REPORT No.: SZ18050094W03

TEST REPORT

APPLICANT	:	Thundercomm Technology Co., Ltd
PRODUCT NAME	:	Thundersoft TurboX S626 SOM
MODEL NAME	:	TurboX S626
BRAND NAME	:	TurboX
FCC ID	:	2AOHHTURBOXSOMS626
STANDARD(S)	:	47 CFR Part 15 Subpart C
TEST DATE	:	2018-05-24 to 2018-05-31
ISSUE DATE	:	2018-06-12

Tested by: Su Hang

Su Hang (Test Engineer)

Approved by: Andy Yeh

Andy Yeh (Technical Director)

MORLAB

SHENZHEN MORLAB COMMUNICATIONS TECHNOLOGY Co., Ltd.
FL1-3, Building A, FeiYang Science Park, No.8 LongChang Road,
Block67, BaoAn District, ShenZhen , GuangDong Province, P. R. China

Tel: 86-755-36698555 Fax: 86-755-36698525

Http://www.morlab.cn E-mail: service@morlab.cn

DIRECTORY

Change History		
Issue	**Date**	**Reason for change**
1.0	2018-06-12	First edition

1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	Thundercomm Technology Co., Ltd
Applicant Address:	4 floor, Taixiang Building 1A# Longxiang Road Haidian District Beijing, China,100191
Manufacturer:	Thundercomm Technology Co., Ltd
Manufacturer Address:	4 floor, Taixiang Building 1A# Longxiang Road Haidian District Beijing, China,100191

1.2. Equipment Under Test (EUT) Description

Product Name:	Thundersoft TurboX S626 SOM
Serial No:	(N/A, marked #1 by test site)
Hardware Version:	S625_SOM_V03
Software Version:	N/A
Modulation Type:	DSSS, OFDM
Operating Frequency Range:	802.11b/g/n-20MHz: 2.412GHz - 2.462GHz 802.11n-40MHz: 2.422GHz - 2.452GHz
Channel Number:	802.11b/g/n-20MHz: 11 802.11n-40MHz: 7
Antenna Type:	PCB Antenna **Note2**
Antenna Gain:	4 dBi **Note2**

Note 1: The EUT is operating at 2.4GHz ISM; it supports 802.11b, 802.11g, 802.11n and they are all tested in this report.

For 802.11b/g/n-20MHz (2.4GHz band), the frequencies allocated is F (MHz) =2412+5*(n-1) (1<=n<=11). The lowest, middle, highest channel numbers of the EUT used and tested in this report are separately 1 (2412MHz), 6 (2437MHz) and 11 (2462MHz).

For 802.11n-40MHz, the frequencies allocated is F (MHz) =2412+5*(n-1) (3<=n<=9). The lowest, middle, highest channel numbers of the EUT used and tested in this report are separately 3 (2422MHz), 6 (2437MHz) and 9 (2452MHz).

Note 2: The product will not sell with antenna. The antennas we use for all radiated test were just for test, the antenna type is PCB antenna and the antenna gain is 4 dBi. For more detailed, please refer to the internal photos.

Note 3: The EUT connected to the serial port of the computer with a serial communication cable, we use the dedicated software to control the EUT continuous transmission.
Note 4: For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

1.3. 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 (10-1-15 Edition)	Radio Frequency Devices

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

No.	Section	Description	Test Date	Test Engineer	Result
1	15.203	Antenna Requirement	N/A	N/A	PASS
2	15.247(b)	Peak Output Power	May 23, 2018	Su Hang	PASS
3	15.247(a)	Bandwidth	May 23, 2018	Su Hang	PASS
4	15.247(d)	Conducted Spurious Emission and Band Edge	May 23, 2018	Su Hang	PASS
5	15.247(e)	Power spectral density (PSD)	May 23, 2018	Su Hang	PASS
6	15.247(d)	Restricted Frequency Bands	May 30, 2018	Peng Xuewei	PASS
7	15.207	Conducted Emission	May 24, 2018	Peng Xuewei	PASS
8	15.209, 15.247(d)	Radiated Emission	May 30, 2018	Peng Xuewei	PASS
Note: The tests of Conducted Emission and Radiated Emission were performed according to the method of measurements prescribed in ANSI C63.10 2013 and KDB558074 D01 v04 (04/05/2017).					

1.4. 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. Peak Output Power

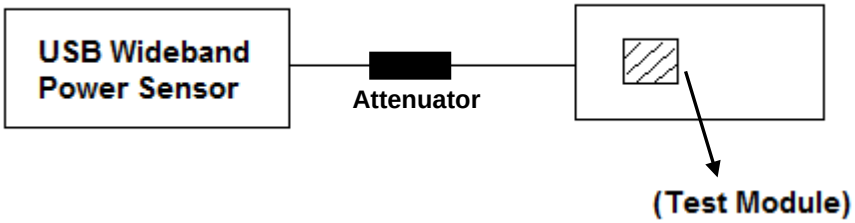
2.2.1. Requirement

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.

2.2.2. 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.

B. Equipments List:

Please refer ANNEX A(1.5).

2.2.3. Test Result

2.2.3.1 802.11b Test Mode

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
1	2412	14.88	0.0308	30	1	PASS
6	2437	14.52	0.0283			PASS
11	2462	14.41	0.0276			PASS

Channel	Frequency (MHz)	Measured Output Average Power		Limit		Verdict
		dBm	W	dBm	W	
1	2412	11.98	0.0158	30	1	PASS
6	2437	11.65	0.0146			PASS
11	2462	11.61	0.0145			PASS

2.2.3.2 802.11g Test mode

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
1	2412	19.79	0.0953	30	1	PASS
6	2437	19.61	0.0914			PASS
11	2462	19.98	0.0995			PASS

Channel	Frequency (MHz)	Measured Output Average Power		Limit		Verdict
		dBm	W	dBm	W	
1	2412	9.98	0.0100	30	1	PASS
6	2437	9.88	0.0097			PASS
11	2462	10.14	0.0103			PASS

2.2.3.3 802.11n-20MHz Test mode

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
1	2412	19.67	0.0927	30	1	PASS
6	2437	19.42	0.0875			PASS
11	2462	19.64	0.0920			PASS

Channel	Frequency (MHz)	Measured Output Average Power		Limit		Verdict
		dBm	W	dBm	W	
1	2412	10.01	0.0100	30	1	PASS
6	2437	9.87	0.0097			PASS
11	2462	10.20	0.0105			PASS

2.2.3.4 802.11n-40MHz Test mode

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
3	2422	19.19	0.0830	30	1	PASS
6	2437	18.79	0.0757			PASS
9	2452	19.47	0.0885			PASS

Channel	Frequency (MHz)	Measured Output Average Power		Limit		Verdict
		dBm	W	dBm	W	
3	2422	9.20	0.0083	30	1	PASS
6	2437	9.27	0.0085			PASS
9	2452	9.19	0.0083			PASS

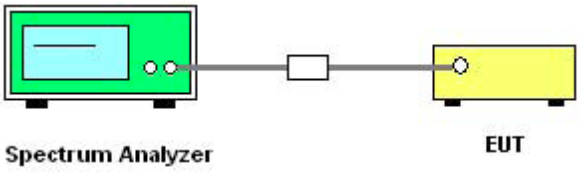
2.3. Bandwidth

2.3.1. 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.

2.3.2. 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.

KDB 558074 Section 8.1 Option 1 was used in order to prove compliance.

B. Equipments List:

Please refer ANNEX A(1.5).

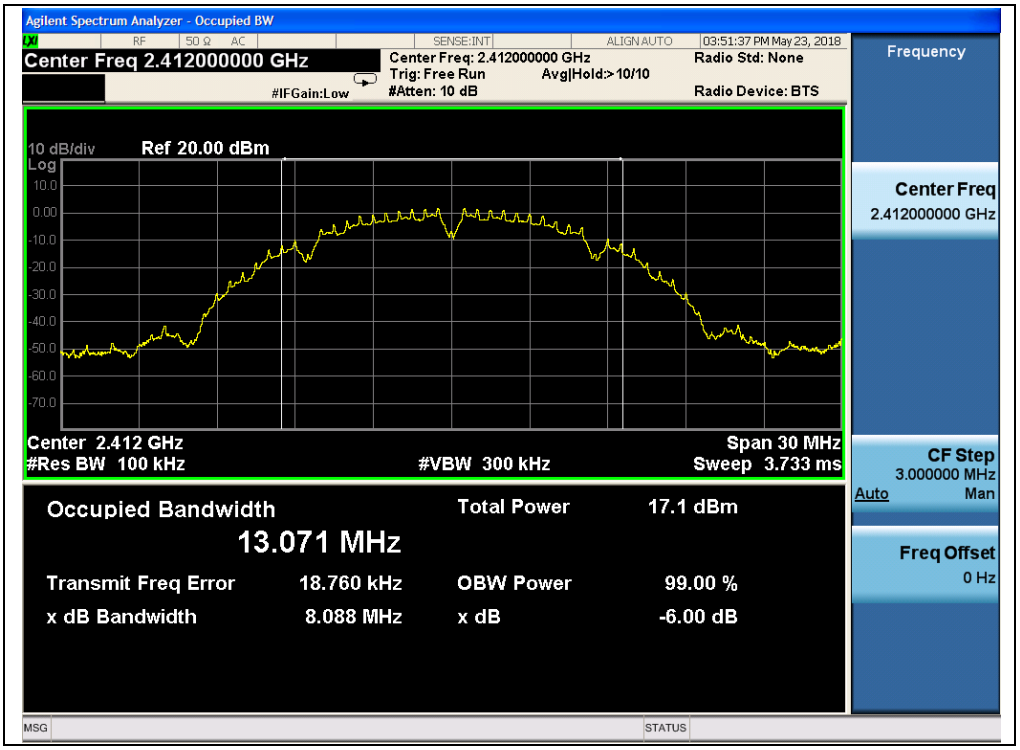
2.3.3. Test Result

2.3.3.1 802.11b Test mode

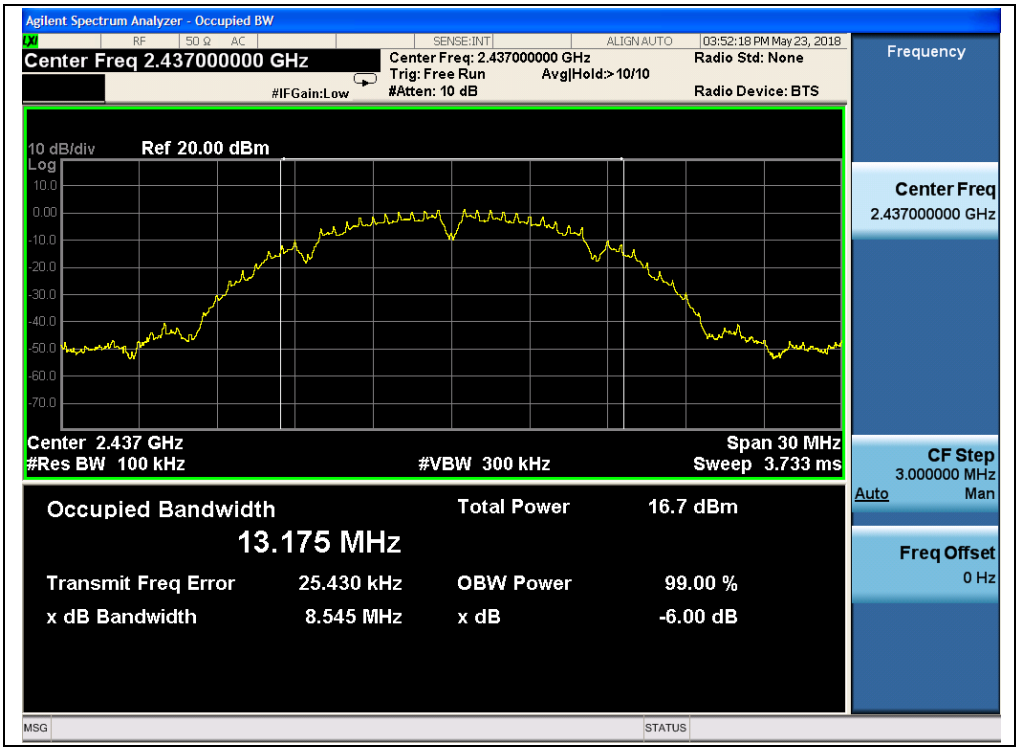
A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits(kHz)	Result
1	2412	8.088	≥500	PASS
6	2437	8.545	≥500	PASS
11	2462	8.543	≥500	PASS

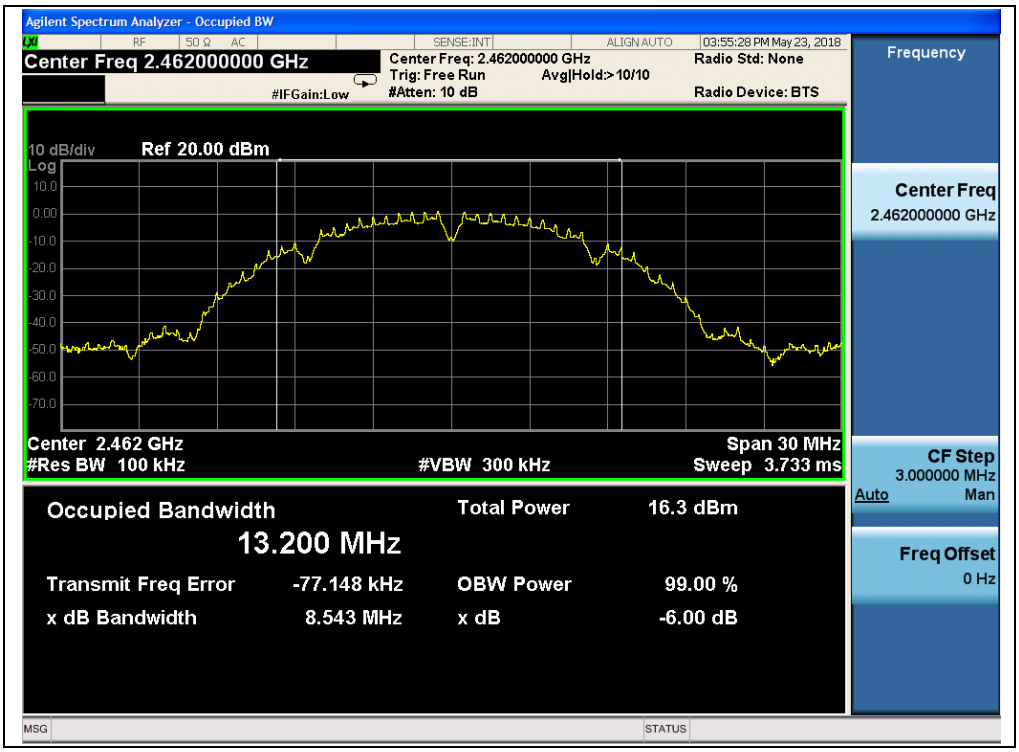
B. Test Plots



(Channel 1, 2412MHz, 802.11b)



(Channel 6, 2437 MHz, 802.11b)



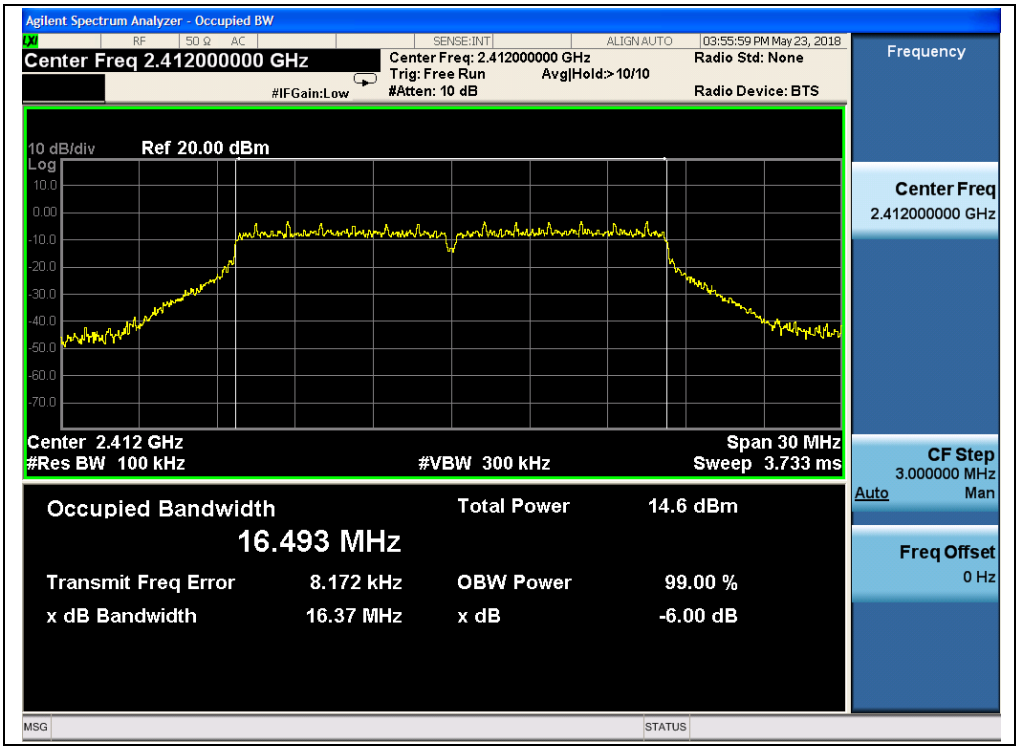
(Channel 11, 2462MHz, 802.11b)

2.3.3.2 802.11g Test mode

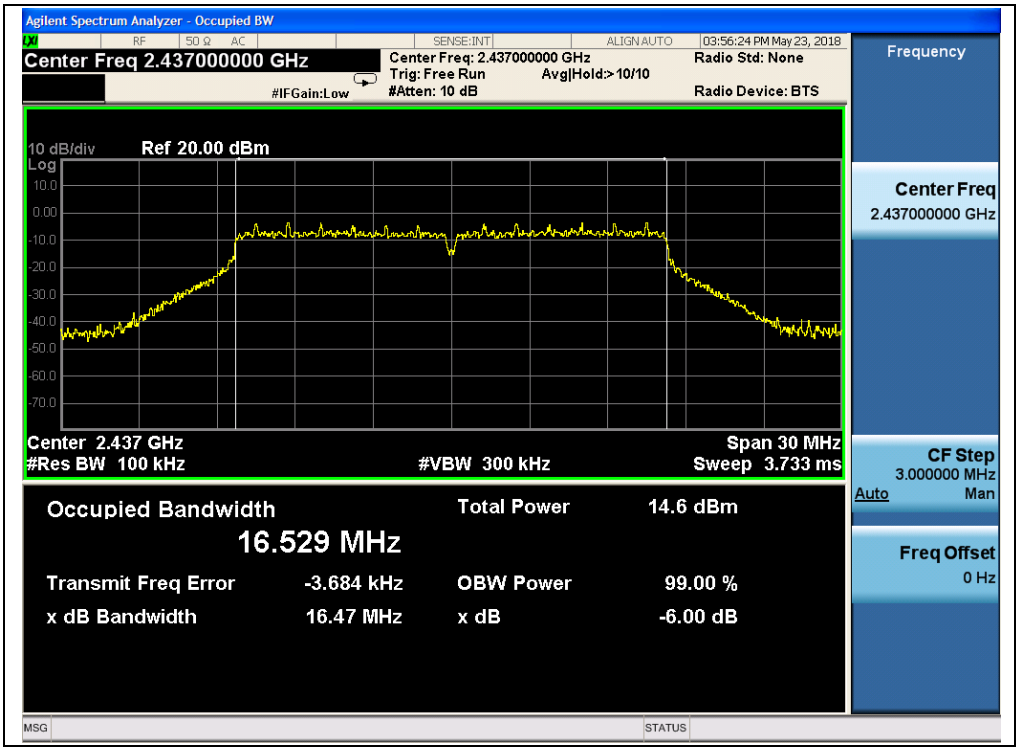
A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits (kHz)	Result
1	2412	16.37	≥500	PASS
6	2437	16.47	≥500	PASS
11	2462	16.39	≥500	PASS

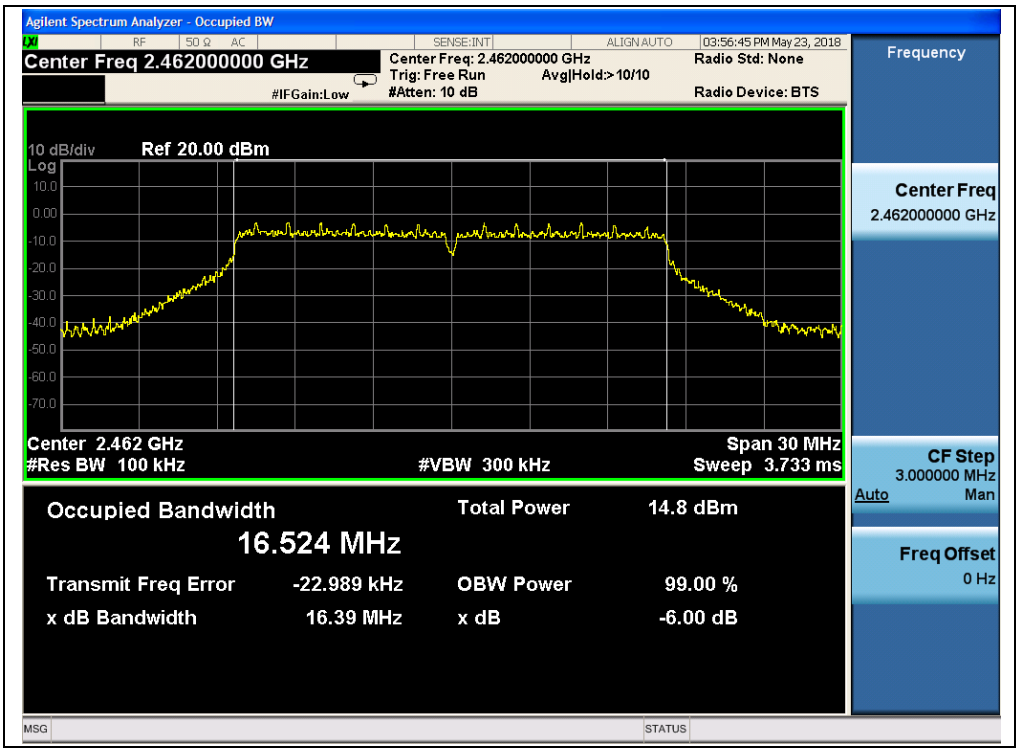
B. Test Plots:



(Channel 1, 2412MHz, 802.11g)



(Channel 6, 2437MHz, 802.11g)



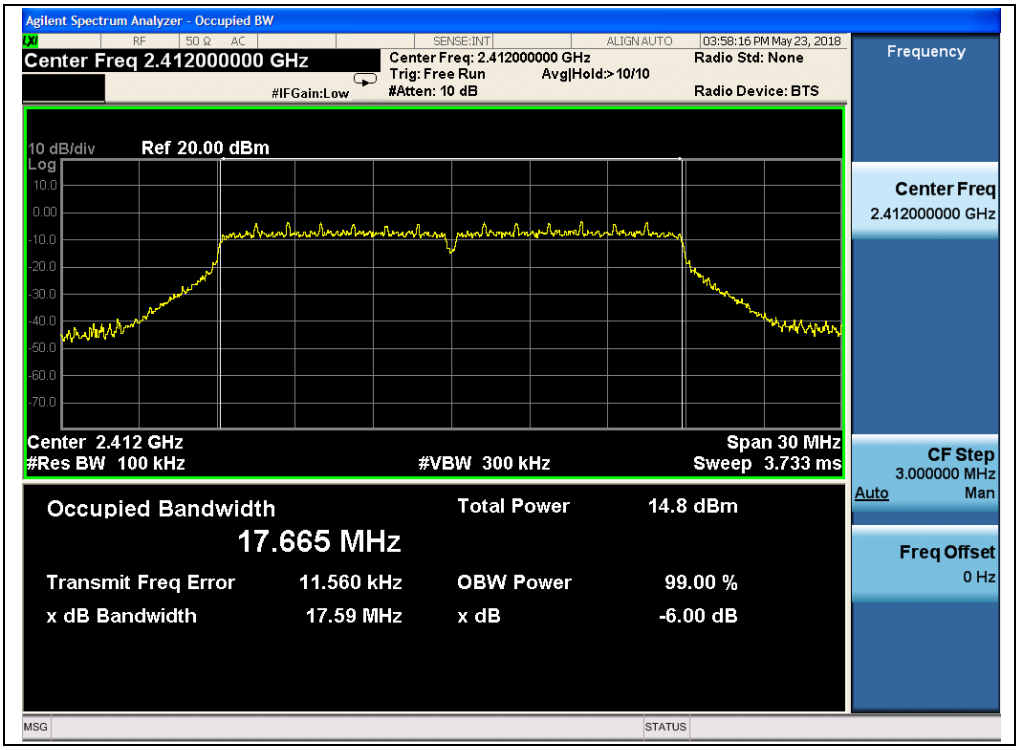
(Channel 11, 2462MHz, 802.11g)

2.3.3.3 802.11n-20 Test mode

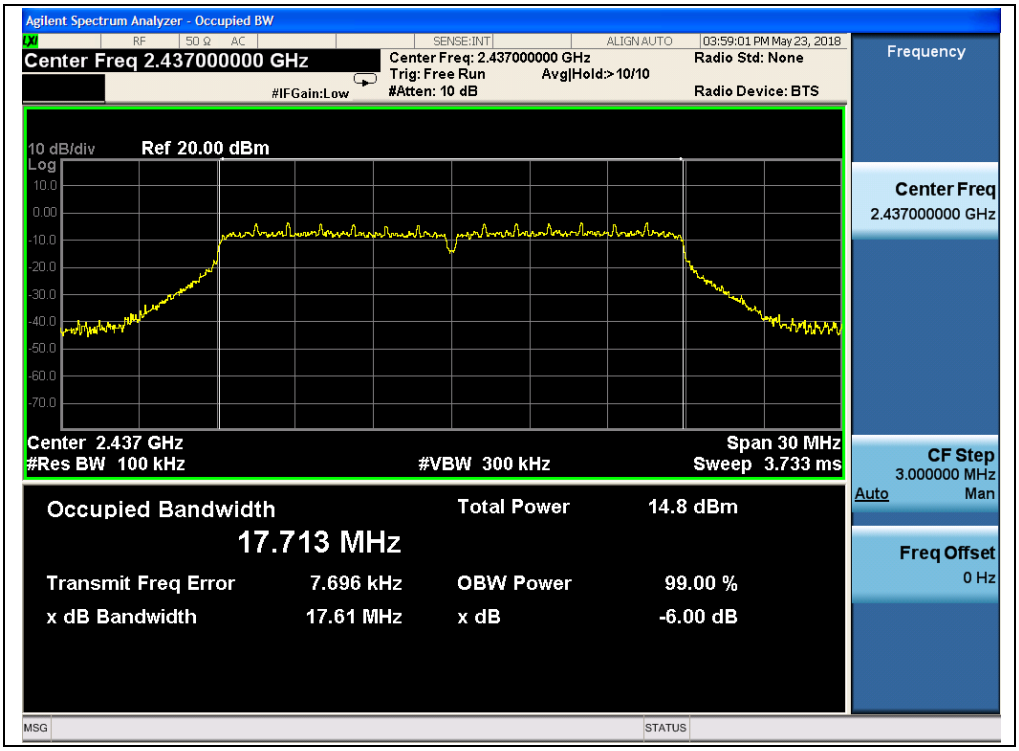
A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits (kHz)	Result
1	2412	17.59	≥500	PASS
6	2437	17.61	≥500	PASS
11	2462	17.59	≥500	PASS

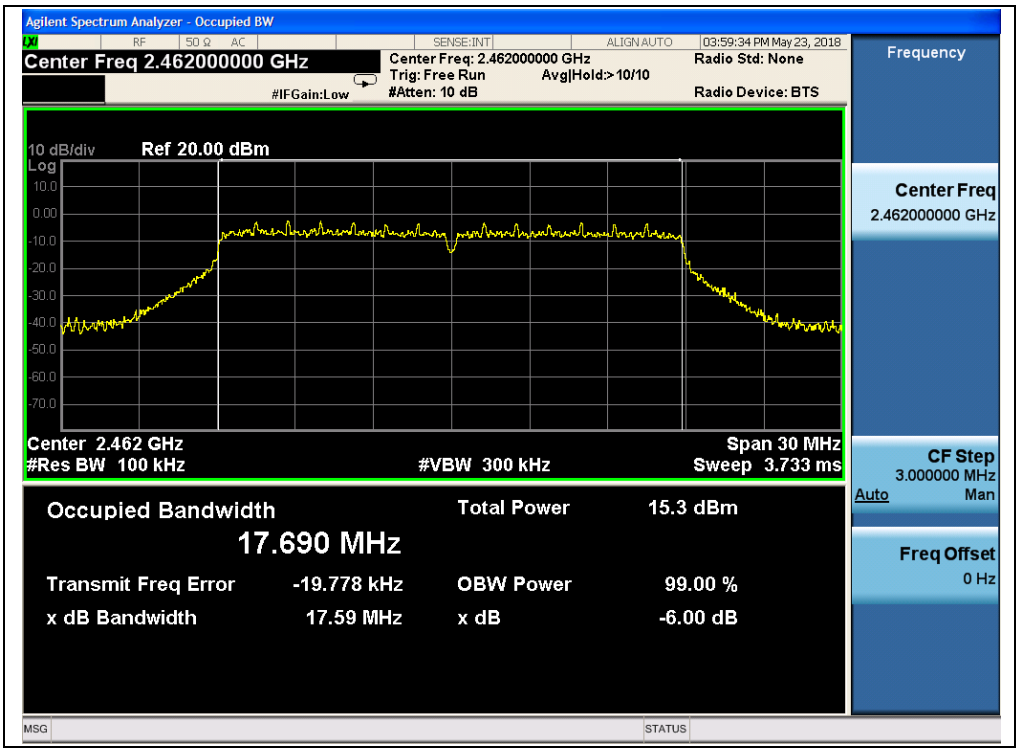
B. Test Plots:



(Channel 1, 2412MHz, 802.11n-20)



(Channel 6, 2437MHz, 802.11n-20)



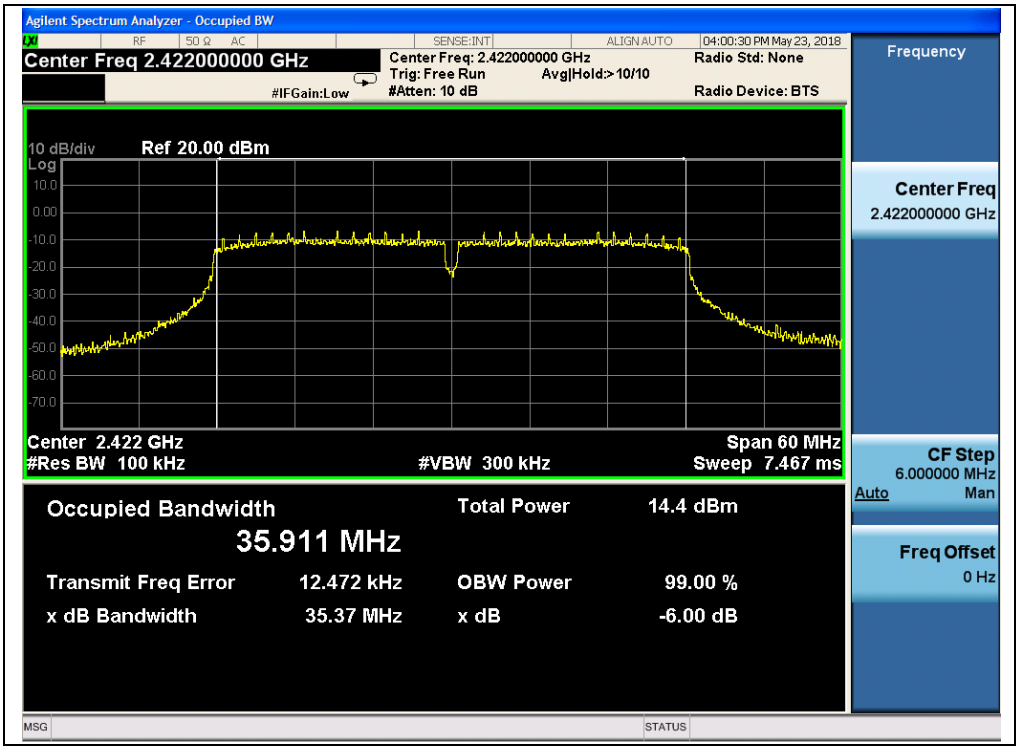
(Channel 11, 2462MHz, 802.11n-20)

2.3.3.4 802.11n-40 Test mode

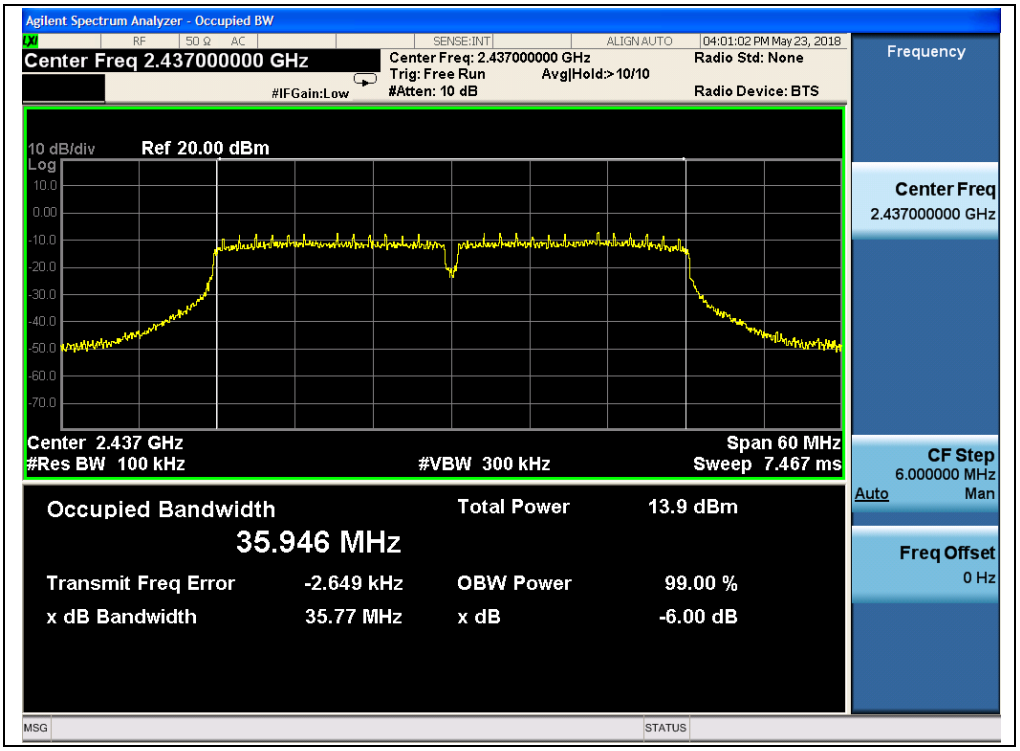
A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits (kHz)	Result
3	2422	35.37	≥500	PASS
6	2437	35.77	≥500	PASS
9	2452	35.33	≥500	PASS

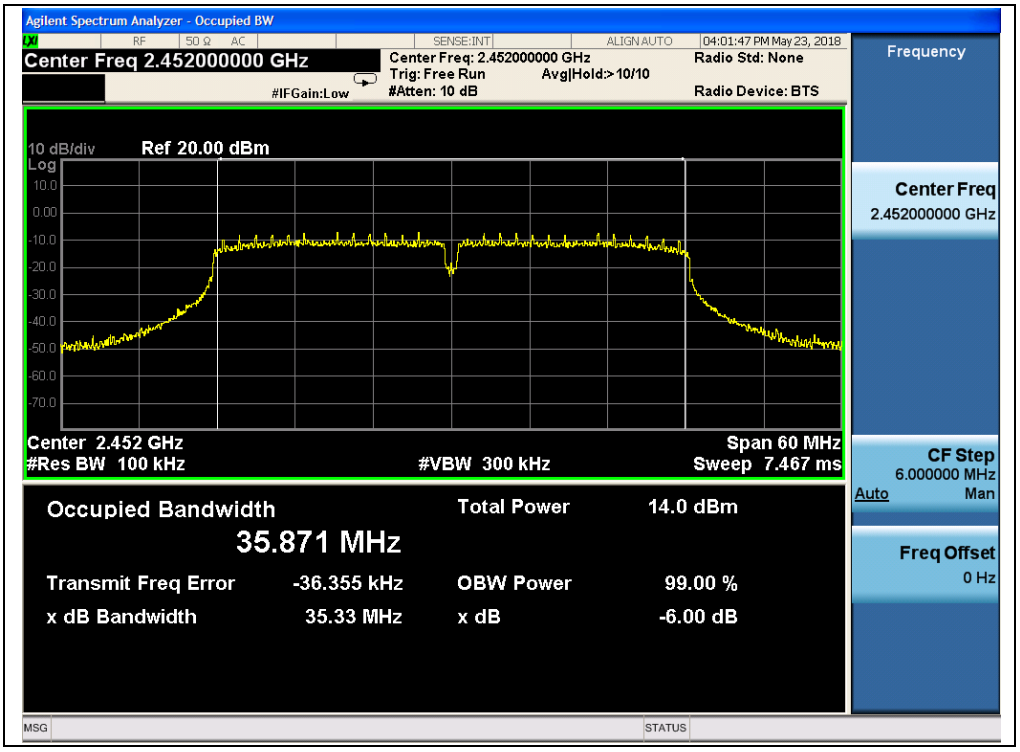
B. Test Plots:



(Channel 3, 2422Mz, 802.11n-40)



(Channel 6, 2437MHz, 802.11n-40)



(Channel 9, 2452MHz, 802.11n-40)

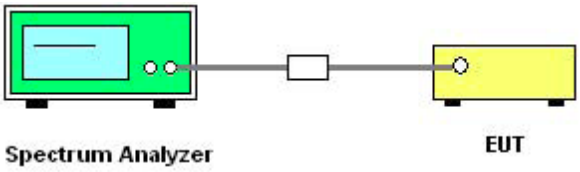
2.4. Conducted Spurious Emissions and Band Edge

2.4.1. 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.

2.4.2. 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.

KDB 558074 Section 11.0 was used in order to prove compliance.

B. Equipments List:

Please refer ANNEX A(1.5).

2.4.3. Test Result

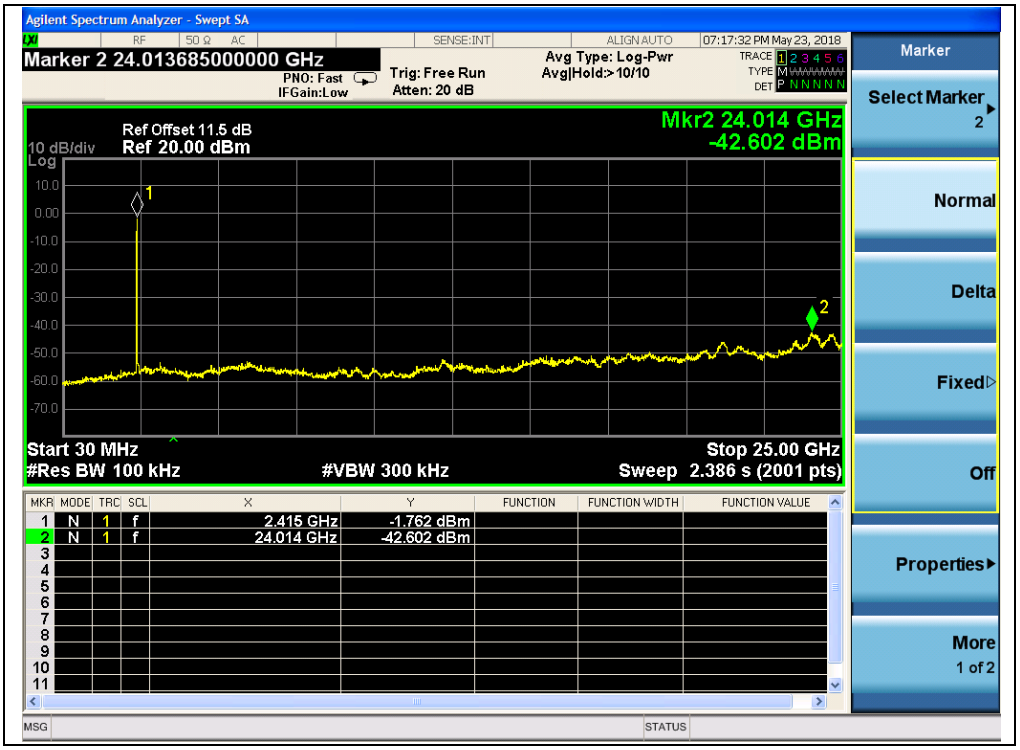
2.4.3.1 802.11b Test mode

A. Test Verdict:

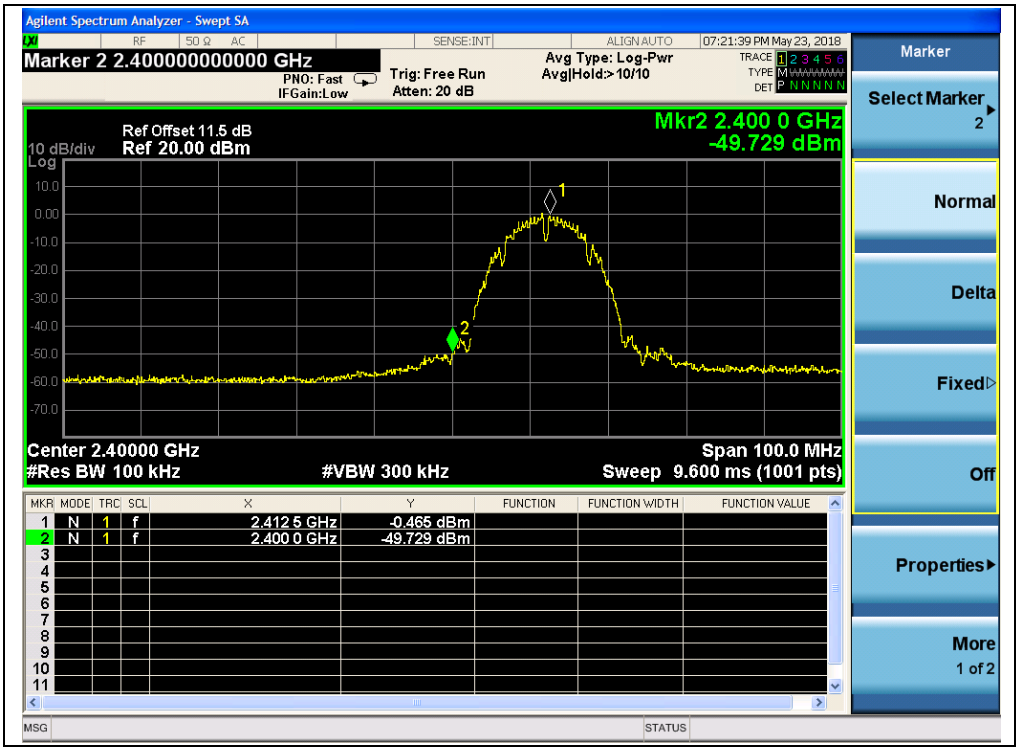
Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-42.60	-1.76	-21.76	PASS
6	2437	-43.04	-1.25	-21.25	PASS
11	2462	-43.03	-0.81	-20.81	PASS

B. Test Plots:

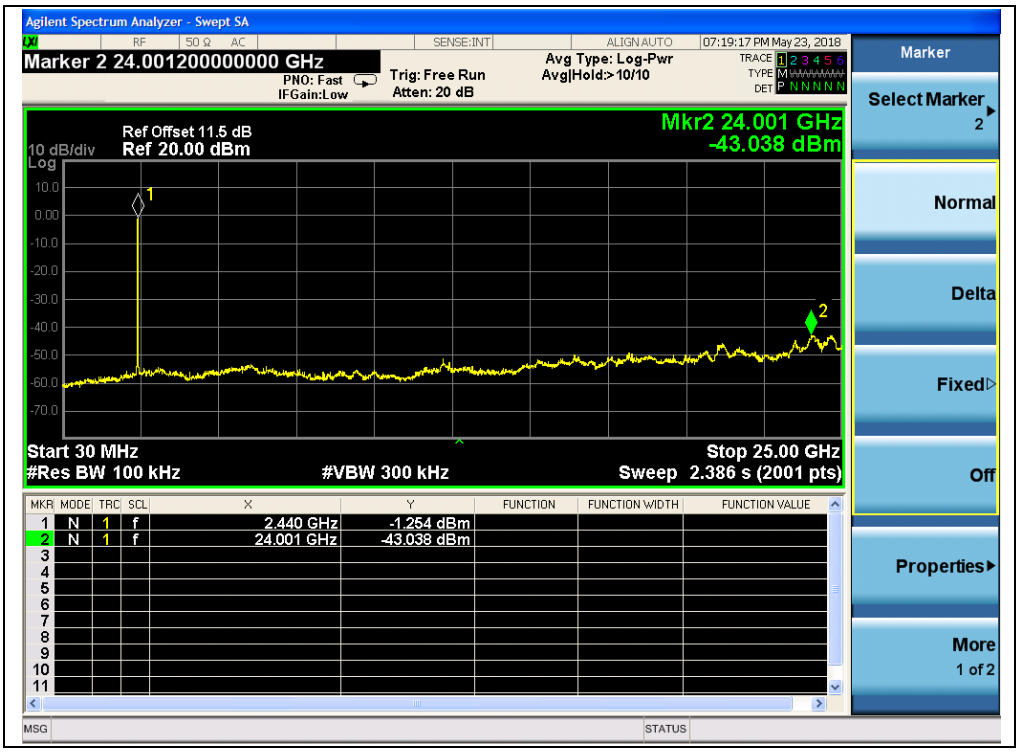
Note: The power of the Module transmitting frequency should be ignored.



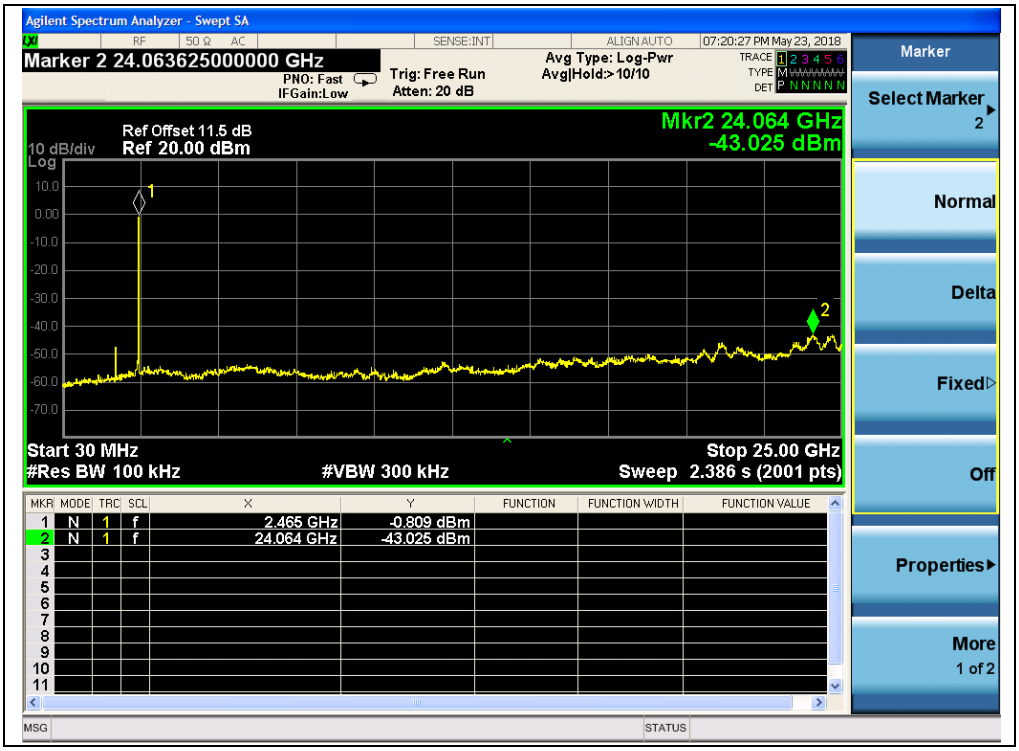
(Channel = 1, 30MHz to 25GHz)



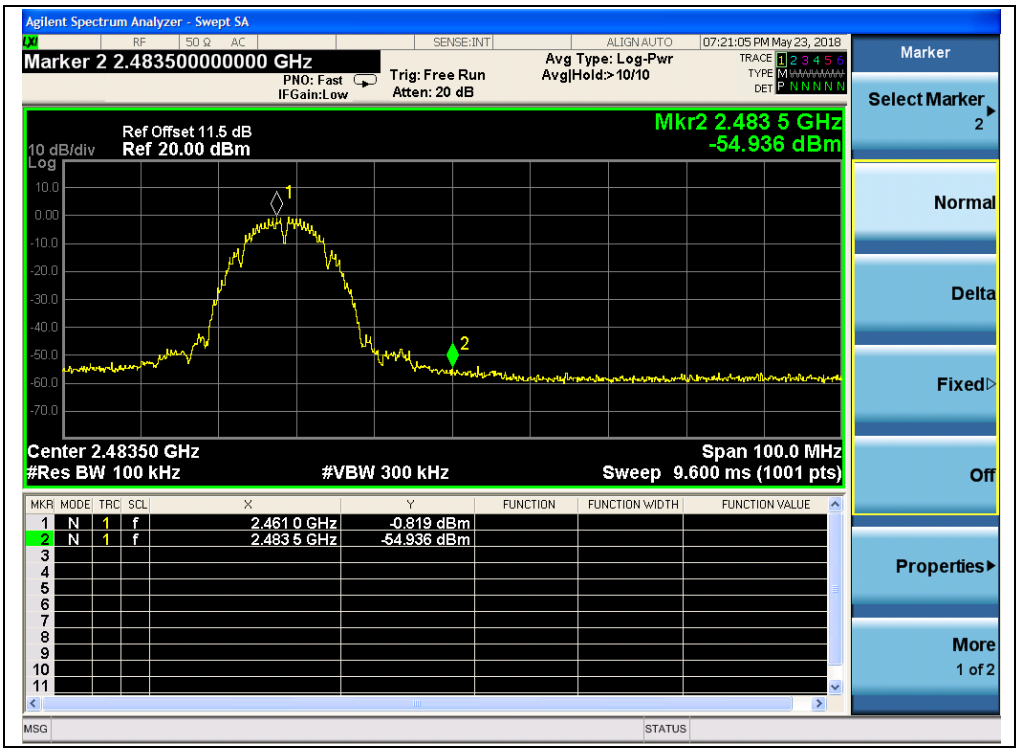
(Band Edge @ Channel = 1)



(Channel = 6, 30MHz to 25GHz)



(Channel = 11, 30MHz to 25GHz)



(Band Edge @ Channel = 11)

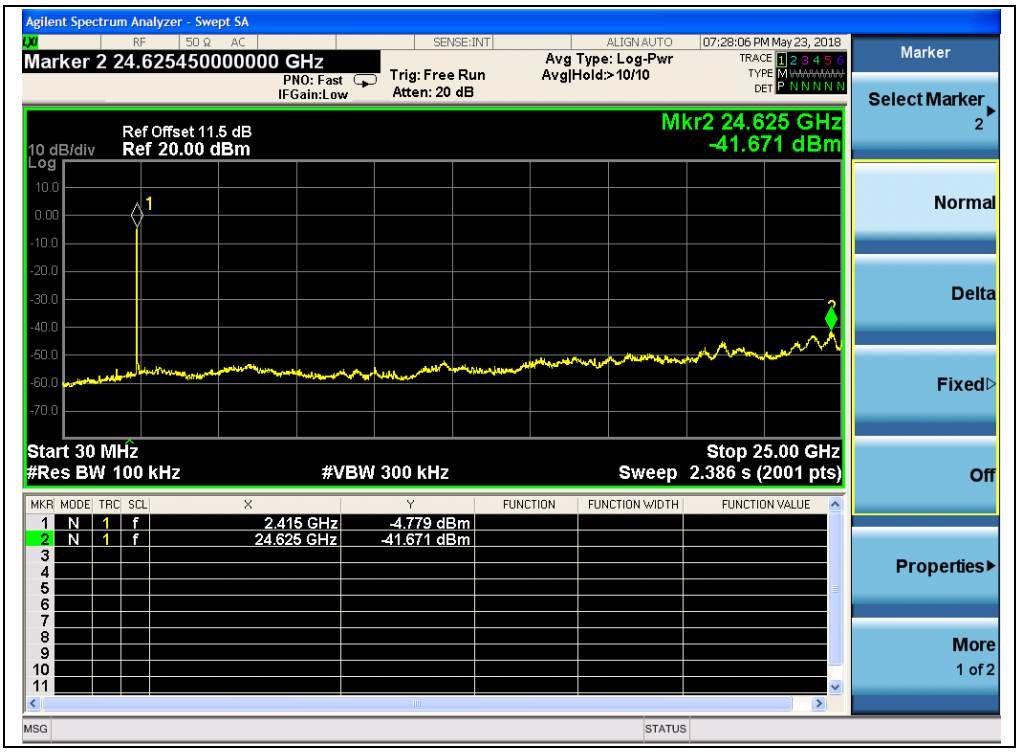
2.4.3.2 802.11g Test mode

A. Test Verdict:

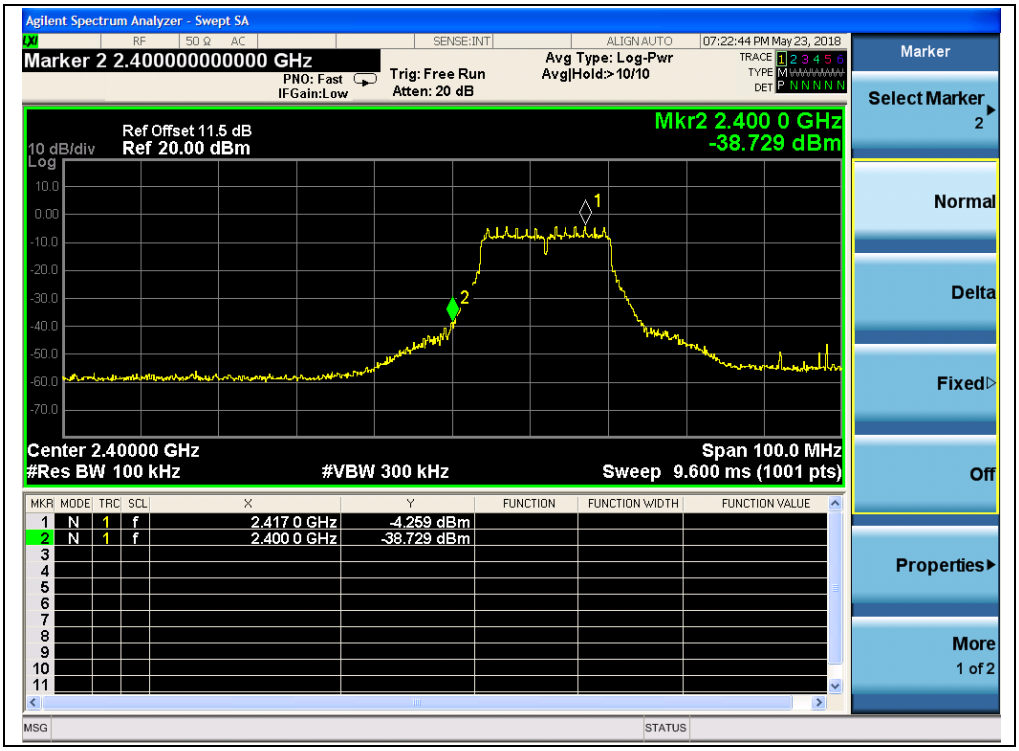
Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-41.67	-4.78	-24.78	PASS
6	2437	-42.83	-5.18	-25.18	PASS
11	2462	-41.93	-6.30	-26.30	PASS

B. Test Plots:

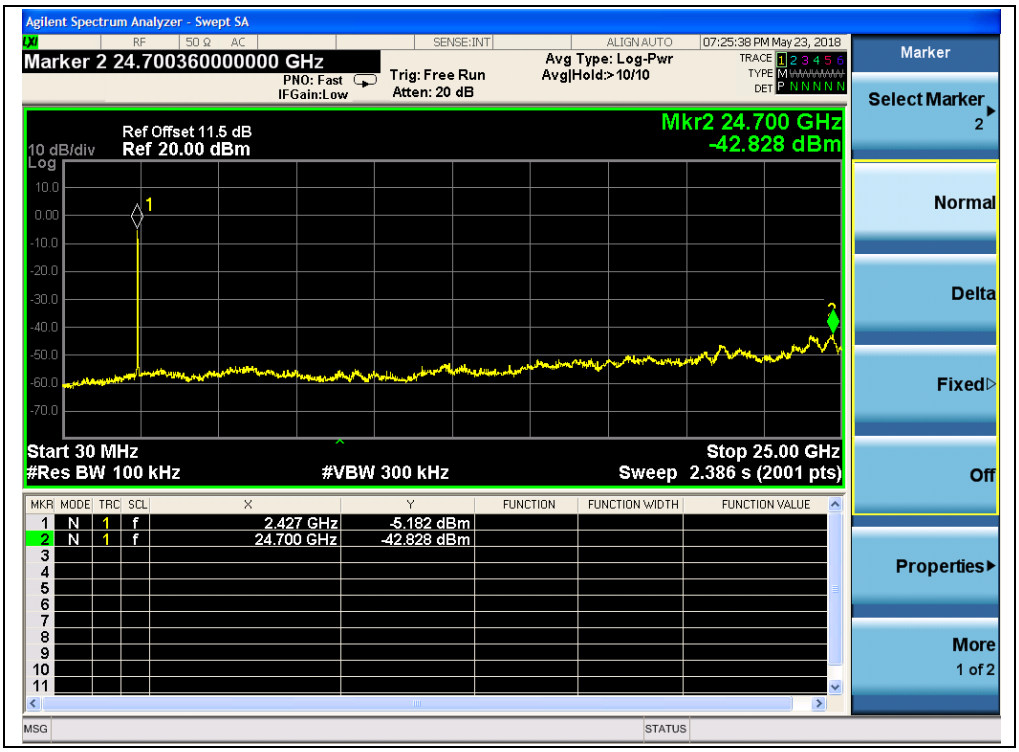
Note: The power of the Module transmitting frequency should be ignored.



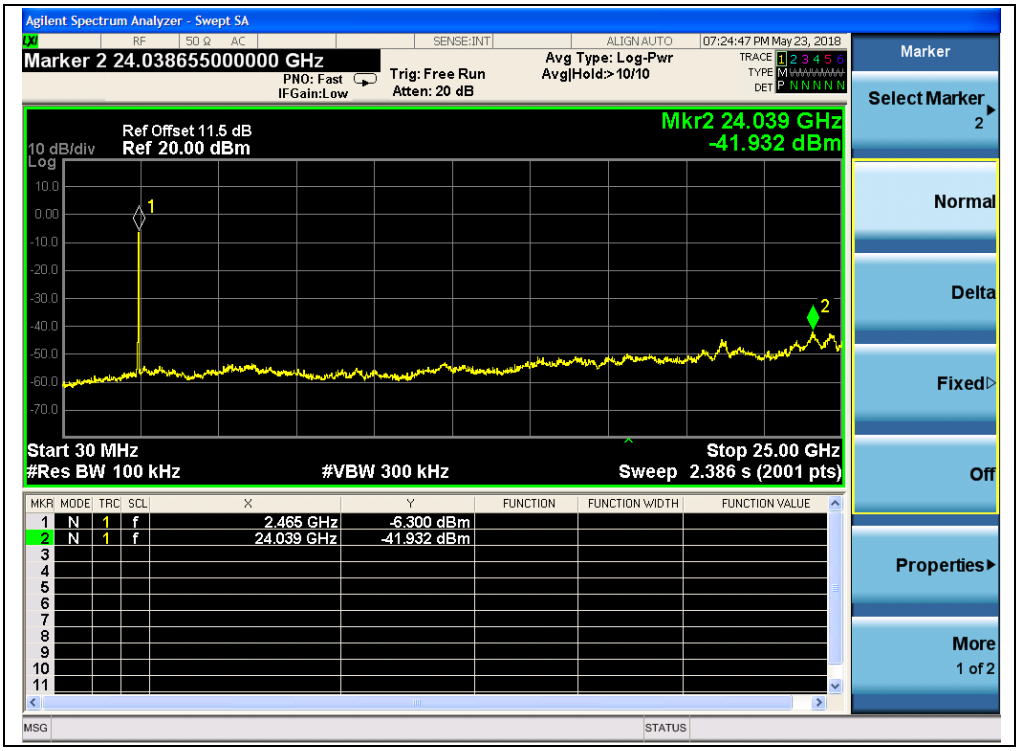
(Channel = 1, 30MHz to 25GHz)



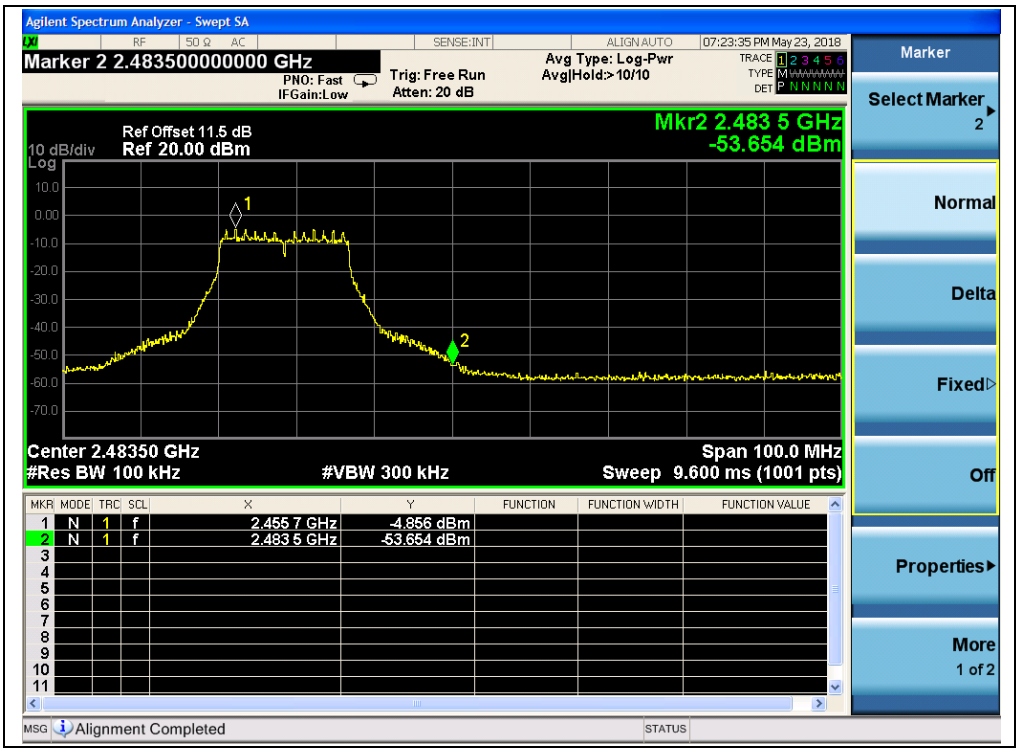
(Band Edge @ Channel = 1)



(Channel = 6, 30MHz to 25GHz)



(Channel = 11, 30MHz to 25GHz)



(Band Edge @ Channel = 11)

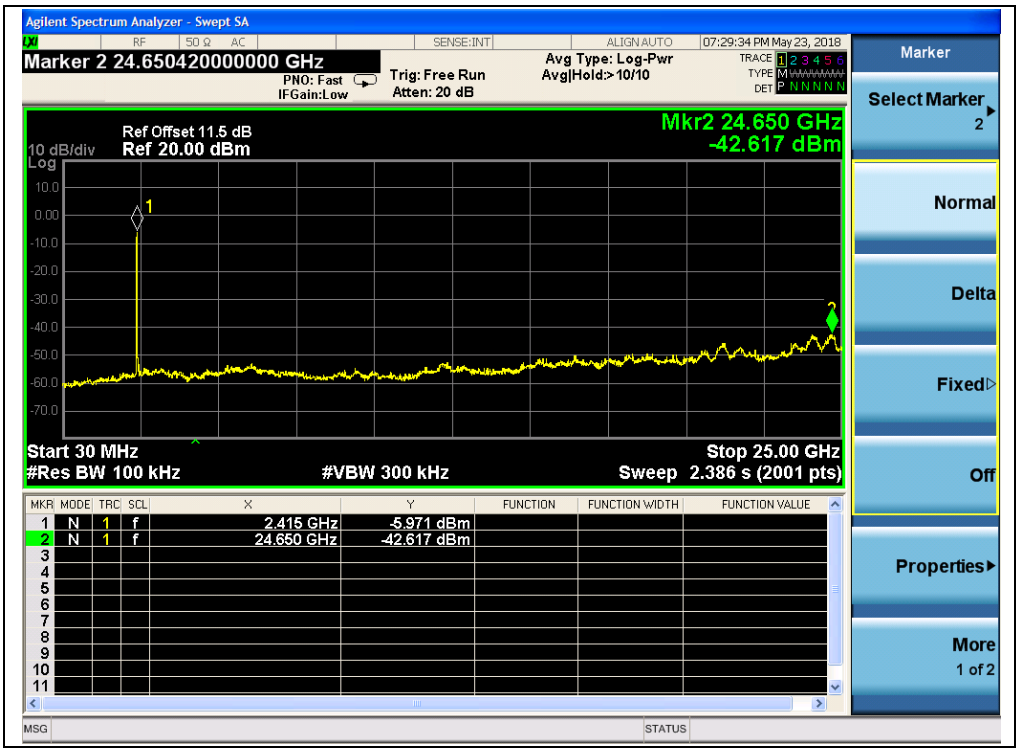
2.4.3.3 802.11n -20MHz Test mode

A. Test Verdict:

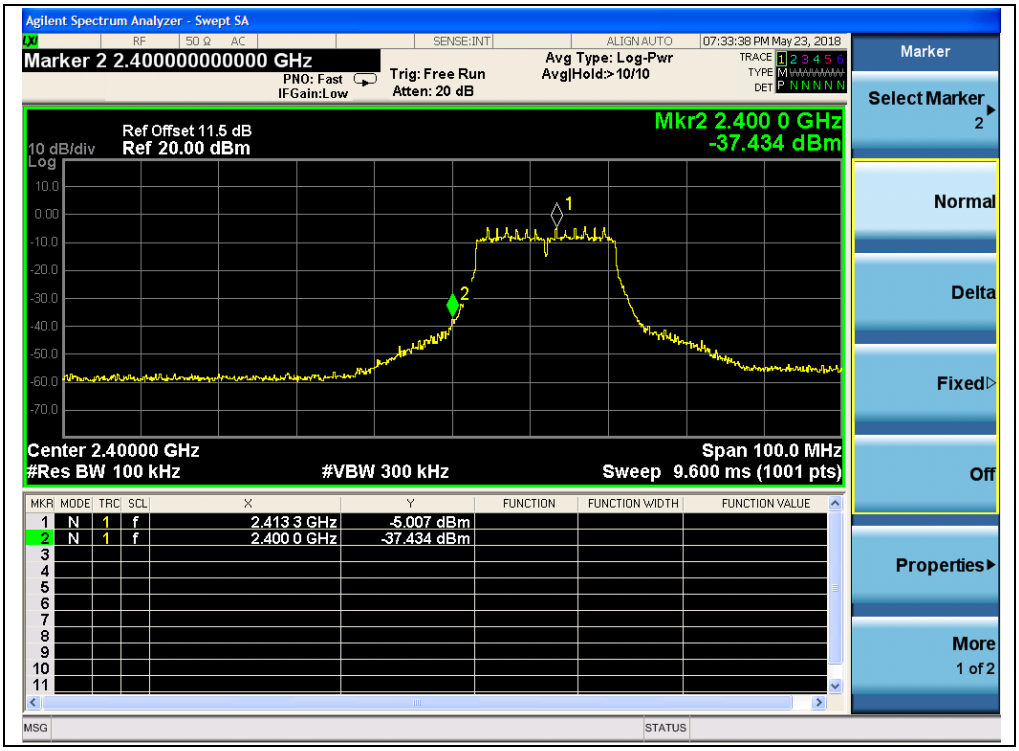
Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-42.62	-5.97	-25.97	PASS
6	2437	-43.34	-6.62	-26.62	PASS
11	2462	-42.47	-6.22	-26.22	PASS

B. Test Plots:

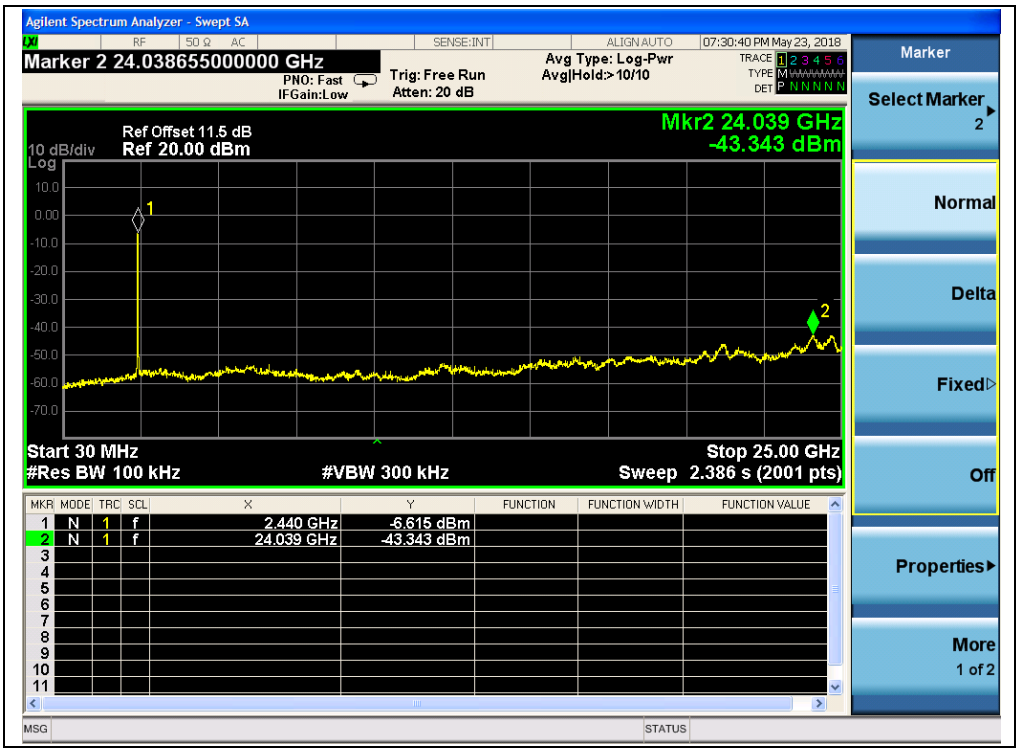
Note: The power of the Module transmitting frequency should be ignored.



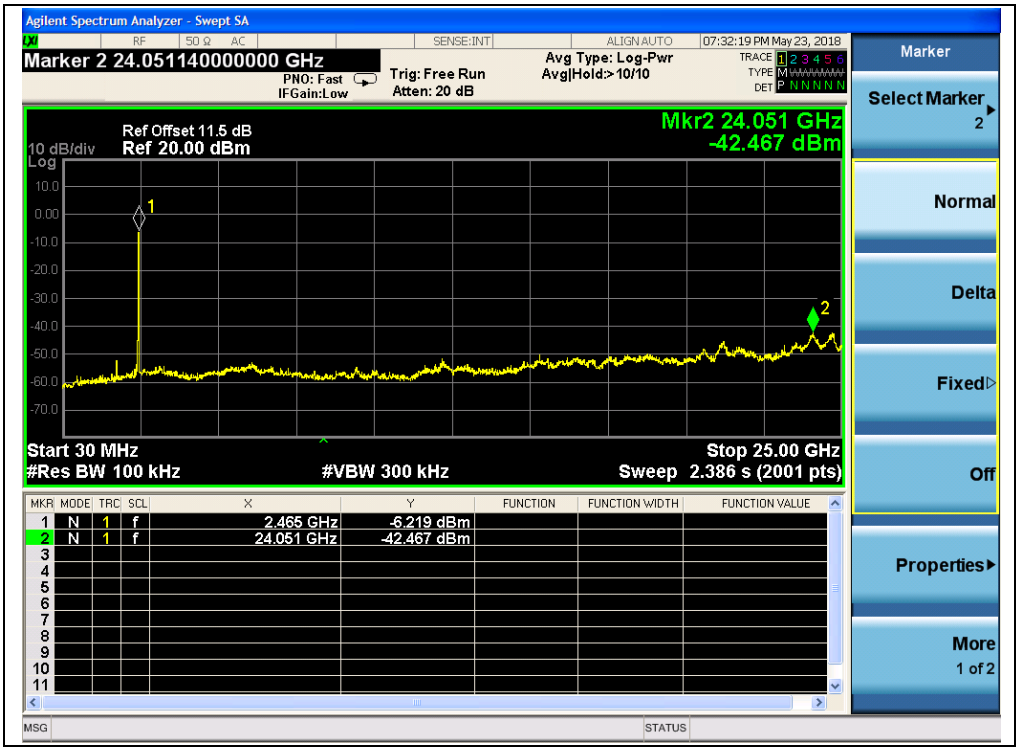
(Channel = 1, 30MHz to 25GHz)



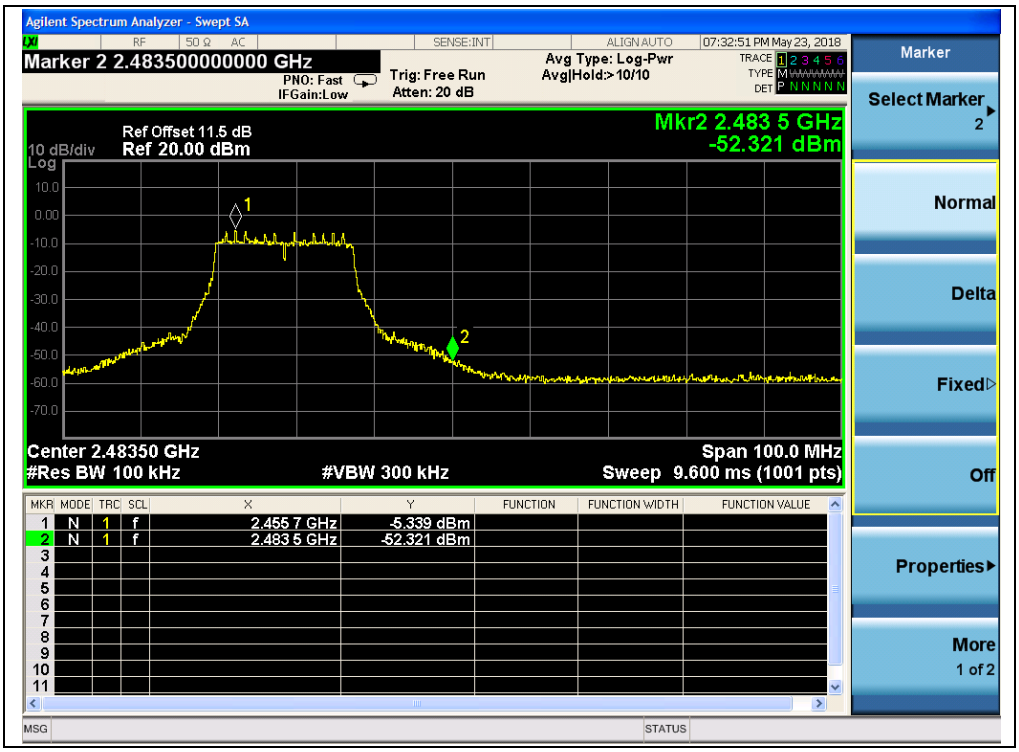
(Band Edge @ Channel = 1)



(Channel = 6, 30MHz to 25GHz)



(Channel = 11, 30MHz to 25GHz)



(Band Edge @ Channel = 11)

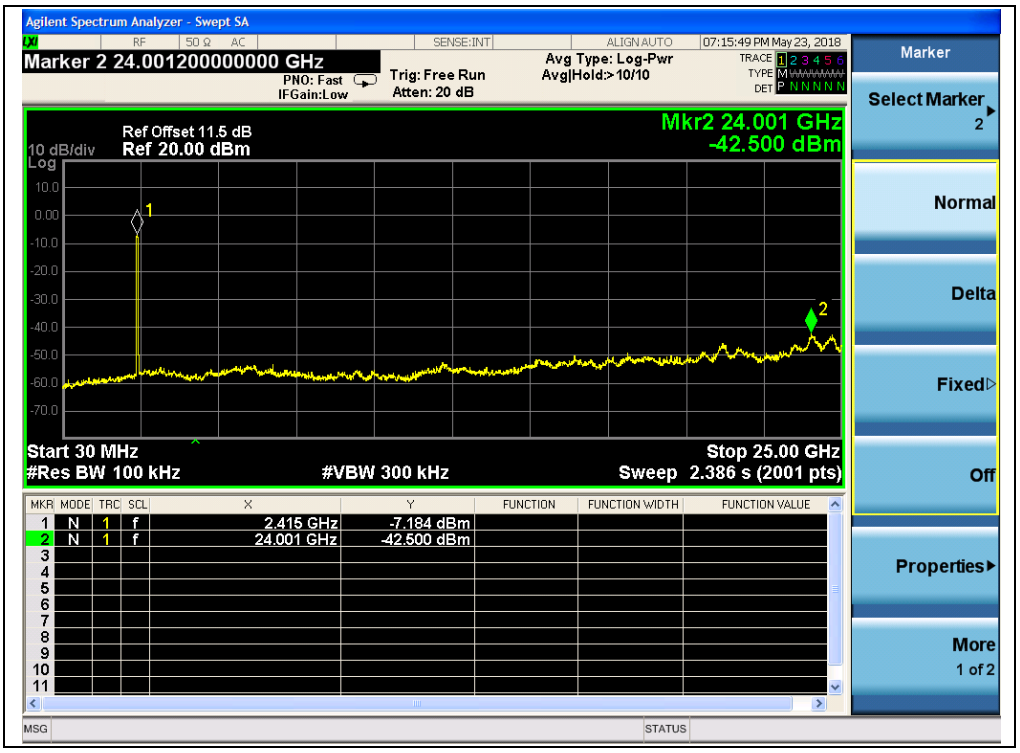
2.4.3.4 802.11n -40MHz Test mode

A. Test Verdict:

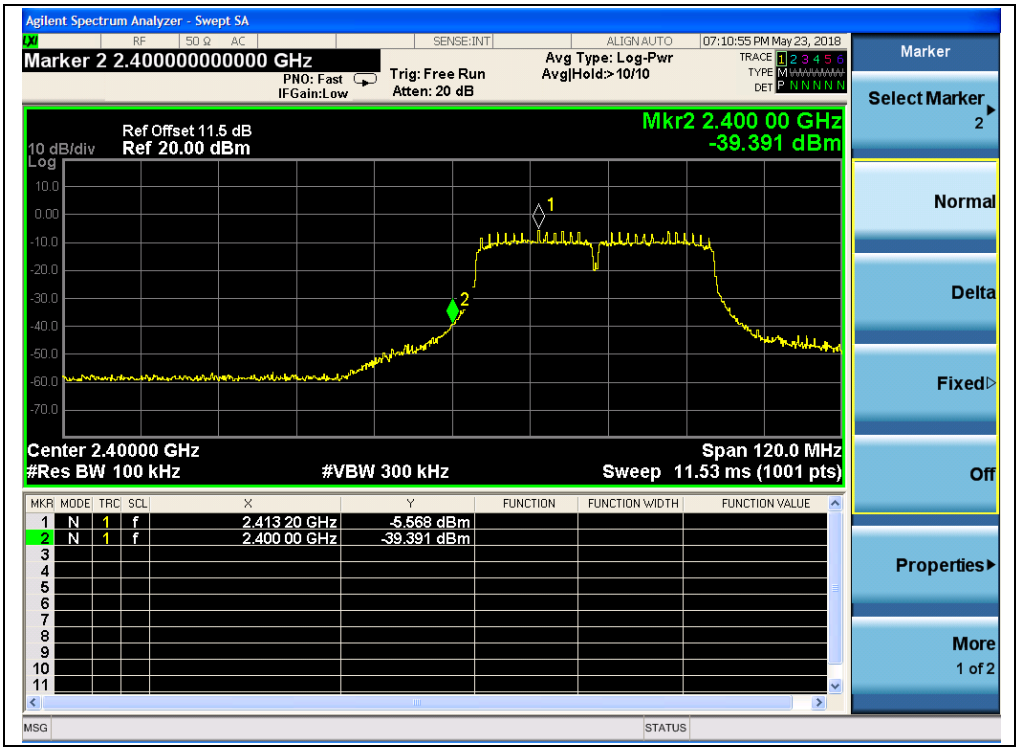
Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
3	2422	-42.50	-7.18	-27.18	PASS
6	2437	-43.26	-7.43	-27.43	PASS
9	2452	-41.86	-8.82	-28.82	PASS

B. Test Plots:

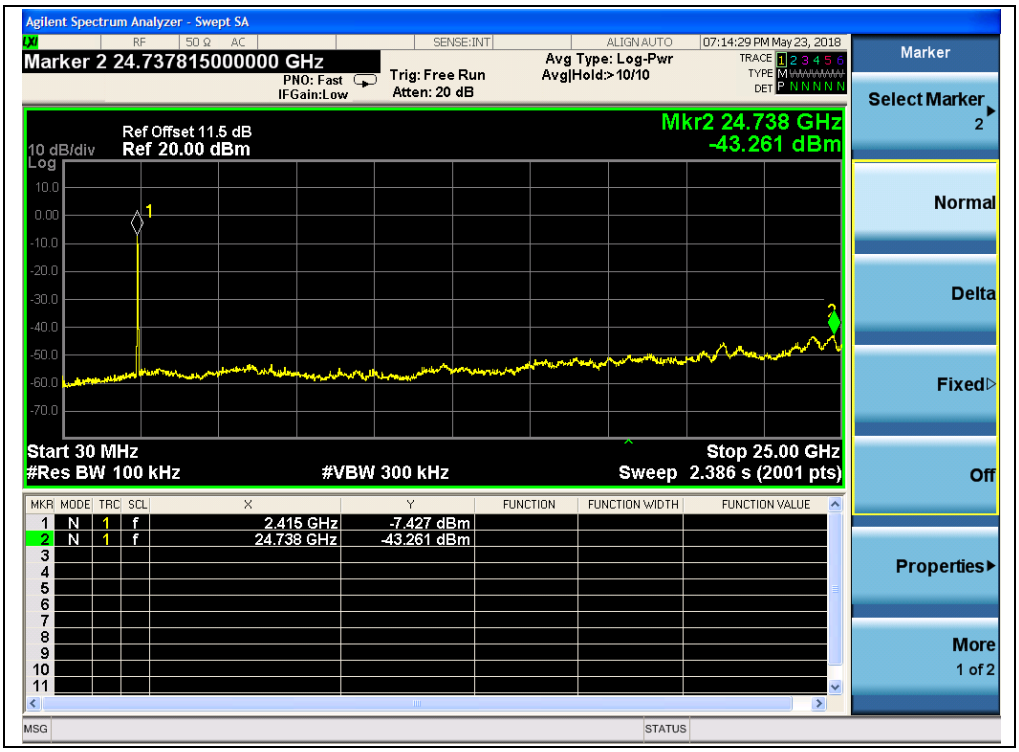
Note: The power of the Module transmitting frequency should be ignored.



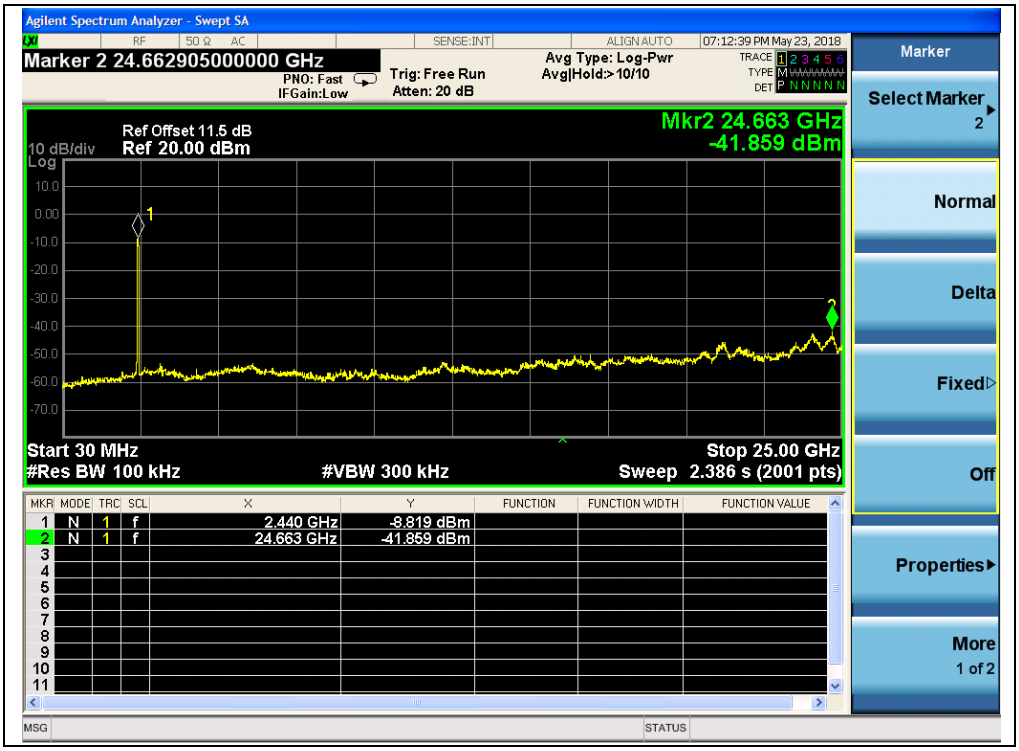
(Channel = 3, 30MHz to 25GHz)



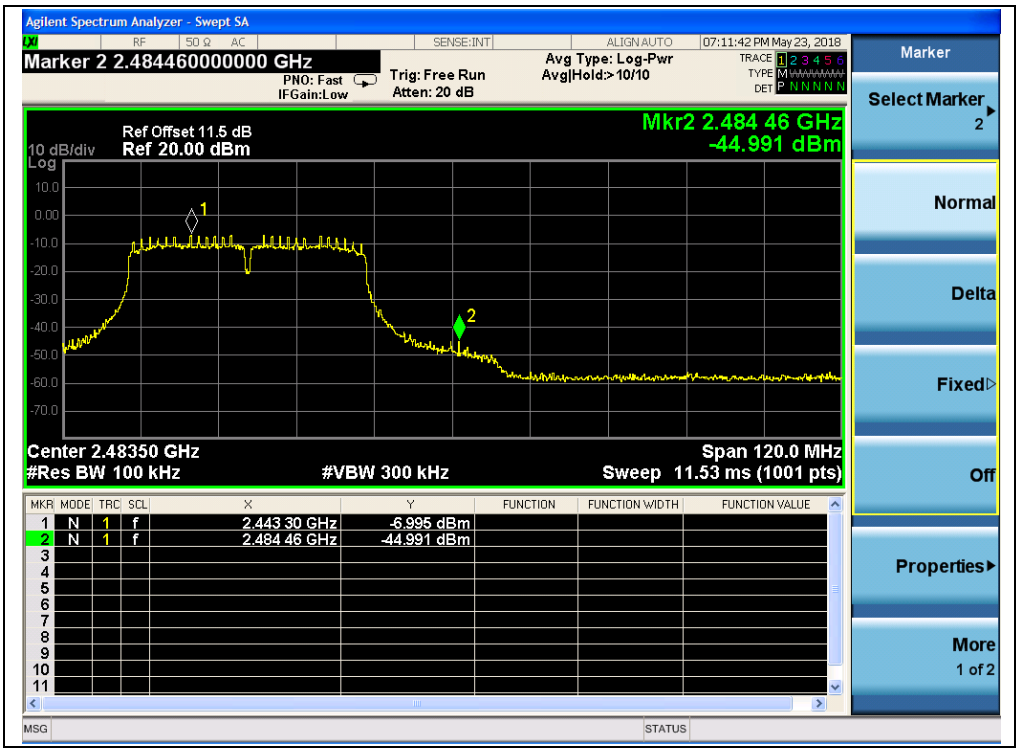
(Band Edge @ Channel = 3)



(Channel = 6, 30MHz to 25GHz)



(Channel = 9, 30MHz to 25GHz)



(Band Edge @ Channel = 9)

2.5. Power spectral density (PSD)

2.5.1. 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.

2.5.2. Test Description

A. Test procedure

The measured power spectral density was calculated by the reading of the spectrum analyzer and calibration. Following is the test procedure for PSD test:
a) Set analyzer center frequency to channel center frequency.
b) Set the span to 1.5 times DTS
c) Set the RBW to 3 kHz
d) Set the VBW to 10 kHz
e) Detector = peak.
f) Sweep time = auto couple.
g) Trace mode = max hold.
h) Allow trace to fully stabilize.
i) Use the peak marker function to determine the maximum amplitude level within the RBW.

B. 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.

KDB 558074 Section 10.2 was used in order to prove compliance.

C. Equipments List:

Please refer ANNEX A(1.5).

2.5.3. Test Result

2.5.3.1 802.11b Test mode

A. Test Verdict:

Spectral power density (dBm/3kHz)				
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
1	2412	-12.42	8	PASS
6	2437	-12.62	8	PASS
11	2462	-12.37	8	PASS

B. Test Plots:

(Channel = 1, 802.11b)

(Channel = 6, 802.11b)

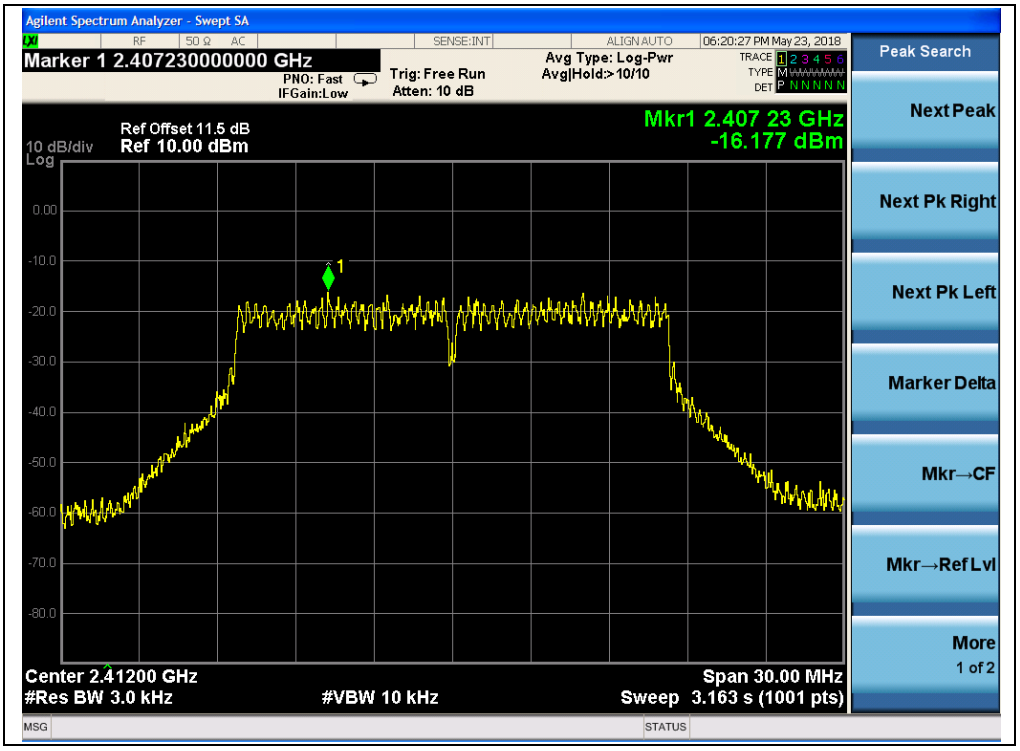
(Channel = 11, 802.11b)

2.5.3.2 802.11g Test mode

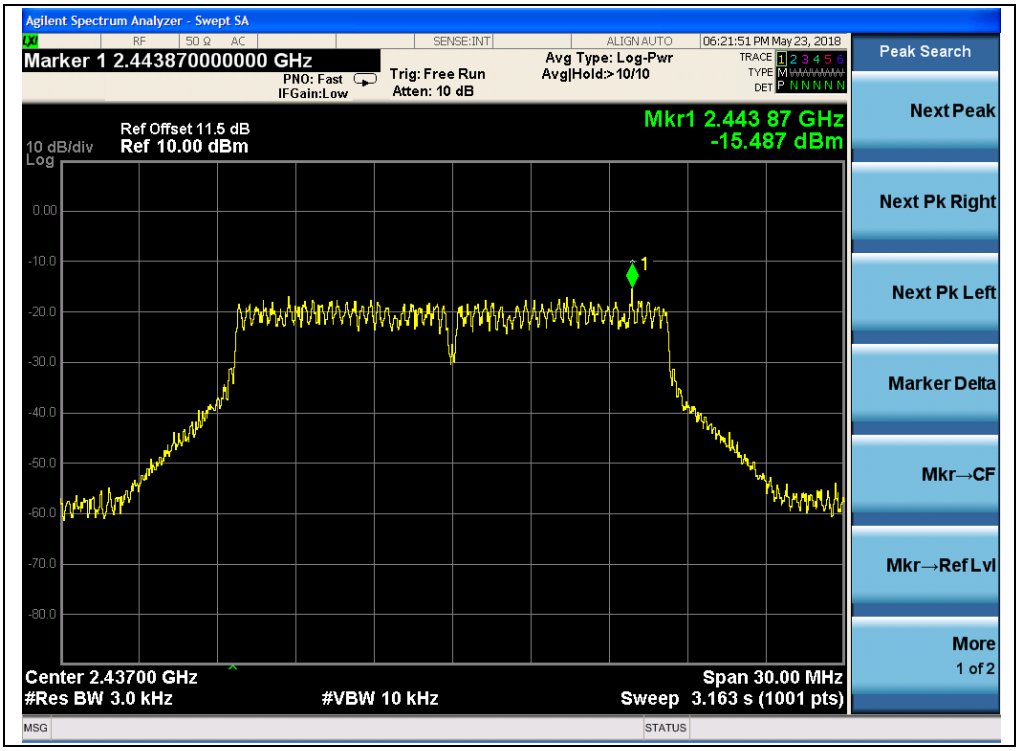
A. Test Verdict:

Spectral power density (dBm/3kHz)				
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
1	2412	-16.18	8	PASS
6	2437	-15.49	8	PASS
11	2462	-17.85	8	PASS

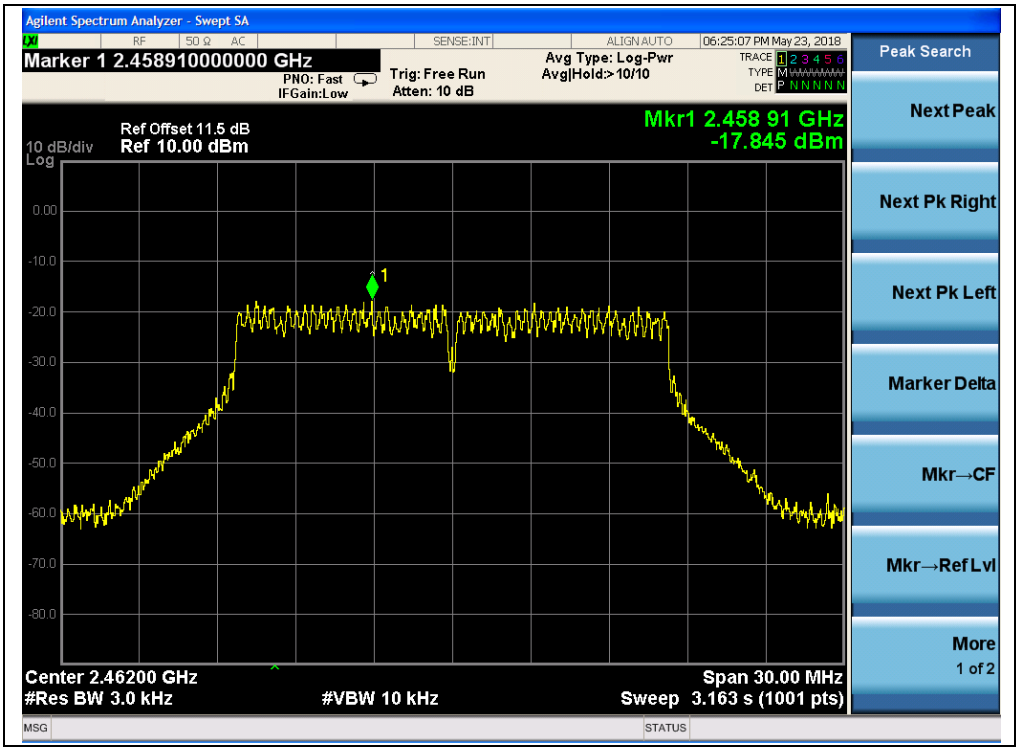
B. Test Plots:



(Channel = 1, 802.11g)



(Channel = 6, 802.11g)



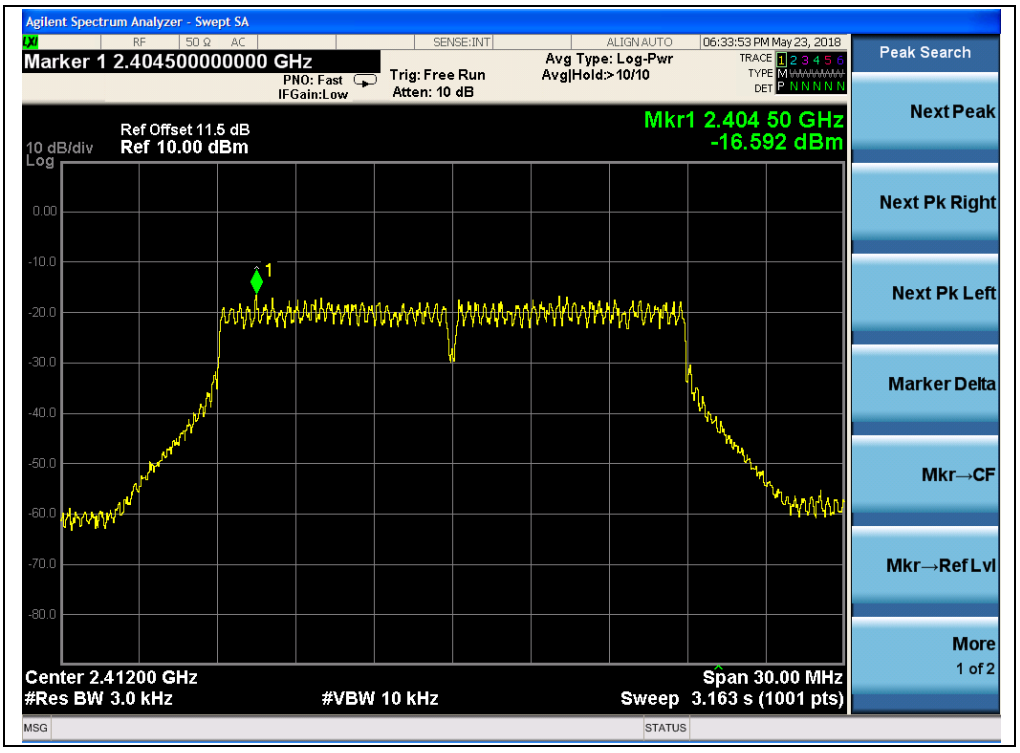
(Channel = 11, 802.11g)

2.5.3.3 802.11n-20MHz Test mode

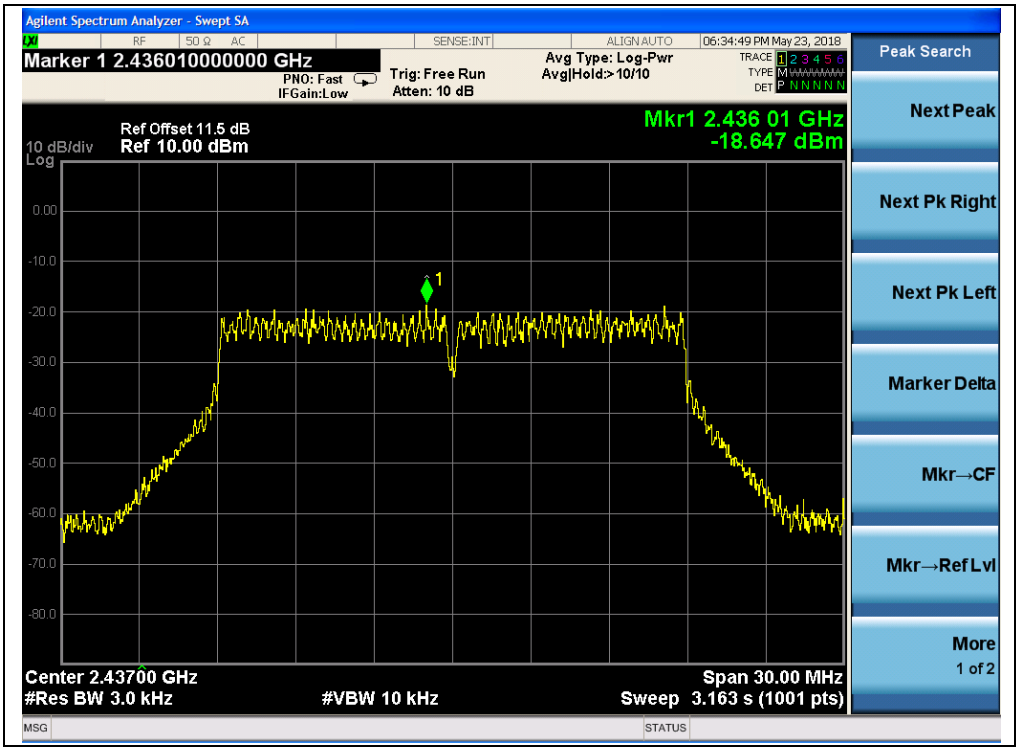
A. Test Verdict:

Spectral power density (dBm/3kHz)				
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
1	2412	-16.59	8	PASS
6	2437	-18.65	8	PASS
11	2462	-18.36	8	PASS

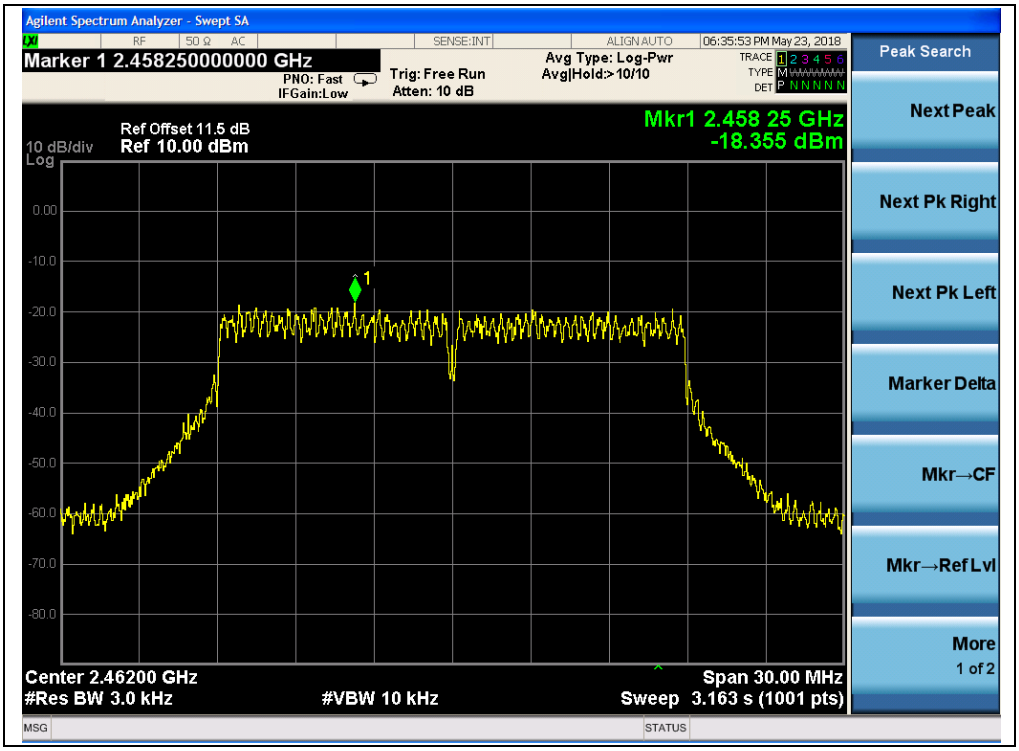
B. Test Plots:



(Channel = 1, 802.11n-20MHz)



(Channel = 6, 802.11n-20MHz)



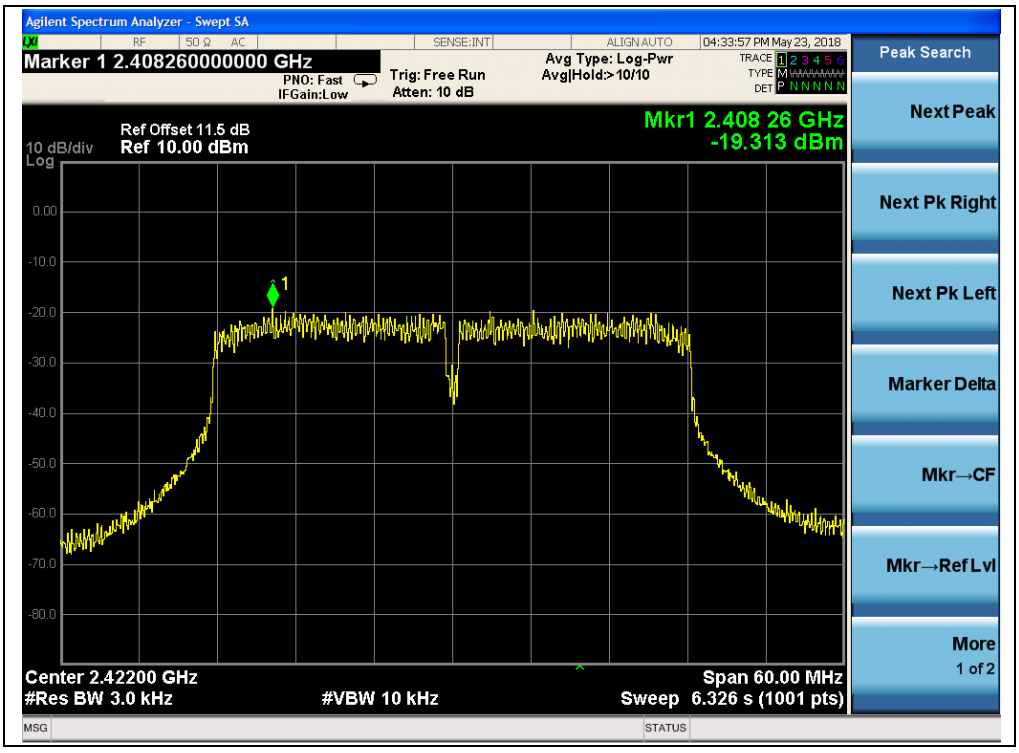
(Channel = 11, 802.11n-20MHz)

2.5.3.4 802.11n-40MHz Test mode

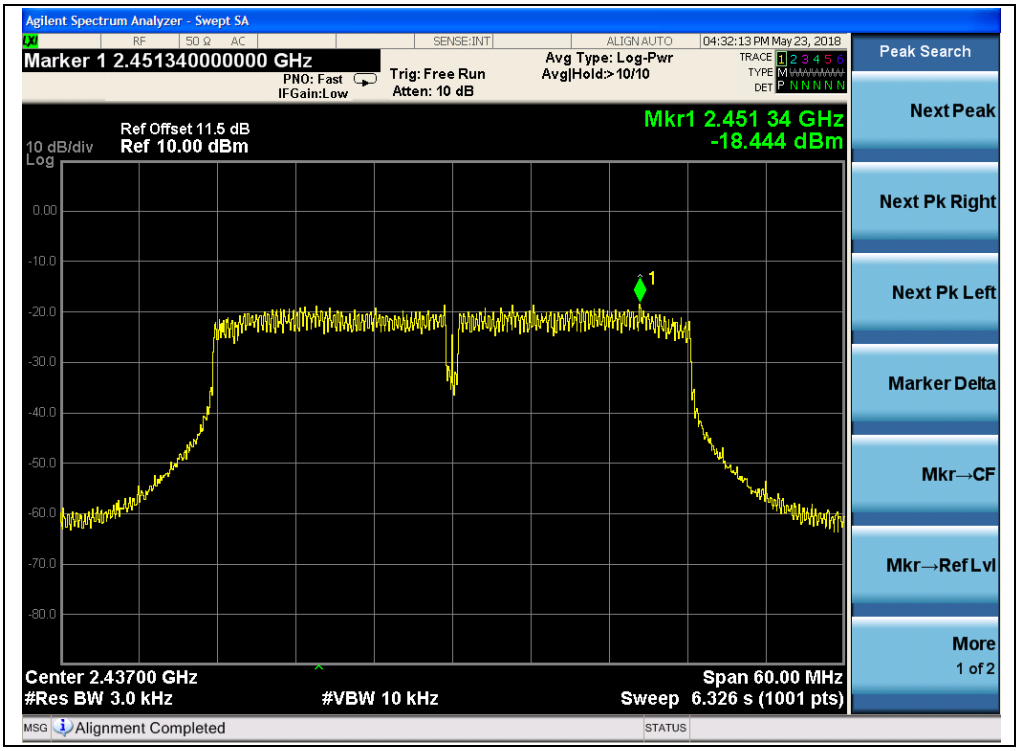
A. Test Verdict:

Spectral power density (dBm/3kHz)				
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
3	2422	-19.31	8	PASS
6	2437	-18.44	8	PASS
9	2452	-19.63	8	PASS

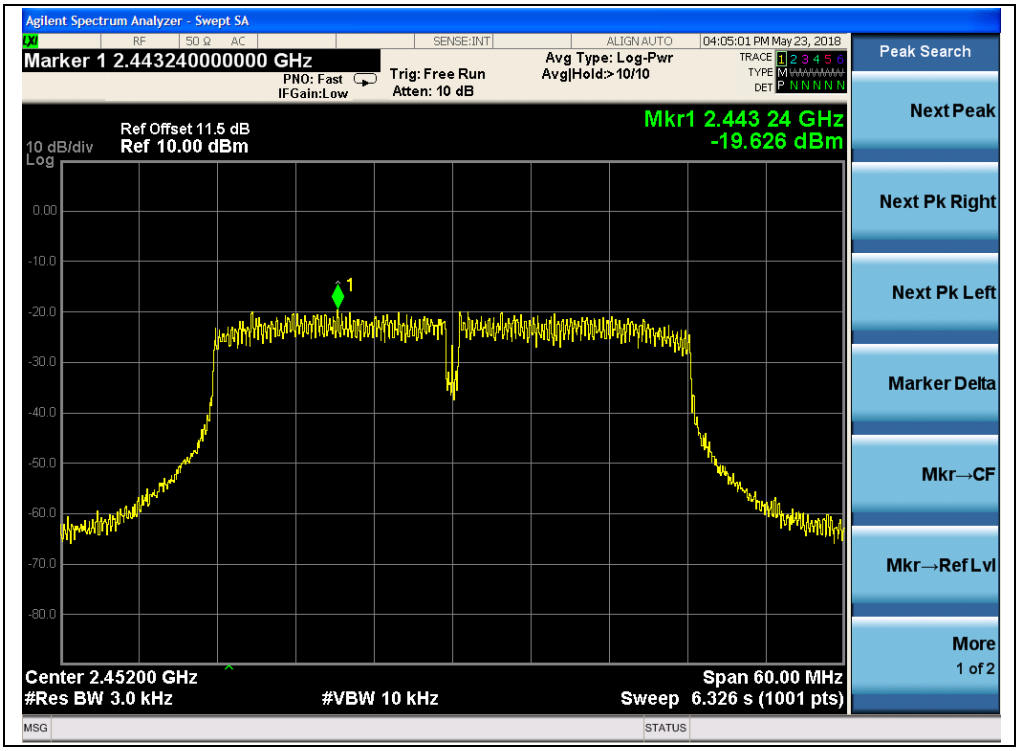
B. Test Plots:



(Channel = 3, 802.11n-40MHz)



(Channel = 6, 802.11n-40MHz)



(Channel = 9, 802.11n-40MHz)

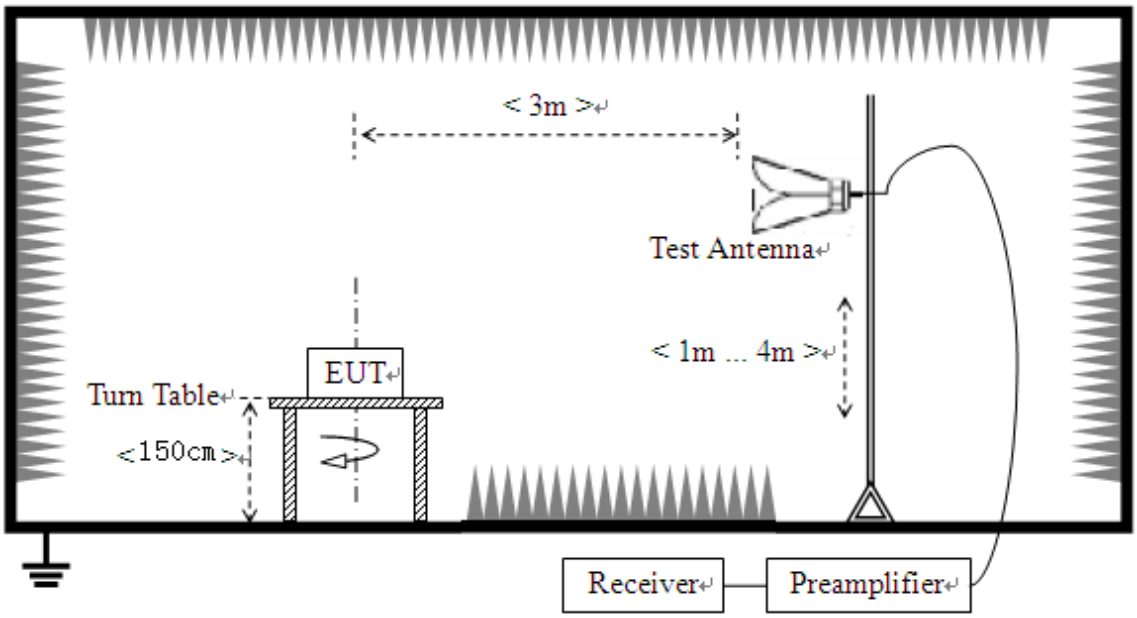
2.6. Restricted Frequency Bands

2.6.1. 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).

2.6.2. 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.

KDB 558074 Section 12.1 was used in order to prove compliance.

B. Equipments List:

Please refer ANNEX A(1.5).

2.6.3. 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

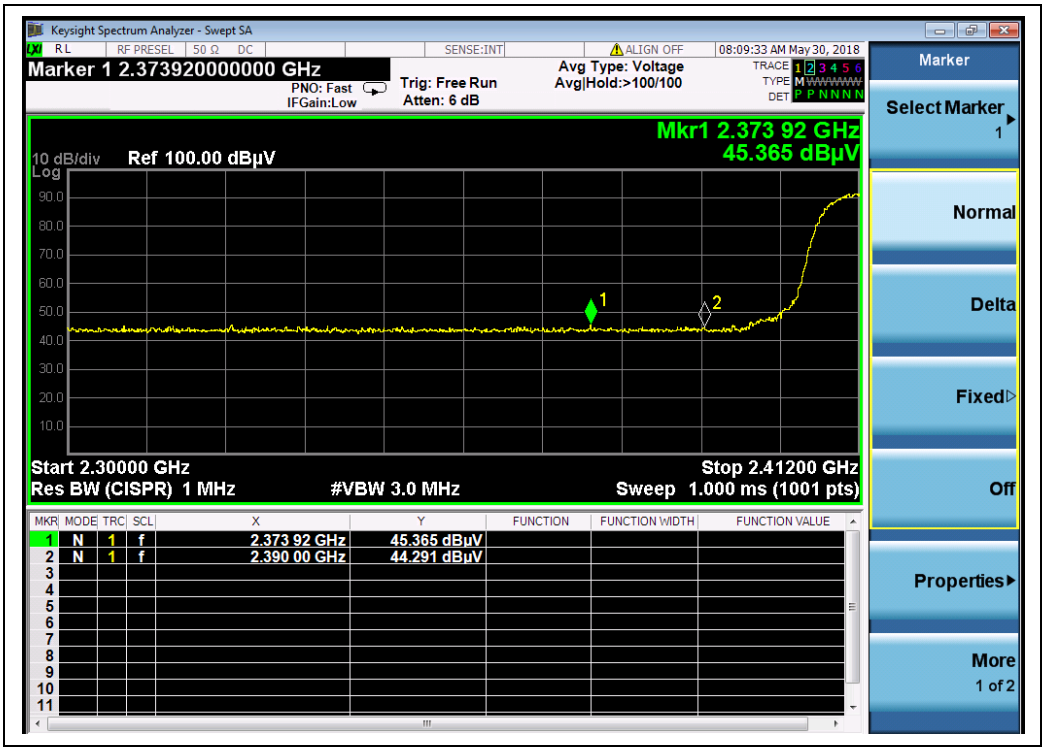
Note: Restricted Frequency Bands were performed when antenna was at vertical and horizontal polarity, and only the worse test condition (vertical) was recorded in this test report.

2.6.3.1 802.11b Test mode

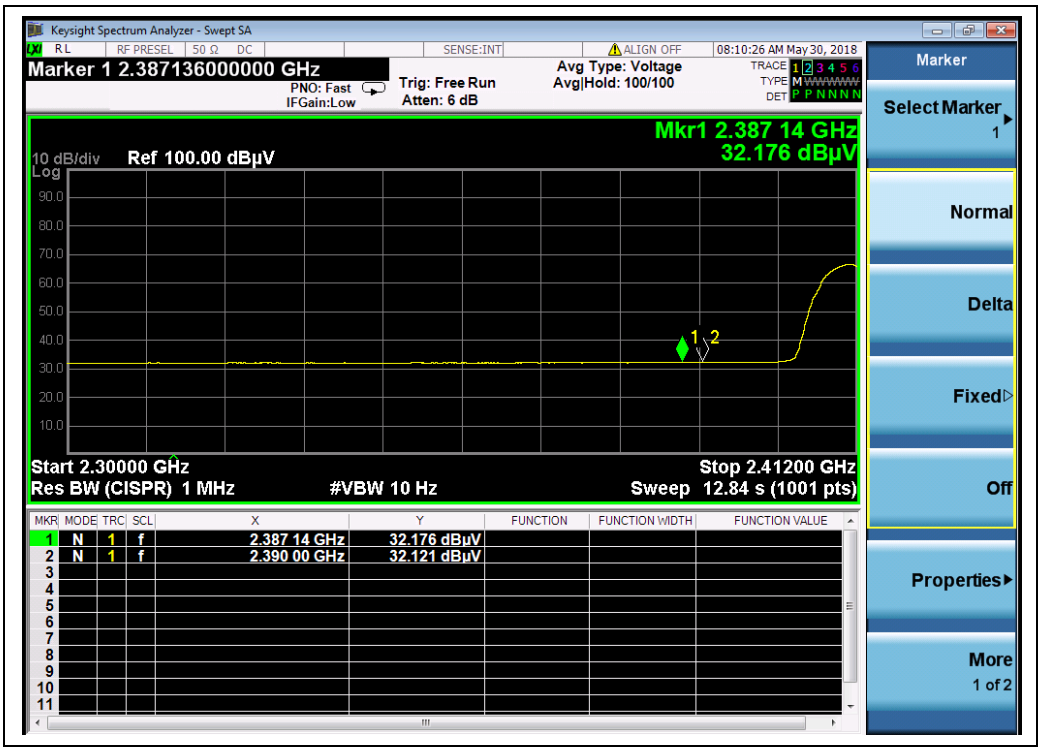
A. Test Verdict:

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	2373.92	PK	45.37	-33.63	32.56	44.30	74	Pass
1	2387.14	AV	32.18	-33.63	32.56	31.11	54	Pass
11	2485.86	PK	43.91	-33.18	32.50	43.23	74	Pass
11	2484.88	AV	32.00	-33.18	32.50	31.32	54	Pass

B. Test Plots:



(Channel = 1 PEAK, 802.11b)



(Channel = 1 AVG, 802.11b)

(Channel = 11 PEAK, 802.11b)

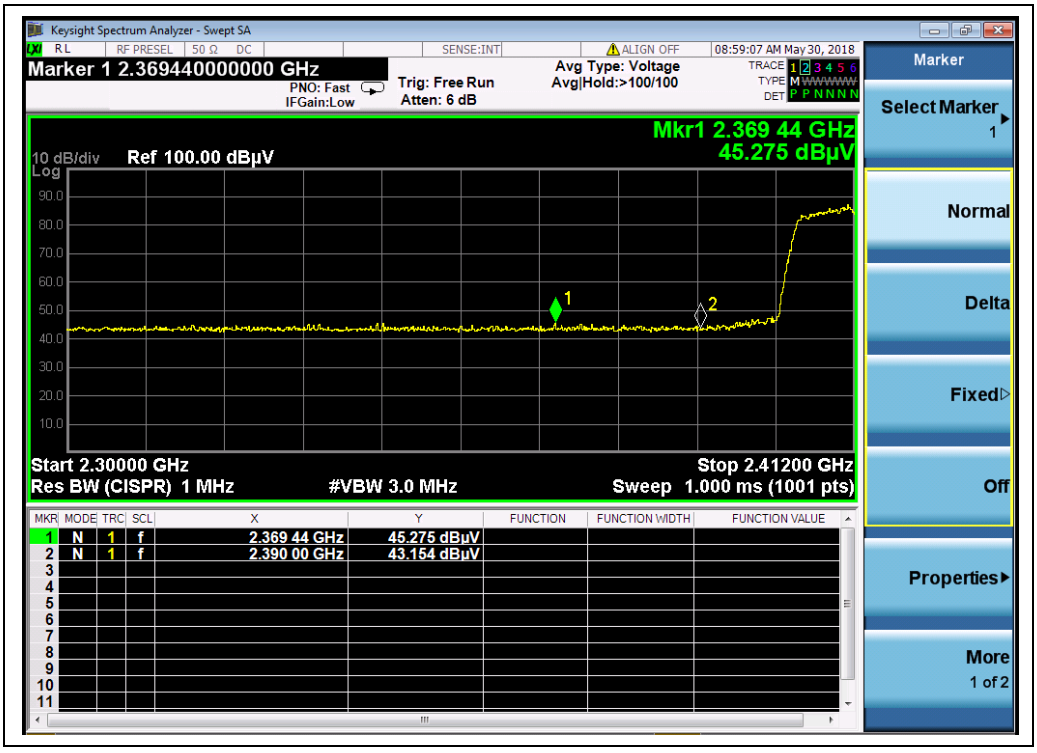
(Channel = 11 AVG, 802.11b)

2.6.3.2 802.11g Test mode

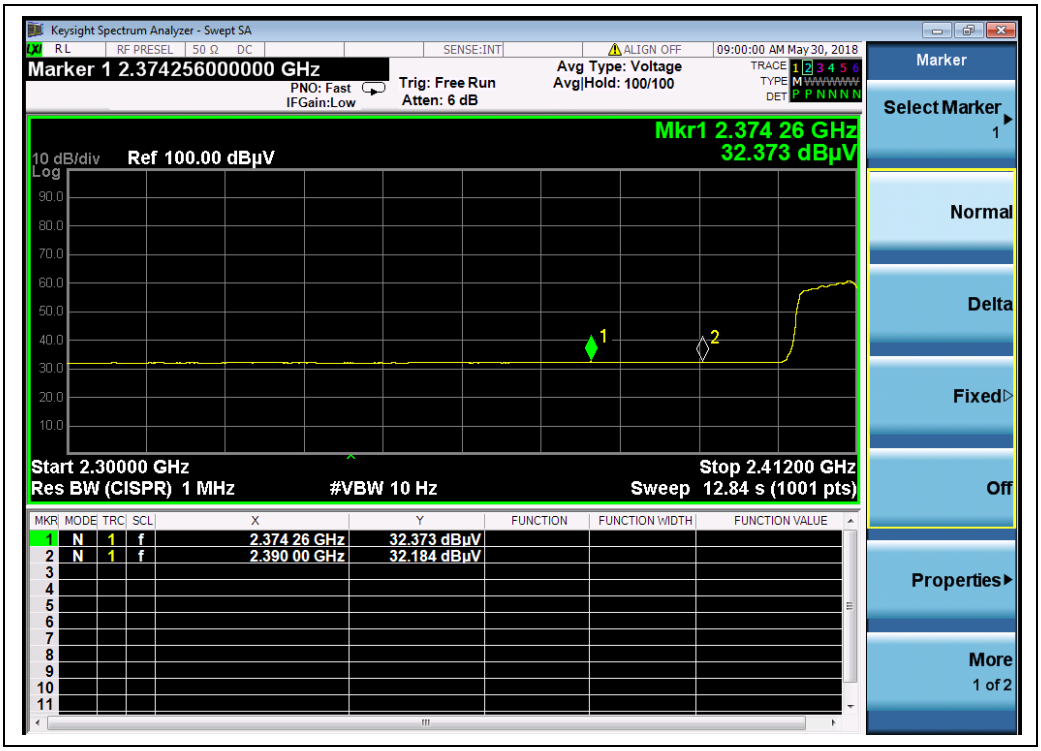
A. Test Verdict:

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	2369.44	PK	45.28	-33.63	32.56	44.21	74	Pass
1	2374.26	AV	32.37	-33.63	32.56	31.30	54	Pass
11	2484.27	PK	53.03	-33.18	32.50	52.35	74	Pass
11	2483.70	AV	30.31	-33.18	32.50	29.63	54	Pass

B. Test Plots:



(Channel = 1 PEAK, 802.11g)



(Channel = 1 AVG, 802.11g)

(Channel = 11 PEAK, 802.11g)

(Channel = 11 AVG, 802.11g)

2.6.3.3 802.11n-20MHz 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	2389.26	PK	48.76	-33.63	32.56	47.69	74	Pass
1	2374.26	AV	32.58	-33.63	32.56	31.51	54	Pass
11	2484.15	PK	49.26	-33.18	32.50	48.58	74	Pass
11	2483.89	AV	30.30	-33.18	32.50	29.62	54	Pass

B. Test Plots:

(Channel = 1 PEAK, 802.11n-20)

(Channel = 1 AVG, 802.11n-20)

(Channel = 11 PEAK, 802.11n-20)

(Channel = 11 AVG, 802.11n-20)

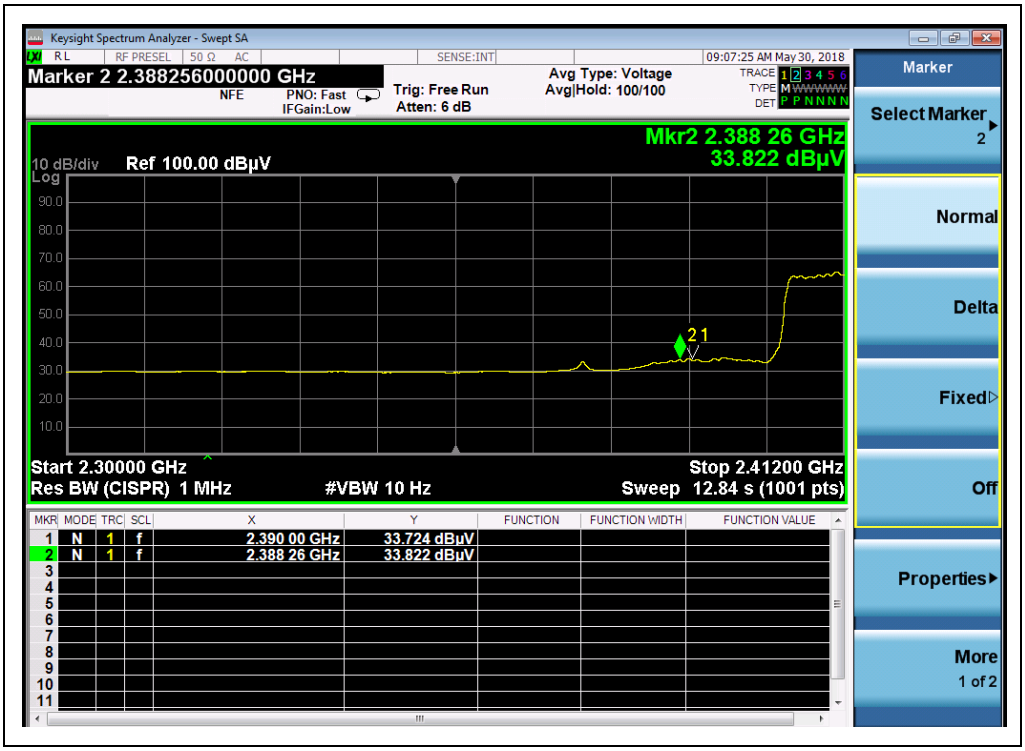
2.6.3.4 802.11n-40MHz Test mode

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	2388.26	PK	57.80	-33.63	32.56	56.73	74	Pass
3	2388.26	AV	33.82	-33.63	32.56	32.75	54	Pass
9	2485.75	PK	45.10	-33.18	32.50	44.42	74	Pass
9	2483.96	AV	32.63	-33.18	32.50	31.95	54	Pass

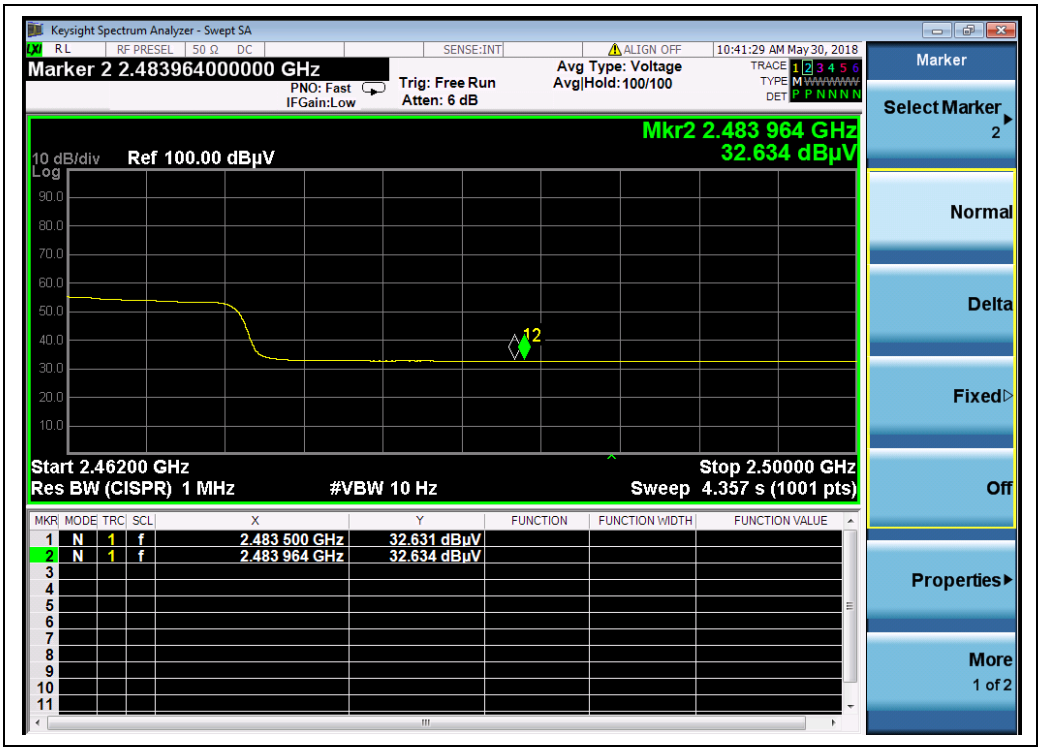
B. Test Plots:

(Channel = 3 PEAK, 802.11n-40)



(Channel = 3 AVG, 802.11n-40)

(Channel = 9 PEAK, 802.11n-40)



(Channel = 9 AVG, 802.11n-40)

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

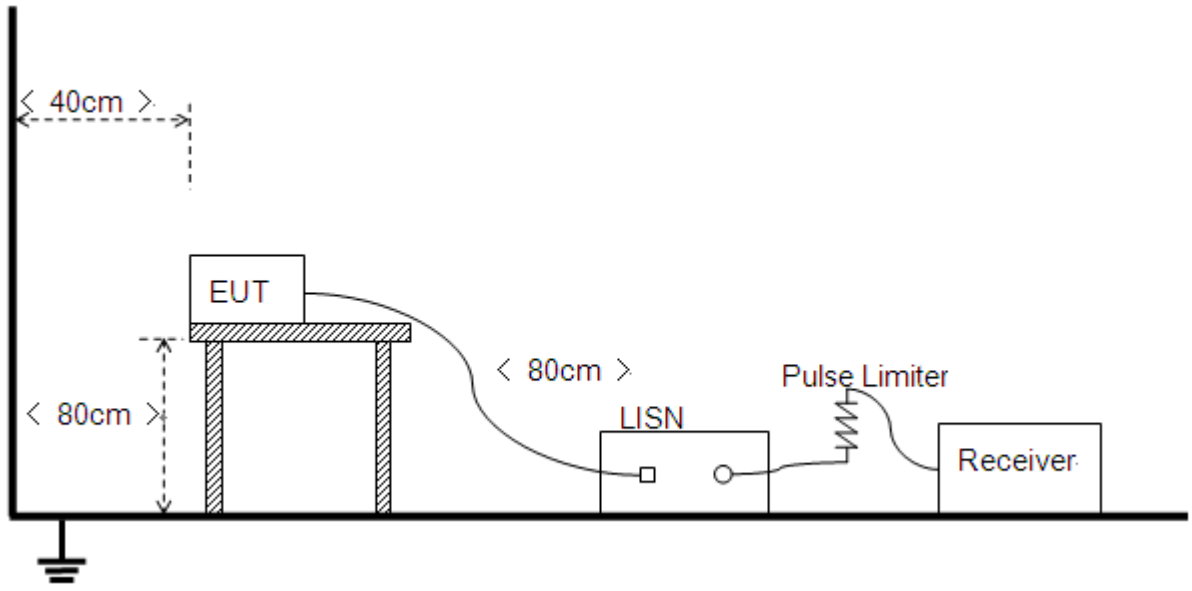
NOTE:

(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.

B. Equipments List:

Please refer ANNEX A(1.5).

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.

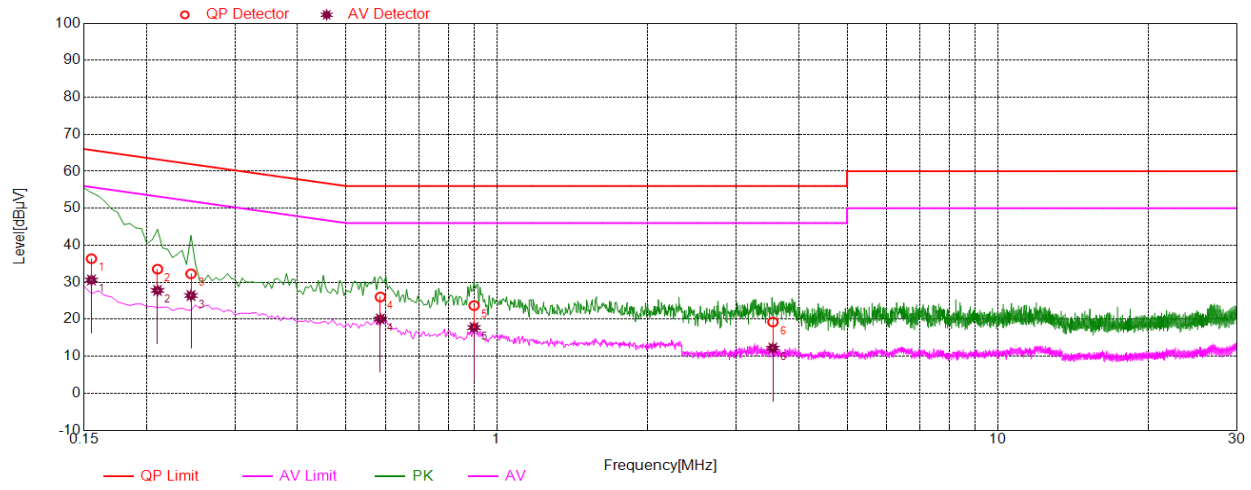
Note: Both of the test voltage AC 120V/60Hz and AC 230V/50Hz were considered and tested respectively, only the results of the worst case AC 120V/60Hz were recorded in this report.

A. Test setup:

The EUT configuration of the emission tests is EUT + Link.

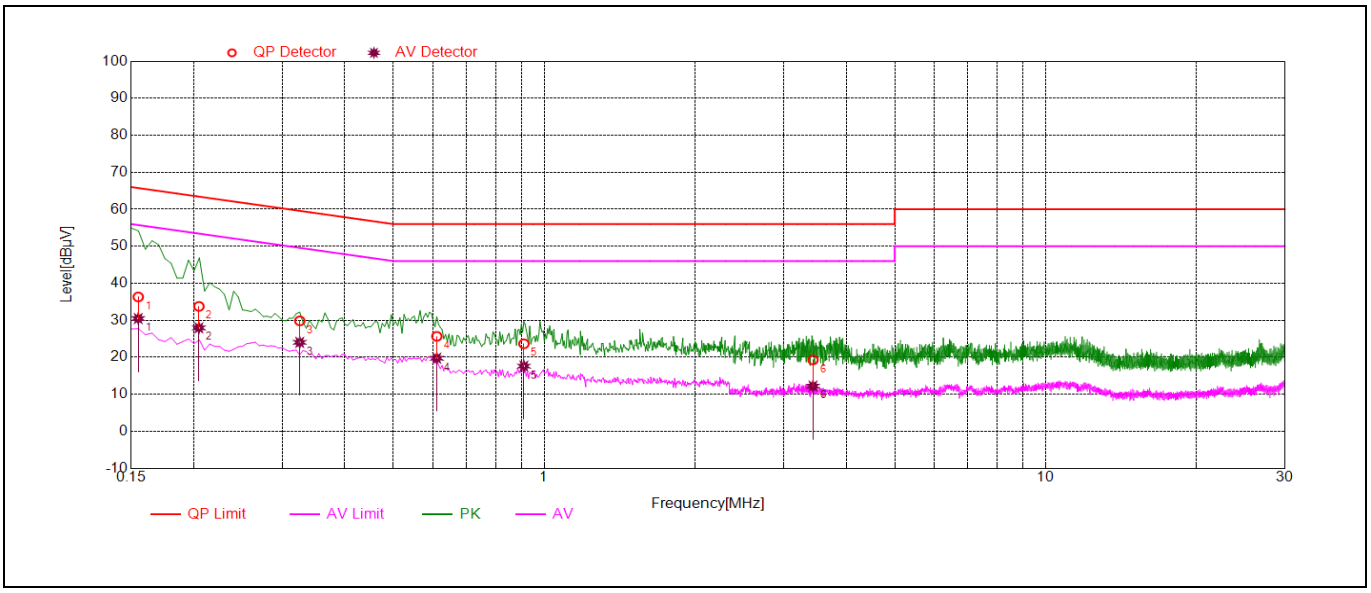
Note: The test voltage is AC 120V/60Hz.

B. Test Plots:



(Plot A: L Phase)

NO.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.16	36.38	30.61	65.73	55.73	Line	PASS
2	0.21	33.54	27.80	63.21	53.21		PASS
3	0.25	32.28	26.42	61.92	51.92		PASS
4	0.58	26.04	20.09	56.00	46.00		PASS
5	0.90	23.70	17.77	56.00	46.00		PASS
6	3.55	19.26	12.21	56.00	46.00		PASS



(Plot B: N Phase)

NO.	Fre. (MHz)	Emission Level (dBµV)		Limit (dBµV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.15	36.31	30.47	65.74	55.74	Neutral	PASS
2	0.20	33.75	27.95	63.42	53.42		PASS
3	0.33	29.85	24.03	59.58	49.58		PASS
4	0.61	25.66	19.75	56.00	46.00		PASS
5	0.91	23.64	17.60	56.00	46.00		PASS
6	3.44	19.30	12.19	56.00	46.00		PASS

2.8. Radiated Emission

2.8.1. 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.

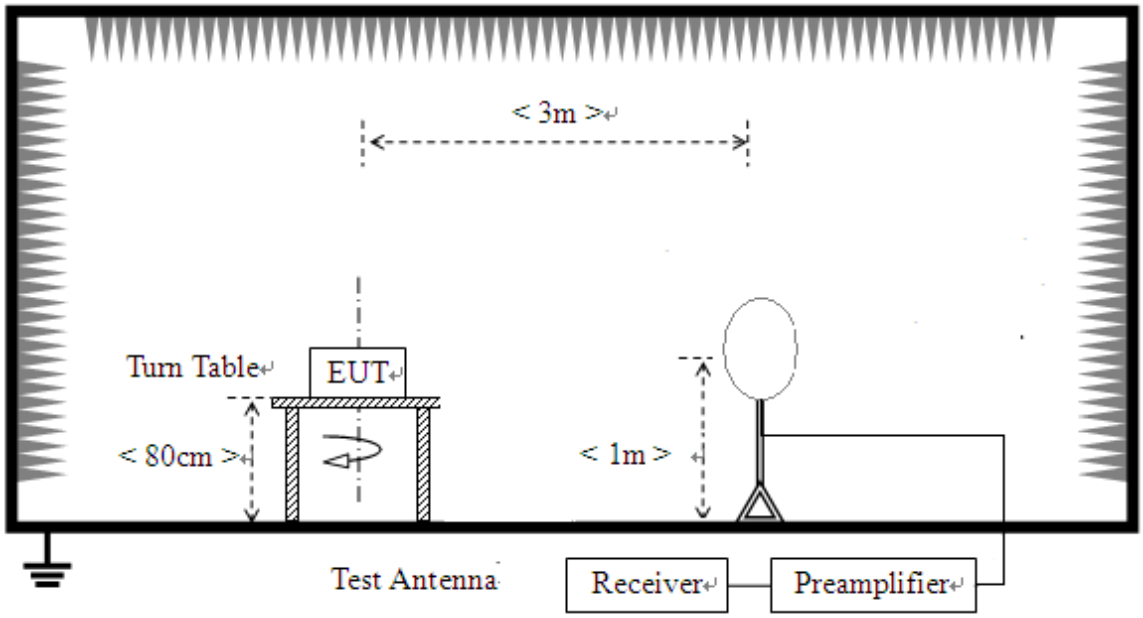
For above 1000MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK)

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)

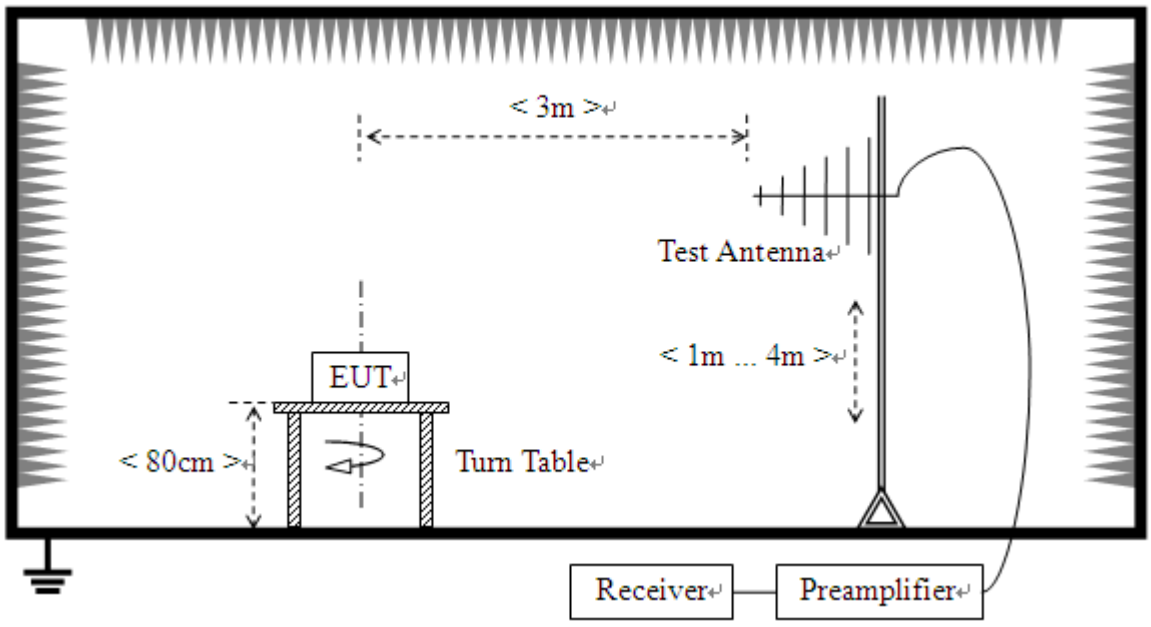
2.8.2. Test Description

A. Test Setup:

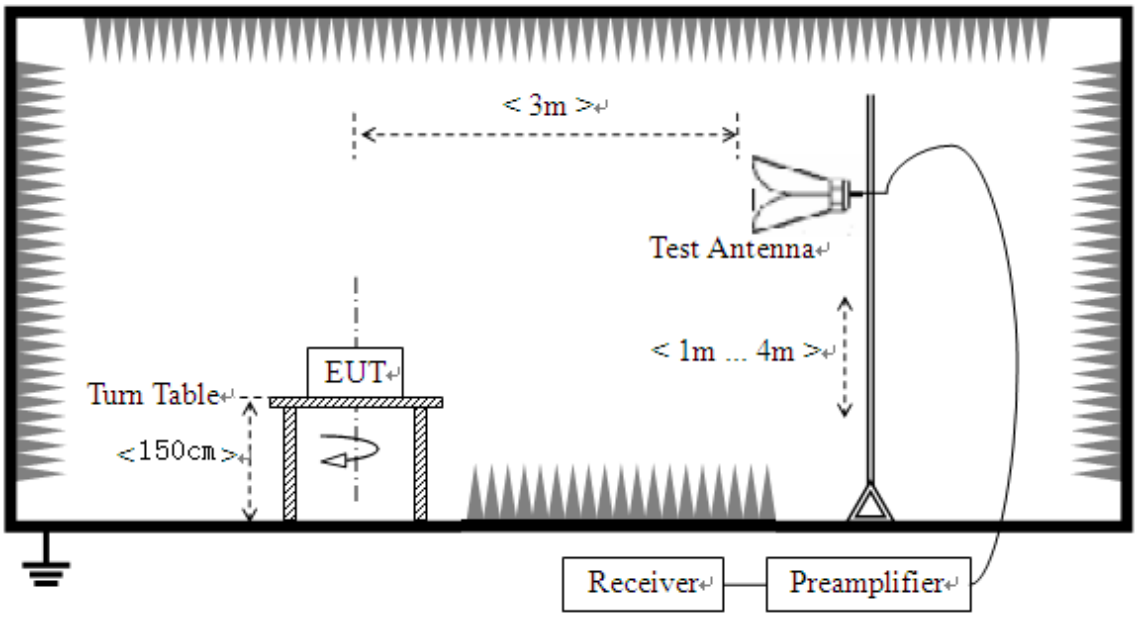
1) For radiated emissions from 9kHz to 30MHz



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.

A. Equipments List:

Please refere ANNEX A(1.5).

2.8.3. 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

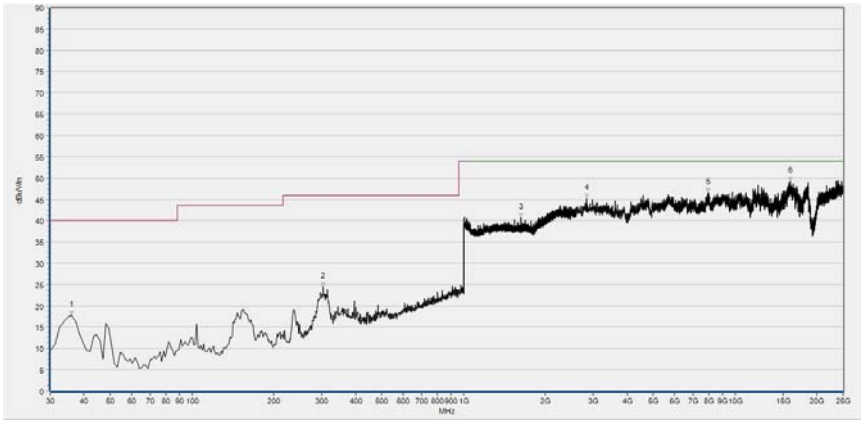
A_{Factor}: Antenna Factor at 3m

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 10dB lower than the limit was not recorded.

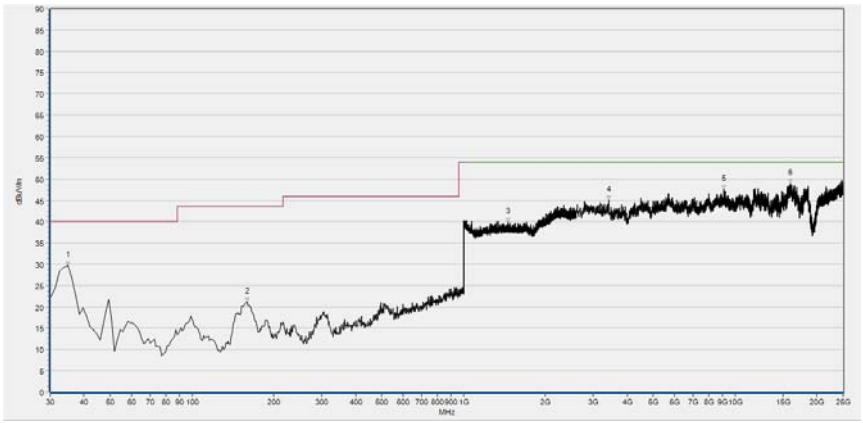
2.8.3.1 802.11b Test mode

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
36.070	17.69	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
304.368	24.52	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1625.530	40.69	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2840.335	45.20	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
7968.831	46.61	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
15965.048	49.23	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

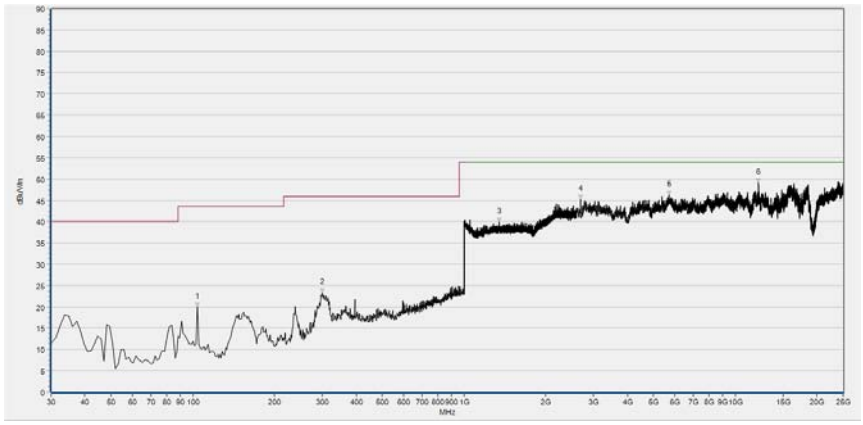
(Antenna Horizontal, 30MHz to 25GHz)



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
34.856	29.60	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
159.900	21.19	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
1459.704	39.86	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
3422.841	45.16	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
9109.402	47.55	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
15989.489	48.94	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

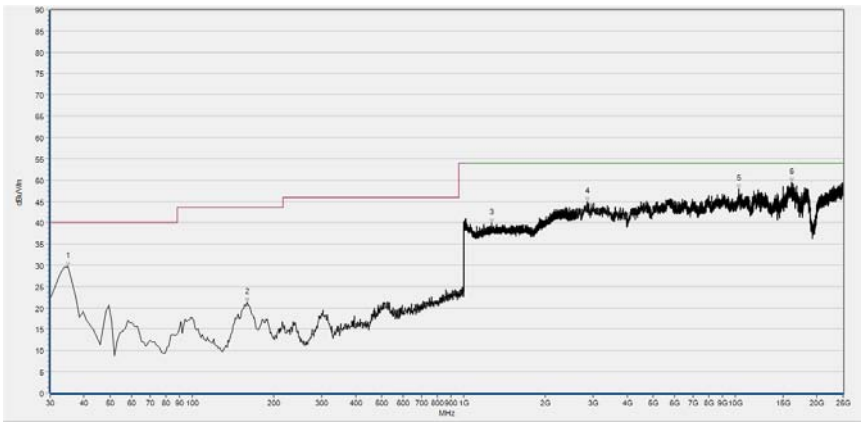
(Antenna Vertical, 30MHz to 25GHz)

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
104.055	19.91	N/A	N/A	N/A	43.50	N/A	Horizontal	PASS
300.726	23.25	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1348.299	39.86	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2689.616	45.23	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5699.909	46.20	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
12193.017	49.08	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

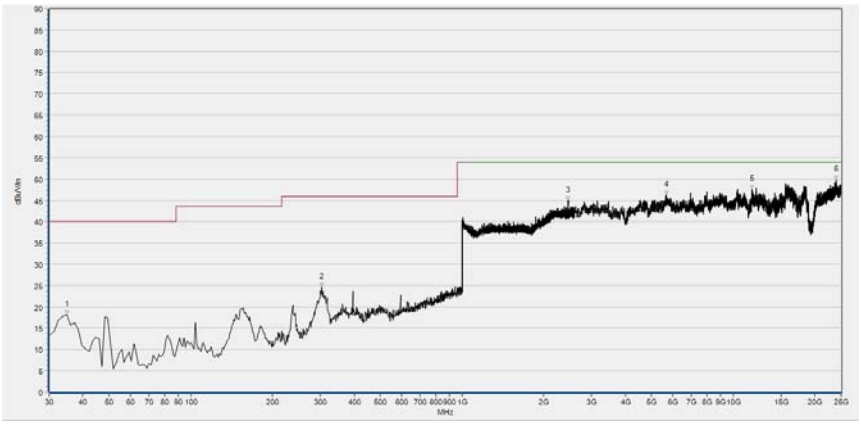
(Antenna Horizontal, 30MHz to 25GHz)



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
34.856	29.73	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
159.900	21.24	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
1265.706	39.82	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2852.555	44.88	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
10347.736	47.92	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
16119.840	49.51	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

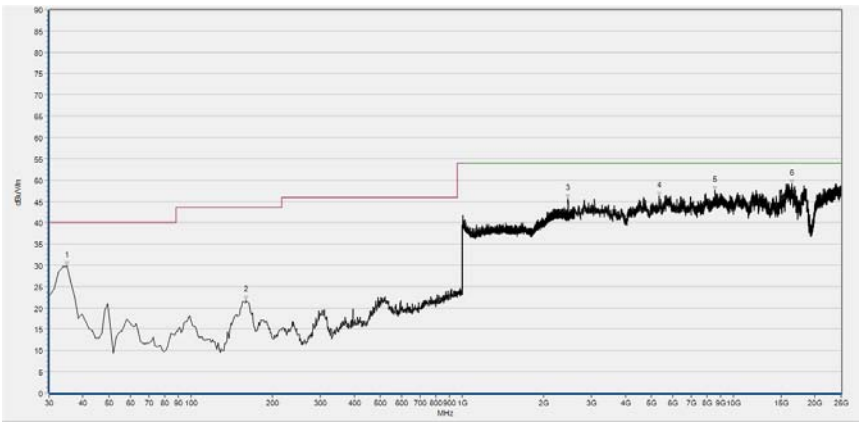
(Antenna Vertical, 30MHz to 25GHz)

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
34.856	18.13	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
304.368	24.56	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2462.345	44.98	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5651.027	46.28	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
11749.009	47.53	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
23936.825	49.85	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

(Antenna Horizontal, 30MHz to 25GHz)

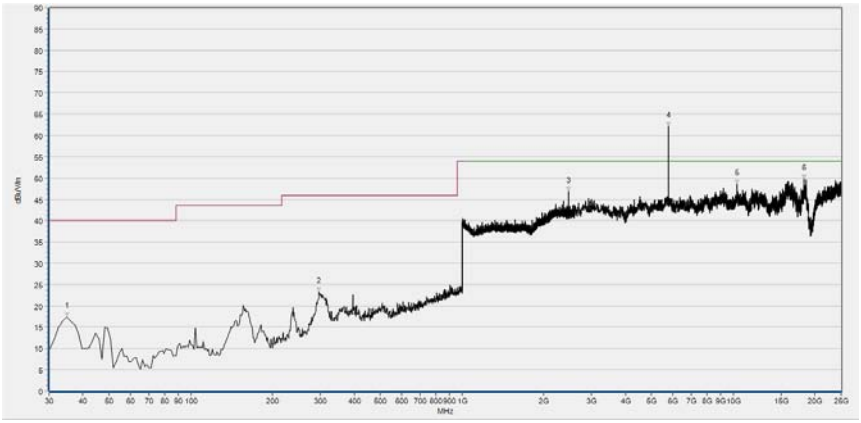


Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
34.856	29.88	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
159.900	21.80	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
2462.345	45.54	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5317.003	46.27	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8579.851	47.56	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
16425.350	49.05	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)

2.8.3.2 802.11g Test mode

Plots for Channel = 1



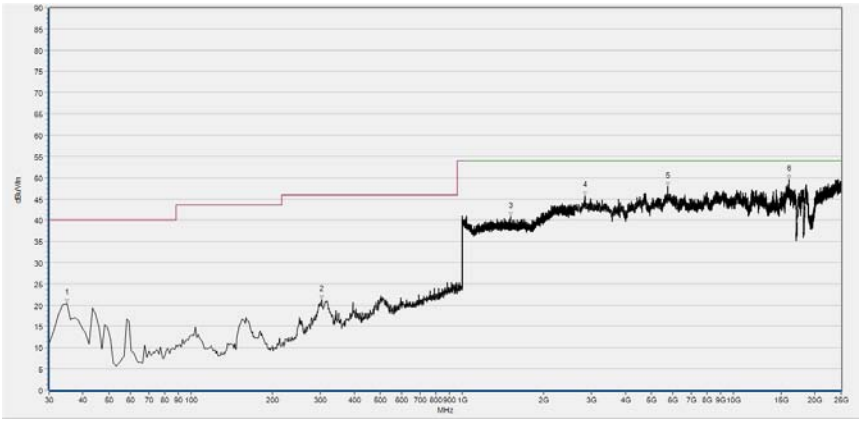
Fre. (MHz)	Pk (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
34.856	17.36	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
297.084	23.37	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2474.510	46.90	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5766.100	62.30	N/A	34.05	74.00	N/A	54.00	Horizontal	PASS
10331.442	48.61	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
18246.190	49.77	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
33.642	29.87	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
159.900	22.23	N/A	N/A	N/A	43.50	N/A	Vertical	PASS
1436.014	41.00	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2375.270	46.51	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
6539.043	46.50	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
15879.505	48.58	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)

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
34.856	20.47	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
304.368	21.23	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1507.723	40.93	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
2840.335	45.69	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
5744.717	47.87	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
16022.077	49.55	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
36.070	33.58	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
515.607	24.09	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1366.867	40.65	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
3088.816	44.94	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
6966.758	45.92	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
16030.224	48.96	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)

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
34.856	20.78	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
315.294	20.95	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1460.984	40.90	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4701.909	46.82	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
9150.136	47.03	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
18515.039	48.64	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

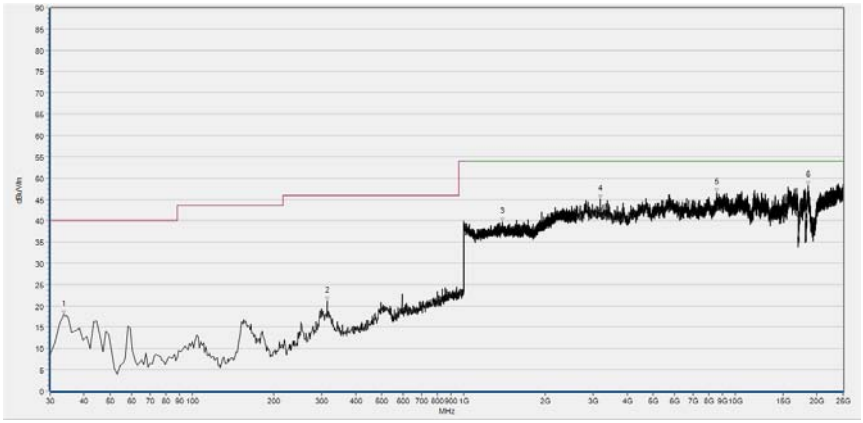
(Antenna Horizontal, 30MHz to 25GHz)

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
36.070	33.24	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
519.249	23.39	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1259.304	39.76	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4433.061	45.84	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
10331.442	47.48	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
23965.339	49.98	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)

2.8.3.3 802.11n-20MHz Test mode

Plots for Channel = 1



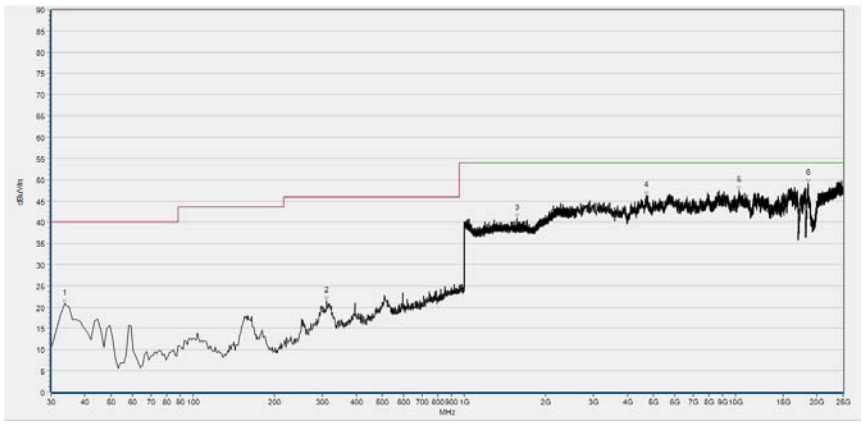
Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
33.642	17.99	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
314.080	21.04	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1391.837	39.72	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
3182.506	45.10	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
8575.777	46.60	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
18559.847	48.33	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
36.070	33.53	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
507.109	23.88	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1528.211	40.84	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2673.322	45.73	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
5883.215	46.87	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
16563.848	49.70	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

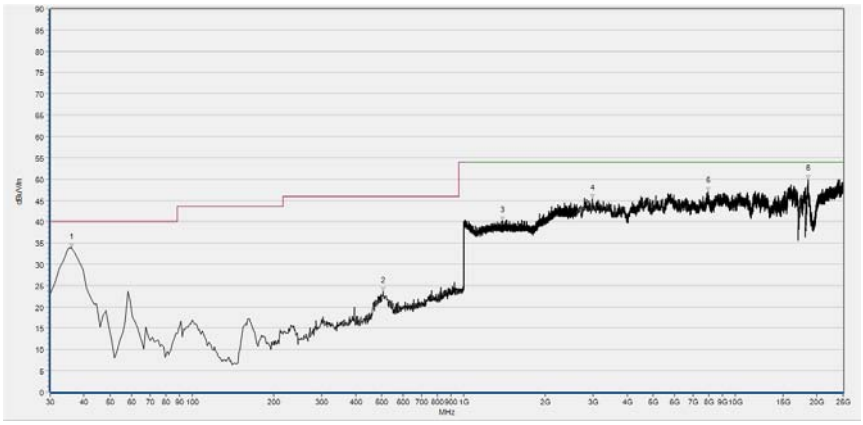
(Antenna Vertical, 30MHz to 25GHz)

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
33.642	20.73	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
311.652	21.42	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1569.188	40.94	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4697.836	46.28	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
10351.809	47.50	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
18527.260	49.14	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
36.070	33.87	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
505.895	23.67	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1393.117	40.25	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2974.759	45.38	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
7952.537	47.02	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
18559.847	49.96	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)

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
34.856	19.09	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
526.533	21.66	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1286.194	39.89	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
3284.343	44.10	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
10307.001	47.46	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
17826.623	47.61	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS

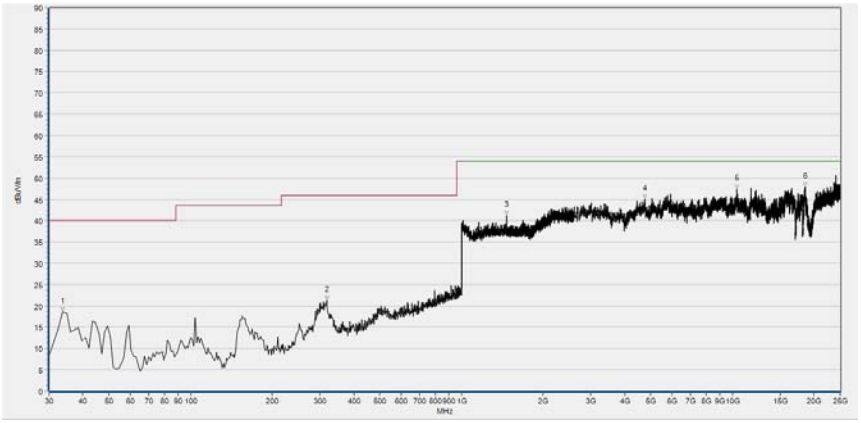
(Antenna Horizontal, 30MHz to 25GHz)

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
36.070	33.12	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
501.039	22.72	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
2239.536	44.42	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4583.779	45.81	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
11871.213	47.35	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
22527.405	48.50	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)

2.8.3.4 802.11n-40MHz Test mode

Plots for Channel = 3



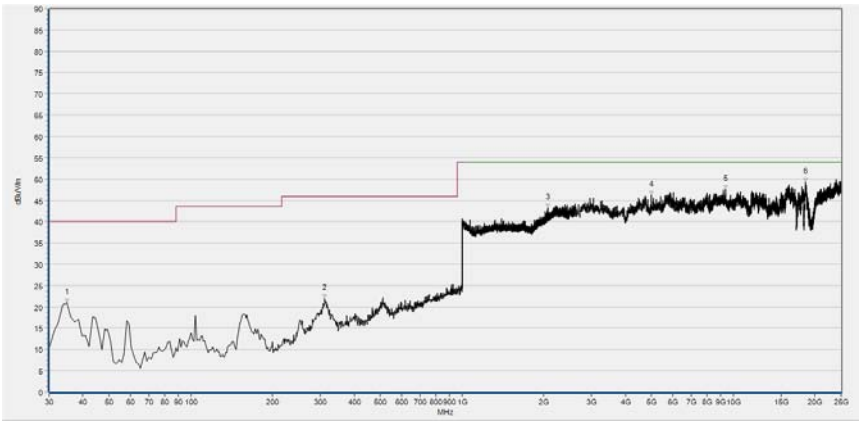
Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
33.642	18.58	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
317.722	21.31	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1468.027	41.26	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4754.865	45.02	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
10359.956	47.40	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
18551.700	47.96	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
36.070	33.16	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
508.323	23.05	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1370.708	40.41	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
4506.383	47.05	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
9740.789	47.59	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
18510.966	48.82	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)

Plots for Channel = 6



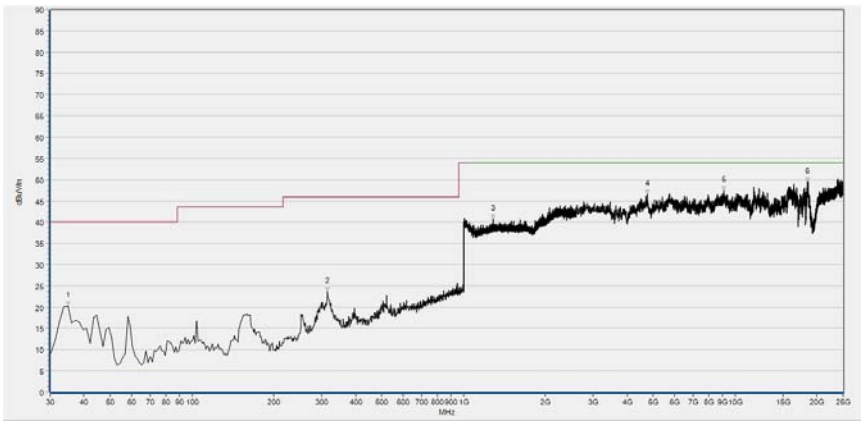
Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
34.856	20.92	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
311.652	21.88	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
2077.551	43.18	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4991.126	46.18	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
9361.957	47.63	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
18449.864	49.28	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
34.856	33.33	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
507.109	23.03	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1444.978	41.13	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2982.906	44.74	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8897.581	47.22	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
18531.333	49.17	N/A	N/A	74.00	N/A	54.00	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)

Plots for Channel = 9



Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
34.856	20.25	N/A	N/A	N/A	40.00	N/A	Horizontal	PASS
315.294	23.60	N/A	N/A	N/A	46.00	N/A	Horizontal	PASS
1287.475	40.69	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
4742.644	46.54	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
9064.594	47.40	N/A	N/A	74.00	N/A	54.00	Horizontal	PASS
18498.745	49.38	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
36.070	33.39	N/A	N/A	N/A	40.00	N/A	Vertical	PASS
515.607	24.04	N/A	N/A	N/A	46.00	N/A	Vertical	PASS
1560.864	41.12	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
2779.233	44.84	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
8820.185	46.76	N/A	N/A	74.00	N/A	54.00	Vertical	PASS
16087.252	49.30	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

Company Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Department:	Morlab Laboratory
Address:	FL.3, Building A, FeiYang Science Park, No.8 LongChang Road, Block 67, BaoAn District, ShenZhen, GuangDong Province, P. R. China
Responsible Test Lab Manager:	Mr. Su Feng
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.

4. Test Equipments Utilized

4.1 Conducted Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal. Due
Power Splitter	NW521	1506A	Weinschel	2018.04.17	2019.04.16
Attenuator 1	(N/A.)	10dB	Resnet	2018.04.17	2019.04.16
Attenuator 2	(N/A.)	3dB	Resnet	2018.04.17	2019.04.16
EXA Signal Analzyer	MY53470836	N9010A	Agilent	2017.12.03	2018.12.02
USB Wideband Power Sensor	MY54210011	U2021XA	Agilent	2018.04.17	2019.04.16
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

4.2 Conducted Emission Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal. Due
Receiver	MY56400093	N9038A	KEYSIGHT	2017.07.13	2018.07.12
LISN	812744	NSLK 8127	Schwarzbeck	2018.05.08	2019.05.07
Pulse Limiter (20dB)	9391	VTSD 9561-D	Schwarzbeck	2018.05.08	2019.05.07
Coaxial cable(BNC) (30MHz-26GHz)	CB01	EMC01	Morlab	N/A	N/A

4.3Auxiliary Test Equipment

Equipment Name	Model No.	Brand Name	Manufacturer	Cal.Date	Cal.Due Date
Computer	T430i	Think Pad	Lenovo	N/A	N/A

4.4 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

4.5 Radiated Test Equipments

Equipment Name	Serial No.	Type	Manufacturer	Cal. Date	Cal.Due Date
Receiver	MY54130016	N9038A	Agilent	2018.05.08	2019.05.07
Test Antenna - Bi-Log	9163-519	VULB 9163	Schwarzbeck	2018.05.08	2019.05.07
Test Antenna - Horn	9170C-531	BBHA9170	Schwarzbeck	2017.09.13	2018.09.12
Test Antenna - Loop	1519-022	FMZB1519	Schwarzbeck	2018.03.03	2019.03.02
Test Antenna - Horn	01774	BBHA 9120D	Schwarzbeck	2017.09.13	2018.09.12
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	2018.05.08	2019.05.07
18-26.5GHz pre-Amplifier	MA03	TS-PR18	Rohde& Schwarz	2018.05.08	2019.05.07
Anechoic Chamber	N/A	9m*6m*6m	CRT	2017.11.19	2020.11.18

END OF REPORT