

RF Test Report

For

HUNAN FN-LINK TECHNOLOGY LIMITED

Test Standards:	Part 15C Subpart C §15.247 <u>RSS 247 Issue 2</u>
Product Description:	<u>2.4G Wi-Fi+Bluetooth V5.0 Module</u>
Tested Model:	<u>6220N-IS</u>
Brand Name	<u>FN-LINK</u>
FCC ID:	<u>2AATL-6220N-IS</u>
IC:	<u>24844-6220NIS</u>
Classification	<u>(DTS) Digital Transmission System</u>
Report No.:	<u>EC1909021RF01</u>
Tested Date:	<u>2019-09-24 to 2019-11-12</u>
Issued Date:	<u>2019-11-12</u>
Prepared By:	<u>Victorique Gao</u> Victorique Gao /Engineer
Approved By:	<u>Bacon Wu</u> Bacon Wu / RF Manager

Hunan Ecloud Testing Technology Co., Ltd.
Building A1, Changsha E Center, No. 18 Xiangtai Avenue, Liuyang Economic and
Technological Development Zone, Hunan, P.R.C
Tel.: +86-731-89634887 Fax.: +86-731-89634887
www.hn-ecloud.com

Note: The test results in this report apply exclusively to the tested model / sample. Without written approval of Hunan Ecloud Testing Technology Co., Ltd., the test report shall not be reproduced except in full.

Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	2019.11.12	Valid	Original Report

TABLE OF CONTENTS

1	TEST LABORATORY	5
1.1	Test facility	5
2	GENERAL DESCRIPTION.....	6
2.1	Applicant	6
2.2	Manufacturer	6
2.3	General Description Of EUT	6
2.4	Modification of EUT	7
2.5	Applicable Standards.....	7
3	TEST CONFIGURATION OF EQUIPMENT UNDER TEST.....	8
3.1	Descriptions of Test Mode	8
3.2	Test Mode	8
3.3	Support Equipment	9
3.4	Test Setup	10
3.5	Measurement Results Explanation Example.....	13
4	TEST RESULT	14
4.1	DTS and Occupied Channel Bandwidth Measurement.....	14
4.2	Maximum Conducted Output Power Measurement	15
4.3	Maximum Power Spectral Density Measurement	16
4.4	Band Edges and Spurious Emission Measurement	17
4.5	Radiated Band Edges and Spurious Emission Measurement	18
4.6	AC Conducted Emission Measurement.....	127
4.7	Antenna Requirements.....	130
5	LIST OF MEASURING EQUIPMENT.....	131
6	UNCERTAINTY OF EVALUATION.....	133
	Appendix A: DTS Bandwidth.....	134
	Appendix B: Occupied Channel Bandwidth	141
	Appendix C: Maximum conducted output power	148
	Appendix D: Duty Cycle.....	155
	Appendix E: Maximum power spectral density.....	162
	Appendix F: Band edge measurements.....	169
	Appendix G: Conducted Spurious Emission	174
	Appendix H: Setup Photographs	194

Summary Of Test Result

FCC Rule	IC Rule	Description	Limit	Result	Remark
15.247(a)(2)	RSS-247 5.2(a)	6dB Bandwidth	$\geq 0.5\text{MHz}$	Pass	-
-	RSS-Gen 6.7	99% Bandwidth	-	Pass	-
15.247(b)(3)	RSS-247 A5.4(d)	Peak Output Power	$\leq 30\text{dBm}$	Pass	-
15.247(e)	RSS-247 5.2(b)	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$	Pass	-
15.247(d)	RSS-247 5.5	Conducted Band Edges and Spurious Emission	$\leq 20\text{dBc}$	Pass	-
15.247(d)	RSS-247 5.5	Radiated Band Edges and Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 4.17 dB at 4824 MHz
15.207	RSS-GEN 8.8	AC Conducted Emission	15.207(a)	Pass	Under limit 8.37 dB at 0.529 MHz
15.203 & 15.247(b)	RSS-GEN 6.8	Antenna Requirement	15.203 & 15.247(b) RSS-GEN 6.8	Pass	-

1 Test Laboratory

1.1 Test facility

CNAS (accreditation number: L11138)

Hunan Ecloud Testing Technology Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS).

FCC (Designation number: CN1244 , Test Firm Registration Number: 793308)

Hunan Ecloud Testing Technology Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

ISED(CAB identifier: CN0012, ISED# :24347)

Hunan Ecloud Testing Technology Co., Ltd. has been listed on the Wireless Device Testing Laboratories list of innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements.

A2LA (Certificate Code : 4895.01)

Hunan Ecloud Testing Technology Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

2 General Description

2.1 Applicant

HUNAN FN-LINK TECHNOLOGY LIMITED

No. 8, Litong Road, Liuyang Economic Development Zone, Liuyang City, Hunan Province, China

2.2 Manufacturer

HUNAN FN-LINK TECHNOLOGY LIMITED

No. 8, Litong Road, Liuyang Economic Development Zone, Liuyang City, Hunan Province, China

2.3 General Description Of EUT

Product	2.4G Wi-Fi+Bluetooth V5.0 Module
Model No.	6220N-IS
Brand Name	FN-LINK
FCC ID	2AATL-6220N-IS
IC	24844-6220NIS
Power Supply	3.3Vdc
Modulation Technology	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Type	802.11b : DSSS 802.11g/n : OFDM
Operating Frequency	2412-2462MHz
Number Of Channel	11
Max. Output Power	802.11b : 16.38 dBm (0.043 W) 802.11g : 15.26 dBm (0.034 W) 802.11n HT20 : 14.32 dBm (0.027 W) 802.11n HT40 : 14.41 dBm (0.028 W)
Antenna Type	PCB Antenna type with 2dBi gain
I/O Ports	Refer to user's manual

NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

2.4 Modification of EUT

No modifications are made to the EUT during all test items.

2.5 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ FCC Part 15 Subpart C §15.247
- ♦ ANSI C63.10-2013
- ♦ IC RSS-247 Issue 2
- ♦ IC RSS-Gen Issue 5
- ♦ KDB 558074 D01 15.247 Meas Guidance v05r02

Remark:

1. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, ICES-003 recorded in a separate test report.

3 Test Configuration of Equipment Under Test

3.1 Descriptions of Test Mode

11 channels are provided for 802.11b, 802.11g, 802.11n(HT20) and 802.11n(HT40):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412 MHz	7	2442 MHz
2	2417 MHz	8	2447 MHz
3	2422 MHz	9	2452 MHz
4	2427 MHz	10	2457 MHz
5	2432 MHz	11	2462 MHz
6	2437 MHz		

The transmitter has a maximum conducted output power as follows:

Frequency Range(MHz)	Mode	Rate	Output Power(dBm)
2412~2462	802.11b	1Mbps	16.38
2412~2462	802.11g	6Mbps	15.26
2412~2462	802.11n HT20	6.5Mbps	14.32
2422~2452	802.11n HT40	6.5Mbps	14.41

- a. Radiated emission and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

3.2 Test Mode

3.2.1 Antenna Port Conducted Measurement

Summary table of Test Cases				
Test Item	Modulation			
	802.11 b	802.11 g	802.11n HT20	802.11n HT40
Conducted Test Cases	Mode 1: CH01	Mode 4: CH01	Mode 7: CH01	Mode 10: CH03
	Mode 2: CH06	Mode 5: CH06	Mode 8: CH06	Mode 11: CH06
	Mode 3: CH11	Mode 6: CH11	Mode 9: CH11	Mode 12: CH09

3.2.2 Radiated Emission Test (Below 1GHz)

Radiated	802.11 b
Test Cases	Mode 1: CH01

Note : 1. Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, XYZ axis, antenna ports (if EUT with antenna diversity architecture) and packet type. X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X orientation.

2. Following channel(s) was (were) selected for the final test as listed above

3.2.3 Radiated Emission Test (Above 1GHz)

Test Item	Modulation			
	802.11 b	802.11 g	802.11n HT20	802.11n HT40
Radiated Test Cases	Mode 1: CH01	Mode 4: CH01	Mode 7: CH01	Mode 10: CH03
	Mode 2: CH06	Mode 5: CH06	Mode 8: CH06	Mode 11: CH06
	Mode 3: CH11	Mode 6: CH11	Mode 9: CH11	Mode 12: CH09

Note : 1. The fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z it was determined that X orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in X orientation.

2. Following channel(s) was (were) selected for the final test as listed above

3. For frequency above 18GHz, the measured value is 20dB lower than the limit, therefore, it is not reflected in the report.

3.2.4 Power Line Conducted Emission Test:

AC Conducted Emission	Mode 1 : Wlan Idle+ Power supply(From Notebook)
-----------------------------	---

3.3 Support Equipment

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Notebook	Lenovo	E470C	FCC DoC	N/A	shielded cable DC O/P 1.8 m unshielded AC I/P cable1.2 m
2.	USB Cable	N/A	N/A	N/A	N/A	unshielded 0.8m

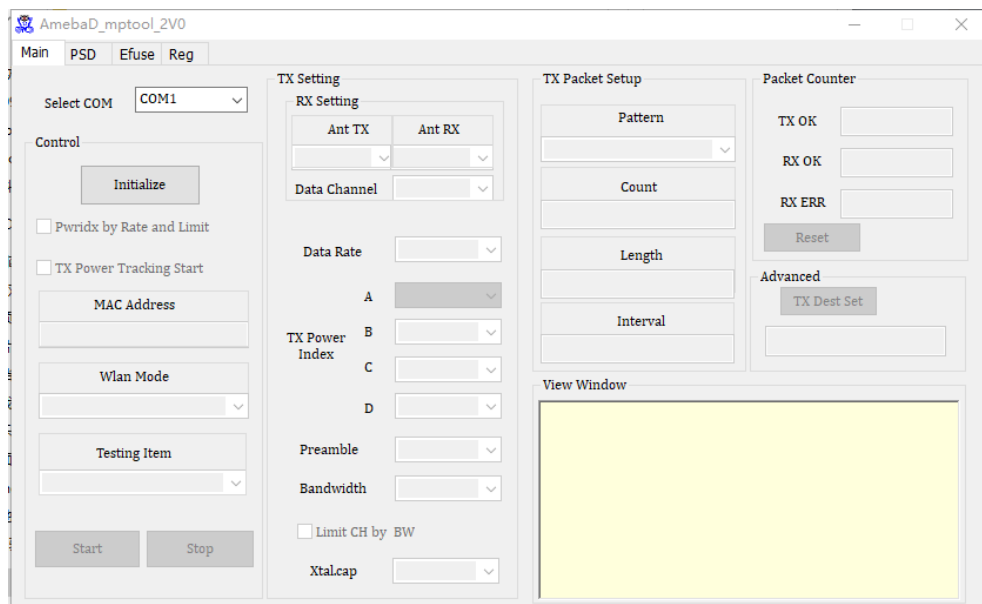
3.4 Test Setup

The EUT is continuously communicating to the WIFI tester during the tests.

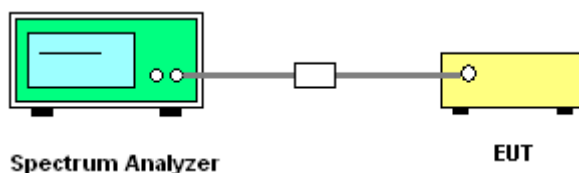
EUT was set in the Hidden menu mode to enable WIFI communications.

The following picture is a screenshot of the test software

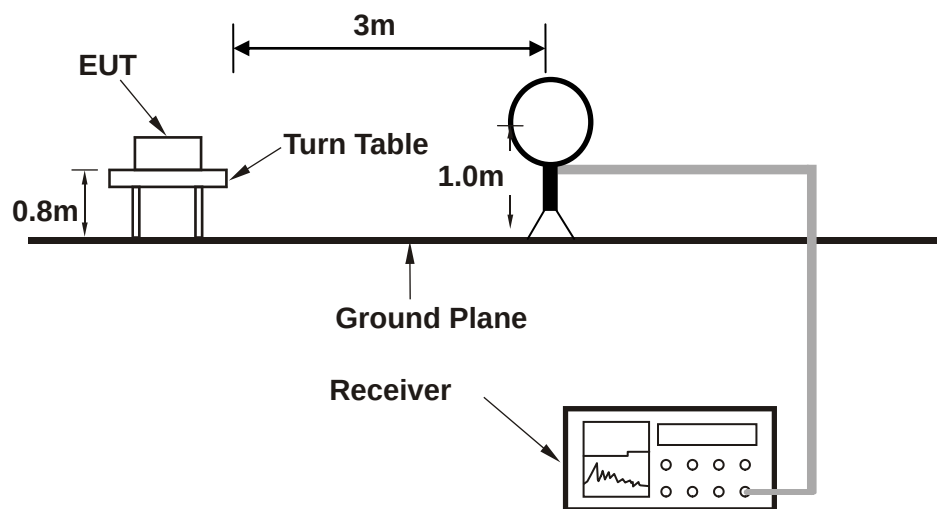
WIFI:



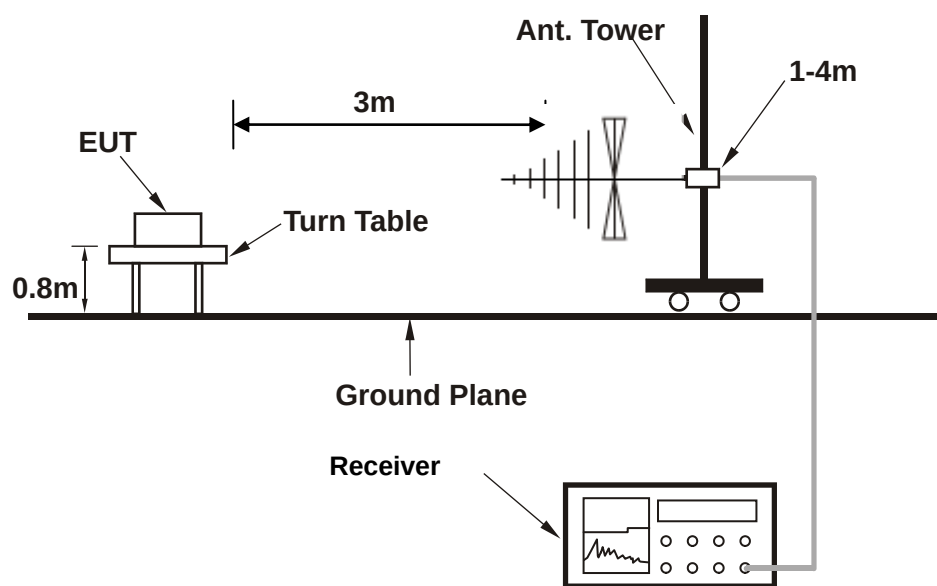
Setup diagram for Conducted Test



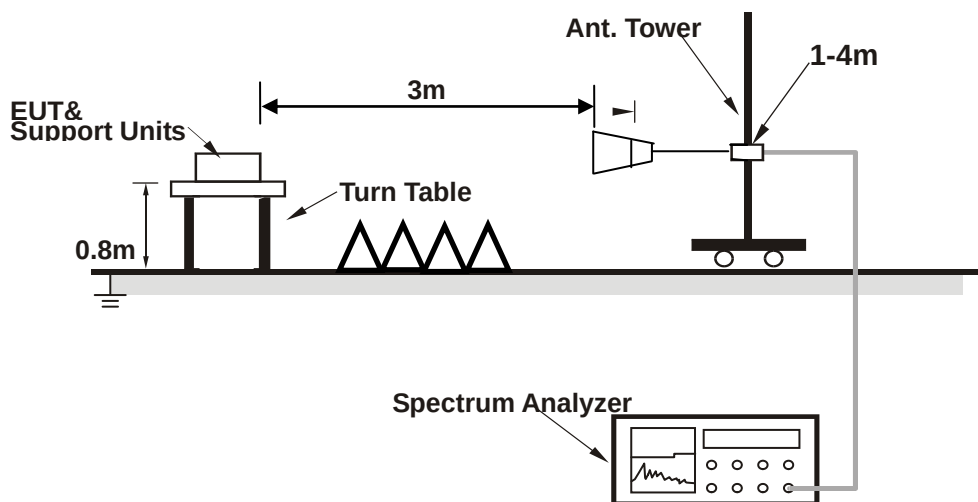
Setup diagram for Raidation(9KHz~30MHz) Test



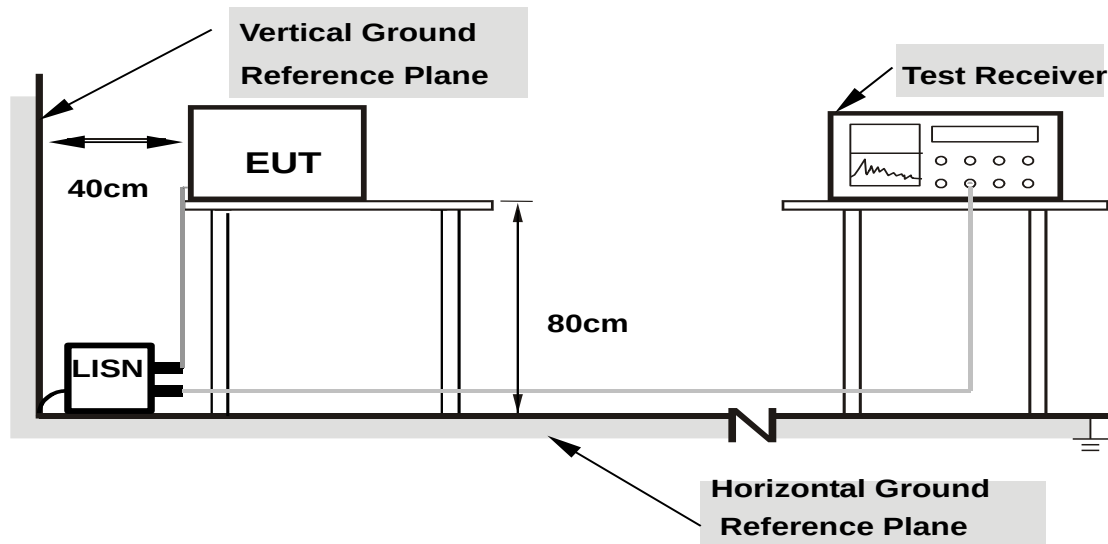
Setup diagram for Raidation(Below 1G) Test



Setup diagram for Raidation(Above1G) Test



Setup diagram for AC Conducted Emission Test



Note: 1.Support units were connected to second LISN.

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.5 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

Offset = RF cable loss + attenuator factor.

Following shows an offset computation example with cable loss 5 dB and 10dB attenuator.

$$\begin{aligned}\text{Offset(dB)} &= \text{RF cable loss(dB)} + \text{attenuator factor(dB)} \\ &= 5 + 10 = 15 \text{ (dB)}\end{aligned}$$

For all radiated test items:

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

Over Limit (dB μ V/m) = Level(dB μ V/m) - Limit Level (dB μ V/m)

4 Test Result

4.1 DTS and Occupied Channel Bandwidth Measurement

4.1.1 Limit of 6dB Bandwidth

FCC §15.247 (a) (2)

IC RSS-247 5.2(a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

4.1.2 Test Procedures

1. The testing follows FCC KDB Publication No. 558074 DTS D01 Meas. Guidance v05r02.
2. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
3. Turn on the EUT and connect it to measurement instrument.
4. Set to the maximum power setting and enable Transmitting the EUT transmit continuously
5. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz.
Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
6. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) setting should be 1%-5% of OBW, please revise and set the Video bandwidth (VBW) $\geq 3 \times$ RBW.

4.1.3 Test Result of 6dB Bandwidth

Refer to Appendix A of this test report.

4.1.4 Test Result of 99% Bandwidth

Refer to Appendix B of this test report.

4.2 Maximum Conducted Output Power Measurement

4.2.1 Limit of Output Power

FCC §15.247 (b)(3)

IC RSS-247 A5.4(d)

For systems using digital modulation in the 2400-2483.5 MHz bands: 30dBm.

4.2.2 Test Procedures

1. The testing follows the Measurement Procedure of ANSI C63.10-2013 section 11.9.2.2.4 Measurement using a spectrum analyzer.
2. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
3. Turn on the EUT and connect it to spectrum analyzer.
4. Set to the maximum power setting and enable Transmitting the EUT transmit continuously
5. Measure the duty cycle, x , of the transmitter output signal as described in below:
 - a. Set the center frequency of the instrument to the center frequency of the transmission.
 - b. Set RBW to the largest available Transmitting value.
 - c. Set detector = peak
6. Set span to at least $1.5 \times \text{OBW}$. Set RBW=510KHz, VBW=2MHz, Number of points in sweep $\geq 2/3 \times$ span, Sweep time = auto. Detector = RMS
7. Allow the sweep to "free run". Trace average 100 traces in RMS mode
8. Compute power by integrating the spectrum across the OBW of the signal using the instrument's Channel power measurement function with band limits set equal to the OBW band edges.
9. Add $10 \log (1/x)$, where x is the duty cycle.

4.2.3 Test Result of Peak Output Power

Refer to Appendix C of this test report.

4.2.4 Test Result of Duty Cycle

Refer to Appendix D of this test report.

4.3 Maximum Power Spectral Density Measurement

4.3.1 Limits of Power Spectral Density

FCC§15.247(e)

IC RSS-247 5.2(b)

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

4.3.2 Test Procedure

1. The testing follows Measurement Procedure 8.4 DTS maximum power spectral density level in the fundamental emission of ANSI C63.10-2013 section 11.9.2.2.4
2. Turn on the EUT and connect it to measurement instrument.
3. Measure the duty cycle, x , of the transmitter output signal as described in below:
 - a. Set the center frequency of the instrument to the center frequency of the transmission.
 - b. Set RBW to the largest available Transmitting value.
 - c. Set detector = peak
4. Set span to at least $1.5 \times \text{OBW}$. Set RBW= 30 KHz, VBW=100 KHz, Number of points in sweep $\geq 2/3 \times \text{span}$, Sweep time = auto.
5. Detector = power averaging (rms), Sweep time = auto couple, Trace mode = averaging (rms) mode over a minimum of 100 traces. Use the peak marker function to determine the maximum power level.
6. Add $10 \log (1/x)$, where x is the duty cycle.
7. Measure and record the results in the test report.
8. The Measured power density (dBm)/ 100kHz is a reference level and used as 30dBc down limit line for Conducted Band Edges and Conducted Spurious Emission.

4.3.3 Test Result of Power Spectral Density

Refer to Appendix E of this test report.

4.4 Band Edges and Spurious Emission Measurement

4.4.1 Limit of Conducted Band Edges and Spurious Emission

FCC §15.247 (d)

IC RSS-247 5.5

Maximum conducted (average) output power was used to determine compliance, then the peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD level in 100 kHz (i.e., 30 dBc).

4.4.2 Test Procedures

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument.
3. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
4. Measure and record the results in the test report.
5. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

4.4.3 Test Result of Conducted Band Edges

Refer to Appendix F of this test report.

4.4.4 Test Result of Conducted Spurious Emission

Refer to Appendix G of this test report.

4.5 Radiated Band Edges and Spurious Emission Measurement

4.5.1 Limit of Radiated Band Edges and Spurious Emission

FCC §15.247 (d)

IC RSS-247 5.5

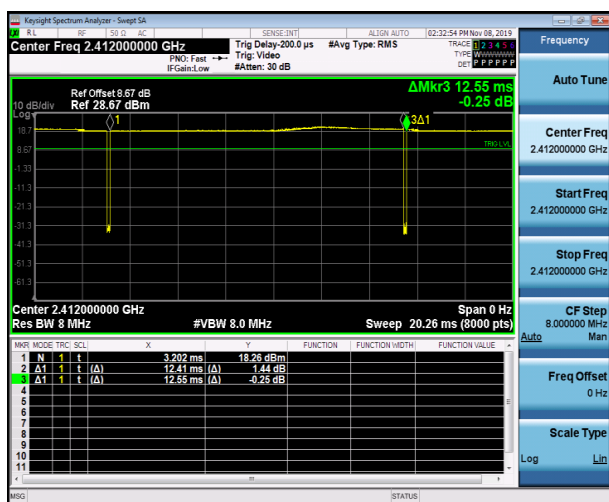
In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as below.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

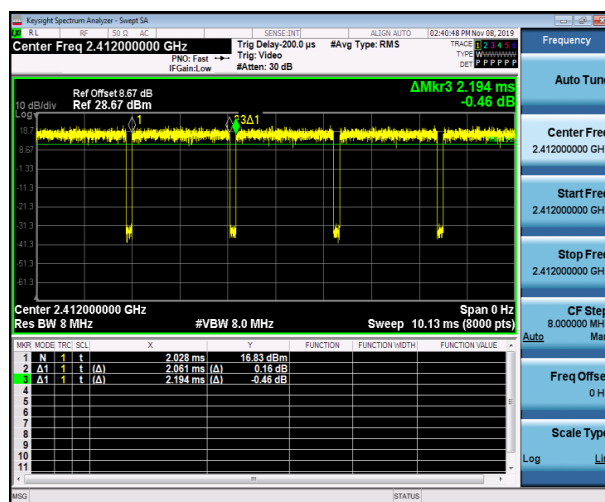
4.5.2 Test Procedures

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Use the following spectrum analyzer settings:
 - (1) Span shall wide enough to fully capture the emission being measured;
 - (2) Set RBW=100 kHz for $f < 1$ GHz, RBW=1MHz for $f > 1$ GHz ; VBW RBW; Sweep = auto; Detector function = peak; Trace = max hold for peak
 - (3) For average measurement:
VBW = 10 Hz, when duty cycle is no less than 98 percent.
VBW $\geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
5. Add the maximum transmit antenna gain (in dBi) to the measured output power level to determine the EIRP.
6. Convert the resultant EIRP to an equivalent electric field strength using the following relationship:
$$E = \text{EIRP} - 20 \log d + 104.8$$
Where:
E is the electric field strength in dB μ V/m
EIRP is the equivalent isotropically radiated power in dBm
d is the specified measurement distance in m
$$E[\text{dB}\mu\text{V/m}] = \text{EIRP}[\text{dBm}] + 95.2, \text{ for } d = 3 \text{ m}.$$
7. Compare the resultant electric field strength level with the applicable regulatory limit.

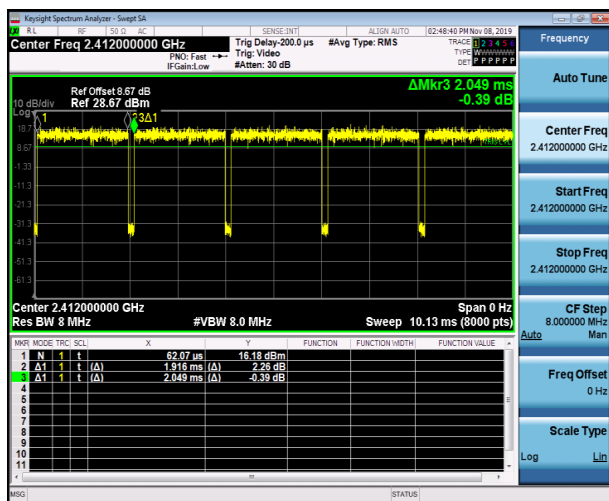
Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11b	98.93	12.41	0.081	100Hz
802.11g	93.94	2.06	0.485	1kHz
802.11n HT20	93.51	1.92	0.521	1kHz
802.11n HT40	87.62	0.94	1.063	3kHz



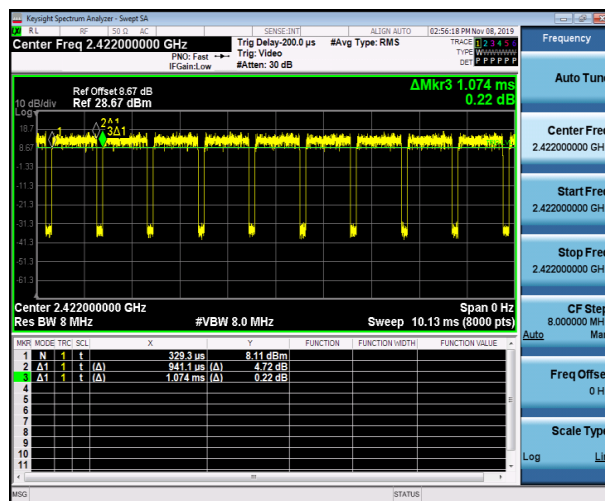
802.11b



802.11g



802.11n HT20



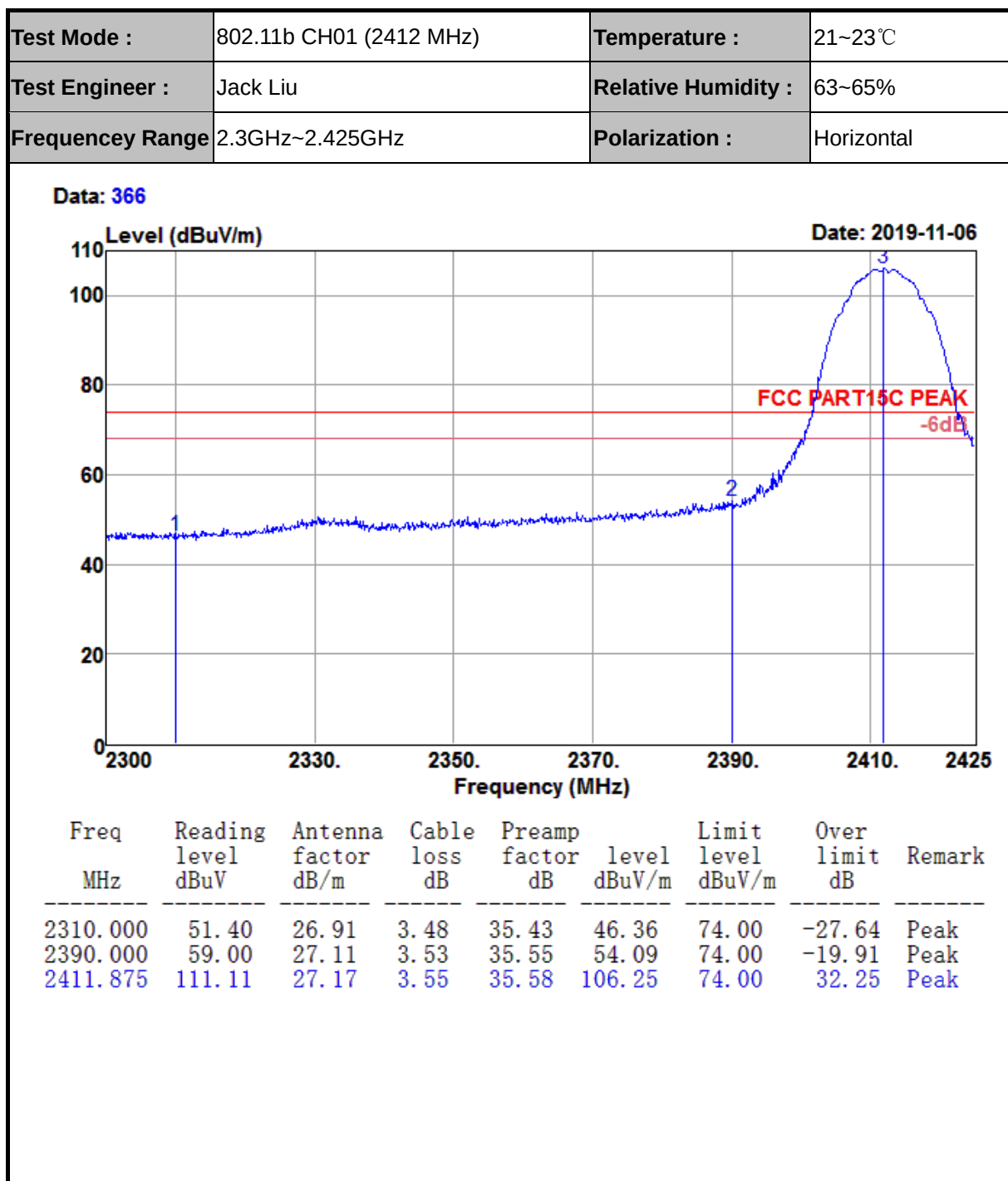
802.11n HT40

8. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

4.5.3 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

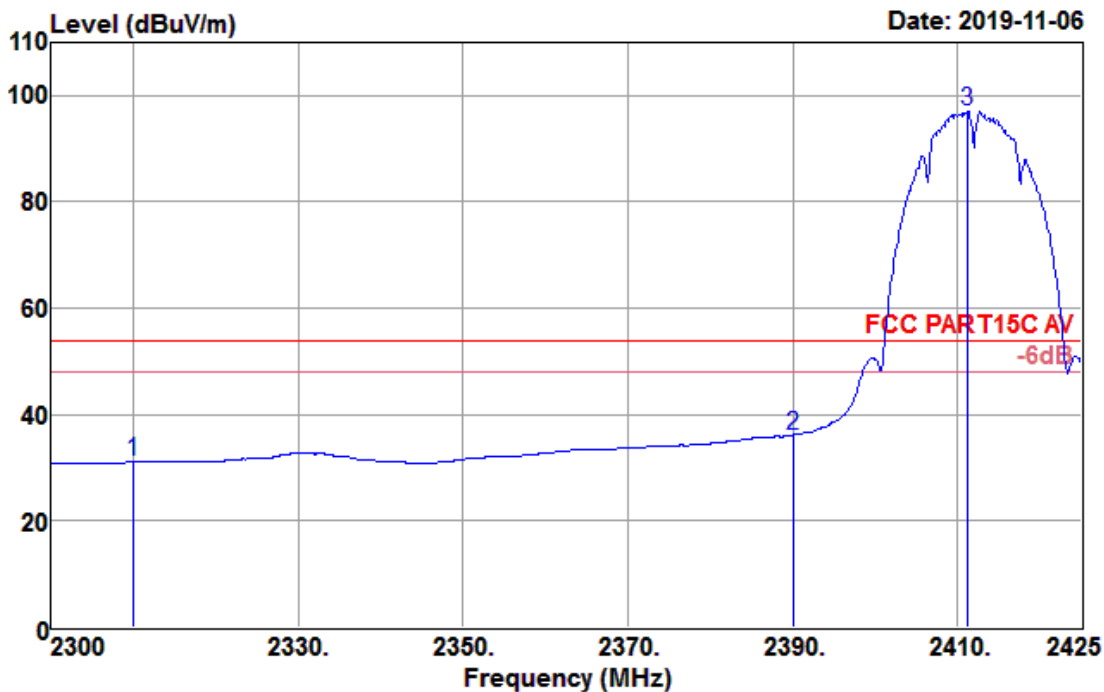
The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

4.5.4 Test Result of Radiated Spurious at Band Edges



Test Mode :	802.11b CH01 (2412 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.425GHz	Polarization :	Horizontal

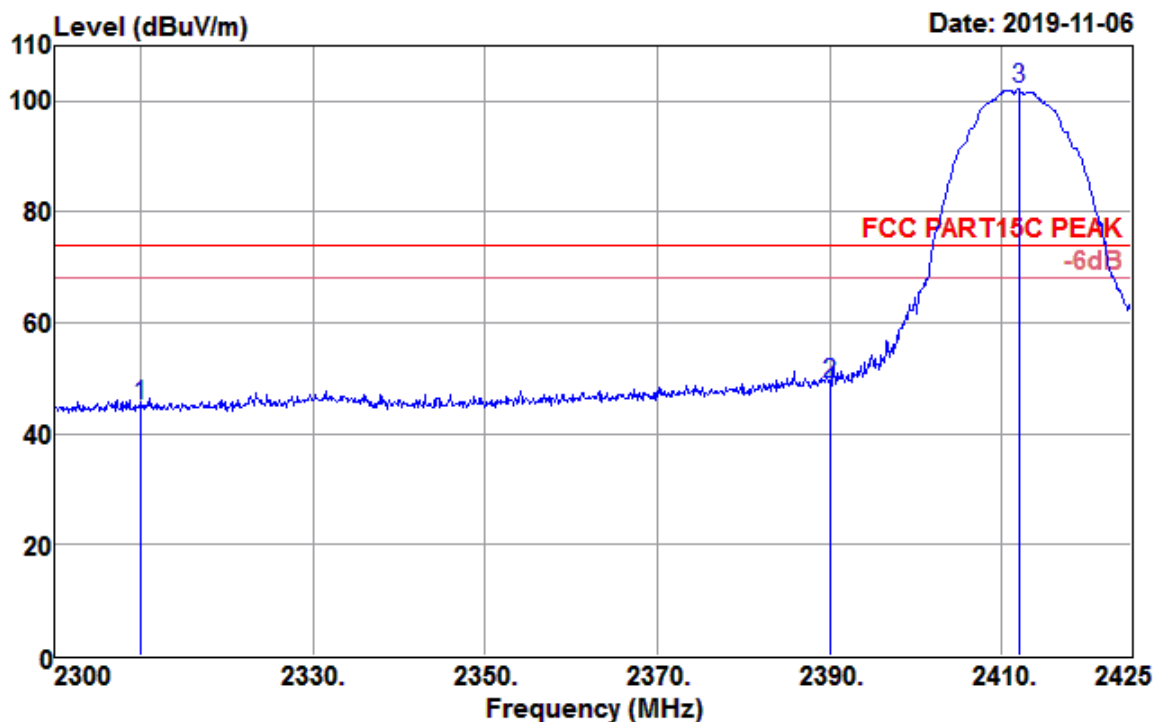
Data: 370



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	36.08	26.91	3.48	35.43	31.04	54.00	-22.96	Average
2390.000	41.10	27.11	3.53	35.55	36.19	54.00	-17.81	Average
2411.250	102.05	27.17	3.55	35.58	97.19	54.00	43.19	Average

Test Mode :	802.11b CH01 (2412 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.425GHz	Polarization :	Vertical

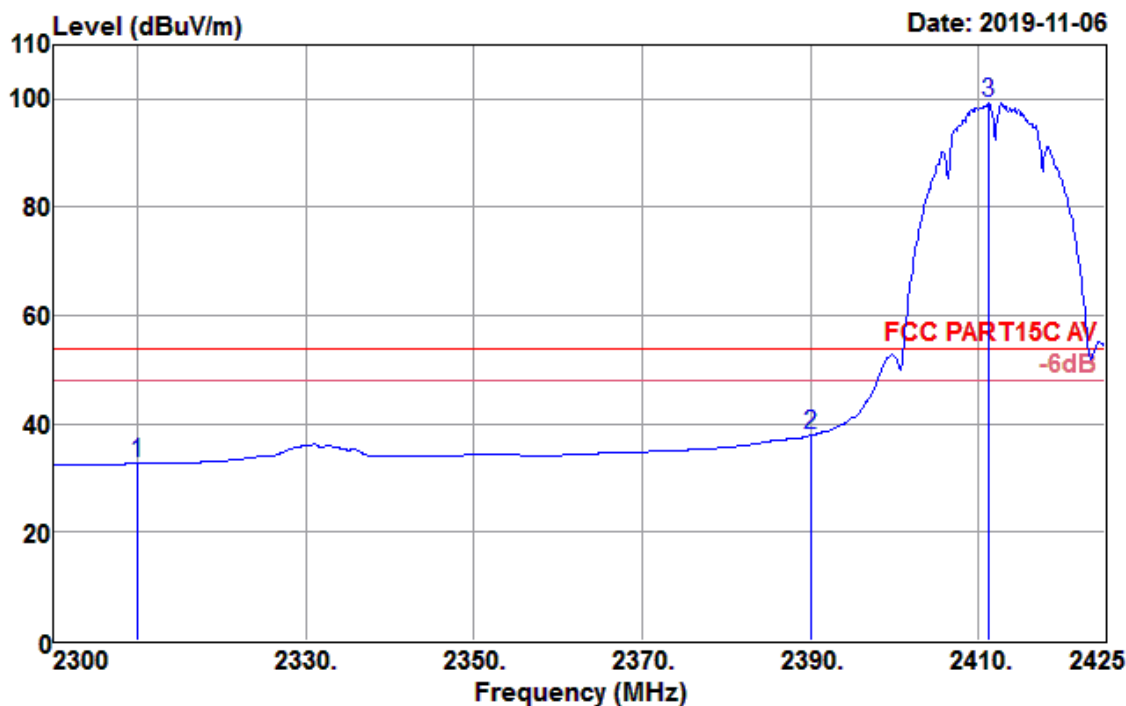
Data: 369



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	50.23	26.91	3.48	35.43	45.19	74.00	-28.81	Peak
2390.000	53.91	27.11	3.53	35.55	49.00	74.00	-25.00	Peak
2412.000	107.16	27.17	3.55	35.58	102.30	74.00	28.30	Peak

Test Mode :	802.11b CH01 (2412 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.425GHz	Polarization :	Vertical

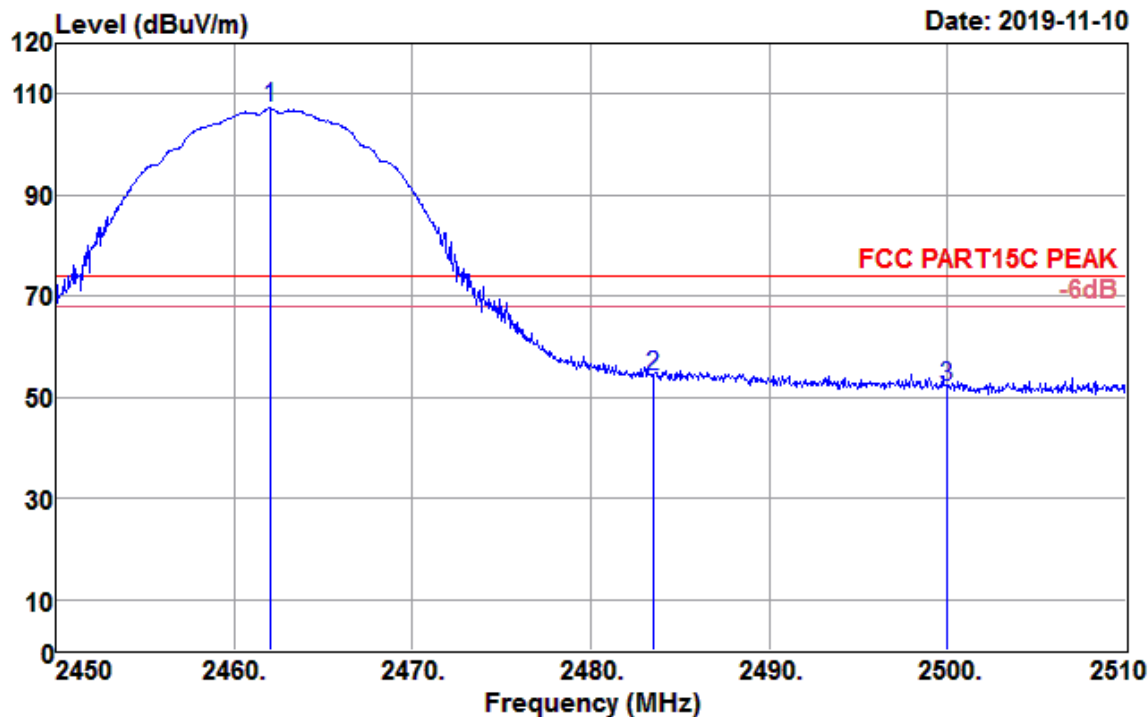
Data: 367



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	37.75	26.91	3.48	35.43	32.71	54.00	-21.29	Average
2390.000	42.81	27.11	3.53	35.55	37.90	54.00	-16.10	Average
2411.250	104.12	27.17	3.55	35.58	99.26	54.00	45.26	Average

Test Mode :	802.11b CH11 (2462 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.45GHz~2.51GHz	Polarization :	Horizontal

Data: 382

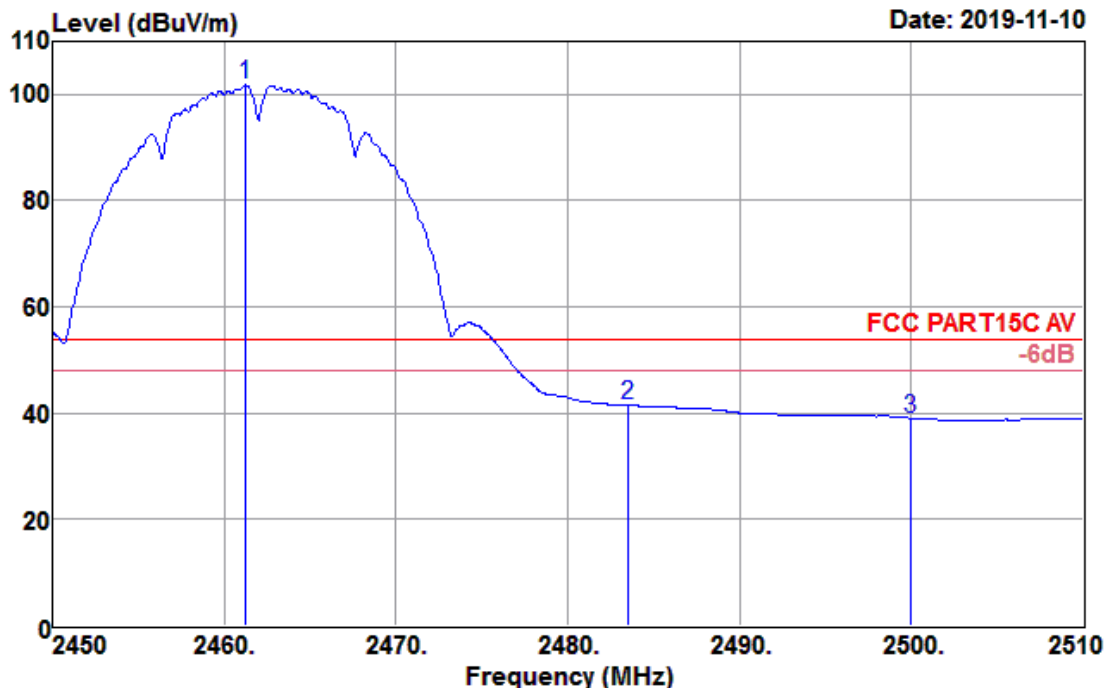


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamplifier factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2462.060	112.06	27.30	3.58	35.65	107.29	74.00	33.29	Peak
2483.500	58.87	27.36	3.59	35.68	54.14	74.00	-19.86	Peak
2500.000	56.74	27.40	3.60	35.70	52.04	74.00	-21.96	Peak

Test Mode :	802.11b CH11 (2462 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.45GHz~2.51GHz	Polarization :	Horizontal

Data: 383

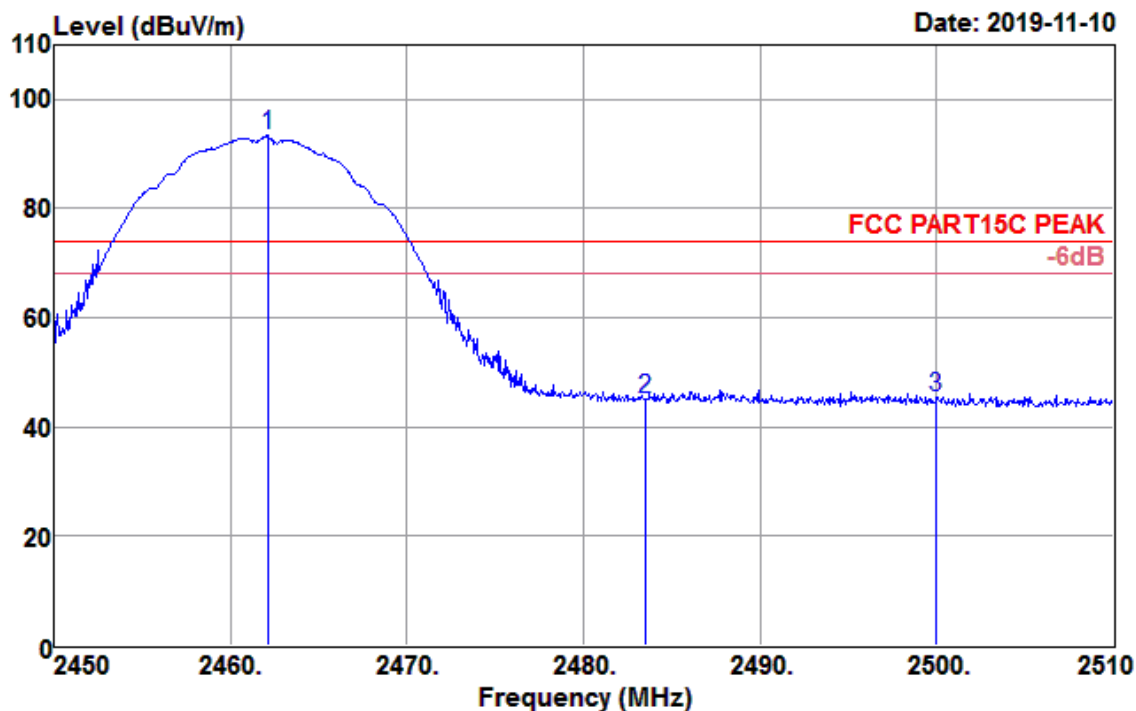
Date: 2019-11-10



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2461.280	106.56	27.30	3.58	35.65	101.79	54.00	47.79	Average
2483.500	46.22	27.36	3.59	35.68	41.49	54.00	-12.51	Average
2500.000	43.80	27.40	3.60	35.70	39.10	54.00	-14.90	Average

Test Mode :	802.11b CH11 (2462 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.45GHz~2.51GHz	Polarization :	Vertical

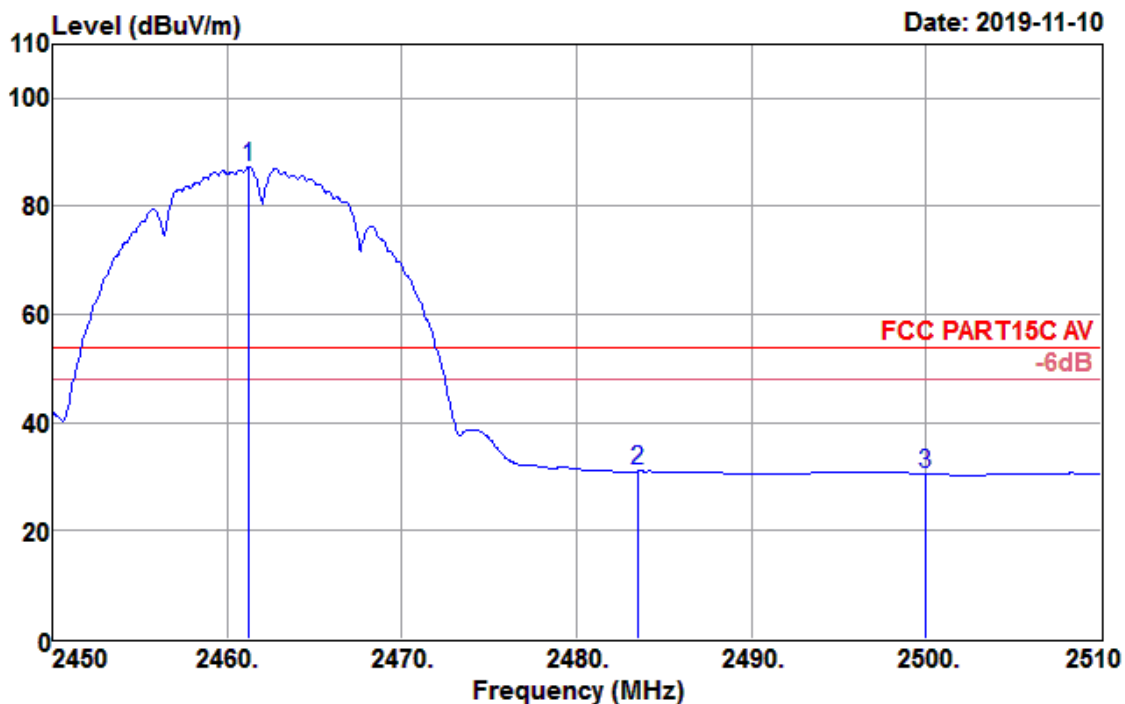
Data: 385



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamplifier factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2462.180	98.10	27.30	3.58	35.65	93.33	74.00	19.33	Peak
2483.500	49.83	27.36	3.59	35.68	45.10	74.00	-28.90	Peak
2500.000	50.28	27.40	3.60	35.70	45.58	74.00	-28.42	Peak

Test Mode :	802.11b CH11 (2462 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.45GHz~2.51GHz	Polarization :	Vertical

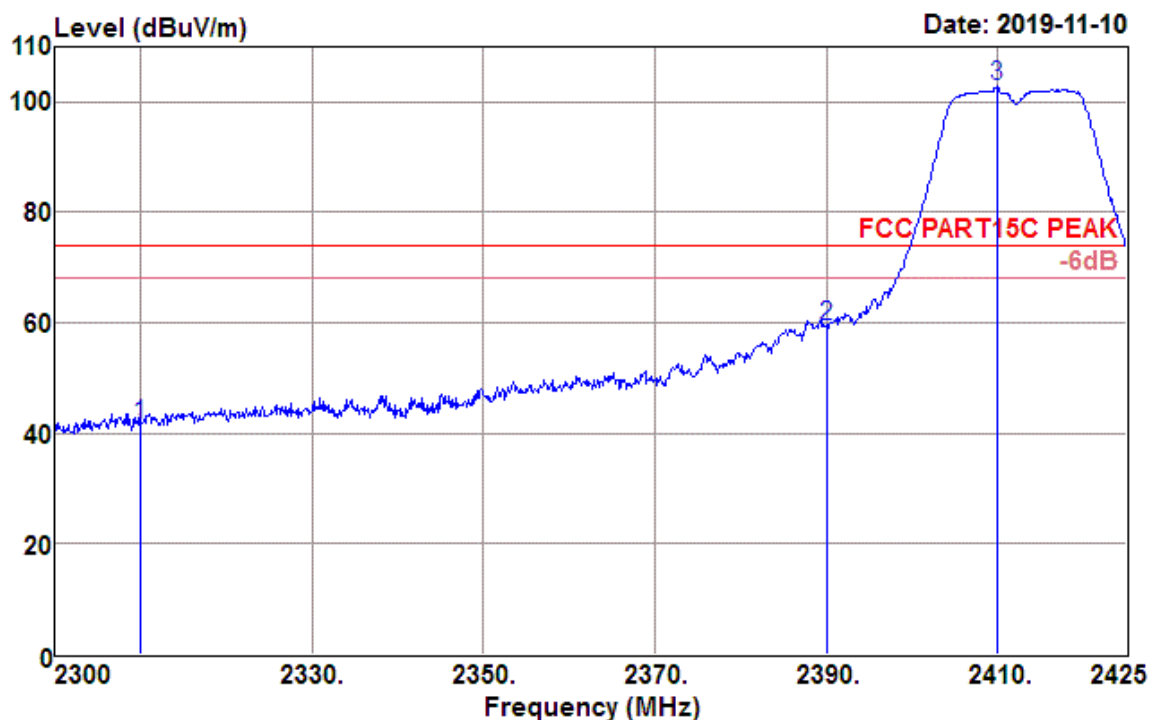
Data: 386



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2461.280	92.10	27.30	3.58	35.65	87.33	54.00	33.33	Average
2483.500	35.74	27.36	3.59	35.68	31.01	54.00	-22.99	Average
2500.000	35.27	27.40	3.60	35.70	30.57	54.00	-23.43	Average

Test Mode :	802.11g CH01 (2412 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.425GHz	Polarization :	Horizontal

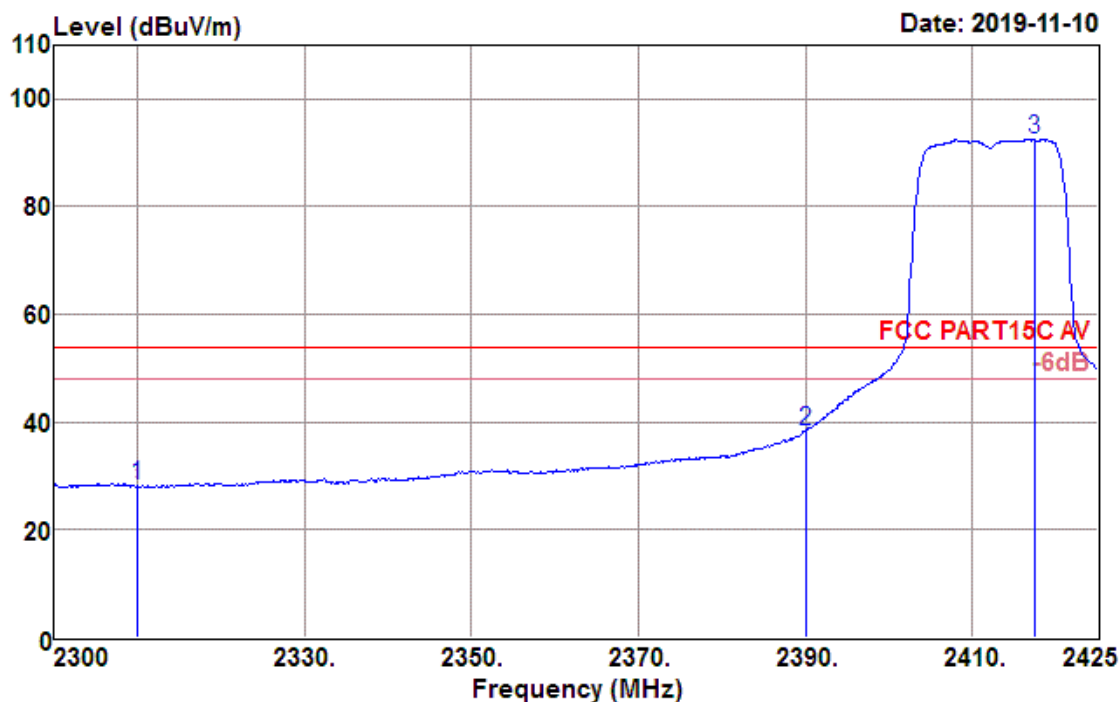
Data: 230



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamplifier factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	46.47	26.91	3.48	35.43	41.43	74.00	-32.57	Peak
2390.000	64.29	27.11	3.53	35.55	59.38	74.00	-14.62	Peak
2409.875	107.59	27.17	3.55	35.57	102.74	74.00	28.74	Peak

Test Mode :	802.11g CH01 (2412 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.425GHz	Polarization :	Horizontal

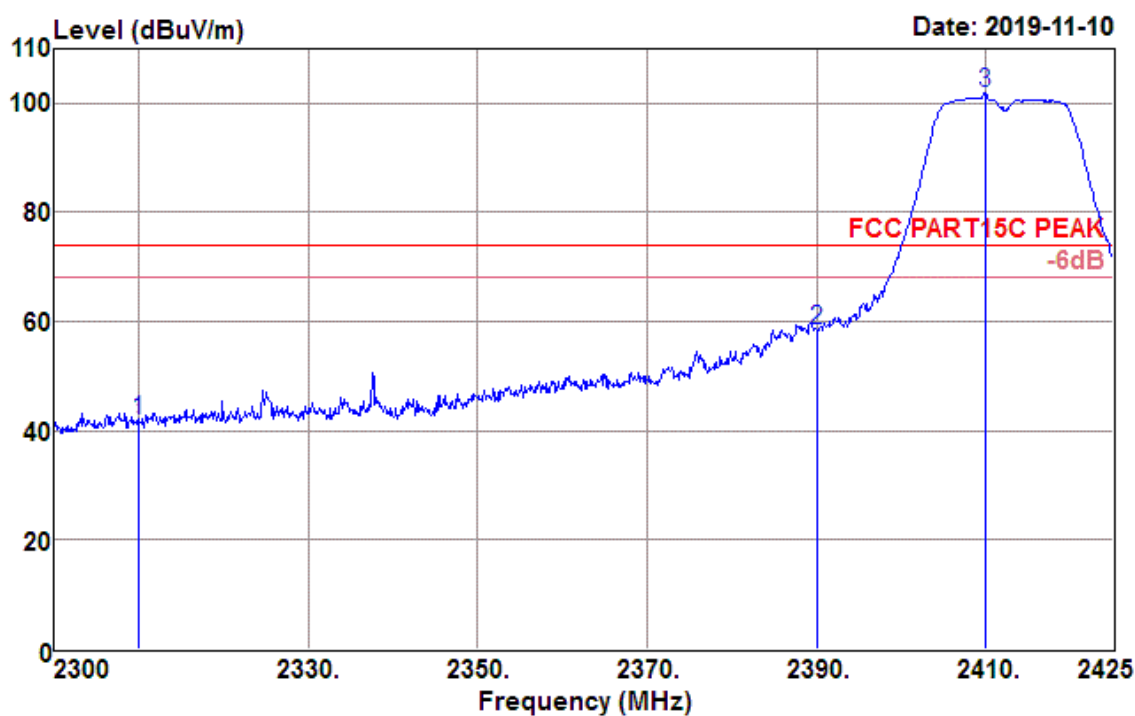
Data: 231



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamplifier factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	33.18	26.91	3.48	35.43	28.14	54.00	-25.86	Average
2390.000	43.23	27.11	3.53	35.55	38.32	54.00	-15.68	Average
2417.375	97.36	27.19	3.55	35.58	92.52	54.00	38.52	Average

Test Mode :	802.11g CH01 (2412 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.425GHz	Polarization :	Vertical

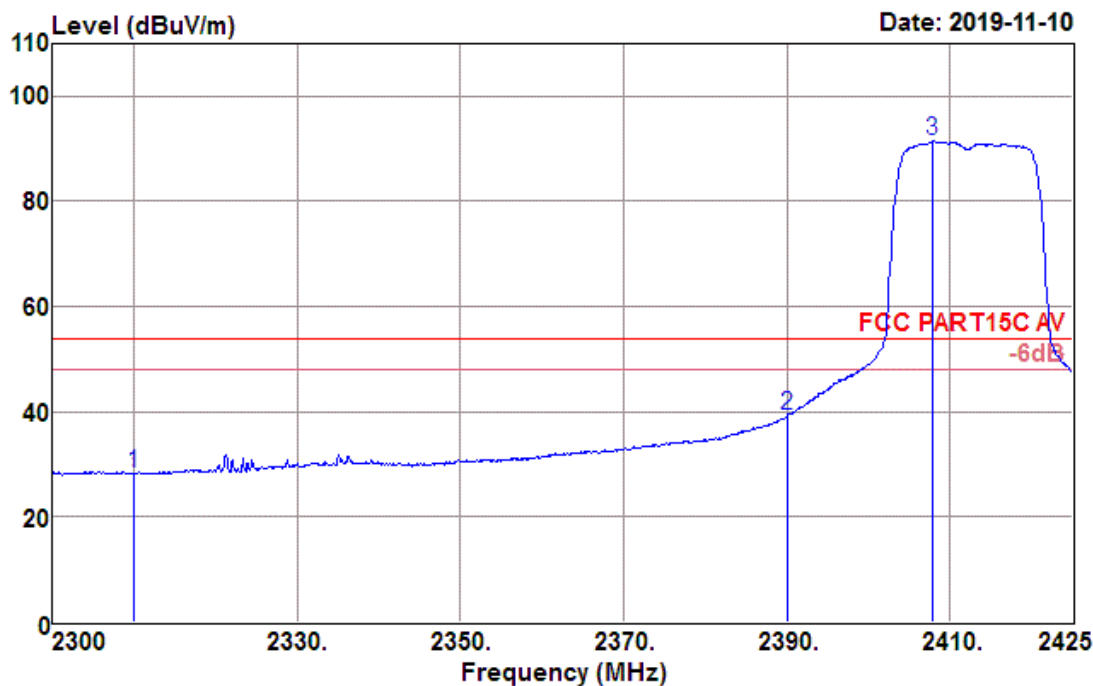
Data: 228



Freq MHz	Reading level dBUV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBUV/m	Limit level dBUV/m	Over limit dB	Remark
2310.000	47.04	26.91	3.48	35.43	42.00	74.00	-32.00	Peak
2390.000	63.27	27.11	3.53	35.55	58.36	74.00	-15.64	Peak
2409.875	106.63	27.17	3.55	35.57	101.78	74.00	27.78	Peak

Test Mode :	802.11g CH01 (2412 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.425GHz	Polarization :	Vertical

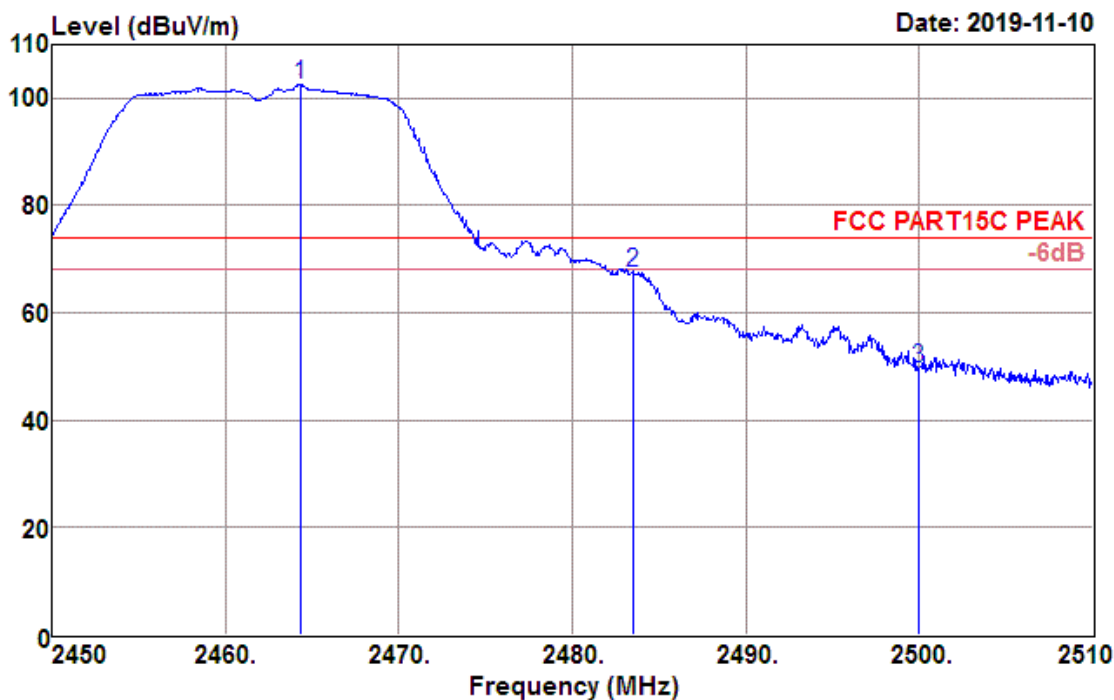
Data: 229



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	33.19	26.91	3.48	35.43	28.15	54.00	-25.85	Average
2390.000	44.27	27.11	3.53	35.55	39.36	54.00	-14.64	Average
2407.875	96.34	27.16	3.54	35.57	91.47	54.00	37.47	Average

Test Mode :	802.11g CH11 (2462 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.45GHz~2.51GHz	Polarization :	Horizontal

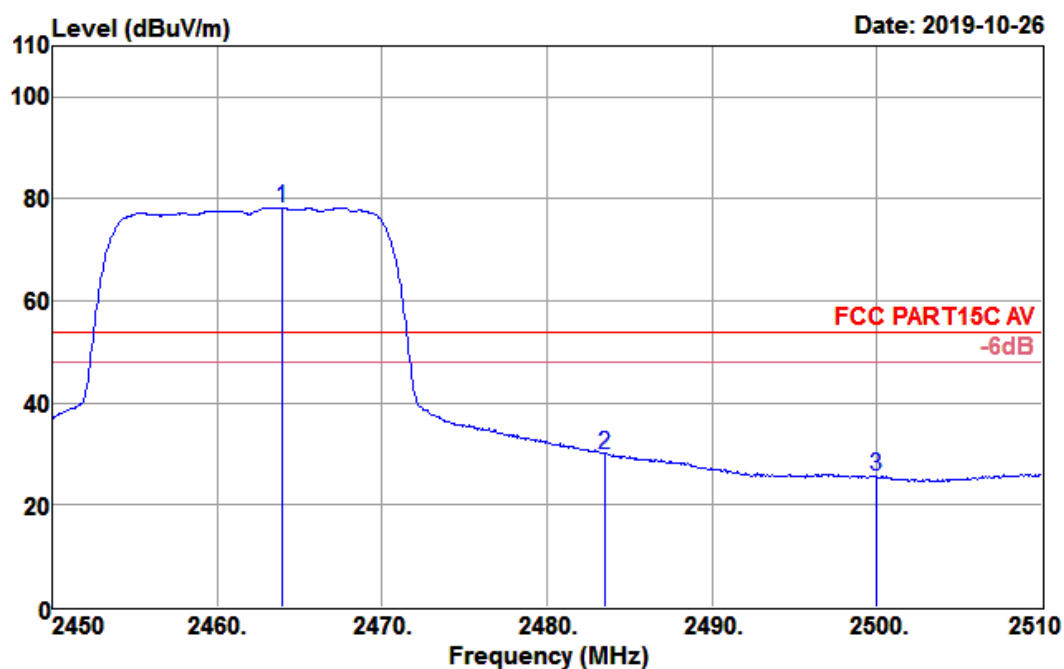
Data: 246



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2464.340	107.29	27.31	3.58	35.65	102.53	74.00	28.53	Peak
2483.500	72.10	27.36	3.59	35.68	67.37	74.00	-6.63	Peak
2500.000	54.32	27.40	3.60	35.70	49.62	74.00	-24.38	Peak

Test Mode :	802.11g CH11 (2462 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.45GHz~2.51GHz	Polarization :	Horizontal

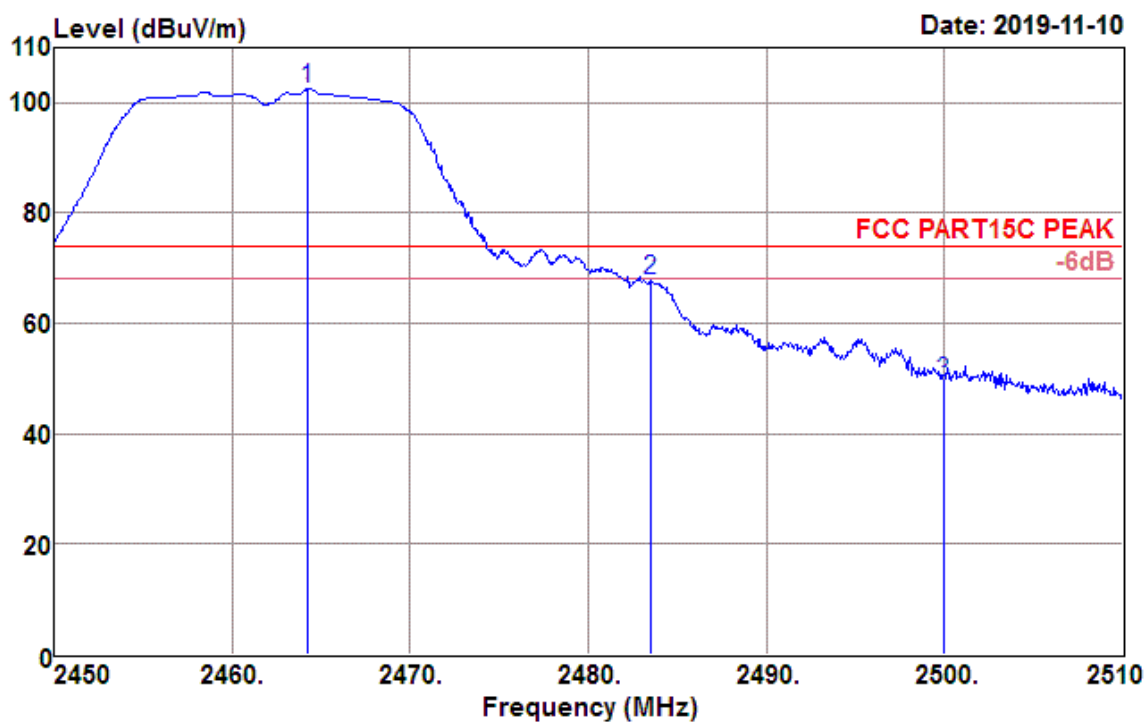
Data: 35



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2463.920	83.09	27.31	3.58	35.65	78.33	54.00	24.33	Average
2483.500	34.59	27.36	3.59	35.68	29.86	54.00	-24.14	Average
2500.000	30.21	27.40	3.60	35.70	25.51	54.00	-28.49	Average

Test Mode :	802.11g CH11 (2462 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.45GHz~2.51GHz	Polarization :	Vertical

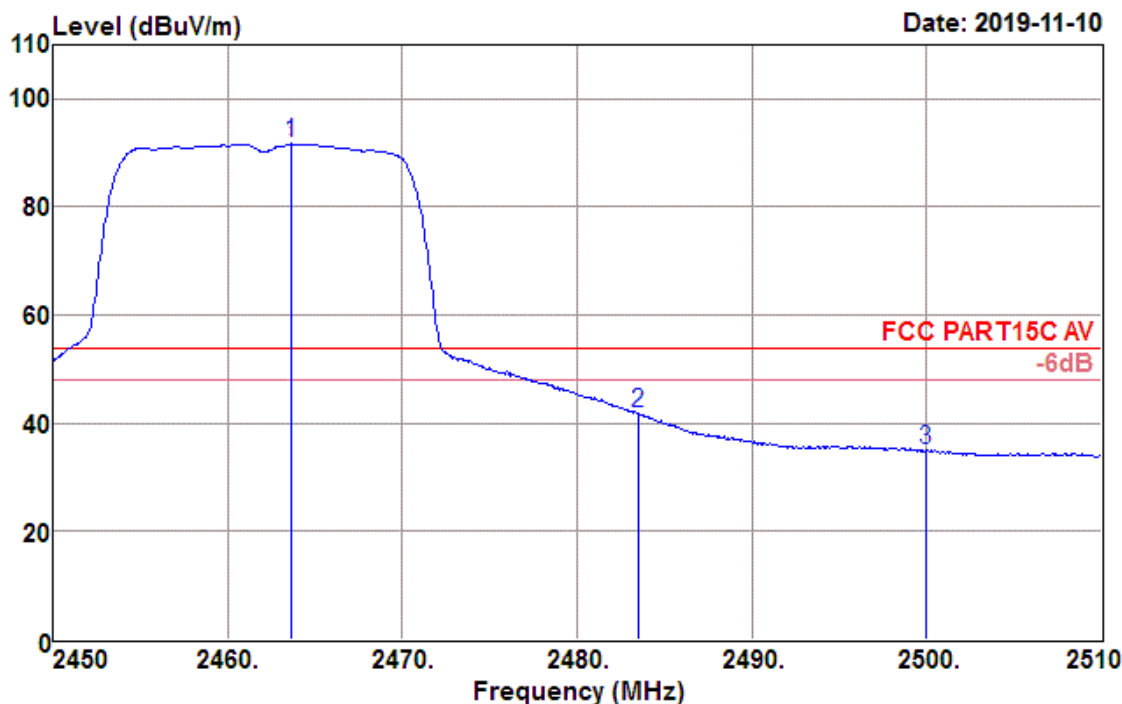
Data: 242



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2464.280	107.33	27.31	3.58	35.65	102.57	74.00	28.57	Peak
2483.500	72.46	27.36	3.59	35.68	67.73	74.00	-6.27	Peak
2500.000	54.01	27.40	3.60	35.70	49.31	74.00	-24.69	Peak

Test Mode :	802.11g CH11 (2462 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.45GHz~2.51GHz	Polarization :	Vertical

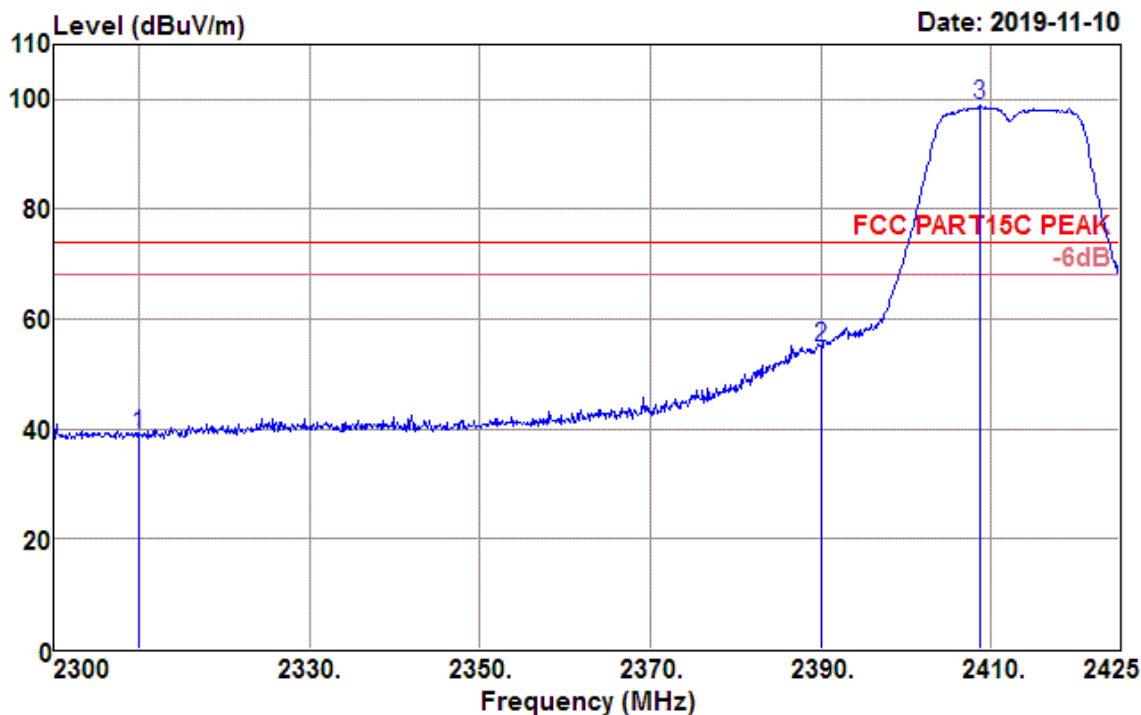
Data: 243



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2463.680	96.44	27.31	3.58	35.65	91.68	54.00	37.68	Average
2483.500	46.48	27.36	3.59	35.68	41.75	54.00	-12.25	Average
2500.000	39.76	27.40	3.60	35.70	35.06	54.00	-18.94	Average

Test Mode :	802.11n HT20 CH01 (2412 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.425GHz	Polarization :	Horizontal

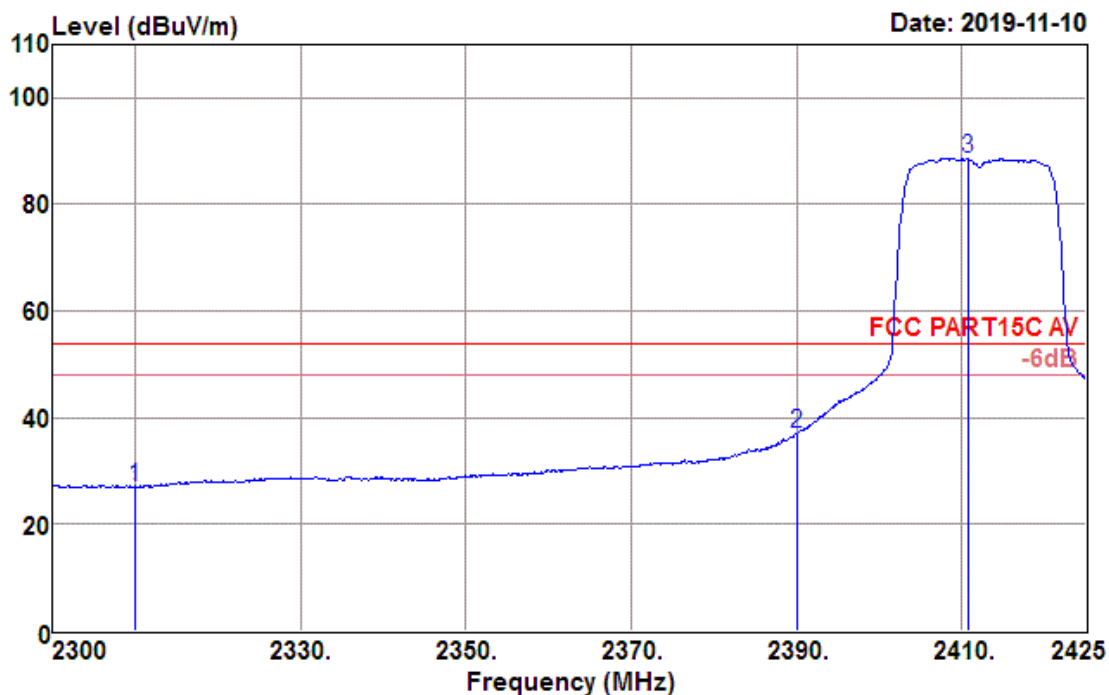
Data: 253



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	44.07	26.91	3.48	35.43	39.03	74.00	-34.97	Peak
2390.000	59.92	27.11	3.53	35.55	55.01	74.00	-18.99	Peak
2408.750	103.90	27.16	3.55	35.57	99.04	74.00	25.04	Peak

Test Mode :	802.11n HT20 CH01 (2412 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.425GHz	Polarization :	Horizontal

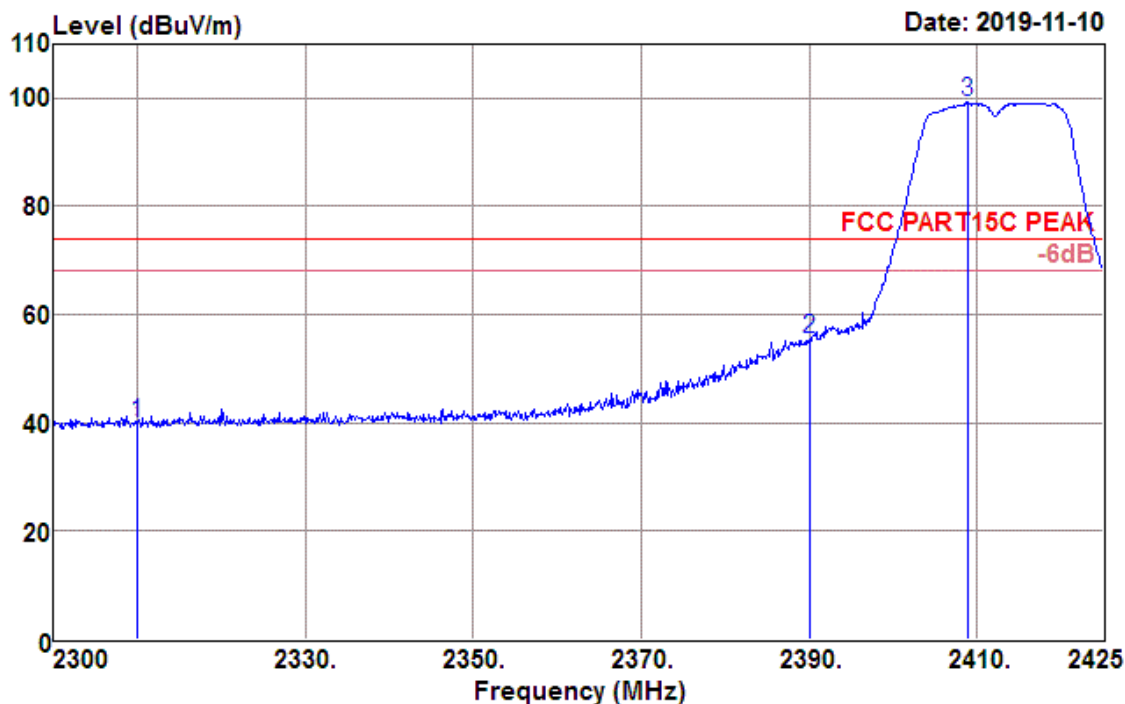
Data: 254



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamplifier factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	32.07	26.91	3.48	35.43	27.03	54.00	-26.97	Average
2390.000	41.83	27.11	3.53	35.55	36.92	54.00	-17.08	Average
2410.875	93.54	27.17	3.55	35.58	88.68	54.00	34.68	Average

Test Mode :	802.11n HT20 CH01 (2412 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.425GHz	Polarization :	Vertical

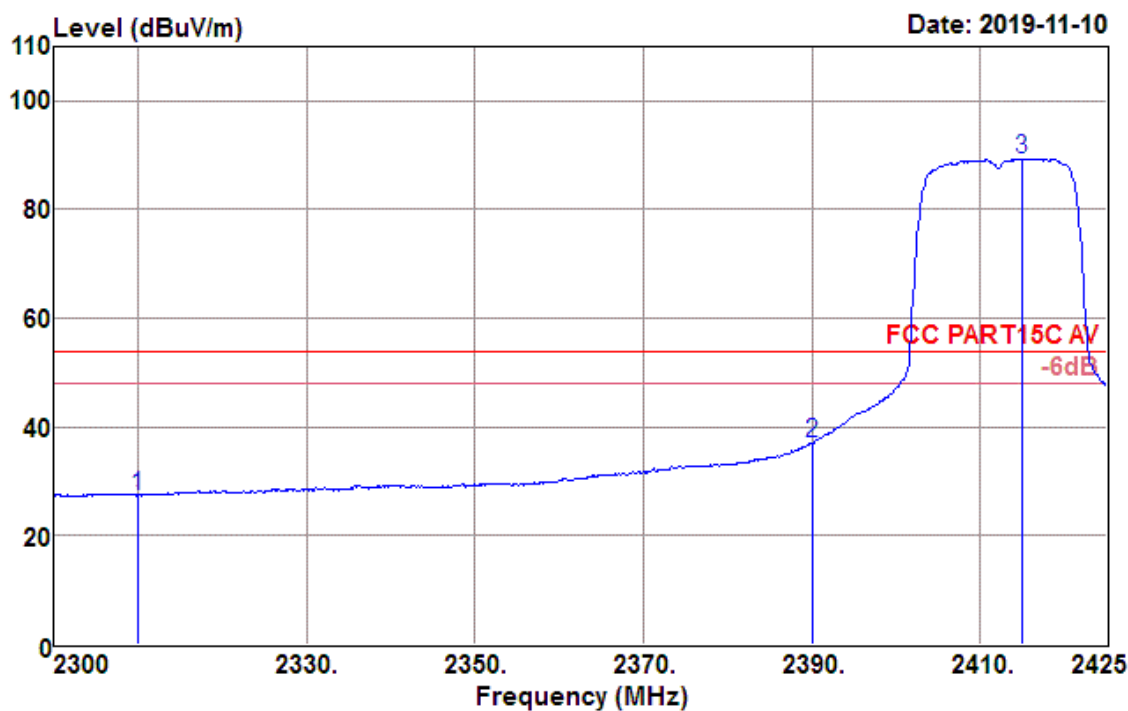
Data: 256



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	44.95	26.91	3.48	35.43	39.91	74.00	-34.09	Peak
2390.000	60.50	27.11	3.53	35.55	55.59	74.00	-18.41	Peak
2408.875	104.16	27.16	3.55	35.57	99.30	74.00	25.30	Peak

Test Mode :	802.11n HT20 CH01 (2412 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.425GHz	Polarization :	Vertical

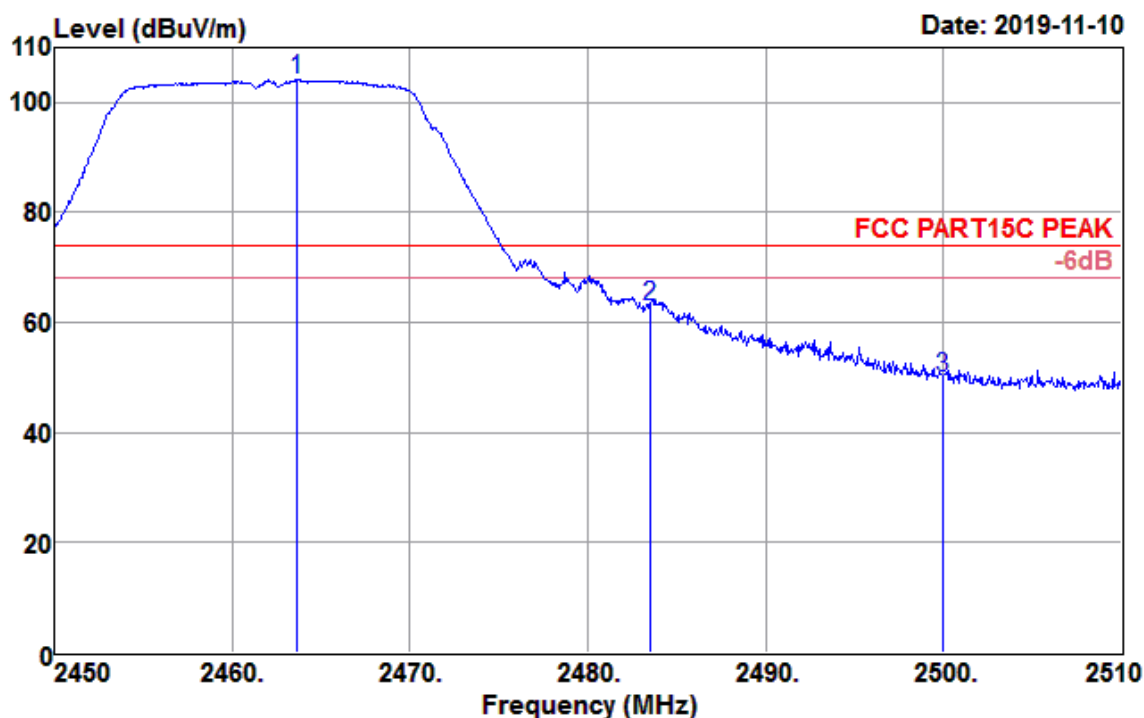
Data: 257



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamplifier factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	32.42	26.91	3.48	35.43	27.38	54.00	-26.62	Average
2390.000	41.92	27.11	3.53	35.55	37.01	54.00	-16.99	Average
2415.000	94.21	27.18	3.55	35.58	89.36	54.00	35.36	Average

Test Mode :	802.11n HT20 CH11 (2462 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.45GHz~2.51GHz	Polarization :	Horizontal

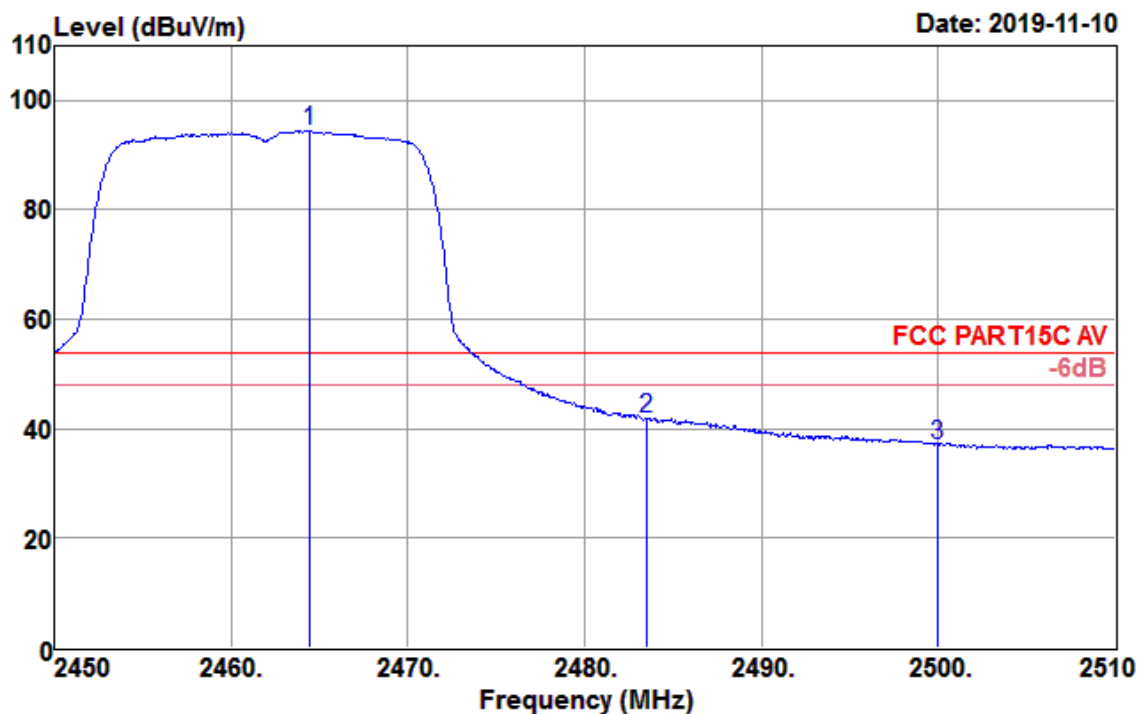
Data: 407



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2463.680	108.86	27.31	3.58	35.65	104.10	74.00	30.10	Peak
2483.500	67.80	27.36	3.59	35.68	63.07	74.00	-10.93	Peak
2500.000	54.65	27.40	3.60	35.70	49.95	74.00	-24.05	Peak

Test Mode :	802.11n HT20 CH11 (2462 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.45GHz~2.51GHz	Polarization :	Horizontal

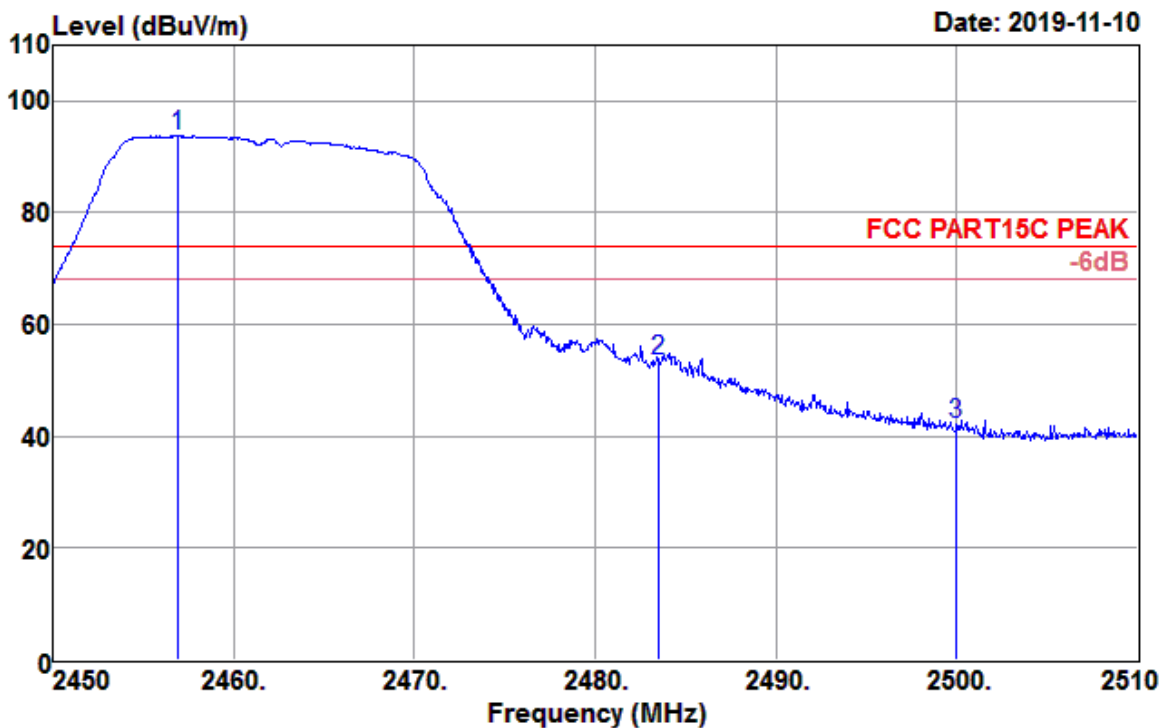
Data: 408



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2464.400	99.21	27.31	3.58	35.65	94.45	54.00	40.45	Average
2483.500	46.51	27.36	3.59	35.68	41.78	54.00	-12.22	Average
2500.000	41.76	27.40	3.60	35.70	37.06	54.00	-16.94	Average

Test Mode :	802.11n HT20 CH11 (2462 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.45GHz~2.51GHz	Polarization :	Vertical

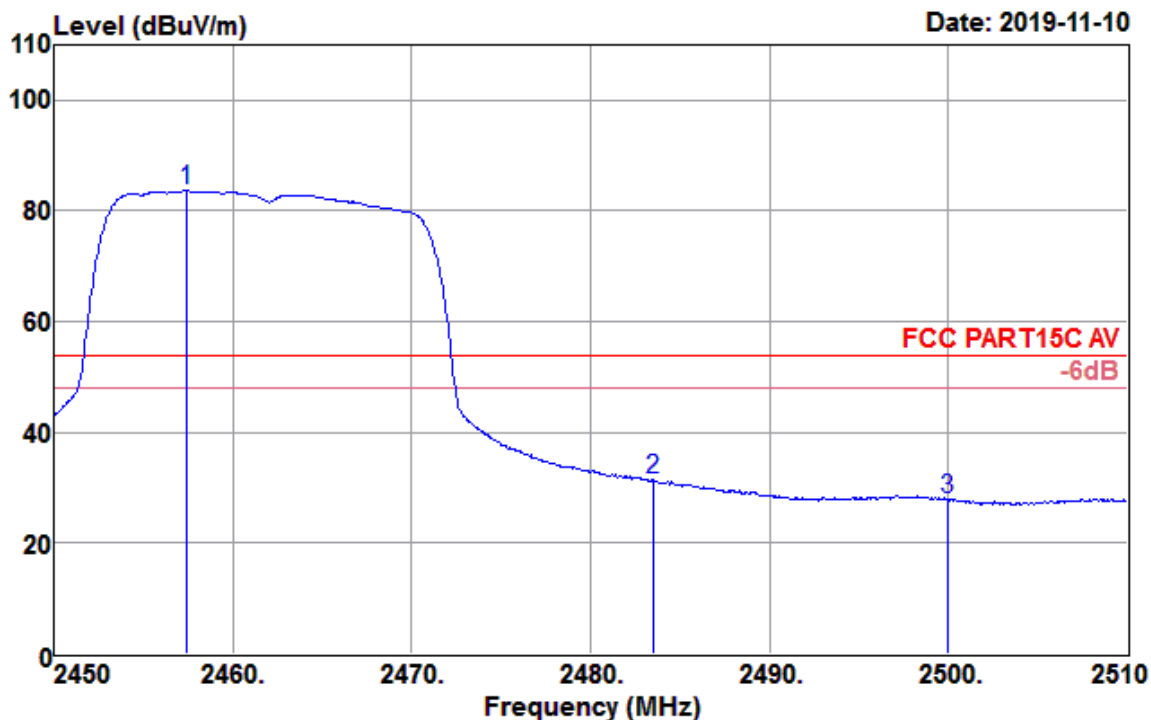
Data: 404



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2456.900	98.54	27.29	3.57	35.64	93.76	74.00	19.76	Peak
2483.500	58.44	27.36	3.59	35.68	53.71	74.00	-20.29	Peak
2500.000	46.91	27.40	3.60	35.70	42.21	74.00	-31.79	Peak

Test Mode :	802.11n HT20 CH11 (2462 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.45GHz~2.51GHz	Polarization :	Vertical

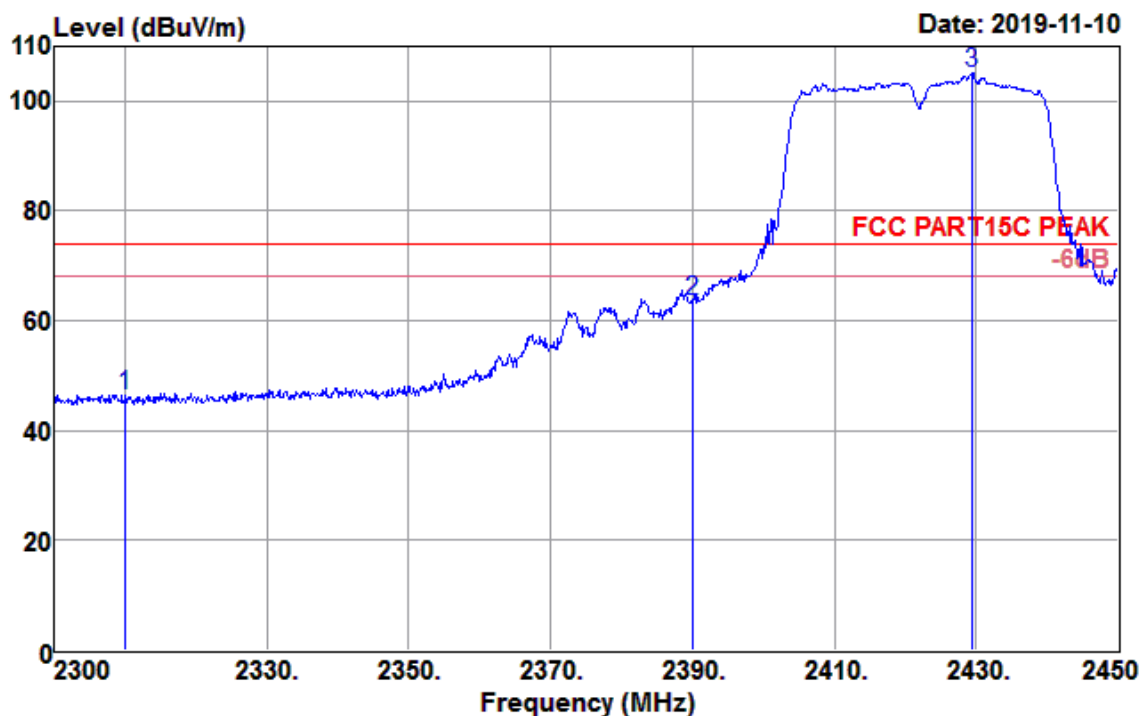
Data: 405



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2457.440	88.47	27.29	3.57	35.64	83.69	54.00	29.69	Average
2483.500	36.22	27.36	3.59	35.68	31.49	54.00	-22.51	Average
2500.000	32.55	27.40	3.60	35.70	27.85	54.00	-26.15	Average

Test Mode :	802.11n HT40 CH01 (2422 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.425GHz	Polarization :	Horizontal

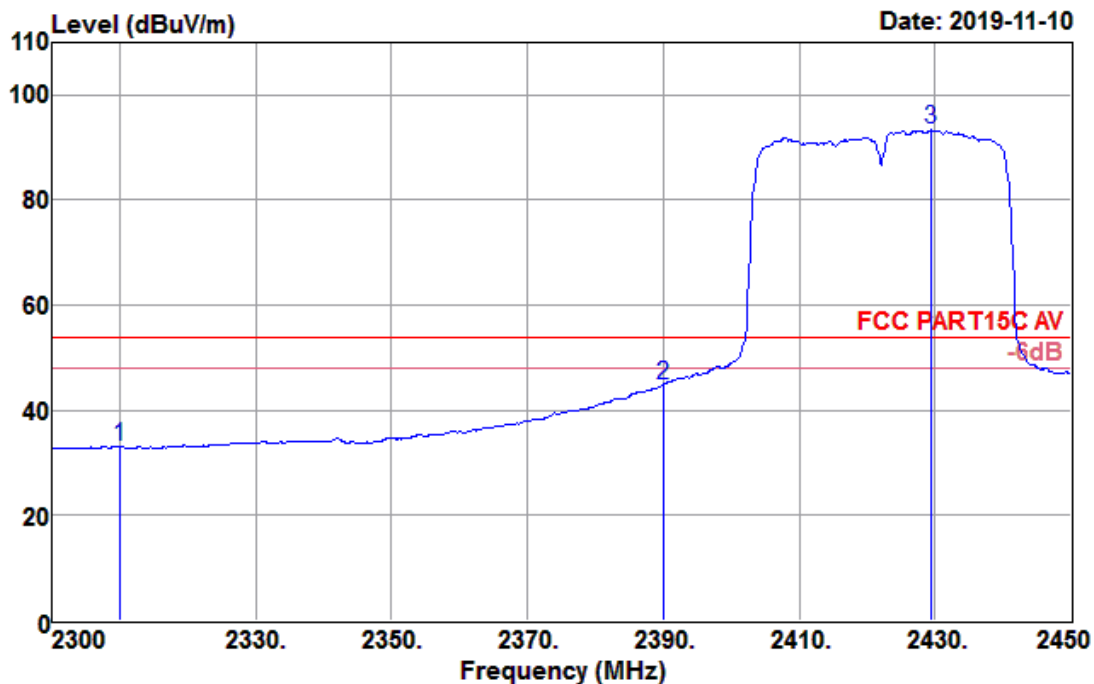
Data: 417



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	51.42	26.91	3.48	35.43	46.38	74.00	-27.62	Peak
2390.000	68.37	27.11	3.53	35.55	63.46	74.00	-10.54	Peak
2429.450	110.06	27.22	3.56	35.60	105.24	74.00	31.24	Peak

Test Mode :	802.11n HT40 CH01 (2422 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.425GHz	Polarization :	Horizontal

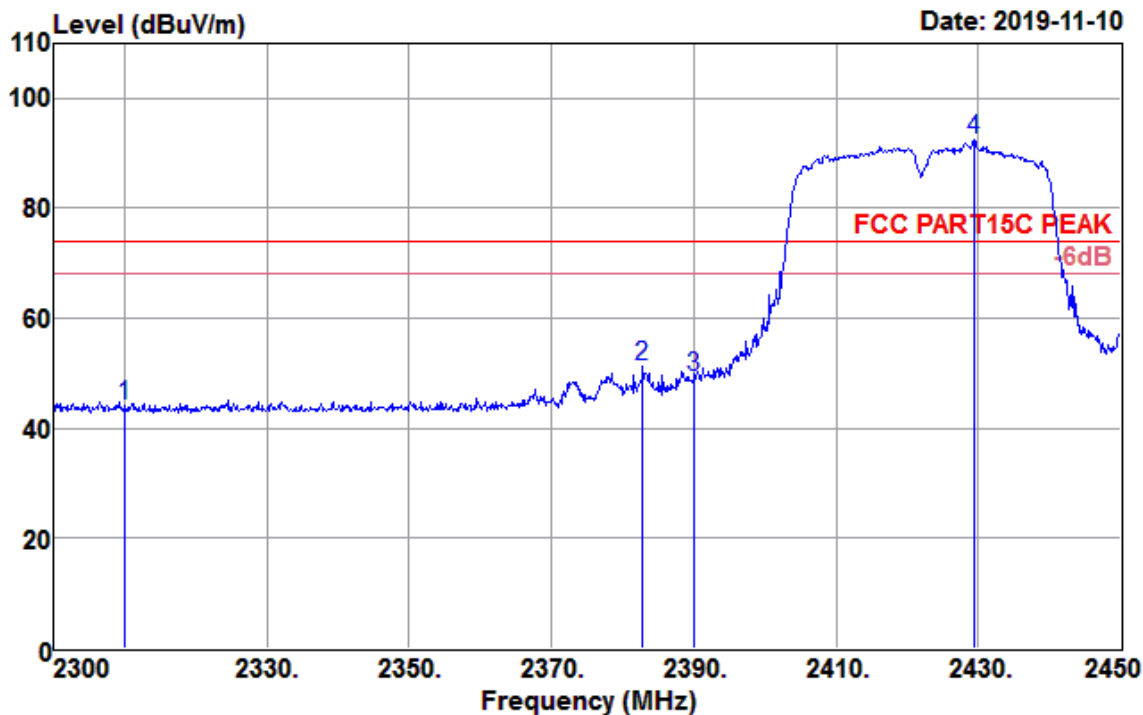
Data: 418



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	38.12	26.91	3.48	35.43	33.08	54.00	-20.92	Average
2390.000	49.82	27.11	3.53	35.55	44.91	54.00	-9.09	Average
2429.450	98.24	27.22	3.56	35.60	93.42	54.00	39.42	Average

Test Mode :	802.11n HT40 CH01 (2422 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.425GHz	Polarization :	Vertical

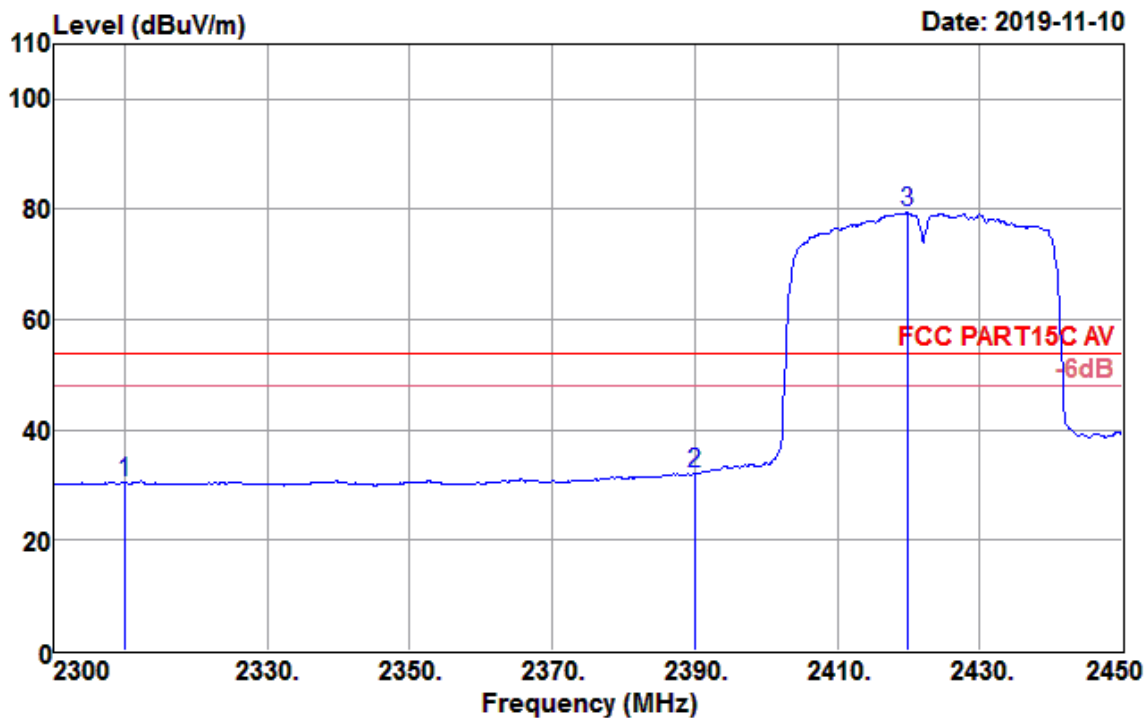
Data: 414



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	49.03	26.91	3.48	35.43	43.99	74.00	-30.01	Peak
2382.800	56.05	27.10	3.53	35.54	51.14	74.00	-22.86	Peak
2390.000	54.25	27.11	3.53	35.55	49.34	74.00	-24.66	Peak
2429.300	97.31	27.22	3.56	35.60	92.49	74.00	18.49	Peak

Test Mode :	802.11n HT40 CH01 (2422 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.425GHz	Polarization :	Vertical

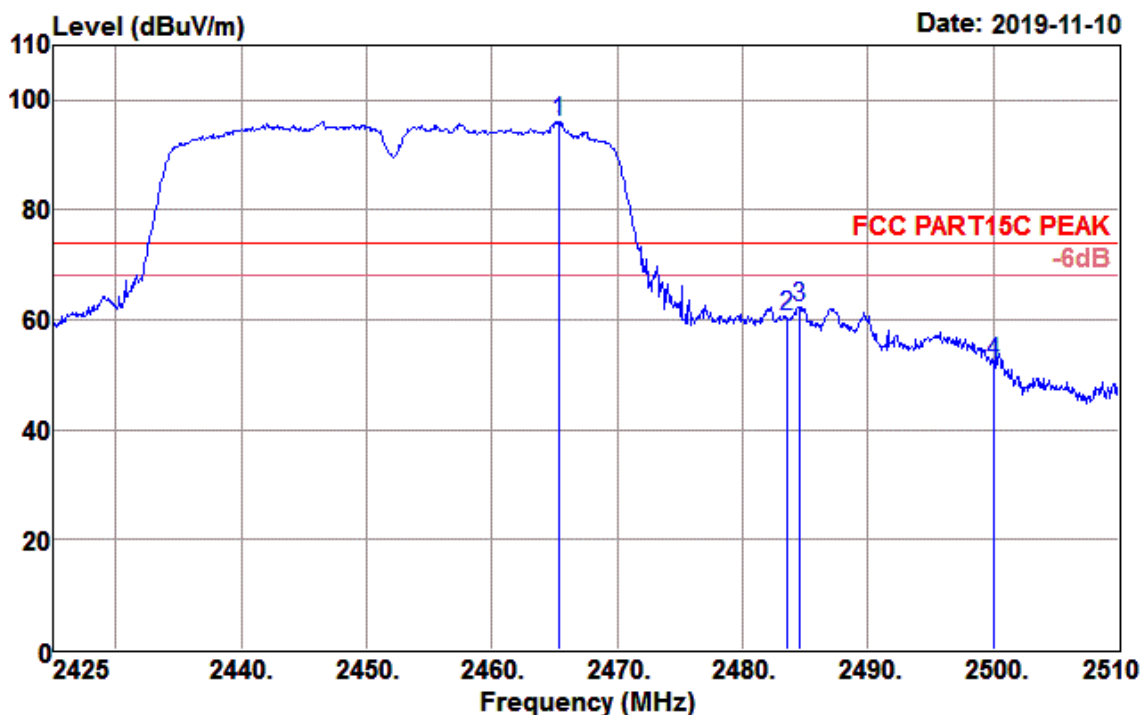
Data: 415



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	35.47	26.91	3.48	35.43	30.43	54.00	-23.57	Average
2390.000	36.90	27.11	3.53	35.55	31.99	54.00	-22.01	Average
2419.850	84.25	27.19	3.55	35.59	79.40	54.00	25.40	Average

Test Mode :	802.11n HT40 CH11 (2452 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.45GHz~2.51GHz	Polarization :	Horizontal

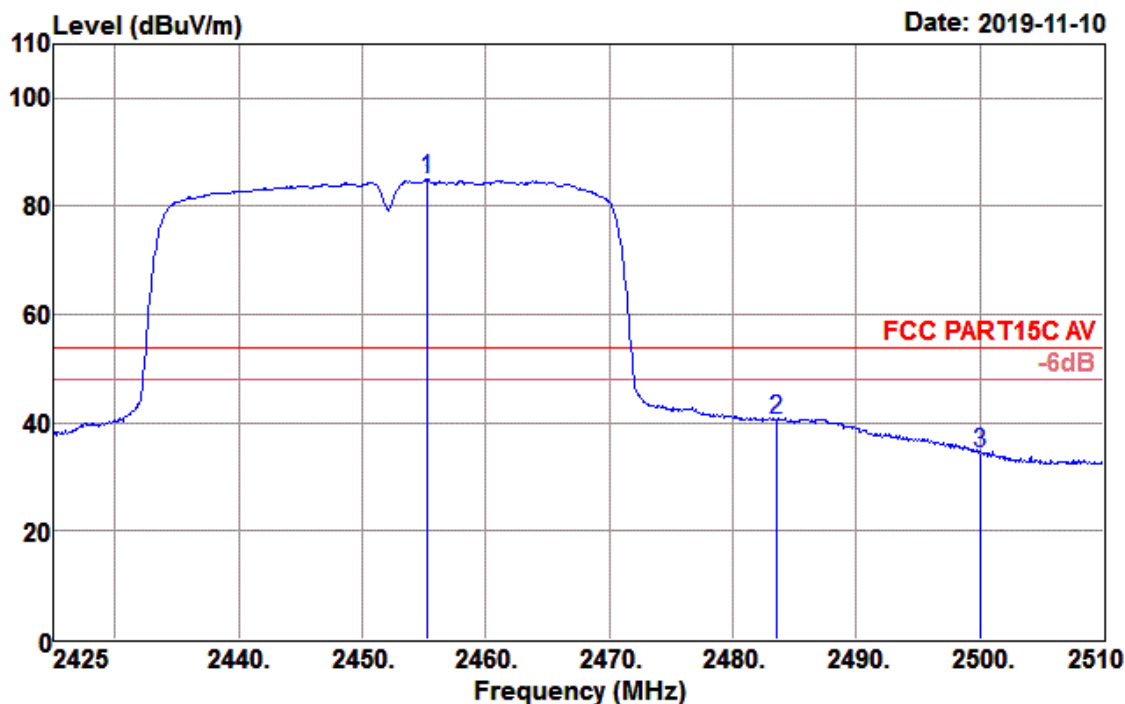
Data: 288



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2465.375	100.87	27.31	3.58	35.65	96.11	74.00	22.11	Peak
2483.500	65.35	27.36	3.59	35.68	60.62	74.00	-13.38	Peak
2484.585	67.11	27.36	3.59	35.68	62.38	74.00	-11.62	Peak
2500.000	56.89	27.40	3.60	35.70	52.19	74.00	-21.81	Peak

Test Mode :	802.11n HT40 CH11 (2452 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.45GHz~2.51GHz	Polarization :	Horizontal

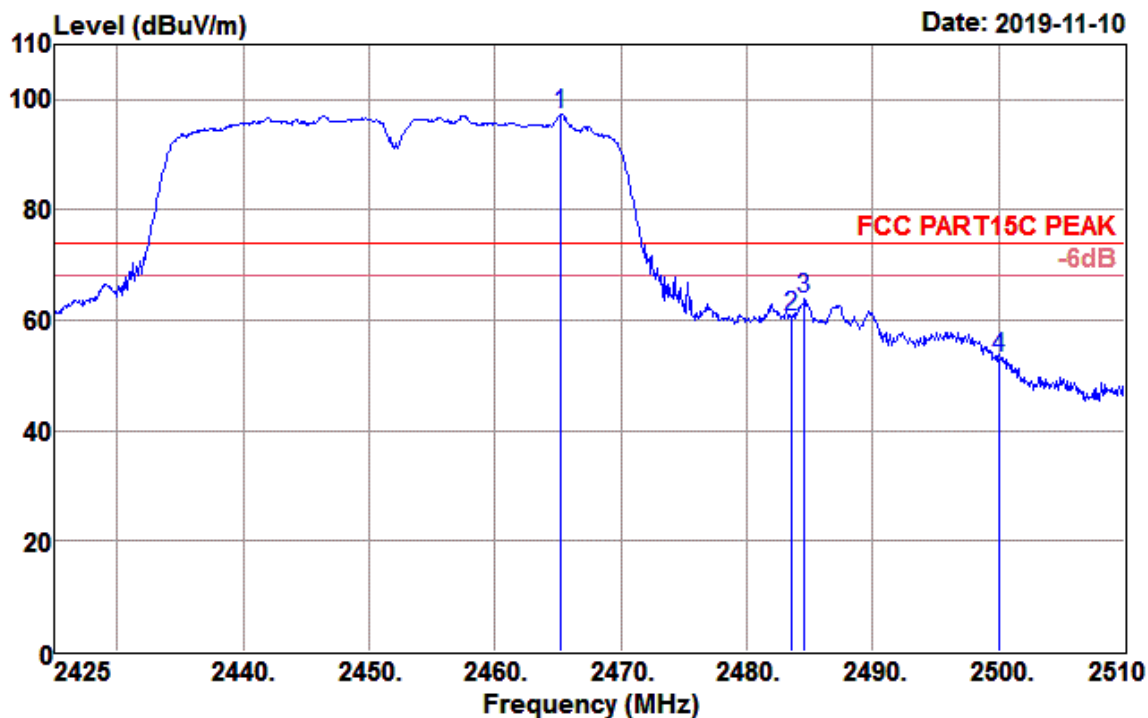
Data: 289



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2455.260	89.75	27.28	3.57	35.64	84.96	54.00	30.96	Average
2483.500	45.34	27.36	3.59	35.68	40.61	54.00	-13.39	Average
2500.000	39.01	27.40	3.60	35.70	34.31	54.00	-19.69	Average

Test Mode :	802.11n HT40 CH11 (2452 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.45GHz~2.51GHz	Polarization :	Vertical

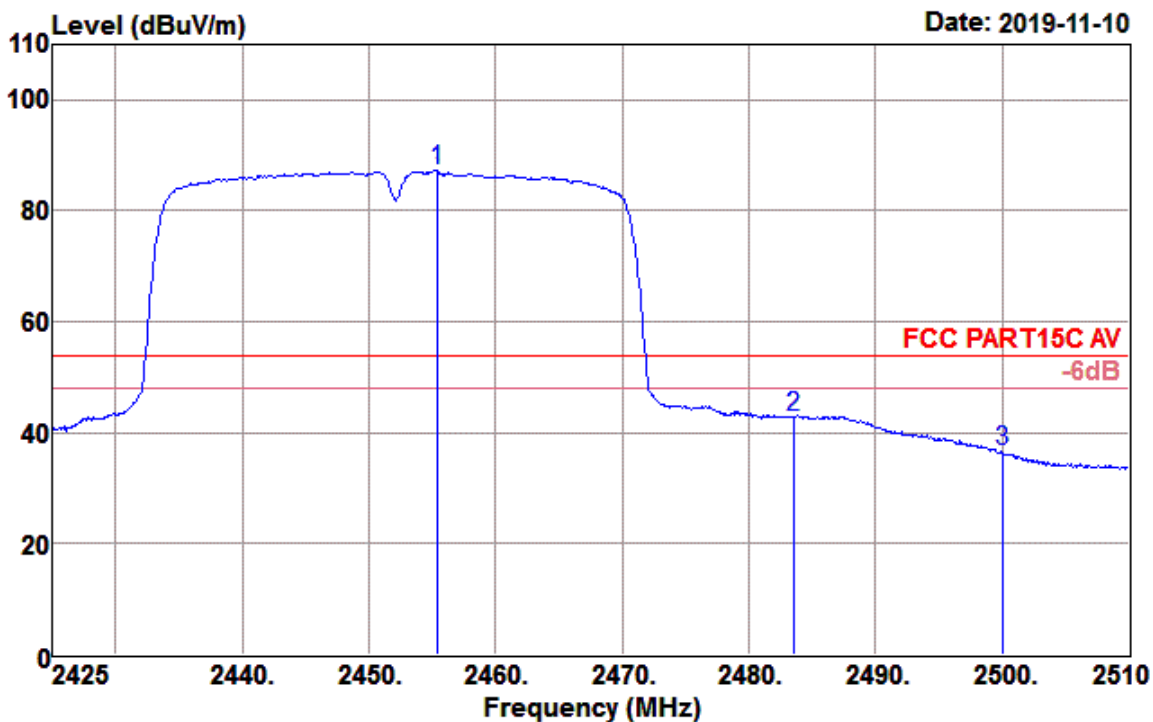
Data: 285



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamplifier factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2465.205	102.07	27.31	3.58	35.65	97.31	74.00	23.31	Peak
2483.500	65.56	27.36	3.59	35.68	60.83	74.00	-13.17	Peak
2484.585	68.53	27.36	3.59	35.68	63.80	74.00	-10.20	Peak
2500.000	57.80	27.40	3.60	35.70	53.10	74.00	-20.90	Peak

Test Mode :	802.11n HT40 CH11 (2452 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.45GHz~2.51GHz	Polarization :	Vertical

Data: 286

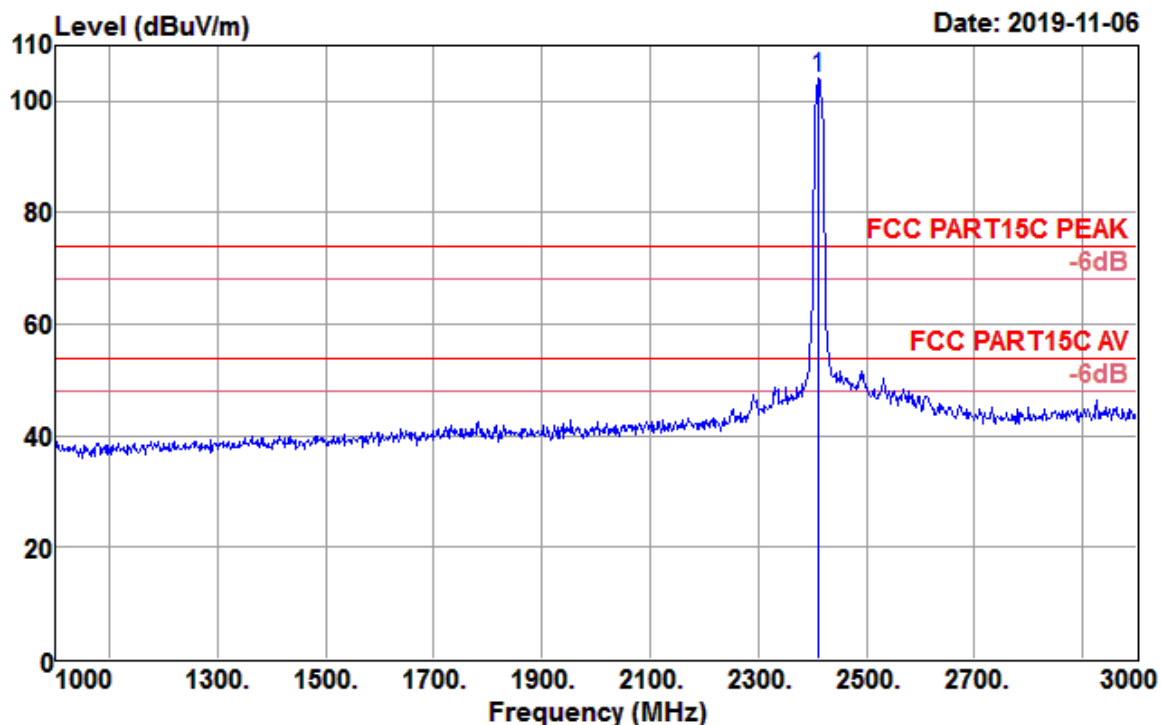


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2455.345	92.08	27.28	3.57	35.64	87.29	54.00	33.29	Average
2483.500	47.48	27.36	3.59	35.68	42.75	54.00	-11.25	Average
2500.000	41.38	27.40	3.60	35.70	36.68	54.00	-17.32	Average

4.5.5 Test Result of Radiated Spurious Emission (1GHz ~ 10th Harmonic)

Test Mode :	802.11b CH01 (2412 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Horizontal

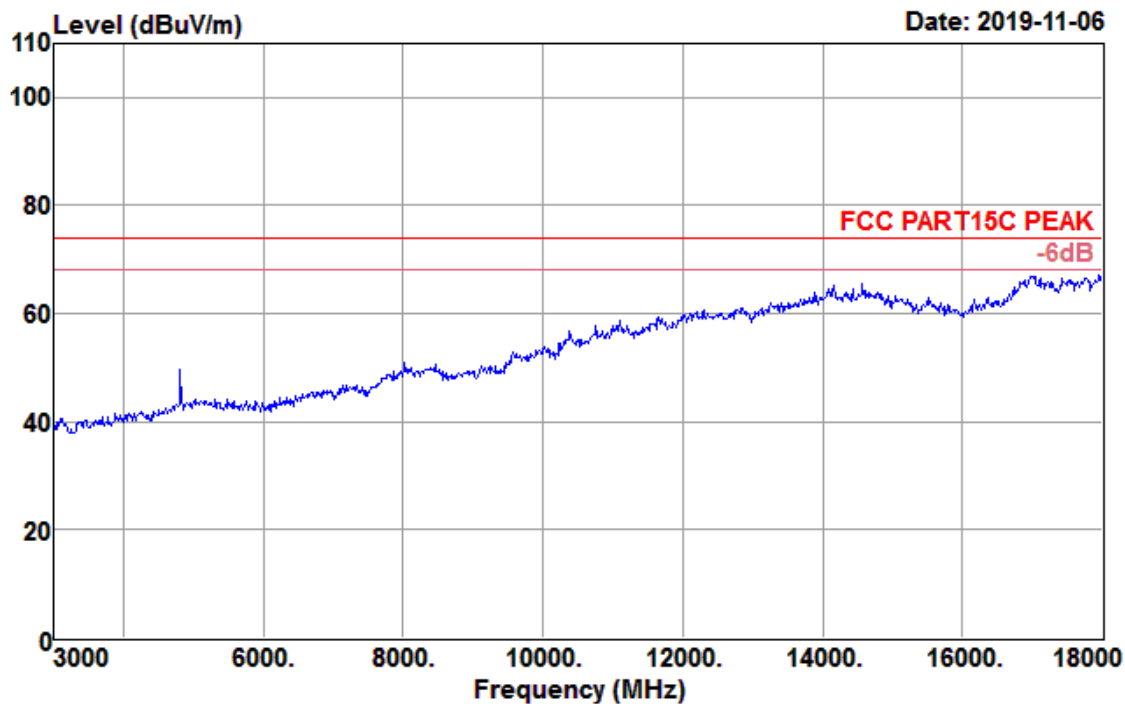
Data: 368



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2412.000	108.93	27.17	3.55	35.58	104.07	74.00	30.07	Peak

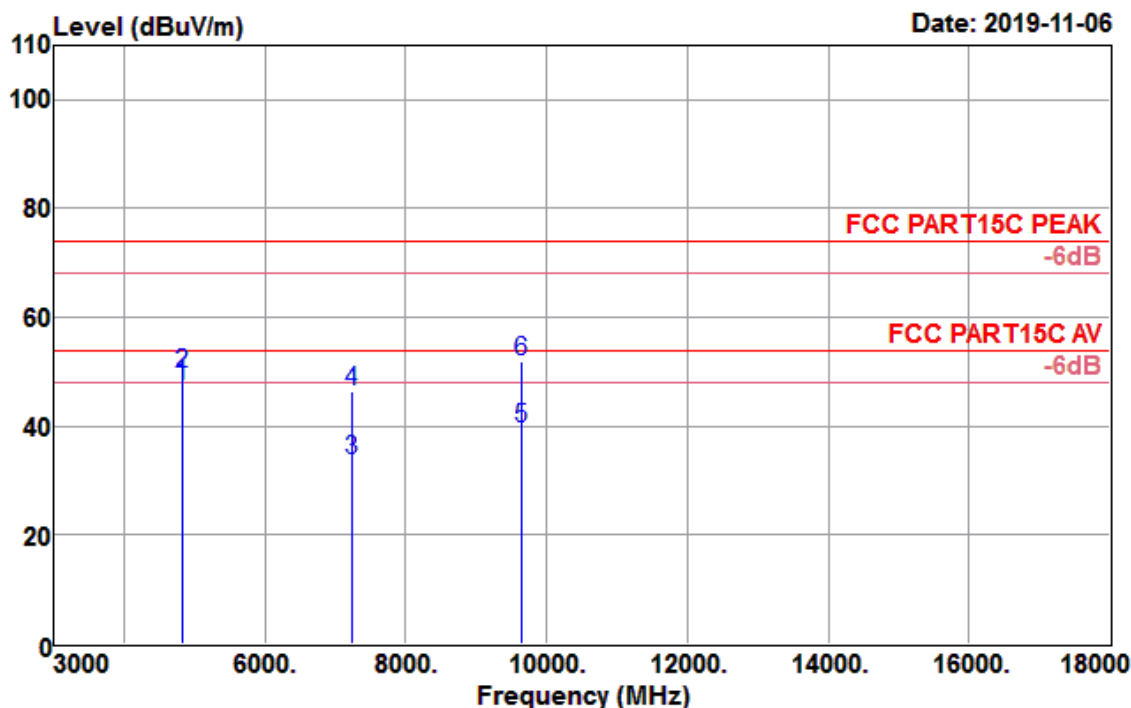
Test Mode :	802.11b CH01 (2412 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Horizontal

Data: 364



Data: 365

Date: 2019-11-06

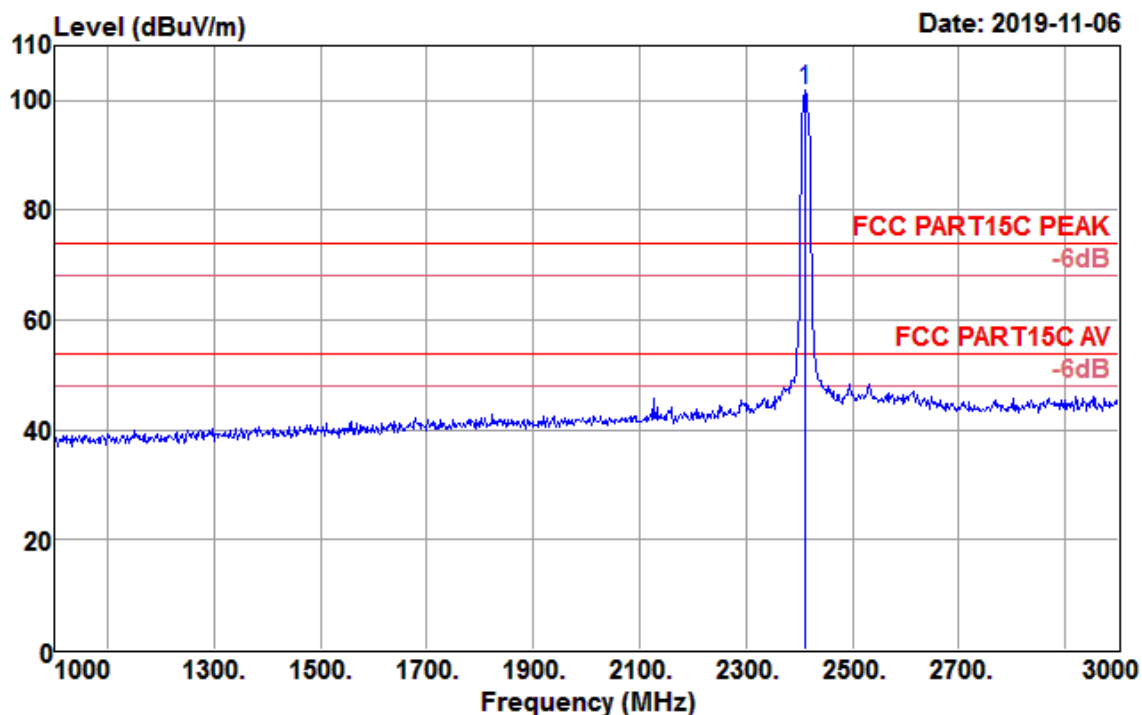


Freq MHz	Reading level dBUV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBUV/m	Limit level dBUV/m	Over limit dB	Remark
4824.000	45.36	31.28	5.56	34.84	47.36	54.00	-6.64	Average
4824.000	47.68	31.28	5.56	34.84	49.68	74.00	-24.32	Peak
7236.000	26.72	35.94	7.61	36.40	33.87	54.00	-20.13	Average
7236.000	39.34	35.94	7.61	36.40	46.49	74.00	-27.51	Peak
9648.000	27.57	37.87	10.41	36.40	39.45	54.00	-14.55	Average
9648.000	39.97	37.87	10.41	36.40	51.85	74.00	-22.15	Peak

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	802.11b CH01 (2412 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Vertical

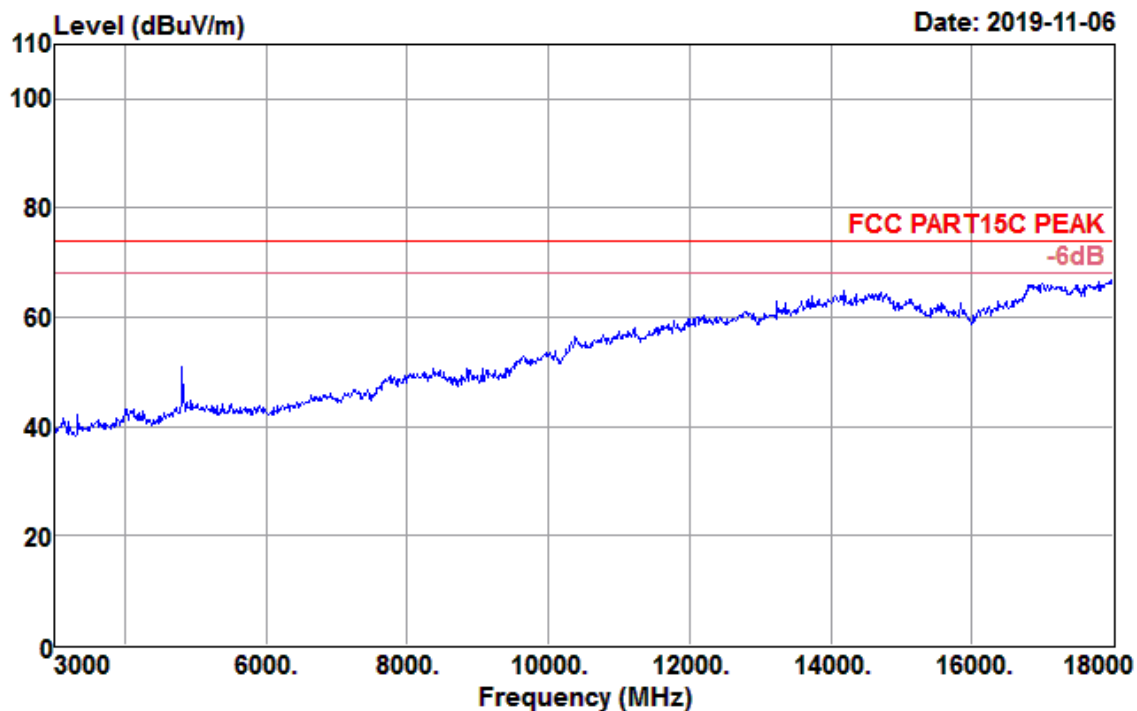
Data: 371



Freq MHz	Reading level dBUV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBUV/m	Limit level dBUV/m	Over limit dB	Remark
2412.000	106.76	27.17	3.55	35.58	101.90	74.00	27.90	Peak

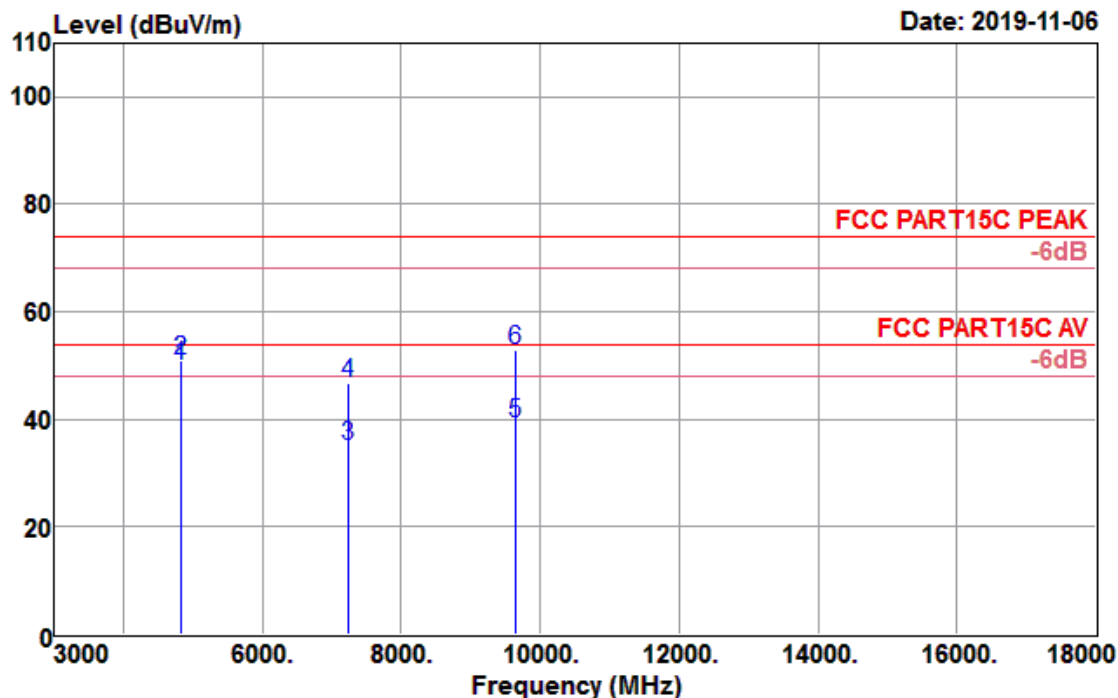
Test Mode :	802.11b CH01 (2412 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Vertical

Data: 362



Data: 363

Date: 2019-11-06

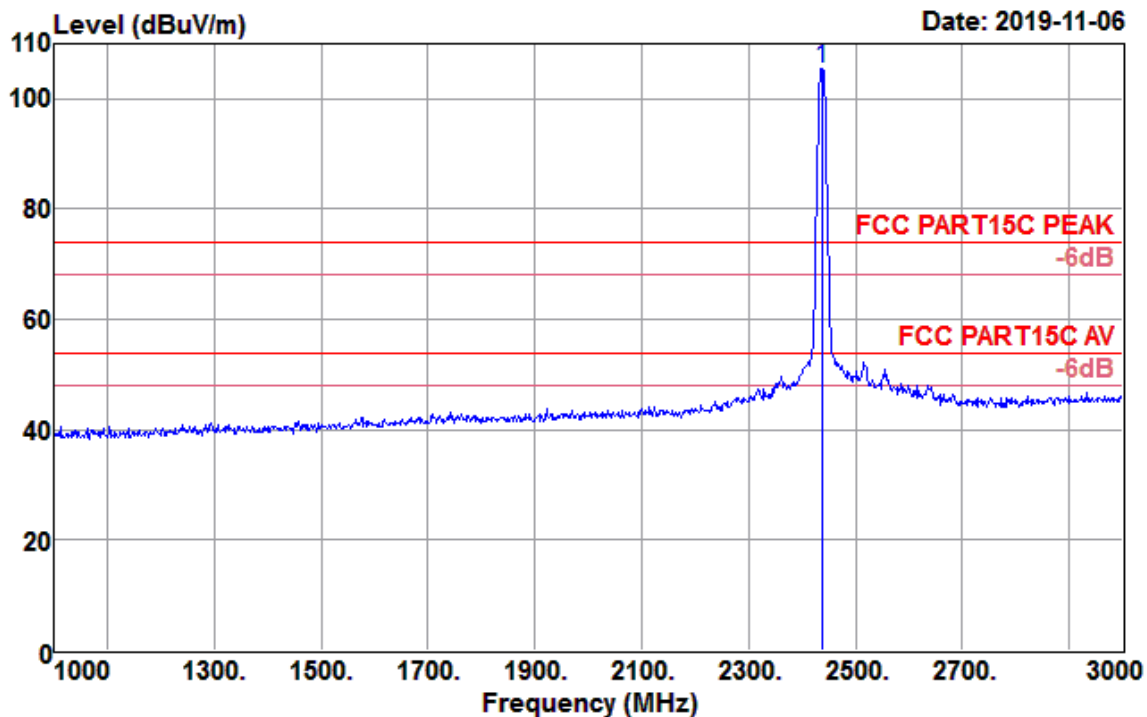


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4824.000	47.83	31.28	5.56	34.84	49.83	54.00	-4.17	Average
4824.000	48.91	31.28	5.56	34.84	50.91	74.00	-23.09	Peak
7236.000	27.86	35.94	7.61	36.40	35.01	54.00	-18.99	Average
7236.000	39.60	35.94	7.61	36.40	46.75	74.00	-27.25	Peak
9648.000	27.39	37.87	10.41	36.40	39.27	54.00	-14.73	Average
9648.000	41.15	37.87	10.41	36.40	53.03	74.00	-20.97	Peak

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	802.11b CH06 (2437MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Horizontal

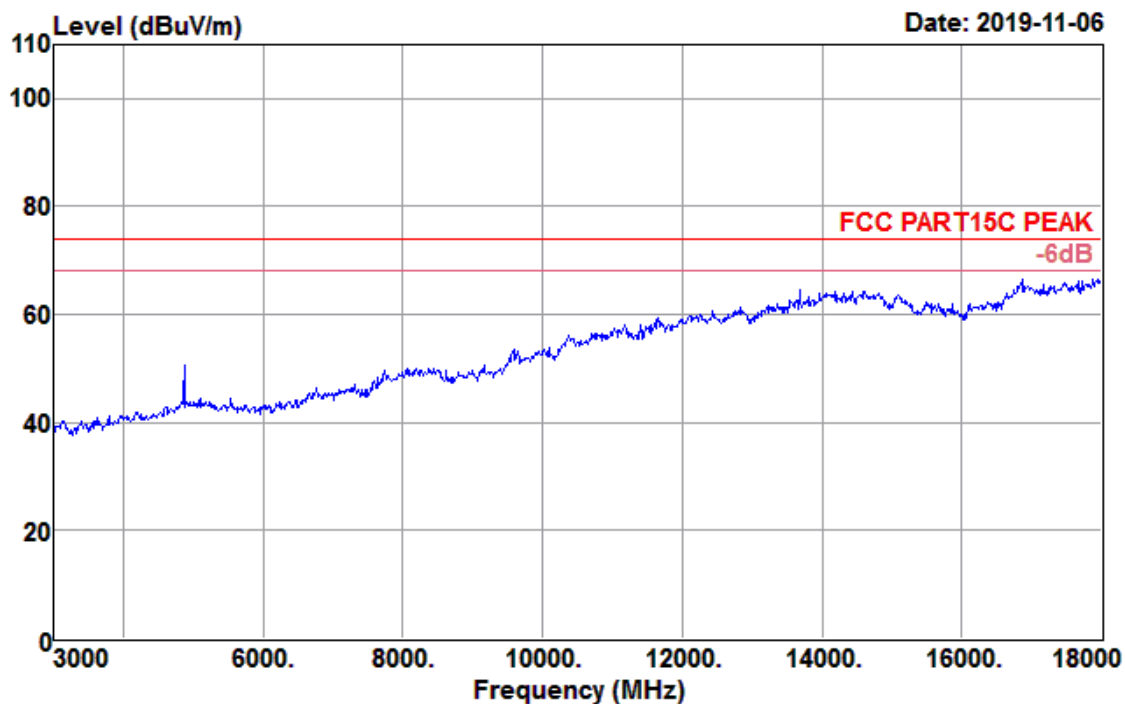
Data: 373



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2437.000	110.24	27.24	3.56	35.61	105.43	74.00	31.43	Peak

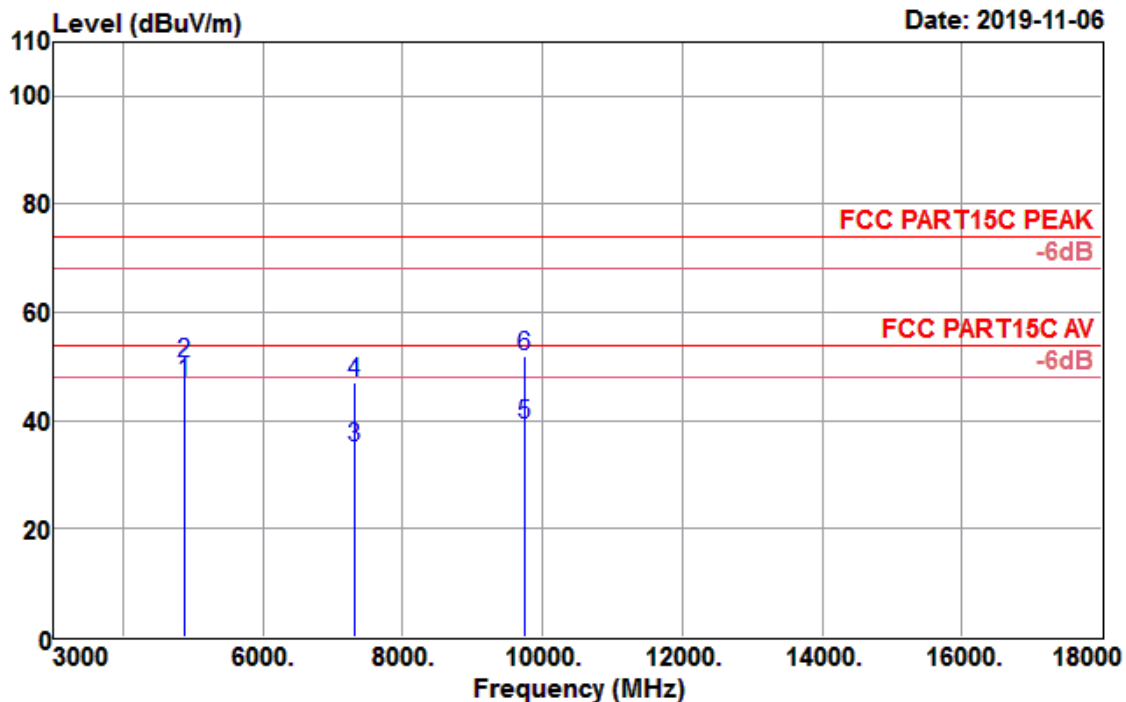
Test Mode :	802.11b CH06 (2437MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Horizontal

Data: 374



Data: 375

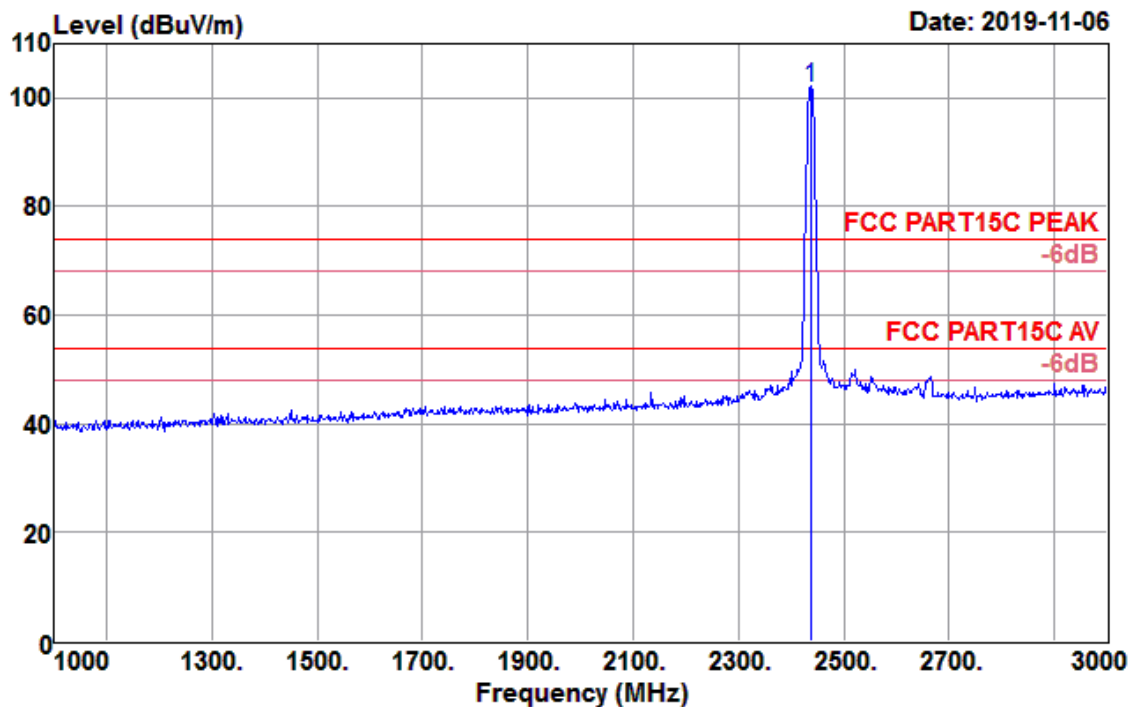
Date: 2019-11-06



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	802.11b CH06 (2437MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Vertical

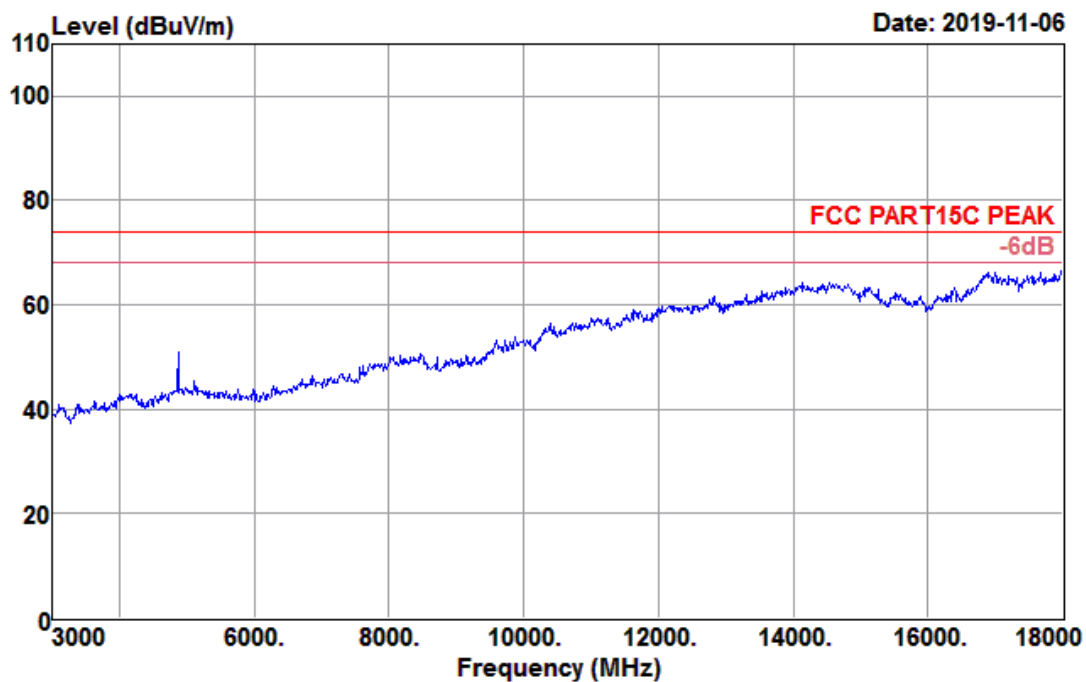
Data: 372



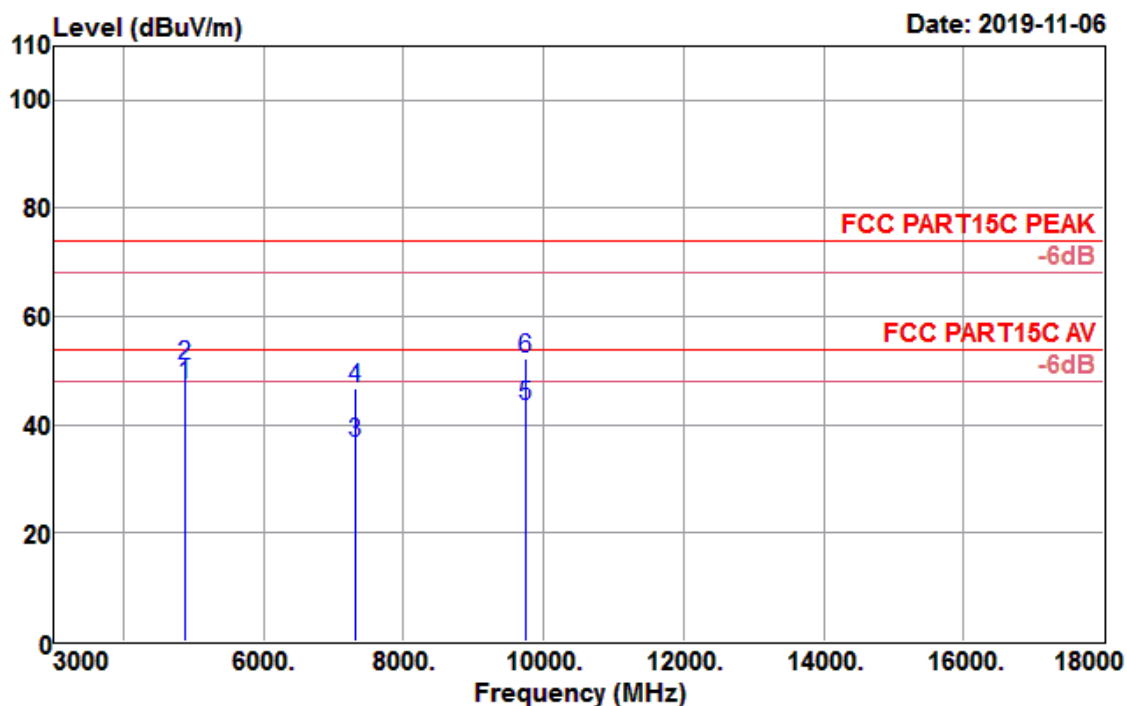
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2437.000	106.56	27.24	3.56	35.61	101.75	74.00	27.75	Peak

Test Mode :	802.11b CH06 (2437MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Vertical

Data: 376



Data: 377

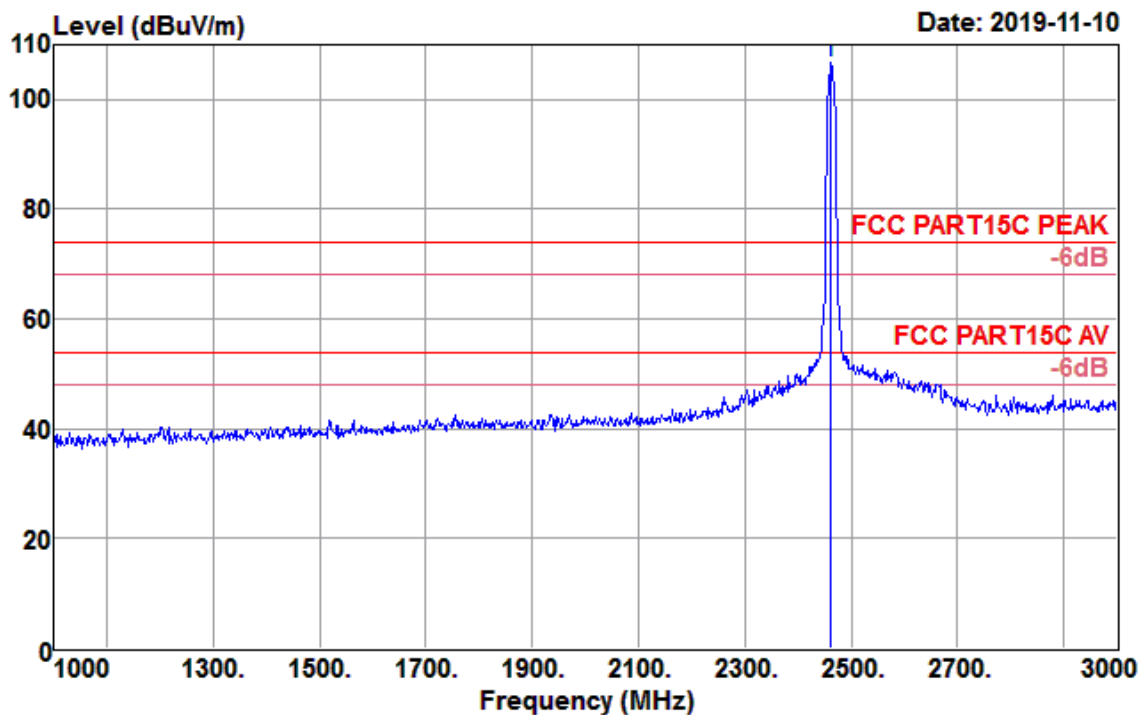


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4874.000	45.35	31.40	5.55	34.80	47.50	54.00	-6.50	Average
4874.000	48.96	31.40	5.55	34.80	51.11	74.00	-22.89	Peak
7311.000	29.29	36.12	7.53	36.40	36.54	54.00	-17.46	Average
7311.000	39.57	36.12	7.53	36.40	46.82	74.00	-27.18	Peak
9748.000	31.20	38.05	10.70	36.40	43.55	54.00	-10.45	Average
9748.000	39.81	38.05	10.70	36.40	52.16	74.00	-21.84	Peak

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	802.11b CH11 (2462MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Horizontal

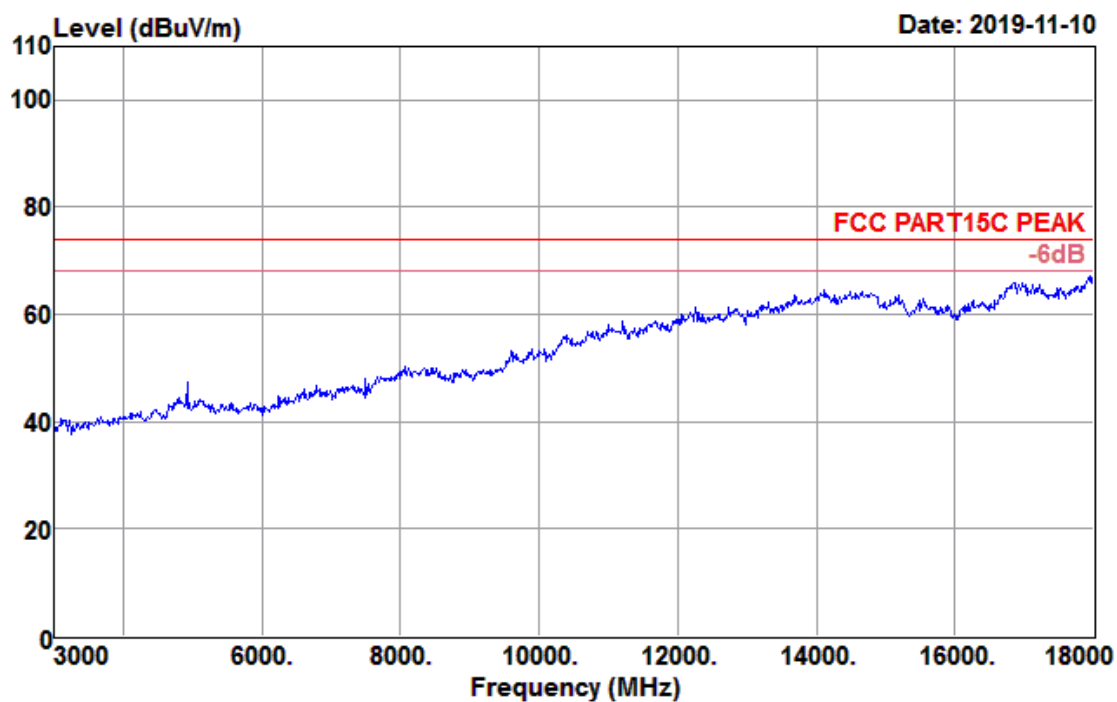
Data: 384



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2462.000	111.49	27.30	3.58	35.65	106.72	74.00	32.72	Peak

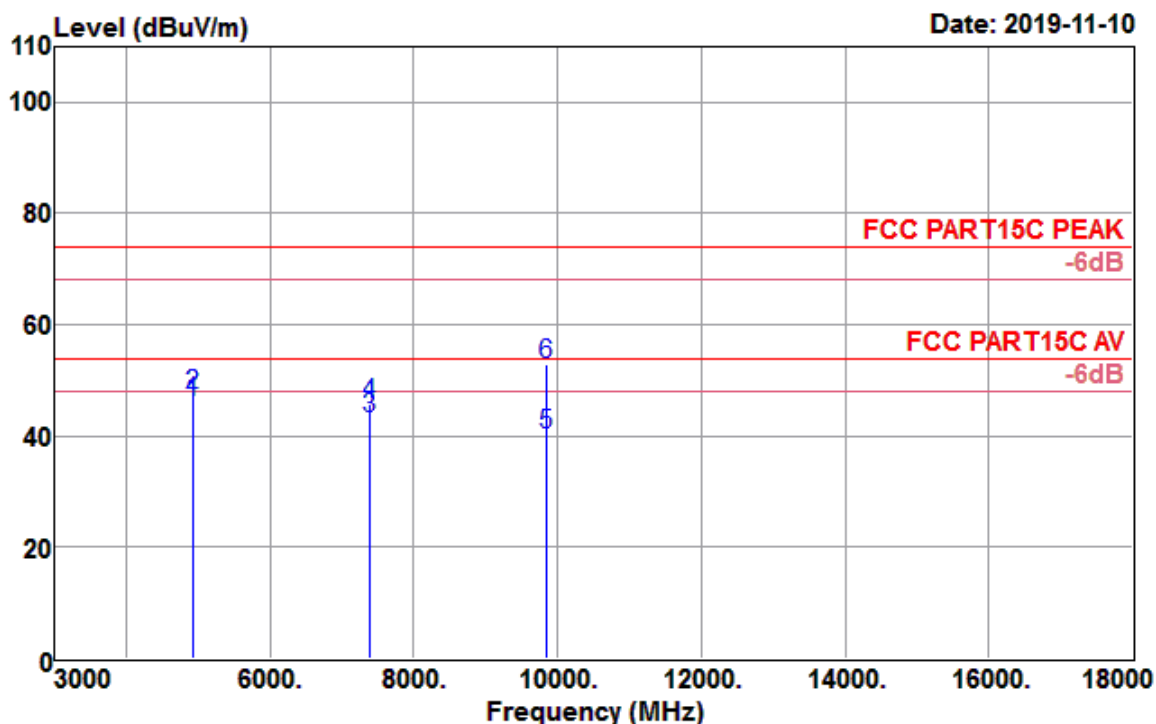
Test Mode :	802.11b CH11 (2462MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Horizontal

Data: 381



Data: 380

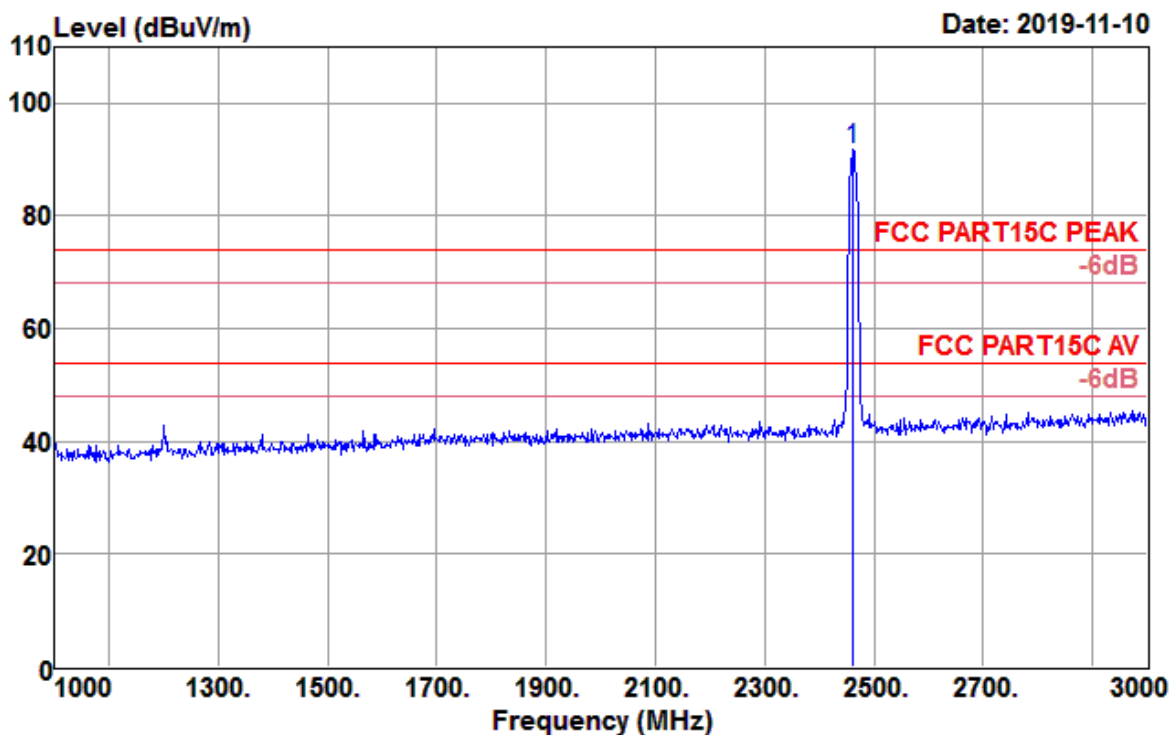
Date: 2019-11-10



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	802.11b CH11 (2462MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Vertical

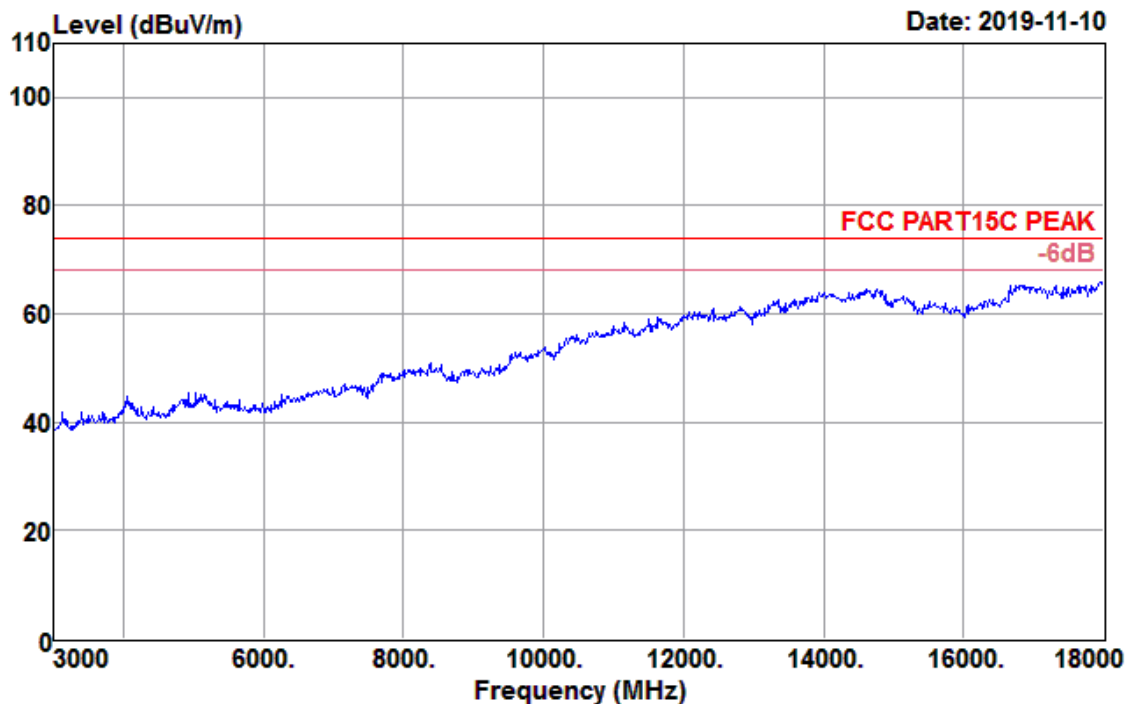
Data: 387



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2462.000	96.71	27.30	3.58	35.65	91.94	74.00	17.94	Peak

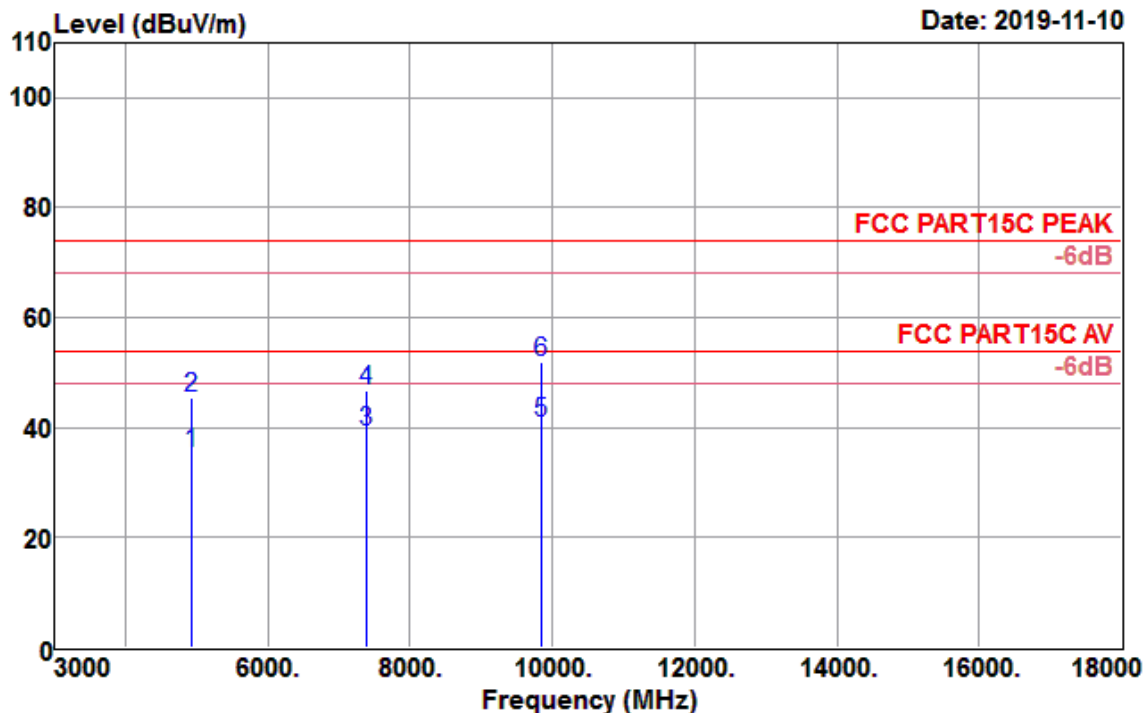
Test Mode :	802.11b CH11 (2462MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Vertical

Data: 378



Data: 379

Date: 2019-11-10

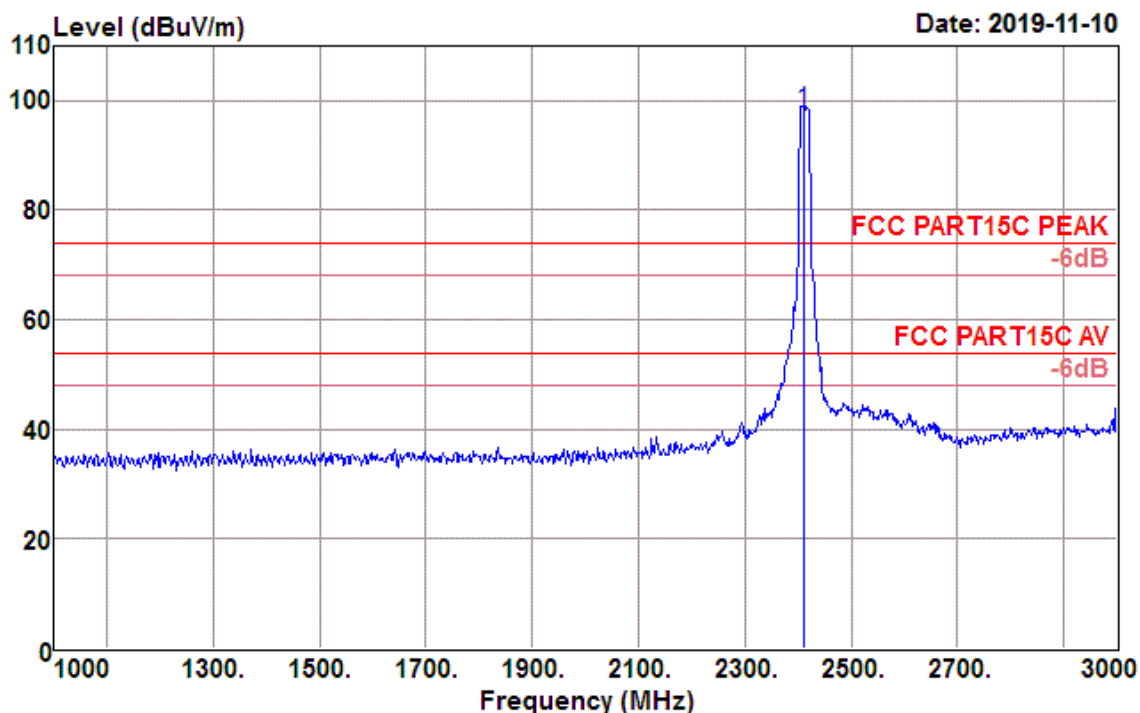


Freq MHz	Reading level dBUV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBUV/m	Limit level dBUV/m	Over limit dB	Remark
4924.000	33.10	31.52	5.53	34.76	35.39	54.00	-18.61	Average
4924.000	43.25	31.52	5.53	34.76	45.54	74.00	-28.46	Peak
7386.000	31.77	36.29	7.46	36.40	39.12	54.00	-14.88	Average
7386.000	39.27	36.29	7.46	36.40	46.62	74.00	-27.38	Peak
9848.000	28.09	38.23	10.98	36.40	40.90	54.00	-13.10	Average
9848.000	39.20	38.23	10.98	36.40	52.01	74.00	-21.99	Peak

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	802.11g CH01 (2412 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Horizontal

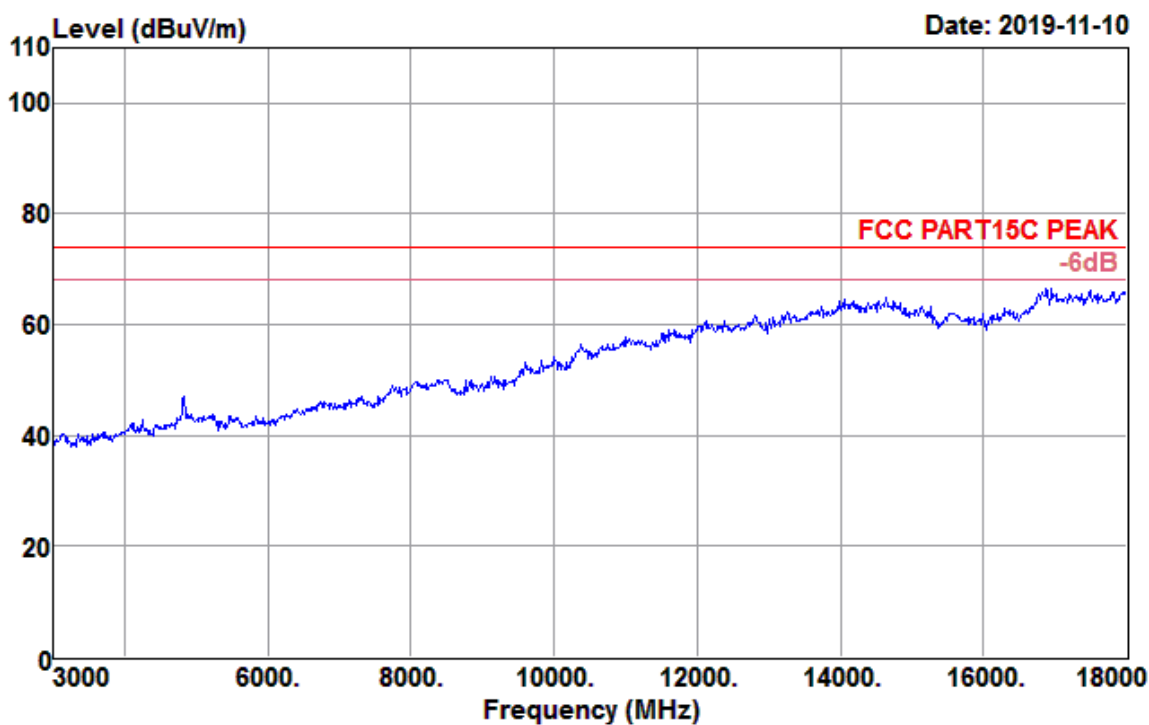
Data: 226



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2412.000	102.95	27.17	3.55	35.58	98.09	74.00	24.09	Peak

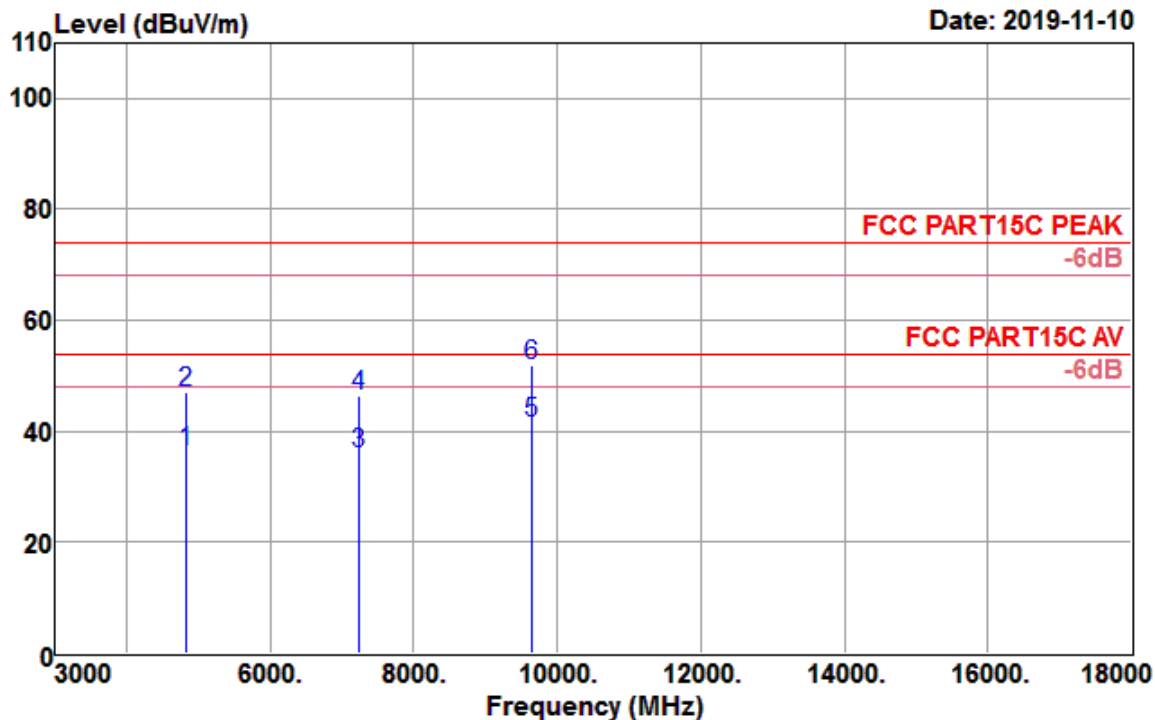
Test Mode :	802.11g CH01 (2412 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Horizontal

Data: 390



Data: 391

Date: 2019-11-10

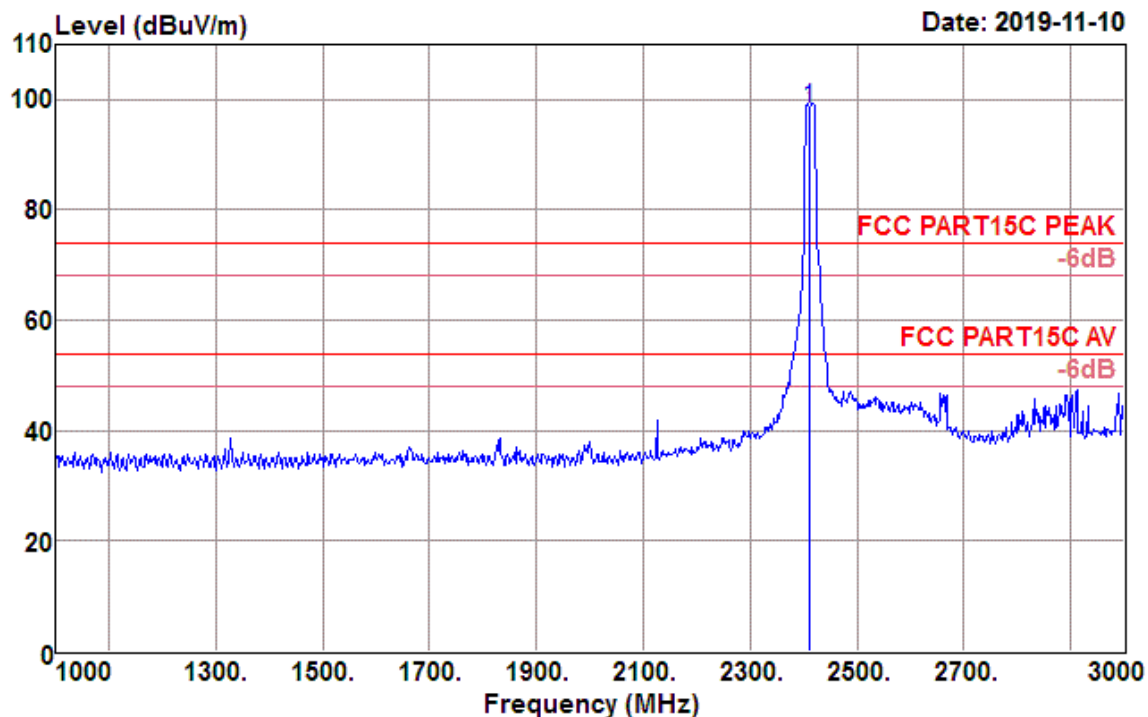


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4824.000	34.42	31.28	5.56	34.84	36.42	54.00	-17.58	Average
4824.000	45.06	31.28	5.56	34.84	47.06	74.00	-26.94	Peak
7236.000	28.89	35.94	7.61	36.40	36.04	54.00	-17.96	Average
7236.000	39.24	35.94	7.61	36.40	46.39	74.00	-27.61	Peak
9648.000	29.68	37.87	10.41	36.40	41.56	54.00	-12.44	Average
9648.000	40.06	37.87	10.41	36.40	51.94	74.00	-22.06	Peak

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	802.11g CH01 (2412 MHz)	Temperature :	21~23°C
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Vertical

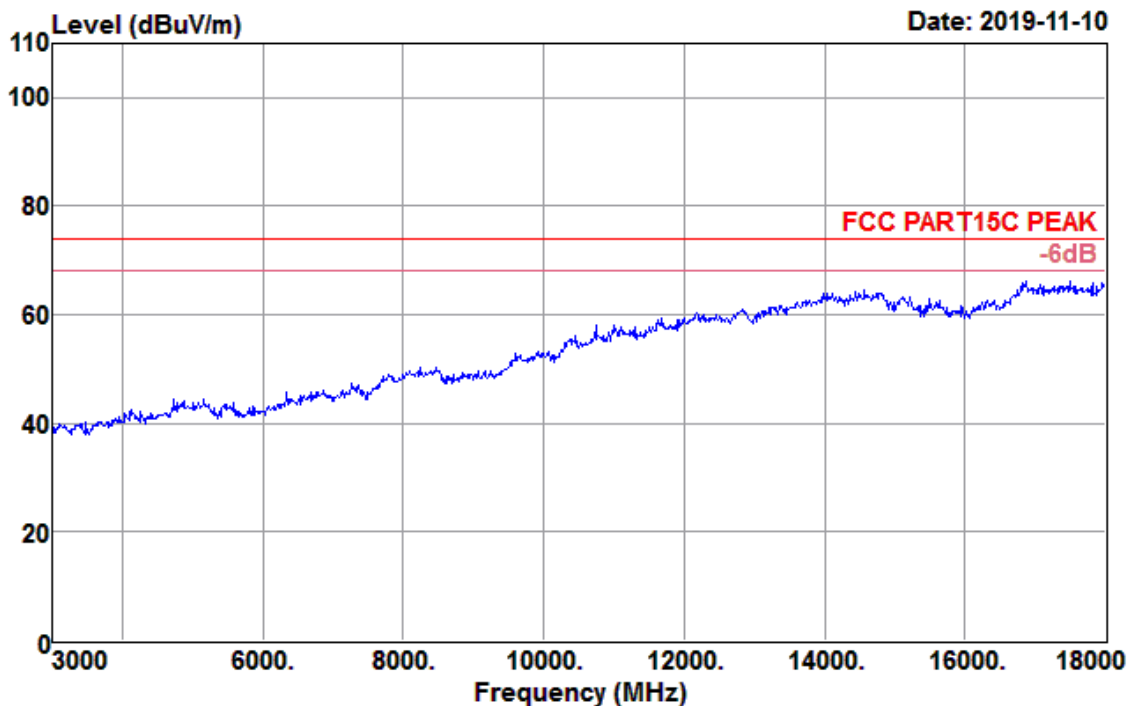
Data: 227



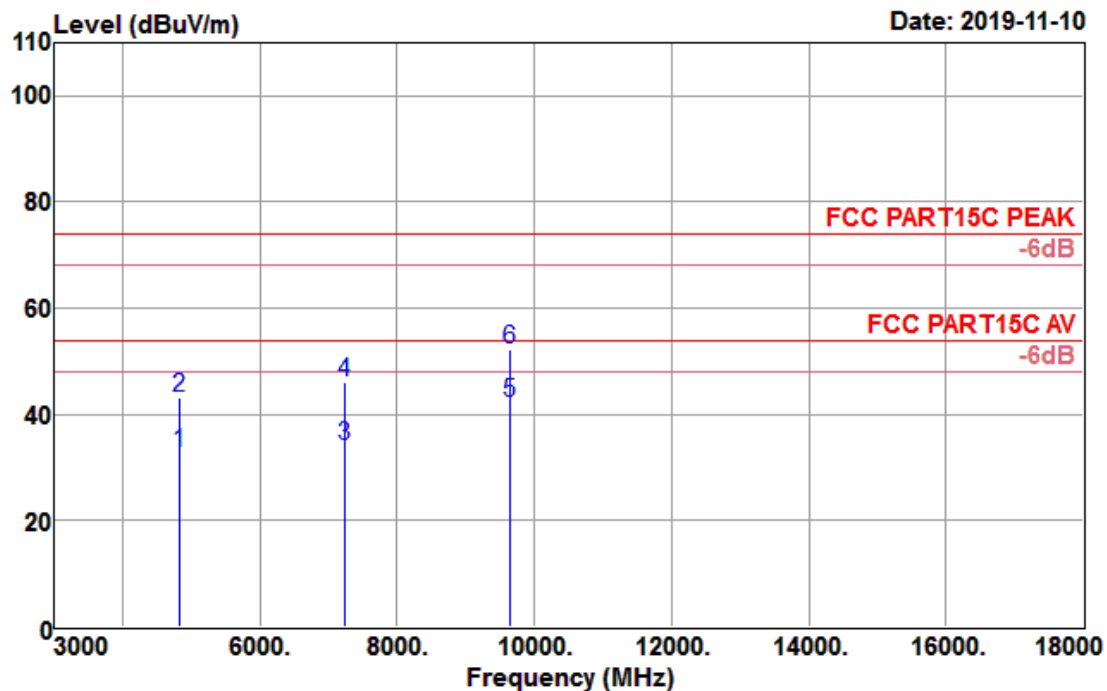
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2412.000	103.17	27.17	3.55	35.58	98.31	74.00	24.31	Peak

Test Mode :	802.11g CH01 (2412 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Vertical

Data: 388



Data: 389

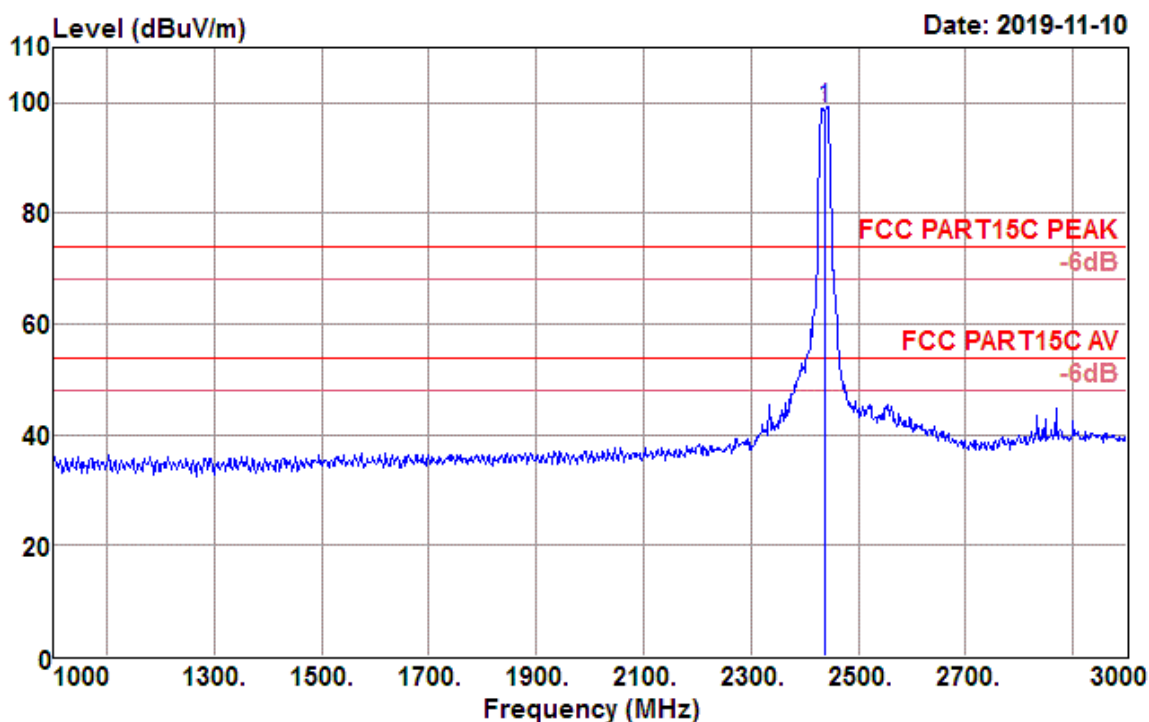


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4824.000	30.64	31.28	5.56	34.84	32.64	54.00	-21.36	Average
4824.000	41.25	31.28	5.56	34.84	43.25	74.00	-30.75	Peak
7236.000	26.83	35.94	7.61	36.40	33.98	54.00	-20.02	Average
7236.000	38.90	35.94	7.61	36.40	46.05	74.00	-27.95	Peak
9648.000	30.35	37.87	10.41	36.40	42.23	54.00	-11.77	Average
9648.000	40.22	37.87	10.41	36.40	52.10	74.00	-21.90	Peak

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	802.11g CH06 (2437MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Horizontal

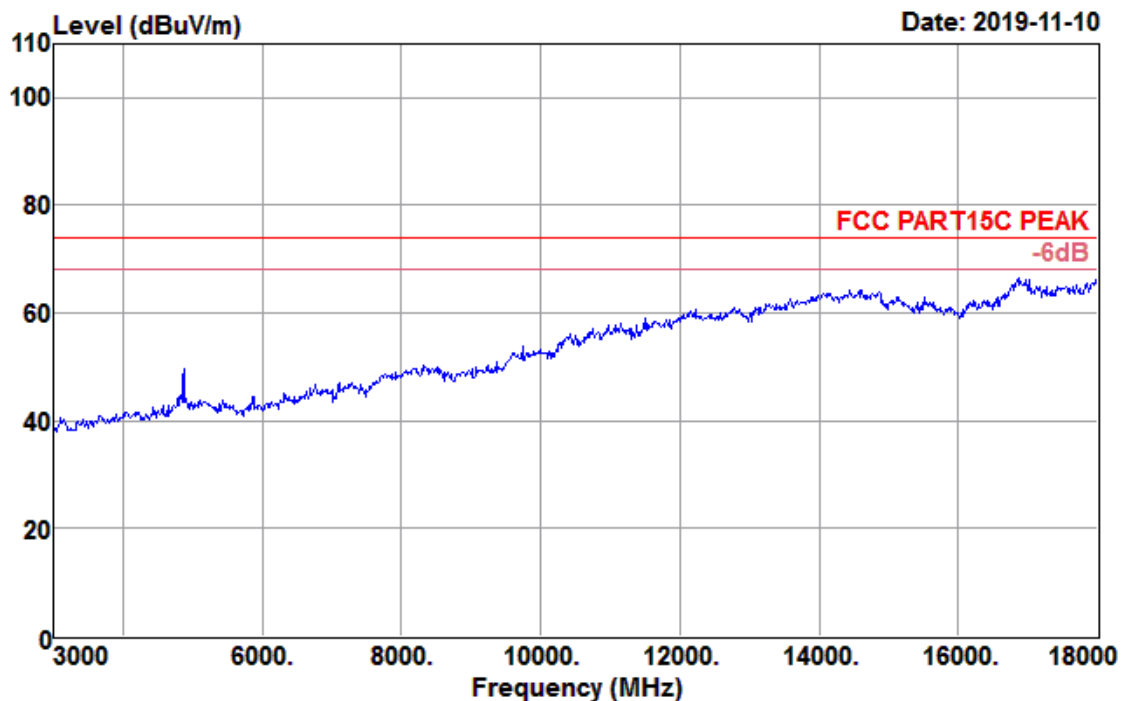
Data: 232



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2437.000	103.71	27.24	3.56	35.61	98.90	74.00	24.90	Peak

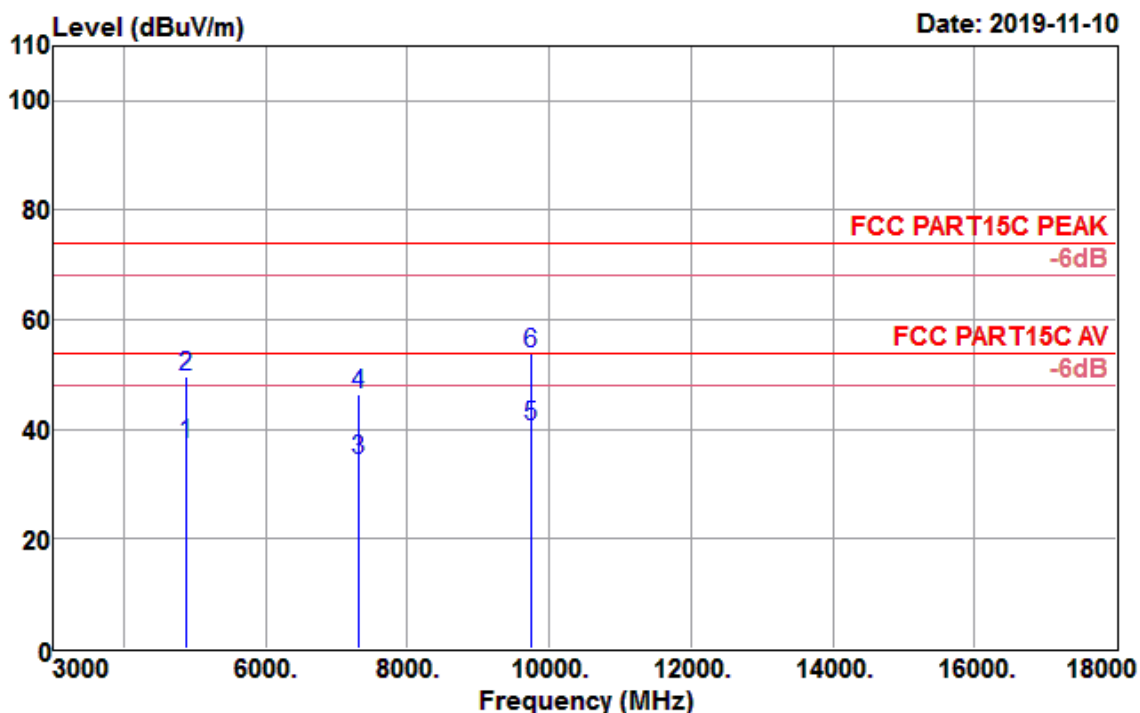
Test Mode :	802.11g CH06 (2437MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Horizontal

Data: 392



Data: 393

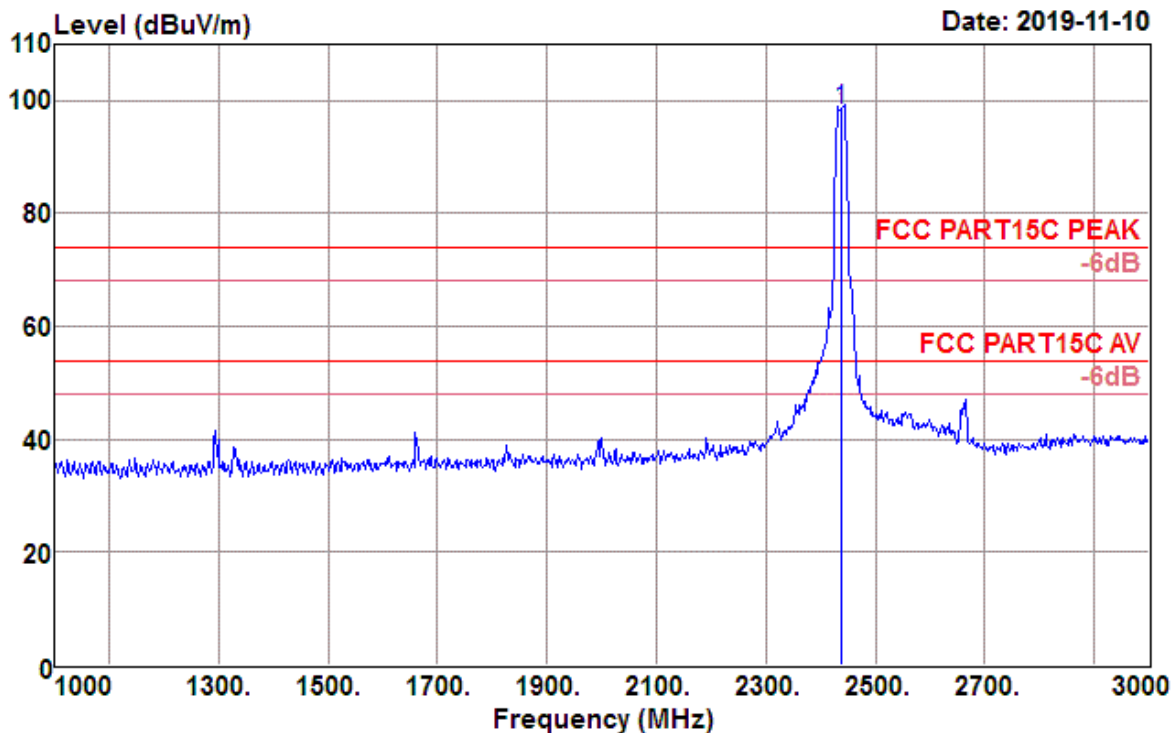
Date: 2019-11-10



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	802.11g CH06 (2437MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Vertical

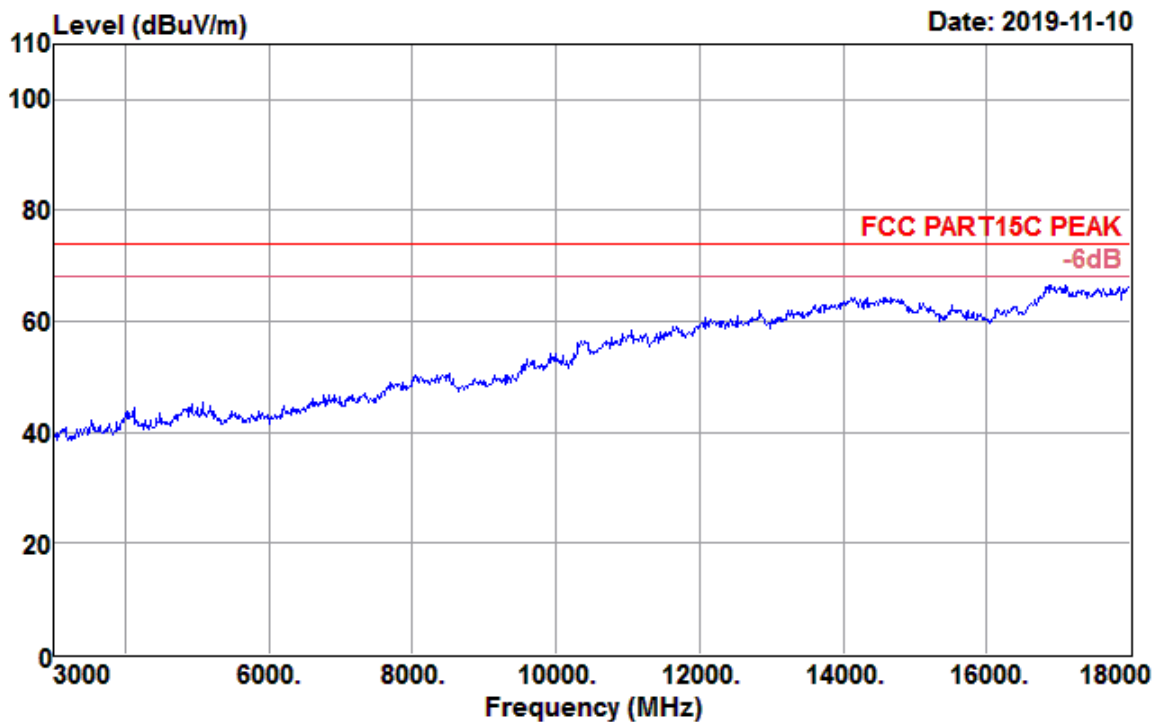
Data: 233



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2437.000	103.10	27.24	3.56	35.61	98.29	74.00	24.29	Peak

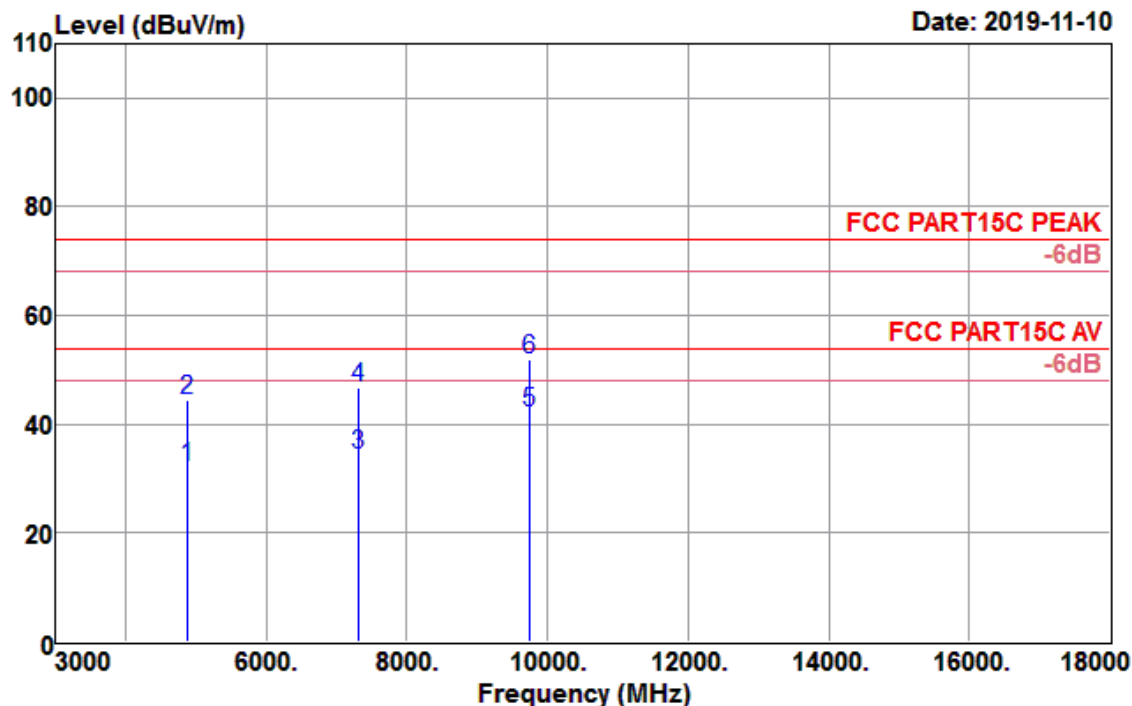
Test Mode :	802.11g CH06 (2437MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Vertical

Data: 394



Data: 395

Date: 2019-11-10

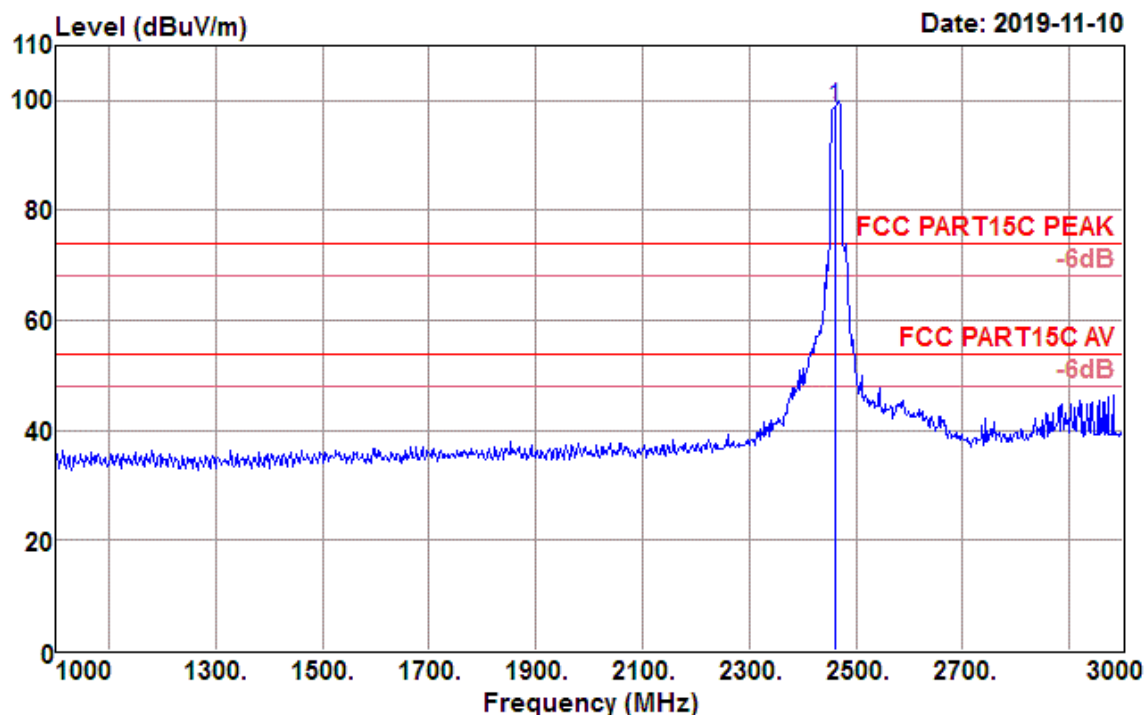


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamplifier factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4874.000	29.84	31.40	5.55	34.80	31.99	54.00	-22.01	Average
4874.000	42.45	31.40	5.55	34.80	44.60	74.00	-29.40	Peak
7311.000	27.18	36.12	7.53	36.40	34.43	54.00	-19.57	Average
7311.000	39.62	36.12	7.53	36.40	46.87	74.00	-27.13	Peak
9748.000	29.75	38.05	10.70	36.40	42.10	54.00	-11.90	Average
9748.000	39.71	38.05	10.70	36.40	52.06	74.00	-21.94	Peak

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	802.11g CH11 (2462MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Horizontal

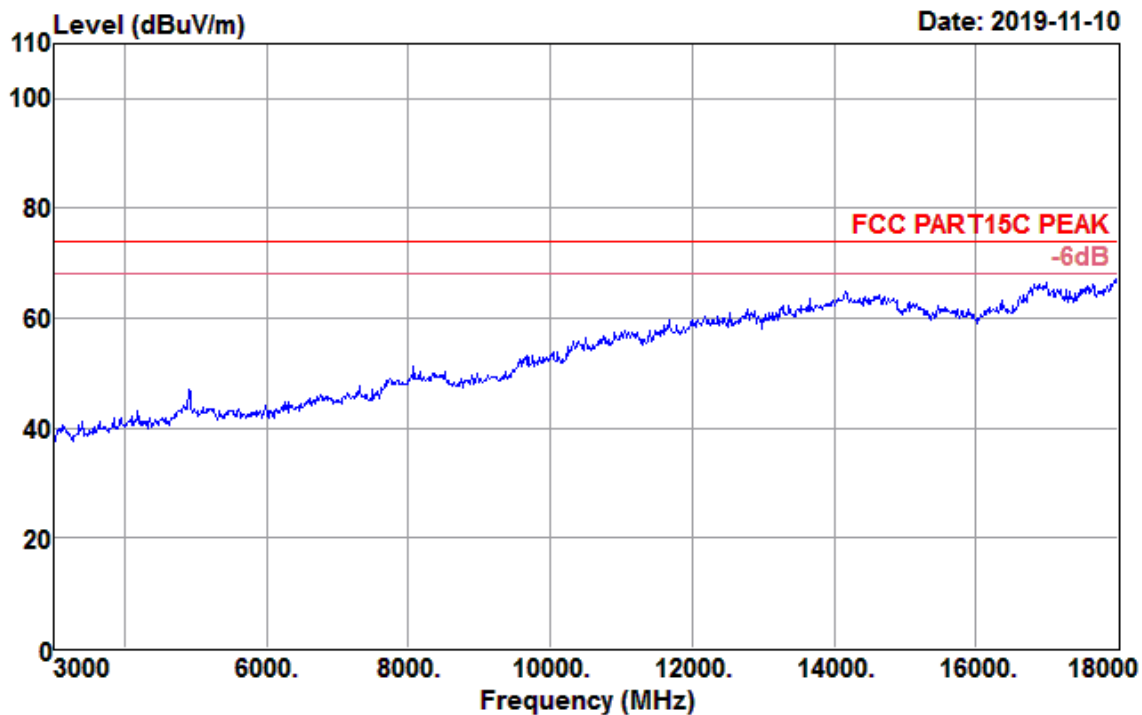
Data: 245



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2462.000	103.36	27.30	3.58	35.65	98.59	74.00	24.59	Peak

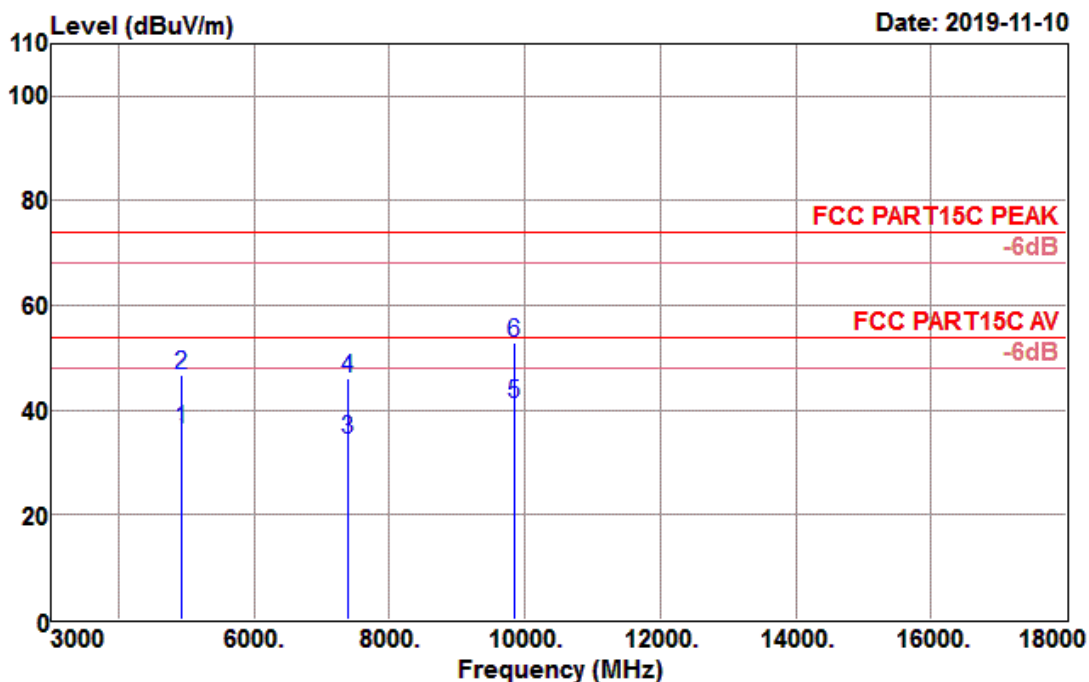
Test Mode :	802.11g CH11 (2462MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Horizontal

Data: 398



Data: 399

Date: 2019-11-10

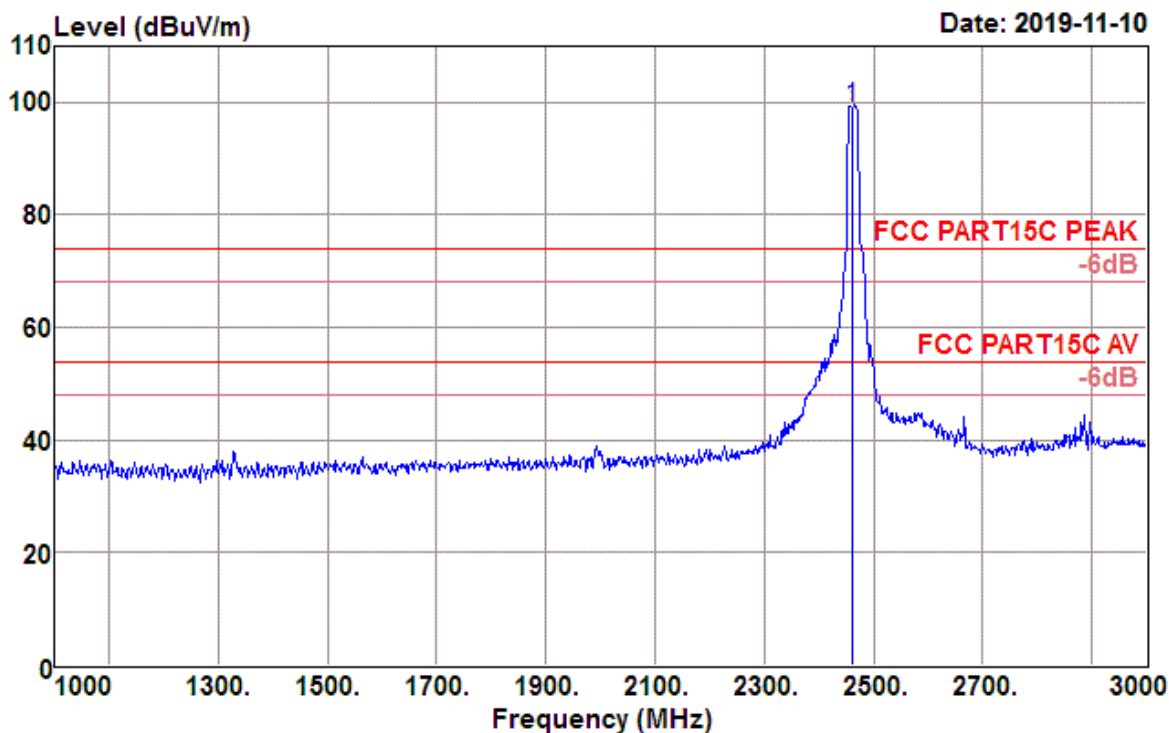


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4924.000	34.19	31.52	5.53	34.76	36.48	54.00	-17.52	Average
4924.000	44.52	31.52	5.53	34.76	46.81	74.00	-27.19	Peak
7386.000	27.02	36.29	7.46	36.40	34.37	54.00	-19.63	Average
7386.000	38.72	36.29	7.46	36.40	46.07	74.00	-27.93	Peak
9848.000	28.54	38.23	10.98	36.40	41.35	54.00	-12.65	Average
9848.000	39.96	38.23	10.98	36.40	52.77	74.00	-21.23	Peak

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	802.11g CH11 (2462MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Vertical

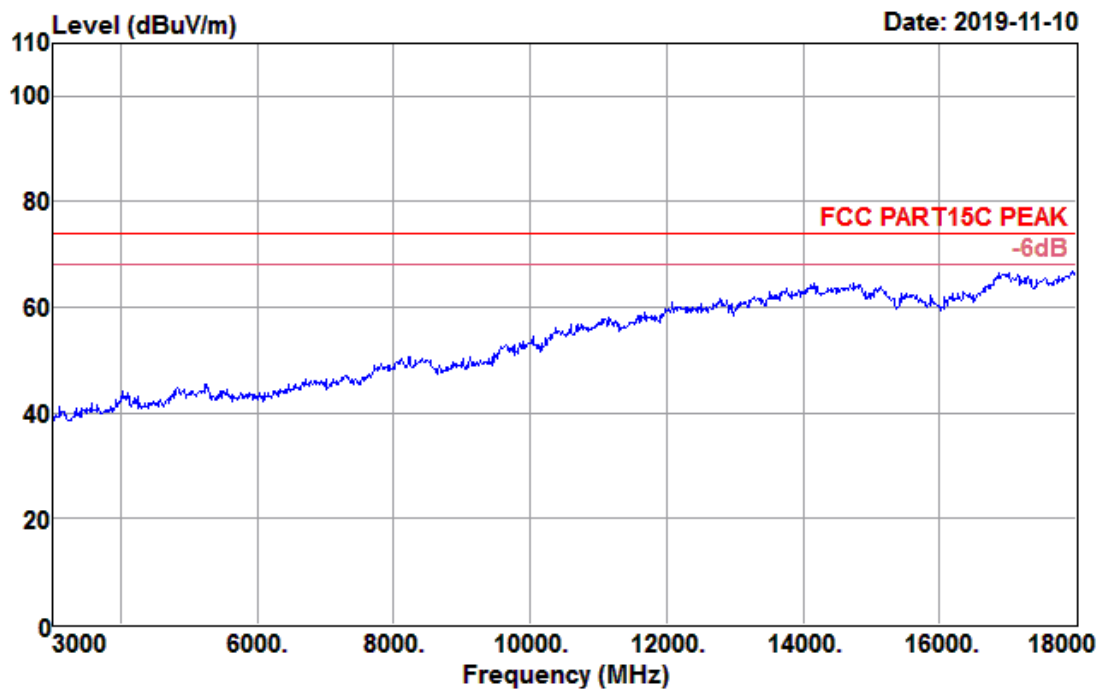
Data: 244



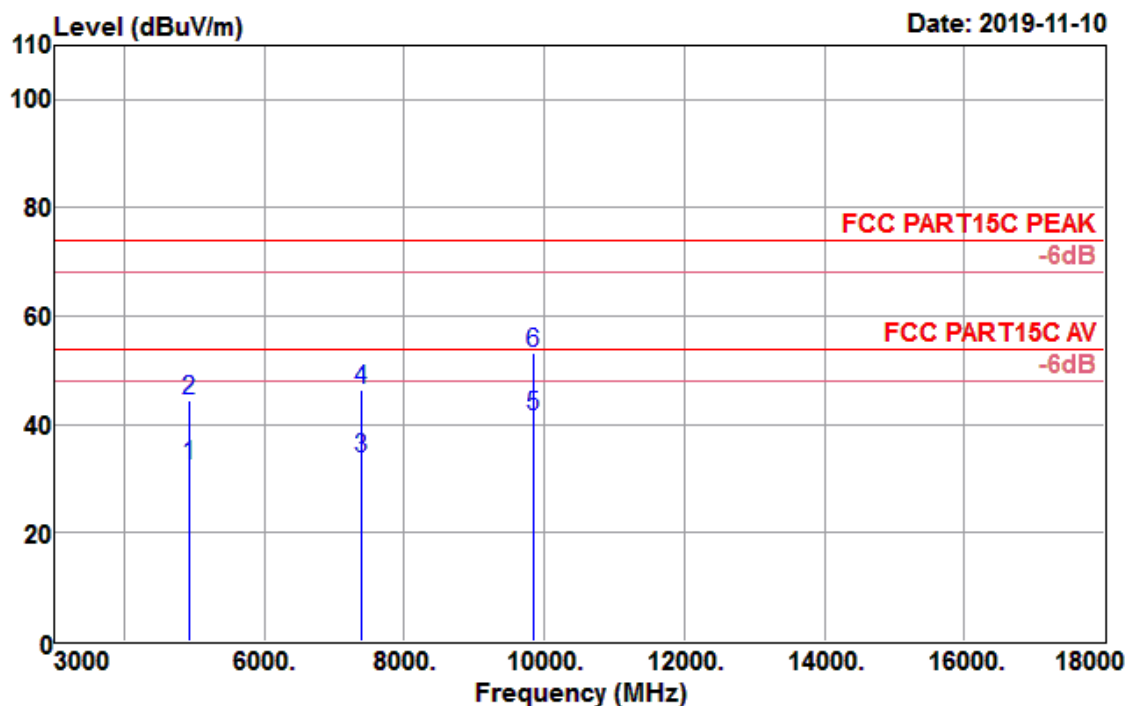
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2462.000	103.80	27.30	3.58	35.65	99.03	74.00	25.03	Peak

Test Mode :	802.11g CH11 (2462MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Vertical

Data: 396



Data: 397

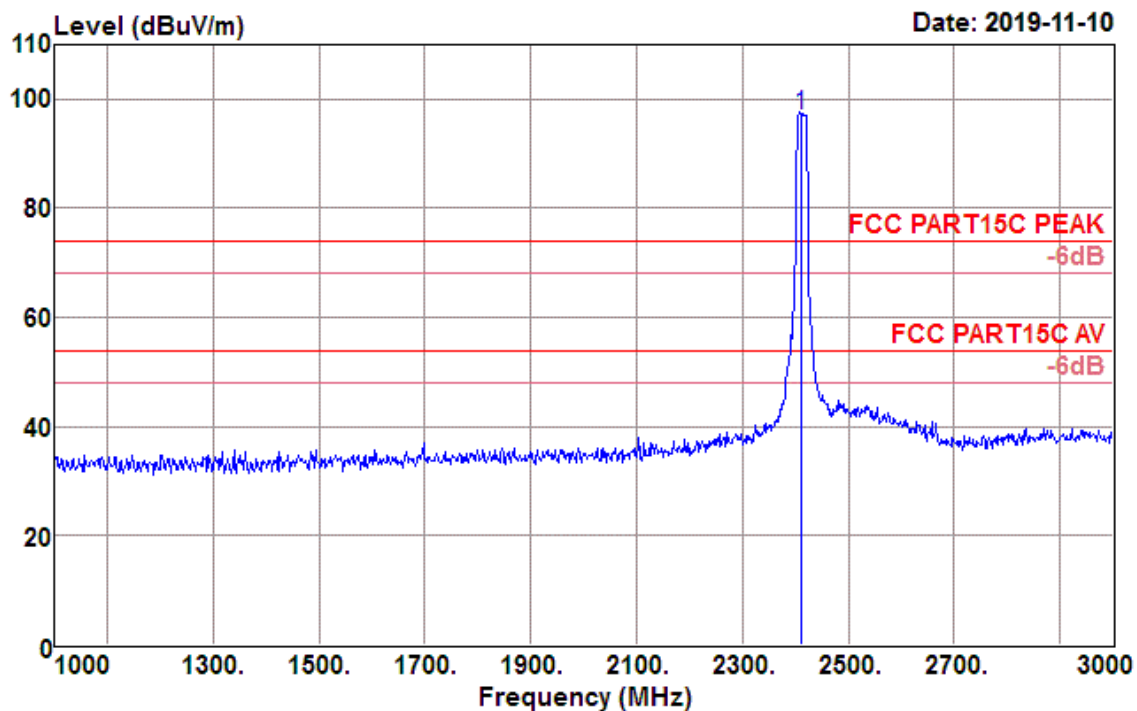


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4924.000	30.14	31.52	5.53	34.76	32.43	54.00	-21.57	Average
4924.000	42.18	31.52	5.53	34.76	44.47	74.00	-29.53	Peak
7386.000	26.48	36.29	7.46	36.40	33.83	54.00	-20.17	Average
7386.000	38.93	36.29	7.46	36.40	46.28	74.00	-27.72	Peak
9848.000	28.73	38.23	10.98	36.40	41.54	54.00	-12.46	Average
9848.000	40.34	38.23	10.98	36.40	53.15	74.00	-20.85	Peak

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	802.11n HT20 CH01 (2412 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Horizontal

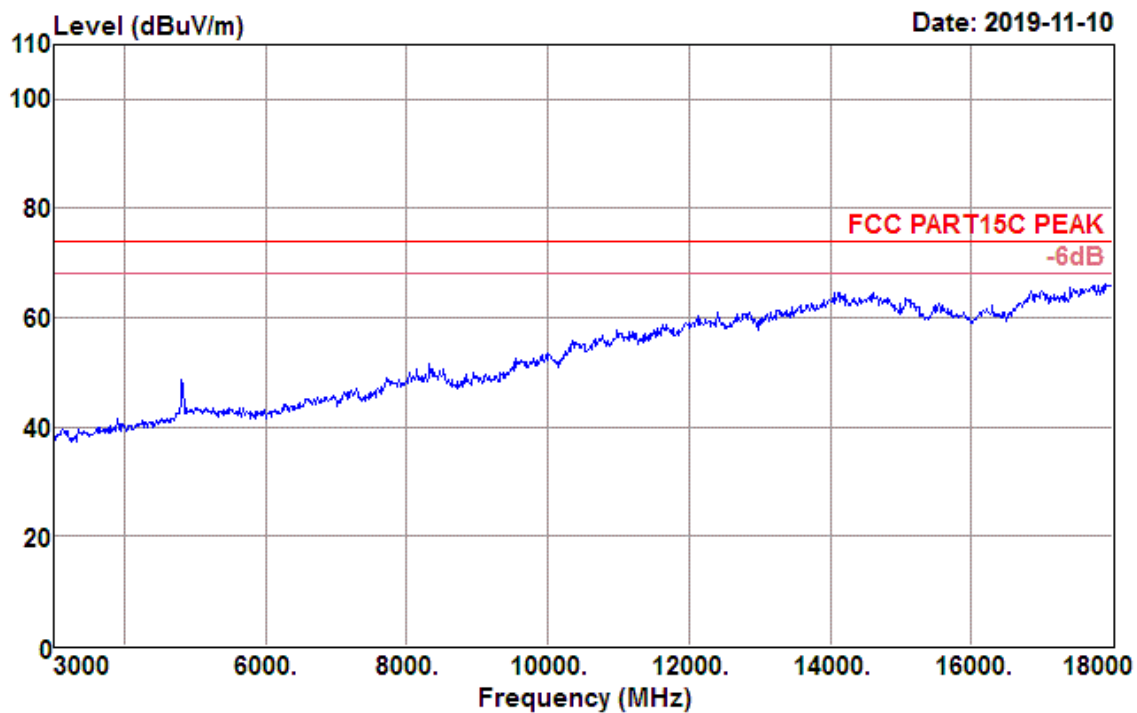
Data: 255



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2412.000	101.81	27.17	3.55	35.58	96.95	74.00	22.95	Peak

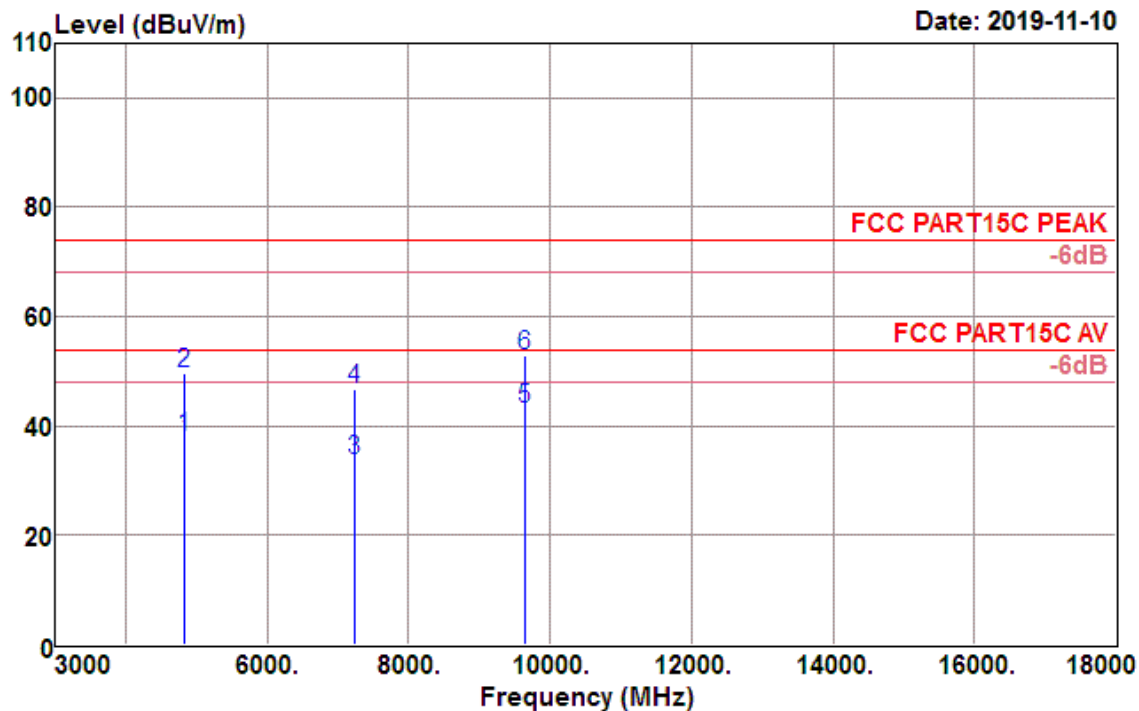
Test Mode :	802.11n HT20 CH01 (2412 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Horizontal

Data: 251



Data: 252

Date: 2019-11-10

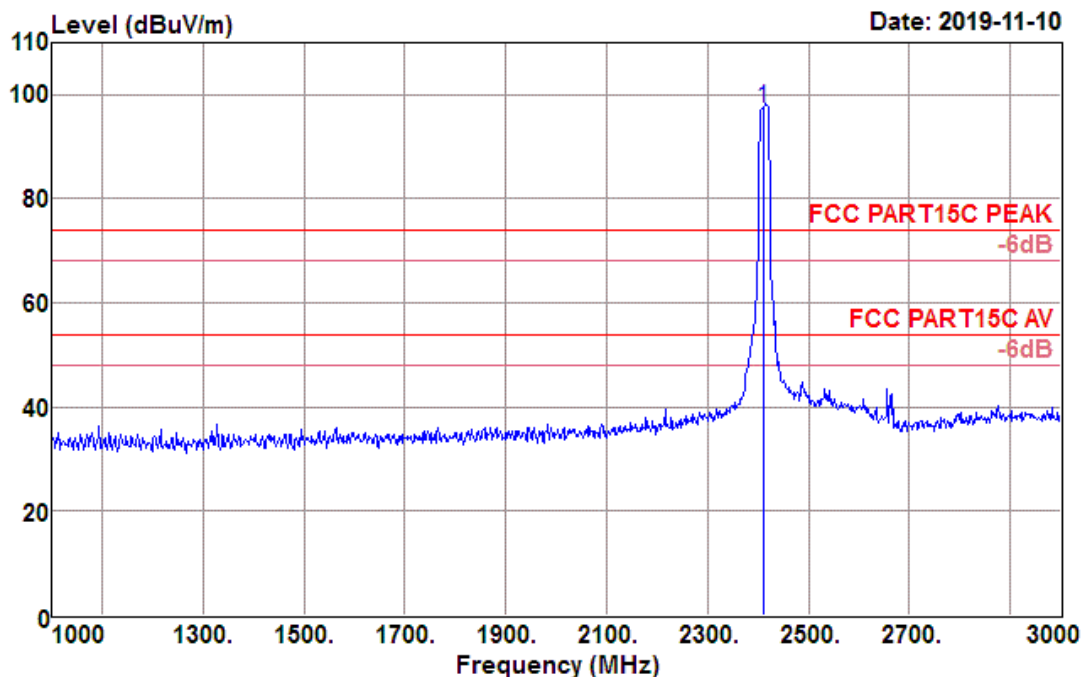


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4824.000	36.08	31.28	5.56	34.84	38.08	54.00	-15.92	Average
4824.000	47.56	31.28	5.56	34.84	49.56	74.00	-24.44	Peak
7236.000	26.58	35.94	7.61	36.40	33.73	54.00	-20.27	Average
7236.000	39.69	35.94	7.61	36.40	46.84	74.00	-27.16	Peak
9648.000	31.17	37.87	10.41	36.40	43.05	54.00	-10.95	Average
9648.000	41.00	37.87	10.41	36.40	52.88	74.00	-21.12	Peak

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	802.11n HT20 CH01 (2412 MHz)	Temperature :	21~23°C
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Vertical

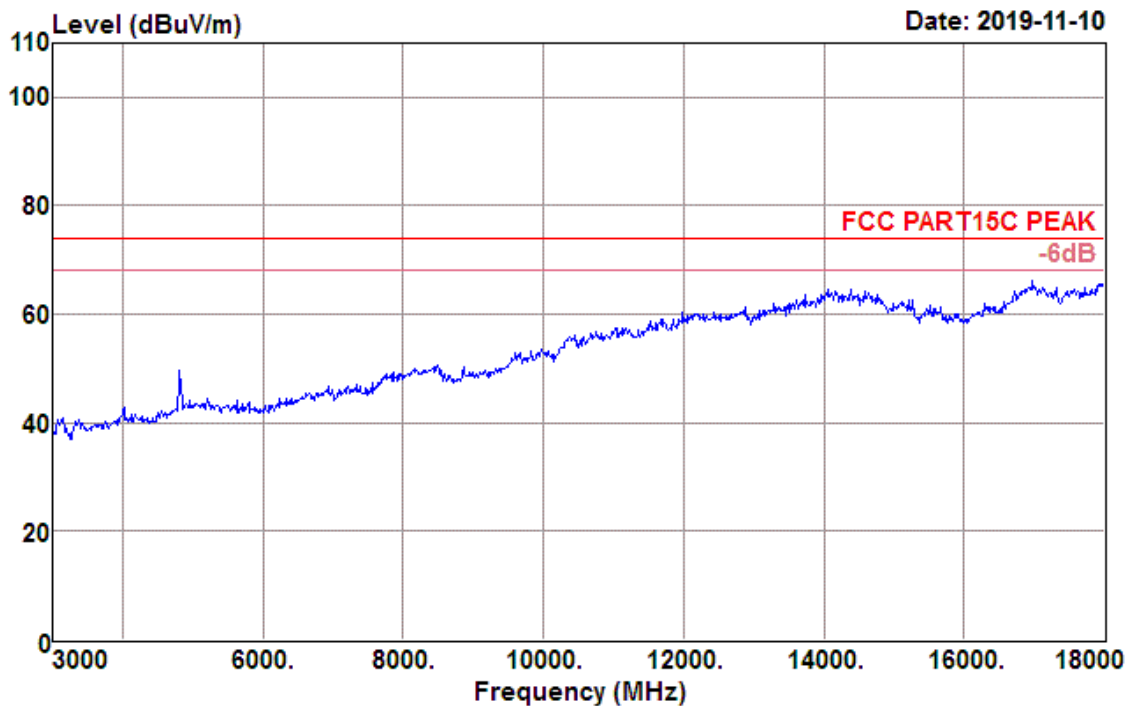
Data: 258



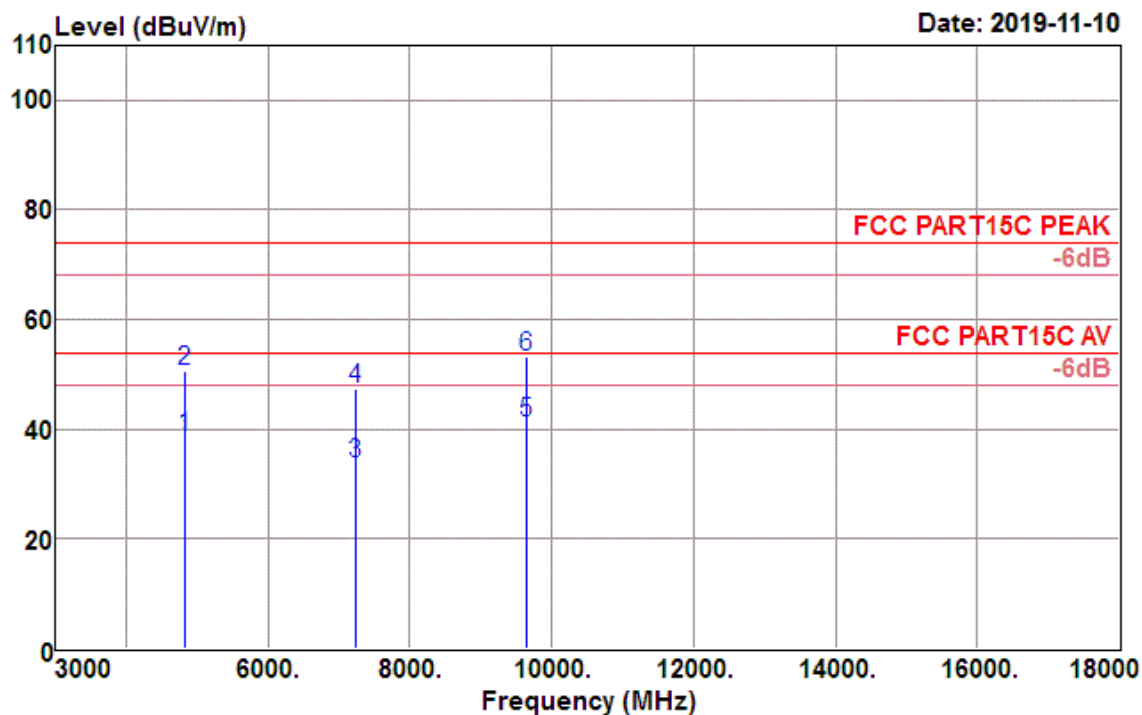
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2412.000	102.23	27.17	3.55	35.58	97.37	74.00	23.37	Peak

Test Mode :	802.11n HT20 CH01 (2412 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Vertical

Data: 249



Data: 250

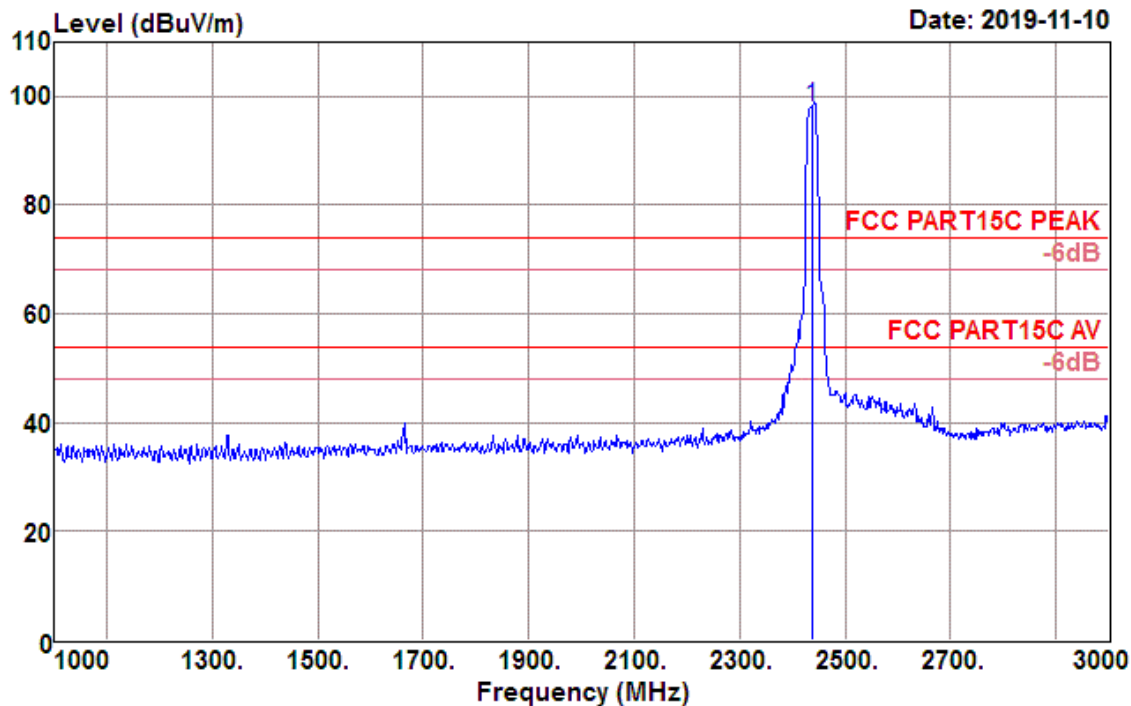


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamplifier factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4824.000	36.65	31.28	5.56	34.84	38.65	54.00	-15.35	Average
4824.000	48.77	31.28	5.56	34.84	50.77	74.00	-23.23	Peak
7236.000	26.73	35.94	7.61	36.40	33.88	54.00	-20.12	Average
7236.000	40.31	35.94	7.61	36.40	47.46	74.00	-26.54	Peak
9648.000	29.27	37.87	10.41	36.40	41.15	54.00	-12.85	Average
9648.000	41.43	37.87	10.41	36.40	53.31	74.00	-20.69	Peak

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	802.11n HT20 CH06 (2437MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Horizontal

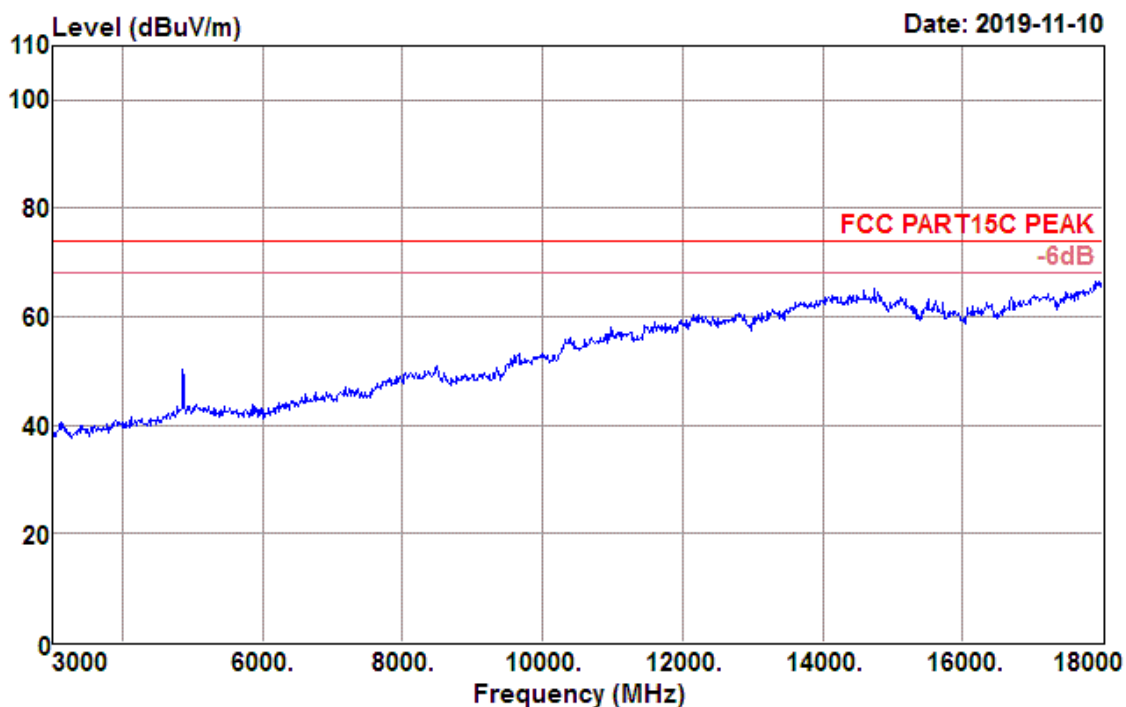
Data: 260



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2437.000	102.82	27.24	3.56	35.61	98.01	74.00	24.01	Peak

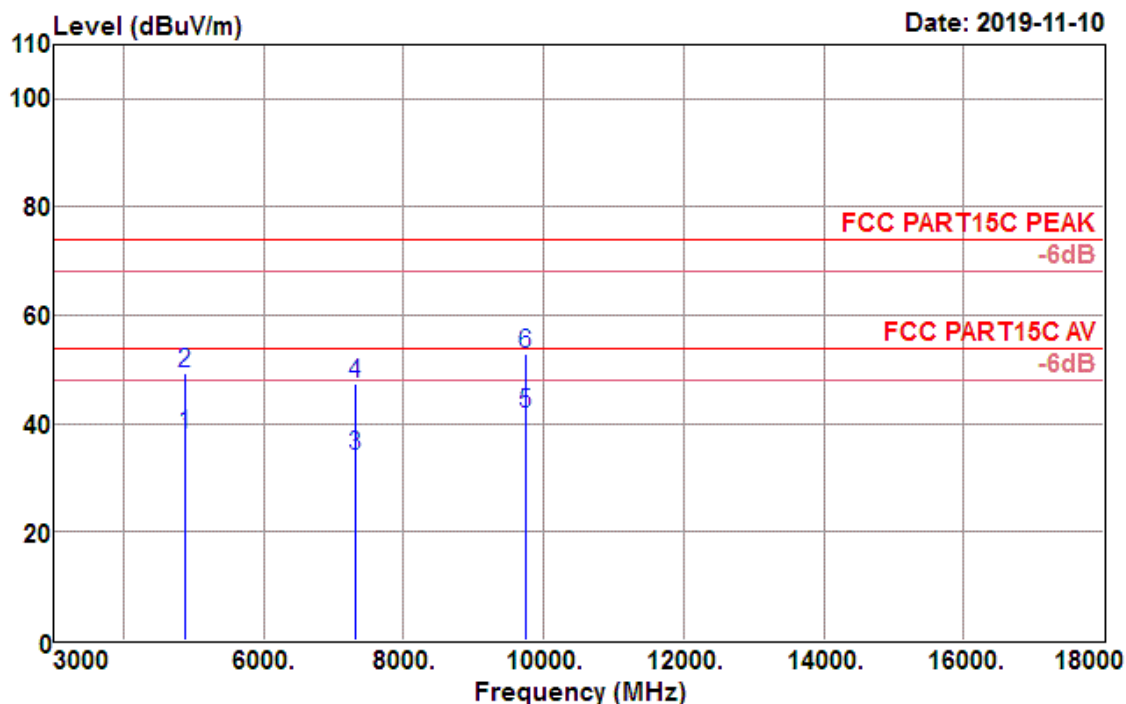
Test Mode :	802.11n HT20 CH06 (2437MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Horizontal

Data: 263



Data: 262

Date: 2019-11-10

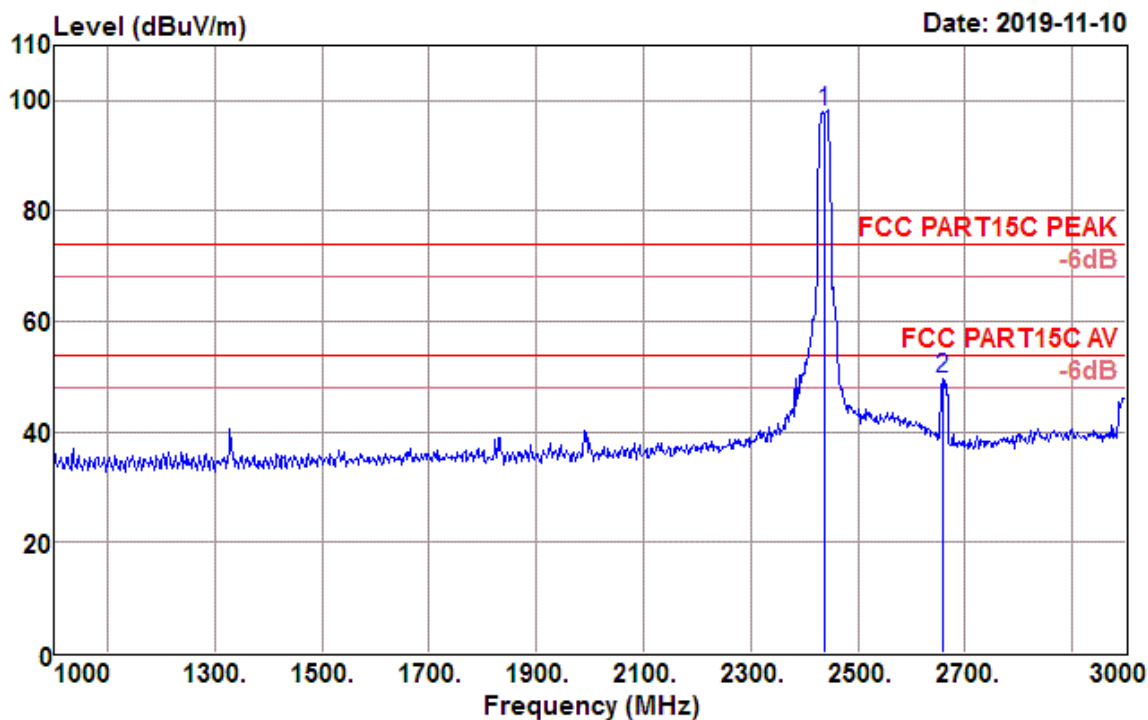


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4874.000	35.97	31.40	5.55	34.80	38.12	54.00	-15.88	Average
4874.000	47.18	31.40	5.55	34.80	49.33	74.00	-24.67	Peak
7311.000	26.77	36.12	7.53	36.40	34.02	54.00	-19.98	Average
7311.000	40.03	36.12	7.53	36.40	47.28	74.00	-26.72	Peak
9748.000	29.50	38.05	10.70	36.40	41.85	54.00	-12.15	Average
9748.000	40.56	38.05	10.70	36.40	52.91	74.00	-21.09	Peak

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	802.11n HT20 CH06 (2437MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Vertical

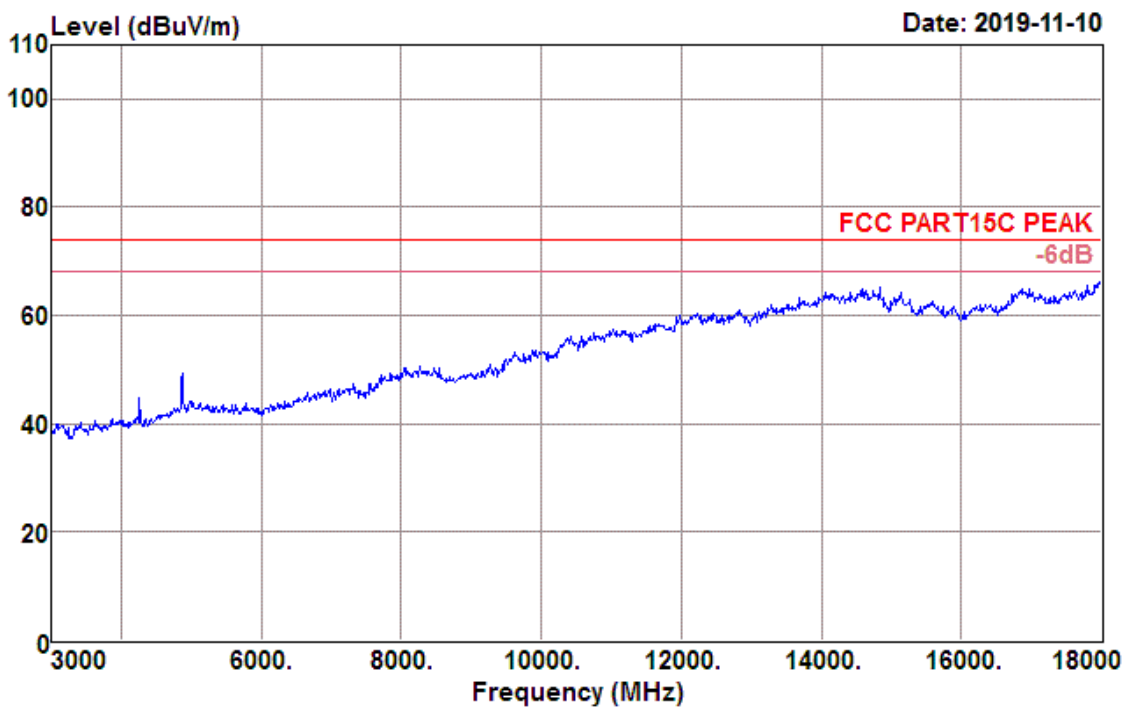
Data: 259



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2437.000	102.67	27.24	3.56	35.61	97.86	74.00	23.86	Peak
2660.000	54.03	27.82	3.71	35.92	49.64	74.00	-24.36	Peak

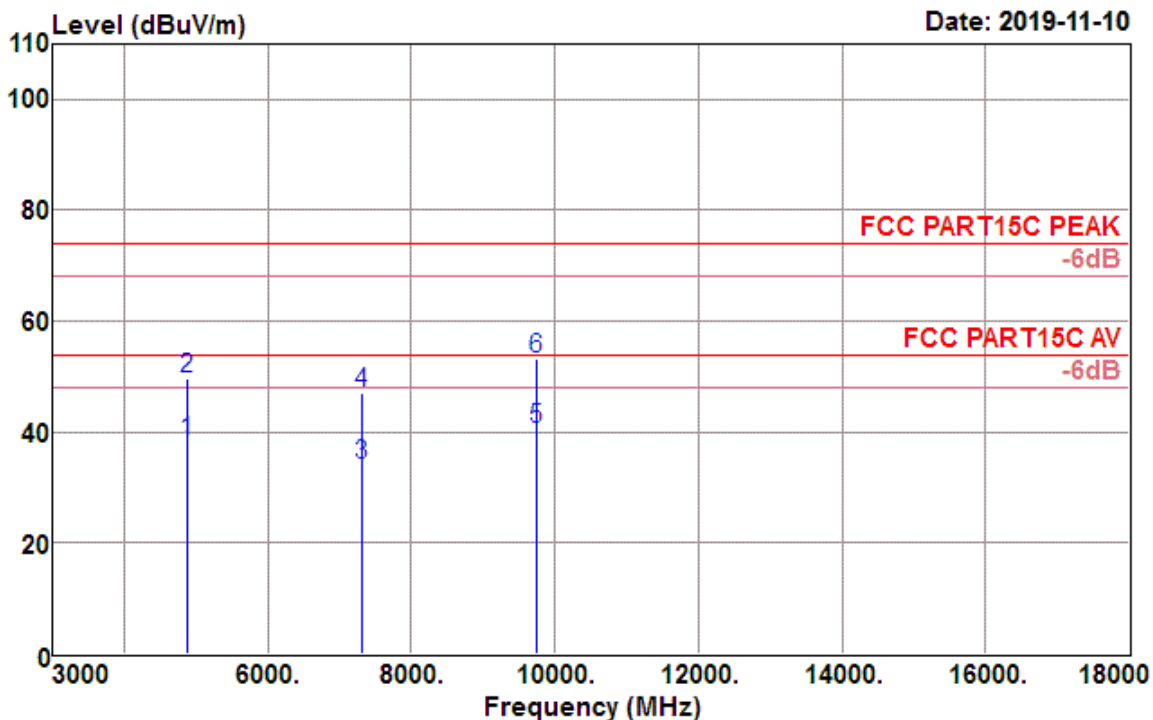
Test Mode :	802.11n HT20 CH06 (2437MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Vertical

Data: 261



Data: 264

Date: 2019-11-10

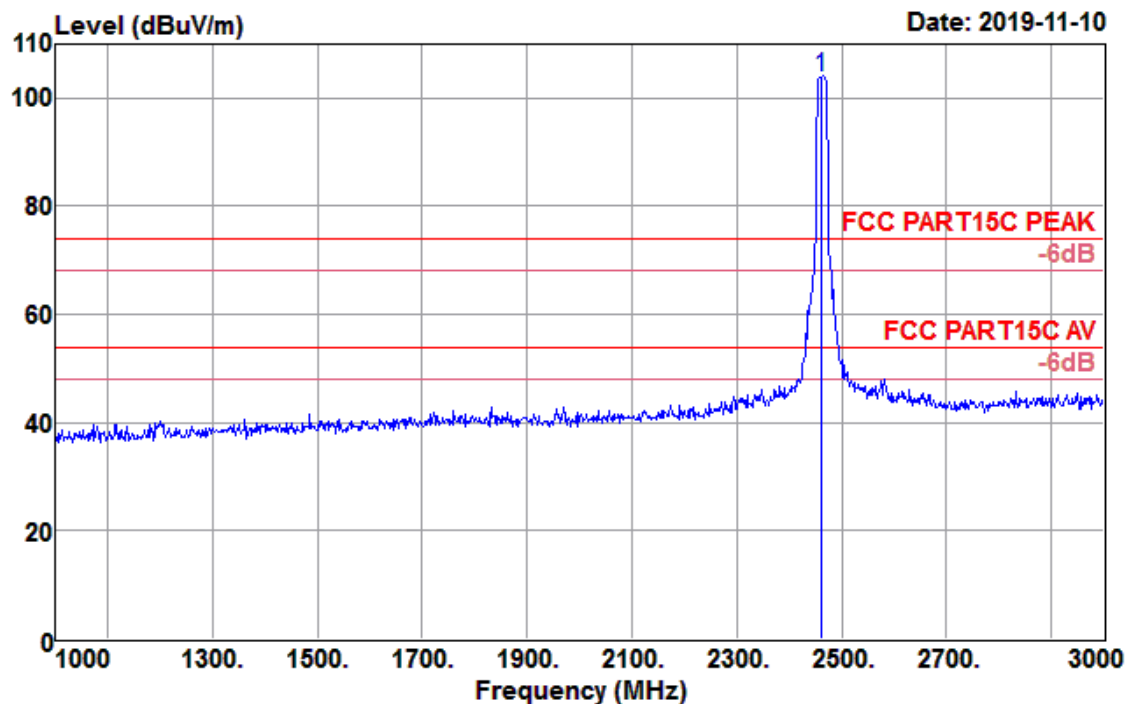


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamplifier factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4874.000	36.20	31.40	5.55	34.80	38.35	54.00	-15.65	Average
4874.000	47.59	31.40	5.55	34.80	49.74	74.00	-24.26	Peak
7311.000	26.78	36.12	7.53	36.40	34.03	54.00	-19.97	Average
7311.000	39.80	36.12	7.53	36.40	47.05	74.00	-26.95	Peak
9748.000	28.37	38.05	10.70	36.40	40.72	54.00	-13.28	Average
9748.000	40.97	38.05	10.70	36.40	53.32	74.00	-20.68	Peak

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	802.11n HT20 CH11 (2462 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Horizontal

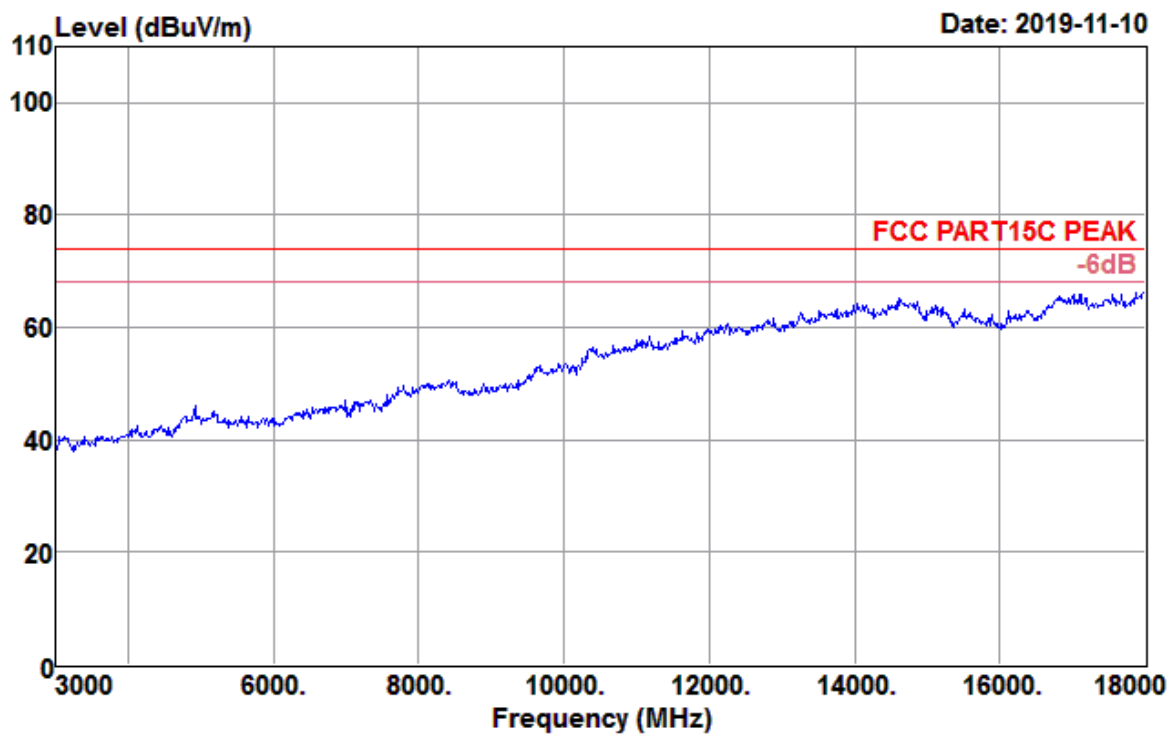
Data: 409



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2462.000	108.63	27.30	3.58	35.65	103.86	74.00	29.86	Peak

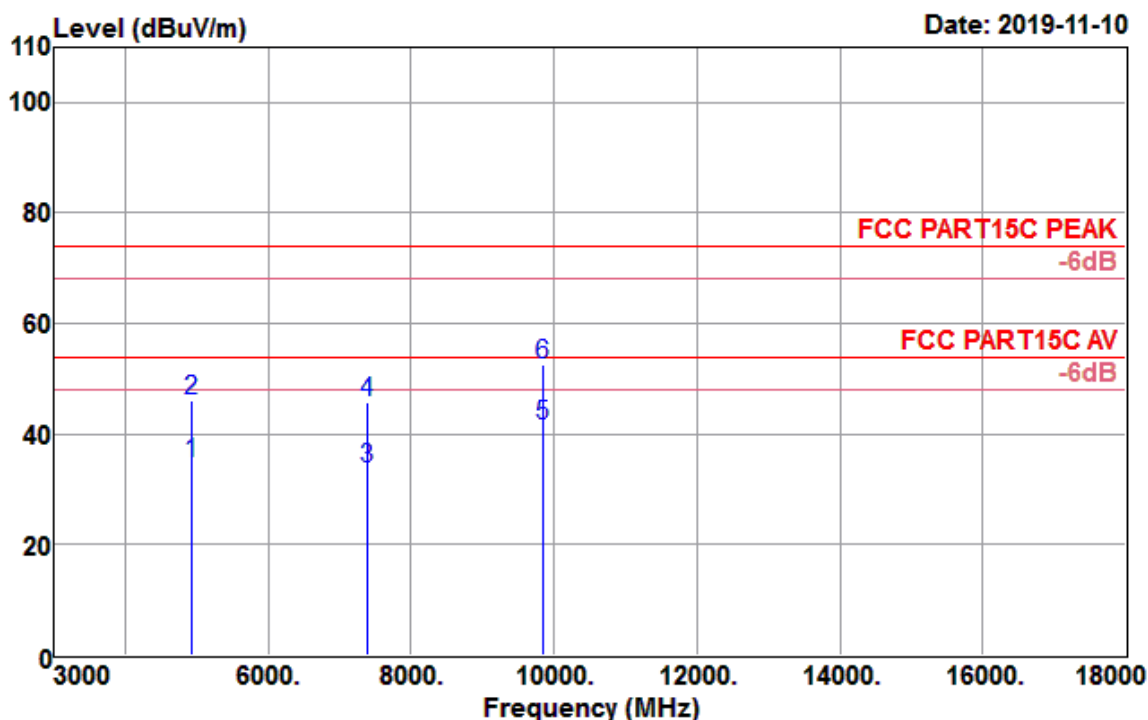
Test Mode :	802.11n HT20 CH11 (2462 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Horizontal

Data: 400



Data: 401

Date: 2019-11-10

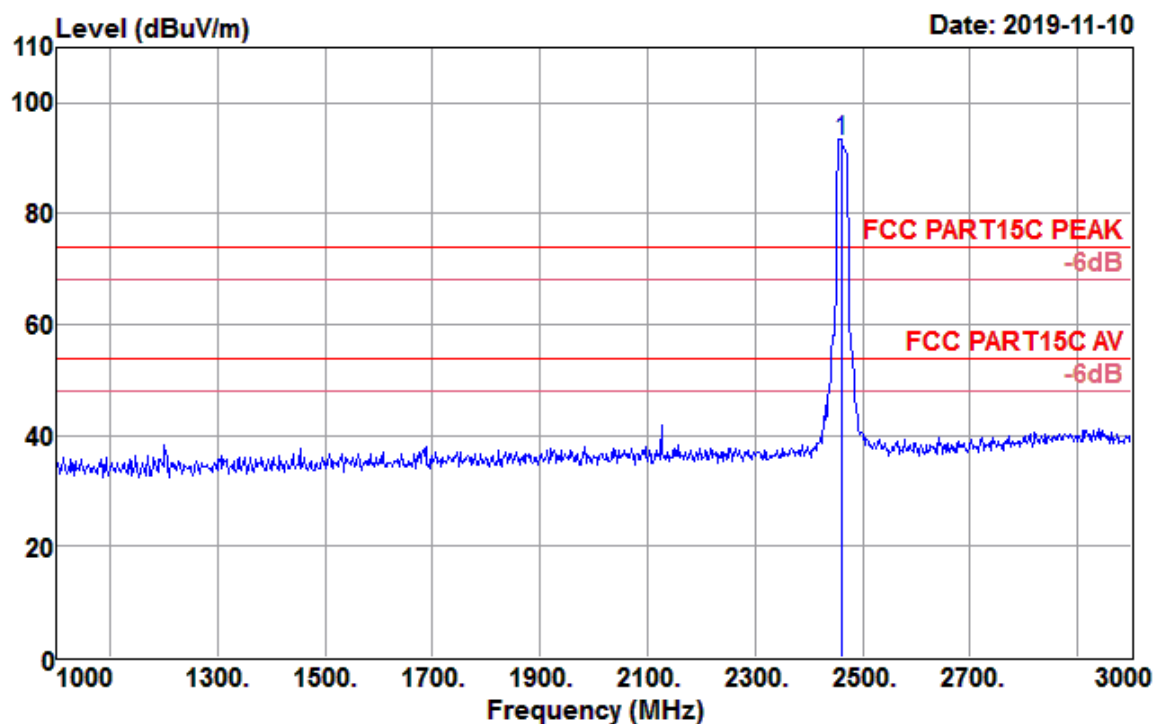


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamplifier factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4924.000	32.35	31.52	5.53	34.76	34.64	54.00	-19.36	Average
4924.000	43.77	31.52	5.53	34.76	46.06	74.00	-27.94	Peak
7386.000	26.46	36.29	7.46	36.40	33.81	54.00	-20.19	Average
7386.000	38.46	36.29	7.46	36.40	45.81	74.00	-28.19	Peak
9848.000	28.59	38.23	10.98	36.40	41.40	54.00	-12.60	Average
9848.000	39.63	38.23	10.98	36.40	52.44	74.00	-21.56	Peak

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	802.11n HT20 CH11 (2462 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Vertical

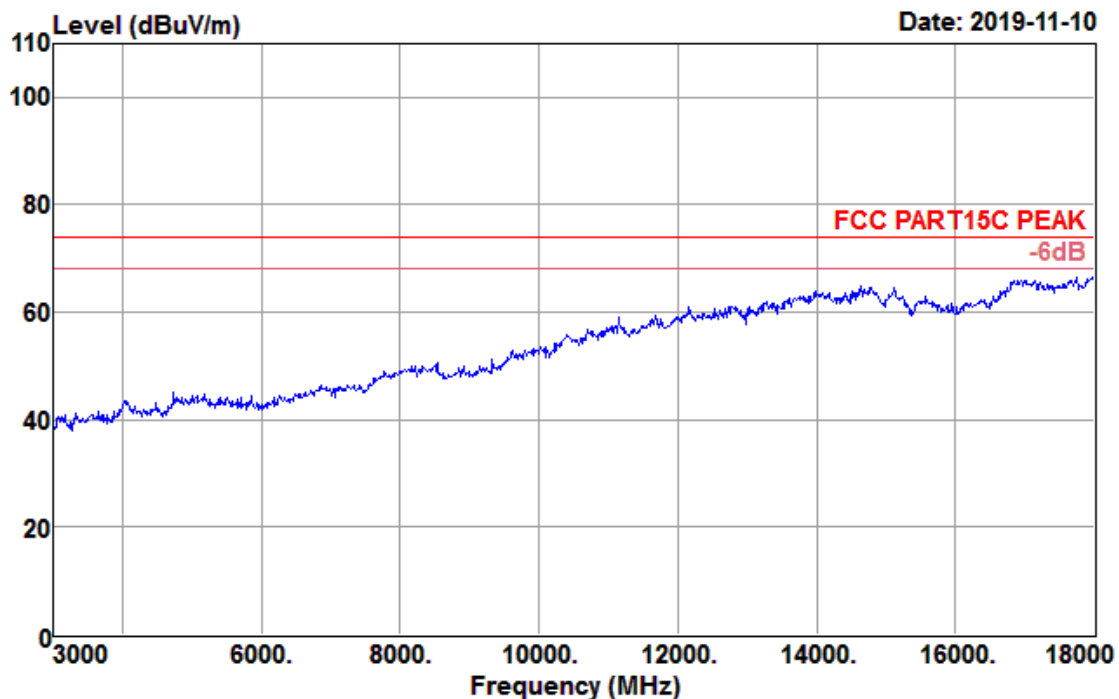
Data: 406



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2462.000	97.90	27.30	3.58	35.65	93.13	74.00	19.13	Peak

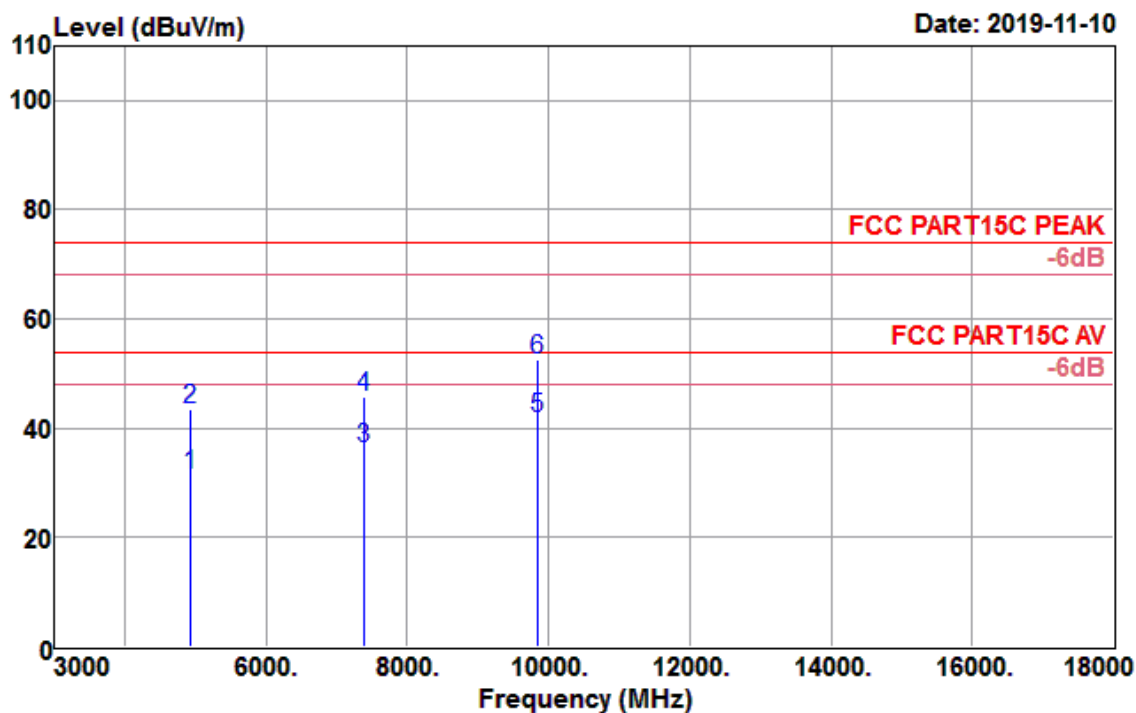
Test Mode :	802.11n HT20 CH11 (2462 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Vertical

Data: 402



Data: 403

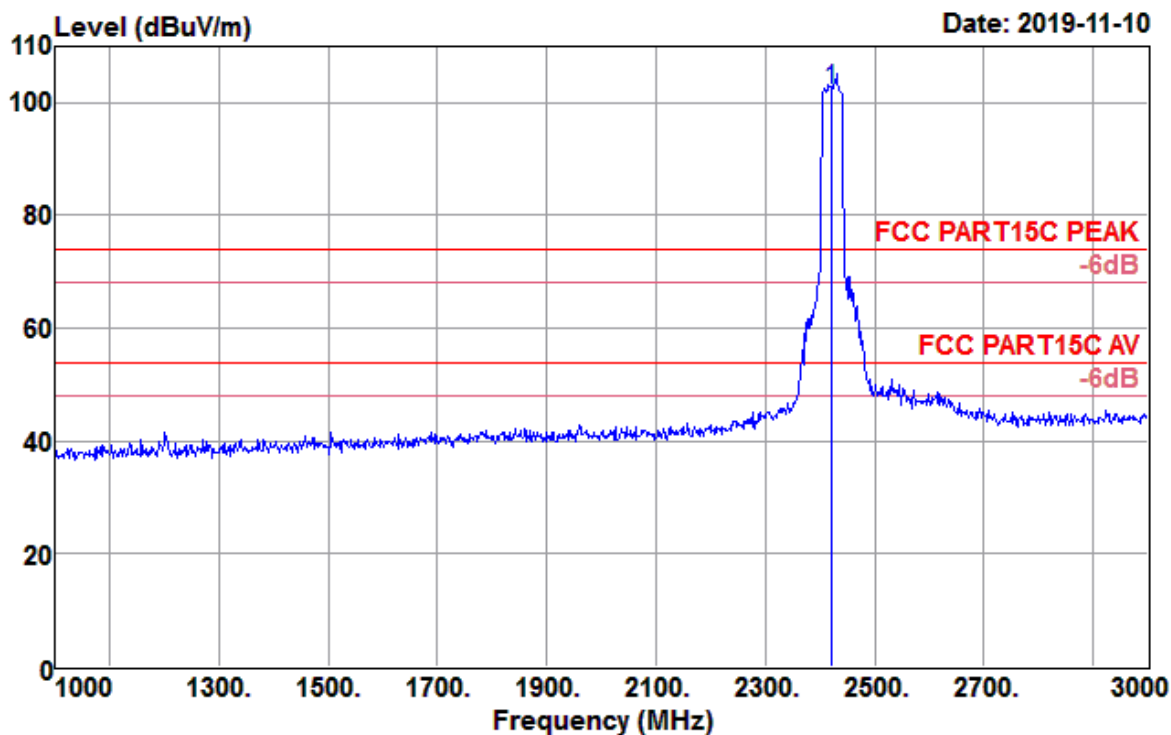
Date: 2019-11-10



Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	802.11n HT20 CH01 (2412 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Horizontal

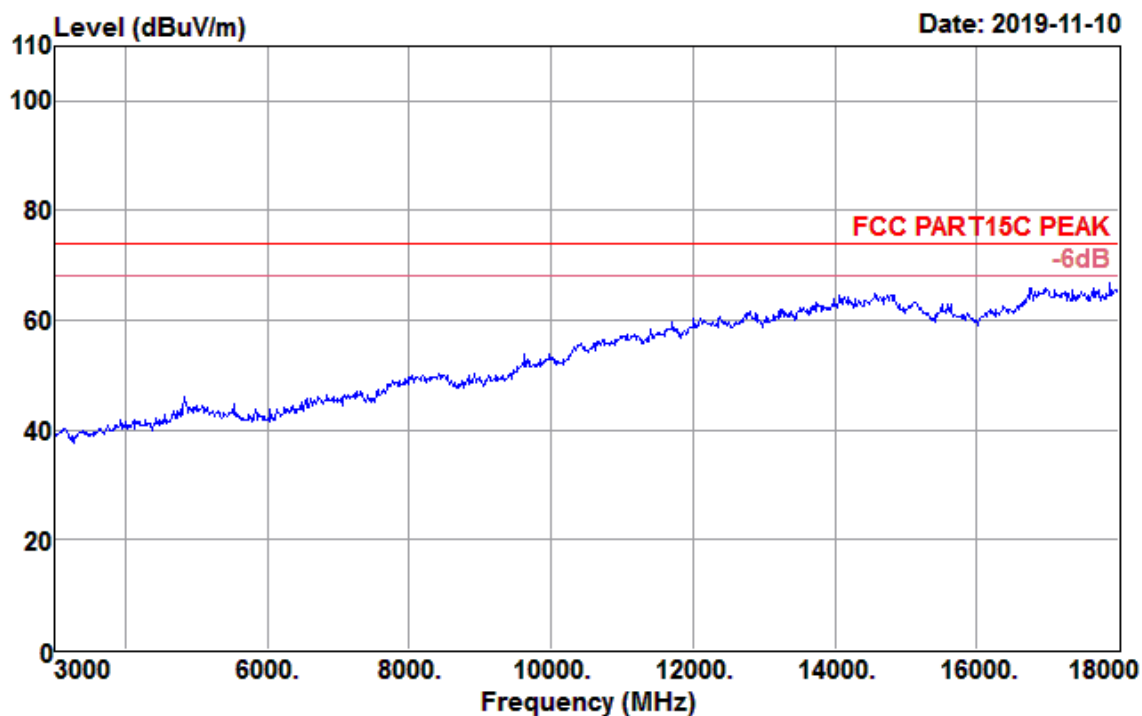
Data: 419



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2422.000	107.14	27.20	3.55	35.59	102.30	74.00	28.30	Peak

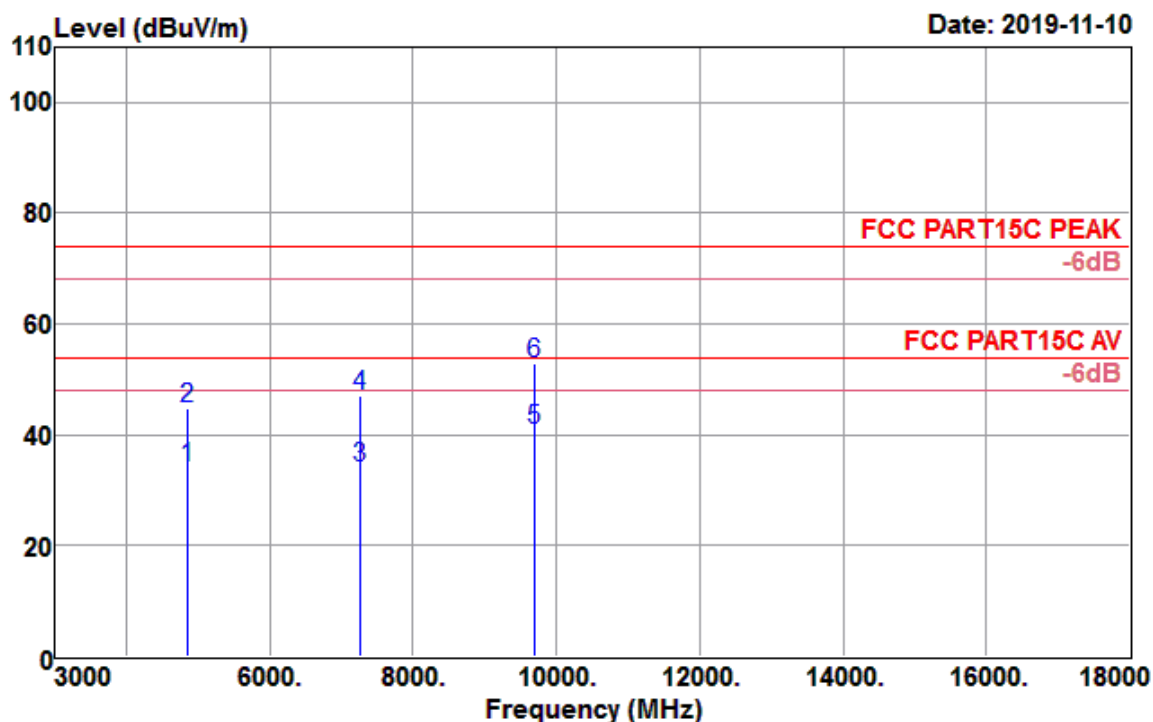
Test Mode :	802.11n HT20 CH01 (2412 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Horizontal

Data: 410



Data: 411

Date: 2019-11-10

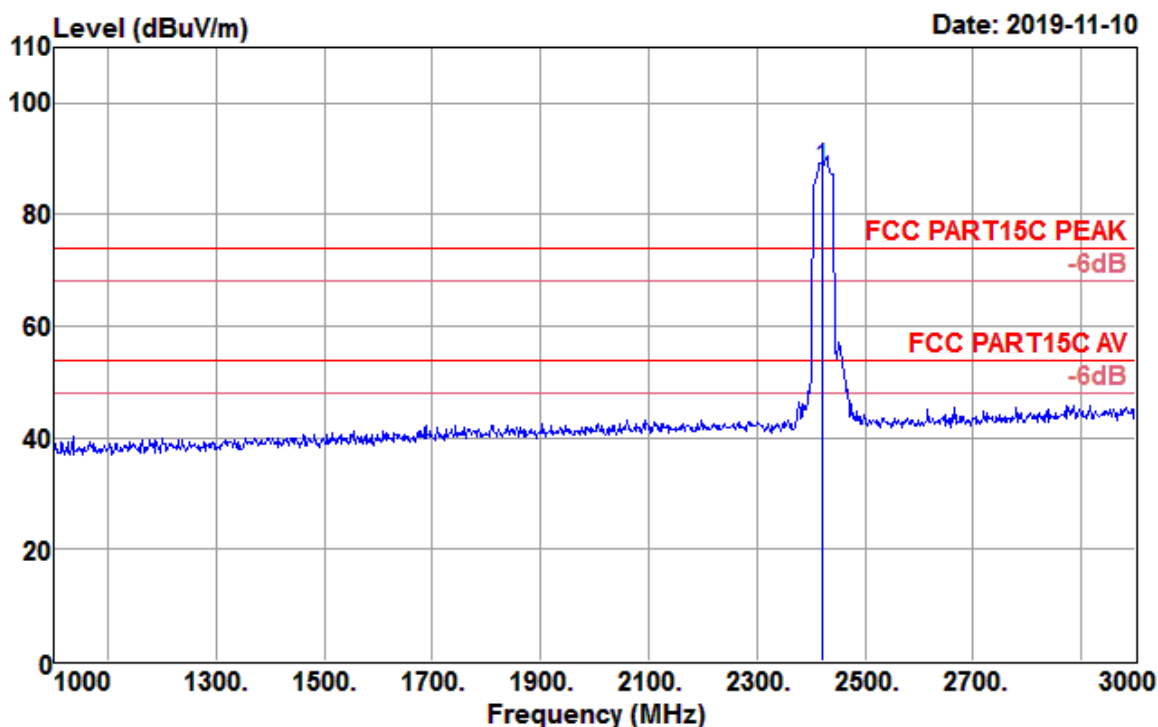


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4844.000	32.16	31.33	5.56	34.82	34.23	54.00	-19.77	Average
4844.000	42.68	31.33	5.56	34.82	44.75	74.00	-29.25	Peak
7266.000	26.87	36.01	7.58	36.40	34.06	54.00	-19.94	Average
7266.000	39.71	36.01	7.58	36.40	46.90	74.00	-27.10	Peak
9688.000	28.89	37.94	10.53	36.40	40.96	54.00	-13.04	Average
9688.000	40.69	37.94	10.53	36.40	52.76	74.00	-21.24	Peak

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	802.11n HT20 CH01 (2412 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Vertical

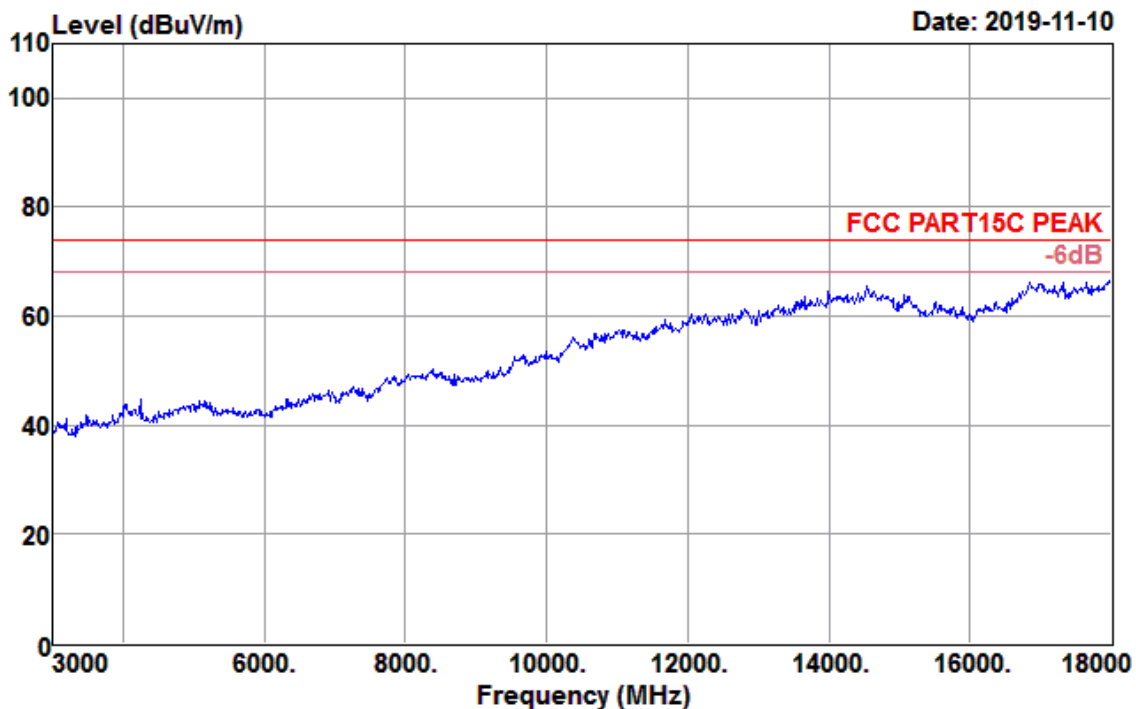
Data: 416



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2422.000	93.23	27.20	3.55	35.59	88.39	74.00	14.39	Peak

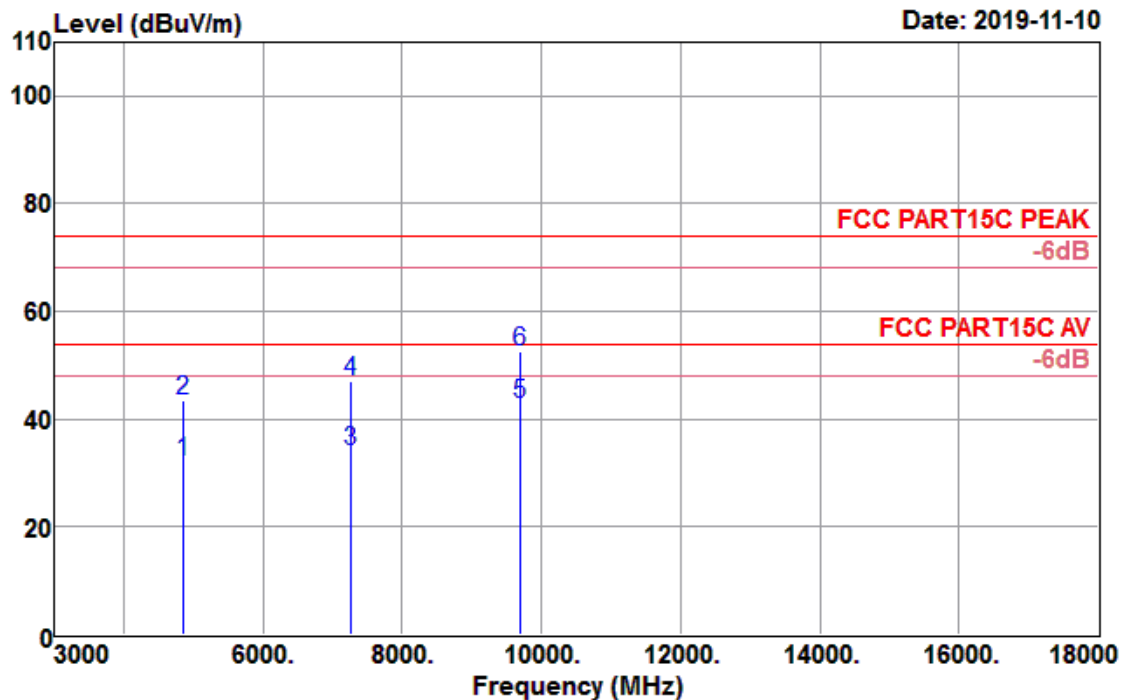
Test Mode :	802.11n HT20 CH01 (2412 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Vertical

Data: 412



Data: 413

Date: 2019-11-10

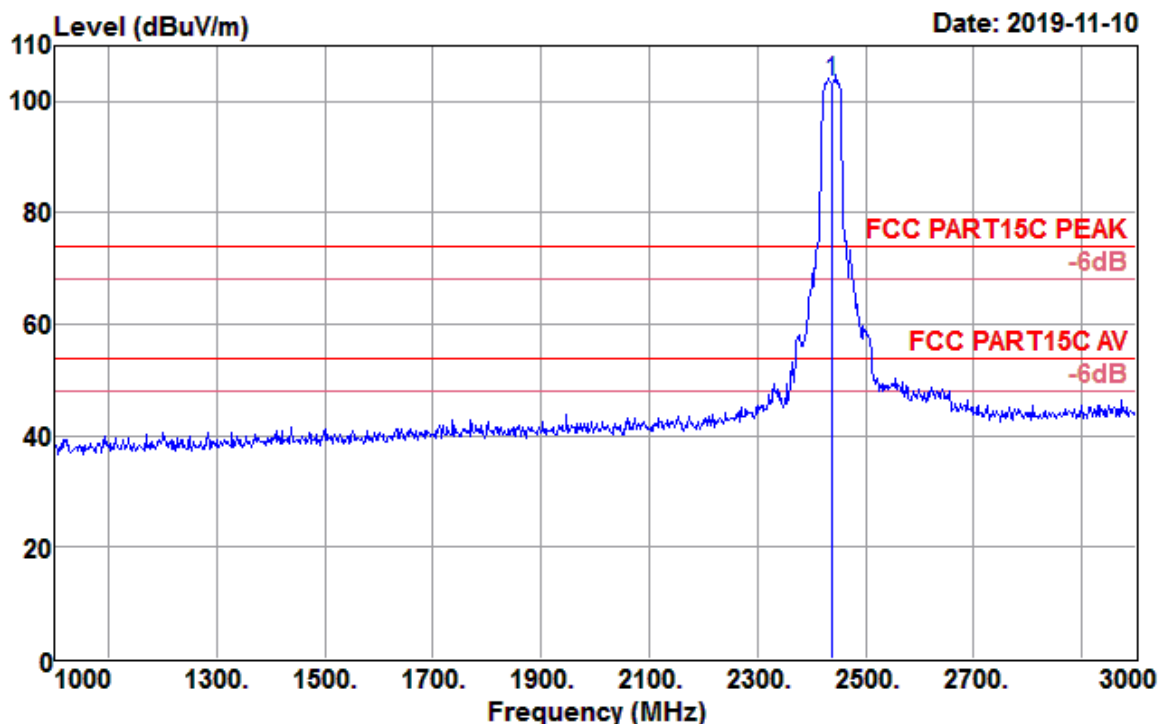


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4844.000	29.95	31.33	5.56	34.82	32.02	54.00	-21.98	Average
4844.000	41.39	31.33	5.56	34.82	43.46	74.00	-30.54	Peak
7266.000	26.89	36.01	7.58	36.40	34.08	54.00	-19.92	Average
7266.000	39.93	36.01	7.58	36.40	47.12	74.00	-26.88	Peak
9688.000	30.61	37.94	10.53	36.40	42.68	54.00	-11.32	Average
9688.000	40.66	37.94	10.53	36.40	52.73	74.00	-21.27	Peak

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	802.11n HT20 CH06 (2437MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Horizontal

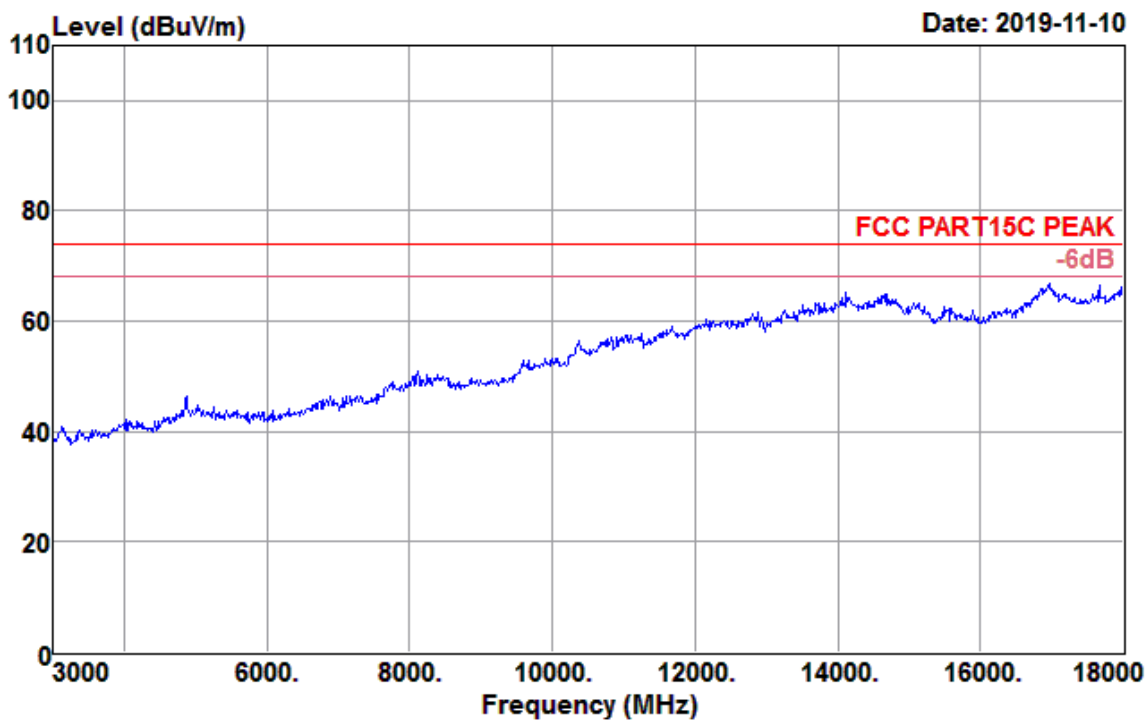
Data: 420



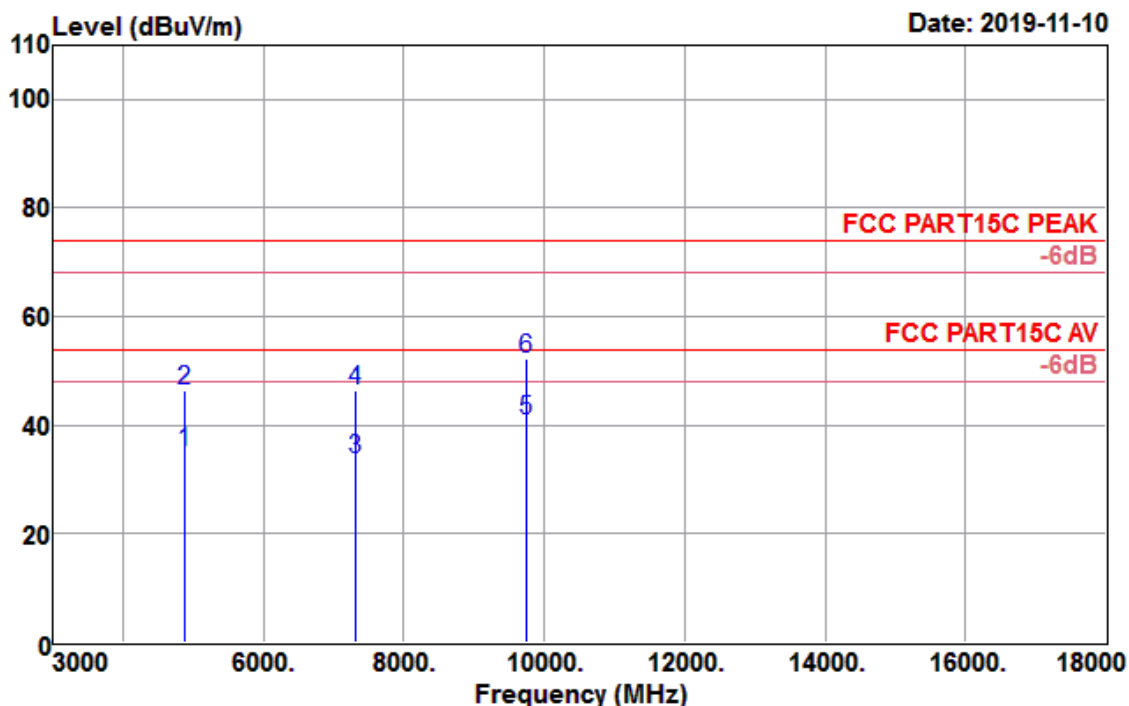
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2437.000	108.30	27.24	3.56	35.61	103.49	74.00	29.49	Peak

Test Mode :	802.11n HT20 CH06 (2437MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Horizontal

Data: 424



Data: 425

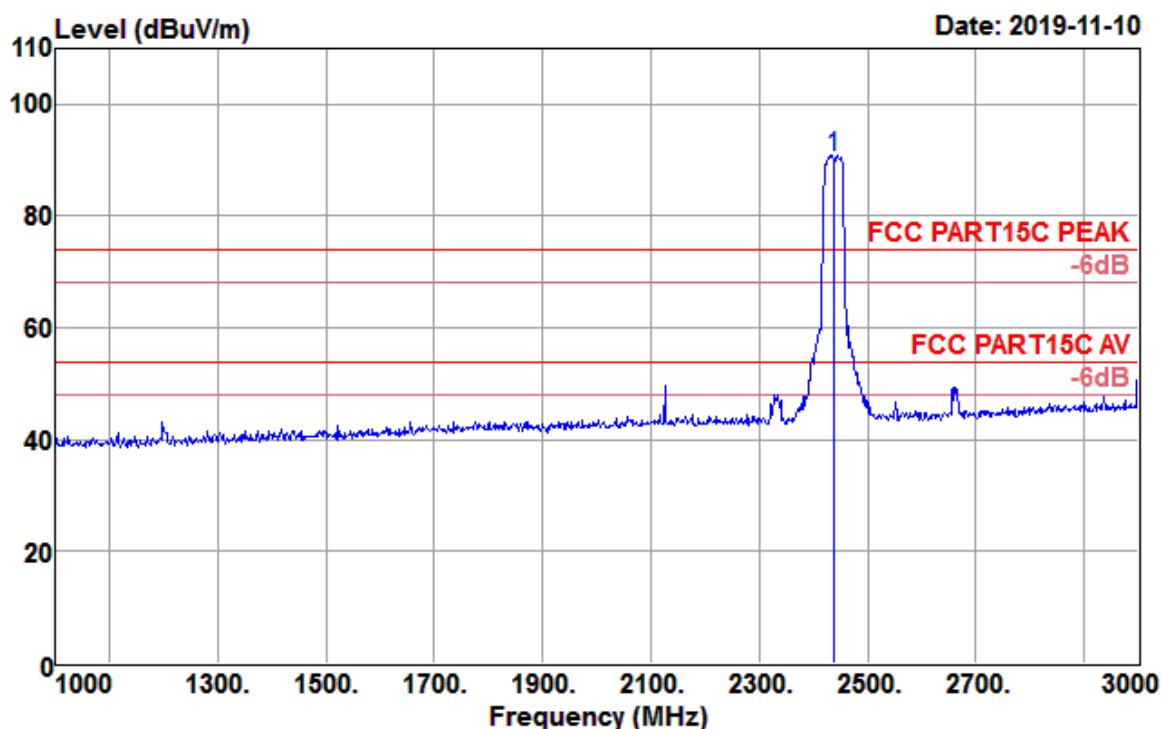


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4874.000	33.00	31.40	5.55	34.80	35.15	54.00	-18.85	Average
4874.000	44.42	31.40	5.55	34.80	46.57	74.00	-27.43	Peak
7311.000	26.65	36.12	7.53	36.40	33.90	54.00	-20.10	Average
7311.000	39.30	36.12	7.53	36.40	46.55	74.00	-27.45	Peak
9748.000	28.45	38.05	10.70	36.40	40.80	54.00	-13.20	Average
9748.000	39.75	38.05	10.70	36.40	52.10	74.00	-21.90	Peak

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	802.11n HT20 CH06 (2437MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Vertical

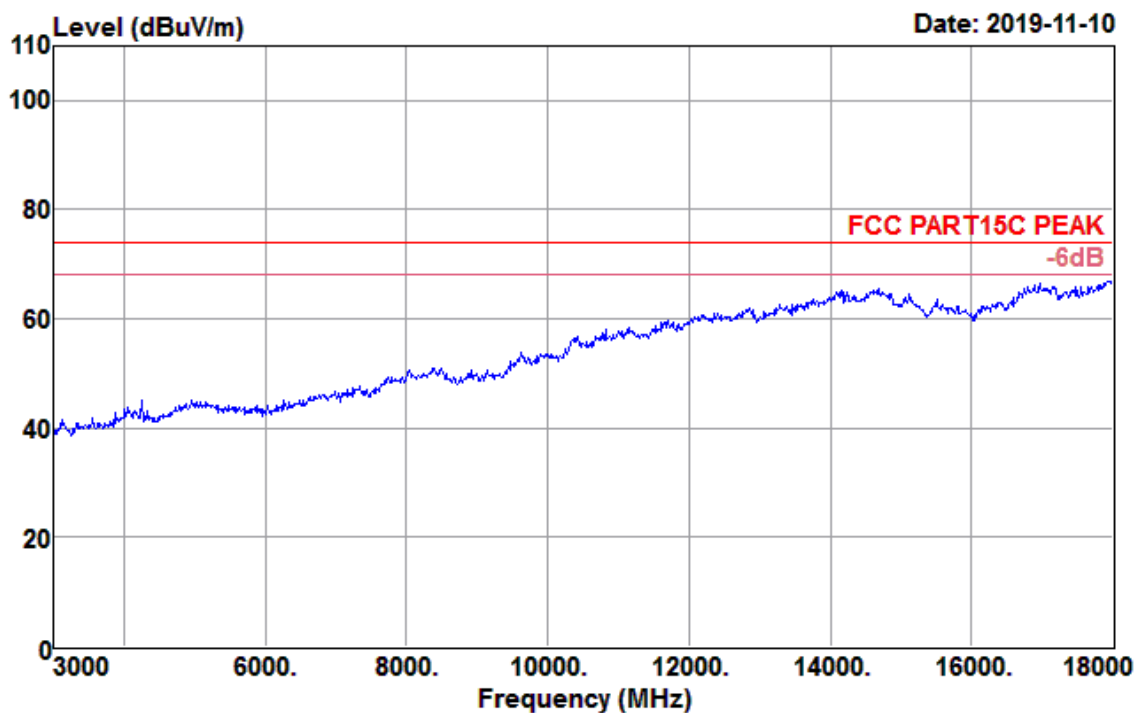
Data: 421



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2437.000	95.28	27.24	3.56	35.61	90.47	74.00	16.47	Peak

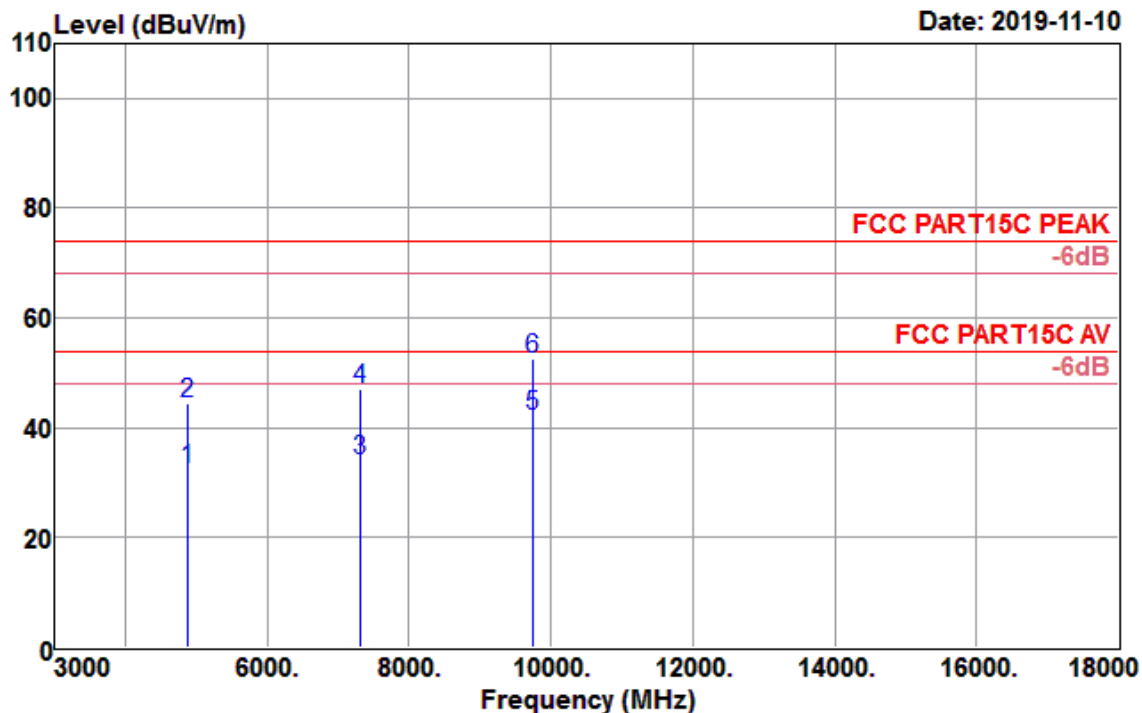
Test Mode :	802.11n HT20 CH06 (2437MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Vertical

Data: 422



Data: 423

Date: 2019-11-10

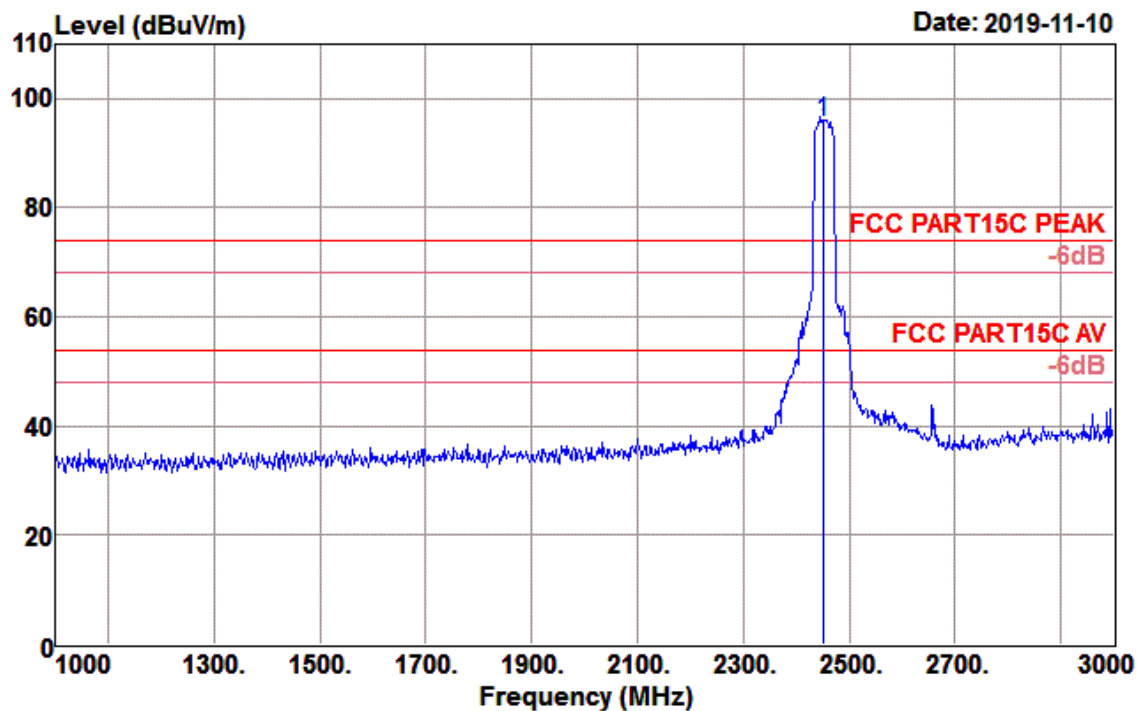


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4874.000	30.36	31.40	5.55	34.80	32.51	54.00	-21.49	Average
4874.000	42.16	31.40	5.55	34.80	44.31	74.00	-29.69	Peak
7311.000	26.87	36.12	7.53	36.40	34.12	54.00	-19.88	Average
7311.000	39.73	36.12	7.53	36.40	46.98	74.00	-27.02	Peak
9748.000	29.70	38.05	10.70	36.40	42.05	54.00	-11.95	Average
9748.000	40.14	38.05	10.70	36.40	52.49	74.00	-21.51	Peak

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	802.11n HT20 CH11 (2462 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Horizontal

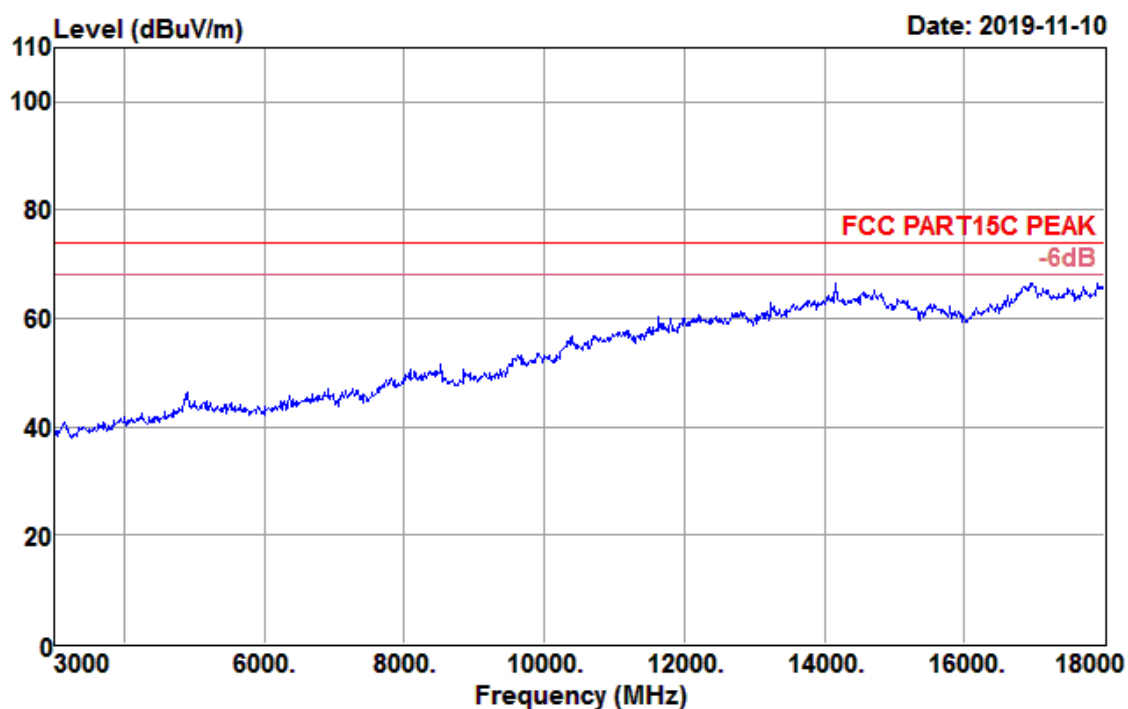
Data: 287



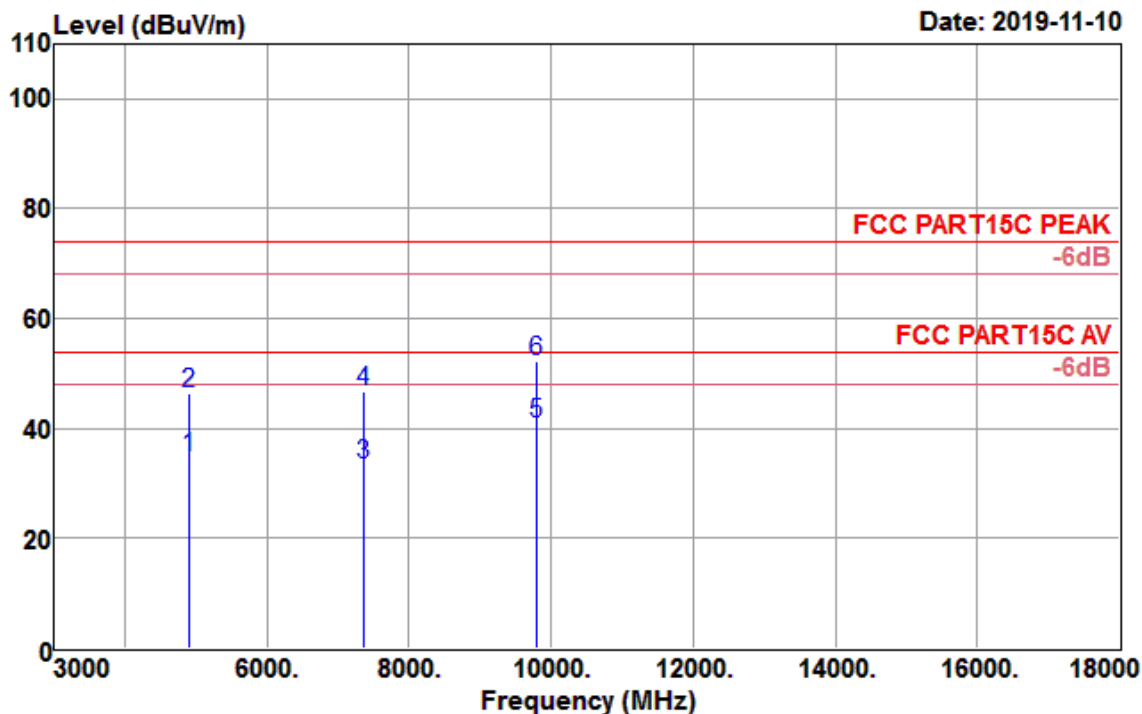
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2452.000	100.53	27.28	3.57	35.63	95.75	74.00	21.75	Peak

Test Mode :	802.11n HT20 CH11 (2462 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Horizontal

Data: 426



Data: 427

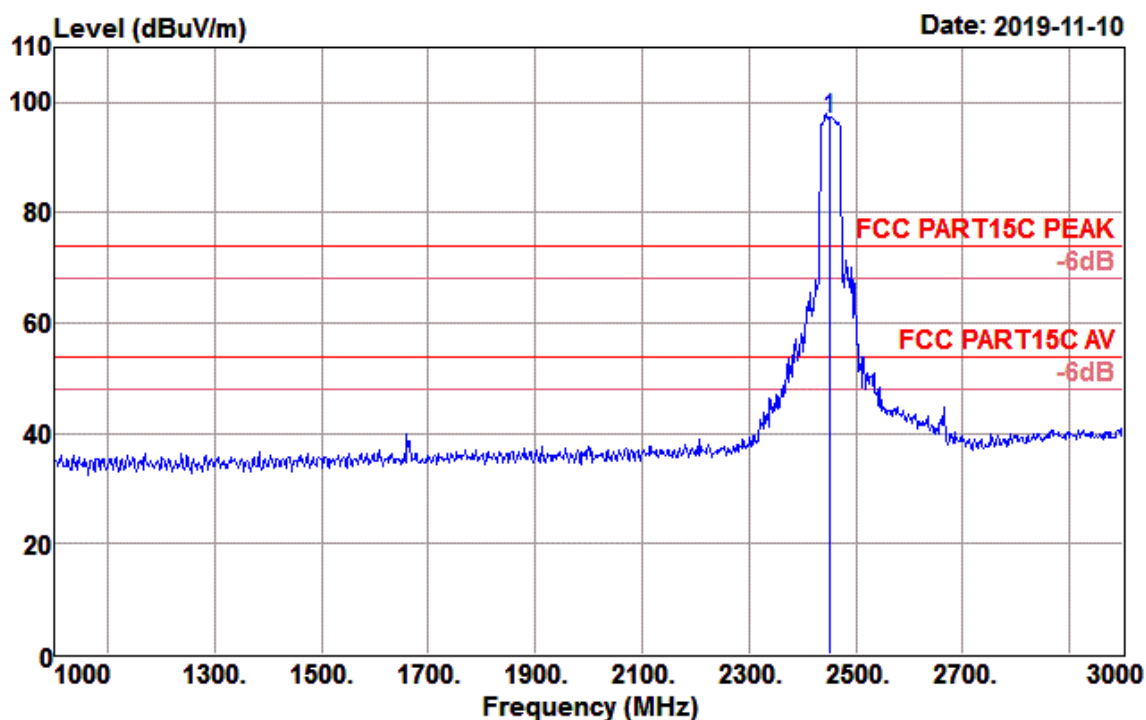


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamplifier factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4904.000	32.57	31.47	5.54	34.78	34.80	54.00	-19.20	Average
4904.000	44.22	31.47	5.54	34.78	46.45	74.00	-27.55	Peak
7356.000	26.19	36.22	7.49	36.40	33.50	54.00	-20.50	Average
7356.000	39.28	36.22	7.49	36.40	46.59	74.00	-27.41	Peak
9808.000	28.26	38.15	10.87	36.40	40.88	54.00	-13.12	Average
9808.000	39.69	38.15	10.87	36.40	52.31	74.00	-21.69	Peak

Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	802.11n HT20 CH11 (2462 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Vertical

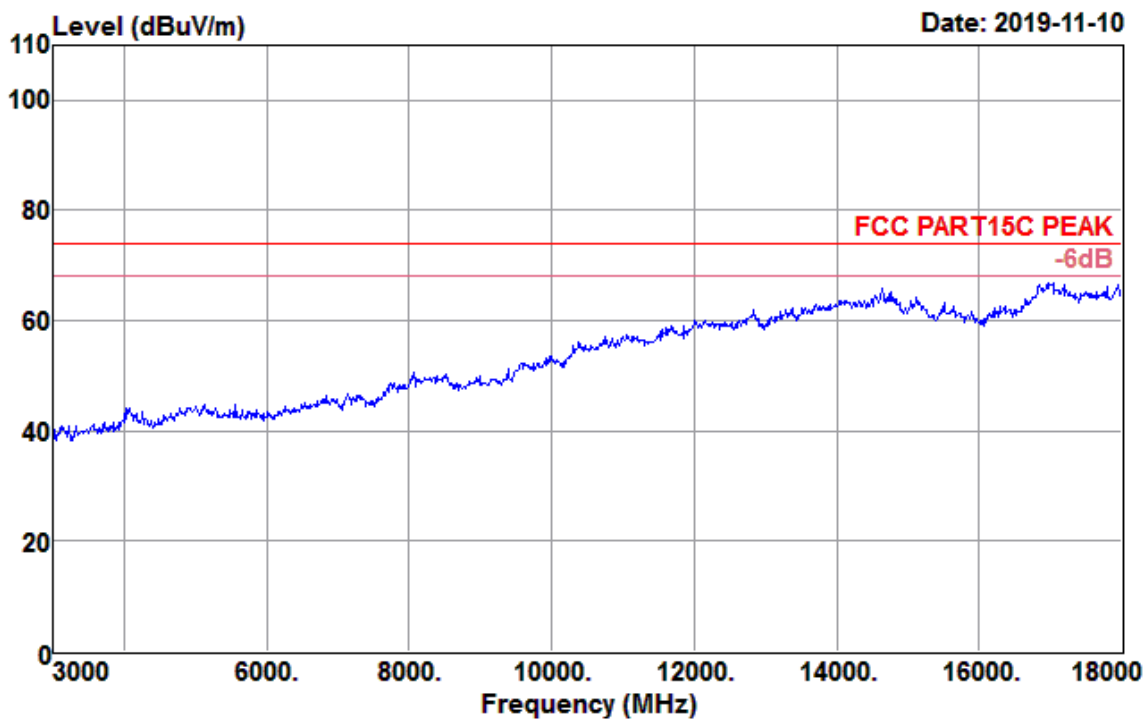
Data: 290



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2452.000	101.82	27.28	3.57	35.63	97.04	74.00	23.04	Peak

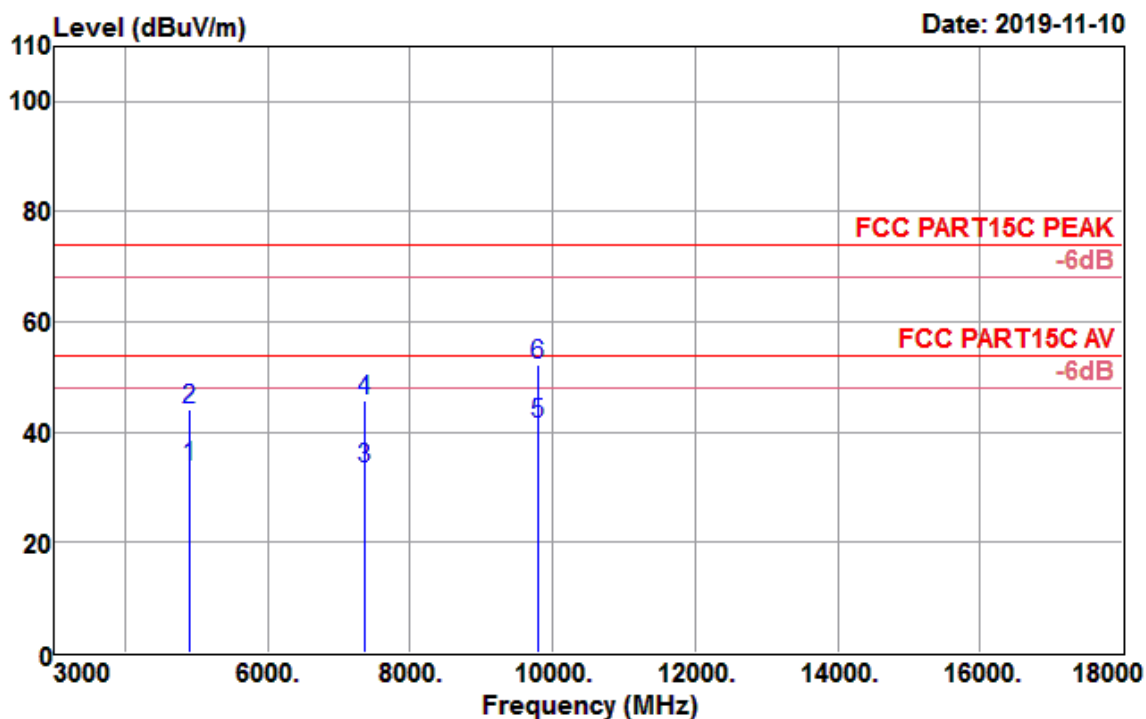
Test Mode :	802.11n HT20 CH11 (2462 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Vertical

Data: 428



Data: 429

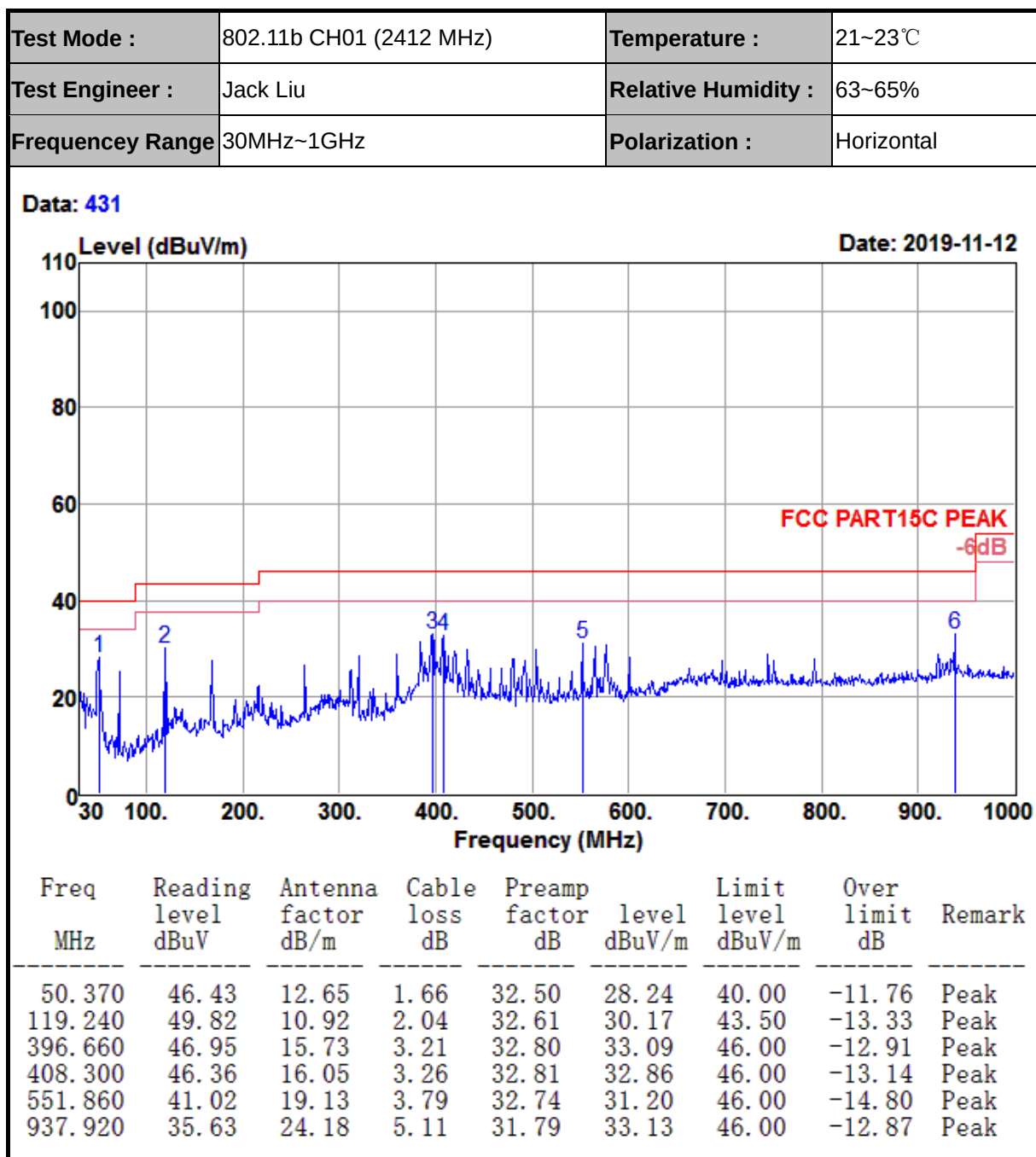
Date: 2019-11-10



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4904.000	31.53	31.47	5.54	34.78	33.76	54.00	-20.24	Average
4904.000	41.76	31.47	5.54	34.78	43.99	74.00	-30.01	Peak
7356.000	26.14	36.22	7.49	36.40	33.45	54.00	-20.55	Average
7356.000	38.55	36.22	7.49	36.40	45.86	74.00	-28.14	Peak
9808.000	29.02	38.15	10.87	36.40	41.64	54.00	-12.36	Average
9808.000	39.55	38.15	10.87	36.40	52.17	74.00	-21.83	Peak

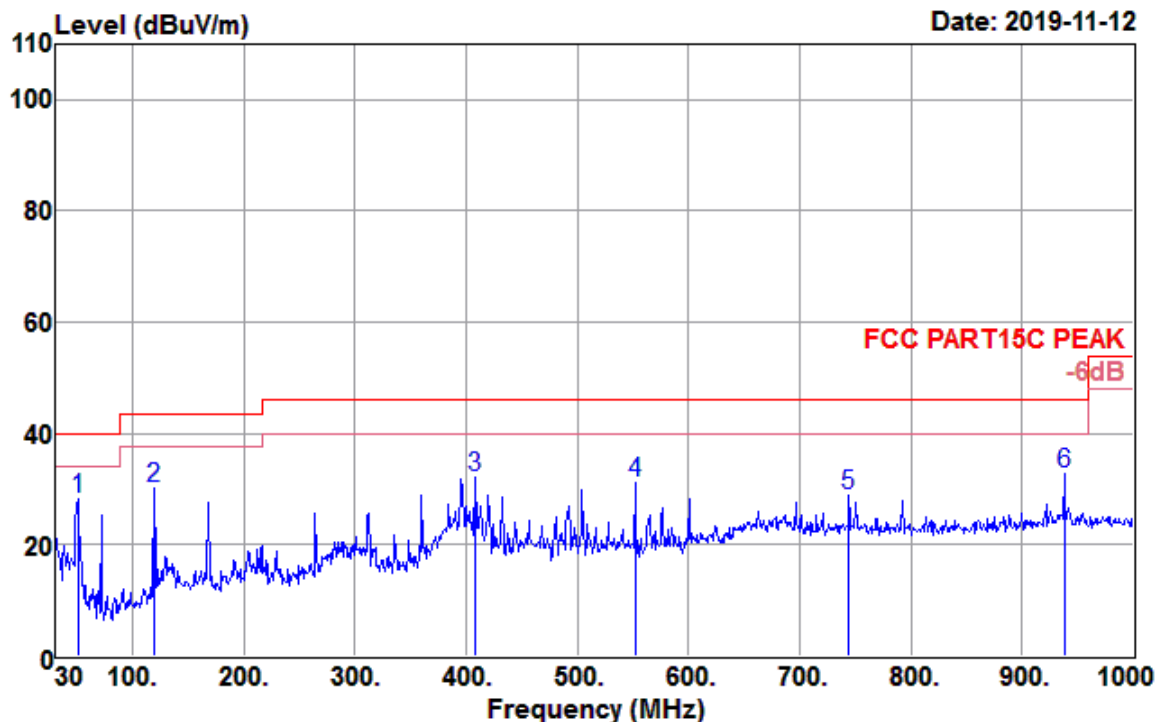
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

4.5.6 Test Result of Radiated Spurious Emission (30MHz ~ 1GHz)



Test Mode :	802.11b CH01 (2412 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	30MHz~1GHz	Polarization :	Vertical

Data: 430



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
50.370	46.43	12.65	1.66	32.50	28.24	40.00	-11.76	Peak
119.240	49.82	10.92	2.04	32.61	30.17	43.50	-13.33	Peak
408.300	45.66	16.05	3.26	32.81	32.16	46.00	-13.84	Peak
551.860	41.02	19.13	3.79	32.74	31.20	46.00	-14.80	Peak
743.920	34.45	22.08	4.49	32.17	28.85	46.00	-17.15	Peak
937.920	35.40	24.18	5.11	31.79	32.90	46.00	-13.10	Peak

4.6 AC Conducted Emission Measurement

4.6.1 Limit of AC Conducted Emission

FCC §15.207

IC RSS-GEN 8.8

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

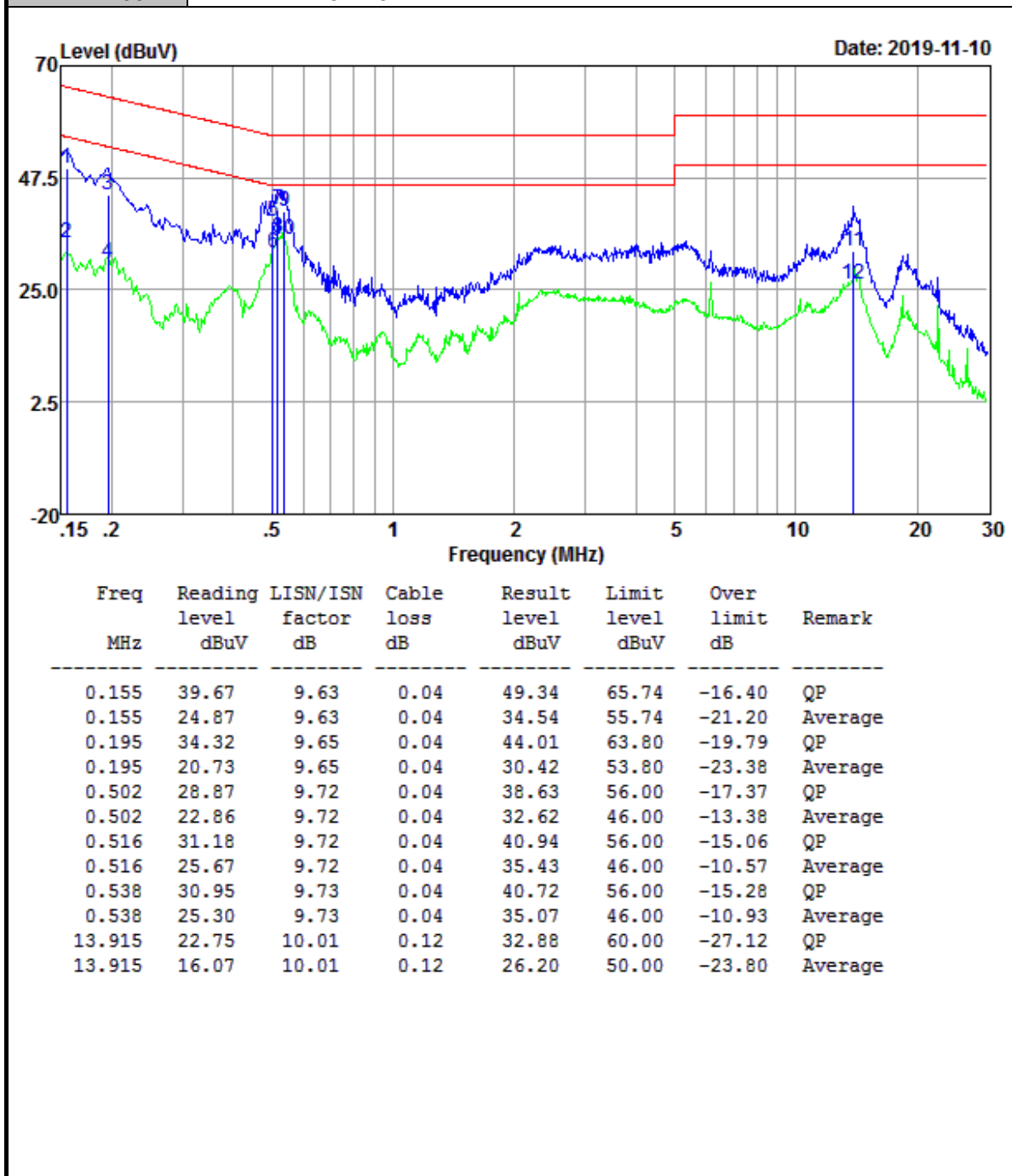
*Decreases with the logarithm of the frequency.

4.6.2 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

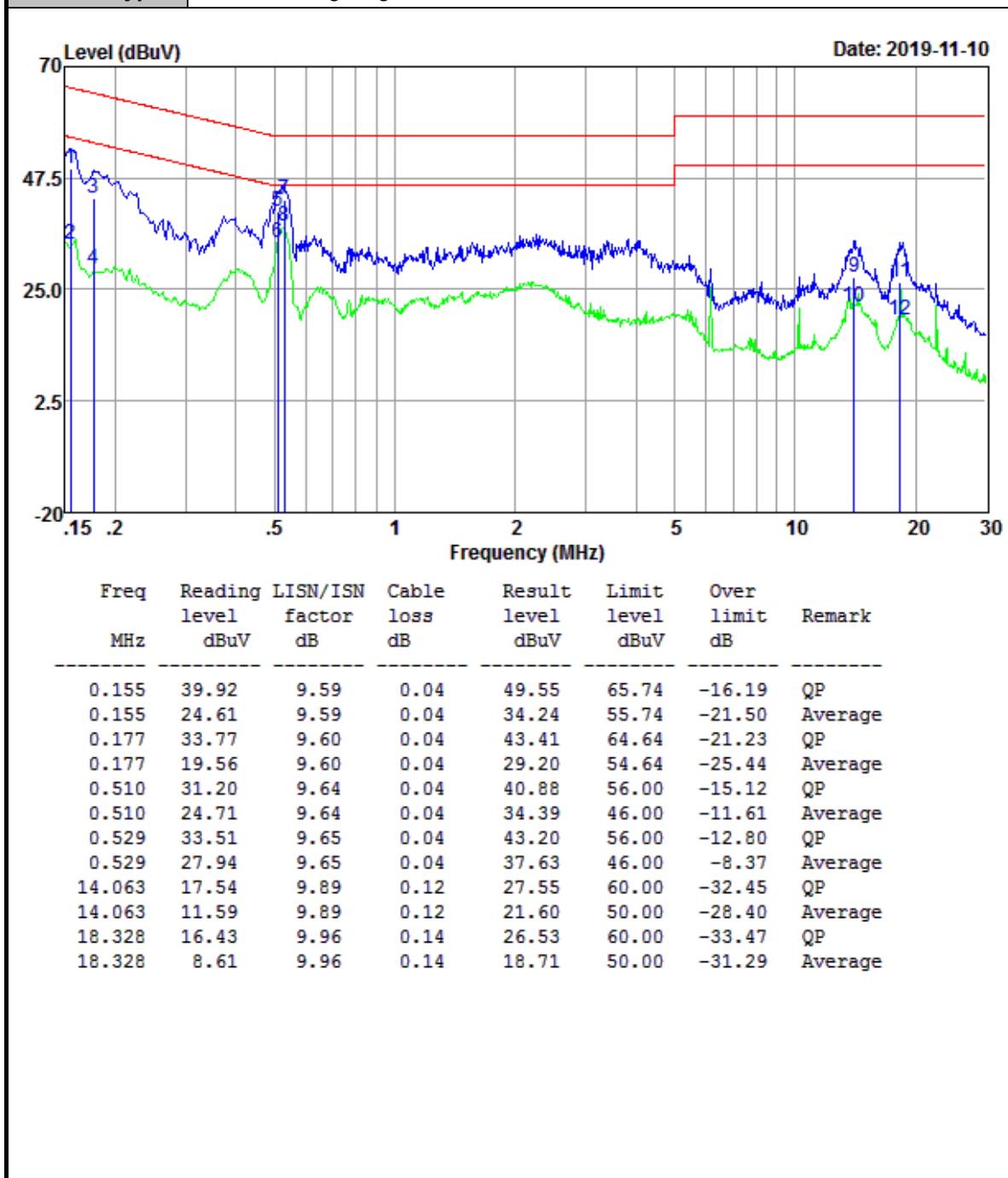
4.6.3 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	20℃
Test Engineer :	Victorique.Gao	Relative Humidity :	64%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN Link+lighting		



Result Level= Reading Level + LISN Factor + Cable Loss

Test Mode :	Mode 1	Temperature :	20°C
Test Engineer :	Victorique.Gao	Relative Humidity :	64%
Test Voltage :	120Vac / 60Hz	Phase :	NEUTRAL
Function Type :	WLAN Link+lighting		



Result Level= Reading Level + LISN Factor + Cable Loss

4.7 Antenna Requirements

4.7.1 Standard Applicable

According to antenna requirement of §15.203.

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be re-placed by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded..

And according to §15.247(4)(1), system operating in the 2400-2483.5MHz bands that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

4.7.2 Antenna Connected Construction

An embedded-in antenna design is used.

4.7.3 Antenna Gain

The antenna peak gain of EUT is less than 6 dBi. Therefore, it is not necessary to reduce maximum peak output power limit.

5 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Due Date	Remark
Spectrum Analyzer	Keysight	N9010A	MY56070788	2019-01-23	2020-01-22	Conducted
Power Sensor	Keysight	U2021XA	MY56510025	2019-01-23	2020-01-22	Conducted
Power Sensor	Keysight	U2021XA	MY57030005	2019-01-23	2020-01-22	Conducted
Power Sensor	Keysight	U2021XA	MY56510018	2019-01-23	2020-01-22	Conducted
Power Sensor	Keysight	U2021XA	MY56480002	2019-01-23	2020-01-22	Conducted
Thermal Chamber	Sanmtest	SMC-408-CD	2435	2019-05-09	2020-05-08	Conducted
Base Station	R&S	CMW 270	101231	2019-01-23	2020-01-22	Conducted
Signal Generator (Interferer)	Keysight	N5182B	MY56200384	2019-04-10	2020-04-09	Conducted
Signal Generator (Blocker)	Keysight	N5171B	MY56200661	2019-01-23	2020-01-22	Conducted

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV 40	101433	2019-02-18	2020-02-17	Radiation
Amplifier	Sonoma	310	363917	2019-01-22	2020-01-21	Radiation
Amplifier	Schwarzbeck	BBV 9718	327	2019-01-22	2020-01-21	Radiation
Amplifier	Narda	TTA1840-35-HG	2034380	2019-07-18	2020-07-17	Radiation
Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-051	2017/3/3	2020-03-02	Radiation
Broadband Antenna	Schwarzbeck	VULB 9168	9168-757	2017-03-03	2020-03-02	Radiation
Horn Antenna	Schwarzbeck	BBHA 9120 D	1677	2017-03-03	2020-03-02	Radiation
Horn Antenna	COM-POWER	AH-1840	101117	2018-06-20	2021-06-19	Radiation
Test Software	Auidx	E3	6.111221a	N/A	N/A	Radiation
Filter	Micro-Tronics	BRM 50702	G266	N/A	N/A	Radiation

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Due Date	Remark
LISN	R&S	ENV216	102125	2019-01-22	2020-01-21	Conducted
LISN	R&S	ENV432	101327	2019-01-22	2020-01-21	Conducted
EMI Test Receiver	R&S	ESR3	102143	2019-01-23	2020-01-22	Conducted
EMI Test Software	Audix	E3	N/A	N/A	N/A	Conducted

N/A: No Calibration Required

6 Uncertainty of Evaluation

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.60dB
Radiated emissions	30MHz ~ 1GMHz	5.05dB
	1GHz ~ 18GHz	5.06 dB
	18GHz ~ 40GHz	3.65dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

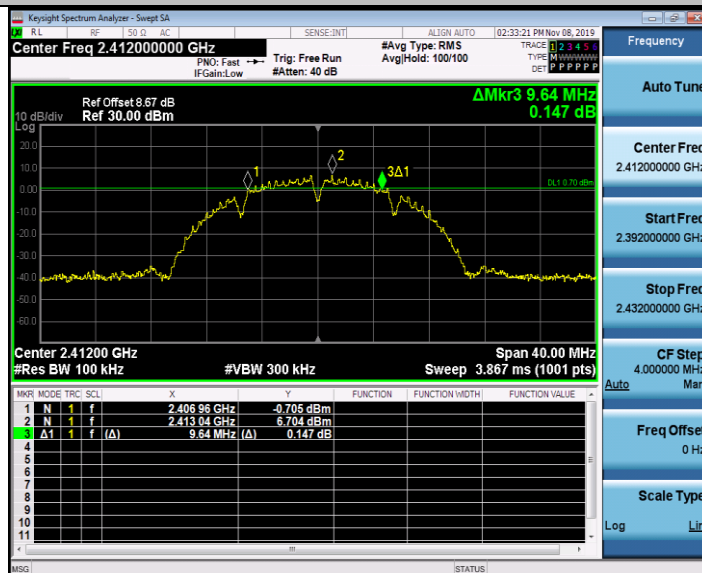
Appendix A: DTS Bandwidth

Test Result

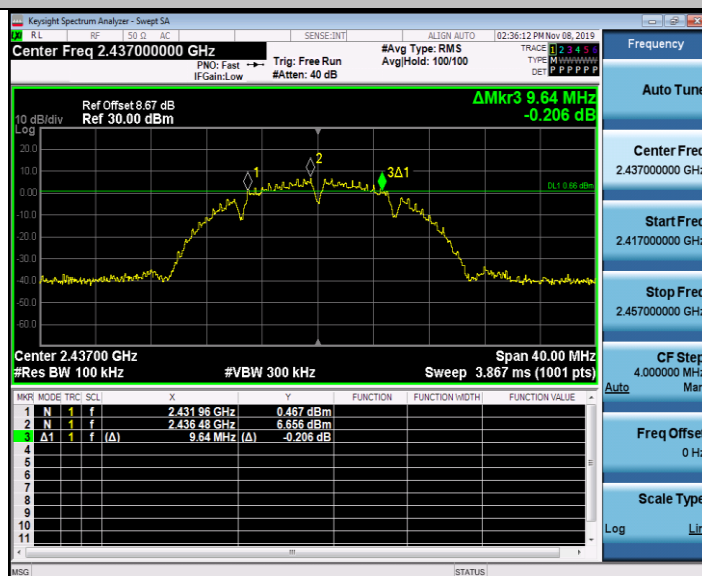
TestMode	Antenna	Channel	DTS BW [MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	9.640	0.5	PASS
		2437	9.640	0.5	PASS
		2462	9.160	0.5	PASS
11G	Ant1	2412	16.360	0.5	PASS
		2437	16.440	0.5	PASS
		2462	16.400	0.5	PASS
11N20SISO	Ant1	2412	17.640	0.5	PASS
		2437	17.360	0.5	PASS
		2462	17.640	0.5	PASS
11N40SISO	Ant1	2422	35.120	0.5	PASS
		2437	35.200	0.5	PASS
		2452	35.200	0.5	PASS

Test Graphs

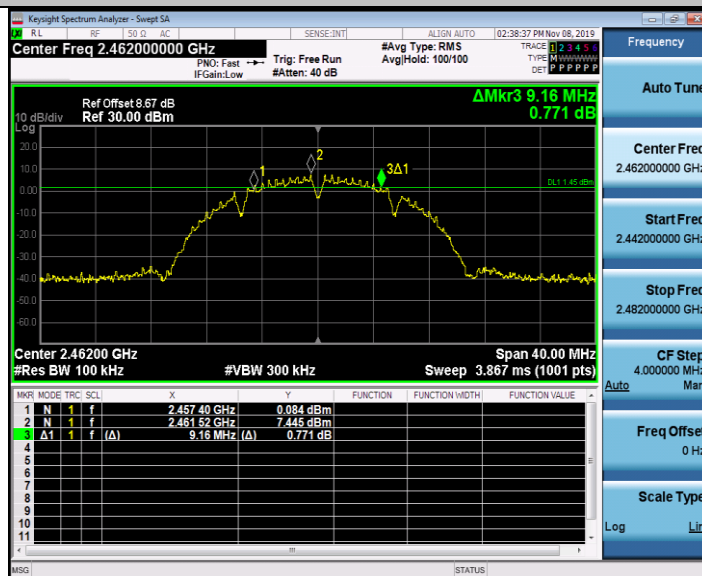
11B_Ant1_2412



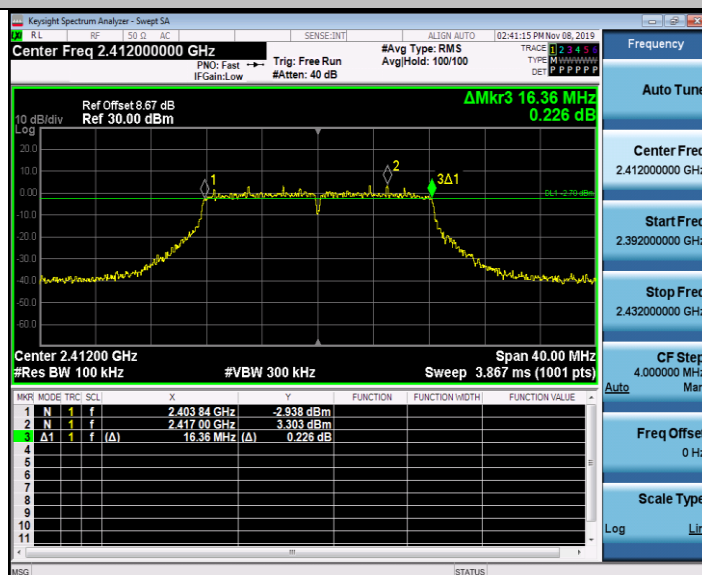
11B_Ant1_2437



11B_Ant1_2462



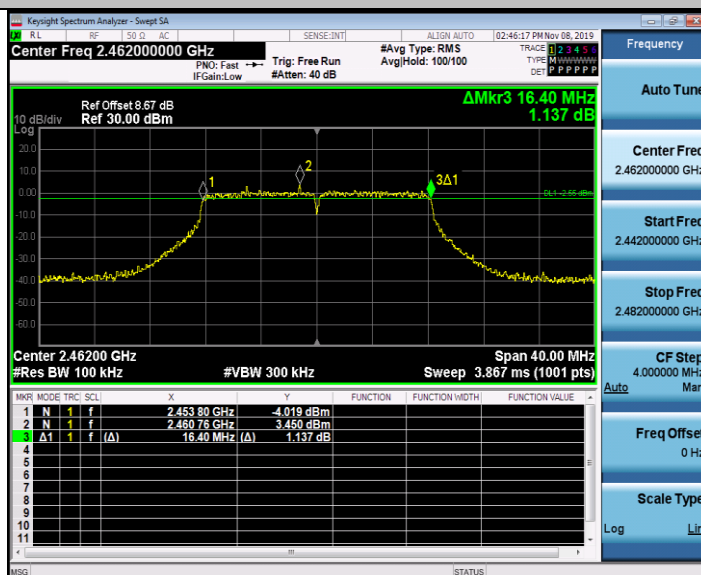
11G_Ant1_2412



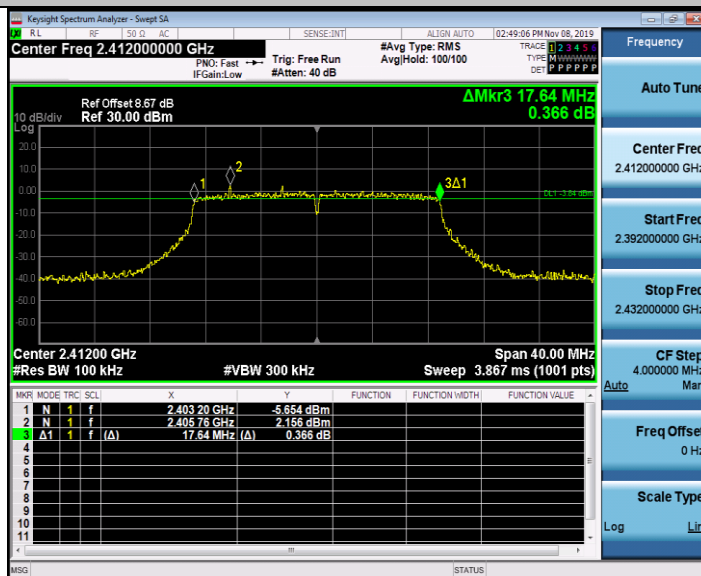
11G_Ant1_2437



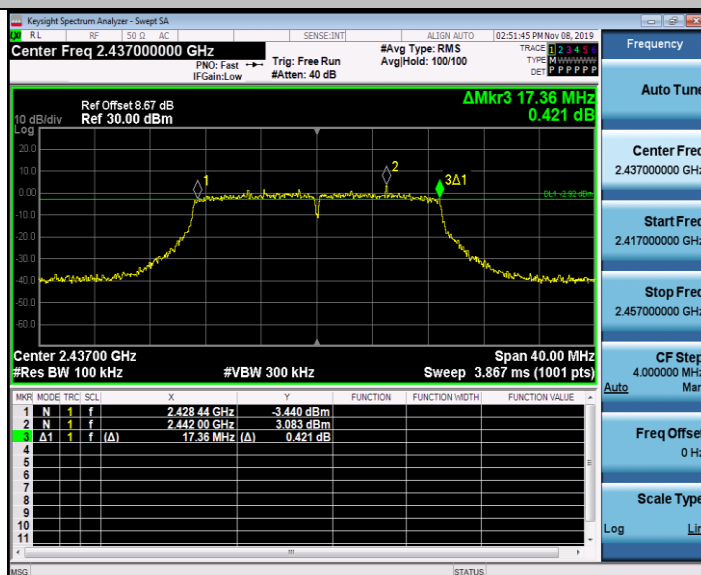
11G_Ant1_2462



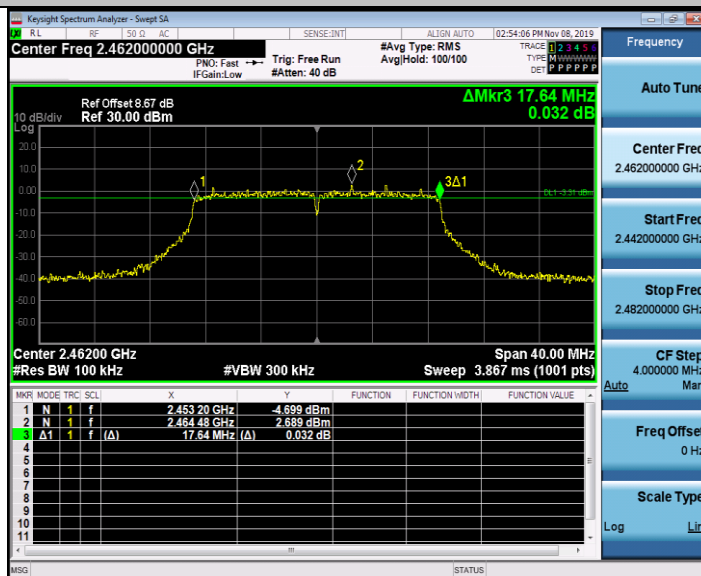
11N20SISO_Ant1_2412



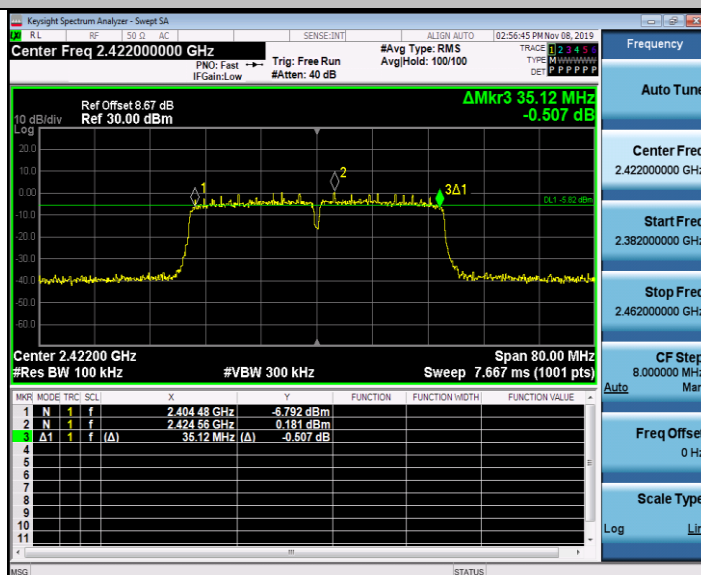
11N20SISO_Ant1_2437



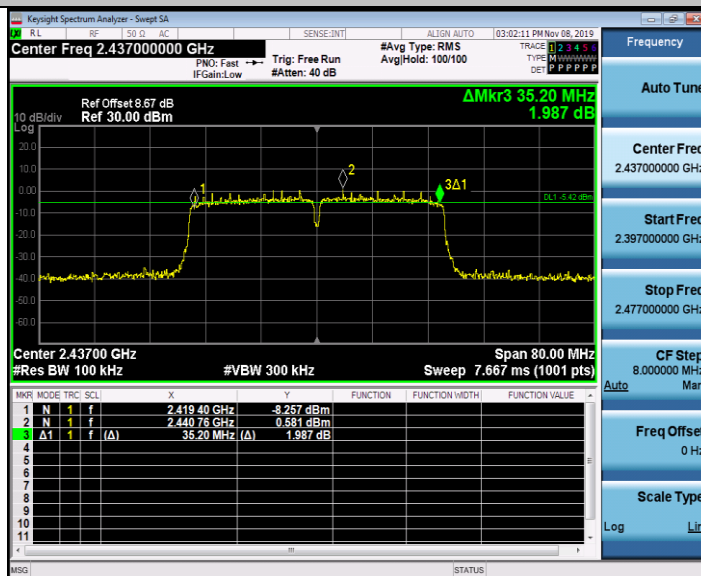
11N20SISO_Ant1_2462



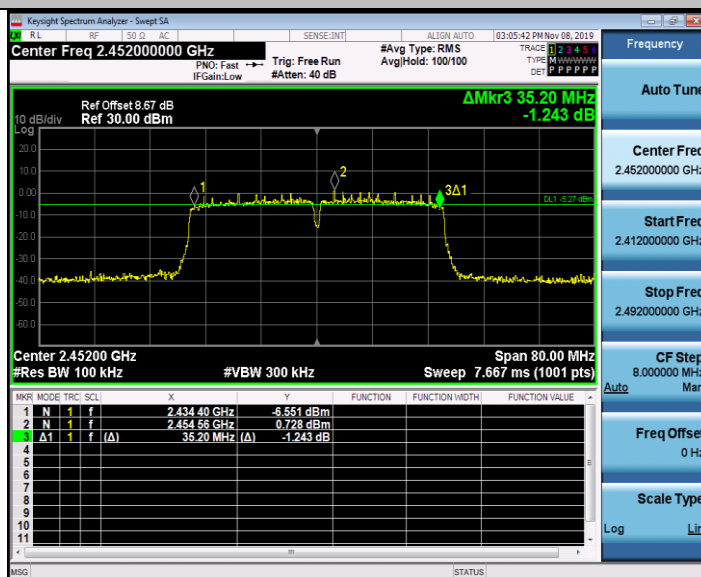
11N40SISO_Ant1_2422



11N40SISO_Ant1_2437



11N40SISO_Ant1_2452



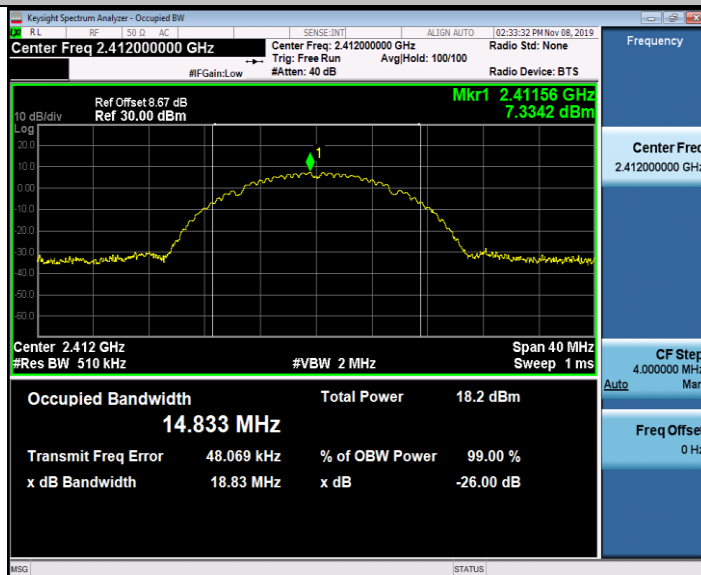
Appendix B: Occupied Channel Bandwidth

Test Result

TestMode	Antenna	Channel	OCB [MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	14.833	---	PASS
		2437	14.812	---	PASS
		2462	14.781	---	PASS
11G	Ant1	2412	17.211	---	PASS
		2437	17.128	---	PASS
		2462	17.239	---	PASS
11N20SISO	Ant1	2412	18.137	---	PASS
		2437	18.198	---	PASS
		2462	18.089	---	PASS
11N40SISO	Ant1	2422	35.897	---	PASS
		2437	35.877	---	PASS
		2452	35.854	---	PASS

Test Graphs

11B_Ant1_2412



11B_Ant1_2437

