Echelon Fitness Multimedia LLC

TEST REPORT

SCOPE OF WORK
FCC TESTING–ECHKIN24-3399-C

REPORT NUMBER
210810028SZN-003

ISSUE DATE **[REVISED DATE]**
15 October 2021 [----------]

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TEST REPORT

Intertek Report No.: 210810028SZN-003

Echelon Fitness Multimedia LLC

Application
For
Certification

FCC ID: 2AWD4-KS243399CUR

24 inch Curved Screen-P

Model: ECHKIN24-3399-C

2.4GHz Wi-Fi Transceiver

Report No.: 210810028SZN-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 [10-1-20]

Prepared and Checked by:

Ryan Chen
Engineer

Approved by:

Peter Kang
Sr. Technical Supervisor
Date: 15 October 2021

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 [10-01-20] Edition] provision.

Report prepared by:

Ryan Chen
Intertek Testing Services Shenzhen Ltd. Longhua Branch
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Table of Contents

1.0 Summary of Test results

Applicant: Echelon Fitness Multimedia LLC
Applicant Address: 605 Chestnut Street, Suite 700, Chattanooga, TN 37450, USA
Manufacturer: SHENZHEN KINSTONE D&T DEVELOP CO.,LTD
Manufacturer Address: 5F, A2 B, XinJianXing Tech Industrial Park, Fengxin Road, Lou Cun, Guangming New Dist., Shenzhen, China

Model: ECHKIN24-3399-C

FCC ID: 2AWD4-KS243399CUR

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), 15.209, FCC 15.205	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.

2.0 General Description

2.1 Product Description

The equipment under test (EUT) is a 24 inch Curved Screen-P with Bluetooth 5.0 (dual-mode) function operating in 2402-2480MHz, 2.4G WIFI function operating in 2412-2462MHz and 5G WIFI function operating in 5150MHz~5250 MHz, 5250MHz~5350MHz, 5470MHz-5725MHZ, 5725MHz~5850MHz. The EUT is powered by DC 12V. For more detail information pls. refer to the user manual.

Type of Modulation: BPSK, QPSK, 16QAM, 64QAM for OFDM; CCK, DQPSK, DBPSK for DSSS.
Antenna Type: Integral Antenna
Antenna Gain 1: 1.2dBi
Antenna Gain 2: 1.2dBi

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 a transceiver for the 24 inch Curved Screen-P which has 2.4GHz WIFI function.
For the classic Bluetooth function was tested and demonstrated in report 210810028SZN-001.
For the BT BLE function was tested and demonstrated in report 210810028SZN-002.
For the 5GHz WIFI function was tested and demonstrated in report 210810028SZN-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.

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. During testing, all cables were manipulated to produce worst case emissions. The EUT was powered by DC 12V from an adapter and the adapter is powered by AC 120V/60Hz during the test, only the worst data was reported in this report.

On 802.11b/g/n-HT20 mode, two antennas are used, and all data rates 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-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 EUT and transmitting antennas were centered on the turntable.

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.

Test software: RFTest Tool V5.4 installed in the EUT.

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 Echelon Fitness Multimedia LLC 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	Remark
AC ADAPTER (Provided by Client)	Rongweixin	Model: Rrc0653-1205000D Input: 100-240V~ 50/60Hz 1.5A Output: DC 12 V⎓5 A
Power Cord (Provided by Client)	---	Unshielded, 1.5m
TF card (Provided by Intertek)	Kingston	class10
USB*2 (Provided by Intertek)	SanDisk	Model: SDCZ36-002G-P36
HDMI Cable (Provided by Intertek)	---	Unshielded, 120cm
Test TV (Provided by Intertek)	SAMSUNG	Model: U28H750UQ
Test TV (Provided by Intertek)	SONY	Model: KDL-24EX520)
AUX Cable (Provided by Intertek)	---	Unshielded, 150cm*2
RJ45 Cable (Provided by Intertek)	---	Unshielded, 160cm*2
Type C Cable	---	Unshielded, 150cm
Speaker	Victonic	Model: GSB710
PC	Apple	Mac Mini
Laptop	Dell	Latitude 2480

Applicant: Echelon Fitness Multimedia LLC
Date of Test: 26 August 2021 Model: ECHKIN24-3399-C

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 have 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). 2.4G band Ant gain: 1.2dBi. In MIMO (2Tx), Ant1+Ant2 Directional gain = GANT + 10 log(N) dBi = 1.2 + 10 log(2) = 4.2 dBi< 6 dBi.

SISO Mode, Ant1:

IEEE 802.11b (Antenna Gain = 1.2dBi) (CCK, 1Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt
Low Channel: 2412	17.70	58.88
Middle Channel: 2437	17.00	50.12
High Channel: 2462	17.80	60.26

IEEE 802.11g (Antenna Gain = 1.2dBi) (16QAM, 6Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt
Low Channel: 2412	16.72	46.99
Middle Channel: 2437	16.38	43.45
High Channel: 2462	16.18	41.50

IEEE 802.11n-HT20 (Antenna Gain = 1.2dBi) (64QAM, 6Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt
Low Channel: 2412	17.29	53.58
Middle Channel: 2437	17.82	60.53
High Channel: 2462	16.31	42.76

SISO Mode, Ant2:

IEEE 802.11b (Antenna Gain = 1.2dBi) (CCK, 1Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt
Low Channel: 2412	17.90	61.66
Middle Channel: 2437	17.10	51.29
High Channel: 2462	17.89	61.52

IEEE 802.11g (Antenna Gain = 1.2dBi) (16QAM, 6Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt
Low Channel: 2412	16.18	41.50
Middle Channel: 2437	15.79	37.93
High Channel: 2462	15.49	35.40

IEEE 802.11n-HT20 (Antenna Gain = 1.2dBi) (64QAM, 6Mbps)		
Frequency (MHz)	Output in dBm (Peak Reading)	Output in mWatt
Low Channel: 2412	13.89	24.49
Middle Channel: 2437	14.32	27.04
High Channel: 2462	14.49	28.12

MIMO Mode:

IEEE 802.11n-HT20 (Antenna Gain = 4.2dBi) (64QAM, 6.5Mbps)				
Frequency (MHz)	Output in dBm (Peak Reading)			Output in mWatt
	Ant 1	Ant 2	Total	
Low Channel: 2412	14.5	14.8	17.66	58.34
Middle Channel: 2437	14.7	14.6	17.66	58.34
High Channel: 2462	14.7	14.5	17.61	57.68

Cable loss: 1.0 dB External Attenuation: 0 dB

Cable loss, external attenuation has been included in OFFSET function

EUT max. output level = 17.90dBm
EUT max. E.I.R.P = 17.90dBm + 4.2dBi = 22.1dBm = 162.18mW

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

Applicant: Echelon Fitness Multimedia LLC
Date of Test: 30 September 2021 Model: ECHKIN24-3399-C

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.

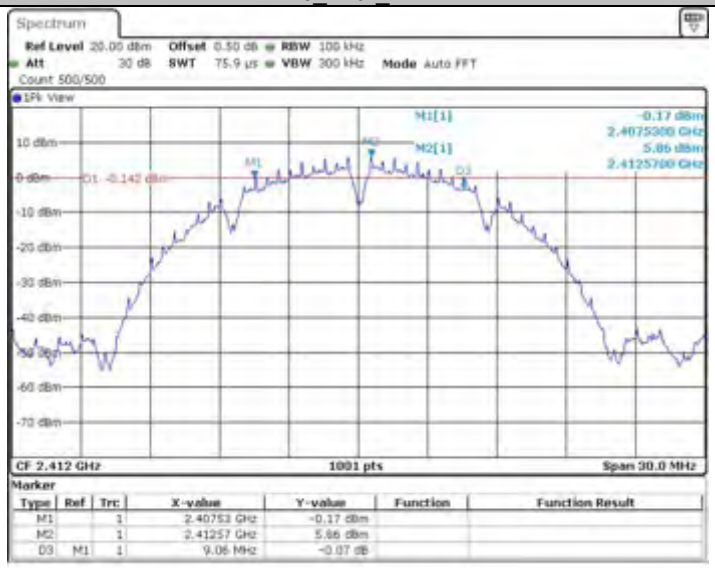
IEEE 802.11b (CCK, 1Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	9.060
2437	9.090
2462	8.610

IEEE 802.11g (16QAM, 6Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	15.150
2437	15.150
2462	15.090

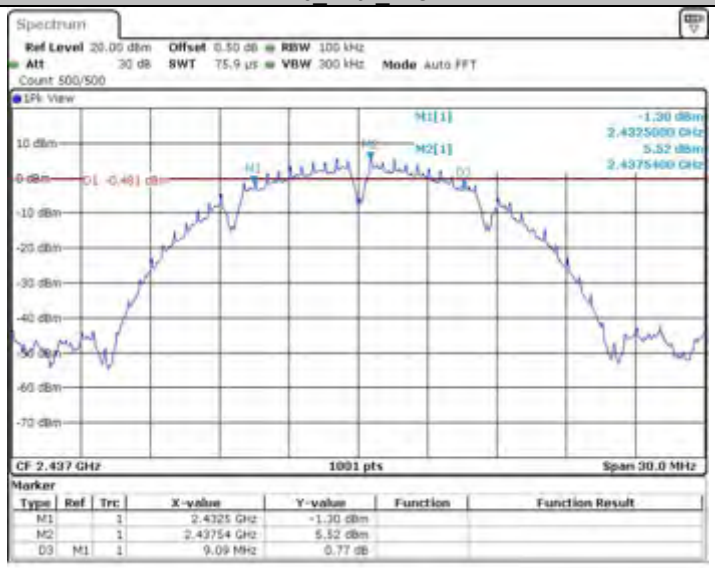
IEEE 802.11n-HT20 (64QAM, 6Mbps)	
Frequency (MHz)	6 dB Bandwidth (MHz)
2412	14.460
2437	15.750
2462	15.060

The test plots are attached as below.

11b_Ant1_2412

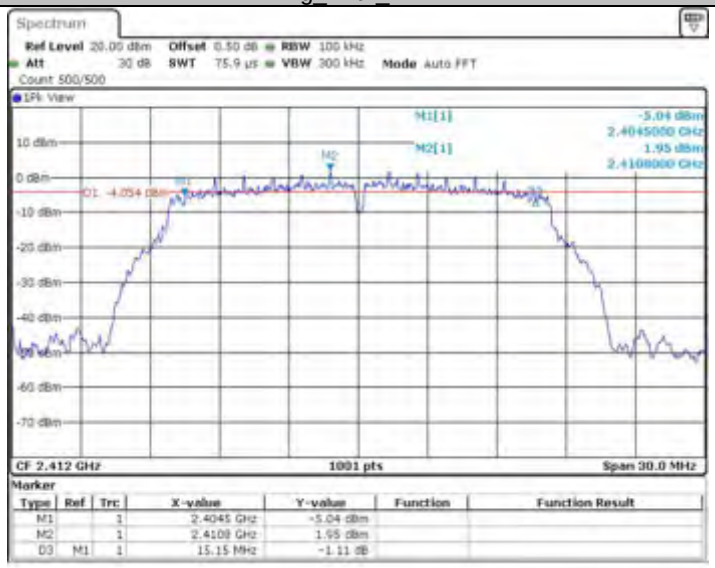


11b_Ant1_2437



11b_Ant1_2462

11g_Ant1_2412



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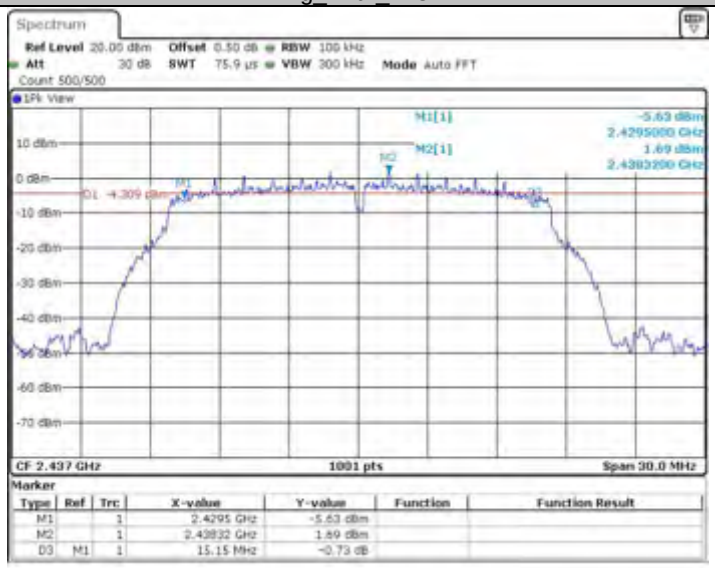

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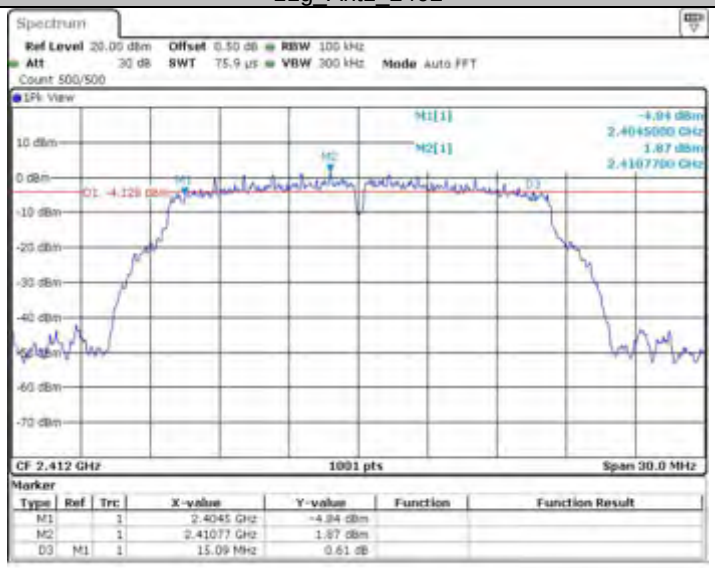

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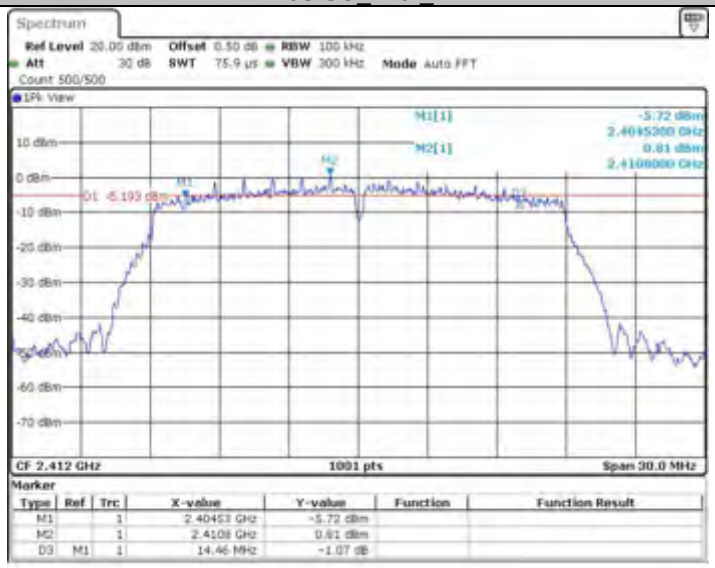

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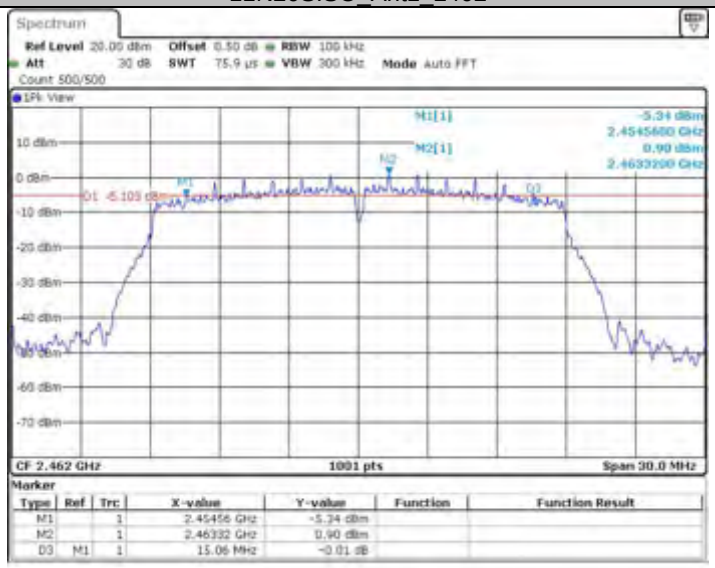
11N20SISO_Ant1_2462



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.

SISO Mode:

IEEE 802.11b (CCK, 1Mbps)		
Frequency (MHz)	Power Density with RBW 3KHz	
	Ant 1	Ant 2
2412	-7.88	-7.22
2437	-7.17	-5.66
2462	-6.42	-7.68

IEEE 802.11g (16QAM, 6Mbps)		
Frequency (MHz)	Power Density with RBW 3KHz	
	Ant 1	Ant 2
2412	-8.67	-10.99
2437	-11.85	-11.35
2462	-11.27	-11.24

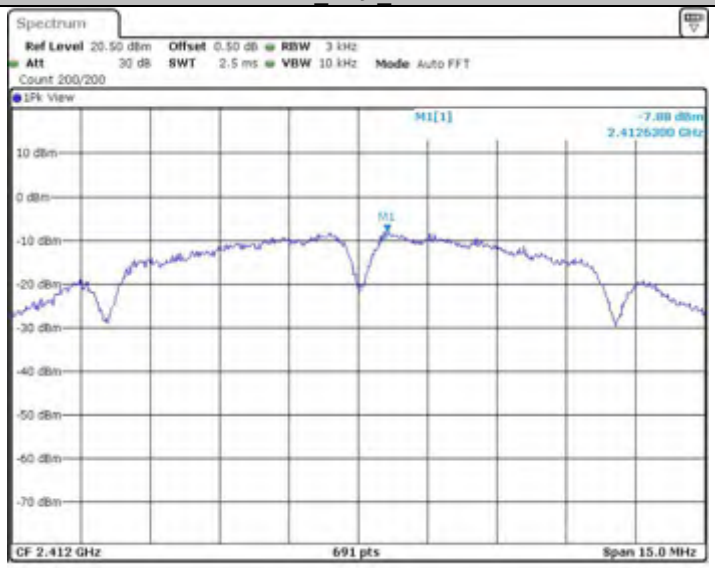
IEEE 802.11n-HT20 (64QAM, 6.5Mbps)		
Frequency (MHz)	Power Density with RBW 3KHz	
	Ant 1	Ant 2
2412	-12.53	-12.23
2437	-13.42	-11.83
2462	-12.53	-12.22

MIMO Mode:

IEEE 802.11n-HT20 (64QAM, 6.5Mbps)			
Frequency (MHz)	Power Density with RBW 3KHz		
	Ant 1	Ant 2	Total
2412	-19.93	-18.69	-16.26
2437	-20.37	-19.62	-16.97
2462	-20.42	-19.26	-16.79

The test plots are attached as below.

11B_Ant1_2412



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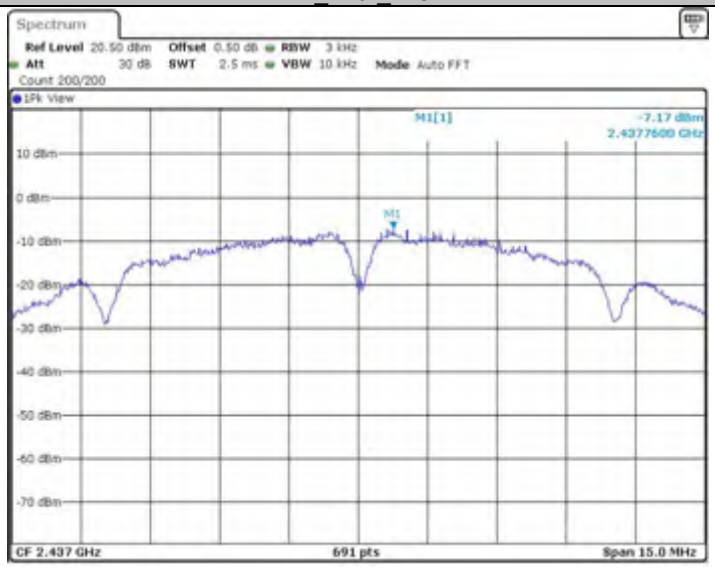

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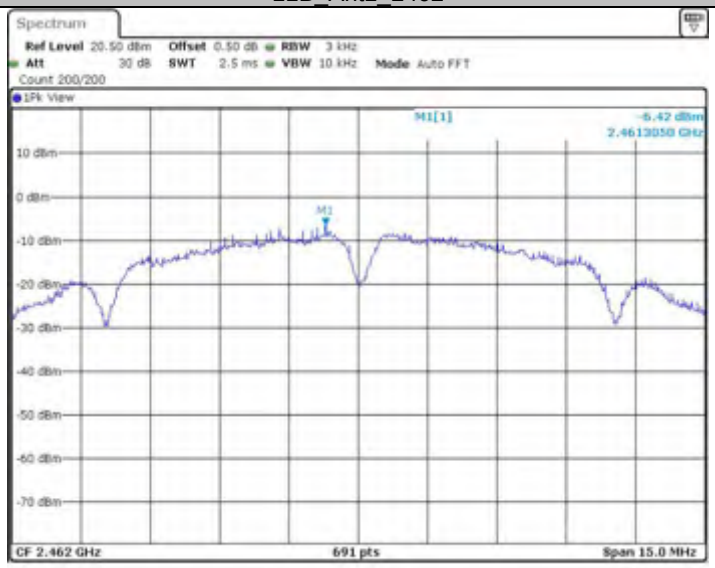
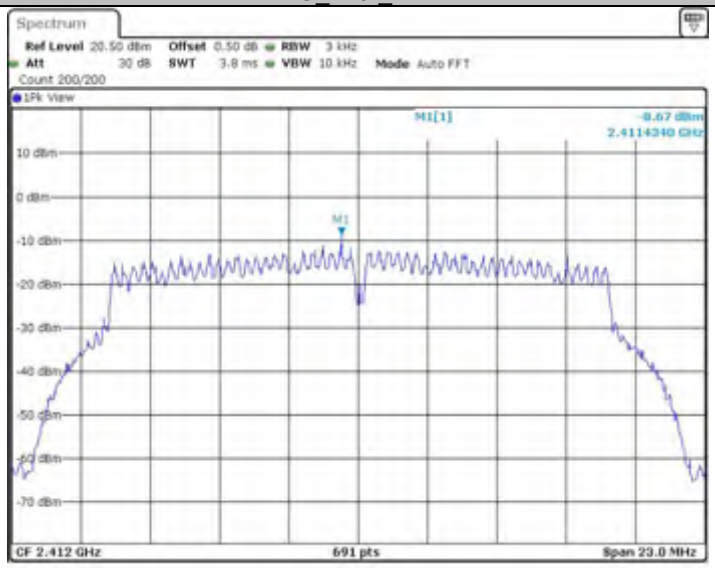


11G_Ant1_2412



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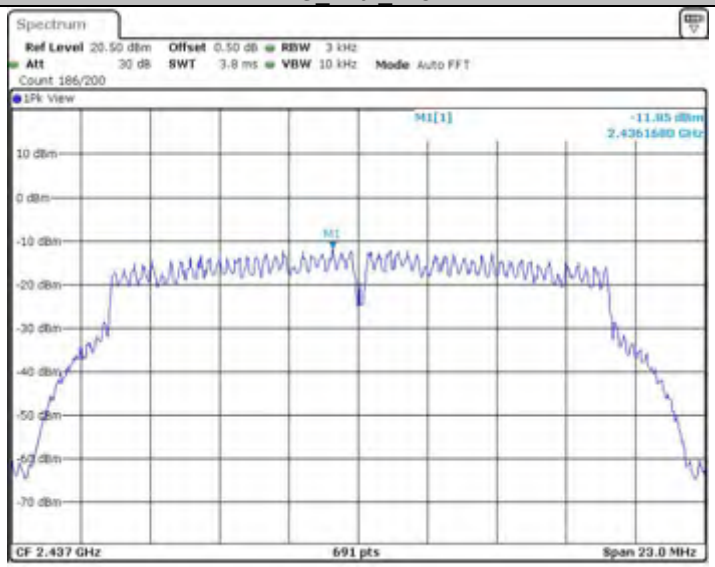

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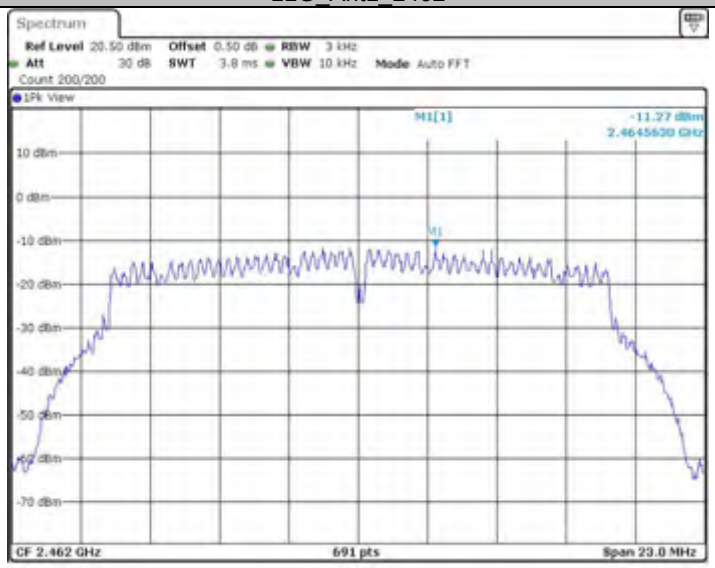

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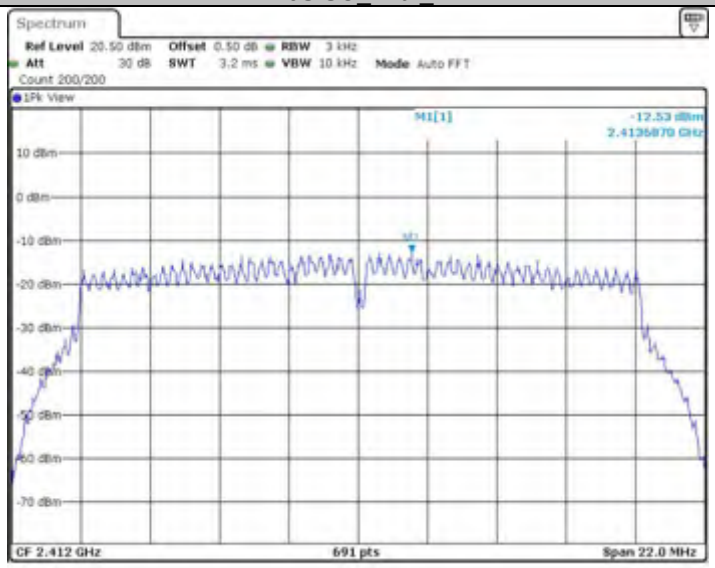

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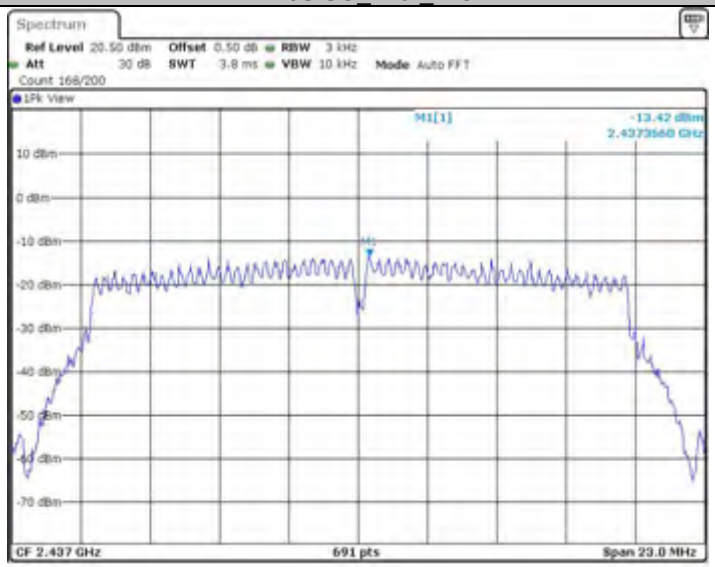

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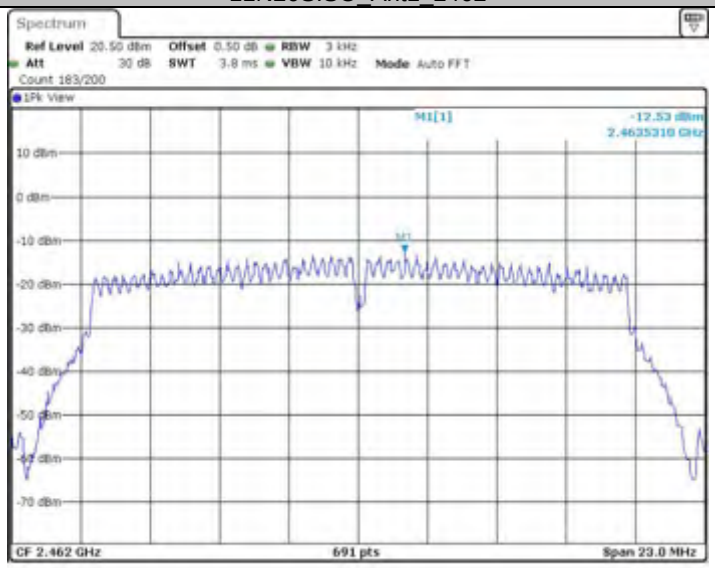

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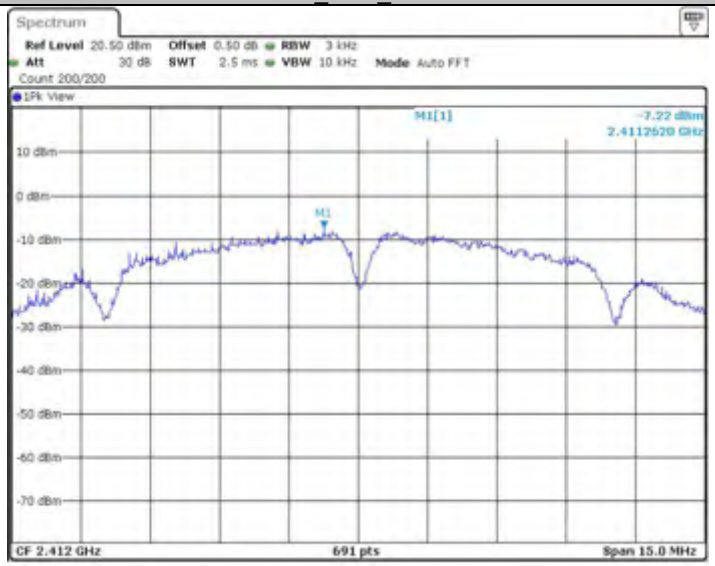

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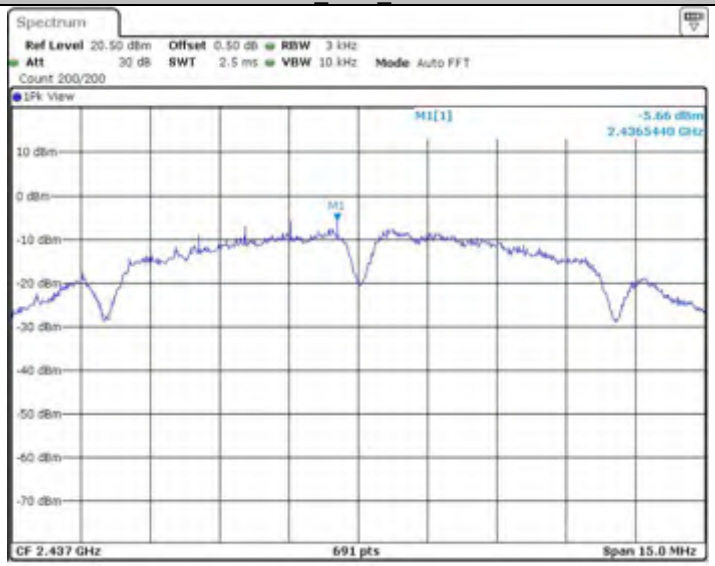

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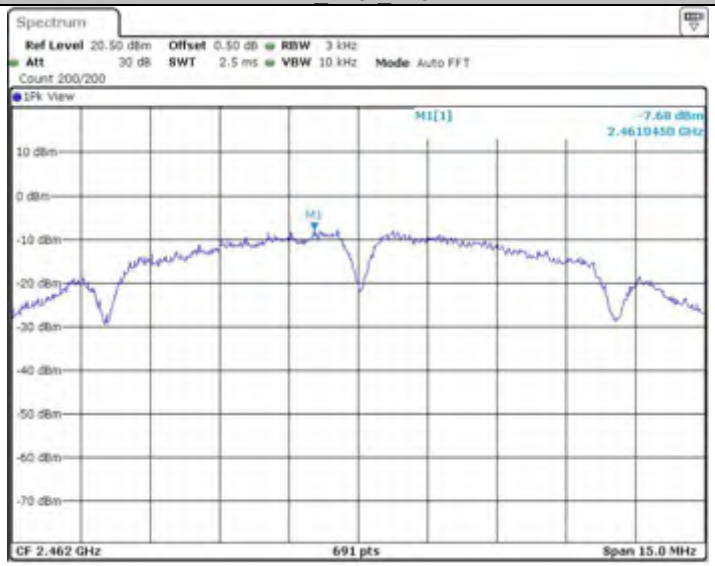

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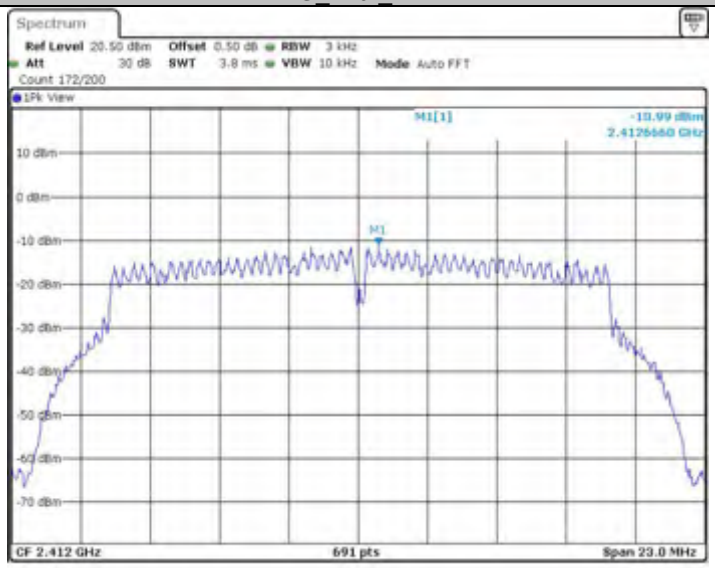

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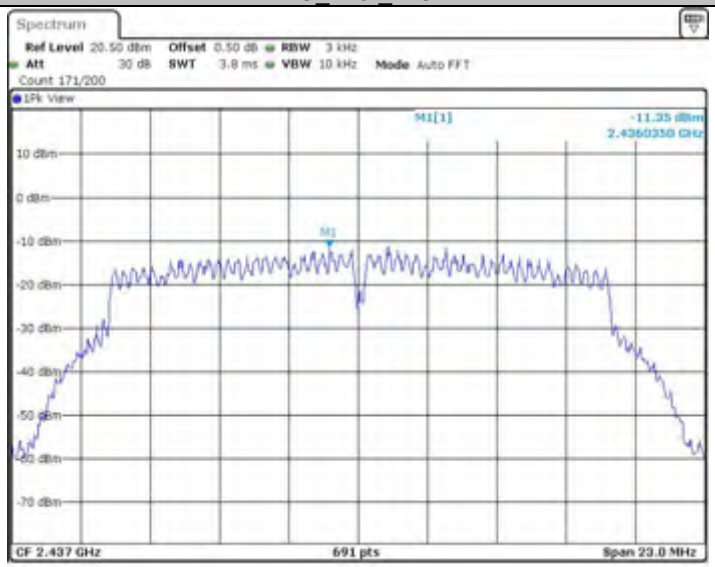

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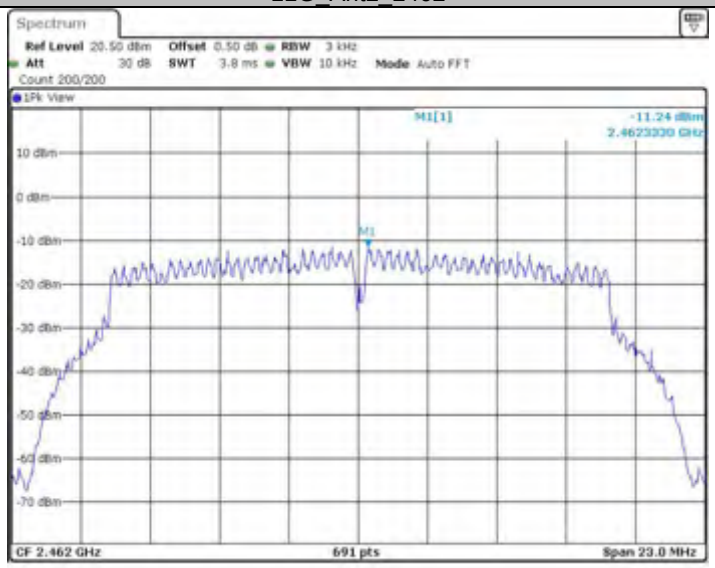

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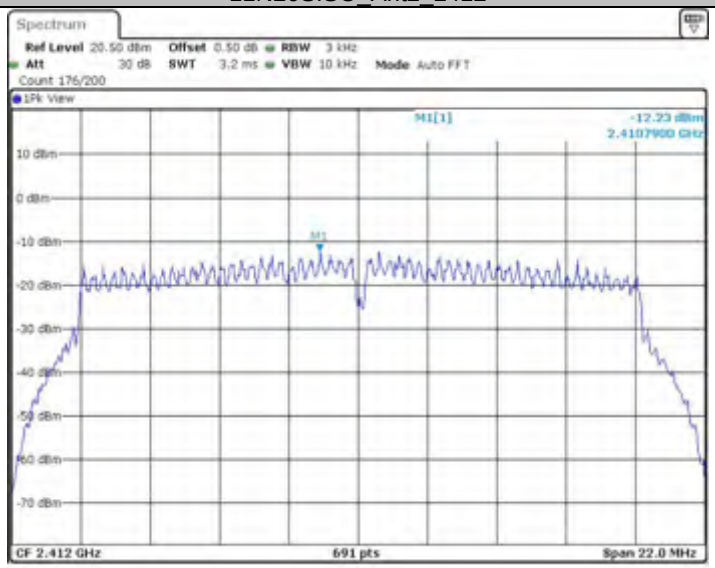

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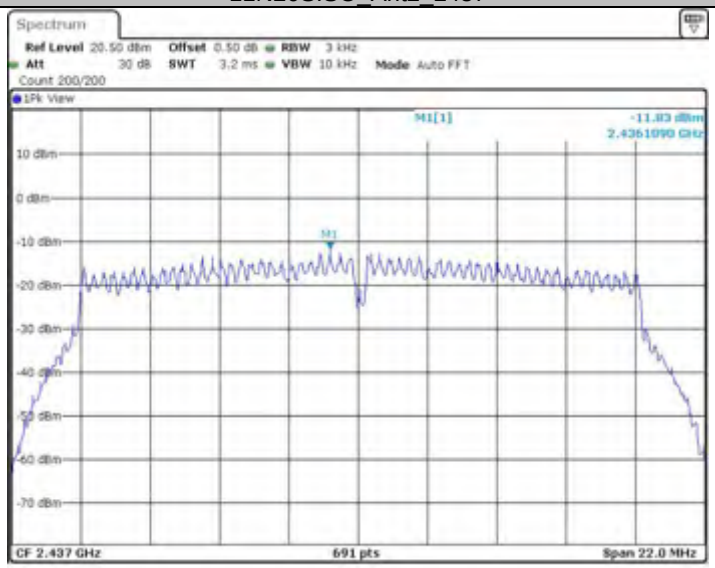

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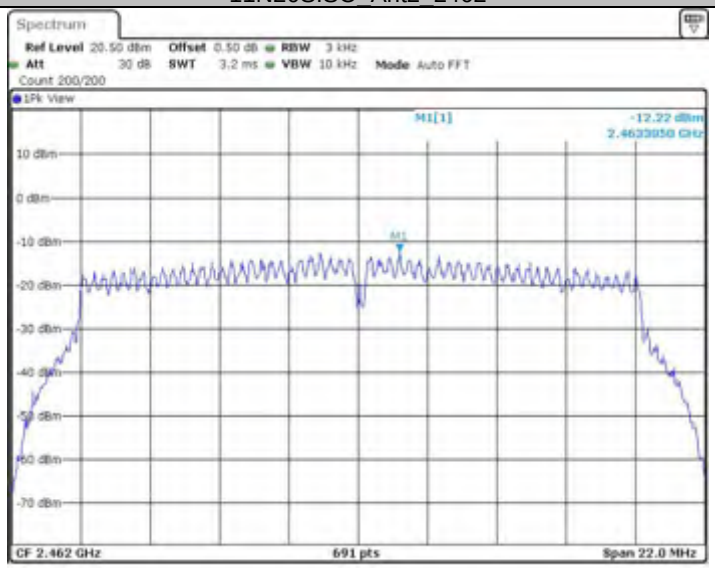

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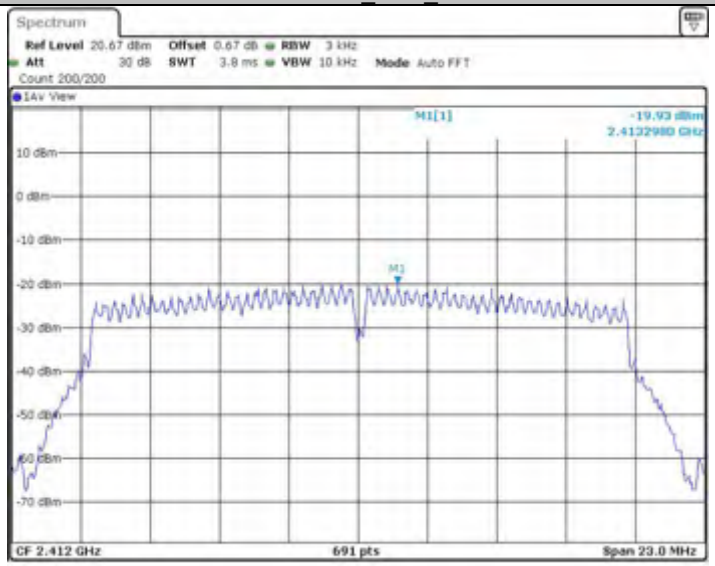
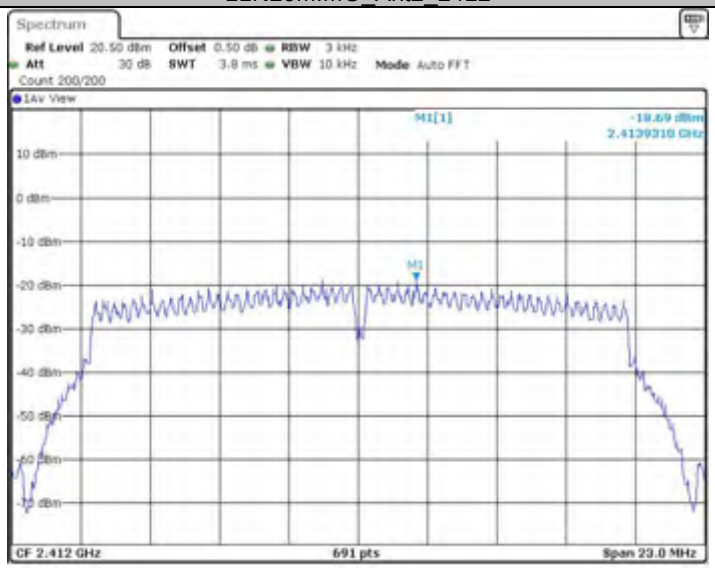
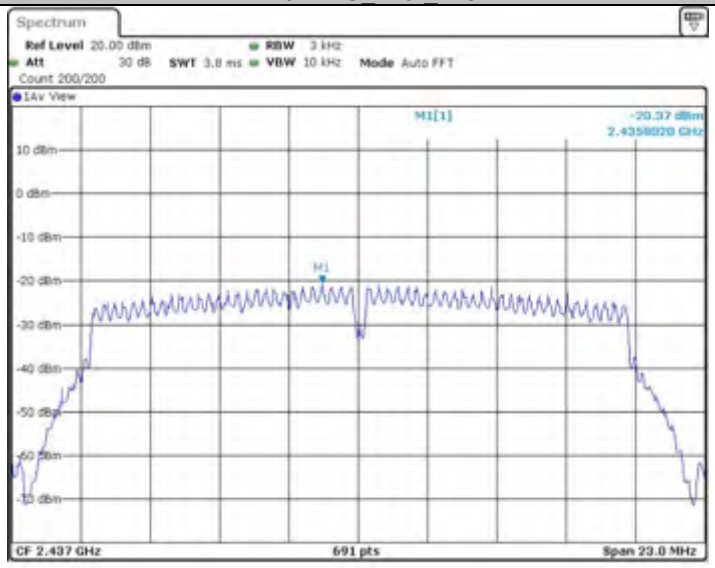


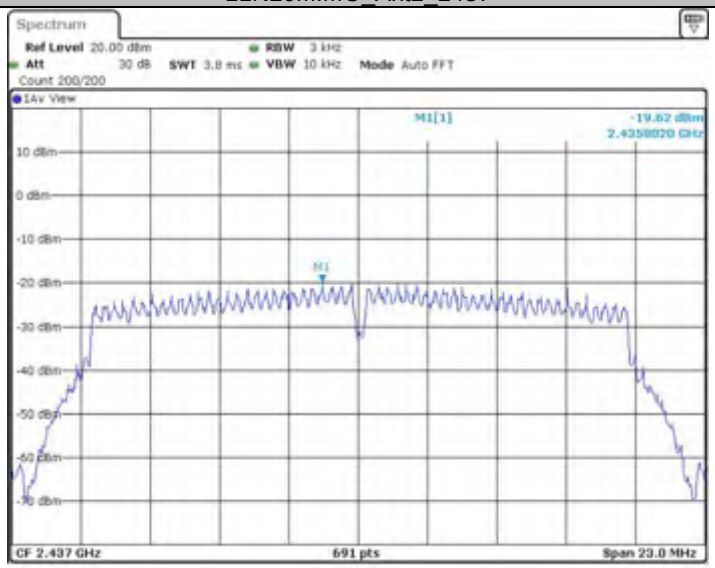
11N20MIMO_Ant2_2412



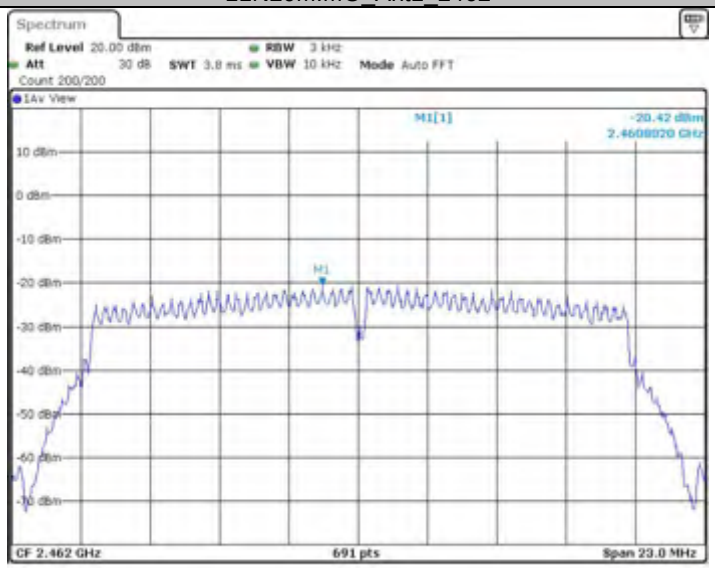
11N20MIMO_Ant1_2437



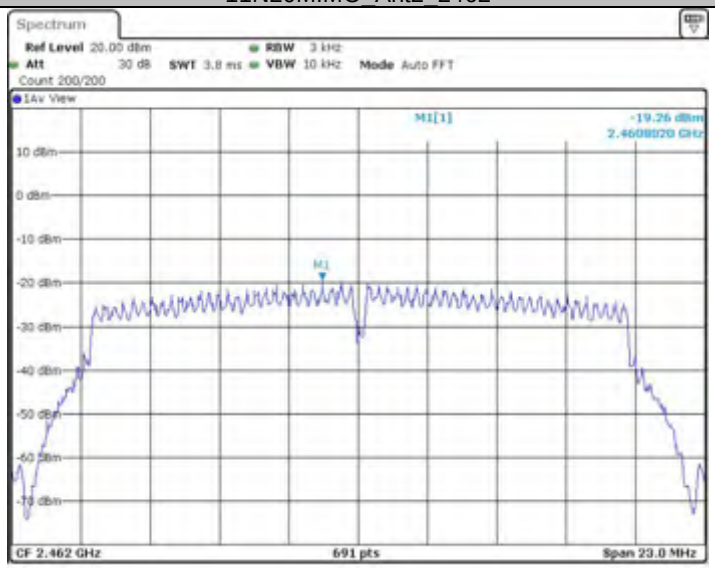
11N20MIMO_Ant2_2437



11N20MIMO_Ant1_2462



11N20MIMO_Ant2_2462



Applicant: Echelon Fitness Multimedia LLC
Date of Test: 30 September 2021 Model: ECHKIN24-3399-C

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.

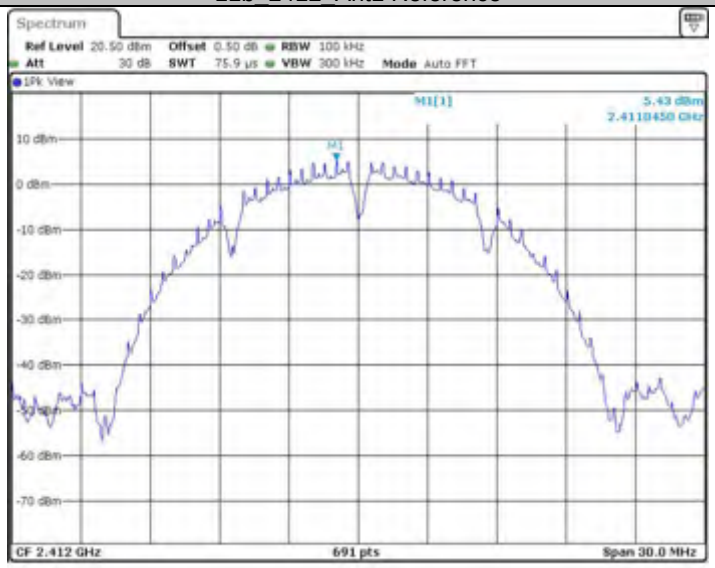
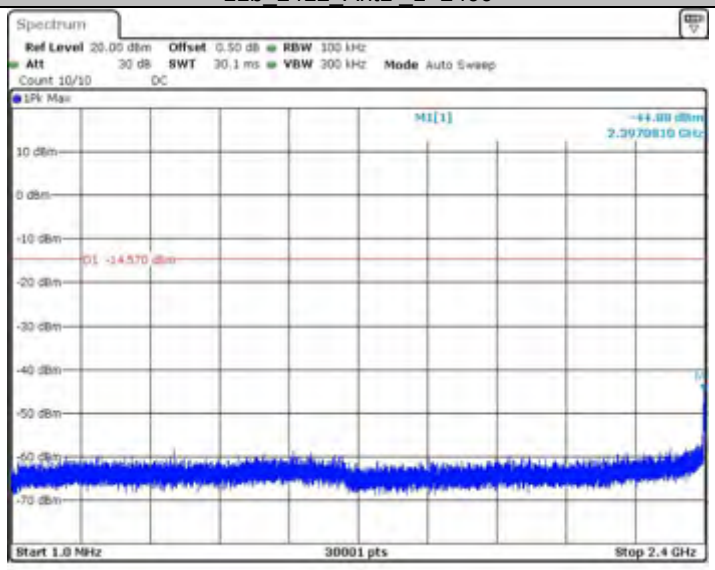
All other types of emissions from the EUT shall meet the general limits for radiated frequencies outside the passband.

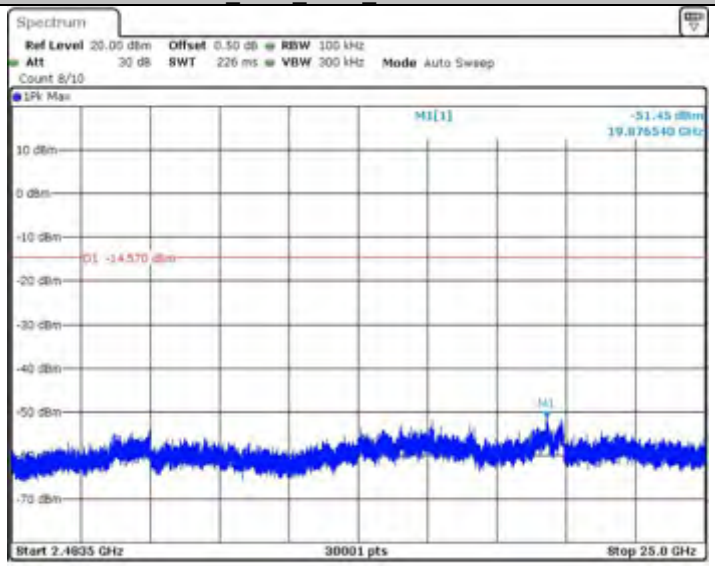
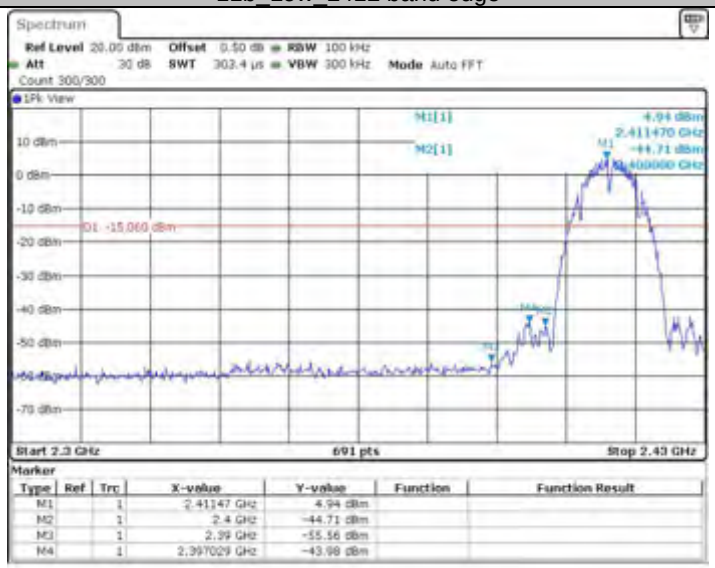
Refer to the attached test plots for out of band conducted emissions data with rate of 1Mbps for 802.11b and 6Mbps for 802.11g and 6Mbps for 802.11n-HT20.

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.

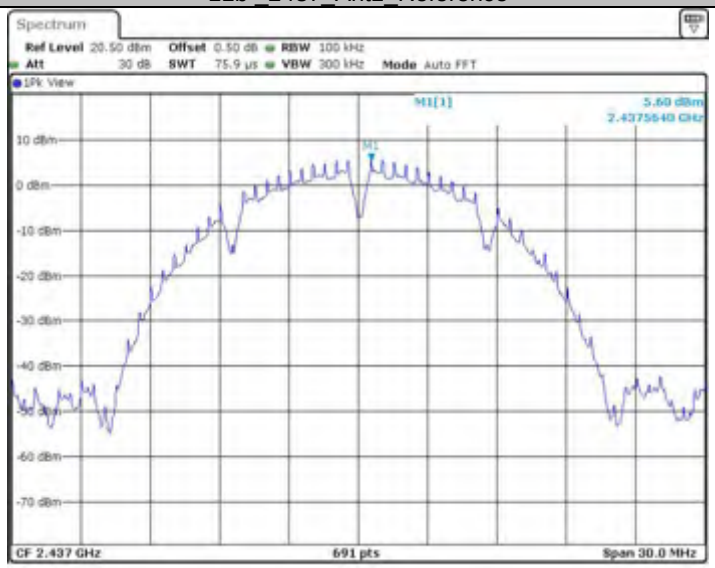
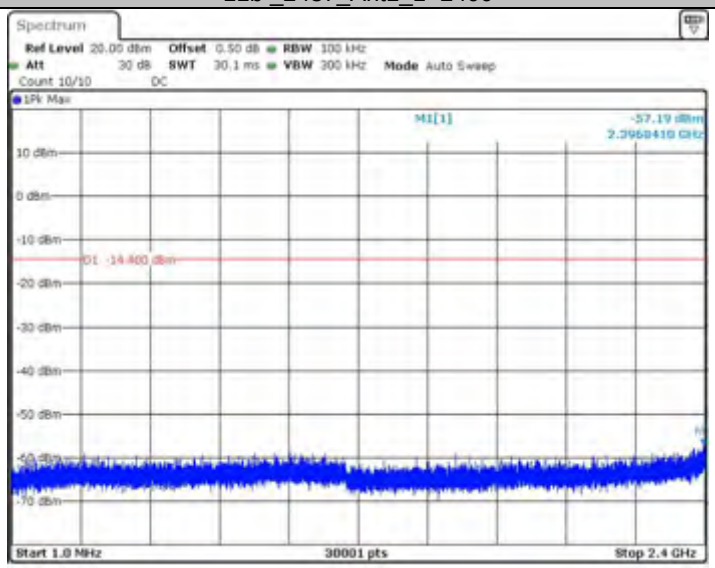
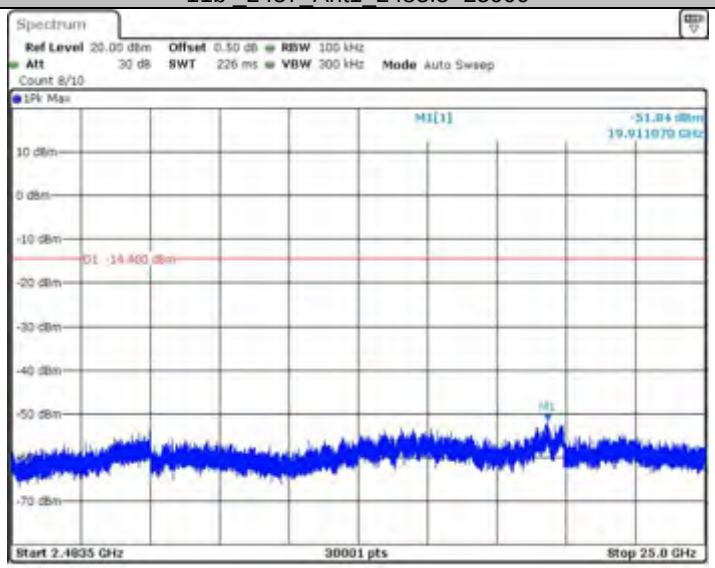
The test plots are attached as below.

SISO Mode, Ant1
802.11b
Channel 01 (2412MHz) Reference Level: 5.43dBm

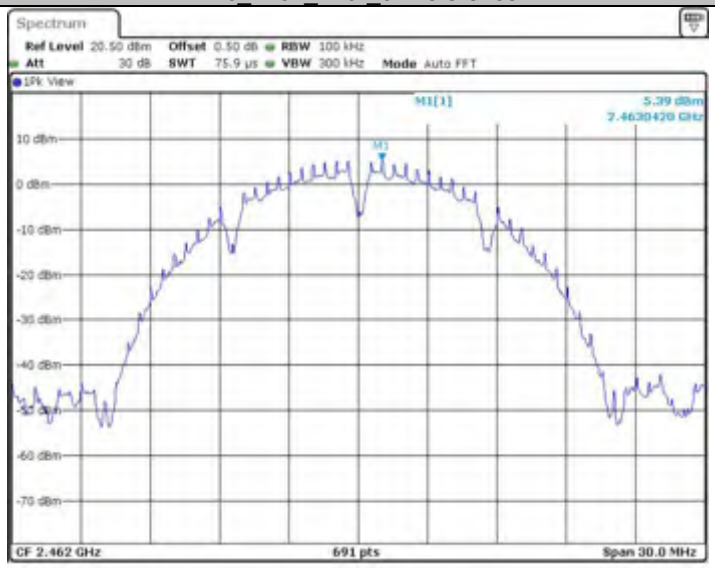
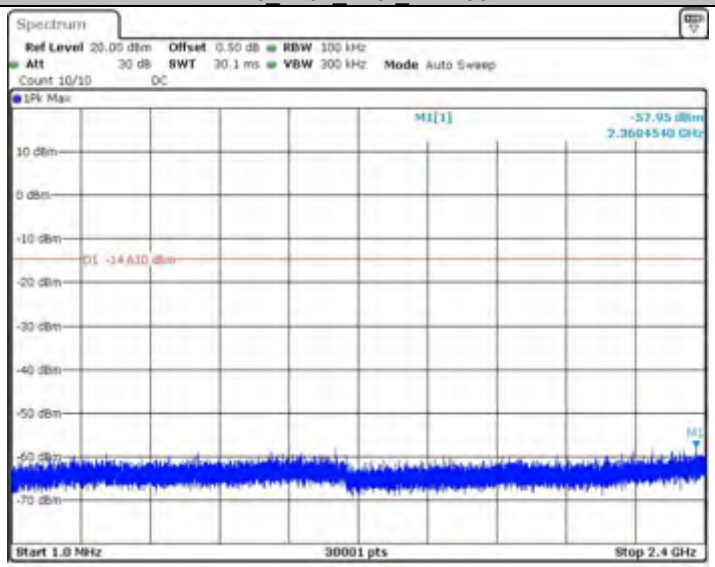
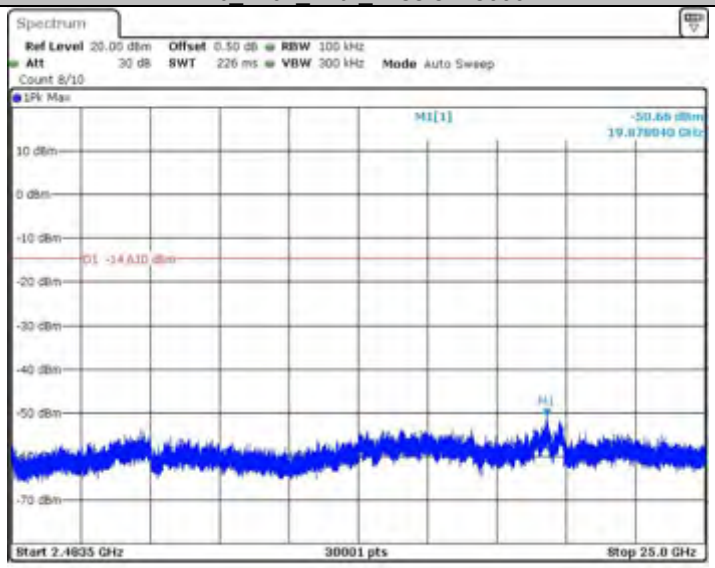
11b_2412_Ant1 Reference

11b_2412_Ant1 _1~2400


11b_2412_Ant1 _2483.5~25000

11b_Low_2412 band edge


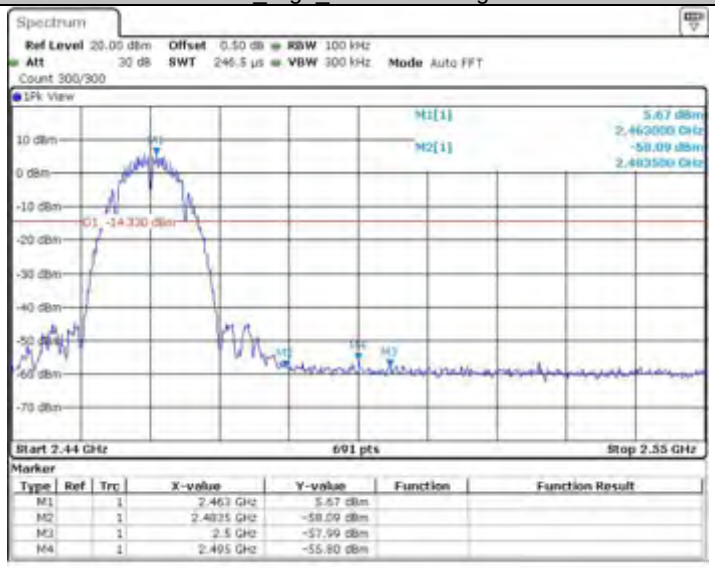
Channel 06 (2437MHz) Reference Level: 5.60dBm

11b _2437_Ant1_Reference

11b _2437_Ant1_1~2400

11b _2437_Ant1_2483.5~25000


Channel 11 (2462MHz) Reference Level: 5.39dBm

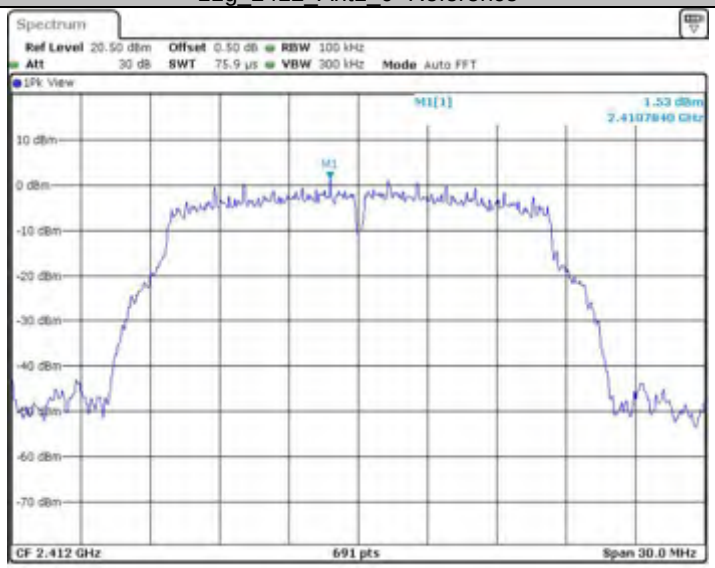
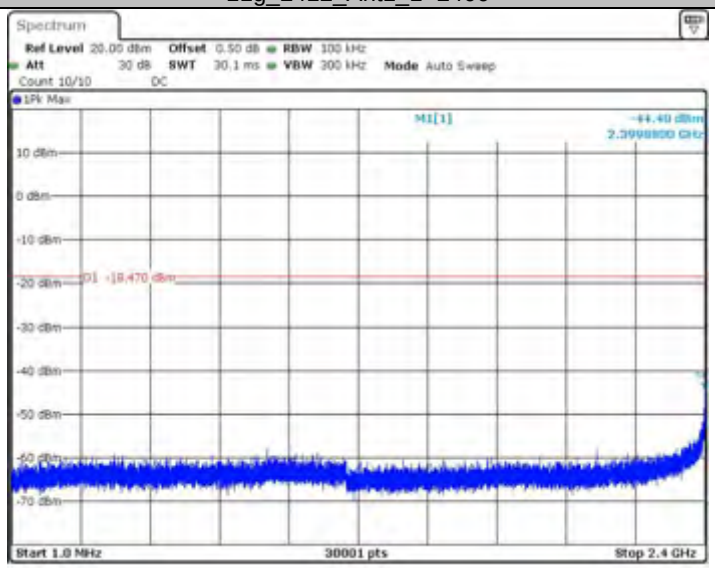
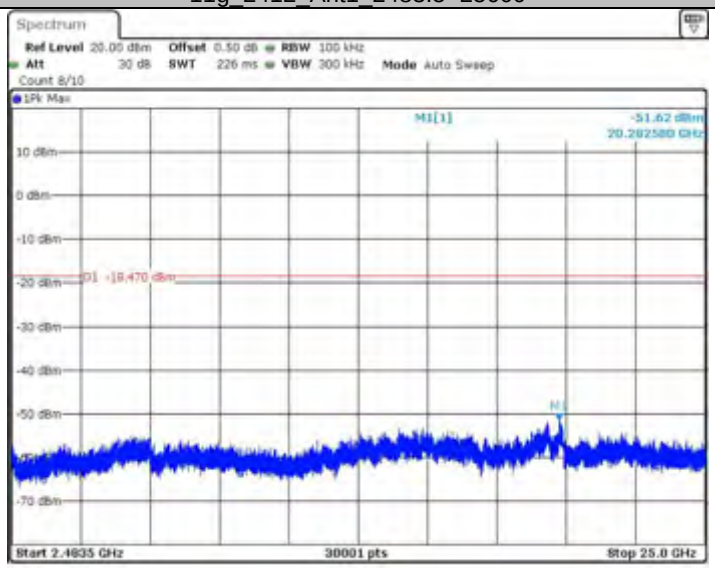
11b_2462_Ant1_0~Reference

11b_2462_Ant1_1~2400

11b_2462_Ant1_2483.5~25000


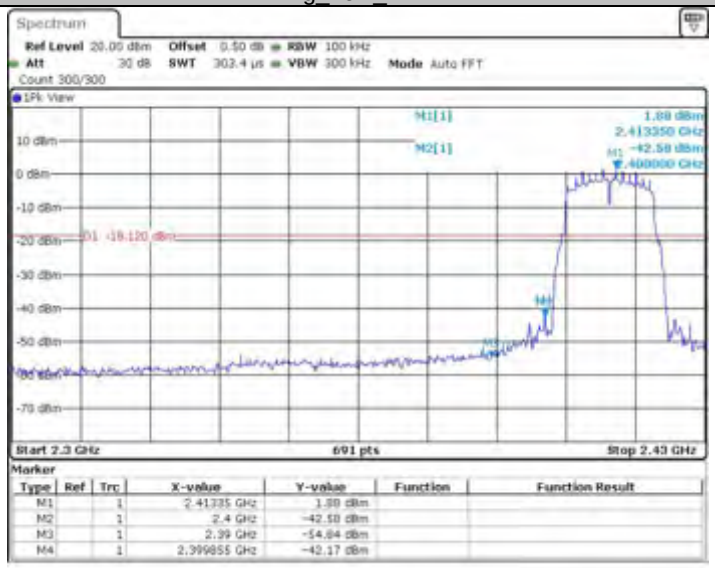
11b_High_2462 band edge



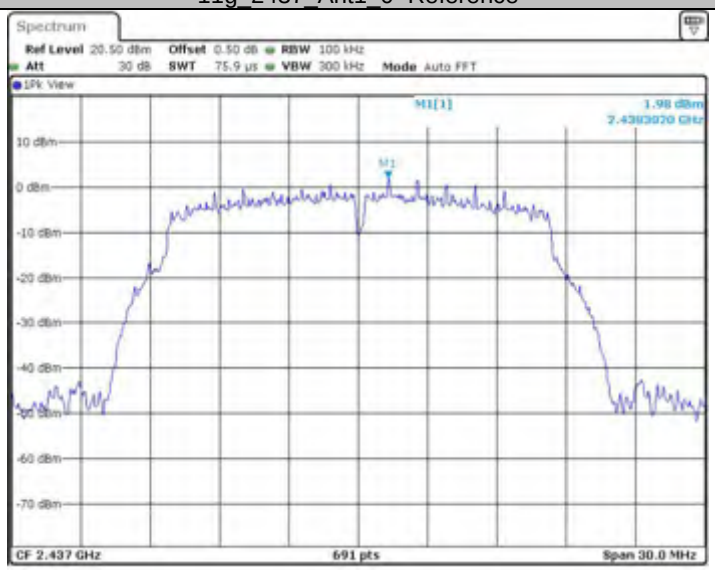
802.11g

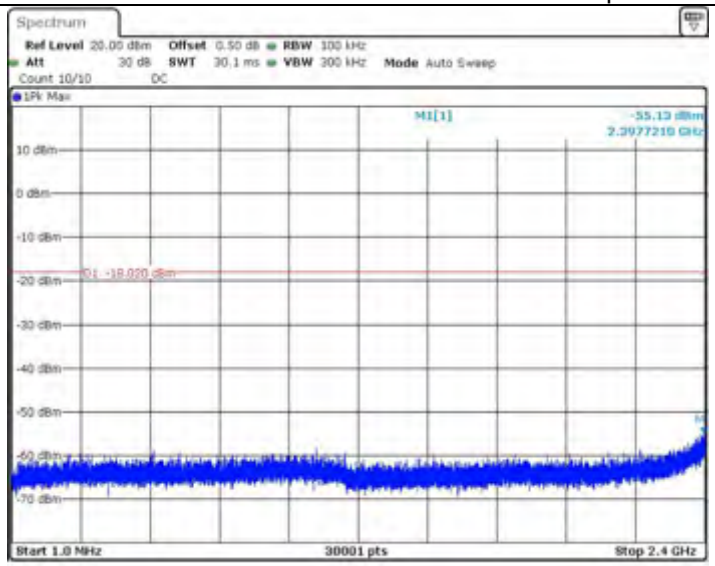
Channel 01 (2412MHz) Reference Level: 1.53dBm

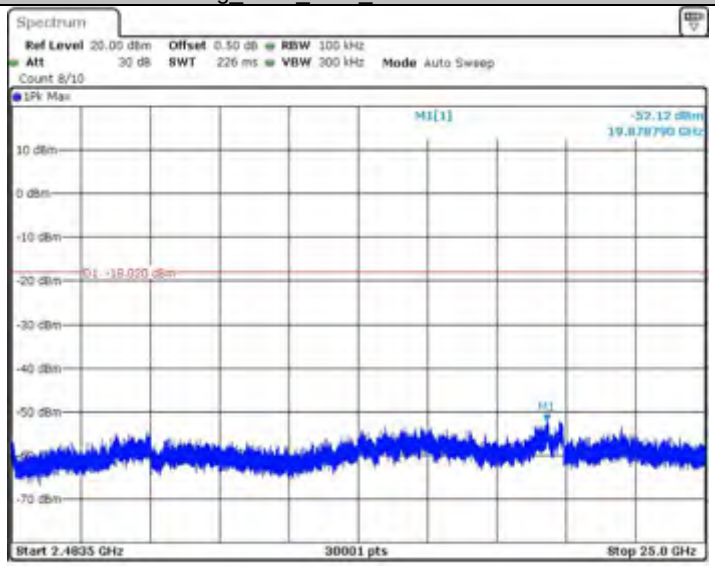
11g_2412_Ant1_0~Reference

11g_2412_Ant1_1~2400

11g_2412_Ant1_2483.5~25000


11g_Low_2412


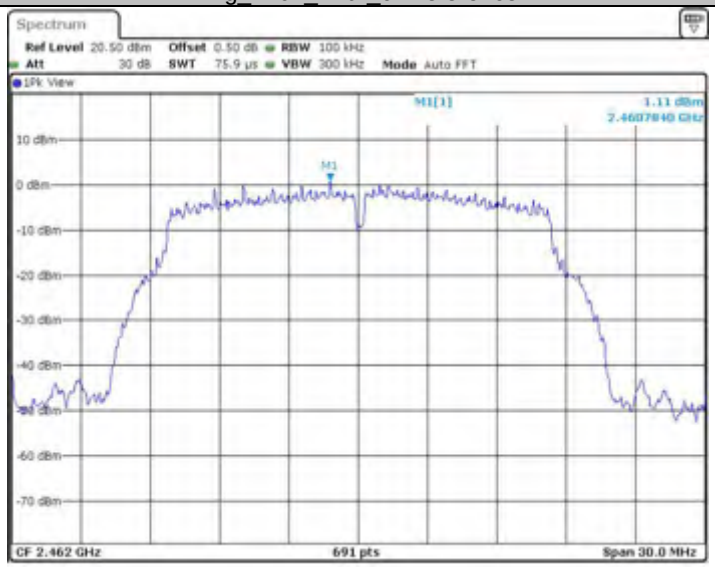
Channel 06 (2437MHz) Reference Level: 1.98dBm

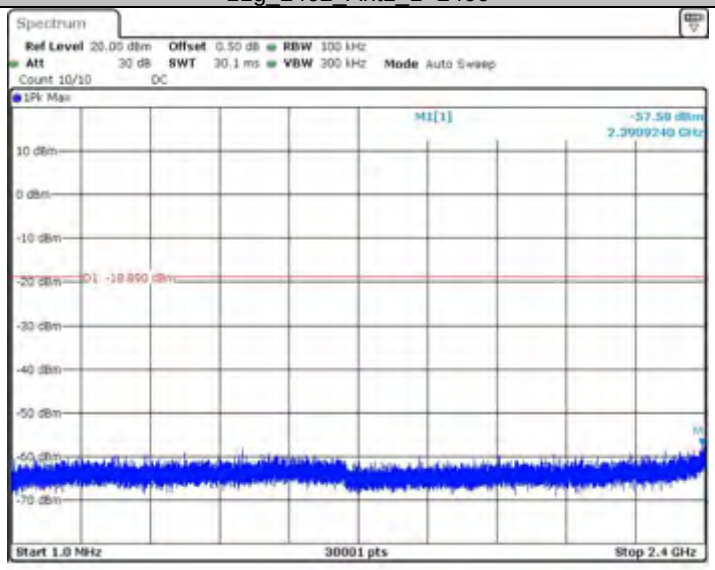
11g_2437_Ant1_0~Reference

11g_2437_Ant1_1~2400


Spectrum
Ref Level 20.00 dBm Offset 0.50 dB RBW 100 kHz
Att 30 dB SWT 30.1 ms VBW 300 kHz Mode Auto Sweep
Count 10/10 DC
1Pk Max
M1[1] -55.13 dBm
2.3977219 GHz
10 dBm
0 dBm
-10 dBm
-20 dBm
-30 dBm
-40 dBm
-50 dBm
-60 dBm
-70 dBm
Start 1.0 MHz
30001 pts
Stop 2.4 GHz

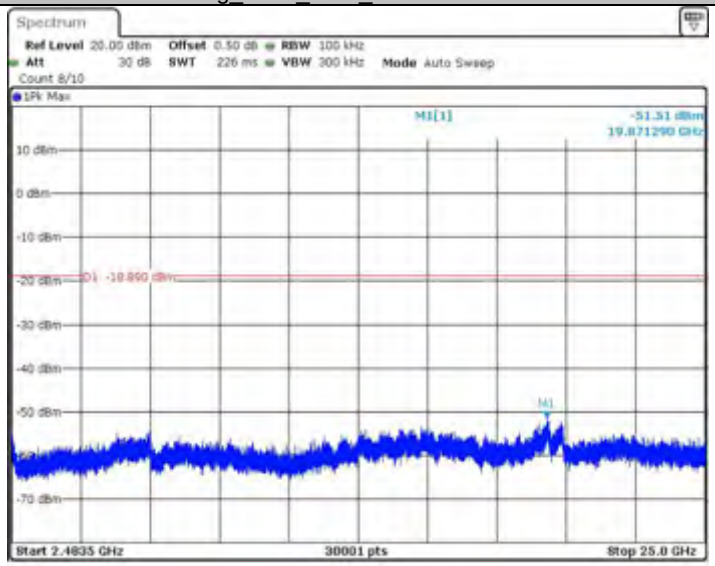
11g_2437_Ant1_2483.5~25000


Channel 11 (2462MHz) Reference Level: 1.11dBm

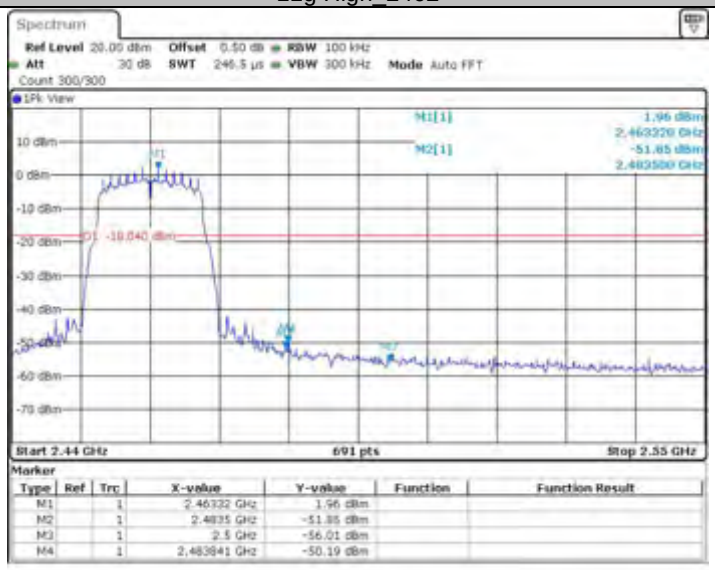
11g_2462_Ant1_0~Reference


11g_2462_Ant1_1~2400


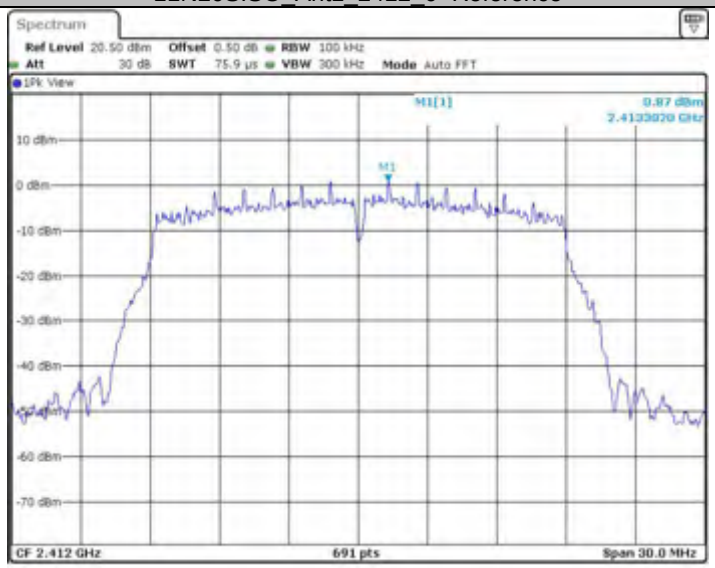
11g_2462_Ant1_2483.5~25000



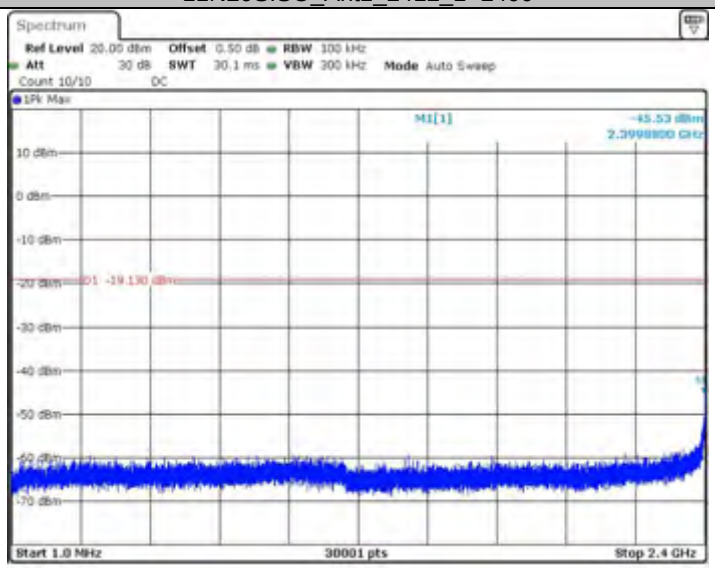
11g High_2462



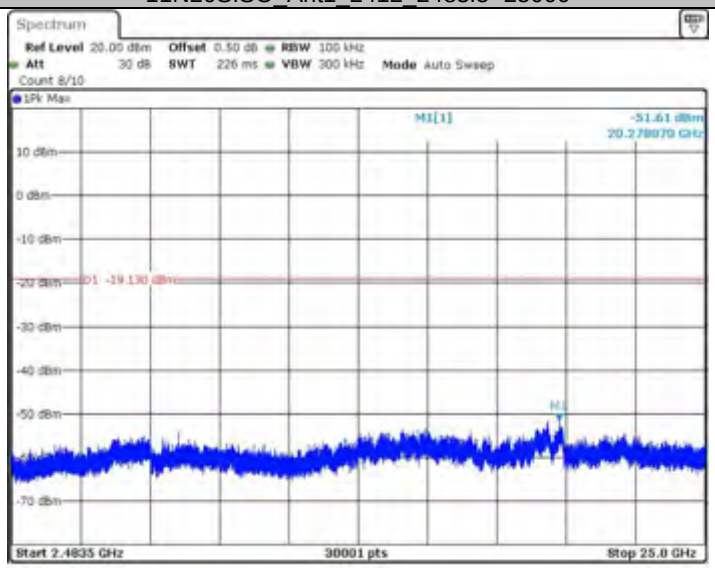
11N20SISO_Ant1_2412_0~Reference



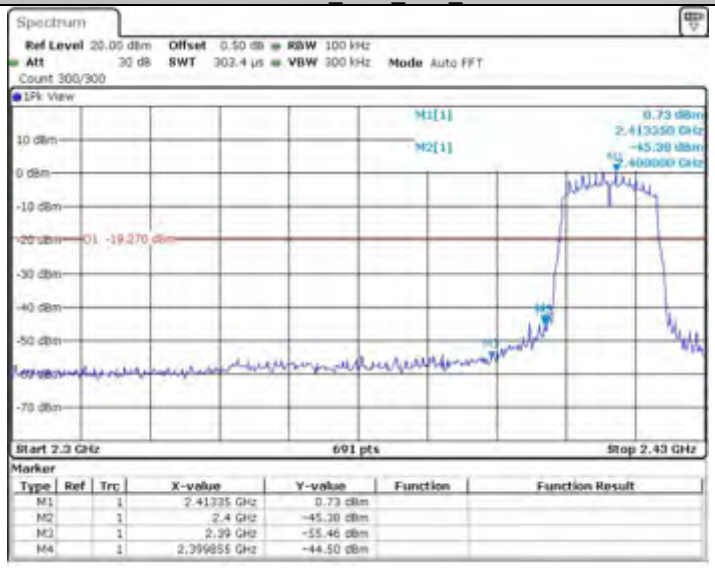
11N20SISO_Ant1_2412_1~2400



11N20SISO_Ant1_2412_2483.5~25000

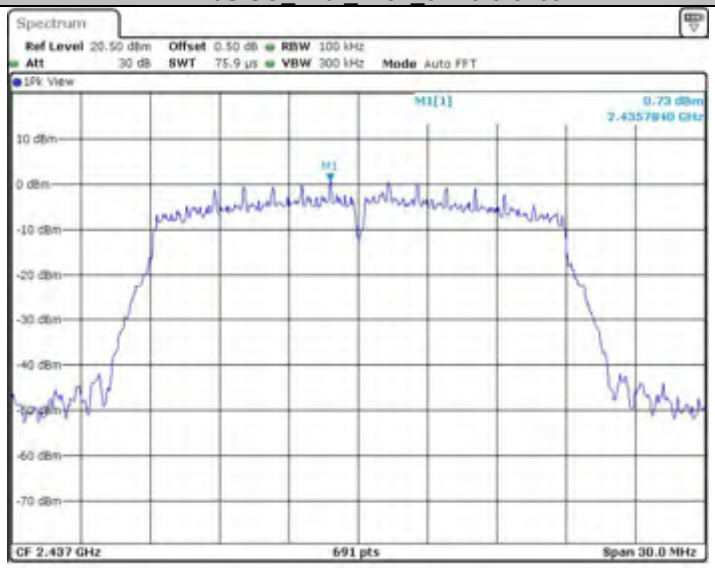


11N20SISO_Ant1_Low_2412

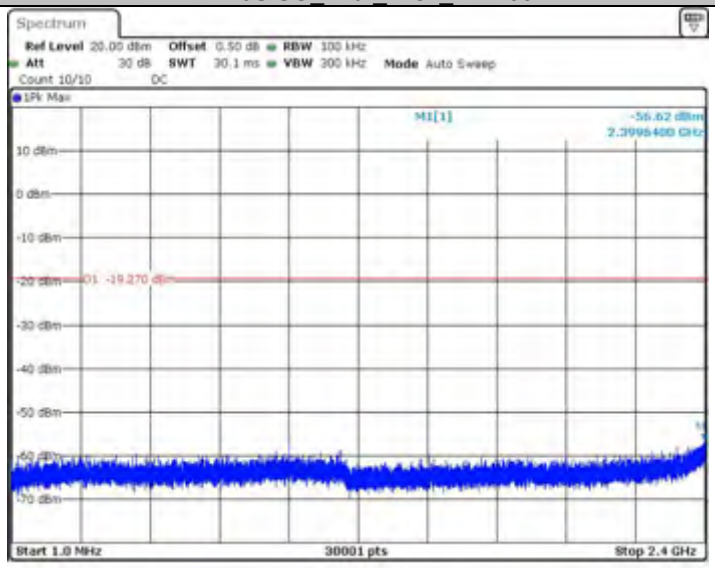


Channel 06 (2437MHz) Reference Level: 0.73dBm

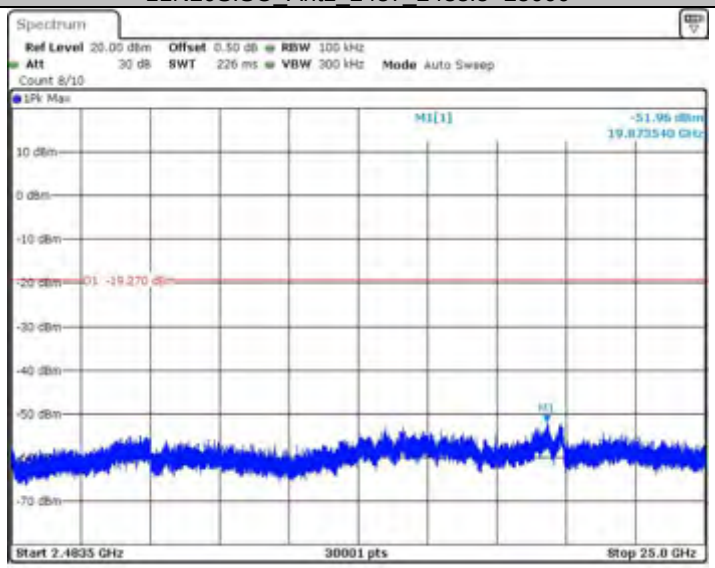
11N20SISO_Ant1_2437_0~Reference



11N20SISO_Ant1_2437_1~2400

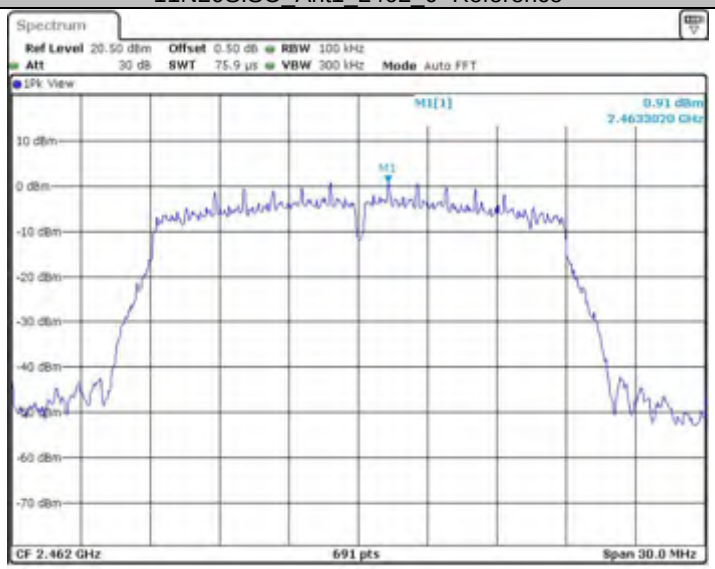


11N20SISO_Ant1_2437_2483.5~25000

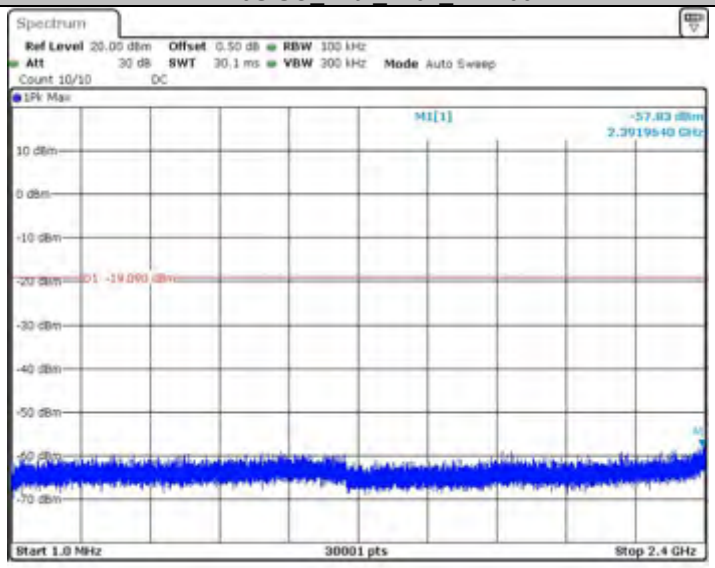


Channel 11 (2462MHz) Reference Level: 0.91dBm

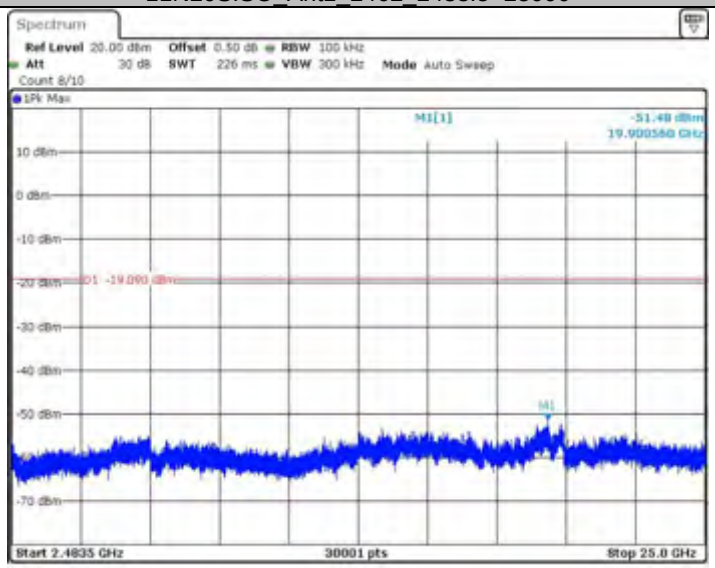
11N20SISO_Ant1_2462_0~Reference



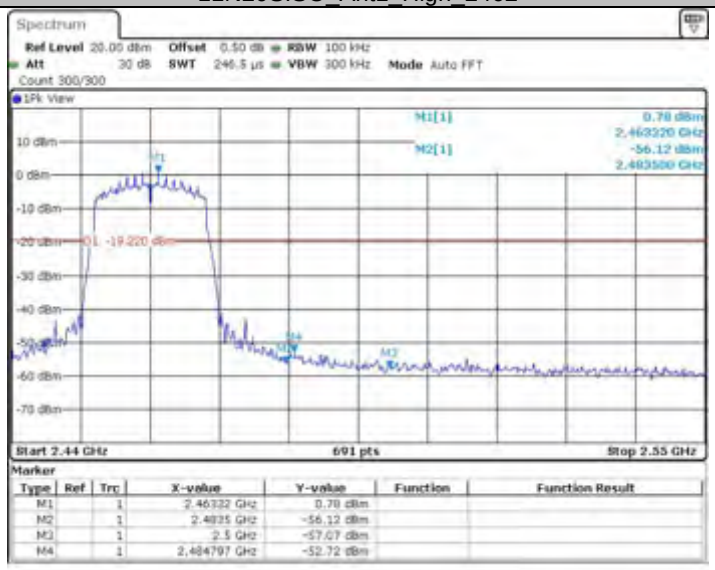
11N20SISO_Ant1_2462_1~2400



11N20SISO_Ant1_2462_2483.5~25000



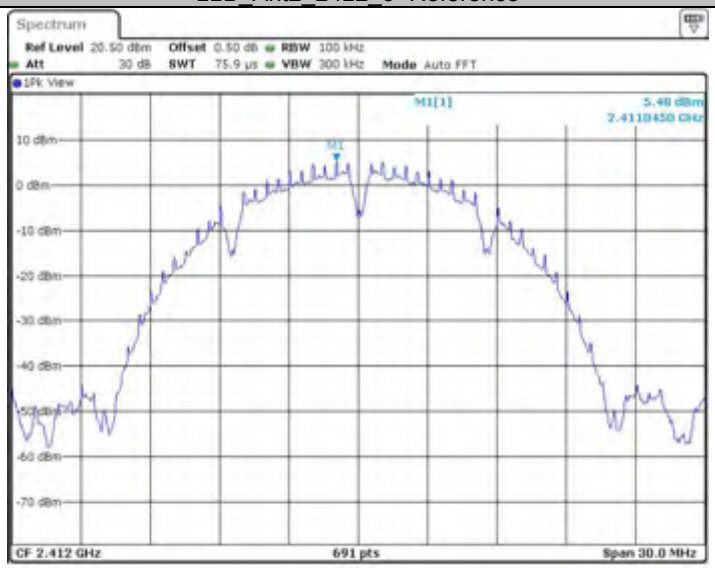
11N20SISO_Ant1_High_2462



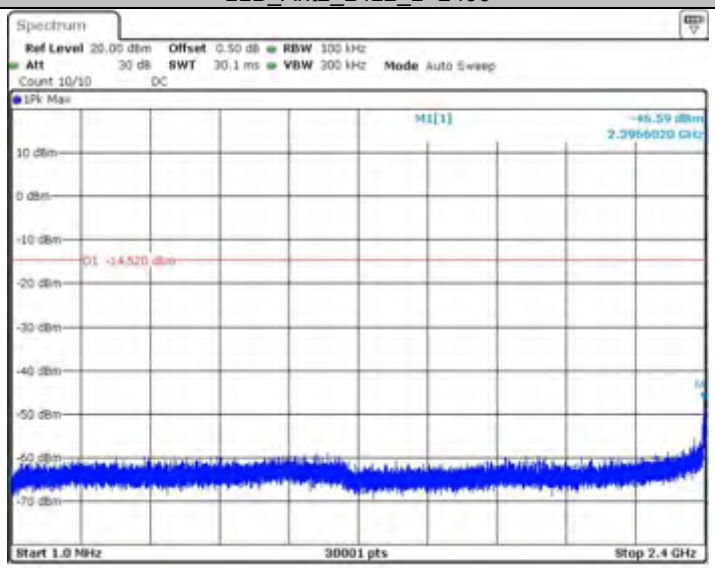
SISO Mode, Ant2

802.11b Channel 01 (2412MHz) Reference Level: 5.48 dBm

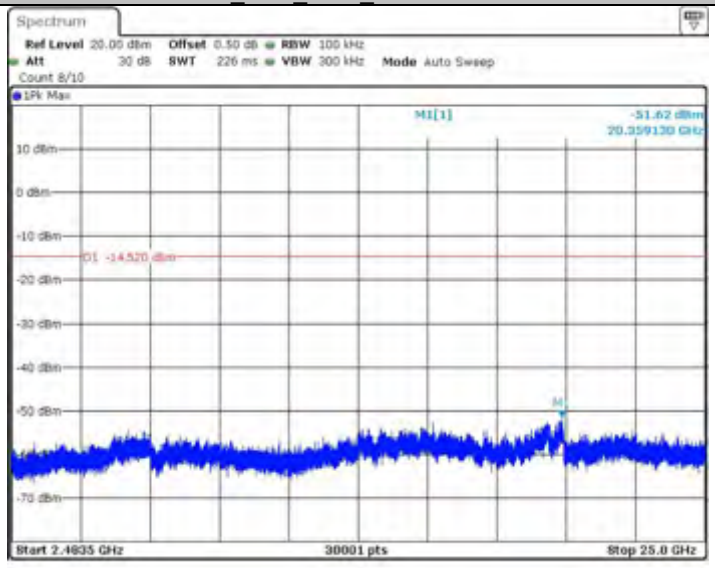
11B_Ant2_2412_0~Reference



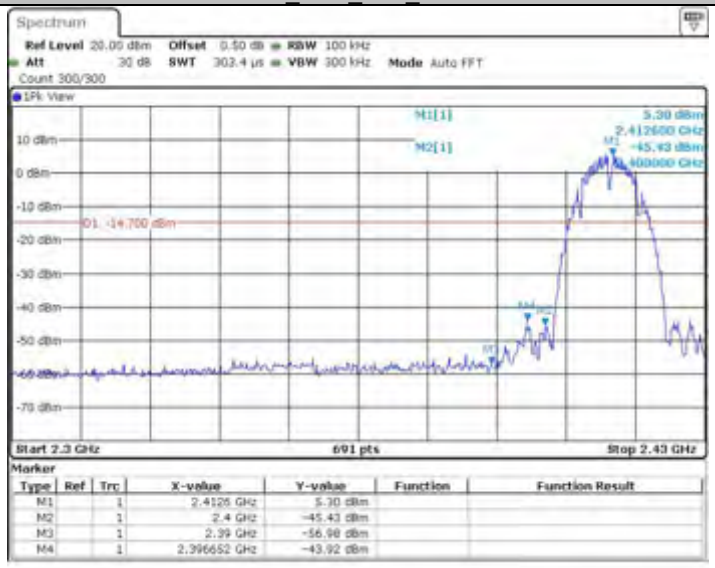
11B_Ant2_2412_1~2400



11B_Ant2_2412_2483.5~25000

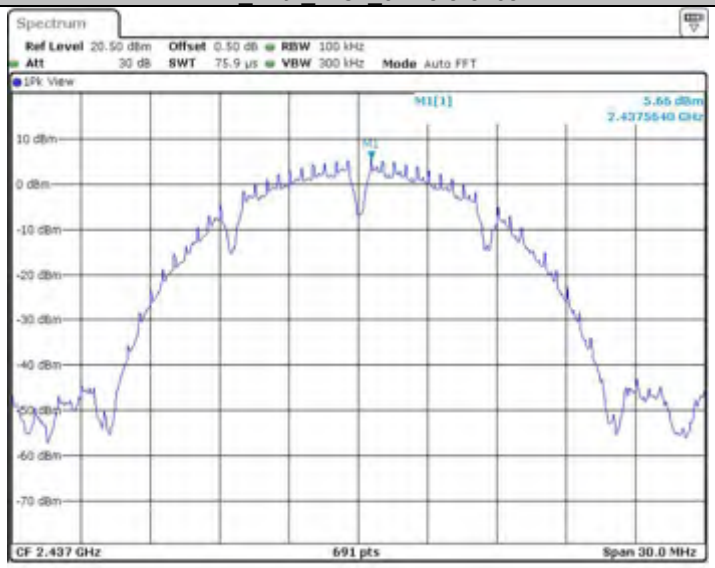


11B_Ant2_Low_2412

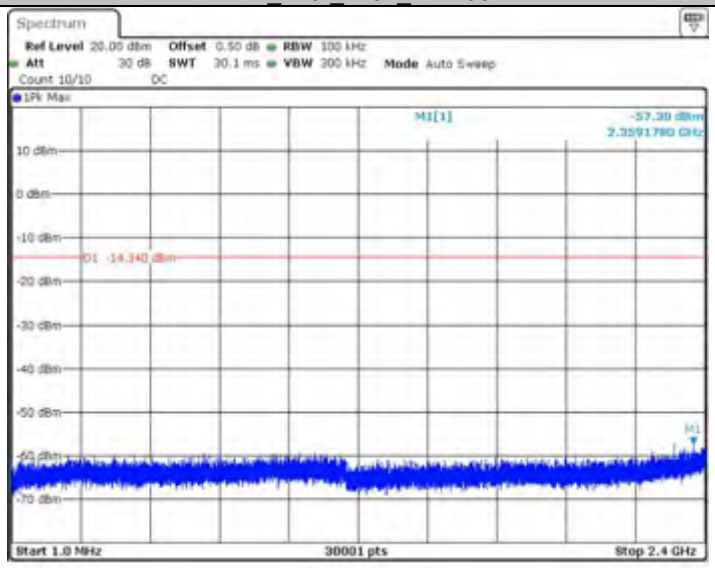


Channel 06 (2437MHz) Reference Level: 5.66dBm

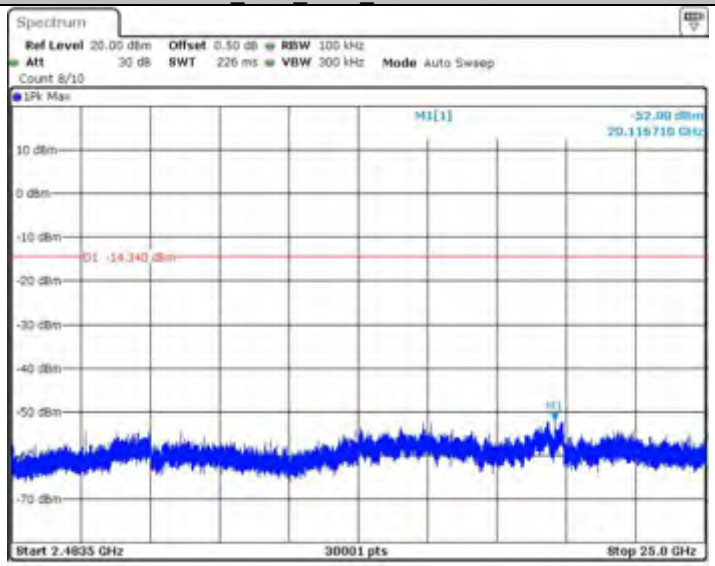
11B_Ant2_2437_0~Reference



11B_Ant2_2437_1~2400

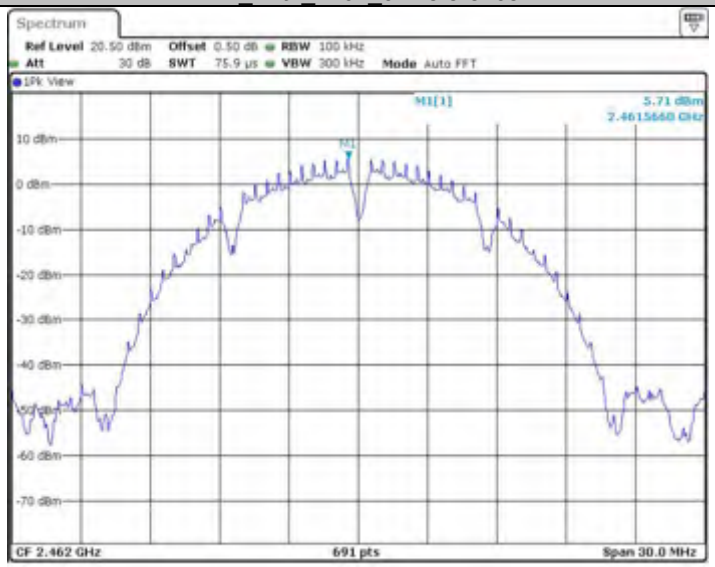


11B_Ant2_2437_2483.5~25000

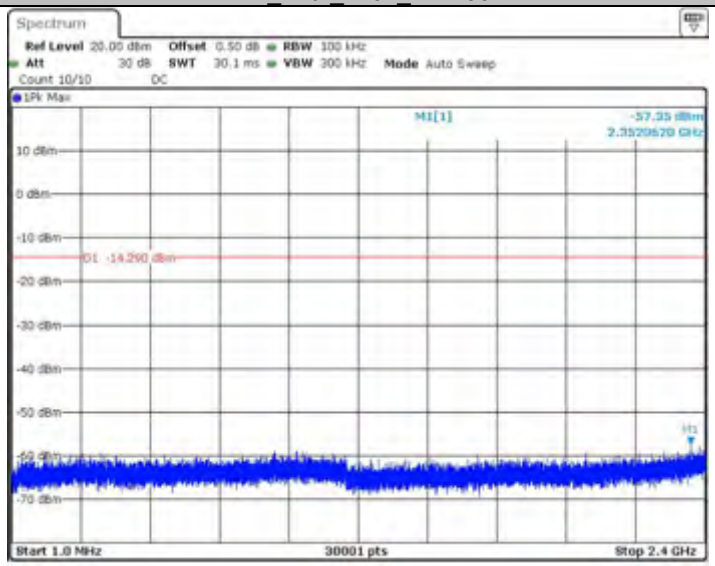


Channel 11 (2462MHz) Reference Level: 5.71dBm

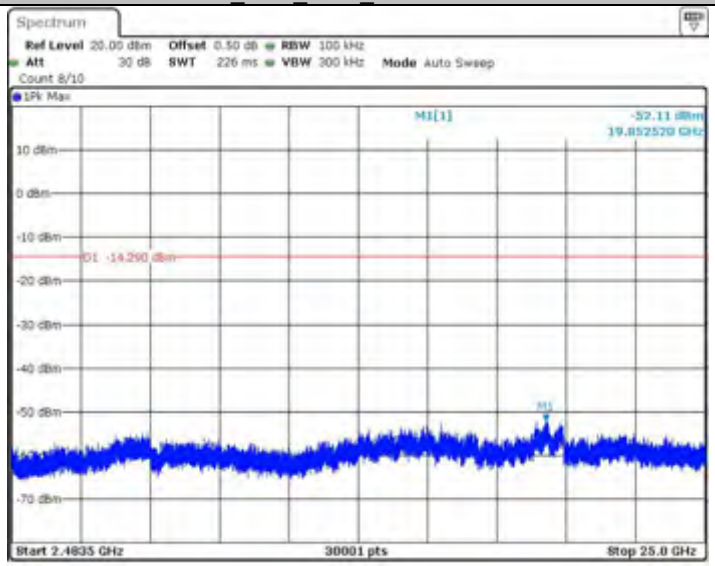
11B_Ant2_2462_0~Reference



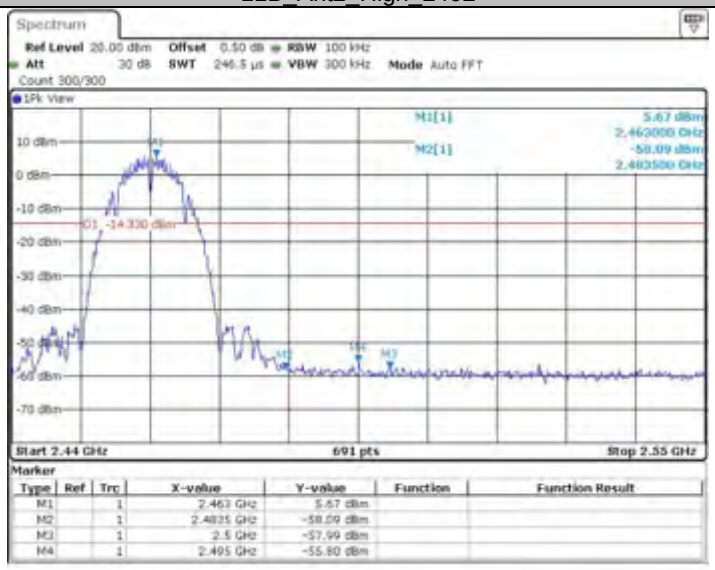
11B_Ant2_2462_1~2400



11B_Ant2_2462_2483.5~25000

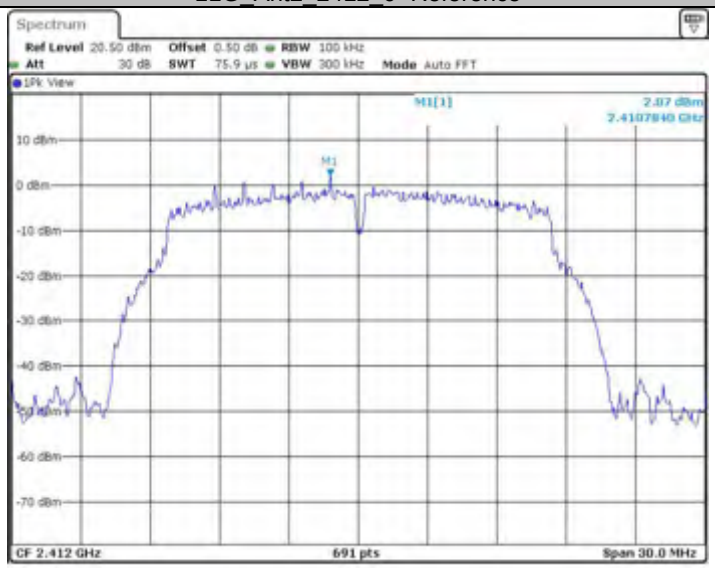
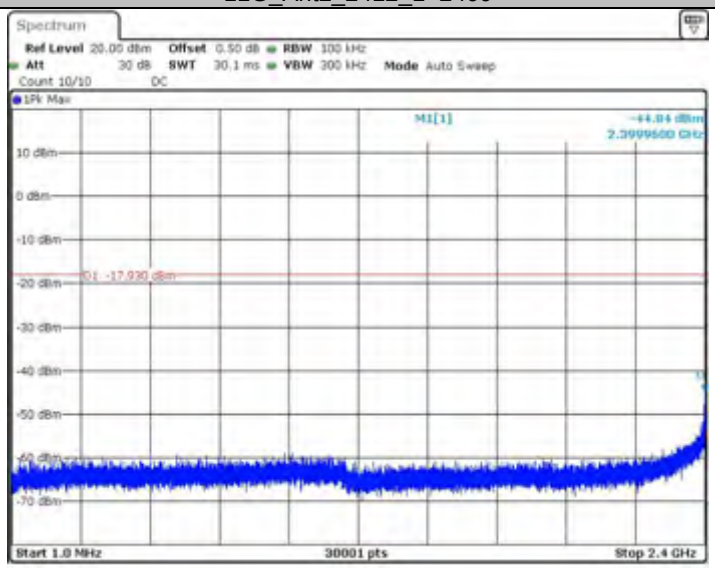
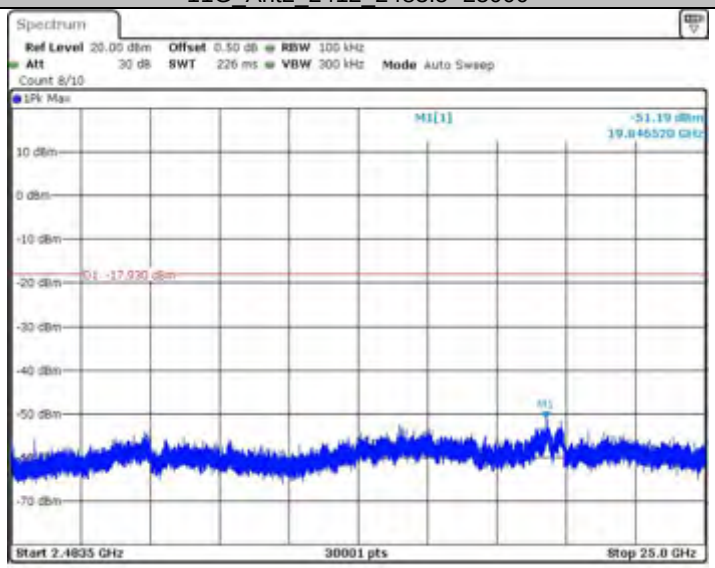


11B_Ant2_High_2462

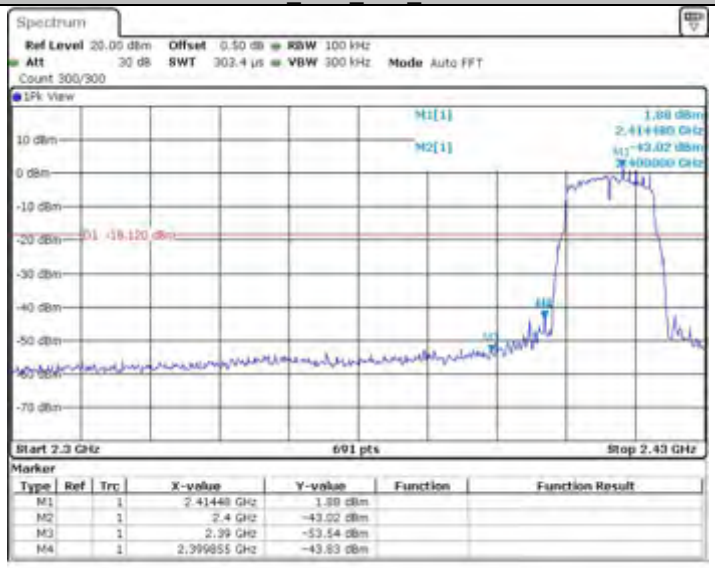


802.11g

Channel 01 (2412MHz) Reference Level: 2.07dBm

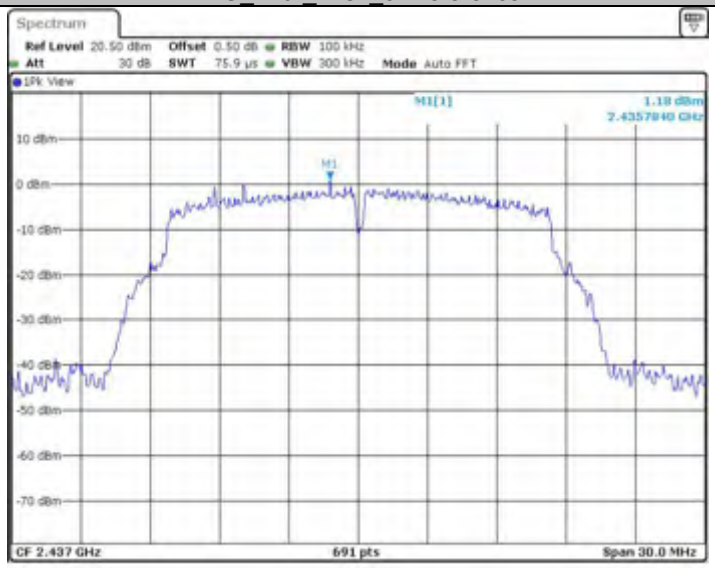
11G_Ant2_2412_0~Reference

11G_Ant2_2412_1~2400

11G_Ant2_2412_2483.5~25000


11G_Ant2_Low_2412

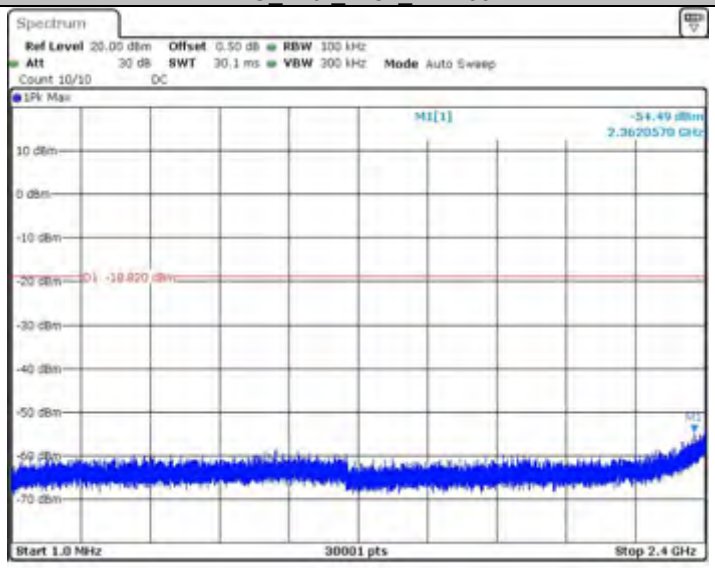


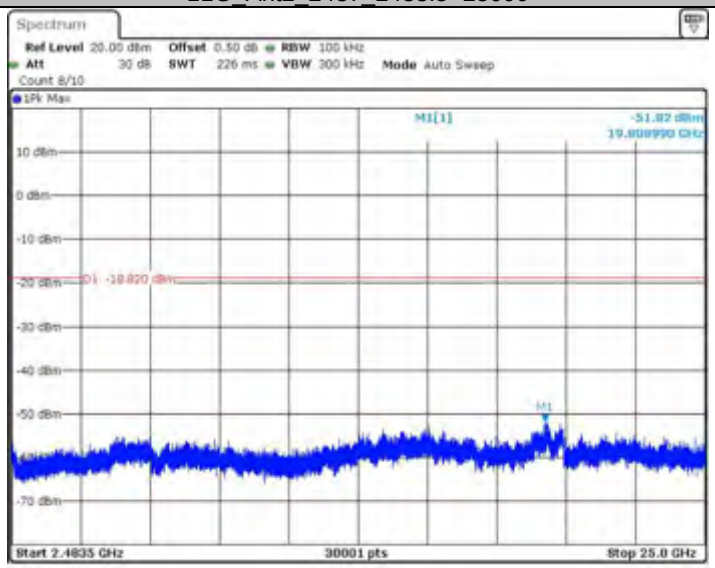
Channel 06 (2437MHz) Reference Level: 1.18dBm

11G_Ant2_2437_0~Reference

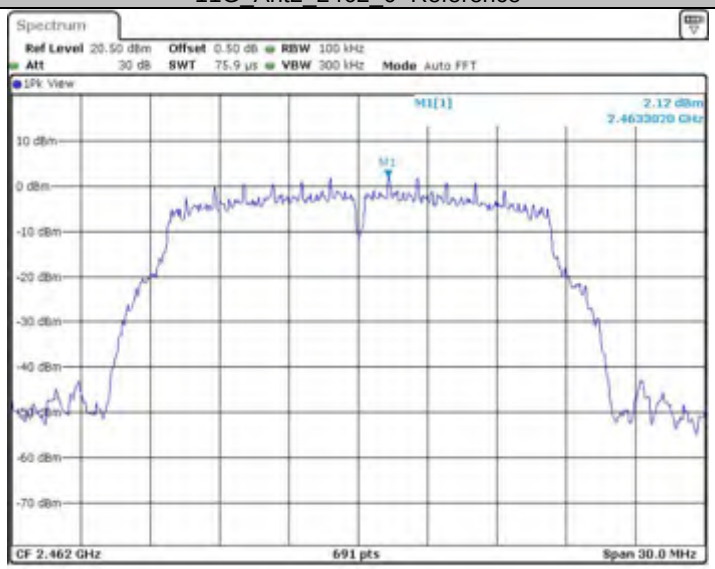


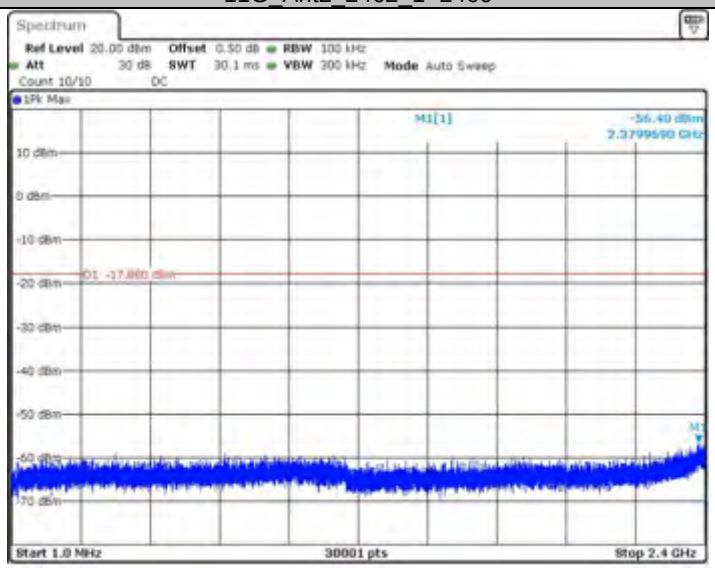
11G_Ant2_2437_1~2400



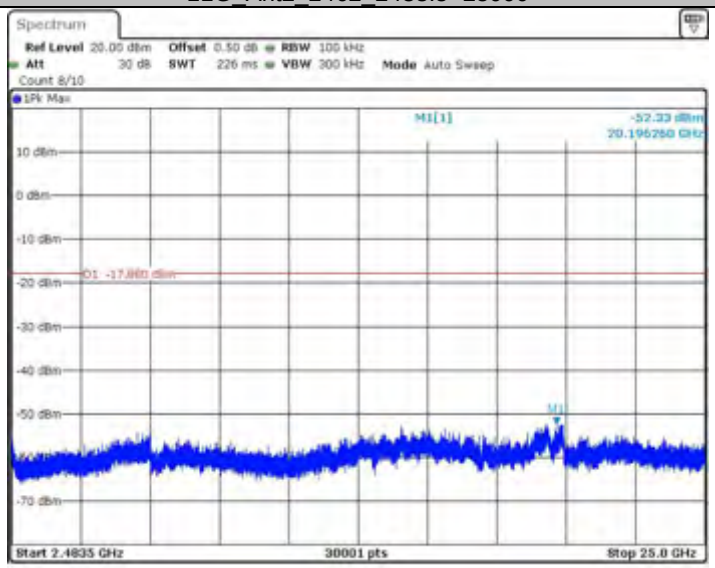
11G_Ant2_2437_2483.5~25000


Channel 11 (2462MHz) Reference Level: 2.12dBm

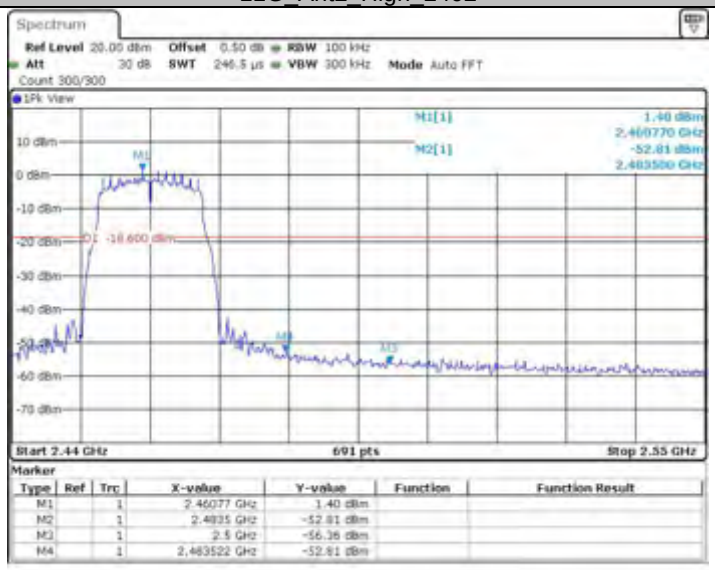
11G_Ant2_2462_0~Reference


11G_Ant2_2462_1~2400


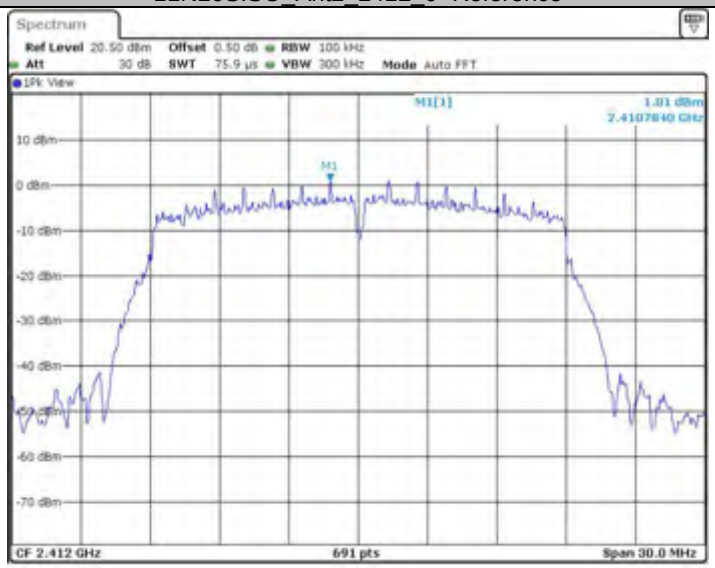
11G_Ant2_2462_2483.5~25000



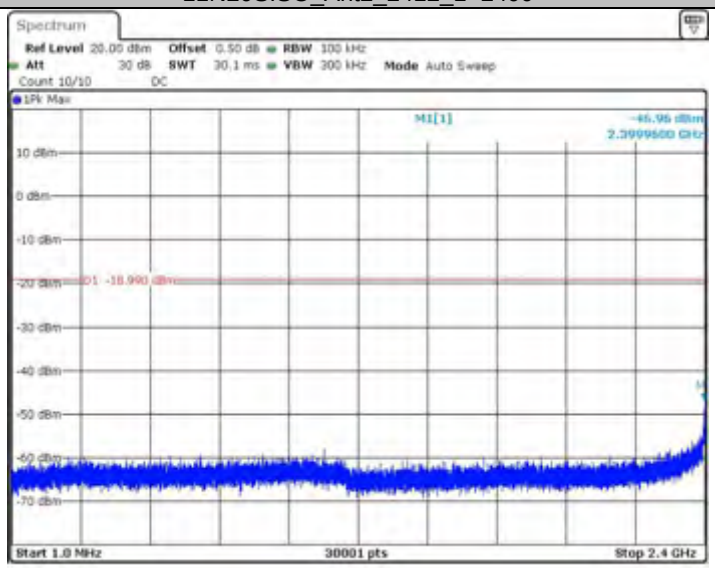
11G_Ant2_High_2462



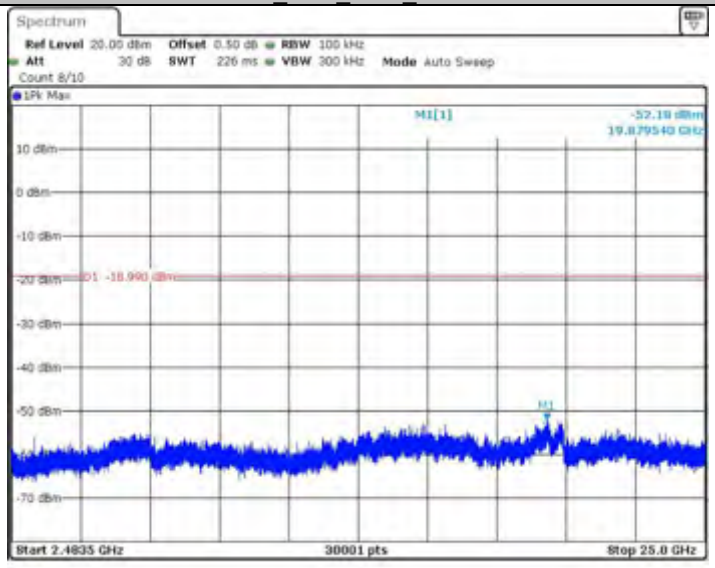
11N20SISO_Ant2_2412_0~Reference



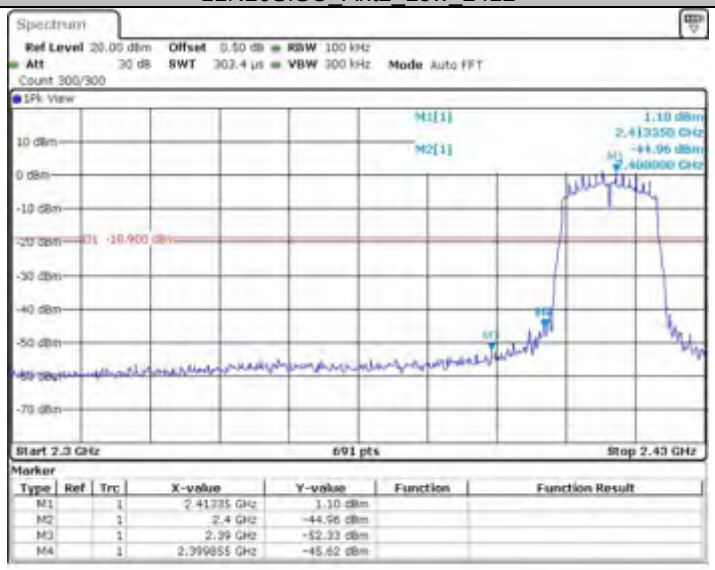
11N20SISO_Ant2_2412_1~2400



11N20SISO_Ant2_2412_2483.5~25000

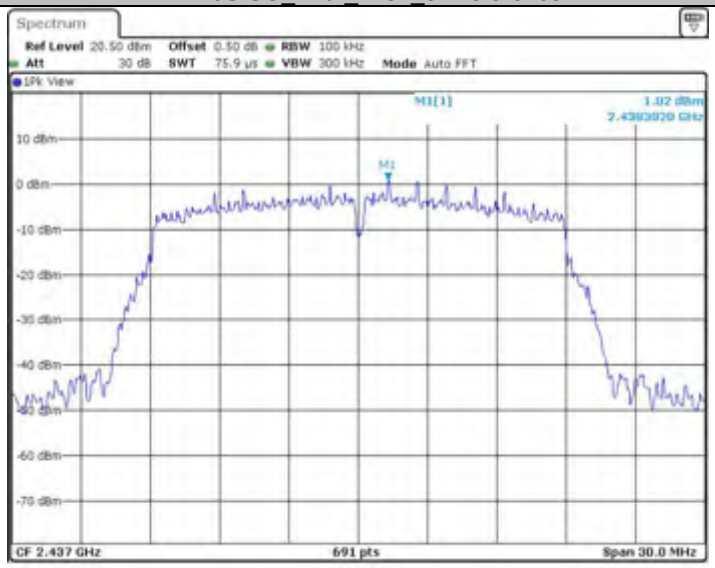


11N20SISO_Ant2_Low_2412

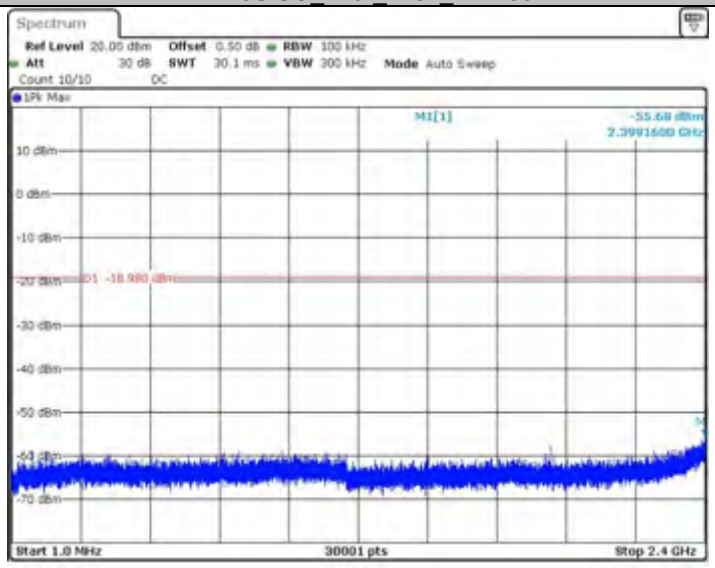


Channel 06 (2437MHz) Reference Level: 1.02dBm

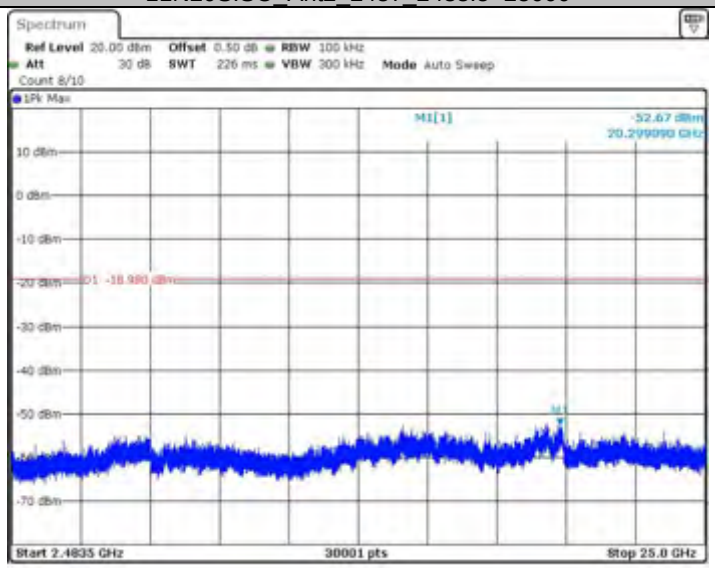
11N20SISO_Ant2_2437_0~Reference



11N20SISO_Ant2_2437_1~2400

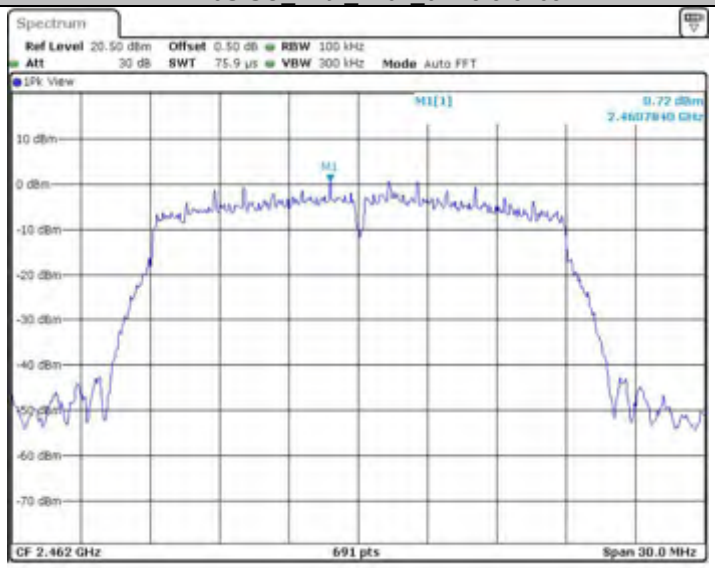


11N20SISO_Ant2_2437_2483.5~25000

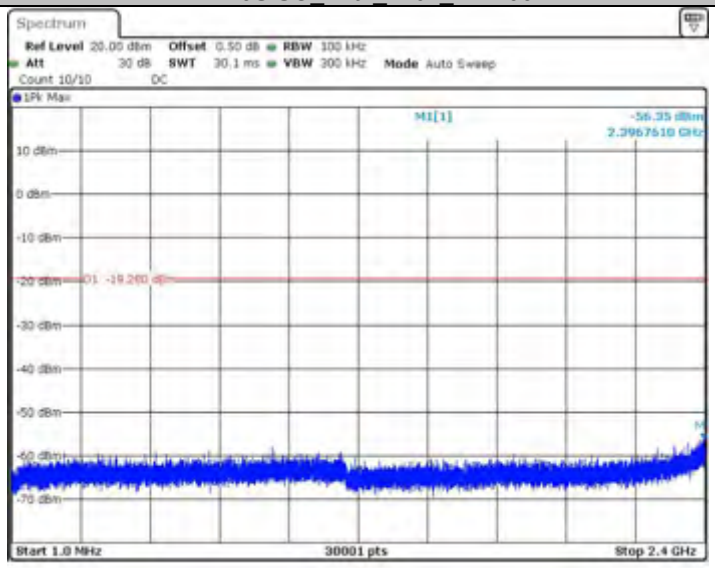


Channel 11 (2462MHz) Reference Level: 0.72dBm

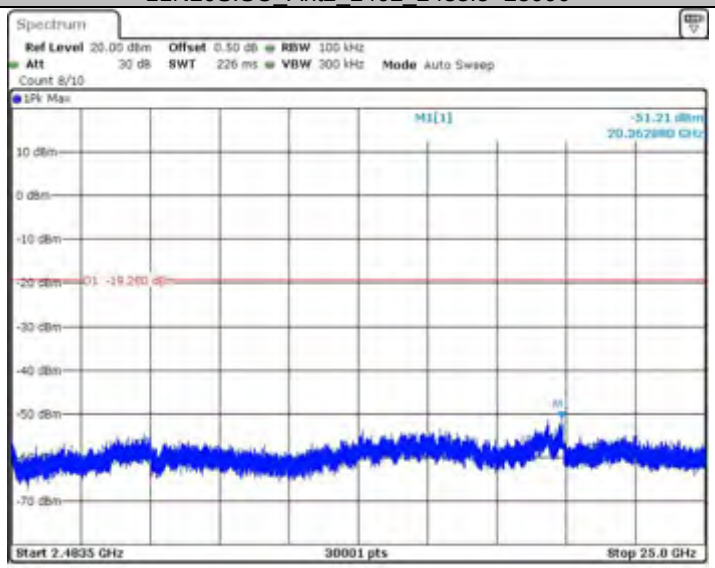
11N20SISO_Ant2_2462_0~Reference



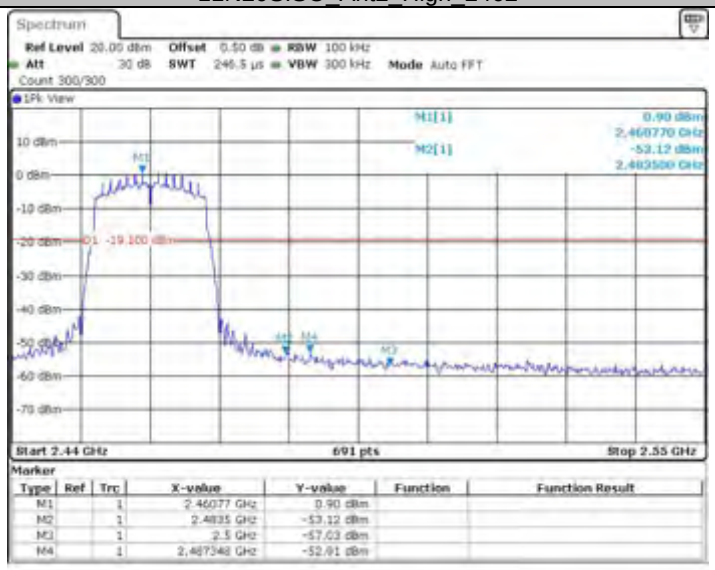
11N20SISO_Ant2_2462_1~2400



11N20SISO_Ant2_2462_2483.5~25000



11N20SISO_Ant2_High_2462



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

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.

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/m
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/m 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/m
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: Echelon Fitness Multimedia LLC
Date of Test: 26 August 2021 Model: ECHKIN24-3399-C

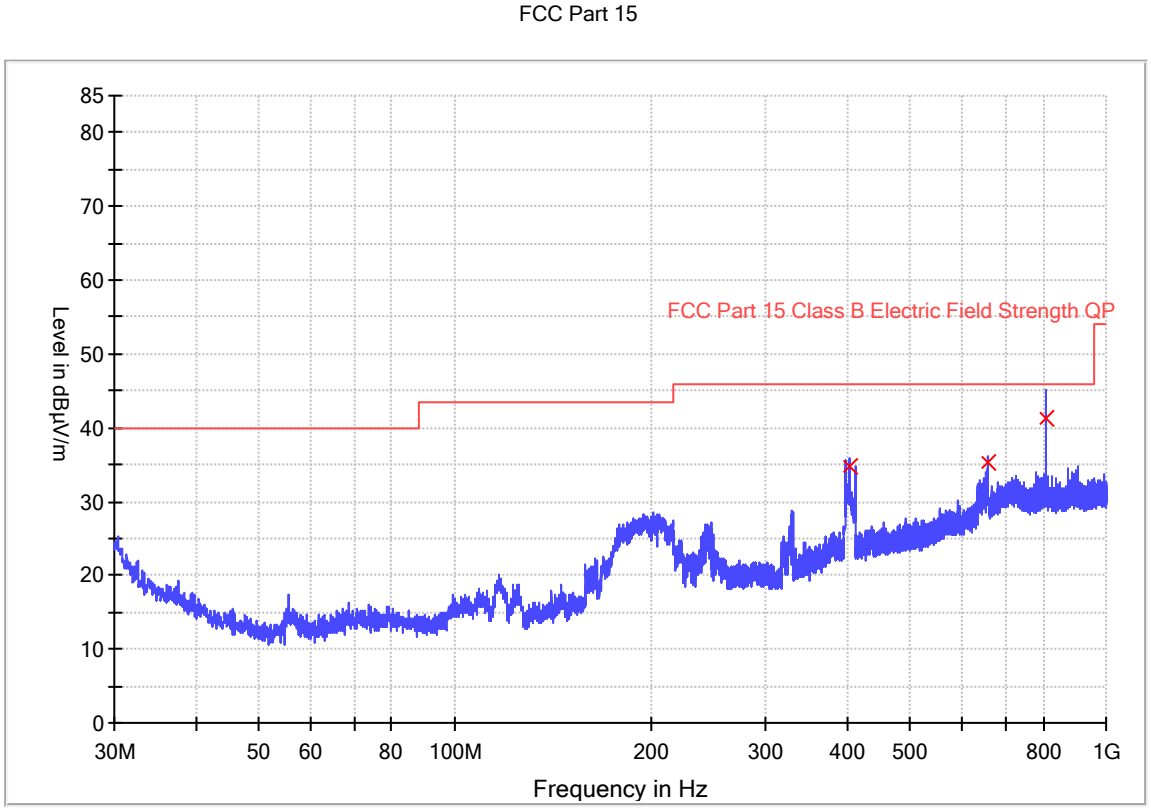
4.8 Radiated Spurious Emission

Worst Case Radiated Spurious Emission
at 808.392667MHz
is passed by 4.8dB margin.

For the electronic filing, the worst case radiated emission configuration photographs are saved with filename: radiated photos.pdf. Simultaneous transmission was considered during the test, only the worst-case data is recorded in this report.

Applicant: Echelon Fitness Multimedia LLC
Date of Test: 26 August 2021 Model: ECHKIN24-3399-C
Worst Case Operating Mode: Simultaneous transmission

ANT Polarity: Horizontal



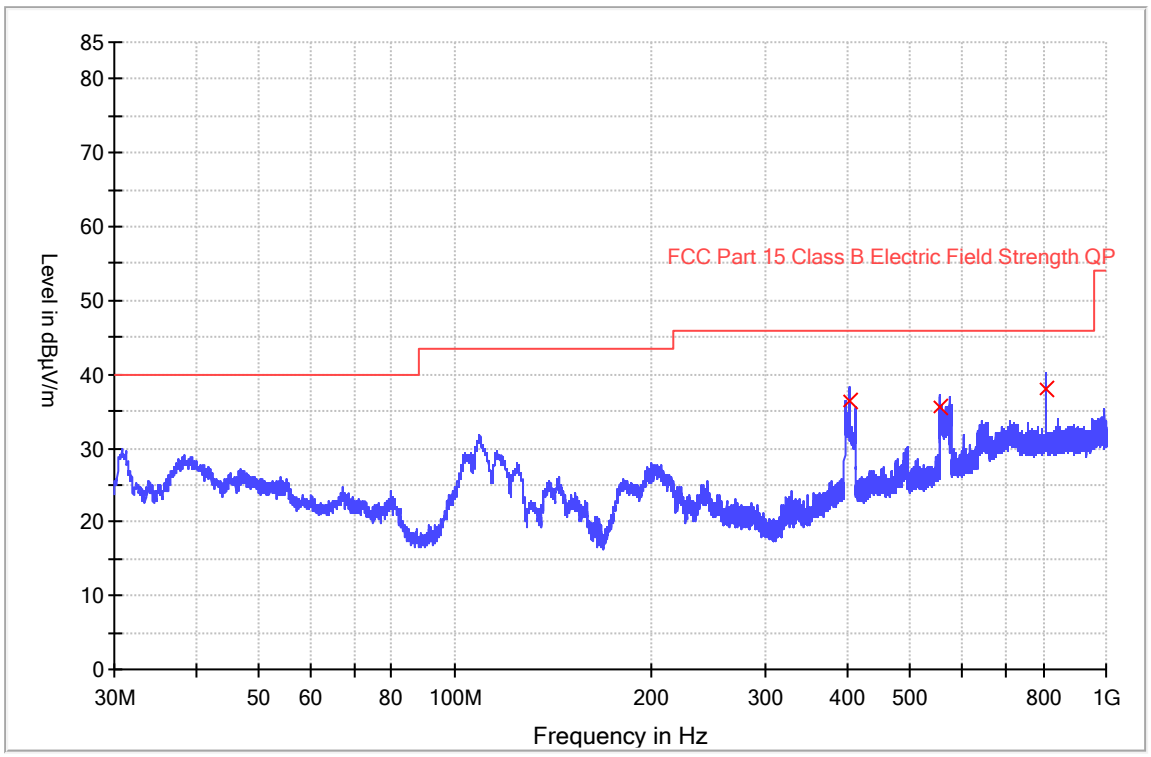
Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Polarization	Corr. (dB/m)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
404.129000	34.8	1000.0	120.000	H	25.2	11.2	46.0
659.724000	35.2	1000.0	120.000	H	30.6	10.8	46.0
808.392667	41.2	1000.0	120.000	H	32.0	4.8	46.0

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: Echelon Fitness Multimedia LLC
Date of Test: 26 August 2021 Model: ECHKIN24-3399-C
Worst Case Operating Mode: Simultaneous transmission

ANT Polarity: Vertical

FCC Part 15



Frequency (MHz)	QuasiPeak (dBuV/m)	Meas. Time (ms)	Bandwidth (kHz)	Polarization	Corr. (dB/m)	Margin - QPK (dB)	Limit - QPK (dBuV/m)
404.420000	36.4	1000.0	120.000	V	25.2	9.6	46.0
556.871667	35.6	1000.0	120.000	V	27.7	10.4	46.0
808.134000	38.0	1000.0	120.000	V	32.0	8.0	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: Echelon Fitness Multimedia LLC
Date of Test: 26 August 2021 Model: ECHKIN24-3399-C

Radiated Emissions (above 1GHz)

Worst Case Operating Mode: SISO-ANT1-Transmitting (802.11b-Channel 01)

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	60.9	36.8	33.5	57.6	74.0	-16.4
Horizontal	*2390.000	58.5	36.4	29.1	51.2	74.0	-22.8

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	*4824.000	48.7	36.8	33.5	45.4	54.0	-8.6
Horizontal	*2390.000	54.5	36.4	29.1	47.2	54.0	-6.8

Worst Case Operating Mode: SISO-ANT1-Transmitting (802.11b-Channel 06)

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	60.2	36.7	33.4	56.9	74.0	-17.1
Horizontal	*7311.000	59.7	36.6	35.8	58.9	74.0	-15.1

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	48.4	36.7	33.4	45.1	54.0	-8.9
Horizontal	*7311.000	47.6	36.6	35.8	46.8	54.0	-7.2

Worst Case Operating Mode: SISO-ANT1-Transmitting (802.11b-Channel 11)

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	62.6	36.8	33.3	59.1	74.0	-14.9
Horizontal	*7386.000	67.5	36.5	29.3	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	*4924.000	49.7	36.8	33.3	46.2	54.0	-7.8
Horizontal	*7386.000	50.9	36.5	29.3	43.7	54.0	-10.3

Worst Case Operating Mode:
SISO-ANT1-Transmitting (802.11g-Channel 01)

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	63.5	36.8	33.5	60.2	74.0	-13.8
Horizontal	*2390.000	68.6	36.4	29.1	61.3	74.0	-12.7

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	*4824.000	47.6	36.8	33.5	44.3	54.0	-9.7
Horizontal	*2390.000	54.2	36.4	29.1	46.9	54.0	-7.1

Worst Case Operating Mode:
SISO-ANT1-Transmitting (802.11g-Channel 06)

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	64.6	36.7	33.4	61.3	74.0	-12.7
Horizontal	*7311.000	60.2	36.6	35.8	59.4	74.0	-14.6

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	49.5	36.7	33.4	46.2	54.0	-7.8
Horizontal	*7311.000	48.7	36.6	35.8	47.9	54.0	-6.1

Worst Case Operating Mode:
SISO-ANT1-Transmitting (802.11g-Channel 11)

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	61.5	36.8	33.3	58.0	74.0	-16.0
Horizontal	*7386.000	67.8	36.5	29.3	60.6	74.0	-13.4

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	*4924.000	50.3	36.8	33.3	46.8	54.0	-7.2
Horizontal	*7386.000	55.9	36.5	29.3	48.7	54.0	-5.3

Worst Case Operating Mode:
SISO-ANT1-Transmitting (802.11n20-Channel 01)

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	59.5	36.8	33.5	56.2	74.0	-17.8
Horizontal	*2390.000	64.6	36.4	29.1	57.3	74.0	-16.7

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	*4824.000	50.7	36.8	33.5	47.4	54.0	-6.6
Horizontal	*2390.000	54.3	36.4	29.1	47.0	54.0	-7.0

Worst Case Operating Mode:
SISO-ANT1-Transmitting (802.11n20-Channel 06)

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	61.9	36.7	33.4	58.6	74.0	-15.4
Horizontal	*7311.000	62.1	36.6	35.8	61.3	74.0	-12.7

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	50.5	36.7	33.4	47.2	54.0	-6.8
Horizontal	*7311.000	46.1	36.6	35.8	45.3	54.0	-8.7

Worst Case Operating Mode:
SISO-ANT1-Transmitting (802.11n20-Channel 11)

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	60.7	36.8	33.3	57.2	74.0	-16.8
Horizontal	*7386.000	65.8	36.5	29.3	58.6	74.0	-15.4

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	*4924.000	49.8	36.8	33.3	46.3	54.0	-7.7
Horizontal	*7386.000	51.4	36.5	29.3	44.2	54.0	-9.8

Worst Case Operating Mode:
SISO-ANT2-Transmitting (802.11b-Channel 01)

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	60.7	36.8	33.5	57.4	74.0	-16.6
Horizontal	*2390.000	63.6	36.4	29.1	56.3	74.0	-17.7

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	*4824.000	50.5	36.8	33.5	47.2	54.0	-6.8
Horizontal	*2390.000	55.2	36.4	29.1	47.9	54.0	-6.1

Worst Case Operating Mode:
SISO-ANT2-Transmitting (802.11b-Channel 06)

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	57.4	36.7	33.4	54.1	74.0	-19.9
Horizontal	*7311.000	57.7	36.6	35.8	56.9	74.0	-17.1

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	50.2	36.7	33.4	46.9	54.0	-7.1
Horizontal	*7311.000	48.8	36.6	35.8	48.0	54.0	-6.0

Worst Case Operating Mode:
SISO-ANT2-Transmitting (802.11b-Channel 11)

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	54.3	36.8	33.3	50.8	74.0	-23.2
Horizontal	*7386.000	62.9	36.5	29.3	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	*4924.000	49.2	36.8	33.3	45.7	54.0	-8.3
Horizontal	*7386.000	55.3	36.5	29.3	48.1	54.0	-5.9

Worst Case Operating Mode:
SISO-ANT2-Transmitting (802.11g-Channel 01)

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	53.6	36.8	33.5	50.3	74.0	-23.7
Horizontal	*2390.000	63.0	36.4	29.1	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	49.1	36.8	33.5	45.8	54.0	-8.2
Horizontal	*2390.000	54.5	36.4	29.1	47.2	54.0	-6.8

Worst Case Operating Mode:
SISO-ANT2-Transmitting (802.11g-Channel 06)

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	58.6	36.7	33.4	55.3	74.0	-18.7
Horizontal	*7311.000	59.0	36.6	35.8	58.2	74.0	-15.8

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	48.6	36.7	33.4	45.3	54.0	-8.7
Horizontal	*7311.000	48.7	36.6	35.8	47.9	54.0	-6.1

Worst Case Operating Mode:
SISO-ANT2-Transmitting (802.11g-Channel 11)

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	57.7	36.8	33.3	54.2	74.0	-19.8
Horizontal	*7386.000	65.9	36.5	29.3	58.7	74.0	-15.3

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	*4924.000	48.4	36.8	33.3	44.9	54.0	-9.1
Horizontal	*7386.000	54.3	36.5	29.3	47.1	54.0	-6.9

Worst Case Operating Mode:
SISO-ANT2-Transmitting (802.11n20-Channel 01)

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	57.5	36.8	33.5	54.2	74.0	-19.8
Horizontal	*2390.000	65.6	36.4	29.1	58.3	74.0	-15.7

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	*4824.000	49.6	36.8	33.5	46.3	54.0	-7.7
Horizontal	*2390.000	53.6	36.4	29.1	46.3	54.0	-7.7

Worst Case Operating Mode:
SISO-ANT2-Transmitting (802.11n20-Channel 06)

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	59.0	36.7	33.4	55.7	74.0	-18.3
Horizontal	*7311.000	61.6	36.6	35.8	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	50.1	36.7	33.4	46.8	54.0	-7.2
Horizontal	*7311.000	47.9	36.6	35.8	47.1	54.0	-6.9

Worst Case Operating Mode:
SISO-ANT2-Transmitting (802.11n20-Channel 11)

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	61.6	36.8	33.3	58.1	74.0	-15.9
Horizontal	*7386.000	67.5	36.5	29.3	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	*4924.000	45.1	36.8	33.3	41.6	54.0	-12.4
Horizontal	*7386.000	55.5	36.5	29.3	48.3	54.0	-5.7

Worst Case Operating Mode:
MIMO-Transmitting (802.11n20-Channel 01)

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	57.0	36.8	33.5	53.7	74.0	-20.3
Horizontal	*2390.000	64.6	36.4	29.1	57.3	74.0	-16.7

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	*4824.000	50.5	36.8	33.5	47.2	54.0	-6.8
Horizontal	*2390.000	50.7	36.4	29.1	43.4	54.0	-10.6

Worst Case Operating Mode:
MIMO-Transmitting (802.11n20-Channel 06)

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	57.1	36.7	33.4	53.8	74.0	-20.2
Horizontal	*7311.000	59.0	36.6	35.8	58.2	74.0	-15.8

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	49.0	36.7	33.4	45.7	54.0	-8.3
Horizontal	*7311.000	48.7	36.6	35.8	47.9	54.0	-6.1

Worst Case Operating Mode:
MIMO-Transmitting (802.11n20-Channel 11)

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	60.0	36.8	33.3	56.5	74.0	-17.5
Horizontal	*7386.000	65.3	36.5	29.3	58.1	74.0	-15.9

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	48.8	36.8	33.3	45.3	54.0	-8.7
Horizontal	*7386.000	55.9	36.5	29.3	48.7	54.0	-5.3

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.

Applicant: Echelon Fitness Multimedia LLC
Date of Test: 28 September 2021
Model: ECHKIN24-3399-C

4.9 Conducted Emission

Simultaneous transmission was considered during the test, only the worst-case data is recorded in this report.

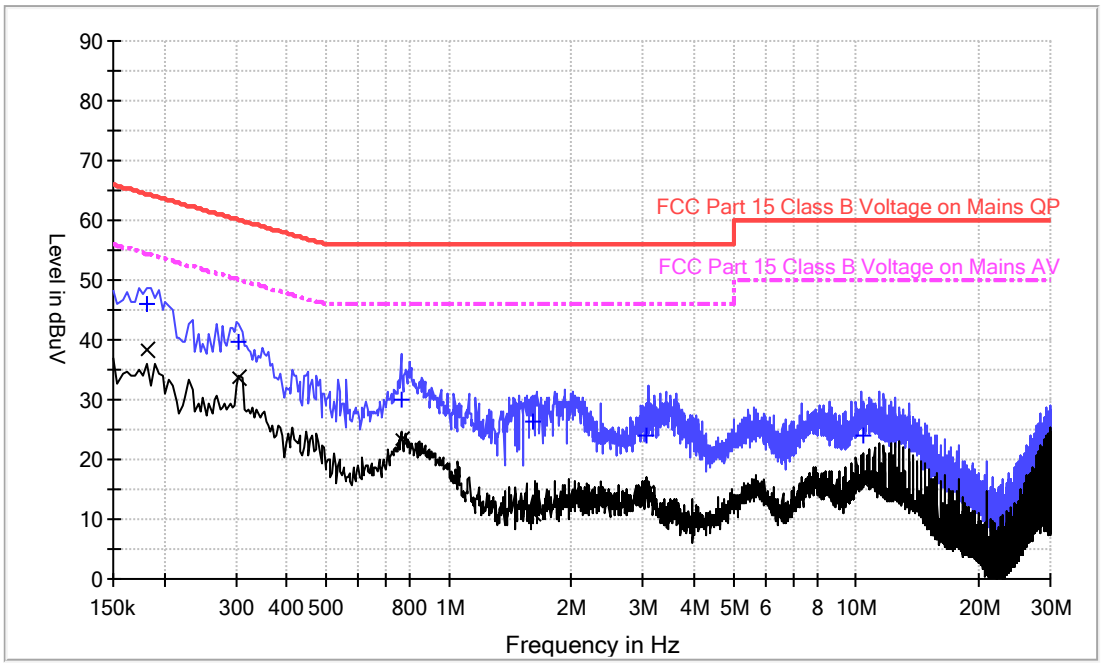
Worst Case Conducted Emission
at 0.182000 / 0.306000MHz
is passed by 15.9dB margin.

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

Applicant: Echelon Fitness Multimedia LLC
Date of Test: 28 September 2021
Model: ECHKIN24-3399-C
Worst Case Operating Mode: Simultaneous transmission
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)
0.182000	46.1	9.000	L1	9.6	18.3	64.4
0.306000	39.7	9.000	L1	9.6	20.4	60.1
0.766000	29.9	9.000	L1	9.6	26.1	56.0
1.602000	26.2	9.000	L1	9.6	29.8	56.0
3.050000	23.9	9.000	L1	9.7	32.1	56.0
10.378000	24.1	9.000	L1	9.8	35.9	60.0

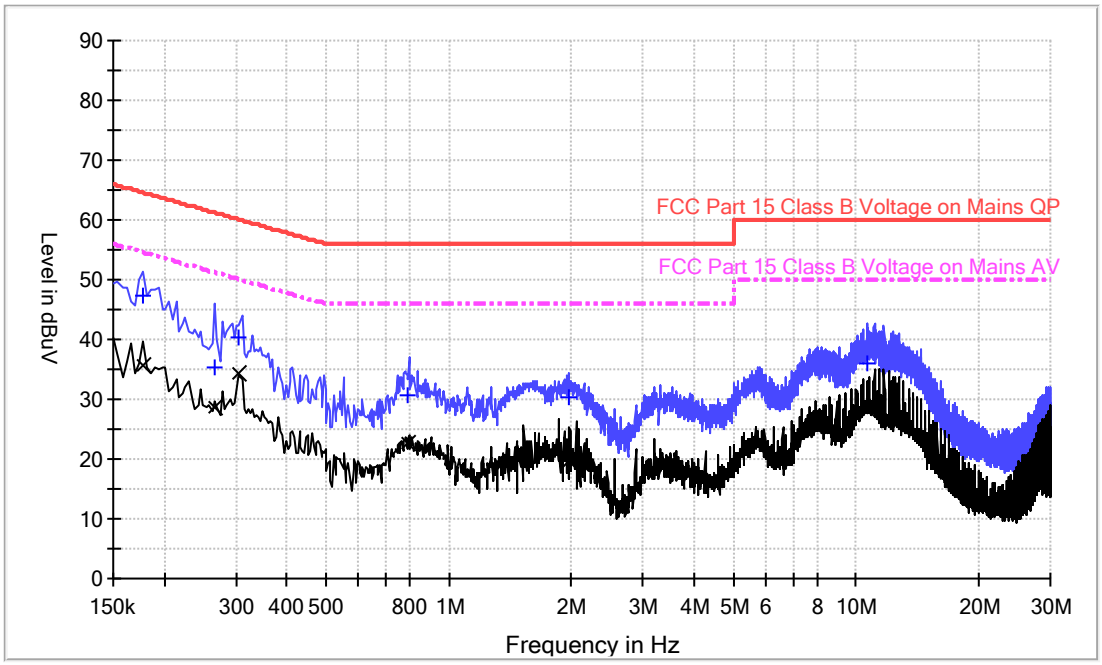
Limit and Margin AV

Frequency (MHz)	Average (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.182000	38.5	9.000	L1	9.6	15.9	54.4
0.306000	33.6	9.000	L1	9.6	16.5	50.1
0.766000	23.2	9.000	L1	9.6	22.8	46.0
1.602000	11.1	9.000	L1	9.6	34.9	46.0
3.050000	14.4	9.000	L1	9.7	31.6	46.0
10.378000	16.4	9.000	L1	9.8	33.6	50.0

Applicant: Echelon Fitness Multimedia LLC
Date of Test: 28 September 2021
Model: ECHKIN24-3399-C
Worst Case Operating Mode: Simultaneous transmission
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	47.3	9.000	N	9.5	17.3	64.6
0.266000	35.3	9.000	N	9.5	25.9	61.2
0.306000	40.4	9.000	N	9.5	19.7	60.1
0.794000	30.8	9.000	N	9.5	25.2	56.0
1.978000	30.3	9.000	N	9.5	25.7	56.0
10.706000	36.0	9.000	N	9.7	24.0	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	9.5	19.1	54.6
0.266000	28.7	9.000	N	9.5	22.5	51.2
0.306000	34.2	9.000	N	9.5	15.9	50.1
0.794000	22.6	9.000	N	9.5	23.4	46.0
1.978000	19.7	9.000	N	9.5	26.3	46.0
10.706000	28.4	9.000	N	9.7	21.6	50.0

Applicant: Echelon Fitness Multimedia LLC
Date of Test: 26 August 2021
Model: ECHKIN24-3399-C

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: Echelon Fitness Multimedia LLC
Date of Test: 26 August 2021
Model: ECHKIN24-3399-C

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
SZ061-13	Biconilog Antenna	ETS	3142E	00217919	2019-06-10	2022-06-10
SZ061-06	Active Loop Antenna	Electro-Metrics	EM-6876	217	2021-05-18	2023-05-18
SZ061-08	Horn Antenna	ETS	3115	00092346	2019-09-07 2021-09-05	2021-09-07 2024-09-05
SZ061-07	Pyramidal Horn Antenna	ETS	3160-09	00083067	2019-08-13	2022-08-13
SZ056-03	Spectrum Analyzer	R&S	FSP30	101148	2021-05-10	2022-05-10
SZ185-01	EMI Receiver	R & S	ESCI	100547	2020-12-22	2021-12-22
SZ181-04	Preamplifier	Agilent	8449B	3008A02474	2021-05-10	2022-05-10
SZ188-01	Anechoic Chamber	ETS	RFD-F/A-100	4102	2018-12-15	2021-12-15
SZ062-02	RF Cable	RADIALL	RG 213U	--	2021-06-01	2021-12-01
SZ062-05	RF Cable	RADIALL	0.04-26.5GHz	--	2021-06-01	2021-12-01
SZ062-12	RF Cable	RADIALL	0.04-26.5GHz	--	2021-06-01	2021-12-01
SZ067-04	Notch Filter	Micro-Tronics	BRM50702-02	--	2021-05-11	2022-05-11
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	2020-10-15	2021-10-15
SZ187-01	Two-Line V-Network	R & S	ENV216	100072	2020-10-27	2021-10-27
SZ187-02	Two-Line V-Network	R&S	ENV216	100073	2021-05-11	2022-05-11
SZ188-03	Shielding Room	ETS	RFD-100	4100	2018-12-15	2021-12-15
SZ062-16	RF Cable	HUBER+SUHNER	CBL2-BN-1m	110127-2231000	2020-10-15	2021-10-15

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