TEST REPORT

APPLICANT	:	mMax Communications, Inc.
PRODUCT NAME	:	Mobile Hotspot
MODEL NAME	:	HPP-M14
BRAND NAME	:	Hot Pepper
FCC ID	:	2AWVS-M14
STANDARD(S)	:	47 CFR Part 15 Subpart C
RECEIPT DATE	:	2020-07-15
TEST DATE	:	2020-07-15 to 2020-08-06
ISSUE DATE	:	2020-08-19

Edited by : Bowers Zeng

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Change History		
Version	Date	Reason for change
1.0	2020-08-19	First edition

1. Technical Information

Note: Provide by applicant.

1.1. Applicant and Manufacturer Information

Applicant:	mMax Communications, Inc.
Applicant Address:	5151 California Ave., Suite 100, Irvine 92617, USA
Manufacturer:	mMax Communications, Inc.
Manufacturer Address:	5151 California Ave., Suite 100, Irvine 92617, USA

1.2. Equipment Under Test (EUT) Description

Product Name:	Mobile Hotspot	
Serial No:	(N/A, marked #1 by test site)	
Hardware Version:	SD305T_V1.0	
Software Version:	Fresno_V1.0.2_RLK	
Modulation Type:	DSSS, OFDM	
Operating Frequency Range:	802.11b/g/n-20MHz: 2.412GHz - 2.472GHz 802.11n-40MHz: 2.422GHz - 2.462GHz	
Channel Number:	802.11b/g/n-20MHz: 13 802.11n-40MHz: 9Z	
Antenna Type:	PIFA Antenna	
Antenna Gain:	1.2 dBi	
Accessory Information:	**Battery**	
	Manufacturer:	Shenzhen Chaonengtong Technology Co.,LTD.
	Brand Name:	Hot Pepper
	Model No.:	C2020M14
	Capacity:	3000mAh
	Rated Voltage:	3.70V
	Charge Limit:	4.20V
	AC Adapter	
	Manufacturer:	Shenzhen King Fu Lin Technology Co.,Ltd
	Brand Name:	Hot Pepper
	Model No.:	KFL-C060500100
	Rated Input:	100-240V ~ 50/60Hz 0.2A

	Rated Output:	5V⎓1.0A

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<=13). Channel numbers of the EUT used and tested in this report are separately 1 (2412MHz), 6 (2437MHz) ,11 (2462MHz),12(2467MHz) and 13(2472MHz).

For 802.11n-40MHz, the frequencies allocated is F (MHz) =2412+5*(n-1) (3<=n<=11). Channel numbers of the EUT used and tested in this report are separately 3 (2422MHz), 6 (2437MHz) ,9 (2452MHz) and 11(2462MHz).

Note 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.

Note 3: 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	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)	Output Power	Jul 18, 2020	Stefan Sun	**PASS**
3	15.247(a)	Bandwidth	Jul 18, 2020	Stefan Sun	**PASS**
4	15.247(d)	Conducted Spurious Emission and Band Edge	Jul 18, 2020	Stefan Sun	**PASS**
5	15.247(e)	Power spectral density (PSD)	Jul 18, 2020	Stefan Sun	**PASS**
6	15.247(d)	Restricted Frequency Bands	Jul 26, 2020 Jul 29, 2020	Zhuoqing Zhou	**PASS**
7	15.207	Conducted Emission	Jul 29, 2020	Yaming Luo	**PASS**
8	15.209, 15.247(d)	Radiated Emission	Jul 26, 2020 Jul 29, 2020	Zhuoqing Zhou	**PASS**
Note1: 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 v05r02. **Note2:** The path loss has been calibrated by the system.					

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 N type antenna connector. The antenna is N type Omni-Directional PIFA Antenna and max gain is 1.2dBi. Please refer to the EUT external photos.

2.2. 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 B(4).

2.2.3. Test Result

Duty Cycle Factor

Mode	Channel	Frequency (MHz)	T_{on} (ms)	$T_{(on+off)}$ (ms)	Duty Cycle (%)	Duty Cycle Factor
802.11b	6	2437	100	100	100	0
802.11g	6	2437	100	100	100	0
802.11n-20MHz	6	2437	100	100	100	0
802.11n-40MHz	6	2437	100	100	100	0

Output Average Power

Mode	Channel	Frequency (MHz)	Output Average Power		Limit		Verdict
			dBm	W	dBm	W	
802.11 b	1	2412	15.90	0.039	30	1	**PASS**
	6	2437	15.45	0.035			**PASS**
	11	2462	16.56	0.045			**PASS**
802.11 g	1	2412	17.97	0.063			**PASS**
	6	2437	18.18	0.066			**PASS**
	11	2462	19.23	0.084			**PASS**
802.11 HT20	1	2412	17.75	0.060			**PASS**
	6	2437	17.40	0.055			**PASS**
	11	2462	18.63	0.073			**PASS**
802.11 HT40	3	2422	17.81	0.060			**PASS**
	6	2437	17.88	0.061			**PASS**
	9	2452	18.05	0.064			**PASS**

Note: The duty cycle factor has been compensated into the test result

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.
KDB558074 V05R02 Section 8.1 Option 1 was used in order to prove compliance.

B. Equipments List:

Please refer ANNEX B(4).

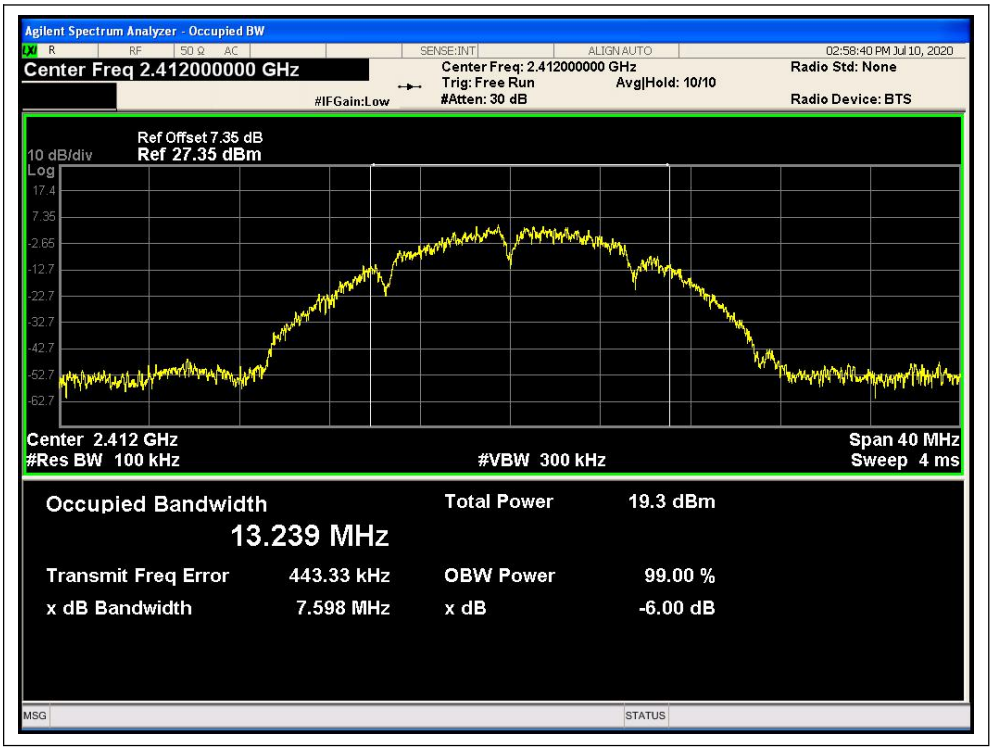
2.3.3. Test Result

802.11b Test mode

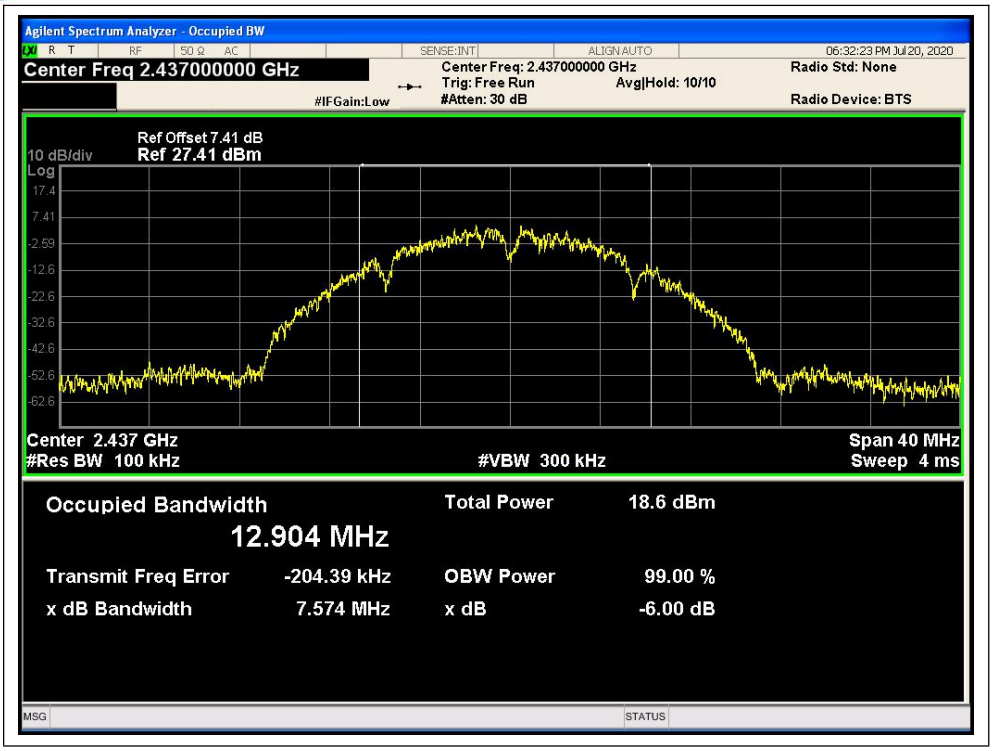
A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits(kHz)	Result
1	2412	7.598	≥500	**PASS**
6	2437	7.574	≥500	**PASS**
11	2462	7.588	≥500	**PASS**

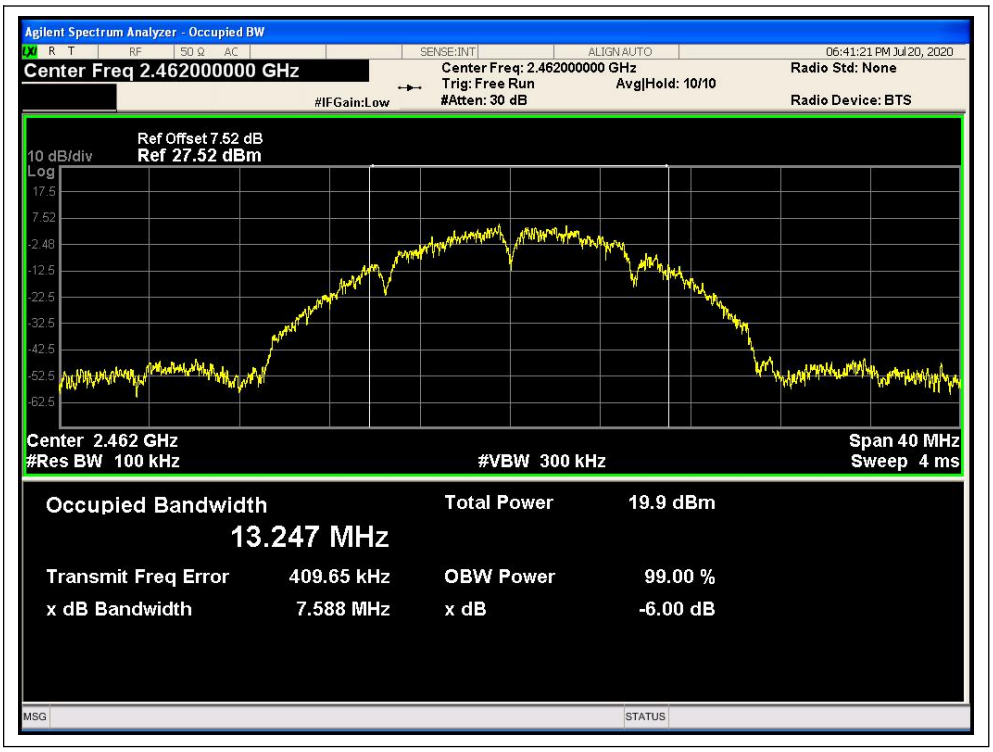
B. Test Plots



(Channel 1, 2412MHz, 802.11b)



(Channel 6, 2437 MHz, 802.11b)



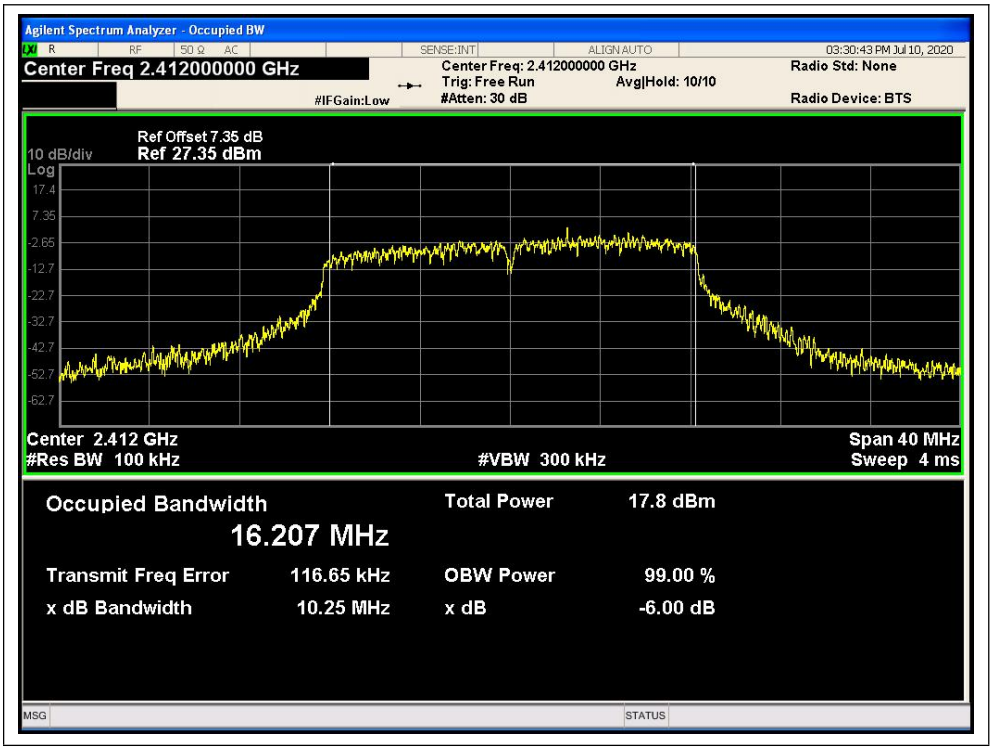
(Channel 11, 2462MHz, 802.11b)

802.11g Test mode

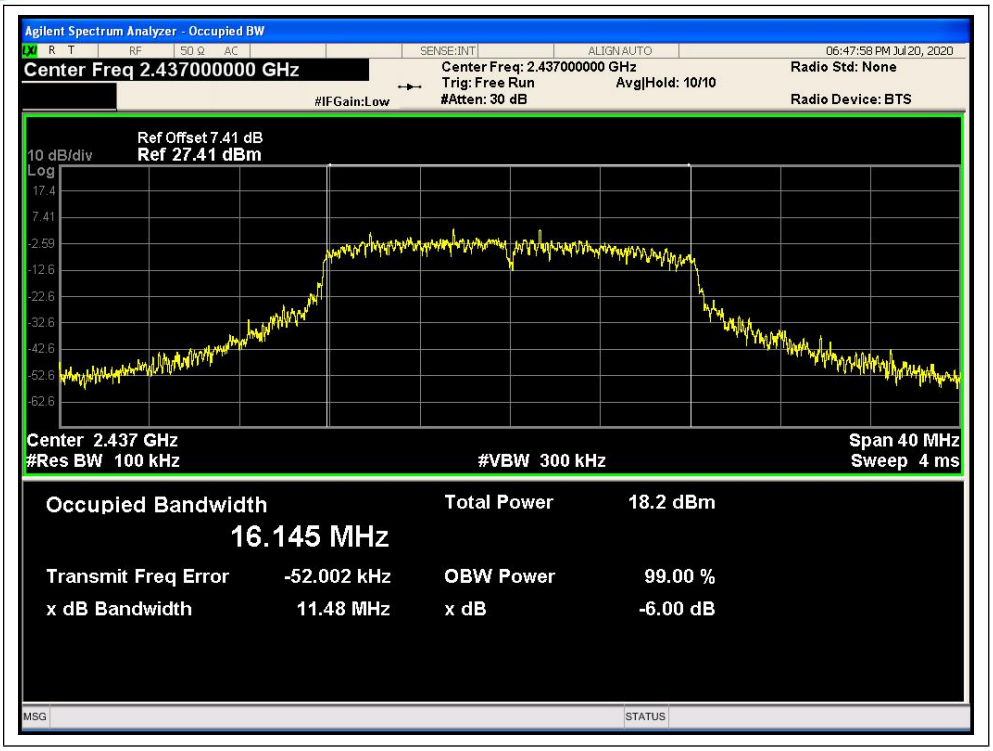
A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits (kHz)	Result
1	2412	10.245	≥500	**PASS**
6	2437	11.477	≥500	**PASS**
11	2462	13.824	≥500	**PASS**

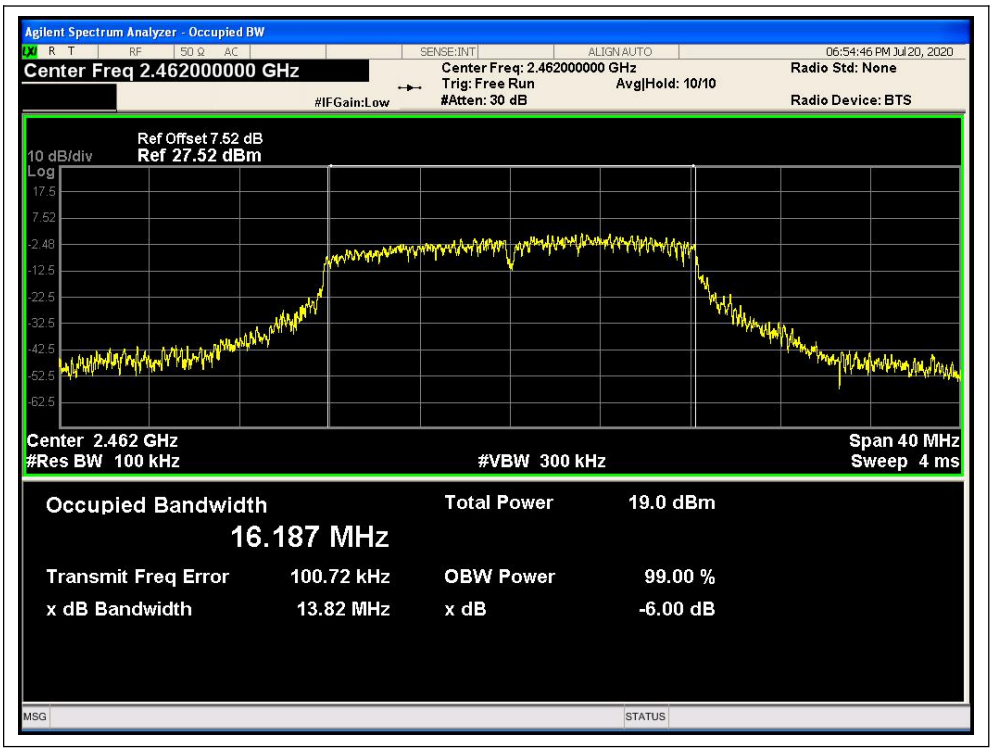
B. Test Plots:



(Channel 1, 2412MHz, 802.11g)



(Channel 6, 2437MHz, 802.11g)



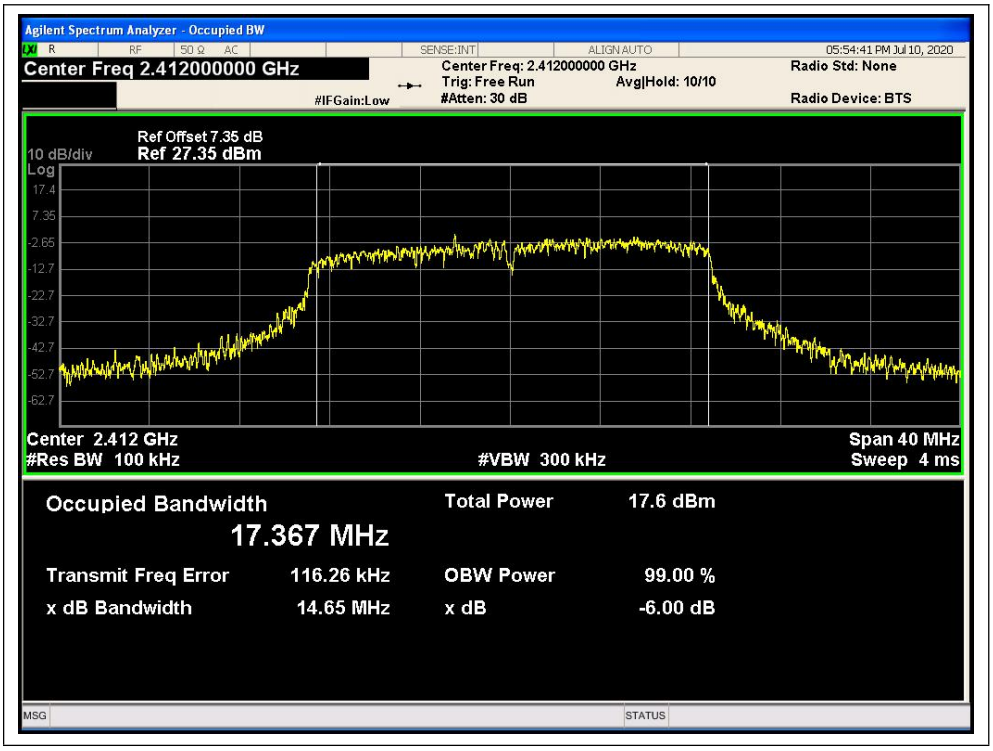
(Channel 11, 2462MHz, 802.11g)

802.11n-20 Test mode

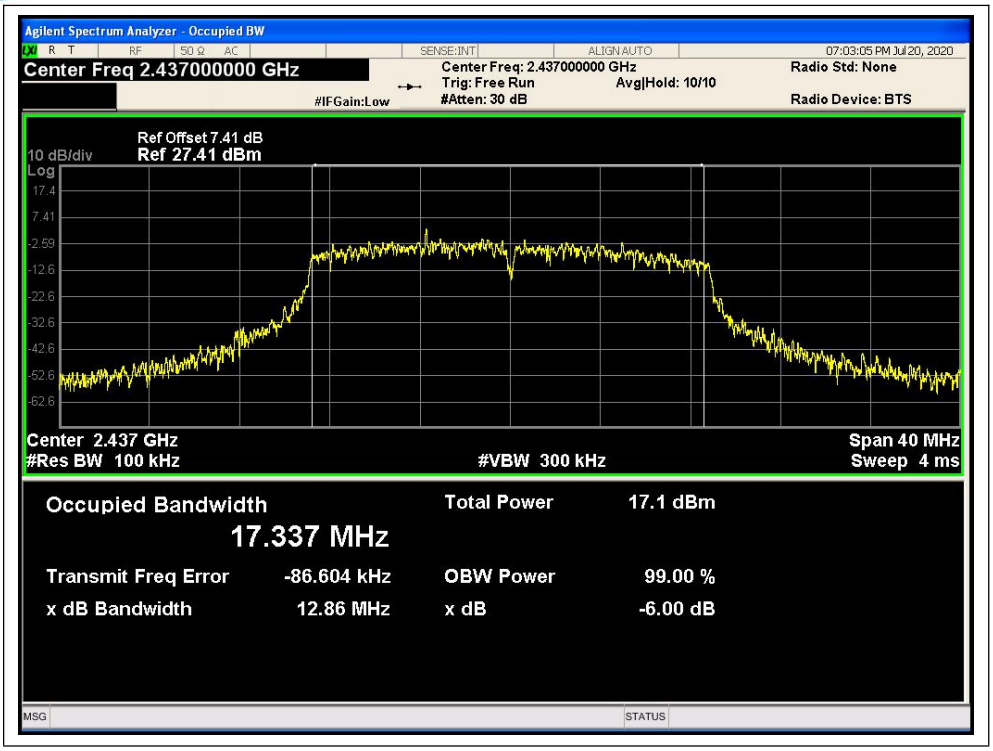
A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits (kHz)	Result
1	2412	14.649	≥500	**PASS**
6	2437	12.864	≥500	**PASS**
11	2462	11.490	≥500	**PASS**

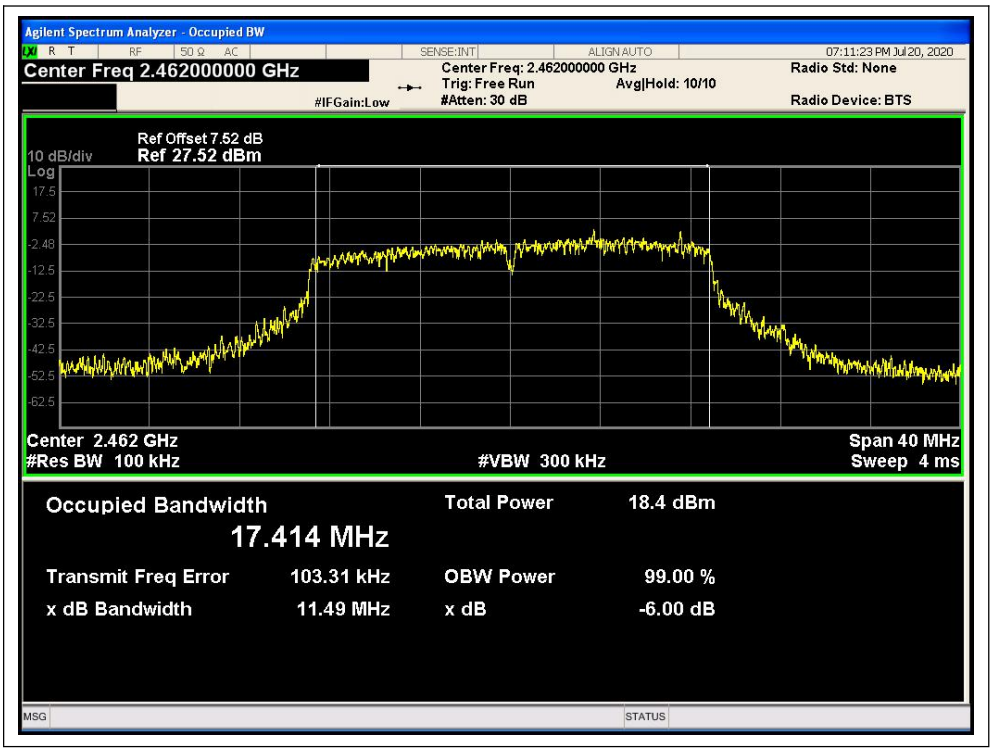
B. Test Plots:



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



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



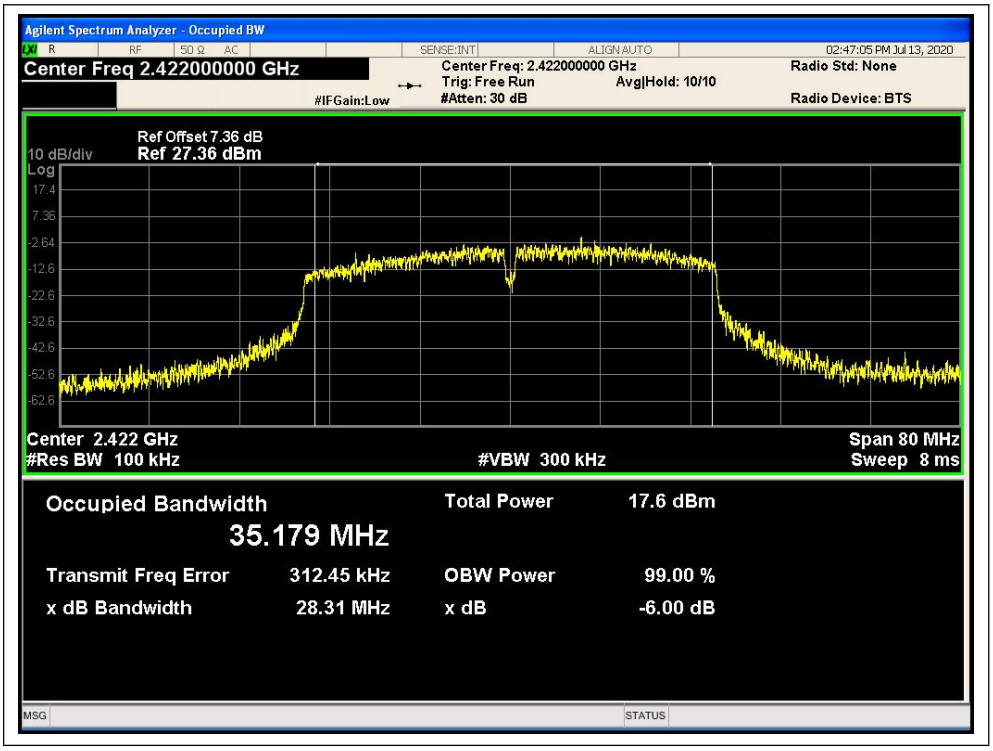
(Channel 11, 2462MHz, 802.11n-20)

802.11n-40 Test mode

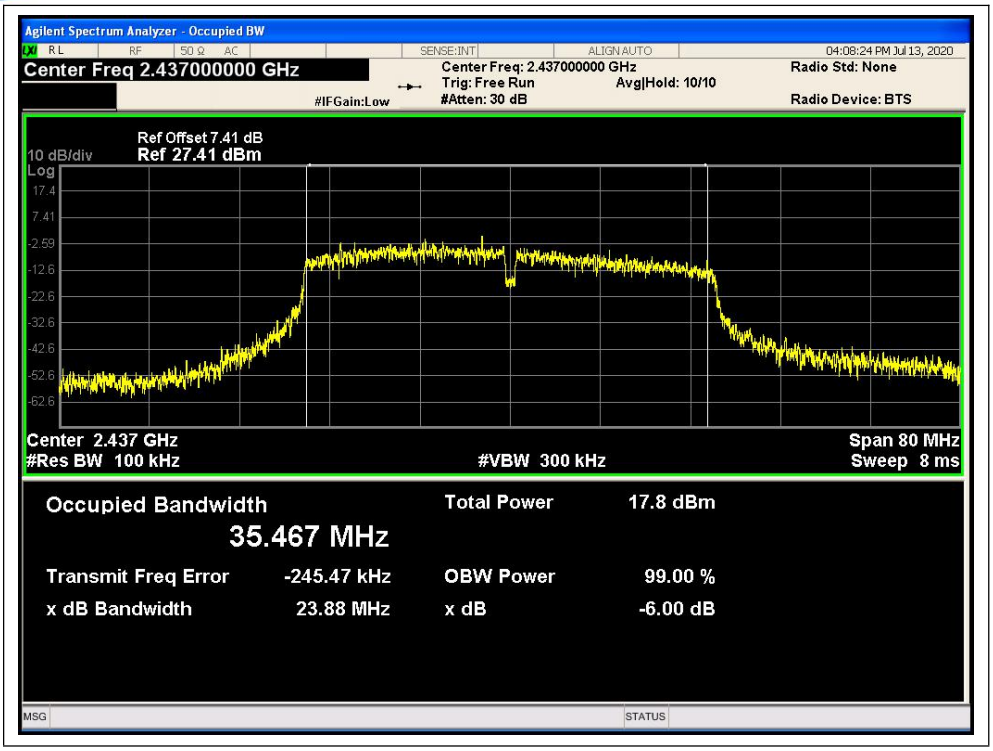
A. Test Verdict:

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Limits (kHz)	Result
3	2422	28.309	≥500	**PASS**
6	2437	23.883	≥500	**PASS**
9	2452	36.090	≥500	**PASS**

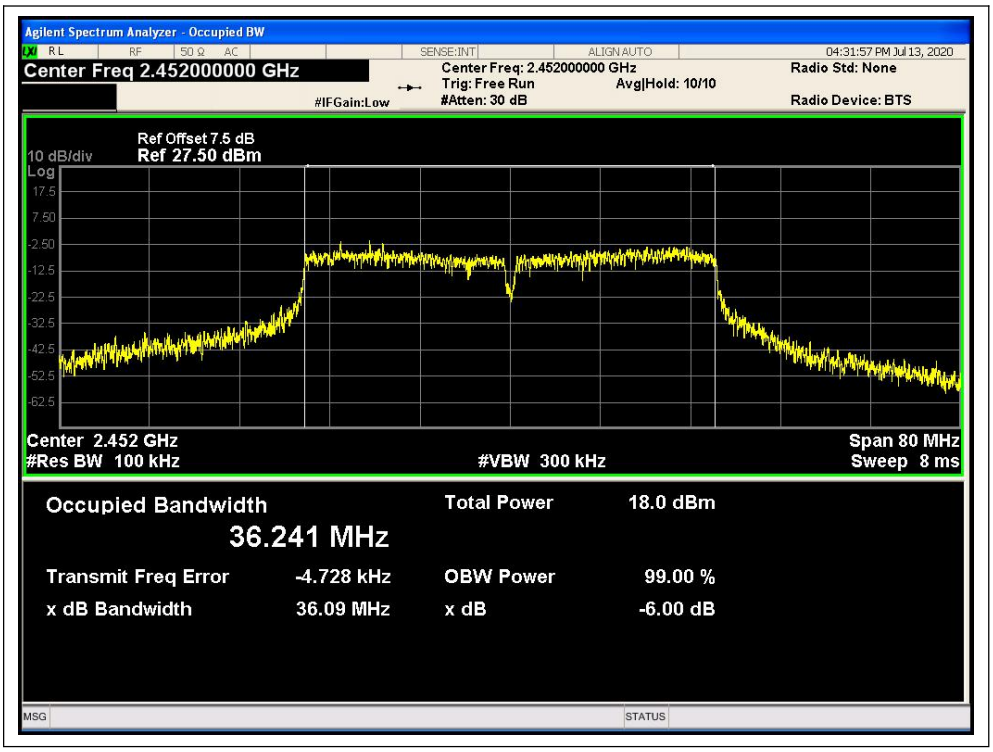
B. Test Plots:



(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 digitalSly 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.

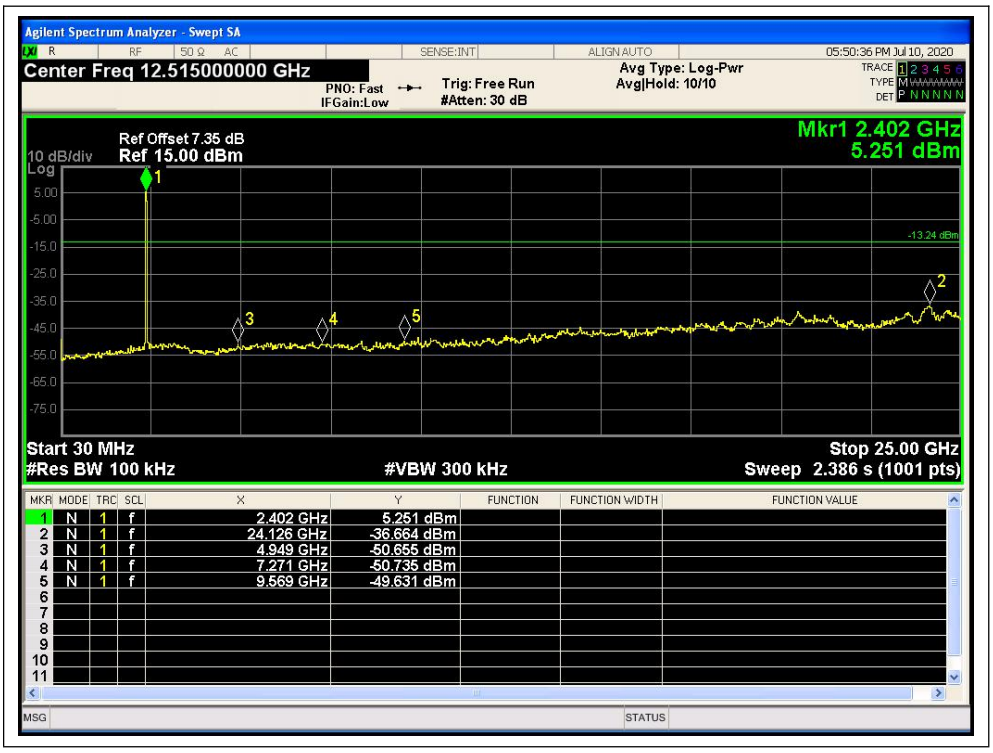
KDB 558074 D01 v05r02 Section 11.0 was used in order to prove compliance.

B. Equipments List:

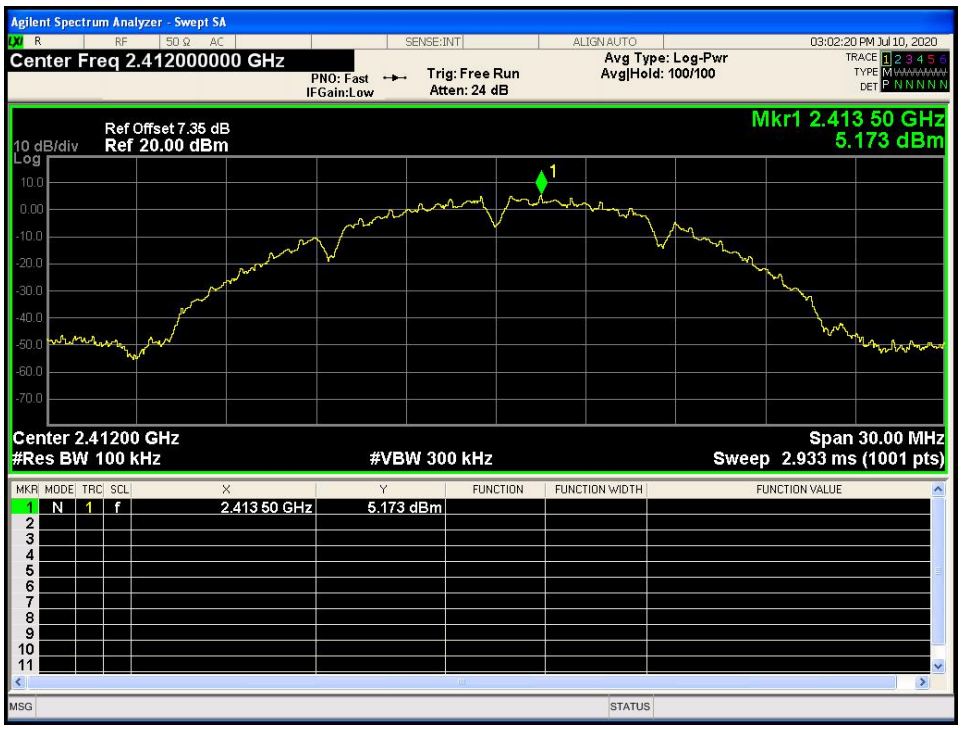
Please refer ANNEX B(4).

2.4.3. Test Result

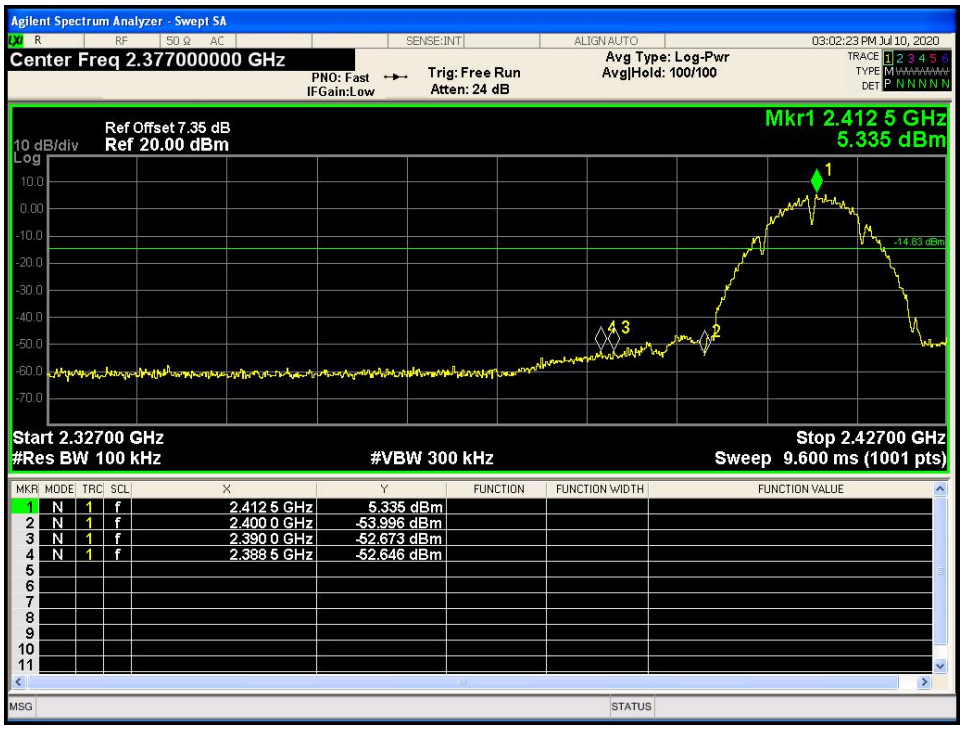
(802.11 b, Channel = 1, 30MHz to 25GHz peak power)



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

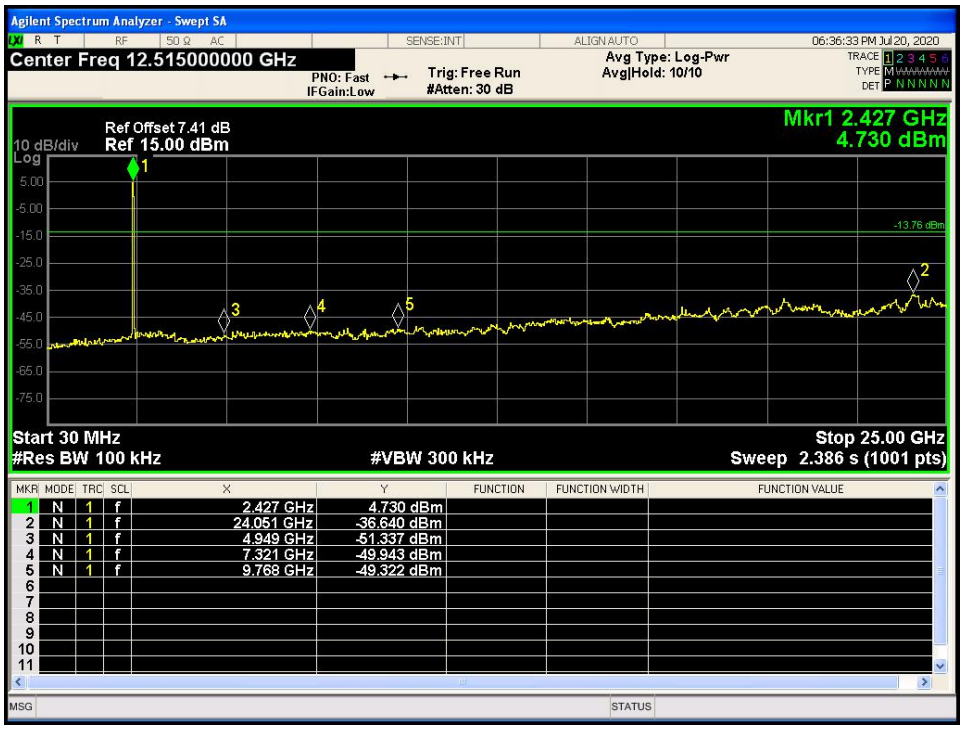


(802.11 b, Band Edge @ Channel = 1 peak power)



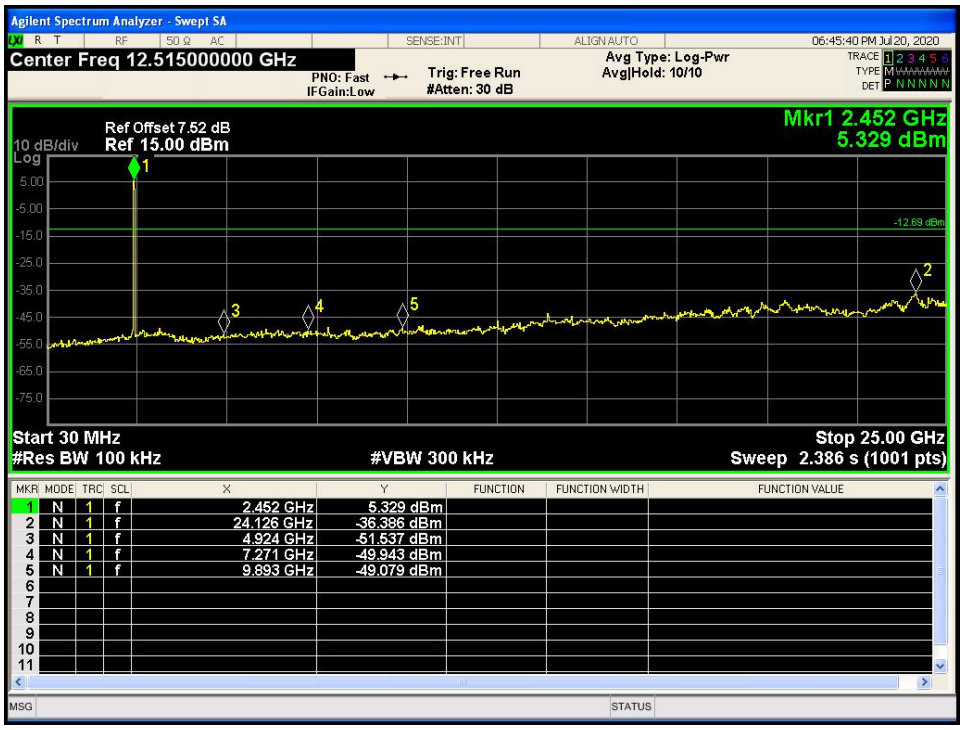
(802.11 b, Band Edge @ Channel = 1)

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

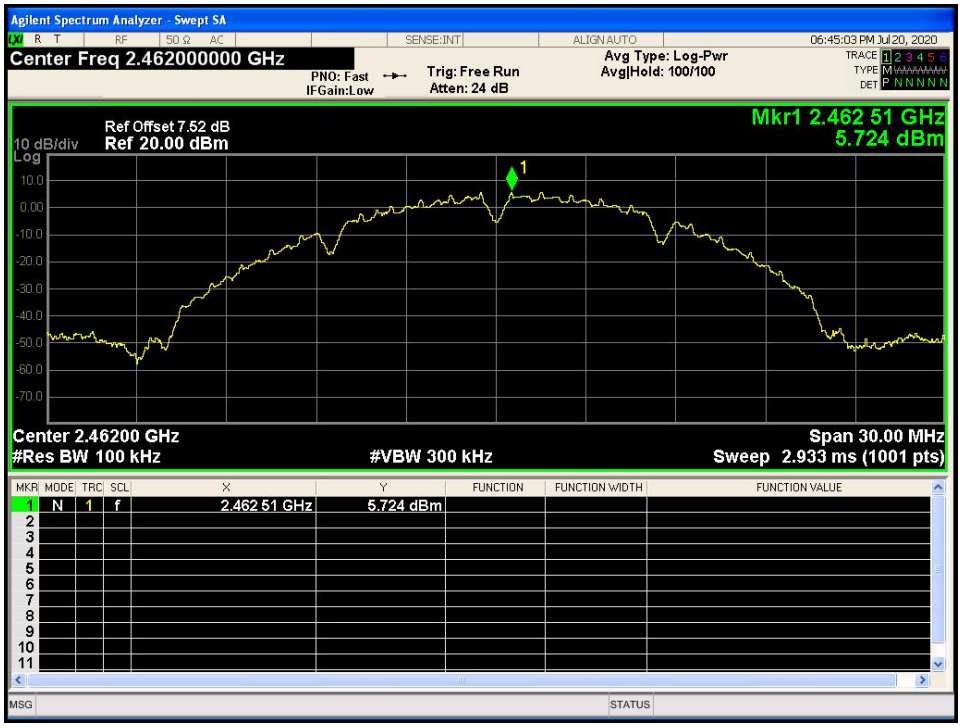


(802.11 b, Channel = 6, 30MHz to 25GHz)

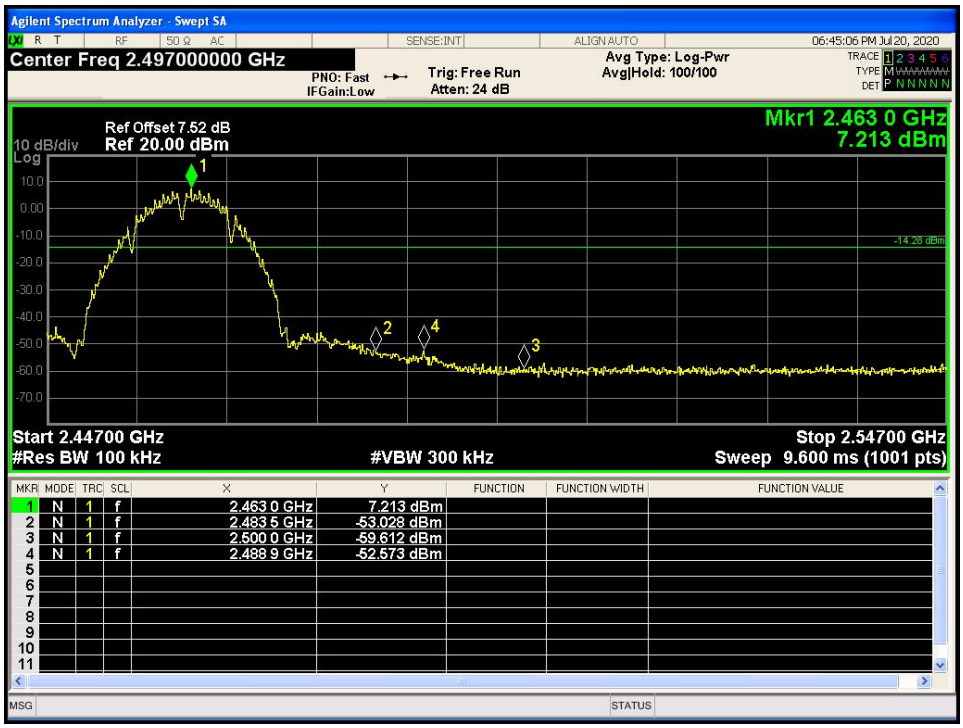
(802.11 b, Channel = 11, 30MHz to 25GHz peak power)



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

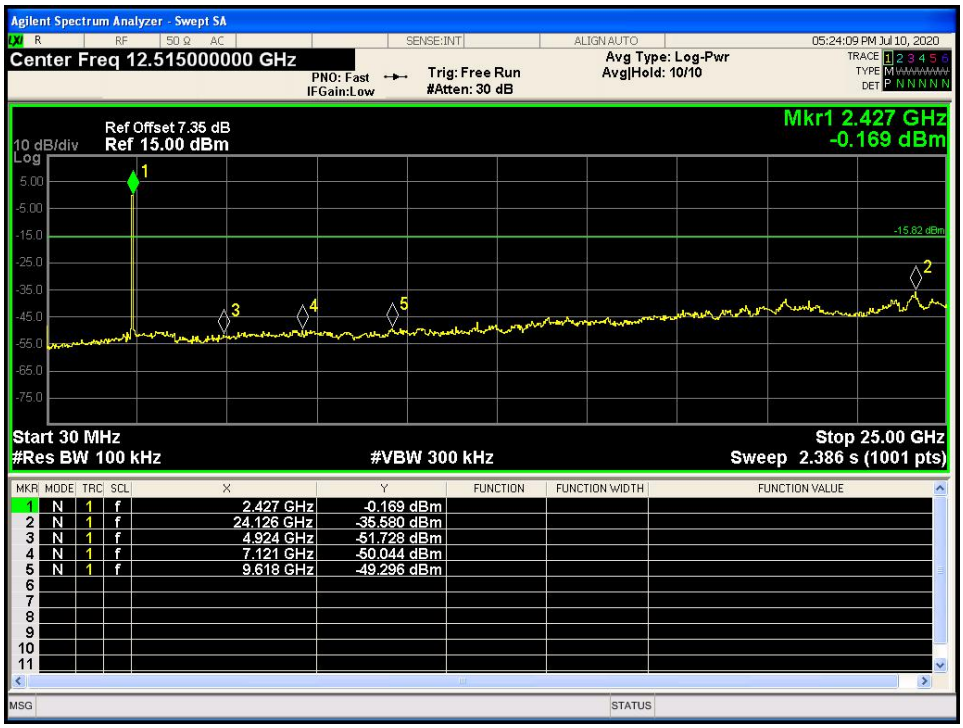


(802.11 b, Band Edge @ Channel = 11 peak power)

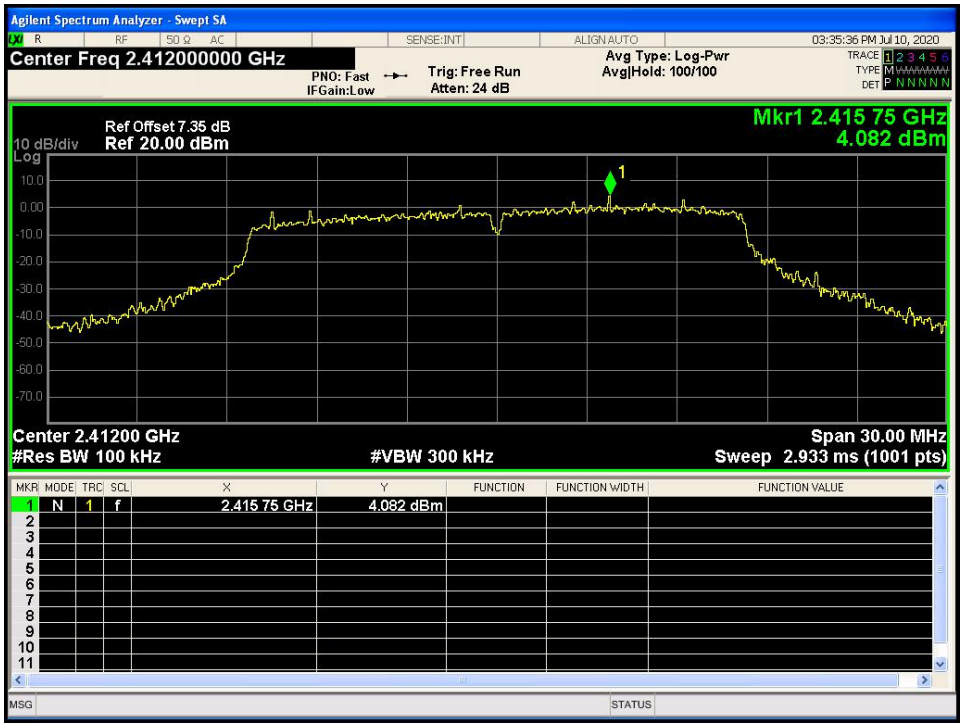


(802.11 b, Band Edge @ Channel = 11)

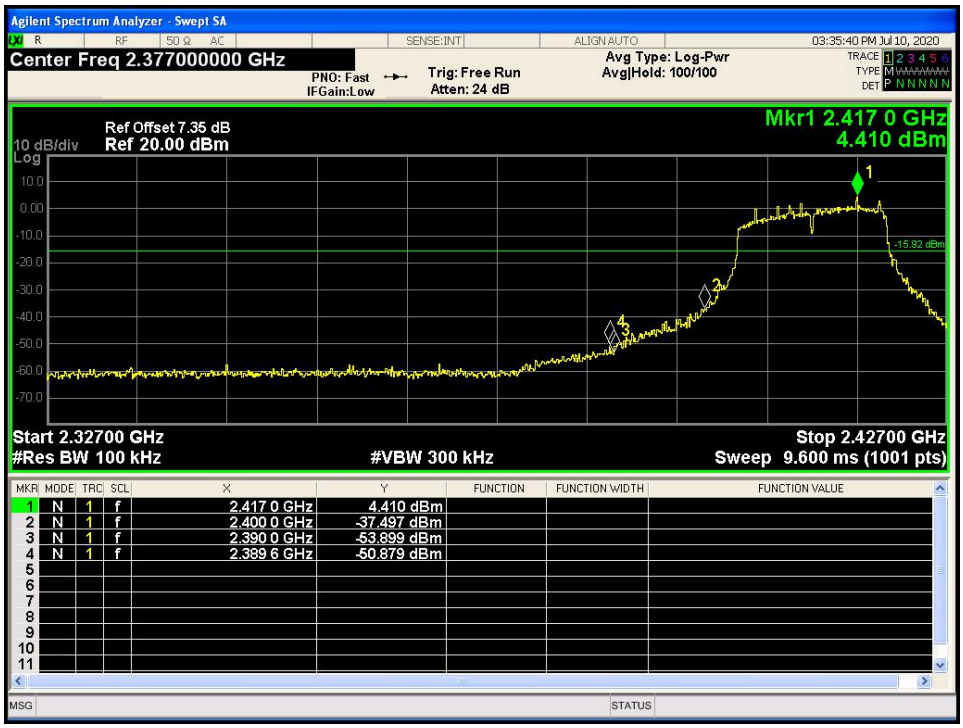
(802.11 g, Channel = 1, 30MHz to 25GHz peak power)



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

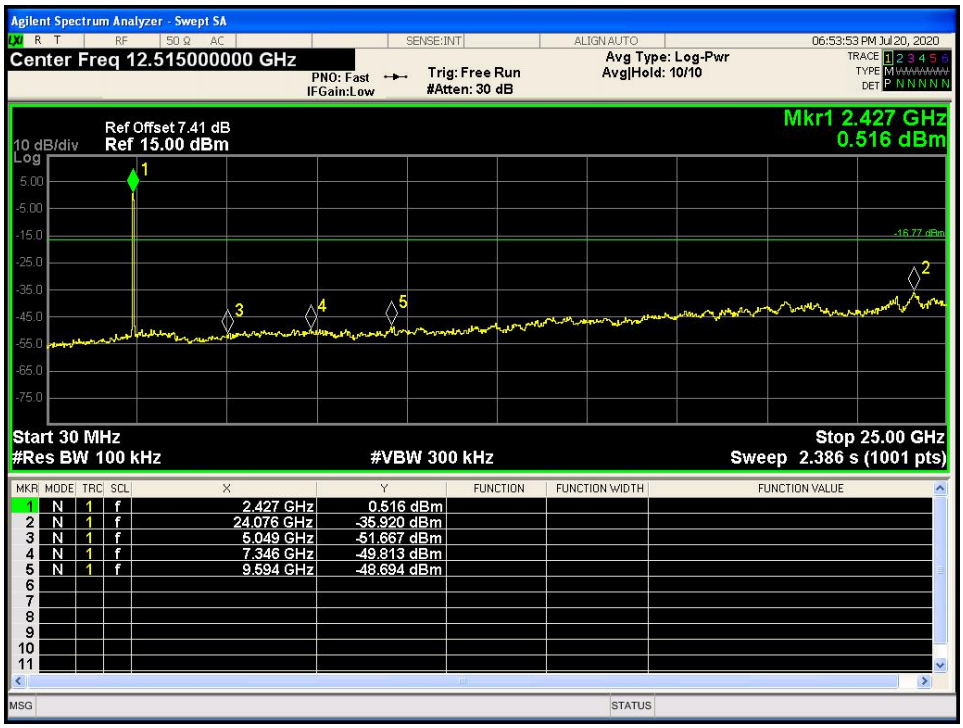


(802.11 g, Band Edge @ Channel = 1 peak power)



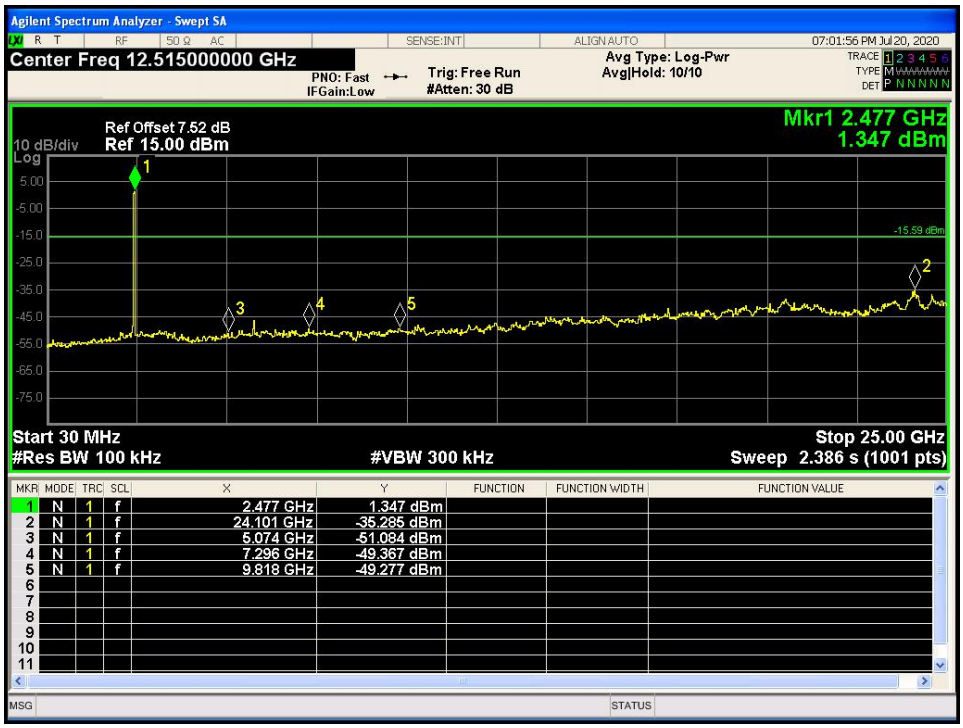
(802.11 g, Band Edge @ Channel = 1)

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

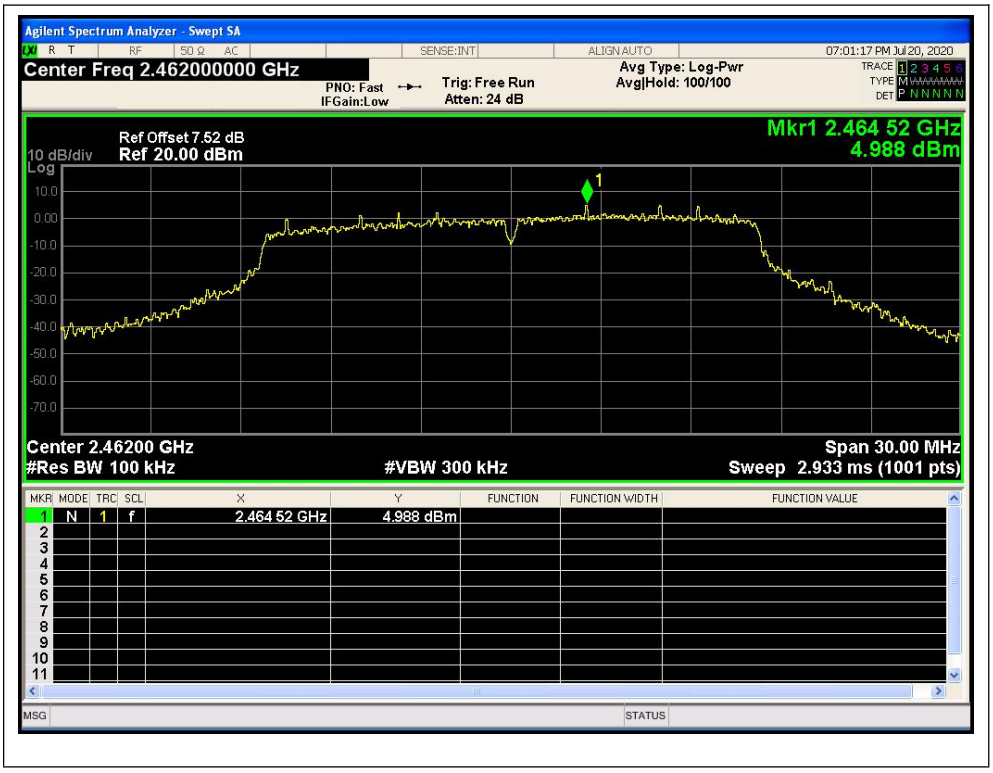


(802.11 g, Channel = 6, 30MHz to 25GHz)

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

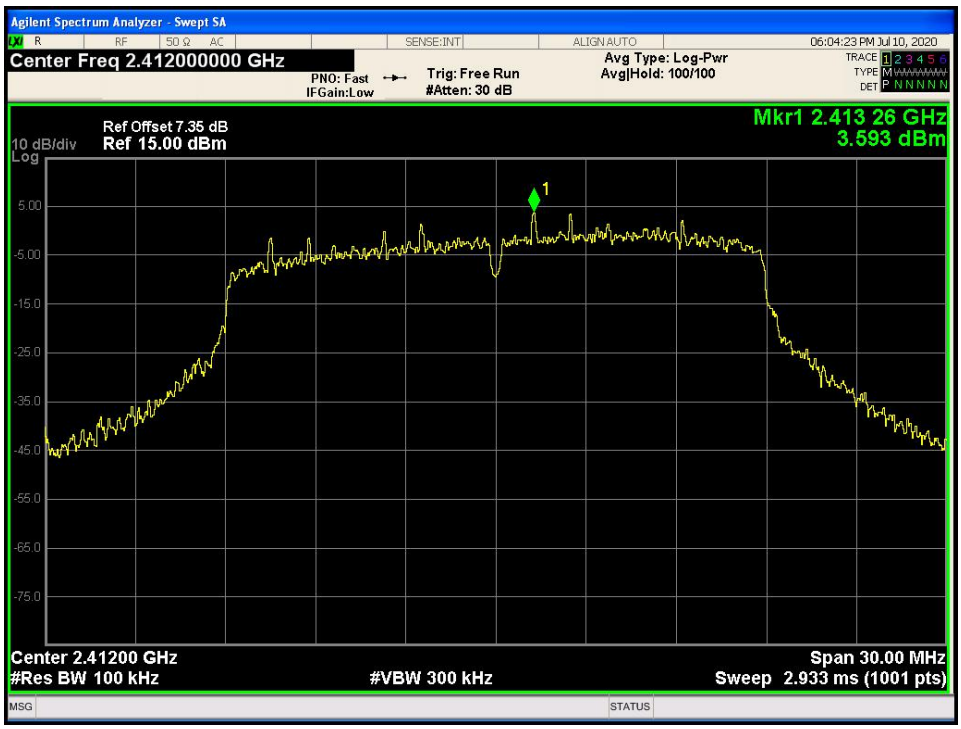


(802.11 g, Channel = 11, 30MHz to 25GHz)

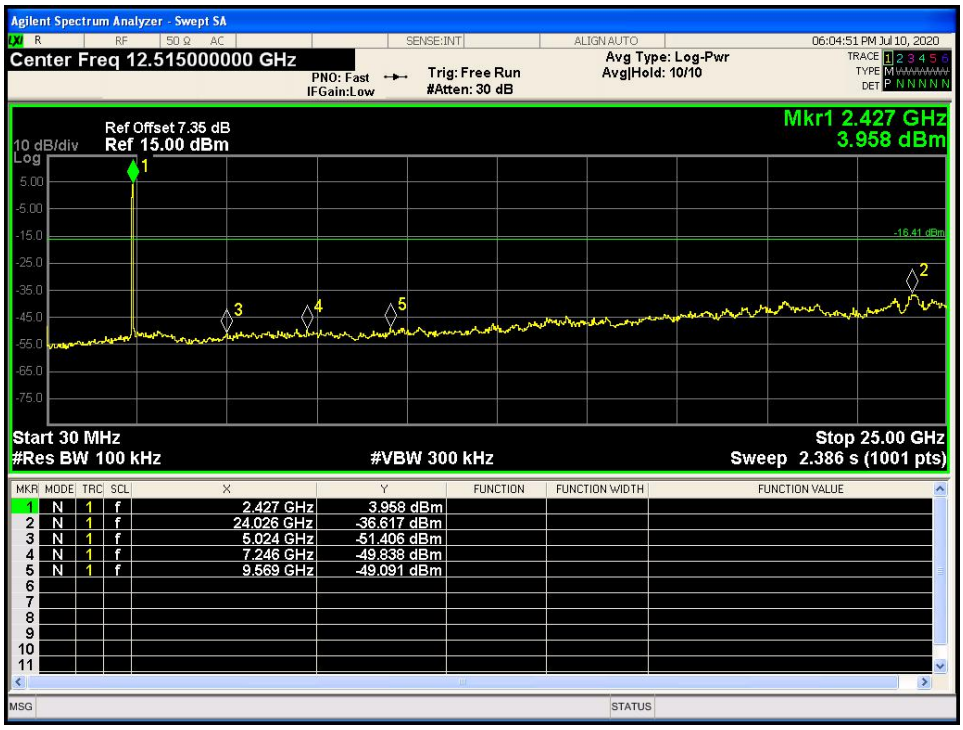


(802.11 g, Band Edge @ Channel = 11 peak power)

(802.11 g, Band Edge @ Channel = 11)



(802.11 HT20, Channel = 1, 30MHz to 25GHz peak power)



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