Dongguan Toye Electronics Technology Co., Ltd

TEST REPORT

SCOPE OF WORK
FCC TESTING–MC352, BKSPRGB, TY1934

REPORT NUMBER
190722050SZN-001

ISSUE DATE **[REVISED DATE]**

3 August 2019 [----------]

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TEST REPORT

Intertek Report No.: 190722050SZN-001

Dongguan Toye Electronics Technology Co., Ltd

Application
For
Certification

FCC ID: 2AT32-MC352

WiFi Smart Socket

Model: MC352, BKSPRGB, TY1934

2.4GHz Wi-Fi Transceiver

Report No.: 190722050SZN-001

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 [10-1-18]

Prepared and Checked by:

Leo Li
Project Engineer

Approved by:

Kidd Yang
Technical Supervisor
Date: 3 August 2019

MEASUREMENT/TECHNICAL REPORT

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 [10-01-18] Edition] provision.

Report prepared by:

Leo Li
Intertek Testing Services Shenzhen Ltd. Longhua Branch
101, 201, Building B, No. 308 Wuhe Avenue,
Zhangkengjing Community, GuanHu Subdistrict, LongHua District, Shenzhen, P.R. China.
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Table of Contents

1.0 Summary of Test results

Applicant: Dongguan Toye Electronics Technology Co., Ltd
Applicant Address: 3F, Building A, NO. 32, 2nd Xiangdong Xiapu Road, Ailingkan Viliage, Dalingshan Town, DONGGUAN Guangdong 523000 CHINA

Model: MC352
FCC ID: 2AT32-MC352

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
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.

2.0 General Description

2.1 Product Description

The Equipment Under Test (EUT) is a WiFi Smart Socket with Wi-Fi function operating at 2412-2462MHz for 802.11b/g/n-HT20, 11 channels with 5MHz channel spacing. The EUT is powered by AC120V/60Hz. For more detailed features description, please refer to the user's manual.

Type of Modulation: CCK, BPSK, QPSK, 16QAM, 64QAM, DQPSK, DBPSK
Antenna Type: Integral Antenna
Antenna Gain: 1.7dBi

The Model: BKSPRGB, TY1934 are the same as the Model: MC352 in hardware and electrical aspect. The difference in model number serves as marketing strategy.

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).

Remaining portions are subject to the following procedures:
1. Receiver portion of WiFi: exempt from technical requirement of this Part.
2. Other Digital Function: Subject to FCC Part 15B SDOC.

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 shielded 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.

2.4 Test Facility

The Semi-anechoic chamber and shielded 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, P.R. China. This test facility and site measurement data have been fully placed on file with File Number: CN1188.

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. The EUT was powered by AC120V/60Hz during the test.

On 802.11b/g/n-HT20 mode, only one antenna is used, and all data rate were tested and only the worst-case data is shown in the 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 meters 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 shall be flushed with the rear of the table.

Radiated emission measurement was 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.

Test Software: SecureCRT

3.3 Special Accessories

N/A.

3.4 Measurement Uncertainty

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

3.5 Equipment Modification

Any modifications installed previous to testing by Dongguan Toye Electronics Technology 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

Description	Manufacturer	Model No.
Incandescent lamp	Provided by Intertek	E27
Lamp holder	Provided by Intertek	/

Applicant: Dongguan Toye Electronics Technology Co., Ltd
Date of Test: July 26, 2019 Model: MC352

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 6 dBi or less, maximum allowed Transmitter output is 1 watt (+30 dBm).

IEEE 802.11b (Antenna Gain = 1.7dBi) (CCK, 1Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt
Low Channel: 2412	17.9	61.7
Middle Channel: 2437	17.9	61.7
High Channel: 2462	18.3	67.6

IEEE 802.11g (Antenna Gain = 1.7dBi) (16QAM, 6Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt
Low Channel: 2412	20.0	100.0
Middle Channel: 2437	21.1	128.8
High Channel: 2462	20.7	117.5

IEEE 802.11n-HT20 (Antenna Gain = 1.7dBi) (64QAM, 6Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt
Low Channel: 2412	20.9	123.0
Middle Channel: 2437	21.3	134.9
High Channel: 2462	21.5	141.3

Cable loss: 0.5 dB External Attenuation: 0 dB

Cable loss, external attenuation has been included in OFFSET function

EUT max. output level = 21.5dBm
EUT max. E.I.R.P = 21.5dBm + 1.7dBi = 23.2dBm = 208.9mW

For RF Exposure, the information is saved with filename: RF exposure.pdf.

Applicant: Dongguan Toye Electronics Technology Co., Ltd
Date of Test: July 26, 2019 Model: MC352

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.

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

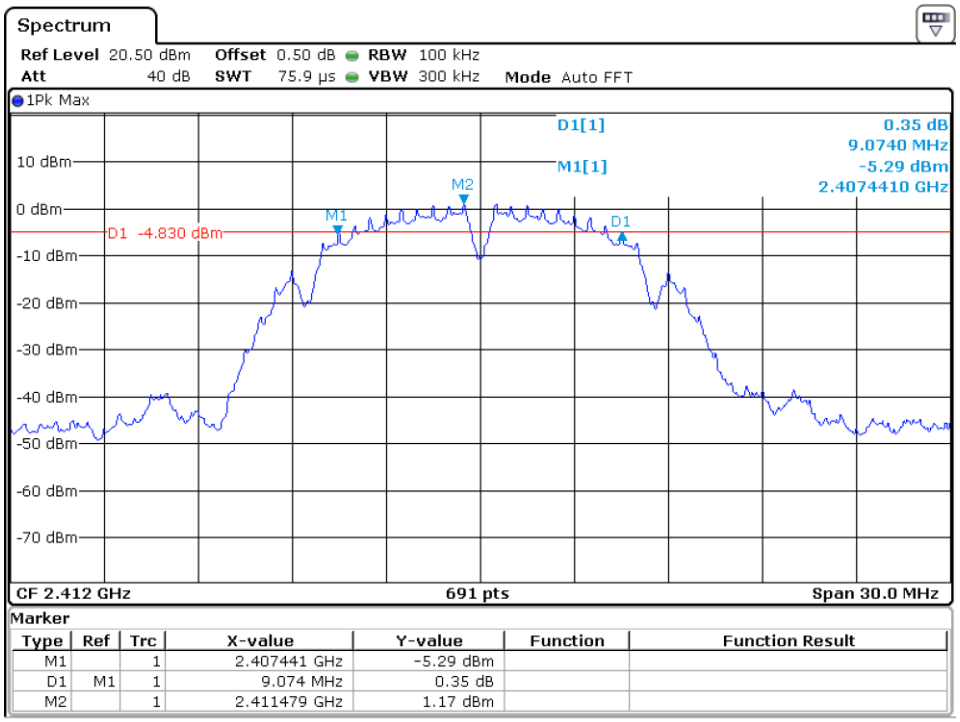
IEEE 802.11b (CCK, 1Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	9.074
2437	9.074
2462	9.074

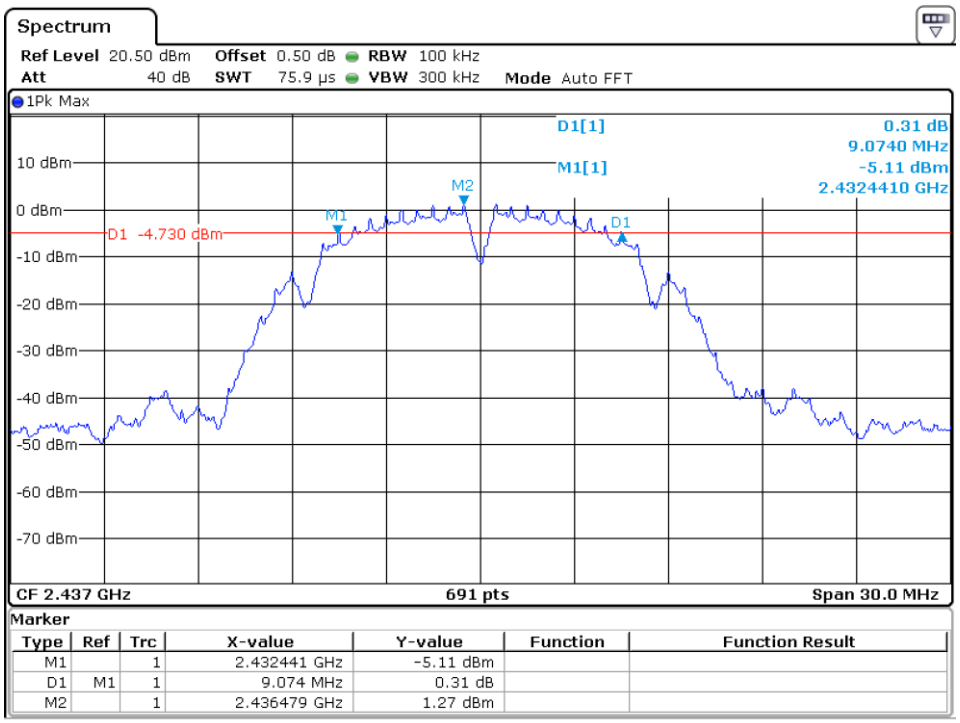
IEEE 802.11g (16QAM, 6Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	16.368
2437	16.368
2462	16.368

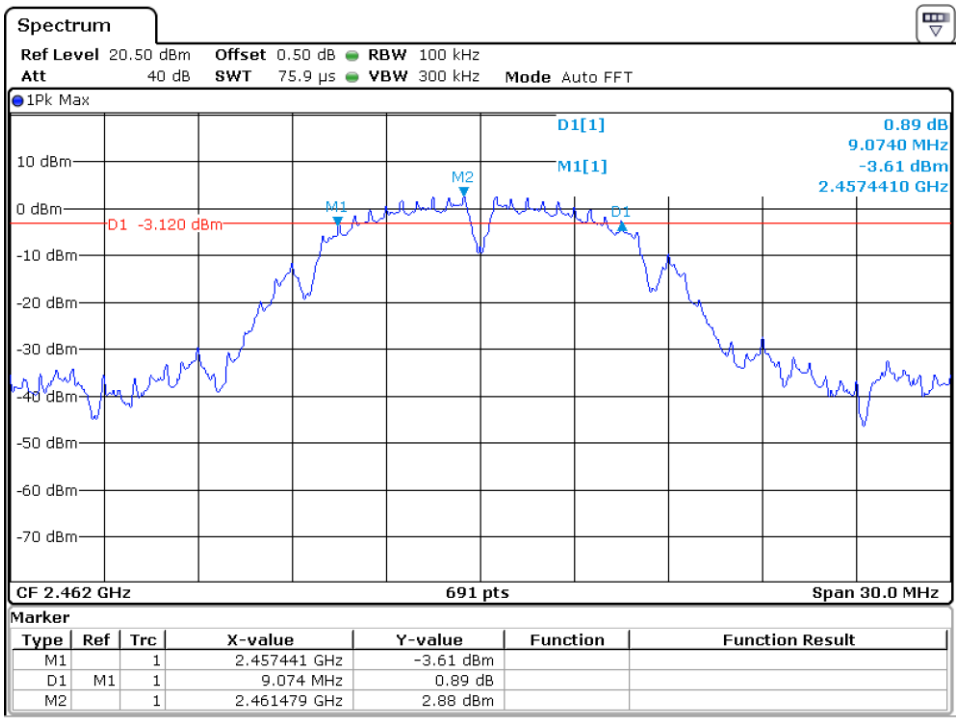
IEEE 802.11n-HT20 (64QAM, 6Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	17.583
2437	17.583
2462	17.583

The test plots are attached as below.

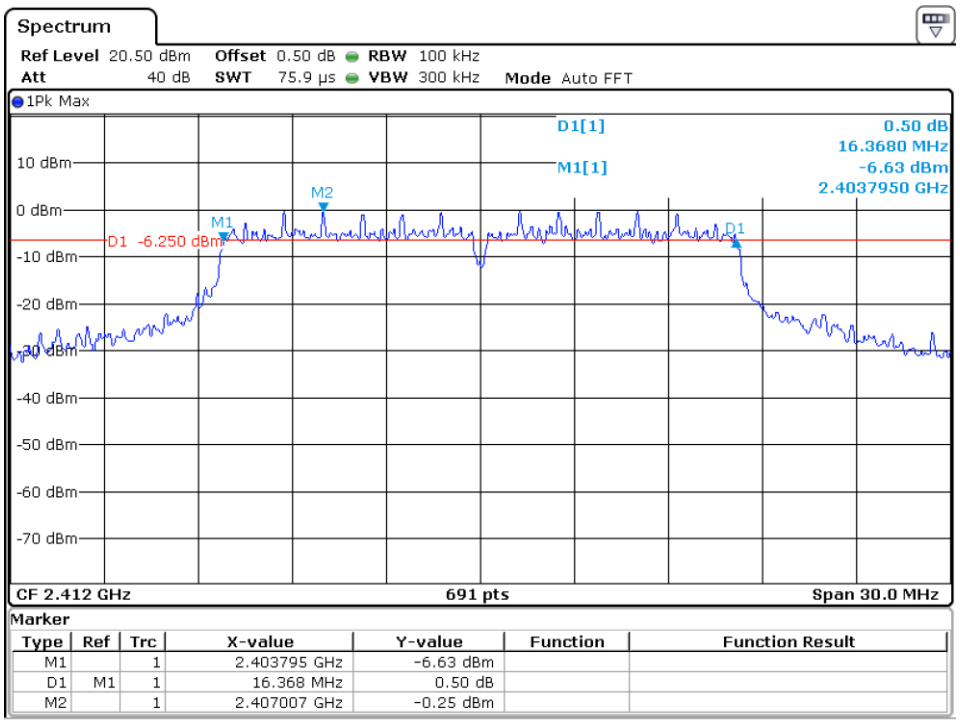
802.11b

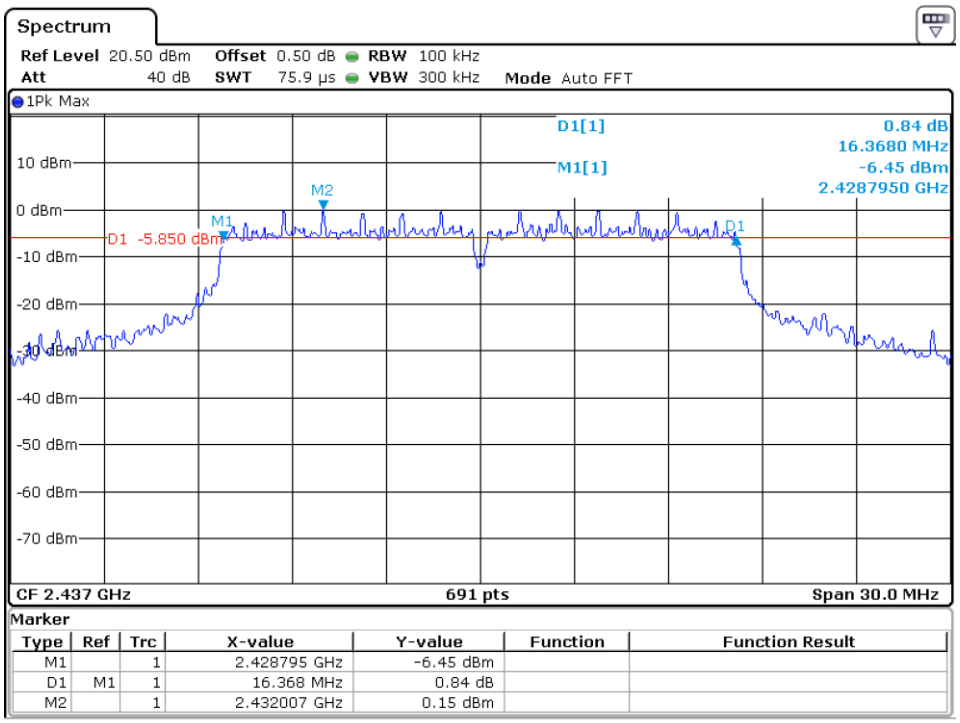

Spectrum
Ref Level 20.50 dBm Offset 0.50 dB RBW 100 kHz
Att 40 dB SWT 75.9 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] 0.35 dB
9.0740 MHz
M1[1] -5.29 dBm
2.4074410 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
D1 -4.830 dBm
M1
M2
D1
CF 2.412 GHz
691 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.407441 GHz -5.29 dBm
D1 M1 1 9.074 MHz 0.35 dB
M2 1 2.411479 GHz 1.17 dBm

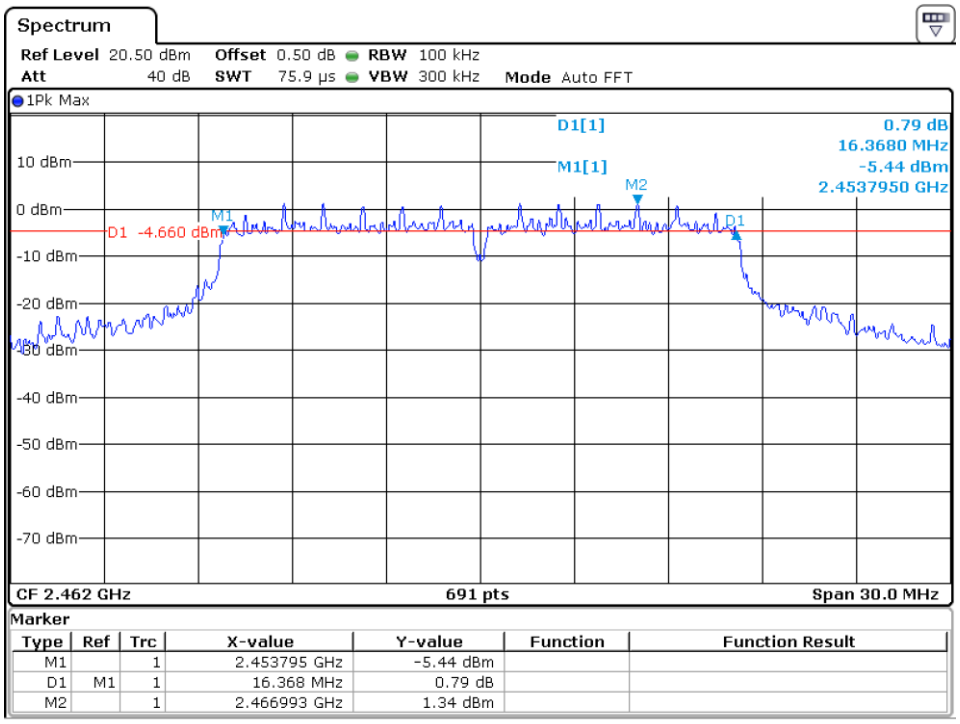

Spectrum
Ref Level 20.50 dBm Offset 0.50 dB RBW 100 kHz
Att 40 dB SWT 75.9 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] 0.31 dB
9.0740 MHz
M1[1] -5.11 dBm
2.4324410 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
D1 -4.730 dBm
M1
M2
D1
CF 2.437 GHz
691 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.432441 GHz -5.11 dBm
D1 M1 1 9.074 MHz 0.31 dB
M2 1 2.436479 GHz 1.27 dBm


Spectrum
Ref Level 20.50 dBm Offset 0.50 dB RBW 100 kHz
Att 40 dB SWT 75.9 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] 0.89 dB
9.0740 MHz
M1[1] -3.61 dBm
2.4574410 GHz
10 dBm
0 dBm
D1 -3.120 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 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 -3.61 dBm
D1 M1 1 9.074 MHz 0.89 dB
M2 1 2.461479 GHz 2.88 dBm

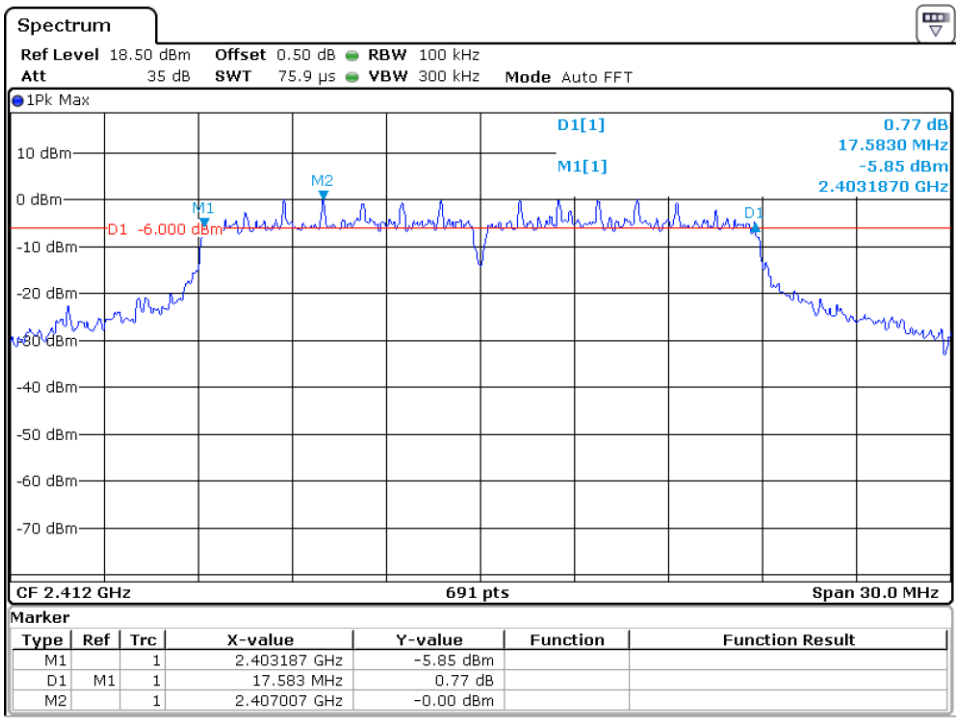
802.11g

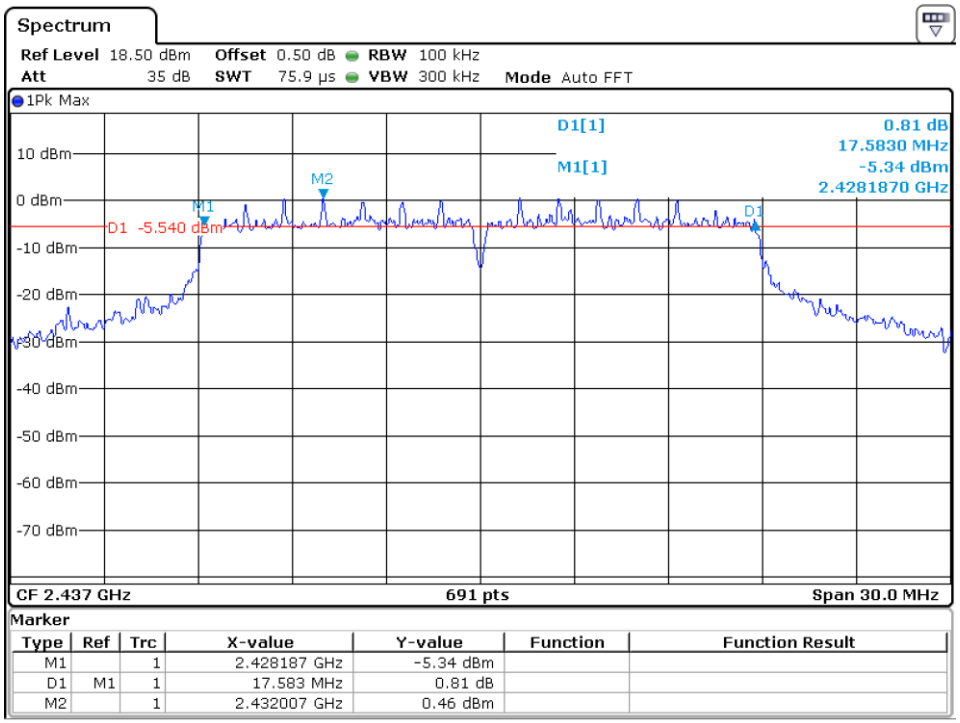

Spectrum
Ref Level 20.50 dBm Offset 0.50 dB RBW 100 kHz
Att 40 dB SWT 75.9 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] 0.50 dB
16.3680 MHz
M1[1] -6.63 dBm
2.4037950 GHz
10 dBm
0 dBm
D1 -6.250 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.412 GHz
691 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.403795 GHz -6.63 dBm
D1 M1 1 16.368 MHz 0.50 dB
M2 1 2.407007 GHz -0.25 dBm

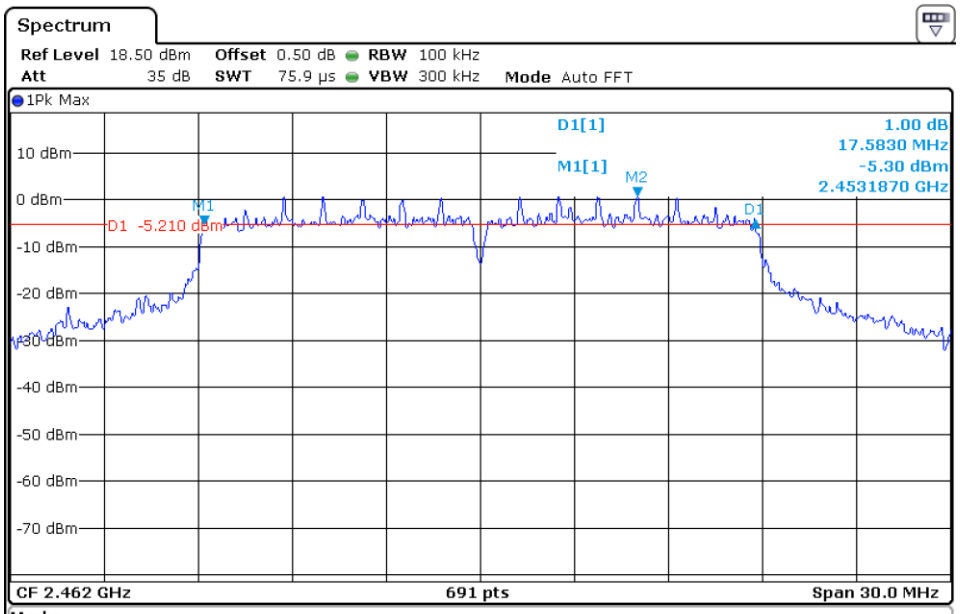

Spectrum
Ref Level 20.50 dBm Offset 0.50 dB RBW 100 kHz
Att 40 dB SWT 75.9 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] 0.84 dB
16.3680 MHz
M1[1] -6.45 dBm
2.4287950 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
M2
D1
D1 -5.850 dBm
CF 2.437 GHz
691 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.428795 GHz -6.45 dBm
D1 M1 1 16.368 MHz 0.84 dB
M2 1 2.432007 GHz 0.15 dBm


Spectrum
Ref Level 20.50 dBm Offset 0.50 dB RBW 100 kHz
Att 40 dB SWT 75.9 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] 0.79 dB
16.3680 MHz
M1[1] -5.44 dBm
2.4537950 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
M2
D1
D1 -4.660 dBm
CF 2.462 GHz
691 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.453795 GHz -5.44 dBm
D1 M1 1 16.368 MHz 0.79 dB
M2 1 2.466993 GHz 1.34 dBm

802.11n-HT20


Spectrum
Ref Level 18.50 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] 0.77 dB
17.5830 MHz
M1[1] -5.85 dBm
2.4031870 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
M2
D1
D1 -6.000 dBm
CF 2.412 GHz
691 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.403187 GHz -5.85 dBm
D1 M1 1 17.583 MHz 0.77 dB
M2 1 2.407007 GHz -0.00 dBm


Spectrum
Ref Level 18.50 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] 0.81 dB
17.5830 MHz
M1[1] -5.34 dBm
2.4281870 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
M2
D1
D1 -5.540 dBm
CF 2.437 GHz
691 pts
Span 30.0 MHz
Marker
Type Ref Trc X-value Y-value Function Function Result
M1 1 2.428187 GHz -5.34 dBm
D1 M1 1 17.583 MHz 0.81 dB
M2 1 2.432007 GHz 0.46 dBm



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	2.453187 GHz	-5.30 dBm		
D1	M1	1	17.583 MHz	1.00 dB		
M2		1	2.466993 GHz	0.79 dBm		

Applicant: Dongguan Toye Electronics Technology Co., Ltd
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4.3 Maximum Power Density Reading, FCC Rule 15.247(e):

The Measurement Procedure PKPSD 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.

Limit: The Power Density does not exceed 8dBm/3 kHz.

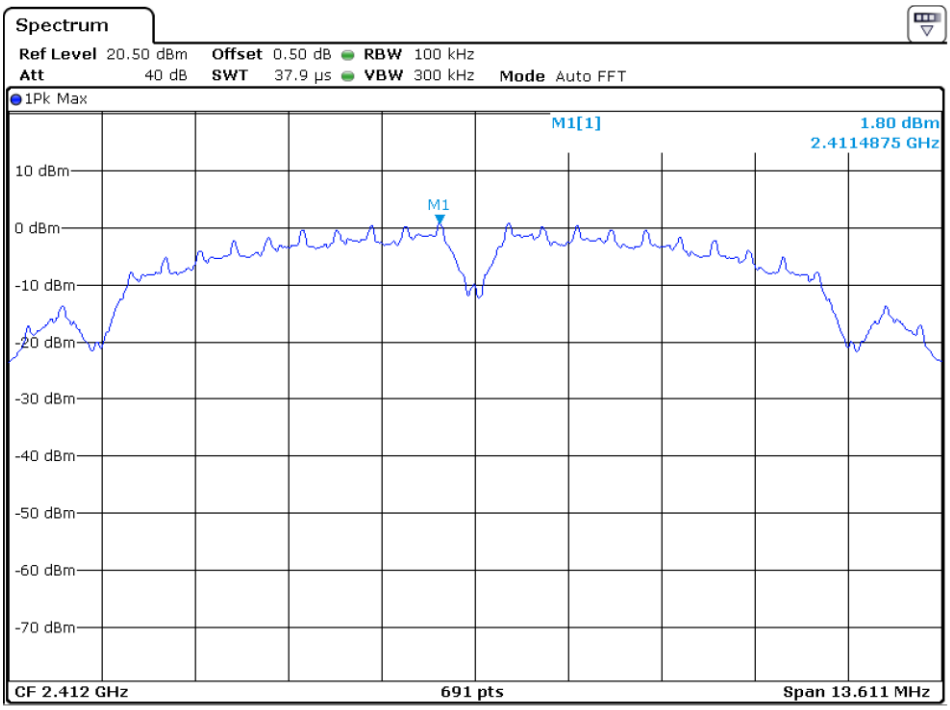
IEEE 802.11b (CCK, 1Mbps)	
Frequency (MHz)	Power Density with RBW 100KHz
2412	1.80
2437	1.14
2462	2.54

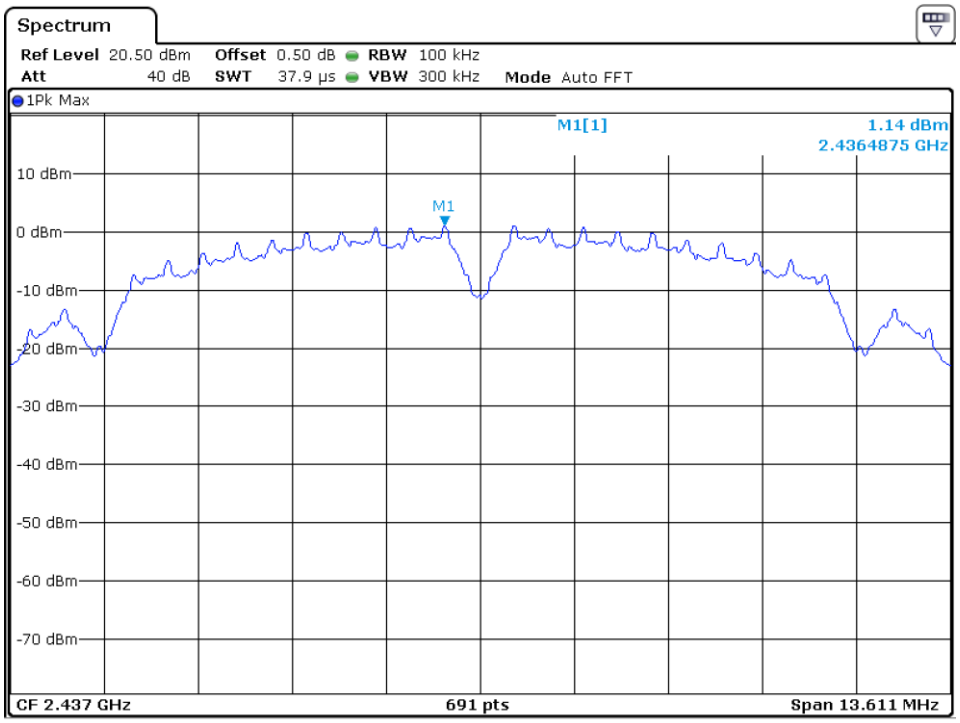
IEEE 802.11g (16QAM, 6Mbps)	
Frequency (MHz)	Power Density with RBW 100KHz
2412	-0.22
2437	0.07
2462	1.17

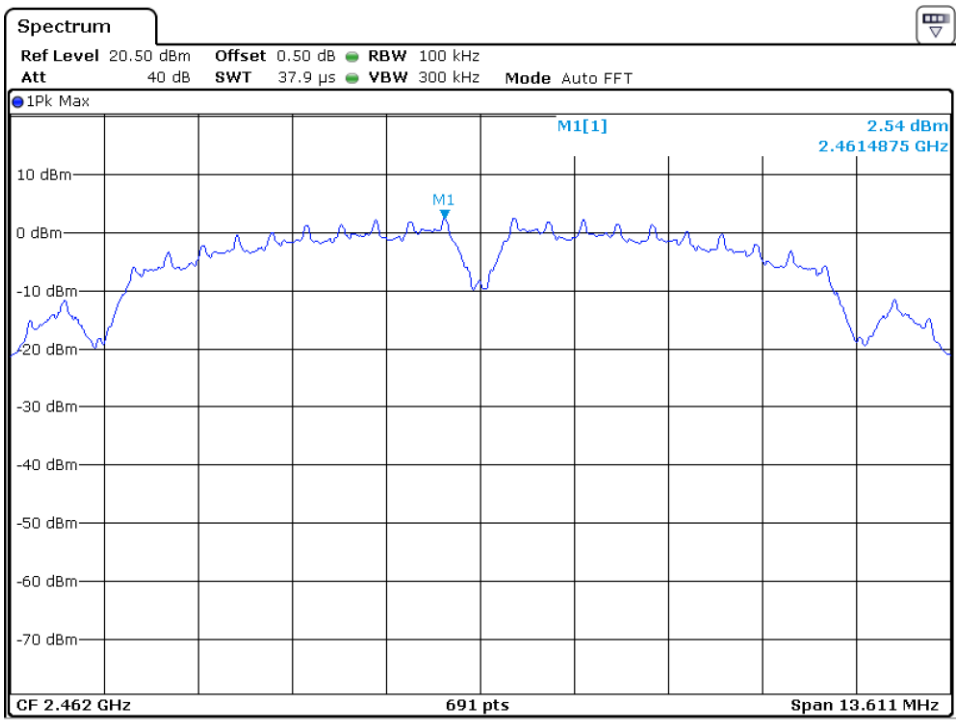
IEEE 802.11n-HT20 (64QAM, 6Mbps)	
Frequency (MHz)	Power Density with RBW 100KHz
2412	-0.06
2437	0.33
2462	0.68

The test plots are attached as below.

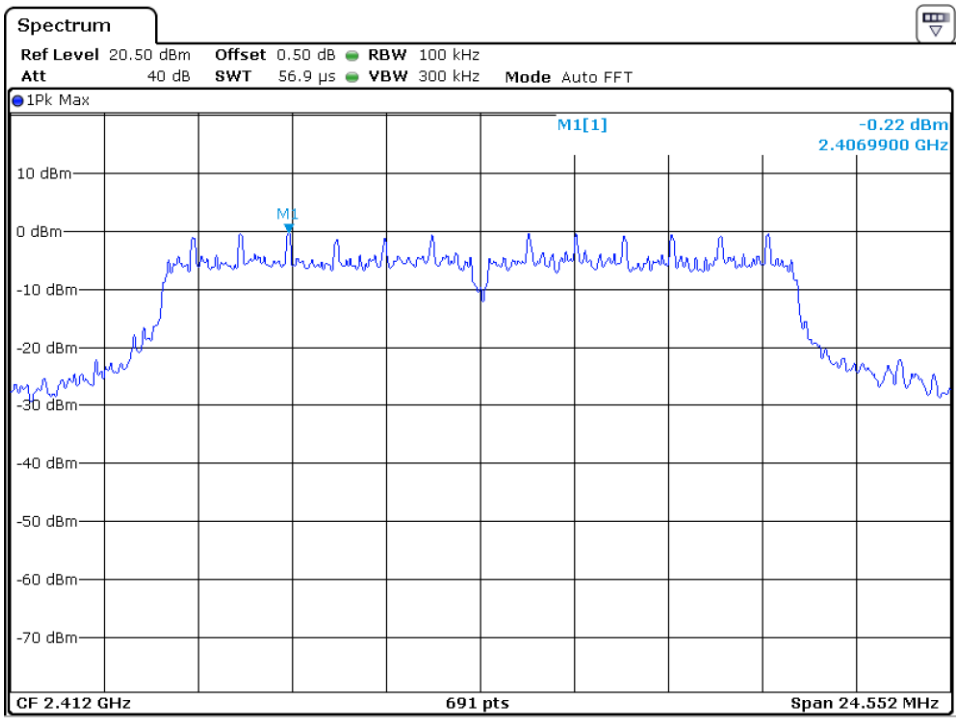
802.11b

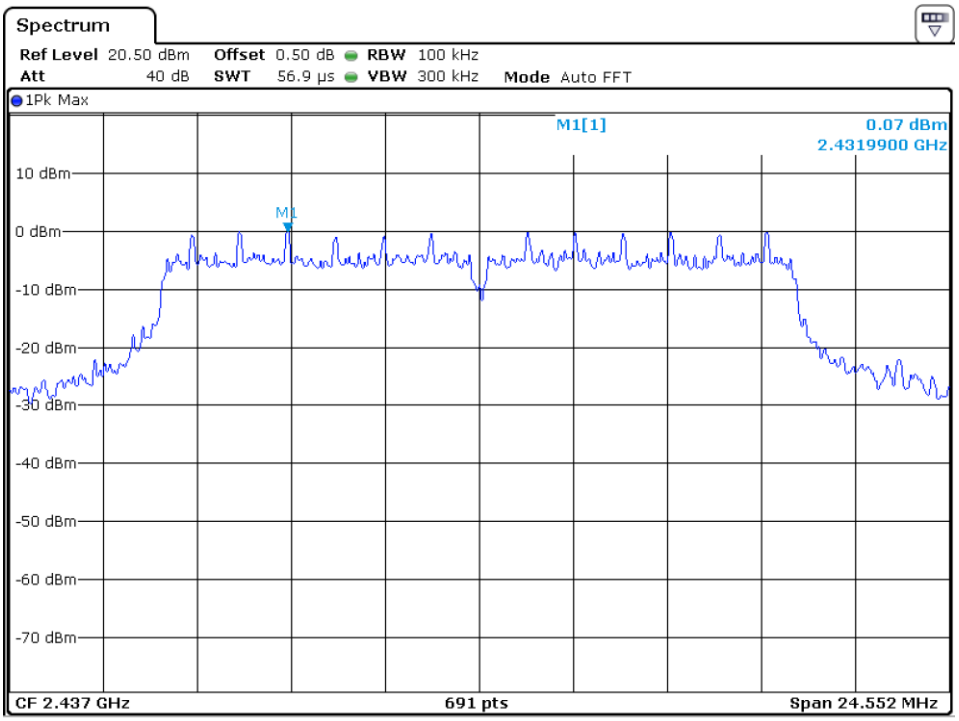

Spectrum
Ref Level 20.50 dBm Offset 0.50 dB RBW 100 kHz
Att 40 dB SWT 37.9 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] 1.80 dBm
2.4114875 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 2.412 GHz
691 pts
Span 13.611 MHz

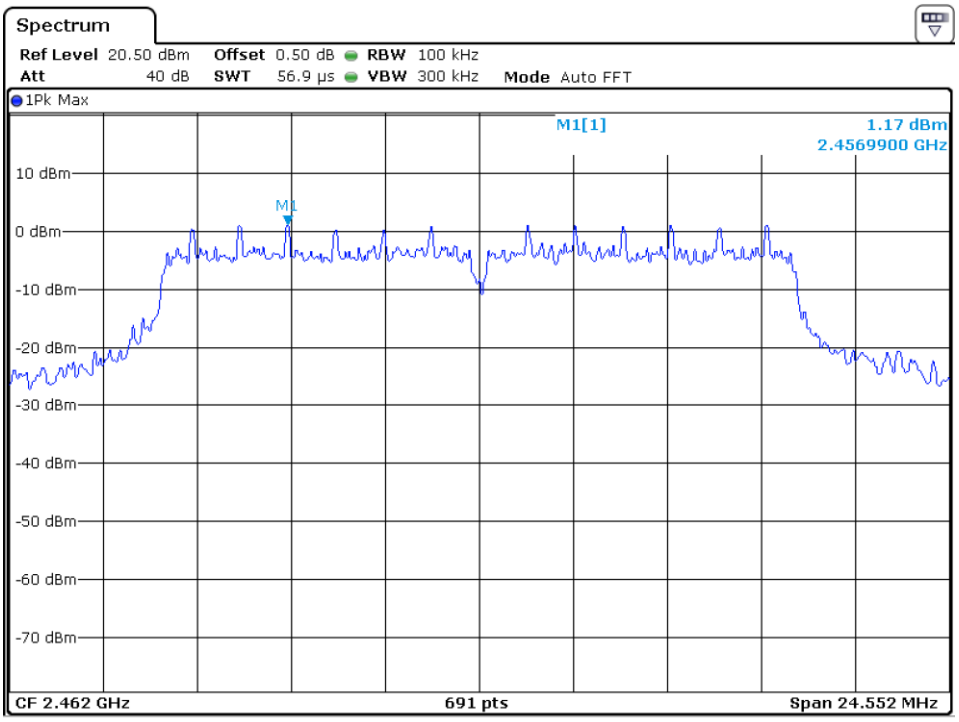

Spectrum
Ref Level 20.50 dBm Offset 0.50 dB RBW 100 kHz
Att 40 dB SWT 37.9 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] 1.14 dBm
2.4364875 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 2.437 GHz
691 pts
Span 13.611 MHz


Spectrum
Ref Level 20.50 dBm Offset 0.50 dB RBW 100 kHz
Att 40 dB SWT 37.9 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] 2.54 dBm
2.4614875 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.462 GHz
691 pts
Span 13.611 MHz

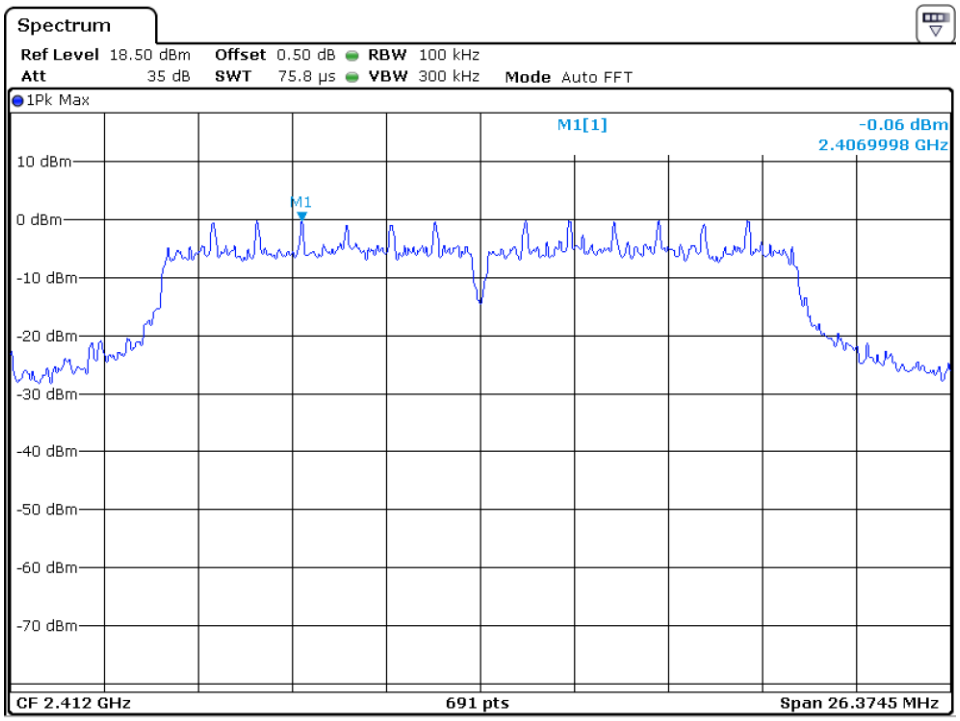
802.11g

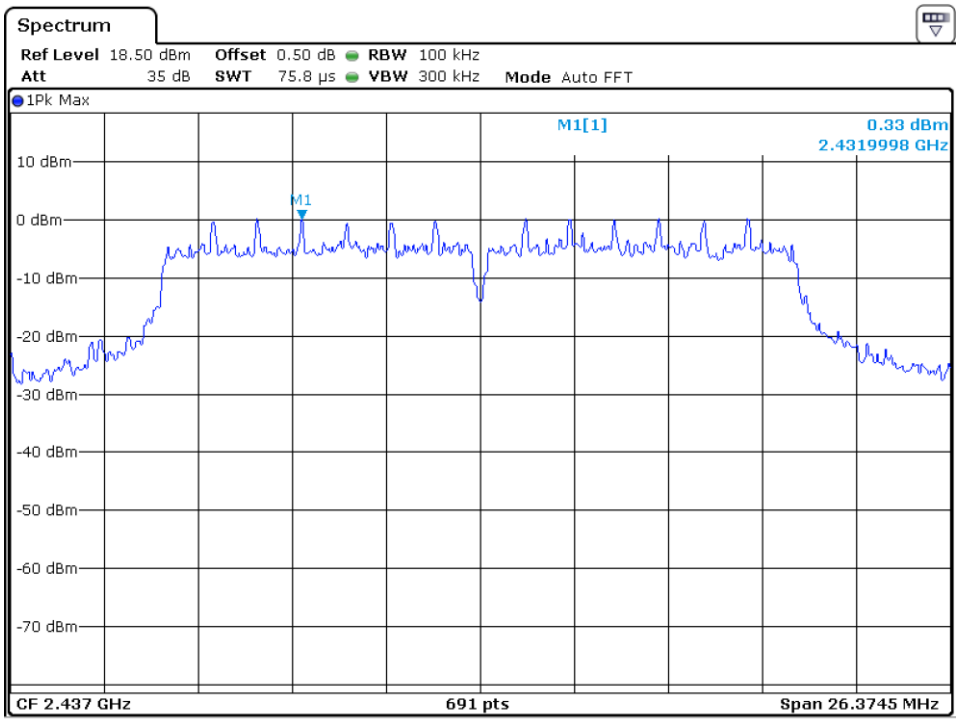

Spectrum
Ref Level 20.50 dBm Offset 0.50 dB RBW 100 kHz
Att 40 dB SWT 56.9 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -0.22 dBm
2.4069900 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.412 GHz
691 pts
Span 24.552 MHz

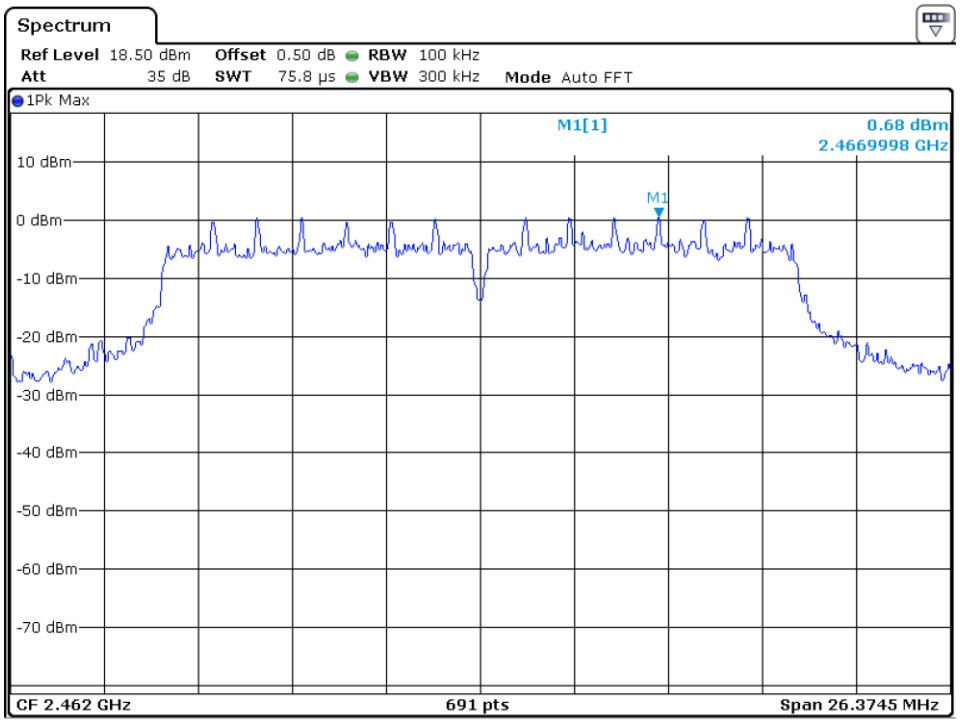

Spectrum
Ref Level 20.50 dBm Offset 0.50 dB RBW 100 kHz
Att 40 dB SWT 56.9 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] 0.07 dBm
2.4319900 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 2.437 GHz
691 pts
Span 24.552 MHz


Spectrum
Ref Level 20.50 dBm Offset 0.50 dB RBW 100 kHz
Att 40 dB SWT 56.9 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] 1.17 dBm
2.4569900 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 2.462 GHz
691 pts
Span 24.552 MHz

802.11n-HT20


Spectrum
Ref Level 18.50 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 75.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] -0.06 dBm
2.4069998 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 2.412 GHz
691 pts
Span 26.3745 MHz


Spectrum
Ref Level 18.50 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 75.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1] 0.33 dBm
2.4319998 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
CF 2.437 GHz
691 pts
Span 26.3745 MHz


Spectrum
Ref Level 18.50 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 75.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
M1[1]
0.68 dBm
2.4669998 GHz
M1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.462 GHz
691 pts
Span 26.3745 MHz

Applicant: Dongguan Toye Electronics Technology Co., Ltd
Date of Test: July 26, 2019 Model: MC352

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.

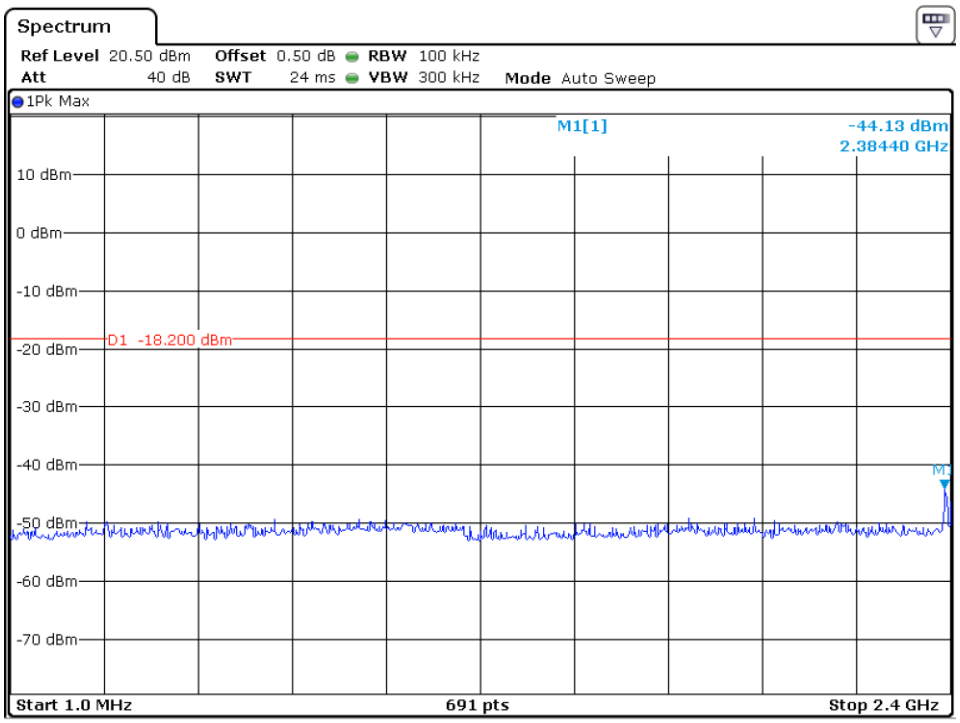
All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the passband.

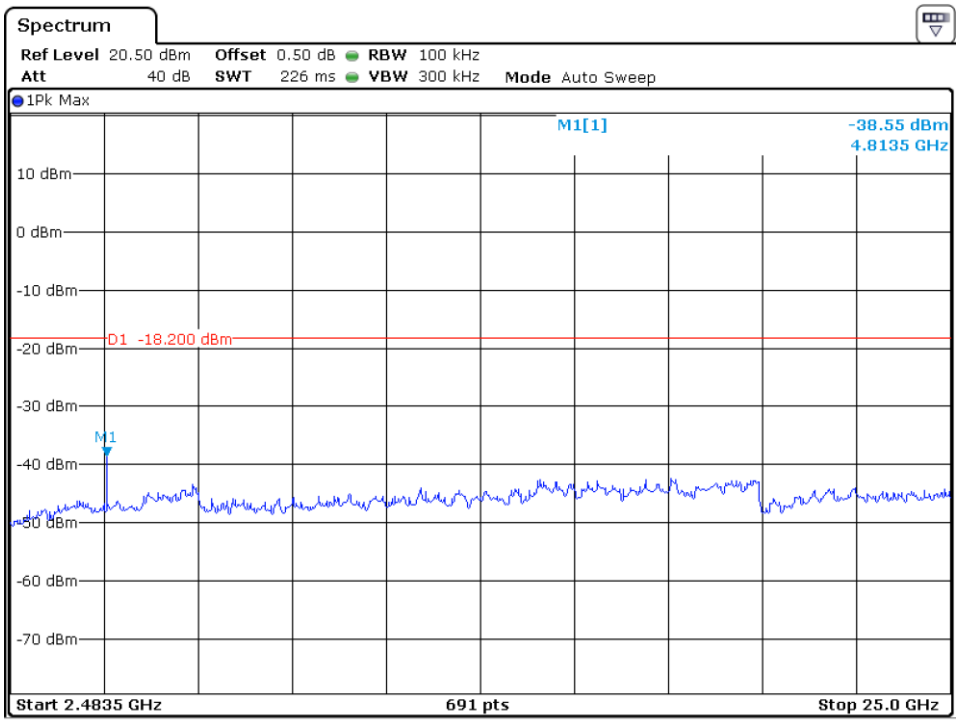
Refer to the attached test plots for out of band conducted emissions data with rate of 1Mbps for 802.11b and 6Mbps for 802.11g and 6Mbps for 802.11n-HT20.

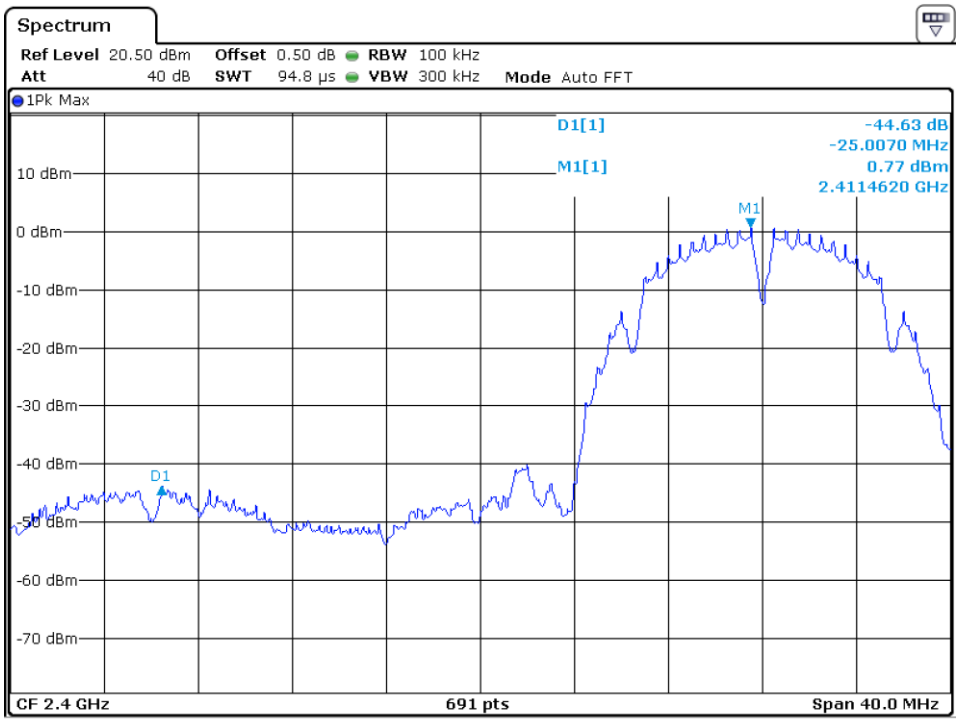
The test plots showed all spurious emission up to the tenth harmonic were measured and they were found to be at least 20 dB below the highest level of the desired power in the passband.

The test plots are attached as below.

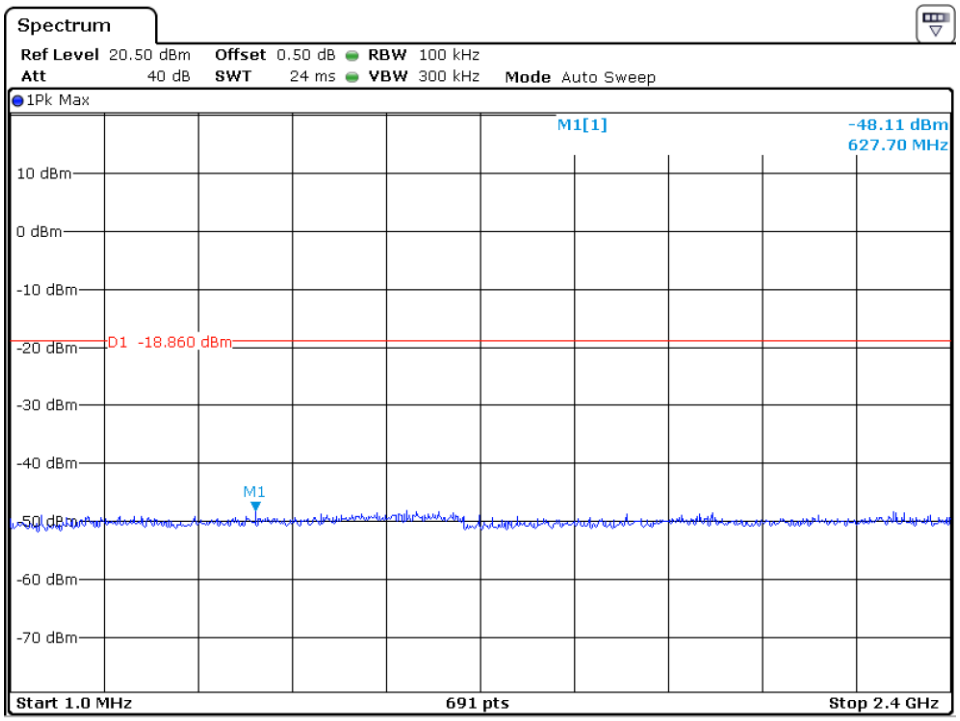
802.11b
Channel 01 (2412MHz) Reference Level: 1.80dBm

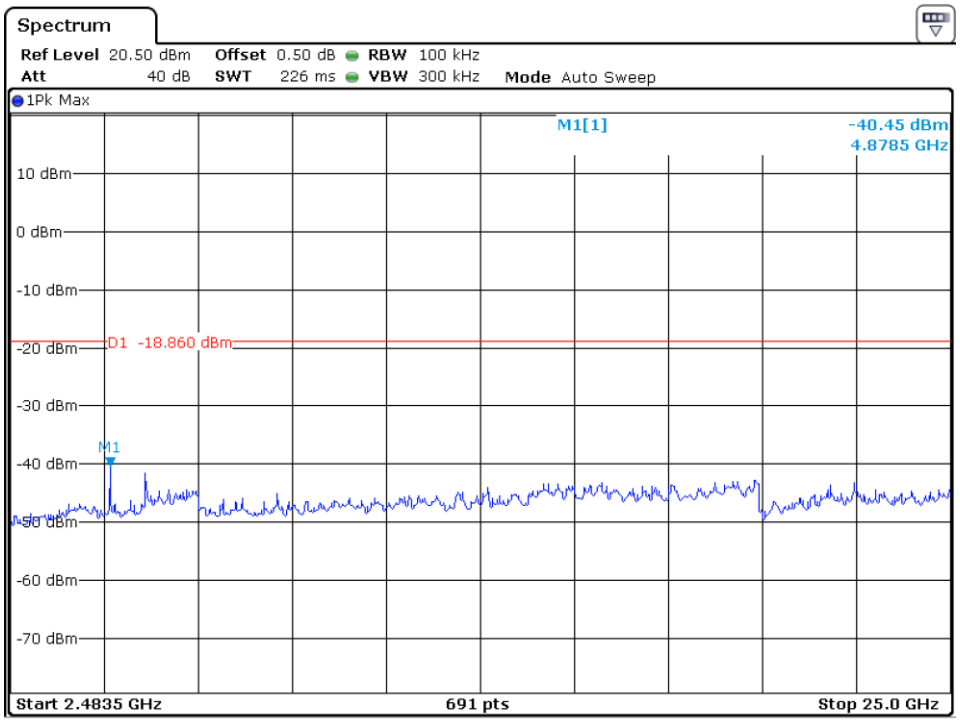




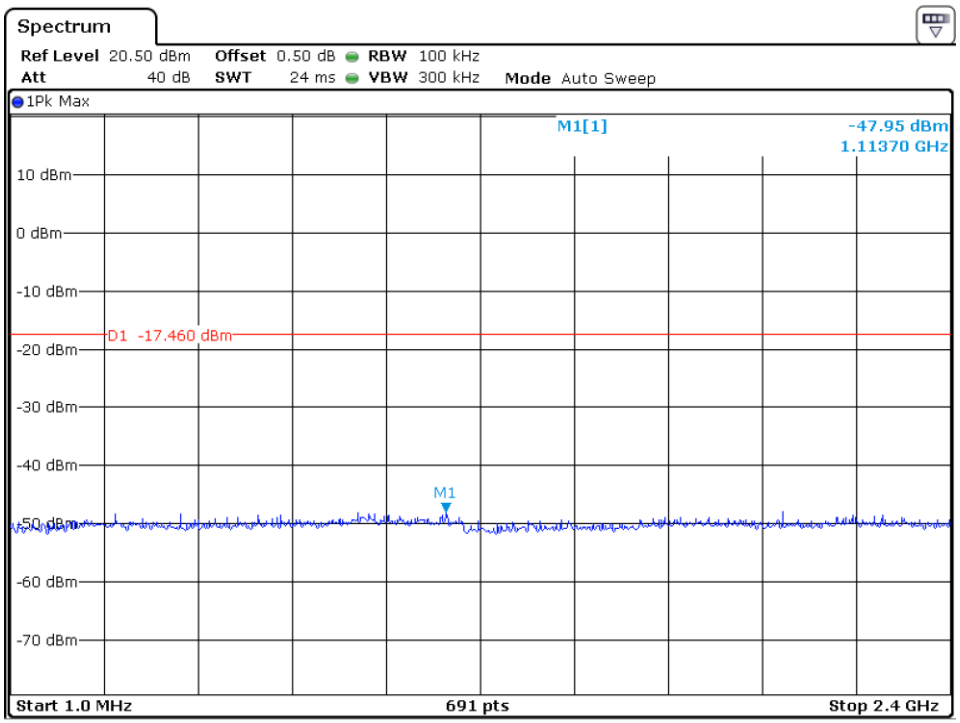

Spectrum
Ref Level 20.50 dBm Offset 0.50 dB RBW 100 kHz
Att 40 dB SWT 94.8 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] -44.63 dB
-25.0070 MHz
M1[1] 0.77 dBm
2.4114620 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
D1
M1
CF 2.4 GHz
691 pts
Span 40.0 MHz

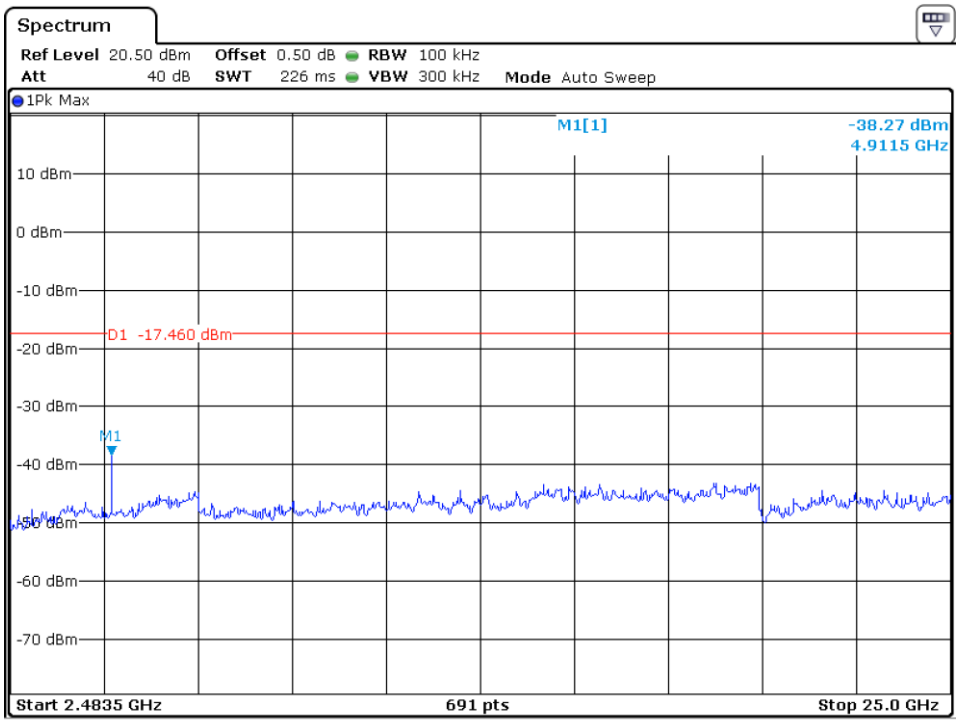
Channel 06 (2437MHz) Reference Level: 1.14dBm





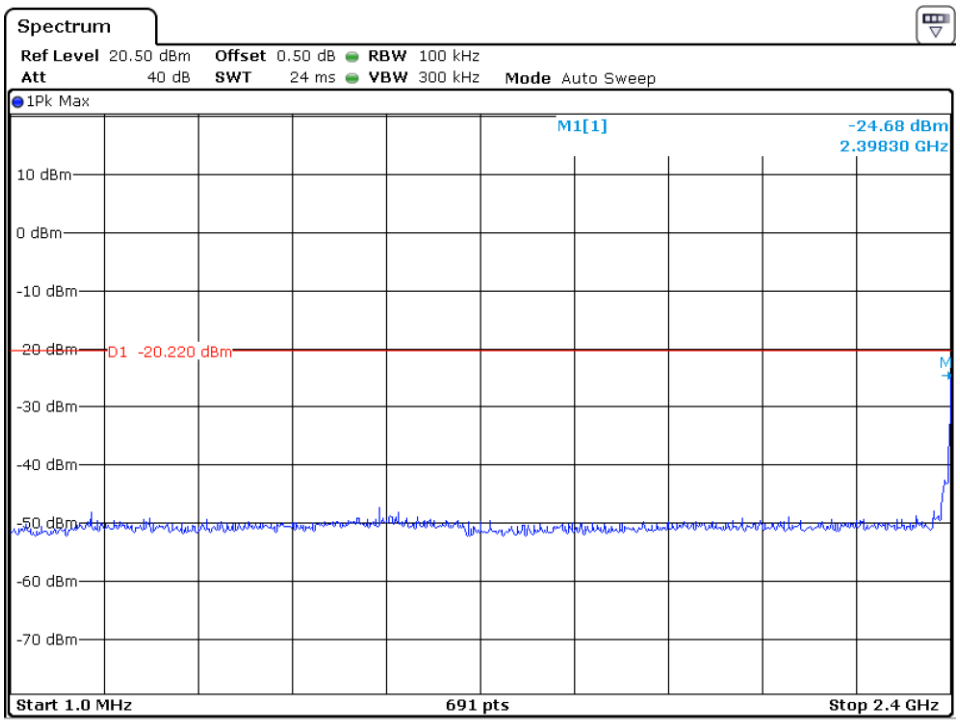
Channel 11 (2462MHz) Reference Level: 2.54dBm

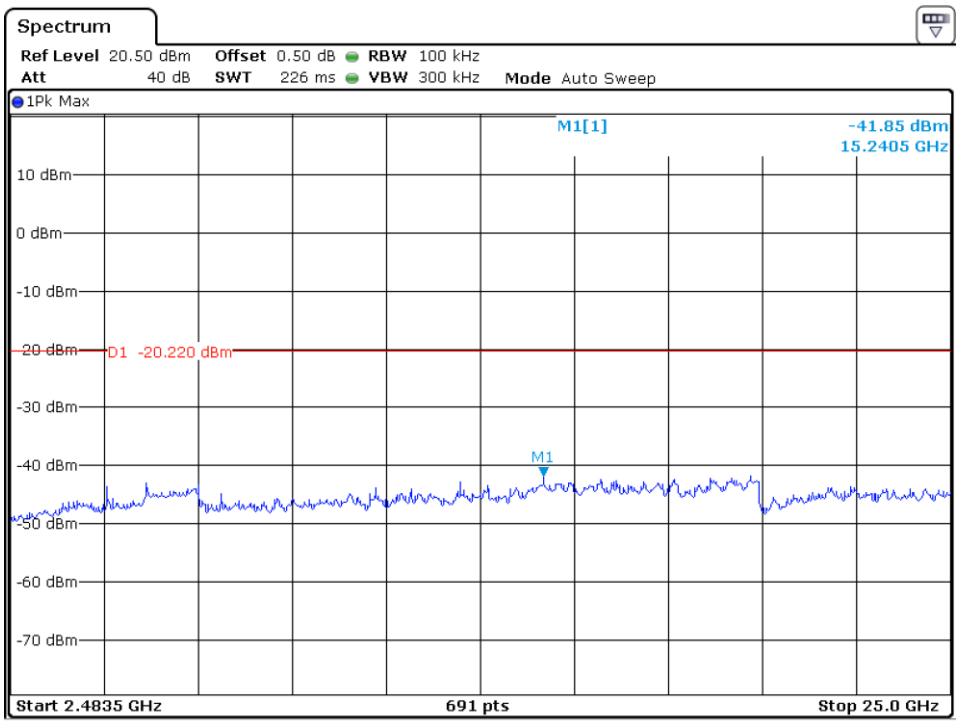


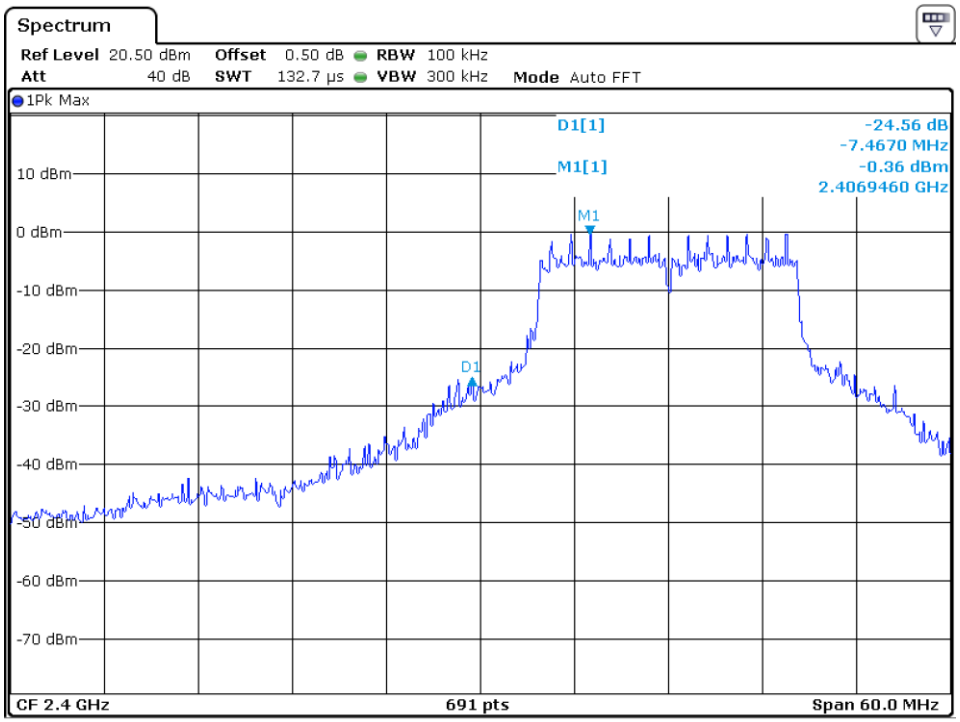



Spectrum
Ref Level 20.50 dBm Offset 0.50 dB RBW 100 kHz
Att 40 dB SWT 132.7 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] -50.12 dB
26.1360 MHz
M1[1] 2.33 dBm
2.4624870 GHz
M1
D1
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
CF 2.4835 GHz
691 pts
Span 60.0 MHz

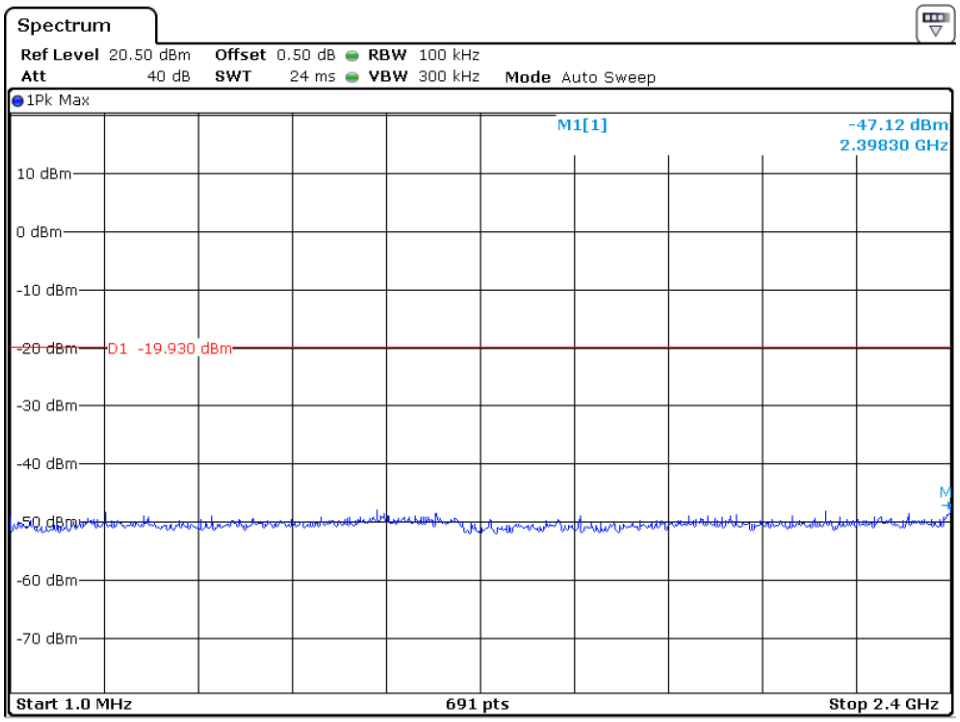
802.11g
Channel 01 (2412MHz) Reference Level: -0.22dBm

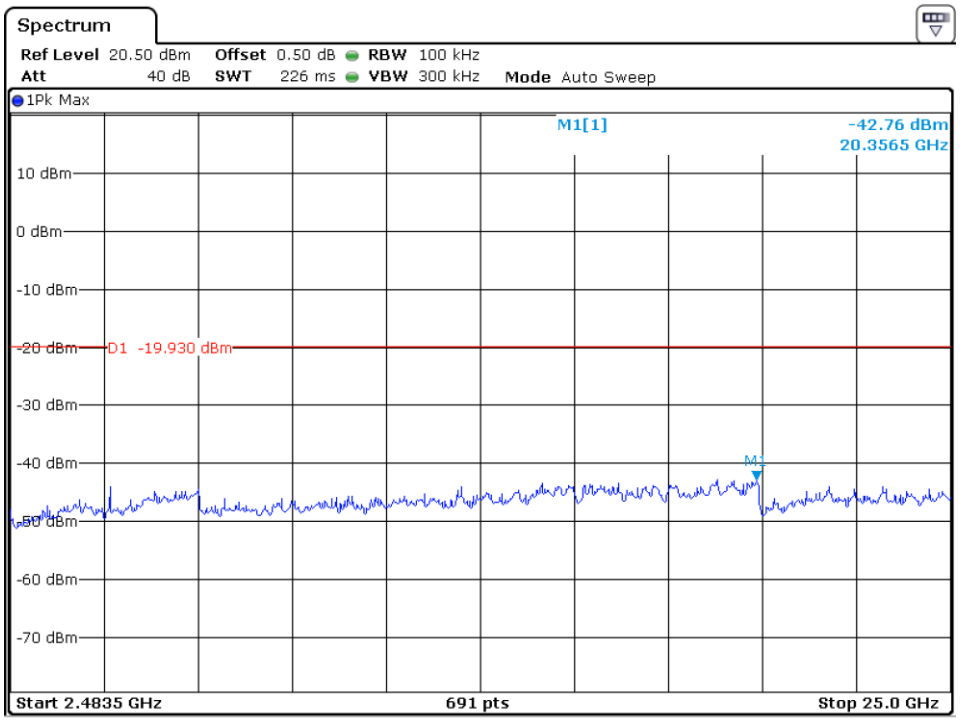




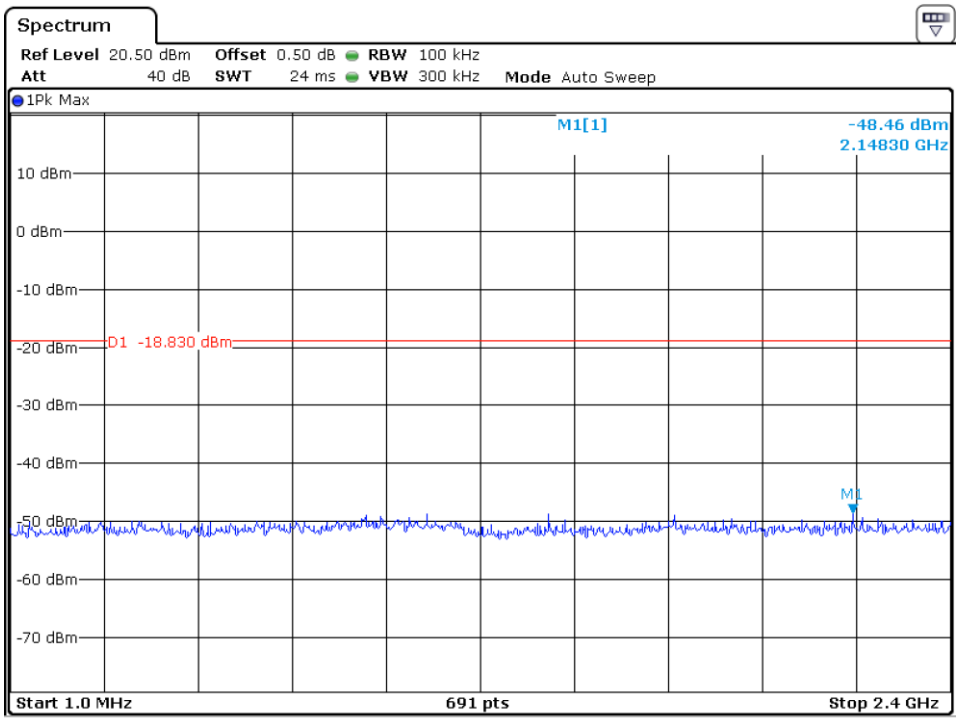

Spectrum
Ref Level 20.50 dBm Offset 0.50 dB RBW 100 kHz
Att 40 dB SWT 132.7 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] -24.56 dB
-7.4670 MHz
M1[1] -0.36 dBm
2.4069460 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
D1
CF 2.4 GHz
691 pts
Span 60.0 MHz

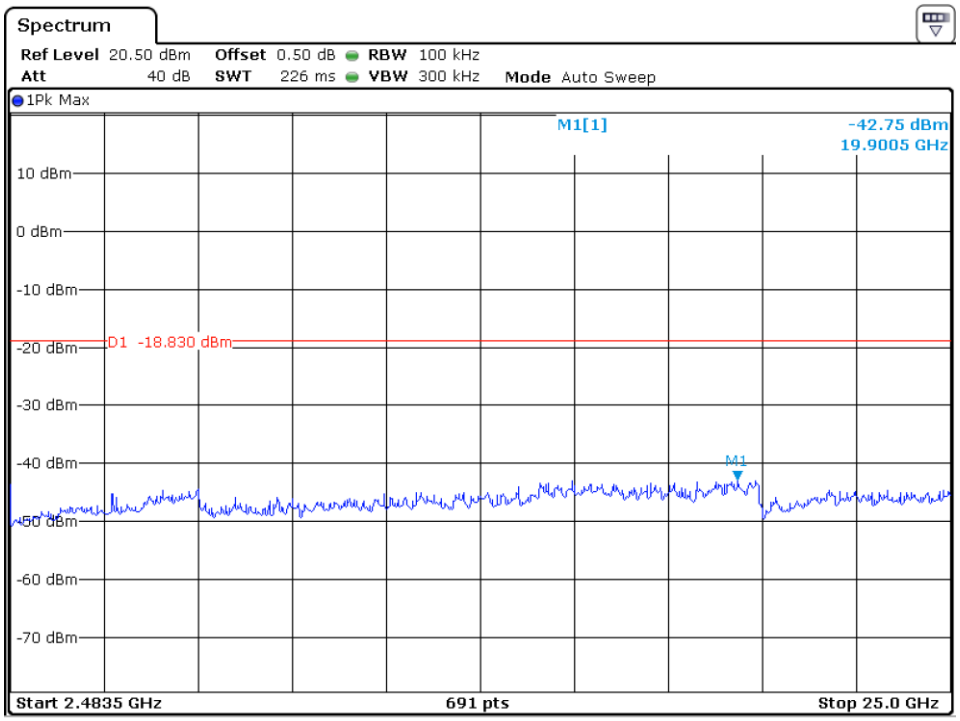
Channel 06 (2437MHz) Reference Level: 0.07dBm

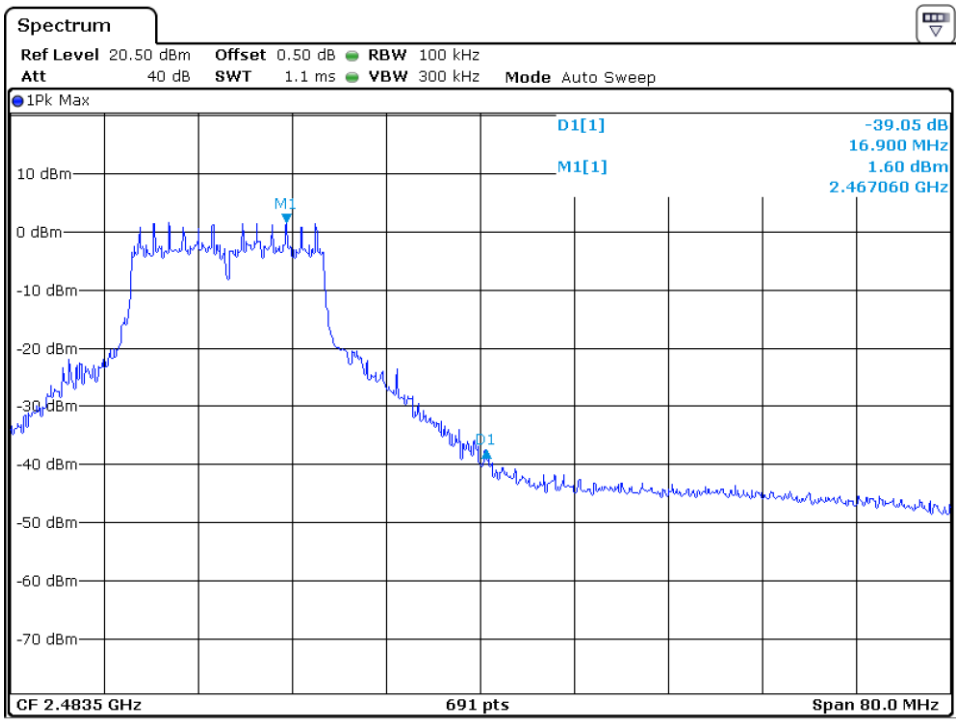




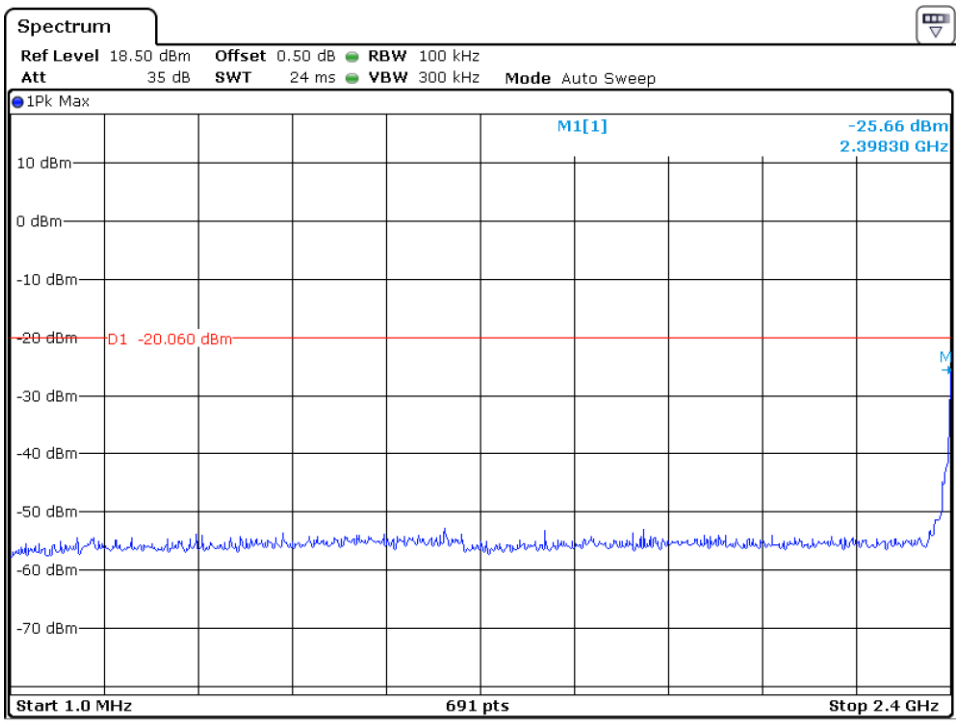
Channel 11 (2462MHz) Reference Level: 1.17dBm

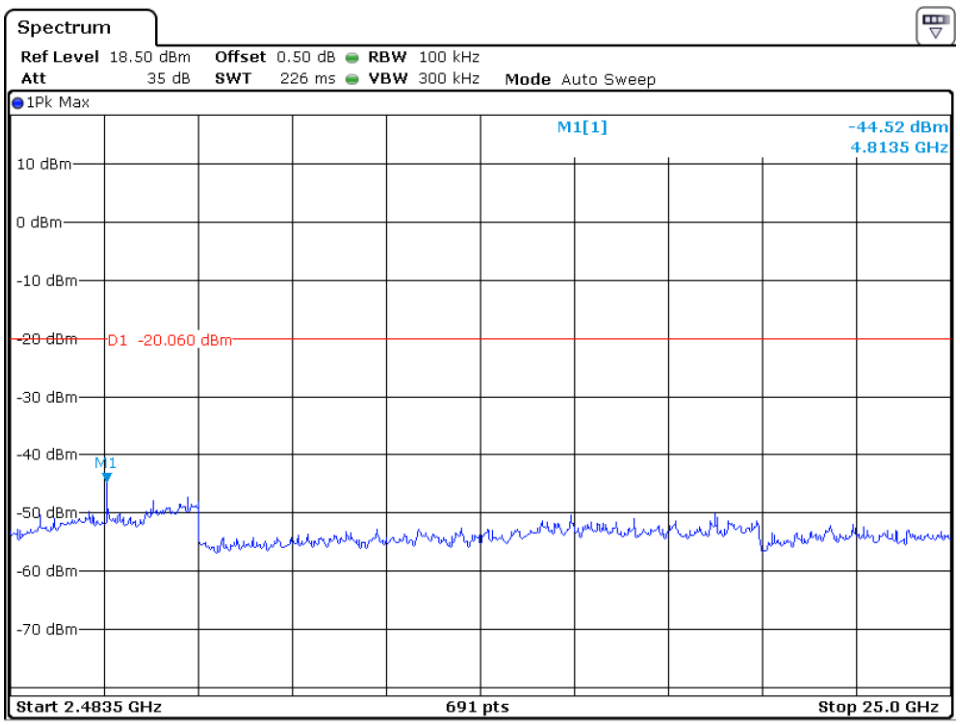


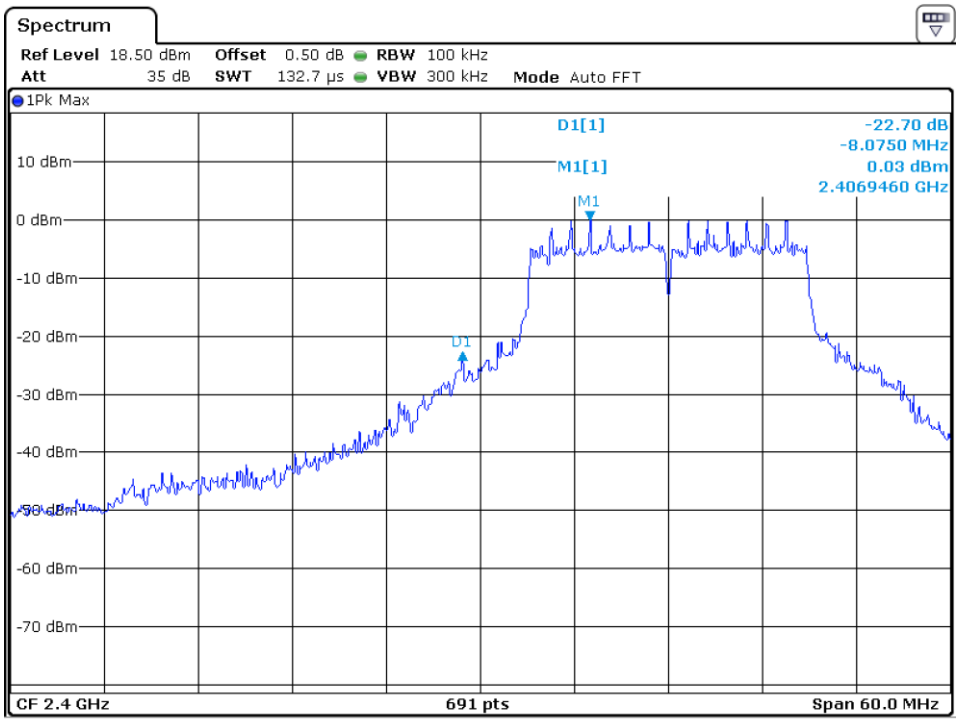



Spectrum
Ref Level 20.50 dBm Offset 0.50 dB RBW 100 kHz
Att 40 dB SWT 1.1 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
D1[1] -39.05 dB
16.900 MHz
M1[1] 1.60 dBm
2.467060 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
D1
CF 2.4835 GHz
691 pts
Span 80.0 MHz

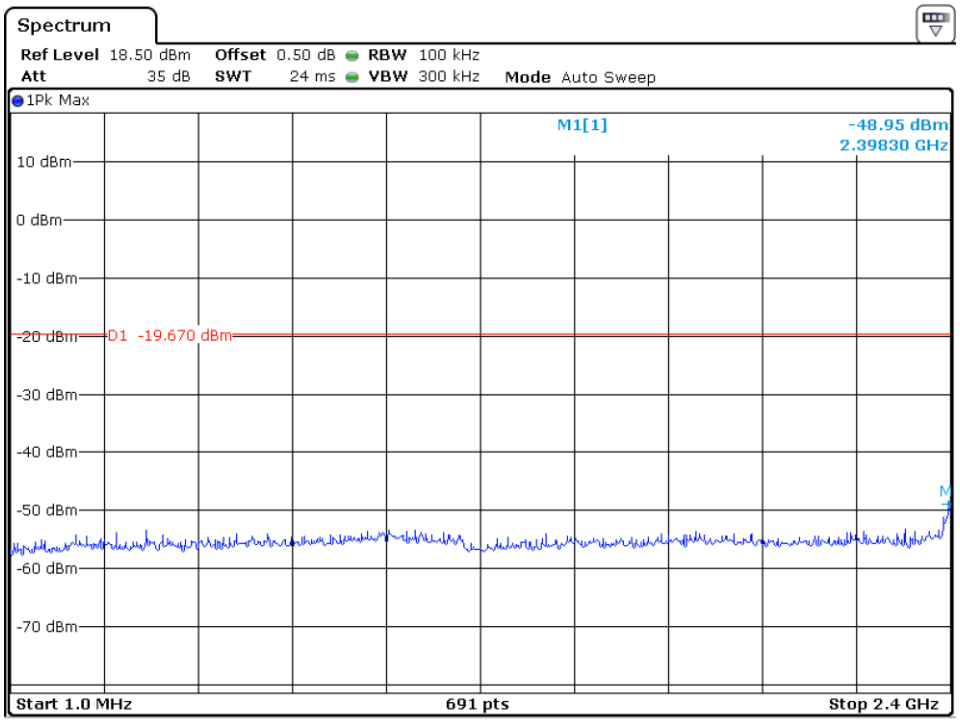
802.11n-HT20
Channel 01 (2412MHz) Reference Level: -0.06dBm

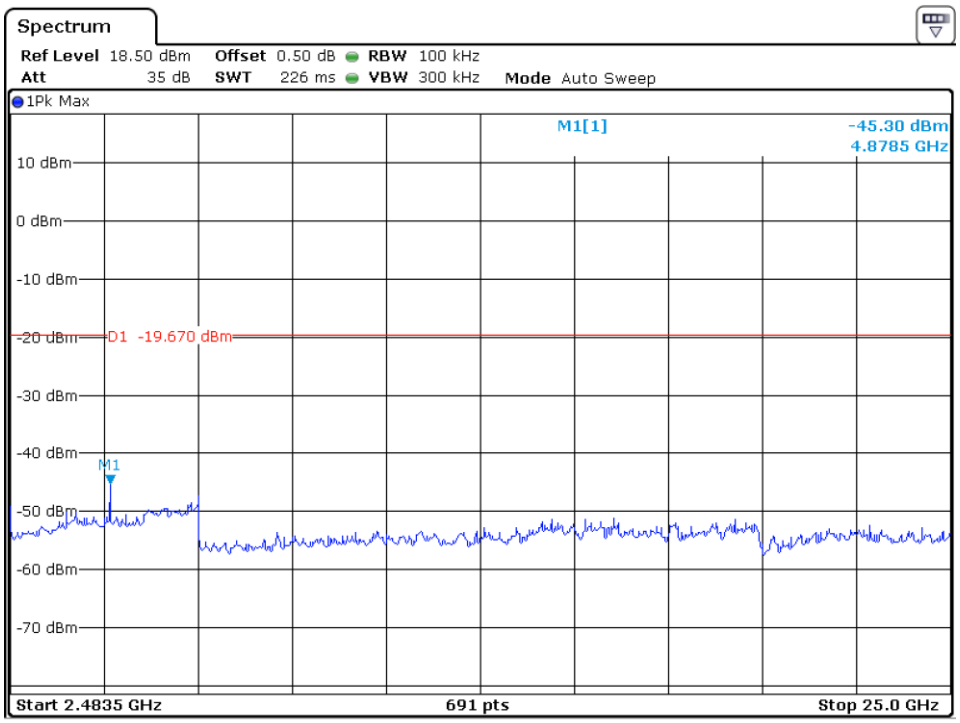




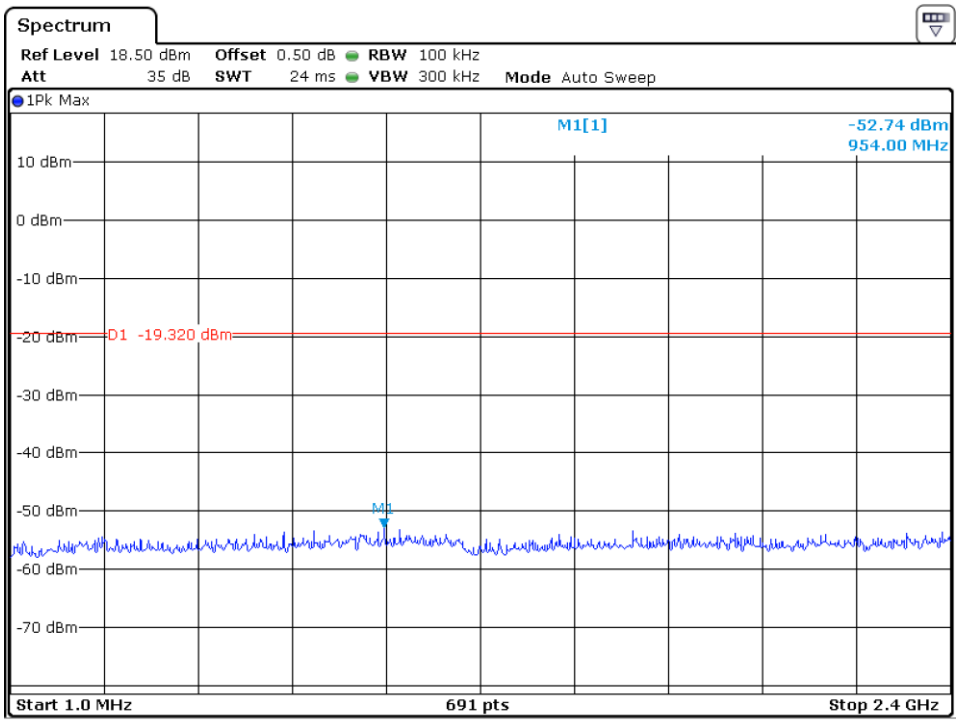

Spectrum
Ref Level 18.50 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 132.7 µs VBW 300 kHz Mode Auto FFT
1Pk Max
D1[1] -22.70 dB
-8.0750 MHz
M1[1] 0.03 dBm
2.4069460 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
D1
CF 2.4 GHz
691 pts
Span 60.0 MHz

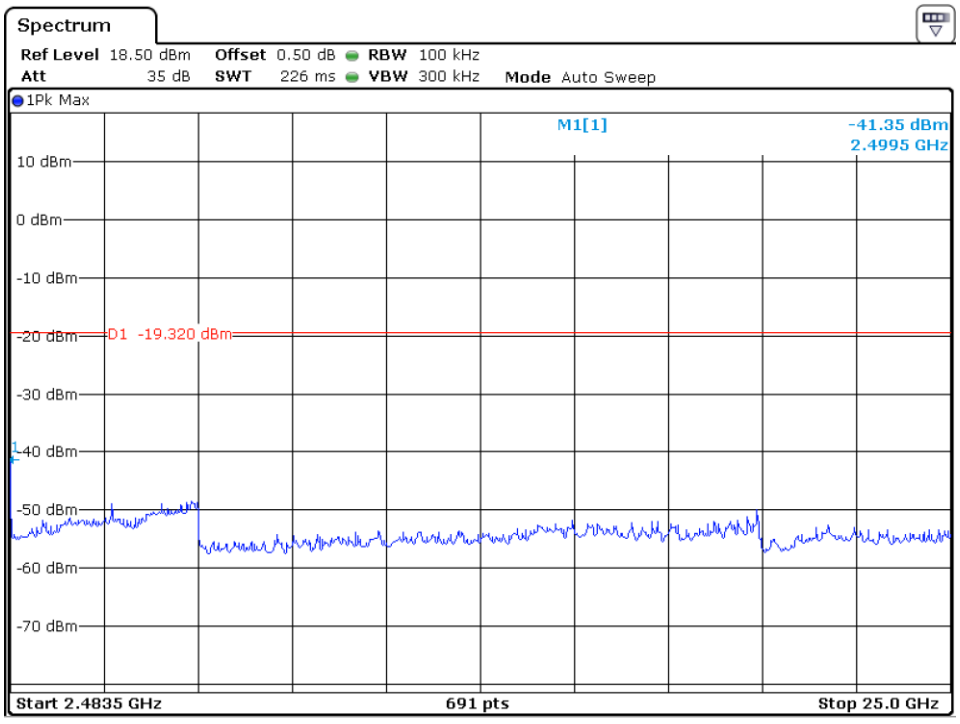
Channel 06 (2437MHz) Reference Level: 0.33dBm

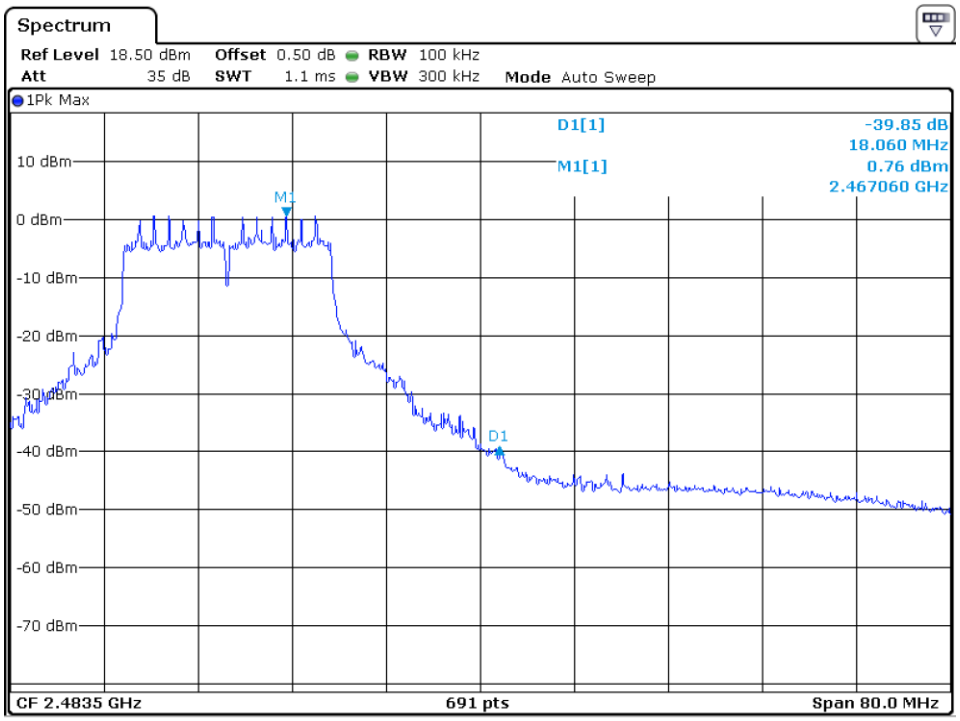




Channel 11 (2462MHz) Reference Level: 0.68dBm






Spectrum
Ref Level 18.50 dBm Offset 0.50 dB RBW 100 kHz
Att 35 dB SWT 1.1 ms VBW 300 kHz Mode Auto Sweep
1Pk Max
D1[1] -39.85 dB
18.060 MHz
M1[1] 0.76 dBm
2.467060 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
M1
D1
CF 2.4835 GHz
691 pts
Span 80.0 MHz

Applicant: Dongguan Toye Electronics Technology Co., Ltd
Date of Test: July 26, 2019 Model: MC352

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: Dongguan Toye Electronics Technology Co., Ltd
Date of Test: July 26, 2019 Model: MC352

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.

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

Applicant: Dongguan Toye Electronics Technology Co., Ltd
Date of Test: July 26, 2019 Model: MC352

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: Dongguan Toye Electronics Technology Co., Ltd
Date of Test: July 26, 2019 Model: MC352

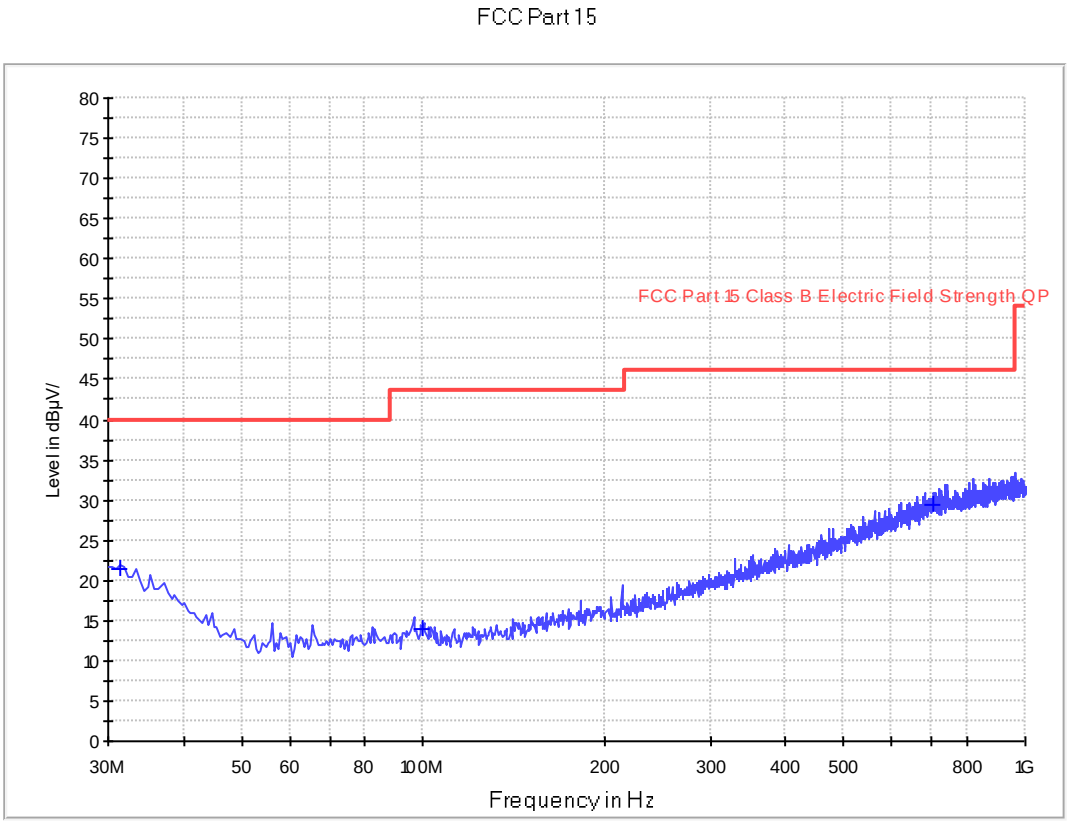
4.8 Radiated Spurious Emission

Worst Case Radiated Spurious Emission (802.11b-Channel 01)
at 2390.0MHz
is passed by 7.0dB margin.

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

Applicant: Dongguan Toye Electronics Technology Co., Ltd
Date of Test: July 26, 2019 Model: MC352
Worst Case Operating Mode: Transmitting (802.11b-Channel 01)

ANT Polarity: Horizontal

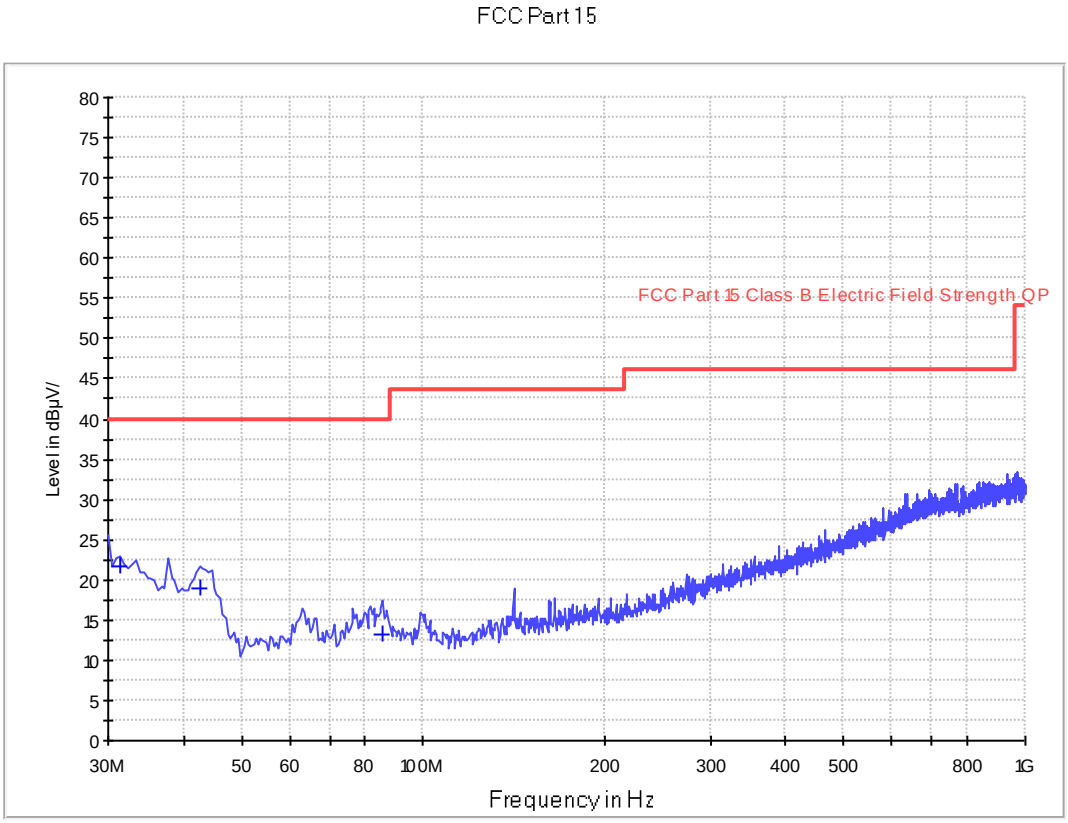


Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
31.455000	21.5	1000.0	120.000	0.0	H	17.3	18.5	40.0
99.840000	14.1	1000.0	120.000	0.0	H	9.8	29.4	43.5
705.605000	29.4	1000.0	120.000	0.0	H	25.5	16.6	46.0

Remark:
1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. QuasiPeak (dBµV/m)= Corr. (dB/m)+ Read Level (dBµV)
3. Margin (dB) = Limit Line(dBµV/m) – Level (dBµV/m)

Applicant: Dongguan Toye Electronics Technology Co., Ltd
Date of Test: July 26, 2019 Model: MC352
Worst Case Operating Mode: Transmitting (802.11b-Channel 01)

ANT Polarity: Vertical



Frequency (MHz)	QuasiPeak (dB¦ÌV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
31.455000	21.6	1000.0	120.000	0.0	V	17.3	18.4	40.0
42.610000	18.9	1000.0	120.000	0.0	V	11.8	21.1	40.0
85.775000	13.1	1000.0	120.000	0.0	V	9.1	26.9	40.0

Remark:
1. Corr. = Antenna Factor (dB/m) + Cable Loss (dB)
2. QuasiPeak (dBµV/m)= Corr. (dB/m)+ Read Level (dBµV)
3. Margin (dB) = Limit Line(dBµV/m) – Level (dBµV/m)

Applicant: Dongguan Toye Electronics Technology Co., Ltd
Date of Test: July 26, 2019 Model: MC352
Worst Case Operating Mode: Transmitting (802.11b-Channel 01)

Radiated Emissions (above 1GHz)

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	58.9	36.8	33.5	55.6	74.0	-18.4
Horizontal	*2390.000	66.9	36.4	29.1	59.6	74.0	-14.4

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	48.3	36.8	33.5	45.0	54.0	-9.0
Horizontal	*2390.000	54.3	36.4	29.1	47.0	54.0	-7.0

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: Dongguan Toye Electronics Technology Co., Ltd
Date of Test: July 26, 2019 Model: MC352
Worst Case Operating Mode: Transmitting (802.11b-Channel 06)

Radiated Emissions (above 1GHz)

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	58.2	36.7	33.4	54.9	74.0	-19.1
Horizontal	*7311.000	52.2	36.6	35.8	51.4	74.0	-22.6

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	*4874.000	50.1	36.7	33.4	46.8	54.0	-7.2
Horizontal	*7311.000	43.9	36.6	35.8	43.1	54.0	-10.9

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: Dongguan Toye Electronics Technology Co., Ltd
Date of Test: July 26, 2019 Model: MC352
Worst Case Operating Mode: Transmitting (802.11b-Channel 11)

Radiated Emissions (above 1GHz)

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	57.4	36.8	33.3	53.9	74.0	-20.1
Horizontal	*7386.000	60.2	36.5	29.3	53.0	74.0	-21.0
Horizontal	*2484.320	57.4	36.5	29.3	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	*4924.000	45.8	36.8	33.3	42.3	54.0	-11.7
Horizontal	*7386.000	50.5	36.5	29.3	43.3	54.0	-10.7
Horizontal	*2484.320	49.7	36.5	29.3	42.5	54.0	-11.5

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: Dongguan Toye Electronics Technology Co., Ltd
Date of Test: July 26, 2019 Model: MC352
Worst Case Operating Mode: Transmitting (802.11g-Channel 01)

Radiated Emissions (above 1GHz)

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	51.7	36.8	33.5	48.4	74.0	-25.6
Horizontal	*2390.000	66.8	36.4	29.1	59.5	74.0	-14.5

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	43.1	36.8	33.5	39.8	54.0	-14.2
Horizontal	*2390.000	54.3	36.4	29.1	47.0	54.0	-7.0

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: Dongguan Toye Electronics Technology Co., Ltd
Date of Test: July 26, 2019 Model: MC352
Worst Case Operating Mode: Transmitting (802.11g-Channel 06)

Radiated Emissions (above 1GHz)

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	53.8	36.7	33.4	50.5	74.0	-23.5
Horizontal	*7311.000	50.5	36.6	35.8	49.7	74.0	-24.3

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	*4874.000	46.1	36.7	33.4	42.8	54.0	-11.2
Horizontal	*7311.000	43.2	36.6	35.8	42.4	54.0	-11.6

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: Dongguan Toye Electronics Technology Co., Ltd
Date of Test: July 26, 2019 Model: MC352
Worst Case Operating Mode: Transmitting (802.11g-Channel 11)

Radiated Emissions (above 1GHz)

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	55.6	36.8	33.3	52.1	74.0	-21.9
Horizontal	*7386.000	61.2	36.5	29.3	54.0	74.0	-20.0
Horizontal	*2484.550	58.5	36.5	29.3	51.3	74.0	-22.7

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	47.4	36.8	33.3	43.9	54.0	-10.1
Horizontal	*7386.000	51.5	36.5	29.3	44.3	54.0	-9.7
Horizontal	*2484.550	50.1	36.5	29.3	42.9	54.0	-11.1

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: Dongguan Toye Electronics Technology Co., Ltd
Date of Test: July 26, 2019 Model: MC352
Worst Case Operating Mode: Transmitting (802.11n20-Channel 01)

Radiated Emissions (above 1GHz)

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	57.9	36.8	33.5	54.6	74.0	-19.4
Horizontal	*2390.000	67.1	36.4	29.1	59.8	74.0	-14.2

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	48.1	36.8	33.5	44.8	54.0	-9.2
Horizontal	*2390.000	54.3	36.4	29.1	47.0	54.0	-7.0

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: Dongguan Toye Electronics Technology Co., Ltd
Date of Test: July 26, 2019 Model: MC352
Worst Case Operating Mode: Transmitting (802.11n20-Channel 06)

Radiated Emissions (above 1GHz)

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	56.8	36.7	33.4	53.5	74.0	-20.5
Horizontal	*7311.000	51.5	36.6	35.8	50.7	74.0	-23.3

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	*4874.000	47.2	36.7	33.4	43.9	54.0	-10.1
Horizontal	*7311.000	42.8	36.6	35.8	42.0	54.0	-12.0

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: Dongguan Toye Electronics Technology Co., Ltd
Date of Test: July 26, 2019 Model: MC352
Worst Case Operating Mode: Transmitting (802.11n20-Channel 11)

Radiated Emissions (above 1GHz)

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	56.9	36.8	33.3	53.4	74.0	-20.6
Horizontal	*7386.000	59.4	36.5	29.3	52.2	74.0	-21.8
Horizontal	*2484.720	59.0	36.5	29.3	51.8	74.0	-22.2

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	*4924.000	48.1	36.8	33.3	44.6	54.0	-9.4
Horizontal	*7386.000	51.0	36.5	29.3	43.8	54.0	-10.2
Horizontal	*2484.720	50.4	36.5	29.3	43.2	54.0	-10.8

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: Dongguan Toye Electronics Technology Co., Ltd
Date of Test: July 26, 2019
Model: MC352

4.9 Conducted Emission

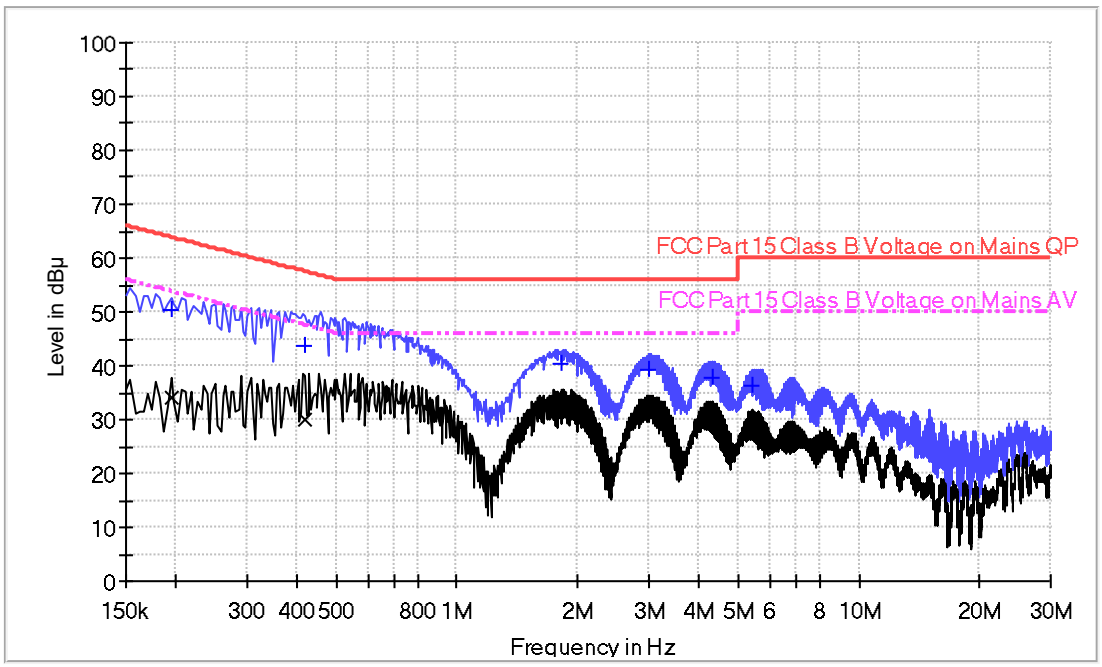
Worst Case Conducted Emission (802.11b-Channel 01)
at 0.394MHz
is passed by 9.8dB margin.

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

Applicant: Dongguan Toye Electronics Technology Co., Ltd
Date of Test: July 26, 2019
Model: MC352
Worst Case Operating Mode: Transmitting (802.11b-Channel 01)
Phase: Live

Graphic / Data Table

Conducted Emissions
Pursuant to FCC 15.207: Emissions Requirement



Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.194000	50.4	9.000	L1	9.7	13.5	63.9
0.418000	43.6	9.000	L1	9.8	13.9	57.5
1.826000	40.3	9.000	L1	9.8	15.7	56.0
3.010000	39.2	9.000	L1	9.8	16.8	56.0
4.318000	37.9	9.000	L1	9.8	18.1	56.0
5.406000	36.1	9.000	L1	9.8	23.9	60.0

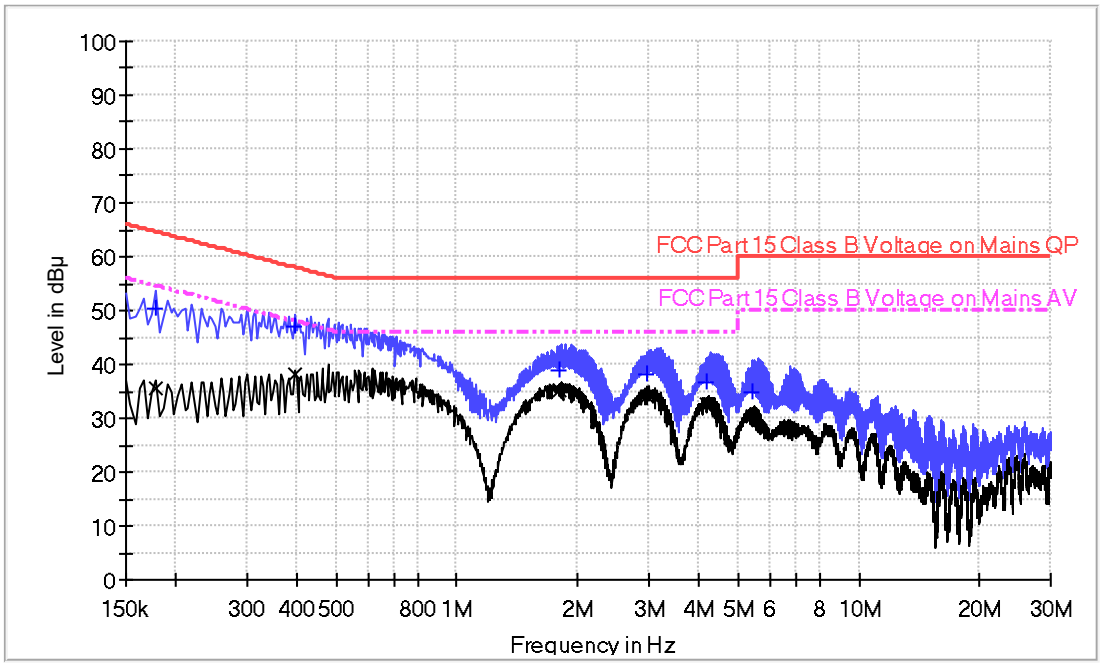
Limit and Margin AV

Frequency (MHz)	Average (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.194000	34.1	9.000	L1	9.7	19.8	53.9
0.418000	30.1	9.000	L1	9.8	17.4	47.5
1.826000	32.0	9.000	L1	9.8	14.0	46.0
3.010000	31.0	9.000	L1	9.8	15.0	46.0
4.318000	29.4	9.000	L1	9.8	16.6	46.0
5.406000	27.9	9.000	L1	9.8	22.1	50.0

Applicant: Dongguan Toye Electronics Technology Co., Ltd
Date of Test: July 26, 2019
Model: MC352
Worst Case Operating Mode: Transmitting (802.11b-Channel 01)
Phase: Neutral

Graphic / Data Table

Conducted Emissions
Pursuant to FCC 15.207: Emissions Requirement



Limit and Margin QP

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.178000	50.3	9.000	N	9.7	14.3	64.6
0.394000	47.0	9.000	N	9.8	11.0	58.0
1.794000	39.0	9.000	N	9.8	17.0	56.0
2.982000	38.1	9.000	N	9.8	17.9	56.0
4.190000	36.8	9.000	N	9.9	19.2	56.0
5.406000	34.8	9.000	N	9.9	25.2	60.0

Limit and Margin AV

Frequency (MHz)	Average (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.178000	35.5	9.000	N	9.7	19.1	54.6
0.394000	38.2	9.000	N	9.8	9.8	48.0
1.794000	35.1	9.000	N	9.8	10.9	46.0
2.982000	34.2	9.000	N	9.8	11.8	46.0
4.190000	32.6	9.000	N	9.9	13.4	46.0
5.406000	30.4	9.000	N	9.9	19.6	50.0

Applicant: Dongguan Toye Electronics Technology Co., Ltd
Date of Test: July 26, 2019
Model: MC352

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: Dongguan Toye Electronics Technology Co., Ltd
Date of Test: July 26, 2019
Model: MC352

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.

5.0 Equipment Photographs

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

6.0 Product Labeling

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

7.0 Technical Specifications

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

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.

9.0 Confidentiality Request

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

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.

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	28-May-2019	28-May-2020
SZ182-02-01	Power Sensor	Anritsu	MA2411B	1207429	28-May-2019	28-May-2020
SZ061-12	BiConiLog Antenna	ETS	3142E	00166158	14-Sep-2018	14-Sep-2019
SZ185-01	EMI Receiver	R&S	ESCI	100547	4-Jan-2019	4-Jan-2020
SZ061-08	Horn Antenna	ETS	3115	00092346	14-Sep-2018	14-Sep-2019
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	24-May-2019	24-May-2020
SZ056-03	Spectrum Analyzer	R&S	FSP 30	101148	28-May-2019	28-May-2020
SZ056-06	Signal Analyzer	R&S	FSV 40	101101	28-May-2019	28-May-2020
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	5-Jul-2019	5-Jul-2020
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	15-Dec-2018	15-Dec-2020
SZ062-02	RF Cable	RADIALL	RG 213U	--	19-Jun-2019	19-Dec-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
SZ067-04	Notch Filter	Micro-Tronics	BRM50702-02	--	28-May-2019	28-May-2020
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

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