REPORT No. : SZ19080095W02

TEST REPORT

APPLICANT	:	Shenzhen Medica Technology Development Co., Ltd.
PRODUCT NAME	:	Sleep Traker
MODEL NAME	:	M800
BRAND NAME	:	N/A
FCC ID	:	2ADIOM800
STANDARD(S)	:	47 CFR Part 15 Subpart C
RECEIPT DATE	:	2019-08-12
TEST DATE	:	2019-09-01 to 2019-09-04
ISSUE DATE	:	2019-09-17

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MORLAB

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Change History		
Version	**Date**	**Reason for change**
1.0	2019-09-17	First edition

1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Shenzhen Medica Technology Development Co., Ltd.
Applicant Address:	2F Building A, Tongfang Information Harbor, No. 11, East Langshan Road, Nanshan District, Shenzhen, China 518057
Manufacturer:	Shenzhen Medica Technology Development Co., Ltd.
Manufacturer Address:	2F Building A, Tongfang Information Harbor, No. 11, East Langshan Road, Nanshan District, Shenzhen, China 518057

1.2. Equipment Under Test (EUT) Description

Product Name:	Sleep Traker	
Serial No:	(N/A, marked #1 by test site)	
Hardware Version:	V1.0	
Software Version:	V1.36	
Equipment type:	WLAN2.4G	
Modulation Type:	DSSS, OFDM	
Operating Frequency Range:	802.11b/g/ n(HT20): 2.412GHz - 2.472GHz 802.11 n(HT40): 2.422GHz - 2.462GHz	
Antenna Type:	PCB Antenna	
Antenna Gain:	2 dBi	
Accessory Information:	AC Adapter	
	Brand Name:	N/A
	Model No.:	SK01G-0500100U
	Serial No.:	(N/A, marked #1 by test site)
	Rated Output:	5V⎓1A
	Rated Input:	100-240V ～ 50/60Hz 0.2A

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

Note 2: 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-20MHz)	BPSK	**6.5**
	QPSK	13/19.5
	16QAM	26/39
	64QAM	52/58.5/65
OFDM (802.11 n (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	12	2467
	6	2437	**13**	**2472**
	7	**2442**		
Test Mode	**Channel**	**Frequency (MHz)**	**Channel**	**Frequency (MHz)**
n(HT40)	**3**	**2422**	8	2447
	4	2427	9	2452
	5	2432	10	2457
	6	2437	**11**	**2462**
	7	**2442**		

Note1: The Lowest Channel (1), Middle Channel (7) and Highest Channel (13) was selected test for 802.11b/g/n(HT20) mode;

Note2: The Lowest Channel (3), Middle Channel (7) and Highest Channel (11) was selected test for n(HT40) mode;

1.5. Test Standards and Results

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

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

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

No.	Section	Description	Test Date	Test Engineer	Result	Method determination /Remark
1	15.203	Antenna Requirement	N/A	N/A	PASS	No deviation
2	N/A	Duty Cycle Of Test Signal	Sep 04, 2019	Ouyang Feng	PASS	No deviation
3	15.247(b)	Maximum Peak and Average Conducted Output Power	Sep 04, 2019	Ouyang Feng	PASS	No deviation
4	15.247(a)	Bandwidth	Sep 04, 2019	Ouyang Feng	PASS	No deviation
5	15.247(d)	Conducted Spurious Emission and Band Edge	Sep 04, 2019	Ouyang Feng	PASS	No deviation
6	15.247(e)	Power spectral density (PSD)	Sep 04, 2019	Ouyang Feng	PASS	No deviation
7	15.207	Conducted Emission	Aug 25, 2019	Lin Jiayong	PASS	No deviation
8	15.247(d)	Restricted Frequency Bands	Sep 04, 2019	Li Zihao	PASS	No deviation
9	15.209, 15.247(d)	Radiated Emission	Aug 31, 2019	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 KDB594280 D01 v02r01.

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 20dB contains two parts that cable loss 2dB and Attenuator 10dB.

Note 3: Additions to, deviation, or exclusions from the method should be judged in the "method determination" column of add, deviate or exclude from the specific method should be explained in the "Remark" of the above table.

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. Result: Compliant

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

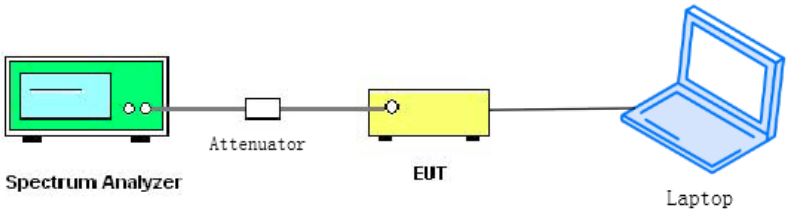
2.2. Duty Cycle Of Test Signal

2.2.1. Requirement

Preferably, all measurements of maximum conducted (average) output power will be performed with 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

A. Test Set:



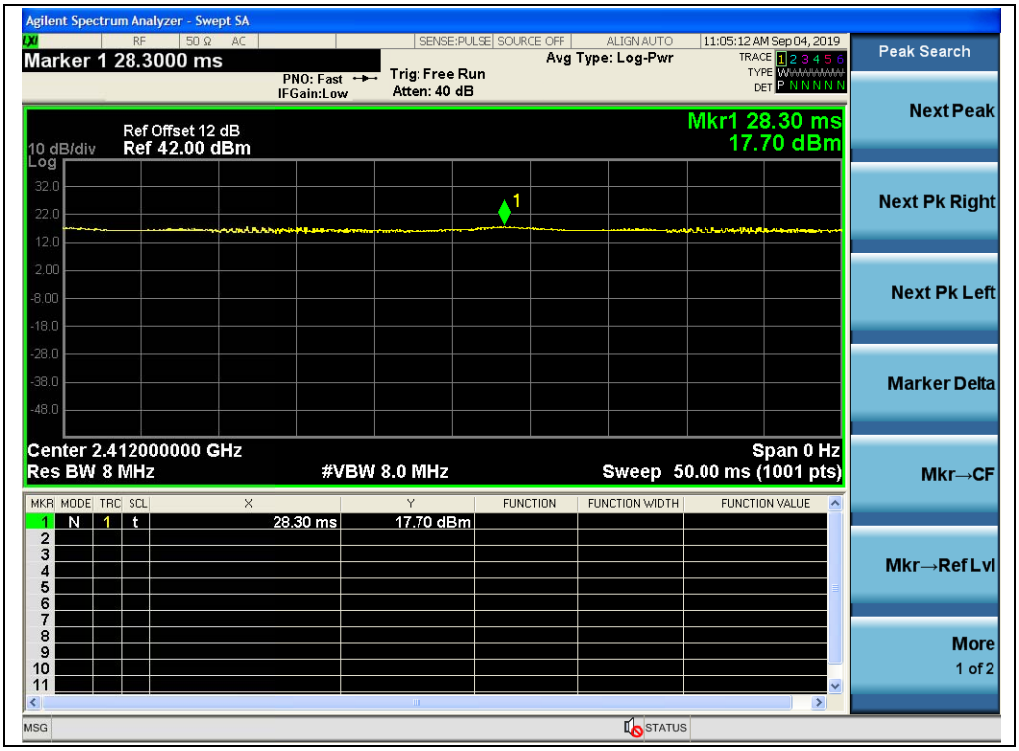
ANSI C63.10 2013 Clause 11.6 was used in order to prove compliance.

2.2.3. Test Result

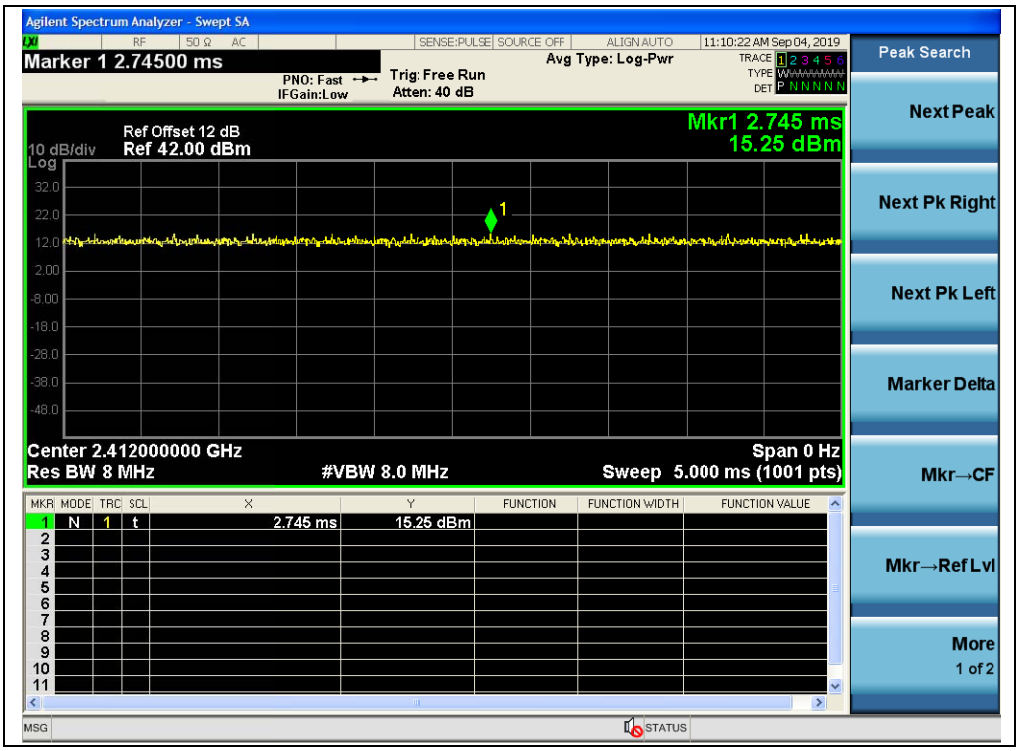
A. Test Verdict:

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

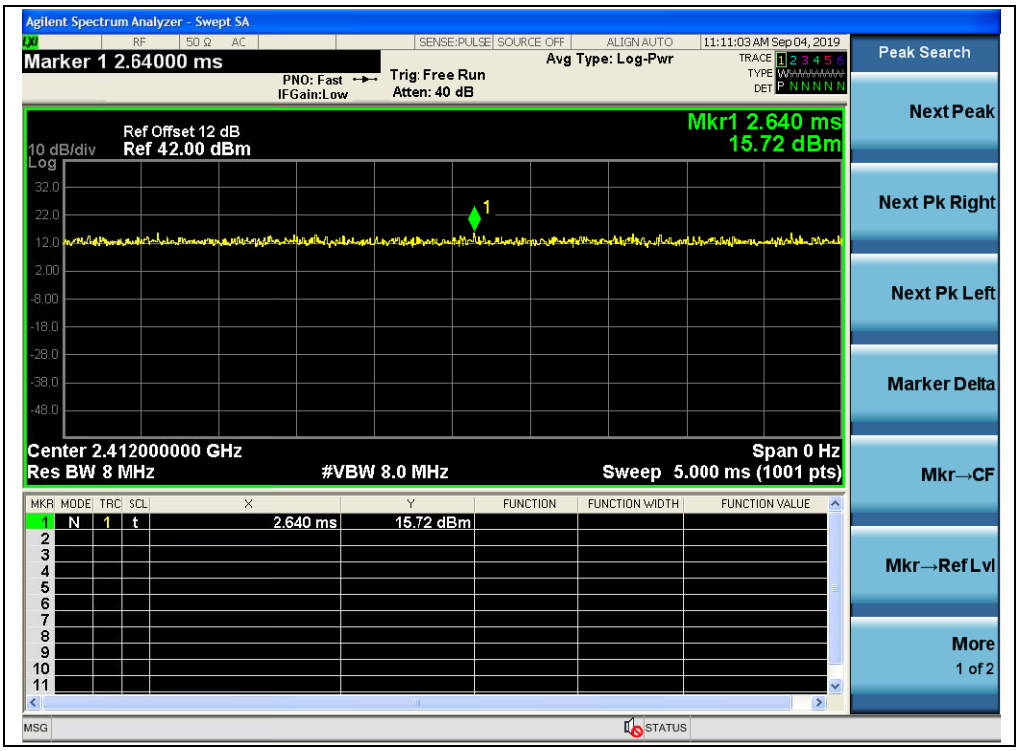
B. Test Plots



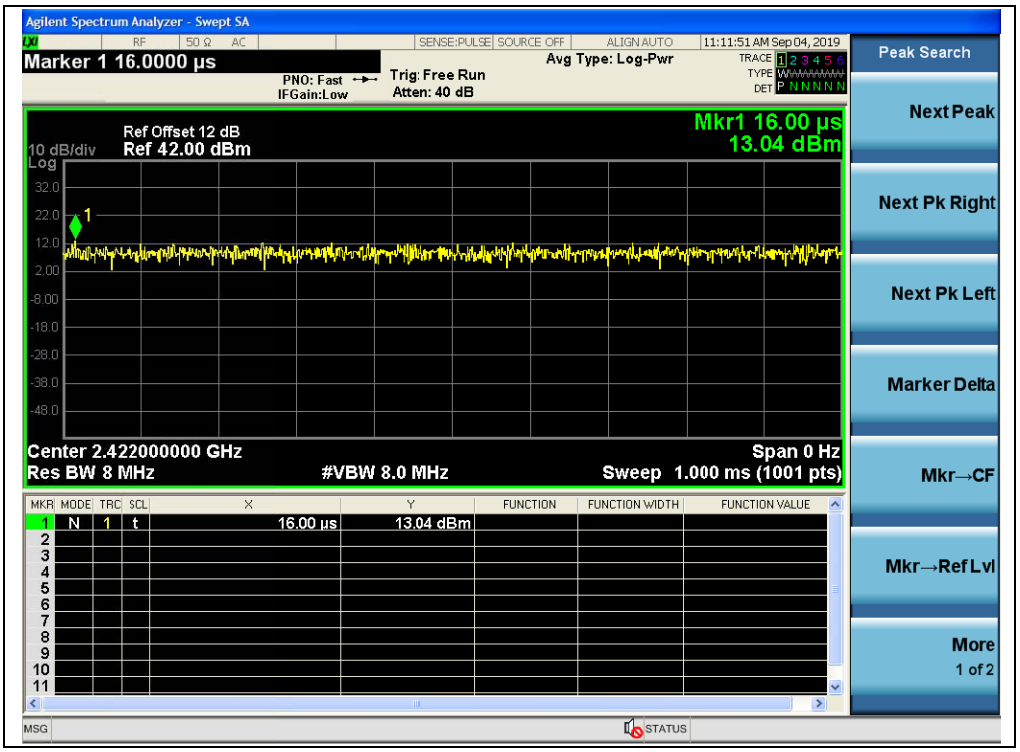
(Channel 1, 2412MHz, 802.11b)



(Channel 1, 2412MHz, 802.11g)



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



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

2.3. Maximum Peak and Average Conducted Output Power

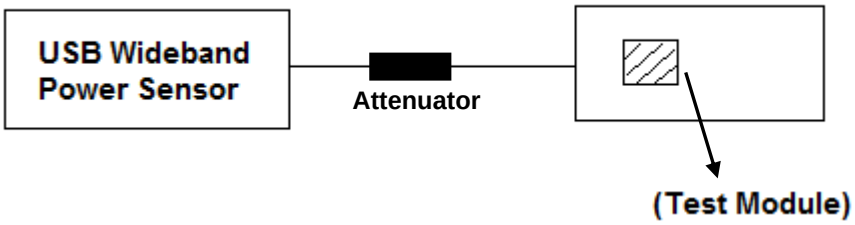
2.3.1. Requirement

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.

A. 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	14.69	0.029	30	1	PASS
7	2442	12.99	0.020			PASS
13	2472	13.02	0.020			PASS

802.11g Test mode

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
1	2412	**15.06**	**0.032**	30	1	PASS
7	2442	13.47	0.022			PASS
13	2472	13.48	0.022			PASS

802.11n(HT20) Test mode

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
1	2412	15.04	0.032	30	1	PASS
7	2442	14.04	0.025			PASS
13	2472	13.68	0.023			PASS

802.11n(HT40) Test mode

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
3	2422	13.77	0.024	30	1	PASS
7	2442	13.14	0.021			PASS
11	2462	12.73	0.019			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	11.78	0.00	**11.78**	**0.015**	30	1	PASS
7	2442	10.49		10.49	0.011			PASS
13	2472	10.58		10.58	0.011			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	10.34	0.00	10.34	0.011	30	1	PASS
7	2442	9.48		9.48	0.009			PASS
13	2472	8.71		8.71	0.007			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	10.20	0.00	10.20	0.010	30	1	PASS
7	2442	9.05		9.05	0.008			PASS
13	2472	8.60		8.60	0.007			PASS

802.11n(HT40) Test mode

Channel	Frequency (MHz)	Average Power				Limit		Verdict
		Measured	Duty Factor	Duty factor Calculated				
		dBm		dBm	W	dBm	W	
1	2412	10.01	0.00	10.01	0.010	30	1	PASS
7	2442	9.18		9.18	0.008			PASS
13	2472	8.56		8.56	0.007			PASS

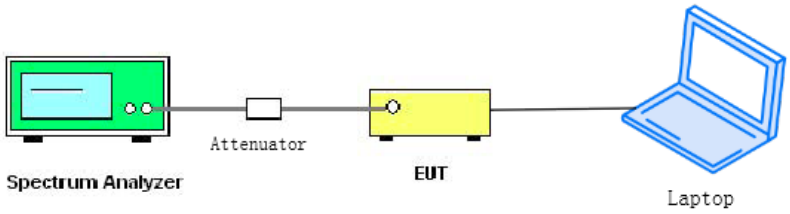
2.4. Bandwidth

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

A. Test Set:



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.

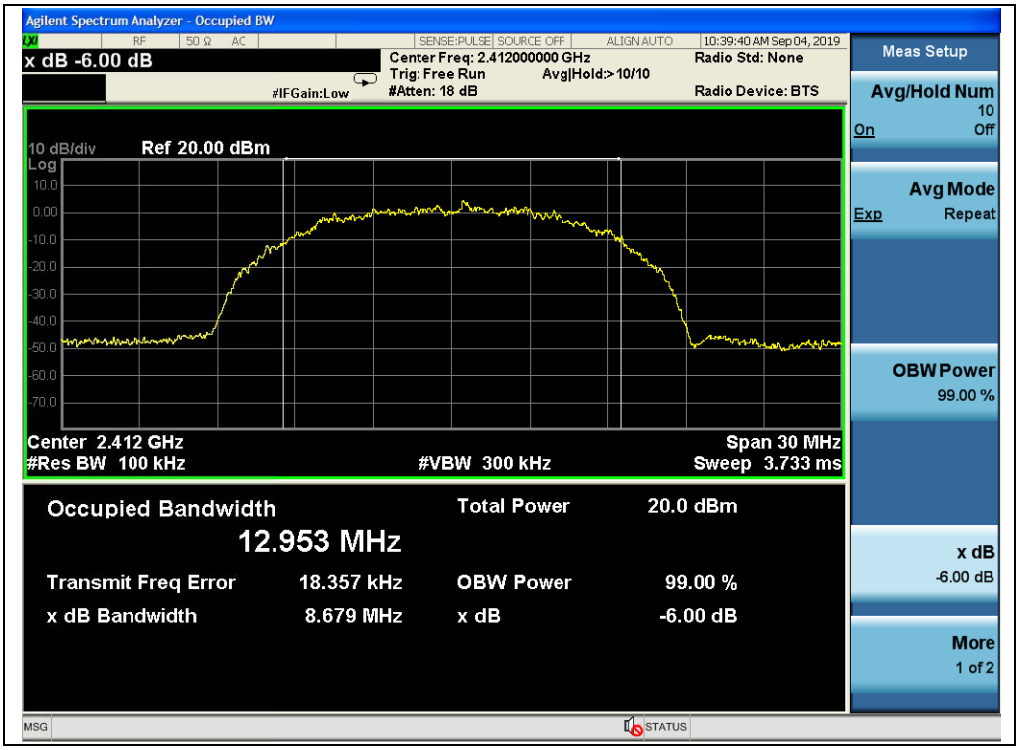
2.4.4. Test Result

802.11b Test mode

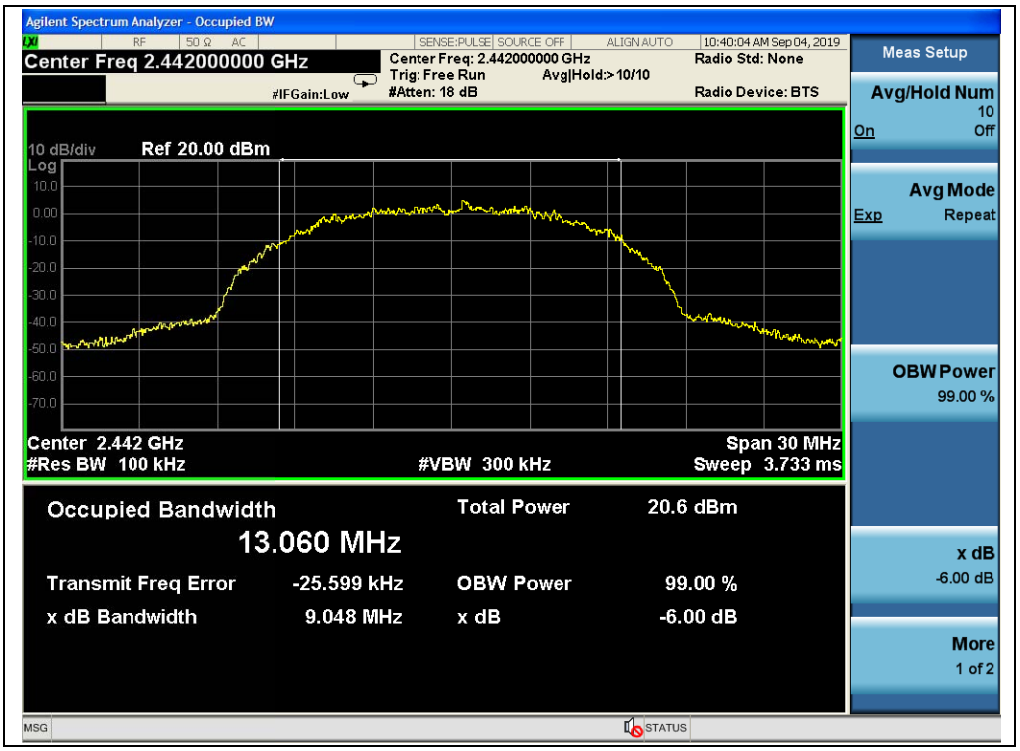
A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits(kHz)	Result
1	2412	8.68	≥500	PASS
7	2442	9.05	≥500	PASS
13	2472	9.13	≥500	PASS

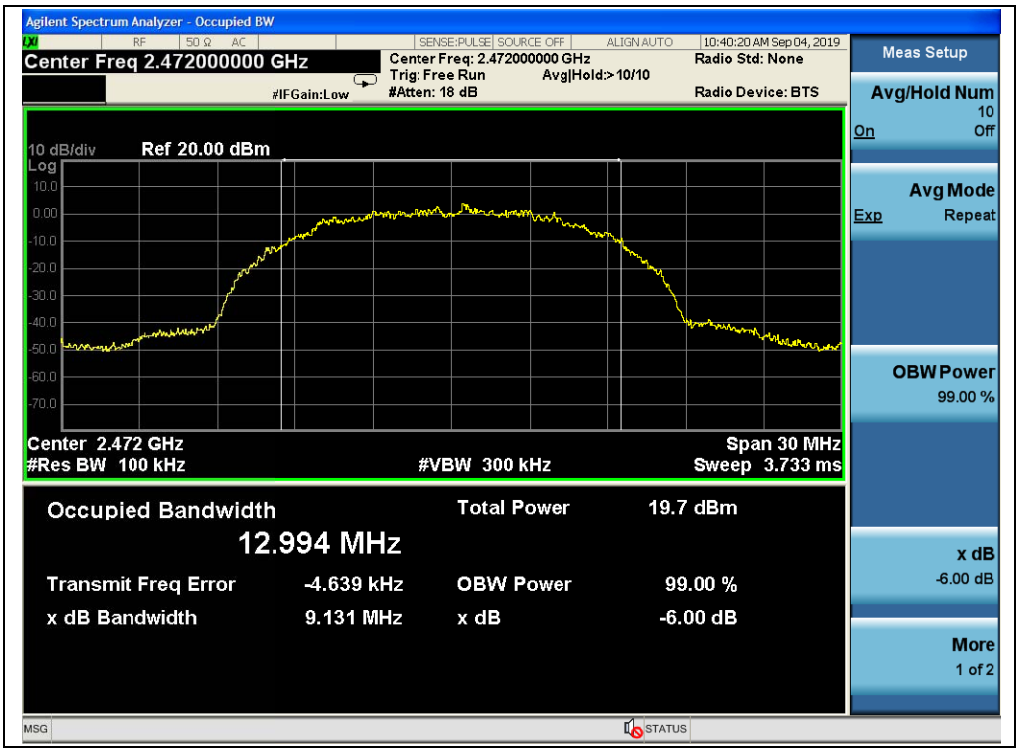
B. Test Plots



(Channel 1, 2412MHz, 802.11b)



(Channel 7, 2442 MHz, 802.11b)



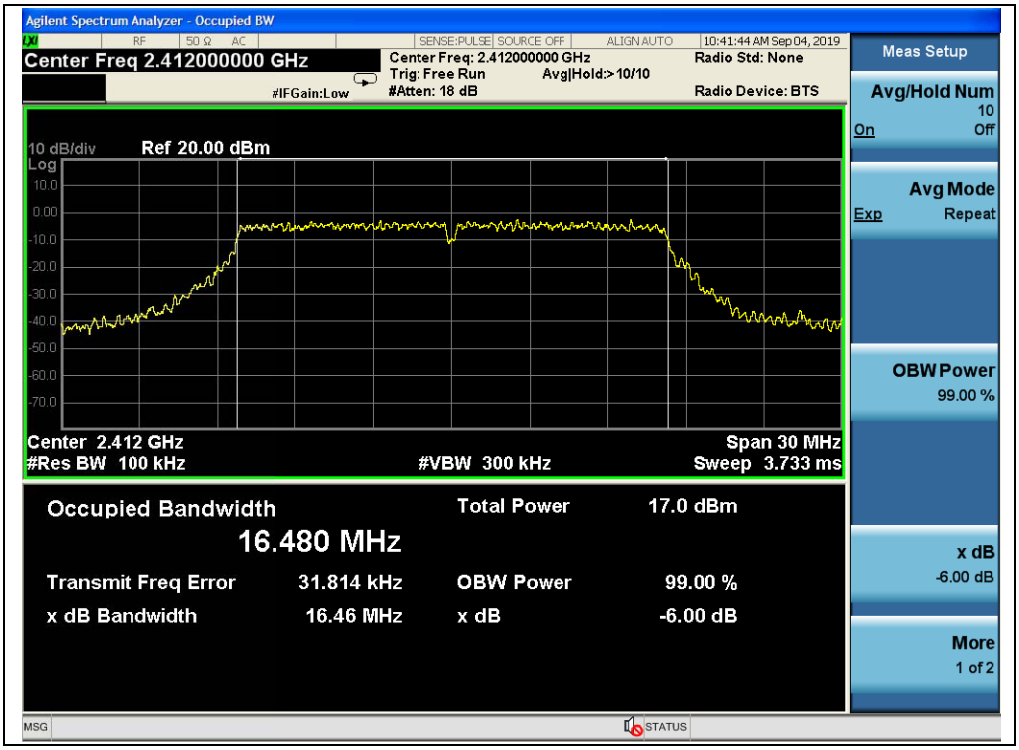
(Channel 13, 2472MHz, 802.11b)

802.11g Test mode

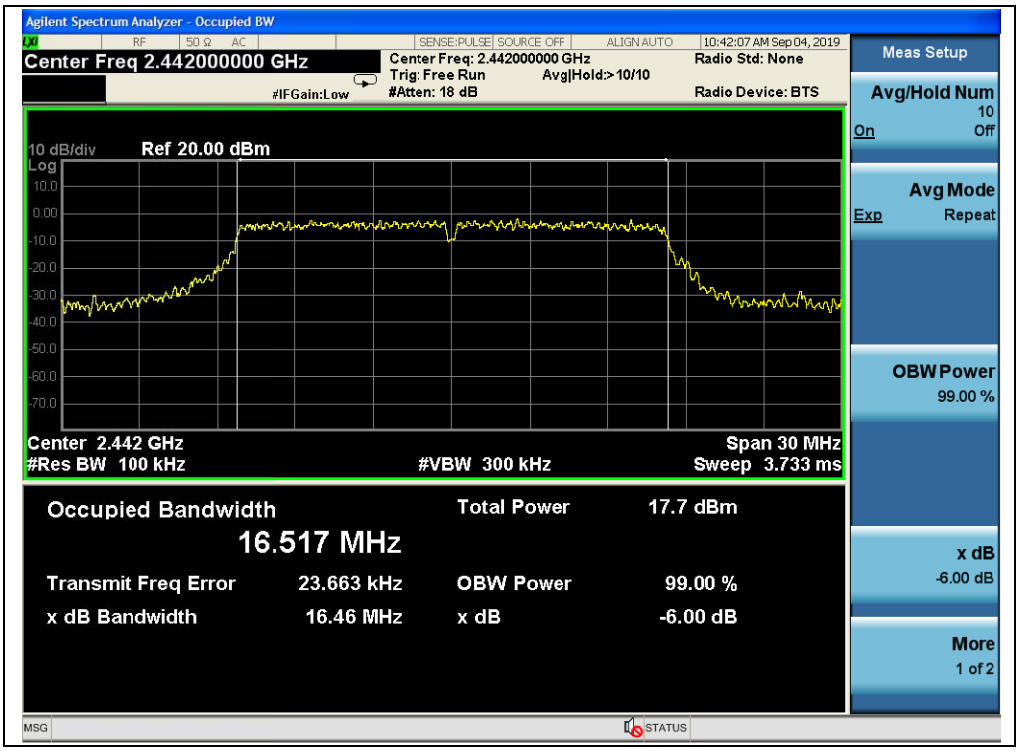
A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits (kHz)	Result
1	2412	16.46	≥500	PASS
7	2442	16.46	≥500	PASS
13	2472	16.45	≥500	PASS

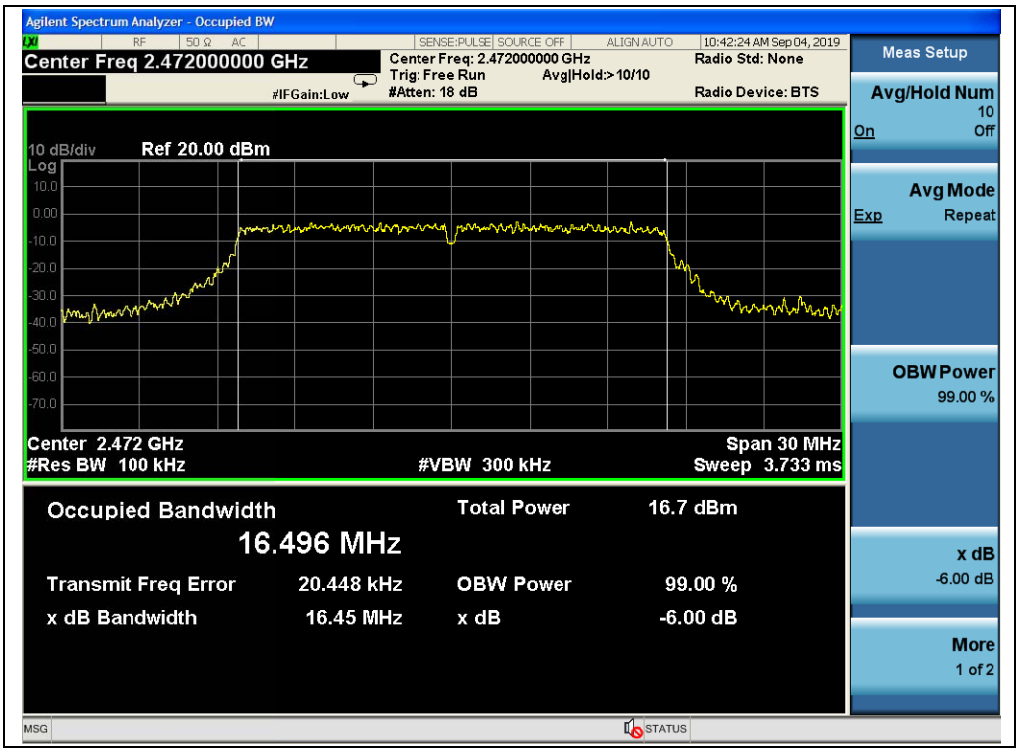
B. Test Plots:



(Channel 1, 2412MHz, 802.11g)



(Channel 7, 2442MHz, 802.11g)



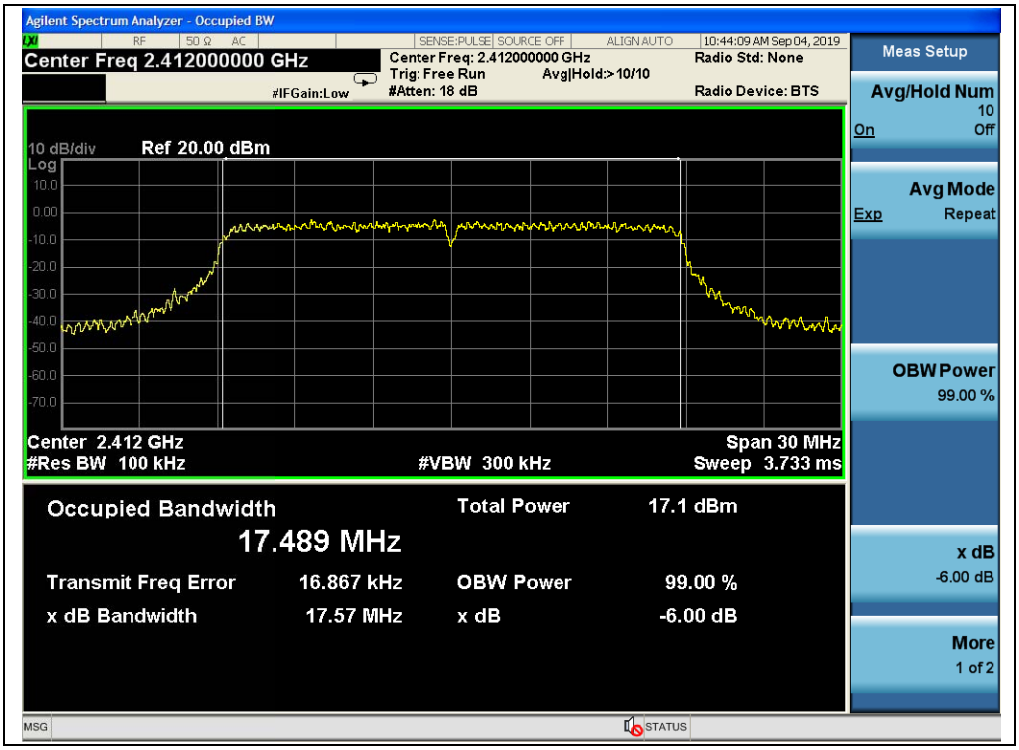
(Channel 13, 2472MHz, 802.11g)

802.11n (HT20) Test mode

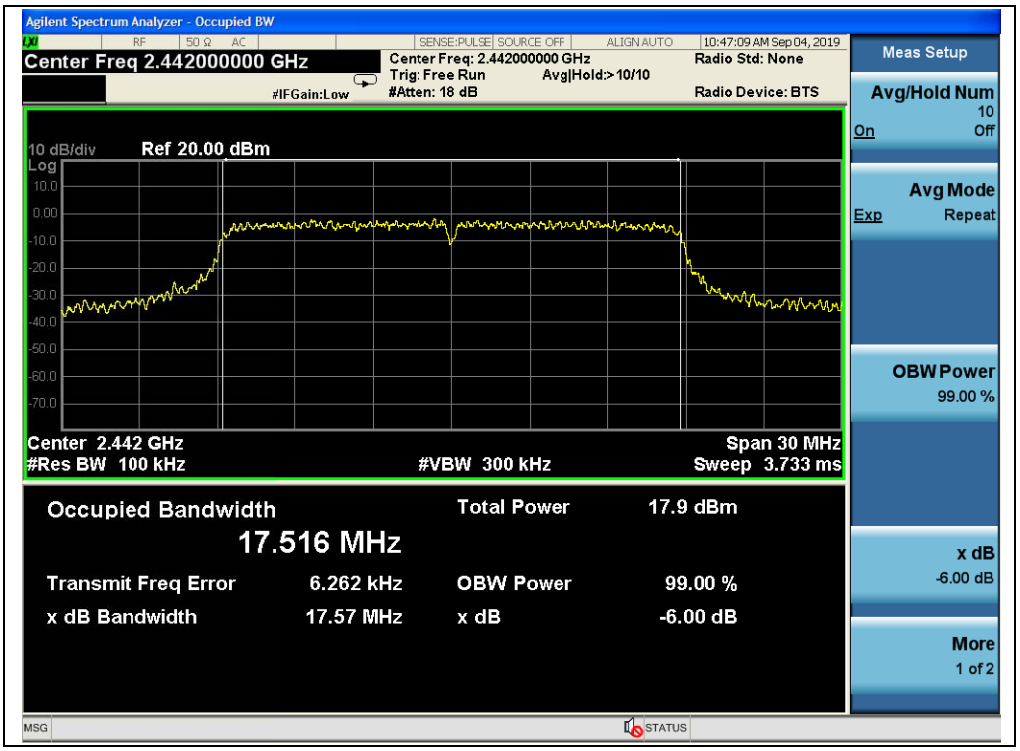
A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits (kHz)	Result
1	2412	17.57	≥500	PASS
7	2442	17.57	≥500	PASS
13	2472	17.59	≥500	PASS

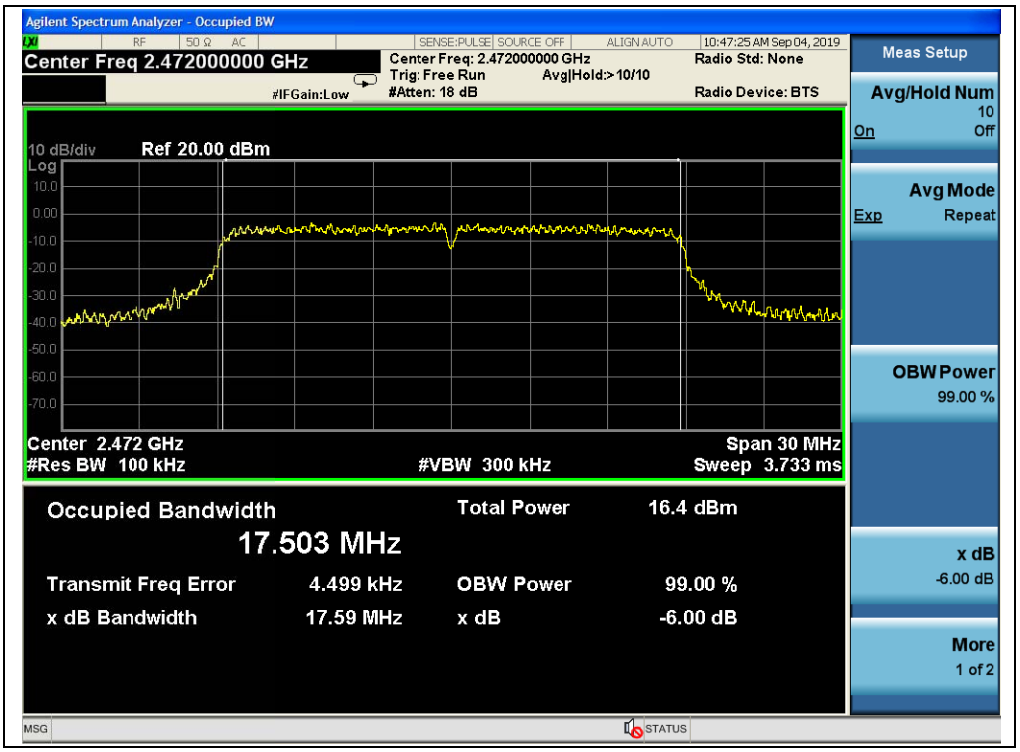
B. Test Plots:



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



(Channel 7, 2442MHz, 802.11n(HT20))



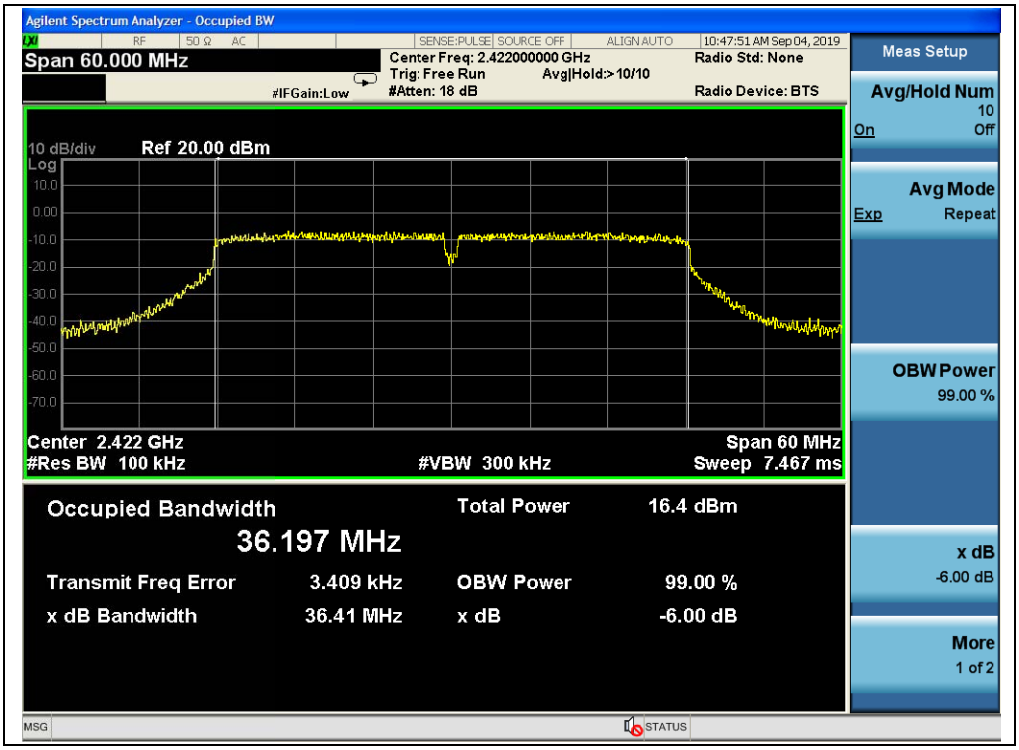
(Channel 13, 2472MHz, 802.11n(HT20))

802.11n (HT40) Test mode

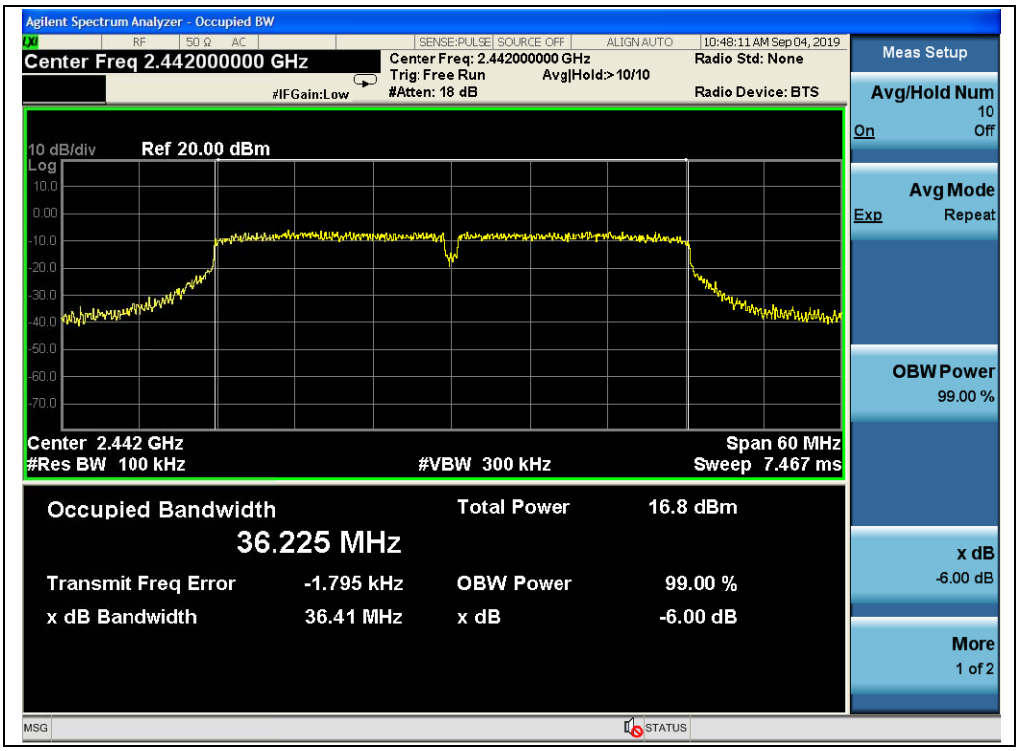
A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits (kHz)	Result
3	2422	36.41	≥500	PASS
7	2442	36.41	≥500	PASS
11	2462	36.41	≥500	PASS

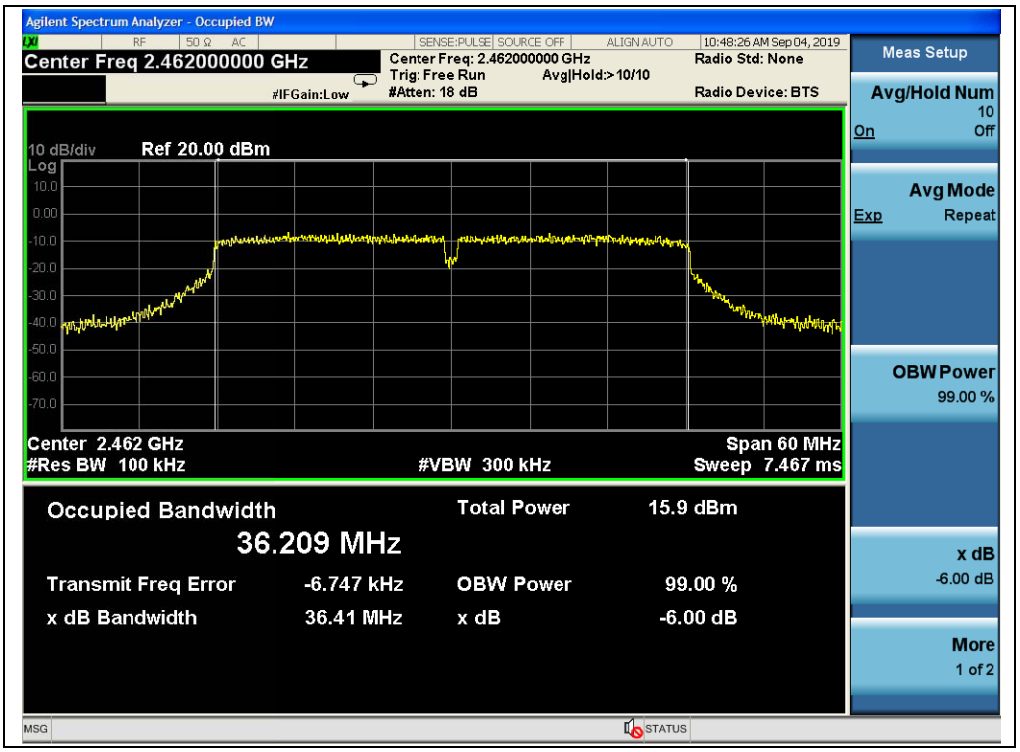
B. Test Plots:



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



(Channel 7, 2442MHz, 802.11n(HT40))



(Channel 11, 2462MHz, 802.11n(HT40))

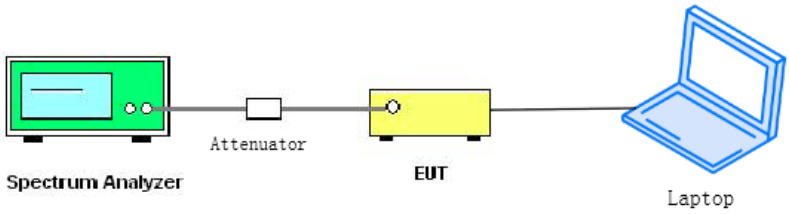
2.5. Conducted Spurious Emissions and Band Edge

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

A. Test Set:



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.

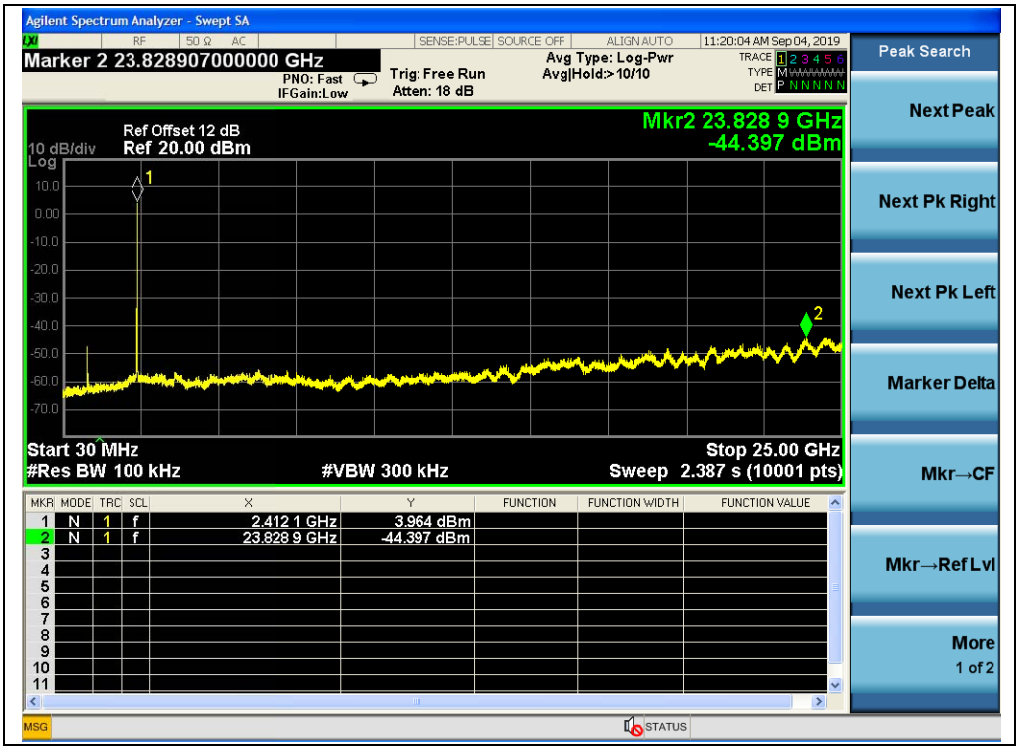
2.5.4. Test Result

802.11b Test mode

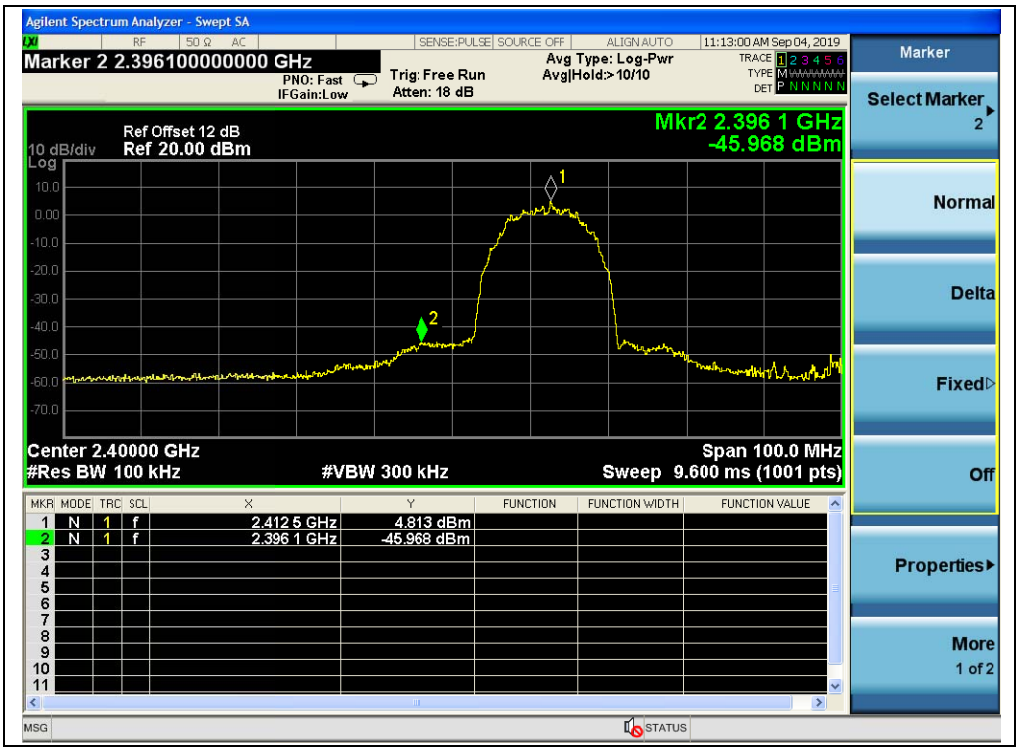
A. Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-44.40	3.96	-16.04	PASS
7	2442	-44.21	4.13	-15.87	PASS
13	2472	-45.86	3.09	-16.91	PASS

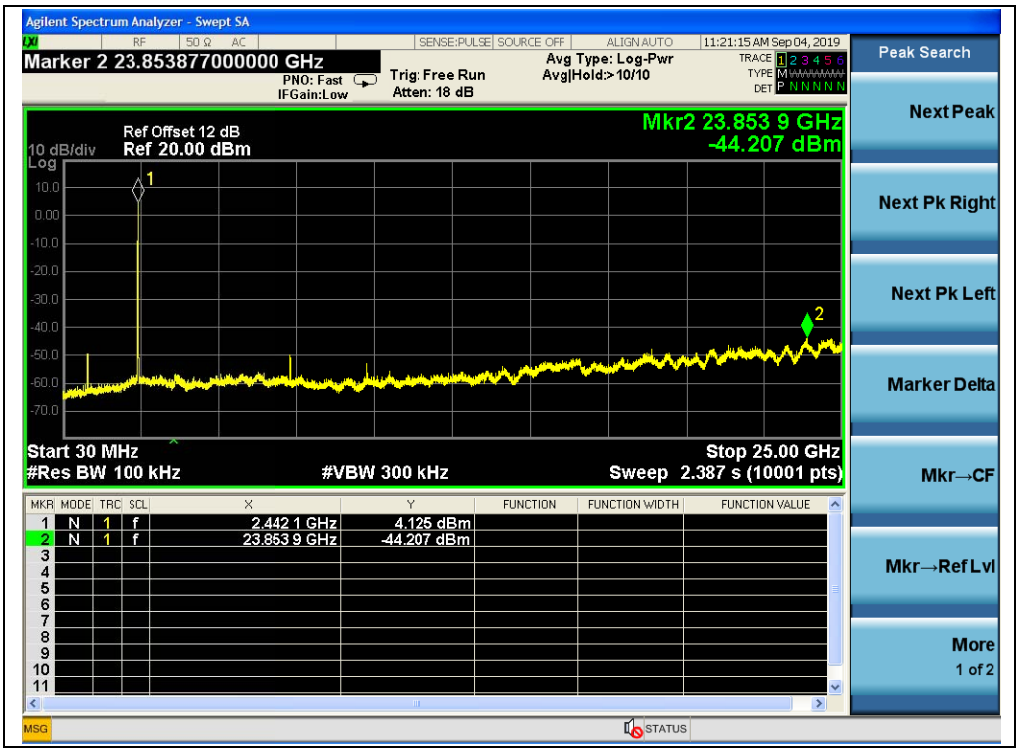
B. Test Plots:



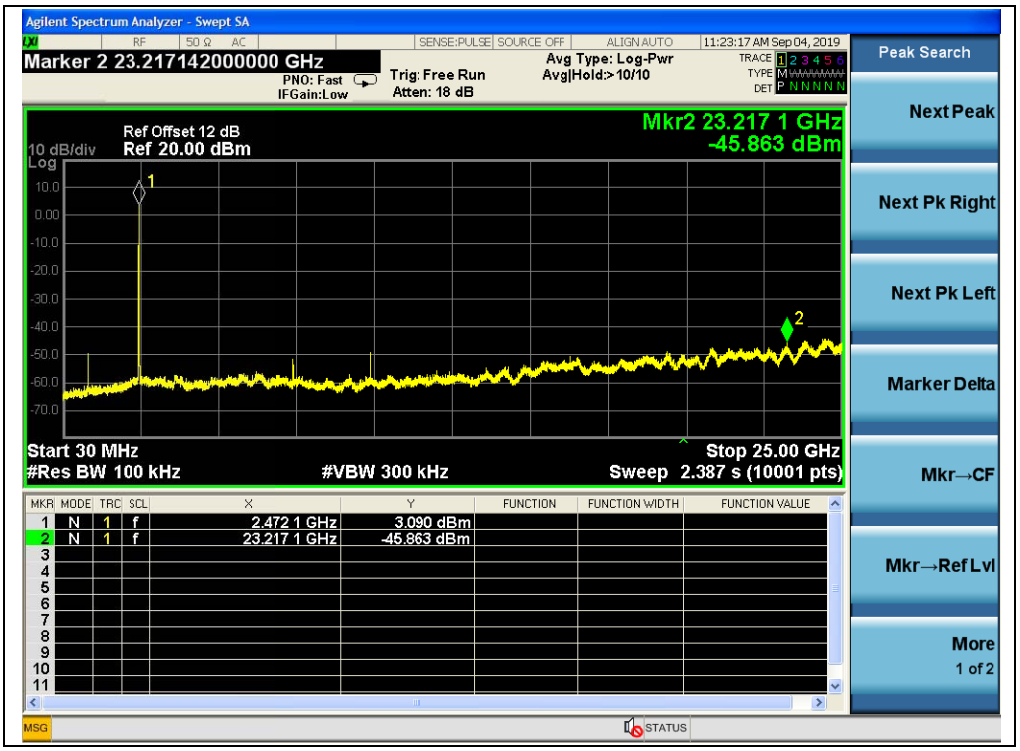
(Channel = 1, 30MHz to 25GHz)



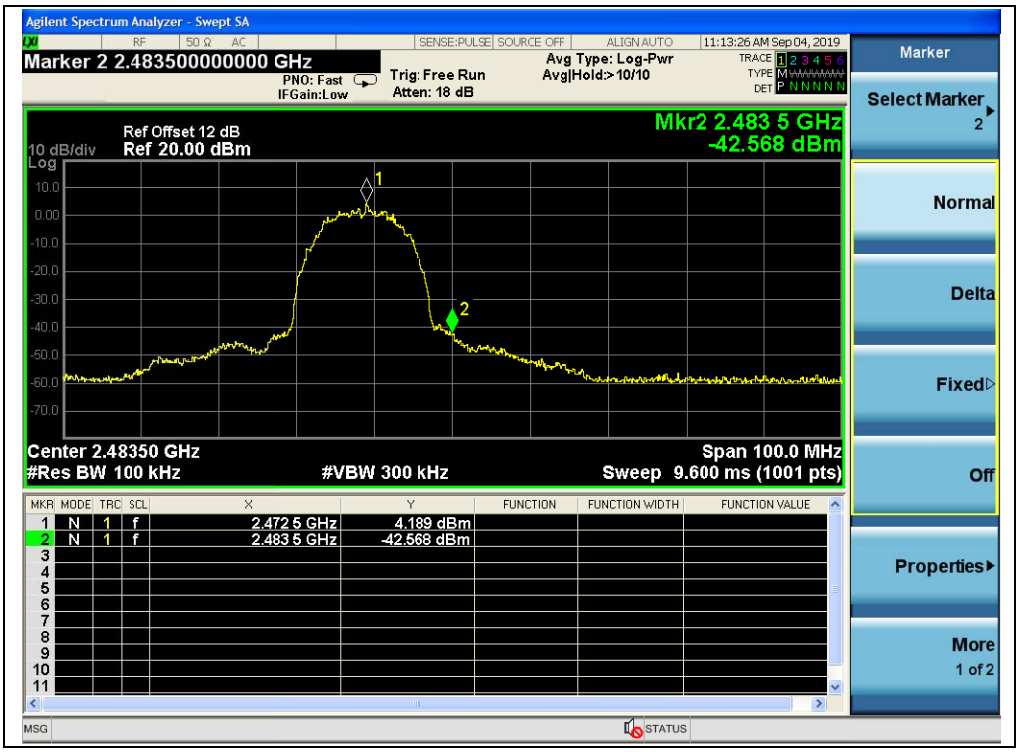
(Band Edge, Channel = 1)



(Channel = 7, 30MHz to 25GHz)



(Channel = 13, 30MHz to 25GHz)



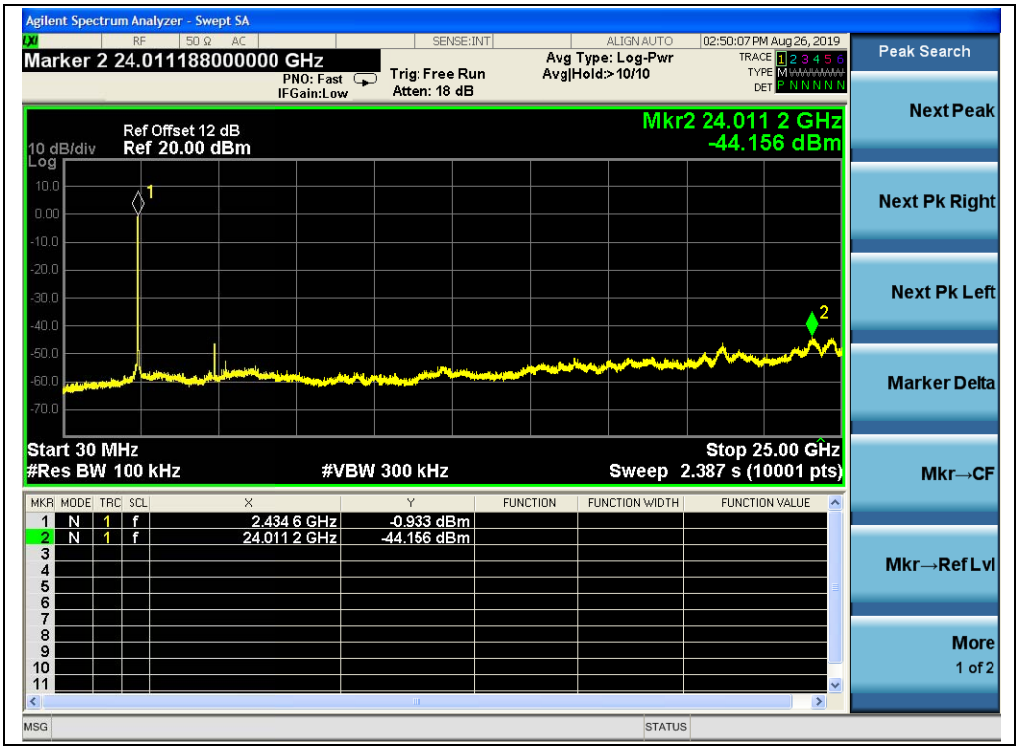
(Band Edge, Channel = 13)

802.11g Test mode

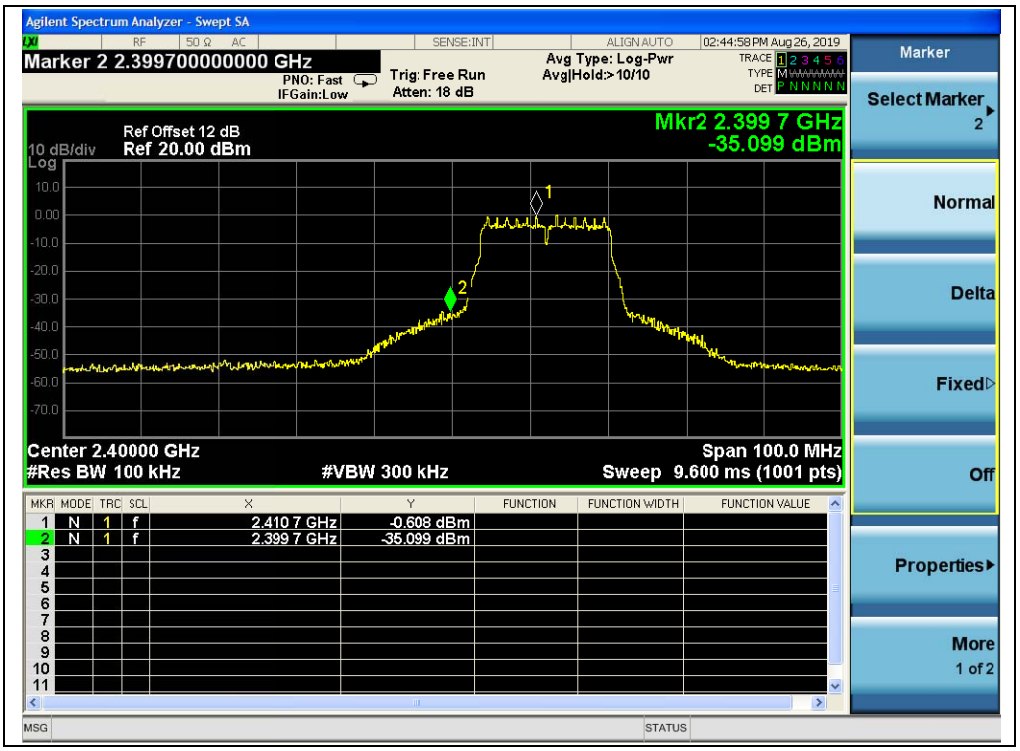
A. Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-44.16	-0.93	-20.93	PASS
7	2442	-44.35	-0.81	-20.81	PASS
13	2472	-43.76	-0.41	-20.41	PASS

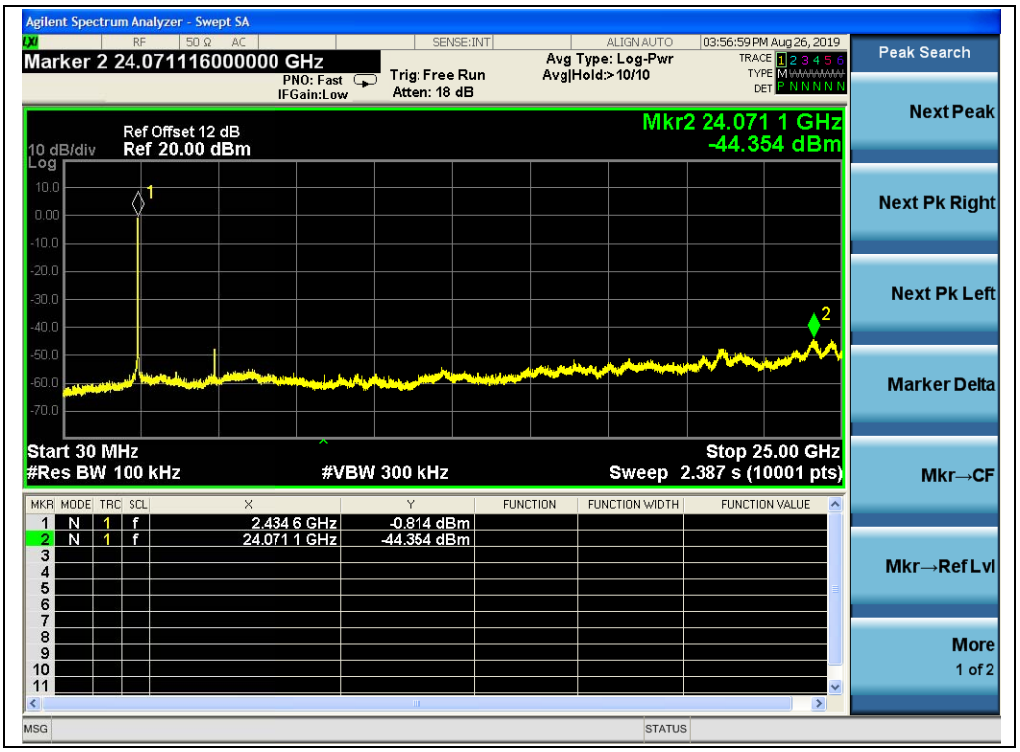
B. Test Plots:



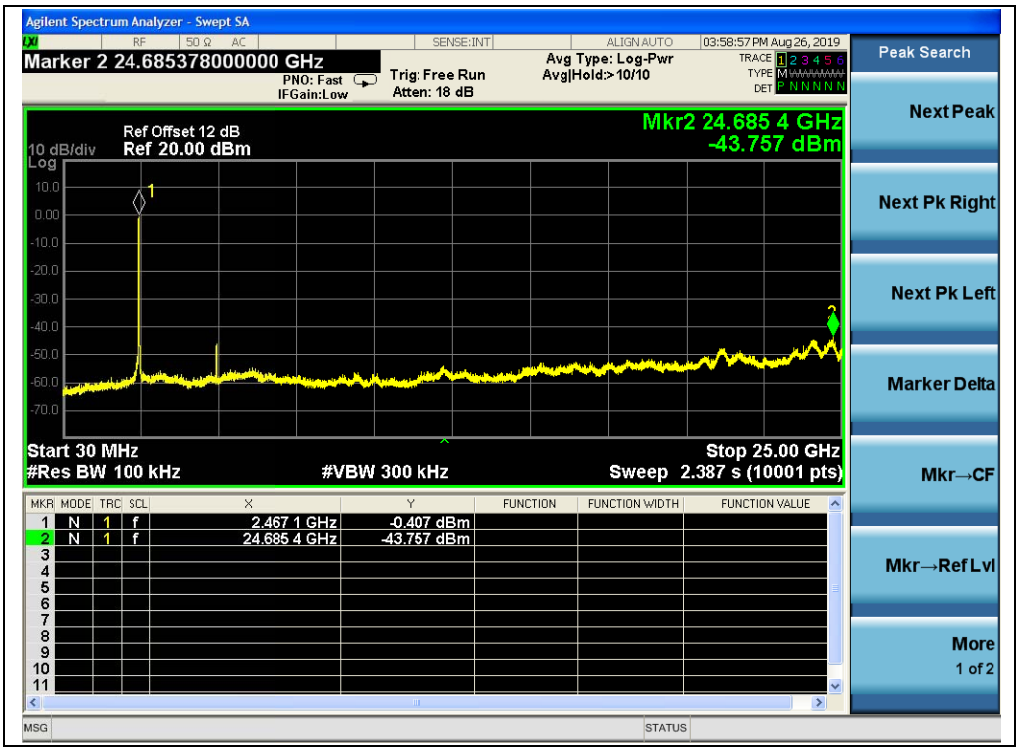
(Channel = 1, 30MHz to 25GHz)



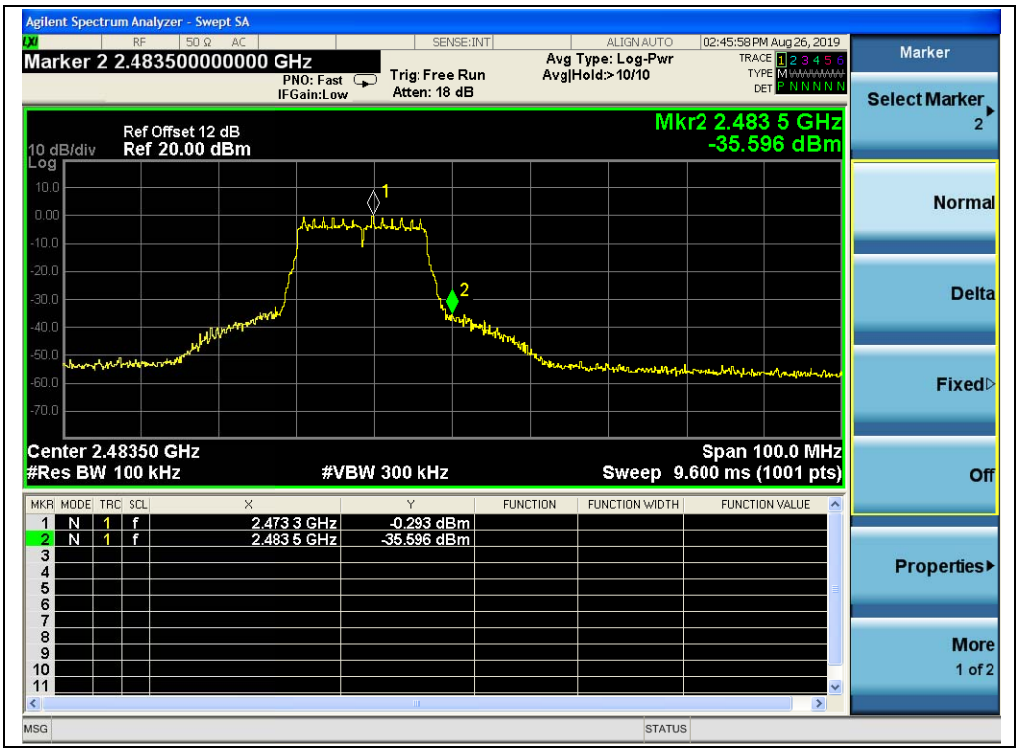
(Band Edge, Channel = 1)



(Channel = 7, 30MHz to 25GHz)



(Channel = 13, 30MHz to 25GHz)



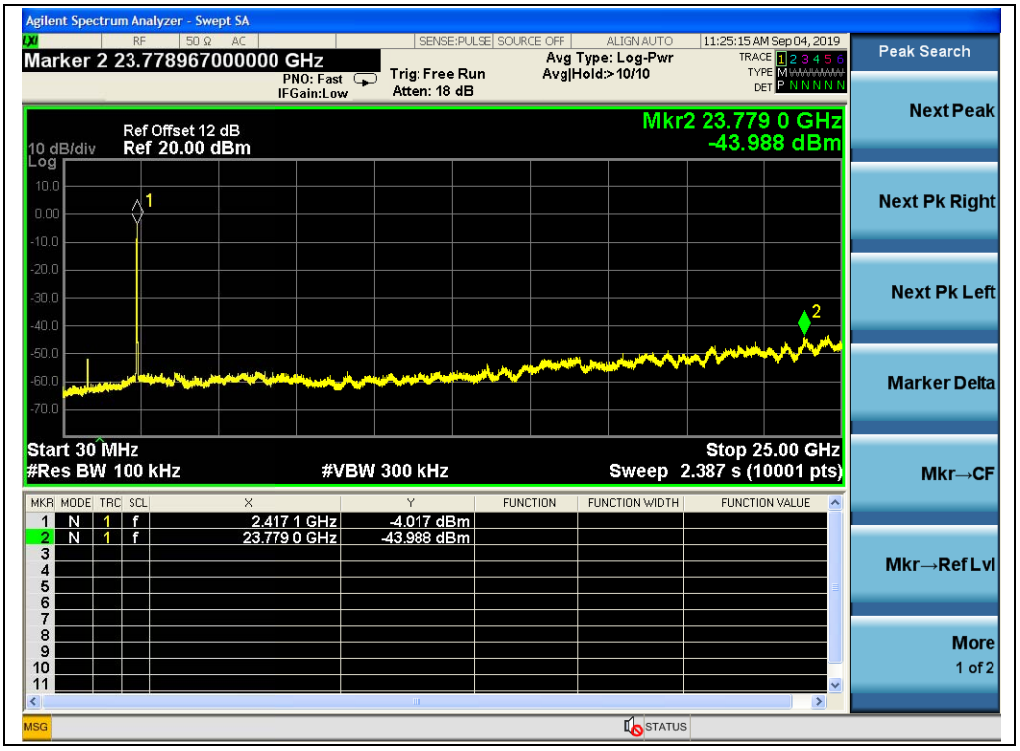
(Band Edge, Channel = 13)

802.11n (HT20) Test mode

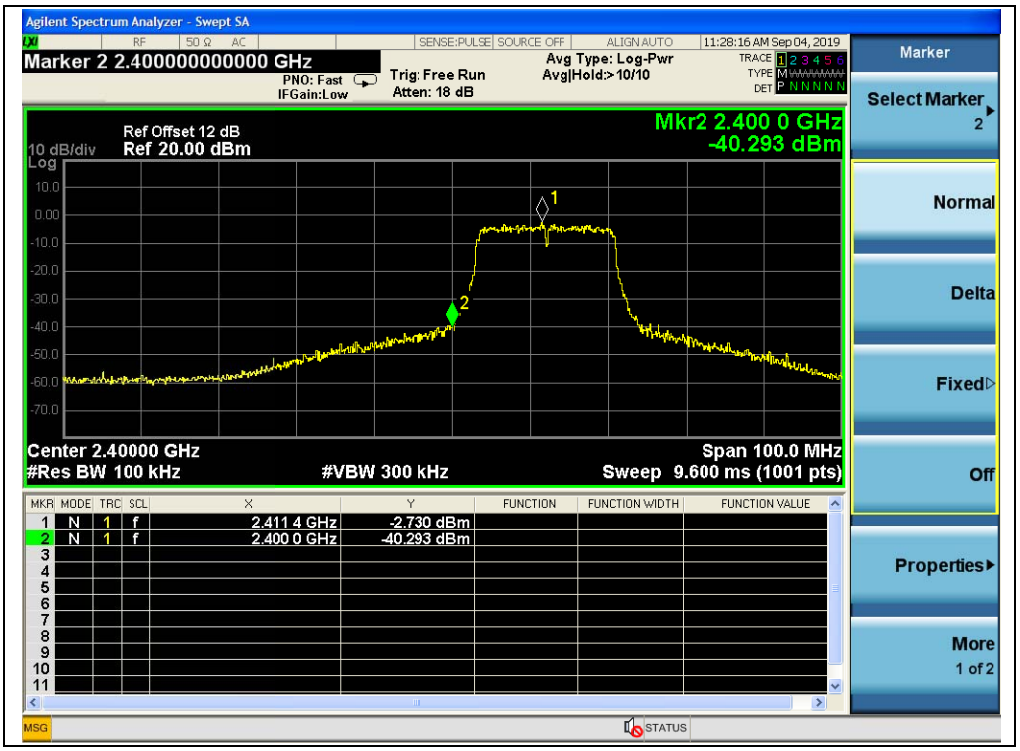
A. Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-43.99	-4.02	-24.02	PASS
7	2442	-44.09	-3.56	-23.56	PASS
13	2472	-43.89	-4.28	-24.28	PASS

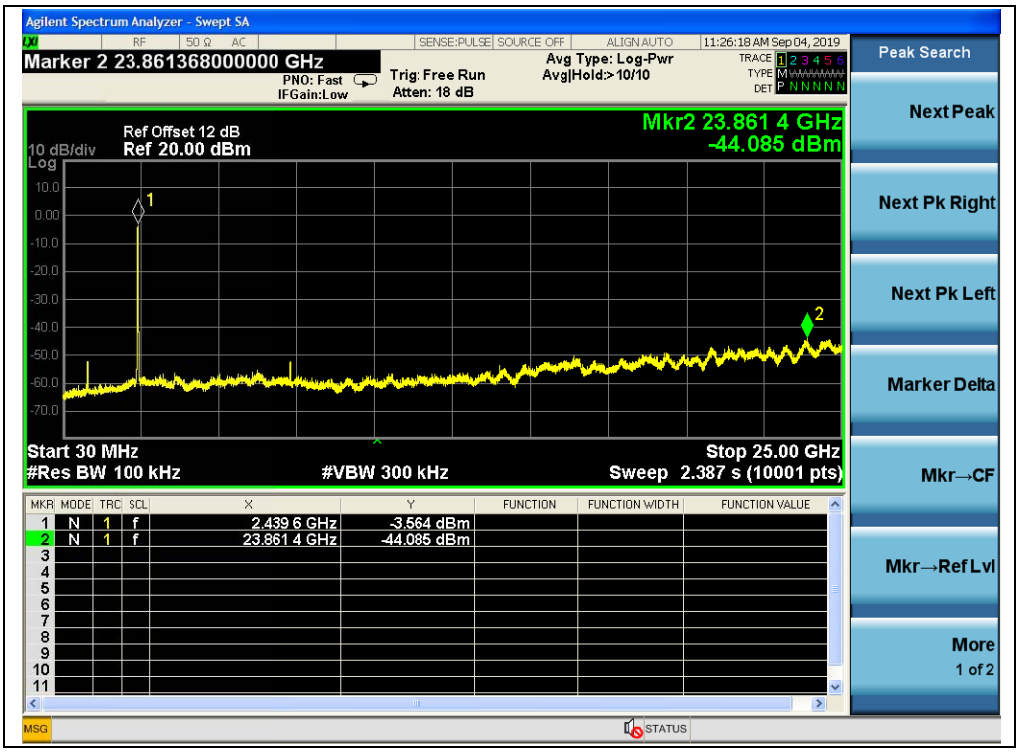
B. Test Plots:



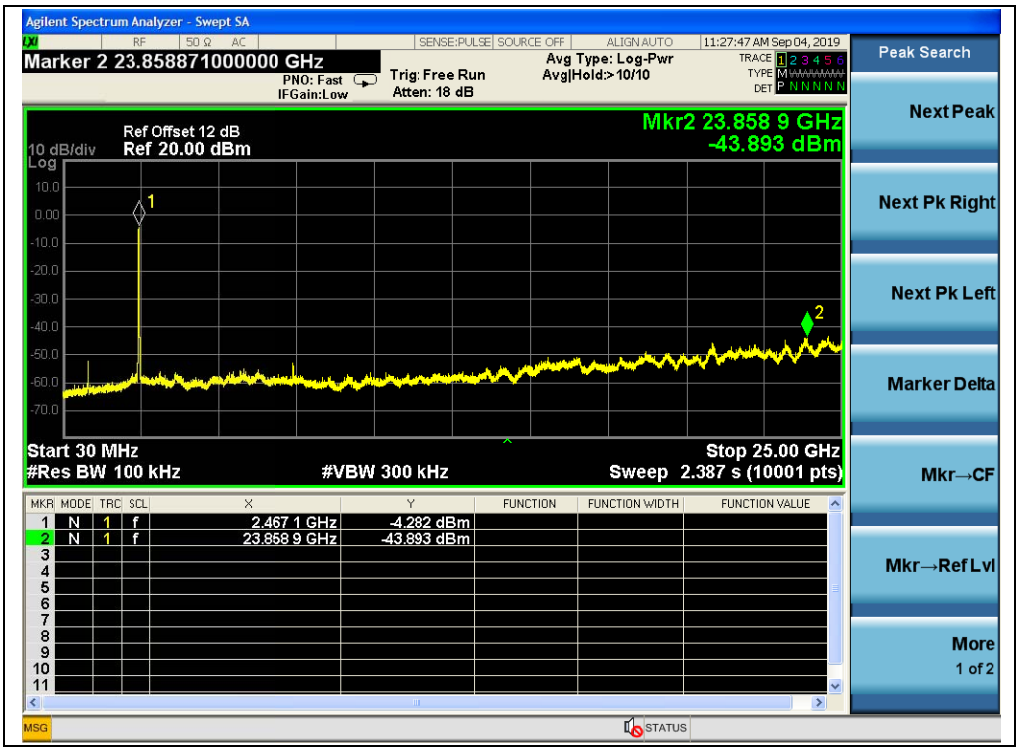
(Channel = 1, 30MHz to 25GHz)



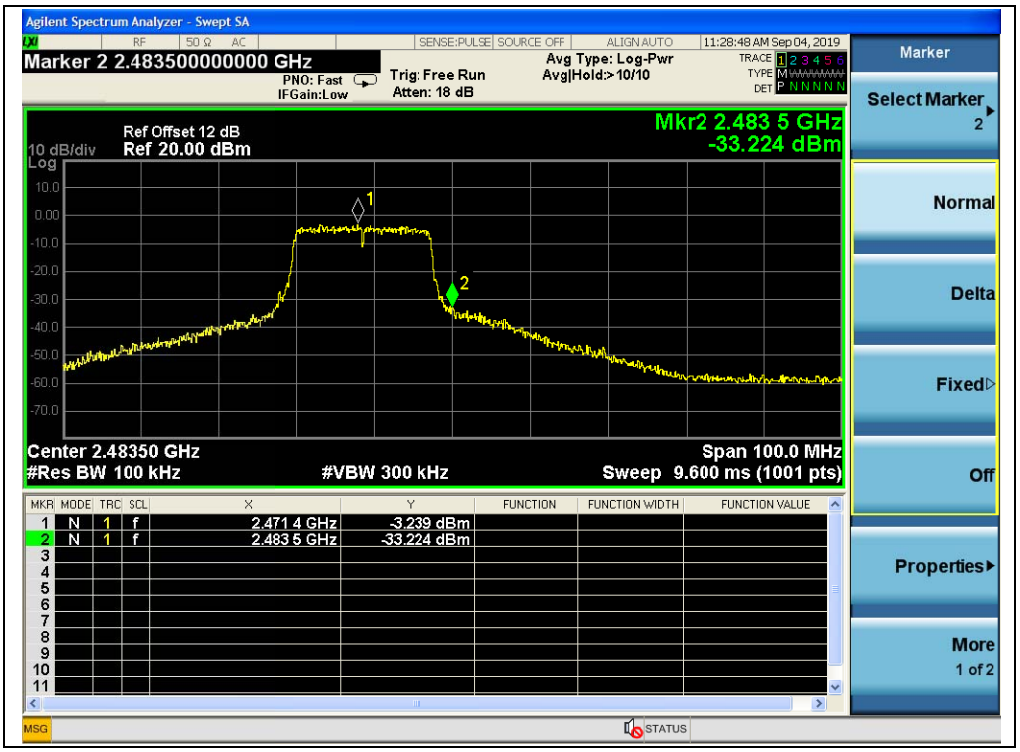
(Band Edge, Channel = 1)



(Channel = 7, 30MHz to 25GHz)



(Channel = 13, 30MHz to 25GHz)



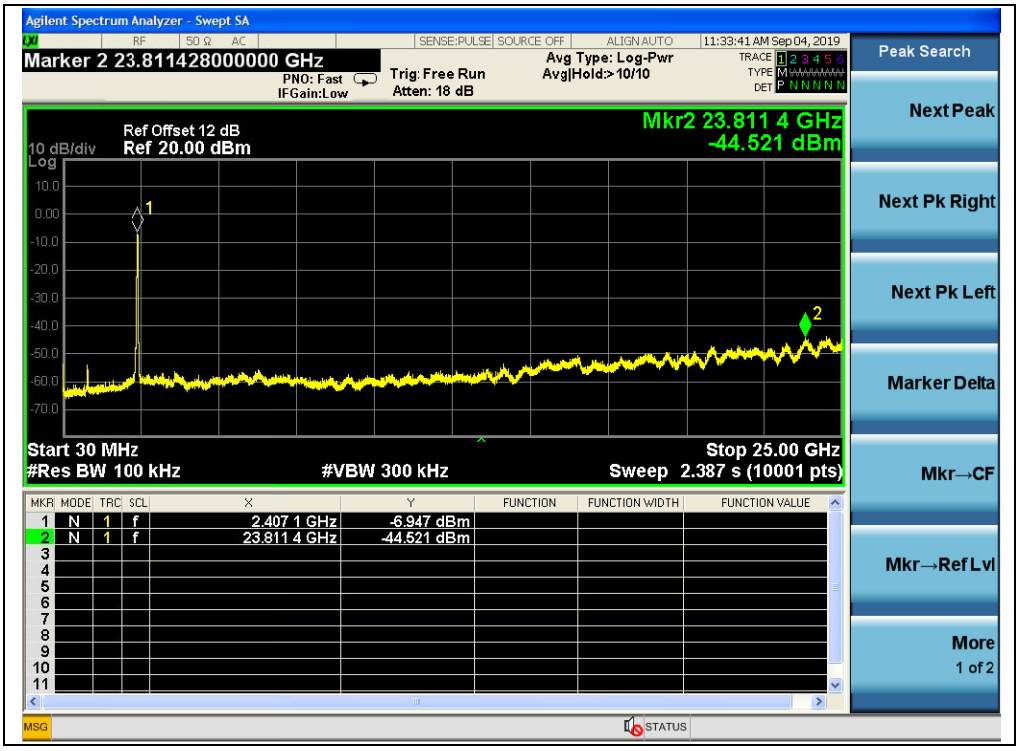
(Band Edge, Channel = 13)

802.11n (HT40) Test mode

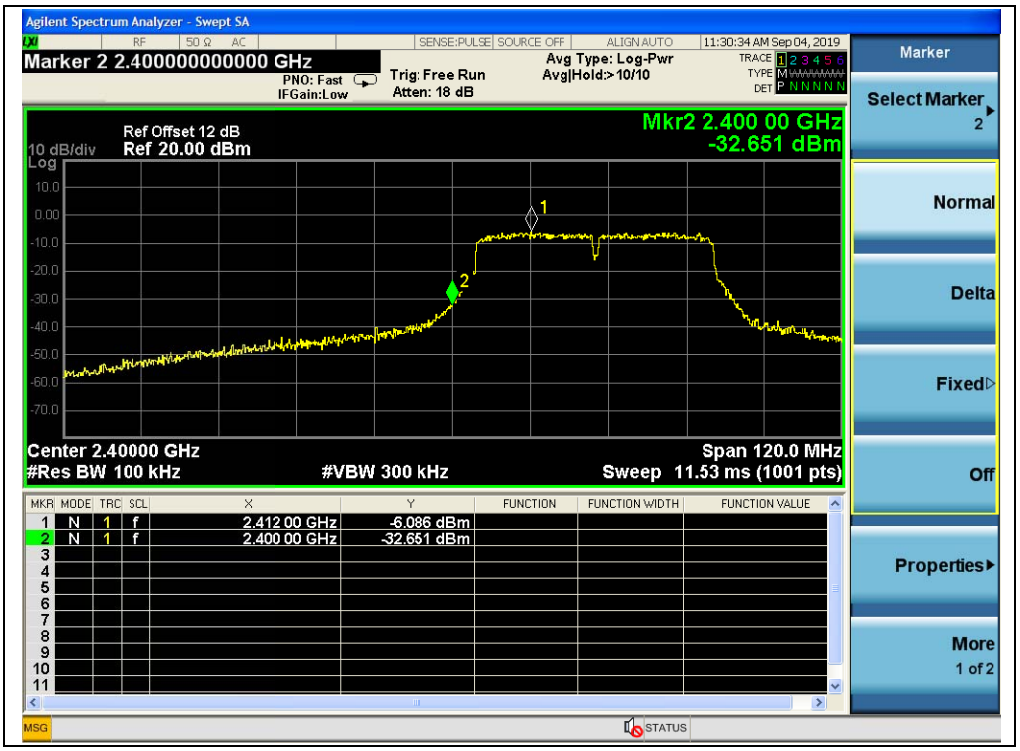
A. Test Verdict:

Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
3	2422	-44.52	-6.95	-26.95	PASS
7	2442	-43.93	-6.37	-26.37	PASS
11	2462	-44.46	-6.88	-26.88	PASS

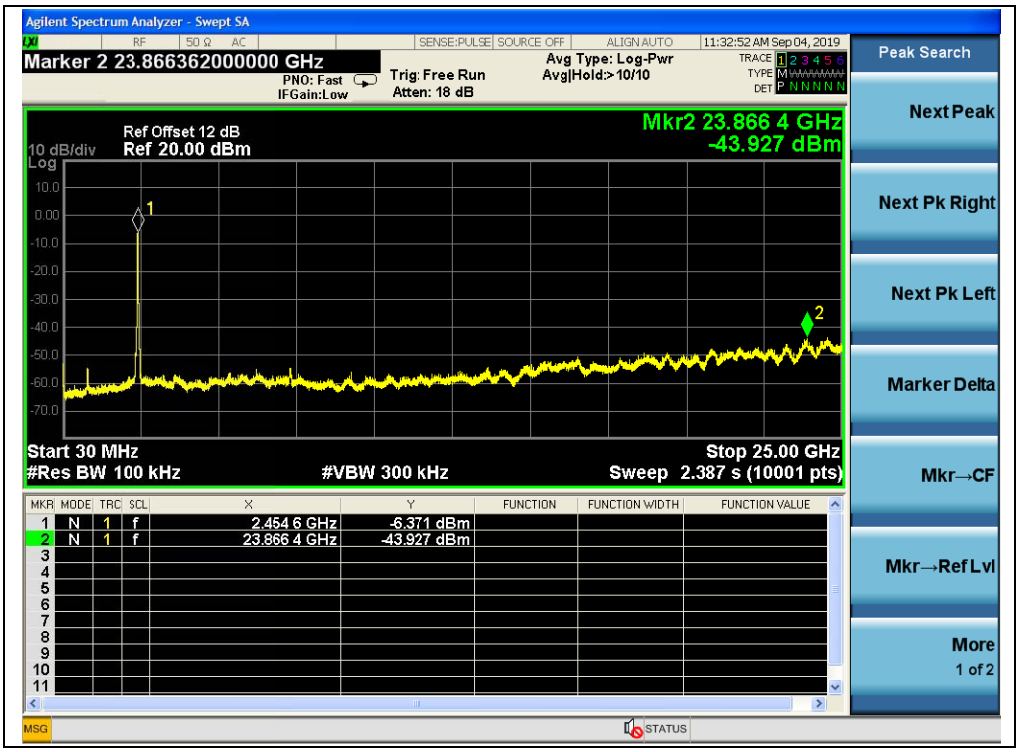
B. Test Plots:



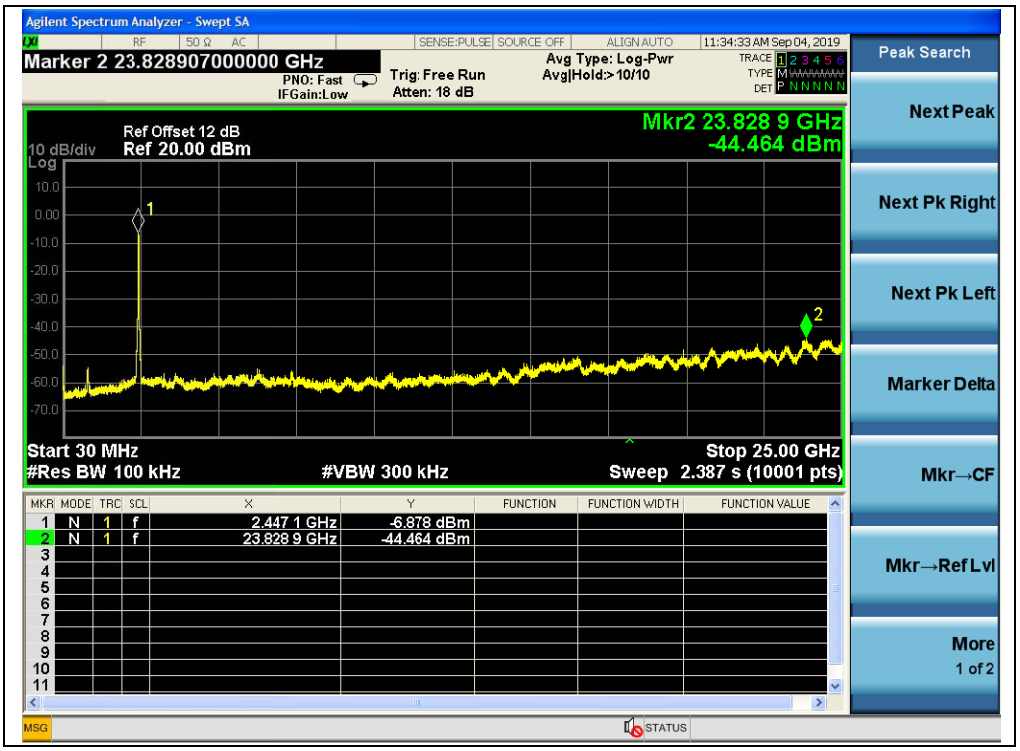
(Channel = 3, 30MHz to 25GHz)



(Band Edge, Channel = 3)



(Channel = 7, 30MHz to 25GHz)



(Channel = 11, 30MHz to 25GHz)

(Band Edge, Channel = 11)

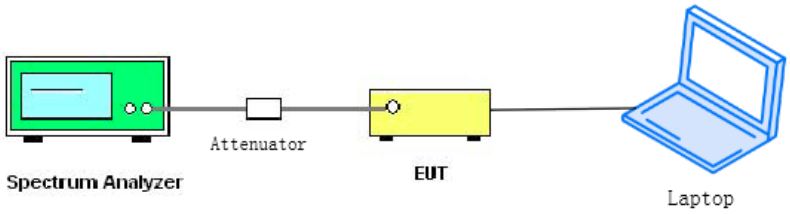
2.6. Power spectral density (PSD)

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

A. Test Set:



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.

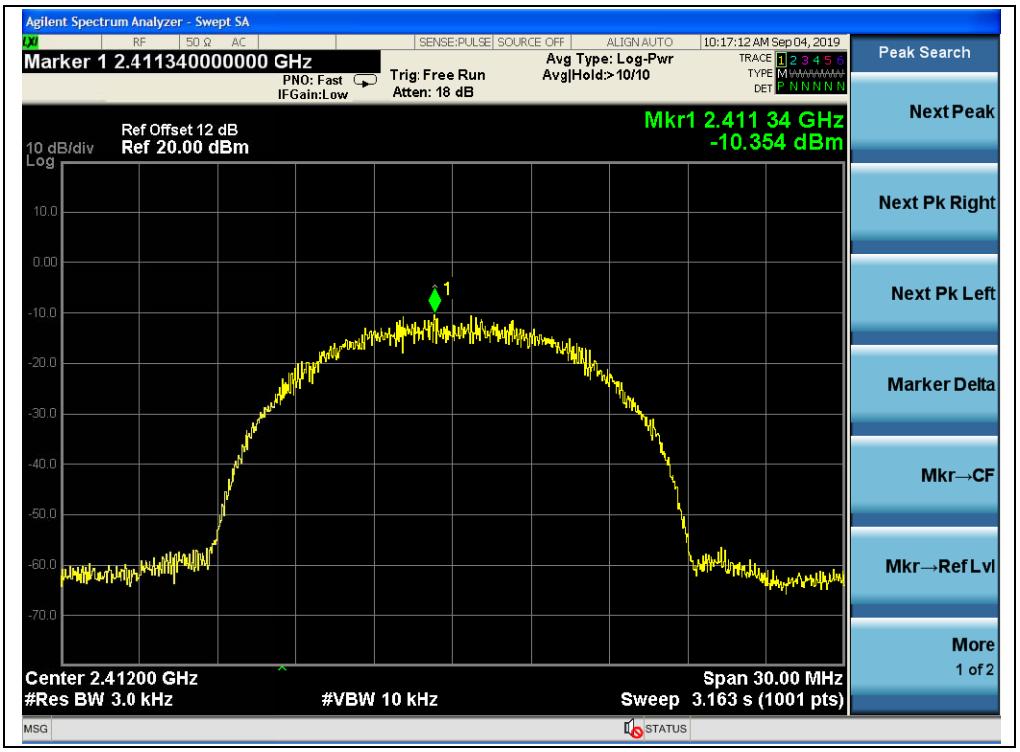
2.6.4. Test Result

802.11b Test mode

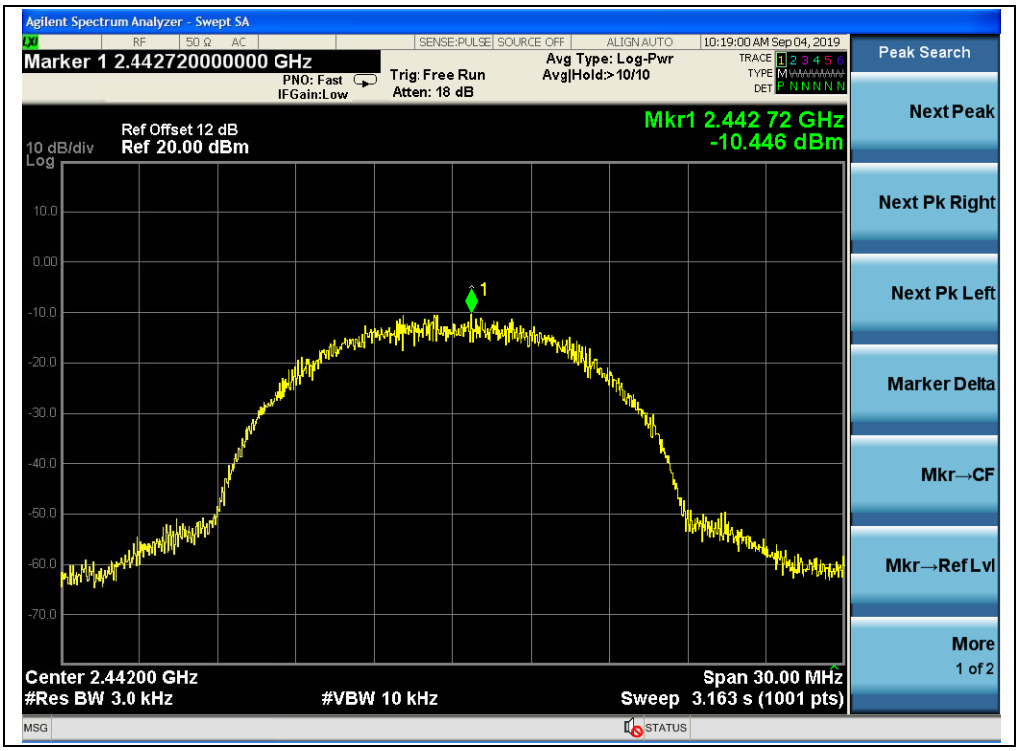
A. Test Verdict:

Spectral power density (dBm/3kHz)				
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
1	2412	-10.35	8	PASS
7	2442	-10.45	8	PASS
13	2472	-10.97	8	PASS

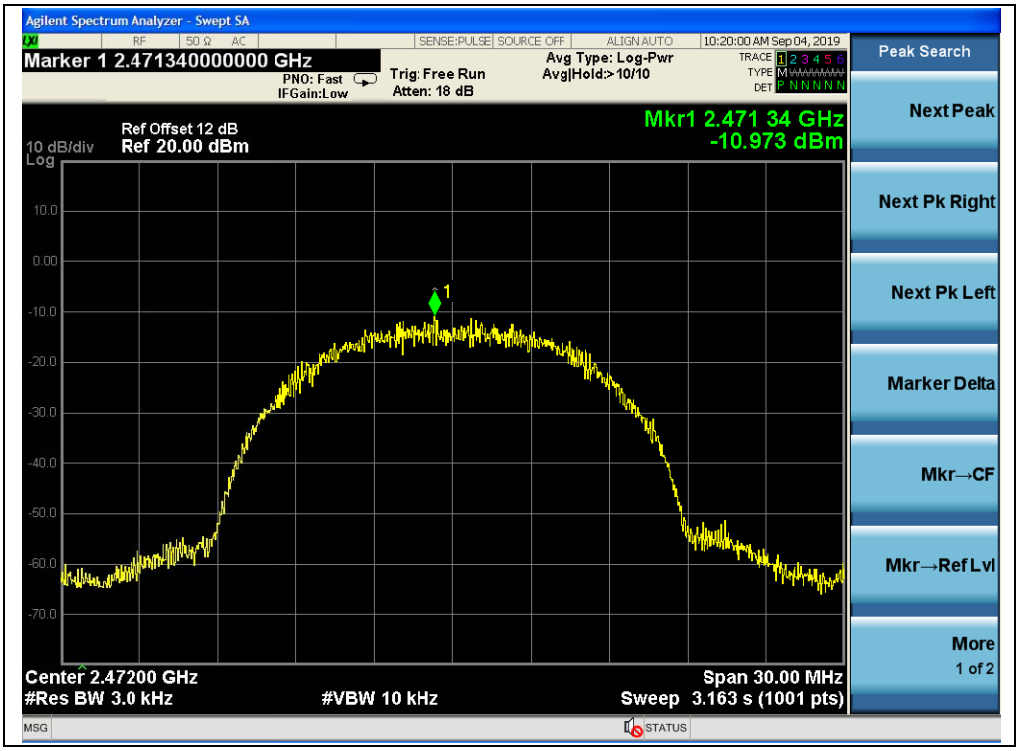
B. Test Plots:



(Channel = 1, 802.11b)



(Channel = 7, 802.11b)



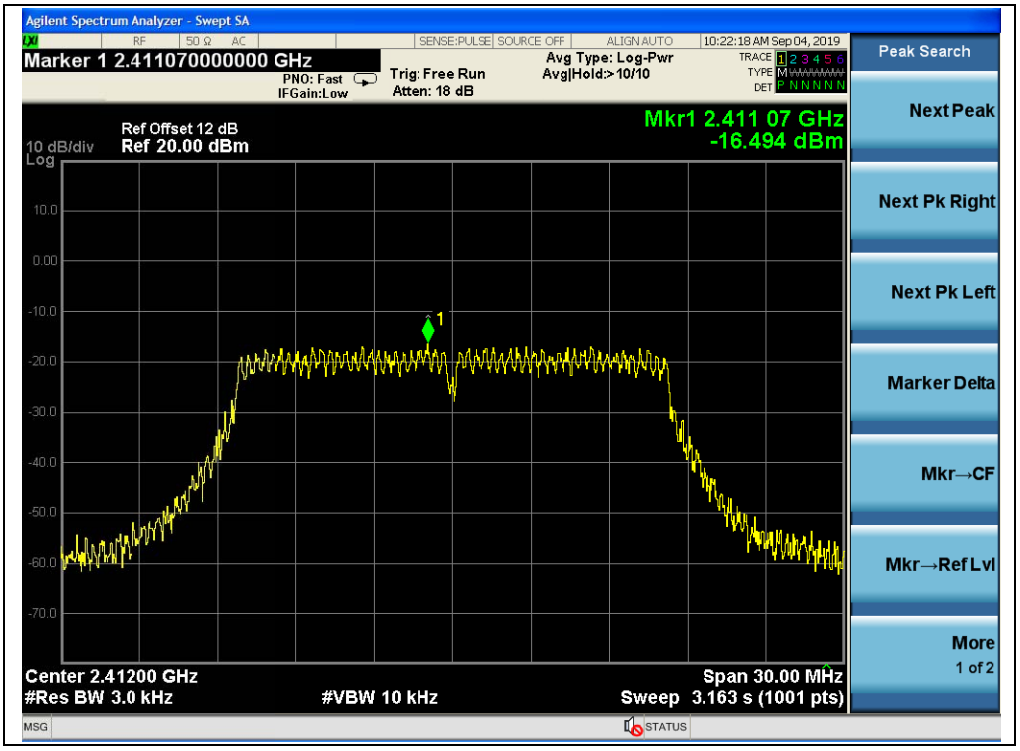
(Channel = 13, 802.11b)

802.11g Test mode

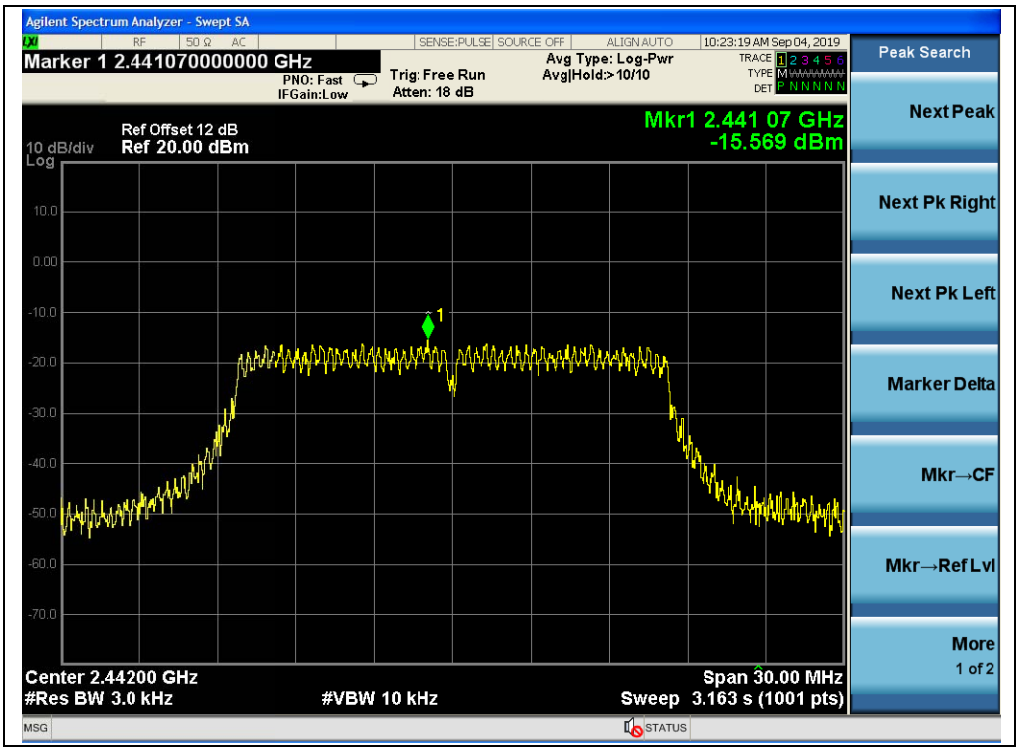
A. Test Verdict:

Spectral power density (dBm/3kHz)				
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
1	2412	-16.49	8	PASS
7	2442	-15.57	8	PASS
13	2472	-16.74	8	PASS

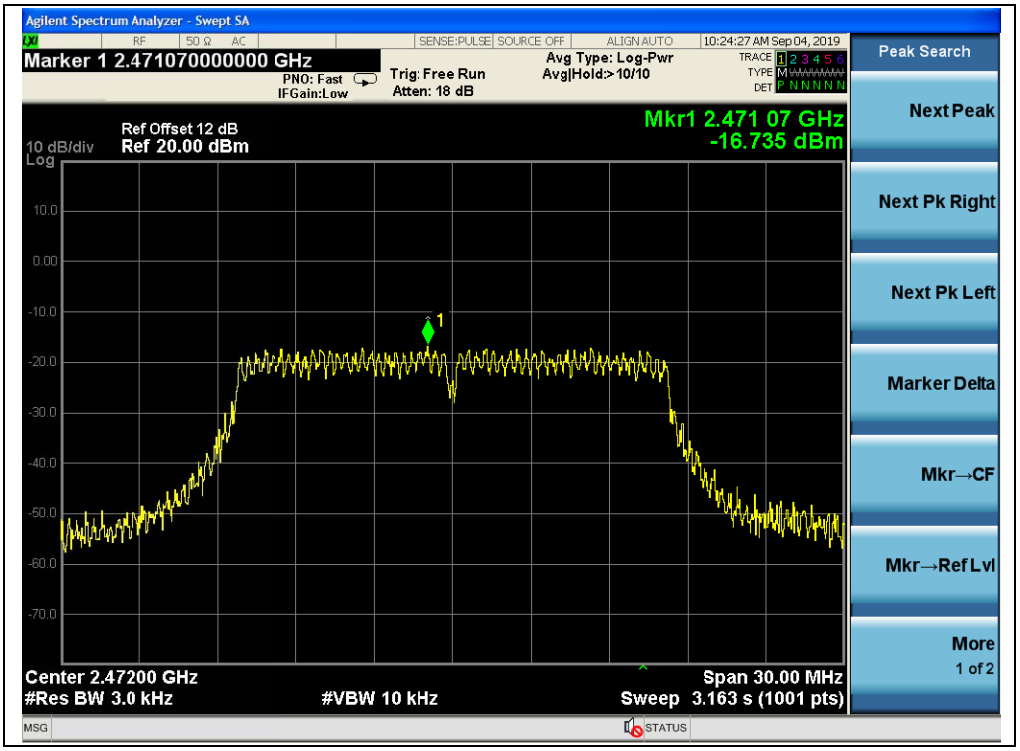
B. Test Plots:



(Channel = 1, 802.11g)



(Channel = 7, 802.11g)



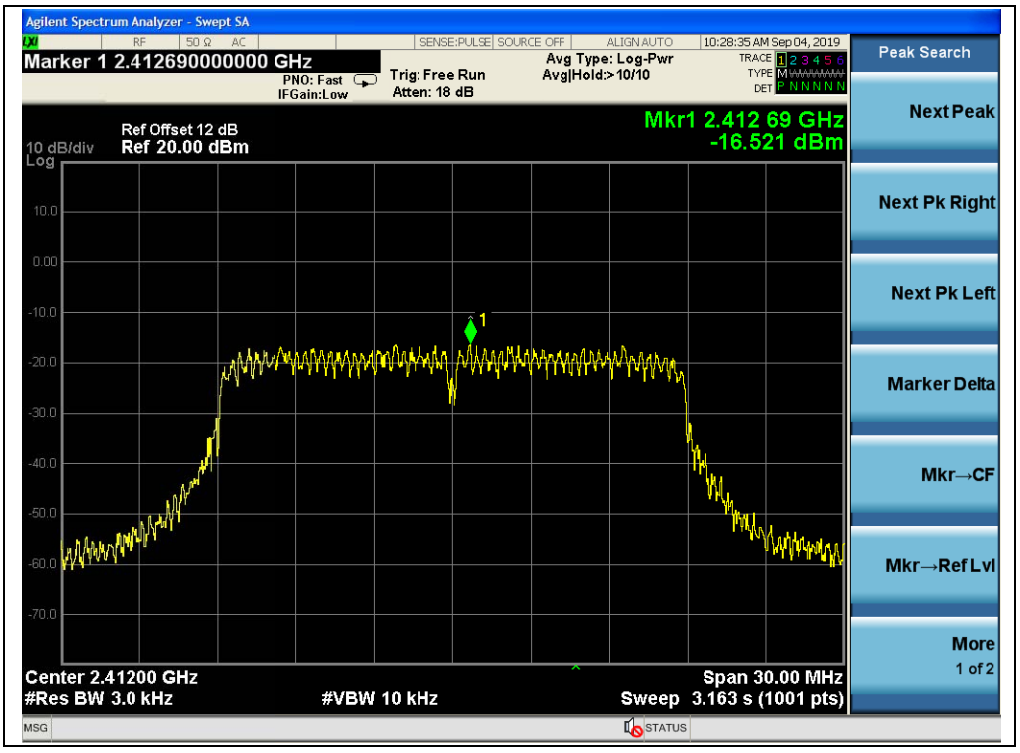
(Channel = 13, 802.11g)

802.11n (HT20) Test mode

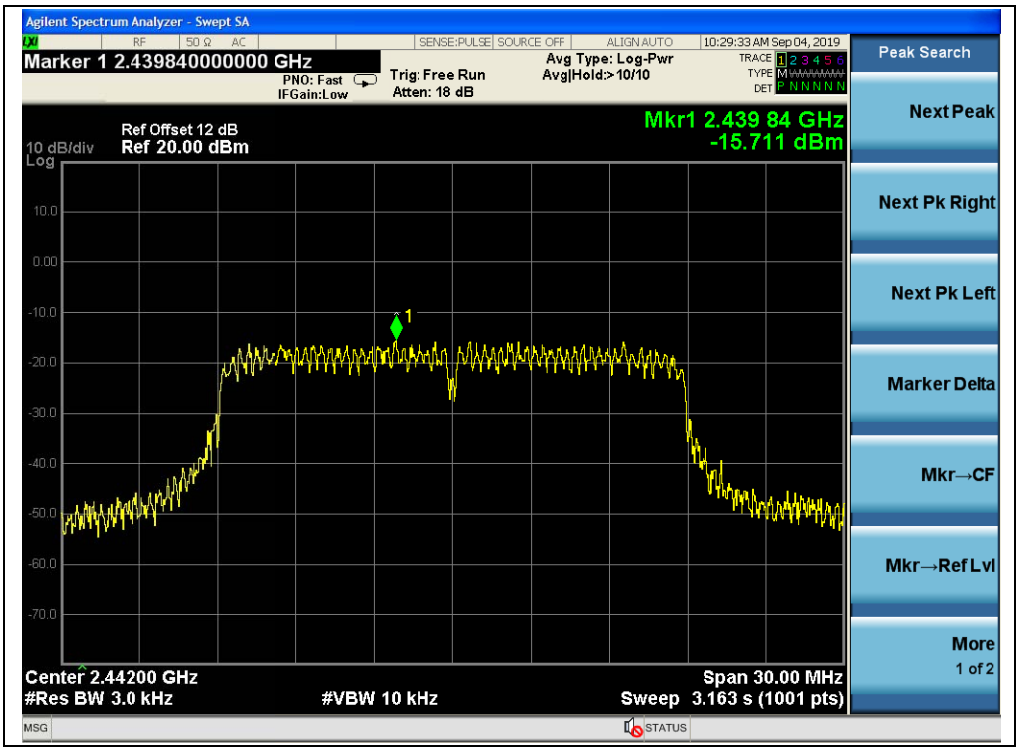
A. Test Verdict:

Spectral power density (dBm/3kHz)				
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
1	2412	-16.51	8	PASS
7	2442	-15.71	8	PASS
13	2472	-16.77	8	PASS

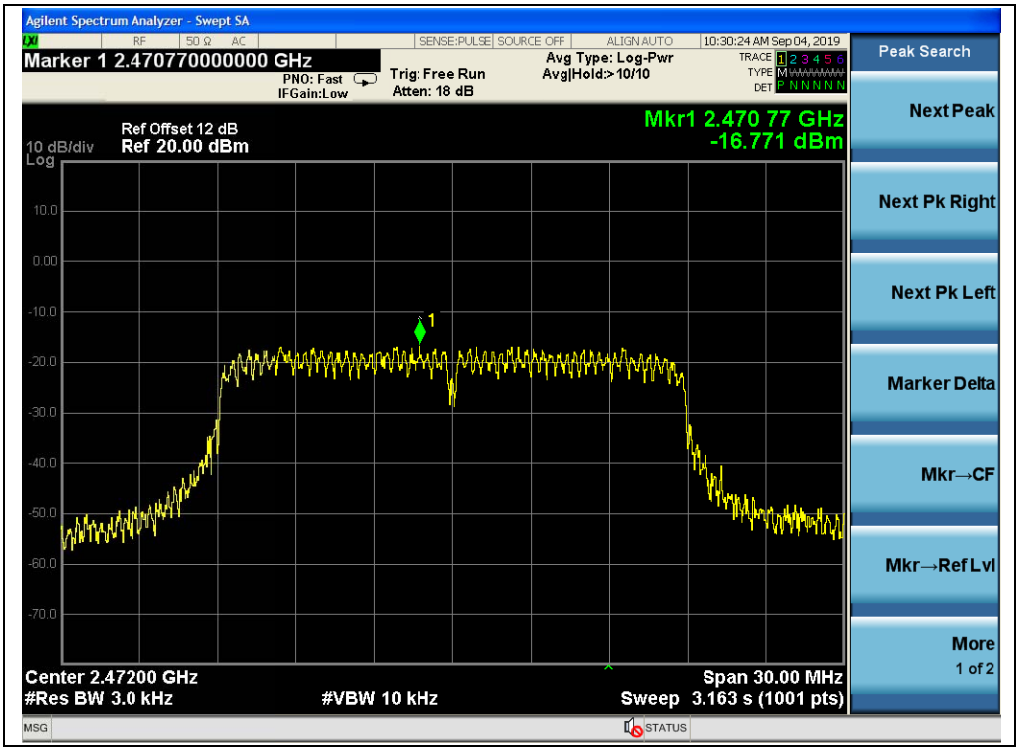
B. Test Plots:



(Channel = 1, 802.11n(HT20))



(Channel = 7, 802.11n(HT20))



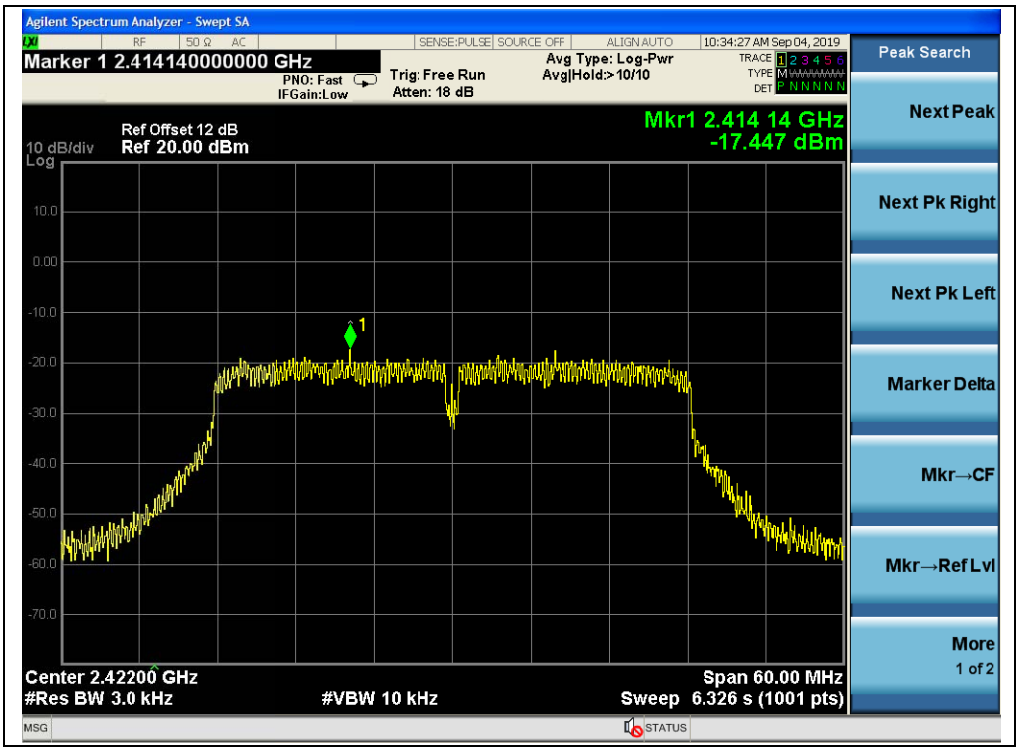
(Channel = 13, 802.11n(HT20))

802.11n (HT40) Test mode

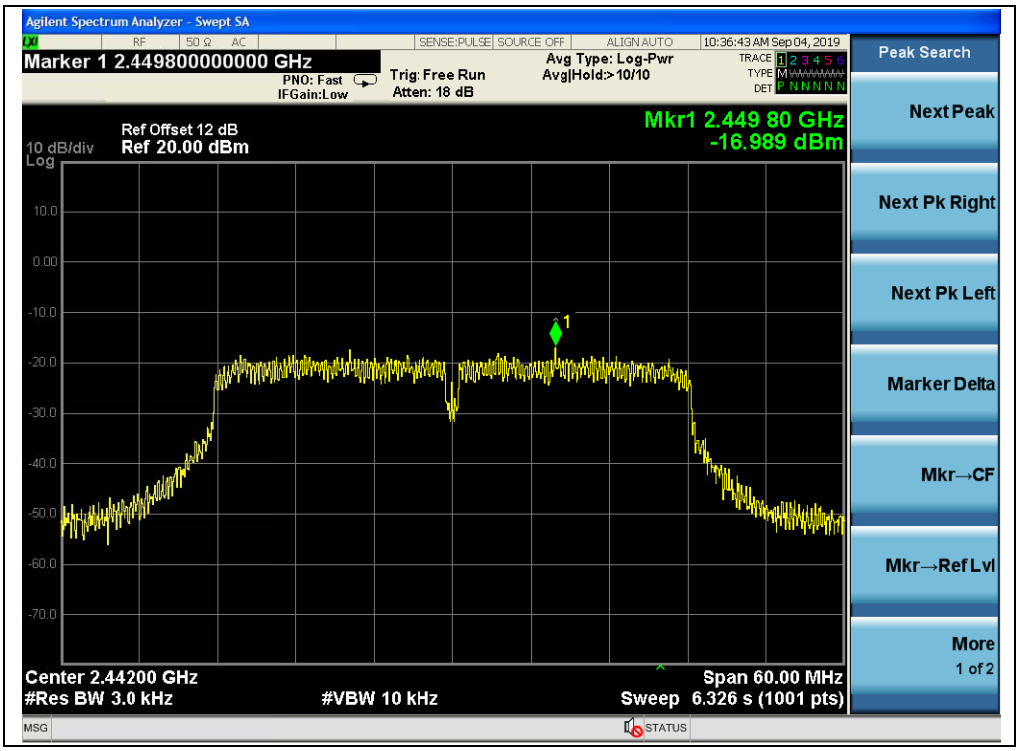
A. Test Verdict:

Spectral power density (dBm/3kHz)				
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
3	2422	-17.45	8	PASS
7	2442	-16.99	8	PASS
11	2462	-17.69	8	PASS

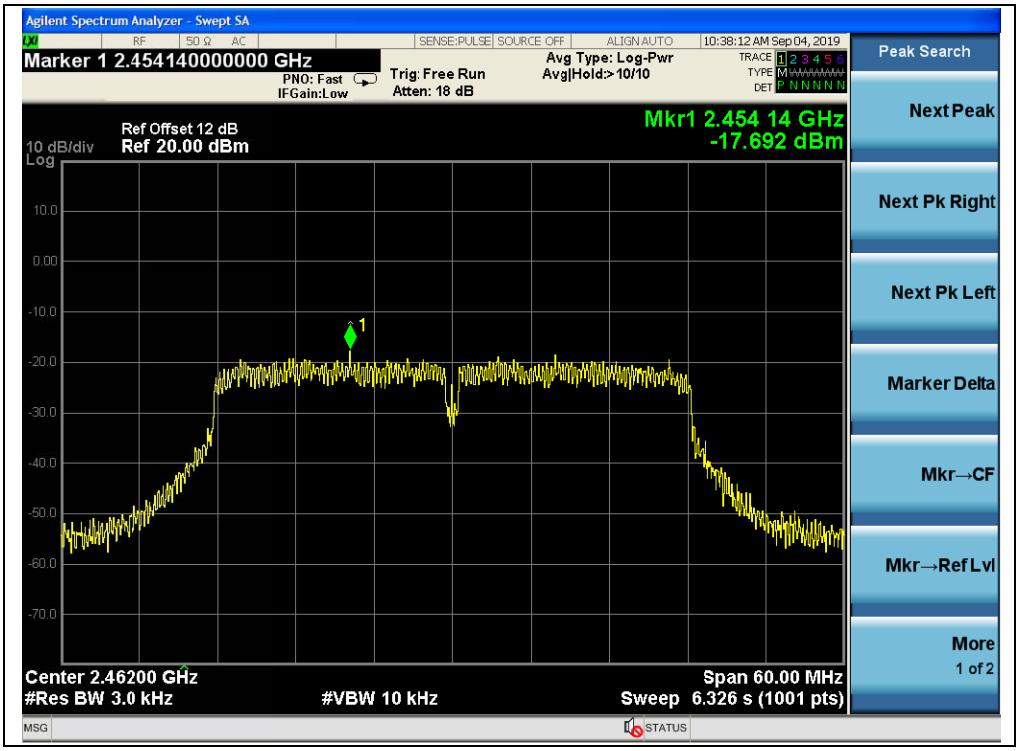
B. Test Plots:



(Channel = 3, 802.11n(HT40))



(Channel = 7, 802.11n(HT40))



(Channel = 11, 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

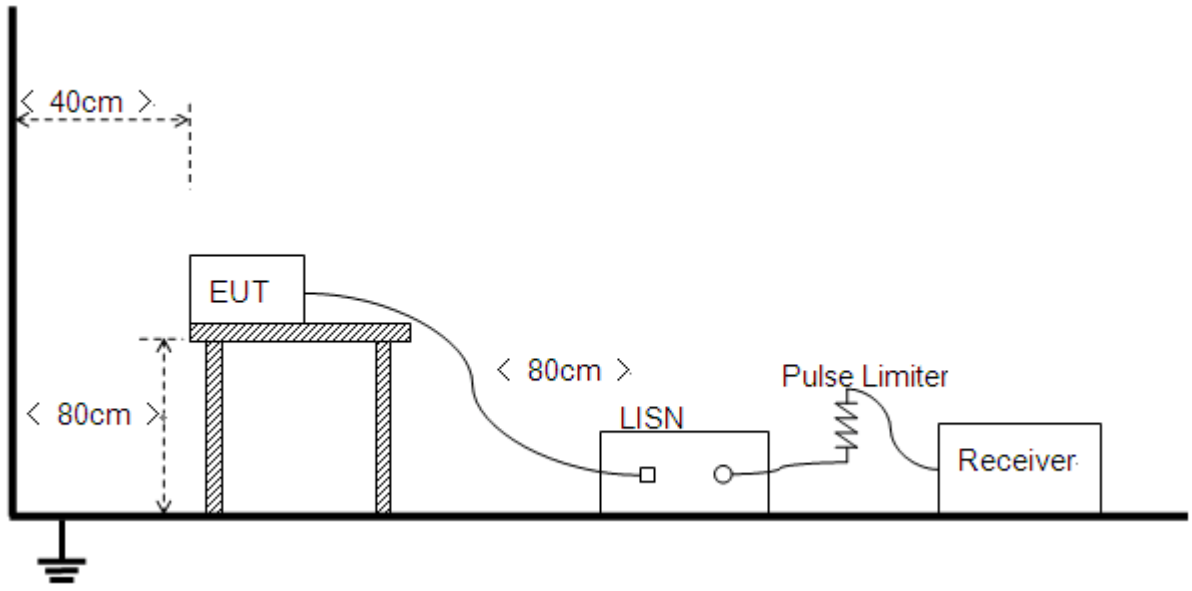
NOTE:

(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

A. 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/50Hz were considered and tested respectively, only the results of the worst case AC 120V/60Hz were recorded in this report.

A. Test setup:

Test Mode: EUT+Adapter + WIFI TX

Test Voltage: AC 120V/60Hz

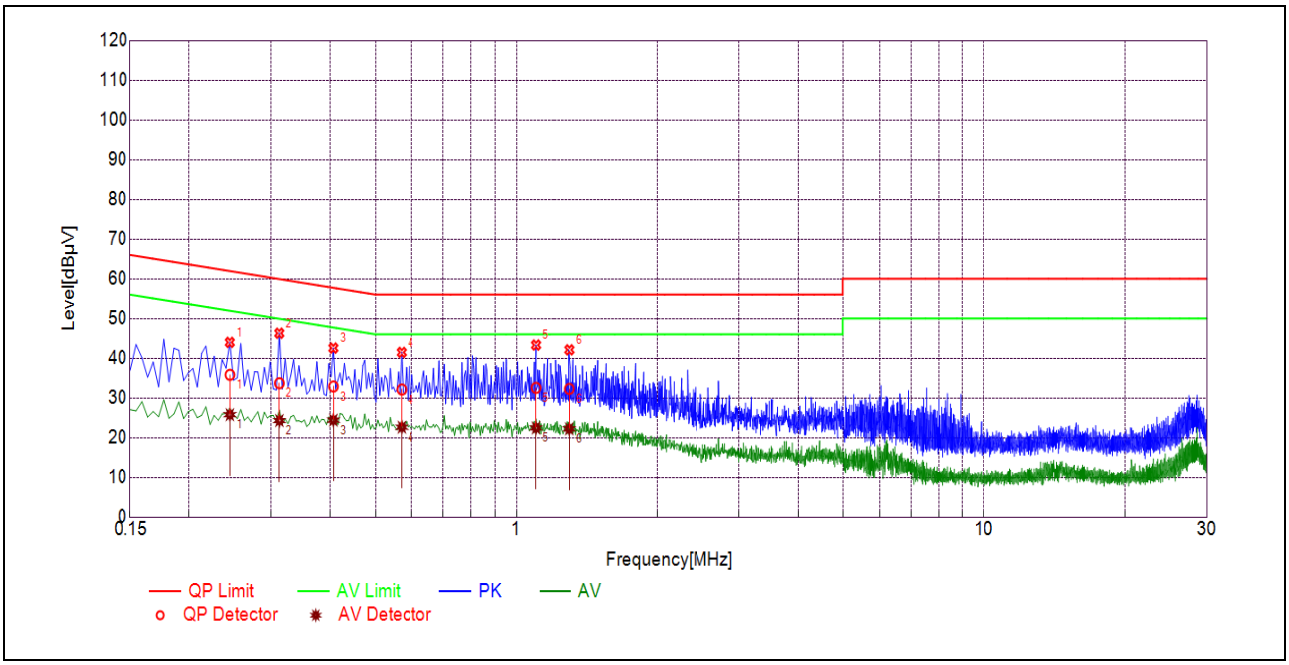
The measurement results are obtained as below:

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

U_R: Receiver Reading

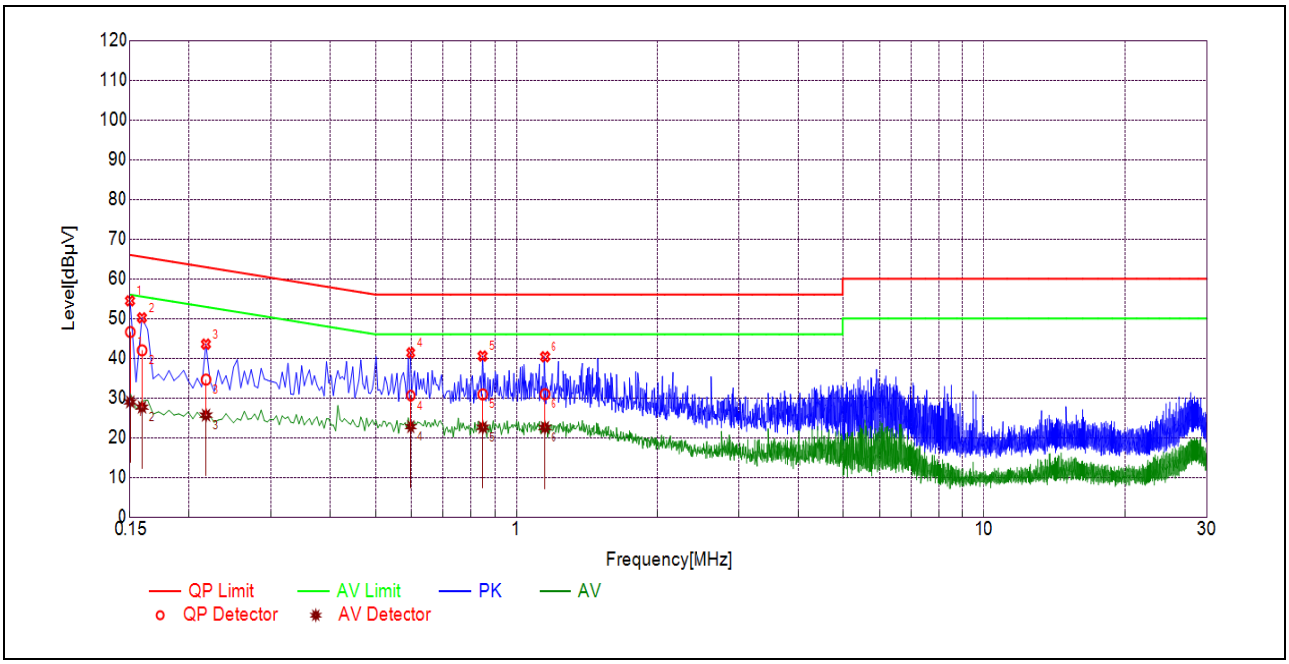
A_{Factor}: Voltage division factor of LISN

B. Test Plots:



(L Phase)

NO.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.2446	35.82	25.78	61.94	51.94	Line	PASS
2	0.3121	33.70	24.30	59.91	49.91		PASS
3	0.4066	32.89	24.40	57.72	47.72		PASS
4	0.5686	32.11	22.62	56.00	46.00		PASS
5	1.0990	32.54	22.44	56.00	46.00		PASS
6	1.3008	32.28	22.21	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	0.1502	46.60	29.00	65.99	55.99	Neutral	PASS
2	0.1591	41.99	27.68	65.51	55.51		PASS
3	0.2176	34.62	25.66	62.91	52.91		PASS
4	0.5957	30.58	22.77	56.00	46.00		PASS
5	0.8483	30.89	22.60	56.00	46.00		PASS
6	1.1479	30.97	22.54	56.00	46.00		PASS

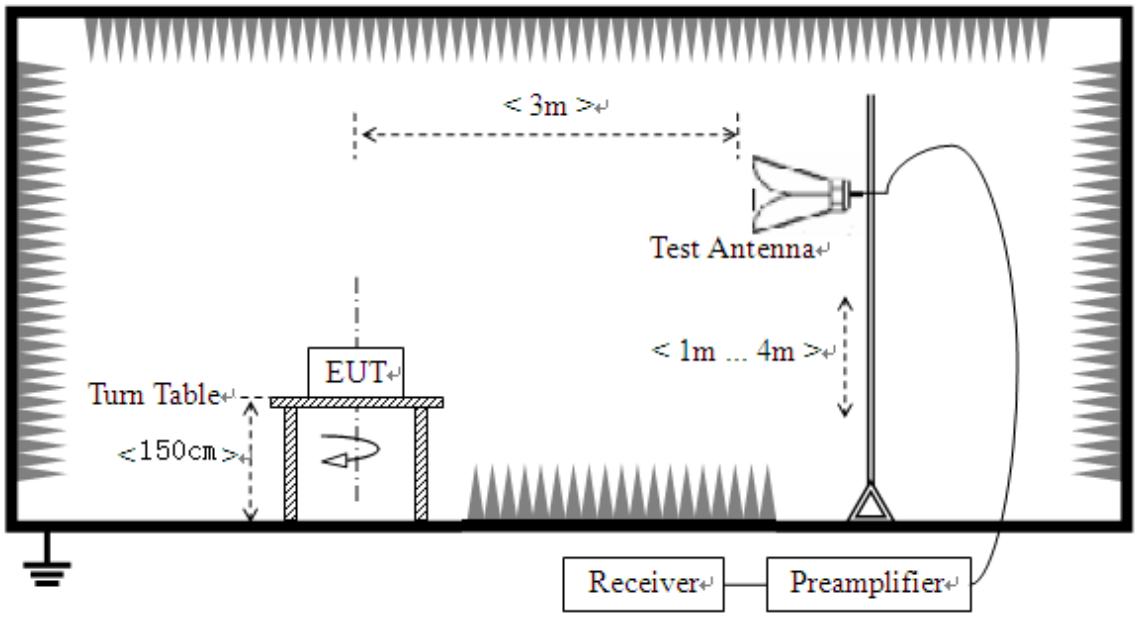
2.8. Restricted Frequency Bands

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

A. 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

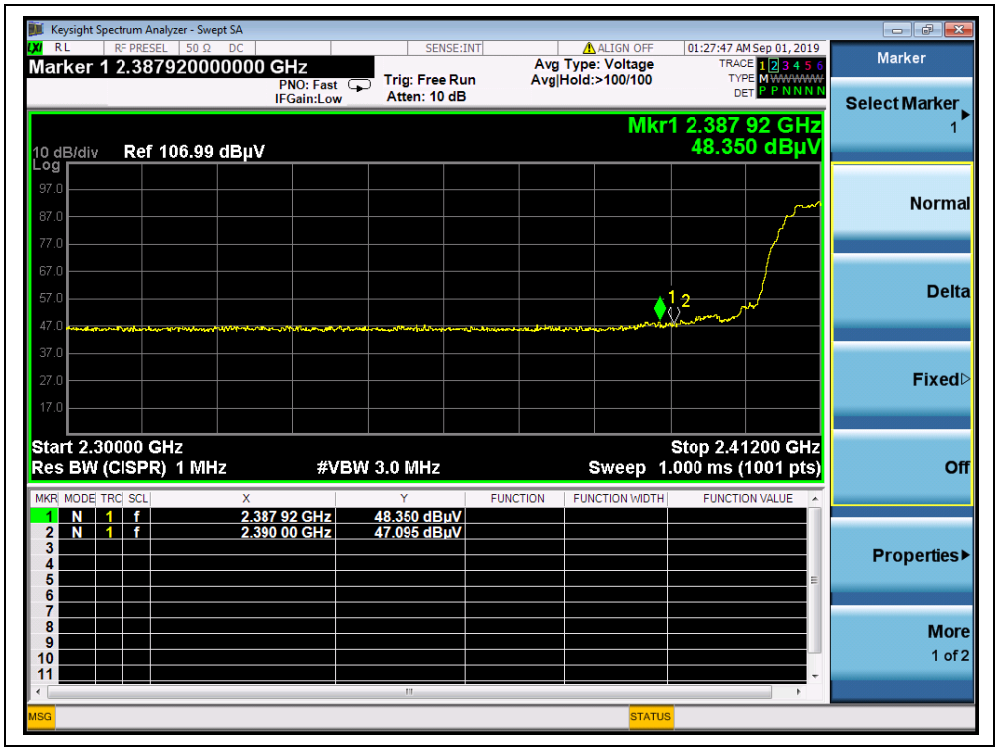
Note: Restricted Frequency Bands were performed when antenna was at vertical and horizontal polarity, and only the worse test condition (vertical) was recorded in this test report.

802.11b Test mode

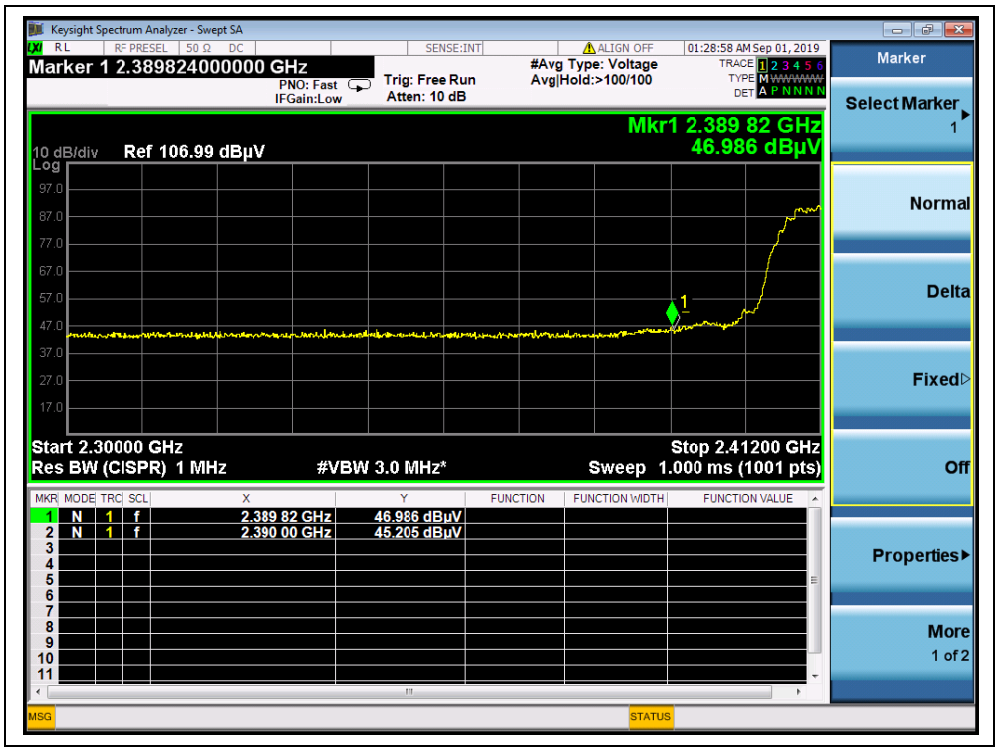
A. Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV						
1	2387.92	PK	48.35	-29.67	32.56	51.24	74	PASS
1	2389.82	AV	46.99	-29.67	32.56	49.88	54	PASS
13	2483.66	PK	49.66	-29.67	32.56	52.55	74	PASS
13	2483.50	AV	37.70	-29.67	32.56	40.59	54	PASS

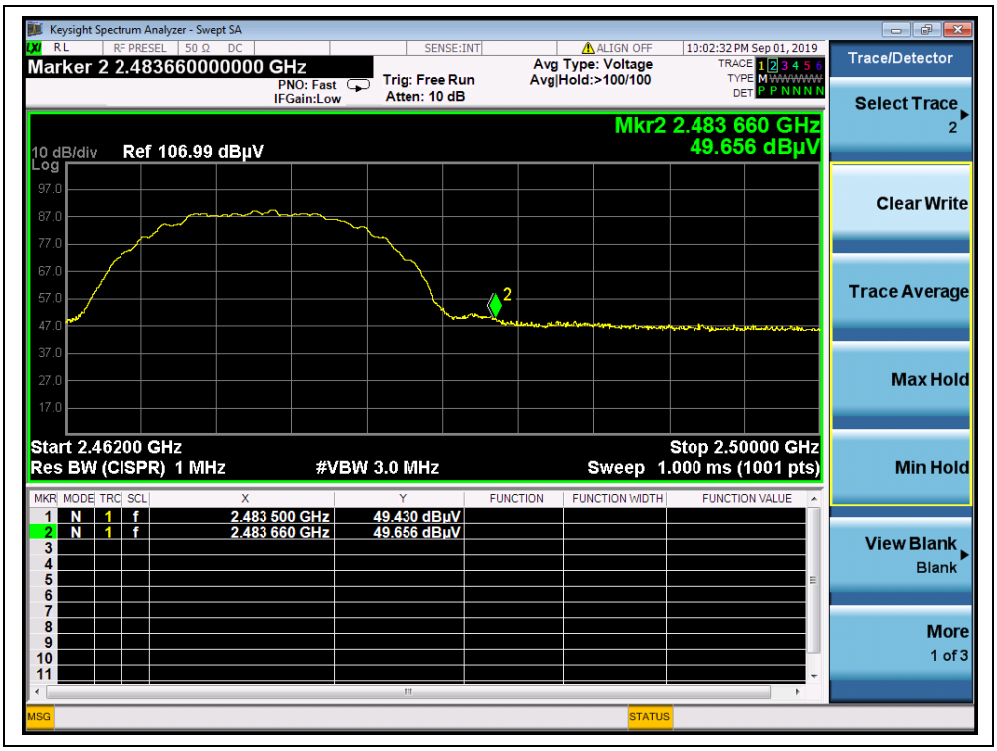
B. Test Plots:



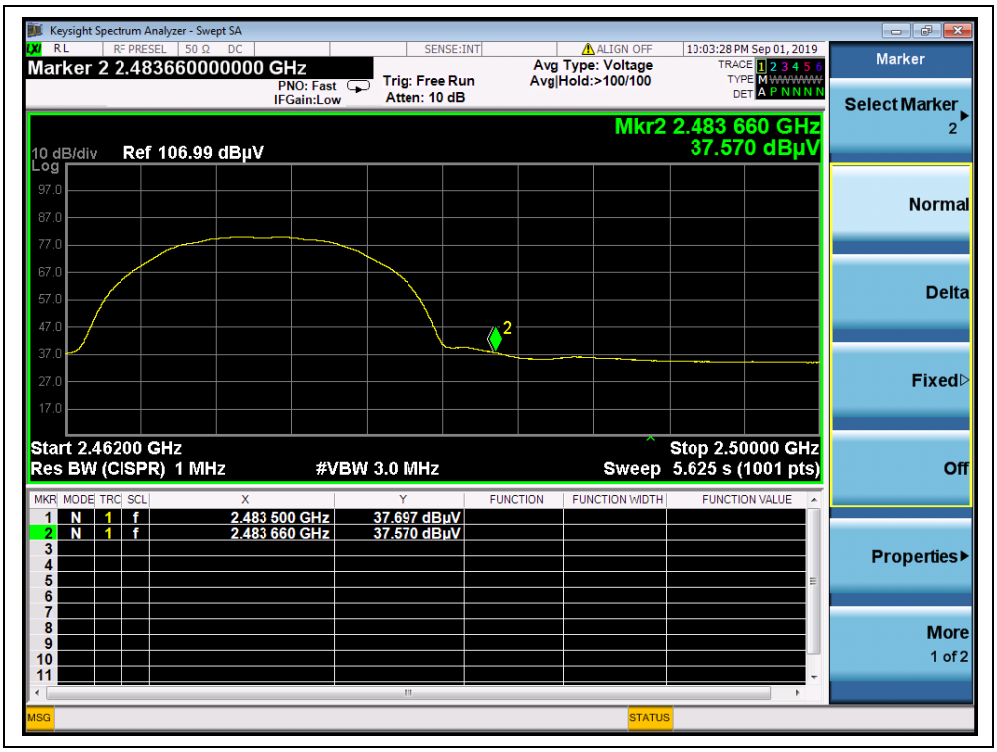
(Channel = 1 PEAK, 802.11b)



(Channel = 1 AVG, 802.11b)



(Channel = 13 PEAK, 802.11b)



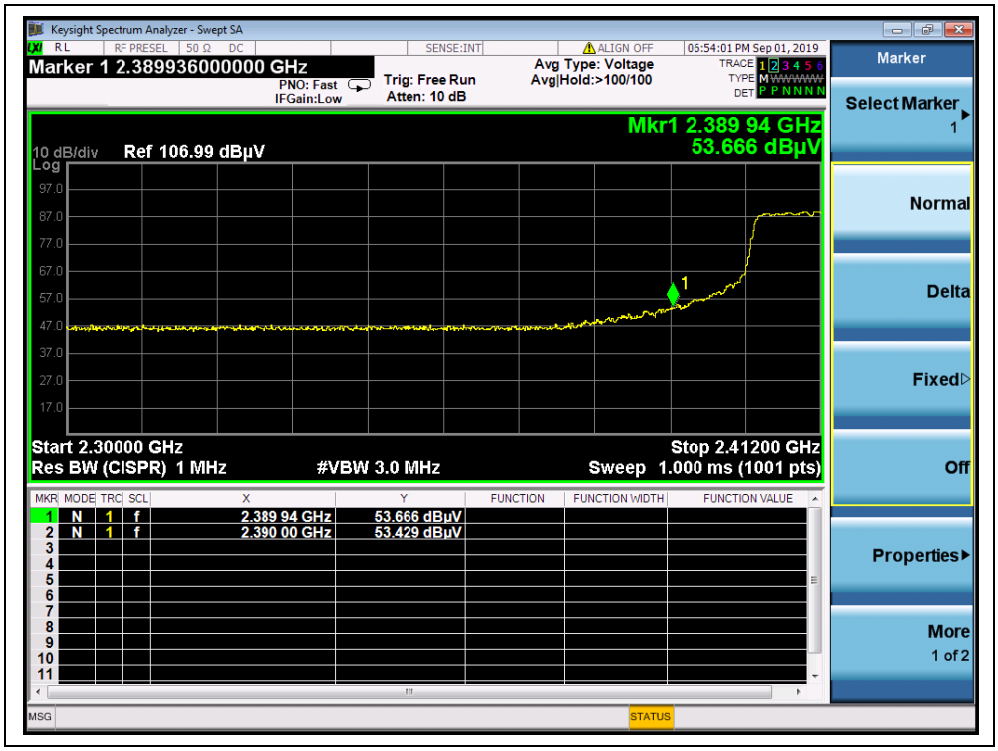
(Channel = 13 AVG, 802.11b)

802.11g Test mode

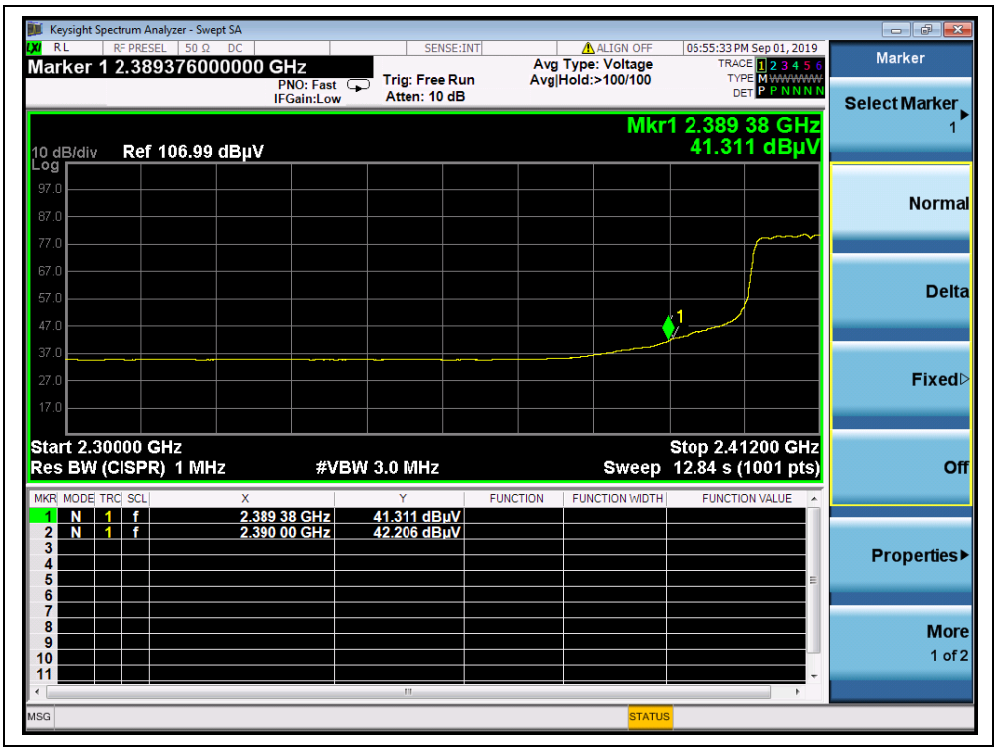
A. Test Verdict:

Channel	Frequency (MHz)	Detector	Receiver Reading U_R (dBuV)	A_T (dB)	A_{Factor} (dB@3m)	Max. Emission E (dBμV/m)	Limit (dBμV/m)	Verdict
		PK/ AV						
1	2389.94	PK	53.67	-29.67	32.56	56.56	74	PASS
1	2390.00	AV	42.21	-29.67	32.56	45.10	54	PASS
13	2485.26	PK	57.16	-29.67	32.56	60.05	74	PASS
13	2484.12	AV	43.46	-29.67	32.56	46.35	54	PASS

B. Test Plots:

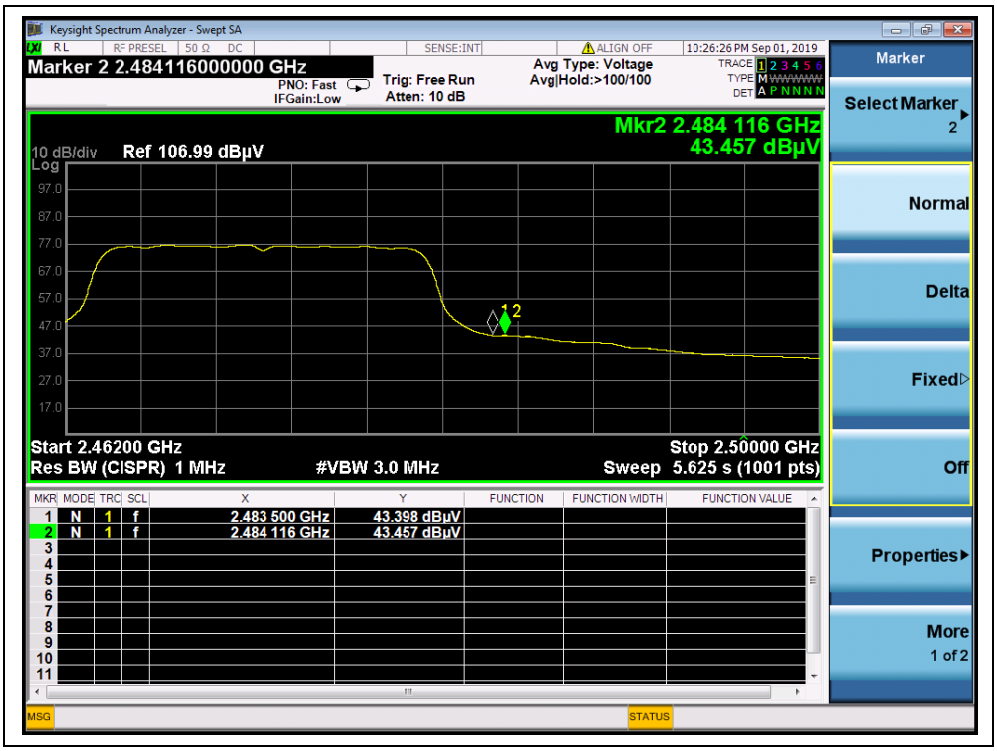


(Channel = 1 PEAK, 802.11g)



(Channel = 1 AVG, 802.11g)

(Channel = 13 PEAK, 802.11g)



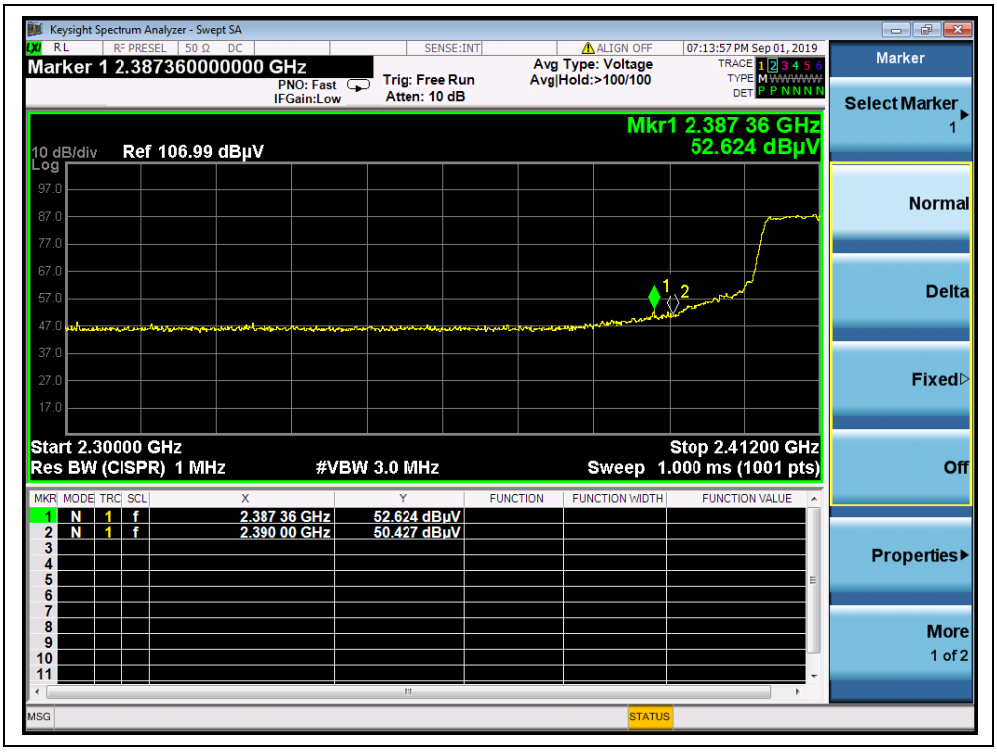
(Channel = 13 AVG, 802.11g)

802.11 n (HT20) Test mode

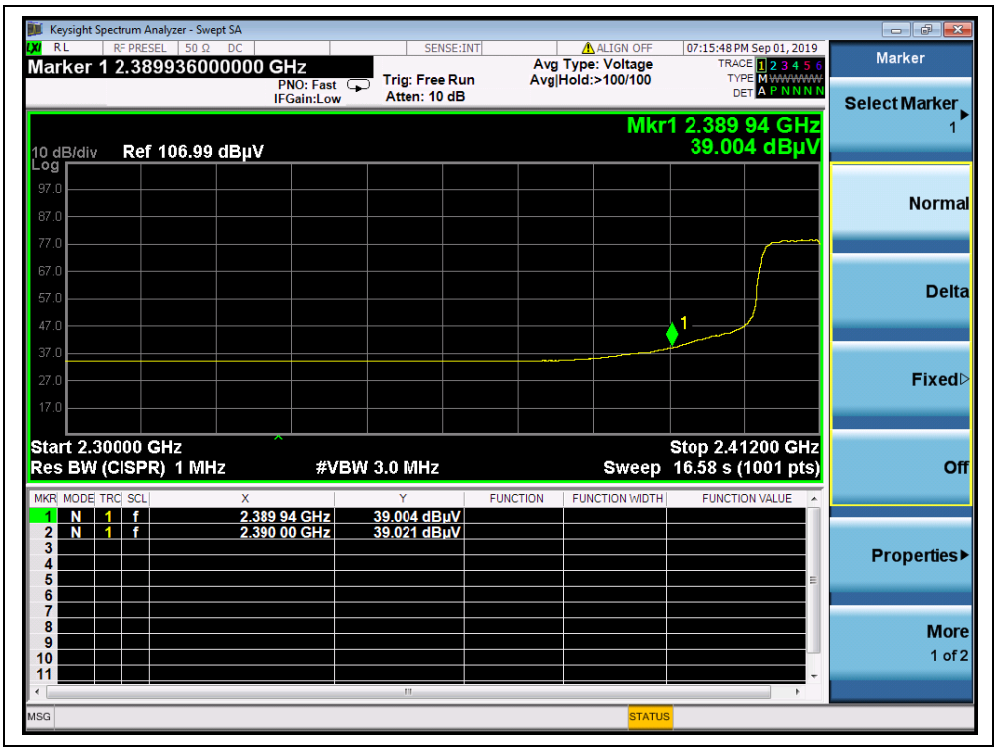
A. Test Verdict:

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	2387.36	PK	52.62	-29.67	32.56	55.51	74	PASS
1	2390.00	AV	39.02	-29.67	32.56	41.91	54	PASS
13	2483.50	PK	57.45	-29.67	32.56	60.34	74	PASS
13	2483.50	AV	43.47	-29.67	32.56	46.36	54	PASS

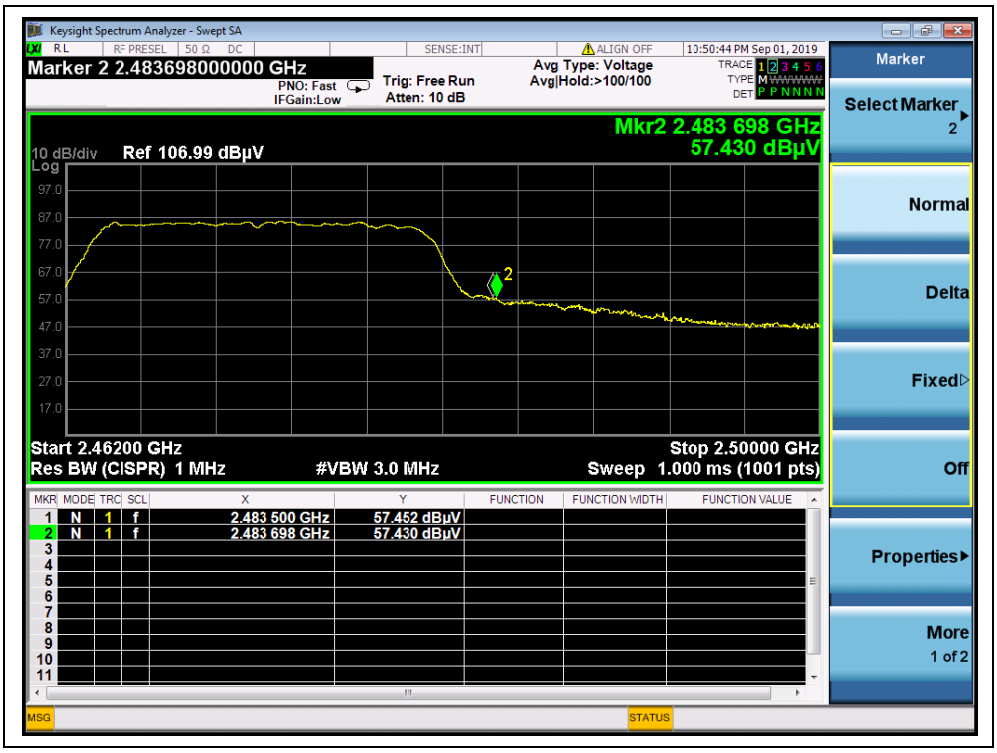
B. Test Plots:



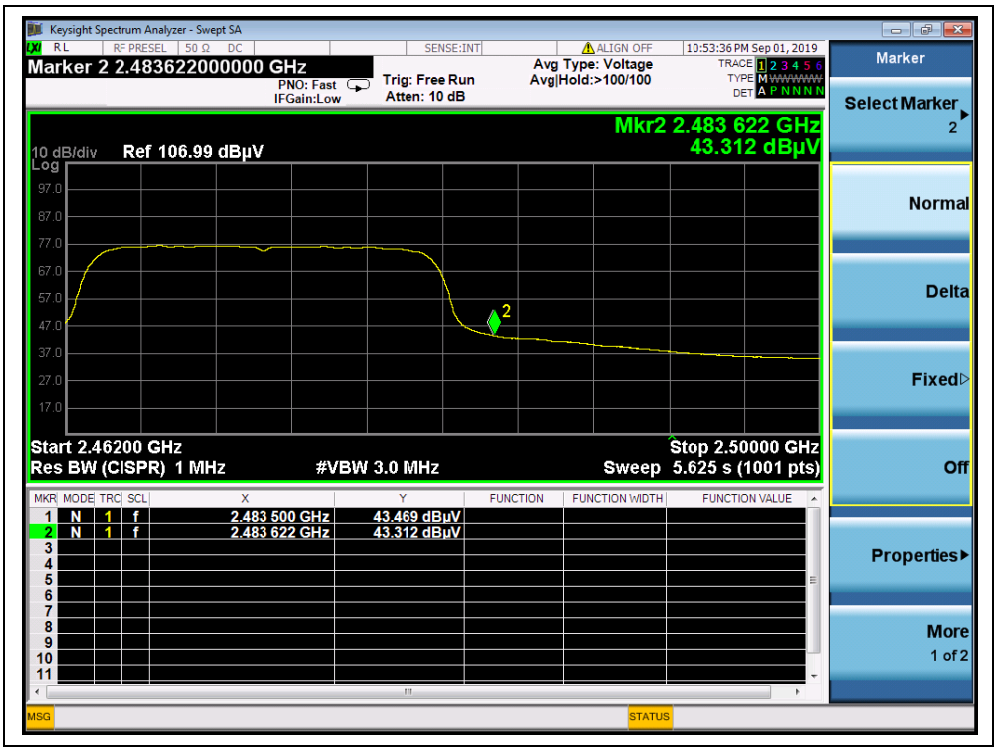
(Channel = 1 PEAK, 802.11n(HT20))



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



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



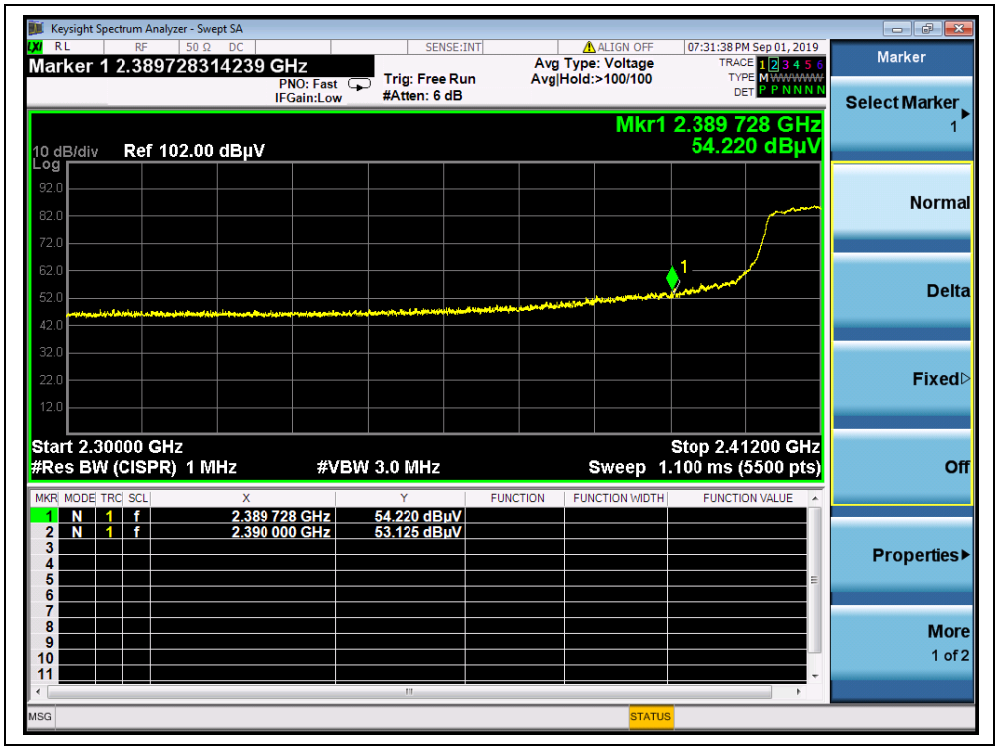
(Channel = 13 AVG, 802.11n(HT20))

802.11n (HT40) Test mode

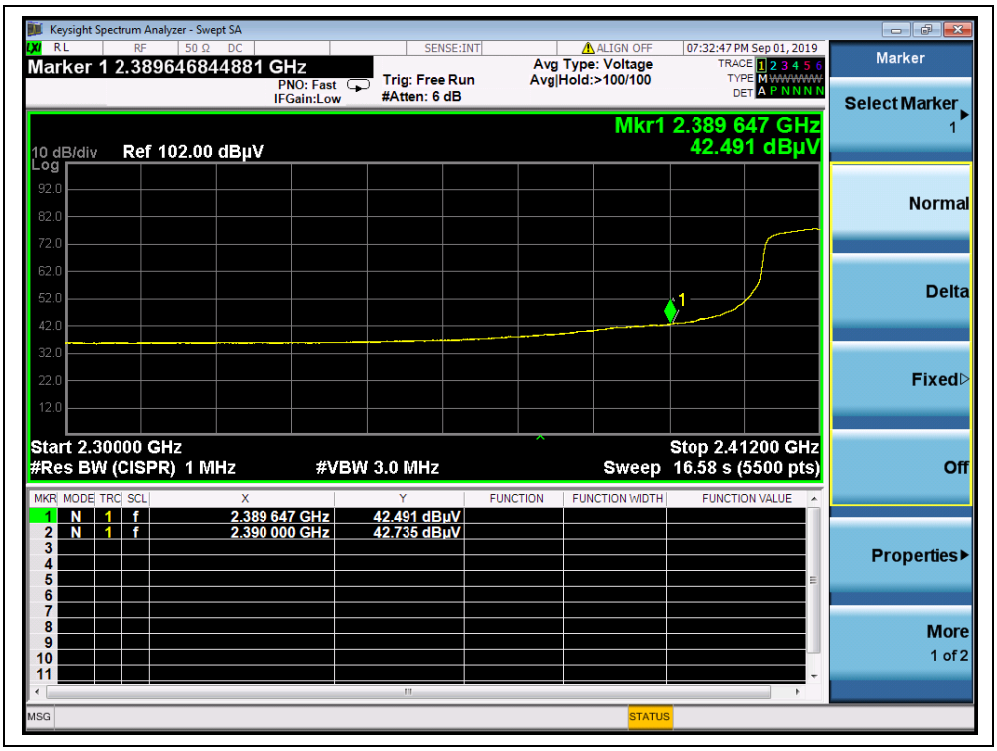
A. Test Verdict:

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	2389.73	PK	54.22	-29.67	32.56	57.11	74	PASS
3	2390.00	AV	42.74	-29.67	32.56	45.63	54	PASS
11	2482.75	PK	56.06	-29.67	32.56	58.95	74	PASS
11	2483.50	AV	44.05	-29.67	32.56	46.94	54	PASS

B. Test Plots:

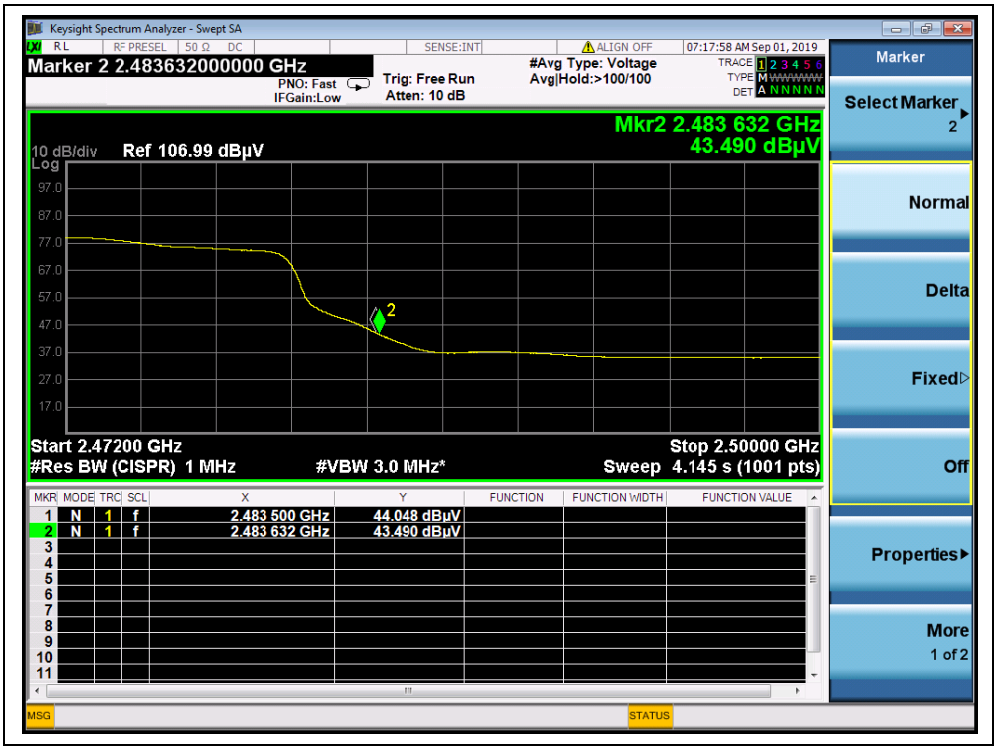


(Channel = 3 PEAK, 802.11n (HT40))



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

(Channel = 11 PEAK, 802.11n (HT40))



(Channel = 11 AVG, 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

Note:

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.

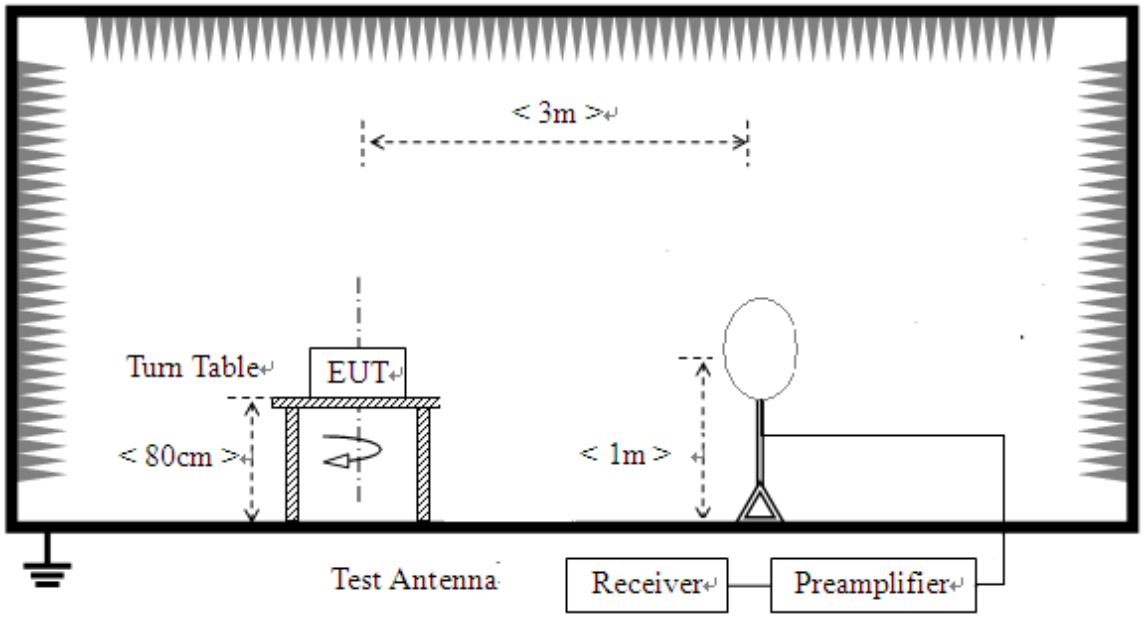
For above 1000MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK)

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)

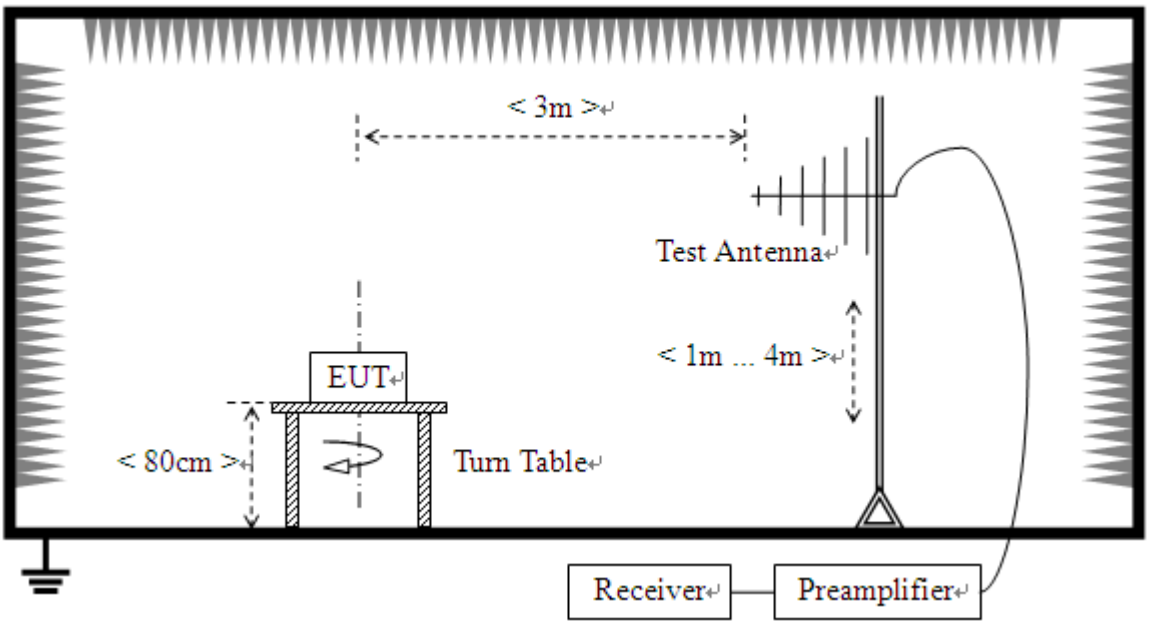
2.9.2. Test Description

A. Test Setup:

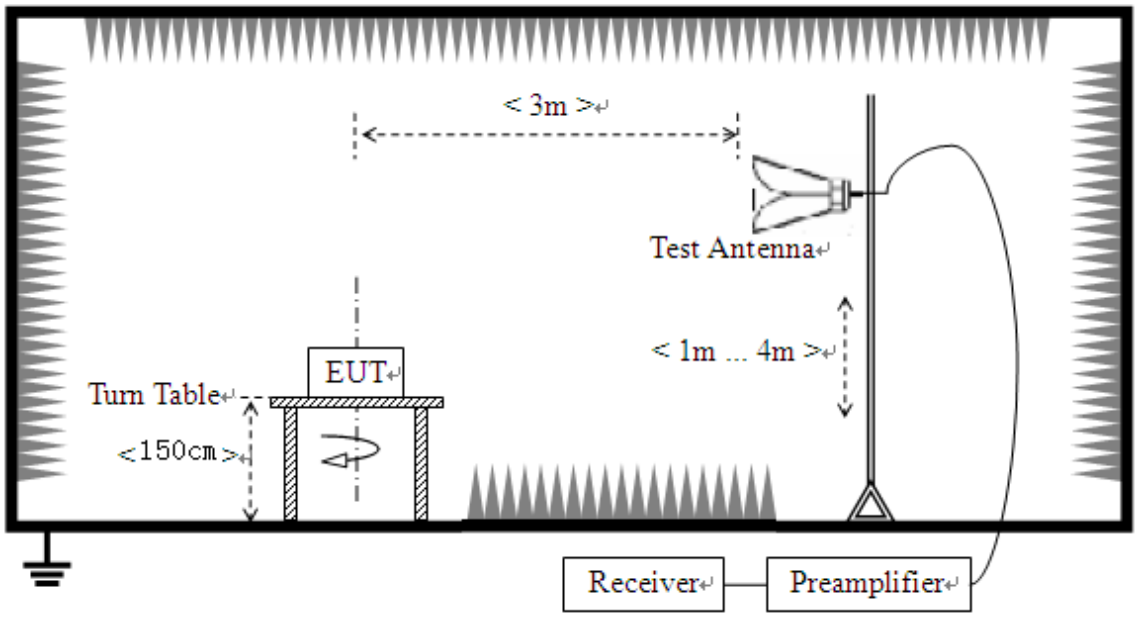
1) For radiated emissions from 9kHz to 30MHz



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

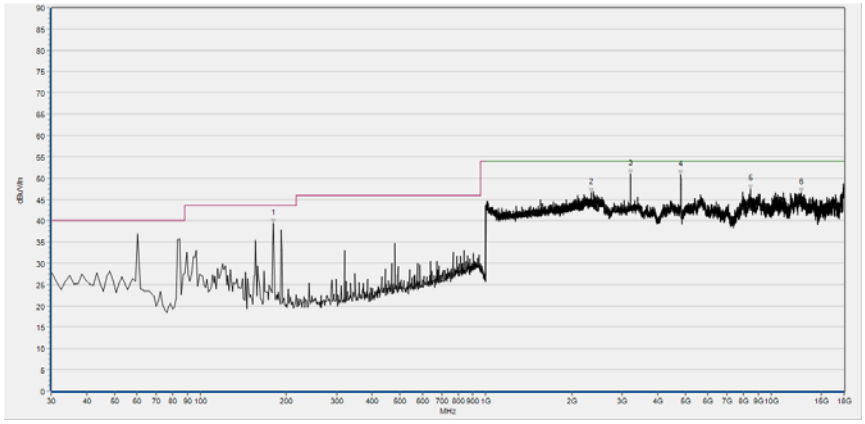
According to ANSI C63.10, because of peak detection will yield amplitudes equal to or greater than amplitudes measured with the quasi-peak (or average) detector, the measurement data from a spectrum analyzer peak detector will represent the worst-case results, if the peak measured value complies with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

The measurement results are obtained as below:
$E\ [dB\mu V/m] = U_R + A_T + A_{Factor}\ [dB]$; $A_T = L_{Cable\ loss}\ [dB] - G_{preamp}\ [dB]$
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 9 kHz 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 25GHz to 40GHz, was pre-scanned and the result which was 20dB lower than the limit was not recorded.

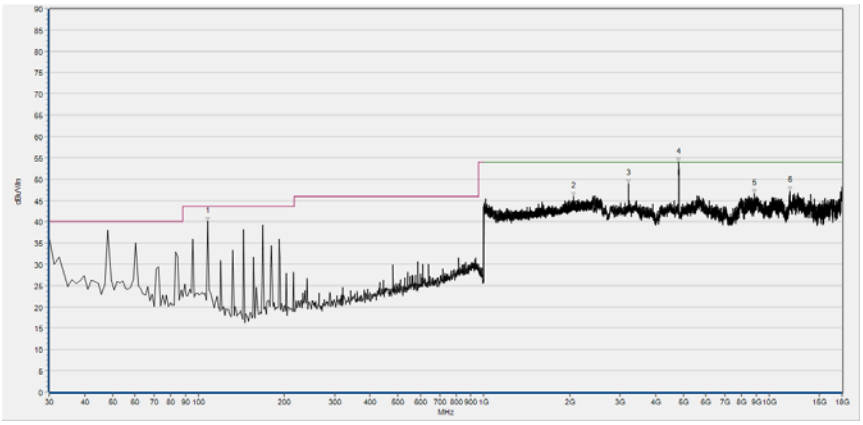
802.11b Test mode

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
180.538	39.40	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
2341.977	46.58	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
3215.900	51.95	N/A	47.61	74.00	N/A	54.00	Horizontal	PASS
4823.604	50.73	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8441.862	47.41	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12760.247	46.53	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

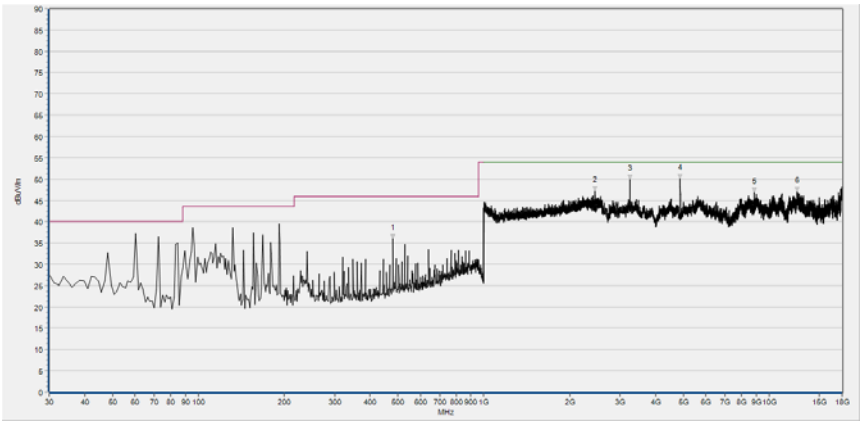
(Antenna Horizontal, 30MHz to 25GHz)



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
107.697	40.04	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
2060.264	45.97	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
3216.112	48.98	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4823.900	54.78	N/A	44.74	74.00	N/A	54.00	Vertical	PASS
8842.335	46.58	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
11833.279	47.26	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

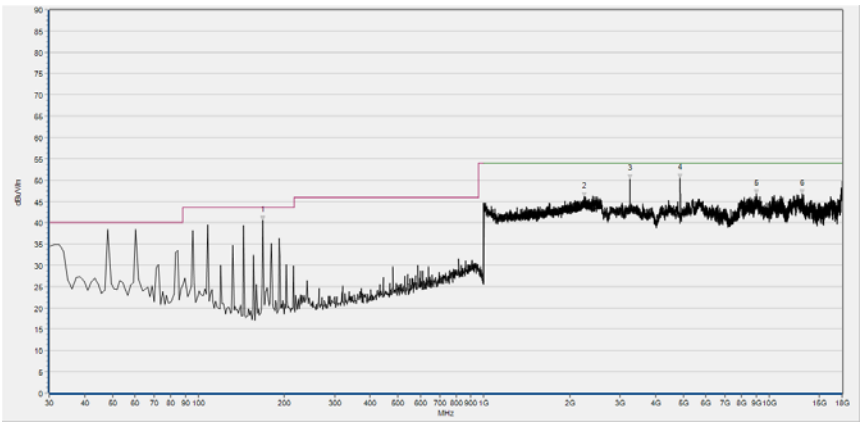
(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 7



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
480.401	36.00	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2450.180	47.23	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
3249.718	50.01	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4874.013	50.13	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8850.736	46.99	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12539.007	47.07	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

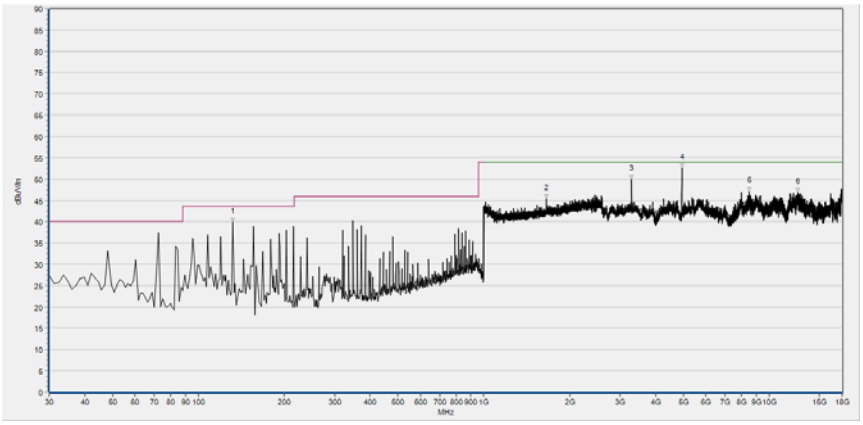
(Antenna Horizontal, 30MHz to 25GHz)



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
168.398	40.57	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
2251.701	46.03	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
3249.718	50.36	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4874.013	50.42	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
9010.366	46.69	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
13045.899	46.75	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

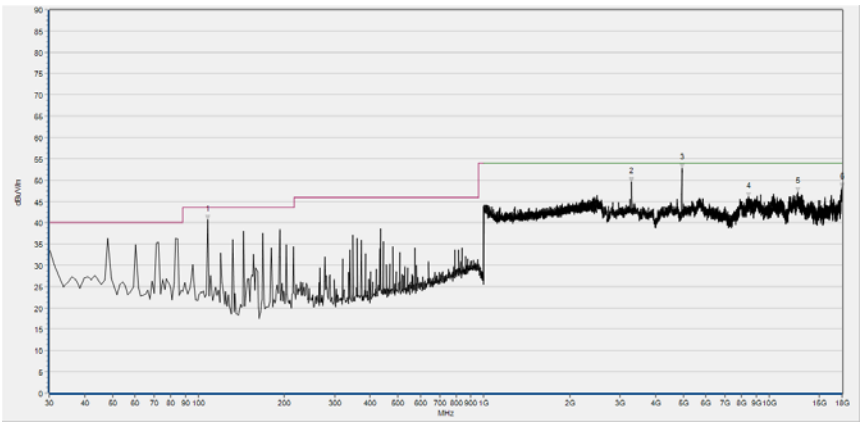
(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 13



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
131.977	39.85	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
1658.824	45.38	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
3294.526	49.94	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4944.100	52.11	N/A	44.70	74.00	N/A	54.00	Horizontal	PASS
8489.471	47.14	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12614.621	46.88	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 25GHz)

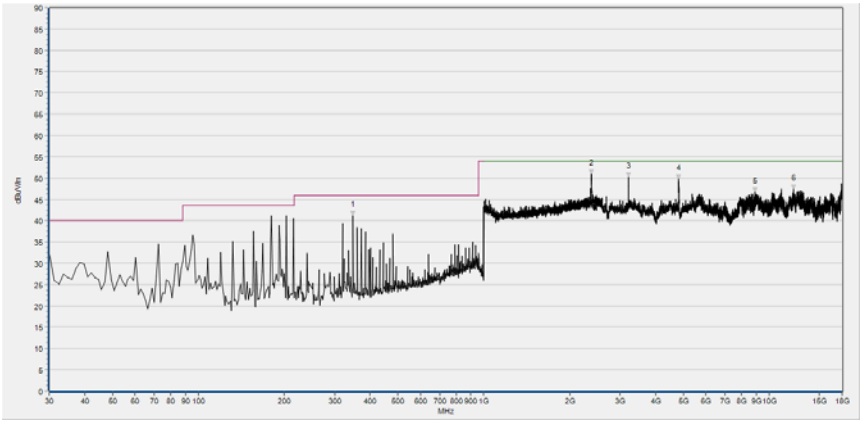


Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
107.697	40.72	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
3297.327	49.57	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4944.100	52.15	N/A	43.90	74.00	N/A	54.00	Vertical	PASS
8441.862	46.12	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12589.416	47.33	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
17957.992	48.28	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)

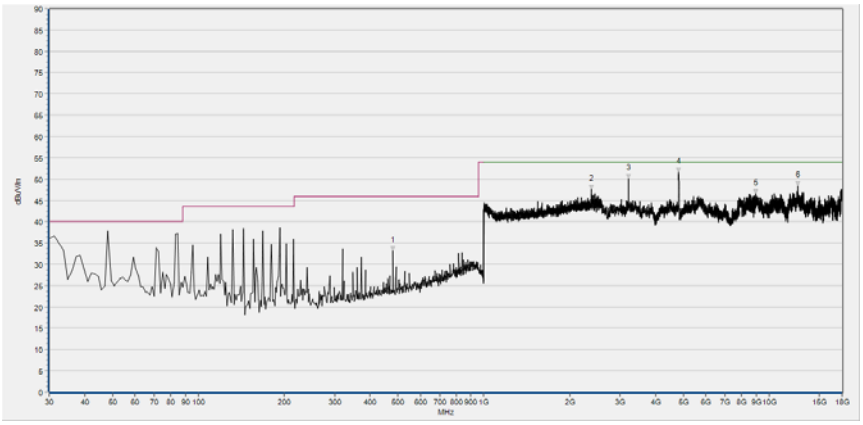
802.11g Test mode

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
348.073	41.28	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2379.112	50.88	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
3216.112	50.24	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4815.203	49.73	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8915.148	46.83	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12146.936	47.38	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

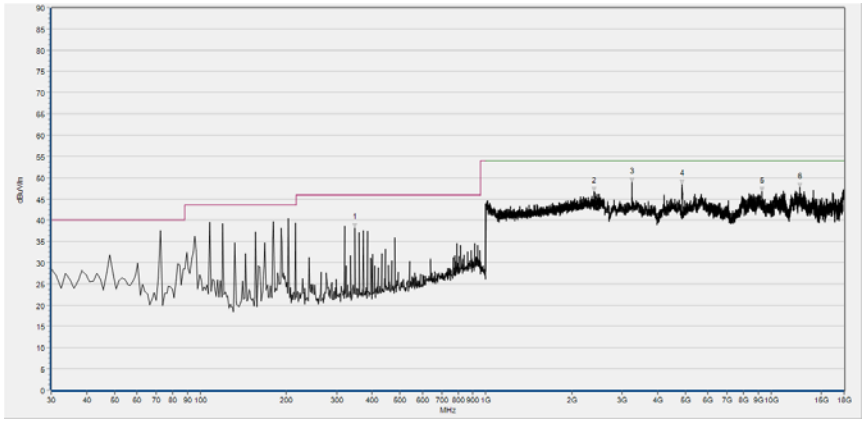
(Antenna Horizontal, 30MHz to 25GHz)



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
480.401	33.23	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2382.313	47.53	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
3213.312	50.14	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4820.900	52.01	N/A	41.24	74.00	N/A	54.00	Vertical	PASS
8945.954	46.67	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12597.818	48.36	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

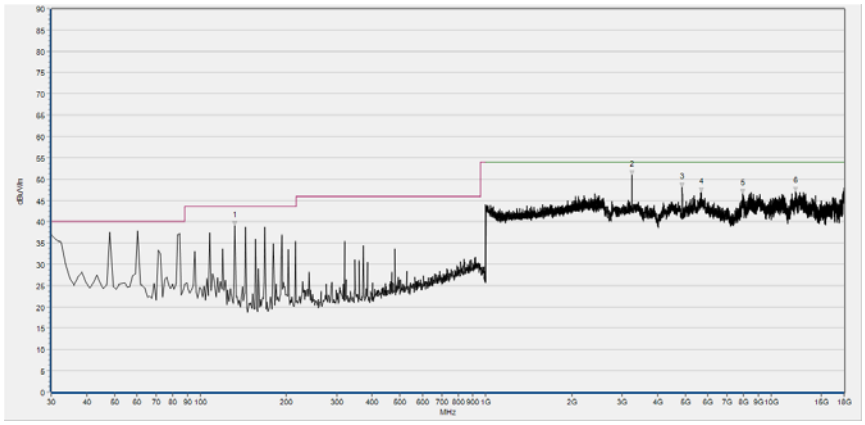
(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 7



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
348.073	38.28	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2389.356	46.75	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
3249.718	48.88	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4876.814	48.37	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
9282.015	46.80	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12603.419	47.74	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

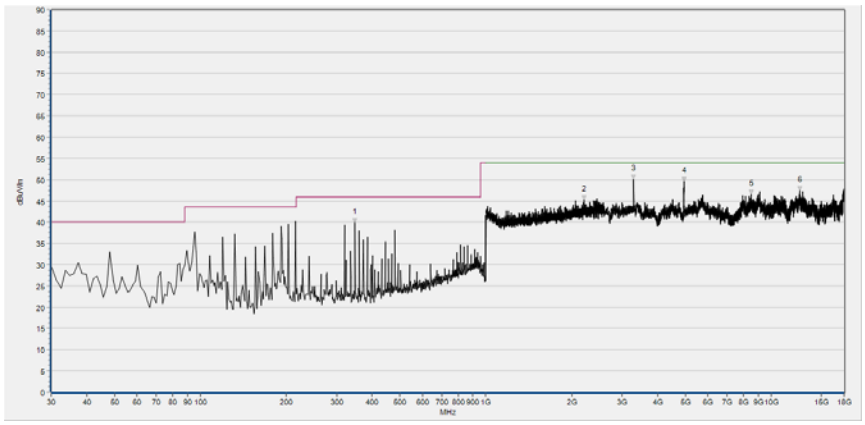
(Antenna Horizontal, 30MHz to 25GHz)



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
131.977	39.13	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
3249.400	51.25	N/A	44.07	74.00	N/A	54.00	Vertical	PASS
4874.013	48.05	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5680.560	46.92	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
7929.369	46.59	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12146.936	47.14	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

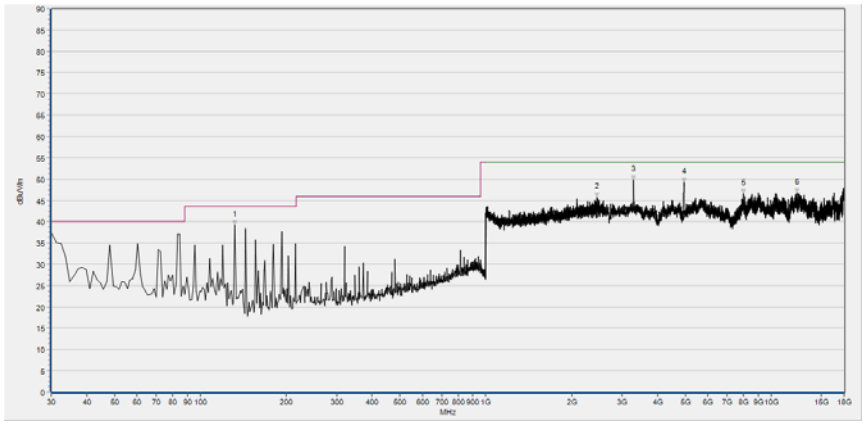
(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 13



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
348.073	39.91	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2210.084	45.30	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
3294.526	50.16	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4946.827	49.56	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8495.072	46.62	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12558.611	47.37	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 25GHz)

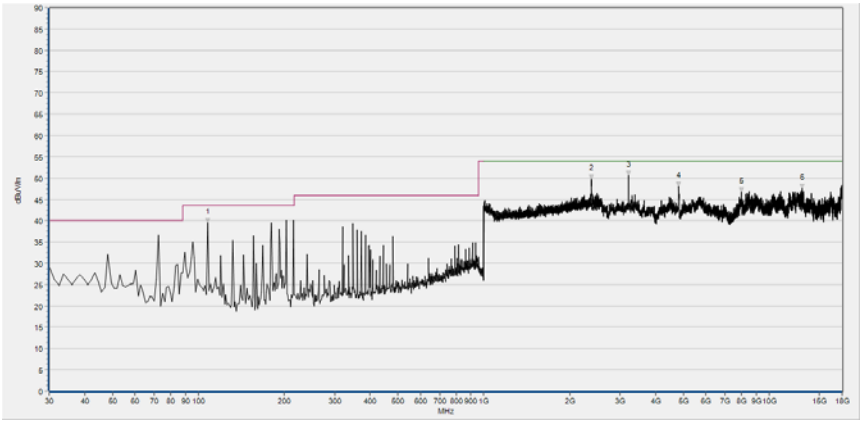


Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
131.977	39.30	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
2452.101	45.73	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
3294.526	49.73	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4941.226	49.30	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
7968.576	46.65	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12272.959	46.75	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)

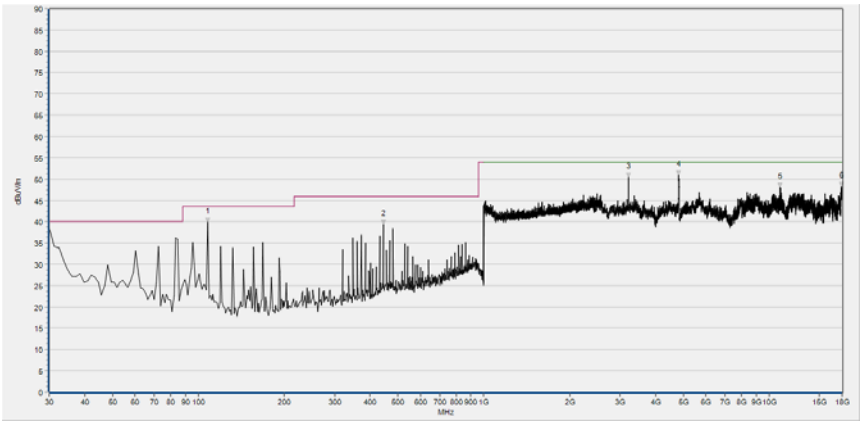
802.11n(HT20) Test mode

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
107.697	39.52	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
2384.234	49.81	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
3216.112	50.64	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4818.003	48.11	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8002.182	46.81	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
13048.700	47.56	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

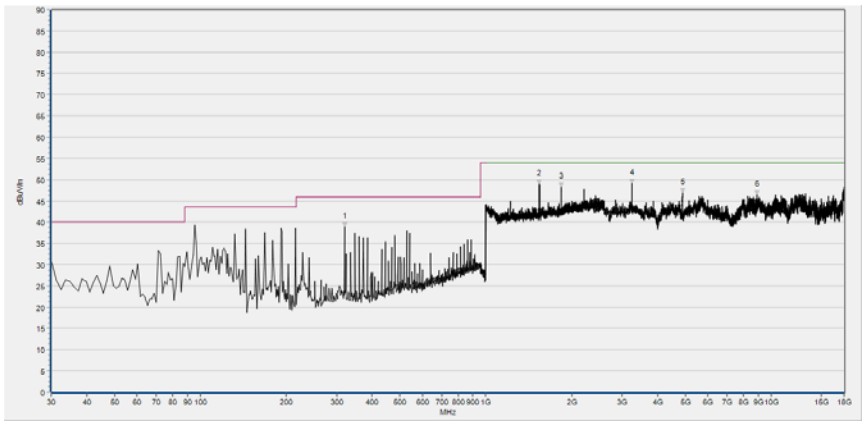
(Antenna Horizontal, 30MHz to 25GHz)



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
107.697	39.87	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
443.980	39.39	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
3216.112	50.37	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4815.203	50.91	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
10878.305	48.02	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
17924.386	48.27	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

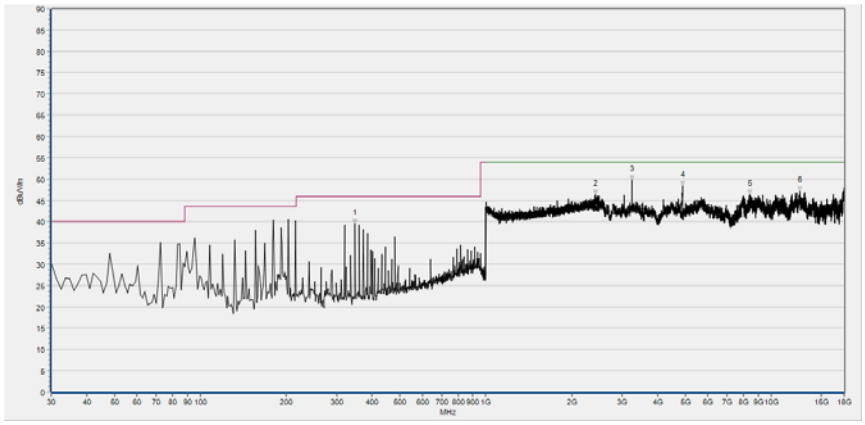
(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 7



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
320.150	38.93	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1533.974	48.99	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
1837.455	48.19	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
3249.718	49.07	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4882.415	46.90	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8912.348	46.45	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

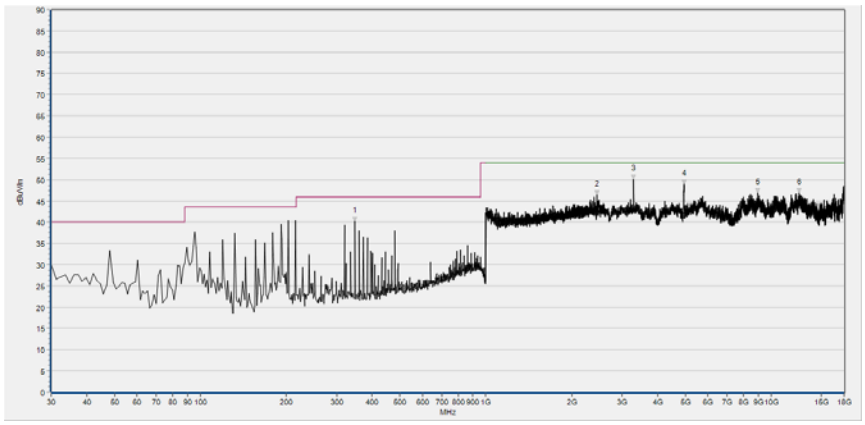
(Antenna Horizontal, 30MHz to 25GHz)



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
348.073	39.58	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2420.728	46.44	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
3249.718	49.83	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4882.415	48.46	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8430.660	46.38	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12623.022	47.19	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

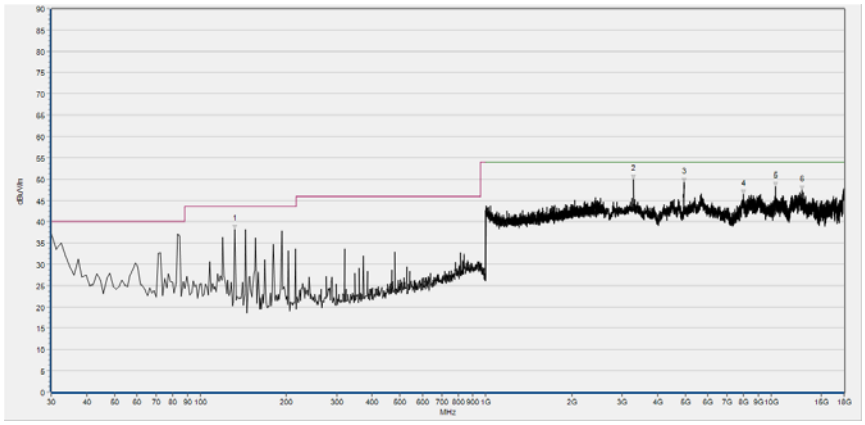
(Antenna Vertical, 30MHz to 25GHz)

Plot for Channel = 13



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
348.073	40.28	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2455.302	46.37	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
3294.526	50.04	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4941.226	48.86	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8954.355	46.85	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12499.800	46.99	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 25GHz)

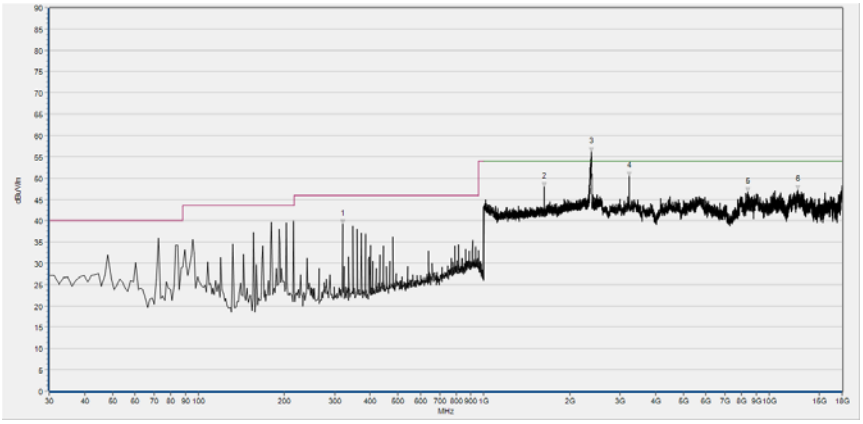


Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
131.977	38.29	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
3294.526	50.02	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4946.827	49.23	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
7990.980	46.38	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
10360.211	48.27	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12785.452	47.36	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)

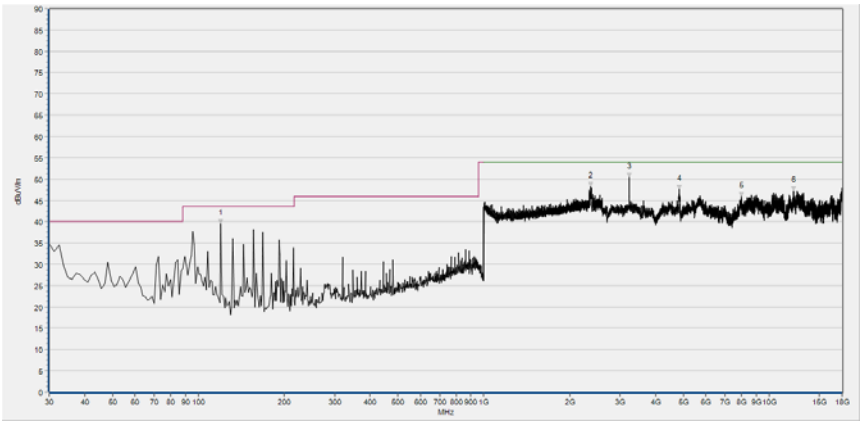
802.11n(HT40) Test mode

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
320.150	39.17	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1630.012	47.93	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2378.900	57.34	N/A	43.66	74.00	N/A	54.00	Horizontal	PASS
3230.115	50.50	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8433.461	46.73	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12606.219	47.25	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

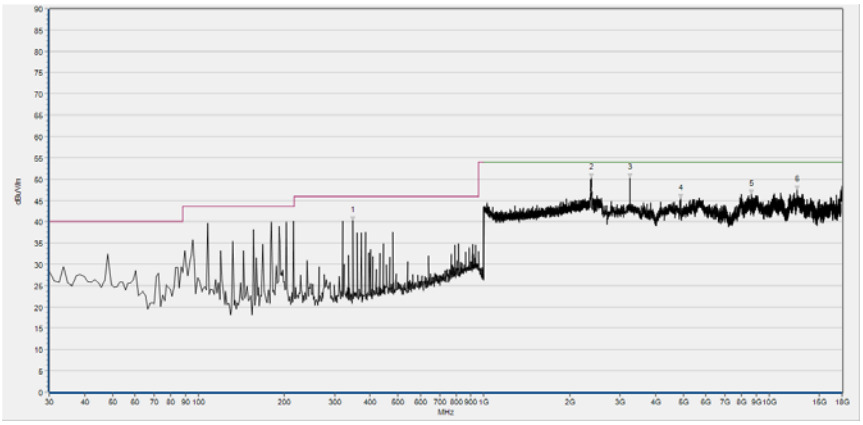
(Antenna Horizontal, 30MHz to 25GHz)



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
119.837	39.57	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
2372.709	48.20	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
3230.115	50.37	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4843.208	47.52	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
7996.581	45.88	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12194.544	47.32	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

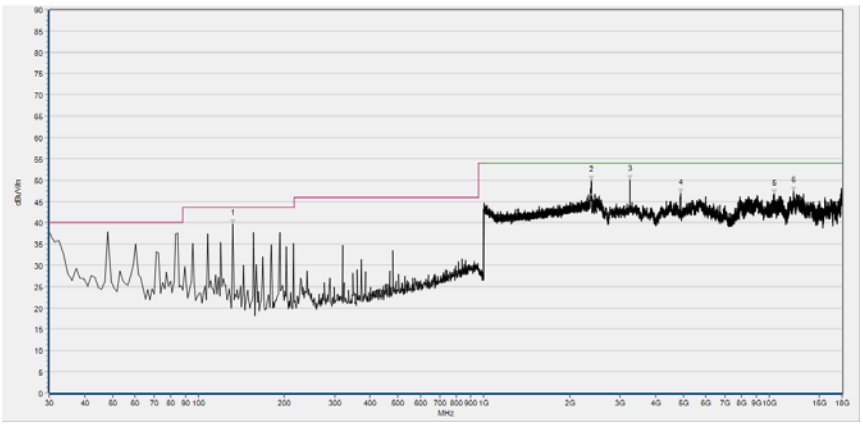
(Antenna Vertical, 30MHz to 25GHz)

Plots for Channel = 7



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
348.073	40.27	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2375.270	50.23	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
3249.718	50.36	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4879.614	45.37	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8665.903	46.46	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12511.002	47.40	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

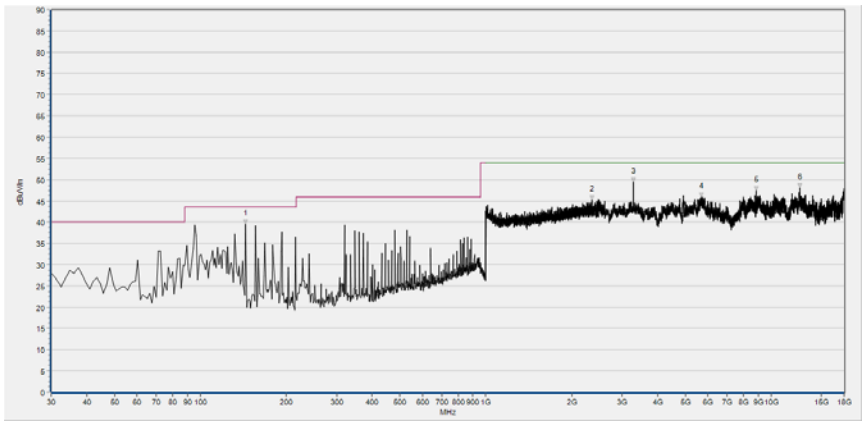
(Antenna Horizontal, 30MHz to 25GHz)



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
131.977	39.71	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
2375.910	50.00	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
3249.718	50.07	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4882.415	46.98	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
10430.224	46.70	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
12186.143	47.43	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

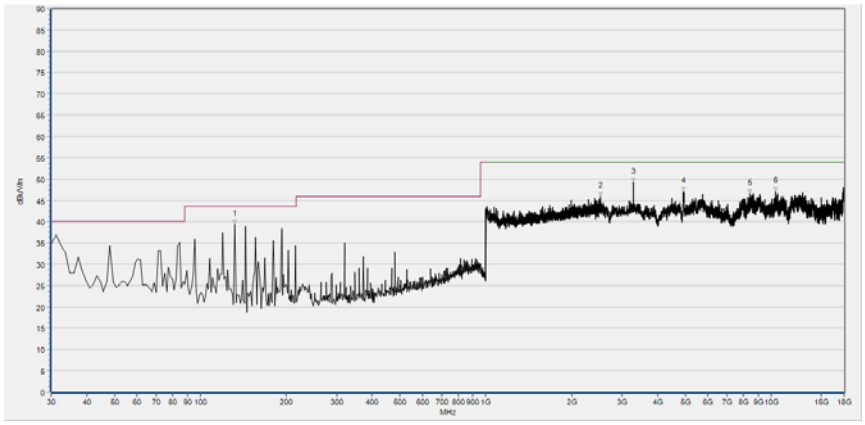
(Antenna Vertical, 30MHz to 25GHz)

Plots 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
144.118	49.55	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
2353.501	45.25	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
3283.324	49.40	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5691.762	45.88	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8836.734	47.42	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12600.618	48.05	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 25GHz)



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
131.977	39.41	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
2517.407	45.89	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
3283.324	49.28	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4932.824	47.17	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8430.660	46.66	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
10357.410	47.11	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)

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	±2.77 dB
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 C63.10-2013 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	Cal. Due
Attenuator 1	(N/A.)	10dB	Resnet	N/A	N/A
EXA Signal Analzyer	MY53470836	N9010A	Agilent	2019.04.09	2020.04.08
USB Wideband Power Sensor	MY54210011	U2021XA	Agilent	2019.04.16	2020.04.15
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	2019.05.08	2020.05.09
LISN	812744	NSLK 8127	Schwarzbeck	2019.05.08	2020.05.09
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	V 1.0

4.4 Radiated Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal. Due
Receiver	MY54130016	N9038A	Agilent	2019.07.26	2020.07.25
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2019.05.08	2020.05.09
Test Antenna - Loop	1519-022	FMZB1519	Schwarzbeck	2019.02.15	2020.02.14
Test Antenna – Horn	01774	BBHA 9120D	Schwarzbeck	2019.07.26	2020.07.25
Test Antenna – Horn	BBHA9170 #774	BBHA9170	Schwarzbeck	2019.07.26	2020.07.25
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
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	2018.12.01	2019.11.30
Anechoic Chamber	N/A	9m*6m*6m	CRT	2017.11.19	2020.11.18

END OF REPORT