RF Test Report

For

Globe Electric Company Inc.

Test Standards:	Part 15C Subpart C §15.247 RSS 247 Issue 2
Product Description:	WiFi Doorbell
Tested Model:	50137
Brand Name:	Globe
FCC ID:	2AQUQGE50137
IC:	8290A-GE50137
Classification	(DTS) Digital Transmission System
Report No.:	EC1911032RF01
Tested Date:	2019-11-26 to 2019-12-20
Issued Date:	2019-12-20
Prepared By:	Jerry Wang Jerry Wang / Engineer
Approved By:	Bacon Wu 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	/	2019.12.20	Valid	Original Report

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Summary Of Test Result

FCC Rule	IC Rule	Description	Limit	Result	Remark
15.247(a)(2)	RSS-247 5.2(a)	6dB Bandwidth	≥ 0.5MHz	Pass	-
-	RSS-Gen 6.7	99% Bandwidth	-	Pass	-
15.247(b)(3)	RSS-247 A5.4(d)	Peak Output Power	≤ 30dBm	Pass	-
15.247(e)	RSS-247 5.2(b)	Power Spectral Density	≤ 8dBm/3kHz	Pass	-
15.247(d)	RSS-247 5.5	Conducted Band Edges and Spurious Emission	≤ 20dBc	Pass	-
15.247(d)	RSS-247 5.5	Radiated Band Edges and Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 2.31 dB at 9648 MHz
15.207	RSS-GEN 8.8	AC Conducted Emission	15.207(a)	Pass	Under limit 5.83 dB at 0.524 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

Globe Electric Company Inc.
150, ONEIDA, MONTREAL, QUEBEC, CANADA, H9R 1A8

2.2 Manufacturer

Globe Electric Company Inc.
150, ONEIDA, MONTREAL, QUEBEC, CANADA, H9R 1A8

2.3 General Description Of EUT

Product	WiFi Doorbell
Model No.	50137
Additional No.	N/A
Difference Description	N/A
FCC ID	2AQUQGE50137
IC	8290A-GE50137
Power Supply	12~24Vac
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 : 9.90 dBm (0.0098 W) 802.11g : 10.71 dBm (0.0118 W) 802.11n HT20 : 10.21 dBm (0.0105 W) 802.11n HT40 : 9.26 dBm (0.0084 W)
Antenna Type	PCB Antenna type with 3dBi gain
HW Version	V1.1
SW Version	V2.9
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, 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 and 802.11n(HT20):

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		

7 channels are provided for 802.11n(HT40):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
		7	2442 MHz
		8	2447 MHz
3	2422 MHz	9	2452 MHz
4	2427 MHz		
5	2432 MHz		
6	2437 MHz		

The transmitter has a maximum peak conducted output power as follows:

Frequency Range(MHz)	Mode	Rate	Output Power(dBm)
2412~2462	802.11b	1Mbps	9.90
2412~2462	802.11g	6Mbps	10.71
2412~2462	802.11n HT20	MCS0	10.21
2422~2452	802.11n HT40	MCS0	9.26

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.

b. Pre-scan the 12V and 24V voltages and find that the worst mode is AC 12V, so the report only lists the test results of AC 12V

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 2: CH06 Mode 3: CH011	Mode 1: CH01 Mode 2: CH06 Mode 3: CH011	Mode 1: CH01 Mode 2: CH06 Mode 3: CH011	Mode 1: CH03 Mode 2: CH06 Mode 3: CH09

3.2.2 Radiated Emission Test (Below 1GHz)

Radiated Test Cases	**802.11 b**
	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. Z orientation was worst-case orientation; therefore, all final radiated testing was performed with the EUT in Z 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 2: CH06 Mode 3: CH11	Mode 1: CH01 Mode 2: CH06 Mode 3: CH11	Mode 1: CH01 Mode 2: CH06 Mode 3: CH11	Mode 1: CH03 Mode 2: CH06 Mode 3: CH09

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

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

3. For frequency above 18GHz, the measured value is much 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 Link+TF Card+Video Record

3.3 Support Equipment

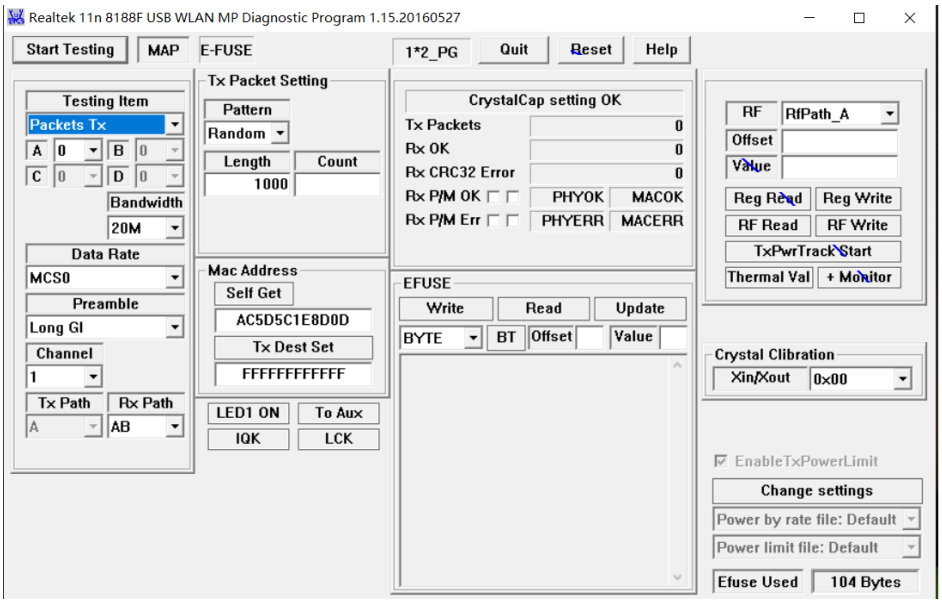
Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	D-link	DIR-628	KA2DIR628A2	N/A	Unshielded, 1.8 m
2.	Notebook	Lenovo	E470C	FCC DoC	N/A	shielded cable DC O/P 1.8 m unshielded AC I/P cable1.2 m
3.	Voltage Transformer	Tianzheng	TDGC2-10KVA	FCC DoC	N/A	N/A

3.4 Test Setup

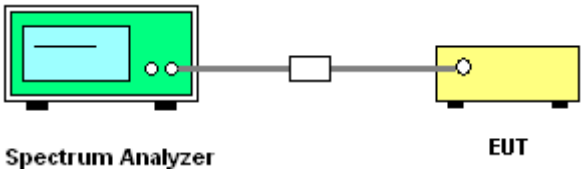
The EUT is continuously communicating to the WIFI tester during the tests.

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

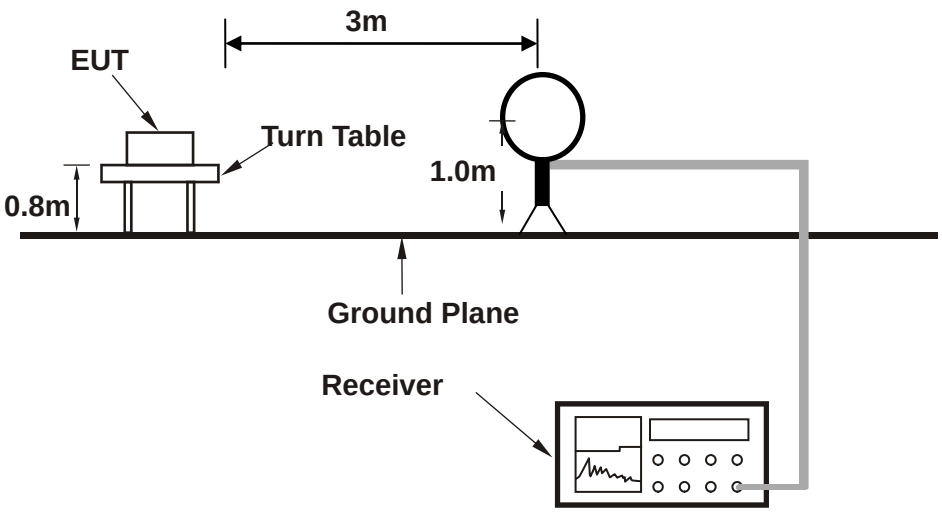
The following picture is a screenshot of the test software



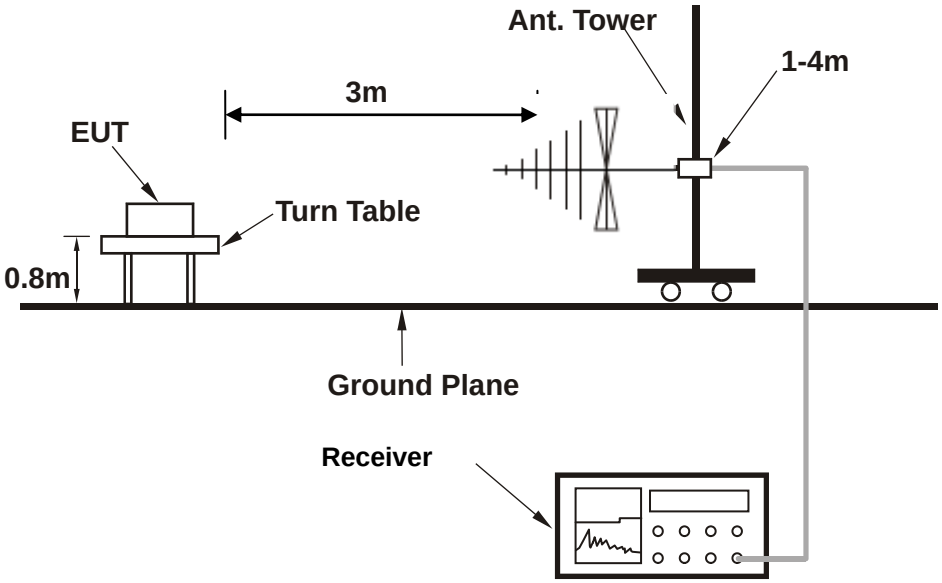
Setup diagram for Conducted Test



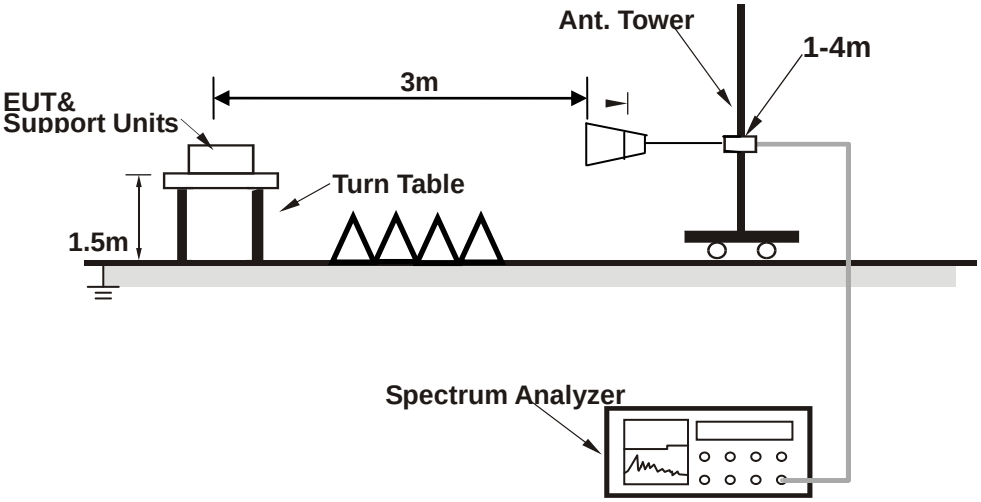
Setup diagram for Raidation(9KHz~30MHz) Test



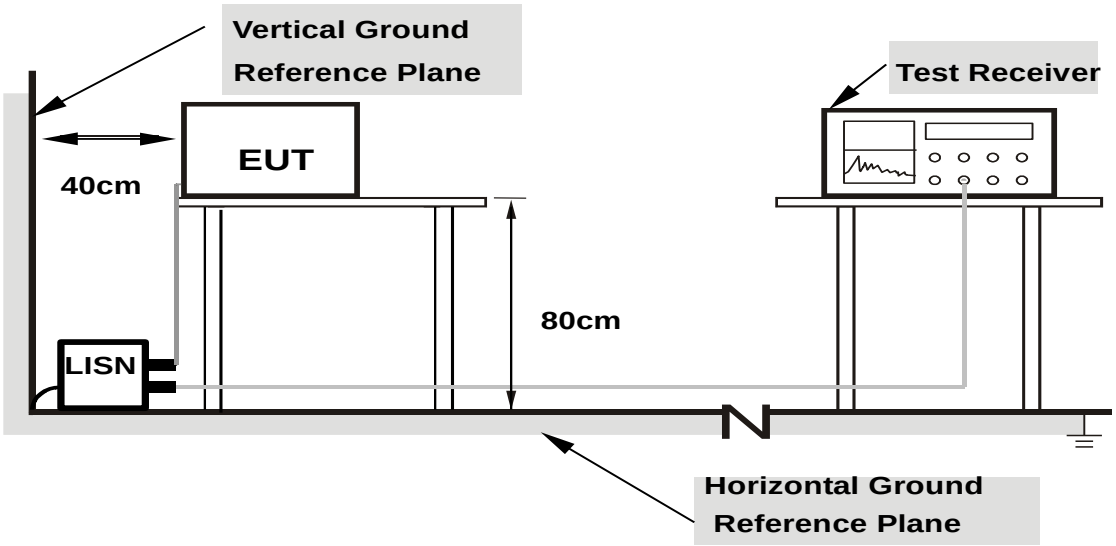
Setup diagram for Raidation(Below 1G) Test



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.

Offset(dB) = RF cable loss(dB) + attenuator factor(dB).

= 5 + 10 = 15 (dB)

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) ≥3* 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)

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

IC RSS-247 A5.4(d)

For DTSs employing digital modulation techniques operating in the bands 902-928MHz and 2400-2483.5MHz, the maximum peak conducted output power shall not exceed 1 W. The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e)

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*OBW.Set RBW=510KHz,VBW=2MHz, Number of points in sweep ≥ 2/3* 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*OBW.Set RBW= 30 KHz,VBW=100 KHz, Number of points in sweep ≥ 2/3* 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.
9. Add 10 log(1/x), where x is the duty cycle. The duty cycle factor has been compensated to the ‘offset ” of the spectrum analyser.

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

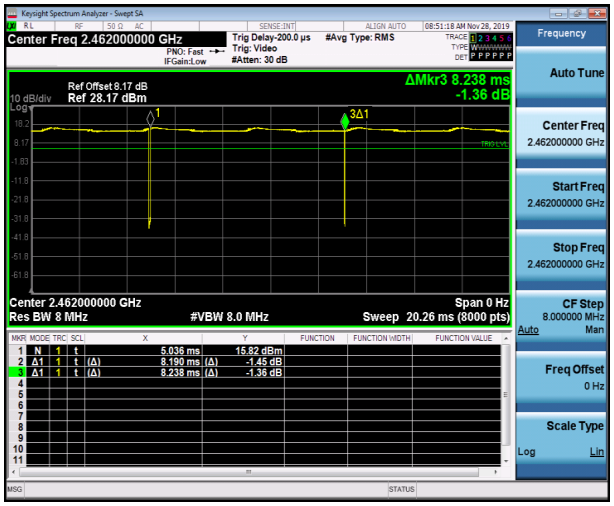
In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 30 dB below the highest emission level within the authorized band. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as 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

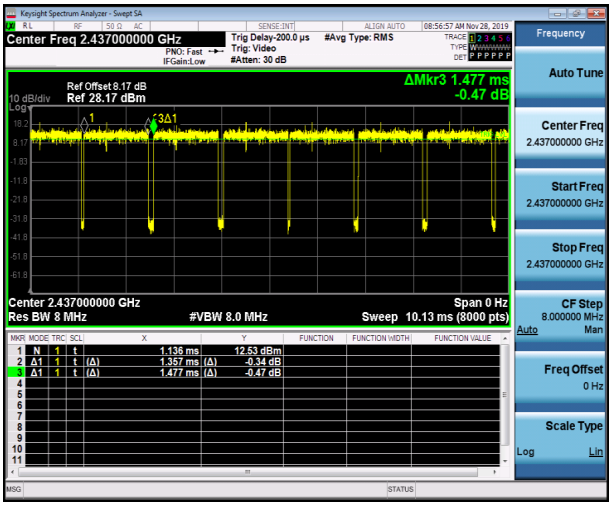
4.5.2 Test Procedures

1. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
2. The measurement distance is 3 meter.
3. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level to comply with the guidelines.
4. Set to the maximum power setting and enable the EUT transmit continuously.
5. 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>1GHz ; 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 ≥ 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.

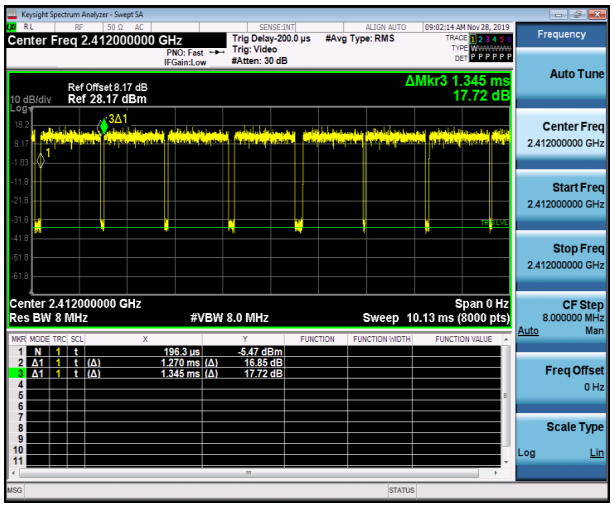
Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11b	99.42	8.19	0.12	10Hz
802.11g	91.85	1.36	0.74	1kHz
802.11n HT20	94.44	1.27	0.79	1kHz
802.11n HT40	90.71	0.63	1.59	3kHz



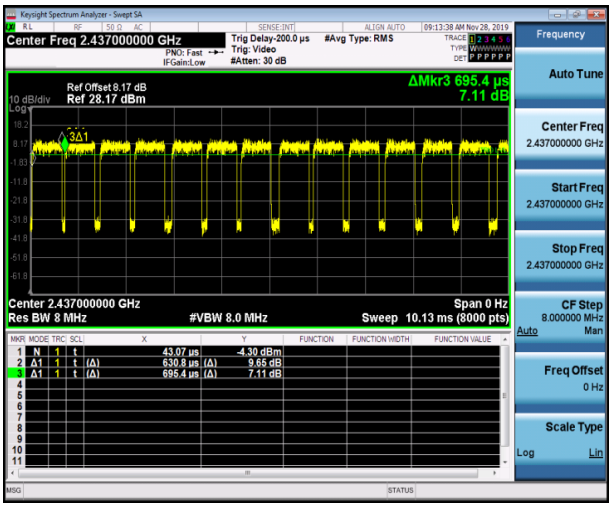
802.11b



802.11g



802.11n HT20



802.11n HT40

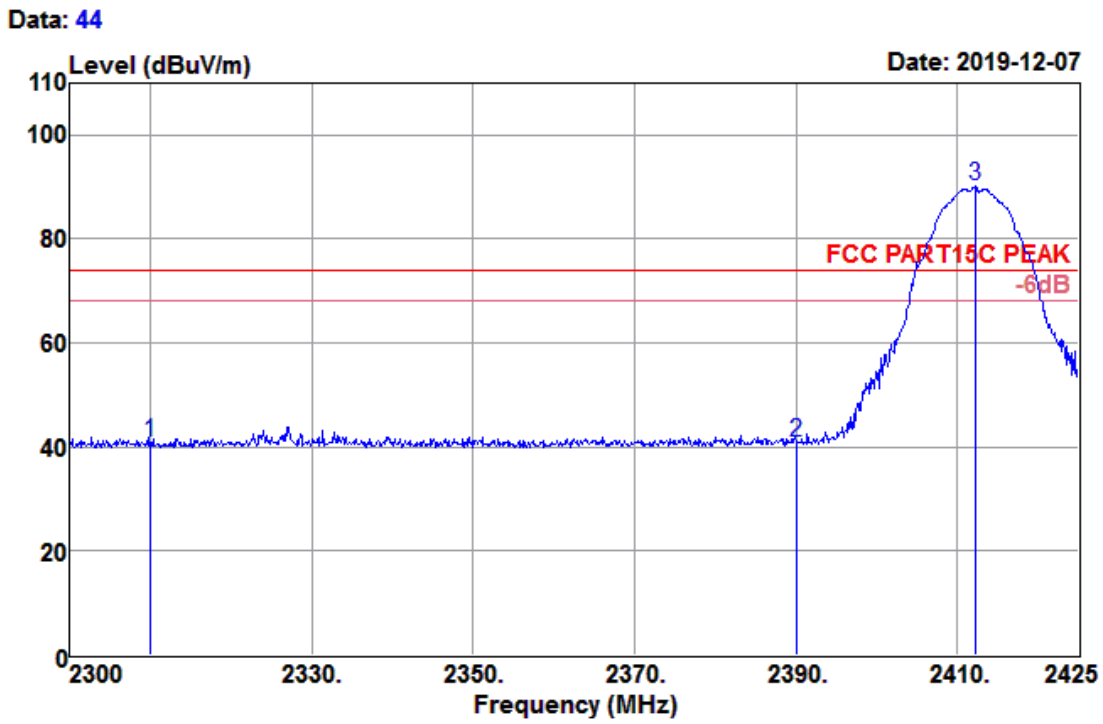
6. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

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.

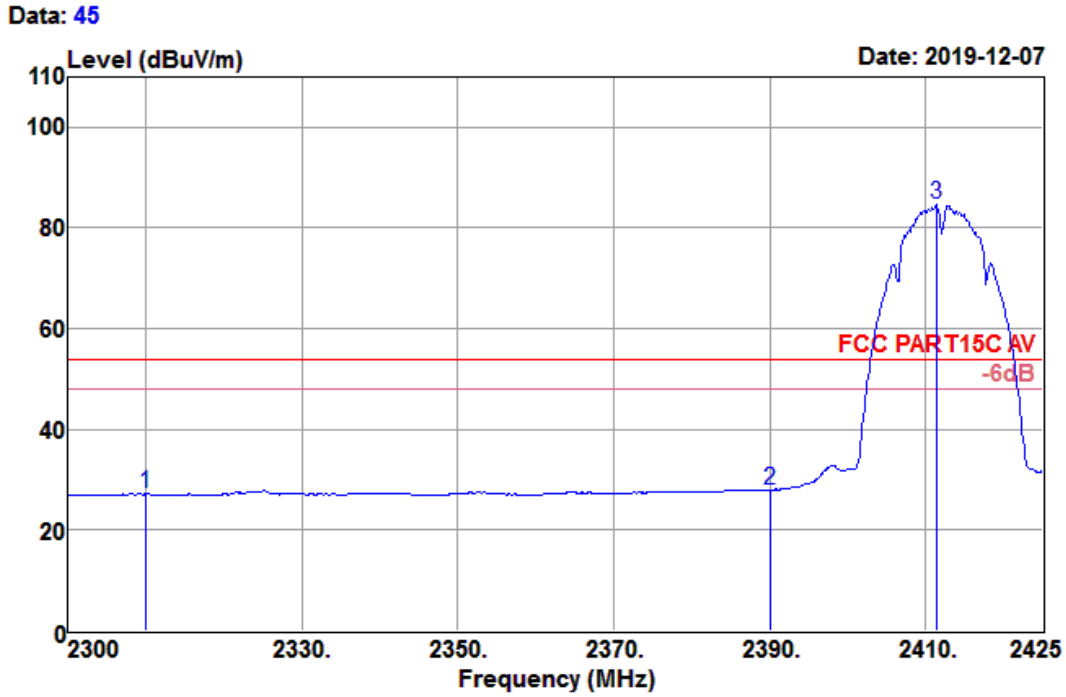
4.5.4 Test Result of Radiated Spurious at Band Edges

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



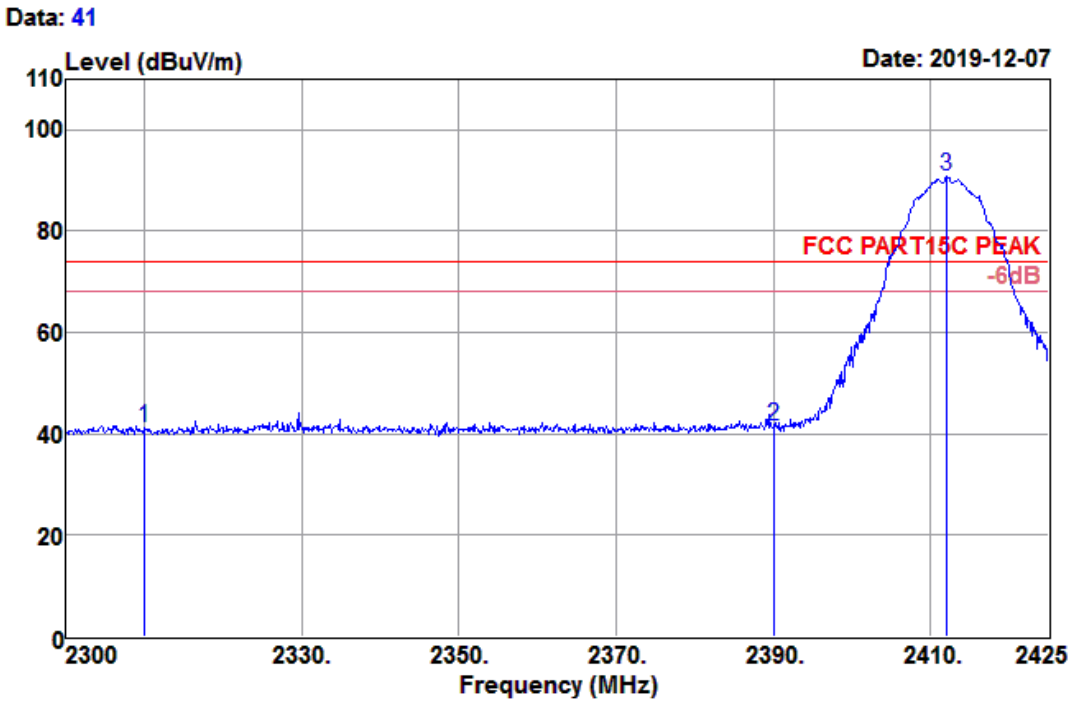
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	45.80	26.91	3.48	35.43	40.76	74.00	-33.24	Peak
2390.000	45.91	27.11	3.53	35.55	41.00	74.00	-33.00	Peak
2412.250	94.99	27.17	3.55	35.58	90.13	74.00	16.13	Peak

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



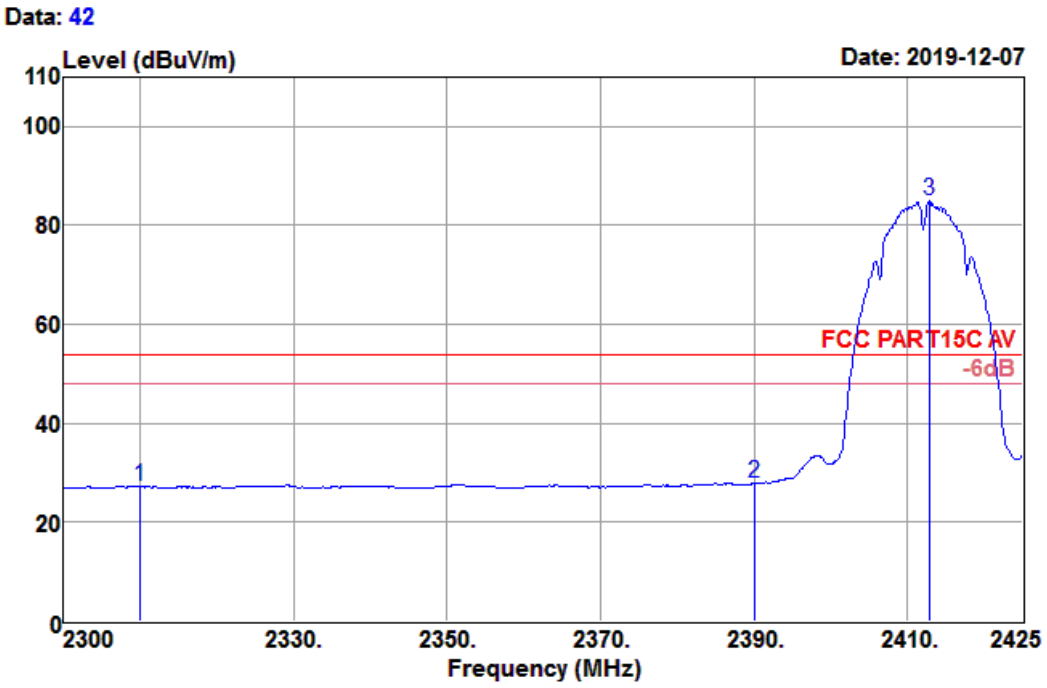
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	32.26	26.91	3.48	35.43	27.22	54.00	-26.78	Average
2390.000	32.94	27.11	3.53	35.55	28.03	54.00	-25.97	Average
2411.375	89.44	27.17	3.55	35.58	84.58	54.00	30.58	Average

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



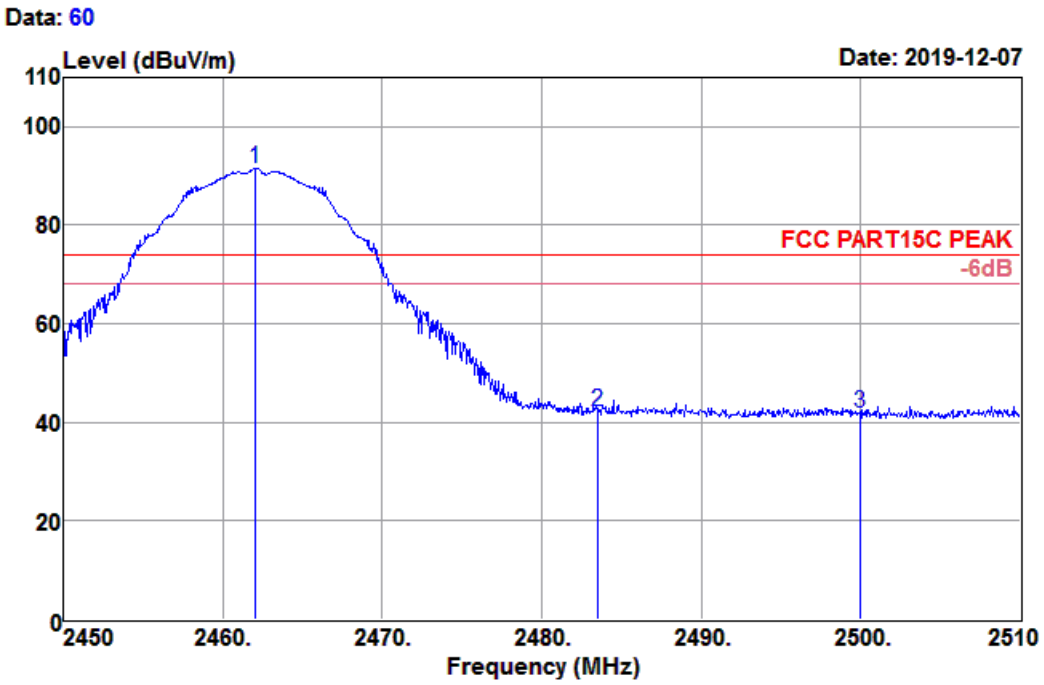
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	46.17	26.91	3.48	35.43	41.13	74.00	-32.87	Peak
2390.000	46.61	27.11	3.53	35.55	41.70	74.00	-32.30	Peak
2412.125	95.63	27.17	3.55	35.58	90.77	74.00	16.77	Peak

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



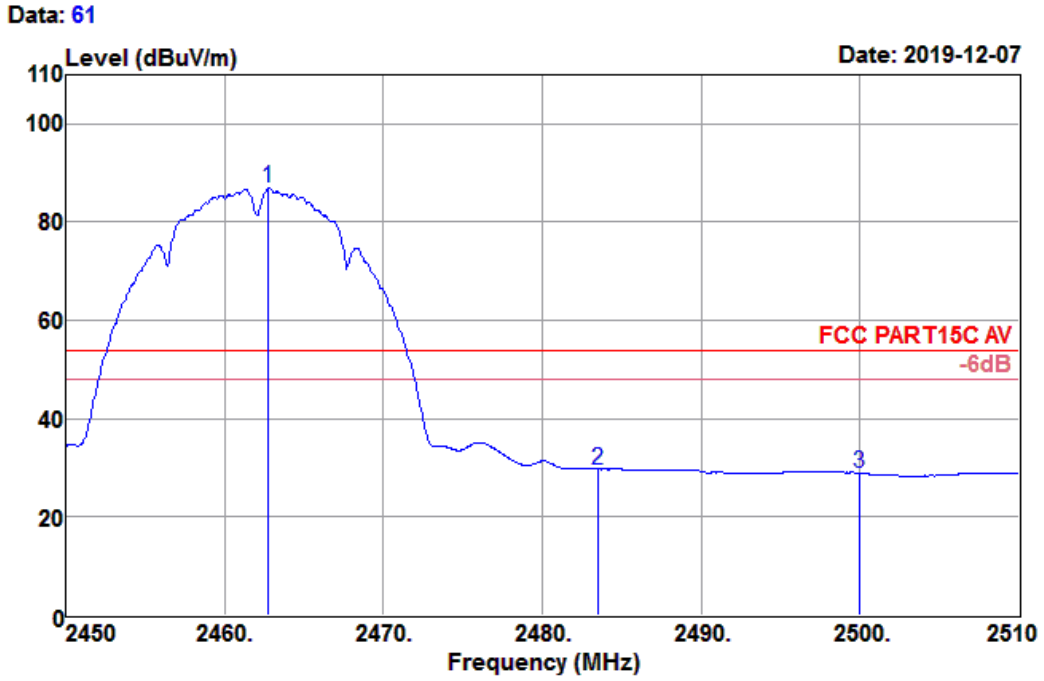
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	32.27	26.91	3.48	35.43	27.23	54.00	-26.77	Average
2390.000	32.67	27.11	3.53	35.55	27.76	54.00	-26.24	Average
2412.875	89.73	27.17	3.55	35.58	84.87	54.00	30.87	Average

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



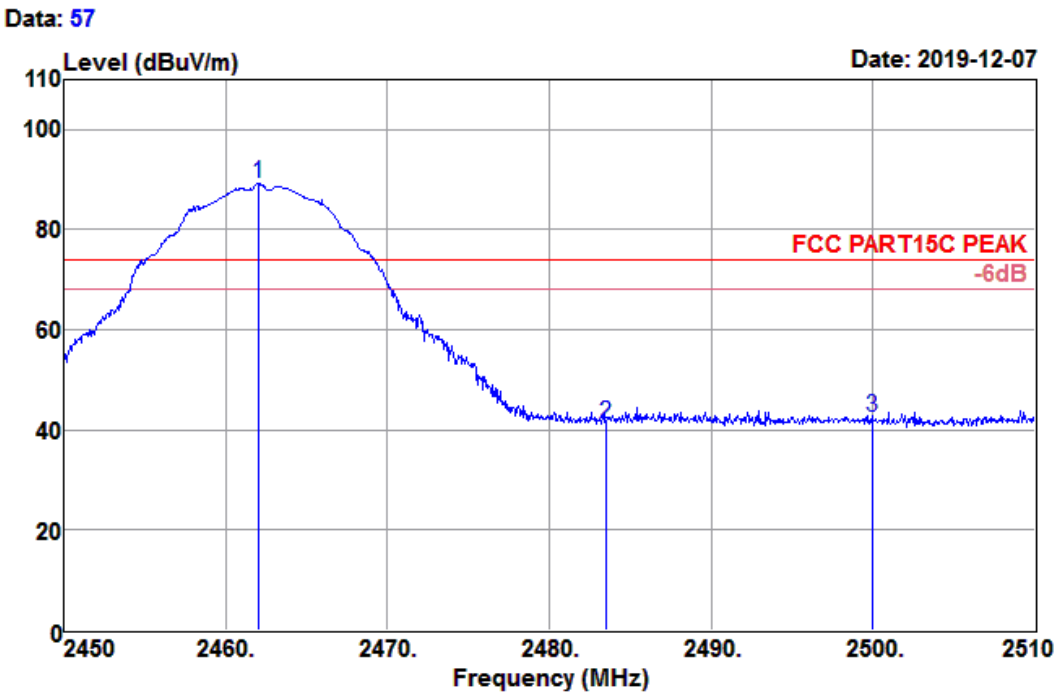
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2462.060	96.40	27.30	3.58	35.65	91.63	74.00	17.63	Peak
2483.500	46.83	27.36	3.59	35.68	42.10	74.00	-31.90	Peak
2500.000	46.69	27.40	3.60	35.70	41.99	74.00	-32.01	Peak

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



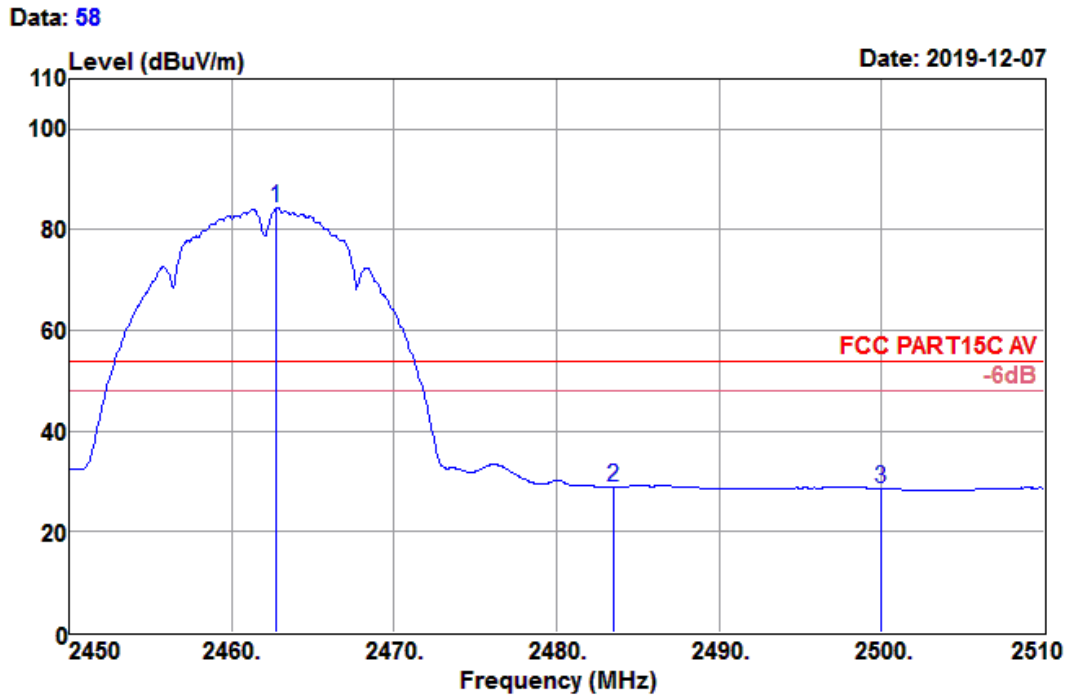
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2462.780	91.61	27.30	3.58	35.65	86.84	54.00	32.84	Average
2483.500	34.43	27.36	3.59	35.68	29.70	54.00	-24.30	Average
2500.000	33.60	27.40	3.60	35.70	28.90	54.00	-25.10	Average

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



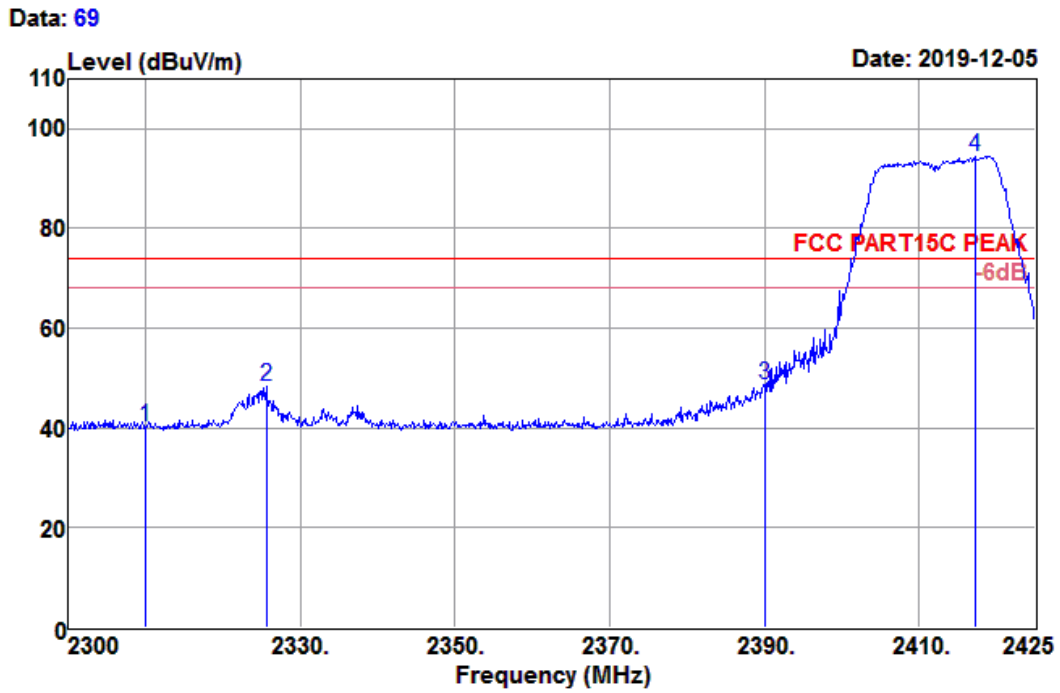
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2462.000	94.08	27.30	3.58	35.65	89.31	74.00	15.31	Peak
2483.500	45.88	27.36	3.59	35.68	41.15	74.00	-32.85	Peak
2500.000	47.27	27.40	3.60	35.70	42.57	74.00	-31.43	Peak

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



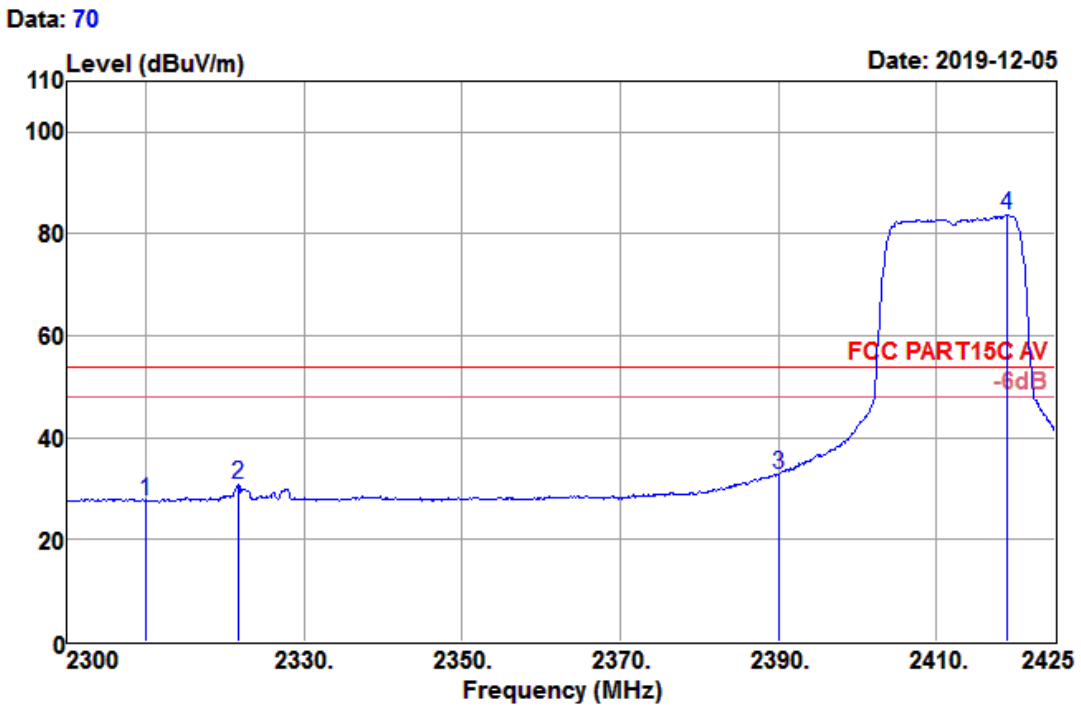
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2462.780	89.10	27.30	3.58	35.65	84.33	54.00	30.33	Average
2483.500	33.67	27.36	3.59	35.68	28.94	54.00	-25.06	Average
2500.000	33.33	27.40	3.60	35.70	28.63	54.00	-25.37	Average

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



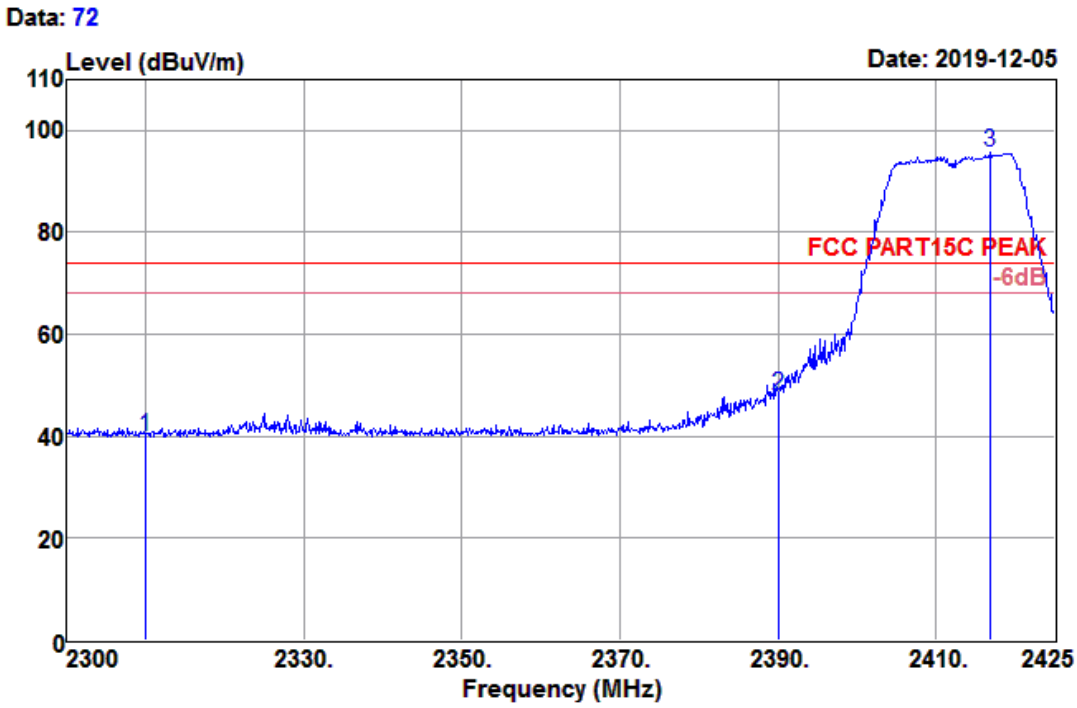
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	45.23	26.91	3.48	35.43	40.19	74.00	-33.81	Peak
2325.625	53.24	26.95	3.49	35.46	48.22	74.00	-25.78	Peak
2390.000	53.67	27.11	3.53	35.55	48.76	74.00	-25.24	Peak
2417.250	99.26	27.18	3.55	35.58	94.41	74.00	20.41	Peak

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



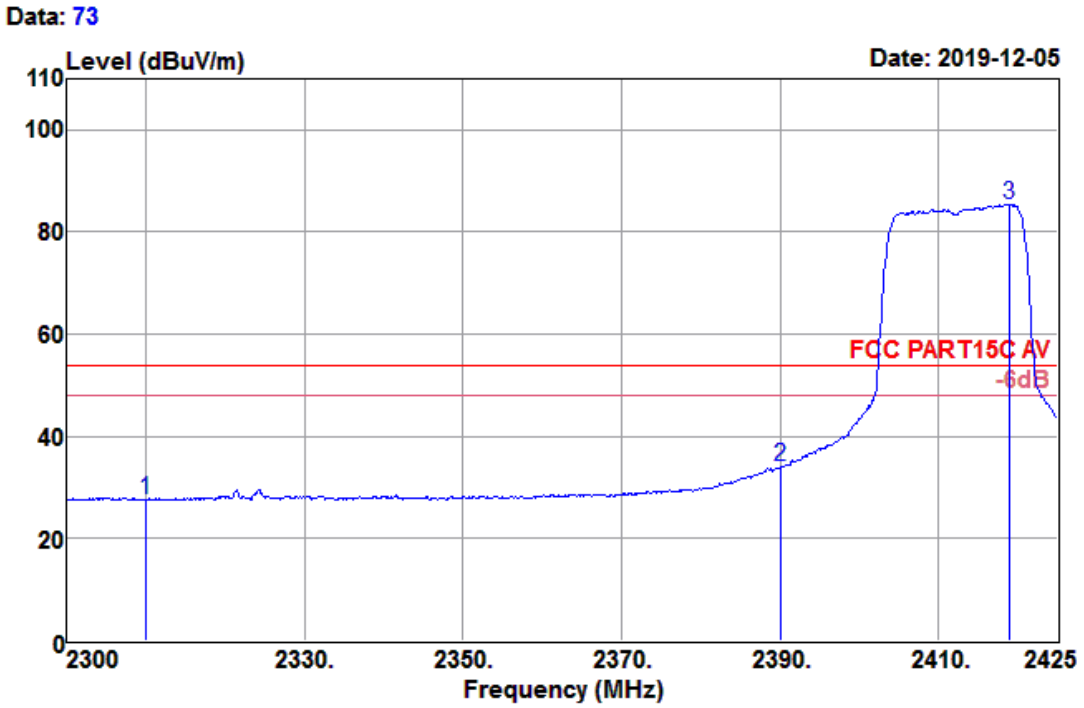
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	32.60	26.91	3.48	35.43	27.56	54.00	-26.44	Average
2321.750	35.75	26.94	3.49	35.45	30.73	54.00	-23.27	Average
2390.000	37.84	27.11	3.53	35.55	32.93	54.00	-21.07	Average
2419.000	88.67	27.19	3.55	35.59	83.82	54.00	29.82	Average

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



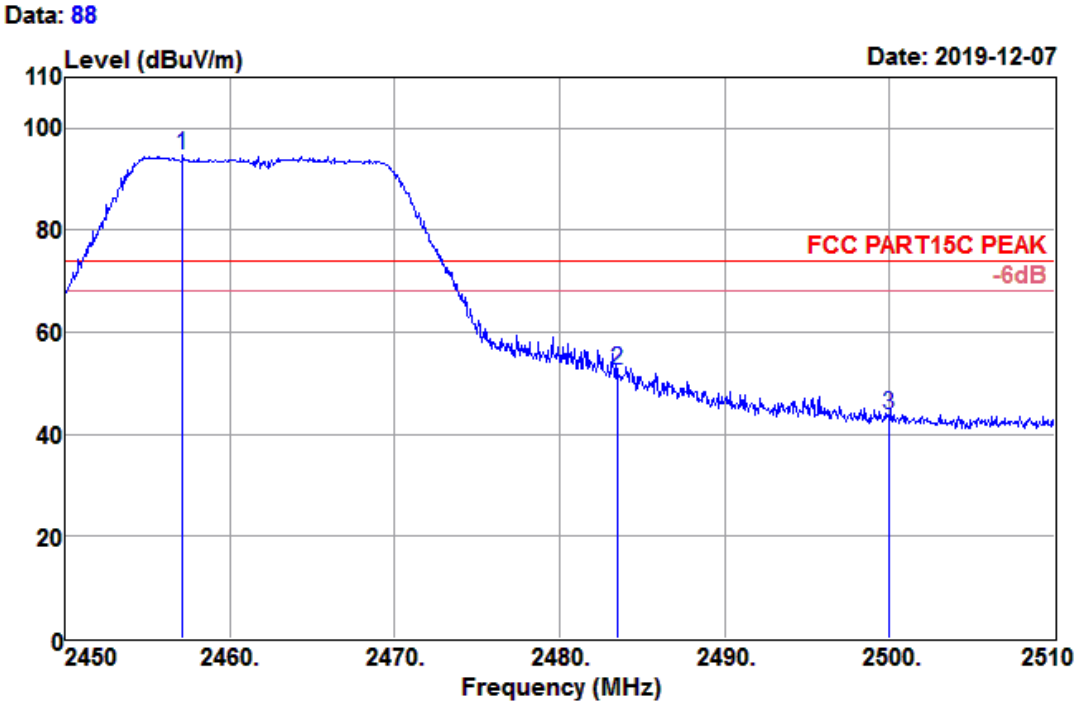
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	45.12	26.91	3.48	35.43	40.08	74.00	-33.92	Peak
2390.000	52.84	27.11	3.53	35.55	47.93	74.00	-26.07	Peak
2416.750	100.47	27.18	3.55	35.58	95.62	74.00	21.62	Peak

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



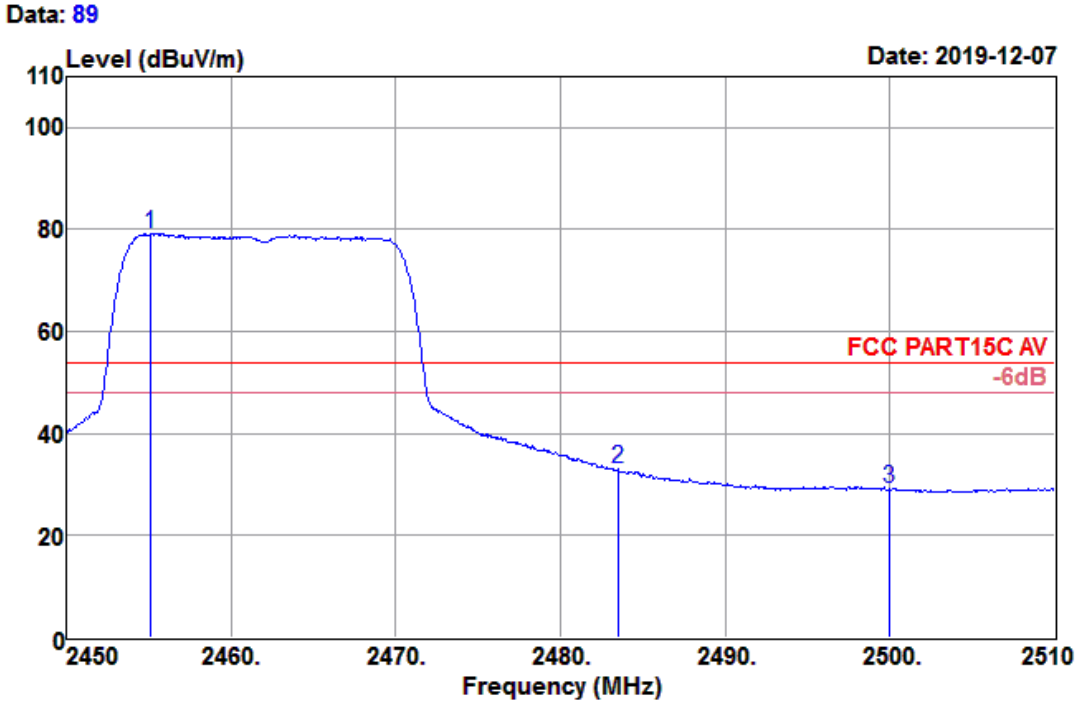
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	32.69	26.91	3.48	35.43	27.65	54.00	-26.35	Average
2390.000	38.98	27.11	3.53	35.55	34.07	54.00	-19.93	Average
2418.875	90.31	27.19	3.55	35.59	85.46	54.00	31.46	Average

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



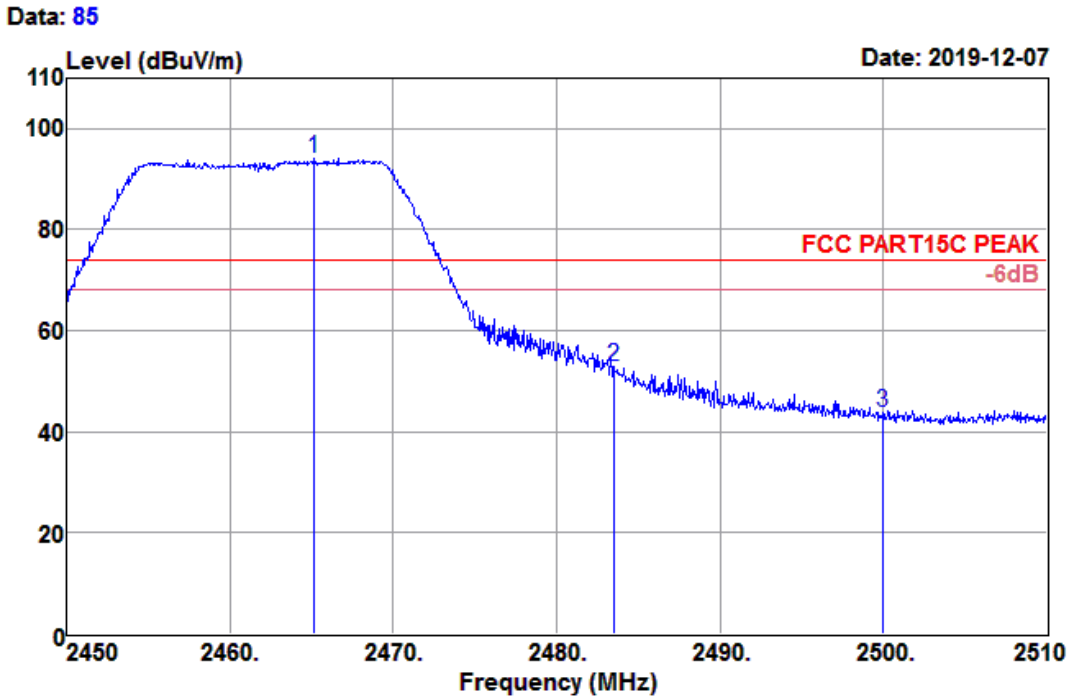
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2457.140	99.44	27.29	3.57	35.64	94.66	74.00	20.66	Peak
2483.500	57.22	27.36	3.59	35.68	52.49	74.00	-21.51	Peak
2500.000	48.41	27.40	3.60	35.70	43.71	74.00	-30.29	Peak

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



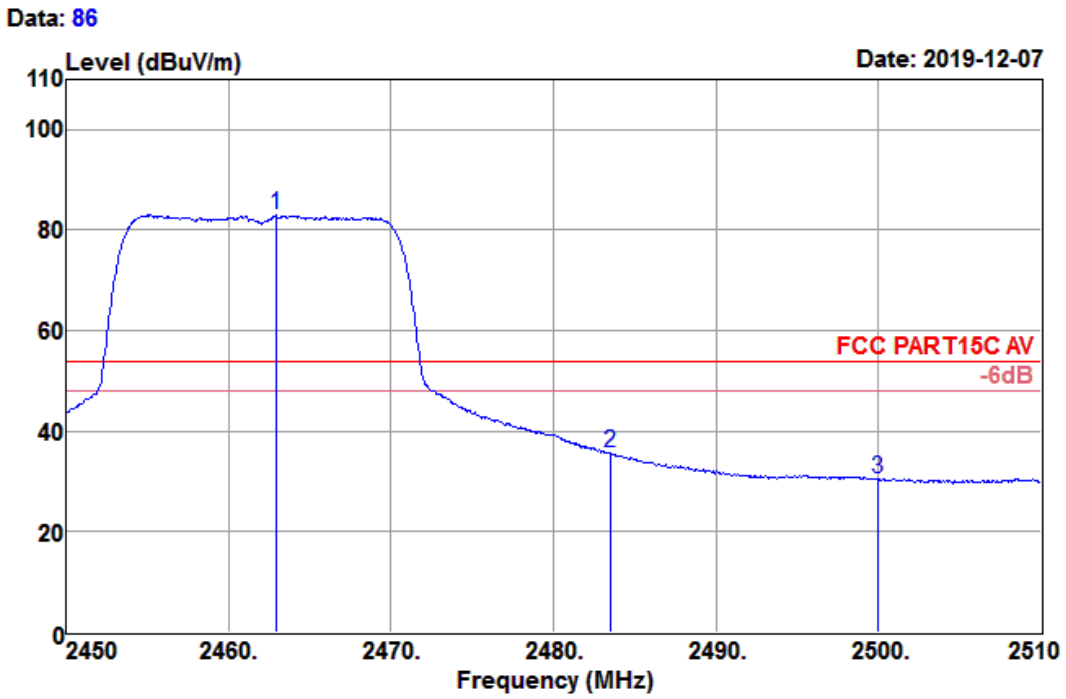
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2455.160	84.02	27.28	3.57	35.64	79.23	54.00	25.23	Average
2483.500	37.72	27.36	3.59	35.68	32.99	54.00	-21.01	Average
2500.000	33.78	27.40	3.60	35.70	29.08	54.00	-24.92	Average

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



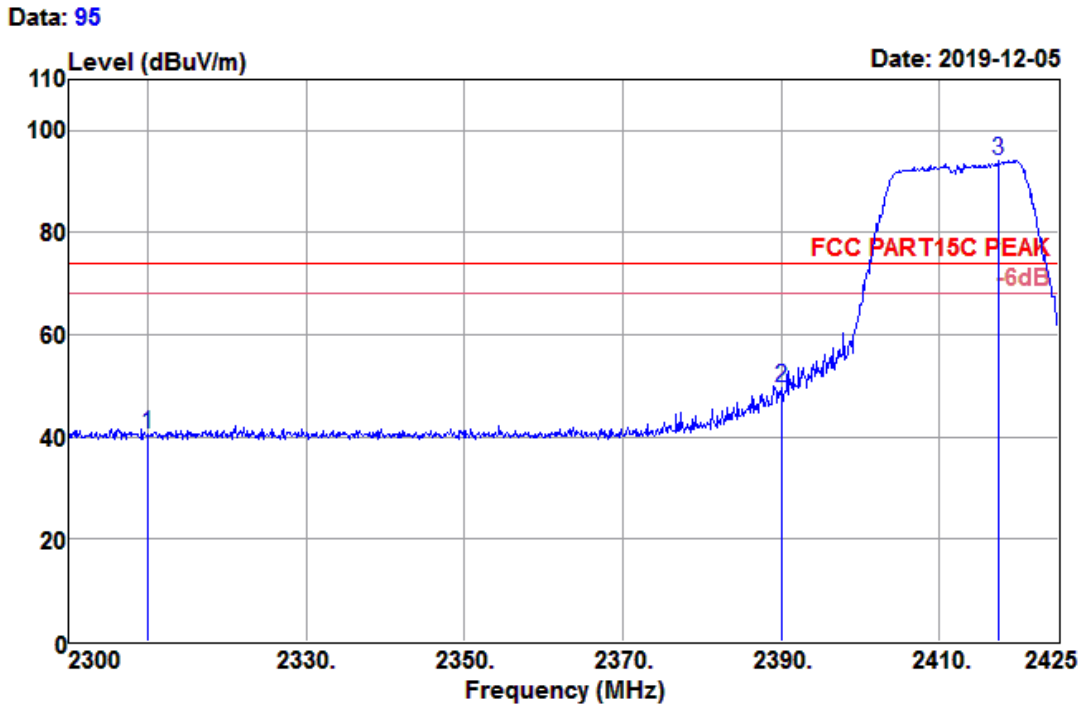
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2465.180	98.99	27.31	3.58	35.65	94.23	74.00	20.23	Peak
2483.500	57.53	27.36	3.59	35.68	52.80	74.00	-21.20	Peak
2500.000	48.36	27.40	3.60	35.70	43.66	74.00	-30.34	Peak

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



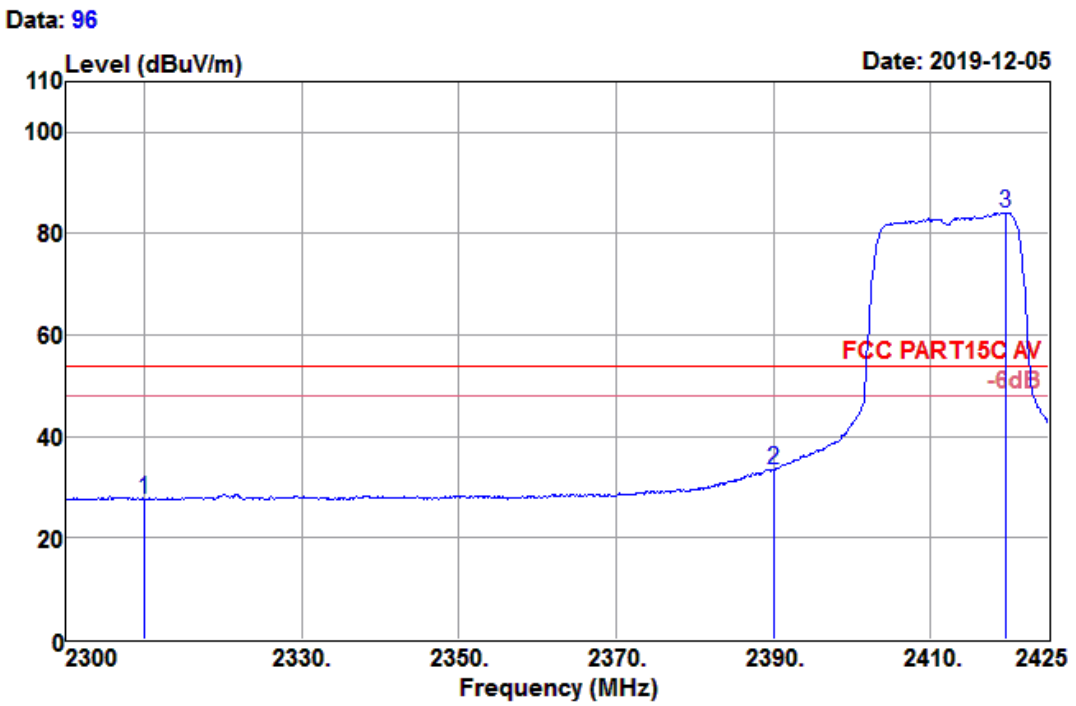
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2462.960	87.86	27.30	3.58	35.65	83.09	54.00	29.09	Average
2483.500	40.30	27.36	3.59	35.68	35.57	54.00	-18.43	Average
2500.000	35.36	27.40	3.60	35.70	30.66	54.00	-23.34	Average

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



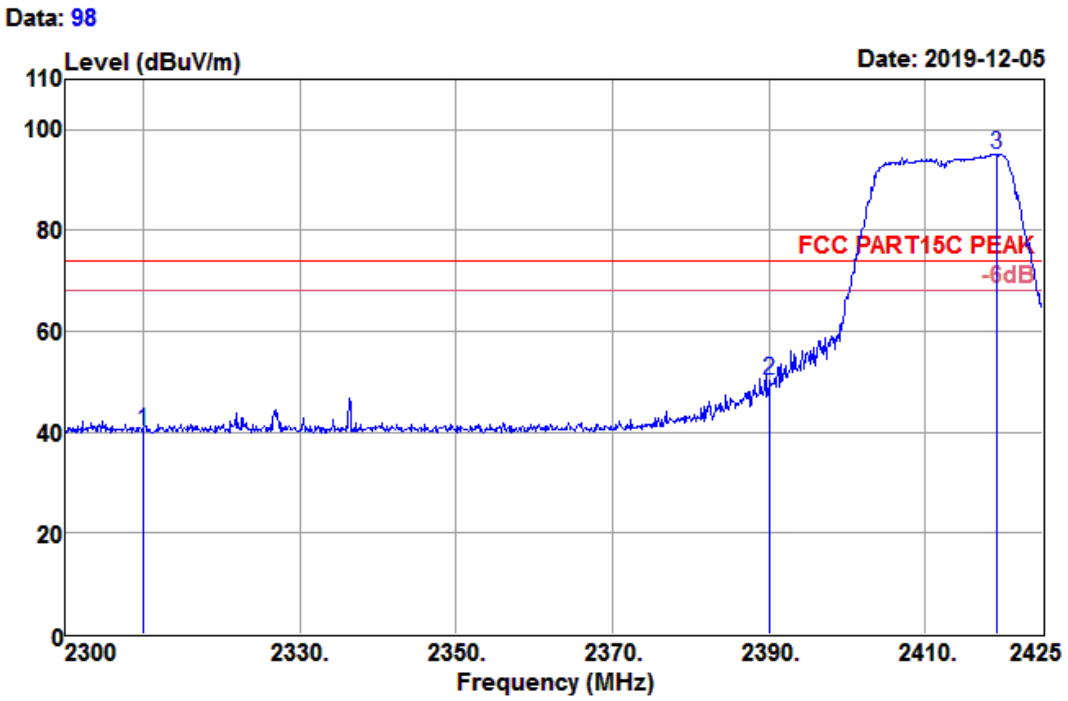
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	45.57	26.91	3.48	35.43	40.53	74.00	-33.47	Peak
2390.000	54.46	27.11	3.53	35.55	49.55	74.00	-24.45	Peak
2417.375	99.11	27.19	3.55	35.58	94.27	74.00	20.27	Peak

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



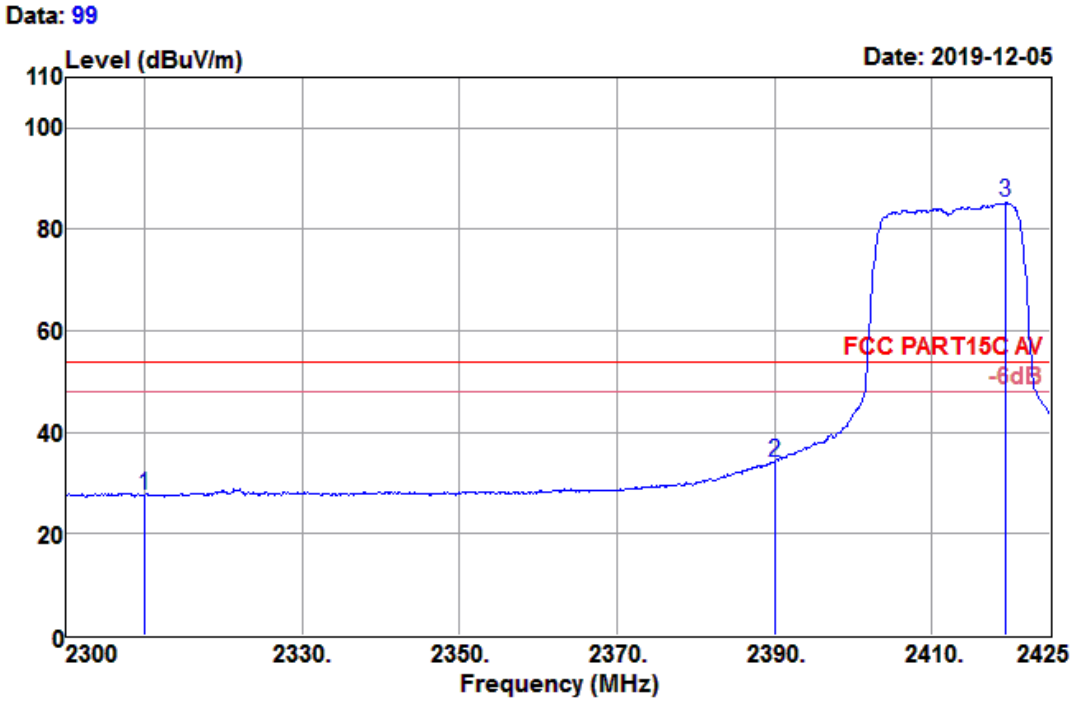
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	32.73	26.91	3.48	35.43	27.69	54.00	-26.31	Average
2390.000	38.32	27.11	3.53	35.55	33.41	54.00	-20.59	Average
2419.500	88.99	27.19	3.55	35.59	84.14	54.00	30.14	Average

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



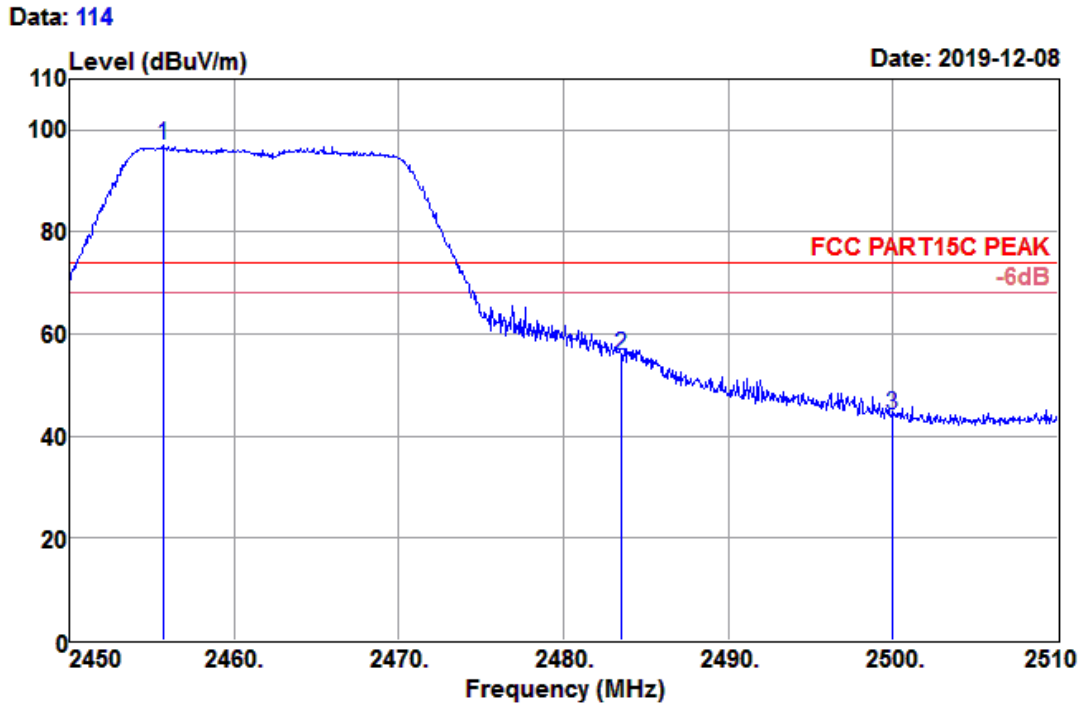
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	45.44	26.91	3.48	35.43	40.40	74.00	-33.60	Peak
2390.000	55.13	27.11	3.53	35.55	50.22	74.00	-23.78	Peak
2419.125	100.04	27.19	3.55	35.59	95.19	74.00	21.19	Peak

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



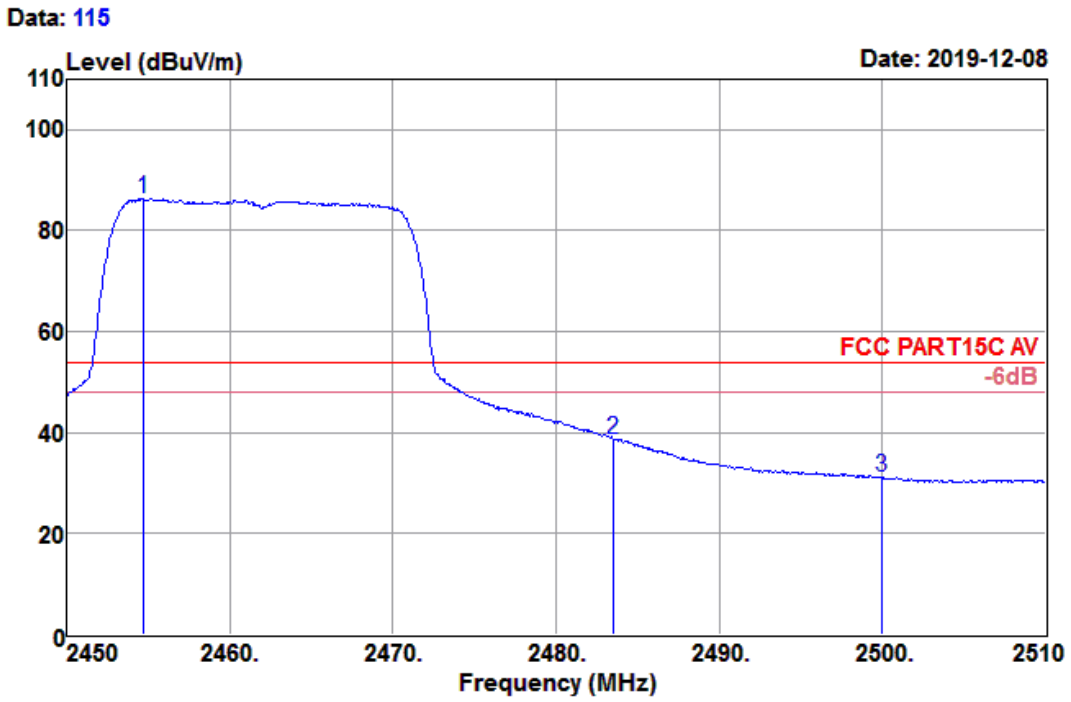
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	32.53	26.91	3.48	35.43	27.49	54.00	-26.51	Average
2390.000	39.05	27.11	3.53	35.55	34.14	54.00	-19.86	Average
2419.375	90.21	27.19	3.55	35.59	85.36	54.00	31.36	Average

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



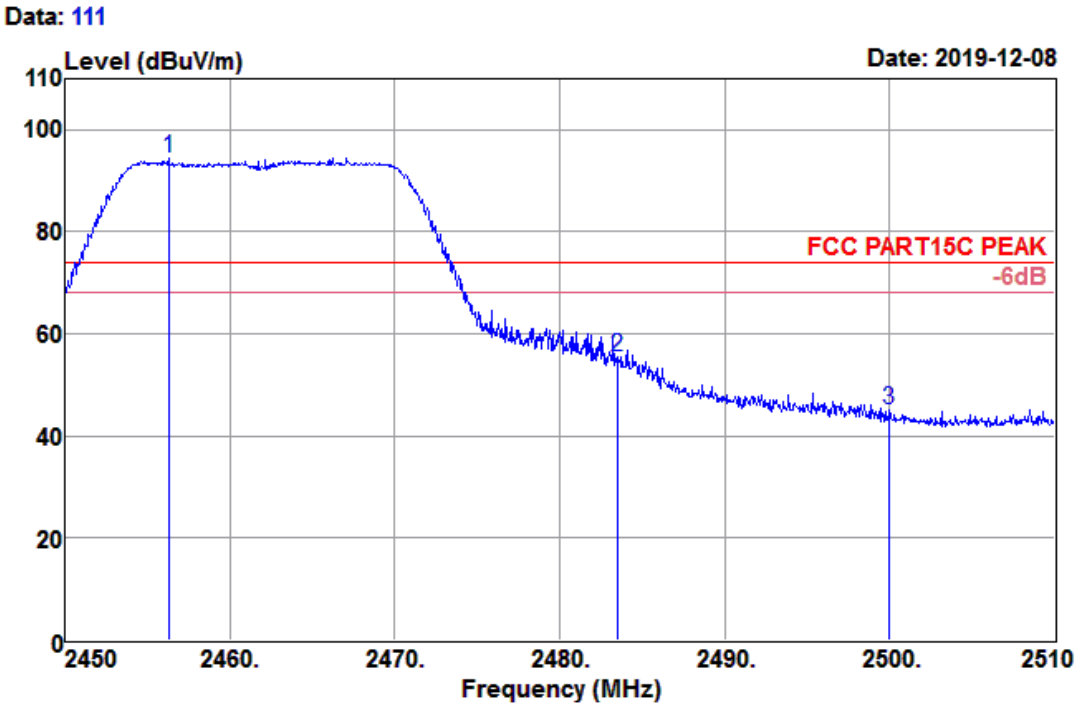
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2455.700	101.72	27.28	3.57	35.64	96.93	74.00	22.93	Peak
2483.500	60.43	27.36	3.59	35.68	55.70	74.00	-18.30	Peak
2500.000	48.94	27.40	3.60	35.70	44.24	74.00	-29.76	Peak

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



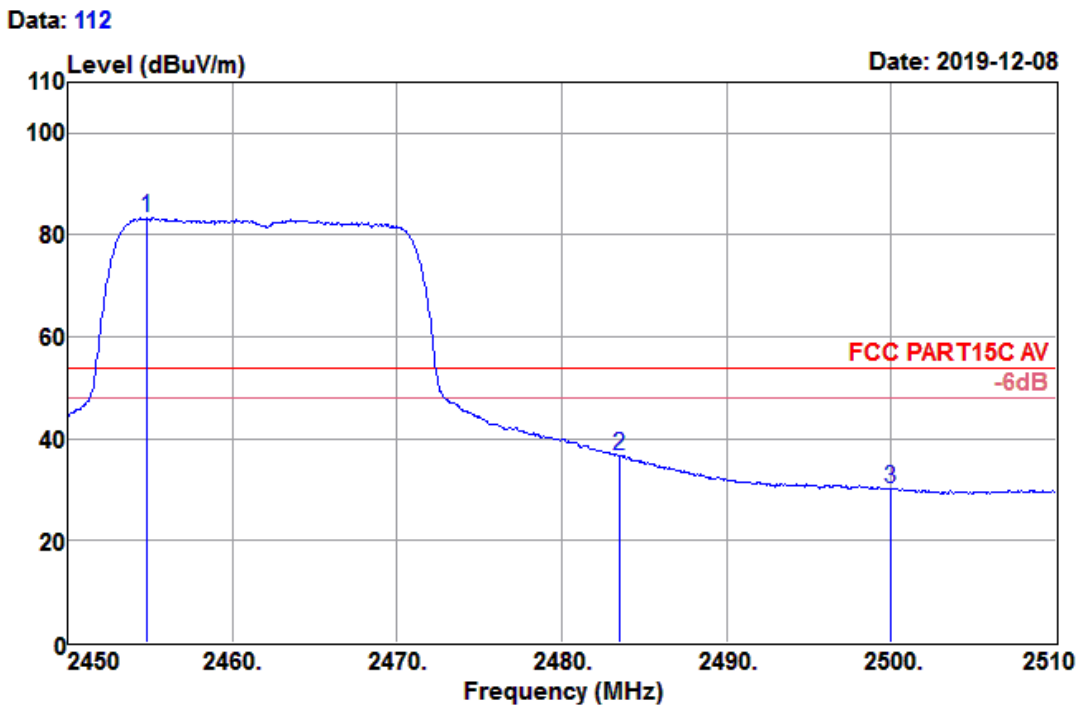
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2454.680	91.17	27.28	3.57	35.64	86.38	54.00	32.38	Average
2483.500	43.51	27.36	3.59	35.68	38.78	54.00	-15.22	Average
2500.000	35.77	27.40	3.60	35.70	31.07	54.00	-22.93	Average

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



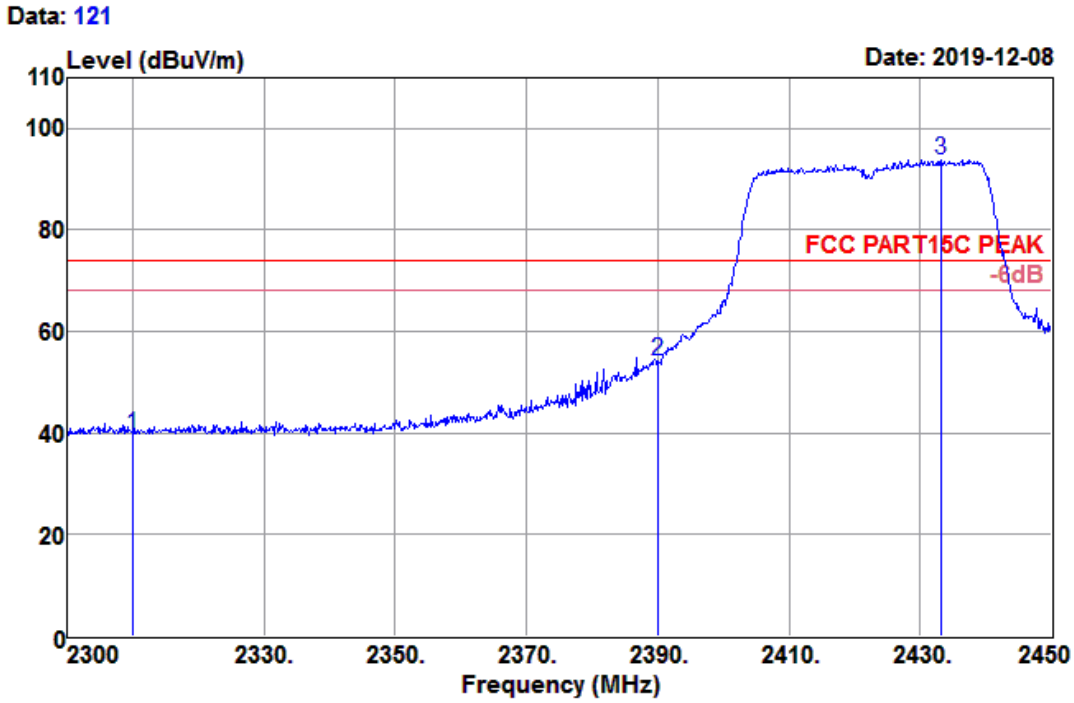
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2456.300	99.30	27.29	3.57	35.64	94.52	74.00	20.52	Peak
2483.500	60.26	27.36	3.59	35.68	55.53	74.00	-18.47	Peak
2500.000	49.83	27.40	3.60	35.70	45.13	74.00	-28.87	Peak

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



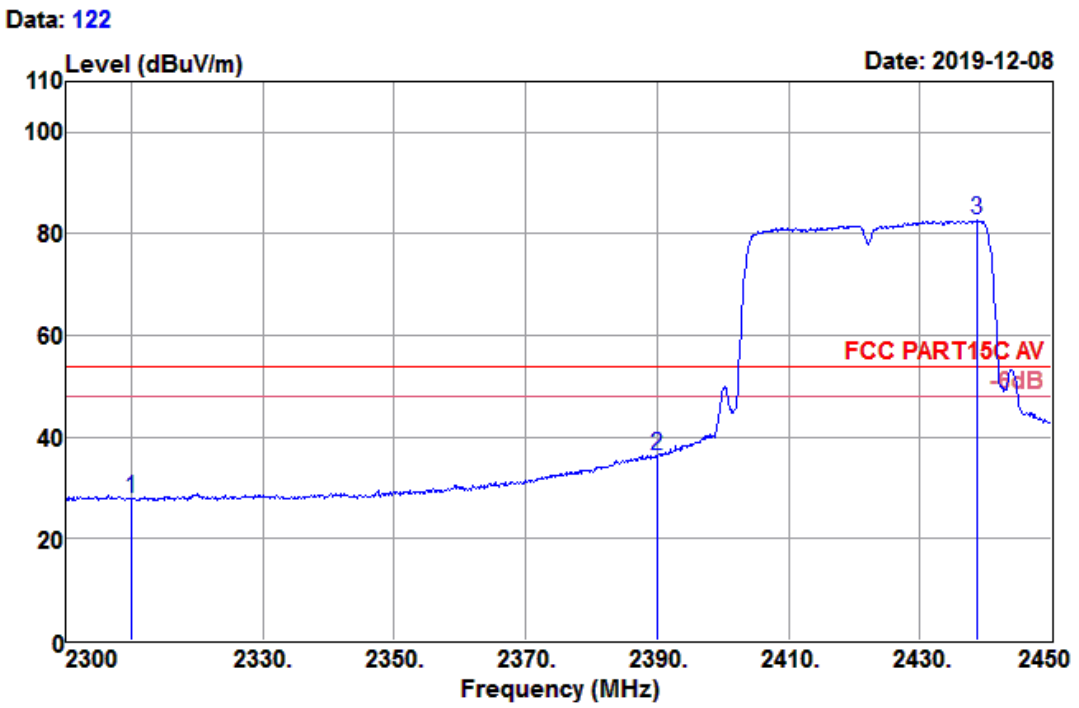
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2454.860	88.08	27.28	3.57	35.64	83.29	54.00	29.29	Average
2483.500	41.30	27.36	3.59	35.68	36.57	54.00	-17.43	Average
2500.000	34.85	27.40	3.60	35.70	30.15	54.00	-23.85	Average

Test Mode :	802.11n HT40 CH03 (2422 MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	2.3GHz~2.45GHz	**Polarization :**	Horizontal



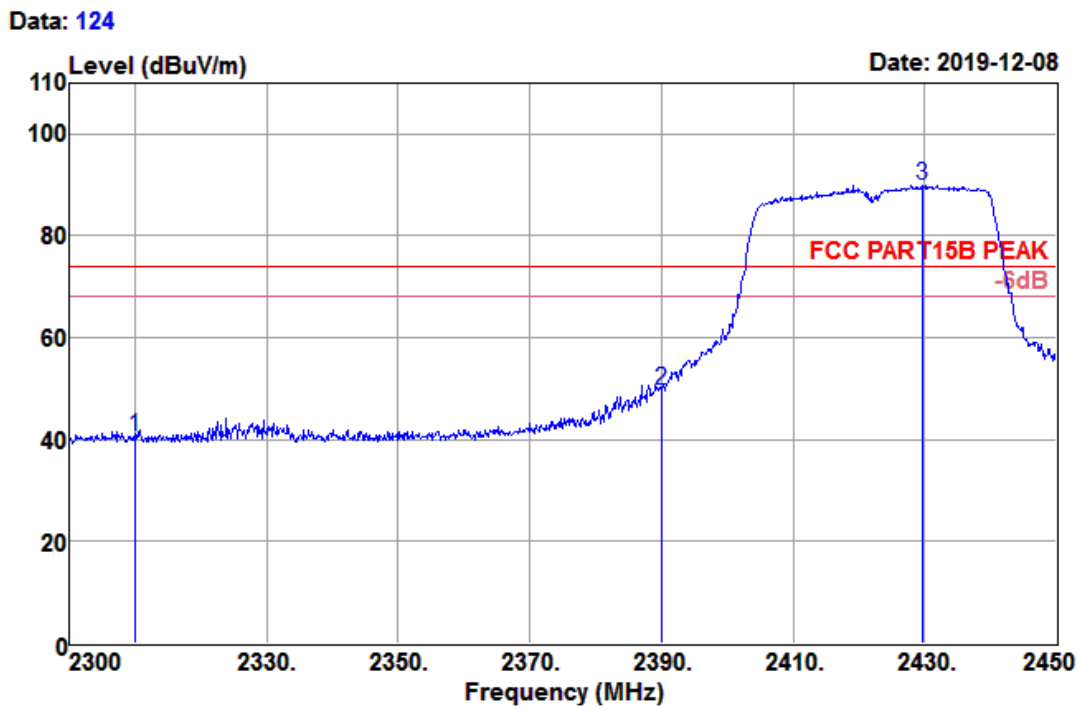
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	44.75	26.91	3.48	35.43	39.71	74.00	-34.29	Peak
2390.000	59.03	27.11	3.53	35.55	54.12	74.00	-19.88	Peak
2433.200	98.64	27.23	3.56	35.61	93.82	74.00	19.82	Peak

Test Mode :	802.11n HT40 CH03 (2422 MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	2.3GHz~2.45GHz	**Polarization :**	Horizontal



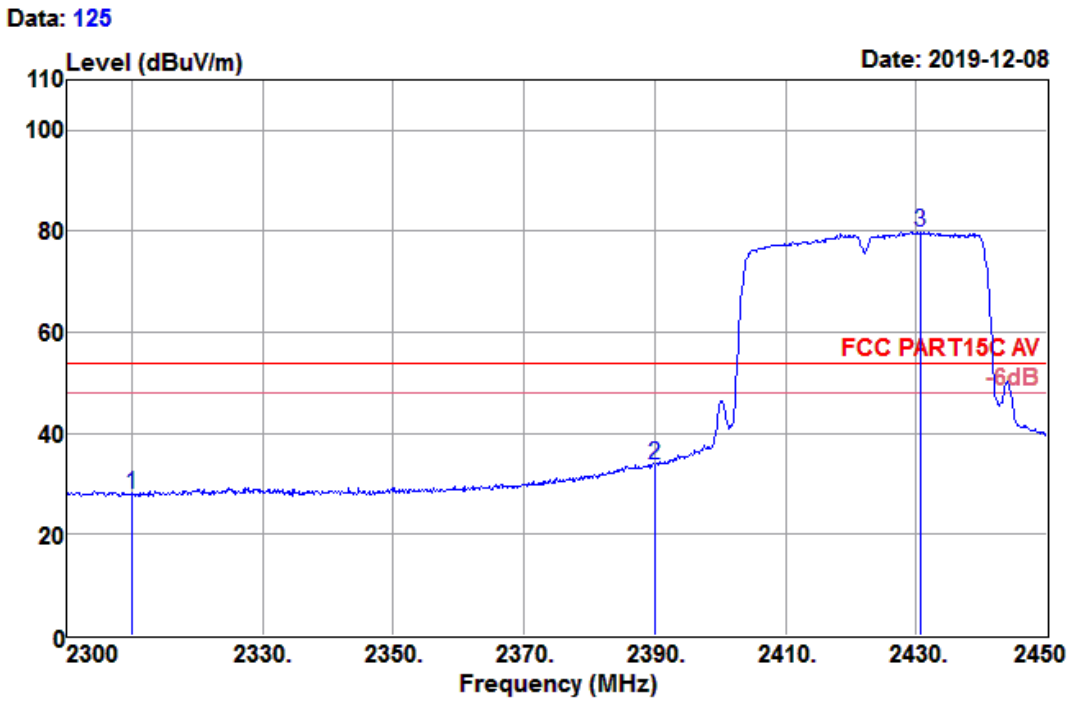
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	33.00	26.91	3.48	35.43	27.96	54.00	-26.04	Average
2390.000	41.28	27.11	3.53	35.55	36.37	54.00	-17.63	Average
2438.600	87.43	27.24	3.56	35.61	82.62	54.00	28.62	Average

Test Mode :	802.11n HT40 CH03 (2422 MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	2.3GHz~2.45GHz	**Polarization :**	Vertical



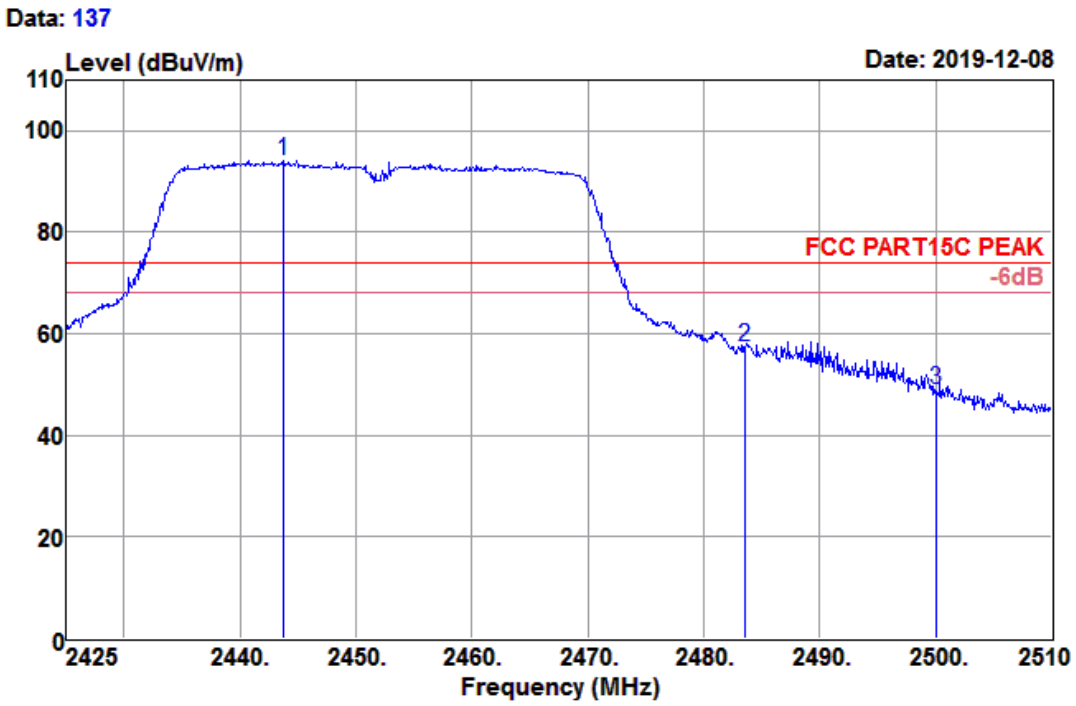
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	45.63	26.91	3.48	35.43	40.59	74.00	-33.41	Peak
2390.000	54.51	27.11	3.53	35.55	49.60	74.00	-24.40	Peak
2429.600	94.82	27.22	3.56	35.60	90.00	74.00	16.00	Peak

Test Mode :	802.11n HT40 CH03 (2422 MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	2.3GHz~2.45GHz	**Polarization :**	Vertical



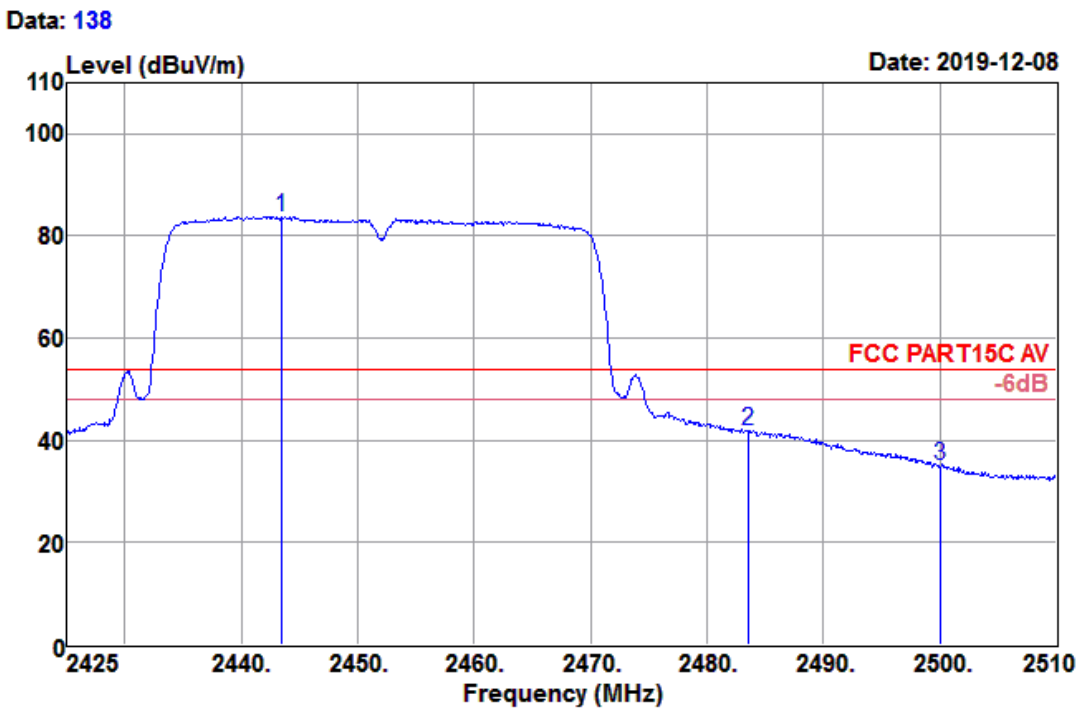
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	32.93	26.91	3.48	35.43	27.89	54.00	-26.11	Average
2390.000	38.71	27.11	3.53	35.55	33.80	54.00	-20.20	Average
2430.800	84.70	27.22	3.56	35.60	79.88	54.00	25.88	Average

Test Mode :	802.11n HT40 CH09 (2452 MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	2.425GHz~2.51GHz	**Polarization :**	Horizontal



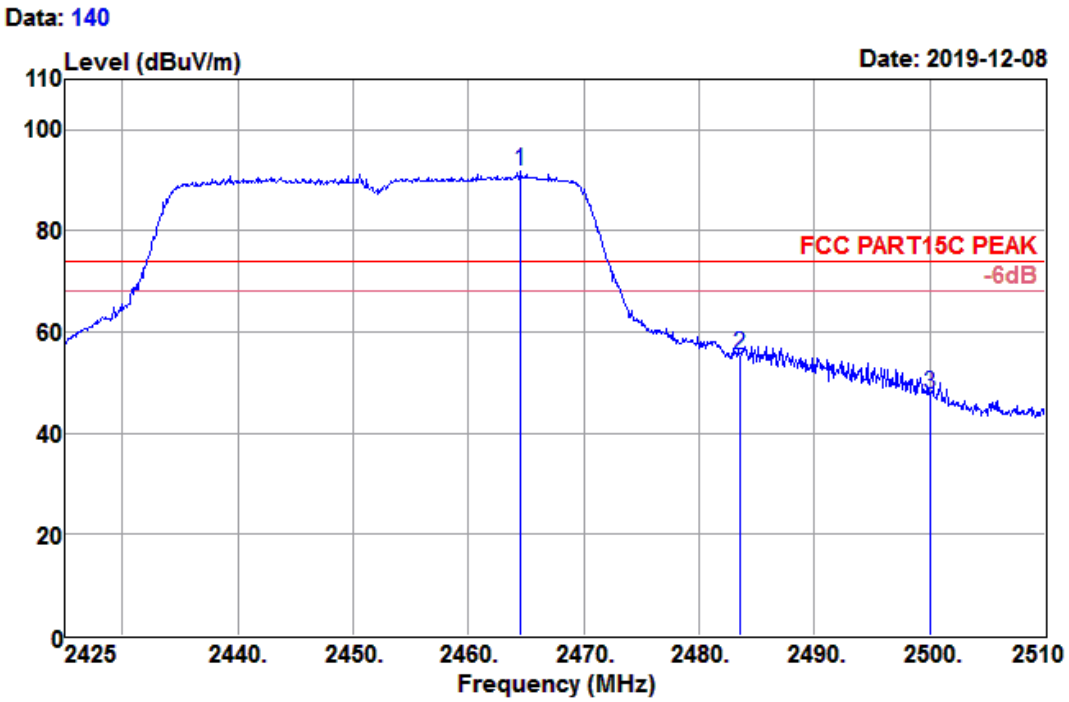
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2443.700	98.90	27.25	3.57	35.62	94.10	74.00	20.10	Peak
2483.500	62.05	27.36	3.59	35.68	57.32	74.00	-16.68	Peak
2500.000	53.80	27.40	3.60	35.70	49.10	74.00	-24.90	Peak

Test Mode :	802.11n HT40 CH09 (2452 MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	2.425GHz~2.51GHz	**Polarization :**	Horizontal



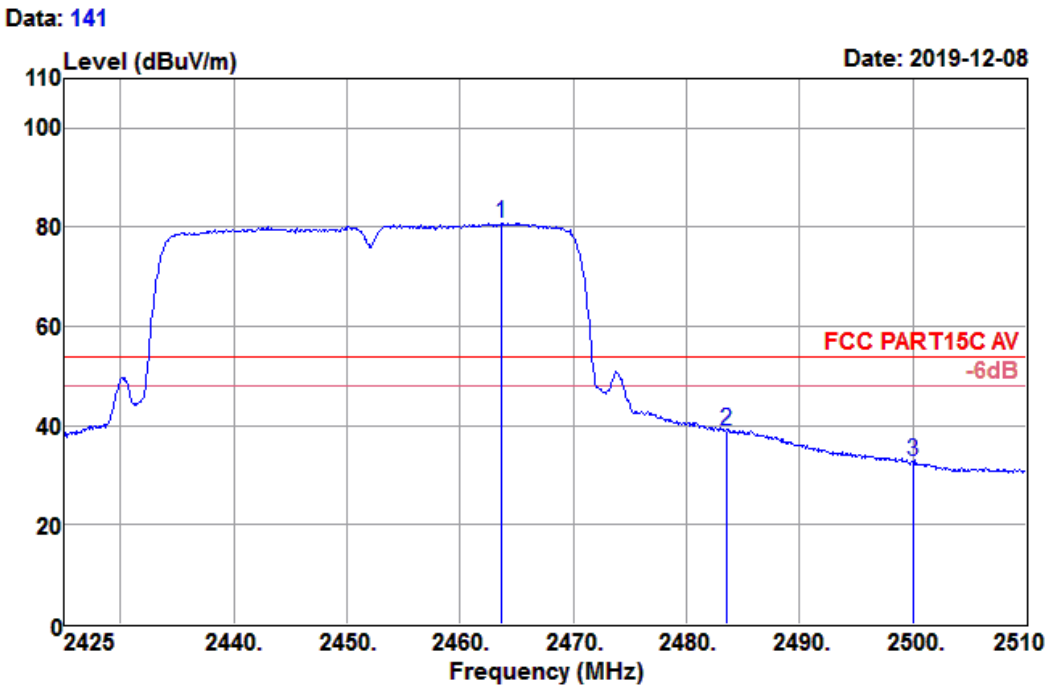
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2443.530	88.52	27.25	3.57	35.62	83.72	54.00	29.72	Average
2483.500	46.62	27.36	3.59	35.68	41.89	54.00	-12.11	Average
2500.000	39.64	27.40	3.60	35.70	34.94	54.00	-19.06	Average

Test Mode :	802.11n HT40 CH09 (2452 MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	2.425GHz~2.51GHz	**Polarization :**	Vertical



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
2464.440	96.70	27.31	3.58	35.65	91.94	74.00	17.94	Peak
2483.500	60.33	27.36	3.59	35.68	55.60	74.00	-18.40	Peak
2500.000	52.48	27.40	3.60	35.70	47.78	74.00	-26.22	Peak

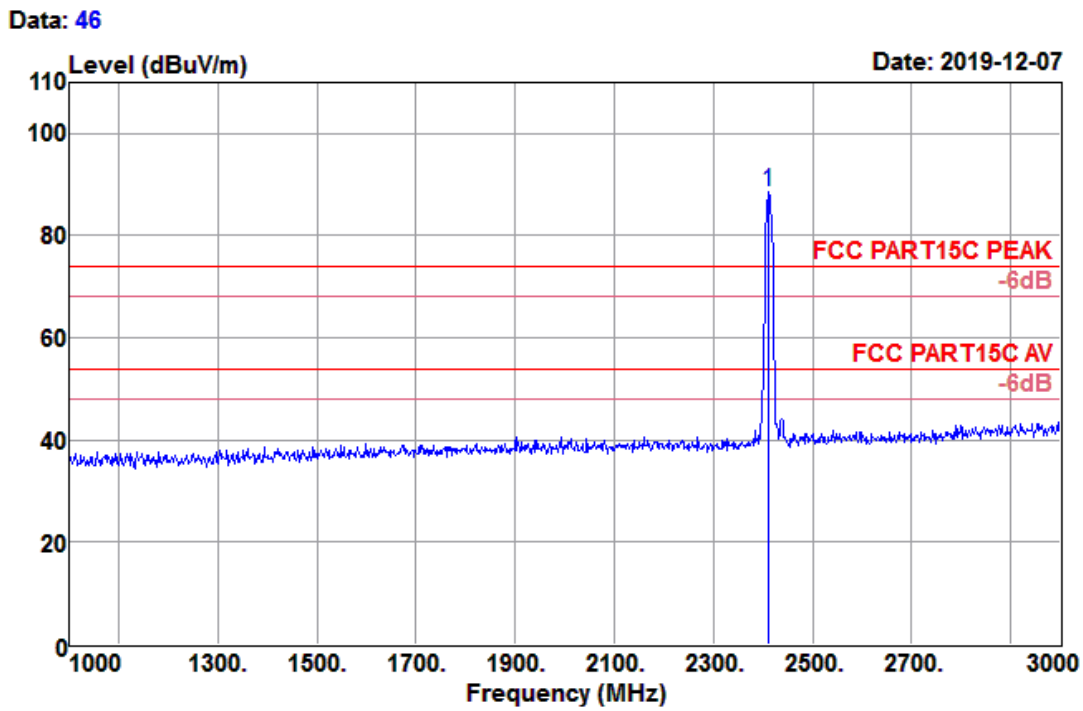
Test Mode :	802.11n HT40 CH09 (2452 MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	2.425GHz~2.51GHz	**Polarization :**	Vertical



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
2463.675	85.60	27.31	3.58	35.65	80.84	54.00	26.84	Average
2483.500	43.70	27.36	3.59	35.68	38.97	54.00	-15.03	Average
2500.000	37.65	27.40	3.60	35.70	32.95	54.00	-21.05	Average

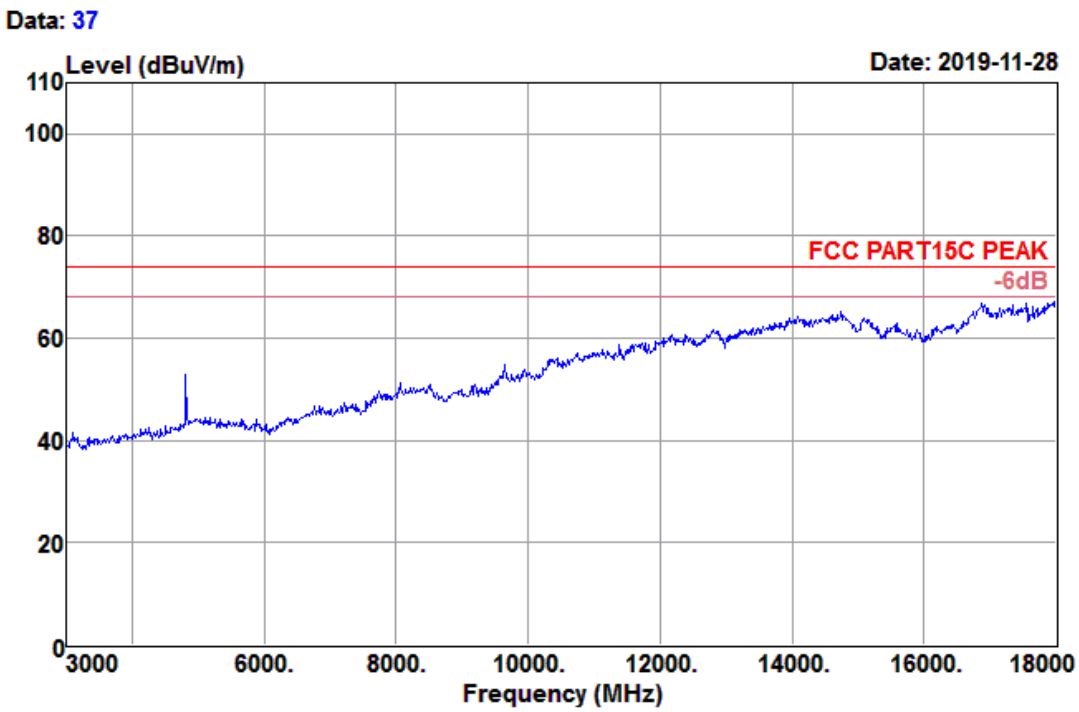
4.5.5 Test Result of Radiated Spurious Emission (1GHz ~ 10th Harmonic)

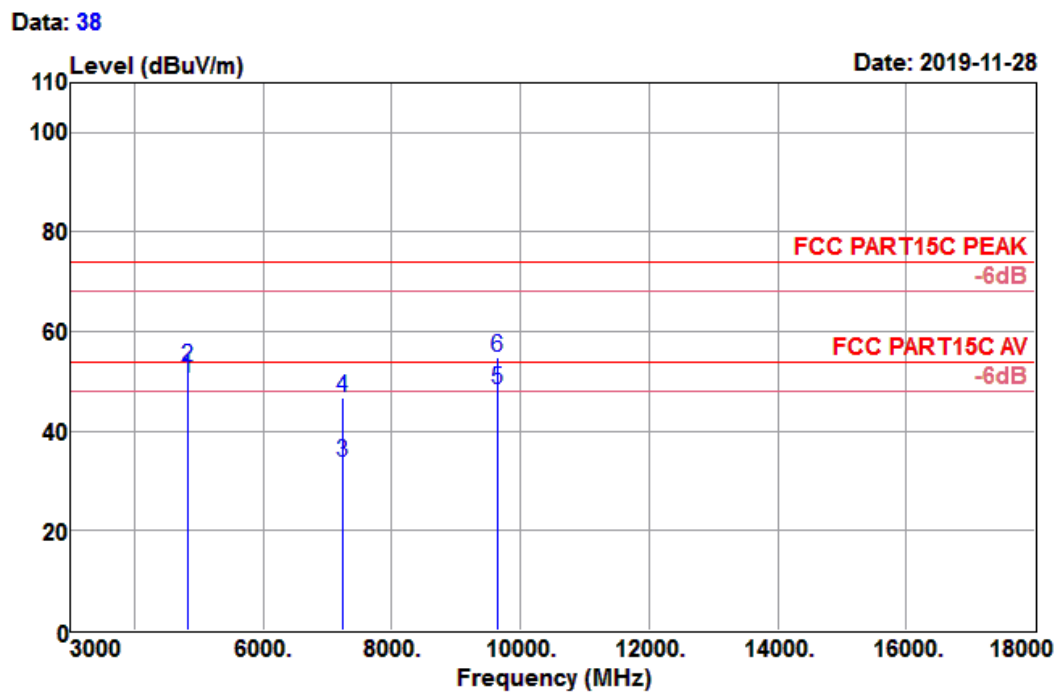
Test Mode :	802.11b CH01 (2412 MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	1GHz~3GHz	**Polarization :**	Horizontal



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	93.40	27.17	3.55	35.58	88.54	74.00	14.54	Peak

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

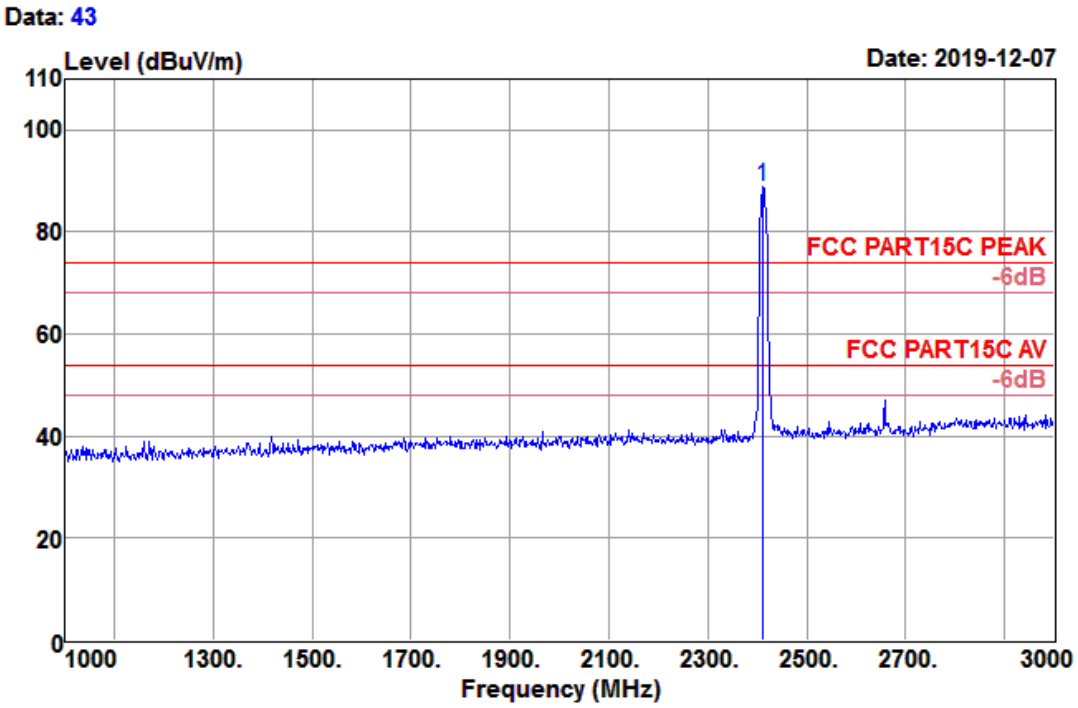




Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4824.000	48.67	31.28	5.56	34.84	50.67	54.00	-3.33	Average
4824.000	50.79	31.28	5.56	34.84	52.79	74.00	-21.21	Peak
7236.000	26.48	35.94	7.61	36.40	33.63	54.00	-20.37	Average
7236.000	39.65	35.94	7.61	36.40	46.80	74.00	-27.20	Peak
9648.000	36.47	37.87	10.41	36.40	48.35	54.00	-5.65	Average
9648.000	43.08	37.87	10.41	36.40	54.96	74.00	-19.04	Peak

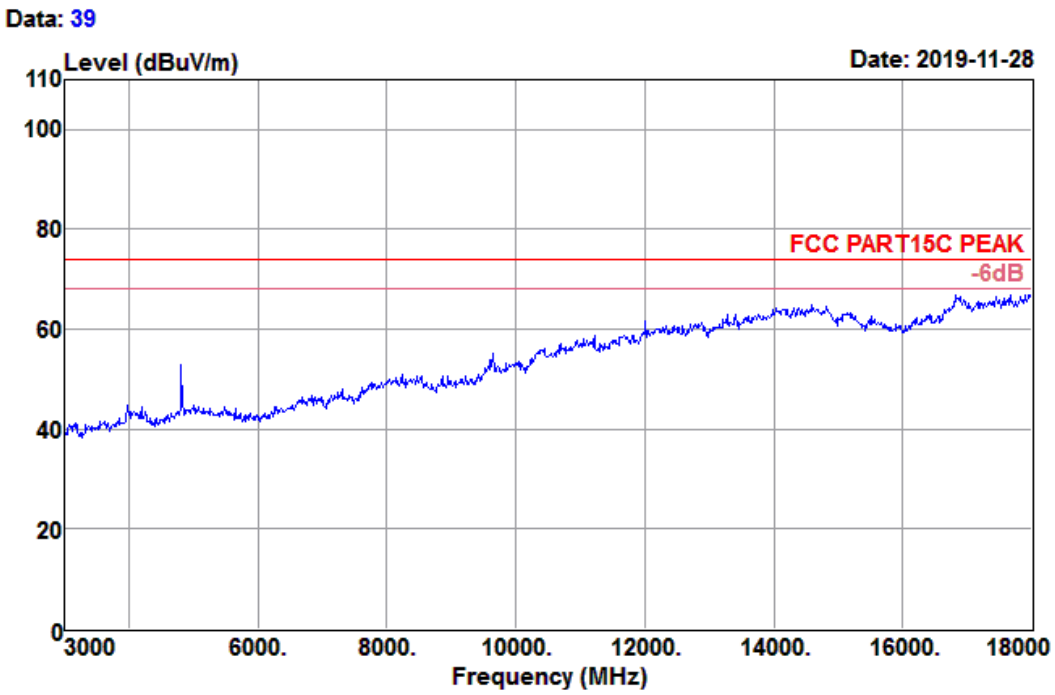
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

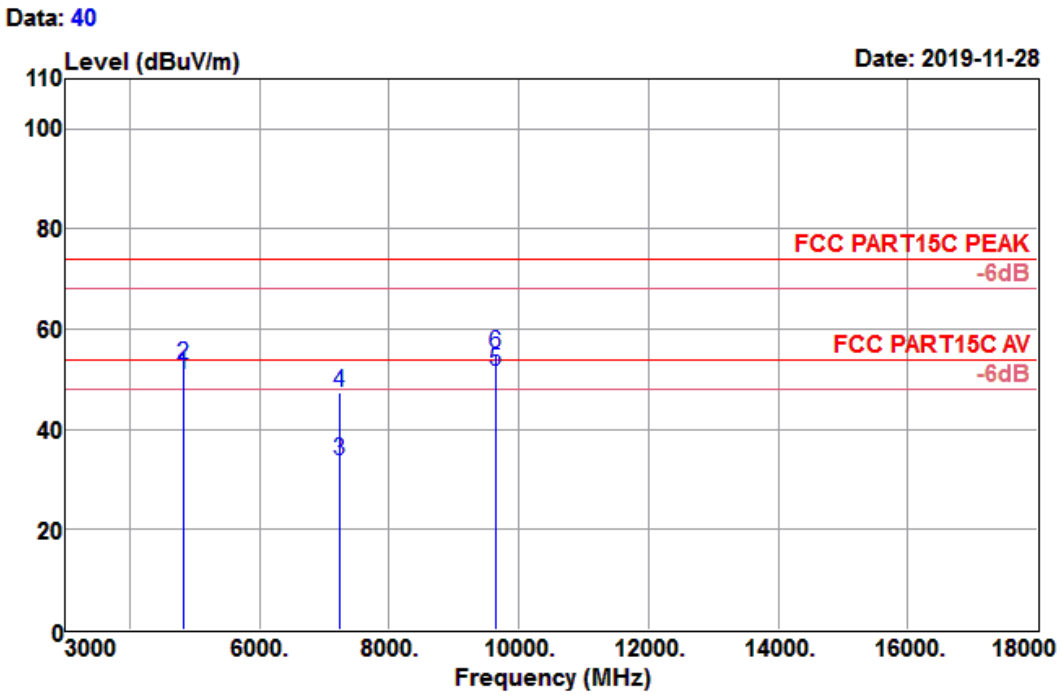
Test Mode :	802.11b CH01 (2412 MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	1GHz~3GHz	**Polarization :**	Vertical



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	93.88	27.17	3.55	35.58	89.02	74.00	15.02	Peak

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

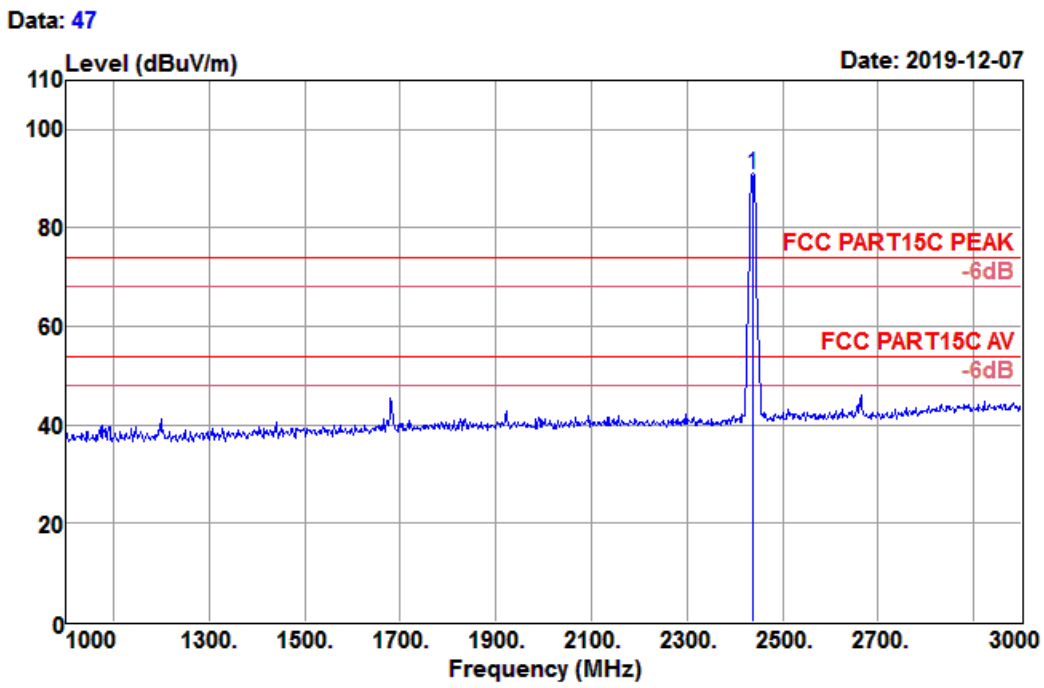




Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4824.000	49.05	31.28	5.56	34.84	51.05	54.00	-2.95	Average
4824.000	50.99	31.28	5.56	34.84	52.99	74.00	-21.01	Peak
7236.000	26.63	35.94	7.61	36.40	33.78	54.00	-20.22	Average
7236.000	40.12	35.94	7.61	36.40	47.27	74.00	-26.73	Peak
9648.000	39.81	37.87	10.41	36.40	51.69	54.00	-2.31	Average
9648.000	43.21	37.87	10.41	36.40	55.09	74.00	-18.91	Peak

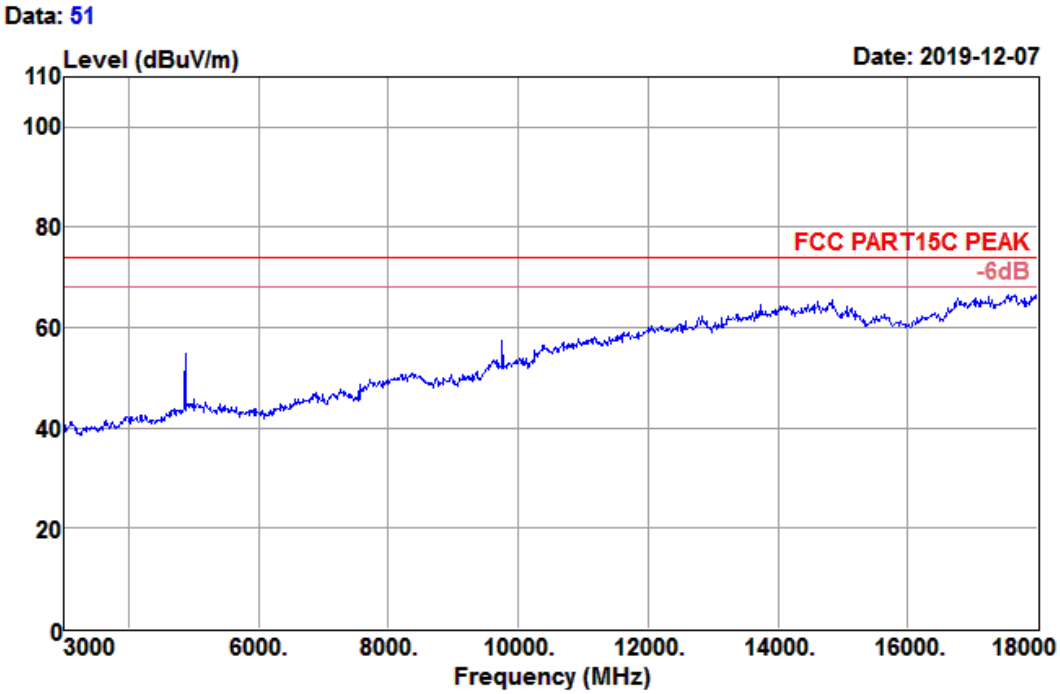
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

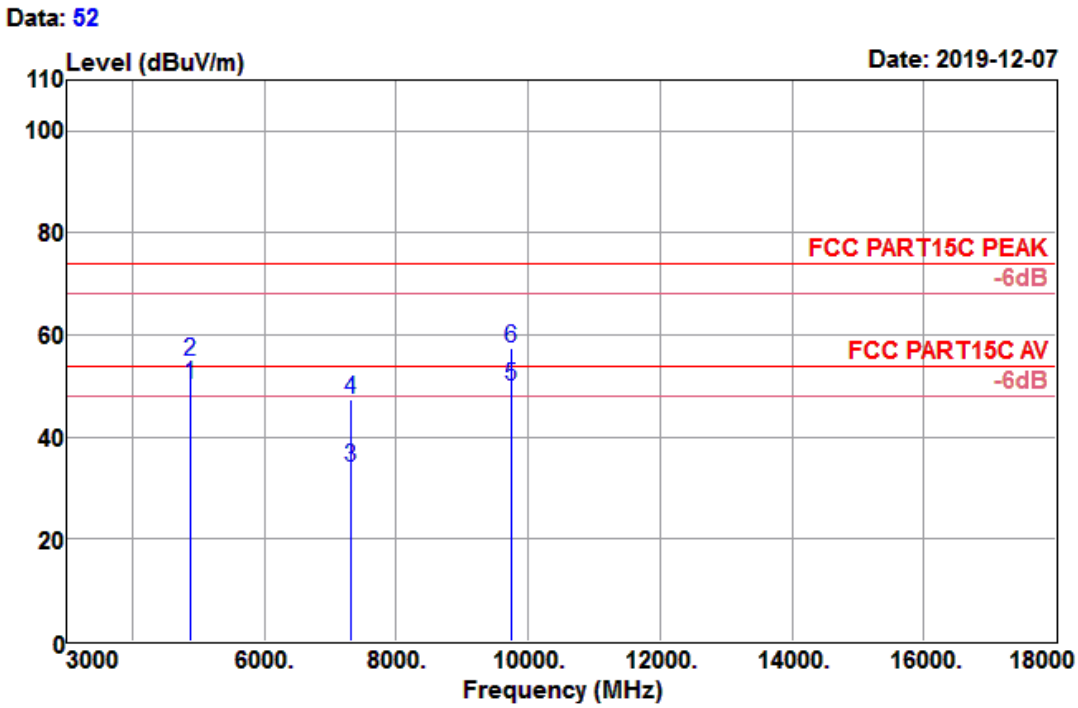
Test Mode :	802.11b CH06 (2437MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	1GHz~3GHz	**Polarization :**	Horizontal



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	95.62	27.24	3.56	35.61	90.81	74.00	16.81	Peak

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

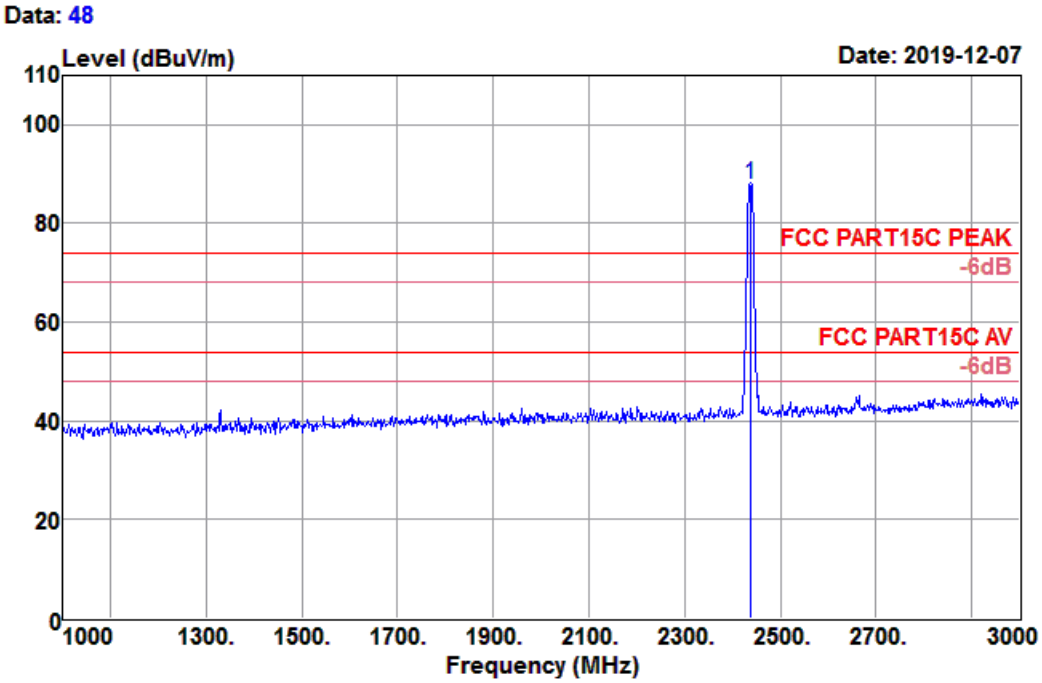




Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4874.000	48.05	31.40	5.55	34.80	50.20	54.00	-3.80	Average
4874.000	52.62	31.40	5.55	34.80	54.77	74.00	-19.23	Peak
7311.000	26.87	36.12	7.53	36.40	34.12	54.00	-19.88	Average
7311.000	40.24	36.12	7.53	36.40	47.49	74.00	-26.51	Peak
9748.000	37.79	38.05	10.70	36.40	50.14	54.00	-3.86	Average
9748.000	45.00	38.05	10.70	36.40	57.35	74.00	-16.65	Peak

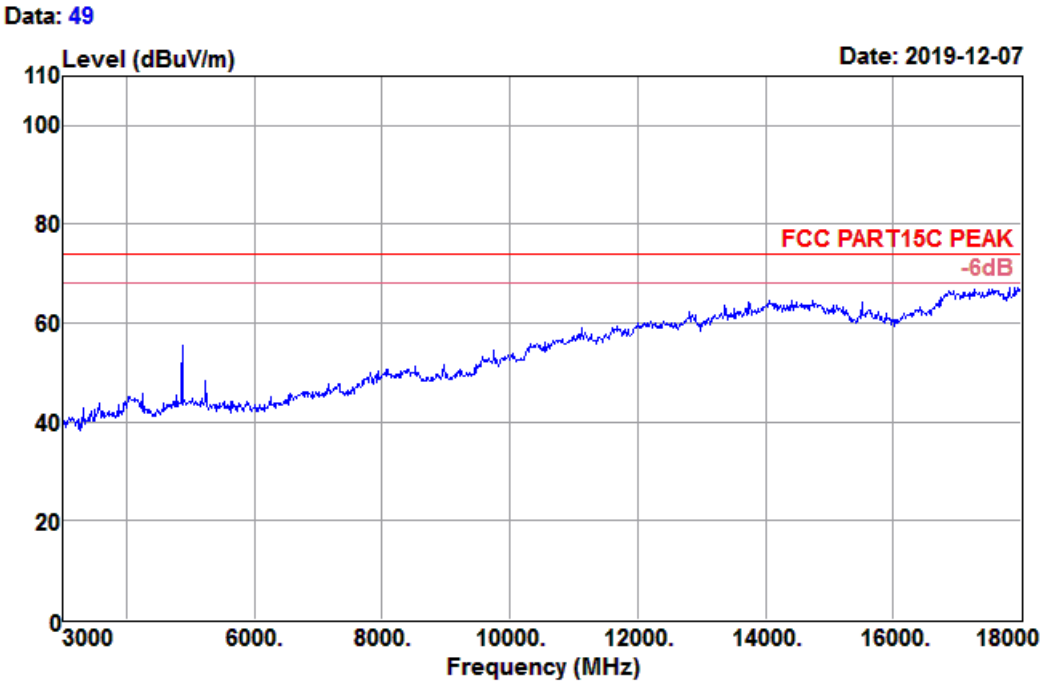
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

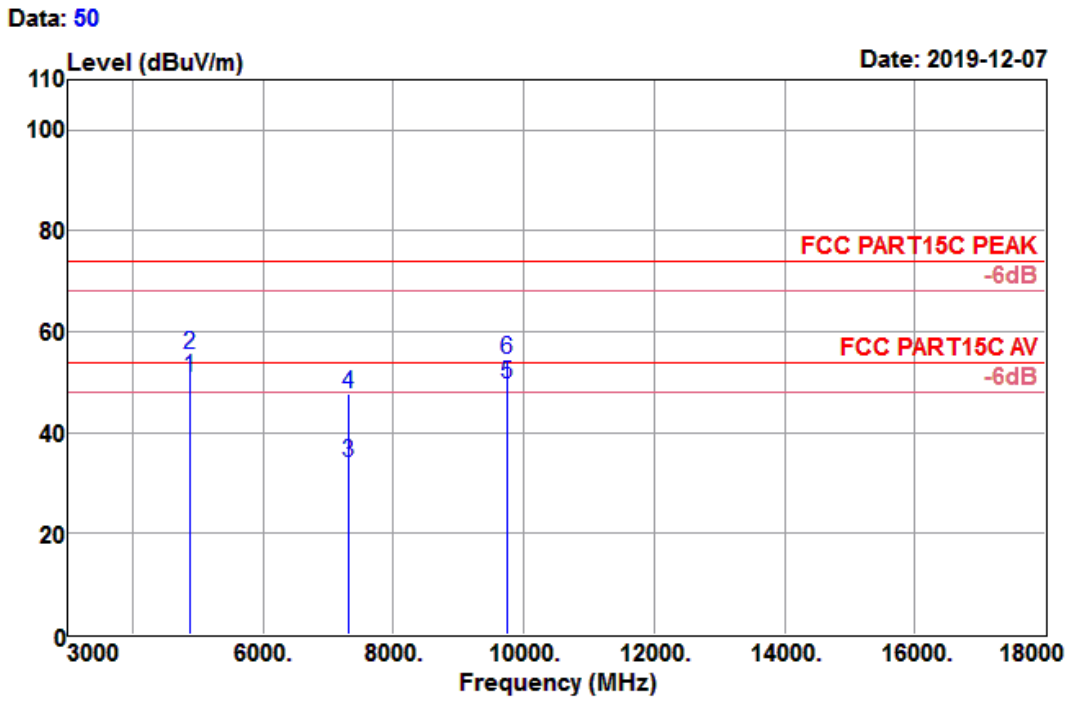
Test Mode :	802.11b CH06 (2437MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	1GHz~3GHz	**Polarization :**	Vertical



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	92.77	27.24	3.56	35.61	87.96	74.00	13.96	Peak

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

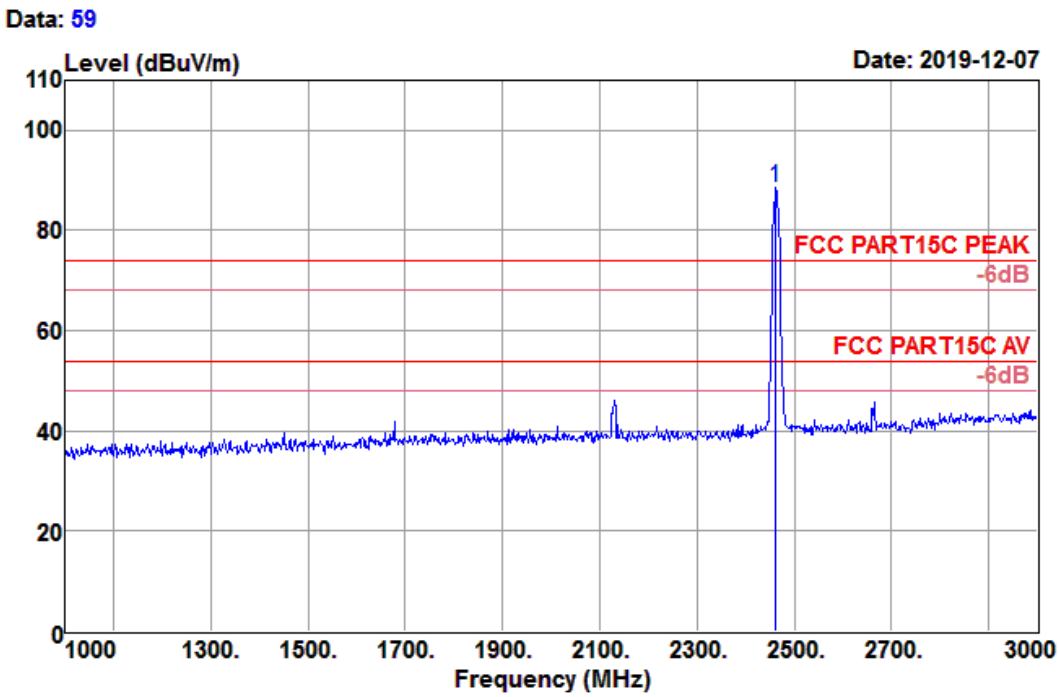




Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4874.000	48.84	31.40	5.55	34.80	50.99	54.00	-3.01	Average
4874.000	53.22	31.40	5.55	34.80	55.37	74.00	-18.63	Peak
7311.000	26.96	36.12	7.53	36.40	34.21	54.00	-19.79	Average
7311.000	40.52	36.12	7.53	36.40	47.77	74.00	-26.23	Peak
9748.000	37.20	38.05	10.70	36.40	49.55	54.00	-4.45	Average
9748.000	42.28	38.05	10.70	36.40	54.63	74.00	-19.37	Peak

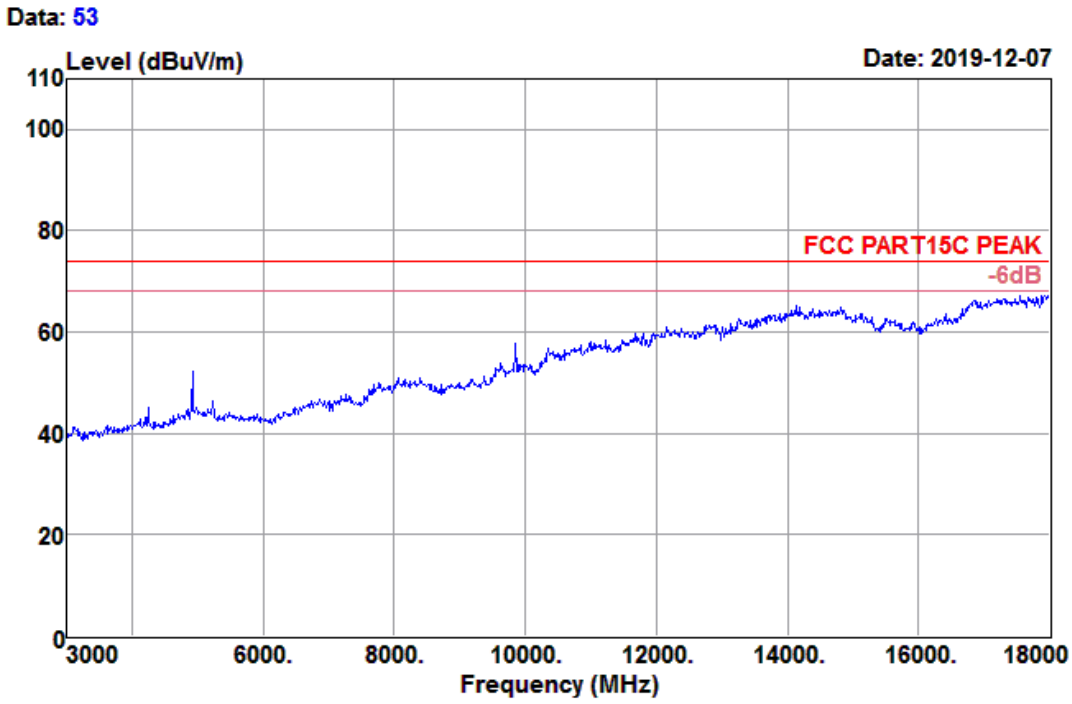
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

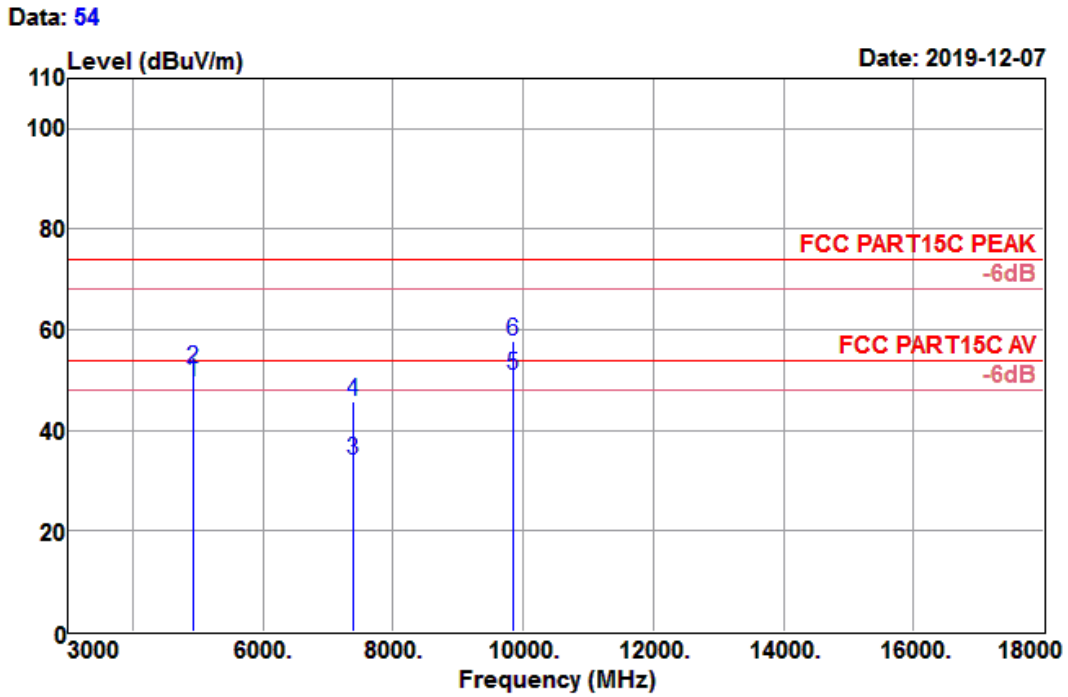
Test Mode :	802.11b CH11 (2462MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	1GHz~3GHz	**Polarization :**	Horizontal



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	93.25	27.30	3.58	35.65	88.48	74.00	14.48	Peak

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

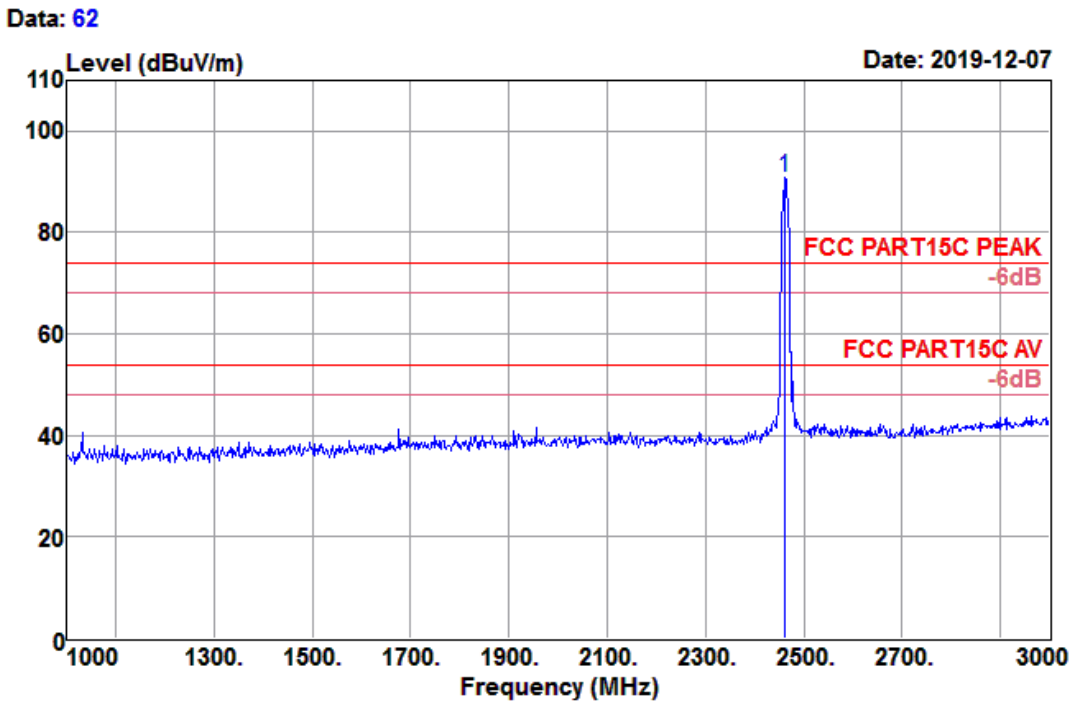




Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4924.000	47.50	31.52	5.53	34.76	49.79	54.00	-4.21	Average
4924.000	49.98	31.52	5.53	34.76	52.27	74.00	-21.73	Peak
7386.000	26.59	36.29	7.46	36.40	33.94	54.00	-20.06	Average
7386.000	38.57	36.29	7.46	36.40	45.92	74.00	-28.08	Peak
9848.000	38.05	38.23	10.98	36.40	50.86	54.00	-3.14	Average
9848.000	44.87	38.23	10.98	36.40	57.68	74.00	-16.32	Peak

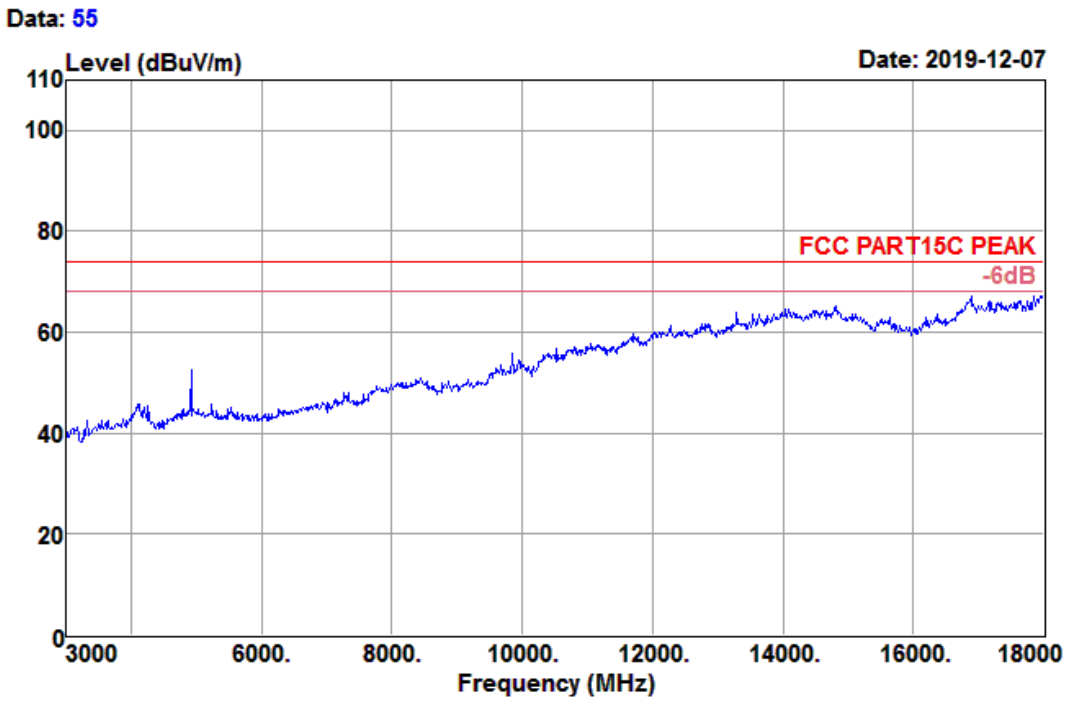
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

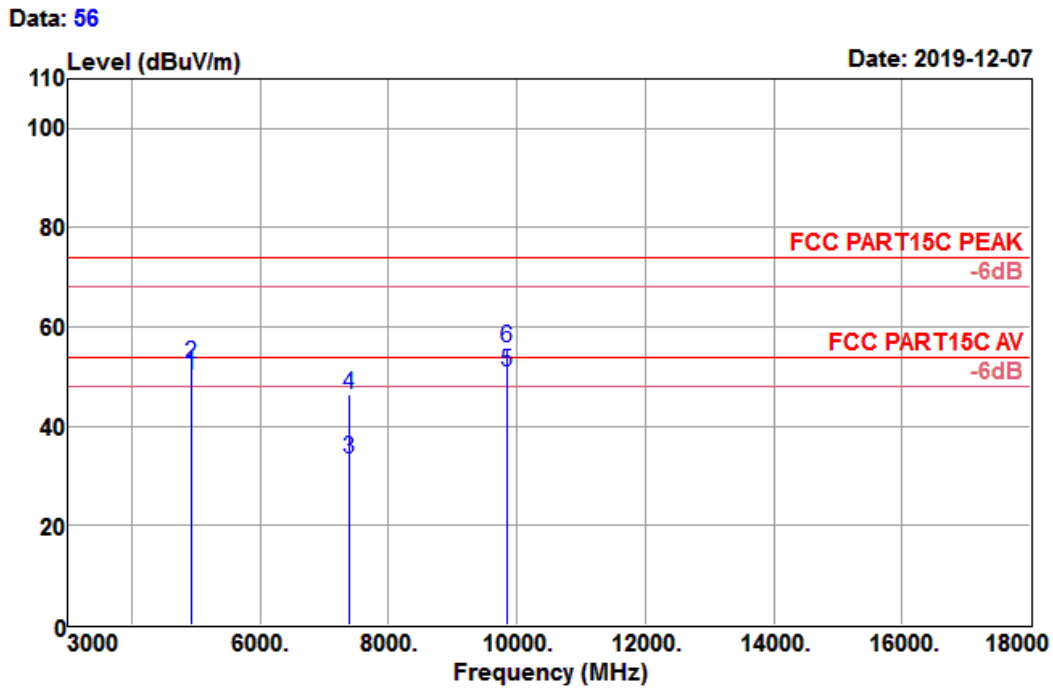
Test Mode :	802.11b CH11 (2462MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	1GHz~3GHz	**Polarization :**	Vertical



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	95.72	27.30	3.58	35.65	90.95	74.00	16.95	Peak

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

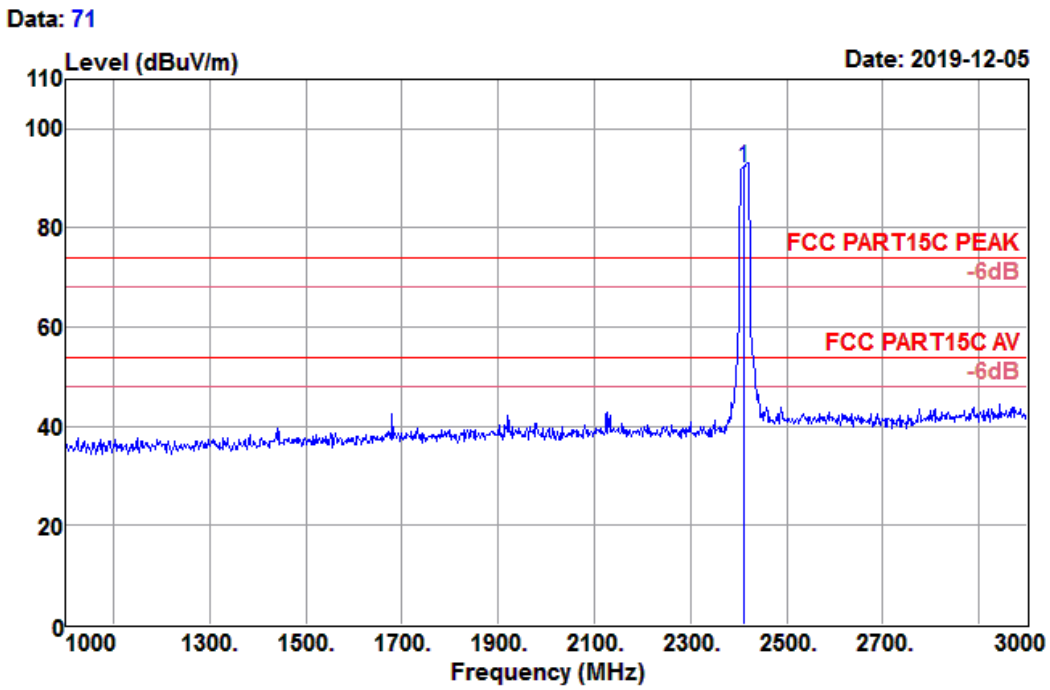




Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4924.000	47.98	31.52	5.53	34.76	50.27	54.00	-3.73	Average
4924.000	50.30	31.52	5.53	34.76	52.59	74.00	-21.41	Peak
7386.000	26.19	36.29	7.46	36.40	33.54	54.00	-20.46	Average
7386.000	39.19	36.29	7.46	36.40	46.54	74.00	-27.46	Peak
9848.000	38.05	38.23	10.98	36.40	50.86	54.00	-3.14	Average
9848.000	42.97	38.23	10.98	36.40	55.78	74.00	-18.22	Peak

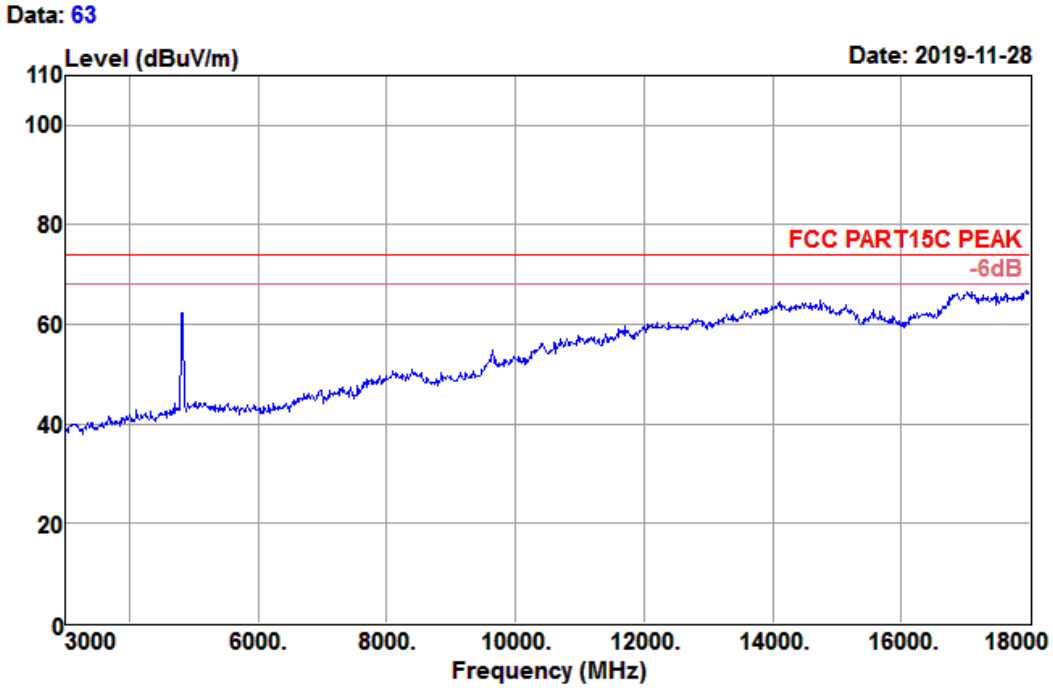
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

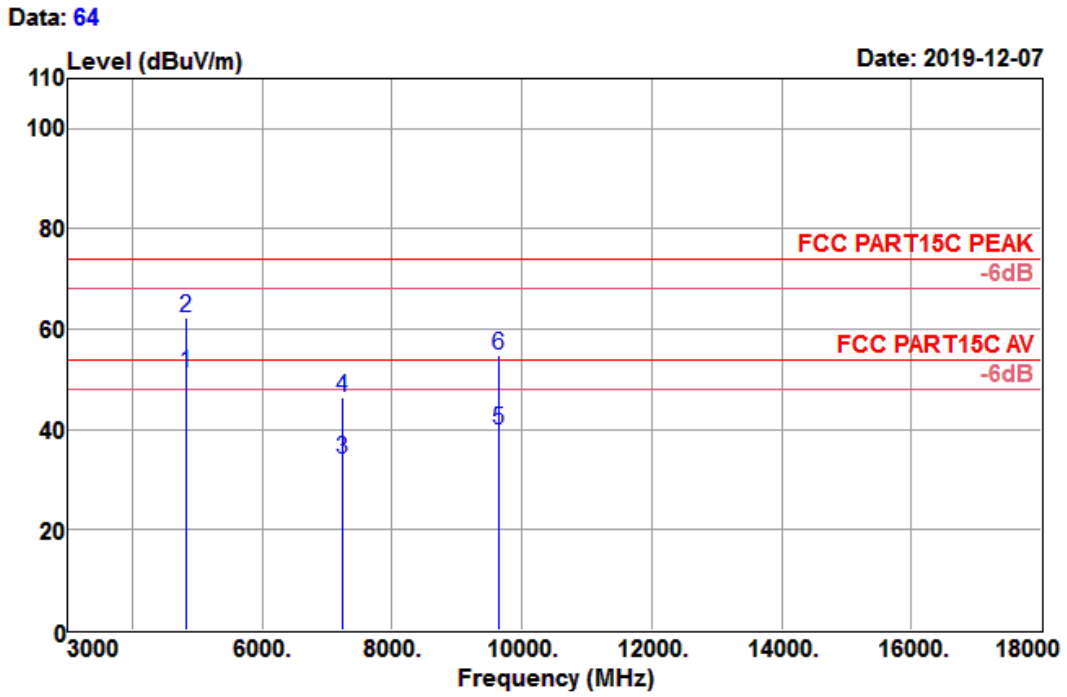
Test Mode :	802.11g CH01 (2412 MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	1GHz~3GHz	**Polarization :**	Horizontal



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	97.12	27.17	3.55	35.58	92.26	74.00	18.26	Peak

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

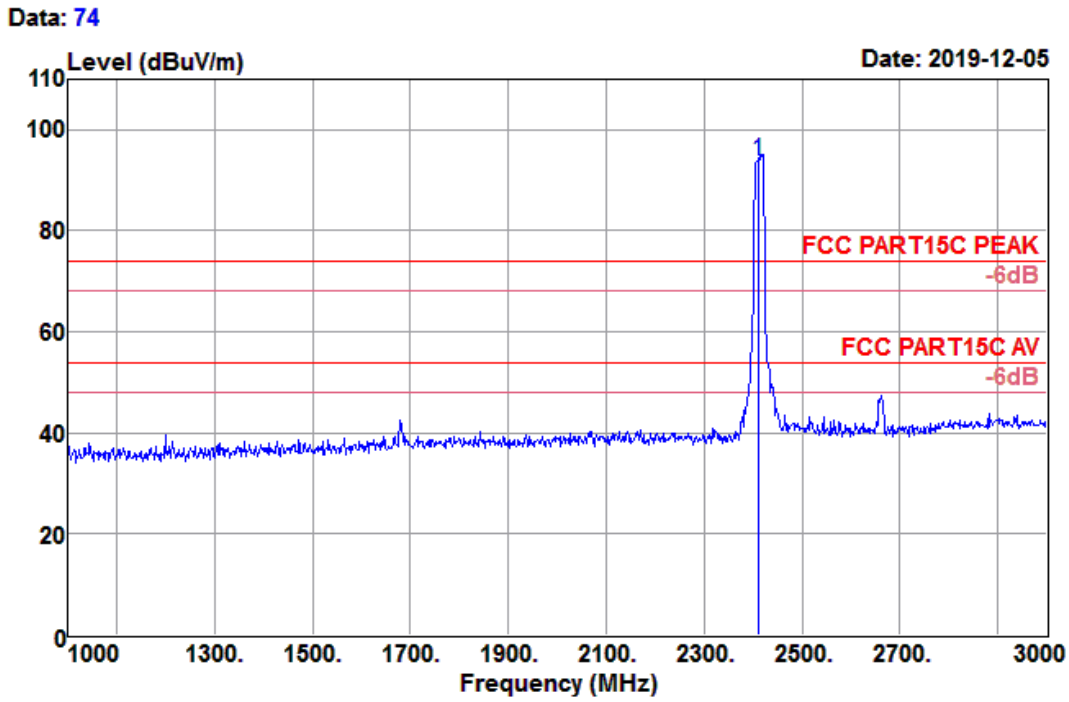




Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4824.000	49.14	31.28	5.56	34.84	51.14	54.00	-2.86	Average
4824.000	60.18	31.28	5.56	34.84	62.18	74.00	-11.82	Peak
7236.000	26.94	35.94	7.61	36.40	34.09	54.00	-19.91	Average
7236.000	39.23	35.94	7.61	36.40	46.38	74.00	-27.62	Peak
9648.000	27.91	37.87	10.41	36.40	39.79	54.00	-14.21	Average
9648.000	43.05	37.87	10.41	36.40	54.93	74.00	-19.07	Peak

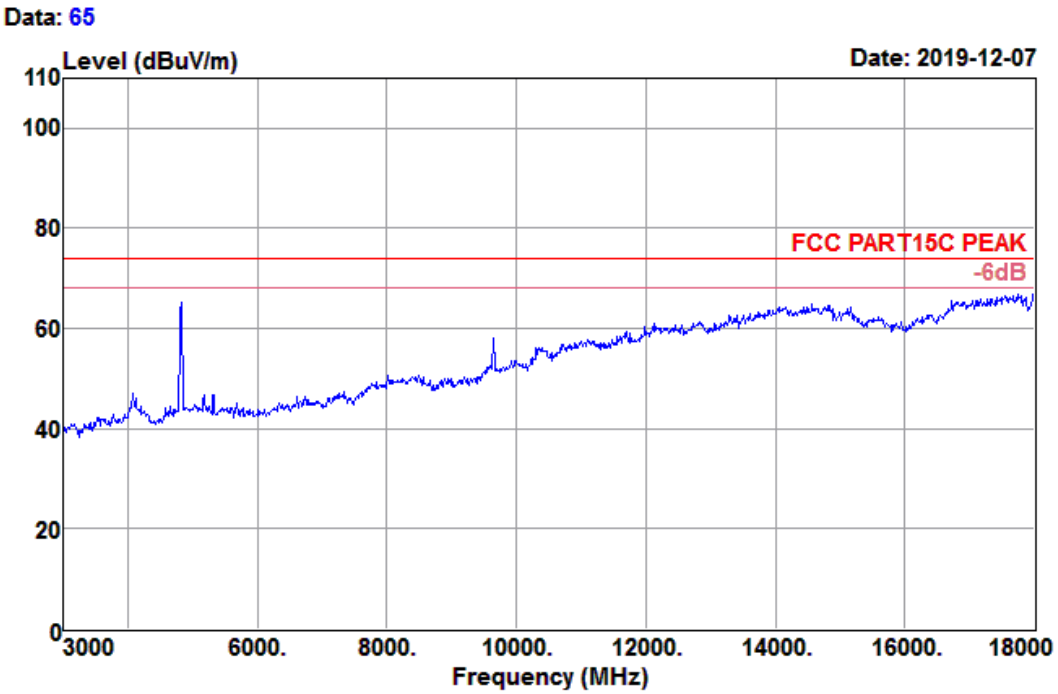
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

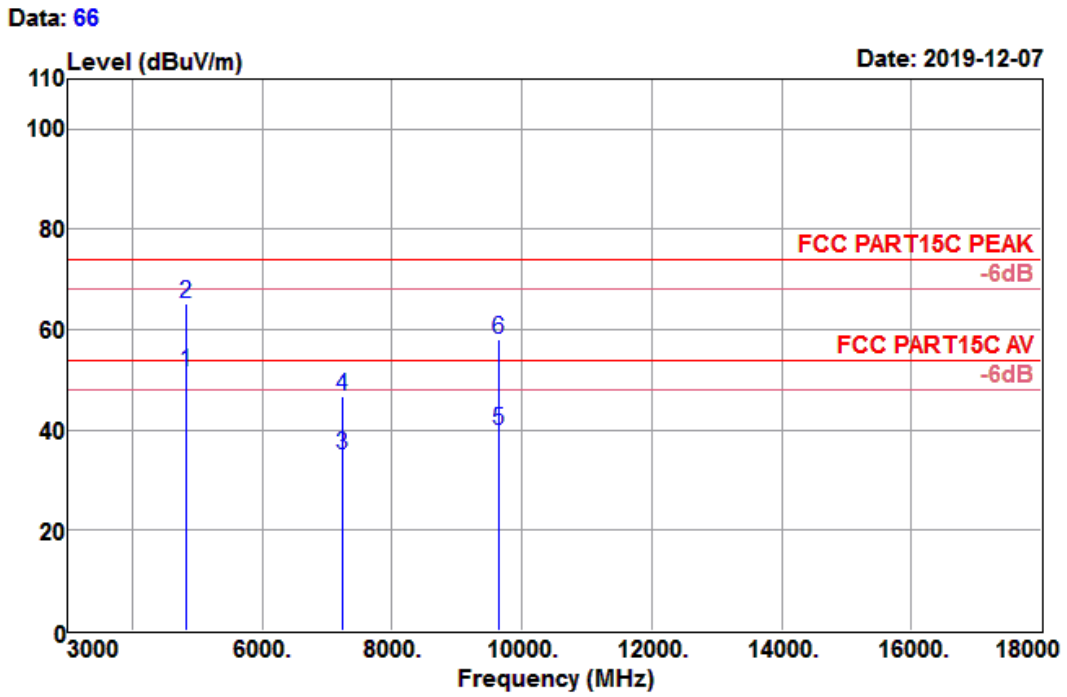
Test Mode :	802.11g CH01 (2412 MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	1GHz~3GHz	**Polarization :**	Vertical



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	98.53	27.17	3.55	35.58	93.67	74.00	19.67	Peak

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

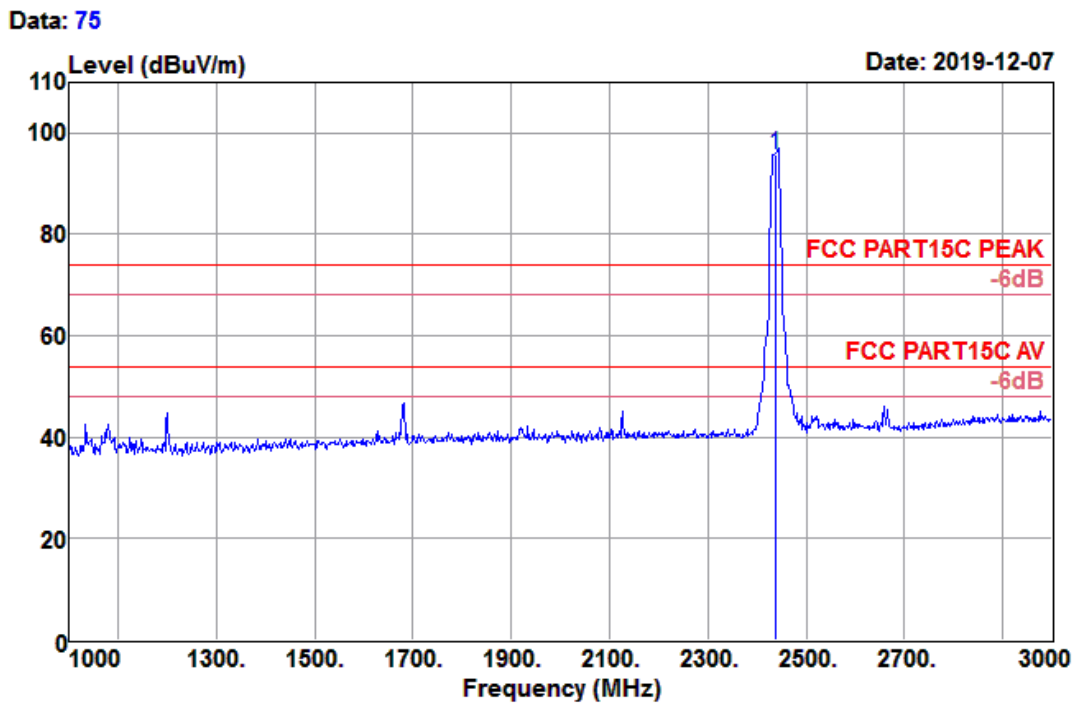




Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4824.000	49.58	31.28	5.56	34.84	51.58	54.00	-2.42	Average
4824.000	63.38	31.28	5.56	34.84	65.38	74.00	-8.62	Peak
7236.000	27.92	35.94	7.61	36.40	35.07	54.00	-18.93	Average
7236.000	39.53	35.94	7.61	36.40	46.68	74.00	-27.32	Peak
9648.000	27.91	37.87	10.41	36.40	39.79	54.00	-14.21	Average
9648.000	46.13	37.87	10.41	36.40	58.01	74.00	-15.99	Peak

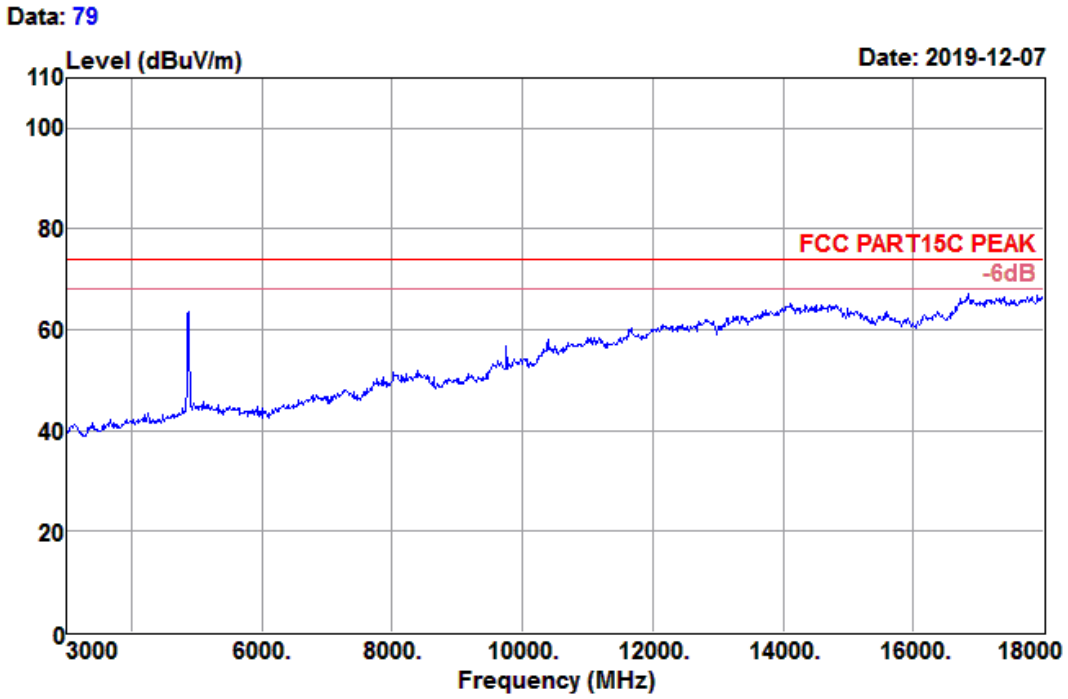
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

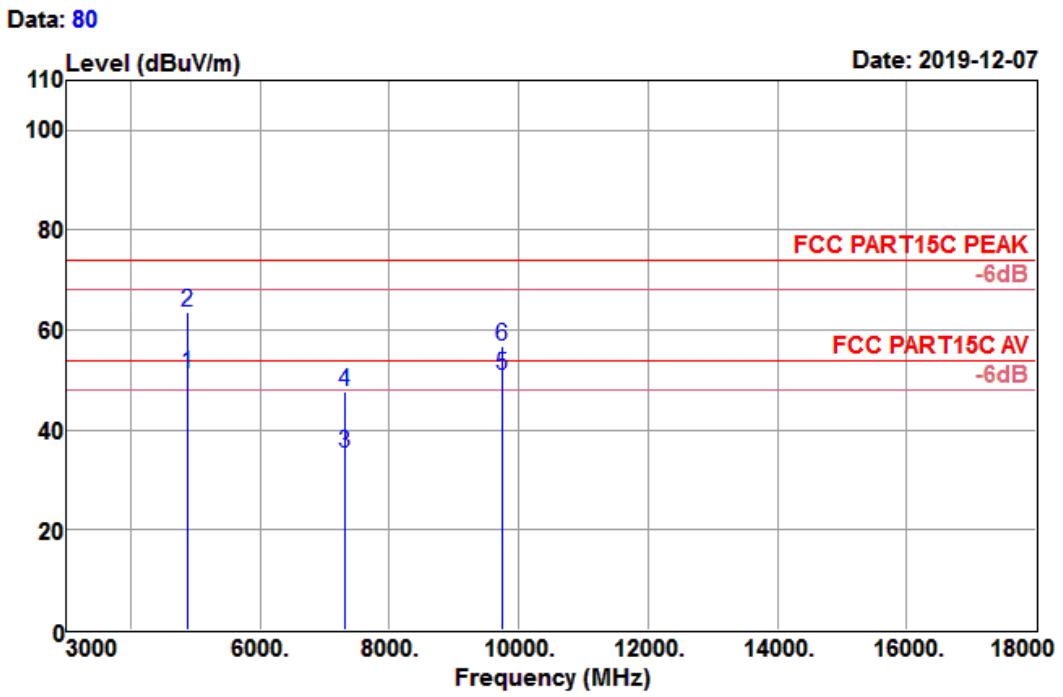
Test Mode :	802.11g CH06 (2437MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	1GHz~3GHz	**Polarization :**	Horizontal



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	100.67	27.24	3.56	35.61	95.86	74.00	21.86	Peak

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

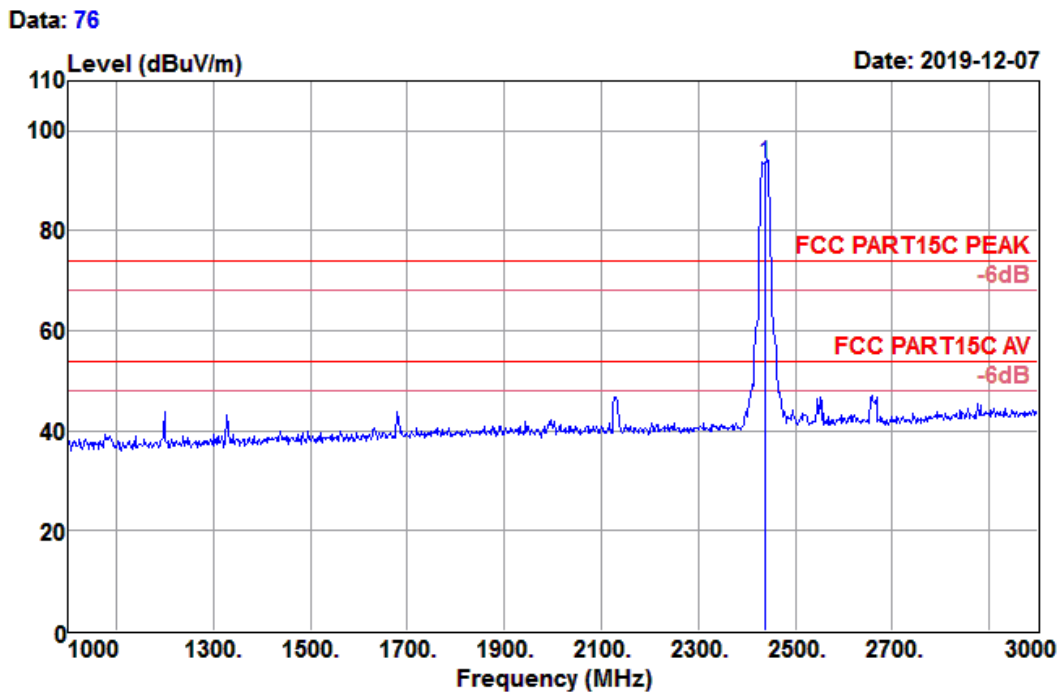




Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4874.000	48.99	31.40	5.55	34.80	51.14	54.00	-2.86	Average
4874.000	61.32	31.40	5.55	34.80	63.47	74.00	-10.53	Peak
7311.000	28.17	36.12	7.53	36.40	35.42	54.00	-18.58	Average
7311.000	40.56	36.12	7.53	36.40	47.81	74.00	-26.19	Peak
9748.000	38.70	38.05	10.70	36.40	51.05	54.00	-2.95	Average
9748.000	44.33	38.05	10.70	36.40	56.68	74.00	-17.32	Peak

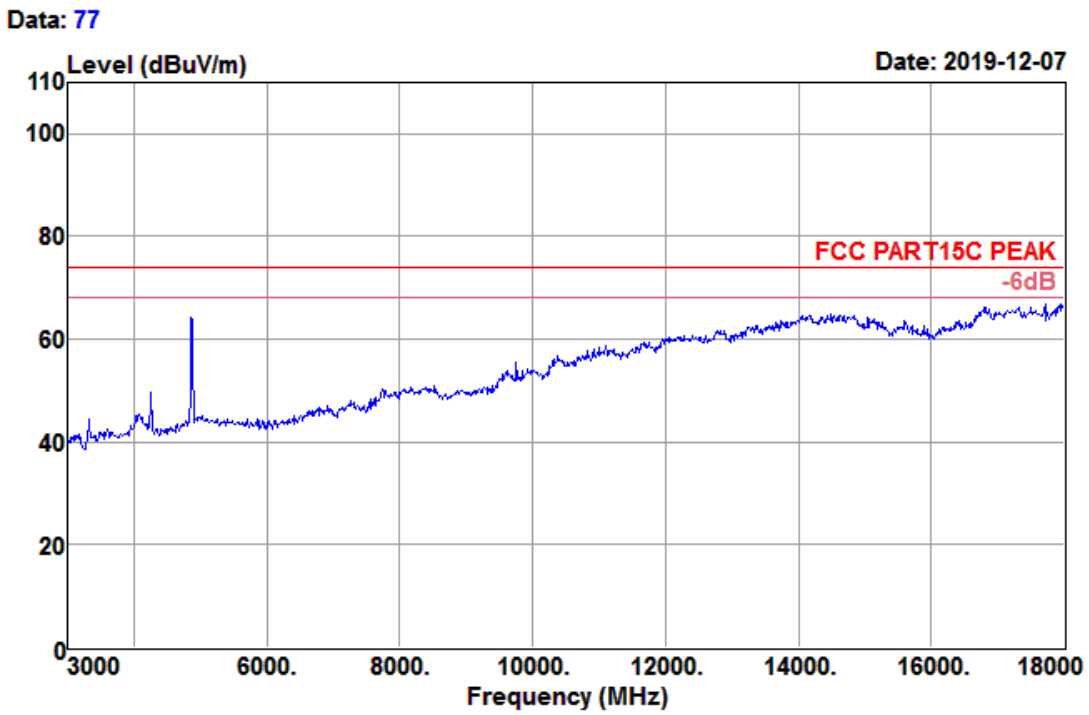
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

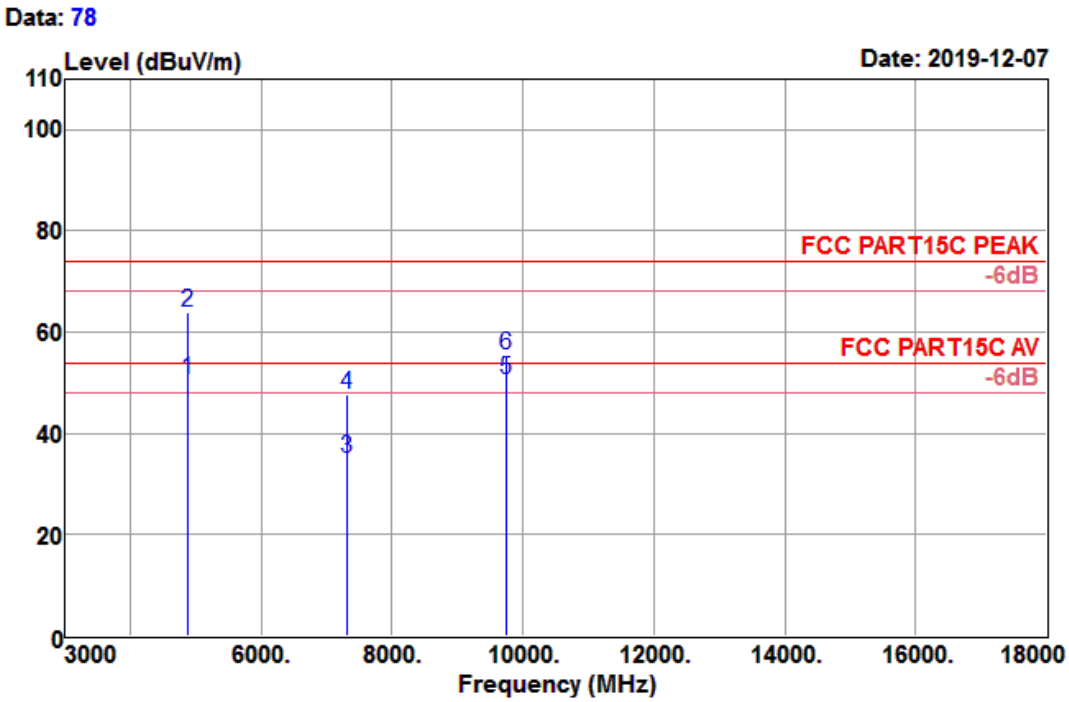
Test Mode :	802.11g CH06 (2437MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	1GHz~3GHz	**Polarization :**	Vertical



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	98.31	27.24	3.56	35.61	93.50	74.00	19.50	Peak

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

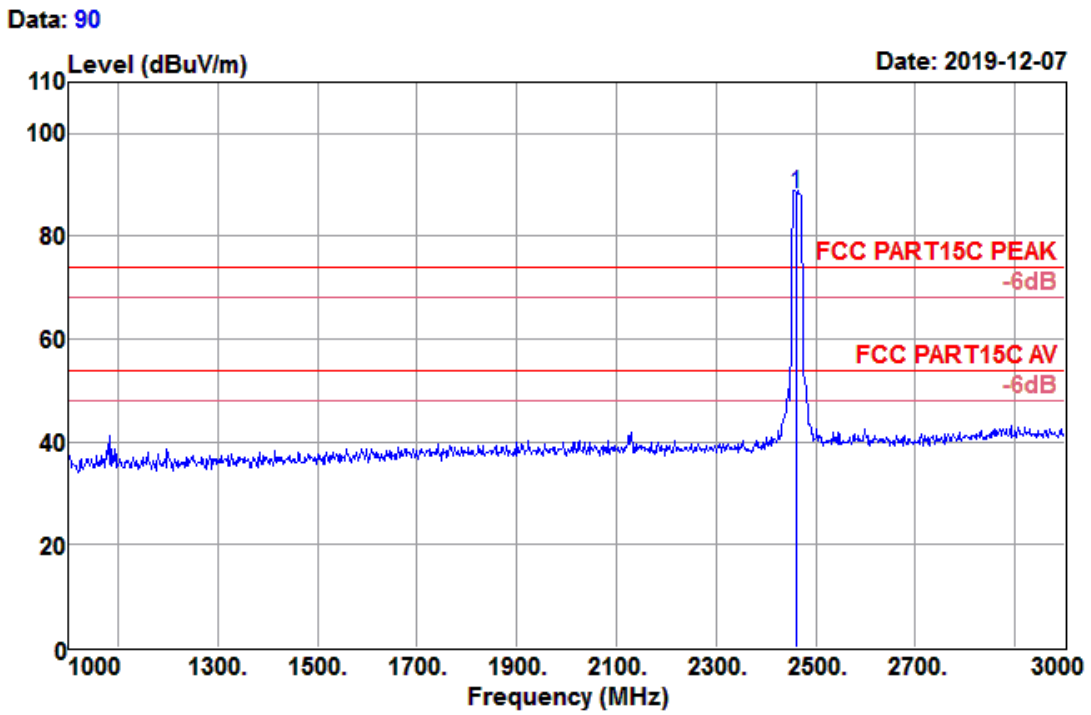




Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4874.000	48.62	31.40	5.55	34.80	50.77	54.00	-3.23	Average
4874.000	61.83	31.40	5.55	34.80	63.98	74.00	-10.02	Peak
7311.000	27.75	36.12	7.53	36.40	35.00	54.00	-19.00	Average
7311.000	40.38	36.12	7.53	36.40	47.63	74.00	-26.37	Peak
9748.000	38.17	38.05	10.70	36.40	50.52	54.00	-3.48	Average
9748.000	43.07	38.05	10.70	36.40	55.42	74.00	-18.58	Peak

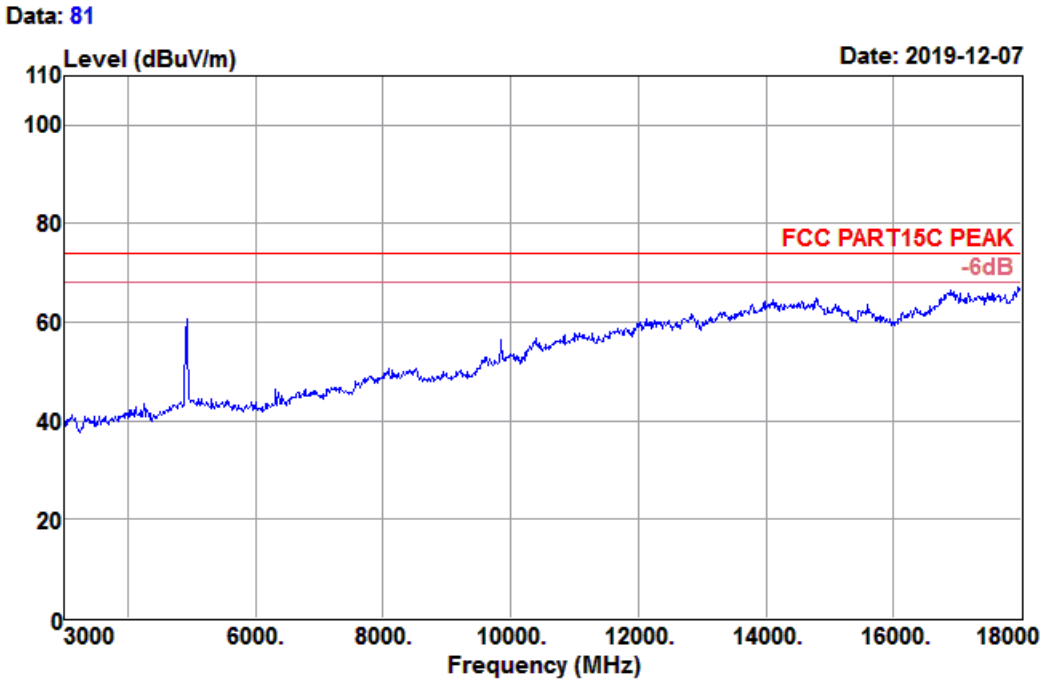
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

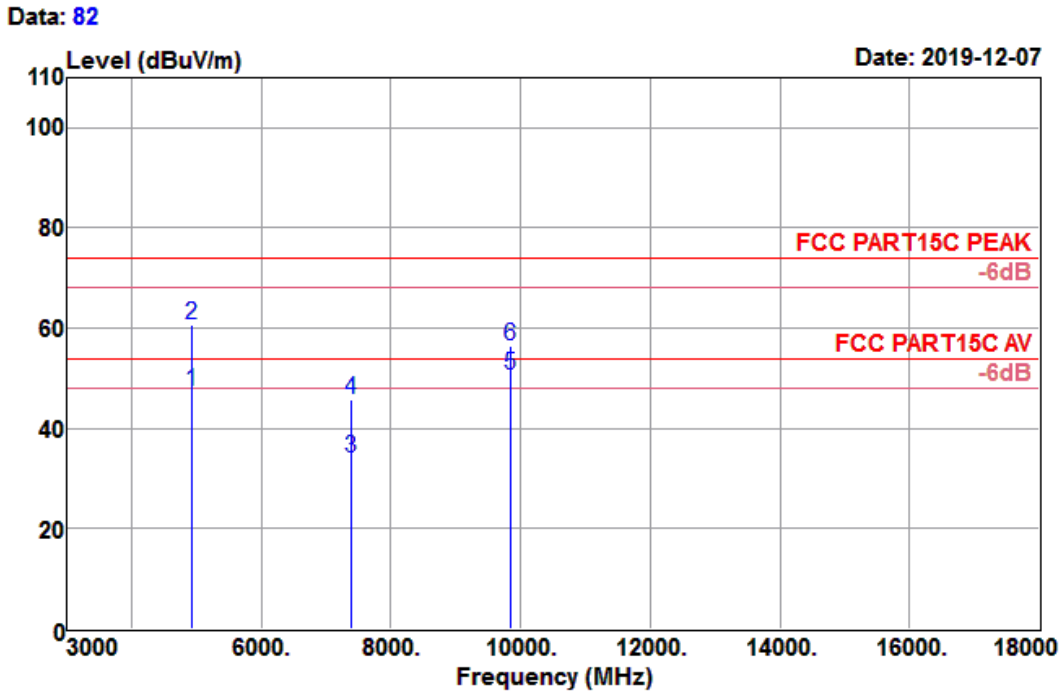
Test Mode :	802.11g CH11 (2462MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	1GHz~3GHz	**Polarization :**	Horizontal



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	93.15	27.30	3.58	35.65	88.38	74.00	14.38	Peak

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

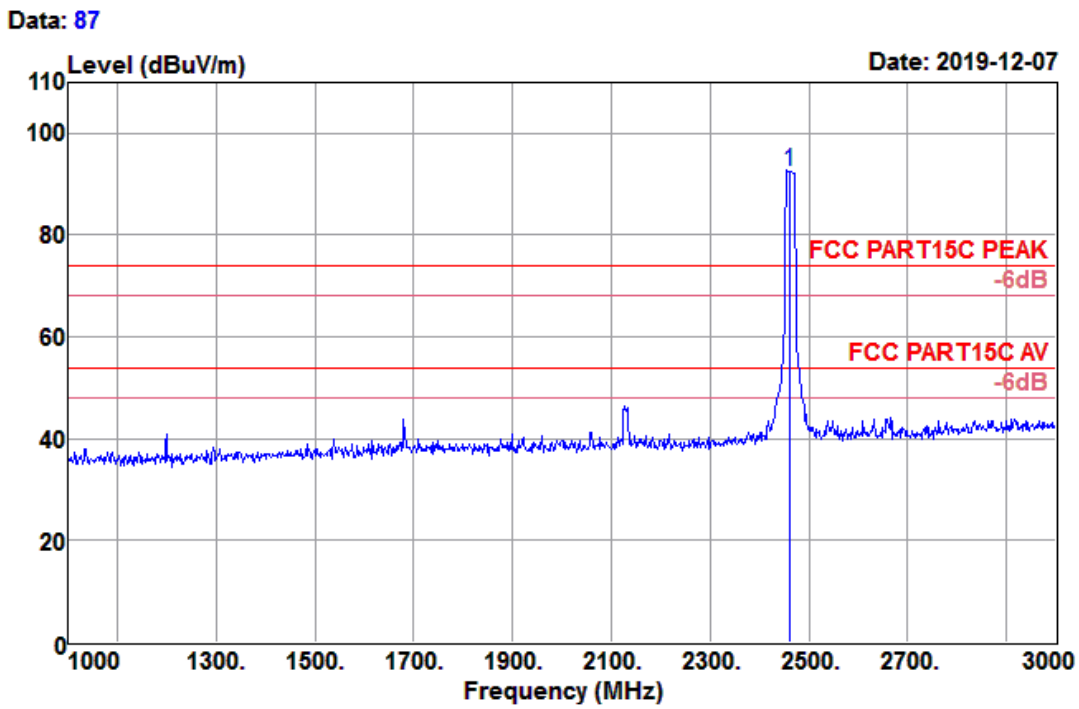




Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4924.000	45.06	31.52	5.53	34.76	47.35	54.00	-6.65	Average
4924.000	58.30	31.52	5.53	34.76	60.59	74.00	-13.41	Peak
7386.000	26.70	36.29	7.46	36.40	34.05	54.00	-19.95	Average
7386.000	38.50	36.29	7.46	36.40	45.85	74.00	-28.15	Peak
9848.000	37.92	38.23	10.98	36.40	50.73	54.00	-3.27	Average
9848.000	43.65	38.23	10.98	36.40	56.46	74.00	-17.54	Peak

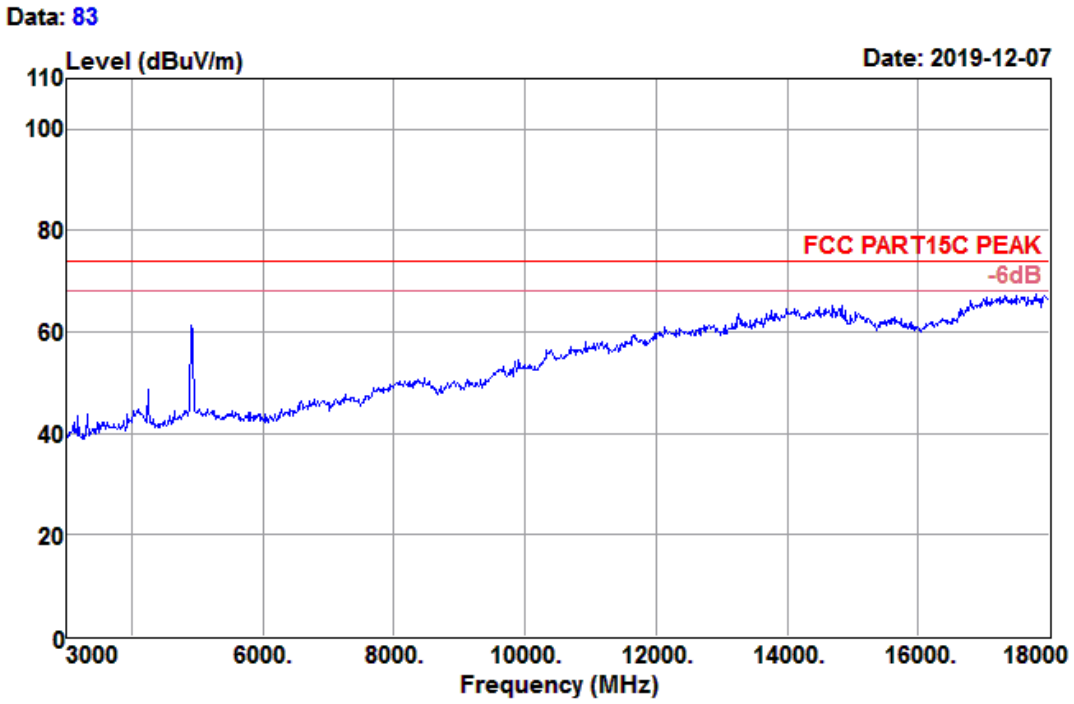
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

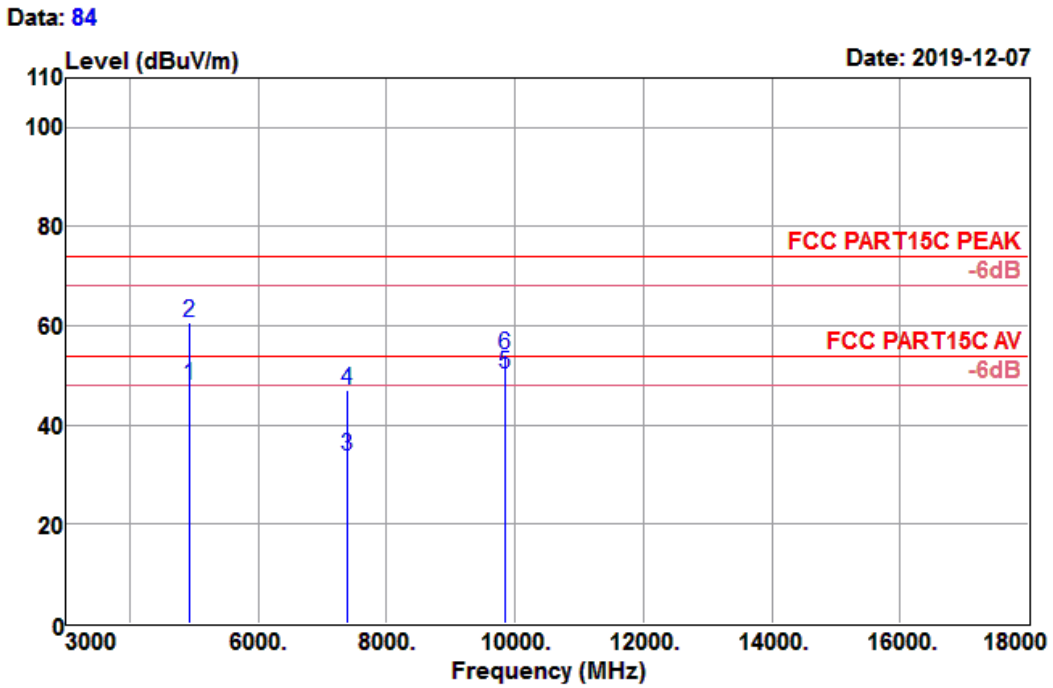
Test Mode :	802.11g CH11 (2462MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	1GHz~3GHz	**Polarization :**	Vertical



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	97.38	27.30	3.58	35.65	92.61	74.00	18.61	Peak

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

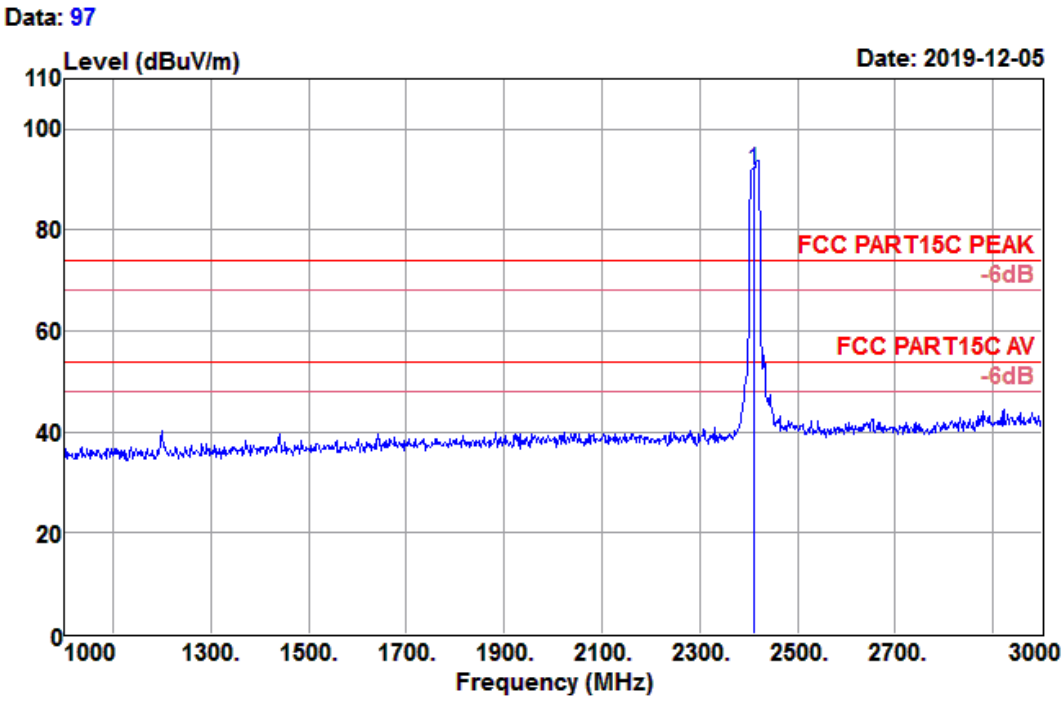




Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4924.000	45.74	31.52	5.53	34.76	48.03	54.00	-5.97	Average
4924.000	58.29	31.52	5.53	34.76	60.58	74.00	-13.42	Peak
7386.000	26.55	36.29	7.46	36.40	33.90	54.00	-20.10	Average
7386.000	39.84	36.29	7.46	36.40	47.19	74.00	-26.81	Peak
9848.000	37.60	38.23	10.98	36.40	50.41	54.00	-3.59	Average
9848.000	41.25	38.23	10.98	36.40	54.06	74.00	-19.94	Peak

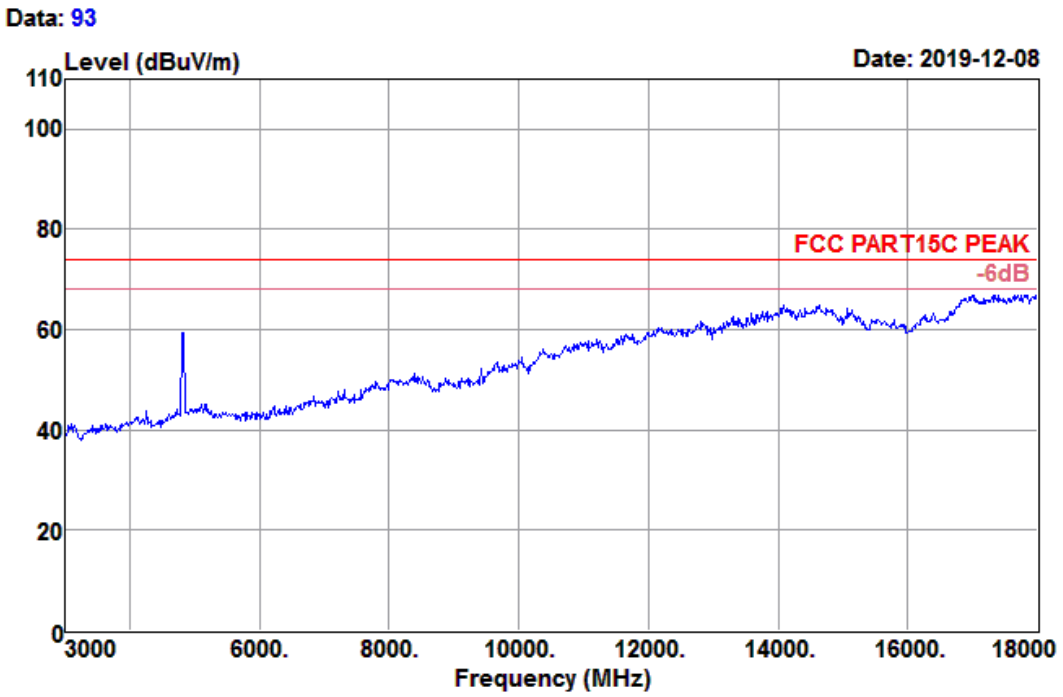
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

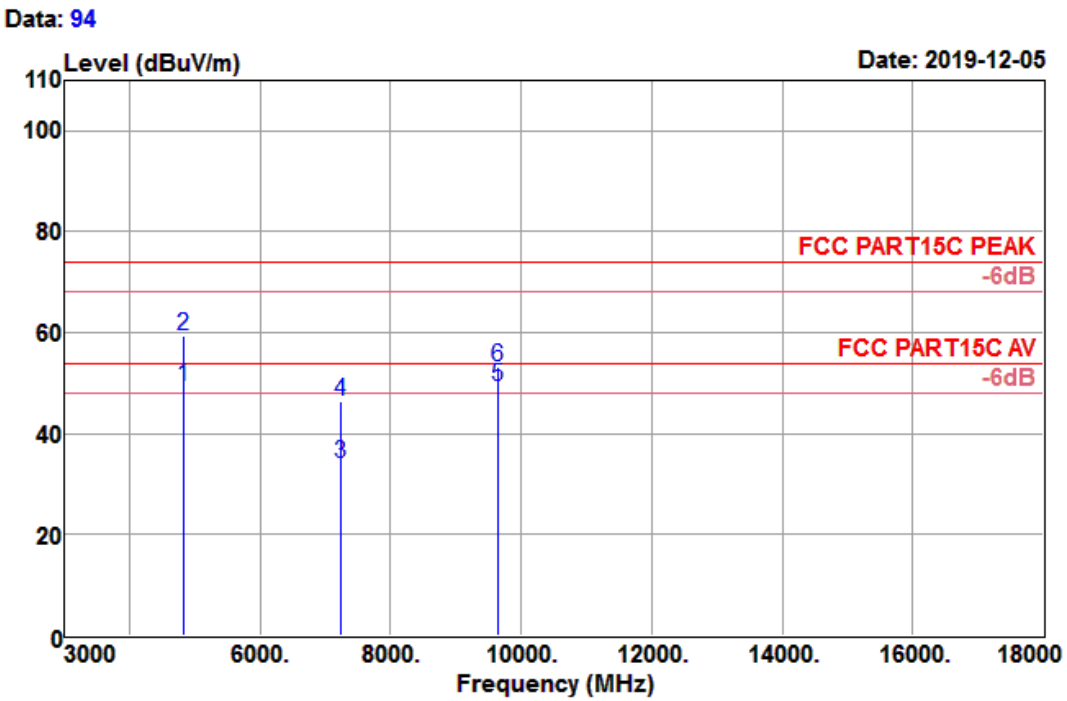
Test Mode :	802.11n HT20 CH01 (2412 MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	1GHz~3GHz	**Polarization :**	Horizontal



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	96.82	27.17	3.55	35.58	91.96	74.00	17.96	Peak

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

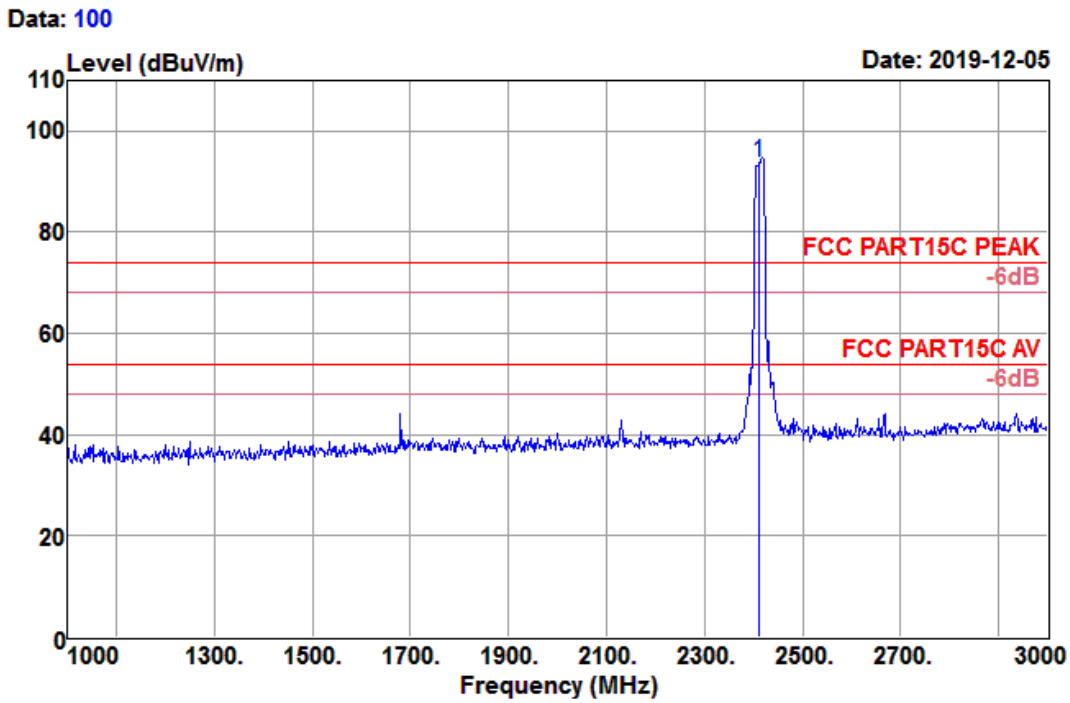




Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4824.000	47.31	31.28	5.56	34.84	49.31	54.00	-4.69	Average
4824.000	57.37	31.28	5.56	34.84	59.37	74.00	-14.63	Peak
7236.000	26.79	35.94	7.61	36.40	33.94	54.00	-20.06	Average
7236.000	39.38	35.94	7.61	36.40	46.53	74.00	-27.47	Peak
9648.000	37.37	37.87	10.41	36.40	49.25	54.00	-4.75	Average
9648.000	41.48	37.87	10.41	36.40	53.36	74.00	-20.64	Peak

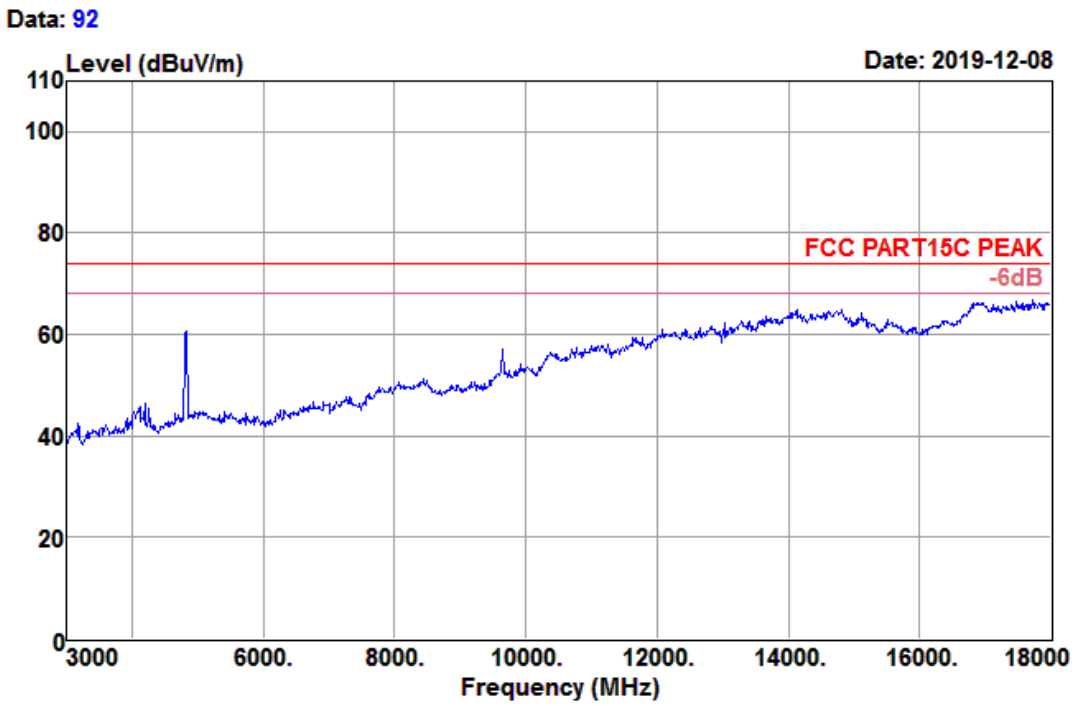
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

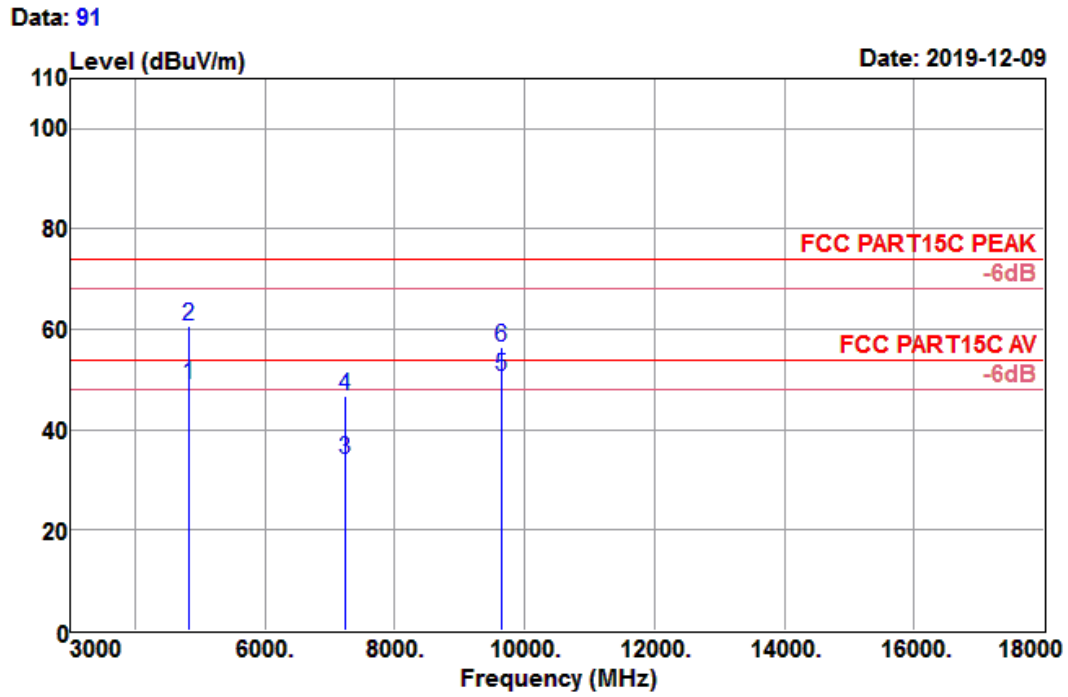
Test Mode :	802.11n HT20 CH01 (2412 MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	1GHz~3GHz	**Polarization :**	Vertical



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	98.51	27.17	3.55	35.58	93.65	74.00	19.65	Peak

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

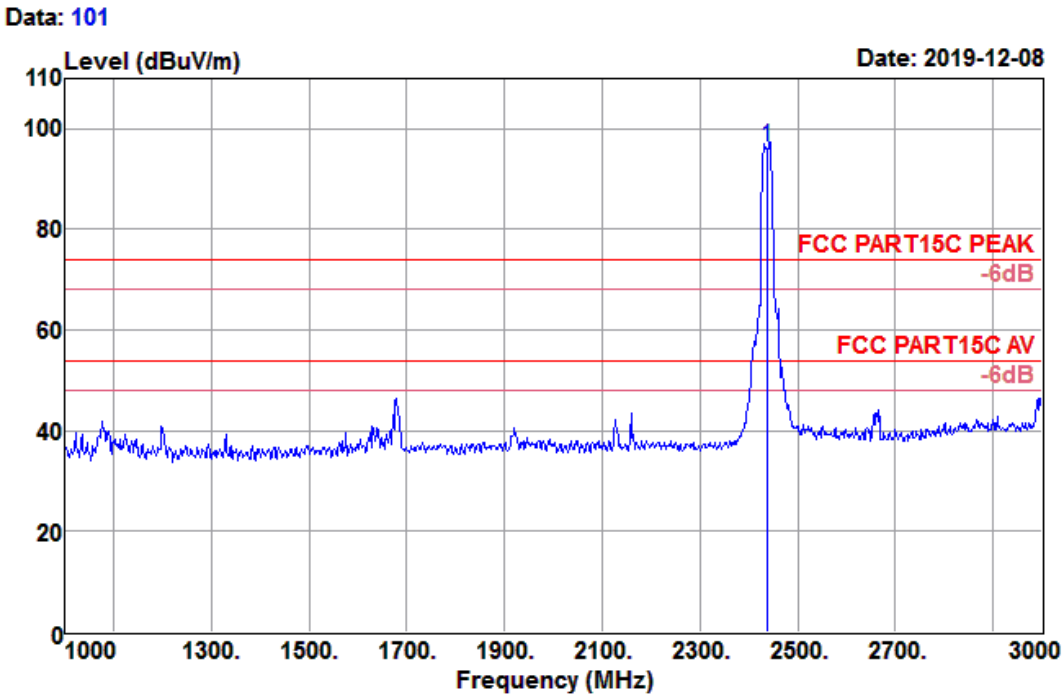




Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4824.000	47.15	31.28	5.56	34.84	49.15	54.00	-4.85	Average
4824.000	58.63	31.28	5.56	34.84	60.63	74.00	-13.37	Peak
7236.000	26.98	35.94	7.61	36.40	34.13	54.00	-19.87	Average
7236.000	39.56	35.94	7.61	36.40	46.71	74.00	-27.29	Peak
9648.000	38.91	37.87	10.41	36.40	50.79	54.00	-3.21	Average
9648.000	44.75	37.87	10.41	36.40	56.63	74.00	-17.37	Peak

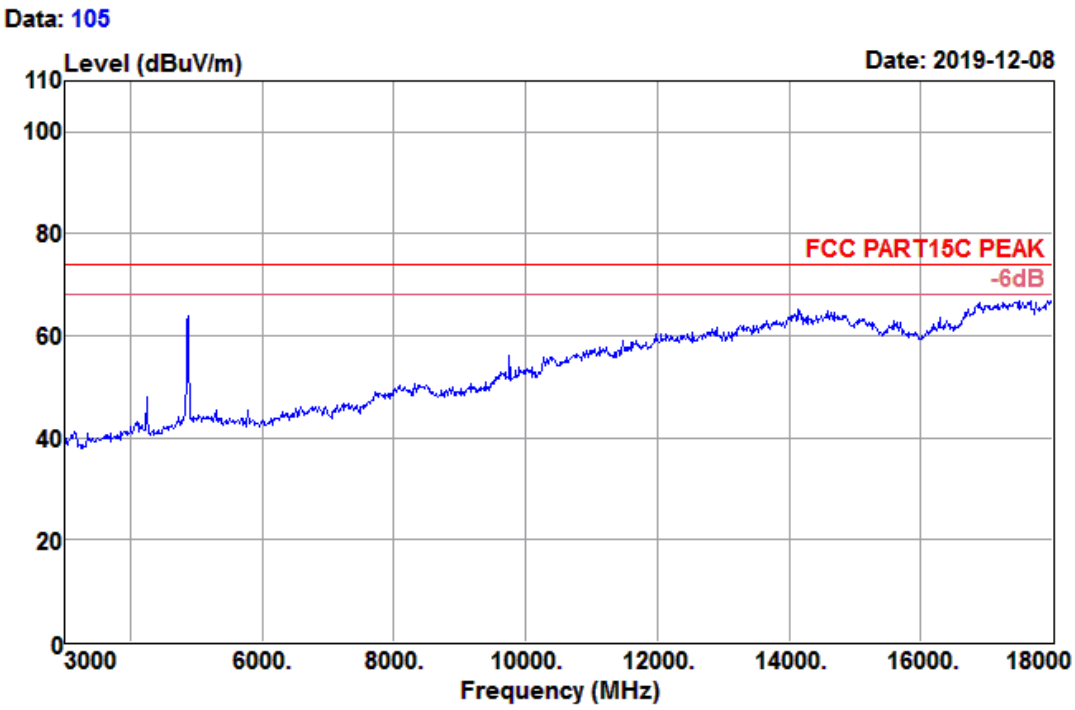
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

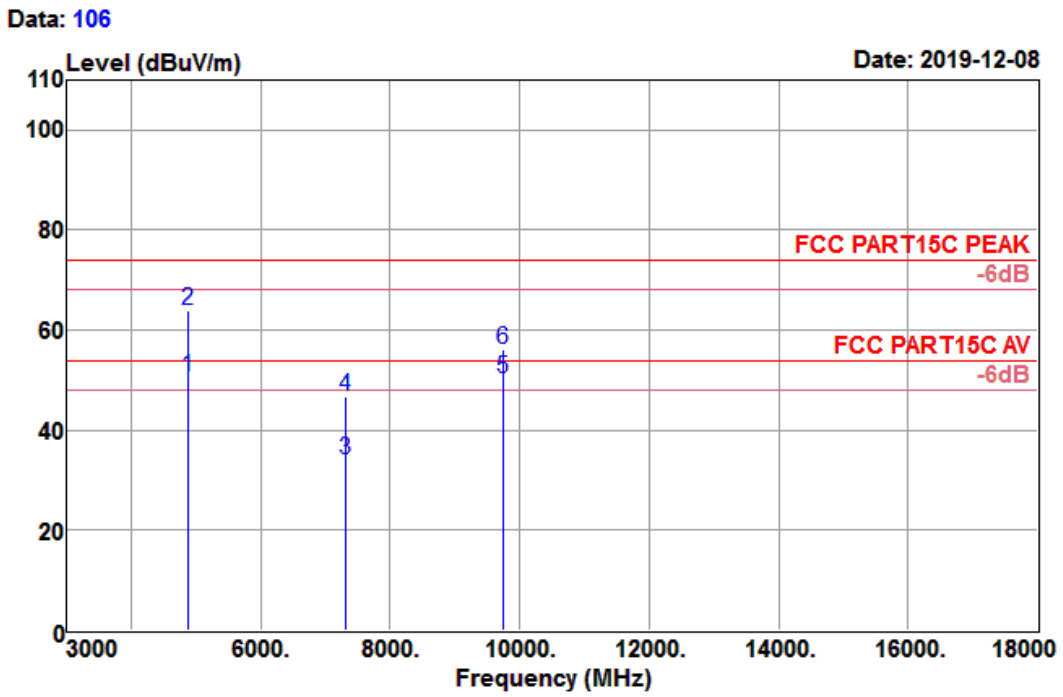
Test Mode :	802.11n HT20 CH06 (2437MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	1GHz~3GHz	**Polarization :**	Horizontal



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	101.33	27.24	3.56	35.61	96.52	74.00	22.52	Peak

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

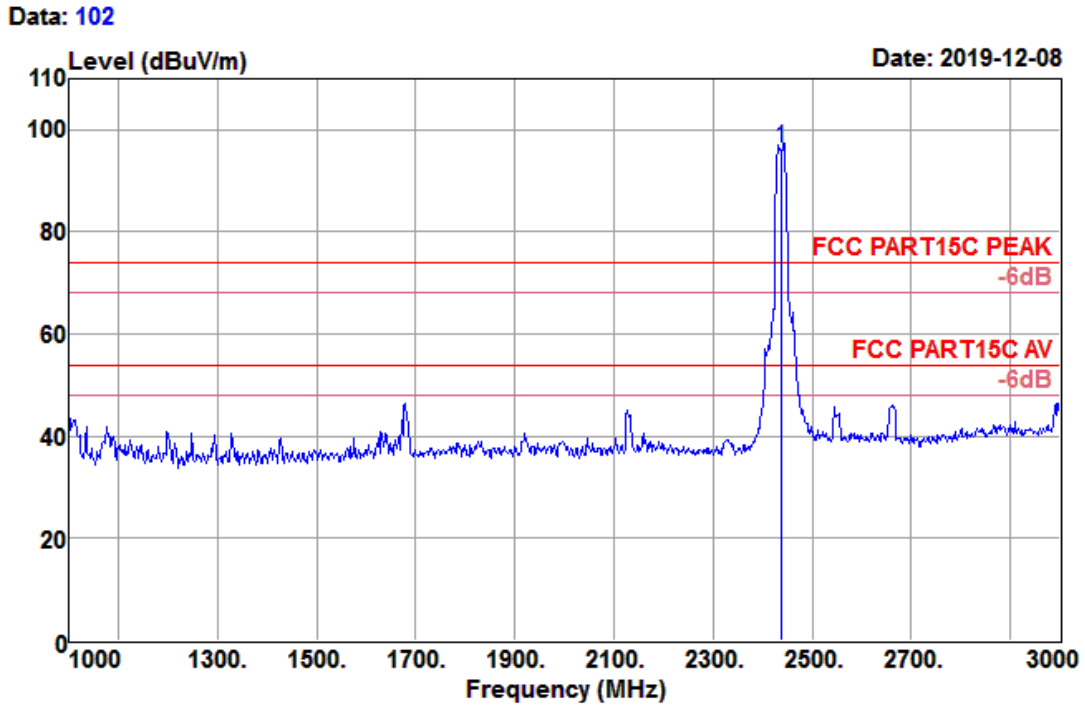




Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4874.000	48.61	31.40	5.55	34.80	50.76	54.00	-3.24	Average
4874.000	61.67	31.40	5.55	34.80	63.82	74.00	-10.18	Peak
7311.000	26.99	36.12	7.53	36.40	34.24	54.00	-19.76	Average
7311.000	39.56	36.12	7.53	36.40	46.81	74.00	-27.19	Peak
9748.000	38.11	38.05	10.70	36.40	50.46	54.00	-3.54	Average
9748.000	43.77	38.05	10.70	36.40	56.12	74.00	-17.88	Peak

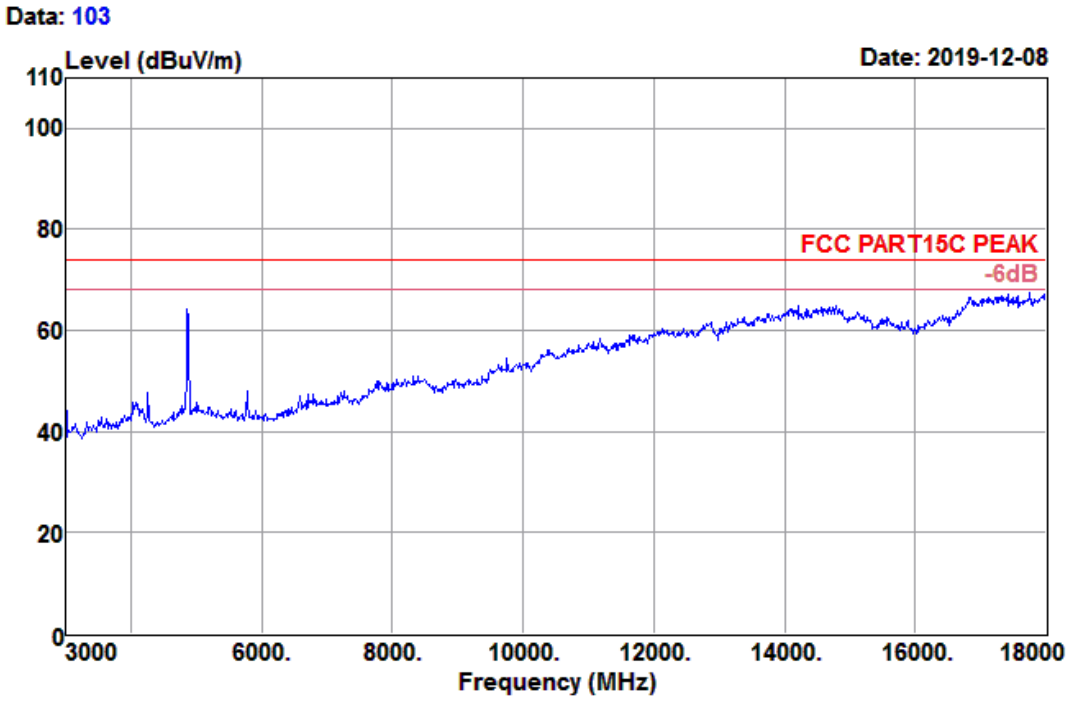
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

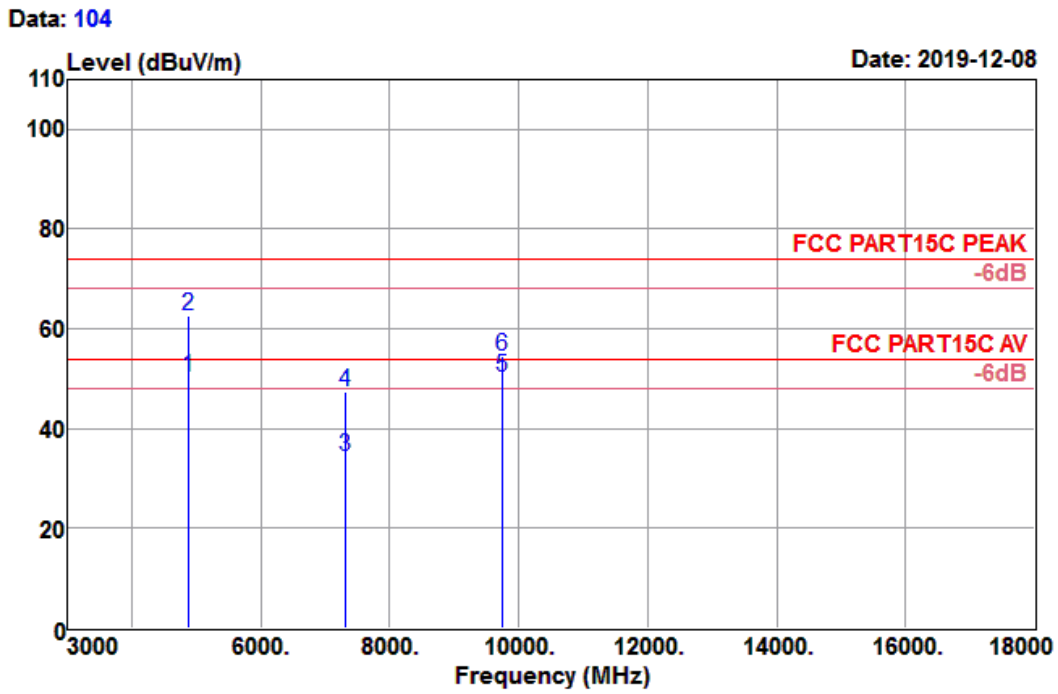
Test Mode :	802.11n HT20 CH06 (2437MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	1GHz~3GHz	**Polarization :**	Vertical



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	101.33	27.24	3.56	35.61	96.52	74.00	22.52	Peak

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

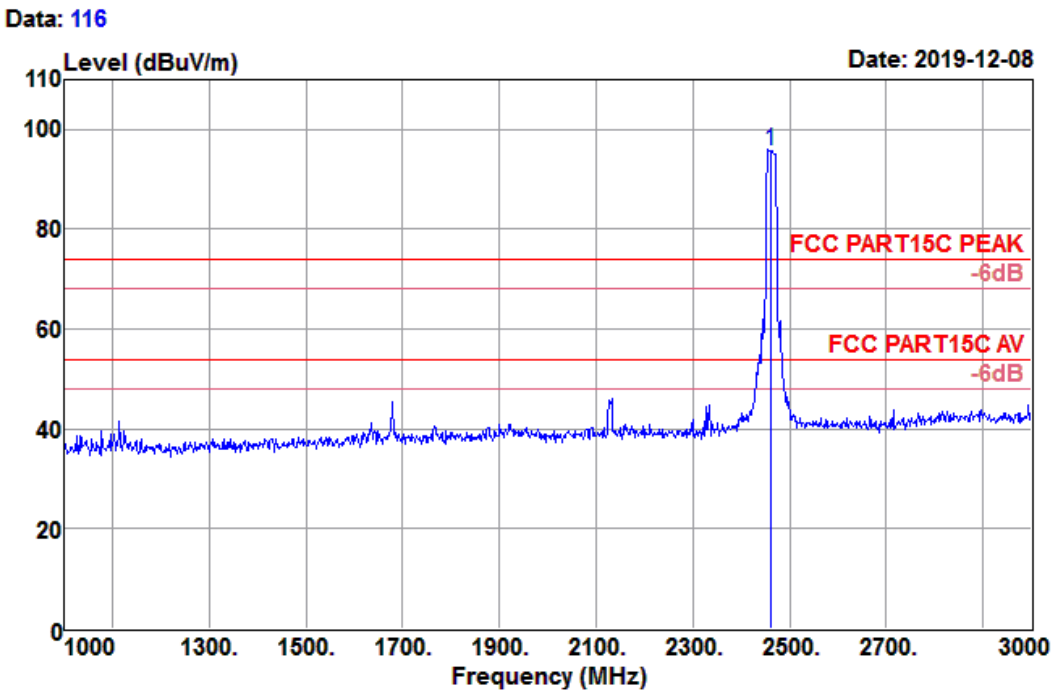




Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4874.000	48.23	31.40	5.55	34.80	50.38	54.00	-3.62	Average
4874.000	60.60	31.40	5.55	34.80	62.75	74.00	-11.25	Peak
7311.000	27.13	36.12	7.53	36.40	34.38	54.00	-19.62	Average
7311.000	40.26	36.12	7.53	36.40	47.51	74.00	-26.49	Peak
9748.000	38.00	38.05	10.70	36.40	50.35	54.00	-3.65	Average
9748.000	42.15	38.05	10.70	36.40	54.50	74.00	-19.50	Peak

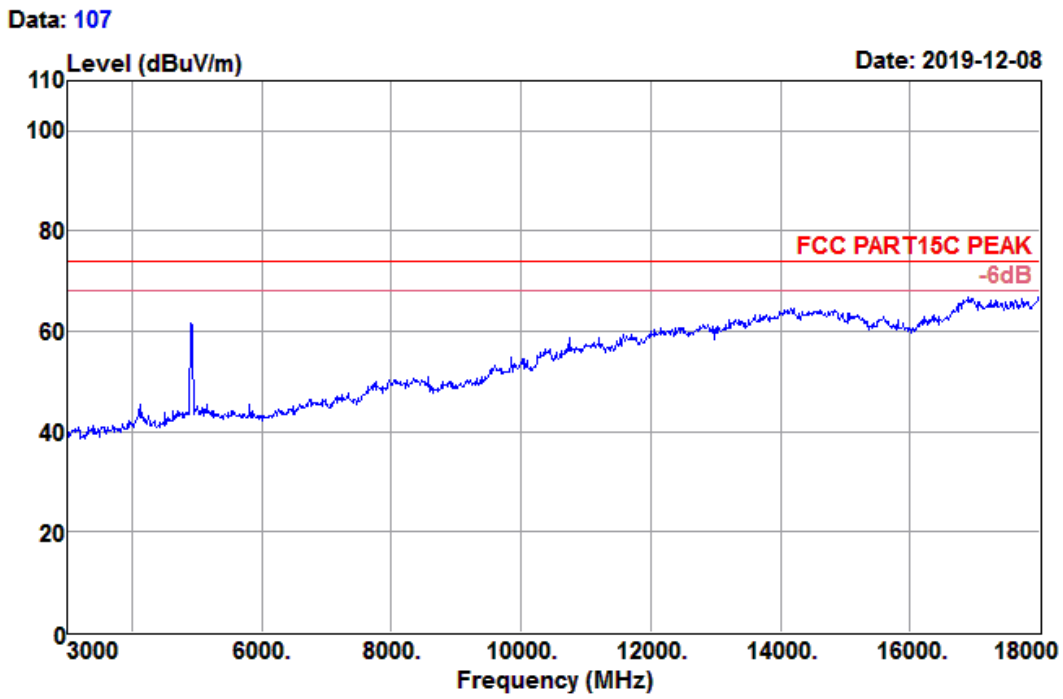
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

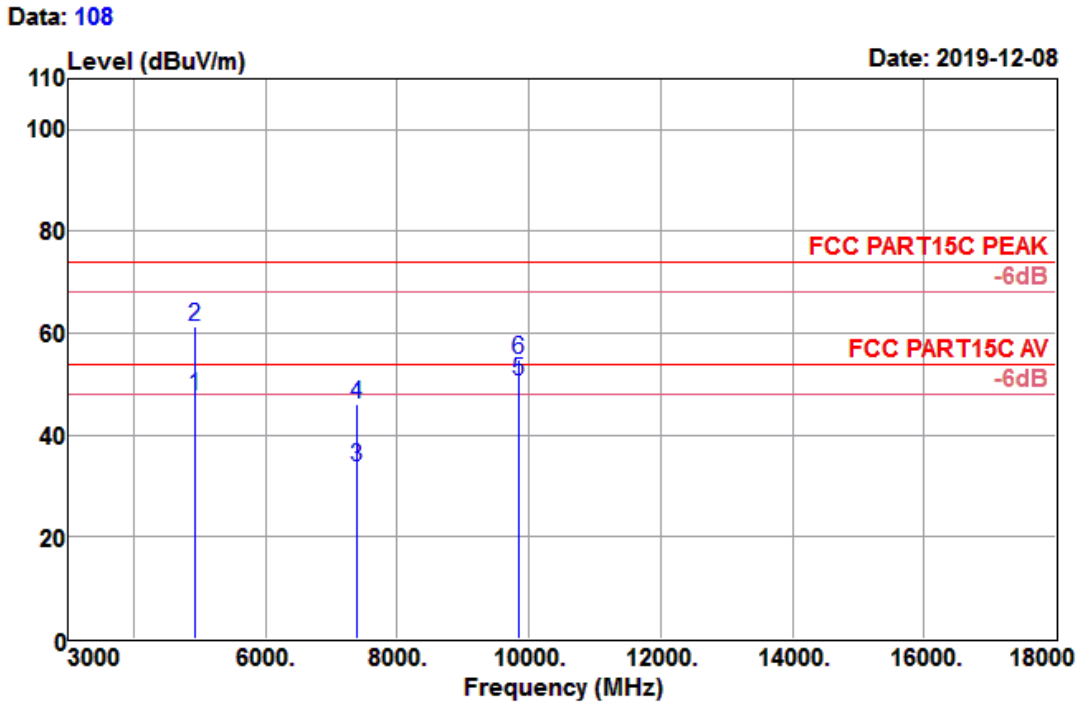
Test Mode :	802.11n HT20 CH11 (2462 MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	1GHz~3GHz	**Polarization :**	Horizontal



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	100.51	27.30	3.58	35.65	95.74	74.00	21.74	Peak

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

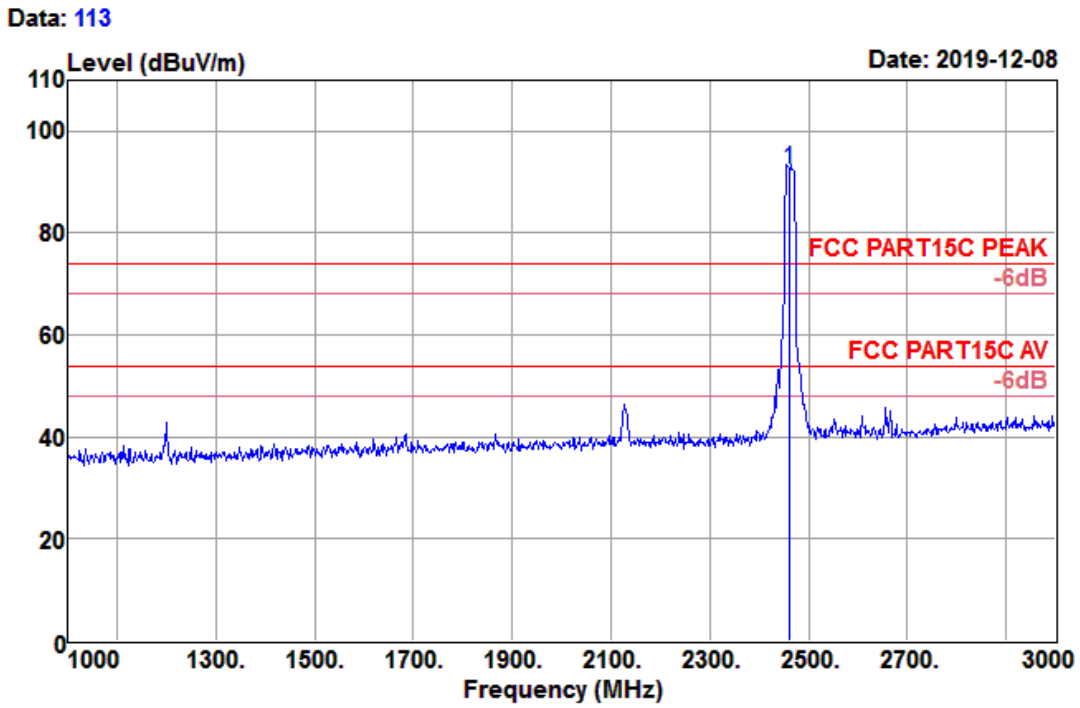




Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4924.000	45.46	31.52	5.53	34.76	47.75	54.00	-6.25	Average
4924.000	59.14	31.52	5.53	34.76	61.43	74.00	-12.57	Peak
7386.000	26.45	36.29	7.46	36.40	33.80	54.00	-20.20	Average
7386.000	38.70	36.29	7.46	36.40	46.05	74.00	-27.95	Peak
9848.000	37.70	38.23	10.98	36.40	50.51	54.00	-3.49	Average
9848.000	41.96	38.23	10.98	36.40	54.77	74.00	-19.23	Peak

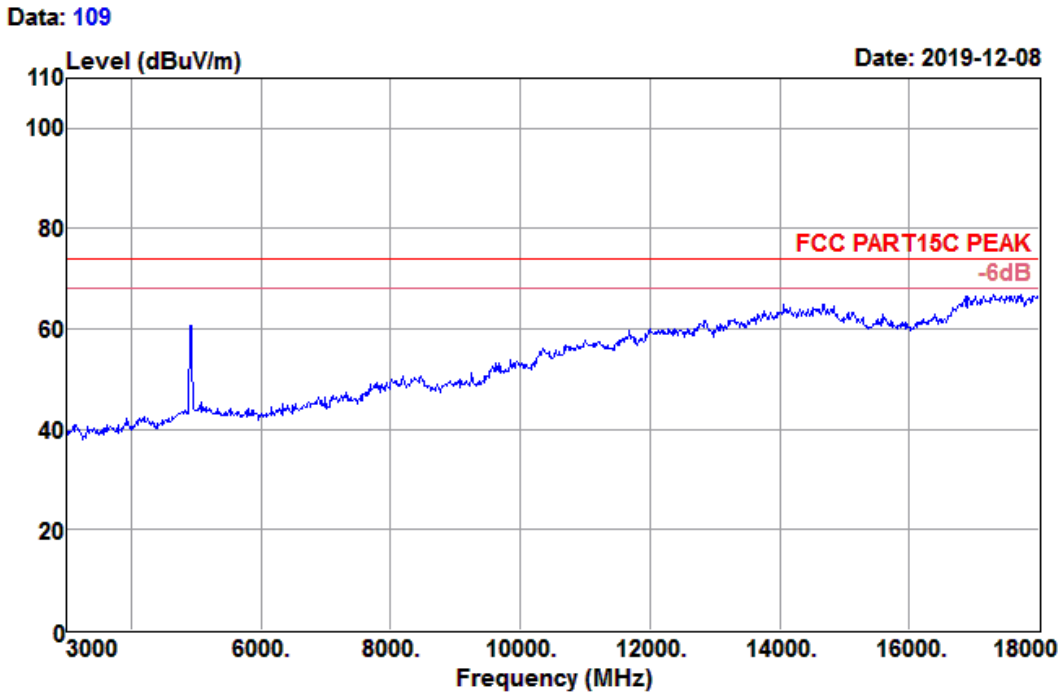
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

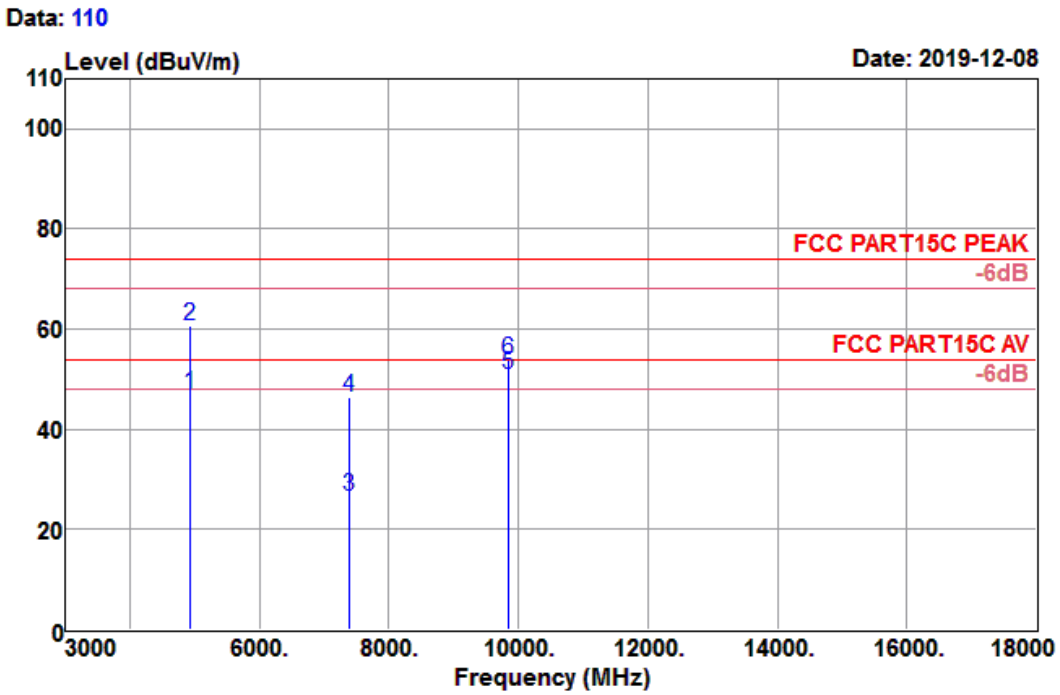
Test Mode :	802.11n HT20 CH11 (2462 MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	1GHz~3GHz	**Polarization :**	Vertical



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	97.12	27.30	3.58	35.65	92.35	74.00	18.35	Peak

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

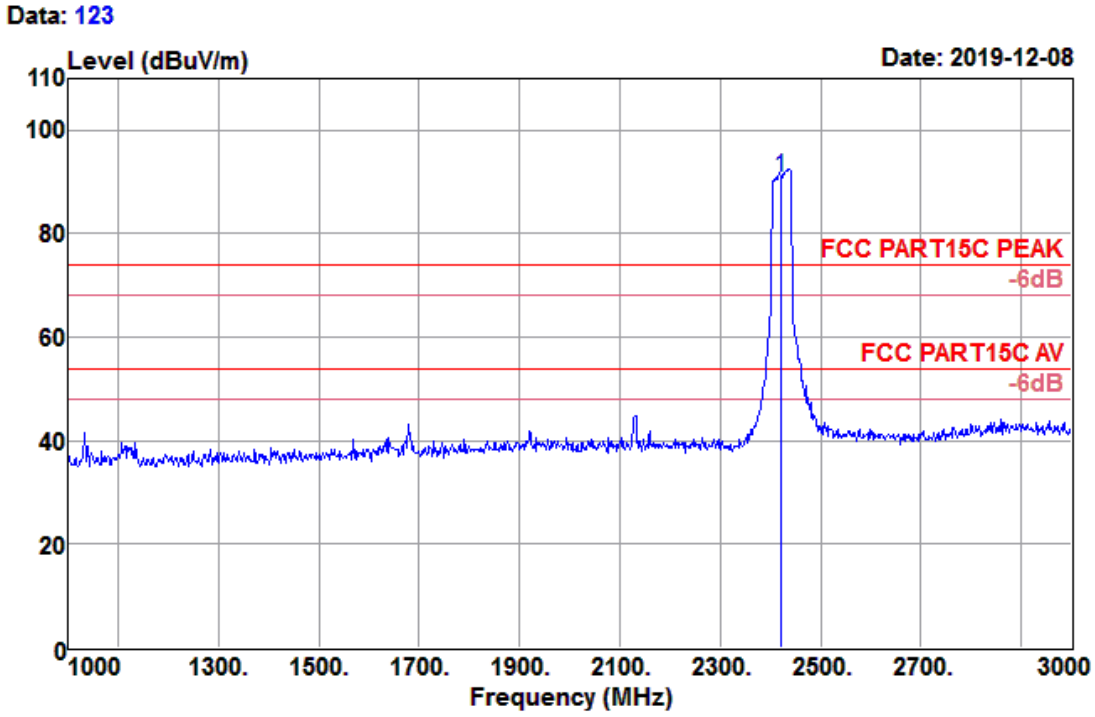




Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4924.000	44.69	31.52	5.53	34.76	46.98	54.00	-7.02	Average
4924.000	58.34	31.52	5.53	34.76	60.63	74.00	-13.37	Peak
7386.000	19.36	36.29	7.46	36.40	26.71	54.00	-27.29	Average
7386.000	39.01	36.29	7.46	36.40	46.36	74.00	-27.64	Peak
9848.000	38.08	38.23	10.98	36.40	50.89	54.00	-3.11	Average
9848.000	41.17	38.23	10.98	36.40	53.98	74.00	-20.02	Peak

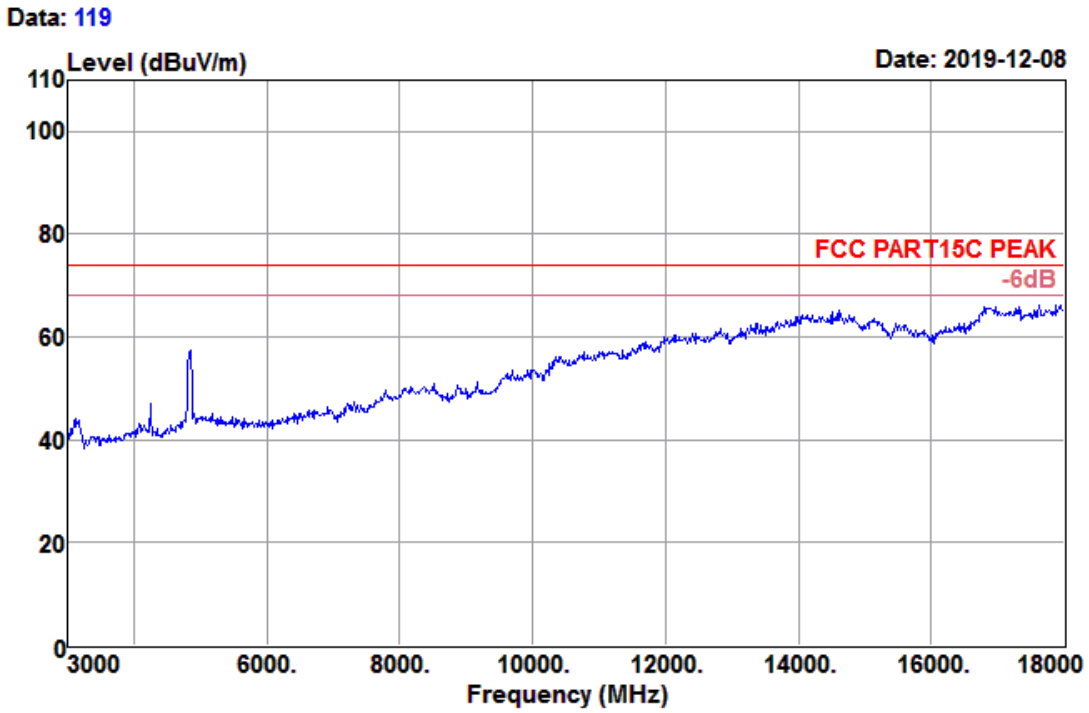
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

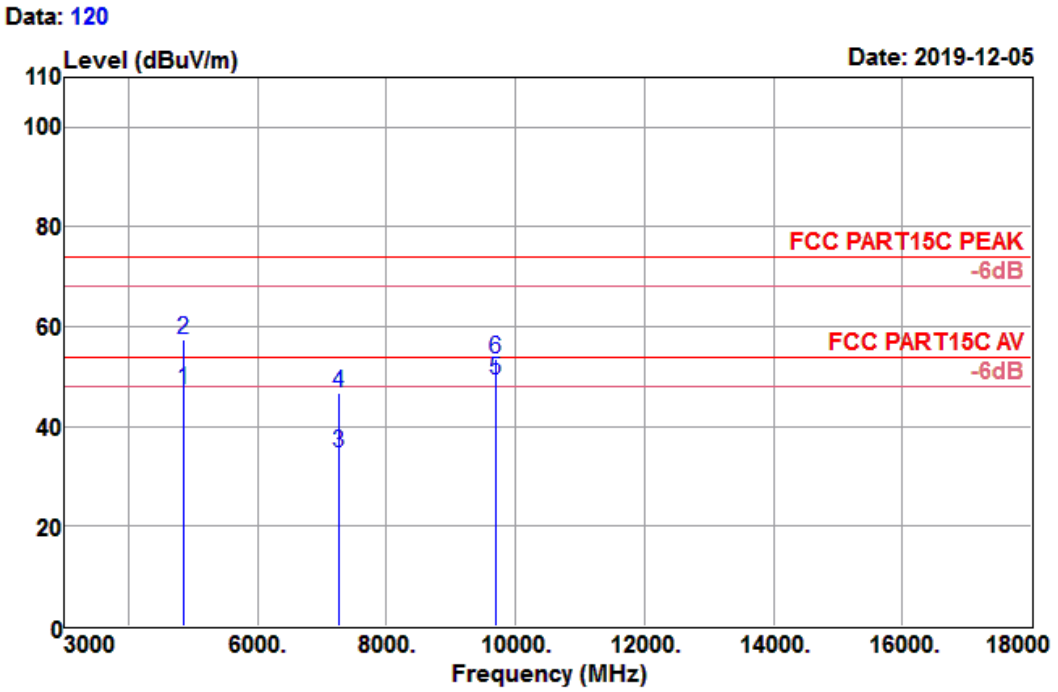
Test Mode :	802.11n HT40 CH03 (2422 MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	1GHz~3GHz	**Polarization :**	Horizontal



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	95.63	27.20	3.55	35.59	90.79	74.00	16.79	Peak

Test Mode :	802.11n HT40 CH03 (2422 MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	3GHz~18GHz	**Polarization :**	Horizontal

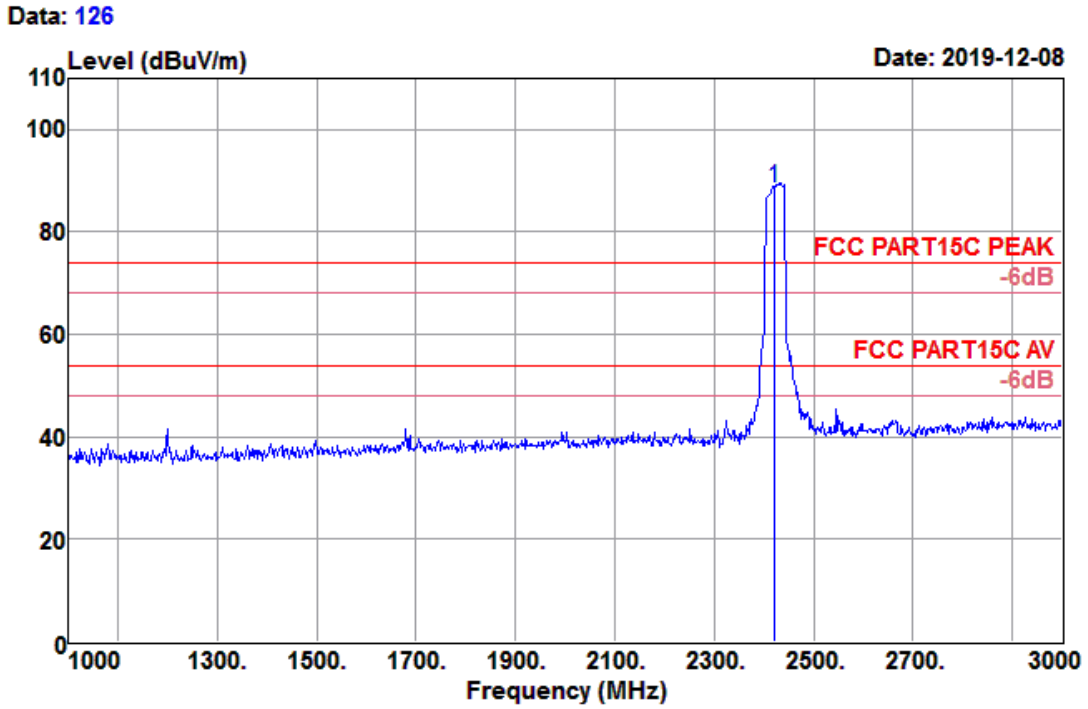




Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4844.000	45.38	31.33	5.56	34.82	47.45	54.00	-6.55	Average
4844.000	55.52	31.33	5.56	34.82	57.59	74.00	-16.41	Peak
7266.000	27.59	36.01	7.58	36.40	34.78	54.00	-19.22	Average
7266.000	39.51	36.01	7.58	36.40	46.70	74.00	-27.30	Peak
9688.000	37.25	37.94	10.53	36.40	49.32	54.00	-4.68	Average
9688.000	41.44	37.94	10.53	36.40	53.51	74.00	-20.49	Peak

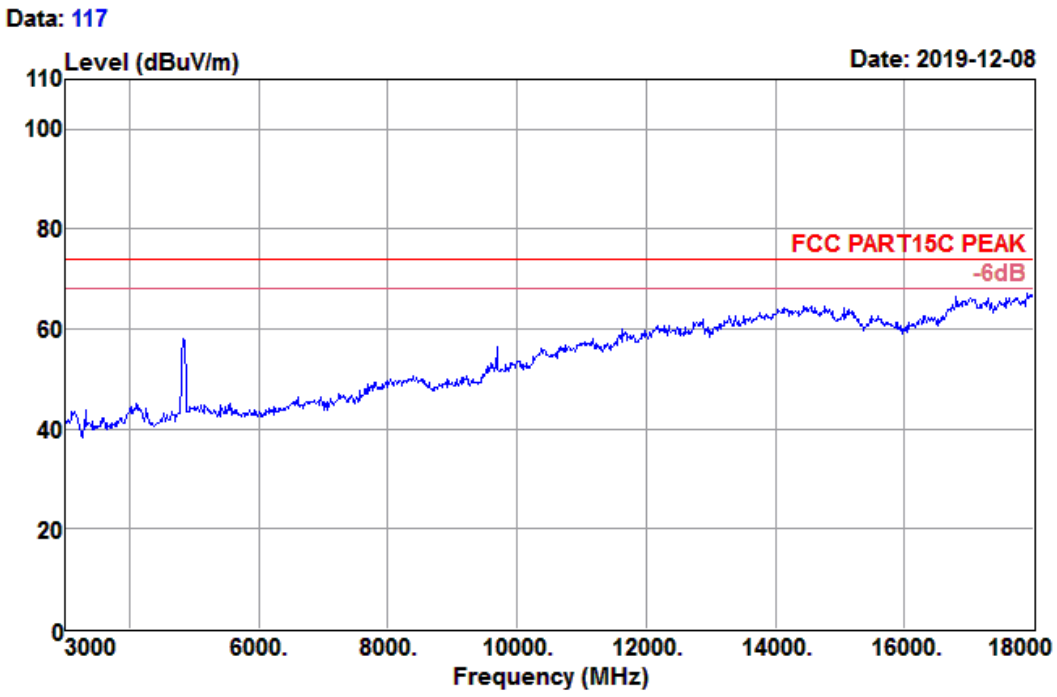
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

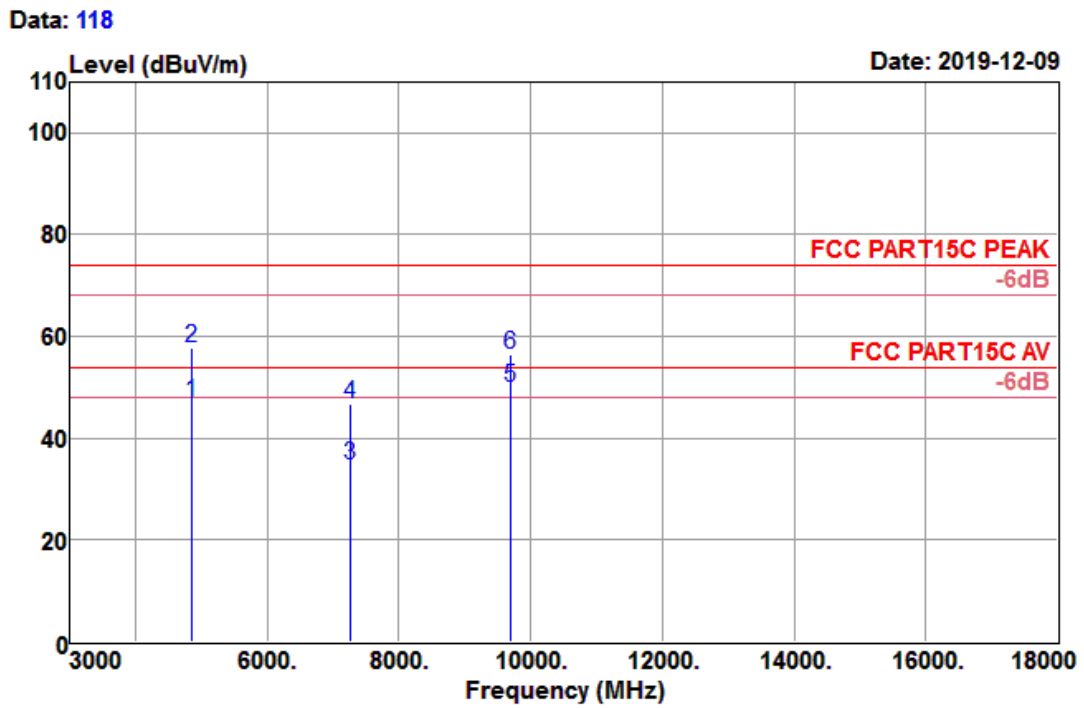
Test Mode :	802.11n HT40 CH03 (2422 MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	1GHz~3GHz	**Polarization :**	Vertical



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	93.38	27.20	3.55	35.59	88.54	74.00	14.54	Peak

Test Mode :	802.11n HT40 CH03 (2422 MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	3GHz~18GHz	**Polarization :**	Vertical

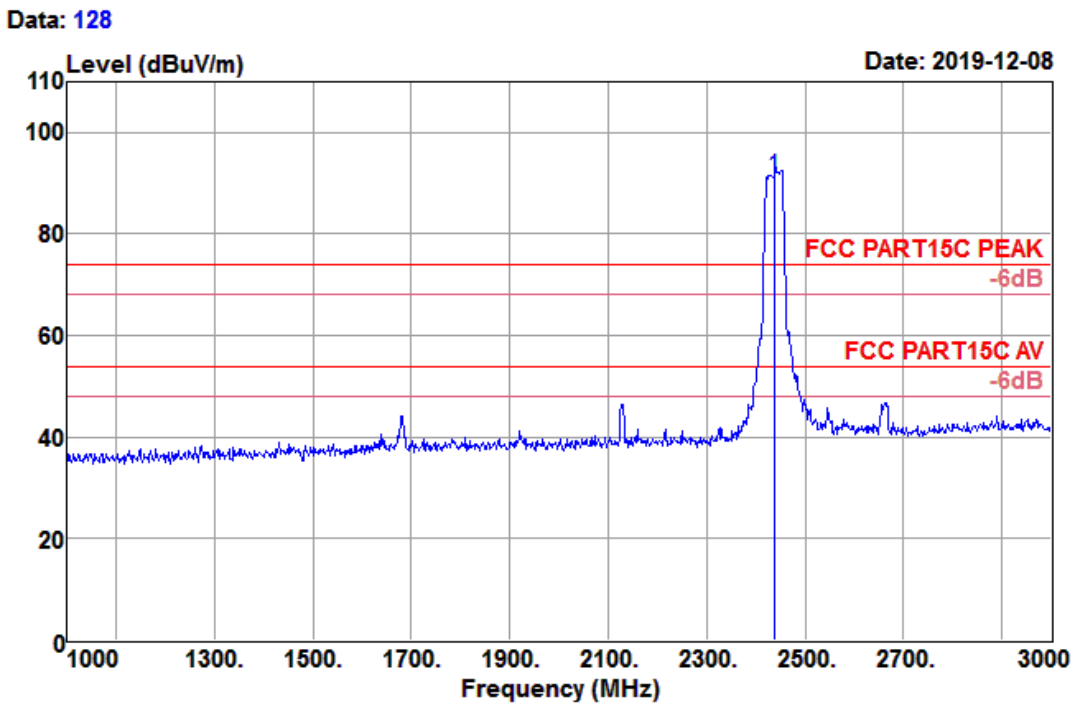




Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4844.000	44.85	31.33	5.56	34.82	46.92	54.00	-7.08	Average
4844.000	55.84	31.33	5.56	34.82	57.91	74.00	-16.09	Peak
7266.000	27.66	36.01	7.58	36.40	34.85	54.00	-19.15	Average
7266.000	39.48	36.01	7.58	36.40	46.67	74.00	-27.33	Peak
9688.000	38.02	37.94	10.53	36.40	50.09	54.00	-3.91	Average
9688.000	44.34	37.94	10.53	36.40	56.41	74.00	-17.59	Peak

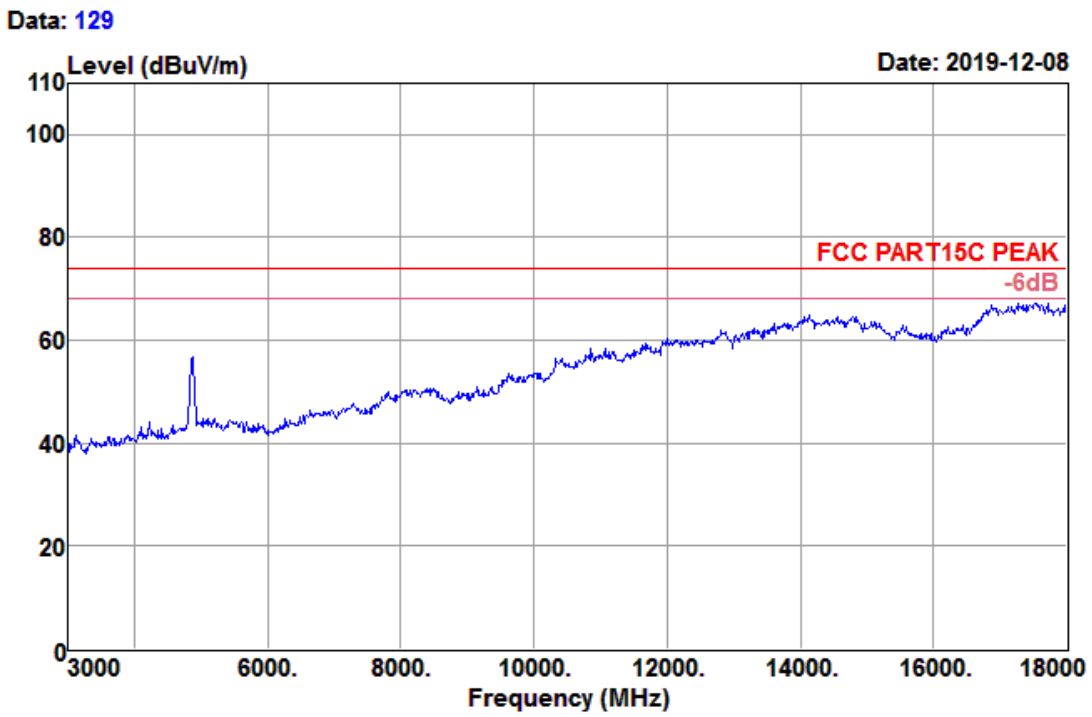
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

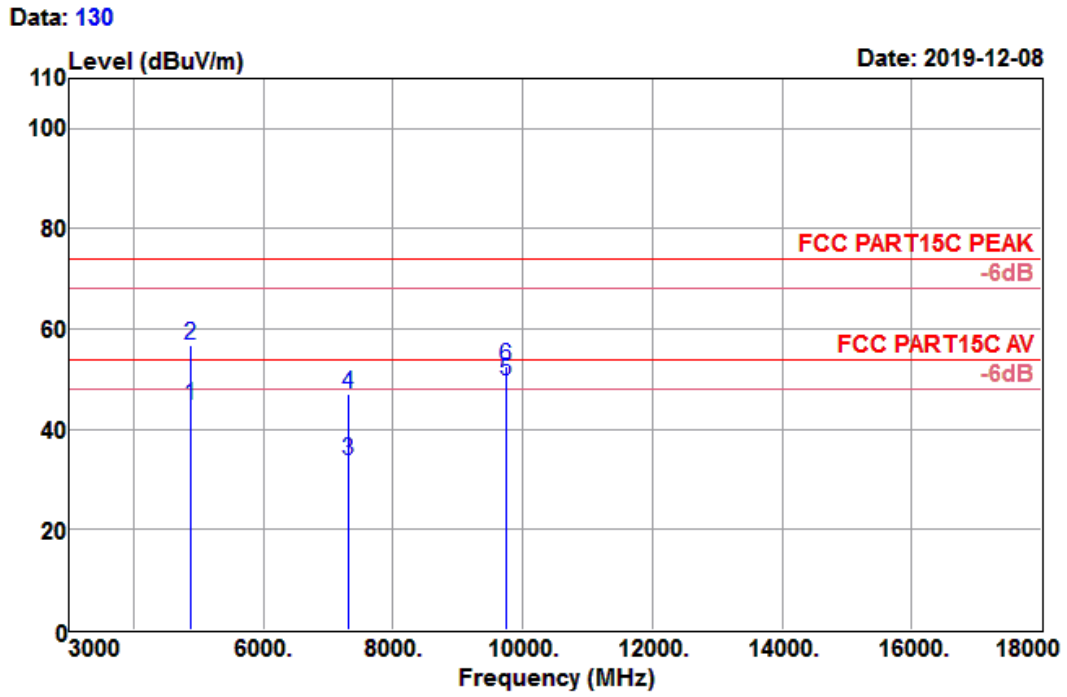
Test Mode :	802.11n HT40 CH06 (2437MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	1GHz~3GHz	**Polarization :**	Horizontal



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	95.94	27.24	3.56	35.61	91.13	74.00	17.13	Peak

Test Mode :	802.11n HT40 CH06 (2437MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	3GHz~18GHz	**Polarization :**	Horizontal

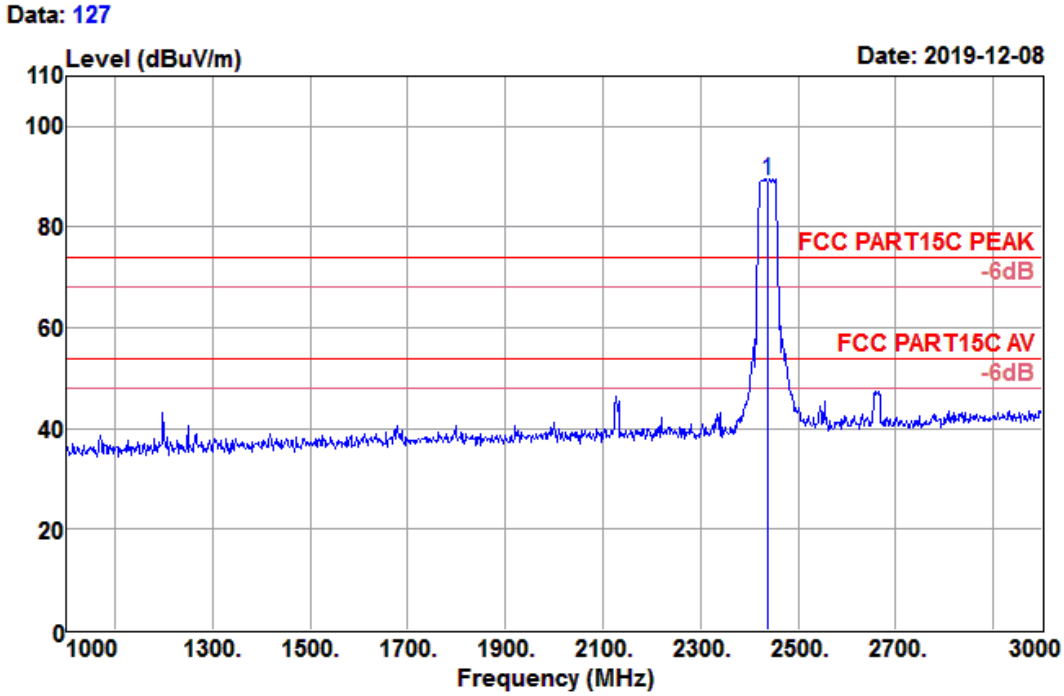




Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4874.000	42.76	31.40	5.55	34.80	44.91	54.00	-9.09	Average
4874.000	54.66	31.40	5.55	34.80	56.81	74.00	-17.19	Peak
7311.000	26.51	36.12	7.53	36.40	33.76	54.00	-20.24	Average
7311.000	39.93	36.12	7.53	36.40	47.18	74.00	-26.82	Peak
9748.000	37.16	38.05	10.70	36.40	49.51	54.00	-4.49	Average
9748.000	40.15	38.05	10.70	36.40	52.50	74.00	-21.50	Peak

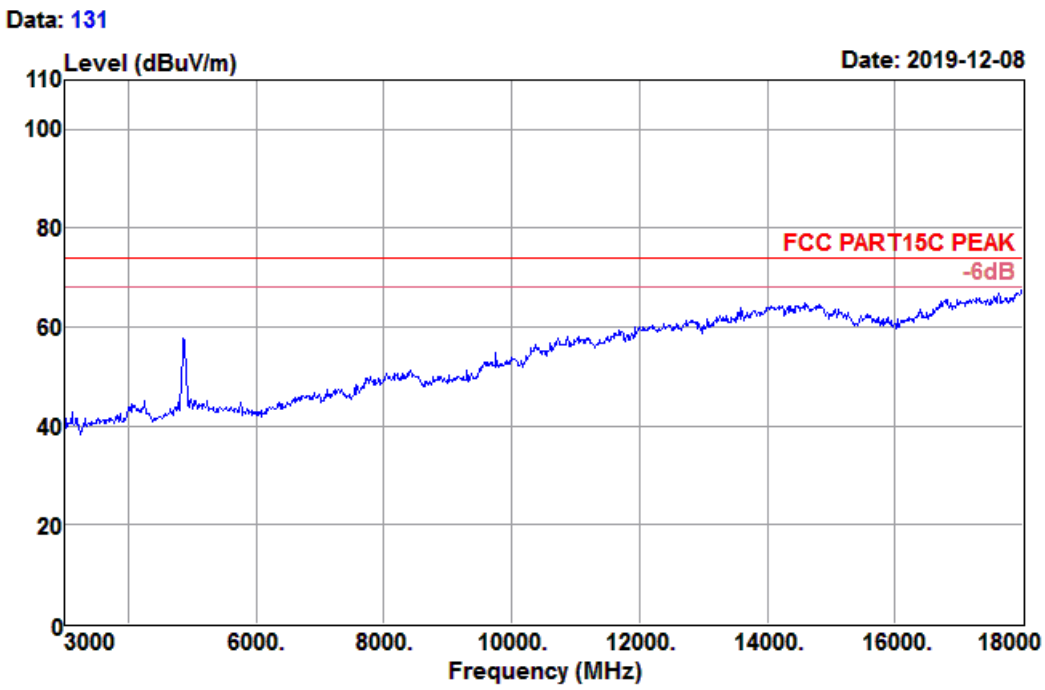
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

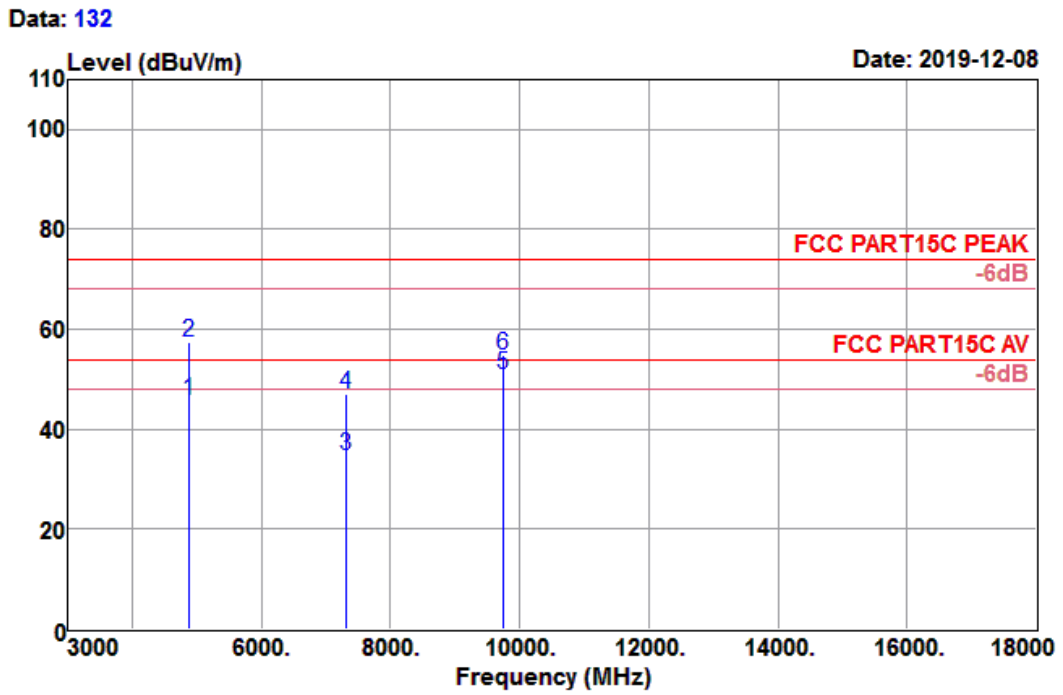
Test Mode :	802.11n HT40 CH06 (2437MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	1GHz~3GHz	**Polarization :**	Vertical



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	93.90	27.24	3.56	35.61	89.09	74.00	15.09	Peak

Test Mode :	802.11n HT40 CH06 (2437MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	3GHz~18GHz	**Polarization :**	Vertical

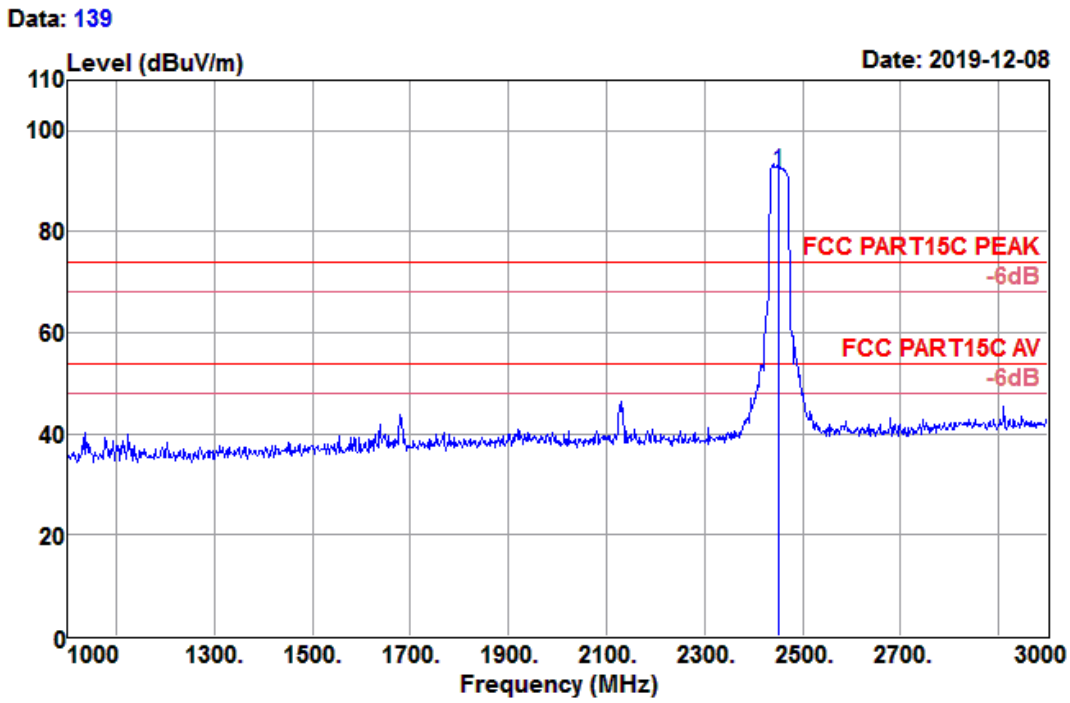




Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4874.000	43.74	31.40	5.55	34.80	45.89	54.00	-8.11	Average
4874.000	55.17	31.40	5.55	34.80	57.32	74.00	-16.68	Peak
7311.000	27.62	36.12	7.53	36.40	34.87	54.00	-19.13	Average
7311.000	39.74	36.12	7.53	36.40	46.99	74.00	-27.01	Peak
9748.000	38.64	38.05	10.70	36.40	50.99	54.00	-3.01	Average
9748.000	42.34	38.05	10.70	36.40	54.69	74.00	-19.31	Peak

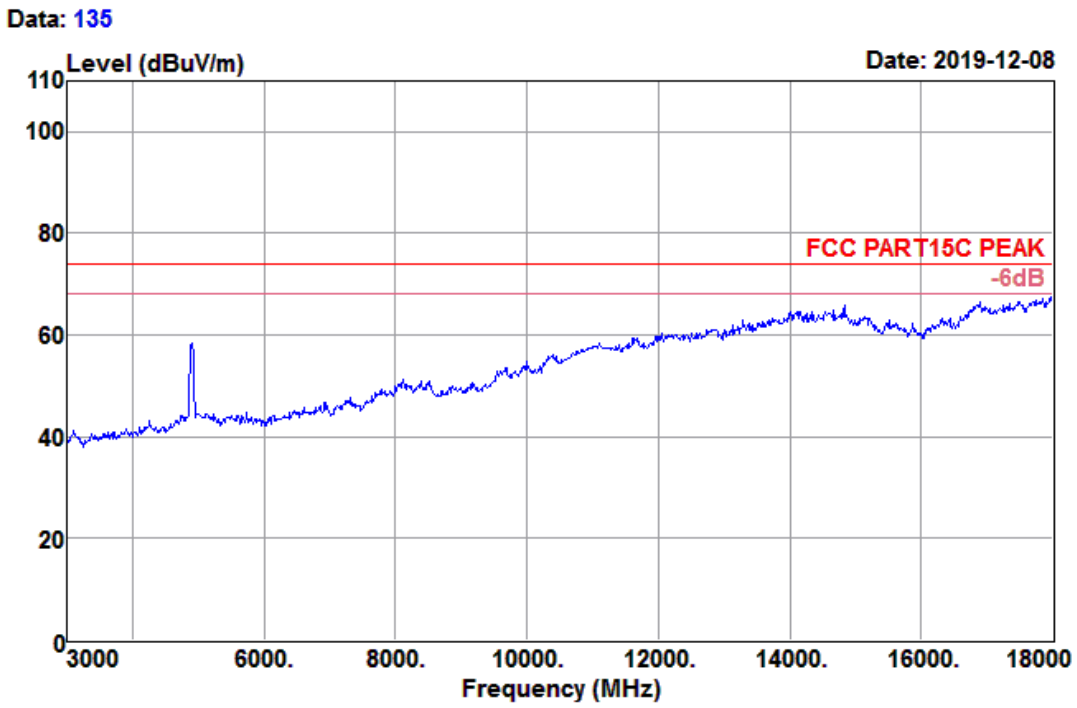
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

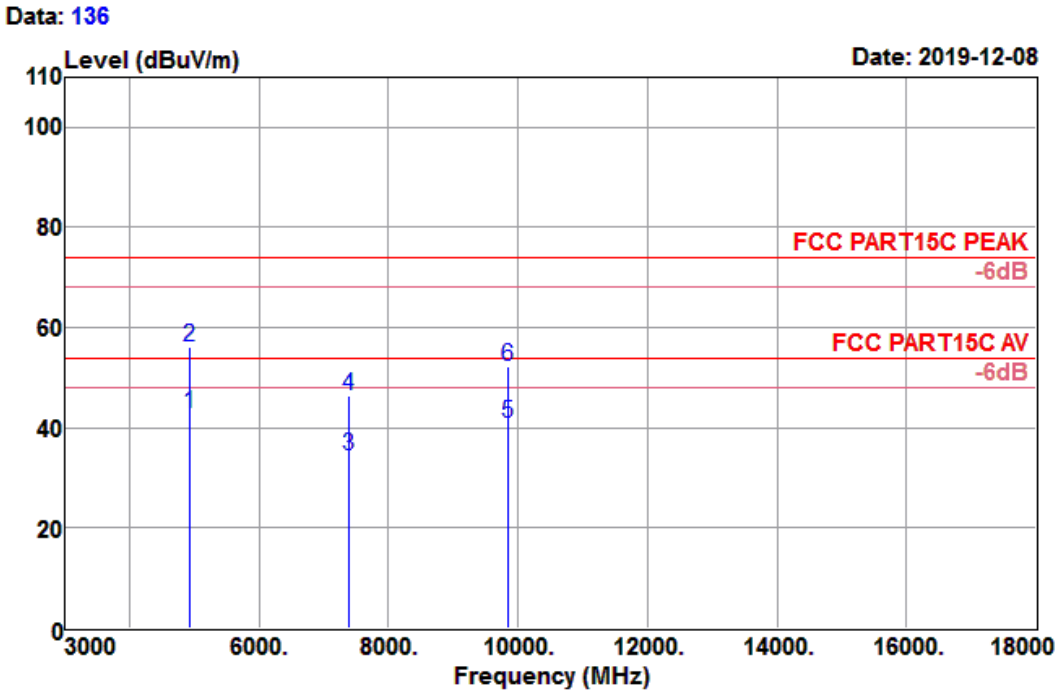
Test Mode :	802.11n HT40 CH09(2452 MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	1GHz~3GHz	**Polarization :**	Horizontal



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	96.59	27.28	3.57	35.63	91.81	74.00	17.81	Peak

Test Mode :	802.11n HT40 CH09(2452 MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	3GHz~18GHz	**Polarization :**	Horizontal

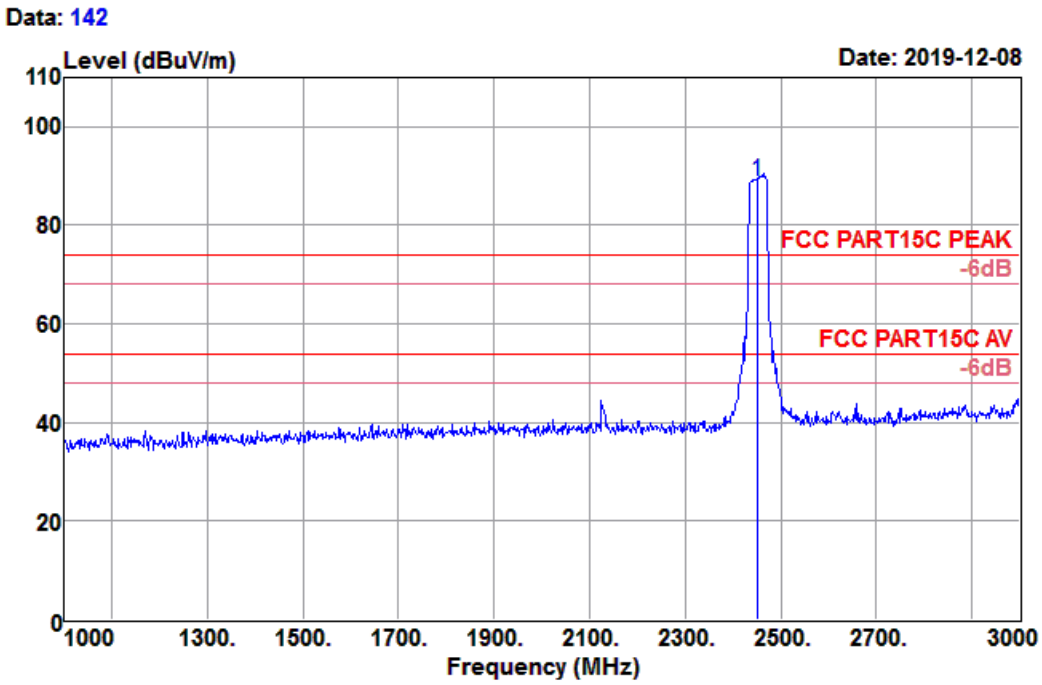




Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4924.000	40.66	31.52	5.53	34.76	42.95	54.00	-11.05	Average
4924.000	53.96	31.52	5.53	34.76	56.25	74.00	-17.75	Peak
7386.000	27.11	36.29	7.46	36.40	34.46	54.00	-19.54	Average
7386.000	39.04	36.29	7.46	36.40	46.39	74.00	-27.61	Peak
9848.000	28.11	38.23	10.98	36.40	40.92	54.00	-13.08	Average
9848.000	39.57	38.23	10.98	36.40	52.38	74.00	-21.62	Peak

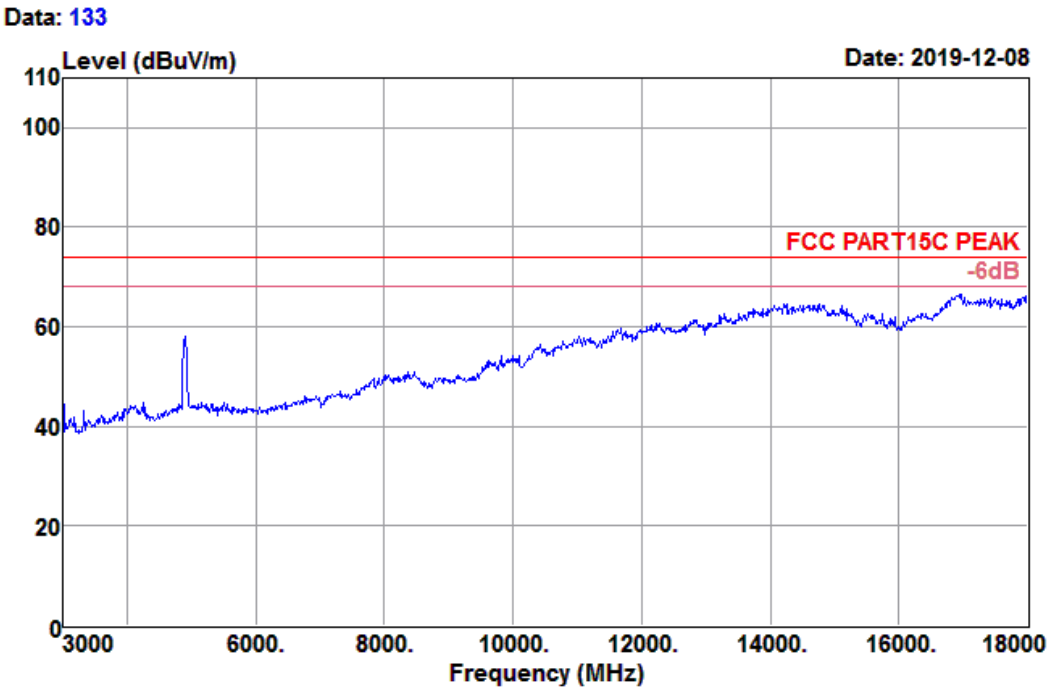
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

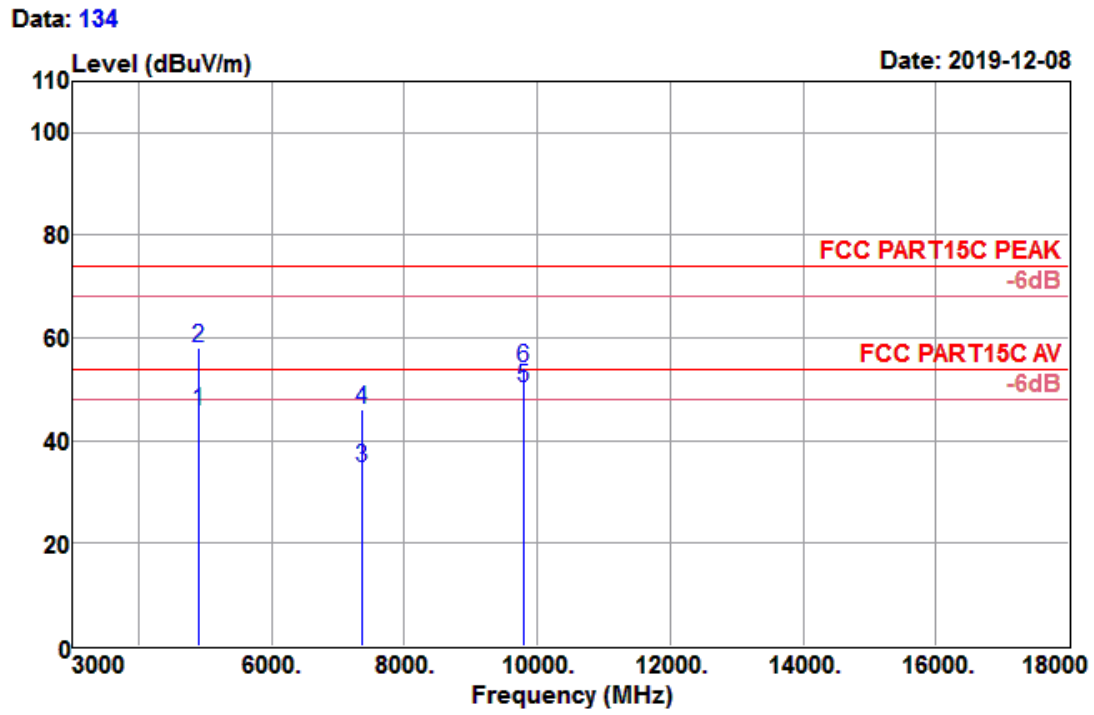
Test Mode :	802.11n HT40 CH09(2452 MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	1GHz~3GHz	**Polarization :**	Vertical



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	93.58	27.28	3.57	35.63	88.80	74.00	14.80	Peak

Test Mode :	802.11n HT40 CH09(2452 MHz)	**Temperature :**	21~23℃
Test Engineer :	Jack Liu	**Relative Humidity :**	63~65%
Frequencey Range	3GHz~18GHz	**Polarization :**	Vertical



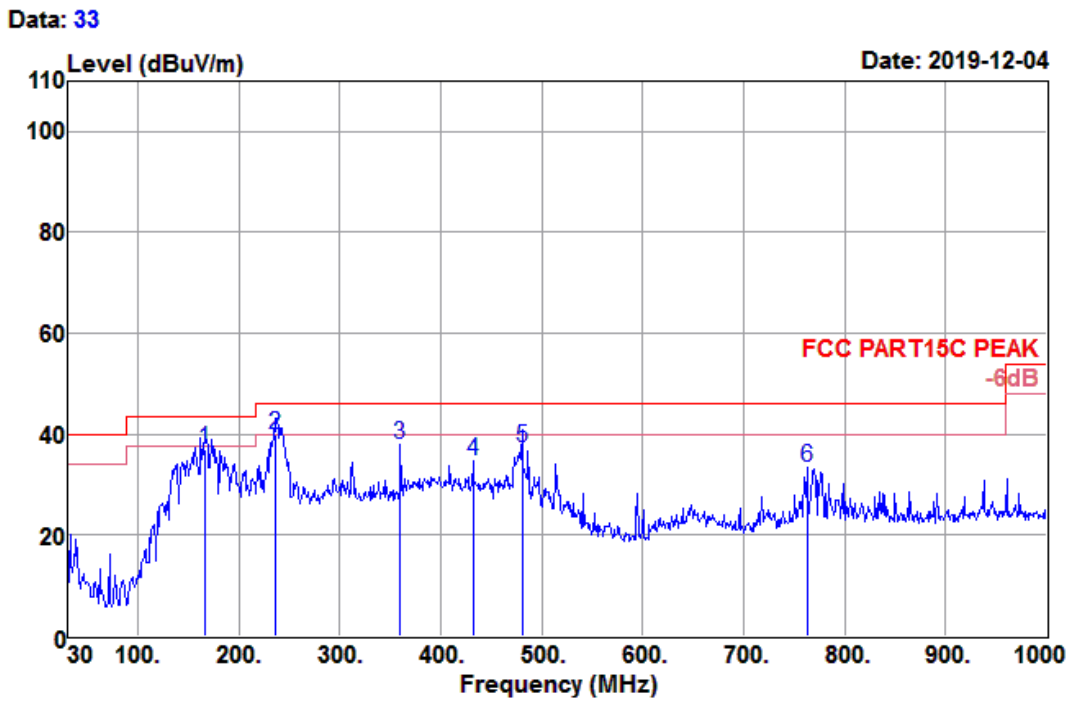


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4904.000	43.47	31.47	5.54	34.78	45.70	54.00	-8.30	Average
4904.000	55.97	31.47	5.54	34.78	58.20	74.00	-15.80	Peak
7356.000	27.32	36.22	7.49	36.40	34.63	54.00	-19.37	Average
7356.000	38.82	36.22	7.49	36.40	46.13	74.00	-27.87	Peak
9808.000	37.82	38.15	10.87	36.40	50.44	54.00	-3.56	Average
9808.000	41.62	38.15	10.87	36.40	54.24	74.00	-19.76	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.

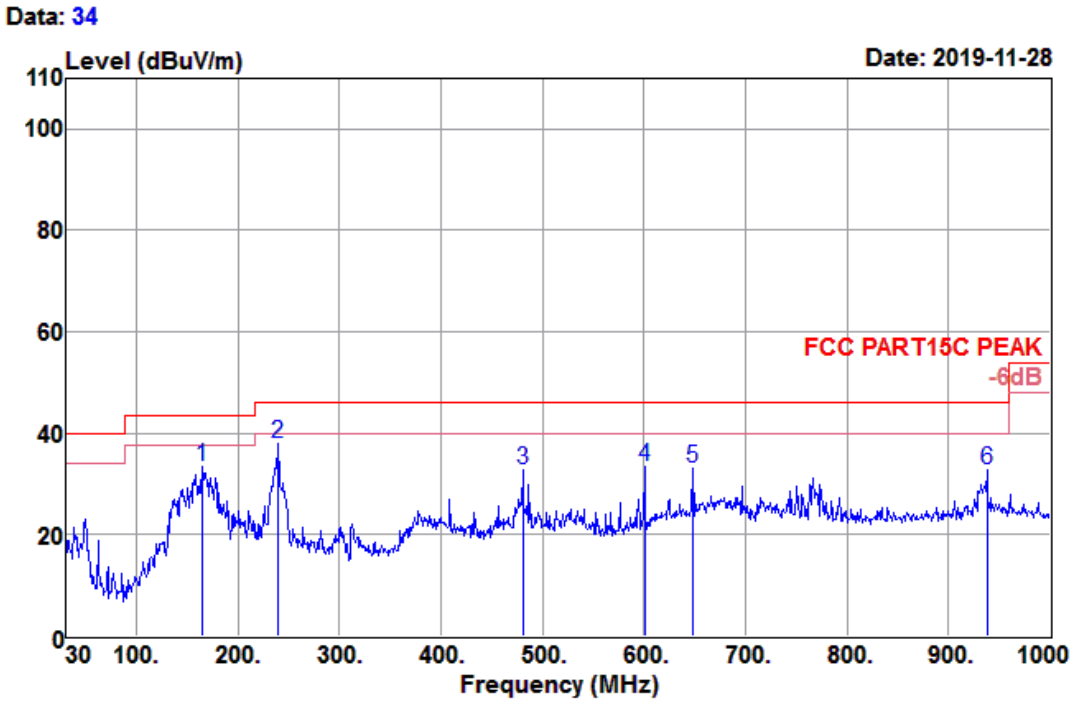
4.5.6 Test Result of Radiated Spurious Emission (30MHz ~ 1GHz)

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



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
166.770	53.97	13.46	2.22	32.63	37.02	43.50	-6.48	QP
235.640	57.87	12.38	2.49	32.67	40.07	46.00	-5.93	QP
359.800	52.53	15.00	3.09	32.76	37.86	46.00	-8.14	Peak
431.580	47.32	16.75	3.35	32.83	34.59	46.00	-11.41	Peak
480.080	48.98	17.66	3.53	32.88	37.29	46.00	-8.71	QP
762.350	38.65	22.25	4.55	32.11	33.34	46.00	-12.66	Peak

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



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
163.860	50.15	13.61	2.20	32.63	33.33	43.50	-10.17	Peak
239.520	55.57	12.58	2.50	32.67	37.98	46.00	-8.02	Peak
480.080	44.32	17.66	3.53	32.88	32.63	46.00	-13.37	Peak
600.360	41.98	20.01	3.95	32.60	33.34	46.00	-12.66	Peak
647.890	40.85	20.67	4.14	32.46	33.20	46.00	-12.80	Peak
937.920	35.19	24.18	5.11	31.79	32.69	46.00	-13.31	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

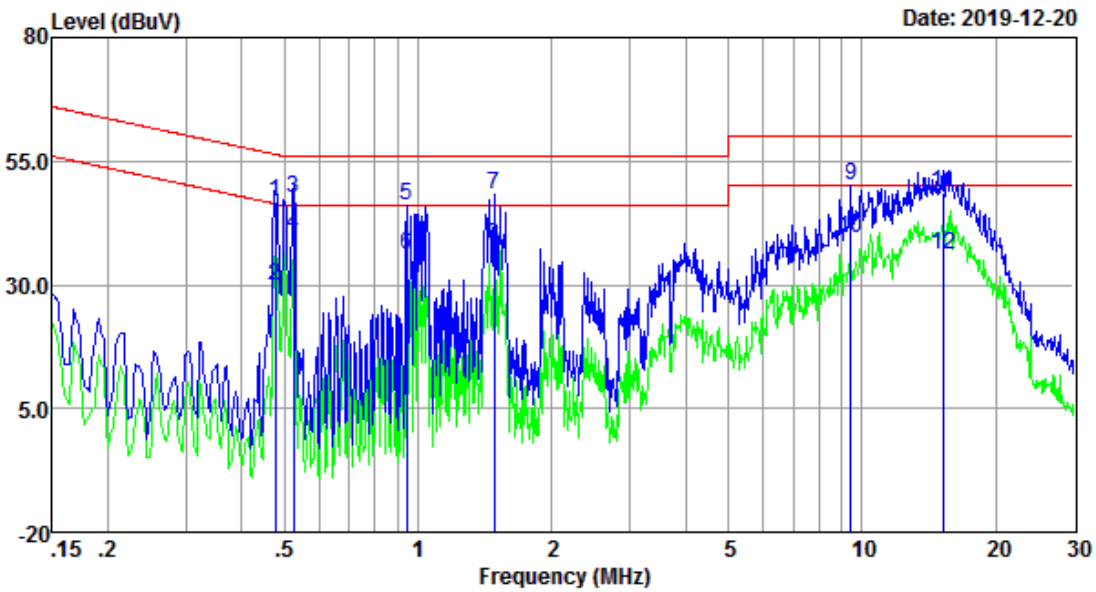
*Decreases with the logarithm of the frequency.

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

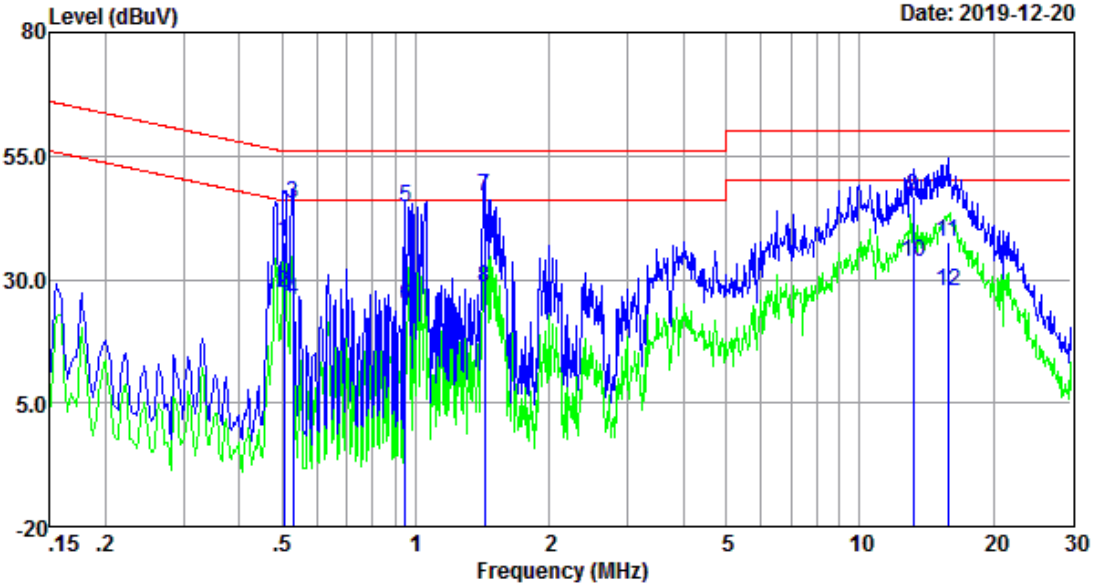
Test Mode :	Mode 1	**Temperature :**	21~24℃
Test Engineer :	Jerry Wang	**Relative Humidity :**	43~52%
Test Voltage :	12Vac	**Phase :**	Line
Function Type :	Normal Wroking		



Freq MHz	Reading level dBuV	LISN/ISN factor dB	Cable loss dB	Result level dBuV	Limit level dBuV	Over limit dB	Remark
0.476	37.00	9.72	0.04	46.76	56.41	-9.65	QP
0.476	20.00	9.72	0.04	29.76	46.41	-16.65	Average
0.524	37.60	9.72	0.04	47.36	56.00	-8.64	QP
0.524	30.41	9.72	0.04	40.17	46.00	-5.83	Average
0.943	36.06	9.79	0.05	45.90	56.00	-10.10	QP
0.943	26.35	9.79	0.05	36.19	46.00	-9.81	Average
1.487	38.30	9.85	0.05	48.20	56.00	-7.80	QP
1.487	28.20	9.85	0.05	38.10	46.00	-7.90	Average
9.451	39.91	9.98	0.10	49.99	60.00	-10.01	QP
9.451	29.31	9.98	0.10	39.39	50.00	-10.61	Average
15.226	38.60	10.01	0.13	48.74	60.00	-11.26	QP
15.226	26.00	10.01	0.13	36.14	50.00	-13.86	Average

Result Level= Reading Level + LISN Factor + Cable Loss

Test Mode :	Mode 1	**Temperature :**	21~24℃
Test Engineer :	Jerry Wang	**Relative Humidity :**	43~52%
Test Voltage :	12Vac	**Phase :**	NETURAL
Function Type :	Normal Wroking		



Freq MHz	Reading level dBuV	LISN/ISN factor dB	Cable loss dB	Result level dBuV	Limit level dBuV	Over limit dB	Remark
0.505	28.00	9.64	0.04	37.68	56.00	-18.32	QP
0.505	17.40	9.64	0.04	27.08	46.00	-18.92	Average
0.529	35.70	9.65	0.04	45.39	56.00	-10.61	QP
0.529	16.00	9.65	0.04	25.69	46.00	-20.31	Average
0.948	34.90	9.66	0.05	44.61	56.00	-11.39	QP
0.948	15.10	9.66	0.05	24.81	46.00	-21.19	Average
1.426	37.10	9.72	0.05	46.87	56.00	-9.13	QP
1.426	18.40	9.72	0.05	28.17	46.00	-17.83	Average
13.197	36.80	9.88	0.12	46.80	60.00	-13.20	QP
13.197	23.40	9.88	0.12	33.40	50.00	-16.60	Average
15.801	27.59	9.91	0.14	37.64	60.00	-22.36	QP
15.801	17.59	9.91	0.14	27.64	50.00	-22.36	Average

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	2019-07-05	2020-07-04	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
Power regulator	Tianzheng	TDGC2-10KVA	170105SCHBT5	2017-03-03	2020-03-02	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

MEASUREMENT	UNCERTAINTY
Occupied Channel Bandwidth	±0.1%
RF output power, conducted	±1.2dB
Power density, conducted	±1.2dB

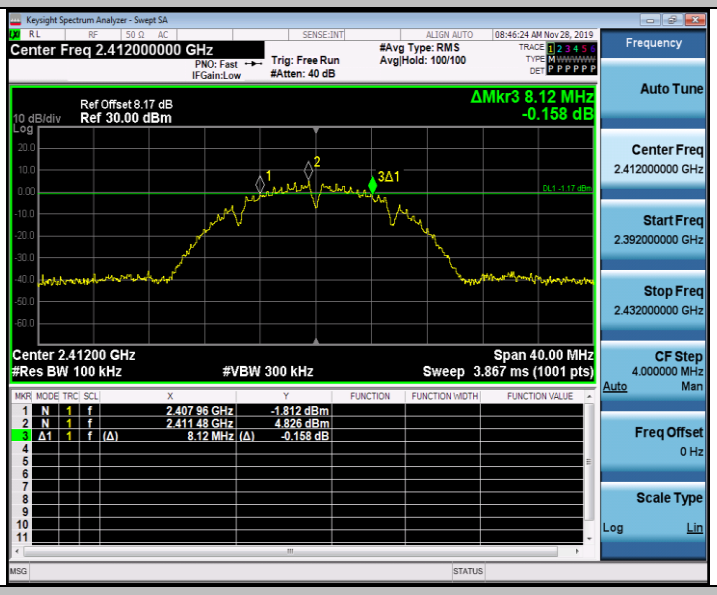
This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

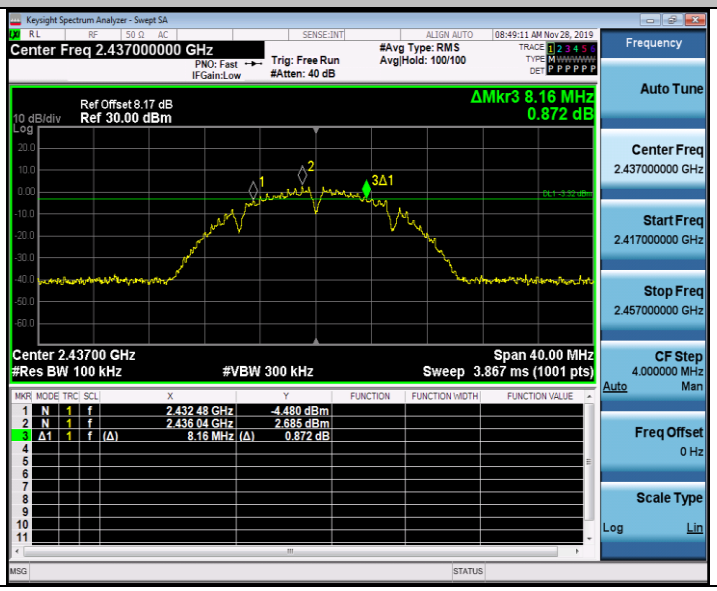
Appendix A: DTS Bandwidth

Test Result

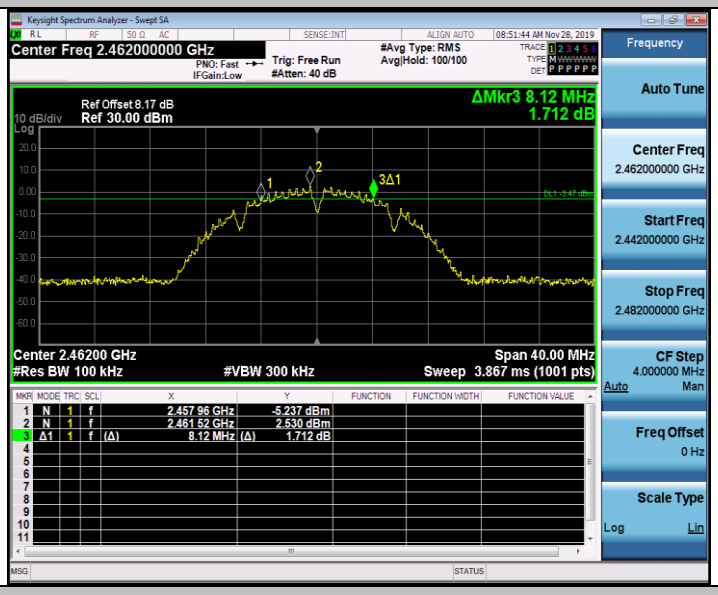
TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	8.120	2407.960	2416.080	>=0.5	PASS
		2437	8.160	2432.480	2440.640	>=0.5	PASS
		2462	8.120	2457.960	2466.080	>=0.5	PASS
11G	Ant1	2412	16.440	2403.840	2420.280	>=0.5	PASS
		2437	16.440	2428.840	2445.280	>=0.5	PASS
		2462	16.400	2453.840	2470.240	>=0.5	PASS
11N20SISO	Ant1	2412	17.640	2403.240	2420.880	>=0.5	PASS
		2437	17.640	2428.240	2445.880	>=0.5	PASS
		2462	17.680	2453.240	2470.920	>=0.5	PASS
11N40SISO	Ant1	2422	36.080	2404.240	2440.320	>=0.5	PASS
		2437	36.480	2418.840	2455.320	>=0.5	PASS
		2452	36.480	2433.840	2470.320	>=0.5	PASS

Test Graphs

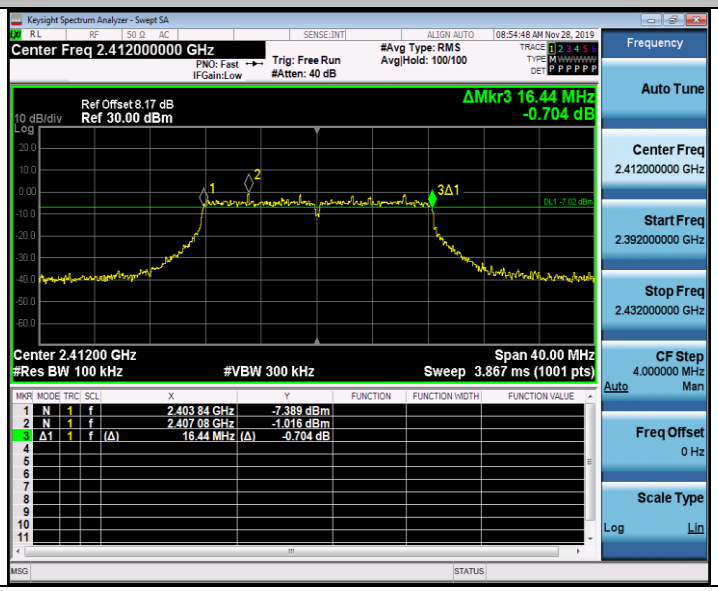
11B_Ant1_2412


11B_Ant1_2437


11B_Ant1_2462



11G_Ant1_2412



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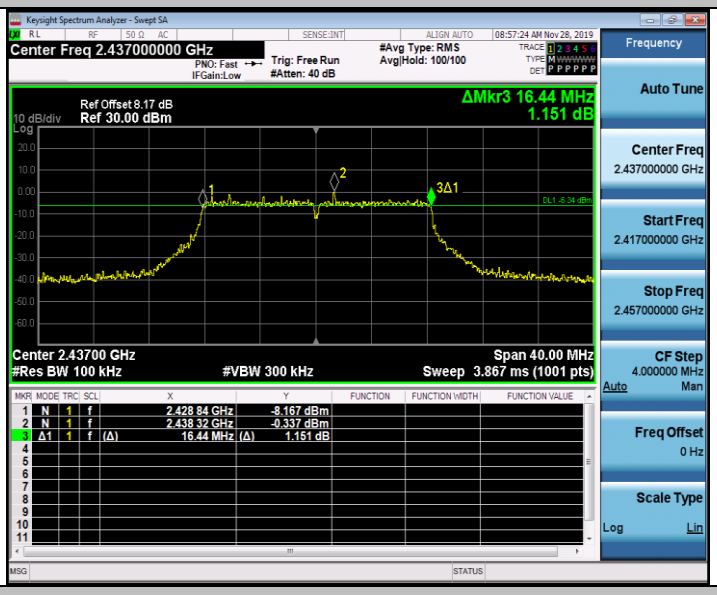
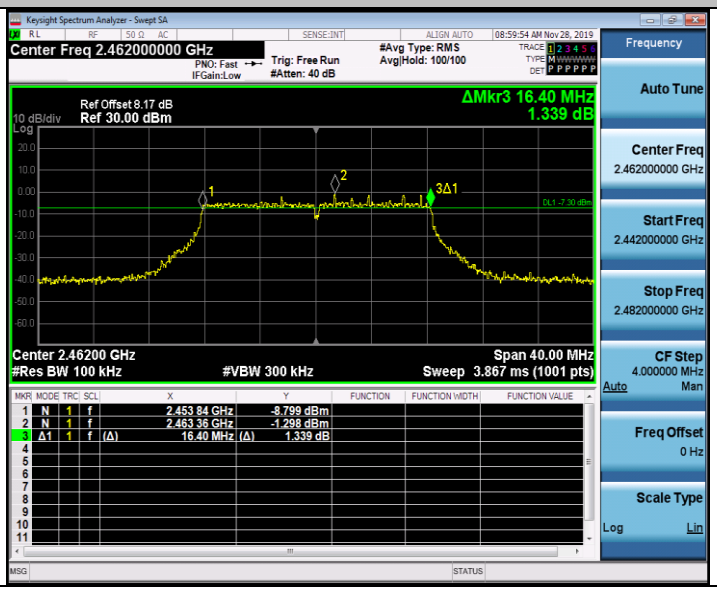
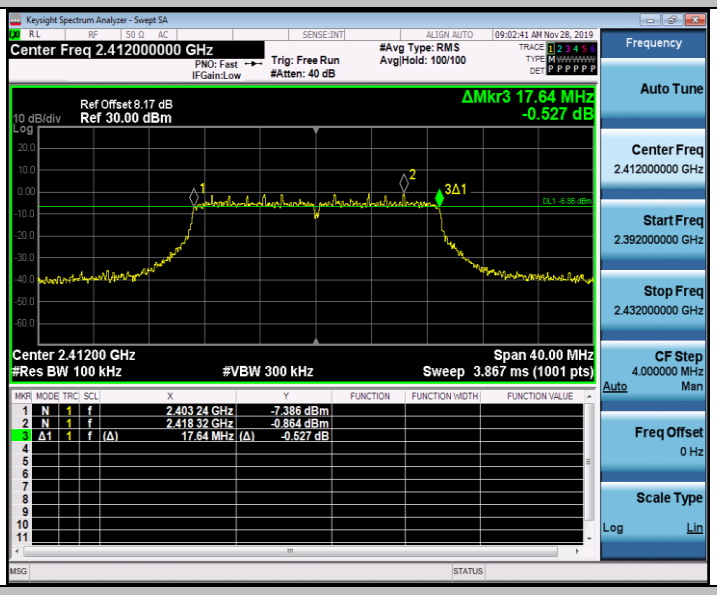


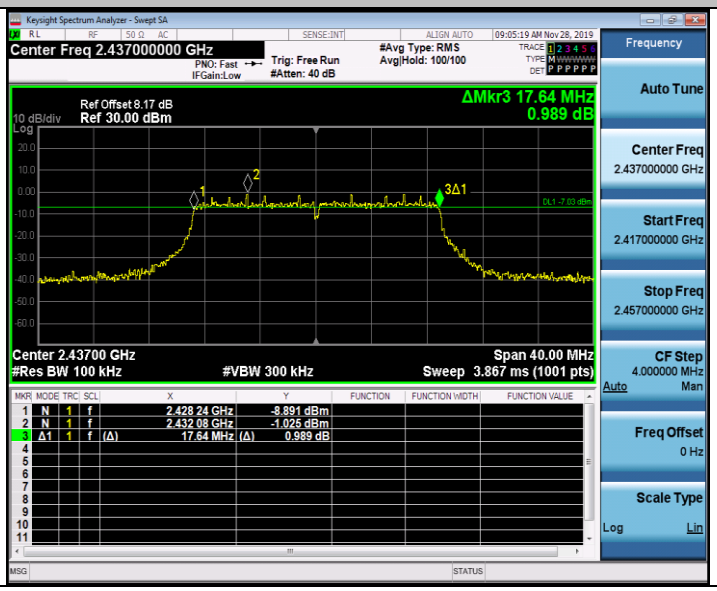
11G_Ant1_2462



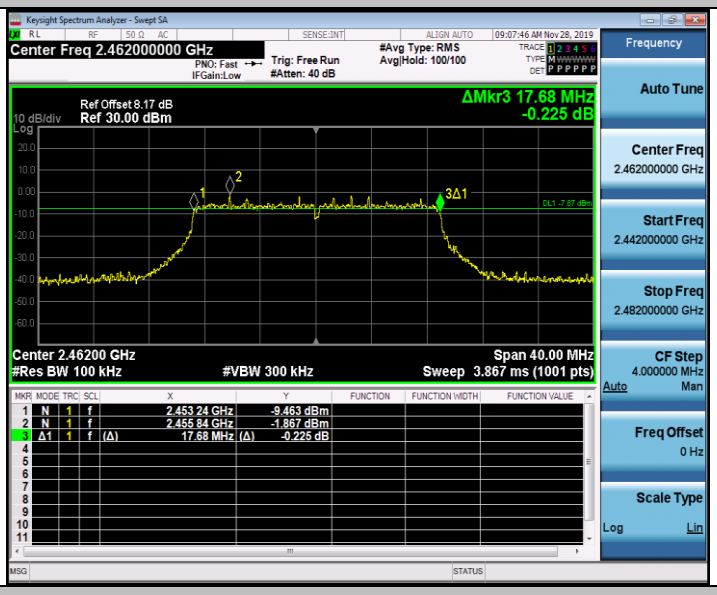
11N20SISO_Ant1_2412



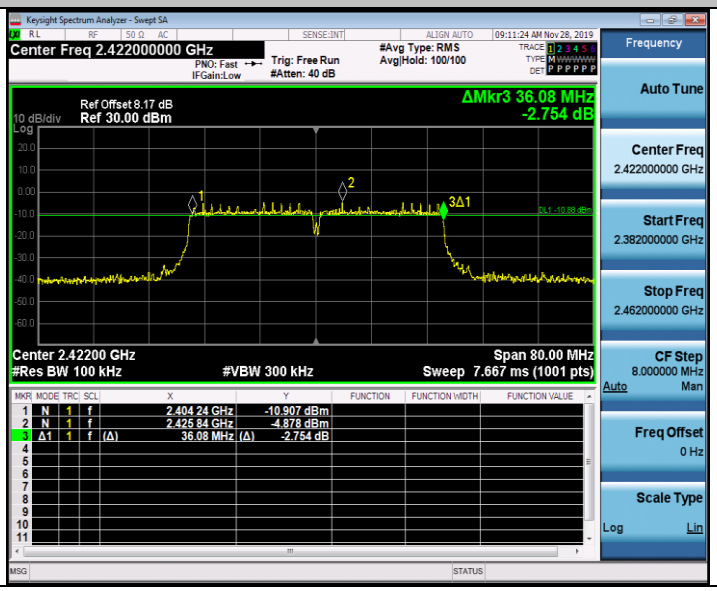
11N20SISO_Ant1_2437



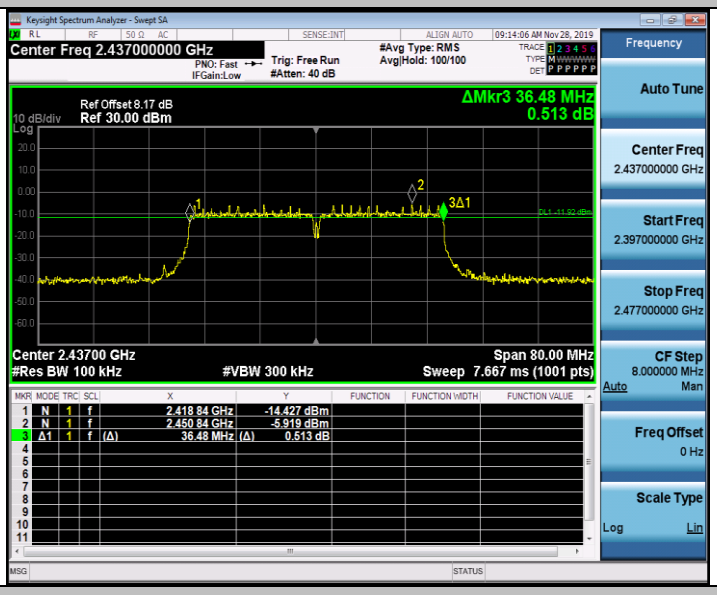
11N20SISO_Ant1_2462



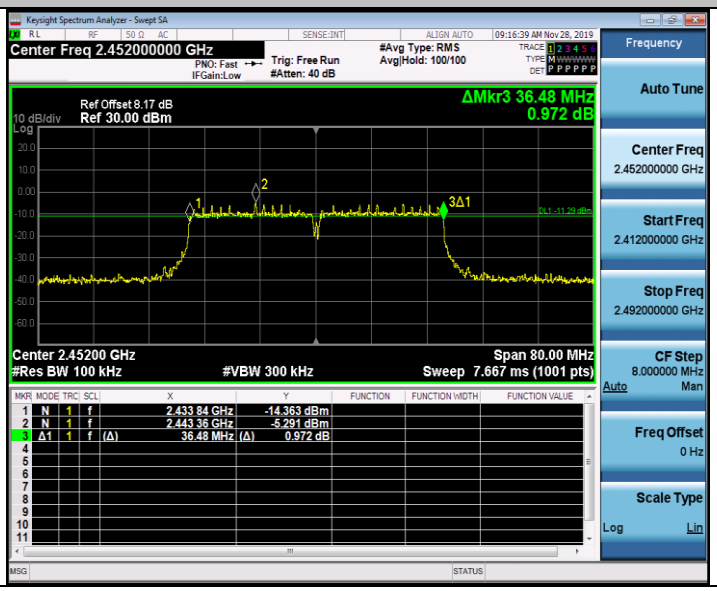
11N40SISO_Ant1_2422



11N40SISO_Ant1_2437



11N40SISO_Ant1_2452



Appendix B: Occupied Channel Bandwidth

Test Result

TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	13.798	2405.110	2418.908	---	PASS
		2437	13.807	2430.118	2443.925	---	PASS
		2462	13.825	2455.139	2468.964	---	PASS
11G	Ant1	2412	17.371	2403.352	2420.723	---	PASS
		2437	17.321	2428.413	2445.734	---	PASS
		2462	17.296	2453.410	2470.706	---	PASS
11N20SISO	Ant1	2412	18.226	2402.920	2421.146	---	PASS
		2437	18.298	2427.916	2446.214	---	PASS
		2462	18.262	2452.955	2471.217	---	PASS
11N40SISO	Ant1	2422	36.427	2403.875	2440.302	---	PASS
		2437	36.469	2418.856	2455.325	---	PASS
		2452	36.331	2433.919	2470.250	---	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