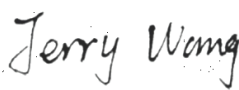


RF Test Report

For

Globe Electric Company Inc.

Test Standards:	Part 15C Subpart C §15.247 <u>RSS 247 Issue 2</u>
Product Name:	Smart Light Switch
Tested Model:	50200
Brand Name:	Globe
FCC ID:	2AQUQGE50200
IC:	8290A-GE50200
Classification	<u>(DTS) Digital Transmission System</u>
Report No.:	<u>EC2007034RF01</u>
Tested Date:	<u>2020-07-24 to 2020-08-05</u>
Issued Date:	<u>2020-08-05</u>
Prepared By:	<u></u> Jerry Wang / Engineer
Approved By:	<u></u> Bacon Wu / RF Manager

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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	/	2020.08.05	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	$\geq 0.5\text{MHz}$	Pass	-
-	RSS-Gen 6.7	99% Bandwidth	-	Pass	-
15.247(b)(3)	RSS-247 A5.4(d)	Peak Output Power	$\leq 30\text{dBm}$	Pass	-
15.247(e)	RSS-247 5.2(b)	Power Spectral Density	$\leq 8\text{dBm}/3\text{kHz}$	Pass	-
15.247(d)	RSS-247 5.5	Conducted Band Edges and Spurious Emission	$\leq 20\text{dBc}$	Pass	-
15.247(d)	RSS-247 5.5	Radiated Band Edges and Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 2.60 dB at 4924 MHz
15.207	RSS-GEN 8.8	AC Conducted Emission	15.207(a)	Pass	Under limit 22.62 dB at 0.447 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	Smart Light Switch
Model No.	50200
Additional No.	N/A
Difference Description	N/A
FCC ID	2AQUQGE50200
IC	8290A-GE50200
Power Supply*	125Vac
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 : 13.34 dBm (0.0216 W) 802.11g : 14.45 dBm (0.0279 W) 802.11n HT20 : 14.37 dBm (0.0274 W)
Max. e.i.r.p.	17.45 dBm (0.0556 W)
Antenna Type	PCB Antenna type with 3dBi gain
HW Version	1.0.0
SW Version	1.0.0
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.
3. *: Pre-test AC120V and AC125V, only the worst AC125V test data is recorded in the 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		

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

Frequency Range(MHz)	Mode	Rate	Output Power(dBm)
2412~2462	802.11b	1Mbps	13.34
2412~2462	802.11g	6Mbps	14.45
2412~2462	802.11n HT20	MCS0	14.37

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

3.2 Test Mode

3.2.1 Antenna Port Conducted Measurement

Summary table of Test Cases			
Test Item	Modulation		
	802.11 b	802.11 g	802.11n HT20
Conducted Test Cases	Mode 1: CH01	Mode 1: CH01	Mode 1: CH01
	Mode 2: CH06	Mode 2: CH06	Mode 2: CH06
	Mode 3: CH011	Mode 3: CH011	Mode 3: CH011

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
Radiated Test Cases	Mode 1: CH01	Mode 1: CH01	Mode 1: CH01
	Mode 2: CH06	Mode 2: CH06	Mode 2: CH06
	Mode 3: CH11	Mode 3: CH11	Mode 3: CH11

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 Linking + Switching On
-----------------------	--------------------------------------

3.3 Support Equipment

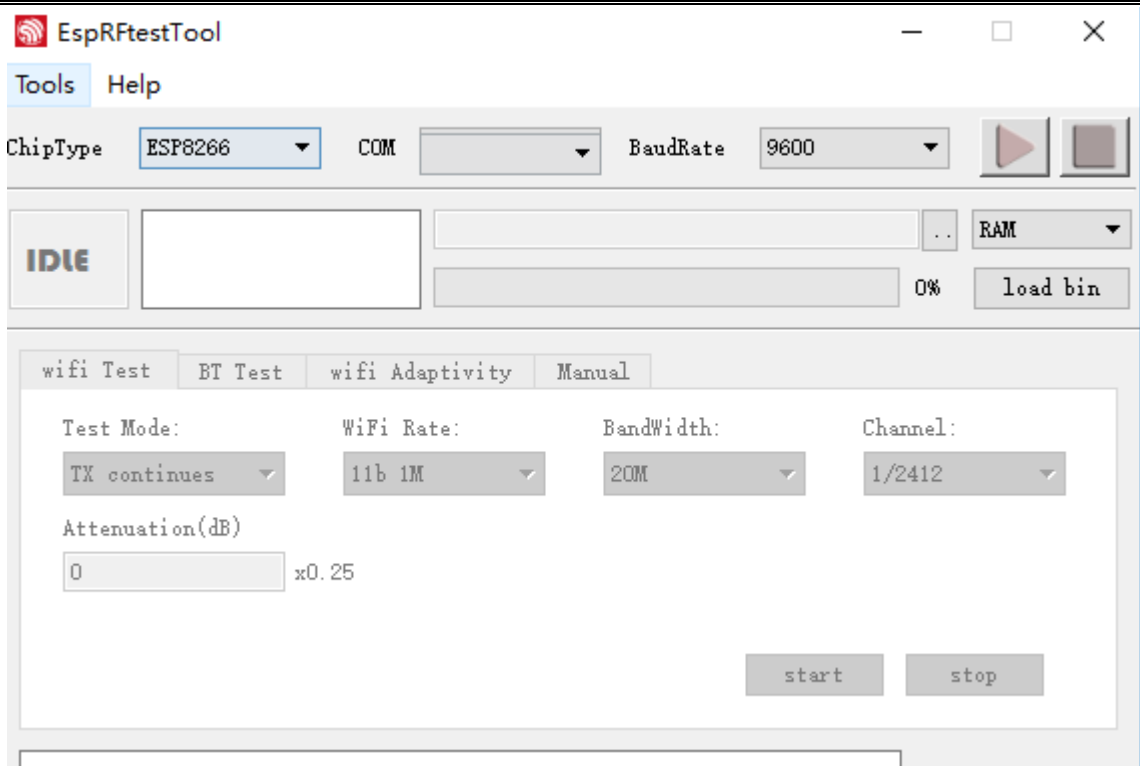
Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	WLAN AP	NETGEAR	R7800	PY315100319	N/A	shielded, 1.8 m
2.	Notebook	Lenovo	E470C	FCC sDoC	N/A	shielded cable DC O/P 1.8 m unshielded AC I/P cable 1.2 m

3.4 Test Setup

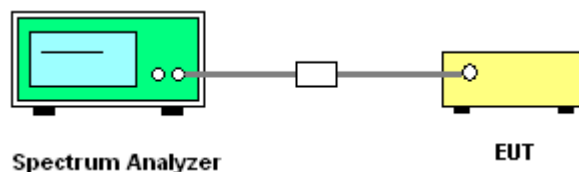
The EUT is continuously communicating to the WIFI tester during the tests.

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

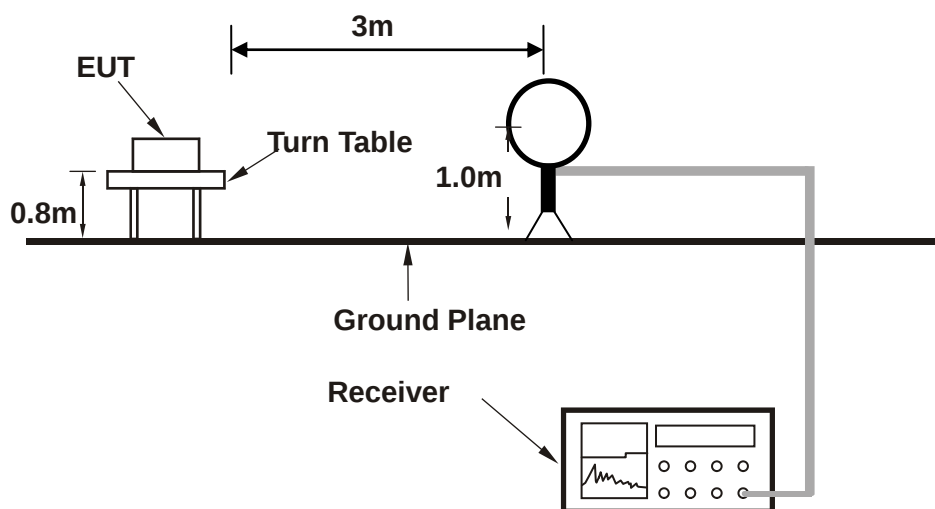
The following picture is a screenshot of the test software



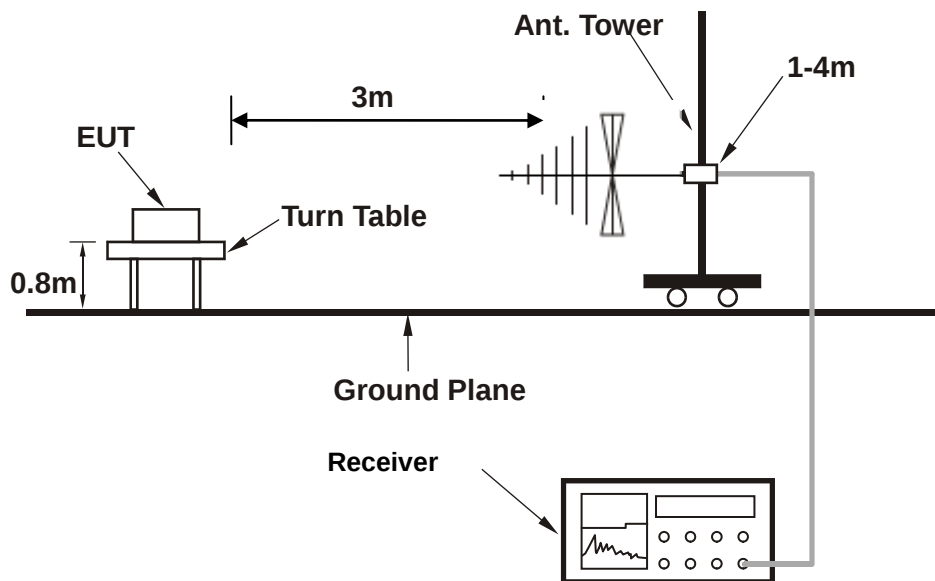
Setup diagram for Conducted Test



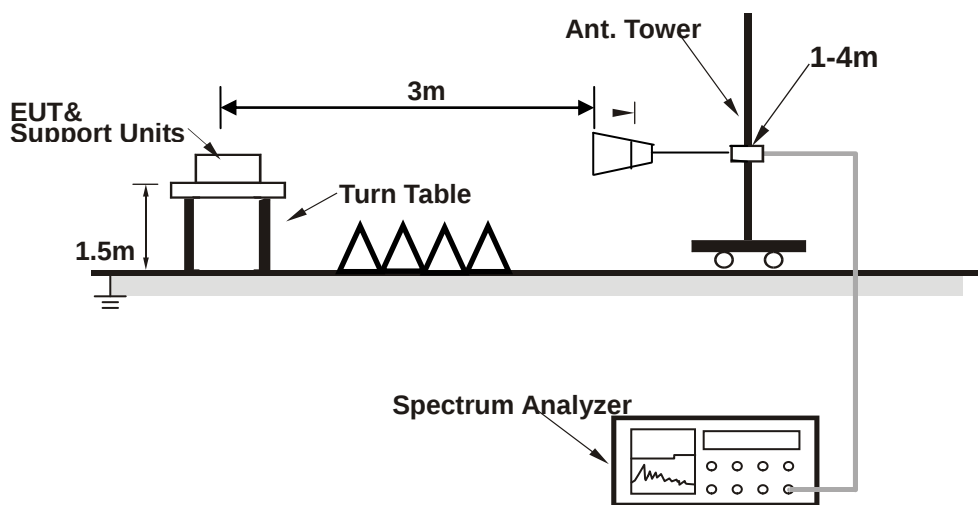
Setup diagram for Raidation(9KHz~30MHz) Test



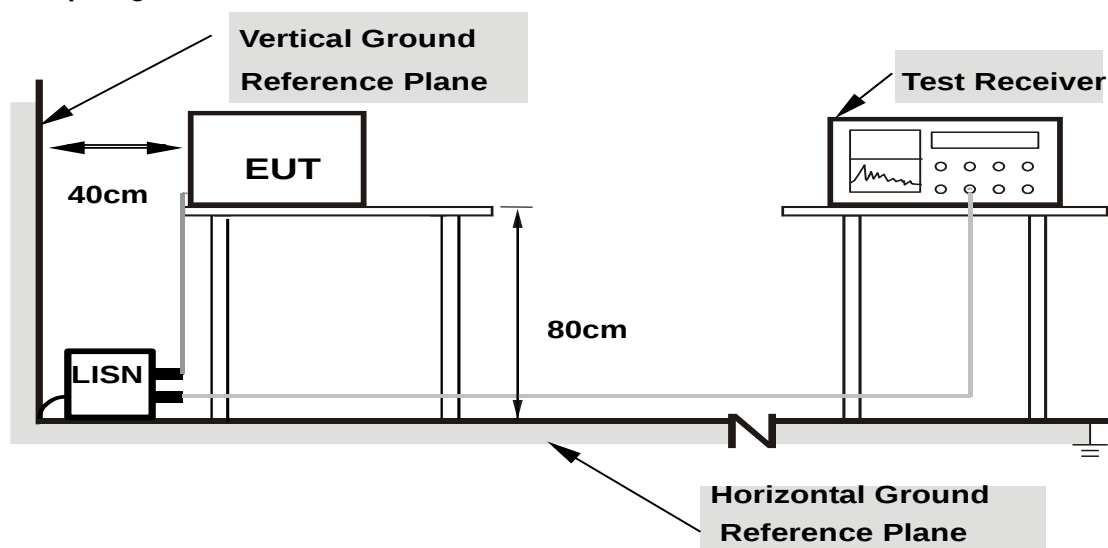
Setup diagram for Raidation(Below 1G) Test



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.

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

For all radiated test items:

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

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

4 Test Result

4.1 DTS and Occupied Channel Bandwidth Measurement

4.1.1 Limit of 6dB Bandwidth

FCC §15.247 (a) (2)

IC RSS-247 5.2(a)

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

4.1.2 Test Procedures

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

4.1.3 Test Result of 6dB Bandwidth

Refer to Appendix A of this test report.

4.1.4 Test Result of 99% Bandwidth

Refer to Appendix B of this test report.

4.2 Maximum Conducted Output Power Measurement

4.2.1 Limit of Output Power

FCC §15.247 (b)(3)

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 $1.5 \times \text{OBW}$. Set RBW=510KHz, VBW=2MHz, Number of points in sweep $\geq 2/3 \times$ span, Sweep time = auto. Detector = RMS
7. Allow the sweep to "free run". Trace average 100 traces in RMS mode
8. Compute power by integrating the spectrum across the OBW of the signal using the instrument's Channel power measurement function with band limits set equal to the OBW band edges.
9. Add $10 \log (1/x)$, where x is the duty cycle. The duty cycle factor has been compensated to the "offset" of the spectrum analyser.

4.2.3 Test Result of Peak Output Power

Refer to Appendix C of this test report.

4.2.4 Test Result of Duty Cycle

Refer to Appendix D of this test report.

4.3 Maximum Power Spectral Density Measurement

4.3.1 Limits of Power Spectral Density

FCC§15.247(e)

IC RSS-247 5.2(b)

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

4.3.2 Test Procedure

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

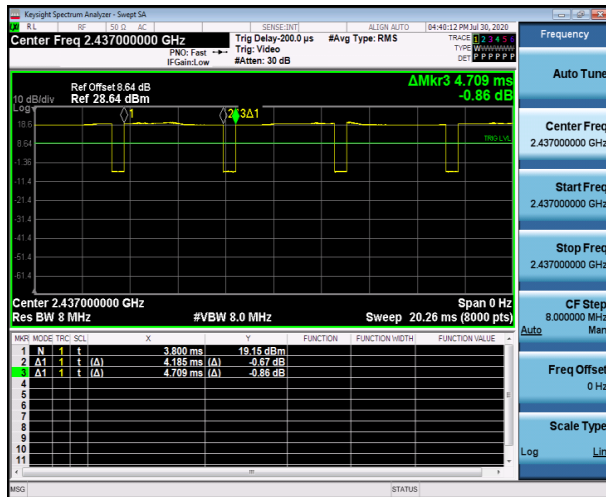
In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 30 dB below the highest emission level within the authorized band. In addition, radiated emissions which fall in the restricted bands must also comply with the FCC section 15.209 limits as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

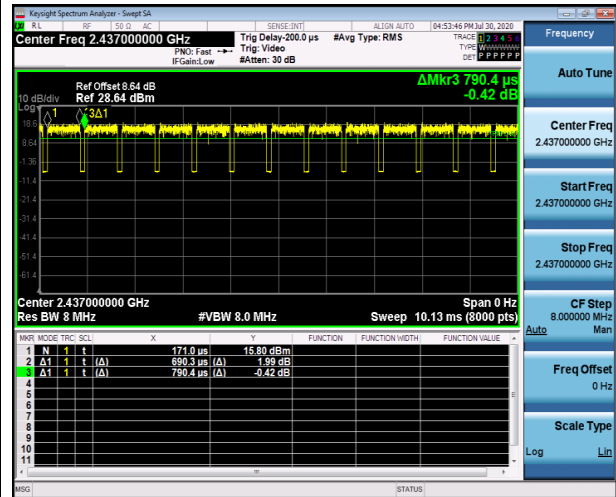
4.5.2 Test Procedures

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 $f > 1$ GHz ; VBW RBW; Sweep = auto; Detector function = peak; Trace = max hold for peak
 - (3) For average measurement:
VBW = 10 Hz, when duty cycle is no less than 98 percent.
VBW $\geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

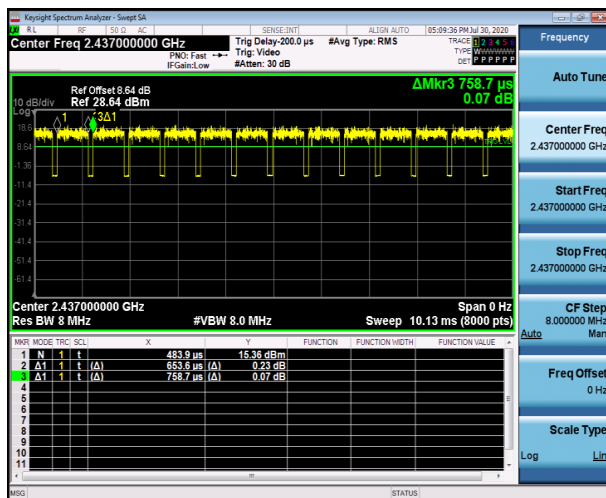
Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11b	88.86	4.19	0.24	1kHz
802.11g	87.34	0.69	1.45	3kHz
802.11n HT20	86.14	0.65	1.54	3kHz



802.11b



802.11g



802.11n HT20

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

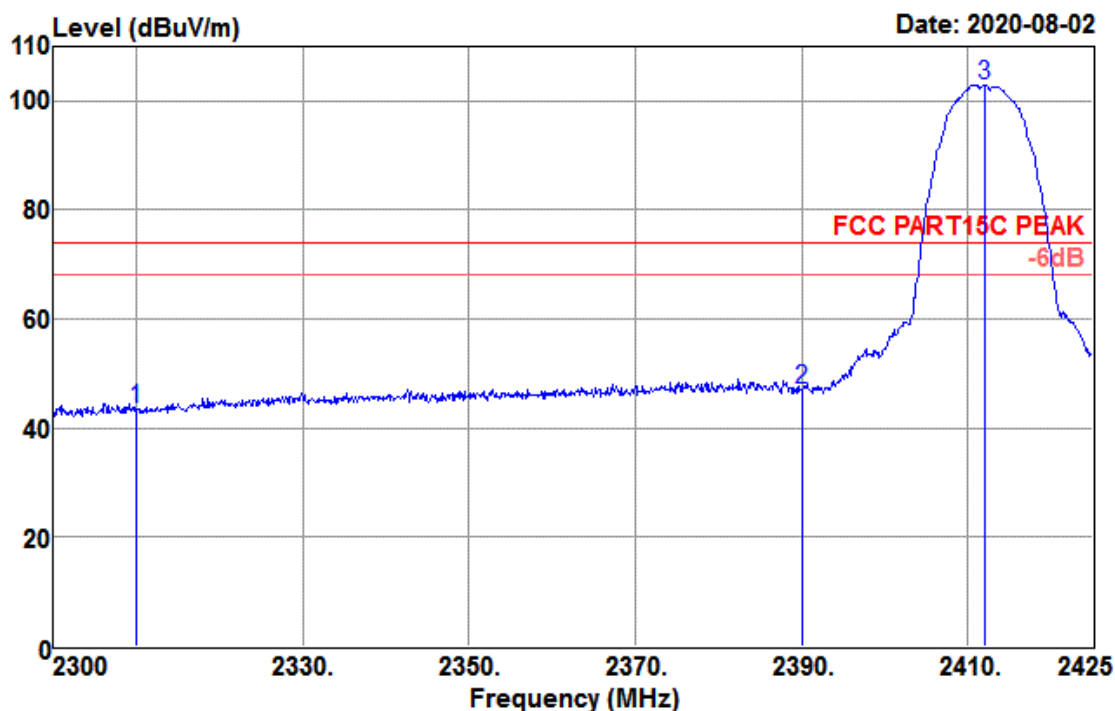
4.5.3 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

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 :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.425GHz	Polarization :	Horizontal

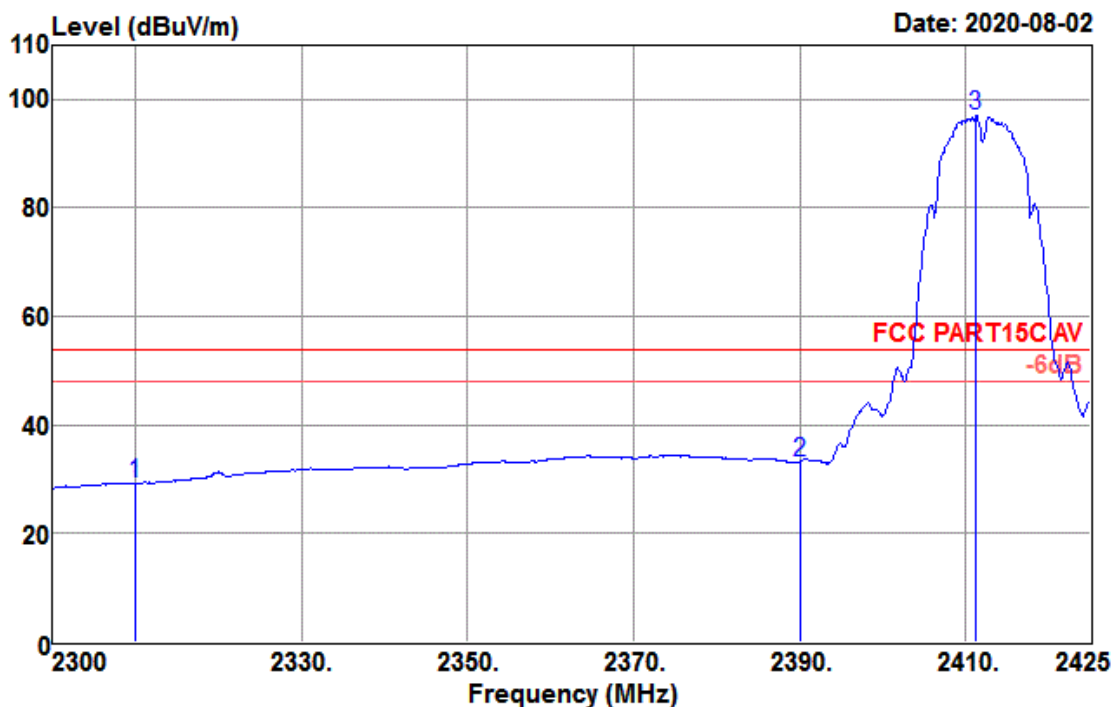
Data: 231



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	47.75	27.38	4.11	35.61	43.63	74.00	-30.37	Peak
2390.000	51.26	27.56	4.18	35.79	47.21	74.00	-26.79	Peak
2412.000	107.06	27.61	4.20	35.84	103.03	74.00	29.03	Peak

Test Mode :	802.11b CH01 (2412 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.425GHz	Polarization :	Horizontal

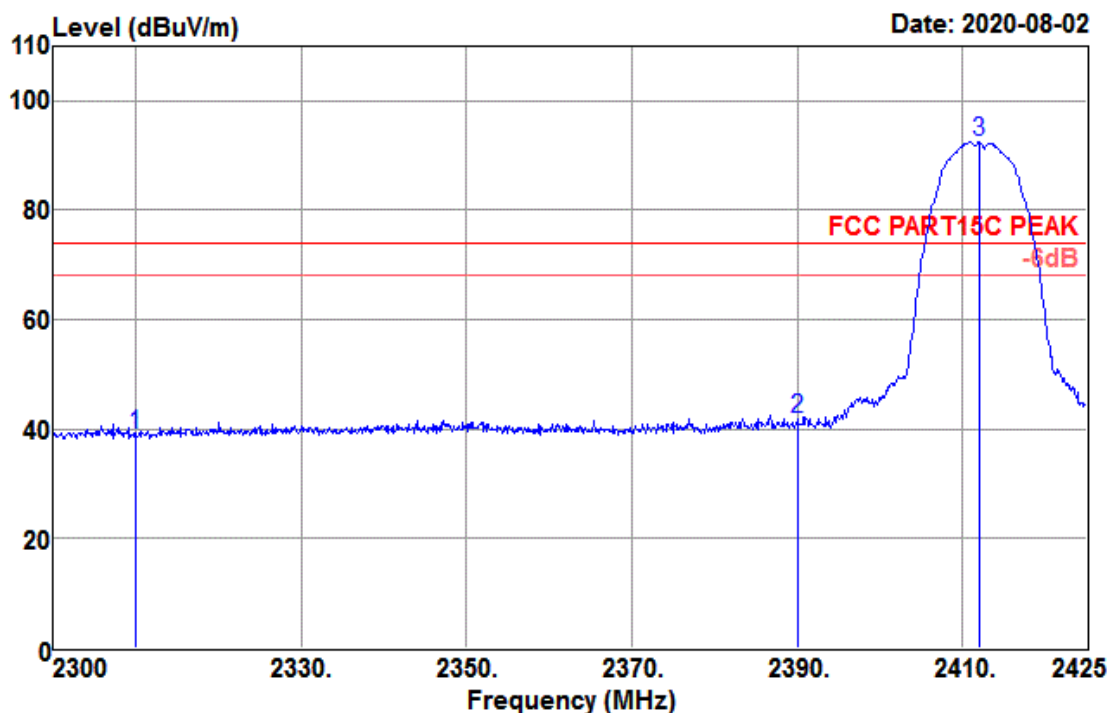
Data: 232



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	33.42	27.38	4.11	35.61	29.30	54.00	-24.70	Average
2390.000	37.24	27.56	4.18	35.79	33.19	54.00	-20.81	Average
2411.250	101.08	27.60	4.20	35.84	97.04	54.00	43.04	Average

Test Mode :	802.11b CH01 (2412 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.425GHz	Polarization :	Vertical

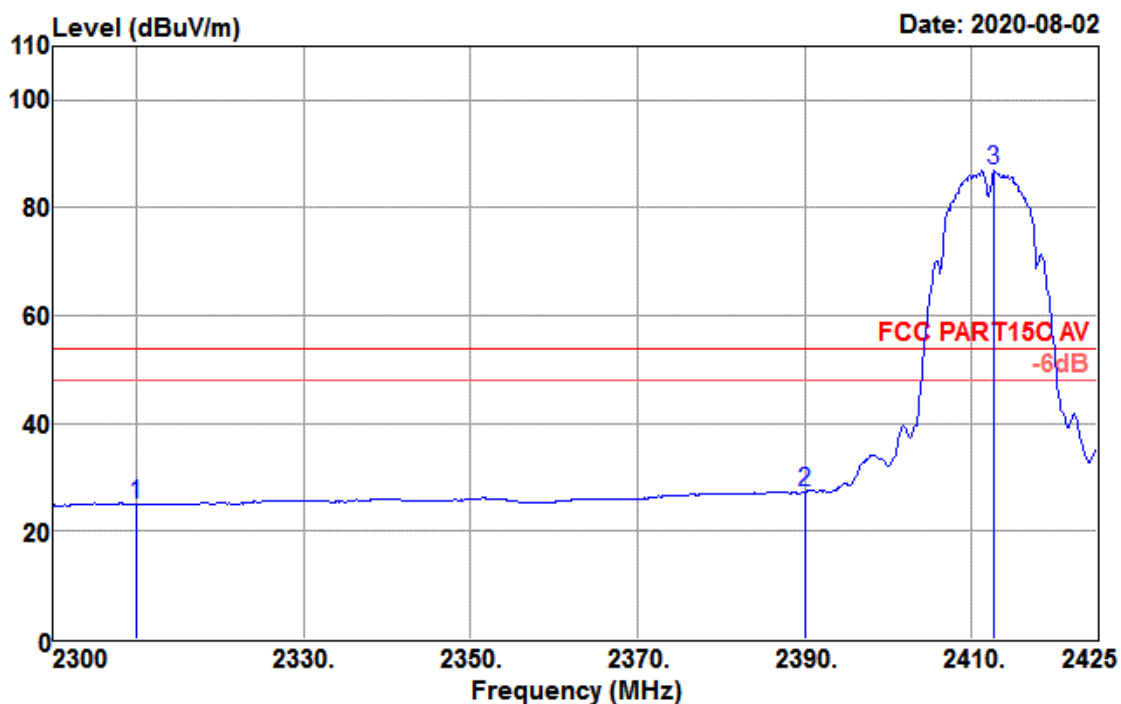
Data: 234



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	43.06	27.38	4.11	35.61	38.94	74.00	-35.06	Peak
2390.000	46.04	27.56	4.18	35.79	41.99	74.00	-32.01	Peak
2412.125	96.48	27.61	4.20	35.84	92.45	74.00	18.45	Peak

Test Mode :	802.11b CH01 (2412 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.425GHz	Polarization :	Vertical

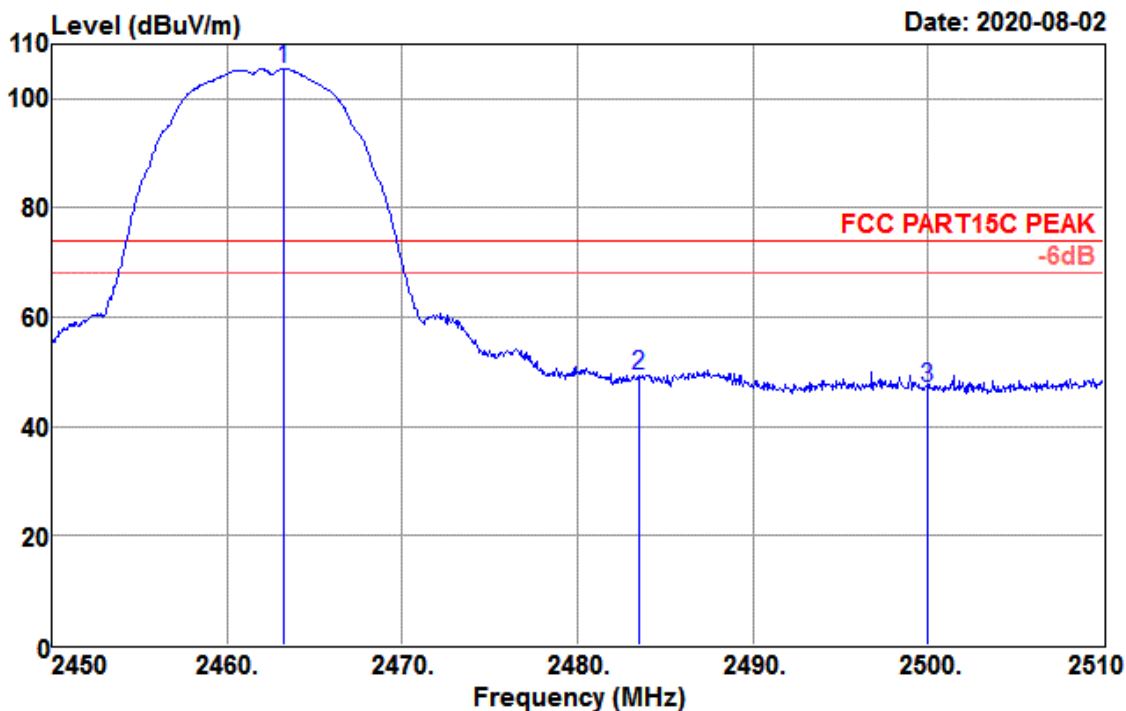
Data: 235



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	29.10	27.38	4.11	35.61	24.98	54.00	-29.02	Average
2390.000	31.36	27.56	4.18	35.79	27.31	54.00	-26.69	Average
2412.750	90.89	27.61	4.20	35.84	86.86	54.00	32.86	Average

Test Mode :	802.11b CH11 (2462 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.45GHz~2.51GHz	Polarization :	Horizontal

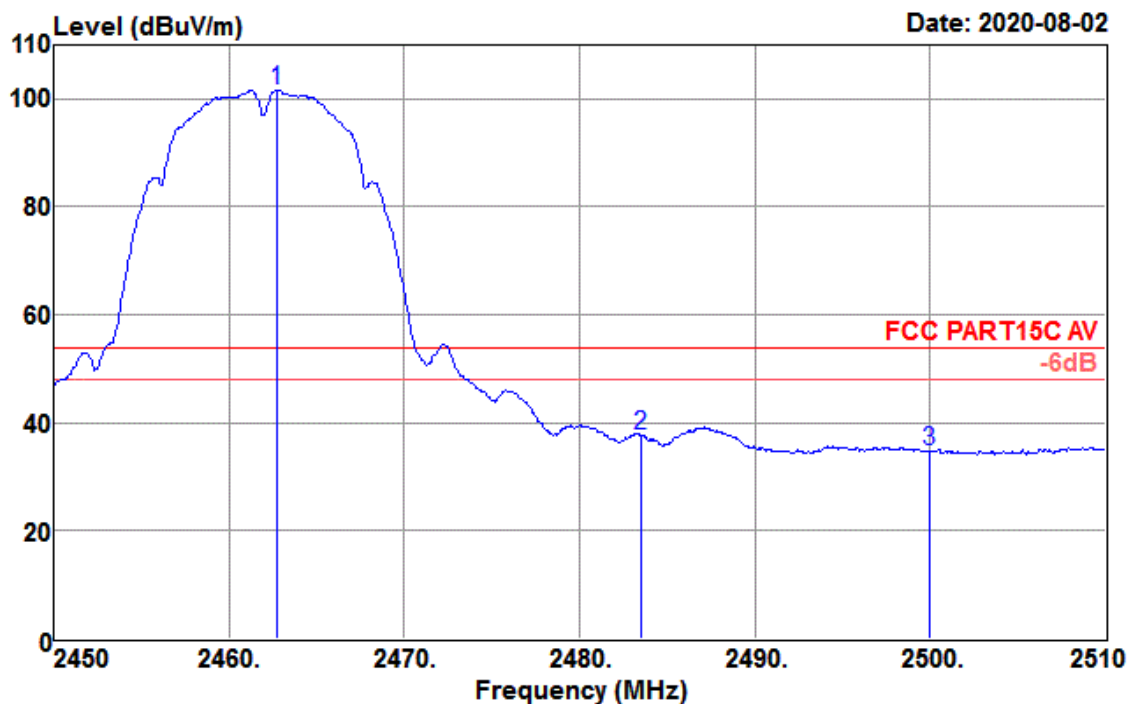
Data: 239



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
2463.200	109.50	27.72	4.24	35.96	105.50	74.00	31.50	Peak
2483.500	53.34	27.76	4.26	36.00	49.36	74.00	-24.64	Peak
2500.000	51.12	27.80	4.28	36.04	47.16	74.00	-26.84	Peak

Test Mode :	802.11b CH11 (2462 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.45GHz~2.51GHz	Polarization :	Horizontal

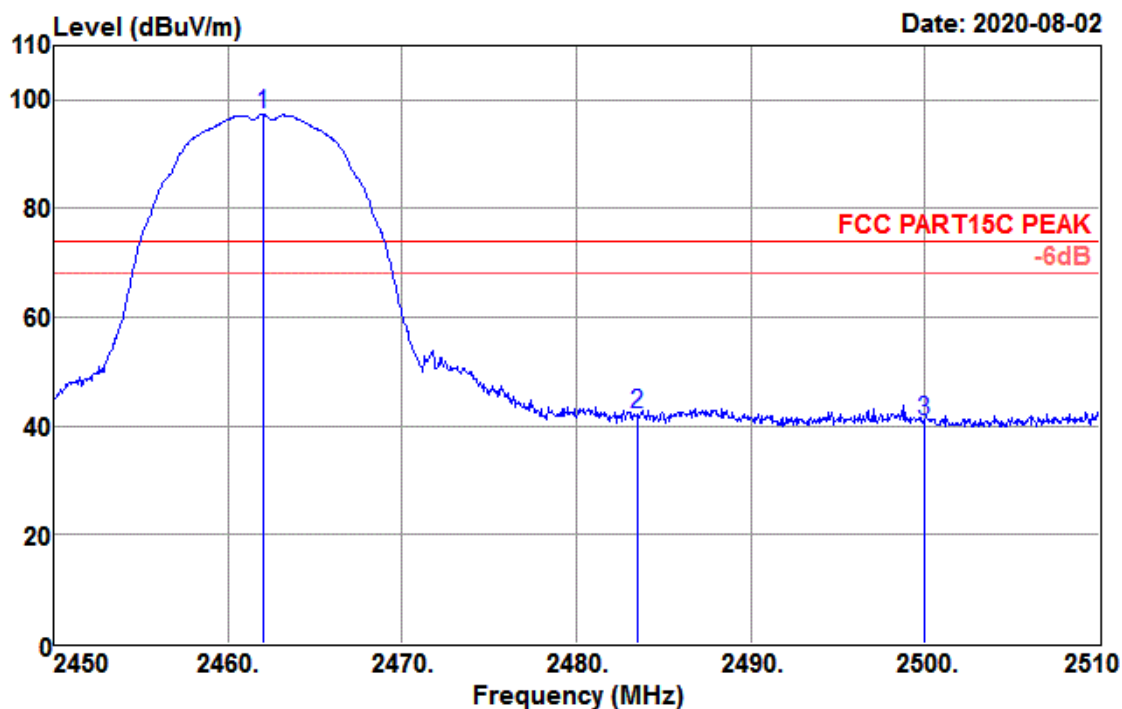
Data: 240



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	105.70	27.72	4.24	35.96	101.70	54.00	47.70	Average
2483.500	41.71	27.76	4.26	36.00	37.73	54.00	-16.27	Average
2500.000	38.83	27.80	4.28	36.04	34.87	54.00	-19.13	Average

Test Mode :	802.11b CH11 (2462 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.45GHz~2.51GHz	Polarization :	Vertical

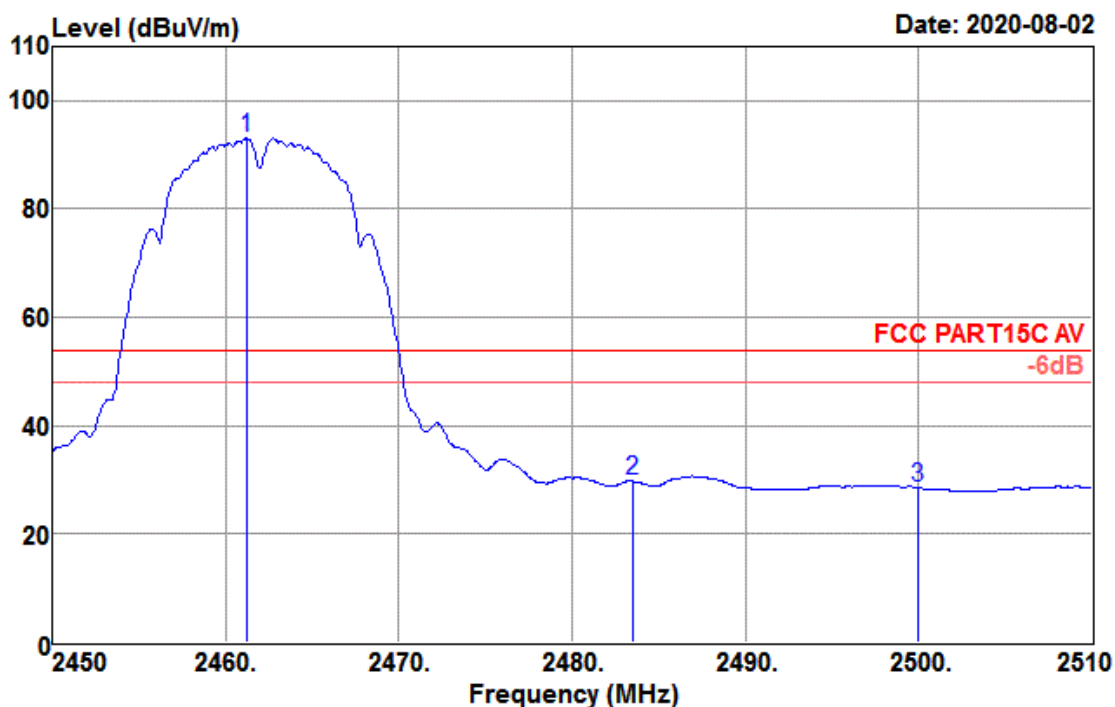
Data: 242



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2462.000	101.29	27.72	4.24	35.95	97.30	74.00	23.30	Peak
2483.500	46.11	27.76	4.26	36.00	42.13	74.00	-31.87	Peak
2500.000	44.98	27.80	4.28	36.04	41.02	74.00	-32.98	Peak

Test Mode :	802.11b CH11 (2462 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.45GHz~2.51GHz	Polarization :	Vertical

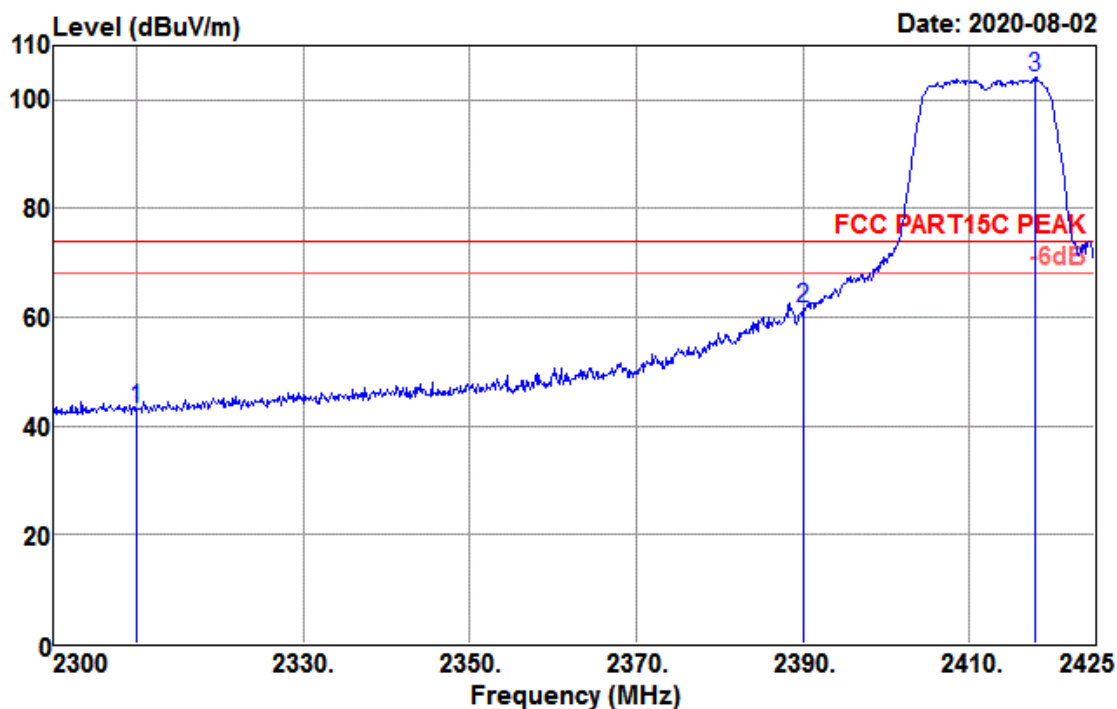
Data: 243



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamplifier factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2461.220	97.08	27.71	4.24	35.95	93.08	54.00	39.08	Average
2483.500	33.69	27.76	4.26	36.00	29.71	54.00	-24.29	Average
2500.000	32.47	27.80	4.28	36.04	28.51	54.00	-25.49	Average

Test Mode :	802.11g CH01 (2412 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.425GHz	Polarization :	Horizontal

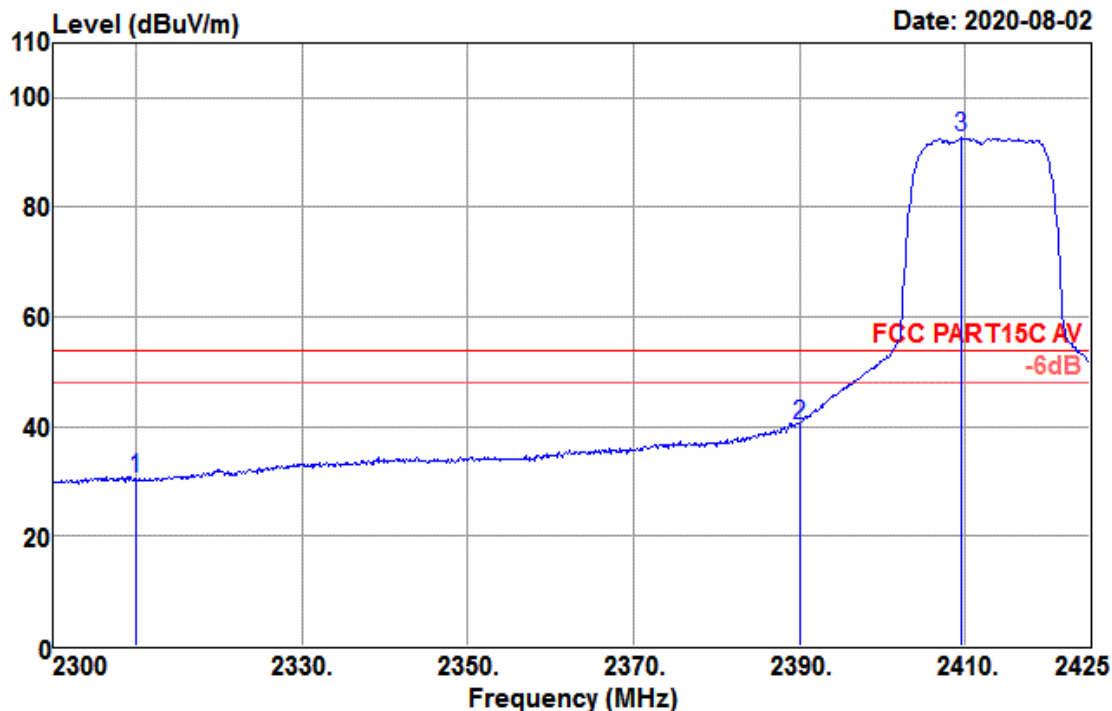
Data: 248



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	47.21	27.38	4.11	35.61	43.09	74.00	-30.91	Peak
2390.000	65.58	27.56	4.18	35.79	61.53	74.00	-12.47	Peak
2417.875	108.25	27.62	4.21	35.85	104.23	74.00	30.23	Peak

Test Mode :	802.11g CH01 (2412 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.425GHz	Polarization :	Horizontal

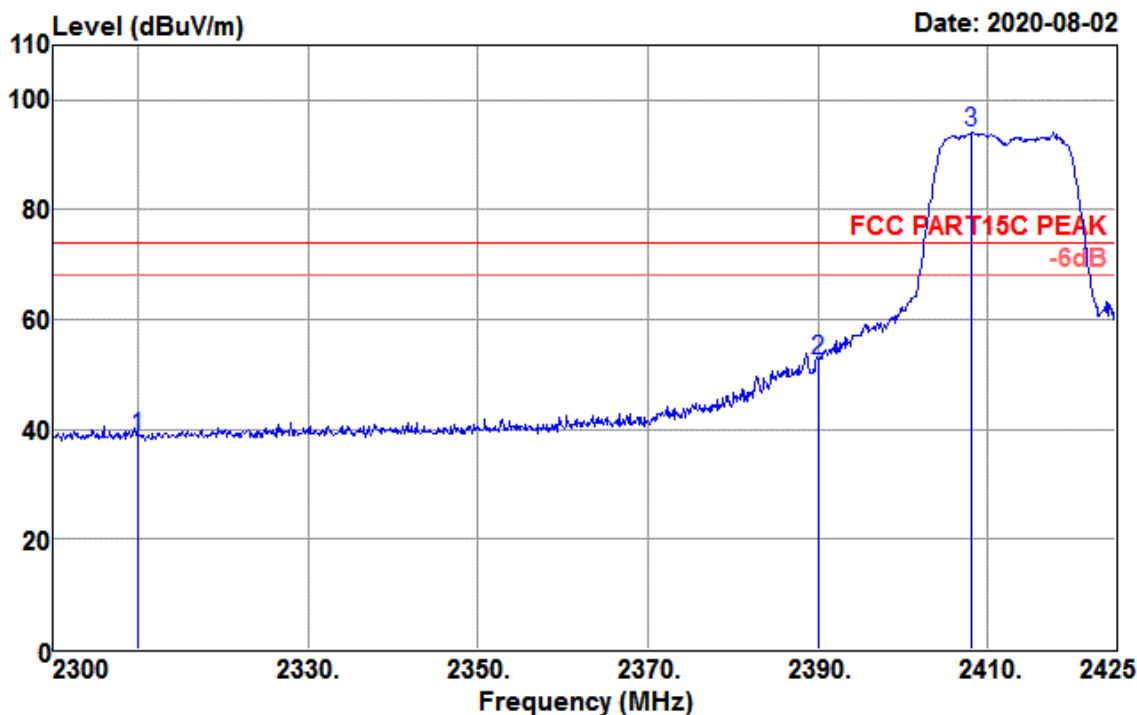
Data: 249



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	34.69	27.38	4.11	35.61	30.57	54.00	-23.43	Average
2390.000	44.24	27.56	4.18	35.79	40.19	54.00	-13.81	Average
2409.625	96.69	27.60	4.20	35.83	92.66	54.00	38.66	Average

Test Mode :	802.11g CH01 (2412 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.425GHz	Polarization :	Vertical

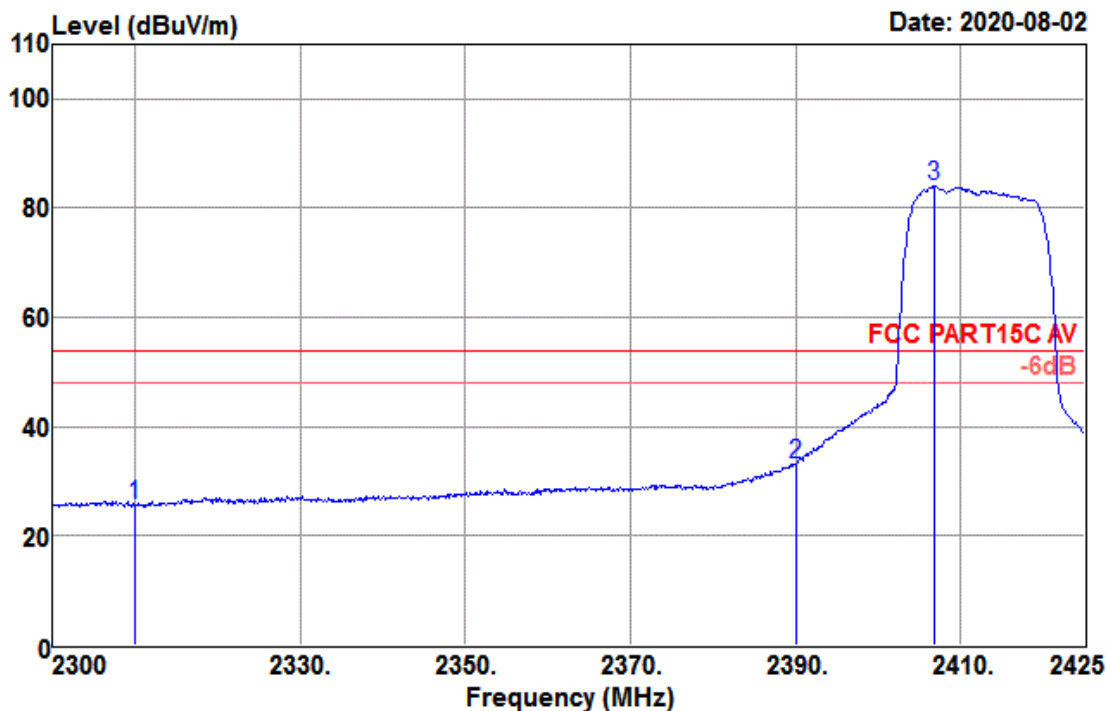
Data: 245



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	42.84	27.38	4.11	35.61	38.72	74.00	-35.28	Peak
2390.000	56.55	27.56	4.18	35.79	52.50	74.00	-21.50	Peak
2408.125	98.08	27.60	4.20	35.83	94.05	74.00	20.05	Peak

Test Mode :	802.11g CH01 (2412 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.425GHz	Polarization :	Vertical

Data: 246

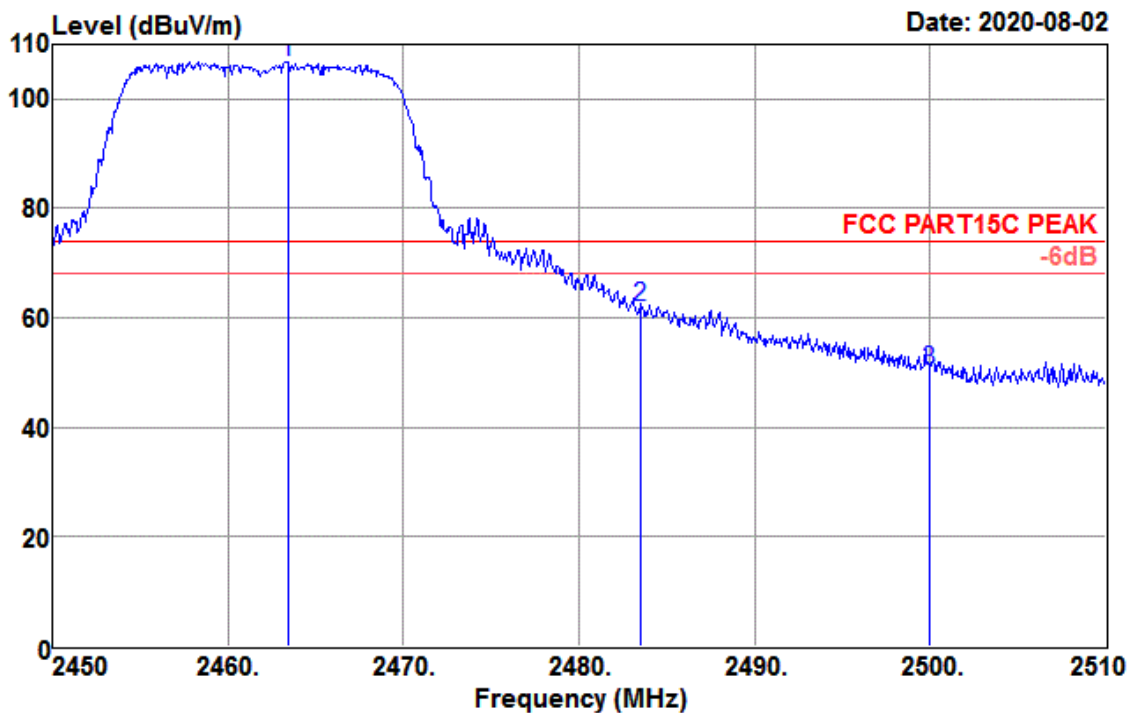


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	29.86	27.38	4.11	35.61	25.74	54.00	-28.26	Average
2390.000	37.27	27.56	4.18	35.79	33.22	54.00	-20.78	Average
2406.875	88.06	27.60	4.20	35.83	84.03	54.00	30.03	Average

Test Mode :	802.11g CH11 (2462 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.45GHz~2.51GHz	Polarization :	Horizontal

Data: 256

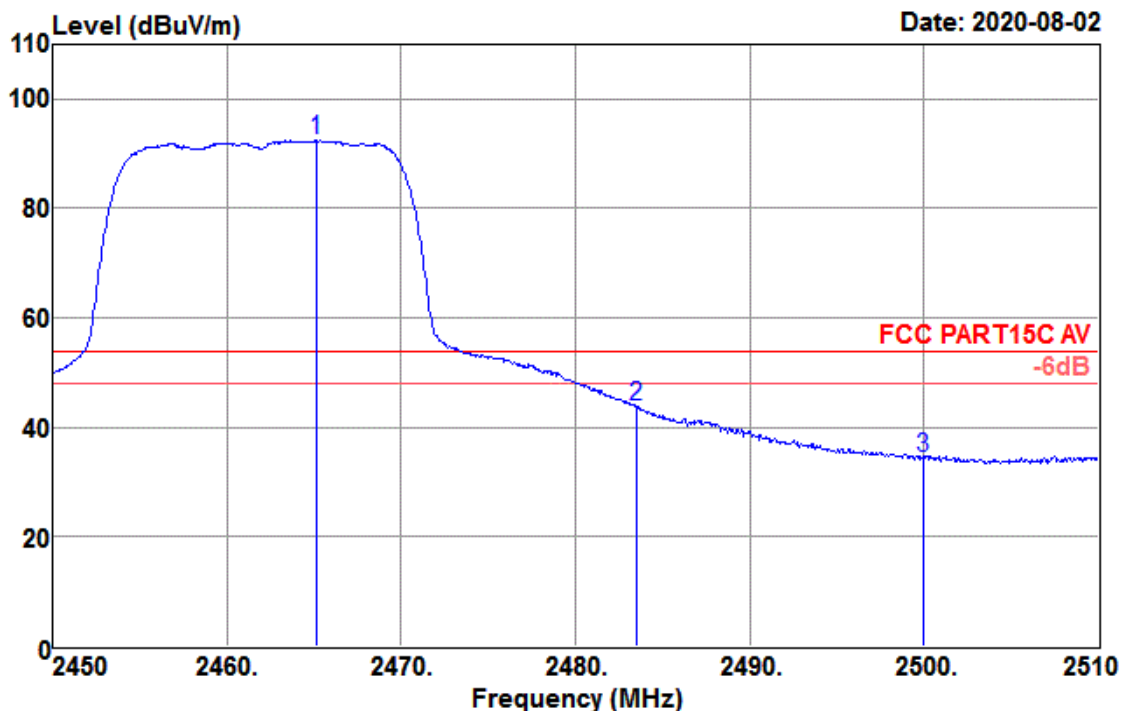
Date: 2020-08-02



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
2463.440	110.77	27.72	4.24	35.96	106.77	74.00	32.77	Peak
2483.500	65.94	27.76	4.26	36.00	61.96	74.00	-12.04	Peak
2500.000	54.40	27.80	4.28	36.04	50.44	74.00	-23.56	Peak

Test Mode :	802.11g CH11 (2462 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.45GHz~2.51GHz	Polarization :	Horizontal

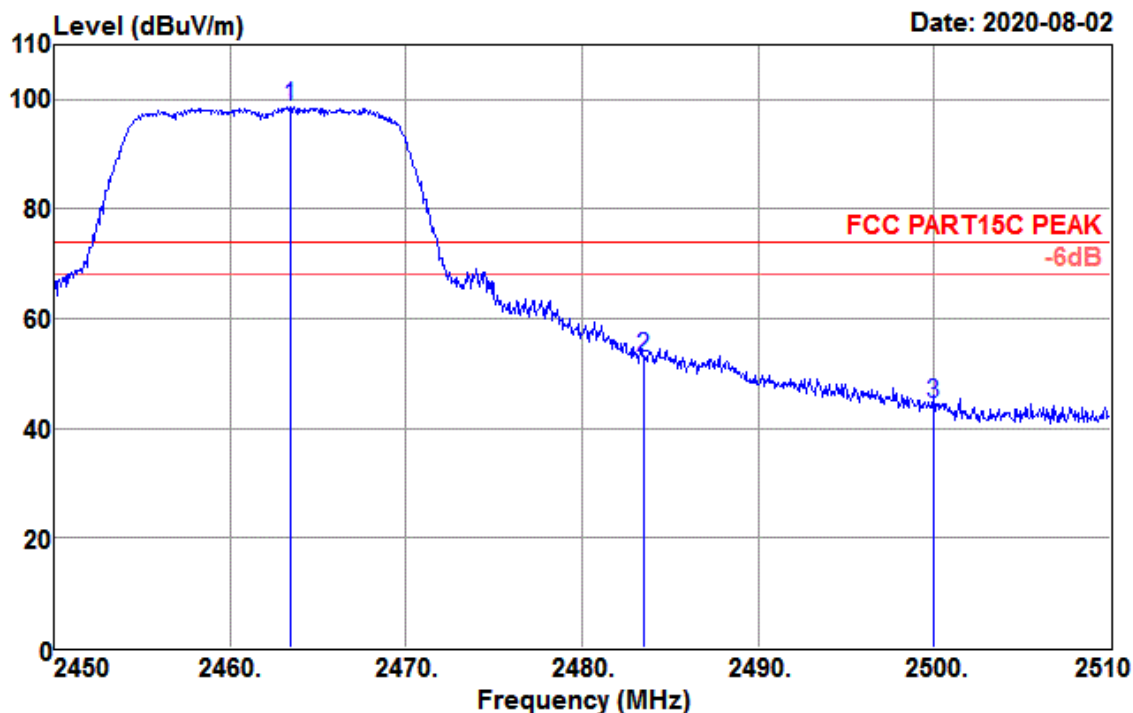
Data: 257



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
2465.120	96.44	27.72	4.25	35.96	92.45	54.00	38.45	Average
2483.500	47.79	27.76	4.26	36.00	43.81	54.00	-10.19	Average
2500.000	38.37	27.80	4.28	36.04	34.41	54.00	-19.59	Average

Test Mode :	802.11g CH11 (2462 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.45GHz~2.51GHz	Polarization :	Vertical

Data: 253

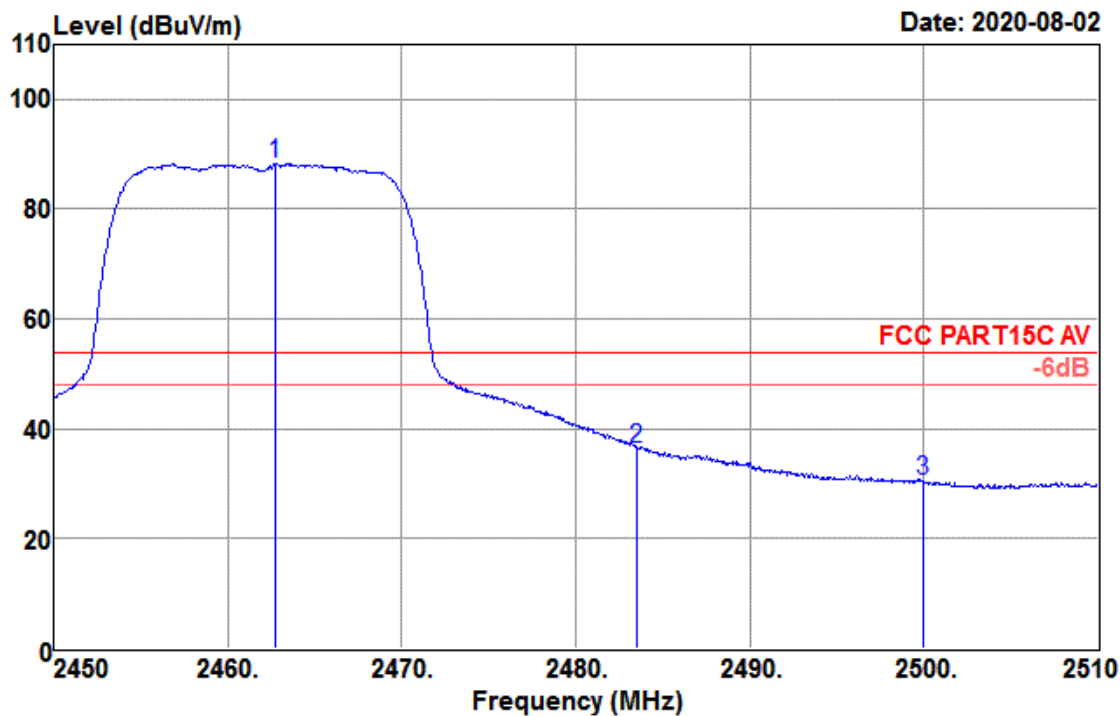


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2463.440	102.73	27.72	4.24	35.96	98.73	74.00	24.73	Peak
2483.500	56.88	27.76	4.26	36.00	52.90	74.00	-21.10	Peak
2500.000	48.41	27.80	4.28	36.04	44.45	74.00	-29.55	Peak

Test Mode :	802.11g CH11 (2462 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.45GHz~2.51GHz	Polarization :	Vertical

Data: 254

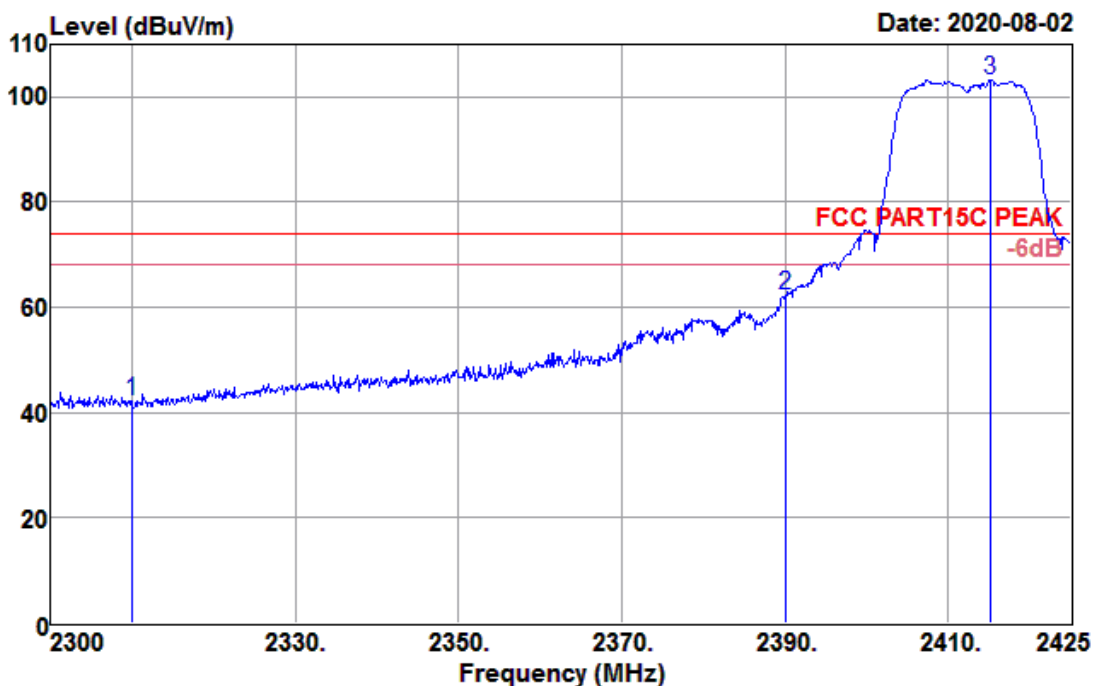
Date: 2020-08-02



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
2462.720	92.18	27.72	4.24	35.96	88.18	54.00	34.18	Average
2483.500	40.39	27.76	4.26	36.00	36.41	54.00	-17.59	Average
2500.000	34.54	27.80	4.28	36.04	30.58	54.00	-23.42	Average

Test Mode :	802.11n HT20 CH01 (2412 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.425GHz	Polarization :	Horizontal

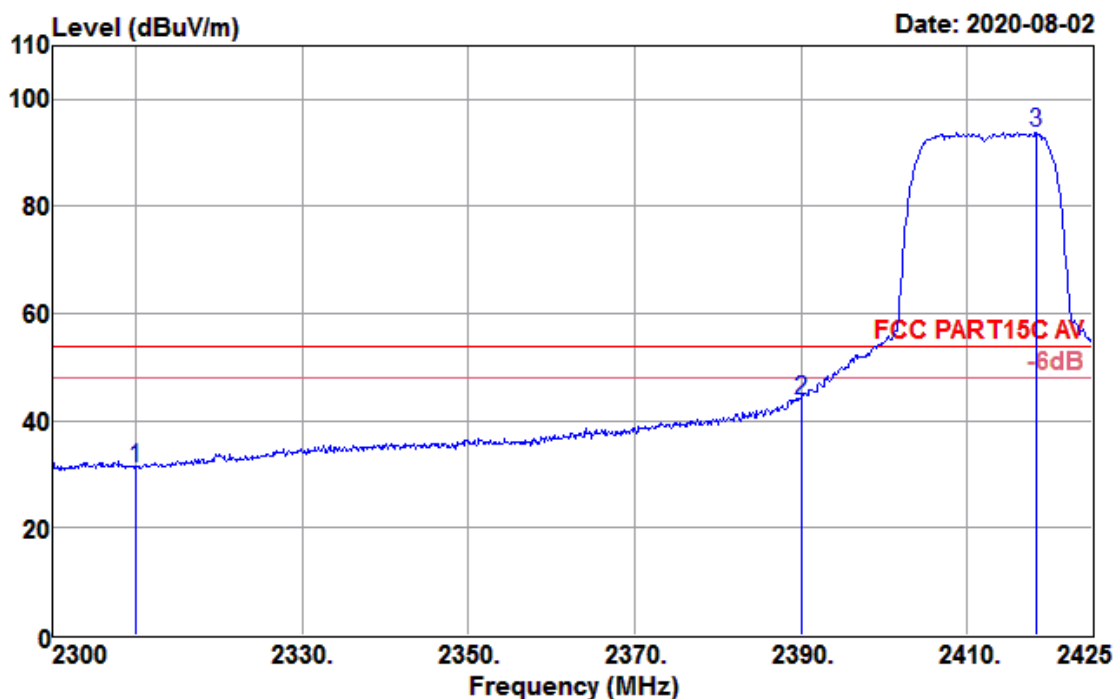
Data: 171



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	46.18	27.38	4.11	35.61	42.06	74.00	-31.94	Peak
2390.000	66.50	27.56	4.18	35.79	62.45	74.00	-11.55	Peak
2415.125	107.32	27.61	4.20	35.85	103.28	74.00	29.28	Peak

Test Mode :	802.11n HT20 CH01 (2412 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.425GHz	Polarization :	Horizontal

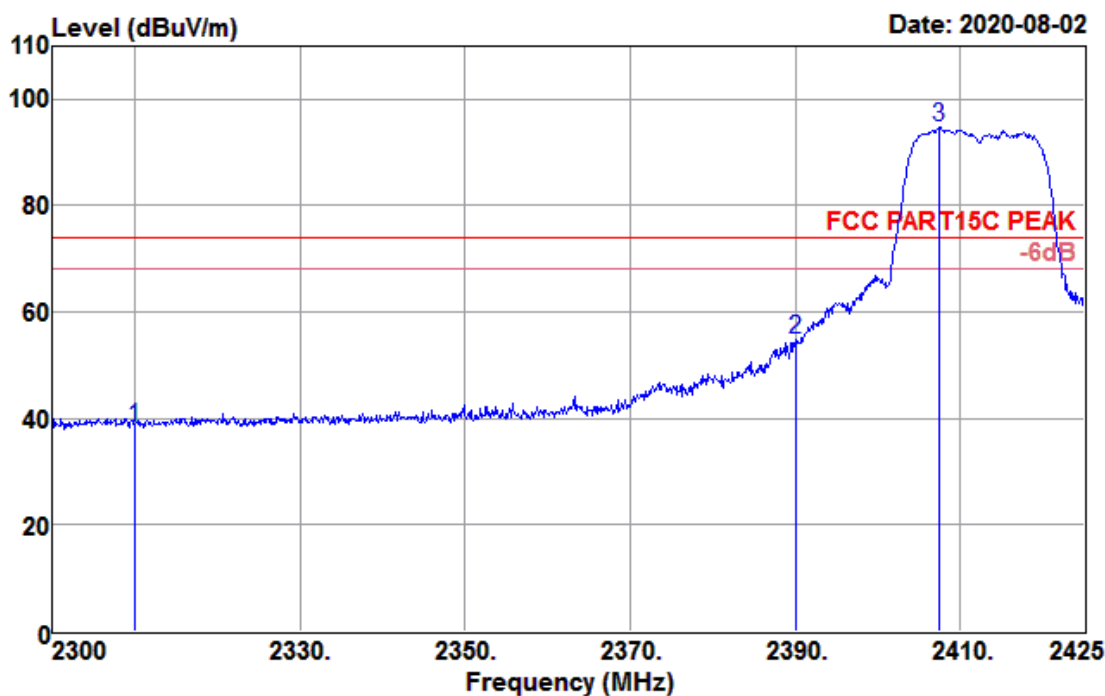
Data: 172



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	35.34	27.38	4.11	35.61	31.22	54.00	-22.78	Average
2390.000	47.89	27.56	4.18	35.79	43.84	54.00	-10.16	Average
2418.250	97.78	27.62	4.21	35.85	93.76	54.00	39.76	Average

Test Mode :	802.11n HT20 CH01 (2412 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.425GHz	Polarization :	Vertical

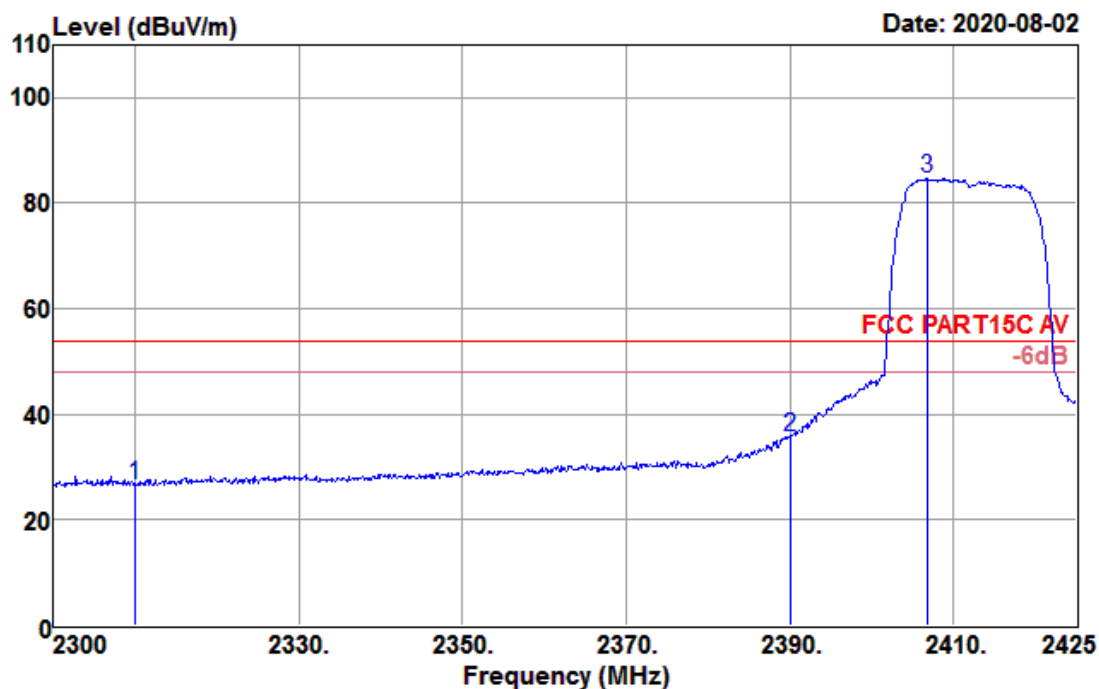
Data: 174



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	42.45	27.38	4.11	35.61	38.33	74.00	-35.67	Peak
2390.000	58.95	27.56	4.18	35.79	54.90	74.00	-19.10	Peak
2407.500	98.85	27.60	4.20	35.83	94.82	74.00	20.82	Peak

Test Mode :	802.11n HT20 CH01 (2412 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.425GHz	Polarization :	Vertical

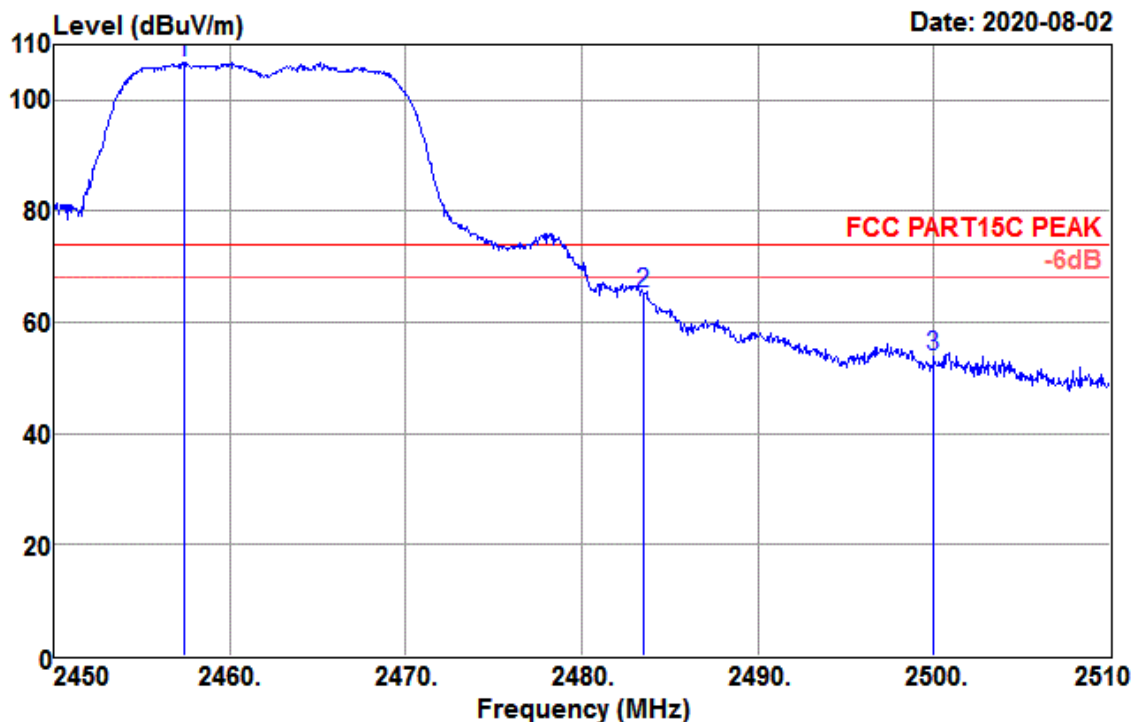
Data: 175



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	30.80	27.38	4.11	35.61	26.68	54.00	-27.32	Average
2390.000	39.82	27.56	4.18	35.79	35.77	54.00	-18.23	Average
2406.750	88.71	27.59	4.20	35.83	84.67	54.00	30.67	Average

Test Mode :	802.11n HT20 CH11 (2462 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.45GHz~2.51GHz	Polarization :	Horizontal

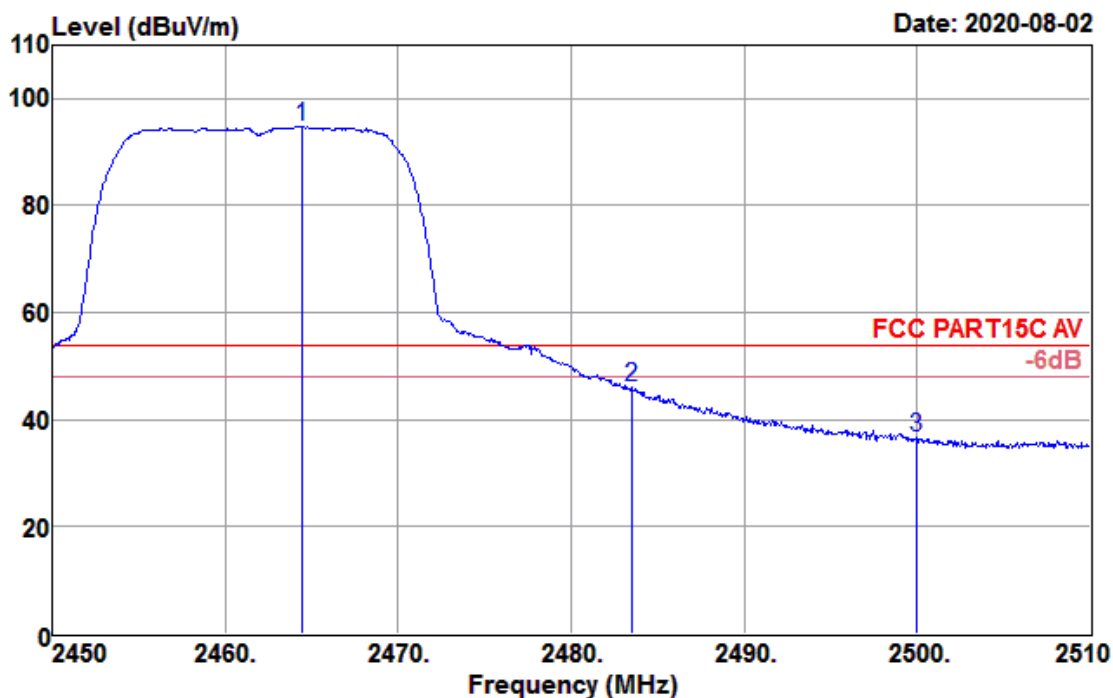
Data: 179



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
2457.380	110.80	27.71	4.24	35.94	106.81	74.00	32.81	Peak
2483.500	69.36	27.76	4.26	36.00	65.38	74.00	-8.62	Peak
2500.000	57.94	27.80	4.28	36.04	53.98	74.00	-20.02	Peak

Test Mode :	802.11n HT20 CH11 (2462 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.45GHz~2.51GHz	Polarization :	Horizontal

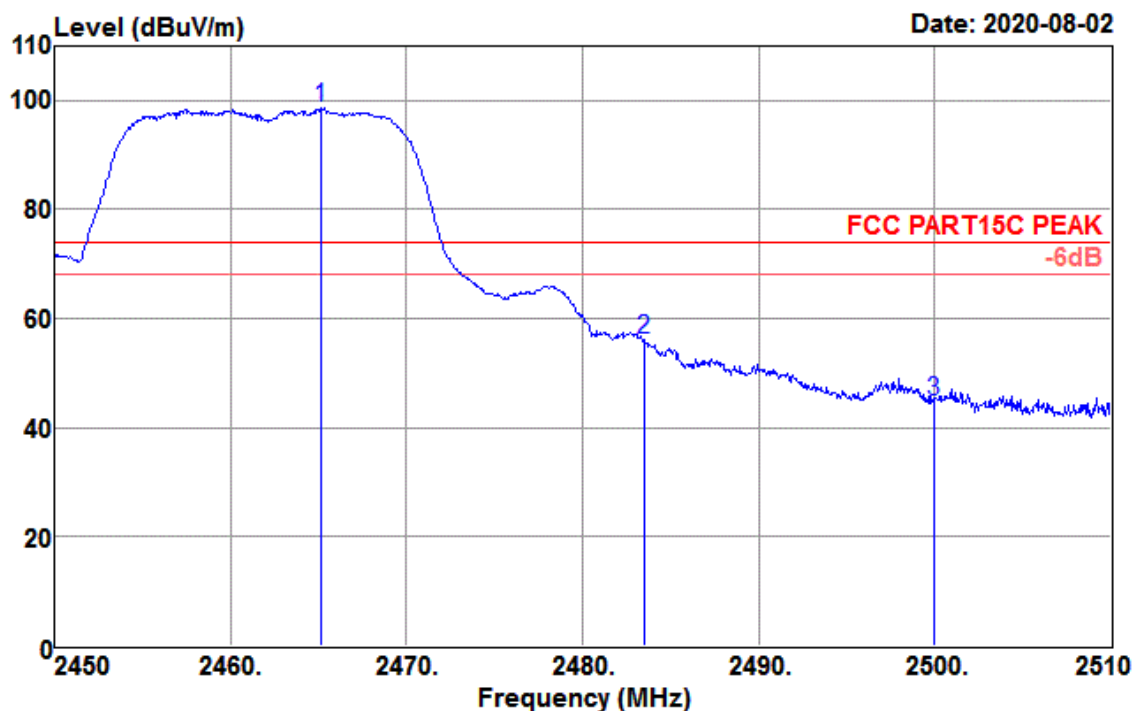
Data: 180



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2464.400	98.80	27.72	4.24	35.96	94.80	54.00	40.80	Average
2483.500	49.99	27.76	4.26	36.00	46.01	54.00	-7.99	Average
2500.000	40.63	27.80	4.28	36.04	36.67	54.00	-17.33	Average

Test Mode :	802.11n HT20 CH11 (2462 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.45GHz~2.51GHz	Polarization :	Vertical

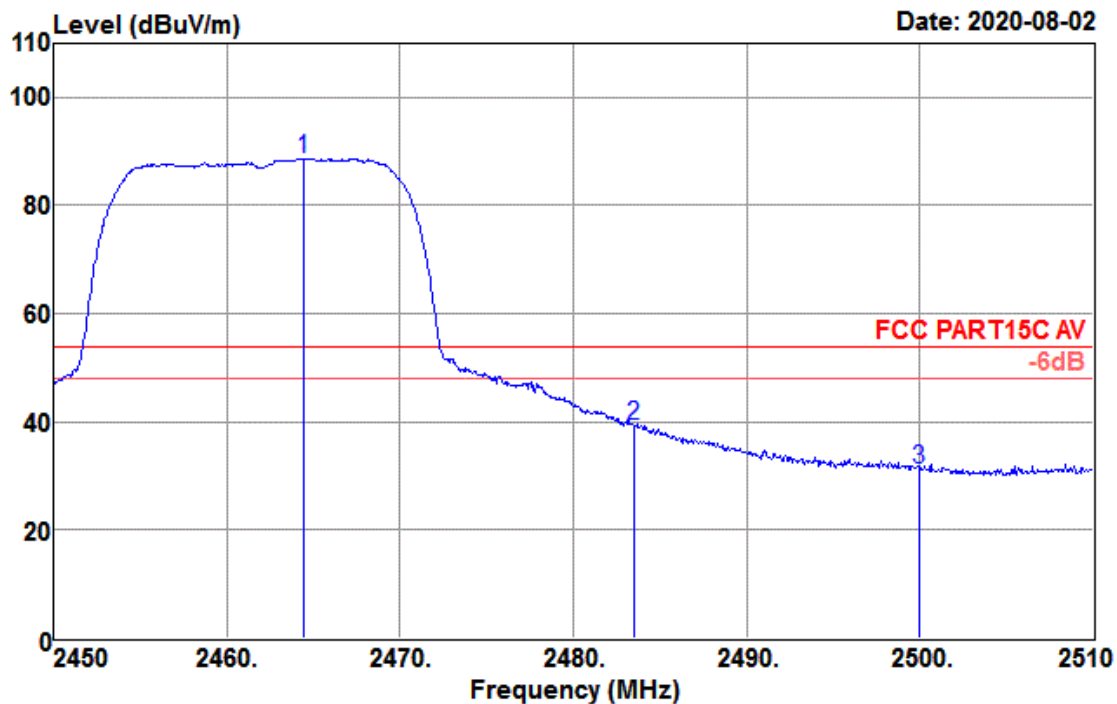
Data: 182



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	102.66	27.72	4.25	35.96	98.67	74.00	24.67	Peak
2483.500	60.29	27.76	4.26	36.00	56.31	74.00	-17.69	Peak
2500.000	48.88	27.80	4.28	36.04	44.92	74.00	-29.08	Peak

Test Mode :	802.11n HT20 CH11 (2462 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.45GHz~2.51GHz	Polarization :	Vertical

Data: 183

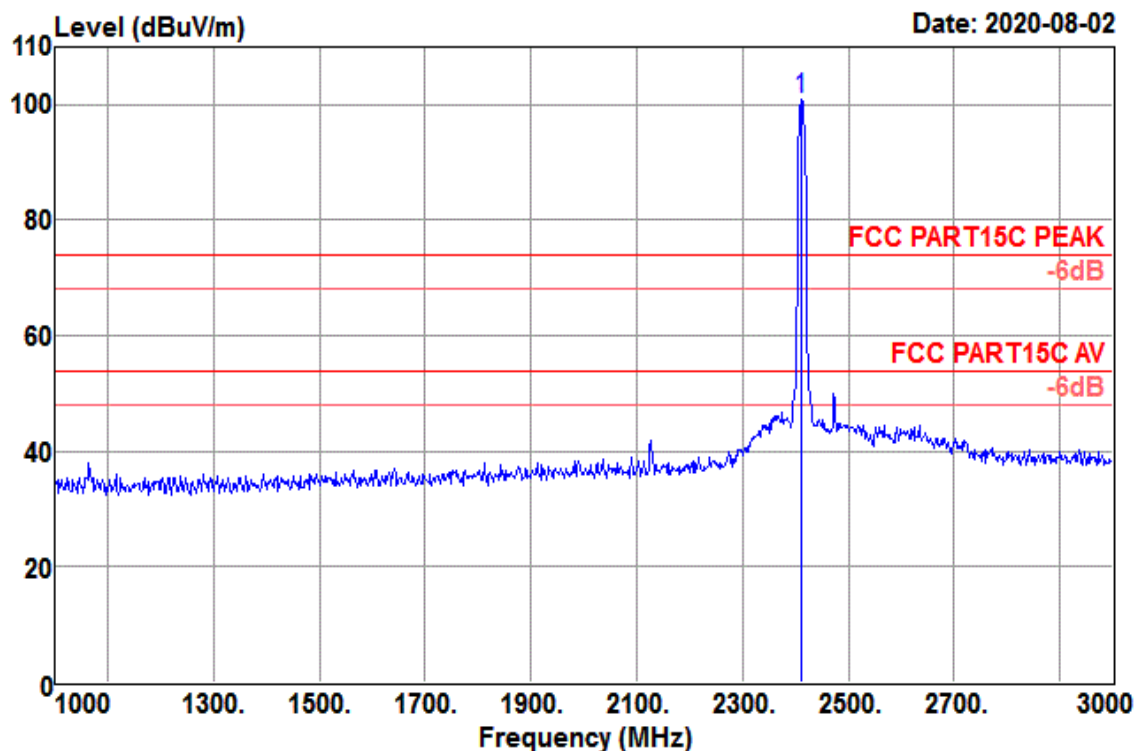


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2464.460	92.65	27.72	4.24	35.96	88.65	54.00	34.65	Average
2483.500	43.10	27.76	4.26	36.00	39.12	54.00	-14.88	Average
2500.000	35.01	27.80	4.28	36.04	31.05	54.00	-22.95	Average

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

Test Mode :	802.11b CH01 (2412 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Horizontal

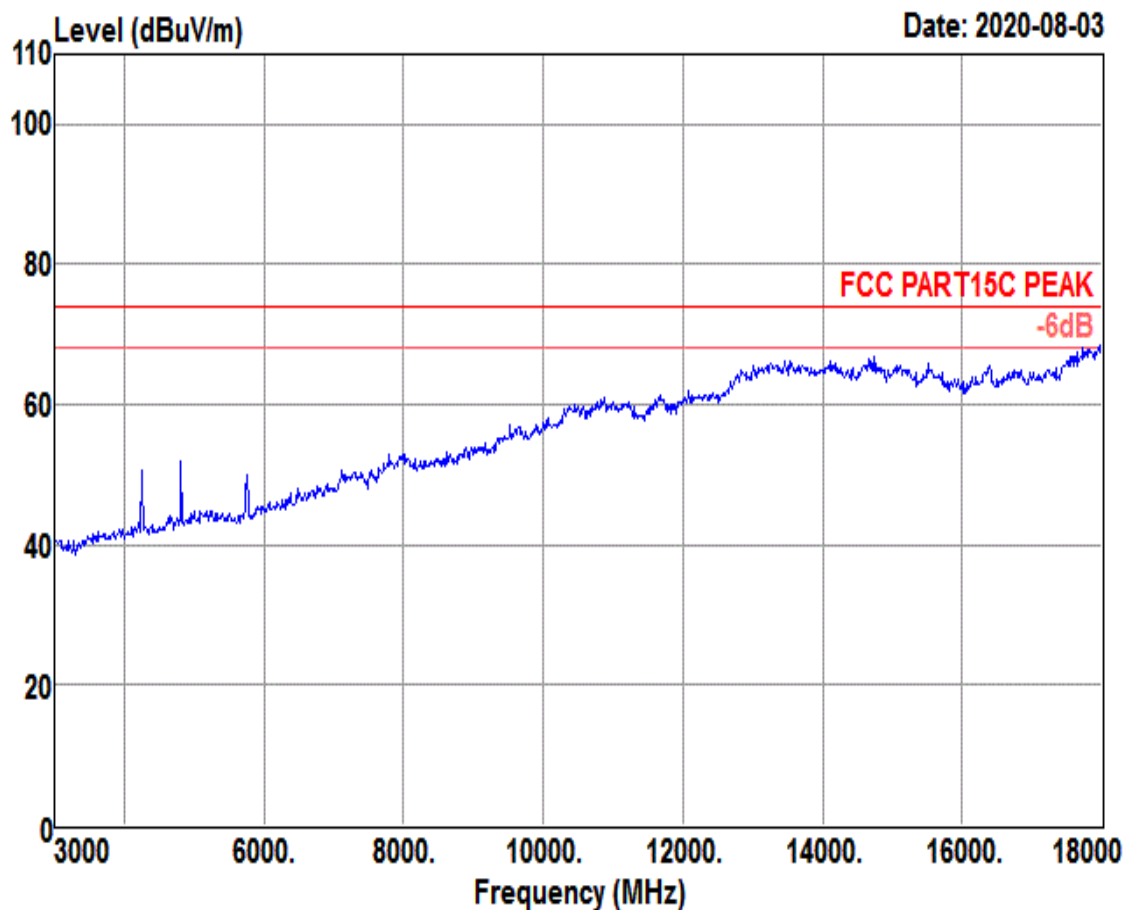
Data: 233



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2412.000	105.04	27.61	4.20	35.84	101.01	74.00	27.01	Peak

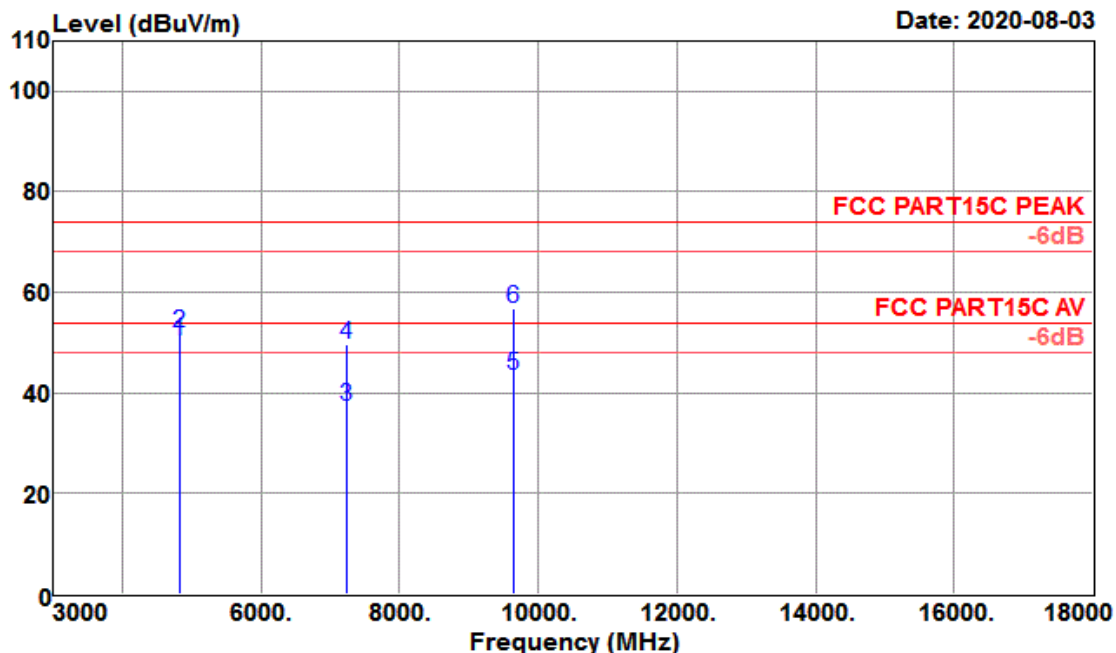
Test Mode :	802.11b CH01 (2412 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Horizontal

Data: 299



Data: 300

Date: 2020-08-03

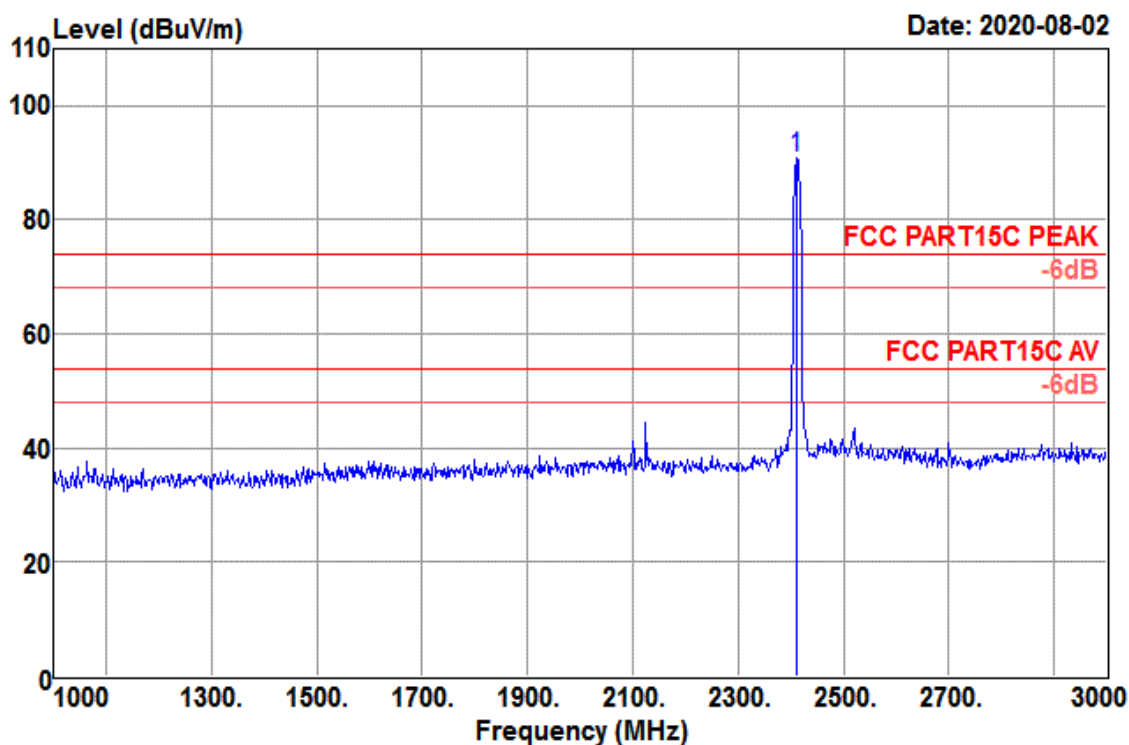


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4824.000	71.50	30.95	6.09	58.24	50.30	54.00	-3.70	Average
4824.000	73.21	30.95	6.09	58.24	52.01	74.00	-21.99	Peak
7236.000	51.31	35.47	9.21	58.53	37.46	54.00	-16.54	Average
7236.000	63.37	35.47	9.21	58.53	49.52	74.00	-24.48	Peak
9648.000	50.94	38.42	12.32	58.03	43.65	54.00	-10.35	Average
9648.000	64.16	38.42	12.32	58.03	56.87	74.00	-17.13	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 :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Vertical

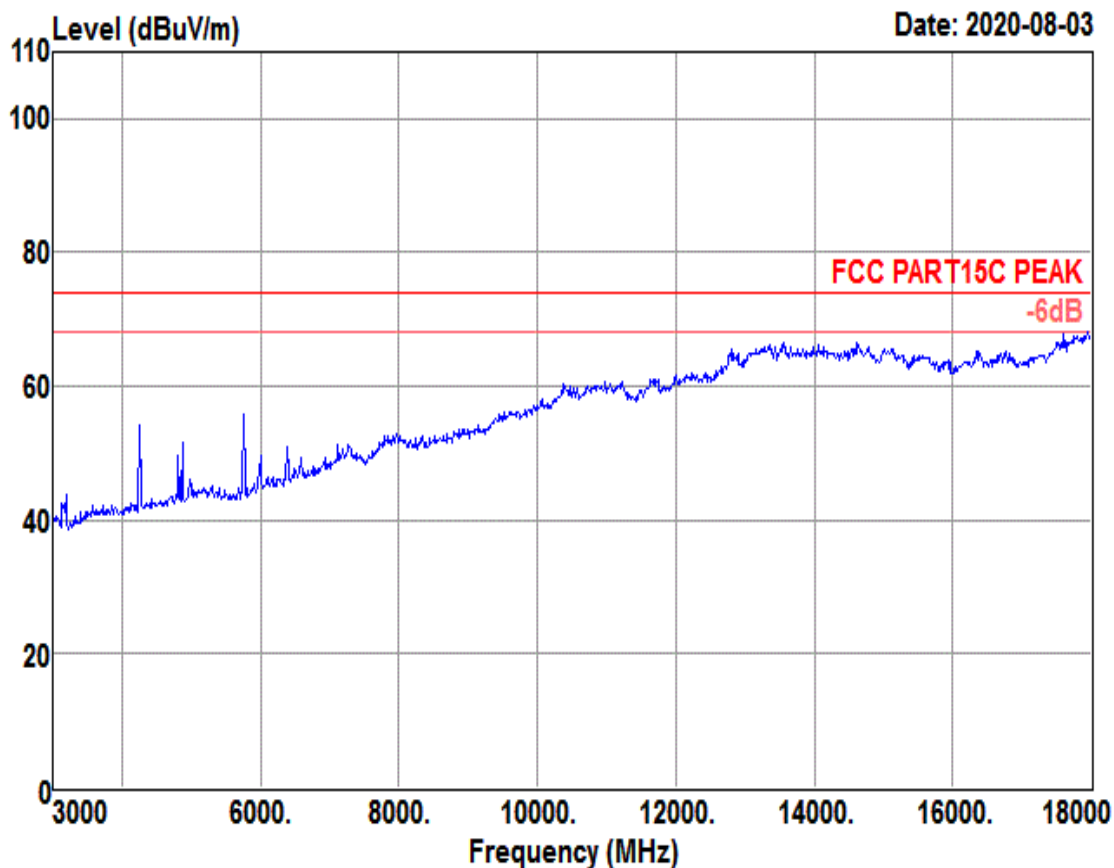
Data: 236



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	94.92	27.61	4.20	35.84	90.89	74.00	16.89	Peak

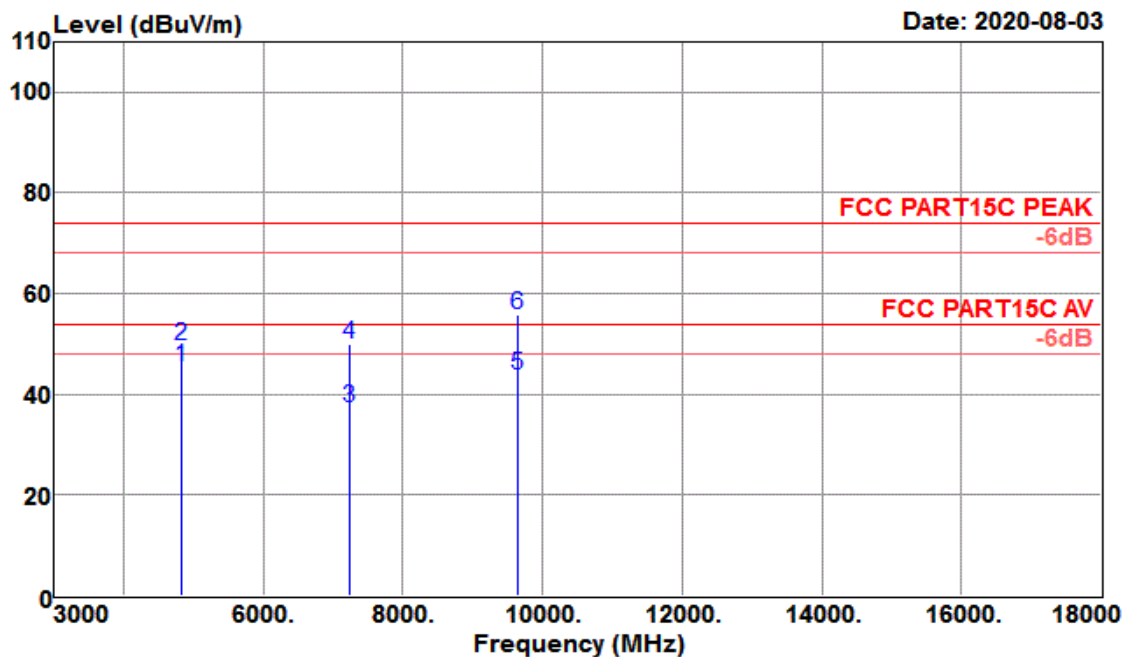
Test Mode :	802.11b CH01 (2412 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Vertical

Data: 297



Data: 298

Date: 2020-08-03

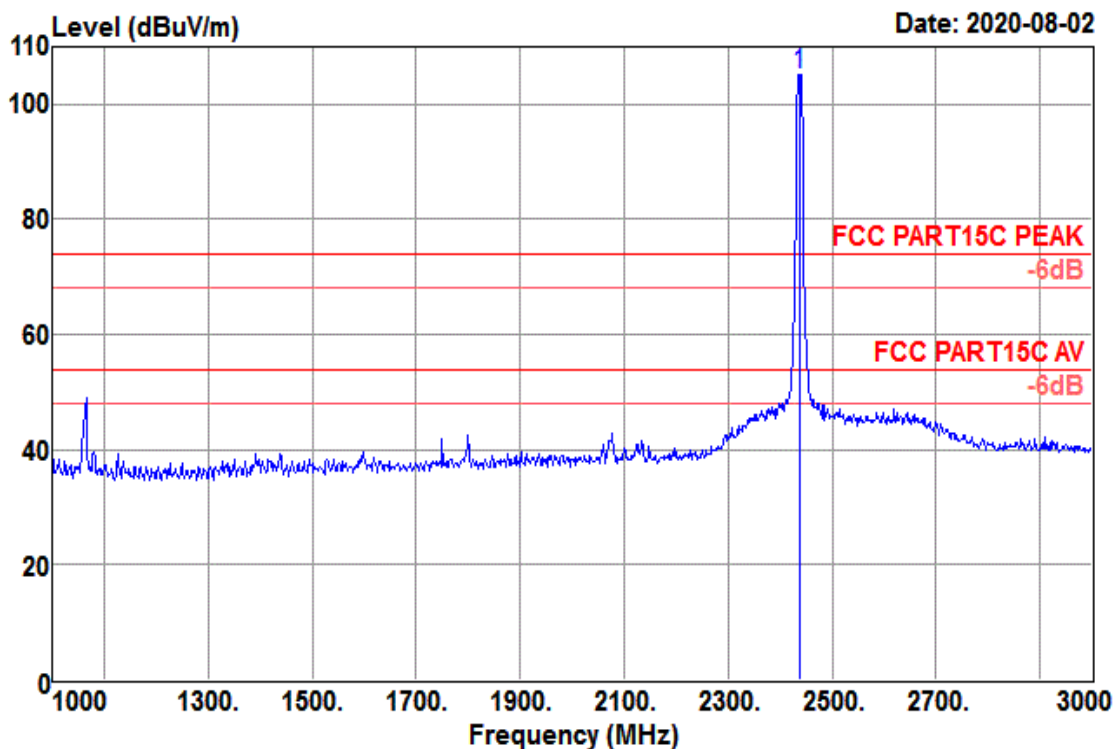


Freq MHz	Reading level dBUV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBUV/m	Limit level dBUV/m	Over limit dB	Remark
4824.000	66.65	30.95	6.09	58.24	45.45	54.00	-8.55	Average
4824.000	70.90	30.95	6.09	58.24	49.70	74.00	-24.30	Peak
7236.000	51.33	35.47	9.21	58.53	37.48	54.00	-16.52	Average
7236.000	63.74	35.47	9.21	58.53	49.89	74.00	-24.11	Peak
9648.000	51.01	38.42	12.32	58.03	43.72	54.00	-10.28	Average
9648.000	63.22	38.42	12.32	58.03	55.93	74.00	-18.07	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 :	802.11b CH06 (2437MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Horizontal

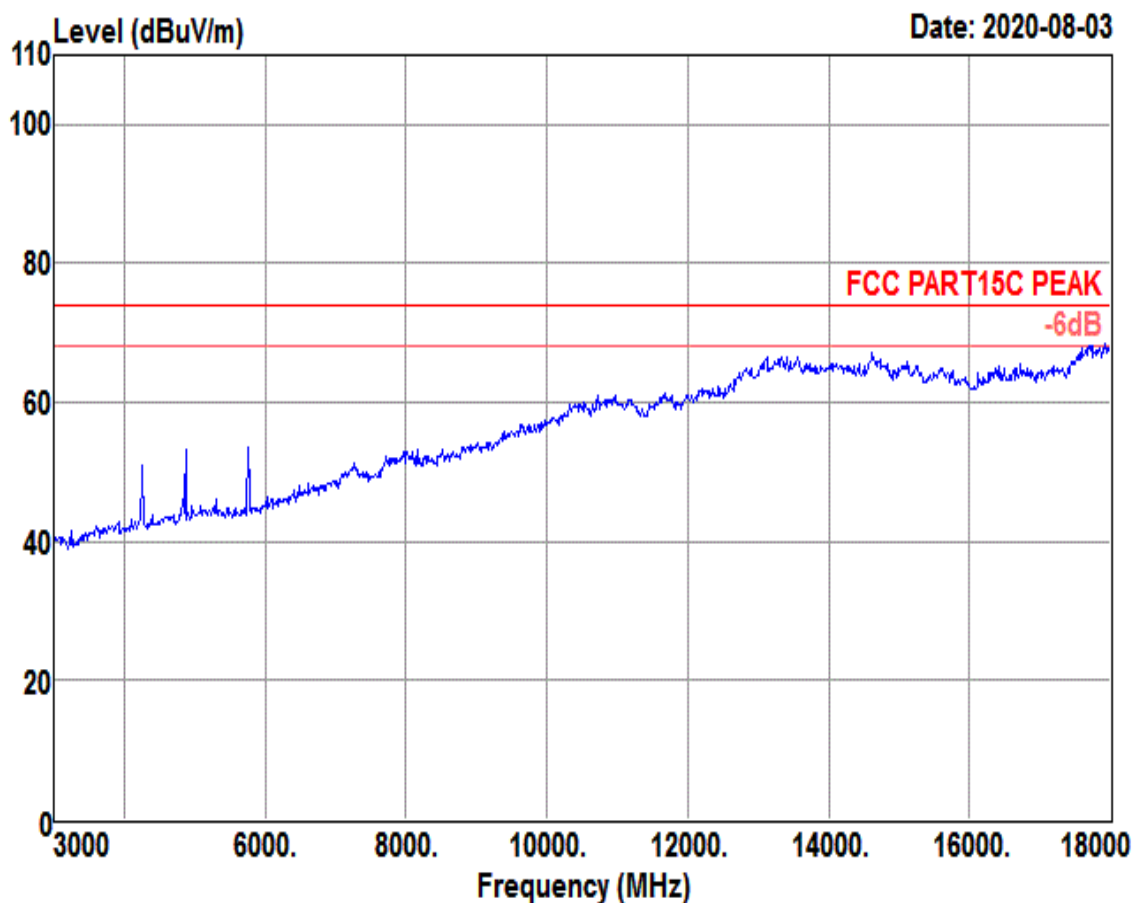
Data: 238



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	109.11	27.66	4.22	35.90	105.09	74.00	31.09	Peak

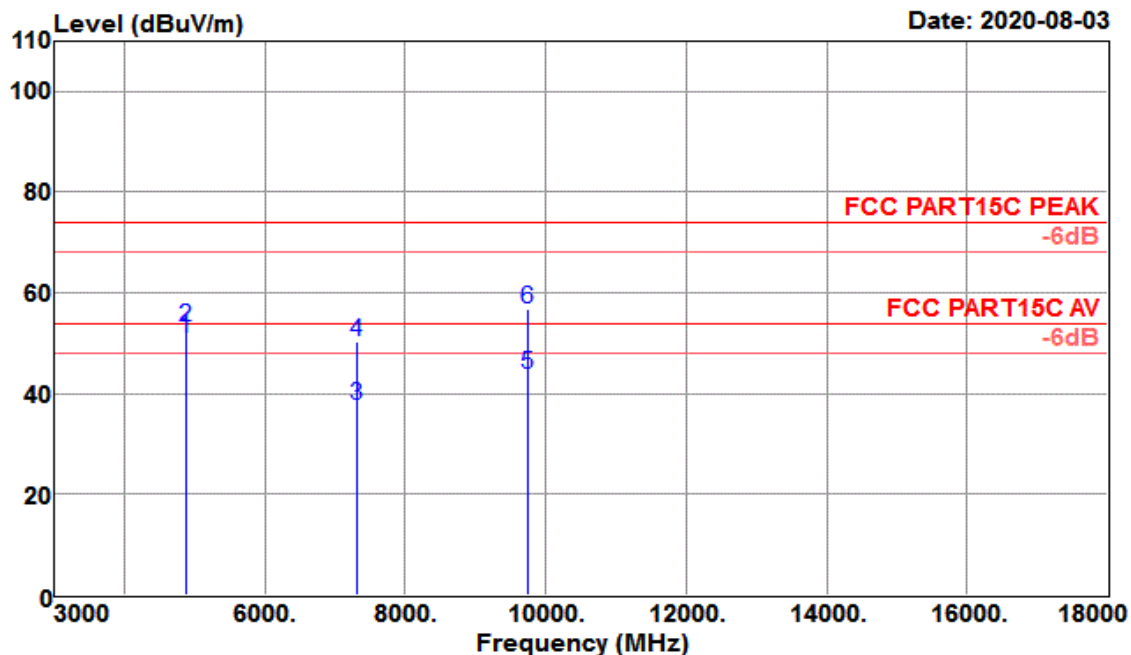
Test Mode :	802.11b CH06 (2437MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Horizontal

Data: 307



Data: 308

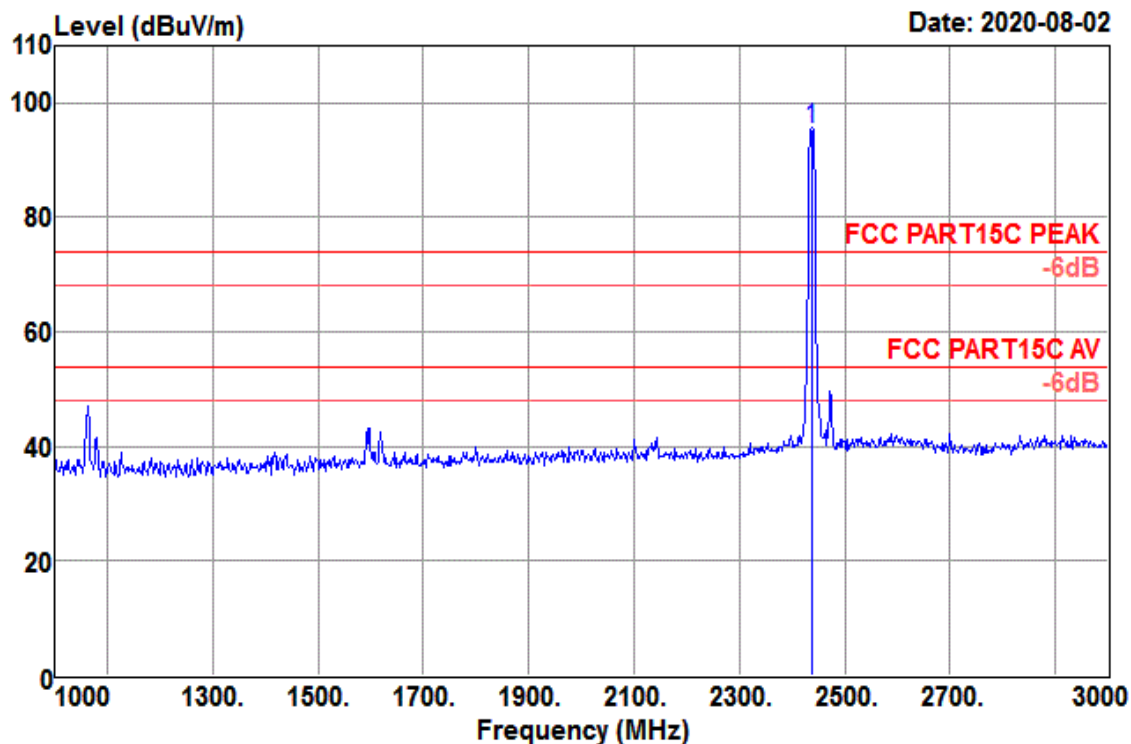
Date: 2020-08-03



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 :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Vertical

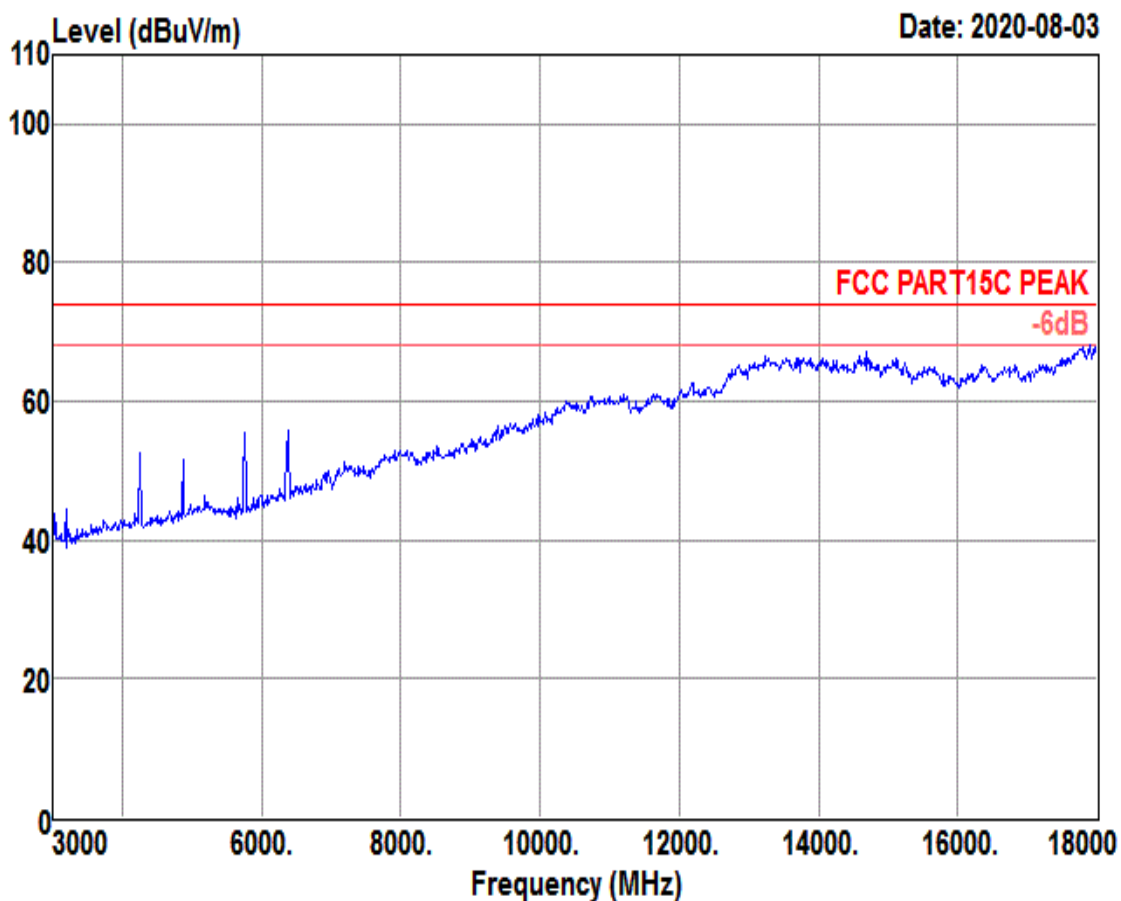
Data: 237

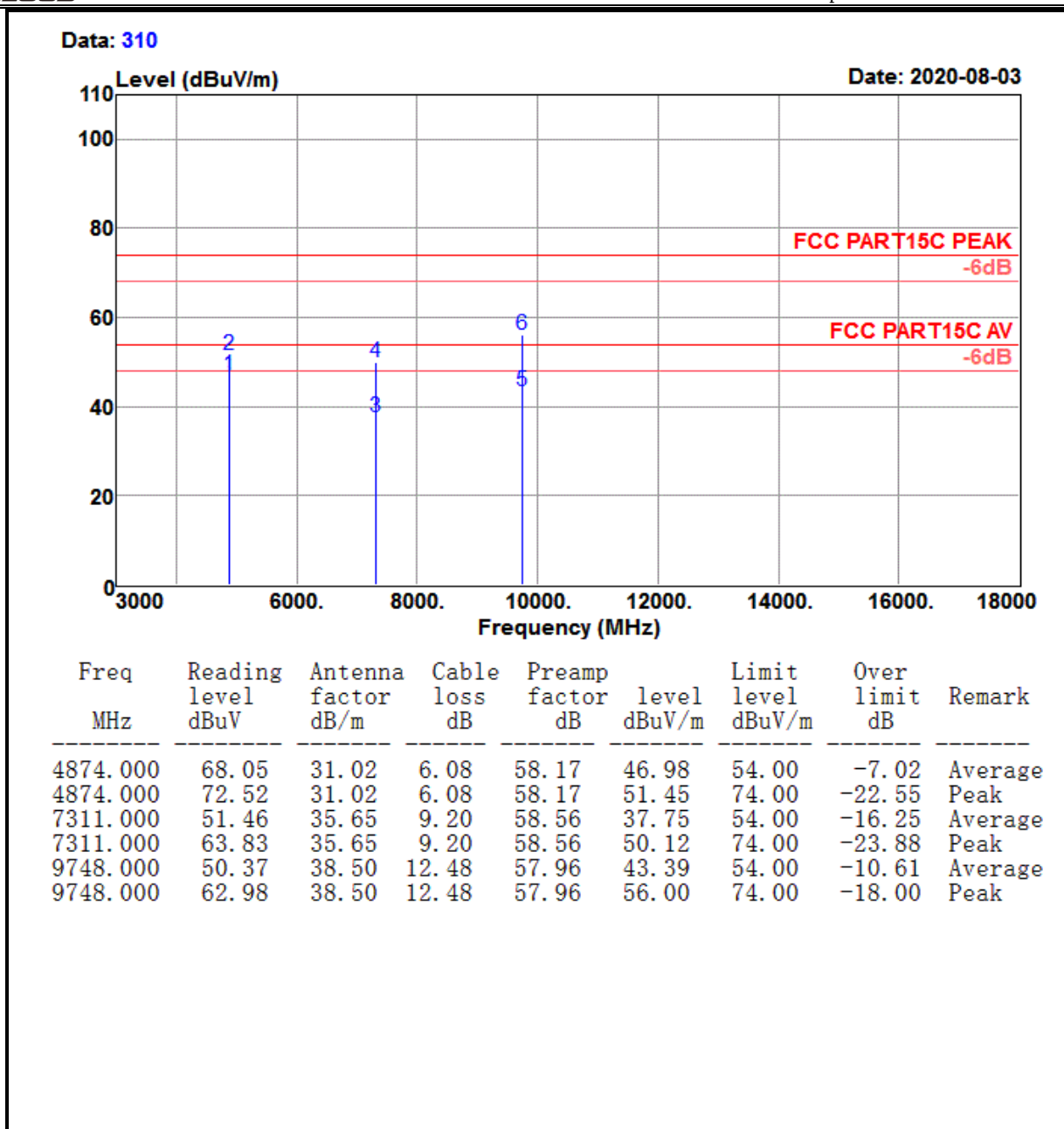


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2437.000	99.59	27.66	4.22	35.90	95.57	74.00	21.57	Peak

Test Mode :	802.11b CH06 (2437MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Vertical

Data: 309

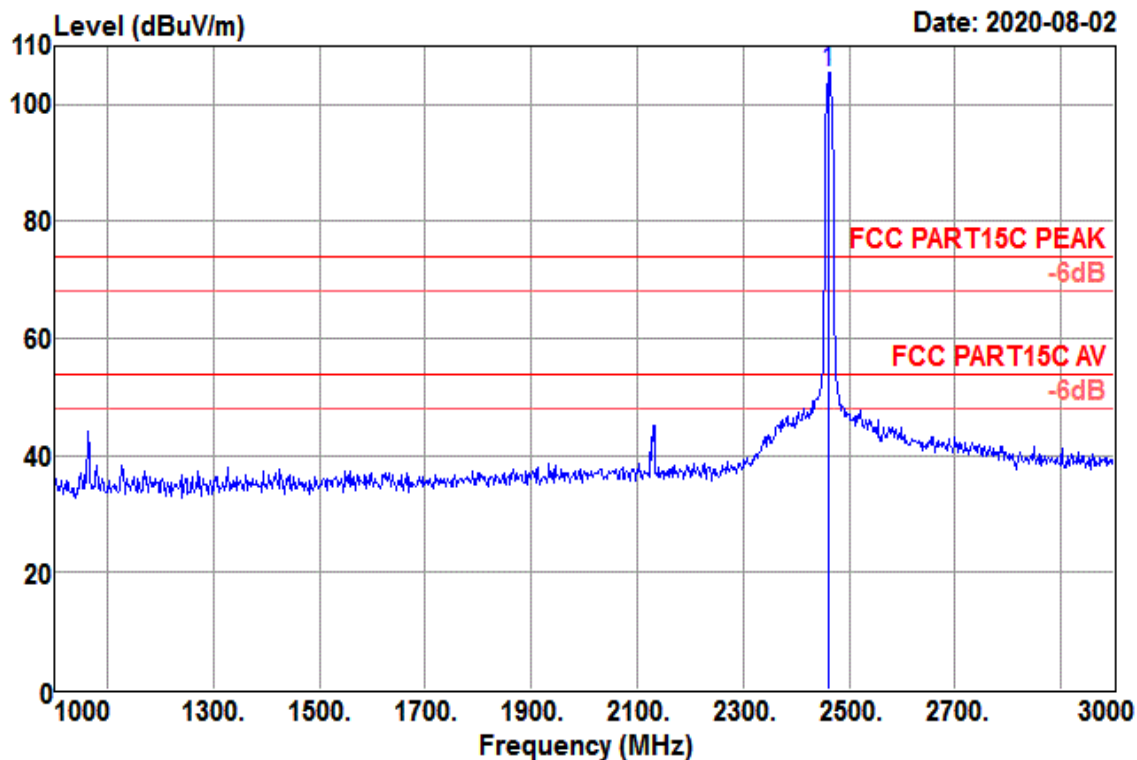




Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

Test Mode :	802.11b CH11 (2462MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Horizontal

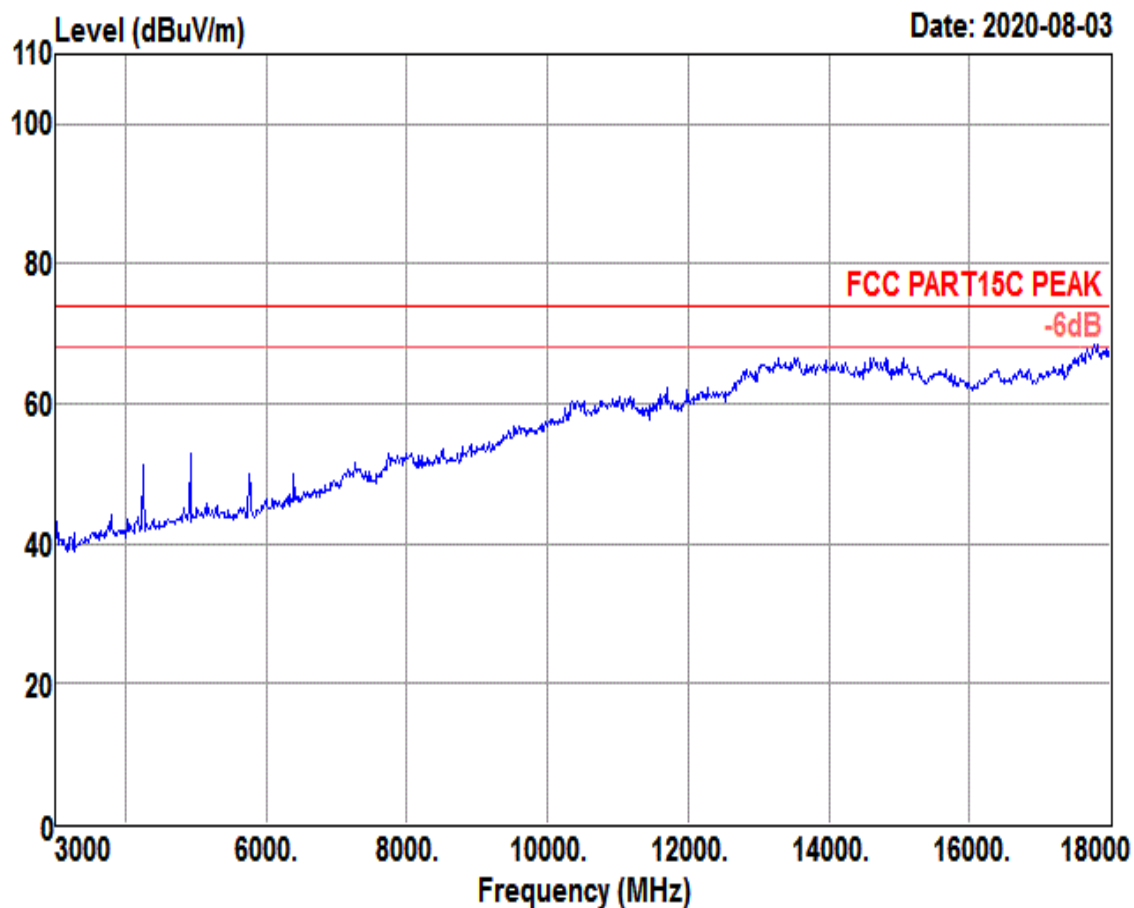
Data: 241



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	109.40	27.72	4.24	35.95	105.41	74.00	31.41	Peak

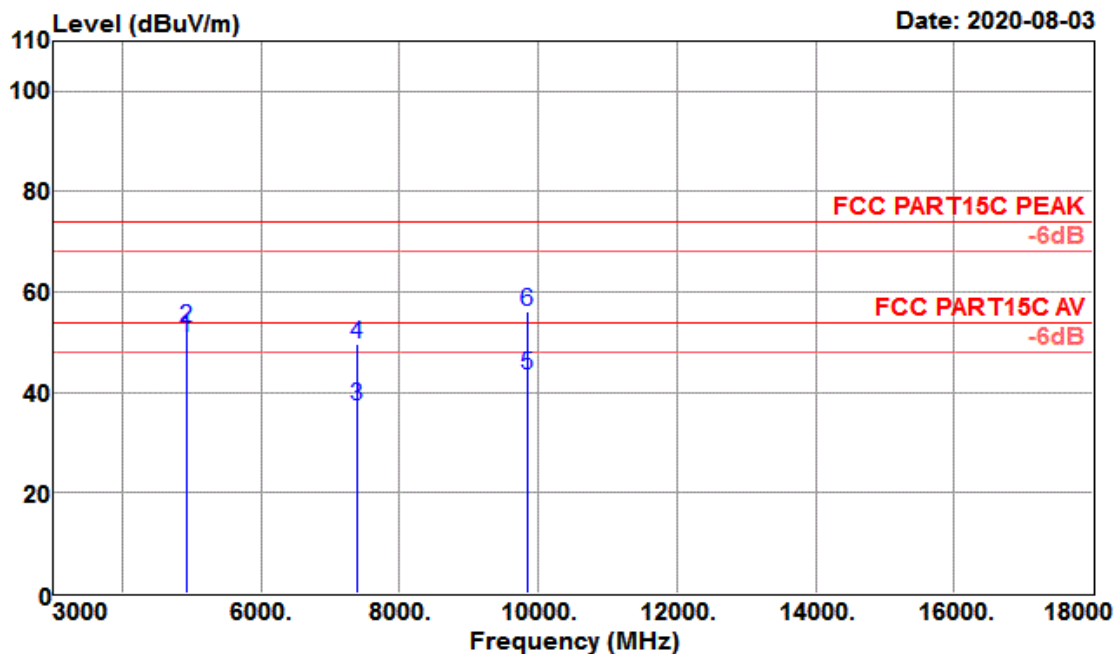
Test Mode :	802.11b CH11 (2462MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Horizontal

Data: 305



Data: 306

Date: 2020-08-03

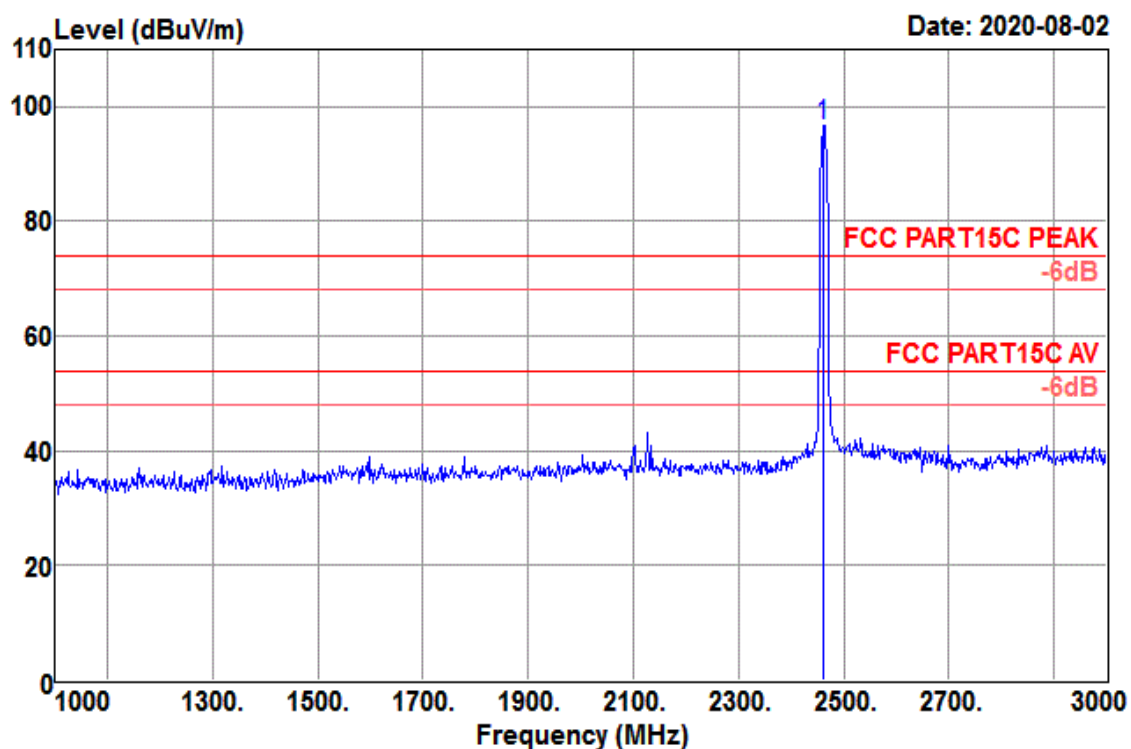


Freq MHz	Reading level dBUV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBUV/m	Limit level dBUV/m	Over limit dB	Remark
4924.000	72.03	31.09	6.08	58.11	51.09	54.00	-2.91	Average
4924.000	73.79	31.09	6.08	58.11	52.85	74.00	-21.15	Peak
7386.000	50.88	35.83	9.18	58.59	37.30	54.00	-16.70	Average
7386.000	63.33	35.83	9.18	58.59	49.75	74.00	-24.25	Peak
9848.000	50.05	38.58	12.83	57.89	43.57	54.00	-10.43	Average
9848.000	62.66	38.58	12.83	57.89	56.18	74.00	-17.82	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 :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Vertical

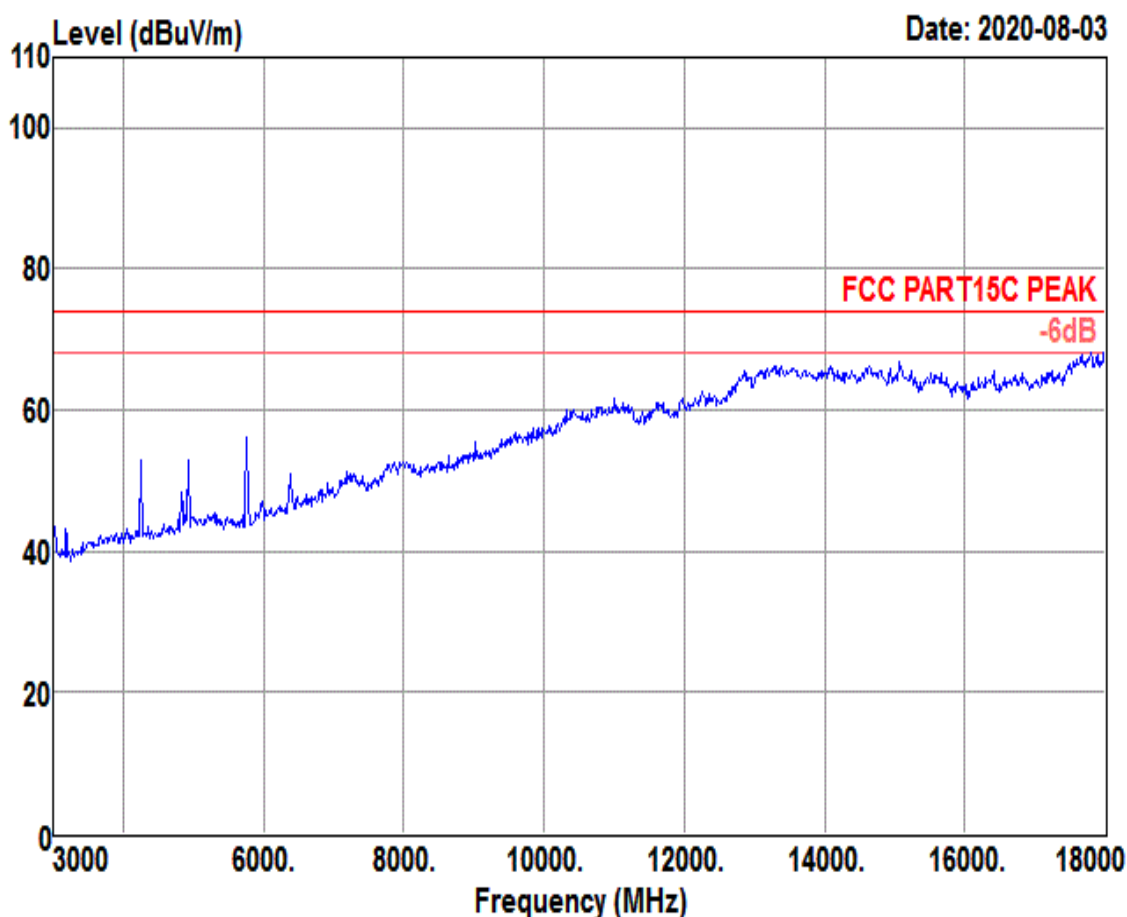
Data: 244



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2462.000	100.75	27.72	4.24	35.95	96.76	74.00	22.76	Peak

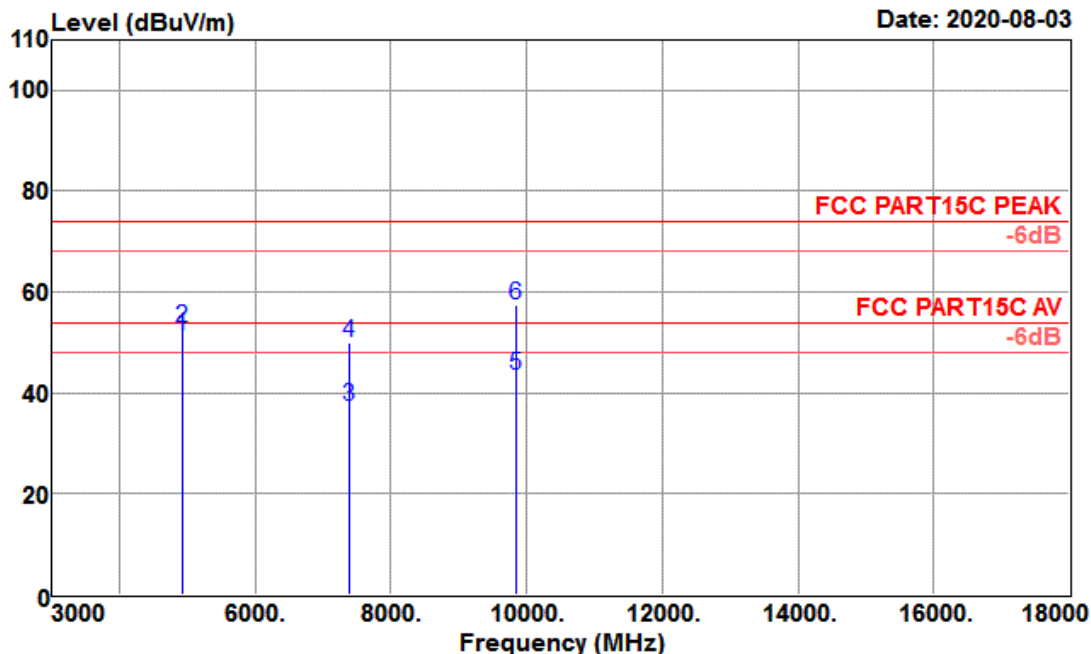
Test Mode :	802.11b CH11 (2462MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Vertical

Data: 303



Data: 304

Date: 2020-08-03

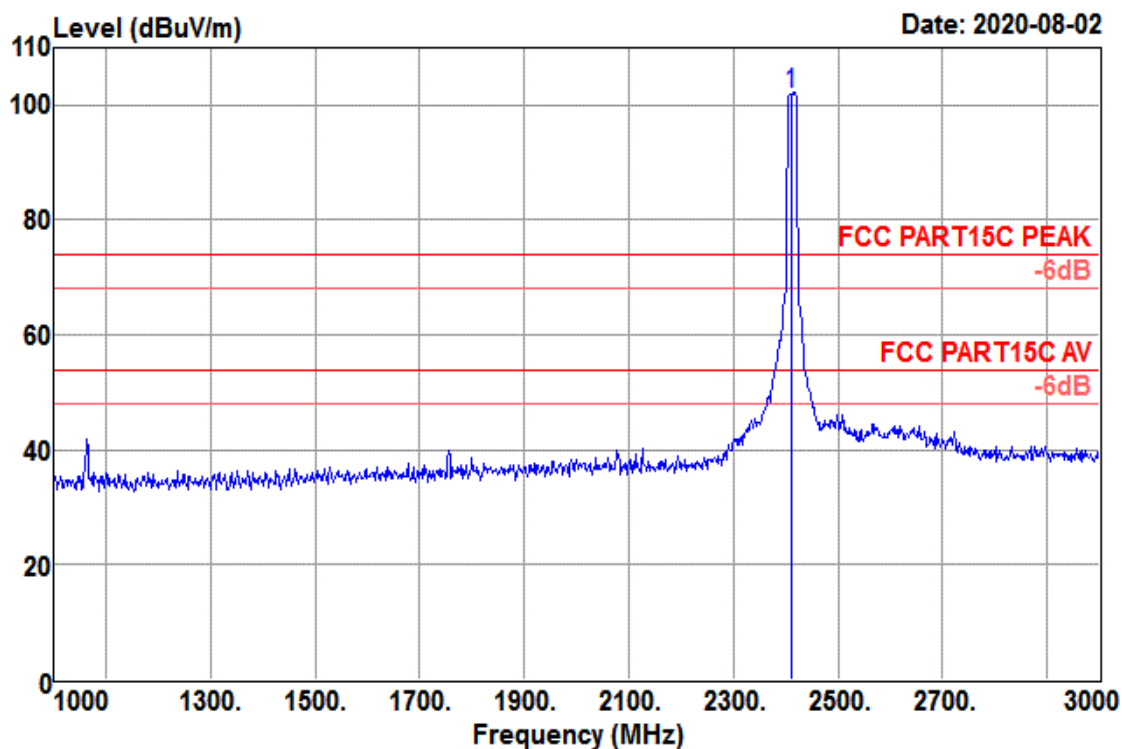


Freq MHz	Reading level dBUV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBUV/m	Limit level dBUV/m	Over limit dB	Remark
4924.000	72.34	31.09	6.08	58.11	51.40	54.00	-2.60	Average
4924.000	73.91	31.09	6.08	58.11	52.97	74.00	-21.03	Peak
7386.000	50.88	35.83	9.18	58.59	37.30	54.00	-16.70	Average
7386.000	63.60	35.83	9.18	58.59	50.02	74.00	-23.98	Peak
9848.000	50.04	38.58	12.83	57.89	43.56	54.00	-10.44	Average
9848.000	63.77	38.58	12.83	57.89	57.29	74.00	-16.71	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 :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Horizontal

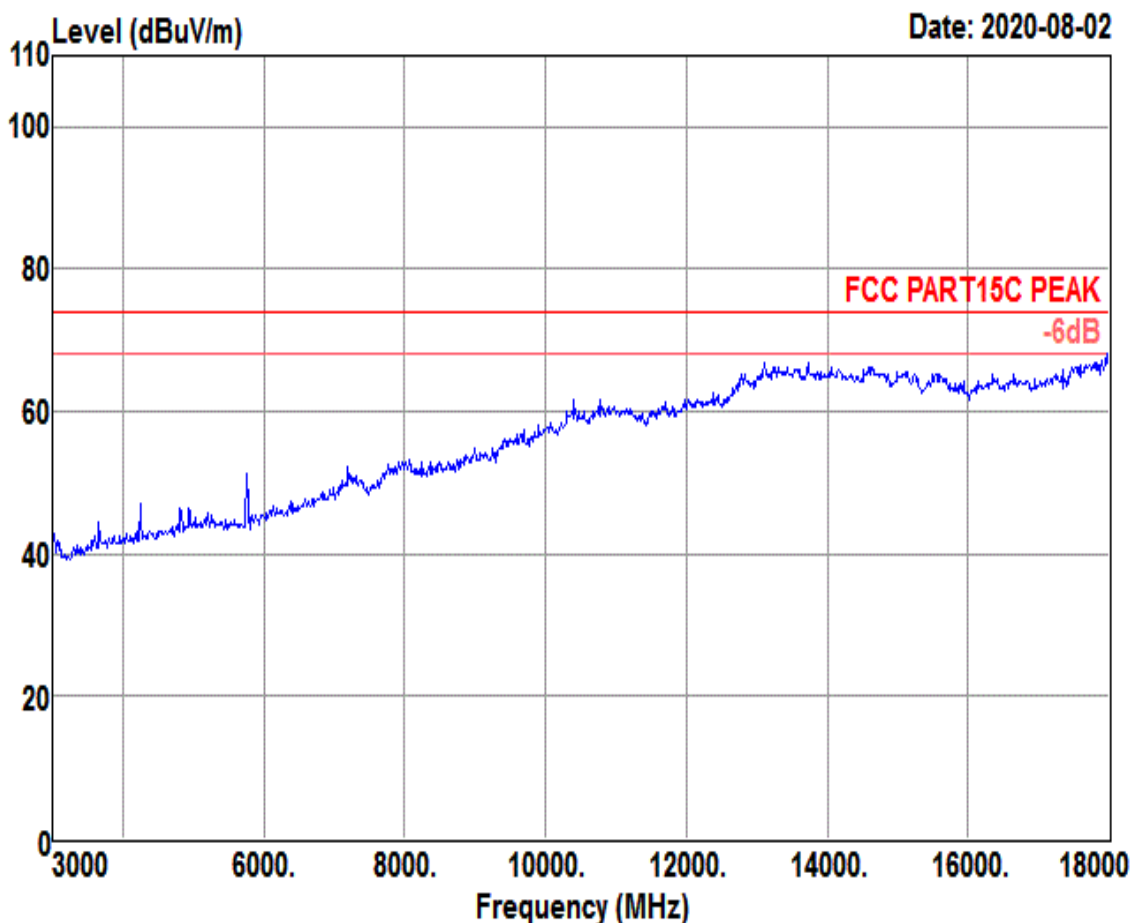
Data: 250



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	105.84	27.61	4.20	35.84	101.81	74.00	27.81	Peak

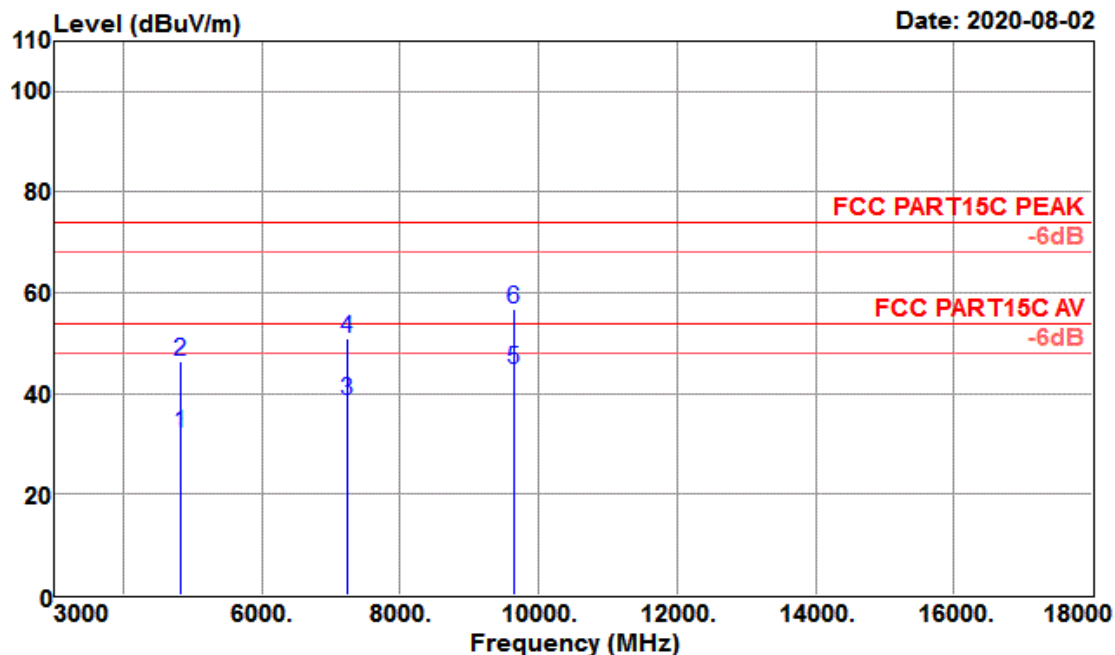
Test Mode :	802.11g CH01 (2412 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Horizontal

Data: 285



Data: 286

Date: 2020-08-02

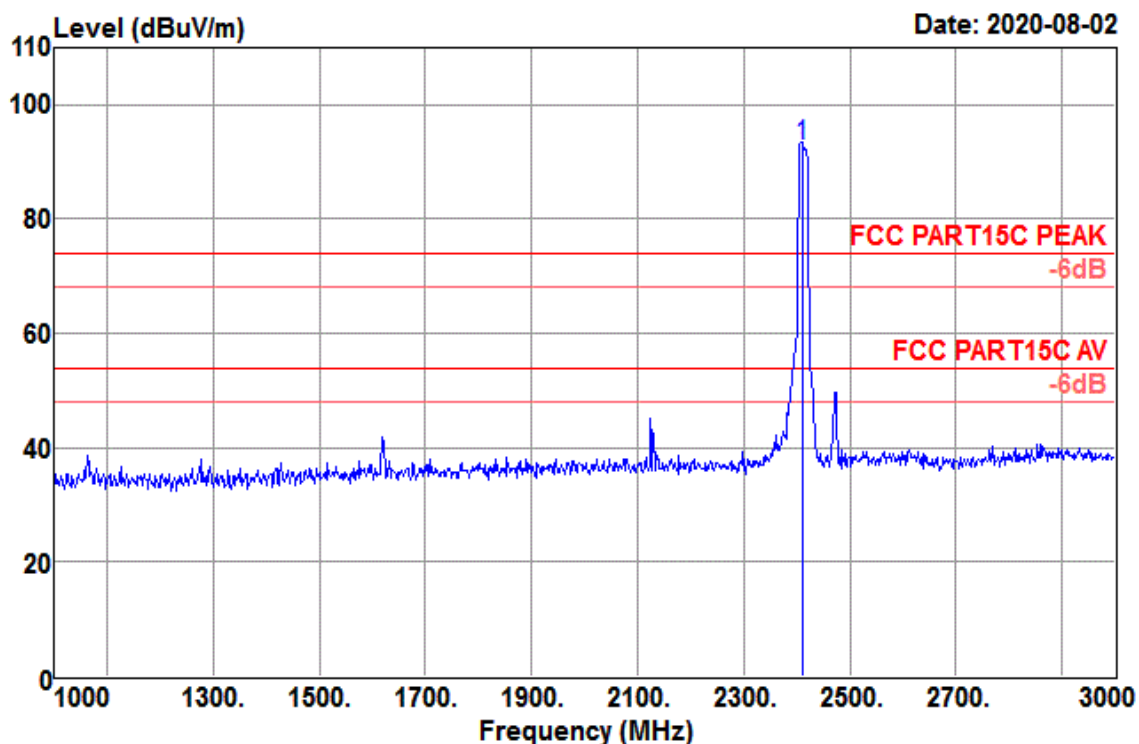


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4824.000	53.18	30.95	6.09	58.24	31.98	54.00	-22.02	Average
4824.000	67.64	30.95	6.09	58.24	46.44	74.00	-27.56	Peak
7236.000	52.50	35.47	9.21	58.53	38.65	54.00	-15.35	Average
7236.000	64.71	35.47	9.21	58.53	50.86	74.00	-23.14	Peak
9648.000	52.02	38.42	12.32	58.03	44.73	54.00	-9.27	Average
9648.000	63.99	38.42	12.32	58.03	56.70	74.00	-17.30	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 :	23~25°C
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Vertical

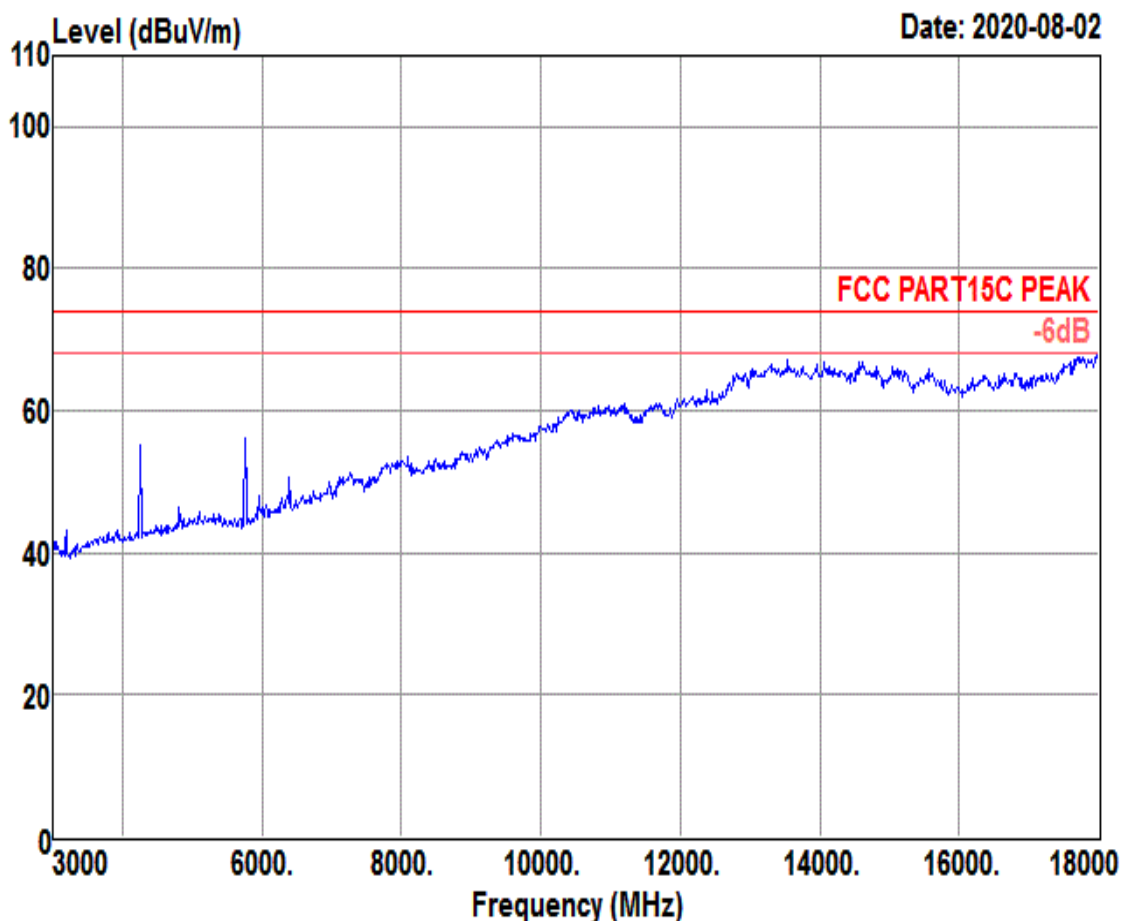
Data: 247



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	96.80	27.61	4.20	35.84	92.77	74.00	18.77	Peak

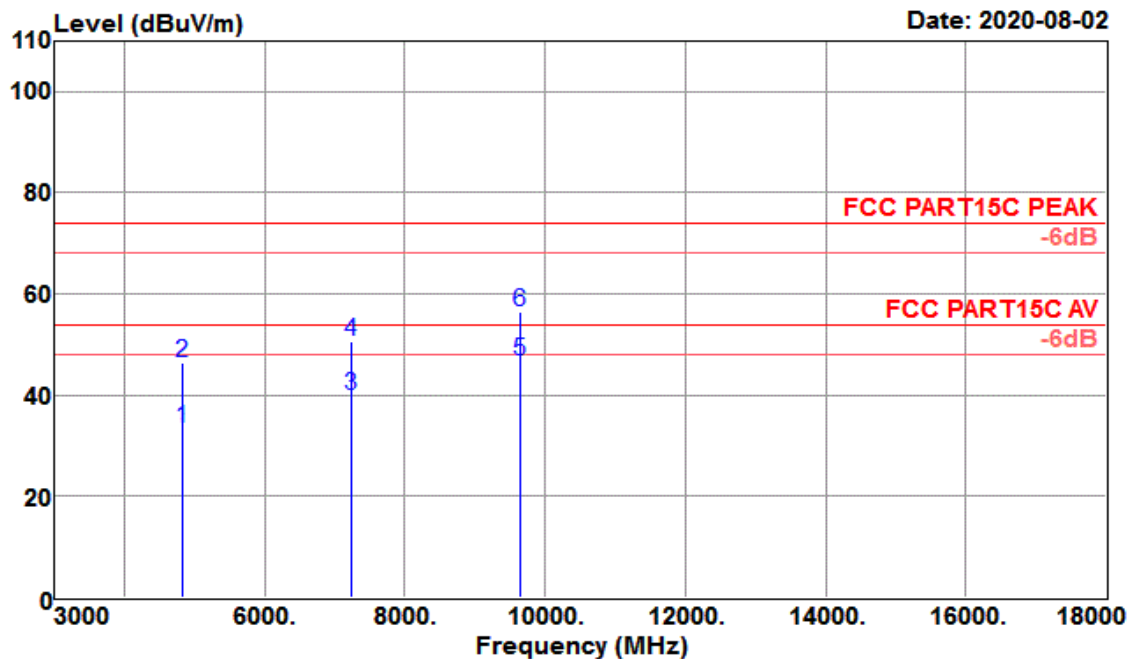
Test Mode :	802.11g CH01 (2412 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Vertical

Data: 287



Data: 288

Date: 2020-08-02

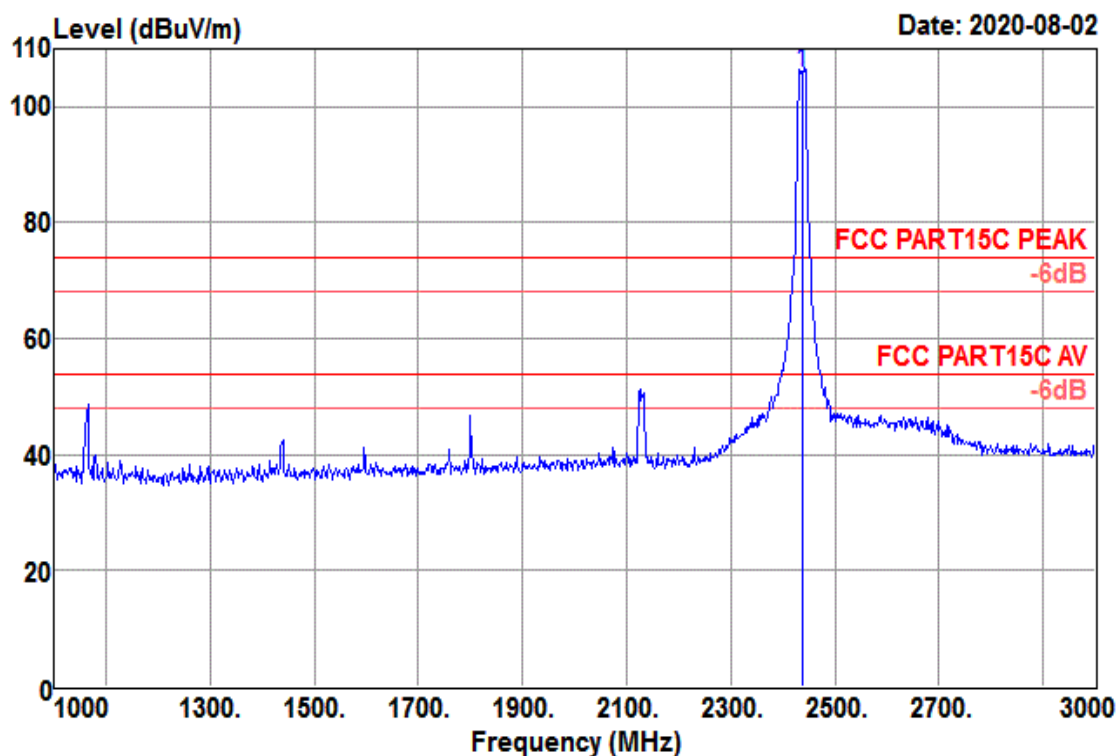


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4824.000	54.71	30.95	6.09	58.24	33.51	54.00	-20.49	Average
4824.000	67.68	30.95	6.09	58.24	46.48	74.00	-27.52	Peak
7236.000	53.89	35.47	9.21	58.53	40.04	54.00	-13.96	Average
7236.000	64.39	35.47	9.21	58.53	50.54	74.00	-23.46	Peak
9648.000	54.13	38.42	12.32	58.03	46.84	54.00	-7.16	Average
9648.000	63.74	38.42	12.32	58.03	56.45	74.00	-17.55	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 :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Horizontal

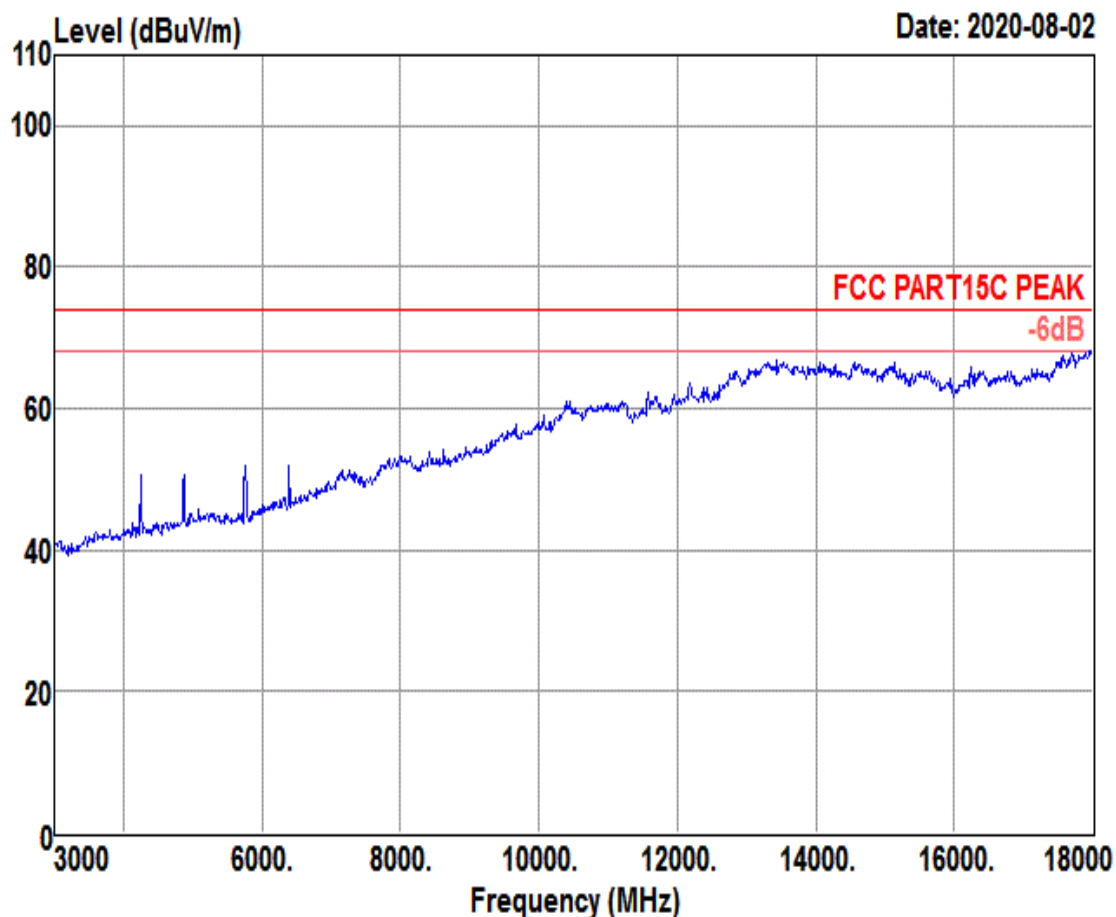
Data: 251



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	109.82	27.66	4.22	35.90	105.80	74.00	31.80	Peak

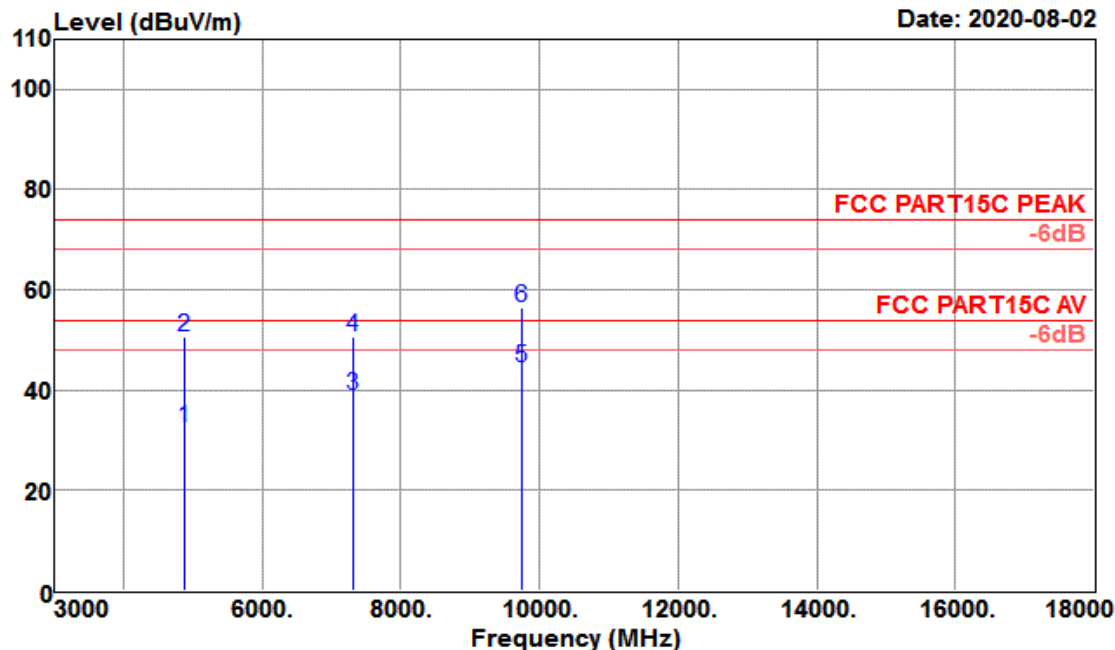
Test Mode :	802.11g CH06 (2437MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Horizontal

Data: 291



Data: 292

Date: 2020-08-02

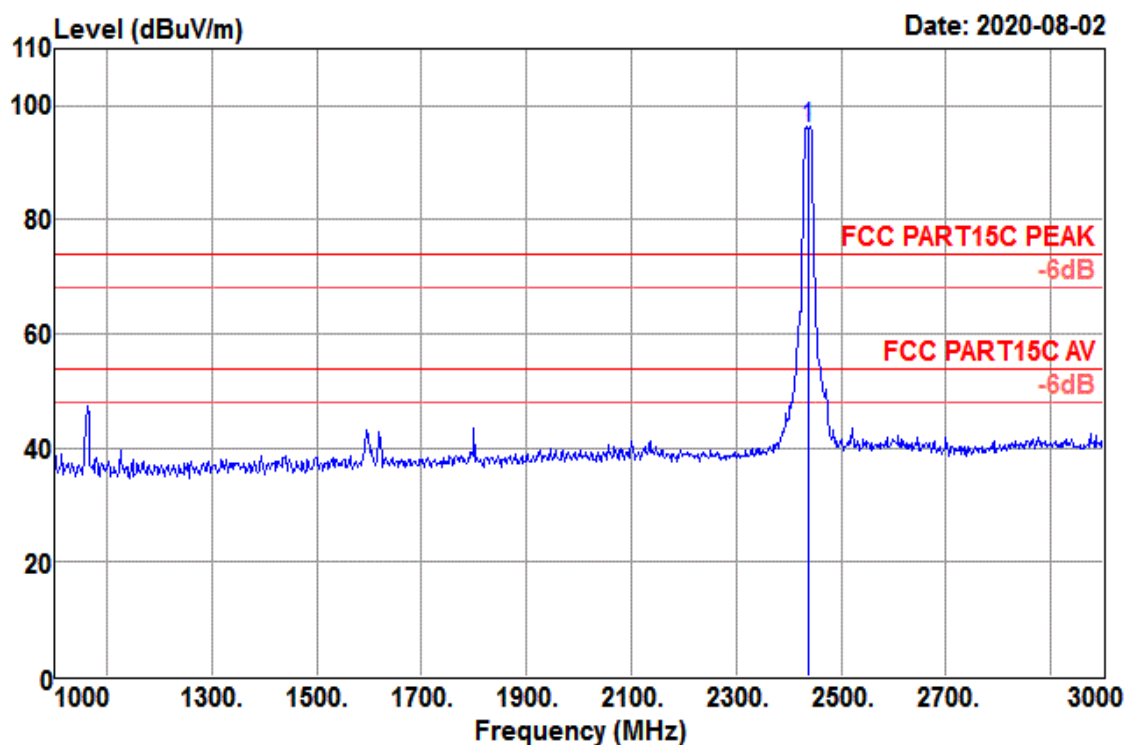


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4874.000	53.65	31.02	6.08	58.17	32.58	54.00	-21.42	Average
4874.000	71.80	31.02	6.08	58.17	50.73	74.00	-23.27	Peak
7311.000	52.66	35.65	9.20	58.56	38.95	54.00	-15.05	Average
7311.000	64.48	35.65	9.20	58.56	50.77	74.00	-23.23	Peak
9748.000	51.41	38.50	12.48	57.96	44.43	54.00	-9.57	Average
9748.000	63.30	38.50	12.48	57.96	56.32	74.00	-17.68	Peak

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

Test Mode :	802.11g CH06 (2437MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Vertical

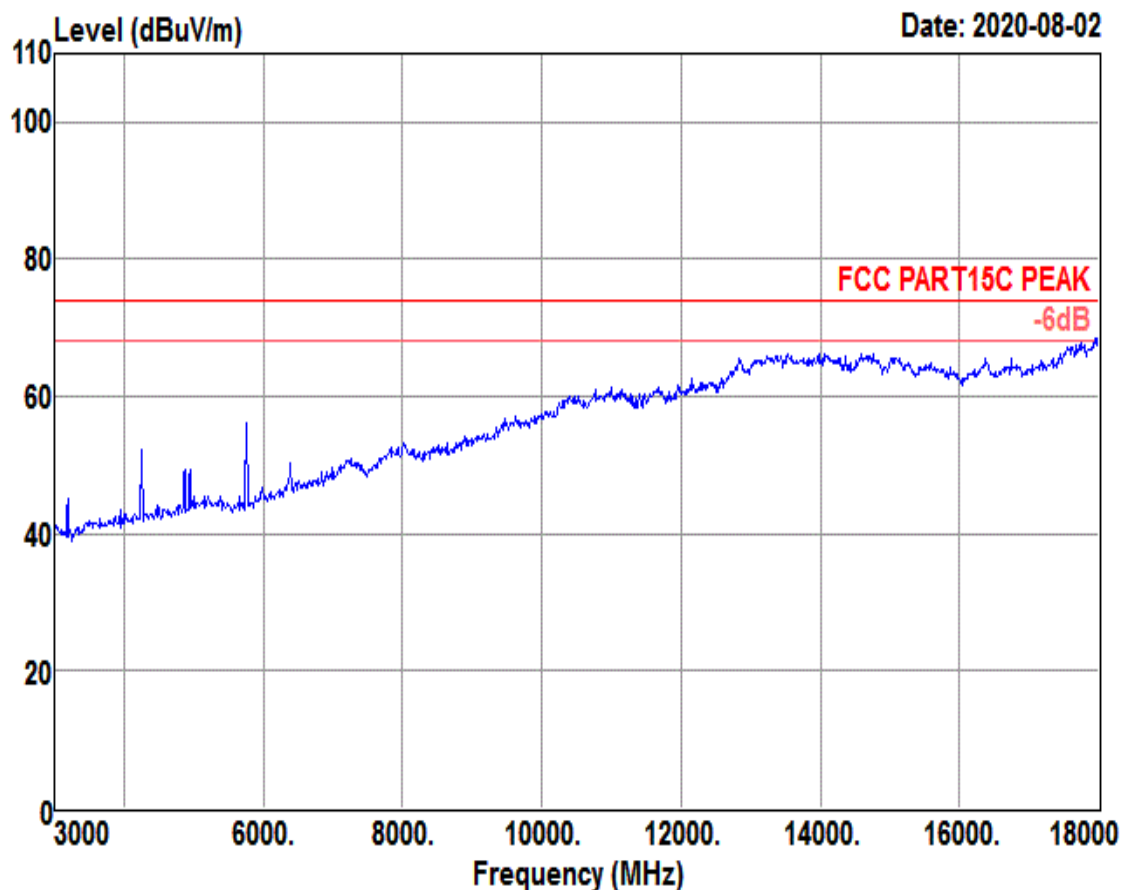
Data: 252



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	99.93	27.66	4.22	35.90	95.91	74.00	21.91	Peak

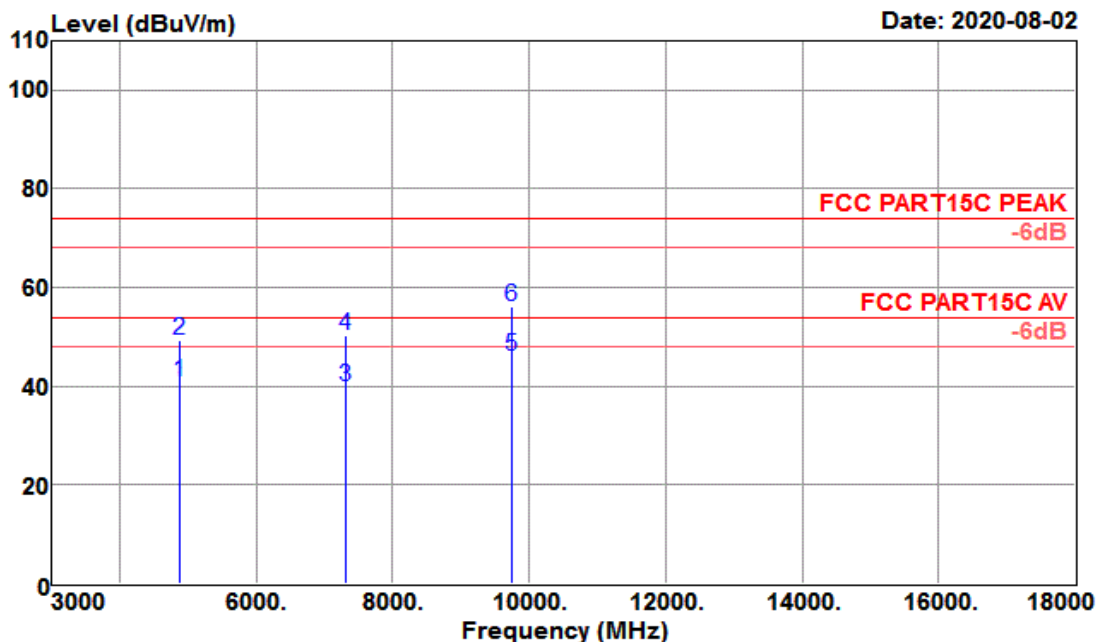
Test Mode :	802.11g CH06 (2437MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Vertical

Data: 289



Data: 290

Date: 2020-08-02

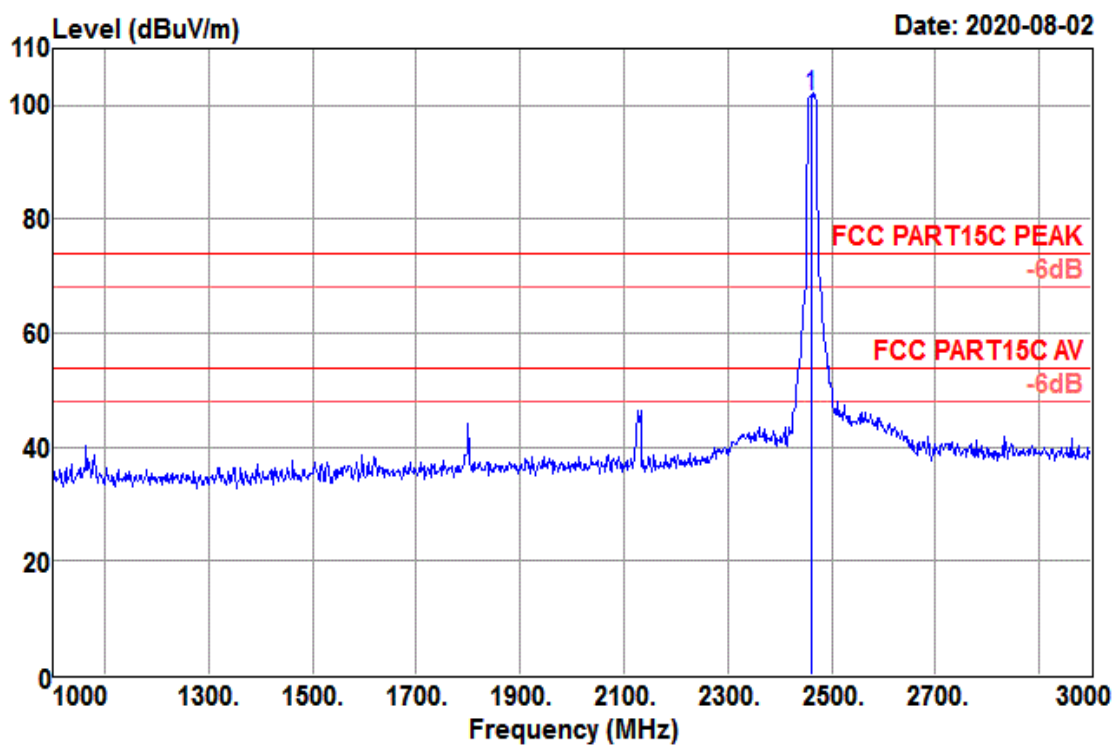


Freq MHz	Reading level dBUV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBUV/m	Limit level dBUV/m	Over limit dB	Remark
4874.000	61.84	31.02	6.08	58.17	40.77	54.00	-13.23	Average
4874.000	70.37	31.02	6.08	58.17	49.30	74.00	-24.70	Peak
7311.000	53.80	35.65	9.20	58.56	40.09	54.00	-13.91	Average
7311.000	64.02	35.65	9.20	58.56	50.31	74.00	-23.69	Peak
9748.000	53.10	38.50	12.48	57.96	46.12	54.00	-7.88	Average
9748.000	63.24	38.50	12.48	57.96	56.26	74.00	-17.74	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 :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Horizontal

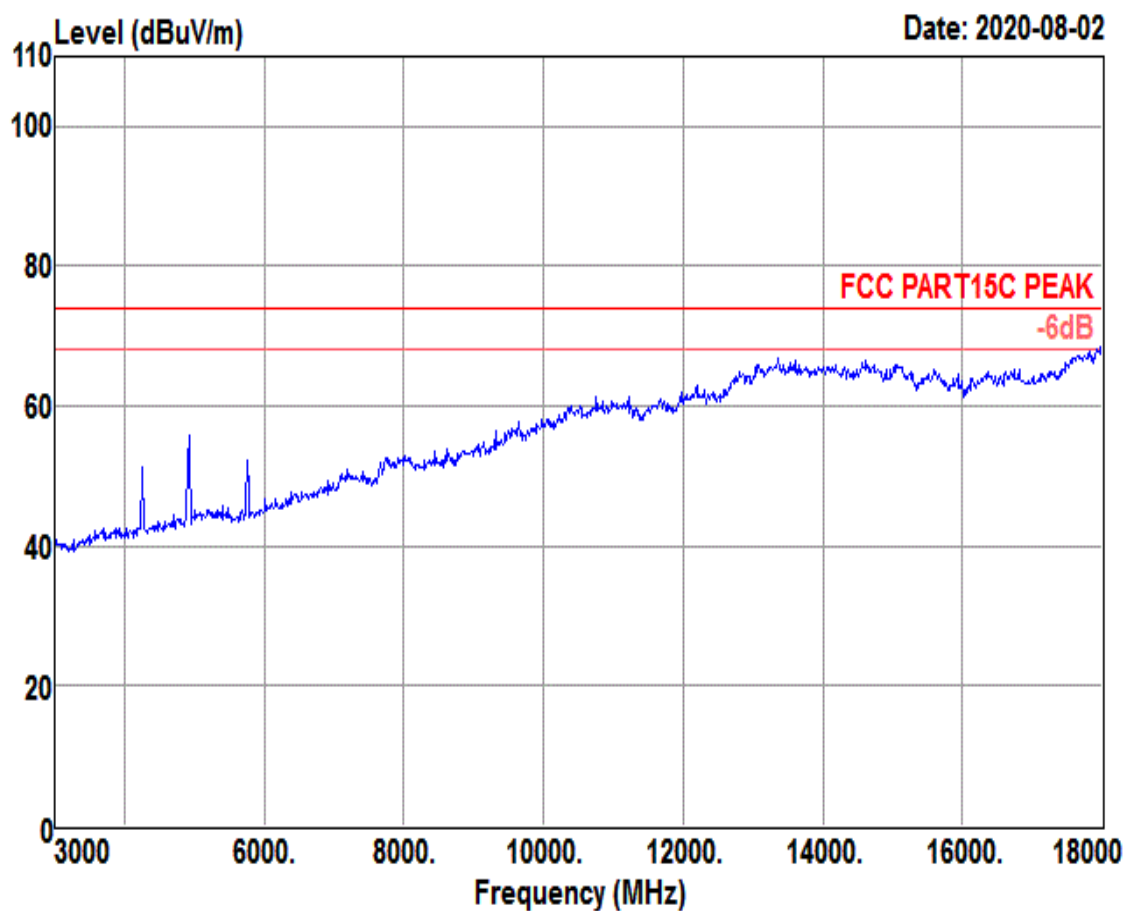
Data: 258



Freq MHz	Reading level dBUV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBUV/m	Limit level dBUV/m	Over limit dB	Remark
2462.000	105.50	27.72	4.24	35.95	101.51	74.00	27.51	Peak

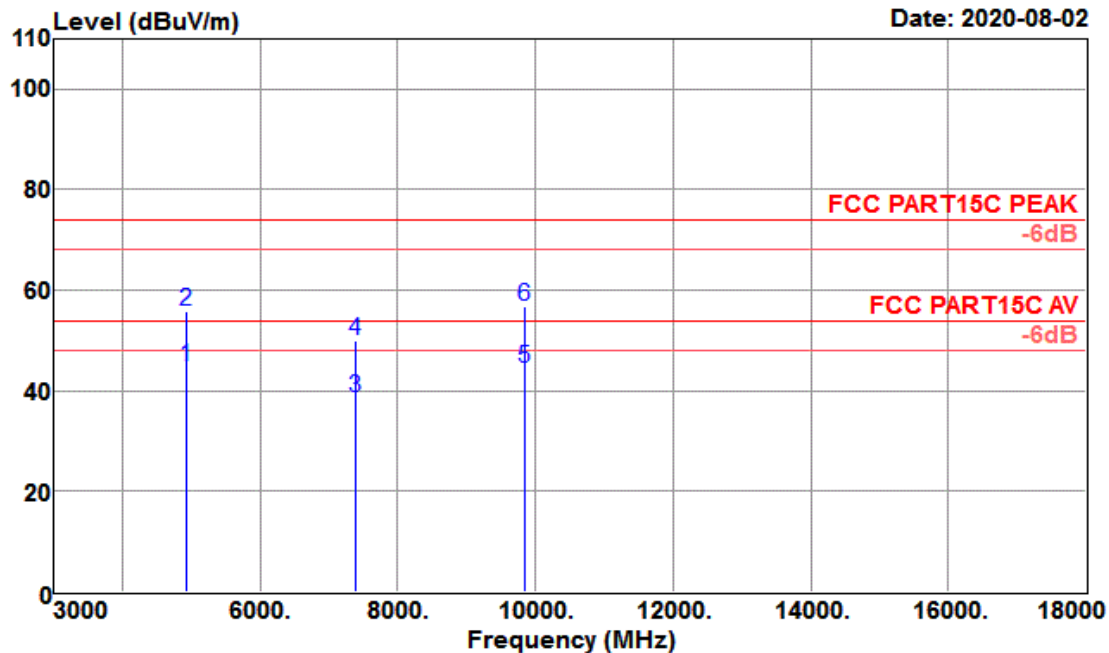
Test Mode :	802.11g CH11 (2462MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Horizontal

Data: 293



Data: 294

Date: 2020-08-02

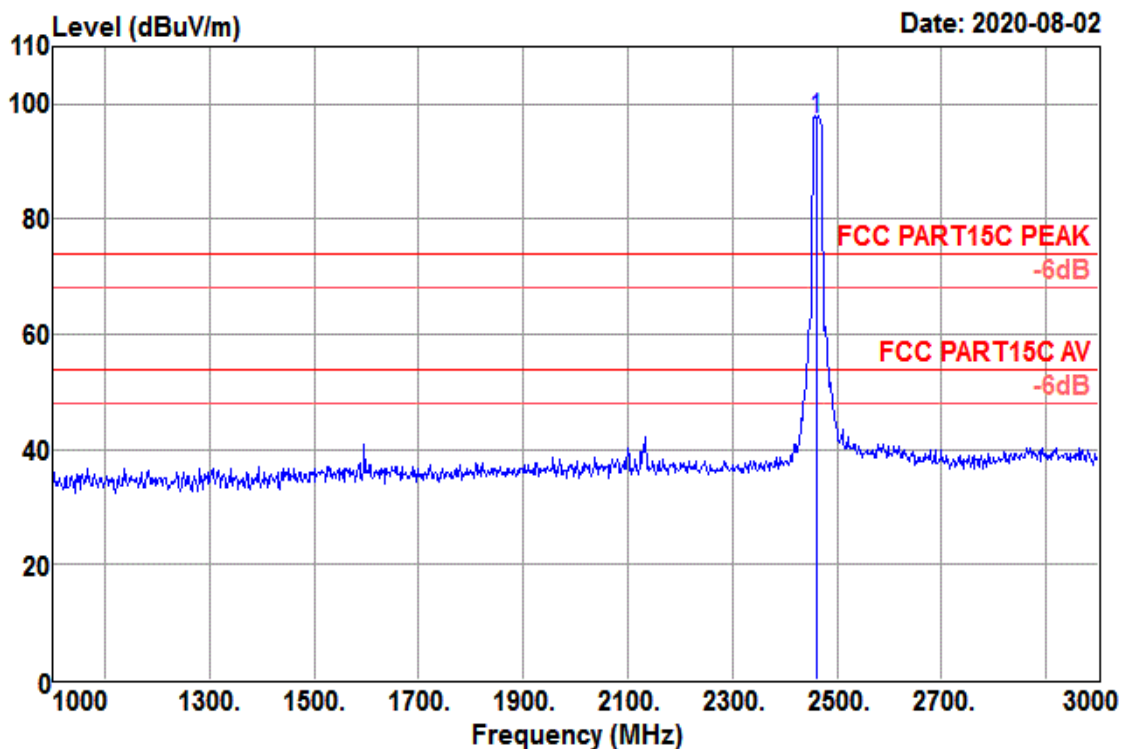


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4924.000	65.69	31.09	6.08	58.11	44.75	54.00	-9.25	Average
4924.000	76.83	31.09	6.08	58.11	55.89	74.00	-18.11	Peak
7386.000	52.05	35.83	9.18	58.59	38.47	54.00	-15.53	Average
7386.000	63.70	35.83	9.18	58.59	50.12	74.00	-23.88	Peak
9848.000	51.03	38.58	12.83	57.89	44.55	54.00	-9.45	Average
9848.000	63.23	38.58	12.83	57.89	56.75	74.00	-17.25	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 :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Vertical

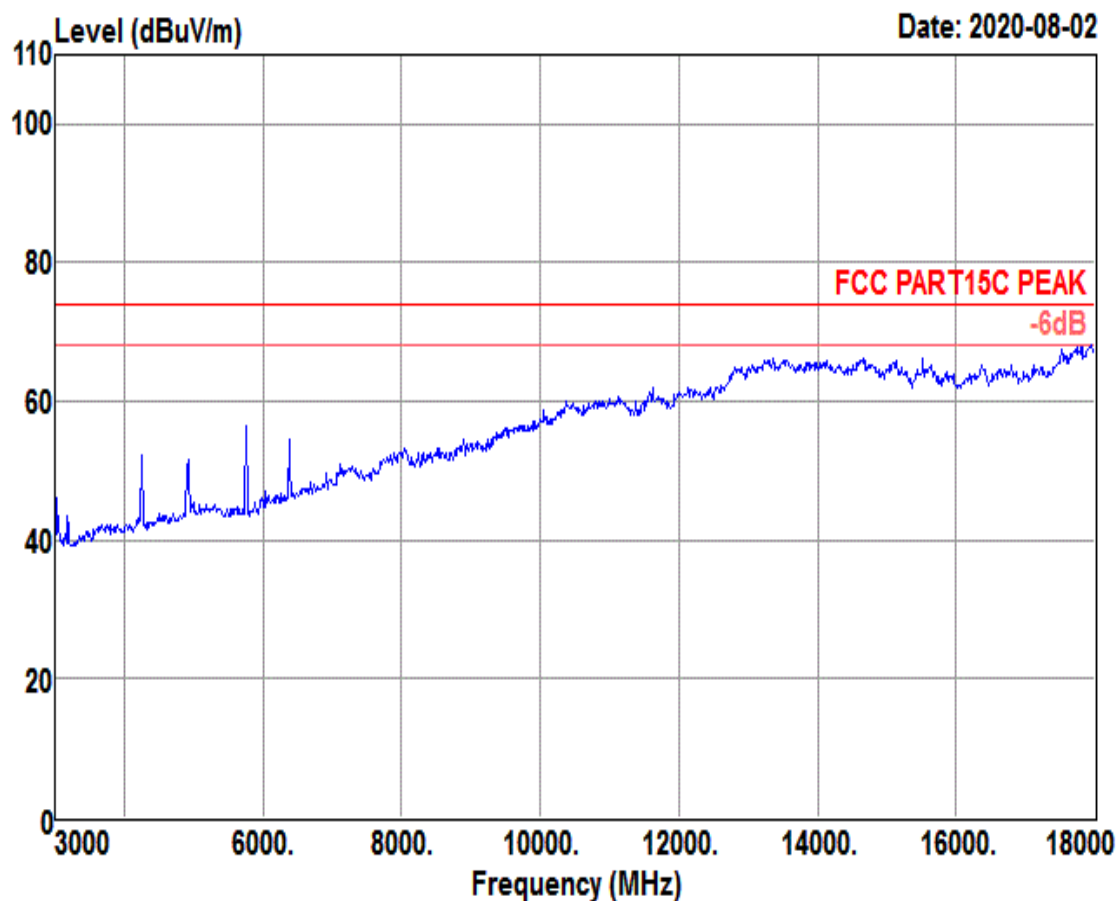
Data: 255



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2462.000	101.29	27.72	4.24	35.95	97.30	74.00	23.30	Peak

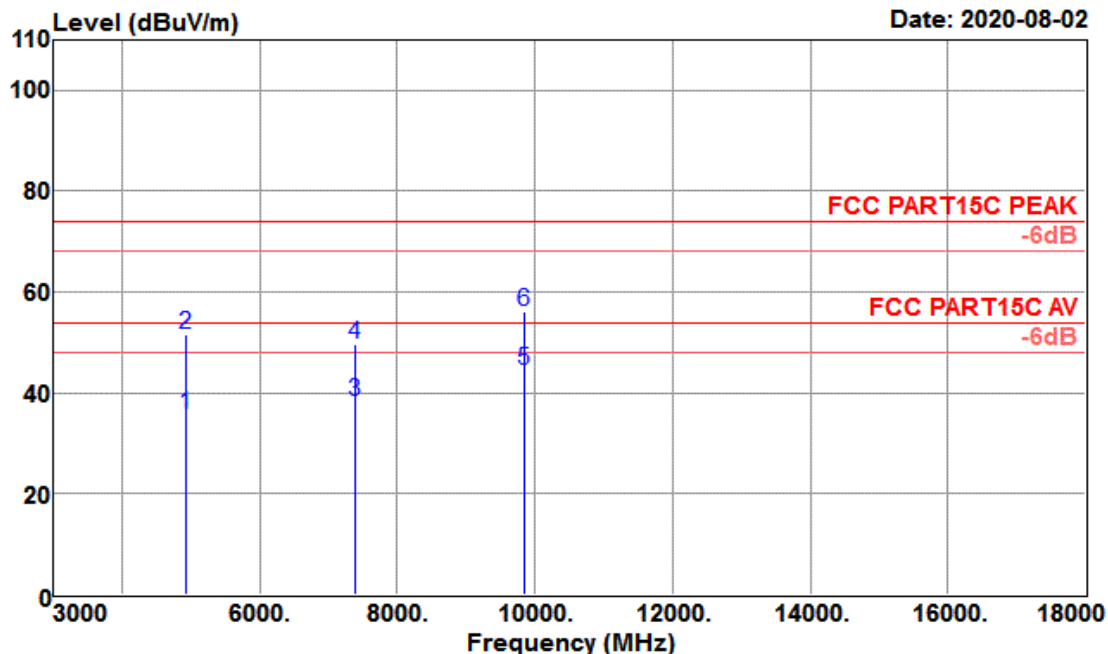
Test Mode :	802.11g CH11 (2462MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Vertical

Data: 295



Data: 296

Date: 2020-08-02

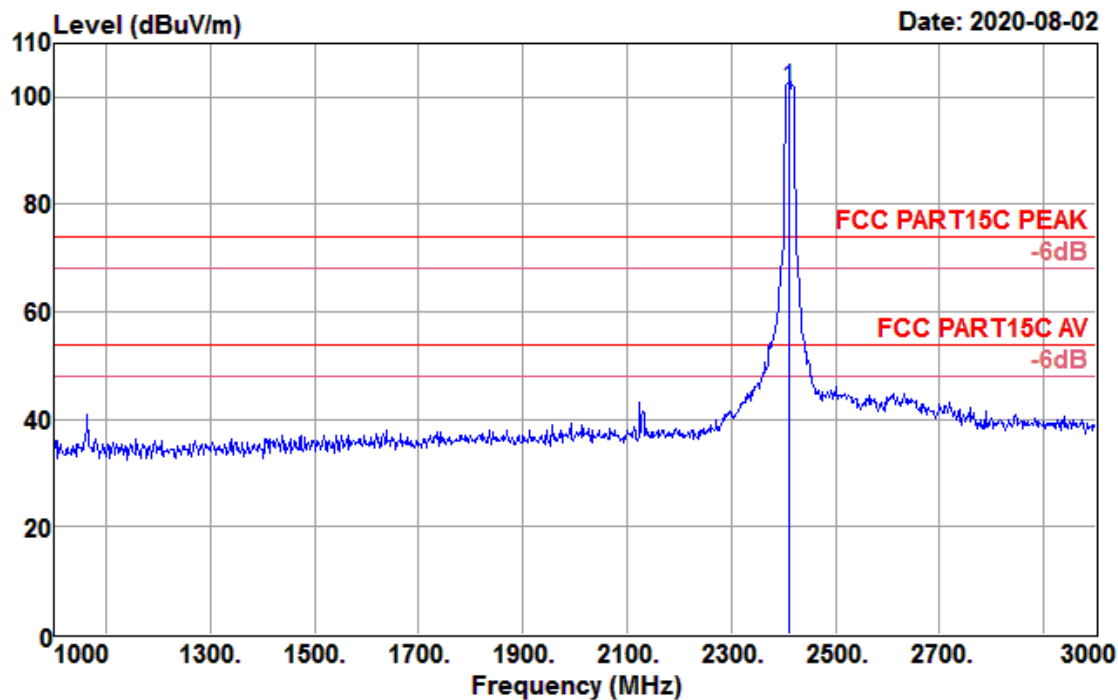


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4924.000	56.70	31.09	6.08	58.11	35.76	54.00	-18.24	Average
4924.000	72.54	31.09	6.08	58.11	51.60	74.00	-22.40	Peak
7386.000	51.72	35.83	9.18	58.59	38.14	54.00	-15.86	Average
7386.000	63.27	35.83	9.18	58.59	49.69	74.00	-24.31	Peak
9848.000	50.88	38.58	12.83	57.89	44.40	54.00	-9.60	Average
9848.000	62.76	38.58	12.83	57.89	56.28	74.00	-17.72	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 :	23~25°C
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Horizontal

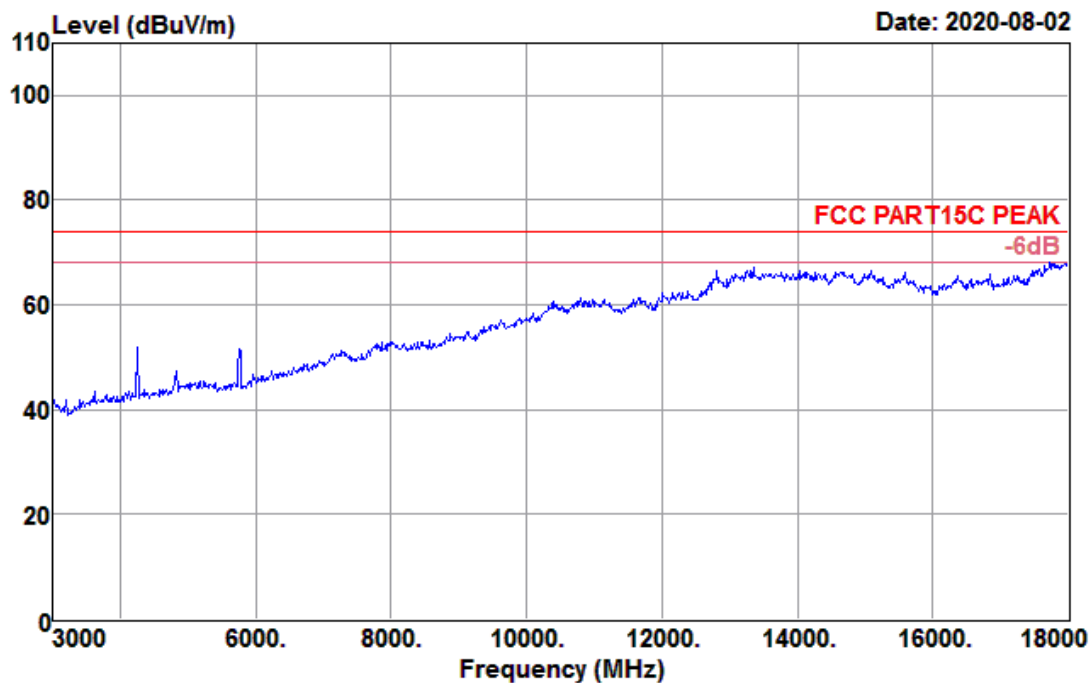
Data: 261



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	105.76	27.61	4.20	35.84	101.73	74.00	27.73	Peak

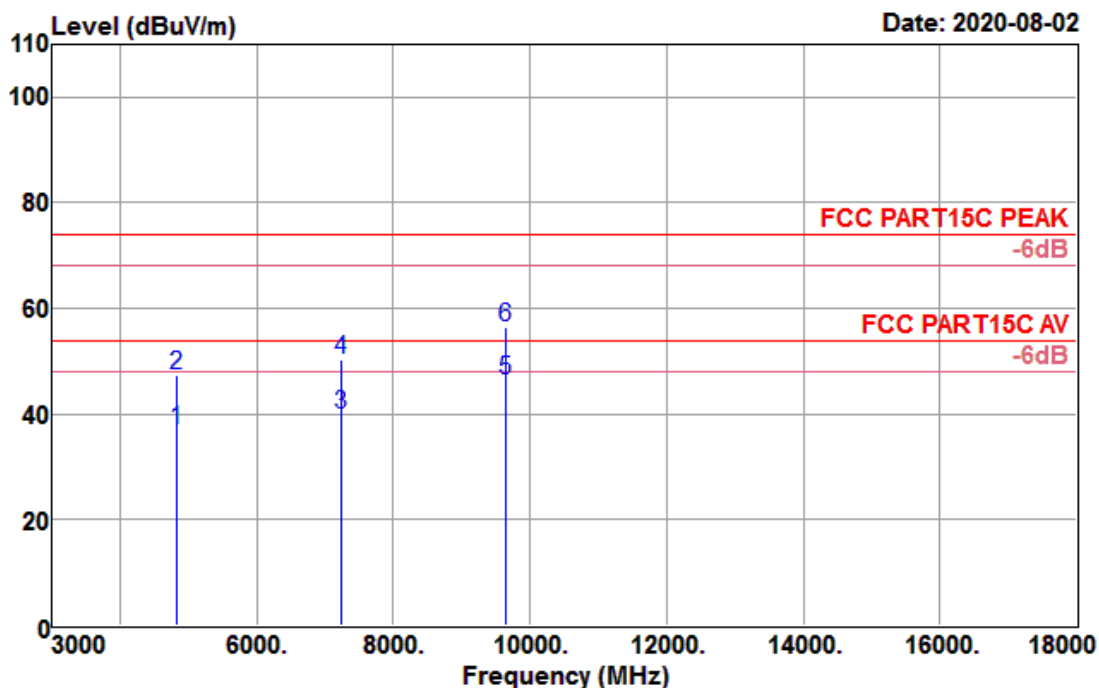
Test Mode :	802.11n HT20 CH01 (2412 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Horizontal

Data: 283



Data: 284

Date: 2020-08-02

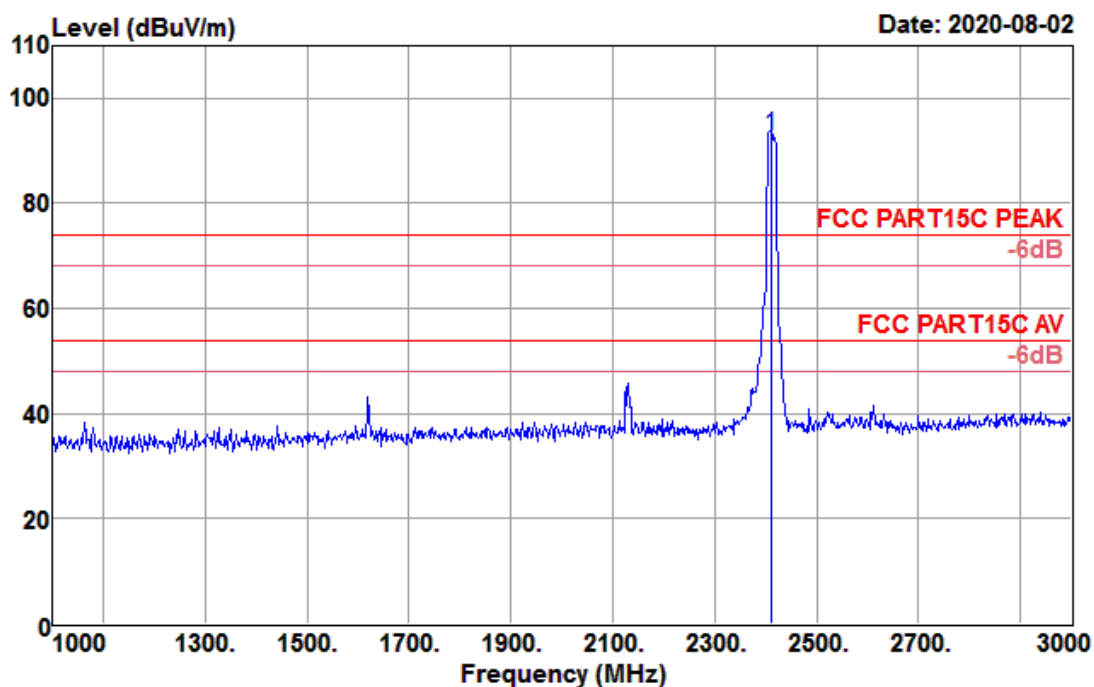


Freq MHz	Reading level dBUV	Antenna factor dB/m	Cable loss dB	Preamplifier factor dB	level dBUV/m	Limit level dBUV/m	Over limit dB	Remark
4824.000	58.07	30.95	6.09	58.24	36.87	54.00	-17.13	Average
4824.000	68.46	30.95	6.09	58.24	47.26	74.00	-26.74	Peak
7236.000	53.82	35.47	9.21	58.53	39.97	54.00	-14.03	Average
7236.000	64.29	35.47	9.21	58.53	50.44	74.00	-23.56	Peak
9648.000	53.64	38.42	12.32	58.03	46.35	54.00	-7.65	Average
9648.000	63.67	38.42	12.32	58.03	56.38	74.00	-17.62	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 HT20 CH01 (2412 MHz)	Temperature :	23~25°C
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Vertical

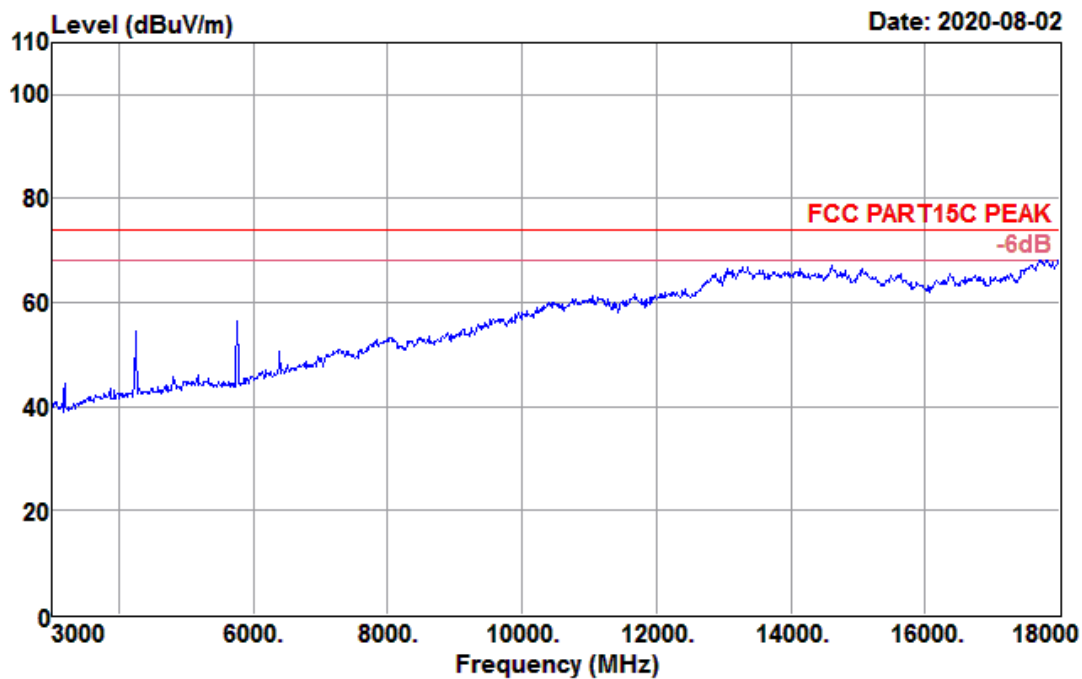
Data: 264



Freq MHz	Reading level dBUV	Antenna factor dB/m	Cable loss dB	Preamplifier factor dB	level dBUV/m	Limit level dBUV/m	Over limit dB	Remark
2412.000	96.84	27.61	4.20	35.84	92.81	74.00	18.81	Peak

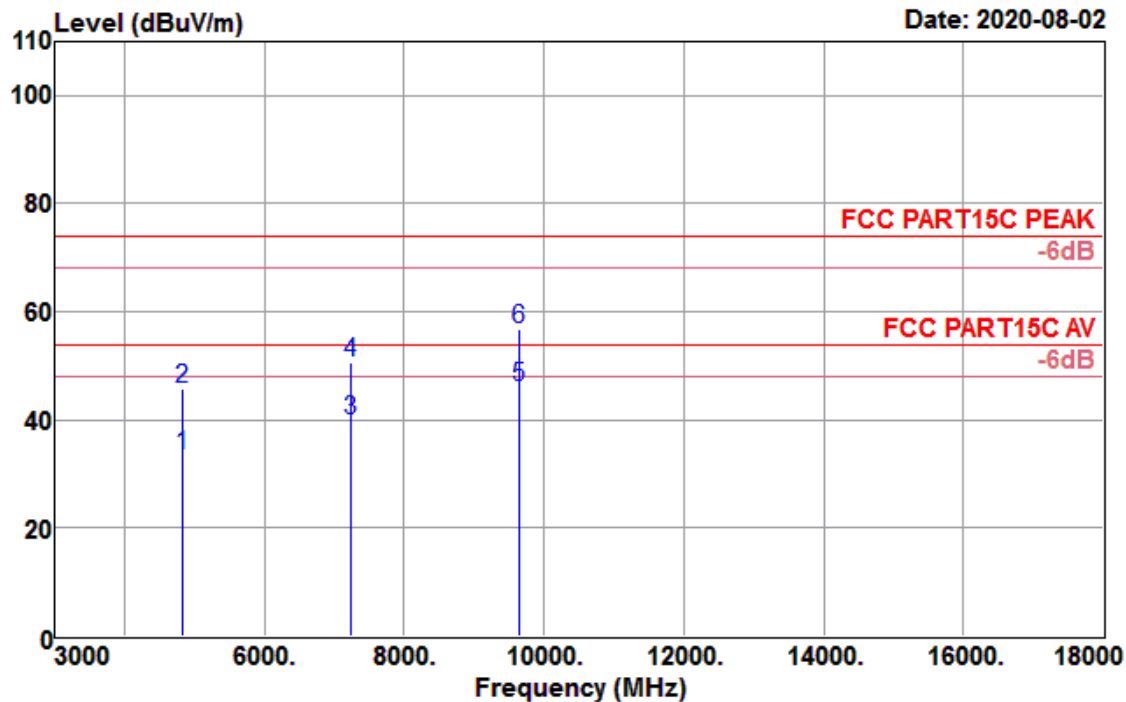
Test Mode :	802.11n HT20 CH01 (2412 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Vertical

Data: 281



Data: 282

Date: 2020-08-02

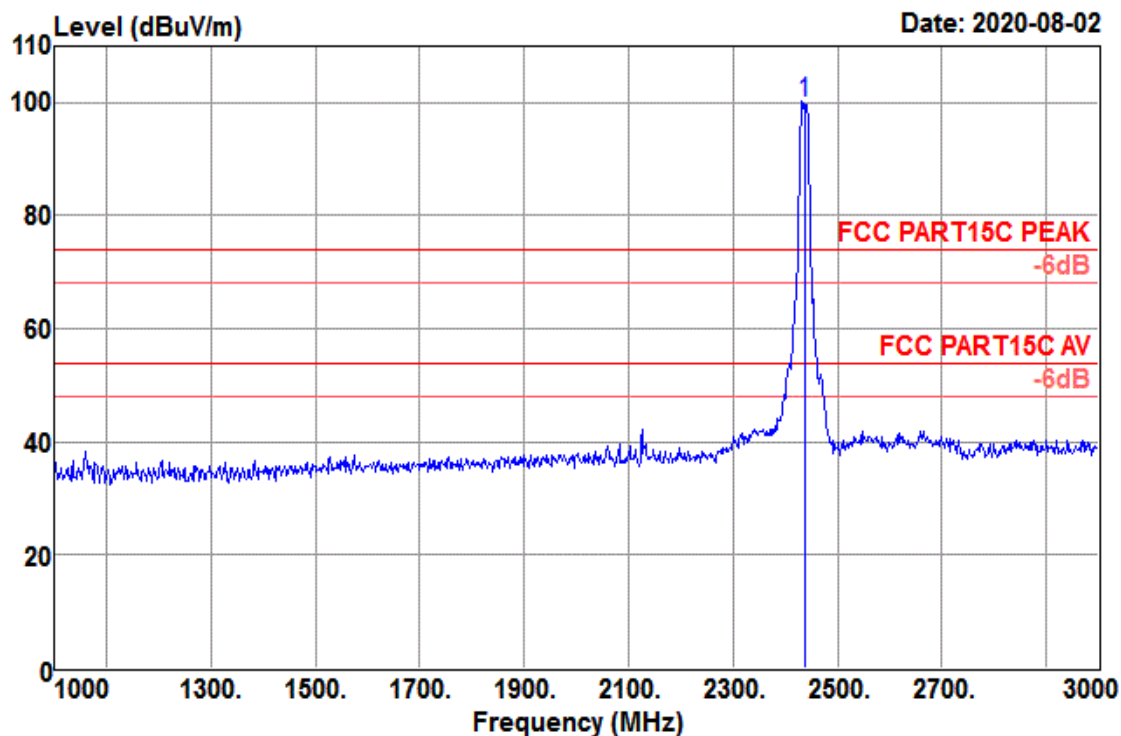


Freq MHz	Reading level dBUV	Antenna factor dB/m	Cable loss dB	Preamplifier factor dB	level dBUV/m	Limit level dBUV/m	Over limit dB	Remark
4824.000	54.50	30.95	6.09	58.24	33.30	54.00	-20.70	Average
4824.000	66.89	30.95	6.09	58.24	45.69	74.00	-28.31	Peak
7236.000	53.84	35.47	9.21	58.53	39.99	54.00	-14.01	Average
7236.000	64.43	35.47	9.21	58.53	50.58	74.00	-23.42	Peak
9648.000	53.27	38.42	12.32	58.03	45.98	54.00	-8.02	Average
9648.000	64.07	38.42	12.32	58.03	56.78	74.00	-17.22	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 :	802.11n HT20 CH06 (2437MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Horizontal

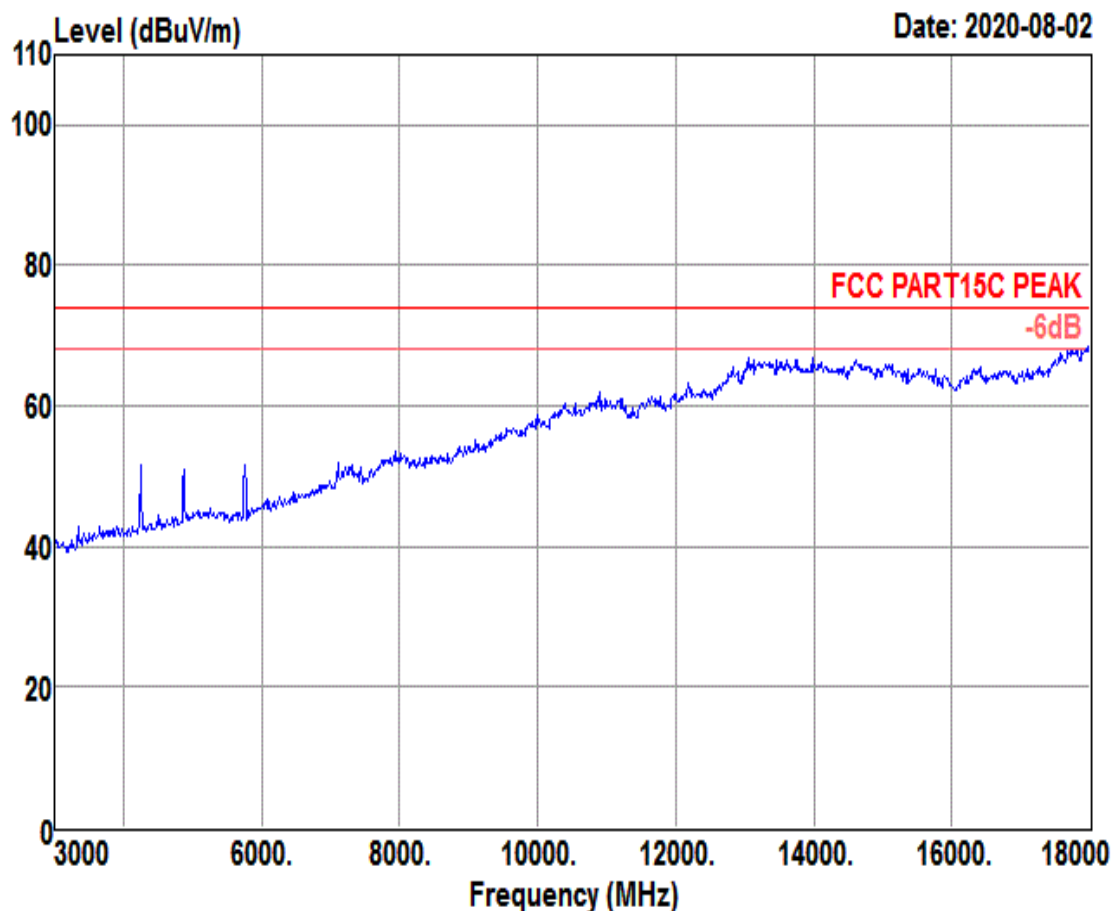
Data: 266



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2437.000	103.89	27.66	4.22	35.90	99.87	74.00	25.87	Peak

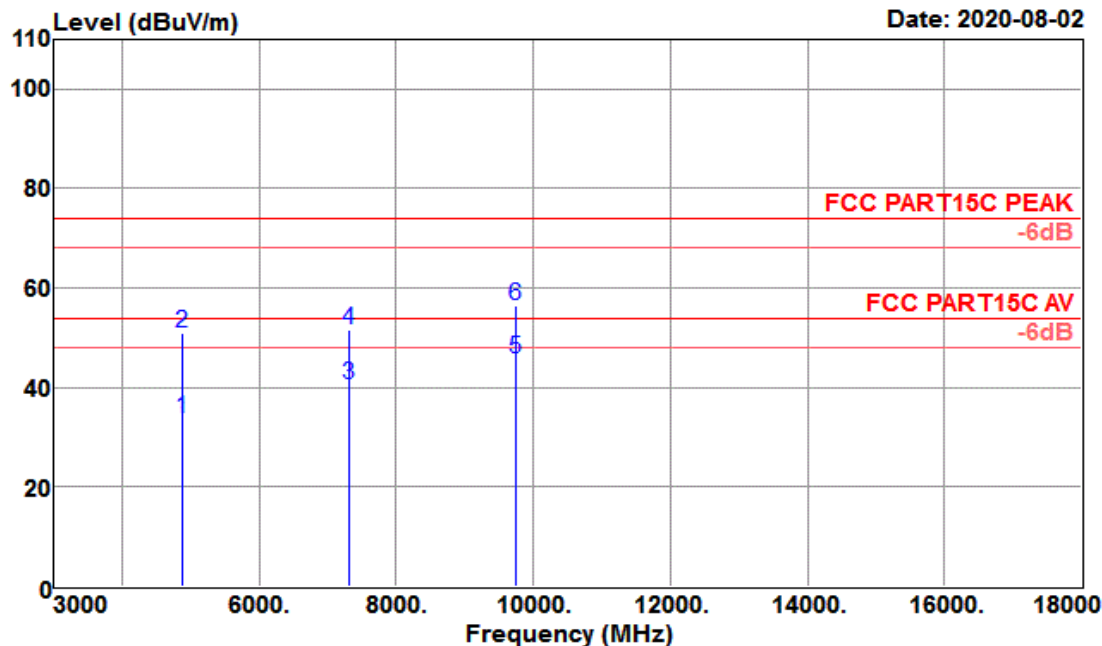
Test Mode :	802.11n HT20 CH06 (2437MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Horizontal

Data: 277



Data: 278

Date: 2020-08-02

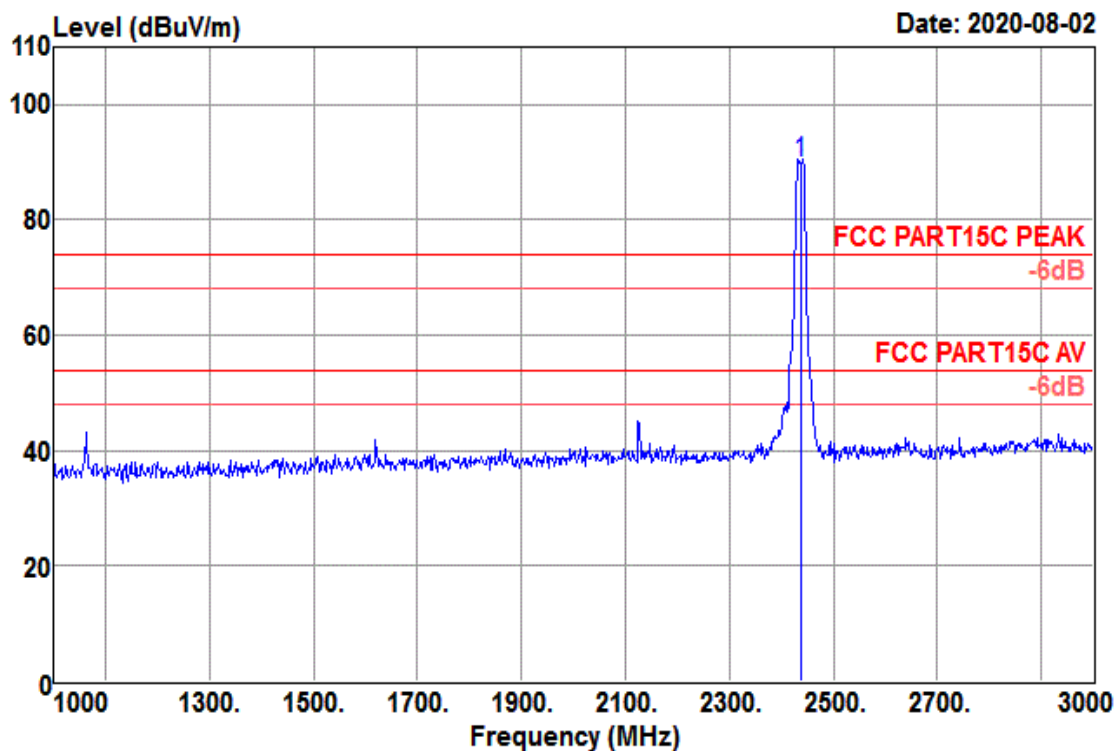


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4874.000	54.90	31.02	6.08	58.17	33.83	54.00	-20.17	Average
4874.000	72.05	31.02	6.08	58.17	50.98	74.00	-23.02	Peak
7311.000	54.13	35.65	9.20	58.56	40.42	54.00	-13.58	Average
7311.000	65.33	35.65	9.20	58.56	51.62	74.00	-22.38	Peak
9748.000	52.73	38.50	12.48	57.96	45.75	54.00	-8.25	Average
9748.000	63.55	38.50	12.48	57.96	56.57	74.00	-17.43	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 :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Vertical

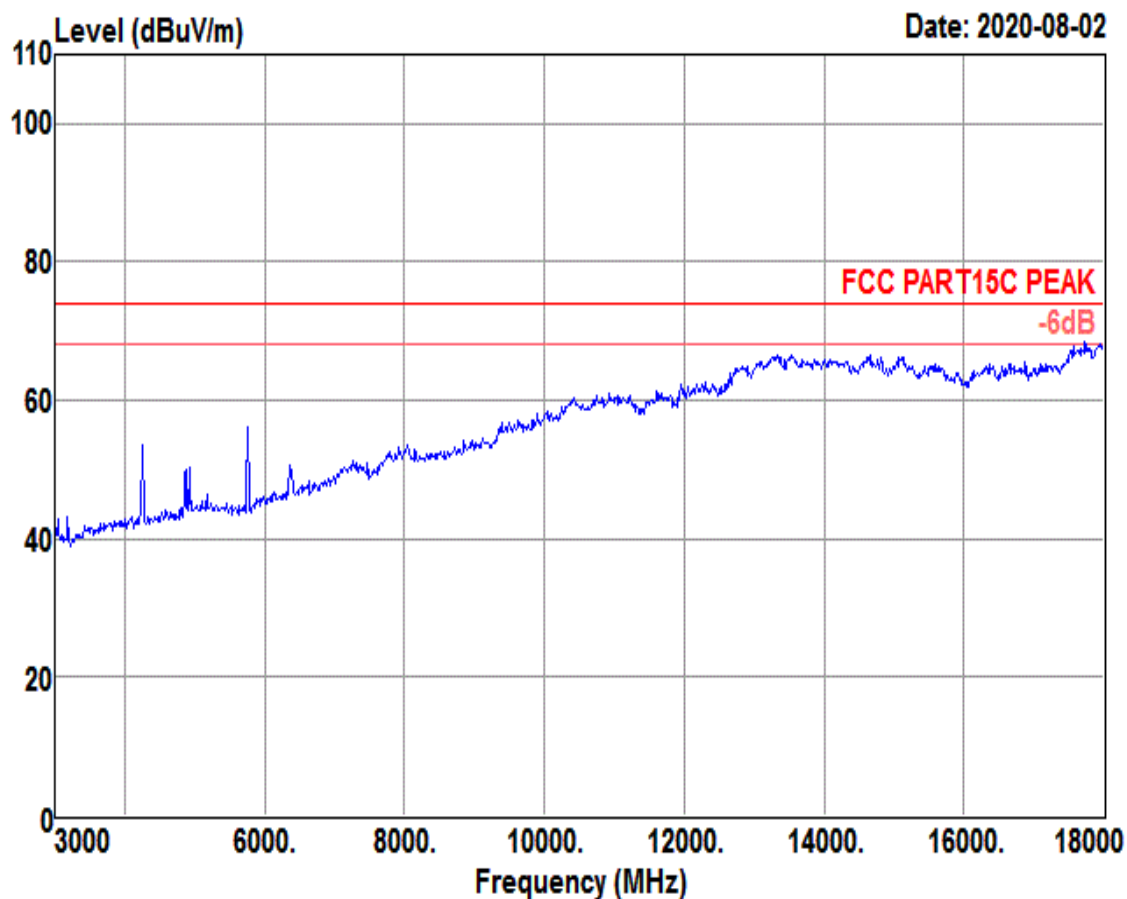
Data: 265



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	94.03	27.66	4.22	35.90	90.01	74.00	16.01	Peak

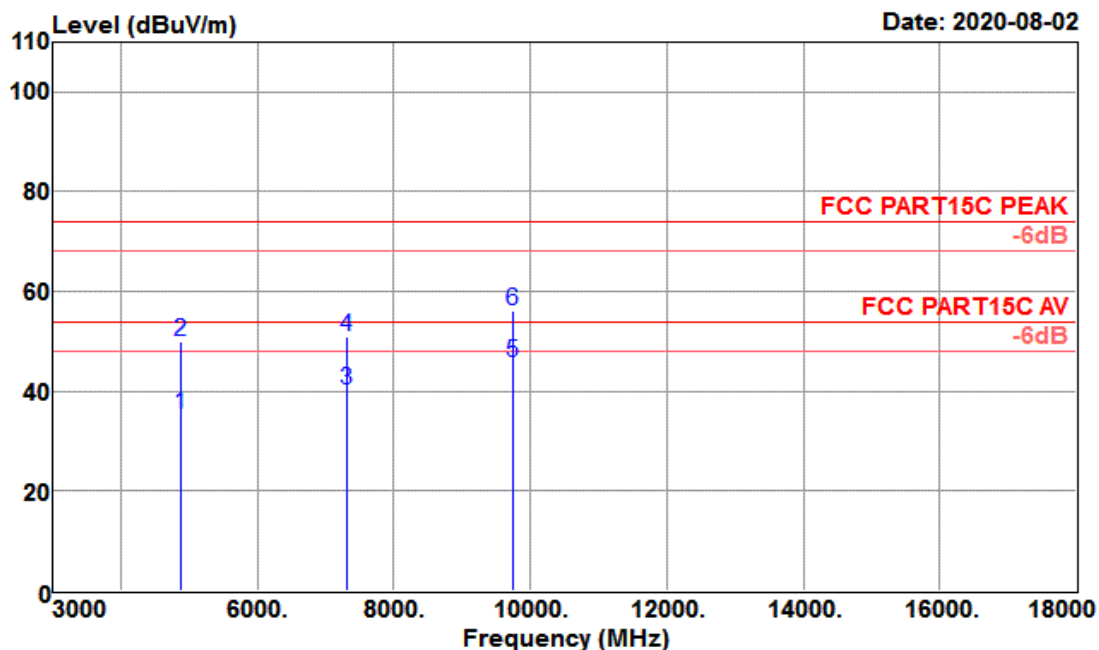
Test Mode :	802.11n HT20 CH06 (2437MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Vertical

Data: 279



Data: 280

Date: 2020-08-02

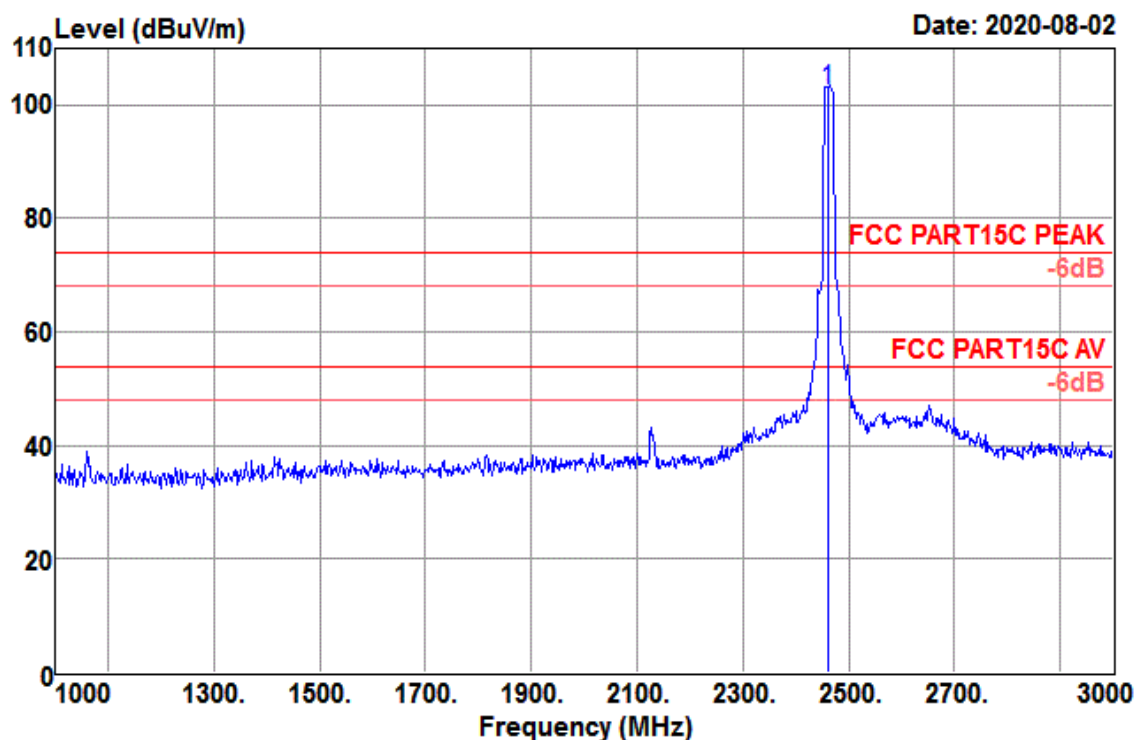


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4874.000	56.42	31.02	6.08	58.17	35.35	54.00	-18.65	Average
4874.000	70.94	31.02	6.08	58.17	49.87	74.00	-24.13	Peak
7311.000	54.03	35.65	9.20	58.56	40.32	54.00	-13.68	Average
7311.000	64.82	35.65	9.20	58.56	51.11	74.00	-22.89	Peak
9748.000	52.68	38.50	12.48	57.96	45.70	54.00	-8.30	Average
9748.000	63.04	38.50	12.48	57.96	56.06	74.00	-17.94	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 CH11 (2462 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Horizontal

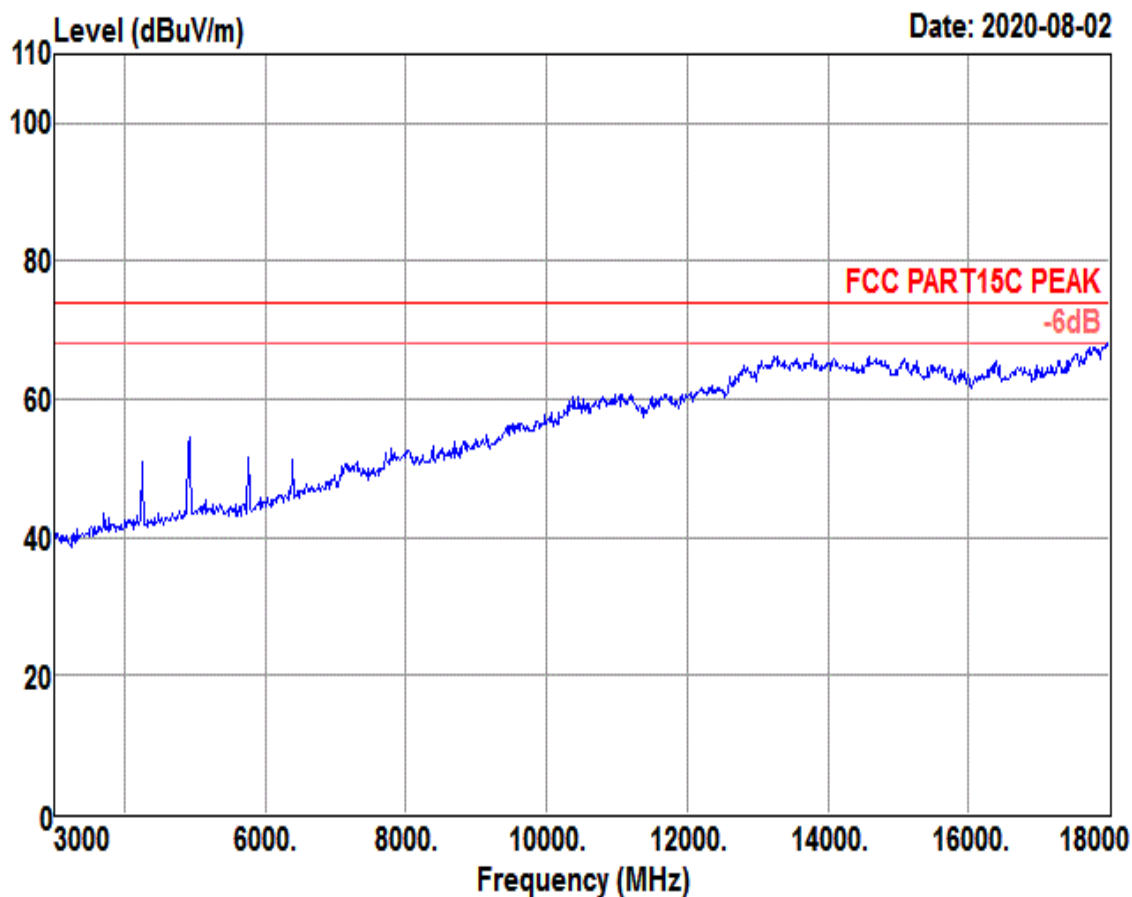
Data: 269



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	106.68	27.72	4.24	35.95	102.69	74.00	28.69	Peak

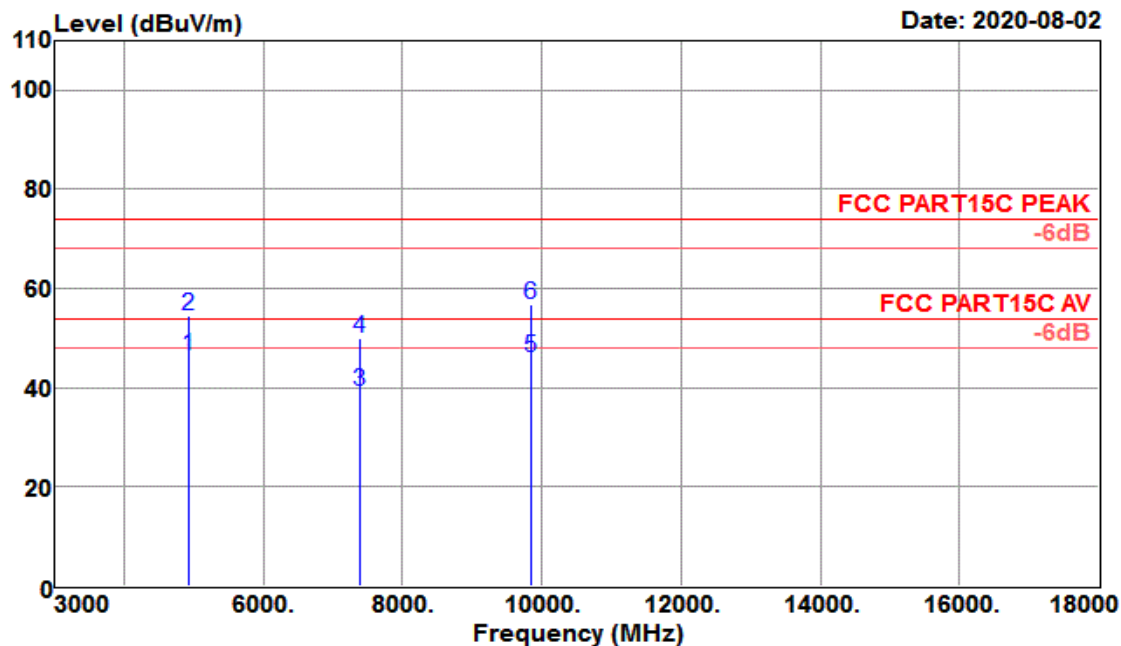
Test Mode :	802.11n HT20 CH11 (2462 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Horizontal

Data: 275



Data: 276

Date: 2020-08-02

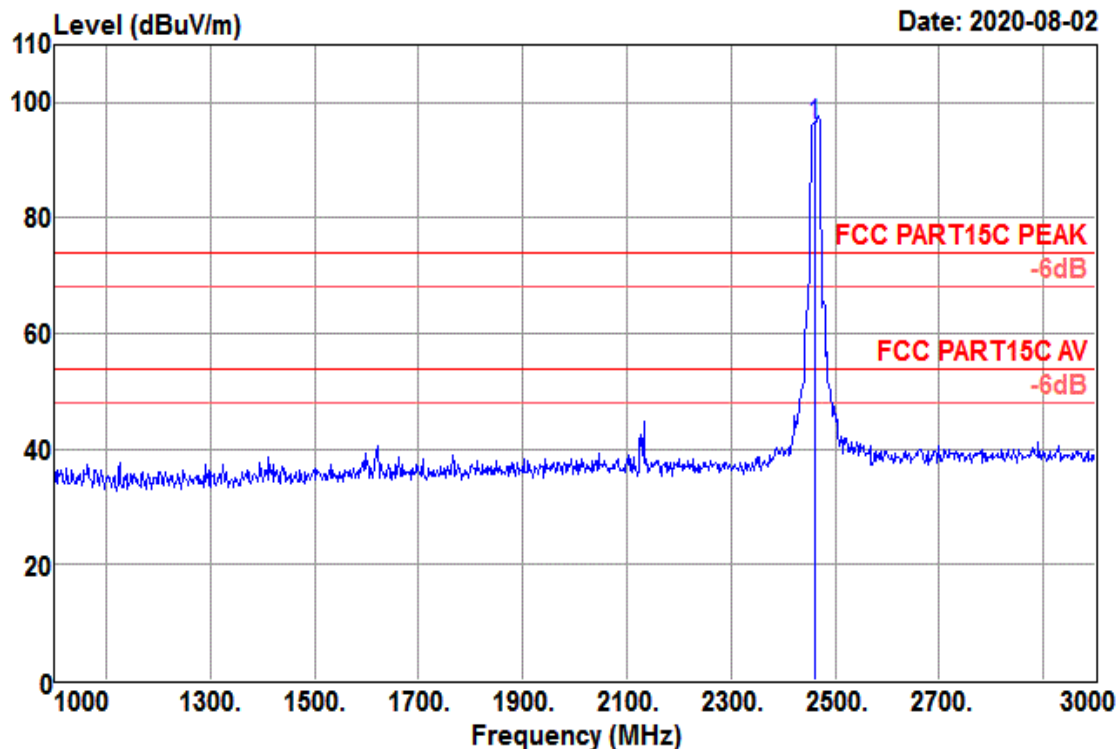


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4924.000	67.42	31.09	6.08	58.11	46.48	54.00	-7.52	Average
4924.000	75.58	31.09	6.08	58.11	54.64	74.00	-19.36	Peak
7386.000	52.95	35.83	9.18	58.59	39.37	54.00	-14.63	Average
7386.000	63.72	35.83	9.18	58.59	50.14	74.00	-23.86	Peak
9848.000	52.51	38.58	12.83	57.89	46.03	54.00	-7.97	Average
9848.000	63.24	38.58	12.83	57.89	56.76	74.00	-17.24	Peak

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

Test Mode :	802.11n HT20 CH11 (2462 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Vertical

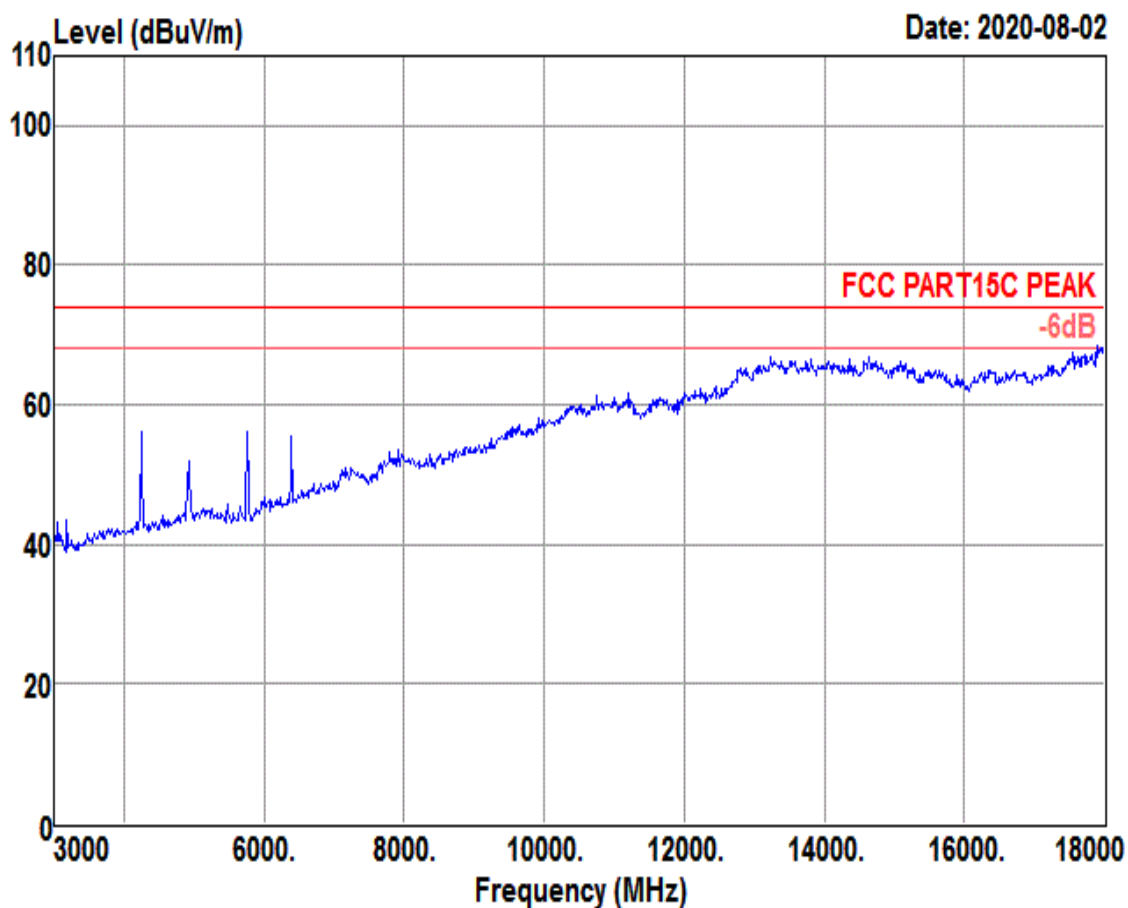
Data: 272



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	100.17	27.72	4.24	35.95	96.18	74.00	22.18	Peak

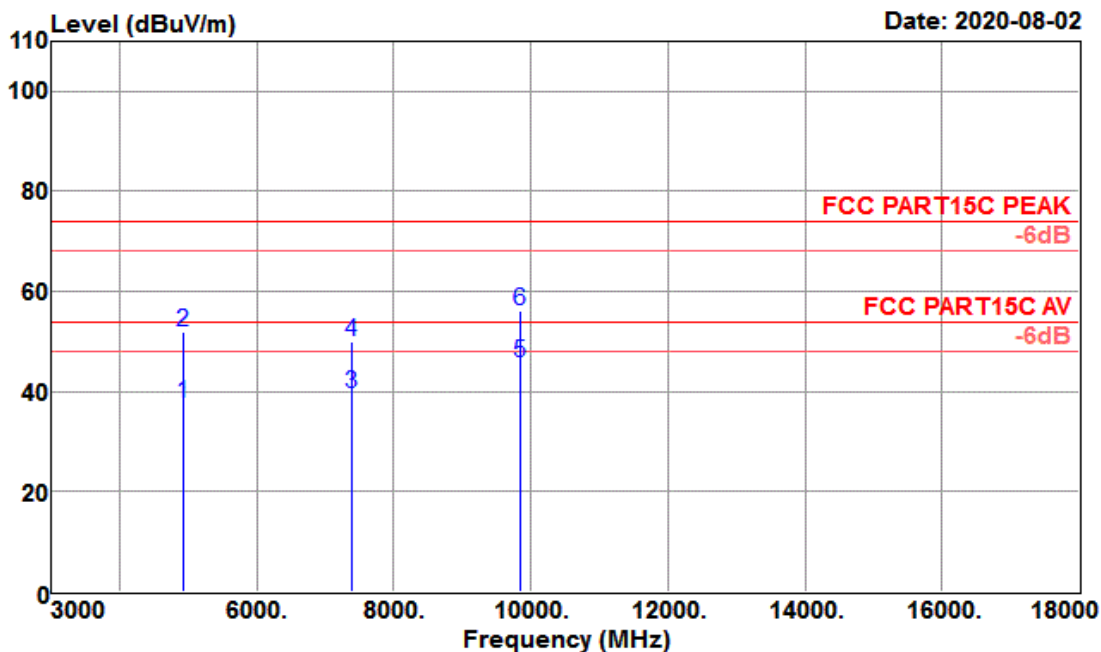
Test Mode :	802.11n HT20 CH11 (2462 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	3GHz~18GHz	Polarization :	Vertical

Data: 273



Data: 274

Date: 2020-08-02



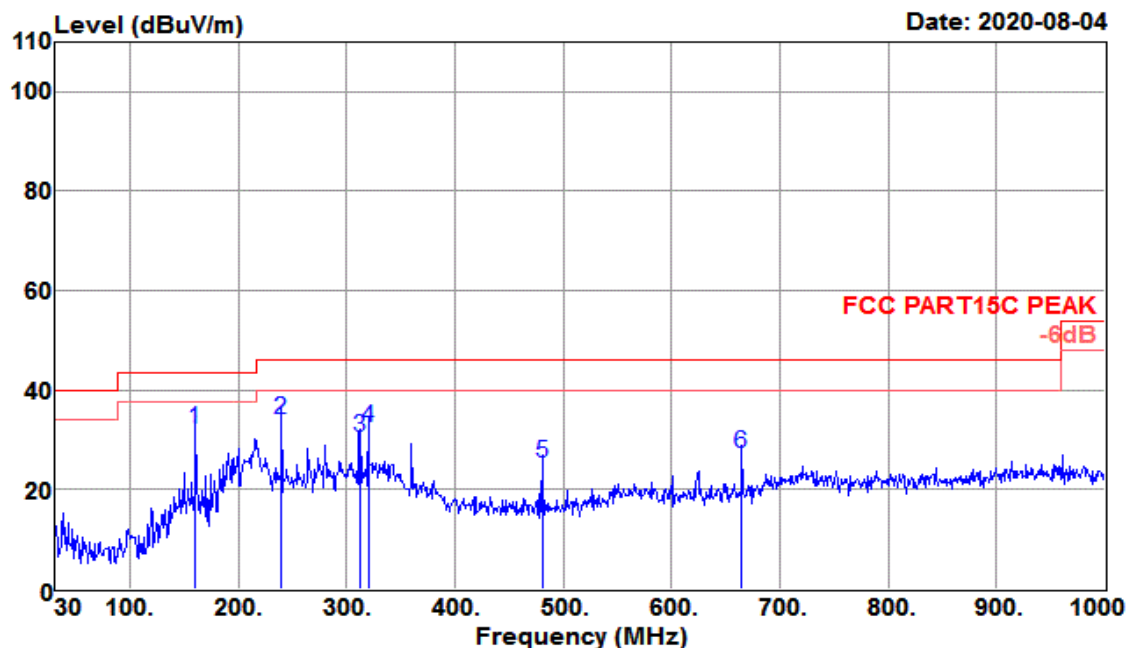
Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamplifier factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4924.000	58.48	31.09	6.08	58.11	37.54	54.00	-16.46	Average
4924.000	72.88	31.09	6.08	58.11	51.94	74.00	-22.06	Peak
7386.000	53.03	35.83	9.18	58.59	39.45	54.00	-14.55	Average
7386.000	63.52	35.83	9.18	58.59	49.94	74.00	-24.06	Peak
9848.000	52.32	38.58	12.83	57.89	45.84	54.00	-8.16	Average
9848.000	62.47	38.58	12.83	57.89	55.99	74.00	-18.01	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.

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

Test Mode :	802.11b CH01 (2412 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	30MHz~1GHz	Polarization :	Horizontal

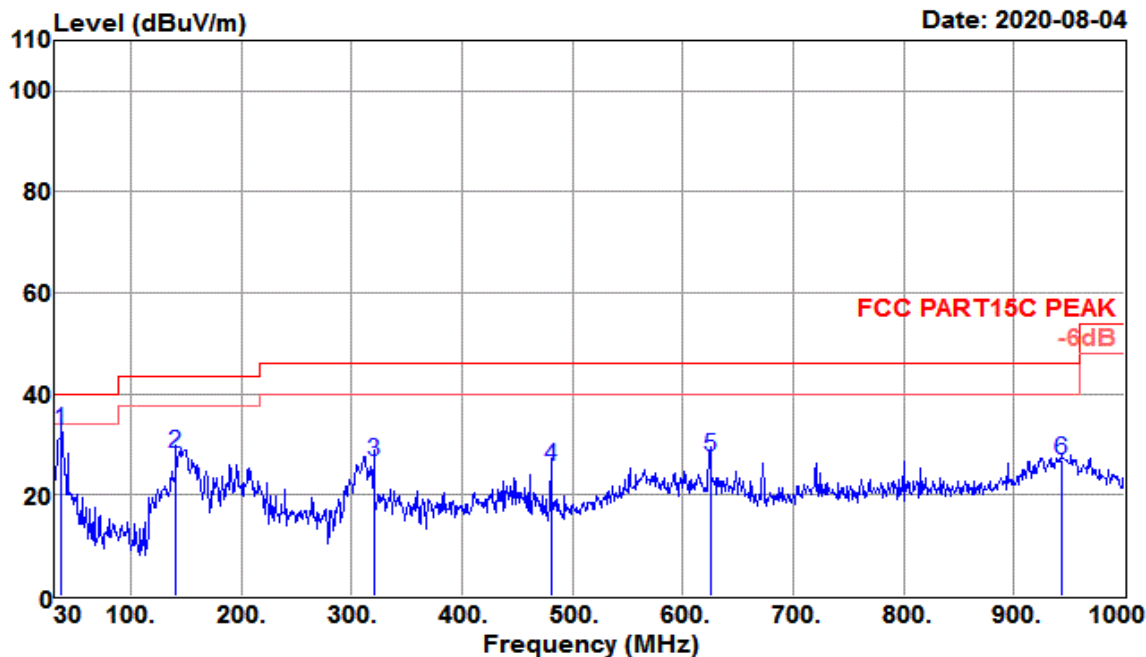
Data: 223



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
159.980	48.28	13.80	2.45	32.48	32.05	43.50	-11.45	QP
239.520	50.85	12.58	3.02	32.48	33.97	46.00	-12.03	QP
312.270	45.26	14.35	3.47	32.50	30.58	46.00	-15.42	QP
320.030	46.92	14.44	3.51	32.50	32.37	46.00	-13.63	QP
480.080	35.81	17.66	4.33	32.61	25.19	46.00	-20.81	QP
664.380	34.11	20.84	5.14	32.66	27.43	46.00	-18.57	QP

Test Mode :	802.11b CH01 (2412 MHz)	Temperature :	23~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	30MHz~1GHz	Polarization :	Vertical

Data: 224



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
36.790	51.80	12.28	1.18	32.46	32.80	40.00	-7.20	QP
140.580	44.27	14.03	2.29	32.48	28.11	43.50	-15.39	QP
320.030	41.23	14.44	3.51	32.50	26.68	46.00	-19.32	QP
480.080	36.13	17.66	4.33	32.61	25.51	46.00	-20.49	QP
624.610	34.86	20.34	4.97	32.68	27.49	46.00	-18.51	QP
943.740	28.50	24.29	6.14	32.14	26.79	46.00	-19.21	QP

4.6 AC Conducted Emission Measurement

4.6.1 Limit of AC Conducted Emission

FCC §15.207

IC RSS-GEN 8.8

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

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

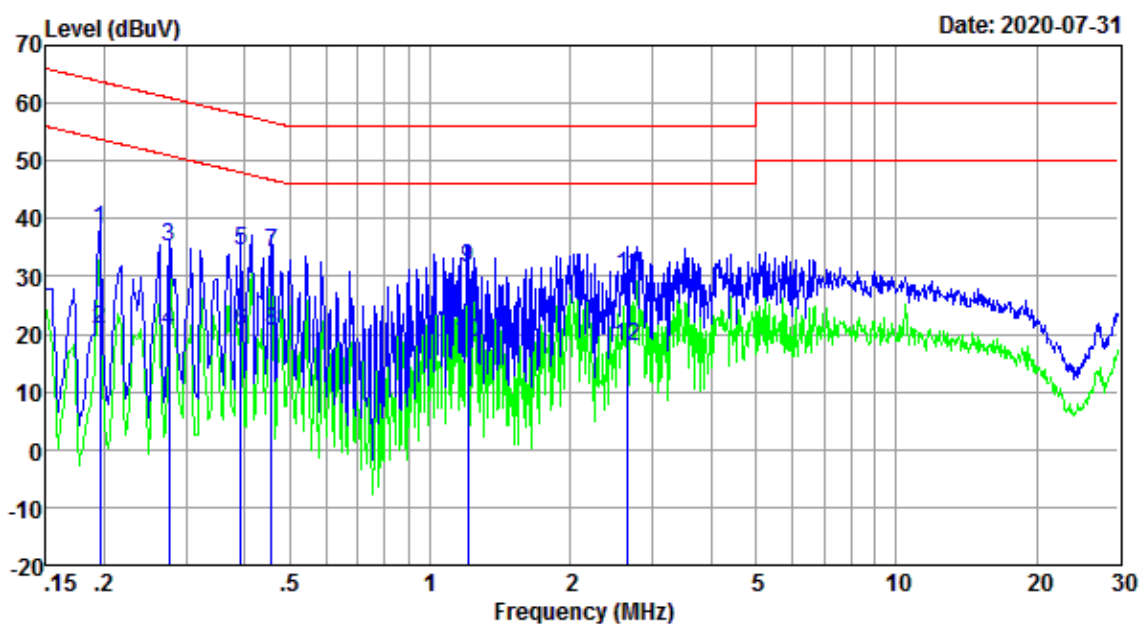
*Decreases with the logarithm of the frequency.

4.6.2 Test Procedures

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

4.6.3 Test Result of AC Conducted Emission

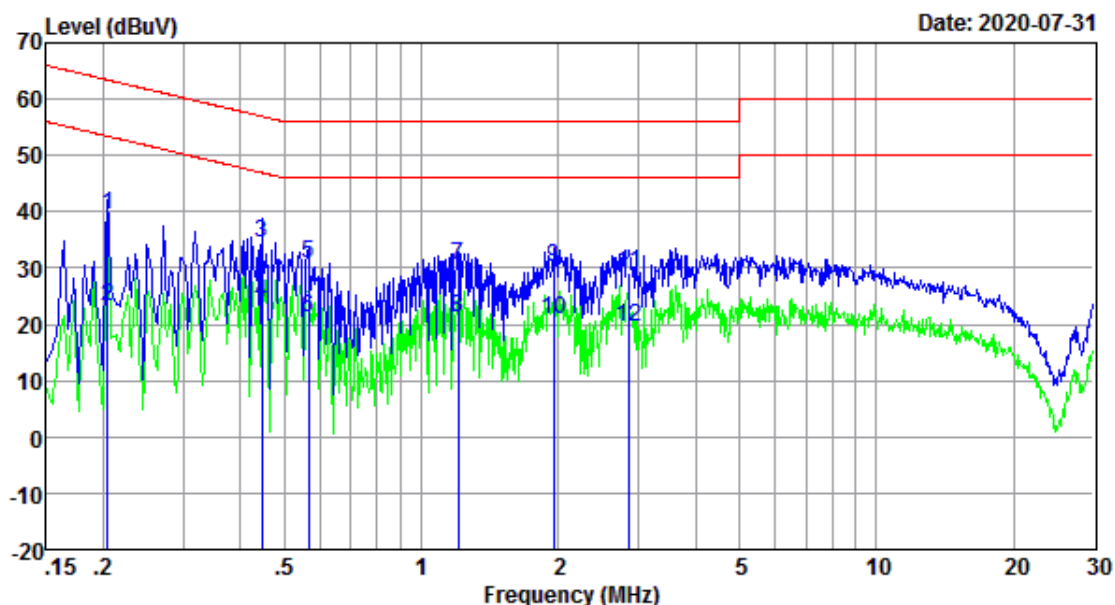
Test Mode :	Mode 1	Temperature :	20°C
Test Engineer :	Jack Liu	Relative Humidity :	64%
Test Voltage :	125Vac / 60Hz	Phase :	Line
Function Type :	WLAN Linking + Switching On		



Freq MHz	Reading level dBuV	LISN/ISN factor dB	Cable loss dB	Result level dBuV	Limit level dBuV	Over limit dB	Remark
0.195	28.40	9.55	0.03	37.98	63.80	-25.82	QP
0.195	11.30	9.55	0.03	20.88	53.80	-32.92	Average
0.276	25.60	9.55	0.03	35.18	60.94	-25.76	QP
0.276	10.80	9.55	0.03	20.38	50.94	-30.56	Average
0.393	24.90	9.56	0.02	34.48	57.99	-23.51	QP
0.393	10.90	9.56	0.02	20.48	47.99	-27.51	Average
0.456	24.50	9.56	0.02	34.08	56.76	-22.68	QP
0.456	10.90	9.56	0.02	20.48	46.76	-26.28	Average
1.203	21.80	9.57	0.01	31.38	56.00	-24.62	QP
1.203	8.80	9.57	0.01	18.38	46.00	-27.62	Average
2.650	20.50	9.59	0.03	30.12	56.00	-25.88	QP
2.650	8.10	9.59	0.03	17.72	46.00	-28.28	Average

Result Level= Reading Level + LISN Factor + Cable Loss

Test Mode :	Mode 1	Temperature :	20°C
Test Engineer :	Jack Liu	Relative Humidity :	64%
Test Voltage :	125Vac / 60Hz	Phase :	NEUTRAL
Function Type :	WLAN Linking + Switching On		



Freq MHz	Reading level dBuV	LISN/ISN factor dB	Cable loss dB	Result level dBuV	Limit level dBuV	Over limit dB	Remark
0.204	29.90	9.56	0.03	39.49	63.45	-23.96	QP
0.204	13.60	9.56	0.03	23.19	53.45	-30.26	Average
0.447	24.71	9.58	0.02	34.31	56.93	-22.62	QP
0.447	14.11	9.58	0.02	23.71	46.93	-23.22	Average
0.564	21.10	9.59	0.02	30.71	56.00	-25.29	QP
0.564	11.50	9.59	0.02	21.11	46.00	-24.89	Average
1.203	20.80	9.60	0.01	30.41	56.00	-25.59	QP
1.203	11.60	9.60	0.01	21.21	46.00	-24.79	Average
1.949	20.40	9.61	0.02	30.03	56.00	-25.97	QP
1.949	11.20	9.61	0.02	20.83	46.00	-25.17	Average
2.869	19.60	9.64	0.03	29.27	56.00	-26.73	QP
2.869	9.80	9.64	0.03	19.47	46.00	-26.53	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 PCB 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	2020-01-15	2021-01-14	Conducted
Power Sensor	Keysight	U2021XA	MY56510025	2020-01-16	2021-01-15	Conducted
Power Sensor	Keysight	U2021XA	MY57030005	2020-01-16	2021-01-15	Conducted
Power Sensor	Keysight	U2021XA	MY56510018	2020-01-16	2021-01-15	Conducted
Power Sensor	Keysight	U2021XA	MY56480002	2020-01-16	2021-01-15	Conducted
Thermal Chamber	Sanmtest	SMC-408-CD	2435	2020-05-09	2021-05-08	Conducted
Base Station	R&S	CMW 270	101231	2020-01-16	2021-01-15	Conducted
Signal Generator (Interferer)	Keysight	N5182B	MY56200384	2020-02-21	2021-02-20	Conducted
Signal Generator (Blocker)	Keysight	N5171B	MY56200661	2020-01-15	2021-01-14	Conducted

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV 40	101433	2020-01-16	2021-01-15	Radiation
Amplifier	Sonoma	310	363917	2020-01-15	2021-01-14	Radiation
Amplifier	Schwarzbeck	BBV 9718	327	2020-01-15	2021-01-14	Radiation
Amplifier	Narda	TTA1840-35-HG	2034380	2020-05-14	2021-05-15	Radiation
Loop Antenna	Schwarzbeck	FMZB 1519B	1519B-051	2020-02-14	2023-02-13	Radiation
Broadband Antenna	Schwarzbeck	VULB 9168	9168-757	2018-08-31	2021-08-30	Radiation
Horn Antenna	Schwarzbeck	BBHA 9120 D	1677	2020-02-14	2023-02-13	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	2020-01-08	2021-01-07	Conducted
LISN	R&S	ENV432	101327	2020-01-08	2021-01-07	Conducted
EMI Test Receiver	R&S	ESR3	102143	2020-01-16	2021-01-15	Conducted
EMI Test Software	Audix	E3	N/A	N/A	N/A	Conducted

N/A: No Calibration Required

6 Uncertainty of Evaluation

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

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.42dB
Radiated emission	30MHz ~ 1GMHz	2.50dB
	1GHz ~ 18GHz	3.51dB
	18GHz ~ 40GHz	3.96dB

MEASUREMENT	UNCERTAINTY
Occupied Channel Bandwidth	$\pm 196.4\text{Hz}$
RF output power, conducted	$\pm 2.31\text{dB}$
Power density, conducted	$\pm 2.31\text{dB}$

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

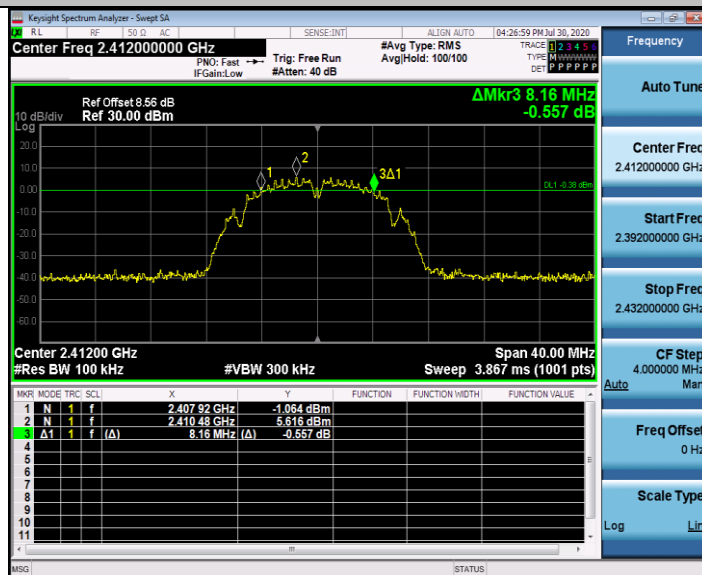
Appendix A: DTS Bandwidth

Test Result

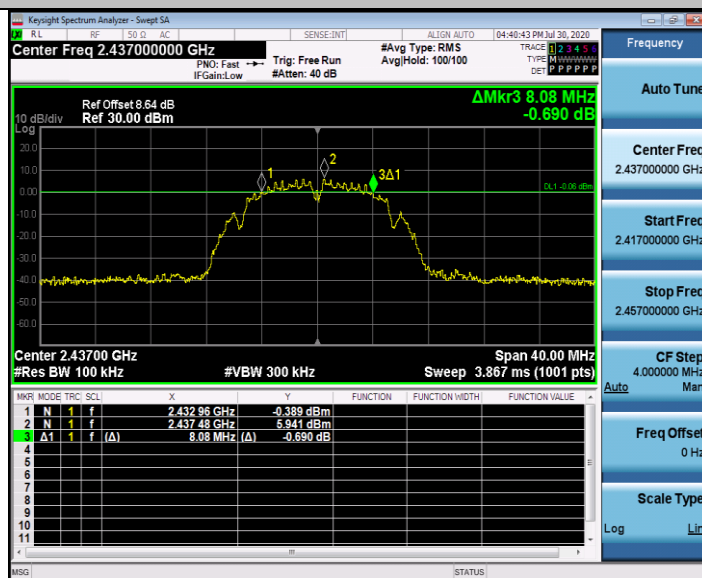
TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	8.160	2407.920	2416.080	≥ 0.5	PASS
		2437	8.080	2432.960	2441.040	≥ 0.5	PASS
		2462	8.160	2457.920	2466.080	≥ 0.5	PASS
11G	Ant1	2412	15.080	2404.440	2419.520	≥ 0.5	PASS
		2437	15.200	2429.360	2444.560	≥ 0.5	PASS
		2462	15.080	2454.480	2469.560	≥ 0.5	PASS
11N20SISO	Ant1	2412	15.200	2404.400	2419.600	≥ 0.5	PASS
		2437	15.120	2429.480	2444.600	≥ 0.5	PASS
		2462	15.200	2454.360	2469.560	≥ 0.5	PASS

Test Graphs

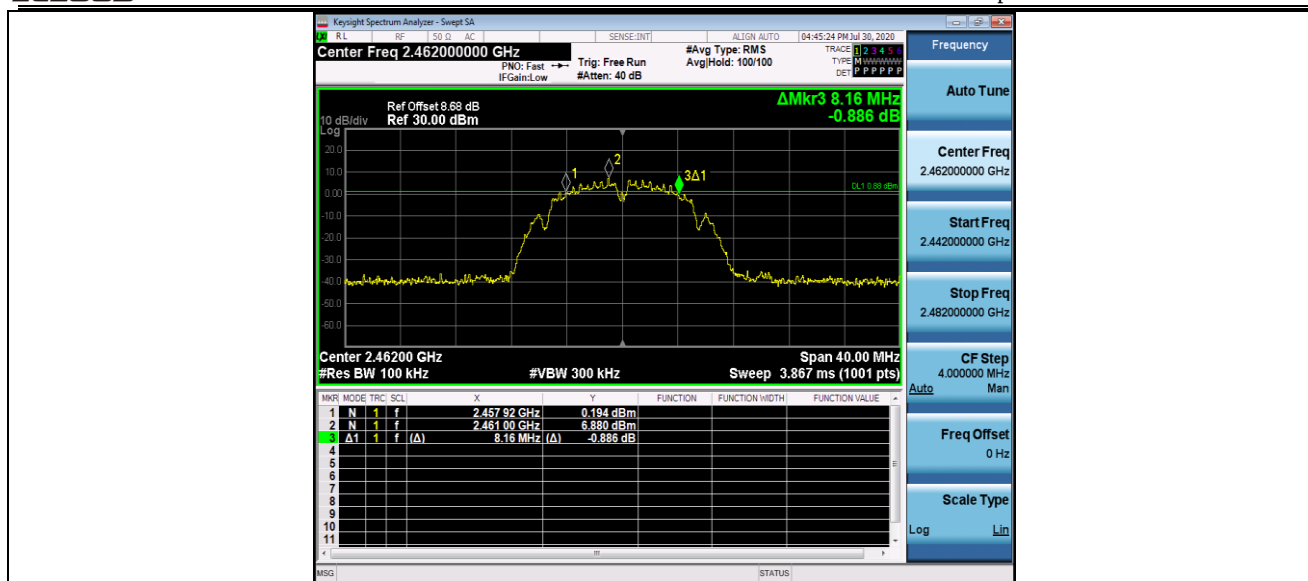
11B_Ant1_2412



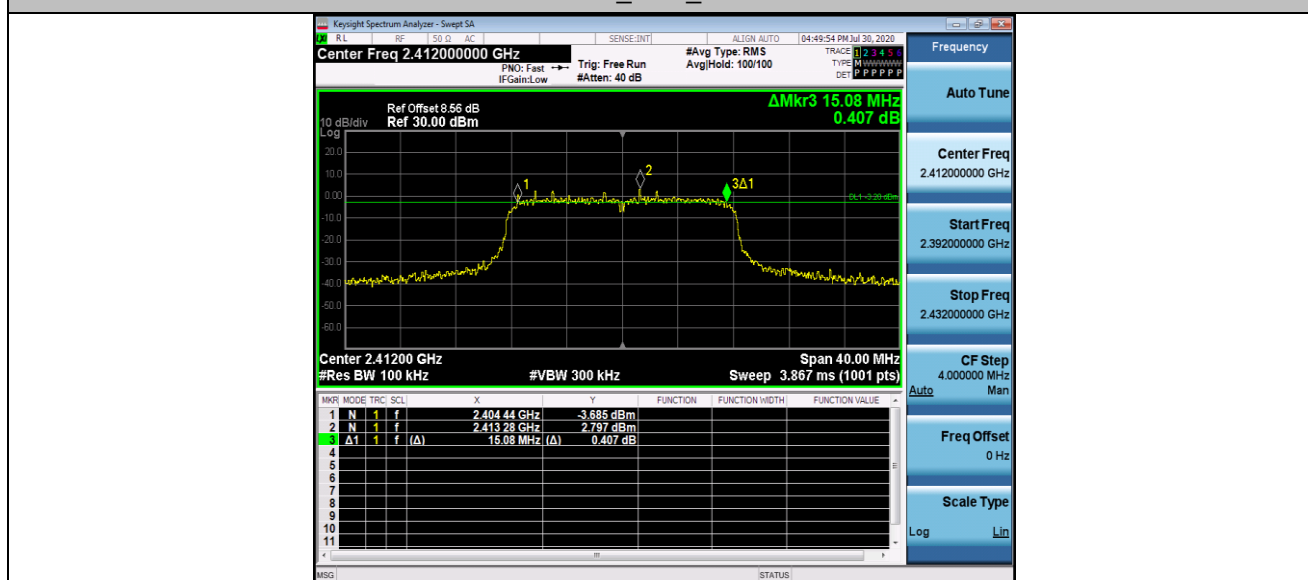
11B_Ant1_2437



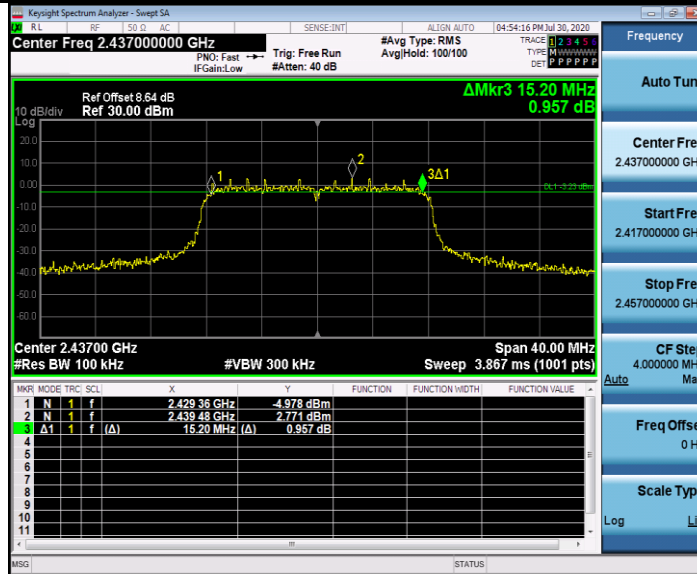
11B_Ant1_2462



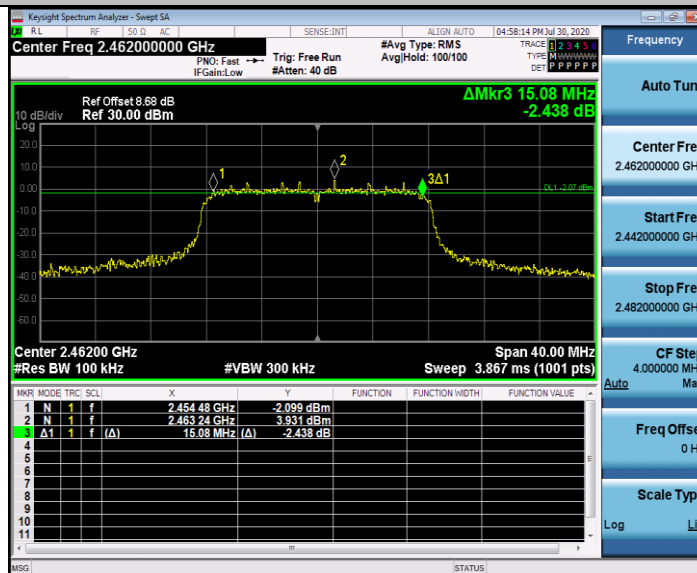
11G_Ant1_2412



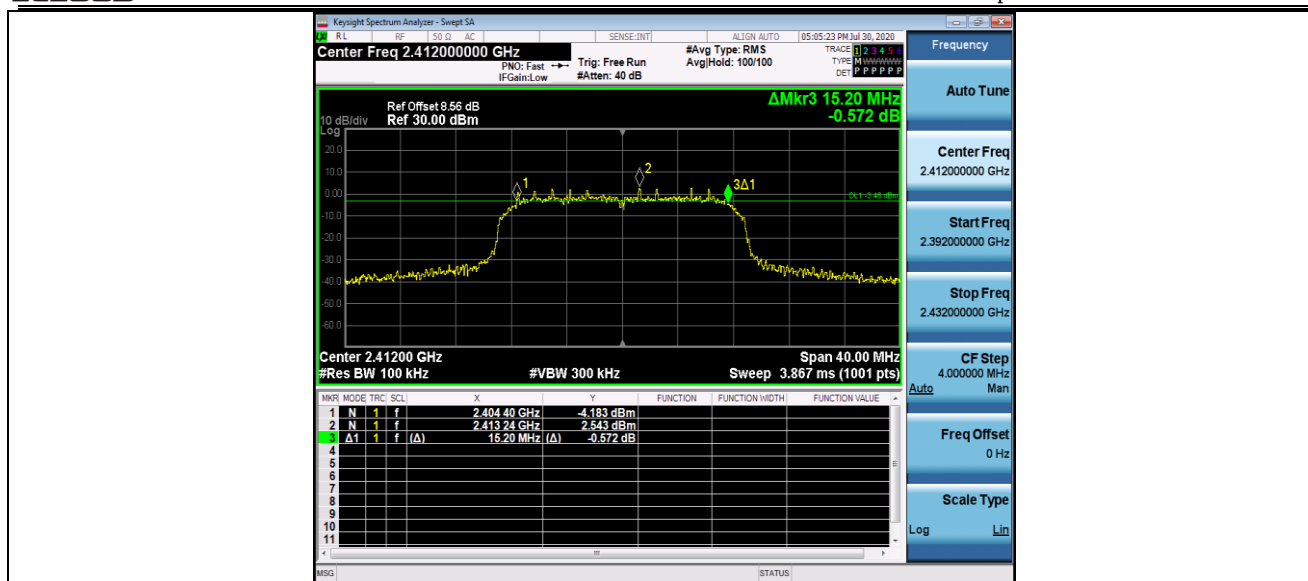
11G_Ant1_2437



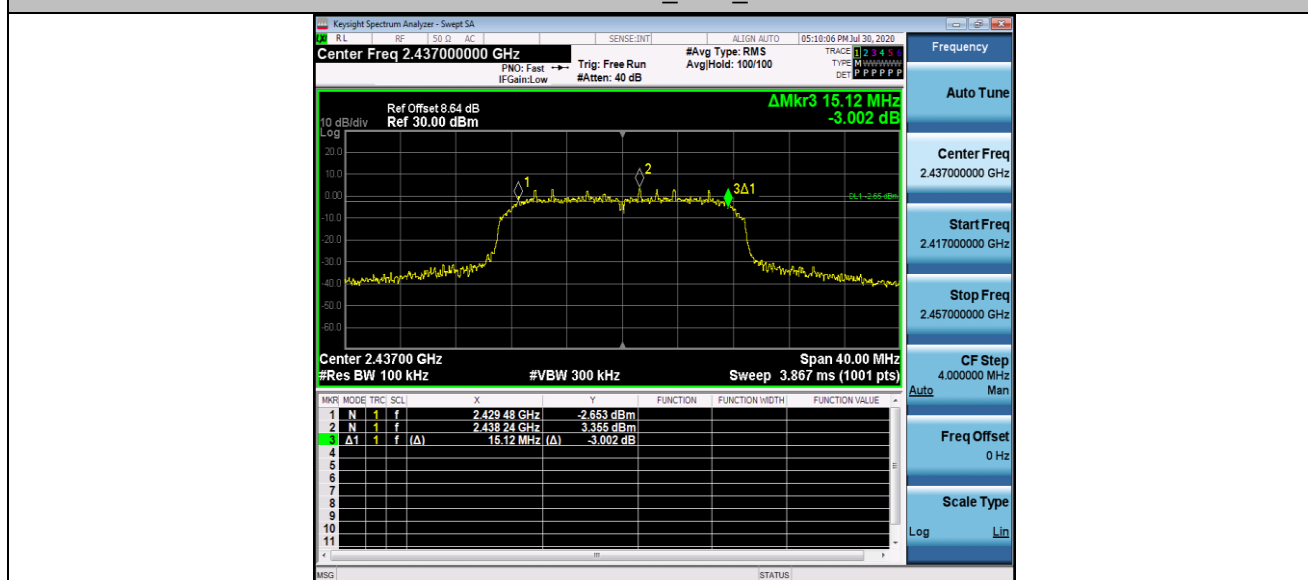
11G_Ant1_2462



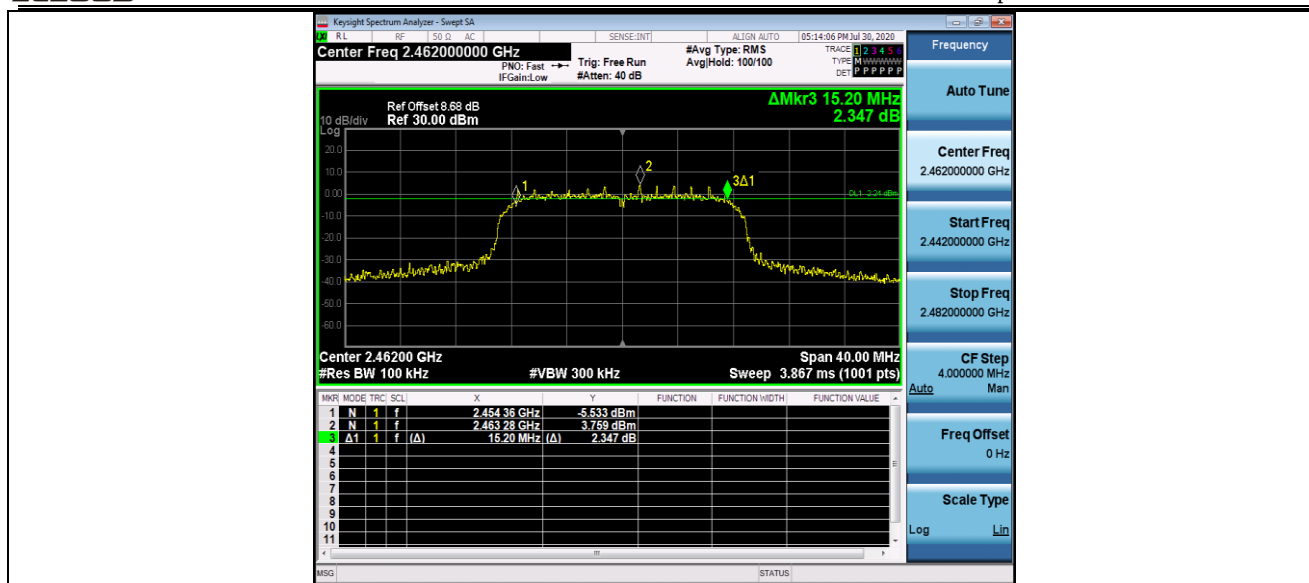
11N20SISO_Ant1_2412



11N20SISO_Ant1_2437



11N20SISO_Ant1_2462



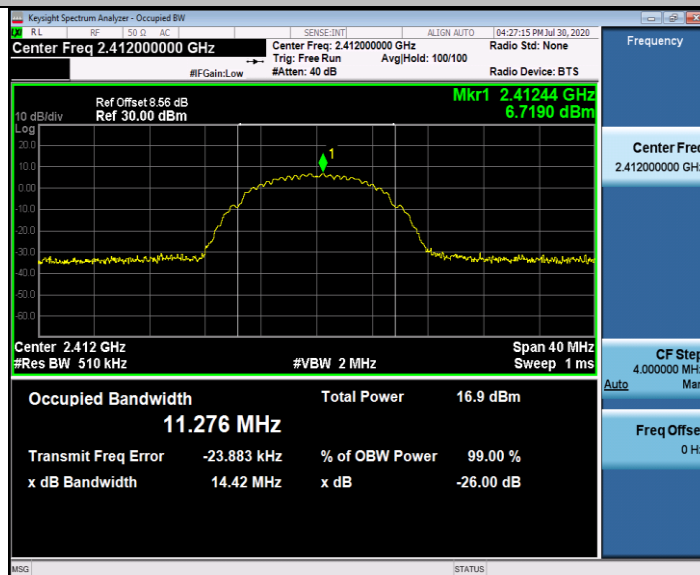
Appendix B: Occupied Channel Bandwidth

Test Result

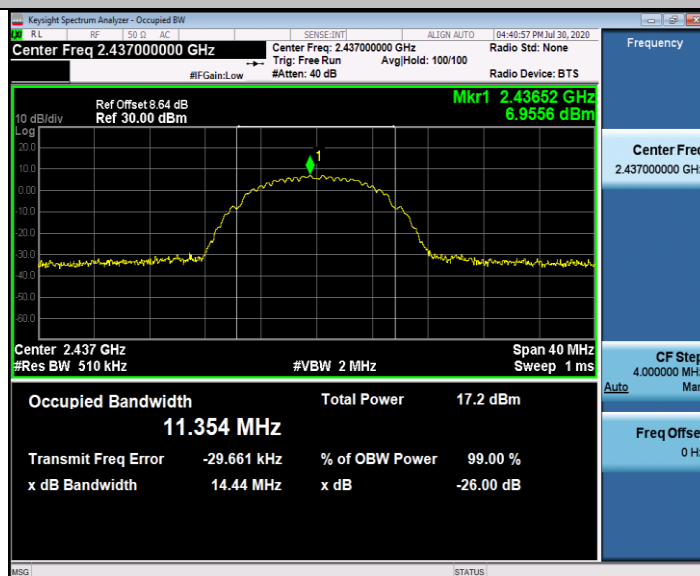
TestMode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	11.276	2406.338	2417.614	---	PASS
		2437	11.354	2431.293	2442.647	---	PASS
		2462	11.325	2456.314	2467.639	---	PASS
11G	Ant1	2412	16.237	2403.846	2420.083	---	PASS
		2437	16.232	2428.860	2445.092	---	PASS
		2462	16.224	2453.859	2470.083	---	PASS
11N20SISO	Ant1	2412	16.877	2403.534	2420.411	---	PASS
		2437	16.911	2428.520	2445.431	---	PASS
		2462	16.904	2453.517	2470.421	---	PASS

Test Graphs

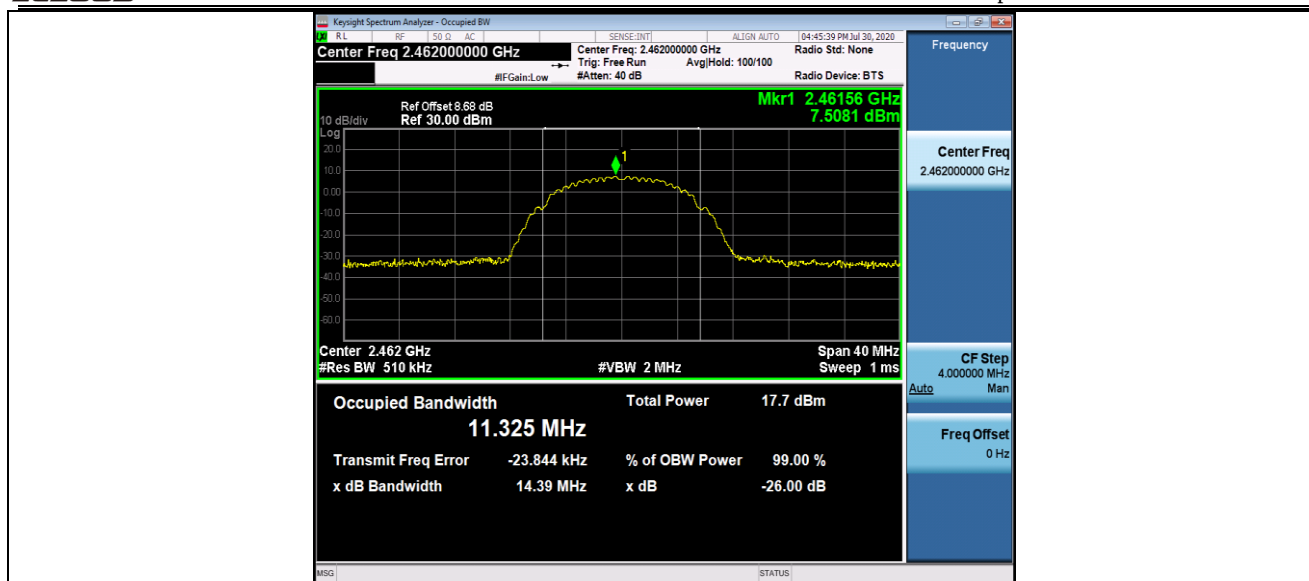
11B_Ant1_2412



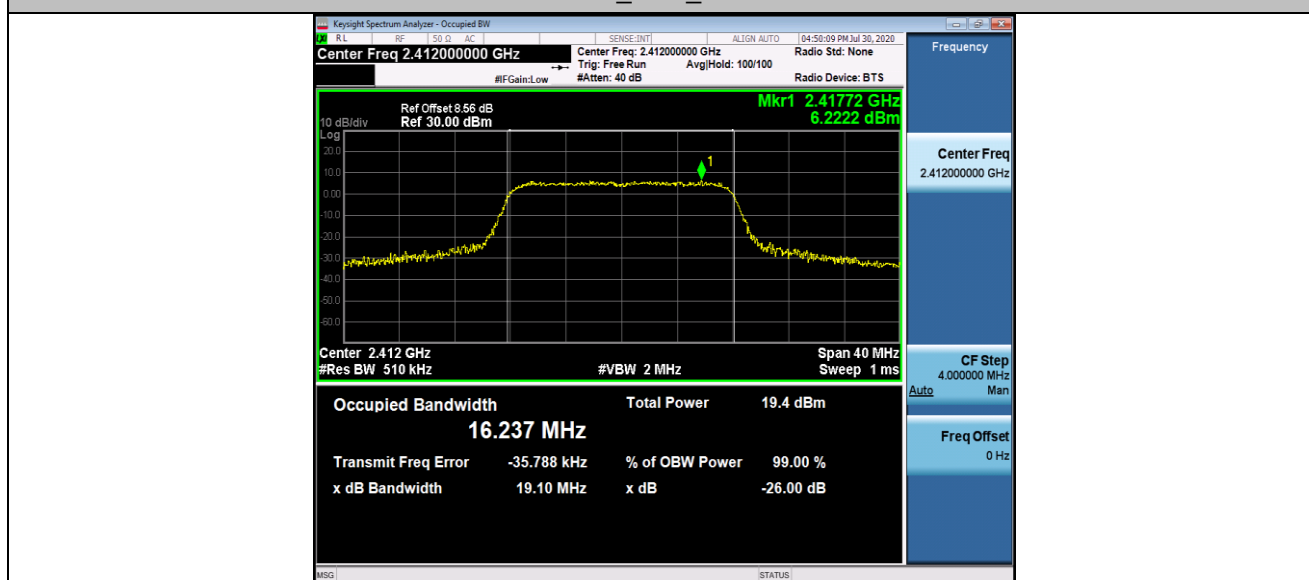
11B_Ant1_2437



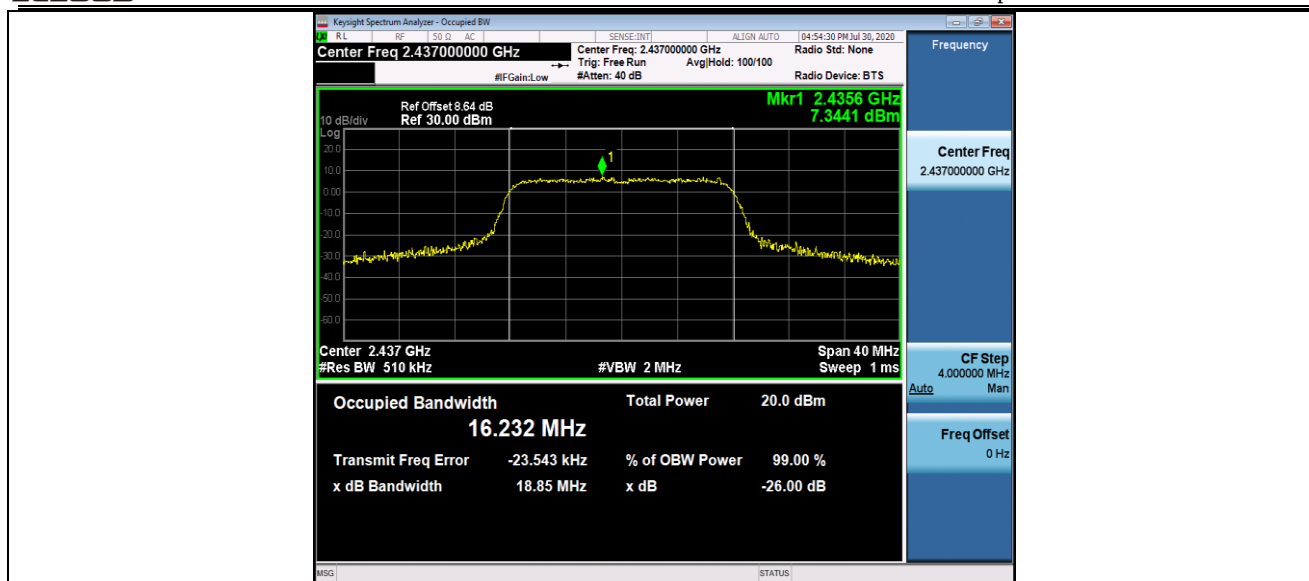
11B_Ant1_2462



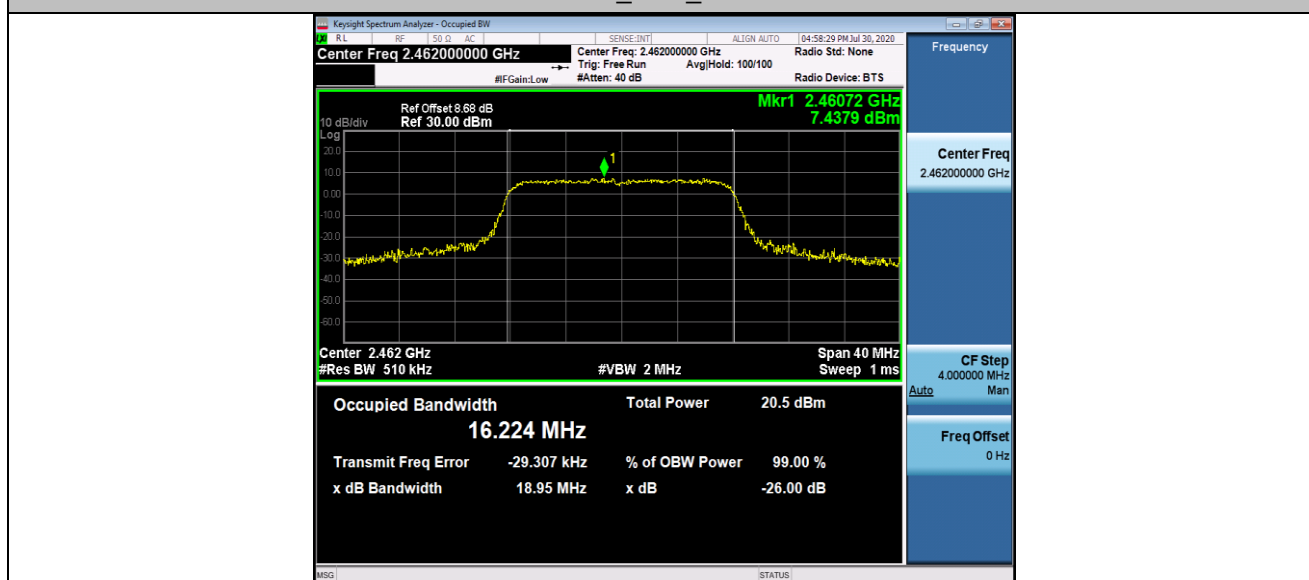
11G_Ant1_2412



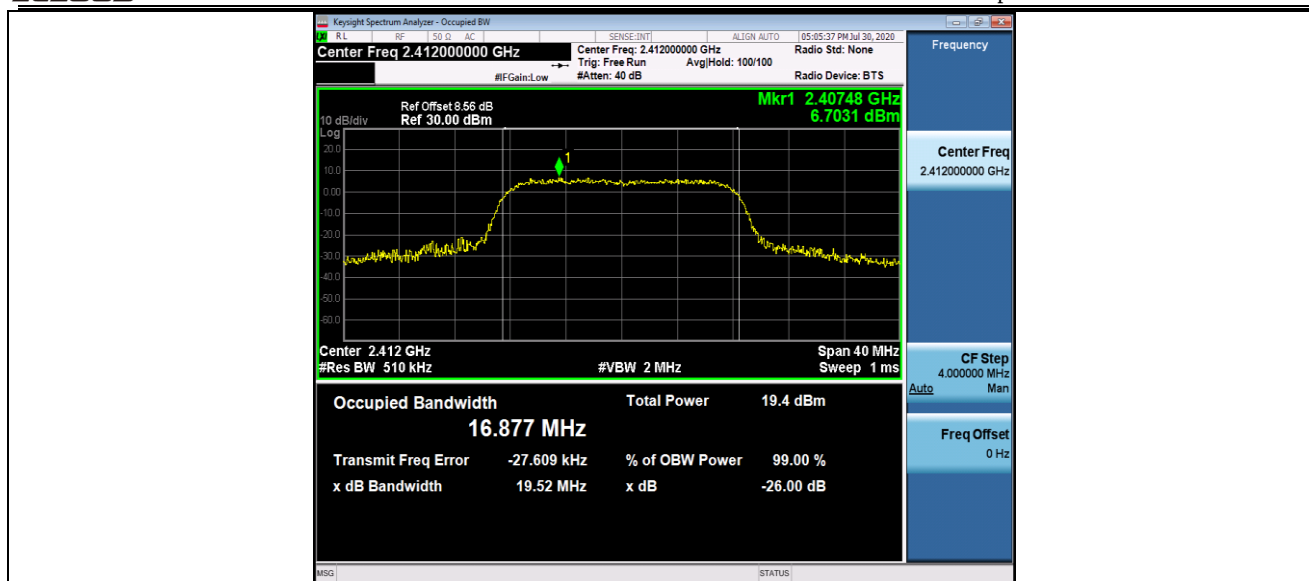
11G_Ant1_2437



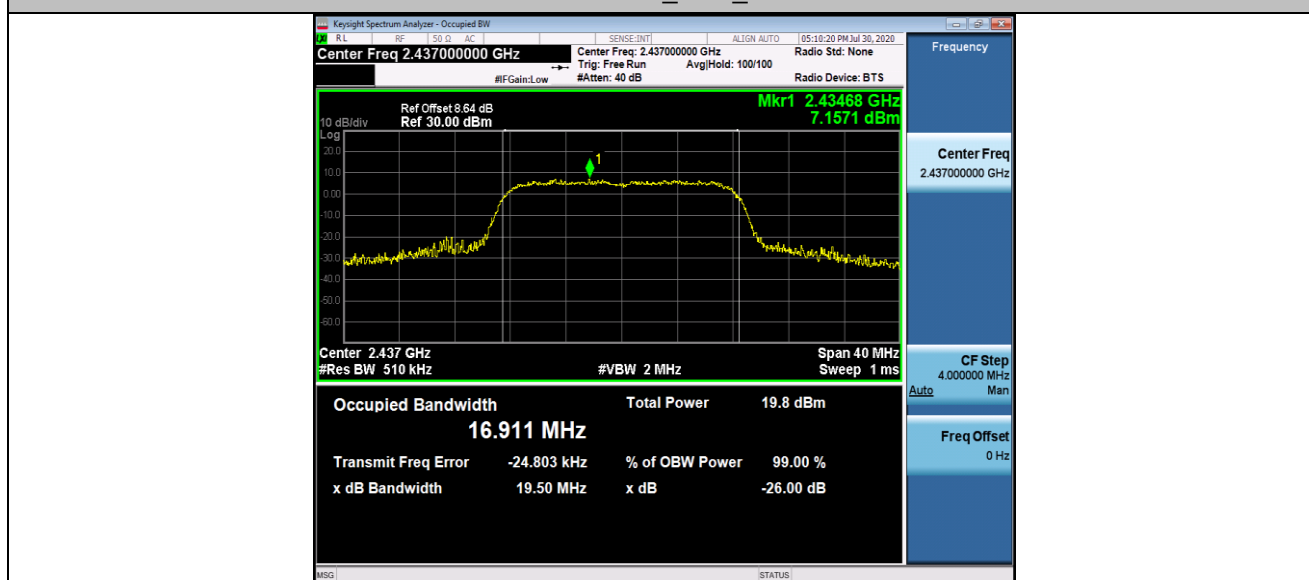
11G_Ant1_2462



11N20SISO_Ant1_2412



11N20SISO_Ant1_2437



11N20SISO_Ant1_2462



Appendix C: Maximum conducted output power

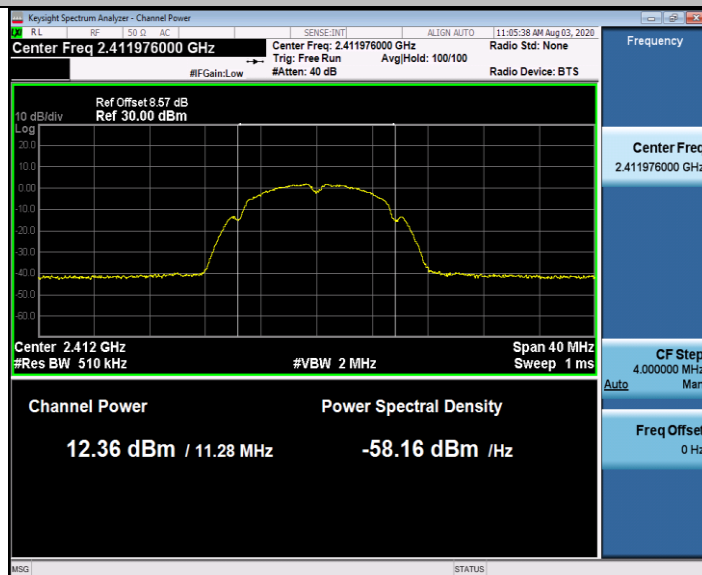
Test Result

TestMode	Antenna	Channel	DT (%)	10 log (1/x)	Result [dBm]	EIRP [dBm]	Limit[dBm]	Verdict
11B	Ant1	2412	88.82	0.51	12.36	15.36	<=30	PASS
		2437	88.86	0.51	12.78	15.78	<=30	PASS
		2462	88.82	0.51	13.34	16.34	<=30	PASS
11G	Ant1	2412	87.32	0.59	13.47	16.47	<=30	PASS
		2437	87.34	0.59	13.94	16.94	<=30	PASS
		2462	86.62	0.62	14.45	17.45	<=30	PASS
11N20SISO	Ant1	2412	86.00	0.66	13.32	16.32	<=30	PASS
		2437	86.14	0.65	13.73	16.73	<=30	PASS
		2462	86.00	0.66	14.37	17.37	<=30	PASS

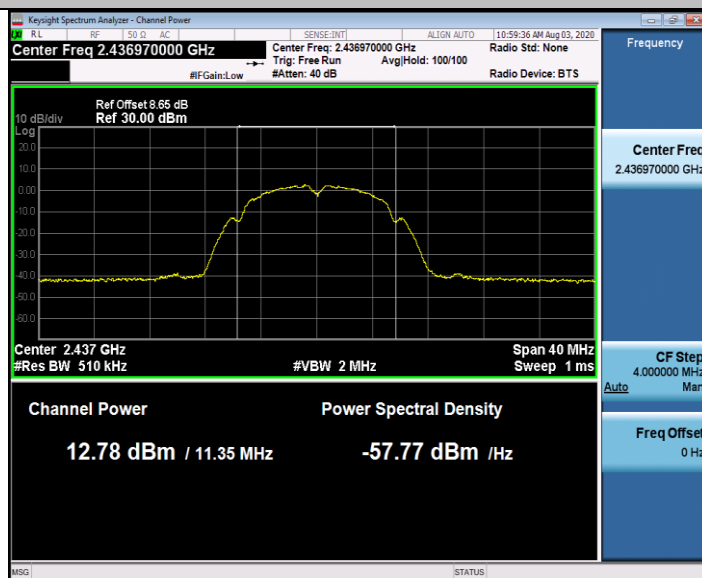
Note: The duty cycle factor has been compensated to the “offset “of the spectrum analyser.

Test Graphs

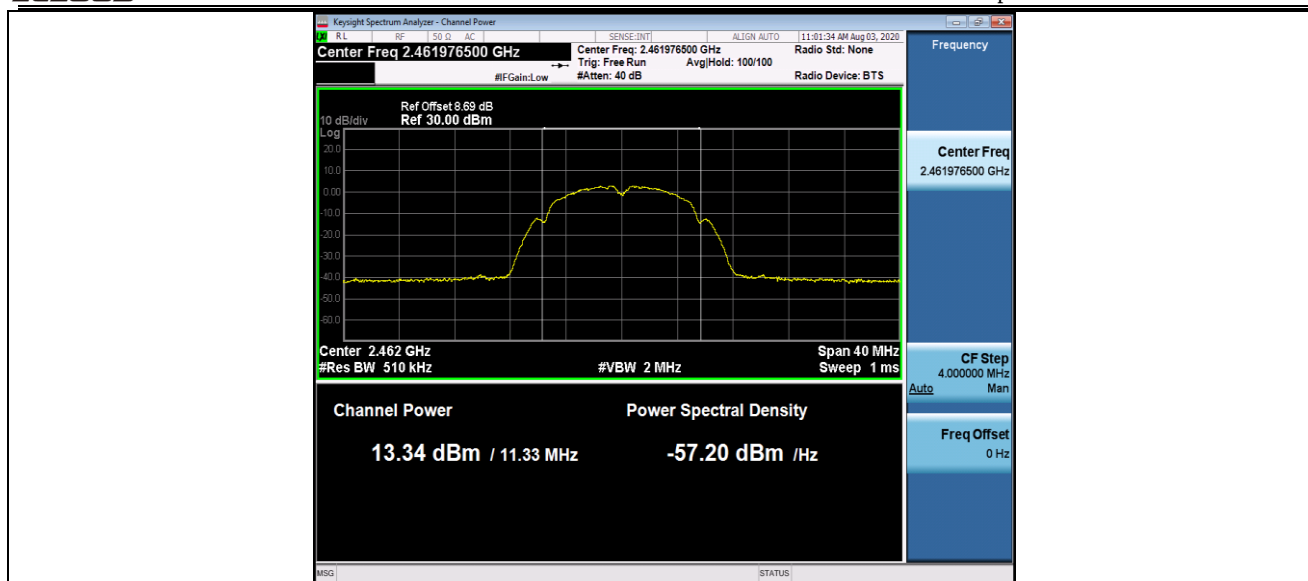
11B_Ant1_2412



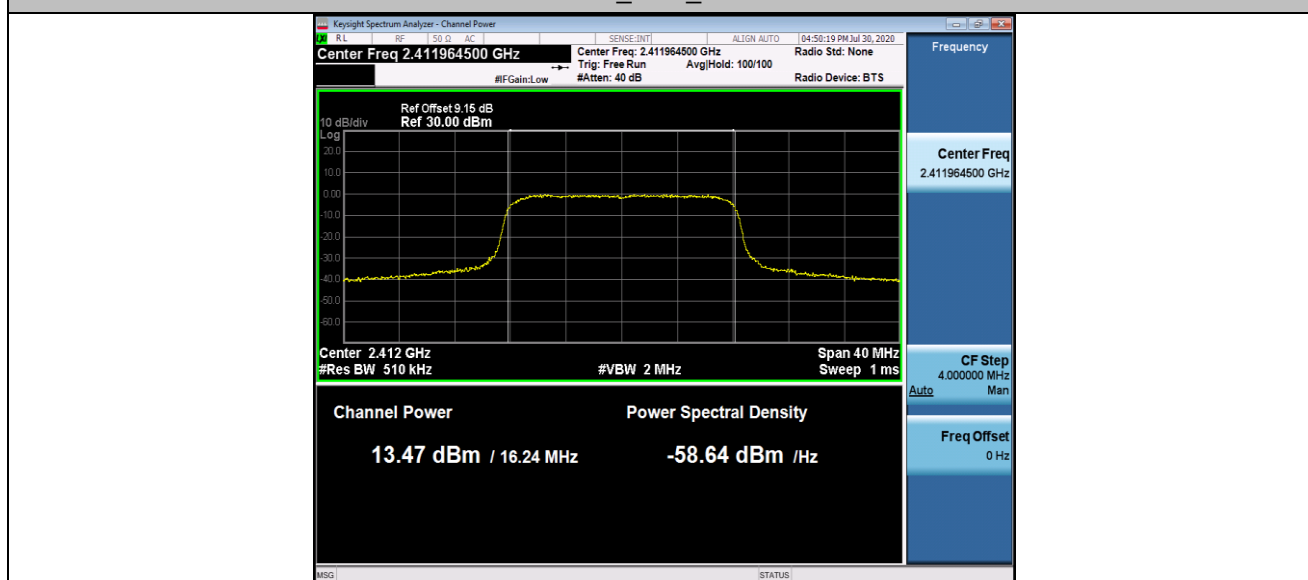
11B_Ant1_2437



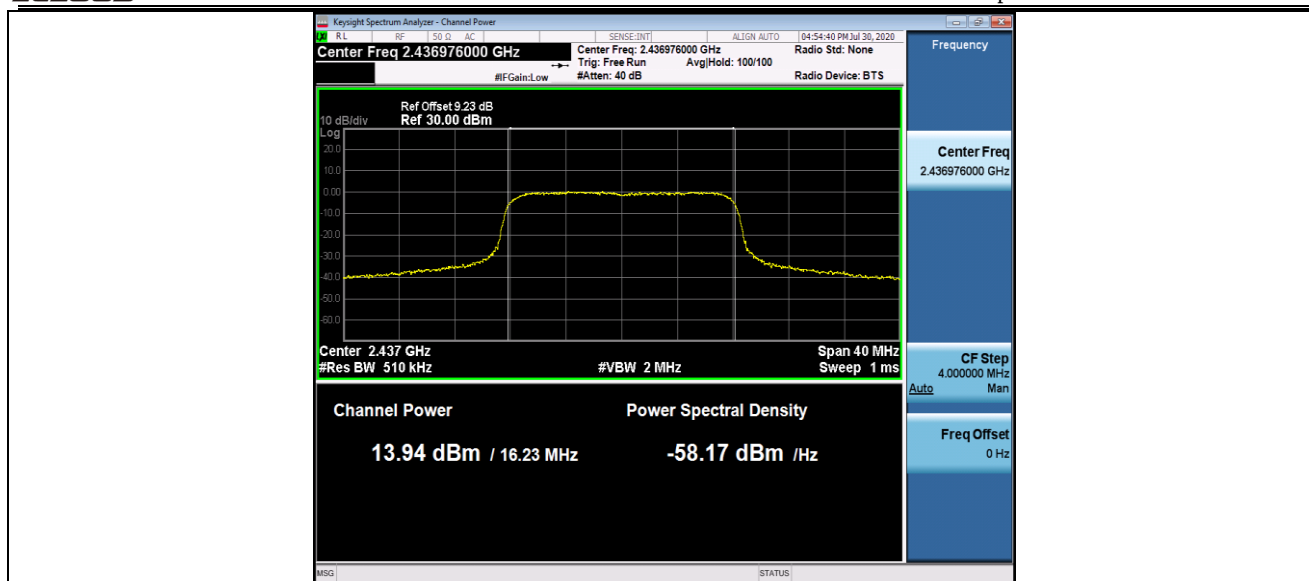
11B_Ant1_2462



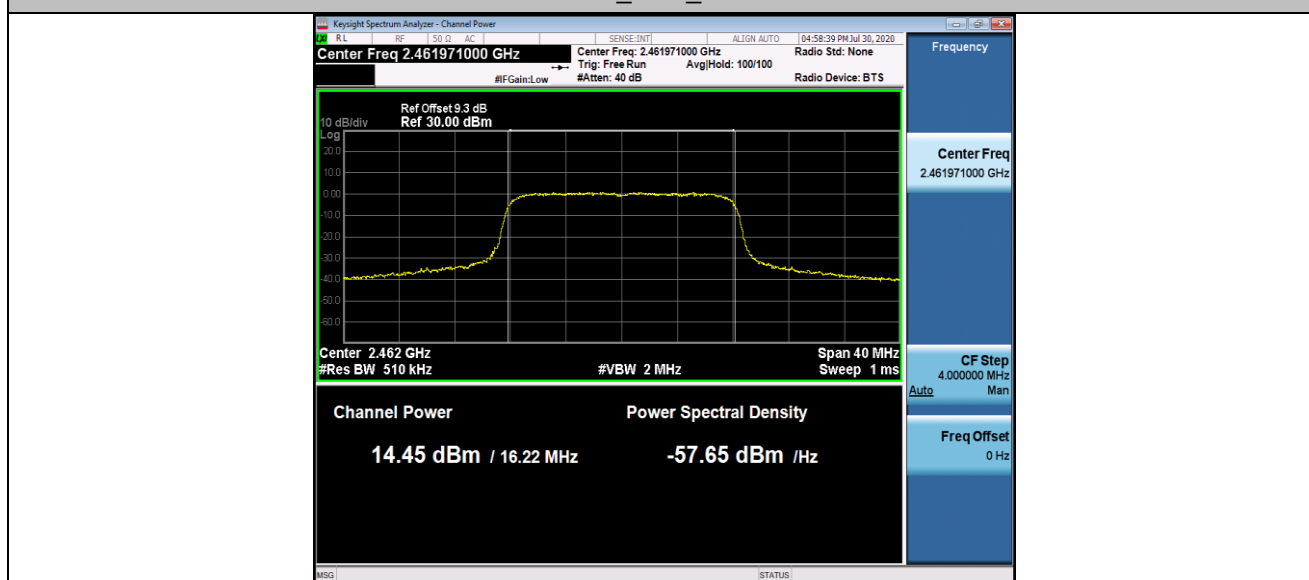
11G_Ant1_2412



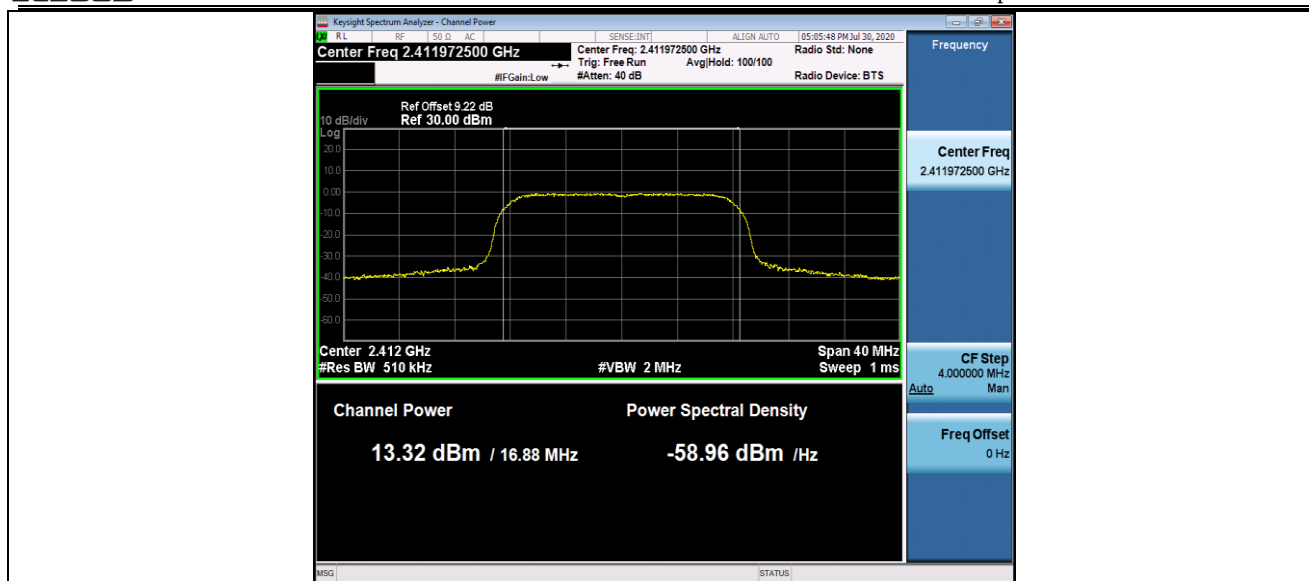
11G_Ant1_2437



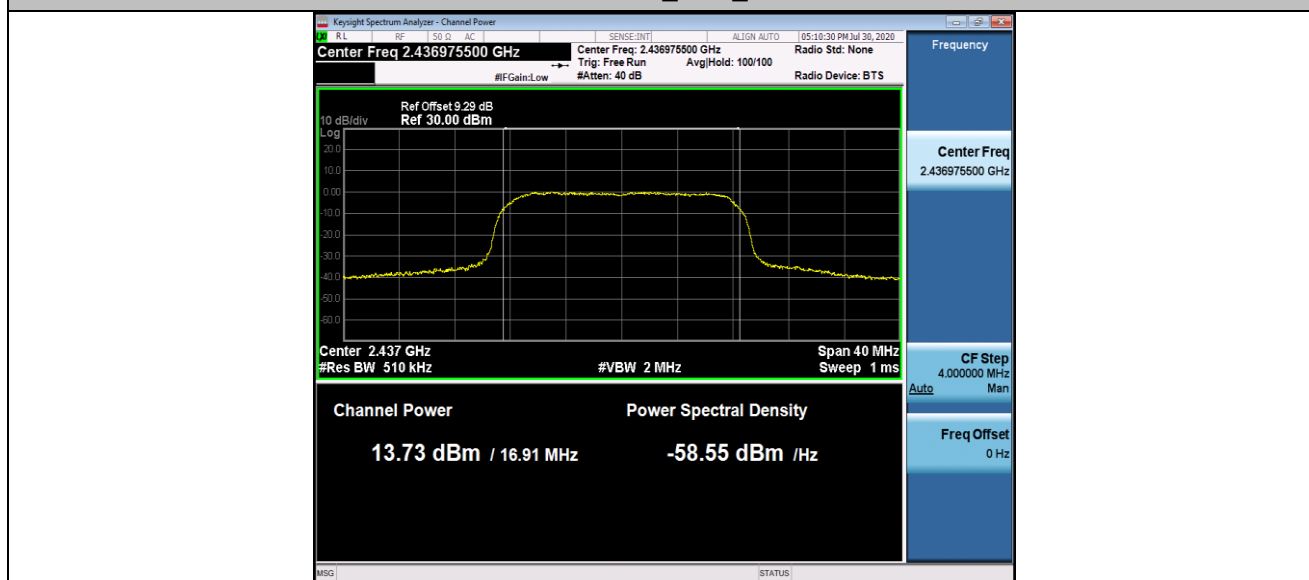
11G_Ant1_2462



11N20SISO_Ant1_2412



11N20SISO_Ant1_2437



11N20SISO_Ant1_2462

