

RF Test Report

For

HUNAN FN-LINK TECHNOLOGY LIMITED

Test Standards:	<u>Part 15C Subpart C</u>
Product Name:	<u>WIFI Module</u>
Tested Model:	<u>F89FTSM13-W3</u>
Brand Name:	<u>FN-LINK</u>
FCC ID:	<u>2AATL-F89FTSM13-W3</u>
Classification	<u>(DTS) Digital Transmission System</u>
Report No.:	<u>EC2101042RF01</u>
Tested Date:	<u>2021-03-09 to 2021-04-26</u>
Issued Date:	<u>2021-04-26</u>
Prepared By:	<u>Jack Liu.</u> Jack Liu / Engineer
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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	/	2021.04.26	Valid	Based on the original FCC ID: 2AATL-F89FTSM13-W3 to apply for C2PC certification, the content of the change is to replace the product antenna

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Summary Of Test Result

FCC Rule	Description	Limit	Result	Remark
15.247(d)	Radiated Band Edges and Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 5.83 dB at 2483.5 MHz
15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 5.45 dB at 0.200 MHz
15.203 & 15.247(b)	Antenna Requirement	15.203 & 15.247(b) RSS-GEN 6.8	Pass	-

1 Test Laboratory

1.1 Test facility

CNAS (accreditation number: L11138)

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

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

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

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

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

A2LA (Certificate Code : 4895.01)

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

2 General Description

2.1 Applicant

HUNAN FN-LINK TECHNOLOGY LIMITED

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

2.2 Manufacturer

HUNAN FN-LINK TECHNOLOGY LIMITED

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

2.3 General Description Of EUT

Product	WIFI Module
Model No.	F89FTSM13-W3
Additional No.	N/A
Difference Description	N/A
FCC ID	2AATL-F89FTSM13-W3
Power Supply	3.3Vdc for EUT
Modulation Technology	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Type	802.11b : DSSS 802.11g/n : OFDM
Operating Frequency	2412-2462MHz
Number Of Channel	11
Max. Output Power	802.11b : 16.28 dBm (0.0425 W) 802.11g : 15.53 dBm (0.0357 W) 802.11n HT20 : 14.94 dBm (0.0312 W) 802.11n HT40 : 14.45 dBm (0.0279 W)
Antenna Type	PCB Antenna type with 3.52dBi gain
HW Version	V1.0
SW Version	V1.0
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.

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
- ♦ 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	16.28
2412~2462	802.11g	6Mbps	15.53
2412~2462	802.11n HT20	MCS0	14.94
2422~2452	802.11n HT40	MCS0	14.45

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

3.2 Test Mode

3.2.1 Antenna Port Conducted Measurement

Summary table of Test Cases				
Test Item	Modulation			
	802.11 b	802.11 g	802.11n HT20	802.11n HT40
Conducted Test Cases	Mode 1: CH01	Mode 1: CH01	Mode 1: CH01	Mode 1: CH03
	Mode 2: CH06	Mode 2: CH06	Mode 2: CH06	Mode 2: CH06
	Mode 3: CH011	Mode 3: CH011	Mode 3: CH011	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 1: CH01	Mode 1: CH01	Mode 1: CH03
	Mode 2: CH06	Mode 2: CH06	Mode 2: CH06	Mode 2: CH06
	Mode 3: CH11	Mode 3: CH11	Mode 3: CH11	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.

3.3 Support Equipment

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Dual band WiFi AP	NETGARE	R7800	PY315100319	N/A	unshielded AC I/P cable1.2 m

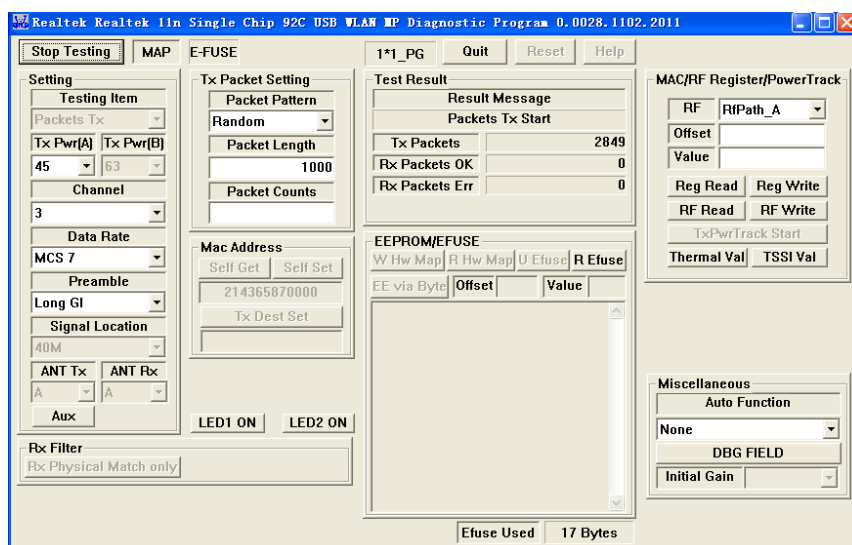
2.	Notebook	Lenovo	Xiaoxinchao5000	FCC sDOC	N/A	shielded cable DC O/P 1.8 m unshielded AC I/P cable 1.2 m
3.	PC	Lenovo	T4900d	FCC sDOC	N/A	N/A
4.	LCD monitor	Lenovo	LS2014wA	FCC sDOC	N/A	N/A
5.	Test Fixture	FN-LINK	12X12MM_TB_V5.0	N/A	N/A	N/A
6.	Wired Mouse	Logitech	M-U0026	FCC sDOC	N/A	N/A
7.	Keyboard	Lenovo	EKB-536A	FCC sDOC	N/A	N/A
8.	WiFi ANT/PCB /L=52mm	NARWEL	YC-DZ-W00064-00-00	N/A	N/A	N/A

3.4 Test Setup

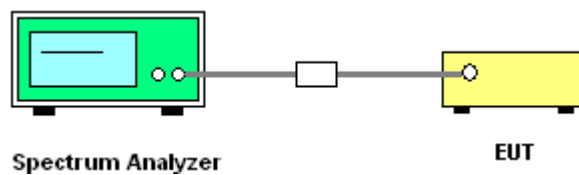
The EUT is continuously communicating to the WIFI tester during the tests.

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

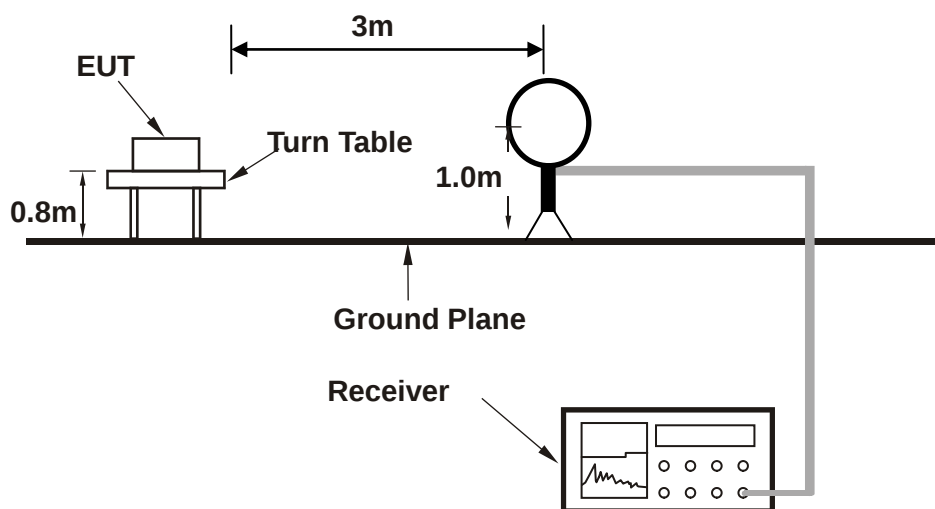
The following picture is a screenshot of the test software



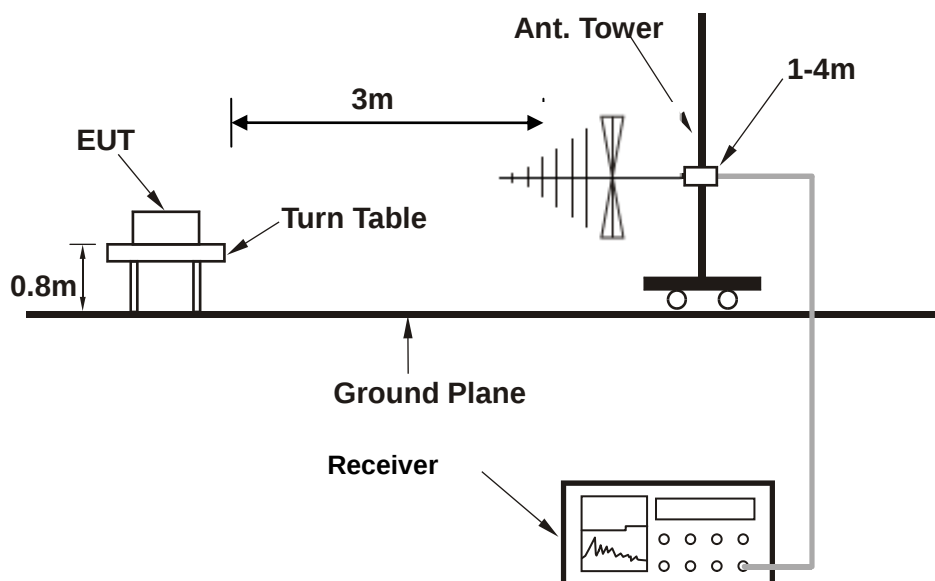
Setup diagram for Conducted Test



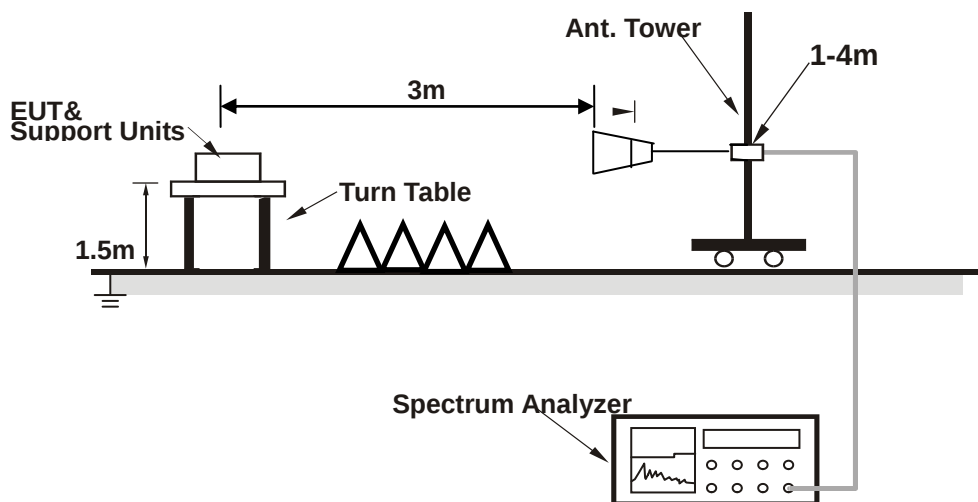
Setup diagram for Raidation(9KHz~30MHz) Test



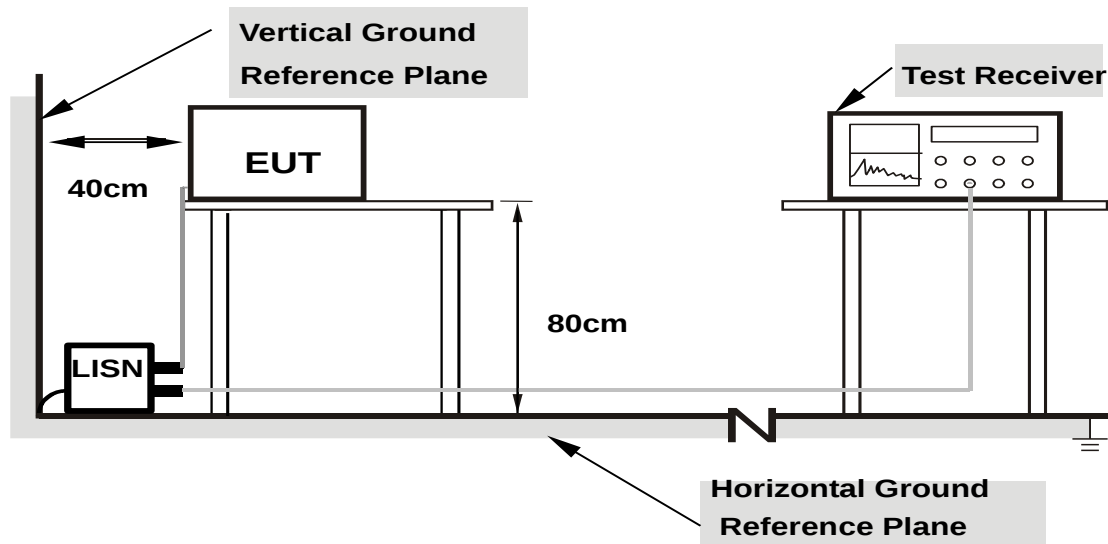
Setup diagram for Raidation(Below 1G) Test



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.

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

For all radiated test items:

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

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

4 Test Result

4.1 Radiated Band Edges and Spurious Emission Measurement

4.1.1 Limit of Radiated Band Edges and Spurious Emission

FCC §15.247 (d)

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.

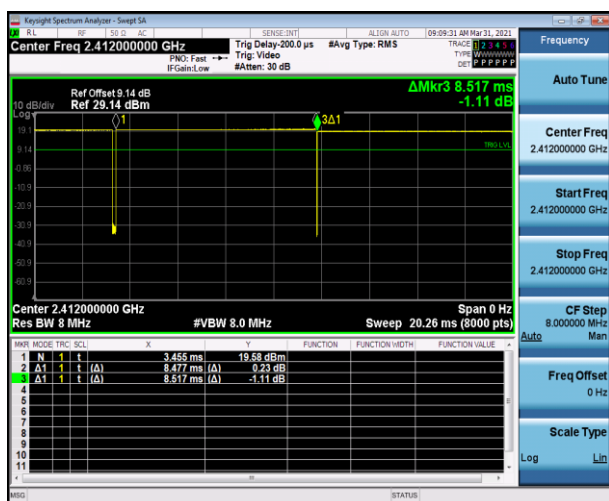
Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

4.1.2 Test Procedures

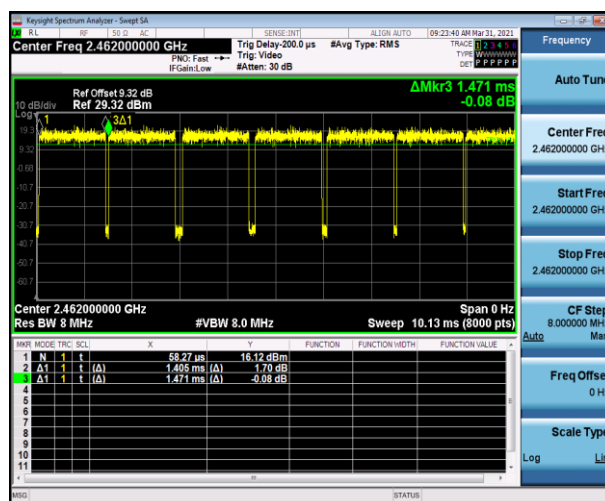
1. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
2. The measurement distance is 3 meter.
3. For each suspected emission, the EUT was arranged to its worst case and then tune the Antenna tower (from 1 m to 4 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.

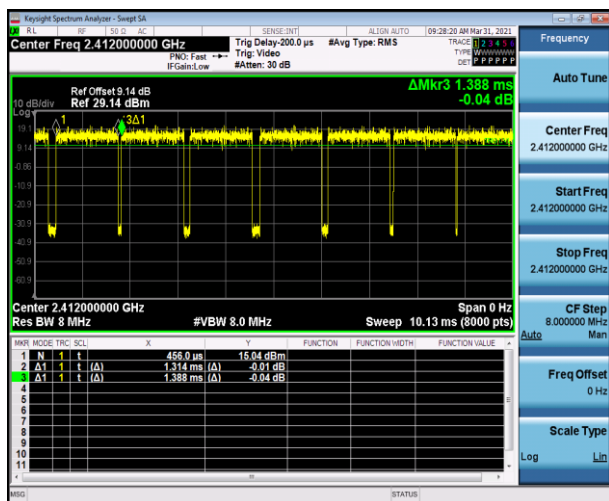
Band	Duty Cycle(%)	T(ms)	1/T(kHz)	VBW Setting
802.11b	99.53	-	-	10Hz
802.11g	95.24	1.40	0.71	1kHz
802.11n HT20	94.24	1.31	0.76	1kHz
802.11n HT40	89.04	0.65	1.54	3kHz



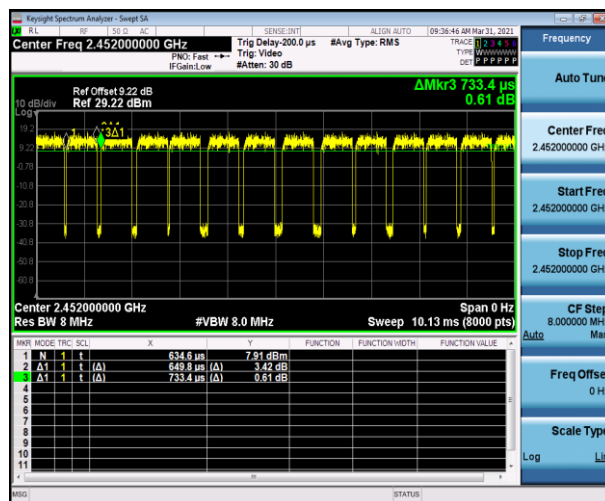
802.11b



802.11g



802.11n HT20



802.11n HT40

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

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

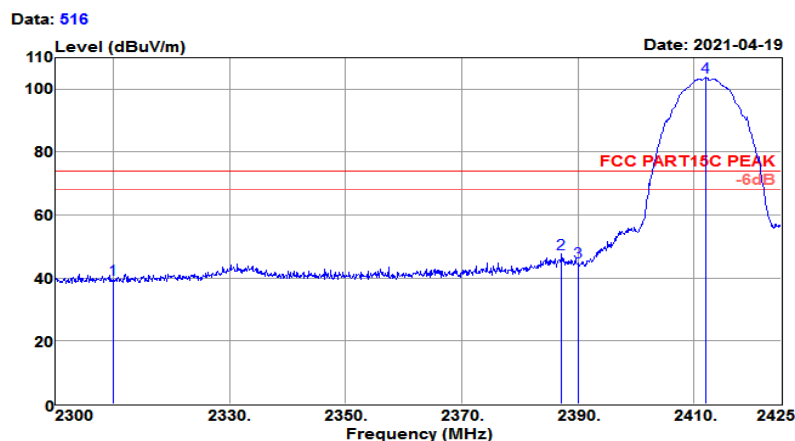
The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was

20dB lower than the limit line per 15.31(o) was not reported.

4.1.4 Test Result of Radiated Spurious at Band Edges

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

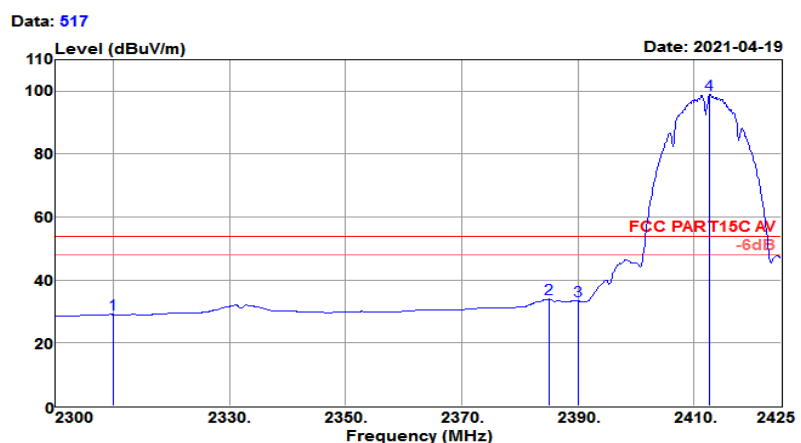
Test Site : 3m Chamber
Temp/Humi : 22℃/59%
Tested by : Jack
Pol/Phase : HORIZONTAL
Test Mode : 802.11b CH01(2412MHz)
Power rating: DC 5V
EUT : WIFI Module
Model No. : F89FTSM13-W3



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	43.91	27.38	4.08	35.68	39.69	74.00	-34.31	Peak
2387.250	51.79	27.55	4.16	35.87	47.63	74.00	-26.37	Peak
2390.000	49.13	27.56	4.16	35.88	44.97	74.00	-29.03	Peak
2412.000	108.09	27.61	4.17	35.93	103.94	74.00	29.94	Peak

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

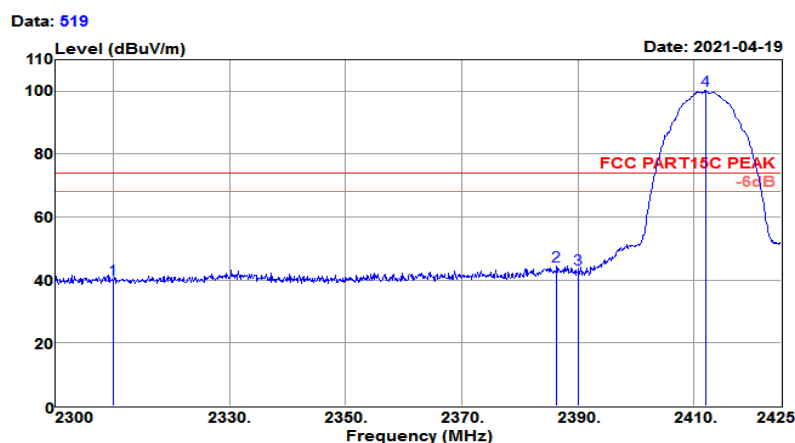
Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : HORIZONTAL
 Test Mode : 802.11b CH01(2412MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3



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	33.28	27.38	4.08	35.68	29.06	54.00	-24.94	Average
2385.000	38.10	27.55	4.16	35.86	33.95	54.00	-20.05	Average
2390.000	37.70	27.56	4.16	35.88	33.54	54.00	-20.46	Average
2412.750	103.05	27.61	4.17	35.93	98.90	54.00	44.90	Average

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

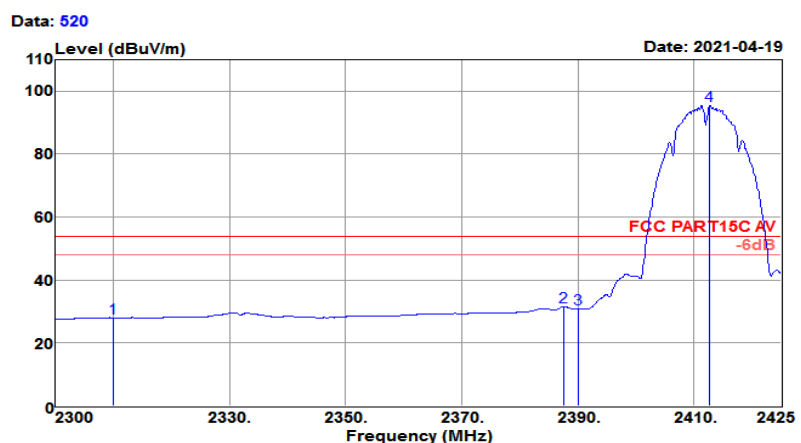
Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: VERTICAL
Test Mode	: 802.11b CH01(2412MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamplifier factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	44.60	27.38	4.08	35.68	40.38	74.00	-33.62	Peak
2386.375	48.74	27.55	4.16	35.87	44.58	74.00	-29.42	Peak
2390.000	47.61	27.56	4.16	35.88	43.45	74.00	-30.55	Peak
2412.000	104.45	27.61	4.17	35.93	100.30	74.00	26.30	Peak

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

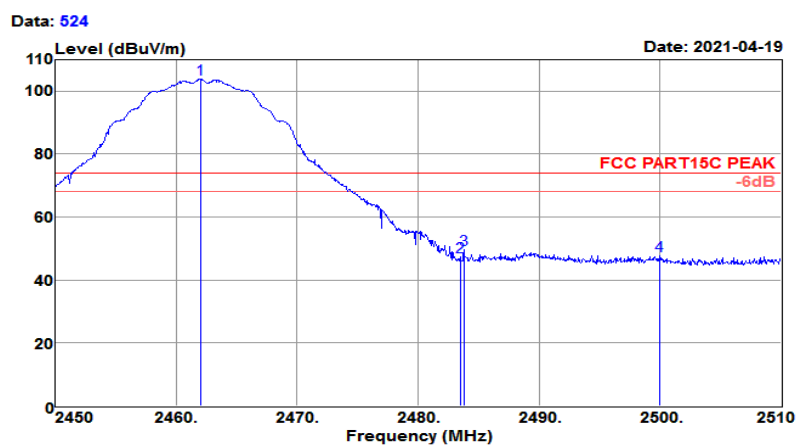
Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : VERTICAL
 Test Mode : 802.11b CH01(2412MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3



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	32.29	27.38	4.08	35.68	28.07	54.00	-25.93	Average
2387.500	35.75	27.55	4.16	35.87	31.59	54.00	-22.41	Average
2390.000	35.16	27.56	4.16	35.88	31.00	54.00	-23.00	Average
2412.750	99.55	27.61	4.17	35.93	95.40	54.00	41.40	Average

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

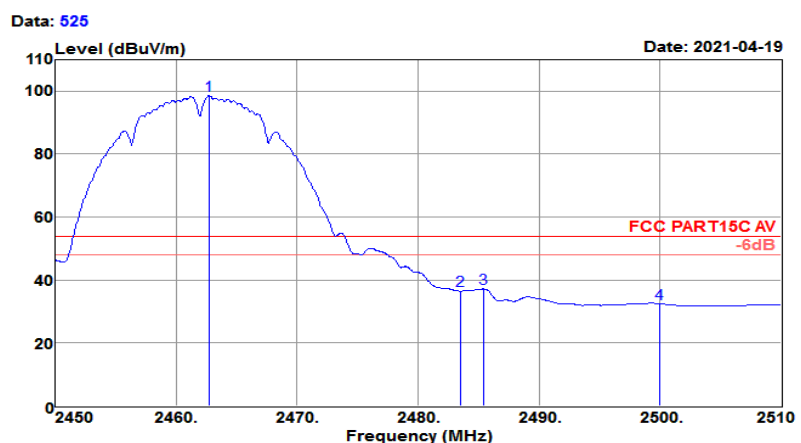
Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: 802.11b CH11(2462MHz)	Power rating	: DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2462.000	108.00	27.72	4.19	36.06	103.85	74.00	29.85	Peak
2483.500	51.53	27.76	4.19	36.11	47.37	74.00	-26.63	Peak
2483.780	53.75	27.76	4.19	36.11	49.59	74.00	-24.41	Peak
2500.000	52.00	27.80	4.19	36.15	47.84	74.00	-26.16	Peak

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

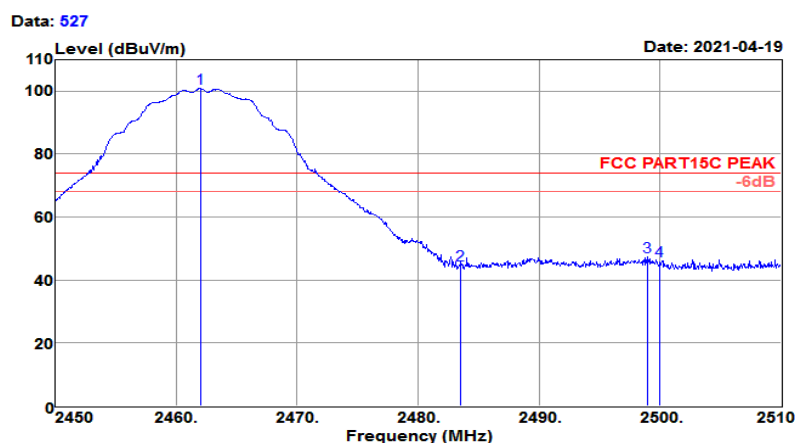
Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: 802.11b CH11(2462MHz)	Power rating	: DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamplifier factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2462.720	102.71	27.72	4.19	36.06	98.56	54.00	44.56	Average
2483.500	40.75	27.76	4.19	36.11	36.59	54.00	-17.41	Average
2485.400	41.35	27.77	4.19	36.11	37.20	54.00	-16.80	Average
2500.000	36.67	27.80	4.19	36.15	32.51	54.00	-21.49	Average

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

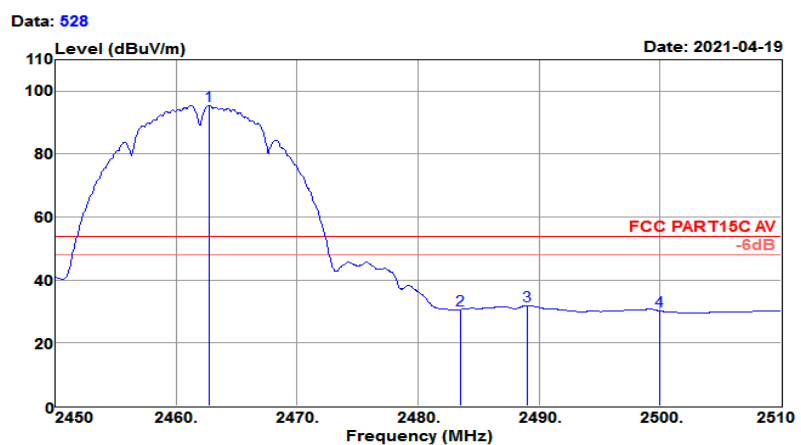
Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: VERTICAL
Test Mode	: 802.11b CH11(2462MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		



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	104.97	27.72	4.19	36.06	100.82	74.00	26.82	Peak
2483.500	48.81	27.76	4.19	36.11	44.65	74.00	-29.35	Peak
2498.960	51.66	27.80	4.19	36.15	47.50	74.00	-26.50	Peak
2500.000	50.32	27.80	4.19	36.15	46.16	74.00	-27.84	Peak

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

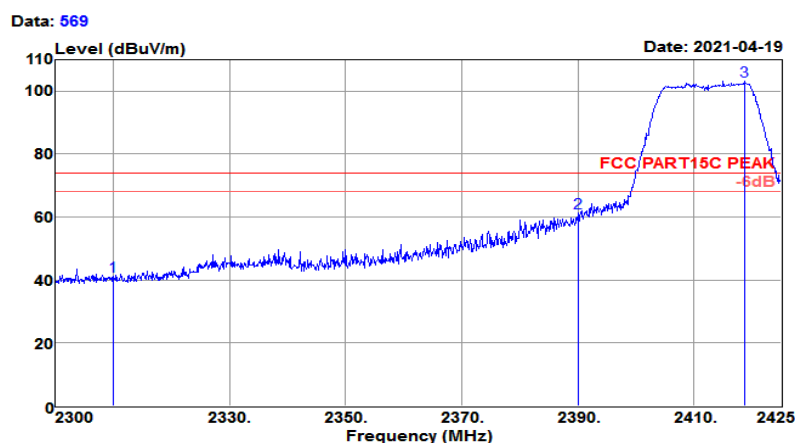
Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: VERTICAL
Test Mode	: 802.11b CH11(2462MHz)	Power rating	: DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		



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	99.65	27.72	4.19	36.06	95.50	54.00	41.50	Average
2483.500	34.81	27.76	4.19	36.11	30.65	54.00	-23.35	Average
2489.000	36.06	27.78	4.19	36.12	31.91	54.00	-22.09	Average
2500.000	34.51	27.80	4.19	36.15	30.35	54.00	-23.65	Average

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

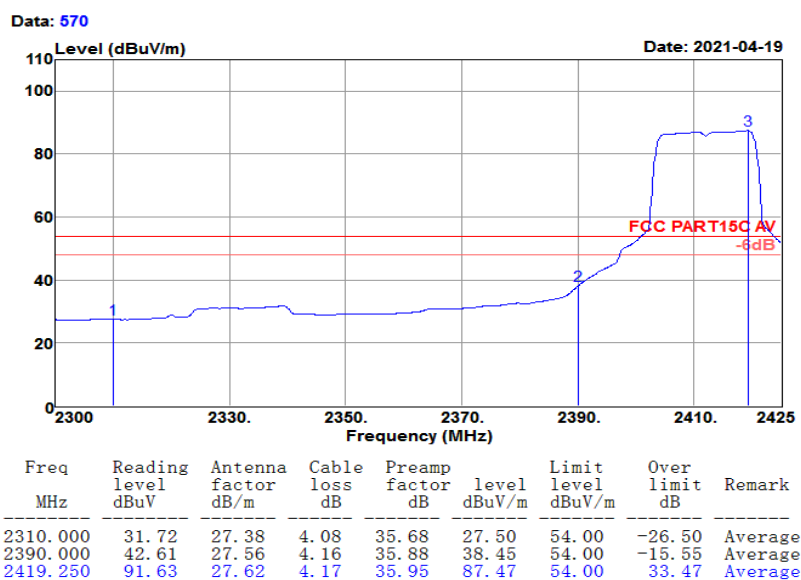
Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: 802.11g CH01(2412MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		



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	45.41	27.38	4.08	35.68	41.19	74.00	-32.81	Peak
2390.000	65.44	27.56	4.16	35.88	61.28	74.00	-12.72	Peak
2418.625	107.27	27.62	4.17	35.95	103.11	74.00	29.11	Peak

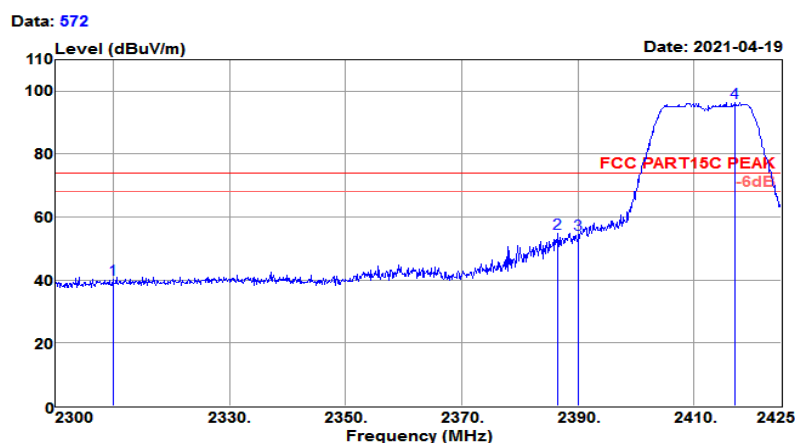
Test Mode :	802.11g CH01 (2412 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.425GHz	Polarization :	Horizontal

Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : HORIZONTAL
 Test Mode : 802.11g CH01(2412MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3



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

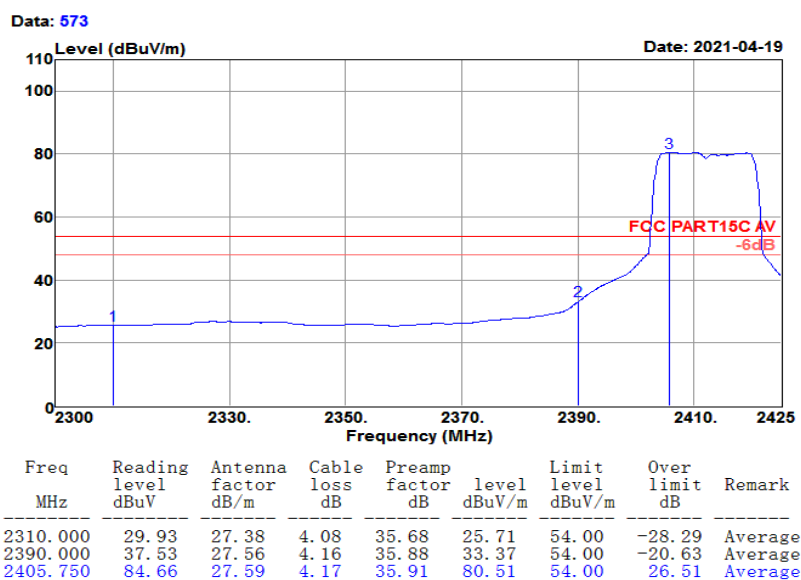
Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: VERTICAL
Test Mode	: 802.11g CH01(2412MHz)	Power rating	: DC 5W
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		



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	44.39	27.38	4.08	35.68	40.17	74.00	-33.83	Peak
2386.625	59.07	27.55	4.16	35.87	54.91	74.00	-19.09	Peak
2390.000	58.79	27.56	4.16	35.88	54.63	74.00	-19.37	Peak
2417.125	100.66	27.62	4.17	35.94	96.51	74.00	22.51	Peak

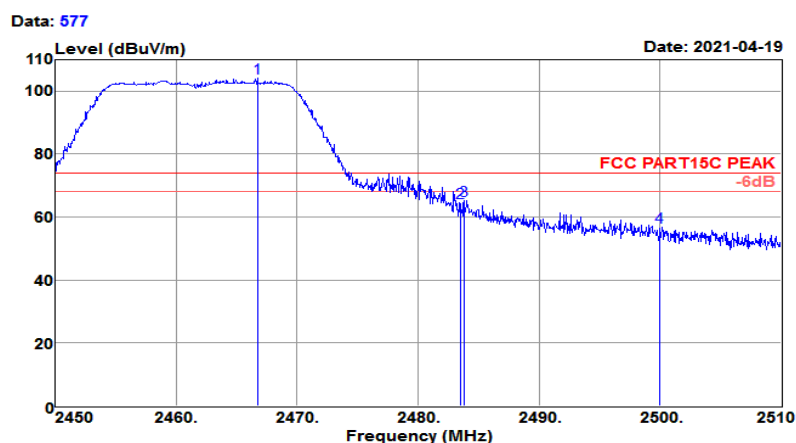
Test Mode :	802.11g CH01 (2412 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.425GHz	Polarization :	Vertical

Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : VERTICAL
 Test Mode : 802.11g CH01(2412MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3



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

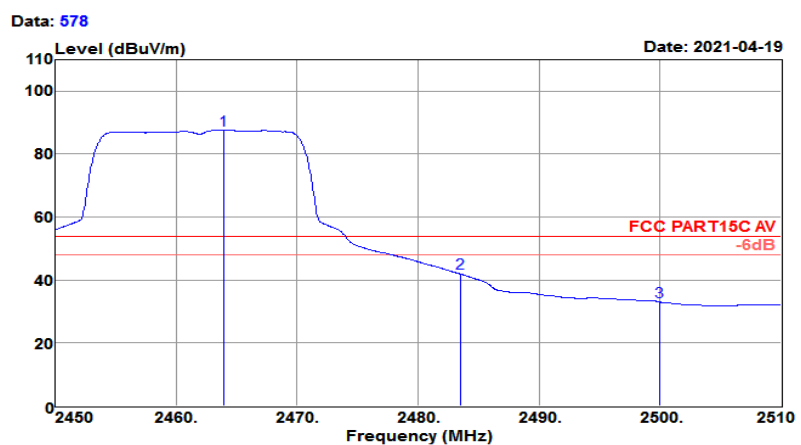
Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: 802.11g CH11(2462MHz)	Power rating	: DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		



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
2466.740	108.19	27.73	4.19	36.07	104.04	74.00	30.04	Peak
2483.500	68.79	27.76	4.19	36.11	64.63	74.00	-9.37	Peak
2483.780	69.29	27.76	4.19	36.11	65.13	74.00	-8.87	Peak
2500.000	60.82	27.80	4.19	36.15	56.66	74.00	-17.34	Peak

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

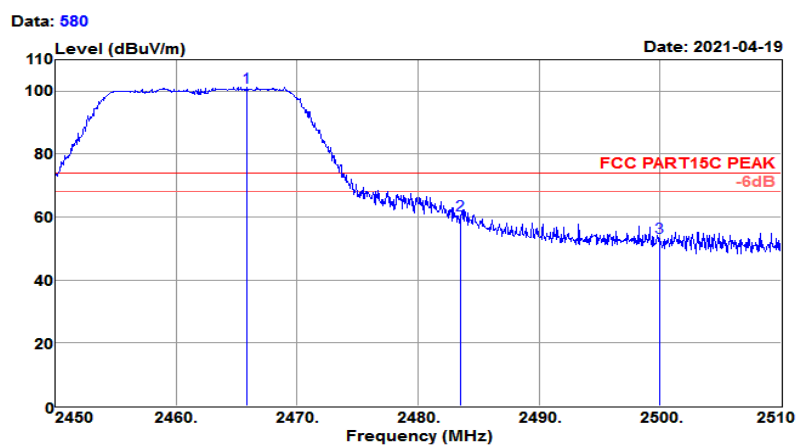
Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: 802.11g CH11(2462MHz)	Power rating	: DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		



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
2463.980	91.81	27.72	4.19	36.06	87.66	54.00	33.66	Average
2483.500	46.42	27.76	4.19	36.11	42.26	54.00	-11.74	Average
2500.000	37.31	27.80	4.19	36.15	33.15	54.00	-20.85	Average

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

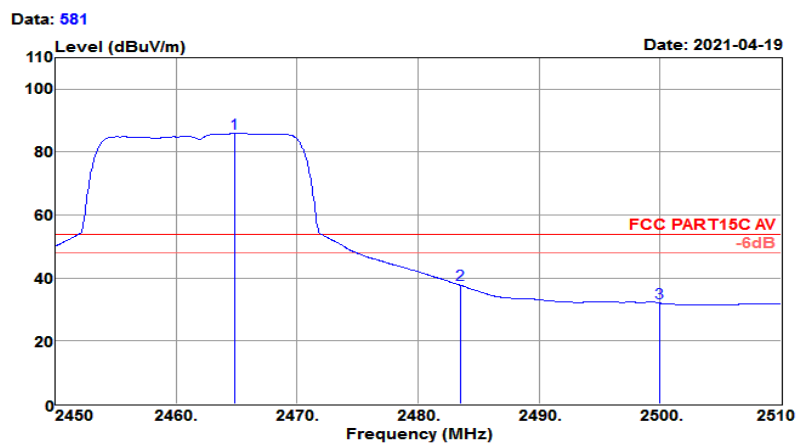
Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: VERTICAL
Test Mode	: 802.11g CH11(2462MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		



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
2465.840	105.45	27.72	4.19	36.06	101.30	74.00	27.30	Peak
2483.500	64.94	27.76	4.19	36.11	60.78	74.00	-13.22	Peak
2500.000	57.67	27.80	4.19	36.15	53.51	74.00	-20.49	Peak

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

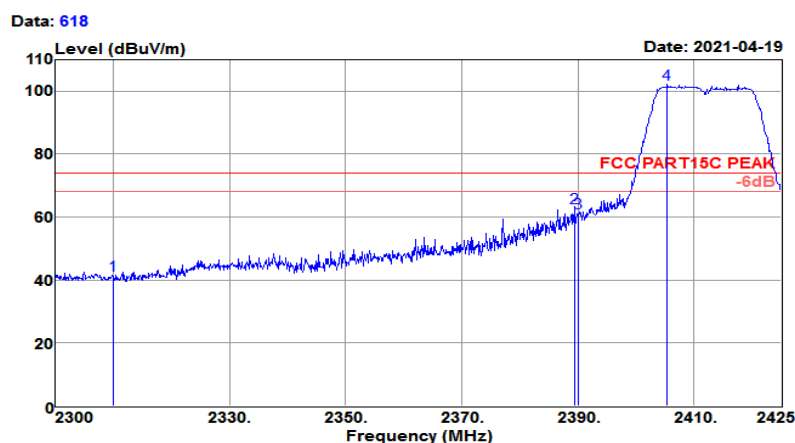
Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: VERTICAL
Test Mode	: 802.11g CH11(2462MHz)	Power rating	: DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		



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
2464.880	90.13	27.72	4.19	36.06	85.98	54.00	31.98	Average
2483.500	42.24	27.76	4.19	36.11	38.08	54.00	-15.92	Average
2500.000	36.31	27.80	4.19	36.15	32.15	54.00	-21.85	Average

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

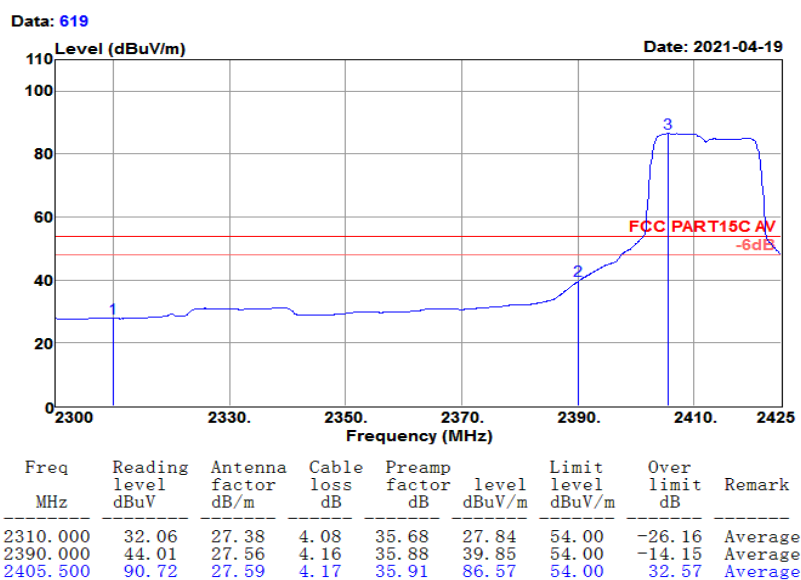
Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : HORIZONTAL
 Test Mode : 802.11N HT20 CH01(2412MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3



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	45.69	27.38	4.08	35.68	41.47	74.00	-32.53	Peak
2389.375	67.21	27.56	4.16	35.87	63.06	74.00	-10.94	Peak
2390.000	65.57	27.56	4.16	35.88	61.41	74.00	-12.59	Peak
2405.375	106.24	27.59	4.17	35.91	102.09	74.00	28.09	Peak

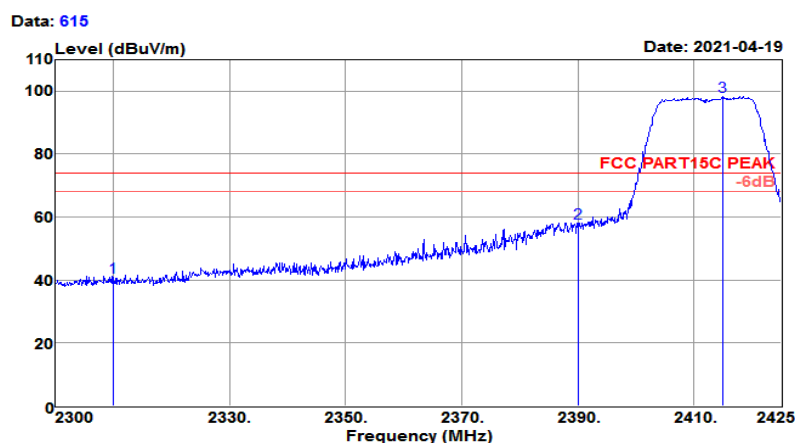
Test Mode :	802.11n HT20 CH01 (2412 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	2.3GHz~2.425GHz	Polarization :	Horizontal

Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : HORIZONTAL
 Test Mode : 802.11N HT20 CH01(2412MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3



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

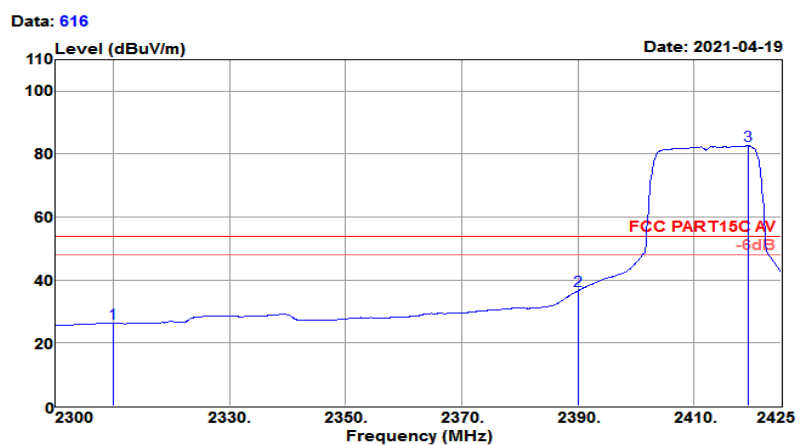
Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : VERTICAL
 Test Mode : 802.11N HT20 CH01(2412MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3



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	45.19	27.38	4.08	35.68	40.97	74.00	-33.03	Peak
2390.000	62.32	27.56	4.16	35.88	58.16	74.00	-15.84	Peak
2414.875	102.49	27.61	4.17	35.94	98.33	74.00	24.33	Peak

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

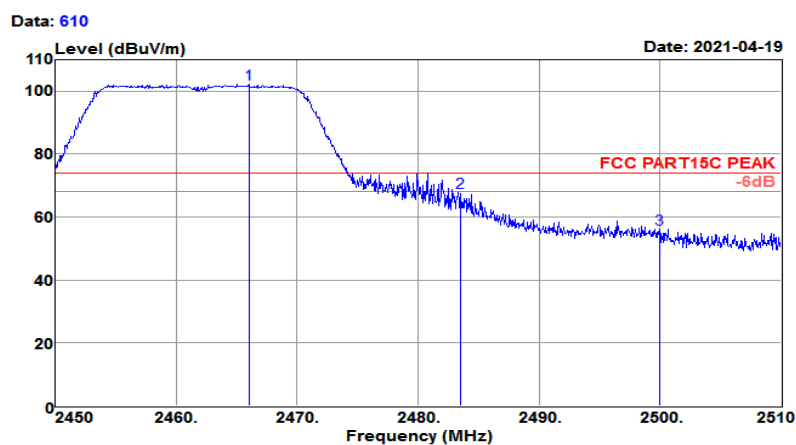
Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : VERTICAL
 Test Mode : 802.11N HT20 CH01(2412MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3



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	30.45	27.38	4.08	35.68	26.23	54.00	-27.77	Average
2390.000	40.97	27.56	4.16	35.88	36.81	54.00	-17.19	Average
2419.250	86.86	27.62	4.17	35.95	82.70	54.00	28.70	Average

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

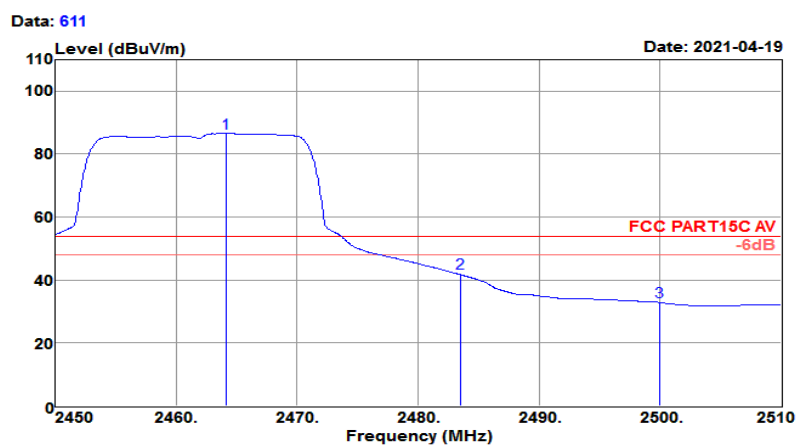
Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : HORIZONTAL
 Test Mode : 802.11N HT20 CH11(2462MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3



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
2466.020	106.50	27.73	4.19	36.07	102.35	74.00	28.35	Peak
2483.500	71.93	27.76	4.19	36.11	67.77	74.00	-6.23	Peak
2500.000	60.17	27.80	4.19	36.15	56.01	74.00	-17.99	Peak

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

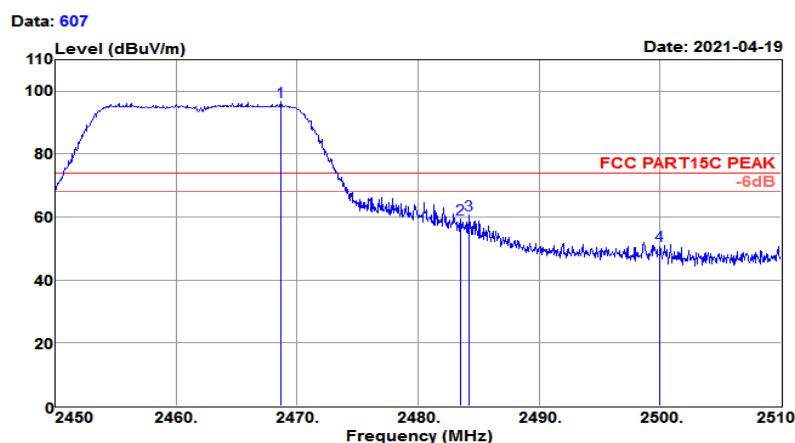
Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : HORIZONTAL
 Test Mode : 802.11N HT20 CH11(2462MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3



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
2464.100	90.77	27.72	4.19	36.06	86.62	54.00	32.62	Average
2483.500	46.24	27.76	4.19	36.11	42.08	54.00	-11.92	Average
2500.000	37.11	27.80	4.19	36.15	32.95	54.00	-21.05	Average

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

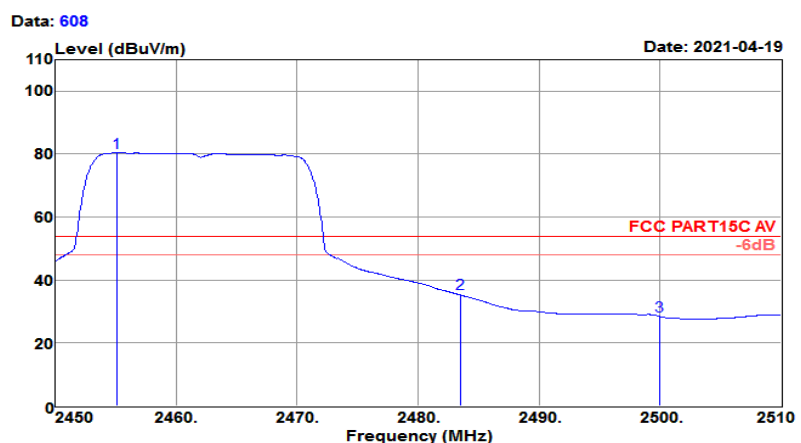
Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : VERTICAL
 Test Mode : 802.11N HT20 CH11(2462MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3



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
2468.660	100.70	27.73	4.19	36.07	96.55	74.00	22.55	Peak
2483.500	63.54	27.76	4.19	36.11	59.38	74.00	-14.62	Peak
2484.260	64.92	27.77	4.19	36.11	60.77	74.00	-13.23	Peak
2500.000	55.20	27.80	4.19	36.15	51.04	74.00	-22.96	Peak

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

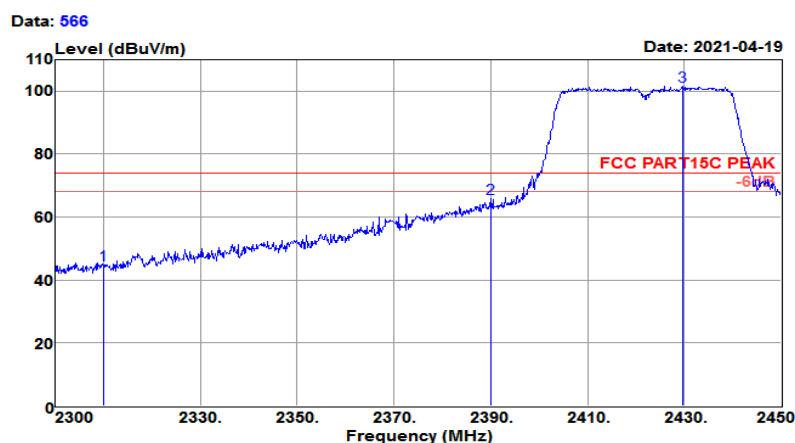
Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : VERTICAL
 Test Mode : 802.11N HT20 CH11(2462MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3



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	84.65	27.70	4.18	36.04	80.49	54.00	26.49	Average
2483.500	39.74	27.76	4.19	36.11	35.58	54.00	-18.42	Average
2500.000	32.80	27.80	4.19	36.15	28.64	54.00	-25.36	Average

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

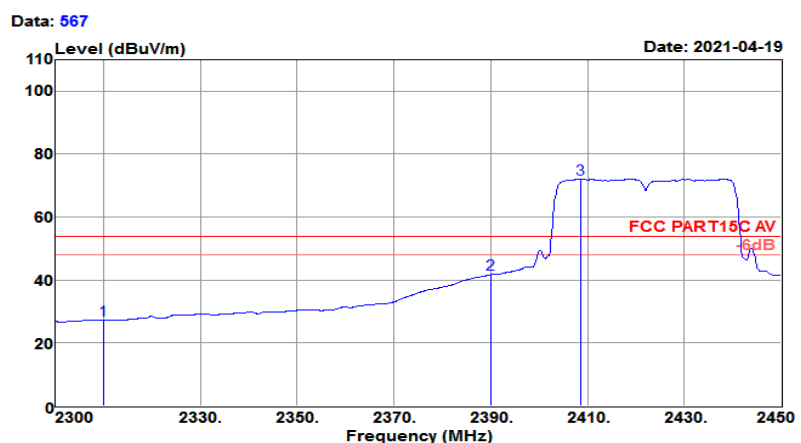
Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : HORIZONTAL
 Test Mode : 802.11N HT40 CH03(2422MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2310.000	49.12	27.38	4.08	35.68	44.90	74.00	-29.10	Peak
2390.000	70.13	27.56	4.16	35.88	65.97	74.00	-8.03	Peak
2429.600	105.86	27.65	4.18	35.97	101.72	74.00	27.72	Peak

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

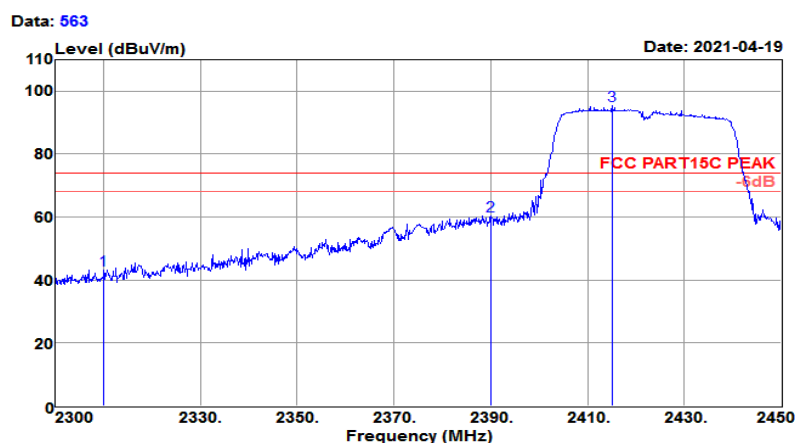
Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : HORIZONTAL
 Test Mode : 802.11N HT40 CH03(2422MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3



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	31.46	27.38	4.08	35.68	27.24	54.00	-26.76	Average
2390.000	45.88	27.56	4.16	35.88	41.72	54.00	-12.28	Average
2408.600	76.22	27.60	4.17	35.92	72.07	54.00	18.07	Average

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

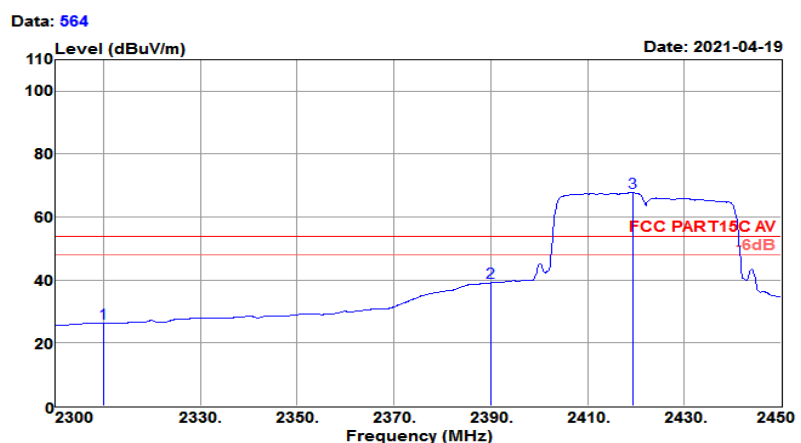
Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : VERTICAL
 Test Mode : 802.11N HT40 CH03(2422MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3



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	47.55	27.38	4.08	35.68	43.33	74.00	-30.67	Peak
2390.000	64.52	27.56	4.16	35.88	60.36	74.00	-13.64	Peak
2415.050	99.46	27.61	4.17	35.94	95.30	74.00	21.30	Peak

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

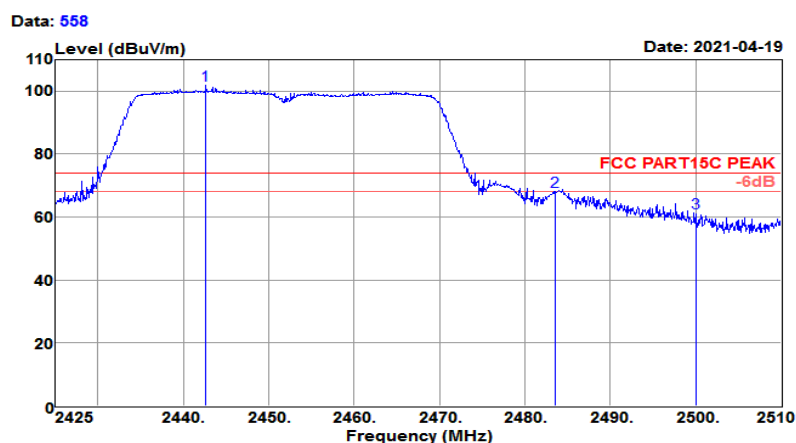
Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : VERTICAL
 Test Mode : 802.11N HT40 CH03(2422MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3



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	30.59	27.38	4.08	35.68	26.37	54.00	-27.63	Average
2390.000	43.32	27.56	4.16	35.88	39.16	54.00	-14.84	Average
2419.400	71.97	27.62	4.17	35.95	67.81	54.00	13.81	Average

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

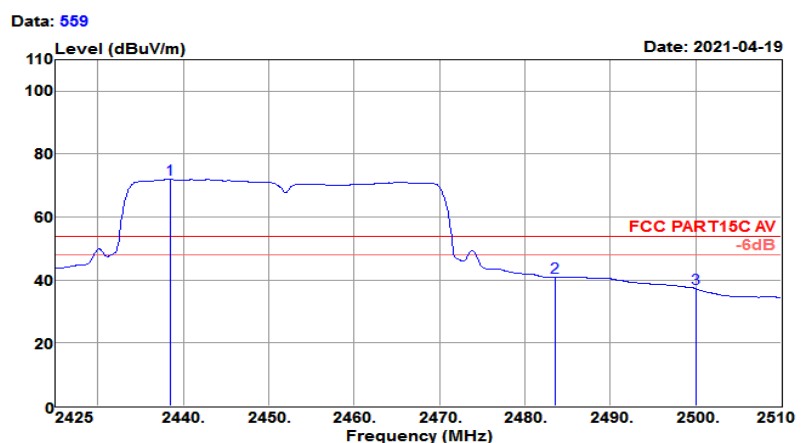
Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : HORIZONTAL
 Test Mode : 802.11N HT40 CH09(2452MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3



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
2442.680	106.07	27.67	4.18	36.01	101.91	74.00	27.91	Peak
2483.500	72.18	27.76	4.19	36.11	68.02	74.00	-5.98	Peak
2500.000	65.40	27.80	4.19	36.15	61.24	74.00	-12.76	Peak

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

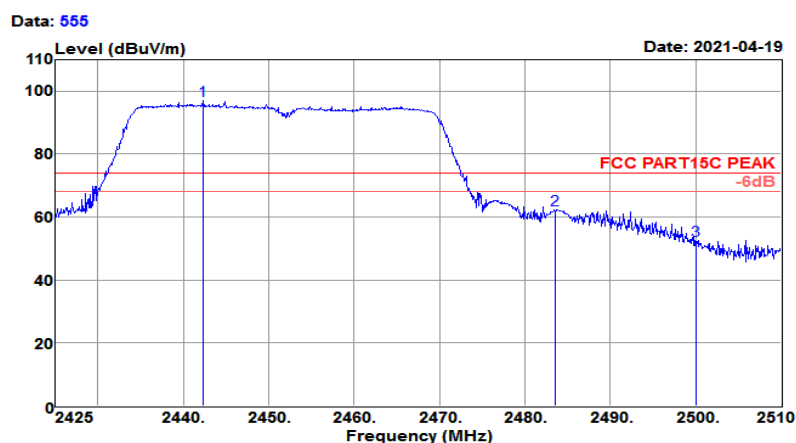
Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : HORIZONTAL
 Test Mode : 802.11N HT40 CH09(2452MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3



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
2438.430	76.22	27.66	4.18	36.00	72.06	54.00	18.06	Average
2483.500	45.18	27.76	4.19	36.11	41.02	54.00	-12.98	Average
2500.000	41.61	27.80	4.19	36.15	37.45	54.00	-16.55	Average

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

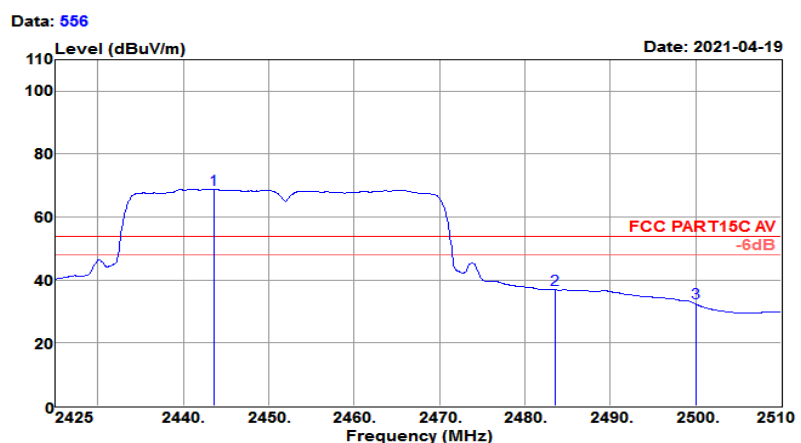
Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : VERTICAL
 Test Mode : 802.11N HT40 CH09(2452MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3



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
2442.340	101.30	27.67	4.18	36.01	97.14	74.00	23.14	Peak
2483.500	66.38	27.76	4.19	36.11	62.22	74.00	-11.78	Peak
2500.000	56.65	27.80	4.19	36.15	52.49	74.00	-21.51	Peak

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

Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : VERTICAL
 Test Mode : 802.11N HT40 CH09(2452MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3

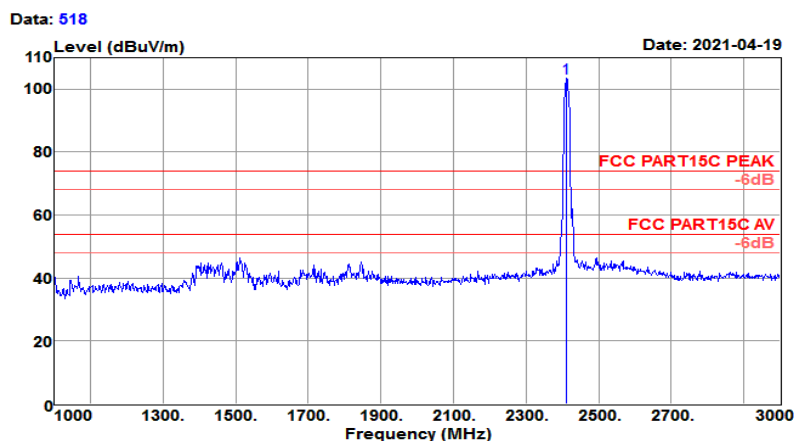


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2443.615	73.02	27.68	4.18	36.01	68.87	54.00	14.87	Average
2483.500	41.06	27.76	4.19	36.11	36.90	54.00	-17.10	Average
2500.000	36.87	27.80	4.19	36.15	32.71	54.00	-21.29	Average

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

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

Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: 802.11b CH01(2412MHz)	Power rating	: DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		

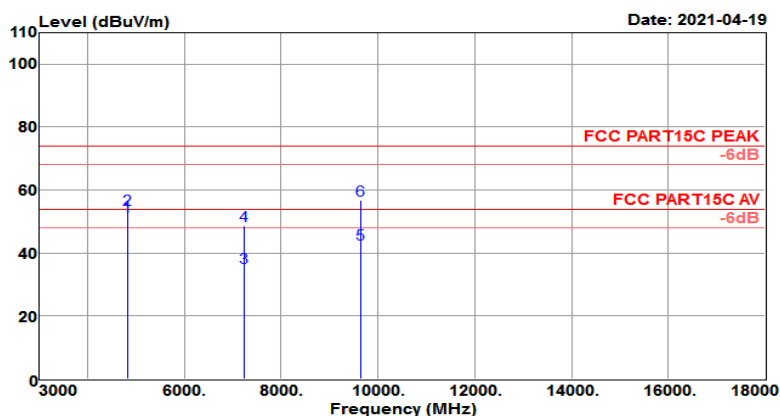


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2412.000	107.59	27.61	4.17	35.93	103.44	74.00	29.44	Peak

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

Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: 802.11b CH01(2412MHz)	Power rating	: DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		

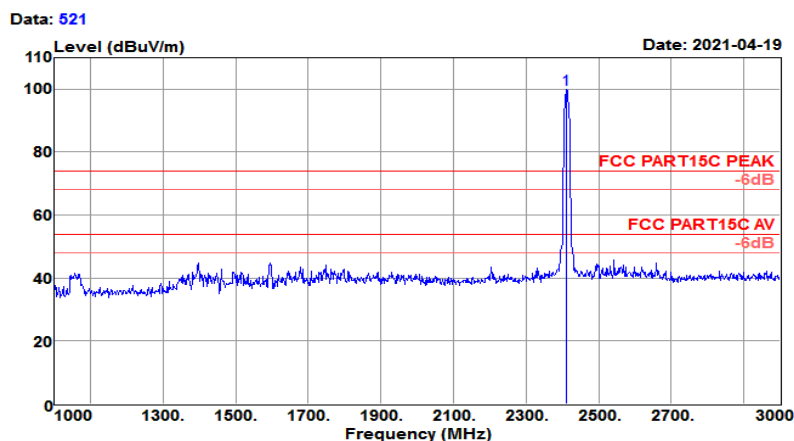
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Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4824.000	48.24	30.95	6.59	34.09	51.69	54.00	-2.31	Average
4824.000	50.37	30.95	6.59	34.09	53.82	74.00	-20.18	Peak
7236.000	25.61	35.47	8.71	34.41	35.38	54.00	-18.62	Average
7236.000	38.98	35.47	8.71	34.41	48.75	74.00	-25.25	Peak
9648.000	26.93	38.42	11.55	34.16	42.74	54.00	-11.26	Average
9648.000	40.93	38.42	11.55	34.16	56.74	74.00	-17.26	Peak

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

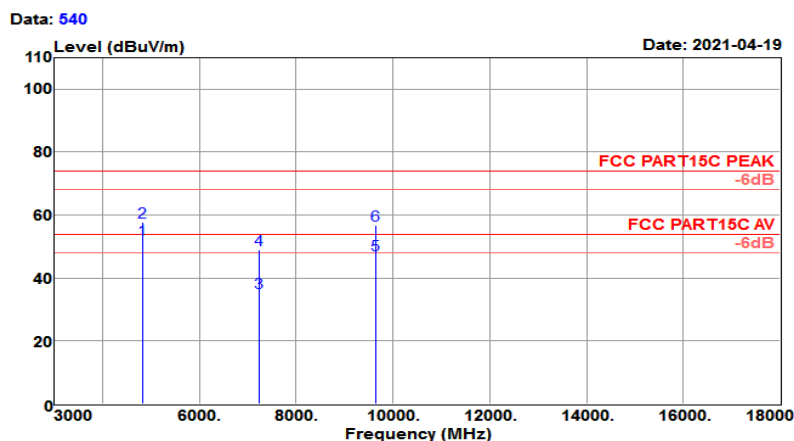
Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: VERTICAL
Test Mode	: 802.11b CH01(2412MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		



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	104.16	27.61	4.17	35.93	100.01	74.00	26.01	Peak

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

Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: VERTICAL
Test Mode	: 802.11b CH01(2412MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		

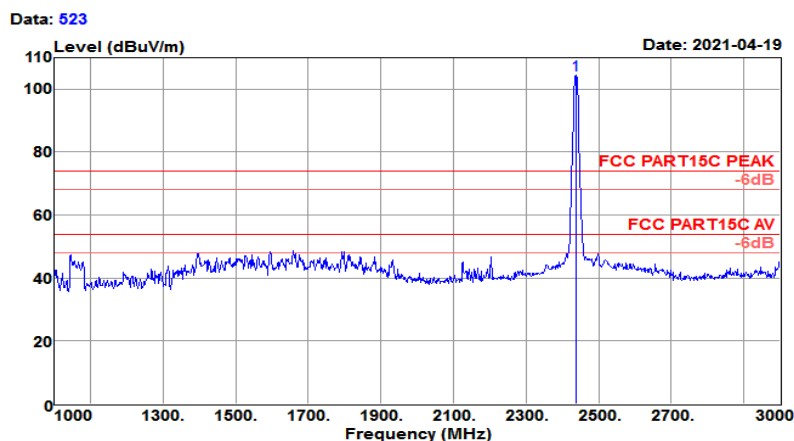


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4824.000	48.67	30.95	6.59	34.09	52.12	54.00	-1.88	Average
4824.000	54.28	30.95	6.59	34.09	57.73	74.00	-16.27	Peak
7236.000	25.56	35.47	8.71	34.41	35.33	54.00	-18.67	Average
7236.000	39.22	35.47	8.71	34.41	48.99	74.00	-25.01	Peak
9648.000	31.71	38.42	11.55	34.16	47.52	54.00	-6.48	Average
9648.000	40.90	38.42	11.55	34.16	56.71	74.00	-17.29	Peak

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

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

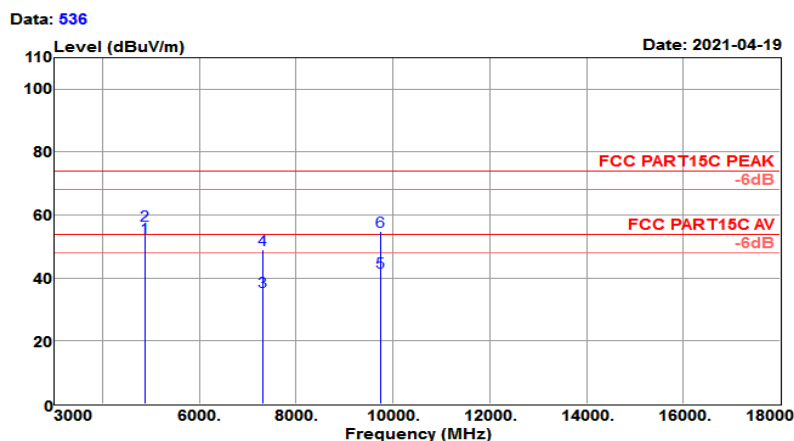
Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: 802.11b CH06(2437MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2437.000	108.50	27.66	4.18	35.99	104.35	74.00	30.35	Peak

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

Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: 802.11b CH06(2437MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		

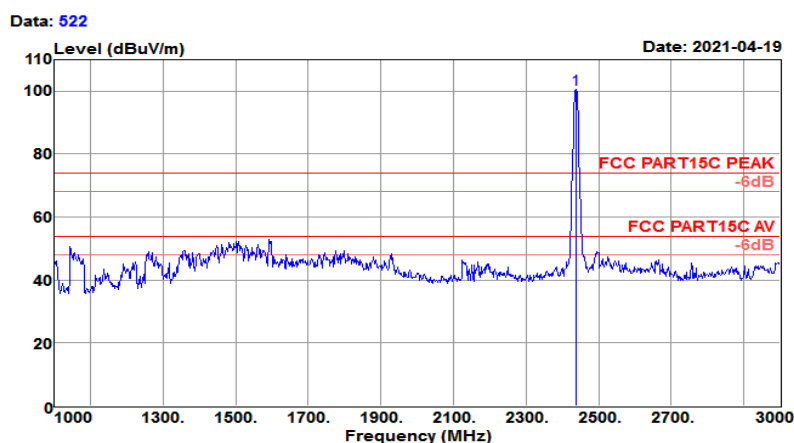


Freq	Reading level	Antenna factor	Cable loss	Preamp factor	level	Limit level	Over limit	Remark
MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
4874.000	48.86	31.02	6.97	34.04	52.81	54.00	-1.19	Average
4874.000	52.71	31.02	6.97	34.04	56.66	74.00	-17.34	Peak
7311.000	25.48	35.65	8.95	34.48	35.60	54.00	-18.40	Average
7311.000	38.78	35.65	8.95	34.48	48.90	74.00	-25.10	Peak
9748.000	26.34	38.50	11.20	34.20	41.84	54.00	-12.16	Average
9748.000	39.29	38.50	11.20	34.20	54.79	74.00	-19.21	Peak

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

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

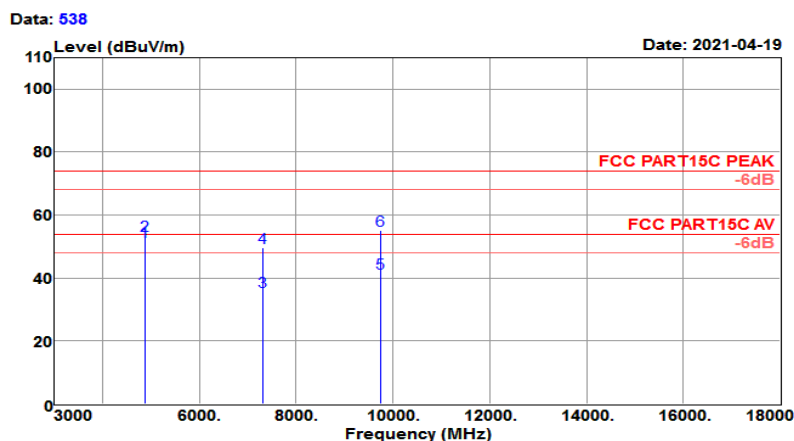
Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: VERTICAL
Test Mode	: 802.11b CH06(2437MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		



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	104.63	27.66	4.18	35.99	100.48	74.00	26.48	Peak

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

Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: VERTICAL
Test Mode	: 802.11b CH06(2437MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		

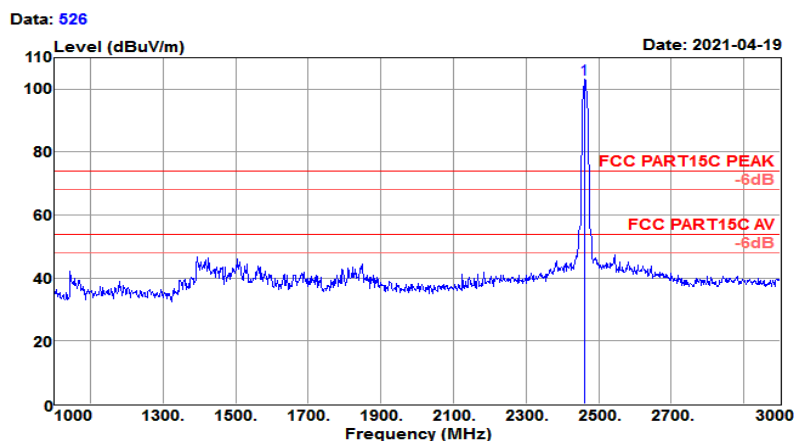


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4874.000	47.51	31.02	6.97	34.04	51.46	54.00	-2.54	Average
4874.000	49.70	31.02	6.97	34.04	53.65	74.00	-20.35	Peak
7311.000	25.68	35.65	8.95	34.48	35.80	54.00	-18.20	Average
7311.000	39.45	35.65	8.95	34.48	49.57	74.00	-24.43	Peak
9748.000	26.17	38.50	11.20	34.20	41.67	54.00	-12.33	Average
9748.000	39.65	38.50	11.20	34.20	55.15	74.00	-18.85	Peak

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

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

Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: 802.11b CH11(2462MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		

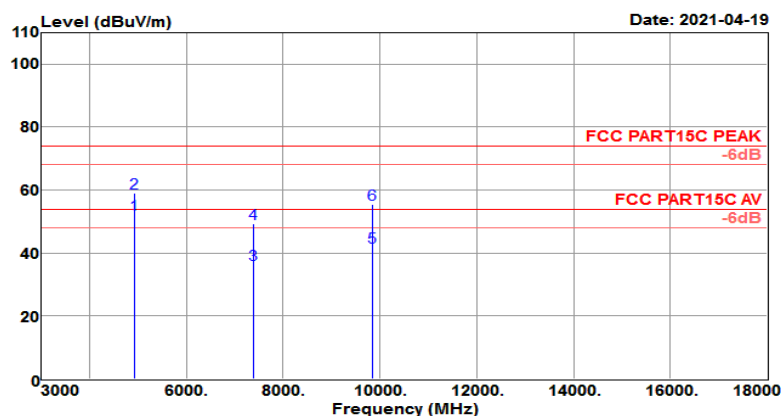


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2462.000	107.32	27.72	4.19	36.06	103.17	74.00	29.17	Peak

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

Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: 802.11b CH11(2462MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		

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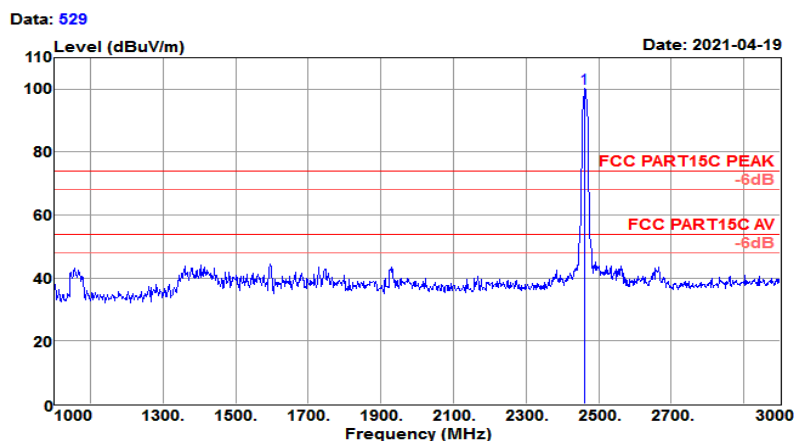


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4924.000	47.83	31.09	7.35	33.98	52.29	54.00	-1.71	Average
4924.000	54.54	31.09	7.35	33.98	59.00	74.00	-15.00	Peak
7386.000	25.82	35.83	9.19	34.55	36.29	54.00	-17.71	Average
7386.000	38.76	35.83	9.19	34.55	49.23	74.00	-24.77	Peak
9848.000	26.16	38.58	11.49	34.24	41.99	54.00	-12.01	Average
9848.000	39.56	38.58	11.49	34.24	55.39	74.00	-18.61	Peak

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

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

Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: VERTICAL
Test Mode	: 802.11b CH11(2462MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		

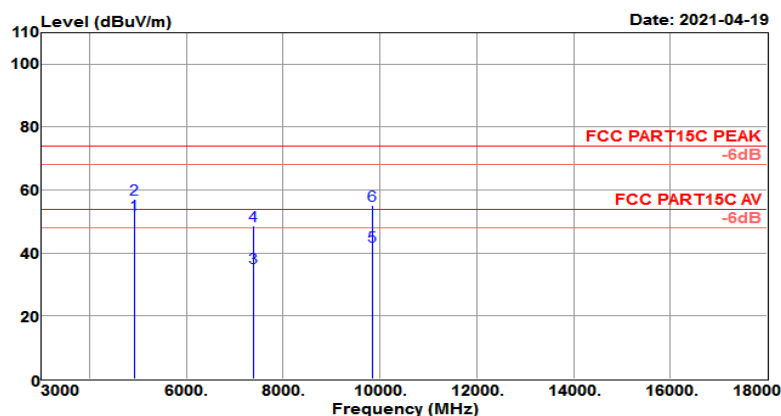


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2462.000	104.38	27.72	4.19	36.06	100.23	74.00	26.23	Peak

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

Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: VERTICAL
Test Mode	: 802.11b CH11(2462MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		

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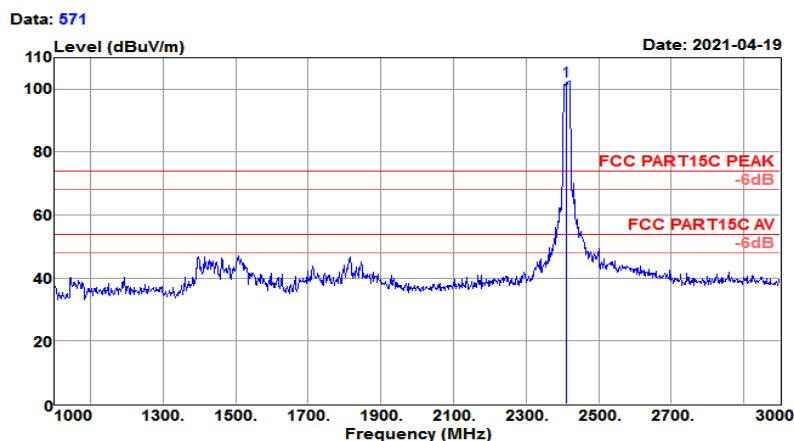


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4924.000	47.93	31.09	7.35	33.98	52.39	54.00	-1.61	Average
4924.000	52.75	31.09	7.35	33.98	57.21	74.00	-16.79	Peak
7386.000	25.04	35.83	9.19	34.55	35.51	54.00	-18.49	Average
7386.000	38.25	35.83	9.19	34.55	48.72	74.00	-25.28	Peak
9848.000	26.35	38.58	11.49	34.24	42.18	54.00	-11.82	Average
9848.000	39.35	38.58	11.49	34.24	55.18	74.00	-18.82	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 :	802.11g CH01 (2412 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Horizontal

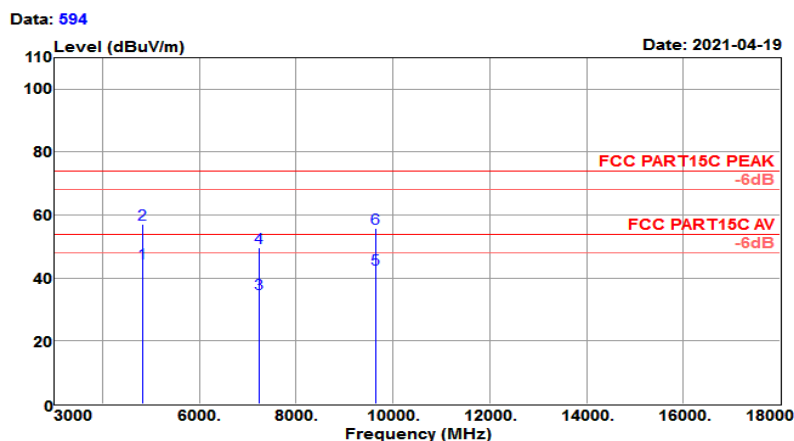
Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: 802.11g CH01(2412MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2412.000	106.69	27.61	4.17	35.93	102.54	74.00	28.54	Peak

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

Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: 802.11g CH01(2412MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		

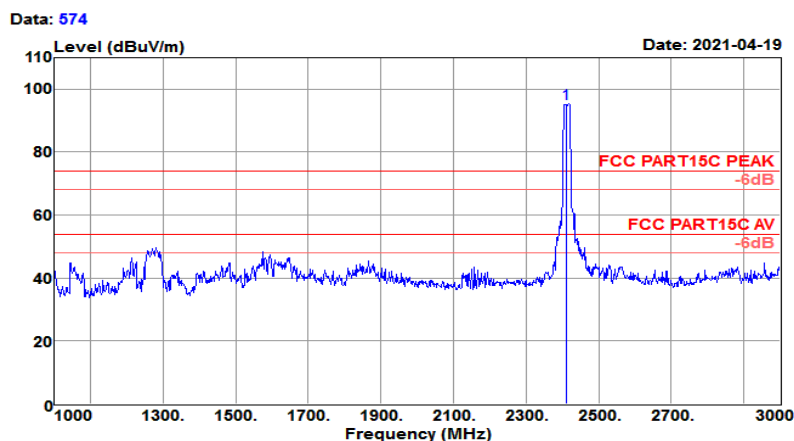


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4824.000	41.30	30.95	6.59	34.09	44.75	54.00	-9.25	Average
4824.000	53.52	30.95	6.59	34.09	56.97	74.00	-17.03	Peak
7236.000	25.43	35.47	8.71	34.41	35.20	54.00	-18.80	Average
7236.000	39.76	35.47	8.71	34.41	49.53	74.00	-24.47	Peak
9648.000	26.94	38.42	11.55	34.16	42.75	54.00	-11.25	Average
9648.000	40.14	38.42	11.55	34.16	55.95	74.00	-18.05	Peak

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

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

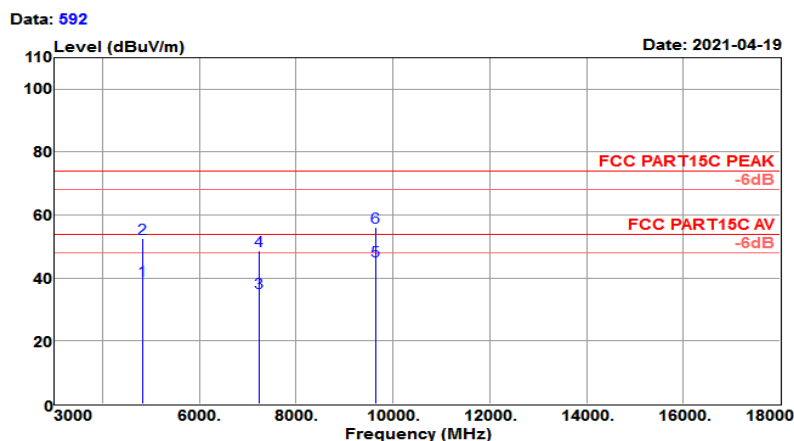
Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: VERTICAL
Test Mode	: 802.11g CH01(2412MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		



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	99.51	27.61	4.17	35.93	95.36	74.00	21.36	Peak

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

Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: VERTICAL
Test Mode	: 802.11g CH01(2412MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		

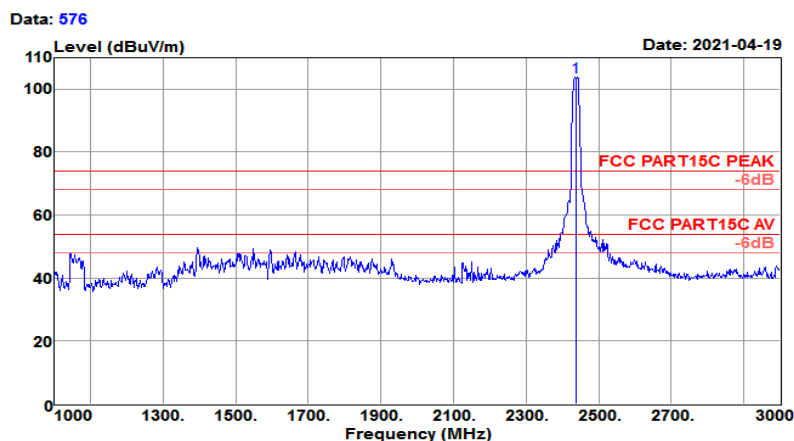


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4824.000	35.98	30.95	6.59	34.09	39.43	54.00	-14.57	Average
4824.000	49.22	30.95	6.59	34.09	52.67	74.00	-21.33	Peak
7236.000	25.46	35.47	8.71	34.41	35.23	54.00	-18.77	Average
7236.000	38.86	35.47	8.71	34.41	48.63	74.00	-25.37	Peak
9648.000	29.56	38.42	11.55	34.16	45.37	54.00	-8.63	Average
9648.000	40.35	38.42	11.55	34.16	56.16	74.00	-17.84	Peak

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

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

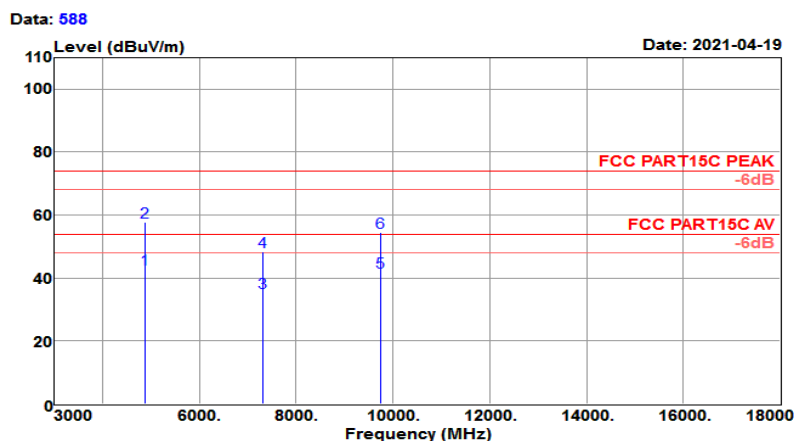
Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: 802.11g CH06(2437MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2437.000	108.13	27.66	4.18	35.99	103.98	74.00	29.98	Peak

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

Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: 802.11g CH06(2437MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		

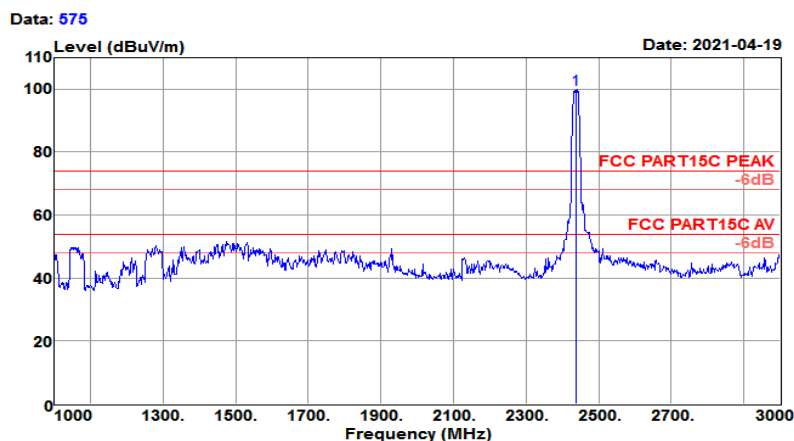


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4874.000	38.94	31.02	6.97	34.04	42.89	54.00	-11.11	Average
4874.000	53.87	31.02	6.97	34.04	57.82	74.00	-16.18	Peak
7311.000	25.40	35.65	8.95	34.48	35.52	54.00	-18.48	Average
7311.000	38.39	35.65	8.95	34.48	48.51	74.00	-25.49	Peak
9748.000	26.24	38.50	11.20	34.20	41.74	54.00	-12.26	Average
9748.000	38.93	38.50	11.20	34.20	54.43	74.00	-19.57	Peak

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

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

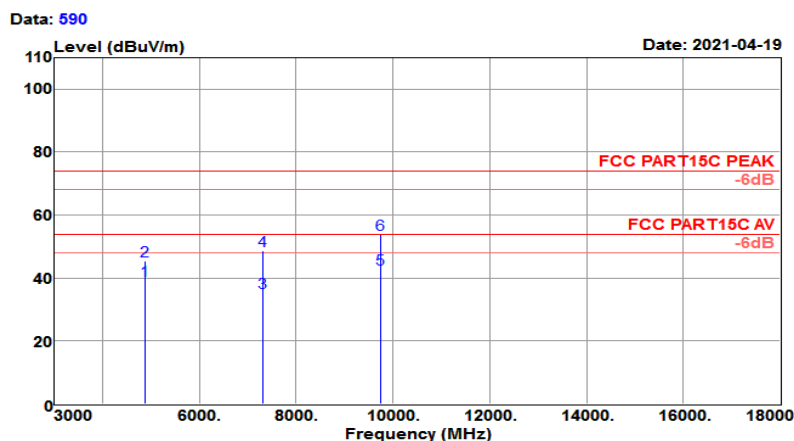
Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: VERTICAL
Test Mode	: 802.11g CH06(2437MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		



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	104.23	27.66	4.18	35.99	100.08	74.00	26.08	Peak

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

Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: VERTICAL
Test Mode	: 802.11g CH06(2437MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		

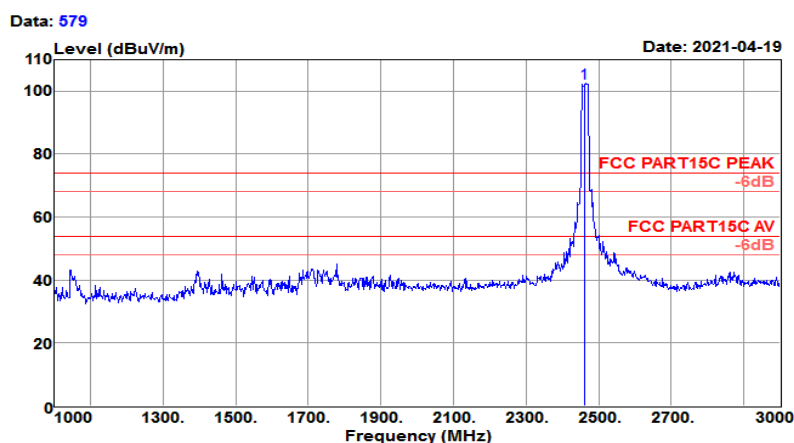


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4874.000	35.31	31.02	6.97	34.04	39.26	54.00	-14.74	Average
4874.000	41.52	31.02	6.97	34.04	45.47	74.00	-28.53	Peak
7311.000	25.38	35.65	8.95	34.48	35.50	54.00	-18.50	Average
7311.000	38.42	35.65	8.95	34.48	48.54	74.00	-25.46	Peak
9748.000	27.20	38.50	11.20	34.20	42.70	54.00	-11.30	Average
9748.000	38.33	38.50	11.20	34.20	53.83	74.00	-20.17	Peak

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

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

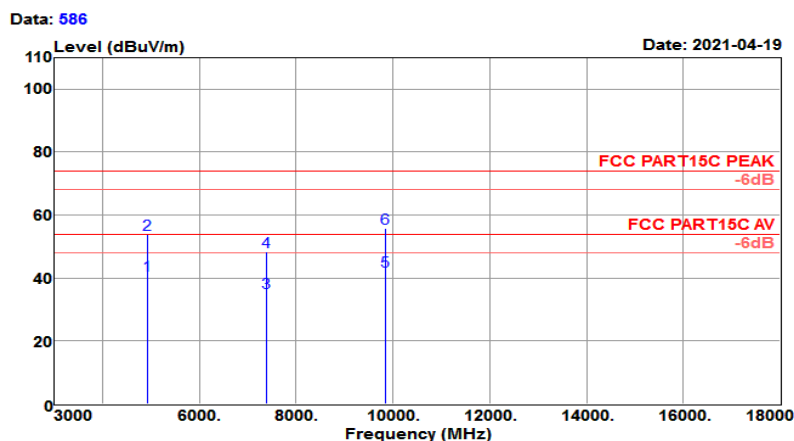
Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: 802.11g CH11(2462MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		



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	106.70	27.72	4.19	36.06	102.55	74.00	28.55	Peak

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

Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: 802.11g CH11(2462MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		

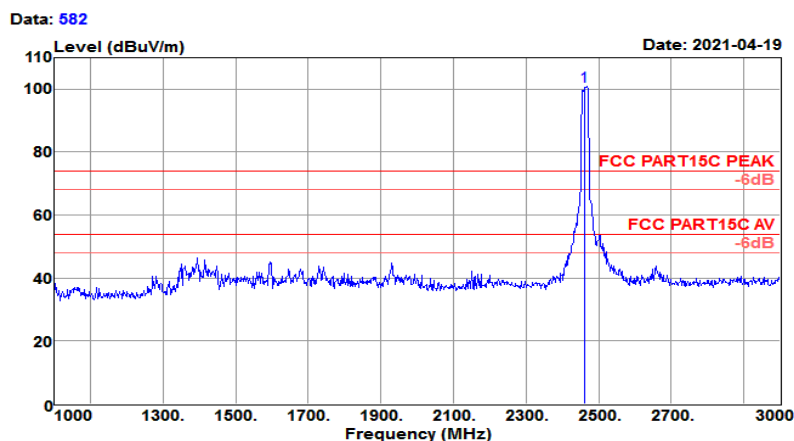


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4924.000	36.40	31.09	7.35	33.98	40.86	54.00	-13.14	Average
4924.000	49.57	31.09	7.35	33.98	54.03	74.00	-19.97	Peak
7386.000	24.92	35.83	9.19	34.55	35.39	54.00	-18.61	Average
7386.000	38.02	35.83	9.19	34.55	48.49	74.00	-25.51	Peak
9848.000	26.26	38.58	11.49	34.24	42.09	54.00	-11.91	Average
9848.000	40.04	38.58	11.49	34.24	55.87	74.00	-18.13	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 :	802.11g CH11 (2462MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Vertical

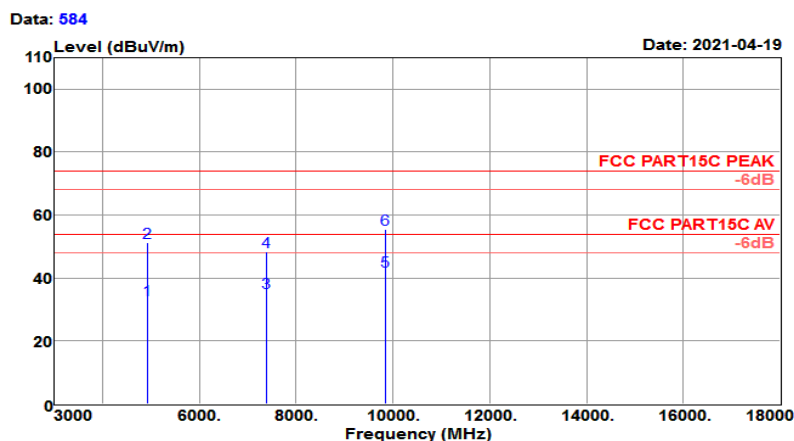
Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: VERTICAL
Test Mode	: 802.11g CH11(2462MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		



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	105.21	27.72	4.19	36.06	101.06	74.00	27.06	Peak

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

Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: VERTICAL
Test Mode	: 802.11g CH11(2462MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		

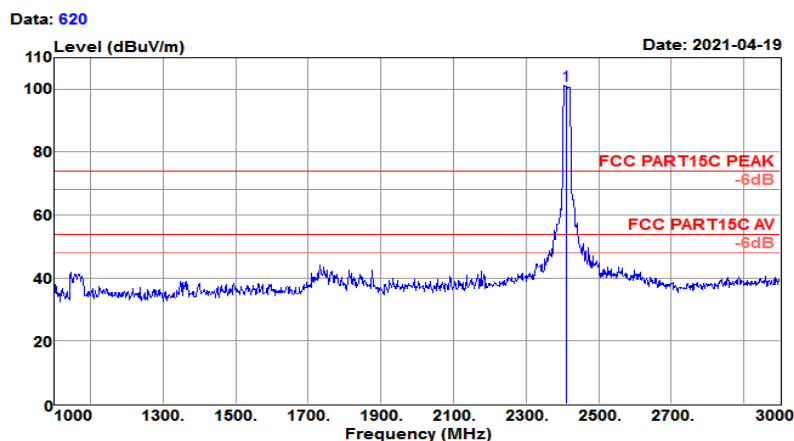


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4924.000	28.62	31.09	7.35	33.98	33.08	54.00	-20.92	Average
4924.000	46.96	31.09	7.35	33.98	51.42	74.00	-22.58	Peak
7386.000	24.95	35.83	9.19	34.55	35.42	54.00	-18.58	Average
7386.000	38.03	35.83	9.19	34.55	48.50	74.00	-25.50	Peak
9848.000	26.34	38.58	11.49	34.24	42.17	54.00	-11.83	Average
9848.000	39.68	38.58	11.49	34.24	55.51	74.00	-18.49	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 HT20 CH01 (2412 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Horizontal

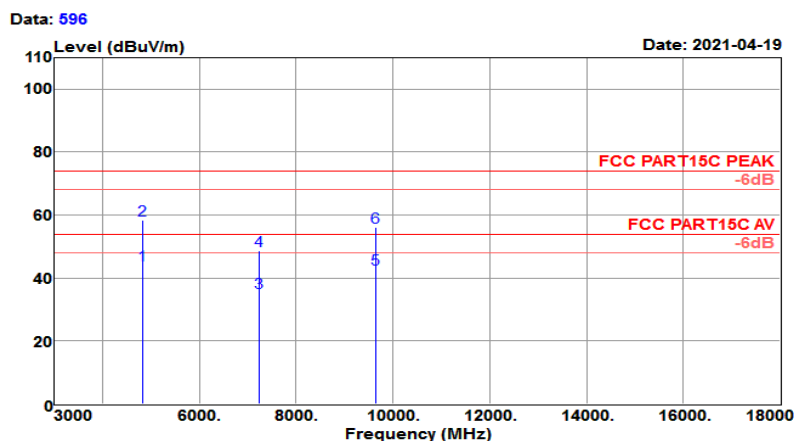
Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: 802.11N HT20 CH01(2412MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		



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	105.49	27.61	4.17	35.93	101.34	74.00	27.34	Peak

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

Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : HORIZONTAL
 Test Mode : 802.11N HT20 CH01(2412MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3

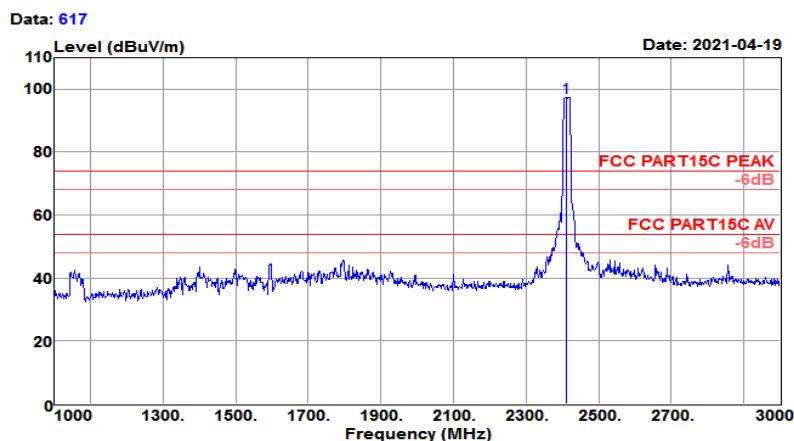


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4824.000	40.82	30.95	6.59	34.09	44.27	54.00	-9.73	Average
4824.000	54.87	30.95	6.59	34.09	58.32	74.00	-15.68	Peak
7236.000	25.50	35.47	8.71	34.41	35.27	54.00	-18.73	Average
7236.000	38.91	35.47	8.71	34.41	48.68	74.00	-25.32	Peak
9648.000	26.97	38.42	11.55	34.16	42.78	54.00	-11.22	Average
9648.000	40.26	38.42	11.55	34.16	56.07	74.00	-17.93	Peak

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

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

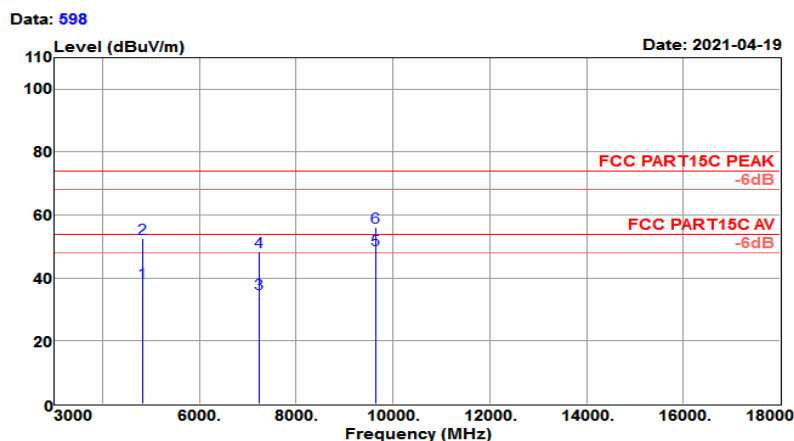
Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : VERTICAL
 Test Mode : 802.11N HT20 CH01(2412MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3



Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2412.000	101.63	27.61	4.17	35.93	97.48	74.00	23.48	Peak

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

Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : VERTICAL
 Test Mode : 802.11N HT20 CH01(2412MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3

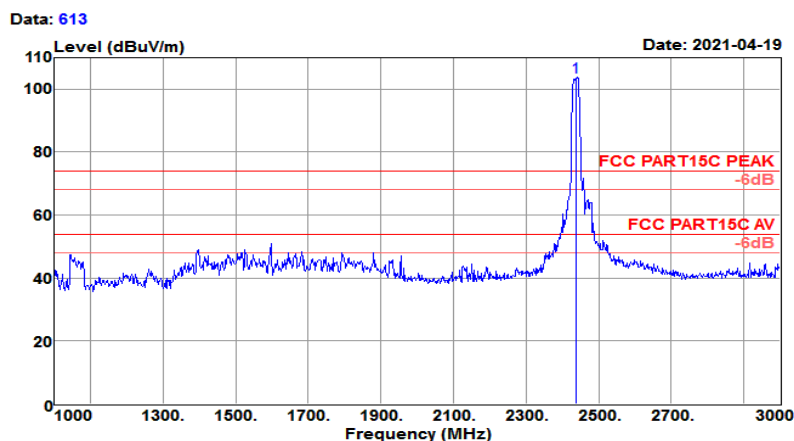


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4824.000	35.04	30.95	6.59	34.09	38.49	54.00	-15.51	Average
4824.000	49.08	30.95	6.59	34.09	52.53	74.00	-21.47	Peak
7236.000	25.45	35.47	8.71	34.41	35.22	54.00	-18.78	Average
7236.000	38.44	35.47	8.71	34.41	48.21	74.00	-25.79	Peak
9648.000	33.07	38.42	11.55	34.16	48.88	54.00	-5.12	Average
9648.000	40.42	38.42	11.55	34.16	56.23	74.00	-17.77	Peak

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

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

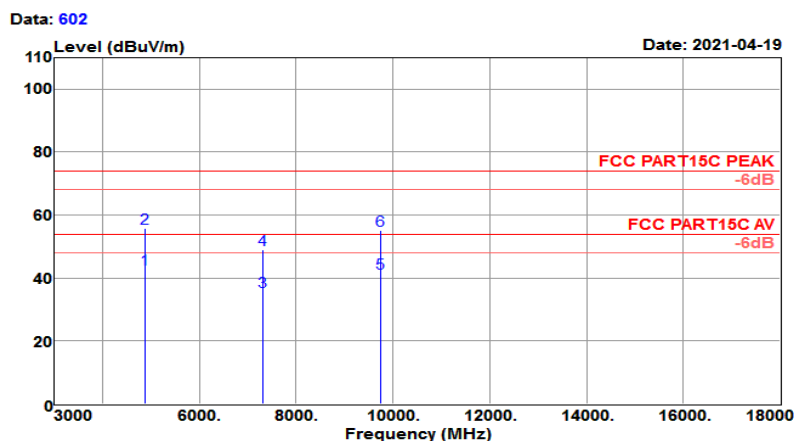
Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: 802.11N HT20 CH06(2437MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		



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	107.90	27.66	4.18	35.99	103.75	74.00	29.75	Peak

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

Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : HORIZONTAL
 Test Mode : 802.11N HT20 CH06(2437MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3

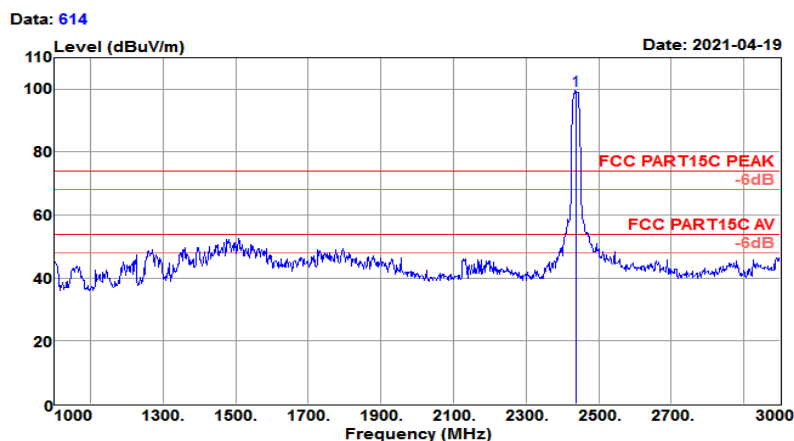


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4874.000	39.02	31.02	6.97	34.04	42.97	54.00	-11.03	Average
4874.000	51.81	31.02	6.97	34.04	55.76	74.00	-18.24	Peak
7311.000	25.46	35.65	8.95	34.48	35.58	54.00	-18.42	Average
7311.000	38.77	35.65	8.95	34.48	48.89	74.00	-25.11	Peak
9748.000	26.18	38.50	11.20	34.20	41.68	54.00	-12.32	Average
9748.000	39.81	38.50	11.20	34.20	55.31	74.00	-18.69	Peak

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

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

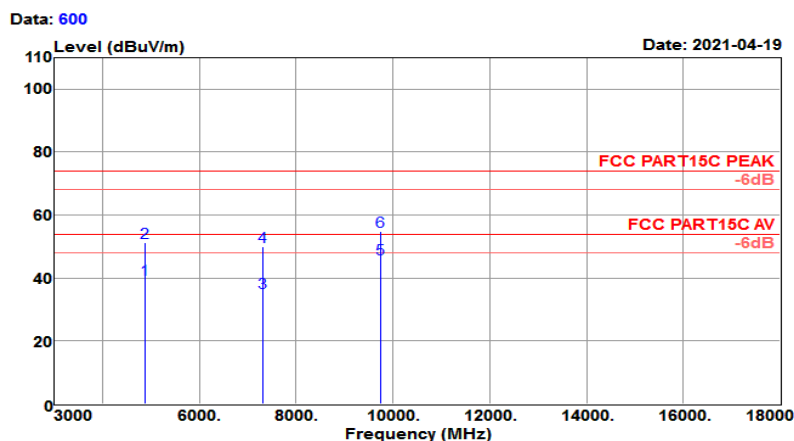
Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : VERTICAL
 Test Mode : 802.11N HT20 CH06(2437MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3



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	103.74	27.66	4.18	35.99	99.59	74.00	25.59	Peak

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

Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : VERTICAL
 Test Mode : 802.11N HT20 CH06(2437MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3

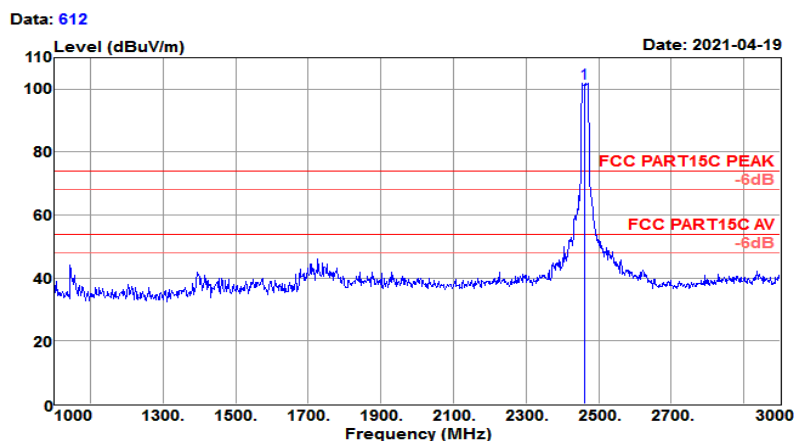


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4874.000	35.66	31.02	6.97	34.04	39.61	54.00	-14.39	Average
4874.000	47.42	31.02	6.97	34.04	51.37	74.00	-22.63	Peak
7311.000	25.38	35.65	8.95	34.48	35.50	54.00	-18.50	Average
7311.000	39.72	35.65	8.95	34.48	49.84	74.00	-24.16	Peak
9748.000	30.43	38.50	11.20	34.20	45.93	54.00	-8.07	Average
9748.000	39.40	38.50	11.20	34.20	54.90	74.00	-19.10	Peak

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

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

Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : HORIZONTAL
 Test Mode : 802.11N HT20 CH11(2462MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3

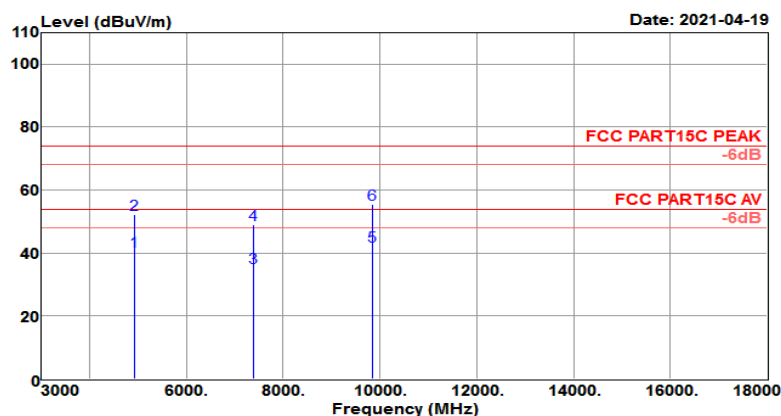


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
2462.000	106.09	27.72	4.19	36.06	101.94	74.00	27.94	Peak

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

Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : HORIZONTAL
 Test Mode : 802.11N HT20 CH11(2462MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3

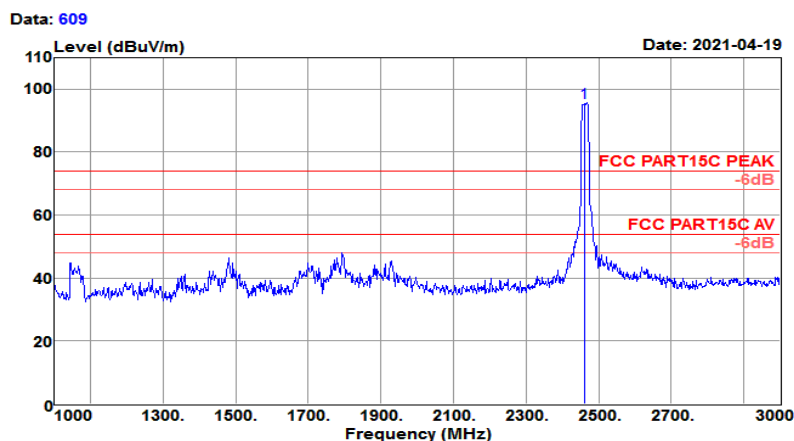
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Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4924.000	36.19	31.09	7.35	33.98	40.65	54.00	-13.35	Average
4924.000	47.69	31.09	7.35	33.98	52.15	74.00	-21.85	Peak
7386.000	25.01	35.83	9.19	34.55	35.48	54.00	-18.52	Average
7386.000	38.59	35.83	9.19	34.55	49.06	74.00	-24.94	Peak
9848.000	26.28	38.58	11.49	34.24	42.11	54.00	-11.89	Average
9848.000	39.59	38.58	11.49	34.24	55.42	74.00	-18.58	Peak

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

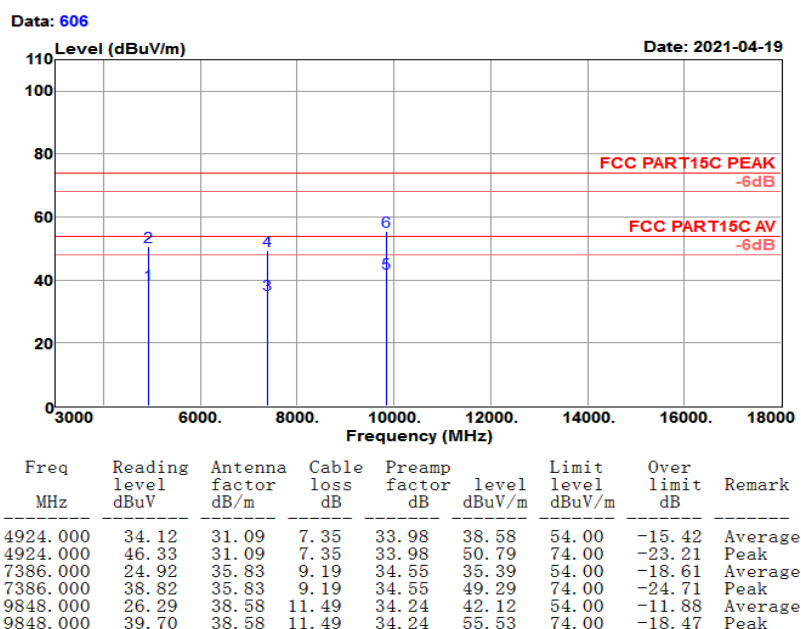
Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: VERTICAL
Test Mode	: 802.11N HT20 CH11(2462MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		



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	99.81	27.72	4.19	36.06	95.66	74.00	21.66	Peak

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

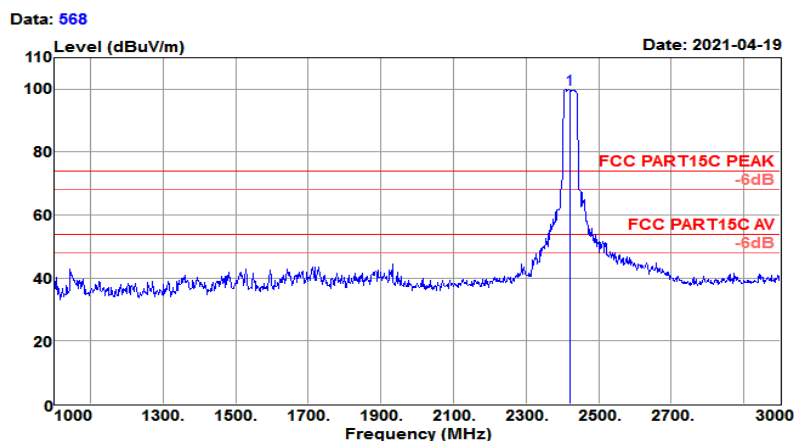
Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : VERTICAL
 Test Mode : 802.11N HT20 CH11(2462MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3



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%
Frequency Range	1GHz~3GHz	Polarization :	Horizontal

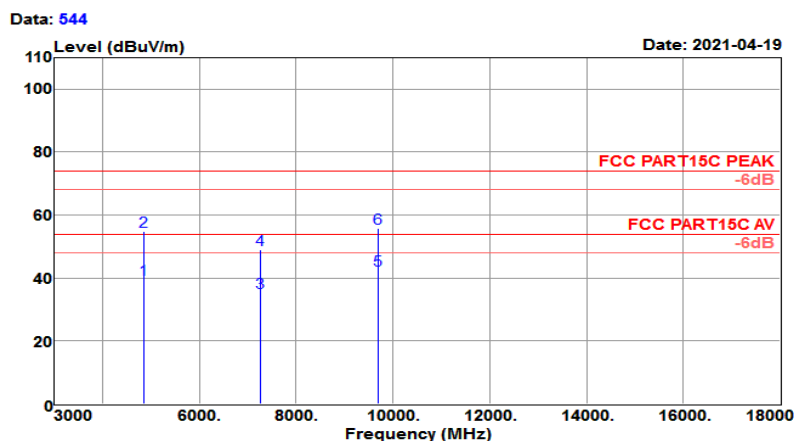
Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: 802.11N HT40 CH03(2422MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		



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	103.97	27.63	4.18	35.96	99.82	74.00	25.82	Peak

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

Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : HORIZONTAL
 Test Mode : 802.11N HT40 CH03(2422MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3

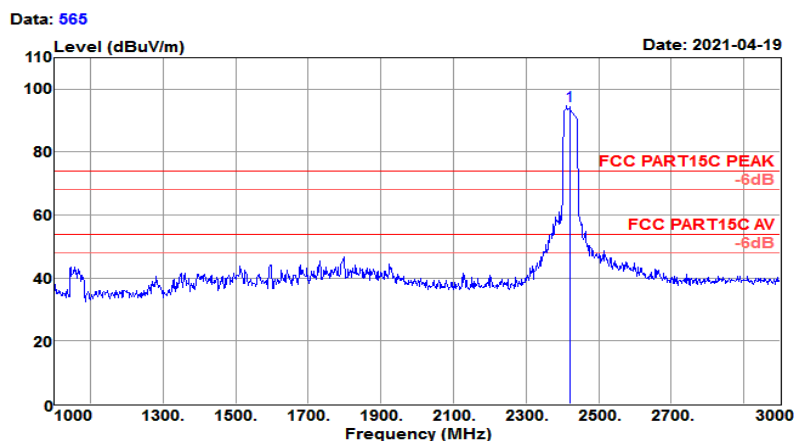


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4844.000	35.83	30.98	6.74	34.07	39.48	54.00	-14.52	Average
4844.000	51.32	30.98	6.74	34.07	54.97	74.00	-19.03	Peak
7266.000	25.58	35.54	8.80	34.44	35.48	54.00	-18.52	Average
7266.000	39.22	35.54	8.80	34.44	49.12	74.00	-24.88	Peak
9688.000	26.78	38.45	11.41	34.18	42.46	54.00	-11.54	Average
9688.000	40.14	38.45	11.41	34.18	55.82	74.00	-18.18	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%
Frequency Range	1GHz~3GHz	Polarization :	Vertical

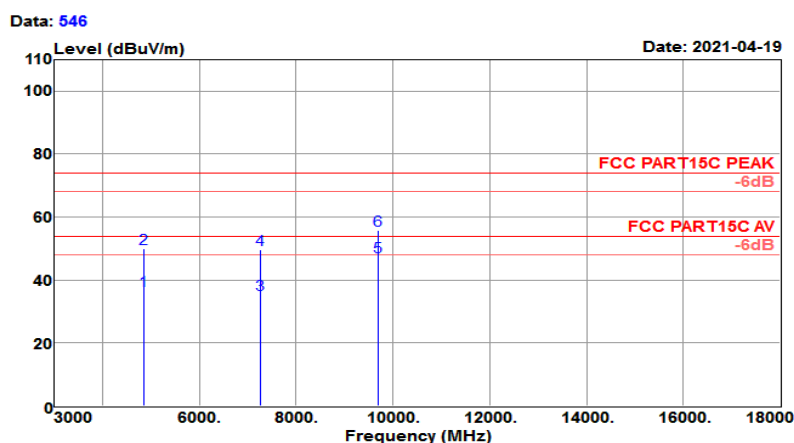
Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: VERTICAL
Test Mode	: 802.11N HT40 CH03(2422MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		



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	98.89	27.63	4.18	35.96	94.74	74.00	20.74	Peak

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

Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : VERTICAL
 Test Mode : 802.11N HT40 CH03(2422MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3

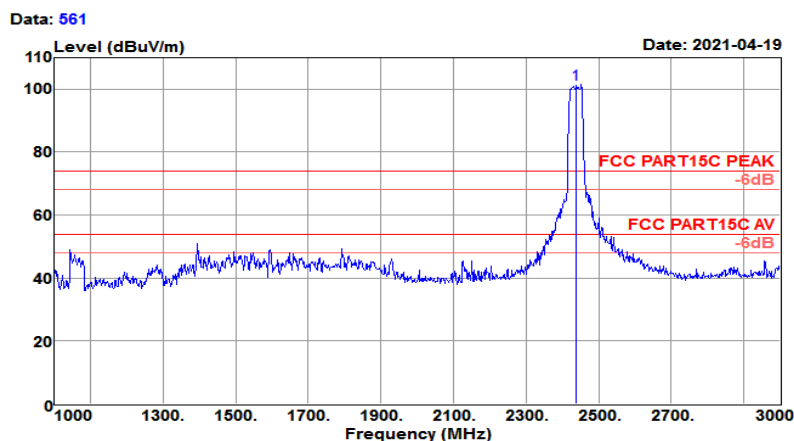


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4844.000	33.12	30.98	6.74	34.07	36.77	54.00	-17.23	Average
4844.000	46.25	30.98	6.74	34.07	49.90	74.00	-24.10	Peak
7266.000	25.60	35.54	8.80	34.44	35.50	54.00	-18.50	Average
7266.000	39.71	35.54	8.80	34.44	49.61	74.00	-24.39	Peak
9688.000	31.58	38.45	11.41	34.18	47.26	54.00	-6.74	Average
9688.000	40.05	38.45	11.41	34.18	55.73	74.00	-18.27	Peak

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

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

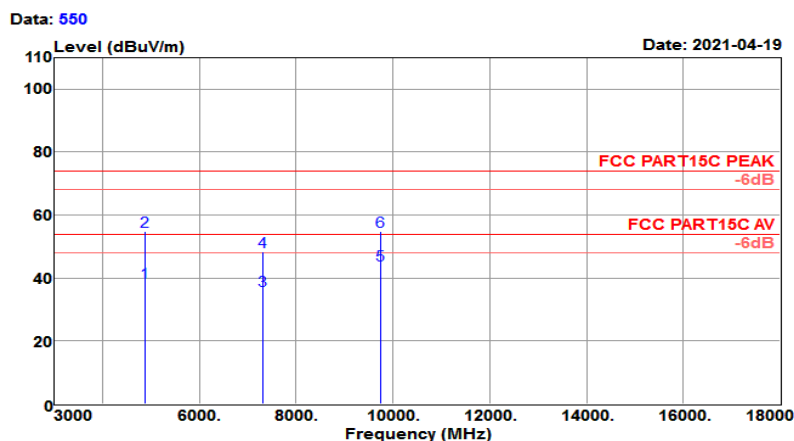
Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: 802.11N HT40 CH06(2437MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		



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	105.81	27.66	4.18	35.99	101.66	74.00	27.66	Peak

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

Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: 802.11N HT40 CH06(2437MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		

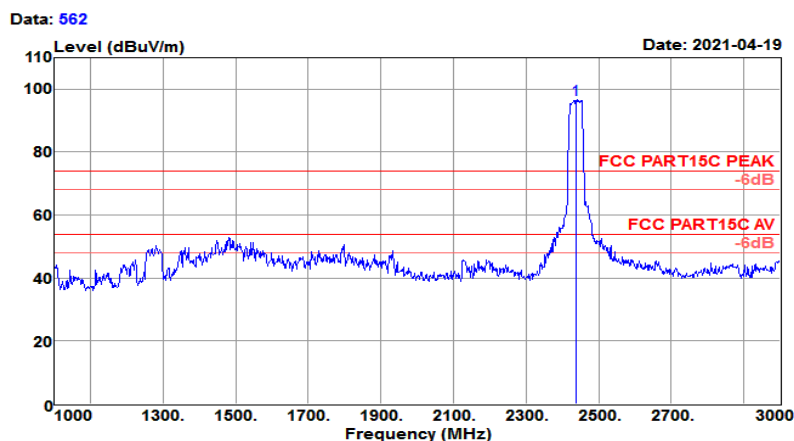


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4874.000	34.79	31.02	6.97	34.04	38.74	54.00	-15.26	Average
4874.000	50.79	31.02	6.97	34.04	54.74	74.00	-19.26	Peak
7311.000	25.91	35.65	8.95	34.48	36.03	54.00	-17.97	Average
7311.000	38.34	35.65	8.95	34.48	48.46	74.00	-25.54	Peak
9748.000	28.59	38.50	11.20	34.20	44.09	54.00	-9.91	Average
9748.000	39.43	38.50	11.20	34.20	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 :	802.11n HT40 CH06 (2437MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Vertical

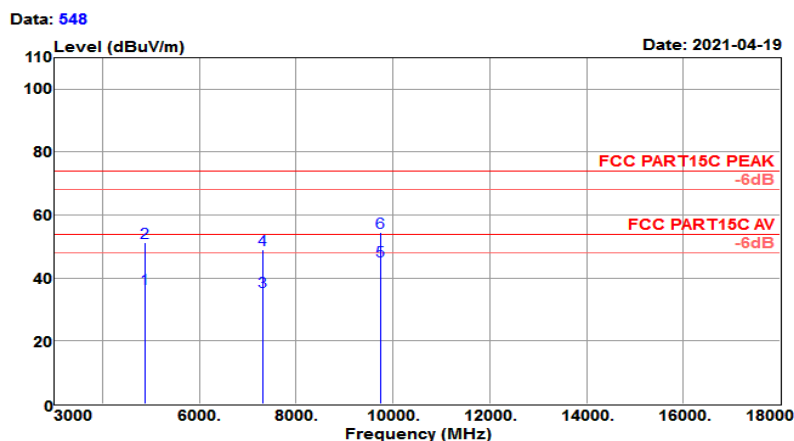
Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : VERTICAL
 Test Mode : 802.11N HT40 CH06(2437MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3



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	100.95	27.66	4.18	35.99	96.80	74.00	22.80	Peak

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

Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : VERTICAL
 Test Mode : 802.11N HT40 CH06(2437MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3

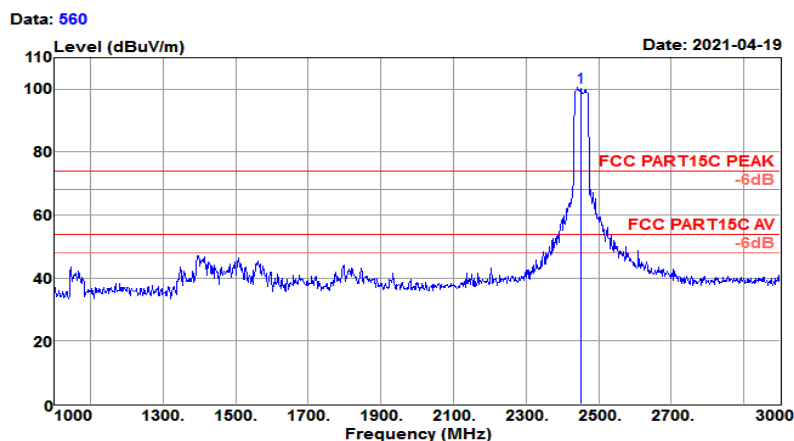


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4874.000	32.83	31.02	6.97	34.04	36.78	54.00	-17.22	Average
4874.000	47.40	31.02	6.97	34.04	51.35	74.00	-22.65	Peak
7311.000	25.66	35.65	8.95	34.48	35.78	54.00	-18.22	Average
7311.000	38.97	35.65	8.95	34.48	49.09	74.00	-24.91	Peak
9748.000	29.83	38.50	11.20	34.20	45.33	54.00	-8.67	Average
9748.000	39.07	38.50	11.20	34.20	54.57	74.00	-19.43	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 HT40 CH09(2452 MHz)	Temperature :	21~23℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	1GHz~3GHz	Polarization :	Horizontal

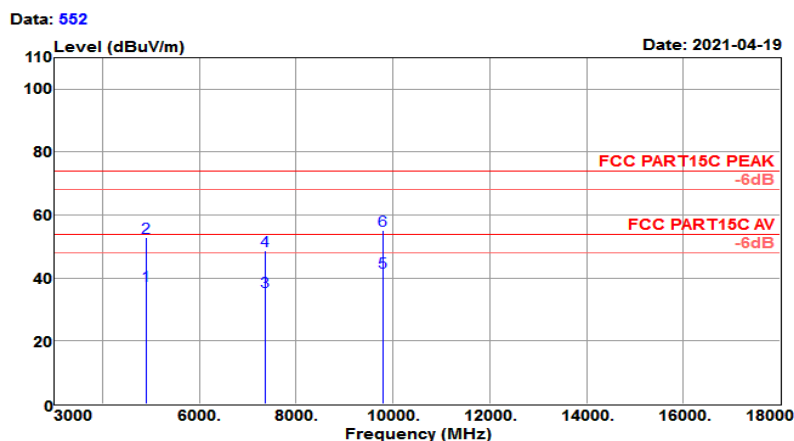
Test Site	: 3m Chamber	Temp/Humi	: 22℃/59%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: 802.11N HT40 CH09(2452MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		



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	104.63	27.69	4.18	36.03	100.47	74.00	26.47	Peak

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

Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : HORIZONTAL
 Test Mode : 802.11N HT40 CH09(2452MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3

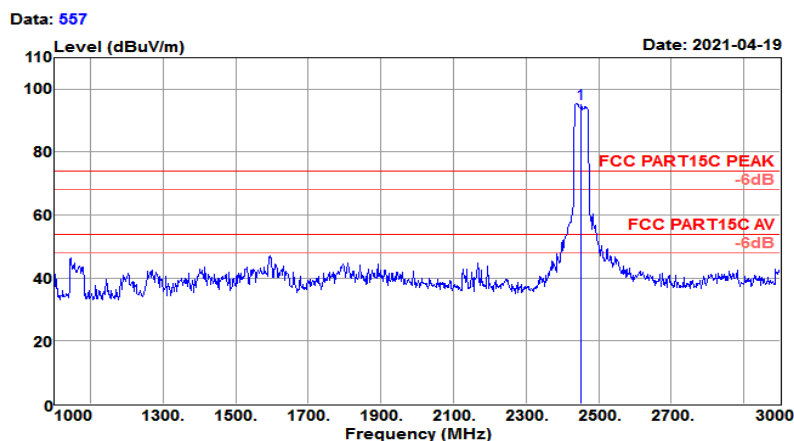


Freq MHz	Reading level dBuV	Antenna factor dB/m	Cable loss dB	Preamp factor dB	level dBuV/m	Limit level dBuV/m	Over limit dB	Remark
4904.000	33.44	31.07	7.20	34.01	37.70	54.00	-16.30	Average
4904.000	48.70	31.07	7.20	34.01	52.96	74.00	-21.04	Peak
7356.000	25.35	35.75	9.09	34.52	35.67	54.00	-18.33	Average
7356.000	38.34	35.75	9.09	34.52	48.66	74.00	-25.34	Peak
9808.000	26.34	38.55	11.10	34.22	41.77	54.00	-12.23	Average
9808.000	39.62	38.55	11.10	34.22	55.05	74.00	-18.95	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%
Frequency Range	1GHz~3GHz	Polarization :	Vertical

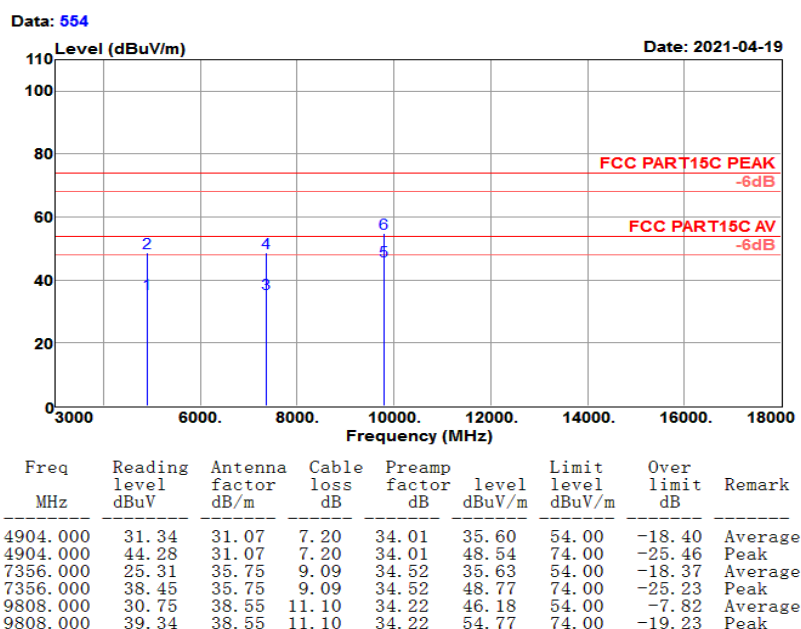
Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : VERTICAL
 Test Mode : 802.11N HT40 CH09(2452MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3



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	99.46	27.69	4.18	36.03	95.30	74.00	21.30	Peak

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

Test Site : 3m Chamber
 Temp/Humi : 22℃/59%
 Tested by : Jack
 Pol/Phase : VERTICAL
 Test Mode : 802.11N HT40 CH09(2452MHz)
 Power rating: DC 5V
 EUT : WIFI Module
 Model No. : F89FTSM13-W3



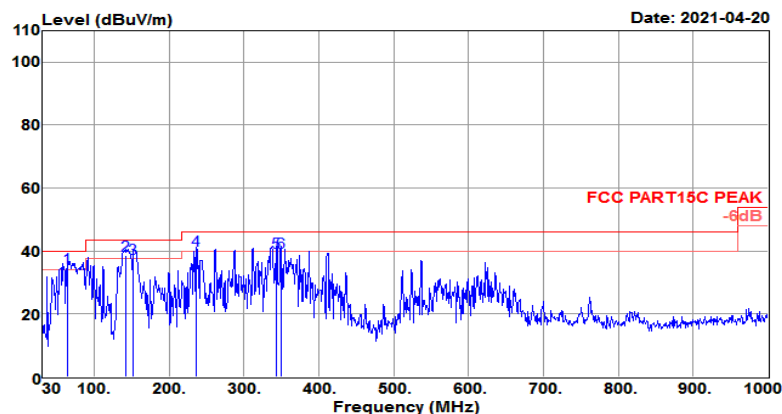
Note: Emission was scanned up to 26GHz; No emissions were detected above the noise floor which was at least 20dB below the specification limit.

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

Test Mode :	802.11b CH01 (2412 MHz)	Temperature :	21~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	30MHz~1GHz	Polarization :	Horizontal

Test Site	: 3m Chamber	Temp/Humi	: 25℃/64%
Tested by	: Jack	Pol/Phase	: HORIZONTAL
Test Mode	: 802.11b CH01(2412MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		

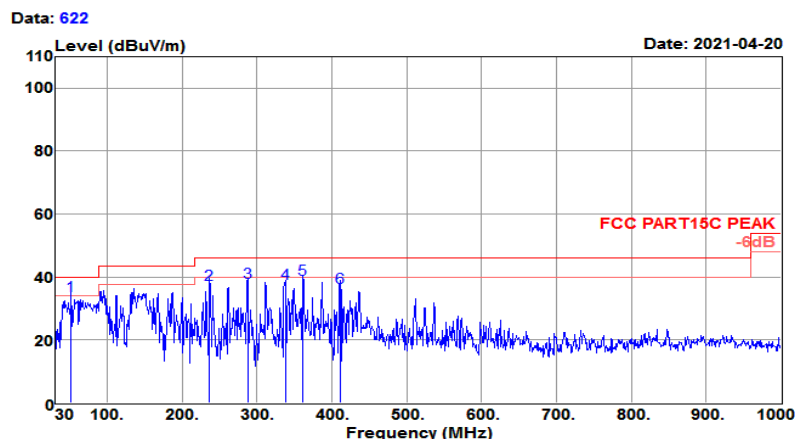
Data: 621



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
63.950	52.13	13.77	1.33	32.57	34.66	40.00	-5.34	QP
141.550	55.31	13.74	2.02	32.54	38.53	43.50	-4.97	QP
152.220	53.78	14.22	2.12	32.55	37.57	43.50	-5.93	QP
236.610	58.51	11.61	2.70	32.60	40.22	46.00	-5.78	QP
343.310	55.03	13.92	3.24	32.64	39.55	46.00	-6.45	QP
349.130	55.02	14.00	3.27	32.65	39.64	46.00	-6.36	QP

Test Mode :	802.11b CH01 (2412 MHz)	Temperature :	21~25℃
Test Engineer :	Jack Liu	Relative Humidity :	63~65%
Frequency Range	30MHz~1GHz	Polarization :	Vertical

Test Site	: 3m Chamber	Temp/Humi	: 25℃/64%
Tested by	: Jack	Pol/Phase	: VERTICAL
Test Mode	: 802.11b CH01(2412MHz)	Power rating:	DC 5V
EUT	: WIFI Module		
Model No.	: F89FTSM13-W3		



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
51.340	50.43	14.95	1.18	32.60	33.96	40.00	-6.04	QP
236.610	55.84	11.61	2.70	32.60	37.55	46.00	-8.45	QP
287.050	55.19	12.91	2.96	32.60	38.46	46.00	-7.54	QP
337.490	53.71	13.82	3.20	32.64	38.09	46.00	-7.91	QP
360.770	54.28	14.26	3.35	32.66	39.23	46.00	-6.77	QP
411.210	50.67	15.24	3.59	32.71	36.79	46.00	-9.21	QP

4.2 AC Conducted Emission Measurement

4.2.1 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 (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

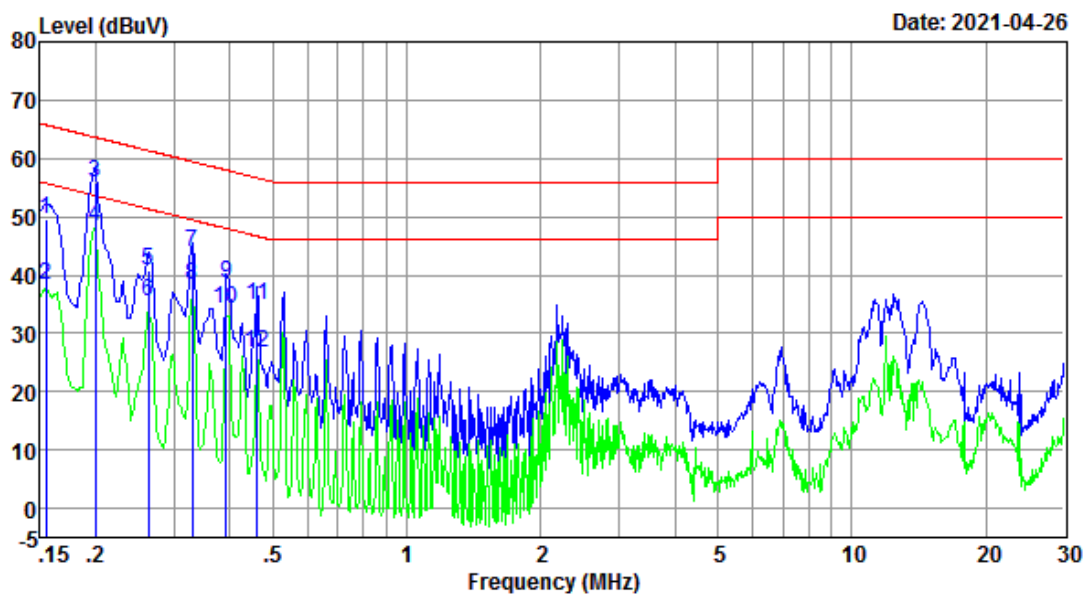
*Decreases with the logarithm of the frequency.

4.2.2 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.

4.2.3 Test Result of AC Conducted Emission

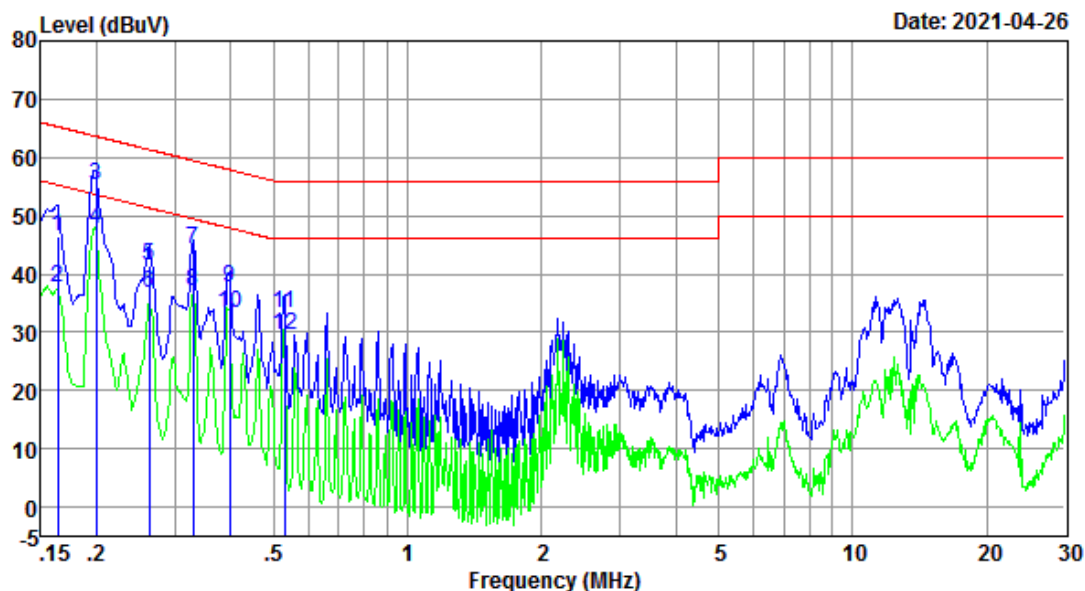
Test Mode :	Mode 1	Temperature :	20℃
Test Engineer :	Jack Liu	Relative Humidity :	64%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN Linking		



Freq MHz	Reading level dBuV	LISN/ISN factor dB	Cable loss dB	Result level dBuV	Limit level dBuV	Over limit dB	Remark
0.155	40.10	9.55	0.01	49.66	65.74	-16.08	QP
0.155	28.60	9.55	0.01	38.16	55.74	-17.58	Average
0.200	46.30	9.56	0.01	55.87	63.62	-7.75	QP
0.200	38.60	9.56	0.01	48.17	53.62	-5.45	Average
0.263	31.20	9.56	0.01	40.77	61.34	-20.57	QP
0.263	26.00	9.56	0.01	35.57	51.34	-15.77	Average
0.330	34.50	9.57	0.01	44.08	59.44	-15.36	QP
0.330	28.80	9.57	0.01	38.38	49.44	-11.06	Average
0.393	28.90	9.57	0.01	38.48	57.99	-19.51	QP
0.393	24.60	9.57	0.01	34.18	47.99	-13.81	Average
0.461	25.40	9.58	0.01	34.99	56.67	-21.68	QP
0.461	17.20	9.58	0.01	26.79	46.67	-19.88	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		



Freq MHz	Reading level dBuV	LISN/ISN factor dB	Cable loss dB	Result level dBuV	Limit level dBuV	Over limit dB	Remark
0.163	36.80	9.55	0.01	46.36	65.30	-18.94	QP
0.163	28.00	9.55	0.01	37.56	55.30	-17.74	Average
0.200	45.80	9.55	0.01	55.36	63.62	-8.26	QP
0.200	38.10	9.55	0.01	47.66	53.62	-5.96	Average
0.263	31.70	9.56	0.01	41.27	61.34	-20.07	QP
0.263	27.00	9.56	0.01	36.57	51.34	-14.77	Average
0.330	34.70	9.57	0.01	44.28	59.44	-15.16	QP
0.330	27.60	9.57	0.01	37.18	49.44	-12.26	Average
0.398	28.10	9.57	0.01	37.68	57.90	-20.22	QP
0.398	23.80	9.57	0.01	33.38	47.90	-14.52	Average
0.529	23.80	9.57	0.01	33.38	56.00	-22.62	QP
0.529	19.90	9.57	0.01	29.48	46.00	-16.52	Average

Result Level= Reading Level + LISN Factor + Cable Loss

4.3 Antenna Requirements

4.3.1 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.

4.3.2 Antenna Connected Construction

An PCB Antenna type design is used.

4.3.3 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	2021-01-05	2022-01-04	Conducted
Power Sensor	Keysight	U2021XA	MY56510025	2021-01-05	2022-01-04	Conducted
Power Sensor	Keysight	U2021XA	MY57030005	2021-01-05	2022-01-04	Conducted
Power Sensor	Keysight	U2021XA	MY56510018	2021-01-05	2022-01-04	Conducted
Power Sensor	Keysight	U2021XA	MY56480002	2021-01-05	2022-01-04	Conducted
Thermal Chamber	Howkin	UHL-34	19111801	2020-05-09	2021-05-08	Conducted
Base Station	R&S	CMW 270	101231	2021-01-05	2022-01-04	Conducted
Signal Generator (Interferer)	Keysight	N5182B	MY56200384	2021-01-05	2022-01-04	Conducted
Signal Generator (Blocker)	Keysight	N5171B	MY56200661	2021-01-05	2022-01-04	Conducted

Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV 40	101433	2021-01-05	2022-01-04	Radiation
Amplifier	Sonoma	310	363917	2021-01-06	2022-01-05	Radiation
Amplifier	Schwarzbeck	BBV 9718	327	2021-01-06	2022-01-05	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	2020-09-27	2023-09-26	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	Audix	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	2021-01-05	2022-01-04	Conducted
LISN	R&S	ENV432	101327	2021-01-06	2022-01-05	Conducted
EMI Test Receiver	R&S	ESR3	102143	2021-01-06	2022-01-05	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	±196.4Hz
RF output power, conducted	±2.31dB
Power density, conducted	±2.31dB

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