TEST REPORT

APPLICANT	:	Reliance Communications LLC
PRODUCT NAME	:	Orbic Speed X
MODEL NAME	:	RC400LX
BRAND NAME	:	Orbic, Kajeet
FCC ID		2ABGH-RC400LX
STANDARD(S)	:	47 CFR Part 15 Subpart C
RECEIPT DATE	:	2020-04-16
TEST DATE	:	2020-04-20 to 2020-04-23
ISSUE DATE	:	2020-07-11

Edited by: Peng Mi (Rapporteur)

Approved by: Peng Huarui (Supervisor)

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Change History		
Version	Date	Reason for change
1.0	2020-07-11	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:	Unimaxcomm
Manufacturer Address:	Room 602, Floor 6th, Building B, Software Park T3,Hi-Tech Park South, Nanshan District, Shenzhen, P.R. China

1.2. Equipment Under Test (EUT) Description

Product Name:	Orbic Speed X	
Serial No.:	(N/A, marked #1 by test site)	
Hardware Version:	V1.1	
Software Version:	ORB400LX_V1.0.2_BVZNAKJ	
Equipment Type:	WLAN2.4G	
Modulation Type:	DSSS, OFDM	
Operating Frequency Range:	802.11b/g/ n(HT20): 2.412GHz - 2.462GHz 802.11 n(HT40): 2.422GHz - 2.452GHz	
Antenna Type:	PIFA Antenna	
Antenna Gain:	2.00dBi	
Accessory Information:	Battery	
	Brand Name:	Orbic
	Model No.:	BTE-3003
	Serial No.:	(N/A, marked #1 by test site)
	Capacity:	3000mAh
	Rated Voltage:	3.7V
	Charge Limit:	4.2V

Accessory Information:	AC Adapter	
	Brand Name:	Orbic
	Model No.:	TPA-5950100UU
	Serial No.:	(N/A, marked #1 by test site)
	Rated Output:	5.0V⎓1A
	Rated Input:	100-240V~50/60Hz, 0.2A

Note 1: This test report is updated from report (Report No.: SZ20040157W03, FCC ID:2ABGH-RC400L), based on the similarity between before, modify the product name, model, software and hardware version; also add a brand; add 3G/4G RF front end components (Added UMTS Band 4 and LTE Band 7/12/14/17/25/26/30/41/71);disable LTE Band 13 (Remove LTE Band 13 components); disable WiFi MIMO function and change to SISO (Remove one WiFi connector and related components), the WiFi chip and circuit are the same as before, the other are all the same. The changes do not affect the test results.

Note2: We use the dedicated software to control the EUT continuous transmission.

Note3: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

1.3. The Channel Number and Frequency

Test Mode	Channel	Frequency (MHz)	Channel	Frequency (MHz)
802.11b/g/ n(HT20)	**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)**
n(HT40)	**3**	**2422**	8	2447
	4	2427	**9**	**2452**
	5	2432		
	6	**2437**		
	7	2442		

Note1: The Lowest Channel (1), Middle Channel (6) and Highest Channel (11) was selected test for 802.11b/g/n(HT20) mode;

Note2: The Lowest Channel (3), Middle Channel (6) and Highest Channel (9) was selected test forn(HT40) mode;

1.4. 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	Apr20, 2020	Tu Yanan	PASS	No deviation
3	15.247(b)	Maximum Peak and Average Conducted Output Power	Apr 20, 2020	Tu Yanan	PASS	No deviation
4	15.247(a)	Bandwidth	Apr 20, 2020	Tu Yanan	PASS	No deviation
5	15.247(d)	Conducted Spurious Emission and Band Edge	Apr 20, 2020	Tu Yanan	PASS	No deviation
6	15.247(e)	Power spectral density (PSD)	Apr 20, 2020	Tu Yanan	PASS	No deviation
7	15.207	Conducted Emission	Apr23, 2020	Huang Zhiye	PASS	No deviation
8	15.247(d)	Restricted Frequency Bands	Apr 20&21, 2020	Li Zihao	PASS	No deviation
9	15.209, 15.247(d)	Radiated Emission	Apr 18&19, 2020	Li Zihao	PASS	No deviation

Note1: The tests were performed according to the method of measurements prescribed in ANSIC63.10-2013, KDB558074 D01 v05r02 and KDB662911 D01v02r01.

Note2: 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.

Note3: 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.

1.5. 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. Result: Compliant

The EUT has a permanently and irreplaceable attached antenna. Please refer to the EUT internal photos.

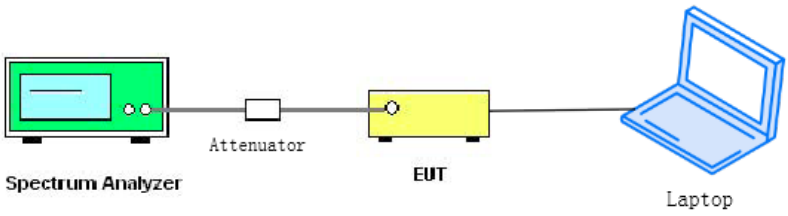
2.2. Duty Cycle of Test Signal

2.2.1. Requirement

Preferably, all measurements of maximum conducted (average) output power will be performed with theEUT transmitting continuously (i.e., with a duty cycle of greater than or equal to 98%).When continuousoperation cannot be realized, then the use of sweep triggering/signal gating techniques can be used toensure that measurements are made only during transmissions at the maximum power control level. Suchsweep 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 testedmode of operation. Sweep triggering/signal gating techniques can then be used if the measurement/sweeptime 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 sub clause, theduty cycle refers to the fraction of time over which the transmitter is ON and is transmitting at its maximumpower 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:



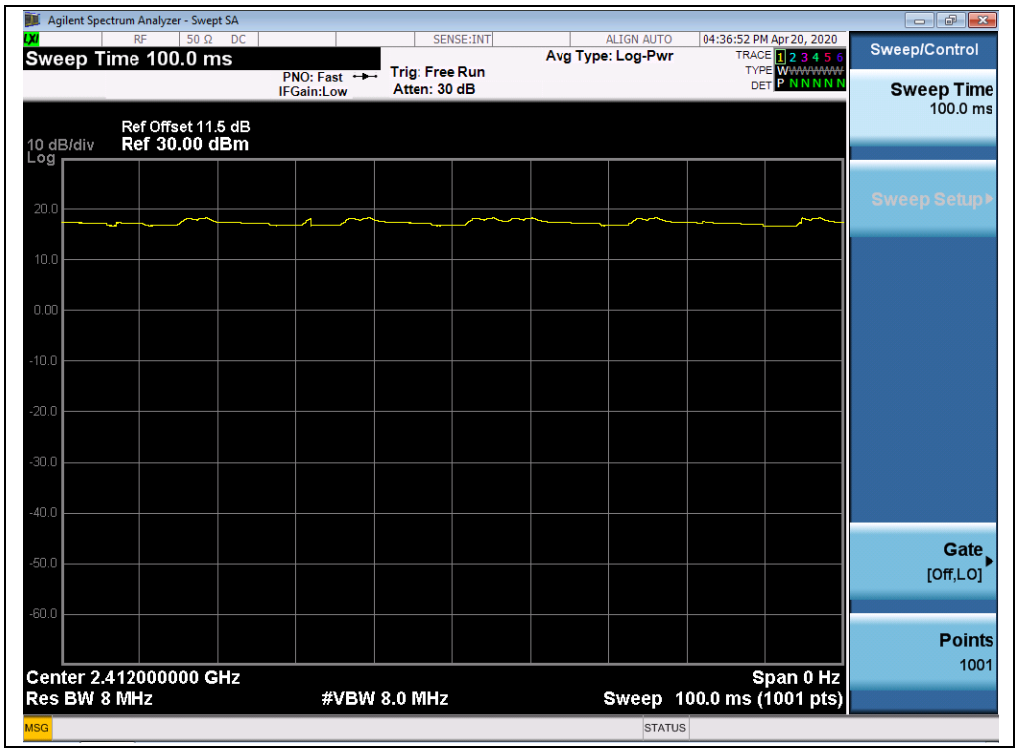
ANSI C63.10 2013 Clause 11.6 was used in order to prove compliance.

2.2.3. Test Result

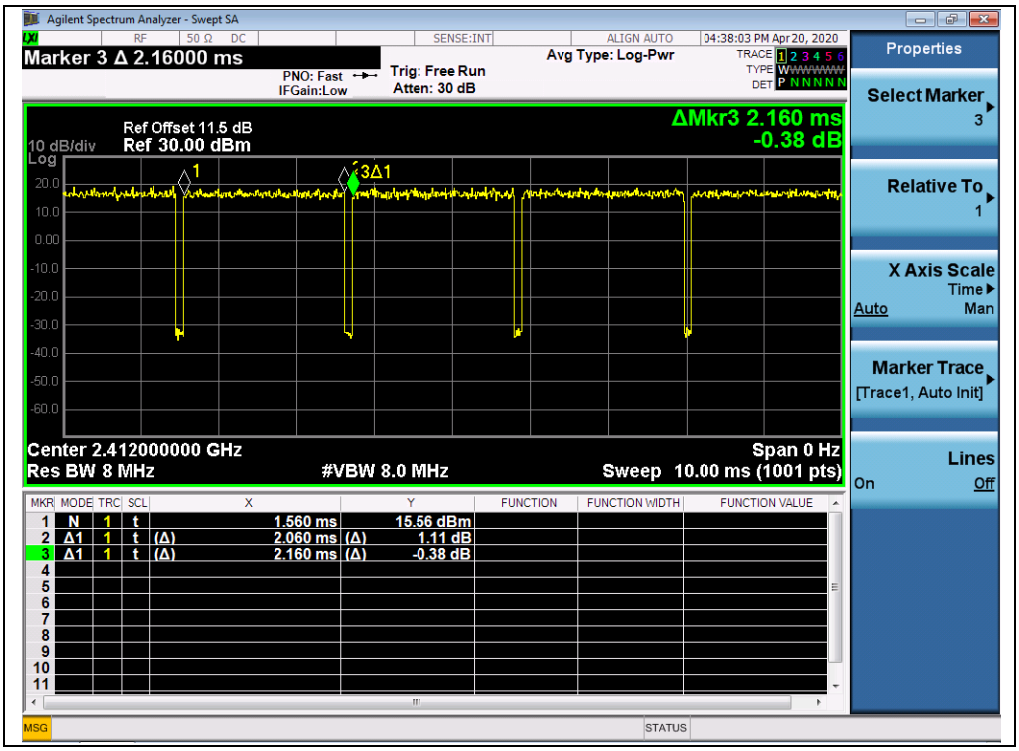
A. Test Verdict:

Test Mode	Duty Cycle(%) (D)	Duty Factor (10*lg[1/D])
802.11b	100.00	0.00
802.11g	95.37	0.21
802.11n(HT20)	94.58	0.24
802.11n(HT40)	90.91	0.41

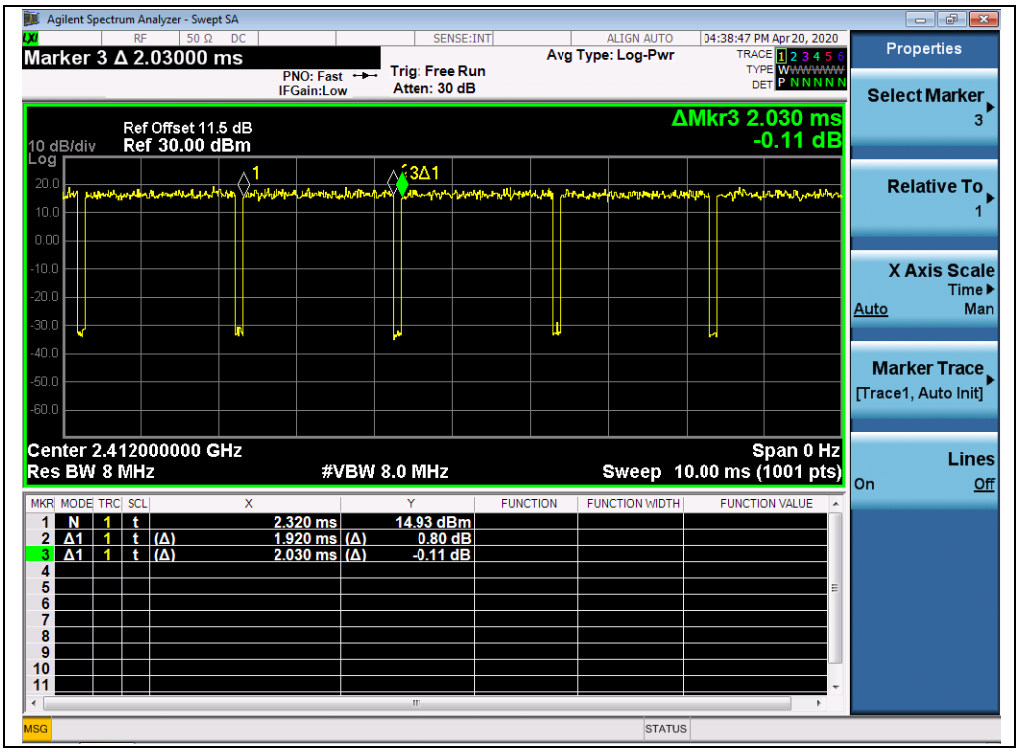
B. Test Plots



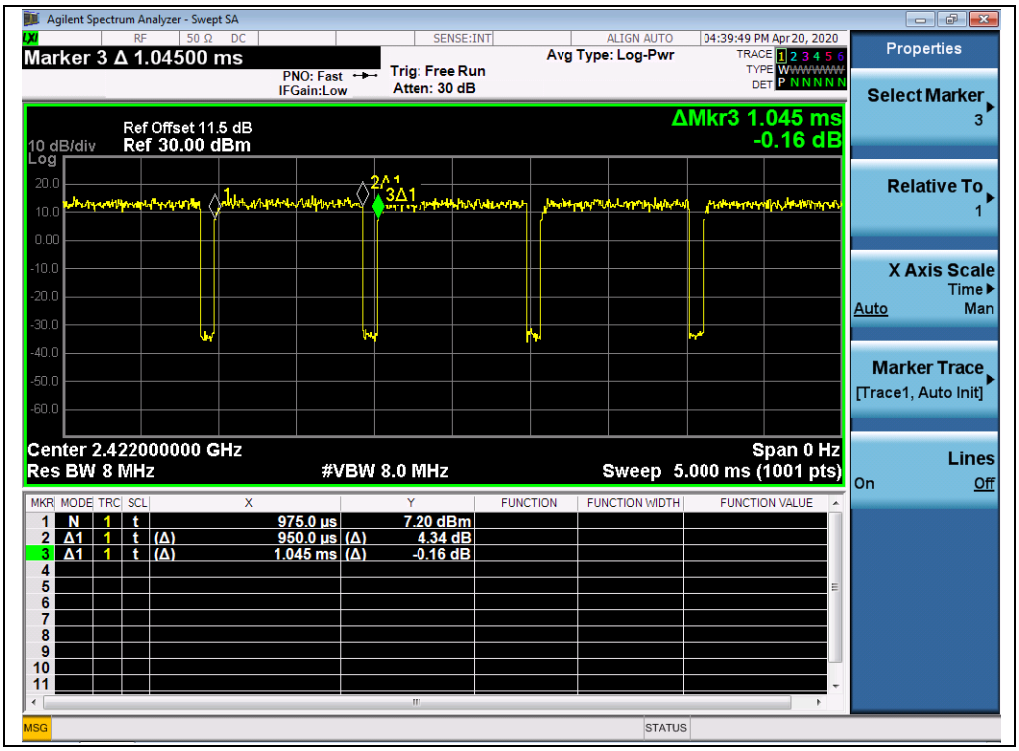
(Channel 1, 2412MHz, 802.11b)



(Channel 1, 2412MHz,802.11g)



(Channel 1, 2412MHz, 802.11n(HT20))



(Channel 3, 2422MHz, 802.11n(HT40))

2.3. Maximum Peak and Average Conducted Output Power

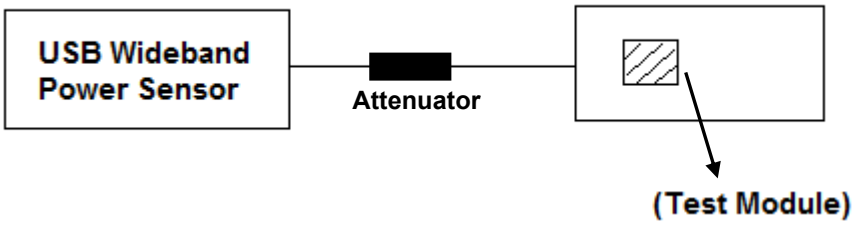
2.3.1. Requirement

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 Test Mode

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
1	2412	16.28	0.042	30	1	PASS
6	2437	16.54	0.045			PASS
11	2462	16.52	0.045			PASS

802.11g Test Mode

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
1	2412	16.28	0.042	30	1	PASS
6	2437	16.54	0.045			PASS
11	2462	16.52	0.045			PASS

802.11n(HT20) Test Mode

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
1	2412	19.71	0.094	30	1	PASS
6	2437	19.78	0.095			PASS
11	2462	19.98	0.100			PASS

802.11n(HT40) Test Mode

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
3	2422	20.23	0.105	30	1	PASS
6	2437	20.27	0.106			PASS
9	2452	20.15	0.104			PASS

Maximum Average Conducted Output Power

802.11b Test Mode

Channel	Frequency (MHz)	Average Power				Limit		Verdict
		Measured	Duty Factor	Duty factor Calculated				
		dBm		dBm	W	dBm	W	
1	2412	13.68	0.00	13.68	0.023	30	1	PASS
6	2437	13.85		13.85	0.024			PASS
11	2462	13.86		**13.86**	**0.024**			PASS

802.11g Test Mode

Channel	Frequency (MHz)	Average Power				Limit		Verdict
		Measured	Duty Factor	Duty factor Calculated				
		dBm		dBm	W	dBm	W	
1	2412	13.15	0.21	13.36	0.022	30	1	PASS
6	2437	13.33		13.54	0.023			PASS
11	2462	13.26		13.47	0.022			PASS

802.11n(HT20) Test Mode

Channel	Frequency (MHz)	Average Power				Limit		Verdict
		Measured	Duty Factor	Duty factor Calculated				
		dBm		dBm	W	dBm	W	
1	2412	13.02	0.24	13.26	0.021	30	1	PASS
6	2437	13.19		13.43	0.022			PASS
11	2462	13.14		13.38	0.022			PASS

802.11n(HT40) Test Mode

Channel	Frequency (MHz)	Average Power				Limit		Verdict
		Measured	Duty Factor	Duty factor Calculated				
		dBm		dBm	W	dBm	W	
3	2422	13.25	0.41	13.66	0.023	30	1	PASS
6	2437	13.34		13.75	0.024			PASS
9	2452	13.05		13.46	0.022			PASS

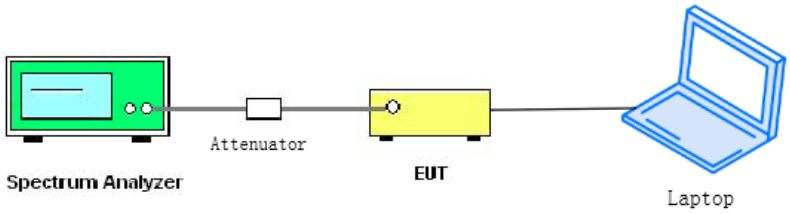
2.4. Bandwidth

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.

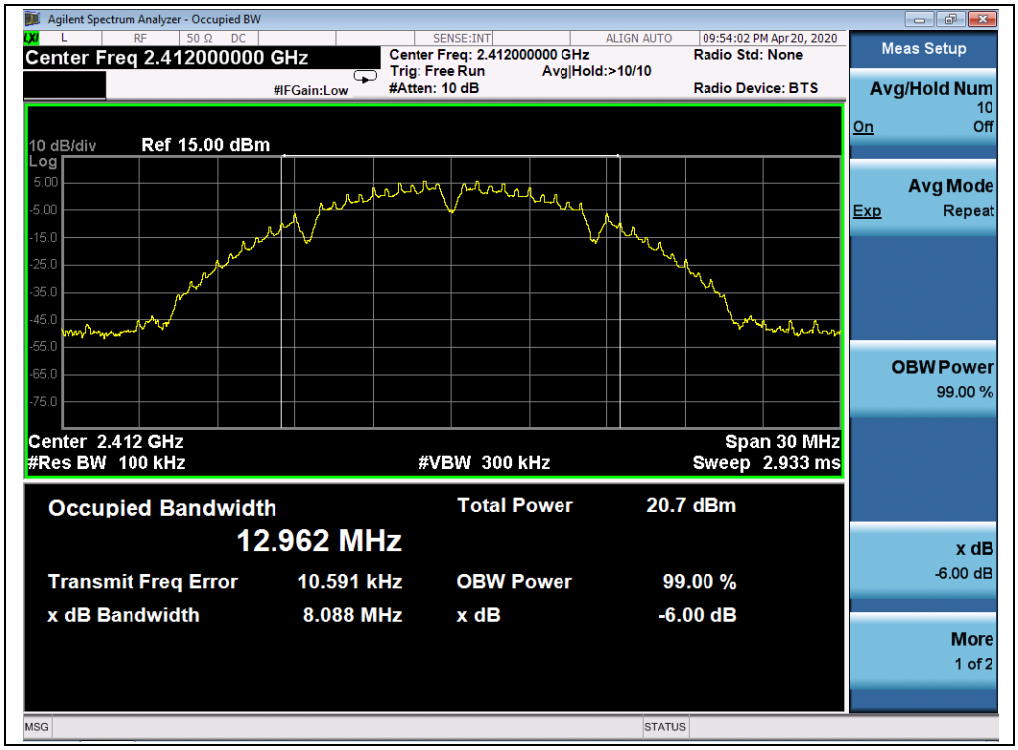
2.4.4. Test Result

802.11b Test Mode

A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits(kHz)	Result
1	2412	8.09	≥500	PASS
6	2437	8.09	≥500	PASS
11	2462	8.09	≥500	PASS

B. Test Plots



(Channel 1, 802.11b)

(Channel 6, 802.11b)

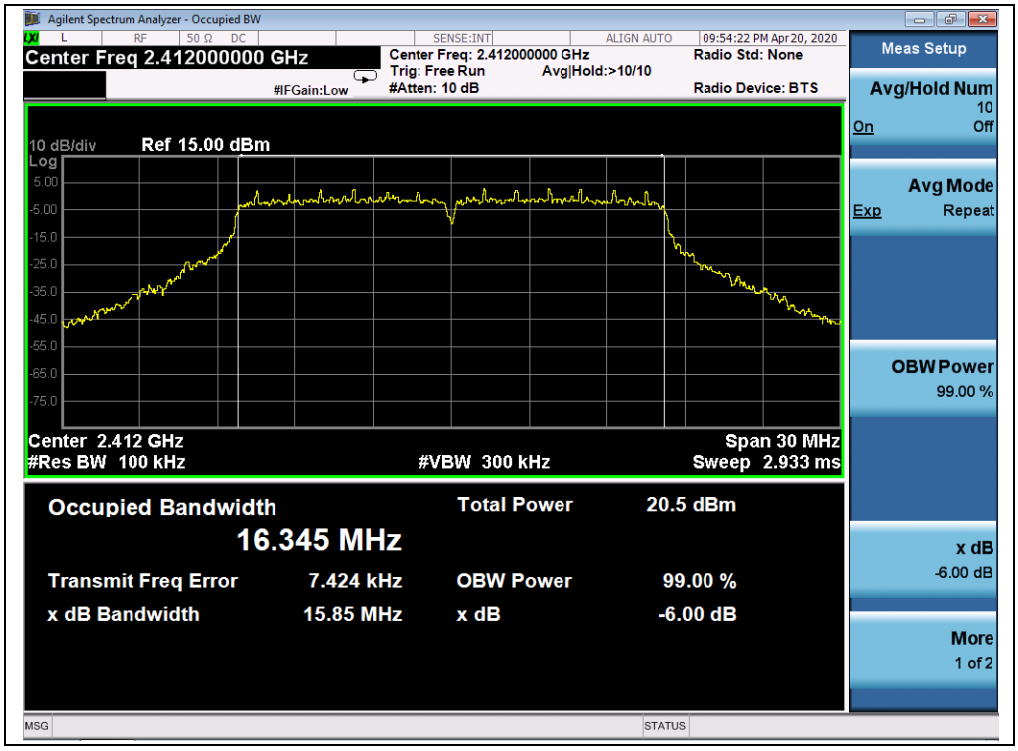
(Channel 11, 802.11b)

802.11g Test Mode

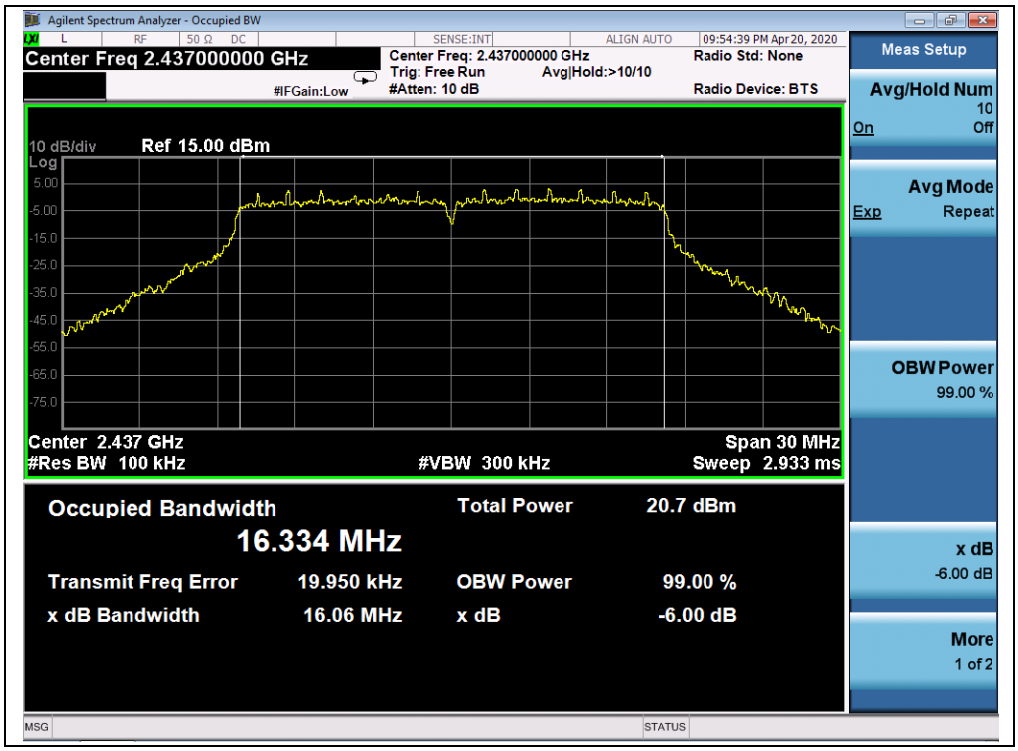
A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits (kHz)	Result
1	2412	15.85	≥500	PASS
6	2437	16.06	≥500	PASS
11	2462	15.96	≥500	PASS

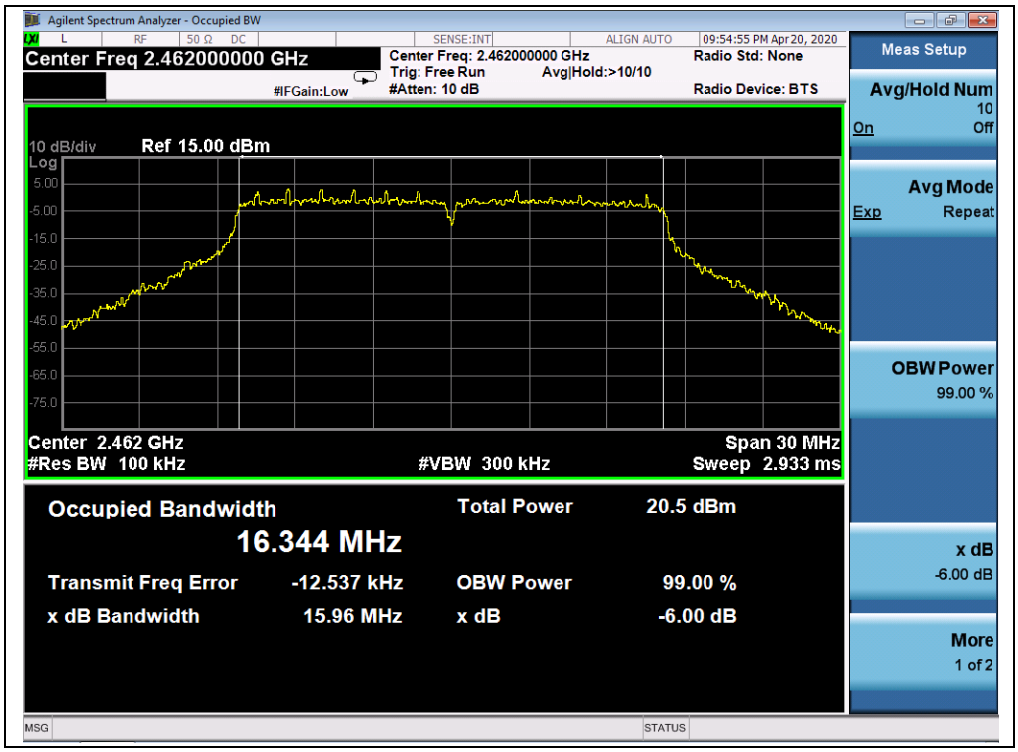
B. Test Plots:



(Channel 1, 802.11g)



(Channel 6, 802.11g)



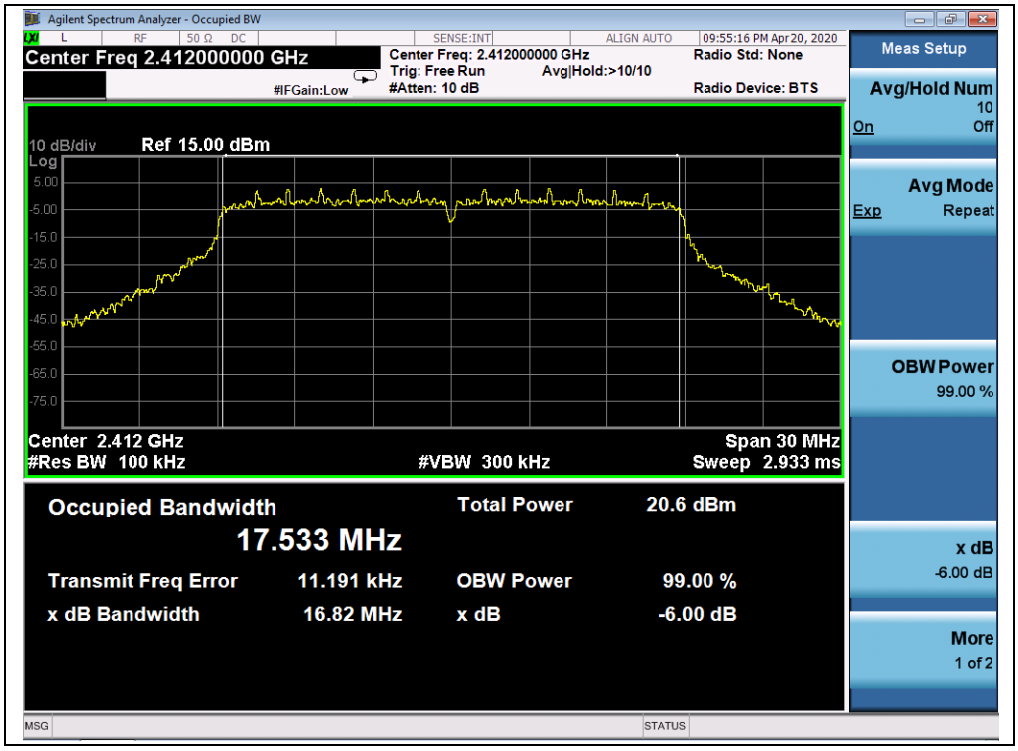
(Channel 11, 802.11g)

802.11n(HT20) Test Mode

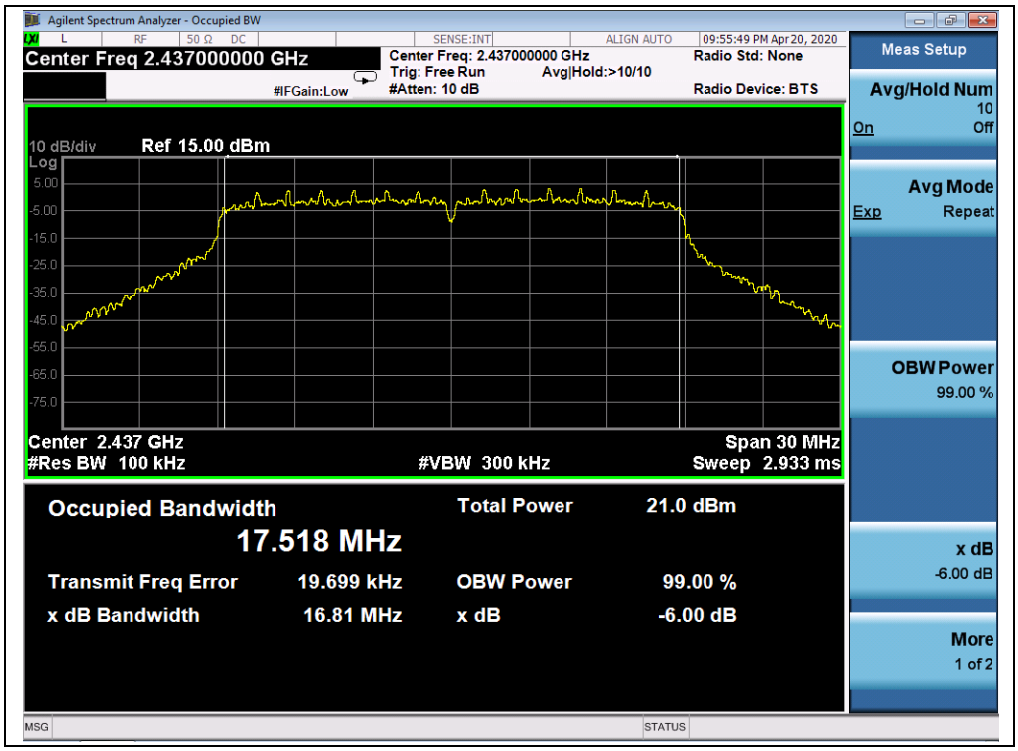
A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits (kHz)	Result
1	2412	16.82	≥500	PASS
6	2437	16.81	≥500	PASS
11	2462	16.36	≥500	PASS

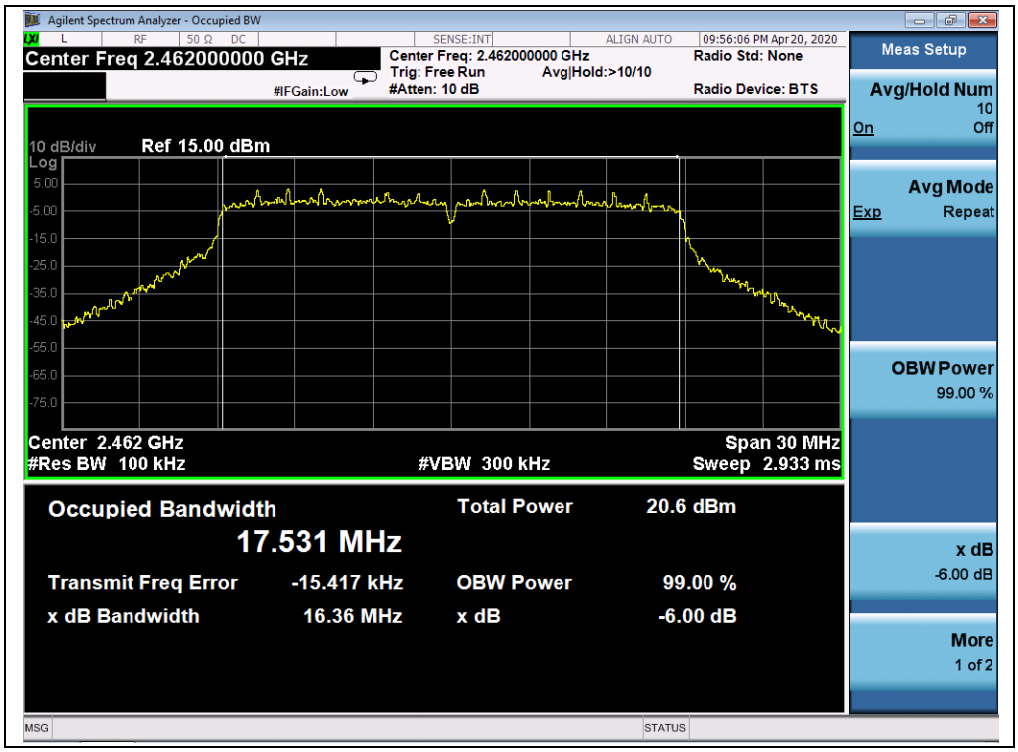
B. Test Plots:



(Channel 1, 802.11n(HT20))



(Channel 6, 802.11n(HT20))



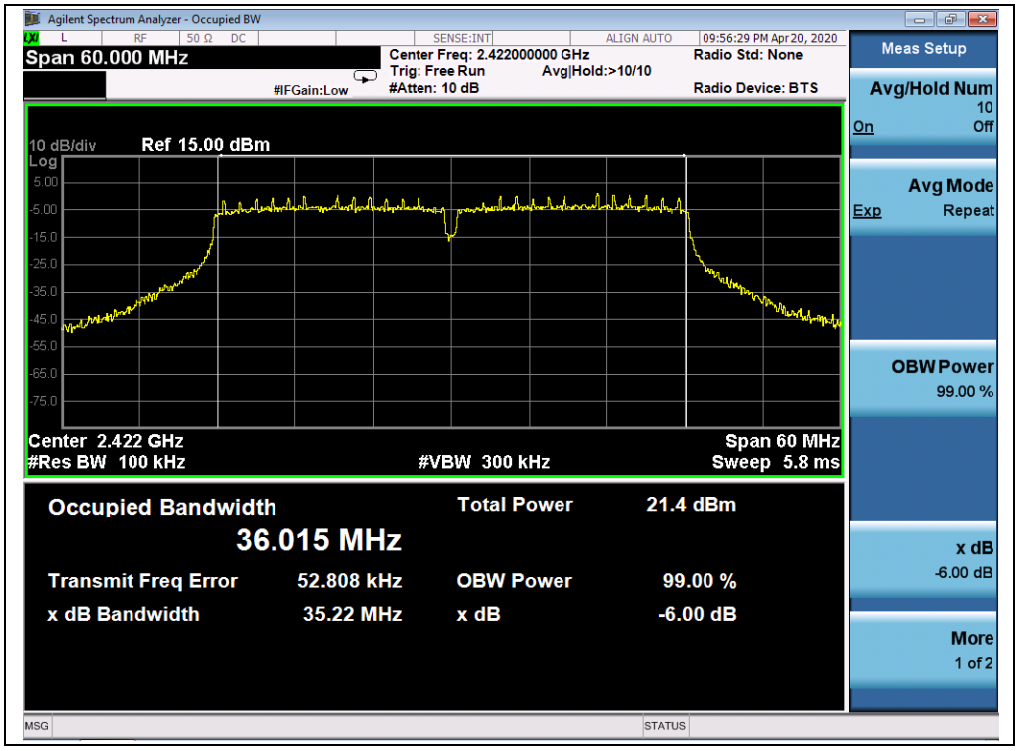
(Channel 11, 802.11n(HT20))

802.11n(HT40) Test Mode

A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits (kHz)	Result
3	2422	35.22	≥500	PASS
6	2437	35.23	≥500	PASS
9	2452	35.21	≥500	PASS

B. Test Plots:



(Channel 3, 802.11n(HT40))

(Channel 6, 802.11n(HT40))

(Channel 9,802.11n(HT40))

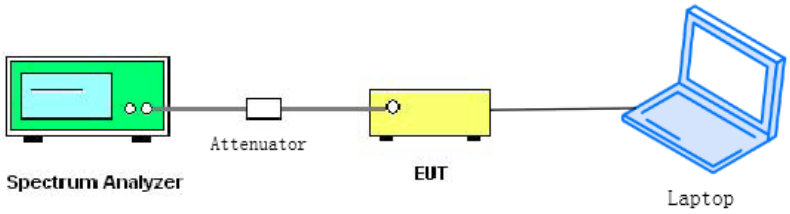
2.5. Conducted Spurious Emissions and Band Edge

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.

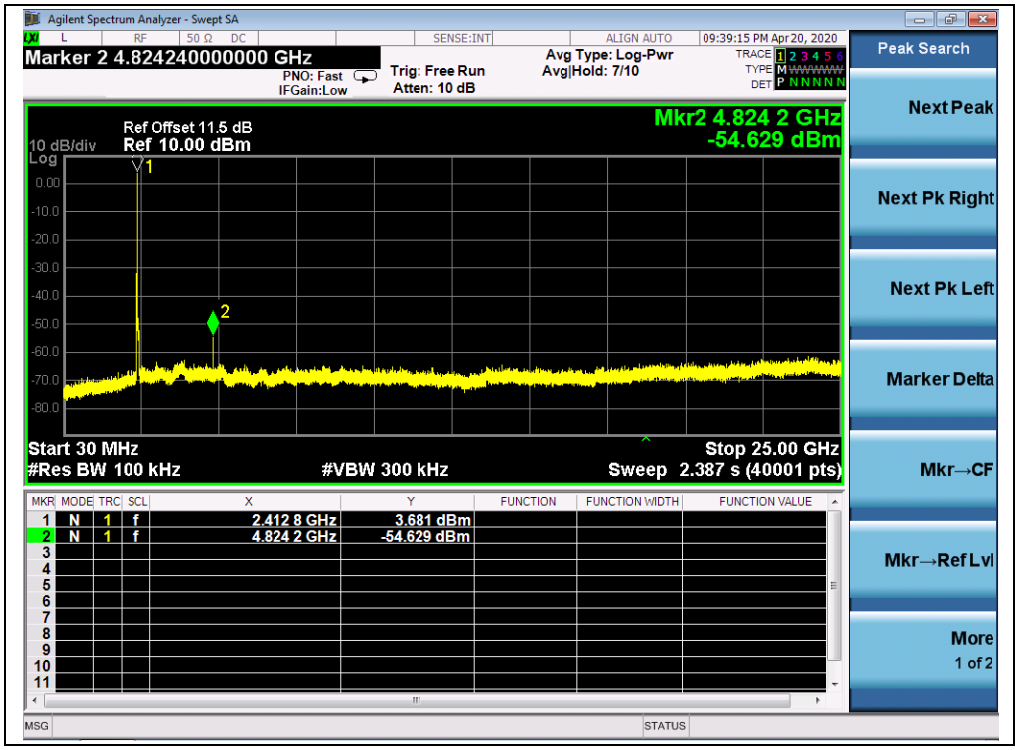
2.5.4. Test Result

802.11b Test Mode

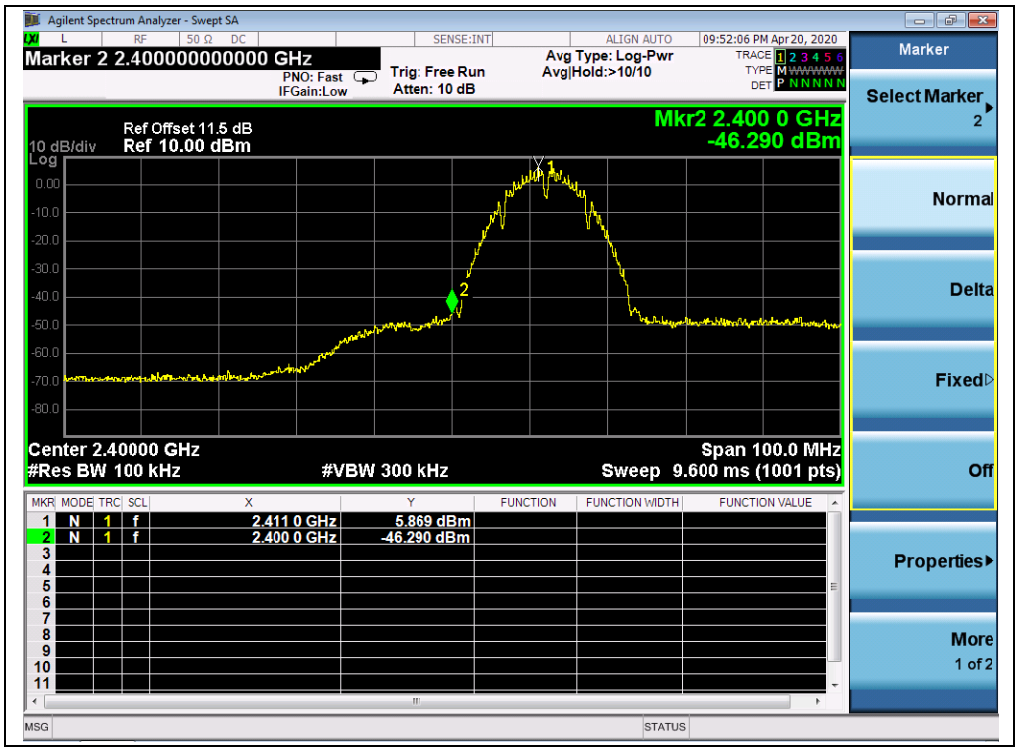
A. Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-54.63	3.68	-16.32	PASS
6	2437	-59.69	4.39	-15.61	PASS
11	2462	-54.45	5.91	-14.09	PASS

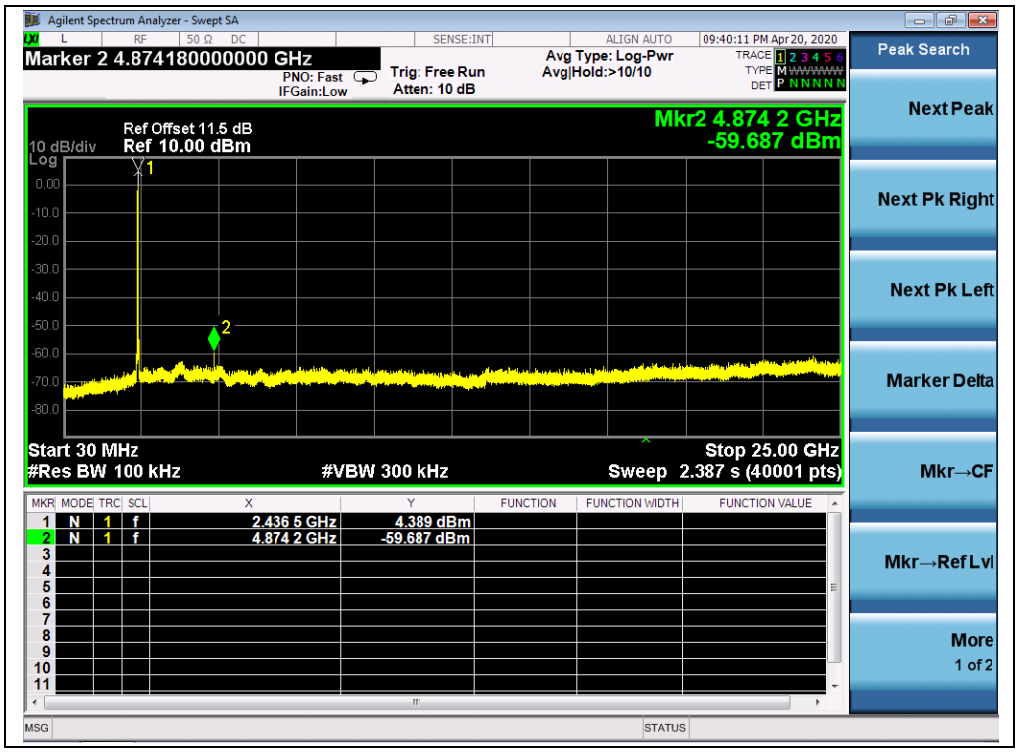
B. Test Plots:



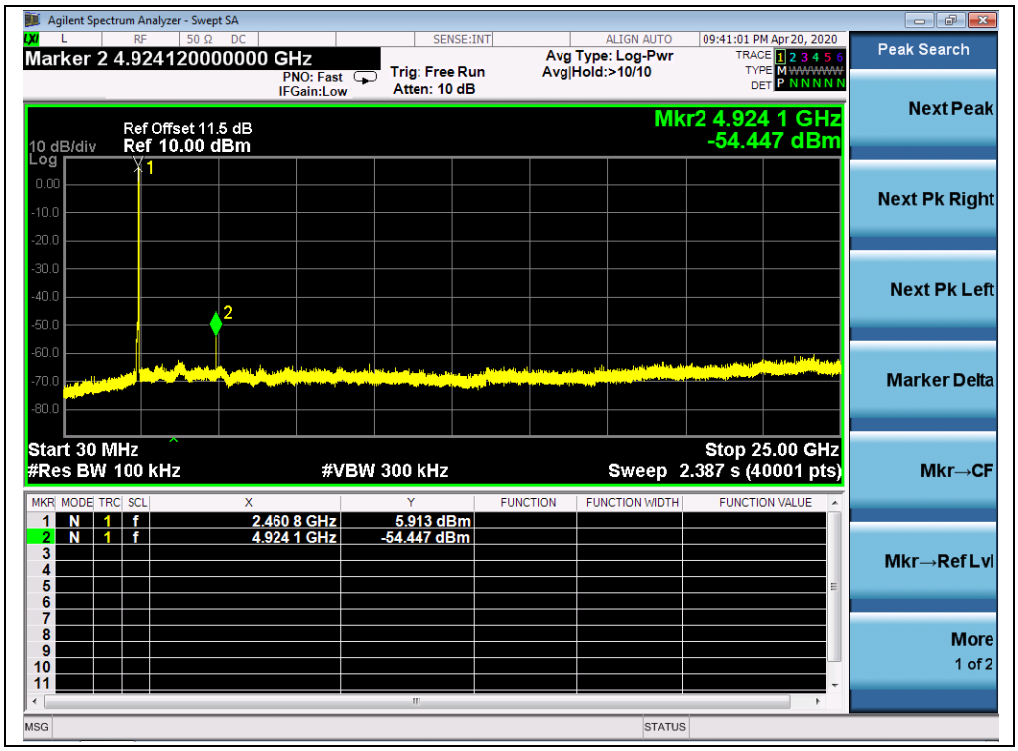
(Channel = 1, 30MHz to 25GHz)



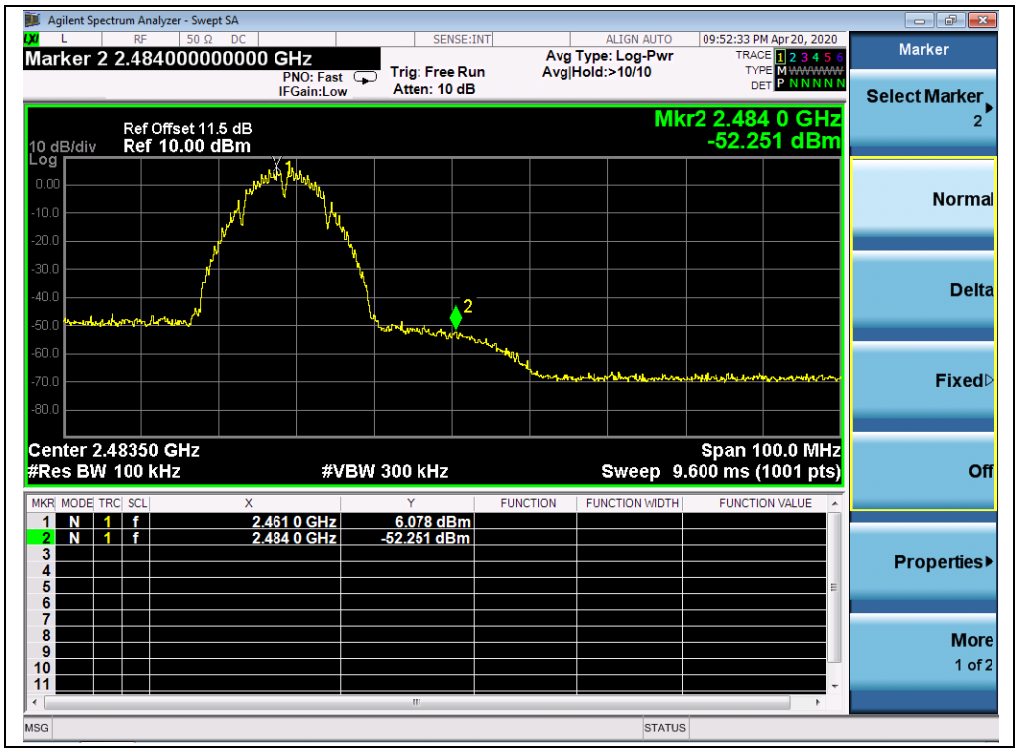
(Band Edge, Channel = 1)



(Channel = 6, 30MHz to 25GHz)



(Channel = 11, 30MHz to 25GHz)



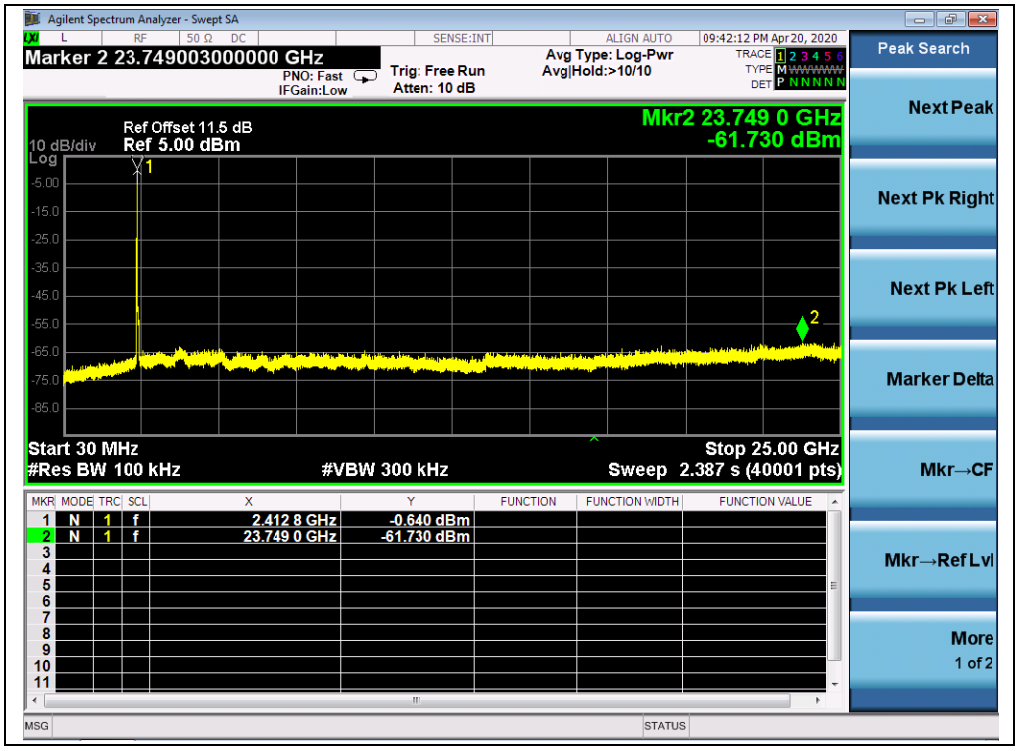
(Band Edge, Channel = 11)

802.11g Test Mode

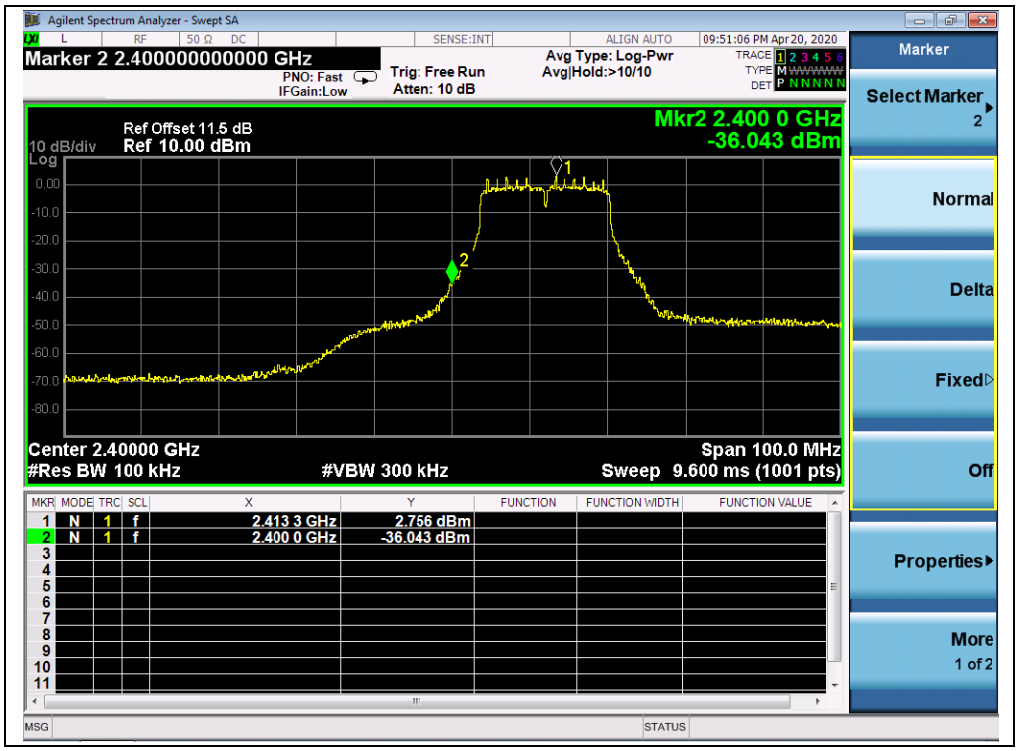
A. Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-61.73	-0.64	-20.64	PASS
6	2437	-61.06	-0.59	-20.59	PASS
11	2462	-60.96	-0.55	-20.55	PASS

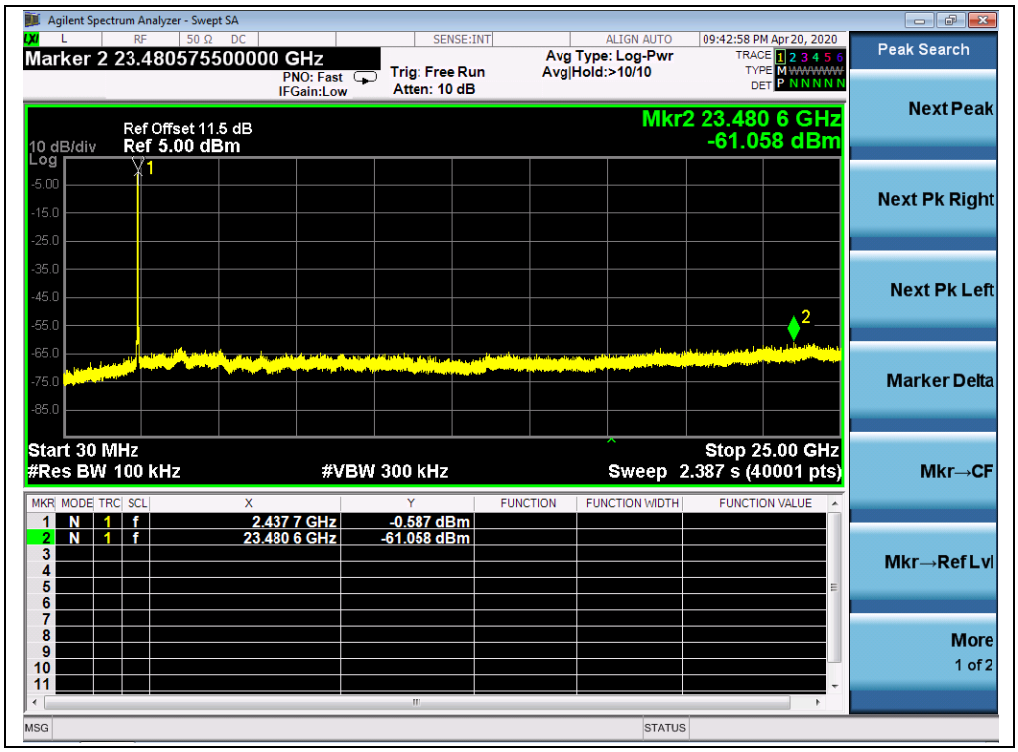
B. Test Plots:



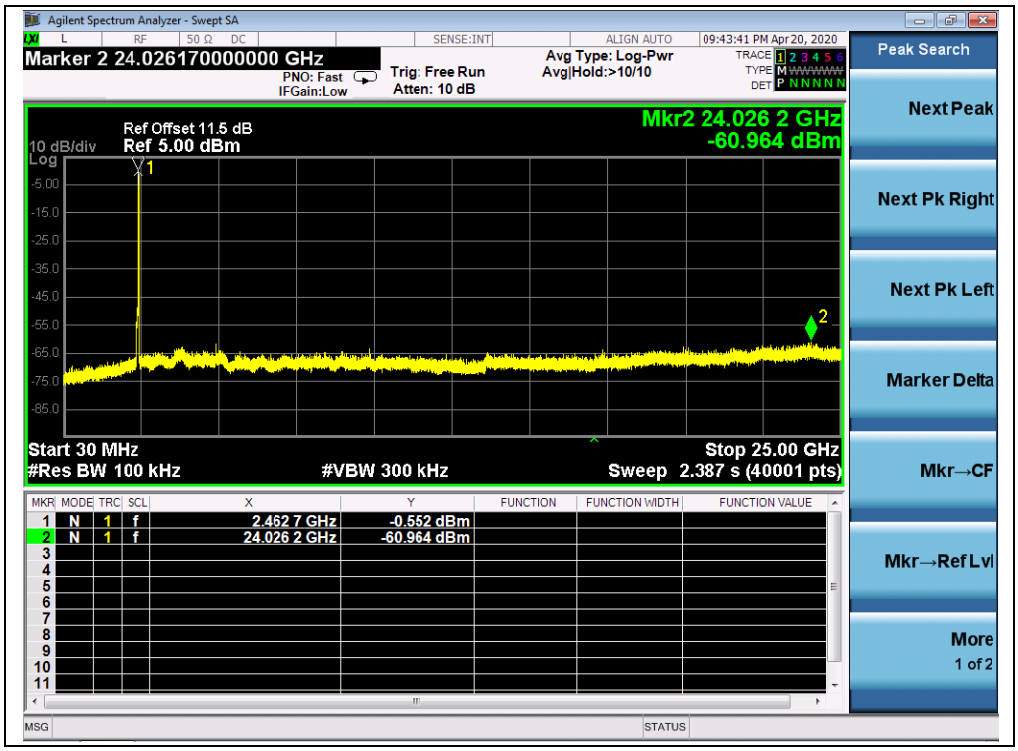
(Channel = 1, 30MHz to 25GHz)



(Band Edge, Channel = 1)



(Channel = 6, 30MHz to 25GHz)



(Channel = 11, 30MHz to 25GHz)

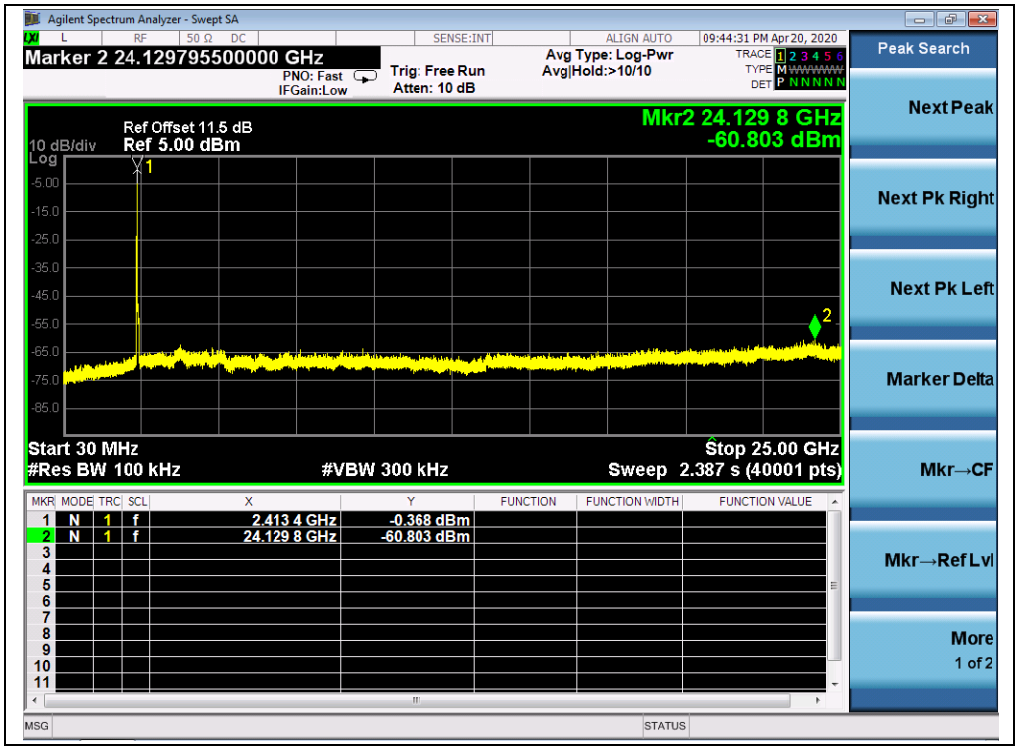
(Band Edge, Channel = 11)

802.11n(HT20) Test Mode

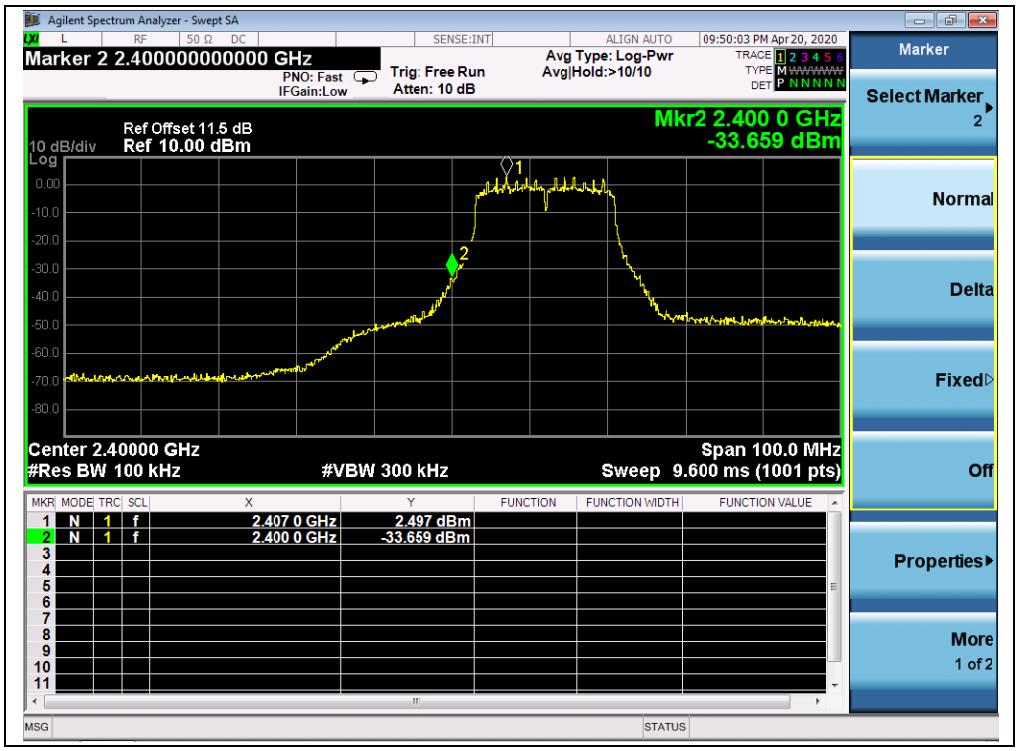
A. Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-60.80	-0.37	-20.37	PASS
6	2437	-61.19	2.06	-17.94	PASS
11	2462	-61.82	0.54	-19.46	PASS

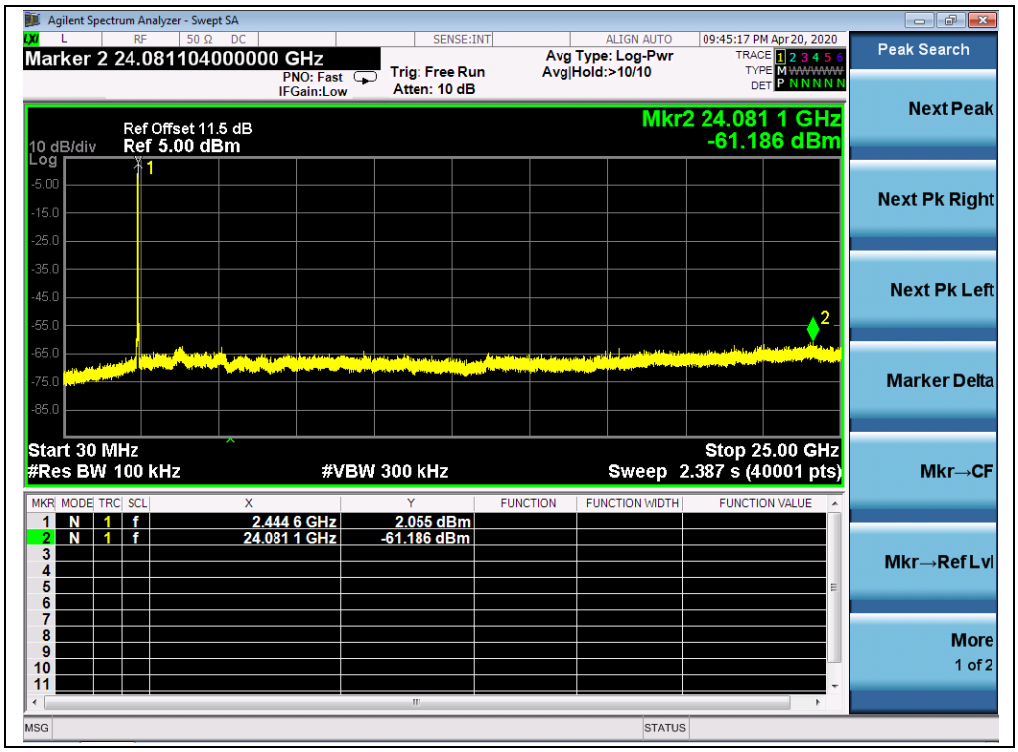
B. Test Plots:



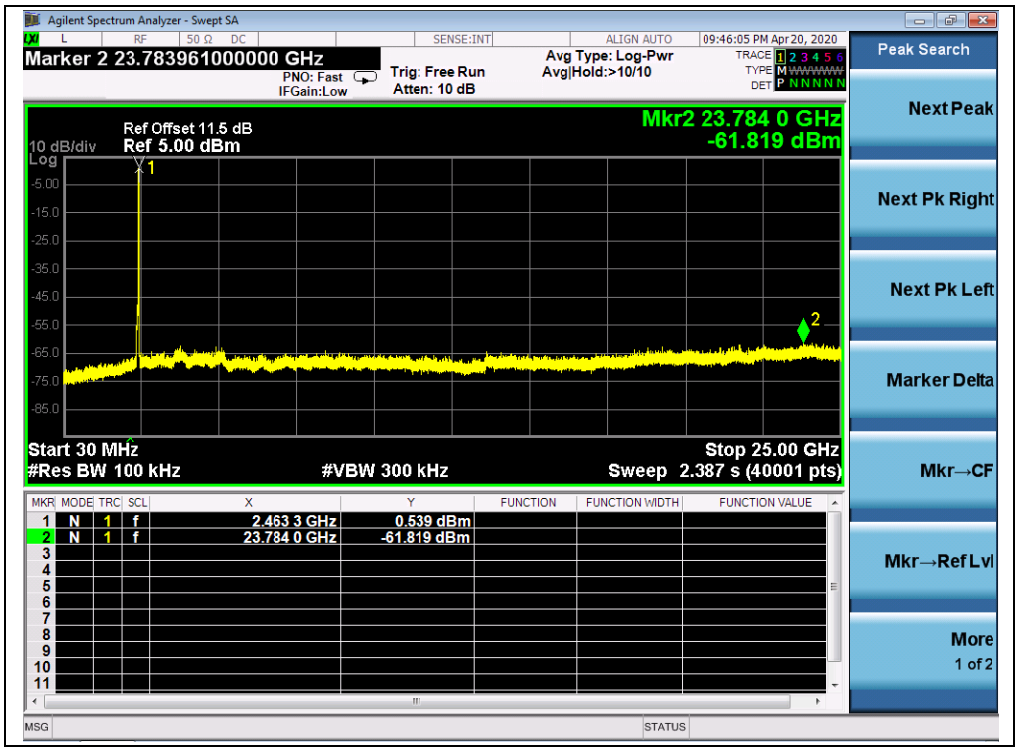
(Channel = 1, 30MHz to 25GHz)



(Band Edge, Channel = 1)



(Channel = 6, 30MHz to 25GHz)



(Channel = 11, 30MHz to 25GHz)

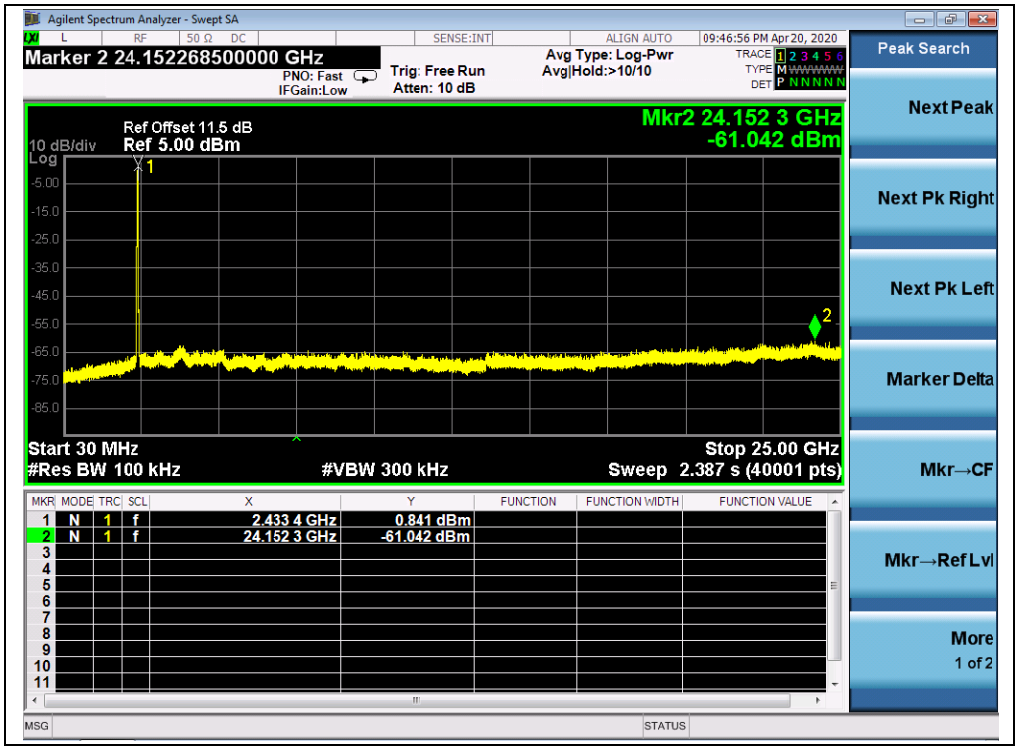
(Band Edge, Channel = 11)

802.11n(HT40) Test Mode

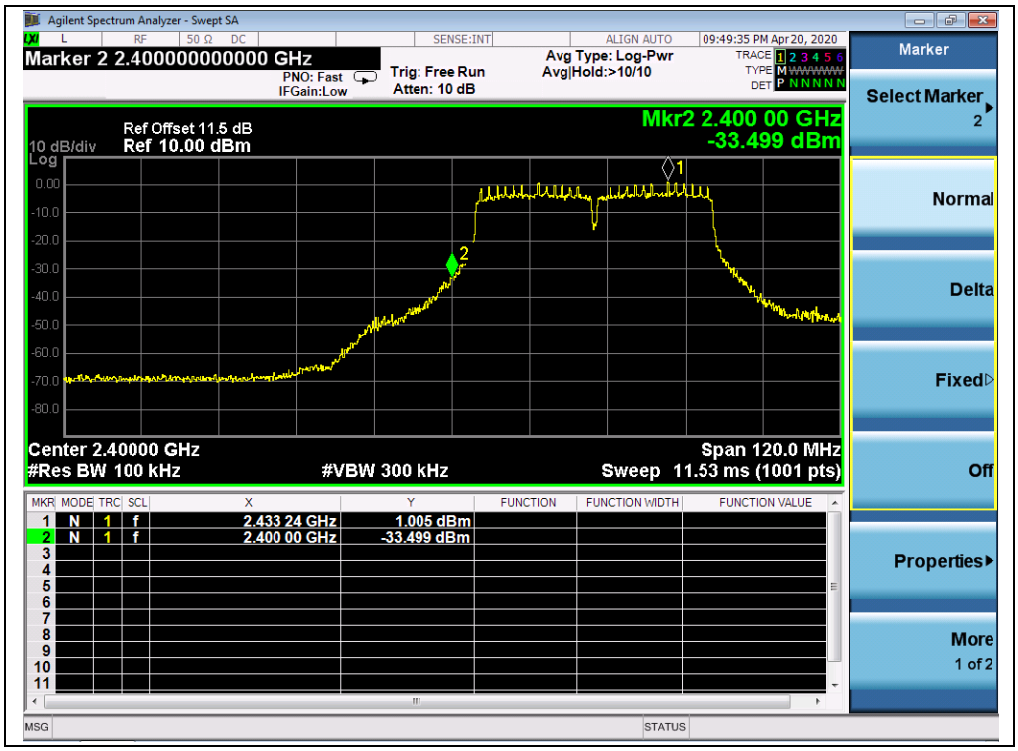
A. Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
3	2422	-61.04	0.84	-19.16	PASS
6	2437	-60.46	-0.34	-20.34	PASS
9	2452	-60.84	-0.27	-20.27	PASS

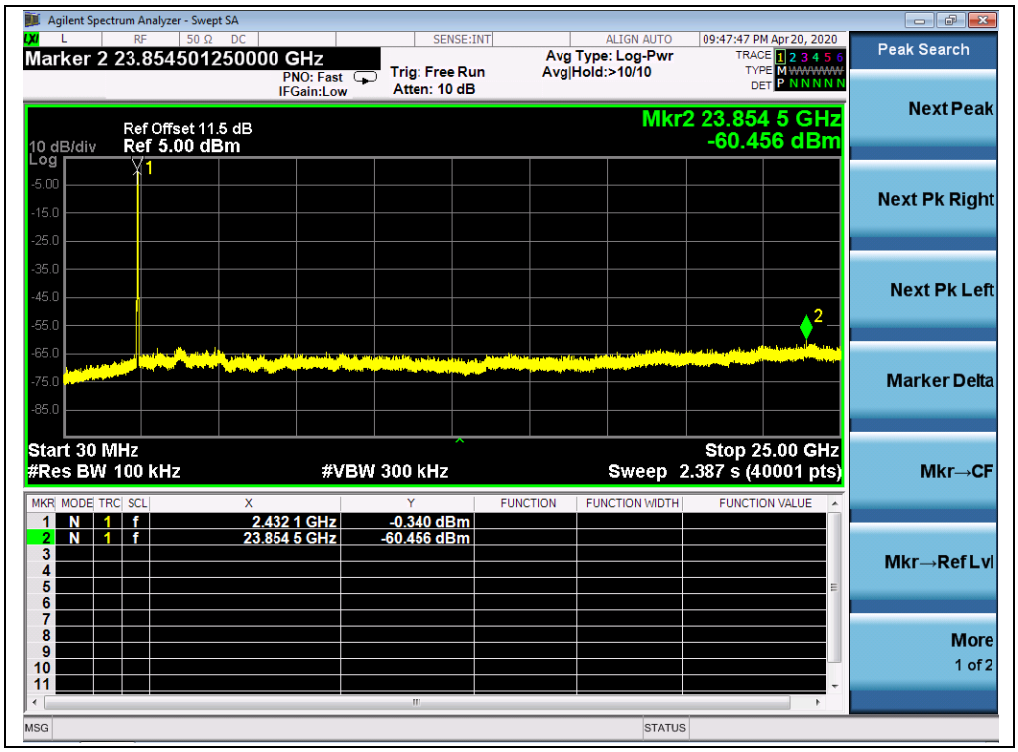
B. Test Plots:



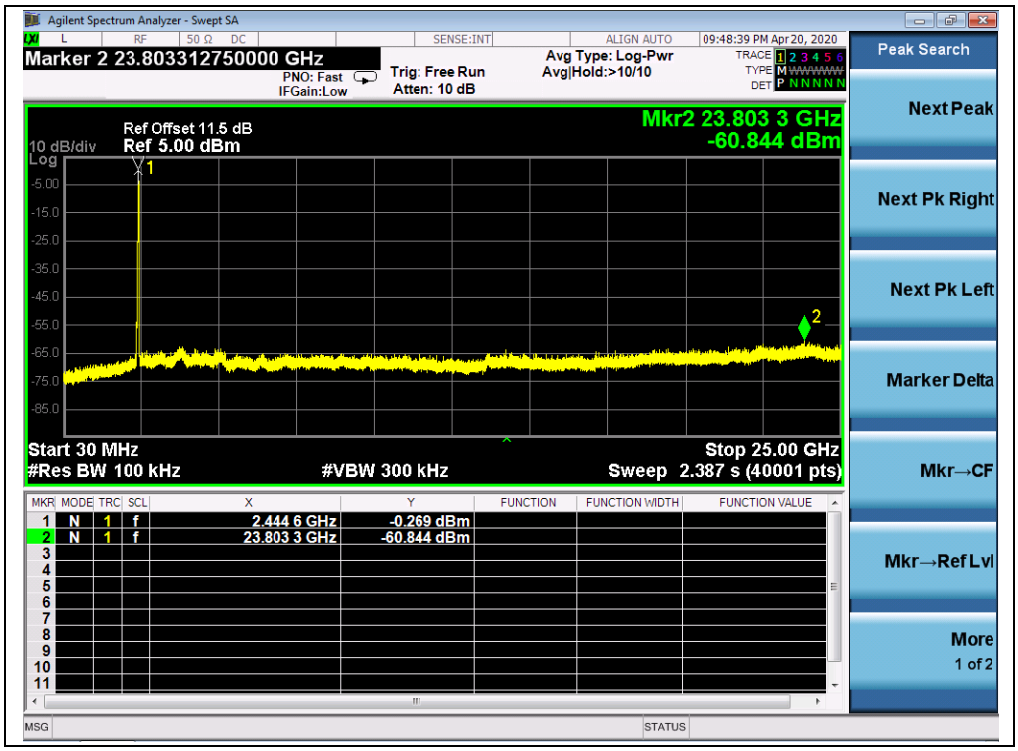
(Channel = 3, 30MHz to 25GHz)



(Band Edge, Channel = 3)



(Channel = 6, 30MHz to 25GHz)



(Channel = 9, 30MHz to 25GHz)

(Band Edge, Channel = 9)

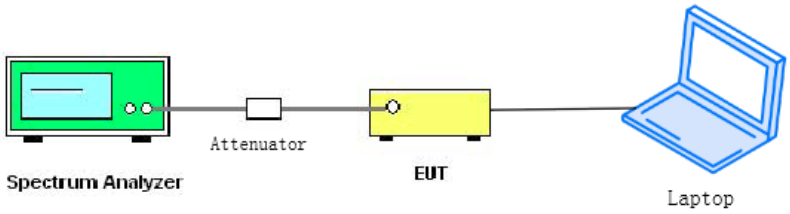
2.6. Power Spectral Density (PSD)

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 Test Mode

A. Test Verdict:

Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
1	2412	-12.18	8	PASS
6	2437	-10.22	8	PASS
11	2462	-6.48	8	PASS

B. Test Plots:

(Channel = 1, 802.11b)

(Channel = 6, 802.11b)

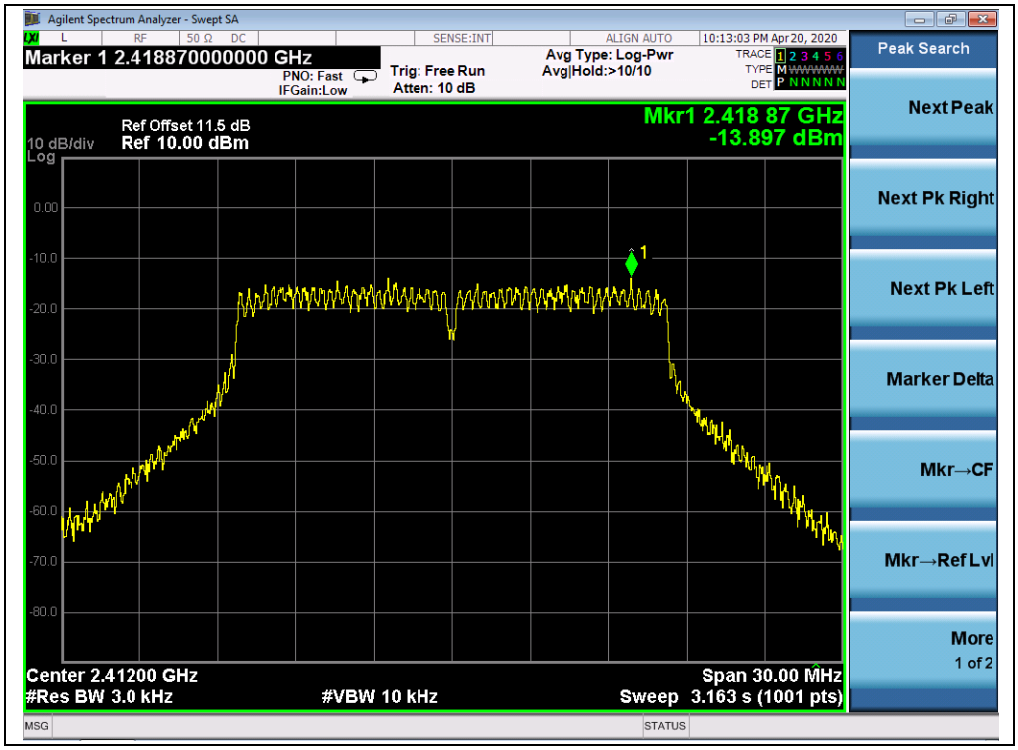
(Channel = 11, 802.11b)

802.11g Test Mode

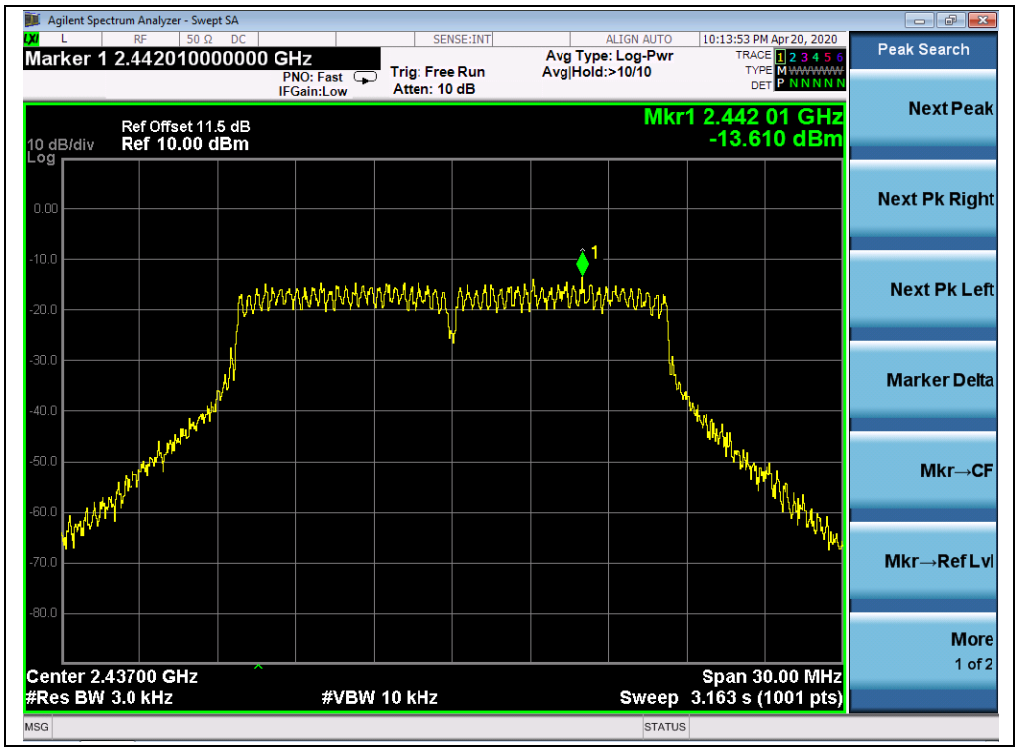
A. Test Verdict:

Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
1	2412	-13.90	8	PASS
6	2437	-13.61	8	PASS
11	2462	-13.69	8	PASS

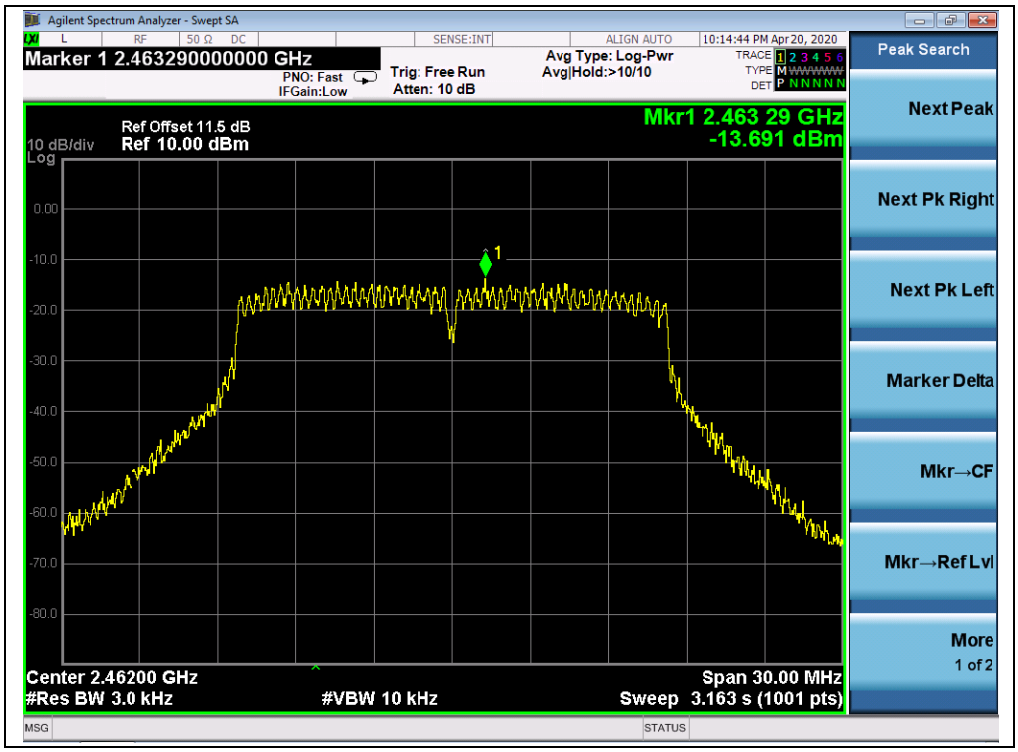
B. Test Plots:



(Channel = 1, 802.11g)



(Channel = 6, 802.11g)



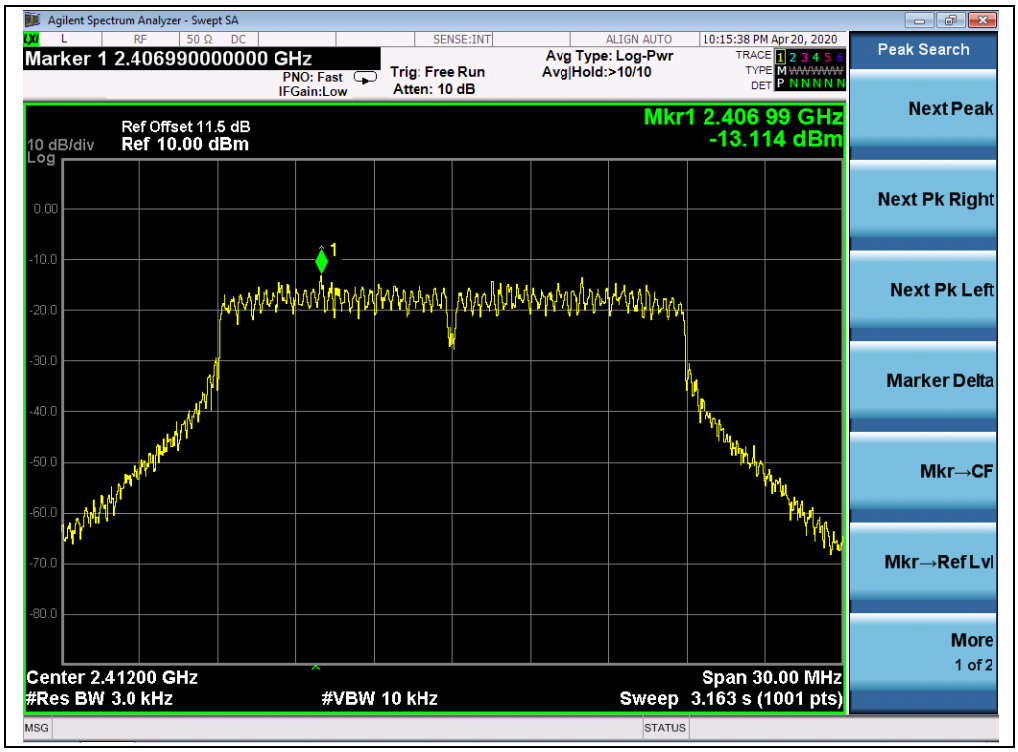
(Channel = 11, 802.11g)

802.11n(HT20) Test Mode

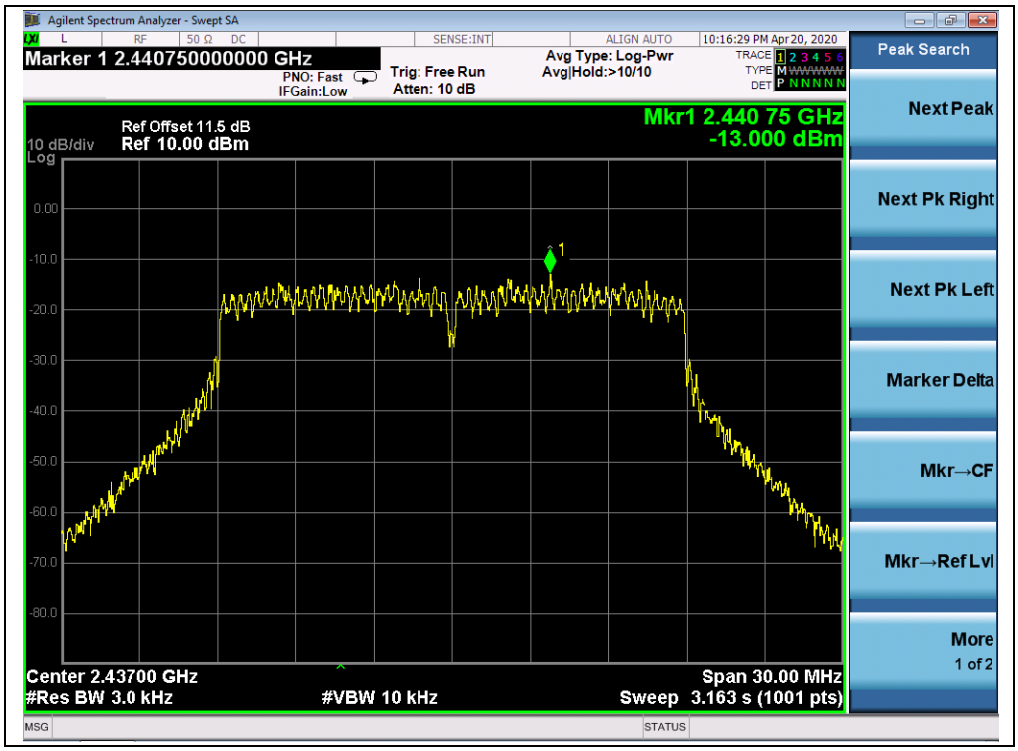
A. Test Verdict:

Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
1	2412	-13.11	8	PASS
6	2437	-13.00	8	PASS
11	2462	-13.76	8	PASS

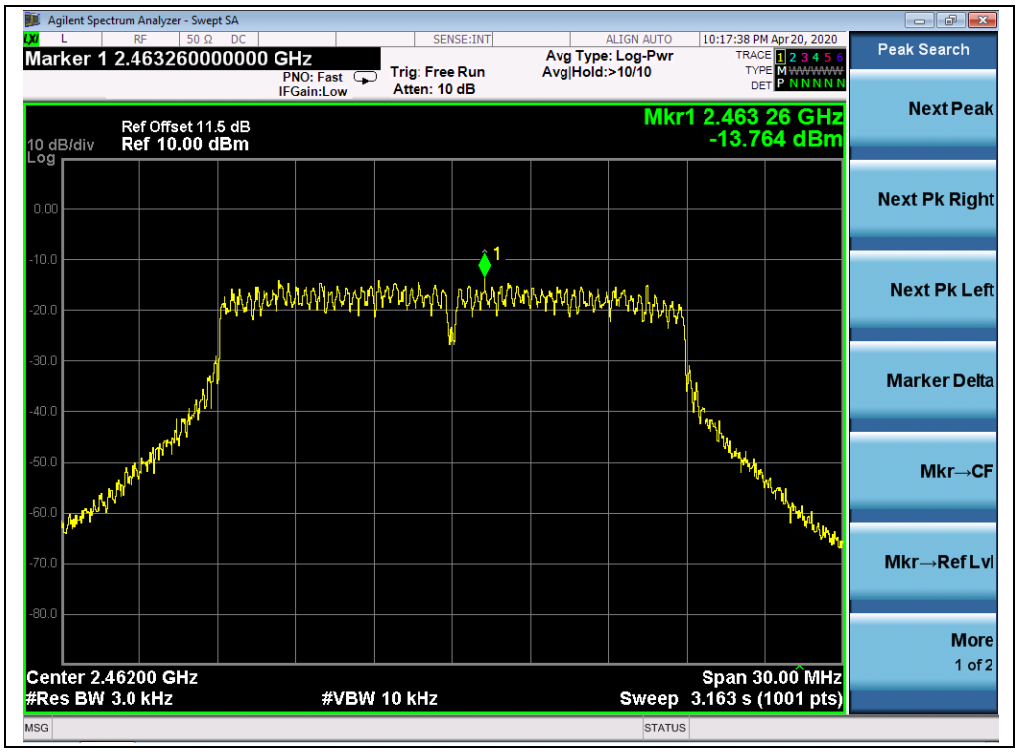
B. Test Plots:



(Channel = 1, 802.11n(HT20))



(Channel = 6, 802.11n(HT20))



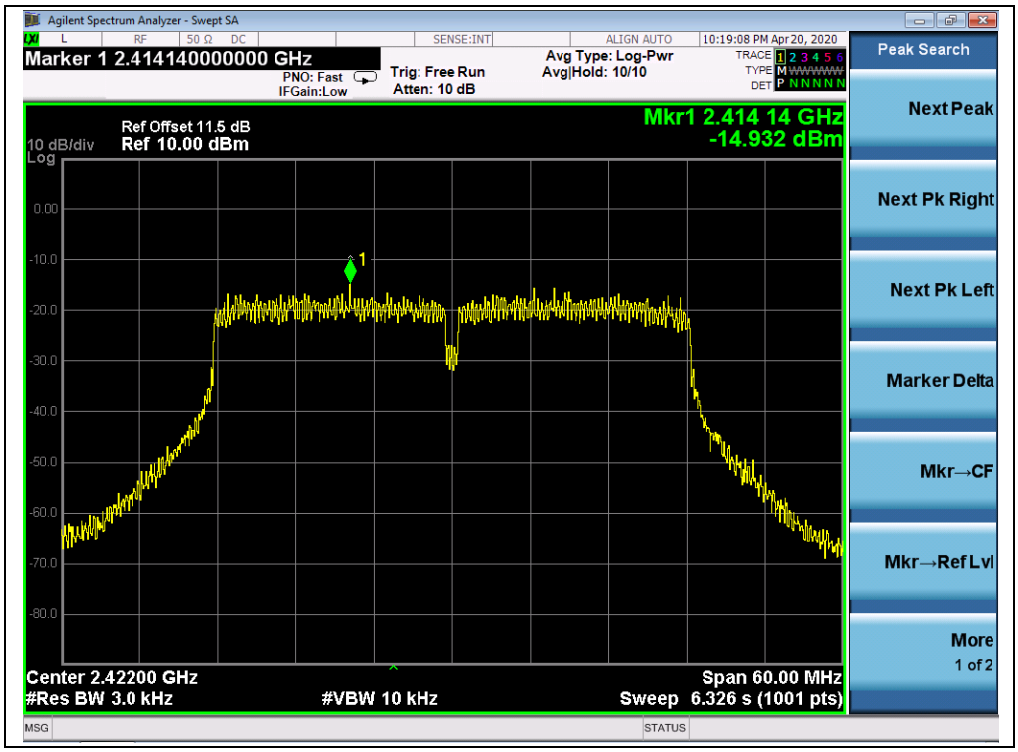
(Channel = 11, 802.11n(HT20))

802.11n(HT40) Test Mode

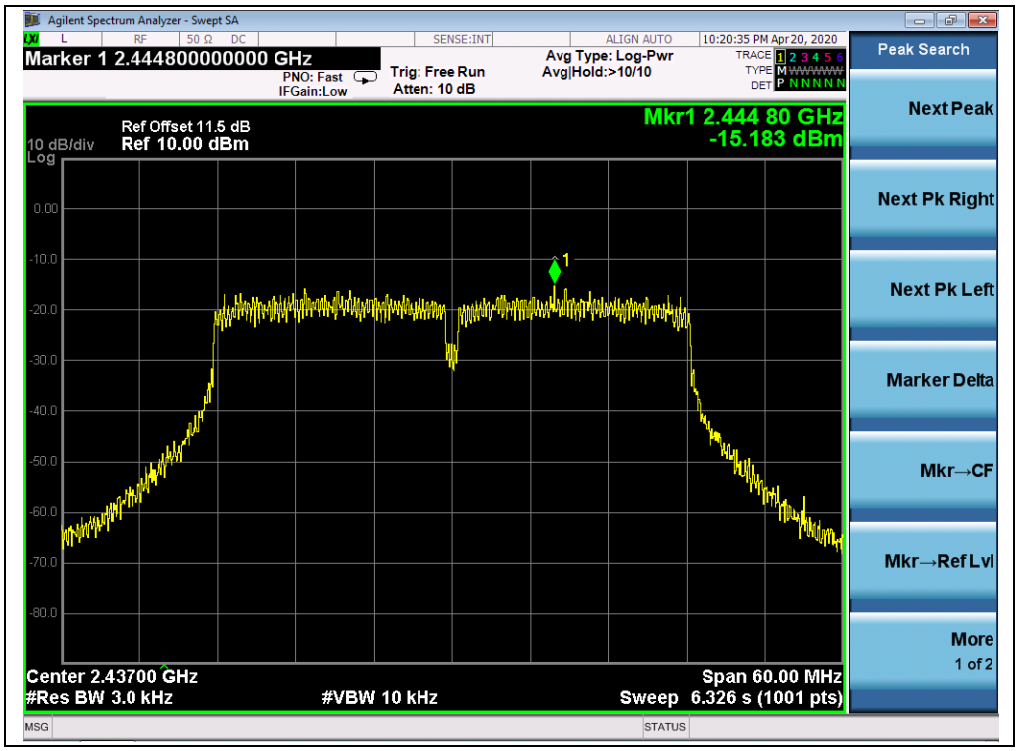
A. Test Verdict:

Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
3	2422	-14.93	8	PASS
6	2437	-15.18	8	PASS
9	2452	-14.85	8	PASS

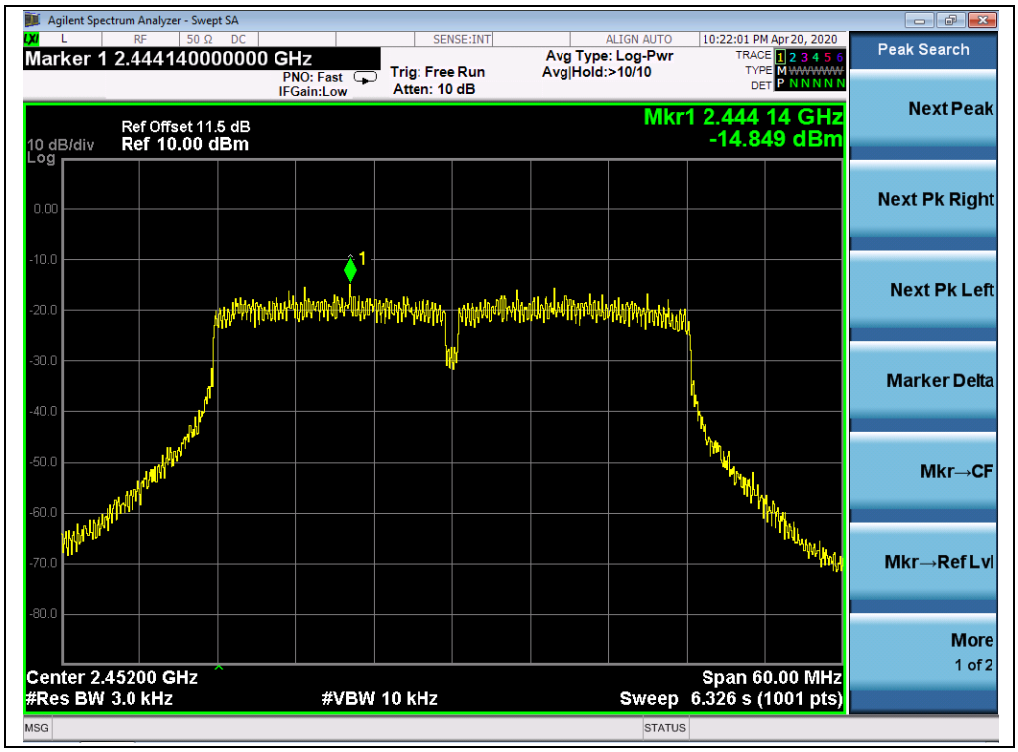
B. Test Plots:



(Channel = 3, 802.11n(HT40))



(Channel = 6, 802.11n(HT40))



(Channel =9, 802.11n(HT40))

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

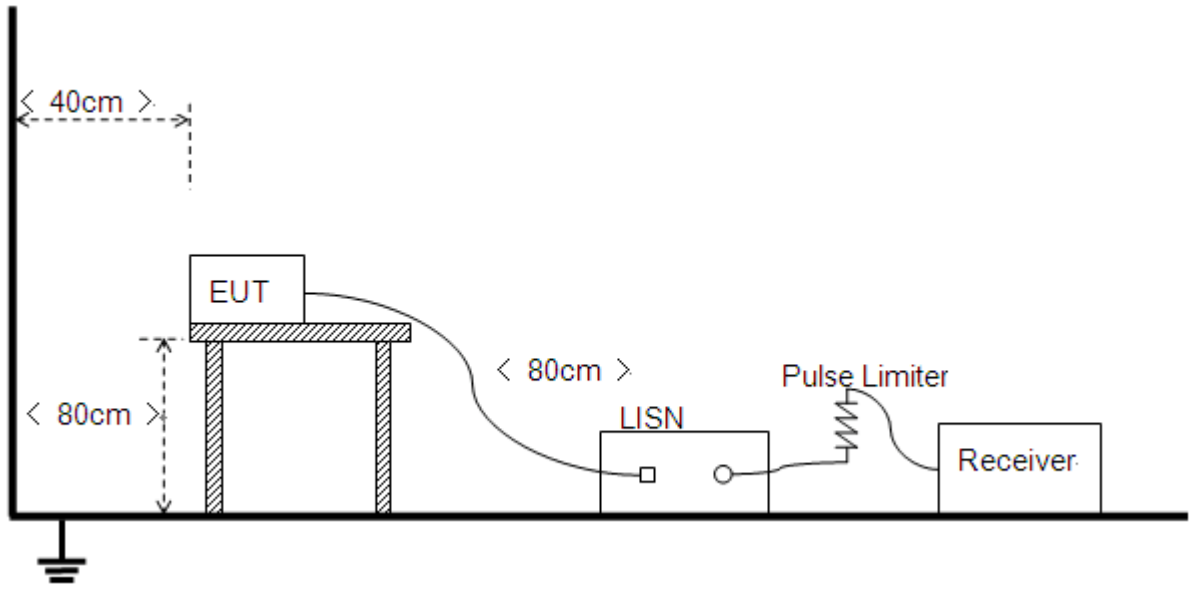
NOTE:

(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. Refer to recorded points and plots below.

Note: Both of the test voltage AC 120V/60Hz and AC 230V/50Hzwere 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

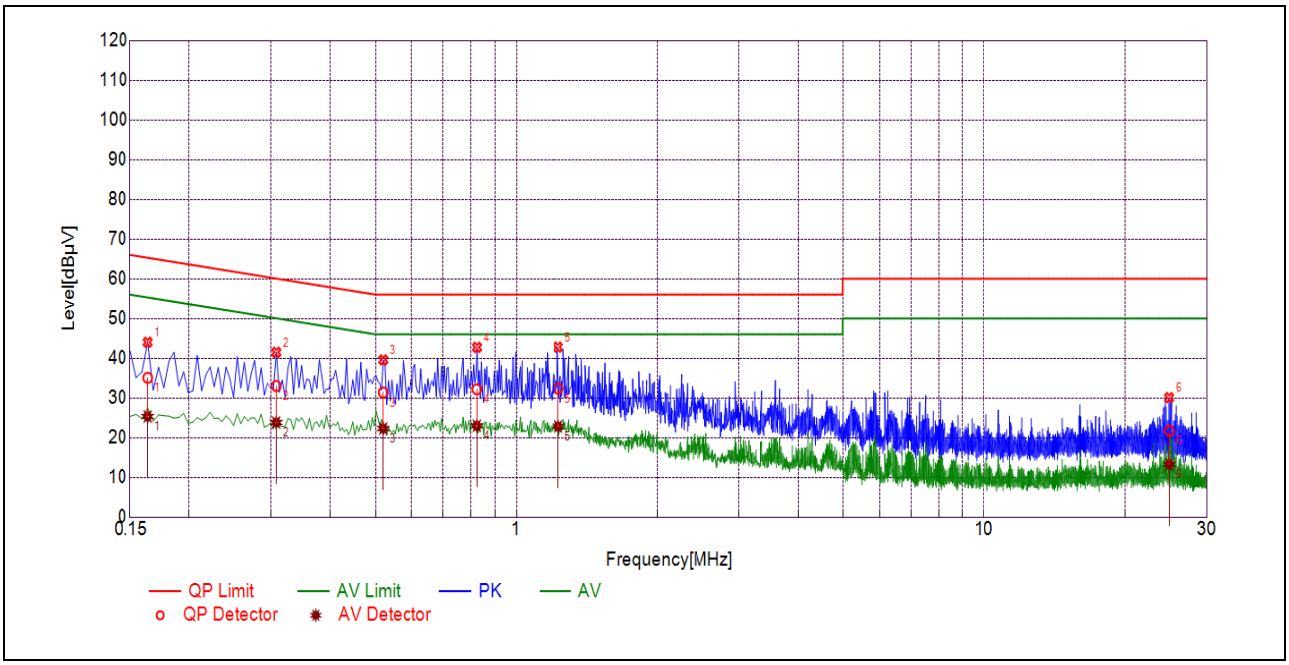
The measurement results are obtained as below:

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

U_R: Receiver Reading

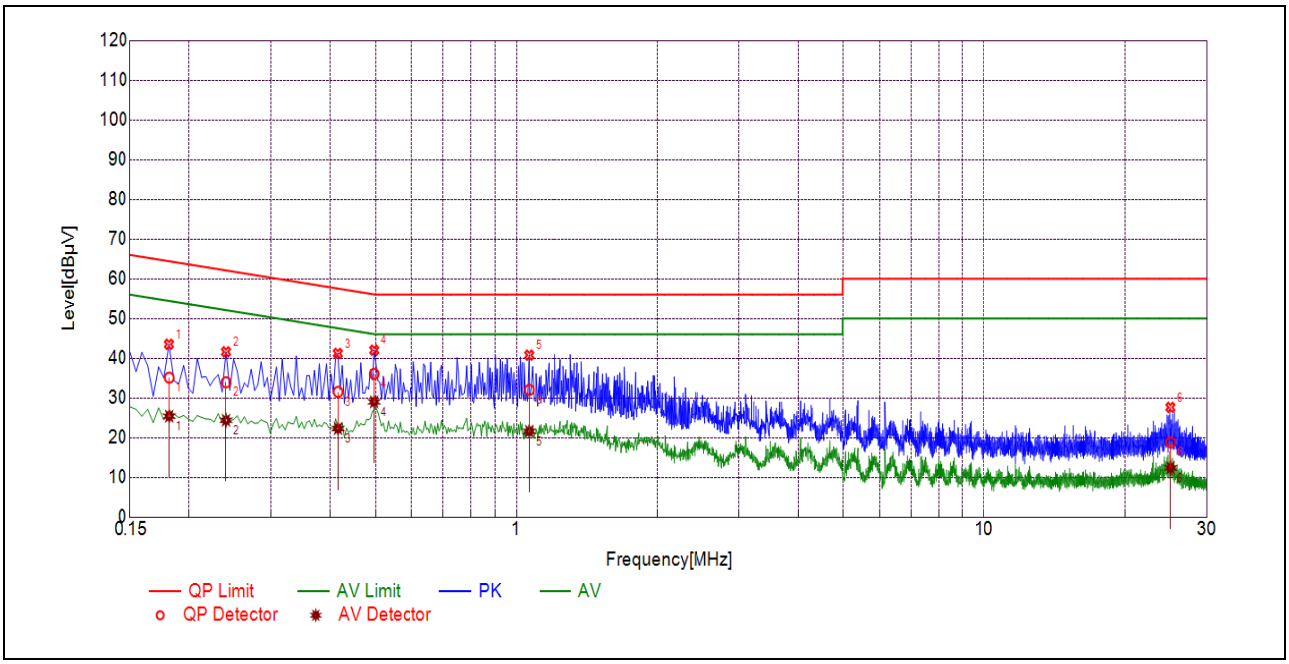
A_{Factor}: Voltage division factor of LISN

B. Test Plots:



(L Phase)

NO.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.1635	35.07	25.31	65.29	55.29	Line	PASS
2	0.3073	33.02	23.79	60.04	50.04		PASS
3	0.5188	31.37	22.29	56.00	46.00		PASS
4	0.8242	32.18	22.97	56.00	46.00		PASS
5	1.2309	32.38	22.80	56.00	46.00		PASS
6	24.9509	21.71	13.26	60.00	50.00		PASS



(N Phase)

NO.	Fre. (MHz)	Emission Level (dBμV)		Limit (dBμV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.1817	35.10	25.40	64.41	54.41	Neutral	PASS
2	0.2400	33.95	24.37	62.09	52.09		PASS
3	0.4159	31.52	22.27	57.53	47.53		PASS
4	0.4963	36.06	29.00	56.06	46.06		PASS
5	1.0638	32.03	21.59	56.00	46.00		PASS
6	25.1077	18.83	12.38	60.00	50.00		PASS

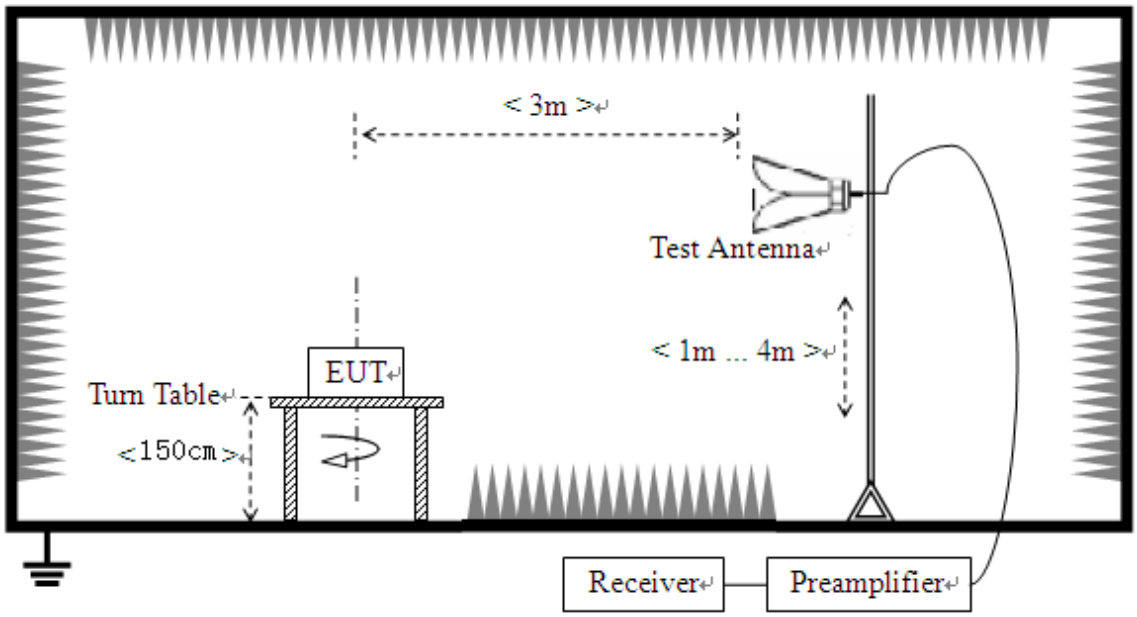
2.8. Restricted Frequency Bands

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

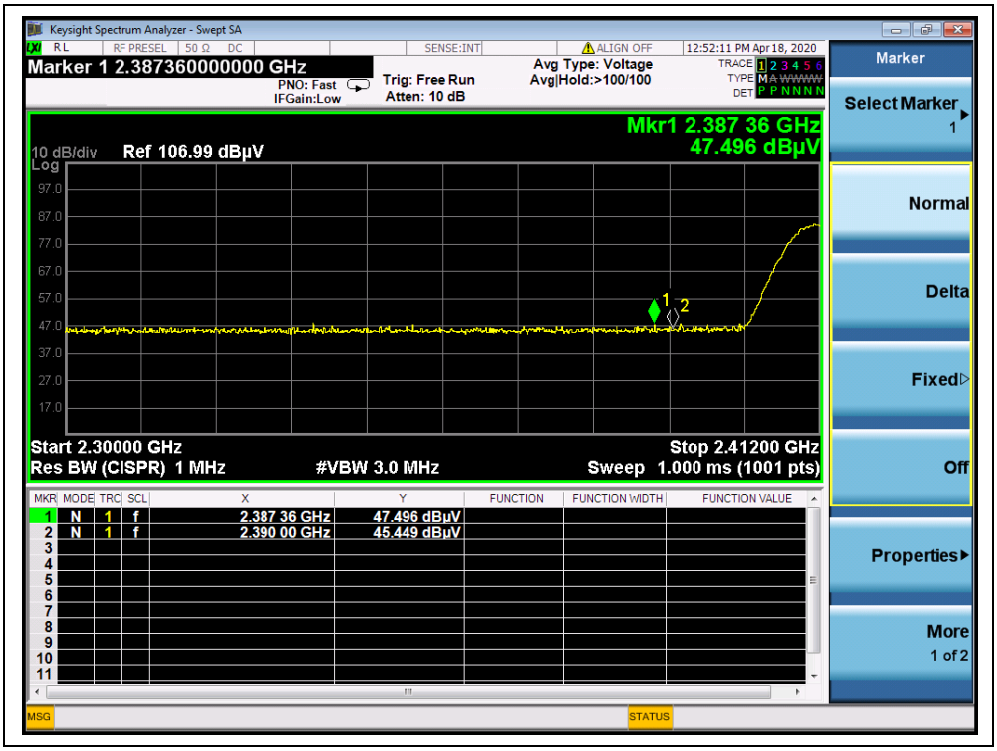
Note: Restricted Frequency Bands were performed when antenna was at vertical and horizontal polarity, and only the worse test condition (vertical) was recorded in this test report.

802.11b Test Mode

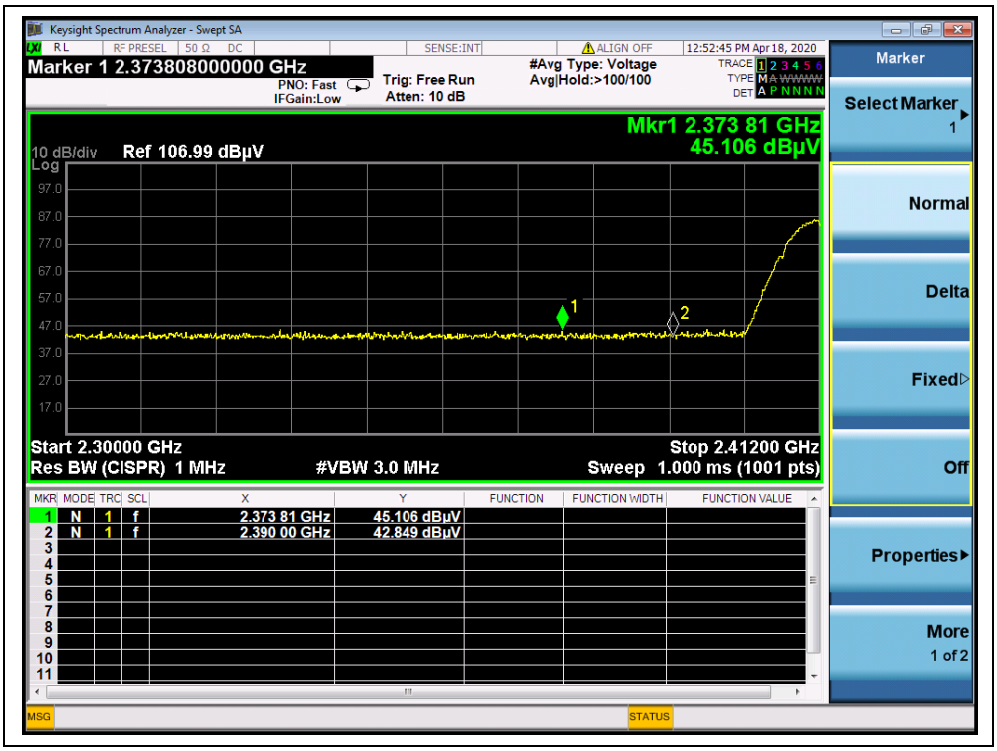
A. Test Verdict:

Channel	Frequency (MHz)	Detector PK/ AV	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
1	2387.36	PK	47.50	-29.67	32.56	50.39	74	PASS
1	2373.81	AV	45.11	-29.67	32.56	48.00	54	PASS
11	2483.50	PK	44.92	-29.67	32.56	47.81	74	PASS
11	2484.43	AV	46.51	-29.67	32.56	49.40	54	PASS

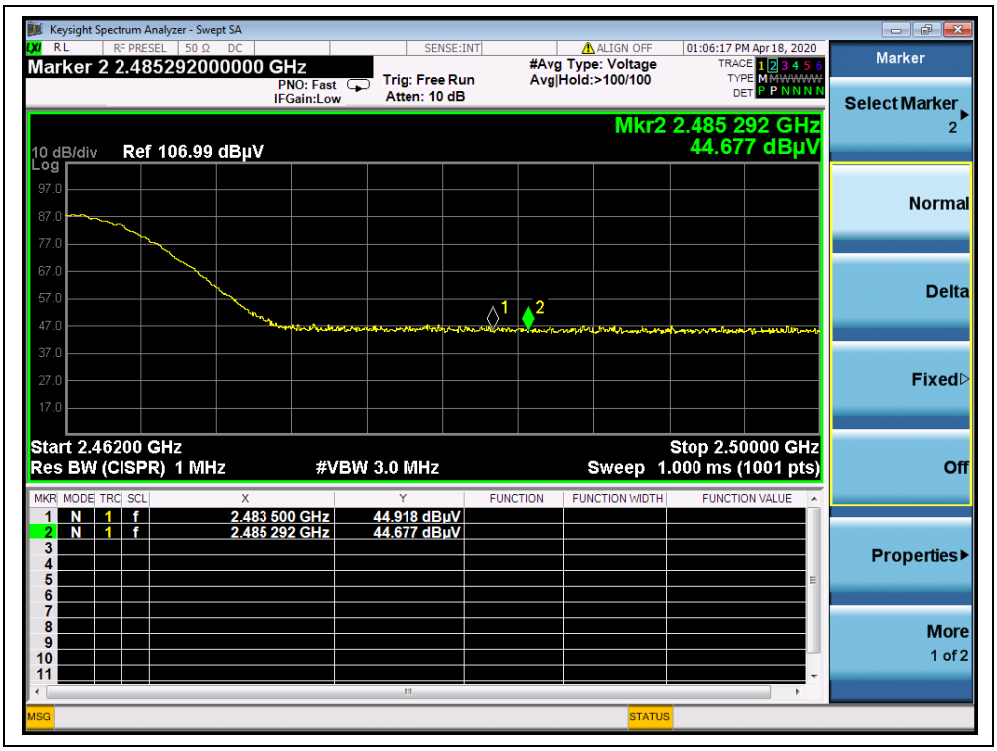
B. Test Plots:



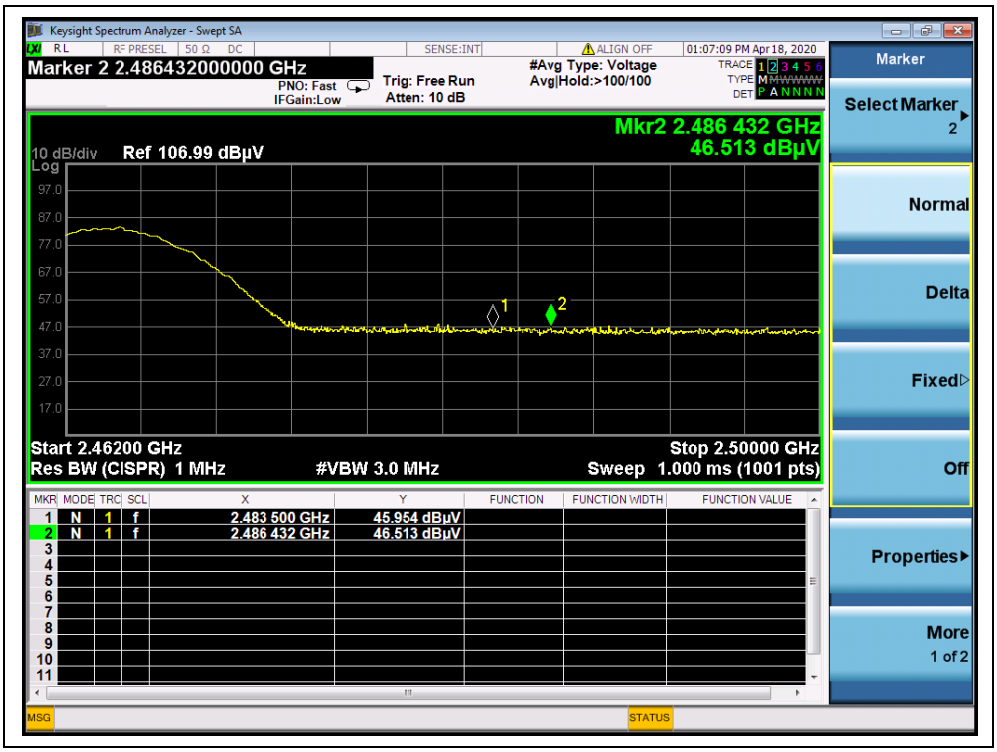
(PEAK,Channel = 1, 802.11b)



(AVG, Channel = 1 802.11b)



(PEAK, Channel = 11 802.11b)



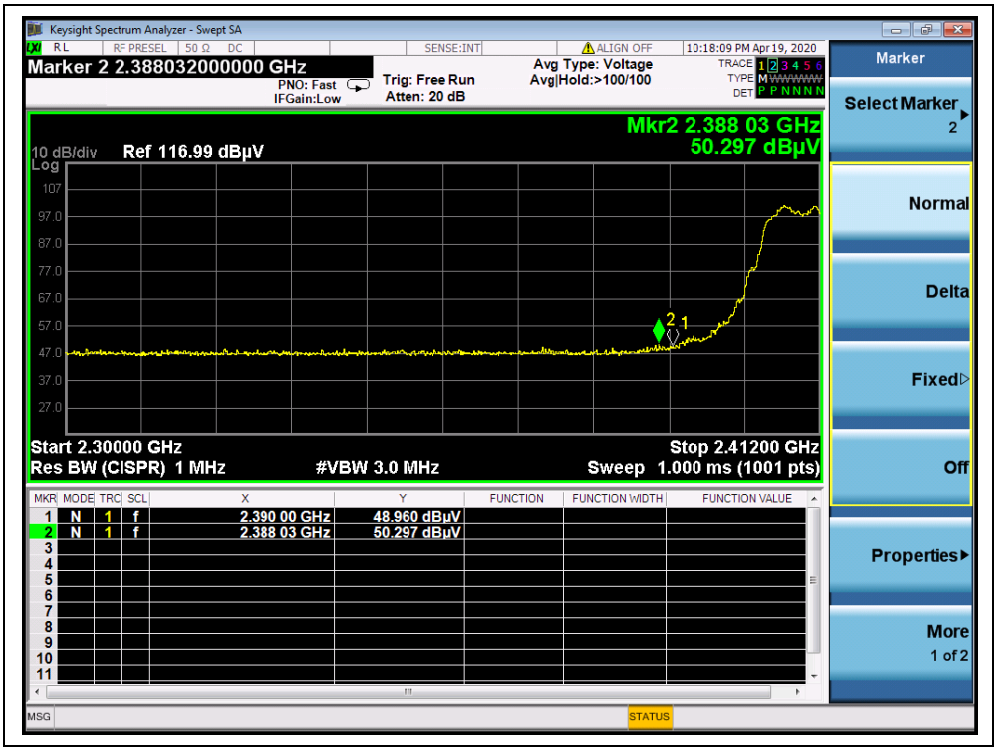
(AVG, Channel = 11 802.11b)

802.11g Test Mode

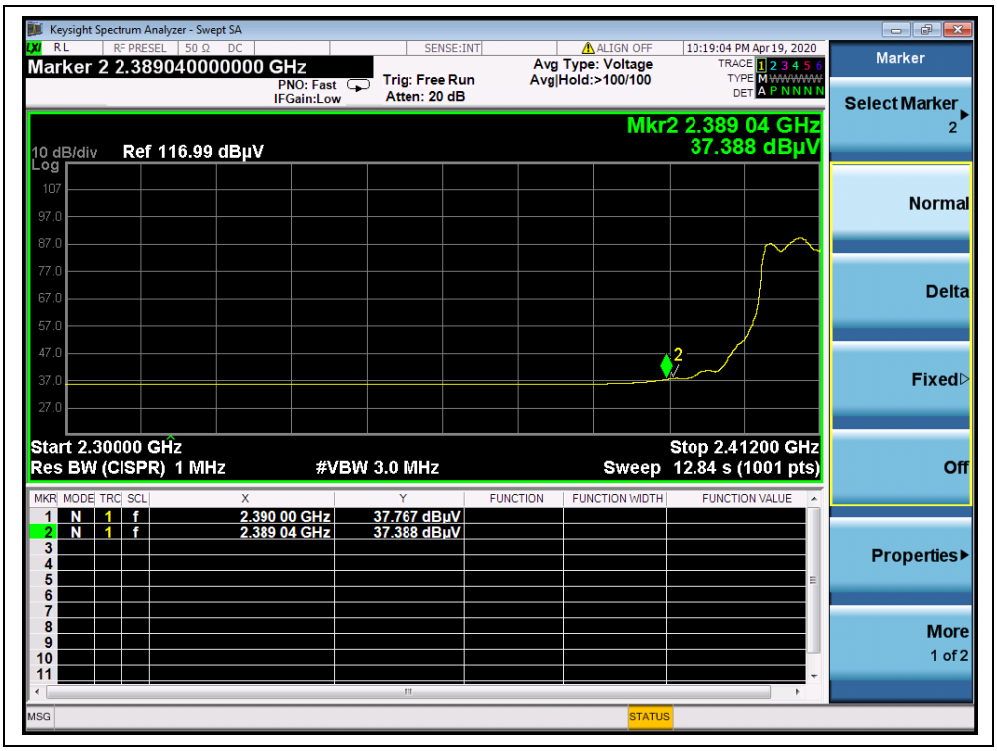
A. Test Verdict:

Channel	Frequency (MHz)	Detector PK/ AV	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
1	2388.03	PK	50.30	-29.67	32.56	53.19	74	PASS
1	2390.00	AV	37.77	-29.67	32.56	40.66	54	PASS
11	2484.38	PK	49.44	-29.67	32.56	52.33	74	PASS
11	2483.50	AV	36.85	-29.67	32.56	39.74	54	PASS

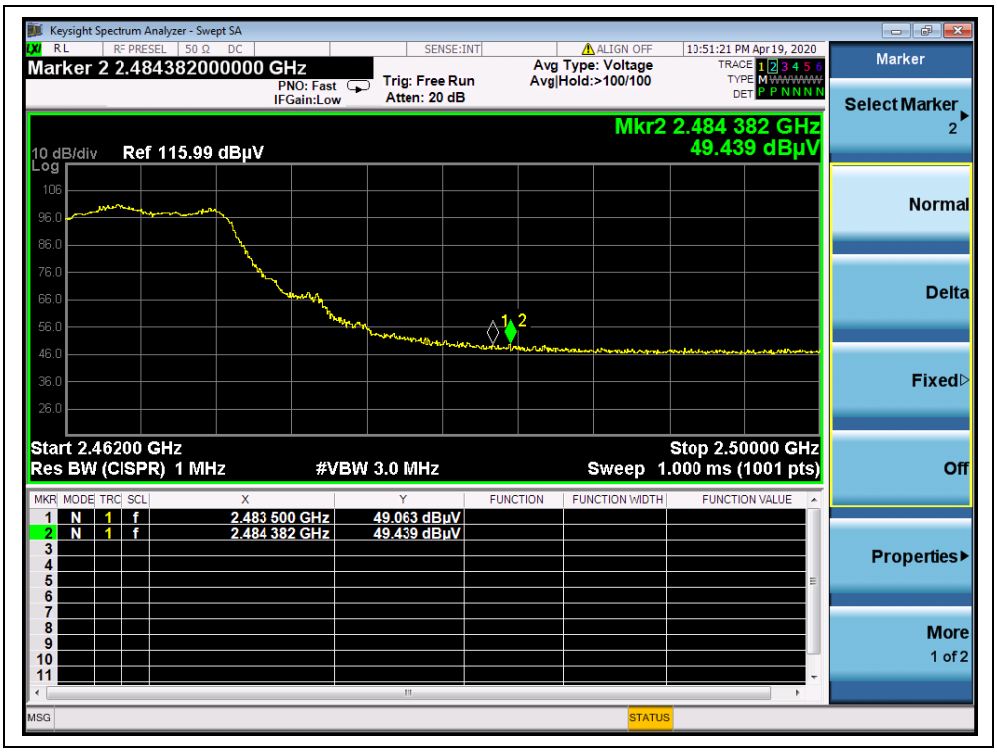
B. Test Plots:



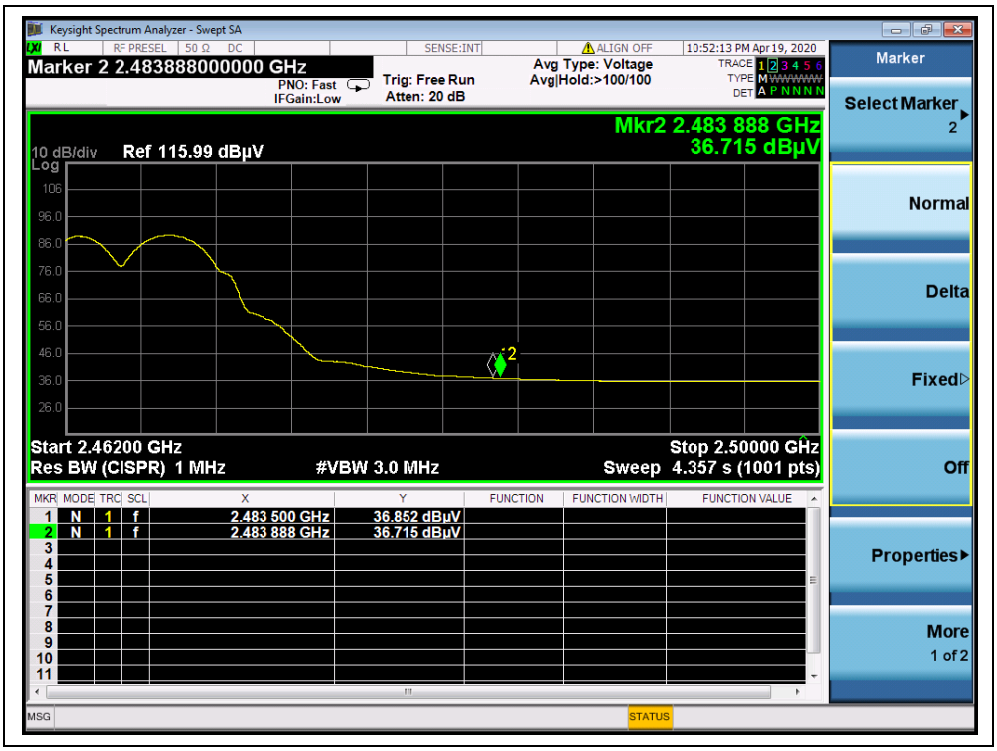
(PEAK, Channel = 1 802.11g)



(AVG, Channel = 1 802.11g)



(PEAK, Channel = 11, 802.11g)



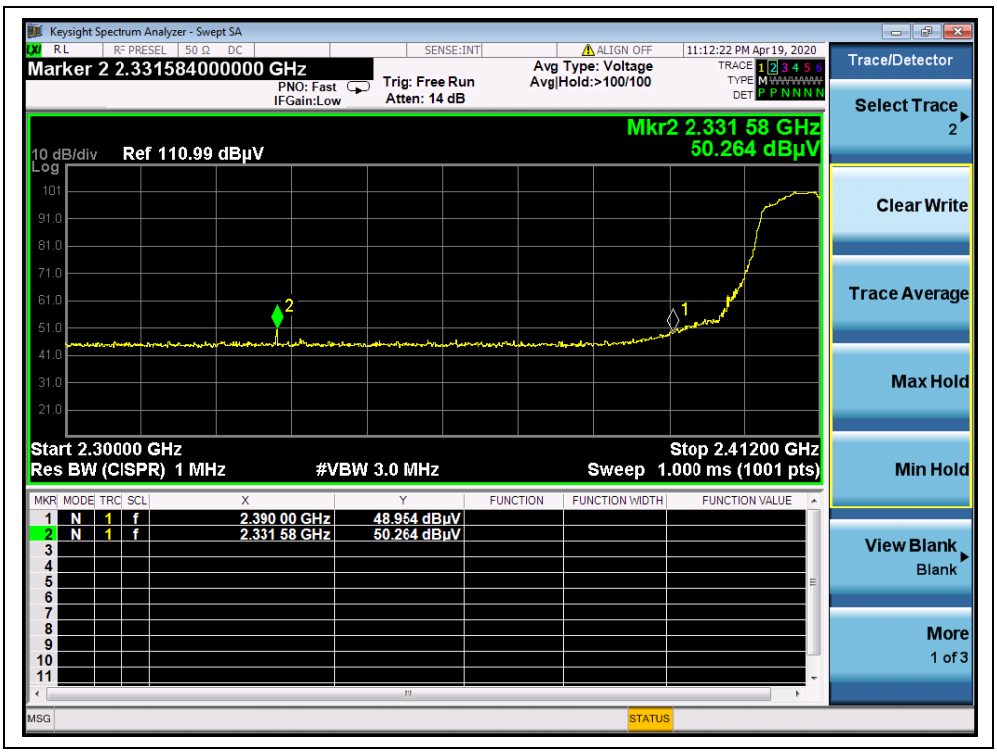
(AVG, Channel = 11, 802.11g)

802.11n(HT20) Test Mode

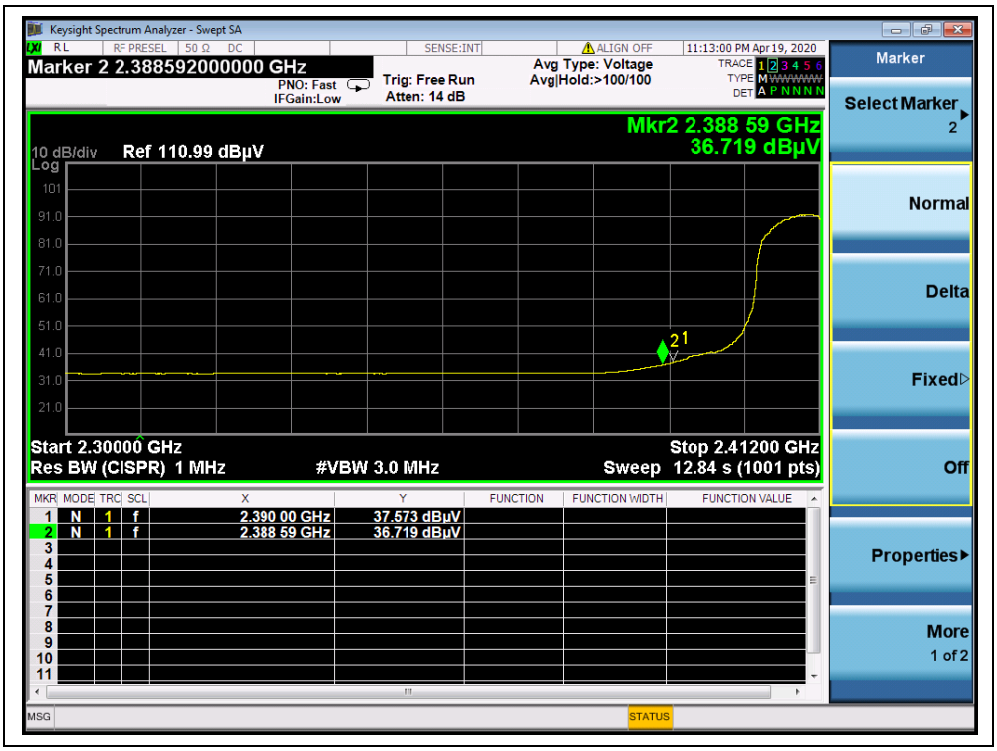
A. Test Verdict:

Channel	Frequency (MHz)	Detector PK/ AV	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
1	2331.58	PK	50.26	-29.67	32.56	53.15	74	PASS
1	2390.00	AV	37.57	-29.67	32.56	40.46	54	PASS
11	2483.62	PK	48.97	-29.67	32.56	51.86	74	PASS
11	2483.50	AV	37.37	-29.67	32.56	40.26	54	PASS

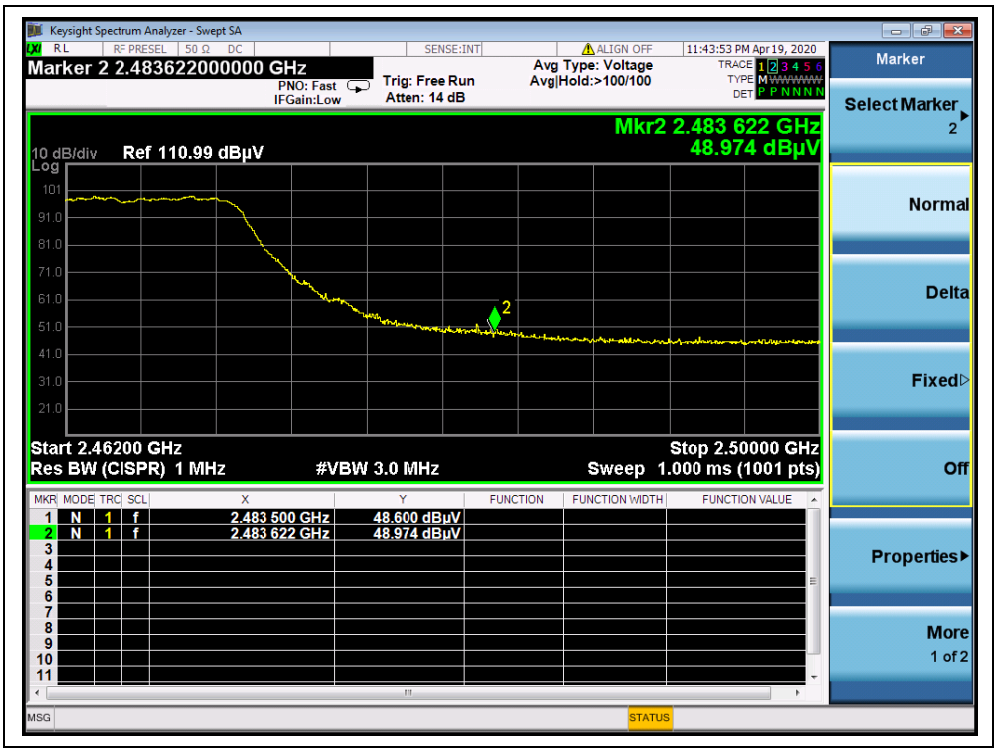
B. Test Plots:



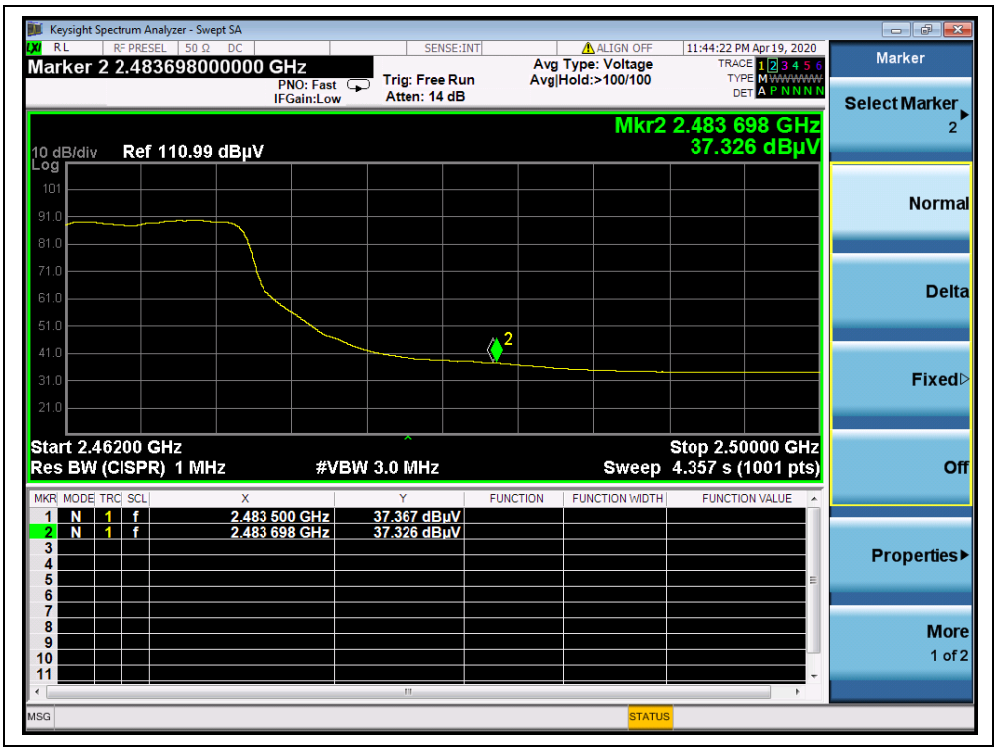
(PEAK, Channel = 1, 802.11n(HT20))



(AVG, Channel = 1, 802.11n(HT20))



(PEAK, Channel = 11, 802.11n(HT20))



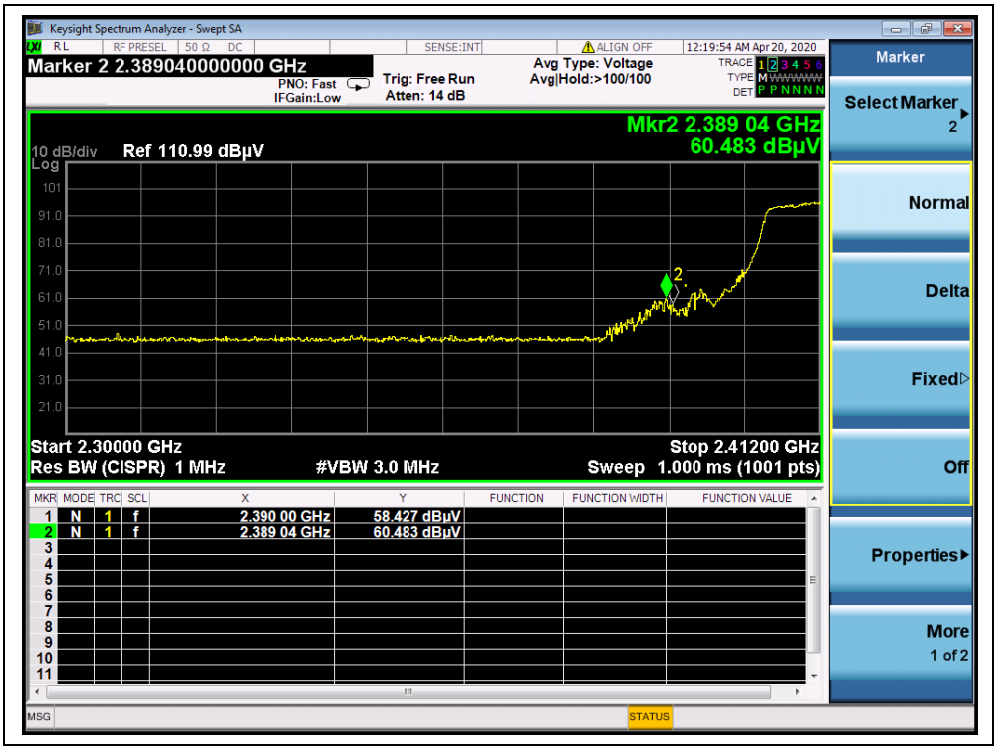
(AVG, Channel = 11, 802.11n(HT20))

802.11n(HT40) Test Mode

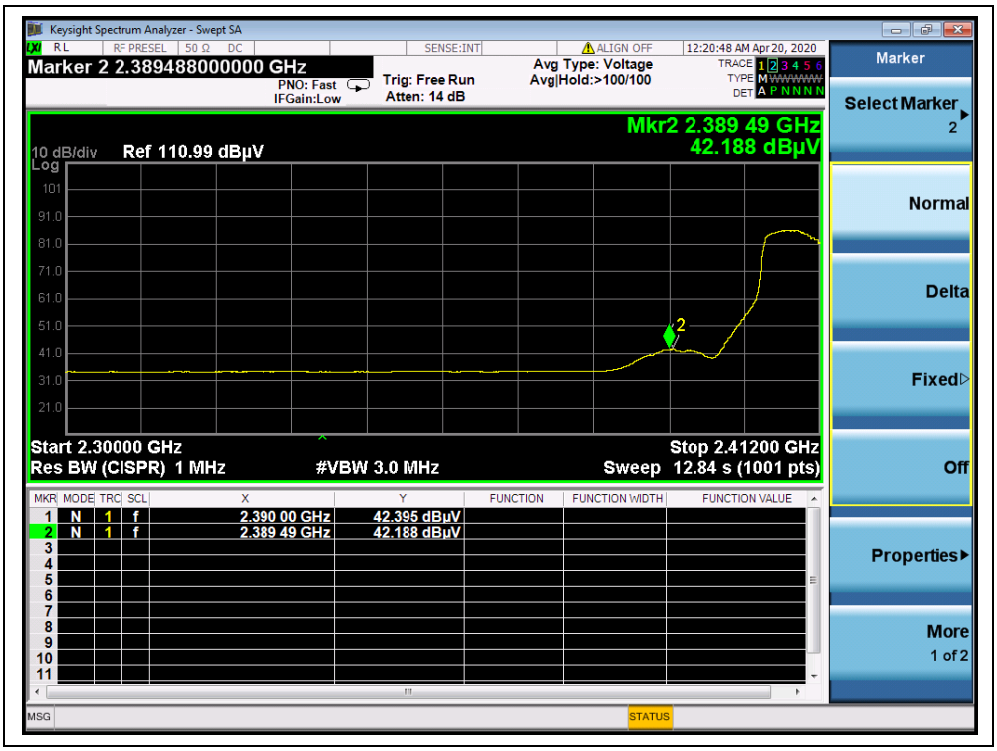
A. Test Verdict:

Channel	Frequency (MHz)	Detector PK/ AV	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
3	2389.04	PK	60.48	-29.67	32.56	63.37	74	PASS
3	2390.00	AV	42.40	-29.67	32.56	45.29	54	PASS
9	2485.26	PK	56.47	-29.67	32.56	59.36	74	PASS
9	2483.50	AV	42.08	-29.67	32.56	44.97	54	PASS

B. Test Plots:

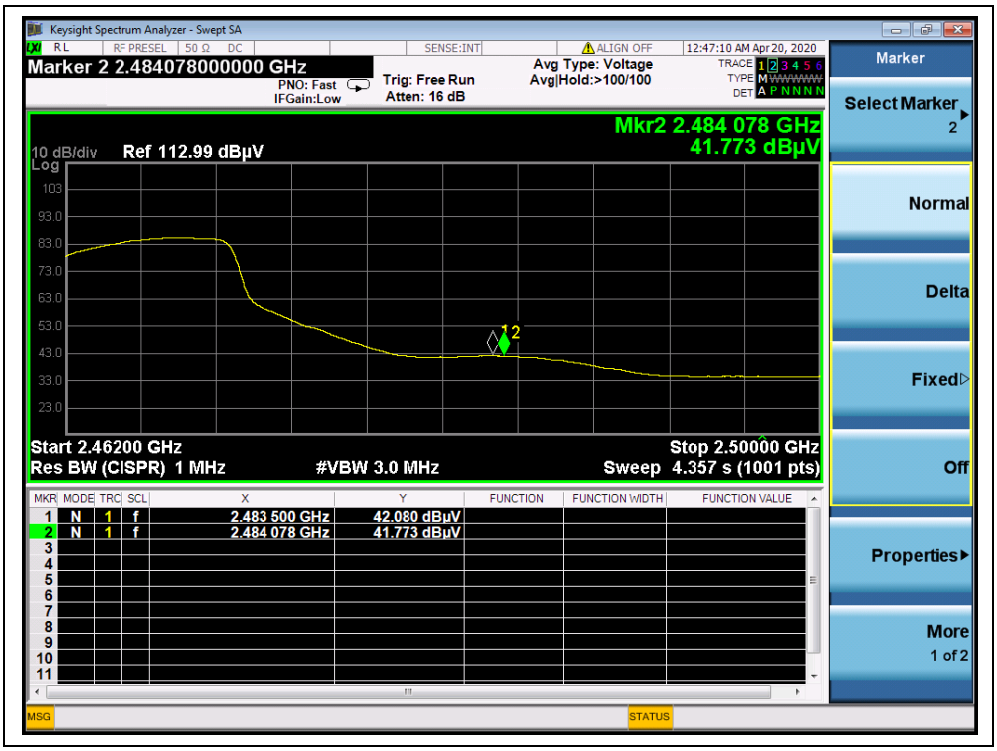


(PEAK, Channel = 3, 802.11n(HT40))



(AVG, Channel = 3, 802.11n(HT40))

(PEAK, Channel = 9, 802.11n(HT40))



(AVG,Channel = 9, 802.11n(HT40))

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

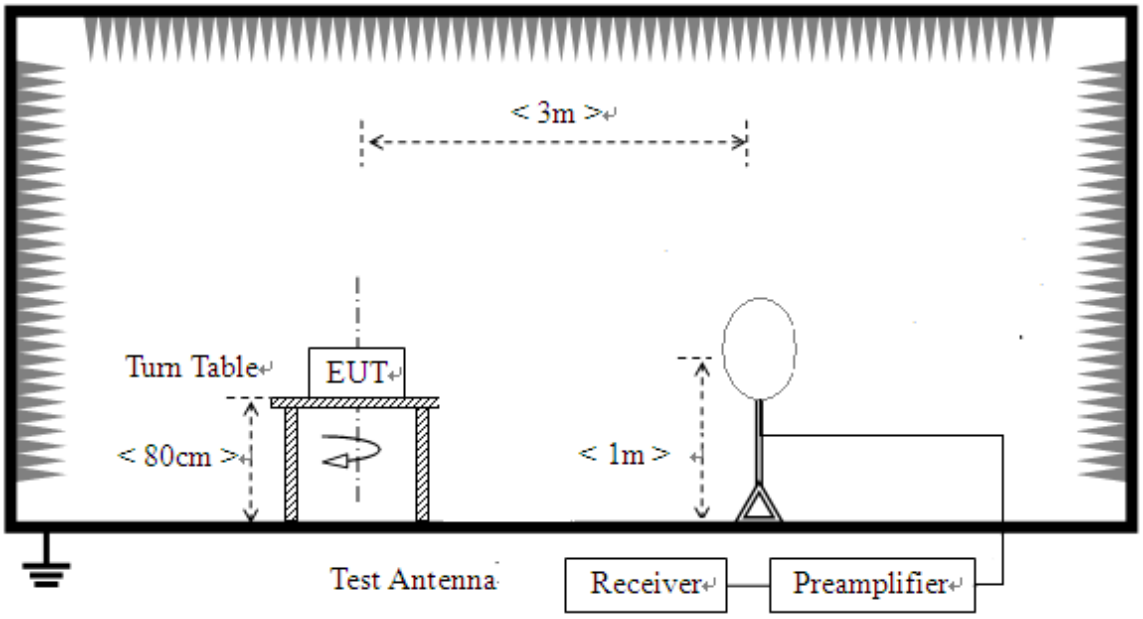
Note1: For Above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.

Note2: For above 1000MHz, limit field strength of harmonics: 54dBμV/m@3m (AV) and 74dBμV/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).

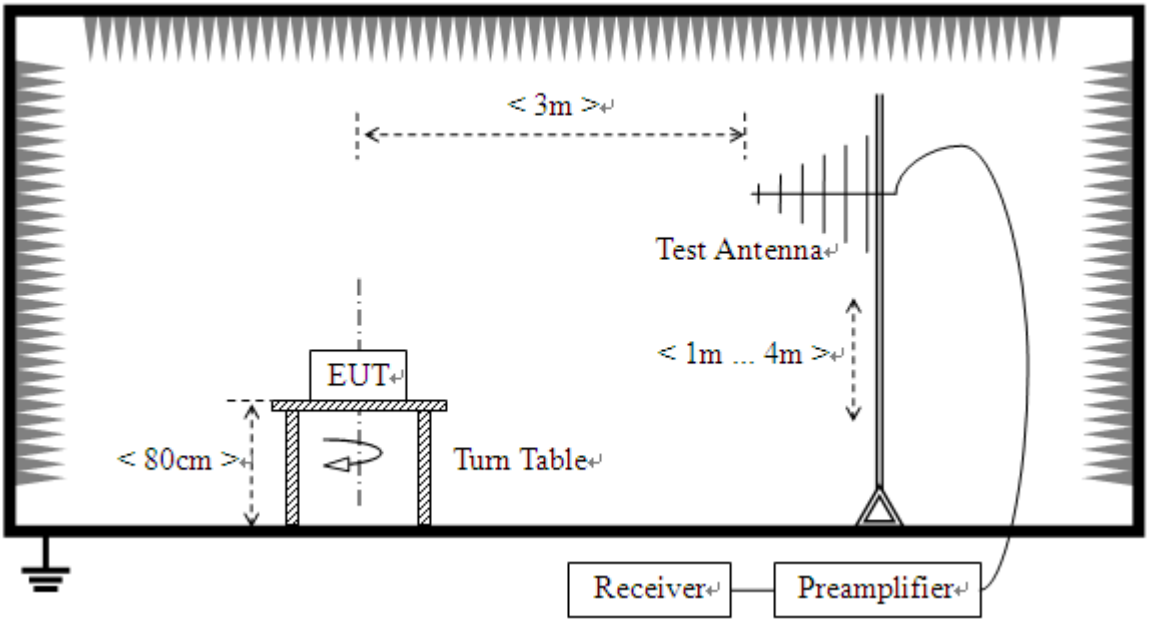
2.9.2. Test Description

Test Setup:

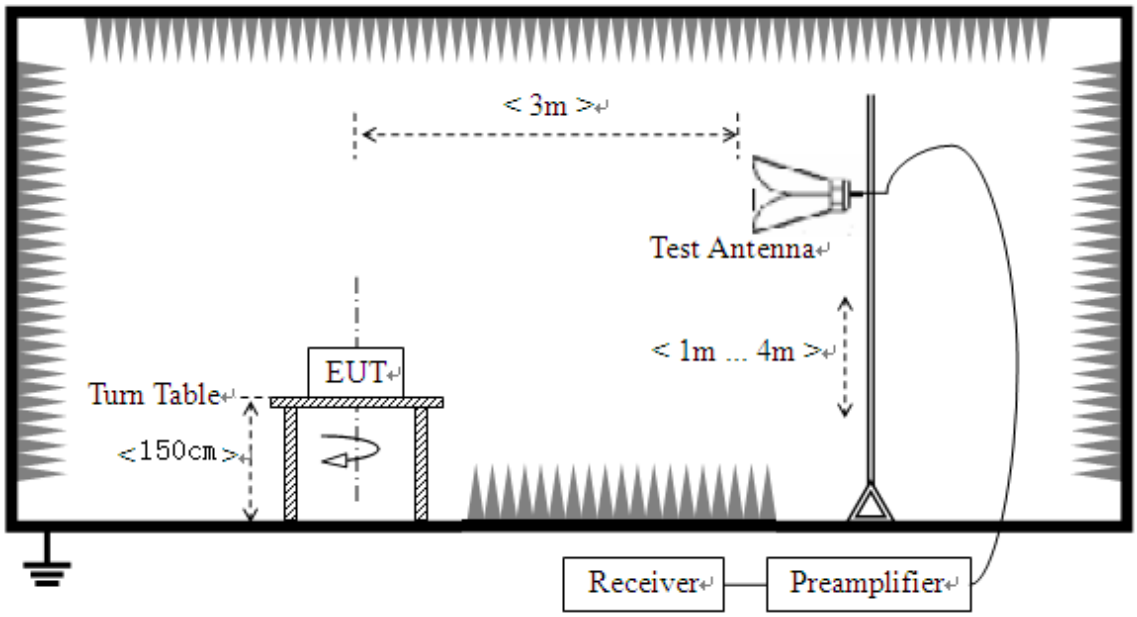
1) For radiated emissions from 9kHz to 30MHz



2) For radiated emissions from 30MHz to1GHz



3) For radiated emissions above 1GHz



The RF absorbing material used on the reference ground plane and on the turntable have a maximum height (thickness) of 30 cm (12 in) and have a minimum-rated attenuation of 20 dB at all frequencies from 1 GHz to 18 GHz. Test site have a minimum area of the ground plane covered with RF absorbing material as specified in Figure 6 of ANSI C63.4: 2014.

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to the standards: ANSI C63.10 (2013). For radiated emissions below or equal to 1GHz,The EUT was set-up on insulator 80cm above the Ground Plane,For radiated emissions above 1GHz, The EUT was set-up on insulator 150cm above the Ground Plane. The set-up and test methods were according to ANSI C63.10

For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
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:

(a) In the frequency range of 9kHz to 30MHz, magnetic field is measured with Loop Test Antenna. The Test Antenna is positioned with its plane vertical at 1m distance from the EUT. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.
(b) In the frequency range above 30MHz, Bi-Log Test Antenna (30MHz to 1GHz) and Horn Test Antenna (above 1GHz) are used. Place the test antenna at 3m away from area of the EUT, while keeping the test antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The test antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final test antenna elevation shall be that which maximizes the emissions. The test antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane. The emission levels at both horizontal and vertical polarizations should be tested.

2.9.3. Test Result

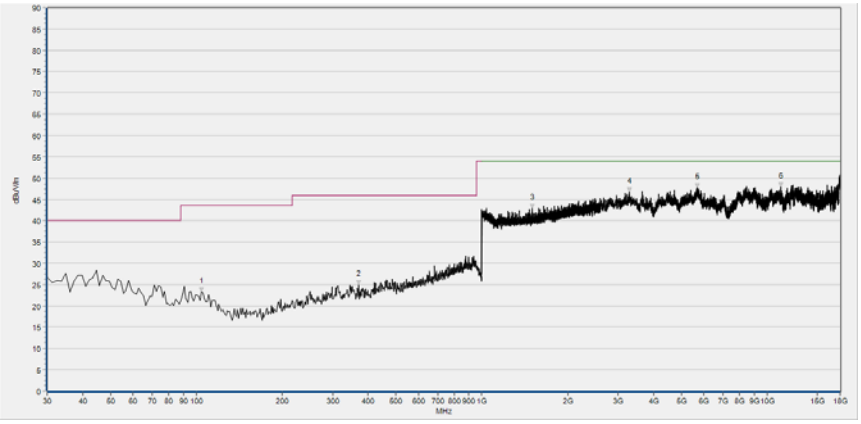
According to ANSI C63.10, because of peak detection will yield amplitudes equal to or greater than amplitudes measured with the quasi-peak (or average) detector, the measurement data from a spectrum analyzer peak detector will represent the worst-case results, if the peak measured value complies with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

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
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.

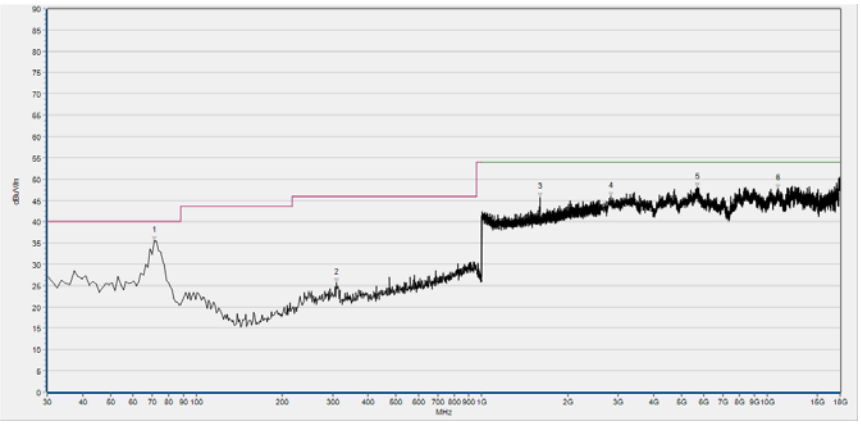
802.11b Test Mode

Plots 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
104.055	23.26	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
371.139	24.98	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1505.162	42.96	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
3294.526	46.73	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5677.760	47.81	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
11144.354	47.92	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

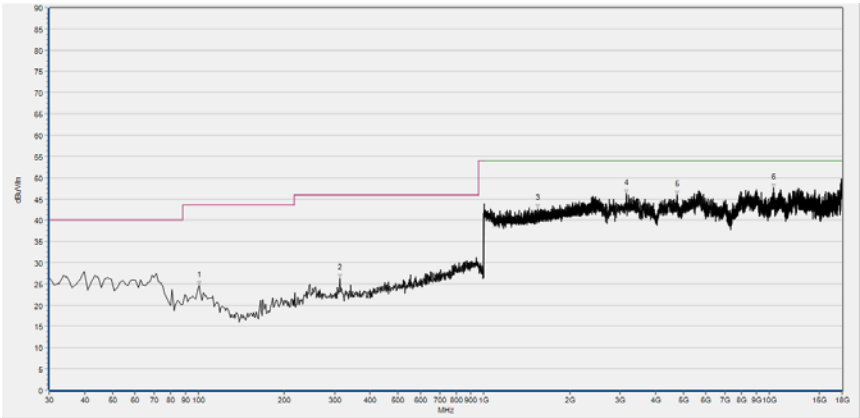
(Antenna Horizontal, 30MHz to 18GHz)



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
71.277	35.51	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
309.224	25.57	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1599.280	45.79	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2838.043	45.92	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5672.159	48.08	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
10889.507	47.82	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

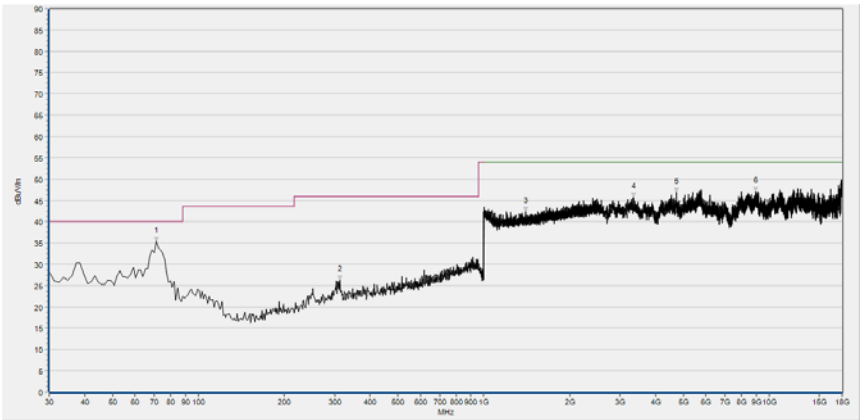
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel = 6



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
100.413	24.69	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
312.866	26.29	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1545.498	42.70	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
3160.102	46.29	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4759.193	45.91	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
10337.807	47.58	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

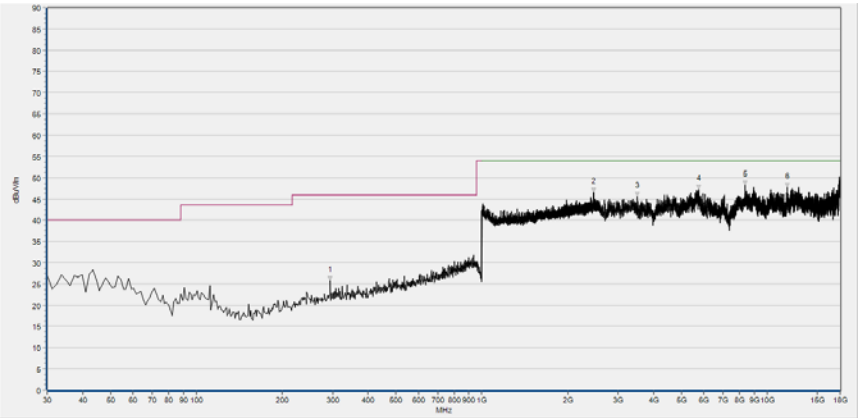
(Antenna Horizontal, 30MHz to 18GHz)



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
71.277	35.36	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
312.866	26.30	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1398.880	42.39	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
3353.337	45.72	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4739.589	46.94	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8968.358	47.12	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

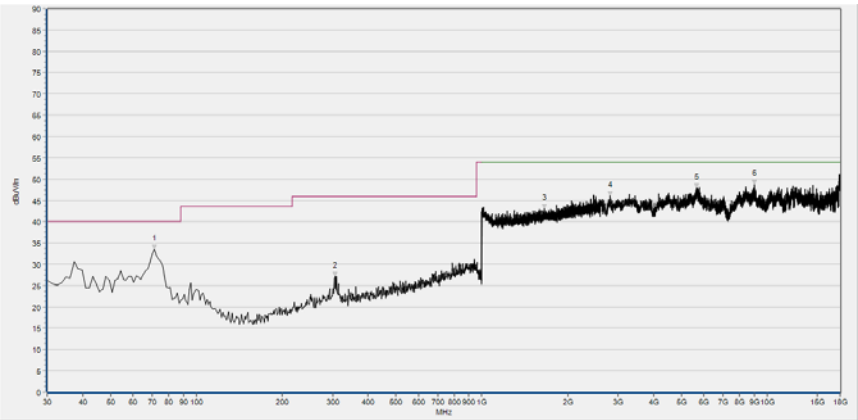
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel = 11



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
294.656	25.81	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2462.985	46.59	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
3504.564	45.63	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5756.174	47.28	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8352.246	48.19	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
11726.859	47.79	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)

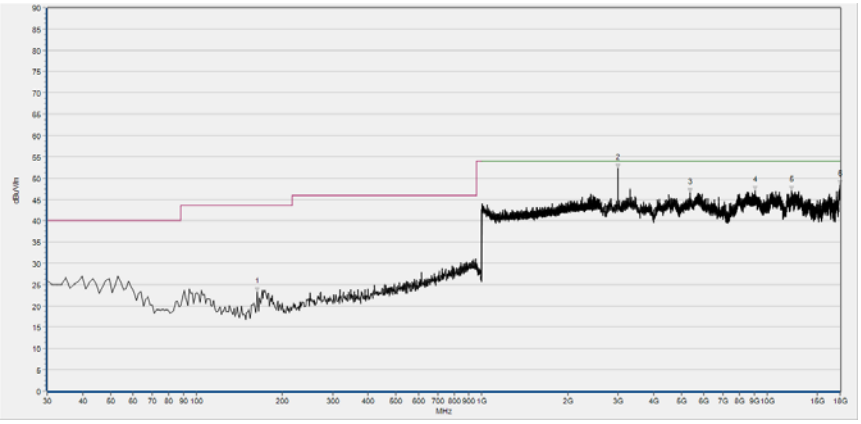


Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
71.277	33.47	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
305.582	27.22	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1653.701	42.99	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2812.839	46.05	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5649.755	48.01	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
9010.366	48.77	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

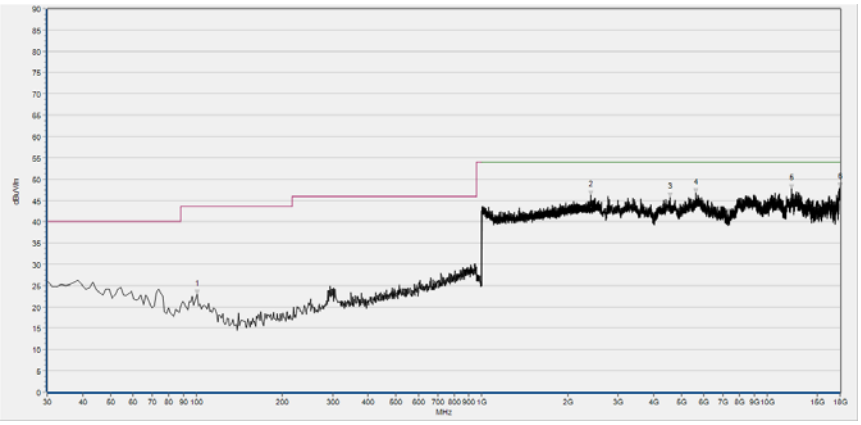
802.11g Test Mode

Plots 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
163.542	23.31	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
3000.000	52.30	N/A	32.58	74.00	N/A	54.00	Horizontal	PASS
5361.302	46.59	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
9052.373	47.01	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12135.734	47.09	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
17974.795	48.44	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

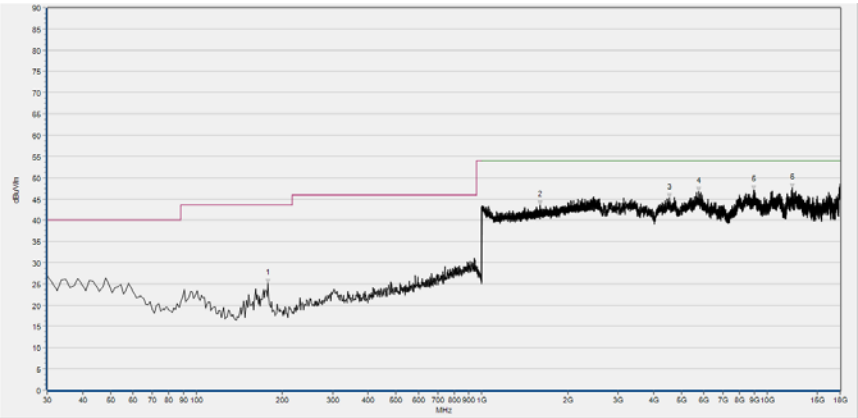
(Antenna Horizontal, 30MHz to 18GHz)



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
100.413	23.03	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
2411.124	46.23	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4557.556	45.80	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5613.348	46.76	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12146.936	47.81	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
17952.391	48.11	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

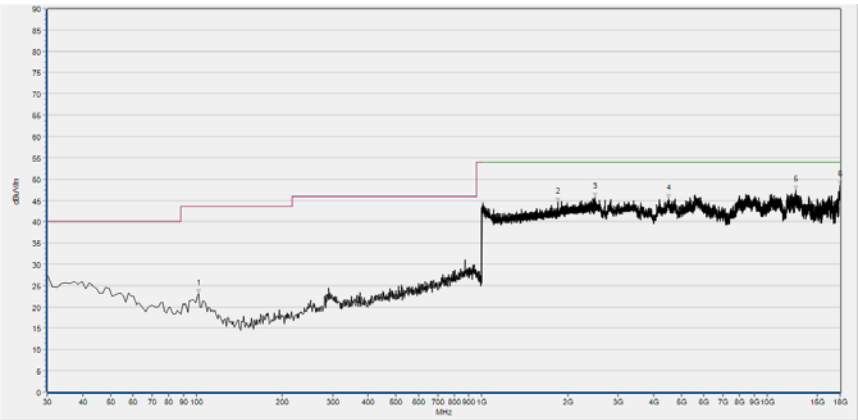
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel = 6



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
178.110	25.11	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1597.359	43.51	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4537.952	45.28	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5742.171	46.75	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8985.161	47.02	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12202.946	47.63	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

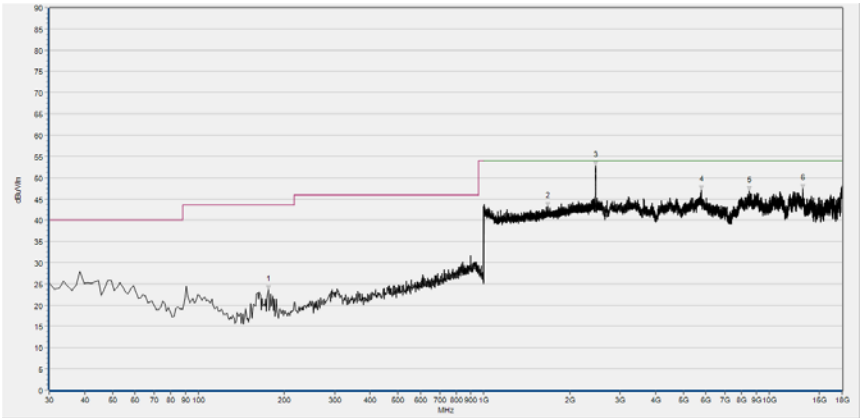
(Antenna Horizontal, 30MHz to 18GHz)



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
101.627	23.05	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
1845.778	44.56	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2497.559	45.76	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4507.147	45.50	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12617.421	47.51	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
17966.394	48.64	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

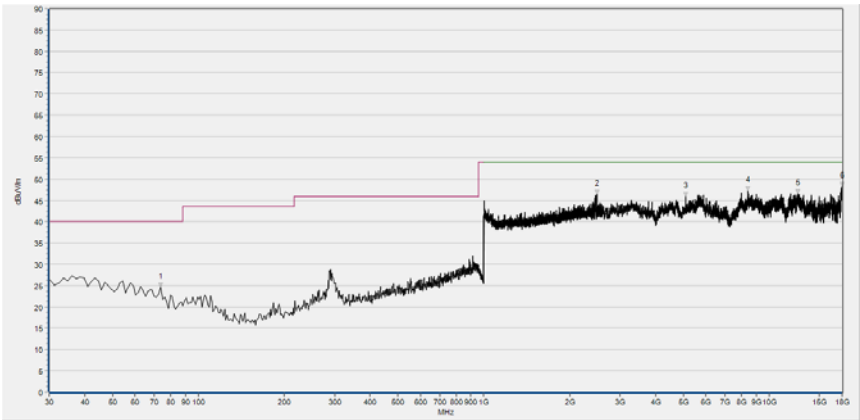
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel = 11



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
175.682	23.61	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1679.312	43.22	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2462.600	51.79	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5784.179	47.02	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8495.072	46.89	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
13082.306	47.42	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)

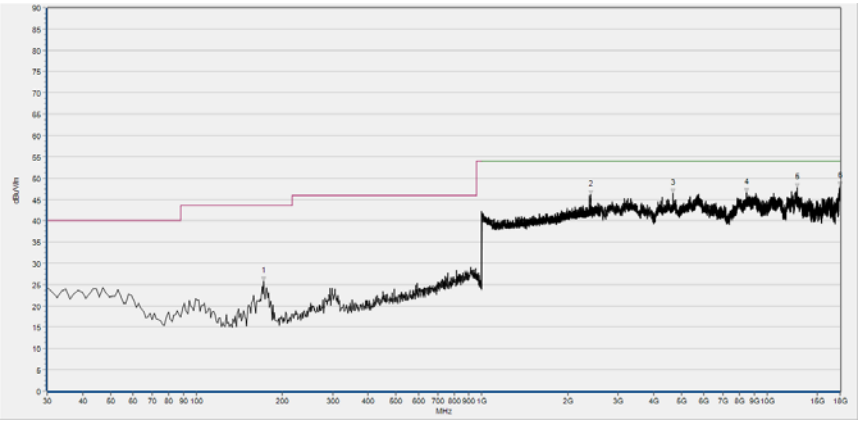


Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
73.705	24.57	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
2488.595	46.34	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5086.852	45.99	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8433.461	47.31	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12606.219	46.57	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
17991.598	48.33	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

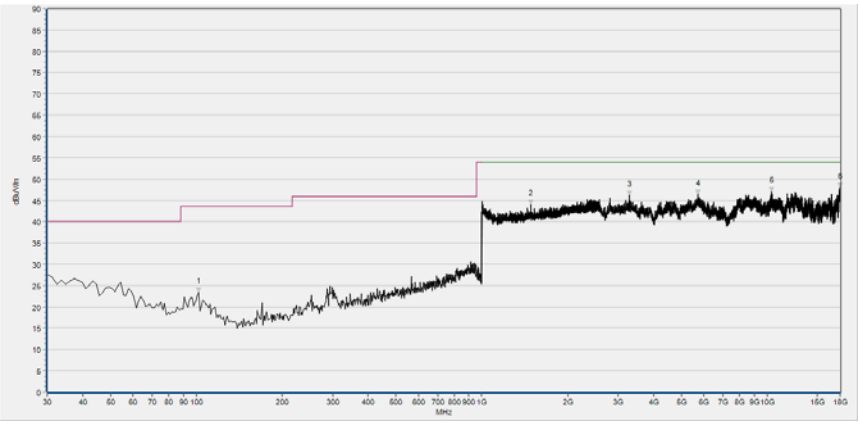
802.11n(HT20) Test Mode

Plots 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
172.040	25.89	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
2404.082	46.01	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4663.975	46.49	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8441.862	46.65	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12707.038	47.72	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
17977.596	48.08	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

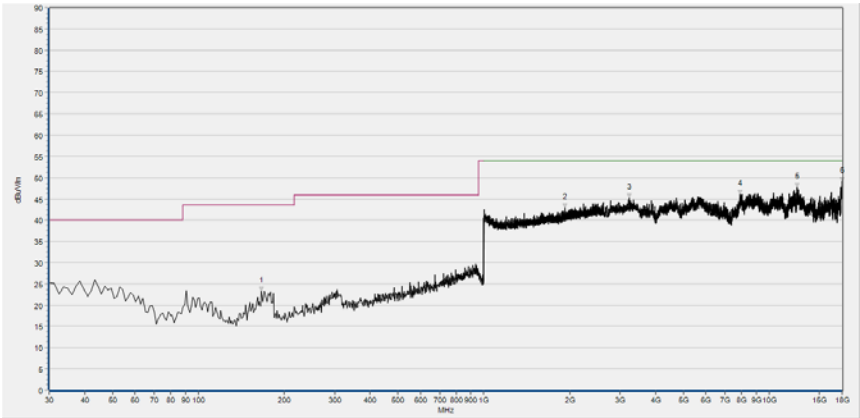
(Antenna Horizontal, 30MHz to 18GHz)



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
101.627	23.39	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
1488.515	44.06	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
3291.726	46.26	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5719.767	46.36	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
10332.206	47.08	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
17983.197	48.17	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

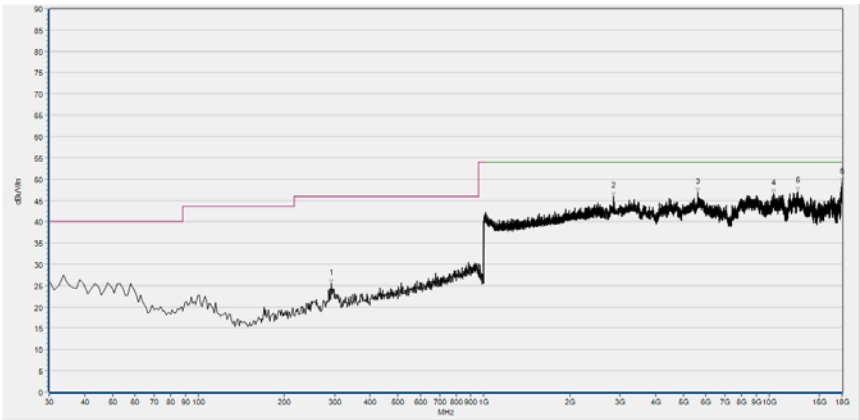
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel = 6



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
165.970	23.33	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1927.091	42.86	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
3238.516	45.23	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
7878.960	46.05	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12539.007	47.76	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
17969.194	49.18	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

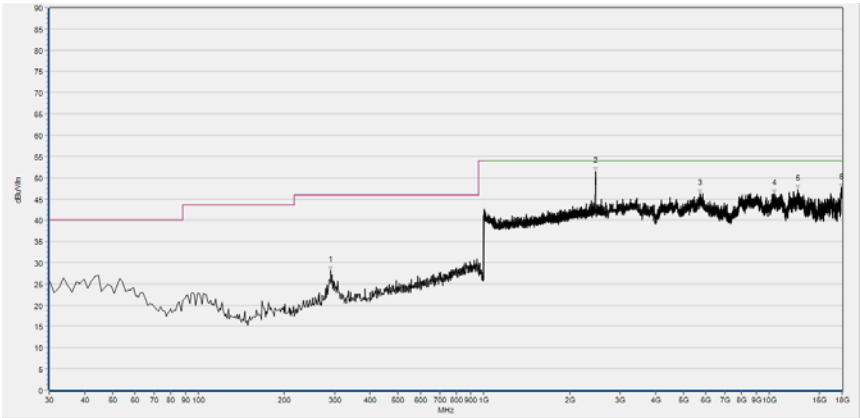
(Antenna Horizontal, 30MHz to 18GHz)



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
292.228	25.43	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2846.445	45.87	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5613.348	47.00	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
10349.009	46.64	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12567.012	47.02	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
17957.992	49.24	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

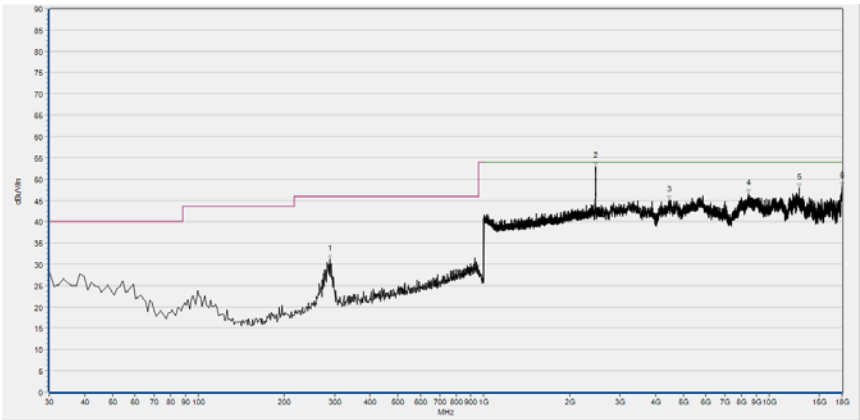
(Antenna Vertical, 30MHz to 18GHz)

Plot for Channel = 11



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
291.014	28.11	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2462.345	51.50	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5719.767	46.17	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
10424.623	46.25	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12578.214	47.21	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
17885.179	47.59	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)

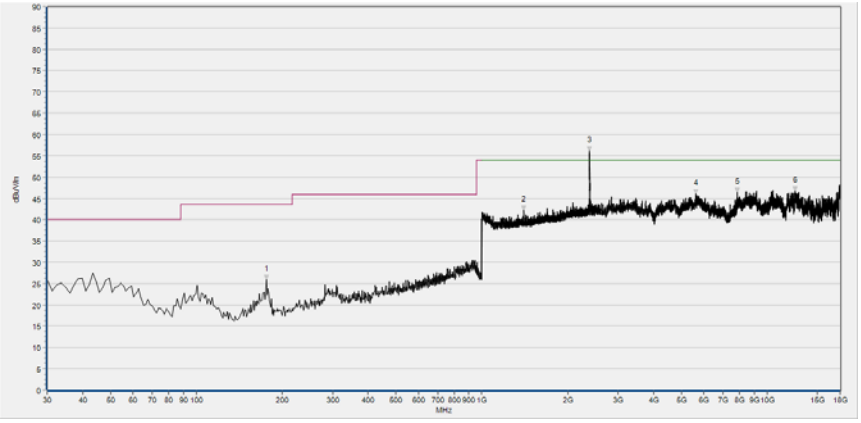


Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
288.586	31.16	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2465.546	52.99	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4459.538	45.06	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8458.665	46.61	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12735.043	48.00	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
17977.596	48.21	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

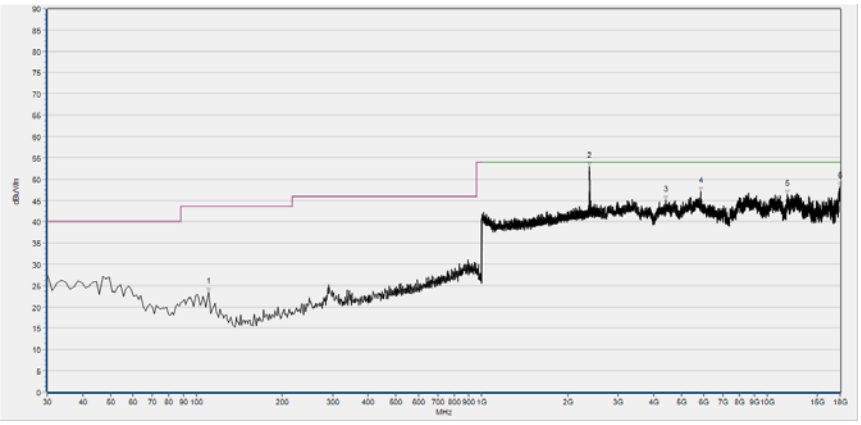
802.11n(HT40) Test Mode

Plots for Channel = 3



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
175.682	25.96	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1404.642	42.17	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2387.435	56.16	N/A	39.00	74.00	N/A	54.00	Horizontal	PASS
5627.350	46.09	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
7862.157	46.43	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12533.406	46.77	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

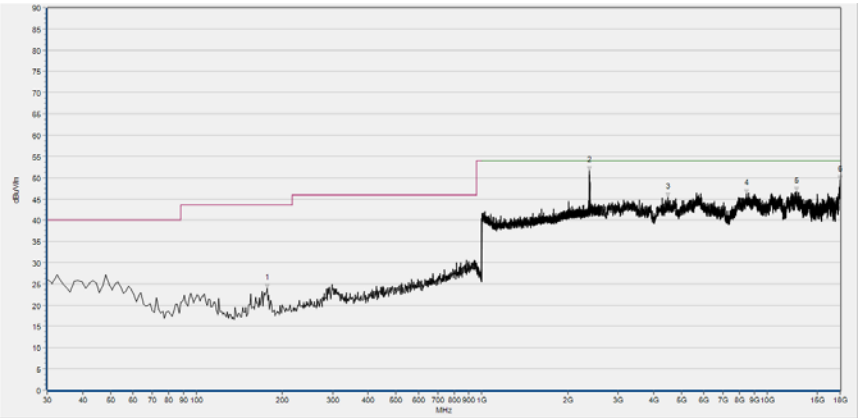
(Antenna Horizontal, 30MHz to 18GHz)



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
110.125	23.49	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
2387.400	53.55	N/A	33.86	74.00	N/A	54.00	Vertical	PASS
4411.929	45.12	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5845.790	47.05	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
11740.862	46.47	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
17983.197	48.26	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

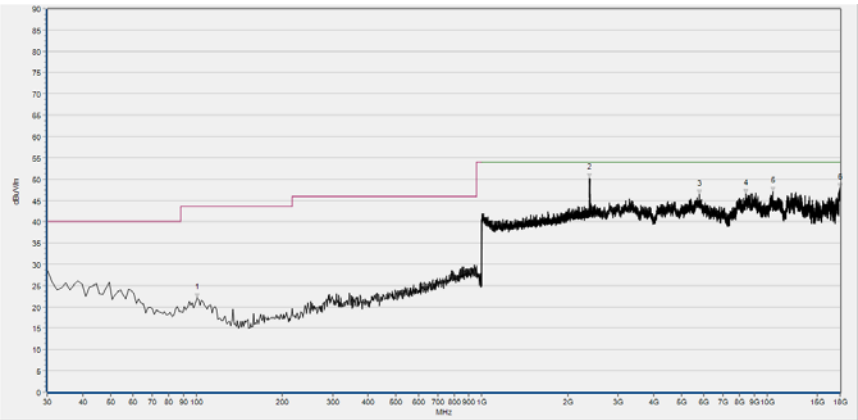
(Antenna Vertical, 30MHz to 18GHz)

Plots for Channel = 6



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
176.896	23.89	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
2385.800	51.55	N/A	31.52	74.00	N/A	54.00	Horizontal	PASS
4487.543	45.37	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8455.865	46.24	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12687.434	46.72	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
17985.997	49.37	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

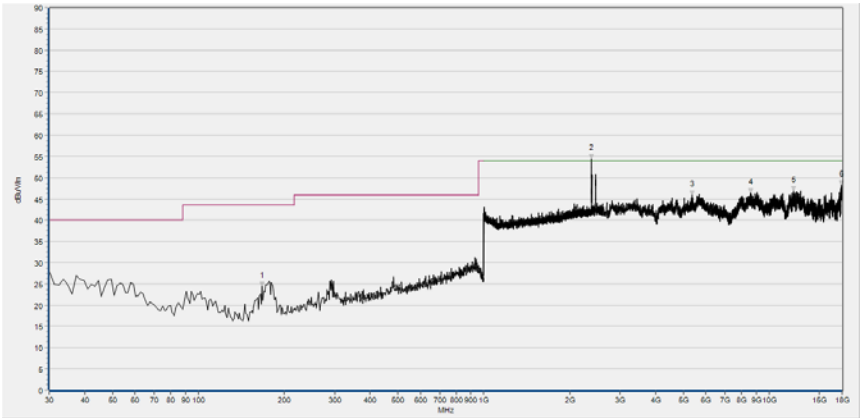
(Antenna Horizontal, 30MHz to 18GHz)



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
100.413	22.09	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
2384.234	50.33	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5770.176	46.39	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8427.860	46.61	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
10441.426	47.07	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
17988.798	47.86	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

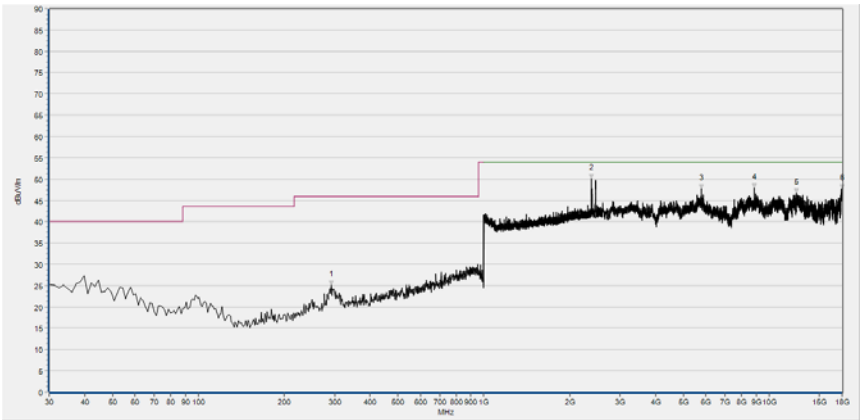
(Antenna Vertical, 30MHz to 18GHz)

Plots for Channel = 9



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
167.184	24.43	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
2382.600	55.43	N/A	43.65	74.00	N/A	54.00	Horizontal	PASS
5372.504	45.95	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8629.496	46.44	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12138.534	46.91	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
17929.987	48.31	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
292.228	25.11	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2386.154	50.06	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5784.179	47.79	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8881.542	47.87	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12466.194	46.79	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
17960.793	47.69	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. Morlab Laboratory
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. Morlab Laboratory
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 C63.10-2013and 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	Cal. Due
Attenuator 1	(N/A.)	10dB	Resnet	N/A	N/A
EXA Signal Analzyer	MY53470836	N9010A	Agilent	2020.04.01	2021.03.31
USB Wideband Power Sensor	MY54210011	U2021XA	Agilent	2020.04.01	2021.03.31
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	Cal. Due
Receiver	MY56400093	N9038A	KEYSIGHT	2020.03.26	2021.03.25
LISN	812744	NSLK 8127	Schwarzbeck	2020.03.26	2021.03.25
Pulse Limiter (20dB)	9391	VTSD 9561-D	Schwarzbeck	2019.05.08	2020.05.09
Coaxial cable(BNC) (30MHz-26GHz)	CB01	EMC01	Morlab	N/A	N/A

4.3 List of Software Used

Description	Manufacturer	Software Version
Test system	Tonscend	V2.6
Power Panel	Agilent	V3.8
MORLAB EMCR V1.2	MORLAB	V1.0

4.4 Radiated Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal.Due
Receiver	MY54130016	N9038A	Agilent	2019.07.29	2020.07.28
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2019.05.24	2022.05.23
Test Antenna - Loop	1519-022	FMZB1519	Schwarzbeck	2019.05.24	2022.05.23
Test Antenna – Horn	01774	BBHA 9120D	Schwarzbeck	2019.02.14	2022.02.13
Test Antenna – Horn	BBHA9170 #774	BBHA9170	Schwarzbeck	2019.05.24	2022.05.23
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
1-18GHz pre-Amplifier	MA02	TS-PR18	Rohde& Schwarz	2019.05.08	2020.05.09
18-26.5GHz pre-Amplifier	MA03	TS-PR18	Rohde& Schwarz	2019.05.08	2020.05.09
Notch Filter	N/A	WRCG-2400-2483.5-60SS	Wainwright	2019.12.01	2020.12.01
Anechoic Chamber	N/A	9m*6m*6m	CRT	2020.01.06	2023.01.05

END OF REPORT