REPORT No.: SZ22030234W03

TEST REPORT

APPLICANT	:	Thundercomm Technology Co., Ltd
PRODUCT NAME	:	Turbox C404 SOM
MODEL NAME	:	TurboX C404
BRAND NAME	:	TurboX
FCC ID	:	2AOHH-TURBOXC404
STANDARD(S)	:	47 CFR Part 15 Subpart C
RECEIPT DATE	:	2020-09-22
TEST DATE	:	2020-10-17 to 2021-01-20
ISSUE DATE	:	2022-07-06

Edited by: Zeng Xiaoying (Rapporteur)

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DIRECTORY

Change History		
Version	Date	Reason for change
1.0	2022-07-06	First edition

1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Thundercomm Technology Co., Ltd
Applicant Address:	No. 107, Middle Datagu Road, Xiantao Street, Yubei District, Chongqing, China, 401122
Manufacturer:	Thundercomm Technology Co., Ltd
Manufacturer Address:	No. 107, Middle Datagu Road, Xiantao Street, Yubei District, Chongqing, China, 401122

1.2. Equipment Under Test (EUT) Description

Product Name:	Turbox C404 SOM	
Sample No.:	7#	
Hardware Version:	TurboX C404 SOM V06	
Software Version:	LE1	
Modulation Technology:	DSSS, OFDM	
Modulation Type:	Refer to section1.3	
Operating Frequency Range:	802.11b/g/ n (HT20): 2412MHz–2462MHz 802.11n (HT40): 2422MHz–2452MHz	
Antenna Information:	Antenna Type A	
	Antenna Type:	ANT1: Dipole Antenna
		ANT2: Dipole Antenna
	Antenna Gain:	ANT1: 3.00dBi
		ANT 2: 3.00dBi
	Antenna Type B	
	Antenna Type:	ANT1: PIFA Antenna
		ANT2: PIFA Antenna
	Antenna Gain:	ANT1: 3.49dBi
		ANT 2: 3.51dBi
	Antenna Type C	
	Antenna Type:	ANT1: PIFA Antenna
		ANT2: PIFA Antenna
	Antenna Gain:	ANT1: 2.99dBi

		ANT 2: 2.69dBi
Directional Gain:	6.52dBi(Type B)Note 4	

Note 1: This is a variant report of original report (Report No.: SZ21070280W03, FCC ID: 2AOHH-TURBOXC404). Based on the similarity between before, add a new type C antenna, change the applicant, manufacturer's address and change memory manufacturers.
Except for the differences shown above, the other parts are the same as before. Their electrical circuit design, layout, components used and internal wiring are identical. No other changes.
The changes do not affect the results in this report.

Note 2: The EUT will not sell with antenna.

Note 3: The EUT supports a MIMO function. Physically, the EUT provides two completed transmitters and two receivers for 802.11n modulation mode.

Note 4: 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 5: 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

Modulation technology	Modulation Type	Data Rate (Mbps) Note1
DSSS (802.11b)	DBPSK	**1**
	DQPSK	2
	CCK	5.5/ 11
OFDM (802.11g)	BPSK	**6** / 9
	QPSK	12 / 18
	16QAM	24 / 36
	64QAM	48 / 54
OFDM (802.11n (HT20))	BPSK	**6.5**
	QPSK	13/19.5
	16QAM	26/39
	64QAM	52/58.5/65
OFDM (802.11n (HT40))	BPSK	**13.5**
	QPSK	27/40.5
	16QAM	54/81/108
	64QAM	121.5/135

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

1.4. The Channel Number and Frequency

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

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

1.5. Test Standards and Results

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

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

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

No.	Section	Description	Test Date	Test Engineer	Result	Method determination /Remark
1	15.203	Antenna Requirement	N/A	N/A	PASS$_{Note1}$	No deviation
2	N/A	Duty Cycle Of Test Signal	Nov 12, 2020	Tu Ya'nan	PASS$_{Note1}$	No deviation
3	15.247(b)	Maximum Peak and Average Conducted Output Power	Jan 20, 2021	Tu Ya'nan	PASS$_{Note1}$	No deviation
4	15.247(a)	Bandwidth	Jan 20, 2021	Tu Ya'nan	PASS$_{Note1}$	No deviation
5	15.247(d)	Conducted Spurious Emission and Band Edge	Jan 20, 2021	Tu Ya'nan	PASS$_{Note1}$	No deviation
6	15.247(e)	Power Spectral Density (PSD)	Jan 20, 2021	Tu Ya'nan	PASS$_{Note1}$	No deviation
7	15.207	Conducted Emission	Oct 17, 2020	Huang Zhiye	PASS$_{Note1}$	No deviation
8	15.247(d)	Restricted Frequency Bands	Jan 06, 2021	Gao Jianrou	PASS$_{Note1}$	No deviation
9	15.209, 15.247(d)	Radiated Emission	Jan 06, 2021	Gao Jianrou	PASS$_{Note1}$	No deviation

Note 1: The test results of these test items in this report refer to the test report (Report No.: SZ21070280W03).

Note 2: The tests were performed according to the method of measurements prescribed in

ANSIC63.10-2013, KDB558074 D01 v05r02.

Note 3: The path loss during the RF test is calibrated to correct the results by the offset setting in the test equipments. The ref offset 11.5dB contains two parts that cable loss 1.5dB and Attenuator 10dB.

Note 4: 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 5: 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

The EUT has a PIFA antenna coupled with the I-PEX connector. Please refer to the EUT internal photos.

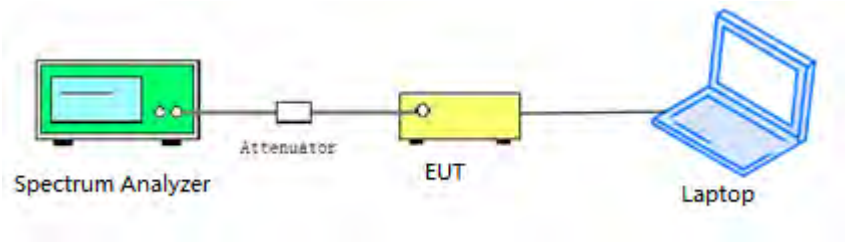
2.2. Duty Cycle of Test Signal

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:



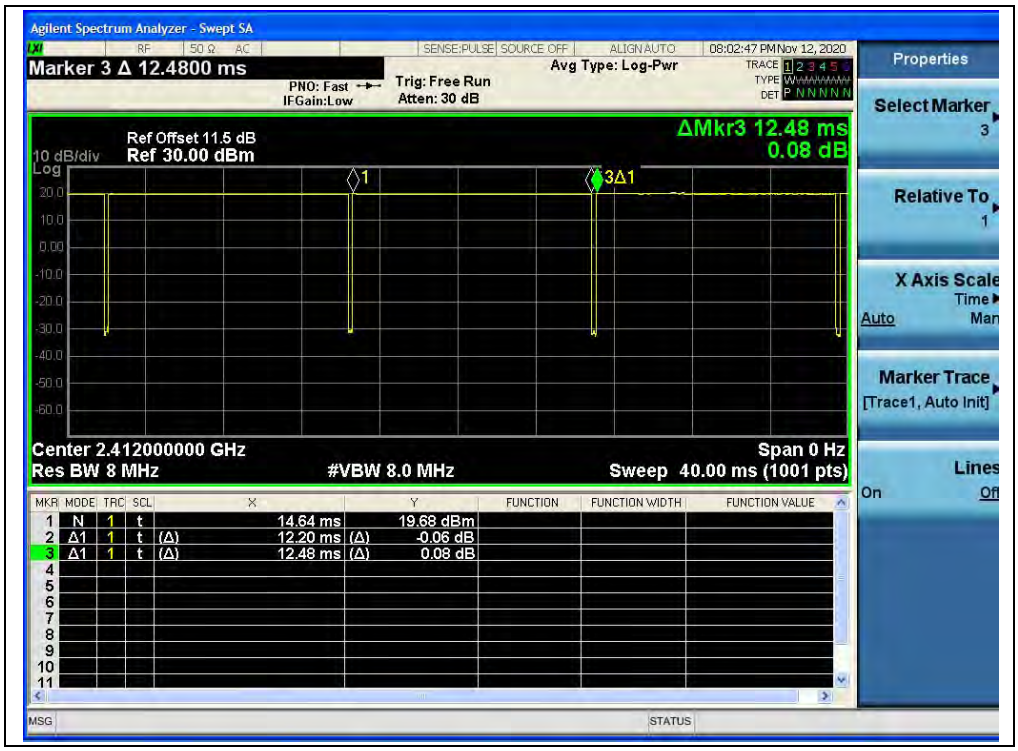
ANSI C63.10 2013 Clause 11.6 was used in order to prove compliance.

2.2.3.Test Result

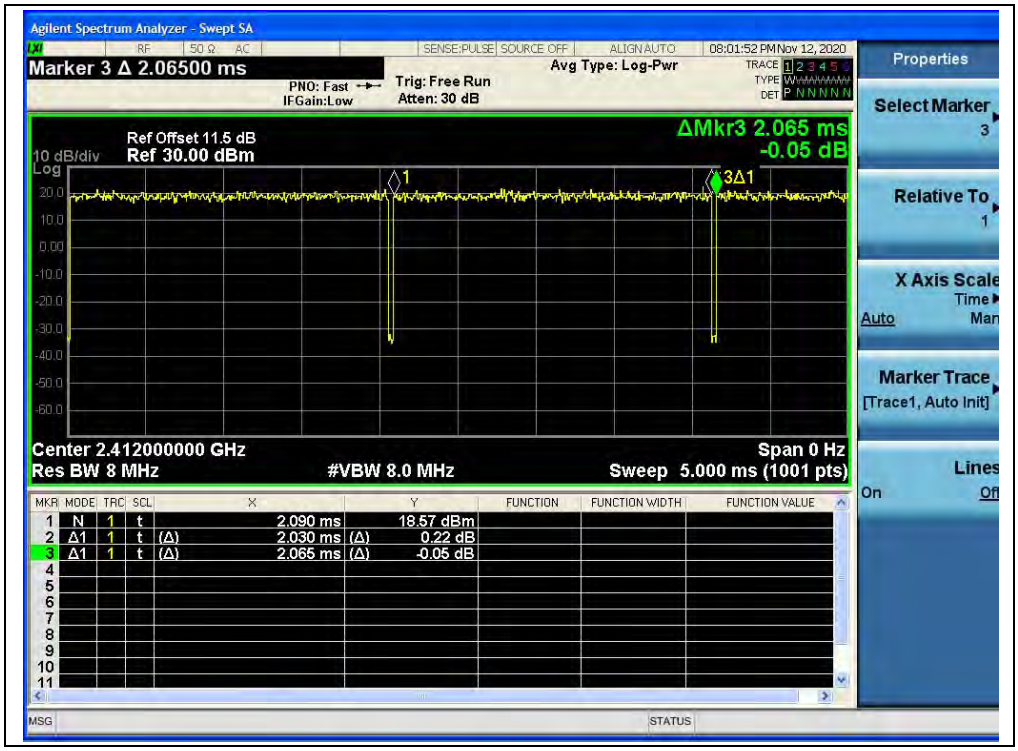
A.Test Verdict:

Test Mode	Duty Cycle (%) (D)	Duty Factor (10*lg[1/D])
802.11b	97.76	0.10
802.11g	98.31	0.07
802.11n (HT20)	98.18	0.08
802.11n (HT40)	94.90	0.23

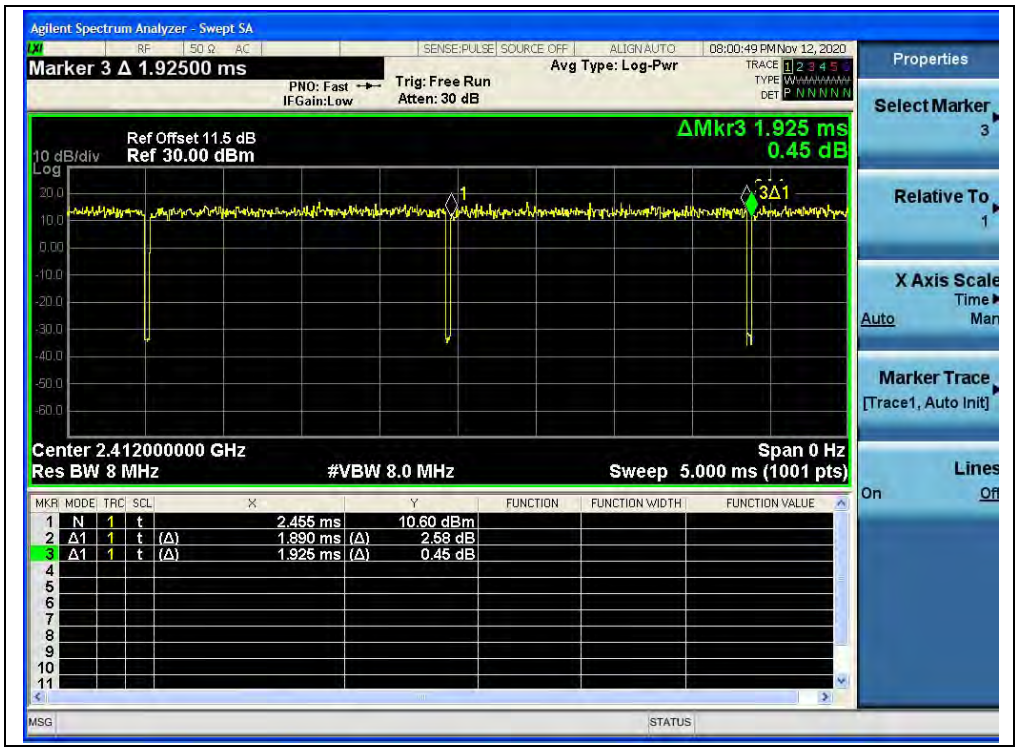
B.Test Plot:



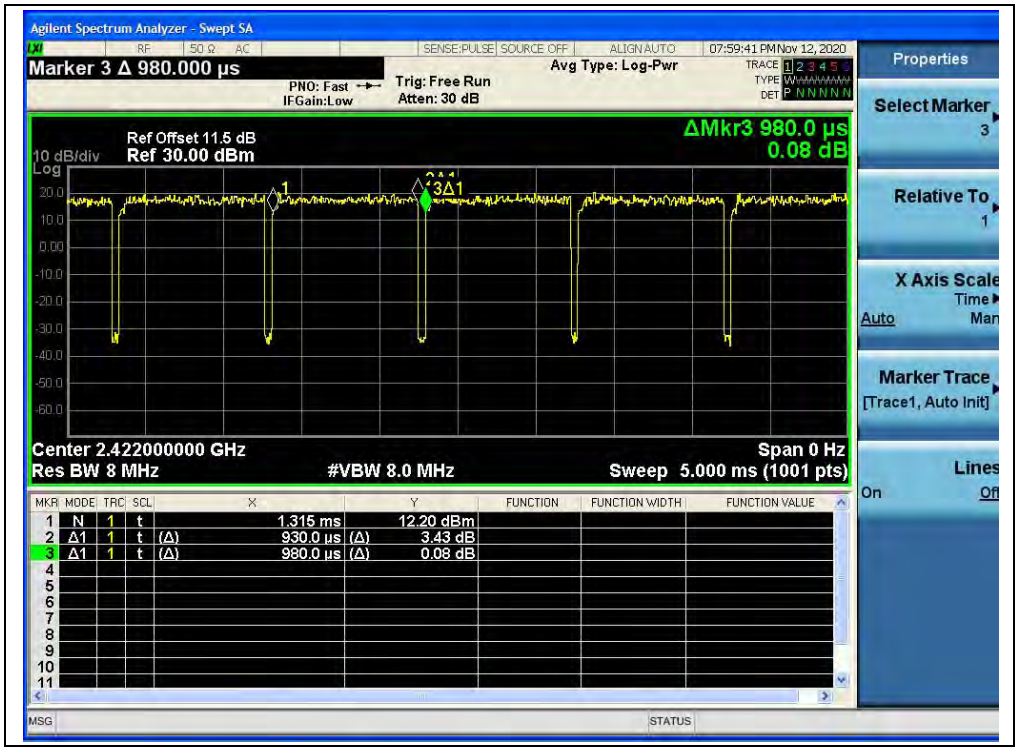
(Channel 1, 802.11b)



(Channel 1, 802.11g)



(Channel 1, 802.11n (HT20))



(Channel 3, 802.11n (HT40))

2.3. Maximum Peak and Average Conducted Output Power

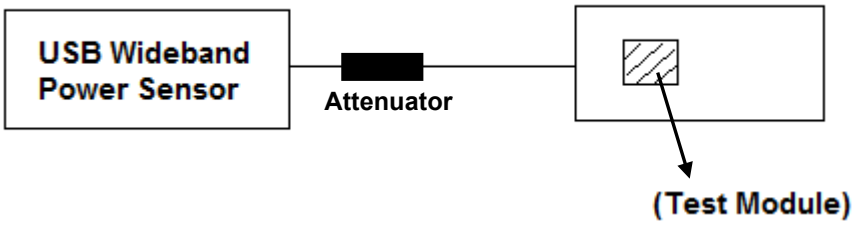
2.3.1.Requirement

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 Mode

Channel	Frequency (MHz)	Measured Peak Power				Limit (dBm)		Verdict
		ANT1		ANT2				
		dBm	W	dBm	W	dBm	W	
1	2412	18.23	0.067	18.32	0.068	30	1	PASS
6	2437	18.41	0.069	18.61	0.073			PASS
11	2462	18.16	0.065	18.22	0.066			PASS

802.11g Mode

Channel	Frequency (MHz)	Measured Peak Power				Limit (dBm)		Verdict
		ANT1		ANT2				
		dBm	W	dBm	W	dBm	W	
1	2412	19.82	0.096	19.92	0.098	30	1	PASS
6	2437	20.12	0.103	20.23	0.105			PASS
11	2462	20.03	0.101	20.14	0.103			PASS

802.11n(HT20) Mode

Channel	Frequency (MHz)	Measured Peak Power (dBm)		Total Power (dBm)	Total Power (W)	Limit		Verdict
		ANT1	ANT2			dBm	W	
1	2412	18.78	19.82	22.33	0.171	29.48	0.88	PASS
6	2437	19.14	19.08	22.12	0.163			PASS
11	2462	18.33	18.41	21.37	0.137			PASS
Note: Directional gain = 3.51dBi +10log(2) = 6.52dBi＞6dBi, so the power limit shall be reduced to 30-(6.52-6) = 29.48dBm(0.88W).								

802.11n(HT40) Mode

Channel	Frequency (MHz)	Measured Peak Power (dBm)		Total Power (dBm)	Total Power (W)	Limit		Verdict
		ANT1	ANT2			dBm	W	
3	2422	19.32	19.23	22.28	0.169	29.48	0.88	PASS
6	2437	19.75	19.82	**22.79**	**0.190**			PASS
9	2452	19.32	19.44	22.38	0.173			PASS
Note: Directional gain = 3.51dBi +10log(2) = 6.52dBi＞6dBi, so the power limit shall be reduced to 30-(6.52-6) = 29.48dBm(0.88W).								

Maximum Average Conducted Output Power

802.11b Mode

Frequency (MHz)	Average Power							Limit		Verdict
	Measured		Duty Factor	Duty factor Calculated						
	ANT1	ANT2		ANT1		ANT2				
	dBm	dBm		dBm	W	dBm	W	dBm	W	
2412	16.11	16.33	0.10	16.21	0.042	16.43	0.044	30	1	PASS
2437	16.89	16.71		16.99	0.050	16.81	0.048			PASS
2462	16.08	16.13		16.18	0.041	16.23	0.042			PASS

802.11g Mode

Frequency (MHz)	Average Power							Limit		Verdict
	Measured		Duty Factor	Duty factor Calculated						
	ANT1	ANT2		ANT1		ANT2				
	dBm	dBm		dBm	W	dBm	W	dBm	W	
2412	13.84	13.96	0.07	13.91	0.025	14.03	0.025	30	1	PASS
2437	14.59	14.33		14.66	0.029	14.40	0.028			PASS
2462	13.81	13.75		13.88	0.024	13.82	0.024			PASS

802.11n (HT20) Mode

Frequency (MHz)	Average Power					Limit		Verdict
	Measured		Duty Factor	Total Power with Duty Factor				
	ANT1	ANT2						
	dBm	dBm		dBm	W	dBm	W	
2412	12.80	12.55	0.08	15.80	0.038	29.48	0.88	PASS
2437	13.21	13.05		16.23	0.042			PASS
2462	12.78	12.61		15.80	0.038			PASS
Note: Directional gain = 3.51dBi +10log(2) = 6.52dBi＞6dBi, so the power limit shall be reduced to 30-(6.52-6) = 29.48dBm(0.88W).								

802.11n (HT40) Mode

Frequency (MHz)	Average Power					Limit		Verdict
	Measured		Duty Factor	Total Power with Duty Factor				
	ANT1	ANT2						
	dBm	dBm		dBm	W	dBm	W	
2422	13.31	13.17	0.23	16.43	0.044	29.48	0.88	PASS
2437	13.73	13.70		**16.99**	**0.050**			PASS
2452	13.49	13.57		16.81	0.048			PASS
Note: Directional gain = 3.51dBi +10log(2) = 6.52dBi＞6dBi, so the power limit shall be reduced to 30-(6.52-6) = 29.48dBm(0.88W).								

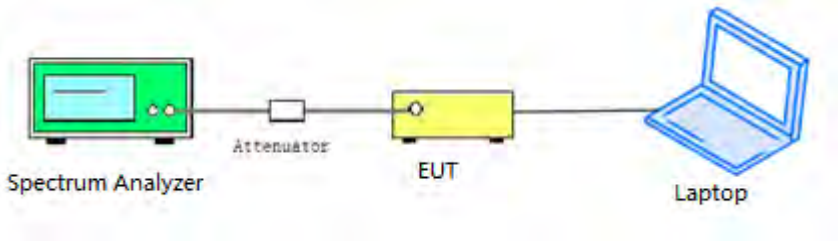
2.4. Bandwidth

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	9.054	≥500	PASS
6	2437	8.078	≥500	PASS
11	2462	8.536	≥500	PASS

B.Test Plot:

(Channel 1, 802.11b)

(Channel 6, 802.11b)

(Channel 11, 802.11b)

802.11g Mode

A.Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits(kHz)	Result
1	2412	15.69	≥500	PASS
6	2437	15.73	≥500	PASS
11	2462	15.73	≥500	PASS

B.Test Plot:

(Channel 1, 802.11g)

(Channel 6, 802.11g)

(Channel 11, 802.11g)

802.11n (HT20) Mode

A.Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits(kHz)	Result
1	2412	16.08	≥500	PASS
6	2437	16.31	≥500	PASS
11	2462	16.30	≥500	PASS

B.Test Plot:

(Channel 1, 802.11n (HT20))

(Channel 6, 802.11n (HT20))

(Channel 11, 802.11n (HT20))

802.11n (HT40) Mode

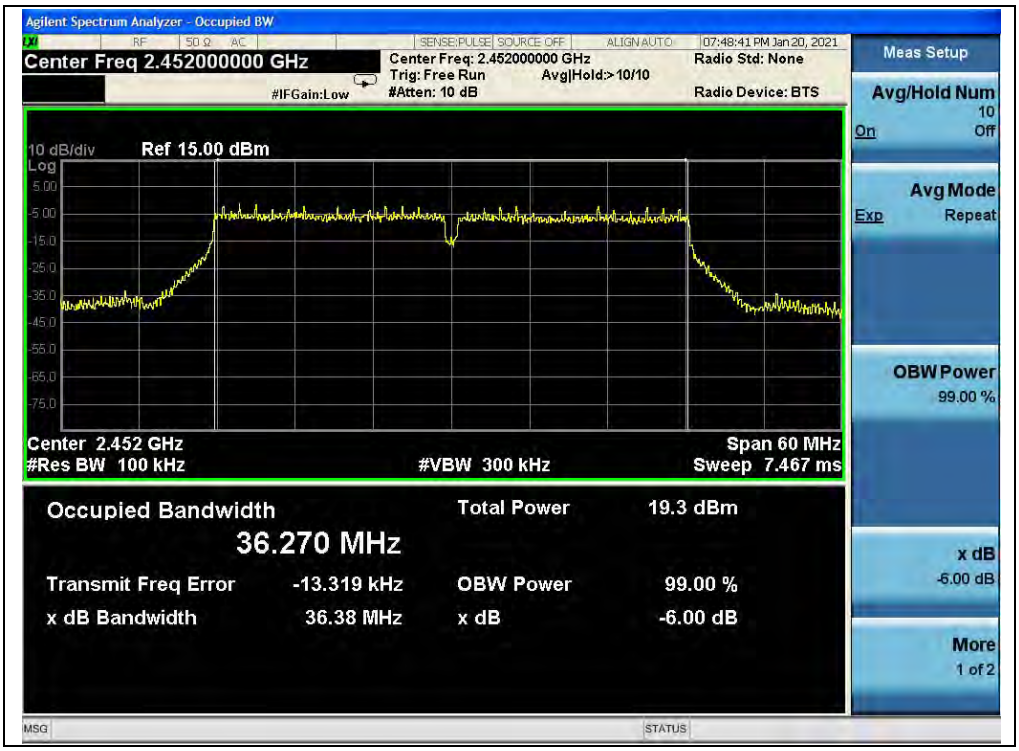
A.Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits(kHz)	Result
3	2422	35.08	≥500	PASS
6	2437	35.68	≥500	PASS
9	2452	36.38	≥500	PASS

B.Test Plot:

(Channel 3, 802.11n (HT40))

(Channel 6, 802.11n (HT40))



(Channel 9, 802.11n (HT40))

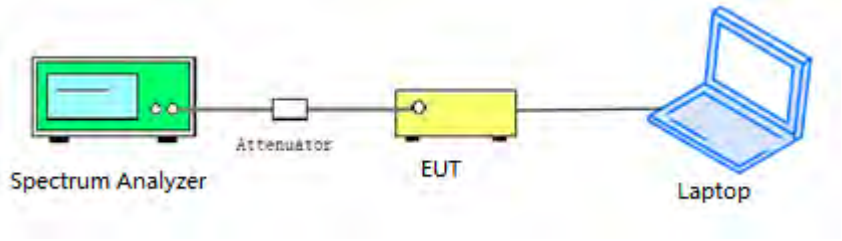
2.5. Conducted Spurious Emissions and Band Edge

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.

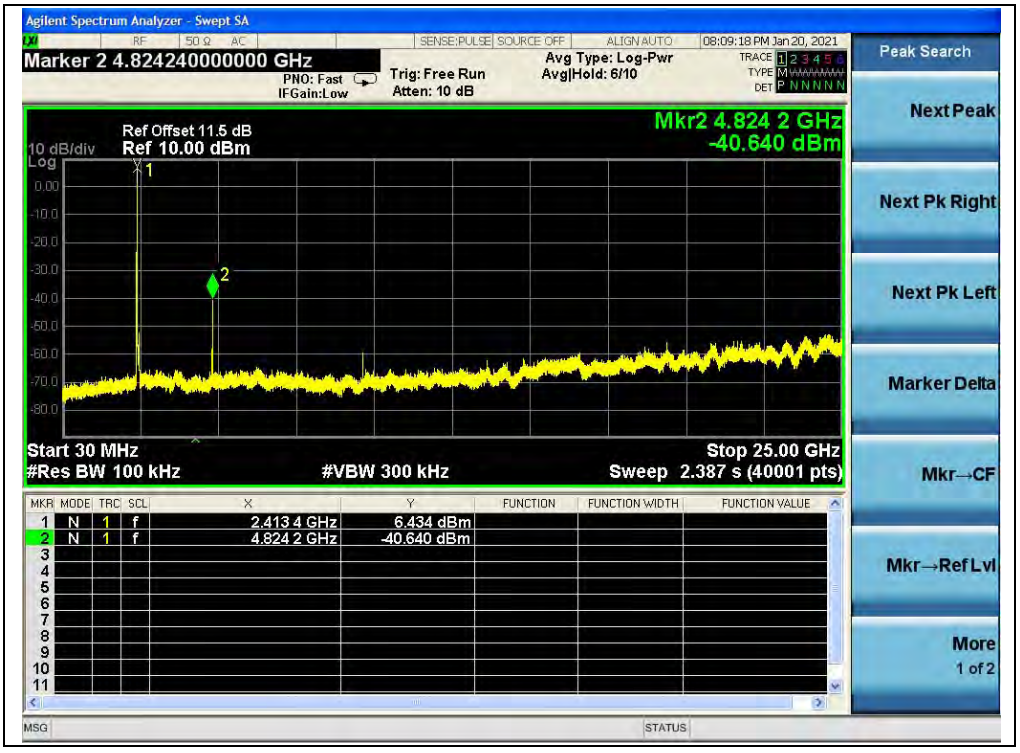
2.5.4.Test Result

802.11b Mode

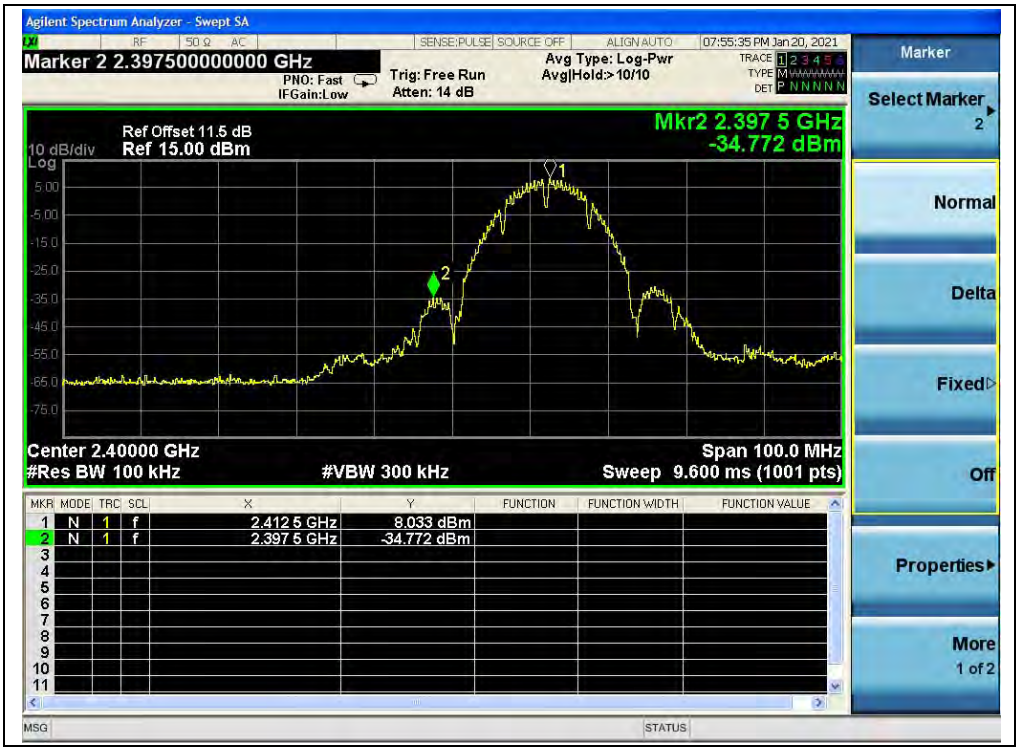
A.Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-40.64	6.43	-13.57	PASS
6	2437	-45.20	7.67	-12.33	PASS
11	2462	-42.17	6.69	-13.31	PASS

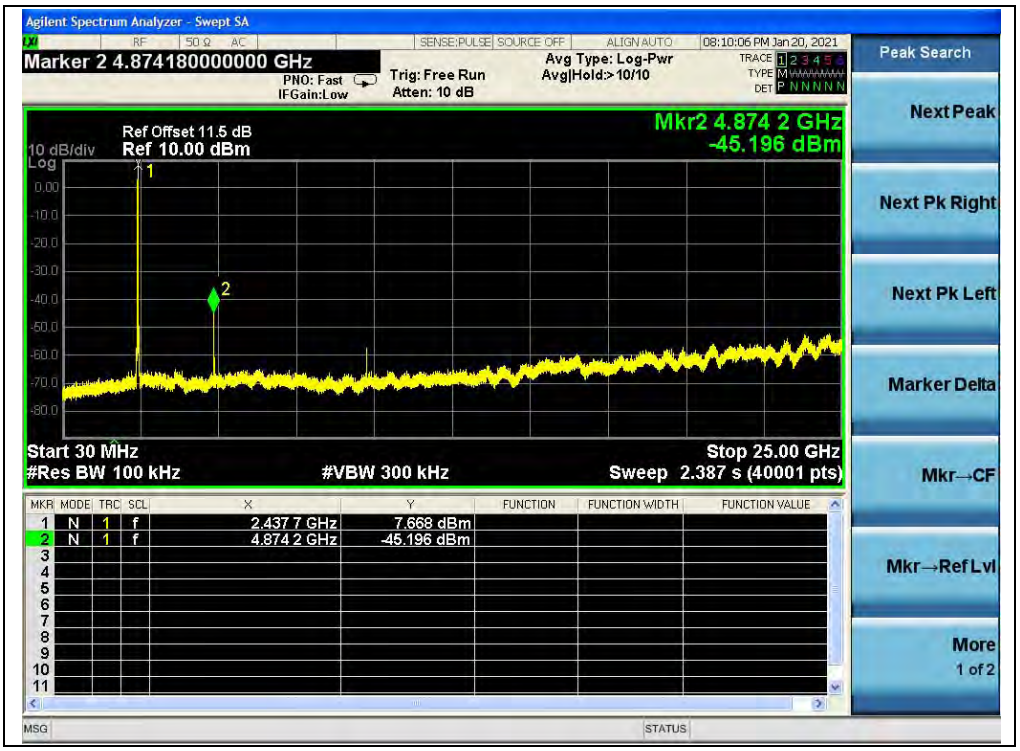
B.Test Plot:



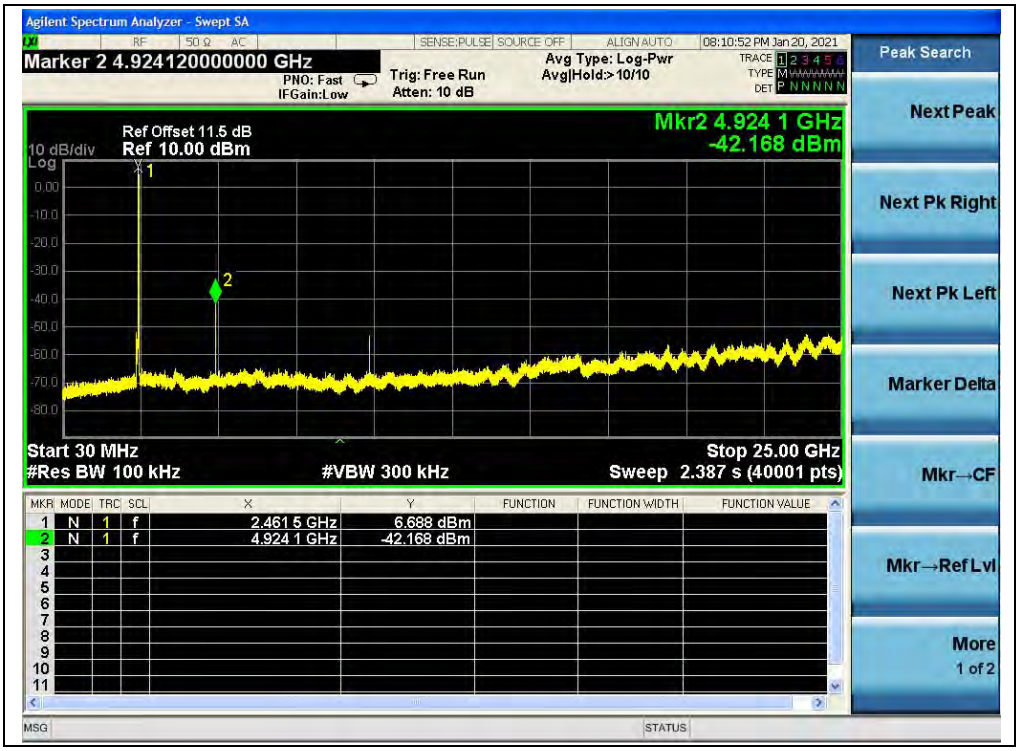
(30MHz to 25GHz, Channel 1, 802.11b)



(Band Edge, Channel 1, 802.11b)



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



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

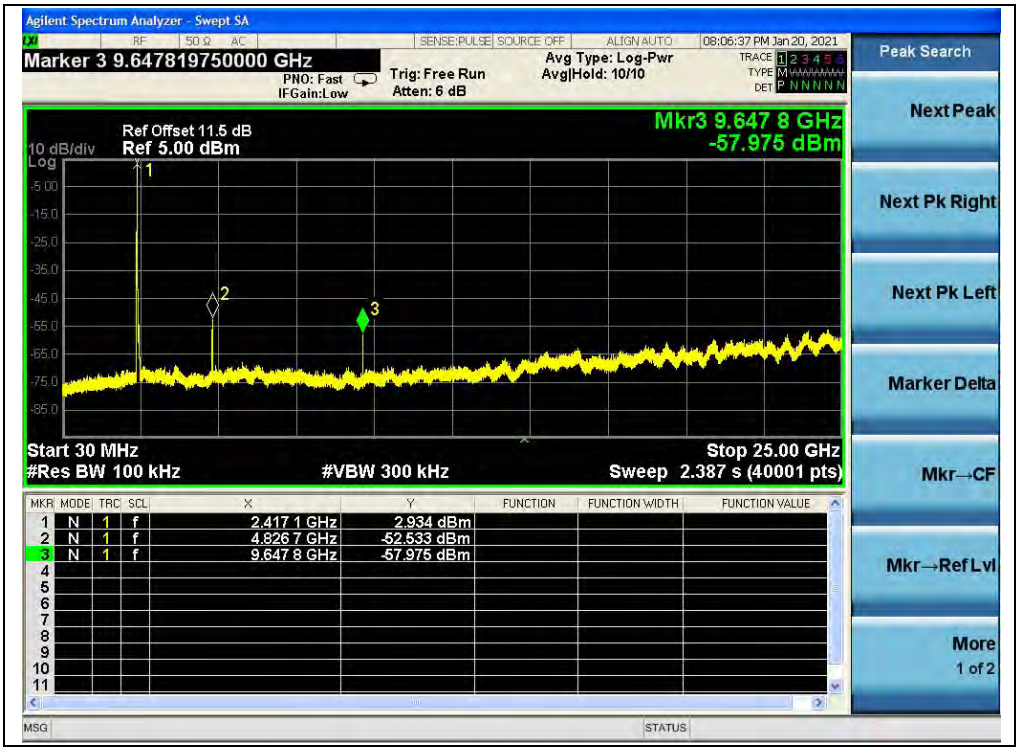
(Band Edge, Channel 11, 802.11b)

802.11g Mode

A.Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-52.53	2.93	-17.07	PASS
6	2437	-57.20	1.05	-18.95	PASS
11	2462	-52.34	-0.46	-20.46	PASS

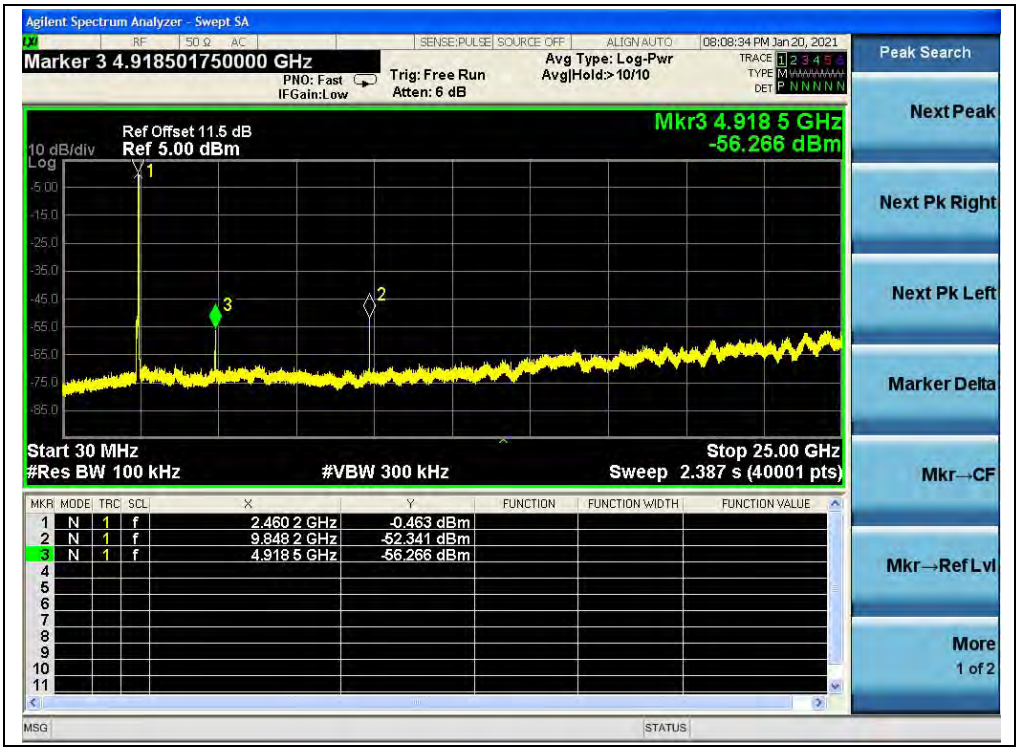
B.Test Plot:



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

(Band Edge, Channel 1, 802.11g)

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



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

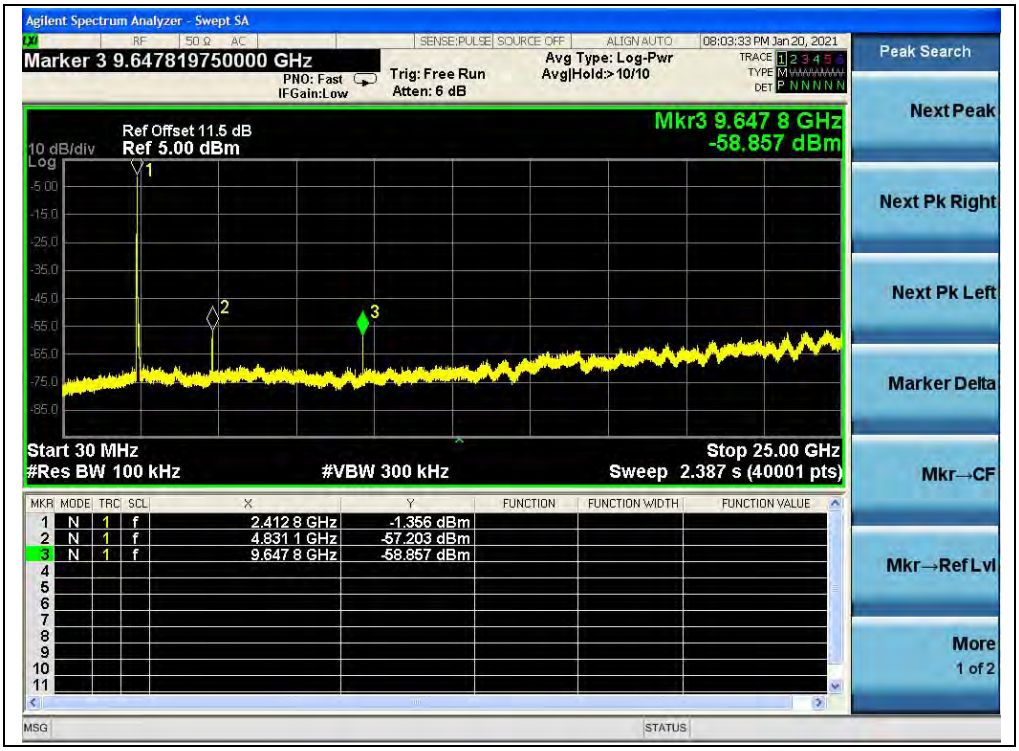
(Band Edge, Channel 11, 802.11g)

802.11n (HT20) Mode

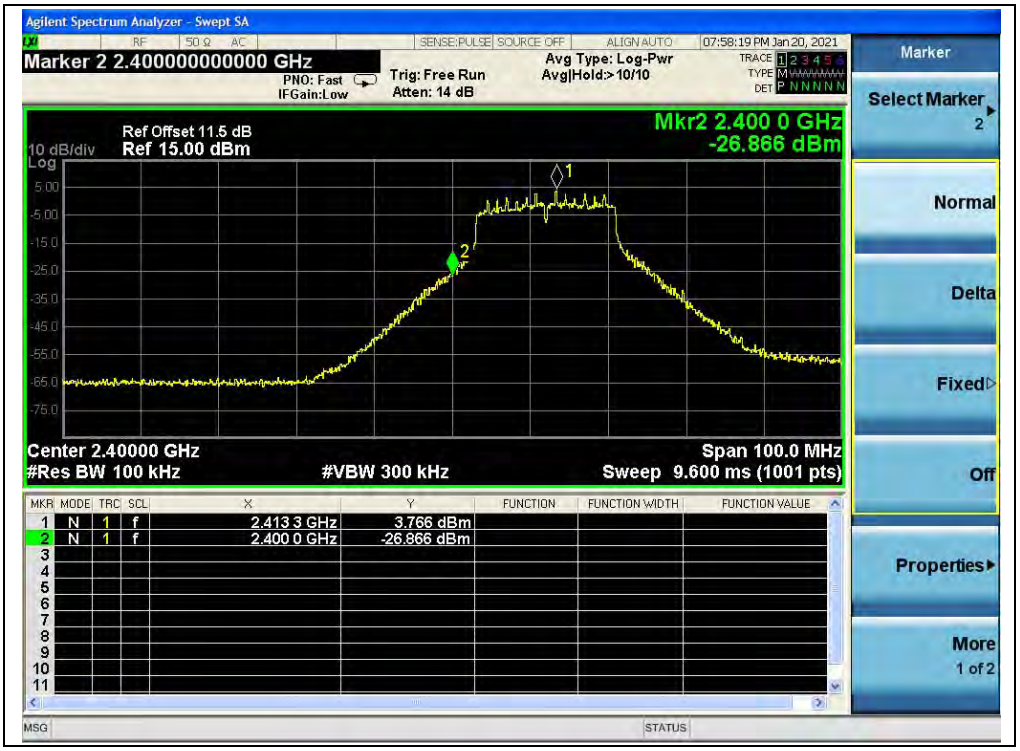
A.Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-57.20	-1.36	-21.36	PASS
6	2437	-57.91	3.98	-16.02	PASS
11	2462	-52.71	-0.53	-20.53	PASS

B.Test Plot:

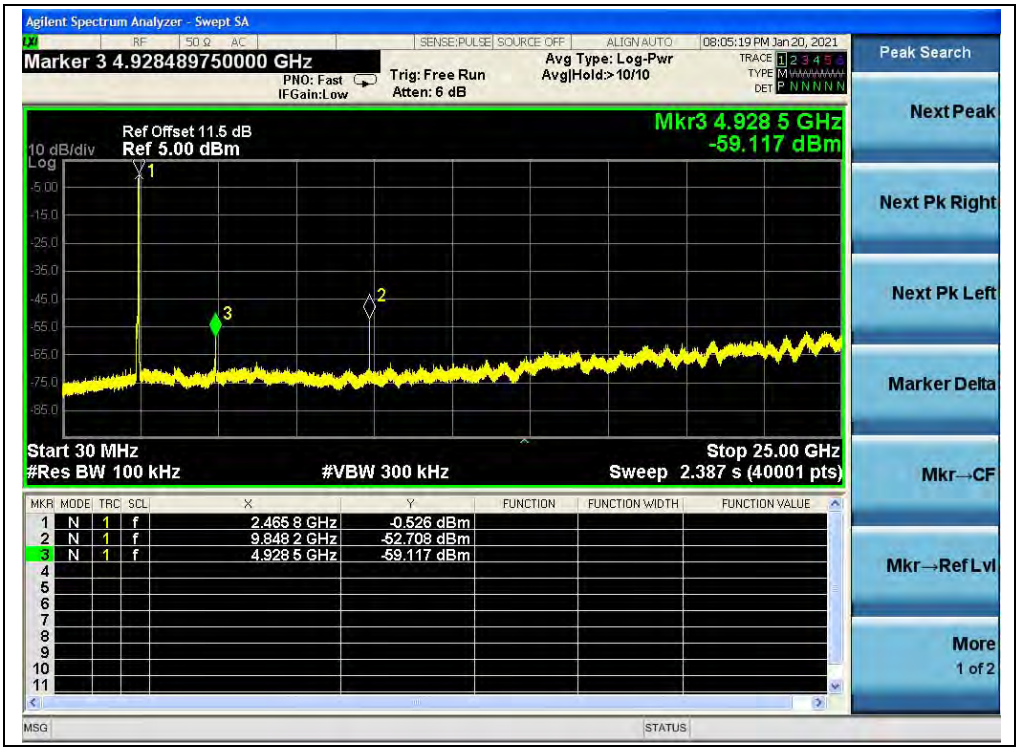


(30MHz to 25GHz, Channel 1, 802.11n (HT20))



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

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



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

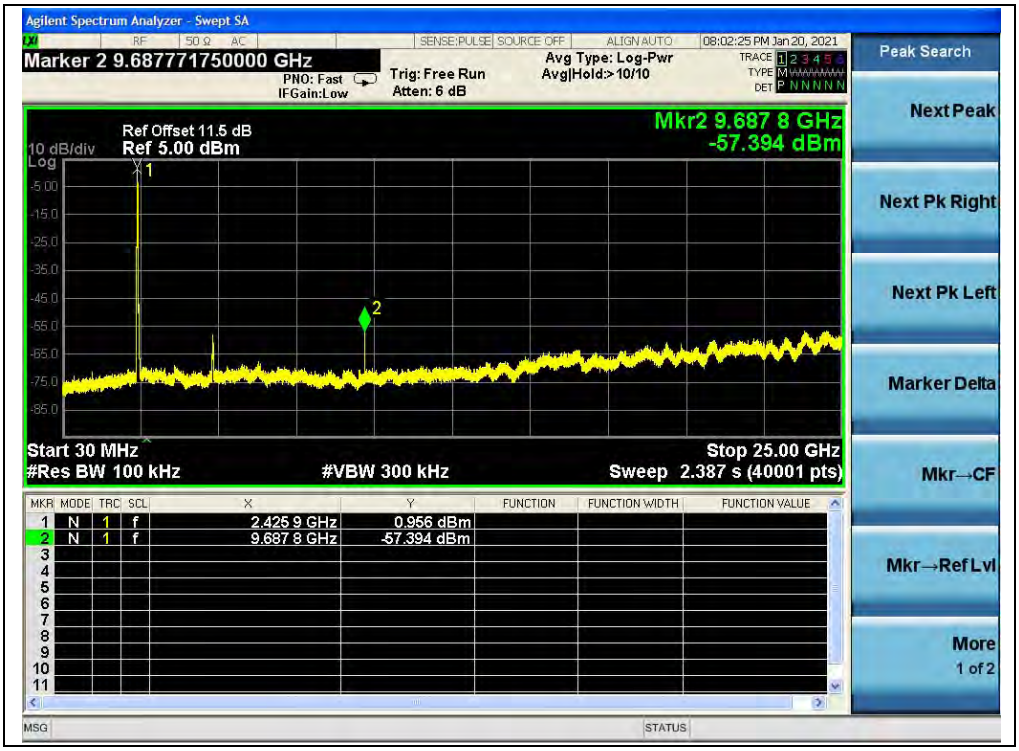
(Band Edge, Channel 11, 802.11n (HT20))

802.11n (HT40) Mode

A.Test Verdict:

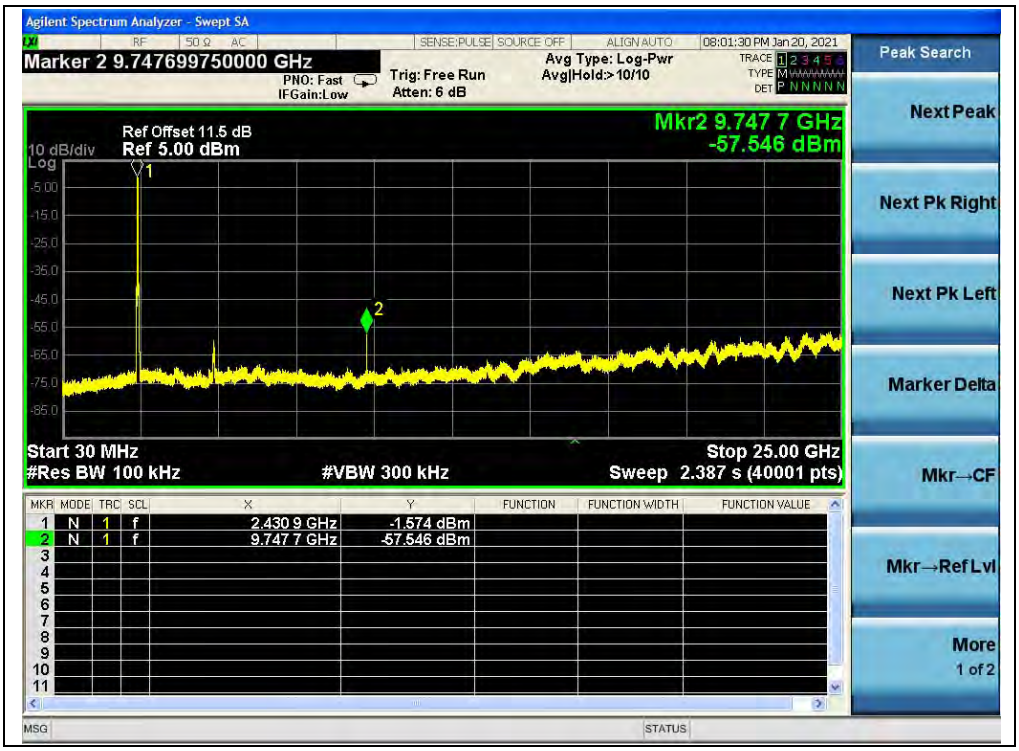
Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
3	2422	-57.39	0.96	-19.04	PASS
6	2437	-57.55	-1.57	-21.57	PASS
9	2452	-54.01	-0.18	-20.18	PASS

B.Test Plot:

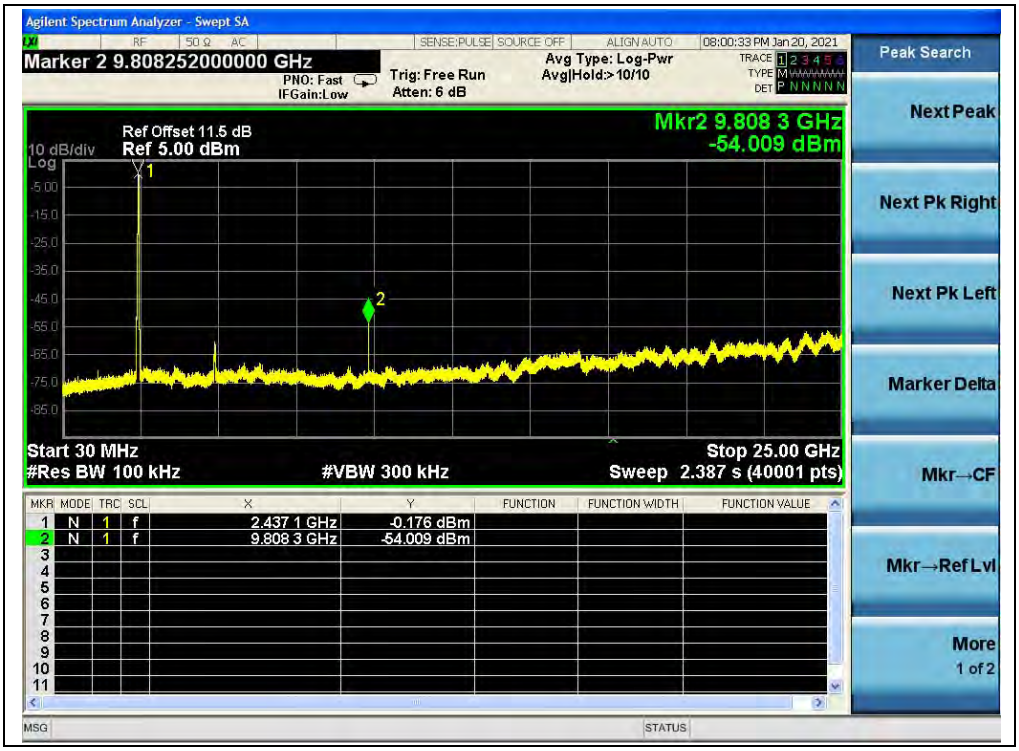


(30MHz to 25GHz, Channel 3, 802.11n (HT40))

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



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



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

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

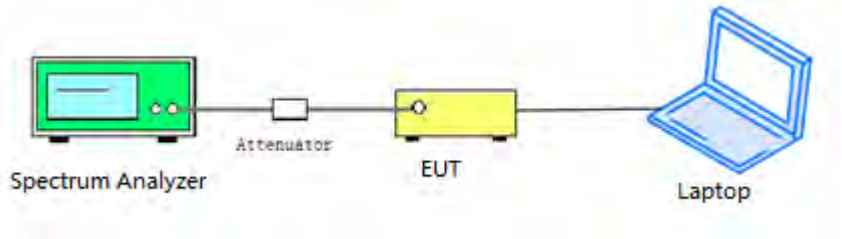
2.6. Power Spectral Density (PSD)

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
		ANT1	ANT2		
1	2412	-5.10	-6.50	8	PASS
6	2437	-4.77	-5.56	8	PASS
11	2462	-6.45	-5.58	8	PASS

B.Test Plot:

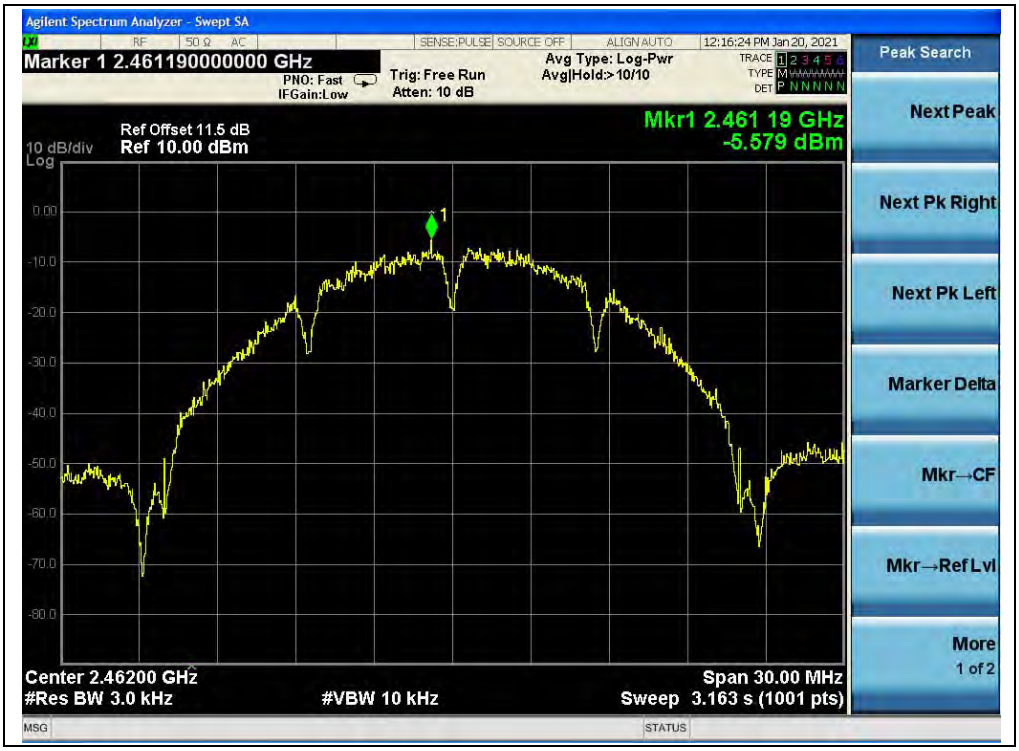
(Channel 1, 802.11b, ANT1)

(Channel 6, 802.11b, ANT1)

(Channel 11, 802.11b, ANT1)

(Channel 1, 802.11b, ANT2)

(Channel 6, 802.11b, ANT2)



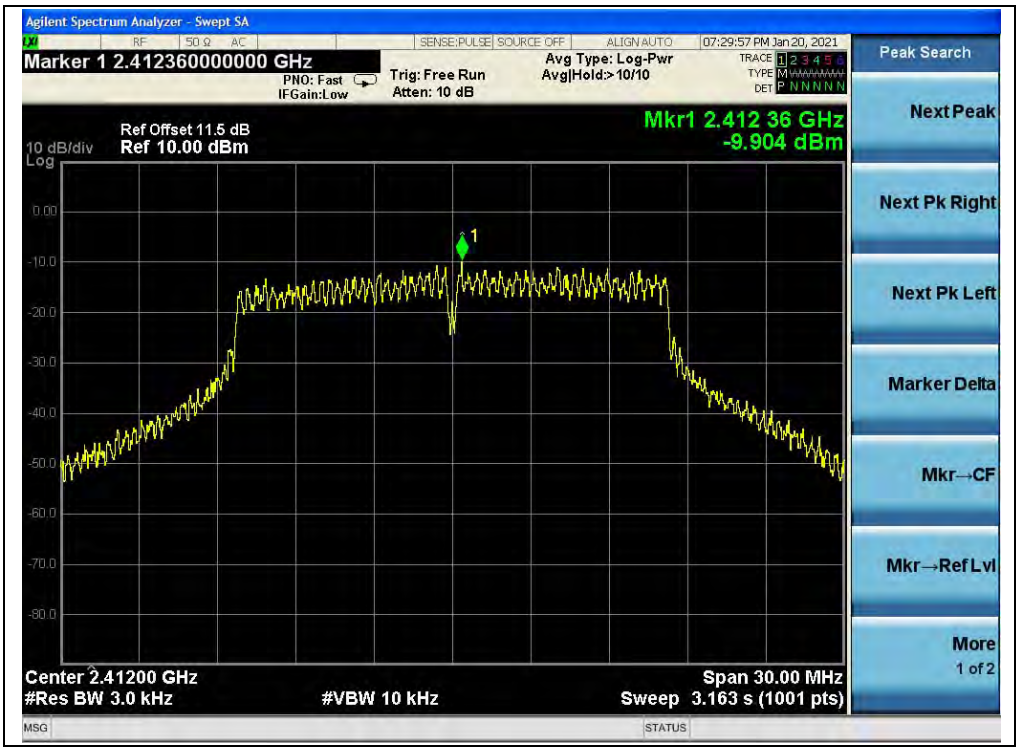
(Channel 11, 802.11b, ANT2)

802.11g Mode

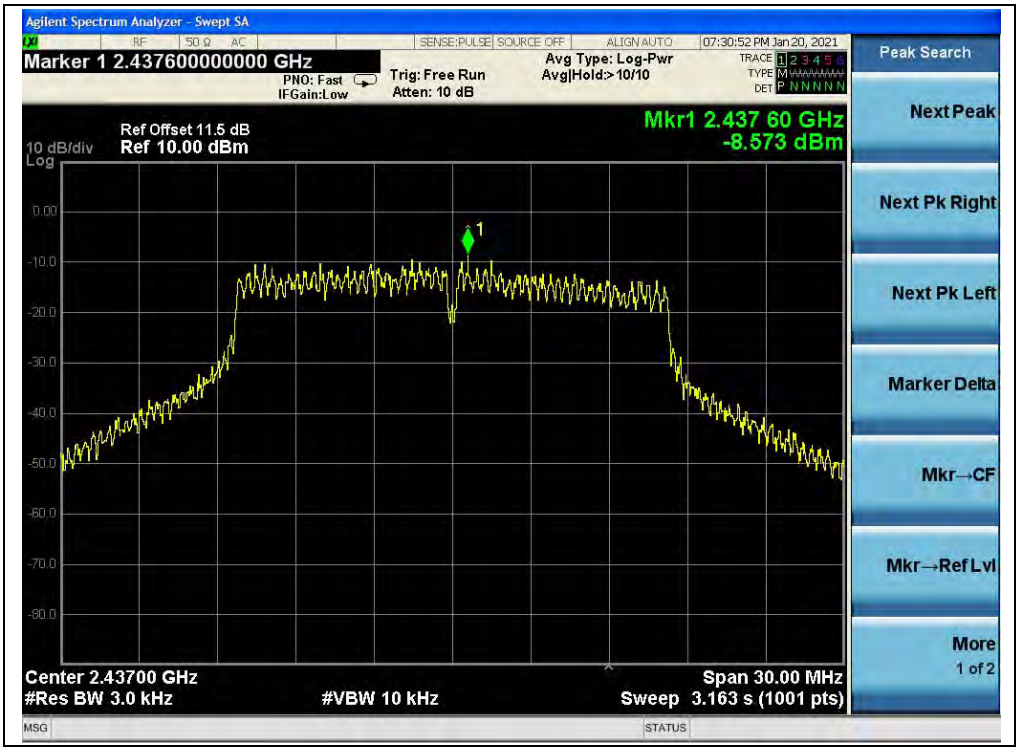
A.Test Verdict:

Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)		Limit (dBm/3kHz)	Verdict
		ANT1	ANT2		
1	2412	-9.90	-9.63	8	PASS
6	2437	-8.57	-9.67	8	PASS
11	2462	-9.61	-10.48	8	PASS

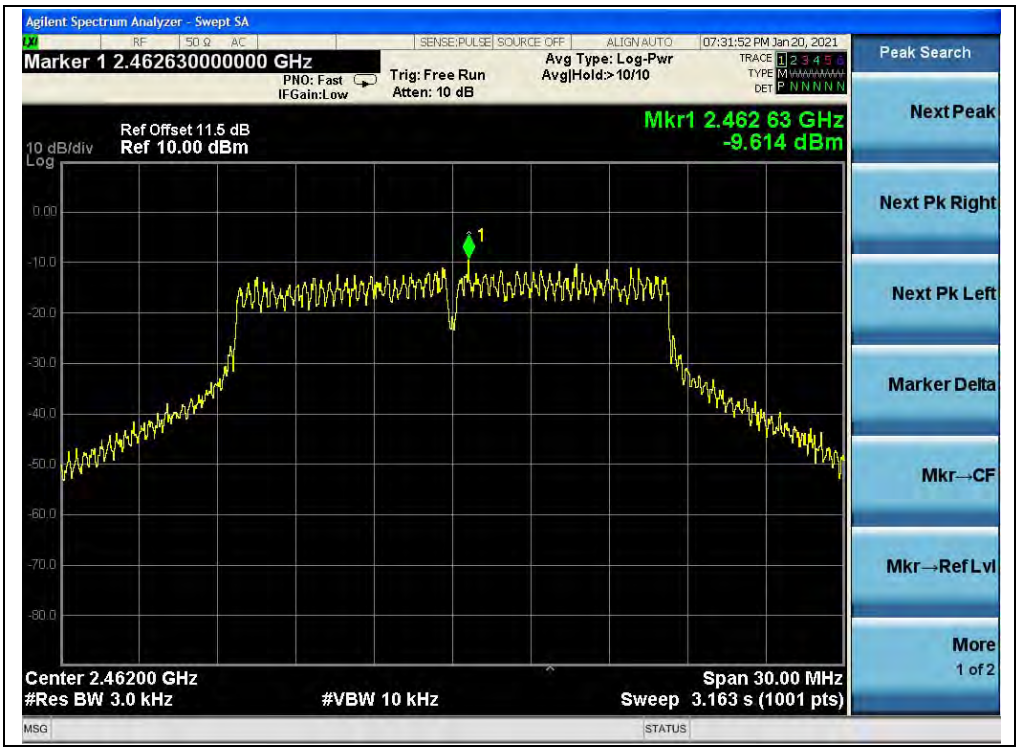
B.Test Plot:



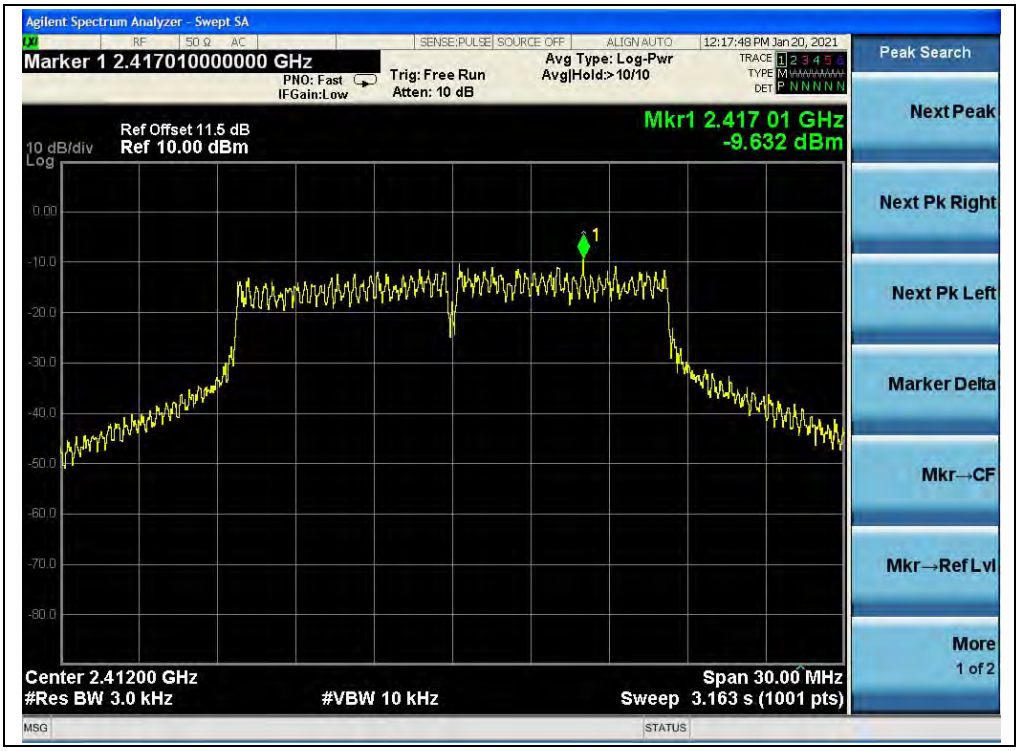
(Channel 1, 802.11g, ANT1)



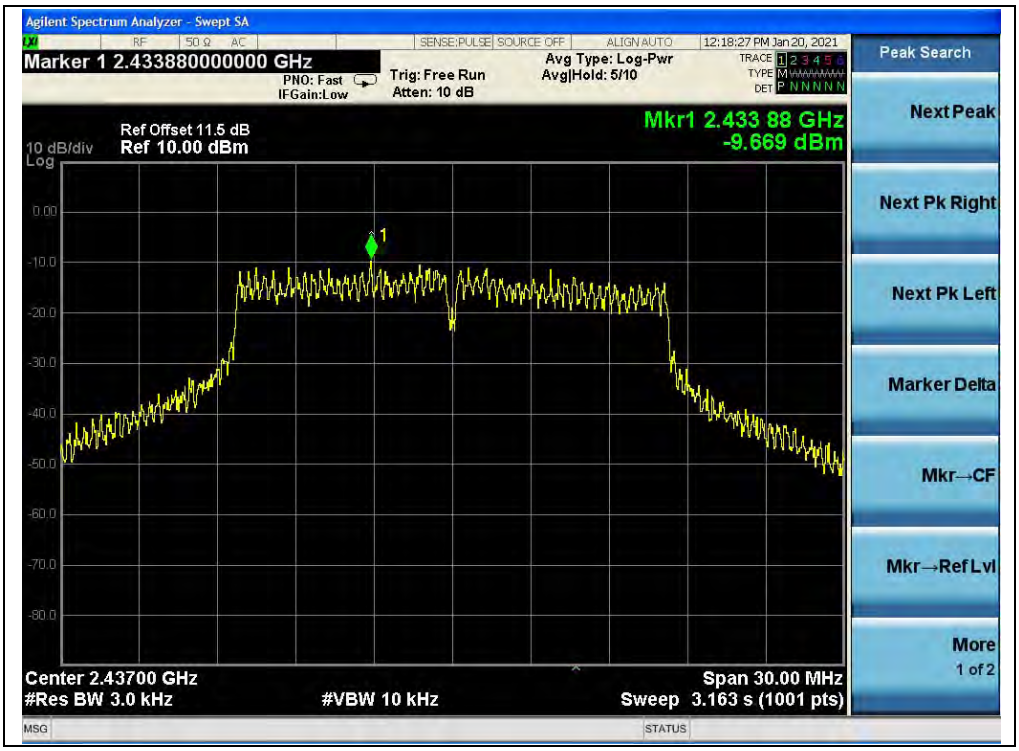
(Channel 6, 802.11g, ANT1)



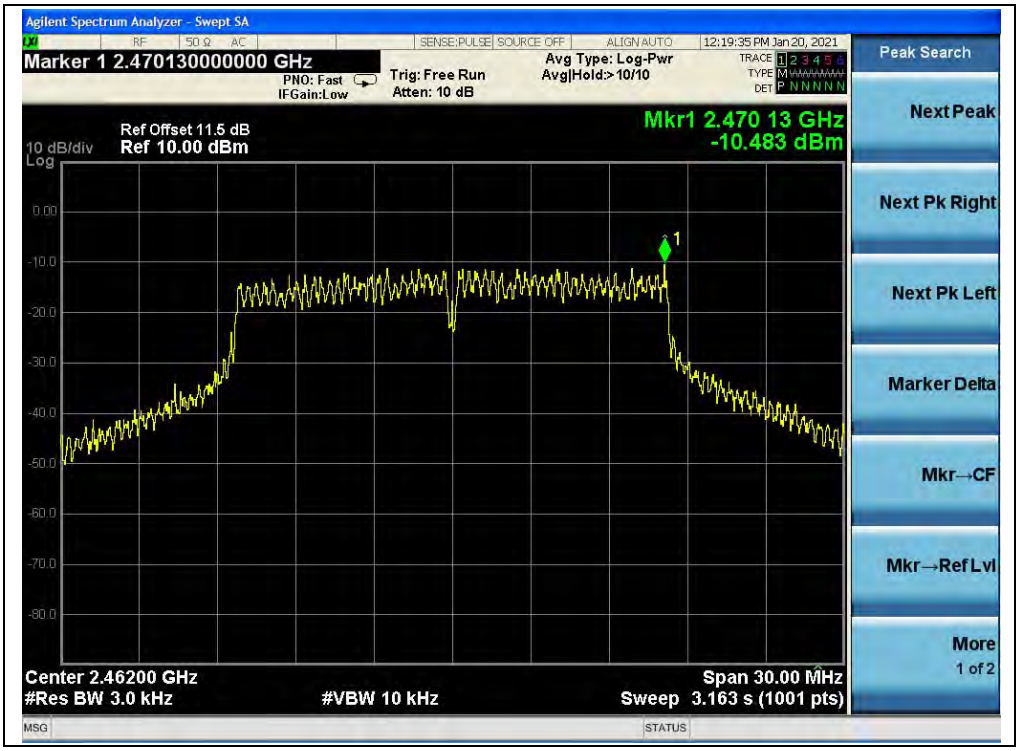
(Channel 11, 802.11g, ANT1)



(Channel 1, 802.11g, ANT2)



(Channel 6, 802.11g, ANT2)



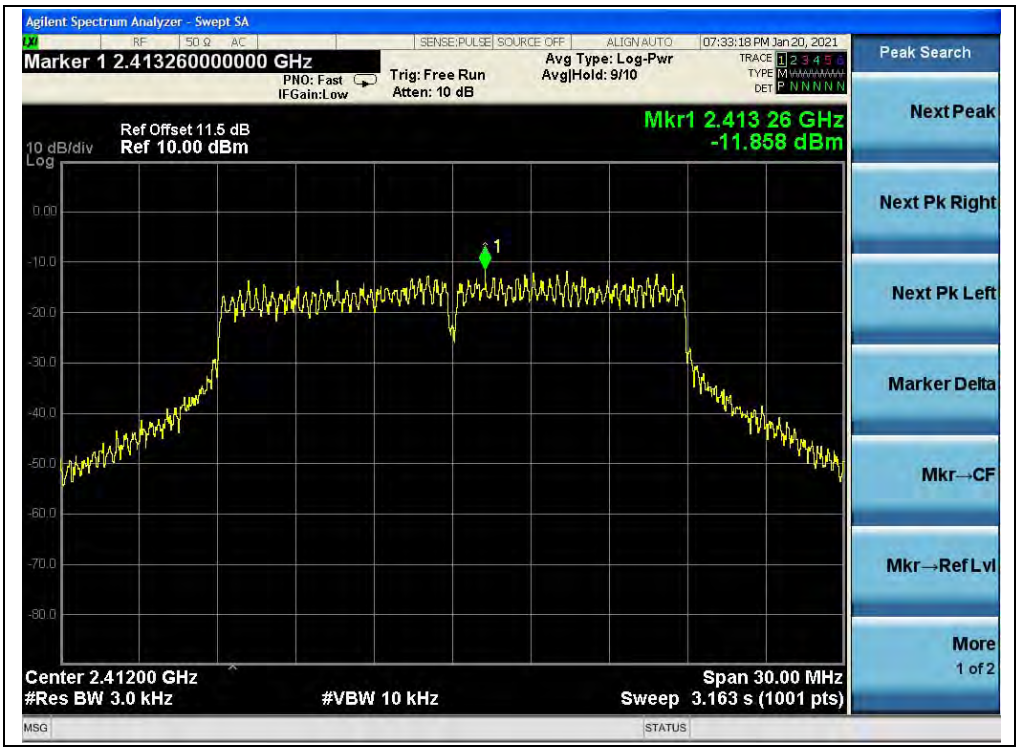
(Channel 11, 802.11g, ANT2)

802.11n (HT20) Mode

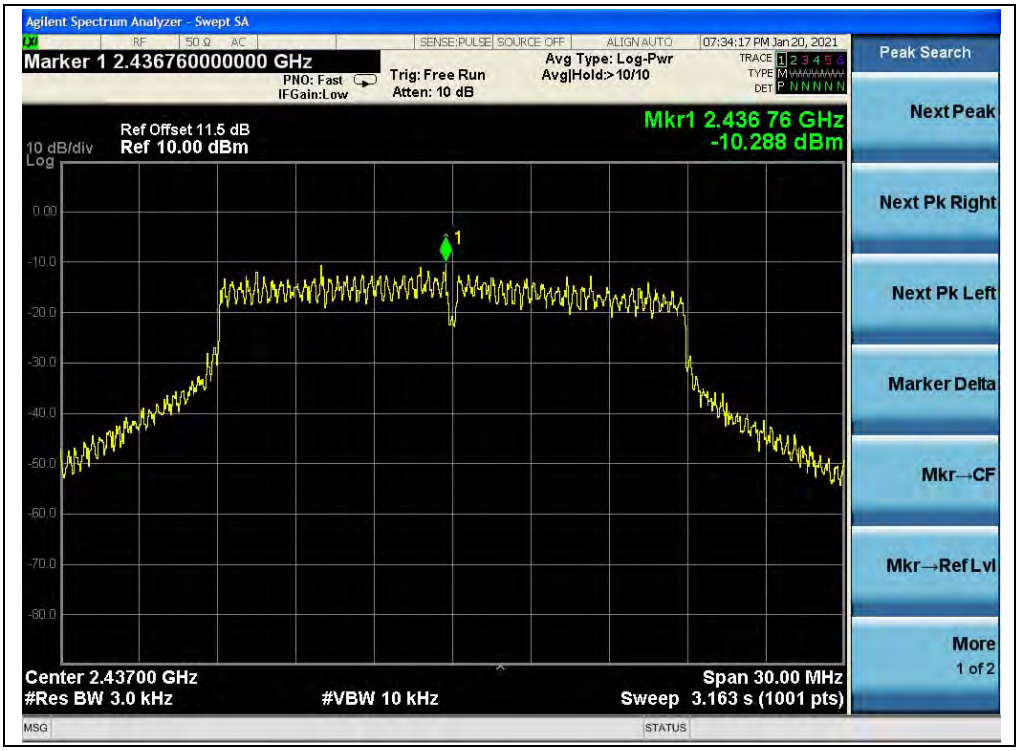
A.Test Verdict:

Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)		Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
		ANT1	ANT2			
1	2412	-11.86	-11.44	-8.63	7.48	PASS
6	2437	-10.29	-11.81	-7.97	7.48	PASS
11	2462	-11.59	-12.18	-8.86	7.48	PASS
Note: Directional gain = 3.51dBi +10log(2) = 6.52dBi＞6dBi, so the limit shall be reduced to 8-(6.52-6) =7.48dBm/3kHz.						

B.Test Plot:

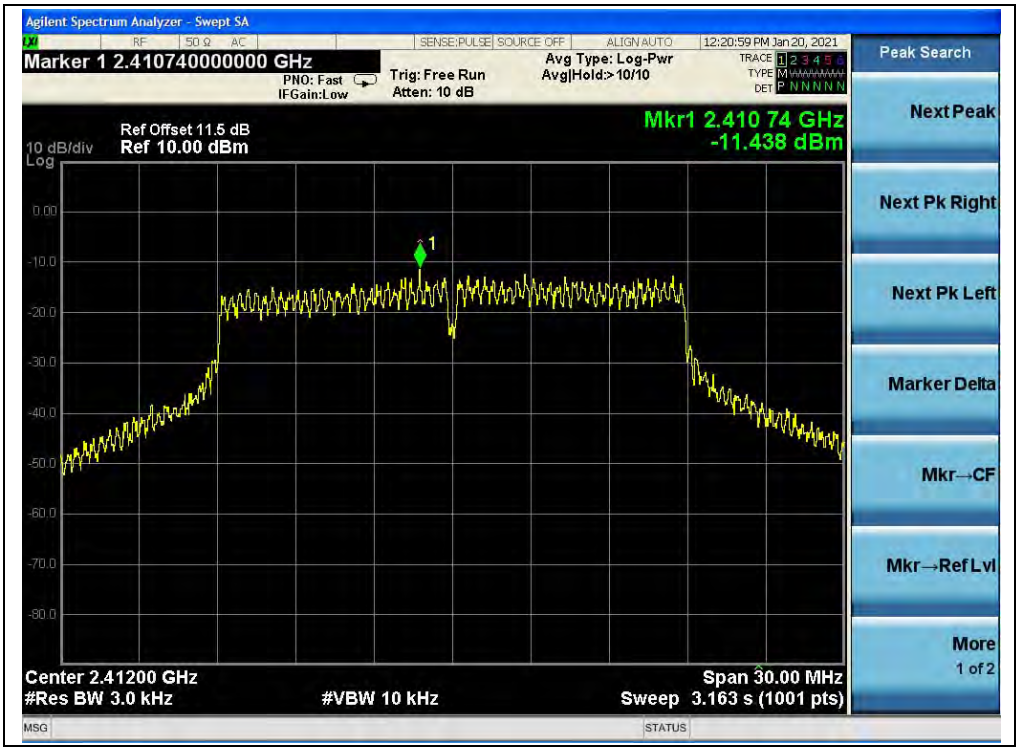


(Channel 1, 802.11n (HT20), ANT1)

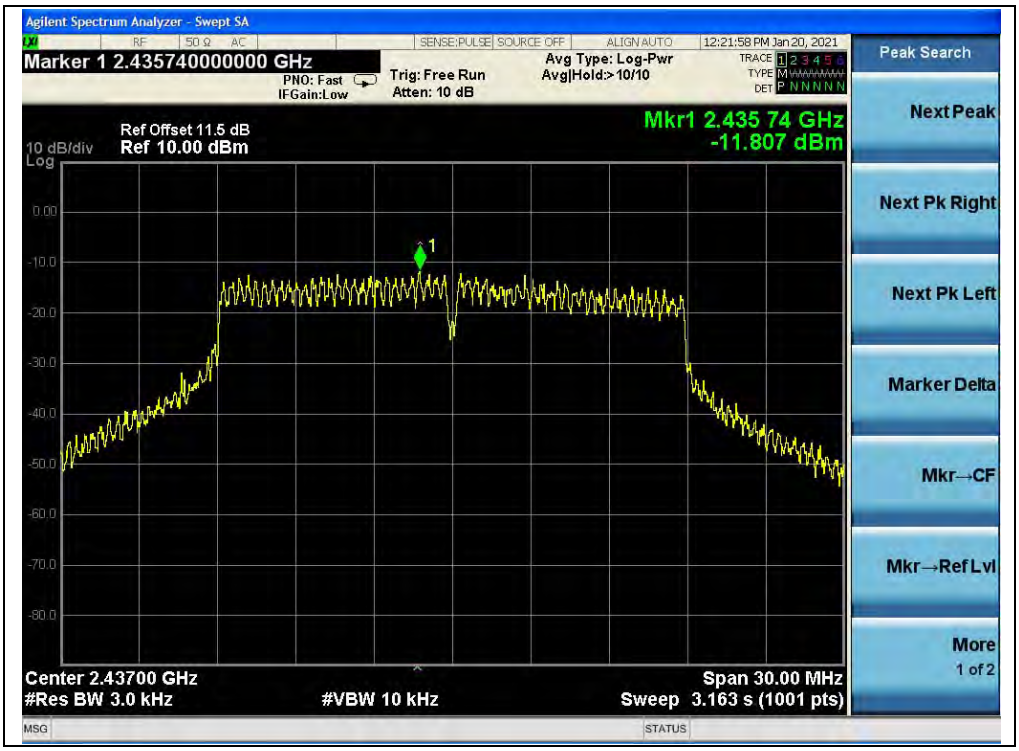


(Channel 6, 802.11n (HT20), ANT1)

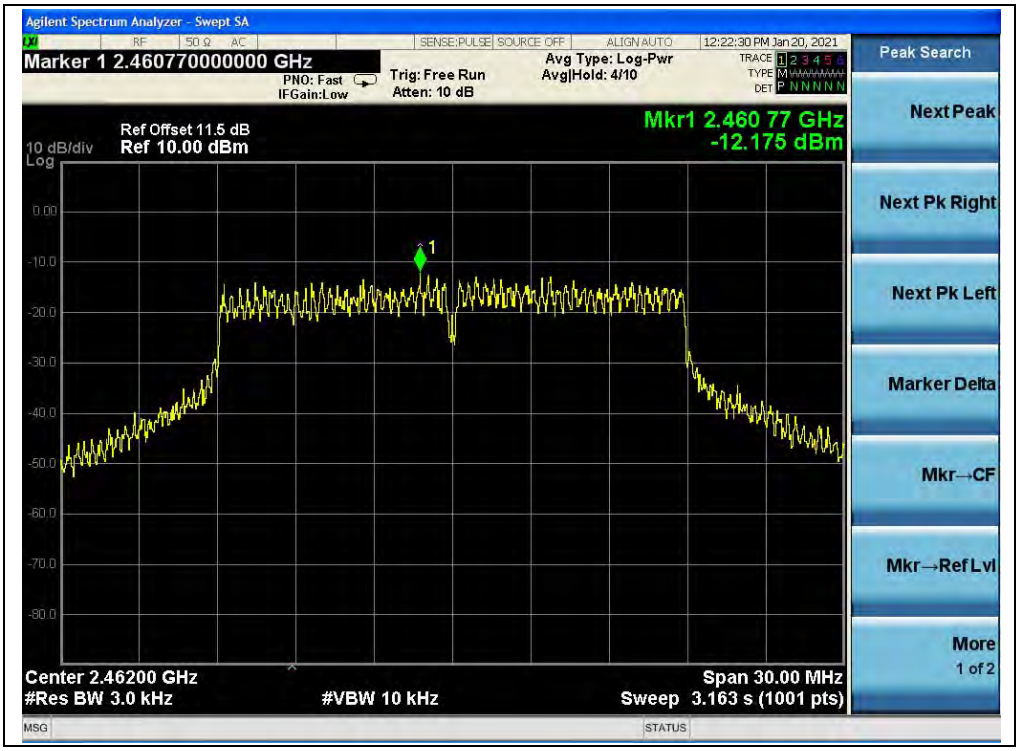
(Channel 11, 802.11n (HT20), ANT1)



(Channel 1, 802.11n (HT20), ANT2)



(Channel 6, 802.11n (HT20), ANT2)



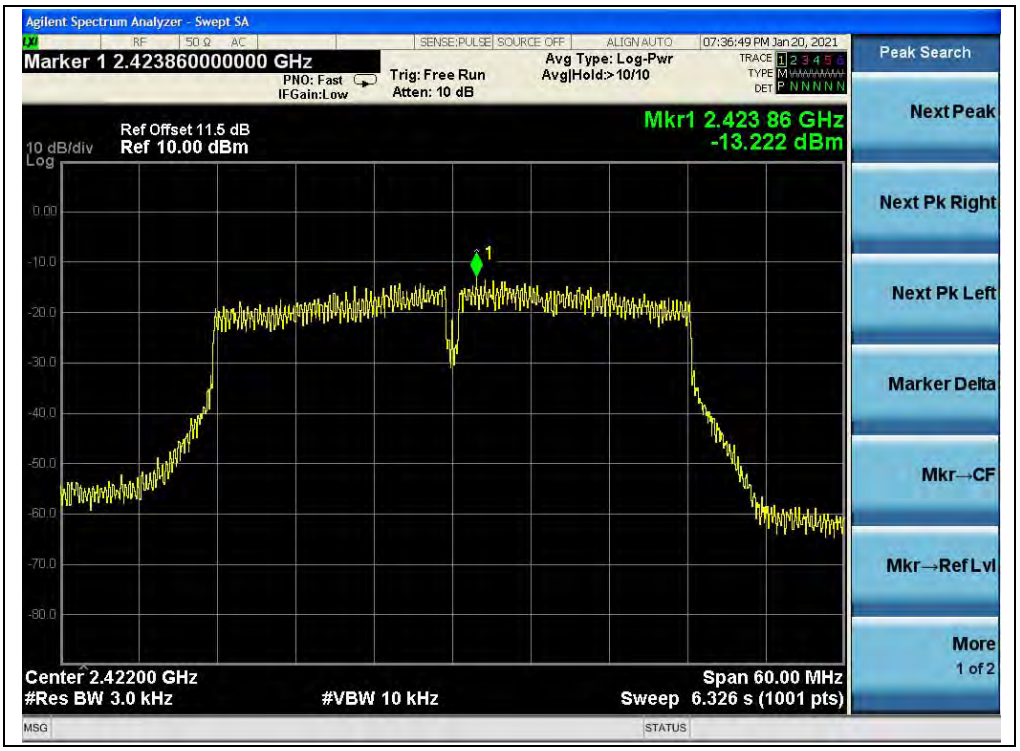
(Channel 11, 802.11n (HT20), ANT2)

802.11n (HT40) Mode

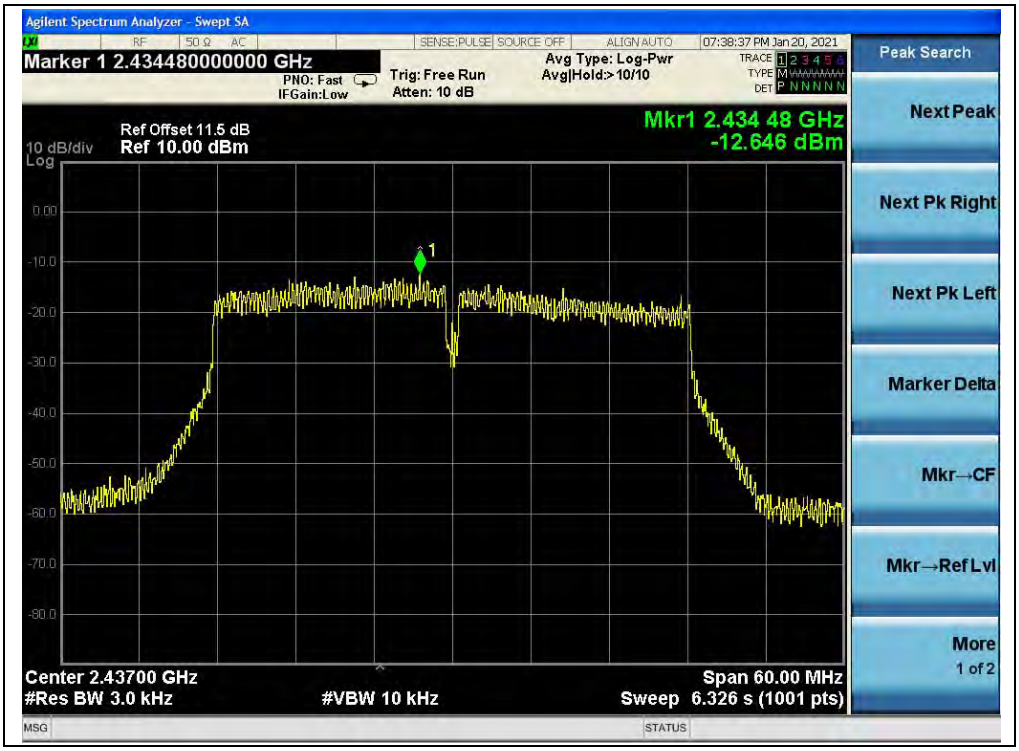
A.Test Verdict:

Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)		Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
		ANT 0	ANT 1			
3	2422	-13.22	-14.15	-10.65	7.48	PASS
6	2437	-12.65	-13.28	-9.94	7.48	PASS
9	2452	-13.82	-13.32	-10.55	7.48	PASS
Note: Directional gain = 3.51dBi +10log(2) = 6.52dBi＞6dBi, so the limit shall be reduced to 8-(6.52-6) =7.48dBm/3kHz.						

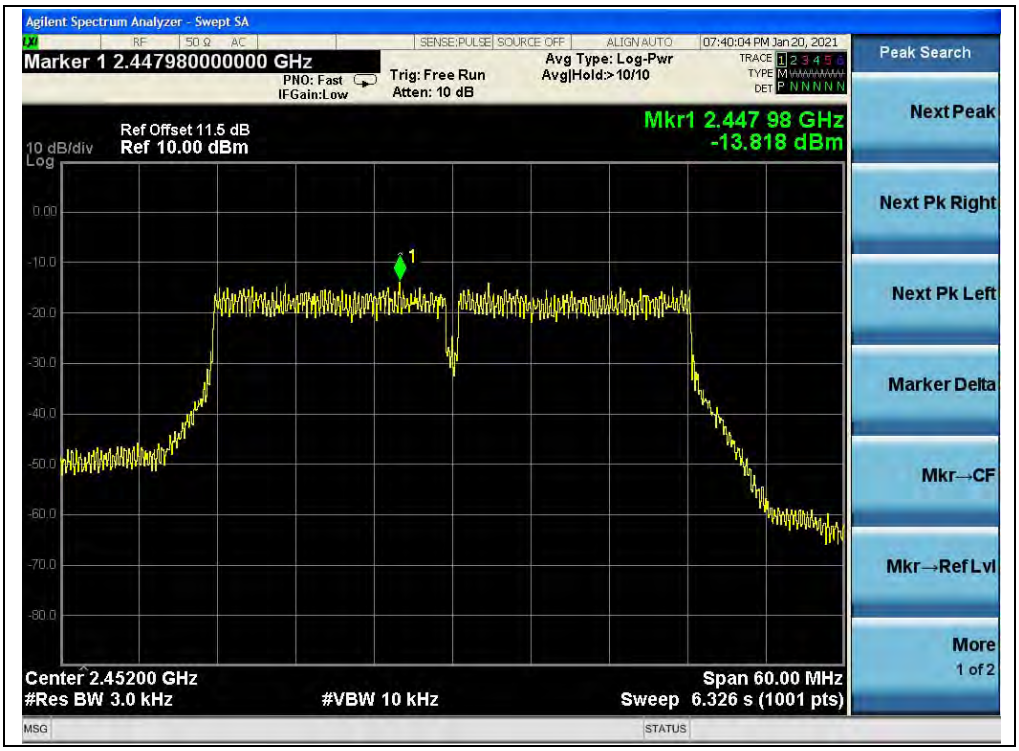
B.Test Plot:



(Channel 3, 802.11n (HT40), ANT1)

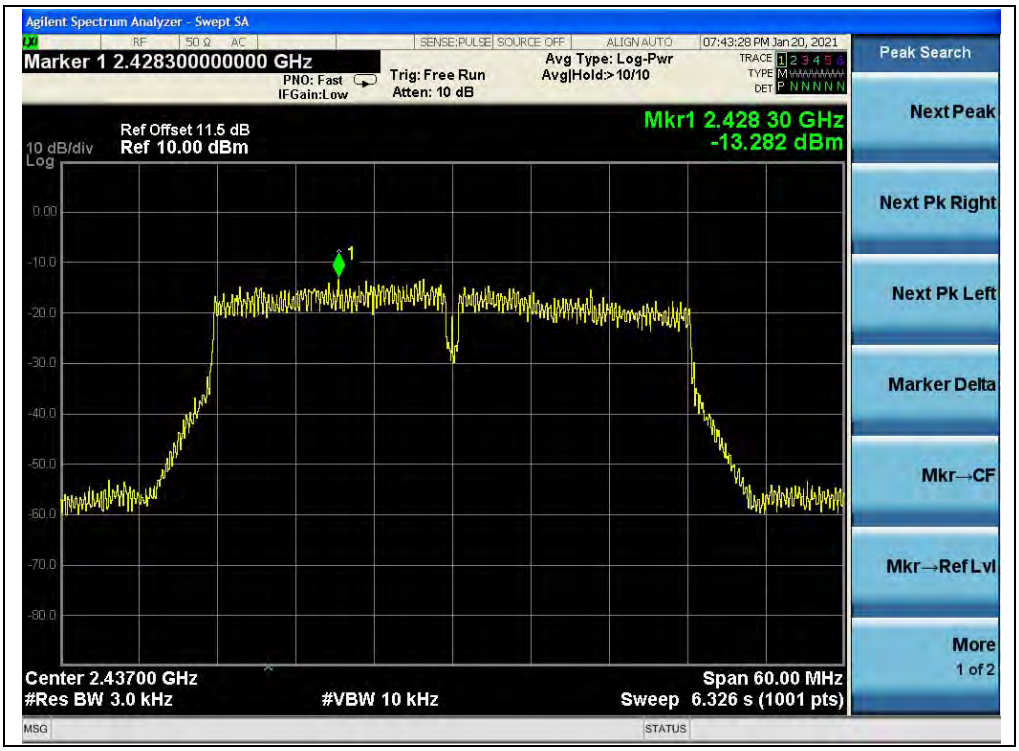


(Channel 6, 802.11n (HT40), ANT1)

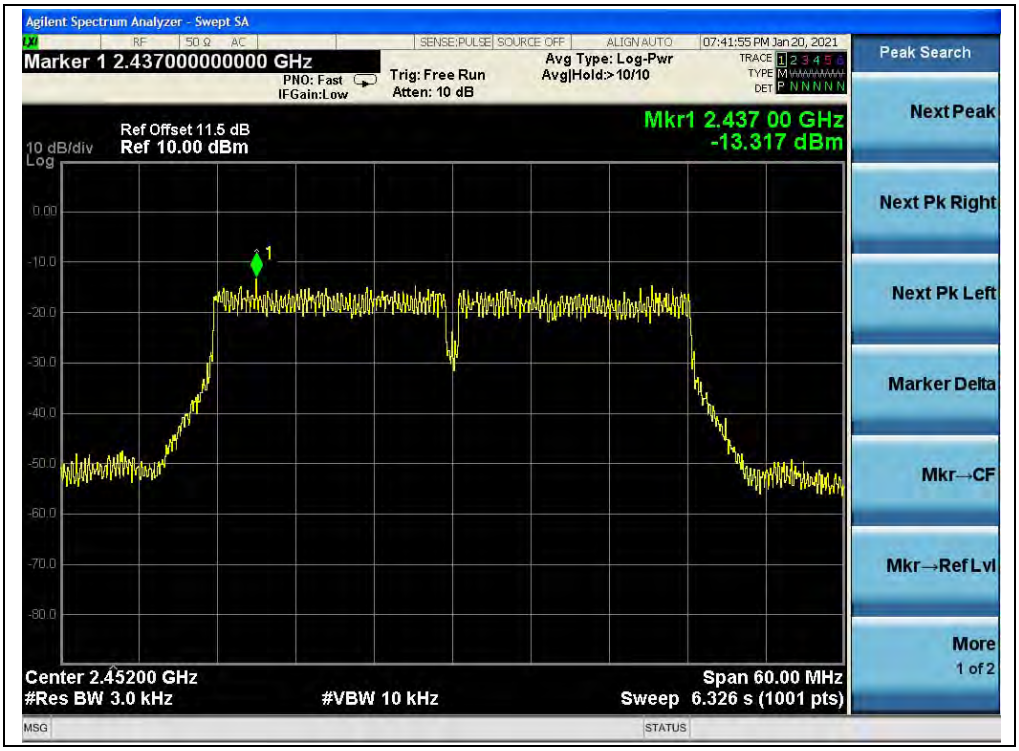


(Channel 9, 802.11n (HT40), ANT1)

(Channel 3, 802.11n (HT40), ANT2)



(Channel 6, 802.11n (HT40), ANT2)



(Channel 9, 802.11n (HT40), ANT2)

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

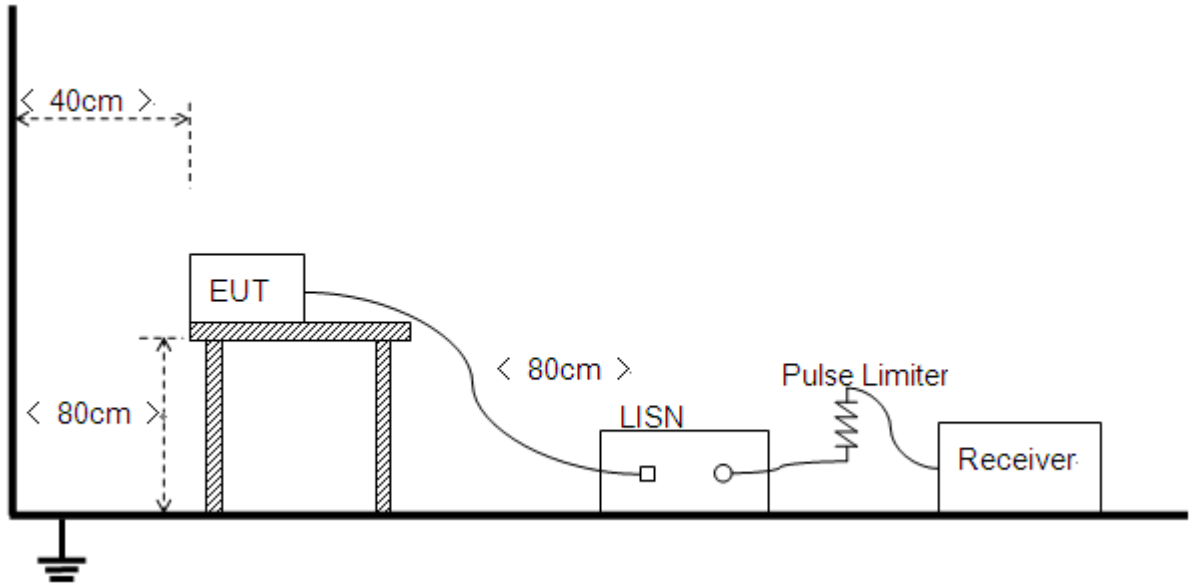
NOTE:

(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+PC+ADAPTER+BT TX

Test Voltage: AC 120V/60Hz

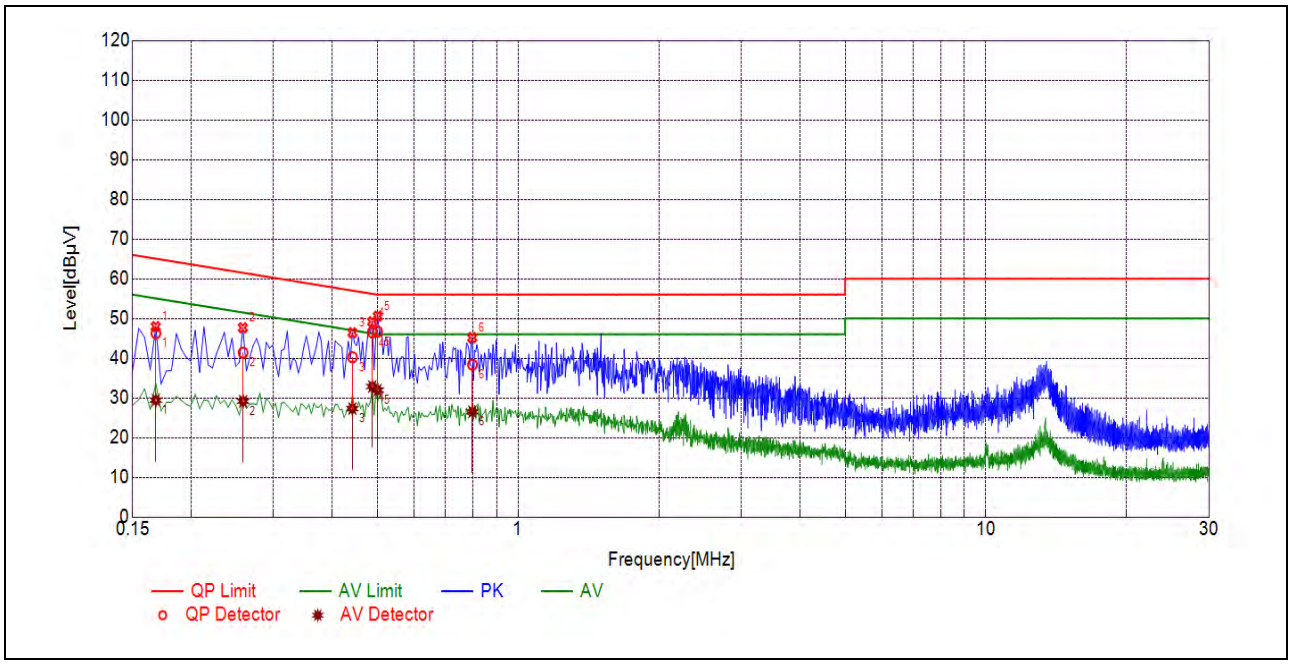
The measurement results are obtained as below:

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

U_R: Receiver Reading

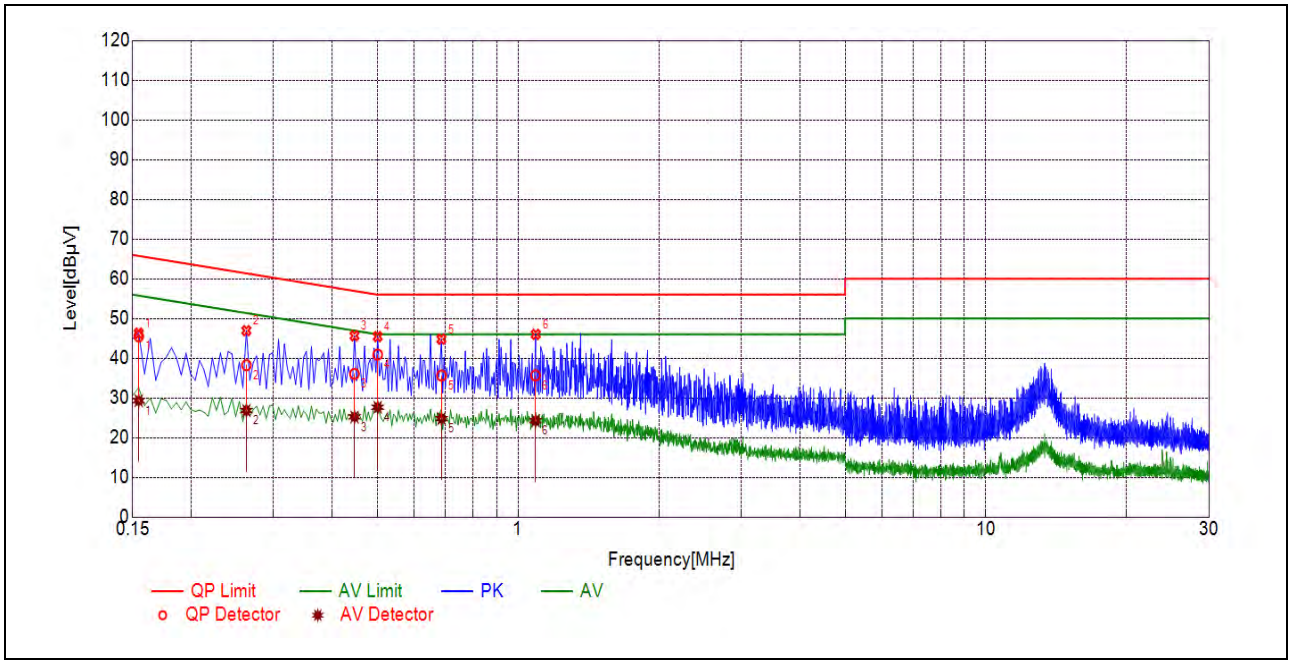
A_{Factor}: Voltage division factor of LISN

B.Test Plot:



(L Phase)

No.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.1681	46.26	29.45	65.05	55.05	Line	PASS
2	0.2583	41.40	29.16	61.49	51.49		PASS
3	0.4423	40.25	27.31	57.02	47.02		PASS
4	0.4877	46.50	32.88	56.21	46.21		PASS
5	0.5006	46.66	31.96	56.00	46.00		PASS
6	0.7985	38.39	26.51	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	0.1545	45.52	29.32	65.75	55.75	Neutral	PASS
2	0.2625	38.24	26.84	61.35	51.35		PASS
3	0.4469	36.06	25.22	56.93	46.93		PASS
4	0.5009	40.92	27.67	56.00	46.00		PASS
5	0.6858	35.63	24.79	56.00	46.00		PASS
6	1.0894	35.66	24.25	56.00	46.00		PASS

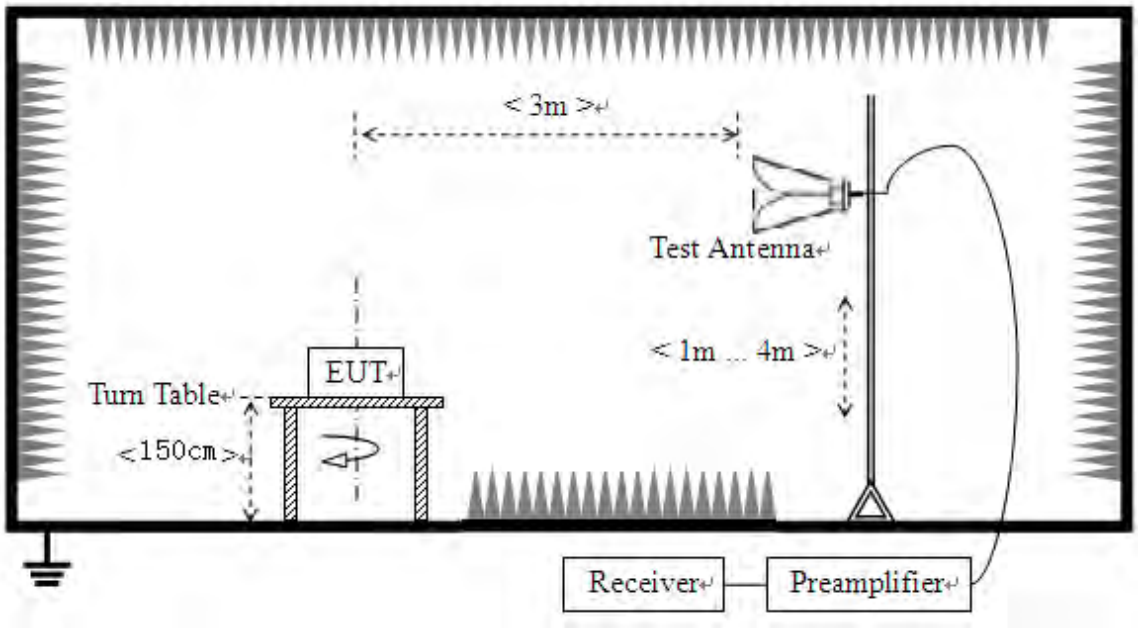
2.8. Restricted Frequency Bands

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

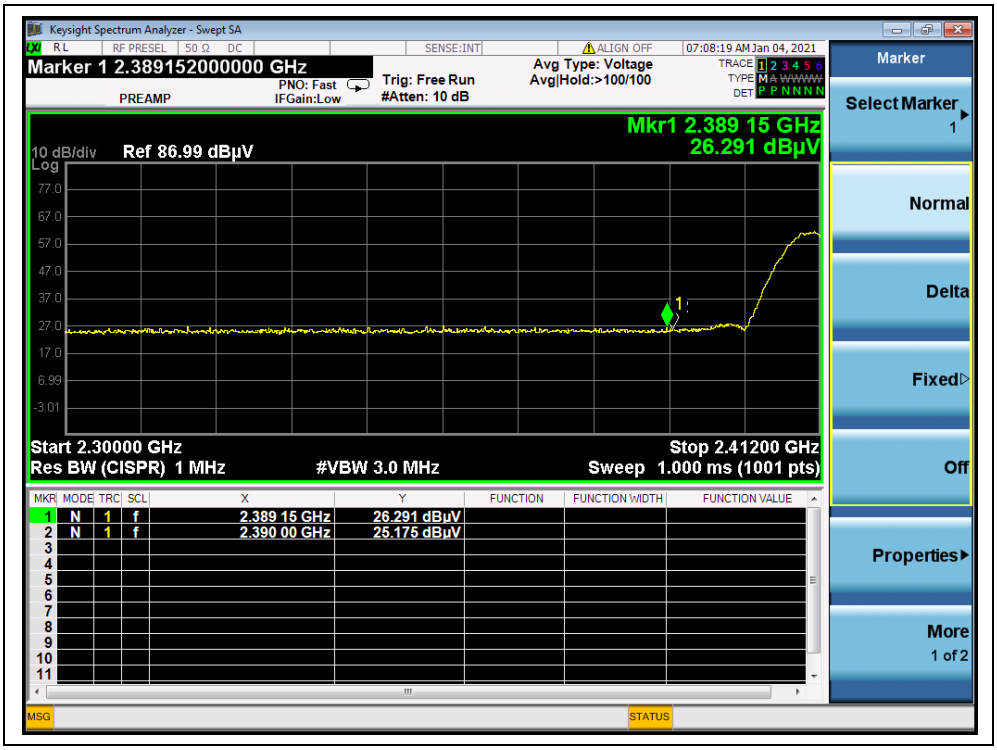
Note: Restricted Frequency Bands were performed when antenna was at vertical and horizontal polarity, and only the worse test condition (vertical) was recorded in this test report.

Antenna Type A
802.11b Mode

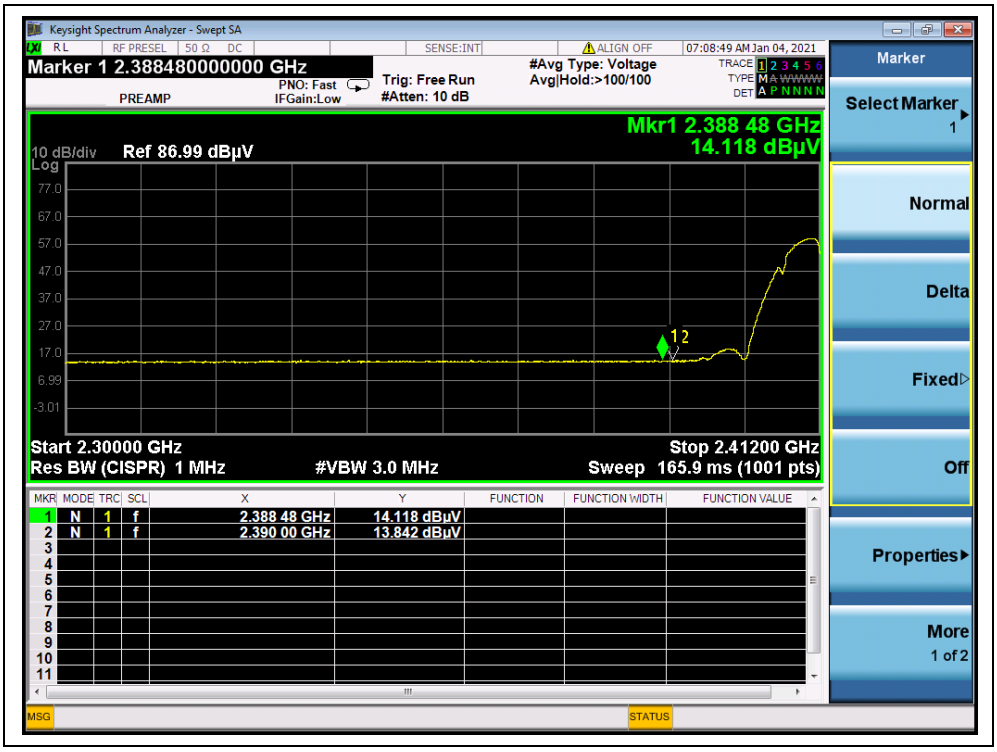
A.Test Verdict:

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	2389.15	PK	26.29	6.74	27.20	60.23	74	PASS
1	2388.48	AV	14.12	6.74	27.20	48.06	54	PASS
11	2484.08	PK	26.20	6.74	27.20	60.14	74	PASS
11	2483.50	AV	14.47	6.74	27.20	48.41	54	PASS

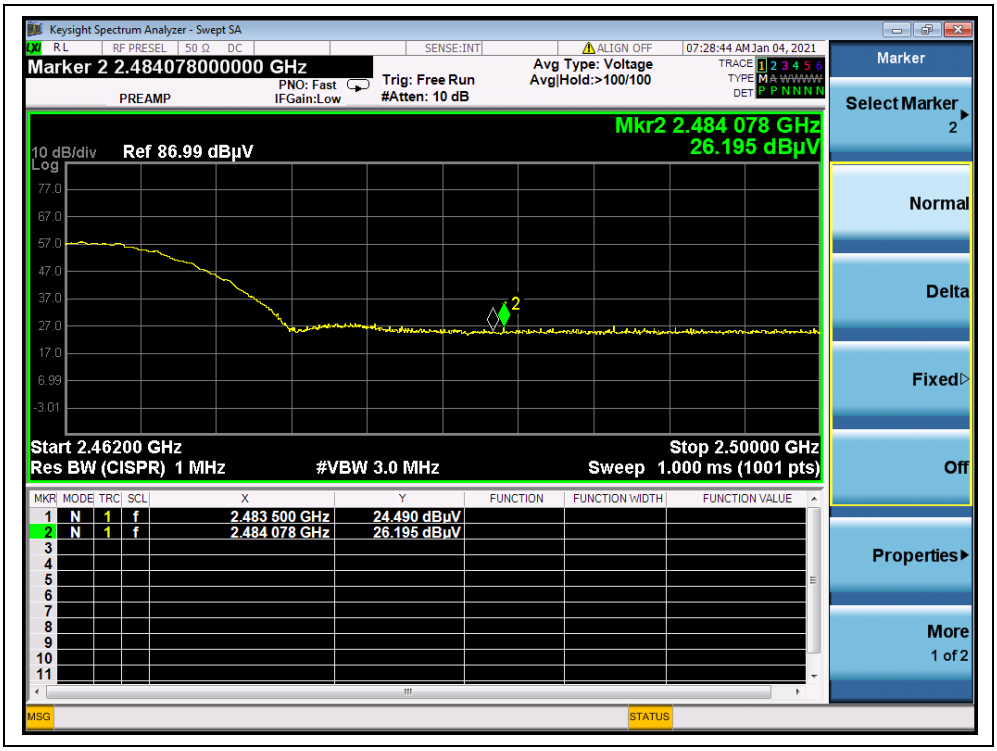
B.Test Plot:



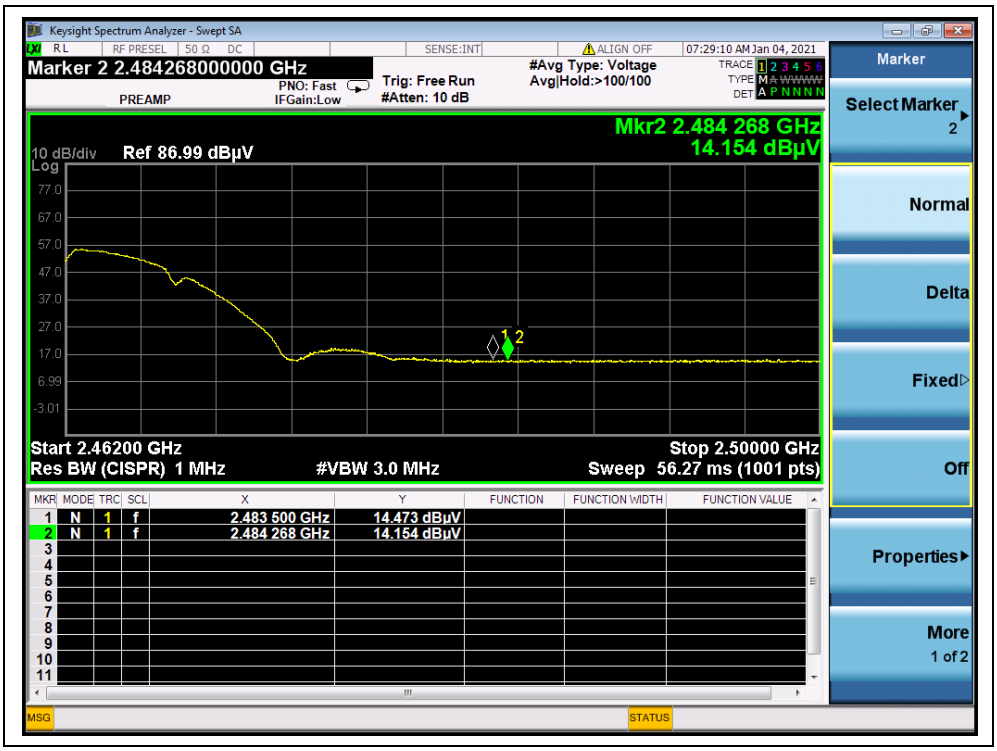
(PEAK, Channel 1, 802.11b)



(AVERAGE, Channel 1, 802.11b)



(PEAK, Channel 11, 802.11b)



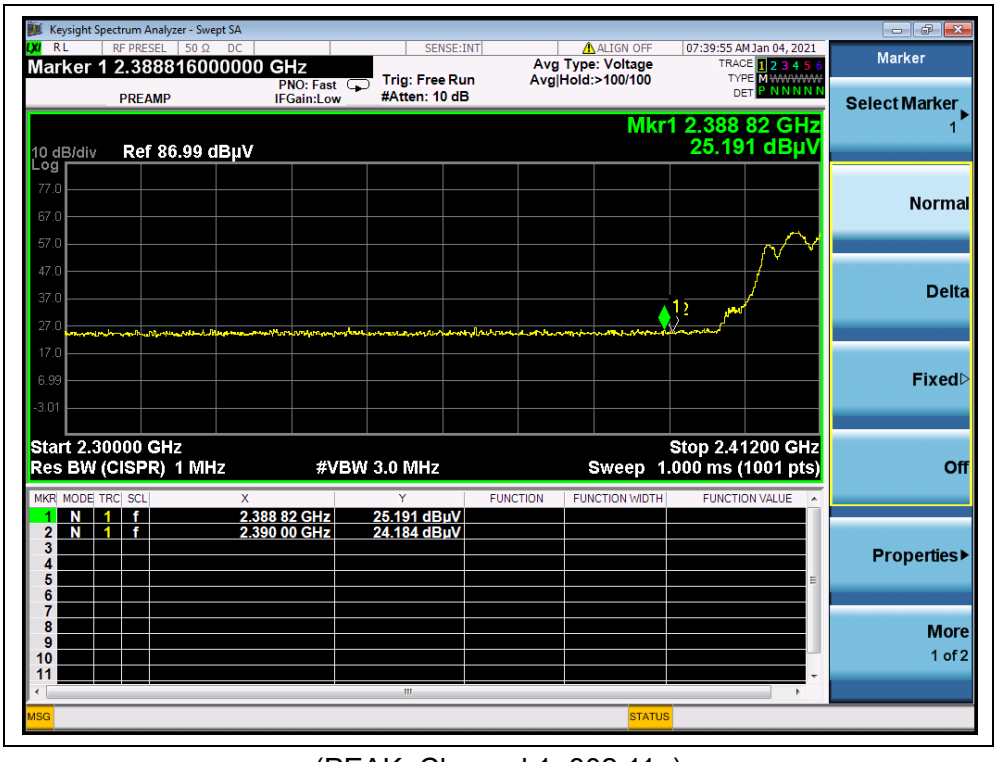
(AVERAGE, Channel 11, 802.11b)

802.11g Mode

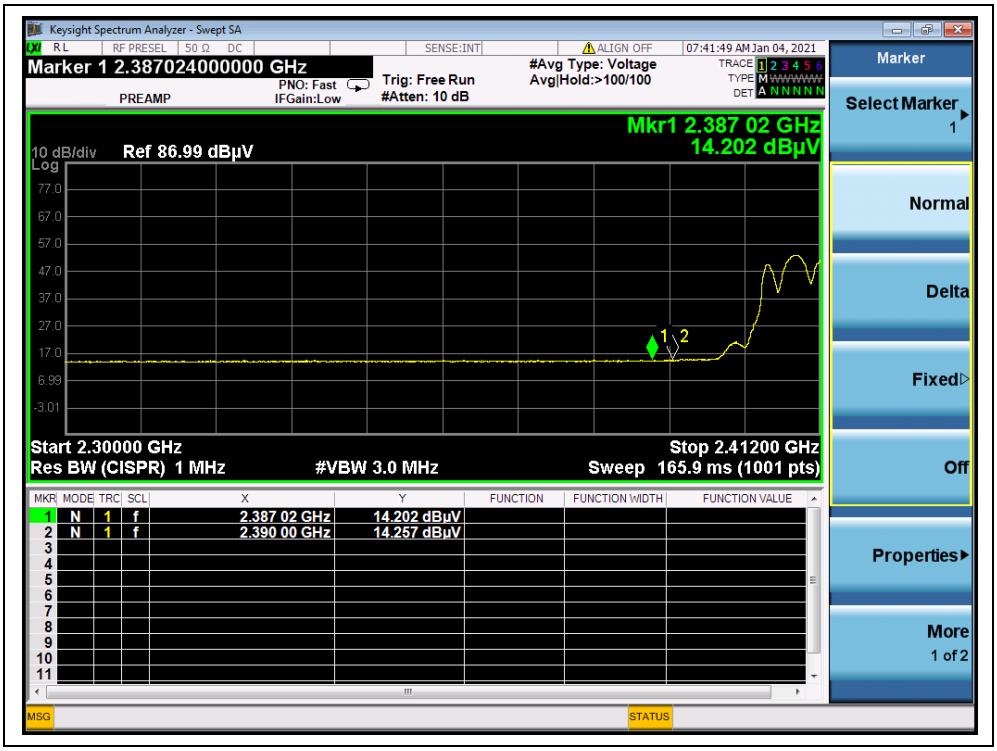
A.Test Verdict:

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	2388.82	PK	25.19	6.74	27.20	59.13	74	PASS
1	2390.00	AV	14.26	6.74	27.20	48.20	54	PASS
11	2485.03	PK	25.15	6.74	27.20	59.09	74	PASS
11	2485.18	AV	14.97	6.74	27.20	48.91	54	PASS

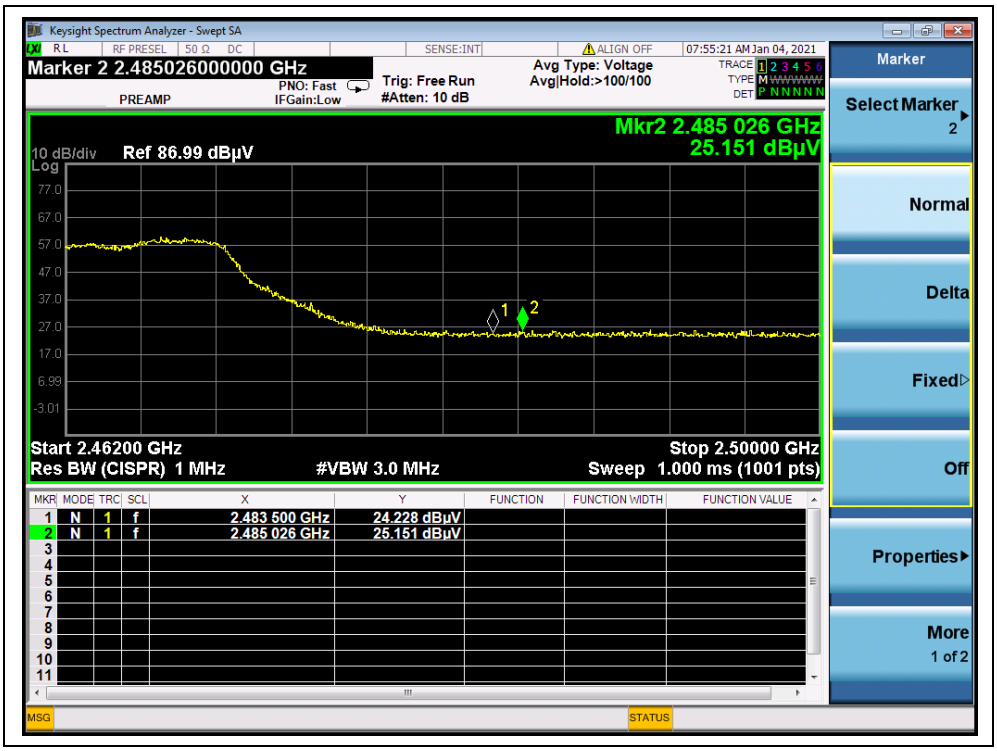
B.Test Plot:



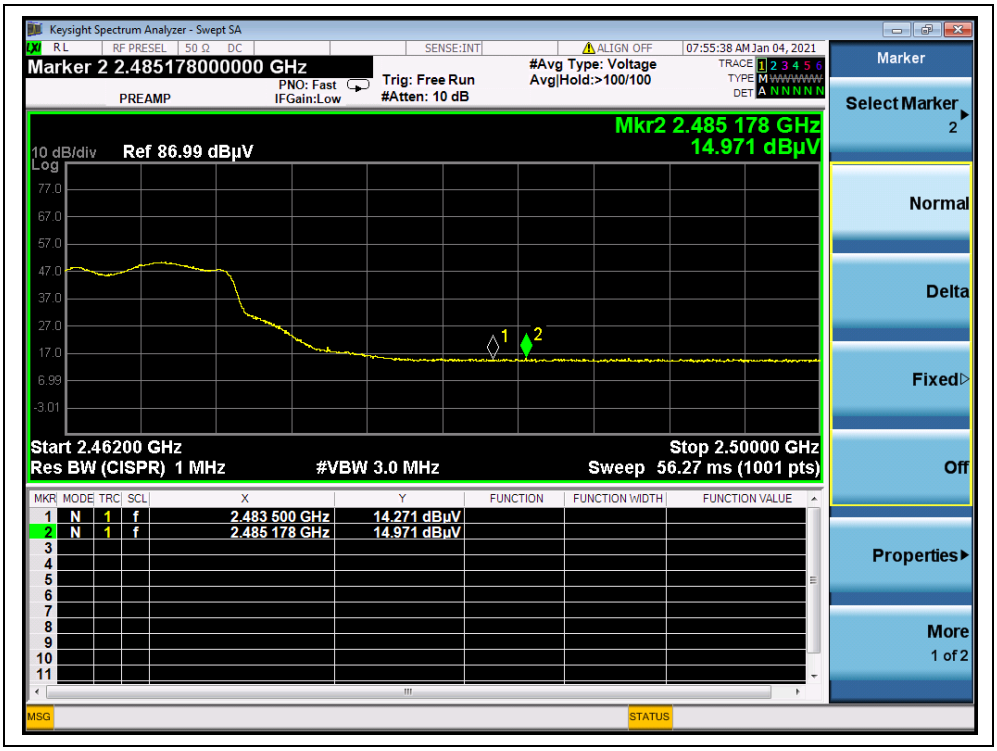
(PEAK, Channel 1, 802.11g)



(AVERAGE, Channel 1, 802.11g)



(PEAK, Channel 11, 802.11g)



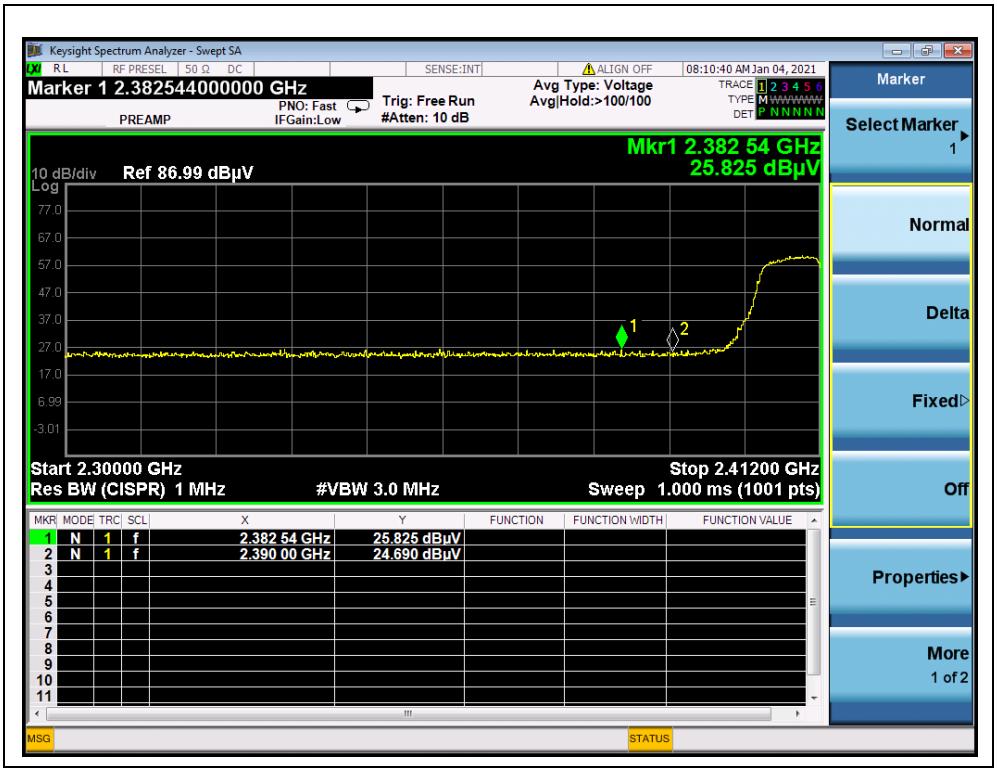
(AVERAGE, Channel 11, 802.11g)

802.11n (HT20) Mode

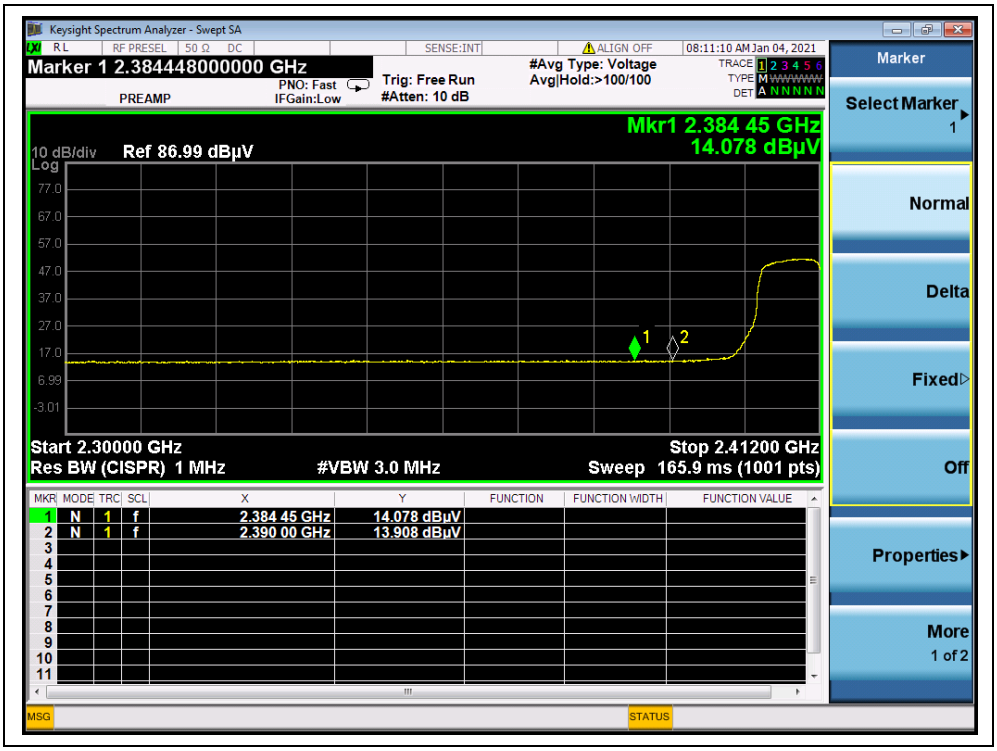
A.Test Verdict:

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	2482.54	PK	25.83	6.74	27.20	59.77	74	PASS
1	2384.45	AV	14.08	6.74	27.20	48.02	54	PASS
11	2484.27	PK	25.72	6.74	27.20	59.66	74	PASS
11	2483.81	AV	14.65	6.74	27.20	48.59	54	PASS

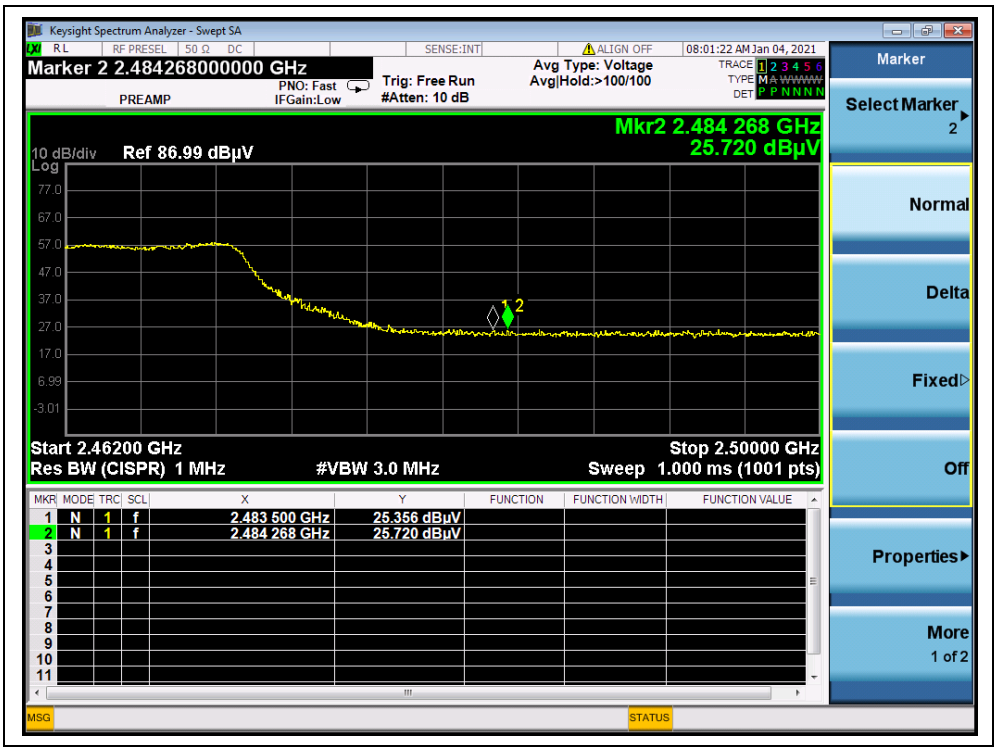
B.Test Plot:



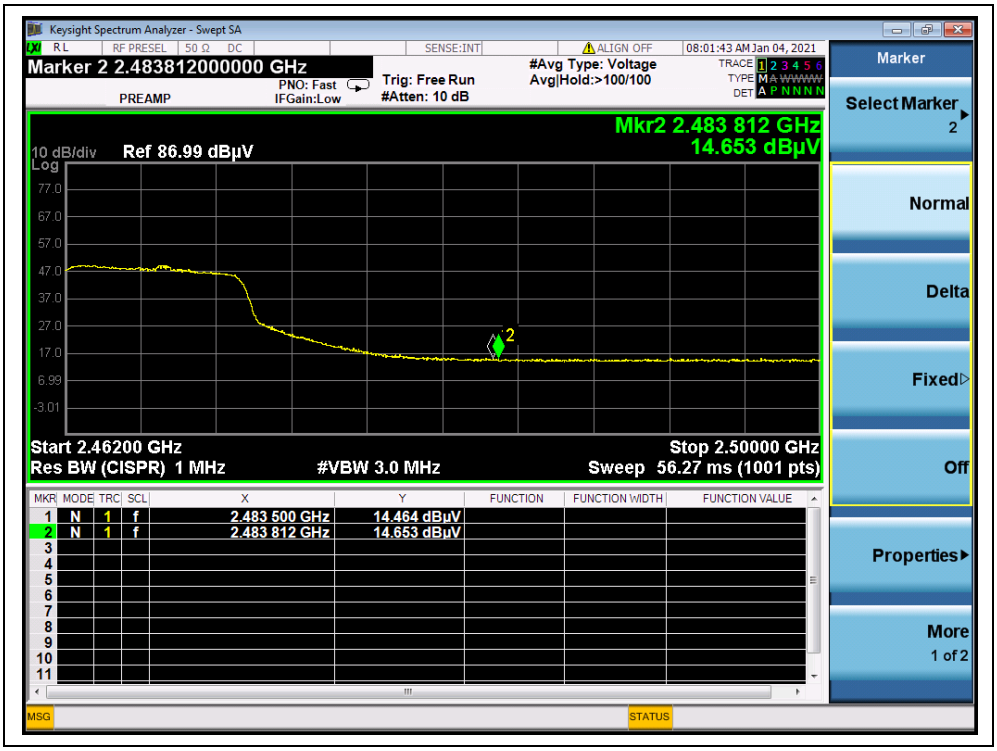
(PEAK, Channel 1, 802.11n (HT20))



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



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



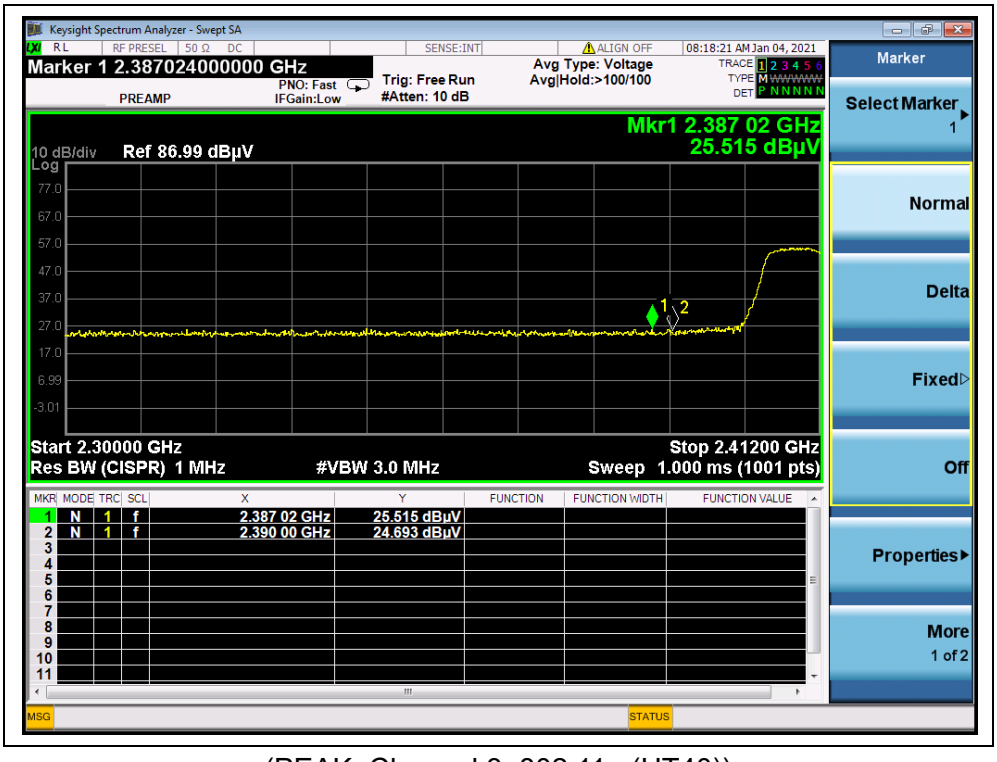
(AVERAGE, Channel 11, 802.11n (HT20))

802.11n (HT40) Mode

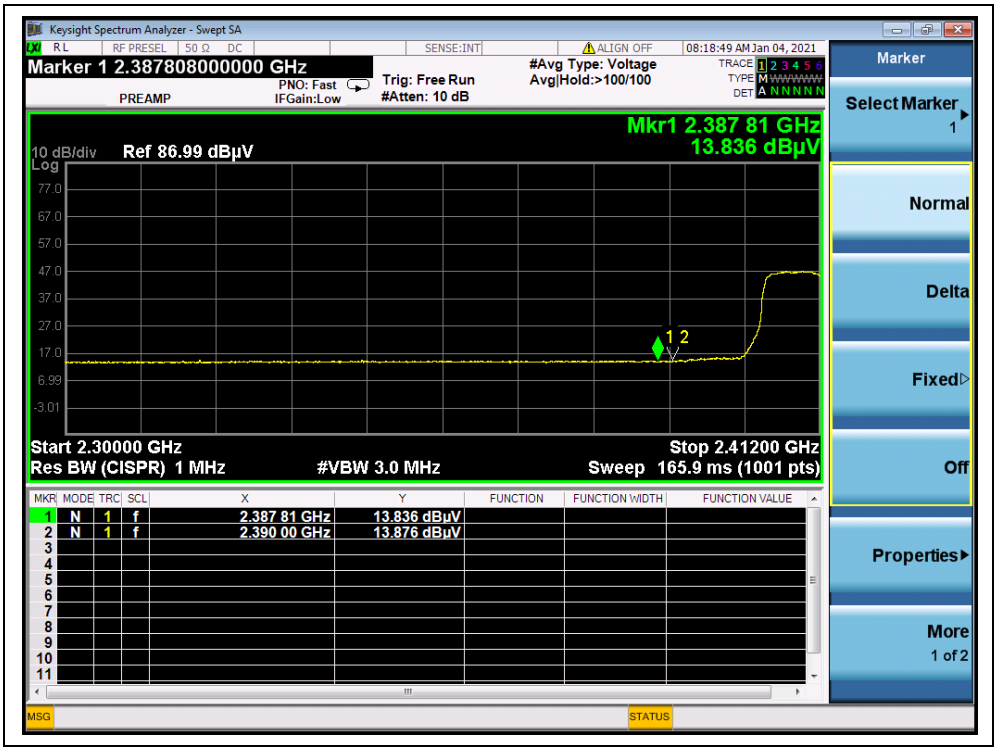
A.Test Verdict:

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						
3	2387.02	PK	25.52	6.74	27.20	59.46	74	PASS
3	2390.00	AV	13.88	6.74	27.20	47.82	54	PASS
9	2484.30	PK	25.93	6.74	27.20	59.87	74	PASS
9	2483.96	AV	14.79	6.74	27.20	48.73	54	PASS

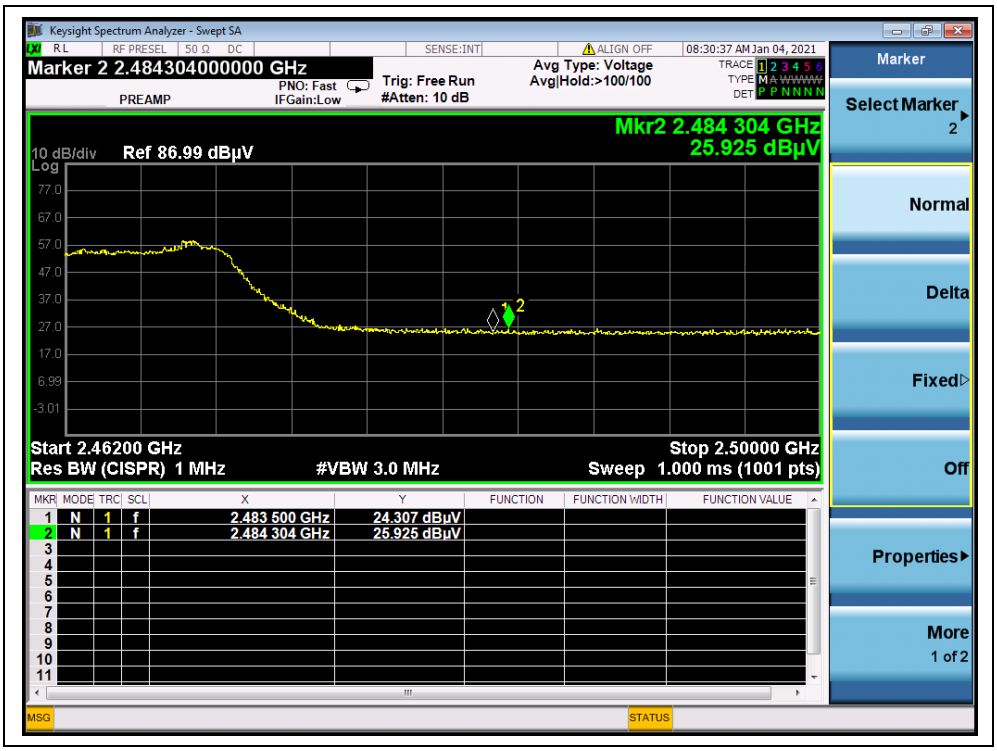
B.Test Plot:



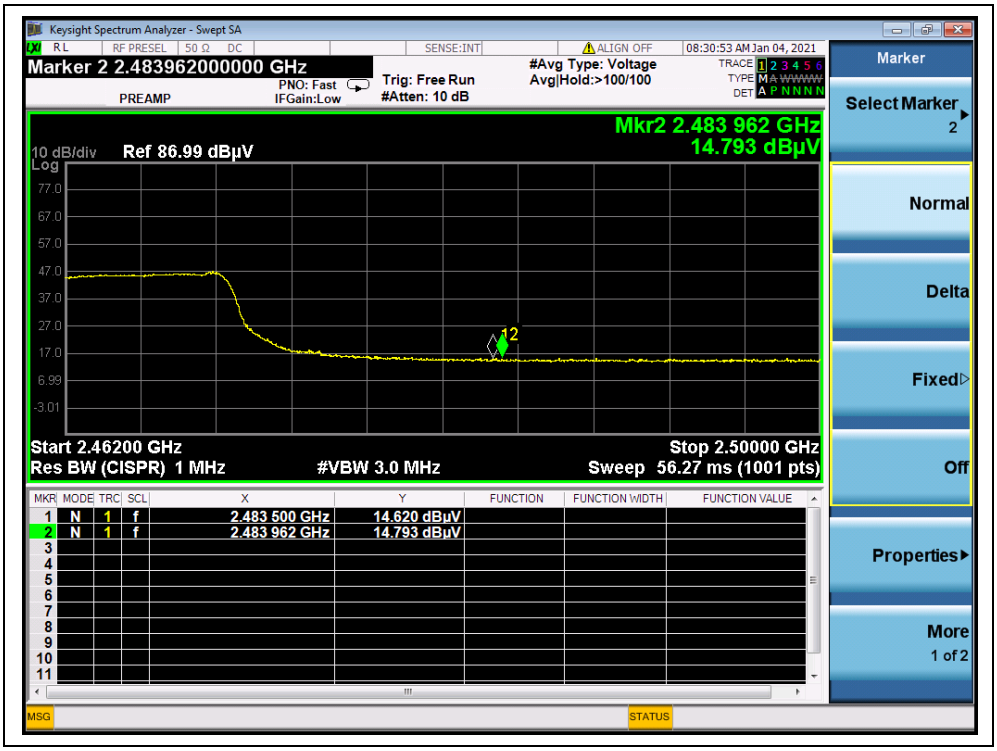
(PEAK, Channel 3, 802.11n (HT40))



(AVERAGE, Channel 3, 802.11n (HT40))



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



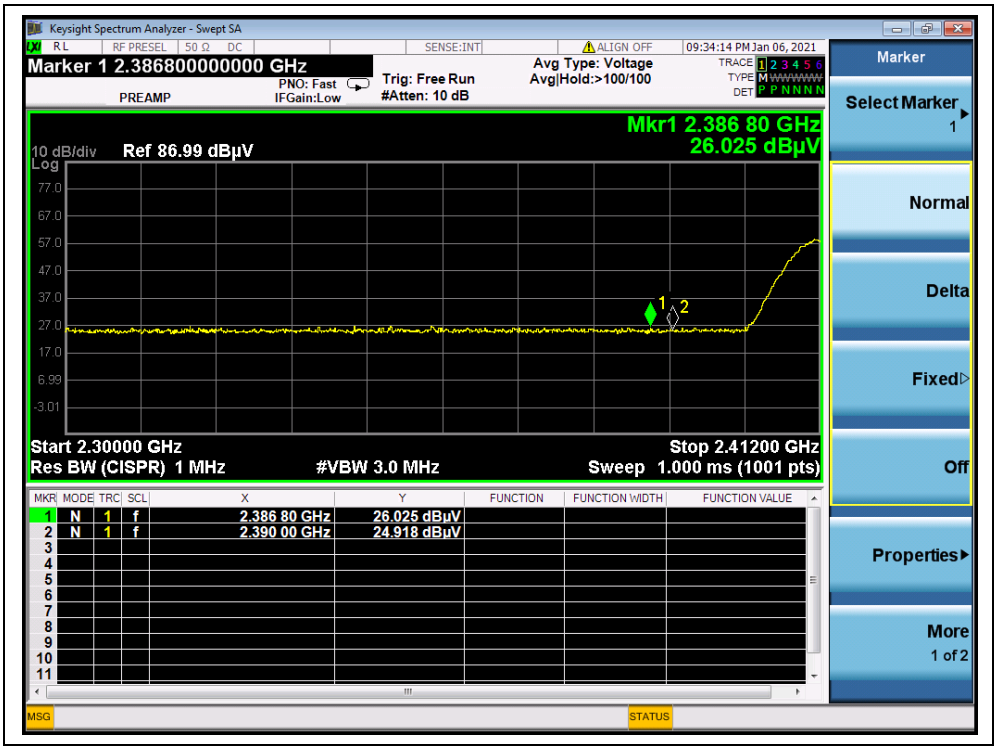
(AVERAGE, Channel 9, 802.11n (HT40))

Antenna Type B
802.11b Mode

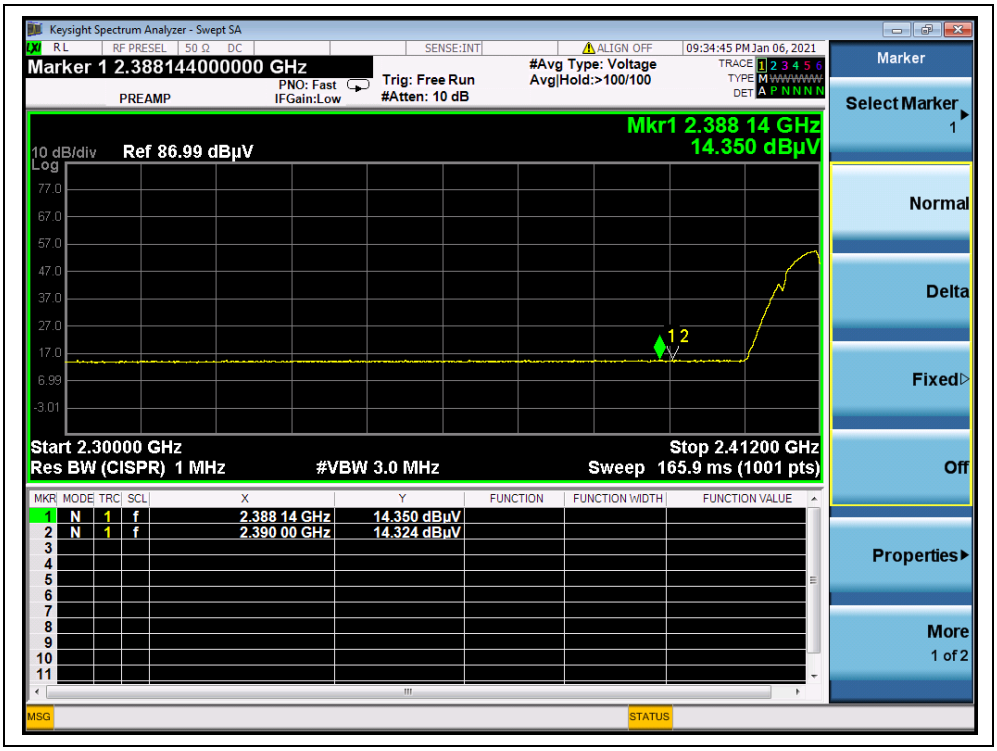
A.Test Verdict:

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	2386.80	PK	26.03	6.74	27.20	59.97	74	PASS
1	2388.14	AV	14.35	6.74	27.20	48.29	54	PASS
11	2490.54	PK	26.25	6.74	27.20	60.19	74	PASS
11	2489.17	AV	15.31	6.74	27.20	49.25	54	PASS

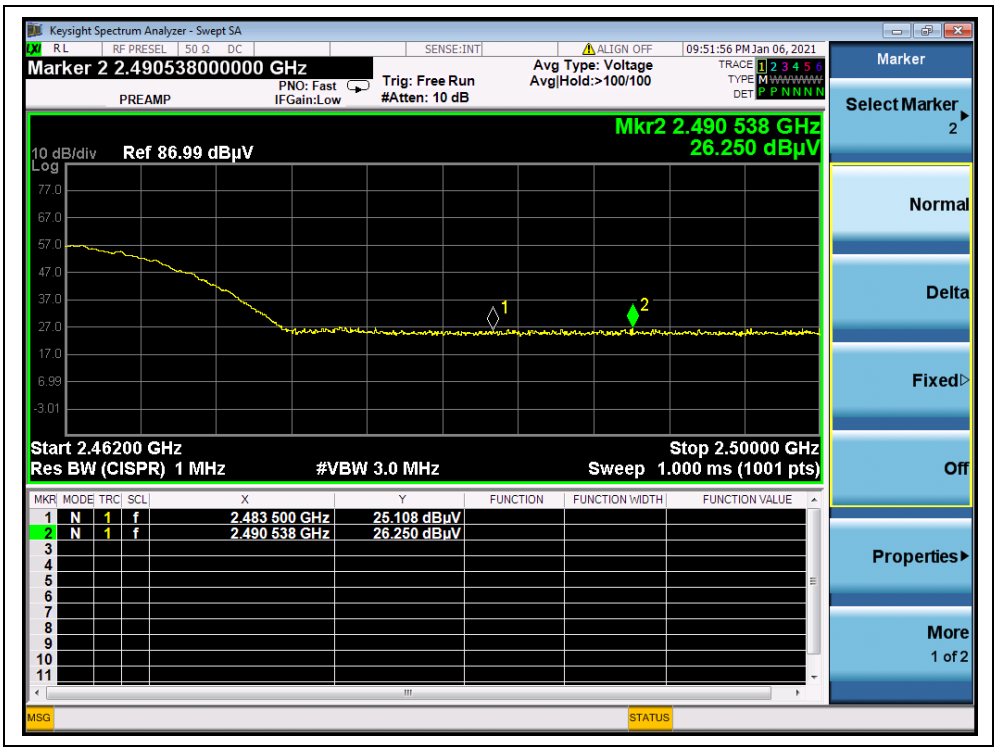
B.Test Plot:



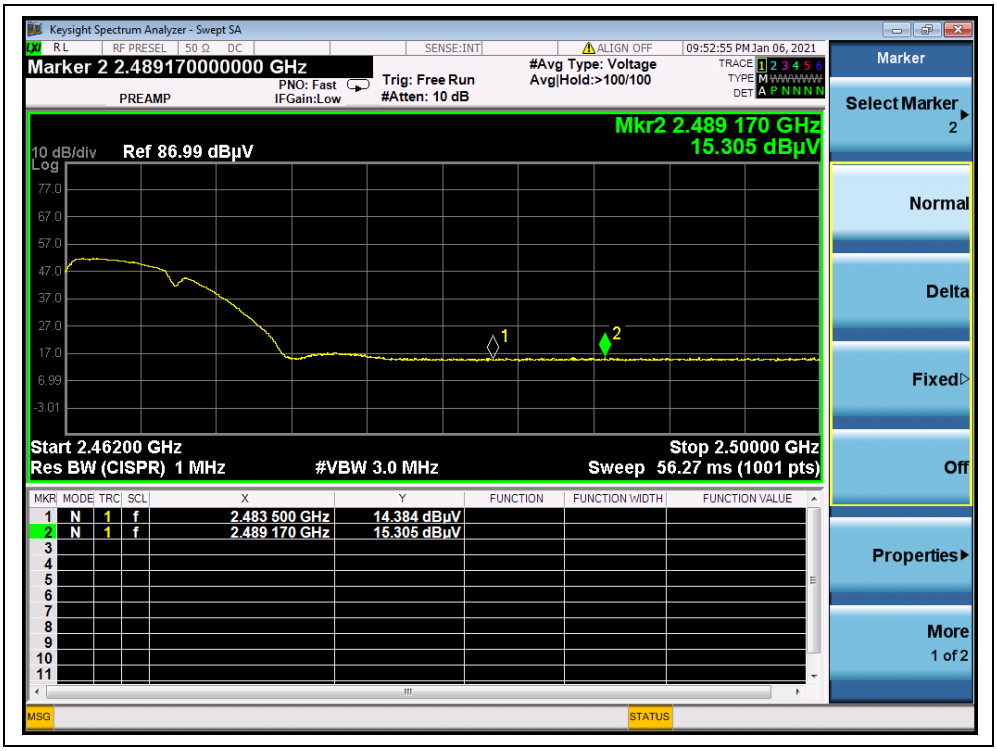
(PEAK, Channel 1, 802.11b)



(AVERAGE, Channel 1, 802.11b)



(PEAK, Channel 11, 802.11b)



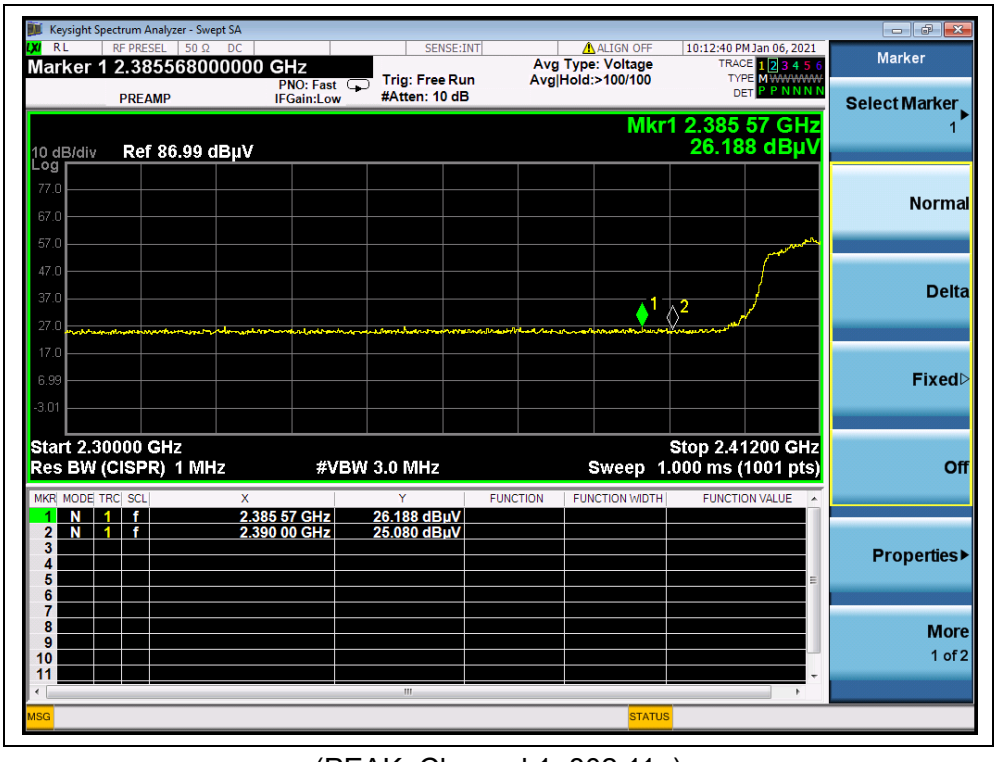
(AVERAGE, Channel 11, 802.11b)

802.11g Mode

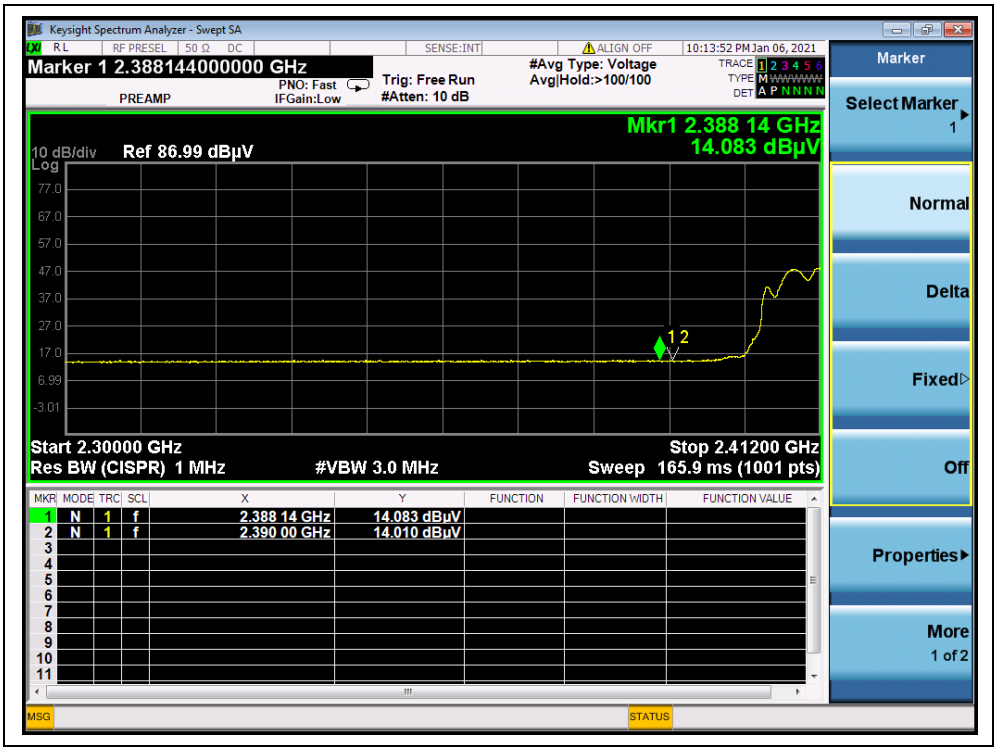
A.Test Verdict:

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	2385.57	PK	26.19	6.74	27.20	60.13	74	PASS
1	2388.14	AV	14.08	6.74	27.20	48.02	54	PASS
11	2484.00	PK	25.98	6.74	27.20	59.92	74	PASS
11	2484.50	AV	14.82	6.74	27.20	48.76	54	PASS

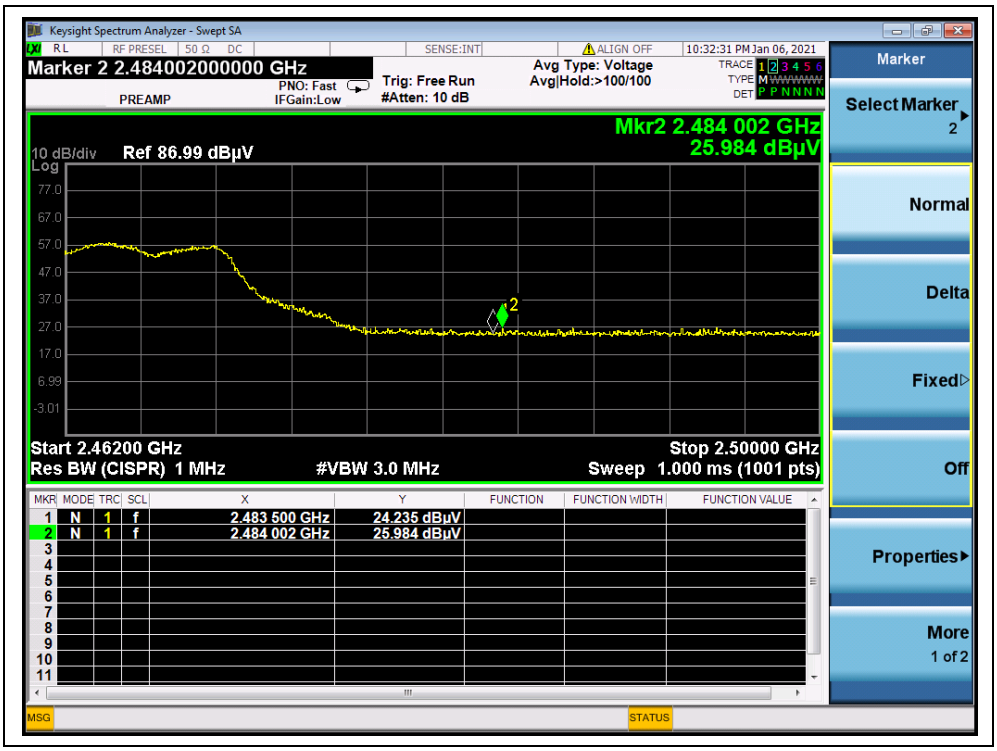
B.Test Plot:



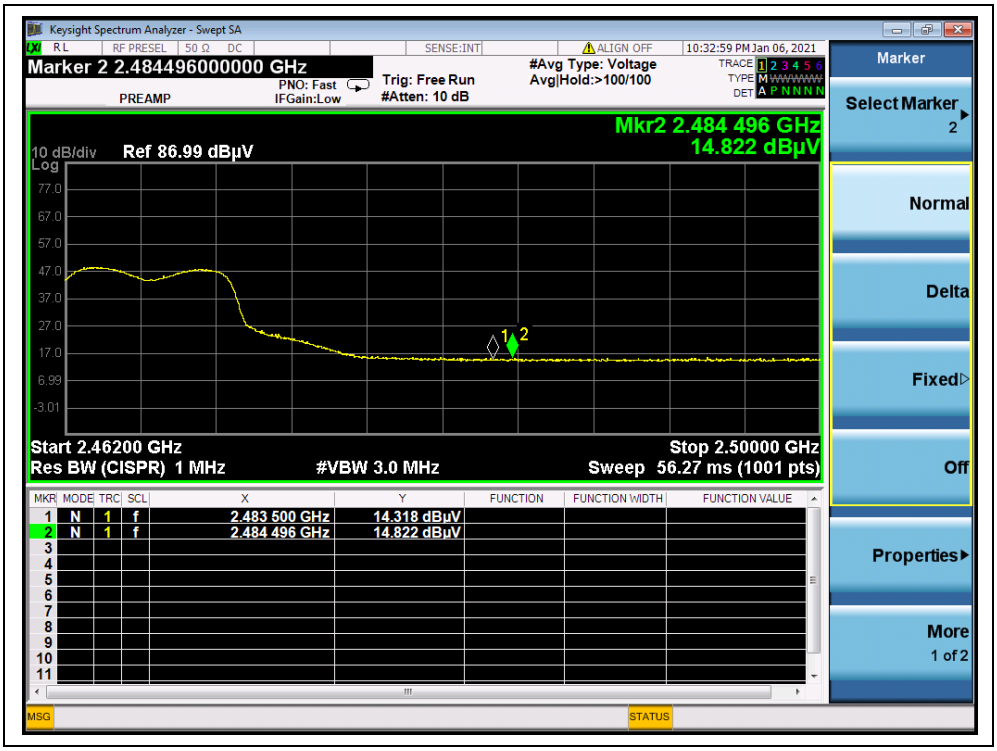
(PEAK, Channel 1, 802.11g)



(AVERAGE, Channel 1, 802.11g)



(PEAK, Channel 11, 802.11g)



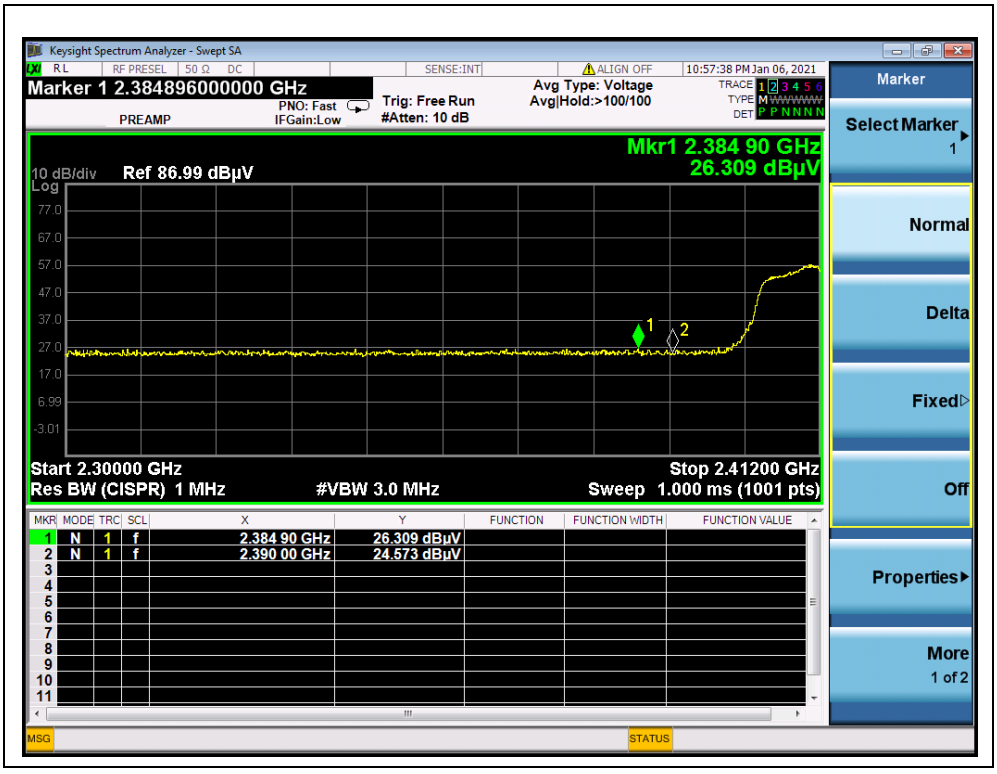
(AVERAGE, Channel 11, 802.11g)

802.11n (HT20) Mode

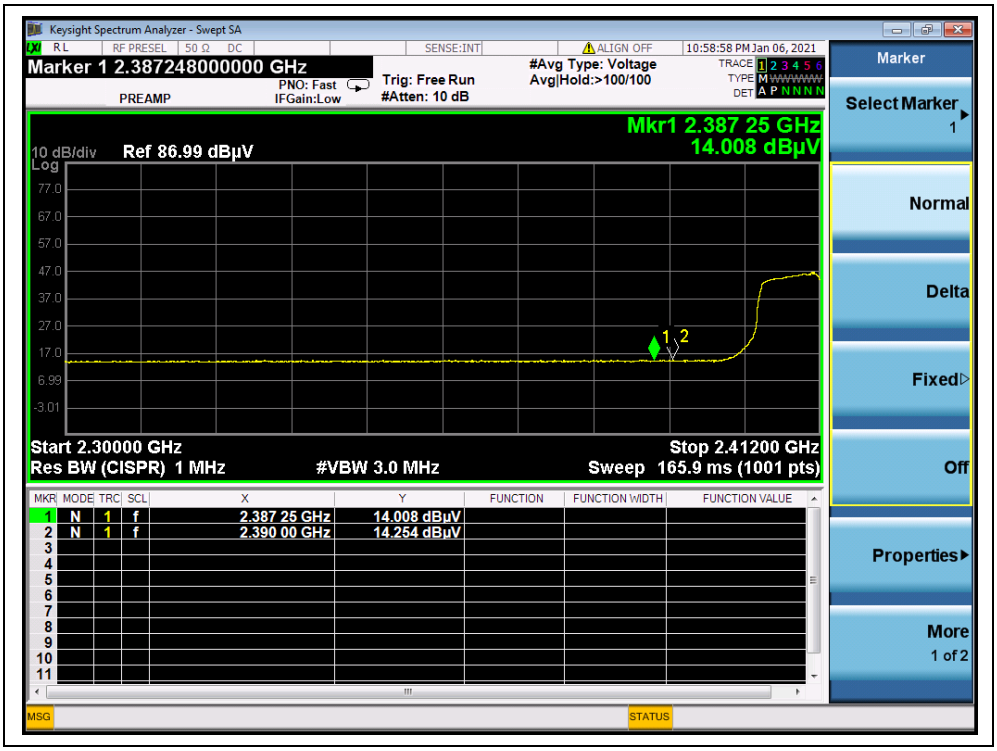
A.Test Verdict:

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	2384.90	PK	26.31	6.74	27.20	60.25	74	PASS
1	2390.00	AV	14.25	6.74	27.20	48.19	54	PASS
11	2484.19	PK	24.82	6.74	27.20	58.76	74	PASS
11	2484.46	AV	14.85	6.74	27.20	48.79	54	PASS

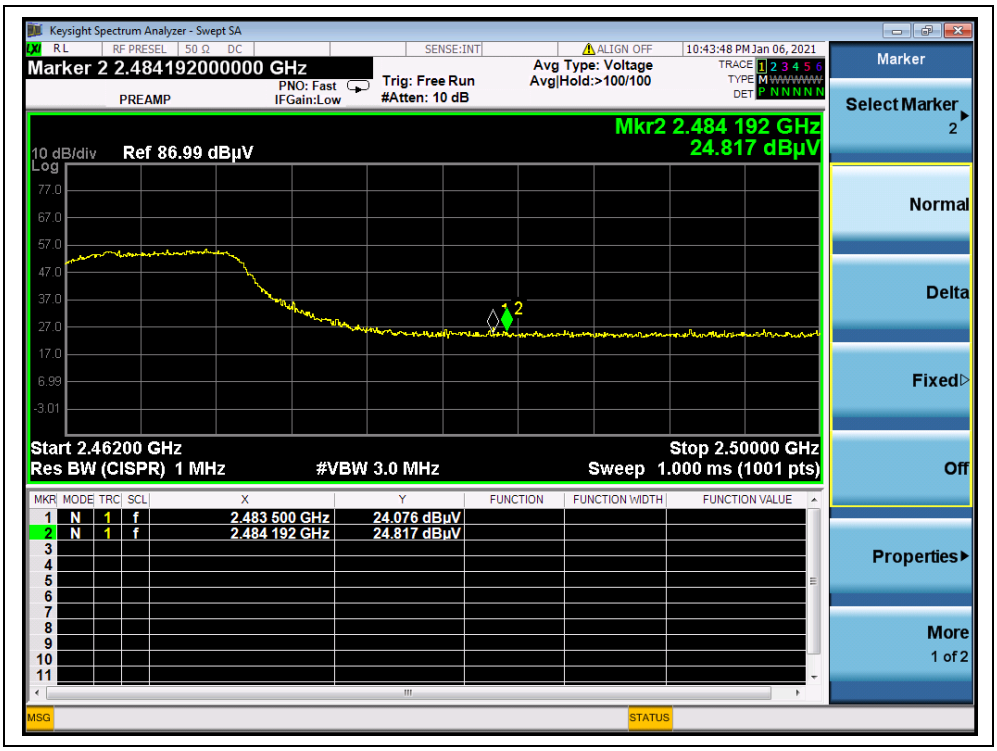
B.Test Plot:



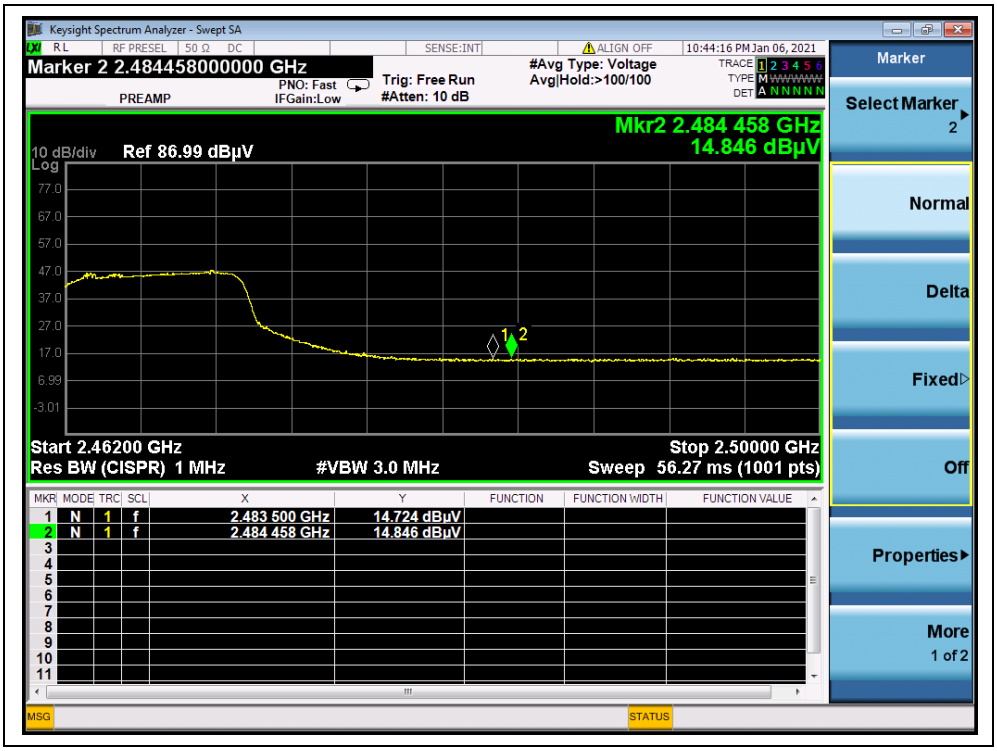
(PEAK, Channel 1, 802.11n (HT20))



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



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



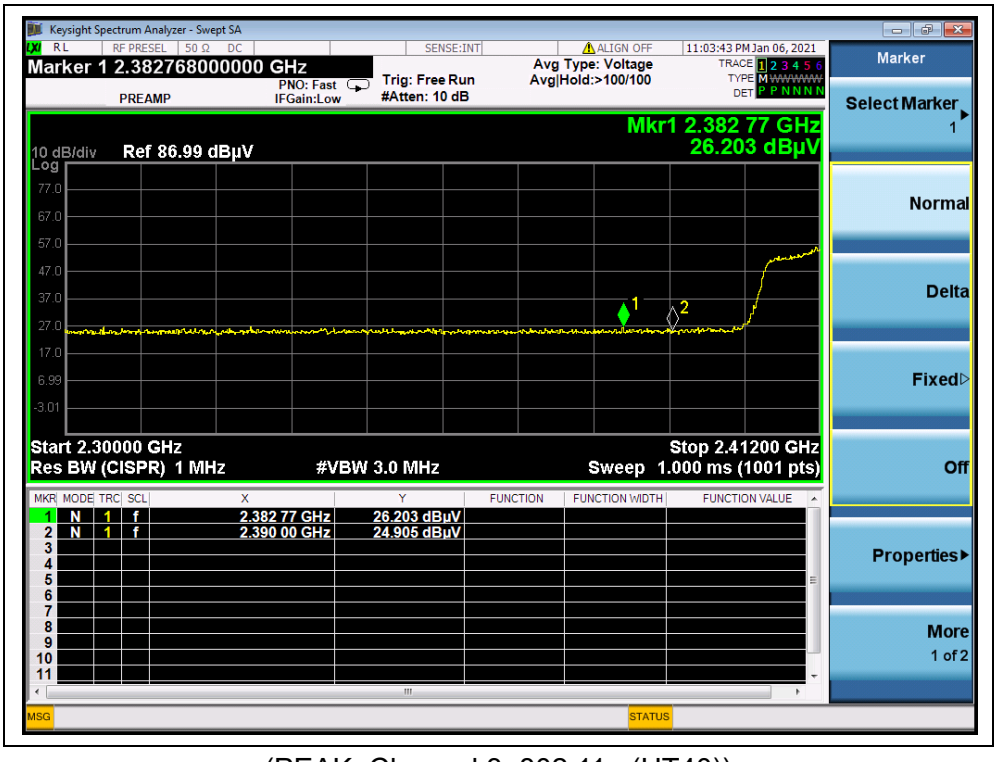
(AVERAGE, Channel 11, 802.11n (HT20))

802.11n (HT40) Mode

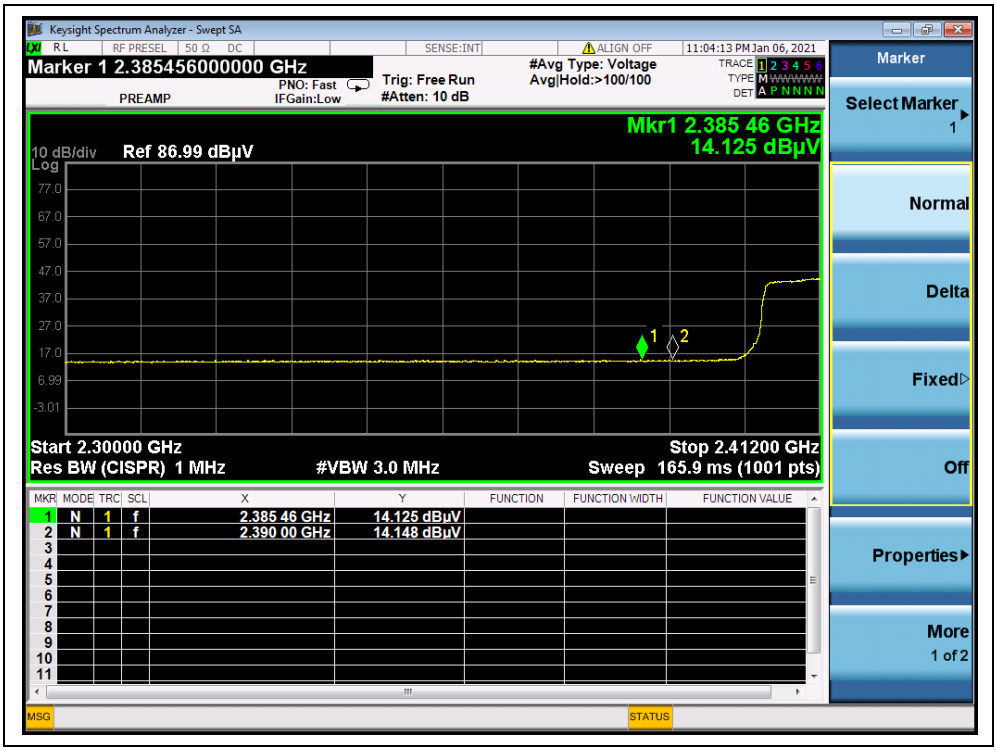
A.Test Verdict:

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						
3	2382.77	PK	26.20	6.74	27.20	60.14	74	PASS
3	2390.00	AV	14.15	6.74	27.20	48.09	54	PASS
9	2489.02	PK	26.32	6.74	27.20	60.26	74	PASS
9	2483.85	AV	15.03	6.74	27.20	48.97	54	PASS

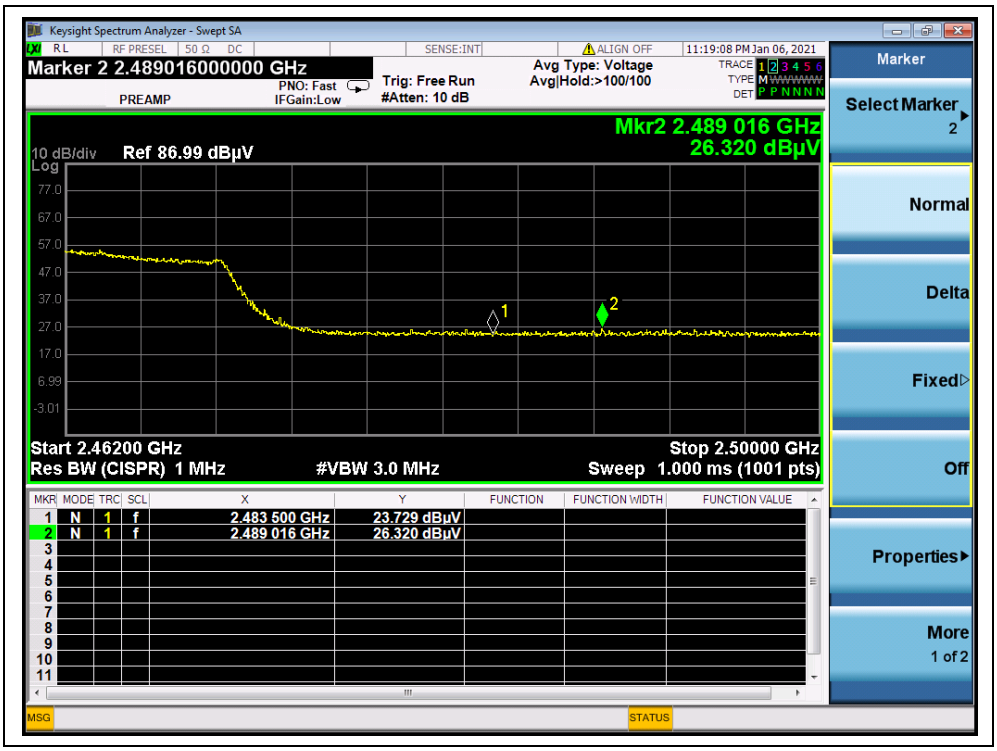
B.Test Plot:



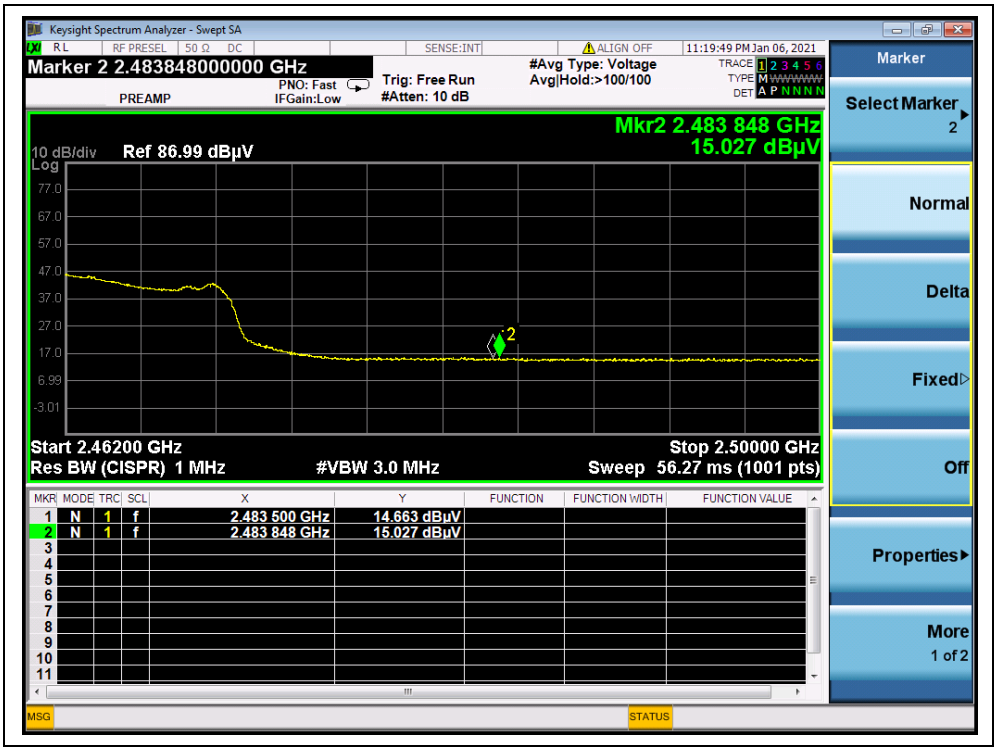
(PEAK, Channel 3, 802.11n (HT40))



(AVERAGE, Channel 3, 802.11n (HT40))



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



(AVERAGE, 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

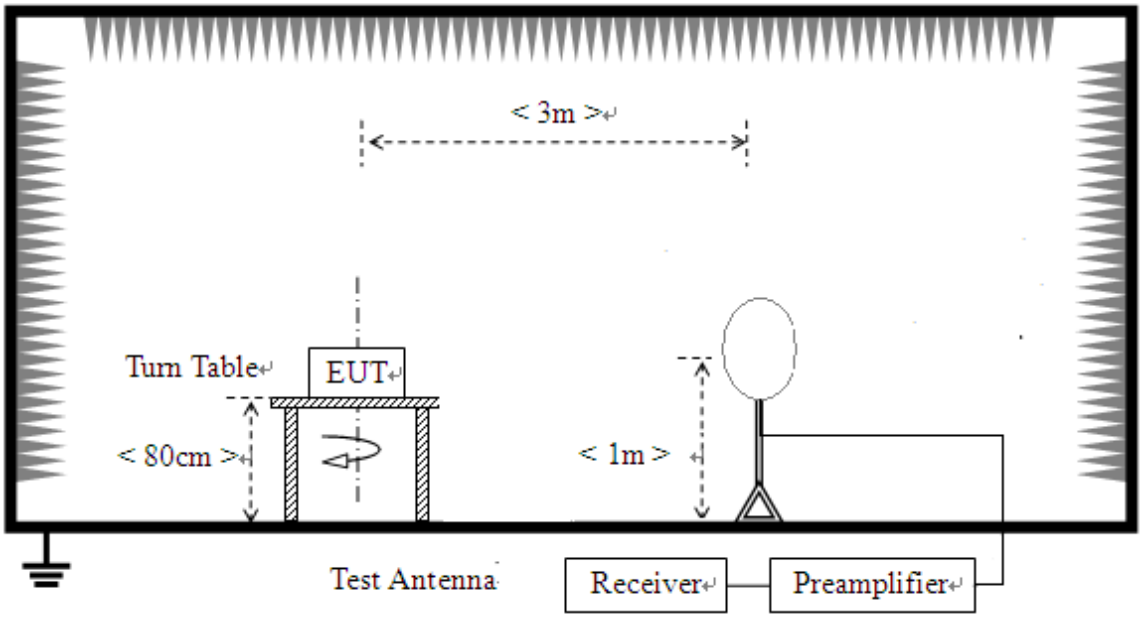
Note1: For above 1000MHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20dB above the maximum permitted average limit.

Note2: For above 1000MHz, limit field strength of harmonics: 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).

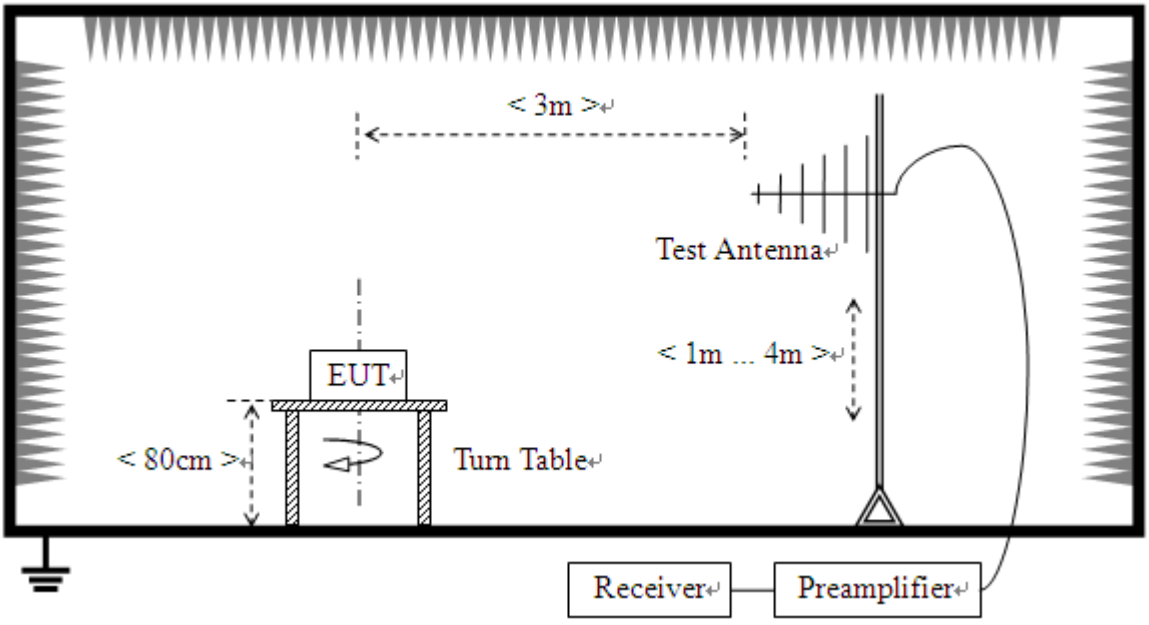
2.9.2.Test Description

Test Setup:

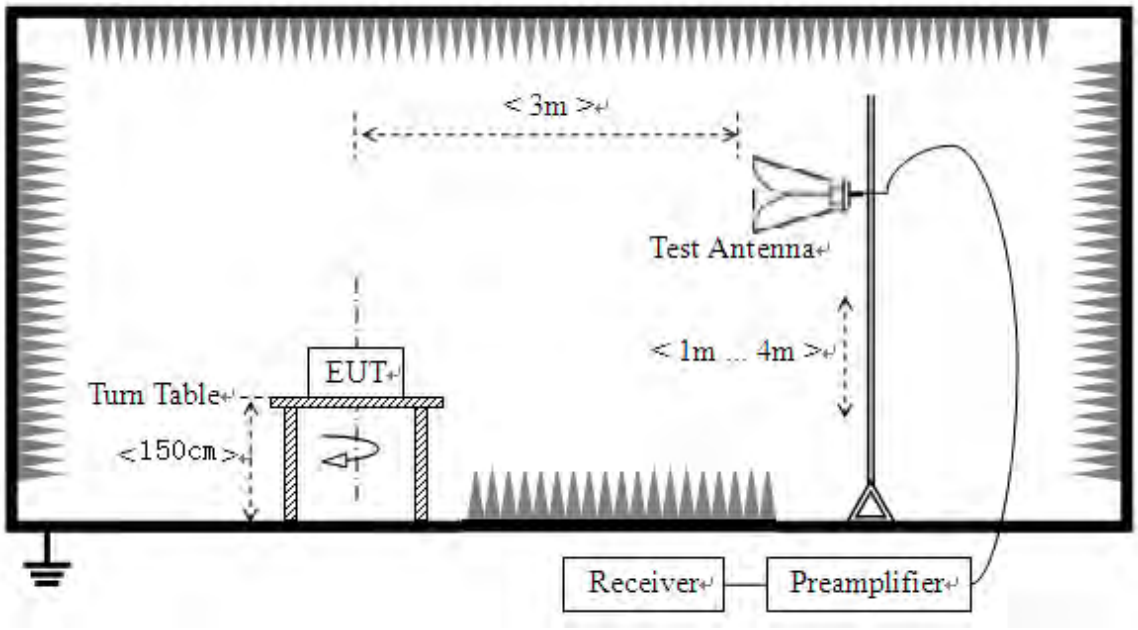
1) For radiated emissions from 9kHz to 30MHz



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.

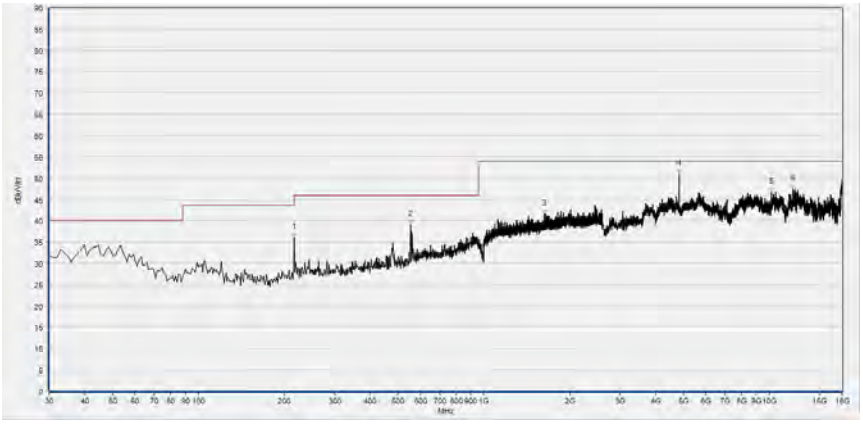
Note1: All radiated emission tests were performed in X, Y, Z axis direction. And only the worst axis test condition was recorded in this test report.

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.

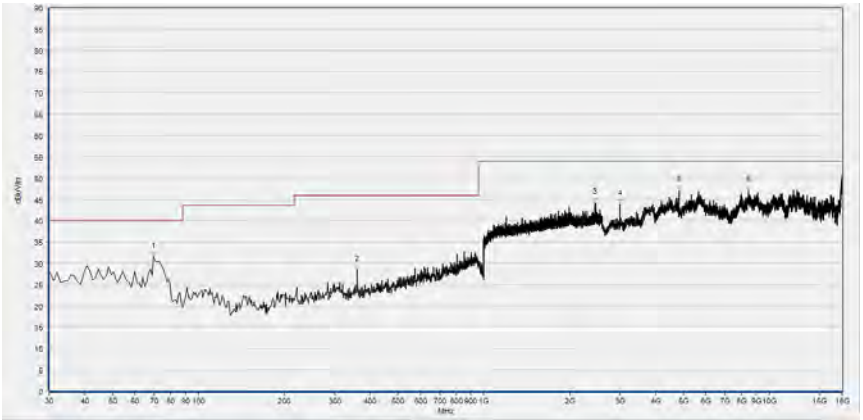
Antenna Type A, 802.11b Mode

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
216.240	35.95	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
553.800	39.04	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1627.733	41.55	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4823.760	50.91	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
10155.240	46.77	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12117.200	47.47	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

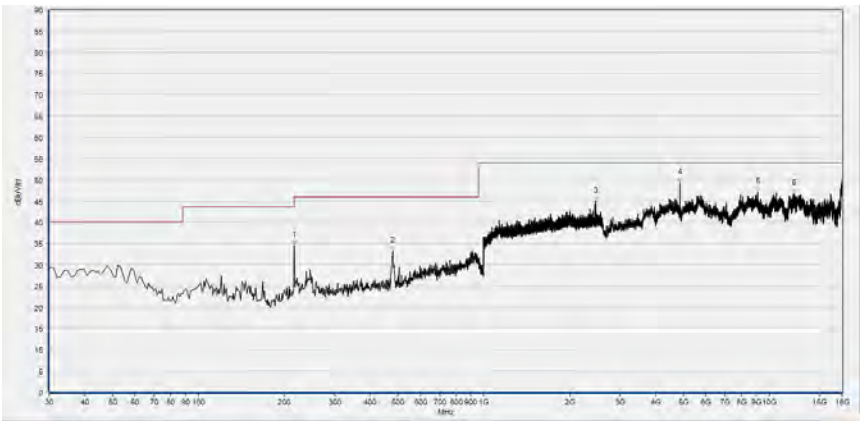
(Antenna Horizontal, 30MHz to 18GHz)



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
69.770	31.46	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
359.800	28.53	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2457.600	44.20	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2994.240	43.90	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4823.760	47.02	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8458.160	47.06	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

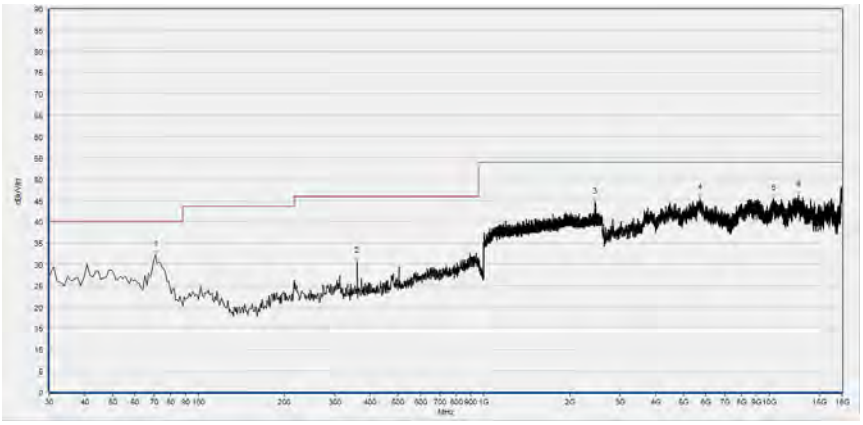
(Antenna Vertical, 30MHz to 18GHz)

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
216.240	34.61	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
480.080	33.15	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2459.200	44.97	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4873.040	49.30	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
9129.600	47.02	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12225.000	46.68	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

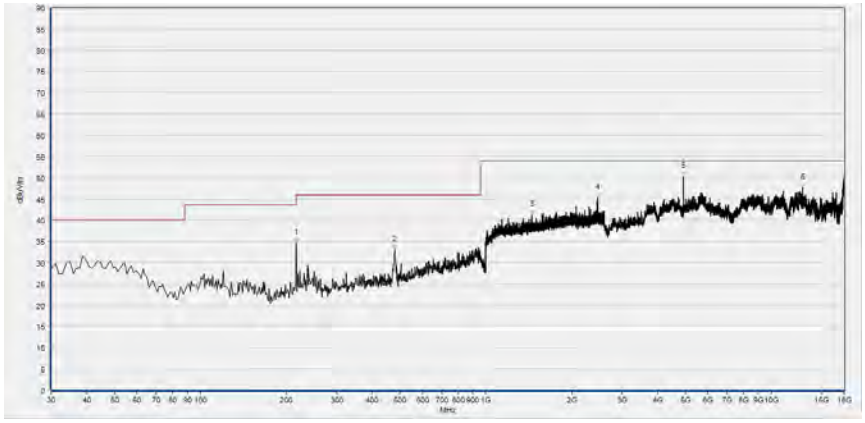
(Antenna Horizontal, 30MHz to 18GHz)



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
70.740	32.25	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
359.800	30.63	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2457.600	44.61	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5704.640	45.60	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
10355.440	45.44	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12680.840	46.30	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

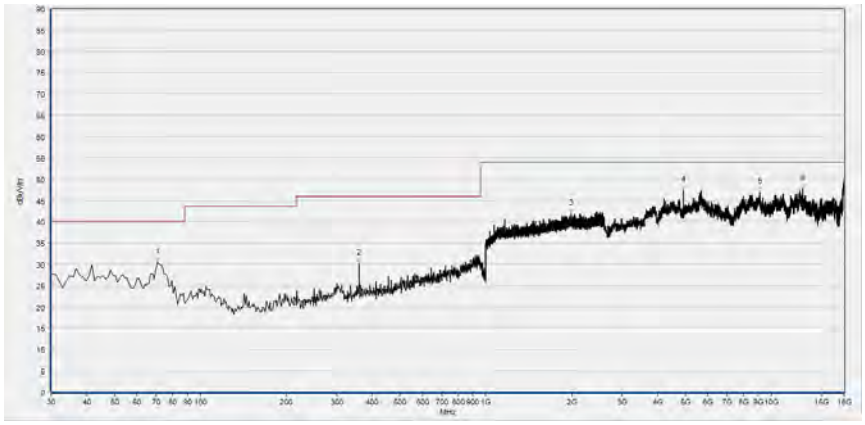
(Antenna Vertical, 30MHz to 18GHz)

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
216.240	34.64	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
480.080	32.96	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1451.733	41.24	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2459.200	45.31	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4922.320	50.24	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12902.600	47.55	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)

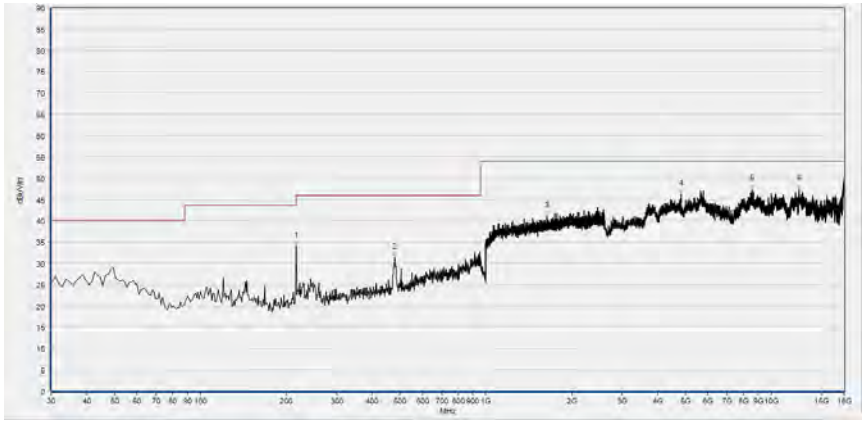


Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
70.740	30.45	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
359.800	30.20	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1987.200	41.95	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4925.400	47.43	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
9120.360	46.89	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12893.360	47.71	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

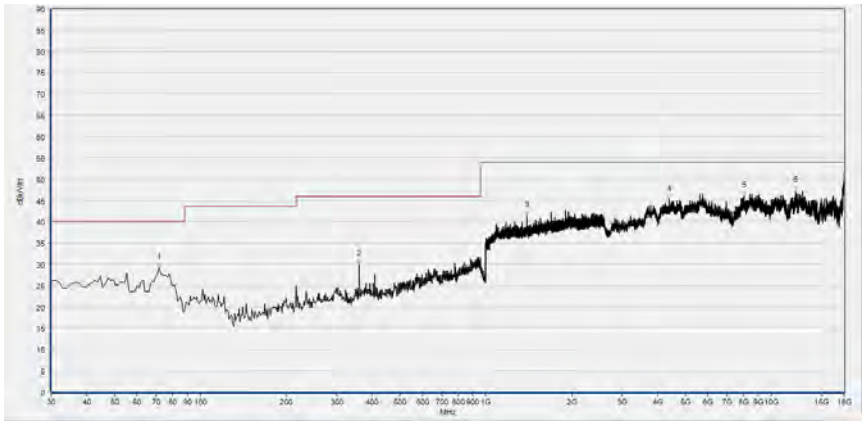
802.11g Mode

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
216.240	34.03	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
480.080	31.39	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1637.867	41.06	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4829.920	46.32	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8572.120	47.51	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12505.280	47.37	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

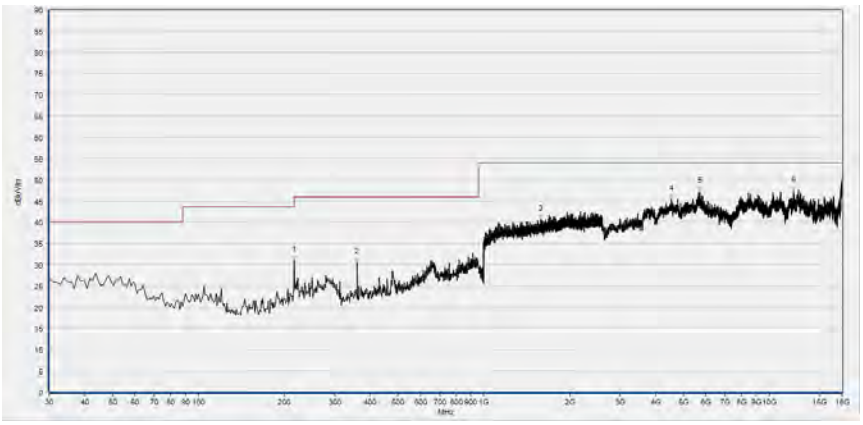
(Antenna Horizontal, 30MHz to 18GHz)



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
71.710	29.10	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
359.800	30.02	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1396.267	41.36	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4380.240	45.28	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8036.200	46.04	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12197.280	47.19	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

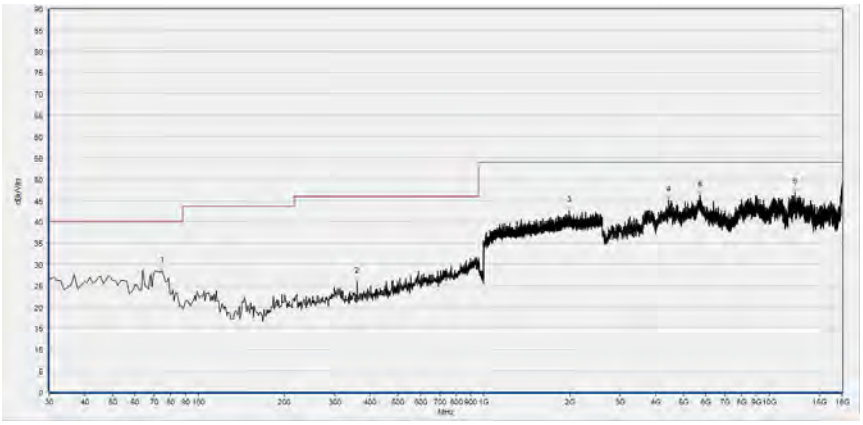
(Antenna Vertical, 30MHz to 18GHz)

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
216.240	31.06	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
359.800	30.43	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1582.933	40.72	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4528.080	45.40	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5716.960	47.33	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12138.760	47.48	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

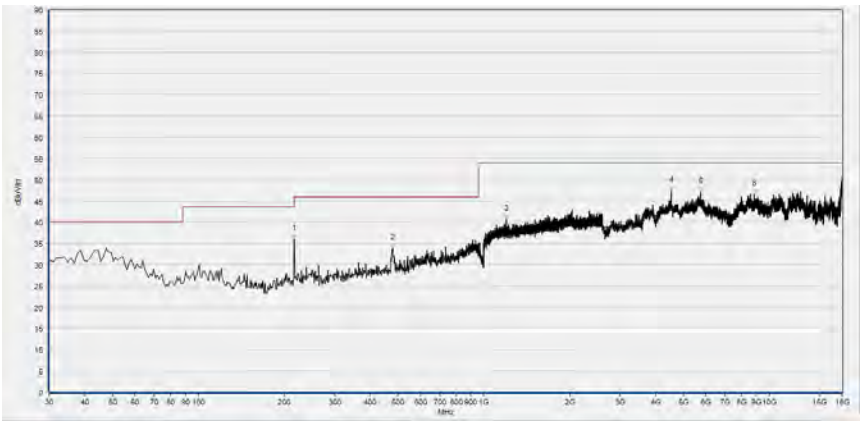
(Antenna Horizontal, 30MHz to 18GHz)



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
74.620	28.55	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
359.800	26.04	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1993.600	42.57	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4448.000	45.15	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5701.560	46.32	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12332.800	46.90	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

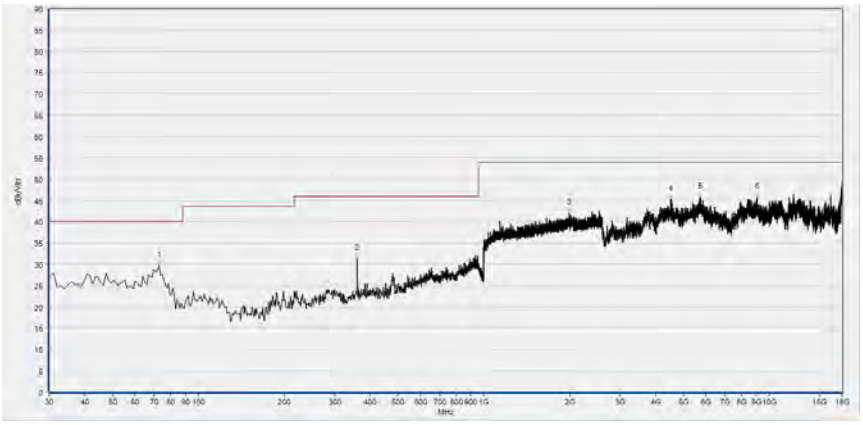
(Antenna Vertical, 30MHz to 18GHz)

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
216.240	36.00	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
480.080	33.79	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1201.067	40.65	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4528.080	47.36	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5753.920	47.04	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8864.720	46.52	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)

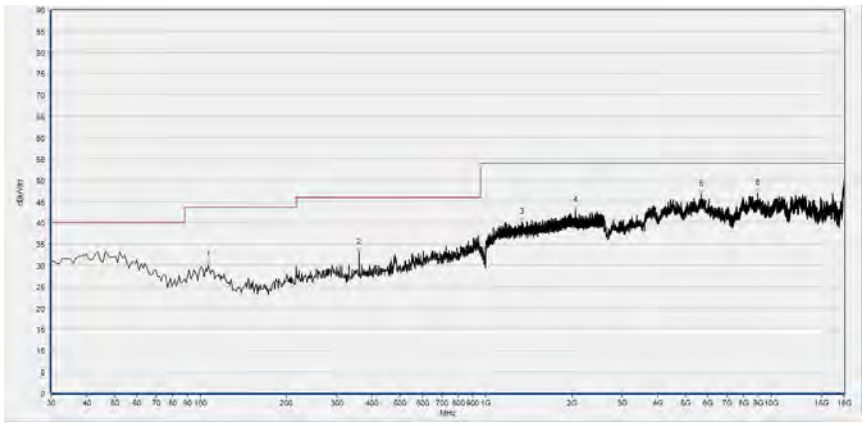


Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
72.680	29.73	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
359.800	31.42	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1988.267	42.00	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4518.840	45.25	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5704.640	45.81	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
9043.360	45.70	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

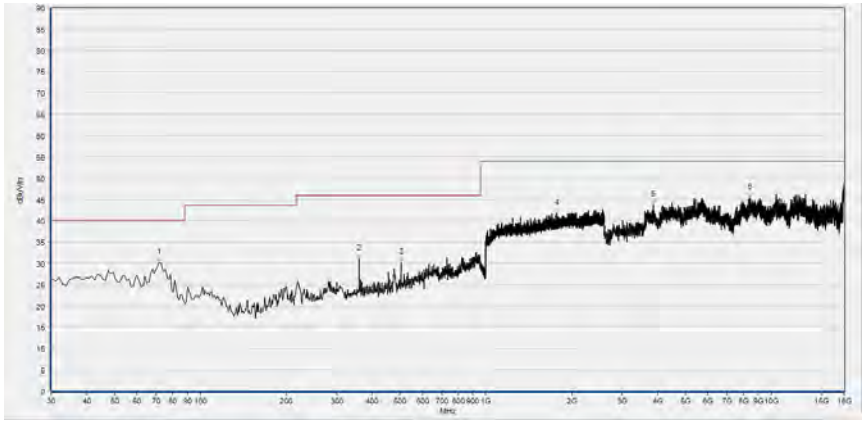
802.11n (HT20) Mode

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
106.630	30.01	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
359.800	33.01	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1337.600	40.12	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2064.000	42.82	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5695.400	46.56	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8984.840	46.88	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

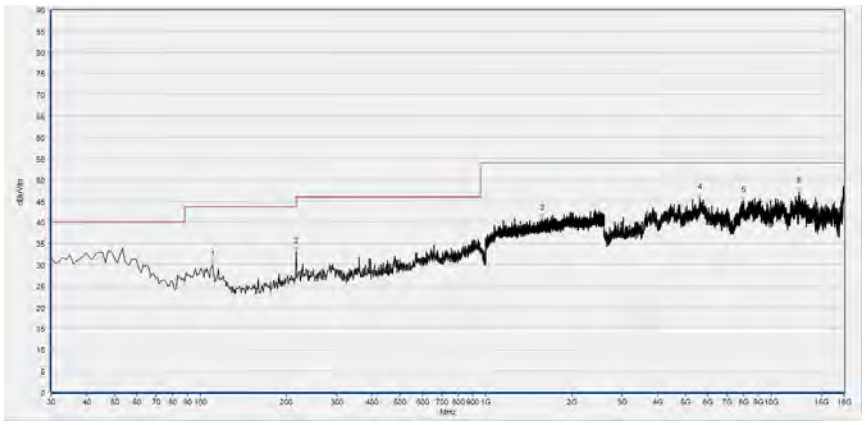
(Antenna Horizontal, 30MHz to 18GHz)



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
71.710	30.09	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
359.800	30.96	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
504.330	30.14	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1773.867	41.66	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
3853.560	43.67	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8427.360	45.48	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

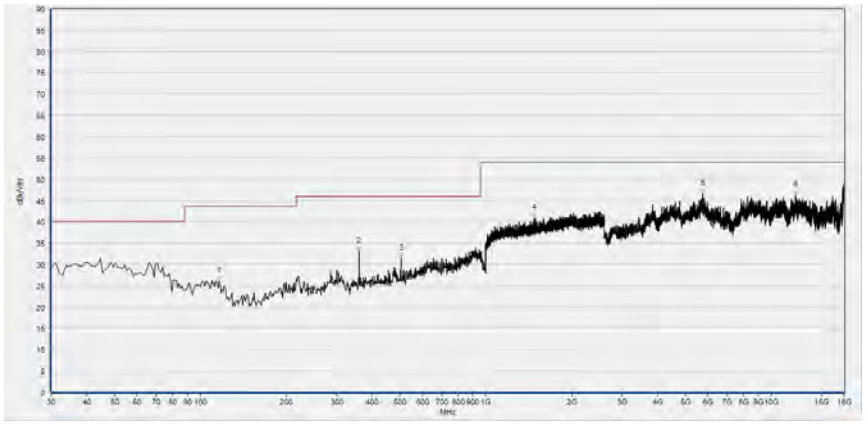
(Antenna Vertical, 30MHz to 18GHz)

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
110.510	30.00	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
216.240	32.96	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1569.067	40.89	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5627.640	45.69	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
7993.080	45.00	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12483.720	47.09	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

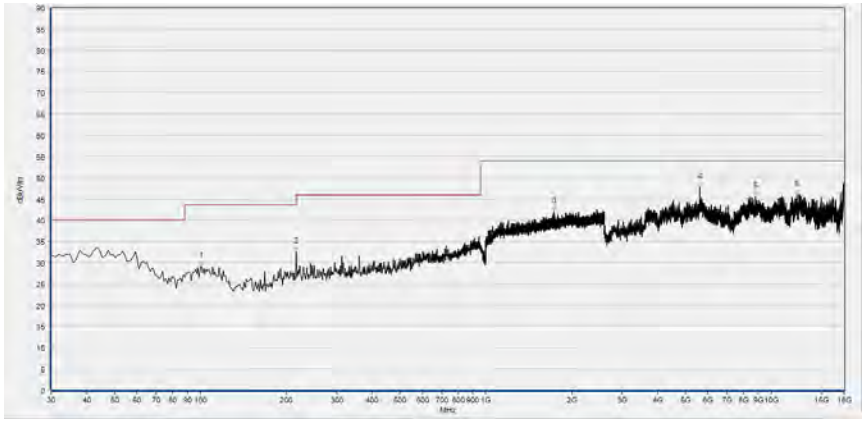
(Antenna Horizontal, 30MHz to 18GHz)



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
116.330	26.13	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
359.800	33.01	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
504.330	31.27	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1475.200	40.84	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5763.160	46.52	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12197.280	46.20	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

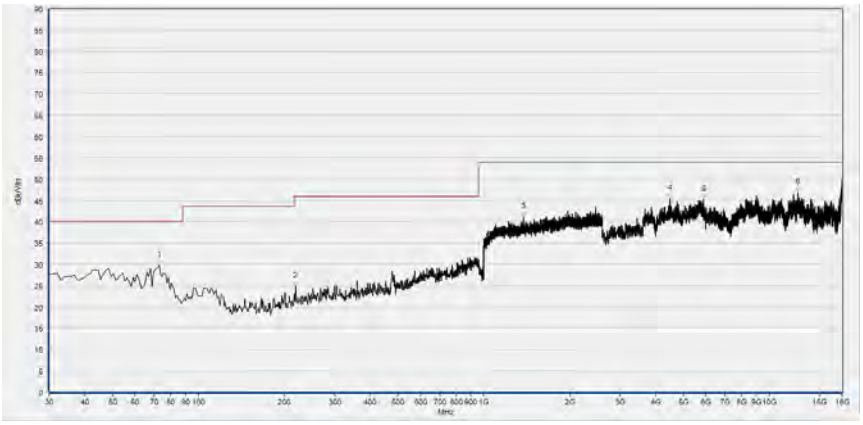
(Antenna Vertical, 30MHz to 18GHz)

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
100.810	29.13	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
216.240	32.47	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1733.333	42.04	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5627.640	47.71	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8824.680	45.51	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12338.960	45.87	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)

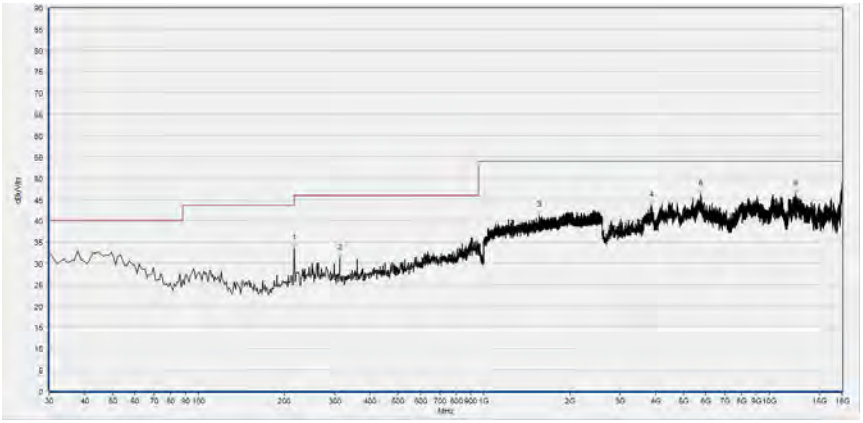


Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
72.680	29.68	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
219.150	24.81	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1379.733	41.05	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4478.800	45.37	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5892.520	45.22	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12606.920	46.92	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

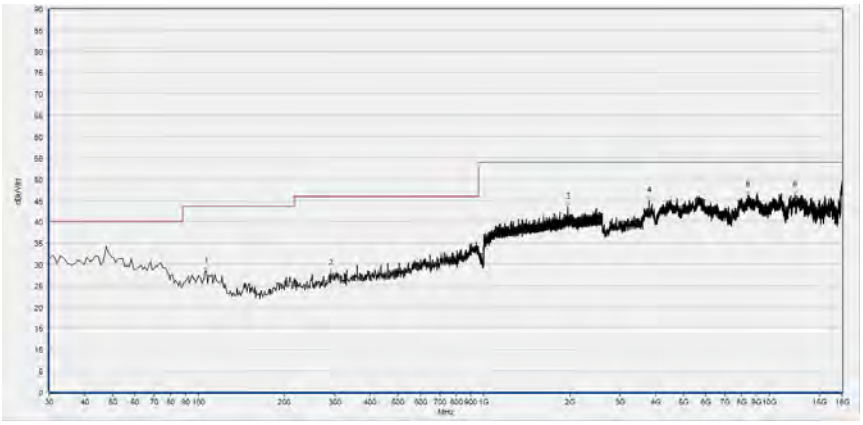
802.11n (HT40) Mode

Plot 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
216.240	33.49	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
312.270	31.12	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1565.867	41.16	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
3862.800	43.51	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5738.520	46.30	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12342.040	46.19	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

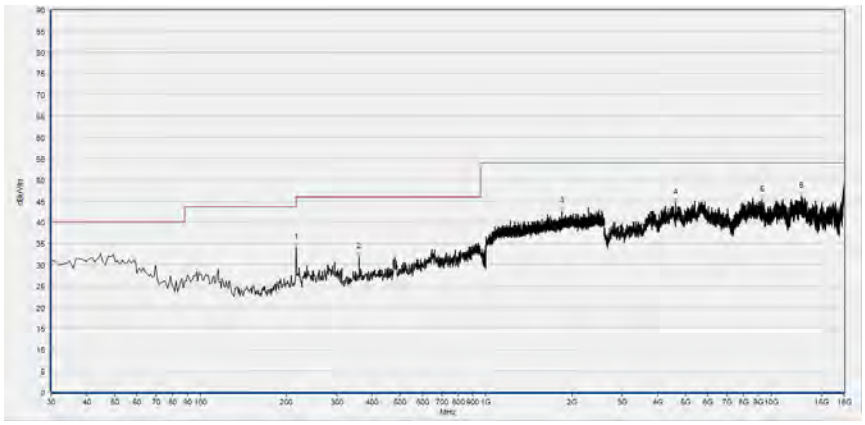
(Antenna Horizontal, 30MHz to 18GHz)



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
106.630	28.34	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
290.930	27.81	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1970.667	43.35	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
3788.880	44.99	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8421.200	46.24	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12292.760	46.30	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

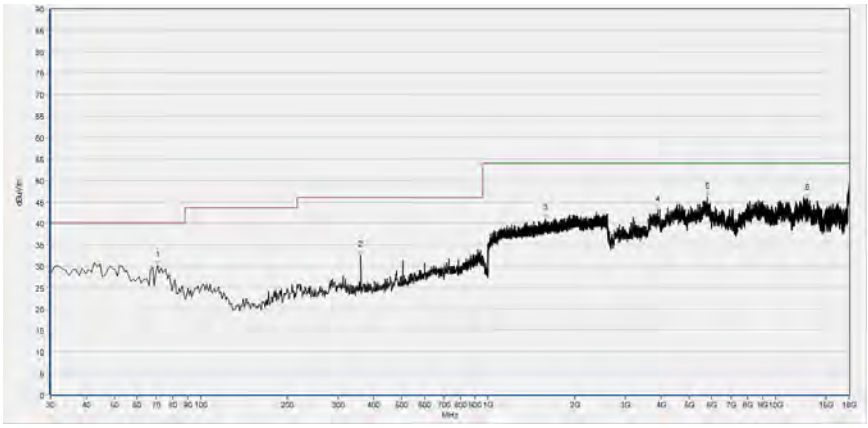
(Antenna Vertical, 30MHz to 18GHz)

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
216.240	34.08	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
359.800	31.76	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1848.533	42.61	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4623.560	44.61	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
9289.760	45.27	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12745.520	46.06	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

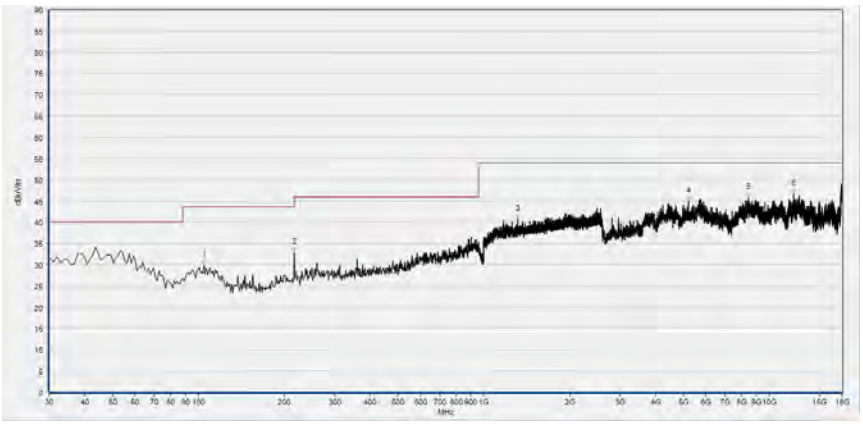
(Antenna Horizontal, 30MHz to 18GHz)



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
70.740	30.10	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
359.800	32.47	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1578.667	40.99	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
3884.360	43.13	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5775.480	46.04	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12887.200	45.74	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

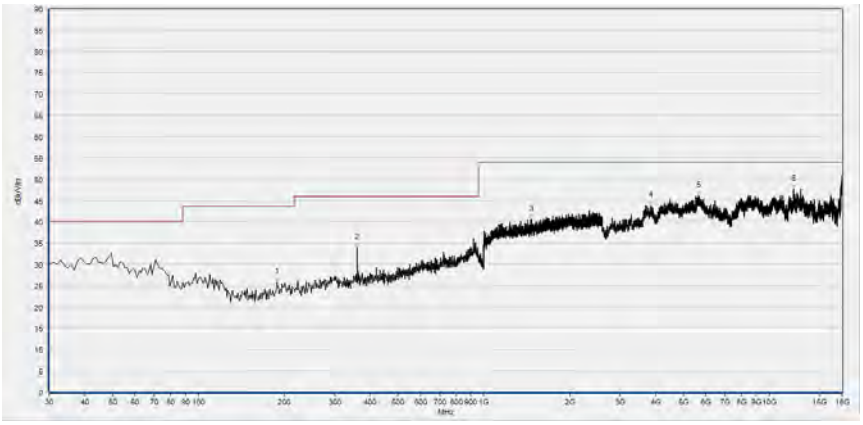
(Antenna Vertical, 30MHz to 18GHz)

Plot 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
104.690	29.77	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
216.240	32.88	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1316.267	40.66	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5214.920	44.86	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8436.600	45.76	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12197.280	46.57	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)

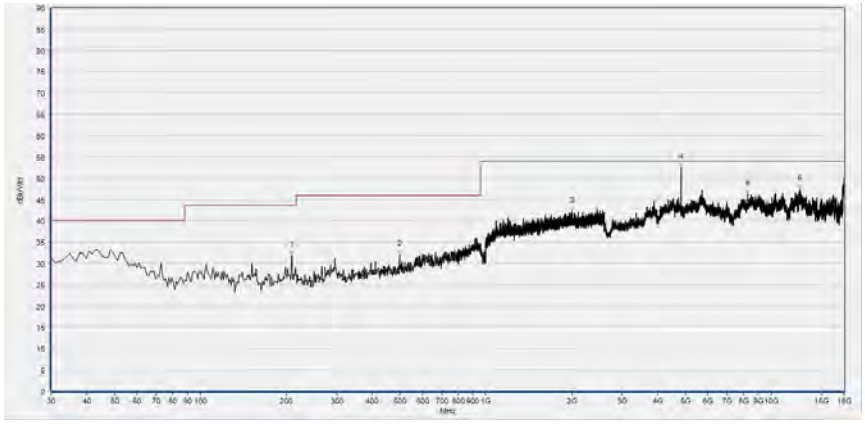


Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
189.080	25.73	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
359.800	33.83	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1465.600	40.55	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
3835.080	43.80	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5658.440	46.12	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12138.760	47.63	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

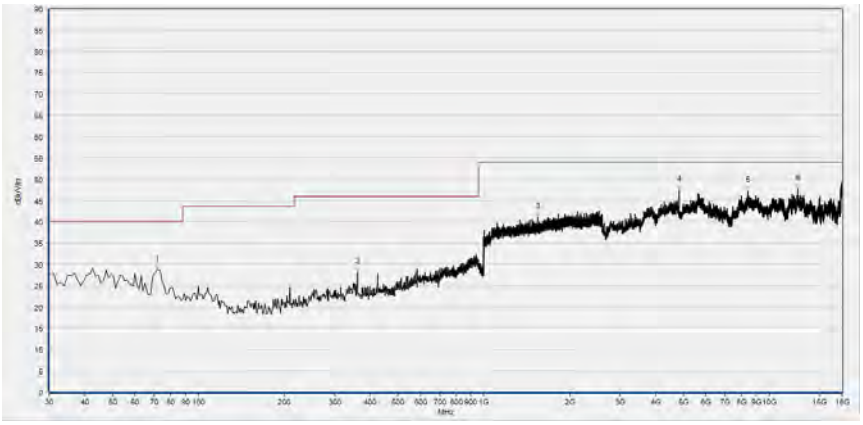
Antenna Type B, 802.11b Mode

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
209.450	31.84	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
498.510	31.94	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2000.000	42.18	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4824.000	53.13	N/A	49.45	74.00	N/A	54.00	Horizontal	PASS
8257.960	46.28	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12600.760	47.36	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

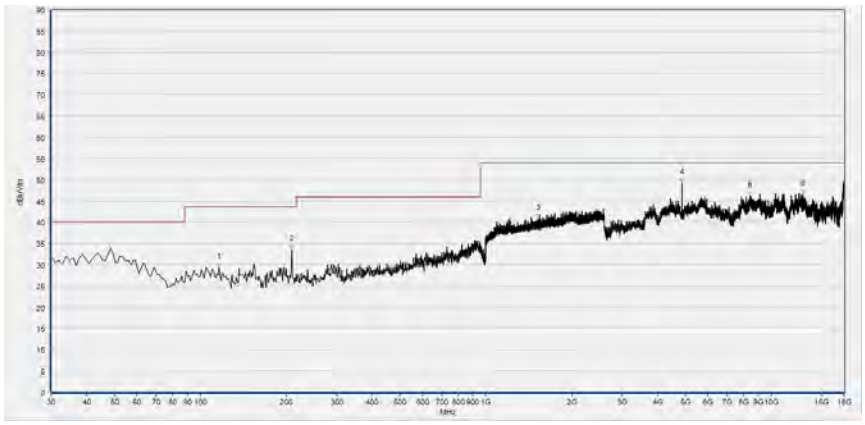
(Antenna Horizontal, 30MHz to 18GHz)



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
71.710	28.65	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
360.770	28.08	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1541.333	40.99	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4823.760	47.47	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8418.120	47.19	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12591.520	47.74	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

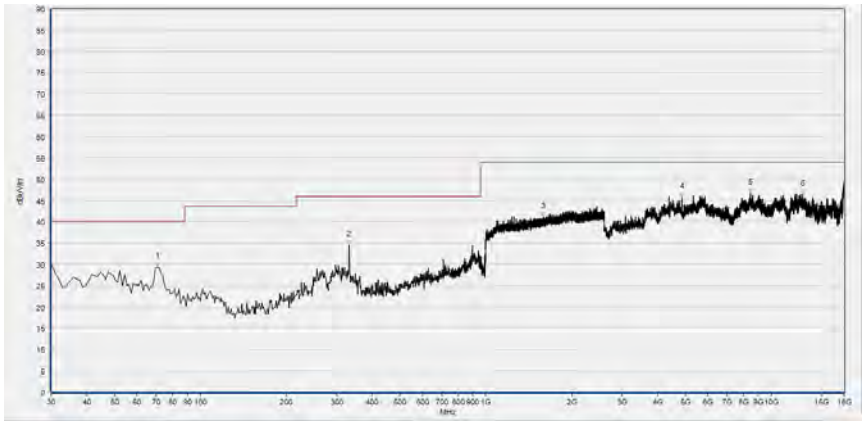
(Antenna Vertical, 30MHz to 18GHz)

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
116.330	29.36	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
209.450	33.44	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1530.133	40.86	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4873.040	49.34	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8415.040	46.32	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12890.280	46.67	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

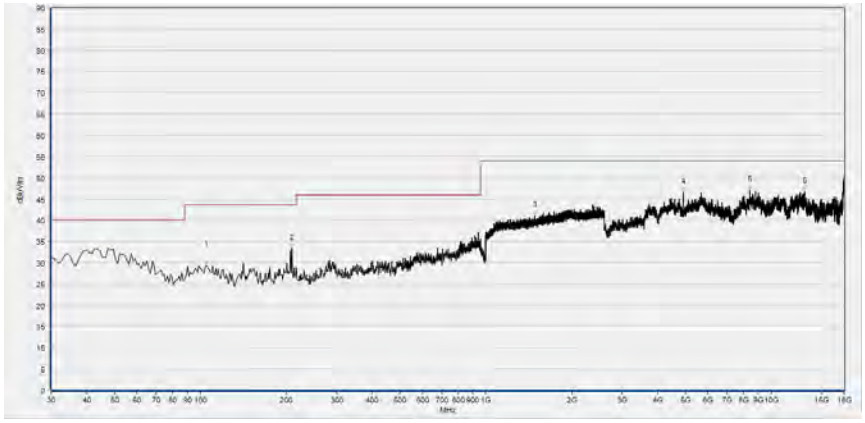
(Antenna Horizontal, 30MHz to 18GHz)



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
70.740	29.36	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
332.640	34.59	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1588.267	41.06	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4873.040	45.79	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8436.600	46.84	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12865.640	46.35	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

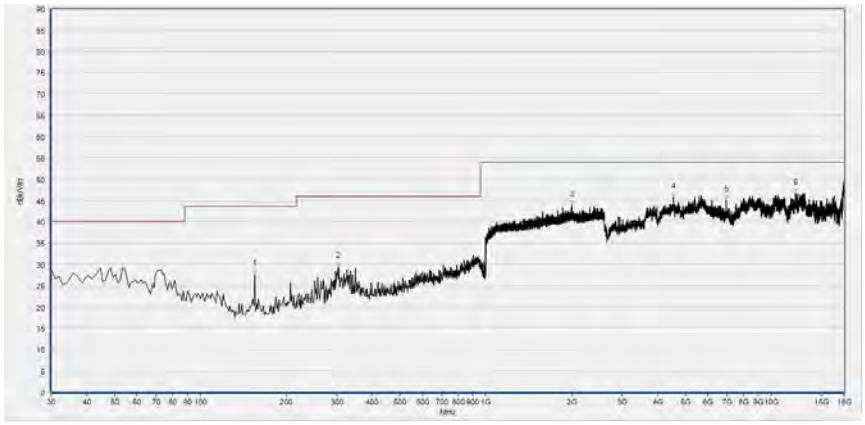
(Antenna Vertical, 30MHz to 18GHz)

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
104.690	29.52	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
209.450	33.35	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1485.333	41.00	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4925.400	46.57	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8415.040	47.06	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
13139.760	46.81	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)

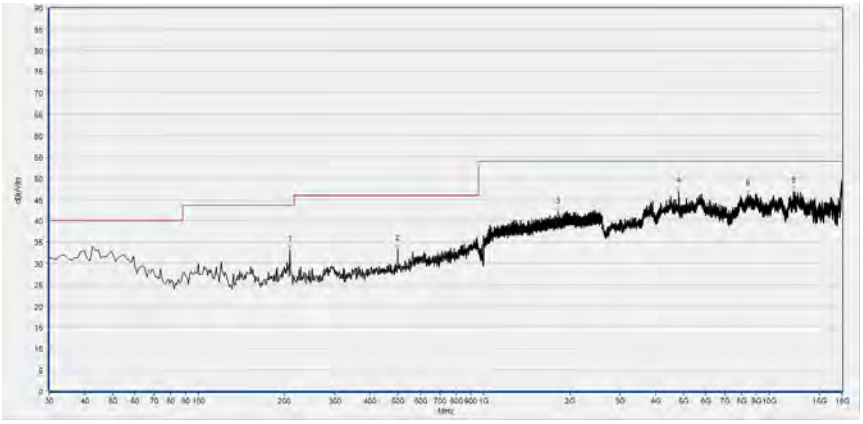


Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
155.130	27.64	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
303.540	29.51	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2002.667	43.97	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4543.480	45.68	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
6961.280	45.01	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12160.320	46.71	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

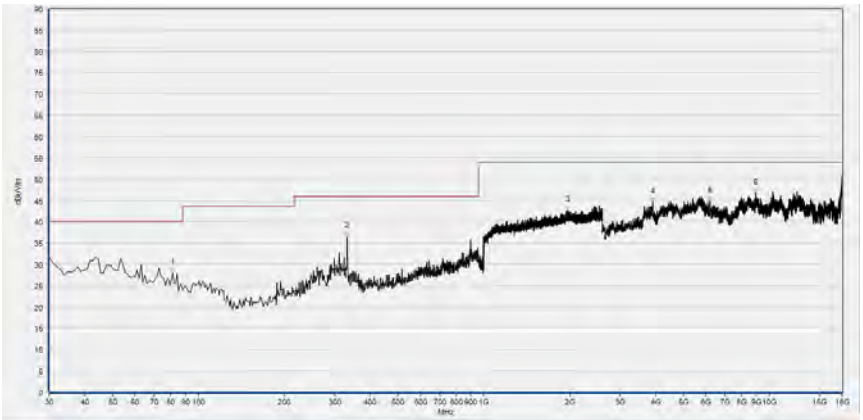
802.11g Mode

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
209.450	33.26	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
499.480	33.37	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1821.333	42.10	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4820.680	46.98	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8430.440	46.18	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12154.160	46.88	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

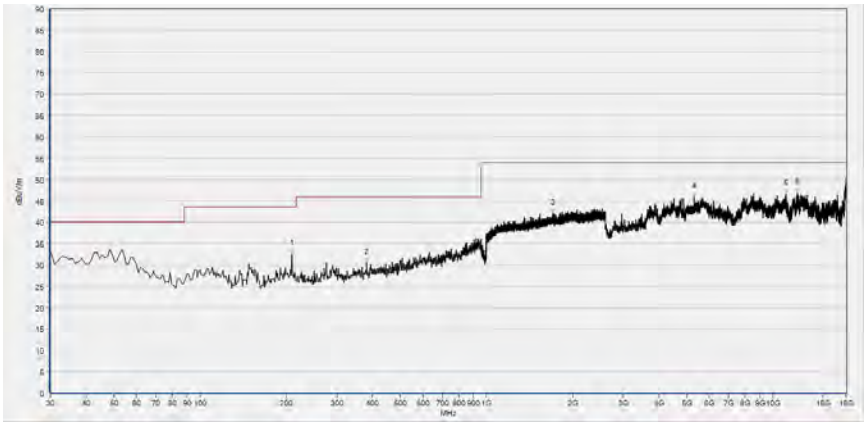
(Antenna Horizontal, 30MHz to 18GHz)



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
81.410	27.95	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
332.640	36.54	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1971.733	42.66	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
3902.840	44.65	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
6191.280	44.81	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8981.760	46.70	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

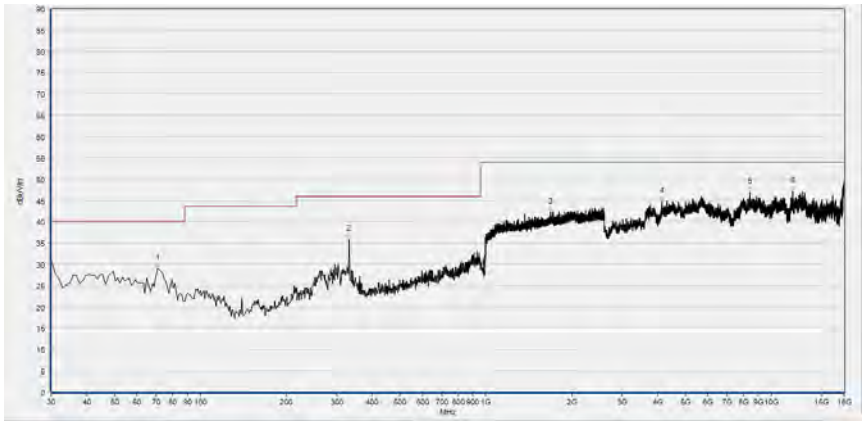
(Antenna Vertical, 30MHz to 18GHz)

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
209.450	32.49	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
381.140	30.48	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1700.800	41.98	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5307.320	45.85	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
11122.360	46.63	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12129.520	47.00	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

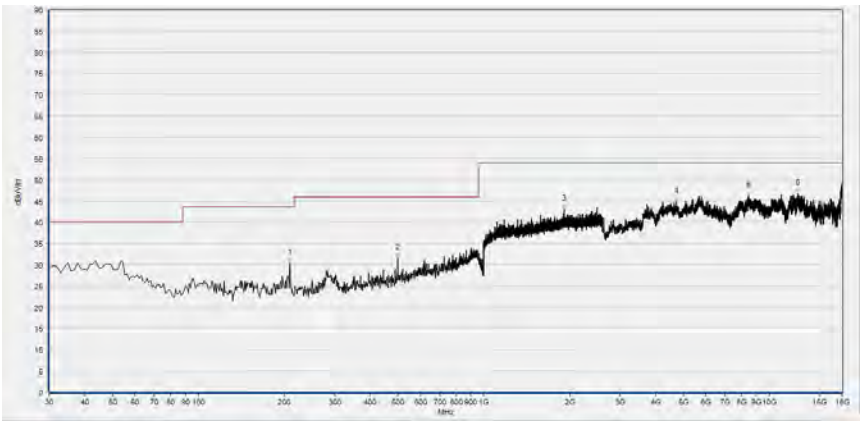
(Antenna Horizontal, 30MHz to 18GHz)



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
70.740	29.04	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
332.640	35.93	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1682.667	42.18	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4149.240	44.73	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8418.120	46.85	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
11876.960	47.04	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

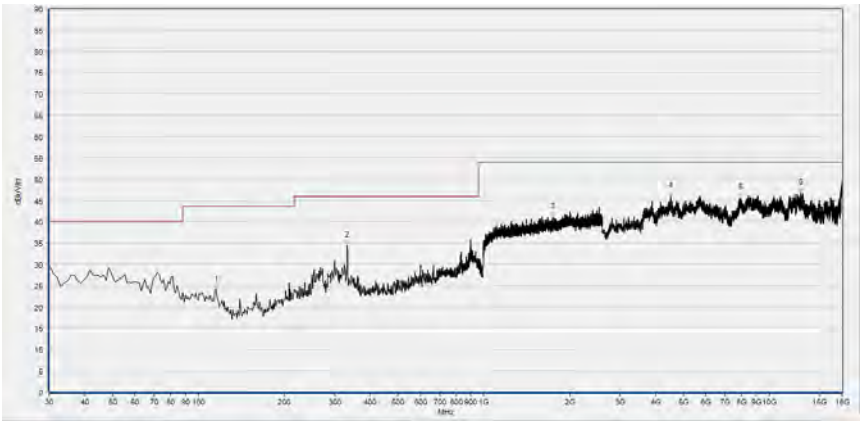
(Antenna Vertical, 30MHz to 18GHz)

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
209.450	30.28	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
499.480	31.48	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1912.000	43.10	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4731.360	44.72	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8455.080	46.27	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12625.400	46.79	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)

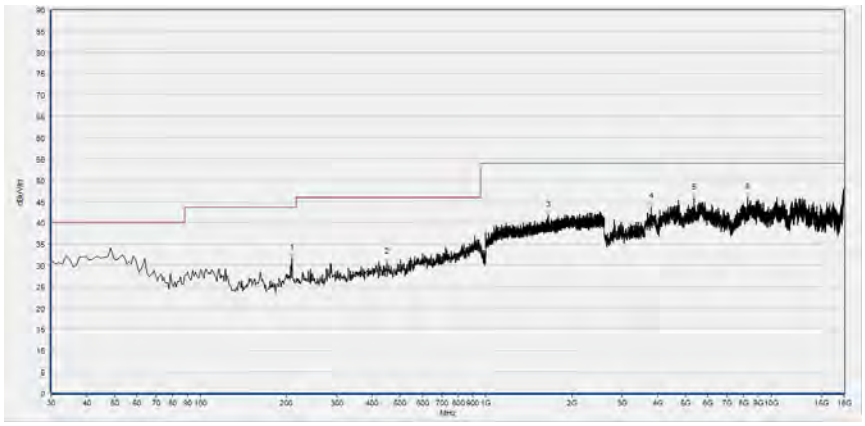


Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
115.360	23.96	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
332.640	34.31	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1740.800	41.07	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4503.440	46.00	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
7962.280	45.56	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12905.680	46.72	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

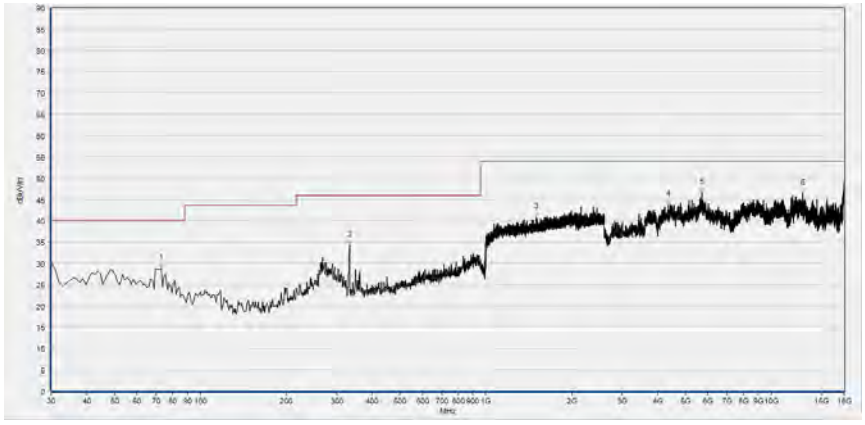
802.11n (HT20) Mode

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
209.450	31.68	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
450.010	30.60	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1653.333	41.73	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
3798.120	43.71	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5365.840	45.68	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8285.680	45.91	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

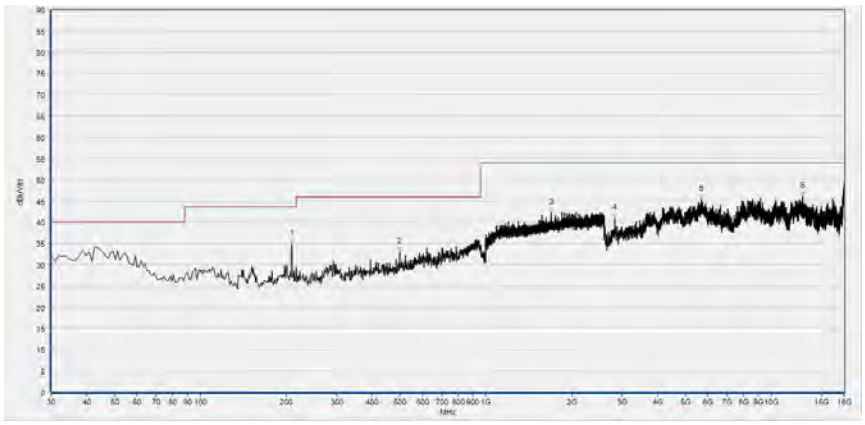
(Antenna Horizontal, 30MHz to 18GHz)



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
72.680	28.86	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
333.610	34.11	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1500.267	40.86	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4364.840	43.67	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5707.720	46.66	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12884.120	46.44	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

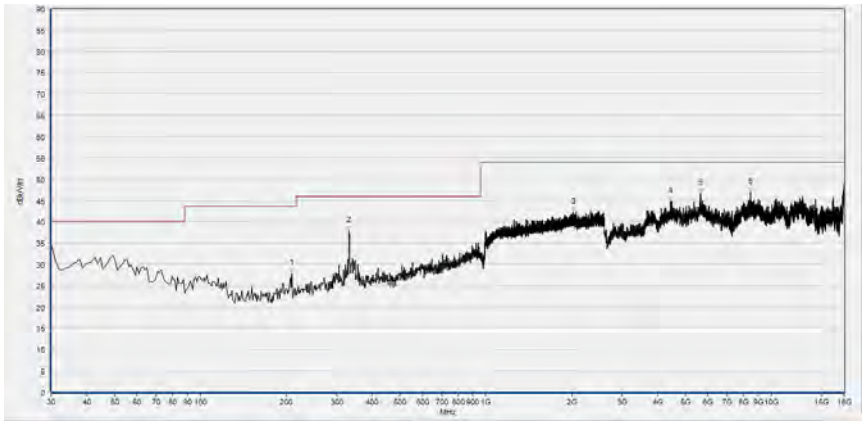
(Antenna Vertical, 30MHz to 18GHz)

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
209.450	34.94	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
499.480	33.01	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1693.867	42.20	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2834.080	40.84	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5689.240	45.45	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12905.680	46.11	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

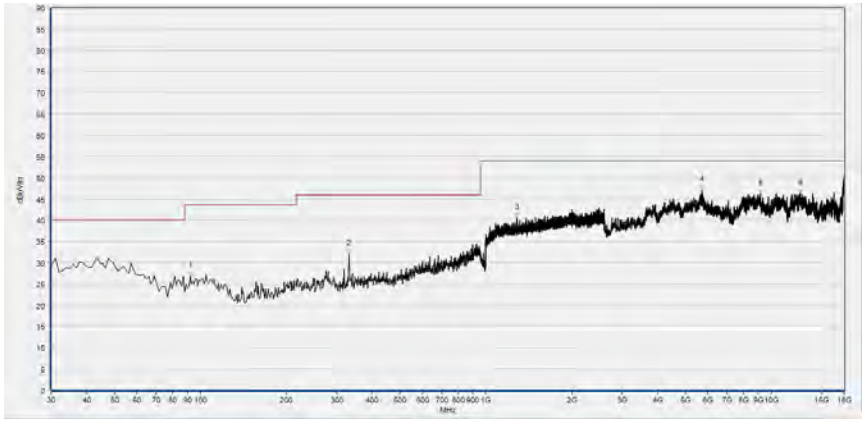
(Antenna Horizontal, 30MHz to 18GHz)



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
209.450	27.89	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
331.670	37.83	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2021.867	42.18	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4432.600	44.76	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5667.680	46.60	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8470.480	46.88	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

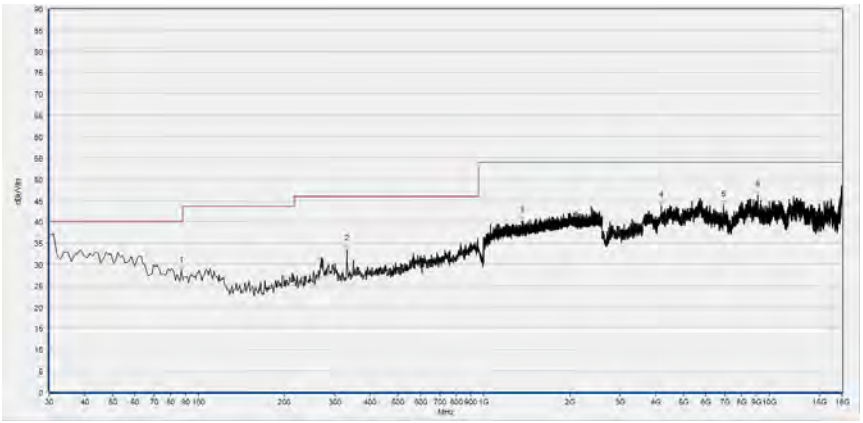
(Antenna Vertical, 30MHz to 18GHz)

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
92.080	26.78	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
332.640	31.96	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1282.133	40.58	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5716.960	47.13	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
9148.080	46.28	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12668.520	46.31	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 18GHz)

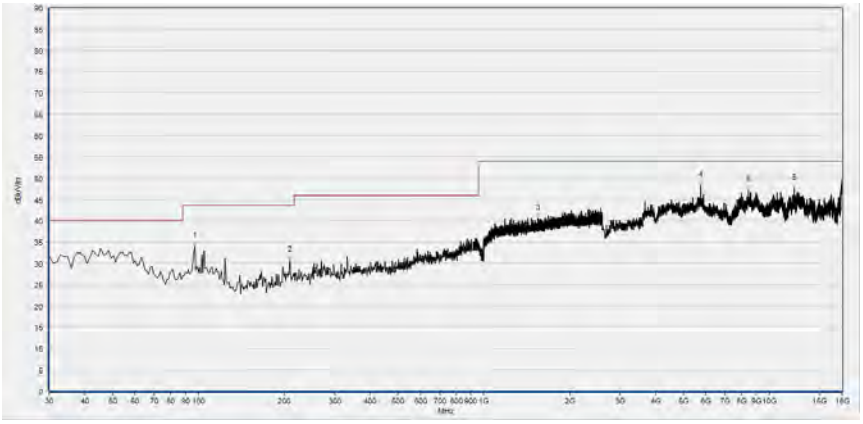


Fre. (MHz)	PK (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
87.230	28.50	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
331.670	33.57	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1364.800	40.28	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4183.120	43.73	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
6908.920	43.93	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
9135.760	46.18	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 18GHz)

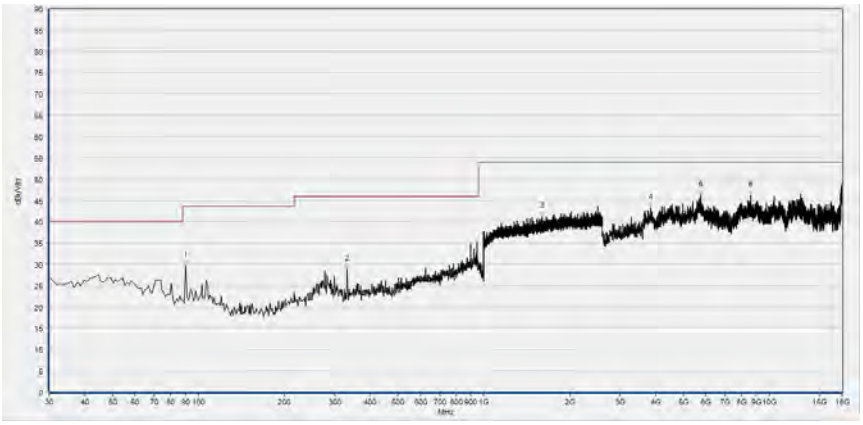
802.11n (HT40) Mode

Plot 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
96.930	33.97	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
209.450	30.70	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1544.533	40.49	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5753.920	48.26	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8448.920	47.10	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12206.520	47.56	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

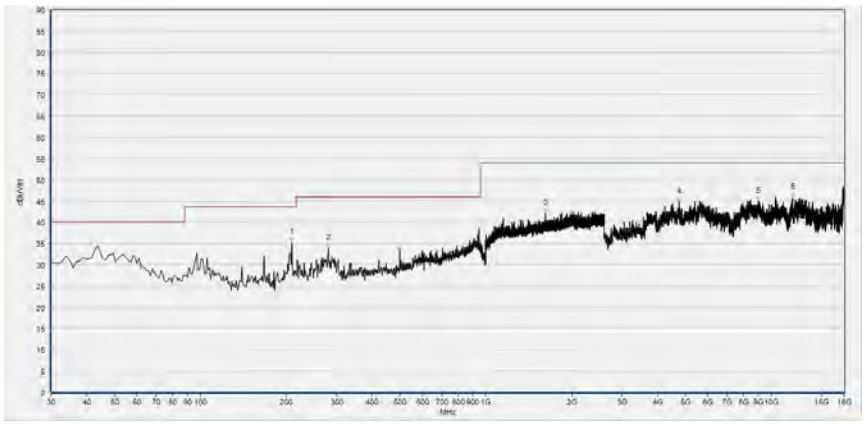
(Antenna Horizontal, 30MHz to 18GHz)



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
90.140	29.58	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
331.670	28.89	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1600.533	41.25	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
3844.320	43.17	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5750.840	46.20	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8602.920	46.30	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

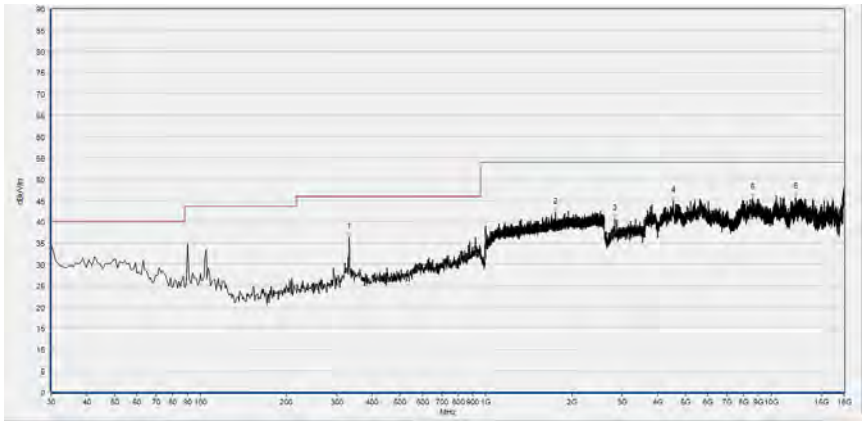
(Antenna Vertical, 30MHz to 18GHz)

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
209.450	35.18	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
281.230	33.90	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1614.933	42.10	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4762.160	44.73	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8994.080	44.84	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
11867.720	45.71	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

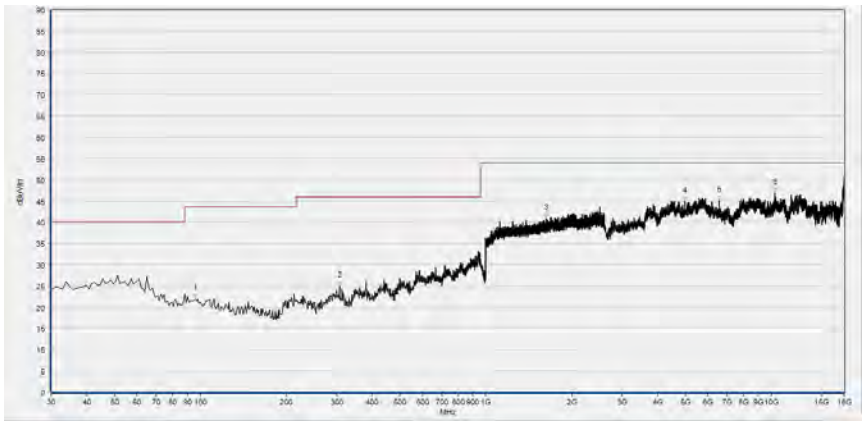
(Antenna Horizontal, 30MHz to 18GHz)



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
332.640	36.32	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1752.000	42.25	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2837.160	40.79	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4528.080	44.98	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8584.440	45.54	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12154.160	45.68	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

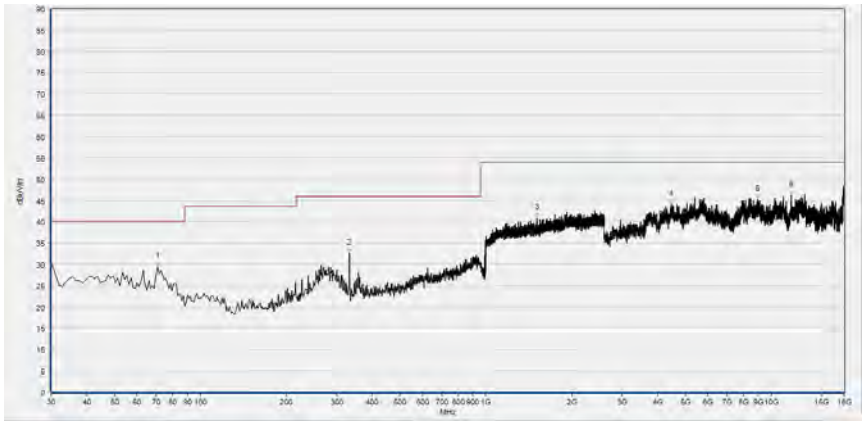
(Antenna Vertical, 30MHz to 18GHz)

Plot 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
95.960	22.02	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
307.420	24.89	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1624.533	40.87	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4983.920	44.85	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
6576.280	45.15	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
10293.840	46.86	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
70.740	29.47	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
332.640	32.57	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1512.000	40.86	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4463.400	44.01	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8944.800	45.29	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
11741.440	46.25	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	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	Due Date
Receiver	MY56400093	N9038A	KEYSIGHT	2020.03.26	2021.03.25
LISN	8127449	NSLK 8127	Schwarzbeck	2020.03.26	2021.03.25
Pulse Limiter (10dB)	VTSD 9561 F-B #206	VTSD 9561-F	Schwarzbeck	2020.07.24	2021.07.23
Coaxial cable(BNC) (30MHz-26GHz)	CB01	EMC01	Morlab	N/A	N/A
Adapter	NA	LYD1202000B	Guangdong Lianyunda Electronic Co., Ltd.	N/A	N/A
PC	OB68192JS	ThinkPad T430I	lenovo	N/A	N/A

4.3 List of Software Used

Description	Manufacturer	Software Version
Test system	Townsend	V2.5.77.0418
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	2020.07.21	2021.07.20
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2019.05.24	2022.05.23
Test Antenna - Loop	1519-022	FMZB1519	Schwarzbeck	2019.02.14	2022.02.13
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	2020.07.21	2021.07.20
18-26.5GHz pre-Amplifier	46732	S10M100L3802	Tonscend	2020.07.21	2021.07.20
26-40GHz pre-Amplifier	56774	S40M400L4002	Tonscend	2020.07.21	2021.07.20
Notch Filter	N/A	WRCG-2400-2483.5-60SS	Wainwright	2020.07.21	2021.07.20
Anechoic Chamber	N/A	9m*6m*6m	CRT	2020.01.06	2023.01.05

END OF REPORT