

FCC RF Test Report

For

System Monitoring Tablet

Model Number : K1002C-POE-K001
FCC ID : 2A2UHK1002C-POE
Date of Receipt : Septemebr 29, 2021
Date of Report : November 19, 2021

Prepared for

Rivertech Co., Ltd.

5F., No. 34, Songde Rd., Xinyi dist., Taipei city Taiwan(R.O.C)



Prepared by

Central Research Technology Co.

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Verification of Compliance

Equipment under Test : System Monitoring Tablet
Model No. : K1002C-POE-K001
FCC ID : 2A2UHK1002C-POE
Applicant : Rivertech Co., Ltd.
Address : 5F., No. 34, Songde Rd., Xinyi dist., Taipei city Taiwan(R.O.C)
Applicable Standards : 47 CFR part 15, Subpart C
ANSI C63.10:2013
Date of Testing : October 13 ~ November 9, 2021
Deviation : The method, configuration and arrangement of the tests are following the requirement of customer and the applicable standards cited above.
Condition of Test Sample : Mass Production



We, **Central Research Technology Co.**, hereby certify that one sample of the designated product was tested in our facility during the period mentioned above. The test records, data evaluation and Equipment Under Test (EUT) configurations shown in the present report are true and accurate representation of the measurements of the sample's RF characteristics under the conditions herein specified.

The test results show that the EUT as described in the present report is in compliance with the requirements set forth in the standards mentioned above and apply to the tested sample identified in the present report only. The test report shall not be reproduced, except in its entirety, without the written approval of Central Research Technology Co.

PREPARED BY : Cathy Chen , **DATE** : November 19, 2021
(Cathy Chen/ Technical Manager)
APPROVED BY : Sam Chien , **DATE** : November 19, 2021
(Sam Chien /General Manager)

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1 General Description

1.1 General Description of EUT

Equipment under Test : System Monitoring Tablet

Model No. : K1002C-POE-K001

Power in : 120 Vac/60 Hz

Frequency Range : 802.11b/g/n HT20: 2412 MHz – 2462 MHz
802.11n HT40: 2422 MHz – 2452 MHz

Modular Function : GFSK, OFDM

Channel No. : 802.11b/g/n HT20:11
802.11n HT40:7

Antenna Spec : Brand/Mode No.: South Star/ SMB-K1002
Type: FPCB Antenna
Antenna Gain : 2.76dBi

Channel List:

802.11 b/g/n HT20

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	4	2427	7	2442	10	2457
2	2417	5	2432	8	2447	11	2462
3	2422	6	2437	9	2452		

802.11n HT40

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
3	2422	5	2432	7	2442	9	2452
4	2427	6	2437	8	2447		

Test Mode

Test item	Mode	Operation Frequency
Conducted power test/ Radiated emission above 1 GHz	802.11b	CH 1 , CH 6, CH 11
	802.11g	CH 1 , CH 6, CH 11
	802.11n HT20	CH 1 , CH 6, CH 11
	802.11n HT40	CH 3, CH 6, CH 9
Radiated emission below 1 GHz	Normal mode	
Power line conducted emission	Normal mode	

EUT Test step:

1. EUT turn on the power.
2. Enter engineer mode.
3. Adjust test mode, channel, setting power.
4. Press start testing.
5. EUT run test program and transmit signal.

1.2 Applied standards

(1) 6 dB Bandwidth

According to FCC 15.247(a)(2), the minimum 6 dB bandwidth shall be at least 500 kHz.

(2) Maximun Peak Output Power

According to FCC 15.247(b)(3), for systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt.

According to FCC 15.247(b) (4), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) Conducted emission measurements

According to FCC 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph FCC 15.247(b)(3), the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in FCC 15.209(a) is not required. Radiated emissions which fall in the restricted bands, as defined in FCC 15.205(a), must also comply with the radiated emission limits specified in FCC 15.209(a).

(4) Power Spectral Density

According to FCC 15.247(e), for digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

(5) Radiated emission measurements

For intentional device, according to FCC 15.209, the general requirement of field strength of radiated emissions from intentional radiator at a distance of 3 meters shall not exceed the below table.

Frequency (MHz)	Measurement Distance (m)	Field Strength (uV/m)	Field Strength (dBuV/m)
0.009-0.490	300	2400/F(kHz)	
0.490-1.705	30	24000/F(kHz)	
1.705-30.0	3	30	29.5
30 – 88	3	100	40.0
88 – 216	3	150	43.5
216 – 960	3	200	46.0
above 1610	3	500	54.0

Note1 : At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

Note 2: At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade)

(6) Conduction Emission Requirement

For intentional device, according to FCC 15.207(a), line conduction emission limit is as below table.

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 - 5	56	46
5 - 30	60	50

* Decreases with the logarithm of the frequency.

(7) Restricted Band

Frequency (MHz)	Frequency (MHz)	Frequency (MHz)	Frequency (GHz)
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(2)
13.36 - 13.41			

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

1.3 Test result

Test Item	FCC standard section	Report section	Test result
Duty cycle	-	2	-
6 dB bandwidth	FCC 15.247(a)(2)	3	PASS
Maximun Peak Output Power	FCC 15.247(b)(3)	4	PASS
Power Spectral Density	FCC 15.247(e)	5	PASS
Conducted spurious emission	FCC 15.247(d)	6	PASS
Radiated emission measurements	FCC 15.209	7	PASS
Power line conducted	FCC 15.207(a)	8	PASS

According to ANSI C63.10, determining compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

1.4 Duty cycle:

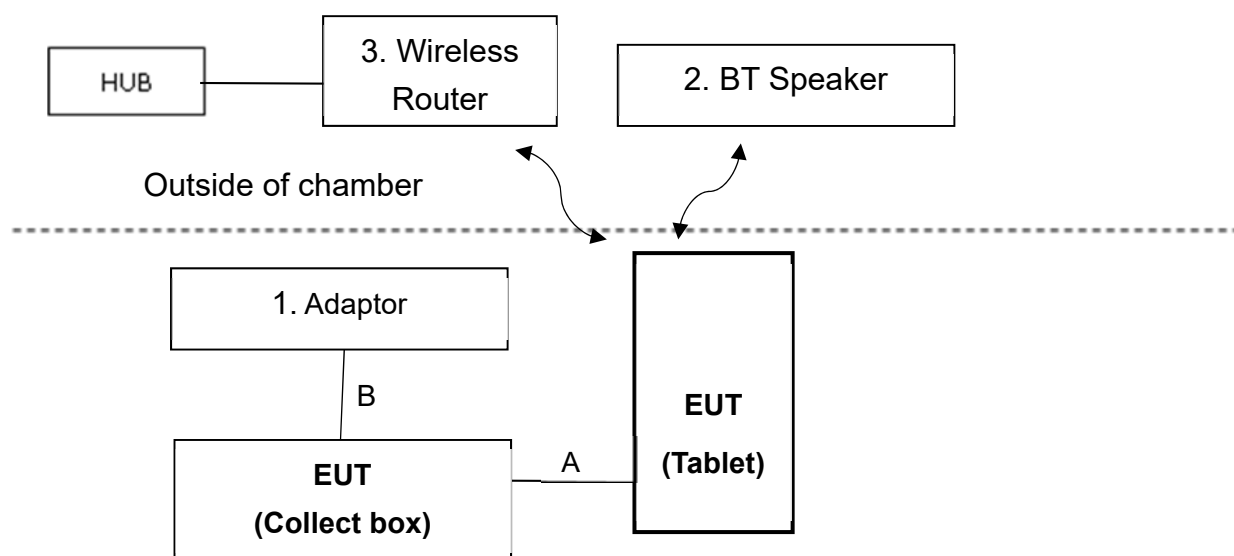
Mode	Duty cycle(%)
802.11b	99.67
802.11g	97.60
802.11n HT20	97.44
802.11n HT40	95.11

1.6 The Support Units

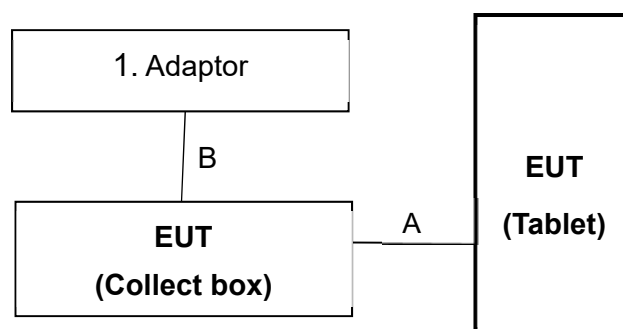
No.	Unit	Model No.	Trade Name	Power Code	Supported by lab.
1.	Adaptor	ICP30-120-2500	Cullpower		
2.	BT Speaker	XMYX03YM	Mi		√
3	Wireless Router	RT-AC51U	ASUS		√

1.7 Layout of Setup

Normal mode



Other Test



Connecting Cables :

No.	Cable	Length	Shielded	Core	Shielded Backshell	Supported by lab.	Note
A	Micro USB cable	0.35m	✓				
B	Power cable	1.2m		✓			

1.8 Test Instruments

Conducted Emission Test

Test Site and Equipment	Manufacturer	Model No. /Serial No.	Last Calibration Date	Calibration Due Date
Spectrum Alayzer	R&S	FSV40/ 101609	2021/10/18	2022/10/18
RFcable	JMCA	MWX/ C0150~C0153, C0161~C0163	2020/12/3	2021/12/3
Test software	R&S	EMC32/ V11.10.00	NCR	NCR
Test room	N/A	TR13	NCR	NCR

Note:

1. The calibrations are traceable to NML/ROC.
2. NCR:No Calibration Required.

Radiated Emission Test (Below 1GHz)

Test Site and Equipment	Manufacturer	Model No. /Serial No.	Last Calibration Date	Calibration Due Date
EMI Receiver	R&S	ESCS30/ 836858/020	2020/10/30	2021/10/30
Spectrum Alayzer	Agilent	E4407B/ MY45106795	2021/6/23	2022/6/23
Antenna	SCHWARZBECK & Mini-Circuits	VULB 9168 & BW-N5W5+/ VULB 9168-668 & 003	2021/5/6	2022/5/6
Pre-amplifier	Mini-circuit	ZKL-1R5+/ 004	2021/7/13	2022/1/13
RF cable	JYEBAO	0214/ C0080-4 + C0080-1 + C0080- 2+RSU(CRC- 011/11)+C0080-3	2021/7/13	2022/1/13
Test software	Audix	e3/ V6.20110303a2	NCR	NCR
Semi-anechoic chamber	ETS. LINDGREN	TR11/ 906-A	2021/4/10	2022/4/10

Note:

1. The calibrations are traceable to NML/ROC.
2. NCR : No Calibration Required.
3. The calibration date of the semi-anechoic chamber listed above is the date of NSA measurement.

Radiated Emission Test (Above 1 GHz)

Test Site and Equipment	Manufacturer	Model No. /Serial No.	Last Calibration Date	Calibration Due Date
Antenna	EMCO	3117/ 0082847	2020/11/3	2021/11/3
Antenna	Com-Power	AH-840/ 101098	2020/12/31	2021/12/31
Pre-amplifier	MITEQ	TTA1800-30-HG- N-M/ 1904295	2020/10/28	2021/10/28
Pre-amplifier	MITEQ	TTA1840-35-HG/ 2034375	2021/9/9	2022/9/9
RFcable	Suhner	Sucoflex 106P / C0091	2021/10/4	2022/10/4
RFcable	JMCA	MWX241/B/ C0103~C0104	2021/4/9	2022/4/9
MXA signal analyzer	KeySight	N9020A/ MY54420147	2021/7/5	2022/7/5
Test software	Audix	e3/ V9 20150907c	NCR	NCR
Semi-anechoic chamber	ETS. LINDGREN	TR1/ 17627-B	2021/2/9	2022/2/9

Note:

1. The calibrations are traceable to NML/ROC.
2. NCR : No Calibration Required.
3. The calibration date of the chamber TR1 listed above is the date of site VSWR measurement.

For Power Line Conducted Measurement

Test Site and Equipment	Manufacturer	Model No./ Serial No.	Last Calibration Date	Calibration Due Date
Test Receiver	R&S	ESCI/ 100316/003	2021/4/9	2022/4/9
LISN	R&S	ESH2-Z5/ 880669/039	2021/4/23	2022/4/23
2 nd LISN	R&S	ESH2-Z5/ 836613/001	2021/9/6	2022/9/6
50Ω terminator	SHHNER	65 BNC-50-0-1/133 NE/004	2021/6/1	2022/6/1
RF Cable	JYBAO	0214/ C0113 + RSU + C0114	2021/8/18	2022/2/18
RF Cable	JYBAO	0214/ C0112 + RSU + C0114	2021/8/18	2022/2/18
Test Software	Audix	e3/ V6.20110303a2	NCR	NCR
TR20 shielded room	ETS LINDGREN	T R20/ 17873-2	NCR	NCR

Note:

1. The calibrations are traceable to NML/ROC.
2. NCR : No Calibration Required.

1.9 Test Capability

Test Facility

The test facility used for evaluating the conformance of the EUT with each standard in the present report meets what required in CISPR16 series and ANSI C63.4:2014 amended as per ANSI C63.4a:2017.

Test Room	Type of Test Room	Descriptions
TR1	10m semi-anechoic chamber	For the radiated emission measurement (below 1GHz)
TR1	3m fully-anechoic chamber	For the radiated emission measurement (above 1GHz)
TR11	3m semi-anechoic chamber	For the radiated emission measurement (below 1GHz)
TR13	Test Site	For the RF conducted emission measurement.
TR5	Shielding Room	For the conducted emission measurement.
TR20	Shielding Room	

Test Laboratory Competence Information

Central Research Technology Co. has been accredited / filed / authorized by the agencies listed in the following table.

Certificate	Nation	Agency	Code	Mark
Accreditation Certificate	USA	NVLAP	200575-0	ISO/IEC 17025
	USA	FCC	TW1104, TW0019	ISO/IEC 17025
	R.O.C. (Taiwan)	TAF	0905	ISO/IEC 17025
	R.O.C. (Taiwan)	BSMI	SL2-IN-E-0033, SL2-IS-E-0033, SL2-R1/R2-E-0033, SL2-A1-E-0033, SL2-L1-E-0033	ISO/IEC 17025
	Canada	ISED	TW0905	ISO/IEC 17025
Site Filing Document	Japan	VCCI	R-11527,C-11609,T-11441, G-10010,C-20010, G-10614, T-20009	Test facility list & NSA Data
Authorization Certificate	Germany	TUV	UA 50235497	ISO/IEC 17025

The copy of each certificate can be downloaded from our web site: www.crc-lab.com

1.10 Measurement Uncertainty

The assessed measurement uncertainty with a suitable coverage factor K to ensure 95% confidence level for the normal distribution are shown as below, the values are less than U_{CISPR} in table 1 of CISPR 16-4-2.

Test Item	Measurement Uncertainty	
Occupied bandwidth	1.2%	
Conducted emission	0.9 dB	
Radiated Emission: (9kHz~30MHz)	Horizontal 3.92dB ; Vertical 3.92dB	
Radiated Emission: (30MHz~1000MHz)	Horizontal 4.42dB ; Vertical 5.98dB	
Radiated Emission: (1GHz~6GHz)	Horizontal 4.60dB ; Vertical 4.48dB	
Radiated Emission: (6GHz~18GHz)	Horizontal 4.66dB ; Vertical 4.58dB	
Radiated Emission: (18GHz~40GHz)	Horizontal 4.74dB ; Vertical 4.76dB	
Line Conducted Emission	NSLK-8128-RC	2.48 dB
	ENV 4200	2.52 dB
	ESH2-Z5	2.20 dB

2 6dB Bandwidth

Result: Pass

2.1 Applied standard

According to According to FCC 15.247(a)(2), the minimum 6 dB bandwidth shall be at least 500 kHz.

2.2 Measurement Procedure

- a. The EUT was set up per the test configuration figured in the next section of this chapter to simulate the typical usage per the user's manual.
- b. A software provided by client enabled the EUT to transmit data at middle channel frequencies individually.
- c. Test procedures follow ANSI C63.10 Section 11.8.1.
- d. Spectrum Alayzer Setting: RBW=100 kHz, VBW=300 kHz, Max peak.
- e. Measure the 6dB bandwidth and compare with the required limit.

2.3 Test configuration



2.4 Test Data

Test Mode : Continuous transmitter

Tester : Wayne

Ambient Temperature : 25°C

Relative Humidity : 51%

Test Date : 110/11/9

802.11b

Operating Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (kHz)
2412	9.6	> 500
2437	10.1	> 500
2462	9.7	> 500

802.11g

Operating Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (kHz)
2412	15.6	> 500
2437	15.4	> 500
2462	15.8	> 500

802.11n HT20

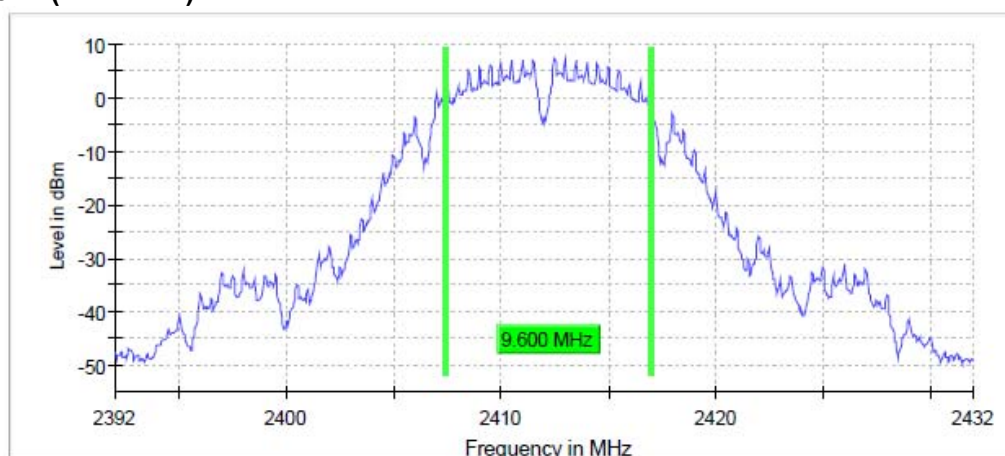
Operating Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (kHz)
2412	15.2	> 500
2437	15.2	> 500
2462	15.2	> 500

802.11n HT40

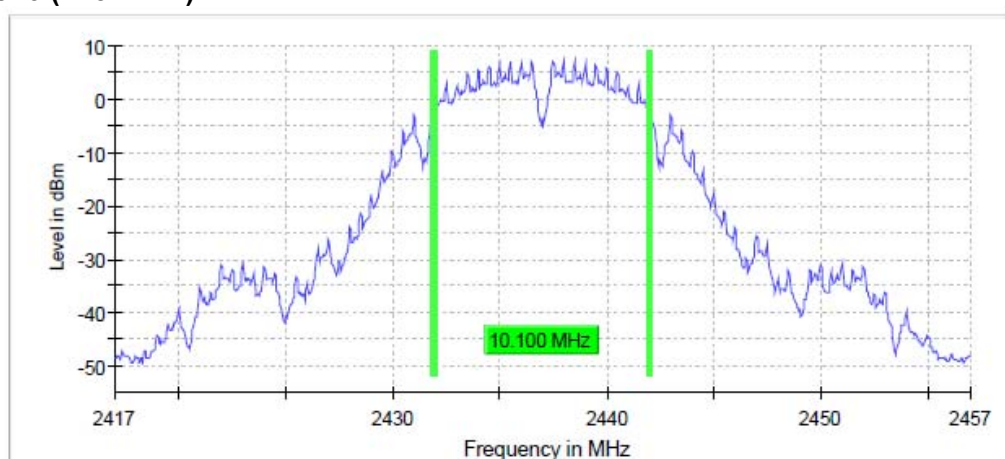
Operating Frequency (MHz)	6 dB Bandwidth (MHz)	Limit (kHz)
2422	35.3	> 500
2437	35.3	> 500
2452	35.3	> 500

802.11b

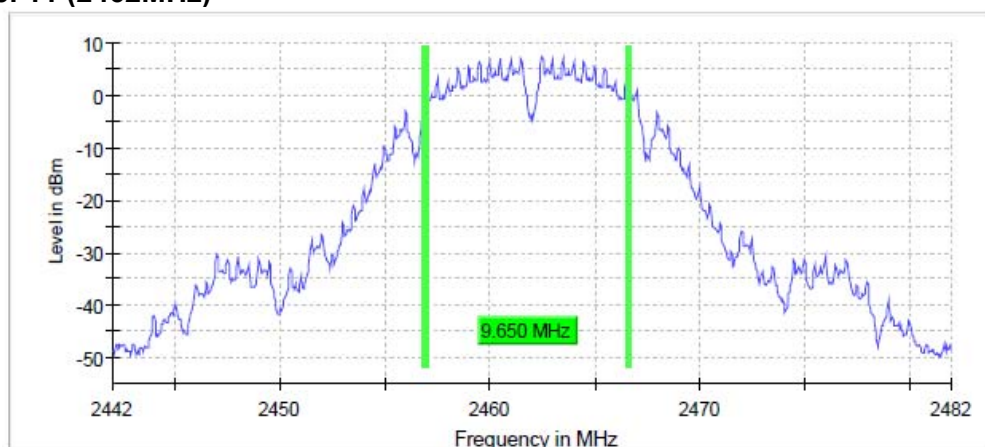
Channel 1 (2412MHz)



Channel 6 (2437MHz)

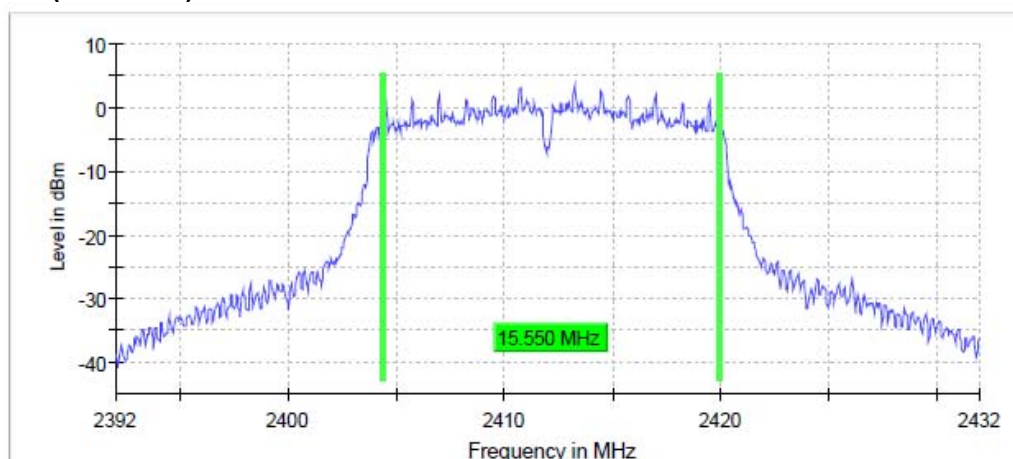


Channel 11 (2462MHz)

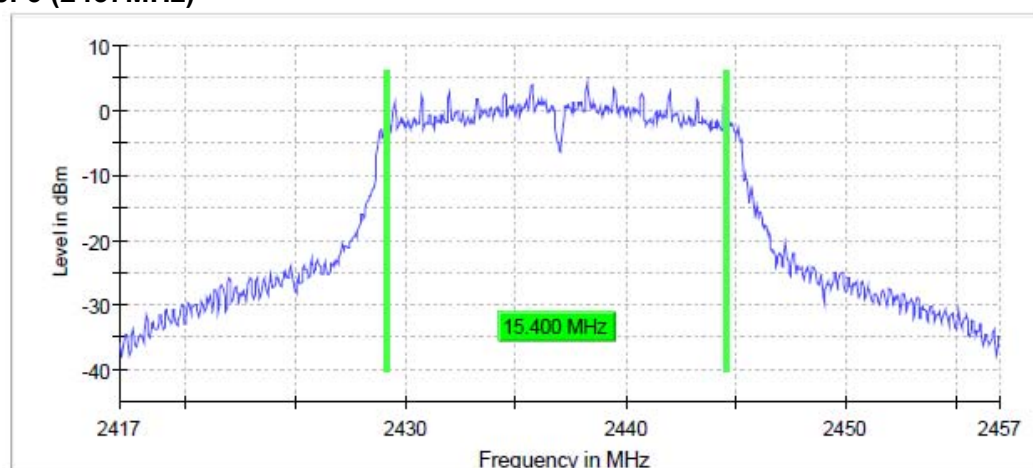


802.11g

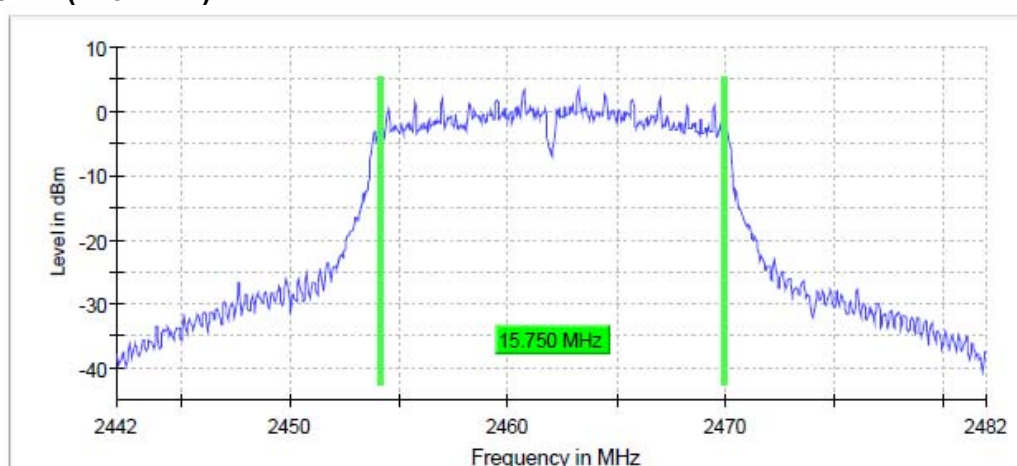
Channel 1 (2412MHz)



Channel 6 (2437MHz)

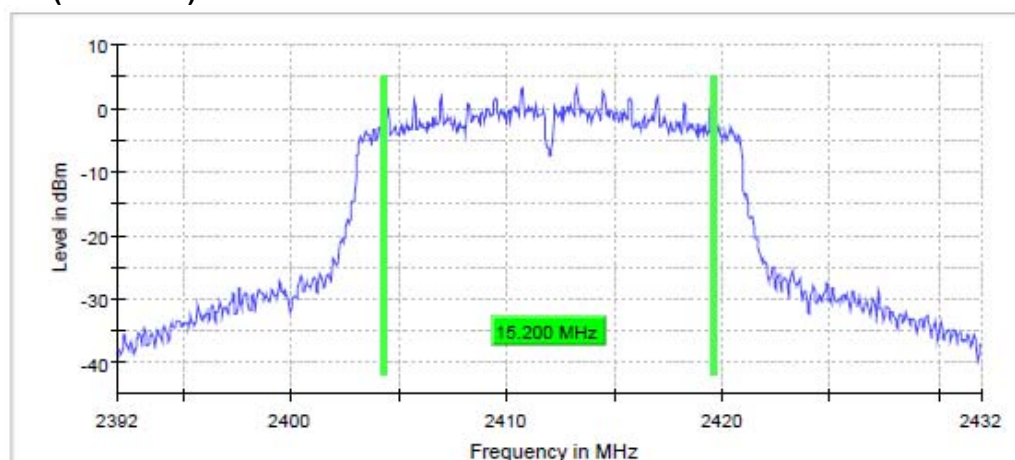


Channel 11 (2462MHz)

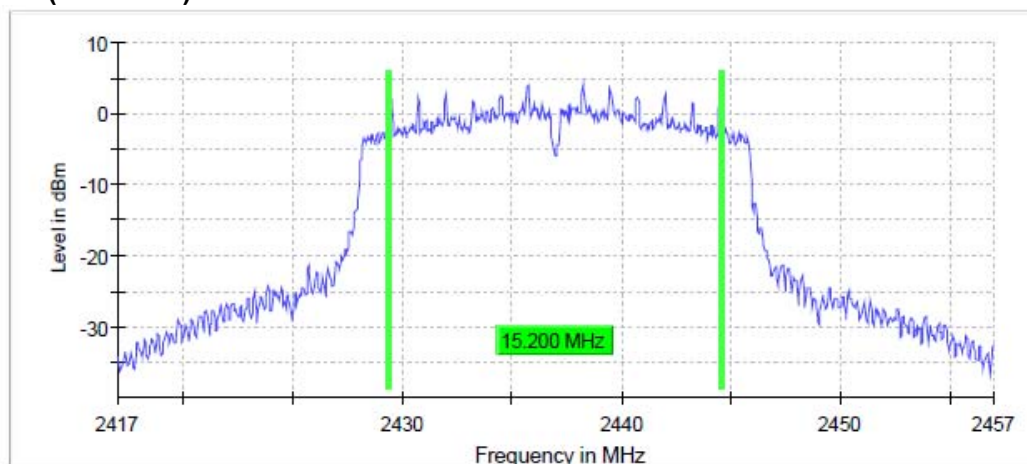


802.11n HT20

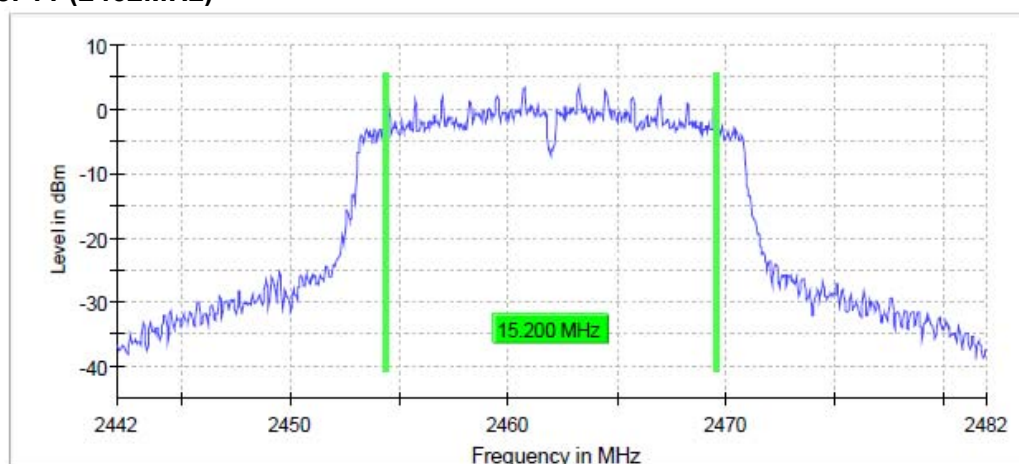
Channel 1 (2412MHz)



Channel 6 (2437MHz)

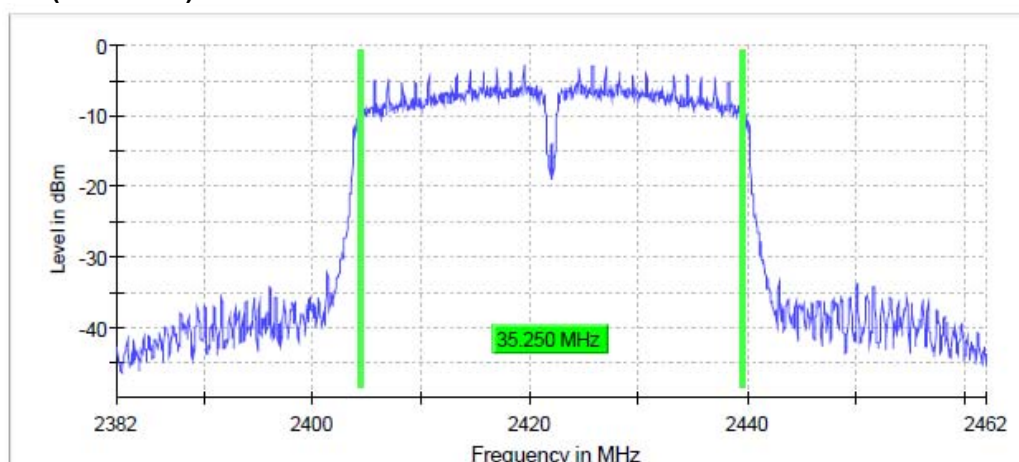


Channel 11 (2462MHz)

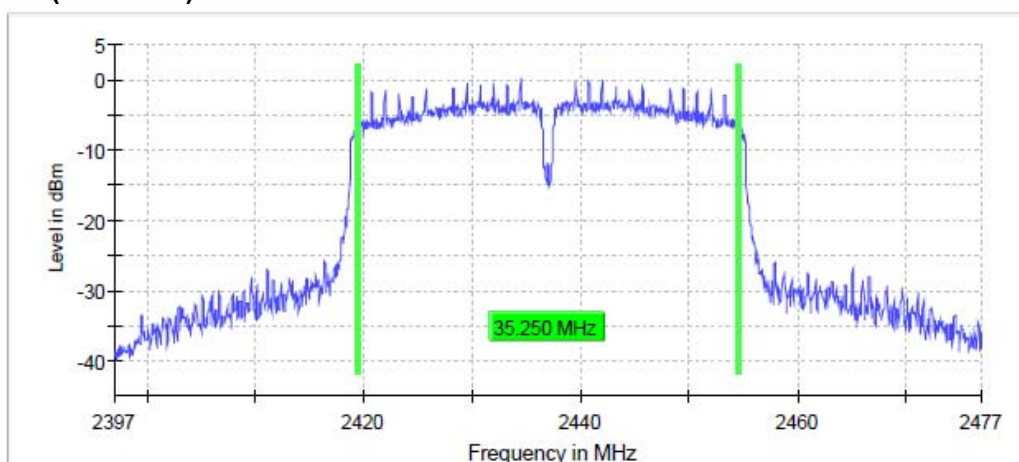


802.11n HT40

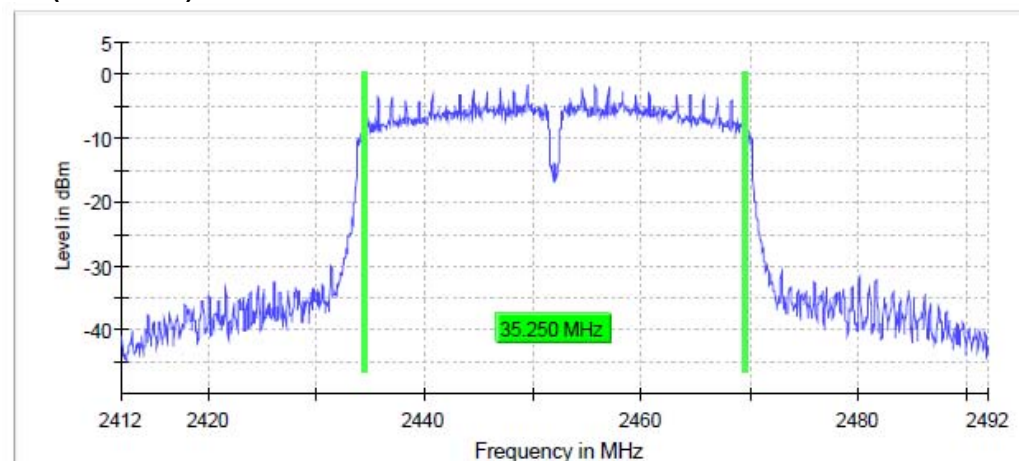
Channel 3 (2422MHz)



Channel 6 (2437MHz)



Channel 9 (2452MHz)



3 Maximum Peak Output Power

Result: Pass

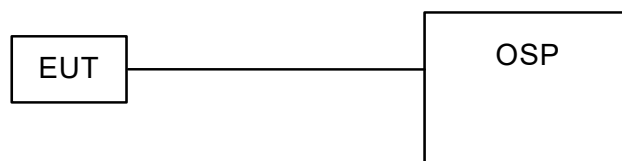
3.1 Applied standard

According to FCC 15.247(b)(3), for systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.

3.2 Measurement Procedure

- a. The EUT was set up per the test configuration figured in the next section of this chapter to simulate the typical usage per the user's manual.
- b. Test procedures follow ANSI C63.10 section 11.9.2.3.2
- c. Measurement the Maximum Peak Output Power and compare with the required limit.

3.3 Test configuration



3.4 Test Data

Test Mode : Continuous transmitter

Tester : Wayne

Ambient Temperature : 25°C

Relative Humidity : 51%

Test Date : 110/11/9

802.11b

Operating Frequency (MHz)	RMS output power (dBm)	Limit (dBm)	Margin (dB)
2412	16.0	30	14.0
2437	16.0	30	14.0
2462	16.1	30	13.9

Note:

1. Margin(dB)=Limit- output power

802.11g

Operating Frequency (MHz)	RMS output power (dBm)	Limit (dBm)	Margin (dB)
2412	13.9	30	16.1
2437	14.6	30	15.4
2462	13.9	30	16.1

Note:

1. Margin(dB)=Limit- output power

802.11n HT20

Operating Frequency (MHz)	RMS output power (dBm)	Limit (dBm)	Margin (dB)
2412	13.7	30	16.3
2437	14.5	30	15.5
2462	13.8	30	16.2

Note:

1. Margin(dB)=Limit- output power

802.11 n HT40

Operating Frequency (MHz)	RMS output power (dBm)	Limit (dBm)	Margin (dB)
2422	10.8	30	19.2
2437	13.8	30	16.2
2452	11.9	30	18.1

Note:

1. Margin(dB)=Limit- output power

4 Power Spectral Density

Result: Pass

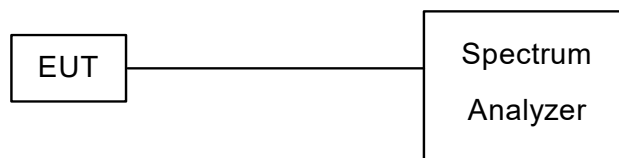
4.1 Applied standard

According to FCC 15.247(e), for digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

4.2 Measurement Procedure

- a. The EUT was set up per the test configuration figured in the next section of this chapter to simulate the typical usage per the user's manual.
- b. Test procedures follow ANSI C63.10 section 11.10.5.
- c. Spectrum Alayzer Setting: RBW=100 kHz, VBW=300 kHz, Max peak.
- d. Measure the power spectrtal density and compare with the required limit.

4.3 Test configuration



4.4 Test Data

Test Mode : Continuous transmitter

Tester : Wayne

Ambient Temperature : 25°C

Relative Humidity : 51%

Test Date : 110/11/9

802.11b

Operating Frequency (MHz)	Power spectral Density (dBm/100kHz)	Limit (dBm/3kHz)	Margin (dB)
2412	7.2	8	0.8
2437	7.3	8	0.7
2462	7.3	8	0.7

802.11g

Operating Frequency (MHz)	Power spectral Density (dBm/100kHz)	Limit (dBm/3kHz)	Margin (dB)
2412	3.4	8	4.6
2437	4.2	8	3.8
2462	3.5	8	4.5

802.11n HT20

Operating Frequency (MHz)	Power spectral Density (dBm/100kHz)	Limit (dBm/3kHz)	Margin (dB)
2412	3.2	8	4.8
2437	4.1	8	3.9
2462	3.4	8	4.6

802.11n HT40

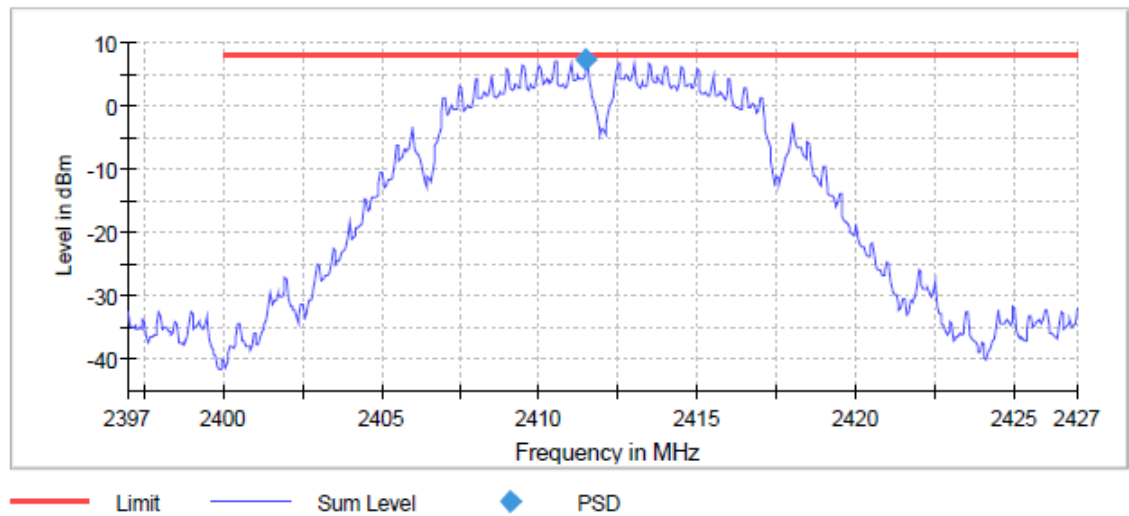
Operating Frequency (MHz)	Power spectral Density (dBm/100kHz)	Limit (dBm/3kHz)	Margin (dB)
2422	-2.7	8	10.7
2437	0.3	8	7.7
2452	-1.5	8	9.5

Note:

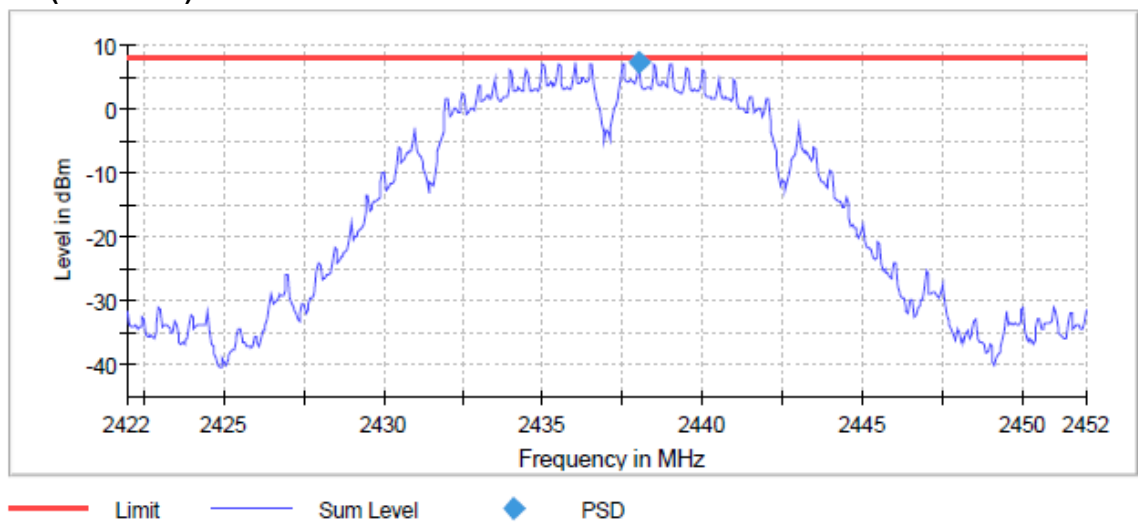
1. Margin (dB) = Limit – Peak Power

802.11b

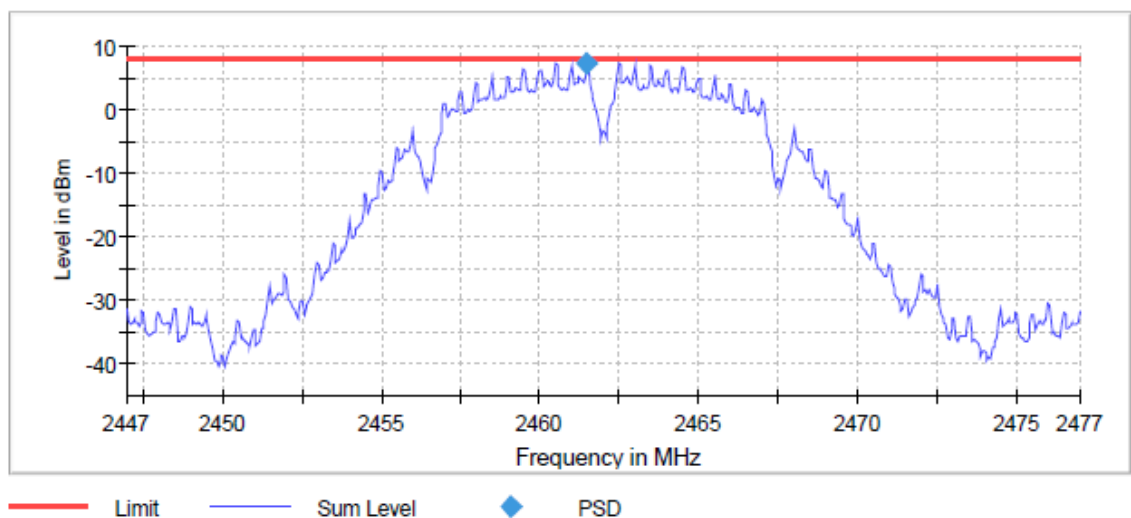
Channel 1 (2412MHz)



Channel 6 (2437MHz)

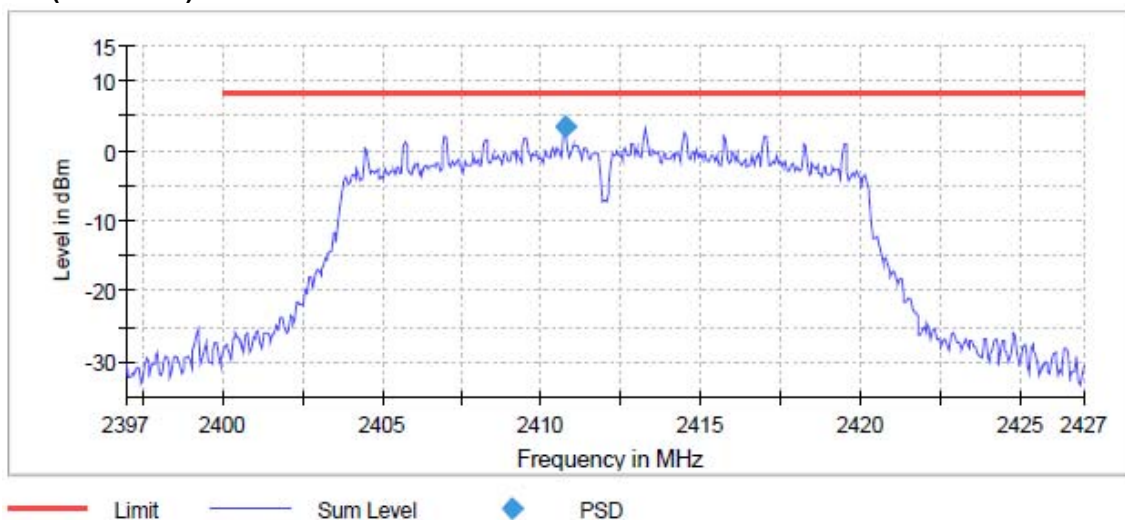


Channel 11 (2462MHz)

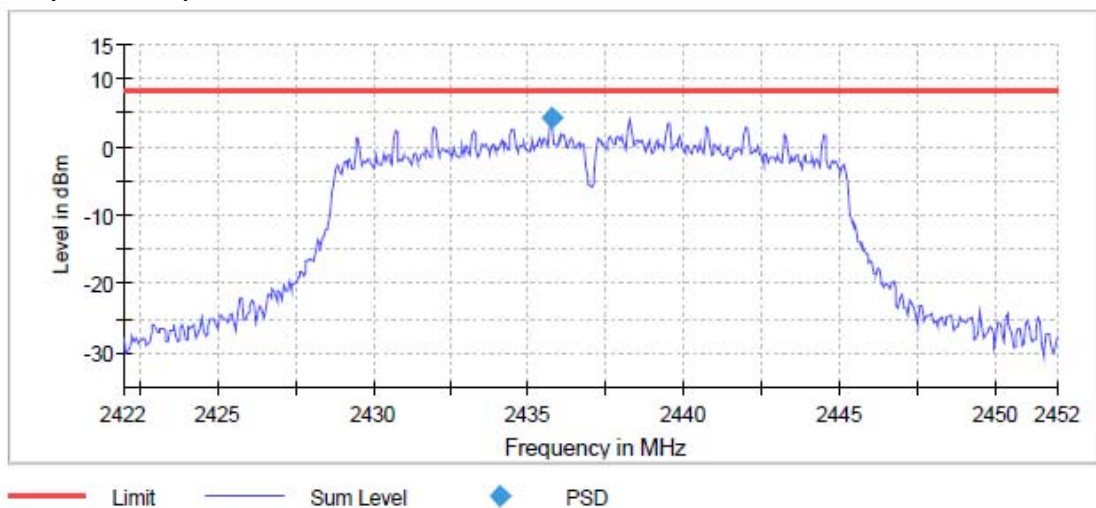


802.11g

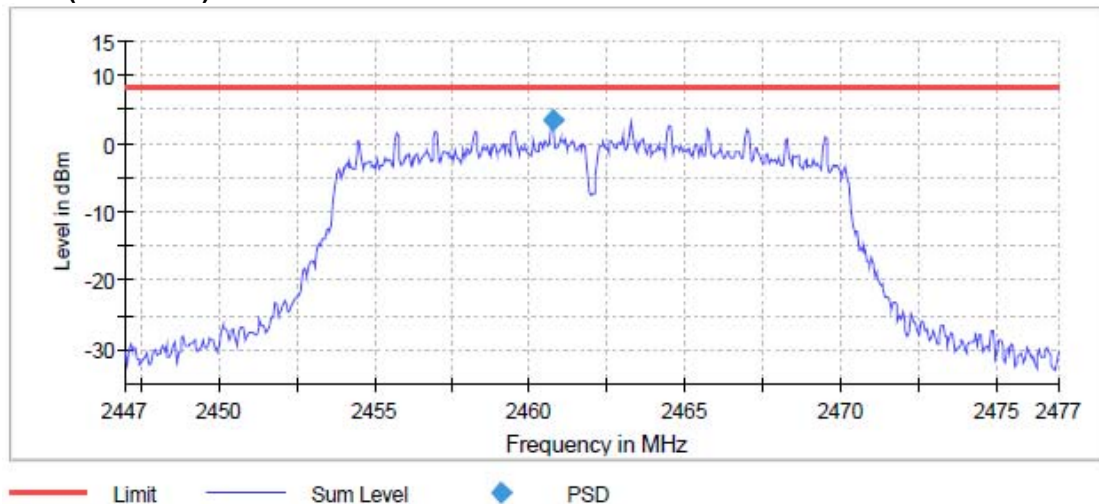
Channel 1 (2412MHz)



Channel 6 (2437MHz)

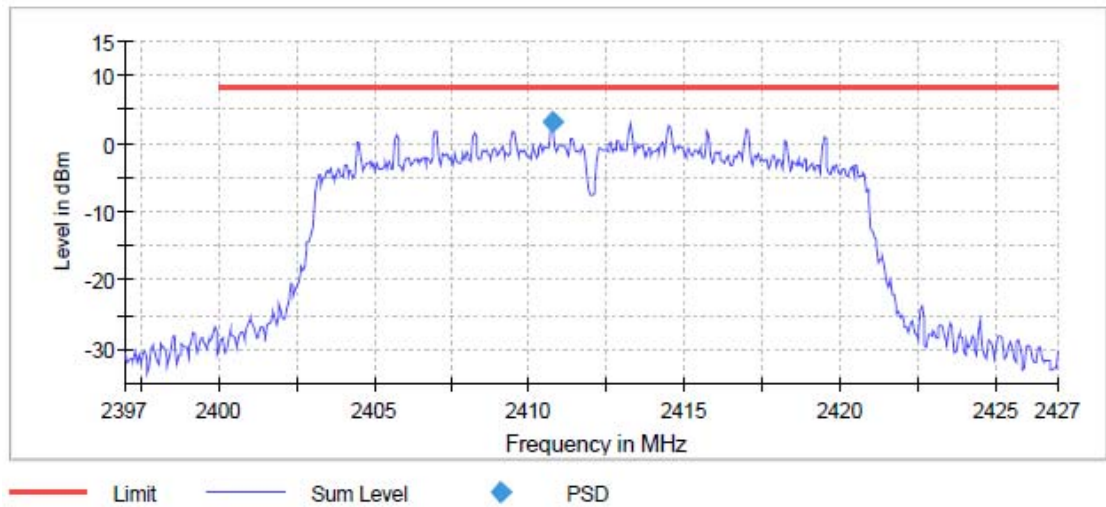


Channel 11 (2462MHz)

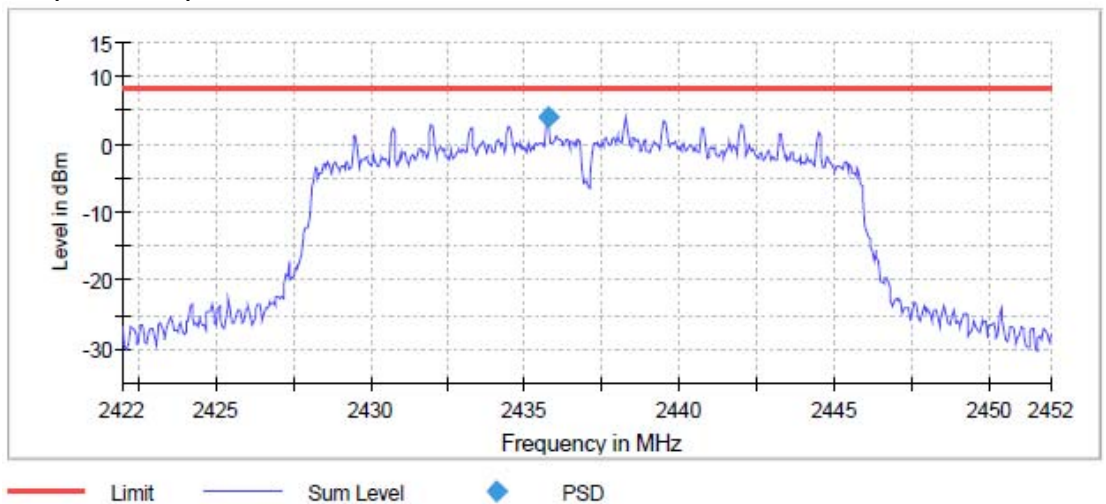


802.11n 20HT

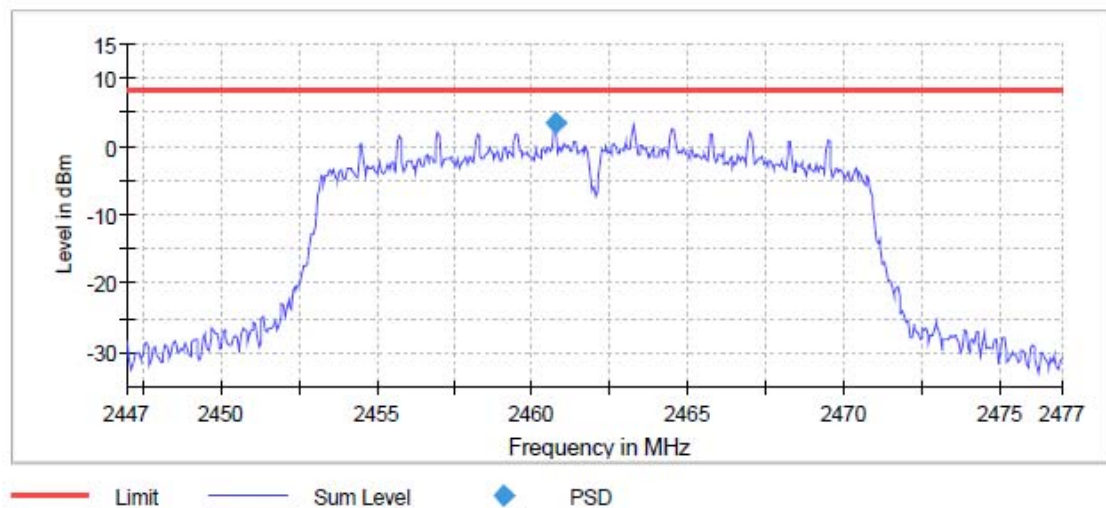
Channel 1 (2412MHz)



Channel 6 (2437MHz)

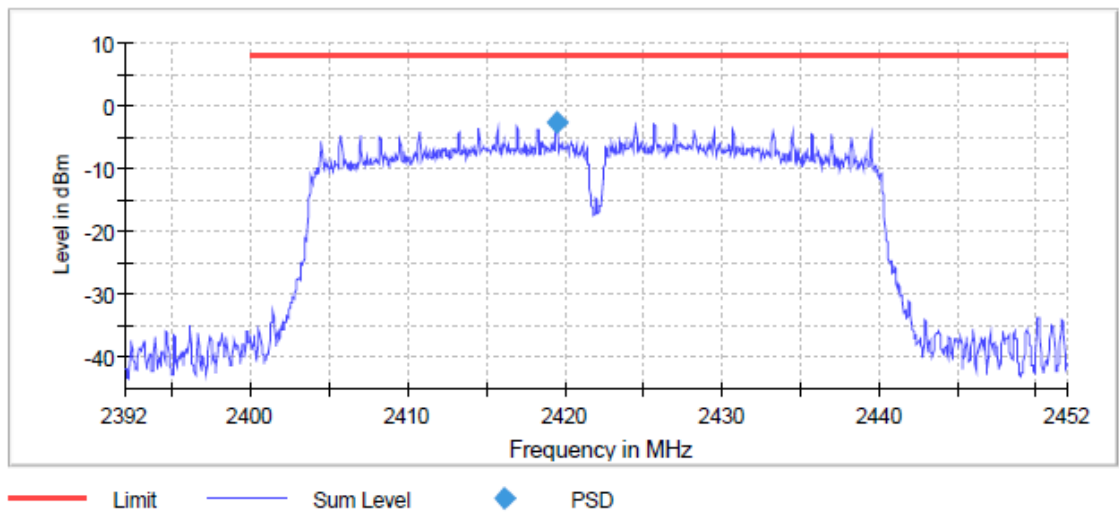


Channel 11 (2462MHz)

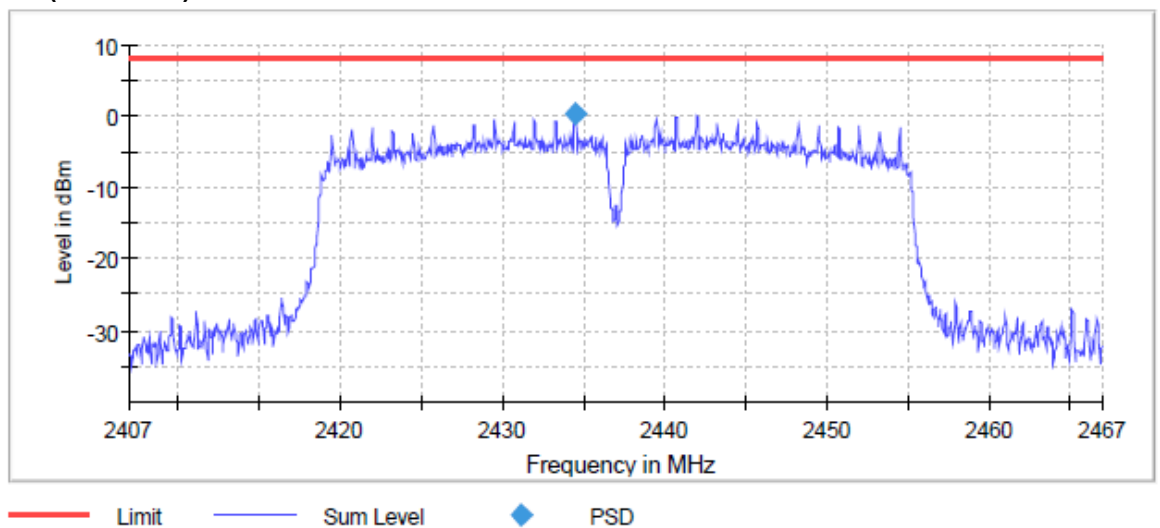


802.11n 40HT

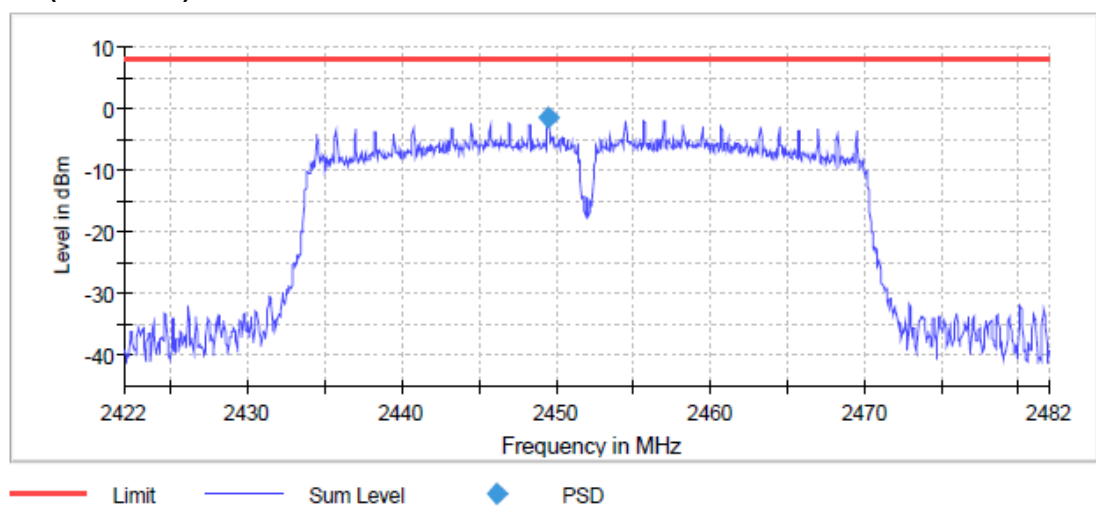
Channel 3 (2422MHz)



Channel 6 (2437MHz)



Channel 9 (2452MHz)



5 Conducted Spurious emission

Result: Pass

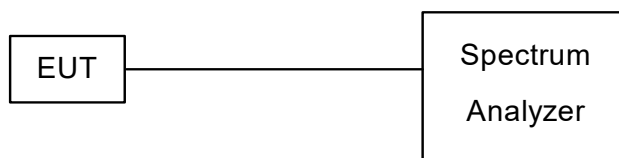
5.1 Applied standard

According to FCC 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph FCC 15.247(b)(3), the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in FCC 15.209(a) are not required.

5.2 Measurement Procedure

- a. The EUT was set up per the test configuration figured in the next section of this chapter to simulate the typical usage per the user's manual.
- b. The software provided by client enabled the EUT to transmit data at low and high channel frequencies individually.
- c. Test procedures follow ANSI C63.10 section 11.11.
- d. Spectrum Alayzer Setting: RBW=100 kHz, VBW=300 kHz, Max peak
- e. Measurement the conducted spurious emission and compare with the required limit.

5.3 Test configuration



5.4 Test Data

Bandedge

Test Mode : Continuous transmitter

Tester : Wayne

Ambient Temperature : 25°C

Relative Humidity : 51%

Test Date : 110/11/9

802.11b

Operating Frequency (MHz)	Max emission of in band (dBm)	Frequency of out band max emission (MHz)	Max emission of out band (dBm)	Limit (dBm)	Margin (dB)
2412	7.2	2397.5	-31.4	-22.8	8.6
2462	7.3	2483.7	-45.2	-22.7	22.5

802.11g

Operating Frequency (MHz)	Max emission of in band (dBm)	Frequency of out band max emission (MHz)	Max emission of out band (dBm)	Limit (dB)	Margin (dB)
2412	3.5	2398.2	-26.8	-26.5	0.3
2462	3.5	2483.8	-39.0	-26.5	12.5

802.11n HT20

Operating Frequency (MHz)	Max emission of in band (dBm)	Frequency of out band max emission (MHz)	Max emission of out band (dBm)	Limit (dBm)	Margin (dB)
2412	1.5	2399.5	-29.4	-28.5	0.9
2462	3.4	2483.8	-38.0	-26.6	11.4

802.11n HT40

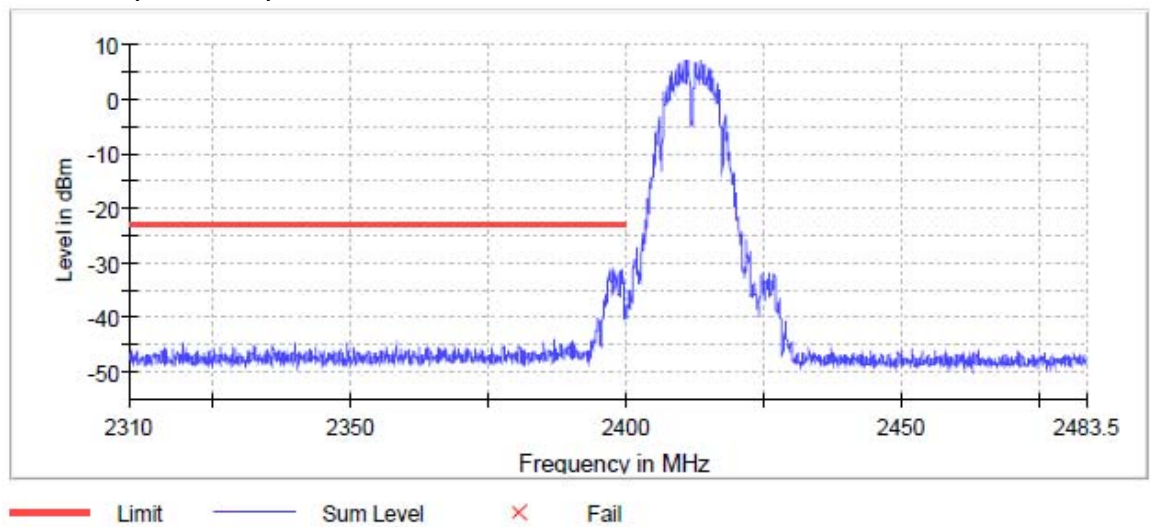
Operating Frequency (MHz)	Max emission of in band (dBm)	Frequency of out band max emission (MHz)	Max emission of out band (dBm)	Limit (dBm)	Margin (dB)
2422	-2.7	2396.1	-33.2	-32.7	0.5
2452	-1.6	2486.1	-33.0	-31.6	1.4

Note:

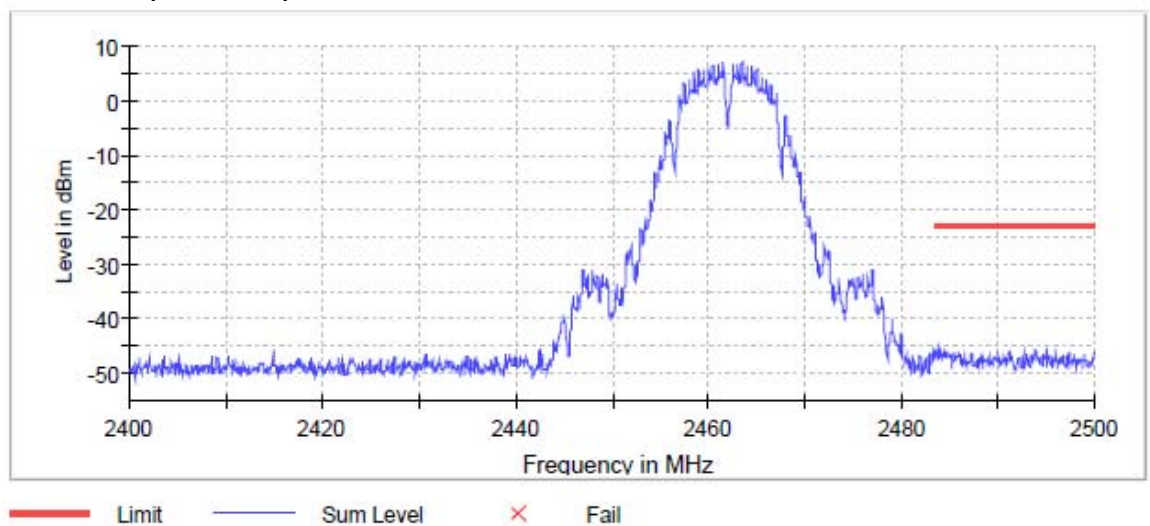
1. Limit(dBm) = Max emission of in band - 30
2. Margin (dB) = Limit – Max emission of out band

802.11b

Channel 1 (2412MHz)

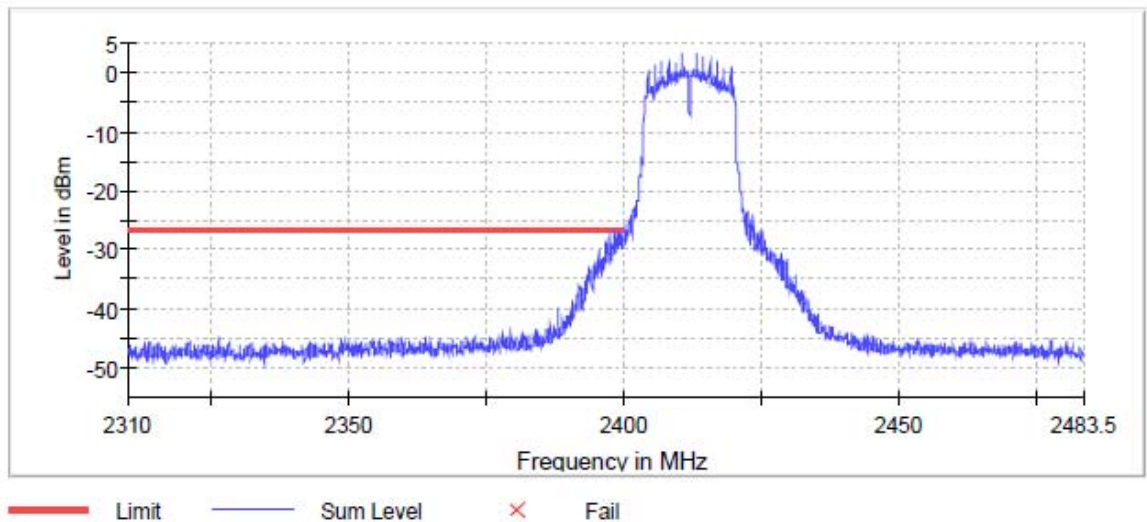


Channel 11 (2462MHz)

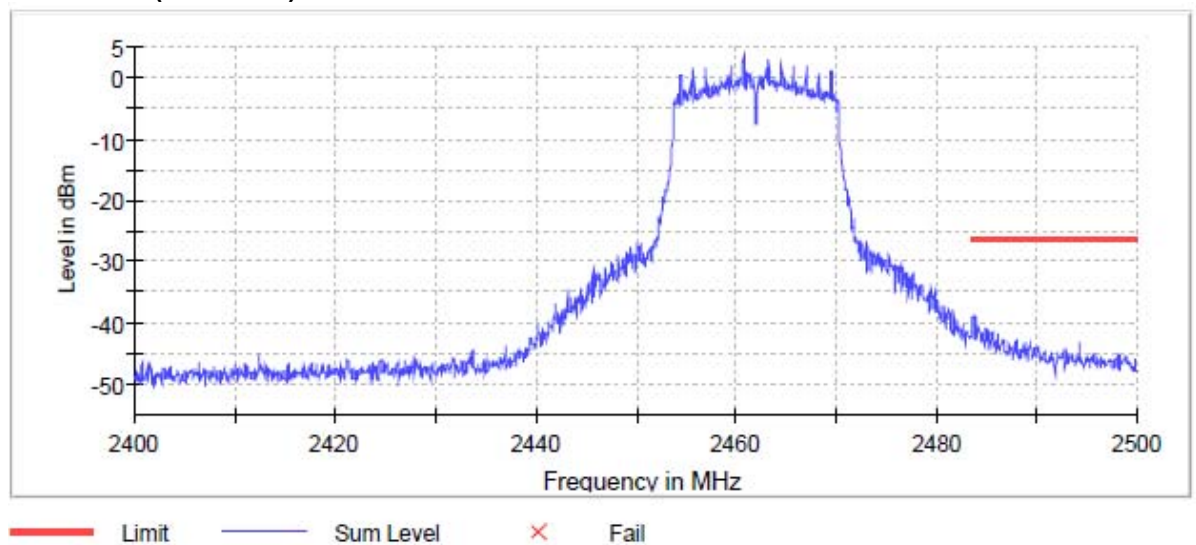


802.11g

Channel 1 (2412MHz)

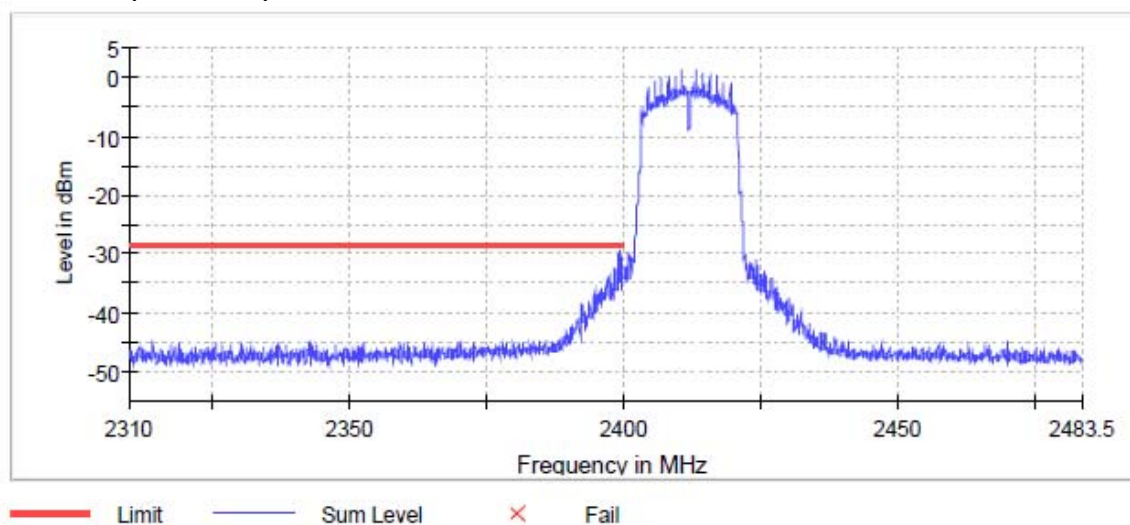


Channel 11 (2462MHz)

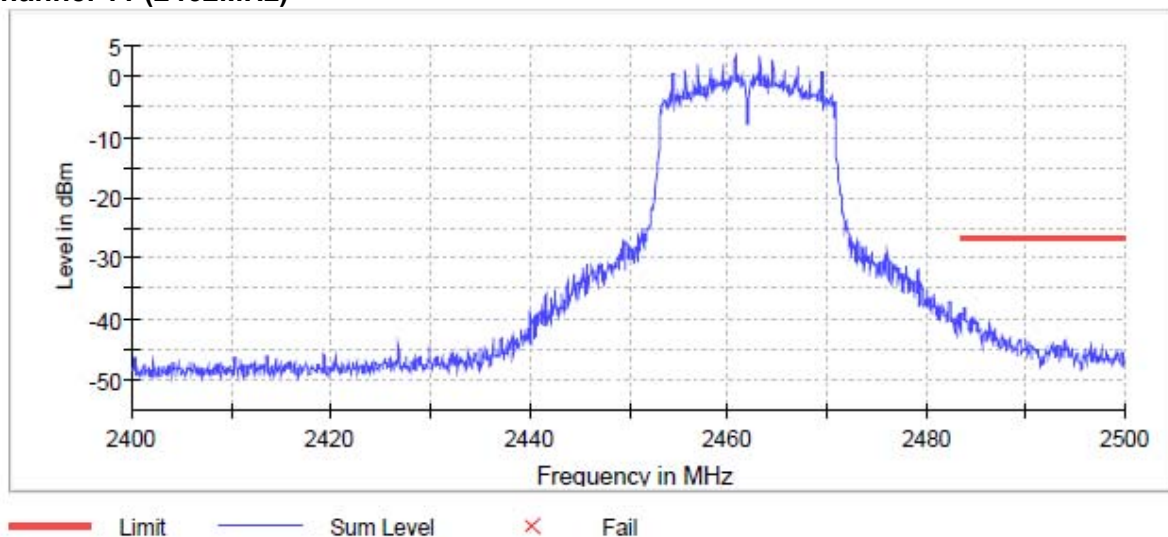


802.11n HT20

Channel 1 (2412MHz)

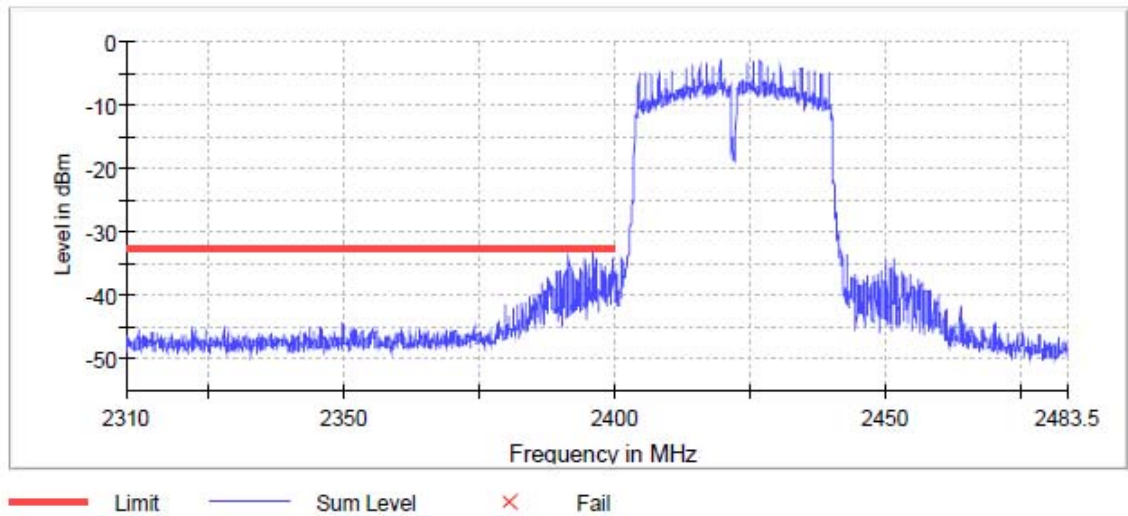


Channel 11 (2462MHz)

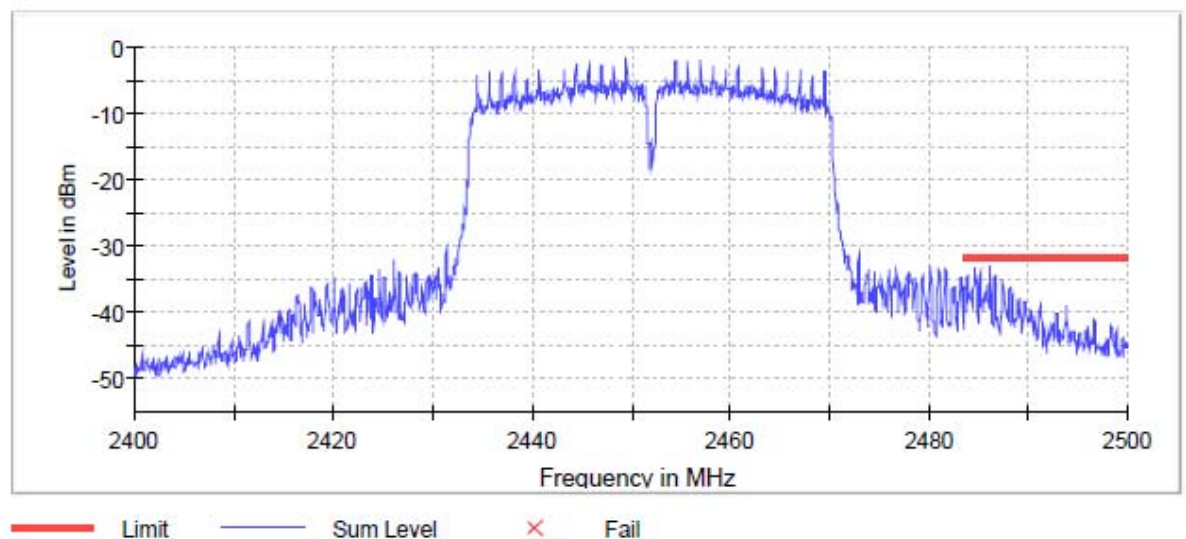


802.11n HT40

Channel 3 (2422MHz)



Channel 9 (2452MHz)

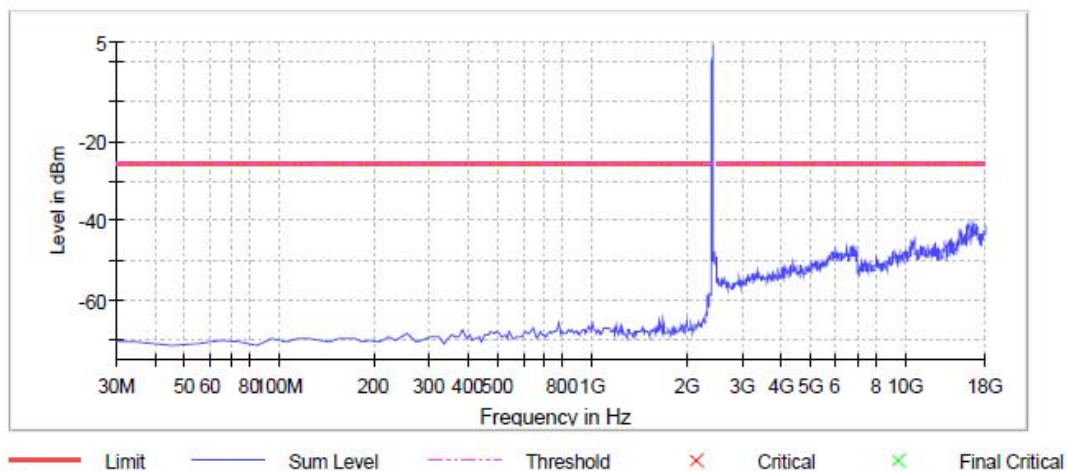


Out of band emission**Test Mode : Continuous transmitter****Tester : Wayne****Ambient Temperature : 25°C****Relative Humidity : 51%****Test Date : 110/11/9**

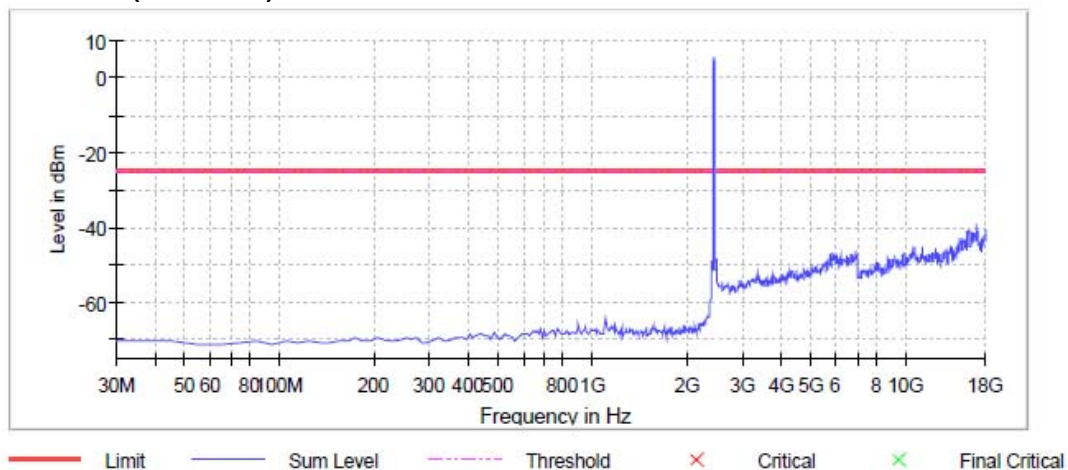
No signal can be detected from 18GHz to 25GHz, so the graphs are omitted above 18GHz

802.11b

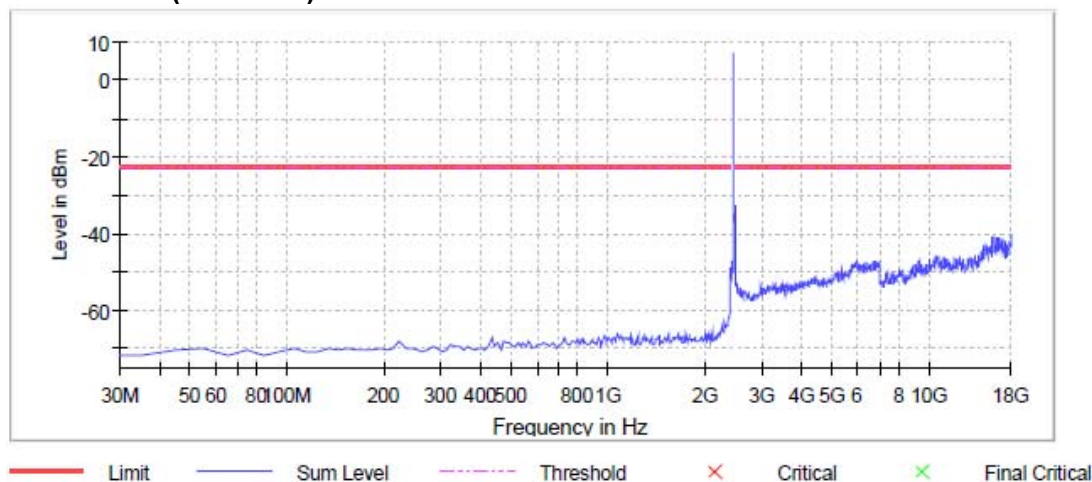
Channel 1 (2412MHz)



Channel 6 (2437MHz)

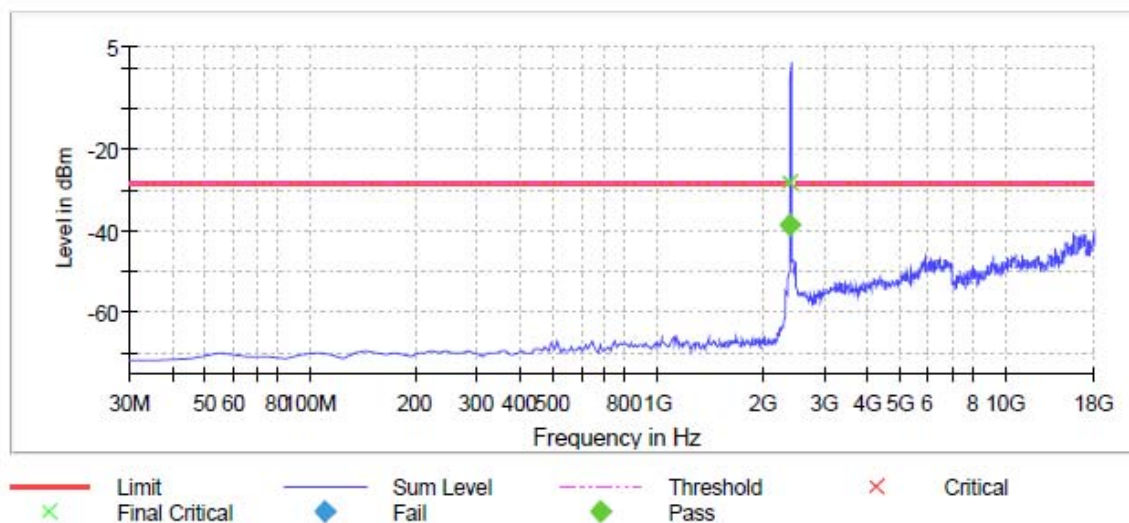


Channel 11 (2462MHz)



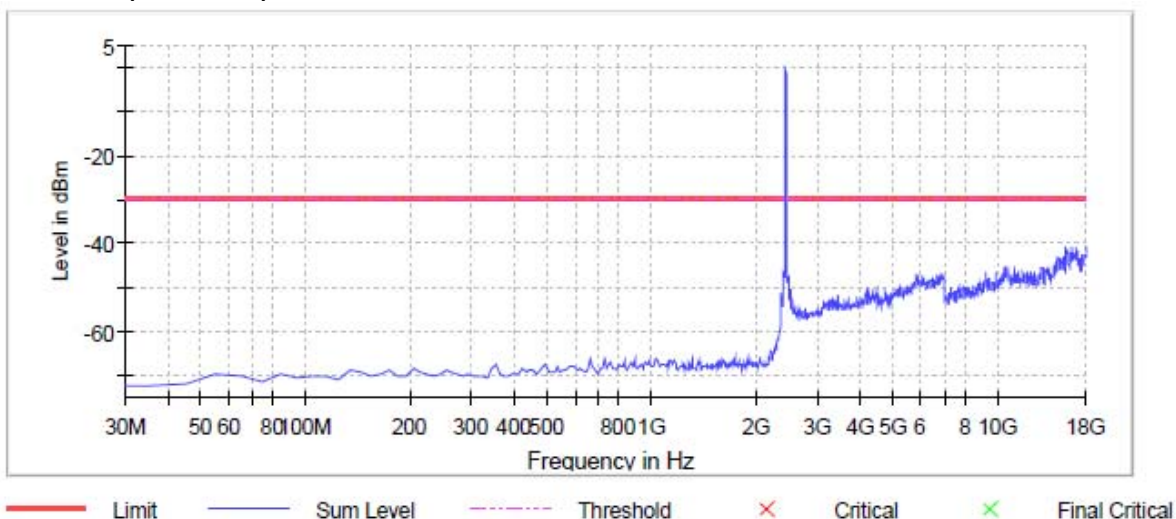
802.11g

Channel 1 (2412MHz)

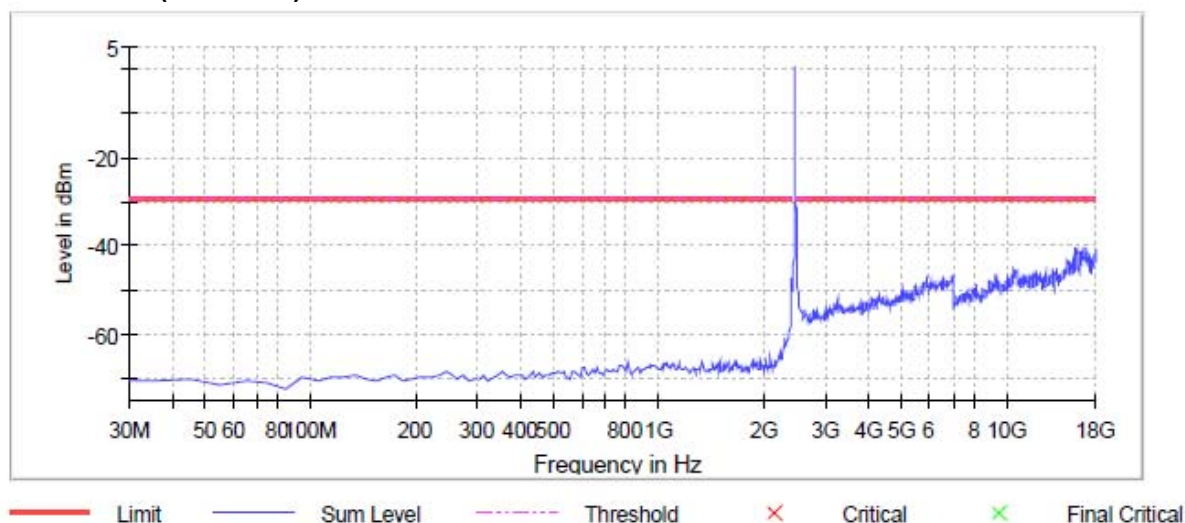


Note: X is Banedge point.

Channel 6 (2437MHz)

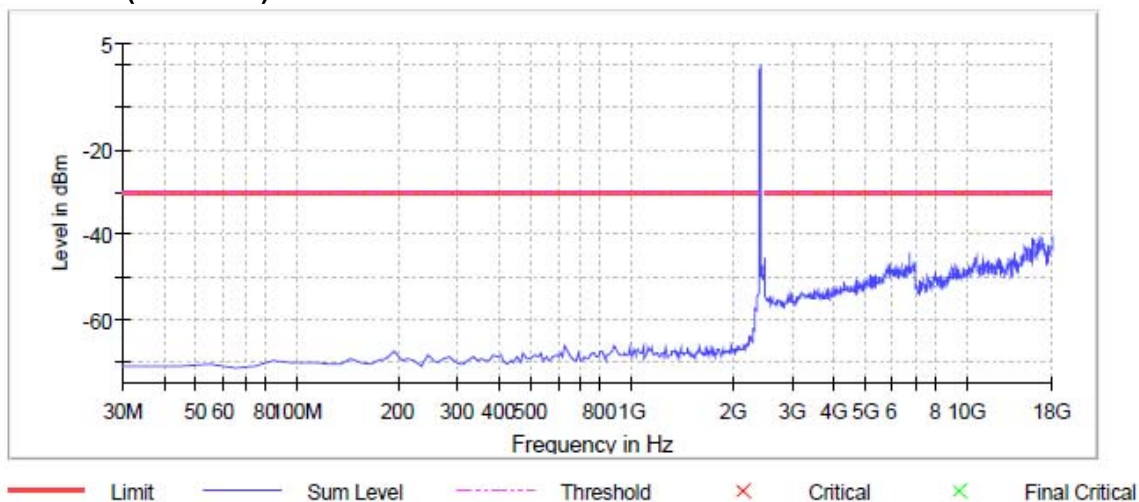


Channel 11 (2462MHz)

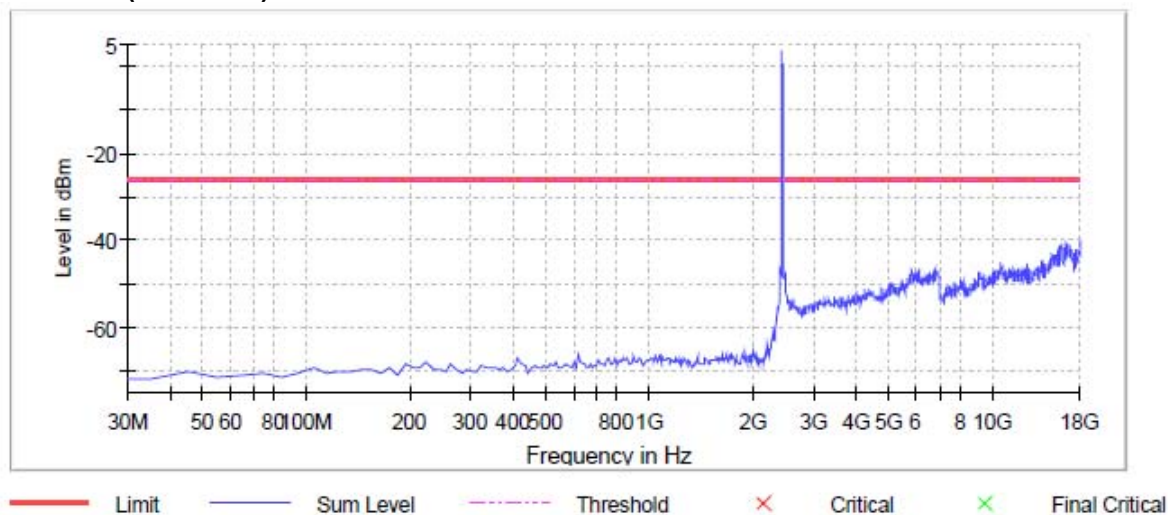


802.11n HT20

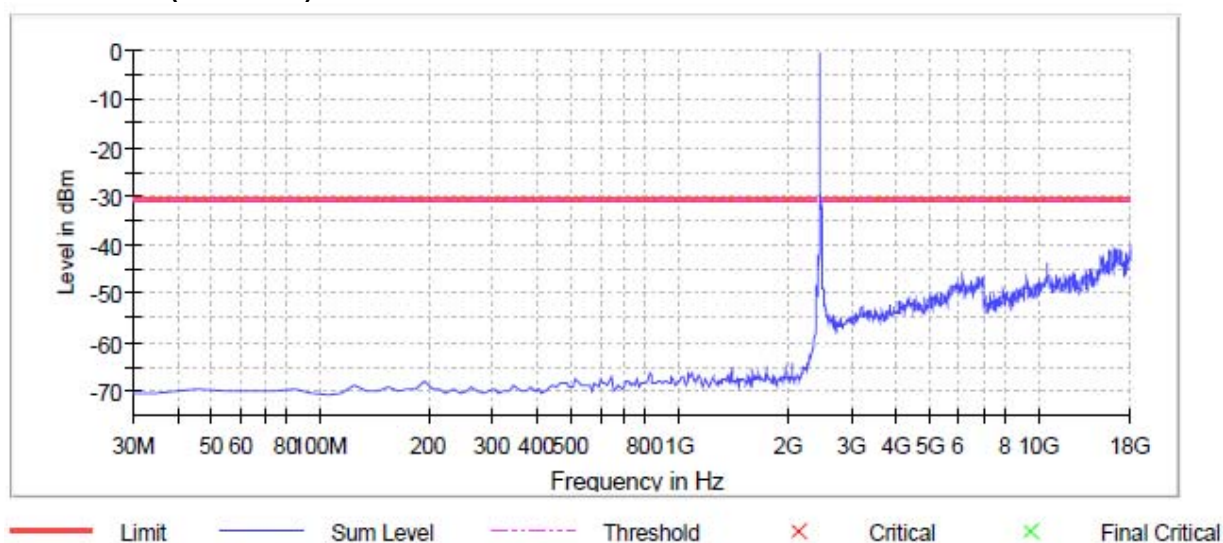
Channel 1 (2412MHz)



Channel 6 (2437MHz)

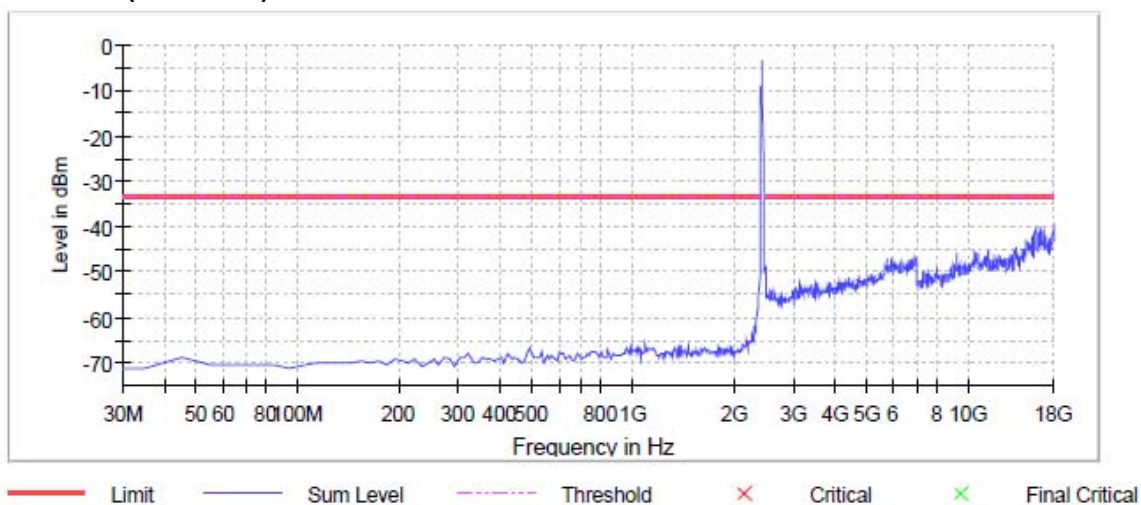


Channel 11 (2462MHz)

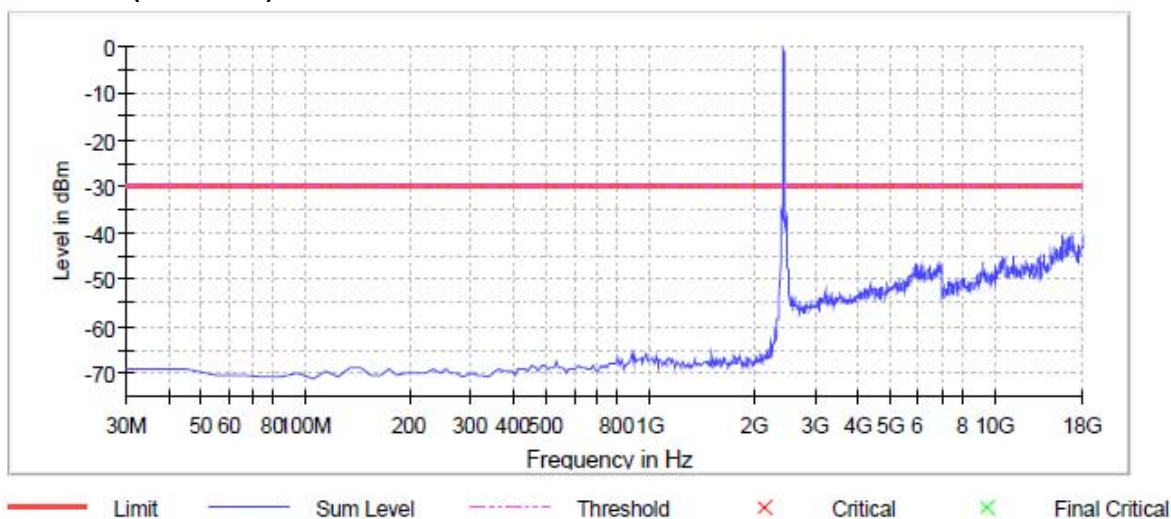


802.11n HT40

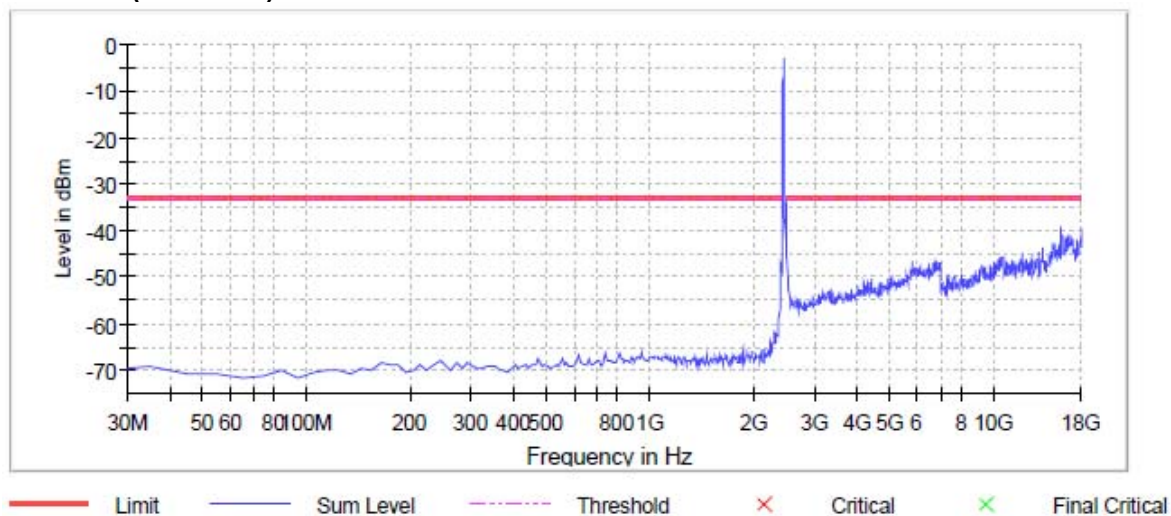
Channel 3 (2422MHz)



Channel 6 (2437MHz)



Channel 9 (2452MHz)



6 Radiated Spurious Emission

Result: Pass

6.1 Applied standard

According to FCC 15.247(d), fall in the restricted bands, as defined in FCC 15.205(a), must also comply with the radiated emission limits specified in FCC 15.209(a).

The amplitude of spurious emission are attenuated by more than 20 dB below the permissible value has no need to be reported.

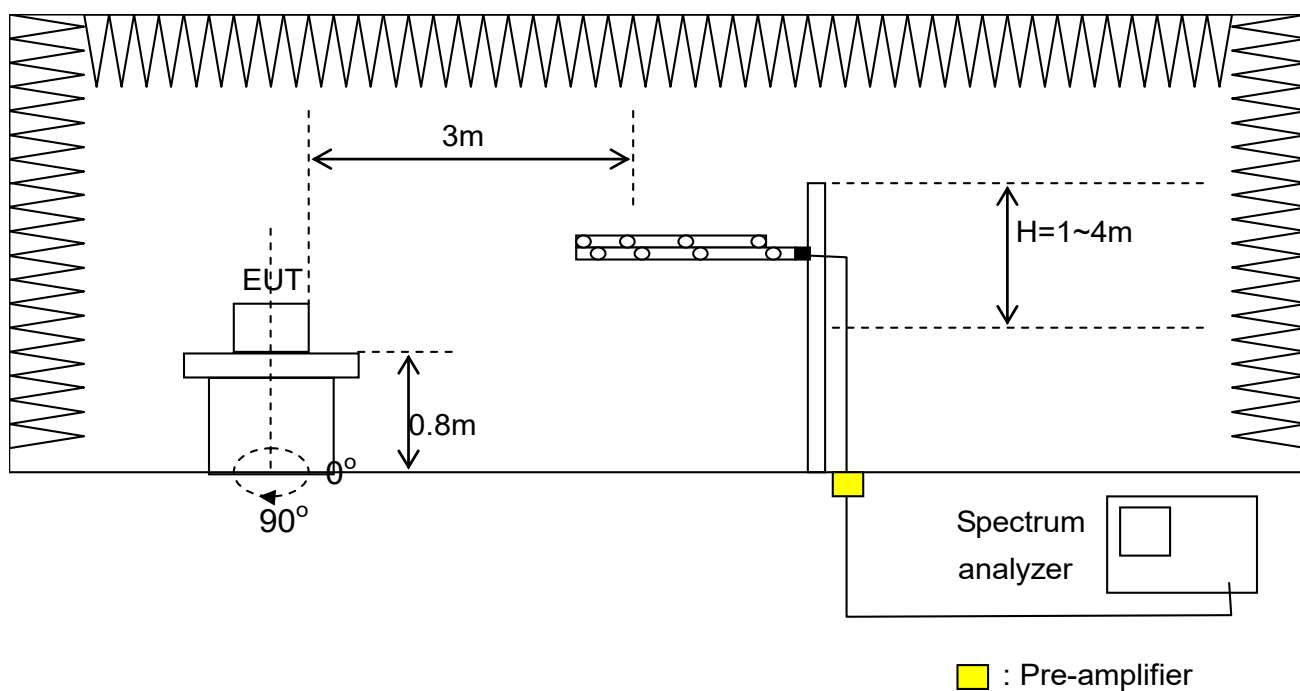
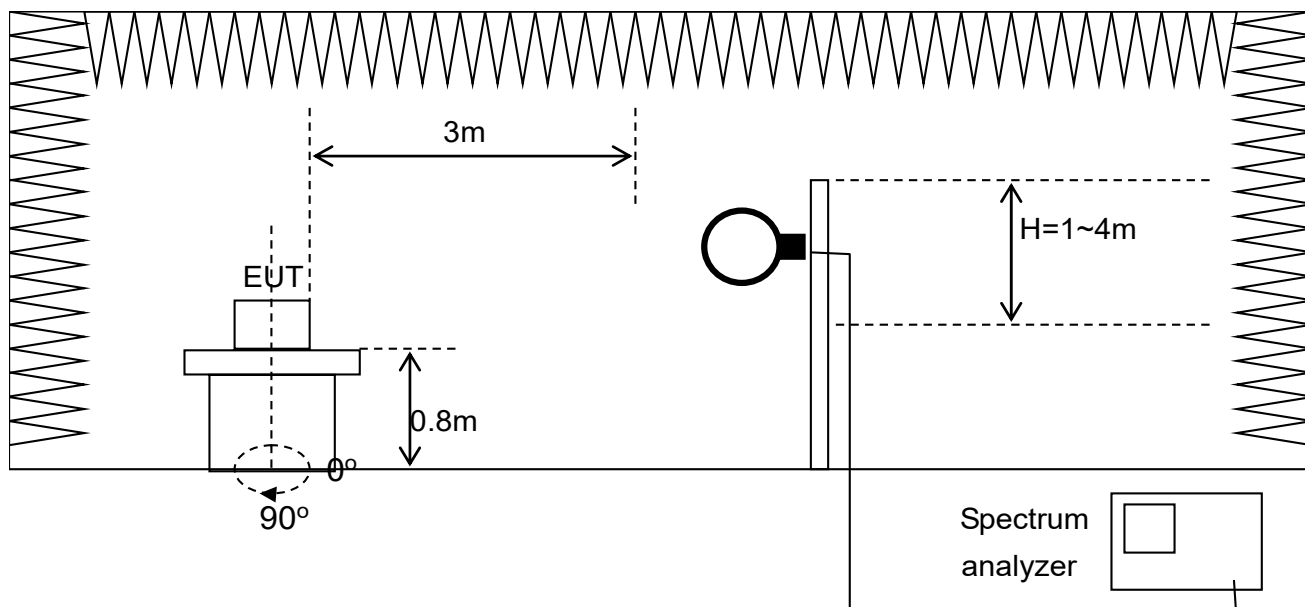
6.2 Measurement Procedure

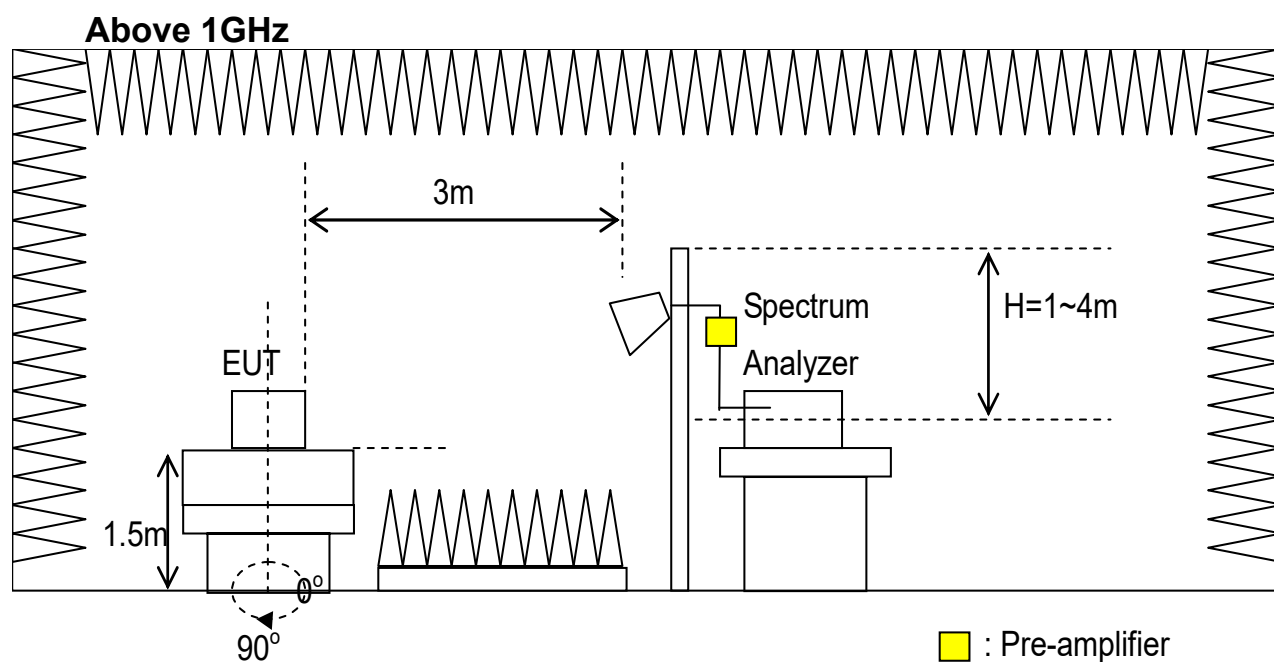
- a. The EUT was set up per the test configuration figured in the next section of this chapter to simulate the typical usage per the user's manual.
- b. A software provided by client enabled the EUT to transmit and receive data at operating frequency.(if necessary)
- c. If the EUT is tabletop equipment, it should be placed on a wooden table with a height of 0.8 meters above the reference ground plane in the semi-anechoic chamber. If the EUT is floor-standing equipment, it should be placed on a non-conducted support with a height of 12 millimeters above the reference ground plane in the semi-anechoic chamber.
- d. The EUT is set 3m away from the interference receiving antenna.
- e. Rapidly sweep the signal in the test frequency range by using the spectrum through the Maximum-peak detector.
- f. Rotate the EUT from 0° to 360° and position the receiving antenna at heights from 1 to 4 meters above the reference ground plane continuously to determine at least six frequencies associated with higher emission levels and record them.
- g. Then measure each frequency found from step f. by using the spectrum with rotating the EUT and positioning the receiving antenna height to determine the maximum level.
- h. For measurement of frequency below 1000MHz, set the receiver detector to be Quasi-Peak per CISPR 16-1 to find out the maximum level occurred. Receiver Setting is 9 kHz – 150kHz: RBW=200 Hz. 150kHz – 30 MHz: RBW=9 kHz. 30 MHz- 1 GHz: RBW=120 kHz.
- i. For measurement of frequency above 1000MHz, set the spectrum detector to be Peak or Average to find out the maximum level occurred, if any. Spectrum Analyzer Setting is Peak:RBW=1 MHz, VBW=3 MHz. Average: RBW=1 MHz, VBW=3 kHz.
- j. Record frequency, azimuth angle of the turntable, height, and polarization of the receiving antenna and compare the maximum level with the required limit.
- k. Change the receiving antenna to another polarization to measure radiated emission by following step e. to j. again.
- l. If the peak emission level below 1000MHz measured from step f. is 4dB lower than the limit specified, then the emission values presented will be the peak value only. Otherwise, accurate Q.P. value will be measured and presented.
- m. If the peak emission level above 1000MHz measured from step f. is 20dB lower than the limit specified, then the emission values presented will be the peak value only. Otherwise, accurate A.V. value will be measured and presented.

n.

6.3 Test configuration

Below 1GHz





6.4 Test Data

Bandedge

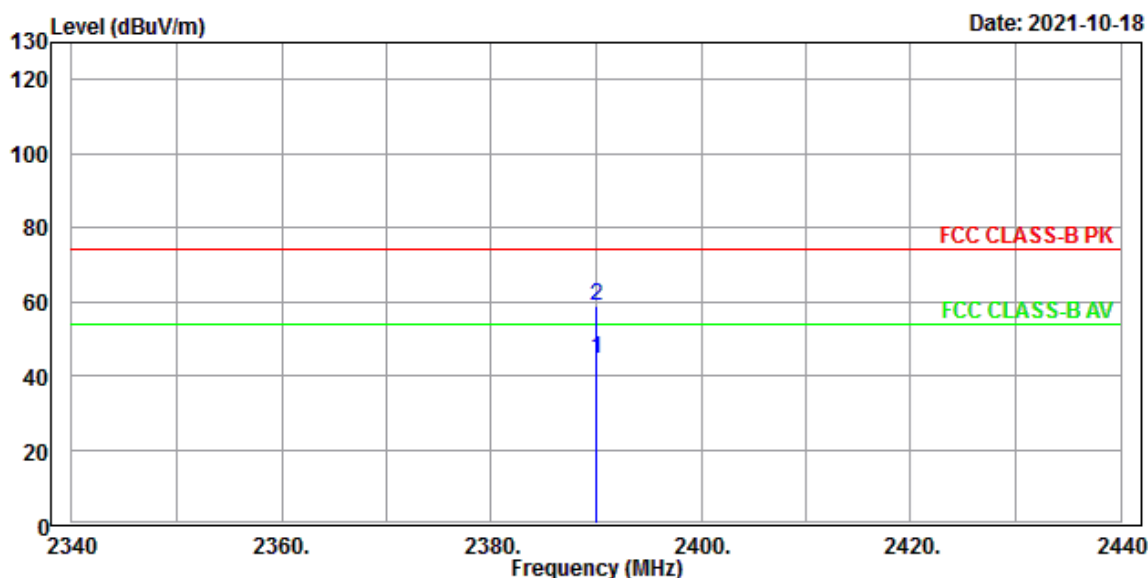
Test Mode : Continuous Transmitting, 802.11b, 2412 MHz

Polarization : Horizontal

Tester : Jeffry

Ambient Temperature : 24°C

Relative Humidity : 58%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 HORIZONTAL

POWER :

OPERATOR : Jeffry T:24 H:58 P:1009

	Freq	Level	Read Level	Limit Factor	Limit Line	Over Limit	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	2390.000	44.56	10.42	34.14	54.00	-9.44	400	33	HORIZONTAL	Average
2	2390.000	59.01	24.87	34.14	74.00	-14.99	400	33	HORIZONTAL	Peak

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line

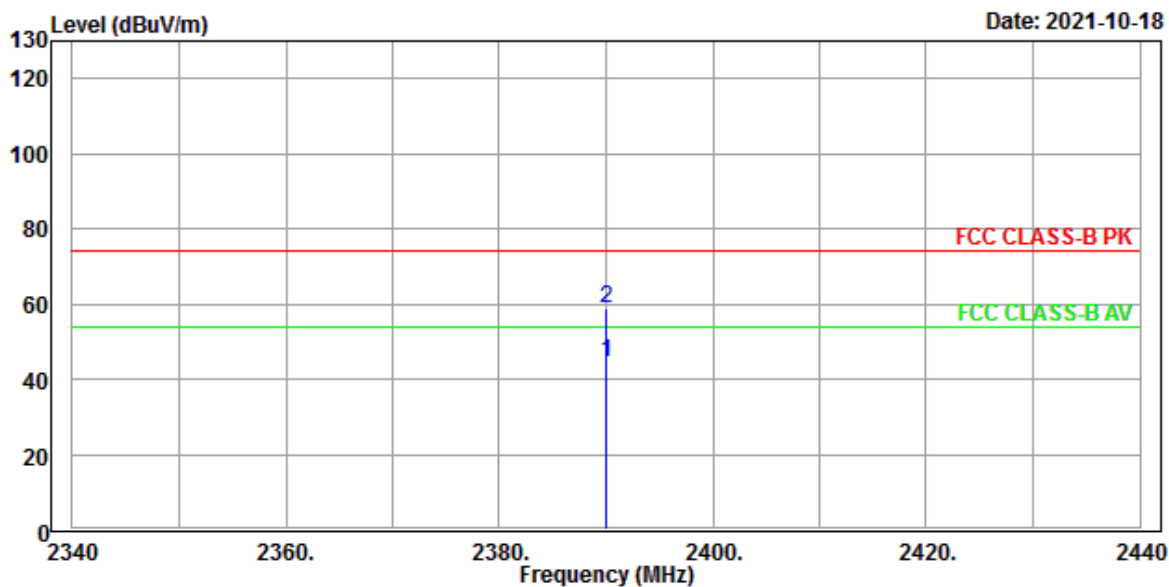
Test Mode : Continuous Transmitting, 802.11b, 2412 MHz

Polarization : Vertical

Tester : Jeffry

Ambient Temperature : 24°C

Relative Humidity : 58%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 VERTICAL

POWER :

OPERATOR : Jeffry T:24 H:58 P:1009

	Freq	Level	Read	Level	Factor	Limit	Over	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB		cm	deg		
1	2390.000	44.29	10.15	34.14	54.00	-9.71		367	186	VERTICAL	Average
2	2390.000	58.93	24.79	34.14	74.00	-15.07		367	186	VERTICAL	Peak

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line

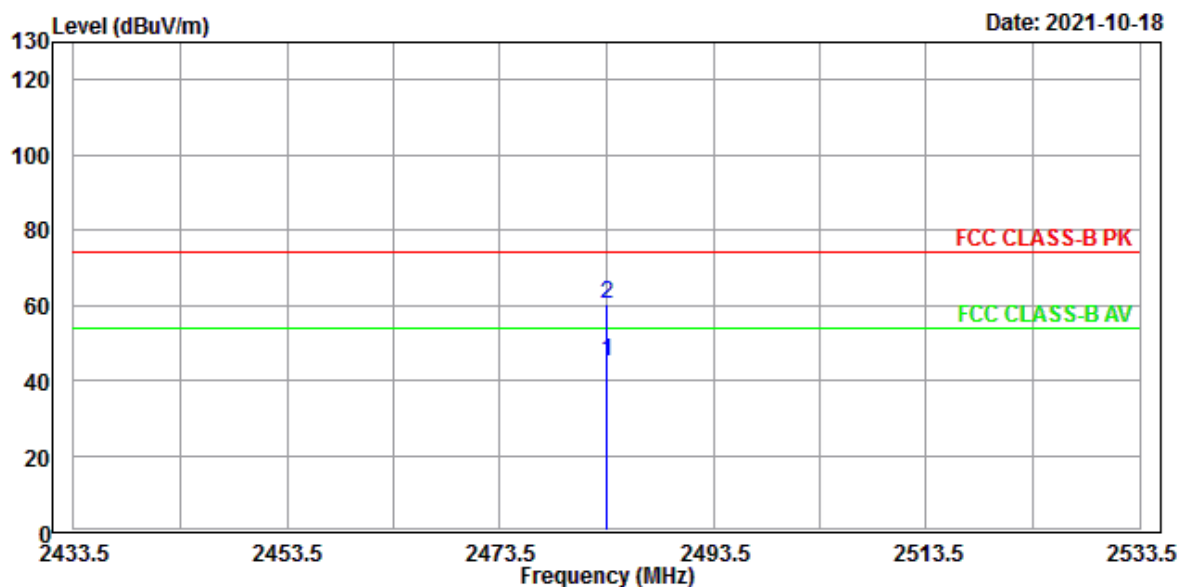
Test Mode : Continuous Transmitting, 802.11b, 2462 MHz

Polarization : Horizontal

Tester : Jeffry

Ambient Temperature : 24°C

Relative Humidity : 58%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 HORIZONTAL

POWER :

OPERATOR : Jeffry T:24 H:58 P:1009

	Freq	Level	Read	Limit	Over	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	Level	Factor	Line	Limit			
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1	2483.500	45.02	10.58	34.44	54.00	-8.98	400	22 HORIZONTAL	Average
2	2483.500	60.46	26.02	34.44	74.00	-13.54	400	22 HORIZONTAL	Peak

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line

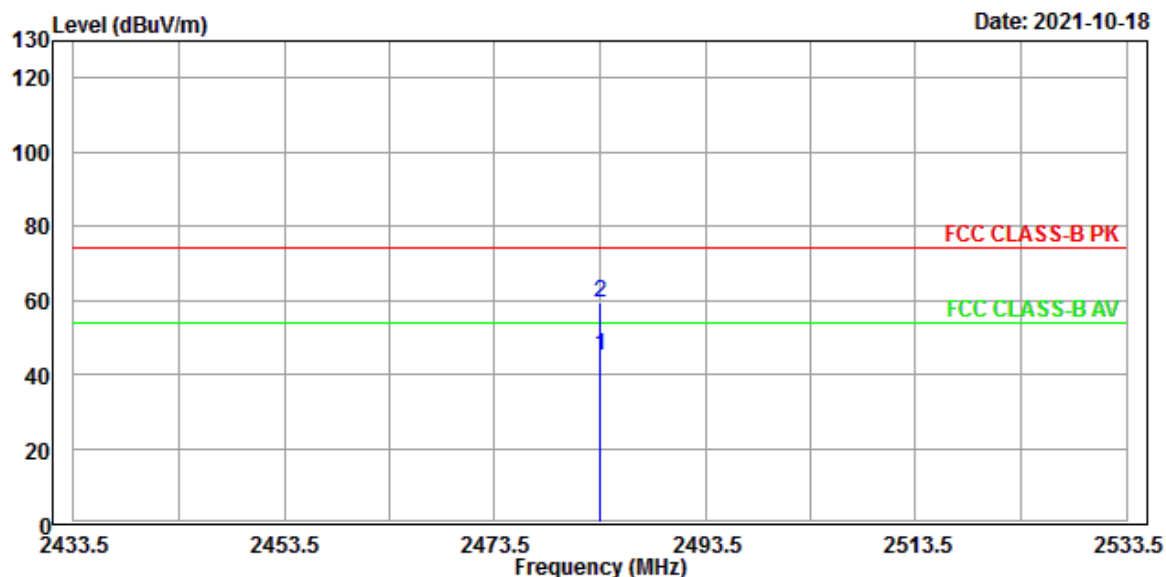
Test Mode : Continuous Transmitting, 802.11b, 2462 MHz

Polarization : Vertical

Tester : Jeffry

Ambient Temperature : 24°C

Relative Humidity : 58%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 VERTICAL

POWER :

OPERATOR : Jeffry T:24 H:58 P:1009

	Freq	Level	Read Level	Limit Factor	Limit Line	Over Limit	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	2483.500	44.89	10.45	34.44	54.00	-9.11	400	315	VERTICAL	Average
2	2483.500	59.26	24.82	34.44	74.00	-14.74	400	315	VERTICAL	Peak

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line

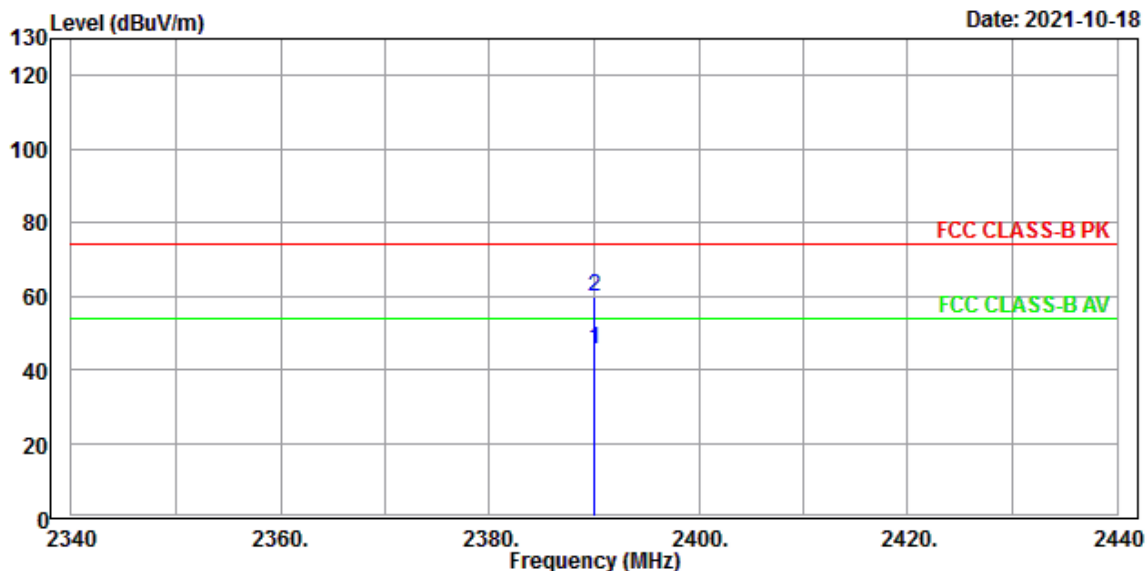
Test Mode : Continuous Transmitting, 802.11g, 2412 MHz

Polarization : Horizontal

Tester : Jeffry

Ambient Temperature : 24°C

Relative Humidity : 58%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 HORIZONTAL

POWER :

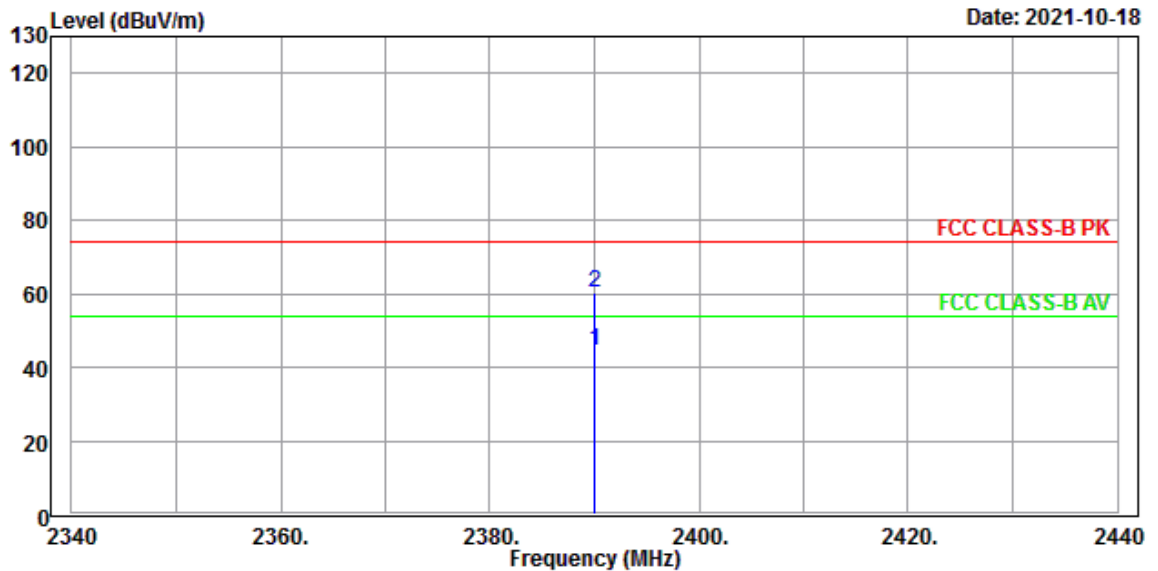
OPERATOR : Jeffry T:24 H:58 P:1009

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	2390.000	45.67	11.53	34.14	54.00	-8.33	364	36	HORIZONTAL	Average
2	2390.000	59.60	25.46	34.14	74.00	-14.40	364	36	HORIZONTAL	Peak

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line

Test Mode : Continuous Transmitting, 802.11g, 2412 MHz
Polarization : Vertical **Tester** : Jeffry
Ambient Temperature : 24°C **Relative Humidity** : 58%



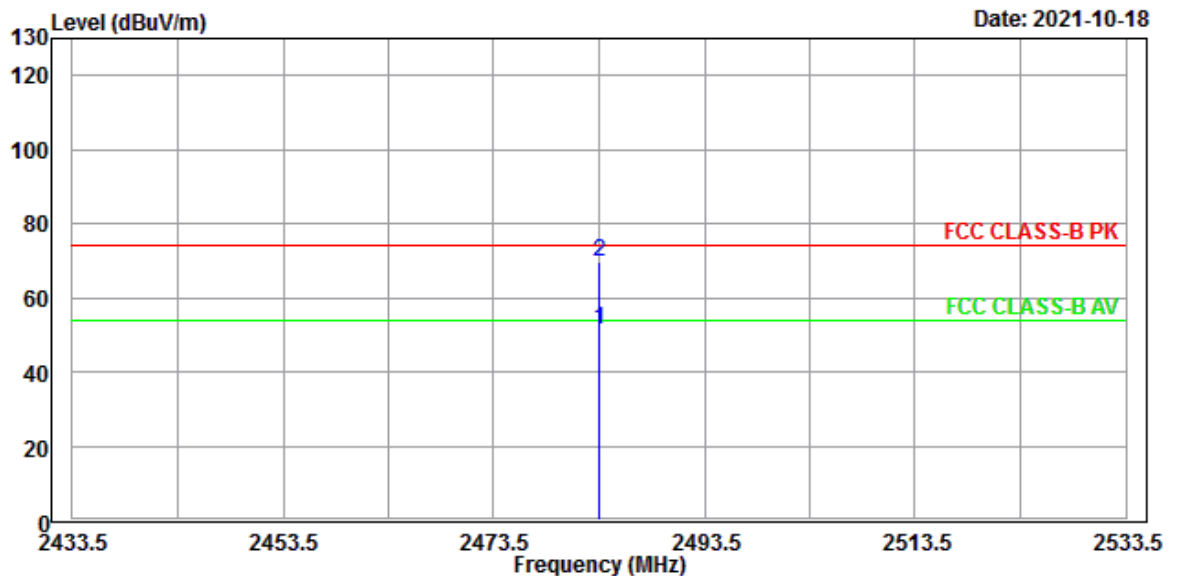
Condition : FCC CLASS-B PK 3m EMCO_3117_82847 VERTICAL
POWER :
OPERATOR : Jeffry T:24 H:58 P:1009

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	2390.000	44.57	10.43	34.14	54.00	-9.43	400	173	VERTICAL	Average
2	2390.000	60.19	26.05	34.14	74.00	-13.81	400	173	VERTICAL	Peak

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line

Test Mode : Continuous Transmitting, 802.11g, 2462 MHz
Polarization : Horizontal **Tester** : Jeffry
Ambient Temperature : 24°C **Relative Humidity** : 58%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 HORIZONTAL
POWER :
OPERATOR : Jeffry T:24 H:58 P:1009

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	2483.500	51.39	16.95	34.44	54.00	-2.61	400	22	HORIZONTAL	Average
2	2483.500	69.55	35.11	34.44	74.00	-4.45	400	22	HORIZONTAL	Peak

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line

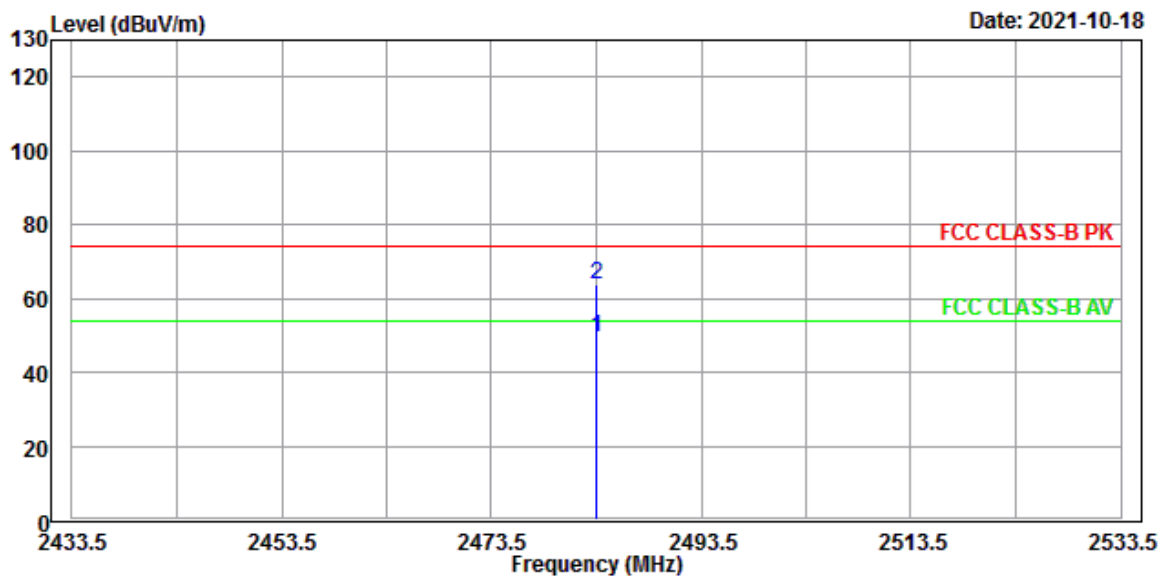
Test Mode : Continuous Transmitting, 802.11g, 2462 MHz

Polarization : Vertical

Tester : Jeffry

Ambient Temperature : 24°C

Relative Humidity : 58%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 VERTICAL

POWER :

OPERATOR : Jeffry T:24 H:58 P:1009

	Freq	Level	Read Level	Limit Factor	Limit Line	Over Limit	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	2483.500	49.25	14.81	34.44	54.00	-4.75	400	360	VERTICAL	Average
2	2483.500	63.55	29.11	34.44	74.00	-10.45	400	360	VERTICAL	Peak

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line

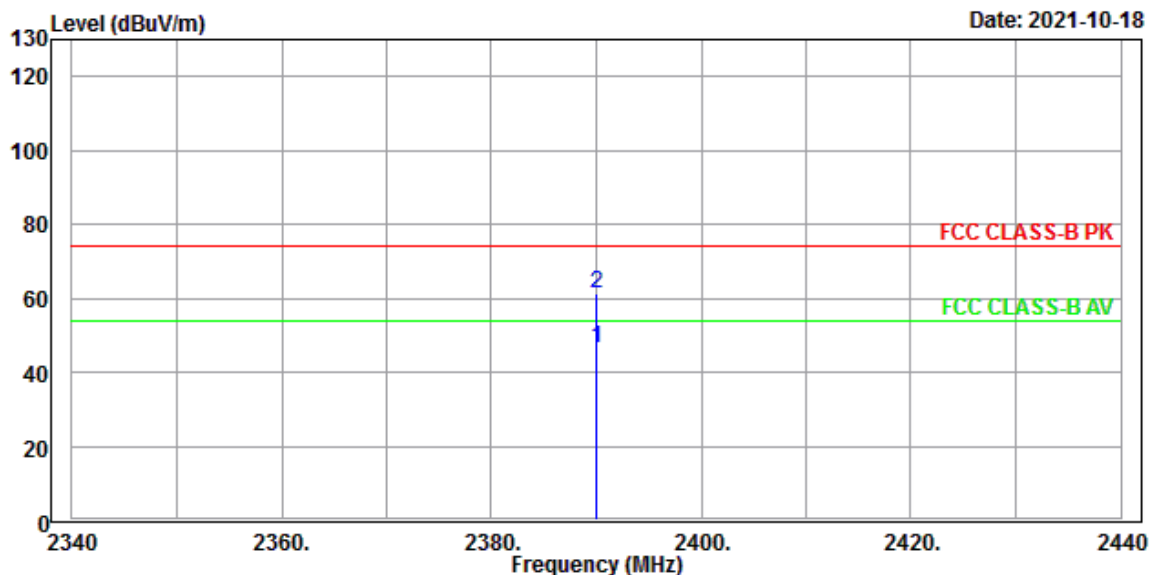
Test Mode : Continuous Transmitting, 802.11n HT20, 2412 MHz

Polarization : Horizontal

Tester : Jeffry

Ambient Temperature : 24°C

Relative Humidity : 58%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 HORIZONTAL

POWER :

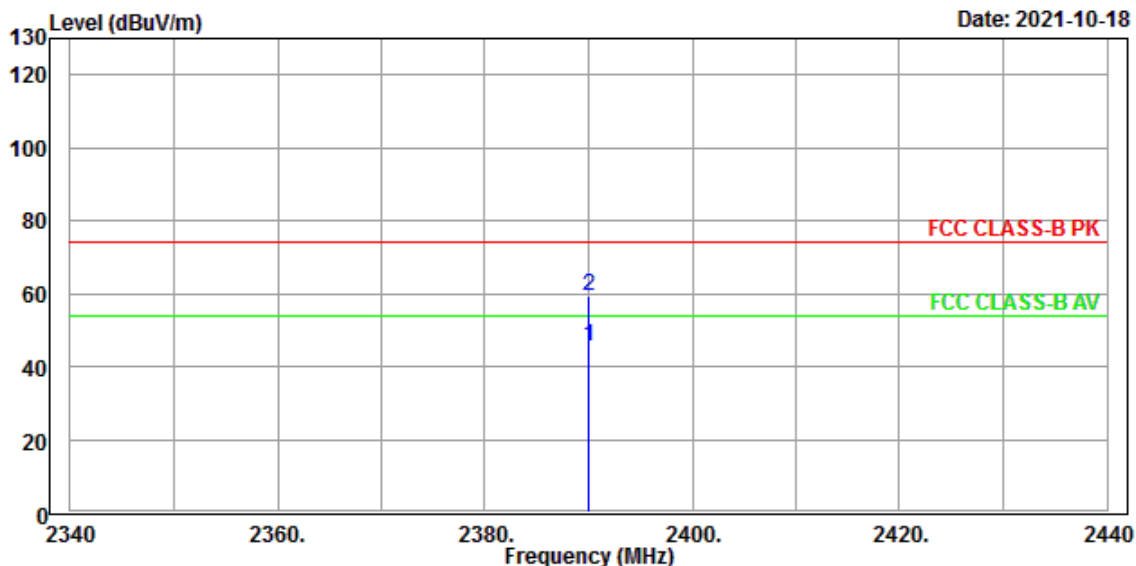
OPERATOR : Jeffry T:24 H:58 P:1009

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	2390.000	46.56	12.42	34.14	54.00	-7.44	368	22	HORIZONTAL	Average
2	2390.000	61.39	27.25	34.14	74.00	-12.61	368	22	HORIZONTAL	Peak

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line

Test Mode : Continuous Transmitting, 802.11n HT20, 2412 MHz
Polarization : Vertical **Tester** : Jeffry
Ambient Temperature : 24°C **Relative Humidity** : 58%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 VERTICAL
POWER :
OPERATOR : Jeffry T:24 H:58 P:1009

	Freq	Level	Read	Limit	Over	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	Level	Factor	Line	Limit			
			dBuV	dB/m	dBuV/m	dB	cm	deg	
1	2390.000	45.30	11.16	34.14	54.00	-8.70	370	270	VERTICAL Average
2	2390.000	59.47	25.33	34.14	74.00	-14.53	370	270	VERTICAL Peak

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line

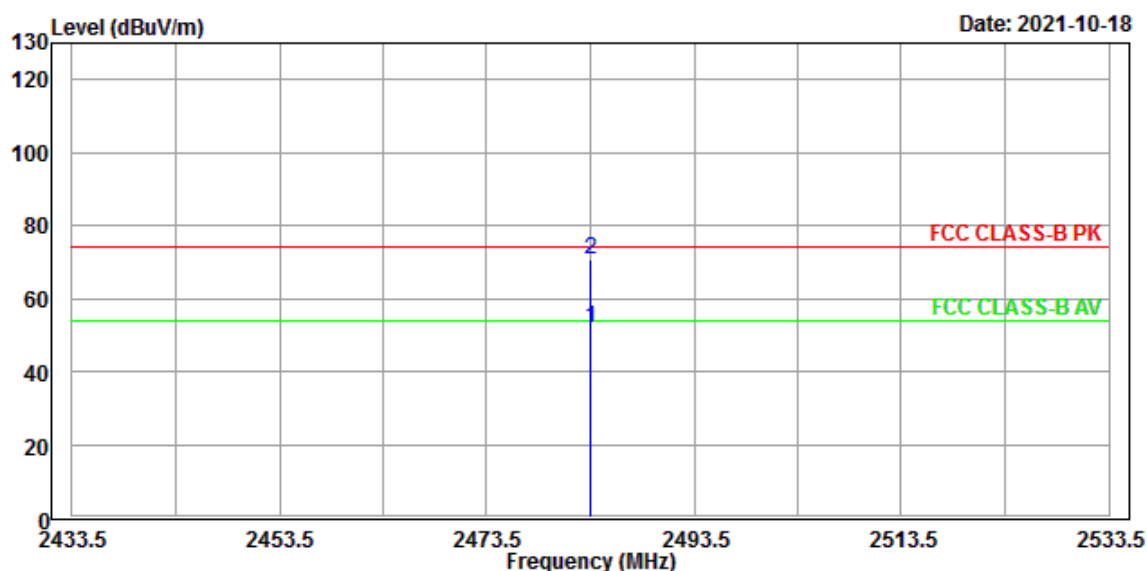
Test Mode : Continuous Transmitting, 802.11n HT20, 2462 MHz

Polarization : Horizontal

Tester : Jeffry

Ambient Temperature : 24°C

Relative Humidity : 58%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 HORIZONTAL

POWER :

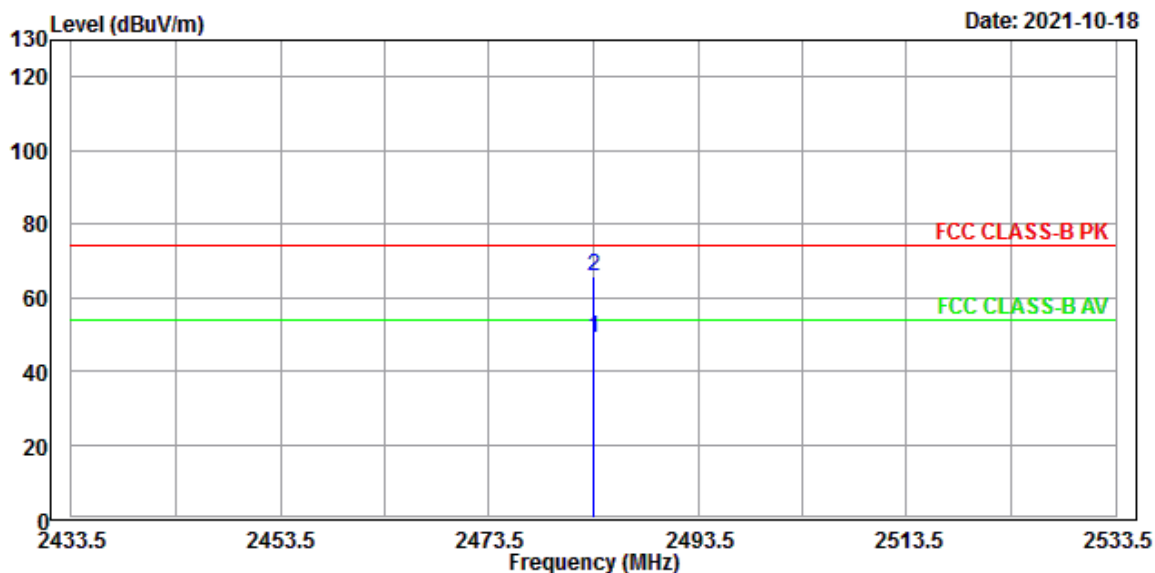
OPERATOR : Jeffry T:24 H:58 P:1009

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	2483.500	51.71	17.27	34.44	54.00	-2.29	302	2	HORIZONTAL	Average
2	2483.500	70.47	36.03	34.44	74.00	-3.53	302	2	HORIZONTAL	Peak

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line

Test Mode : Continuous Transmitting, 802.11n HT20, 2462 MHz
Polarization : Vertical **Tester** : Jeffry
Ambient Temperature : 24°C **Relative Humidity** : 58%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 VERTICAL
POWER :
OPERATOR : Jeffry T:24 H:58 P:1009

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	2483.500	48.86	14.42	34.44	54.00	-5.14	366	342	VERTICAL	Average
2	2483.500	65.73	31.29	34.44	74.00	-8.27	366	342	VERTICAL	Peak

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line

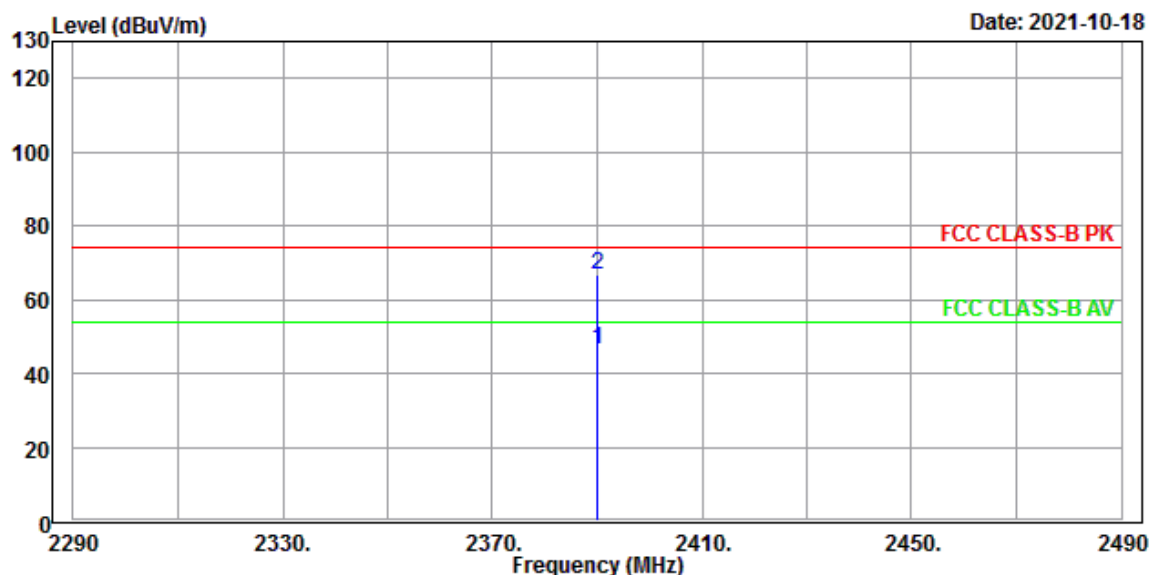
Test Mode : Continuous Transmitting, 802.11n HT40, 2422 MHz

Polarization : Horizontal

Tester : Jeffry

Ambient Temperature : 24°C

Relative Humidity : 58%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 HORIZONTAL

POWER :

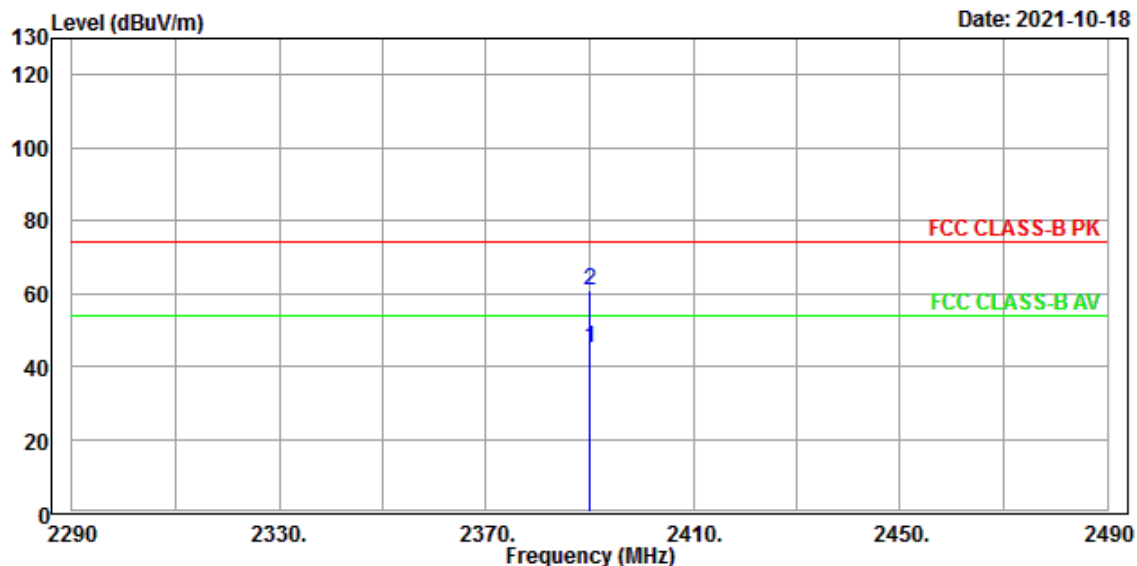
OPERATOR : Jeffry T:24 H:58 P:1009

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	2390.000	46.56	12.42	34.14	54.00	-7.44	323	280	HORIZONTAL	Average
2	2390.000	66.65	32.51	34.14	74.00	-7.35	323	280	HORIZONTAL	Peak

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line

Test Mode : Continuous Transmitting, 802.11n HT40, 2422 MHz
Polarization : Vertical Tester : Jeffry
Ambient Temperature : 24°C Relative Humidity : 58%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 VERTICAL
POWER :
OPERATOR : Jeffry T:24 H:58 P:1009

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	2390.000	44.90	10.76	34.14	54.00	-9.10	400	281	VERTICAL	Average
2	2390.000	60.68	26.54	34.14	74.00	-13.32	400	281	VERTICAL	Peak

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line

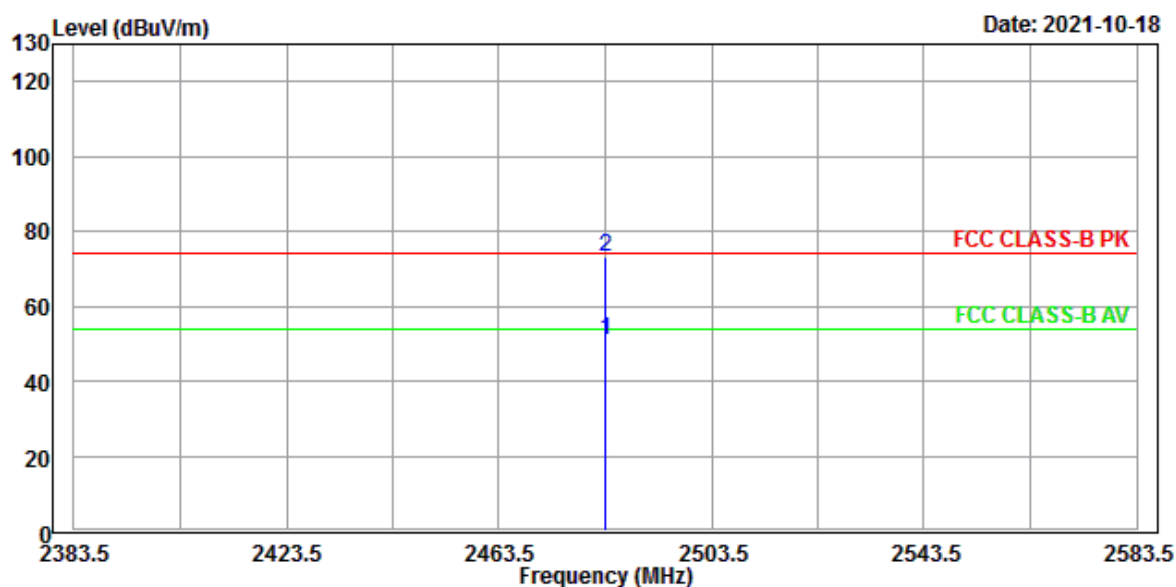
Test Mode : Continuous Transmitting, 802.11n HT40, 2452 MHz

Polarization : Horizontal

Tester : Jeffry

Ambient Temperature : 24°C

Relative Humidity : 58%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 HORIZONTAL

POWER :

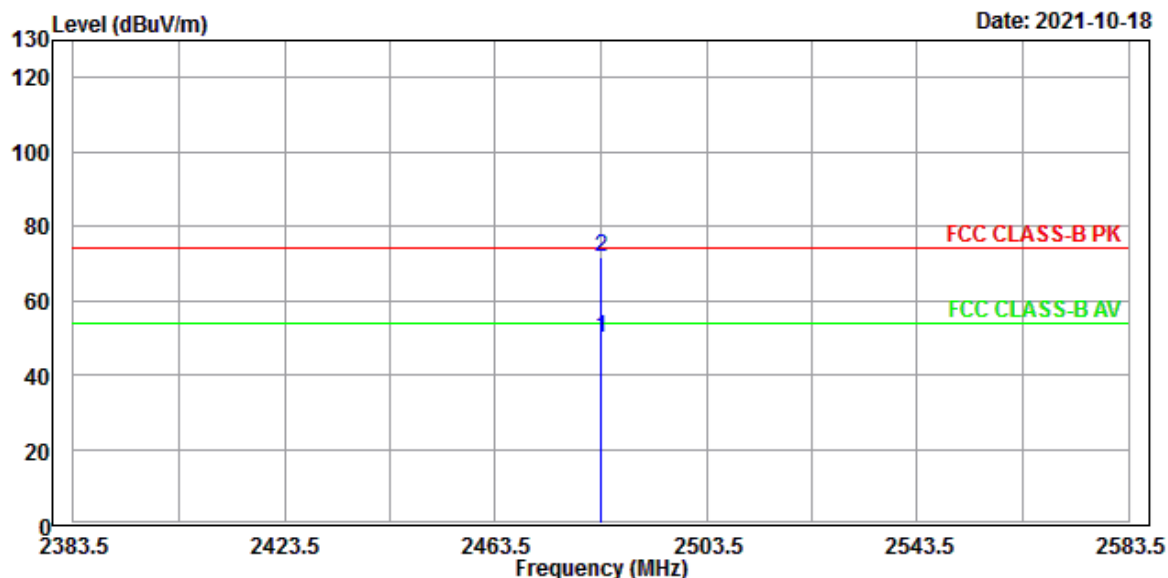
OPERATOR : Jeffry T:24 H:58 P:1009

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	2483.500	50.77	16.33	34.44	54.00	-3.23	381	294	HORIZONTAL	Average
2	2483.500	73.30	38.86	34.44	74.00	-0.70	381	294	HORIZONTAL	Peak

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line

Test Mode : Continuous Transmitting, 802.11n HT40, 2452 MHz
Polarization : Vertical **Tester** : Jeffry
Ambient Temperature : 24°C **Relative Humidity** : 58%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 VERTICAL
POWER :
OPERATOR : Jeffry T:24 H:58 P:1009

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	2483.500	50.07	15.63	34.44	54.00	-3.93	322	280	VERTICAL	Average
2	2483.500	71.78	37.34	34.44	74.00	-2.22	322	280	VERTICAL	Peak

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line

Radiated Emission Measurement below 1000MHz

Test Mode : Normal

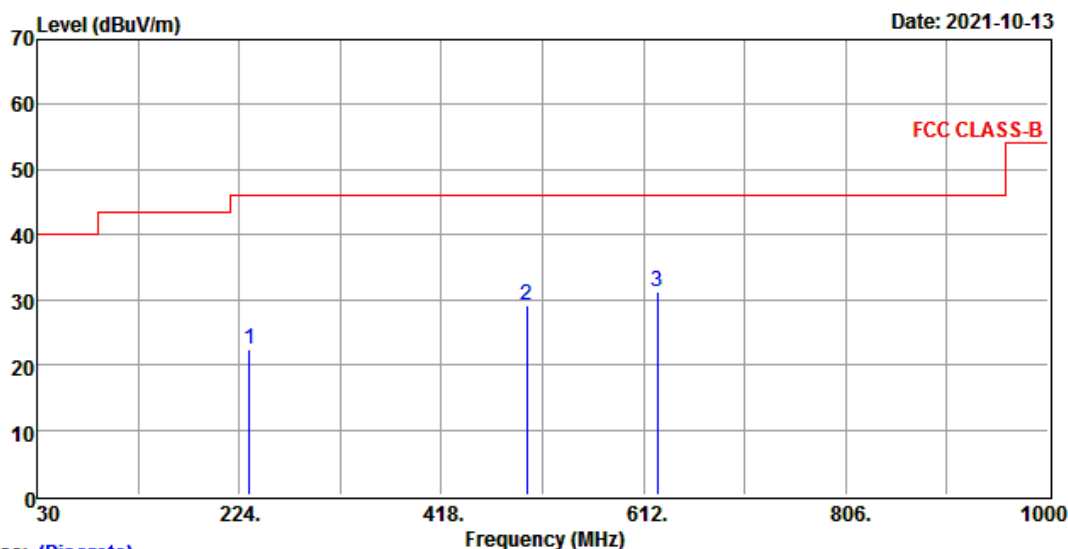
Test Range : 30 MHz ~1 GHz

Polarization : Horizontal

Tester : Martin

Ambient Temperature : 27°C

Relative Humidity : 52%



Trace: (Discrete)

Site : TR11 9*6*6 chamber

Condition : FCC CLASS-B 3m VULB_9168-668 HORIZONTAL

Power : 120V / 60Hz

Operator : Martin T27 H52 P1010

	Freq	Level	Read	Factor	Limit	Over	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	234.015	22.49	45.27	-22.78	46.00	-23.51	138	69	HORIZONTAL	QP
2	500.003	29.12	44.02	-14.90	46.00	-16.88	100	96	HORIZONTAL	QP
3	625.000	31.34	43.27	-11.93	46.00	-14.66	225	115	HORIZONTAL	QP

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. QK. is abbreviation of Quasi-Peak
5. The emission levels were too lower against the limit of frequency 9 kHz~ 30 MHz.

Test Mode : Normal

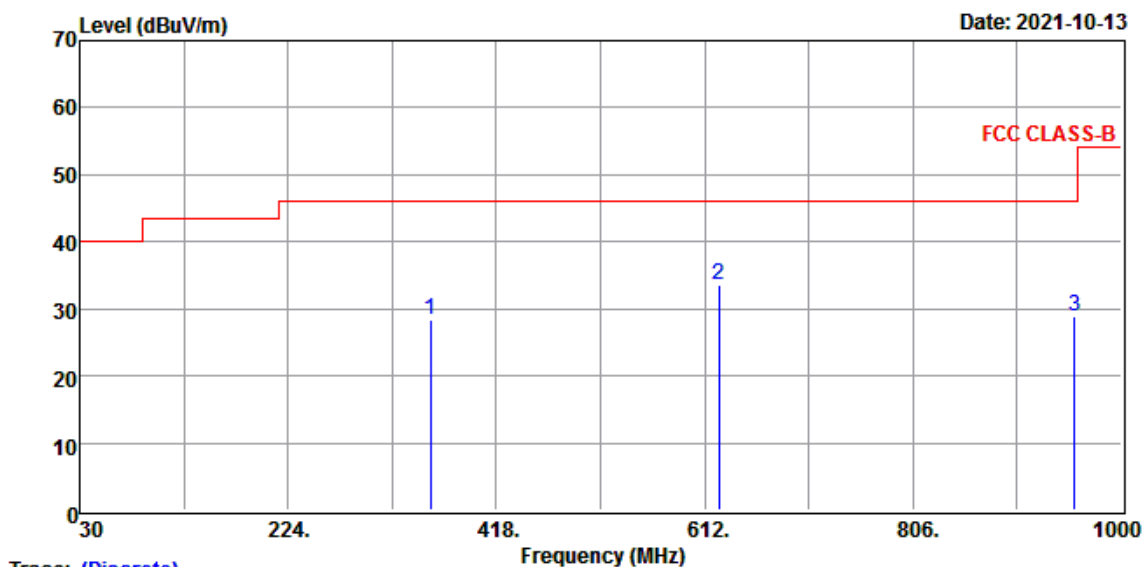
Test Range : 30 MHz ~1 GHz

Polarization : Vertical

Tester : Martin

Ambient Temperature : 27°C

Relative Humidity : 52%



Trace: (Discrete)

Site : TR11 9*6*6 chamber
 Condition : FCC CLASS-B 3m VULB_9168-668 VERTICAL
 Power : 120V / 60Hz
 Operator : Martin T27 H52 P1010

	Freq	Level	Read	Limit	Over	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	Level	Factor	Line	Limit			
			dBuV	dB/m	dBuV/m	dB	cm	deg	
1	356.374	28.46	46.92	-18.46	46.00	-17.54	100	360	VERTICAL QP
2	625.008	33.69	45.60	-11.91	46.00	-12.31	100	209	VERTICAL QP
3	956.623	28.96	36.48	-7.52	46.00	-17.04	100	0	VERTICAL QP

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. QK. is abbreviation of Quasi-Peak
5. The emission levels were too lower against the limit of frequency 9 kHz~ 30 MHz.

Radiated Emission Measurement above 1000MHz

Test Mode : Continuous Transmitting, 802.11b , 2412 MHz

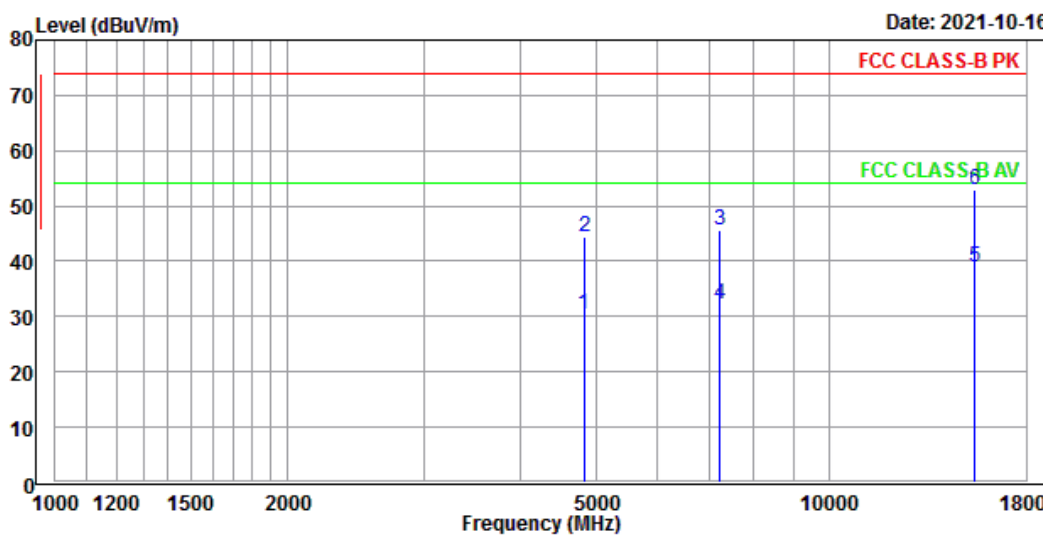
Test Range : 1 GHz ~ 25 GHz

Polarization : Horizontal

Tester : Jack

Ambient Temperature : 21°C

Relative Humidity : 60%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 Horizontal

POWER :

OPERATOR : Jack T:21 H:60 P:1012

	Freq	Level	Read Level	Limit Factor	Over Line	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1	4823.625	30.57	46.08	-15.51	54.00	-23.43	352	149	Horizontal Average
2	4824.308	44.39	59.90	-15.51	74.00	-29.61	356	144	Horizontal Peak
3	7235.959	45.65	58.05	-12.40	74.00	-28.35	262	205	Horizontal Peak
4	7236.295	32.14	44.53	-12.39	54.00	-21.86	267	202	Horizontal Average
5	15444.730	39.07	47.52	-8.45	54.00	-14.93	238	194	Horizontal Average
6	15445.100	52.97	61.43	-8.46	74.00	-21.03	233	190	Horizontal Peak

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. No signal can be detected above 18 GHz, so the graphs are omitted.

Test Mode : Continuous Transmitting, 802.11b , 2412 MHz

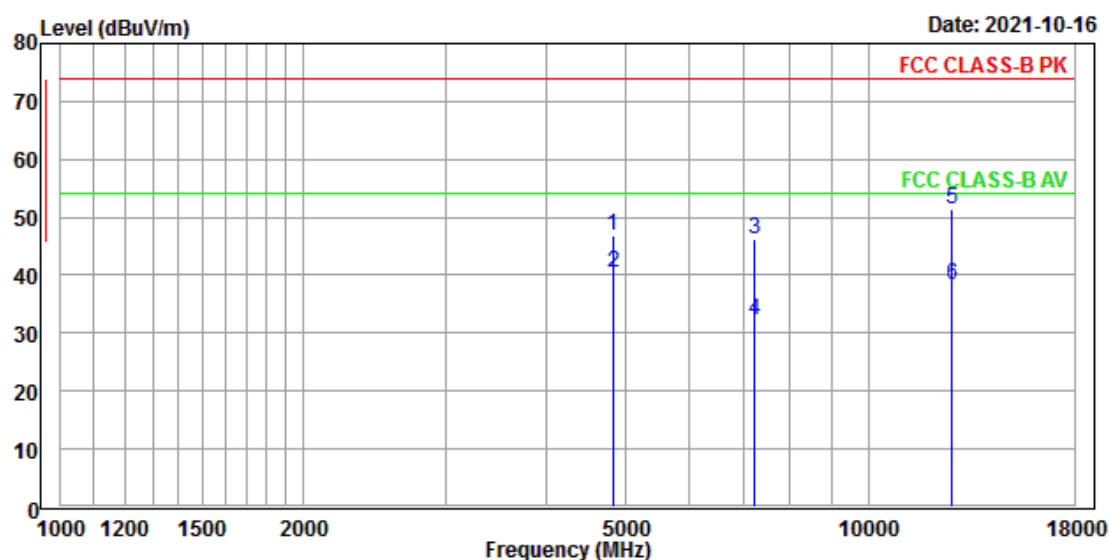
Test Range : 1 GHz ~ 25 GHz

Polarization : Vertical

Tester : Jack

Ambient Temperature : 21°C

Relative Humidity : 60%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 Vertical

POWER :

OPERATOR : Jack T:21 H:60 P:1012

	Freq	Level	Read	Limit	Over	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	Level	Factor	Line	Limit			
			dBuV	dB/m	dBuV/m	dB	cm	deg	
1	4823.796	46.75	62.26	-15.51	74.00	-27.25	164	245	Vertical Peak
2	4824.135	40.55	56.06	-15.51	54.00	-13.45	160	241	Vertical Average
3	7235.779	46.35	58.75	-12.40	74.00	-27.65	186	277	Vertical Peak
4	7236.382	32.22	44.61	-12.39	54.00	-21.78	191	272	Vertical Average
5	12710.830	51.32	59.11	-7.79	74.00	-22.68	278	52	Vertical Peak
6	12711.330	38.36	46.15	-7.79	54.00	-15.64	283	58	Vertical Average

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. No signal can be detected above 18 GHz, so the graphs are omitted.

Test Mode : Continuous Transmitting, 802.11b , 2437 MHz

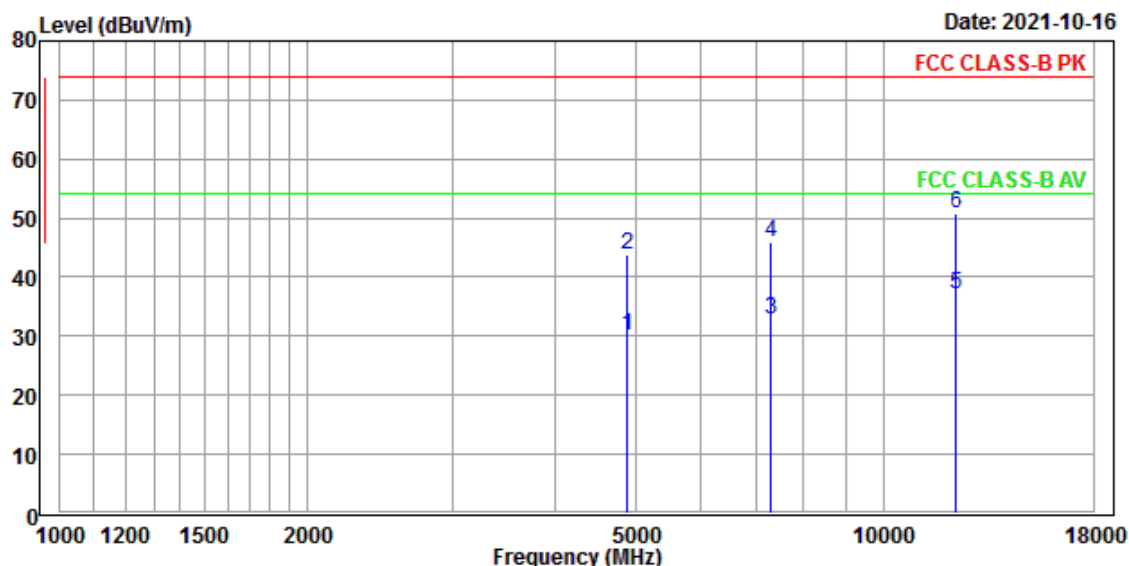
Test Range : 1 GHz ~ 25 GHz

Polarization : Horizontal

Tester : Jack

Ambient Temperature : 21°C

Relative Humidity : 60%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 Horizontal

POWER :

OPERATOR : Jack T:21 H:60 P:1012

	Freq	Level	Read	Limit	Over	APos	TPos		
	MHz	dBuV/m	Level	Line	Limit			Pol/Phase	Remark
			dBuV	dB/m	dBuV/m	dB	cm	deg	
1	4873.676	30.03	45.60	-15.57	54.00	-23.97	218	285 Horizontal	Average
2	4874.048	43.88	59.46	-15.58	74.00	-30.12	214	280 Horizontal	Peak
3	7310.782	32.85	45.23	-12.38	54.00	-21.15	269	181 Horizontal	Average
4	7311.499	45.95	58.33	-12.38	74.00	-28.05	262	184 Horizontal	Peak
5	12257.740	37.13	44.61	-7.48	54.00	-16.87	182	241 Horizontal	Average
6	12258.490	50.93	58.41	-7.48	74.00	-23.07	178	246 Horizontal	Peak

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. No signal can be detected above 18 GHz, so the graphs are omitted.

Test Mode : Continuous Transmitting, 802.11b , 2437 MHz

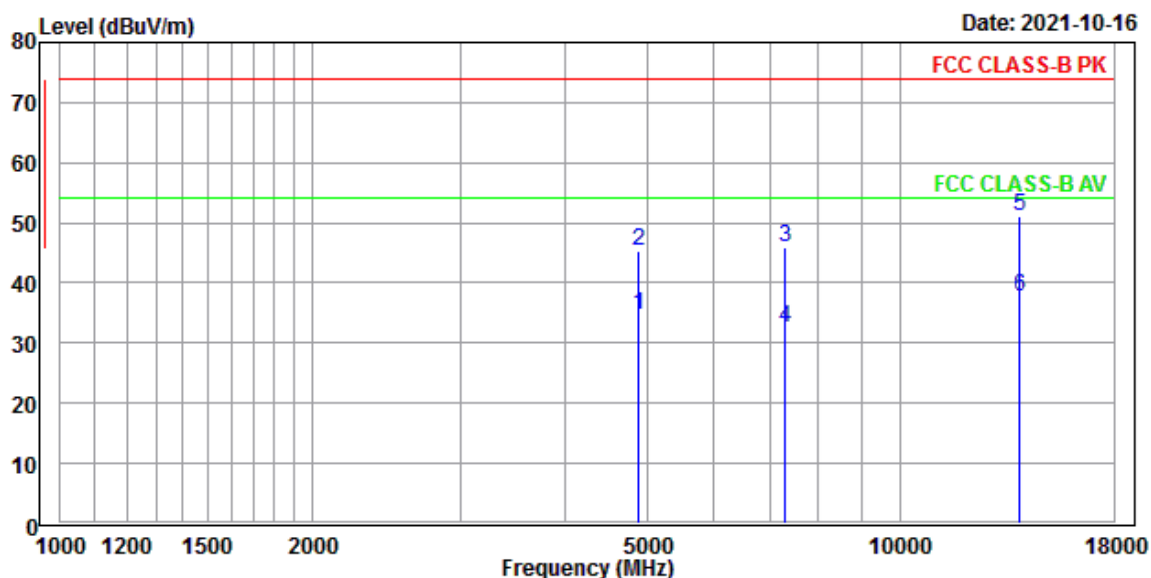
Test Range : 1 GHz ~ 25 GHz

Polarization : Vertical

Tester : Jack

Ambient Temperature : 21°C

Relative Humidity : 60%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 Vertical

POWER :

OPERATOR : Jack T:21 H:60 P:1012

	Freq	Level	Read	Limit	Over	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	Level	Factor	Line	Limit			
			dBuV	dB/m	dBuV/m	dB	cm	deg	
1	4873.424	34.66	50.23	-15.57	54.00	-19.34	274	248 Vertical	Average
2	4874.180	45.24	60.82	-15.58	74.00	-28.76	279	244 Vertical	Peak
3	7310.586	46.04	58.42	-12.38	74.00	-27.96	326	191 Vertical	Peak
4	7311.324	32.43	44.81	-12.38	54.00	-21.57	322	197 Vertical	Average
5	13896.910	51.18	60.56	-9.38	74.00	-22.82	146	82 Vertical	Peak
6	13897.590	37.72	47.10	-9.38	54.00	-16.28	150	89 Vertical	Average

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. No signal can be detected above 18 GHz, so the graphs are omitted.

Test Mode : Continuous Transmitting, 802.11b , 2462 MHz

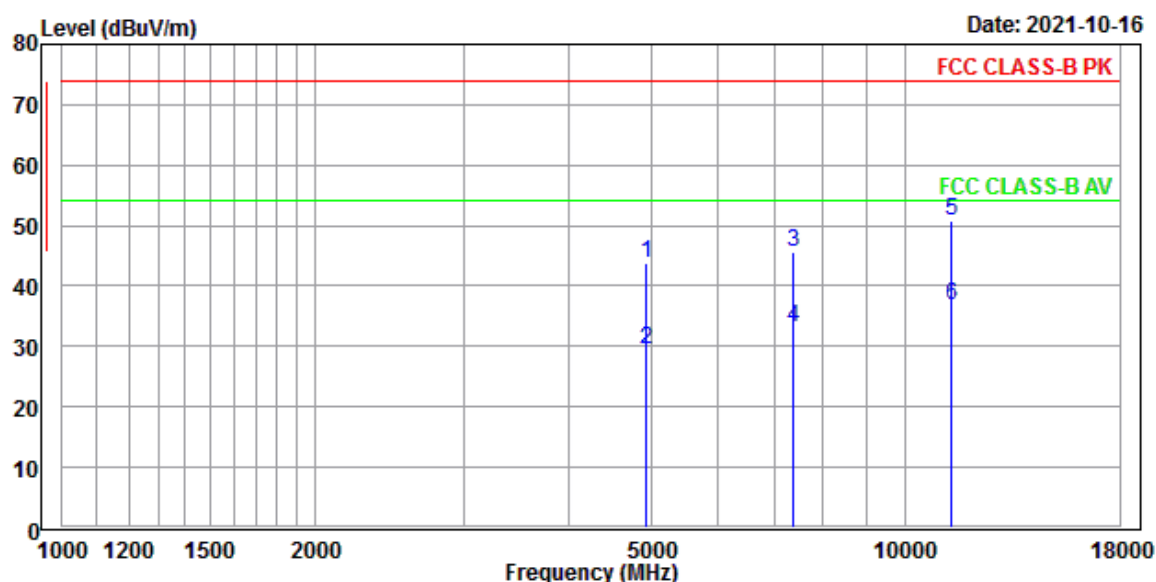
Test Range : 1 GHz ~ 25 GHz

Polarization : Horizontal

Tester : Jack

Ambient Temperature : 21°C

Relative Humidity : 60%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 Horizontal

POWER :

OPERATOR : Jack T:21 H:60 P:1012

	Freq	Level	Read	Limit	Over	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	Level	Factor	Line	Limit			
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1	4923.724	43.73	59.31	-15.58	74.00	-30.27	275	146	Horizontal Peak
2	4924.149	29.62	45.20	-15.58	54.00	-24.38	271	149	Horizontal Average
3	7385.596	45.67	57.83	-12.16	74.00	-28.33	241	107	Horizontal Peak
4	7386.271	33.05	45.21	-12.16	54.00	-20.95	248	102	Horizontal Average
5	11353.970	50.82	58.44	-7.62	74.00	-23.18	196	164	Horizontal Peak
6	11354.120	36.91	44.53	-7.62	54.00	-17.09	191	160	Horizontal Average

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. No signal can be detected above 18 GHz, so the graphs are omitted.

Test Mode : Continuous Transmitting, 802.11b , 2462 MHz

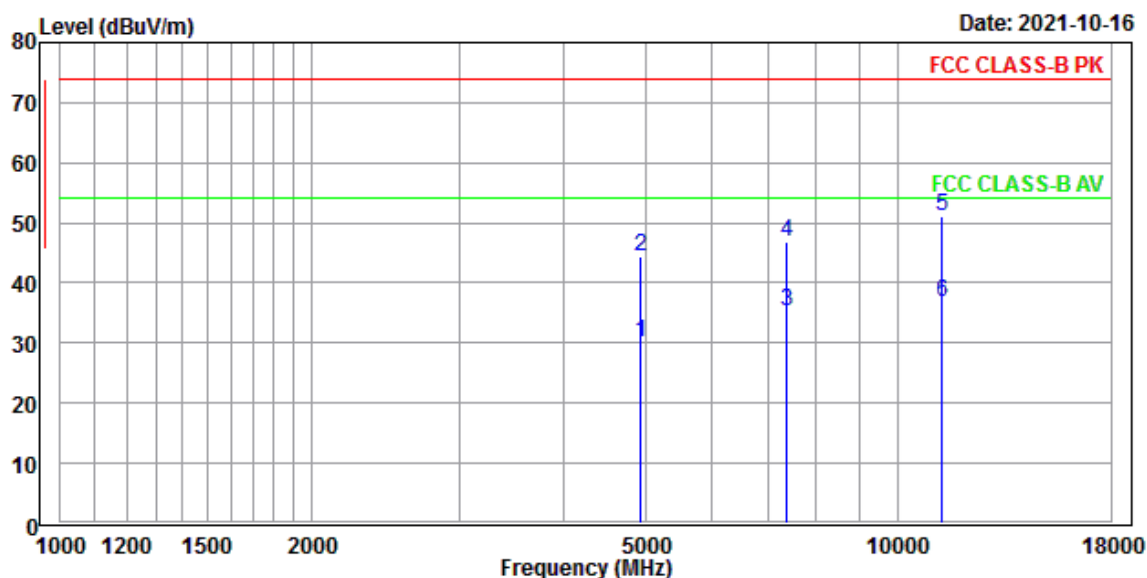
Test Range : 1 GHz ~ 25 GHz

Polarization : Vertical

Tester : Jack

Ambient Temperature : 21°C

Relative Humidity : 60%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 Vertical

POWER :

OPERATOR : Jack T:21 H:60 P:1012

	Freq	Level	Read	Limit	Over	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	Level	Factor	Line	Limit			
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1	4923.671	30.12	45.70	-15.58	54.00	-23.88	185	192 Vertical	Average
2	4924.054	44.30	59.88	-15.58	74.00	-29.70	182	187 Vertical	Peak
3	7385.582	35.36	47.52	-12.16	54.00	-18.64	148	227 Vertical	Average
4	7386.291	46.94	59.10	-12.16	74.00	-27.06	144	231 Vertical	Peak
5	11307.730	50.97	58.61	-7.64	74.00	-23.03	274	116 Vertical	Peak
6	11308.260	36.75	44.39	-7.64	54.00	-17.25	270	111 Vertical	Average

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. No signal can be detected above 18 GHz, so the graphs are omitted.

Test Mode : Continuous Transmitting, 802.11g , 2412 MHz

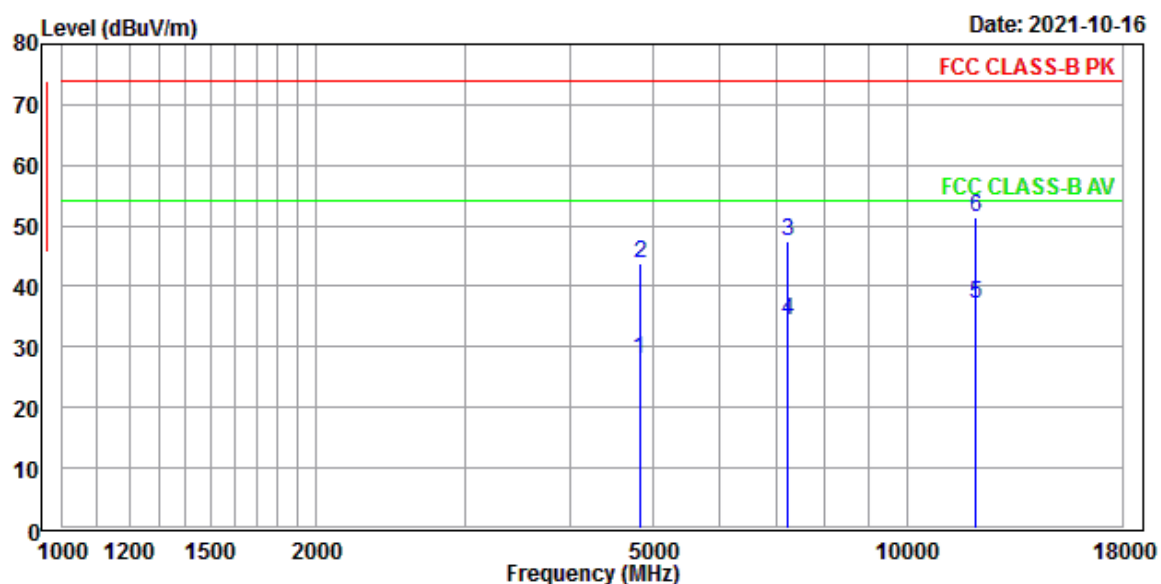
Test Range : 1 GHz ~ 25 GHz

Polarization : Horizontal

Tester : Jack

Ambient Temperature : 21°C

Relative Humidity : 60%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 Horizontal

POWER :

OPERATOR : Jack T:21 H:60 P:1012

	Freq	Level	Read	Limit	Over	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	Level	Factor	Line	Limit			
			dBuV	dB/m	dBuV/m	dB	cm	deg	
1	4823.572	28.12	43.63	-15.51	54.00	-25.88	217	319	Horizontal Average
2	4824.131	43.79	59.30	-15.51	74.00	-30.21	213	314	Horizontal Peak
3	7235.593	47.37	59.77	-12.40	74.00	-26.63	286	262	Horizontal Peak
4	7236.113	34.37	46.76	-12.39	54.00	-19.63	281	267	Horizontal Average
5	12052.810	37.14	44.56	-7.42	54.00	-16.86	181	212	Horizontal Average
6	12053.500	51.33	58.75	-7.42	74.00	-22.67	185	207	Horizontal Peak

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. No signal can be detected above 18 GHz, so the graphs are omitted.

Test Mode : Continuous Transmitting, 802.11g , 2412 MHz

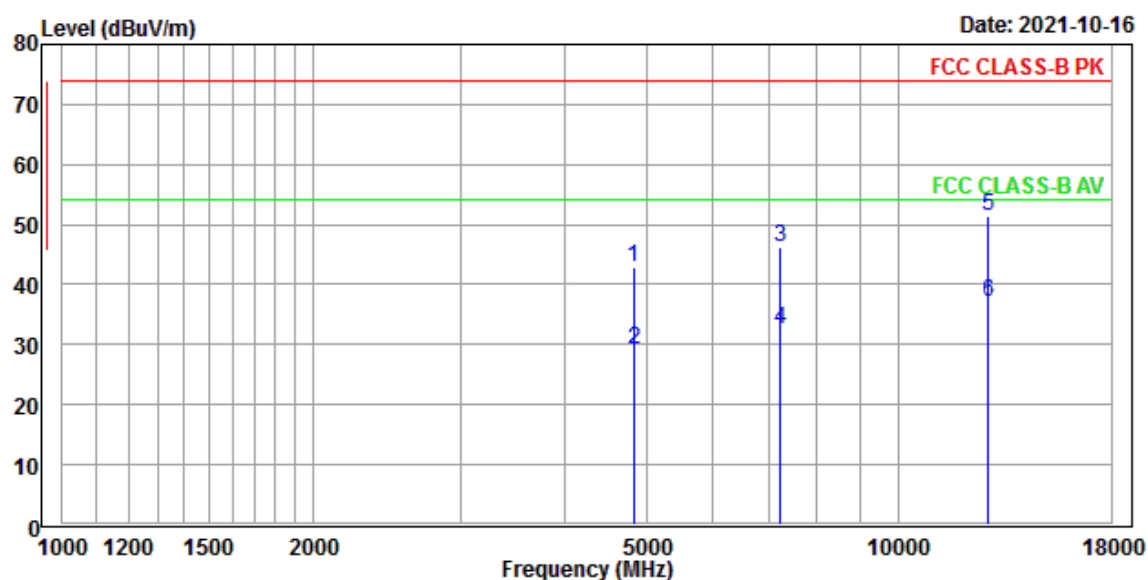
Test Range : 1 GHz ~ 25 GHz

Polarization : Vertical

Tester : Jack

Ambient Temperature : 21°C

Relative Humidity : 60%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 VERTICAL

POWER :

OPERATOR : Jack T:21 H:60 P:1012

	Freq	Level	Read	Limit	Over	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	Level	Factor	Line	Limit			
			dBuV	dB/m	dBuV/m	dB	cm	deg	
1	4823.551	42.87	58.38	-15.51	74.00	-31.13	177	236	VERTICAL Peak
2	4824.217	29.24	44.75	-15.51	54.00	-24.76	183	233	VERTICAL Average
3	7235.615	46.32	58.72	-12.40	74.00	-27.68	326	170	VERTICAL Peak
4	7236.288	32.47	44.86	-12.39	54.00	-21.53	321	175	VERTICAL Average
5	12845.960	51.28	59.19	-7.91	74.00	-22.72	263	196	VERTICAL Peak
6	12846.310	37.22	45.13	-7.91	54.00	-16.78	257	202	VERTICAL Average

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. No signal can be detected above 18 GHz, so the graphs are omitted.

Test Mode : Continuous Transmitting, 802.11g , 2437 MHz

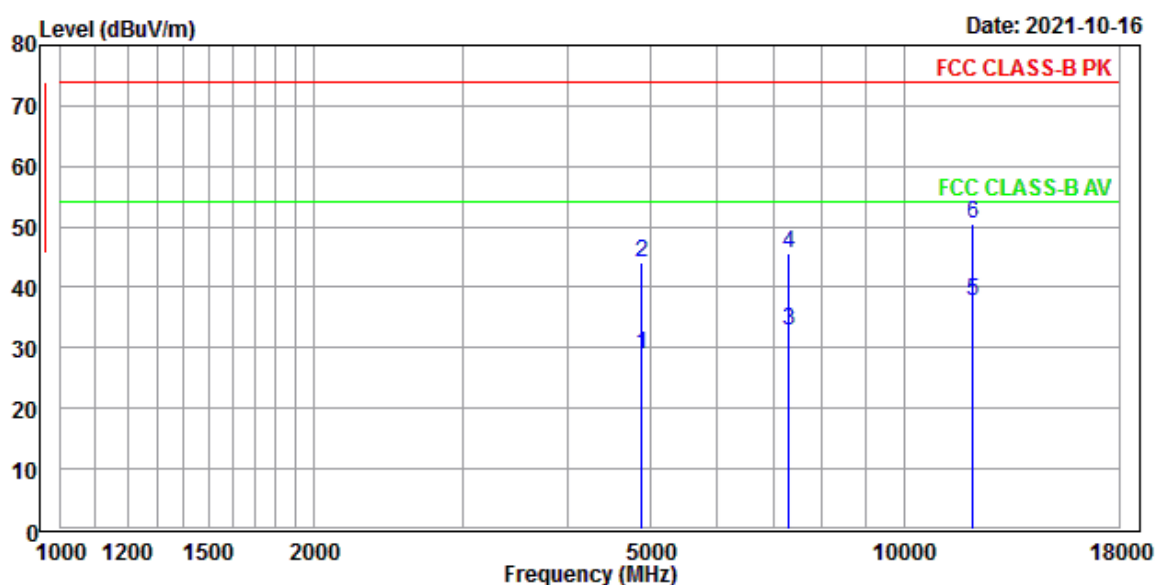
Test Range : 1 GHz ~ 25 GHz

Polarization : Horizontal

Tester : Jack

Ambient Temperature : 21°C

Relative Humidity : 60%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 Horizontal

POWER :

OPERATOR : Jack T:21 H:60 P:1012

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	4873.874	28.91	44.49	-15.58	54.00	-25.09	199	117	Horizontal	Average
2	4874.224	44.06	59.64	-15.58	74.00	-29.94	194	114	Horizontal	Peak
3	7310.618	32.84	45.22	-12.38	54.00	-21.16	158	223	Horizontal	Average
4	7311.373	45.70	58.08	-12.38	74.00	-28.30	152	227	Horizontal	Peak
5	12060.730	37.79	45.20	-7.41	54.00	-16.21	177	276	Horizontal	Average
6	12061.440	50.60	58.01	-7.41	74.00	-23.40	174	272	Horizontal	Peak

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. No signal can be detected above 18 GHz, so the graphs are omitted.

Test Mode : Continuous Transmitting, 802.11g , 2437 MHz

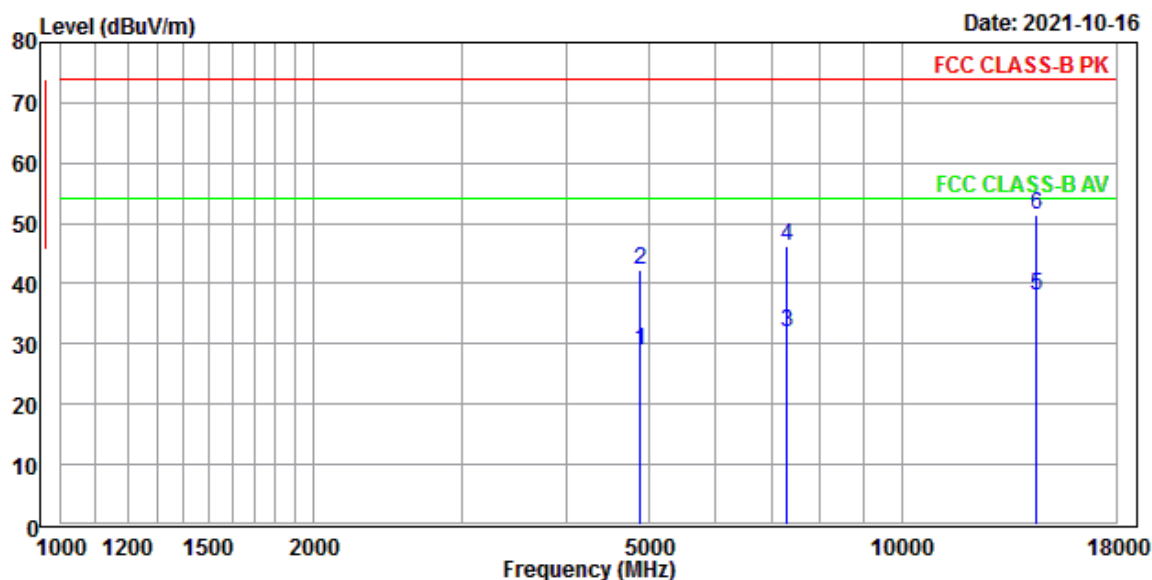
Test Range : 1 GHz ~ 25 GHz

Polarization : Vertical

Tester : Jack

Ambient Temperature : 21°C

Relative Humidity : 60%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 Vertical

POWER :

OPERATOR : Jack T:21 H:60 P:1012

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	4873.762	28.87	44.45	-15.58	54.00	-25.13	338	259	Vertical	Average
2	4874.029	42.33	57.91	-15.58	74.00	-31.67	342	255	Vertical	Peak
3	7310.365	31.80	44.18	-12.38	54.00	-22.20	181	307	Vertical	Average
4	7311.008	46.10	58.48	-12.38	74.00	-27.90	185	302	Vertical	Peak
5	14440.430	38.04	47.98	-9.94	54.00	-15.96	235	143	Vertical	Average
6	14441.220	51.39	61.34	-9.95	74.00	-22.61	232	148	Vertical	Peak

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. No signal can be detected above 18 GHz, so the graphs are omitted.

Test Mode : Continuous Transmitting, 802.11g , 2462 MHz

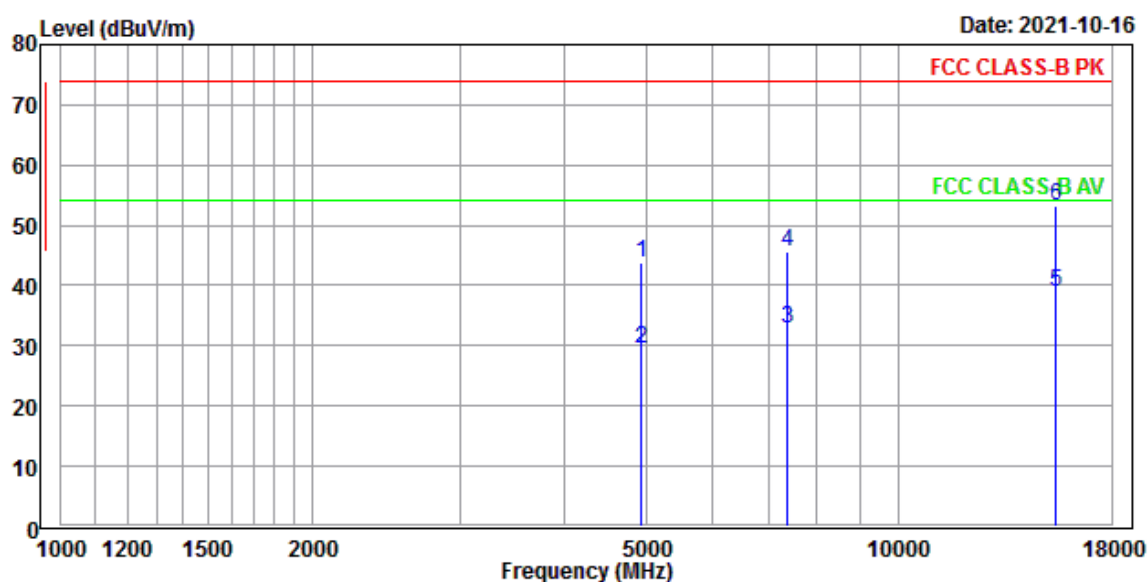
Test Range : 1 GHz ~ 25 GHz

Polarization : Horizontal

Tester : Jack

Ambient Temperature : 21°C

Relative Humidity : 60%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 Horizontal

POWER :

OPERATOR : Jack T:21 H:60 P:1012

	Freq	Level	Read Level	Factor	Limit Line	Over Limit	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	4923.518	43.77	59.35	-15.58	74.00	-30.23	179	112	Horizontal	Peak
2	4924.219	29.59	45.16	-15.57	54.00	-24.41	183	116	Horizontal	Average
3	7385.781	32.83	44.99	-12.16	54.00	-21.17	229	324	Horizontal	Average
4	7386.392	45.49	57.65	-12.16	74.00	-28.51	234	320	Horizontal	Peak
5	15446.810	39.06	47.52	-8.46	54.00	-14.94	251	37	Horizontal	Average
6	15447.470	53.15	61.61	-8.46	74.00	-20.85	258	33	Horizontal	Peak

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. No signal can be detected above 18 GHz, so the graphs are omitted.

Test Mode : Continuous Transmitting, 802.11g , 2462 MHz

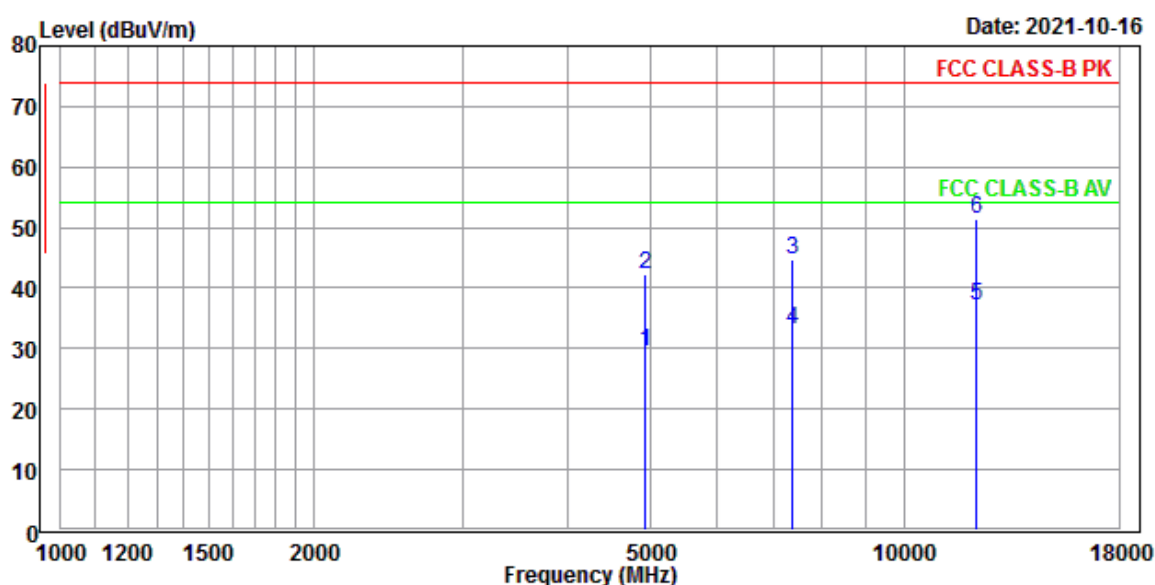
Test Range : 1 GHz ~ 25 GHz

Polarization : Vertical

Tester : Jack

Ambient Temperature : 21°C

Relative Humidity : 60%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 Vertical

POWER :

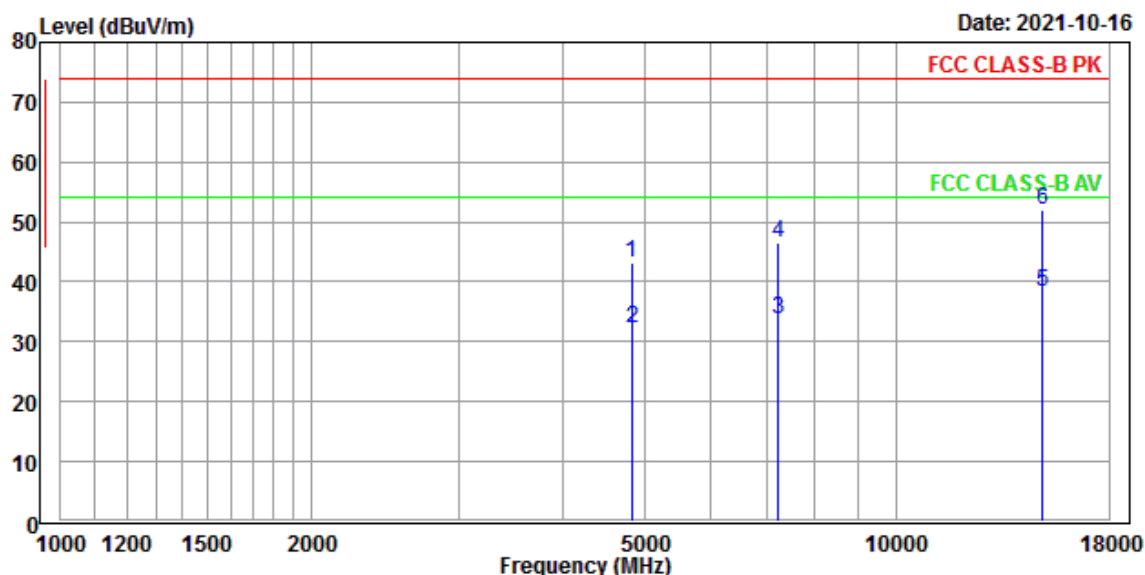
OPERATOR : Jack T:21 H:60 P:1012

	Freq	Level	Read	Limit	Over	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	Level	Factor	Line	Limit			
			dBuV	dB/m	dBuV/m	dB	cm	deg	
1	4923.647	29.60	45.18	-15.58	54.00	-24.40	152	138	Vertical Average
2	4924.185	42.38	57.95	-15.57	74.00	-31.62	148	133	Vertical Peak
3	7385.607	44.83	56.99	-12.16	74.00	-29.17	244	327	Vertical Peak
4	7386.107	33.05	45.21	-12.16	54.00	-20.95	240	322	Vertical Average
5	12218.510	37.23	44.67	-7.44	54.00	-16.77	188	282	Vertical Average
6	12219.380	51.27	58.71	-7.44	74.00	-22.73	184	285	Vertical Peak

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. No signal can be detected above 18 GHz, so the graphs are omitted.

Test Mode : Continuous Transmitting, 802.11n HT20 , 2412 MHz
Test Range : 1 GHz ~ 25 GHz
Polarization : Horizontal **Tester** : Jack
Ambient Temperature : 21°C **Relative Humidity** : 60%



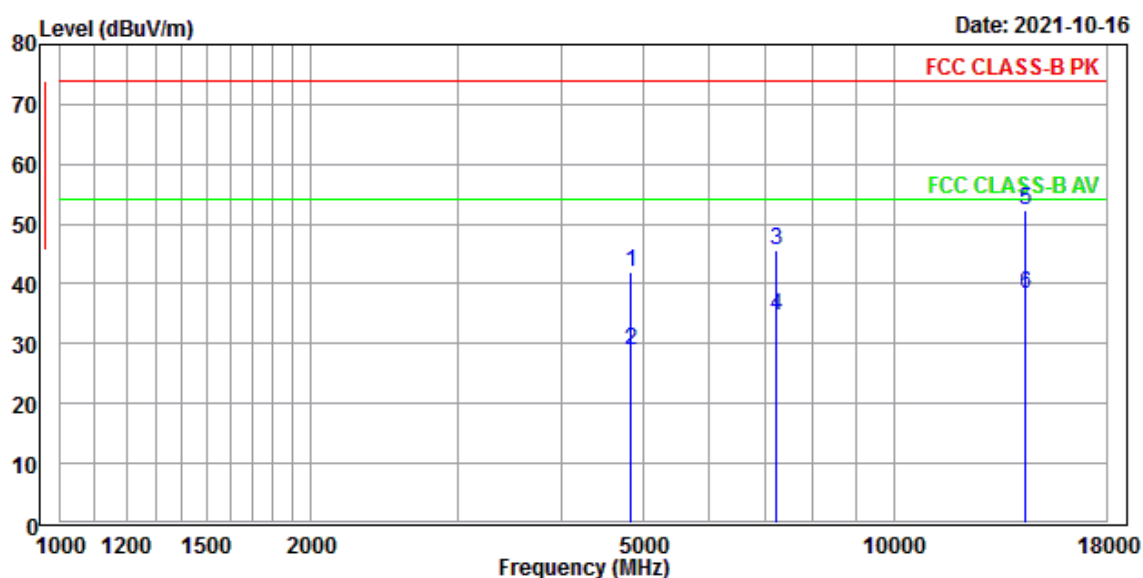
Condition : FCC CLASS-B PK 3m EMCO_3117_82847 Horizontal
POWER :
OPERATOR : Jack T:21 H:60 P:1012

	Freq	Level	Read Level	Limit Factor	Over Line	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1	4823.734	43.30	58.81	-15.51	74.00	-30.70	195	57	Horizontal Peak
2	4824.227	32.10	47.61	-15.51	54.00	-21.90	190	53	Horizontal Average
3	7235.724	33.71	46.11	-12.40	54.00	-20.29	232	301	Horizontal Average
4	7236.448	46.63	59.02	-12.39	74.00	-27.37	236	307	Horizontal Peak
5	15006.740	38.38	46.79	-8.41	54.00	-15.62	160	229	Horizontal Average
6	15007.420	51.91	60.32	-8.41	74.00	-22.09	164	226	Horizontal Peak

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. No signal can be detected above 18 GHz, so the graphs are omitted.

Test Mode : Continuous Transmitting, 802.11n HT20 , 2412 MHz
Test Range : 1 GHz ~ 25 GHz
Polarization : Vertical **Tester** : Jack
Ambient Temperature : 21°C **Relative Humidity** : 60%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 Vertical
POWER :
OPERATOR : Jack T:21 H:60 P:1012

	Freq	Level	Read	Limit	Over	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	Level	Factor	Line	Limit			
			dBuV	dB/m	dBuV/m	dB	cm	deg	
1	4823.978	42.10	57.61	-15.51	74.00	-31.90	172	151	Vertical Peak
2	4824.294	28.84	44.35	-15.51	54.00	-25.16	178	155	Vertical Average
3	7235.896	45.69	58.09	-12.40	74.00	-28.31	286	235	Vertical Peak
4	7236.588	34.81	47.20	-12.39	54.00	-19.19	282	239	Vertical Average
5	14408.590	52.18	62.12	-9.94	74.00	-21.82	193	272	Vertical Peak
6	14409.210	38.26	48.20	-9.94	54.00	-15.74	196	266	Vertical Average

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. No signal can be detected above 18 GHz, so the graphs are omitted.

Test Mode : Continuous Transmitting, 802.11n HT20 , 2437 MHz

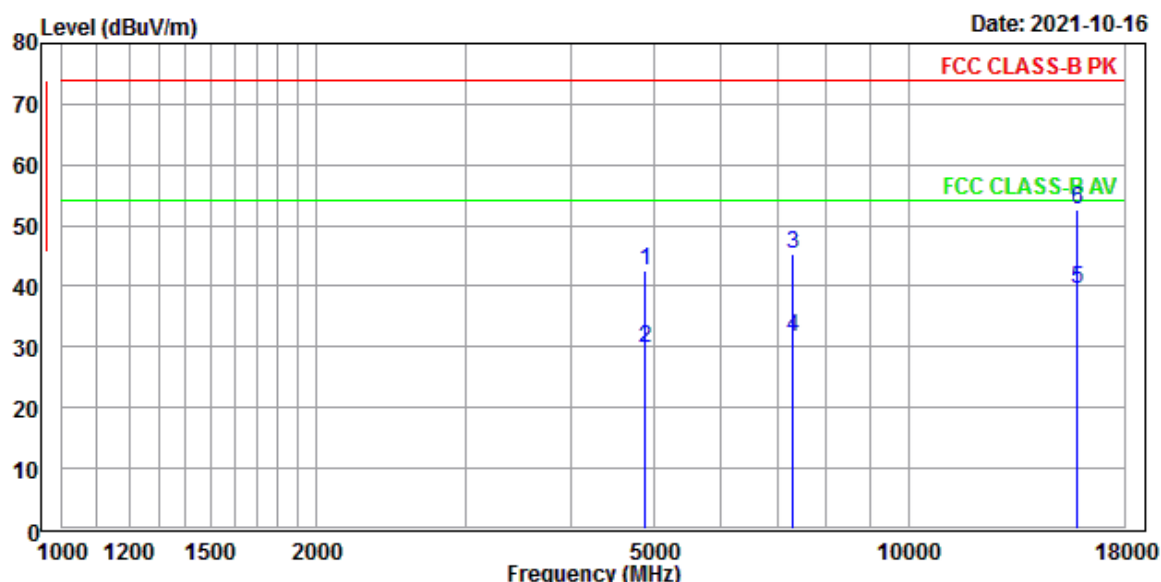
Test Range : 1 GHz ~ 25 GHz

Polarization : Horizontal

Tester : Jack

Ambient Temperature : 21°C

Relative Humidity : 60%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 Horizontal

POWER :

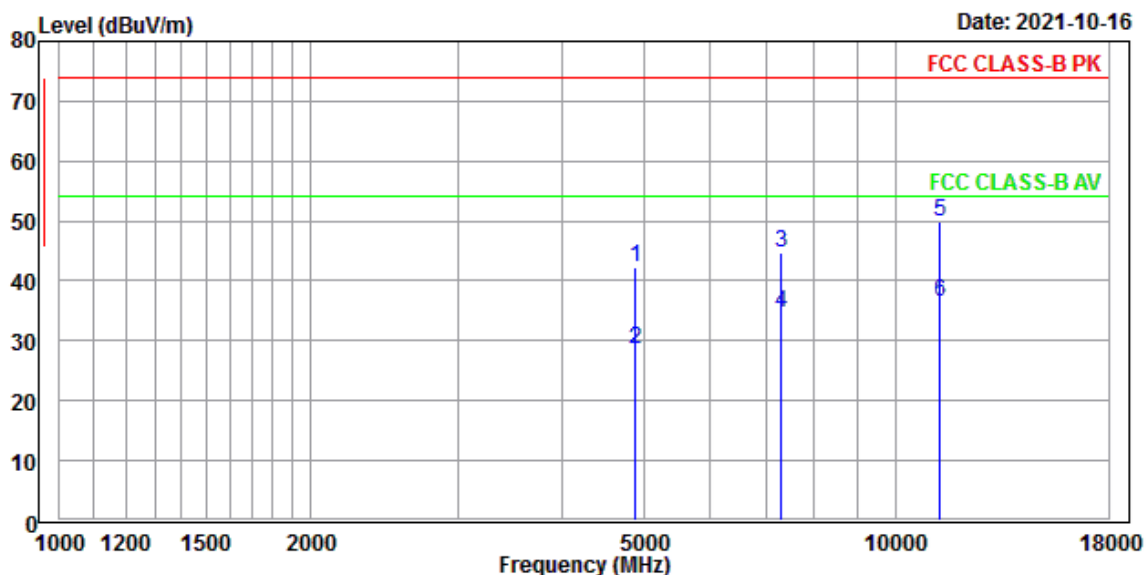
OPERATOR : Jack T:21 H:60 P:1012

	Freq	Level	Read	Limit	Over	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	Level	Factor	Line	Limit			
			dBuV	dB/m	dBuV/m	dB	cm	deg	
1	4873.944	42.45	58.03	-15.58	74.00	-31.55	181	89	Horizontal Peak
2	4874.176	29.67	45.25	-15.58	54.00	-24.33	187	83	Horizontal Average
3	7310.830	45.37	57.75	-12.38	74.00	-28.63	148	263	Horizontal Peak
4	7311.477	31.62	44.00	-12.38	54.00	-22.38	151	267	Horizontal Average
5	15838.720	39.63	47.40	-7.77	54.00	-14.37	268	149	Horizontal Average
6	15839.230	52.77	60.53	-7.76	74.00	-21.23	264	145	Horizontal Peak

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. No signal can be detected above 18 GHz, so the graphs are omitted.

Test Mode : Continuous Transmitting, 802.11n HT20 , 2437 MHz
Test Range : 1 GHz ~ 25 GHz
Polarization : Vertical **Tester** : Jack
Ambient Temperature : 21°C **Relative Humidity** : 60%



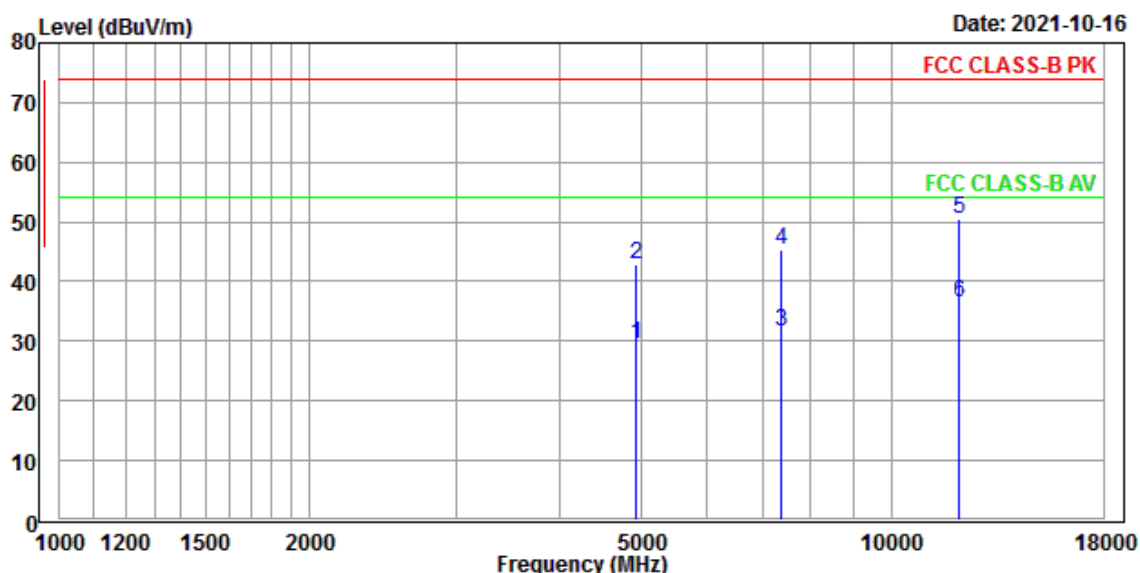
Condition : FCC CLASS-B PK 3m EMCO_3117_82847 Vertical
POWER :
OPERATOR : Jack T:21 H:60 P:1012

	Freq	Level	Read	Limit	Over	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	Level	Factor	Line	Limit			
			dBuV	dB/m	dBuV/m	dB	cm	deg	
1	4873.625	42.16	57.73	-15.57	74.00	-31.84	314	157 Vertical	Peak
2	4874.221	28.74	44.32	-15.58	54.00	-25.26	308	162 Vertical	Average
3	7310.598	44.71	57.09	-12.38	74.00	-29.29	184	249 Vertical	Peak
4	7311.089	34.55	46.93	-12.38	54.00	-19.45	181	245 Vertical	Average
5	11296.960	49.83	57.48	-7.65	74.00	-24.17	163	86 Vertical	Peak
6	11297.150	36.48	44.13	-7.65	54.00	-17.52	167	81 Vertical	Average

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. No signal can be detected above 18 GHz, so the graphs are omitted.

Test Mode : Continuous Transmitting, 802.11n HT20 , 2462 MHz
Test Range : 1 GHz ~ 25 GHz
Polarization : Horizontal **Tester** : Jack
Ambient Temperature : 21°C **Relative Humidity** : 60%



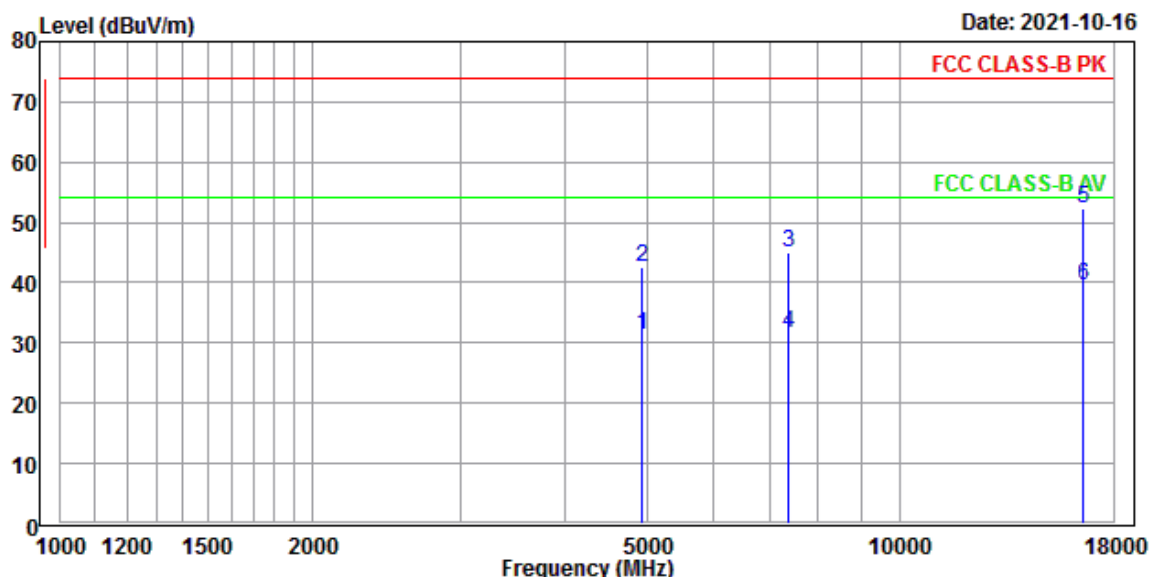
Condition : FCC CLASS-B PK 3m EMCO_3117_82847 Horizontal
POWER :
OPERATOR : Jack T:21 H:60 P:1012

	Freq	Level	Read	Limit	Over	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	Level	Factor	Line	Limit			
			dBuV	dB/m	dBuV/m	dB	cm	deg	
1	4923.768	29.39	44.97	-15.58	54.00	-24.61	187	176	Horizontal Average
2	4924.082	42.95	58.53	-15.58	74.00	-31.05	194	173	Horizontal Peak
3	7385.884	31.68	43.84	-12.16	54.00	-22.32	244	153	Horizontal Average
4	7386.481	45.30	57.46	-12.16	74.00	-28.70	248	147	Horizontal Peak
5	12084.820	50.53	57.95	-7.42	74.00	-23.47	284	227	Horizontal Peak
6	12085.220	36.53	43.94	-7.41	54.00	-17.47	279	222	Horizontal Average

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. No signal can be detected above 18 GHz, so the graphs are omitted.

Test Mode : Continuous Transmitting, 802.11n HT20 , 2462 MHz
Test Range : 1 GHz ~ 25 GHz
Polarization : Vertical **Tester** : Jack
Ambient Temperature : 21°C **Relative Humidity** : 60%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 Vertical
POWER :
OPERATOR : Jack T:21 H:60 P:1012

	Freq	Level	Read Level	Limit Factor	Limit Line	Over Limit	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg		
1	4923.458	31.32	46.90	-15.58	54.00	-22.68	248	305	Vertical	Average
2	4924.290	42.63	58.20	-15.57	74.00	-31.37	244	301	Vertical	Peak
3	7385.590	45.03	57.19	-12.16	74.00	-28.97	149	65	Vertical	Peak
4	7386.282	31.68	43.84	-12.16	54.00	-22.32	143	68	Vertical	Average
5	16602.510	52.28	58.70	-6.42	74.00	-21.72	182	264	Vertical	Peak
6	16603.120	39.46	45.87	-6.41	54.00	-14.54	187	260	Vertical	Average

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. No signal can be detected above 18 GHz, so the graphs are omitted.

Test Mode : Continuous Transmitting, 802.11n HT40 , 2422 MHz

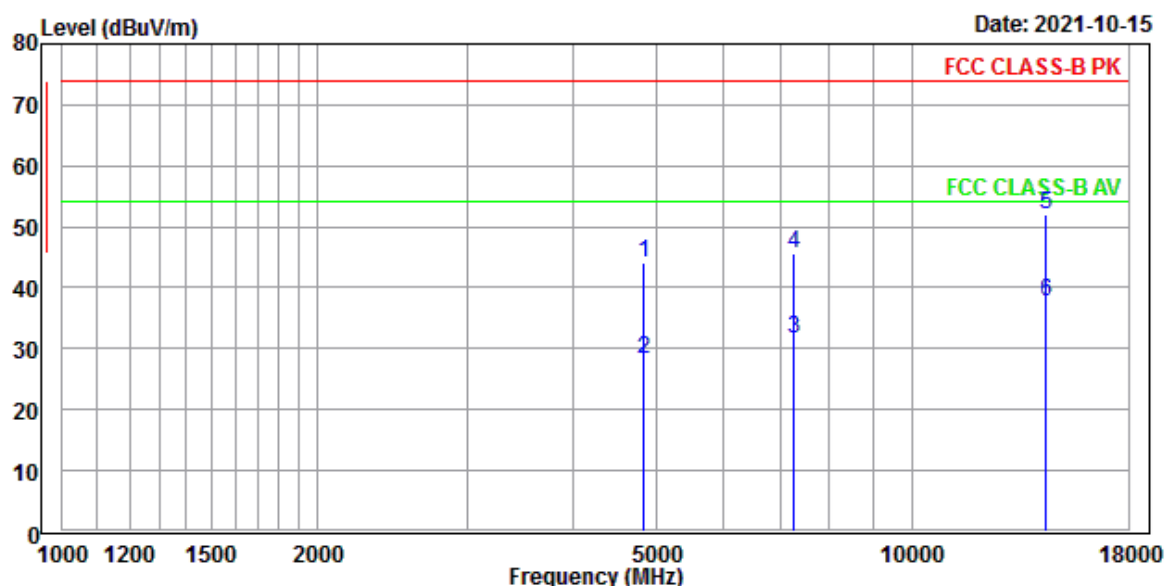
Test Range : 1 GHz ~ 25 GHz

Polarization : Horizontal

Tester : Jack

Ambient Temperature : 22°C

Relative Humidity : 63%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 Horizontal

POWER :

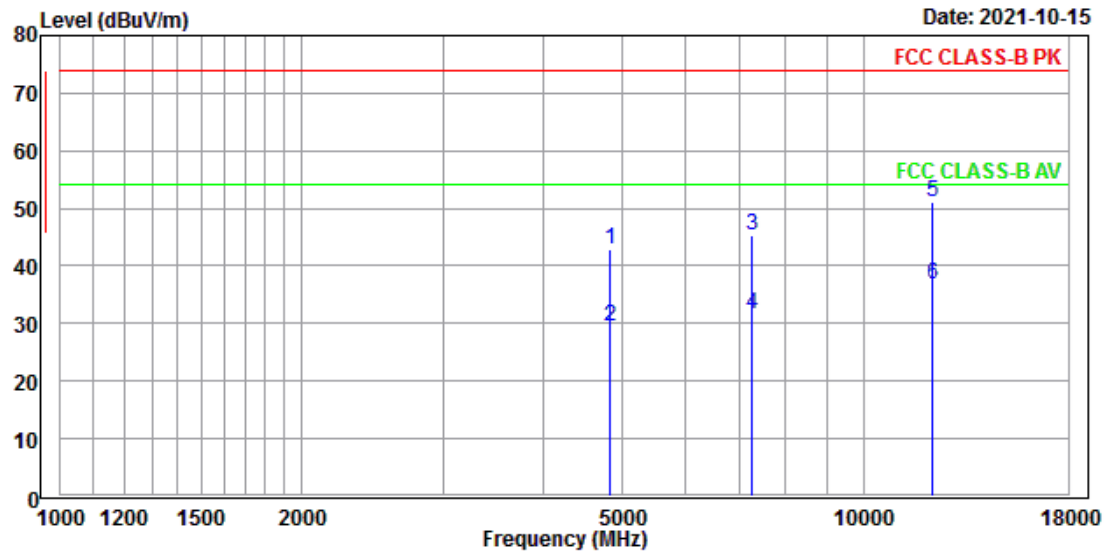
OPERATOR : Jack T:22 H:63 P:1011

	Freq	Level	Read	Limit	Over	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	Level	Line	Limit	cm	deg		
			dBuV	dB/m	dBuV/m	dB			
1	4843.666	44.07	59.55	-15.48	74.00	-29.93	174	225	Horizontal Peak
2	4844.206	28.41	43.89	-15.48	54.00	-25.59	170	221	Horizontal Average
3	7265.412	31.70	44.10	-12.40	54.00	-22.30	196	278	Horizontal Average
4	7266.280	45.64	58.04	-12.40	74.00	-28.36	199	274	Horizontal Peak
5	14389.800	51.96	61.88	-9.92	74.00	-22.04	148	246	Horizontal Peak
6	14390.240	37.77	47.69	-9.92	54.00	-16.23	141	240	Horizontal Average

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. No signal can be detected above 18 GHz, so the graphs are omitted.

Test Mode : Continuous Transmitting, 802.11n HT40 , 2422 MHz
Test Range : 1 GHz ~ 25 GHz
Polarization : Vertical **Tester** : Jack
Ambient Temperature : 22°C **Relative Humidity** : 63%



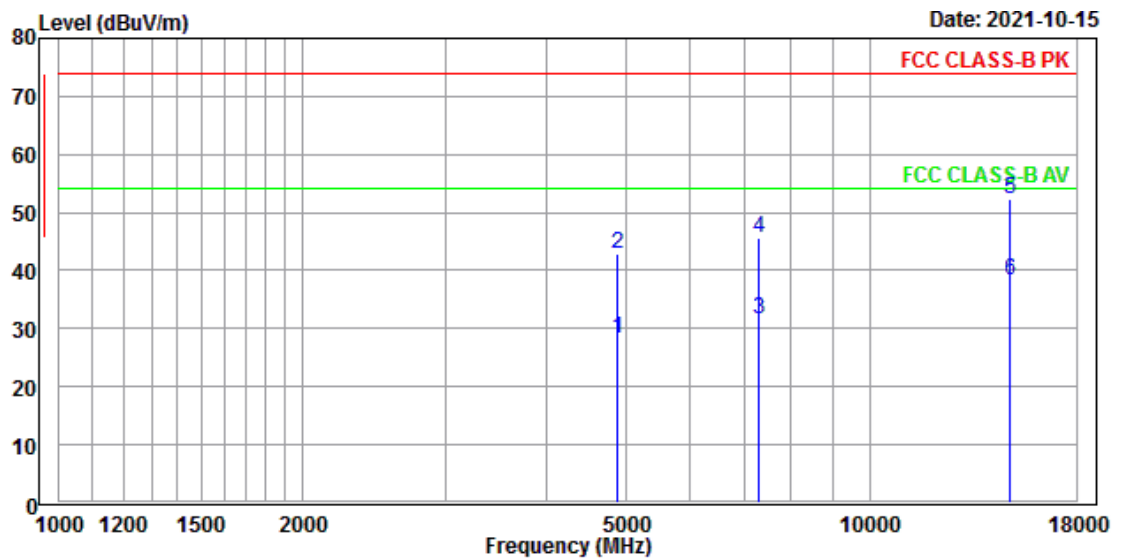
Condition : FCC CLASS-B PK 3m EMCO_3117_82847 Vertical
POWER :
OPERATOR : Jack T:22 H:63 P:1011

	Freq	Level	Read	Limit	Over	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	Level	Factor	Line	Limit			
			dBuV	dB/m	dBuV/m	dB	cm	deg	
1	4843.507	42.82	58.30	-15.48	74.00	-31.18	346	193 Vertical	Peak
2	4844.159	29.46	44.94	-15.48	54.00	-24.54	341	187 Vertical	Average
3	7265.986	45.38	57.78	-12.40	74.00	-28.62	264	92 Vertical	Peak
4	7266.412	31.67	44.07	-12.40	54.00	-22.33	268	95 Vertical	Average
5	12165.870	50.98	58.39	-7.41	74.00	-23.02	186	228 Vertical	Peak
6	12166.430	36.71	44.12	-7.41	54.00	-17.29	192	224 Vertical	Average

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. No signal can be detected above 18 GHz, so the graphs are omitted.

Test Mode : Continuous Transmitting, 802.11n HT40 , 2437 MHz
Test Range : 1 GHz ~ 25 GHz
Polarization : Horizontal **Tester** : Jack
Ambient Temperature : 22°C **Relative Humidity** : 63%



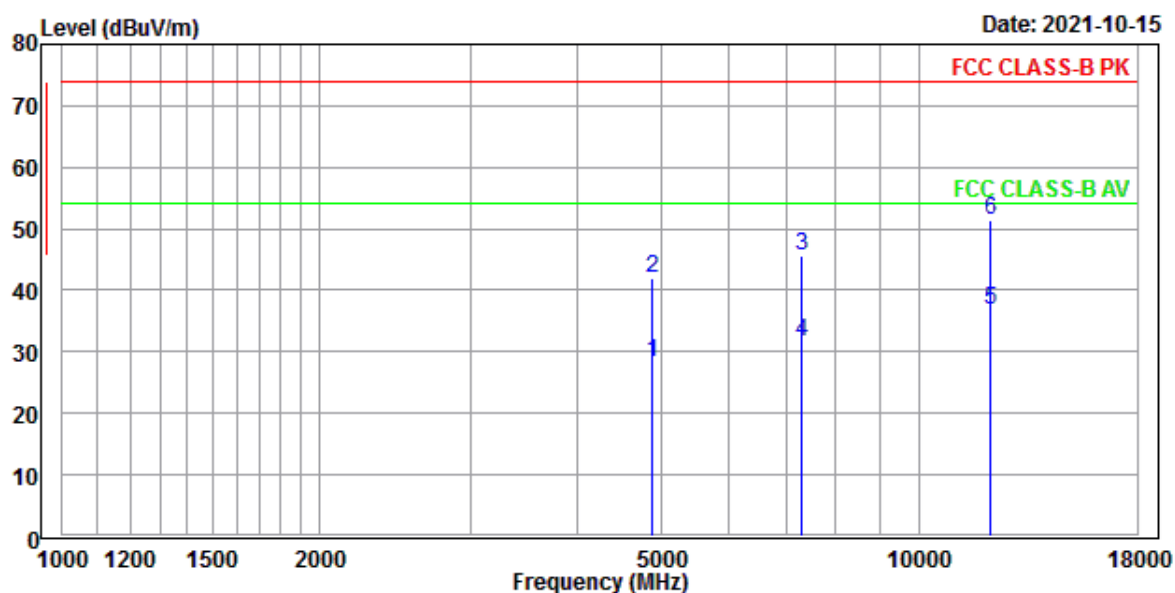
Condition : FCC CLASS-B PK 3m EMCO_3117_82847 Horizontal
POWER :
OPERATOR : Jack T:22 H:63 P:1011

	Freq	Level	Read	Limit	Over	APos	TPos		
	MHz	dBuV/m	Level	Factor	Line	Limit		Pol/Phase	Remark
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1	4873.576	28.36	43.93	-15.57	54.00	-25.64	161	224	Horizontal Average
2	4874.062	42.97	58.55	-15.58	74.00	-31.03	166	220	Horizontal Peak
3	7310.393	31.51	43.89	-12.38	54.00	-22.49	182	258	Horizontal Average
4	7311.093	45.49	57.87	-12.38	74.00	-28.51	188	255	Horizontal Peak
5	14941.980	52.33	60.99	-8.66	74.00	-21.67	297	164	Horizontal Peak
6	14942.440	38.47	47.13	-8.66	54.00	-15.53	292	159	Horizontal Average

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. No signal can be detected above 18 GHz, so the graphs are omitted.

Test Mode : Continuous Transmitting, 802.11n HT40 , 2437 MHz
Test Range : 1 GHz ~ 25 GHz
Polarization : Vertical **Tester** : Jack
Ambient Temperature : 22°C **Relative Humidity** : 63%



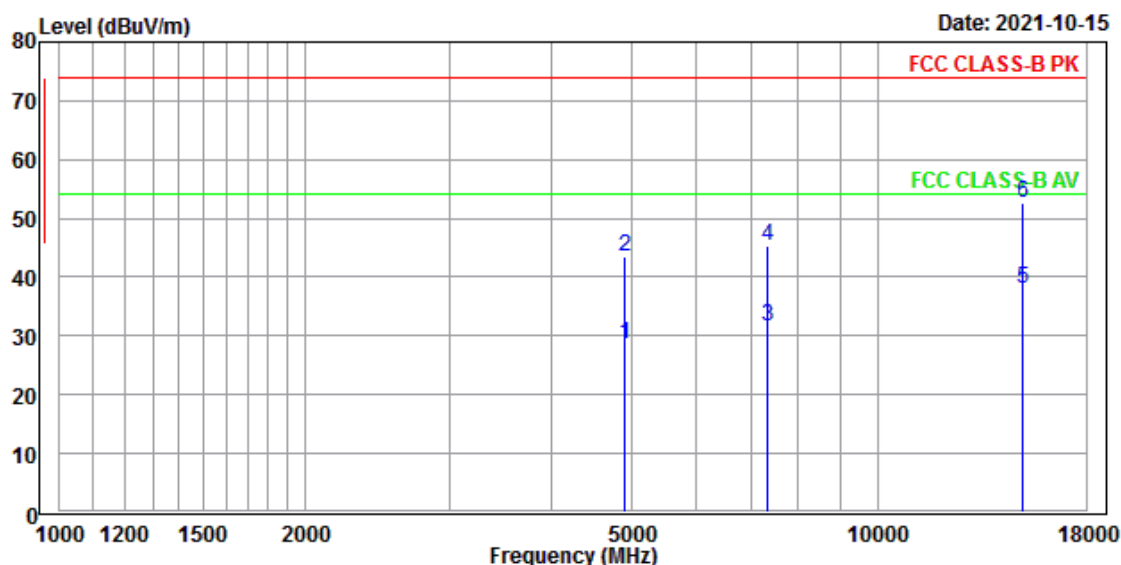
Condition : FCC CLASS-B PK 3m EMCO_3117_82847 Vertical
POWER :
OPERATOR : Jack T:22 H:63 P:1011

	Freq	Level	Read	Limit	Over	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	Level	Factor	Line	Limit			
			dBuV	dB/m	dBuV/m	dB	cm	deg	
1	4873.752	28.39	43.97	-15.58	54.00	-25.61	264	187 Vertical	Average
2	4874.320	41.99	57.57	-15.58	74.00	-32.01	260	183 Vertical	Peak
3	7310.725	45.49	57.87	-12.38	74.00	-28.51	226	129 Vertical	Peak
4	7311.277	31.52	43.90	-12.38	54.00	-22.48	230	134 Vertical	Average
5	12158.700	36.80	44.22	-7.42	54.00	-17.20	296	211 Vertical	Average
6	12159.100	51.50	58.92	-7.42	74.00	-22.50	292	203 Vertical	Peak

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. No signal can be detected above 18 GHz, so the graphs are omitted.

Test Mode : Continuous Transmitting, 802.11n HT40 , 2452 MHz
Test Range : 1 GHz ~ 25 GHz
Polarization : Horizontal **Tester** : Jack
Ambient Temperature : 22°C **Relative Humidity** : 63%



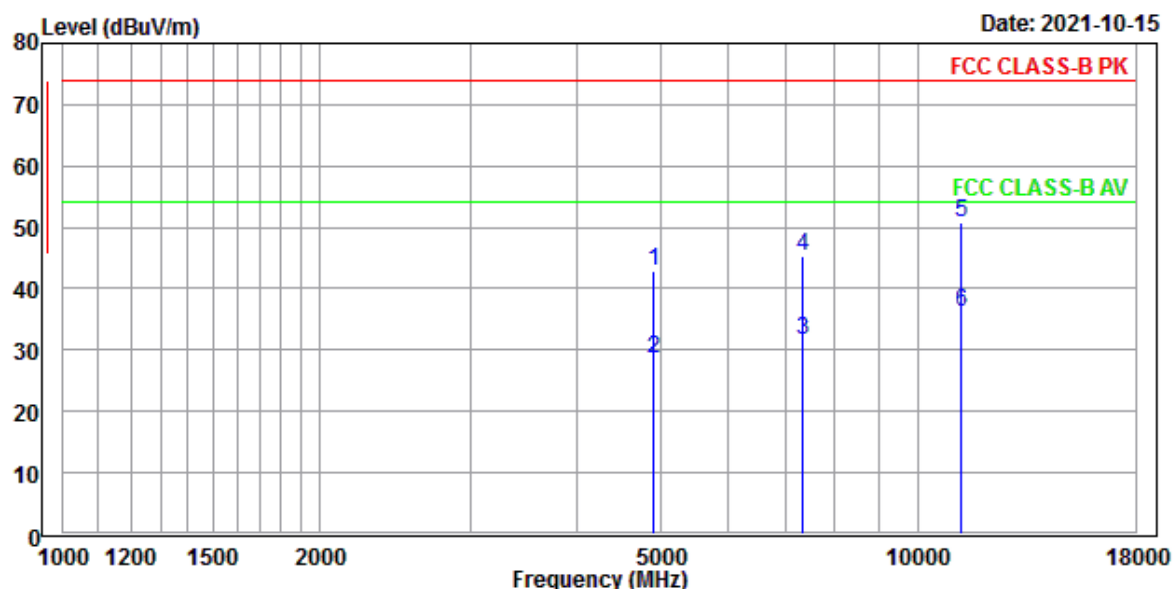
Condition : FCC CLASS-B PK 3m EMCO_3117_82847 Horizontal
POWER :
OPERATOR : Jack T:22 H:63 P:1011

	Freq	Level	Read	Limit	Over	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	Level	Factor	Line	Limit			
	MHz	dBuV/m	dBuV	dB/m	dBuV/m	dB	cm	deg	
1	4903.741	28.60	44.29	-15.69	54.00	-25.40	182	268	Horizontal Average
2	4904.474	43.59	59.27	-15.68	74.00	-30.41	186	263	Horizontal Peak
3	7355.886	31.52	43.81	-12.29	54.00	-22.48	249	137	Horizontal Average
4	7356.221	45.26	57.55	-12.29	74.00	-28.74	244	141	Horizontal Peak
5	15037.730	38.07	46.48	-8.41	54.00	-15.93	161	304	Horizontal Average
6	15038.350	52.48	60.89	-8.41	74.00	-21.52	167	309	Horizontal Peak

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line.
4. No signal can be detected above 18 GHz, so the graphs are omitted.

Test Mode : Continuous Transmitting, 802.11n HT40 , 2452 MHz
Test Range : 1 GHz ~ 25 GHz
Polarization : Vertical **Tester** : Jack
Ambient Temperature : 22°C **Relative Humidity** : 63%



Condition : FCC CLASS-B PK 3m EMCO_3117_82847 Vertical
POWER :
OPERATOR : Jack T:22 H:63 P:1011

	Freq	Level	Read	Limit	Over	APos	TPos	Pol/Phase	Remark
	MHz	dBuV/m	Level	Factor	Line	Limit			
			dBuV	dB/m	dBuV/m	dB	cm	deg	
1	4903.897	42.95	58.64	-15.69	74.00	-31.05	215	241 Vertical	Peak
2	4904.264	28.70	44.38	-15.68	54.00	-25.30	219	233 Vertical	Average
3	7355.824	31.53	43.82	-12.29	54.00	-22.47	255	142 Vertical	Average
4	7356.343	45.35	57.64	-12.29	74.00	-28.65	252	135 Vertical	Peak
5	11260.840	50.86	58.57	-7.71	74.00	-23.14	174	239 Vertical	Peak
6	11261.470	36.22	43.93	-7.71	54.00	-17.78	170	235 Vertical	Average

Note:

1. Level (dBuV/m) = Read level + Factor.
2. Factor (dB/m) = Cable Loss + Antenna Factor – Gain of Preamplifier.
3. Over Limit (dB) = Level – Limit line
4. No signal can be detected above 18 GHz, so the graphs are omitted.

7 Conducted Emission Measurement

Result: Pass

7.1 Limits for Emission Measurement

According to FCC 15.207(a), line conduction emission limit is as below table.

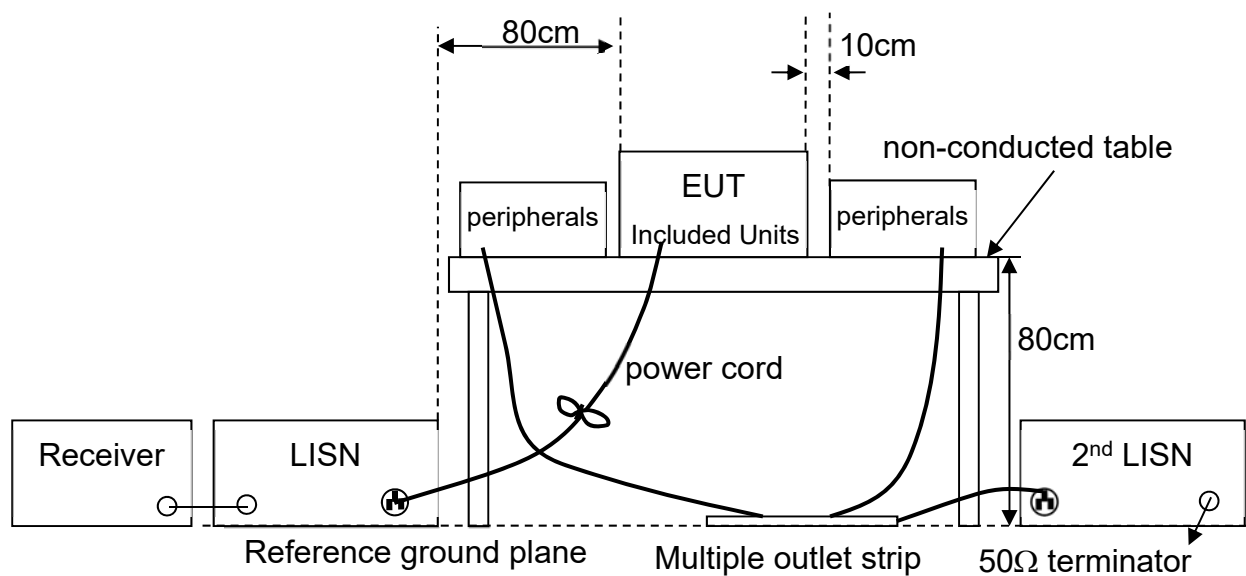
Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 – 0.5	66 to 56*	56 to 46*
0.5 - 5	56	46
5 - 30	60	50

* Decreases with the logarithm of the frequency.

7.2 Test Procedures

- a. The EUT was set up per the test configuration figured in the next section of this chapter to simulate the typical usage per the user's manual.
- b. If the EUT is tabletop equipment, it was placed on a non-conducted table with a height of 0.8 meters above the reference ground plane and 0.4 meters from the conducting wall of the shielded room. Also if the EUT is floor-standing equipment, it was placed on a non-conducted support with a height of 12 millimeters above the reference ground plane.
- c. Connect the EUT's power source to the appropriate power mains through the LISN.
- d. All the other peripherals are connected to the 2nd LISN, if any.
- e. The LISN was placed 0.8 meters from the EUT and at least 0.8 meters from other units and other metal planes.
- f. Measure the conducted emissions on each power line (Neutral Line and Line 1 – Hot side) of the EUT's power source by using the test receiver connected to the coupling RF output port of LISN.
- g. Rapidly scan the signal from 150kHz to 30MHz by using the receiver through the Maximum-Peak detector to determine those frequencies associated with higher emission levels for each measured line. Receiver setting is IF bandwidth=9 kHz.
- h. Then measure the maximum level of conducted disturbance for each frequency found from step g. by using the receiver through the Quasi-Peak and Average detectors per CISPR 16-1.
- i. Record the level for each frequency and compare with the required limit.

7.3 Test Configurations



7.4 Test Data

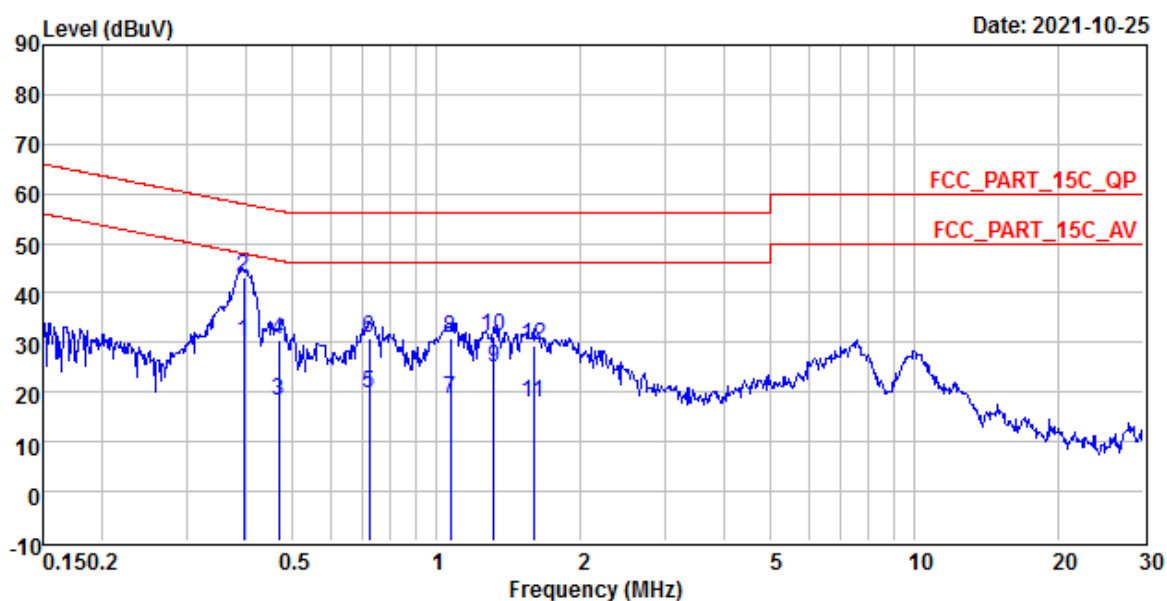
Test Mode : Normal

Phase : Line

Ambient Temperature : 25°C

Tester : David Lu

Relative Humidity : 67%



Site : TR20
 Condition : FCC_PART_15C_QP ESH2-Z5 LINE
 Power : 120V/60Hz
 Operator : David Lu T25 H67 P1016

	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.394	30.32	10.34	19.98	47.98	-17.66	LINE	Average
2	0.394	43.00	10.34	32.66	57.98	-14.98	LINE	QP
3	0.467	18.26	10.34	7.92	46.56	-28.30	LINE	Average
4	0.467	30.56	10.34	20.22	56.56	-26.00	LINE	QP
5	0.721	19.74	10.37	9.37	46.00	-26.26	LINE	Average
6	0.721	31.02	10.37	20.65	56.00	-24.98	LINE	QP
7	1.068	18.46	10.39	8.07	46.00	-27.54	LINE	Average
8	1.068	30.97	10.39	20.58	56.00	-25.03	LINE	QP
9	1.317	24.85	10.41	14.44	46.00	-21.15	LINE	Average
10	1.317	31.33	10.41	20.92	56.00	-24.67	LINE	QP
11	1.590	18.01	10.43	7.58	46.00	-27.99	LINE	Average
12	1.590	29.33	10.43	18.90	56.00	-26.67	LINE	QP

Note:

1. Emission Level = reading value + correction factor.
2. Correction factor = cable loss + insertion loss of LISN.
3. Q.P. is abbreviation of quasi-peak.

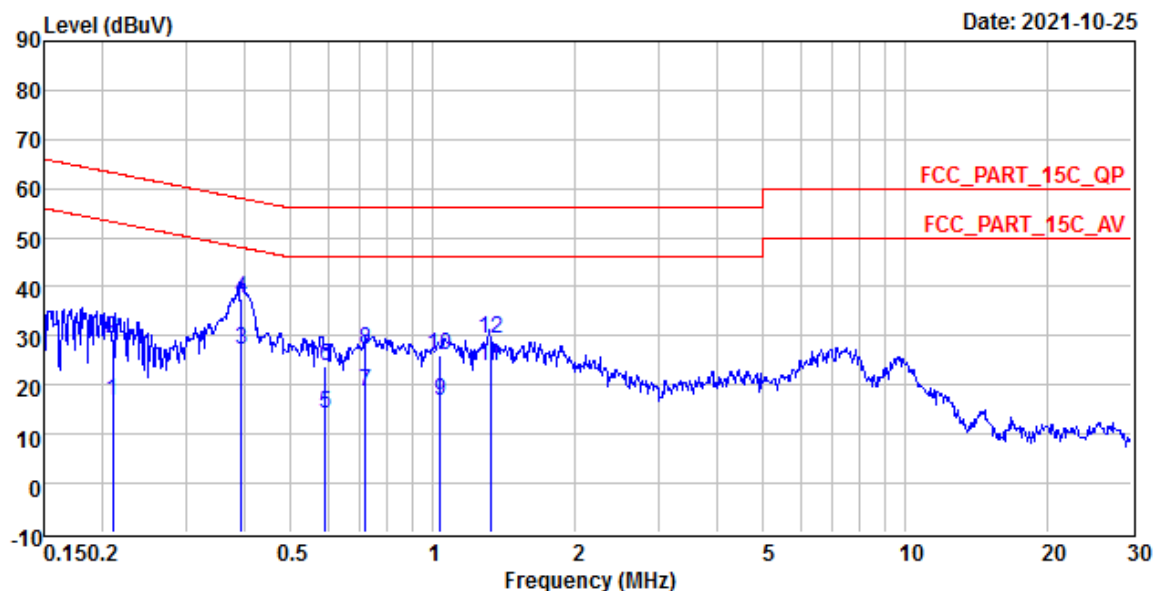
Test Mode : Normal

Phase : Line

Tester : David Lu

Ambient Temperature : 25°C

Relative Humidity : 67%



Site : TR20
 Condition : FCC_PART_15C_QP ESH2-Z5 NEUTRAL
 Power : 120V/60Hz
 Operator : David Lu T25 H67 P1016

	Freq	Level	Factor	Read Level	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.209	16.81	10.31	6.50	53.23	-36.42	NEUTRAL	Average
2	0.209	29.33	10.31	19.02	63.23	-33.90	NEUTRAL	QP
3	0.393	27.28	10.35	16.93	48.01	-20.73	NEUTRAL	Average
4	0.393	37.48	10.35	27.13	58.01	-20.53	NEUTRAL	QP
5	0.591	14.29	10.37	3.92	46.00	-31.71	NEUTRAL	Average
6	0.591	24.00	10.37	13.63	56.00	-32.00	NEUTRAL	QP
7	0.719	18.47	10.38	8.09	46.00	-27.53	NEUTRAL	Average
8	0.719	27.05	10.38	16.67	56.00	-28.95	NEUTRAL	QP
9	1.037	16.66	10.40	6.26	46.00	-29.34	NEUTRAL	Average
10	1.037	26.12	10.40	15.72	56.00	-29.88	NEUTRAL	QP
11	1.319	23.67	10.42	13.25	46.00	-22.33	NEUTRAL	Average
12	1.319	29.38	10.42	18.96	56.00	-26.62	NEUTRAL	QP

Note:

1. Emission Level = reading value + correction factor.
2. Correction factor = cable loss + insertion loss of LISN.
3. Q.P. is abbreviation of quasi-peak.