REPORT No.: SZ17020049W03

FCC RF TEST REPORT

APPLICANT	:	Hoperun mMax Digital Inc.
PRODUCT NAME	:	CDMA 3G Mobile Phone
MODEL NAME	:	H460
TRADE NAME	:	Jabrbox
BRAND NAME	:	Jabrbox
FCC ID	:	2AKQN-H460
STANDARD(S)	:	47 CFR Part 15 Subpart C
ISSUE DATE	:	2017-03-15

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DIRECTORY

Change History		
Issue	Date	Reason for change
1.0	2017-03-15	First edition

TEST REPORT DECLARATION

Applicant	Hoperun mMax Digital Inc.
Applicant Address	4790 Irvine Blvd., Ste. 105-431 Irvine, CA 92620
Manufacturer Address	Hoperun mMax Digital Inc.
Manufacturer	4790 Irvine Blvd., Ste. 105-431 Irvine, CA 92620
Product Name	CDMA 3G Mobile Phone
Model Name	H460
Brand Name	Jabrbox
HW Version	S408_MB_V3.0
SW Version	HMD-H460JB
Test Standards	47 CFR Part 15 Subpart C
Test Date	2017-02-24 to 2017-03-07
Test Result	PASS

Reviewed by : Qiu Xiaojun

Qiu Xiaojun

Approved by : Peng Huarui

Peng Huarui

1. TECHNICAL INFORMATION

Note: Provide by applicant.

1.1 Applicant Information

Company:	Hoperun mMax Digital Inc.
Address	4790 Irvine Blvd., Ste. 105-431 Irvine, CA 92620

1.2 Equipment under Test (EUT) Description

Brand Name:	Jabrbox
Trade Name:	Jabrbox
Model Name:	H460
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
Modulation Type:	DSSS, OFDM
Antenna Type:	PIFA Antenna
Antenna Gain:	-2 dBi

NOTE:

1. The EUT is a CDMA 3G Mobile Phone, it's 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).

2. 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. And the duty cycle is 100%.
3. For a more detailed description, please refer to Specification or User's Manual supplied by the applicant and/or manufacturer.

1.2.1 Identification of all used EUTs

The EUT identity consists of numerical and letter characters, the letter character indicates the test sample, and the following two numerical characters indicate the software version of the test sample.

EUT Identity	Hardware Version	Software Version
A01	S408_MB_V3.0	HMD-H460JB

1.3 Test Standards and Results

The objective of the report is to perform testing according to 47 CFR Part 15 Subpart C (Bluetooth, 2.4GHz ISM band radiators) 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	Result
1	15.203	Antenna Requirement	N.A	**PASS**
2	15.247(b)	Peak Output Power	Feb 24, 2017	**PASS**
3	15.247(a)	Bandwidth	Feb 24, 2017	**PASS**
4	15.247(d)	Conducted Spurious Emission and Band Edge	Feb 24, 2017	**PASS**
5	15.247(d)	Restricted Frequency Bands	Mar 07, 2017	**PASS**
6	15.207	Conducted Emission	Mar 07, 2017	**PASS**
7	15.209 ,15.247(d)	Radiated Emission	Mar 07, 2017	**PASS**
8	15.247(e)	Power spectral density (PSD)	Feb 24, 2017	**PASS**

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 v03r05 (04/08/2016).

1.3.1 Test Environment 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, all test result in power meter.

B. Equipments List:

Please reference ANNEX A(1.5).

2.2.3 Test Result

The lowest, middle and highest channels are selected to perform testing to verify the conducted RF output peak power of the Module.

2.2.3.1 802.11b Test Mode

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
1	2412	18.33	0.0681	30	1	PASS
6	2437	17.63	0.0579			PASS
11	2462	18.23	0.0665			PASS

Channel	Frequency (MHz)	Measured Output Average Power		Limit		Verdict
		dBm	W	dBm	W	
1	2412	15.26	0.0336	30	1	PASS
6	2437	14.74	0.0298			PASS
11	2462	15.23	0.0334			PASS

2.2.3.2 802.11g Test mode

Channel	Frequency (MHz)	Measured Output Peak Power		Limit		Verdict
		dBm	W	dBm	W	
1	2412	21.94	0.1563	30	1	PASS
6	2437	21.63	0.1455			PASS
11	2462	21.78	0.1507			PASS

Channel	Frequency (MHz)	Measured Output Average Power		Limit		Verdict
		dBm	W	dBm	W	
1	2412	14.42	0.0277	30	1	PASS
6	2437	14.51	0.0283			PASS
11	2462	14.58	0.0287			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	21.65	0.1462	30	1	PASS
6	2437	21.58	0.1439			PASS
11	2462	21.71	0.1483			PASS

Channel	Frequency (MHz)	Measured Output Average Power		Limit		Verdict
		dBm	W	dBm	W	
1	2412	14.40	0.0276	30	1	PASS
6	2437	14.33	0.0271			PASS
11	2462	14.52	0.0283			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	20.92	0.1236	30	1	PASS
6	2437	20.45	0.1109			PASS
9	2452	20.59	0.1146			PASS

Channel	Frequency (MHz)	Measured Output Average Power		Limit		Verdict
		dBm	W	dBm	W	
3	2422	12.03	0.0160	30	1	PASS
6	2437	11.84	0.0153			PASS
9	2452	11.62	0.0145			PASS

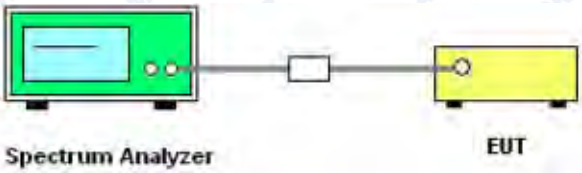
2.3 Bandwidth

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 reference ANNEX A(1.5).

2.3.3 Test Result

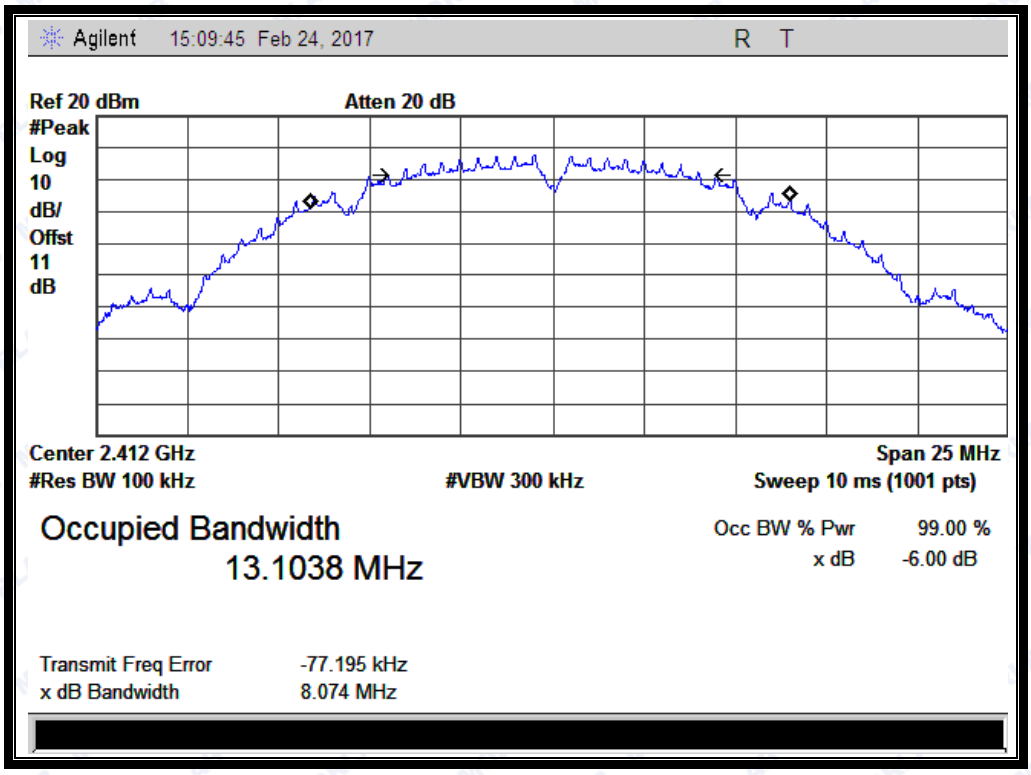
The lowest, middle and highest channels are selected to perform testing to record the 6 dB bandwidth of the Module.

2.3.3.1 802.11b Test mode

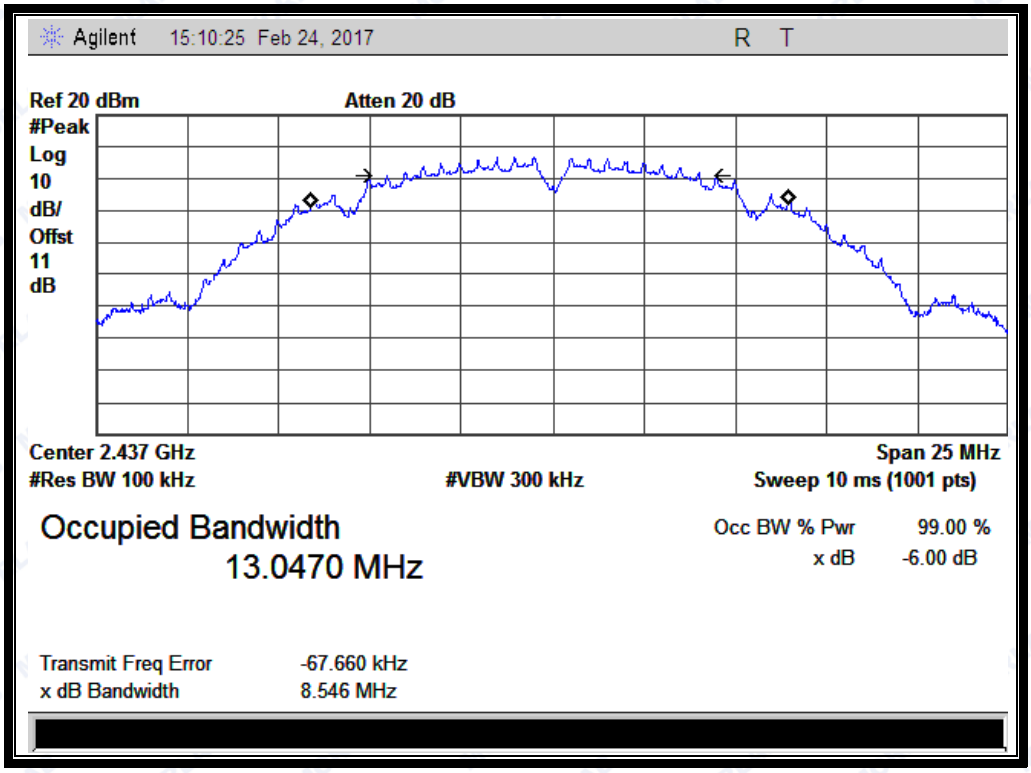
A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits(kHz)	Result
1	2412	8.074	≥500	PASS
6	2437	8.546	≥500	PASS
11	2462	8.558	≥500	PASS

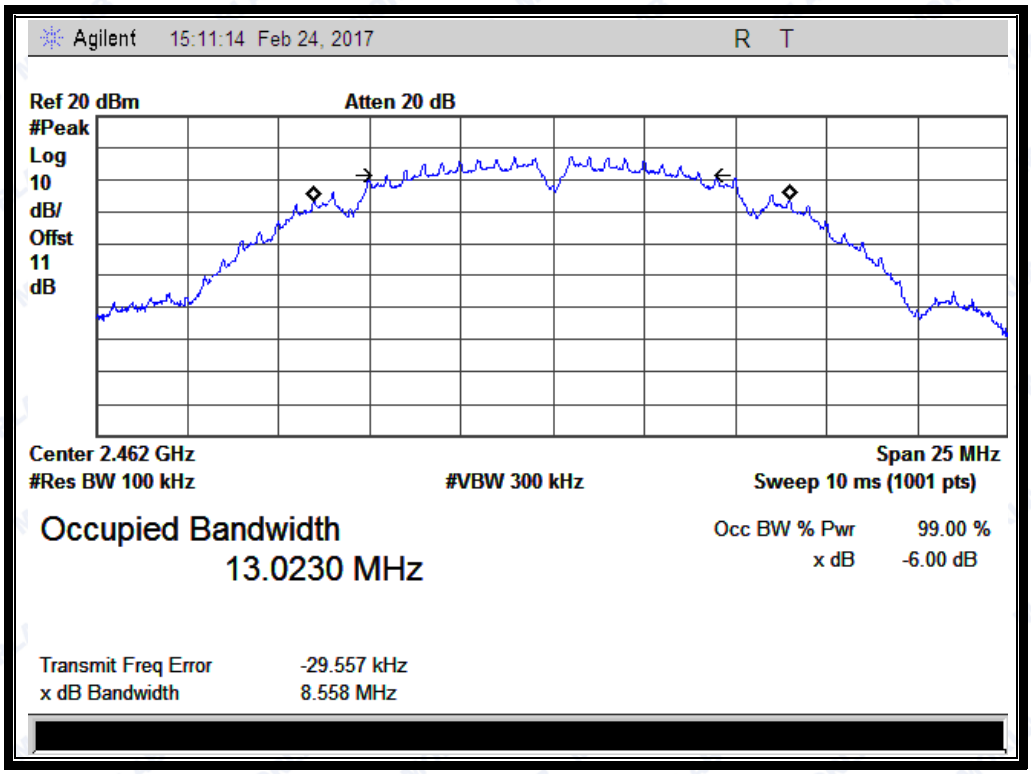
B. Test Plots



(Channel 1: 2412MHz @ 802.11b)



(Channel 6: 2437 MHz @ 802.11b)



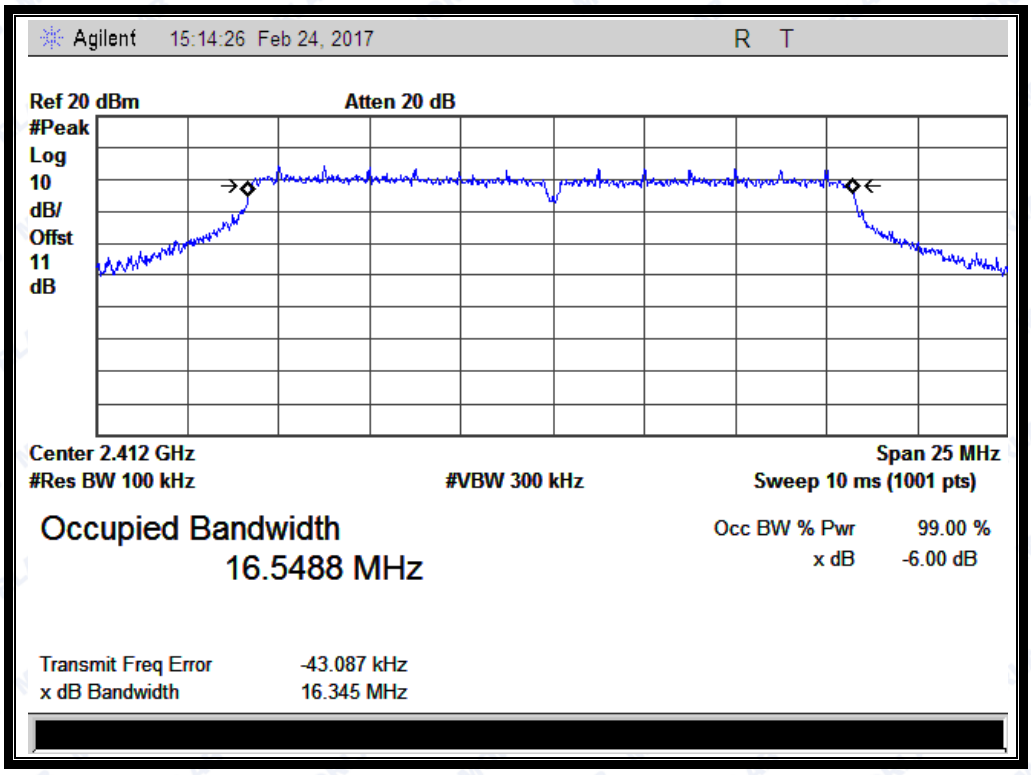
(Channel 11: 2462MHz @ 802.11b)

2.3.3.2 802.11g Test mode

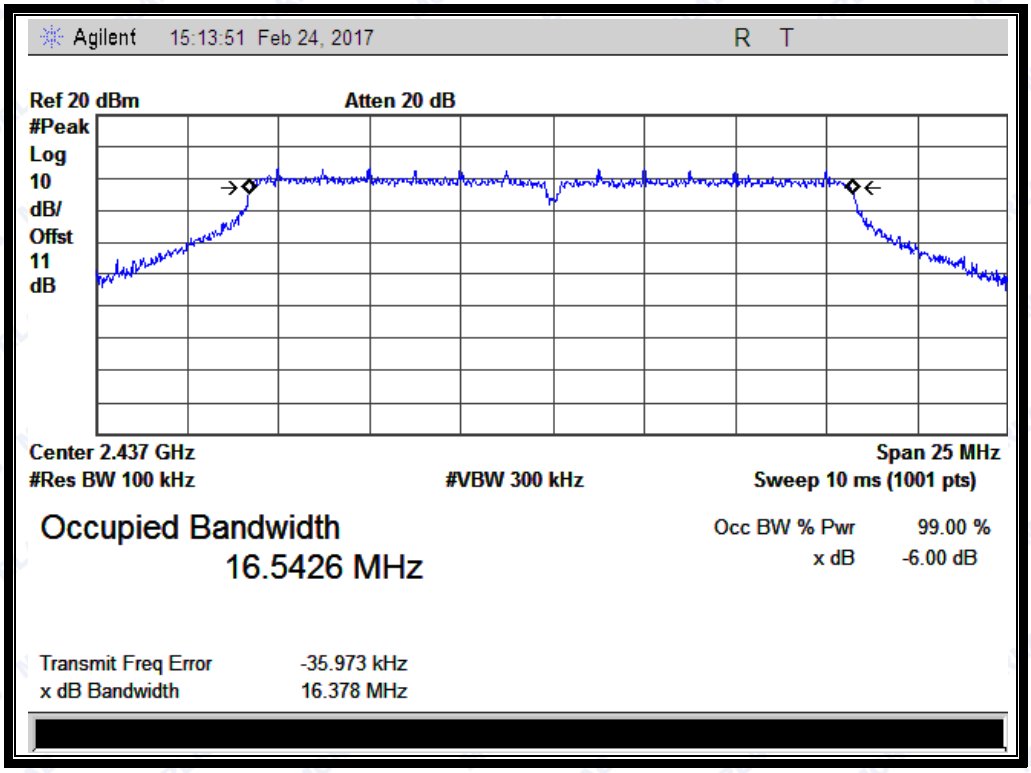
A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits (kHz)	Result
1	2412	16.345	≥500	PASS
6	2437	16.378	≥500	PASS
11	2462	16.385	≥500	PASS

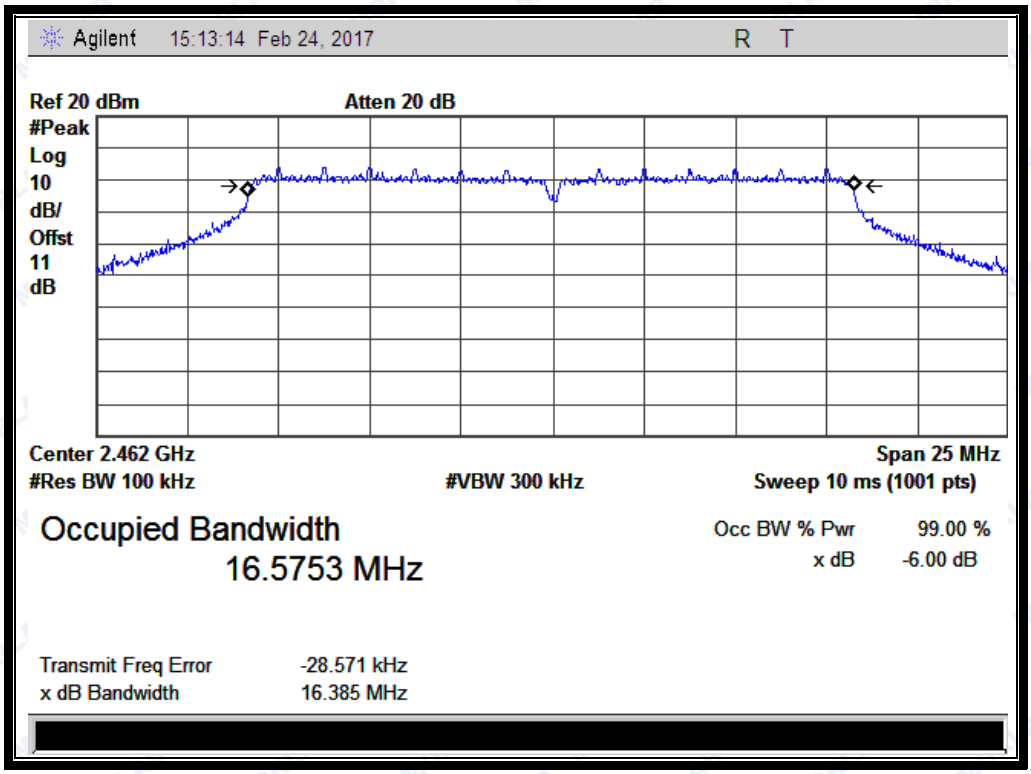
B. Test Plots:



(Channel 1: 2412MHz @ 802.11g)



(Channel 6: 2437MHz @ 802.11g)



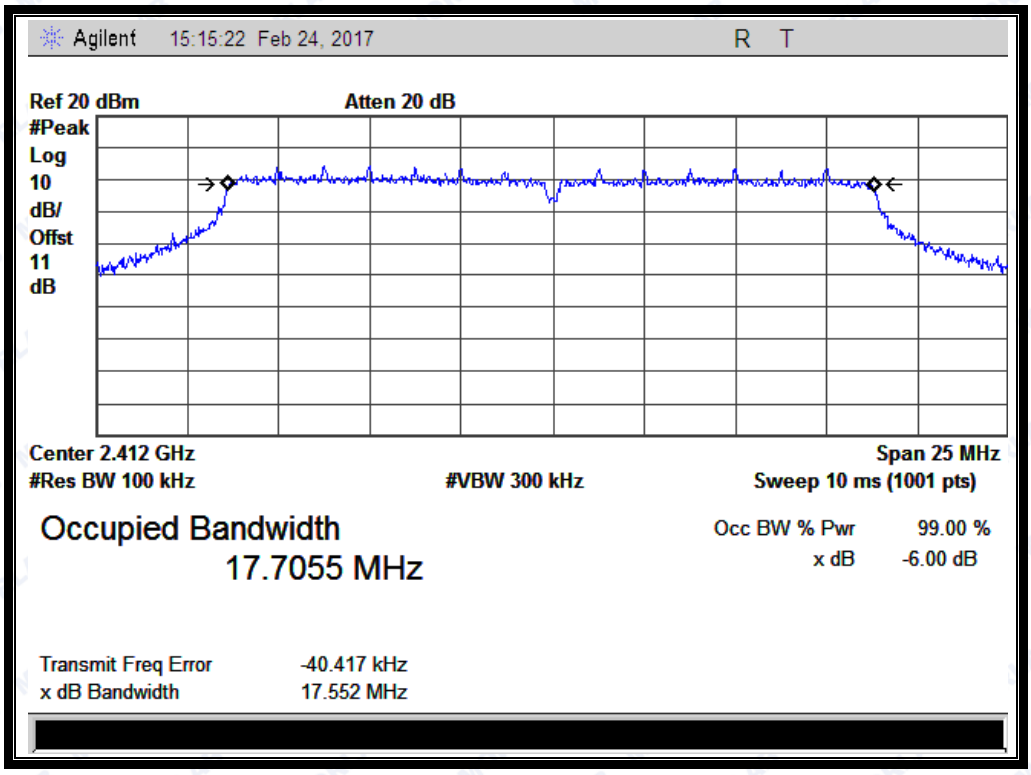
(Channel 11: 2462MHz @ 802.11g)

2.3.3.3 802.11n-20 Test mode

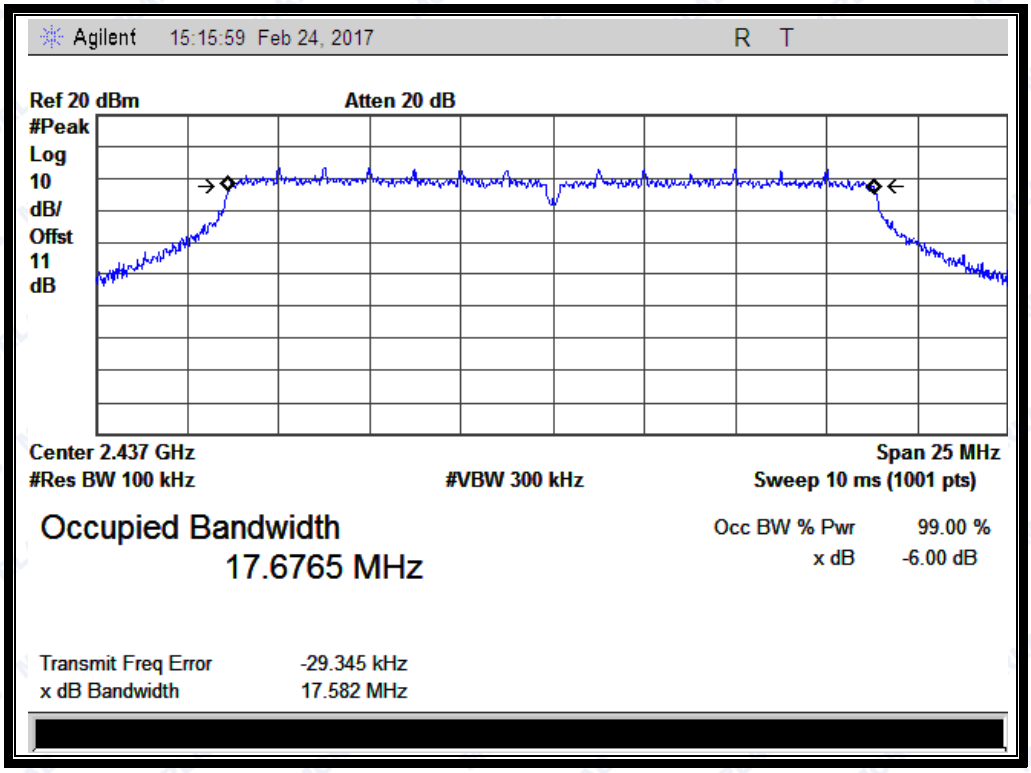
A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits (kHz)	Result
1	2412	17.552	≥500	PASS
6	2437	17.582	≥500	PASS
11	2462	17.597	≥500	PASS

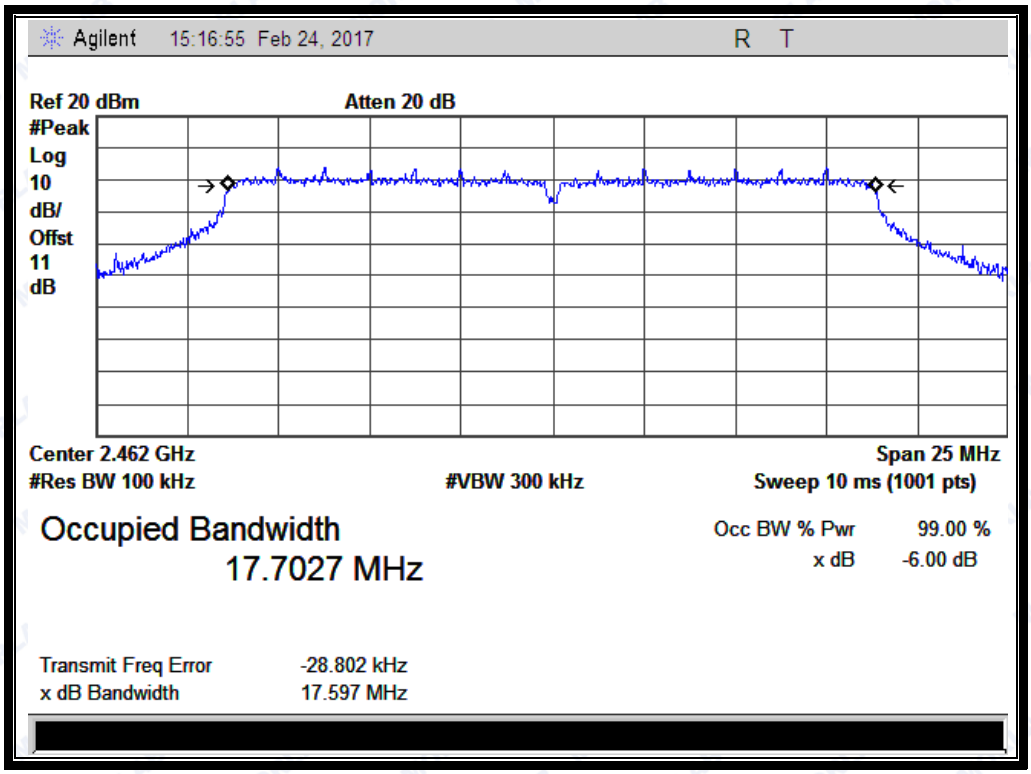
B. Test Plots:



(Channel 1: 2412MHz @ 802.11n-20)



(Channel 6: 2437MHz @ 802.11n-20)



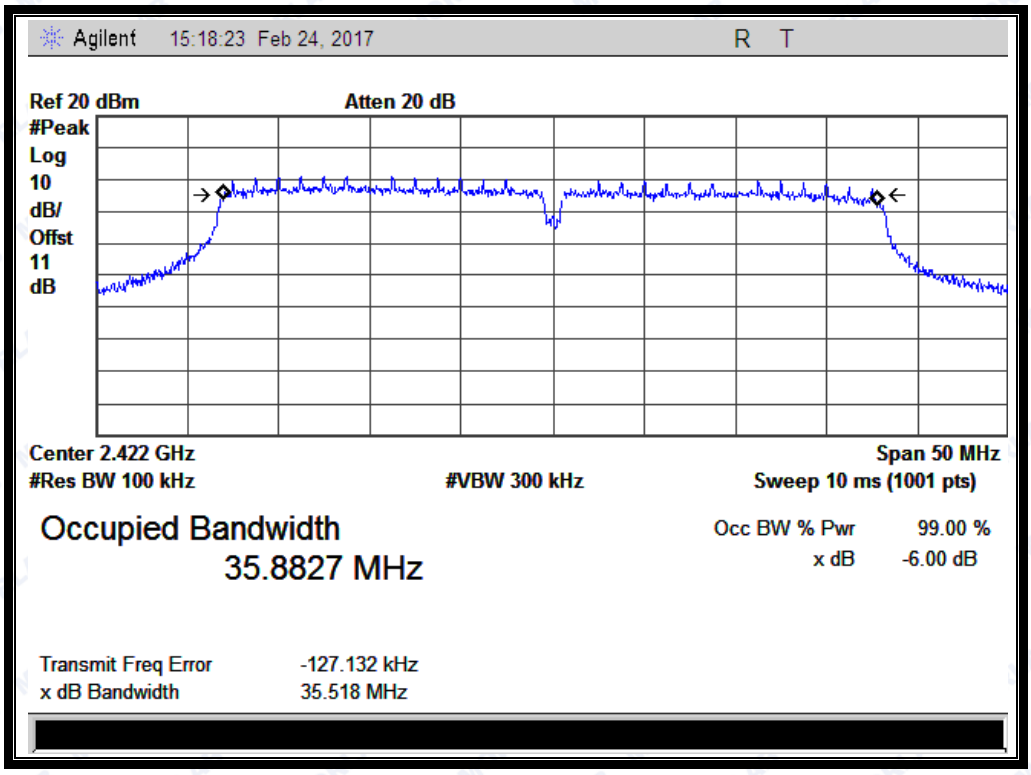
(Channel 11: 2462MHz @ 802.11n-20)

2.3.3.4 802.11n-40 Test mode

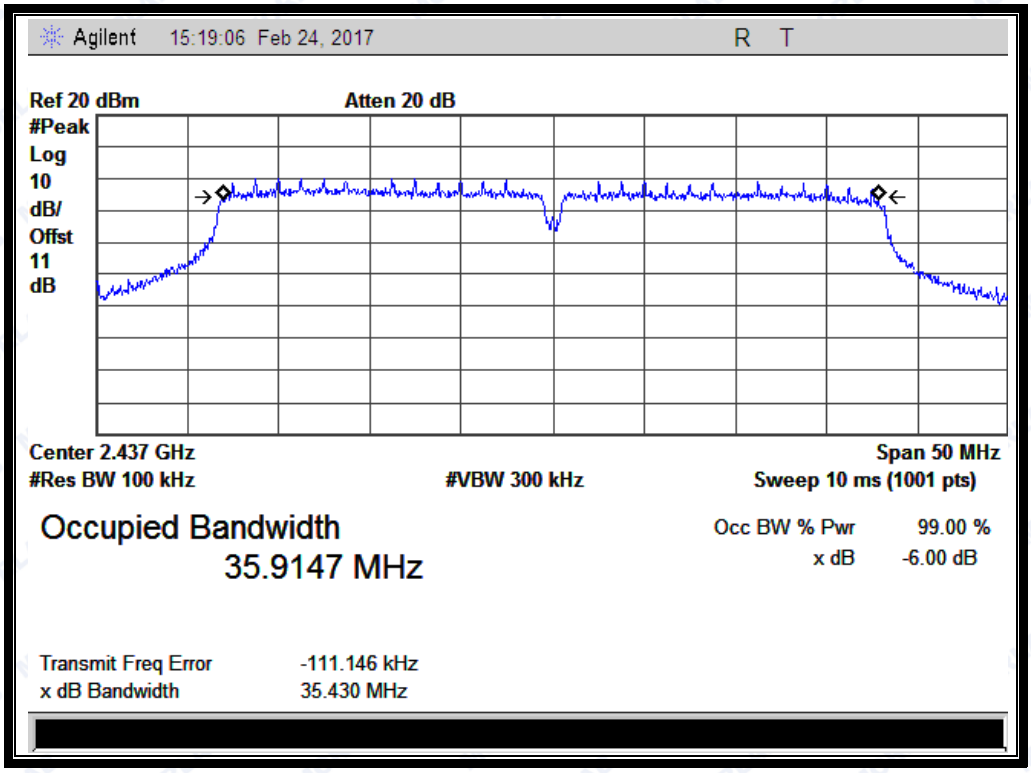
A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits (kHz)	Result
3	2422	35.518	≥500	PASS
6	2437	35.430	≥500	PASS
9	2452	35.564	≥500	PASS

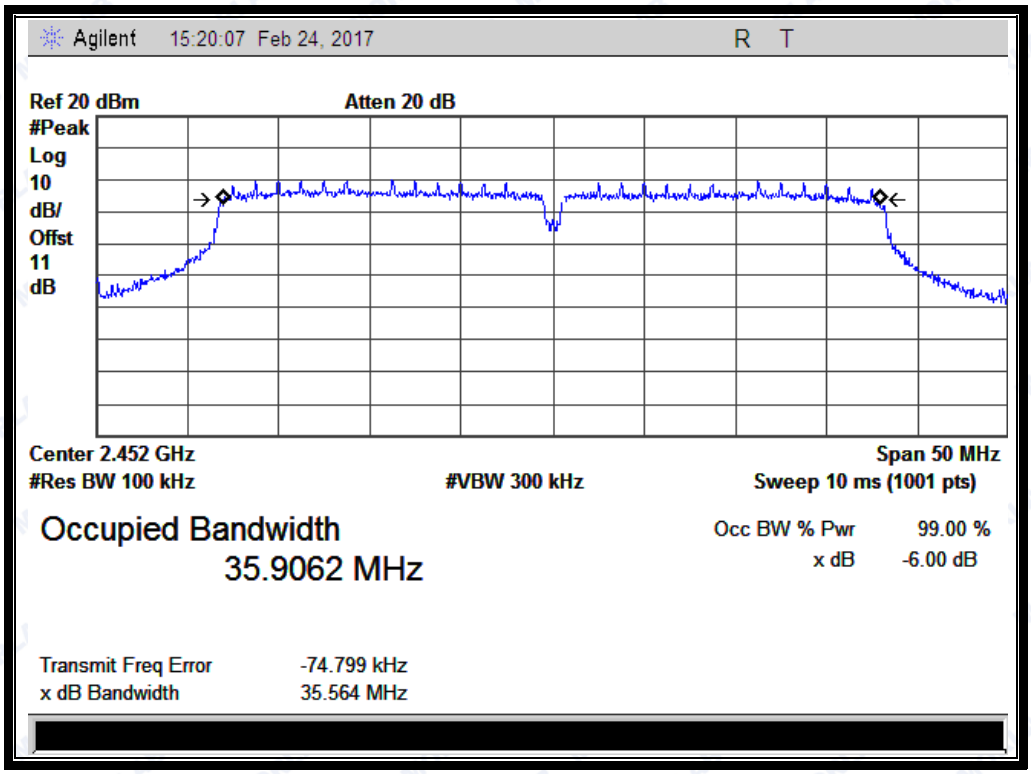
B. Test Plots:



(Channel 3: 2422Mz @ 802.11n-40)



(Channel 6: 2437MHz @ 802.11n-40)



(Channel 9: 2452MHz @ 802.11n-40)

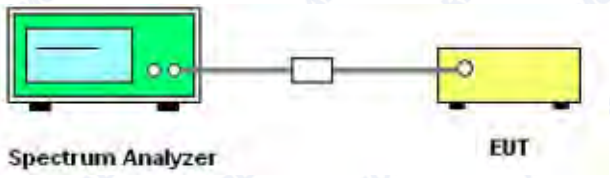
2.4 Conducted Spurious Emissions and Band Edge

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 reference ANNEX A(1.5).

2.4.3 Test Result

The measurement frequency range is from 30MHz to the 10th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions.

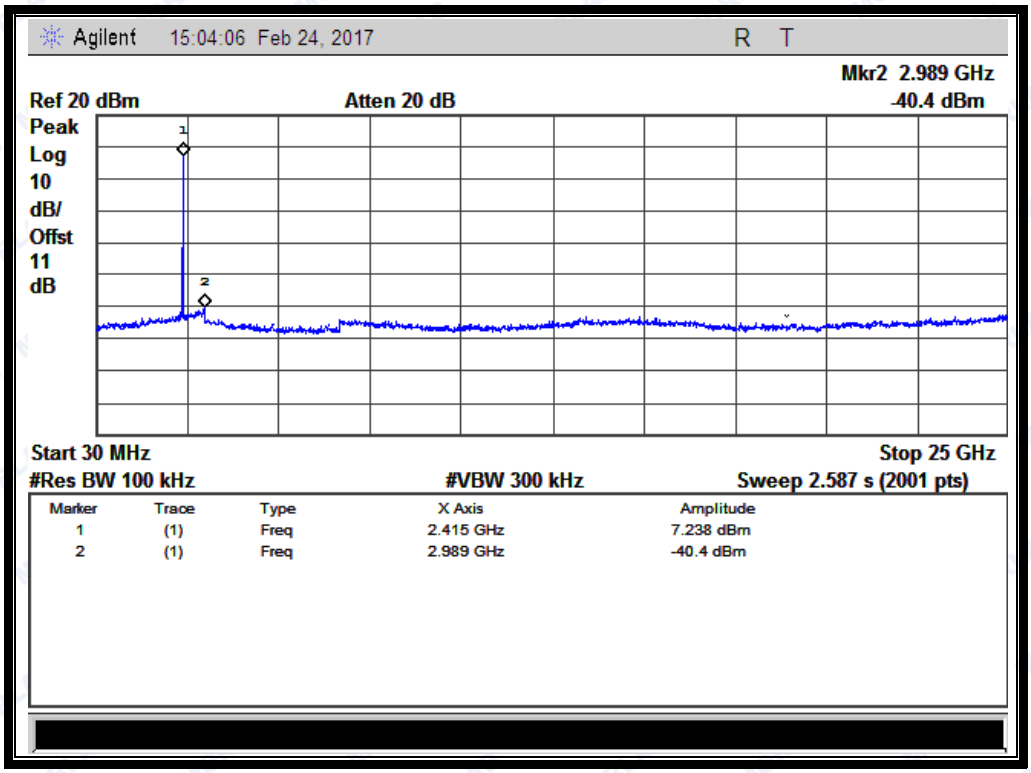
2.4.3.1 802.11b Test mode

A. Test Verdict:

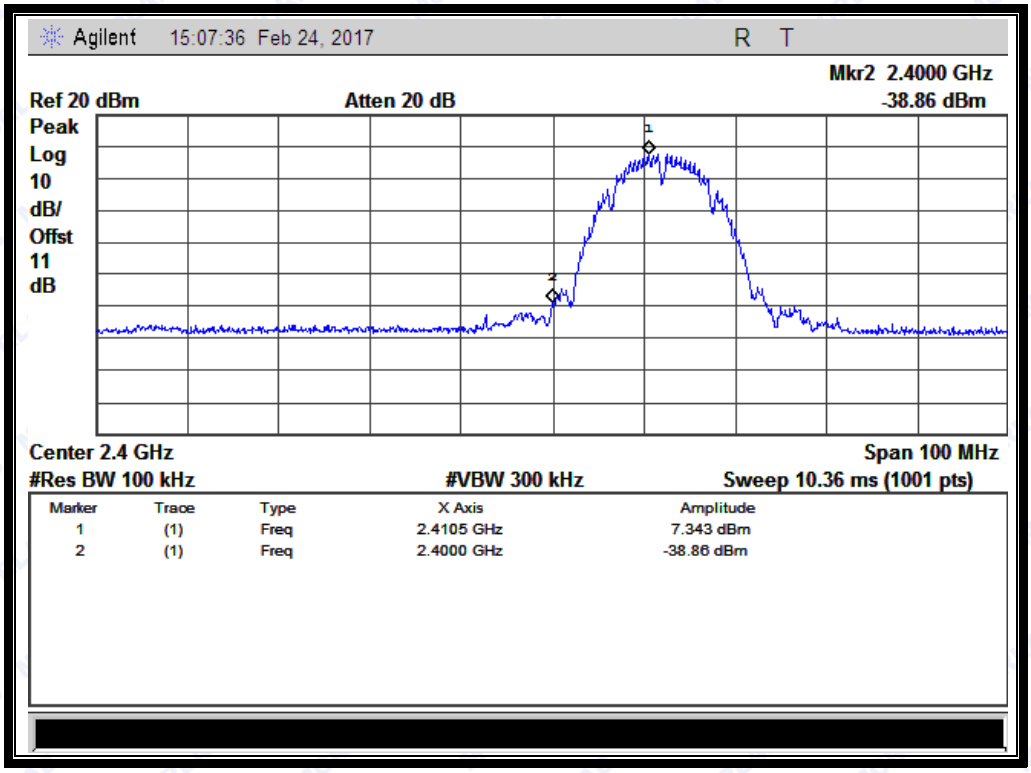
Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-40.40	7.24	-12.76	PASS
6	2437	-40.76	6.54	-13.46	PASS
11	2462	-40.40	7.87	-12.13	PASS

B. Test Plots:

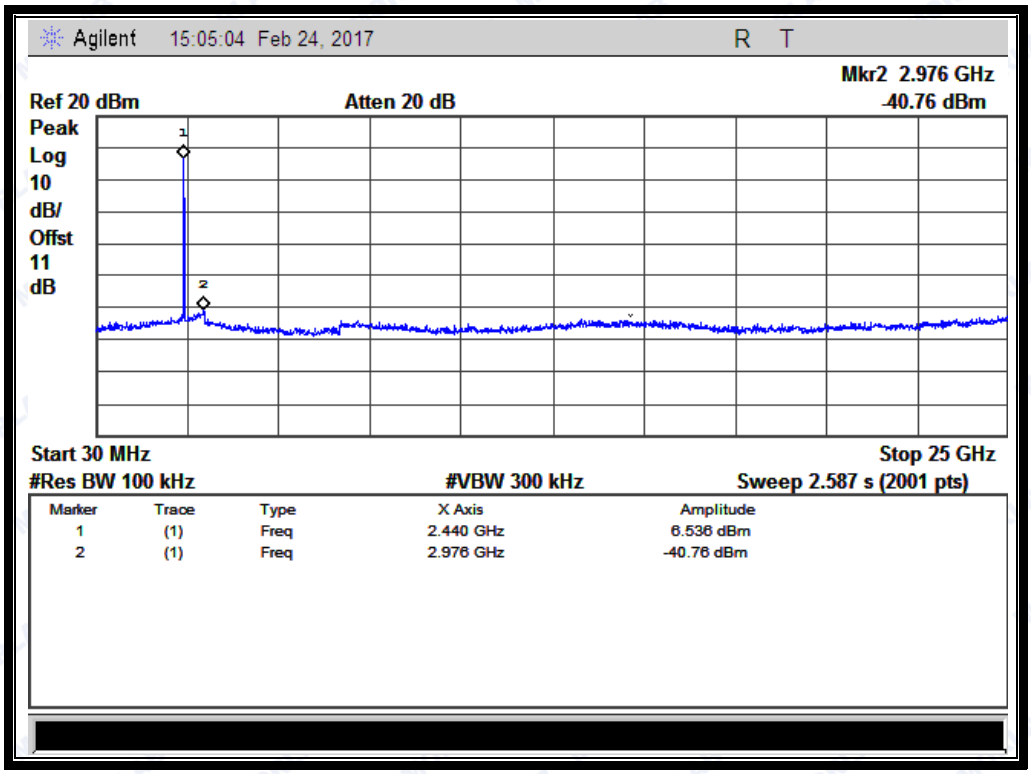
Note: the power of the Module transmitting frequency should be ignored.



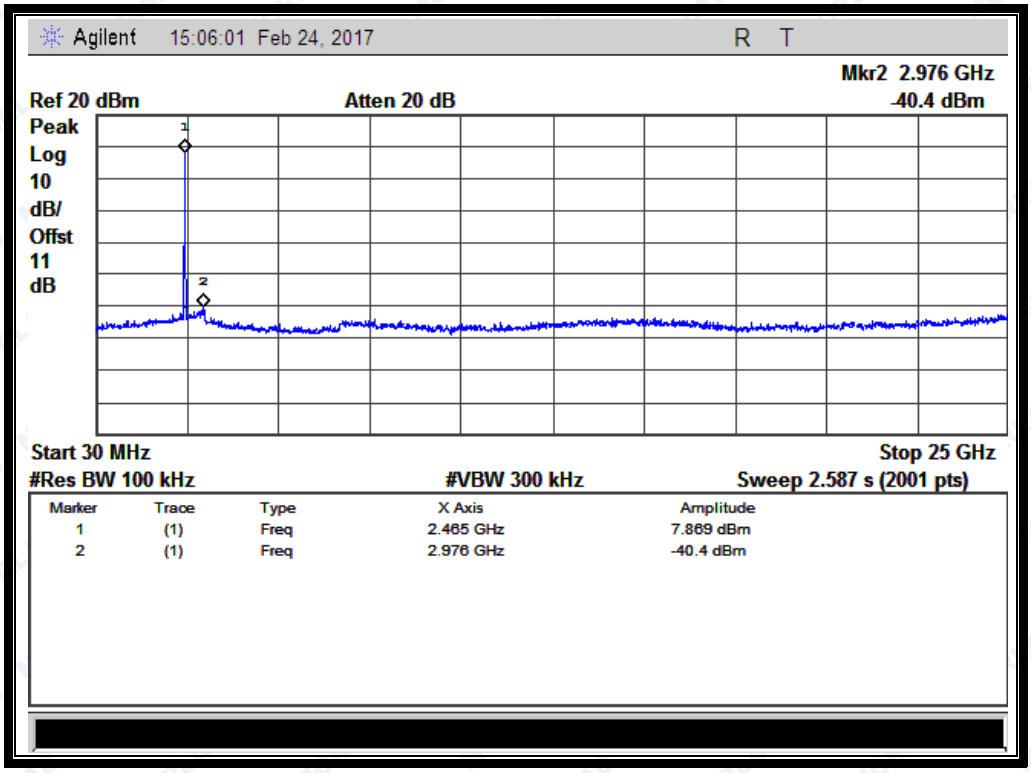
(Channel = 1, 30MHz to 25GHz)



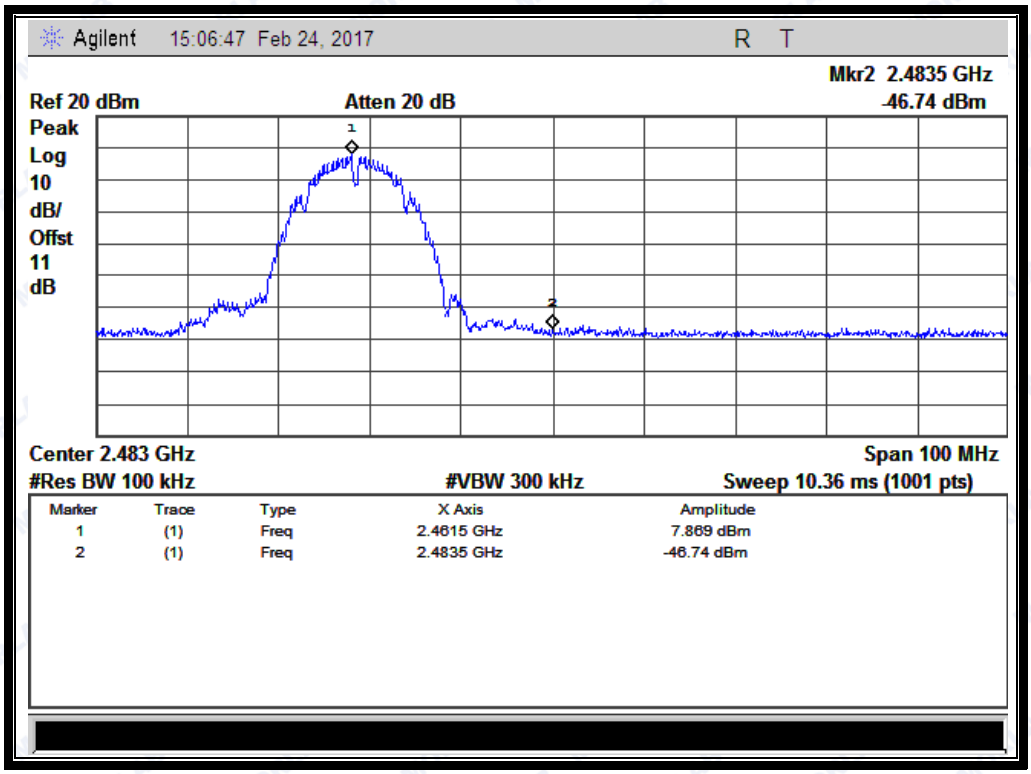
(Band Edge @ Channel = 1)



(Channel = 6, 30MHz to 25GHz)



(Channel = 11, 30MHz to 25GHz)



(Band Edge @ Channel = 11)

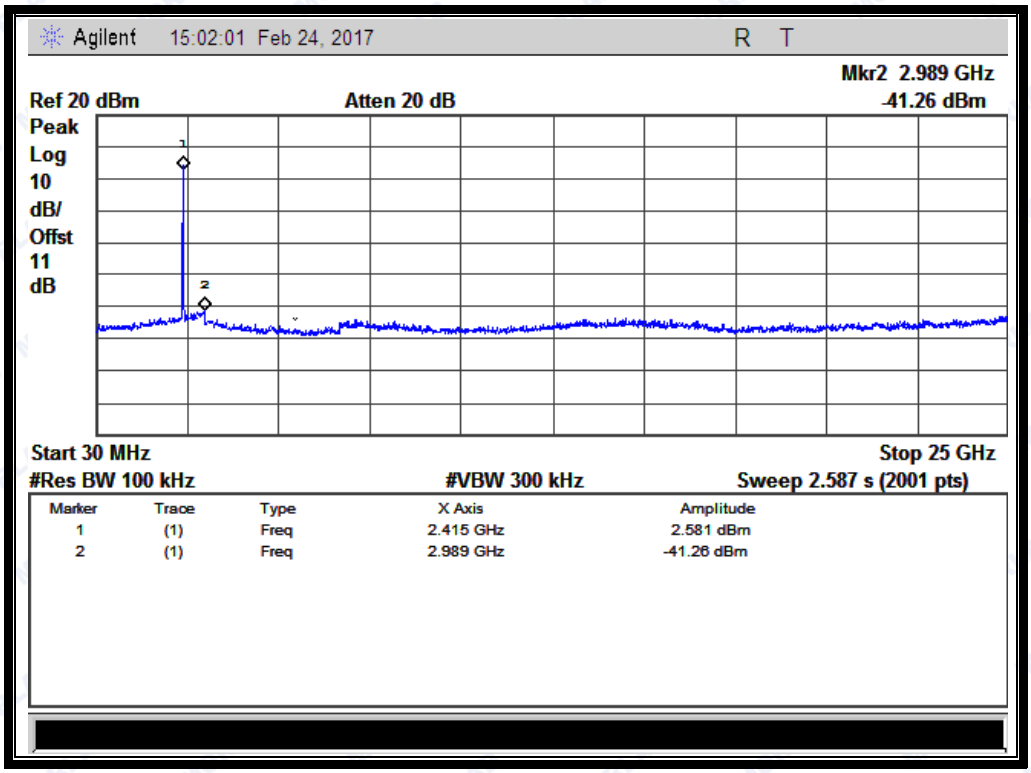
2.4.3.2 802.11g Test mode

A. Test Verdict:

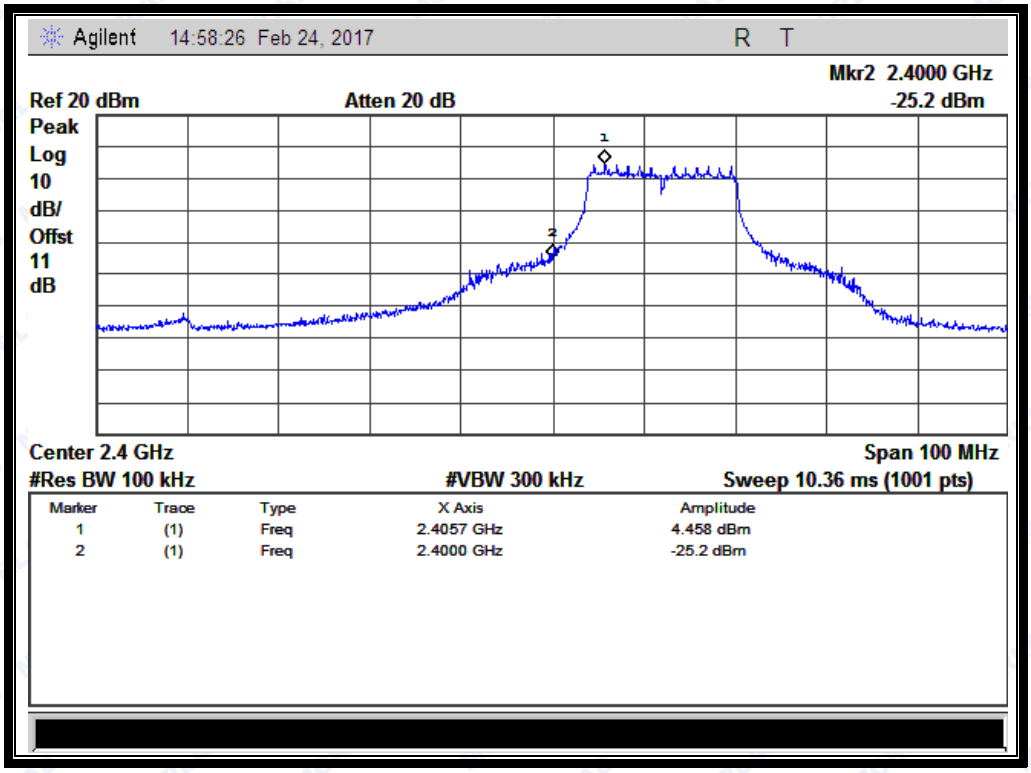
Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-41.26	2.58	-17.42	PASS
6	2437	-41.15	0.29	-19.71	PASS
11	2462	-41.62	1.40	-18.60	PASS

B. Test Plots:

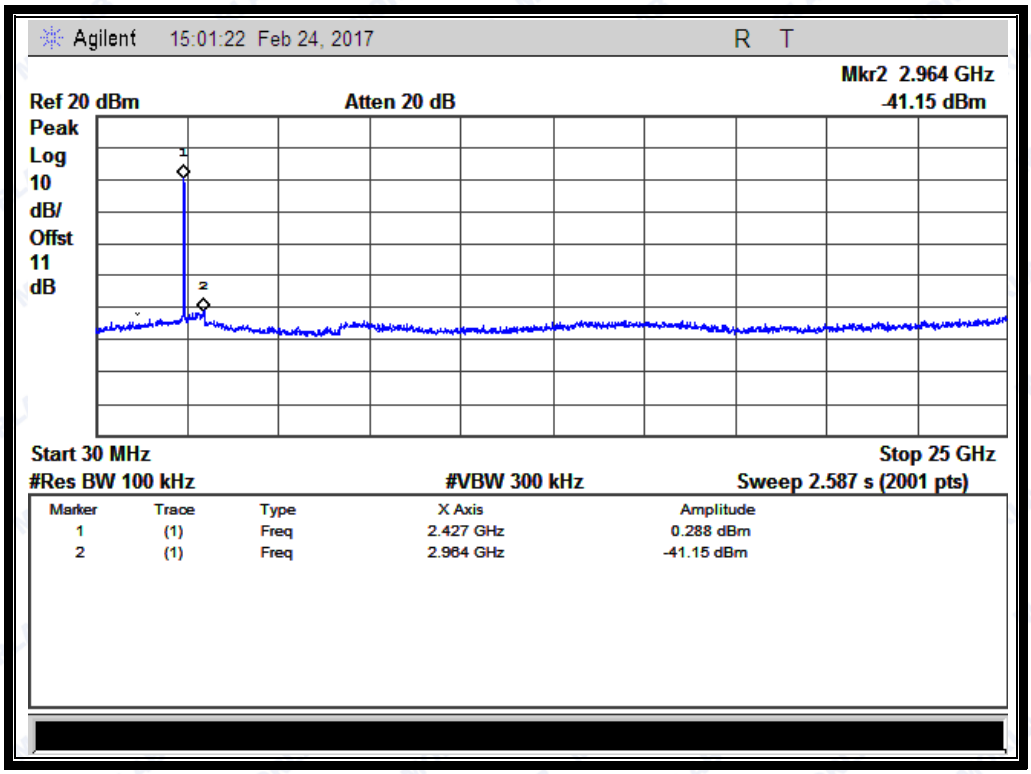
Note: the power of the Module transmitting frequency should be ignored.



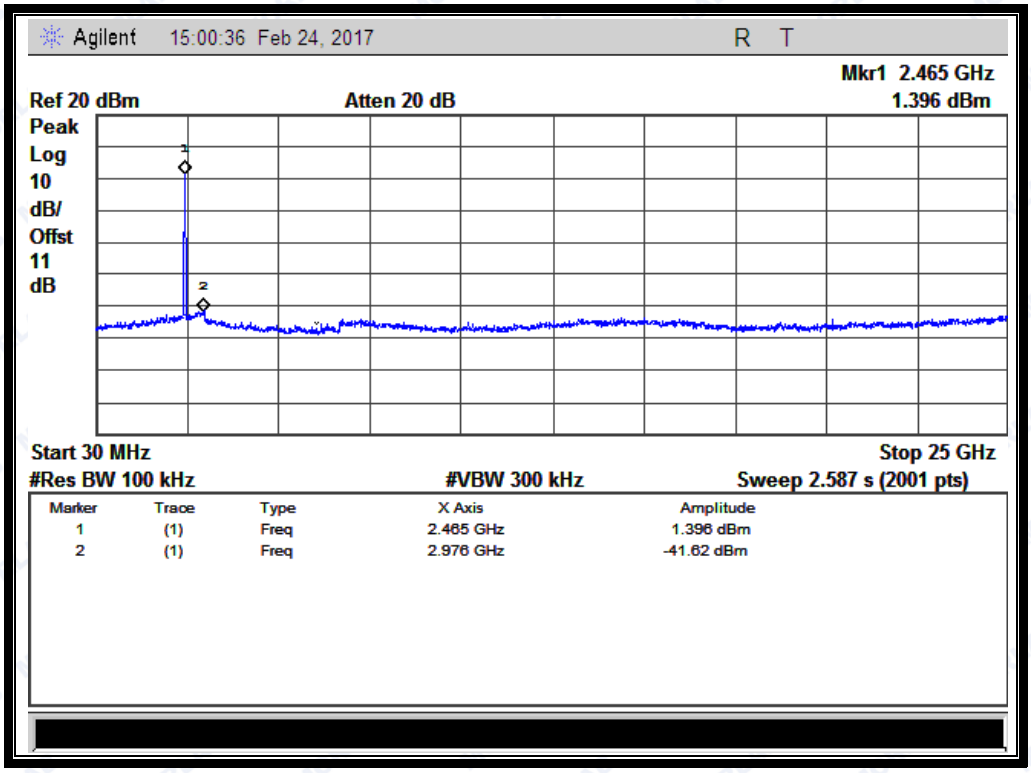
(Channel = 1, 30MHz to 25GHz)



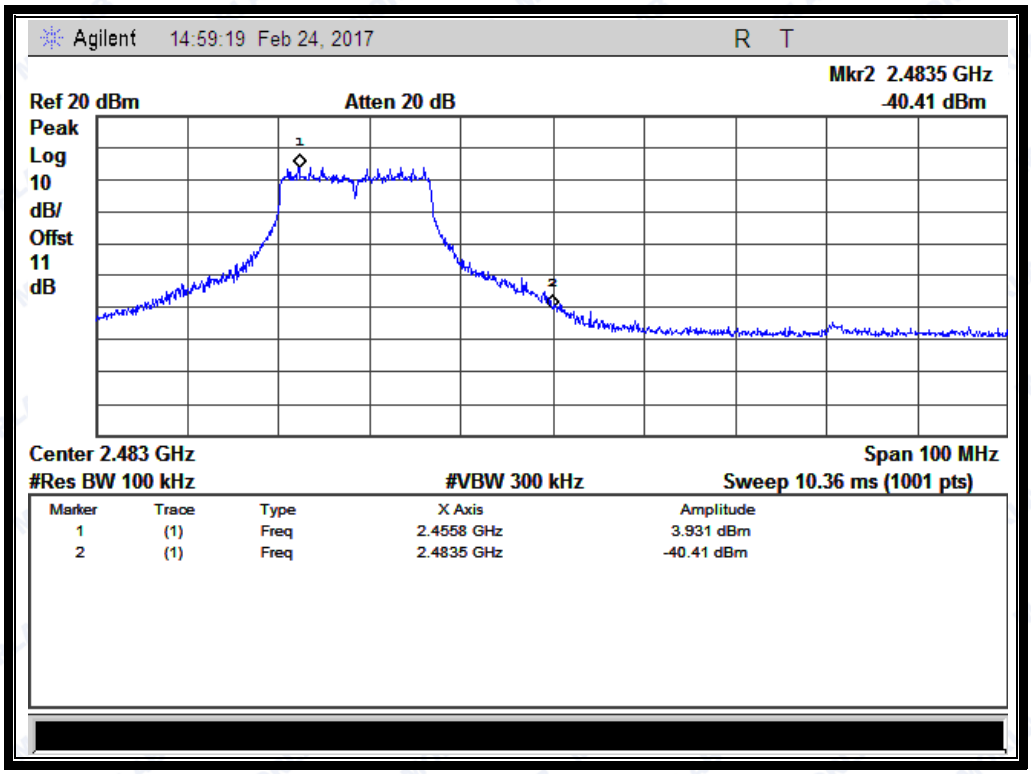
(Band Edge @ Channel = 1)



(Channel = 6, 30MHz to 25GHz)



(Channel = 11, 30MHz to 25GHz)



(Band Edge @ Channel = 11)

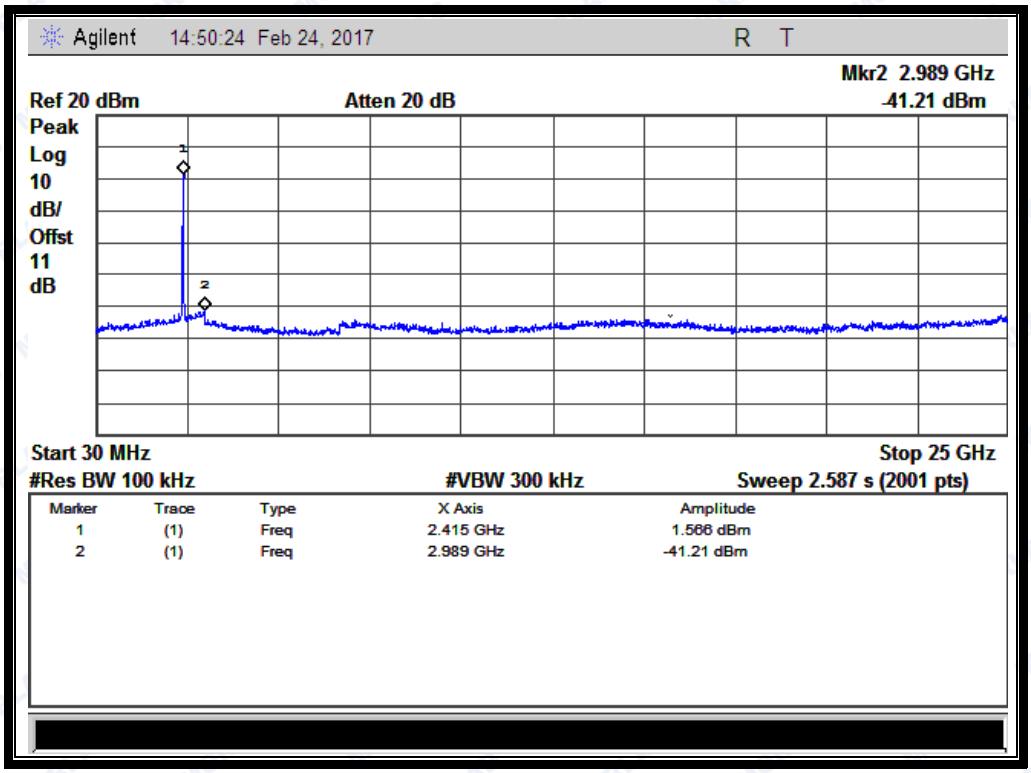
2.4.3.3 802.11n -20MHz Test mode

A. Test Verdict:

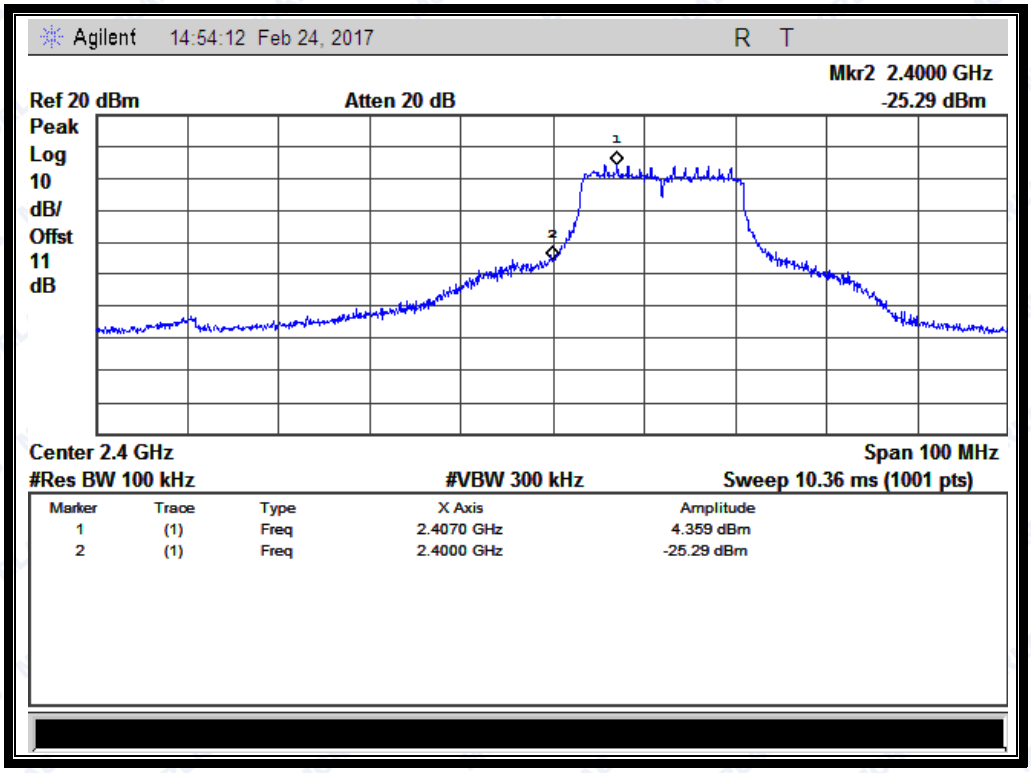
Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
1	2412	-41.21	1.57	-18.43	PASS
6	2437	-39.11	0.59	-19.41	PASS
11	2462	-41.92	0.34	-19.66	PASS

B. Test Plots:

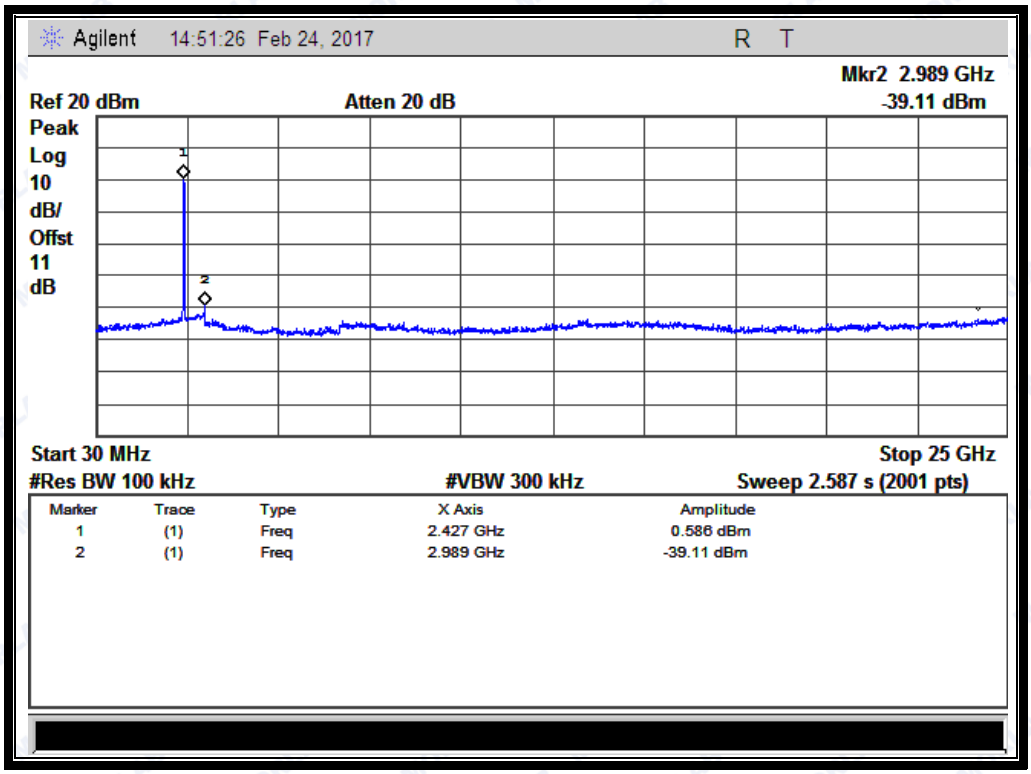
Note: the power of the Module transmitting frequency should be ignored.



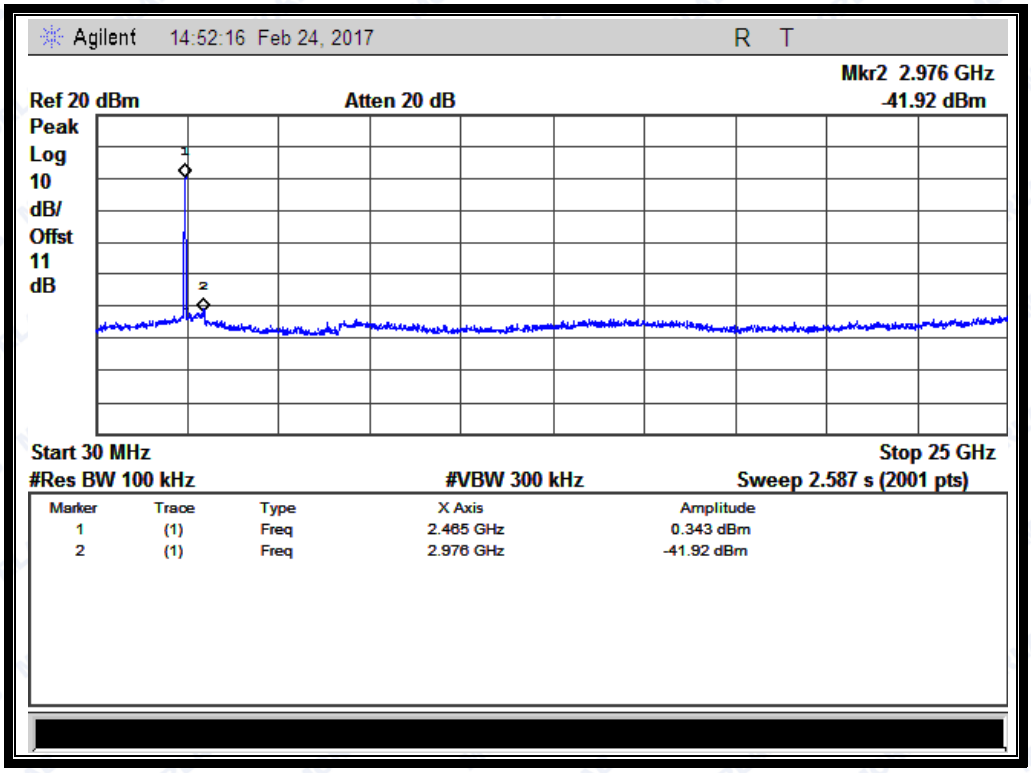
(Channel = 1, 30MHz to 25GHz)



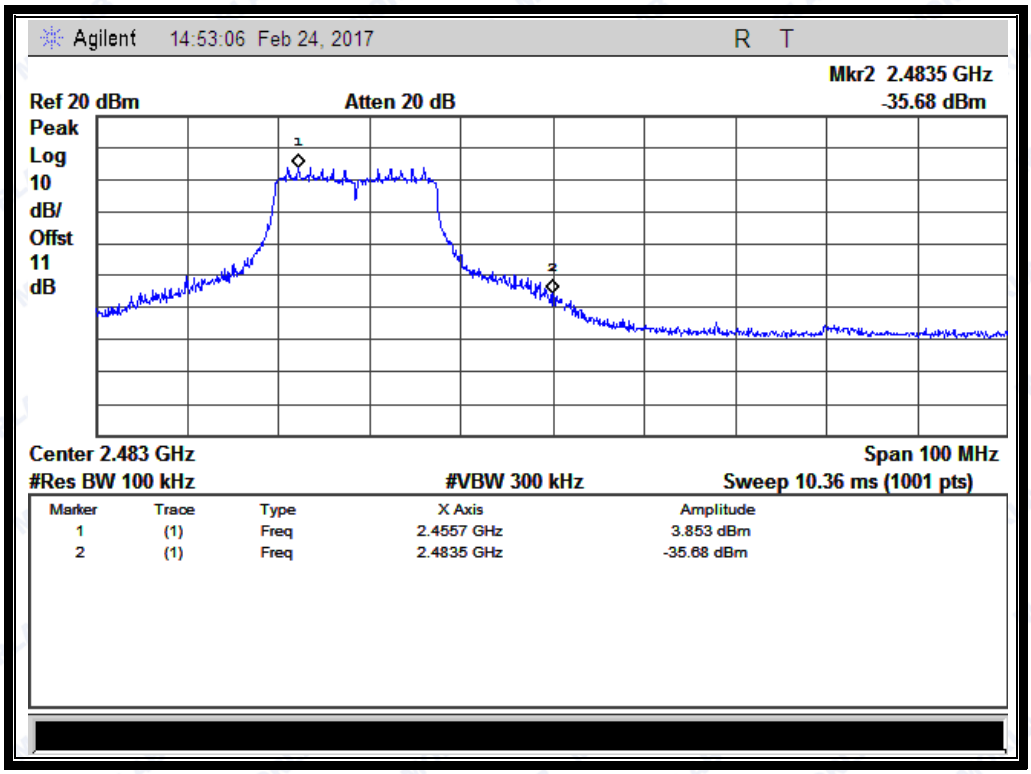
(Band Edge @ Channel = 1)



(Channel = 6, 30MHz to 25GHz)



(Channel = 11, 30MHz to 25GHz)



(Band Edge @ Channel = 11)

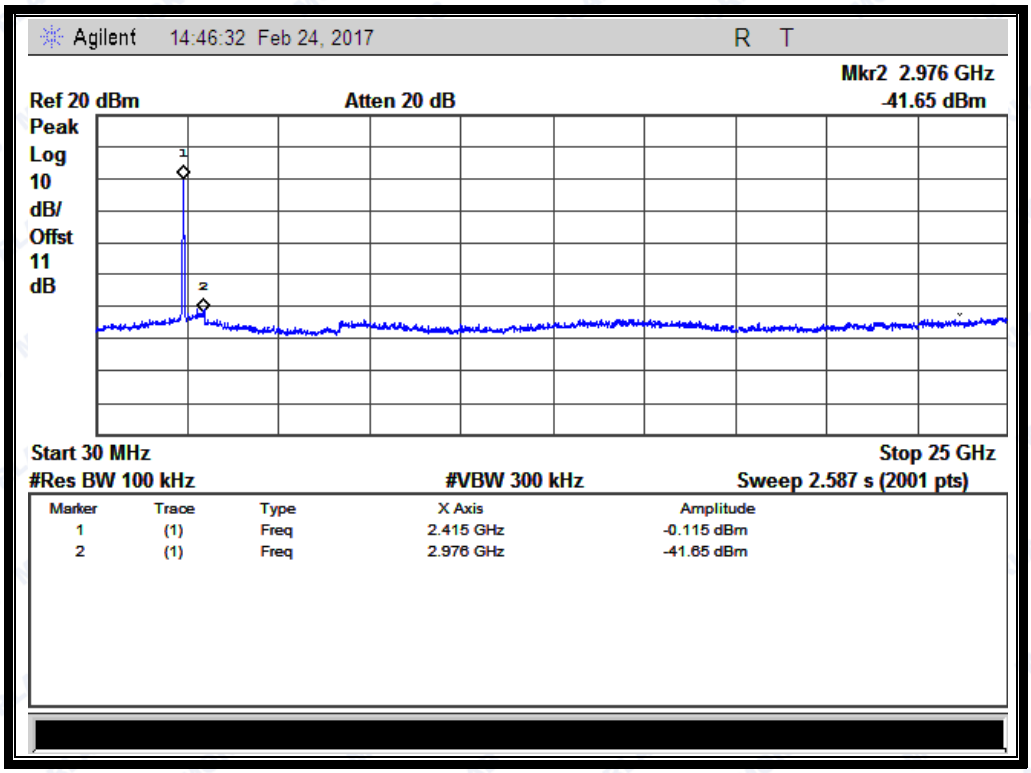
2.4.3.4 802.11n -40MHz Test mode

A. Test Verdict:

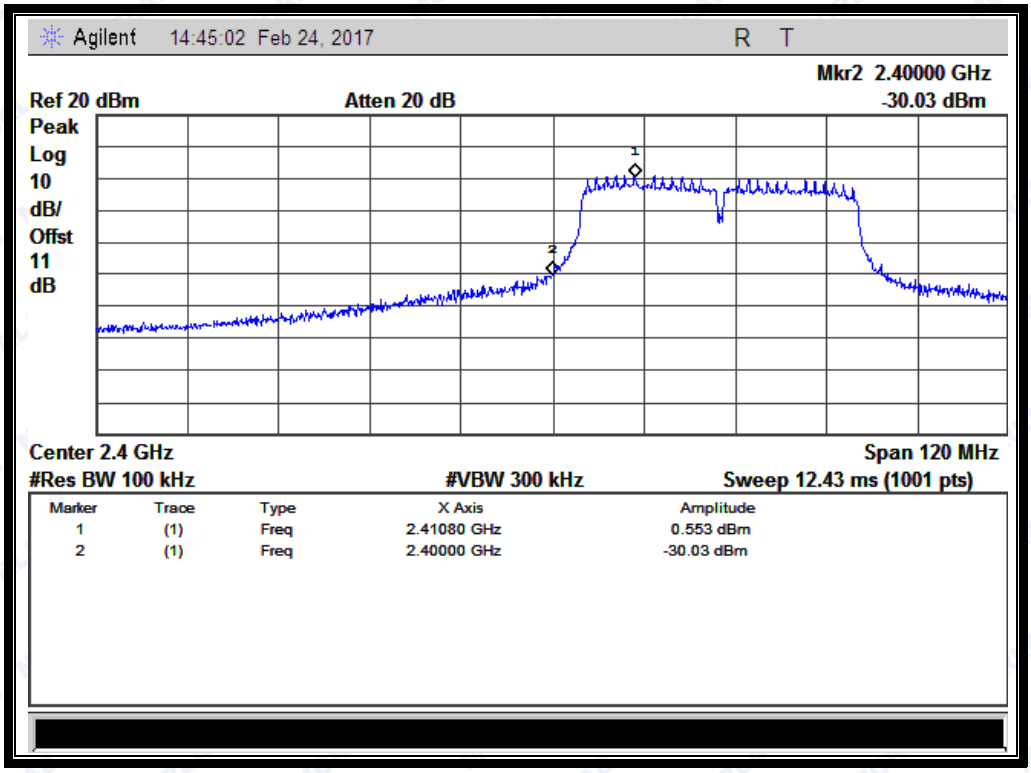
Channel	Frequency (MHz)	Measured Max. Out of Band Emission (dBm)	Limit (dBm)		Verdict
			Carrier Level	Calculated -20dBc Limit	
3	2422	-41.65	-0.12	-20.12	PASS
6	2437	-41.81	-0.21	-20.21	PASS
9	2452	-40.48	-0.86	-20.86	PASS

B. Test Plots:

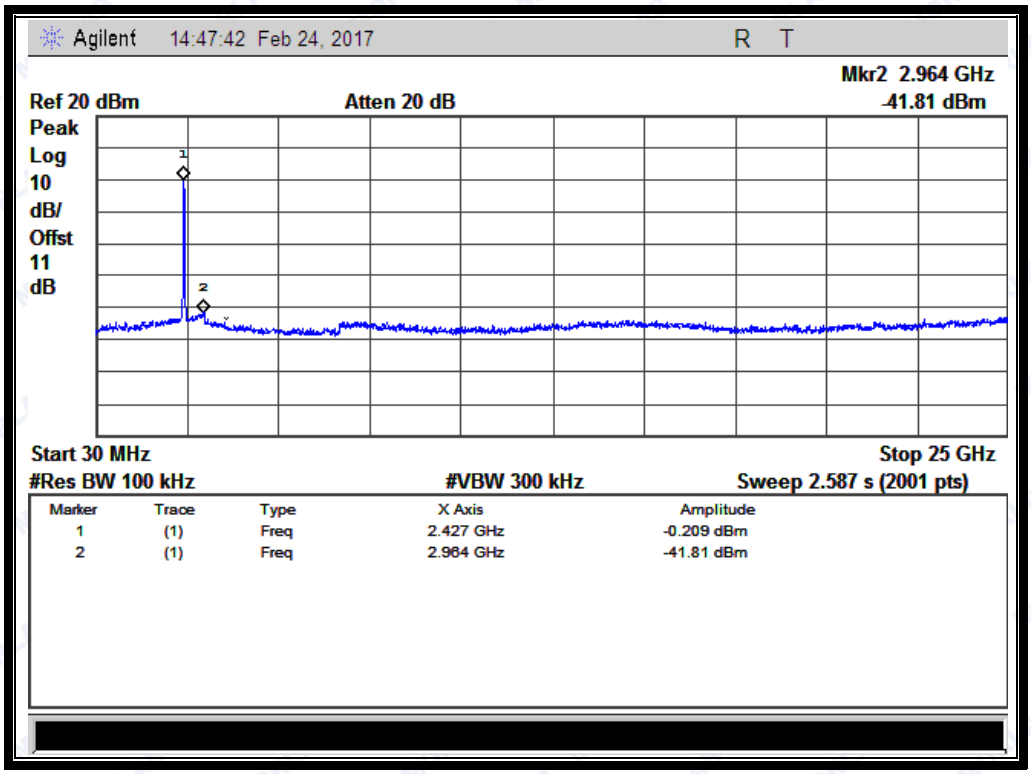
Note: the power of the Module transmitting frequency should be ignored.



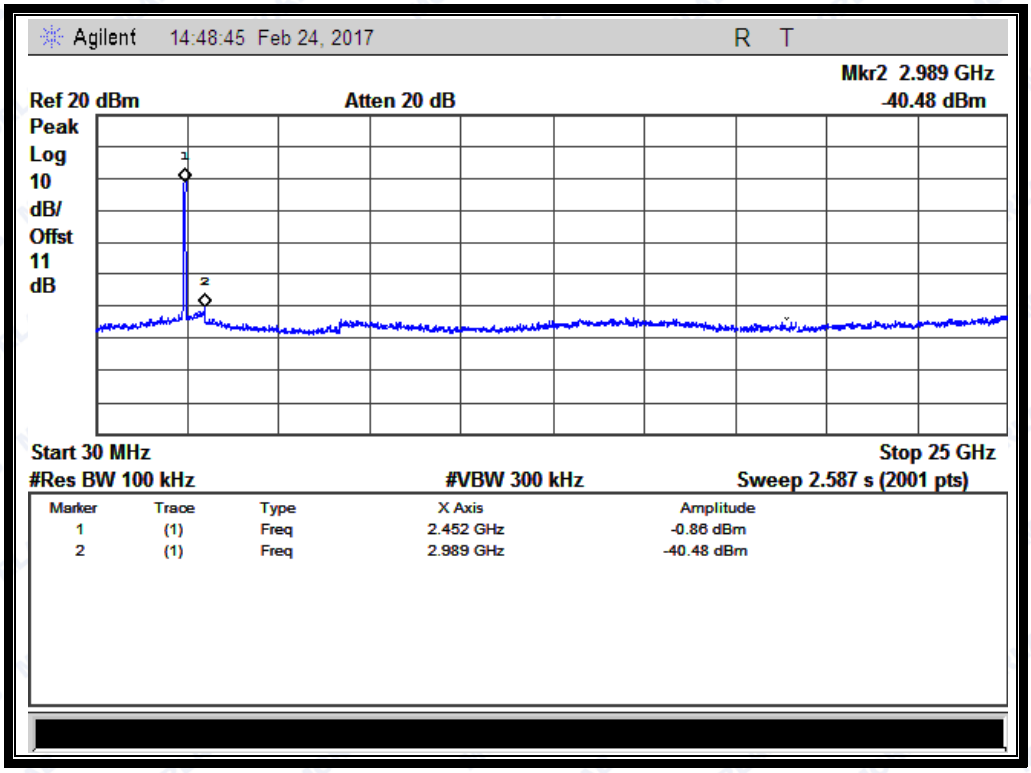
(Channel = 3, 30MHz to 25GHz)



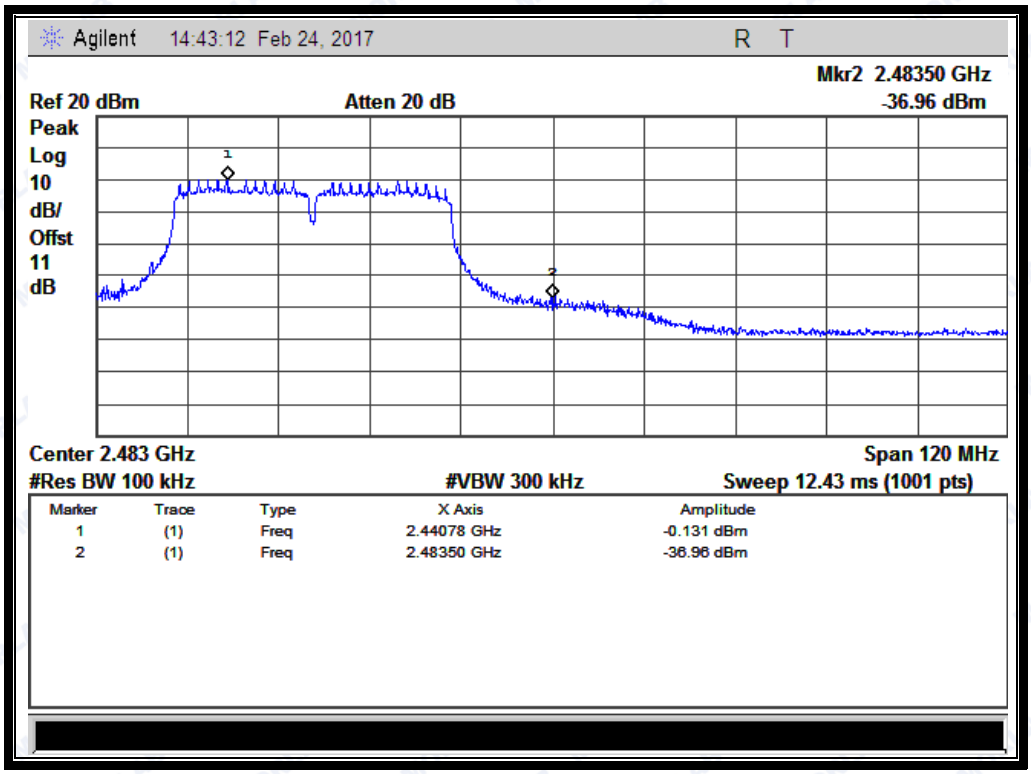
(Band Edge @ Channel = 3)



(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.

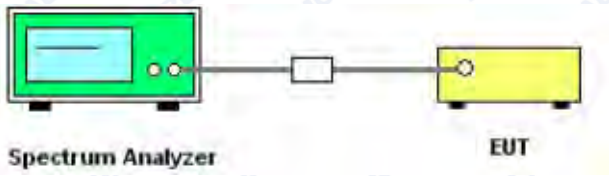
2.5.2 Test Description

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 30MHz
c) Set the RBW to 3 kHz
d) Set the VBW to 10KHz
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 reference ANNEX A(1.5).

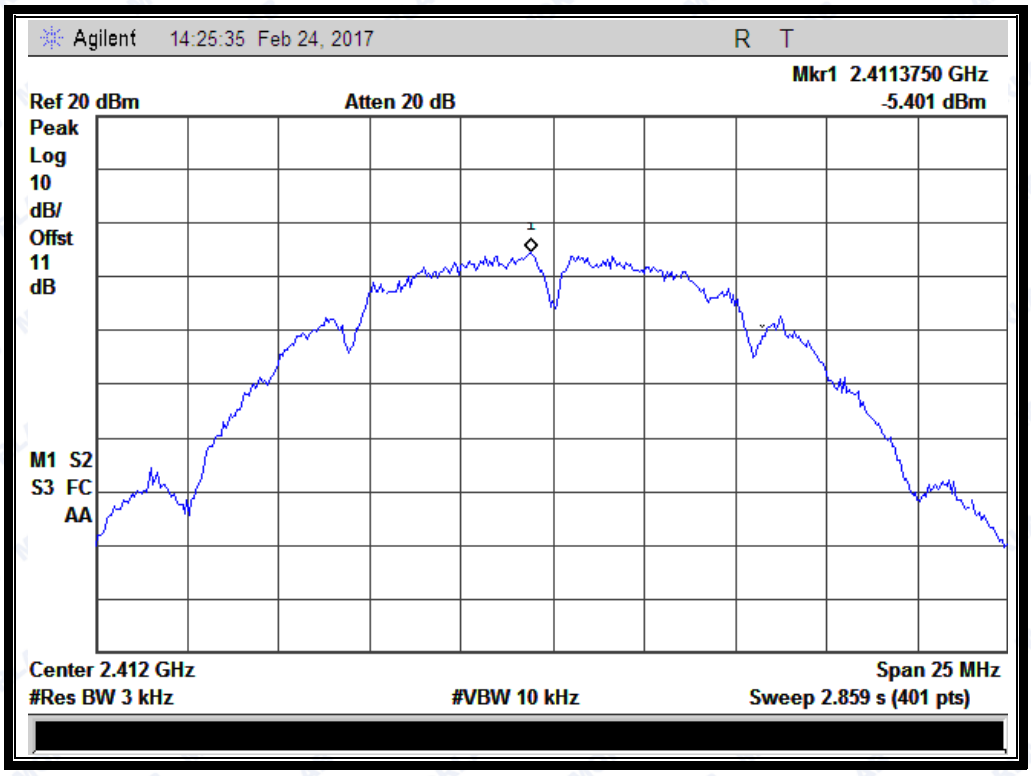
2.5.3 Test Result

2.5.3.1 802.11b Test mode

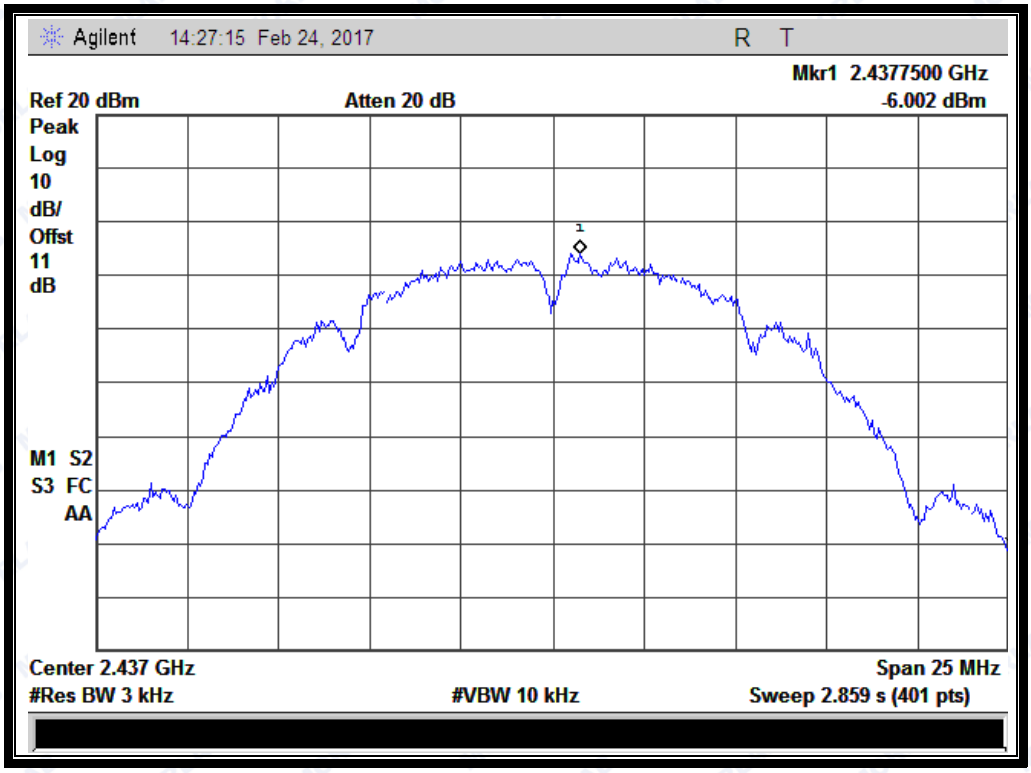
A. Test Verdict:

Spectral power density (dBm/3kHz)				
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
1	2412	-5.40	8	PASS
6	2437	-6.00	8	PASS
11	2462	-5.30	8	PASS
Measurement uncertainty: ±1.3dB				

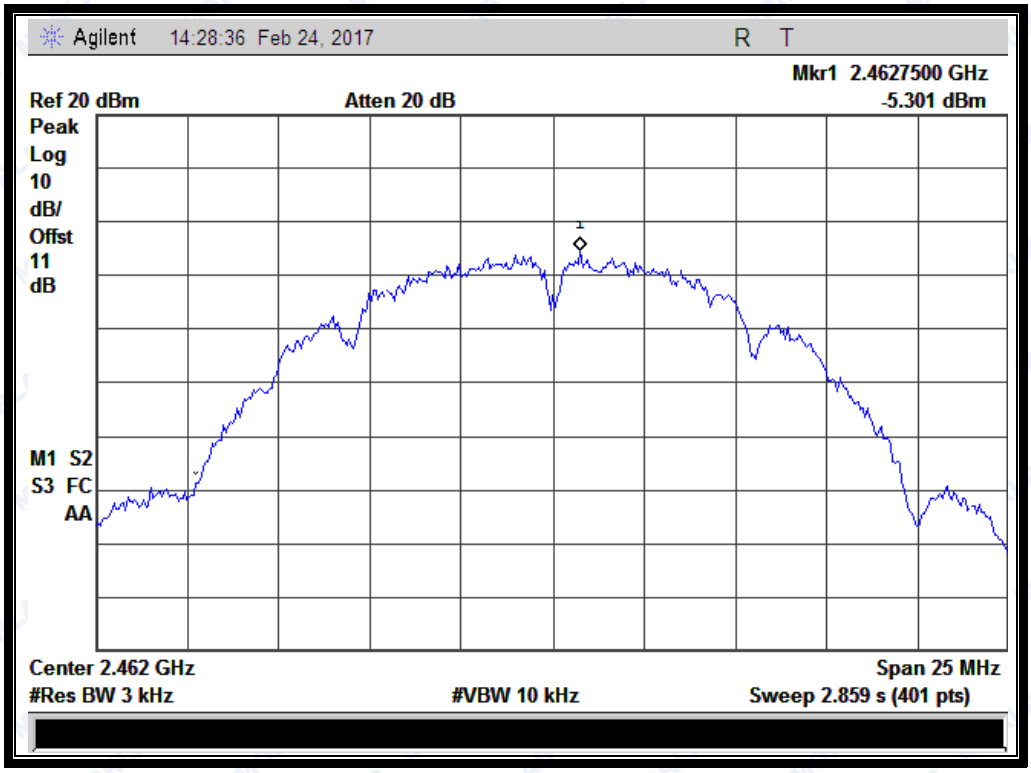
B. Test Plots:



(Channel = 1 @ 802.11b)



(Channel = 6 @ 802.11b)



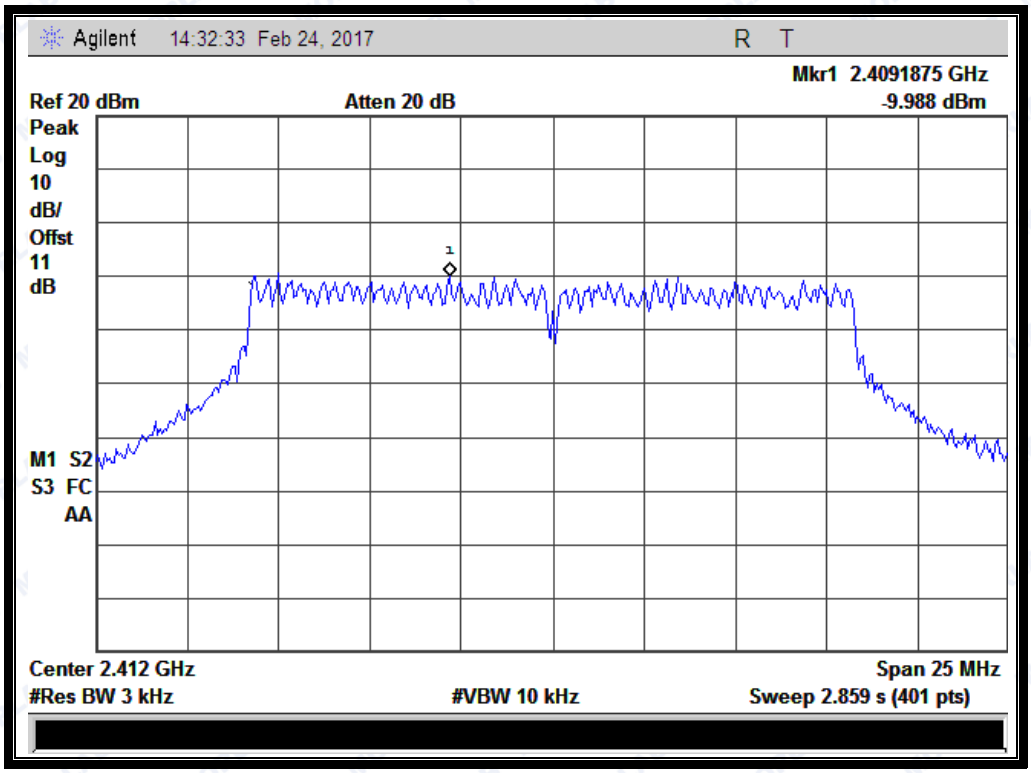
(Channel = 11 @ 802.11b)

2.5.3.2 802.11g Test mode

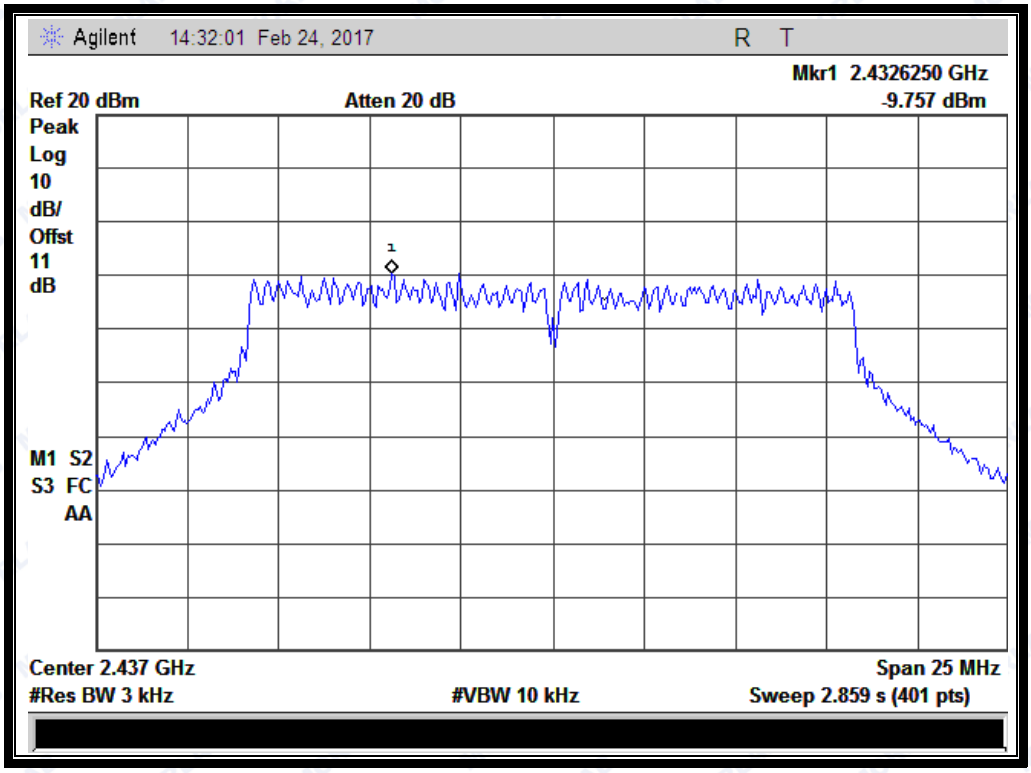
A. Test Verdict:

Spectral power density (dBm/3kHz)				
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
1	2412	-9.99	8	PASS
6	2437	-9.76	8	PASS
11	2462	-8.99	8	PASS
Measurement uncertainty: ±1.3dB				

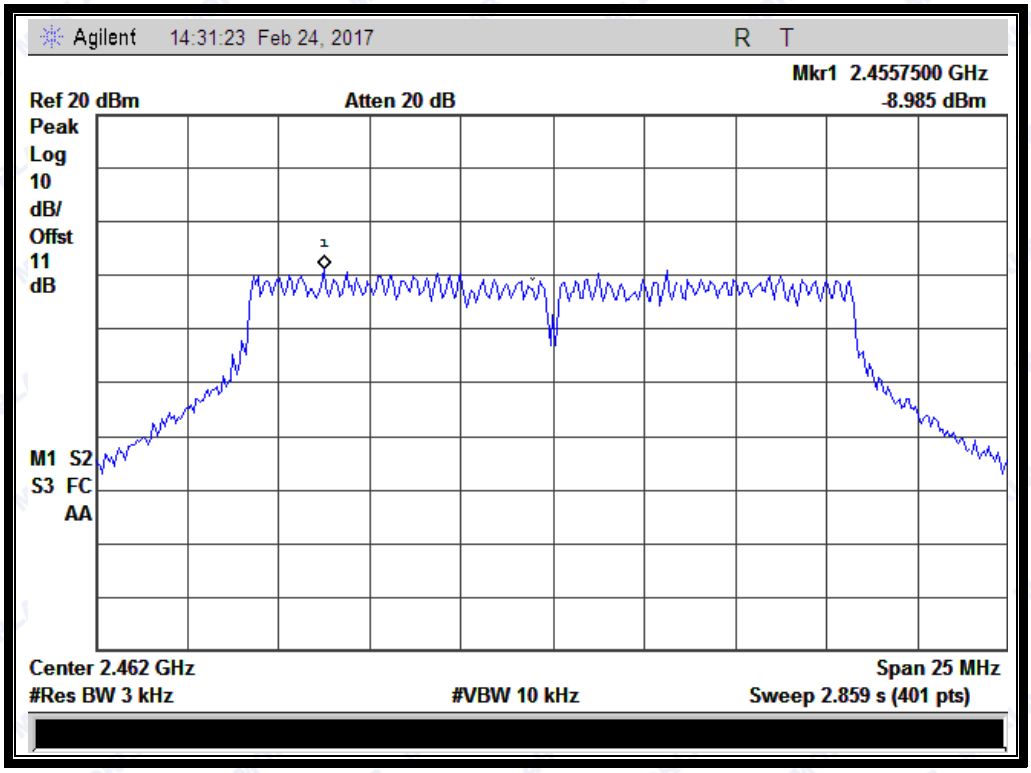
B. Test Plots:



(Channel = 1 @ 802.11g)



(Channel = 6 @ 802.11g)



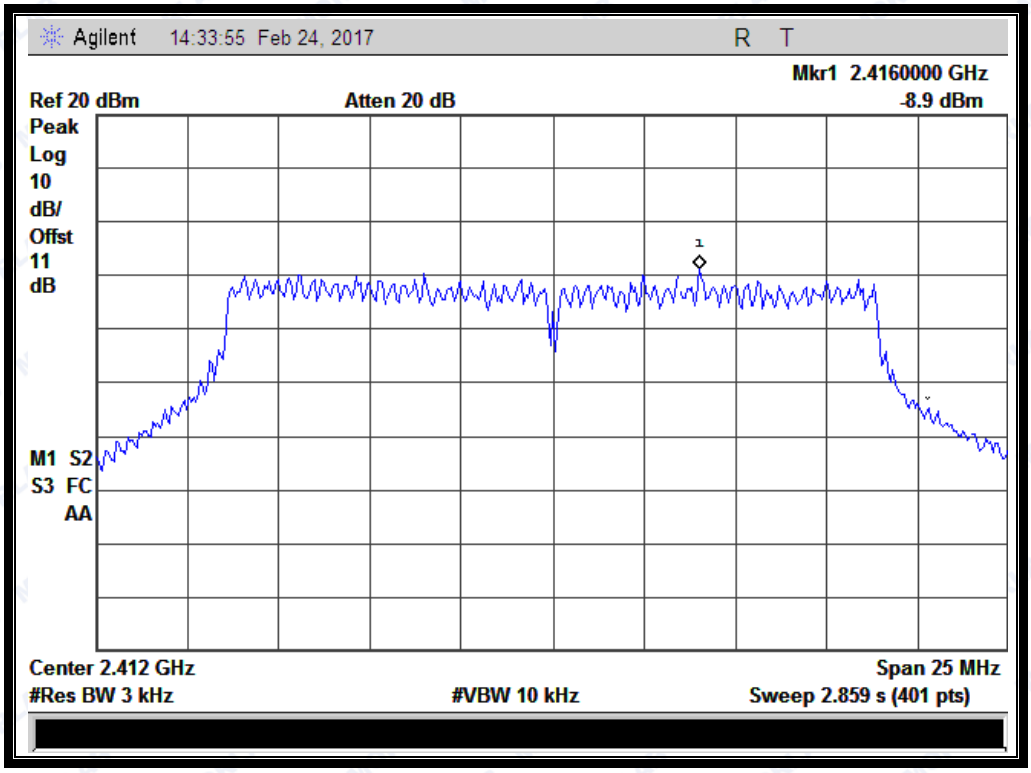
(Channel = 11 @ 802.11g)

2.5.3.3 802.11n-20MHz Test mode

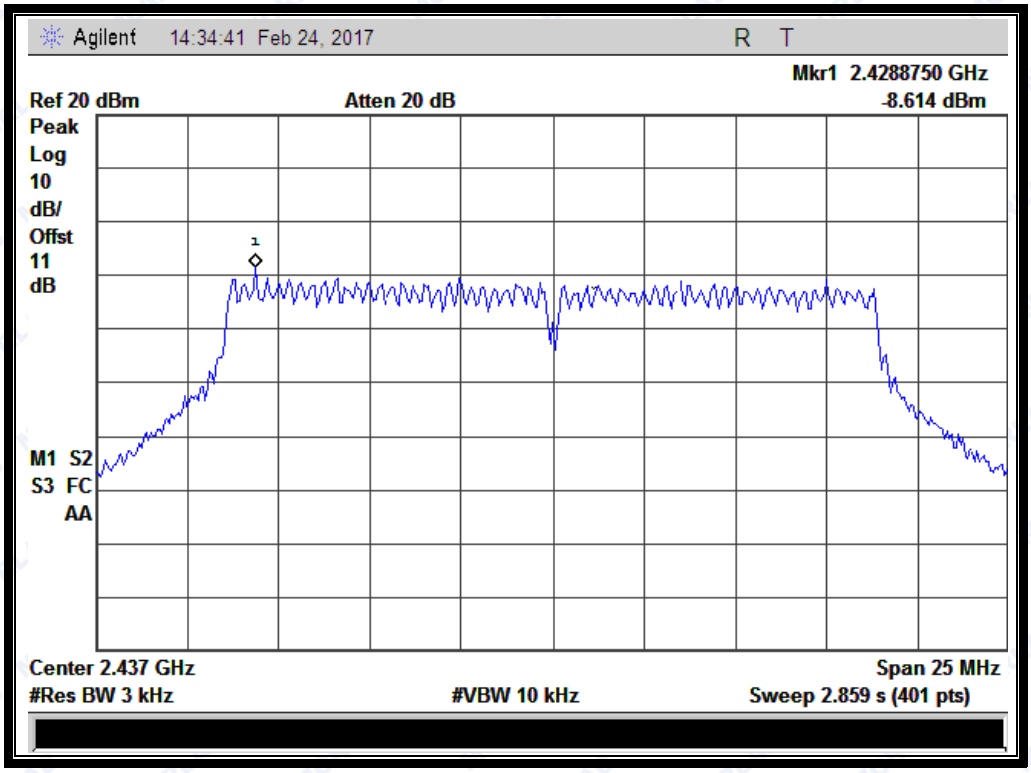
A. Test Verdict:

Spectral power density (dBm/3kHz)				
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
1	2412	-8.90	8	PASS
6	2437	-8.61	8	PASS
11	2462	-9.46	8	PASS
Measurement uncertainty: ±1.3dB				

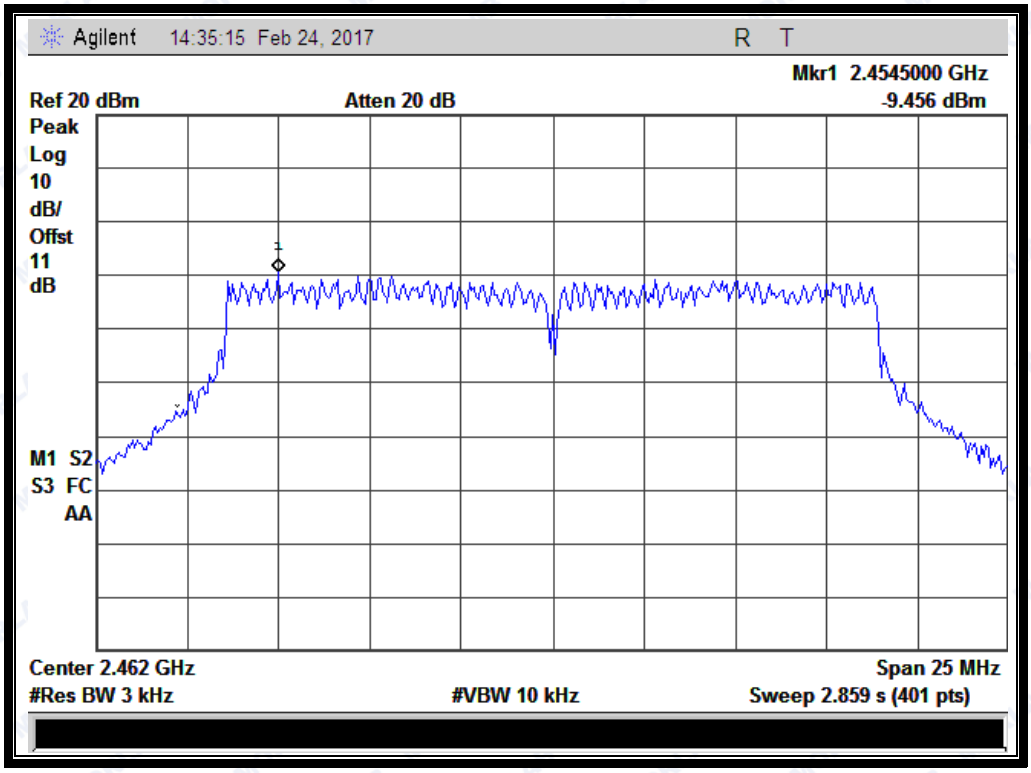
B. Test Plots:



(Channel = 1 @ 802.11n-20MHz)



(Channel = 6 @ 802.11n-20MHz)



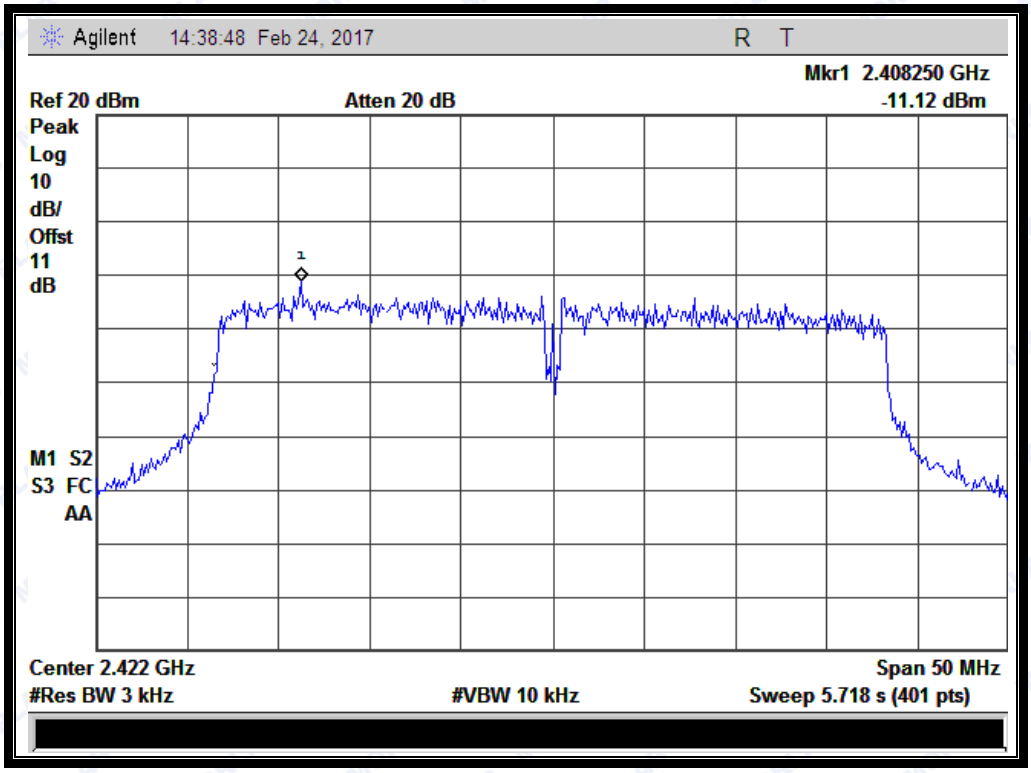
(Channel = 11 @ 802.11n-20MHz)

2.5.3.4 802.11n-40MHz Test mode

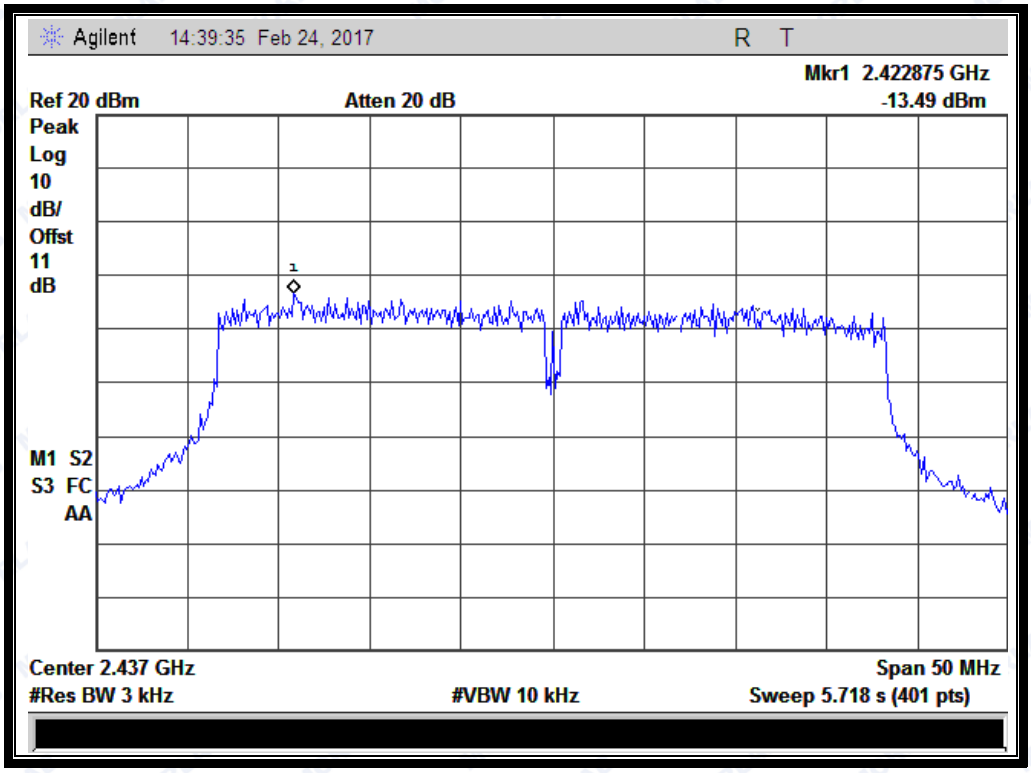
A. Test Verdict:

Spectral power density (dBm/3kHz)				
Channel	Frequency (MHz)	Measured PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
3	2422	-11.12	8	PASS
6	2437	-13.49	8	PASS
9	2452	-14.59	8	PASS
Measurement uncertainty: ±1.3dB				

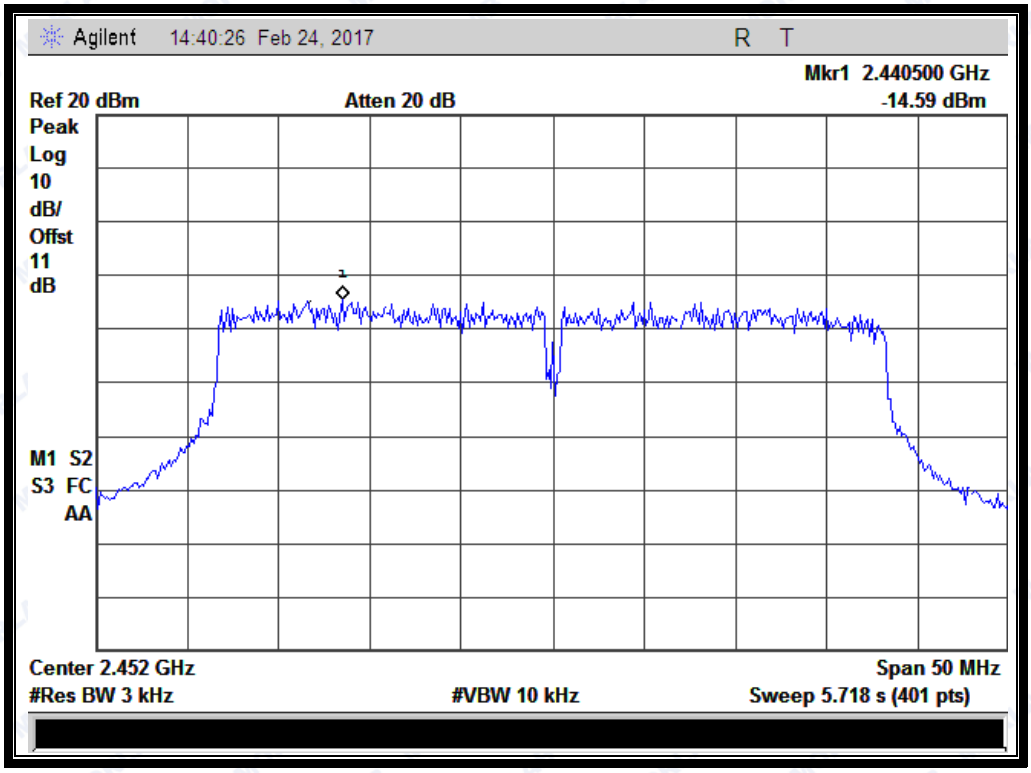
B. Test Plots:



(Channel = 3 @ 802.11n-40MHz)



(Channel = 6 @ 802.11n-40MHz)



(Channel = 9 @ 802.11n-40MHz)

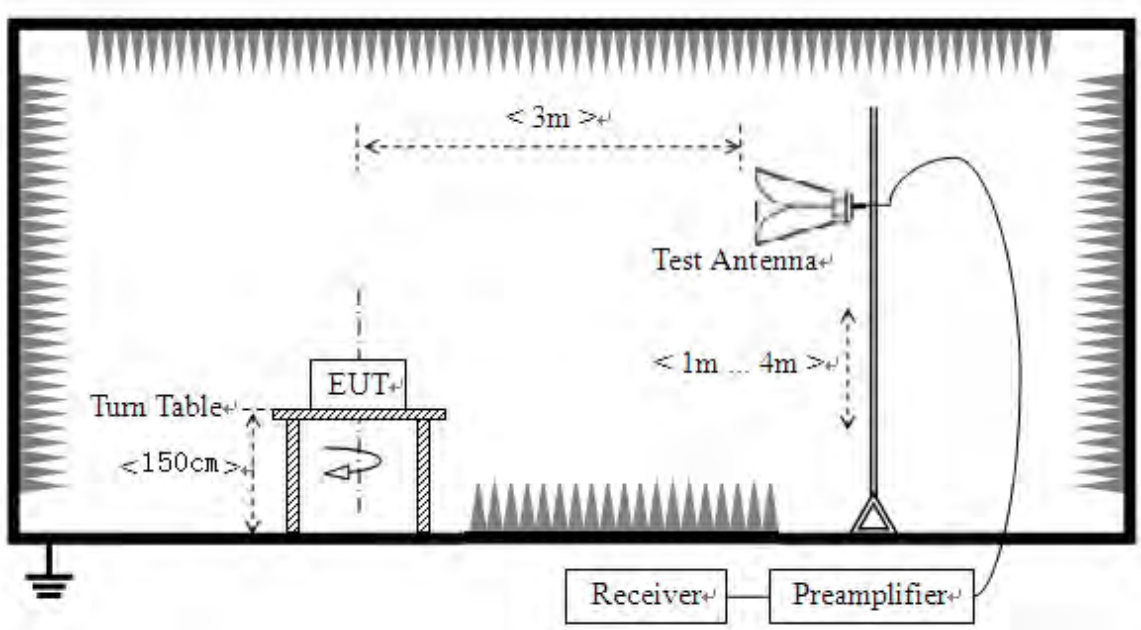
2.6 Restricted Frequency Bands

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 reference 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:
$E\ [dB\mu V/m] = U_R + A_T + A_{Factor}\ [dB]$; $A_T = L_{Cable\ loss}\ [dB] - G_{preamp}\ [dB]$
A_T: Total correction Factor except Antenna
U_R: Receiver Reading
G_{preamp}: Preamplifier Gain
A_{Factor}: Antenna Factor at 3m

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.

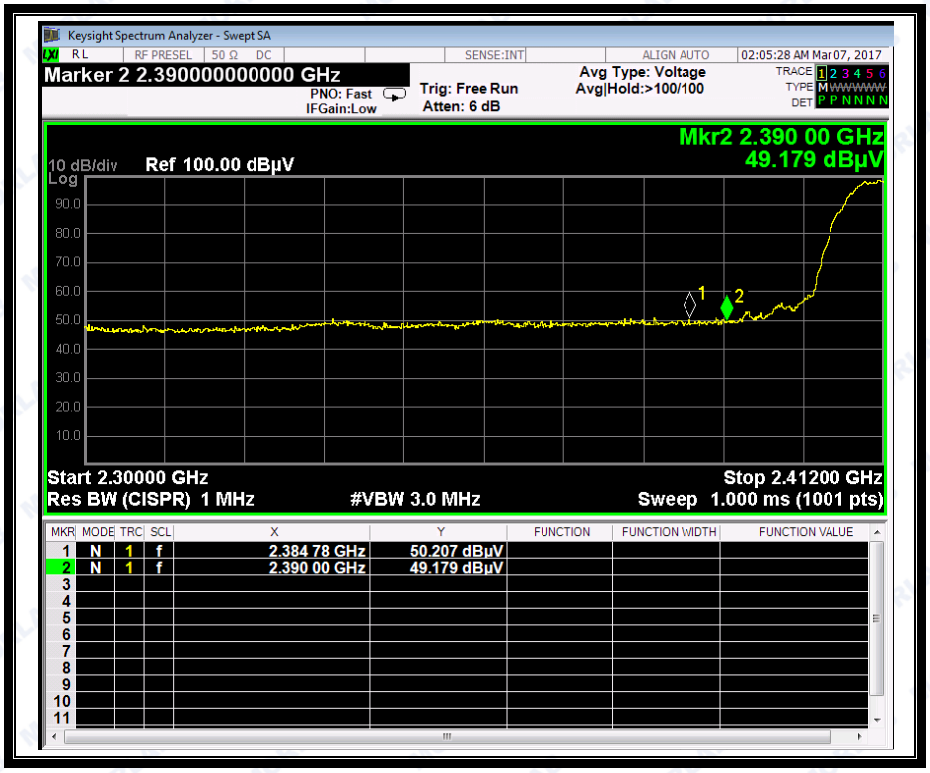
2.6.3.1 802.11b Test mode

The lowest and highest channels are tested to verify the band edge emissions.

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	2384.78	PK	50.21	-33.63	32.56	49.14	74	Pass
1	2384.78	AV	37.73	-33.63	32.56	36.66	54	Pass
11	2484.00	PK	59.90	-33.18	32.5	59.22	74	Pass
11	2484.00	AV	39.02	-33.18	32.5	38.34	54	Pass

B. Test Plots:



(Plot A1: Channel = 1 PEAK @ 802.11b)

(Plot A2: Channel = 1 AVG @ 802.11b)

(Plot B1: Channel = 11 PEAK @ 802.11b)

(Plot B2: Channel = 11 AVG @ 802.11b)

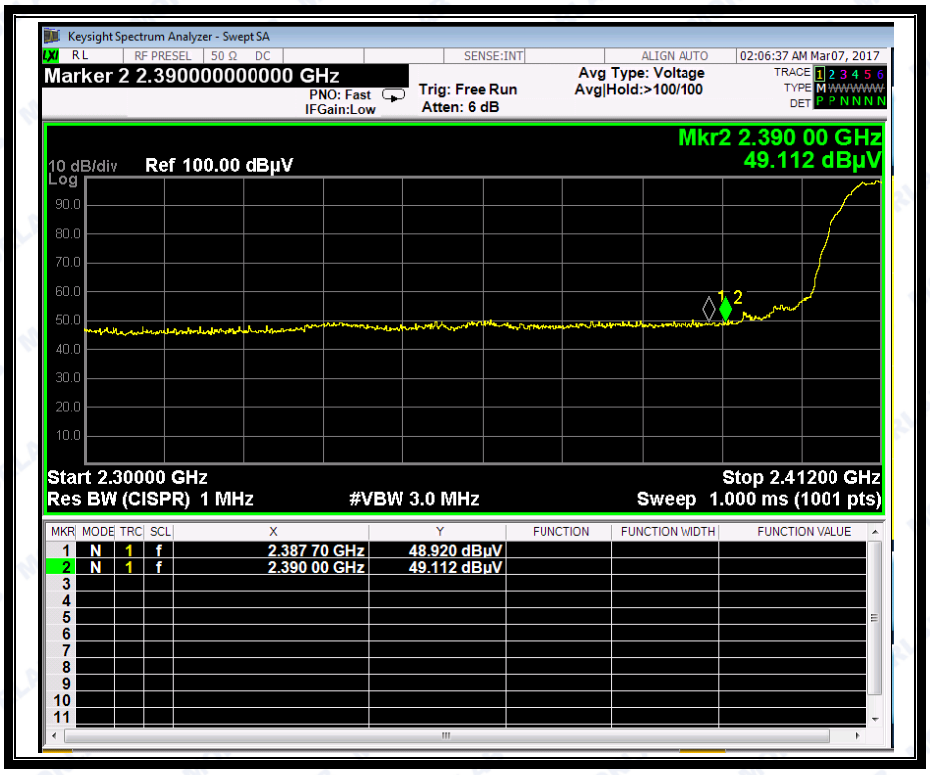
2.6.3.2 802.11g Test mode

The lowest and highest channels are tested to verify the band edge emissions.

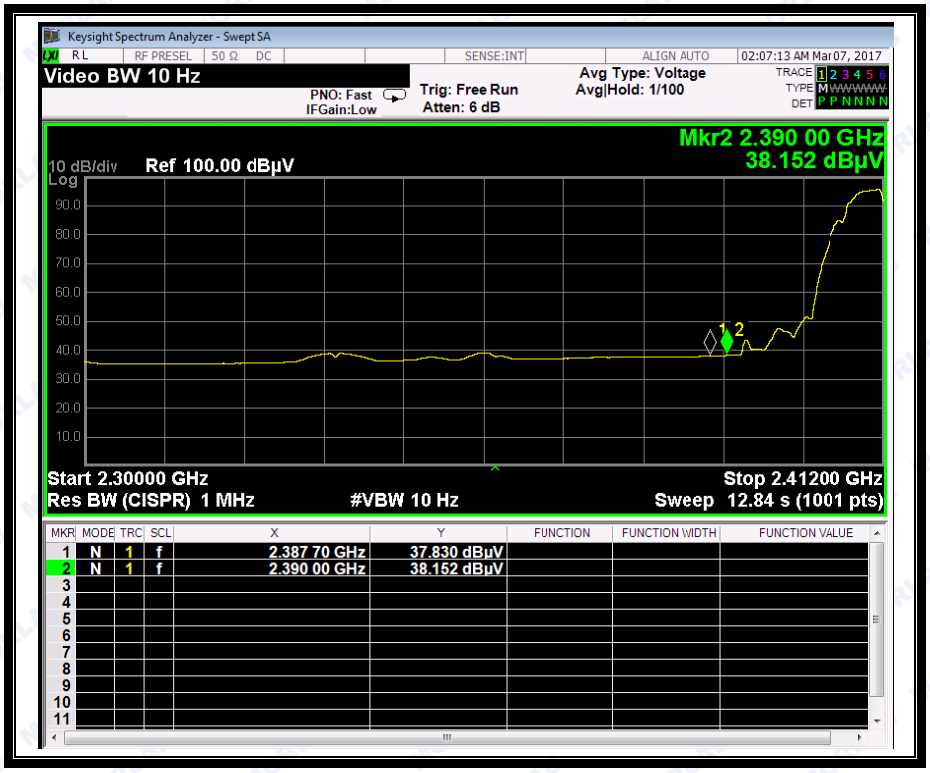
A. Test Verdict:

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	2387.70	PK	48.92	-33.63	32.56	47.85	74	Pass
1	2387.70	AV	37.83	-33.63	32.56	36.76	54	Pass
11	2484.00	PK	58.21	-33.18	32.5	57.53	74	Pass
11	2484.00	AV	39.09	-33.18	32.5	38.41	54	Pass

B. Test Plots:

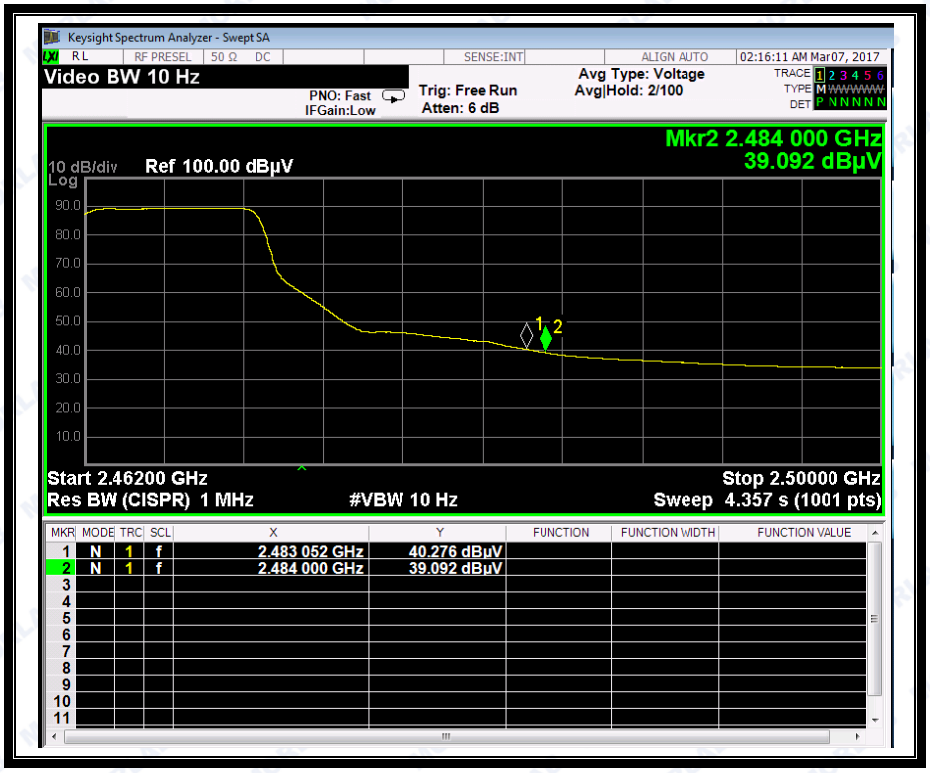


(Plot C1: Channel = 1 PEAK @ 802.11g)



(Plot C2: Channel = 1 AVG @ 802.11g)

(Plot D1: Channel = 11 PEAK @ 802.11g)



(Plot D2: Channel = 11 AVG @ 802.11g)

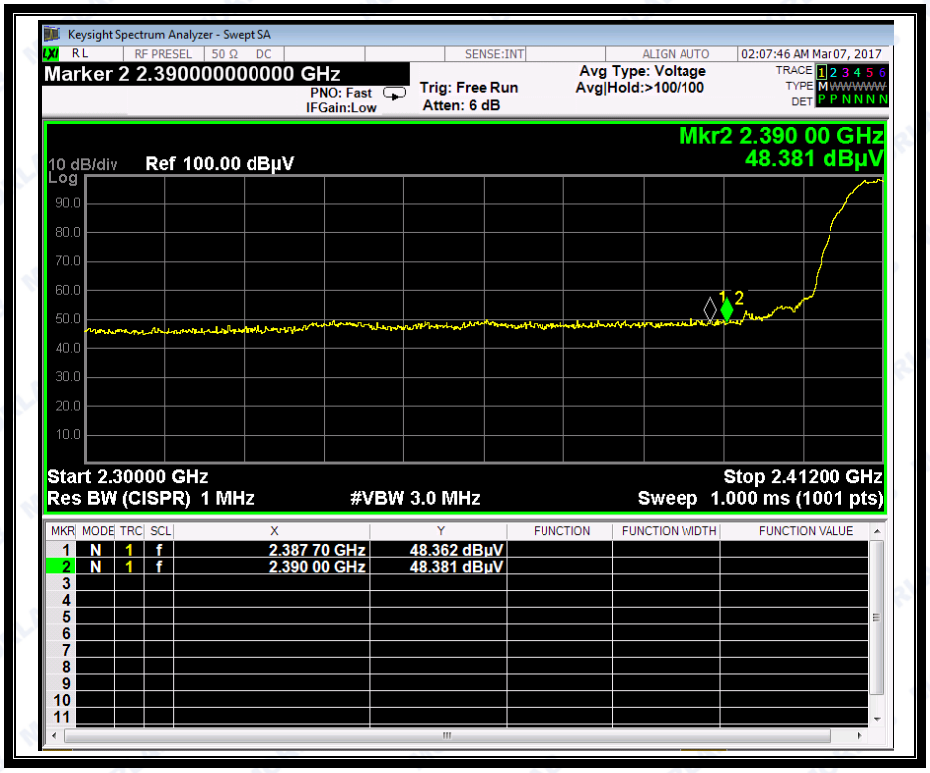
2.6.3.3 802.11n-20MHz Test mode

The lowest and highest channels are tested to verify the band edge emissions.

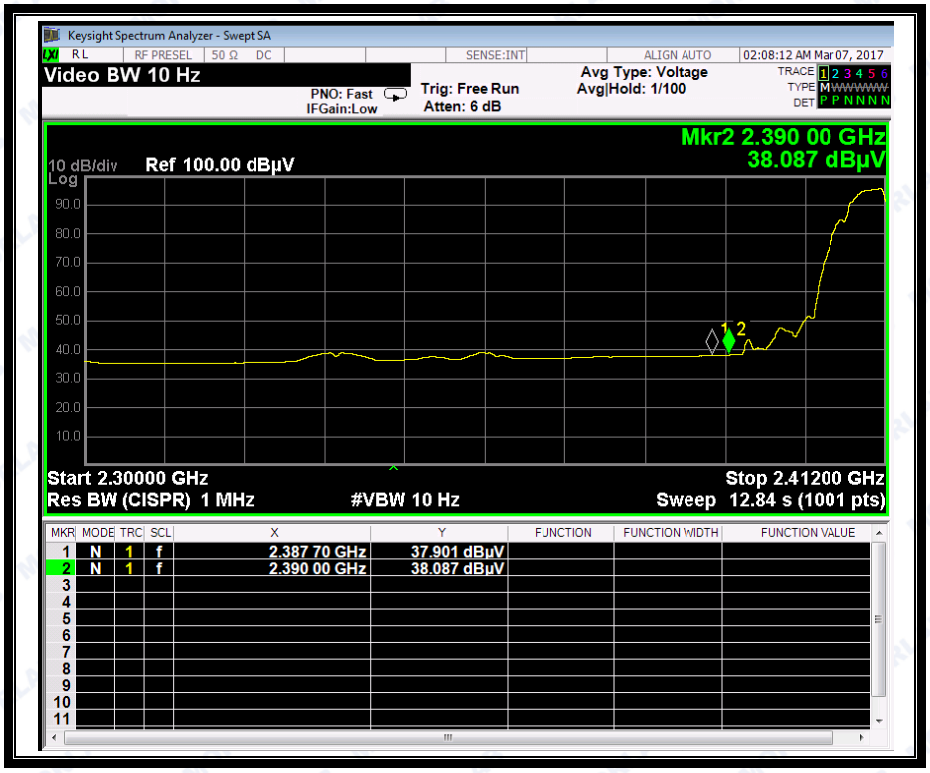
A. Test Verdict:

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	2387.70	PK	48.36	-33.63	32.56	47.29	74	Pass
1	2387.70	AV	37.90	-33.63	32.56	36.83	54	Pass
11	2484.00	PK	57.61	-33.18	32.5	56.93	74	Pass
11	2484.00	AV	39.03	-33.18	32.5	38.35	54	Pass

B. Test Plots:

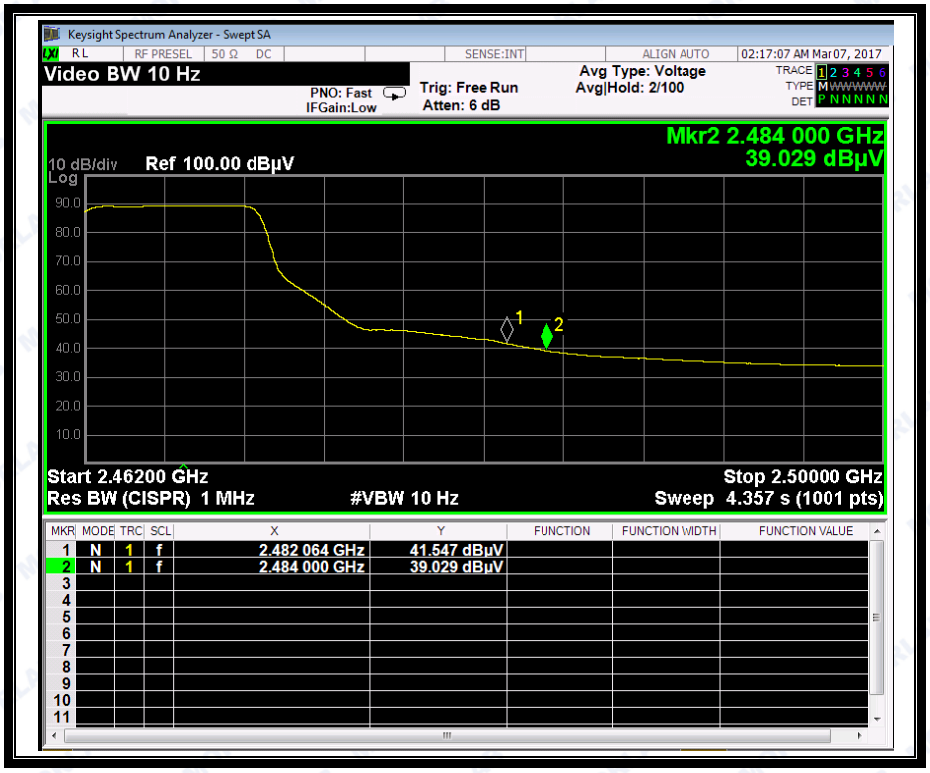


(Plot E1: Channel = 1 PEAK @ 802.11n-20)



(Plot E2: Channel = 1 AVG @ 802.11n-20)

(Plot F1: Channel = 11 PEAK @ 802.11n-20)



(Plot F2: Channel = 11 AVG @ 802.11n-20)

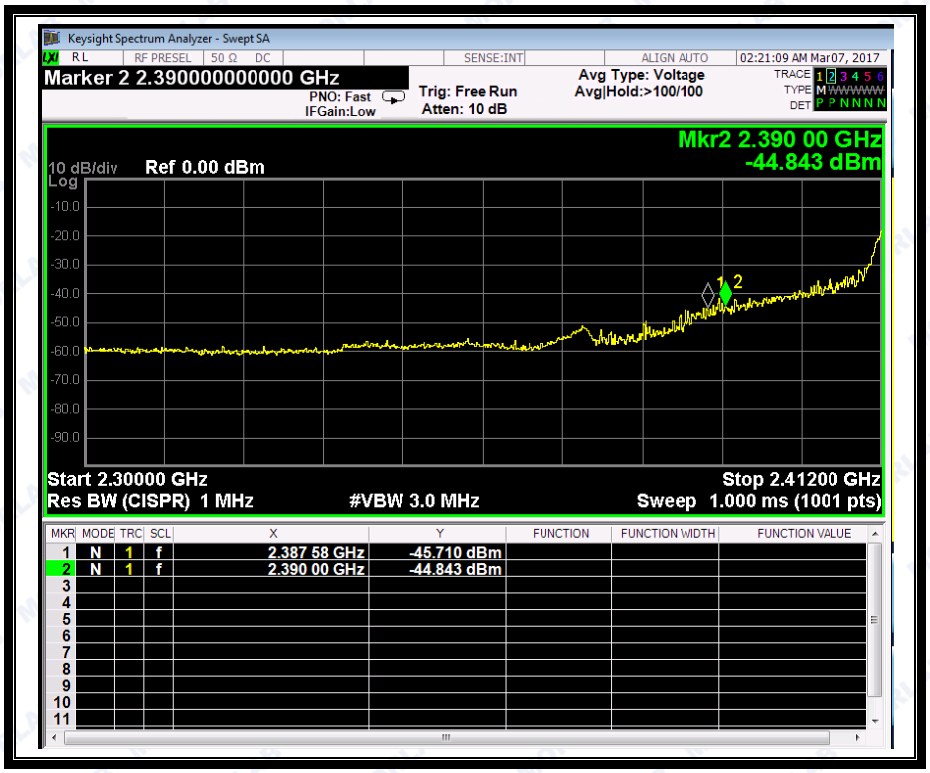
2.6.3.4 802.11n-40MHz Test mode

The lowest and highest channels are tested to verify the band edge emissions.

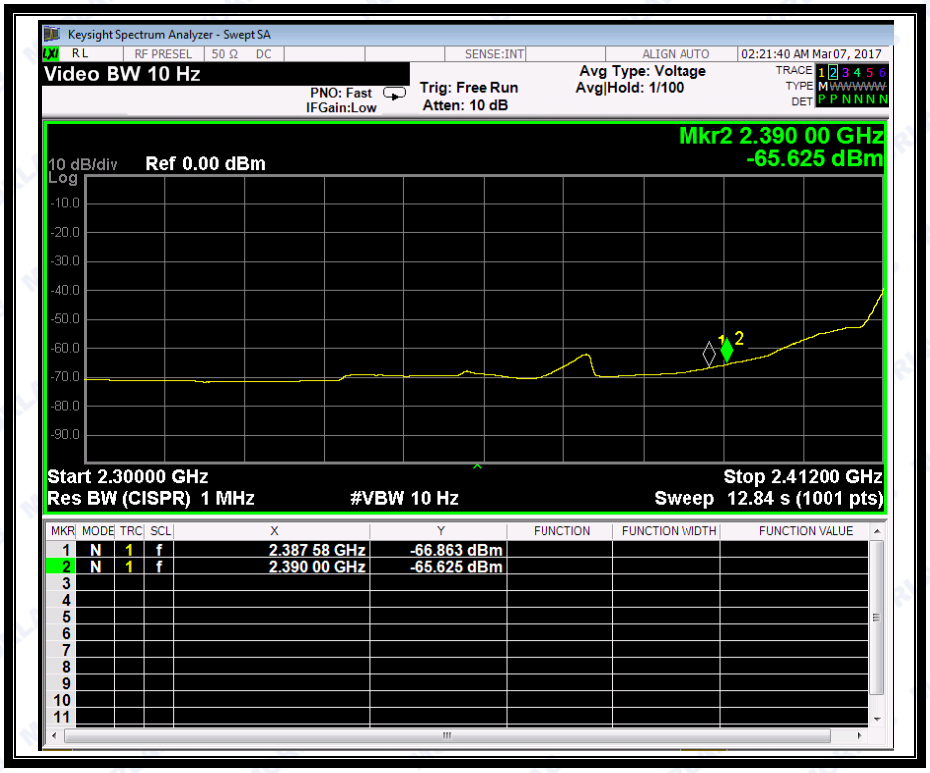
A. Test Verdict:

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						
3	2387.58	PK	-45.71	-33.63	32.56	-46.78	74	Pass
3	2387.58	AV	-66.86	-33.63	32.56	-67.93	54	Pass
9	2484.00	PK	48.01	-33.18	32.5	47.33	74	Pass
9	2484.00	AV	34.90	-33.18	32.5	34.22	54	Pass

B. Test Plots:

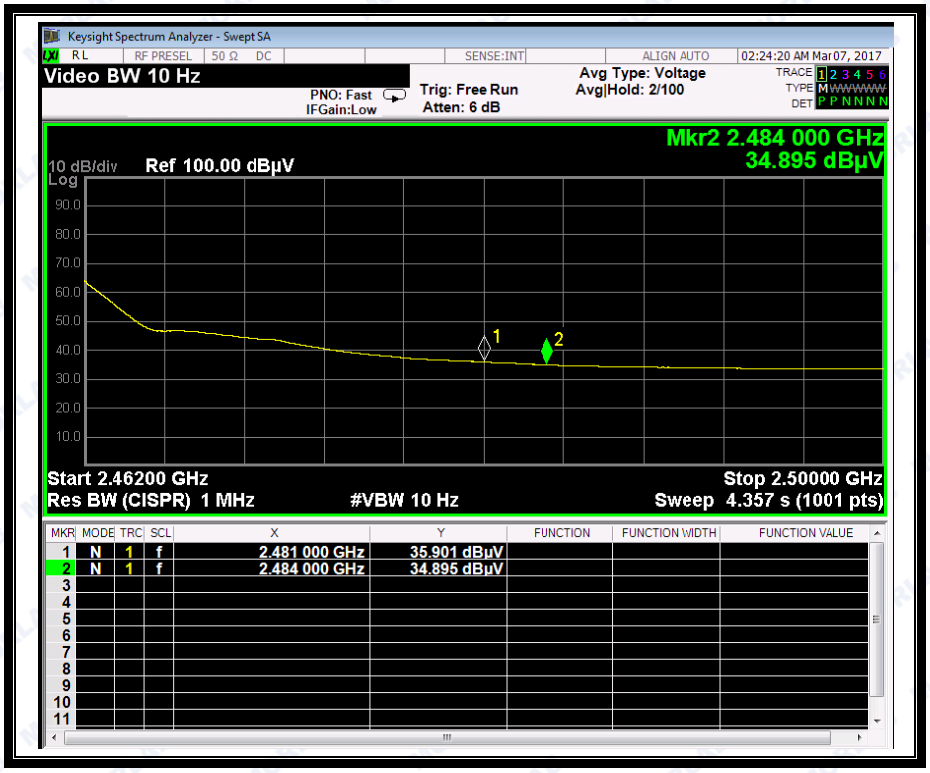


(Plot E1: Channel = 3 PEAK @ 802.11n-40)



(Plot E2: Channel = 3 AVG @ 802.11n-40)

(Plot F1: Channel = 9 PEAK @ 802.11n-40)



(Plot F2: 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

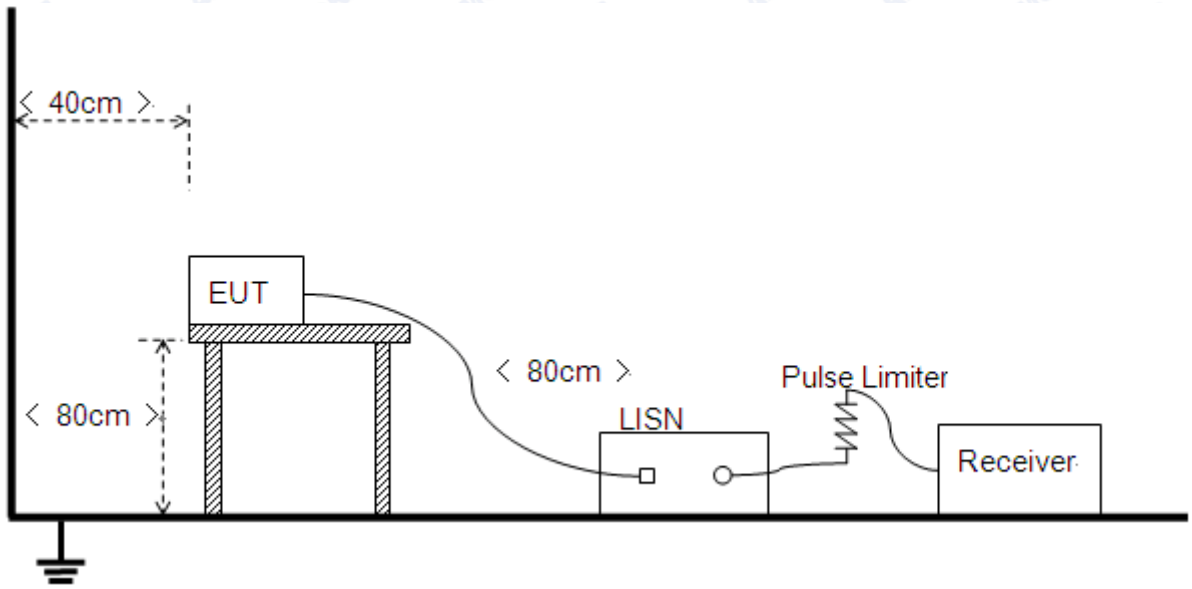
NOTE:

(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 reference ANNEX A(1.5).

2.1.1 Test Result

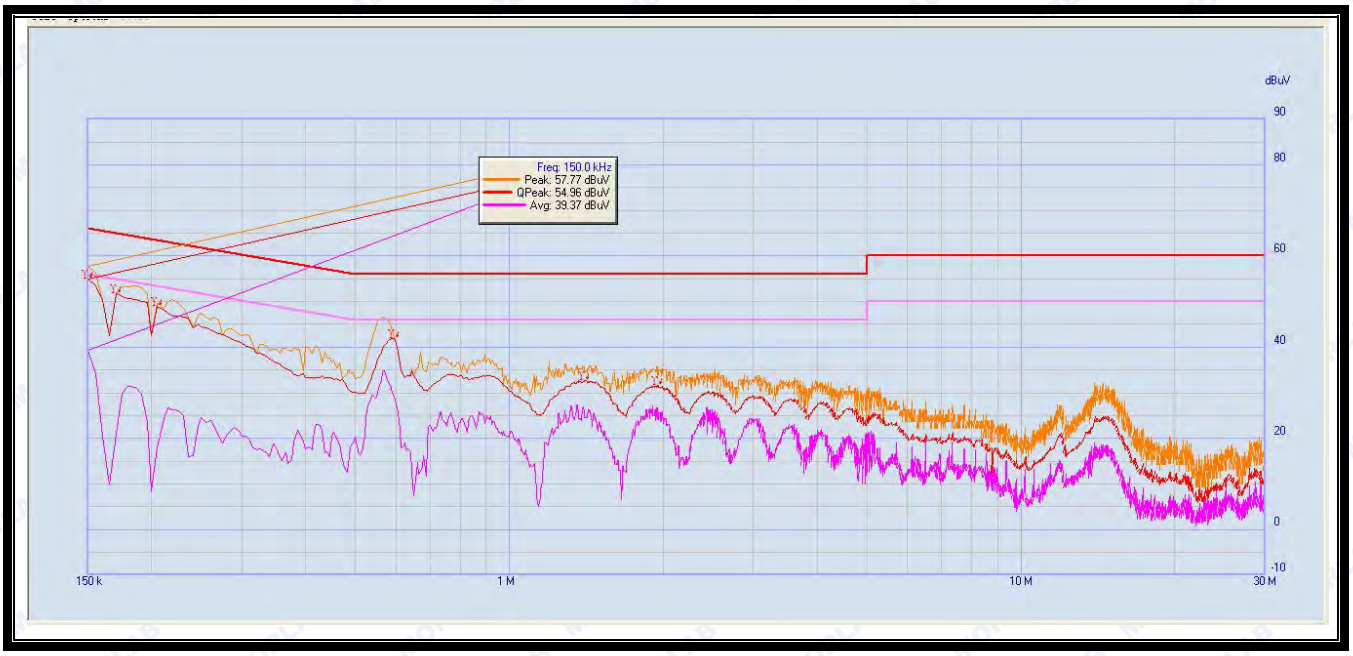
The maximum conducted interference is searched using Peak (PK), if the emission levels more than the AV and QP limits, and that have narrow margins from the AV and QP limits will be re-measured with AV and QP detectors. Tests for both L phase and N phase lines of the power mains connected to the EUT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

A. Test setup:

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

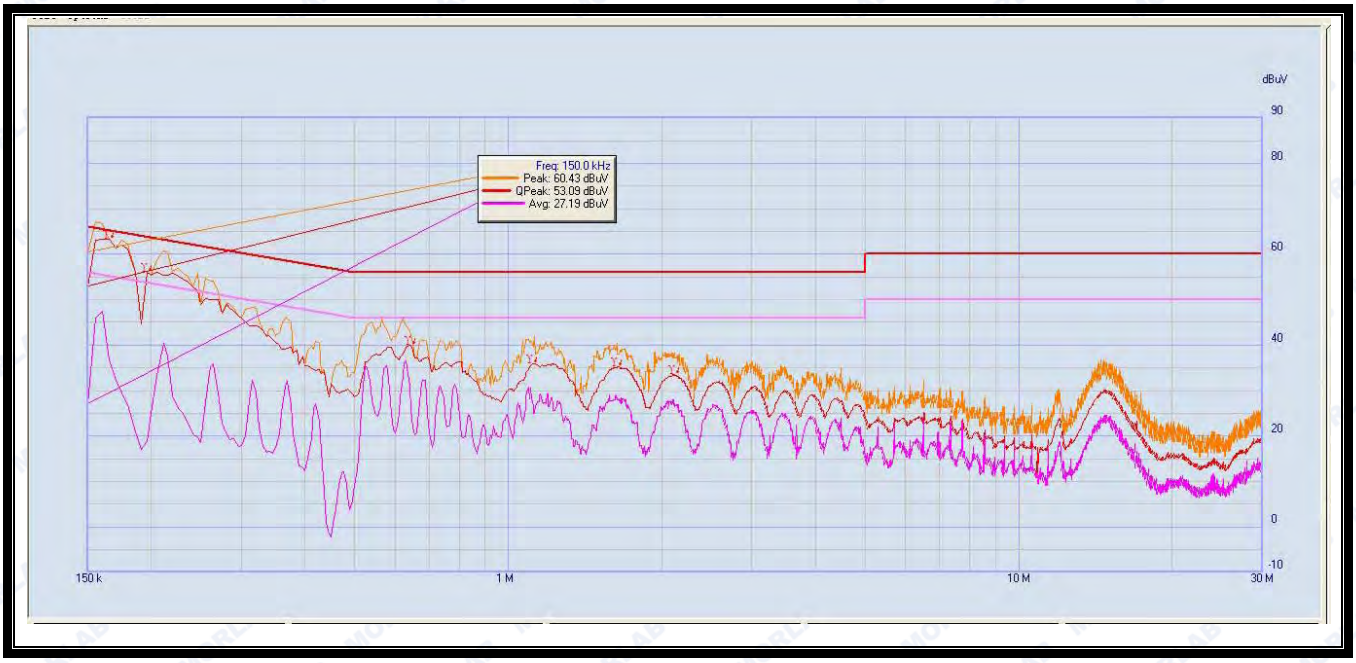
Note: The test voltage is AC 120V/60Hz.

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	0.15	54.96	39.37	66	56	Line	PASS
2	0.17	51.78	20.87	65.43	55.43		PASS
3	0.205	48.96	17.88	64.43	54.43		PASS
4	0.595	41.92	28.95	56	46		PASS
5	1.4	32.48	26.05	56	46		PASS
6	1.945	31.47	26.78	56	46		PASS



(Plot B: N Phase)

NO.	Fre. (MHz)	Emission Level (dBμV)		Limit (dBμV)		Power-line	Verdict
		Quai-peak	Average	Quai-peak	Average		
1	0.165	63.38	36.85	65.57	55.57	Neutral	PASS
2	0.195	56.05	18.84	64.71	54.71		PASS
3	0.645	40.06	25.80	56	46		PASS
4	1.12	35.86	24.90	56	46		PASS
5	1.635	35.01	28.33	56	46		PASS
6	2.125	33.37	26.46	56	46		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.

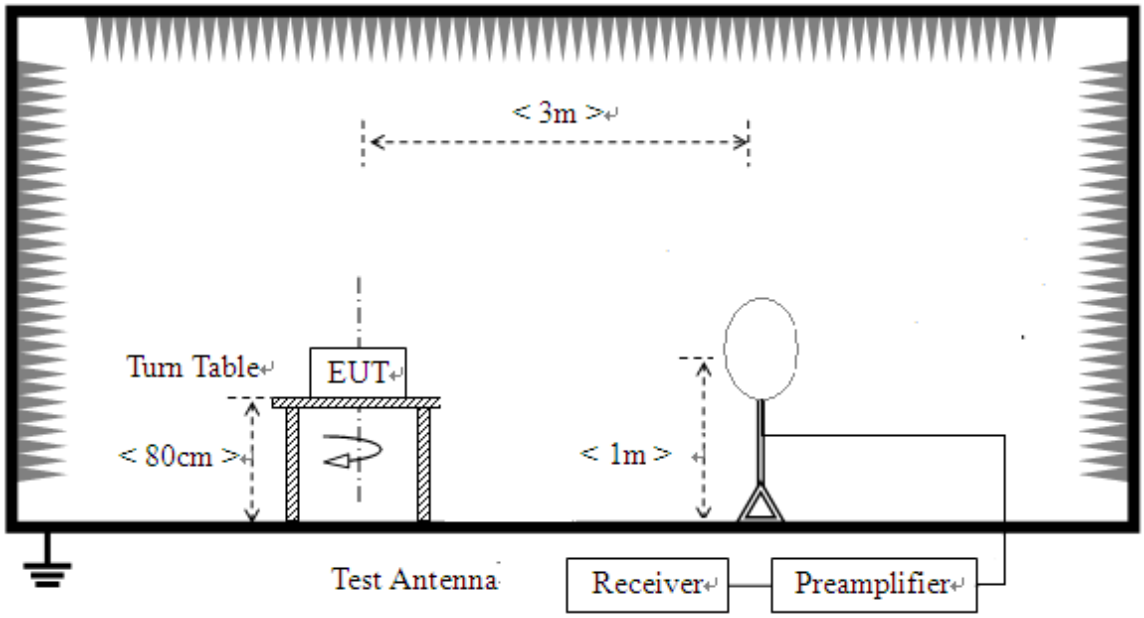
For above 1000MHz, limit field strength of harmonics: 54dBuV/m@3m (AV) and 74dBuV/m@3m (PK)

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)

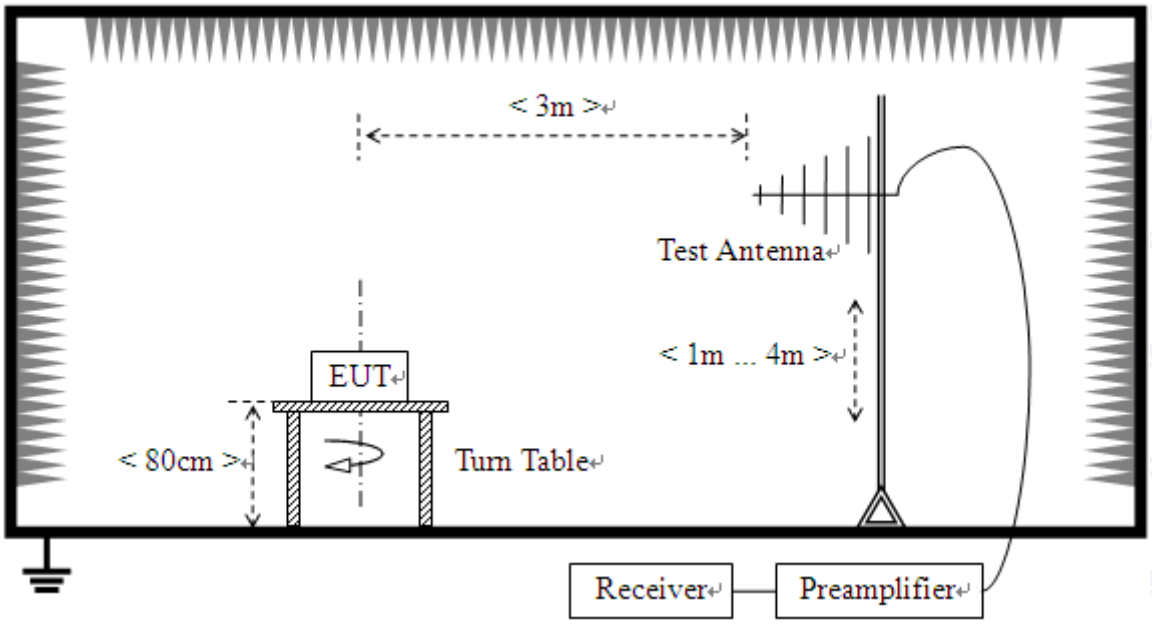
2.8.2 Test Description

A. Test Setup:

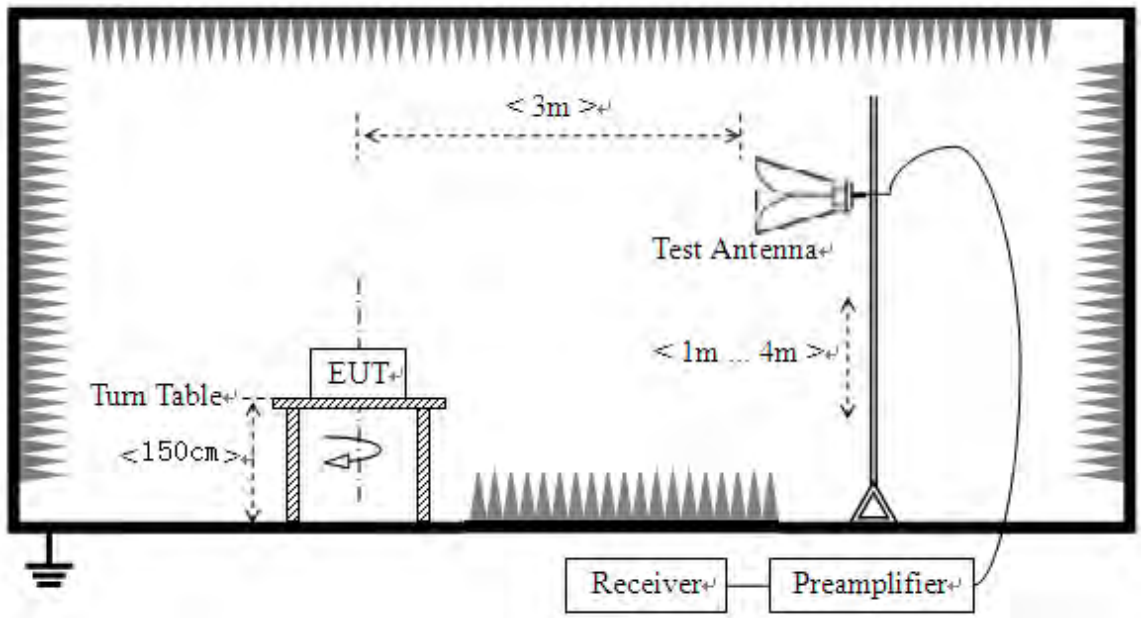
1) For radiated emissions from 9kHz to 30MHz



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.

B. Equipments List:

Please reference 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

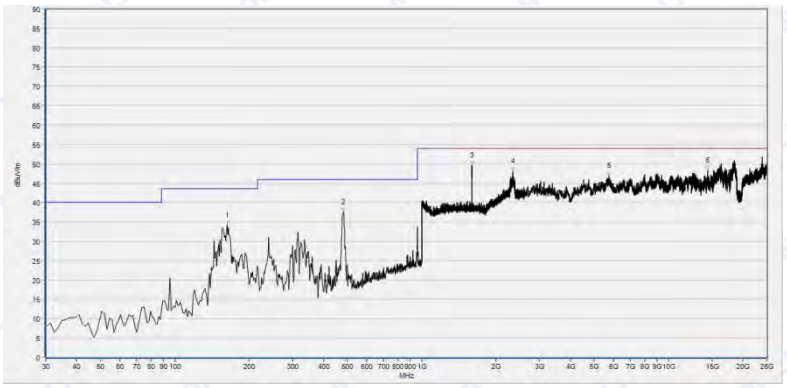
During the test, the total correction Factor A_T and A_{Factor} were built in test software.

The low frequency, which started from 9KHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

2.8.3.1 802.11b Test mode

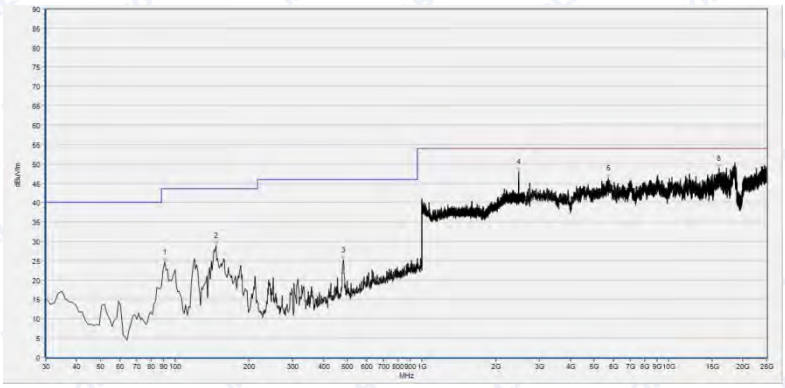
A. Test Plots for the Whole Measurement Frequency Range:

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
162.328	34.20	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
481.615	37.56	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
1594.798	49.59	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
2336.214	48.11	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
5736.570	46.86	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
14404.910	48.28	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS

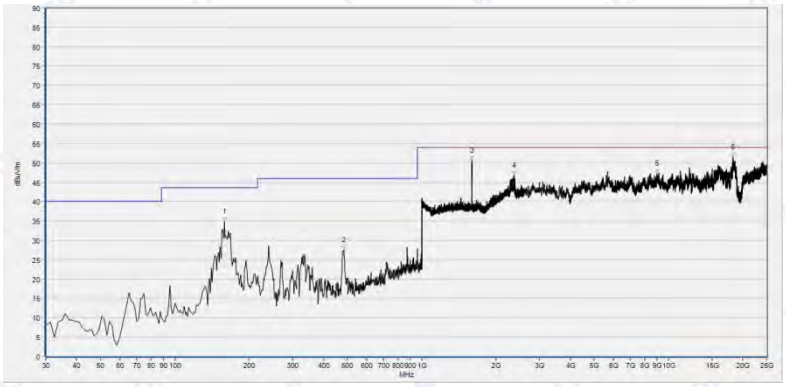
(Antenna Horizontal, 30MHz to 25GHz)



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
90.701	24.66	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
146.546	28.74	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
481.615	25.13	N.A	N.A	N.A	46.00	N.A	Vertical	PASS
2475.150	47.93	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
5699.909	46.33	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
16013.930	48.76	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

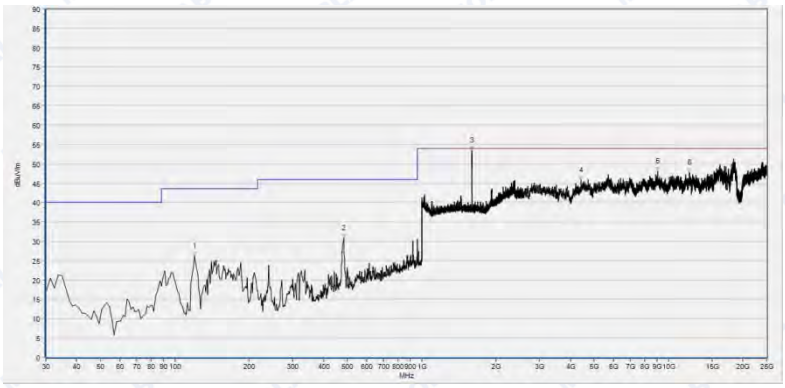
(Antenna Vertical, 30MHz to 25GHz)

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
158.686	34.80	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
484.043	27.51	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
1595.300	51.49	44.85	27.55	74.0	N.A	54.0	Horizontal	PASS
2361.184	46.70	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
8958.683	47.34	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
18242.117	51.45	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS

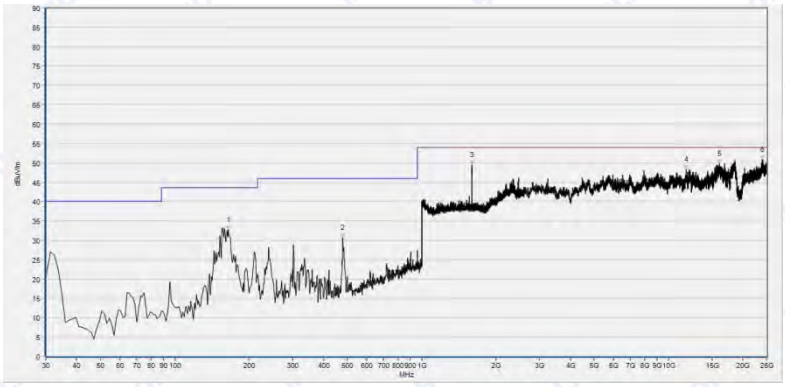
(Antenna Horizontal, 30MHz to 25GHz)



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	26.20	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
482.829	30.85	N.A	N.A	N.A	46.00	N.A	Vertical	PASS
1593.000	53.25	46.31	27.34	74.0	N.A	54.0	Vertical	PASS
4420.840	45.72	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
9011.638	48.05	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
12144.135	47.71	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

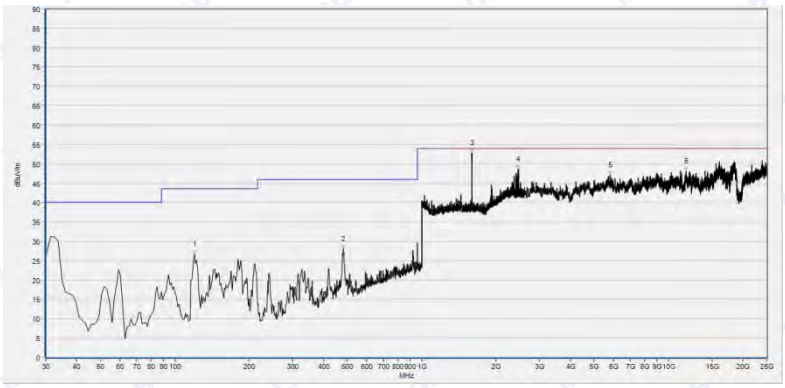
(Antenna Vertical, 30MHz to 25GHz)

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
164.756	32.66	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
479.186	30.61	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
1599.920	49.41	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
11765.303	48.19	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
16091.326	49.78	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
23940.898	50.78	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS

(Antenna Horizontal, 30MHz to 25GHz)



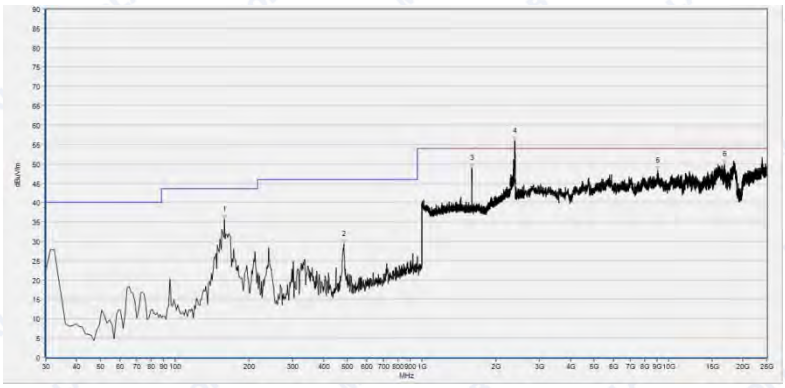
Fre. (MHz)	Pk (dBµV/m)	QP (dBµV/m)	AV (dBµV/m)	Limit-PK (dBµV/m)	Limit-QP (dBµV/m)	Limit-AV (dBµV/m)	Antenna	Verdict
119.837	26.60	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
480.401	27.98	N.A	N.A	N.A	46.00	N.A	Vertical	PASS
1593.300	53.82	47.81	27.44	74.0	N.A	54.0	Vertical	PASS
2459.784	48.56	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
5822.113	47.08	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
11773.450	48.02	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)

2.8.3.2 802.11g Test mode

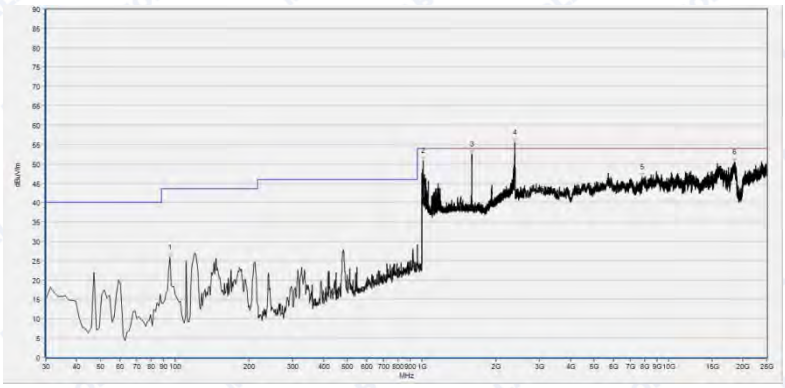
A. Test Plots for the Whole Measurement Frequency Range:

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
158.686	35.71	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
482.829	29.29	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
1594.158	48.95	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
2401.673	55.98	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
9027.932	48.26	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
16816.403	50.01	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS

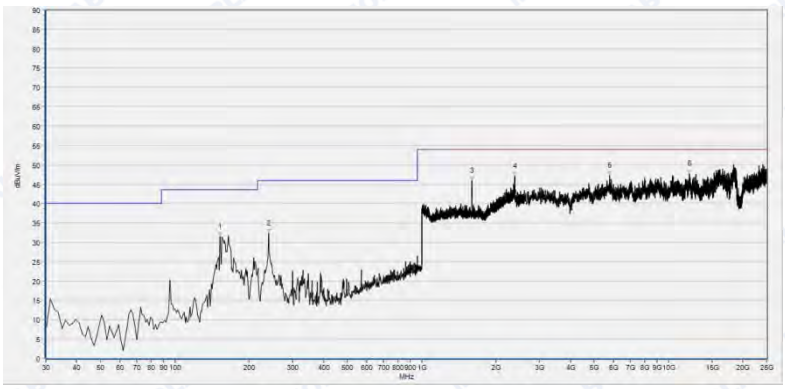
(Antenna Horizontal, 30MHz to 25GHz)



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
95.557	25.87	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
1010.900	50.01	45.29	37.48	74.0	N.A	54.0	Vertical	PASS
1597.500	52.01	46.48	38.36	74.0	N.A	54.0	Vertical	PASS
2401.313	55.55	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
7801.819	46.56	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
18486.525	50.50	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

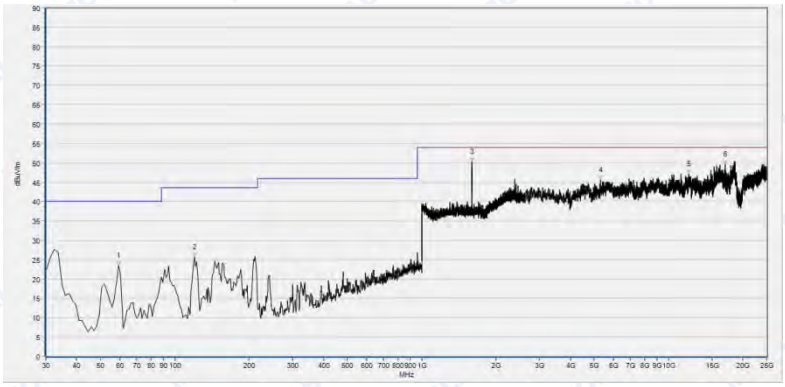
(Antenna Vertical, 30MHz to 25GHz)

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
152.616	31.49	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
240.025	32.43	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
1595.438	46.00	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
2384.234	47.03	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
5781.378	47.29	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
12152.282	47.70	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS

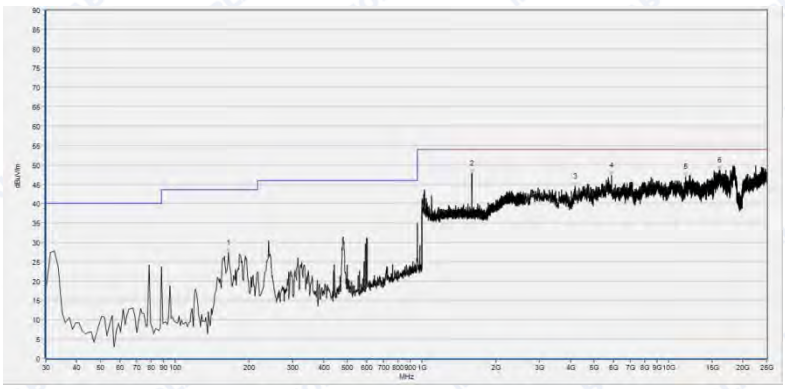
(Antenna Horizontal, 30MHz to 25GHz)



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
59.136	23.45	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
119.837	25.57	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
1599.100	53.34	46.52	38.36	74.0	N.A	54.0	Vertical	PASS
5304.783	45.56	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
12062.666	47.07	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
16975.268	49.56	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

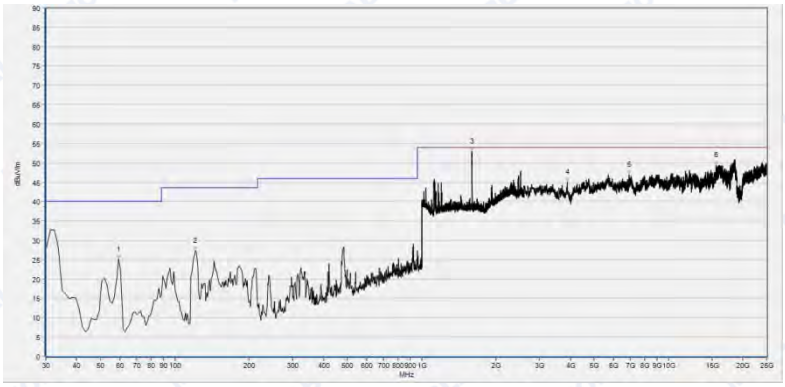
(Antenna Vertical, 30MHz to 25GHz)

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
164.756	27.26	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
1594.798	47.76	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
4188.652	44.38	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
5862.848	47.28	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
11732.715	47.01	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
16026.150	48.58	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS

(Antenna Horizontal, 30MHz to 25GHz)



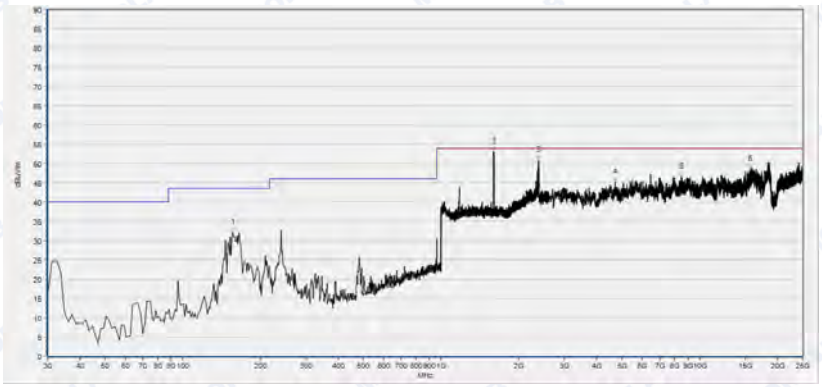
Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
59.136	25.12	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
121.051	27.36	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
1598.300	52.89	46.80	27.51	74.0	N.A	54.0	Vertical	PASS
3891.289	45.08	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
6917.876	46.93	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
15602.510	49.46	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)

2.8.3.3 802.11n-20MHz Test mode

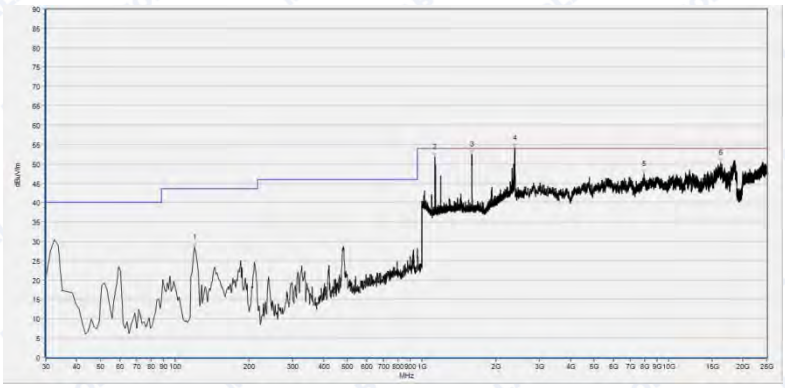
A. Test Plots for the Whole Measurement Frequency Range:

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
156.258	32.13	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
1599.500	53.39	47.14	27.47	74.0	N.A	54.0	Horizontal	PASS
2401.551	50.82	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
4710.056	45.27	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
8494.308	46.64	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
15688.052	48.63	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS

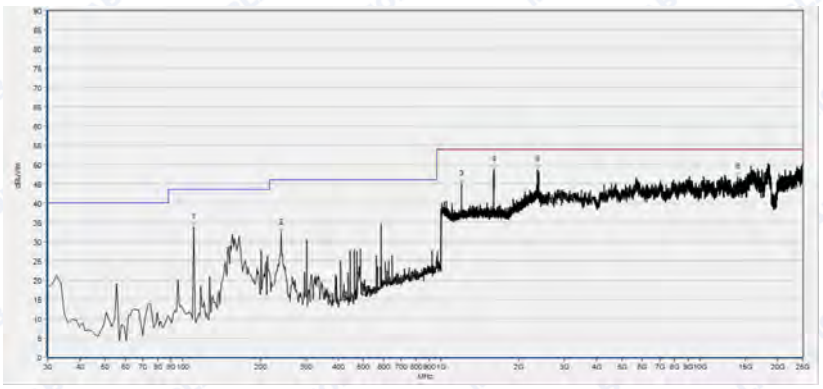
(Antenna Horizontal, 30MHz to 25GHz)



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	28.42	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
1131.300	38.46	33.69	25.85	74.0	N.A	54.0	Vertical	PASS
1595.300	52.56	46.29	27.71	74.0	N.A	54.0	Vertical	PASS
2401.831	54.19	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
7968.831	47.37	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
16213.530	50.22	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

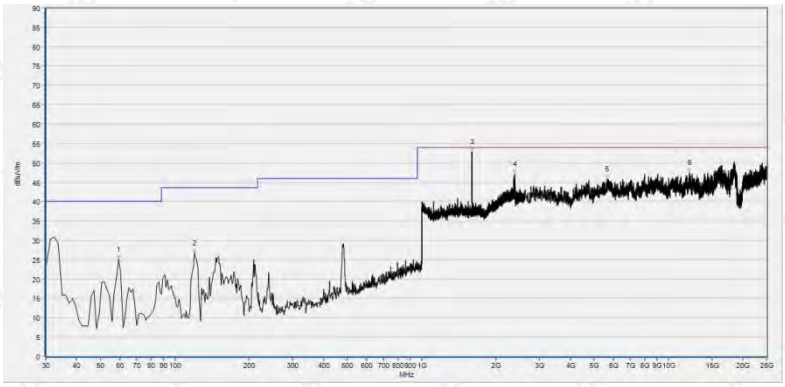
(Antenna Vertical, 30MHz to 25GHz)

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
110.125	33.67	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
240.025	32.24	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
1195.918	45.05	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
1594.798	48.81	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
2358.623	48.76	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
14062.739	46.80	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS

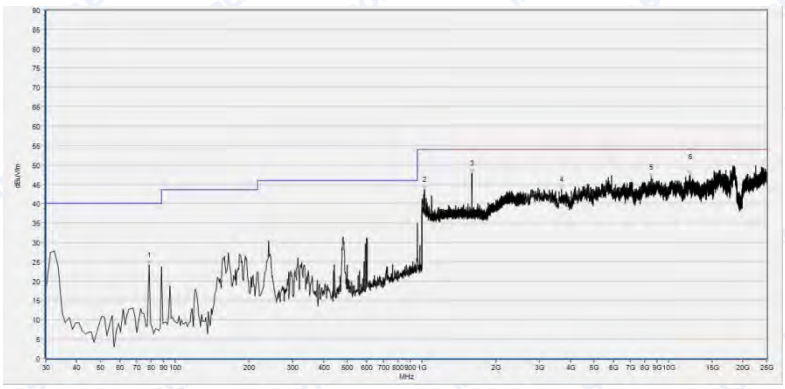
(Antenna Horizontal, 30MHz to 25GHz)



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
59.136	25.02	N.A	N.A	N.A	40.00	N.A	Vertical	PASS
119.837	26.70	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
1596.078	52.71	46.62	35.12	74.0	N.A	54.0	Vertical	PASS
2401.673	47.16	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
5646.954	45.83	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
12148.209	47.45	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

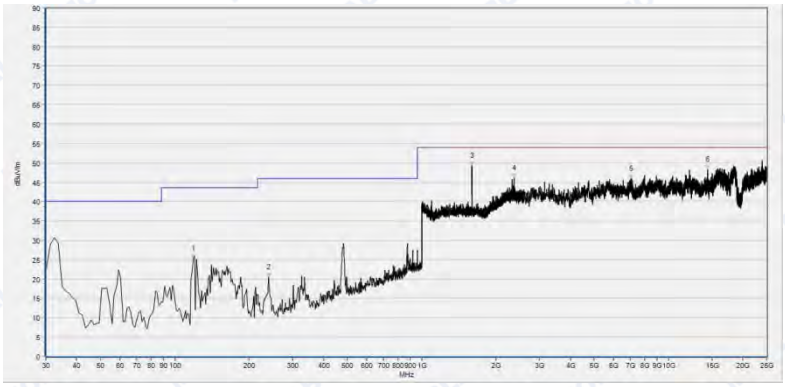
(Antenna Vertical, 30MHz to 25GHz)

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
78.561	24.09	N.A	N.A	N.A	40.00	N.A	Horizontal	PASS
1025.610	43.61	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
1594.798	47.76	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
3683.542	43.51	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
8498.382	46.75	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
12201.164	47.38	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS

(Antenna Horizontal, 30MHz to 25GHz)



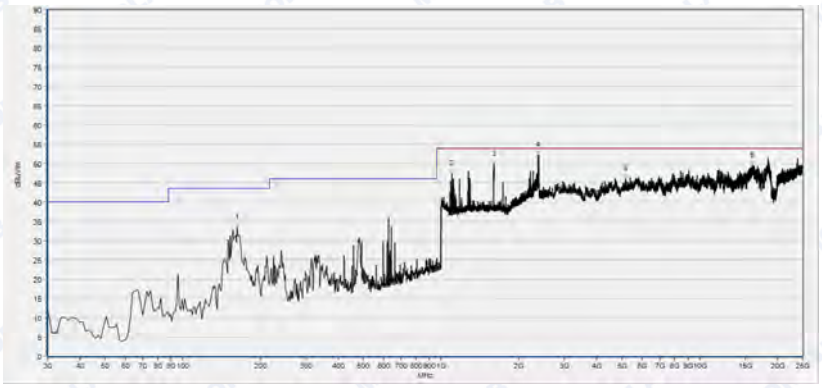
Fre. (MHz)	Pk (dBμV/m)	QP (dBμV/m)	AV (dBμV/m)	Limit-PK (dBμV/m)	Limit-QP (dBμV/m)	Limit-AV (dBμV/m)	Antenna	Verdict
118.623	25.33	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
240.025	20.50	N.A	N.A	N.A	46.00	N.A	Vertical	PASS
1599.280	49.22	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
2370.788	46.17	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
7044.153	45.89	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
14425.277	48.24	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

(Antenna Vertical, 30MHz to 25GHz)

2.8.3.4 802.11n-40MHz Test mode

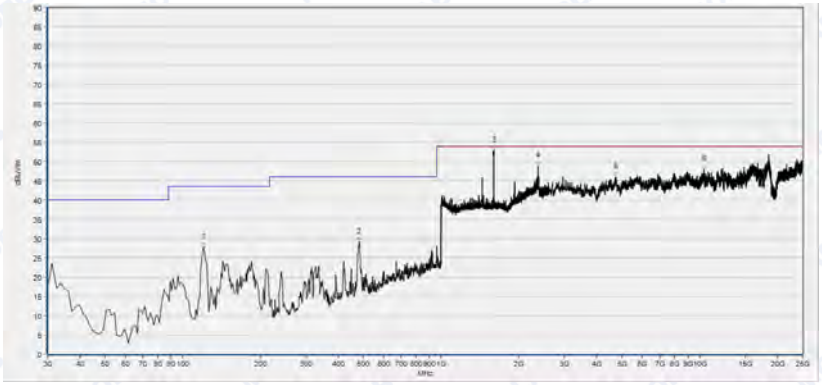
A. Test Plots for the Whole Measurement Frequency Range:

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
162.328	33.44	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
1099.240	47.34	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
1596.719	49.77	51.00	37.90	74.0	N.A	54.0	Horizontal	PASS
2401.148	52.06	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
5166.285	46.10	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
16022.077	49.49	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS

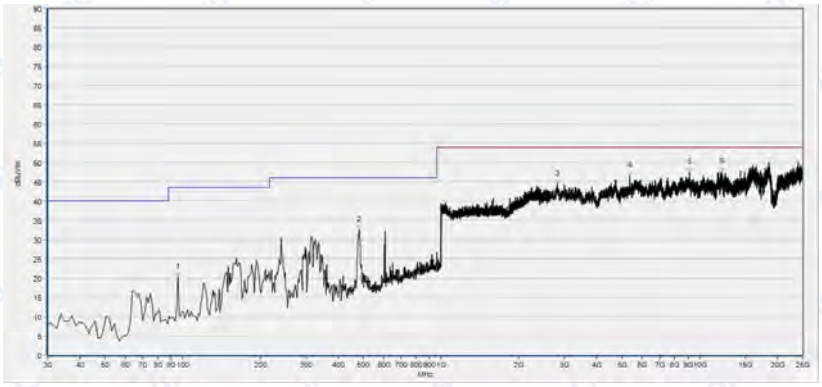
(Plot A.2: Antenna Horizontal, 30MHz to 25GHz)



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	27.90	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
481.615	29.14	N.A	N.A	N.A	46.00	N.A	Vertical	PASS
1593.000	53.39	46.65	27.47	74.0	N.A	54.0	Vertical	PASS
2401.788	48.97	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
4738.571	46.15	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
10408.838	47.97	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

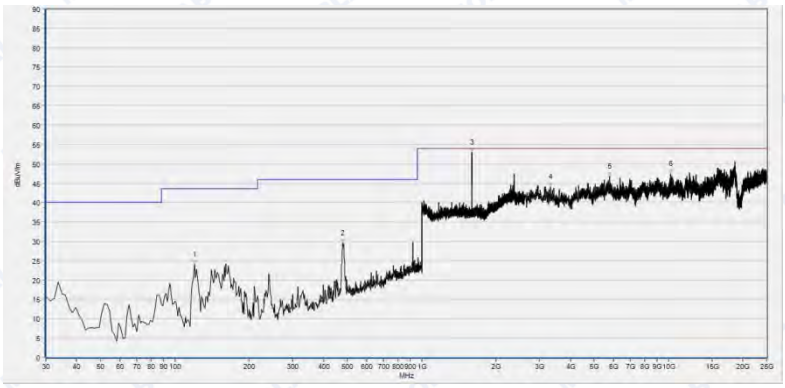
(Plot A.3: Antenna Vertical, 30MHz to 25GHz)

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
95.557	20.39	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
481.615	32.45	N.A	N.A	N.A	46.00	N.A	Horizontal	PASS
2815.894	44.50	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
5374.032	46.55	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
9158.283	47.46	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
12172.650	47.75	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS

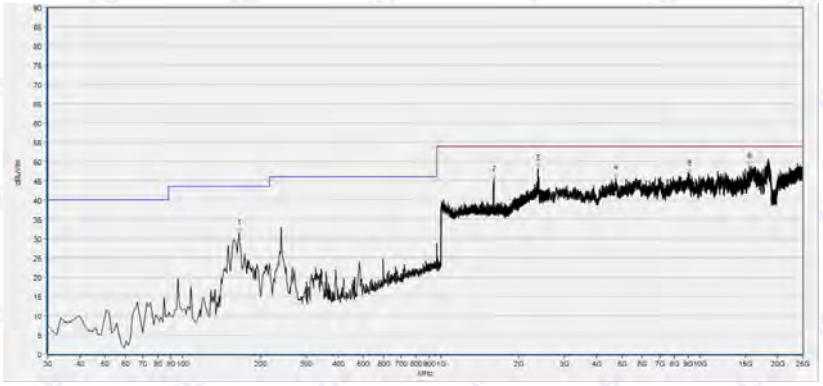
(Plot B.2: Antenna Horizontal, 30MHz to 25GHz)



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	24.02	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
479.186	29.44	N.A	N.A	N.A	46.00	N.A	Vertical	PASS
1599.920	52.94	46.87	28.45	74.0	N.A	54.0	Vertical	PASS
3329.151	44.16	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
5769.158	46.68	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
10209.238	47.44	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

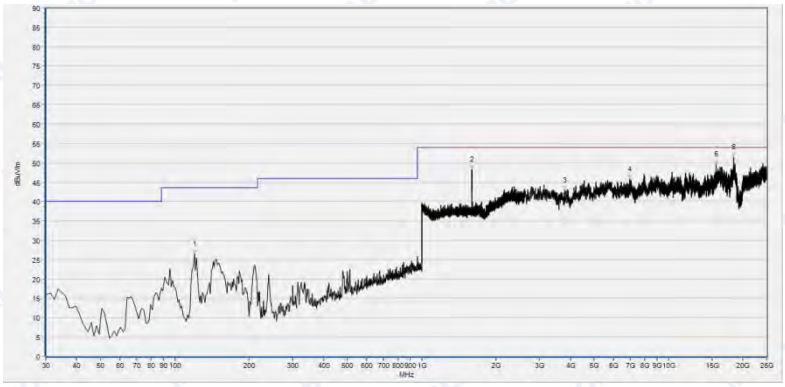
(Plot B.3: Antenna Vertical, 30MHz to 25GHz)

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
164.756	31.42	N.A	N.A	N.A	43.50	N.A	Horizontal	PASS
1596.078	45.31	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
2401.788	48.28	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
4738.571	45.77	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
9137.916	46.79	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS
15598.436	48.78	N.A	N.A	74.0	N.A	54.0	Horizontal	PASS

(Plot C.2: 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	26.41	N.A	N.A	N.A	43.50	N.A	Vertical	PASS
1594.158	48.24	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
3801.673	42.97	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
6974.905	45.72	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
15606.583	49.68	N.A	N.A	74.0	N.A	54.0	Vertical	PASS
18352.100	51.43	N.A	N.A	74.0	N.A	54.0	Vertical	PASS

(Plot C.3: Antenna Vertical, 30MHz to 25GHz)

ANNEX A GENERAL INFORMATION

1.1 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

1.2 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

1.3 Facilities and Accreditations

Shenzhen Morlab Communications Technology Co., Ltd. Morlab Laboratory is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L3572.

All measurement facilities used to collect the measurement data are located at FL.1, 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 registration number is 695796.

1.4 Maximum measurement 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

1.5 Test Equipments Utilized

1.5.1 Conducted Test Equipments

Conducted Test Equipment						
No.	**Equipment Name**	**Serial No.**	**Type**	**Manufacturer**	**Cal. Date**	**Cal. Due**
1	Spectrum Analyzer	MY45101810	E4407B	Agilent	2016.06.02	2017.06.01
2	Power Splitter	NW521	1506A	Weinschel	2016.06.02	2017.06.01
3	Attenuator 1	(N/A.)	10dB	Resnet	2016.06.02	2017.06.01
4	Attenuator 2	(N/A.)	3dB	Resnet	2016.06.02	2017.06.01
5	EXA Signal Analzyer	MY53470836	N9010A	Agilent	2016.12.07	2017.12.06
6	RF cable (30MHz-26GHz)	CB01	RF01	Morlab	N/A	N/A
7	Coaxial cable	CB02	RF02	Morlab	N/A	N/A
8	SMA connector	CN01	RF03	HUBER-SUHNER	N/A	N/A

1.5.2 Conducted Emission Test Equipments

Conducted Emission Test Equipments						
No.	**Equipment Name**	**Serial No.**	**Type**	**Manufacturer**	**Cal. Date**	**Cal. Due**
1	Receiver	US44210471	E7405A	Agilent	2016.06.02	2017.06.01
2	LISN	812744	NSLK 8127	Schwarzbeck	2016.06.02	2017.06.01
3	Service Supplier	100448	CMU200	R&S	2016.06.02	2017.06.01
4	Pulse Limiter (20dB)	9391	VTSD 9561-D	Schwarzbeck	2016.06.02	2017.06.01
5	Coaxial cable(BNC) (30MHz-26GHz)	CB01	EMC01	Morlab	N/A	N/A

1.5.3 Auxiliary Test Equipment

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

1.5.4 Radiated Test Equipments

Radiated Test Equipments						
No.	**Equipment Name**	**Serial No.**	**Type**	**Manufacturer**	**Cal. Date**	**Cal.Due Date**
1	System Simulator	GB45360846	8960-E5515C	Agilent	2016.06.02	2017.06.01
2	Receiver	MY54130016	N9038A	Agilent	2016.06.02	2017.06.01
3	Test Antenna - Bi-Log	N/A	VULB9163	Schwarzbeck	2016.07.05	2017.07.04
4	Test Antenna - Horn	9170C-531	BBHA9170	Schwarzbeck	2016.07.05	2017.07.04
5	Test Antenna - Loop	1519-022	FMZB1519	Schwarzbeck	2016.07.05	2017.07.04
6	Test Antenna - Horn	71688	BBHA 9120D	Schwarzbeck	2016.07.05	2017.07.04
7	Coaxial cable (N male) (9KHz-30MHz)	CB04	EMC04	Morlab	N/A	N/A
8	Coaxial cable (N male) (30MHz-26GHz)	CB02	EMC02	Morlab	N/A	N/A
9	Coaxial cable(N male) (30MHz-26GHz)	CB03	EMC03	Morlab	N/A	N/A
10	1-18GHz pre-Amplifier	MA02	TS-PR18	Rohde& Schwarz	2016.07.05	2017.07.04
11	18-26.5GHz pre-Amplifier	MA03	TS-PR18	Rohde& Schwarz	2016.07.05	2017.07.04

1.5.5 Climate Chamber

Climate Chamber						
No.	**Equipment Name**	**Serial No.**	**Type**	**Manufacturer**	**Cal.Date**	**Cal.Due Date**
1	Climate Chamber	2004012	HL4003T	Yinhe	2017.01.11	2018.01.10

1.5.6 Vibration Table

Vibration Table						
No.	**Equipment Name**	**Serial No.**	**Type**	**Manufacturer**	**Cal.Date**	**Cal.Due Date**
1	Vibration Table	N/A	ACT2000-S015L	CMI-COM	2017.01.11	2018.01.10

1.5.7 Anechoic Chamber

Anechoic Chamber						
No.	**Equipment Name**	**Serial No.**	**Type**	**Manufacturer**	**Cal.Date**	**Cal.Due Date**
1	Anechoic Chamber	N/A	9m*6m*6m	Changning	2017.01.11	2018.01.10

***** END OF REPORT *****