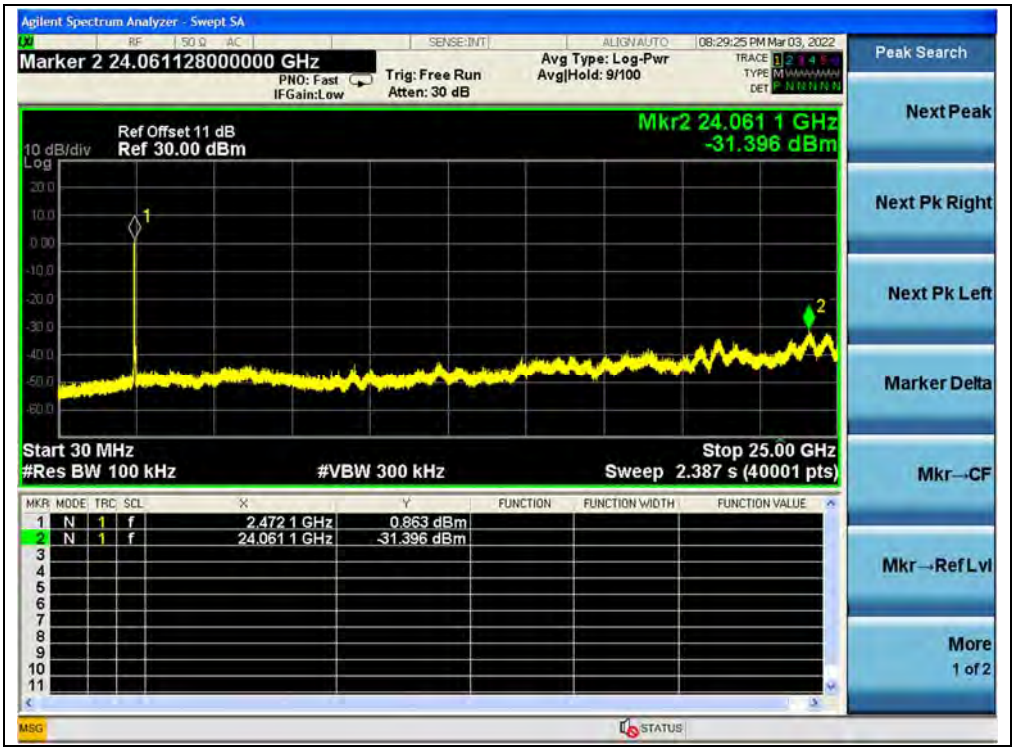


(30MHz to 25GHz, Channel 1, 802.11ax (HEW20))

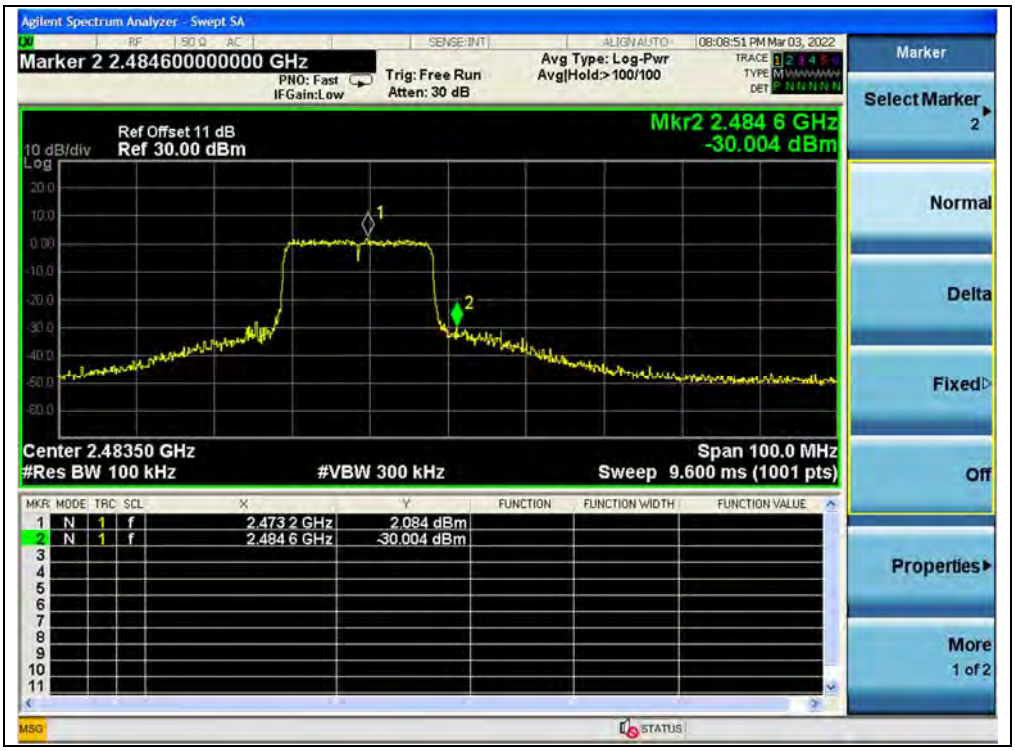
(Band Edge, Channel 1, 802.11ax (HEW20))



(30MHz to 25GHz, Channel 7, 802.11ax (HEW20))



(30MHz to 25GHz, Channel 13, 802.11ax (HEW20))



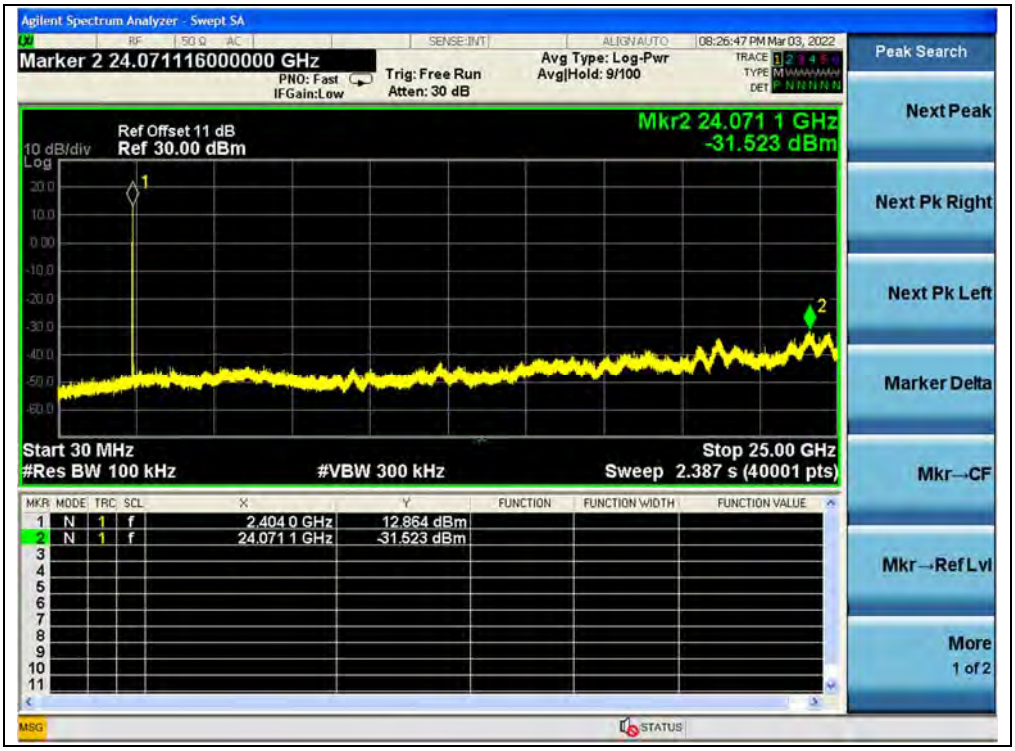
(Band Edge, Channel 13, 802.11ax (HEW20))

802.11ax (HEW20)(RU26) Mode

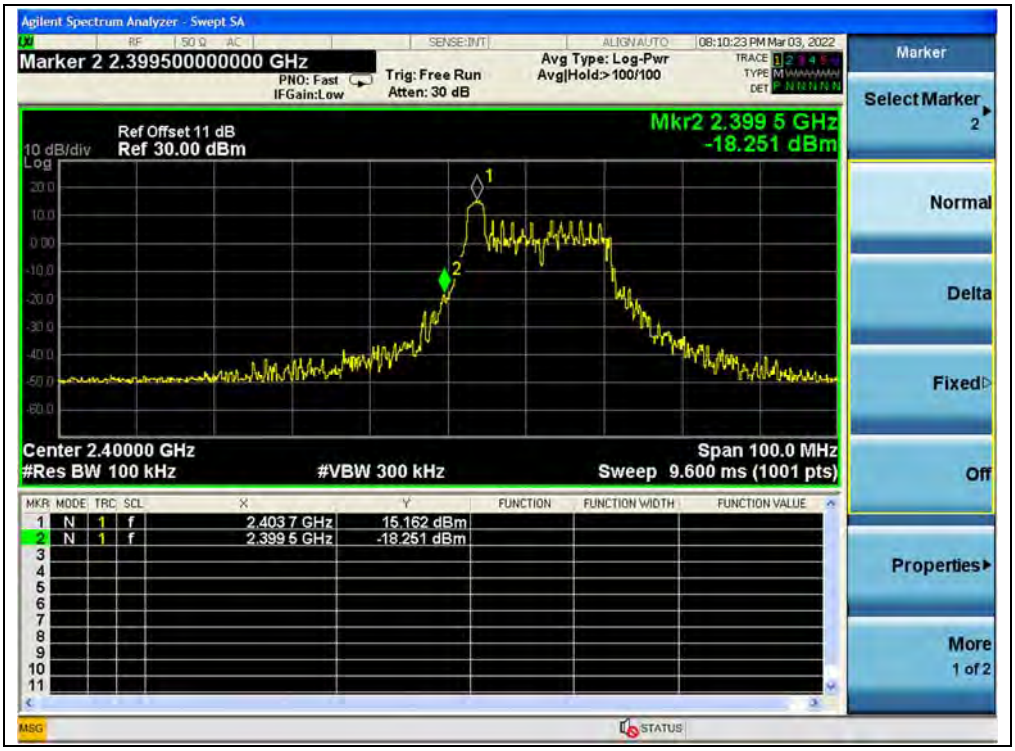
A.Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-31.52	12.86	-7.14	PASS
7	2442	-31.17	11.15	-8.85	PASS
13	2472	-31.22	0.38	-19.62	PASS

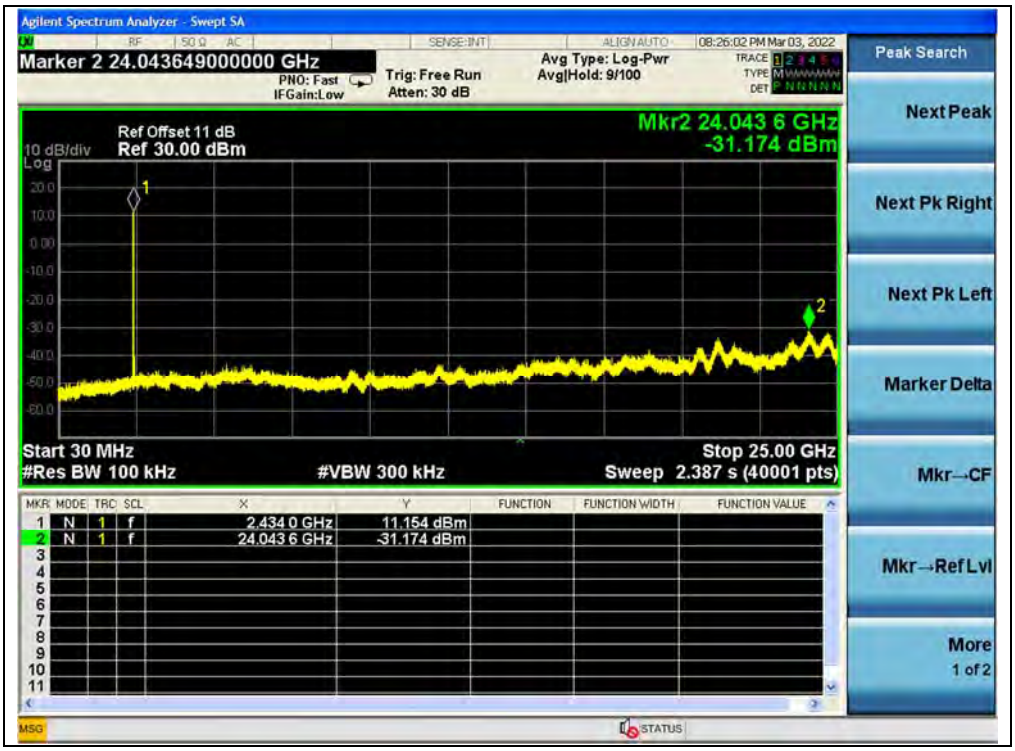
B.Test Plot:



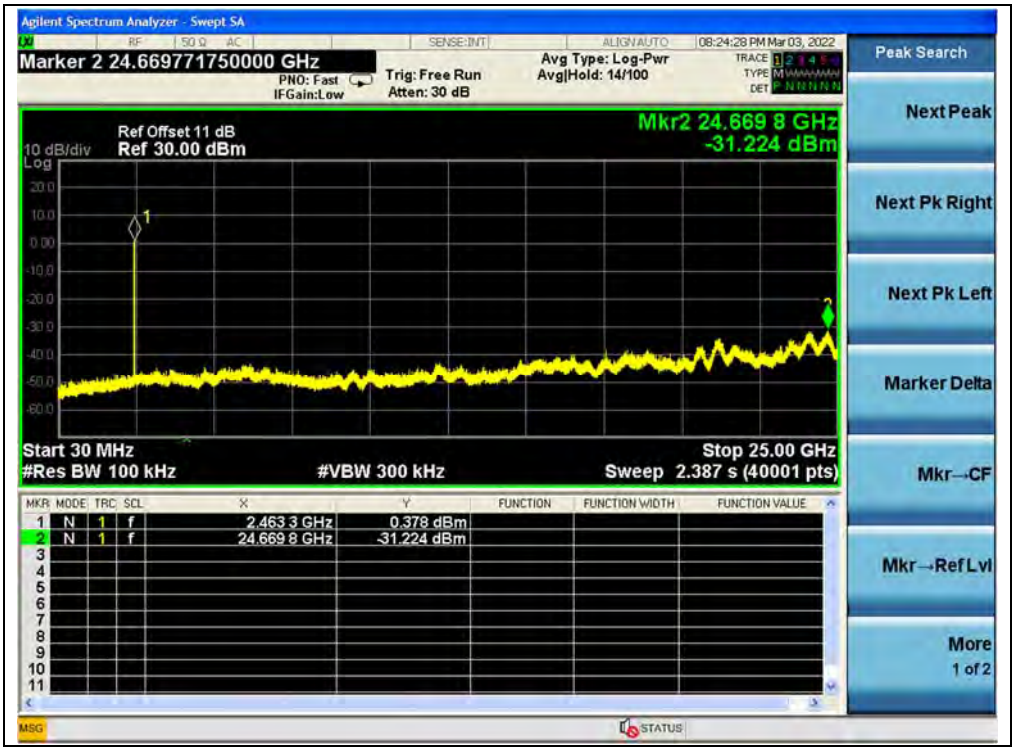
(30MHz to 25GHz, Channel 1, 802.11ax (HEW20)(RU26))



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



(30MHz to 25GHz, Channel 7, 802.11ax (HEW20)(RU26))



(30MHz to 25GHz, Channel 13, 802.11ax (HEW20)(RU26))

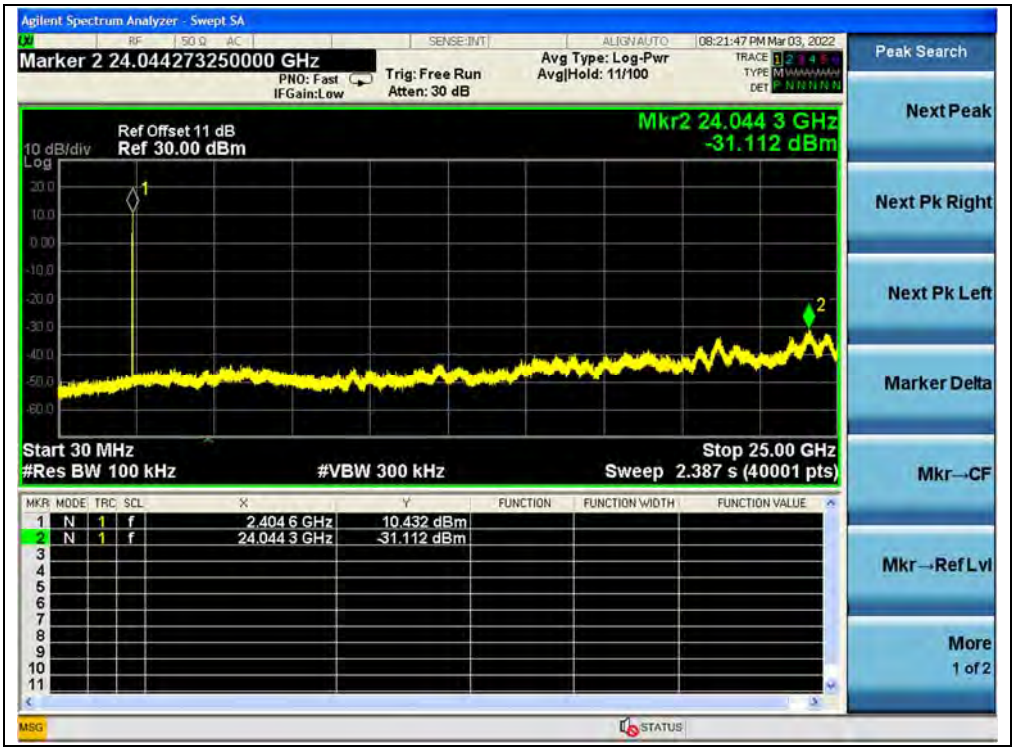
(Band Edge, Channel 13, 802.11ax (HEW20)(RU26))

802.11ax (HEW20)(RU52) Mode

A.Test Verdict:

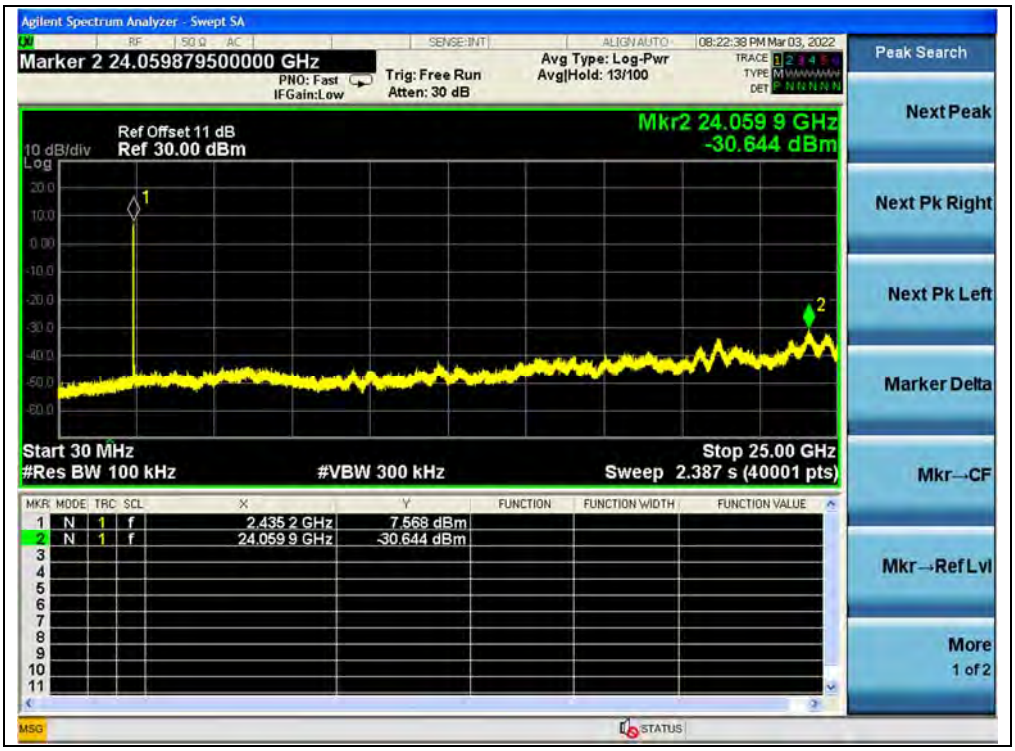
Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-31.11	10.43	-9.57	PASS
7	2442	-30.64	7.57	-12.43	PASS
13	2472	-31.14	-1.85	-21.85	PASS

B.Test Plot:

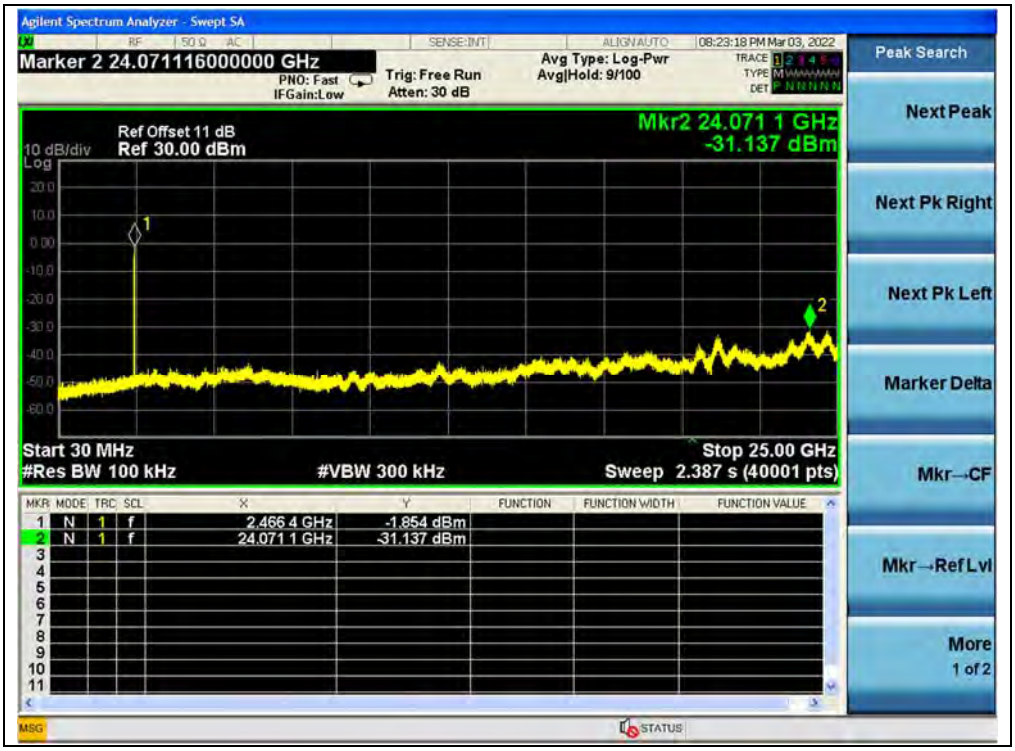


(30MHz to 25GHz, Channel 1, 802.11ax (HEW20)(RU52))

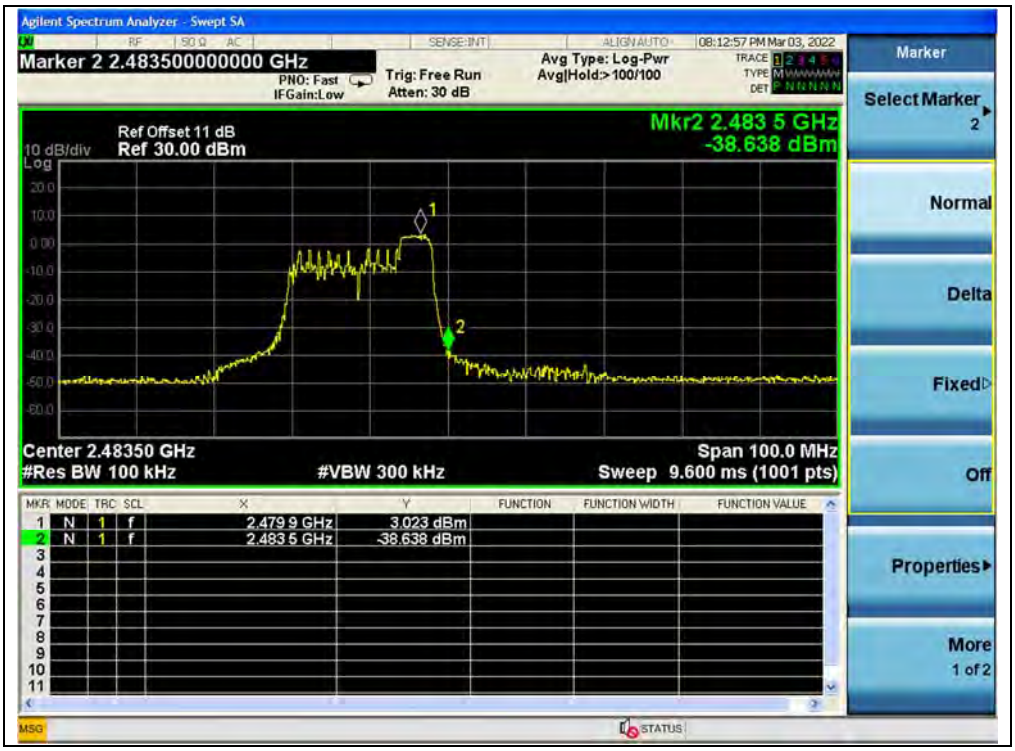
(Band Edge, Channel 1, 802.11ax (HEW20)(RU52))



(30MHz to 25GHz, Channel 7, 802.11ax (HEW20)(RU52))



(30MHz to 25GHz, Channel 13, 802.11ax (HEW20)(RU52))



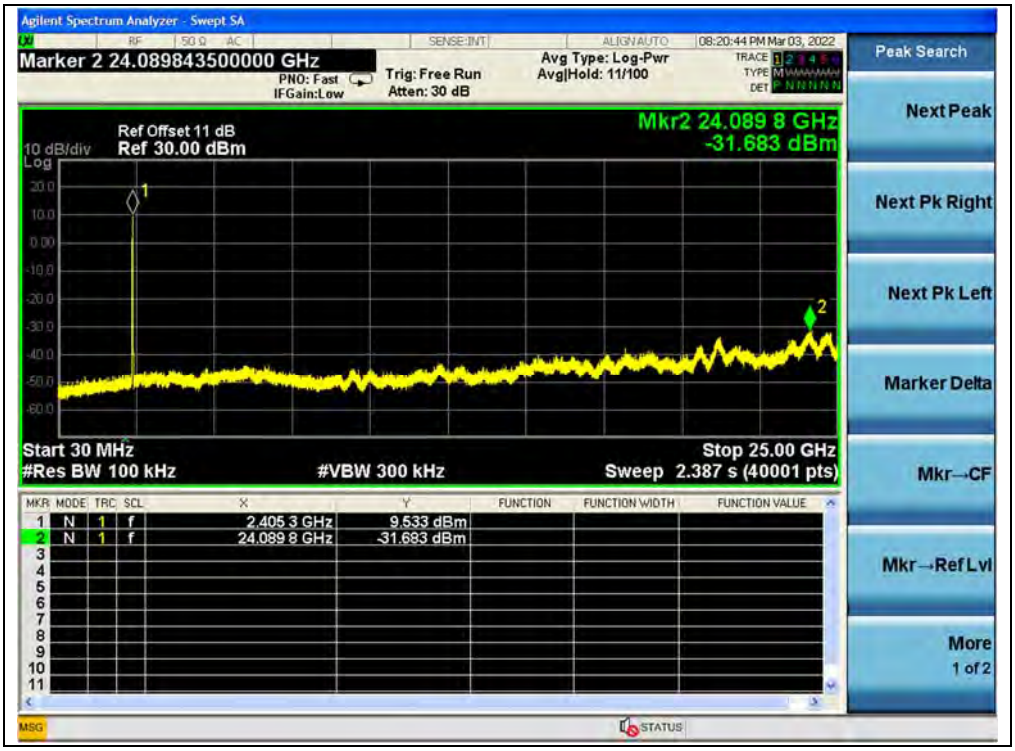
(Band Edge, Channel 13, 802.11ax (HEW20)(RU52))

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	-31.68	9.53	-10.47	PASS
7	2442	-31.73	9.49	-10.51	PASS
13	2472	-31.84	-2.67	-22.67	PASS

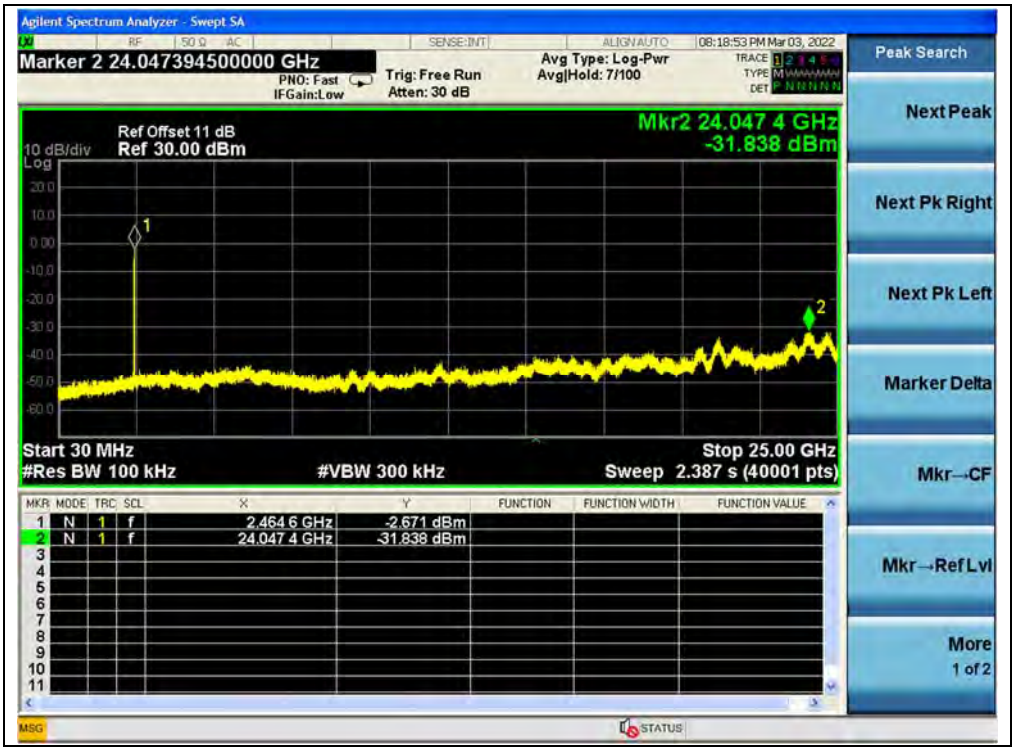
B.Test Plot:



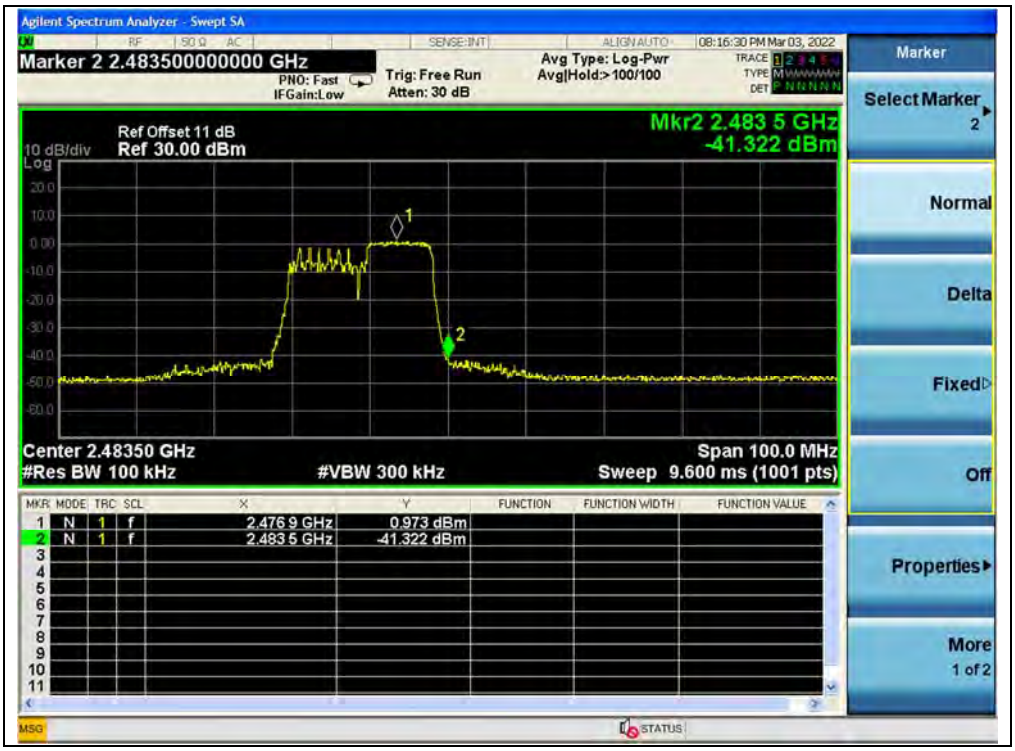
(30MHz to 25GHz, Channel 1, 802.11ax (HEW20)(RU106))

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

(30MHz to 25GHz, Channel 7, 802.11ax (HEW20)(RU106))



(30MHz to 25GHz, Channel 13, 802.11ax (HEW20)(RU106))



(Band Edge, Channel 13, 802.11ax (HEW20)(RU106))

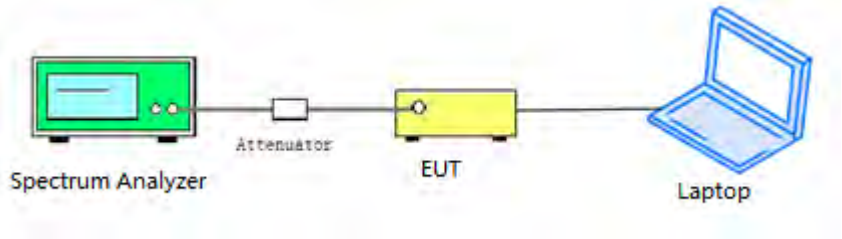
2.6. Power Spectral Density (PSD)

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	-1.64	-1.08	8	PASS
7	2442	-0.81	-1.32	8	PASS
13	2472	-3.32	-4.87	8	PASS

B.Test Plot:

(Channel 1, 802.11b, ANT0)

(Channel 7, 802.11b, ANT0)

(Channel 13, 802.11b, ANT0)

(Channel 1, 802.11b, ANT1)

(Channel 7, 802.11b, ANT1)

(Channel 13, 802.11b, ANT1)

802.11g Mode

A.Test Verdict:

Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)		Limit (dBm/3kHz)	Verdict
		ANT 0	ANT 1		
1	2412	-6.50	-6.42	8	PASS
7	2442	-3.48	-4.13	8	PASS
13	2472	-11.79	-12.74	8	PASS

B.Test Plot:

(Channel 1, 802.11g, ANT0)

(Channel 7, 802.11g, ANT0)

(Channel 13, 802.11g, ANT0)

(Channel 1, 802.11g, ANT1)

(Channel 7, 802.11g, ANT1)

(Channel 13, 802.11g, ANT1)

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	-5.83	-7.54	-3.59	8	PASS
7	2442	-4.06	-4.33	-1.18	8	PASS
13	2472	-13.89	-14.00	-10.93	8	PASS
Note: Directional gain = 0.48dBi +10log(2) = 3.49dBi＜6dBi, so the power limit is 8 dBm/3kHz.						

B.Test Plot:

(Channel 1, 802.11n (HT20), ANT0)

(Channel 7, 802.11n (HT20), ANT0)

(Channel 13, 802.11n (HT20), ANT0)

(Channel 1, 802.11n (HT20), ANT1)

(Channel 7, 802.11n (HT20), ANT1)

(Channel 13, 802.11n (HT20), ANT1)

802.11ax (HEW20) 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	-7.78	-8.22	-4.98	8	PASS
7	2442	-5.98	-4.55	-2.20	8	PASS
13	2472	-13.96	-13.84	-10.89	8	PASS
Note: Directional gain = 0.48dBi +10log(2) = 3.49dBi＜6dBi, so the power limit is 8 dBm/3kHz.						

B.Test Plot:

(Channel 1, 802.11ax (HEW20), ANT0)

(Channel 7, 802.11ax (HEW20), ANT0)

(Channel 13, 802.11ax (HEW20), ANT0)

(Channel 1, 802.11ax (HEW20), ANT1)

(Channel 7, 802.11ax (HEW20), ANT1)

(Channel 13, 802.11ax (HEW20), ANT1)

802.11ax (HEW20)(RU26) 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	0.76	2.78	4.90	8	PASS
7	2442	-1.03	-1.02	1.99	8	PASS
13	2472	-11.50	-2.94	-2.37	8	PASS
Note: Directional gain = 0.48dBi +10log(2) = 3.49dBi＜6dBi, so the power limit is 8 dBm/3kHz.						

B.Test Plot:

(Channel 1, 802.11ax (HEW20)(RU26), ANT0)

(Channel 7, 802.11ax (HEW20)(RU26), ANT0)

(Channel 13, 802.11ax (HEW20)(RU26), ANT0)

(Channel 1, 802.11ax (HEW20)(RU26), ANT1)

(Channel 7, 802.11ax (HEW20)(RU26), ANT1)

(Channel 13, 802.11ax (HEW20)(RU26), ANT1)

802.11ax (HEW20)(RU52) 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	-1.64	-1.70	1.34	8	PASS
7	2442	-1.87	-4.48	0.03	8	PASS
13	2472	-12.42	-14.50	-10.33	8	PASS
Note: Directional gain = 0.48dBi +10log(2) = 3.49dBi＜6dBi, so the power limit is 8 dBm/3kHz.						

B.Test Plot:

(Channel 1, 802.11ax (HEW20)(RU52), ANT0)

(Channel 7, 802.11ax (HEW20)(RU52), ANT0)

(Channel 13, 802.11ax (HEW20)(RU52), ANT0)

(Channel 1, 802.11ax (HEW20)(RU52), ANT1)

(Channel 7, 802.11ax (HEW20)(RU52), ANT1)

(Channel 13, 802.11ax (HEW20)(RU52), ANT1)

802.11ax (HEW20)(RU106) 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	-4.19	-3.81	-0.99	8	PASS
7	2442	-3.56	-3.96	-0.75	8	PASS
13	2472	-15.81	-16.64	-13.19	8	PASS
Note: Directional gain = 0.48dBi +10log(2) = 3.49dBi＜6dBi, so the power limit is 8 dBm/3kHz.						

B.Test Plot:

(Channel 1, 802.11ax (HEW20)(RU106), ANT0)

(Channel 7, 802.11ax (HEW20)(RU106), ANT0)

(Channel 13, 802.11ax (HEW20)(RU106), ANT0)

(Channel 1, 802.11ax (HEW20)(RU106), ANT1)

(Channel 7, 802.11ax (HEW20)(RU106), ANT1)

(Channel 13, 802.11ax (HEW20)(RU106), ANT1)

2.7. Conducted Emission

2.7.1.Requirement

According to FCC section 15.207, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency within the band 150kHz to 30MHz shall not exceed the limits in the following table, as measured using a 50μH/50Ω line impedance stabilization network (LISN).

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

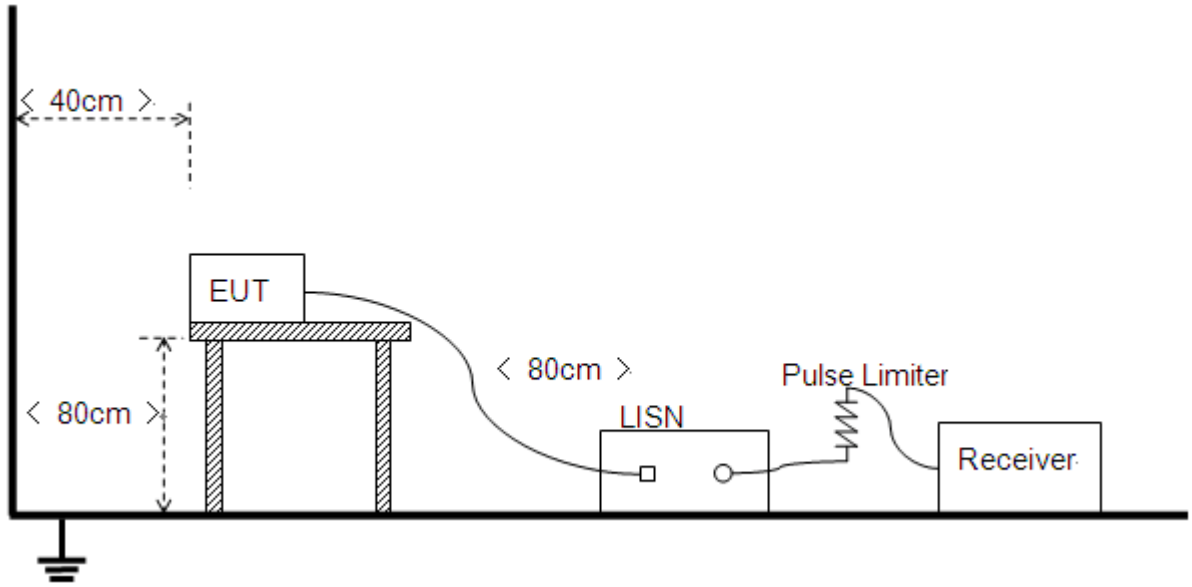
NOTE:

(a) The lower limit shall apply at the band edges.

(b) The limit decreases linearly with the logarithm of the frequency in the range 0.15 - 0.50MHz.

2.7.2.Test Description

Test Setup:



The Table-top EUT was placed upon a non-metallic table 0.8m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm from LISN. The set-up and test methods were according to ANSI C63.10 2013.

2.7.3.Test Result

The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT are performed. Set RBW=9kHz, VBW=30kHz. Refer to recorded points and plots below.

Note: Both of the test voltage AC 120V/60Hz and AC 230V/50Hz were considered and tested respectively, only the results of the worst case AC 120V/60Hz were recorded in this report.

A.Test Setup:

Test Mode: EUT+ ADAPTER + WIFI TX

Test Voltage: AC 120V/60Hz

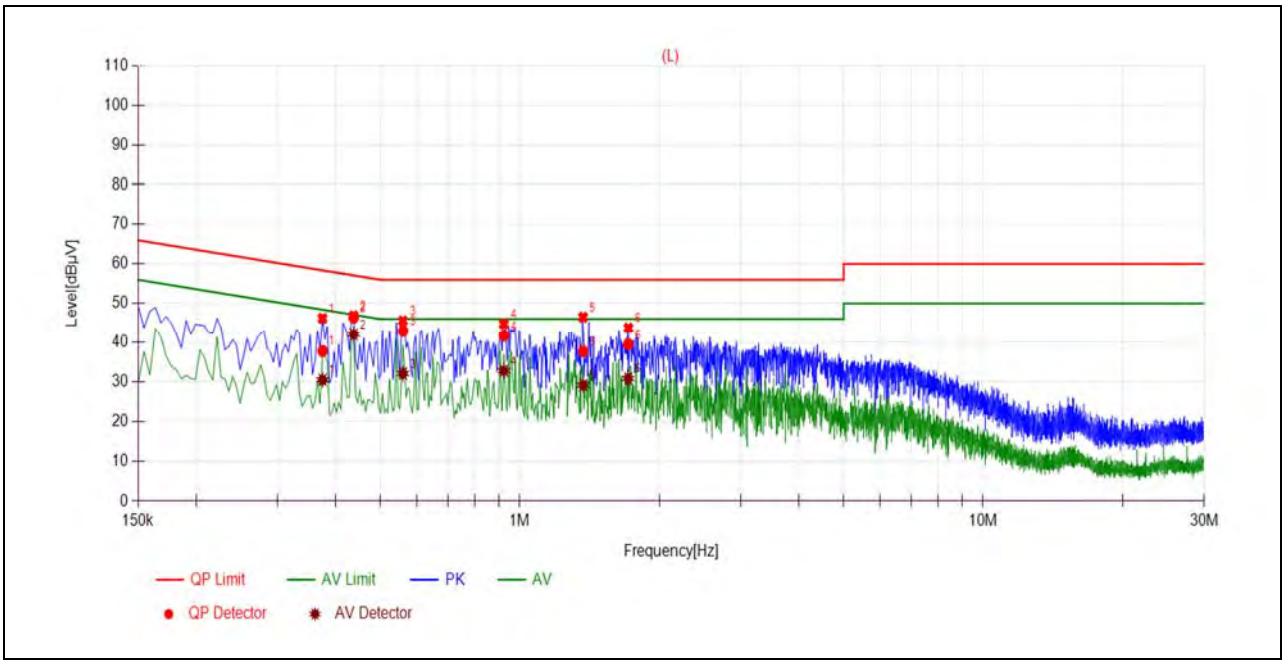
The measurement results are obtained as below:

$E\ [dB\mu V] = U_R + L_{Cable\ loss}\ [dB] + A_{Factor}$

U_R: Receiver Reading

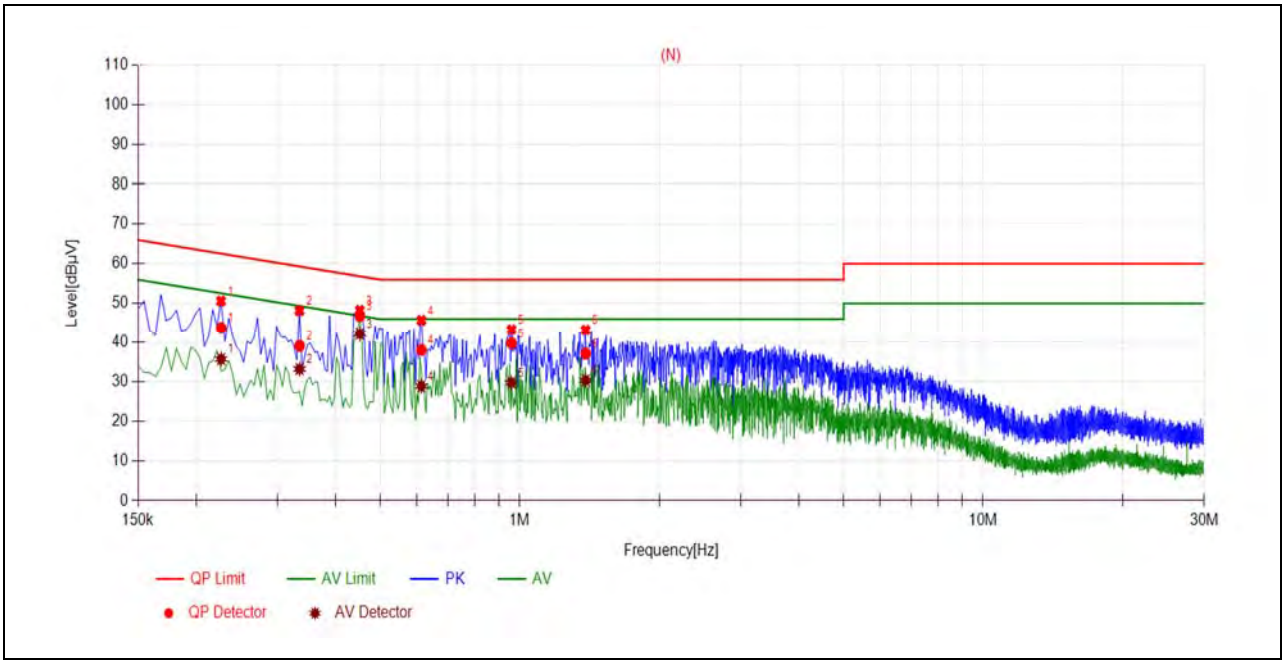
A_{Factor}: Voltage division factor of LISN

B.Test Plot:



(L Phase)

No.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.3753	37.77	30.45	58.38	47.10	Line	PASS
2	0.4379	46.40	42.07	57.10	46.00		PASS
3	0.5597	42.91	32.07	56.00	46.00		PASS
4	0.9244	41.75	32.78	56.00	46.00		PASS
5	1.3700	37.72	29.12	56.00	46.00		PASS
6	1.7144	39.51	30.83	56.00	46.00		PASS



(N Phase)

No.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.2267	43.74	35.71	62.57	52.57	Neutral	PASS
2	0.3347	39.08	33.18	59.33	49.33		PASS
3	0.4515	46.79	42.20	56.85	46.85		PASS
4	0.6131	38.05	28.85	56.00	46.00		PASS
5	0.9597	39.76	29.69	56.00	46.00		PASS
6	1.3873	37.11	30.31	56.00	46.00		PASS

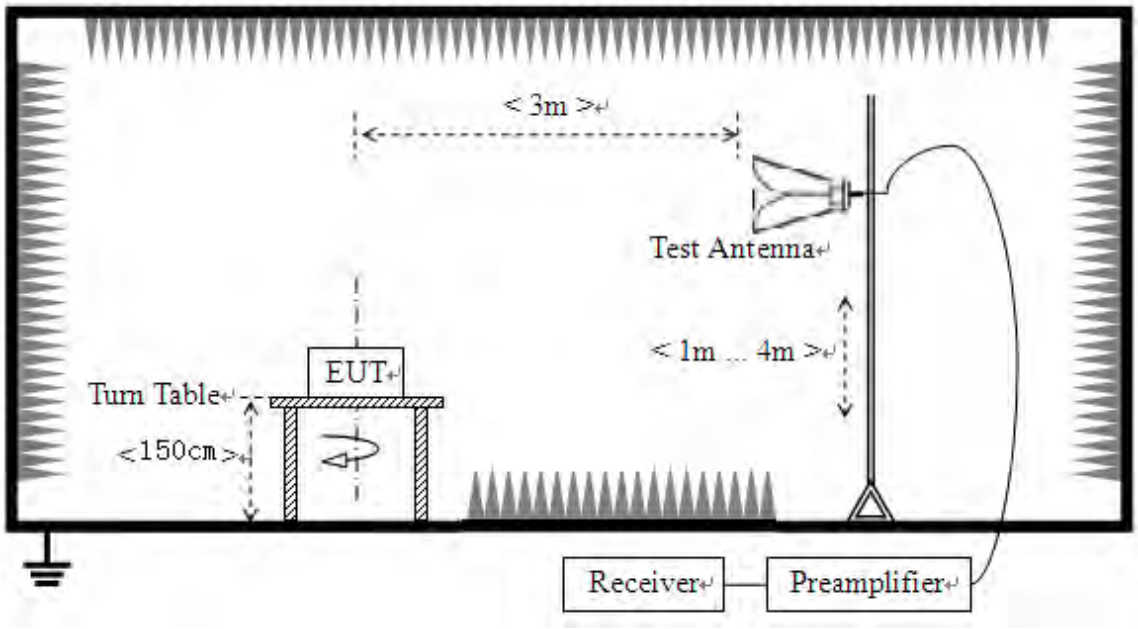
2.8. Restricted Frequency Bands

2.8.1.Requirement

According to FCC section 15.247(d), 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, In addition, radiated emissions which fall in the restricted bands, as defined in 15.205(a), must also comply with the radiated emission limits specified in 15.209(a).

2.8.2.Test Description

Test Setup



The EUT is located in a 3m Semi-Anechoic Chamber; the antenna factors, cable loss and so on of the site as factors are calculated to correct the reading.

For the Test Antenna:
Test Antenna is 3m away from the EUT. Test Antenna height is varied from 1m to 4m above the ground to determine the maximum value of the field strength.

2.8.3.Test Procedure

KDB 558074 Section 8.6 and 8.7 was used in order to prove compliance.

2.8.4.Test Result

The lowest and highest channels are tested to verify Restricted Frequency Bands.
The measurement results are obtained as below:
E [dBμV/m] =U_R + A_T + A_{Factor} [dB]; A_T =$L_{Cable\ loss}$ [dB]-G_{preamp} [dB]
A_T: Total correction Factor except Antenna
U_R: Receiver Reading
G_{preamp}: Preamplifier Gain
A_{Factor}: Antenna Factor at 3m

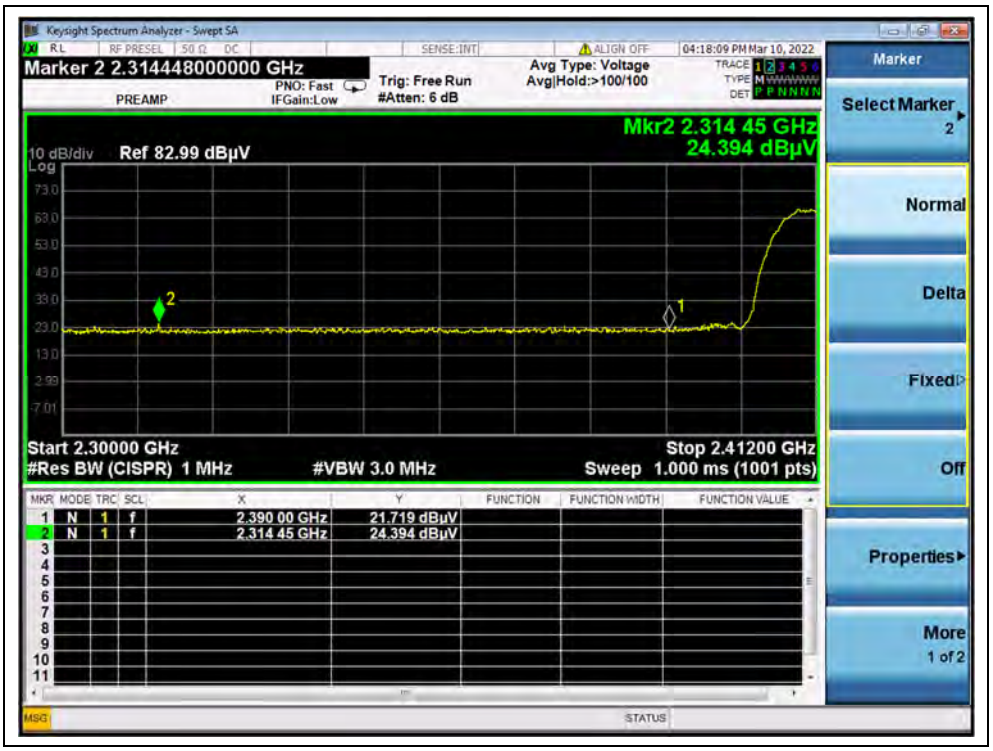
Note: Restricted Frequency Bands were performed when antenna was at vertical and horizontal polarity, and only the worse test condition (vertical) was recorded in this test report.

802.11b Mode

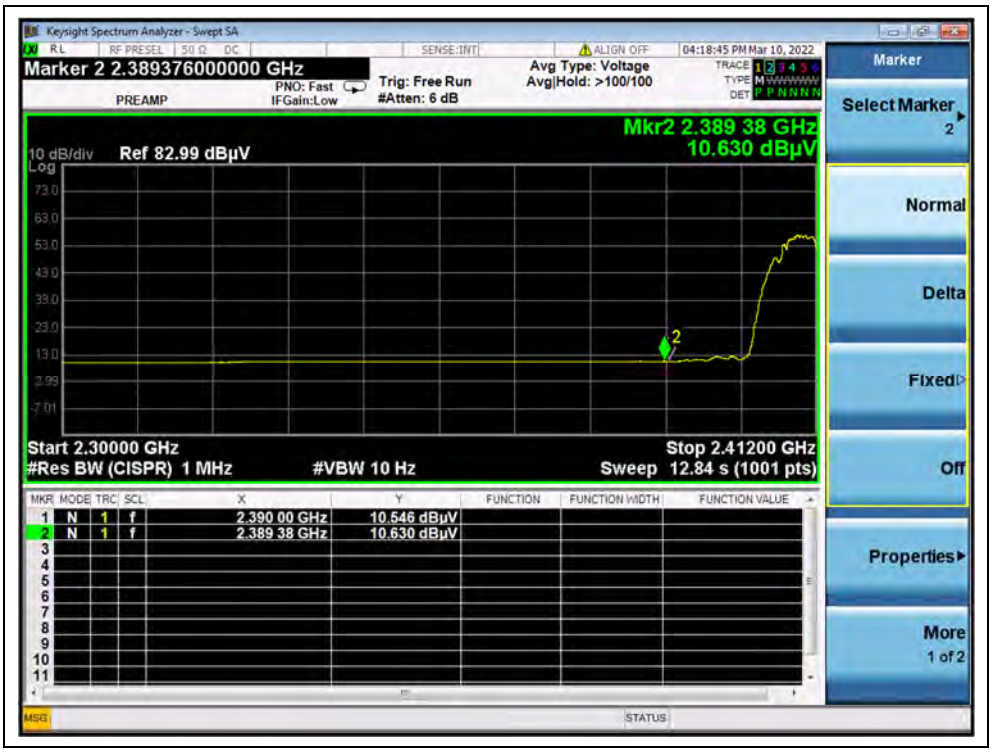
A.Test Verdict:

Channel	Frequency (MHz)	Detector PK/ AV	Receiver Reading U_R (dBμV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
1	2314.45	PK	24.39	6.74	27.20	58.33	74	PASS
1	2389.38	AV	10.63	6.74	27.20	44.57	54	PASS
13	2484.99	PK	25.75	6.74	27.20	59.69	74	PASS
13	2484.80	AV	11.69	6.74	27.20	45.63	54	PASS

B.Test Plot:



(PEAK, Channel 1, 802.11b)



(AVERAGE, Channel 1, 802.11b)

(PEAK, Channel 13, 802.11b)

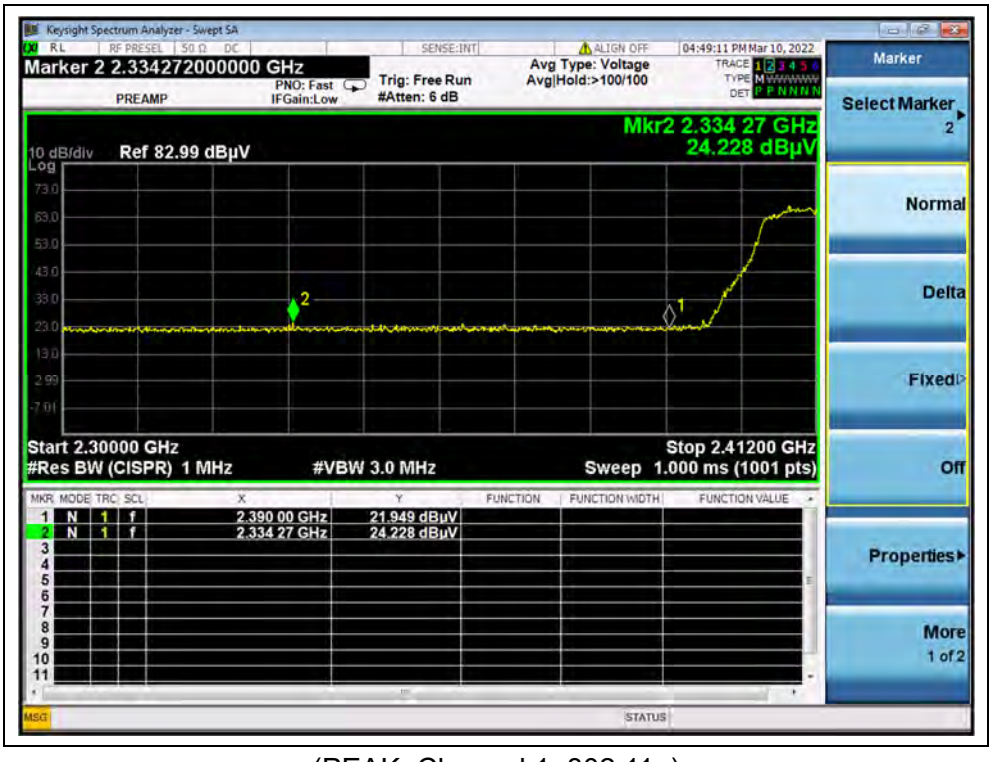
(AVERAGE, Channel 13, 802.11b)

802.11g Mode

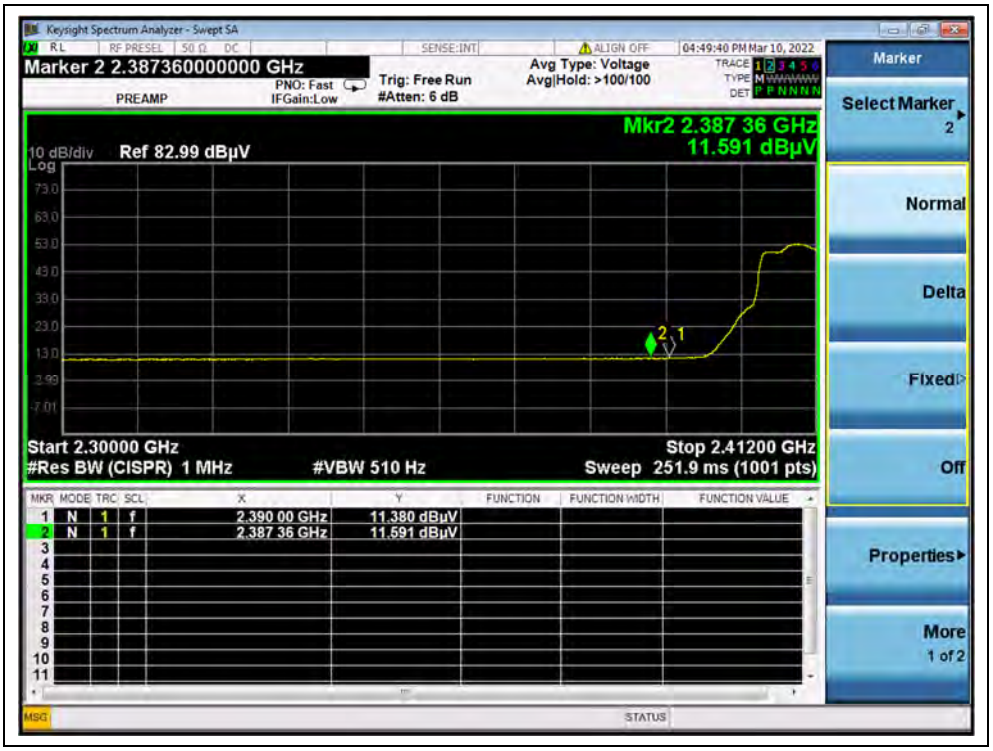
A.Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver Reading U_R (dBμV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV						
1	2334.27	PK	24.23	6.74	27.20	58.17	74	PASS
1	2387.36	AV	11.59	6.74	27.20	45.53	54	PASS
13	2486.89	PK	36.90	6.74	27.20	70.84	74	PASS
13	2484.27	AV	11.67	6.74	27.20	45.61	54	PASS

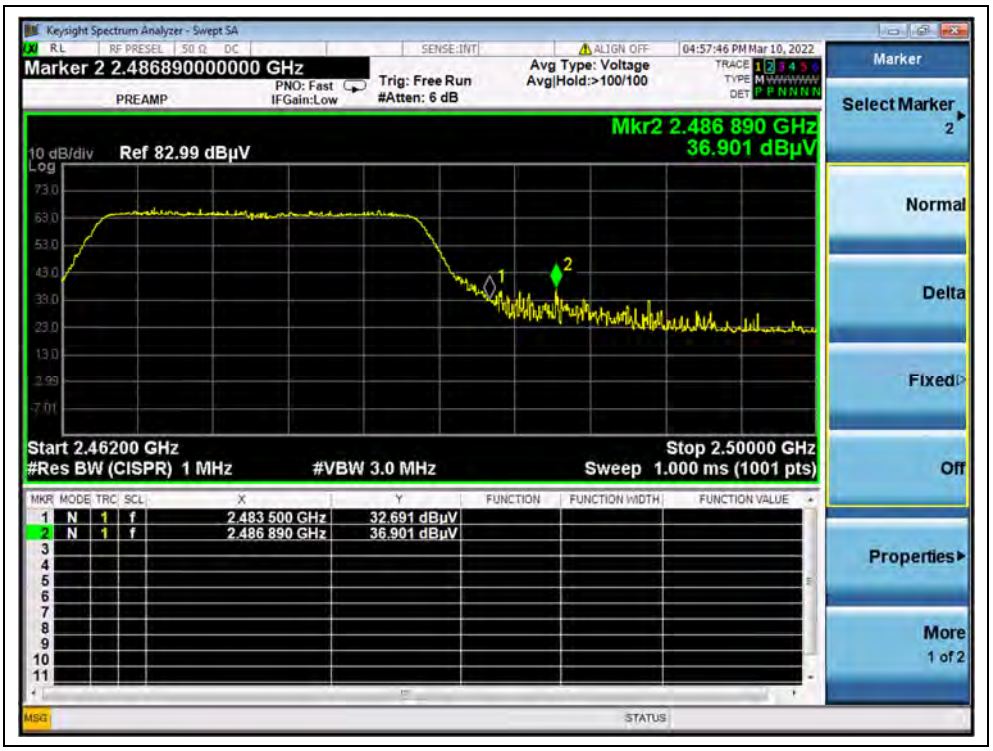
B.Test Plot:



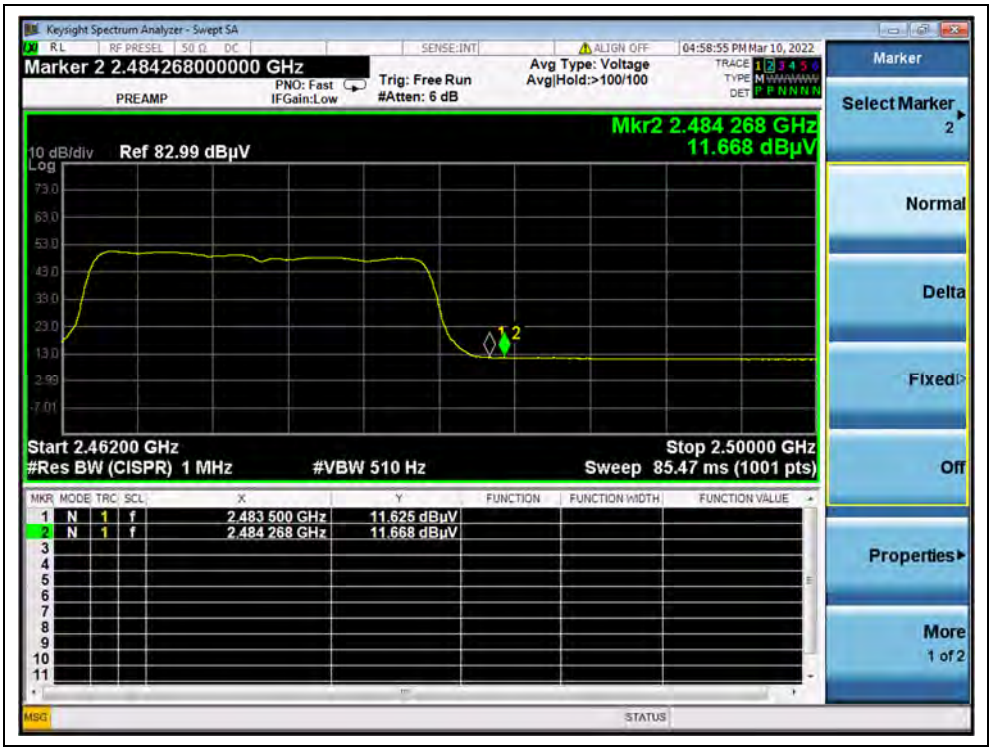
(PEAK, Channel 1, 802.11g)



(AVERAGE, Channel 1, 802.11g)



(PEAK, Channel 13, 802.11g)



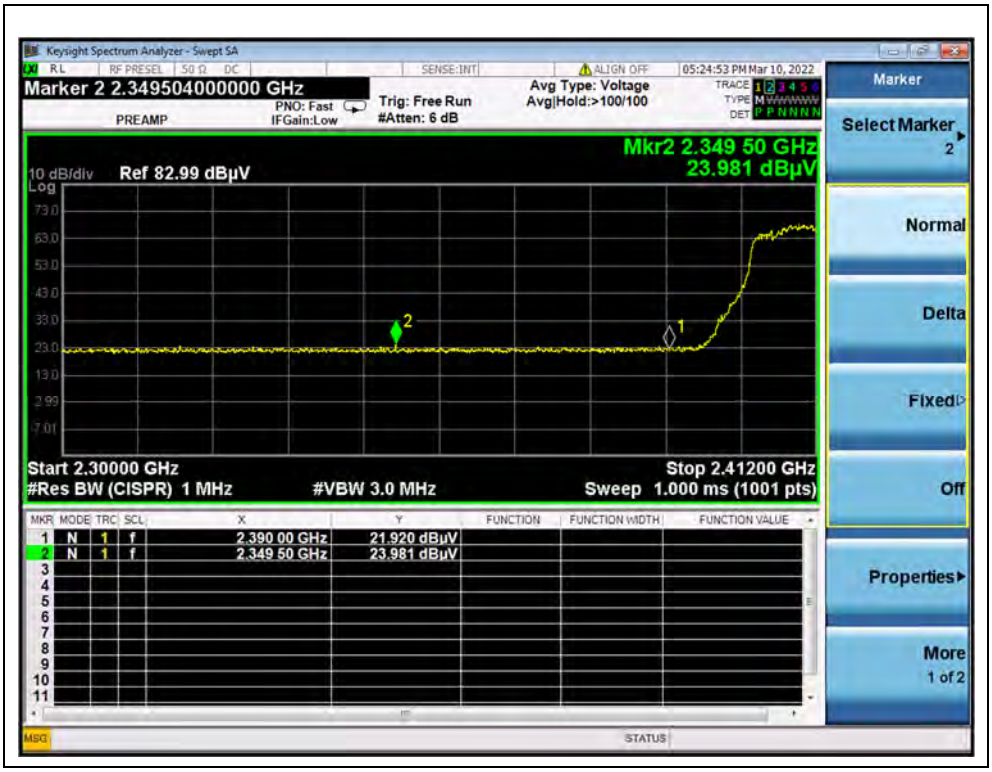
(AVERAGE, Channel 13, 802.11g)

802.11n (HT20) Mode

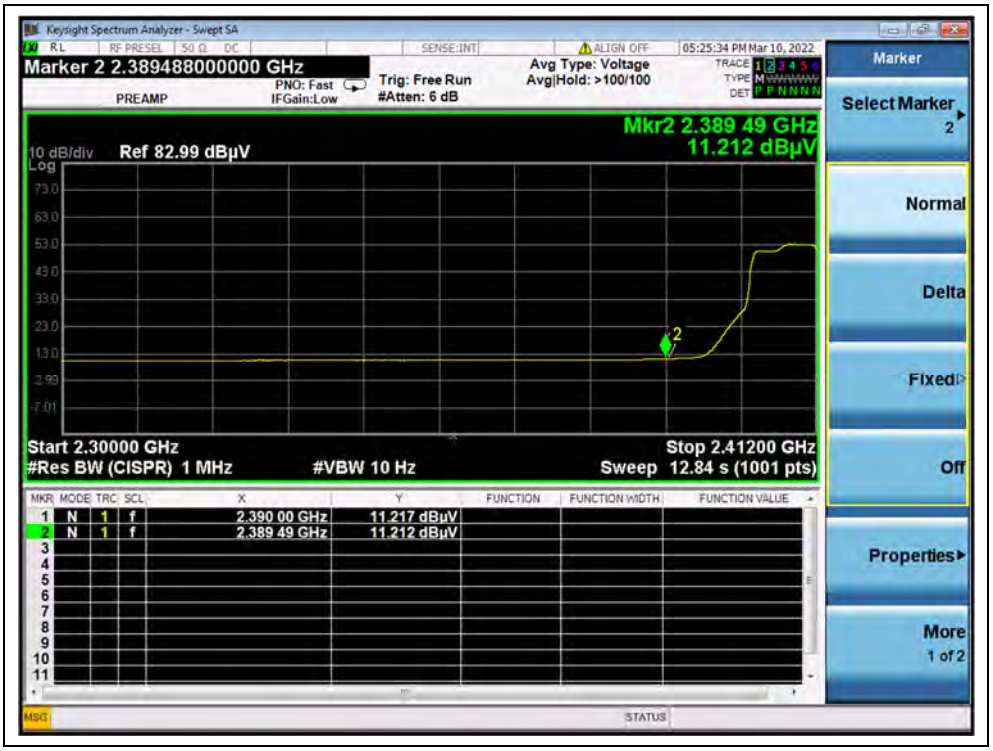
A.Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver Reading U_R (dBμV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV						
1	2349.50	PK	23.98	6.74	27.20	57.92	74	PASS
1	2390.00	AV	11.22	6.74	27.20	45.16	54	PASS
13	2485.83	PK	31.95	6.74	27.20	65.89	74	PASS
13	2483.50	AV	11.25	6.74	27.20	45.19	54	PASS

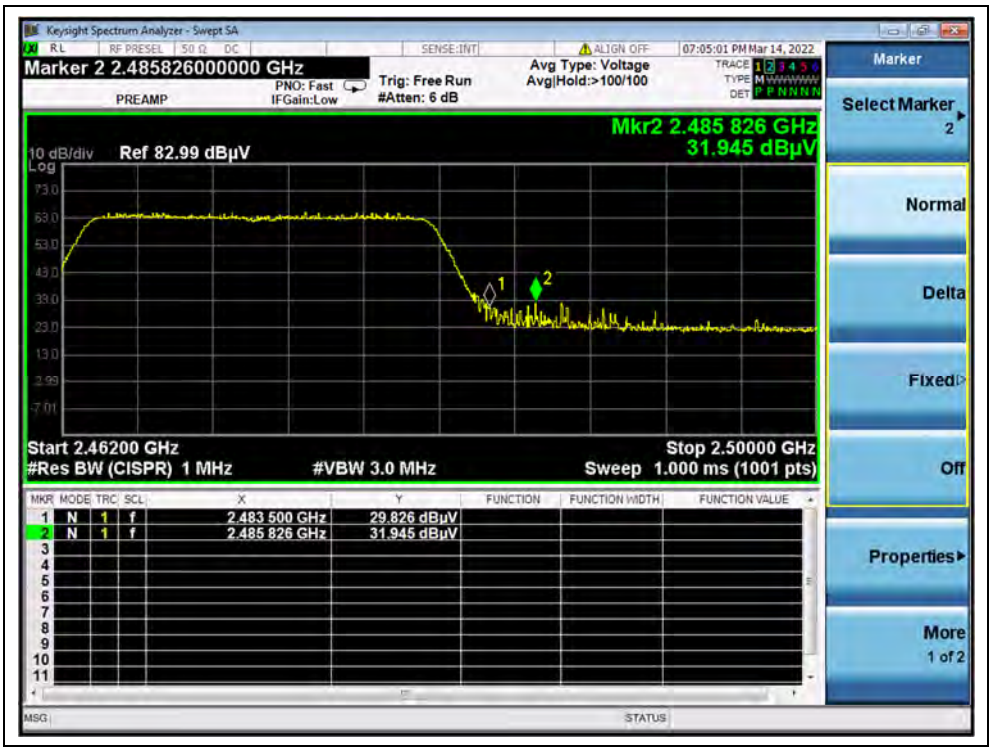
B.Test Plot:



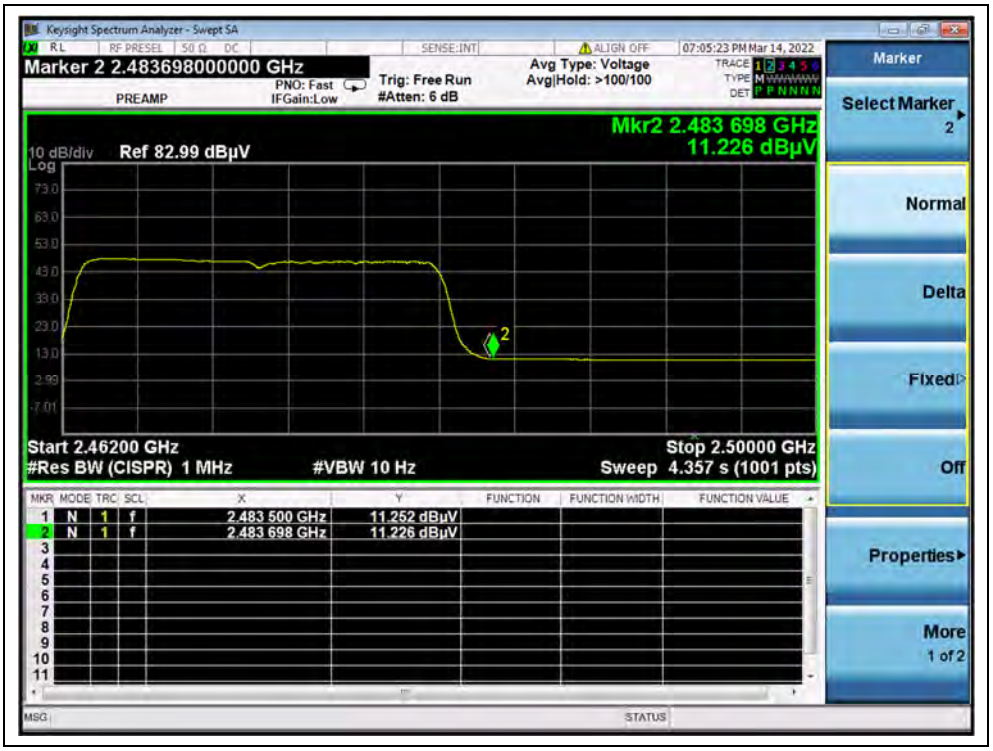
(PEAK, Channel 1, 802.11n (HT20))



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



(PEAK, Channel 13, 802.11n (HT20))



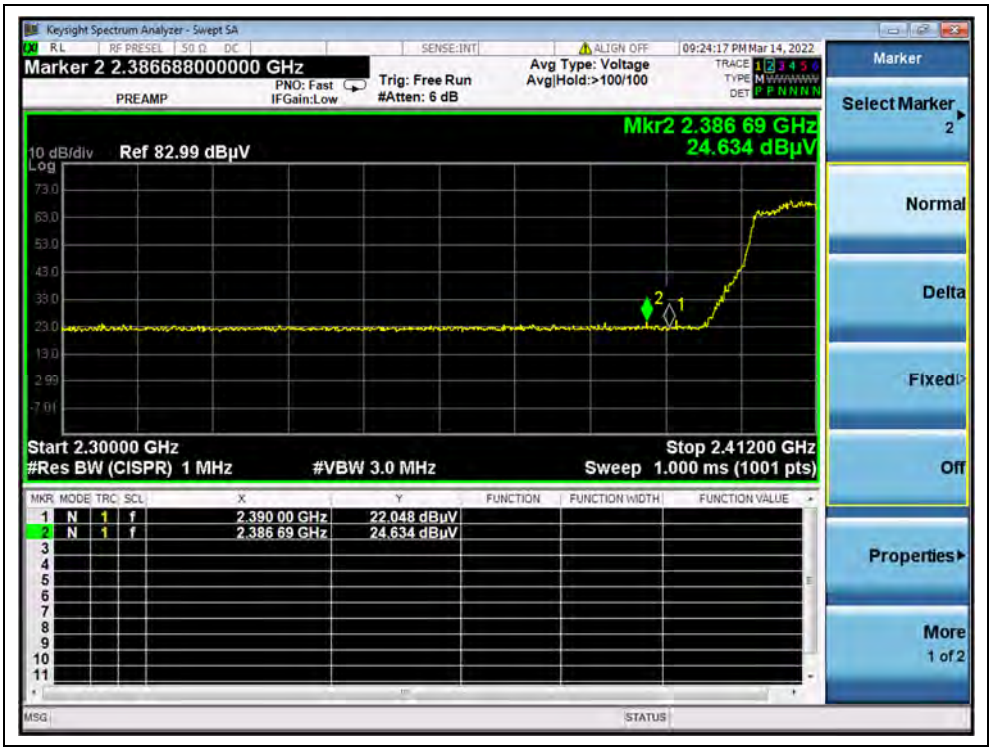
(AVERAGE, Channel 13, 802.11n (HT20))

802.11ax (HEW20) Mode

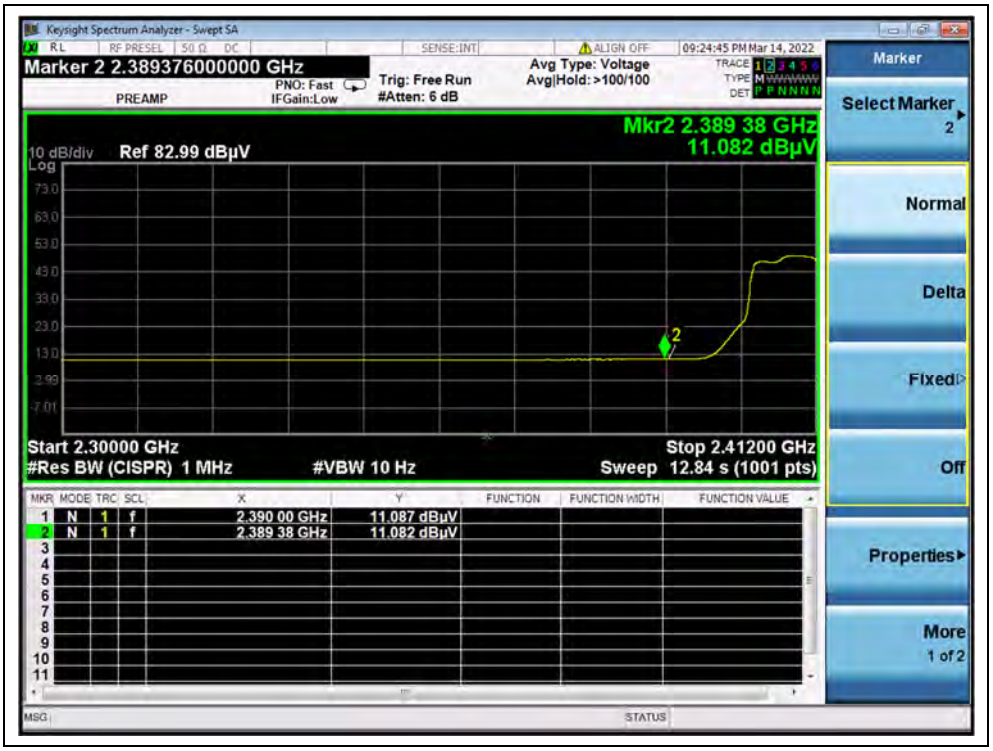
A.Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver Reading U_R (dBμV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV						
1	2386.69	PK	24.63	6.74	27.20	58.57	74	PASS
1	2390.00	AV	11.09	6.74	27.20	45.03	54	PASS
13	2486.81	PK	35.31	6.74	27.20	69.25	74	PASS
13	2483.50	AV	11.16	6.74	27.20	45.10	54	PASS

B.Test Plot:

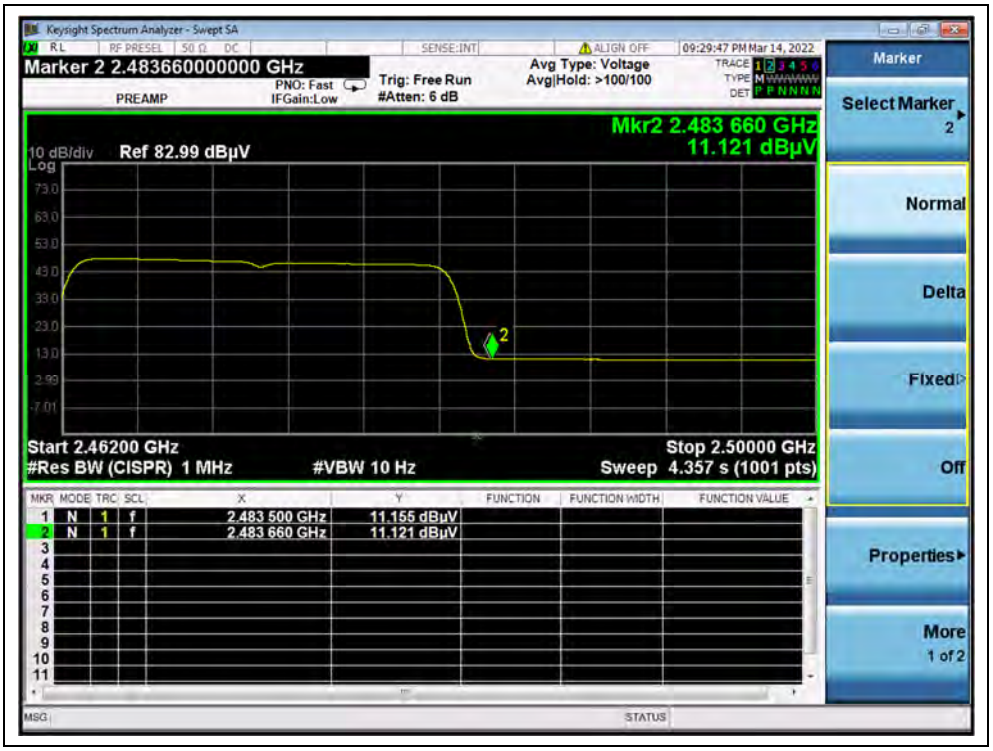


(PEAK, Channel 1, 802.11ax (HEW20))



(AVERAGE, Channel 1, 802.11ax (HEW20))

(PEAK, Channel 13, 802.11ax (HEW20))



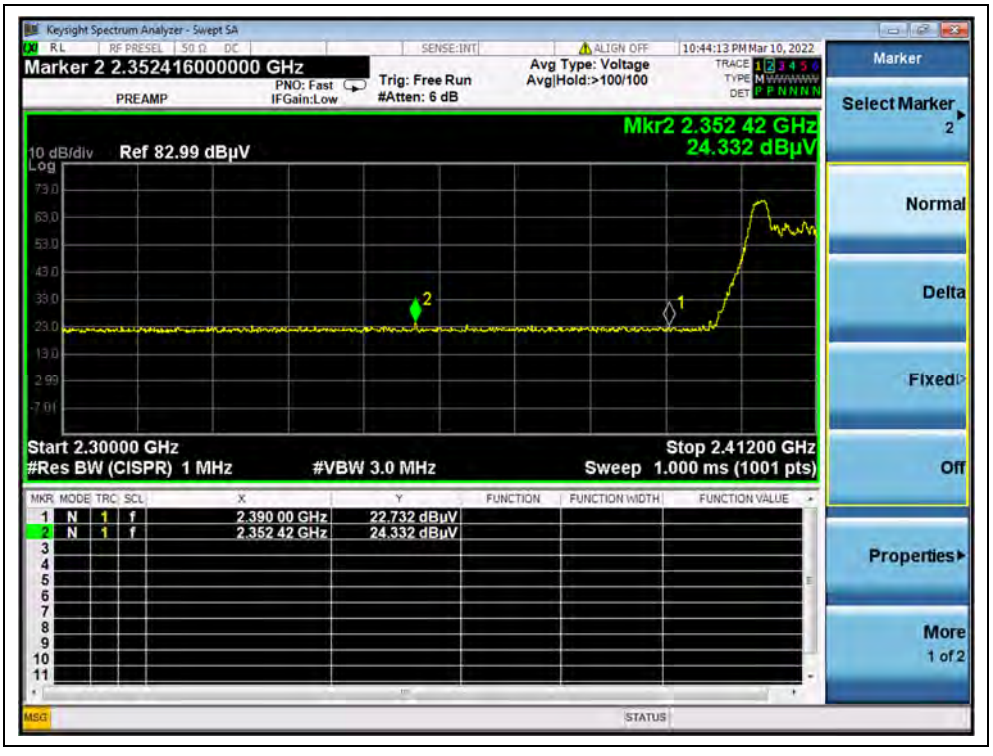
(AVERAGE, Channel 13, 802.11ax (HEW20))

802.11ax (HEW20)(RU26) Mode

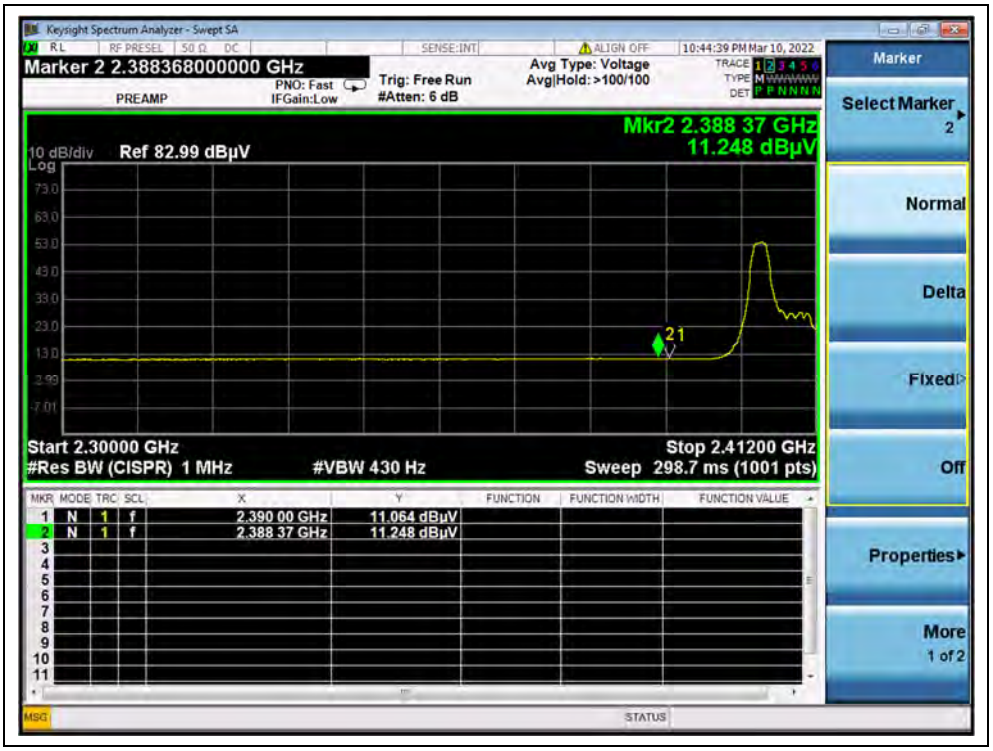
A.Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver Reading U_R (dBμV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV						
1	2352.42	PK	24.33	6.74	27.20	58.27	74	PASS
1	2388.37	AV	11.25	6.74	27.20	45.19	54	PASS
13	2483.55	PK	32.53	6.74	27.20	66.47	74	PASS
13	2483.50	AV	11.67	6.74	27.20	45.61	54	PASS

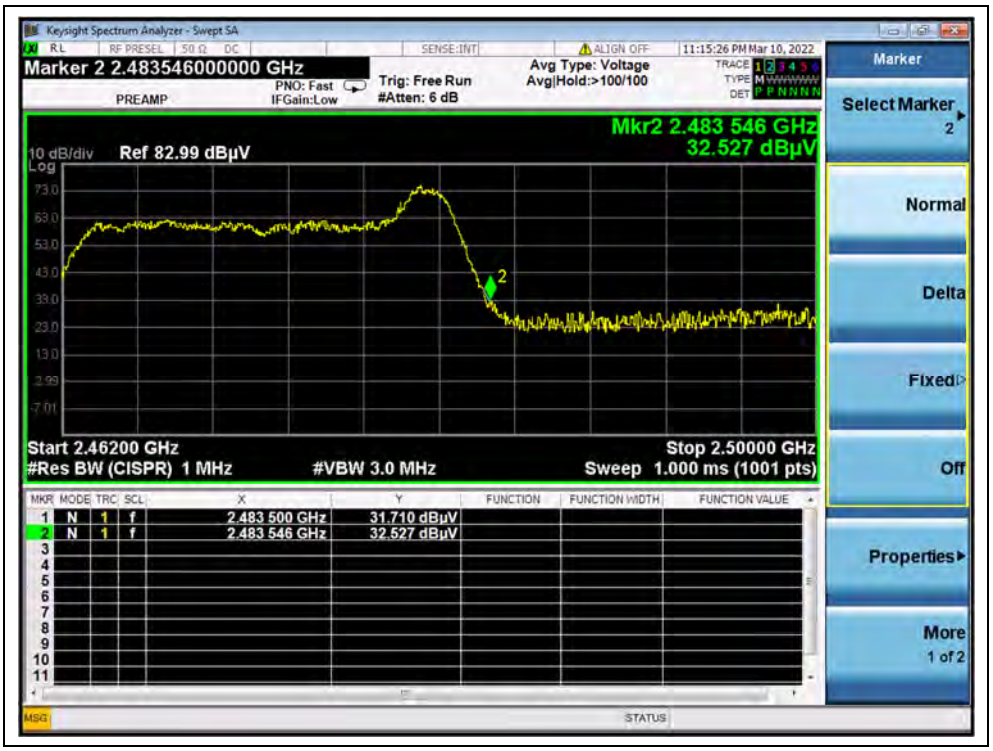
B.Test Plot:



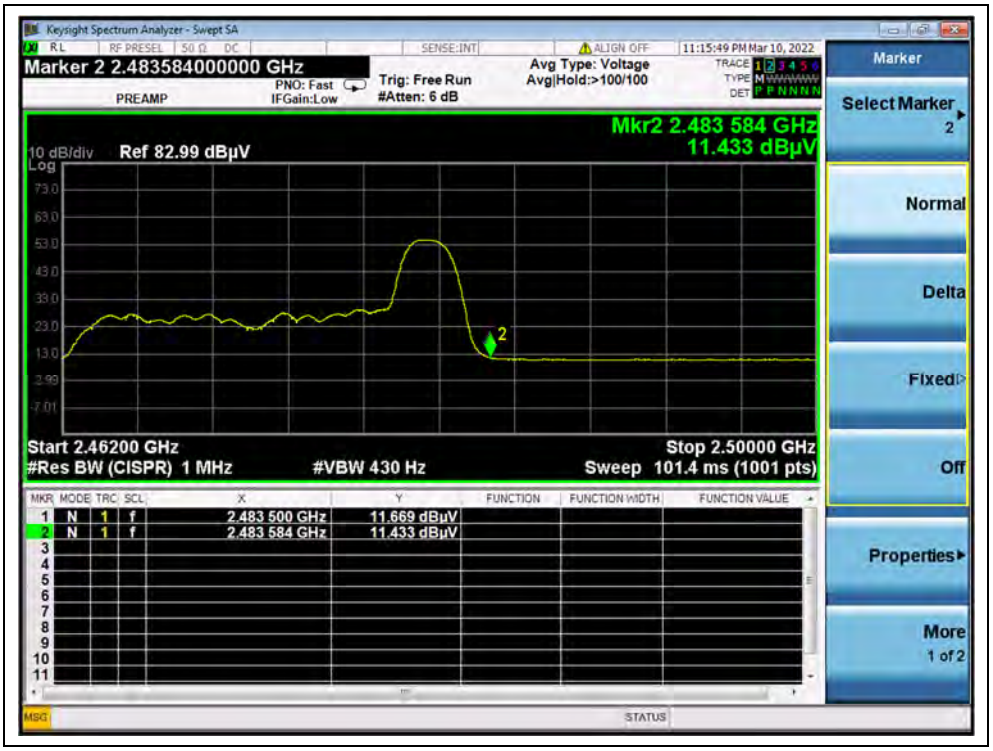
(PEAK, Channel 1, 802.11ax (HEW20)(RU26))



(AVERAGE, Channel 1, 802.11ax (HEW20)(RU26))



(PEAK, Channel 13, 802.11ax (HEW20)(RU26))



(AVERAGE, Channel 13, 802.11ax (HEW20)(RU26))

2.9. Radiated Emission

2.9.1.Requirement

According to FCC section 15.247(d), radiated emission outside the frequency band attenuation below the general limits specified in FCC section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in FCC section 15.205(a), must also comply with the radiated emission limits specified in FCC section 15.209(a).

According to FCC section 15.209 (a), except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

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

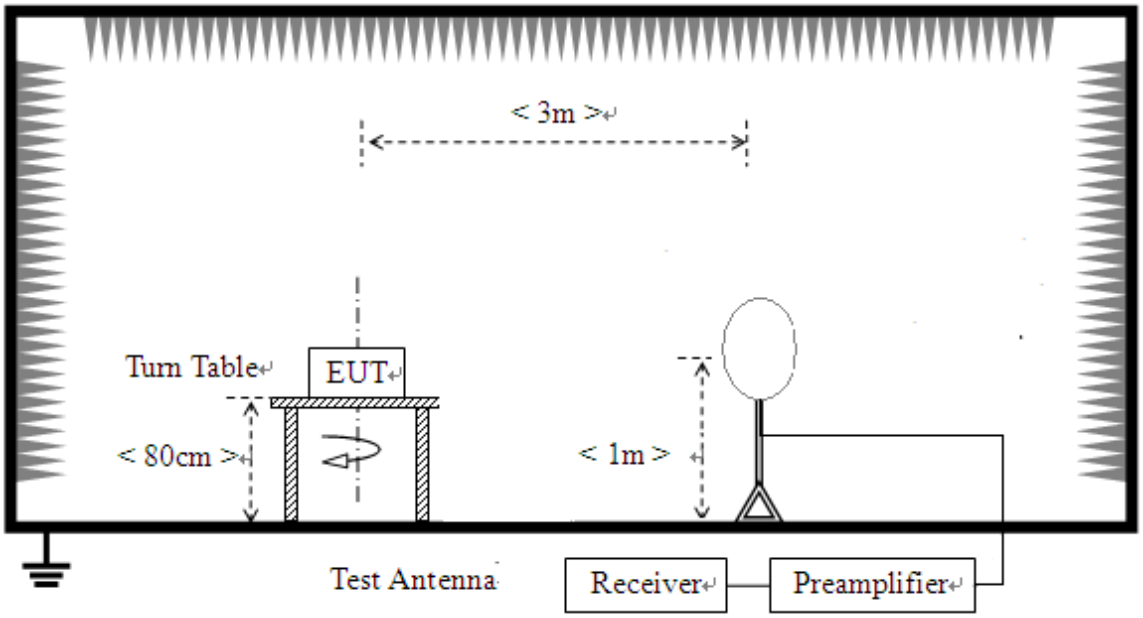
Note1: For above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.

Note2: For above 1000MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK). In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), also should comply with the radiated emission limits specified in Section 15.209(a)(above table).

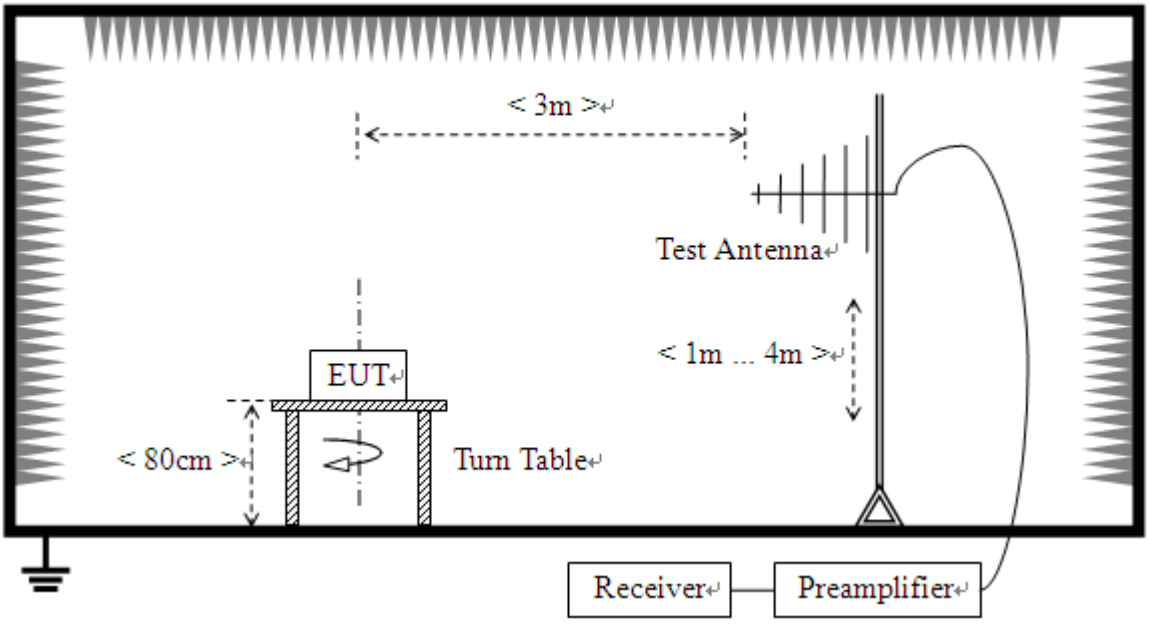
2.9.2.Test Description

Test Setup:

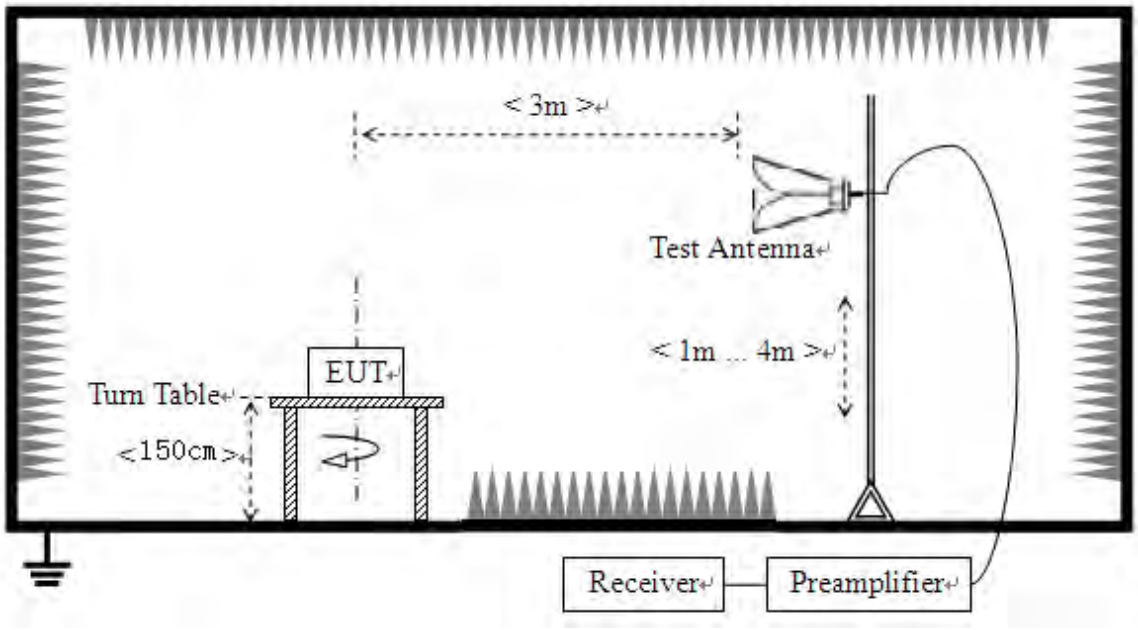
1) For radiated emissions from 9kHz to 30MHz



2) For radiated emissions from 30MHz to1GHz



3) For radiated emissions above 1GHz



The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz.The antenna to EUT distance is 3meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 30MHz, the emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9kHz-90 kHz, 110kHz-490 kHz. Radiated emission limits in these two bands are based on measurements employing an average detector.

For measurements below 1GHz the resolution bandwidth is set to 100kHz for peak detection measurements or 120kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For measurements above 1GHz the resolution bandwidth is set to 1MHz, the video band width is set to 3MHz for peak measurements and as applicable for average measurements.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

2.9.3.Test Result

According to ANSI C63.10, because of peak detection will yield amplitudes equal to or greater than amplitudes measured with the quasi-peak (or average) detector, the measurement data from a spectrum analyzer peak detector will represent the worst-case results, if the peak measured value complies with the quasi-peak (or average) limit, it is unnecessary to perform an quasi-peak measurement (or average).

The measurement results are obtained as below:

$E\ [dB\mu V/m] = U_R + A_T + A_{Factor}\ [dB]$; $A_T = L_{Cable\ loss}\ [dB] - G_{preamp}\ [dB]$

A_T: Total correction Factor except Antenna

U_R: Receiver Reading

G_{preamp}: Preamplifier Gain

A_{Factor}: Antenna Factor at 3m

During the test, the total correction Factor A_T and A_{Factor} were built in test software.

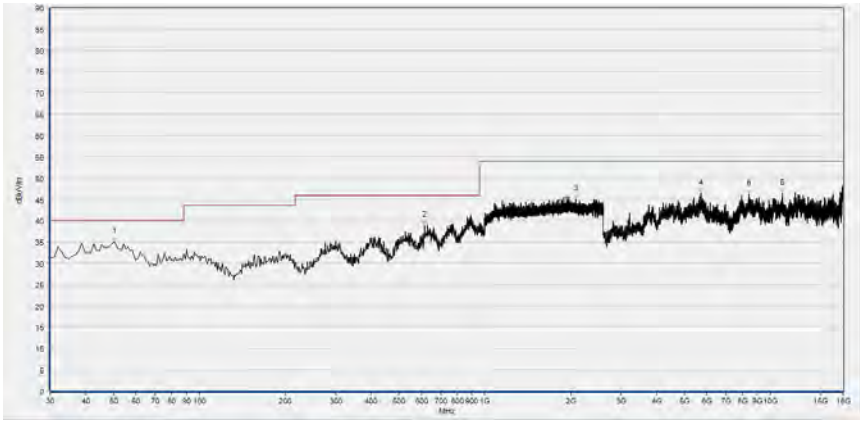
Note1: All radiated emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

Note2: For the frequency, which started from 9kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit was not recorded.

Note3: For the frequency, which started from 18GHz to 40GHz, was pre-scanned and the result which was 20dB lower than the limit was not recorded.

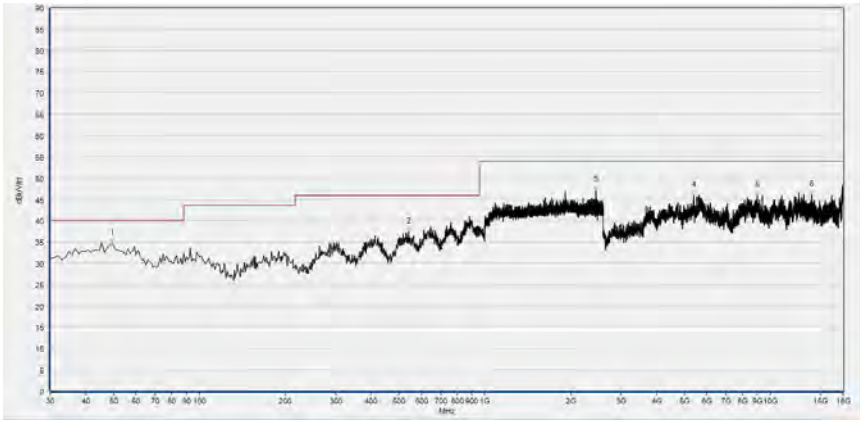
802.11b Mode

Plot for Channel 1



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
50.370	35.02	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
615.880	38.88	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2081.067	45.04	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5716.960	46.42	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8433.520	46.20	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
11026.880	46.41	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

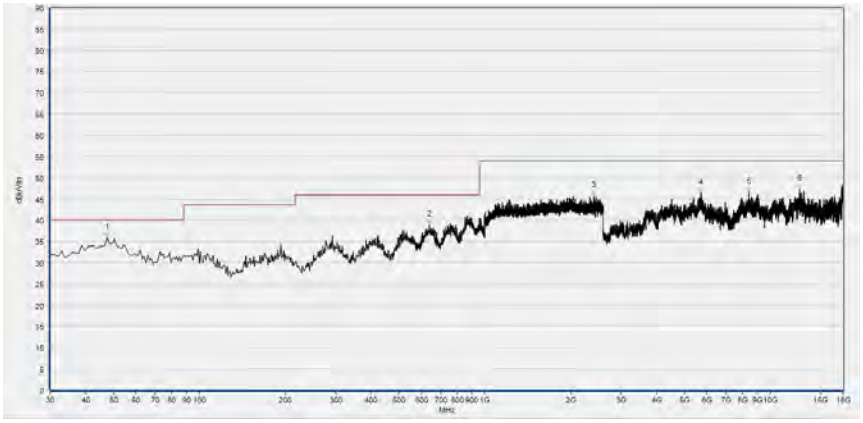
(Antenna Horizontal, 30MHz to 18GHz)



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
49.400	34.61	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
540.220	37.37	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2453.867	47.16	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5396.640	45.95	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
9000.240	45.92	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
13952.880	46.10	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

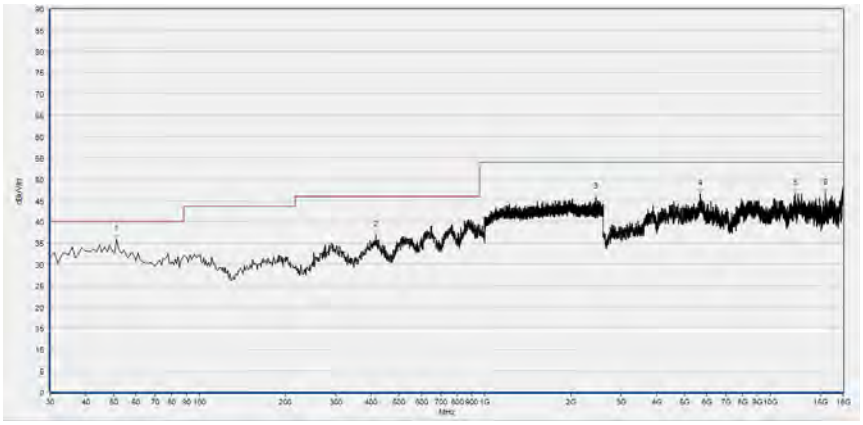
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 7



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
47.460	35.91	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
638.190	38.84	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2408.533	45.72	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5732.360	46.38	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8411.960	46.62	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12683.920	47.24	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

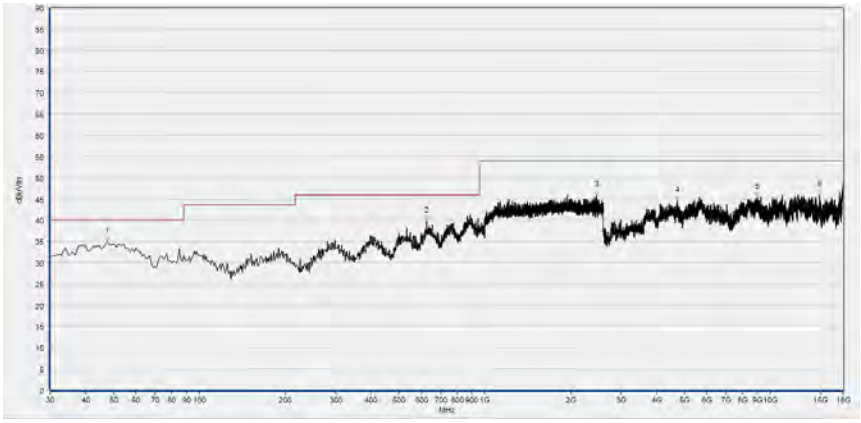
(Antenna Horizontal, 30MHz to 18GHz)



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
51.340	35.80	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
415.090	36.84	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2450.667	45.73	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5676.920	46.57	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12215.760	46.54	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
15603.760	46.72	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

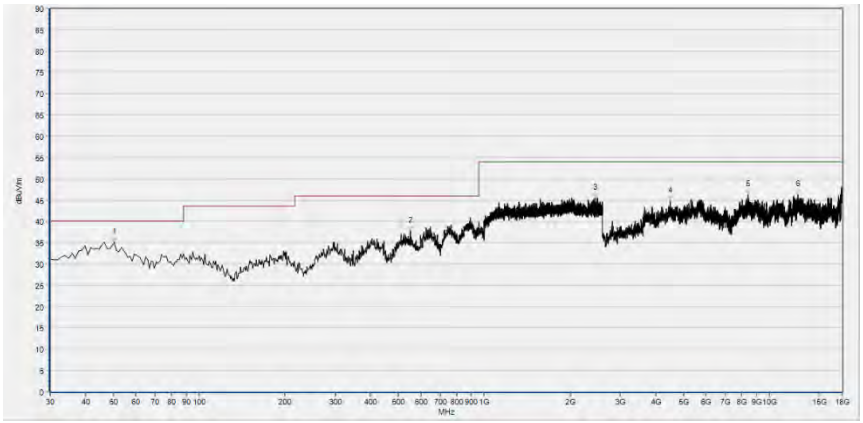
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 13



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
47.460	34.85	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
624.610	39.71	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2458.133	45.87	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4737.520	44.59	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
9009.480	45.34	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
14889.200	45.97	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)

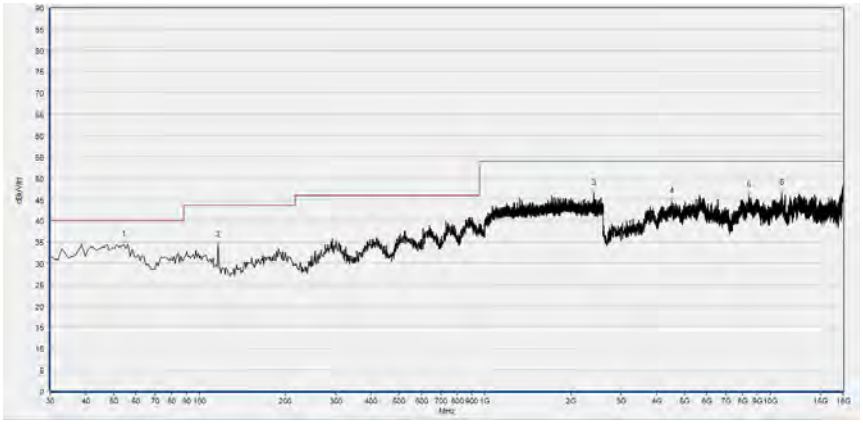


Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
50.370	34.98	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
549.920	37.77	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2453.333	45.45	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4500.360	44.81	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8411.960	46.22	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12579.200	46.29	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

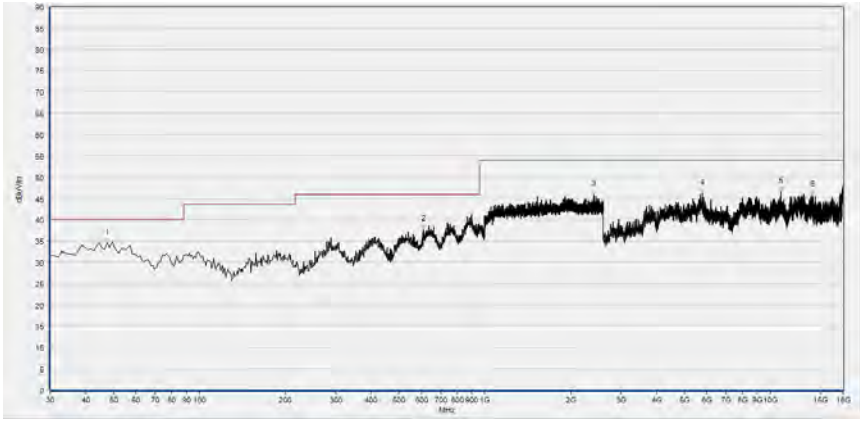
802.11g Mode

Plot for Channel 1



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
54.250	34.36	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
116.330	34.24	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
2413.867	46.43	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4503.440	44.43	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8424.280	45.92	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
10962.200	46.41	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

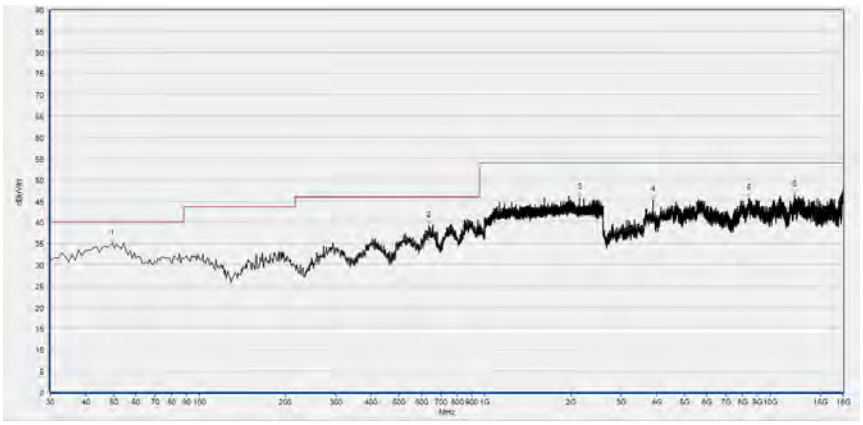
(Antenna Horizontal, 30MHz to 18GHz)



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
47.460	34.59	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
610.060	37.76	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2405.333	45.85	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5769.320	46.20	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
10872.880	46.51	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
14029.880	45.80	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

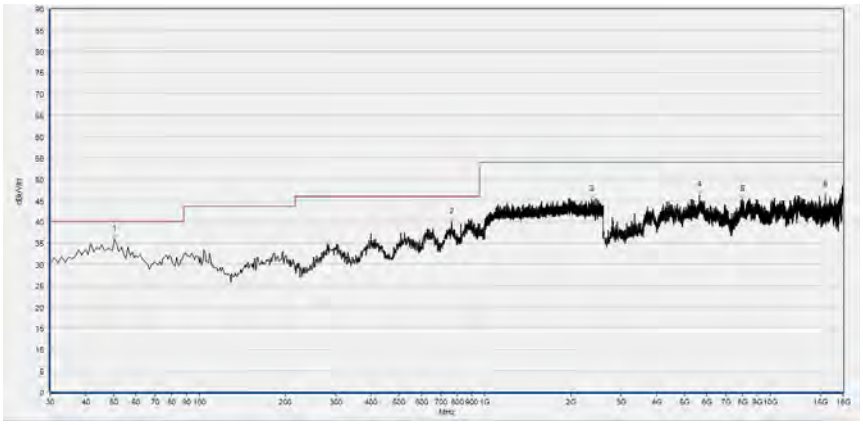
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 7



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
49.400	34.97	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
637.220	39.27	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2141.867	45.80	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
3875.120	45.33	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8424.280	45.60	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12191.120	46.49	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

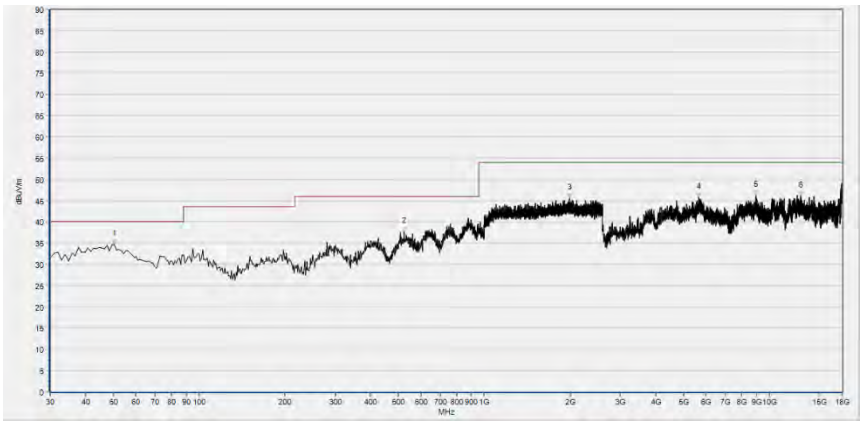
(Antenna Horizontal, 30MHz to 18GHz)



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
50.370	35.90	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
767.200	39.93	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2363.200	45.21	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5649.200	46.22	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
7996.160	45.21	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
15591.440	46.25	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

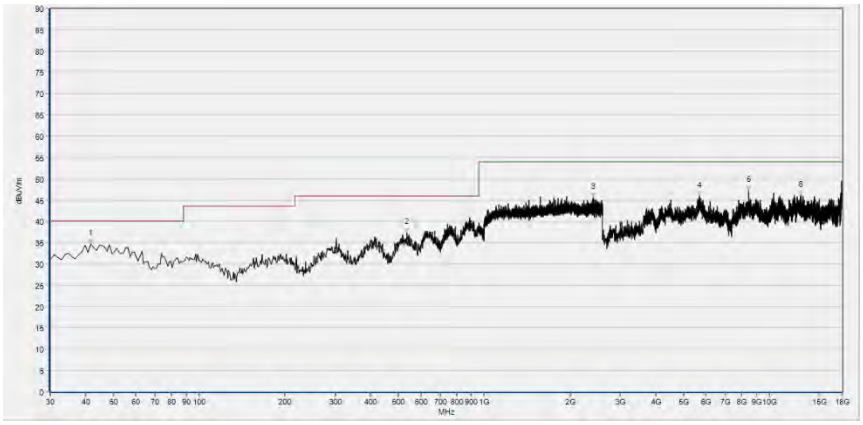
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 13



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
50.370	34.63	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
523.730	37.72	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1986.133	45.52	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5667.680	45.73	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8957.120	46.20	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12893.360	46.03	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)

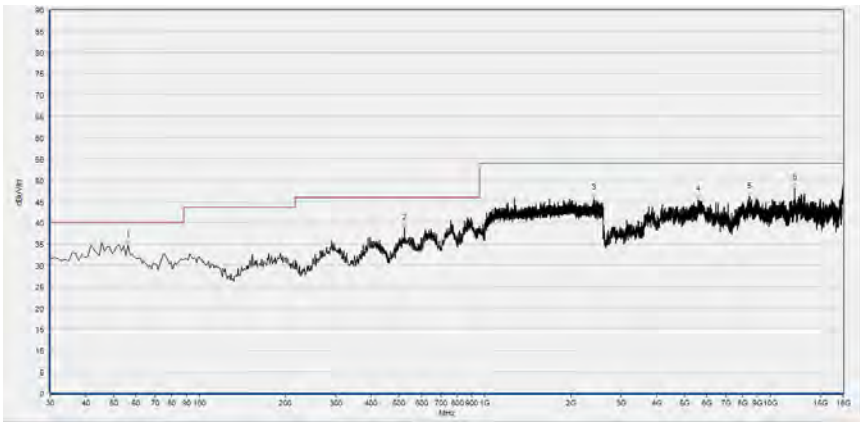


Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
41.640	34.75	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
535.370	37.33	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2411.733	45.59	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5676.920	45.87	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8455.080	47.22	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12914.920	46.10	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

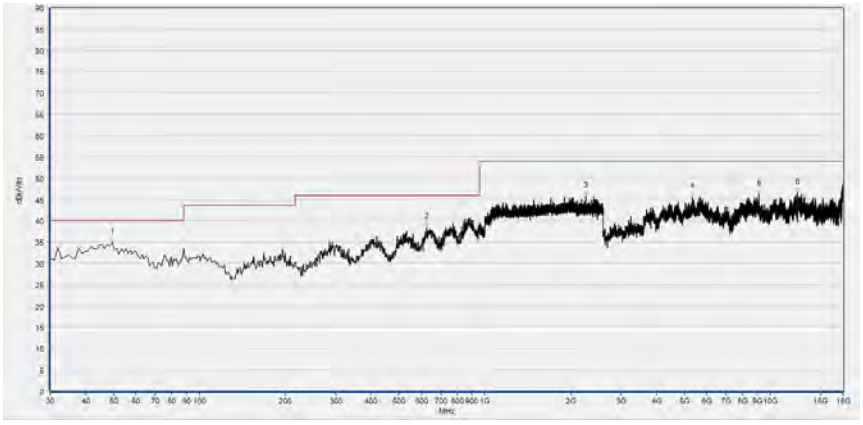
802.11n (HT20) Mode

Plot for Channel 1



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
56.190	34.61	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
523.730	38.68	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2414.400	45.71	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5593.760	45.38	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8439.680	46.08	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12178.800	48.16	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

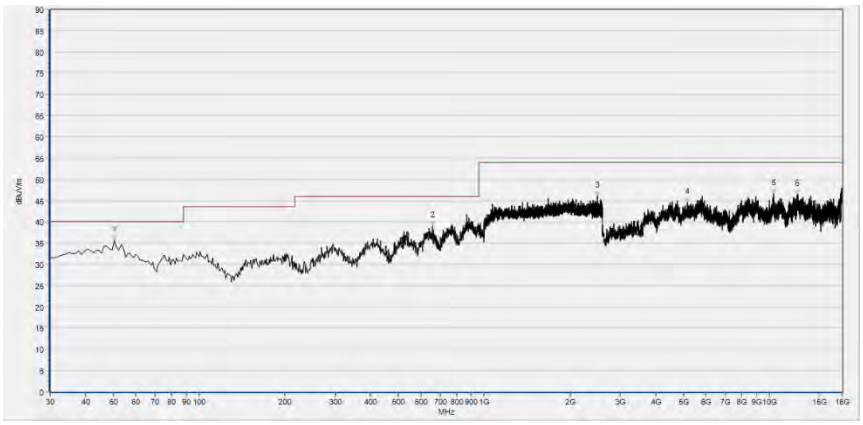
(Antenna Horizontal, 30MHz to 18GHz)



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
49.400	34.82	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
624.610	38.34	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2256.533	45.80	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5325.800	45.52	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
9101.880	46.30	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12471.400	46.66	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

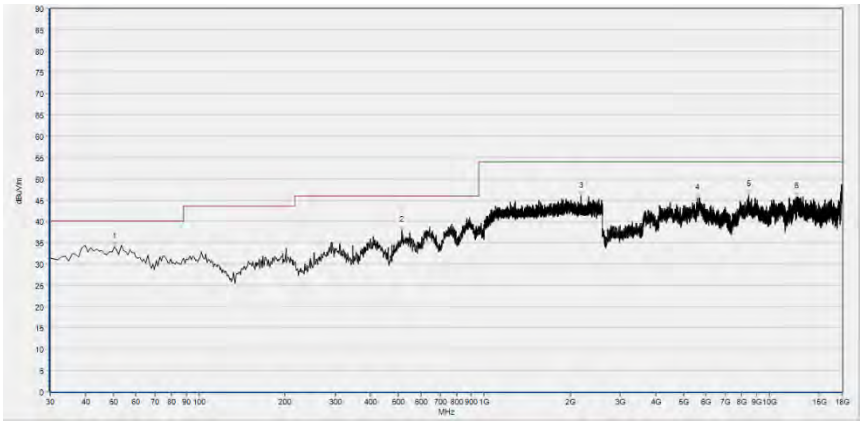
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 7



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
50.370	35.67	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
657.590	38.99	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2491.200	46.06	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5162.560	44.65	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
10364.680	46.66	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12520.680	46.44	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

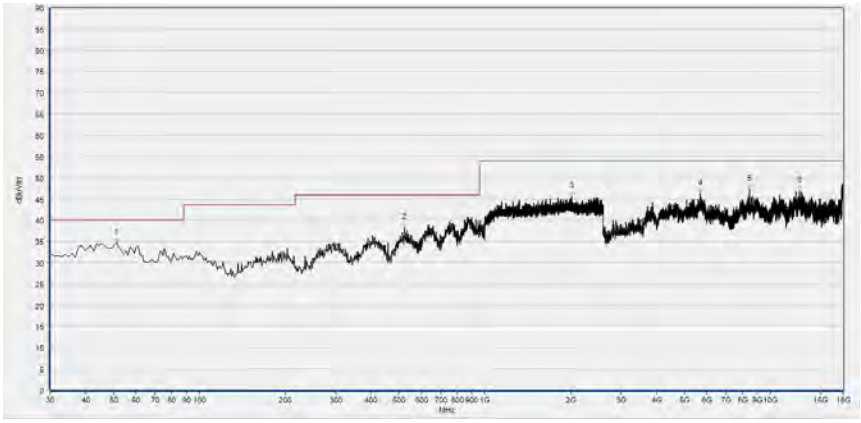
(Antenna Horizontal, 30MHz to 18GHz)



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
50.370	34.04	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
513.060	37.90	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2185.600	45.84	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5584.520	45.40	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8482.800	46.19	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12474.480	45.70	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

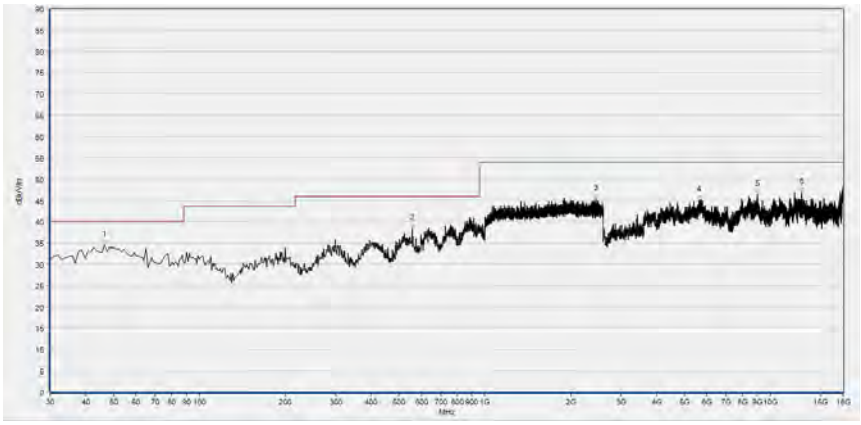
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 13



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
51.340	34.72	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
523.730	38.28	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2014.933	45.57	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5686.160	46.26	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8448.920	47.23	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12693.160	46.88	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)

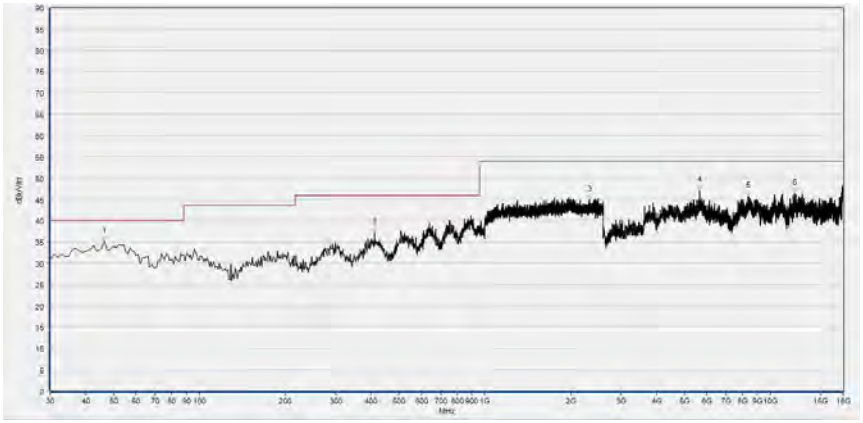


Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
46.490	34.55	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
555.740	38.32	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2447.467	45.44	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5633.800	45.04	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
9015.640	46.37	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12887.200	46.93	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

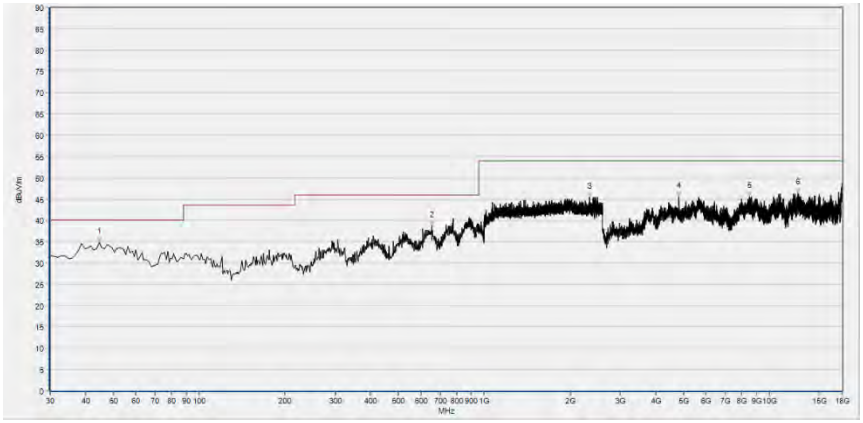
802.11ax (HEW20) Mode

Plot for Channel 1



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
46.490	35.00	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
411.210	37.16	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2329.067	44.88	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5667.680	47.14	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8359.600	45.81	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12160.320	46.36	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

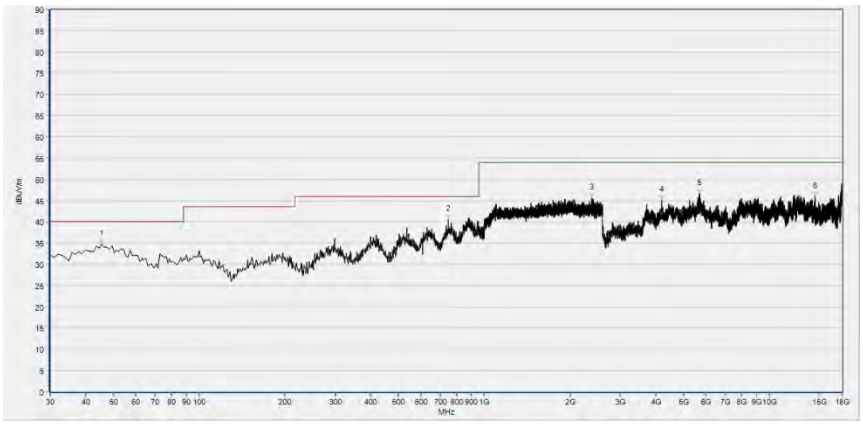
(Antenna Horizontal, 30MHz to 18GHz)



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
44.550	34.80	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
654.680	38.72	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2336.533	45.49	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4820.680	45.67	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8498.200	45.62	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12603.840	46.39	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

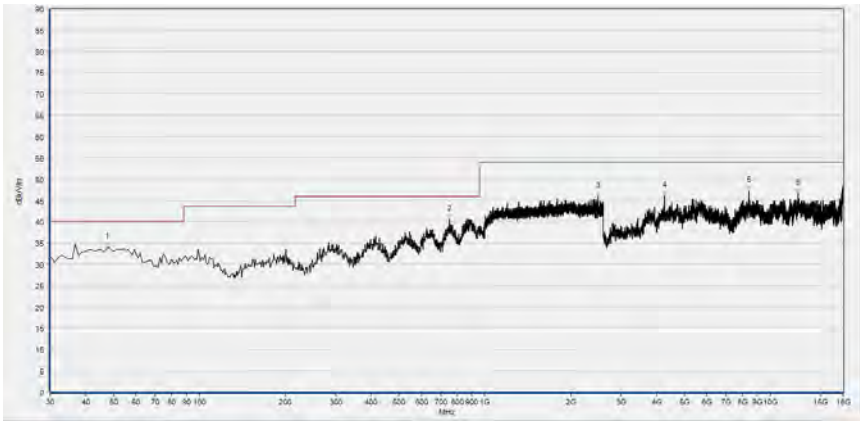
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 7



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
45.520	34.63	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
746.830	40.61	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2384.000	45.65	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4186.200	45.13	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5692.320	46.51	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
14439.520	45.87	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

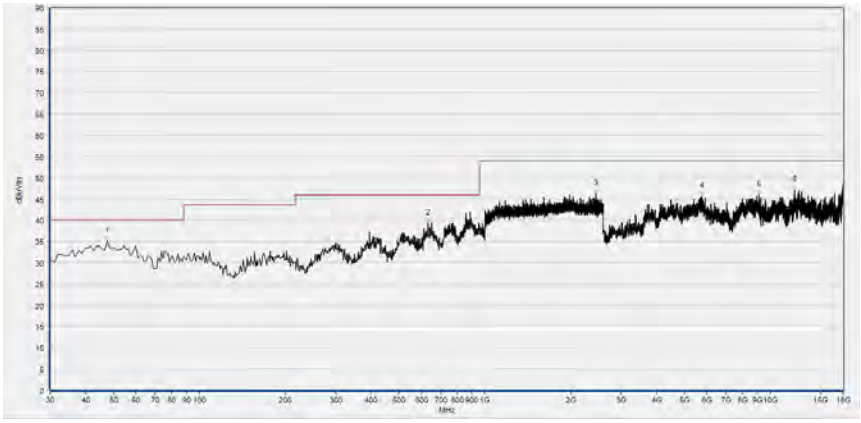
(Antenna Horizontal, 30MHz to 18GHz)



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
47.460	34.03	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
752.650	40.59	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2490.133	45.99	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4269.360	46.05	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8411.960	47.18	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12508.360	46.54	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

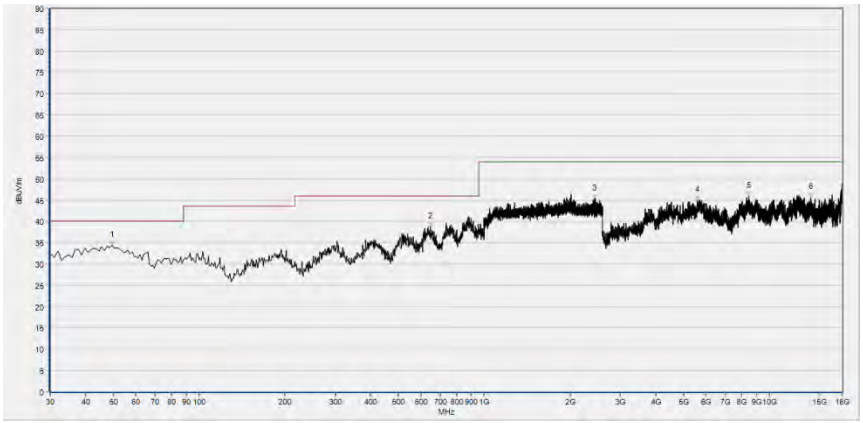
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 13



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
47.460	35.09	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
634.310	39.26	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2451.733	46.19	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5741.600	45.65	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
9101.880	45.99	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12175.720	47.02	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)

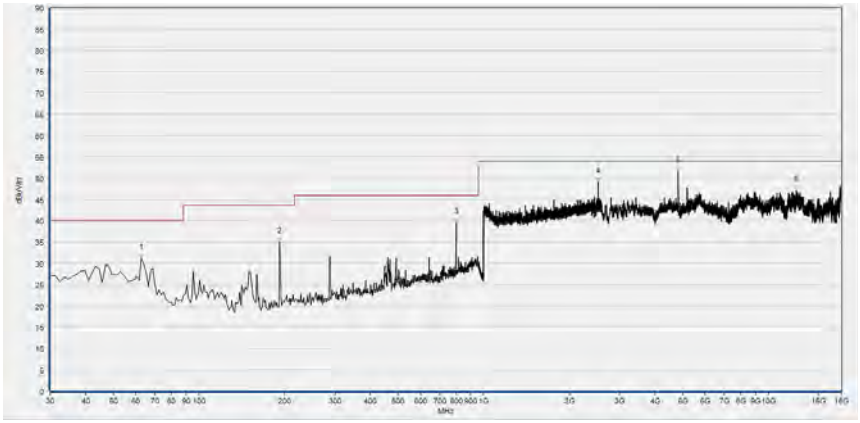


Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
49.400	34.36	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
645.950	38.70	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2442.133	45.30	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5590.680	44.87	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8470.480	46.00	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
13980.600	45.57	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

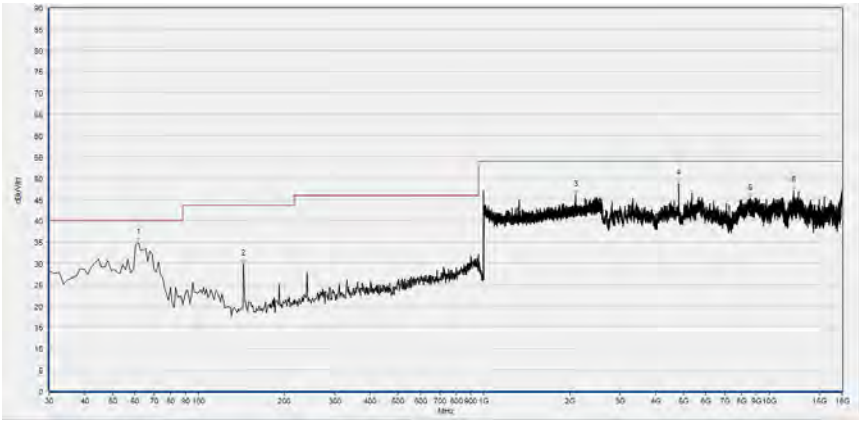
802.11ax (HEW20)(RU26) Mode

Plot for Channel 1



Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
62.778	31.19	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
191.464	35.10	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
800.901	39.57	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2516.126	49.09	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4824.100	51.62	N/A	45.66	74.00	N/A	54.00	Horizontal	PASS
12516.603	47.12	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

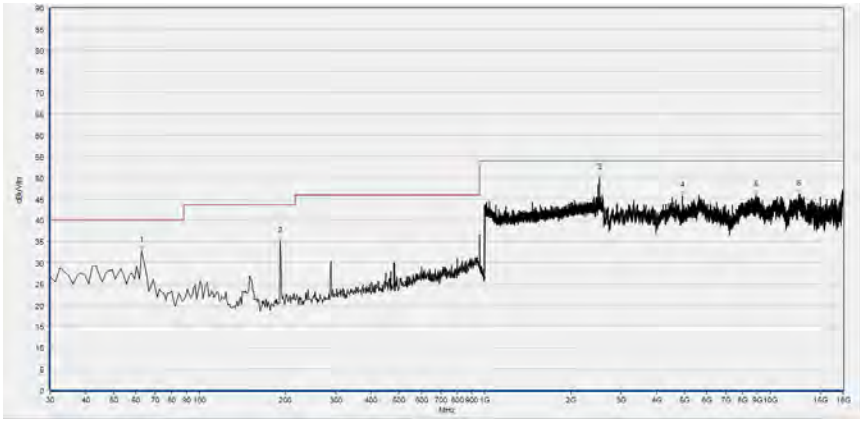
(Antenna Horizontal, 30MHz to 18GHz)



Fre. (MHz)	PK (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
61.564	34.87	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
144.118	29.89	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
2096.118	46.01	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4823.604	48.72	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8567.885	45.22	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12191.744	47.15	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

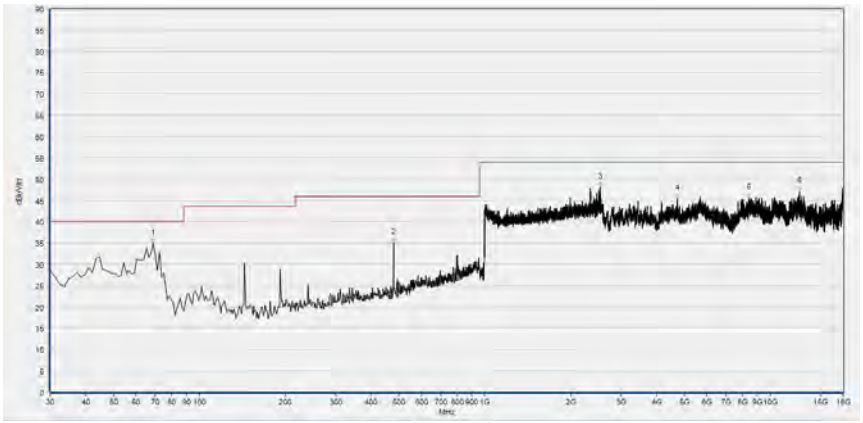
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 7



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
62.778	32.89	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
191.464	35.01	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
2521.889	49.89	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4716.423	45.80	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8903.946	46.00	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12620.222	46.09	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

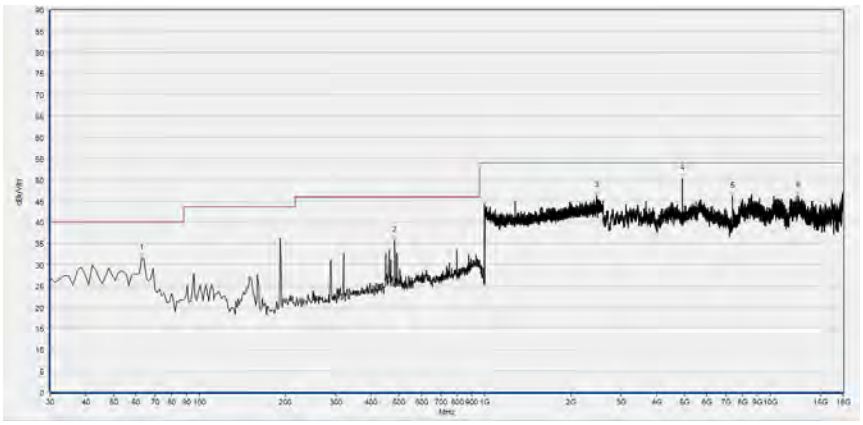
(Antenna Horizontal, 30MHz to 18GHz)



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
68.849	34.83	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
479.186	35.03	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2534.054	48.07	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4719.985	45.45	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8402.655	45.63	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12651.027	47.02	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

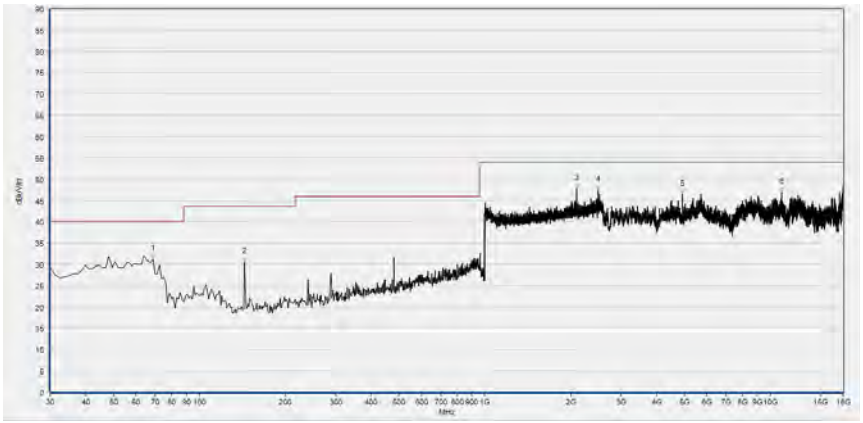
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel 13



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
62.778	31.52	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
482.829	35.75	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2461.064	46.34	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4924.423	50.34	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
7386.070	46.14	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12547.409	46.26	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)



Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
68.849	31.09	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
144.118	30.55	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
2095.478	47.72	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2498.199	47.35	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4924.423	46.48	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
10967.921	46.93	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

Annex A Test Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for test performed on the EUT as specified in CISPR 16-1-2:

Test items	Uncertainty
Peak Output Power	±2.22dB
Power spectral density (PSD)	±2.22dB
Bandwidth	±5%
Conducted Spurious Emission	±2.77dB
Restricted Frequency Bands	±5%
Radiated Emission	±2.95dB
Conducted Emission	±2.44dB

This uncertainty represent an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2

Annex B Testing Laboratory Information

1. Identification of the Responsible Testing Laboratory

Laboratory Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Laboratory Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
Telephone:	+86 755 36698555
Facsimile:	+86 755 36698525

2. Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China

3. Facilities and Accreditations

All measurement facilities used to collect the measurement data are located at FL.3, Building A, FeiYang Science Park, Block 67, BaoAn District, Shenzhen, 518101 P. R. China. The test site is constructed in conformance with the requirements of ANSI C63.10-2013 and CISPR Publication 22; the FCC designation number is CN1192, the test firm registration number is 226174.

4. Test Equipments Utilized

4.1 Conducted Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Due Date
Attenuator 1	(N/A.)	10dB	Resent	N/A	N/A
EXA Signal Analyzer	MY53470836	N9010A	Agilent	2021.03.25	2022.03.24
				2022.03.01	2023.02.28
USB Wideband Power Sensor	MY54210011	U2021XA	Agilent	2021.03.25	2022.03.24
				2022.03.01	2023.02.28
RF cable (30MHz-26GHz)	CB01	RF01	Morlab	N/A	N/A
Coaxial cable	CB02	RF02	Morlab	N/A	N/A
SMA connector	CN01	RF03	HUBER-SUHNER	N/A	N/A
Computer	T430i	Think Pad	Lenovo	N/A	N/A

4.2 Conducted Emission Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Due Date
Receiver	MY56400093	N9038A	KEYSIGHT	2021.03.09	2022.03.08
				2022.03.03	2023.03.02
LISN	8127449	NSLK 8127	Schwarzbeck	2021.03.09	2022.03.08
				2022.03.03	2023.03.02
Pulse Limiter (10dB)	VTSD 9561 F-B #206	VTSD 9561-F	Schwarzbeck	2021.07.21	2022.07.20
Coaxial Cable(BNC) (30MHz-26GHz)	CB01	EMC01	Morlab	N/A	N/A

4.3 List of Software Used

Description	Manufacturer	Software Version
Test system	Townsend	V2.6
Power Panel	Agilent	V3.8
MORLAB EMCR V1.2	MORLAB	V1.0
TS+ -[JS32-CE]	Tonscend	V2.5.0.0

4.4 Radiated Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Due Date
Receiver	MY54130016	N9038A	Agilent	2021.07.16	2022.07.15
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2019.05.24	2022.05.23
Test Antenna - Loop	1519-022	FMZB1519	Schwarzbeck	2022.02.11	2025.02.10
Test Antenna – Horn	01774	BBHA 9120D	Schwarzbeck	2019.07.26	2022.07.25
Test Antenna – Horn	BBHA9170 #774	BBHA9170	Schwarzbeck	2019.07.26	2022.07.25
Coaxial cable (N male) (9kHz-30MHz)	CB04	EMC04	Morlab	N/A	N/A
Coaxial cable (N male) (30MHz-26GHz)	CB02	EMC02	Morlab	N/A	N/A
Coaxial cable (N male) (30MHz-26GHz)	CB03	EMC03	Morlab	N/A	N/A
Coaxial cable (N male) (30MHz-40GHz)	CB05	EMC05	Morlab	N/A	N/A
1-18GHz pre-Amplifier	61171/61172	S020180L3203	Tonscend	2021.07.16	2022.07.15
18-26.5GHz pre-Amplifier	46732	S10M100L3802	Tonscend	2021.07.16	2022.07.15
26-40GHz pre-Amplifier	56774	S40M400L4002	Tonscend	2021.07.16	2022.07.15
Notch Filter	N/A	WRCG-2400-2483.5-60SS	Wainwright	2021.07.16	2022.07.15
Anechoic Chamber	N/A	9m*6m*6m	CRT	2020.01.06	2023.01.05

END OF REPORT