Shenzhen Chuangwei-RGB Electronics Co., Ltd.

TEST REPORT

SCOPE OF WORK
FCC TESTING–NTUD-T4

REPORT NUMBER
190416023SZN-003

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14 May 2019 [----------]

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TEST REPORT

Intertek Report No.: 190416023SZN-003

Shenzhen Chuangwei-RGB Electronics Co., Ltd.

Application
For
Certification

FCC ID: 2ANM3NTUDT4

WIFI Module

Model: NTUD-T4

Brand Name: Skyworth

2.4GHz Transceiver

Report No.: 190416023SZN-003

We hereby certify that the sample of the above item is considered to comply with the requirements of FCC Part 15, Subpart C for Intentional Radiator, mention 47 CFR [10-1-17]

Prepared and Checked by:

Ryan Chen
Engineer

Approved by:

Kidd Yang
Technical Supervisor
Date: 14 May 2019

LIST OF EXHIBITS

MEASUREMENT/TECHNICAL REPORT

Shenzhen Chuangwei-RGB Electronics Co., Ltd.

Model: NTUD-T4

FCC ID: 2ANM3NTUDT4

This report concerns (check one) Original Grant ___X___ Class II Change ____

Equipment Type: DTS - Part 15 Digital Transmission Systems (Wi-Fi transmitter portion)

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? Yes _____ No ___X___

If yes, defer until : _____
date

Company Name agrees to notify the Commission by: _____
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? Yes _____ No ___X___

If no, assumed Part 15, Subpart C for intentional radiator - the new 47 CFR [10-1-17] Edition] provision.

Report prepared by:

Ryan Chen
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Table of Contents

List of attached file

Exhibit type	File Description	Filename
Test Report	Test Report	report.pdf
Test Setup Photo	Radiated Emission	radiated photos.pdf
Test Setup Photo	Conducted Emission	conducted photos.pdf
External Photo	External Photo	external photos.pdf
Internal Photo	Internal Photo	internal photos.pdf
Block Diagram	Block Diagram	block.pdf
Schematics	Circuit Diagram	circuit.pdf
Operation Description	Technical Description	descri.pdf
ID Label/Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf
Cover Letter	Confidentiality Letter	request.pdf
Cover Letter	Letter of Agency	agency.pdf

EXHIBIT 1

SUMMARY OF TEST RESULTS

1.0 Summary of Test results

WIFI Module

Model: NTUD-T4

FCC ID: 2ANM3NTUDT4

TEST ITEM	REFERENCE	RESULTS
Max. Output power	15.247(b)(3)	Pass
6 dB Bandwidth	15.247(a)(2)	Pass
Max. Power Density	15.247(e)	Pass
Out of Band Antenna Conducted Emission	15.247(d)	Pass
Radiated Emission in Restricted Bands	15.247(d)	Pass
AC Conducted Emission	15.207	Pass
Antenna Requirement	15.203	Pass (See Notes)

Notes: The EUT uses an Integral Antenna which in accordance to Section 15.203 is considered sufficient to comply with the provisions of this section.

EXHIBIT 2

GENERAL DESCRIPTION

2.0 General Description

2.1 Product Description

The Equipment Under Test (EUT) is a WIFI Module with 2 Antennas operating at 2412-2462MHz for 802.11b/g/n-HT20, 11 channels with 5MHz channel spacing and 2422-2452MHz for 802.11n-HT40, 7 channels with 5MHz channel spacing. The EUT can be powered by DC 3.3V. For more detailed features description, please refer to the user's manual.

Antenna Type: Integral antenna
Type of Modulation: BPSK, QPSK, 16QAM, 64QAM, CCK, DQPSK, DBPSK, DSSS, OFDM.
Antenna Gain: 3.4 dBi Max for 2.4G WIFI

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

2.2 Related Submittal(s) Grants

This is an application for certification of DTS- Part 15 Digital Transmission Systems (2.4GHz Wi-Fi transmitter portion).

For the Bluetooth EDR mode was tested and demonstrated in report 190416023SZN-003.

For the Bluetooth BLE mode was tested and demonstrated in report 190416023SZN-002.

For other digital function was tested and demonstrated in report 190416023SZN-004.

2.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.10: 2013 and KDB 558074 D01 v05r02. Radiated emission measurement was performed in semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application. All other measurements were made in accordance with the procedures in part 2 of CFR 47.

2.4 Test Facility

The Semi-Anechoic chamber and shield room used to collect the radiated data and conducted data are **Intertek Testing Services Shenzhen Ltd. Longhua Branch** and located at 101, 201, Building B, No. 308 Wuhe Avenue, Zhangkengjing Community, GuanHu Subdistrict, LongHua District, ShenZhen. This test facility and site measurement data have been fully placed on file with the FCC (Registration Number: CN1188).

EXHIBIT 3

SYSTEM TEST CONFIGURATION

3.0 System Test Configuration

3.1 Justification

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables were manipulated to produce worst case emissions. The EUT was powered by USB port through laptop with 120V/60Hz input during the test, only the worst data was reported in this report.

For maximizing emissions, the EUT was rotated through 360°, the EUT was placed on the styrene turntable with 0.8m up to 1GHz and 1.5 m above 1GHz. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000 MHz. The resolution is 1 MHz or greater for frequencies above 1000 MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

The rear of unit was flushed with the rear of the table.

Radiated emission measurement were performed the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

3.2 EUT Exercising Software

The EUT exercise program (provided by client) used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The worst case configuration is used in all specified testing.

The parameters of test software setting:
During the test, Channel and power controlling software provided by the applicant was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the application and is going to be fixed on the firmware of the end product.

3.3 Special Accessories

N/A.

3.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

Uncertainty and Compliance – Unless the standard specifically states that measured values are to be extended by the measurement uncertainty in determining compliance, all compliance determinations are based on the actual measured value.

3.5 Equipment Modification

Any modifications installed previous to testing by Shenzhen Chuangwei-RGB Electronics Co., Ltd. will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd. Longhua Branch.

3.6 Support Equipment List and Description

This product was tested in the following configuration:

Refer List:

Description	Manufacturer	Model No.
Laptop (Provided by Intertek)	DELL	Latitude 3480
Serial Cable (Provided by Chuangwei)	N/A	Unshielded, Length 15cm
USB Cable (Provided by Intertek)	N/A	Unshielded, Length 1.3m
Hard Disk (Provided by Intertek)	Smart.drive	HD-003
USB Serial Driver (Provided by Chuangwei)	N/A	N/A

EXHIBIT 4

MEASUREMENT RESULTS

Applicant: Shenzhen Chuangwei-RGB Electronics Co., Ltd.
Date of Test: 25 April 2019 Model: NTUD-T4

4.0 Measurement Results

4.1 Maximum Conducted Output Power at Antenna Terminals, FCC Rules 15.247(b)(3):

The antenna power of the EUT was connected to the input of a broadband peak RF power meter. The power meter has a video bandwidth that is greater than DTS bandwidth and utilize a fast-responding diode detector. Power was read directly at the EUT antenna terminals with cable loss added.

For antennas with gains of 6dBi or less, So maximum allowed Transmitter output is 30dBm (1000mW). The 2.4G band Ant gain is: 3.4 dBi. In MIMO (2Tx), Ant1 + Ant2 Directional gain = GANT + 10log(N) dBi = 3.4 + 10log(2) = 6.4dBi > 6dBi, so the Power limit is 30.0dBm (1W) for SISO mode, and 29.6dBm for MIMO mode.

SISO Mode Ant 1:

IEEE 802.11b (Antenna Gain = 3.4dBi) (CCK, 1Mbps)		
Frequency (MHz)	Output in dBm (Peak reading)	Output in mWatt
Low Channel: 2412	16.57	45.4
Middle Channel: 2437	16.81	48.0
High Channel: 2462	17.00	50.1

IEEE 802.11g (Antenna Gain = 3.4dBi) (16QAM, 6Mbps)		
Frequency (MHz)	Output in dBm (Peak reading)	Output in mWatt
Low Channel: 2412	18.42	69.5
Middle Channel: 2437	18.35	68.4
High Channel: 2462	18.12	64.9

IEEE 802.11HT20 (Antenna Gain = 3.4dBi) (16QAM, 6.5Mbps)		
Frequency (MHz)	Output in dBm (Peak reading)	Output in mWatt
Low Channel: 2412	18.37	68.7
Middle Channel: 2437	18.14	65.2
High Channel: 2462	18.34	68.2

IEEE 802.11HT40 (Antenna Gain = 3.4dBi) (64QAM, 13.5Mbps)		
Frequency (MHz)	Output in dBm (Peak reading)	Output in mWatt
Low Channel: 2422	18.45	70.0
Middle Channel: 2437	18.41	69.3
High Channel: 2452	18.67	73.6

SISO Mode Ant 2:

IEEE 802.11b (Antenna Gain = 3.4dBi) (CCK, 1Mbps)		
Frequency (MHz)	Output in dBm (Peak reading)	Output in mWatt
Low Channel: 2412	16.84	48.3
Middle Channel: 2437	16.80	47.9
High Channel: 2462	16.75	47.3

IEEE 802.11g (Antenna Gain = 3.4dBi) (16QAM, 6Mbps)		
Frequency (MHz)	Output in dBm (Peak reading)	Output in mWatt
Low Channel: 2412	18.65	73.3
Middle Channel: 2437	18.53	71.3
High Channel: 2462	18.34	68.2

IEEE 802.11HT20 (Antenna Gain = 3.4dBi) (16QAM, 6.5Mbps)		
Frequency (MHz)	Output in dBm (Peak reading)	Output in mWatt
Low Channel: 2412	18.74	74.8
Middle Channel: 2437	18.64	73.1
High Channel: 2462	18.44	69.8

IEEE 802.11HT40 (Antenna Gain = 3.4dBi) (64QAM, 13.5Mbps)		
Frequency (MHz)	Output in dBm (Peak reading)	Output in mWatt
Low Channel: 2422	18.40	69.2
Middle Channel: 2437	18.17	65.6
High Channel: 2452	18.17	65.6

MIMO Mode

IEEE 802.11n-HT20 (MIMO, Antenna Gain = 6.4dBi) (16QAM, 6.5Mbps)				
Frequency (MHz)	Output in dBm (Peak reading)			Worst Total Output in mWatt
	Ant 1	Ant 2	Total	
Low Channel: 2412	17.14	17.33	20.25	105.9
Middle Channel: 2437	17.02	17.37	20.21	104.9
High Channel: 2462	17.36	17.08	20.24	105.6

IEEE 802.11n-HT40 (MIMO, Antenna Gain = 6.4dBi) (64QAM, 13.5Mbps)				
Frequency (MHz)	Output in dBm (Peak reading)			Worst Total Output in mWatt
	Ant 1	Ant 2	Total	
Low Channel: 2422	17.71	17.91	20.82	120.8
Middle Channel: 2437	17.67	17.88	20.79	119.9
High Channel: 2452	17.11	17.13	20.13	103.0

Cable loss: 0.5 dB External Attenuation: 0 dB
Cable loss, external attenuation has been included in OFFSET function

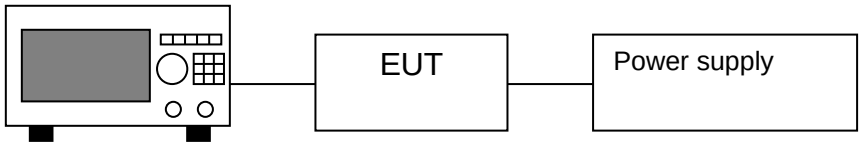
EUT max. output level = 20.82dBm
EUT max. radiated output level = 20.82dBm + 6.4dBi = 27.22dBm
For RF Exposure, the information is saved with filename: RF exposure.pdf.

Applicant: Shenzhen Chuangwei-RGB Electronics Co., Ltd.
Date of Test: 25 April 2019 Model: NTUD-T4

4.2 Minimum 6 dB RF Bandwidth, FCC Rule 15.247(a) (2):

The antenna port of the EUT was connected to the input of a spectrum analyzer. Analyzer RES BW was set to 100 KHz according to FCC KDB 558074 D01 v05r02. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6dB bandwidth was determined from where the channel output spectrum intersected the display line.

Block Diagram:



Spectrum Analyzer

Limit: The 6 dB Bandwidth is at least 500 kHz.

SISO Mode, Ant1:

IEEE 802.11b (CCK, 1Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	8.51
2437	8.99
2462	9.51

IEEE 802.11g (16QAM, 6Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	15.67
2437	15.76
2462	15.11

IEEE 802.11n-HT20 (16QAM, 6.5Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	16.87
2437	16.93
2462	15.11

IEEE 802.11n-HT40 (64QAM, 13.5Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2422	35.17
2437	35.17
2452	35.17

SISO Mode, Ant2:

IEEE 802.11b (CCK, 1Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	9.03
2437	9.07
2462	9.07

IEEE 802.11g (16QAM, 6Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	15.11
2437	15.11
2462	15.11

IEEE 802.11n-HT20 (16QAM, 6.5Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	15.41
2437	15.41
2462	15.41

IEEE 802.11n-HT40 (64QAM, 13.5Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2422	35.17
2437	35.17
2452	35.17

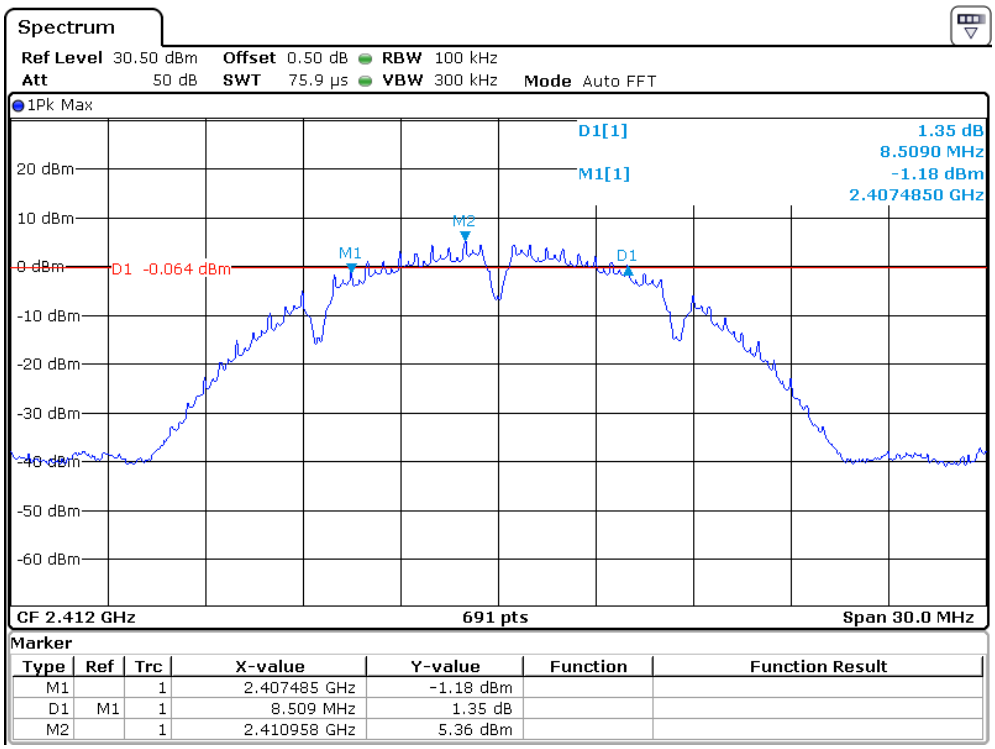
MIMO Mode:

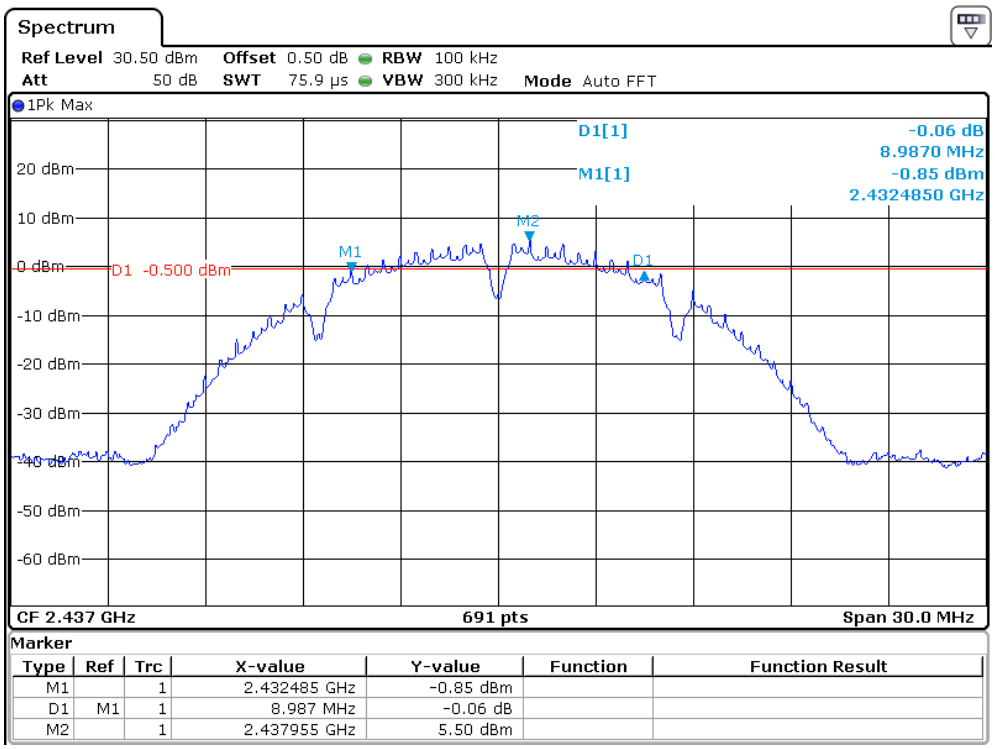
IEEE 802.11n-HT20 (16QAM, 6.5Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	15.11
2437	15.11
2462	15.11

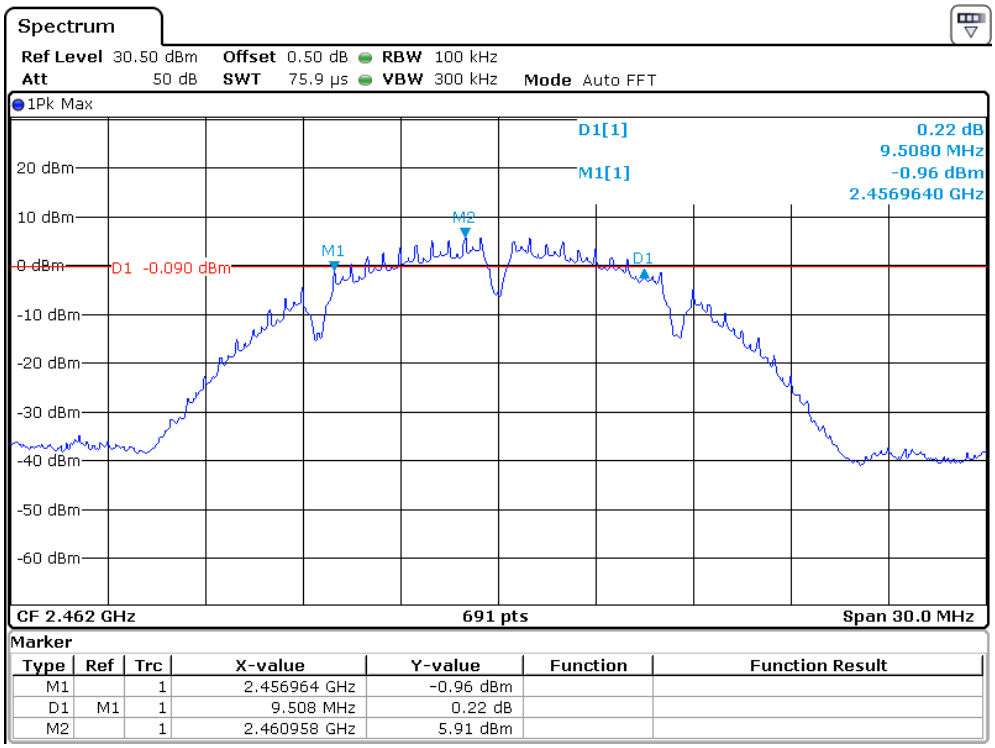
IEEE 802.11n-HT40 (64QAM, 13.5Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2422	35.17
2437	35.17
2452	35.17

The test plots are attached as below.

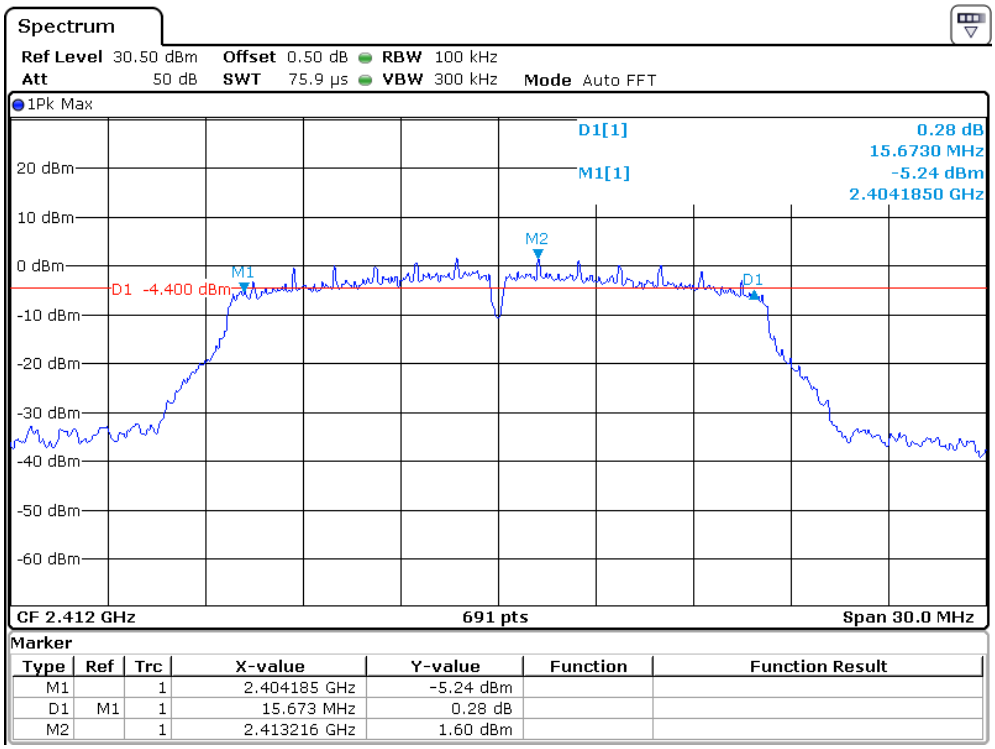
SISO Mode, Ant1:
802.11b

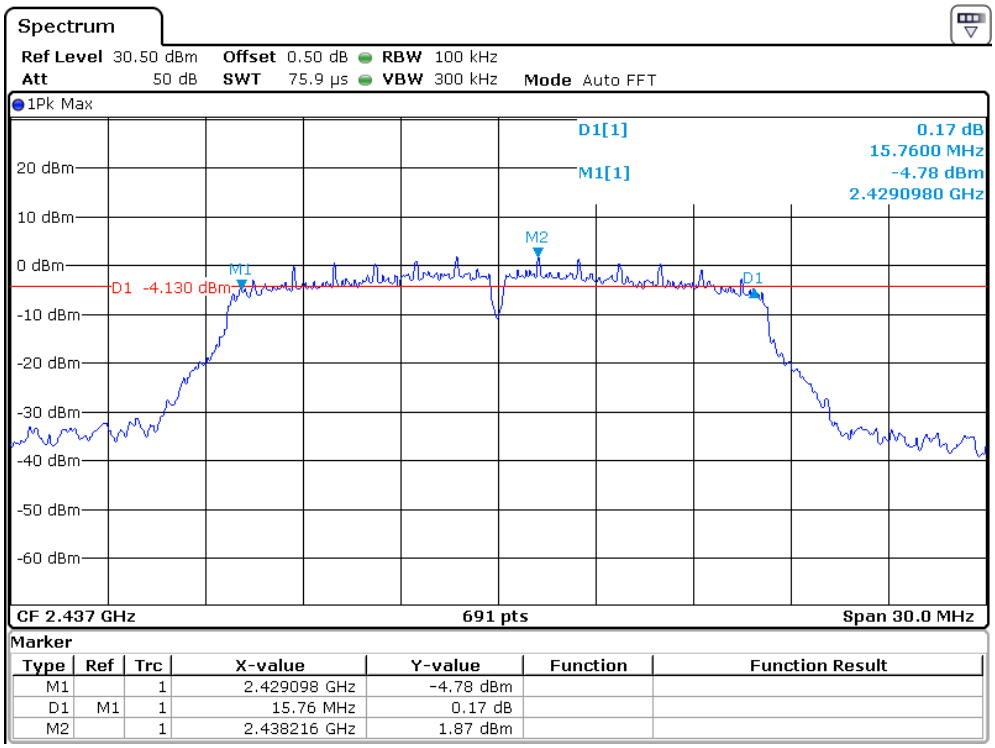




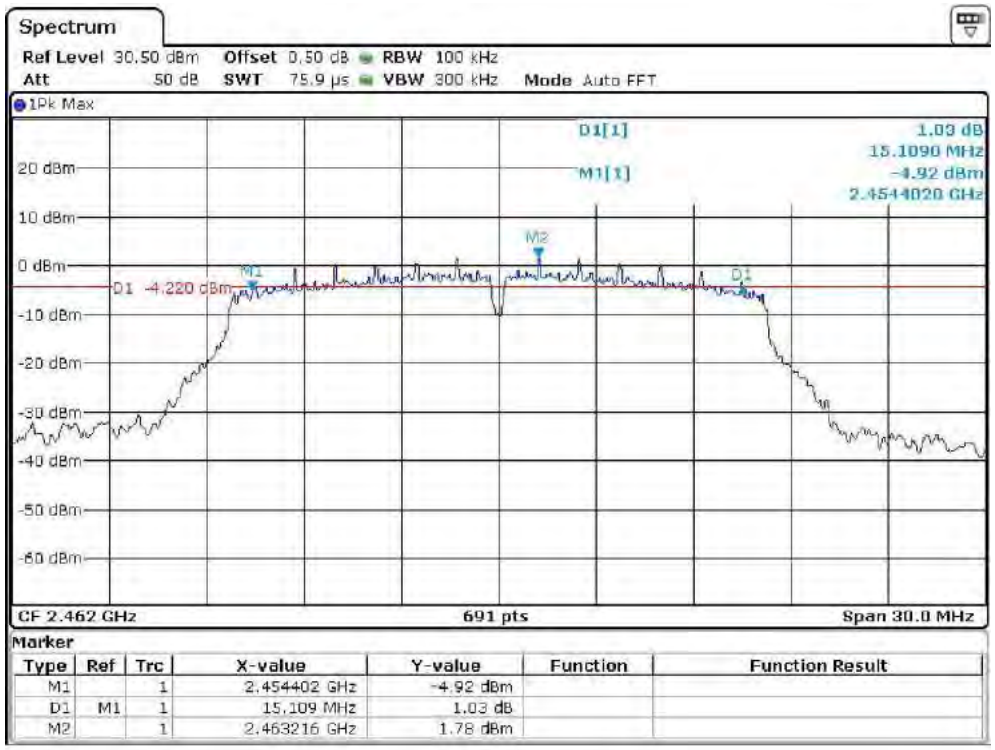

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 75.9 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] 0.22 dB
9.5080 MHz
M1[1] -0.96 dBm
2.4569640 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
D1 -0.090 dBm
M1
M2
D1
CF 2.462 GHz
691 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.456964 GHz -0.96 dBm
D1 M1 1 9.508 MHz 0.22 dB
M2 1 2.460958 GHz 5.91 dBm

802.11g


Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 75.9 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] 0.28 dB
15.6730 MHz
M1[1] -5.24 dBm
2.4041850 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
D1 -4.400 dBm
M1
M2
D1
CF 2.412 GHz
691 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.404185 GHz -5.24 dBm
D1 M1 1 15.673 MHz 0.28 dB
M2 1 2.413216 GHz 1.60 dBm

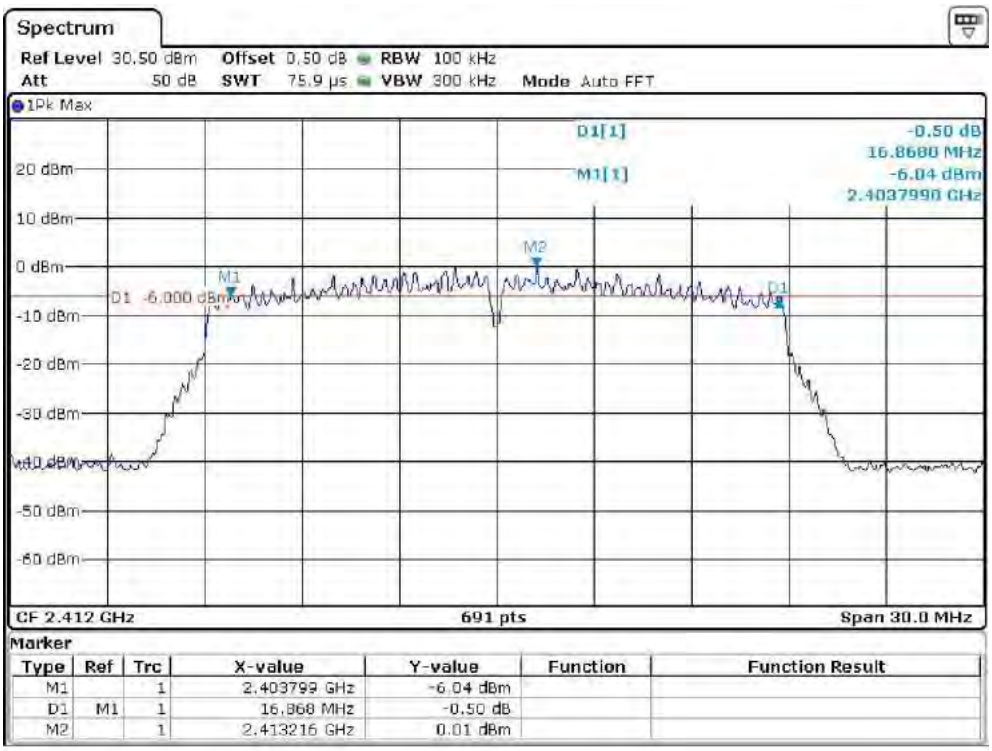


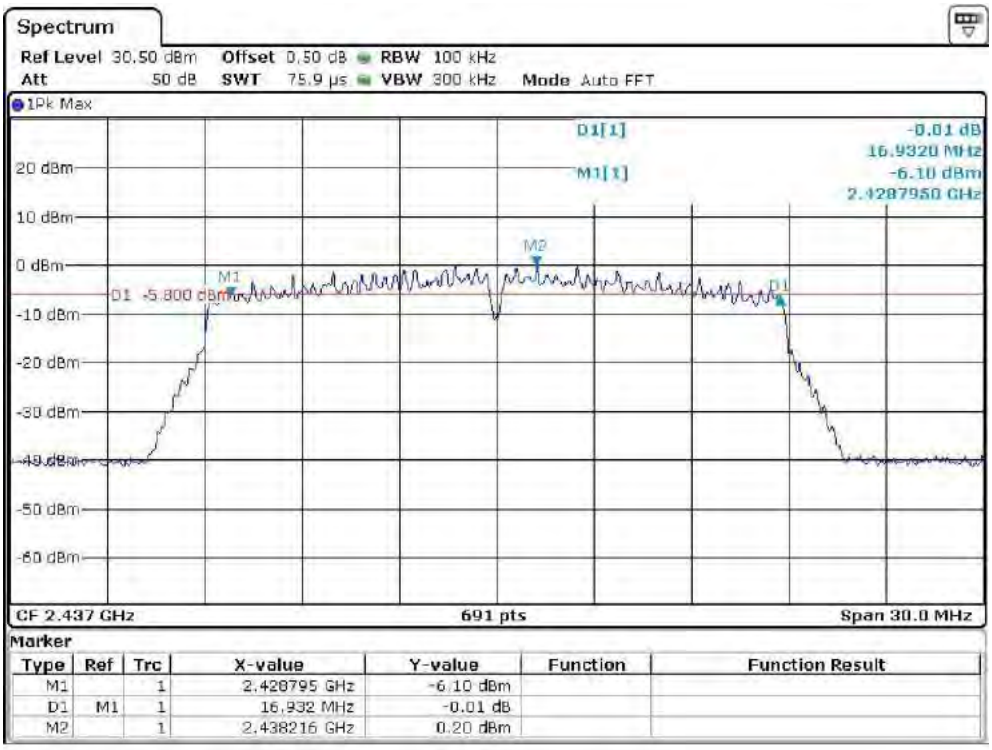
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.429098 GHz	-4.78 dBm		
D1	M1	1	15.76 MHz	0.17 dB		
M2		1	2.438216 GHz	1.87 dBm		

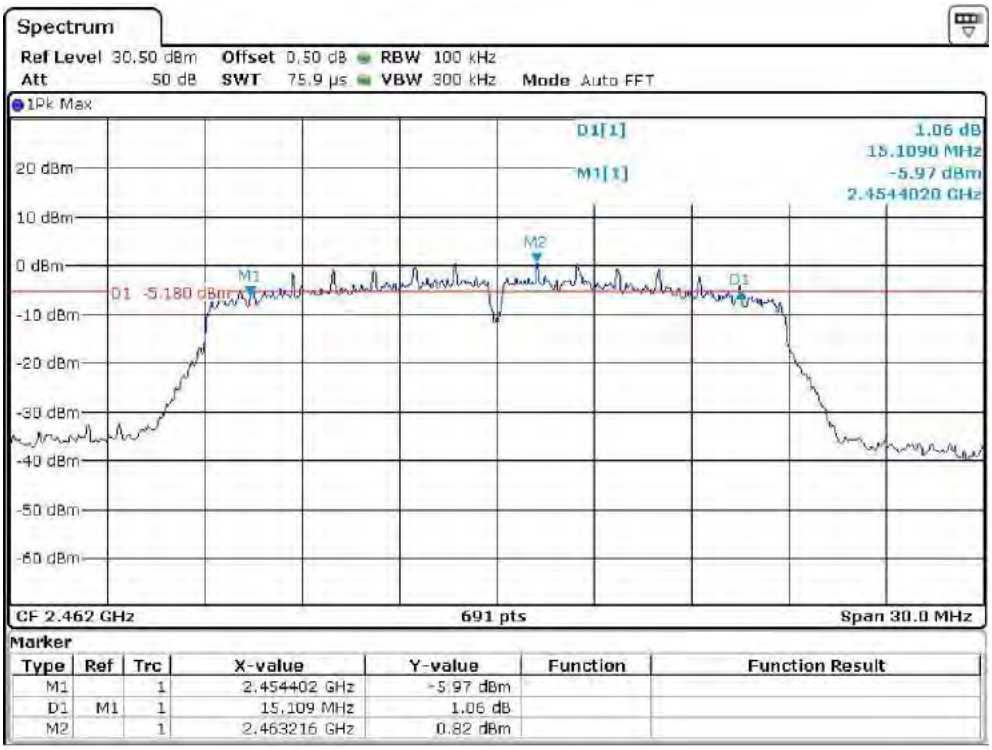


Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.454402 GHz	-4.92 dBm		
D1	M1	1	15.109 MHz	1.03 dB		
M2		1	2.463216 GHz	1.78 dBm		

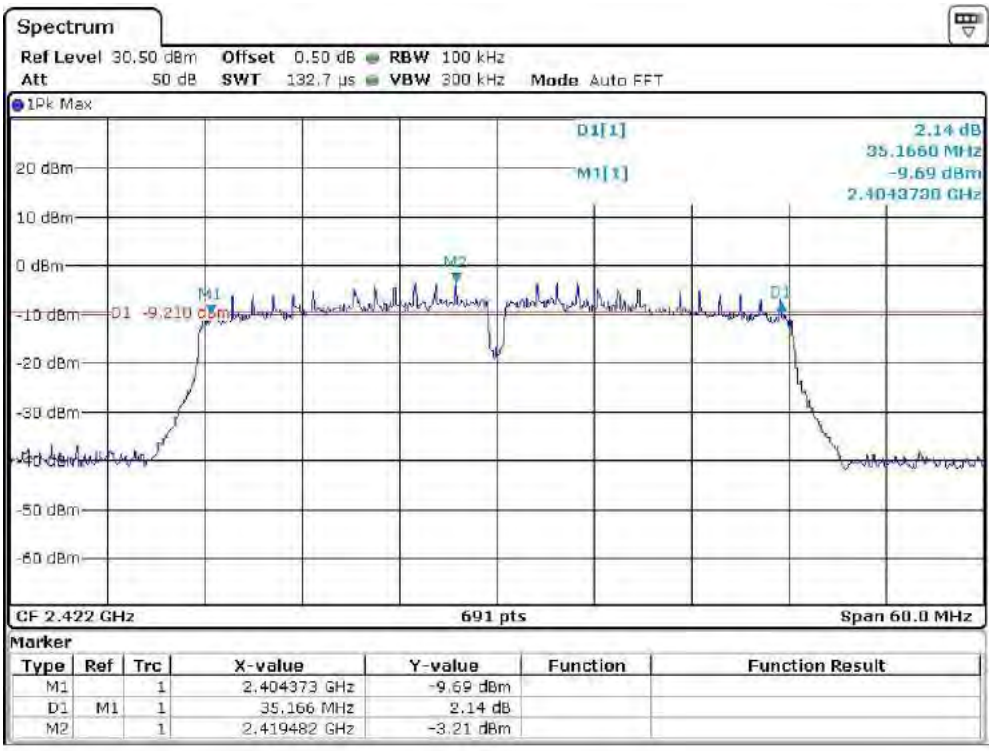
802.11n-HT20

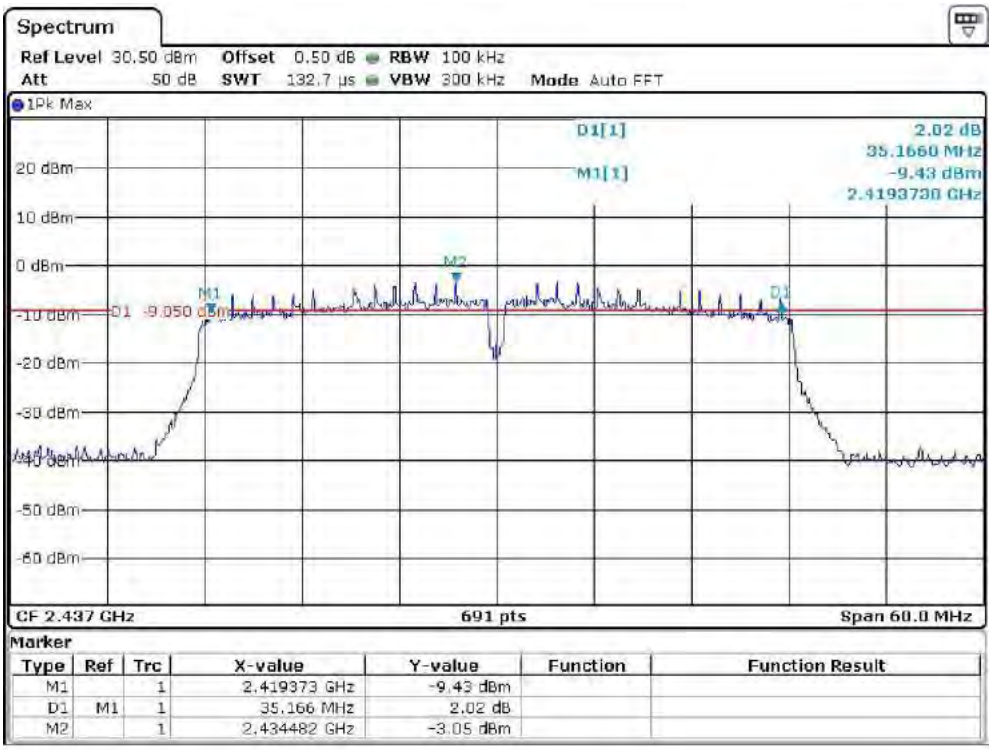

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 75.9 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] -0.50 dB
16.8680 MHz
M1[1] -6.04 dBm
2.4037990 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
D1 -6.000 dBm
M1
M2
D1
CF 2.412 GHz
691 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.403799 GHz -6.04 dBm
D1 M1 1 16.868 MHz -0.50 dB
M2 1 2.413216 GHz 0.01 dBm

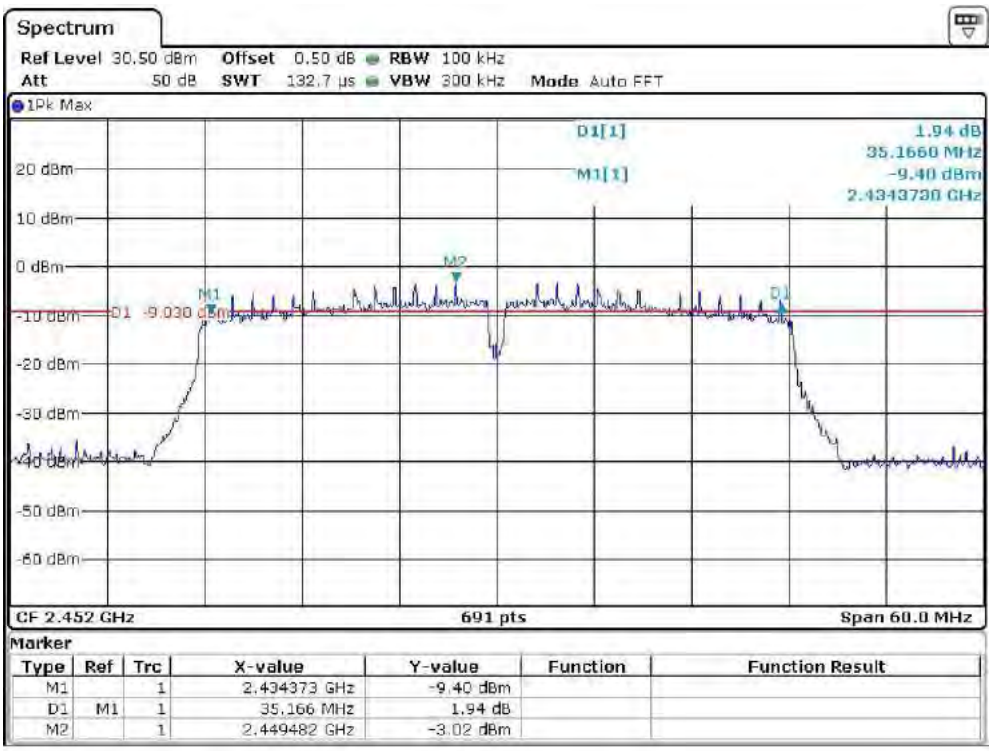

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 75.9 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] -0.01 dB
16.9320 MHz
M1[1] -6.10 dBm
2.4287950 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
D1 -5.800 dBm
M1
M2
D1
CF 2.437 GHz
691 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.428795 GHz -6.10 dBm
D1 M1 1 16.932 MHz -0.01 dB
M2 1 2.438216 GHz 0.20 dBm


Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 75.9 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] 1.06 dB
15.1090 MHz
M1[1] -5.97 dBm
2.4544020 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
D1 -5.180 dBm
M1
M2
D1
CF 2.462 GHz
691 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.454402 GHz -5.97 dBm
D1 M1 1 15.109 MHz 1.06 dB
M2 1 2.463216 GHz 0.82 dBm

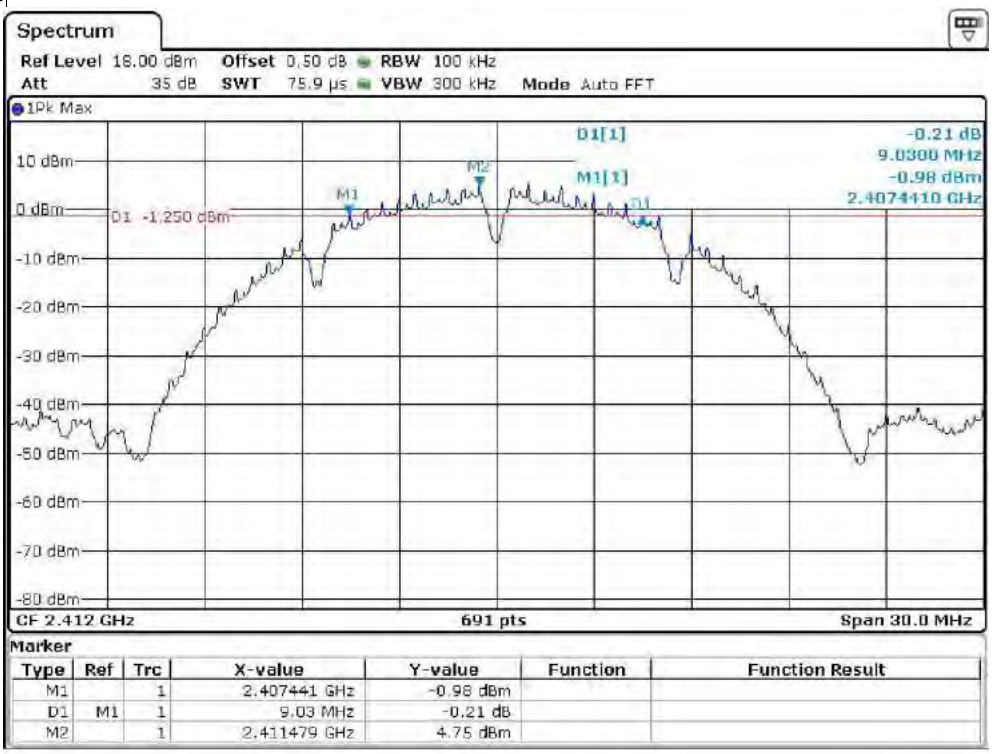
802.11n-HT40

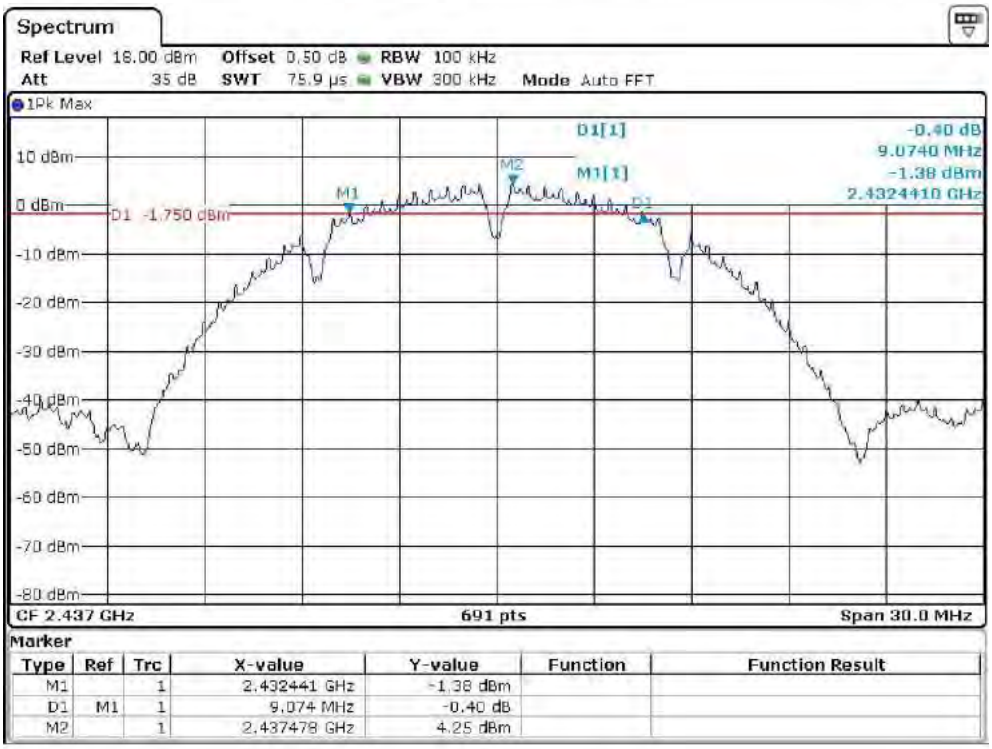

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 132.7 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] 2.14 dB
35.1660 MHz
M1[1] -9.69 dBm
2.4043730 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
D1 -9.210 dBm
M1
M2
D1
CF 2.422 GHz
691 pts
Span 60.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.404373 GHz -9.69 dBm
D1 M1 1 35.166 MHz 2.14 dB
M2 1 2.419482 GHz -3.21 dBm

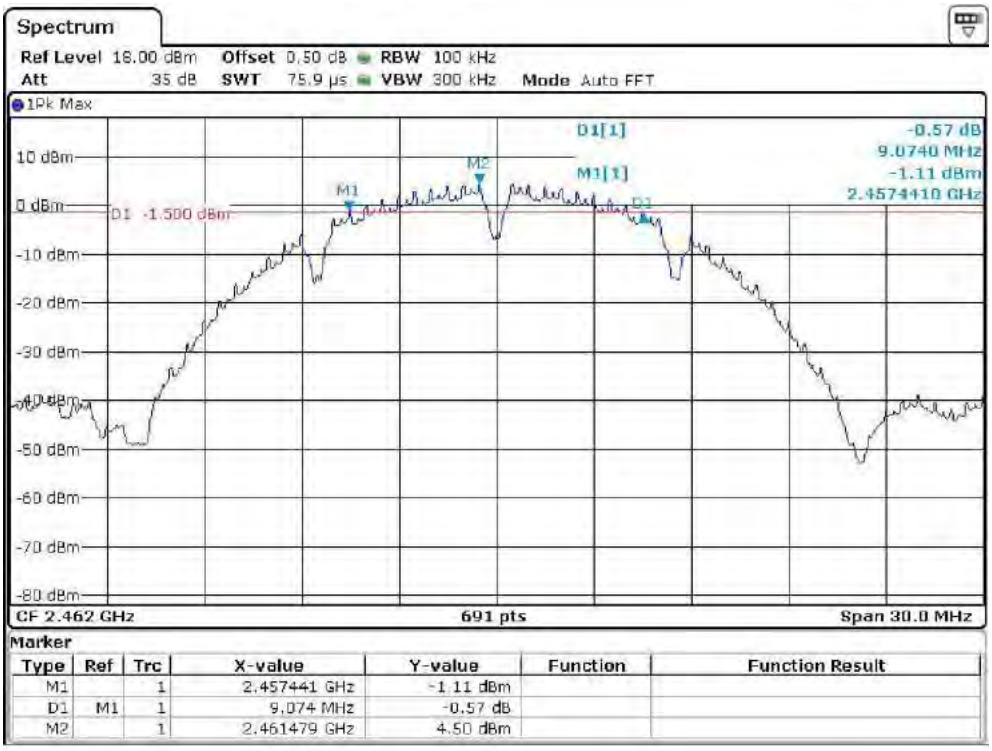

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 132.7 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] 2.02 dB
35.1660 MHz
M1[1] -9.43 dBm
2.4193730 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
D1 -9.050 dBm
CF 2.437 GHz
691 pts
Span 60.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.419373 GHz -9.43 dBm
D1 M1 1 35.166 MHz 2.02 dB
M2 1 2.434482 GHz -3.05 dBm


Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 132.7 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] 1.94 dB
35.1660 MHz
M1[1] -9.40 dBm
2.4343730 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
D1 -9.030 dBm
CF 2.452 GHz
691 pts
Span 60.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.434373 GHz -9.40 dBm
D1 M1 1 35.166 MHz 1.94 dB
M2 1 2.449482 GHz -3.02 dBm

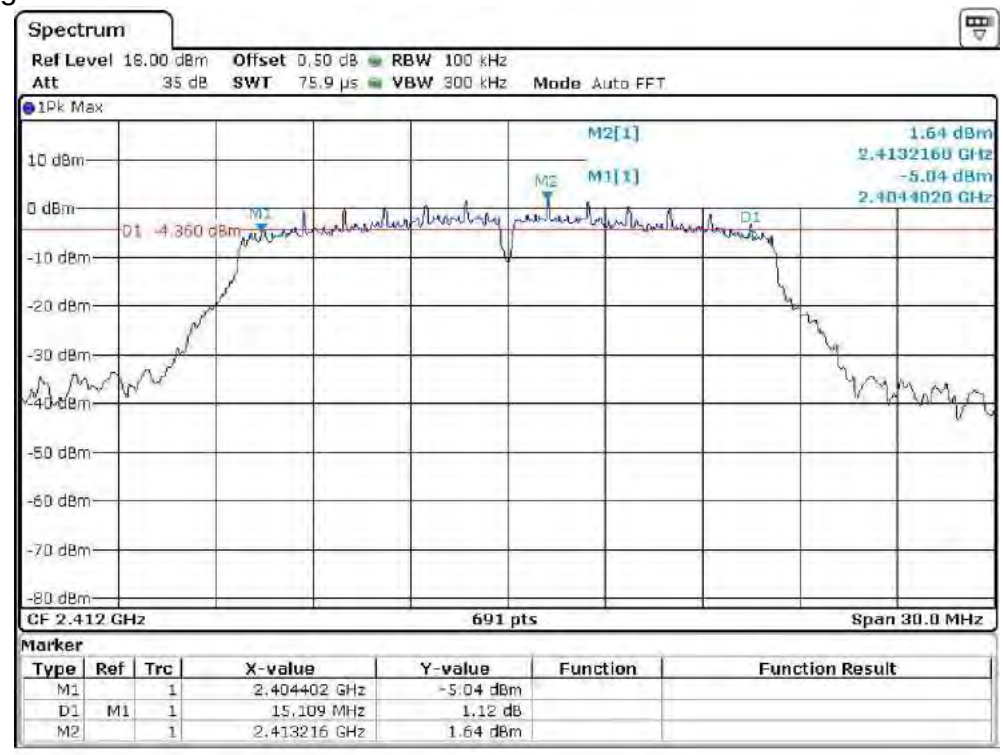
SISO Mode, Ant2:
802.11b

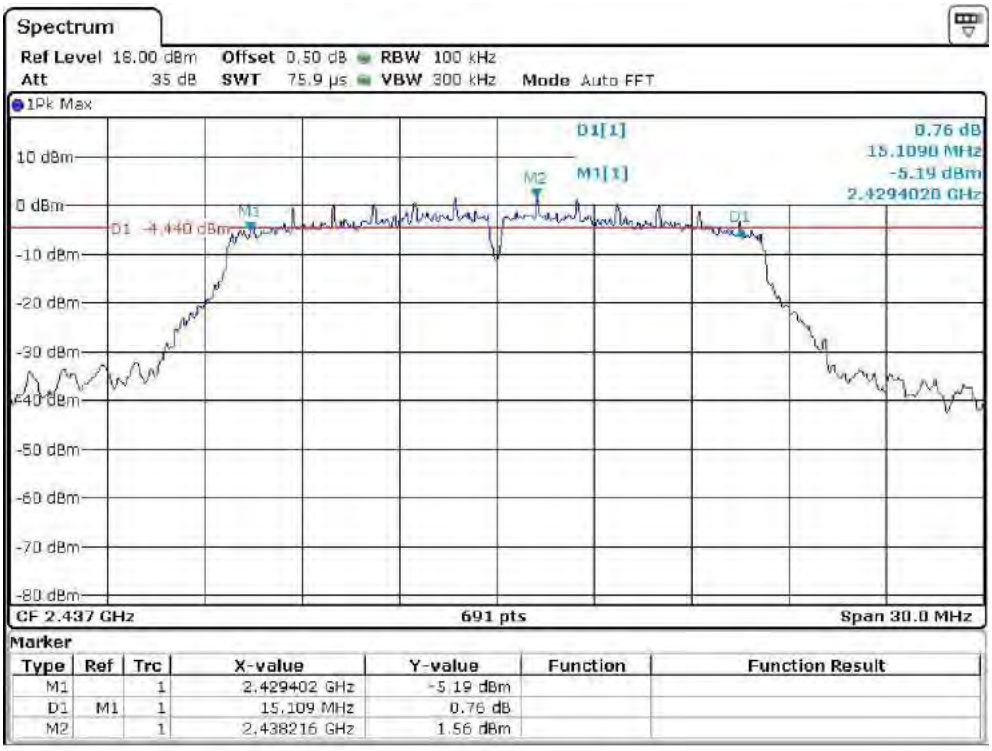


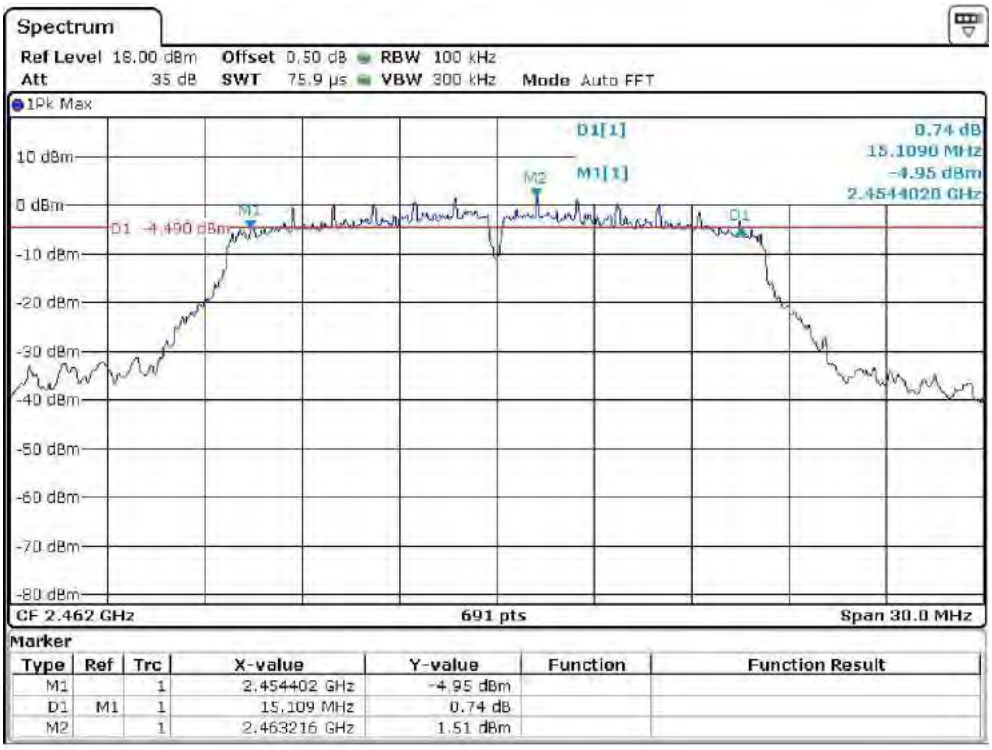



Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 75.9 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] -0.57 dB
9.0740 MHz
M1[1] -1.11 dBm
2.4574410 GHz
D1 -1.500 dBm
CF 2.462 GHz
691 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.457441 GHz -1.11 dBm
D1 M1 1 9.074 MHz -0.57 dB
M2 1 2.461479 GHz 4.50 dBm

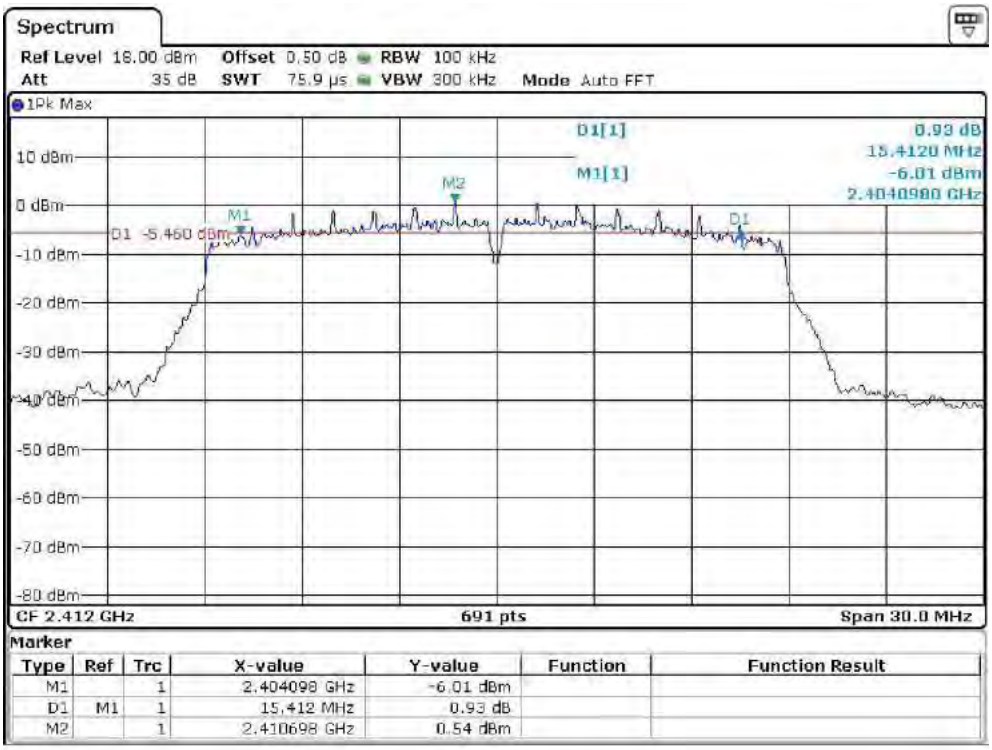
802.11g

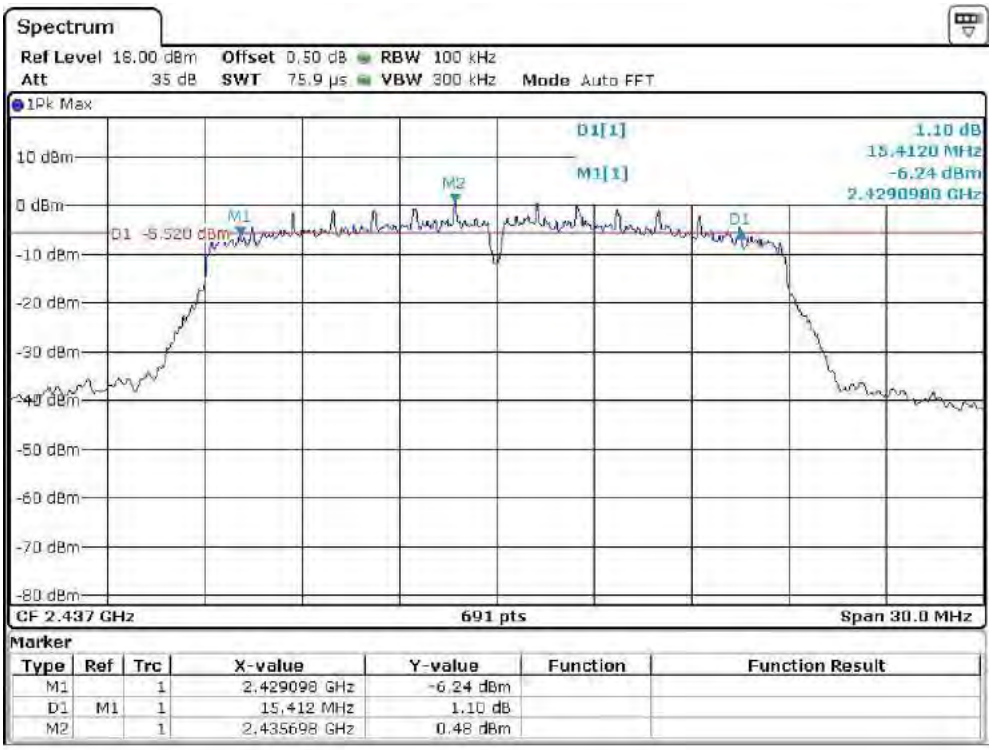

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 75.9 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M2[1] 1.64 dBm
2.4132160 GHz
M1[1] -5.04 dBm
2.4044020 GHz
D1 -4.360 dBm
CF 2.412 GHz
691 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.404402 GHz -5.04 dBm
D1 M1 1 15.109 MHz 1.12 dB
M2 1 2.413216 GHz 1.64 dBm

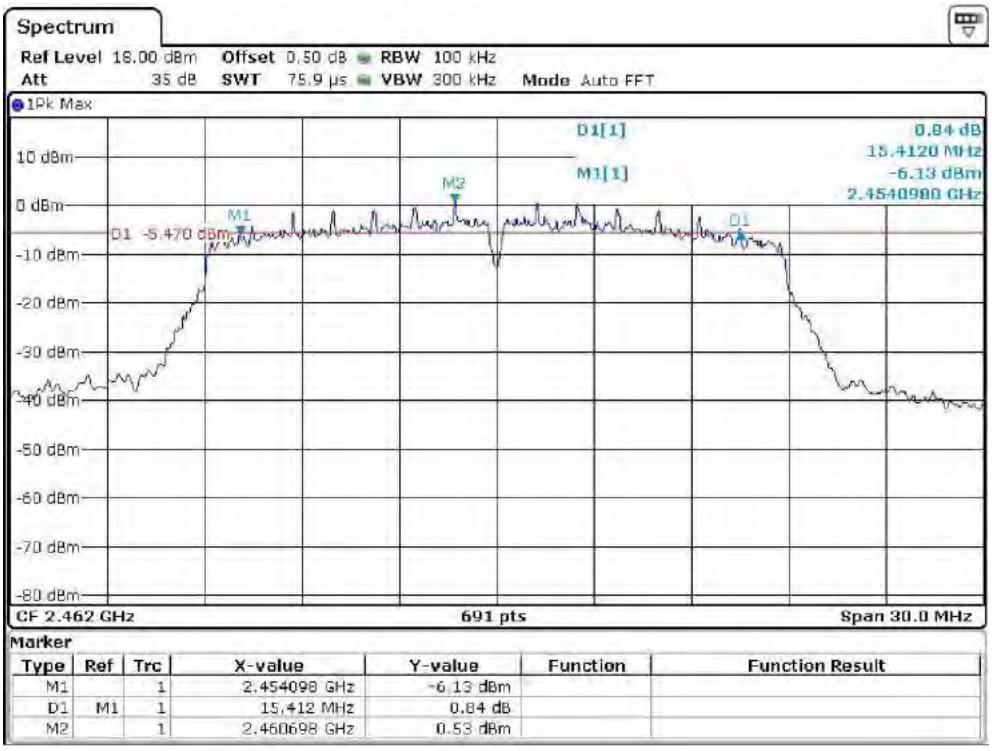

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 75.9 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] 0.76 dB
15.1090 MHz
M1[1] -5.19 dBm
2.4294020 GHz
D1 -4.440 dBm
CF 2.437 GHz
691 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.429402 GHz -5.19 dBm
D1 M1 1 15.109 MHz 0.76 dB
M2 1 2.438216 GHz 1.56 dBm


Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 75.9 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] 0.74 dB
15.1090 MHz
M1[1] -4.95 dBm
2.4544020 GHz
D1 -4.490 dBm
CF 2.462 GHz
691 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.454402 GHz -4.95 dBm
D1 M1 1 15.109 MHz 0.74 dB
M2 1 2.463216 GHz 1.51 dBm

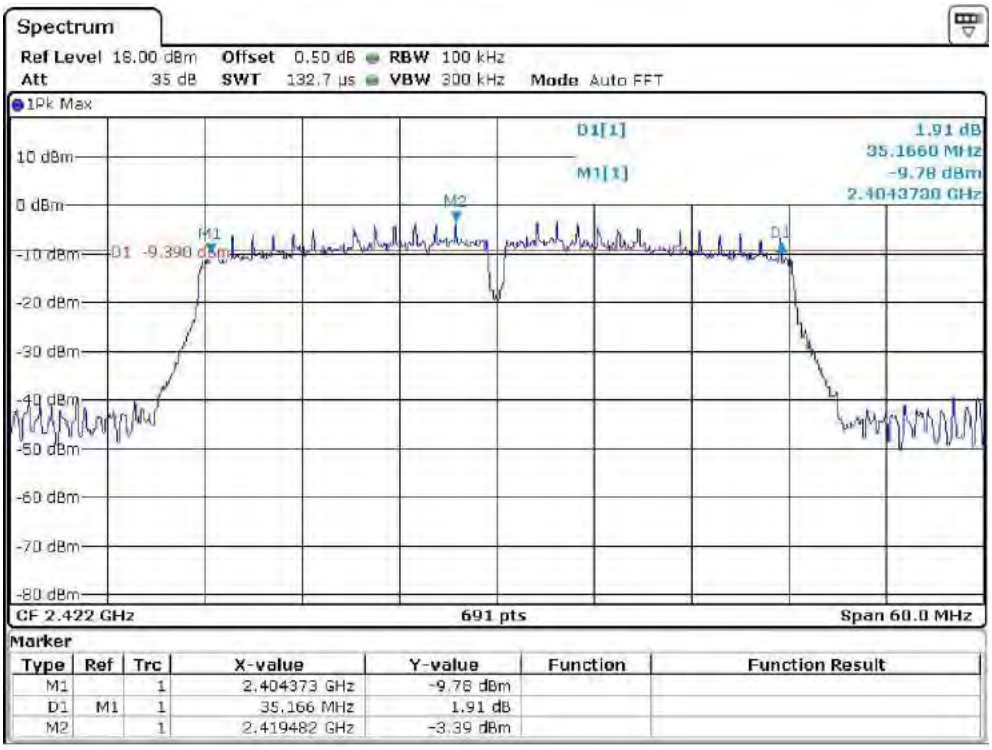
802.11n HT20

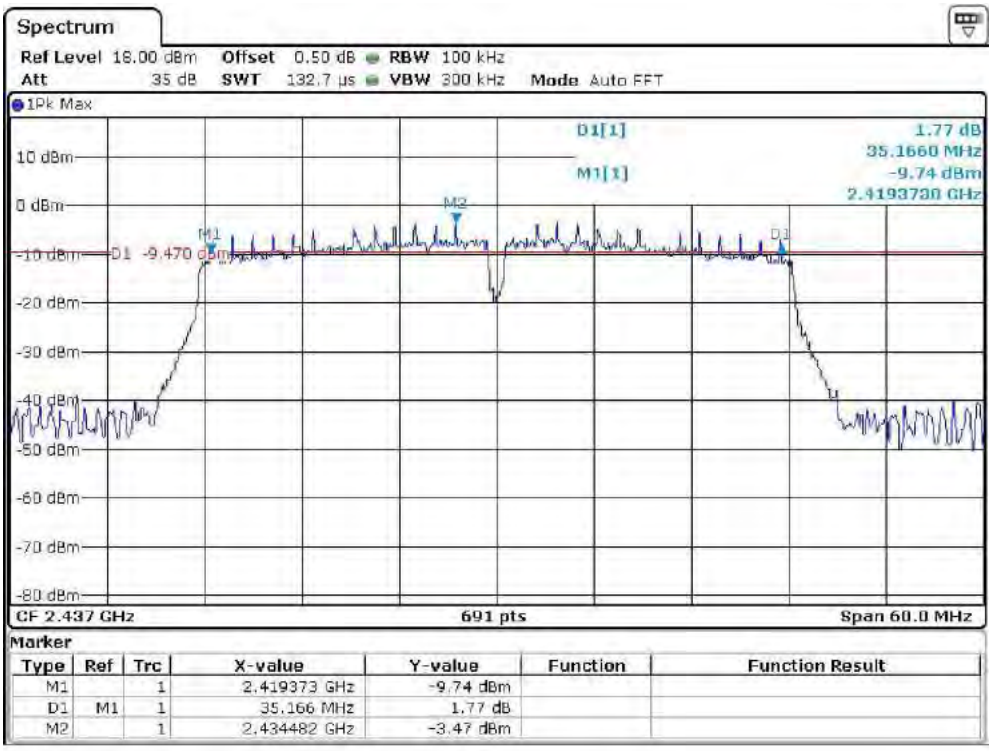

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 75.9 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] 0.93 dB
15.4120 MHz
M1[1] -6.01 dBm
2.4040980 GHz
D1 -5.460 dBm
CF 2.412 GHz
691 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.404098 GHz -6.01 dBm
D1 M1 1 15.412 MHz 0.93 dB
M2 1 2.410698 GHz 0.54 dBm

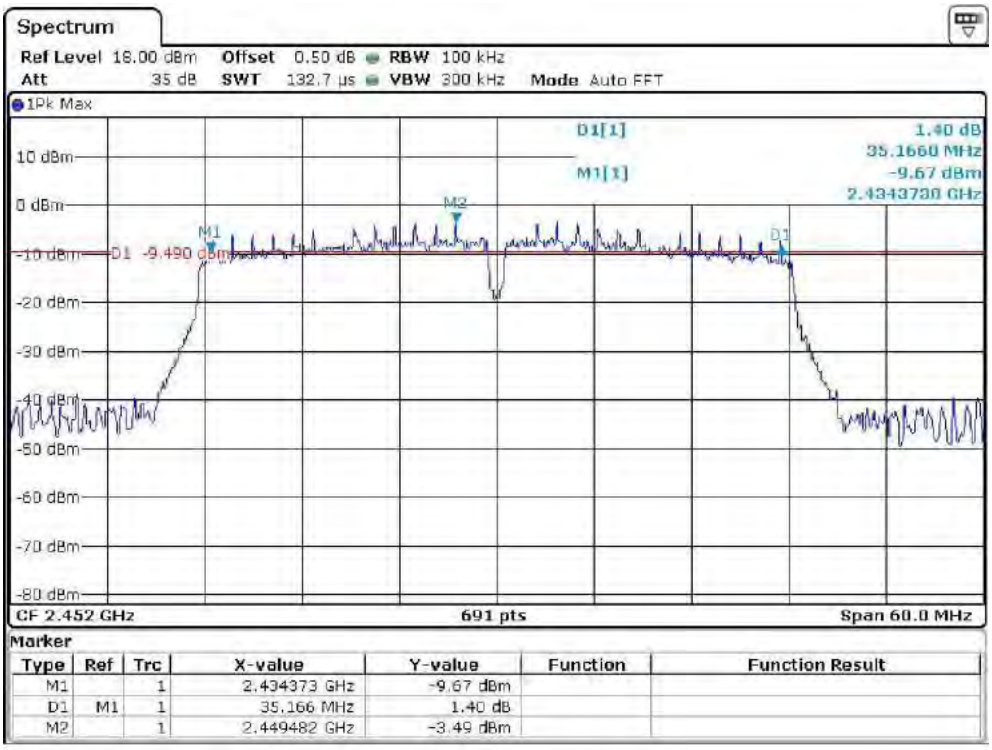

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 75.9 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] 1.10 dB
15.4120 MHz
M1[1] -6.24 dBm
2.4290980 GHz
D1 -5.520 dBm
CF 2.437 GHz
691 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.429098 GHz -6.24 dBm
D1 M1 1 15.412 MHz 1.10 dB
M2 1 2.435698 GHz 0.48 dBm


Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 75.9 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] 0.84 dB
15.4120 MHz
M1[1] -6.13 dBm
2.4540980 GHz
D1 -5.470 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 2.462 GHz
691 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.454098 GHz -6.13 dBm
D1 M1 1 15.412 MHz 0.84 dB
M2 1 2.460698 GHz 0.53 dBm

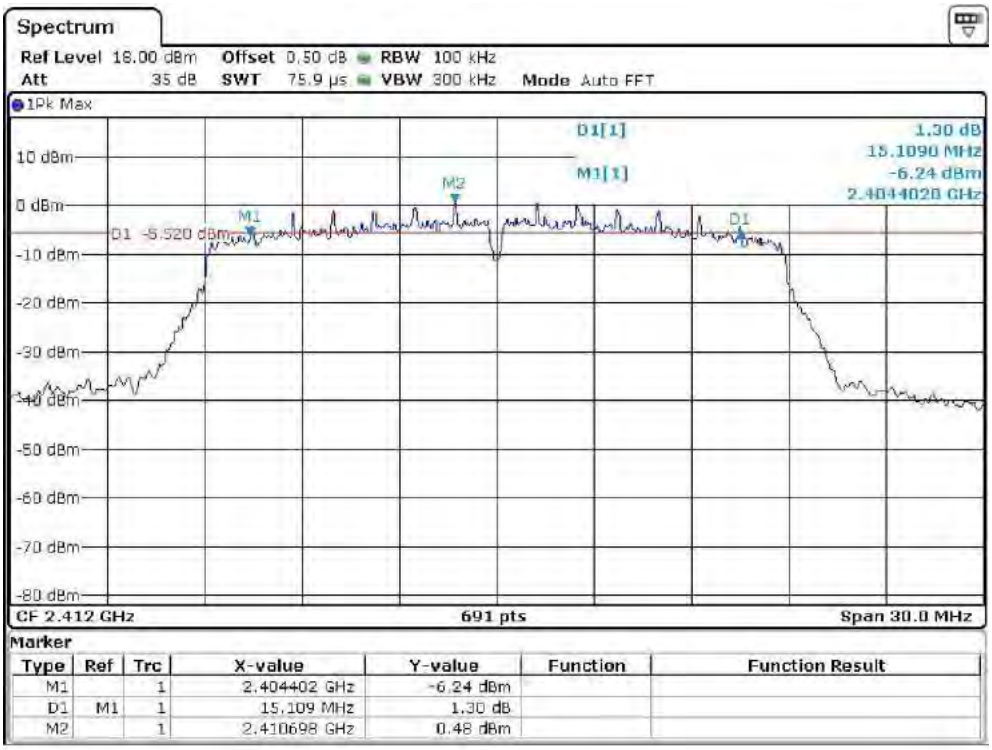
802.11n HT40

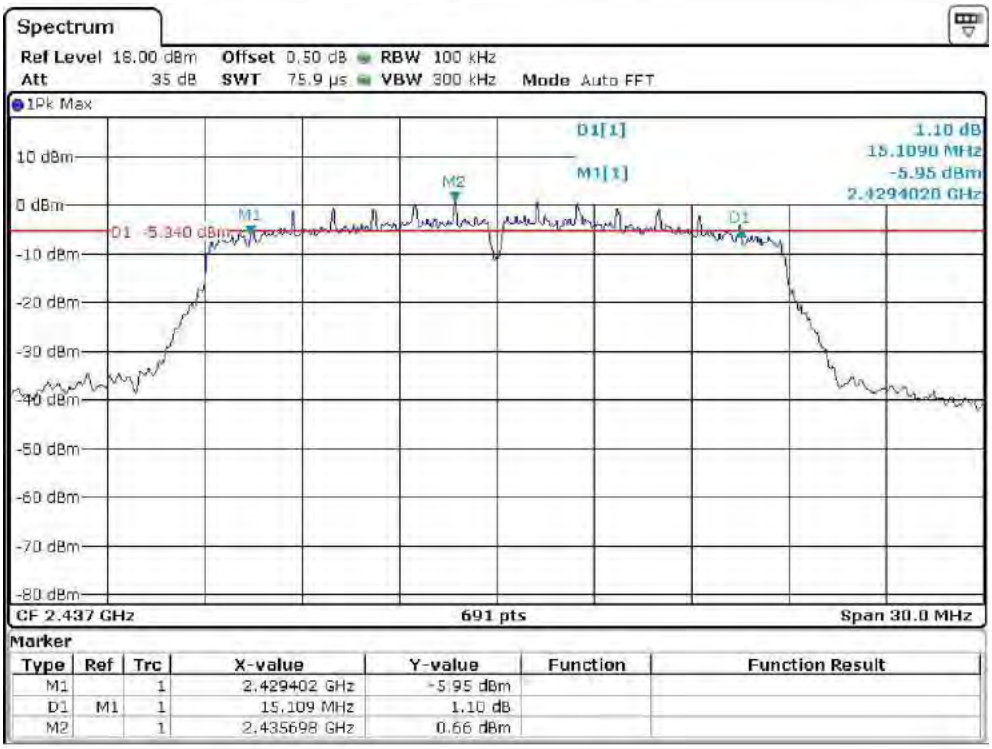

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 132.7 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] 1.91 dB
35.1660 MHz
M1[1] -9.78 dBm
2.4043730 GHz
D1 -9.390 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 2.422 GHz
691 pts
Span 60.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.404373 GHz -9.78 dBm
D1 M1 1 35.166 MHz 1.91 dB
M2 1 2.419482 GHz -3.39 dBm

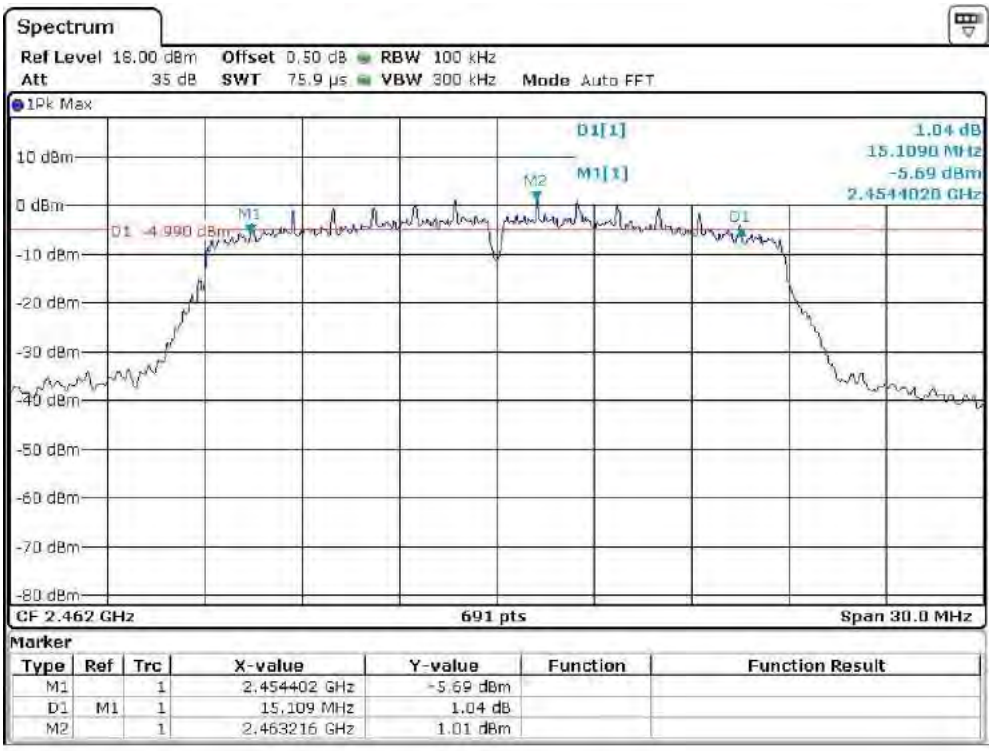

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 132.7 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] 1.77 dB
35.1660 MHz
M1[1] -9.74 dBm
2.4193730 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
D1 -9.470 dBm
M1
M2
D1
CF 2.437 GHz
691 pts
Span 60.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.419373 GHz -9.74 dBm
D1 M1 1 35.166 MHz 1.77 dB
M2 1 2.434482 GHz -3.47 dBm


Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 132.7 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] 1.40 dB
35.1660 MHz
M1[1] -9.67 dBm
2.4343730 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
D1 -9.490 dBm
M1
M2
D1
CF 2.452 GHz
691 pts
Span 60.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.434373 GHz -9.67 dBm
D1 M1 1 35.166 MHz 1.40 dB
M2 1 2.449482 GHz -3.49 dBm

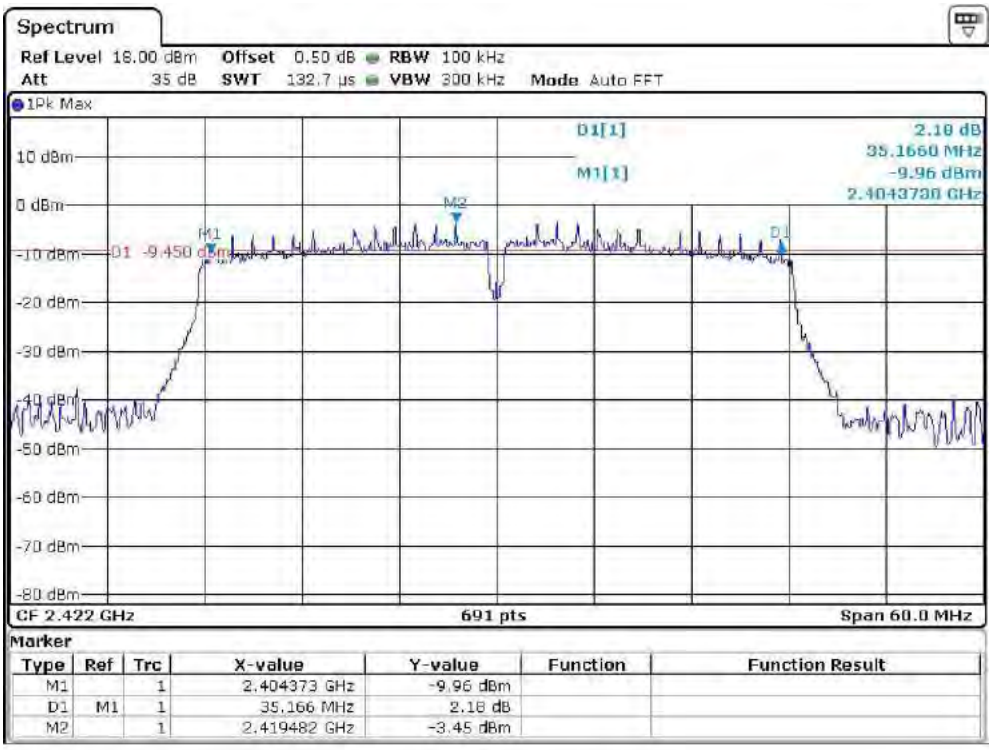
MIMO Mode
802.11n-HT20

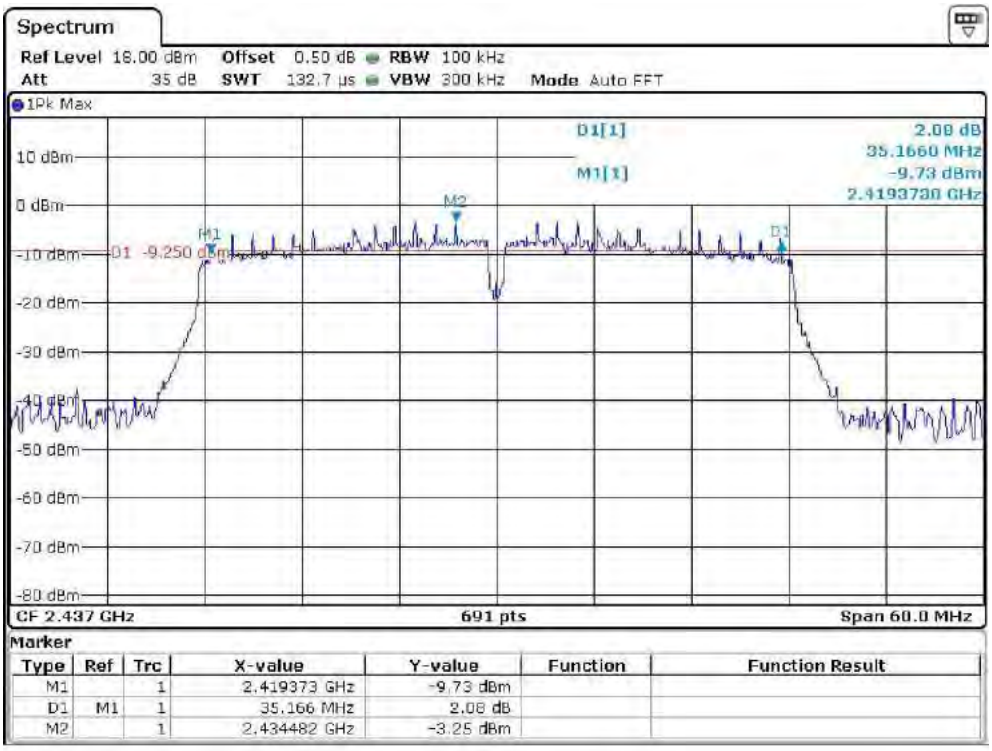


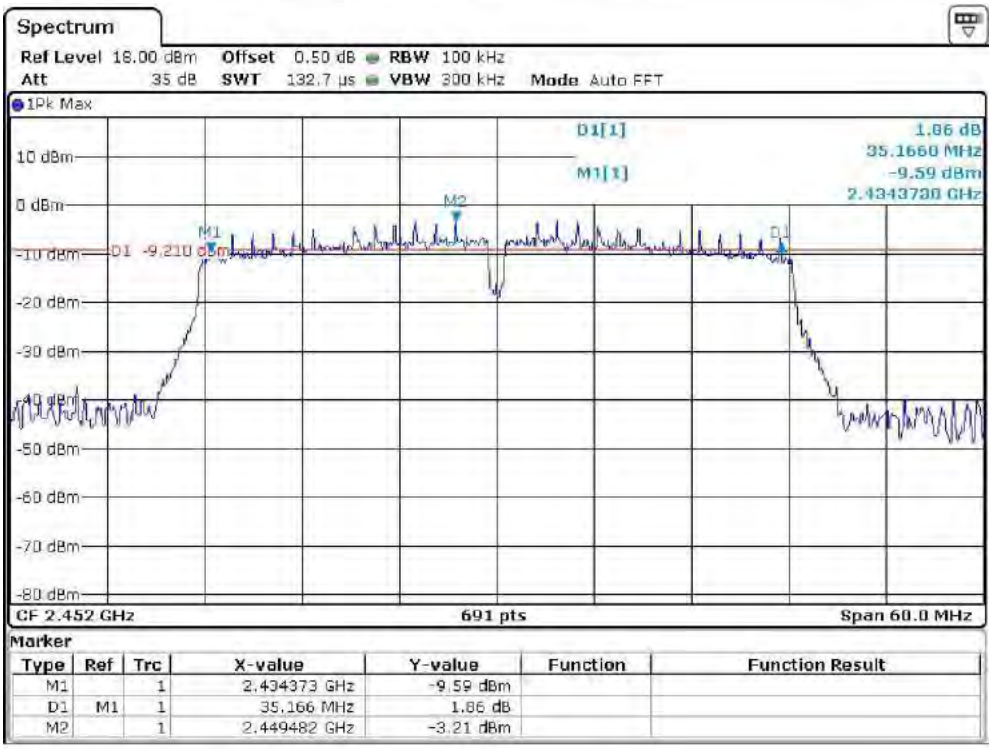



Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 75.9 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] 1.04 dB
15.1090 MHz
M1[1] -5.69 dBm
2.4544020 GHz
D1 -4.990 dBm
CF 2.462 GHz
691 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.454402 GHz -5.69 dBm
D1 M1 1 15.109 MHz 1.04 dB
M2 1 2.463216 GHz 1.01 dBm

802.11n-HT40


Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 132.7 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] 2.18 dB
35.1660 MHz
M1[1] -9.96 dBm
2.4043730 GHz
D1 -9.450 dBm
CF 2.422 GHz
691 pts
Span 60.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.404373 GHz -9.96 dBm
D1 M1 1 35.166 MHz 2.18 dB
M2 1 2.419482 GHz -3.45 dBm


Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 132.7 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] 2.08 dB
35.1660 MHz
M1[1] -9.73 dBm
2.4193730 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
M1
D1 -9.250 dBm
M2
D1
CF 2.437 GHz
691 pts
Span 60.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.419373 GHz -9.73 dBm
D1 M1 1 35.166 MHz 2.08 dB
M2 1 2.434482 GHz -3.25 dBm


Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 132.7 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] 1.86 dB
35.1660 MHz
M1[1] -9.59 dBm
2.4343730 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
M1
D1 -9.210 dBm
M2
D1
CF 2.452 GHz
691 pts
Span 60.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.434373 GHz -9.59 dBm
D1 M1 1 35.166 MHz 1.86 dB
M2 1 2.449482 GHz -3.21 dBm

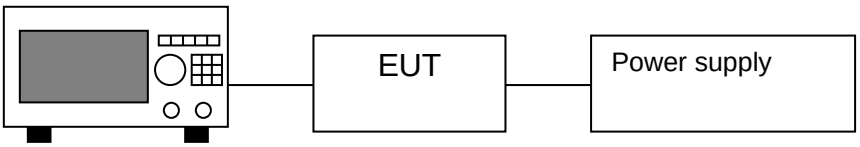
Applicant: Shenzhen Chuangwei-RGB Electronics Co., Ltd.
Date of Test: 25 April 2019 Model: NTUD-T4

4.3 Maximum Power Density Reading, FCC Rule 15.247(e):

The Measurement Procedure PK PSD was set according to the FCC KDB 558074 D01 v05r02.

Antenna output of the EUT was coupled directly to spectrum analyzer; if an external attenuator and/or cable was used, these losses are compensated for with the analyzer OFFSET function.

Block Diagram:



Spectrum Analyzer

The limit of Power Density is 8dBm/3 kHz.

SISO Mode, Ant1：

IEEE 802.11b (CCK, 1Mbps)	
Frequency (MHz)	Power Density with RBW 3KHz
2412	3.24
2437	3.89
2462	3.96

IEEE 802.11g (16QAM, 6Mbps)	
Frequency (MHz)	Power Density with RBW 3KHz
2412	-11.99
2437	-11.80
2462	-12.44

IEEE 802.11n-HT20 (16QAM, 6.5Mbps)	
Frequency (MHz)	Power Density with RBW 3KHz
2412	-14.18
2437	-13.87
2462	-12.34

IEEE 802.11n-HT40 (64QAM, 13.5Mbps)	
Frequency (MHz)	Power Density with RBW 3KHz
2422	-18.11
2437	-18.28
2452	-18.82

SISO Mode, Ant2：

IEEE 802.11b (CCK, 1Mbps)	
Frequency (MHz)	Power Density with RBW 3KHz
2412	3.27
2437	3.30
2462	3.24

IEEE 802.11g (16QAM, 6Mbps)	
Frequency (MHz)	Power Density with RBW 3KHz
2412	-12.27
2437	-12.98
2462	-12.00

IEEE 802.11n-HT20 (16QAM, 6.5Mbps)	
Frequency (MHz)	Power Density with RBW 3KHz
2412	-12.94
2437	-12.82
2462	-12.19

IEEE 802.11n-HT40 (64QAM, 13.5Mbps)	
Frequency (MHz)	Power Density with RBW 3KHz
2422	-19.06
2437	-19.32
2452	-18.91

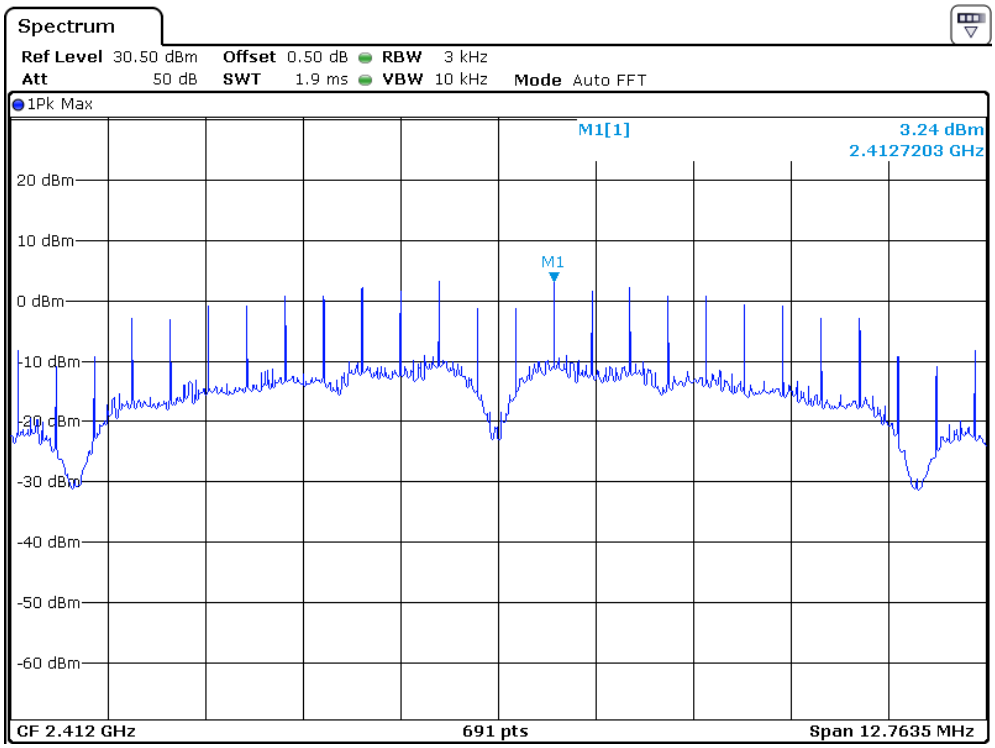
MIMO Mode：

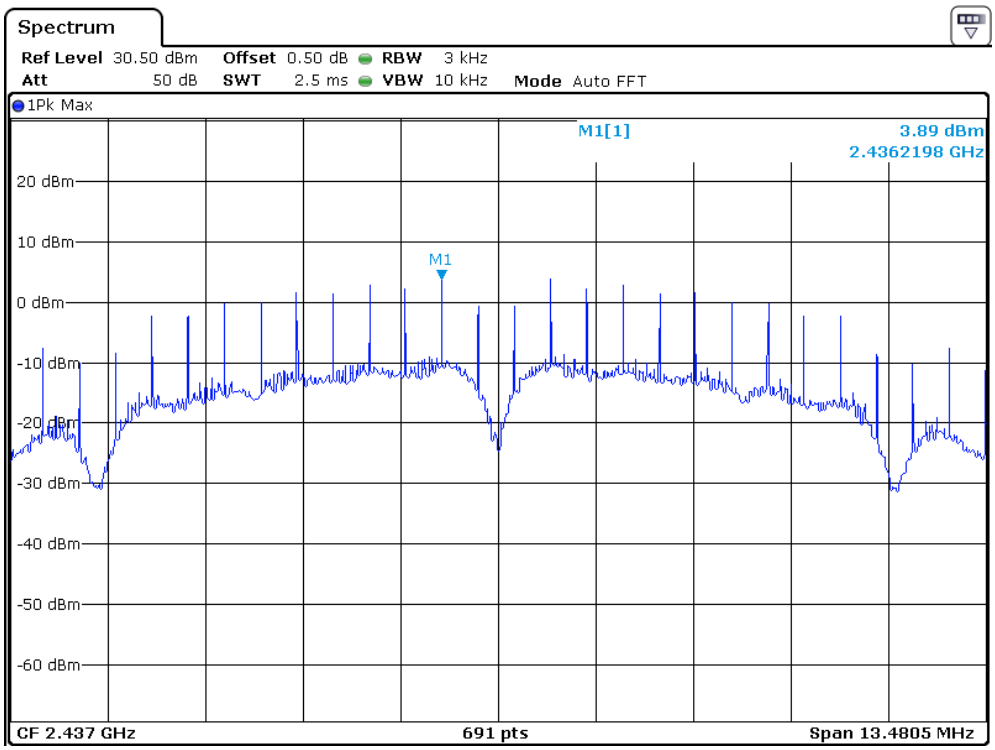
IEEE 802.11n-HT20 (16QAM, 6.5Mbps)			
Frequency (MHz)	Power Density with RBW 3KHz		Power Density with RBW 3KHz
	Ant1	Ant2	Total
2412	-13.25	-11.87	-9.50
2437	-12.11	-13.10	-9.57
2462	-11.84	-11.48	-8.65

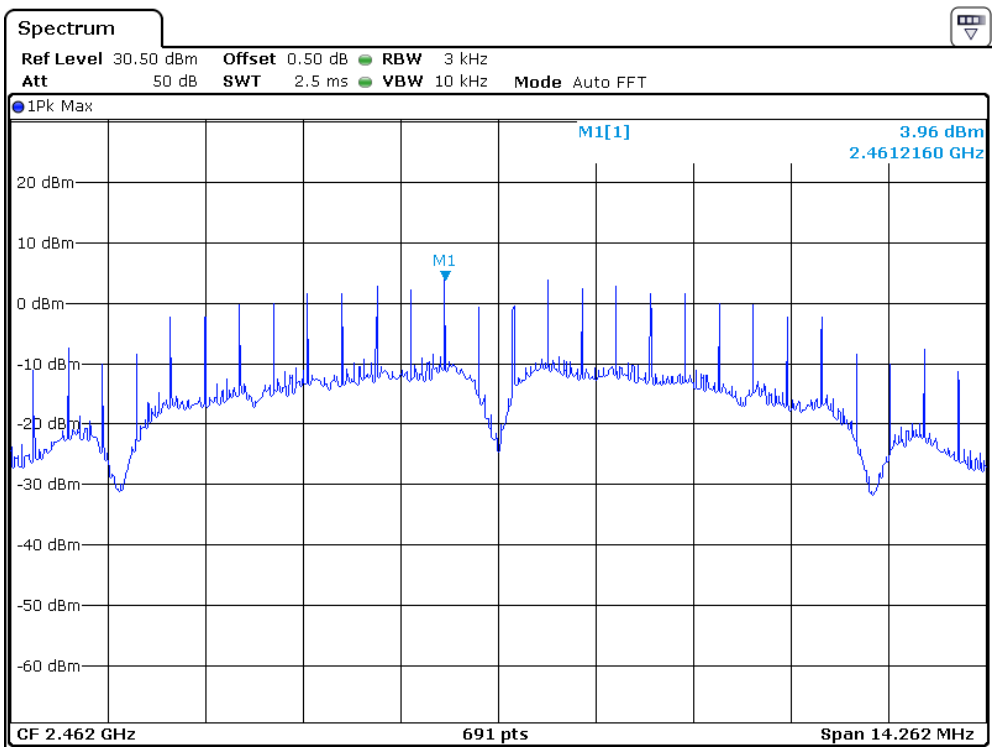
IEEE 802.11n-HT40 (64QAM, 13.5Mbps)			
Frequency (MHz)	Power Density with RBW 3KHz		Power Density with RBW 3KHz
	Ant1	Ant2	Total
2422	-18.71	-19.11	-15.90
2437	-17.97	-18.31	-15.13
2452	-17.11	-18.31	-14.66

The test plots are attached as below.

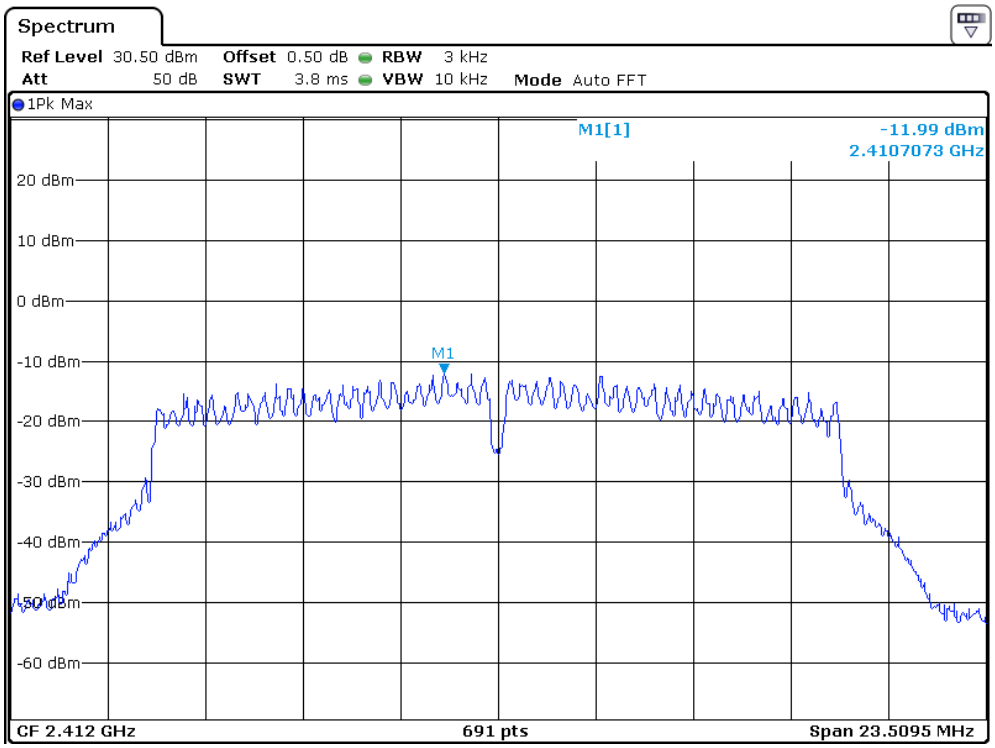
SISO Mode, Ant1:
802.11b

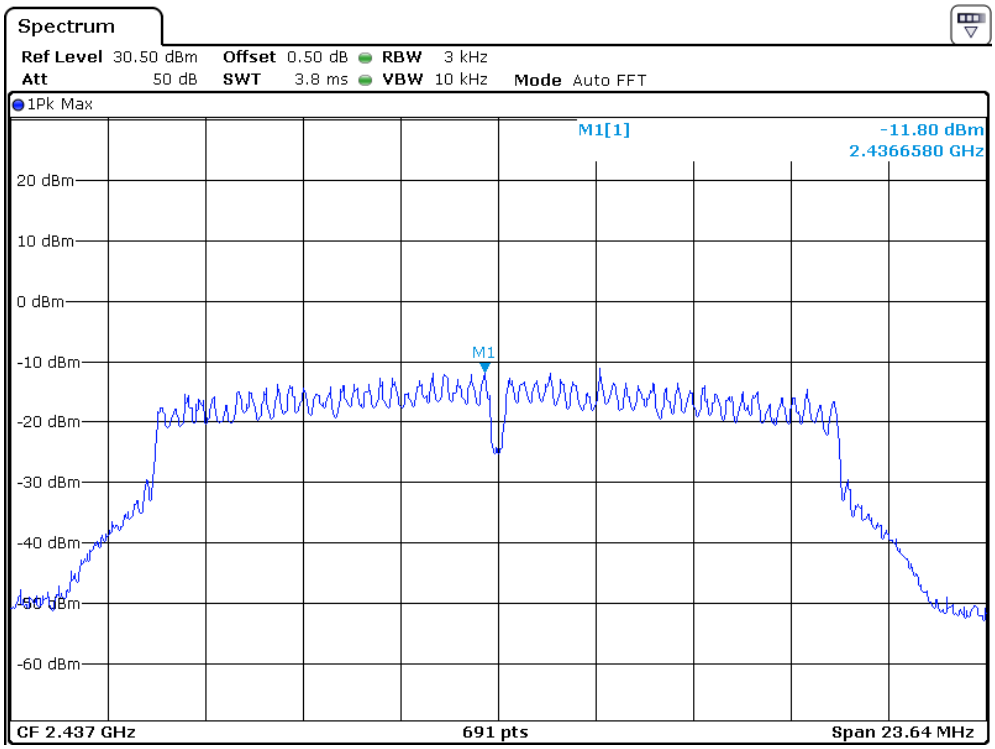


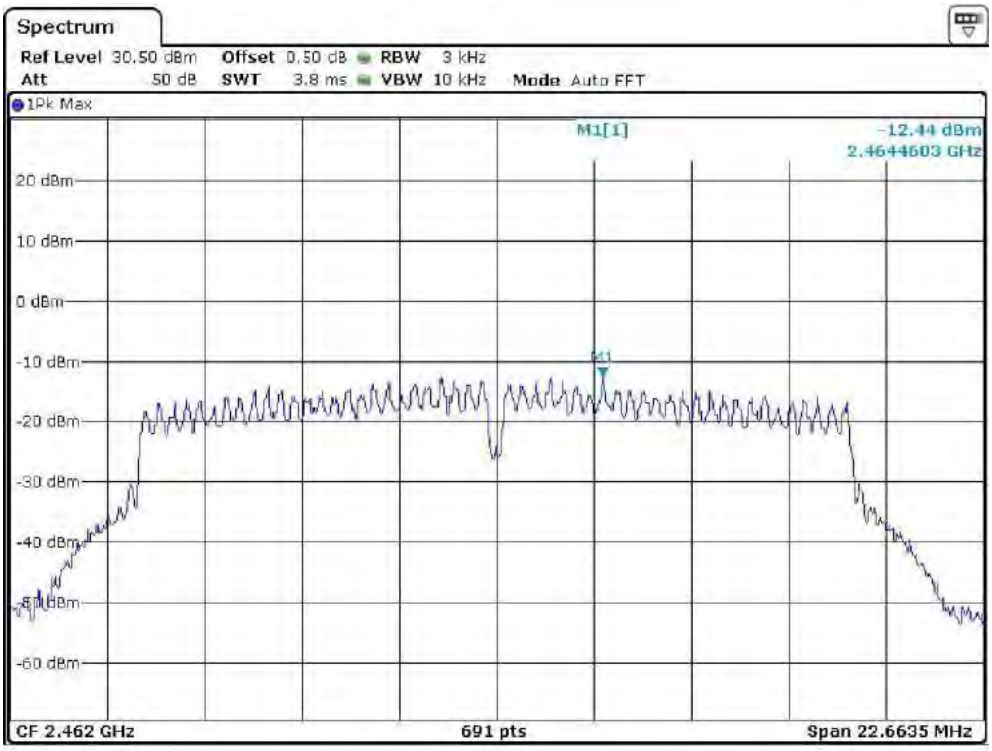

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 3 kHz
Att 50 dB SWT 2.5 ms VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1] 3.89 dBm
2.4362198 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
CF 2.437 GHz
691 pts
Span 13.4805 MHz


Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 3 kHz
Att 50 dB SWT 2.5 ms VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1] 3.96 dBm
2.4612160 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
CF 2.462 GHz
691 pts
Span 14.262 MHz

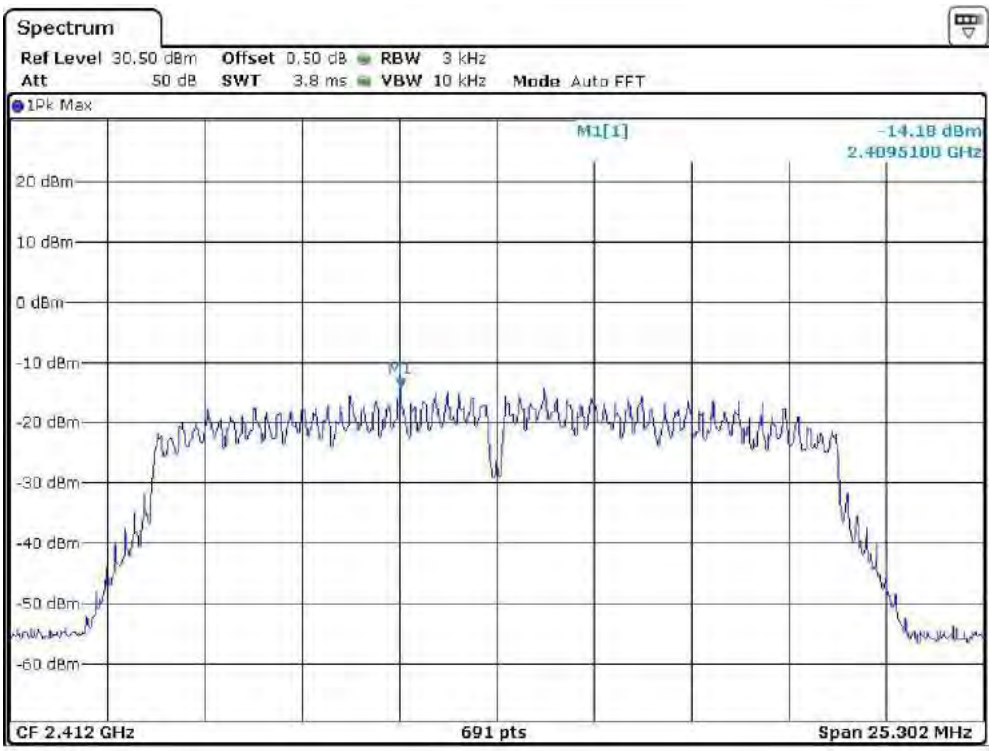
802.11g

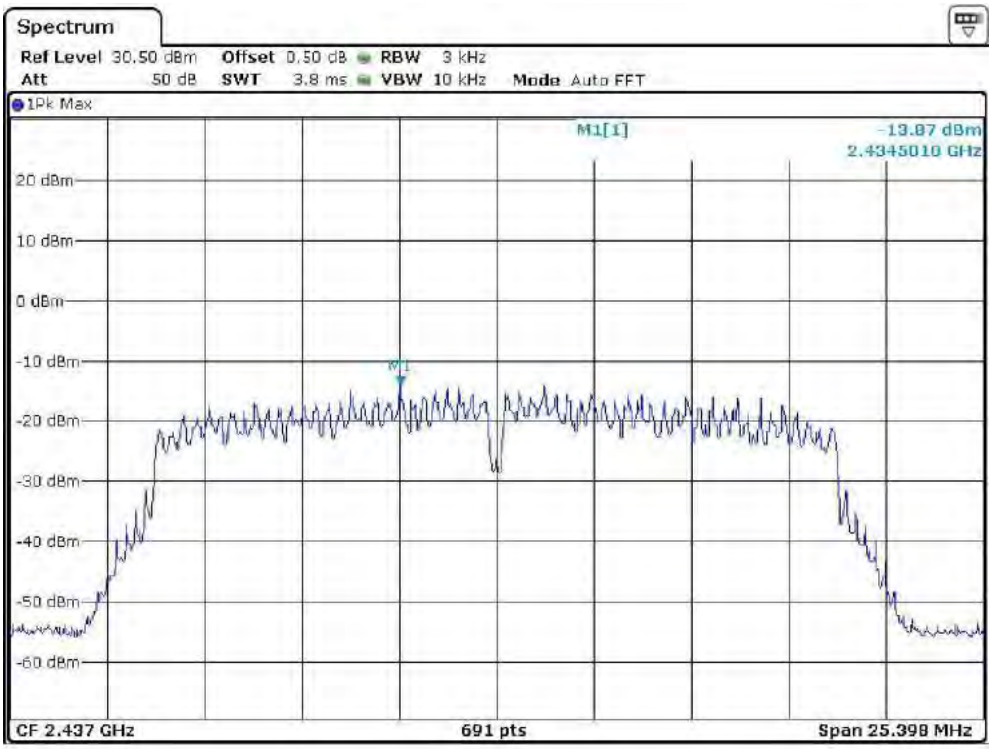

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 3 kHz
Att 50 dB SWT 3.8 ms VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1] -11.99 dBm
2.4107073 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
CF 2.412 GHz
691 pts
Span 23.5095 MHz

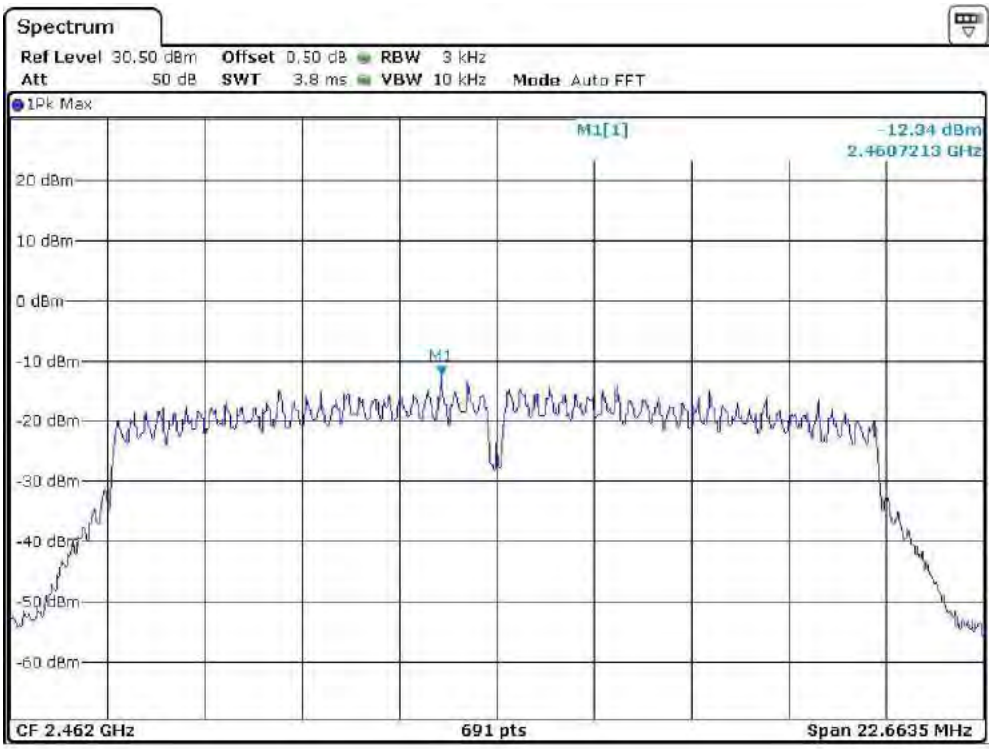

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 3 kHz
Att 50 dB SWT 3.8 ms VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1] -11.80 dBm
2.4366580 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
CF 2.437 GHz
691 pts
Span 23.64 MHz


Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 3 kHz
Att 50 dB SWT 3.8 ms VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1] -12.44 dBm
2.4644603 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
CF 2.462 GHz
691 pts
Span 22.6635 MHz

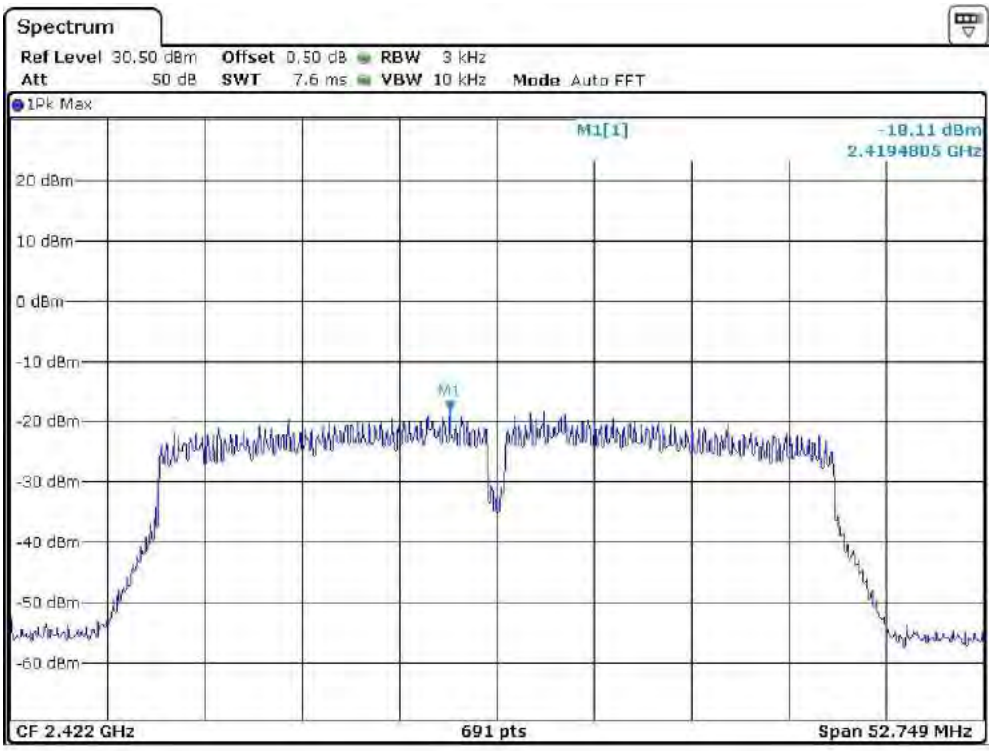
802.11n-HT20

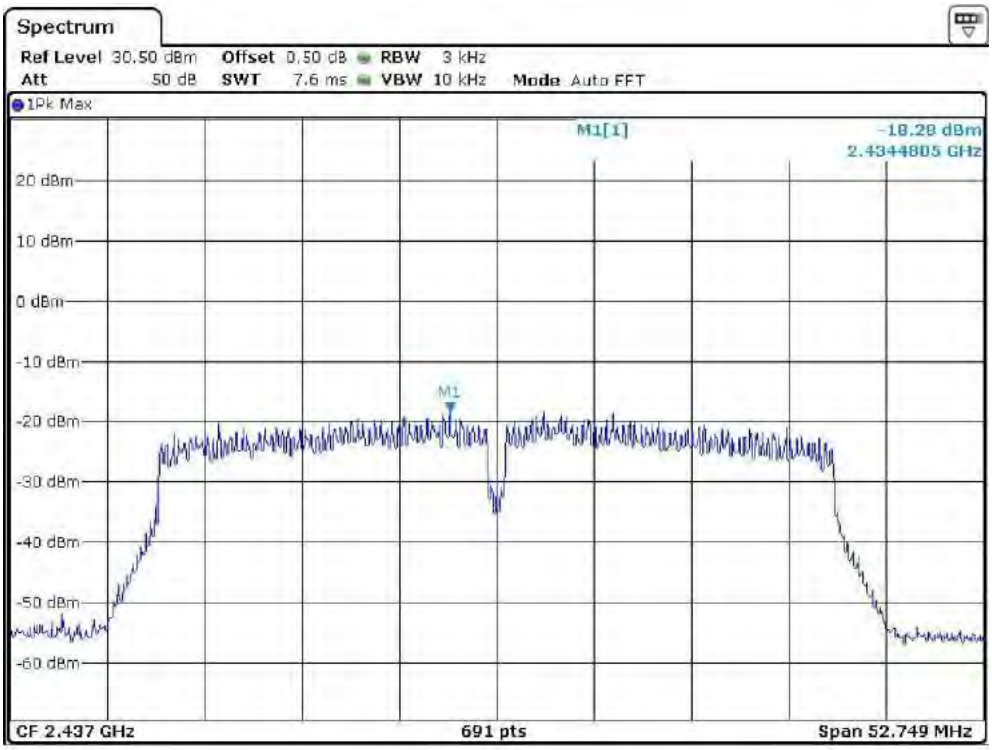

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 3 kHz
Att 50 dB SWT 3.8 ms VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1] -14.18 dBm
2.4095100 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
CF 2.412 GHz
691 pts
Span 25.302 MHz

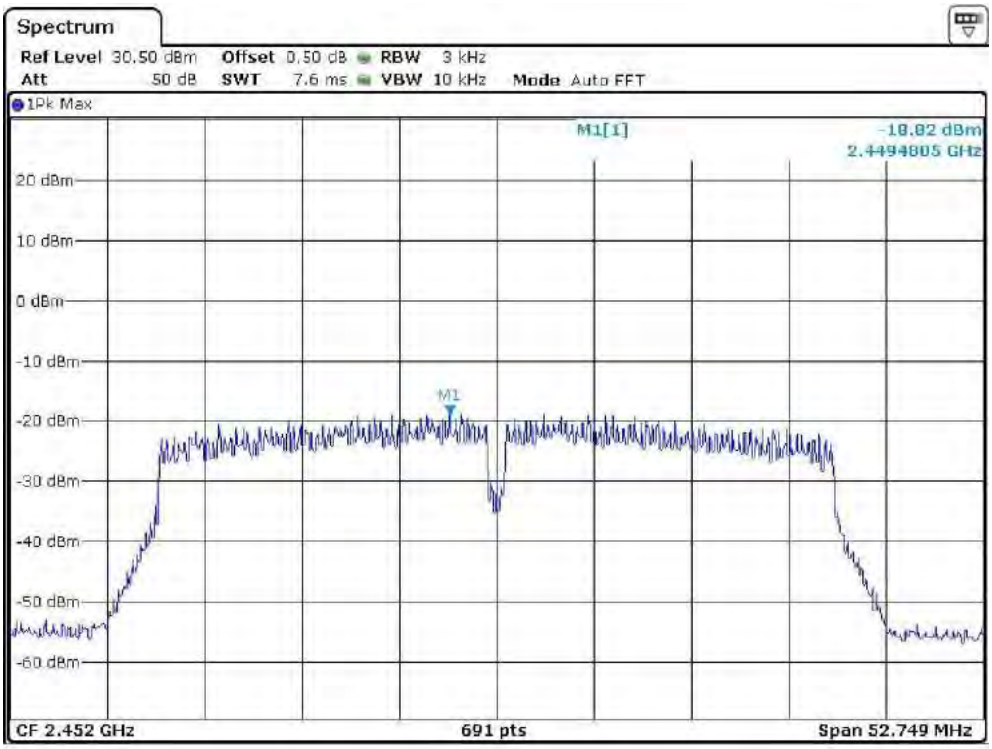

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 3 kHz
Att 50 dB SWT 3.8 ms VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1] -13.87 dBm
2.4345010 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
CF 2.437 GHz
691 pts
Span 25.398 MHz


Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 3 kHz
Att 50 dB SWT 3.8 ms VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1] -12.34 dBm
2.4607213 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
CF 2.462 GHz
691 pts
Span 22.6635 MHz

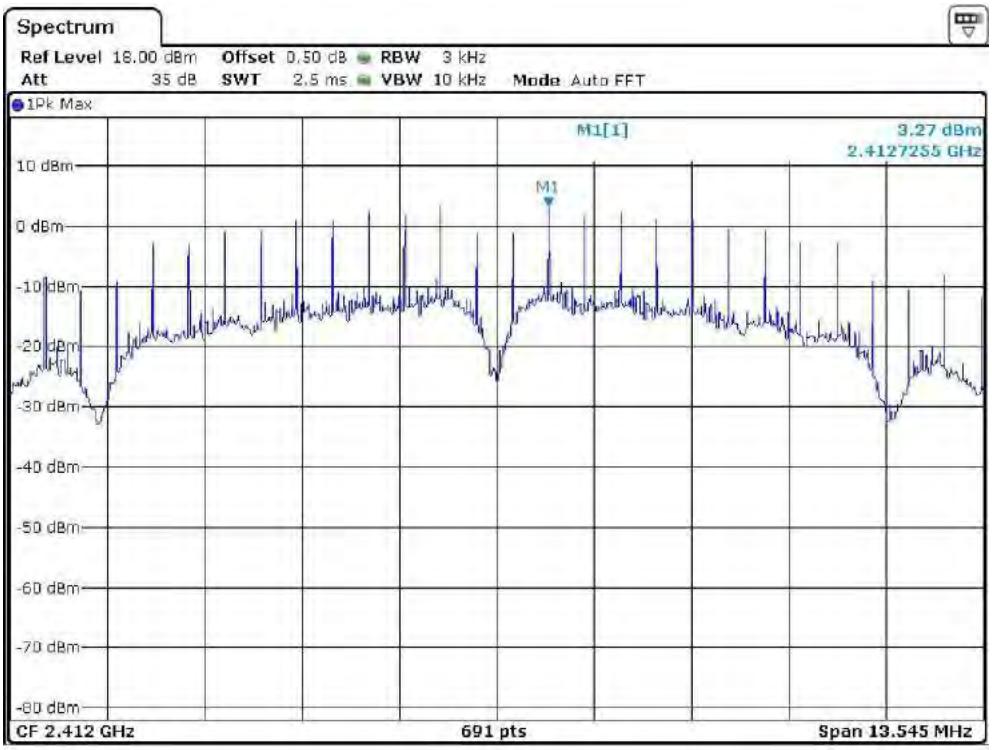
802.11n-HT40

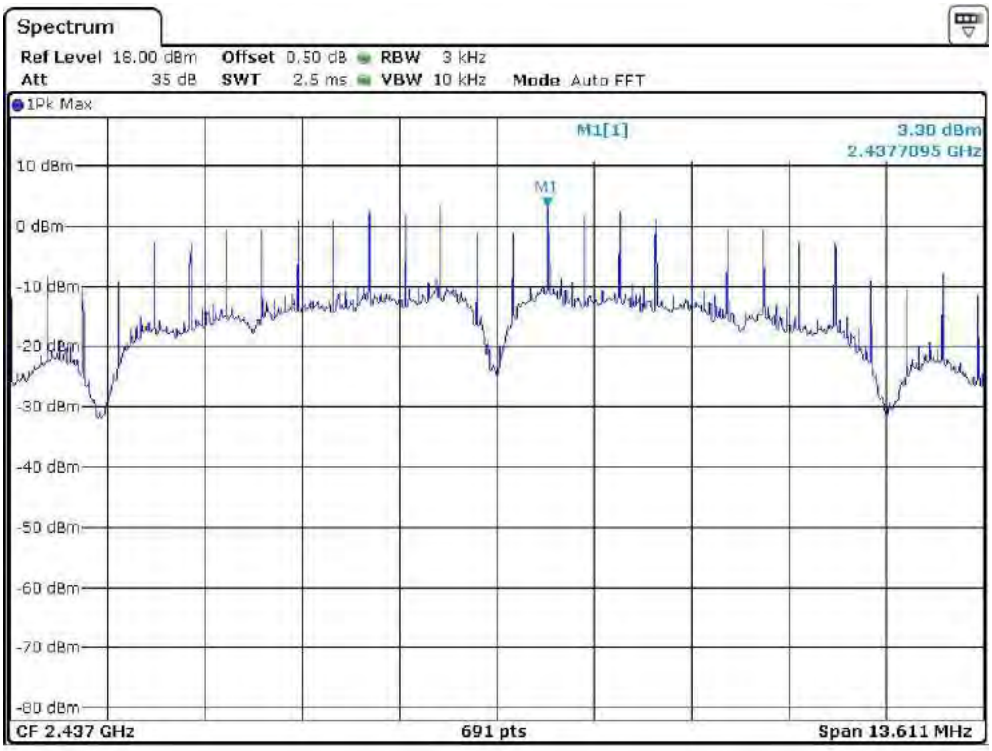

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 3 kHz
Att 50 dB SWT 7.6 ms VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1] -10.11 dBm
2.4194805 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
CF 2.422 GHz
691 pts
Span 52.749 MHz

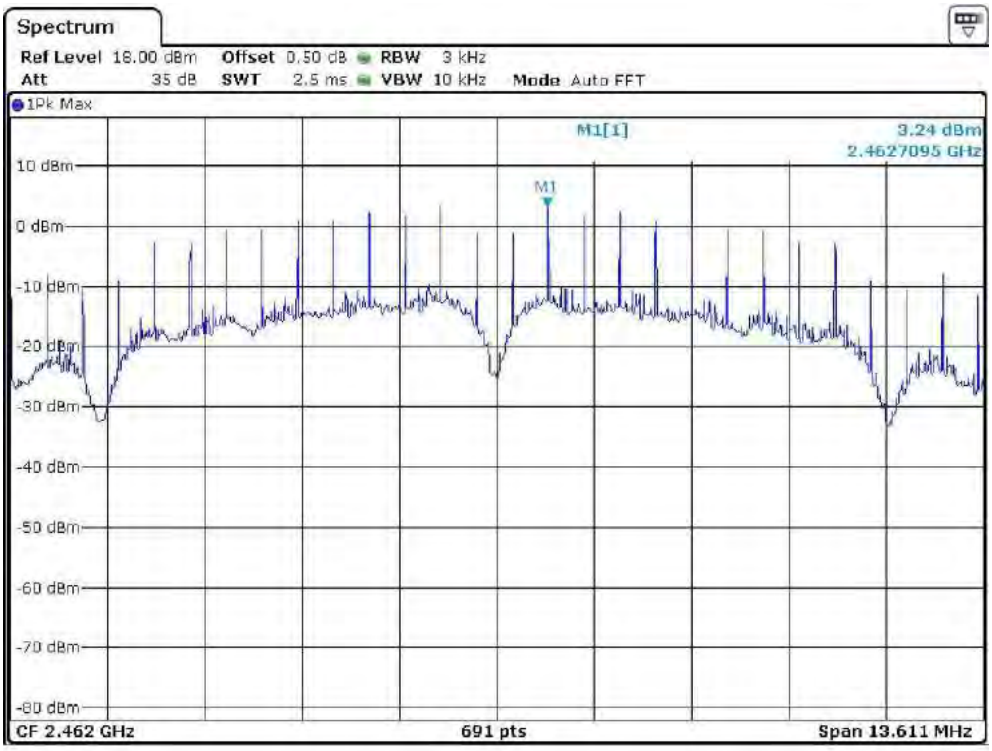

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 3 kHz
Att 50 dB SWT 7.6 ms VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1] -10.28 dBm
2.4344805 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
CF 2.437 GHz
691 pts
Span 52.749 MHz



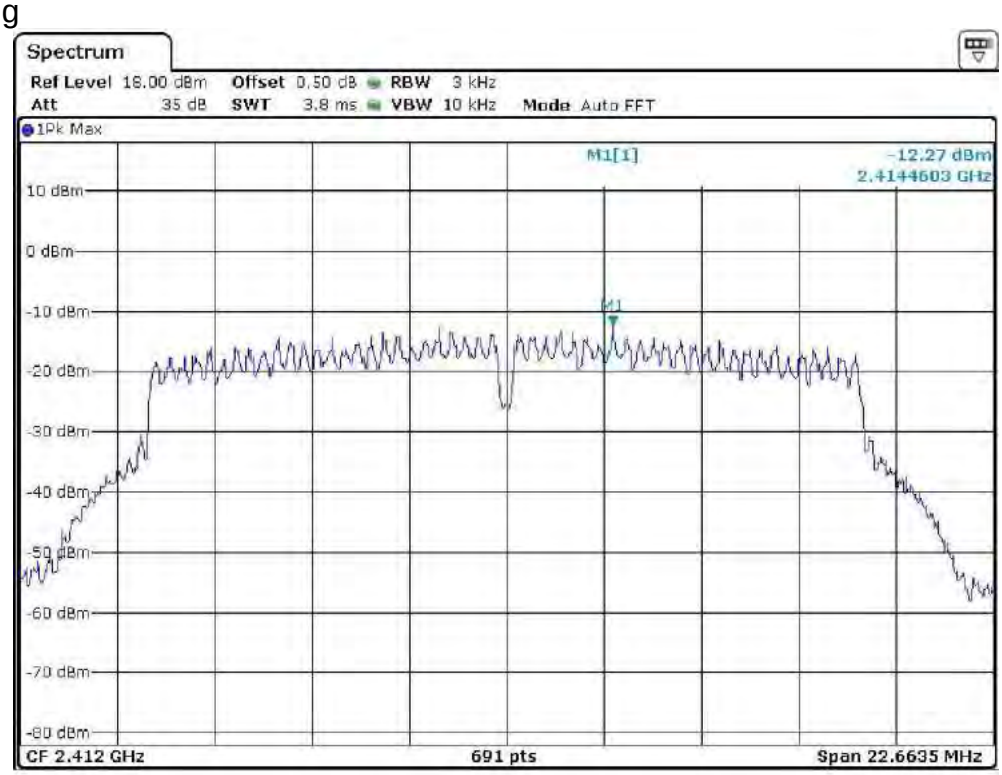
SISO Mode, Ant2:
802.11b

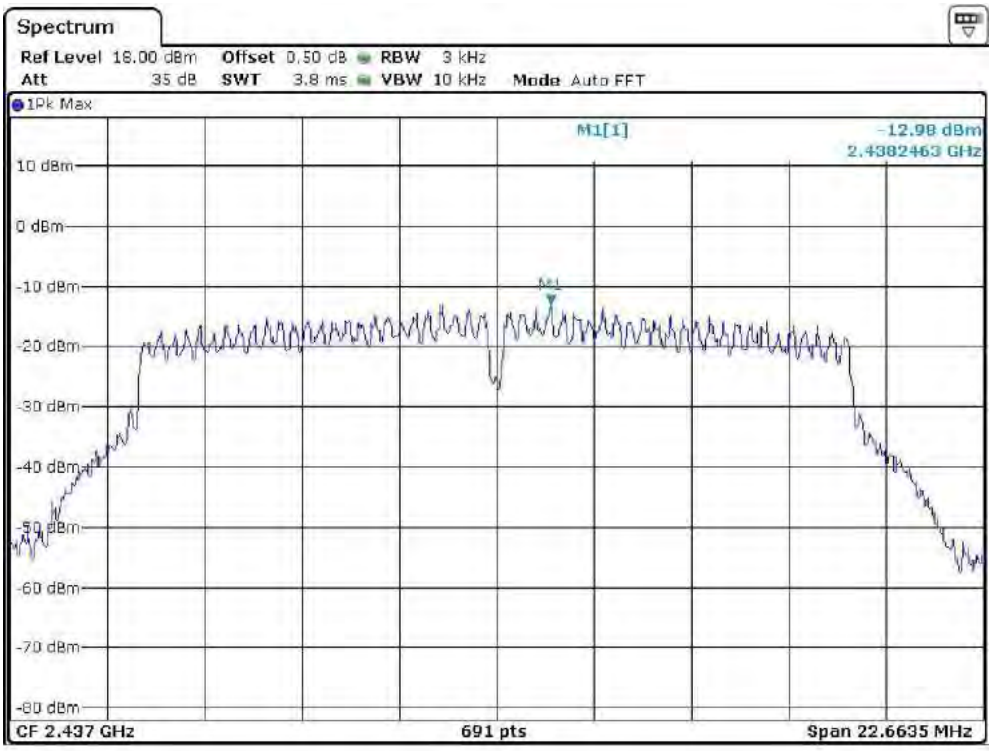


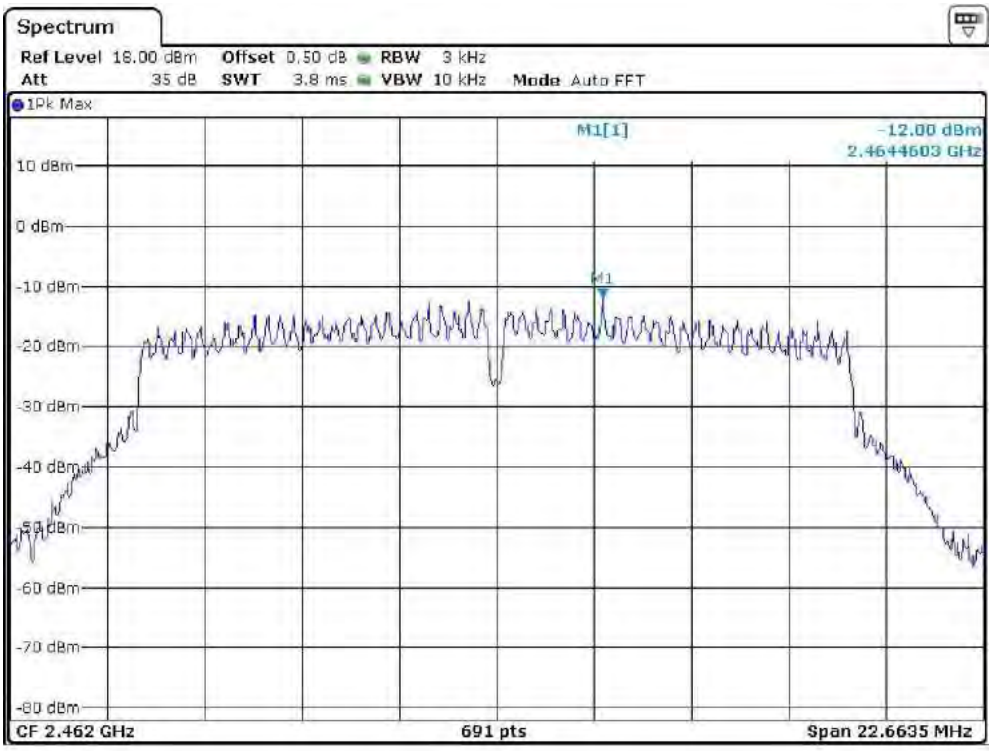

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 3 kHz
Att 35 dB SWT 2.5 ms VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1] 3.30 dBm
2.4377095 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 2.437 GHz
691 pts
Span 13.611 MHz


Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 3 kHz
Att 35 dB SWT 2.5 ms VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1] 3.24 dBm
2.4627095 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 2.462 GHz
691 pts
Span 13.611 MHz

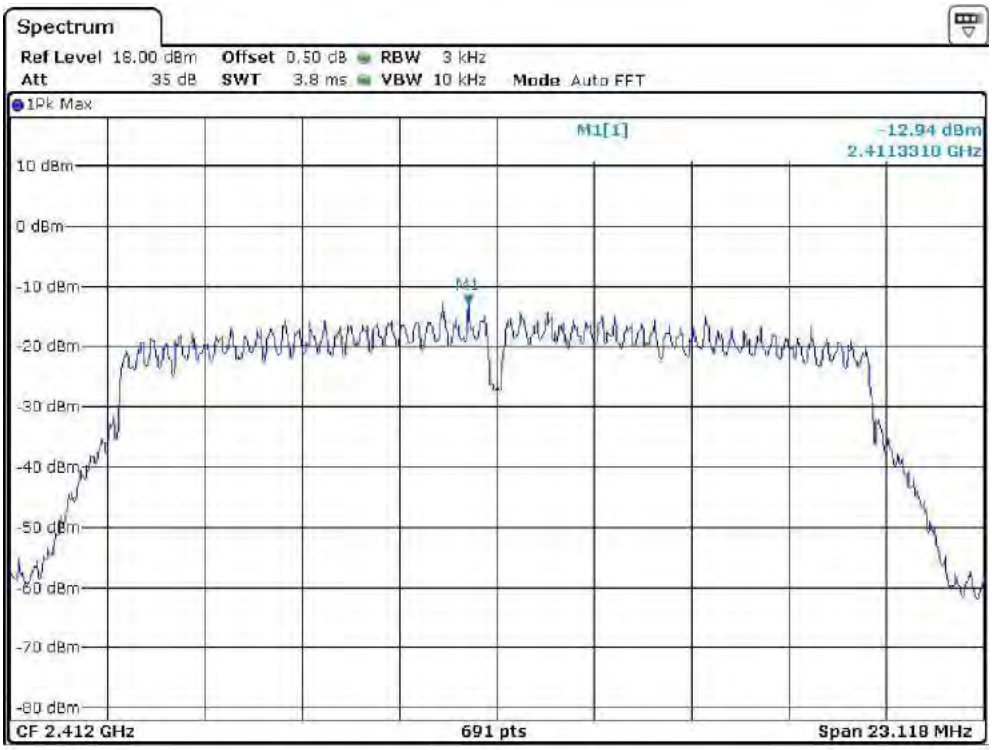
802.11g

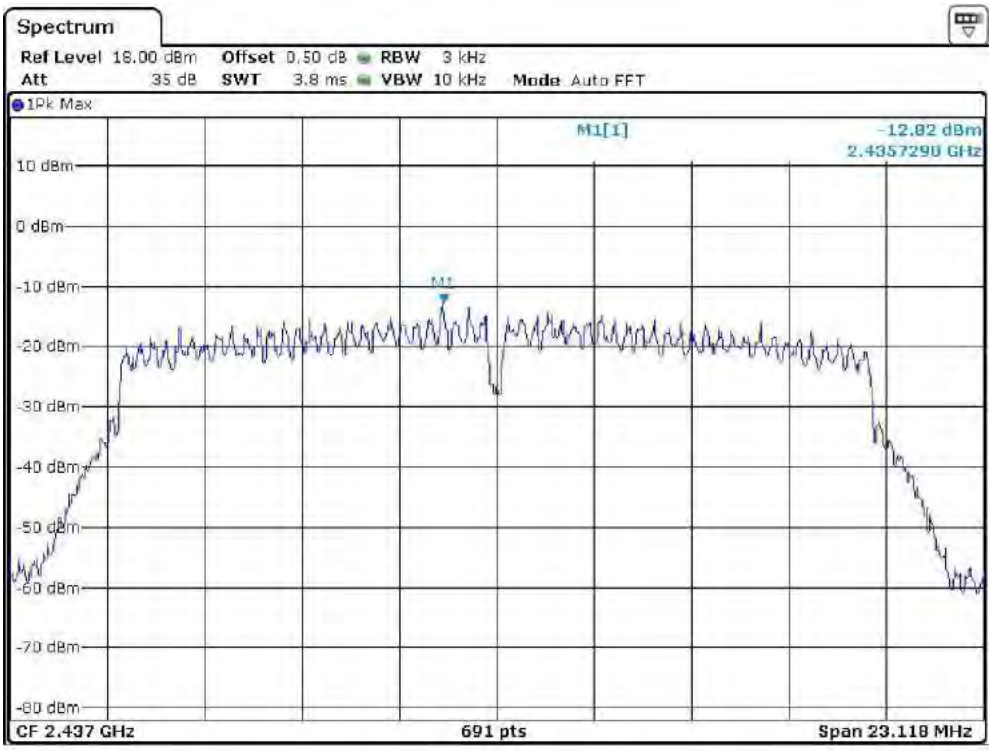

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 3 kHz
Att 35 dB SWT 3.8 ms VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1] -12.27 dBm
2.4144603 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 2.412 GHz
691 pts
Span 22.6635 MHz

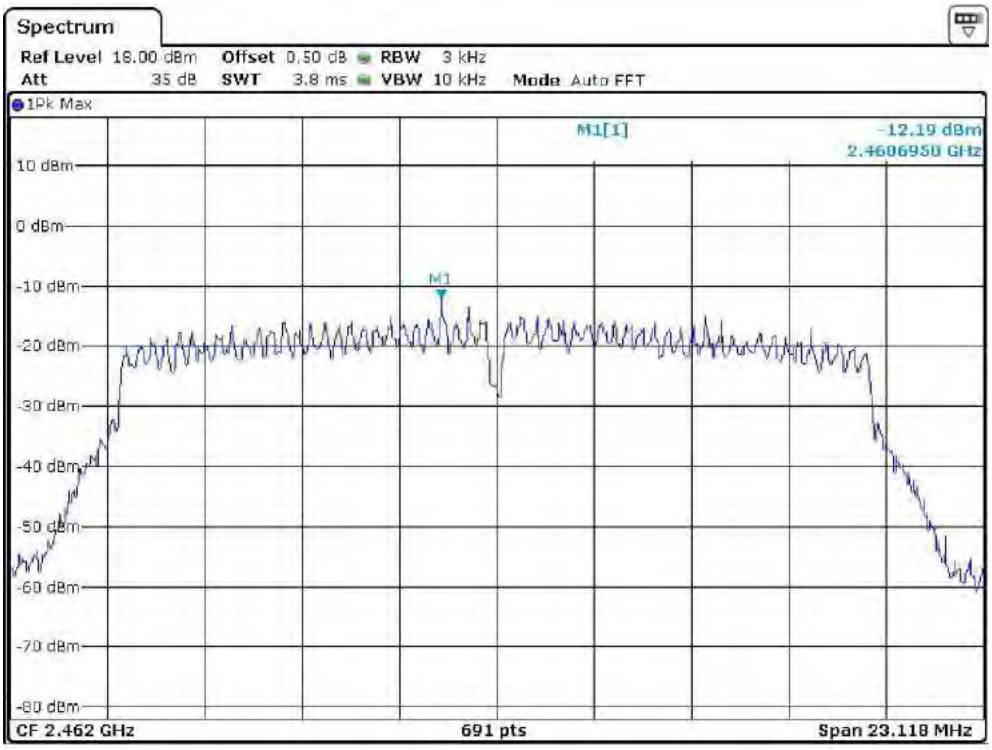

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 3 kHz
Att 35 dB SWT 3.8 ms VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1] -12.98 dBm
2.4382463 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 2.437 GHz
691 pts
Span 22.6635 MHz


Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 3 kHz
Att 35 dB SWT 3.8 ms VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1] -12.00 dBm
2.4644603 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 2.462 GHz
691 pts
Span 22.6635 MHz

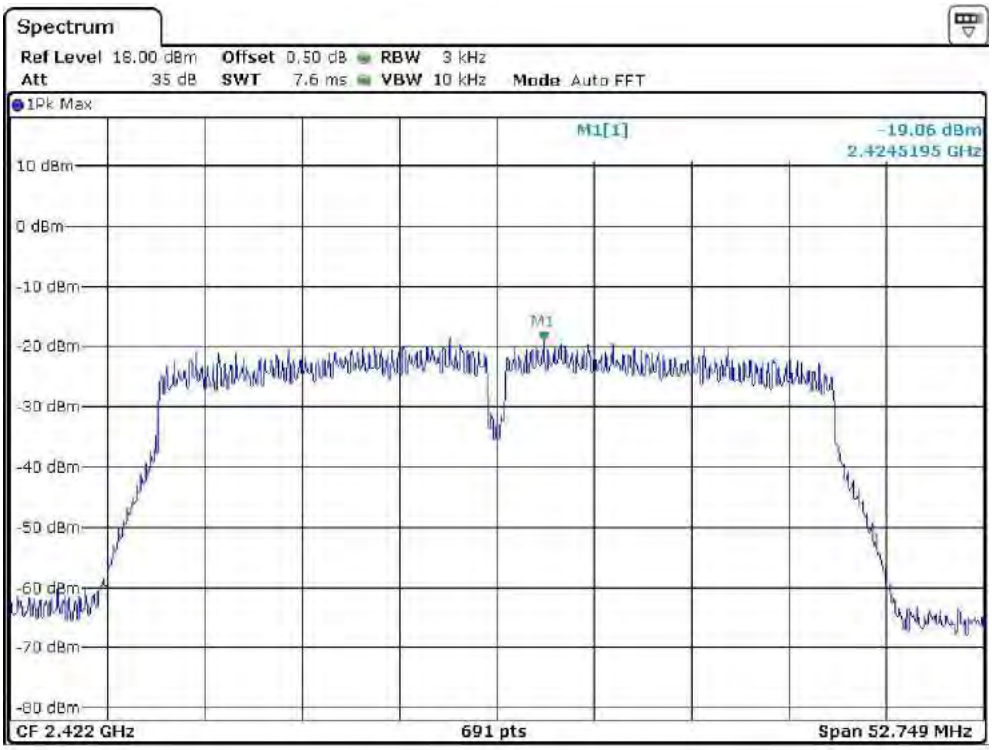
802.11n HT20

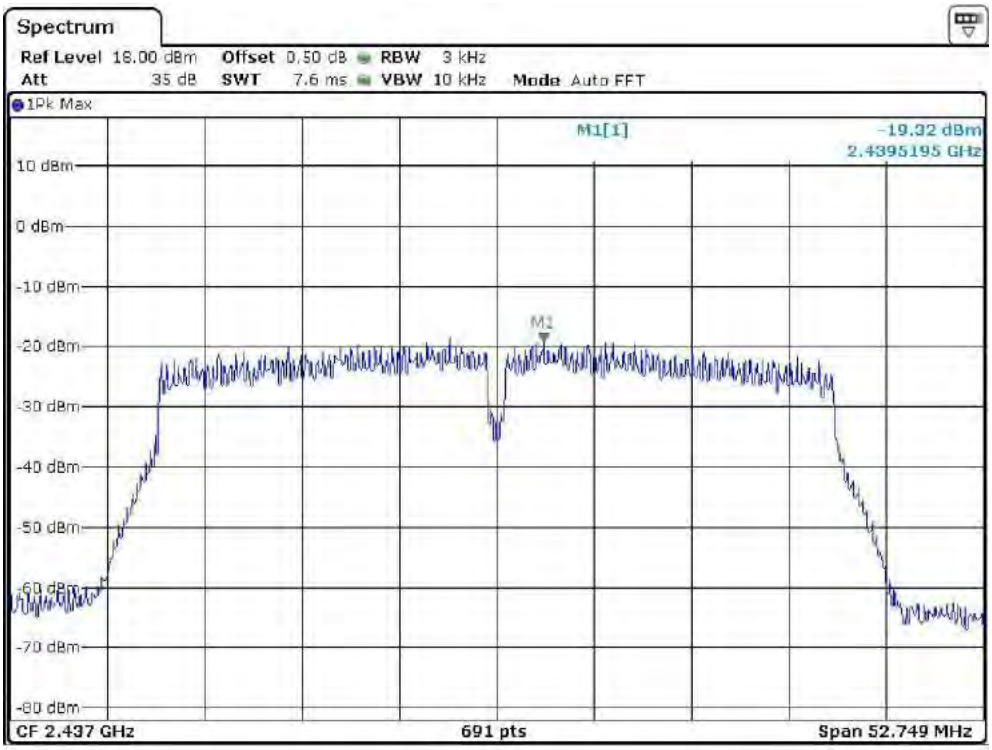

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 3 kHz
Att 35 dB SWT 3.8 ms VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1] -12.94 dBm
2.4113310 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 2.412 GHz
691 pts
Span 23.118 MHz

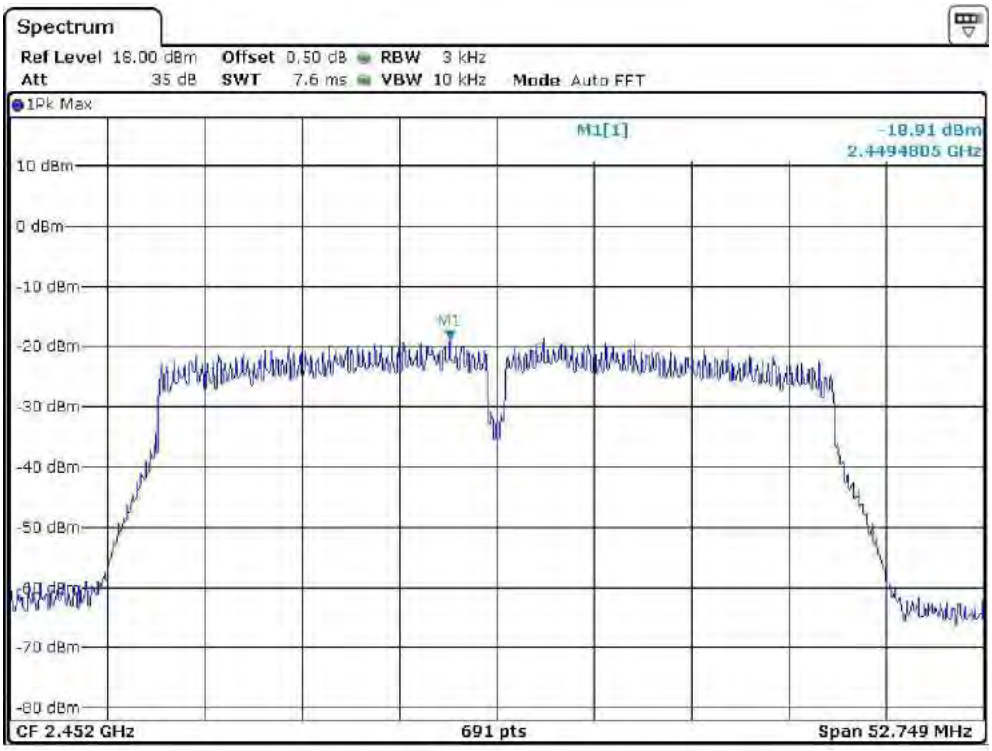

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 3 kHz
Att 35 dB SWT 3.8 ms VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1] -12.82 dBm
2.4357290 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
M1
CF 2.437 GHz
691 pts
Span 23.118 MHz


Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 3 kHz
Att 35 dB SWT 3.8 ms VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1] -12.19 dBm
2.4606950 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
M1
CF 2.462 GHz
691 pts
Span 23.118 MHz

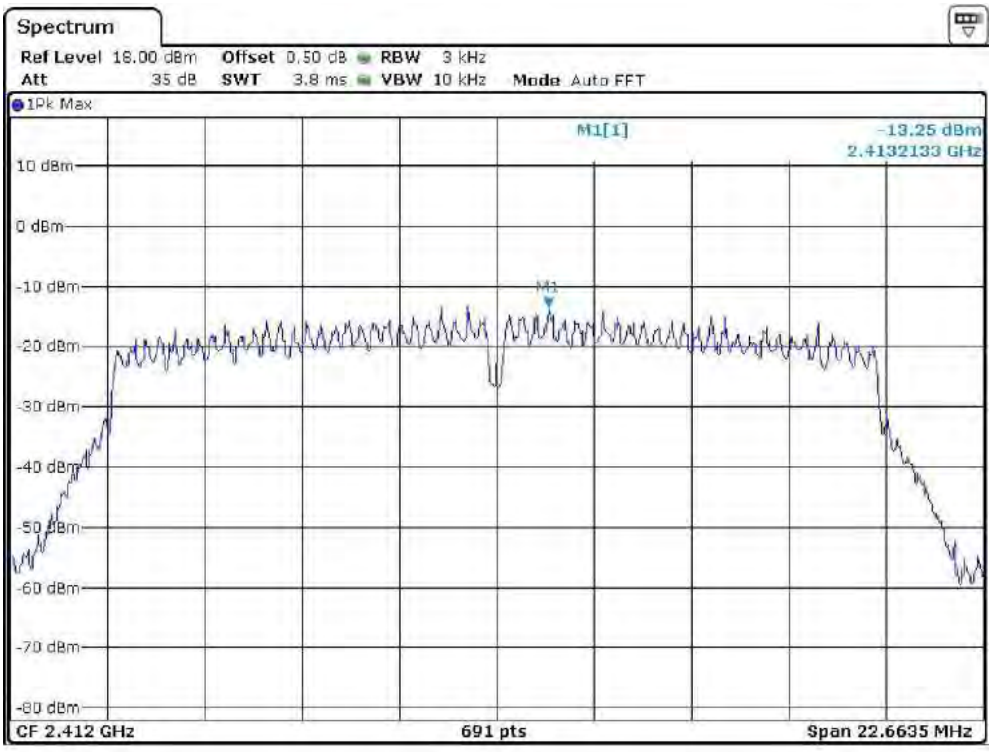
802.11n HT40

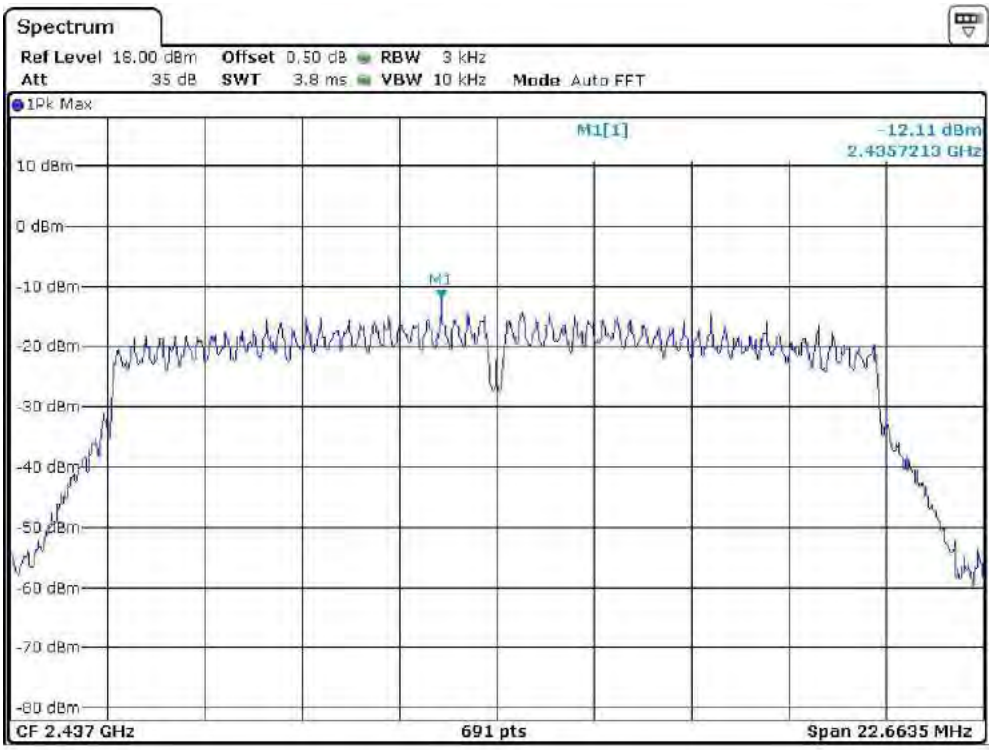

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 3 kHz
Att 35 dB SWT 7.6 ms VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1] -19.06 dBm
2.4245195 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
M1
CF 2.422 GHz
691 pts
Span 52.749 MHz

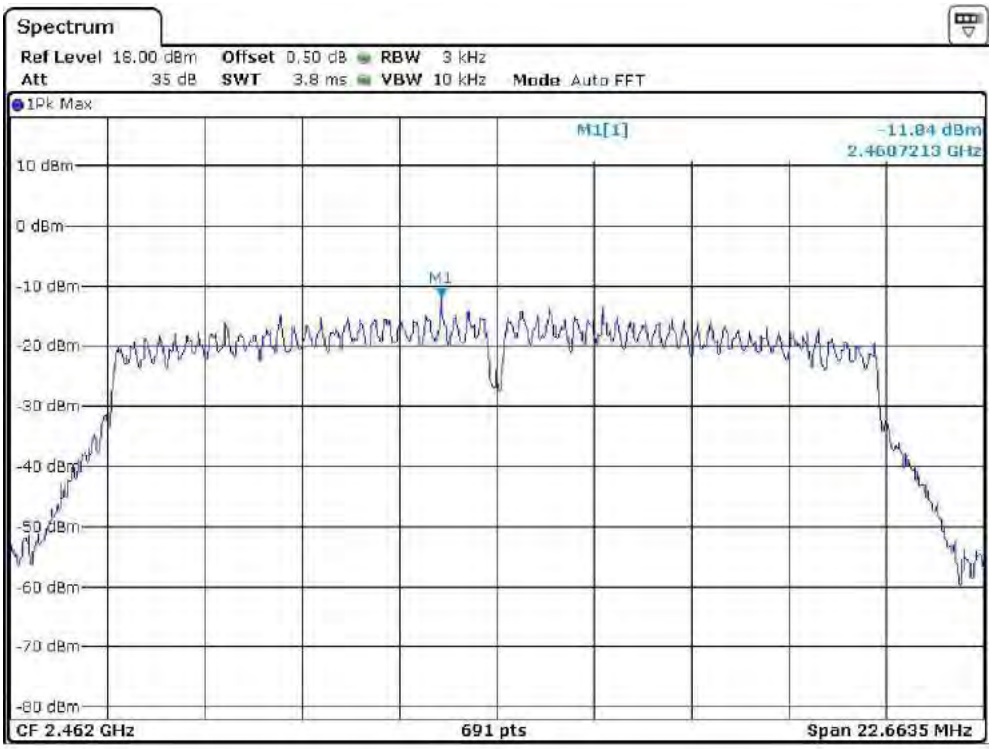

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 3 kHz
Att 35 dB SWT 7.6 ms VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1] -19.32 dBm
2.4395195 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
M1
CF 2.437 GHz
691 pts
Span 52.749 MHz



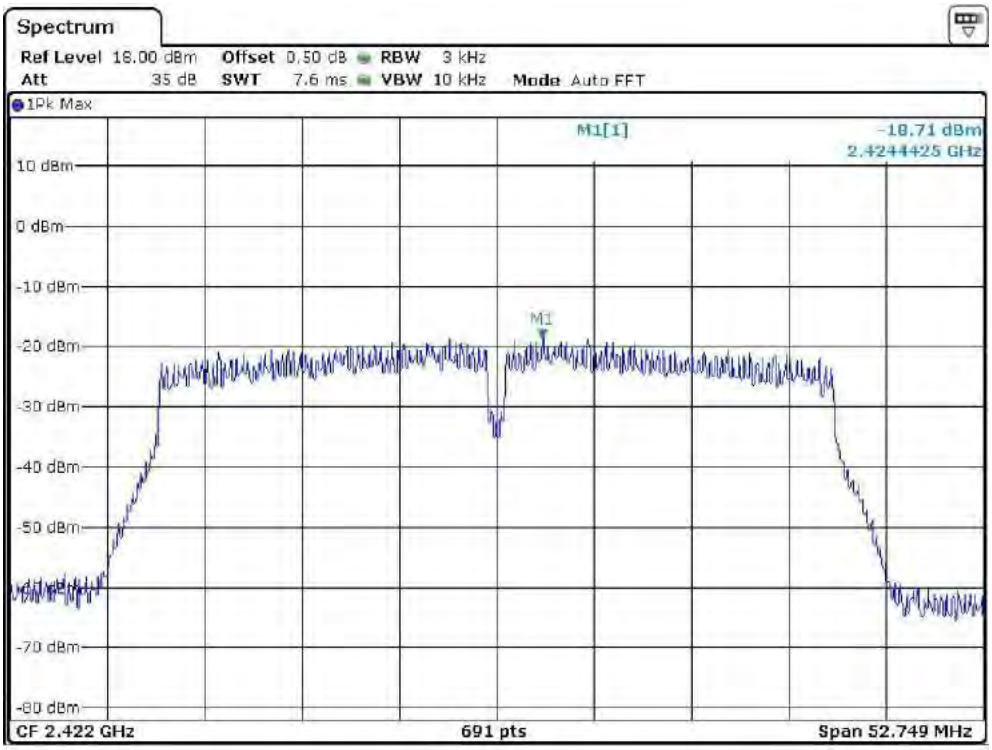
MIMO Mode, Ant1：
802.11n-HT20

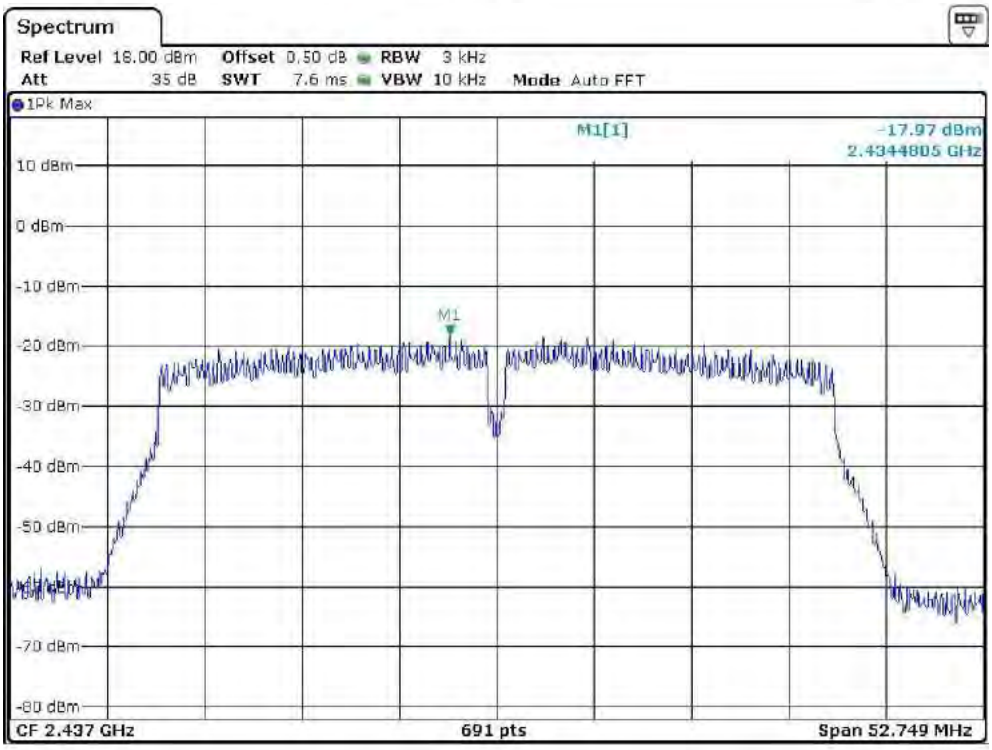


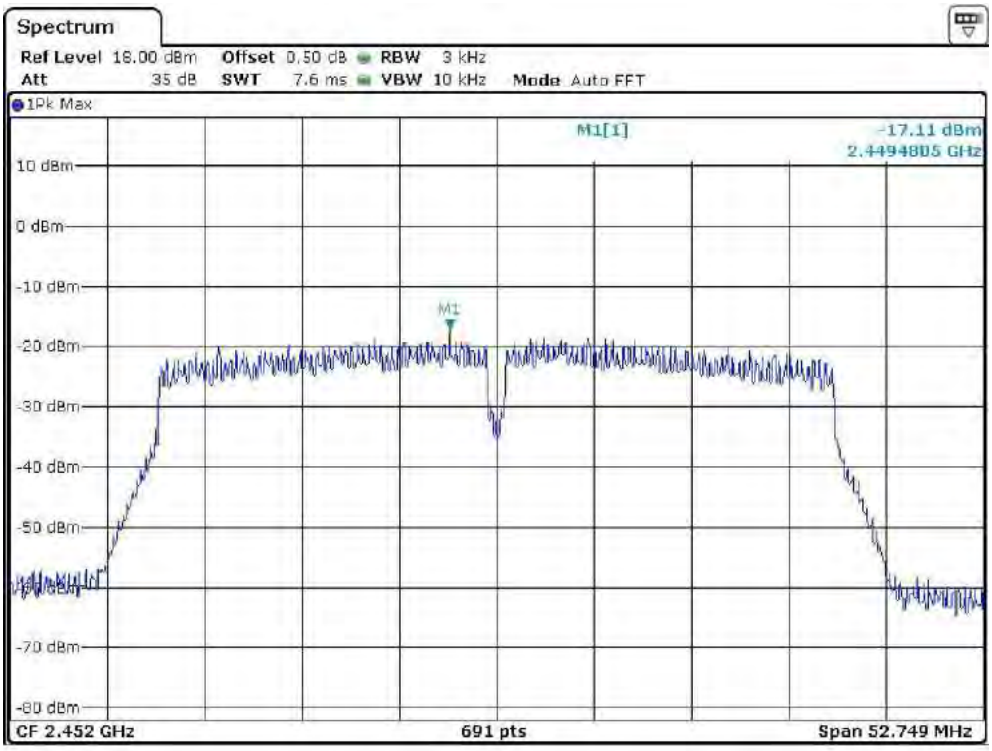

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 3 kHz
Att 35 dB SWT 3.8 ms VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1] -12.11 dBm
2.4357213 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
M1
CF 2.437 GHz
691 pts
Span 22.6635 MHz


Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 3 kHz
Att 35 dB SWT 3.8 ms VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1] -11.84 dBm
2.4607213 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
M1
CF 2.462 GHz
691 pts
Span 22.6635 MHz

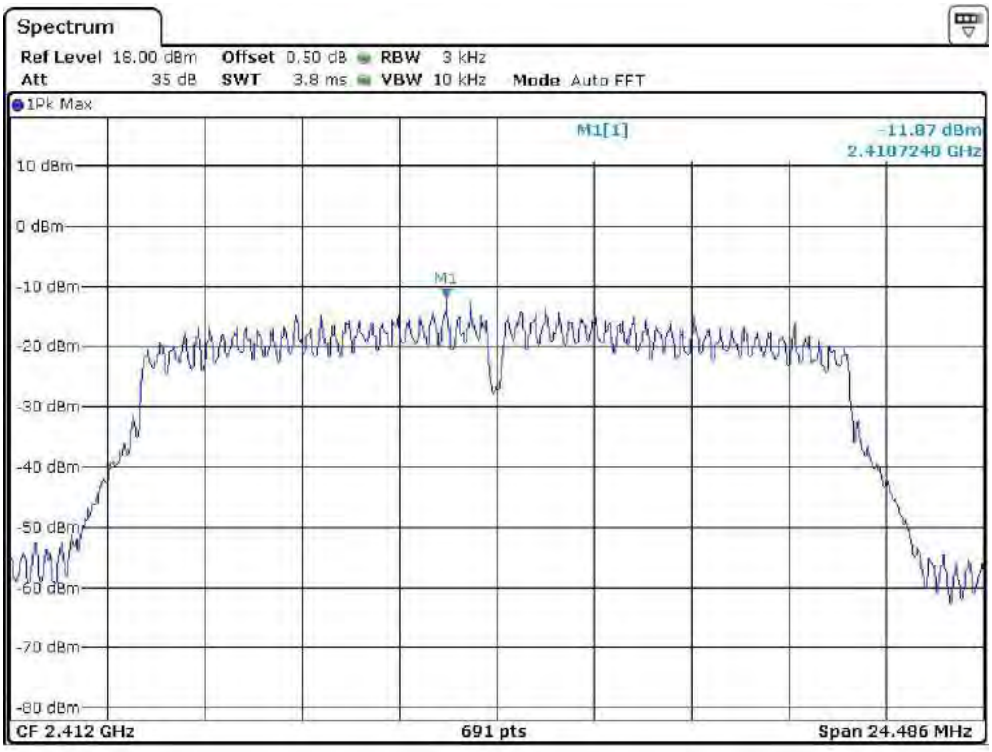
802.11n-HT40

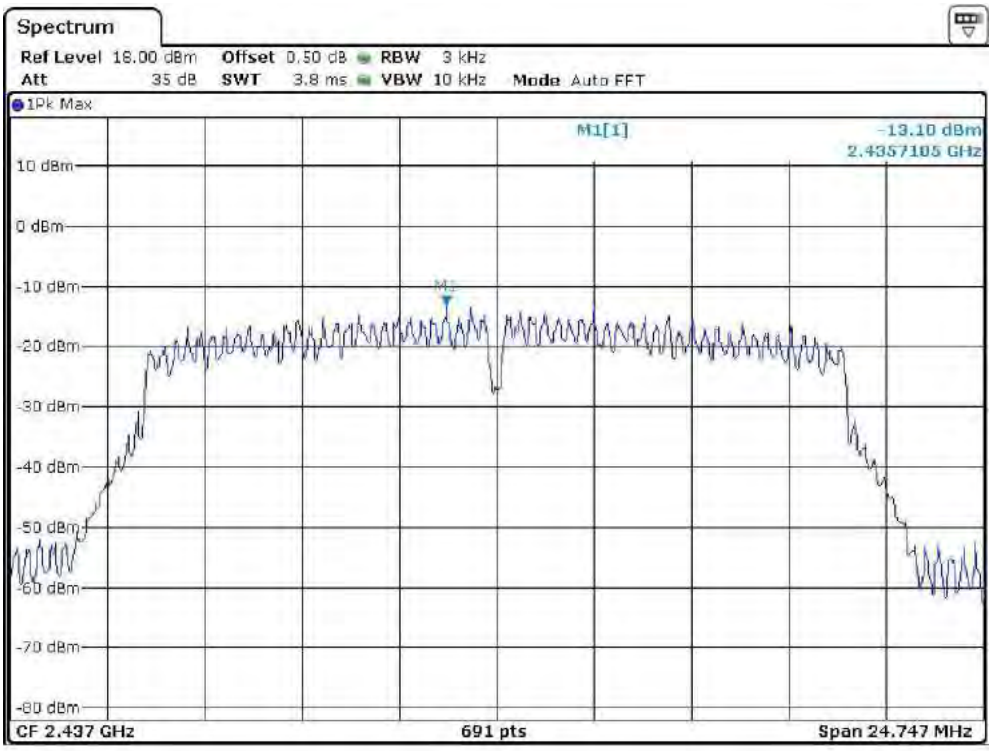

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 3 kHz
Att 35 dB SWT 7.6 ms VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1] -18.71 dBm
2.4244425 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-70 dBm
-80 dBm
M1
CF 2.422 GHz
691 pts
Span 52.749 MHz

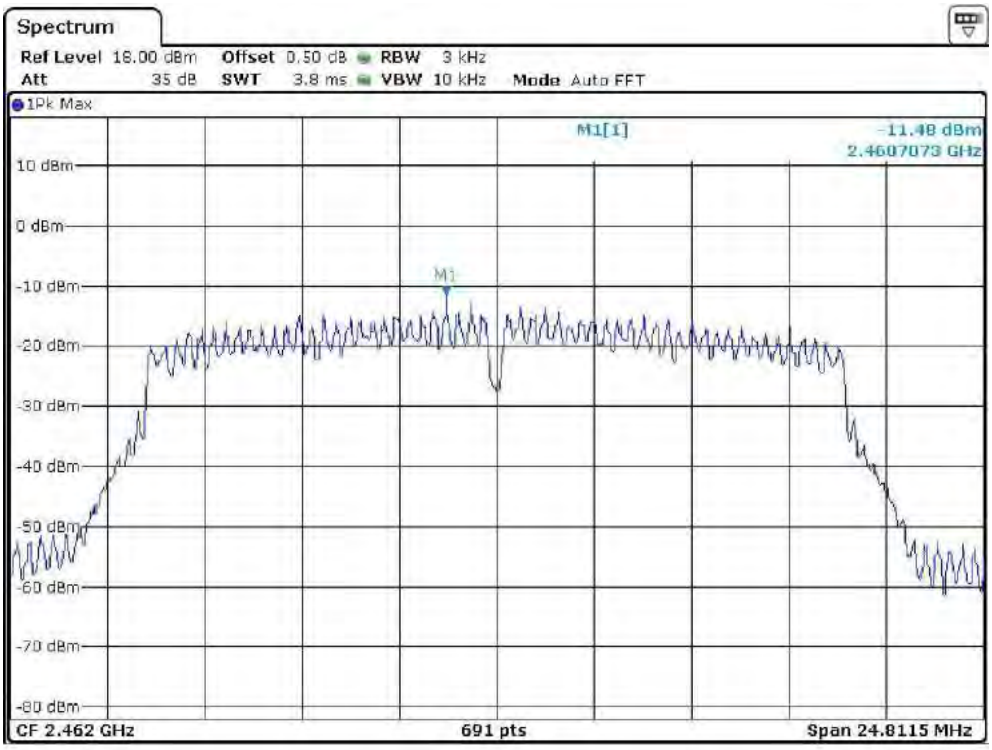

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 3 kHz
Att 35 dB SWT 7.6 ms VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1] -17.97 dBm
2.4344805 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-70 dBm
-80 dBm
M1
CF 2.437 GHz
691 pts
Span 52.749 MHz



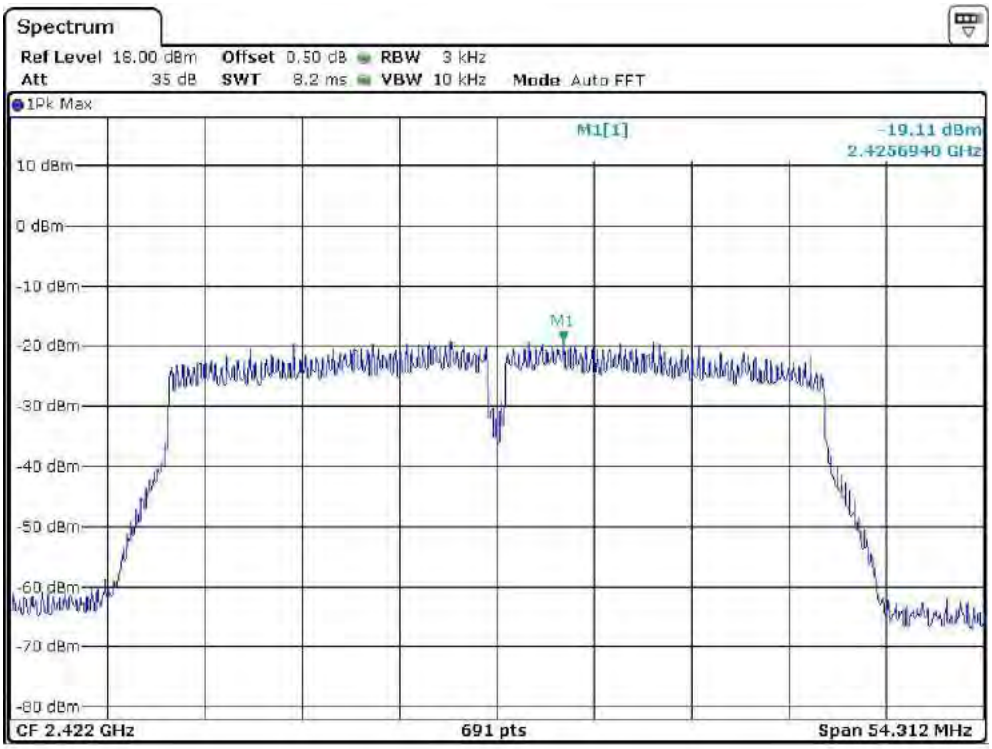
MIMO Mode, Ant2：
802.11n-HT20

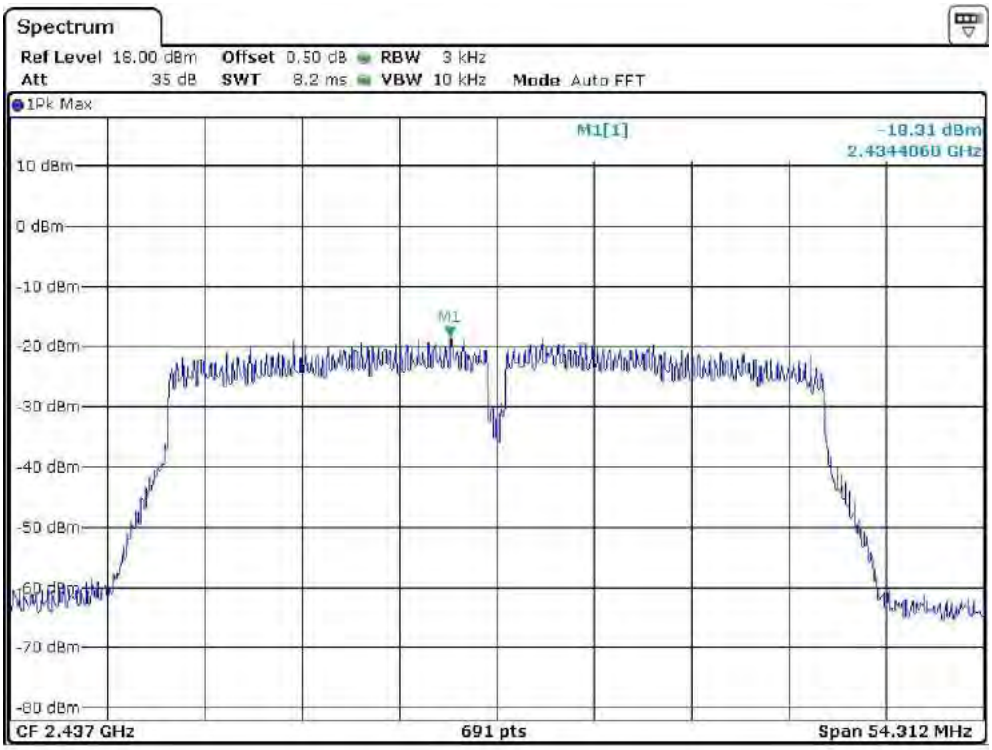


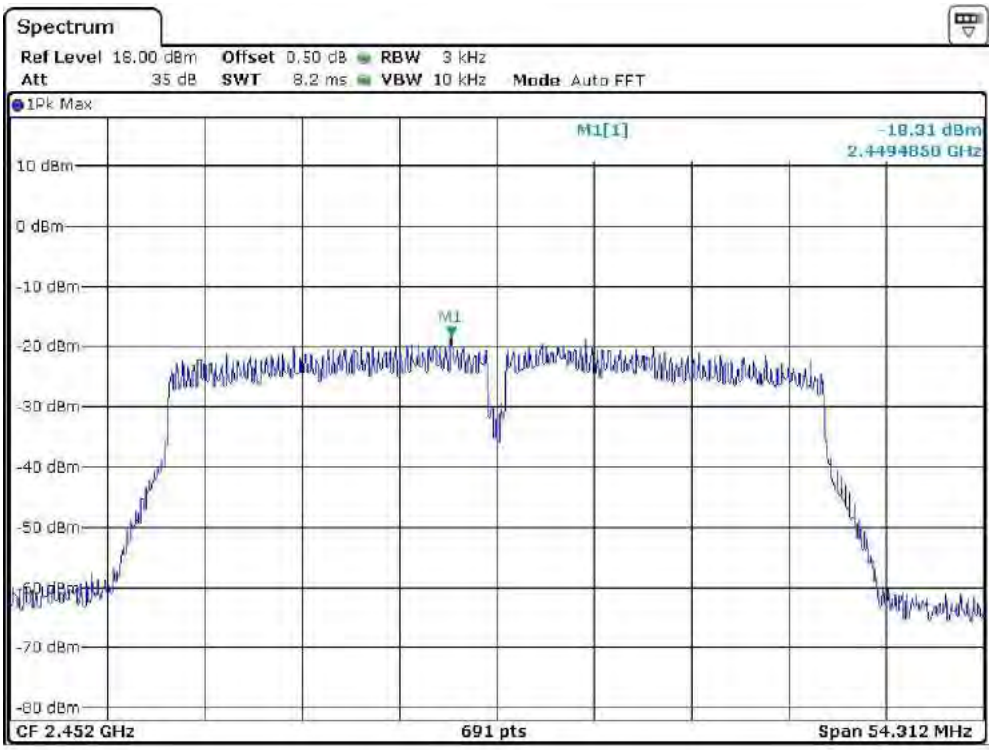

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 3 kHz
Att 35 dB SWT 3.8 ms VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1] -13.10 dBm
2.4357105 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 2.437 GHz
691 pts
Span 24.747 MHz


Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 3 kHz
Att 35 dB SWT 3.8 ms VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1] -11.48 dBm
2.4607073 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
CF 2.462 GHz
691 pts
Span 24.8115 MHz

802.11n-HT40


Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 3 kHz
Att 35 dB SWT 8.2 ms VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1] -19.11 dBm
2.4256940 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
M1
CF 2.422 GHz
691 pts
Span 54.312 MHz


Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 3 kHz
Att 35 dB SWT 8.2 ms VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1] -18.31 dBm
2.4344060 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
M1
CF 2.437 GHz
691 pts
Span 54.312 MHz


Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 3 kHz
Att 35 dB SWT 8.2 ms VBW 10 kHz Mode Auto FFT
1Pk Max
M1[1] -18.31 dBm
2.4494850 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-70 dBm
-80 dBm
M1
CF 2.452 GHz
691 pts
Span 54.312 MHz

Applicant: Shenzhen Chuangwei-RGB Electronics Co., Ltd.
Date of Test: 25 April 2019 Model: NTUD-T4

4.4 Out of Band Conducted Emissions, FCC Rule 15.247(d)

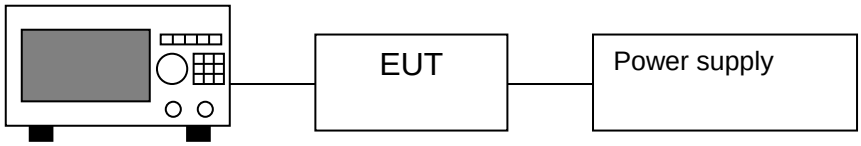
In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. The Measurement Procedure was set according to the FCC KDB 558074 D01 v05r02.

All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the passband.

Refer to the attached test plots for out of band conducted emissions data with rate of 1Mbps for 802.11b, 6Mbps for 802.11g, 6.5Mbps for 802.11n-HT20 and 13.5Mbps for 802.11n-HT40.

The test plots showed all spurious emission up to the tenth harmonic were measured and they were found to be at least 20 dB below the highest level of the desired power in the passband.

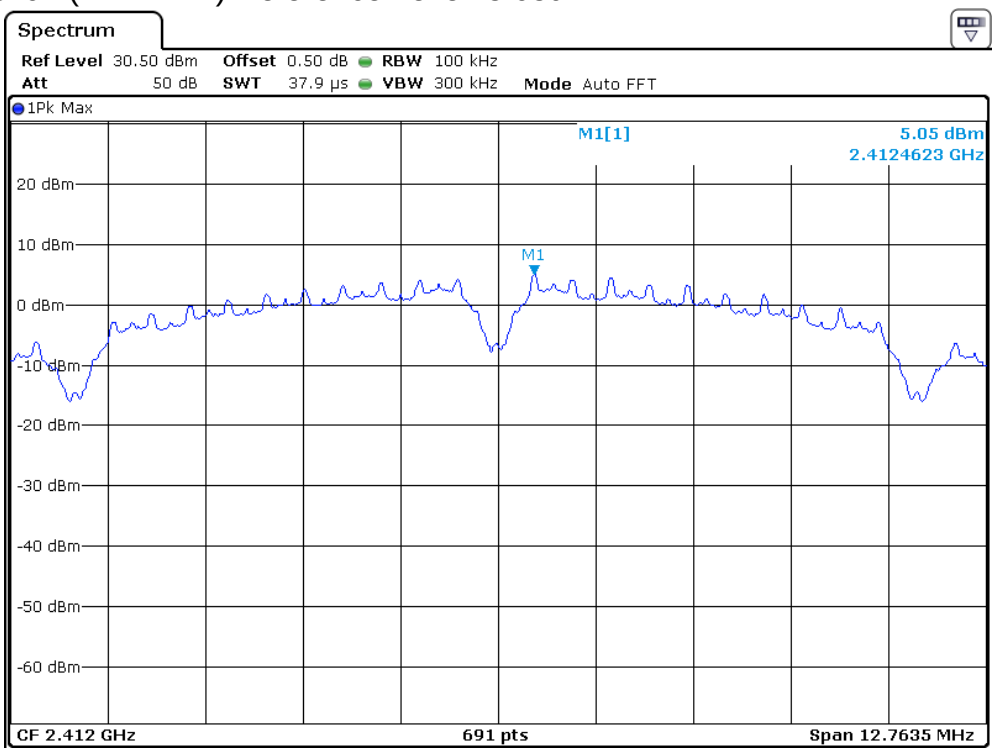
Block Diagram:

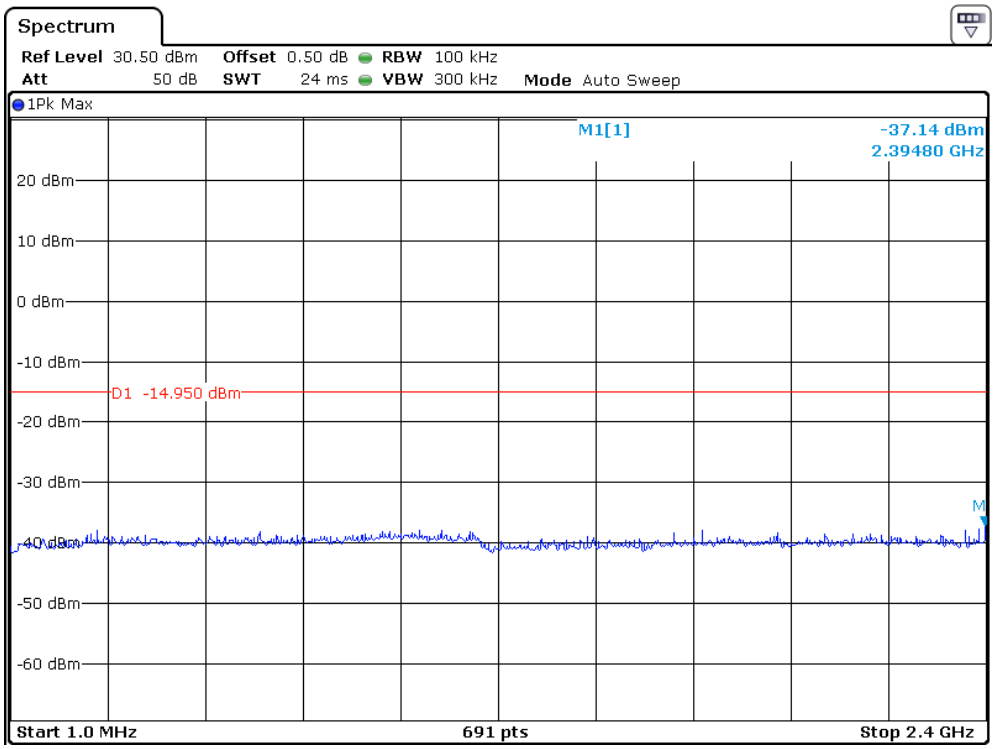


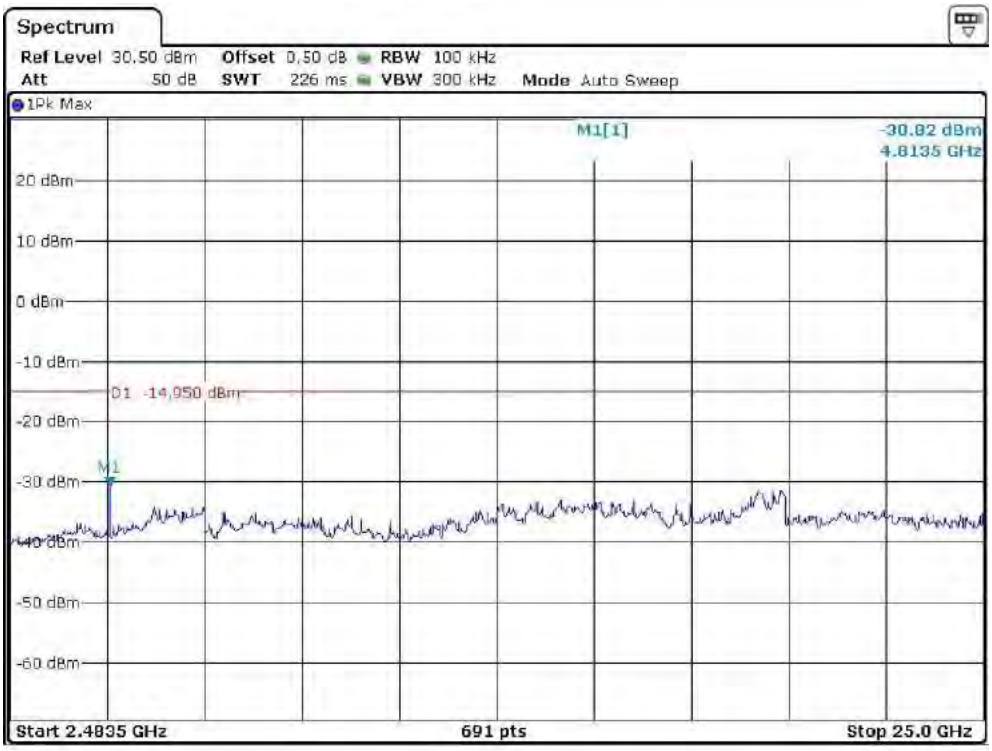
Spectrum Analyzer

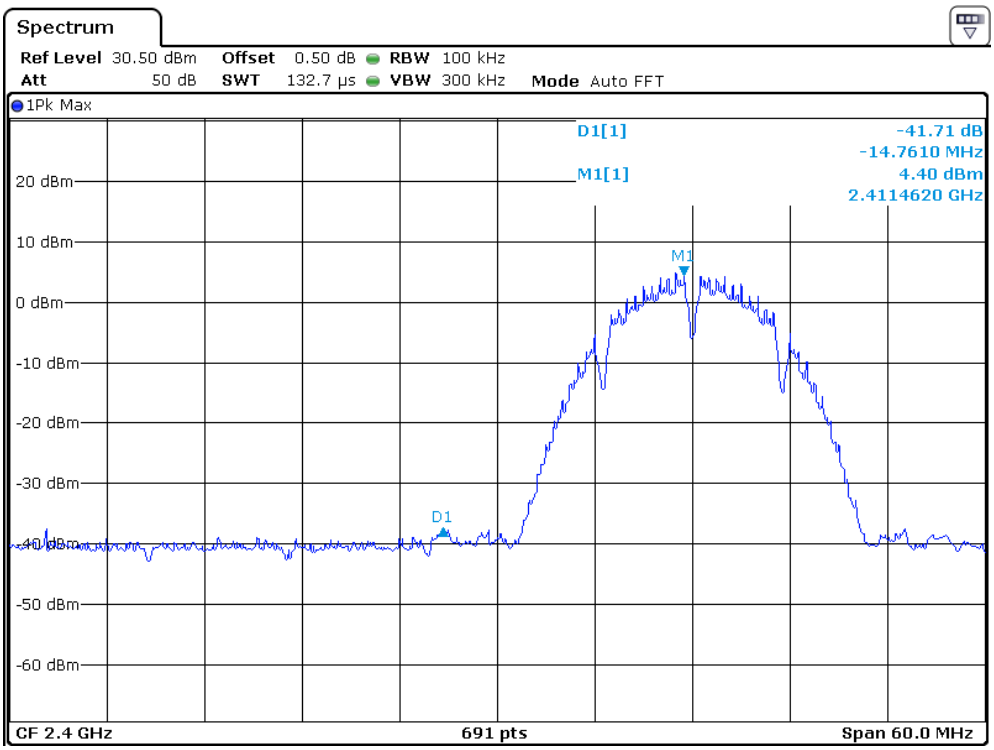
The test plots are attached as below.

SISO Mode, Ant 1:
802.11b
Channel 01 (2412MHz) Reference Level: 5.05dBm

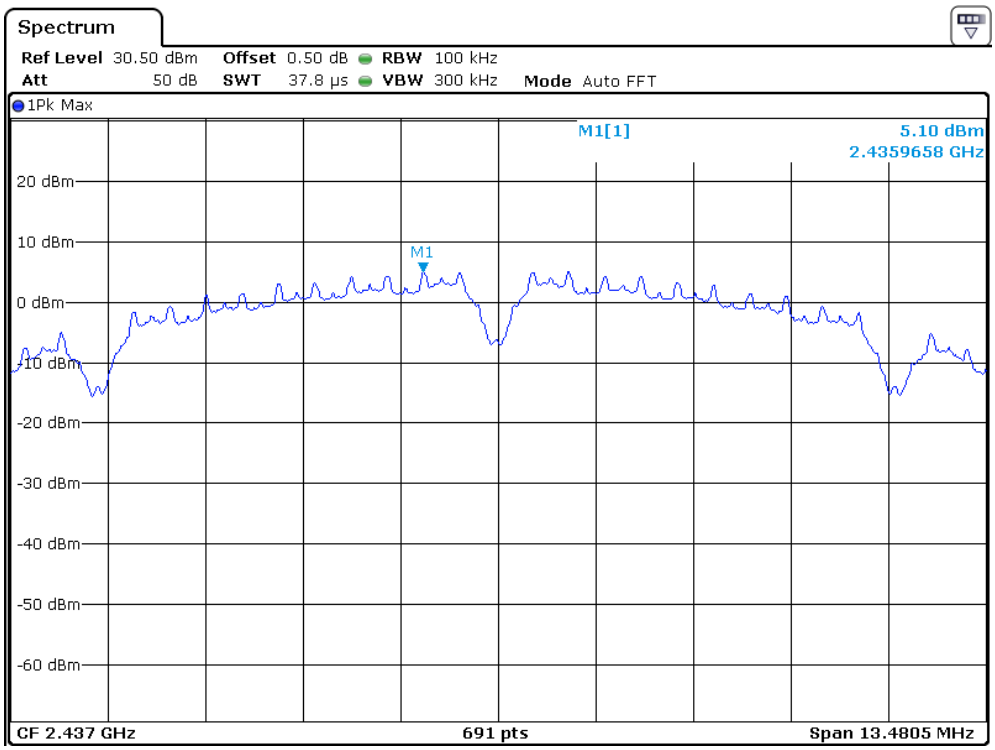


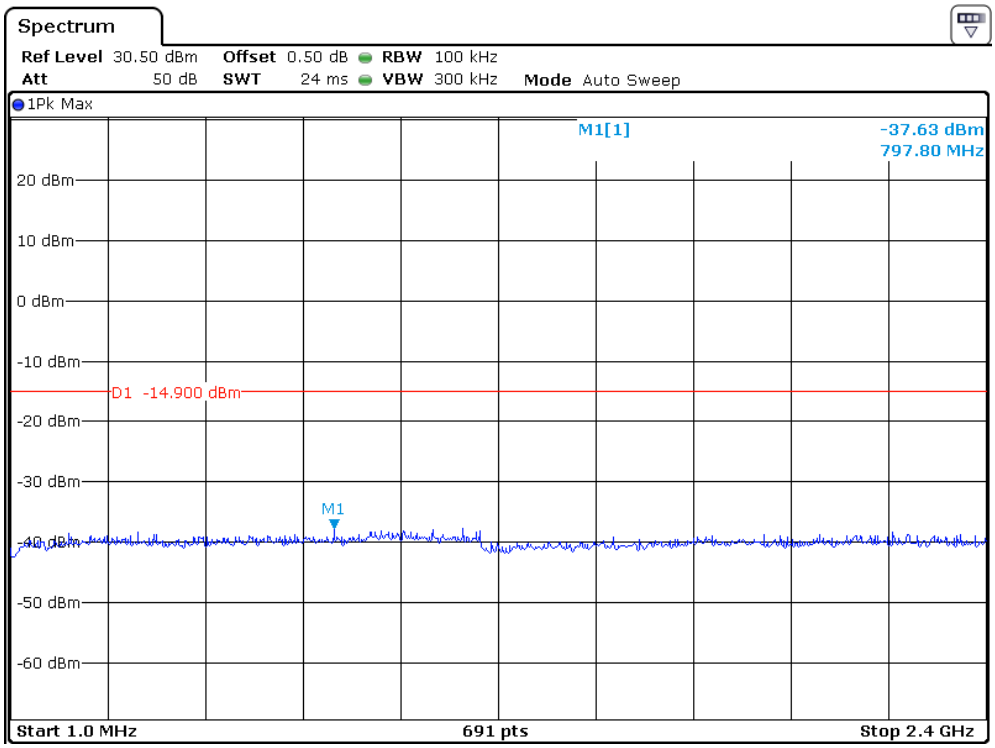


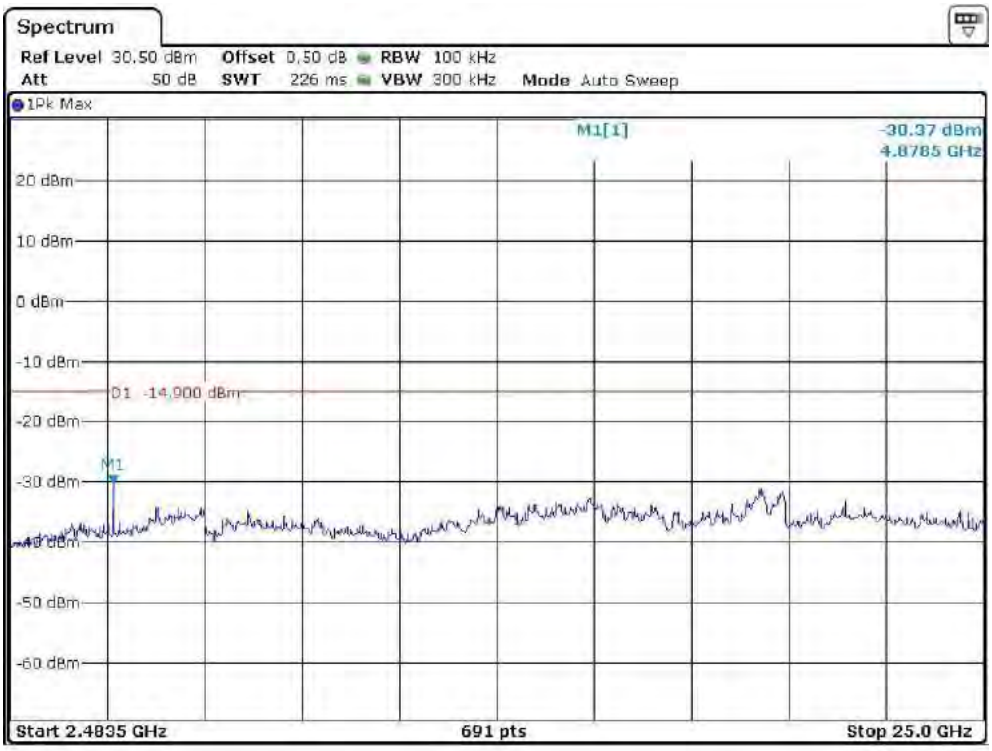

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -30.82 dBm
4.8135 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
D1 -14.950 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
Start 2.4835 GHz
691 pts
Stop 25.0 GHz


Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 132.7 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] -41.71 dB
-14.7610 MHz
M1[1] 4.40 dBm
2.4114620 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
D1
CF 2.4 GHz
691 pts
Span 60.0 MHz

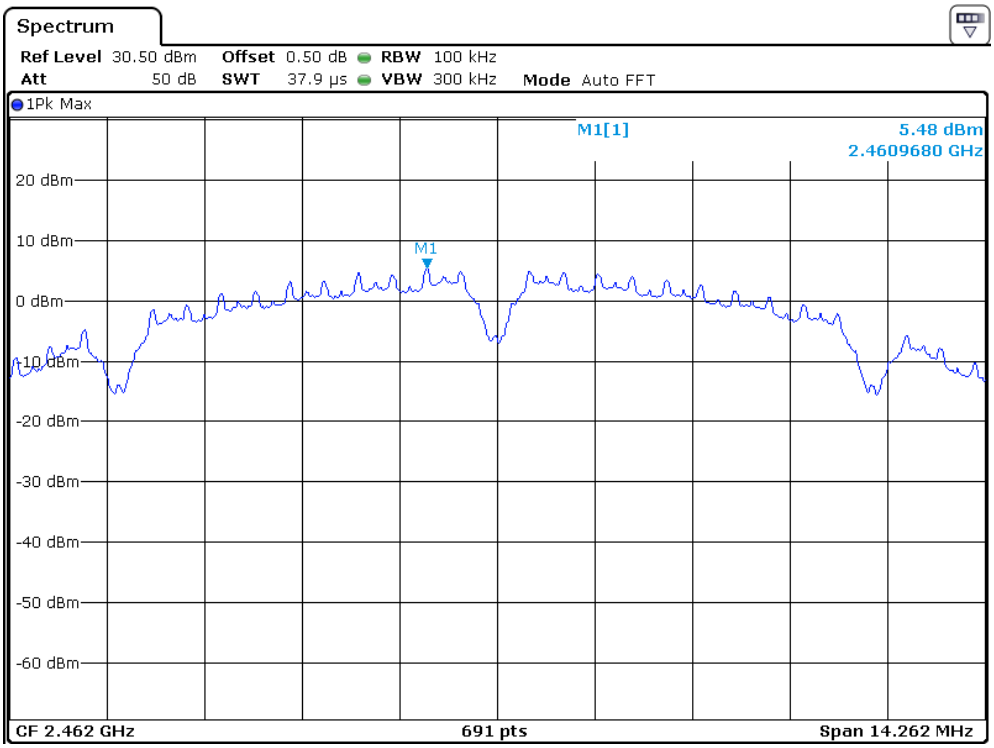
Channel 06 (2437MHz) Reference Level: 5.1dBm

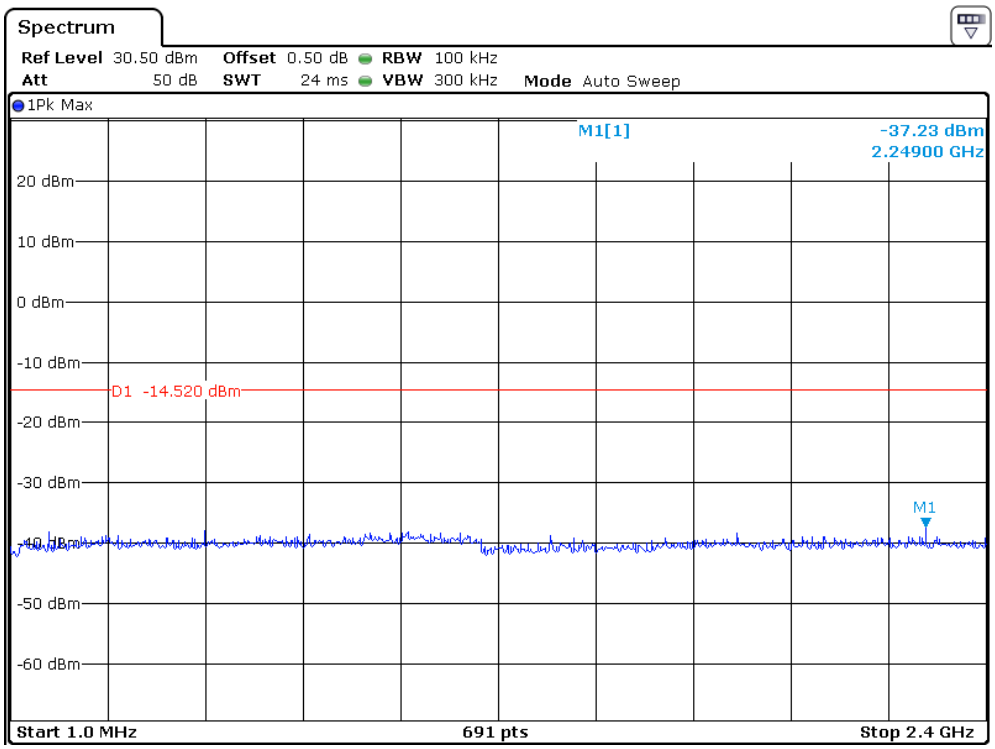


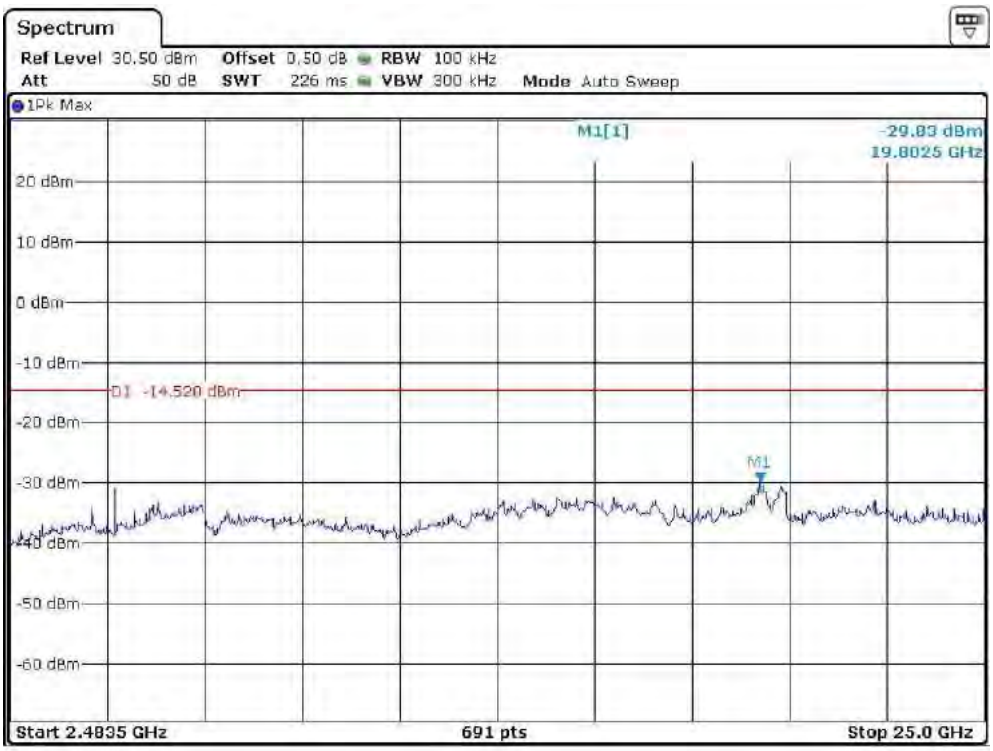


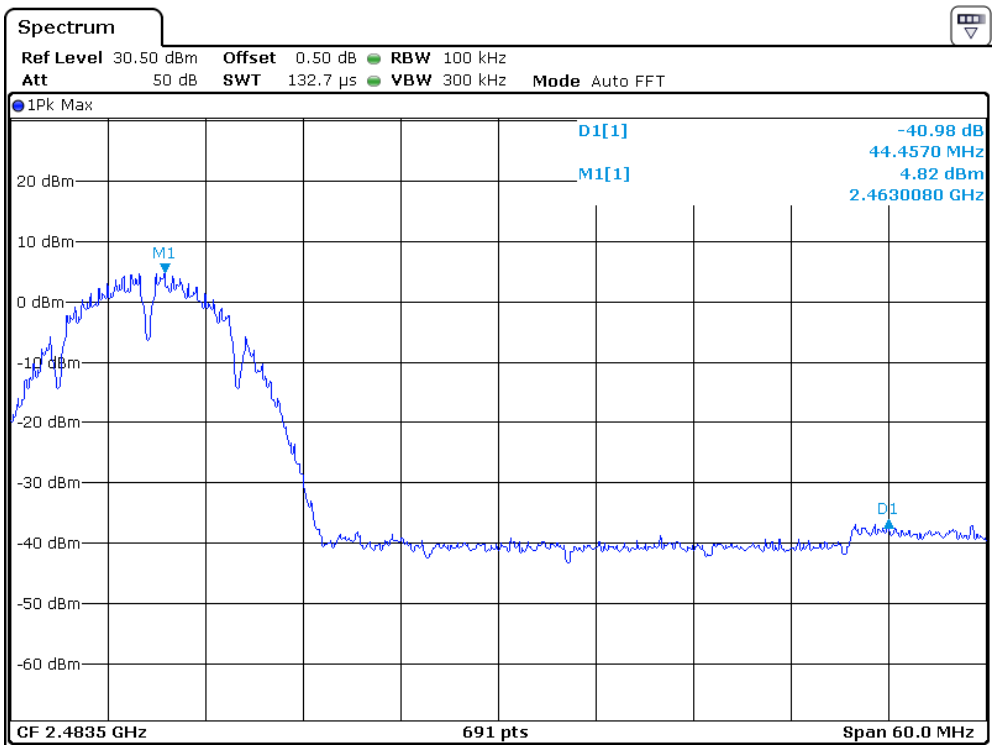


Channel 11 (2462MHz) Reference Level: 5.48dBm

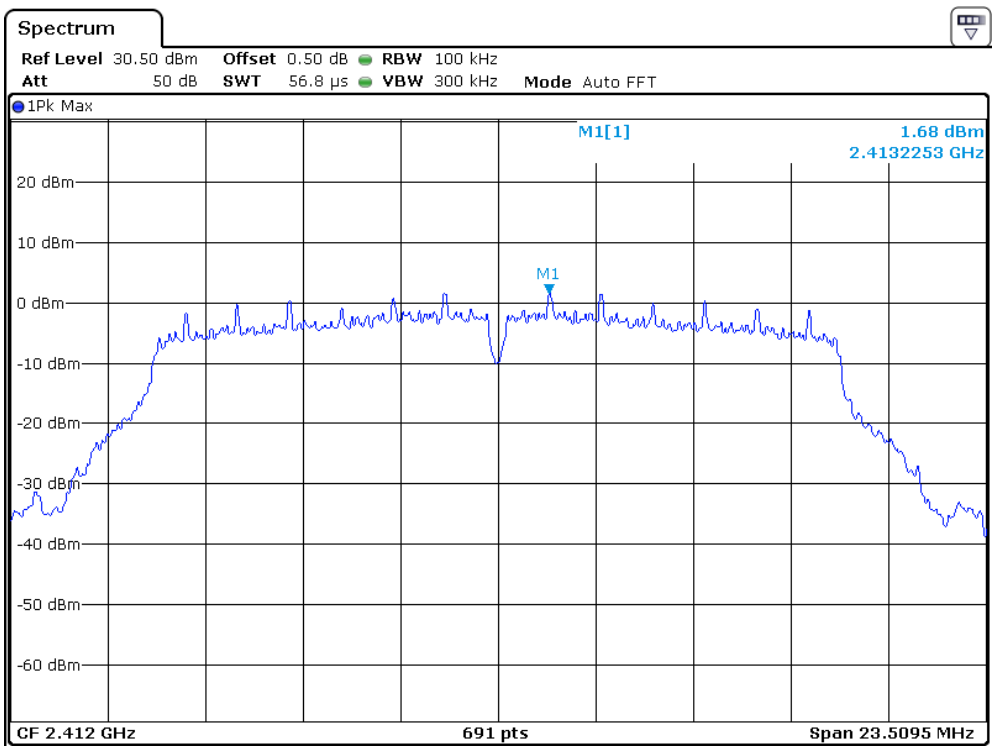


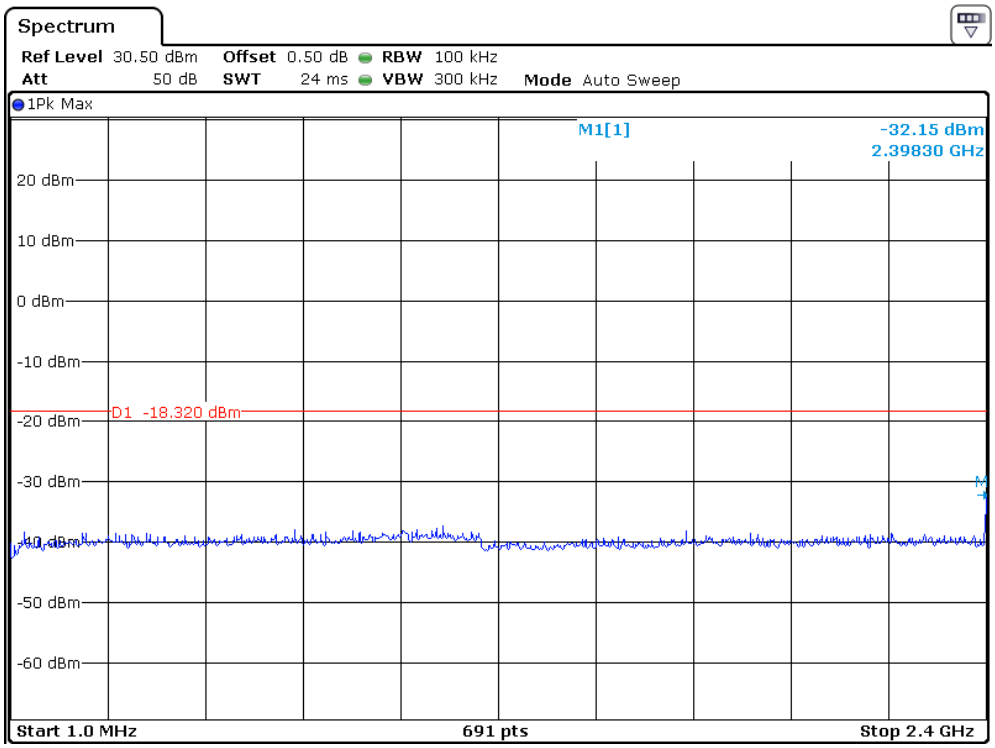

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 24 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -37.23 dBm
2.24900 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
D1 -14.520 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
Start 1.0 MHz
691 pts
Stop 2.4 GHz

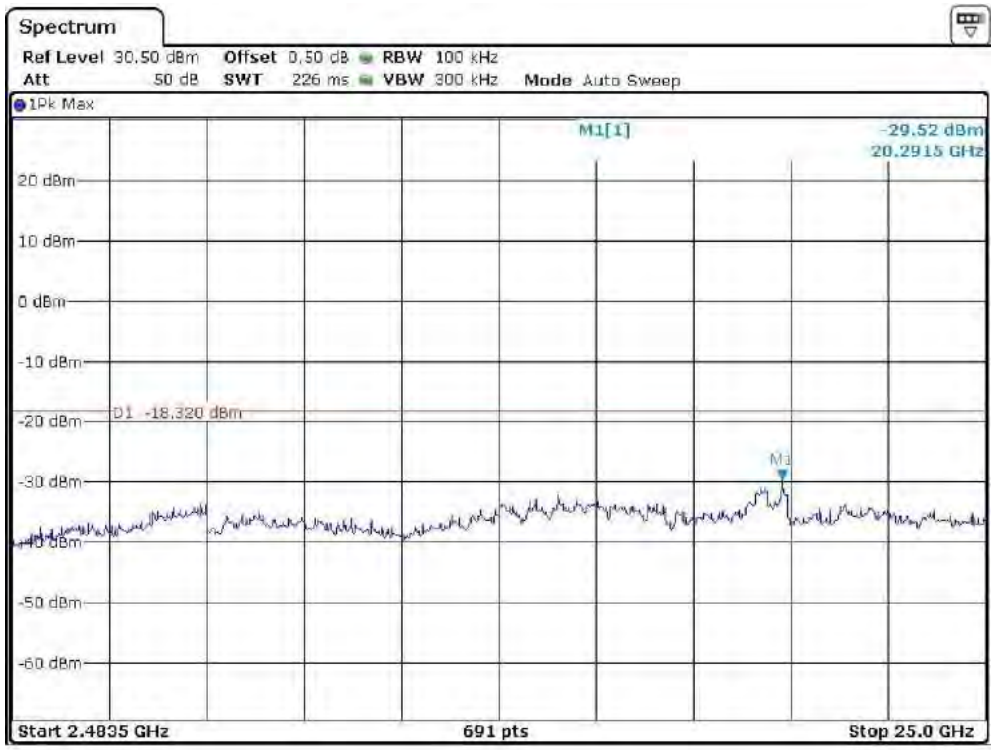

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -29.83 dBm
19.8025 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
D1 -14.520 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
Start 2.4835 GHz
691 pts
Stop 25.0 GHz

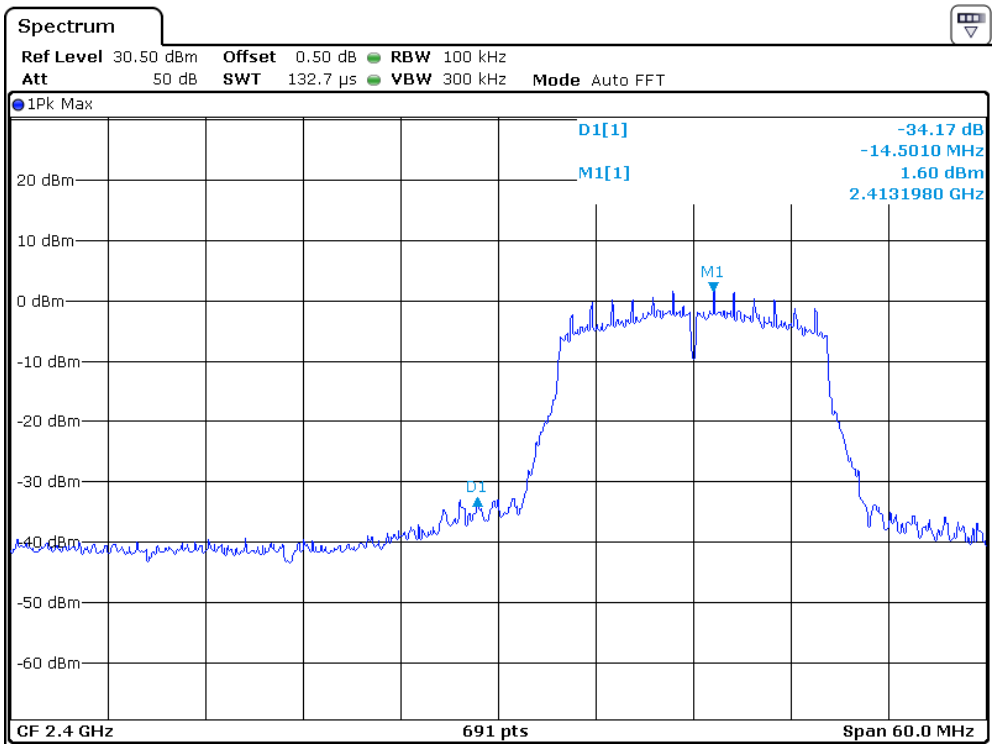


802.11g
Channel 01 (2412MHz) Reference Level: 1.68dBm

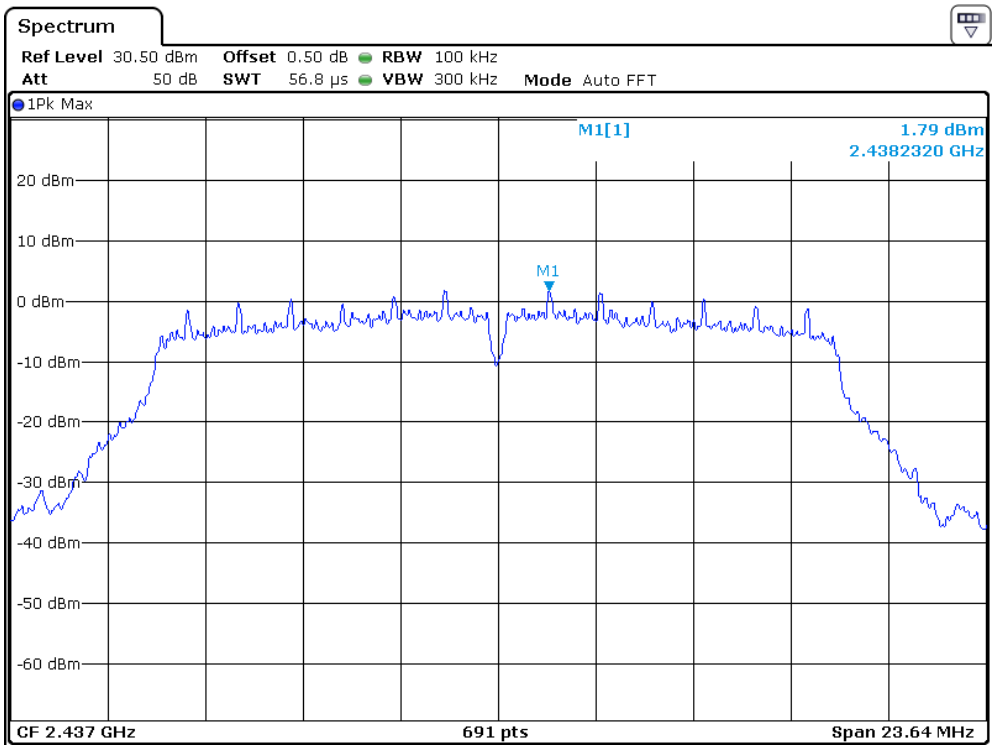


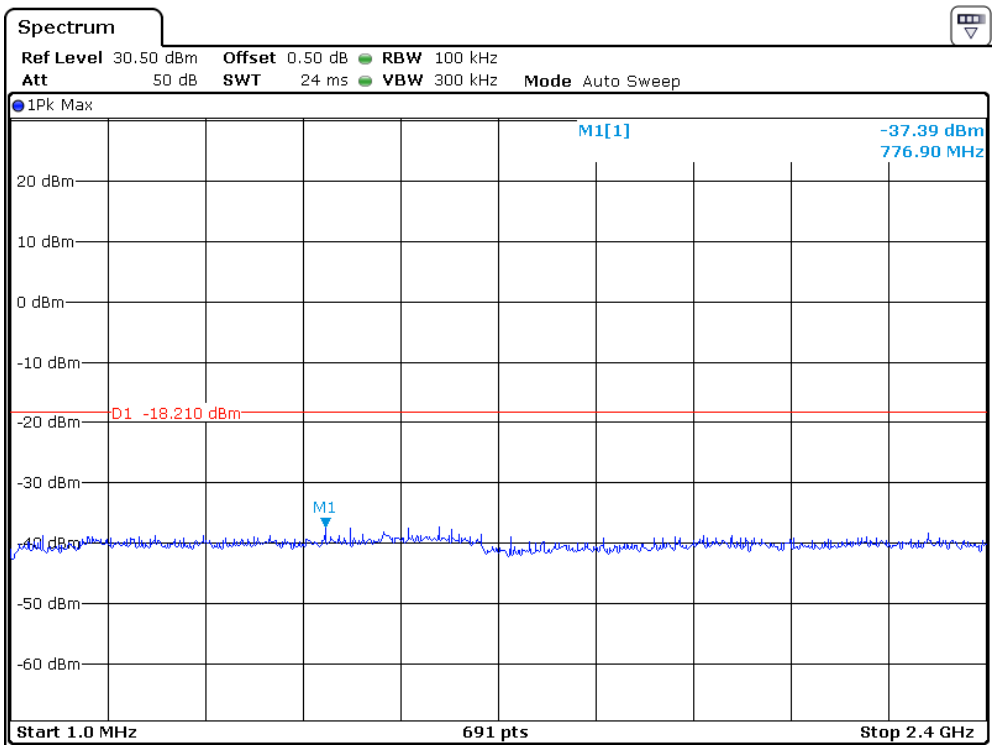

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 24 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -32.15 dBm
2.39830 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
D1 -18.320 dBm
-20 dBm
-30 dBm
-50 dBm
-60 dBm
Start 1.0 MHz
691 pts
Stop 2.4 GHz

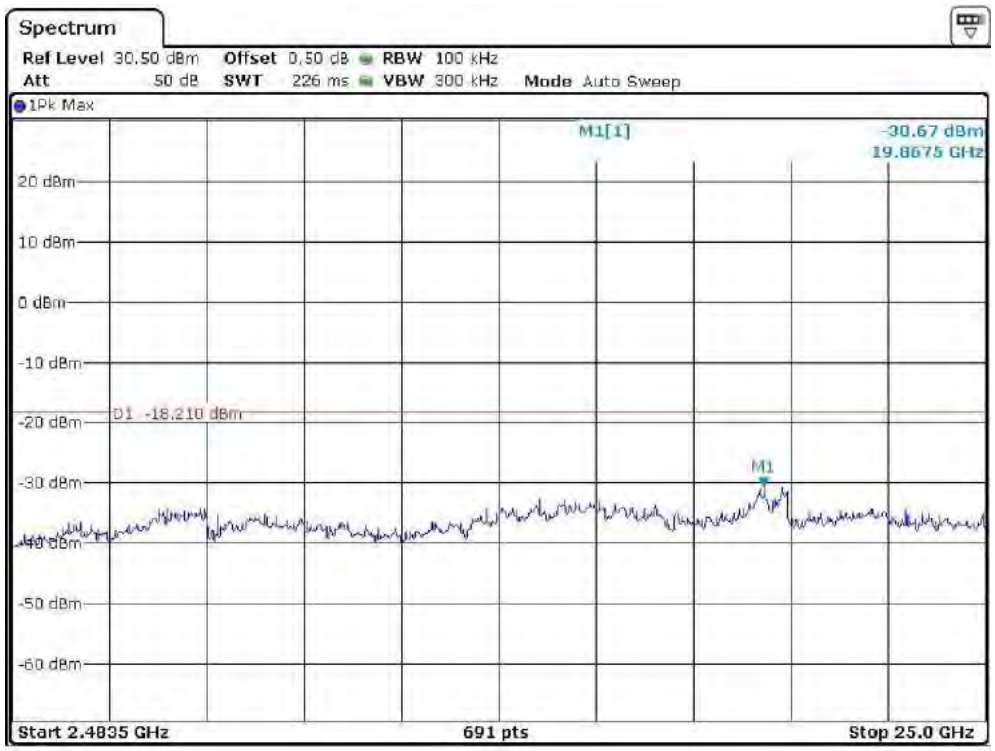

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -29.52 dBm
20.2915 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
D1 -18.320 dBm
-20 dBm
-30 dBm
-50 dBm
-60 dBm
Start 2.4835 GHz
691 pts
Stop 25.0 GHz



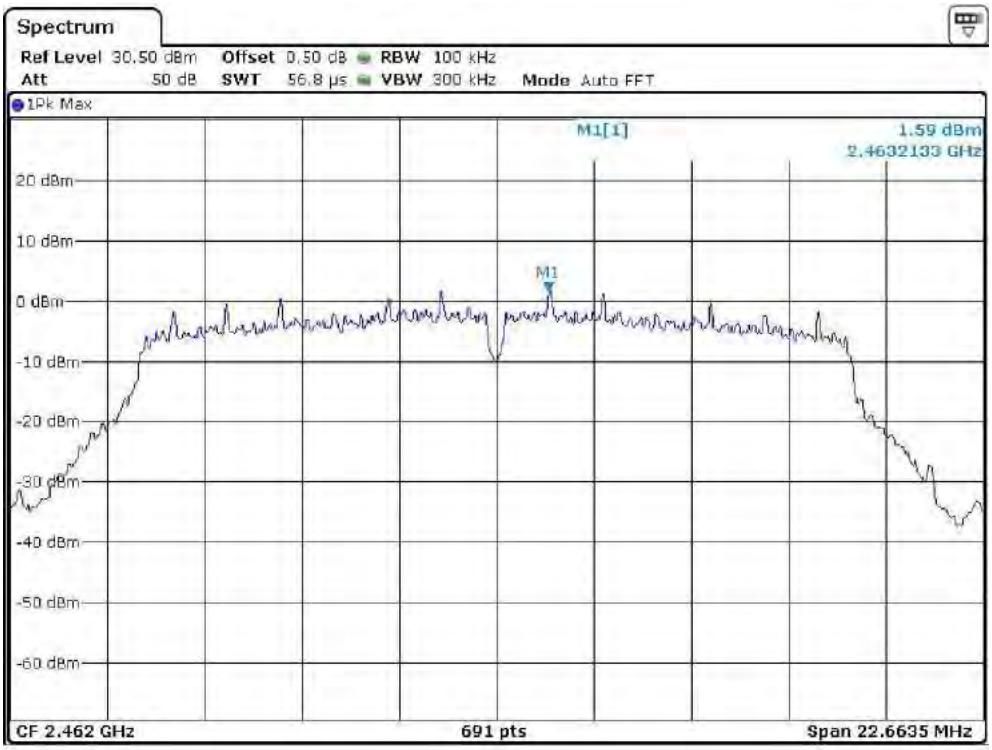
Channel 06 (2437MHz) Reference Level: 1.79dBm

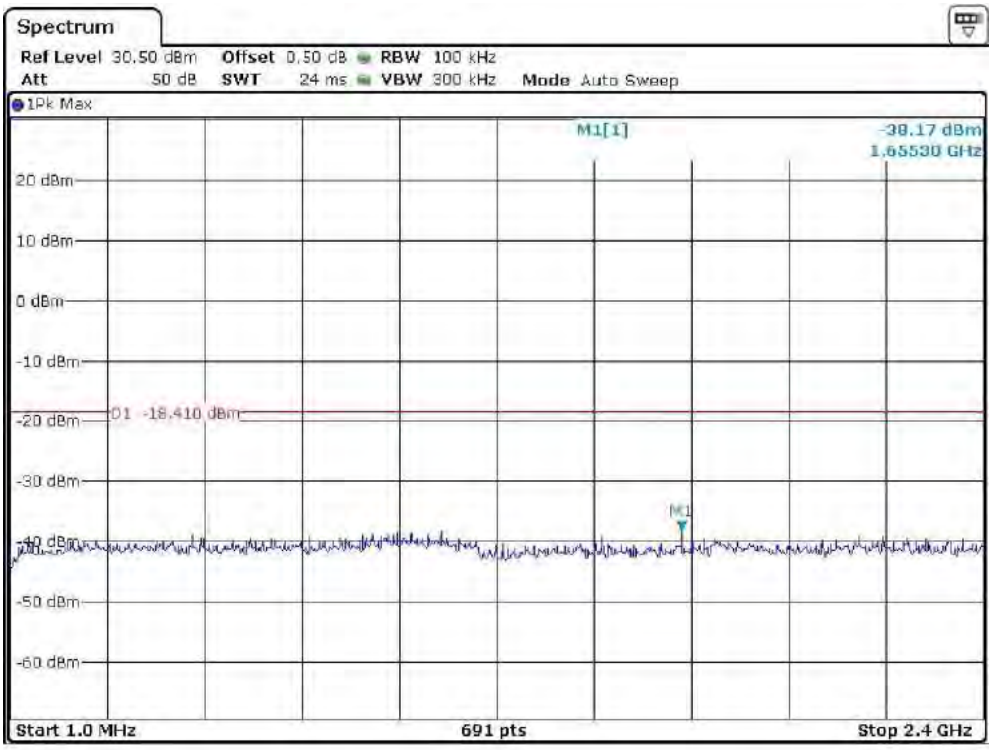


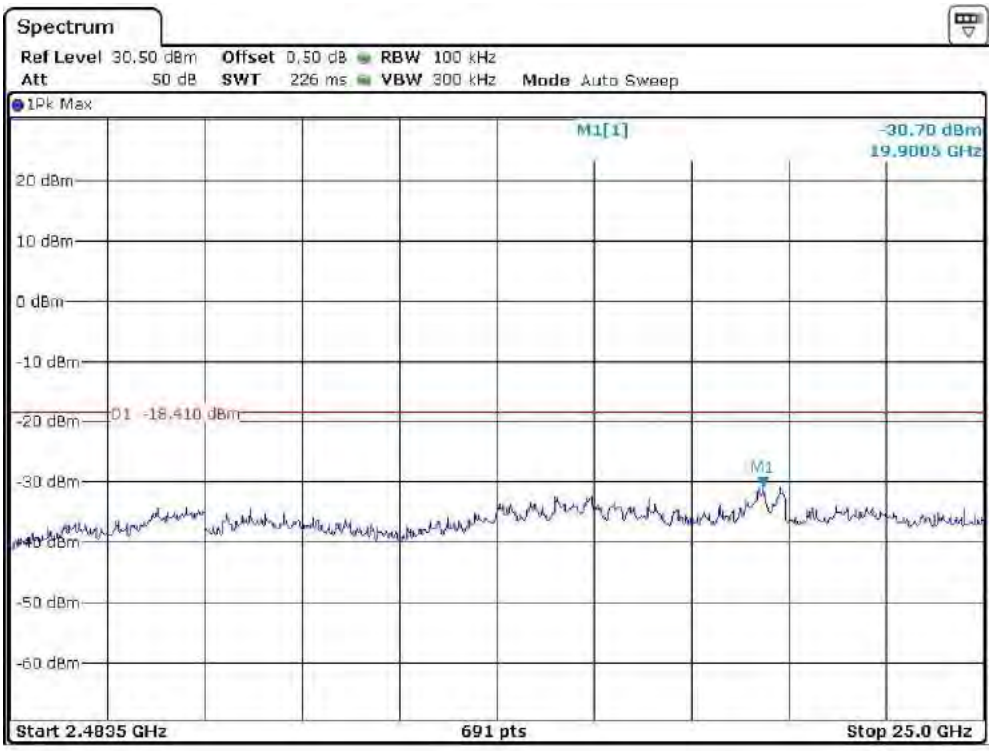

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 24 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -37.39 dBm
776.90 MHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
D1 -18.210 dBm
M1
Start 1.0 MHz
691 pts
Stop 2.4 GHz

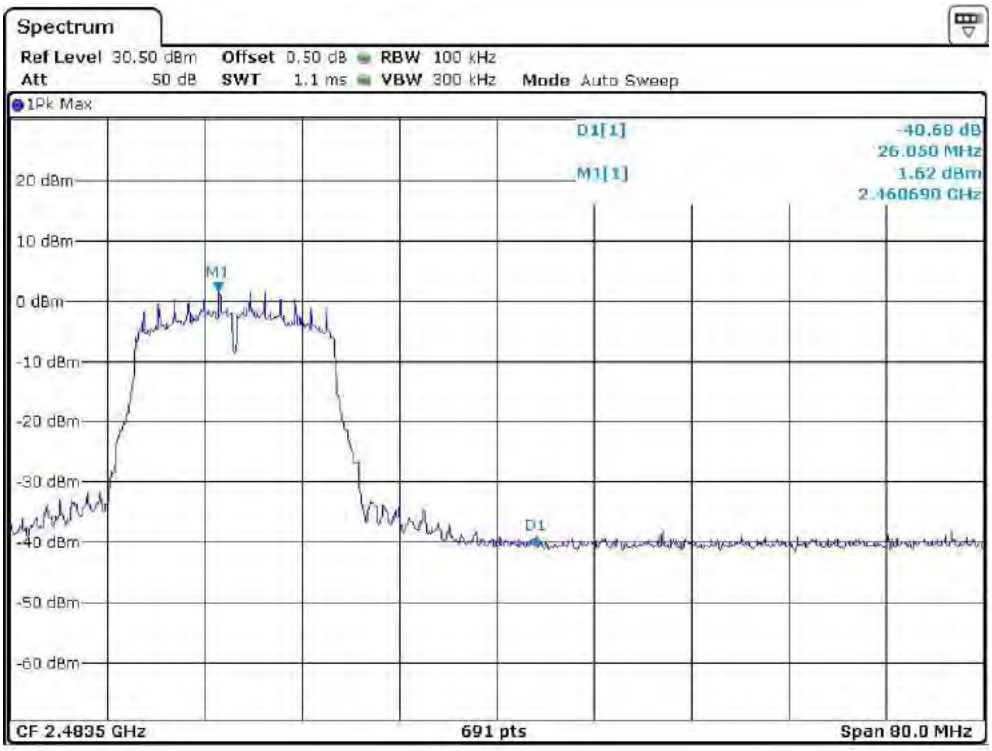

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -30.67 dBm
19.8675 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
D1 -18.210 dBm
M1
Start 2.4835 GHz
691 pts
Stop 25.0 GHz

Channel 11 (2462MHz) Reference Level: 1.59dBm

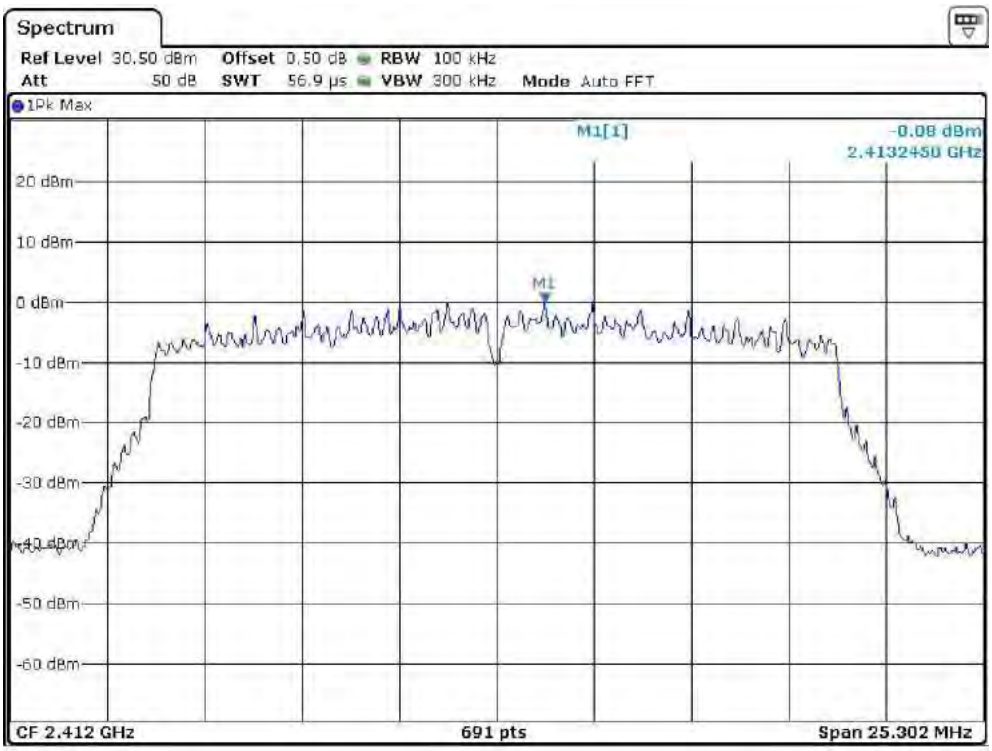


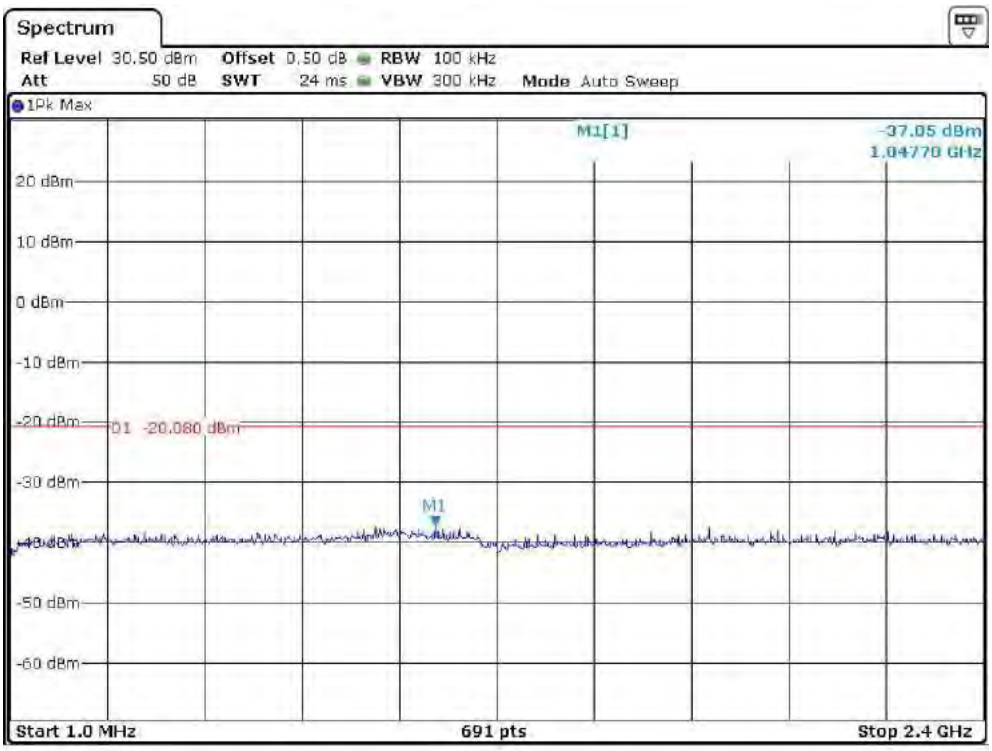


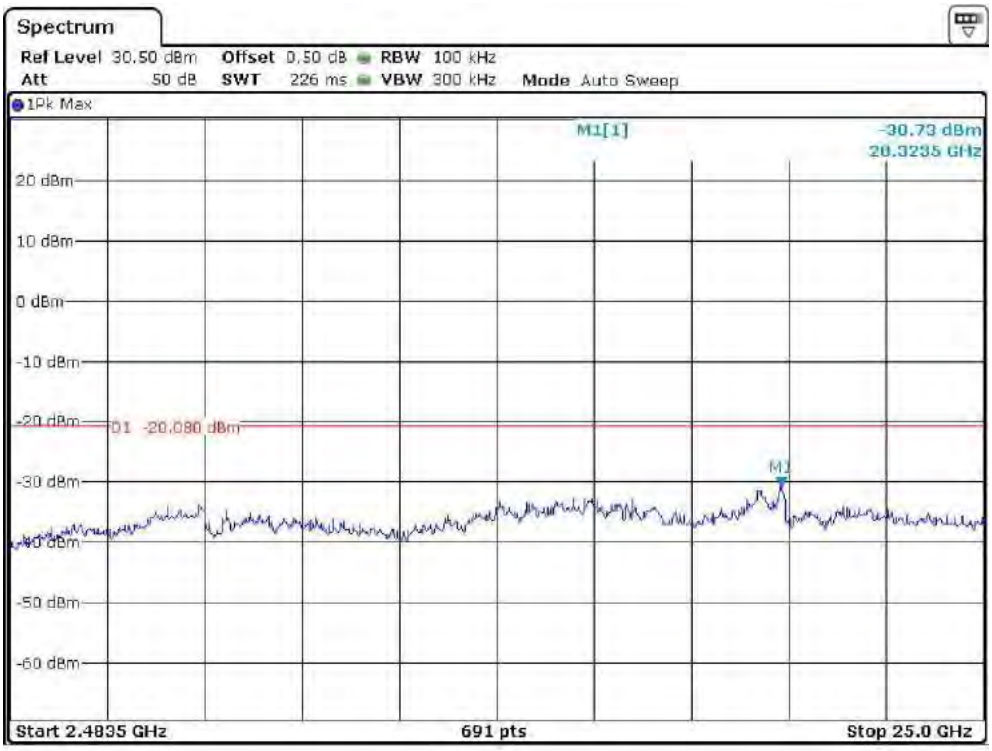

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -30.70 dBm
19.9005 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -18.410 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
Start 2.4835 GHz
691 pts
Stop 25.0 GHz

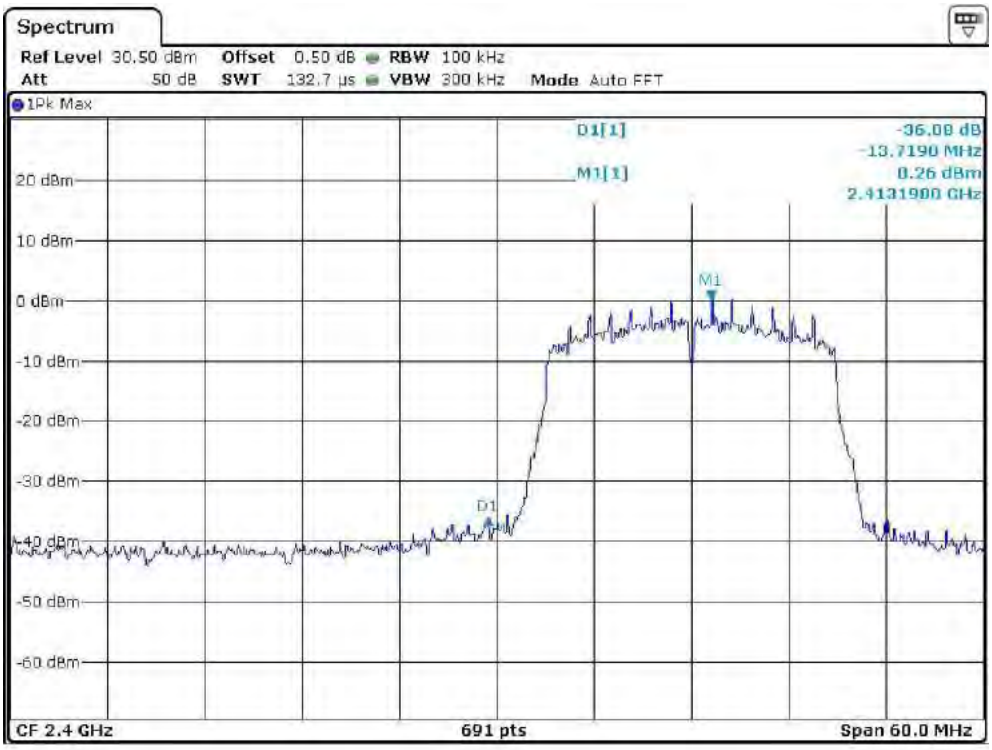

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 1.1 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
D1[1] -40.60 dB
26.050 MHz
M1[1] 1.62 dBm
2.460690 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
D1
CF 2.4835 GHz
691 pts
Span 80.0 MHz

802.11n-HT20
Channel 01 (2412MHz) Reference Level: -0.08dBm

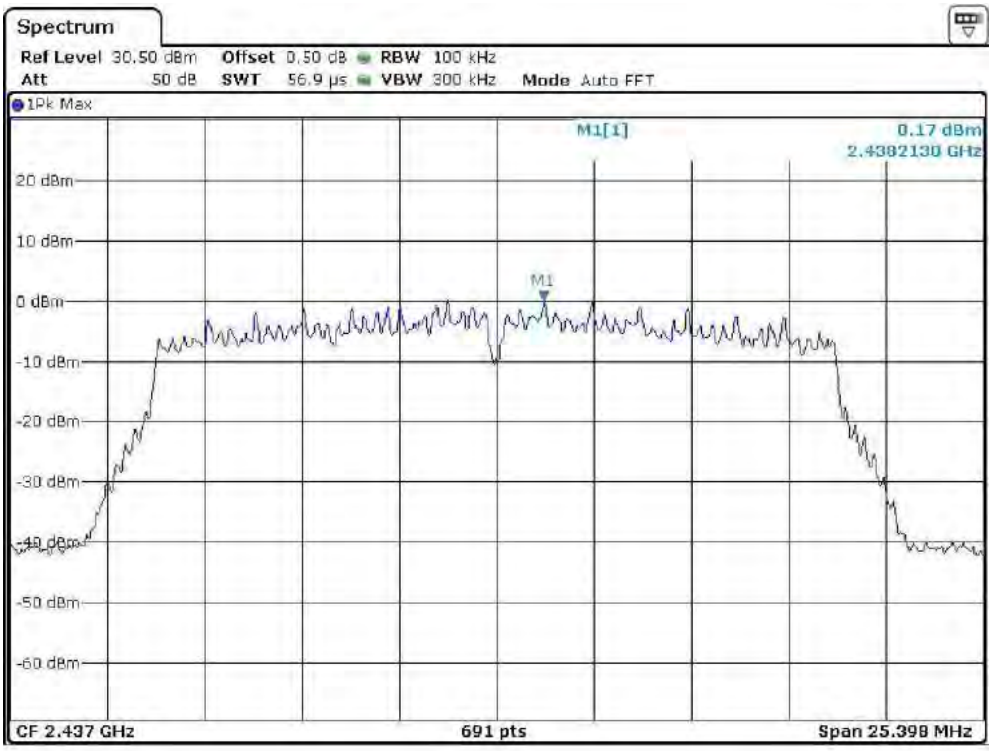


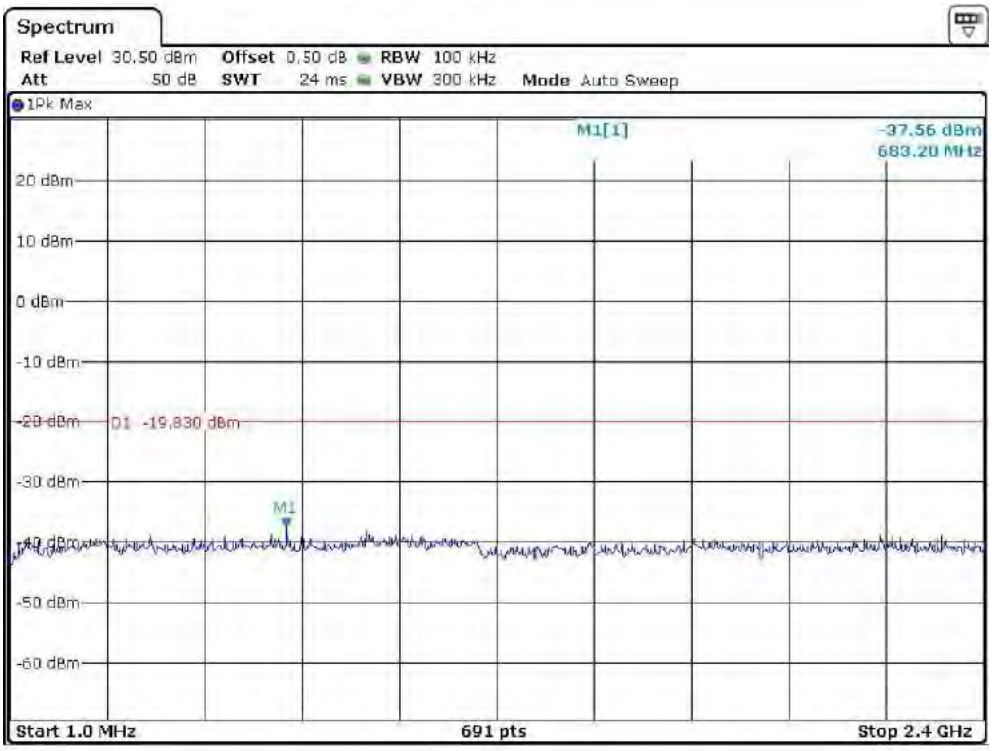



Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -30.73 dBm
20.3235 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -20.080 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
Start 2.4835 GHz
691 pts
Stop 25.0 GHz

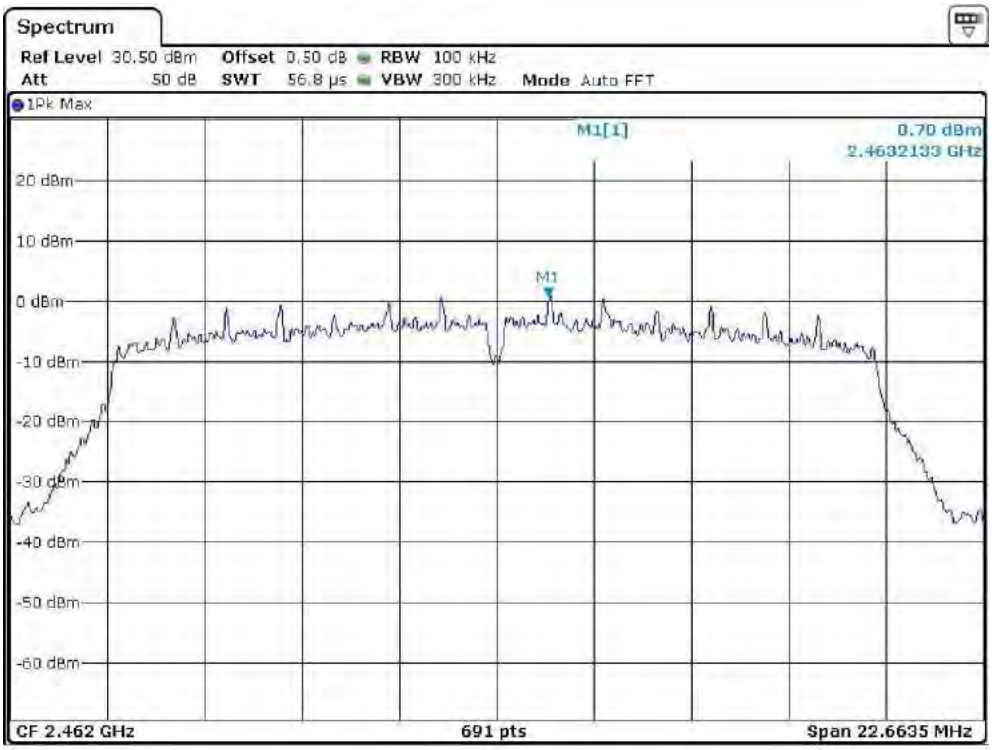

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 132.7 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] -36.00 dB
-13.7190 MHz
M1[1] 0.26 dBm
2.4131900 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
D1
CF 2.4 GHz
691 pts
Span 60.0 MHz

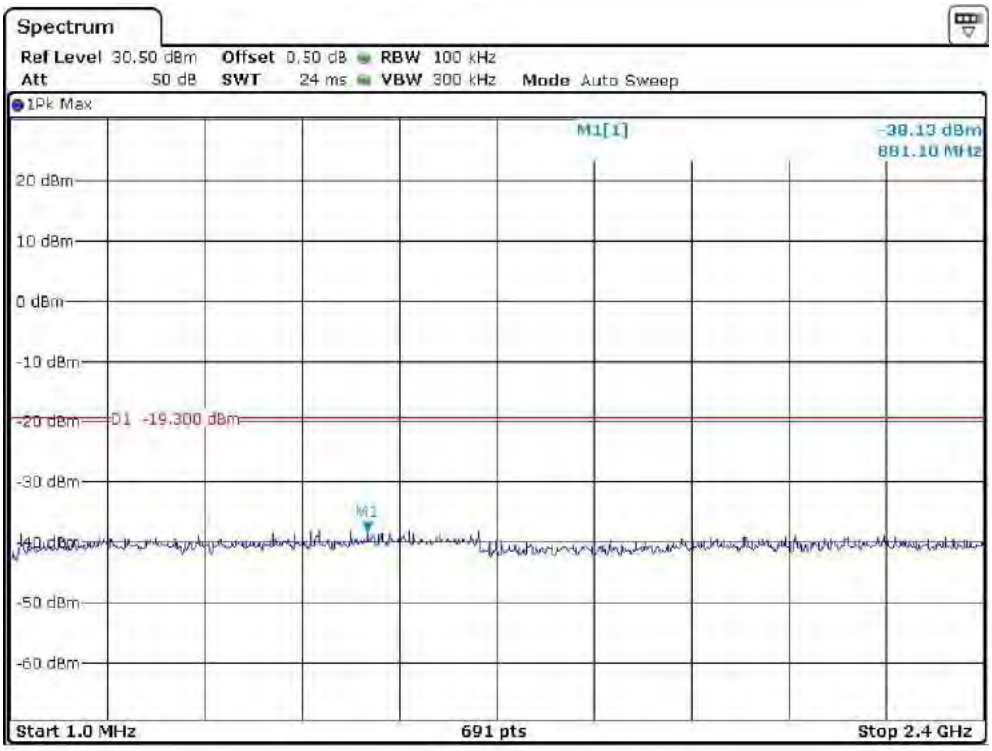
Channel 06 (2437MHz) Reference Level: 0.17dBm

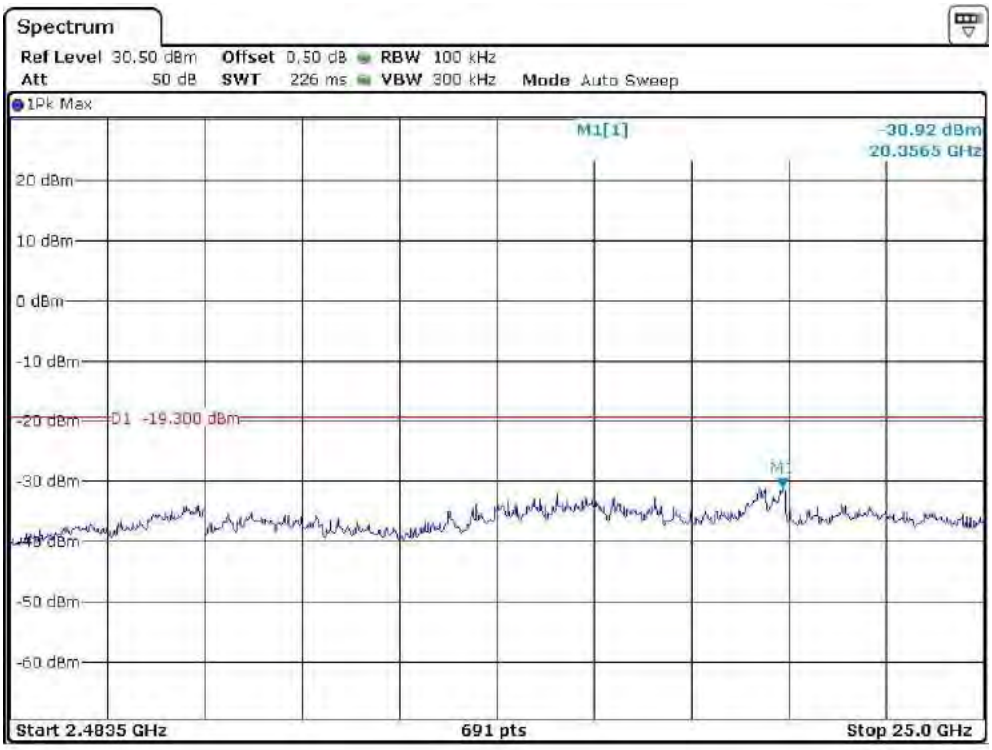


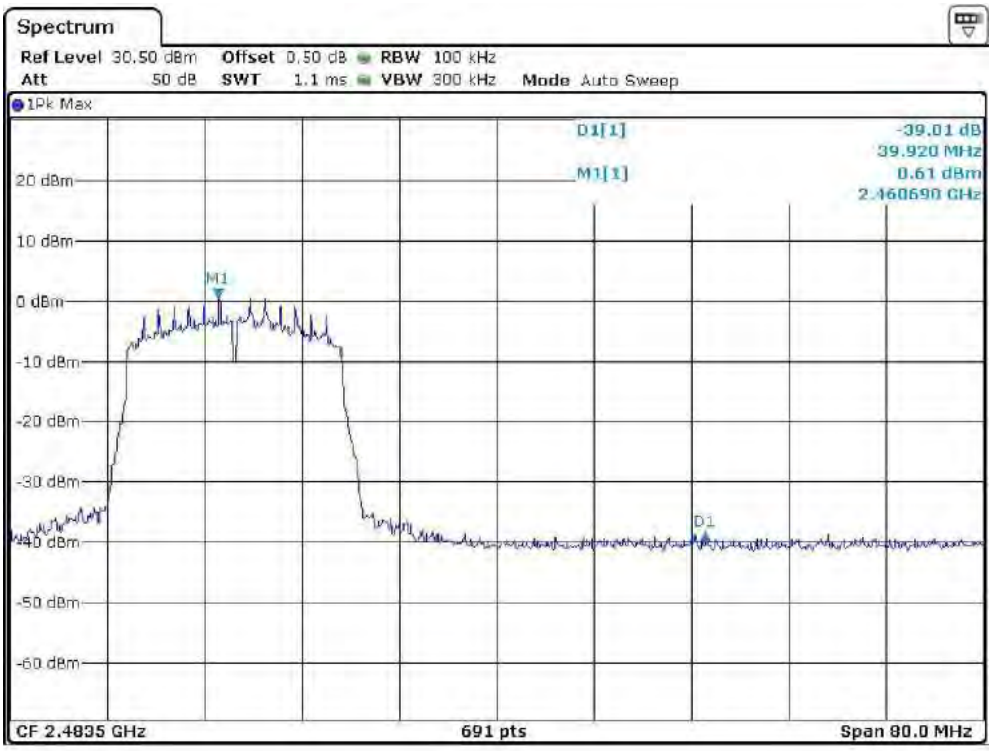


Channel 11 (2462MHz) Reference Level: 0.70dBm

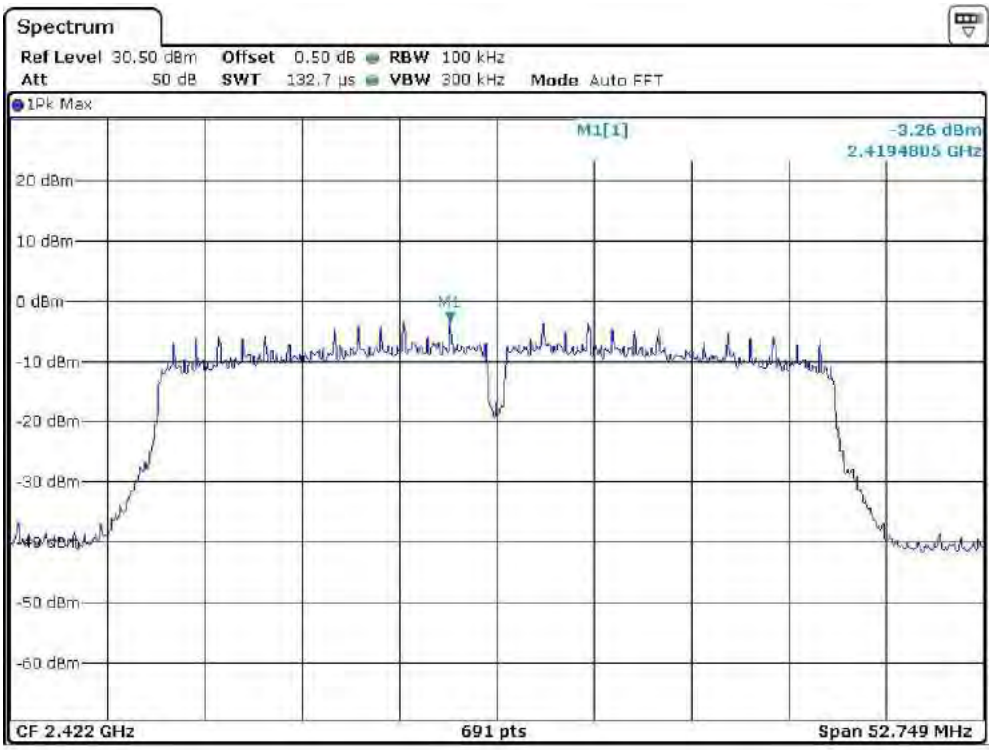


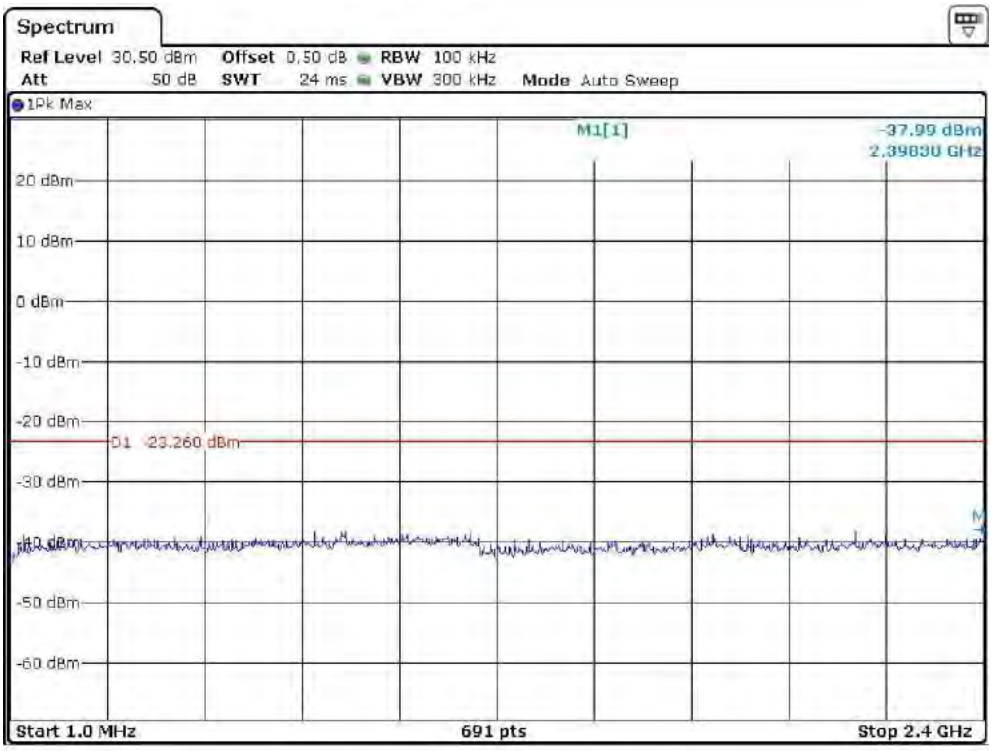

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 24 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -38.13 dBm
881.10 MHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -19.300 dBm
-30 dBm
M1
-40 dBm
-50 dBm
-60 dBm
Start 1.0 MHz
691 pts
Stop 2.4 GHz

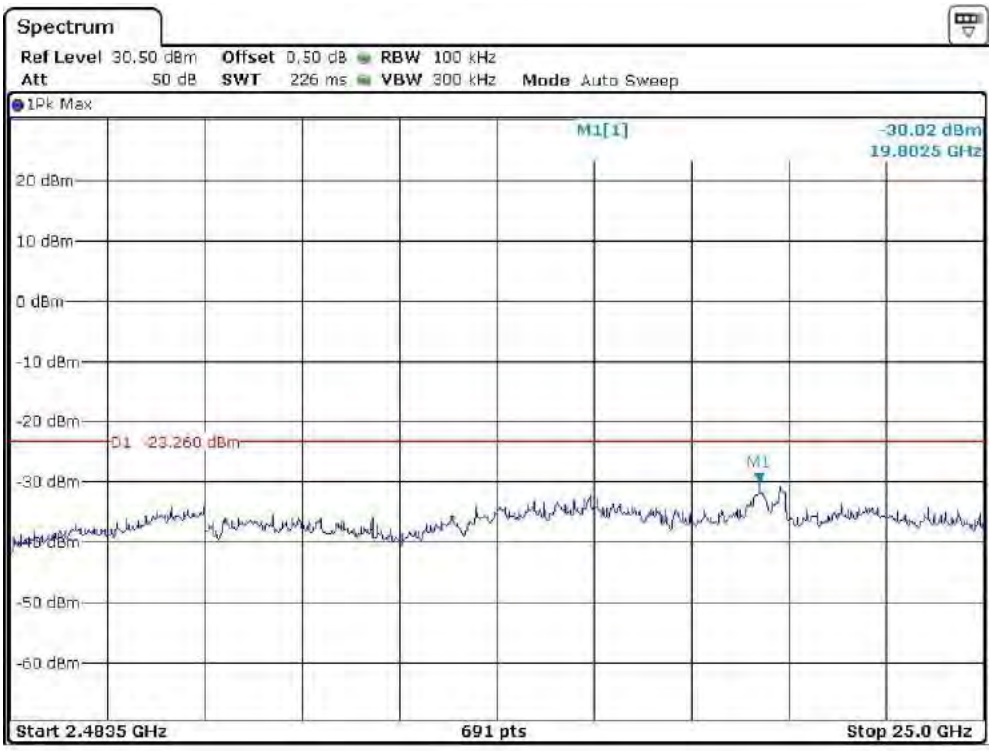

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -30.92 dBm
20.3565 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -19.300 dBm
-30 dBm
M1
-40 dBm
-50 dBm
-60 dBm
Start 2.4835 GHz
691 pts
Stop 25.0 GHz

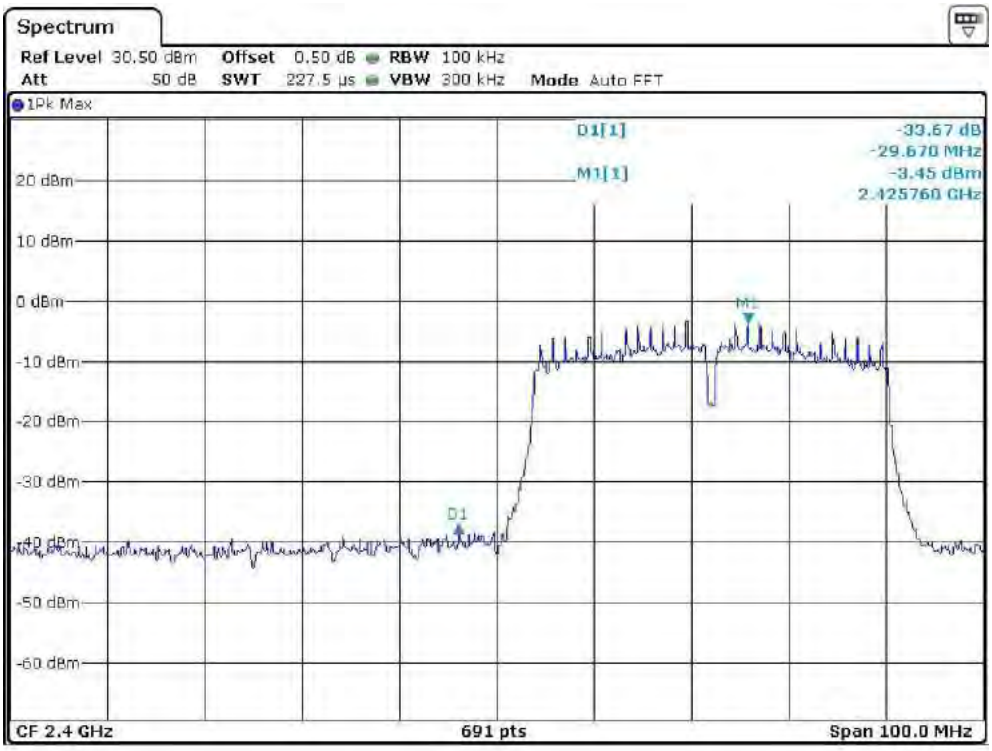


802.11n-HT40
Channel 03 (2422MHz) Reference Level: -3.26dBm

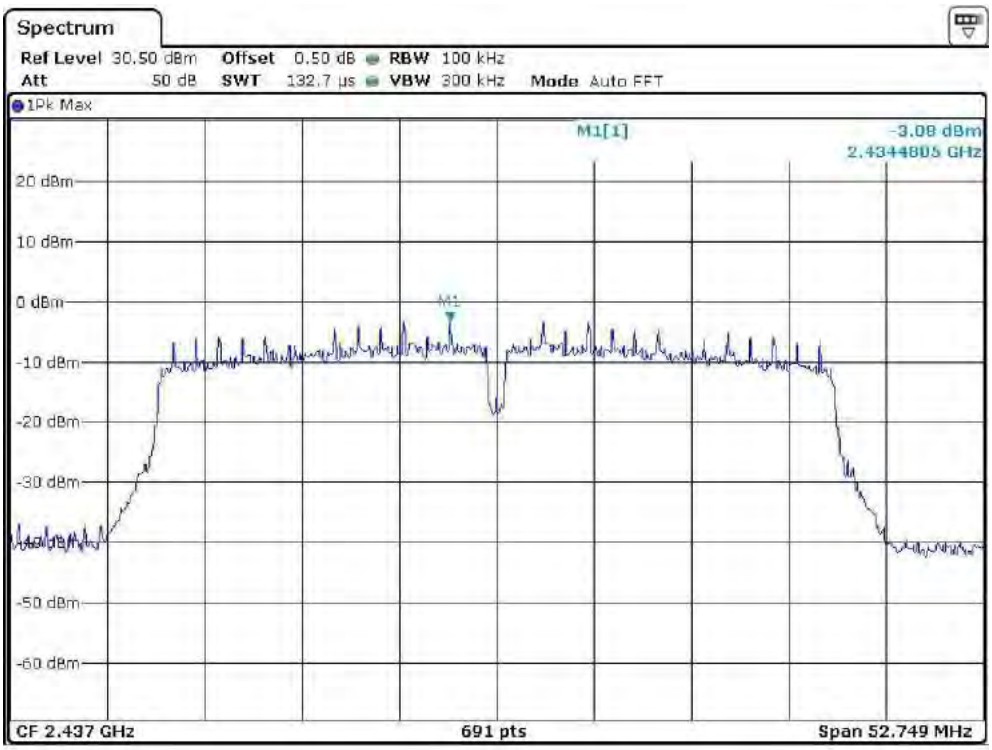


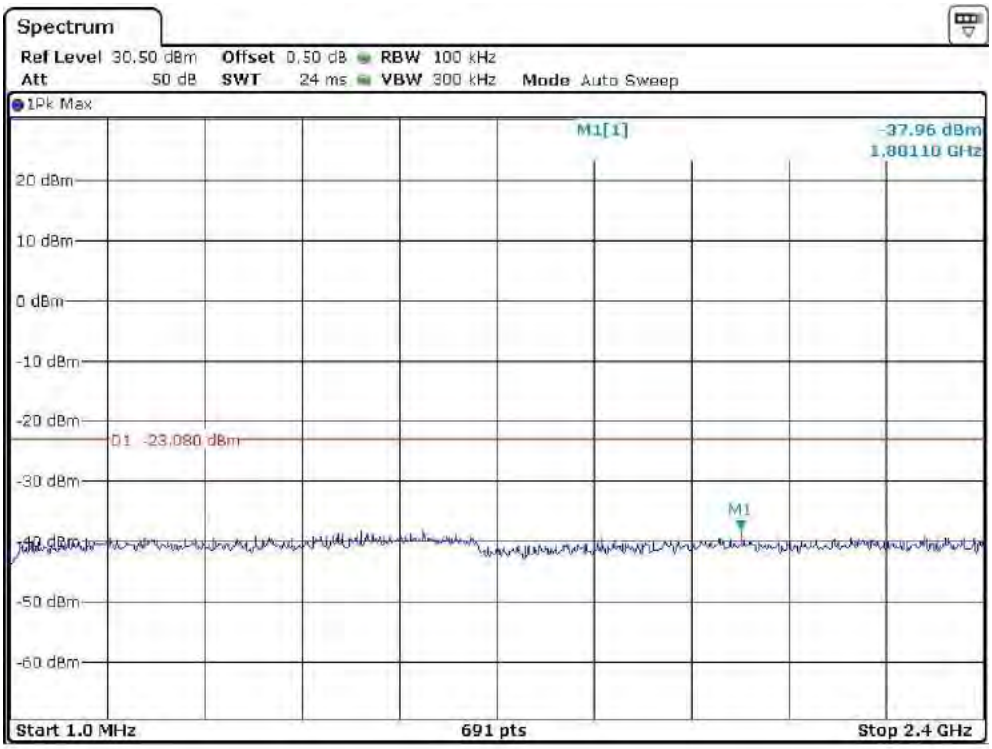

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 24 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -37.99 dBm
2.39830 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -23.260 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
Start 1.0 MHz
691 pts
Stop 2.4 GHz

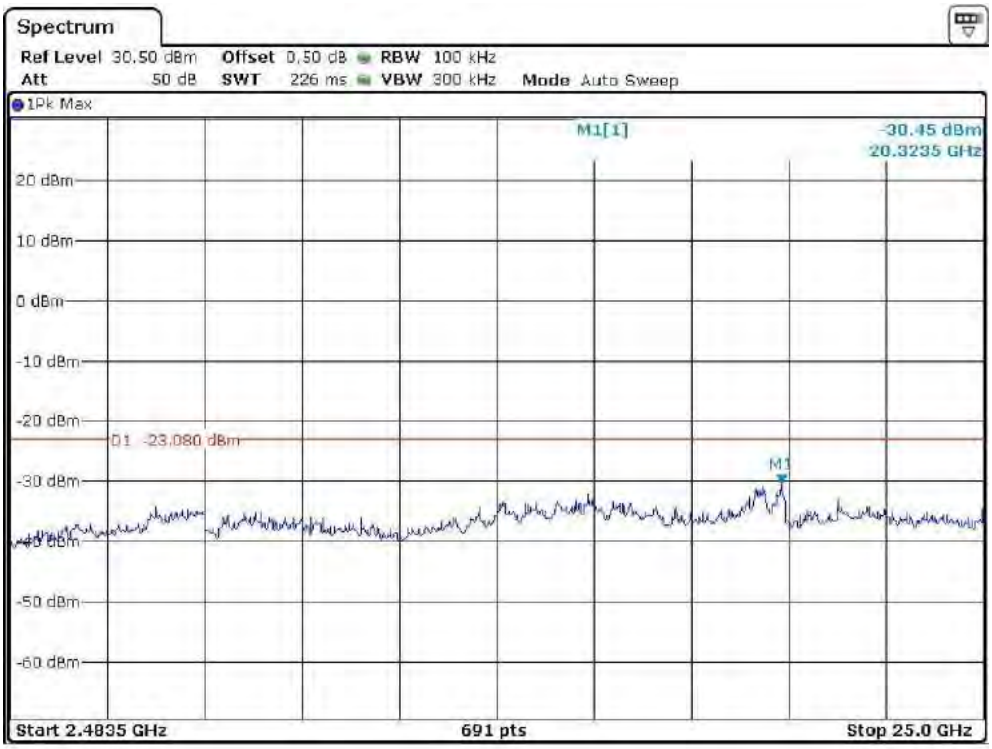

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -30.02 dBm
19.8025 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -23.260 dBm
M1
-30 dBm
-40 dBm
-50 dBm
-60 dBm
Start 2.4835 GHz
691 pts
Stop 25.0 GHz



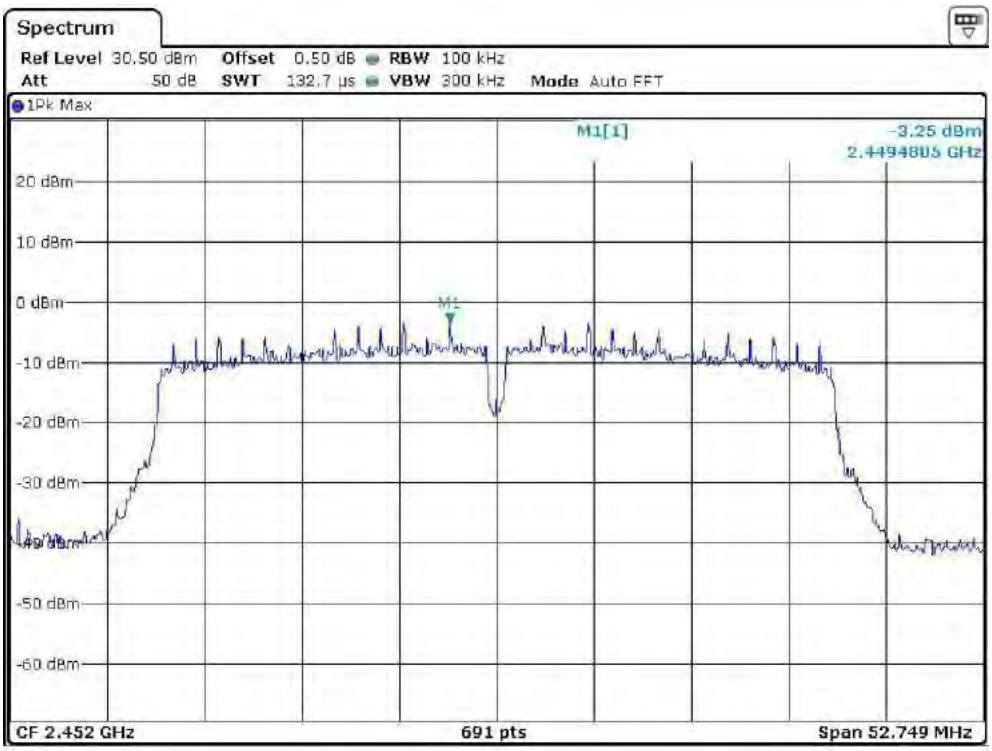
Channel 06 (2437MHz) Reference Level: -3.08dBm

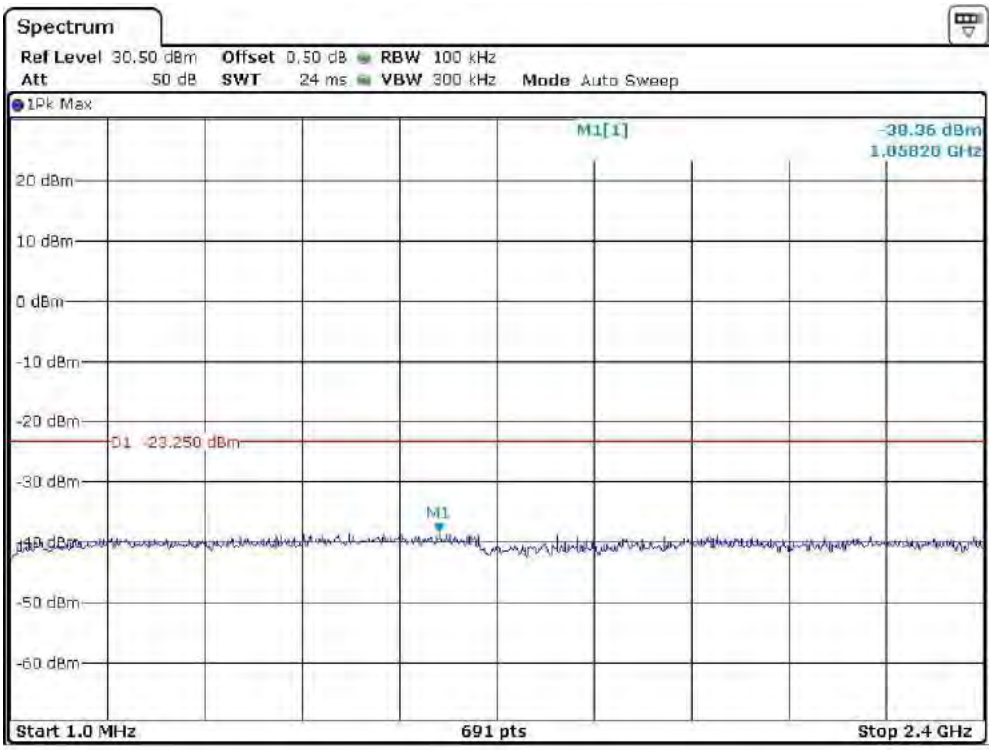


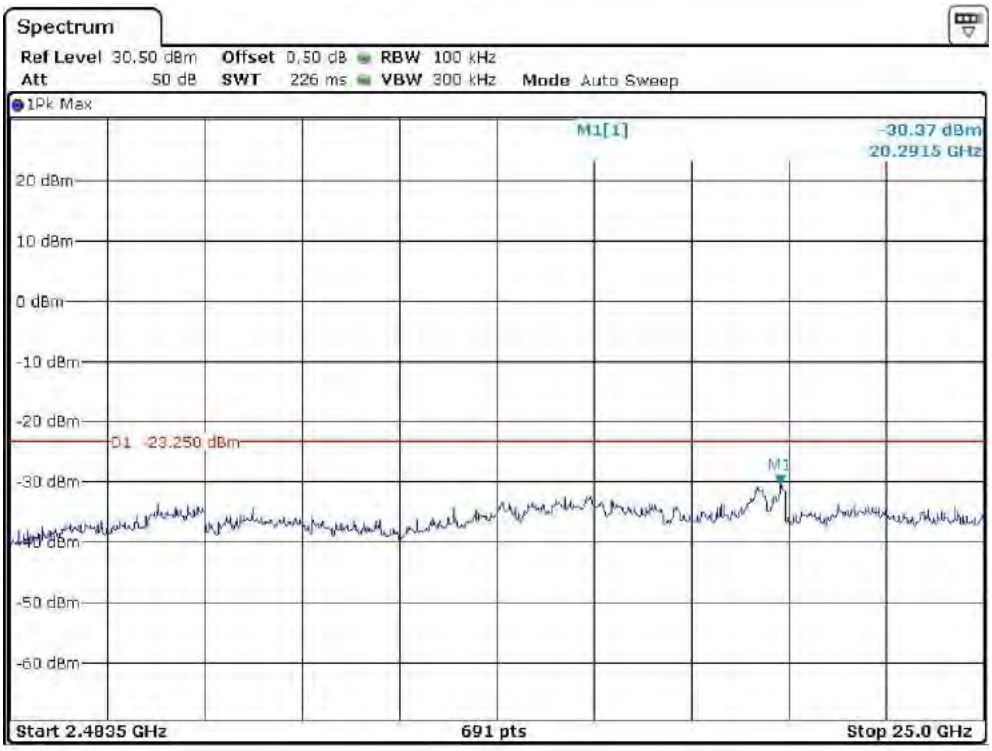

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 24 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -37.96 dBm
1.80110 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -23.080 dBm
-30 dBm
M1
-50 dBm
-60 dBm
Start 1.0 MHz
691 pts
Stop 2.4 GHz

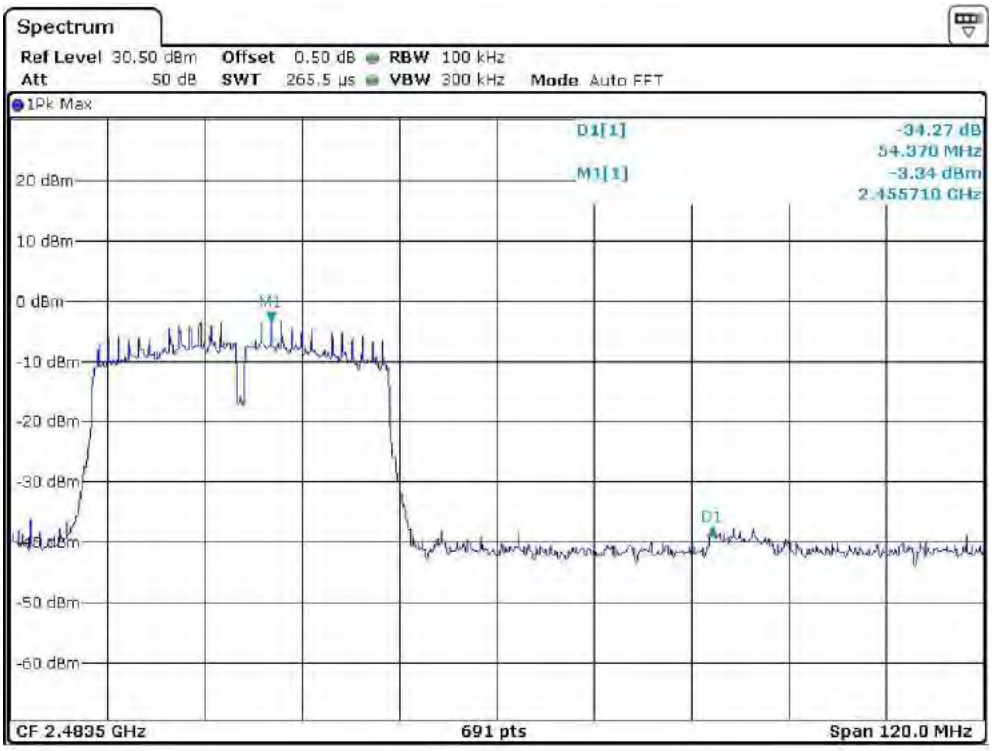

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -30.45 dBm
20.3235 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -23.080 dBm
-30 dBm
M1
-50 dBm
-60 dBm
Start 2.4835 GHz
691 pts
Stop 25.0 GHz

Channel 9 (2452MHz) Reference Level: -3.25dBm

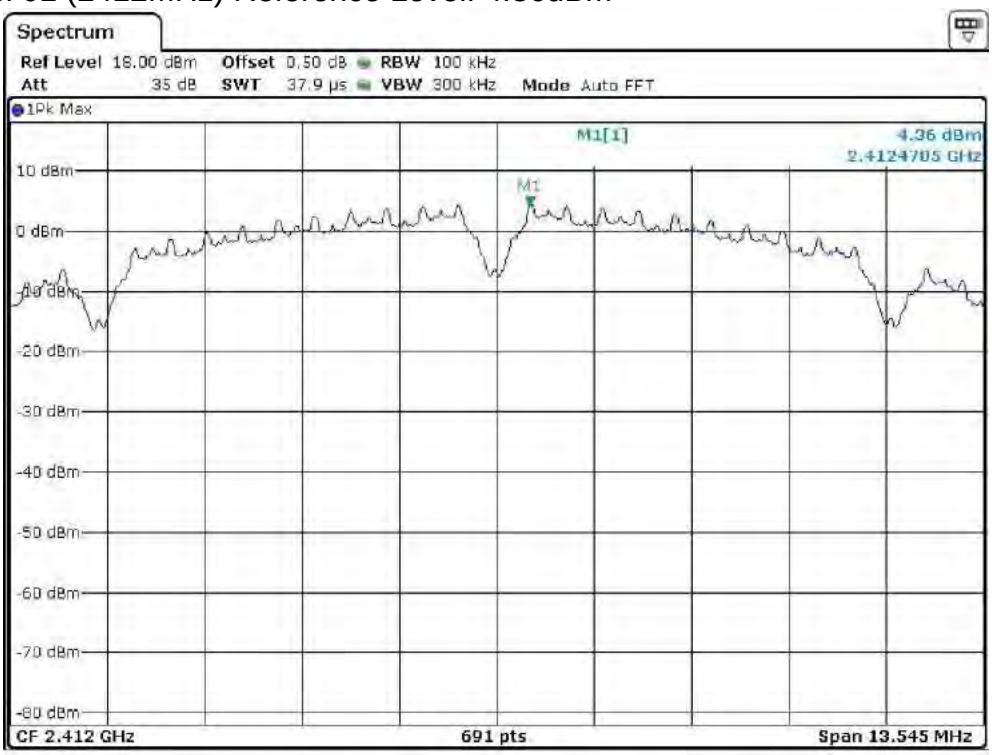


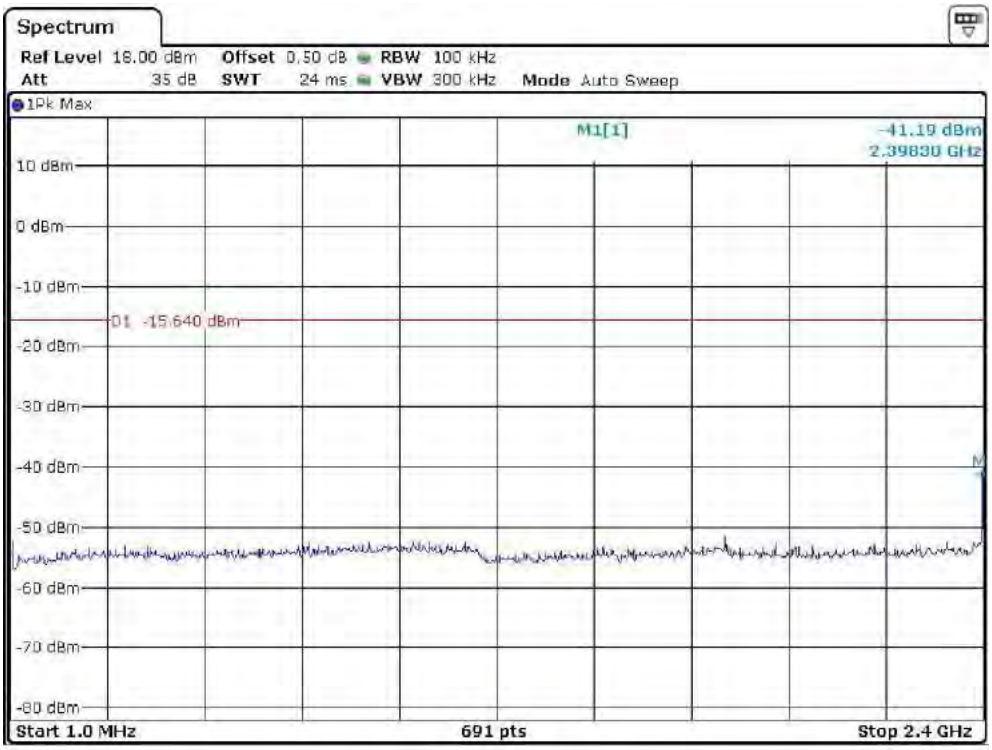


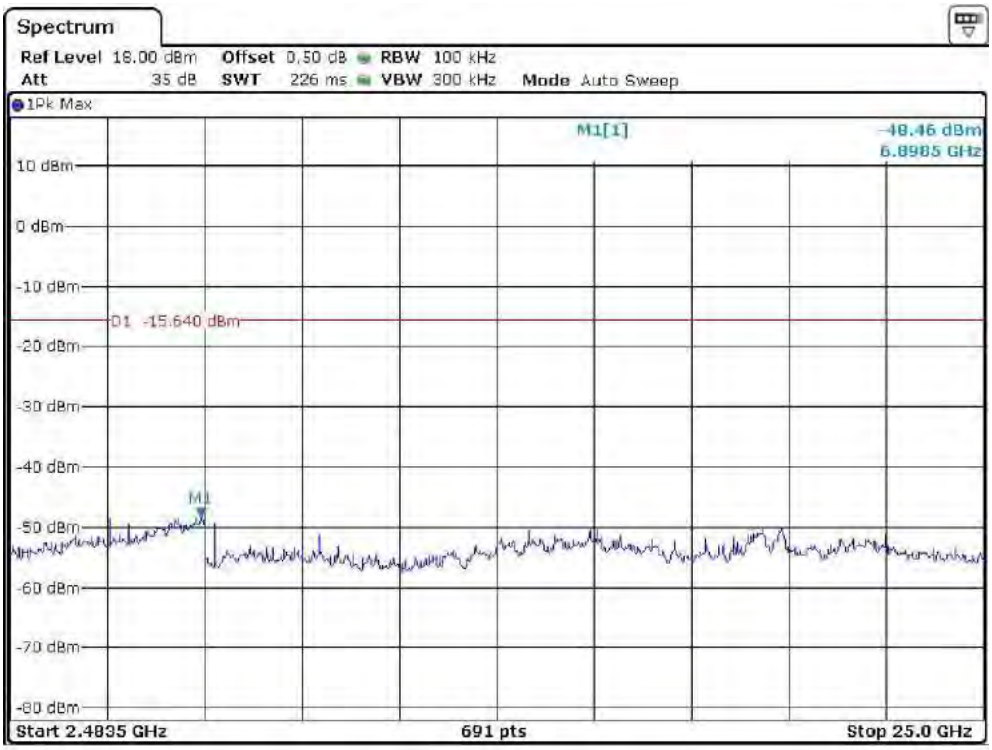

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -30.37 dBm
20.2915 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -23.250 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
Start 2.4835 GHz
691 pts
Stop 25.0 GHz

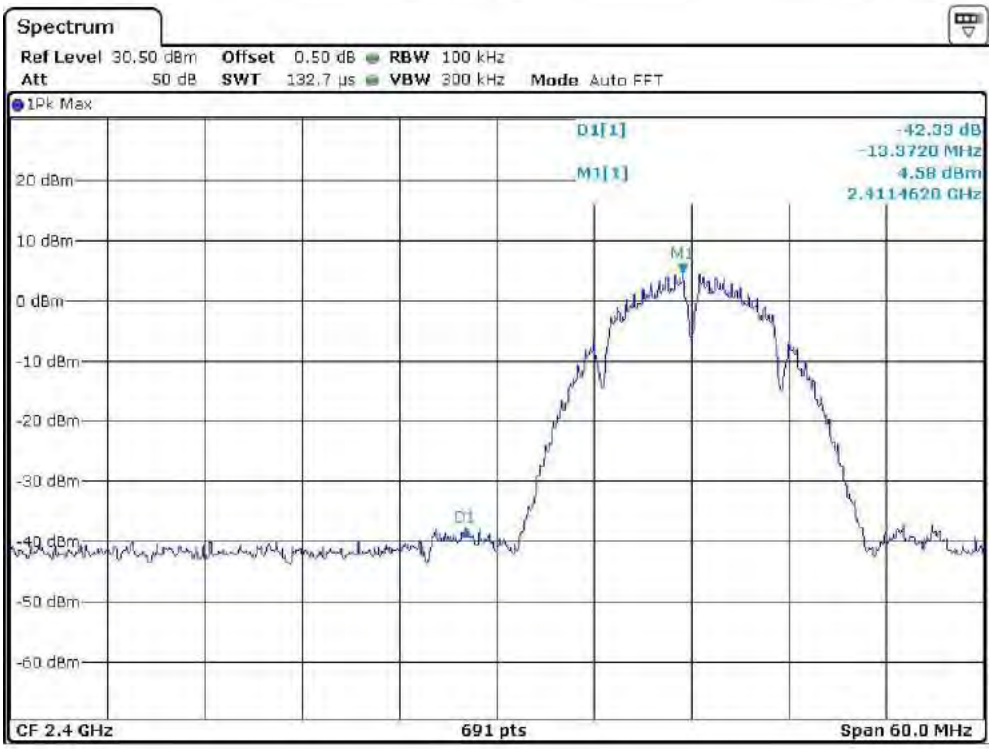

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 265.5 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] -34.27 dB
54.370 MHz
M1[1] -3.34 dBm
2.455710 GHz
20 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
M1
D1
CF 2.4835 GHz
691 pts
Span 120.0 MHz

SISO Mode, Ant 2:
802.11b
Channel 01 (2412MHz) Reference Level: 4.36dBm

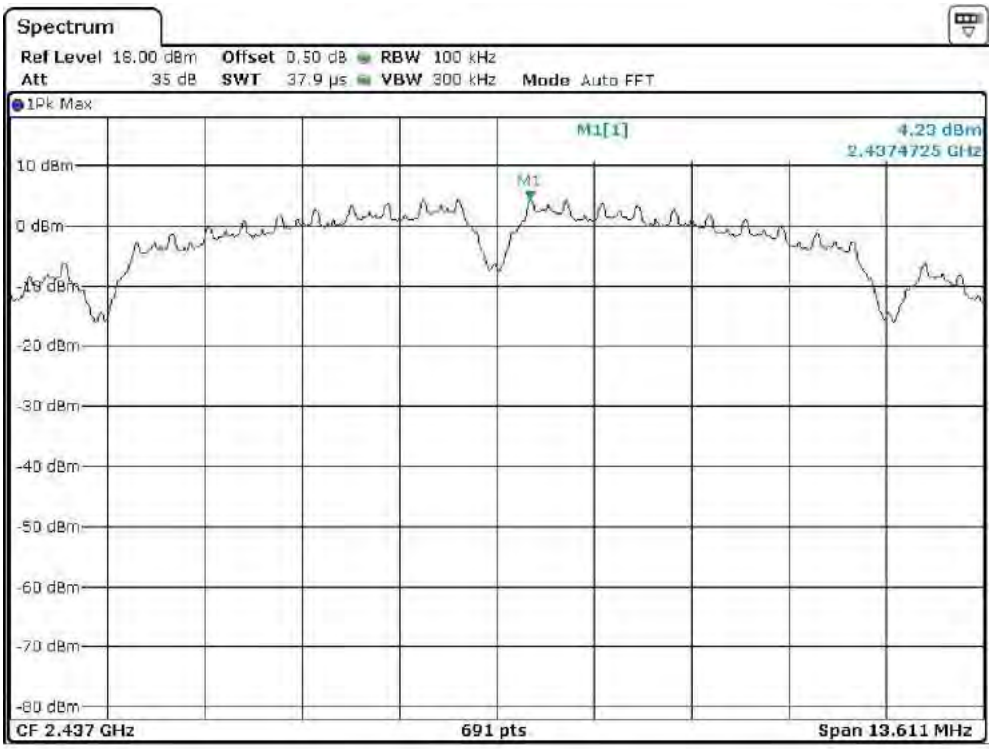


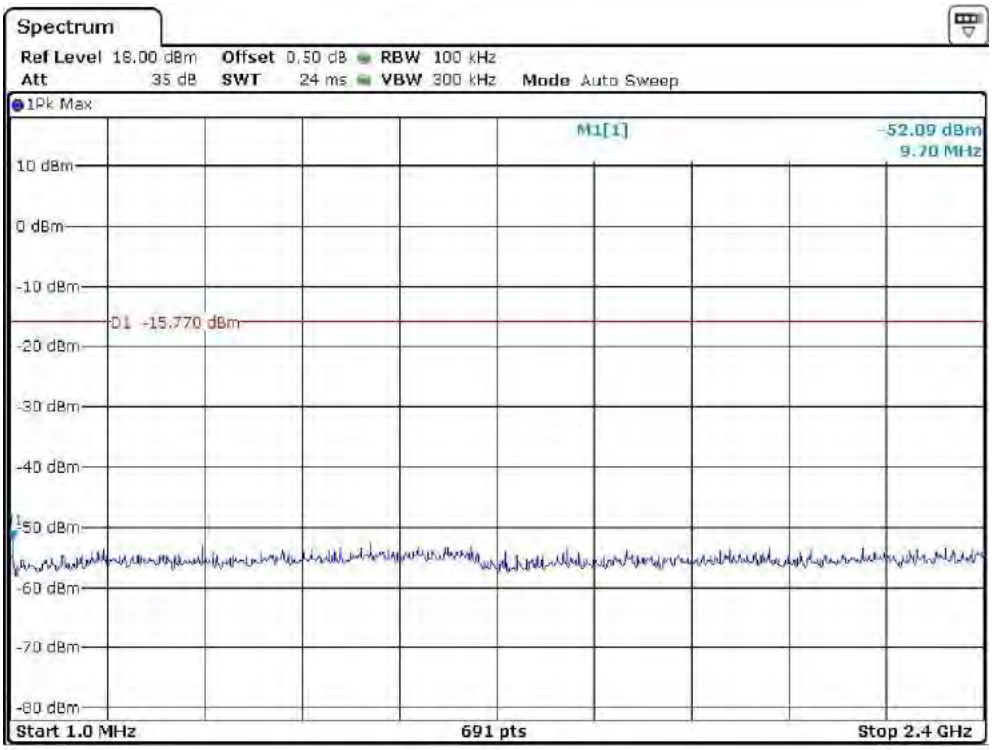


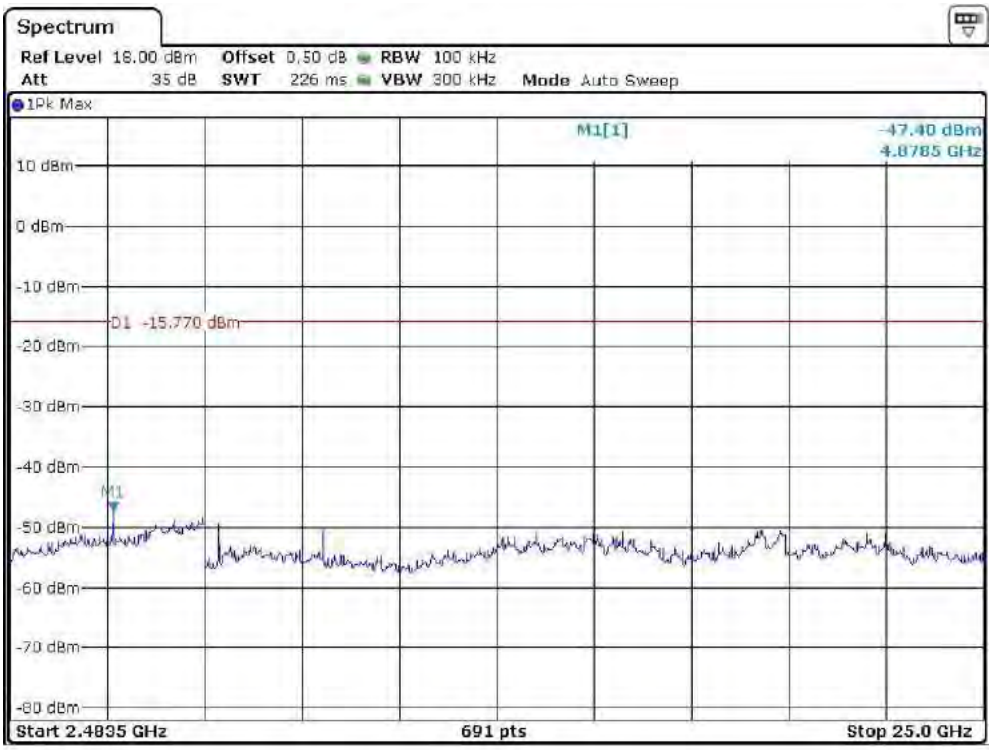

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -48.46 dBm
6.8985 GHz
10 dBm
0 dBm
-10 dBm
D1 -15.640 dBm
-20 dBm
-30 dBm
-40 dBm
M1
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 2.4835 GHz
691 pts
Stop 25.0 GHz


Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 132.7 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] -42.33 dB
-13.9720 MHz
M1[1] 4.58 dBm
2.4114620 GHz
20 dBm
10 dBm
0 dBm
M1
-10 dBm
-20 dBm
-30 dBm
D1
-40 dBm
-50 dBm
-60 dBm
CF 2.4 GHz
691 pts
Span 60.0 MHz

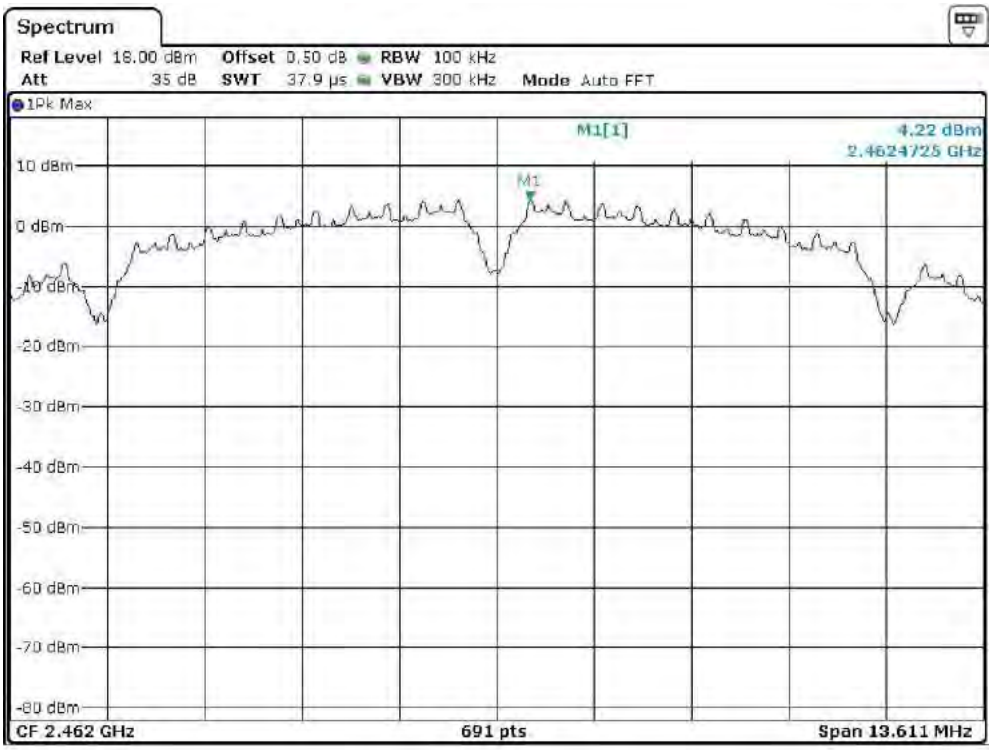
Channel 06 (2437MHz) Reference Level: 4.23dBm

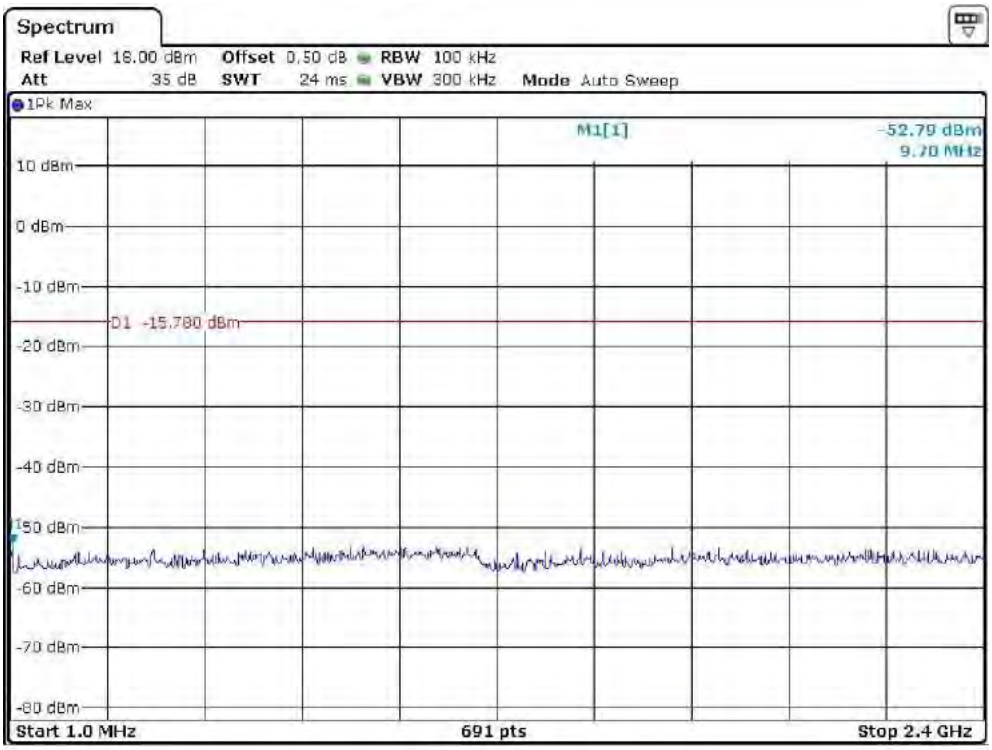


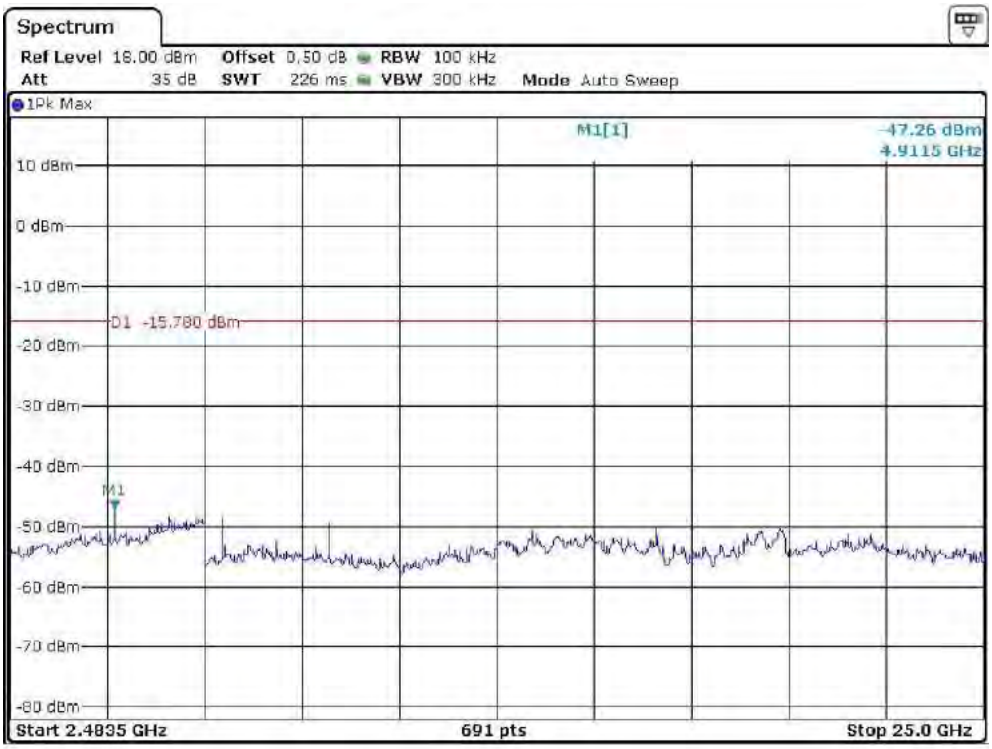


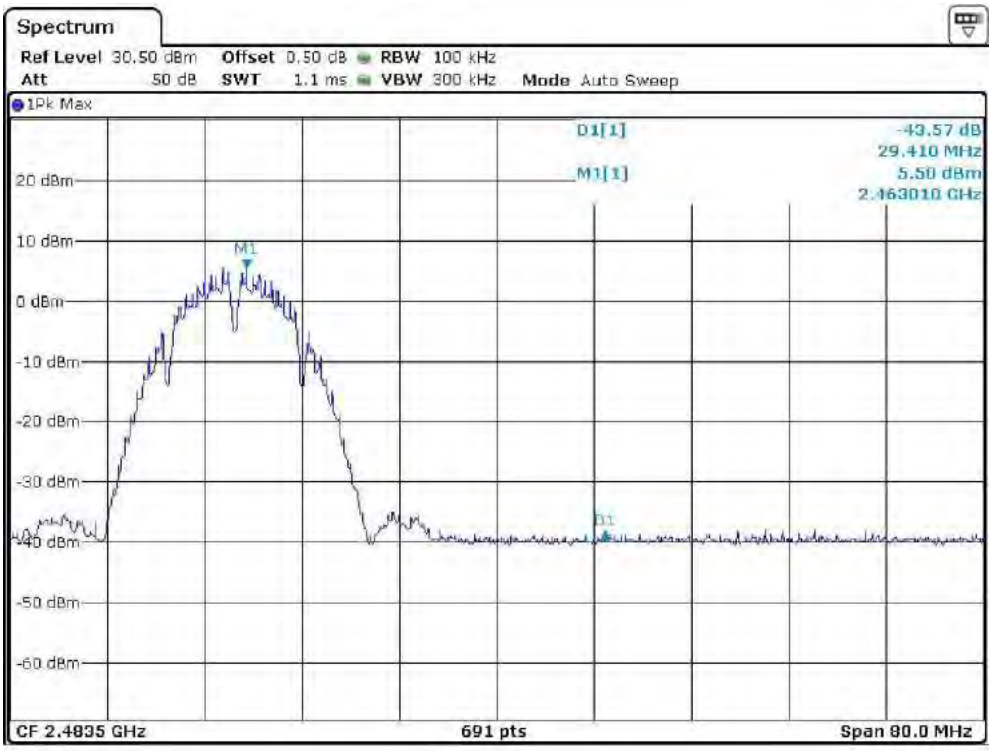


Channel 11 (2462MHz) Reference Level: 4.22dBm

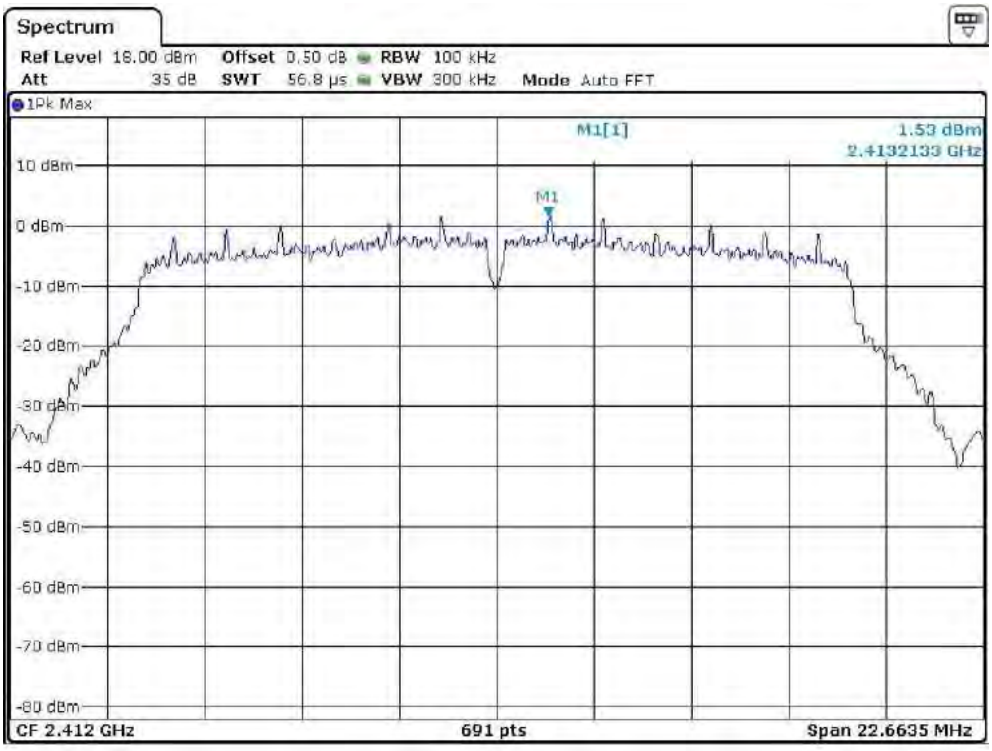


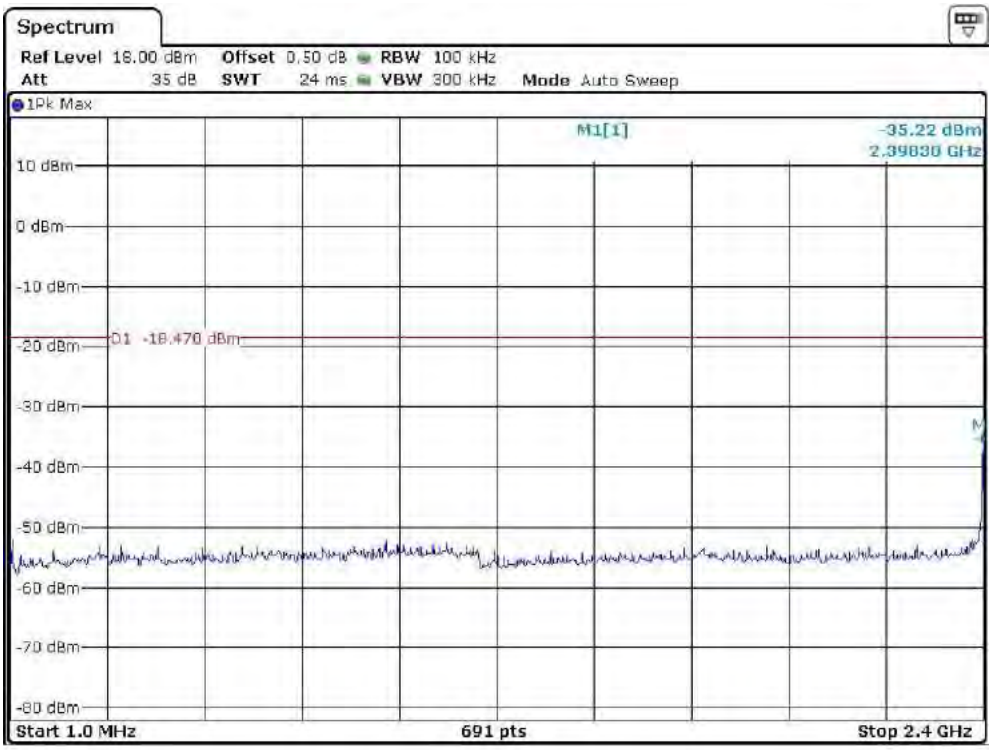

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 24 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -52.79 dBm
9.70 MHz
10 dBm
0 dBm
-10 dBm
D1 -15.780 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 1.0 MHz
691 pts
Stop 2.4 GHz

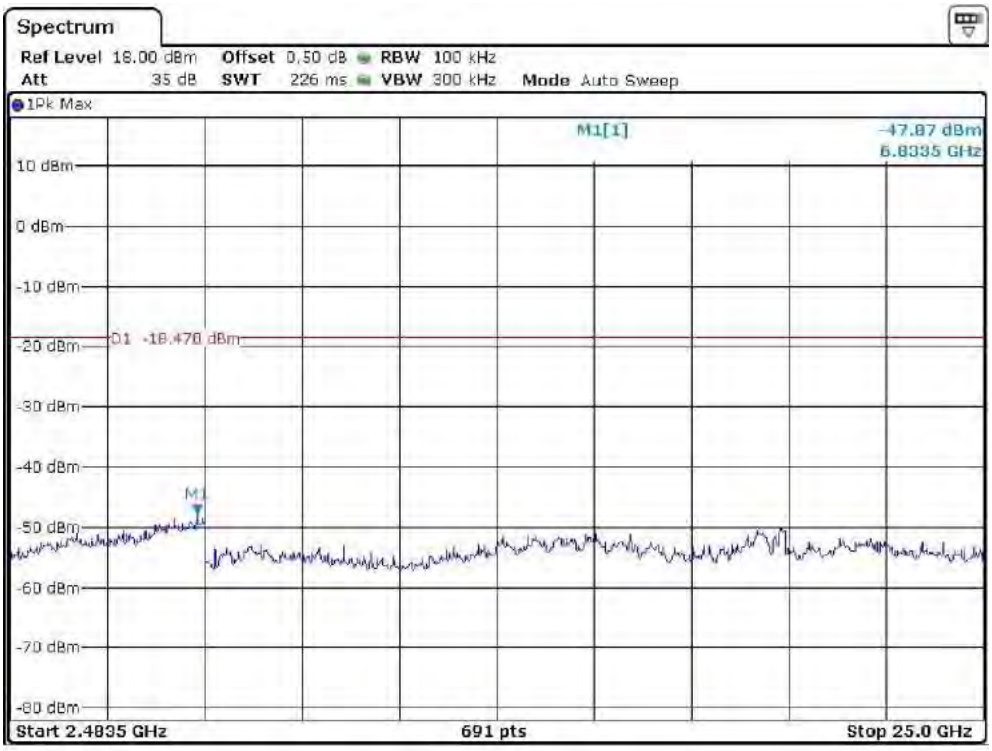

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -47.26 dBm
4.9115 GHz
10 dBm
0 dBm
-10 dBm
D1 -15.780 dBm
-20 dBm
-30 dBm
-40 dBm
M1
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 2.4835 GHz
691 pts
Stop 25.0 GHz

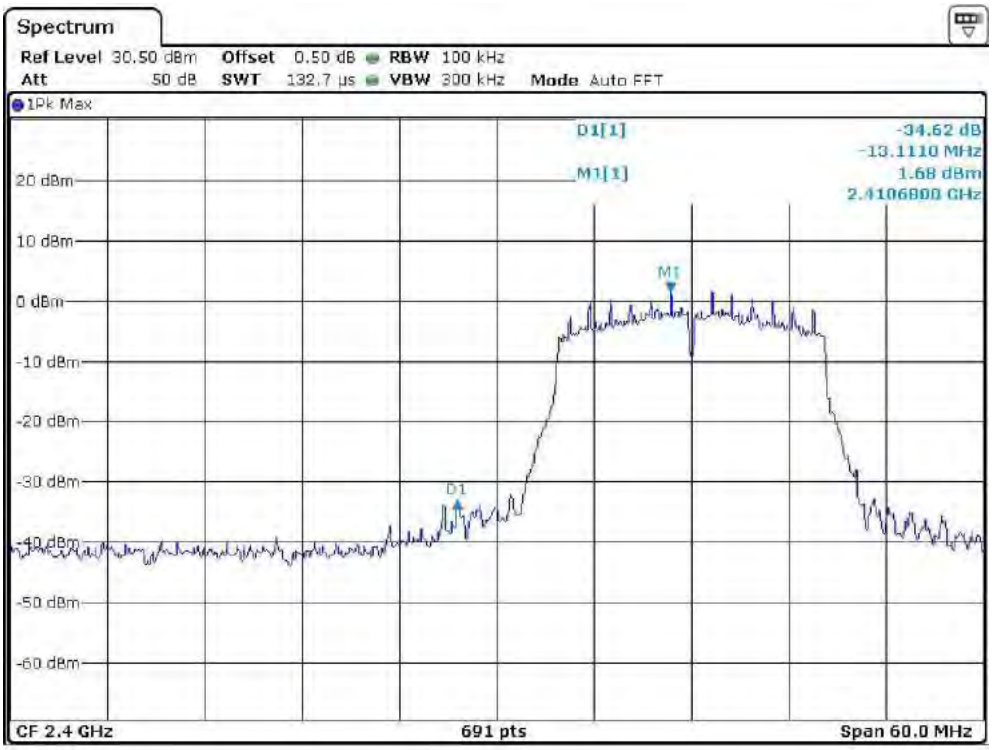


802.11g
Channel 01 (2412MHz) Reference Level: 1.53dBm

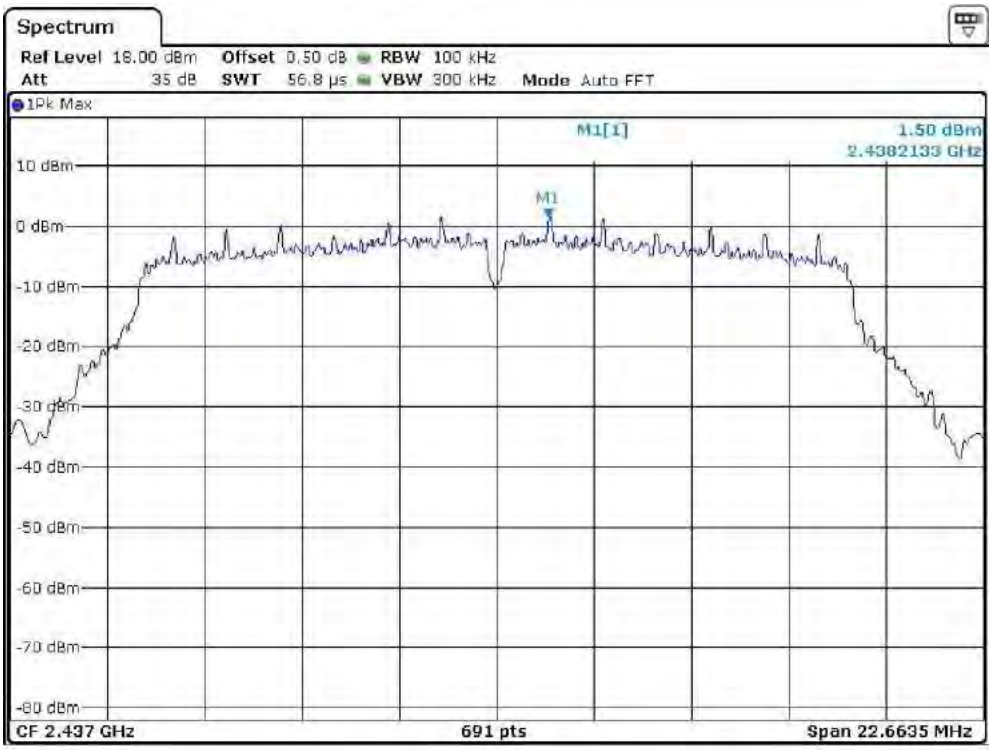


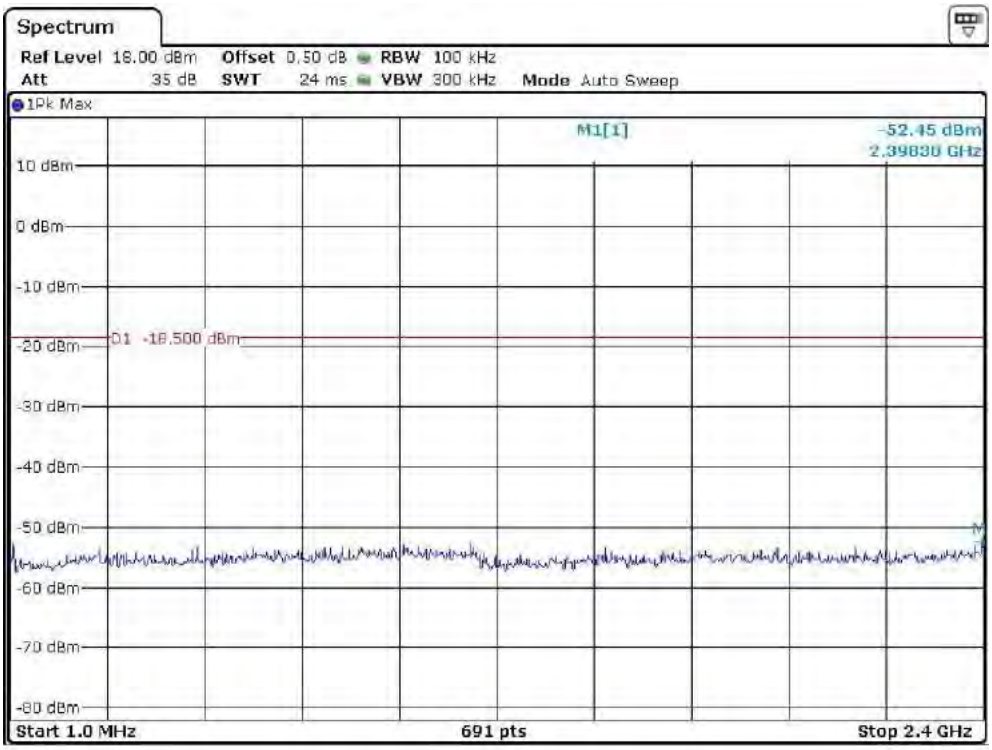

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 24 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -35.22 dBm
2.39830 GHz
D1 -18.470 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 1.0 MHz
691 pts
Stop 2.4 GHz

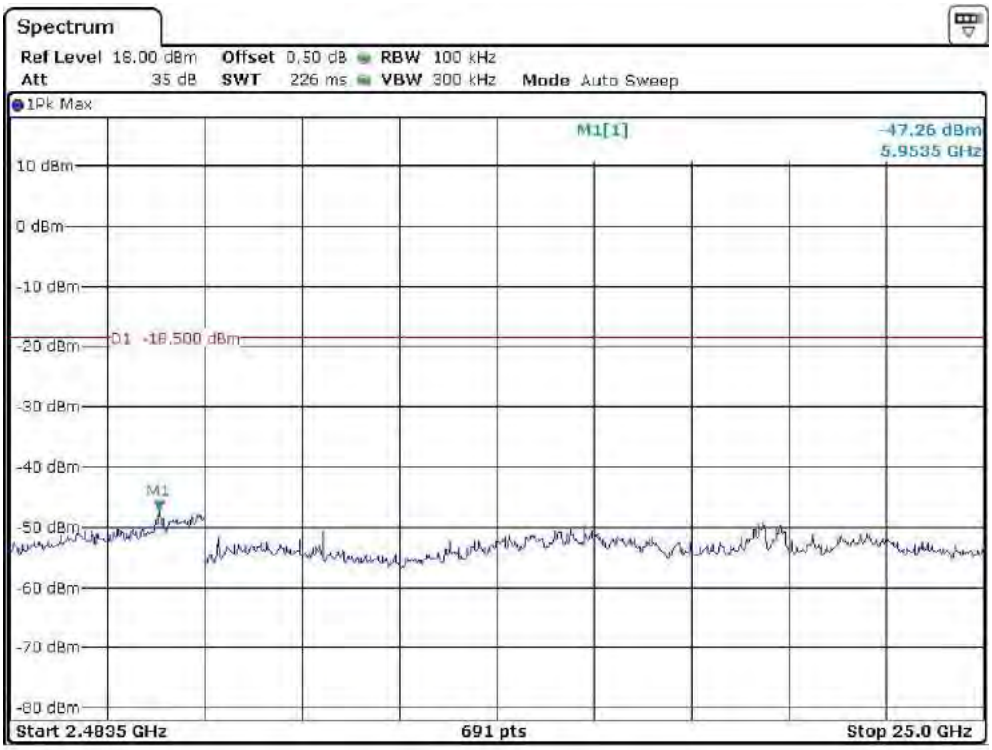

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -47.87 dBm
6.8335 GHz
D1 -18.470 dBm
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 2.4835 GHz
691 pts
Stop 25.0 GHz



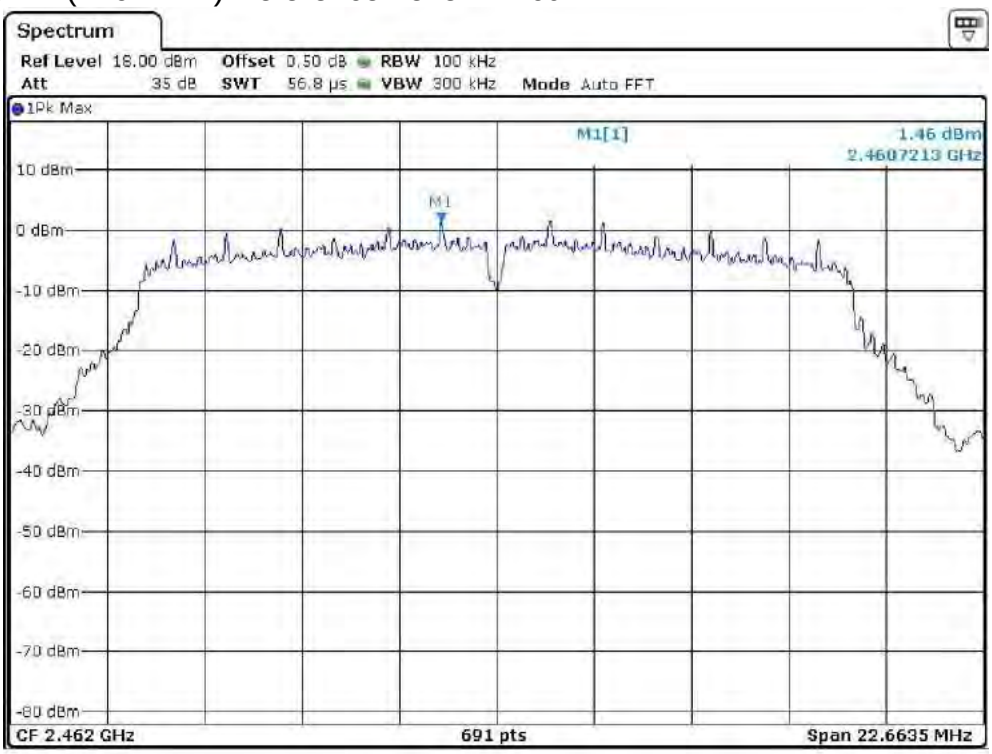
Channel 06 (2437MHz) Reference Level: 1.50dBm

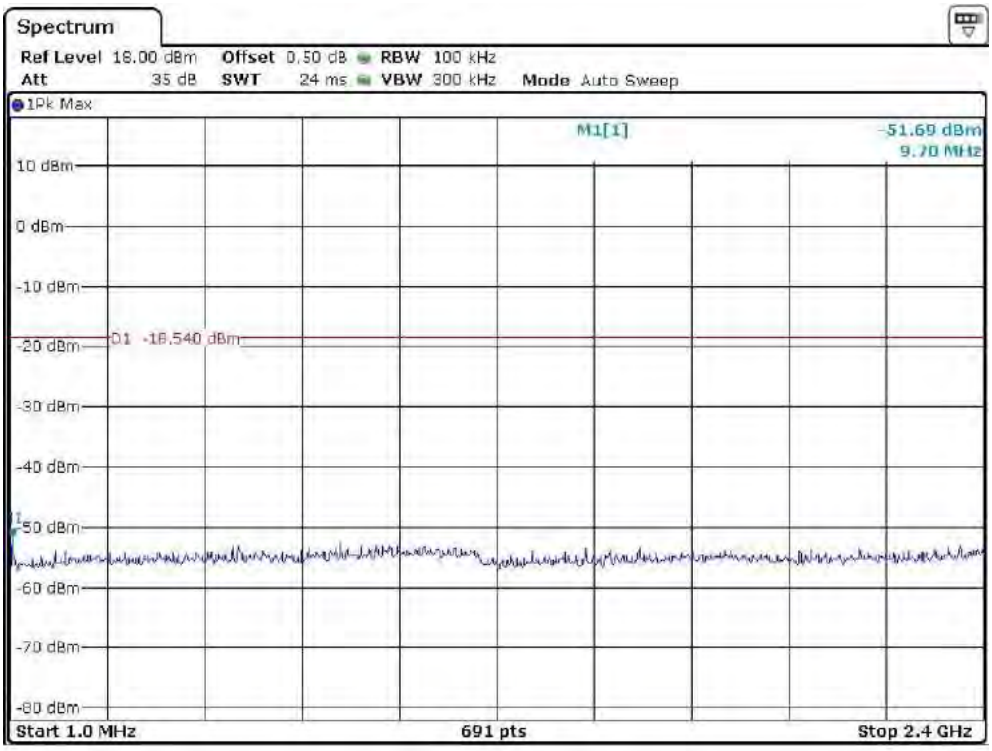


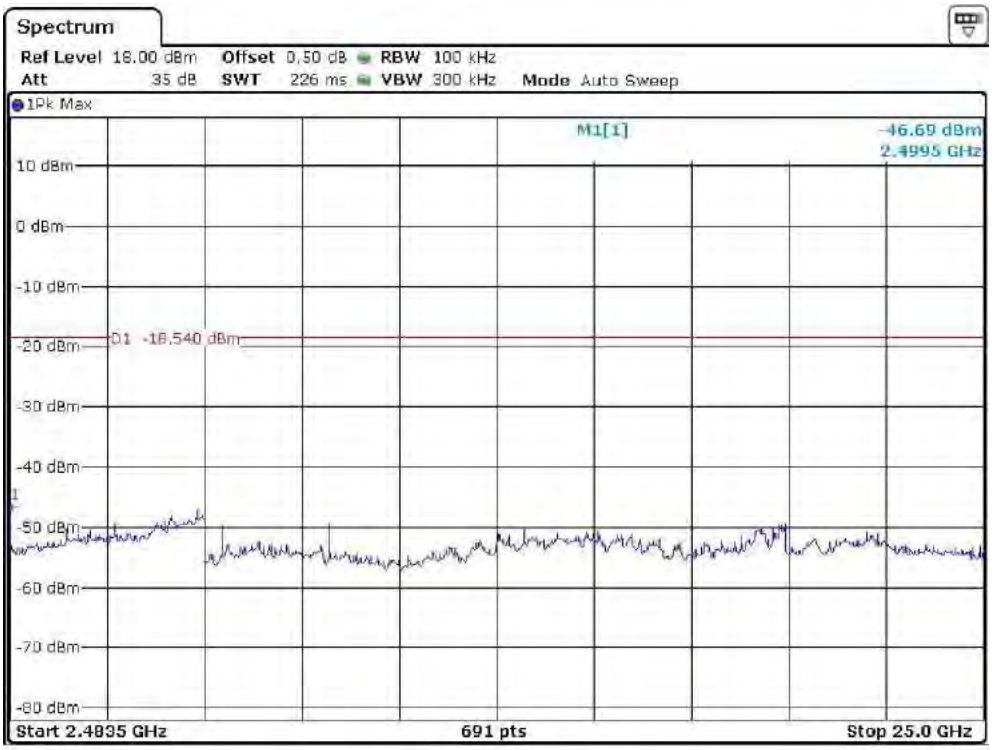

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 24 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -52.45 dBm
2.39830 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -18.500 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 1.0 MHz
691 pts
Stop 2.4 GHz

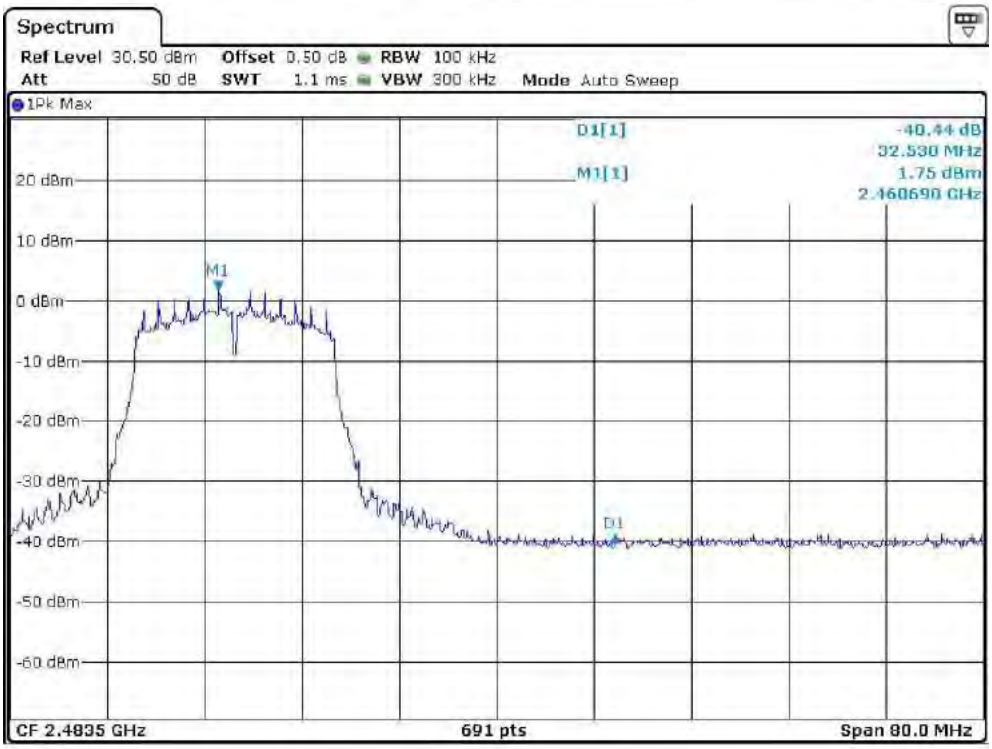

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -47.26 dBm
5.9535 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -18.500 dBm
-30 dBm
-40 dBm
M1
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 2.4835 GHz
691 pts
Stop 25.0 GHz

Channel 11 (2462MHz) Reference Level: 1.46dBm

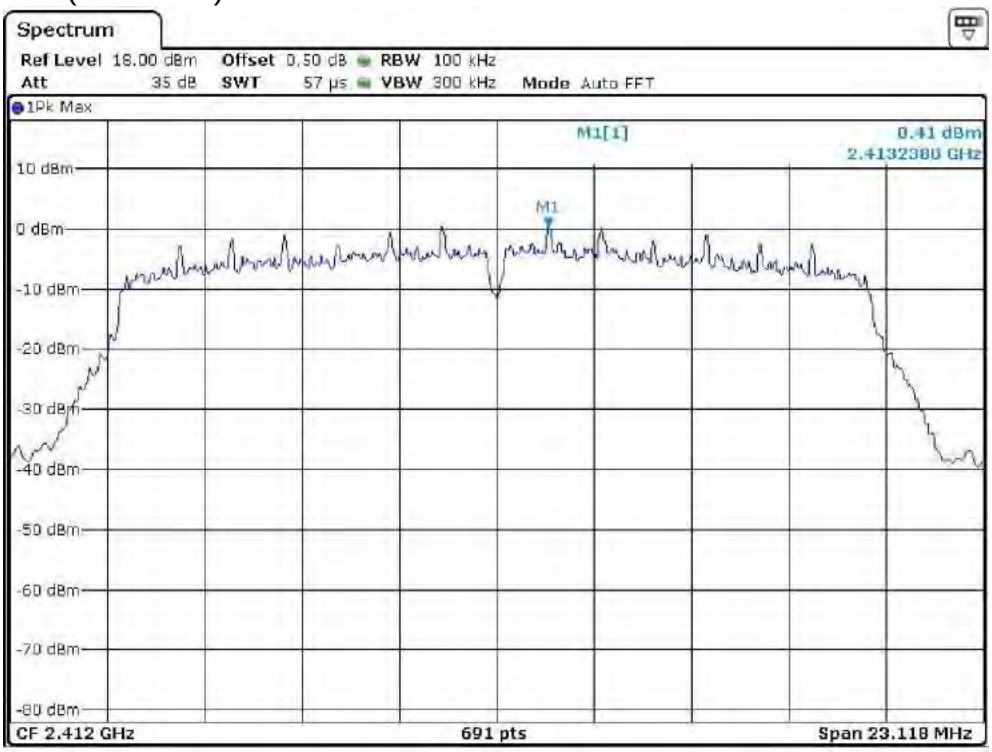


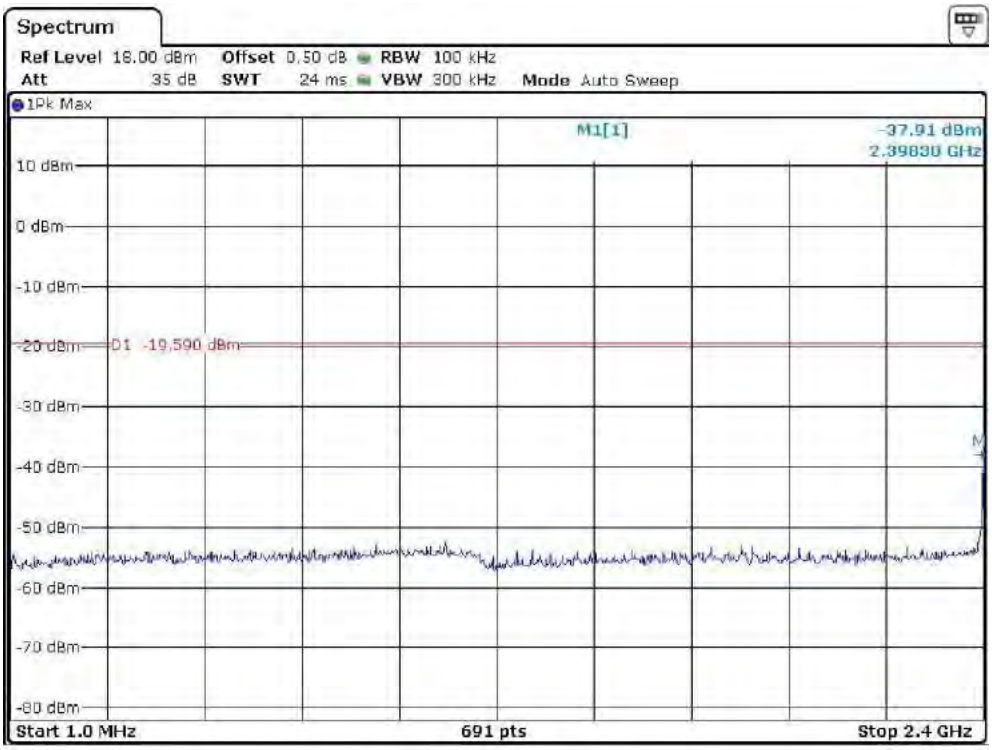


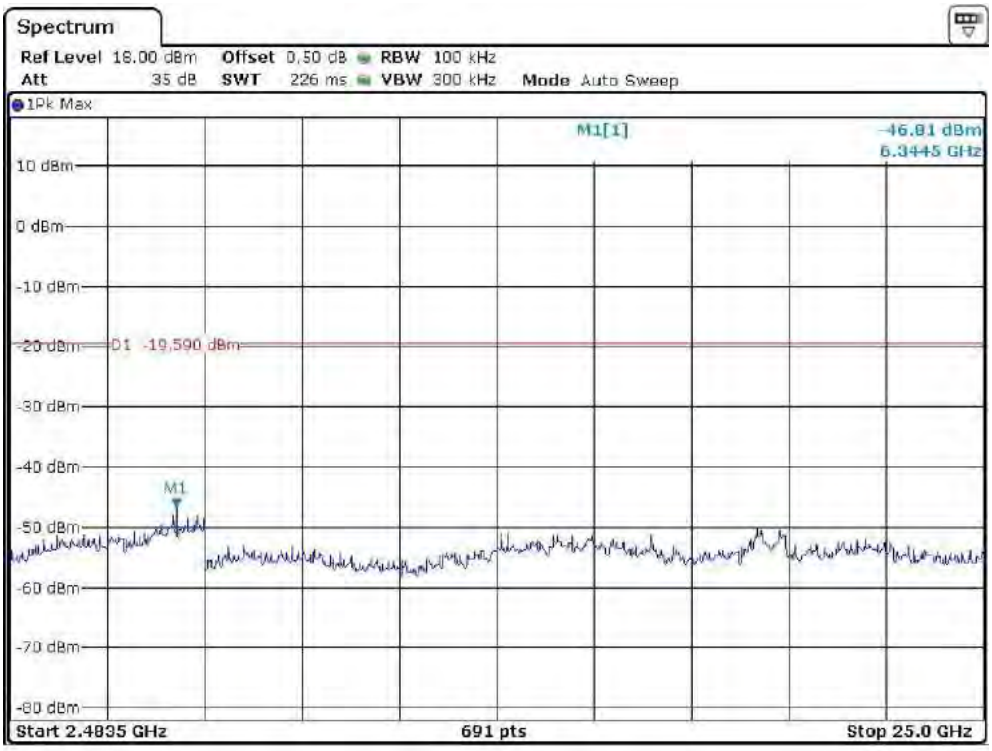

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -46.69 dBm
2.4995 GHz
10 dBm
0 dBm
-10 dBm
D1 -18.540 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 2.4835 GHz
691 pts
Stop 25.0 GHz

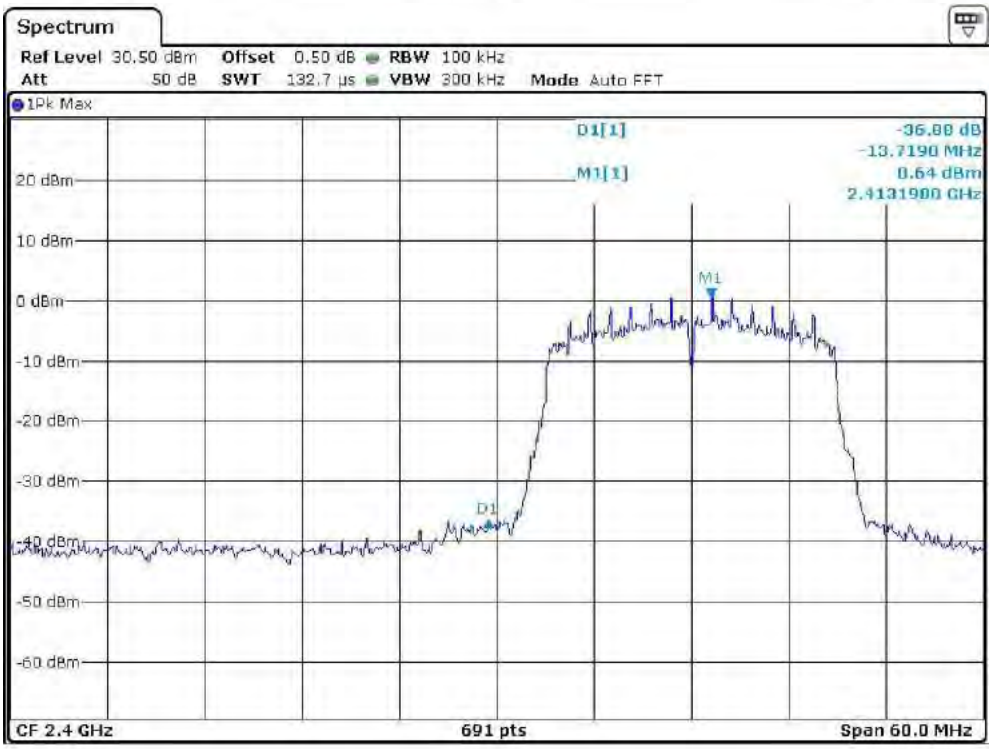

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 1.1 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
D1[1] -40.44 dB
32.530 MHz
M1[1] 1.75 dBm
2.460690 GHz
20 dBm
10 dBm
M1
0 dBm
-10 dBm
-20 dBm
-30 dBm
D1
-40 dBm
-50 dBm
-60 dBm
CF 2.4835 GHz
691 pts
Span 80.0 MHz

802.11n-HT20
Channel 01 (2412MHz) Reference Level: 0.41dBm

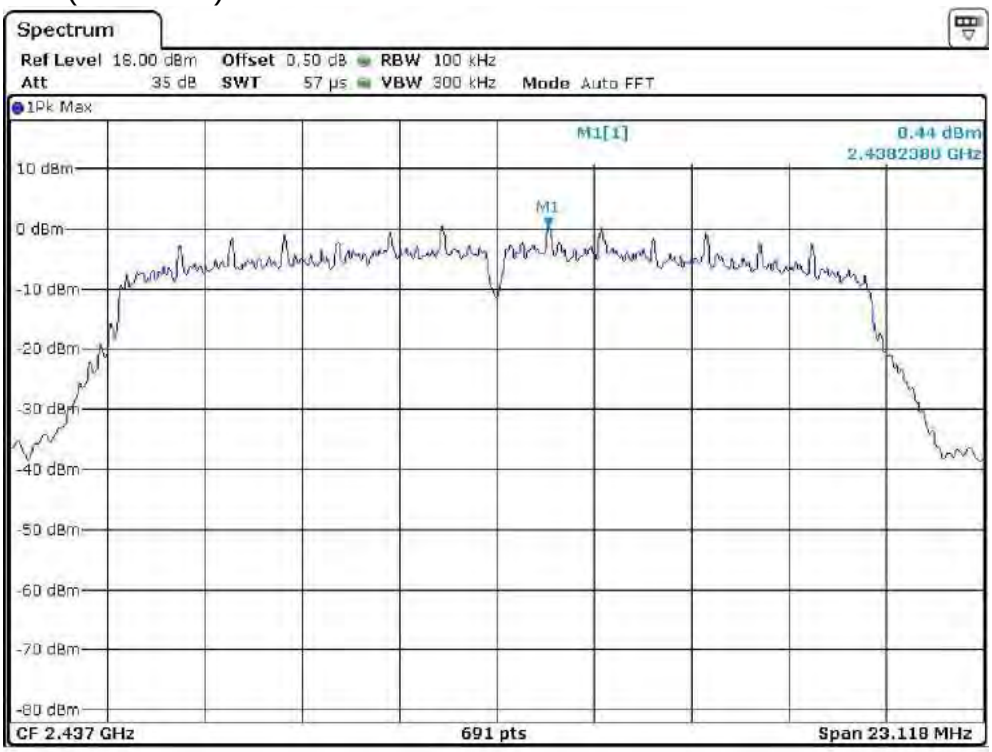


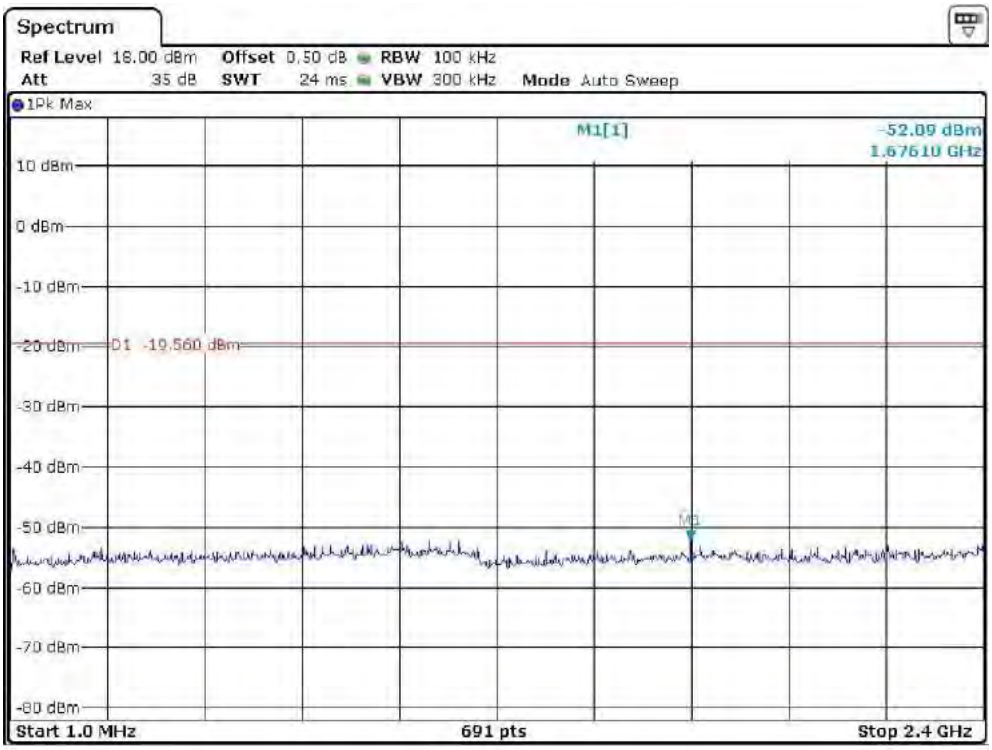


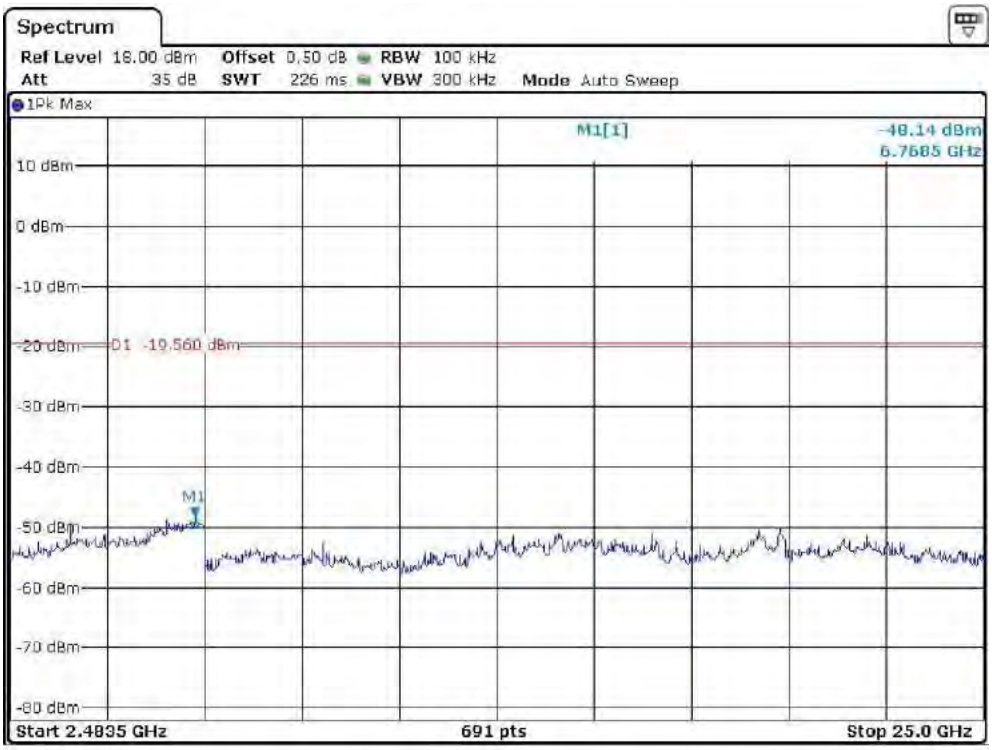

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -46.81 dBm
6.3445 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -19.590 dBm
-30 dBm
-40 dBm
M1
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 2.4835 GHz
691 pts
Stop 25.0 GHz


Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 132.7 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] -36.80 dB
-13.7190 MHz
M1[1] 0.64 dBm
2.4131980 GHz
20 dBm
10 dBm
0 dBm
M1
-10 dBm
-20 dBm
-30 dBm
D1
-40 dBm
-50 dBm
-60 dBm
CF 2.4 GHz
691 pts
Span 60.0 MHz

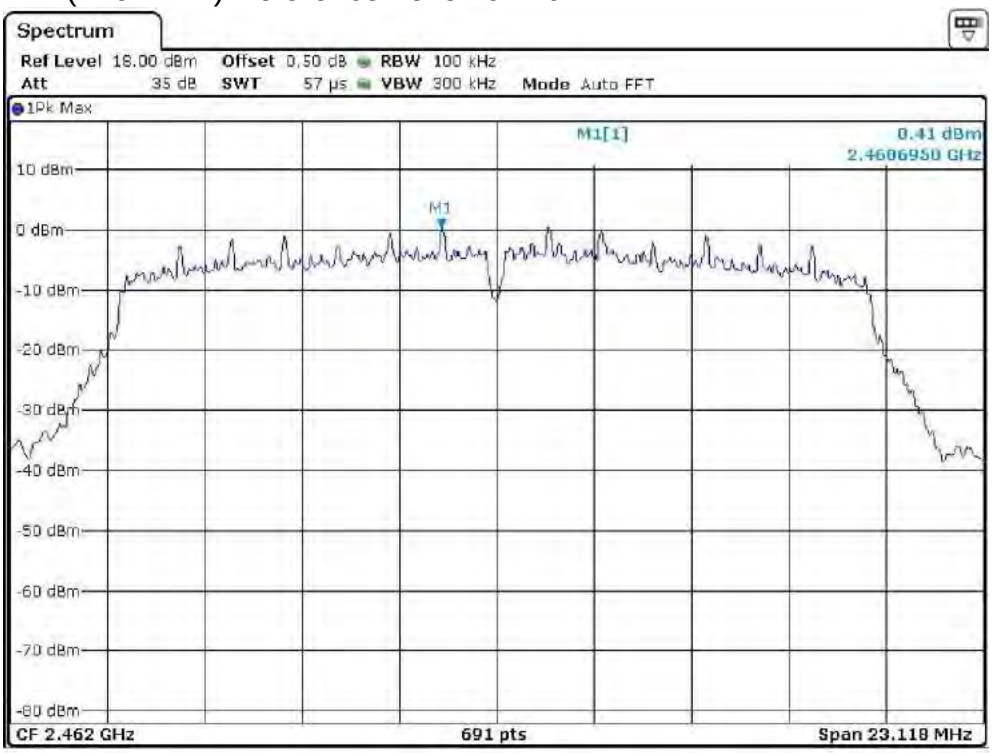
Channel 06 (2437MHz) Reference Level: 0.44dBm

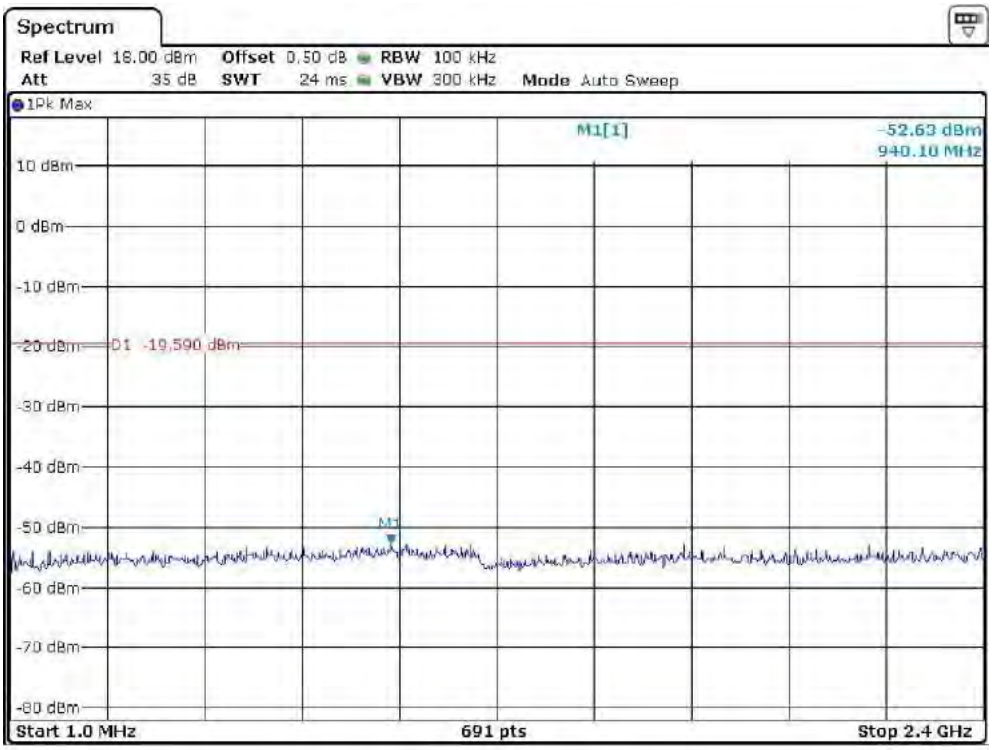


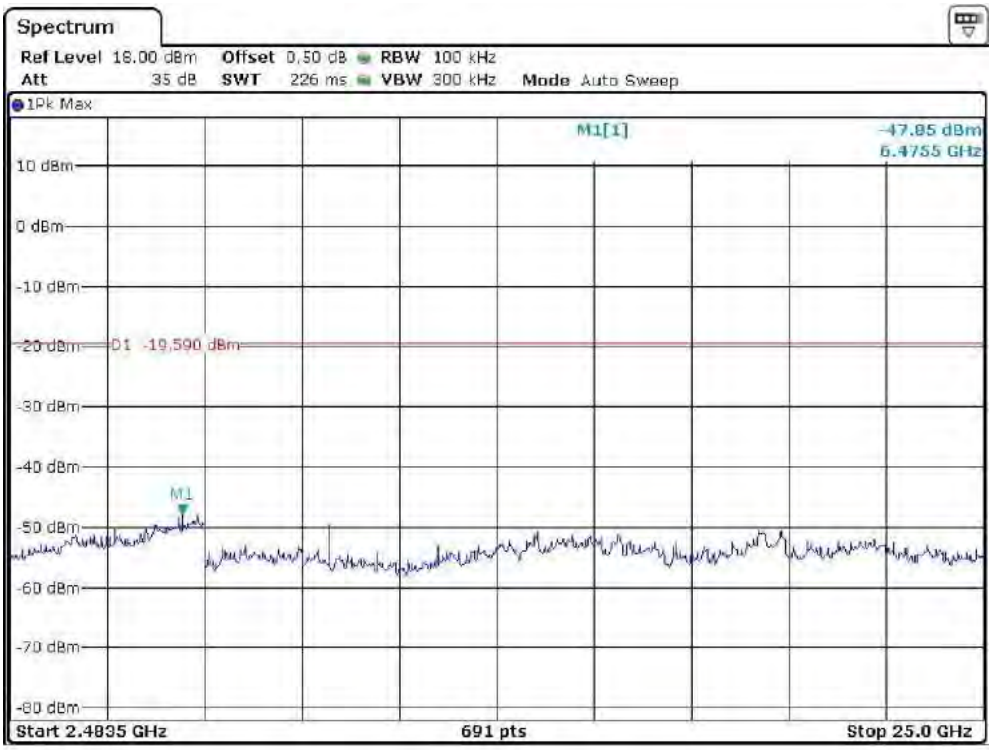


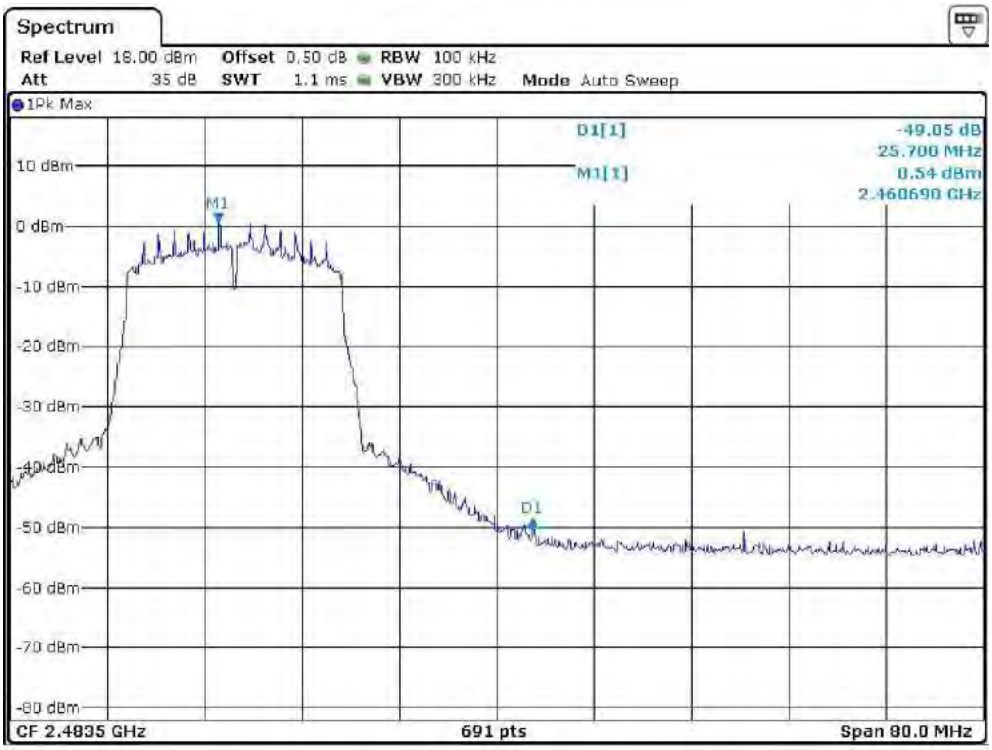


Channel 11 (2462MHz) Reference Level: 0.41dBm

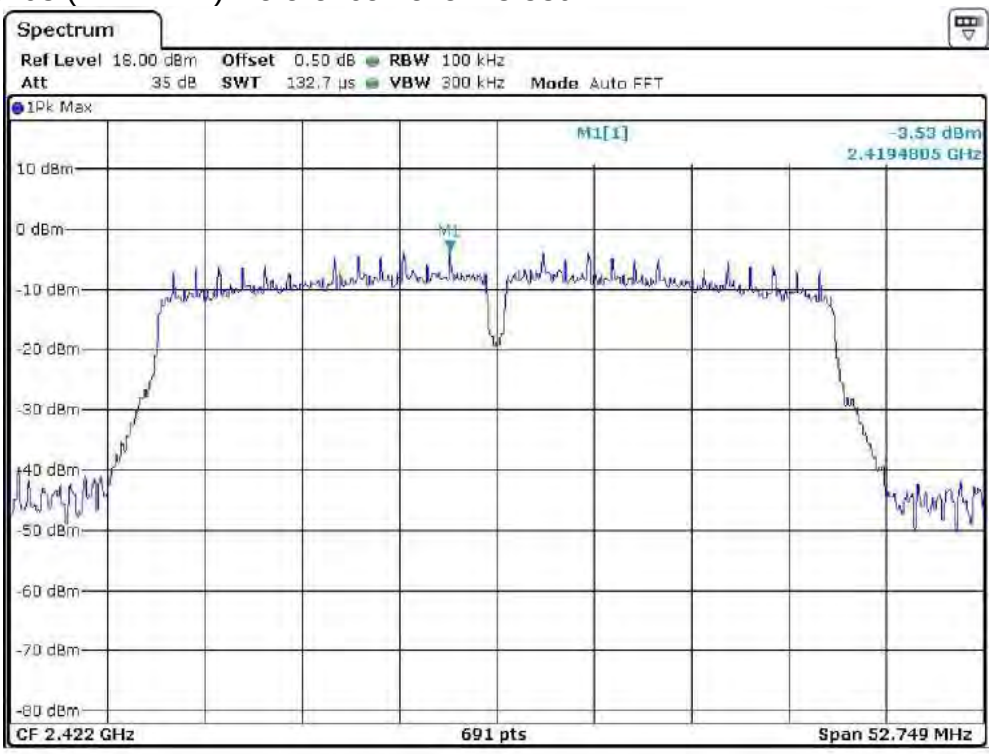


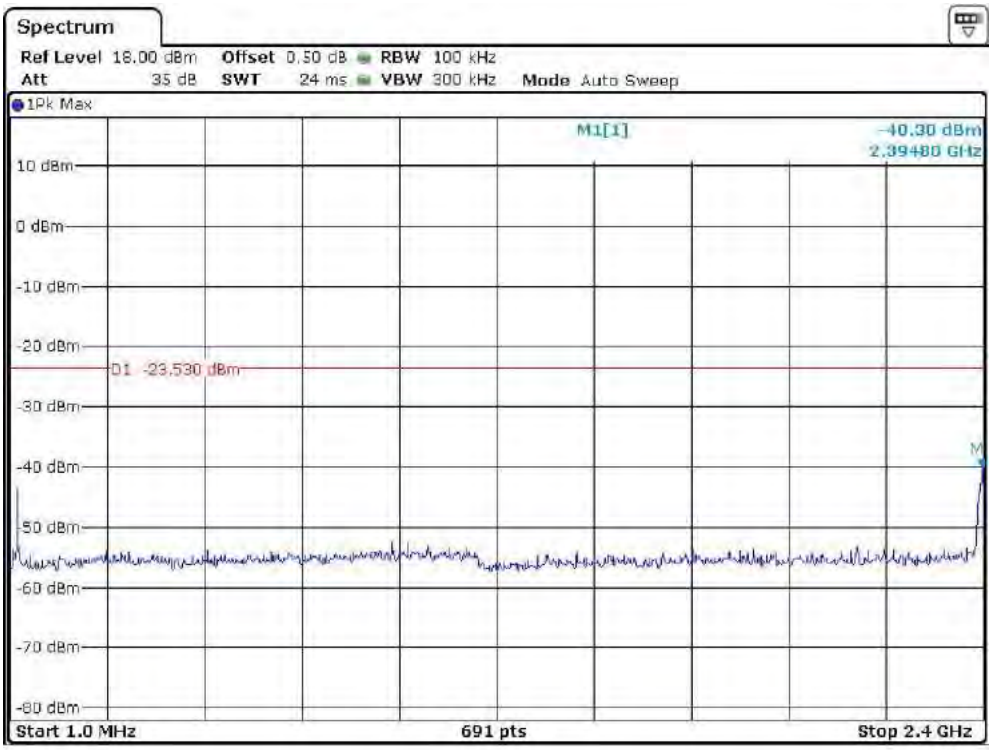

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 24 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -52.63 dBm
940.10 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -19.590 dBm
-30 dBm
-40 dBm
-50 dBm
M1
-60 dBm
-70 dBm
-80 dBm
Start 1.0 MHz
691 pts
Stop 2.4 GHz

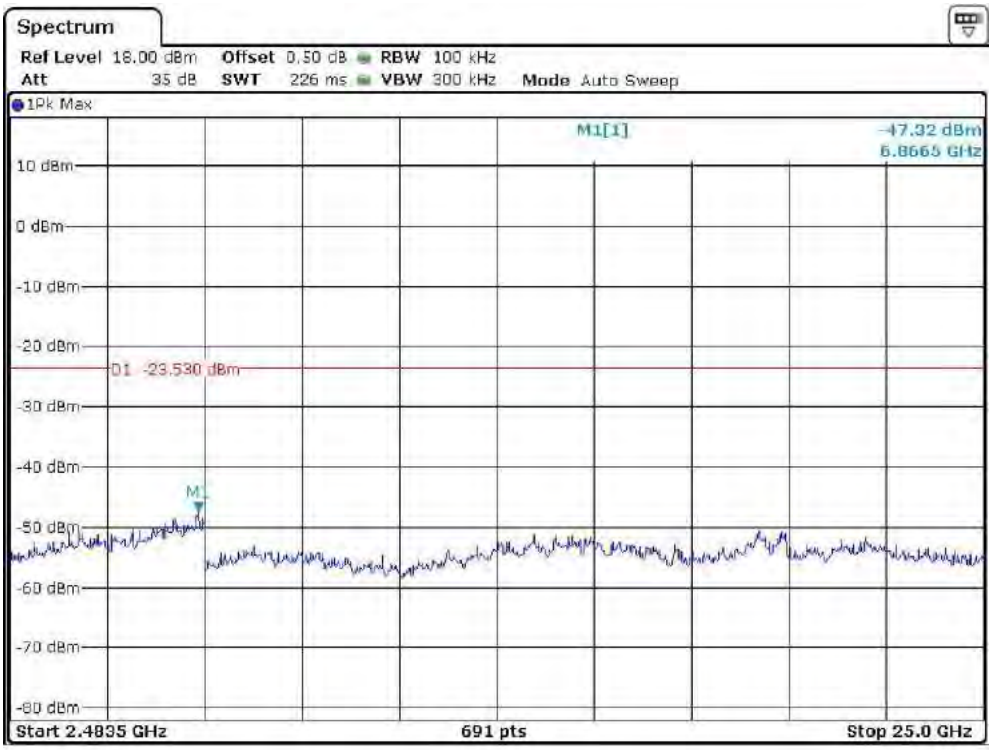

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -47.85 dBm
6.4755 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -19.590 dBm
-30 dBm
-40 dBm
M1
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 2.4835 GHz
691 pts
Stop 25.0 GHz

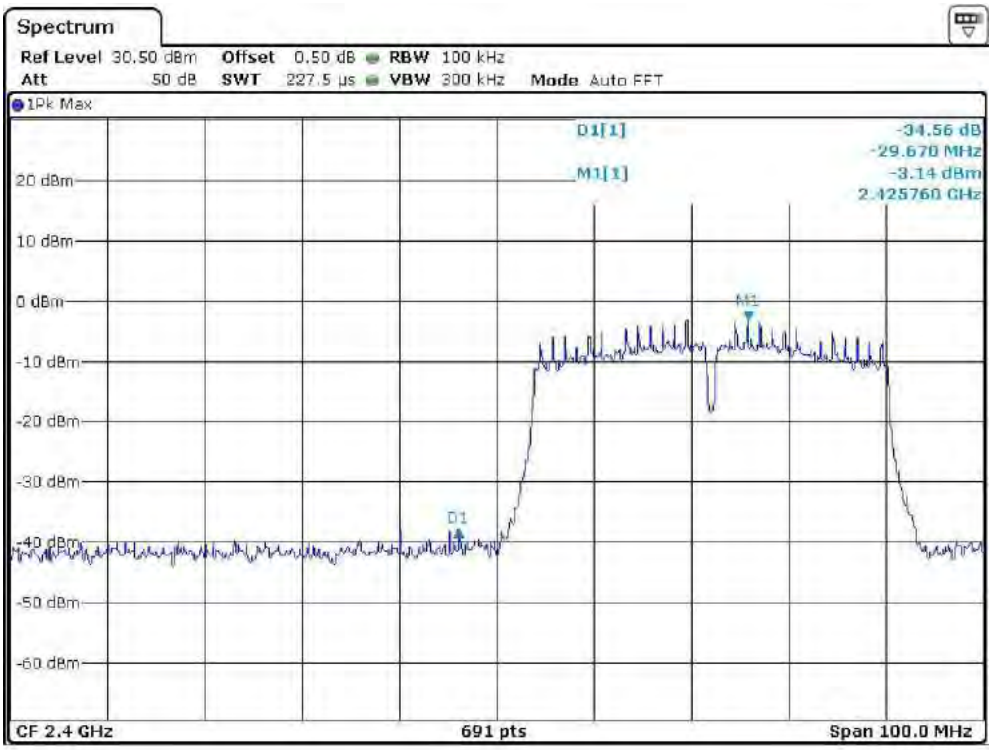


802.11n-HT40
Channel 03 (2422MHz) Reference Level: -3.53dBm

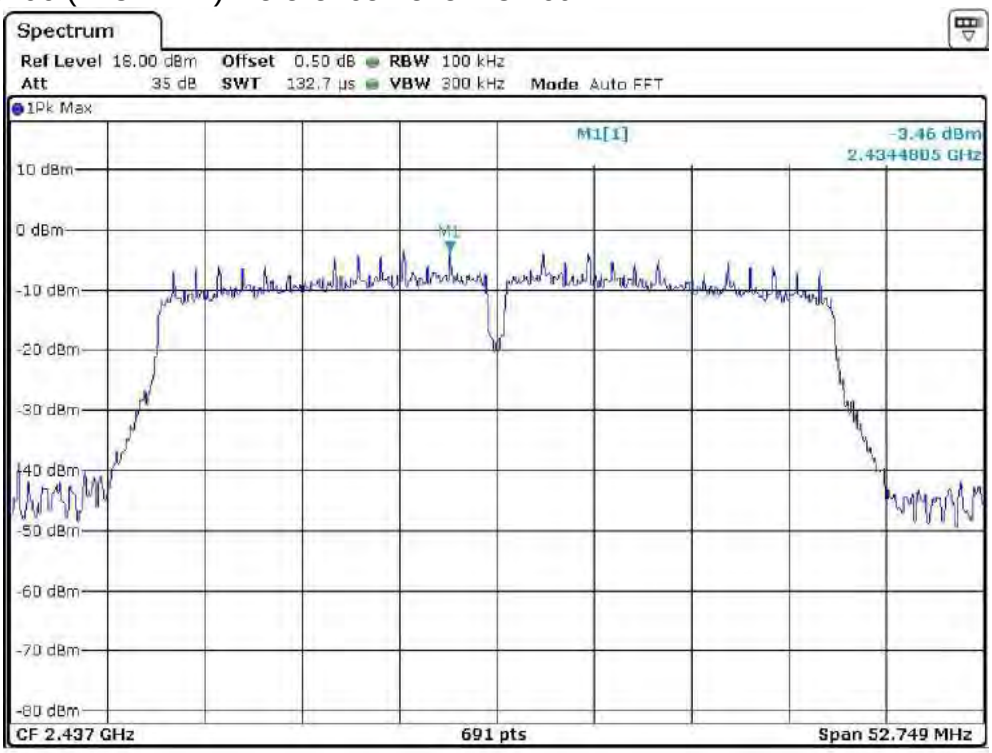


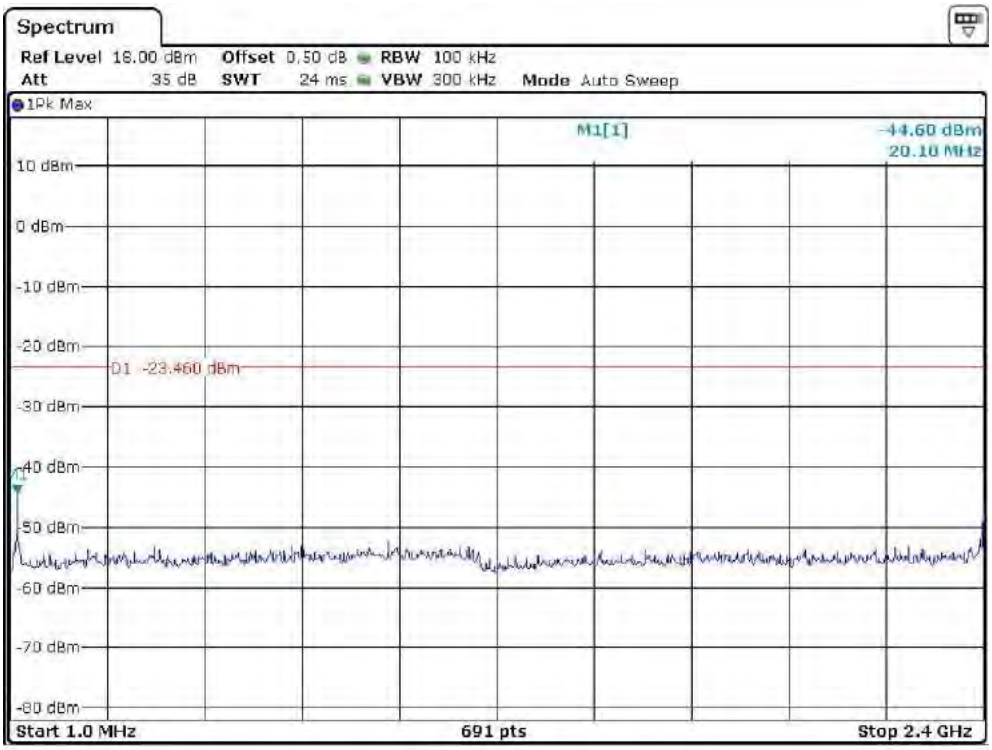

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 24 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -40.30 dBm
2.39480 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -23.530 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 1.0 MHz
691 pts
Stop 2.4 GHz

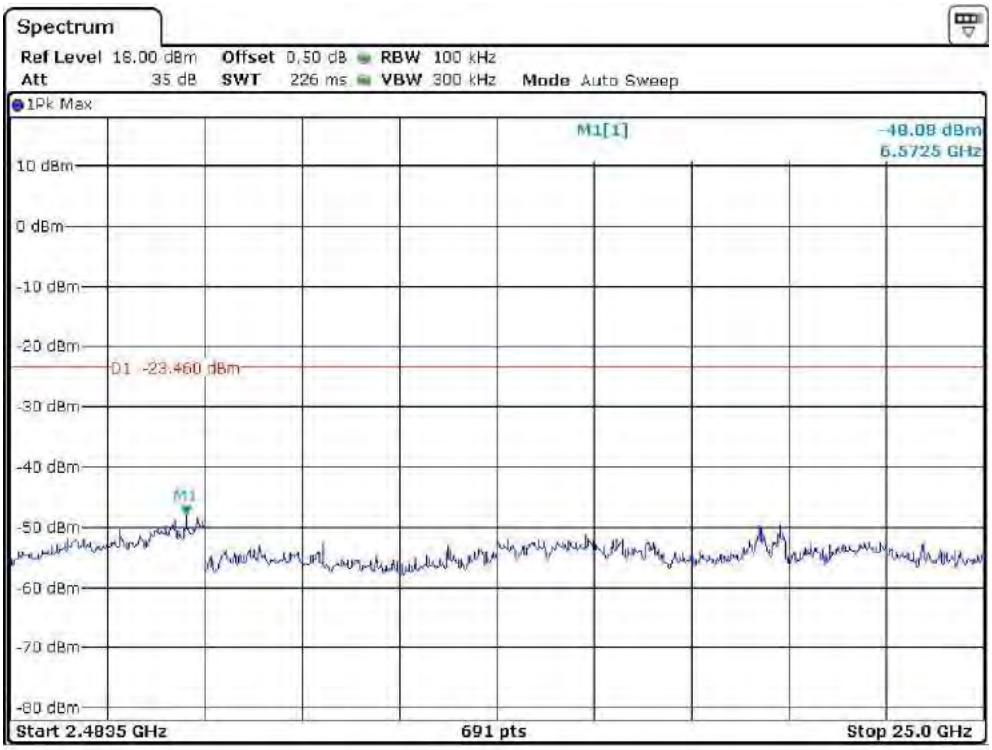

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -47.32 dBm
6.8665 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -23.530 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 2.4835 GHz
691 pts
Stop 25.0 GHz



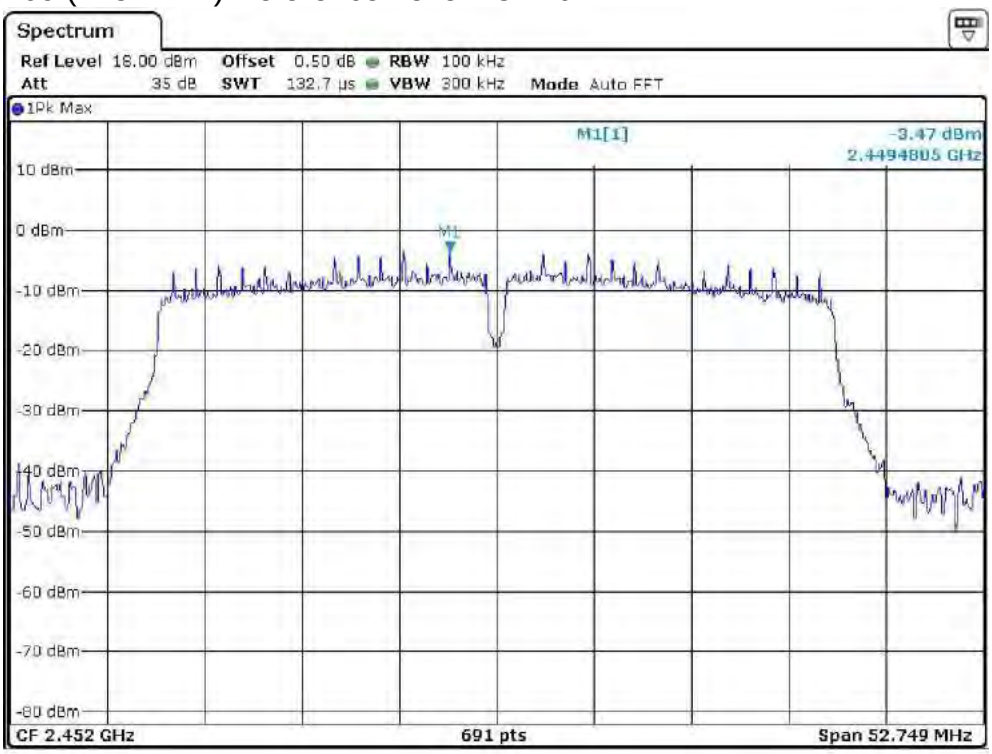
Channel 06 (2437MHz) Reference Level: -3.46dBm

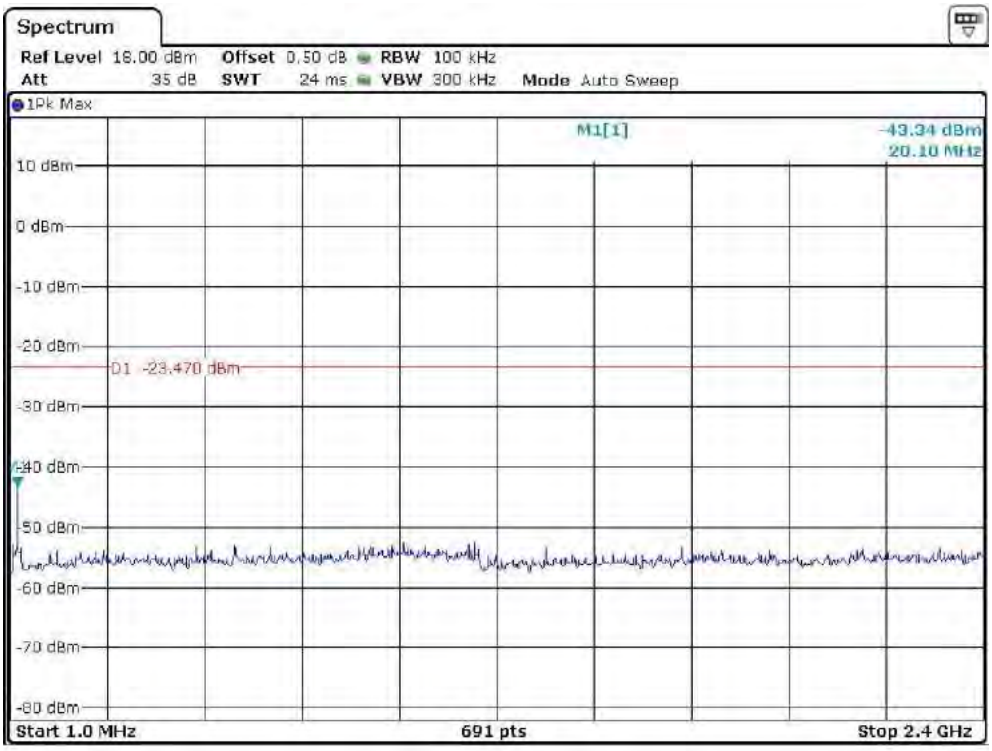


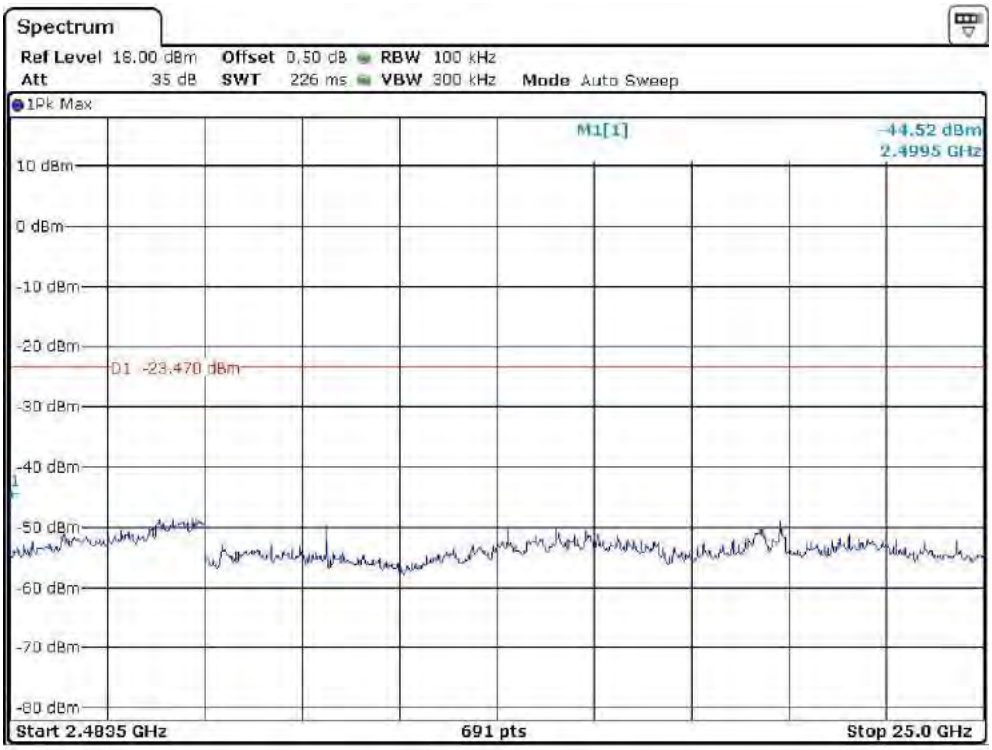

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 24 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -44.60 dBm
20.10 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -23.460 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 1.0 MHz
691 pts
Stop 2.4 GHz

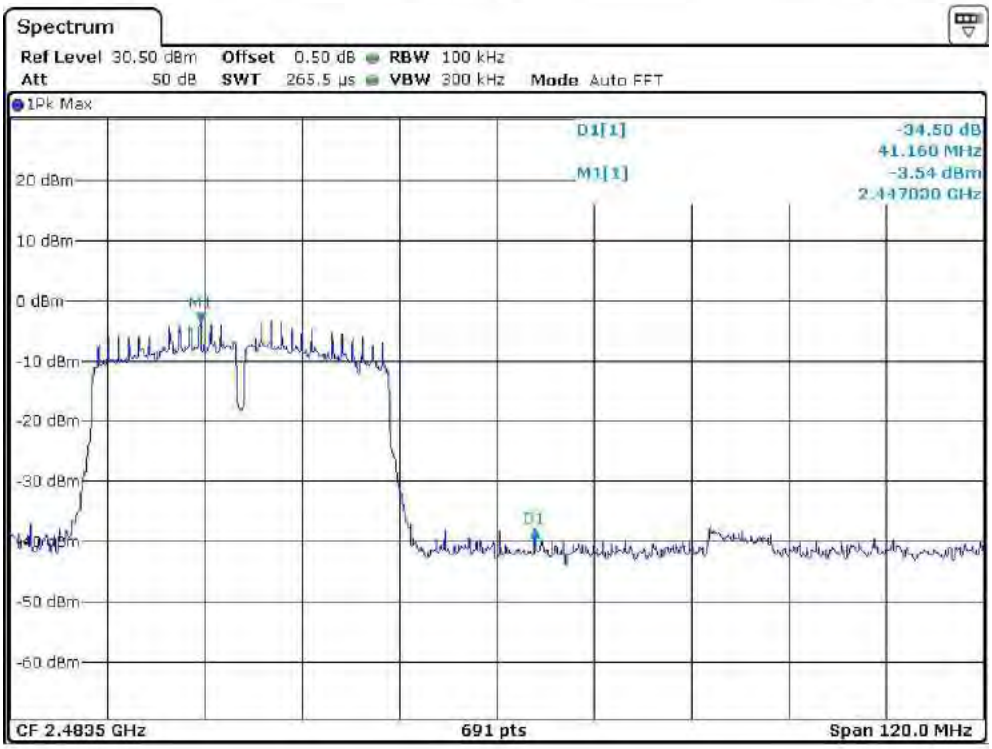

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -48.08 dBm
6.5725 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -23.460 dBm
-30 dBm
-40 dBm
M1
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 2.4835 GHz
691 pts
Stop 25.0 GHz

Channel 09 (2452MHz) Reference Level: -3.47dBm

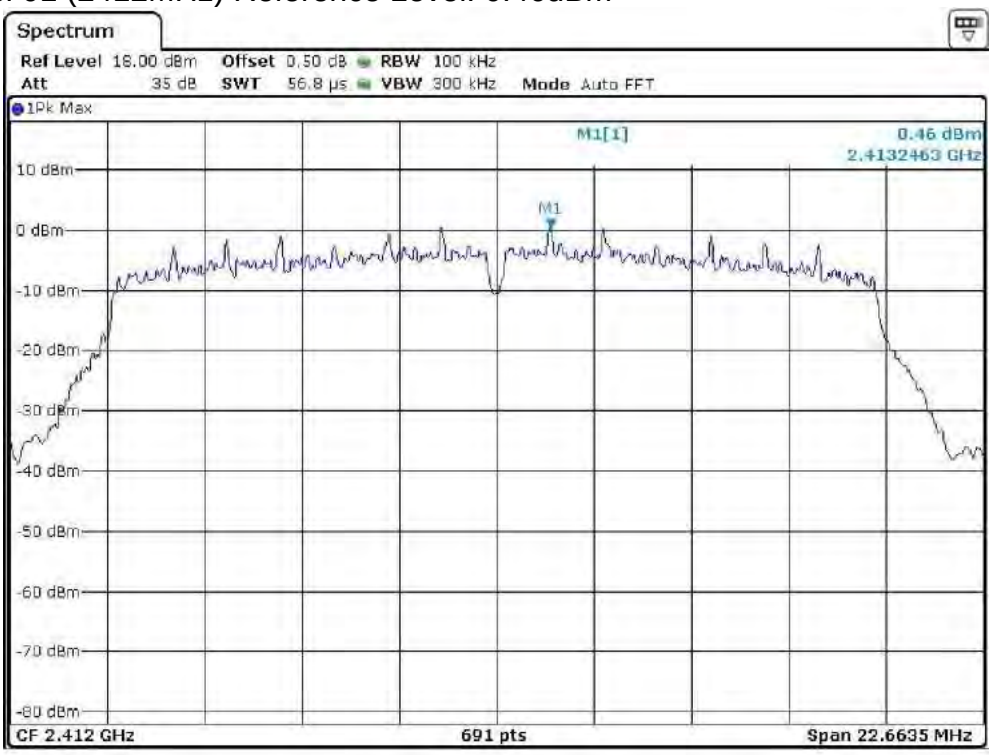


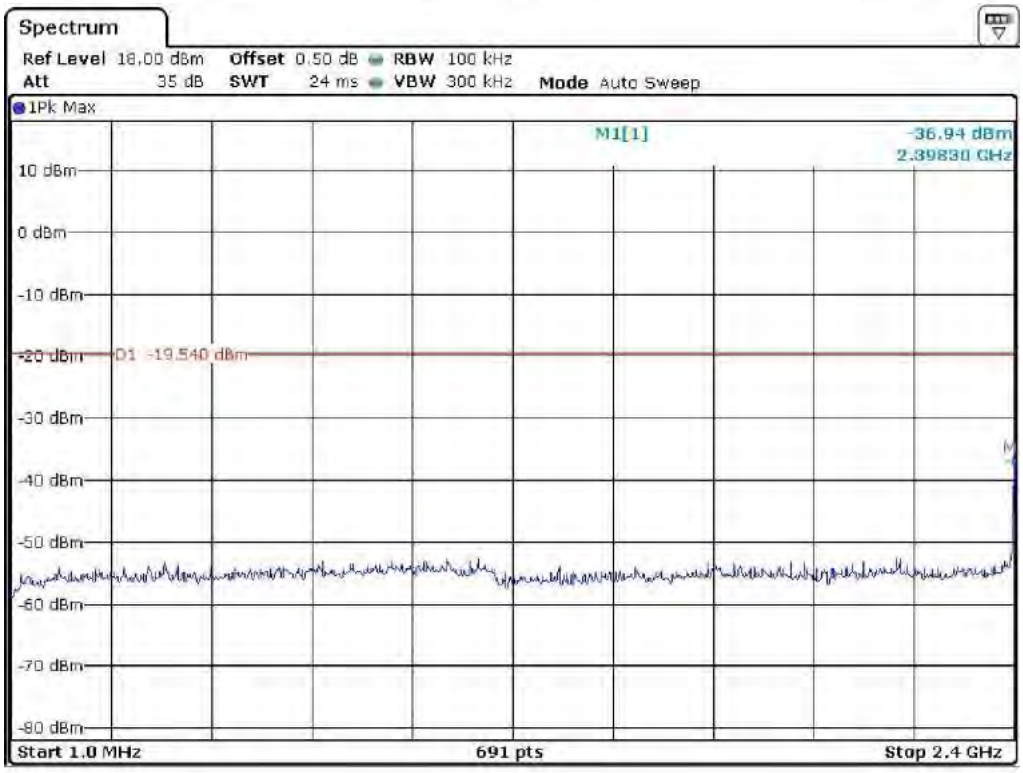


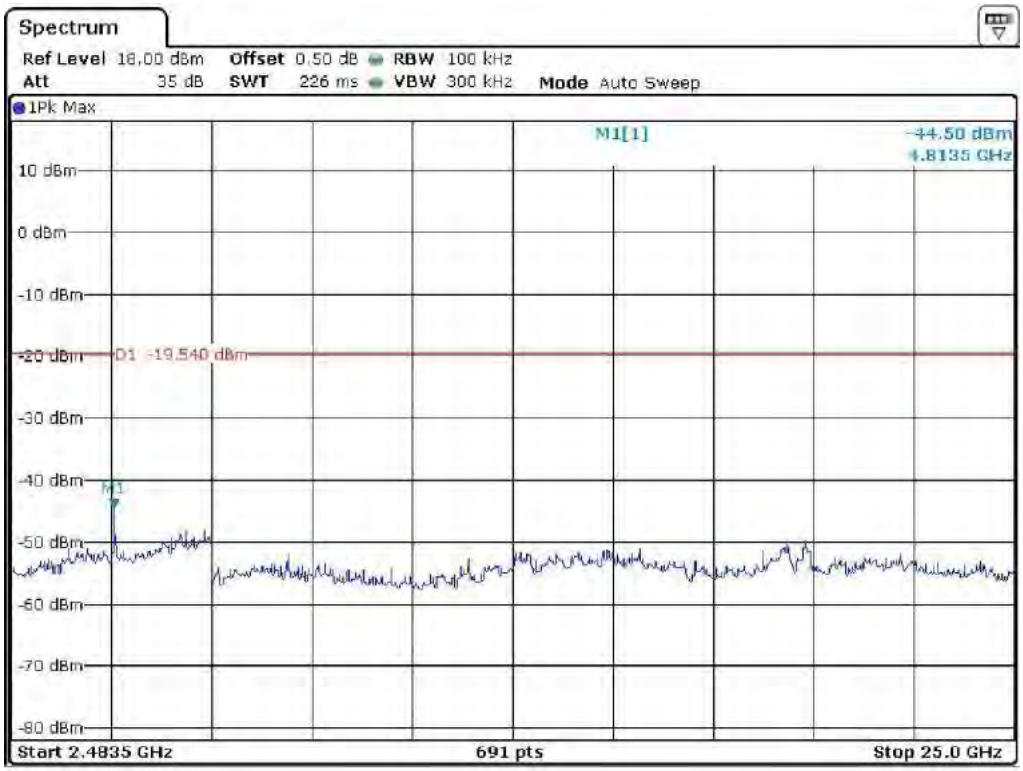

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -44.52 dBm
2.4995 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -23.470 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 2.4835 GHz
691 pts
Stop 25.0 GHz

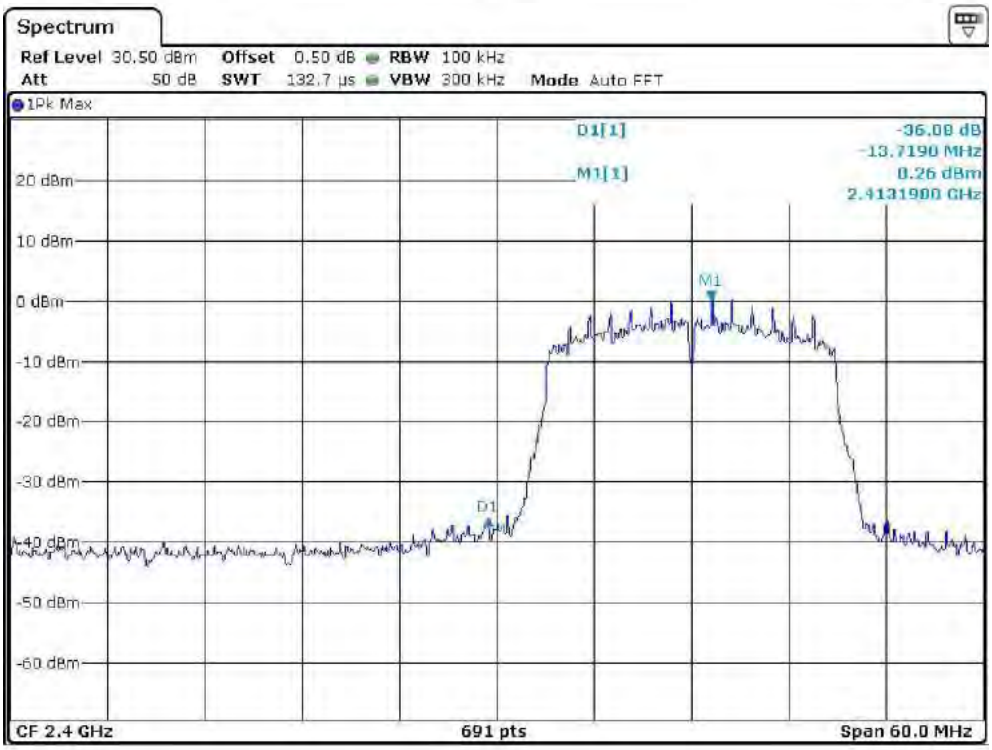

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 265.5 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] -34.50 dB
41.160 MHz
M1[1] -3.54 dBm
2.447030 GHz
20 dBm
10 dBm
0 dBm
M1
-10 dBm
-20 dBm
-30 dBm
D1
-50 dBm
-60 dBm
CF 2.4835 GHz
691 pts
Span 120.0 MHz

MIMO Mode, Ant1：
802.11n-HT20
Channel 01 (2412MHz) Reference Level: 0.46dBm

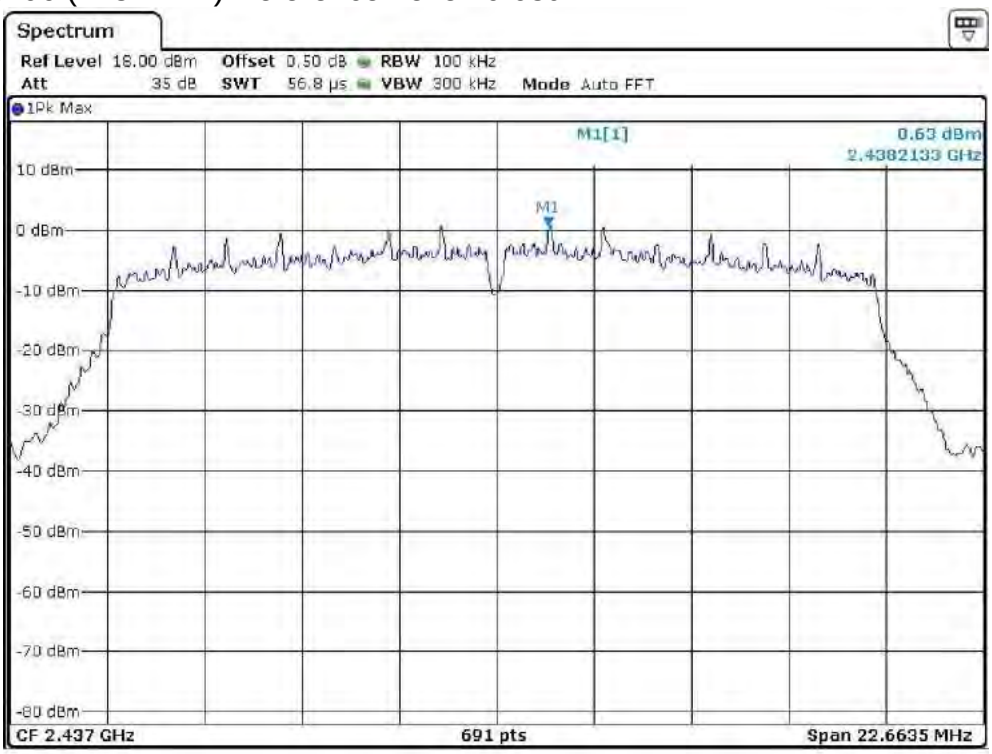


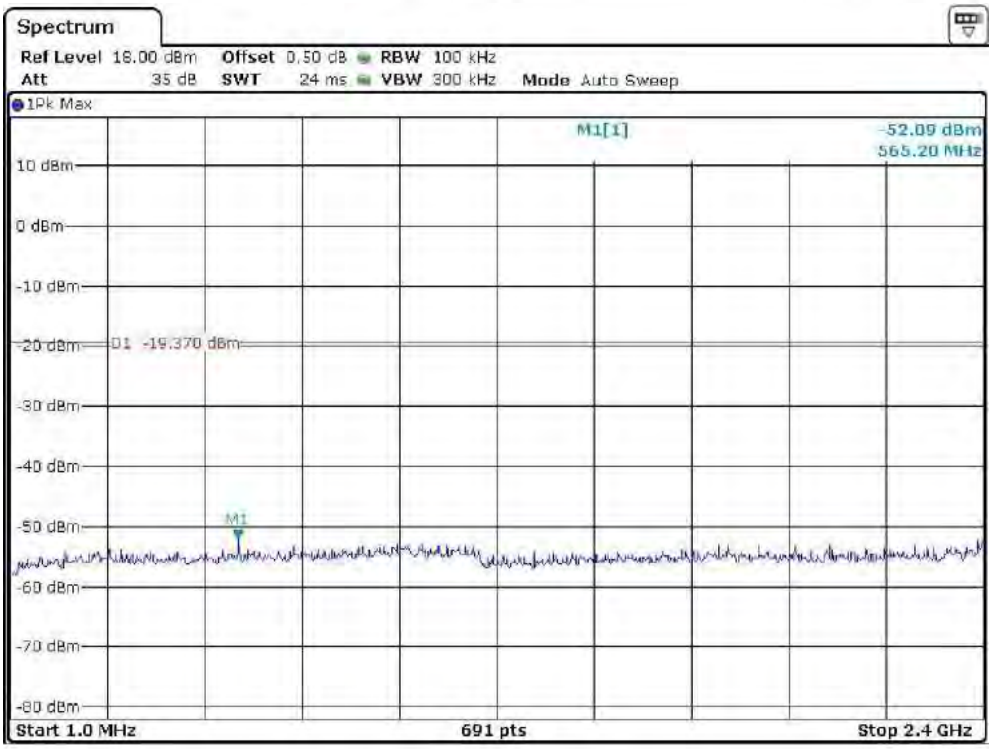


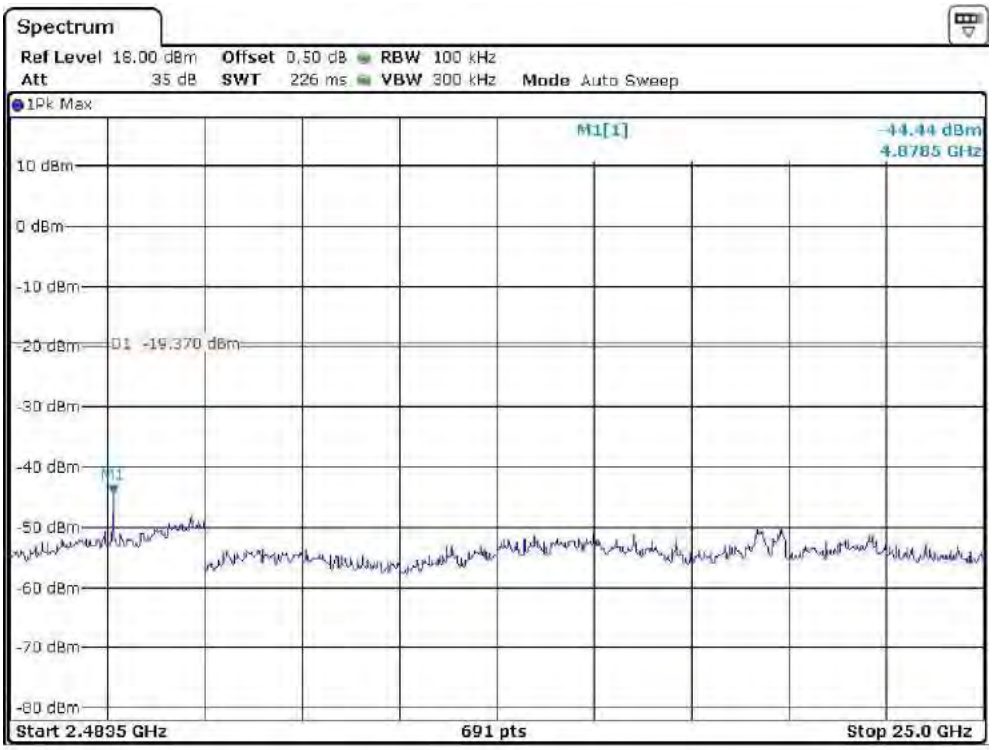

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -44.50 dBm
4.8135 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -19.540 dBm
-30 dBm
-40 dBm
M1
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 2.4835 GHz
691 pts
Stop 25.0 GHz


Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 132.7 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] -36.08 dB
-13.7190 MHz
M1[1] 0.26 dBm
2.4131900 GHz
20 dBm
10 dBm
0 dBm
M1
-10 dBm
-20 dBm
-30 dBm
D1
-40 dBm
-50 dBm
-60 dBm
CF 2.4 GHz
691 pts
Span 60.0 MHz

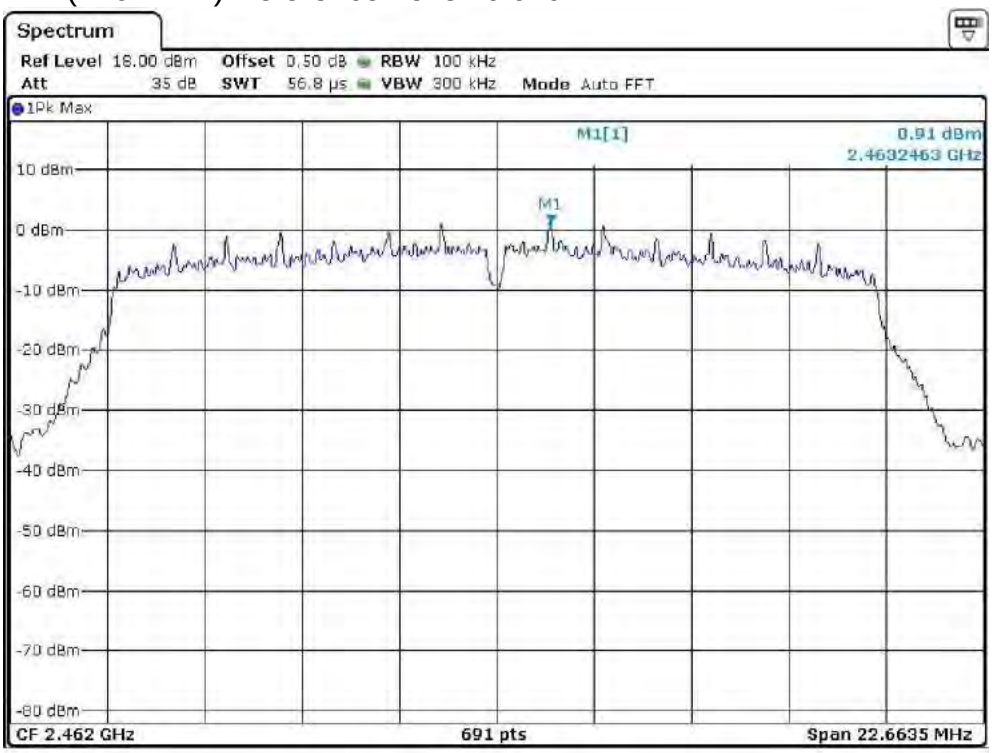
Channel 06 (2437MHz) Reference Level: 0.63dBm

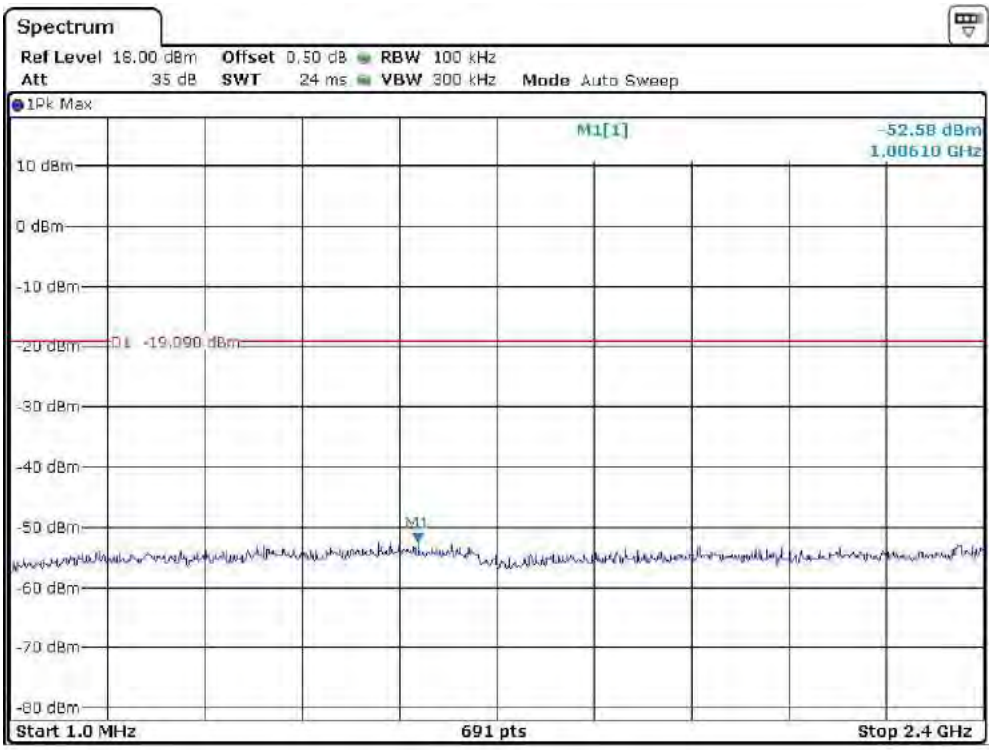


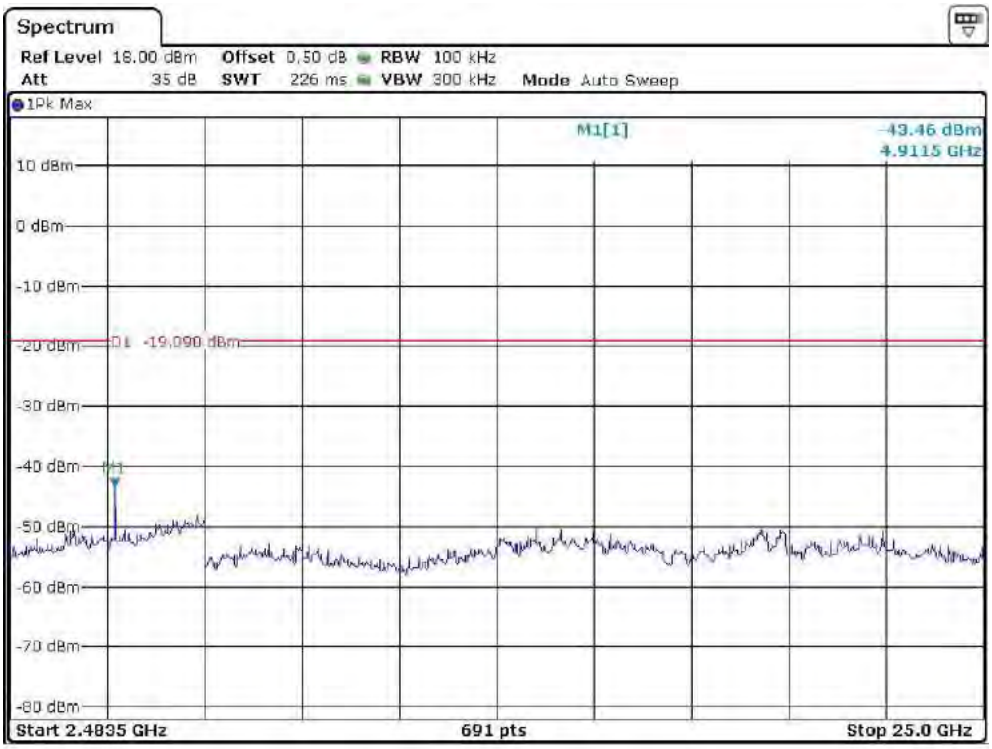


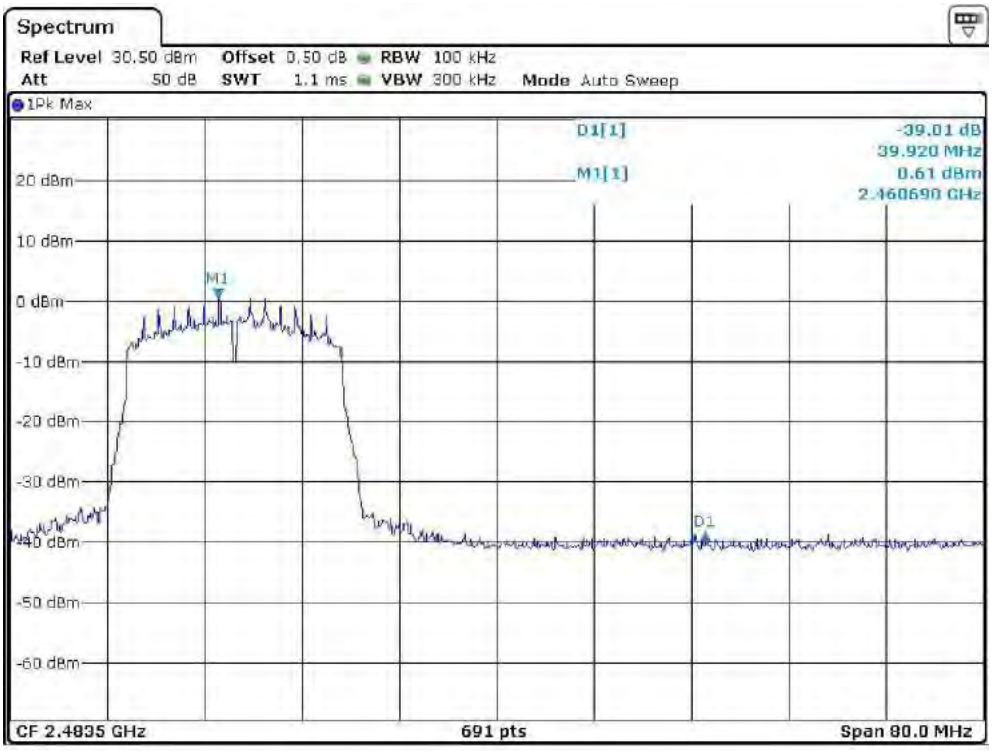


Channel 11 (2462MHz) Reference Level: 0.91dBm

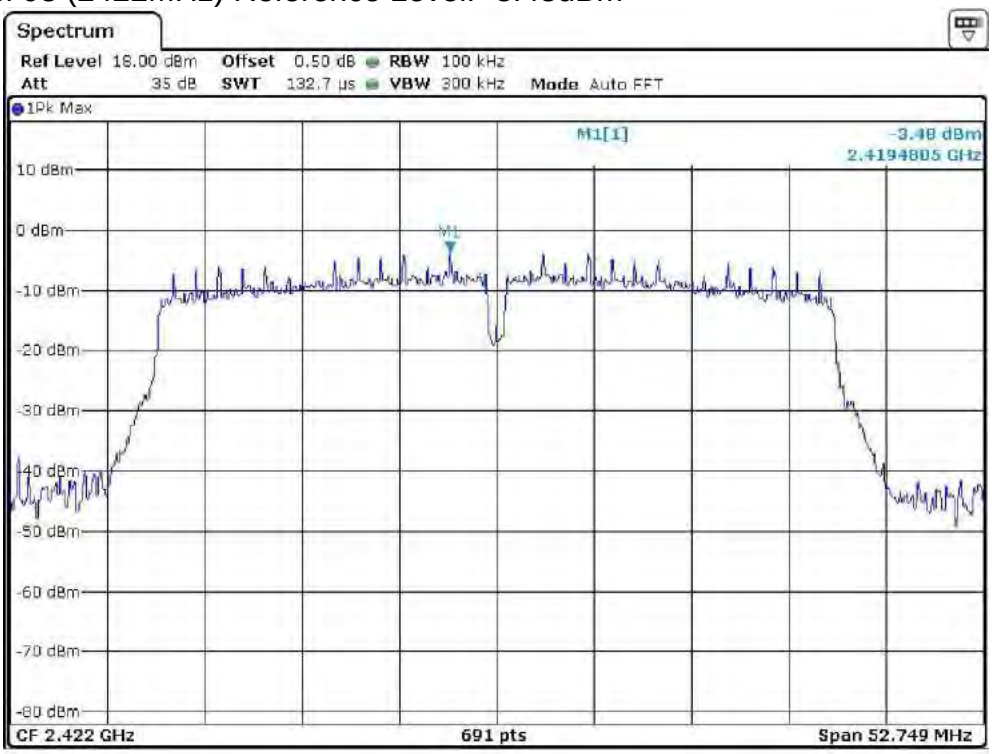


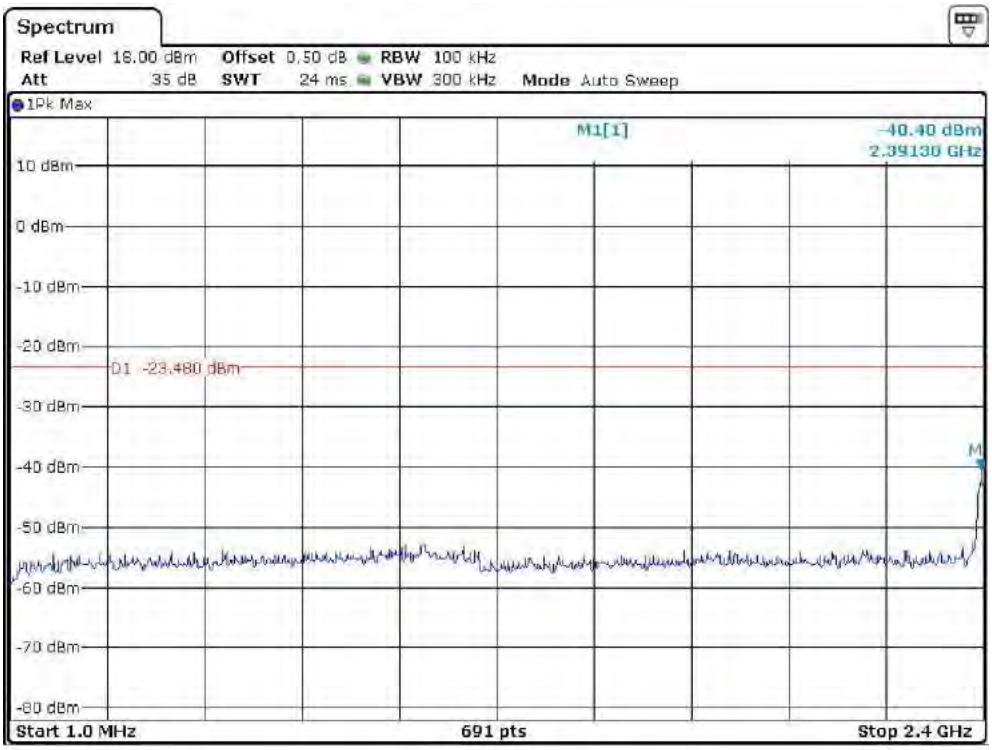

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 24 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -52.58 dBm
1.00610 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -19.090 dBm
-30 dBm
-40 dBm
-50 dBm
M1
-60 dBm
-70 dBm
-80 dBm
Start 1.0 MHz
691 pts
Stop 2.4 GHz

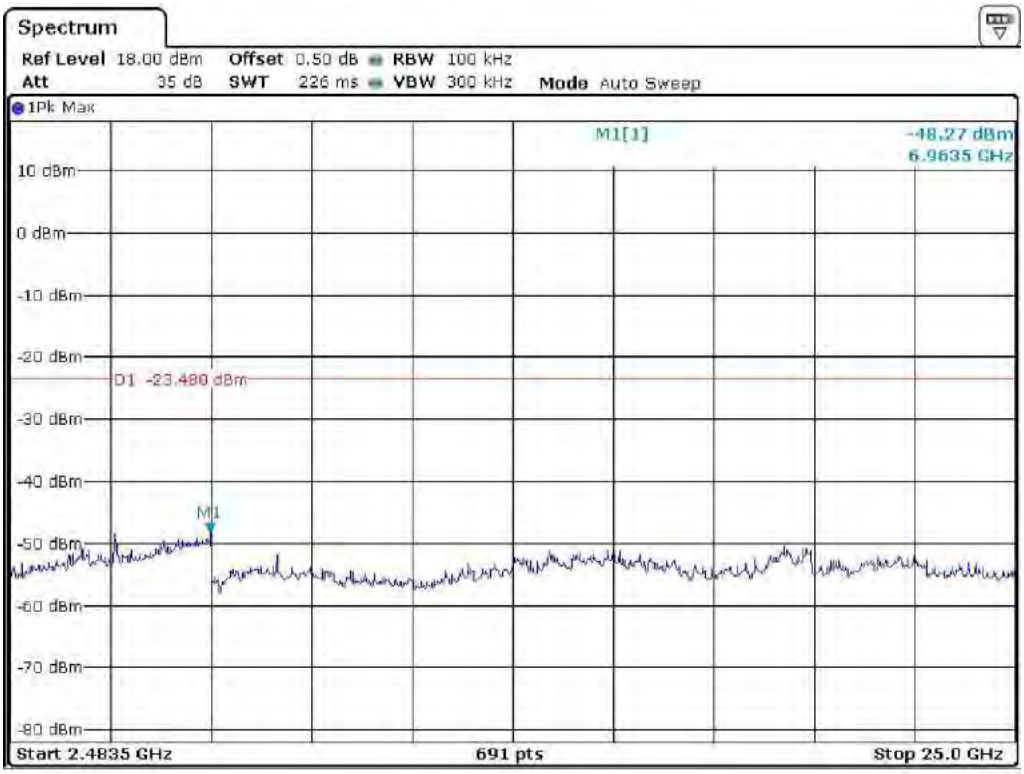

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -43.46 dBm
4.9115 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -19.090 dBm
-30 dBm
-40 dBm
M1
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 2.4835 GHz
691 pts
Stop 25.0 GHz

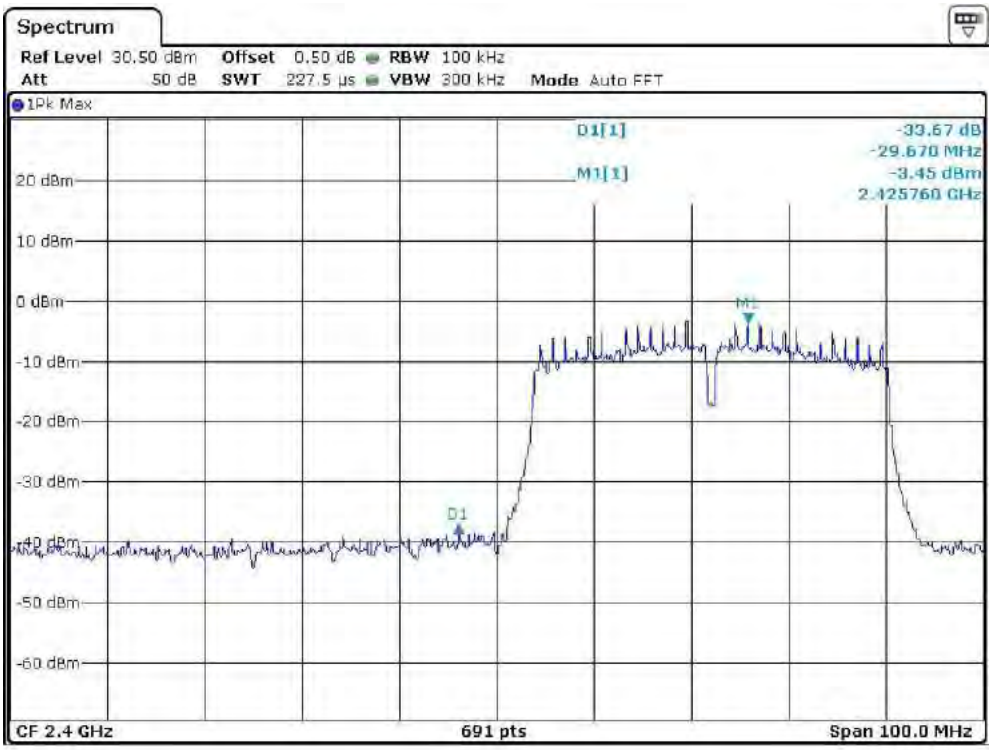


802.11n-HT40
Channel 03 (2422MHz) Reference Level: -3.48dBm

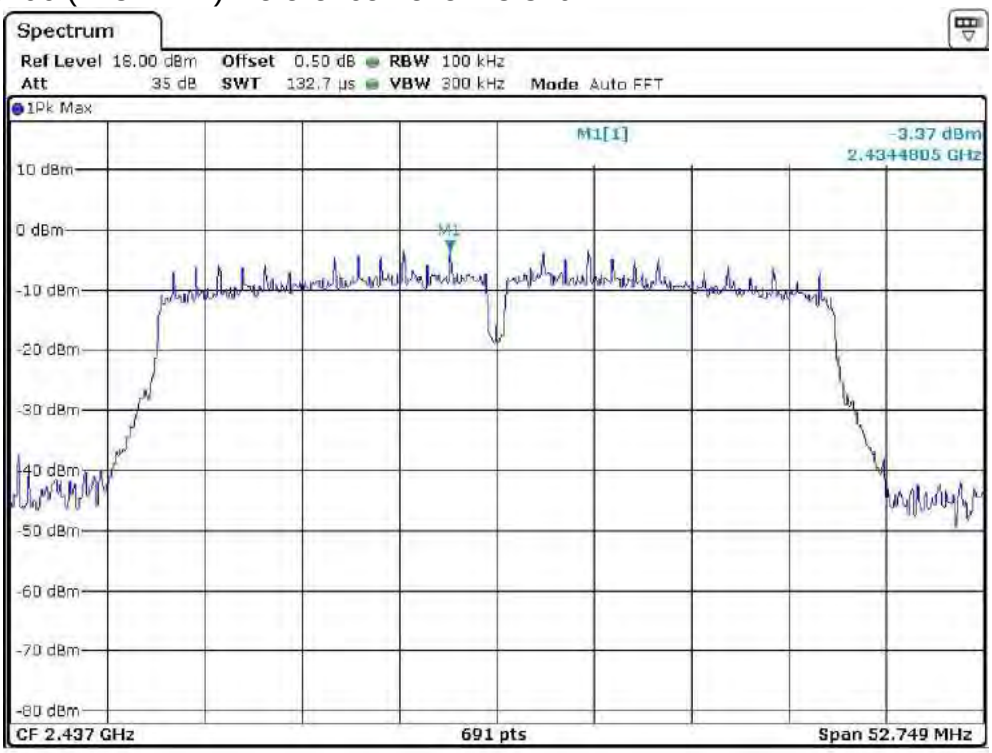


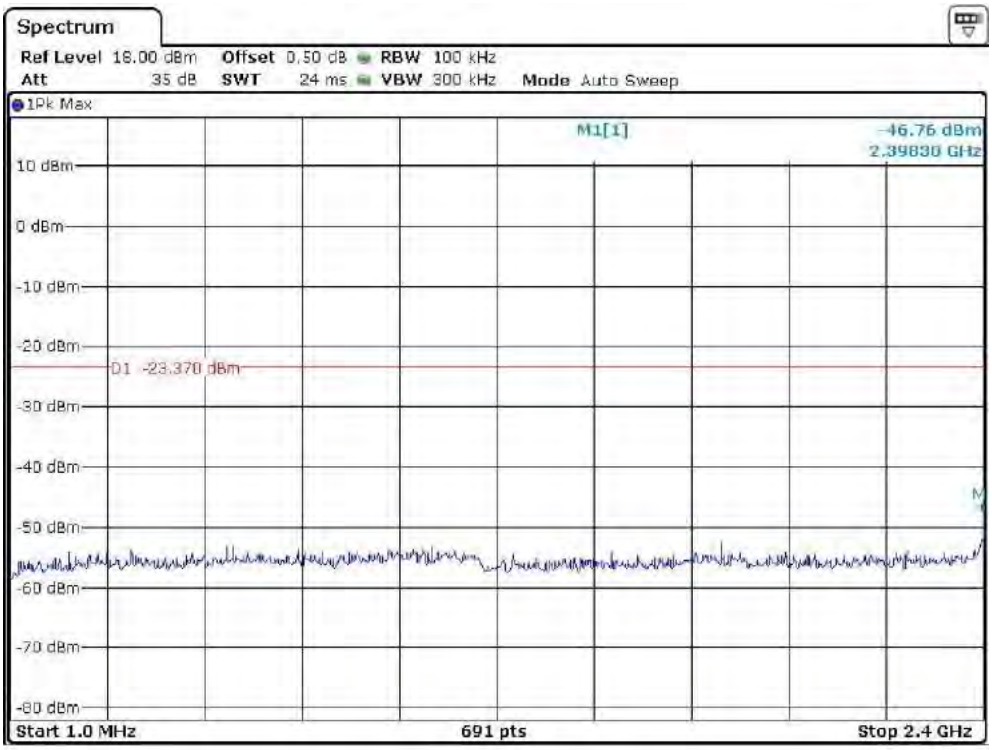

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 24 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -40.40 dBm
2.39130 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -23.480 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 1.0 MHz
691 pts
Stop 2.4 GHz

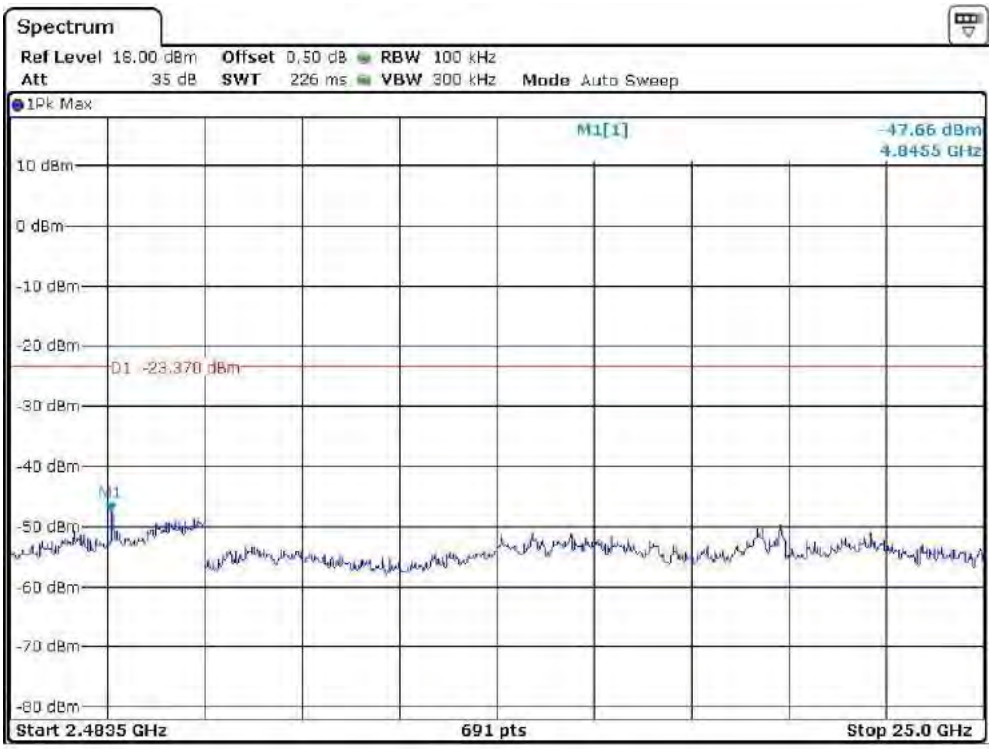

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -48.27 dBm
6.9635 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -23.480 dBm
-30 dBm
-40 dBm
M1
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 2.4835 GHz
691 pts
Stop 25.0 GHz



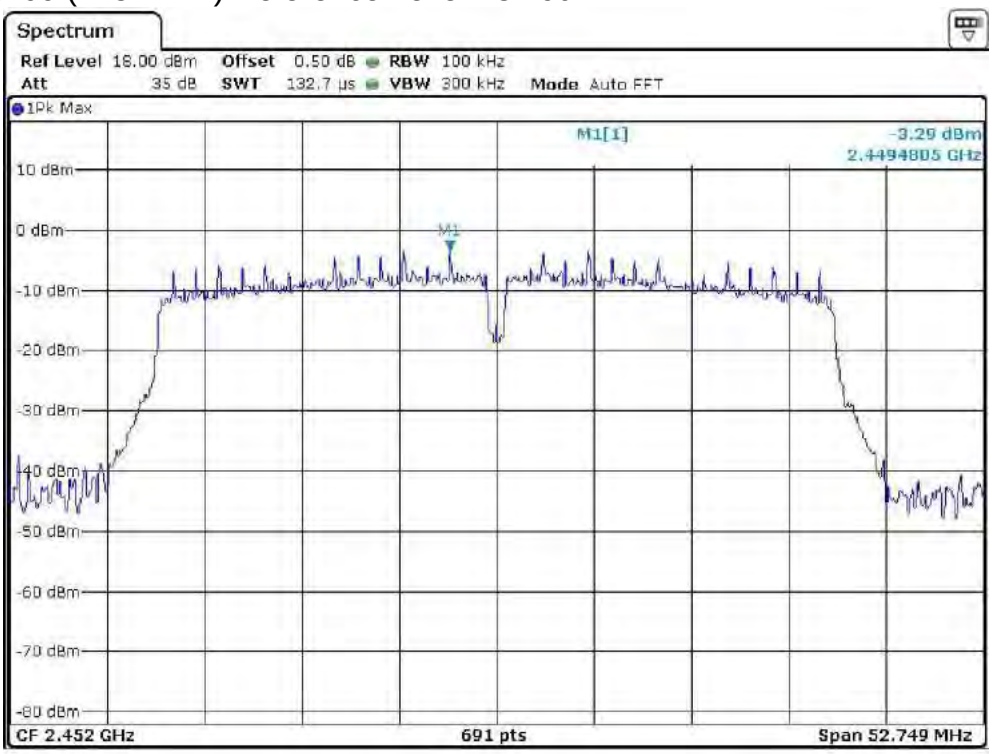
Channel 06 (2437MHz) Reference Level: -3.37dBm

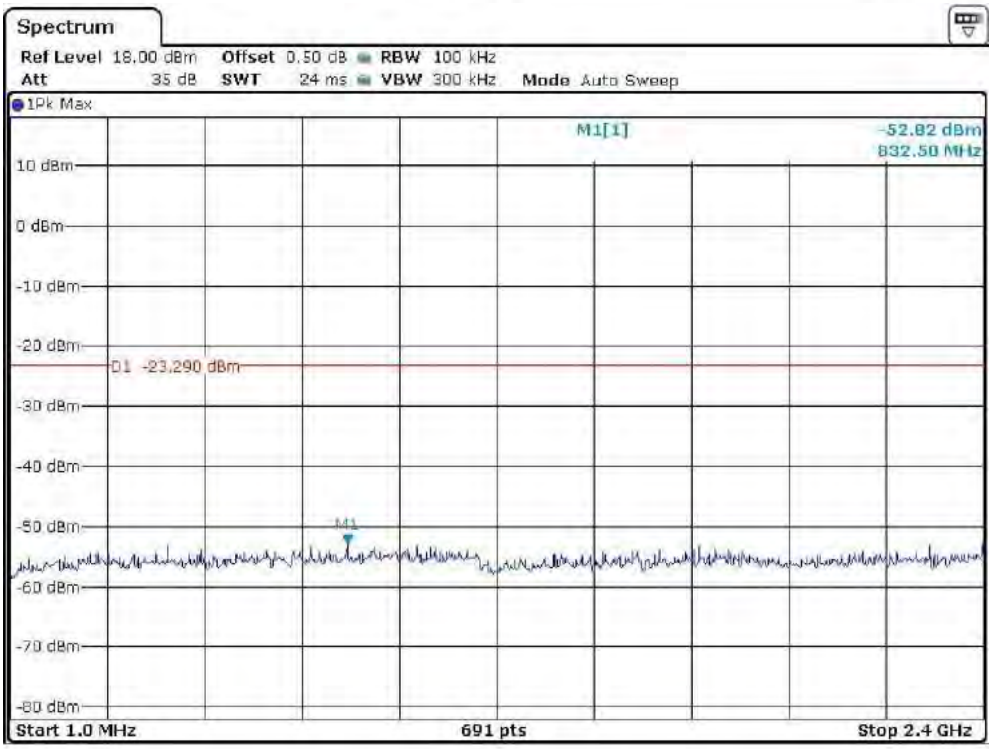


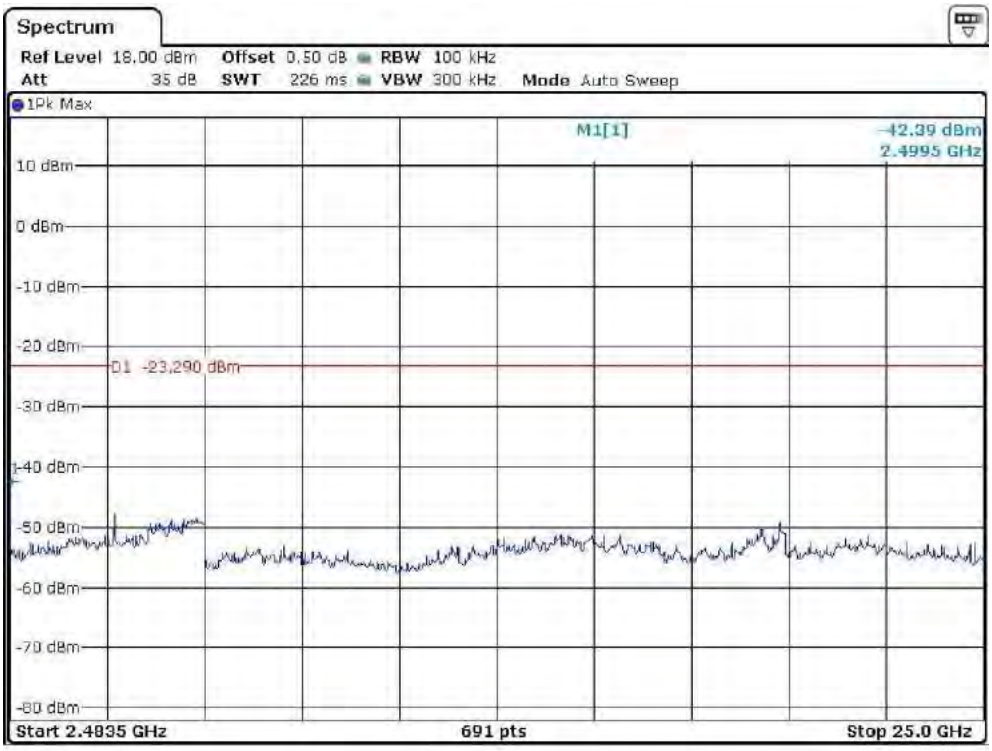

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 24 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -46.76 dBm
2.39830 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -23.370 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 1.0 MHz
691 pts
Stop 2.4 GHz

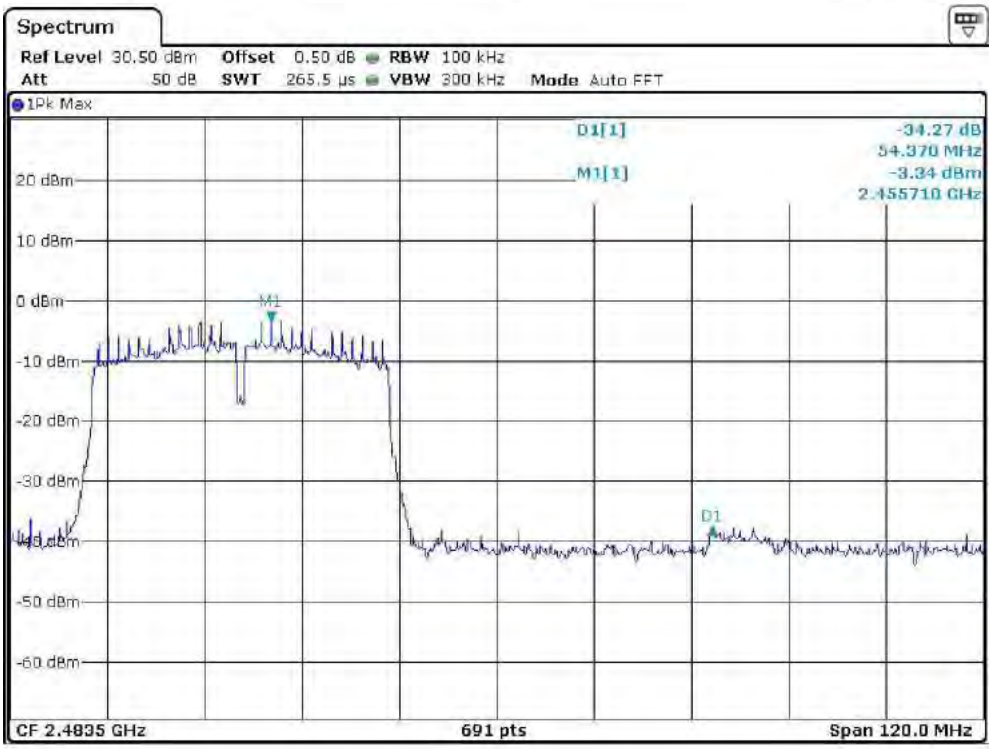

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -47.66 dBm
4.8455 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -23.370 dBm
-30 dBm
-40 dBm
M1
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 2.4835 GHz
691 pts
Stop 25.0 GHz

Channel 09 (2452MHz) Reference Level: -3.29dBm

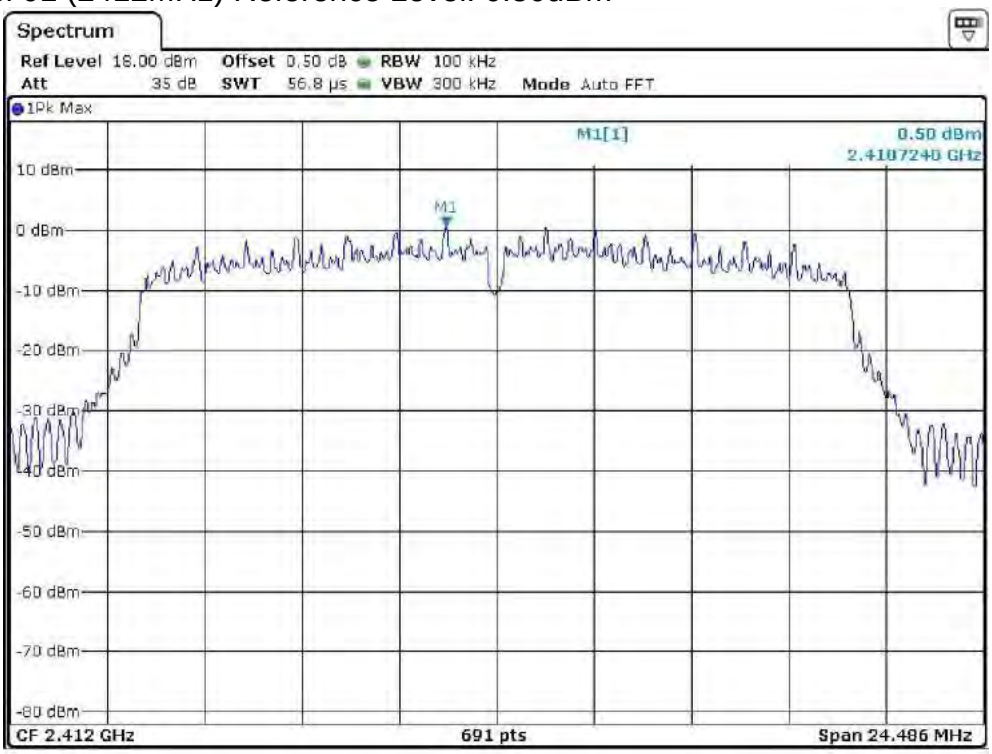


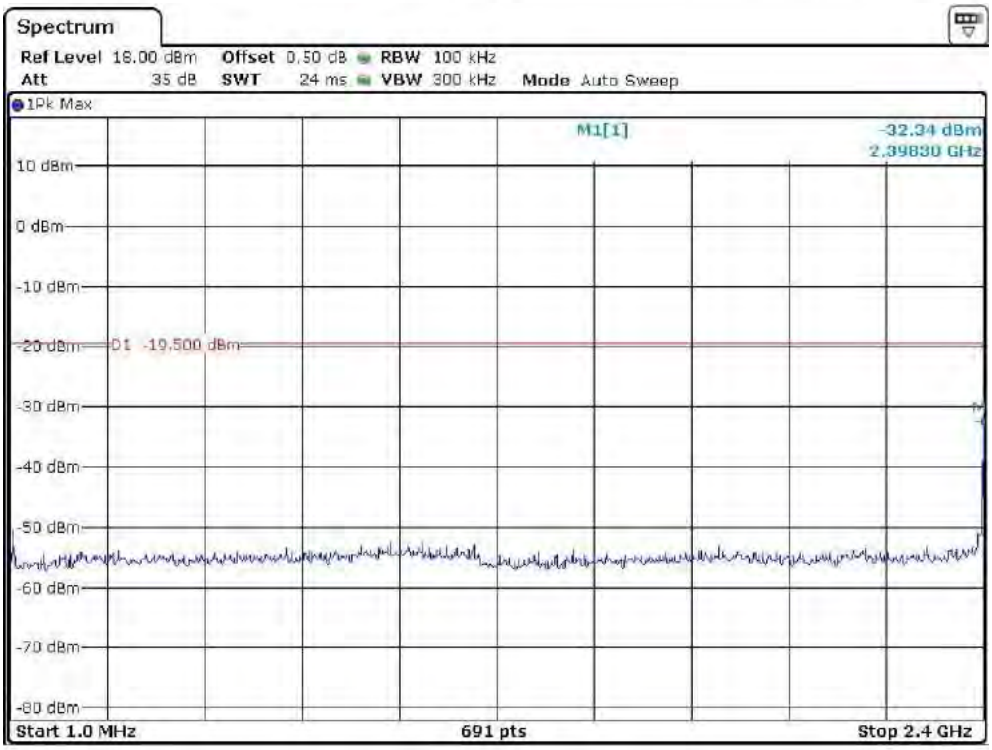


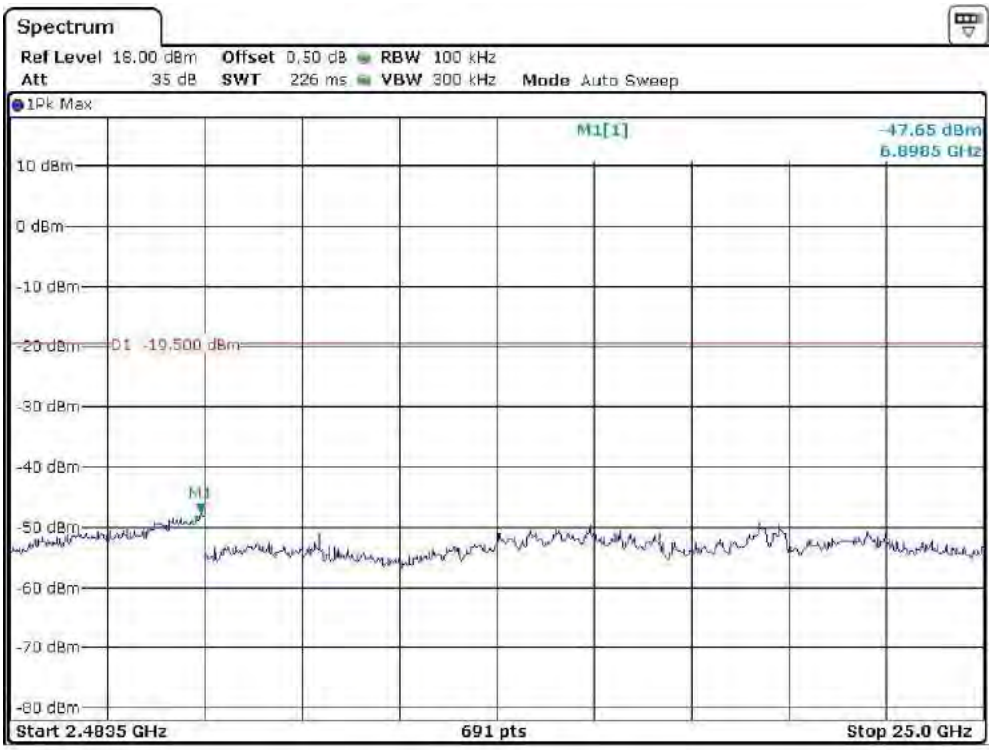

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -42.39 dBm
2.4995 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -23.290 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 2.4835 GHz
691 pts
Stop 25.0 GHz

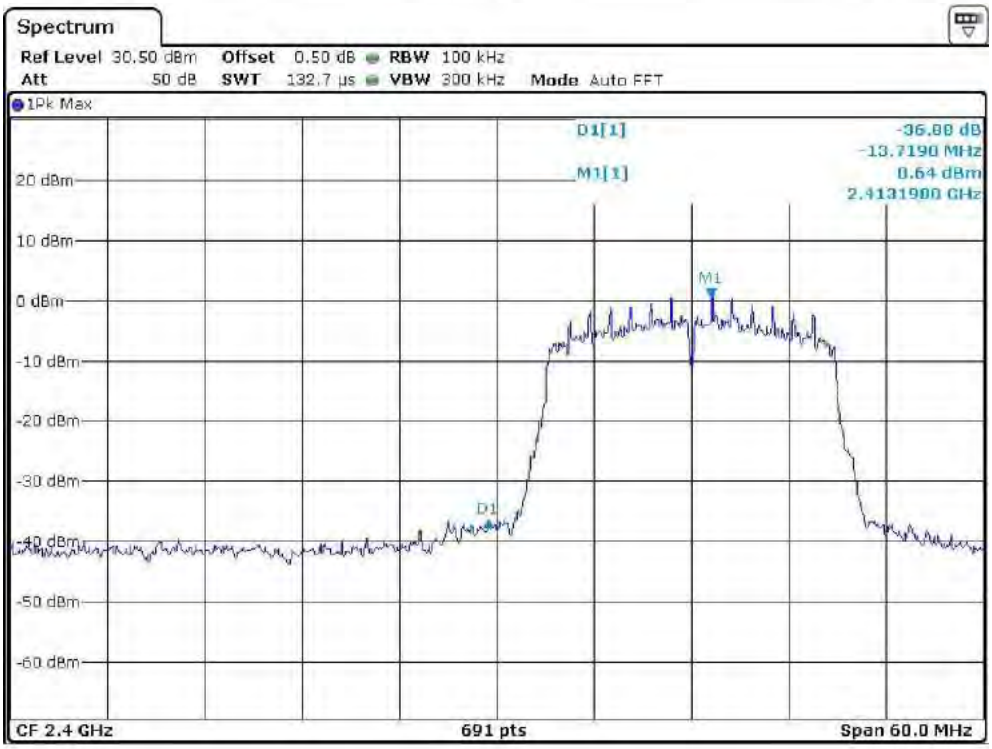

Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 265.5 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] -34.27 dB
54.370 MHz
M1[1] -3.34 dBm
2.455710 GHz
20 dBm
10 dBm
0 dBm
M1
-10 dBm
-20 dBm
-30 dBm
D1
-40 dBm
-50 dBm
-60 dBm
CF 2.4835 GHz
691 pts
Span 120.0 MHz

MIMO Mode, Ant2：
802.11n-HT20
Channel 01 (2412MHz) Reference Level: 0.50dBm

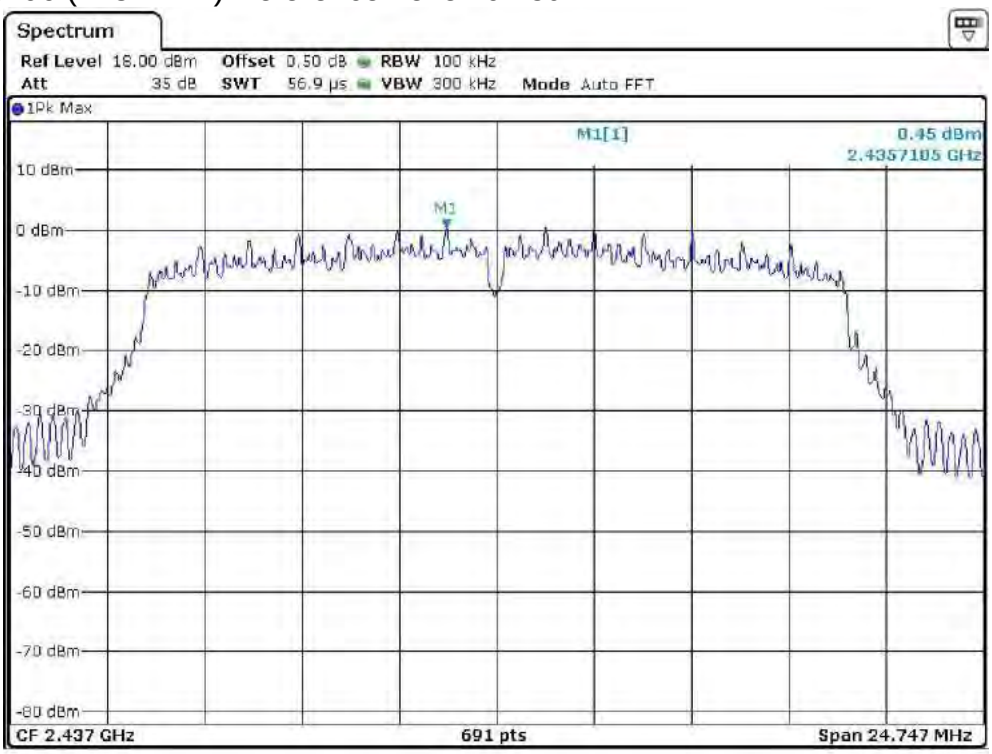


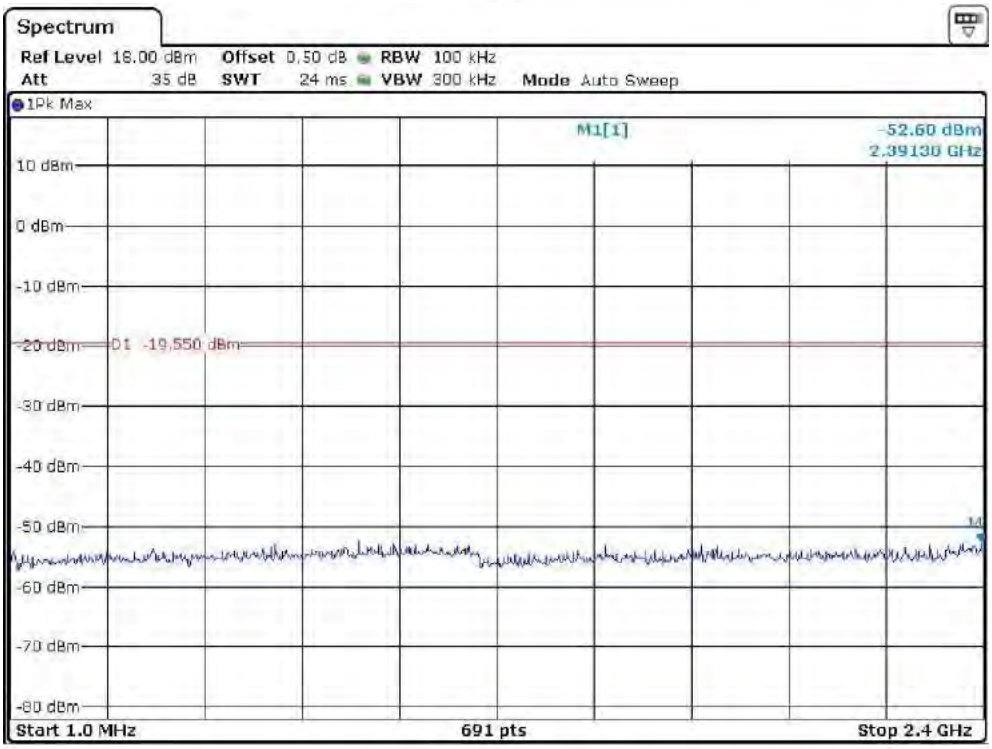


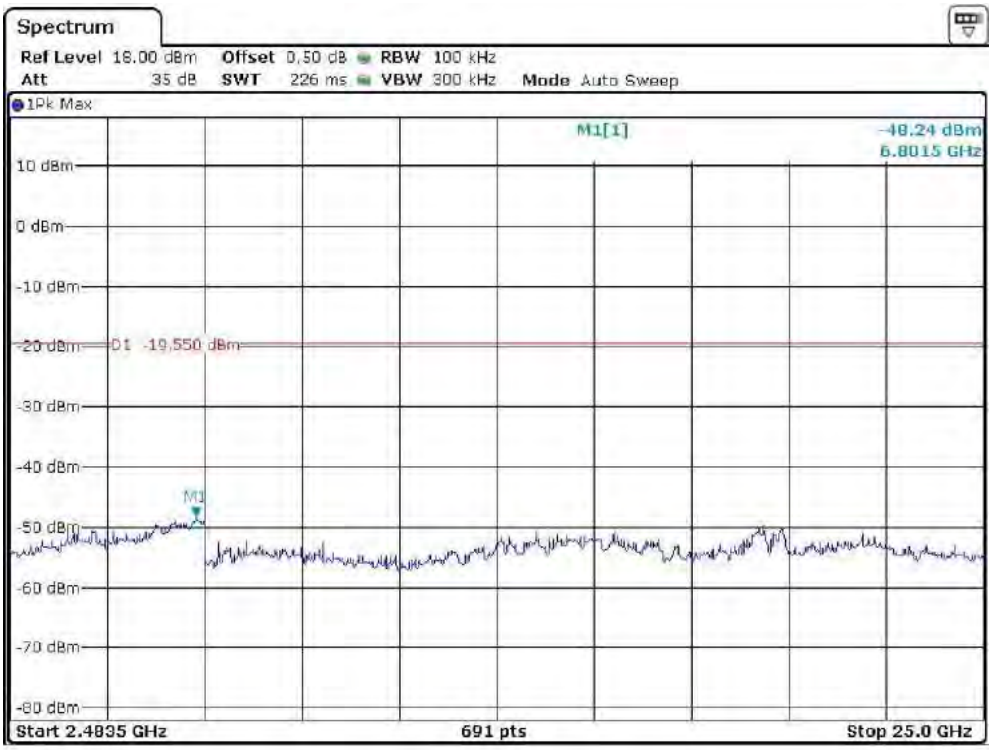

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -47.65 dBm
6.8985 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -19.500 dBm
-30 dBm
-40 dBm
M1
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 2.4835 GHz
691 pts
Stop 25.0 GHz


Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 132.7 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] -36.80 dB
-13.7190 MHz
M1[1] 0.64 dBm
2.4131900 GHz
20 dBm
10 dBm
0 dBm
M1
-10 dBm
-20 dBm
-30 dBm
D1
-40 dBm
-50 dBm
-60 dBm
CF 2.4 GHz
691 pts
Span 60.0 MHz

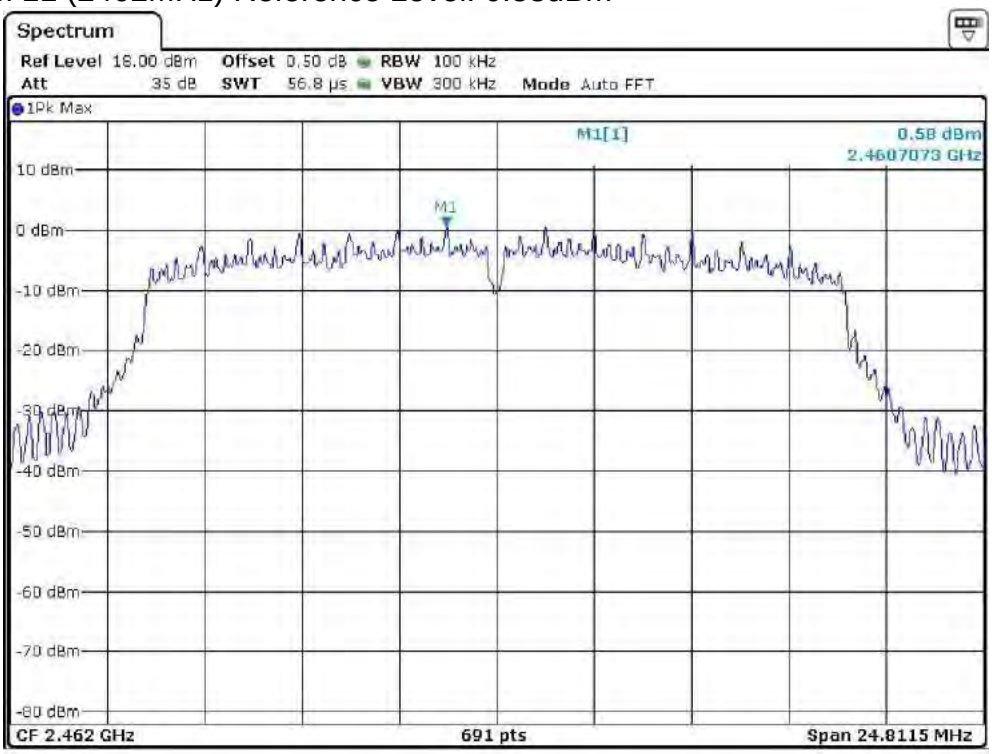
Channel 06 (2437MHz) Reference Level: 0.45dBm

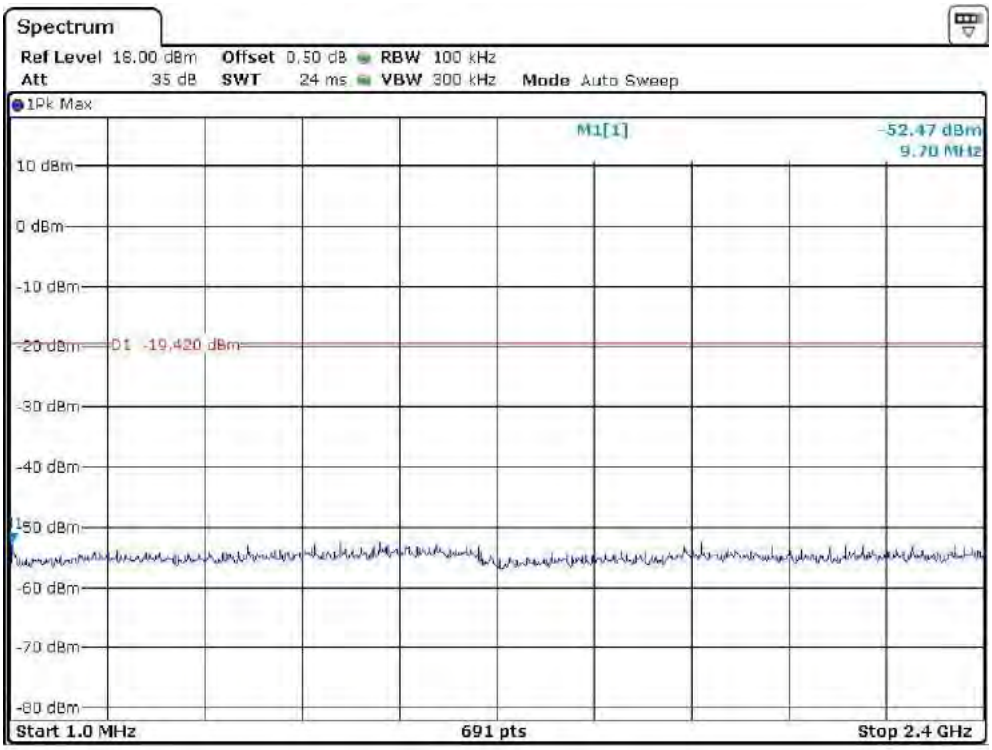


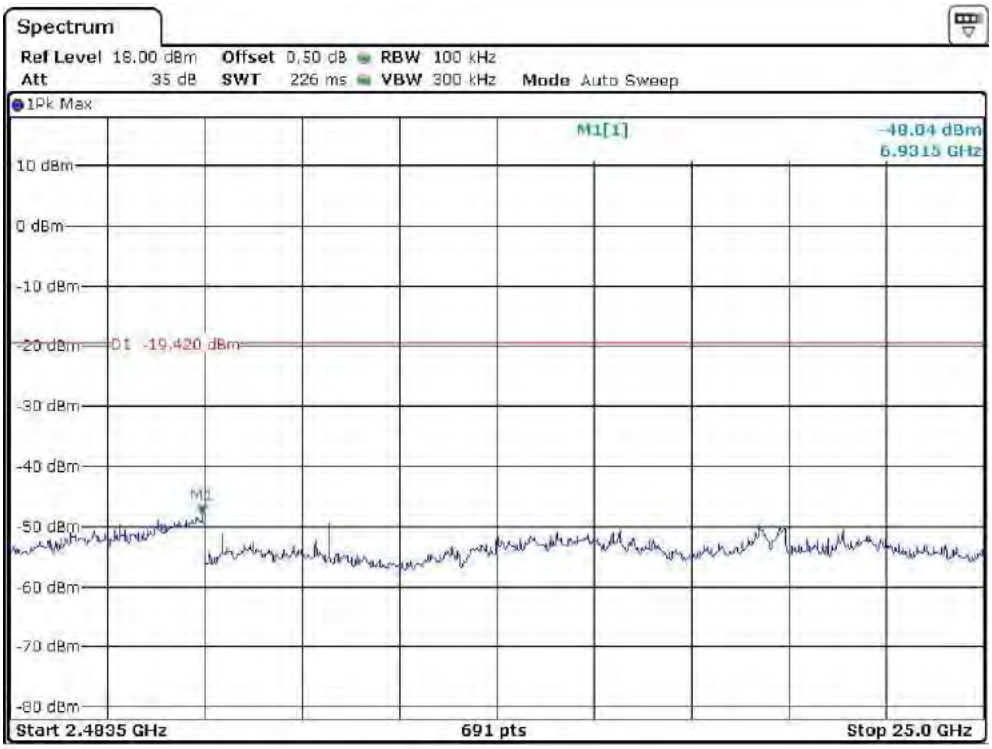


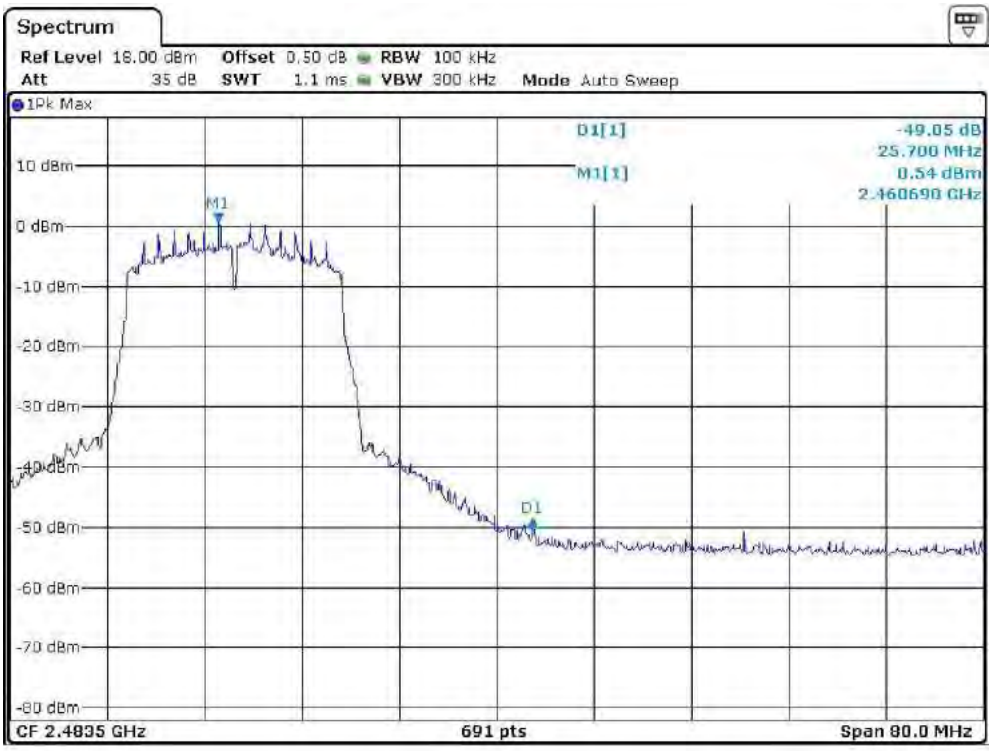


Channel 11 (2462MHz) Reference Level: 0.58dBm

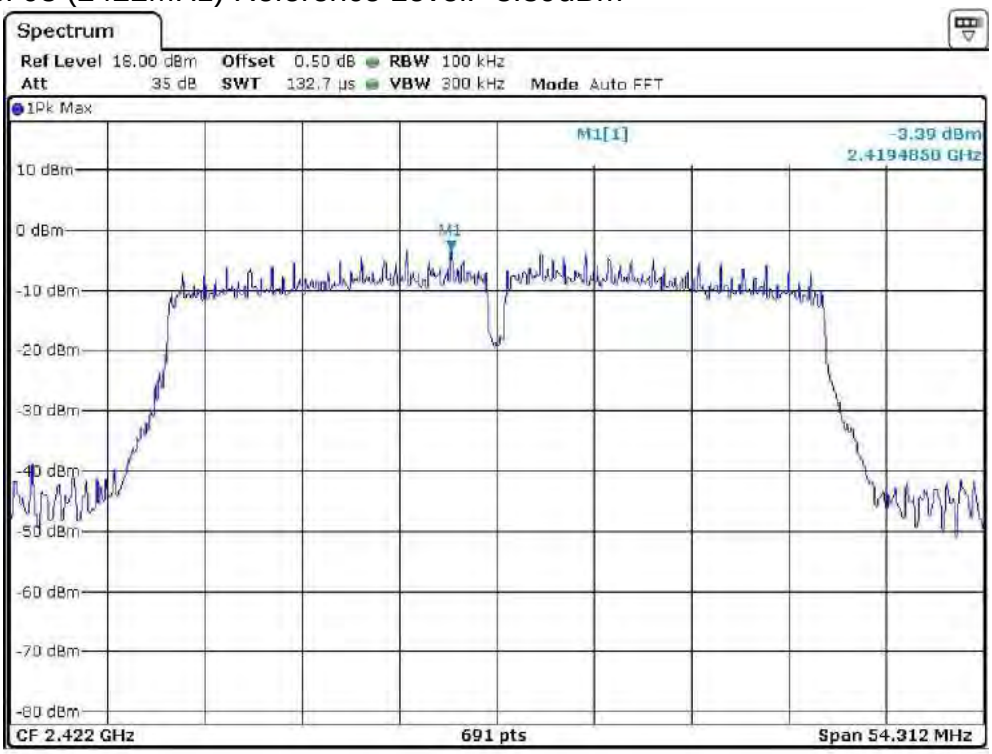


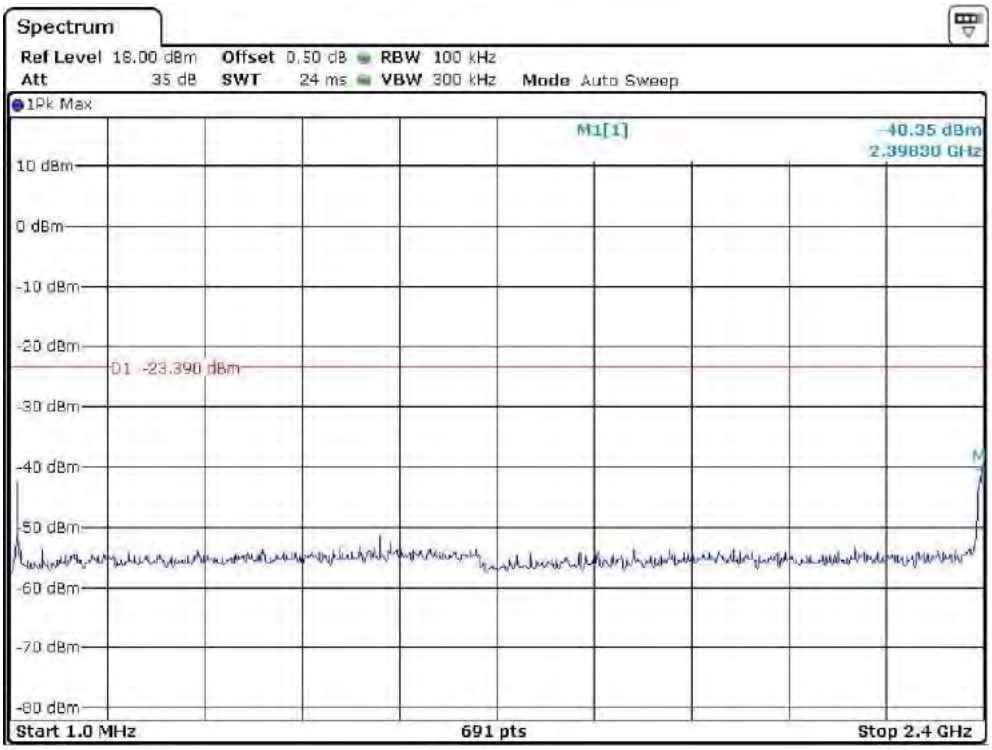

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 24 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -52.47 dBm
9.70 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -19.420 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 1.0 MHz
691 pts
Stop 2.4 GHz

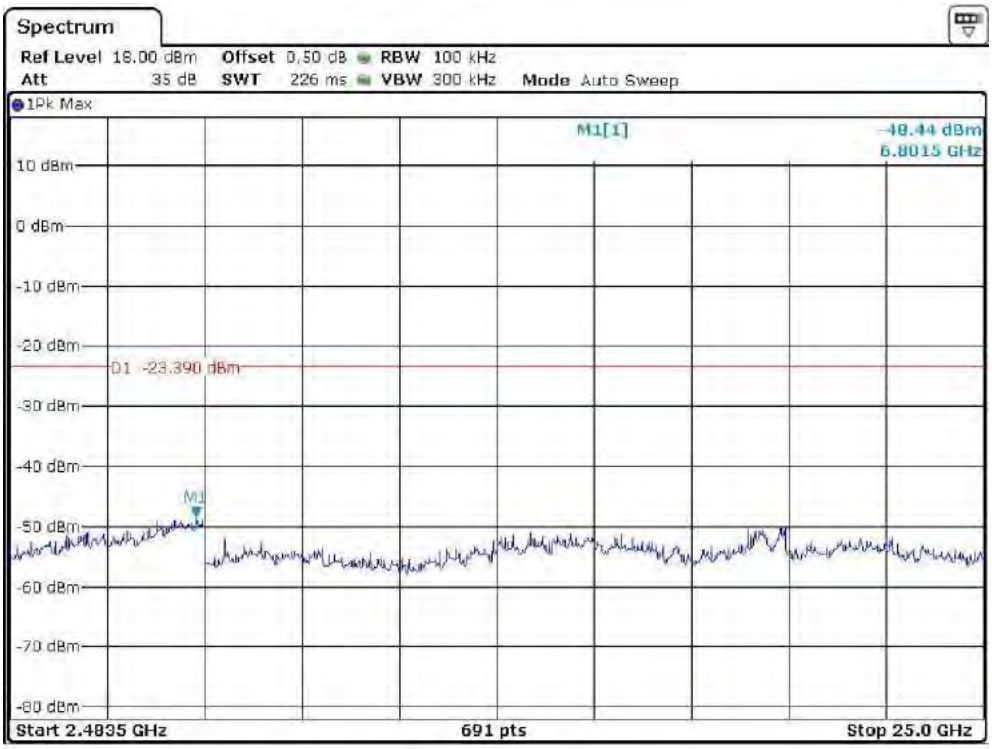

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -48.04 dBm
6.9315 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -19.420 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 2.4835 GHz
691 pts
Stop 25.0 GHz

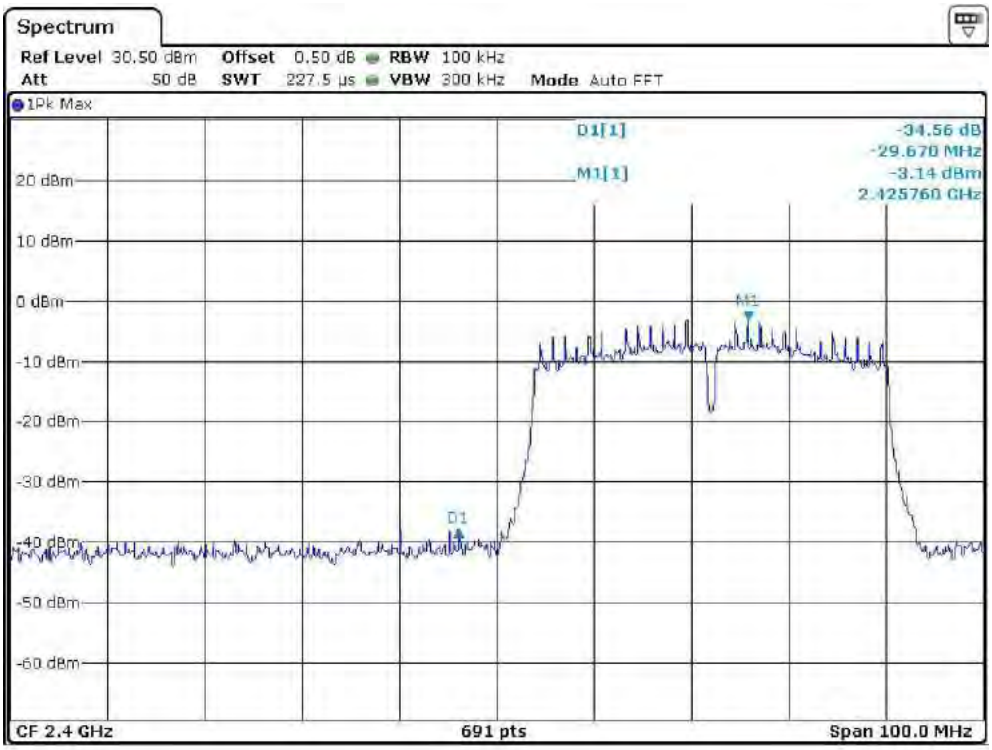


802.11n-HT40
Channel 03 (2422MHz) Reference Level: -3.39dBm

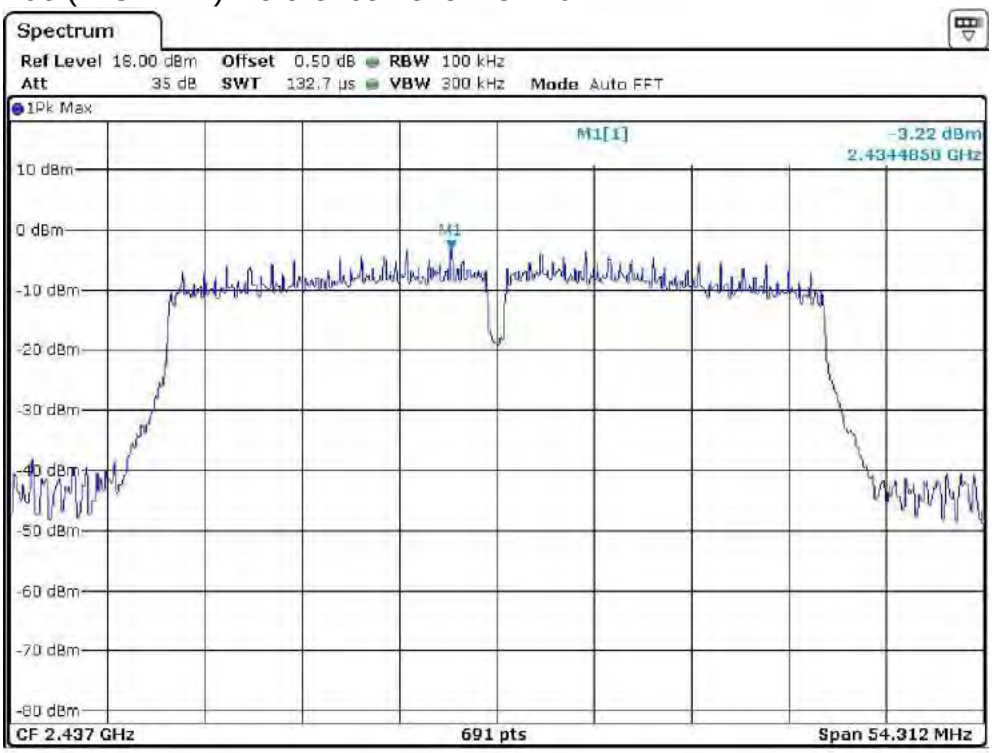


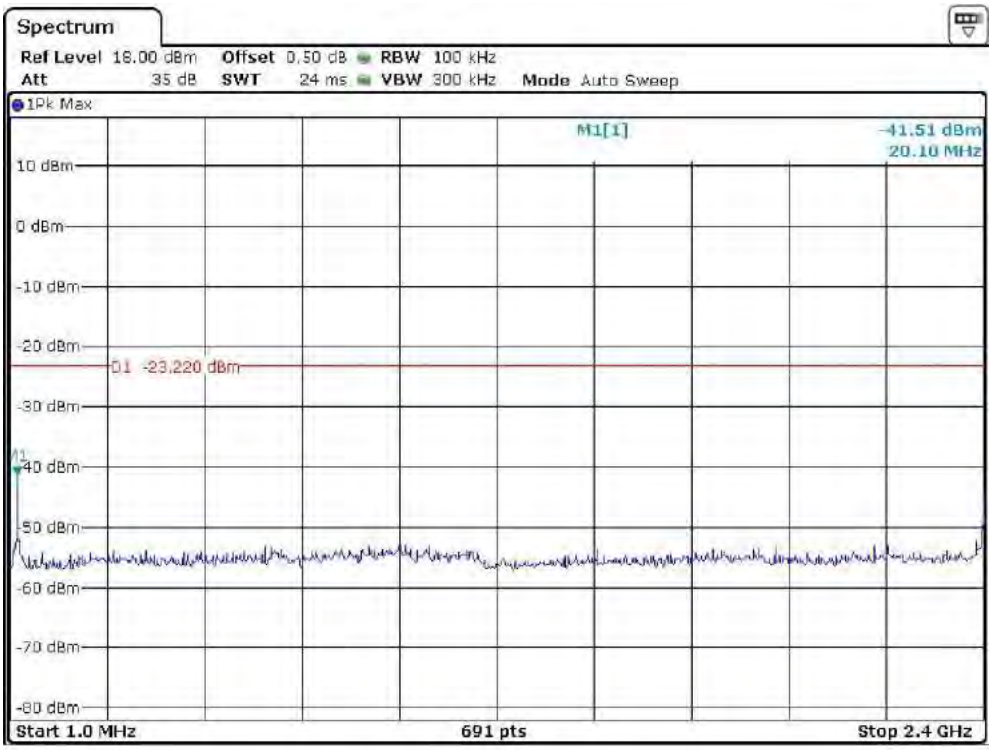

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 24 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -40.35 dBm
2.39830 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -23.390 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 1.0 MHz
691 pts
Stop 2.4 GHz

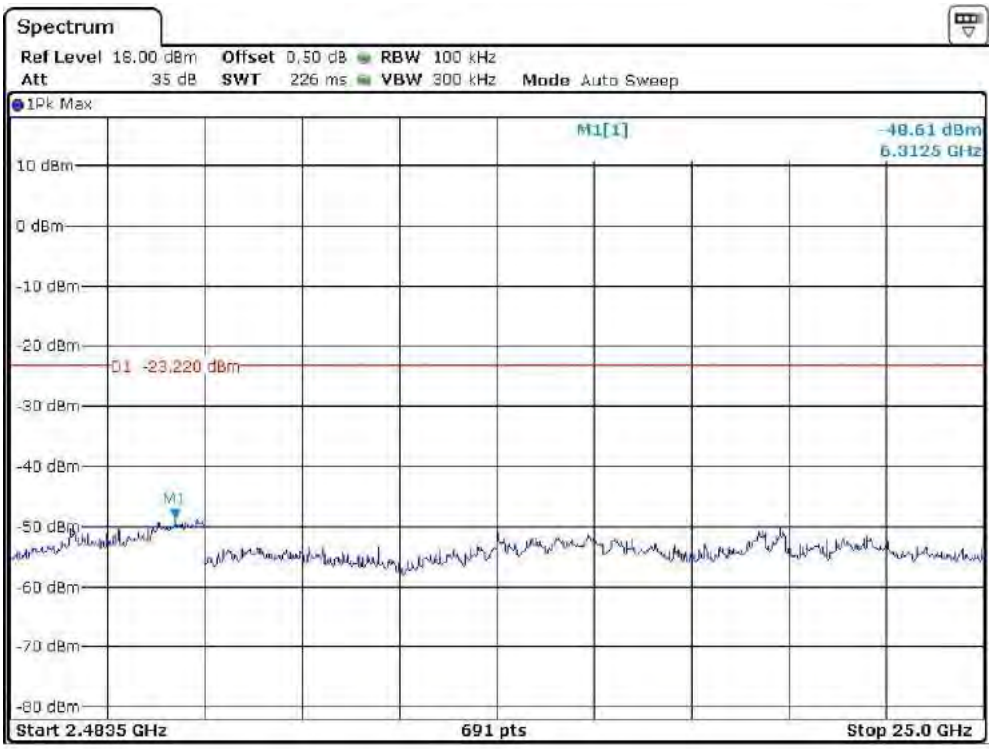

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -48.44 dBm
6.8015 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -23.390 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 2.4835 GHz
691 pts
Stop 25.0 GHz



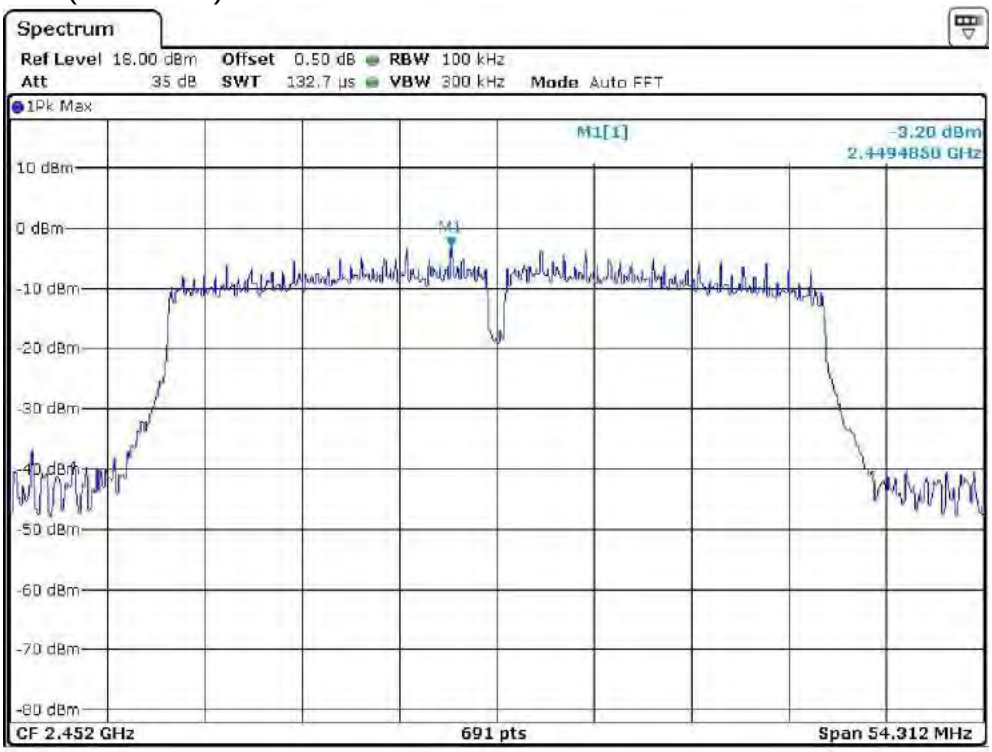
Channel 06 (2437MHz) Reference Level: -3.22dBm

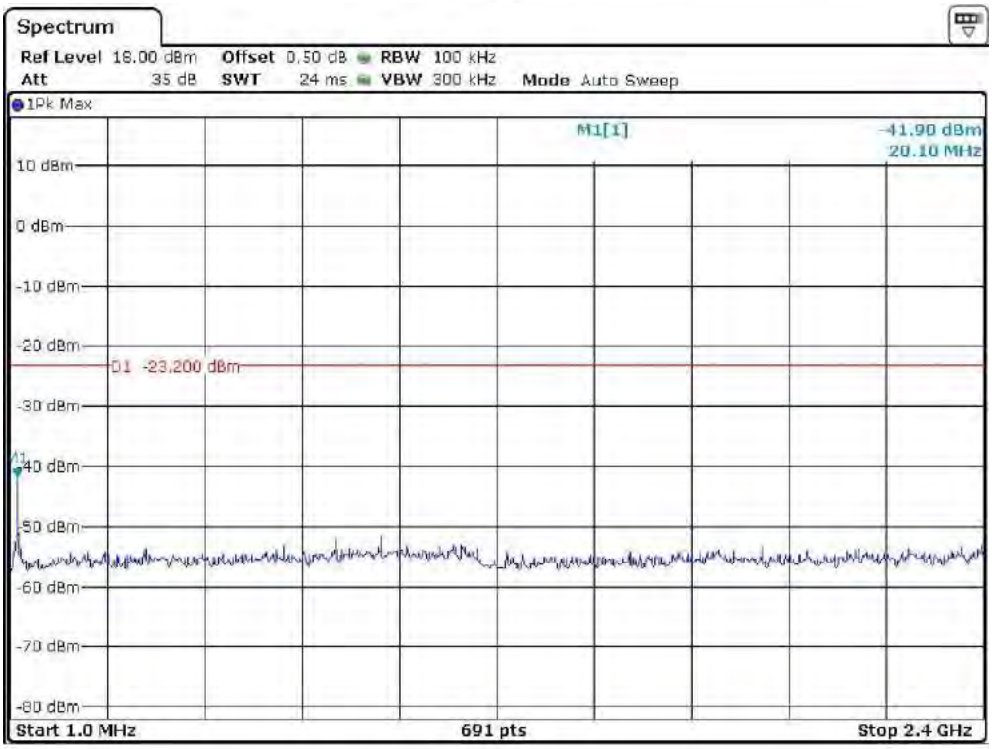


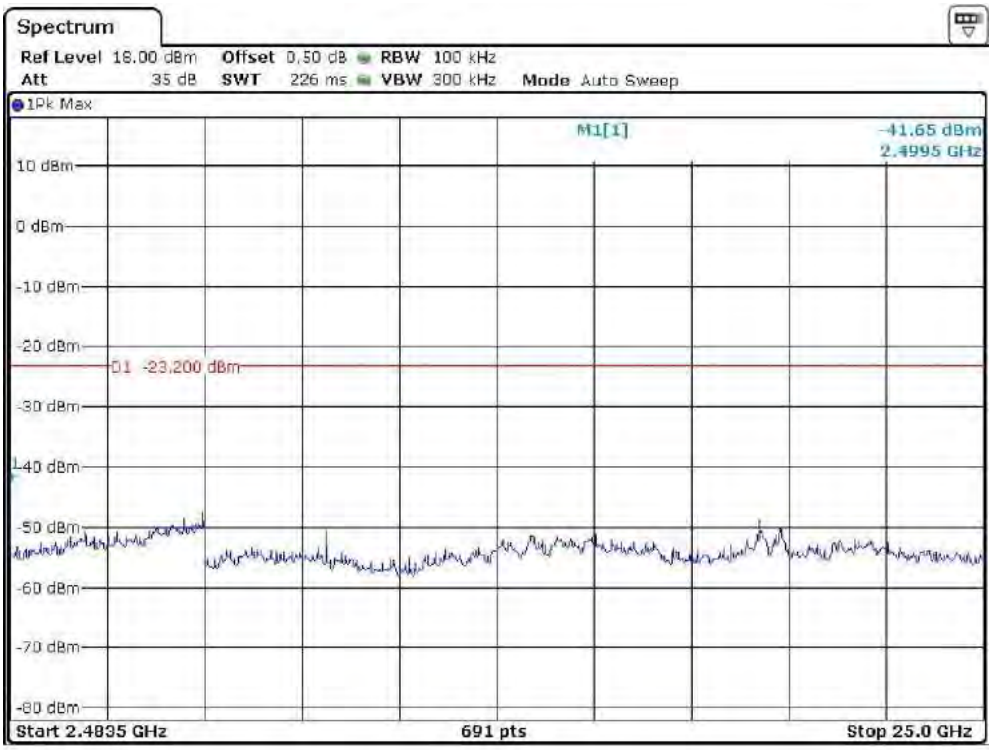

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 24 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -41.51 dBm
20.10 MHz
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -23.220 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 1.0 MHz
691 pts
Stop 2.4 GHz

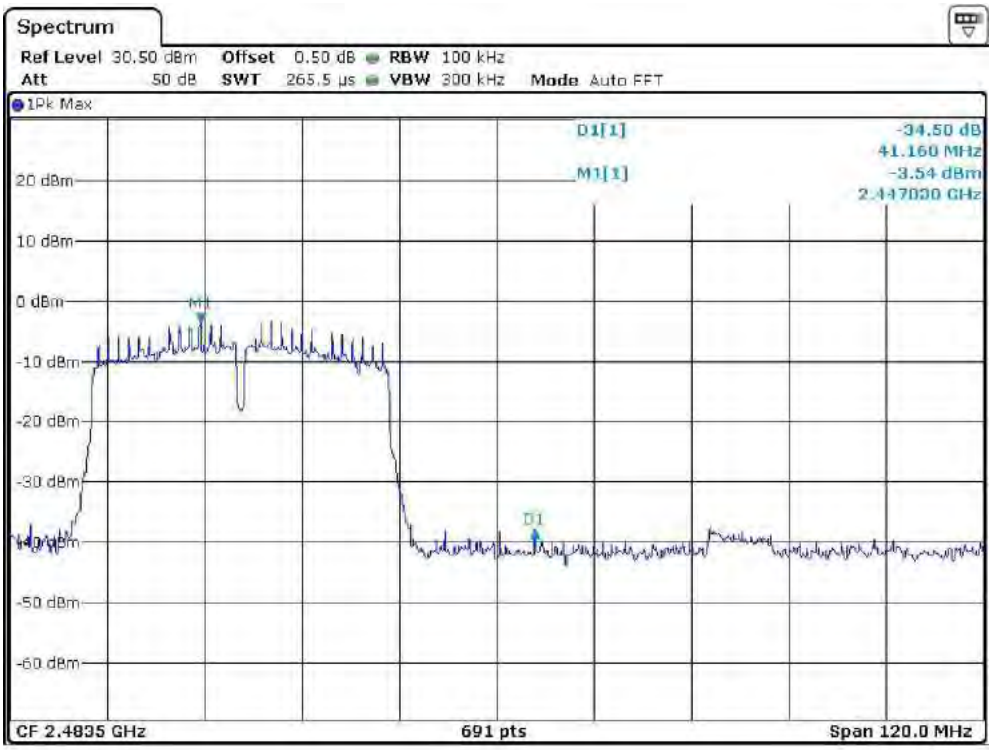

Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -48.61 dBm
6.3125 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -23.220 dBm
-30 dBm
-40 dBm
M1
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 2.4835 GHz
691 pts
Stop 25.0 GHz

Channel 09 (2452MHz) Reference Level: -3.20dBm






Spectrum
Ref Level 18.00 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 226 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
M1[1] -41.65 dBm
2.4995 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
D1 -23.200 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
-80 dBm
Start 2.4835 GHz
691 pts
Stop 25.0 GHz


Spectrum
Ref Level 30.50 dBm Offset 0.50 dB RBW 100 kHz
Att 50 dB SWT 265.5 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] -34.50 dB
41.160 MHz
M1[1] -3.54 dBm
2.447030 GHz
20 dBm
10 dBm
0 dBm
M1
-10 dBm
-20 dBm
-30 dBm
D1
-40 dBm
-50 dBm
-60 dBm
CF 2.4835 GHz
691 pts
Span 120.0 MHz

Applicant: Shenzhen Chuangwei-RGB Electronics Co., Ltd.
Date of Test: 25 April 2019 Model: NTUD-T4

4.5 Out of Band Radiated Emissions (for emissions in 4.4 above that are less than 20dB below carrier), FCC Rule 15.247(d):

For out of band emissions that are close to or that exceed the 20dB attenuation requirement described in the specification, radiated measurements were performed at a 3m separation distance to determine whether these emissions complied with the general radiated emission requirement.

[×] Not required, since all emissions are more than 20dB below fundamental
[ ] See attached data sheet

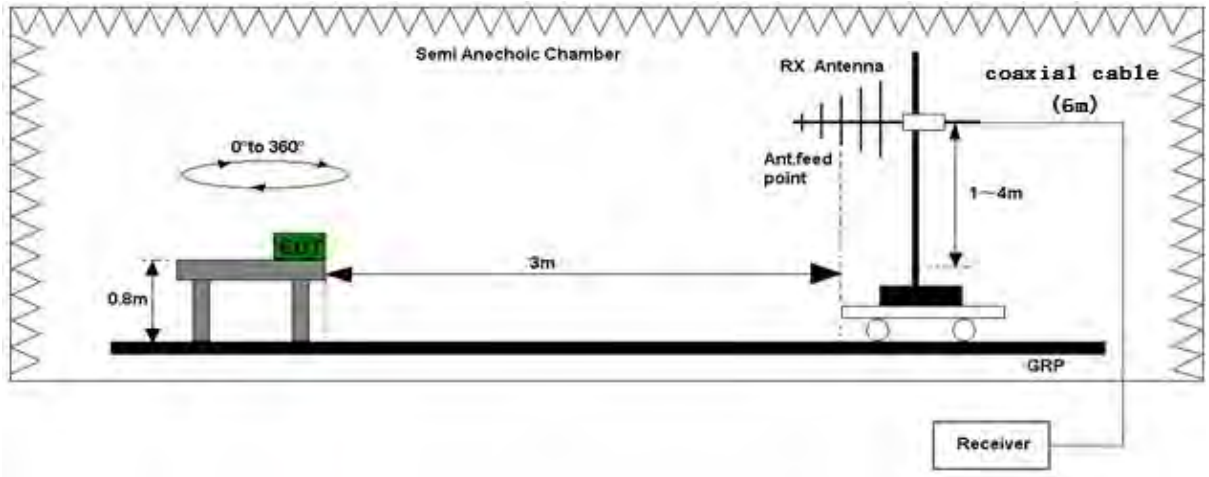
Applicant: Shenzhen Chuangwei-RGB Electronics Co., Ltd.
Date of Test: 27 April 2019 Model: NTUD-T4

4.6 Transmitter Radiated Emissions in Restricted Bands, FCC Rule 15.35(b) (c):

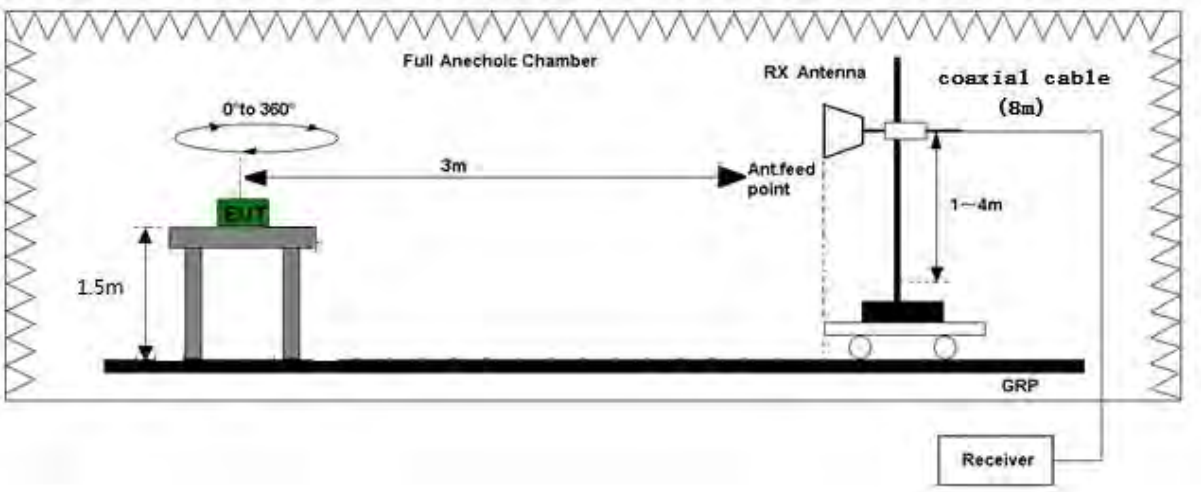
Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included. All measurements were performed with peak detection unless otherwise specified. Simultaneous transmission was considered during the test.

The data on the following pages list the significant emission frequencies, the limit and the margin of compliance.

The Diagram below shows the test setup, which is utilized to make these measurements.



Test set-up of radiated disturbance (Up to 1GHz)



Test set-up of radiated disturbance (Above 1GHz)

Radiated emission measurements were performed from 9KHz to tenth harmonic or 40GHz. The EUT for testing is arranged on a styrene turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meters and down to 1 meter.

Applicant: Shenzhen Chuangwei-RGB Electronics Co., Ltd.
Date of Test: 27 April 2019 Model: NTUD-T4

4.7 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

FS = RA + AF + CF - AG + PD

Where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB
PD = Pulse Desensitization in dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

FS = RA + AF + CF - AG + PD

Example
Assume a receiver reading of 62.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB. The net field strength for comparison to the appropriate emission limit is 42 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 62.0 dBμV
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
PD = 0 dB
FS = 62 + 7.4 + 1.6 - 29 + 0 = 42 dBμV/m

Level in mV/m = Common Antilogarithm [(42 dBμV/m)/20] = 125.9 μV/m

Applicant: Shenzhen Chuangwei-RGB Electronics Co., Ltd.
Date of Test: 27 April 2019 Model: NTUD-T4

4.8 Radiated Spurious Emission

Worst Case Radiated Spurious Emission (802.11N40 MIMO-2437MHz)
at 4874MHz
is passed by 3.0dB margin.

For the electronic filing, the worst case radiated emission configuration photographs are saved with filename: radiated photos.pdf.

Applicant: Shenzhen Chuangwei-RGB Electronics Co., Ltd.
Date of Test: 27 April 2019 Model: NTUD-T4
Worst Case Operating Mode: WIFI Link

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	175.985	39.9	20.0	9.8	29.7	43.5	-13.8
Horizontal	202.660	37.7	20.0	10.3	28.0	43.5	-15.5
Horizontal	721.125	33.9	20.0	22.1	36.0	46.0	-10.0
Vertical	30.485	34.9	20.0	17.4	32.3	40.0	-7.7
Vertical	101.295	40.8	20.0	8.9	29.7	43.5	-13.8
Vertical	400.055	38.3	20.0	17.3	35.6	46.0	-10.4

NOTES:
1. Quasi-Peak detector is used for frequency below 1GHz.
2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. All emissions are below the QP limit.

Applicant: Shenzhen Chuangwei-RGB Electronics Co., Ltd.
Date of Test: 27 April 2019 Model: NTUD-T4
Worst Case Operating Mode: Transmitting (11b ANT1-2412MHz)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	54.8	36.3	33.5	54.3	74.0	-19.7
Horizontal	*2385.180	64.8	36.4	27.3	55.8	74.0	-18.2

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	44.3	36.3	33.5	47.1	54.0	-6.9
Horizontal	*2385.180	53.3	36.4	27.3	45.9	54.0	-8.1

NOTES:
1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz/VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Shenzhen Chuangwei-RGB Electronics Co., Ltd.
Date of Test: 27 April 2019 Model: NTUD-T4
Worst Case Operating Mode: Transmitting (11b ANT1-2437MHz)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	52.5	36.3	33.6	55.1	74.0	-18.9
Horizontal	*7311.000	52.1	36.3	37.8	50.2	74.0	-23.8

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	42.8	36.3	33.6	49.1	54.0	-4.9
Horizontal	*7311.000	42.0	36.3	37.8	42.1	54.0	-11.9

NOTES:
1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Shenzhen Chuangwei-RGB Electronics Co., Ltd.
Date of Test: 27 April 2019 Model: NTUD-T4
Worst Case Operating Mode: Transmitting (11b ANT1-2462MHz)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	51.8	36.3	33.6	56.7	74.0	-17.3
Horizontal	*7386.000	51.1	36.3	37.8	54.4	74.0	-19.6
Horizontal	*2484.390	65.0	36.4	27.5	55.3	74.0	-18.7

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	42.5	36.3	33.6	48.9	54.0	-5.1
Horizontal	*7386.000	43.6	36.3	37.8	44.1	54.0	-9.9
Horizontal	*2484.390	53.2	36.4	27.5	45.4	54.0	-8.6

NOTES:
1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Shenzhen Chuangwei-RGB Electronics Co., Ltd.
Date of Test: 27 April 2019 Model: NTUD-T4
Worst Case Operating Mode: Transmitting (11g ANT1-2412MHz)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	54.8	36.3	33.5	61.2	74.0	-12.8
Horizontal	*2380.210	64.8	36.4	27.3	55.7	74.0	-18.3

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	44.3	36.3	33.5	50.4	54.0	-3.6
Horizontal	*2380.210	53.3	36.4	27.3	45.2	54.0	-8.8

NOTES:
1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz/VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Shenzhen Chuangwei-RGB Electronics Co., Ltd.
Date of Test: 27 April 2019 Model: NTUD-T4
Worst Case Operating Mode: Transmitting (11g ANT1-2437MHz)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	52.5	36.3	33.6	62.9	74.0	-11.1
Horizontal	*7311.000	52.1	36.3	37.8	60.3	74.0	-13.7

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	42.8	36.3	33.6	50.9	54.0	-3.1
Horizontal	*7311.000	42.0	36.3	37.8	47.3	54.0	-6.7

NOTES:
1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Shenzhen Chuangwei-RGB Electronics Co., Ltd.
Date of Test: 27 April 2019 Model: NTUD-T4
Worst Case Operating Mode: Transmitting (11g ANT1-2462MHz)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	51.8	36.3	33.6	59.0	74.0	-15.0
Horizontal	*7386.000	51.1	36.3	37.8	56.0	74.0	-18.0
Horizontal	*2484.267	65.0	36.4	27.5	55.3	74.0	-18.7

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	42.5	36.3	33.6	50.2	54.0	-3.8
Horizontal	*7386.000	43.6	36.3	37.8	45.7	54.0	-8.3
Horizontal	*2484.267	53.2	36.4	27.5	44.4	54.0	-9.6

NOTES:
1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Shenzhen Chuangwei-RGB Electronics Co., Ltd.
Date of Test: 27 April 2019 Model: NTUD-T4
Worst Case Operating Mode: Transmitting (11n20 MIMO-2412MHz)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	54.8	36.3	33.5	59.8	74.0	-14.2
Horizontal	*2383.240	64.8	36.4	27.3	56.0	74.0	-18.0

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4824.000	44.3	36.3	33.5	49.5	54.0	-4.5
Horizontal	*2383.240	53.3	36.4	27.3	45.5	54.0	-8.5

NOTES:
1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz/VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Shenzhen Chuangwei-RGB Electronics Co., Ltd.
Date of Test: 27 April 2019 Model: NTUD-T4
Worst Case Operating Mode: Transmitting (11n20 MIMO-2437MHz)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	52.5	36.3	33.6	61.5	74.0	-12.5
Horizontal	*7311.000	52.1	36.3	37.8	60.8	74.0	-13.2

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	42.8	36.3	33.6	49.9	54.0	-4.1
Horizontal	*7311.000	42.0	36.3	37.8	48.3	54.0	-5.7

NOTES:
1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Shenzhen Chuangwei-RGB Electronics Co., Ltd.
Date of Test: 27 April 2019 Model: NTUD-T4
Worst Case Operating Mode: Transmitting (11n20 MIMO-2462MHz)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	51.8	36.3	33.6	60.0	74.0	-14.0
Horizontal	*7386.000	51.1	36.3	37.8	59.1	74.0	-14.9
Horizontal	*2485.520	65.0	36.4	27.5	56.4	74.0	-17.6

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4924.000	42.5	36.3	33.6	50.4	54.0	-3.6
Horizontal	*7386.000	43.6	36.3	37.8	48.0	54.0	-6.0
Horizontal	*2485.520	53.2	36.4	27.5	45.8	54.0	-8.2

NOTES:
1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Shenzhen Chuangwei-RGB Electronics Co., Ltd.
Date of Test: 27 April 2019 Model: NTUD-T4
Worst Case Operating Mode: Transmitting (11n40 MIMO-2422MHz)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4844.000	54.8	36.3	33.5	62.5	74.0	-11.5
Horizontal	*2385.330	64.8	36.4	27.3	55.4	74.0	-18.6

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4844.000	44.3	36.3	33.5	49.6	54.0	-4.4
Horizontal	*2385.330	53.3	36.4	27.3	45.2	54.0	-8.8

NOTES:
1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz/VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Shenzhen Chuangwei-RGB Electronics Co., Ltd.
Date of Test: 27 April 2019 Model: NTUD-T4
Worst Case Operating Mode: Transmitting (11n40 MIMO-2437MHz)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	52.5	36.3	33.6	62.6	74.0	-11.4
Horizontal	*7311.000	52.1	36.3	37.8	59.9	74.0	-14.1

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4874.000	42.8	36.3	33.6	51.0	54.0	-3.0
Horizontal	*7311.000	42.0	36.3	37.8	47.3	54.0	-6.7

NOTES:
1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.

2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative value in the margin column shows emission below limit.

4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

Applicant: Shenzhen Chuangwei-RGB Electronics Co., Ltd.
Date of Test: 27 April 2019 Model: NTUD-T4
Worst Case Operating Mode: Transmitting (11n40 MIMO-2452MHz)

Radiated Emissions

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4904.000	51.8	36.3	33.6	60.3	74.0	-13.7
Horizontal	*7356.000	51.1	36.3	37.8	58.2	74.0	-15.8
Horizontal	*2485.200	65.0	36.4	27.5	55.9	74.0	-18.1

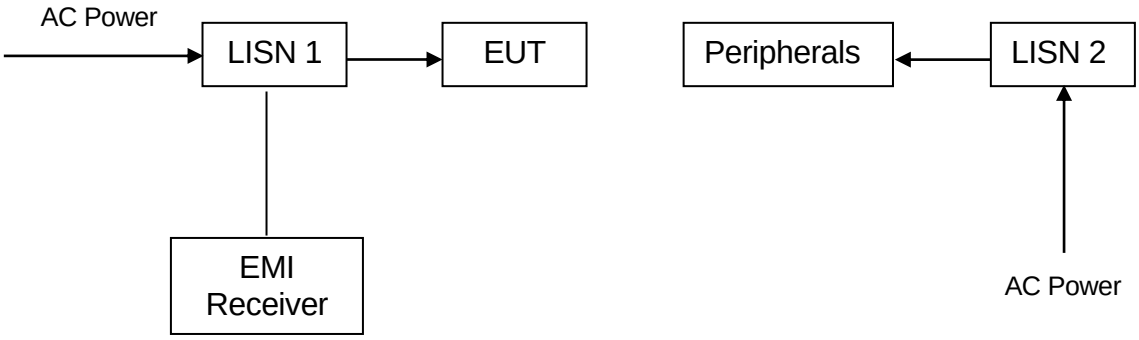
Polarization	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
Horizontal	*4904.000	42.5	36.3	33.6	49.7	54.0	-4.3
Horizontal	*7356.000	43.6	36.3	37.8	47.1	54.0	-6.9
Horizontal	*2485.200	53.2	36.4	27.5	44.7	54.0	-9.3

NOTES:
1. Peak detector is used, RBW=1MHz/VBW=3MHz for peak value and RBW=1MHz / VBW=10Hz for average value.
2. All measurements were made at 3 meters. Radiated emissions not detected at the 3-meter distance were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other radiated emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna used for the emission over 1000MHz.

* Emission within the restricted band meets the requirement of section 15.205. The corresponding limit as per 15.209 is based on Quasi peak limit for frequencies below 1000 MHz and average limit for frequencies over 1000 MHz. The radio frequency emissions above 1GHz also meet corresponding 20dB permitted peak limit with a peak detector function.

4.9 Conducted Emission at Mains Terminal

Block Diagram:



4.9.1 Conducted Emissions Configuration Photograph

For electronic filing, the worst case conducted emission configuration photograph is saved with filename: conducted photos.pdf.

4.9.2 Conducted Emissions

Worst Case Live-Conducted Configuration
At

0.234 MHz

Judgement: Passed by 5.4 dB margin

TEST PERSONNEL:

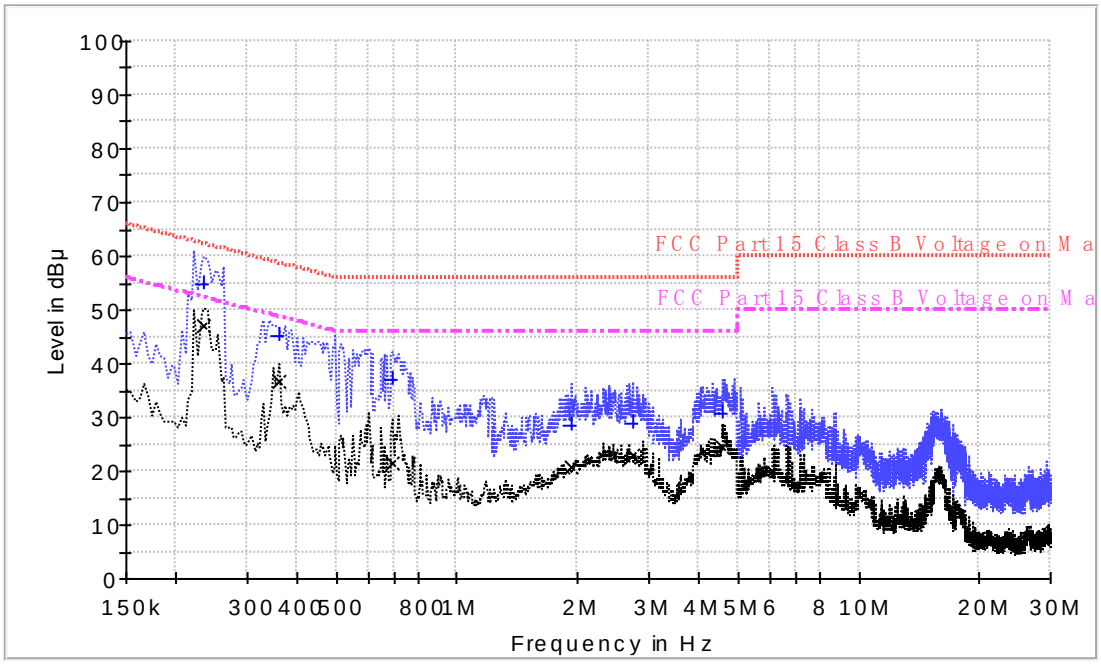
Sign on file

Ryan Chen, Engineer
Typed/Printed Name

13 May 2019
Date

Applicant: Shenzhen Chuangwei-RGB Electronics Co., Ltd.
Date of Test: 13 May 2019 Model: NTUD-T4
Worst Case Operating Mode: WIFI Link

Conducted Emission Test - FCC



Result Table QP

Frequency (MHz)	QuasiPeak (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.234000	55.0	L	9.5	7.3	62.3
0.362000	45.2	L	9.5	13.5	58.7
0.690000	37.1	L	9.4	18.9	56.0
1.922000	28.3	L	9.4	27.7	56.0
2.726000	28.8	L	9.4	27.2	56.0
4.570000	30.6	L	9.4	25.4	56.0

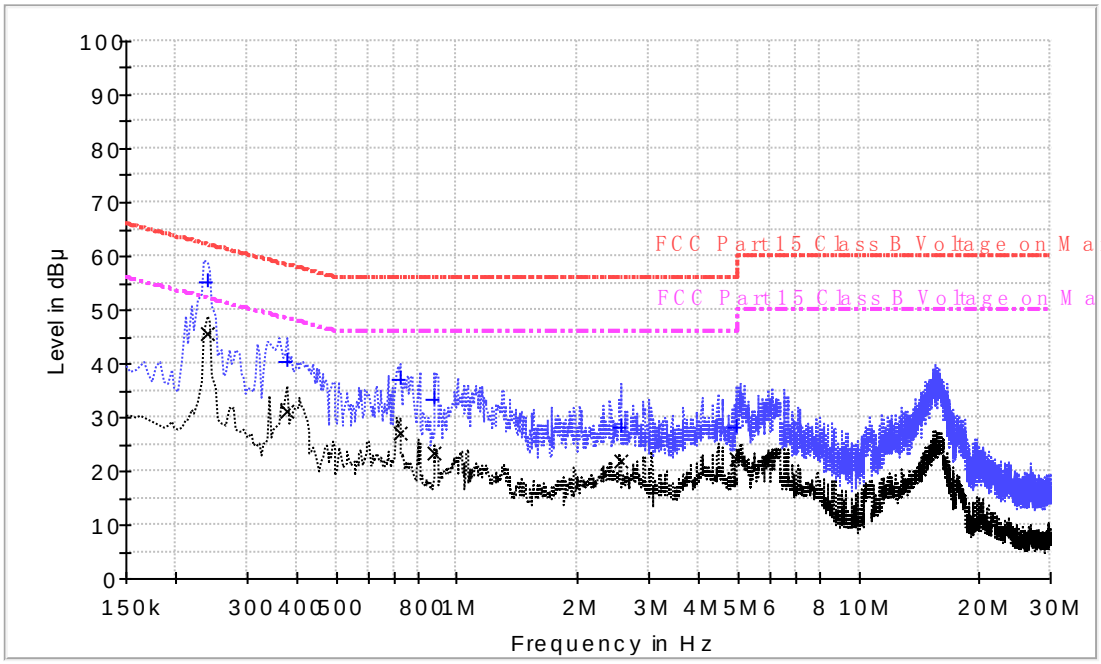
Result Table AV

Frequency (MHz)	Average (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.234000	46.9	L	9.5	5.4	52.3
0.362000	36.7	L	9.5	12.0	48.7
0.690000	21.6	L	9.4	24.4	46.0
1.922000	20.9	L	9.4	25.1	46.0
2.726000	22.9	L	9.4	23.1	46.0
4.570000	24.6	L	9.4	21.4	46.0

Remark:
1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Limit (dBuV) – Level (dBuV)

Applicant: Shenzhen Chuangwei-RGB Electronics Co., Ltd.
Date of Test: 13 May 2019 Model: NTUD-T4
Worst Case Operating Mode: WIFI Link

Conducted Emission Test - FCC



Result Table QP

Frequency (MHz)	QuasiPeak (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.238000	55.2	N	9.5	7.0	62.2
0.378000	40.4	N	9.4	17.9	58.3
0.722000	36.9	N	9.3	19.1	56.0
0.878000	33.2	N	9.3	22.8	56.0
2.550000	28.3	N	9.3	27.7	56.0
4.978000	28.1	N	9.4	27.9	56.0

Result Table AV

Frequency (MHz)	Average (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.238000	45.6	N	9.5	6.6	52.2
0.378000	31.2	N	9.4	17.1	48.3
0.722000	27.1	N	9.3	18.9	46.0
0.878000	23.3	N	9.3	22.7	46.0
2.550000	22.0	N	9.3	24.0	46.0
4.978000	22.2	N	9.4	23.8	46.0

Remark:
1. Corr. Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Limit (dBuV) – Level (dBuV)

Applicant: Shenzhen Chuangwei-RGB Electronics Co., Ltd.
Model: NTUD-T4

4.10 Radiated Emissions from Digital Section of Transceiver, FCC Ref: 15.109

[ ] Not required - No digital part

[ ] Test results are attached

[x] Included in the separated report.

Applicant: Shenzhen Chuangwei-RGB Electronics Co., Ltd.
Date of Test: 25 April 2019
Model: NTUD-T4

4.11 Transmitter Duty Cycle Calculation and Measurements, FCC Rule 15.35(b), (c)

The EUT antenna output port was connected to the input of the spectrum analyzer. The analyzer center frequency was set to EUT RF channel carrier. The SWEP function on the analyzer was set to ZERO SPAN. The Transmitter ON time was determined from the resultant time-amplitude display:

	See attached spectrum analyzer chart (s) for Transmitter timing
	See Transmitter timing diagram provided by manufacturer
x	Not applicable, duty cycle was not used.

EXHIBIT 5

EQUIPMENT PHOTOGRAPHS

5.0 Equipment Photographs

For electronic filing, the photographs are saved with filename: external photos.pdf & internal photos.pdf.

EXHIBIT 6

PRODUCT LABELLING

6.0 Product Labeling

For electronic filing, the FCC ID label artwork and location is saved with filename: label.pdf.

EXHIBIT 7

TECHNICAL SPECIFICATIONS

7.0 Technical Specifications

For electronic filing, the block diagram and circuit diagram are saved with filename: block.pdf and circuit.pdf respectively.

EXHIBIT 8

INSTRUCTION MANUAL

8.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.

EXHIBIT 9

CONFIDENTIALITY REQUEST

9.0 Confidentiality Request

For electronic filing, the confidentiality request of the tested EUT is saved with filename: request.pdf.

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EXHIBIT 10

MISCELLANEOUS INFORMATION

10.0 Discussion of Pulse Desensitization

The determination of pulse desensitivity was made in accordance with Hewlett Packard Application Note 150-2, *Spectrum Analysis ... Pulsed RF.*

Pulse desensitivity is not applicable for this device since the transmitter transmits the RF signal continuously.

EXHIBIT 11

TEST EQUIPMENT LIST

11.0 Test Equipment List

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ182-02	RF Power Meter	Anritsu	ML2496A	1302005	05-Jun-2018	05-Jun-2019
SZ182-02-01	Power Sensor	Anritsu	MA2411B	1207429	05-Jun-2018	05-Jun-2019
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	21-May-2018	21-May-2019
SZ067-04	Notch Filter	Micro-Tronics	BRM50702-02	--	05-Jun-2018	05-Jun-2019
SZ061-03	Biconilog Antenna	ETS	3142C	00078828	16-Oct-2018	16-Oct-2019
SZ061-08	Horn Antenna	ETS	3115	00092346	14-Sep-2018	14-Sep-2019
SZ061-07	Pyramidal Horn Antenna	ETS	3160-09	00083067	25-Oct-2018	25-Oct-2019
SZ056-03	Spectrum Analyzer	R&S	FSP30	101148	05-Jun-2018	05-Jun-2019
SZ185-01	EMI Receiver	R&S	ESCI	100547	04-Jan-2019	04-Jan-2020
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	15-Jan-2019	15-Jan-2020
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	15-Dec-2018	15-Dec-2020
SZ062-02	RF Cable	RADIALL	RG 213U	--	25-Dec-2018	25-Jun-2019
SZ062-05	RF Cable	RADIALL	0.04-26.5GHz	--	23-Feb-2019	23-Aug-2019
SZ062-12	RF Cable	RADIALL	0.04-26.5GHz	--	23-Feb-2019	23-Aug-2019
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	26-Oct-2018	26-Oct-2019
SZ187-01	Two-Line V-Network	R&S	ENV216	100072	26-Oct-2018	26-Oct-2019
SZ188-03	Shielding Room	ETS	RFD-100	4100	16-Jan-2017	16-Jan-2020
SZ062-16	RF Cable	HUBER+SUHNER	CBL2-BN-1m	110127-2231000	29-Oct-2018	29-Oct-2019

********** End of Report**********