



RF TEST REPORT

Applicant Huawei Device Co., Ltd.
FCC ID 2ATEYWS5200V3
Product 1300Mbps Wireless Router
Model WS5200 V3
Report No. R2102A0160-R3V4
Issue Date April 6, 2021

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 15E (2019)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Prepared by: Peng Tao

Approved by: Kai Xu

TA Technology (Shanghai) Co., Ltd.

No.145, Jintang Rd, Tangzhen Industry Park, Pudong Shanghai, China

TEL: +86-021-50791141/2/3

FAX: +86-021-50791141/2/3-8000



TABLE OF CONTENT

1. Test Laboratory.....	5
1.1. Notes of the test report.....	5
1.2. Test facility.....	5
1.3. Testing Location.....	5
2. General Description of Equipment under Test.....	6
2.1. Applicant and Manufacturer Information.....	6
2.2. General information.....	6
3. Applied Standards.....	8
4. Test Configuration.....	9
5. Test Case Results.....	11
5.1. Occupied Bandwidth.....	11
5.2. Average Power Output.....	21
5.3. Frequency Stability.....	30
5.4. Power Spectral Density.....	33
5.5. Unwanted Emission.....	73
5.6. Conducted Emission.....	149
6. Main Test Instruments.....	152
ANNEX A: The EUT Appearance.....	153
ANNEX B: Test Setup Photos.....	154



Version	Revision description	Issue Date
Rev.0	Initial issue of report.	April 1, 2021
Rev.1	Update data.	April 2, 2021
Rev.2	Update data.	April 3, 2021
Rev.3	Update data.	April 6, 2021
Rev.4	Update data.	April 6, 2021
Note: This revised report (Report No. R2102A0160-R3V4) supersedes and replaces the previously issued report (Report No. R2102A0160-R3V3). Please discard or destroy the previously issued report and dispose of it accordingly.		



Summary of measurement results

Number	Test Case	Clause in FCC rules	Verdict
1	Average output power	15.407(a)	PASS
2	Occupied bandwidth	15.407(e)	PASS
3	Frequency stability	15.407(g)	PASS
4	Power spectral density	15.407(a)	PASS
5	Unwanted Emissions	15.407(b)	PASS
6	Conducted Emissions	15.207	PASS
Date of Testing: March 6, 2021~ March 31, 2021			
Date of Sample Received: February 25, 2021			
Note: PASS: The EUT complies with the essential requirements in the standard. FAIL: The EUT does not comply with the essential requirements in the standard. All indications of Pass/Fail in this report are opinions expressed by TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.			



1. Test Laboratory

1.1. Notes of the test report

This report shall not be reproduced in full or partial, without the written approval of **TA technology (shanghai) co., Ltd.** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. Measurement Uncertainties were not taken into account and are published for informational purposes only. This report is written to support regulatory compliance of the applicable standards stated above.

1.2. Test facility

FCC (Designation number: CN1179, Test Firm Registration Number: 446626)

TA Technology (Shanghai) Co., Ltd. has been listed on the US Federal Communications Commission list of test facilities recognized to perform electromagnetic emissions measurements.

A2LA (Certificate Number: 3857.01)

TA Technology (Shanghai) Co., Ltd. has been listed by American Association for Laboratory Accreditation to perform electromagnetic emission measurement.

1.3. Testing Location

Company: TA Technology (Shanghai) Co., Ltd.
Address: No.145, Jintang Rd, Tangzhen Industry Park, Pudong
City: Shanghai
Post code: 201201
Country: P. R. China
Contact: Xu Kai
Telephone: +86-021-50791141/2/3
Fax: +86-021-50791141/2/3-8000
Website: <http://www.ta-shanghai.com>
E-mail: xukai@ta-shanghai.com

2. General Description of Equipment under Test

2.1. Applicant and Manufacturer Information

Applicant	Huawei Device Co., Ltd.
Applicant address	No.2 of Xincheng Road, Songshan Lake Zone, Dongguan, Guangdong 523808, People's Republic of China
Manufacturer	Huawei Device Co., Ltd.
Manufacturer address	No.2 of Xincheng Road, Songshan Lake Zone, Dongguan, Guangdong 523808, People's Republic of China

2.2. General information

EUT Description			
Model		WS5200 V3	
SN		7DNQU21108000199	
Hardware Version		AM1WS520023M	
Software Version		11.0.3.5	
Power Supply		AC adapter	
Antenna Type		External Antenna	
Antenna Gain		Antenna 1: 5.5 dBi Antenna 2: 5.5 dBi	
Directional Gain		Power Direction Gain: 5.5dBi PSD Direction Gain:8.51dBi	
Beamforming Gain		0.1dBi	
Test Band		U-NII-1(5150MHz-5250MHz) U-NII-3(5725MHz-5850MHz)	
Modulation Type		802.11a/n (HT20/HT40) : OFDM 802.11ac (VHT20/VHT40/VHT80): OFDM	
Max. Power Output		25.42dBm	
Operating Frequency Range(s)		U-NII-1: 5150MHz-5250MHz U-NII-3: 5725MHz -5850MHz	
Extreme temperature range:		-20 ° C to 50° C	
Operating temperature range:		0 ° C to 40° C	
Operating voltage range:		11.4 V to 12.6 V	
State AC voltage:		12V	
EUT Accessory			
Accessory	Model	Manufacture	No.
Adapter	HW-120100U01	Dongguan Shilong Fuhua Electronic Co., Ltd.	1



	HW-120100E01	SHENZHEN HONOR ELECTRONIC CO., LTD	2
		Dongguan Shilong Fuhua Electronic Co., Ltd.	3
	HW-120100B01	SHENZHEN HONOR ELECTRONIC CO., LTD	4
		Dongguan Shilong Fuhua Electronic Co., Ltd.	5
		SHENZHEN HONOR ELECTRONIC CO., LTD	6

Note: 1. The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant.

2. There are more than one Adapter each one should be applied throughout the compliance test respectively, however, only the worst case (Adapter 1) will be recorded in this report.



3. Applied Standards

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

Test standards:

FCC CFR47 Part 15E (2019) Unlicensed National Information Infrastructure Devices

ANSI C63.10 (2013)

Reference standard:

KDB 789033 D02 General UNII Test Procedures New Rules v02r01

KDB 662911 D01 Multiple Transmitter Output v02r01

4. Test Configuration

Test Mode

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

The radiated emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in stand-up position (Z axis) and the worst case was recorded.

In order to find the worst case condition, Pre-tests are needed at the presence of different data rate. Preliminary tests have been done on all the configuration for confirming worst case. Data rate below means worst-case rate of each test item.

Worst-case data rates are shown as following table.

Mode	Data Rate		
	Antenna 1	Antenna 2	MIMO
802.11a	6 Mbps	6 Mbps	MCS0
802.11n HT20	MCS0	MCS0	MCS0
802.11n HT40	MCS0	MCS0	MCS0
802.11ac VHT20	MCS0	MCS0	MCS0
802.11ac VHT40	MCS0	MCS0	MCS0
802.11ac VHT80	MCS0	MCS0	MCS0

The worst case Antenna mode for each of the following tests for Wi-Fi:

Test Cases	Antenna 1	Antenna 2	MIMO
Average conducted output power	O	O	O
Occupied bandwidth	--	--	O
Frequency stability	--	--	O
Power Spectral Density	O	O	O
Unwanted Emissions	--	--	O
Conducted Emissions	--	--	O
Note: "O": test all bands			

According to RF Output power results in chapter 5.1, MIMO was selected as the worst antenna. SISO Antenna 2 was selected as the worst SISO antenna.

**Wireless Technology and Frequency Range**

Wireless Technology		Bandwidth	Channel	Frequency
Wi-Fi	U-NII-1	20 MHz	36	5180MHz
			40	5200MHz
			44	5220MHz
			48	5240MHz
		40 MHz	38	5190MHz
			46	5230MHz
		80 MHz	42	5210MHz
	U-NII-3	20 MHz	149	5745MHz
			153	5765MHz
			157	5785MHz
			161	5805MHz
			165	5825MHz
		40 MHz	151	5755MHz
			159	5795MHz
		80 MHz	155	5775MHz
Does this device support TPC Function? ☒ Yes ☐ No				

5. Test Case Results

5.1. Occupied Bandwidth

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The EUT was connected to the spectrum analyzer through an external attenuator (20dB) and a known loss cable.

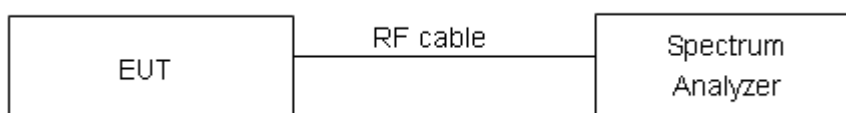
For U-NII-1/U-NII-2A/U-NII-2C, set RBW $\approx$ 1% OCB kHz, VBW $\geq 3 \times$ RBW, measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 26 dB relative to the maximum level measured in the fundamental emission.

For U-NII-3, Set RBW = 100 kHz, VBW $\geq 3 \times$ RBW, measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described above.

Use the 99 % power bandwidth function of the instrument

Test Setup



Limits

Rule FCC Part §15.407(e)

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 936$ Hz.

**Test Results:****U-NII-1**

Mode	Carrier frequency (MHz)	99% bandwidth (MHz)	Minimum 26 dB bandwidth (MHz)	Conclusion
802.11a	5180	16.471	19.16	PASS
	5200	16.463	19.10	PASS
	5220	16.474	19.30	PASS
	5240	16.451	19.18	PASS
802.11n HT20	5180	17.578	19.79	PASS
	5200	17.549	19.72	PASS
	5220	17.559	19.73	PASS
	5240	17.563	19.65	PASS
802.11n HT40	5190	35.741	38.41	PASS
	5230	35.890	39.11	PASS
802.11ac VHT20	5180	17.575	19.68	PASS
	5200	17.544	19.61	PASS
	5220	17.590	20.06	PASS
	5240	17.585	20.00	PASS
802.11ac VHT40	5190	35.741	38.84	PASS
	5230	35.867	38.81	PASS
802.11ac VHT80	5210	75.180	80.24	PASS

U-NII-3

Mode	Carrier frequency (MHz)	99% bandwidth (MHz)	Minimum 6 dB bandwidth (MHz)	Limit (kHz)	Conclusion
802.11a	5745	16.512	16.33	500	PASS
	5785	16.549	16.31	500	PASS
	5825	16.558	16.31	500	PASS
802.11n HT20	5745	17.623	17.56	500	PASS
	5785	17.640	17.14	500	PASS
	5825	17.625	16.92	500	PASS
802.11n HT40	5755	35.906	33.79	500	PASS
	5795	36.273	34.15	500	PASS
802.11ac VHT20	5745	17.644	17.58	500	PASS
	5785	17.635	17.16	500	PASS
	5825	17.593	17.54	500	PASS
802.11ac VHT40	5755	36.914	34.80	500	PASS
	5795	36.414	34.29	500	PASS
802.11ac VHT80	5775	72.257	72.83	500	PASS



U-NII-1, 802.11a
Carrier frequency (MHz): 5180



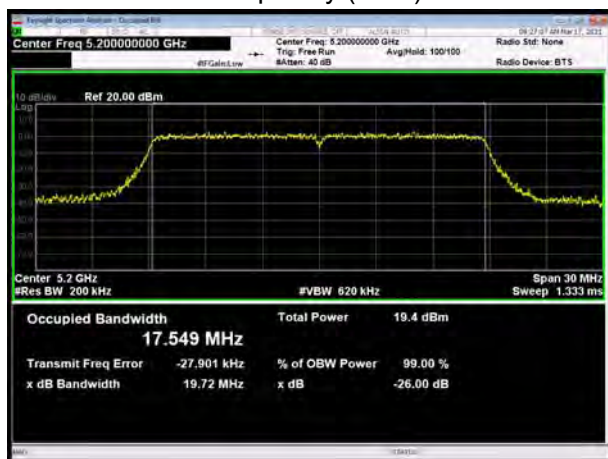
U-NII-1, 802.11n HT20
Carrier frequency (MHz): 5180



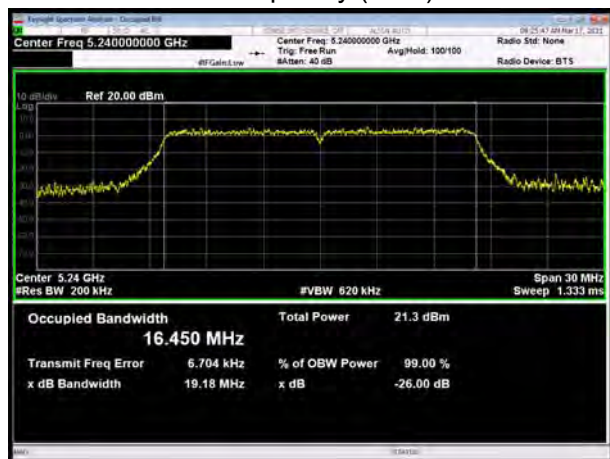
U-NII-1, 802.11a
Carrier frequency (MHz): 5200



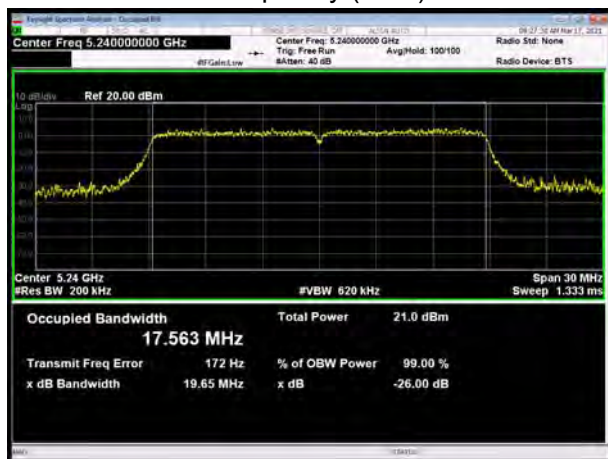
U-NII-1, 802.11n HT20
Carrier frequency (MHz): 5200



U-NII-1, 802.11a
Carrier frequency (MHz): 5240



U-NII-1, 802.11n HT20
Carrier frequency (MHz): 5240



U-NII-1, 802.11a
Carrier frequency (MHz):5220



U-NII-1, 802.11n HT20
Carrier frequency (MHz):5220



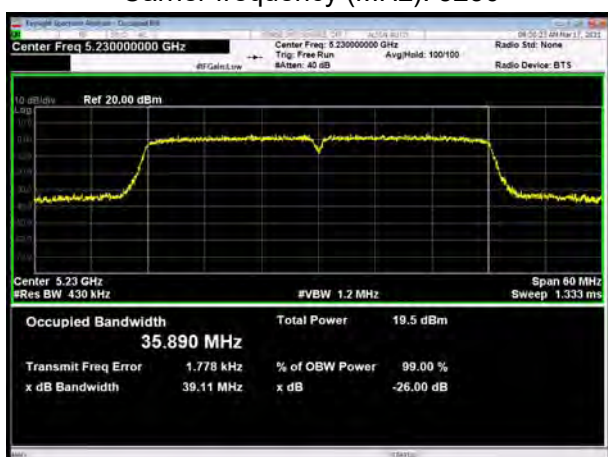
U-NII-1, 802.11n HT40
Carrier frequency (MHz): 5190



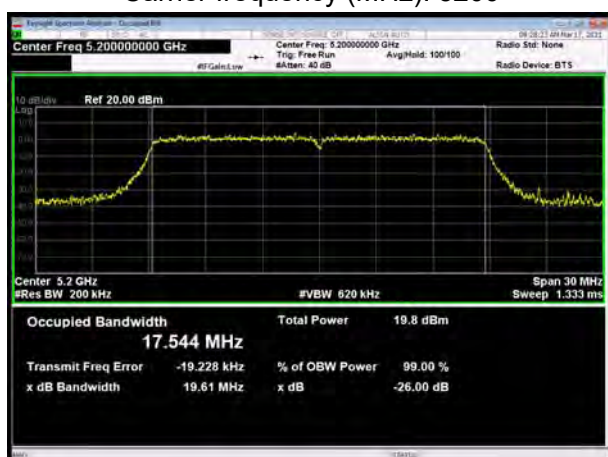
U-NII-1, 802.11ac VHT20
Carrier frequency (MHz): 5180



U-NII-1, 802.11n HT40
Carrier frequency (MHz): 5230



U-NII-1, 802.11ac VHT20
Carrier frequency (MHz): 5200





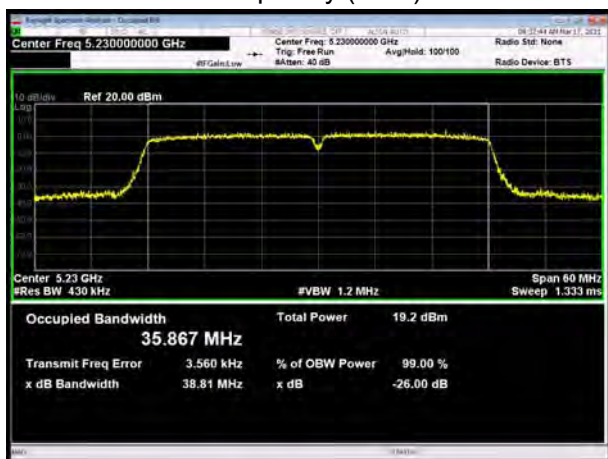
U-NII-1, 802.11ac VHT40
Carrier frequency (MHz): 5190



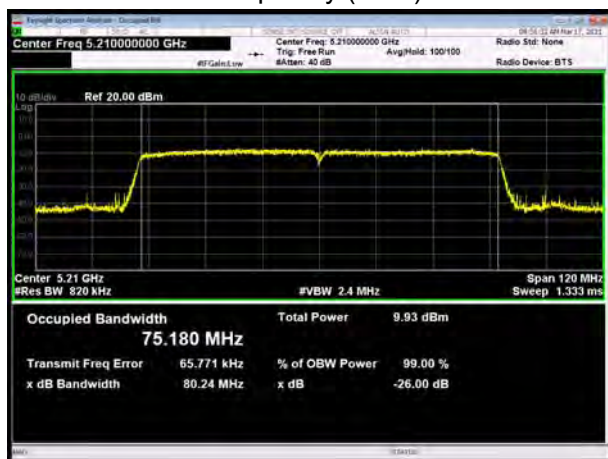
U-NII-1, 802.11ac VHT20
Carrier frequency (MHz): 5240



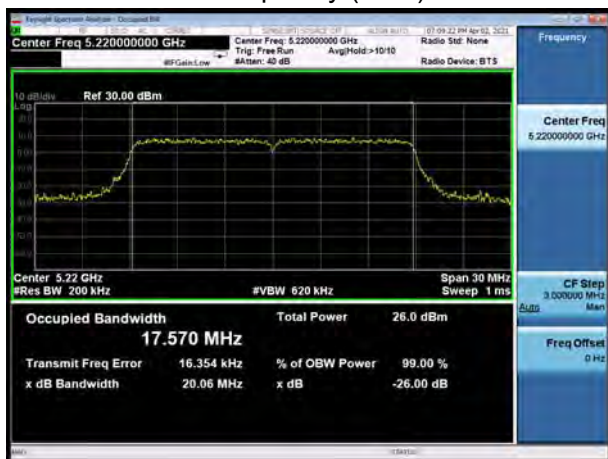
U-NII-1, 802.11ac VHT40
Carrier frequency (MHz): 5230



U-NII-1, 802.11ac VHT80
Carrier frequency (MHz): 5210

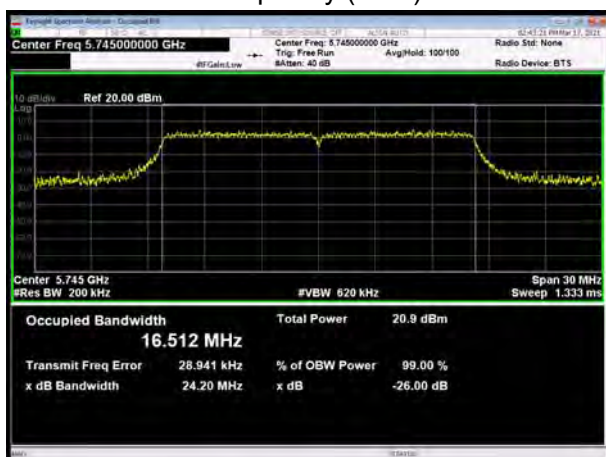
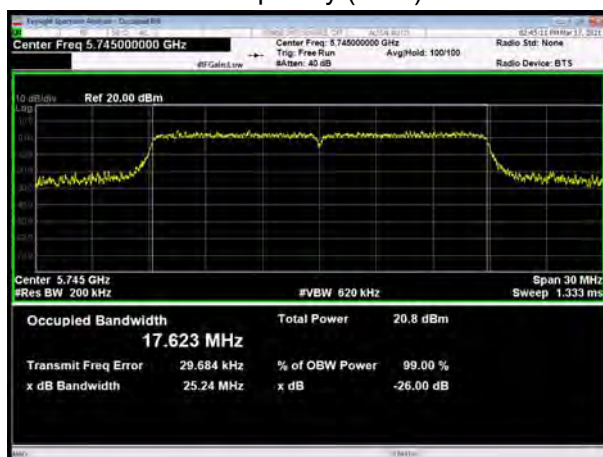
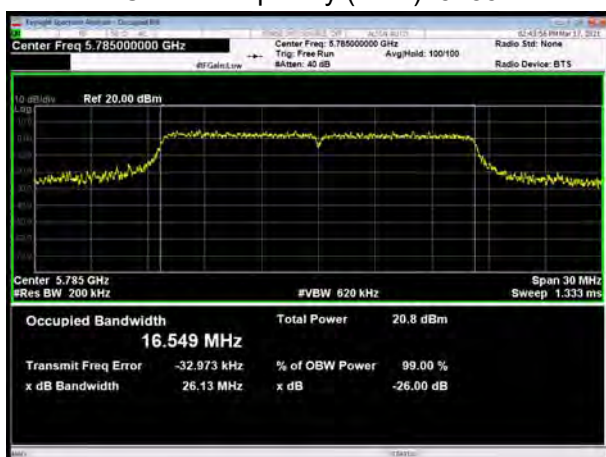
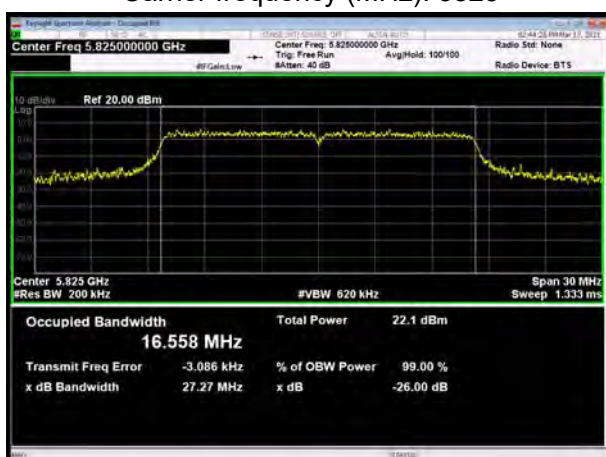
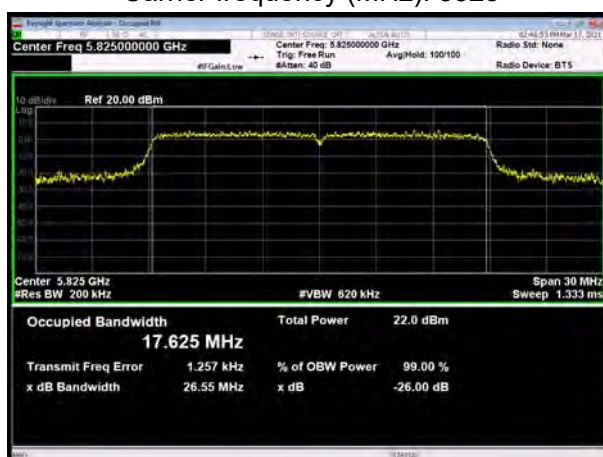


U-NII-1, 802.11ac VHT20
Carrier frequency (MHz): 5220

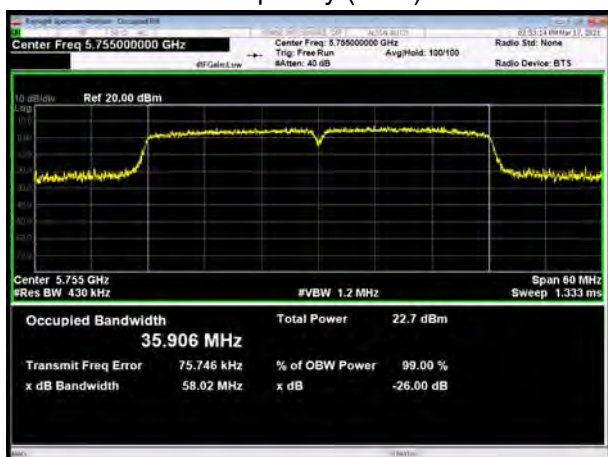




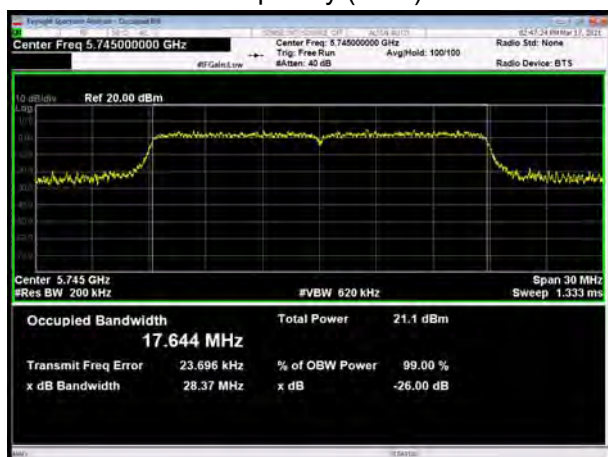
99% bandwidth

U-NII-3, 802.11a
Carrier frequency (MHz): 5745U-NII-3, 802.11n HT20
Carrier frequency (MHz): 5745U-NII-3, 802.11a
Carrier frequency (MHz): 5785U-NII-3, 802.11n HT20
Carrier frequency (MHz): 5785U-NII-3, 802.11a
Carrier frequency (MHz): 5825U-NII-3, 802.11n HT20
Carrier frequency (MHz): 5825

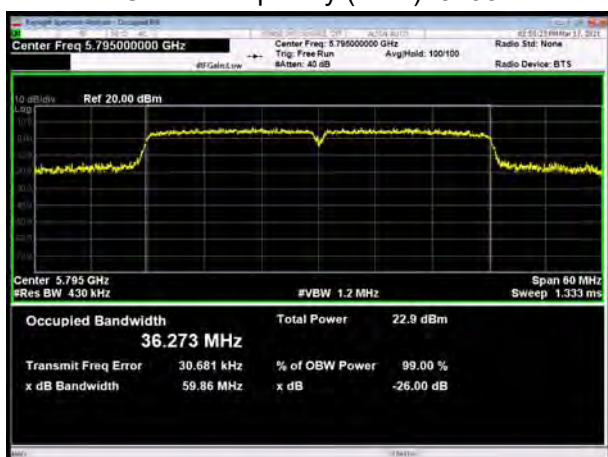
U-NII-3, 802.11n HT40
Carrier frequency (MHz): 5755



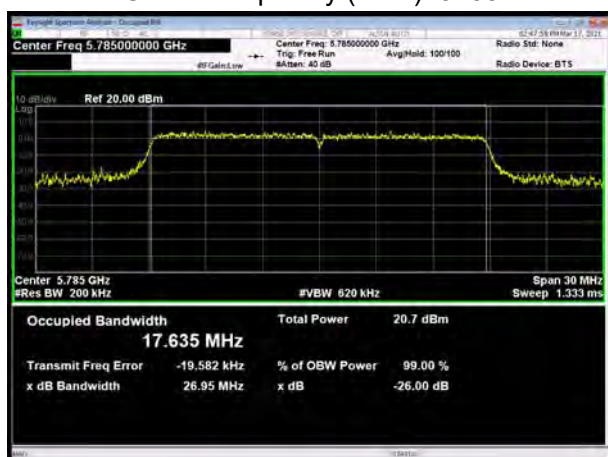
U-NII-3, 802.11ac VHT20
Carrier frequency (MHz): 5745



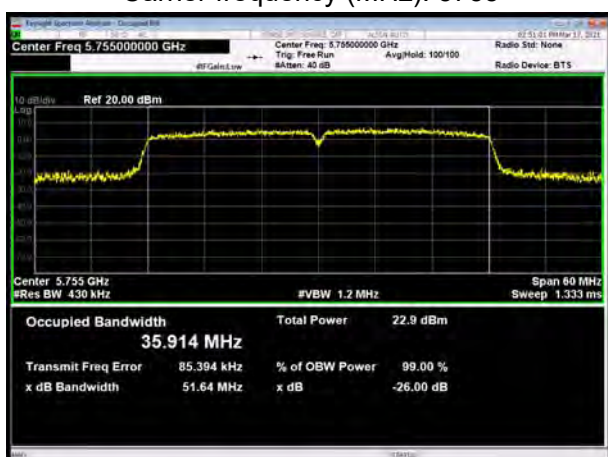
U-NII-3, 802.11n HT40
Carrier frequency (MHz): 5795



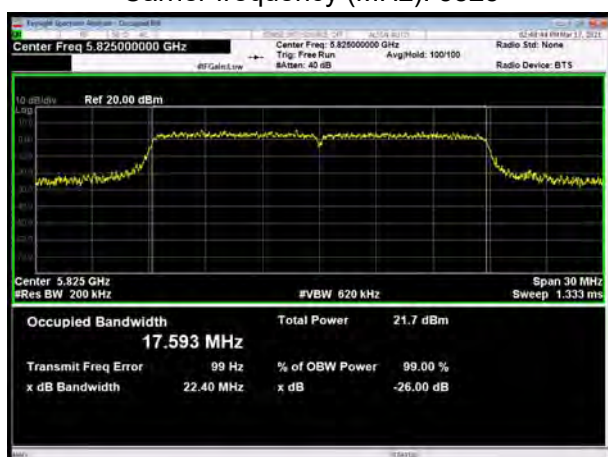
U-NII-3, 802.11ac VHT20
Carrier frequency (MHz): 5785



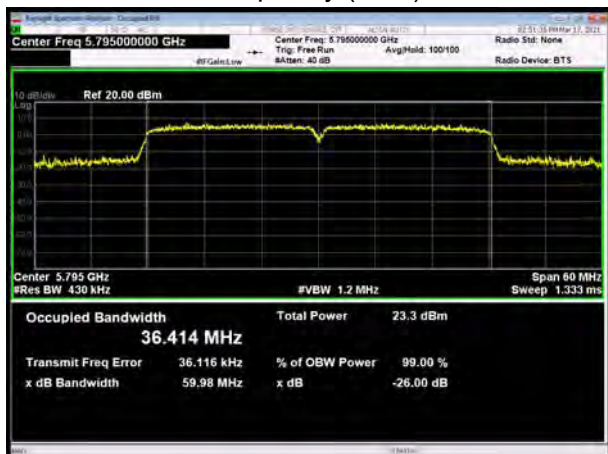
U-NII-3, 802.11ac VHT40
Carrier frequency (MHz): 5755



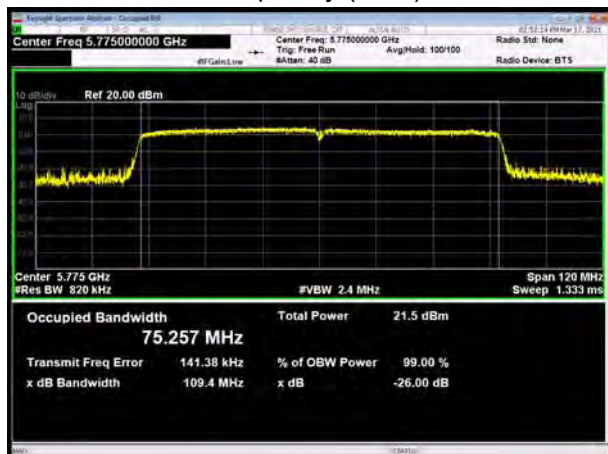
U-NII-3, 802.11ac VHT20
Carrier frequency (MHz): 5825



U-NII-3, 802.11ac VHT40 Carrier frequency (MHz): 5795

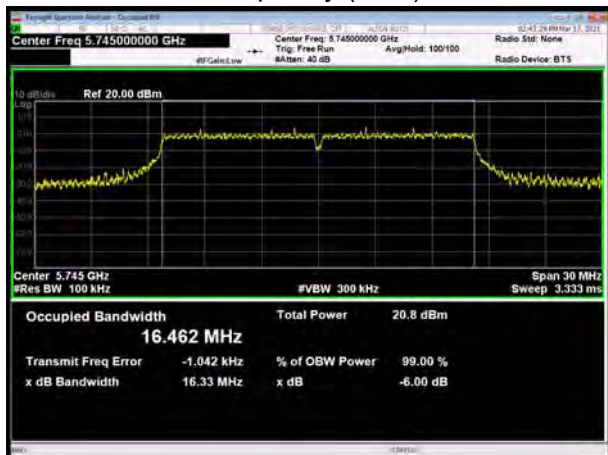


U-NII-3, 802.11ac VHT80 Carrier frequency (MHz): 5775

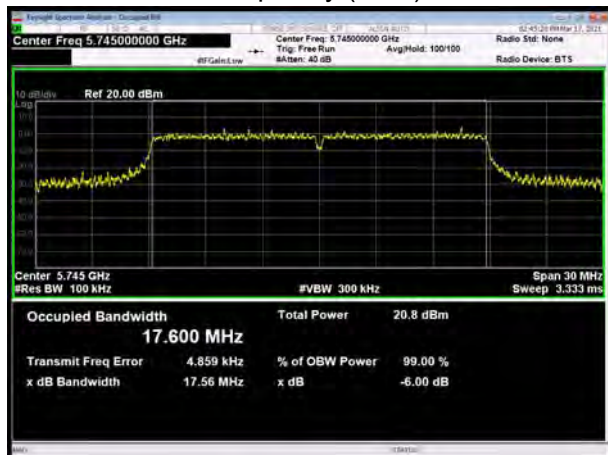


Minimum 6 dB bandwidth

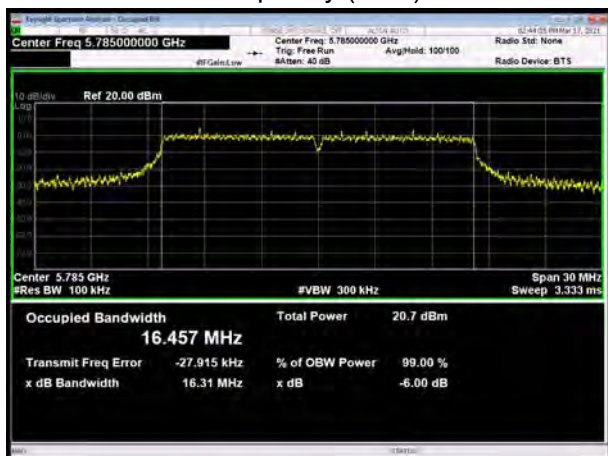
U-NII-3, 802.11a Carrier frequency (MHz): 5745



U-NII-3, 802.11n HT20 Carrier frequency (MHz): 5745



U-NII-3, 802.11a Carrier frequency (MHz): 5785



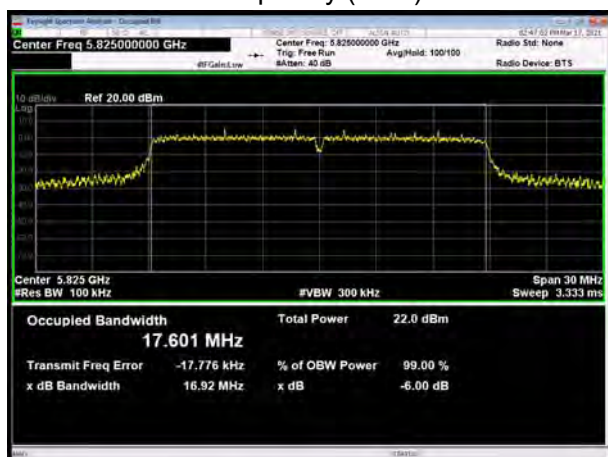
U-NII-3, 802.11n HT20 Carrier frequency (MHz): 5785



U-NII-3, 802.11a
Carrier frequency (MHz): 5825



U-NII-3, 802.11n HT20
Carrier frequency (MHz): 5825



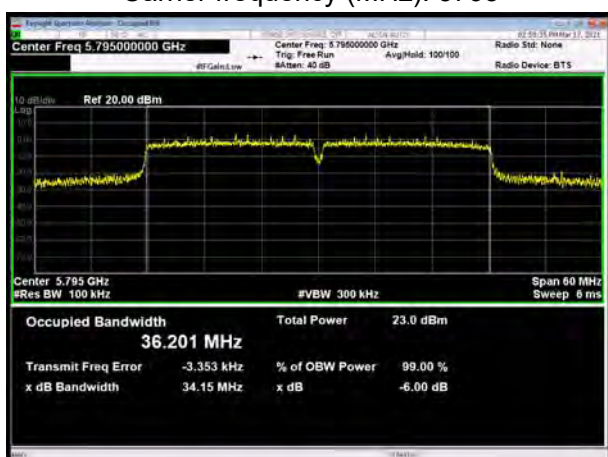
U-NII-3, 802.11n HT40
Carrier frequency (MHz): 5755



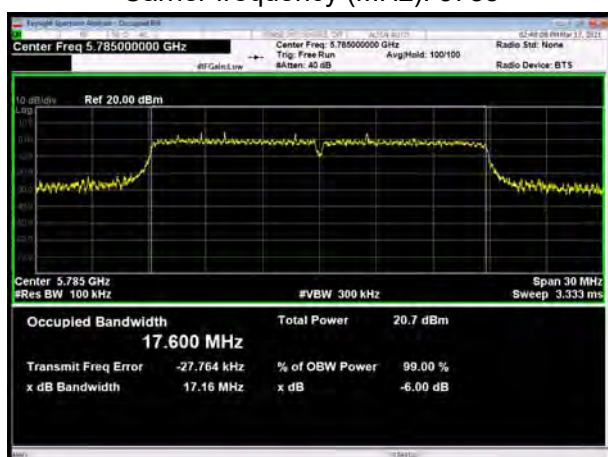
U-NII-3, 802.11ac VHT20
Carrier frequency (MHz): 5745



U-NII-3, 802.11n HT40
Carrier frequency (MHz): 5795



U-NII-3, 802.11ac VHT20
Carrier frequency (MHz): 5785



U-NII-3, 802.11ac VHT40 Carrier frequency (MHz): 5755



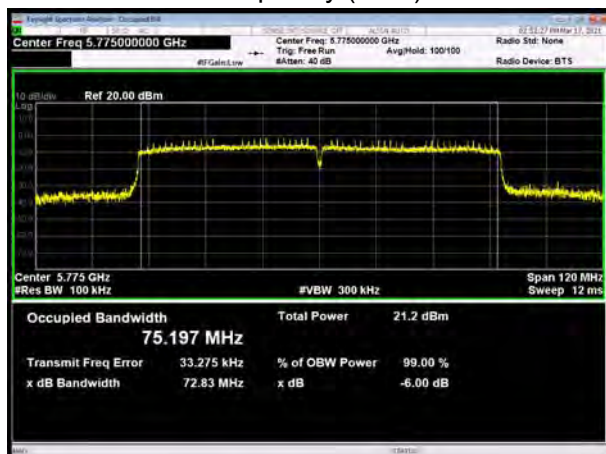
U-NII-3, 802.11ac VHT20 Carrier frequency (MHz): 5825



U-NII-3, 802.11ac VHT40 Carrier frequency (MHz): 5795



U-NII-3, 802.11ac VHT80 Carrier frequency (MHz): 5775



5.2. Average Power Output

Ambient condition

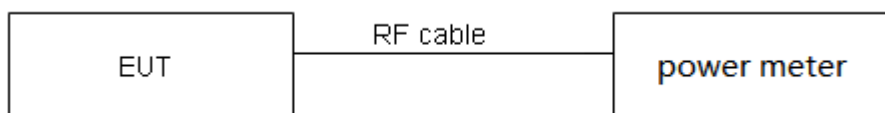
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

During the process of the testing, The EUT was connected to the average power meter through an external attenuator and a known loss cable. The EUT is max power transmission with proper modulation. We use Maximum average Conducted Output Power Level Method in KDB789033 for this test

The conducted Power is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically.

Test Setup



Limits

Rule FCC Part 15.407(a)(1)(2)(3)

(1) For the band 5.15-5.25 GHz.

(i) For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

(ii) For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(iii) For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23

dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(iv) For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 0.44 \text{ dB}$.

**Test Results**

Mode	T _{on} (ms)	T _(on+off) (ms)	Duty cycle	Duty cycle correction Factor(dB)
802.11a	2.75	2.78	0.99	NA
802.11n HT20	2.56	2.64	0.97	0.13
802.11n HT40	1.24	1.28	0.97	0.14
802.11ac VHT20	2.56	2.59	0.99	NA
802.11ac VHT40	1.25	1.30	0.97	0.14
802.11ac VHT80	0.60	0.64	0.94	0.28
Note: when Duty cycle ≥ 0.98 , Duty cycle correction Factor not required.				

Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor

SISO Antenna 1**U-NII-1**

Network Standards	Channel/ Frequency (MHz)	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11a	36/5180	14.16	14.16	30	PASS
	40/5200	18.28	18.28	30	PASS
	44/5220	20.24	20.24	30	PASS
	48/5240	20.20	20.20	30	PASS
802.11n HT20	36/5180	14.11	14.24	30	PASS
	40/5200	18.04	18.17	30	PASS
	44/5220	20.13	20.26	30	PASS
	48/5240	20.08	20.21	30	PASS
802.11n HT40	38/5190	12.01	12.15	30	PASS
	46/5230	18.10	18.24	30	PASS
802.11ac VHT20	36/5180	14.29	14.29	30	PASS
	40/5200	18.32	18.32	30	PASS
	44/5220	20.20	20.20	30	PASS
	48/5240	20.24	20.24	30	PASS
802.11ac VHT40	38/5190	12.07	12.21	30	PASS
	46/5230	18.04	18.18	30	PASS
802.11ac VHT80	42/5210	7.07	7.35	30	PASS
Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor					



U-NII-3

Network Standards	Channel/ Frequency (MHz)	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11a	149/5745	20.23	20.23	30	PASS
	157/5785	20.25	20.25	30	PASS
	165/5825	20.26	20.26	30	PASS
802.11n HT20	149/5745	20.07	20.20	30	PASS
	157/5785	20.16	20.29	30	PASS
	165/5825	20.19	20.32	30	PASS
802.11n HT40	151/5755	20.89	21.03	30	PASS
	159/5795	22.18	22.32	30	PASS
802.11ac VHT20	149/5745	20.10	20.10	30	PASS
	157/5785	20.12	20.12	30	PASS
	165/5825	20.06	20.06	30	PASS
802.11ac VHT40	151/5755	20.92	21.06	30	PASS
	159/5795	22.09	22.23	30	PASS
802.11ac VHT80	155/5775	19.08	19.36	30	PASS

Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor

SISO Antenna 2

U-NII-1

Network Standards	Channel/ Frequency (MHz)	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11a	36/5180	14.10	14.10	30	PASS
	40/5200	18.23	18.23	30	PASS
	44/5220	20.24	20.24	30	PASS
	48/5240	20.18	20.18	30	PASS
802.11n HT20	36/5180	14.06	14.19	30	PASS
	40/5200	18.13	18.26	30	PASS
	44/5220	20.27	20.40	30	PASS
	48/5240	20.07	20.20	30	PASS
802.11n HT40	38/5190	12.12	12.26	30	PASS
	46/5230	18.26	18.40	30	PASS
802.11ac VHT20	36/5180	14.13	14.13	30	PASS
	40/5200	18.22	18.22	30	PASS
	44/5220	20.28	20.28	30	PASS
	48/5240	20.14	20.14	30	PASS



802.11ac VHT40	38/5190	12.15	12.29	30	PASS
	46/5230	18.18	18.32	30	PASS
802.11ac VHT80	42/5210	7.18	7.46	30	PASS

Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor

U-NII-3

Network Standards	Channel/ Frequency (MHz)	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11a	149/5745	20.32	20.32	30	PASS
	157/5785	20.23	20.23	30	PASS
	165/5825	20.02	20.02	30	PASS
802.11n HT20	149/5745	20.14	20.27	30	PASS
	157/5785	20.27	20.40	30	PASS
	165/5825	19.53	19.66	30	PASS
802.11n HT40	151/5755	20.93	21.07	30	PASS
	159/5795	22.18	22.32	30	PASS
802.11ac VHT20	149/5745	20.17	20.17	30	PASS
	157/5785	20.09	20.09	30	PASS
	165/5825	19.12	19.12	30	PASS
802.11ac VHT40	151/5755	20.96	21.10	30	PASS
	159/5795	22.28	22.42	30	PASS
802.11ac VHT80	155/5775	19.02	19.30	30	PASS

Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor

**MIMO without Beamforming****U-NII-1**

Network Standards	Channel/ Frequency (MHz)	MIMO Antenna 1		MIMO Antenna 2		Total Power (dBm)	Limit (dBm)	Conclusion
		Average Power Measured (dBm)	Average Power with duty factor (dBm)	Average Power Measured (dBm)	Average Power with duty factor (dBm)			
802.11a	36/5180	14.14	14.14	14.28	14.28	17.22	30	PASS
	40/5200	18.10	18.10	18.19	18.19	21.16	30	PASS
	44/5220	20.29	20.29	20.31	20.31	23.31	30	PASS
	48/5240	20.21	20.21	20.26	20.26	23.25	30	PASS
802.11n HT20	36/5180	14.09	14.22	14.25	14.38	17.31	30	PASS
	40/5200	18.06	18.19	18.22	18.35	21.28	30	PASS
	44/5220	20.28	20.41	20.23	20.36	23.40	30	PASS
	48/5240	20.19	20.32	20.13	20.26	23.30	30	PASS
802.11n HT40	38/5190	12.13	12.27	12.12	12.26	15.28	30	PASS
	46/5230	18.11	18.25	18.21	18.35	21.31	30	PASS
802.11ac VHT20	36/5180	14.24	14.24	14.31	14.31	17.29	30	PASS
	40/5200	18.13	18.13	18.12	18.12	21.14	30	PASS
	44/5220	20.19	20.19	20.13	20.13	23.17	30	PASS
	48/5240	20.27	20.27	20.11	20.11	23.20	30	PASS
802.11ac VHT40	38/5190	12.16	12.30	12.32	12.46	15.39	30	PASS
	46/5230	18.09	18.23	18.07	18.21	21.23	30	PASS
802.11ac VHT80	42/5210	7.11	7.39	6.91	7.19	10.30	30	PASS

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power = $10\log(10^{(\text{Power antenna1 in dBm}/10)} + 10^{(\text{Power antenna2 in dBm}/10)})$

2. The manufacturer declared the transmitter output signals is CDD mode And $N_{ss}=1$. According to KDB 662911 D01

Multiple Transmitter Output v02r01 2)f)(i): If all antennas have the same gain, Directional gain = $G_{ANT} + \text{Array Gain}$,

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.

So directional gain = $G_{ANT} + \text{Array Gain} = 5.5 + 0 = 5.5 \text{ dBi} < 6 \text{ dBi}$. So the power limit is 30dBm.



U-NII-3

Network Standards	Channel/ Frequency (MHz)	MIMO Antenna 1		MIMO Antenna 2		Total Power (dBm)	Limit (dBm)	Conclusion
		Average Power Measured (dBm)	Average Power with duty factor (dBm)	Average Power Measured (dBm)	Average Power with duty factor (dBm)			
802.11a	149/5745	20.24	20.24	20.17	20.17	23.22	30	PASS
	157/5785	20.32	20.32	20.33	20.33	23.34	30	PASS
	165/5825	20.11	20.11	20.16	20.16	23.15	30	PASS
802.11n HT20	149/5745	20.02	20.15	20.18	20.31	23.24	30	PASS
	157/5785	20.09	20.22	20.20	20.33	23.29	30	PASS
	165/5825	20.26	20.39	20.31	20.44	23.43	30	PASS
802.11n HT40	151/5755	20.91	21.05	20.97	21.11	24.09	30	PASS
	159/5795	22.09	22.23	22.18	22.32	25.29	30	PASS
802.11ac VHT20	149/5745	20.30	20.30	20.18	20.18	23.25	30	PASS
	157/5785	20.11	20.11	20.14	20.14	23.14	30	PASS
	165/5825	20.23	20.23	20.27	20.27	23.26	30	PASS
802.11ac VHT40	151/5755	20.88	21.02	20.95	21.09	24.07	30	PASS
	159/5795	22.26	22.40	22.28	22.42	25.42	30	PASS
802.11ac VHT80	155/5775	18.98	19.26	19.02	19.30	22.29	30	PASS

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power = $10\log(10^{(\text{Power antenna1 in dBm}/10)} + 10^{(\text{Power antenna2 in dBm}/10)})$

2. The manufacturer declared the transmitter output signals is CDD mode And $N_{ss}=1$. According to KDB 662911 D01 Multiple Transmitter Output v02r01 2)f)(i): If all antennas have the same gain, Directional gain = $G_{ANT} + \text{Array Gain}$, For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

Array Gain = $5 \log(N_{ANT}/N_{ss})$ dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.

So directional gain = $G_{ANT} + \text{Array Gain} = 5.5 + 0 = 5.5$ dBi < 6 dBi. So the power limit is 30dBm.

**MIMO with Beamforming****U-NII-1**

Network Standards	Channel/ Frequency (MHz)	MIMO Antenna 1		MIMO Antenna 2		Total Power (dBm)	Limit (dBm)	Conclusion
		Average Power Measured (dBm)	Average Power with duty factor (dBm)	Average Power Measured (dBm)	Average Power with duty factor (dBm)			
802.11ac VHT20	36/5180	14.33	14.33	14.10	14.10	17.23	27.49	PASS
	40/5200	18.14	18.14	18.21	18.21	21.19	27.49	PASS
	44/5220	20.12	20.12	20.23	20.23	23.19	27.49	PASS
	48/5240	20.12	20.12	20.31	20.31	23.23	27.49	PASS
802.11ac VHT40	38/5190	12.09	12.23	12.11	12.25	15.25	27.49	PASS
	46/5230	18.16	18.30	18.19	18.33	21.33	27.49	PASS
802.11ac VHT80	42/5210	7.12	7.40	6.89	7.17	10.30	27.49	PASS

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power = $10\log(10^{(\text{Power antenna1 in dBm}/10)} + 10^{(\text{Power antenna2 in dBm}/10)})$

2. The manufacturer declared the transmitter output signals is CDD mode. And Nss=1. According to KDB 662911 D01 Multiple Transmitter Output v02r01 2)f)(i): If all antennas have the same gain, Directional gain = GANT + Array Gain.

For PSD measurements on all devices, Array Gain = $10\log(N_{\text{ant}}/N_{\text{ss}})$ dB, so directional gain = GANT + Array

Gain = $5.5 + 10\log(2/1) = 8.51$

So the power limit is $30 + 6 - \text{MAX}(6, \text{directional gain}) \text{dBm} = 27.49 \text{ dBm}$



U-NII-3

Network Standards	Channel/ Frequency (MHz)	MIMO Antenna 1		MIMO Antenna 2		Total Power (dBm)	Limit (dBm)	Conclusion
		Average Power Measured (dBm)	Average Power with duty factor (dBm)	Average Power Measured (dBm)	Average Power with duty factor (dBm)			
802.11ac VHT20	149/5745	20.28	20.28	20.24	20.24	23.27	27.49	PASS
	157/5785	20.21	20.21	20.26	20.26	23.25	27.49	PASS
	165/5825	20.18	20.18	20.22	20.22	23.21	27.49	PASS
802.11ac VHT40	151/5755	20.89	21.03	20.88	21.02	24.04	27.49	PASS
	159/5795	22.25	22.39	22.28	22.42	25.42	27.49	PASS
802.11ac VHT80	155/5775	18.93	19.21	19.12	19.40	22.32	27.49	PASS

Note: 1. For Total Power, according to KDB 662911 D01 Multiple Transmitter Output v02r01 1),

The Total Power = $10\log(10^{(\text{Power antenna1 in dBm}/10)} + 10^{(\text{Power antenna2 in dBm}/10)})$

2. The manufacturer declared the transmitter output signals is CDD mode. And Nss=1. According to KDB 662911 D01

Multiple Transmitter Output v02r01 2)f)(i): If all antennas have the same gain, Directional gain = GANT + Array Gain. For PSD measurements on all devices, Array Gain = $10\log(N_{\text{ant}}/N_{\text{ss}})$ dB, so directional gain = GANT + Array

Gain = $5.5 + 10\log(2/1) = 8.51$, So the power limit is $30 + 6 - \text{MAX}(6, \text{directional gain})$ dBm = 27.49 dBm

5.3. Frequency Stability

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

1. Frequency stability with respect to ambient temperature

- a) Supply the EUT with a nominal ac voltage or install a new or fully charged battery in the EUT. If possible, a dummy load shall be connected to the EUT because an antenna near the metallic walls of an environmental test chamber could affect the output frequency of the EUT. If the EUT is equipped with a permanently attached, adjustable-length antenna, then the EUT shall be placed in the center of the chamber with the antenna adjusted to the shortest length possible. Turn ON the EUT and tune it to one of the number of frequencies shown in 5.6.
- b) Couple the unlicensed wireless device output to the measuring instrument by connecting an antenna to the measuring instrument with a suitable length of coaxial cable and placing the measuring antenna near the EUT (e.g., 15 cm away), or by connecting a dummy load to the measuring instrument, through an attenuator if necessary.
- c) Adjust the location of the measurement antenna and the controls on the measurement instrument to obtain a suitable signal level (i.e., a level that will not overload the measurement instrument but is strong enough to allow measurement of the operating or fundamental frequency of the EUT).
- d) Turn the EUT OFF and place it inside the environmental temperature chamber. For devices that have oscillator heaters, energize only the heater circuit.
- e) Set the temperature control on the chamber to the highest specified in the regulatory requirements for the type of device and allow the oscillator heater and the chamber temperature to stabilize.
- f) While maintaining a constant temperature inside the environmental chamber, turn the EUT ON and record the operating frequency at startup, and at 2 minutes, 5 minutes, and 10 minutes after the EUT is energized. Four measurements in total are made.
- g) Measure the frequency at each of frequencies specified in 5.6.
- h) Switch OFF the EUT but do not switch OFF the oscillator heater.
- i) Lower the chamber temperature by not more than 10°C, and allow the temperature inside the chamber to stabilize.
- j) Repeat step f) through step i) down to the lowest specified temperature.

2. Frequency stability when varying supply voltage

Unless otherwise specified, these tests shall be made at ambient room temperature (+15°C to +25°C). An antenna shall be connected to the antenna output terminals of the EUT if possible. If the EUT is equipped with or uses an adjustable-length antenna, then it shall be fully extended.

- a) Supply the EUT with nominal voltage or install a new or fully charged battery in the EUT. Turn ON the EUT and couple its output to a frequency counter or other frequency-measuring instrument.



- b) Tune the EUT to one of the number of frequencies required in 5.6. Adjust the location of the measurement antenna and the controls on the measurement instrument to obtain a suitable signal level (i.e., a level that will not overload the measurement instrument but is strong enough to allow measurement of the operating or fundamental frequency of the EUT).
- c) Measure the frequency at each of the frequencies specified in 5.6.
- d) Repeat the above procedure at 85% and 115% of the nominal supply voltage.

Limit

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the users manual.

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 936\text{Hz}$

**Test Results**

Voltage (V)	Temperature (°C)	U-NII-1 Test Results			
		5200MHz			
		1min	2min	5min	10min
12	-20	5199.993985	5199.991281	5199.989762	5199.980980
12	-10	5199.985974	5199.990471	5199.984197	5199.971559
12	0	5199.979852	5199.984535	5199.979030	5199.970682
12	10	5199.977514	5199.976951	5199.978224	5199.967805
12	20	5199.967781	5199.967539	5199.974910	5199.963634
12	30	5199.959870	5199.961371	5199.965796	5199.954157
12	40	5199.952101	5199.953833	5199.962822	5199.951650
12	50	5199.950609	5199.950777	5199.962448	5199.944431
11.4	20	5199.945754	5199.948706	5199.959318	5199.941274
12.6	20	5199.942566	5199.940164	5199.950740	5199.934056
MHz		-0.057434	-0.059836	-0.049260	-0.065944
PPM		-11.044975	-11.506915	-9.473034	-12.681557

Voltage (V)	Temperature (°C)	U-NII-3 Test Results			
		5785MHz			
		1min	2min	5min	10min
12	-20	5784.993116	5784.992879	5784.983526	5784.980840
12	-10	5784.988570	5784.984107	5784.975157	5784.971062
12	0	5784.984271	5784.978395	5784.974717	5784.965623
12	10	5784.975924	5784.976444	5784.971919	5784.961072
12	20	5784.969266	5784.966868	5784.967852	5784.955465
12	30	5784.964254	5784.966552	5784.967538	5784.951116
12	40	5784.959654	5784.962409	5784.965424	5784.942596
12	50	5784.954975	5784.954275	5784.965389	5784.933535
11.4	20	5784.953426	5784.948131	5784.959530	5784.927824
12.6	20	5784.951091	5784.944634	5784.950855	5784.925415
MHz		-0.048909	-0.055366	-0.049145	-0.074585
PPM		-8.454486	-9.570553	-8.495289	-12.892839

5.4. Power Spectral Density

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

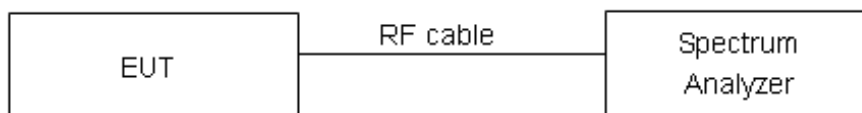
The EUT was connected to the spectrum analyzer through an external attenuator (20dB) and a known loss cable.

Set RBW = 1MHz, VBW =3MHz for the band 5.150-5.250GHz

Set RBW = 470kHz, VBW =1.5MHz for the band 5.725-5.850GHz

The conducted PSD is measured at each antenna port. The measured results at the various antenna ports are then summed mathematically.

Test setup



Limits

Rule FCC Part 15.407(a)(1)/ Part 15.407(a)(2) / Part 15.407(a)(3)

For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the



amount in dB that the directional gain of the antenna exceeds 6 dBi.

Frequency Bands/MHz	Limits
5150-5250	17/11dBm/MHz
5.25-5.35 GHz and 5.47-5.725 GHz	11dBm/MHz
5725-5850	30dBm/500kHz

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 2$, $U = 0.75\text{dB}$.

**Test Results:**

Note: Power Spectral Density =Read Value+Duty cycle correction factor

SISO Antenna 1**U-NII-1**

Mode	Channel/ Frequency (MHz)	Read Value (dBm /MHz)	Power Spectral Density (dBm /MHz)	Limit (dBm /MHz)	Conclusion
802.11a	36/5180	1.62	1.62	17	PASS
	40/5200	6.41	6.41	17	PASS
	44/5220	8.33	8.33	17	PASS
	48/5240	8.06	8.06	17	PASS
802.11n HT20	36/5180	0.80	0.93	17	PASS
	40/5200	5.64	5.77	17	PASS
	44/5220	8.36	8.49	17	PASS
	48/5240	7.45	7.58	17	PASS
802.11n HT40	38/5190	-1.66	-1.52	17	PASS
	46/5230	2.56	2.70	17	PASS
802.11ac VHT20	36/5180	1.74	1.74	17	PASS
	40/5200	6.11	6.11	17	PASS
	44/5220	8.21	8.21	17	PASS
	48/5240	6.99	6.99	17	PASS
802.11ac VHT40	38/5190	-3.44	-3.30	17	PASS
	46/5230	2.35	2.49	17	PASS
802.11ac VHT80	42/5210	-10.23	-9.95	17	PASS



U-NII-3

Mode	Channel/ Frequency (MHz)	Read Value (dBm/470kHz)	Power Spectral Density (dBm/500kHz)	Limit (dBm/500kHz)	Conclusion
802.11a	149/5745	3.92	4.19	30	PASS
	157/5785	3.97	4.24	30	PASS
	165/5825	5.08	5.35	30	PASS
802.11n HT20	149/5745	3.71	4.11	30	PASS
	157/5785	4.06	4.46	30	PASS
	165/5825	5.14	5.54	30	PASS
802.11n HT40	151/5755	2.67	3.08	30	PASS
	159/5795	2.86	3.27	30	PASS
802.11ac VHT20	149/5745	3.83	4.10	30	PASS
	157/5785	3.59	3.86	30	PASS
	165/5825	4.88	5.15	30	PASS
802.11ac VHT40	151/5755	2.55	2.96	30	PASS
	159/5795	3.01	3.42	30	PASS
802.11ac VHT80	155/5775	-2.45	-1.90	30	PASS
Note: PSD=Read Value+Duty cycle+10*LOG(500/470) correction factor					

**SISO Antenna 2****U-NII-1**

Mode	Channel/ Frequency (MHz)	Read Value (dBm /MHz)	Power Spectral Density (dBm /MHz)	Limit (dBm /MHz)	Conclusion
802.11a	36/5180	1.63	1.63	17	PASS
	40/5200	6.43	6.43	17	PASS
	44/5220	8.96	8.96	17	PASS
	48/5240	7.65	7.65	17	PASS
802.11n HT20	36/5180	1.72	1.85	17	PASS
	40/5200	6.53	6.66	17	PASS
	44/5220	8.49	8.62	17	PASS
	48/5240	7.78	7.91	17	PASS
802.11n HT40	38/5190	-2.38	-2.24	17	PASS
	46/5230	2.97	3.11	17	PASS
802.11ac VHT20	36/5180	1.73	1.73	17	PASS
	40/5200	6.38	6.38	17	PASS
	44/5220	8.52	8.52	17	PASS
	48/5240	8.17	8.17	17	PASS
802.11ac VHT40	38/5190	-2.18	-2.04	17	PASS
	46/5230	2.83	2.97	17	PASS
802.11ac VHT80	42/5210	-10.75	-10.47	17	PASS



U-NII-3

Mode	Channel/ Frequency (MHz)	Read Value (dBm/470kHz)	Power Spectral Density (dBm/500kHz)	Limit (dBm/500kHz)	Conclusion
802.11a	149/5745	5.43	5.70	30	PASS
	157/5785	5.44	5.71	30	PASS
	165/5825	6.03	6.30	30	PASS
802.11n HT20	149/5745	5.02	5.42	30	PASS
	157/5785	5.33	5.73	30	PASS
	165/5825	5.54	5.94	30	PASS
802.11n HT40	151/5755	3.72	4.13	30	PASS
	159/5795	3.67	4.08	30	PASS
802.11ac VHT20	149/5745	5.04	5.31	30	PASS
	157/5785	4.94	5.21	30	PASS
	165/5825	5.72	5.99	30	PASS
802.11ac VHT40	151/5755	3.73	4.14	30	PASS
	159/5795	3.42	3.83	30	PASS
802.11ac VHT80	155/5775	-1.83	-1.28	30	PASS

Note: $PSD = \text{Read Value} + \text{Duty cycle} + 10 \cdot \text{LOG}(500/470)$ correction factor.

**MIMO without Beamforming****U-NII-1**

Mode	Channel/ Frequency (MHz)	Power Spectral Density					Limit (dBm /MHz)	Conclusion
		Antenna 1		Antenna 2		Total Power (dBm /MHz)		
		Read Value (dBm/MHz)	PSD (dBm /MHz)	Read Value (dBm/MHz)	PSD (dBm /MHz)			
802.11a	36/5180	1.54	1.54	2.36	2.36	4.98	14.49	PASS
	40/5200	6.39	6.39	6.77	6.77	9.59	14.49	PASS
	44/5220	8.66	8.66	8.62	8.62	11.65	14.49	PASS
	48/5240	7.85	7.85	8.41	8.41	11.15	14.49	PASS
802.11n HT20	36/5180	1.20	1.33	1.92	2.05	4.72	14.49	PASS
	40/5200	5.57	5.70	6.46	6.59	9.18	14.49	PASS
	44/5220	8.27	8.40	8.25	8.38	11.40	14.49	PASS
	48/5240	7.33	7.46	7.19	7.32	10.40	14.49	PASS
802.11n HT40	38/5190	-2.47	-2.33	-2.44	-2.30	0.70	14.49	PASS
	46/5230	2.42	2.56	2.97	3.11	5.86	14.49	PASS
802.11ac VHT20	36/5180	1.42	1.42	2.19	2.19	4.83	14.49	PASS
	40/5200	5.93	5.93	6.32	6.32	9.14	14.49	PASS
	44/5220	8.11	8.11	8.32	8.32	11.22	14.49	PASS
	48/5240	7.64	7.64	7.97	7.97	10.82	14.49	PASS
802.11ac VHT40	38/5190	-2.35	-2.21	-2.00	-1.86	0.98	14.49	PASS
	46/5230	2.67	2.81	2.87	3.01	5.92	14.49	PASS
802.11ac VHT80	42/5210	-11.183	-10.90	-12.09	-11.81	-8.32	14.49	PASS

Note: 1. Power Spectral Density = Read Value + Duty cycle correction factor

2. For Total PSD, according to KDB 662911 D01 Multiple Transmitter Output v02r01 2)a), the power spectral density = $10\log(10^{(\text{PSD antenna1 in dBm}/10)} + 10^{(\text{PSD antenna2 in dBm}/10)})$

3. The manufacturer declared the transmitter output signals is CDD mode And Nss=1. According to KDB 662911 D01 Multiple Transmitter Output v02r01 2)f)(i): If all antennas have the same gain, Directional gain = GANT + Array Gain, For PSD measurements on all devices, Array Gain = $10\log(N_{\text{ant}}/N_{\text{ss}})$ dB, so directional gain = GANT + Array Gain = $5.5 + 10\log(2/1) = 8.51 > 6$ dBi. So the PSD limit is $17 - (\text{directional gain} - 6 \text{ dBi}) = 17 - (8.51 - 6) = 14.49$ dBm.



U-NII-3

Mode	Channel/ Frequency (MHz)	Power Spectral Density					Limit (dBm/ 500kHz)	Conclusion
		Antenna 1		Antenna 2		Total Power (dBm/ 500kHz)		
		Read Value (dBm/ 470kHz)	Power Spectral Density (dBm/ 500kHz)	Read Value (dBm/ 470kHz)	Power Spectral Density (dBm/ 500kHz)			
802.11a	149/5745	4.57	4.84	5.46	5.73	8.31	27.49	PASS
	157/5785	4.54	4.81	5.52	5.79	8.33	27.49	PASS
	165/5825	5.12	5.39	5.99	6.26	8.86	27.49	PASS
802.11n HT20	149/5745	3.64	4.04	4.22	4.62	7.35	27.49	PASS
	157/5785	3.91	4.31	4.21	4.61	7.47	27.49	PASS
	165/5825	4.79	5.19	5.74	6.14	8.70	27.49	PASS
802.11n HT40	151/5755	2.61	3.02	3.28	3.69	6.38	27.49	PASS
	159/5795	3.11	3.52	3.73	4.14	6.85	27.49	PASS
802.11ac VHT20	149/5745	3.50	3.77	4.18	4.45	7.13	27.49	PASS
	157/5785	3.96	4.23	4.50	4.77	7.52	27.49	PASS
	165/5825	4.76	5.03	5.41	5.68	8.38	27.49	PASS
802.11ac VHT40	151/5755	2.89	3.30	3.26	3.67	6.50	27.49	PASS
	159/5795	2.91	3.32	3.35	3.76	6.56	27.49	PASS
802.11ac VHT80	155/5775	-3.74	-3.19	-1.98	-1.43	0.79	27.49	PASS

Note: 1. $PSD = \text{Read Value} + \text{Duty cycle} + 10 \cdot \log(500/470)$ correction factor.

2. For Total PSD, according to KDB 662911 D01 Multiple Transmitter Output v02r01 2)a), the power spectral density = $10 \log(10(PSD \text{ antenna1 in dBm}/10) + 10(PSD \text{ antenna2 in dBm}/10))$

3. The manufacturer declared the transmitter output signals is CDD mode And Nss=1. According to KDB 662911 D01 Multiple Transmitter Output v02r01 2)f)(i): If all antennas have the same gain, Directional gain = GANT + Array Gain, For PSD measurements on all devices, Array Gain = $10 \log(Nant/Nss)$ dB, so directional gain = GANT + Array Gain = $4 + 10 \log(5.5/1) = 8.51 > 6$ dBi. So the PSD limit is $30 - (\text{directional gain} - 6 \text{ dBi}) = 30 - (8.51 - 6) = 27.49 \text{ dBm}$.

**MIMO with Beamforming****U-NII-1**

Mode	Channel/ Frequency (MHz)	Power Spectral Density					Limit (dBm /MHz)	Conclusion
		Antenna 1		Antenna 2		Total Power (dBm /MHz)		
		Read Value (dBm/MHz)	PSD (dBm /MHz)	Read Value (dBm/MHz)	PSD (dBm /MHz)			
802.11ac VHT20	36/5180	1.88	1.88	2.10	2.10	5.01	14.49	PASS
	40/5200	5.72	5.72	6.61	6.61	9.20	14.49	PASS
	44/5220	8.48	8.48	8.22	8.22	11.36	14.49	PASS
	48/5240	7.74	7.74	8.32	8.32	11.05	14.49	PASS
802.11ac VHT40	38/5190	-2.74	-2.60	-2.06	-1.92	0.76	14.49	PASS
	46/5230	2.96	3.10	2.85	2.99	6.06	14.49	PASS
802.11ac VHT80	42/5210	-11.26	-10.98	-11.92	-11.64	-8.29	14.49	PASS

Note: 1. Power Spectral Density =Read Value+Duty cycle correction factor

2. For Total PSD, according to KDB 662911 D01 Multiple Transmitter Output v02r01 2)a),the power spectral density= $10\log(10(\text{PSD antenna1 in dBm}/10)+10(\text{PSD antenna2 in dBm}/10))$

3. The manufacturer declared the transmitter output signals is CDD mode And Nss=1. According to KDB 662911 D01 Multiple Transmitter Output v02r01 2)f)(i): If all antennas have the same gain, Directional gain = GANT + Array Gain, For PSD measurements on all devices,Array Gain= $10\log(\text{Nant}/\text{Nss})\text{dB}$,so directional gain=GANT+Array Gain= $5.5+10\log(2/1)=8.51>6\text{ dBi}$. So the PSD limit is $17-(\text{directional gain}-6\text{ dBi})=17-(18.51-6)=14.49\text{dBm}$.



U-NII-3

Mode	Channel/ Frequency (MHz)	Power Spectral Density					Limit (dBm/ 500kHz)	Conclusion
		Antenna 1		Antenna 2		Total Power (dBm/ 500kHz)		
		Read Value (dBm/ 470kHz)	Power Spectral Density (dBm/ 500kHz)	Read Value (dBm/ 470kHz)	Power Spectral Density (dBm/ 500kHz)			
802.11ac VHT20	149/5745	3.81	4.08	4.63	4.90	7.52	27.49	PASS
	157/5785	3.83	4.10	4.55	4.82	7.48	27.49	PASS
	165/5825	4.96	5.23	5.98	6.25	8.78	27.49	PASS
802.11ac VHT40	151/5755	2.98	3.39	3.24	3.65	6.53	27.49	PASS
	159/5795	3.33	3.74	3.58	3.99	6.88	27.49	PASS
802.11ac VHT80	155/5775	-2.93	-2.38	-1.55	-1.00	1.37	27.49	PASS

Note: 1. $PSD = \text{Read Value} + \text{Duty cycle} + 10 \cdot \log(500/470)$ correction factor.

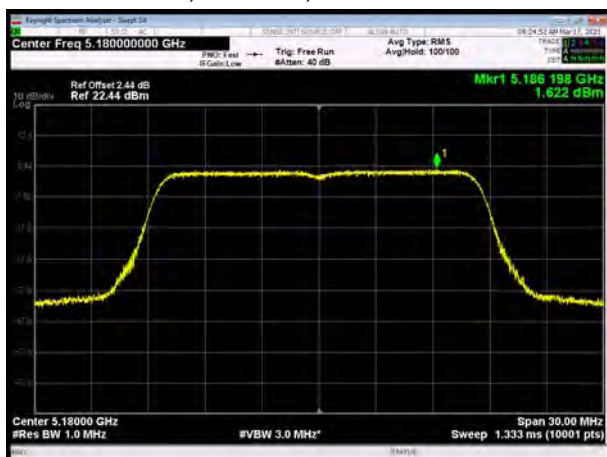
2. For Total PSD, according to KDB 662911 D01 Multiple Transmitter Output v02r01 2)a), the power spectral density = $10 \log(10(PSD \text{ antenna1 in dBm}/10) + 10(PSD \text{ antenna2 in dBm}/10))$

3. The manufacturer declared the transmitter output signals is CDD mode And Nss=1. According to KDB 662911 D01 Multiple Transmitter Output v02r01 2)f)(i): If all antennas have the same gain, Directional gain = GANT + Array Gain, For PSD measurements on all devices, Array Gain = $10 \log(N_{ant}/N_{ss})$ dB, so directional gain = GANT + Array Gain = $5.5 + 10 \log(2/1) = 8.51 > 6$ dBi. So the PSD limit is $30 - (\text{directional gain} - 6 \text{ dBi}) = 30 - (8.51 - 6) = 27.49$ dBm.

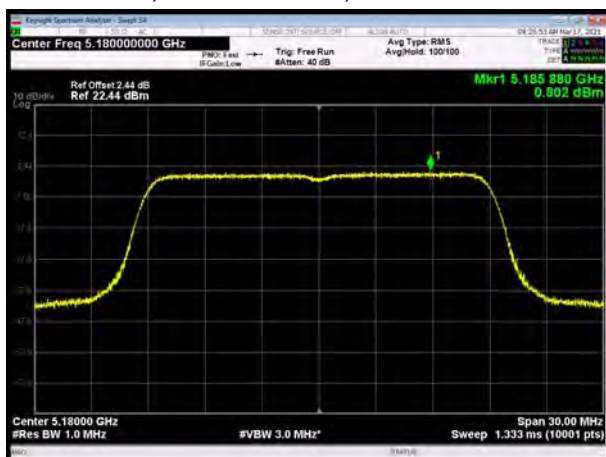


SISO Antenna 1

U-NII-1, 802.11a, Channel No.: 36



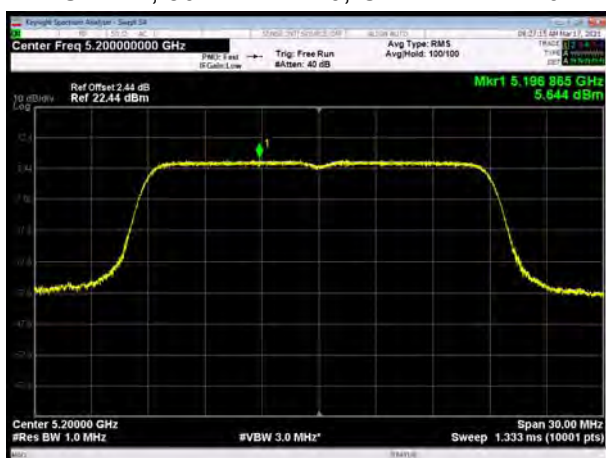
U-NII-1, 802.11n HT20, Channel No.: 36



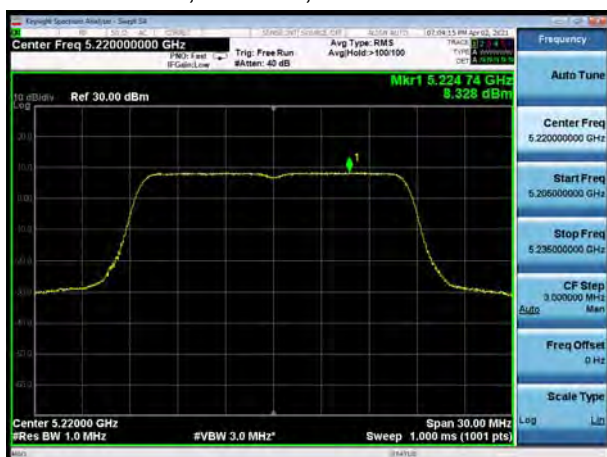
U-NII-1, 802.11a, Channel No.: 40



U-NII-1, 802.11n HT20, Channel No.: 40



U-NII-1, 802.11a, Channel No.: 44



U-NII-1, 802.11n HT20, Channel No.: 44

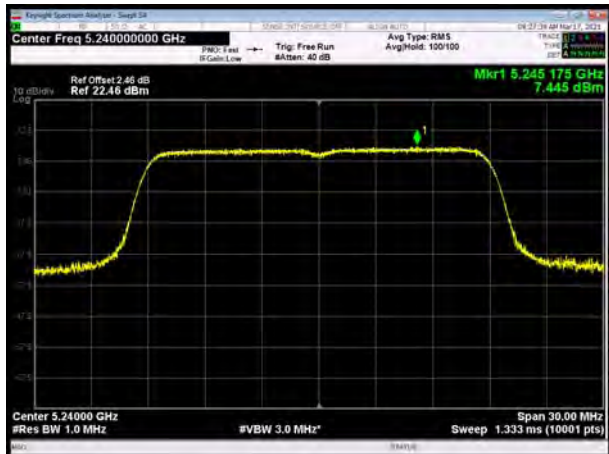




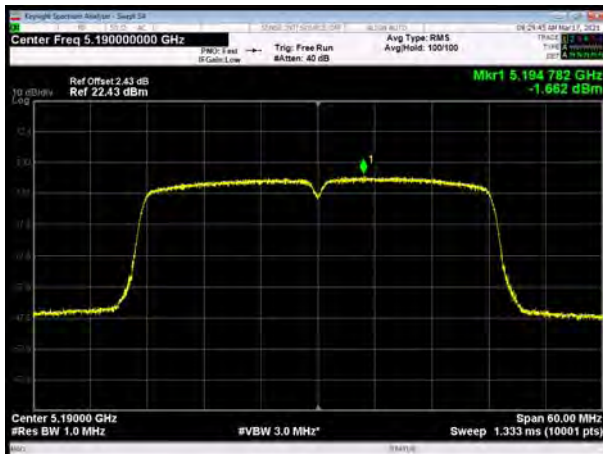
U-NII-1, 802.11a, Channel No.: 48



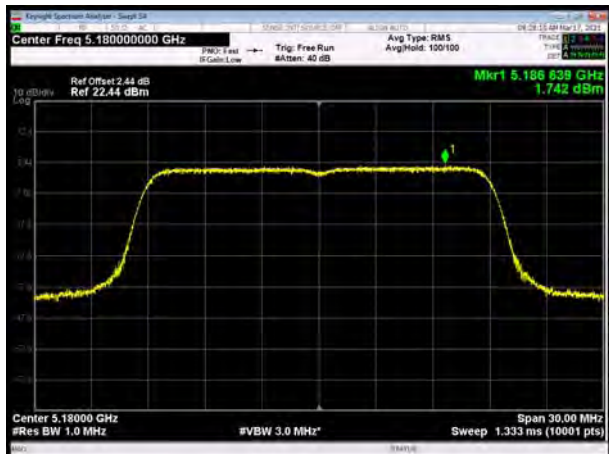
U-NII-1, 802.11n HT20, Channel No.: 48



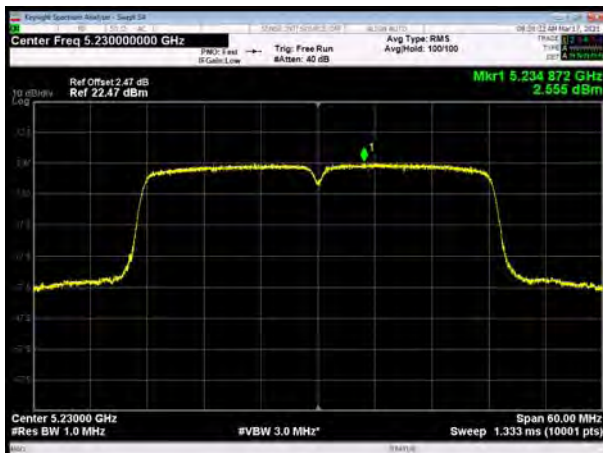
U-NII-1, 802.11n HT40, Channel No.: 38



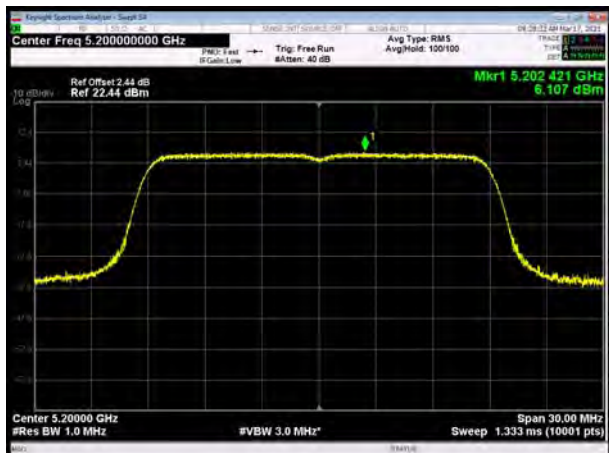
U-NII-1, 802.11ac VHT20, Channel No.: 36



U-NII-1, 802.11n HT40, Channel No.: 46

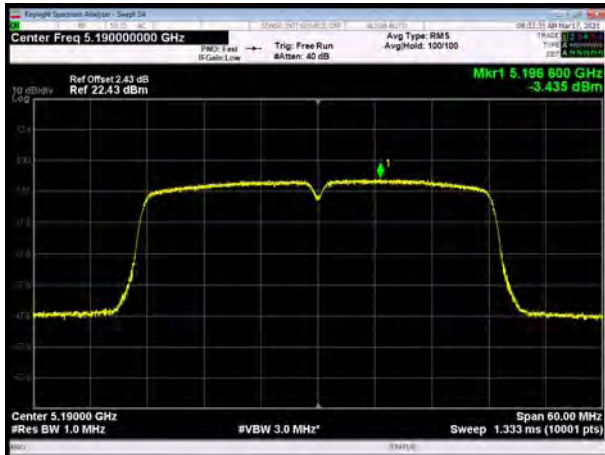


U-NII-1, 802.11ac VHT20, Channel No.: 40

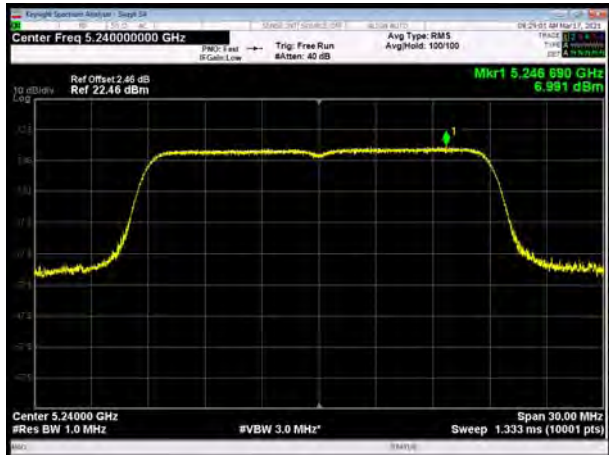




U-NII-1, 802.11ac VHT40, Channel No.: 38



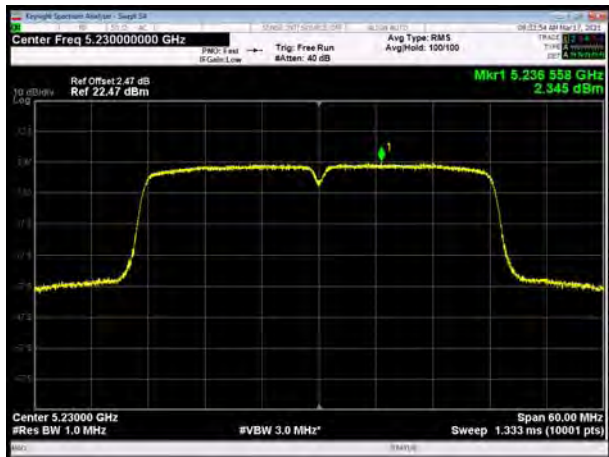
U-NII-1, 802.11ac VHT20, Channel No.: 48



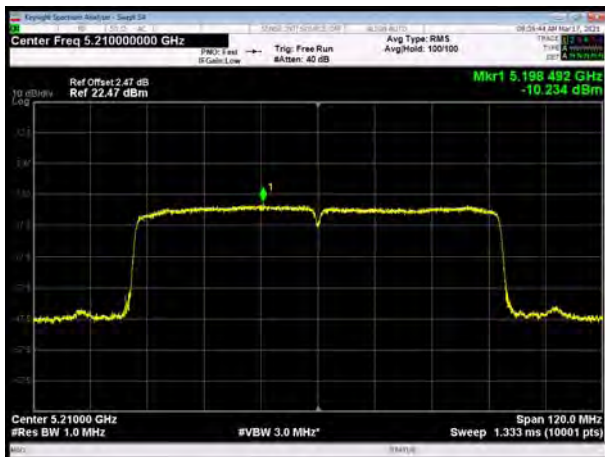
U-NII-1, 802.11ac VHT20, Channel No.: 44



U-NII-1, 802.11ac VHT40, Channel No.: 46

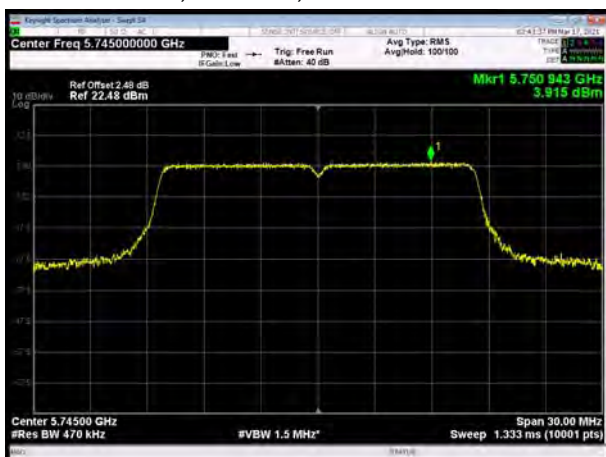


U-NII-1, 802.11ac VHT80, Channel No.: 42

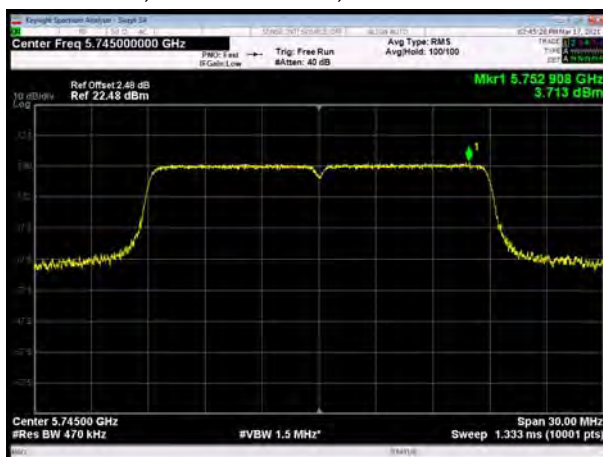




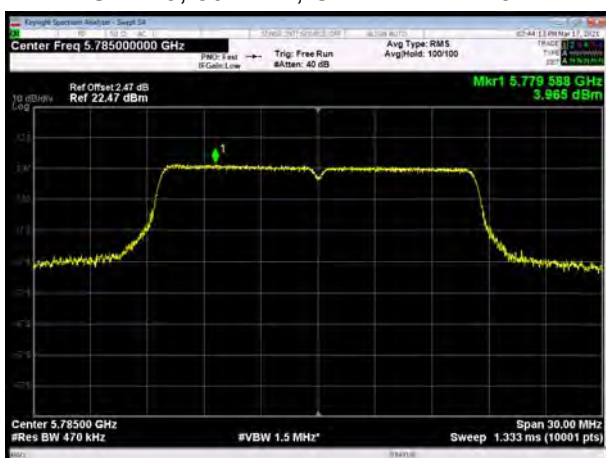
U-NII-3, 802.11a, Channel No.: 149



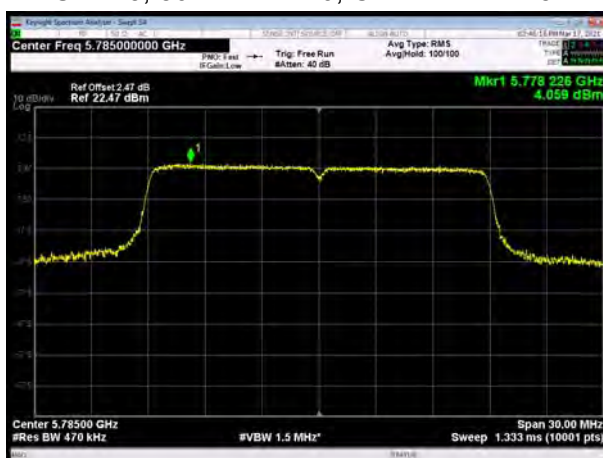
U-NII-3, 802.11n HT20, Channel No.: 149



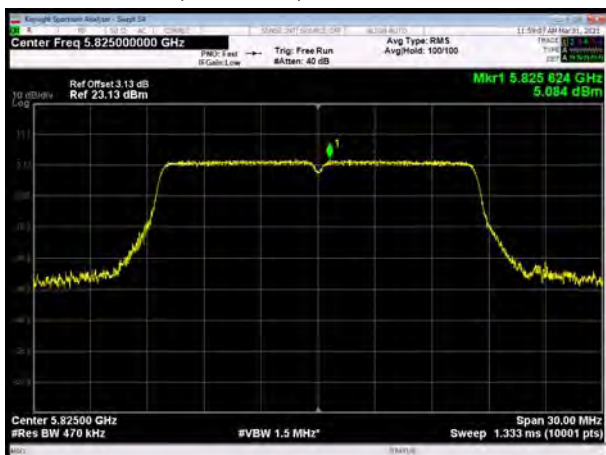
U-NII-3, 802.11a, Channel No.: 157



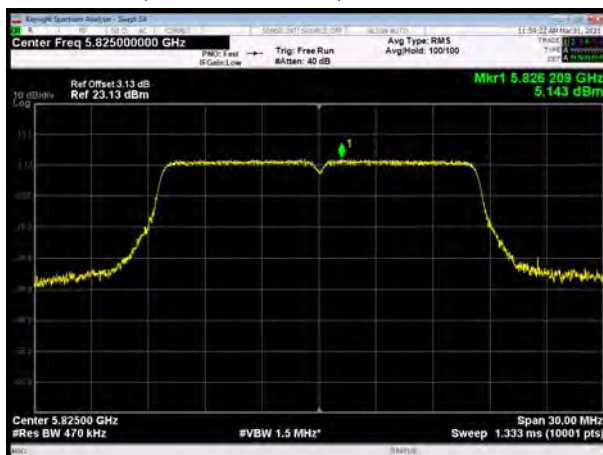
U-NII-3, 802.11n HT20, Channel No.: 157



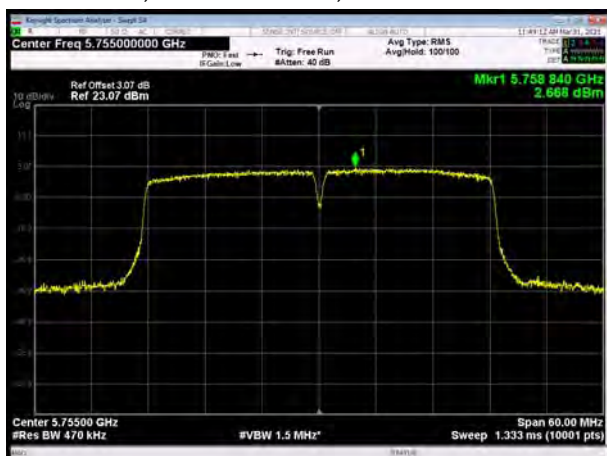
U-NII-3, 802.11a, Channel No.: 165



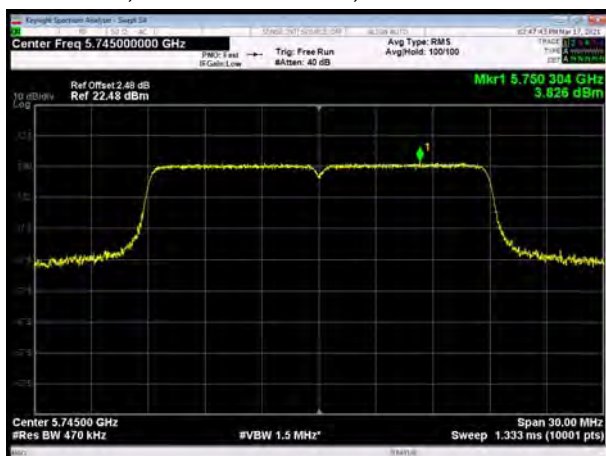
U-NII-3, 802.11n HT20, Channel No.: 165



U-NII-3, 802.11n HT40, Channel No.: 151



U-NII-3, 802.11ac VHT20, Channel No.: 149



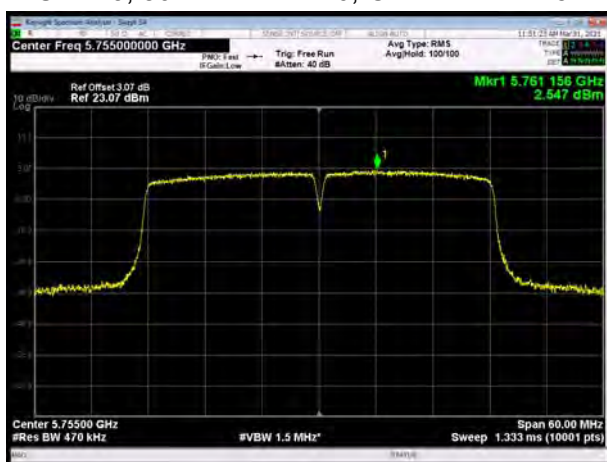
U-NII-3, 802.11n HT40, Channel No.: 159



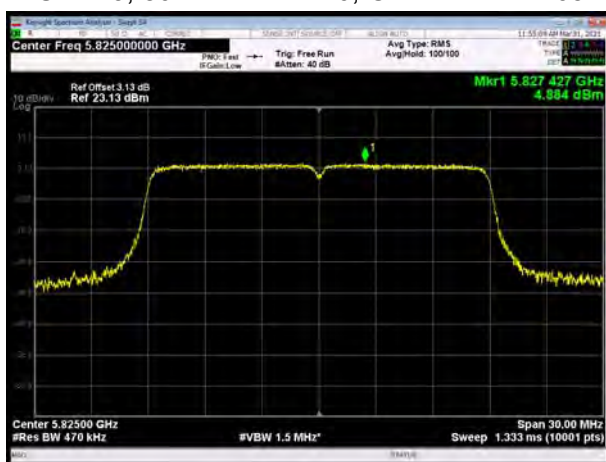
U-NII-3, 802.11ac VHT20, Channel No.: 157



U-NII-3, 802.11ac VHT40, Channel No.: 151

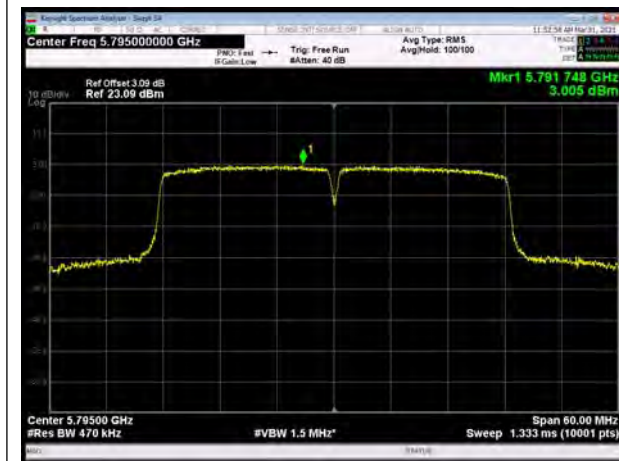


U-NII-3, 802.11ac VHT20, Channel No.: 165

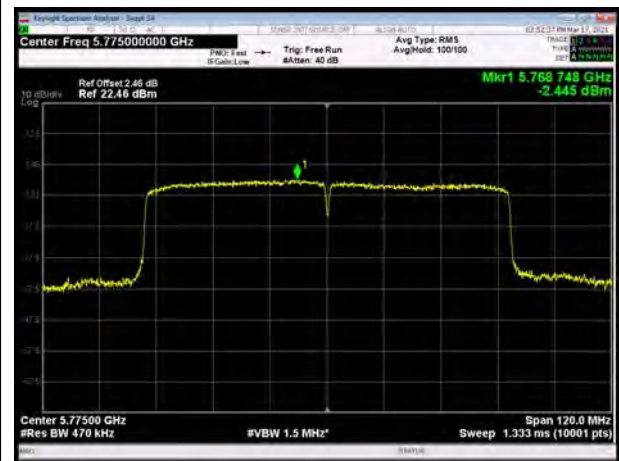




U-NII-3, 802.11ac VHT40, Channel No.: 159



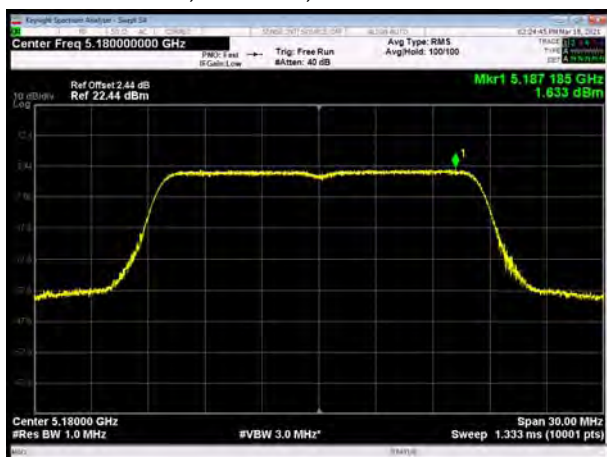
U-NII-3, 802.11ac VHT80, Channel No.: 155



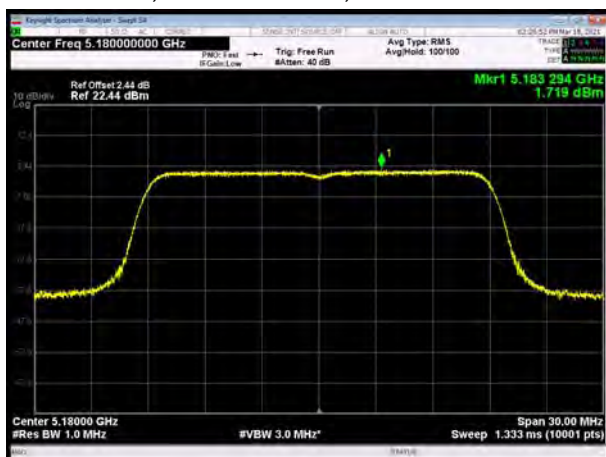


SISO Antenna 2

U-NII-1, 802.11a, Channel No.: 36



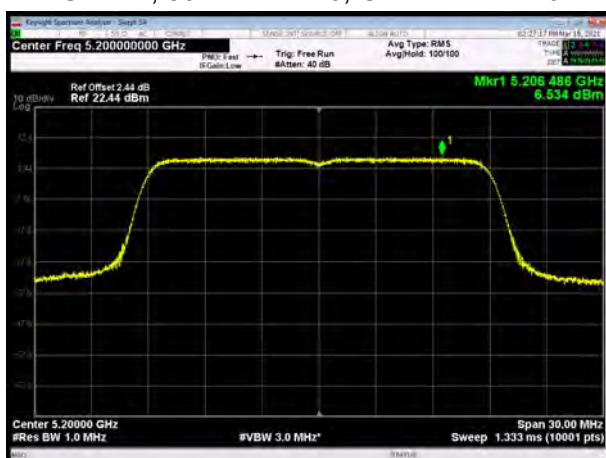
U-NII-1, 802.11n HT20, Channel No.: 36



U-NII-1, 802.11a, Channel No.: 40



U-NII-1, 802.11n HT20, Channel No.: 40



U-NII-1, 802.11a, Channel No.: 44

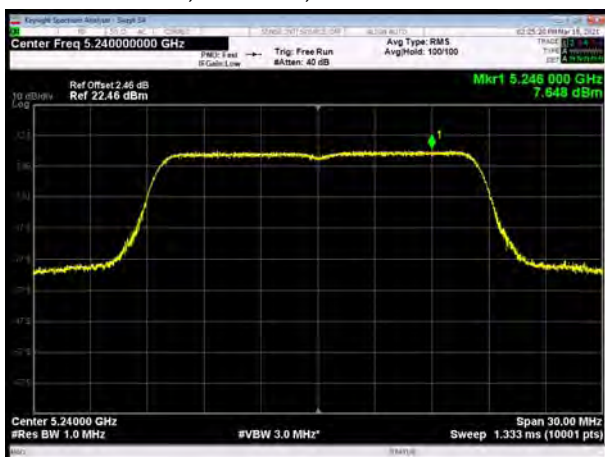


U-NII-1, 802.11n HT20, Channel No.: 44

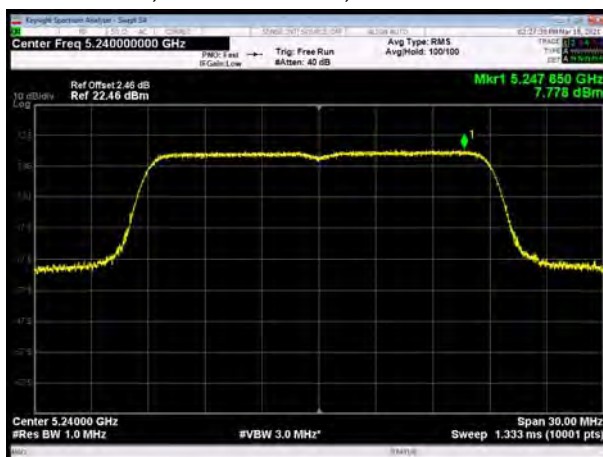




U-NII-1, 802.11a, Channel No.: 48



U-NII-1, 802.11n HT20, Channel No.: 48



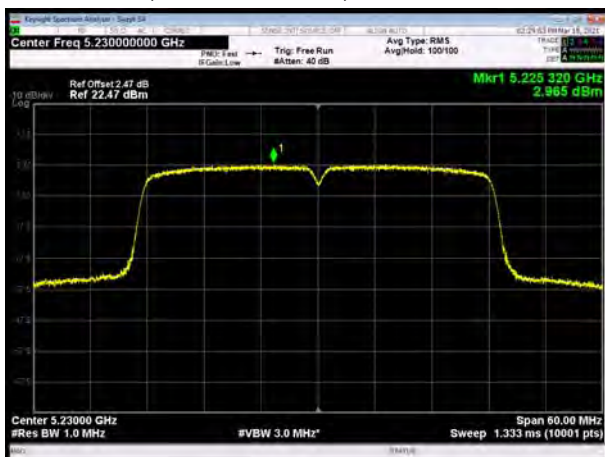
U-NII-1, 802.11n HT40, Channel No.: 38



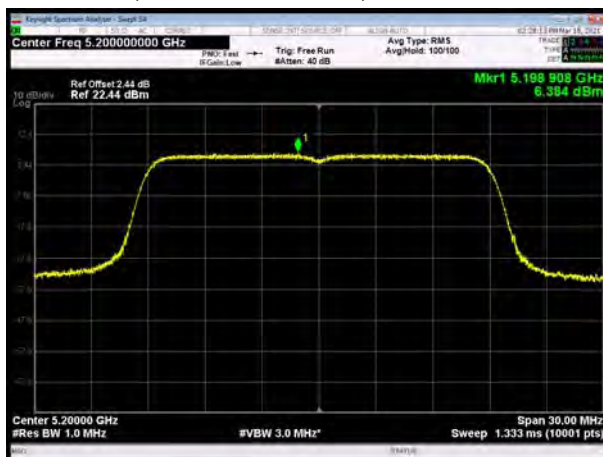
U-NII-1, 802.11ac VHT20, Channel No.: 36



U-NII-1, 802.11n HT40, Channel No.: 46

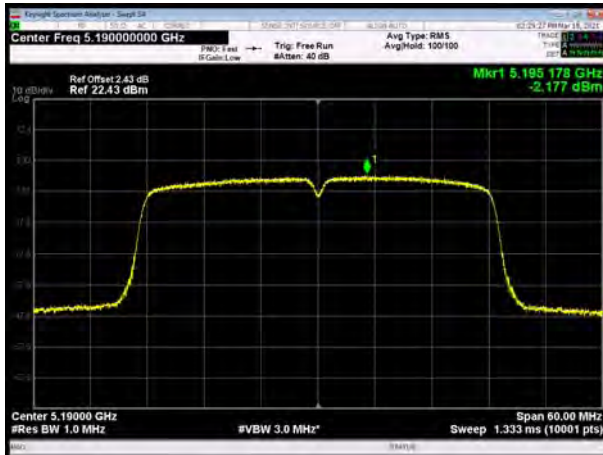


U-NII-1, 802.11ac VHT20, Channel No.: 40

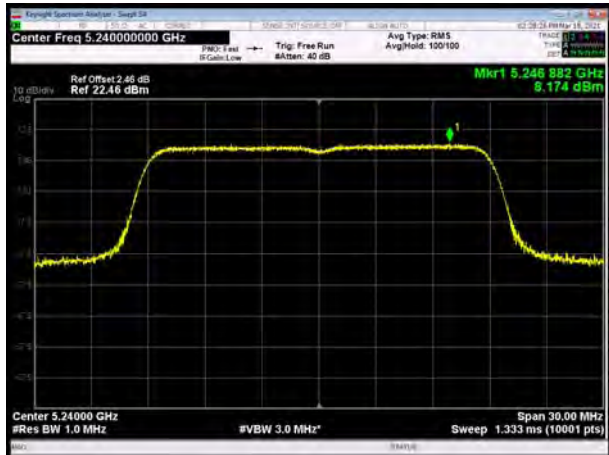




U-NII-1, 802.11ac VHT40, Channel No.: 38



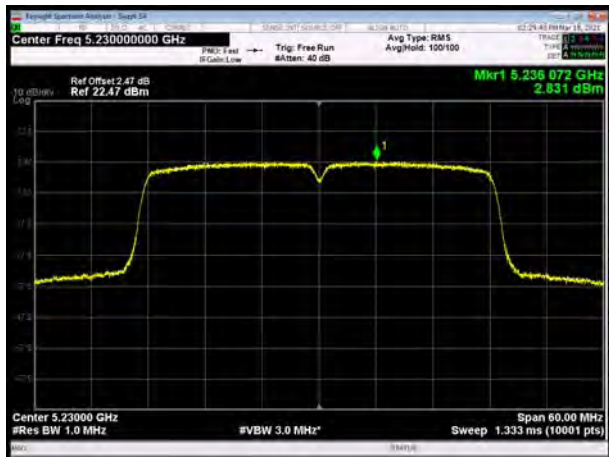
U-NII-1, 802.11ac VHT20, Channel No.: 48



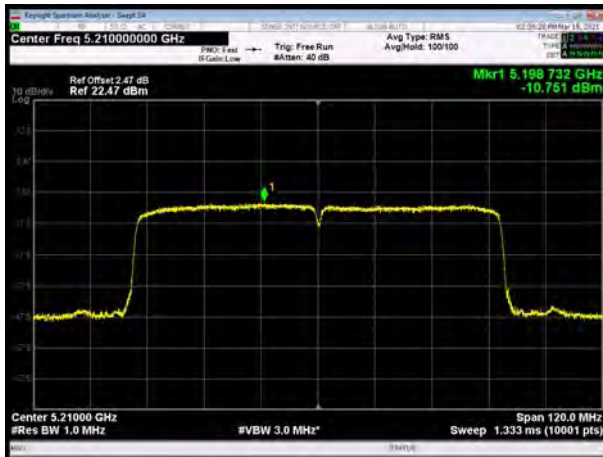
U-NII-1, 802.11ac VHT20, Channel No.: 44



U-NII-1, 802.11ac VHT40, Channel No.: 46

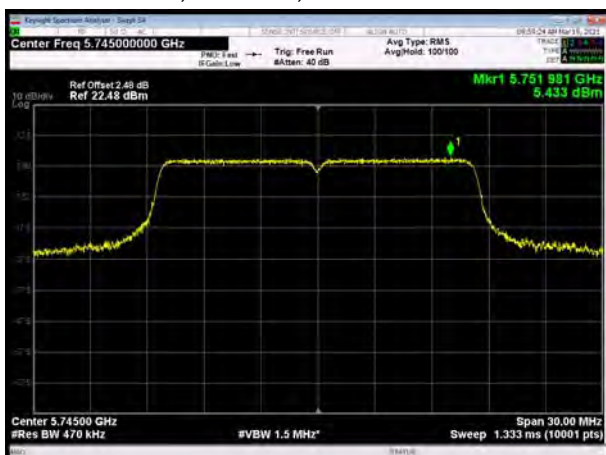


U-NII-1, 802.11ac VHT80, Channel No.: 42

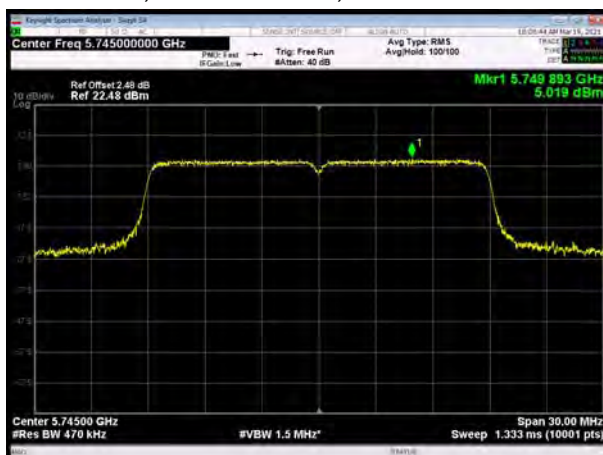




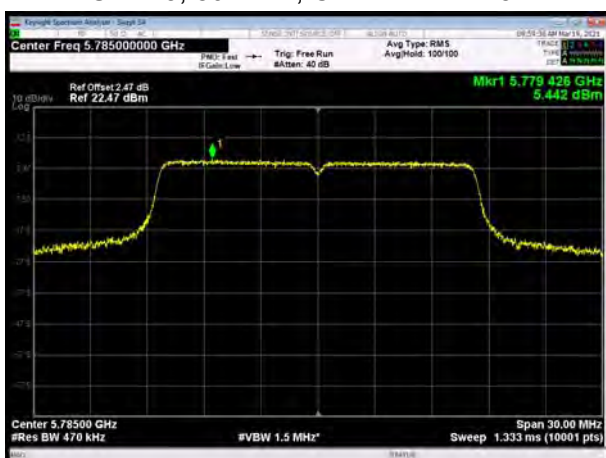
U-NII-3, 802.11a, Channel No.: 149



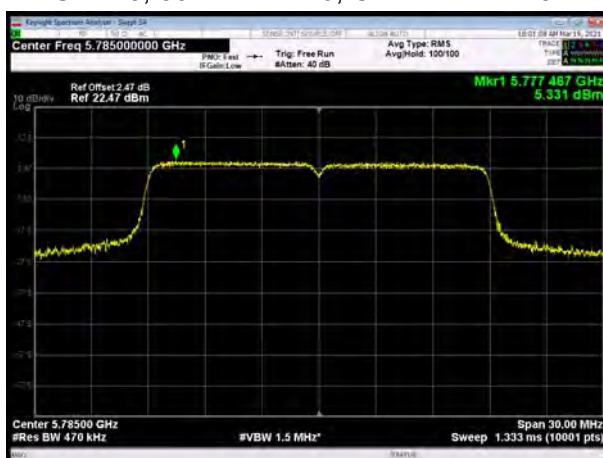
U-NII-3, 802.11n HT20, Channel No.: 149



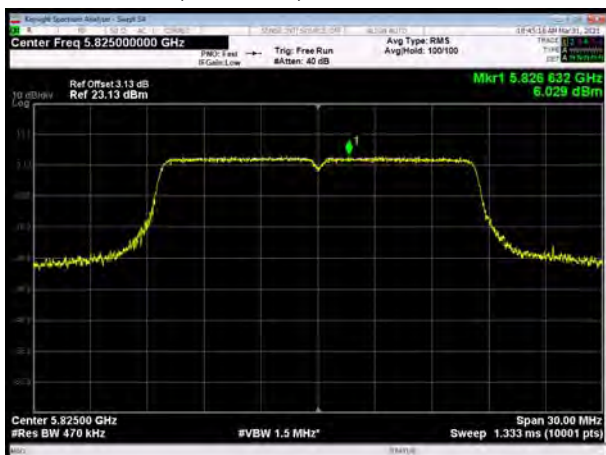
U-NII-3, 802.11a, Channel No.: 157



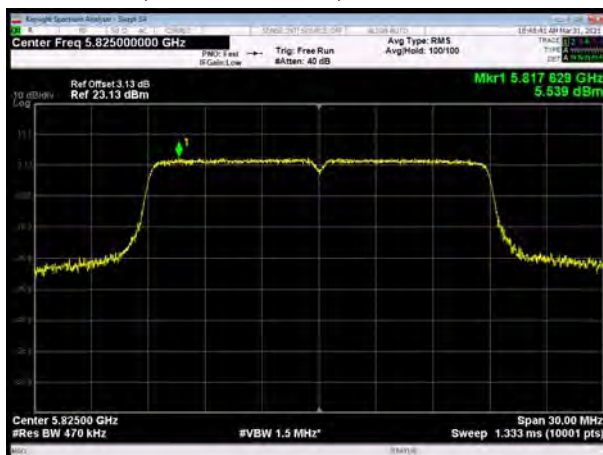
U-NII-3, 802.11n HT20, Channel No.: 157



U-NII-3, 802.11a, Channel No.: 165

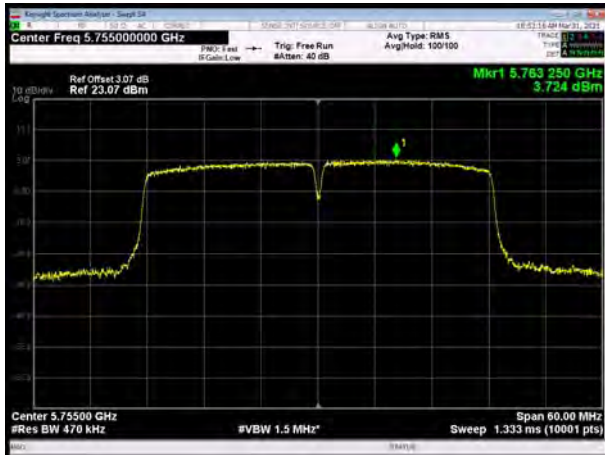


U-NII-3, 802.11n HT20, Channel No.: 165

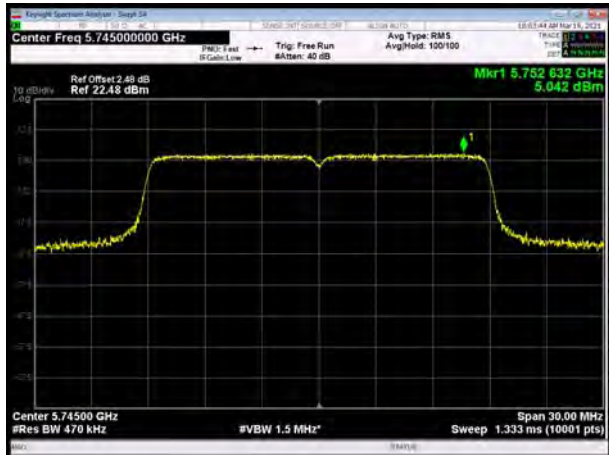




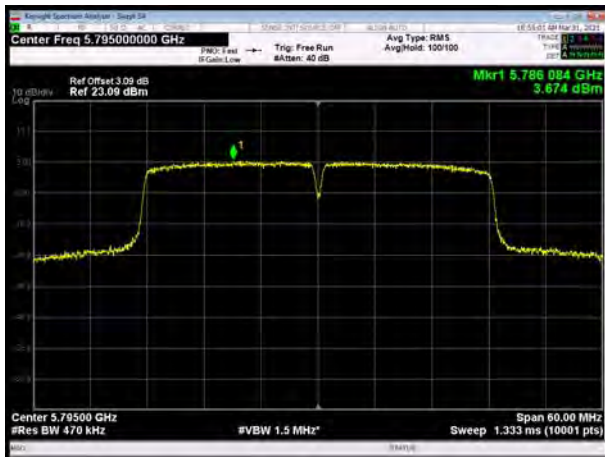
U-NII-3, 802.11n HT40, Channel No.: 151



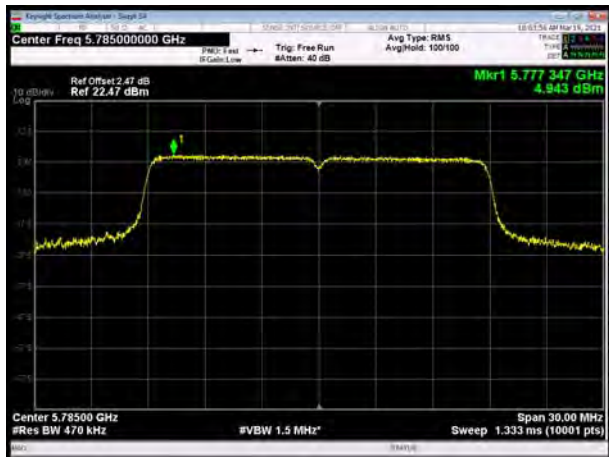
U-NII-3, 802.11ac VHT20, Channel No.: 149



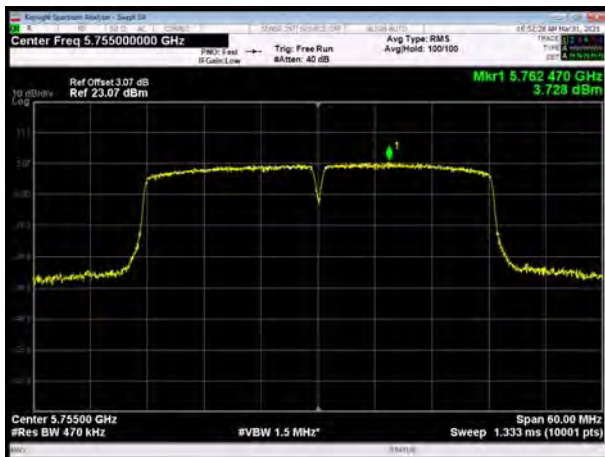
U-NII-3, 802.11n HT40, Channel No.: 159



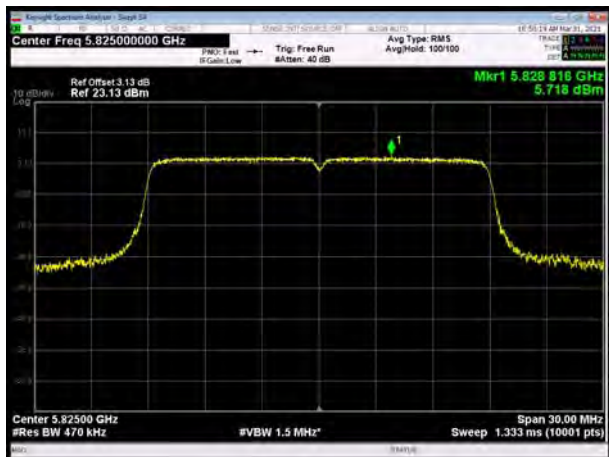
U-NII-3, 802.11ac VHT20, Channel No.: 157



U-NII-3, 802.11ac VHT40, Channel No.: 151

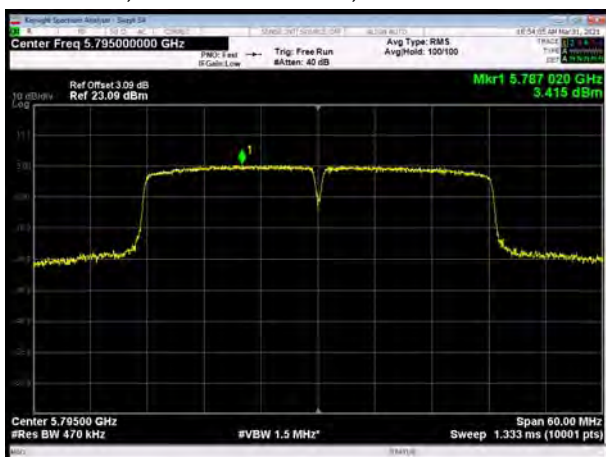


U-NII-3, 802.11ac VHT20, Channel No.: 165

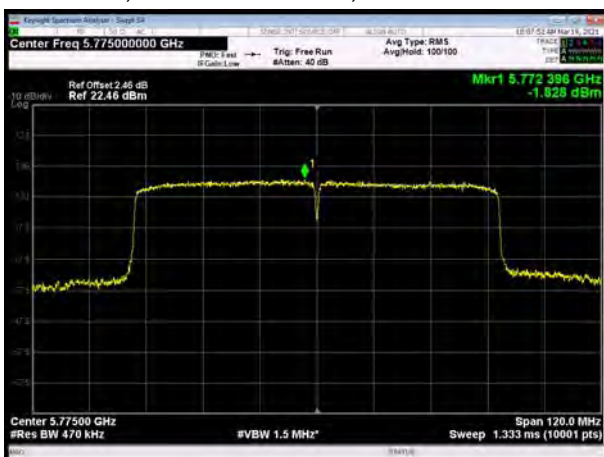




U-NII-3, 802.11ac VHT40, Channel No.: 159



U-NII-3, 802.11ac VHT80, Channel No.: 155





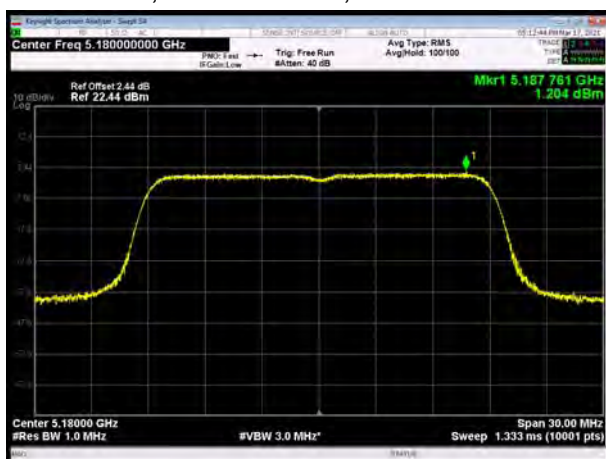
MIMO without Beamforming

MIMO Antenna 1

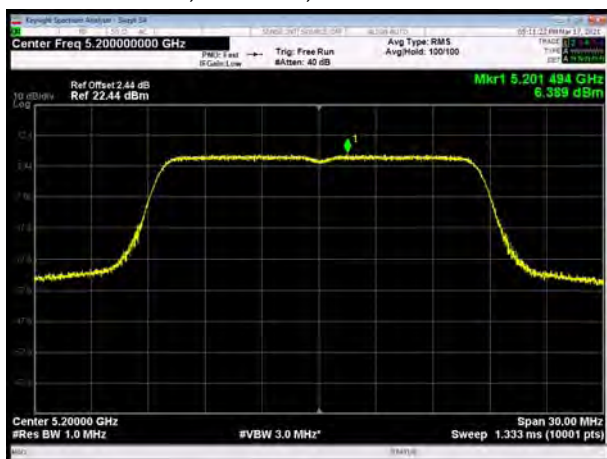
U-NII-1, 802.11a, Channel No.: 36



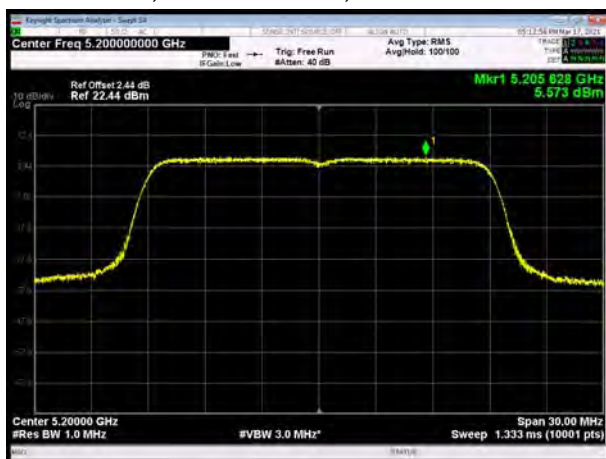
U-NII-1, 802.11n HT20, Channel No.: 36



U-NII-1, 802.11a, Channel No.: 40



U-NII-1, 802.11n HT20, Channel No.: 40



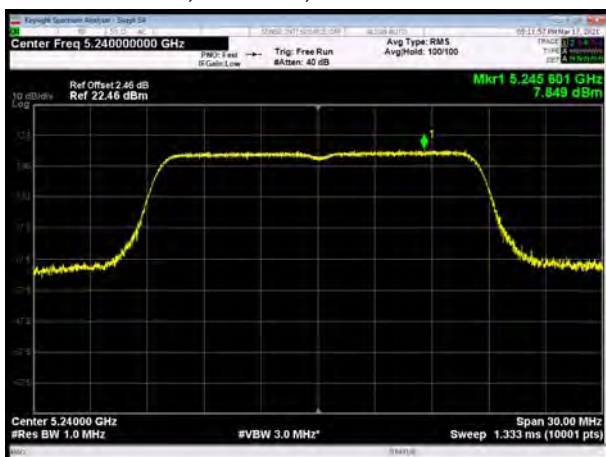
U-NII-1, 802.11a, Channel No.: 44



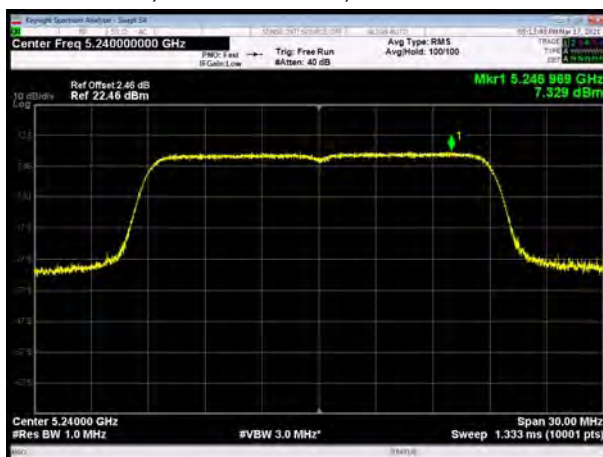
U-NII-1, 802.11n HT20, Channel No.: 44



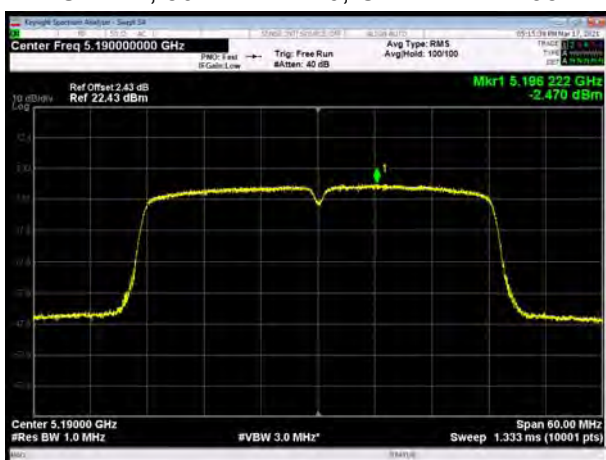
U-NII-1, 802.11a, Channel No.: 48



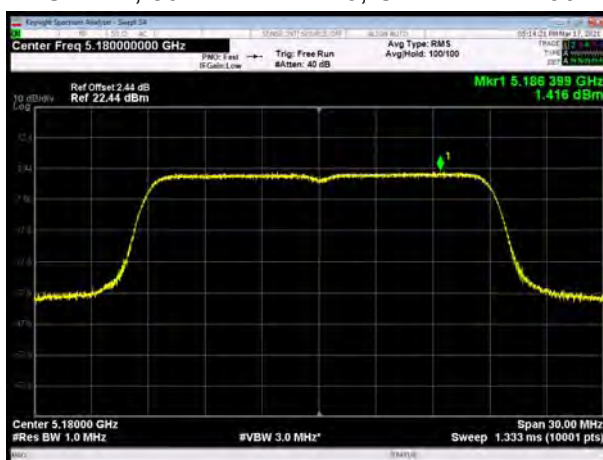
U-NII-1, 802.11n HT20, Channel No.: 48



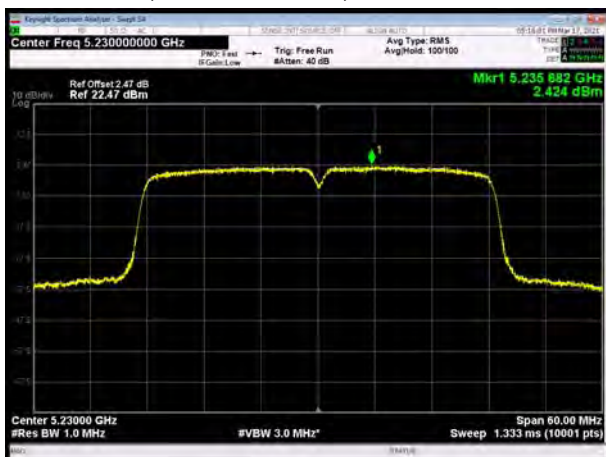
U-NII-1, 802.11n HT40, Channel No.: 38



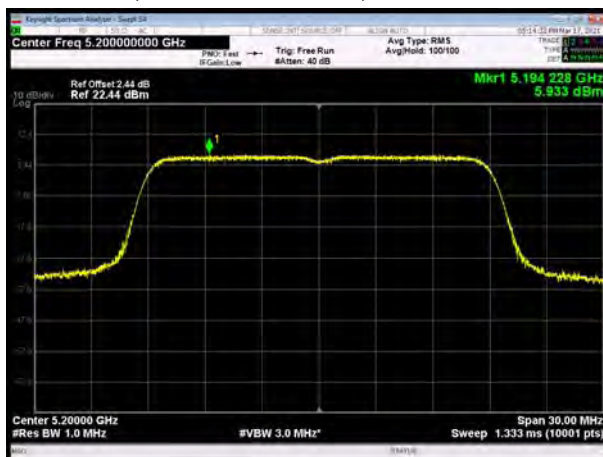
U-NII-1, 802.11ac VHT20, Channel No.: 36



U-NII-1, 802.11n HT40, Channel No.: 46

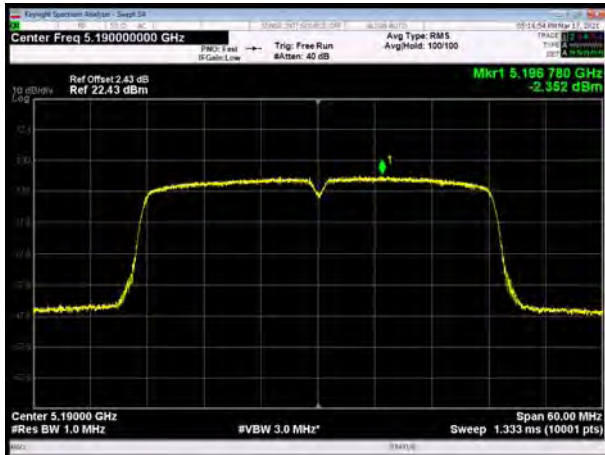


U-NII-1, 802.11ac VHT20, Channel No.: 40

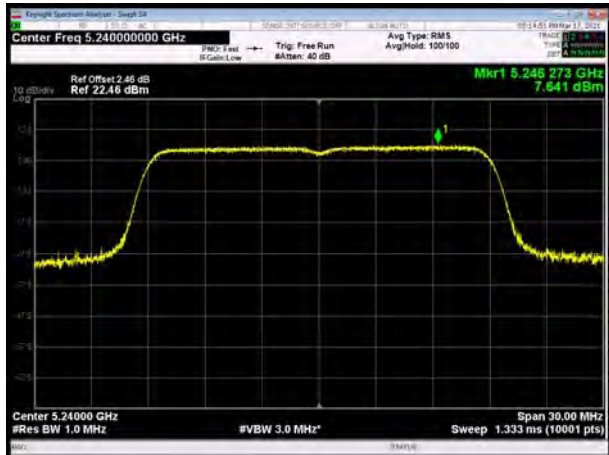




U-NII-1, 802.11ac VHT40, Channel No.: 38



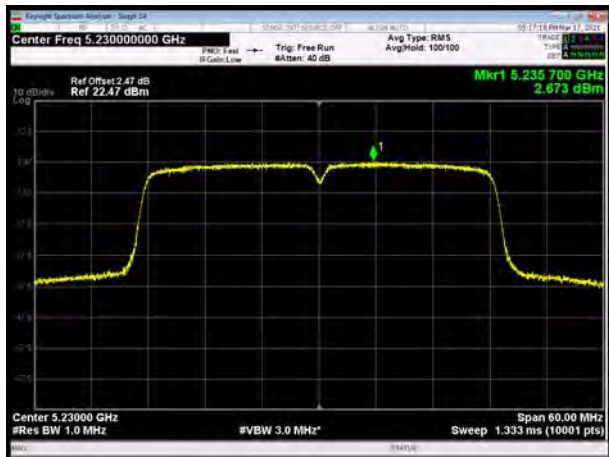
U-NII-1, 802.11ac VHT20, Channel No.: 48



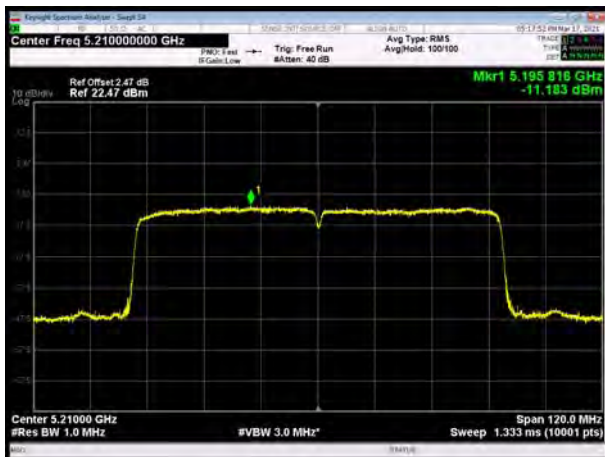
U-NII-1, 802.11ac VHT20, Channel No.: 44



U-NII-1, 802.11ac VHT40, Channel No.: 46

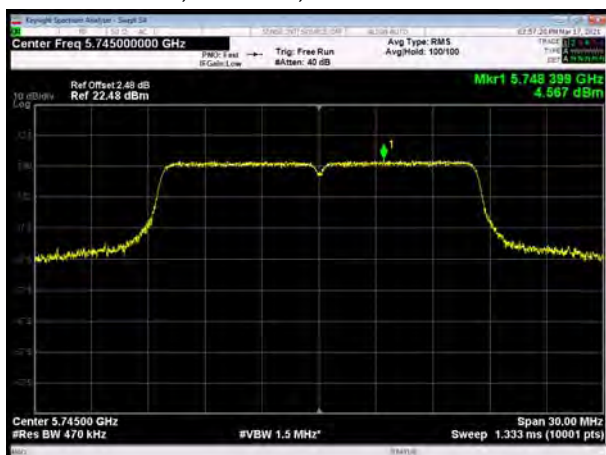


U-NII-1, 802.11ac VHT80, Channel No.: 42

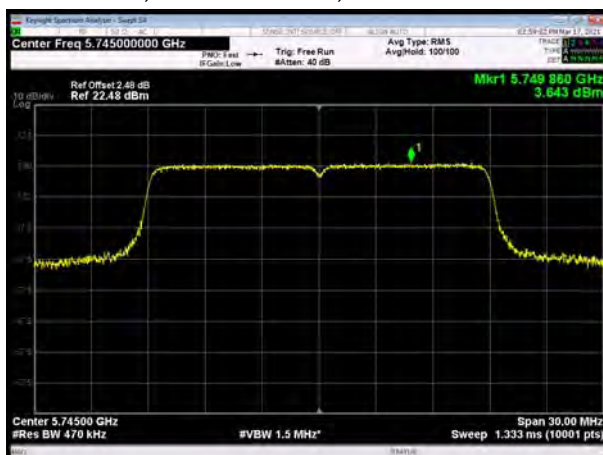




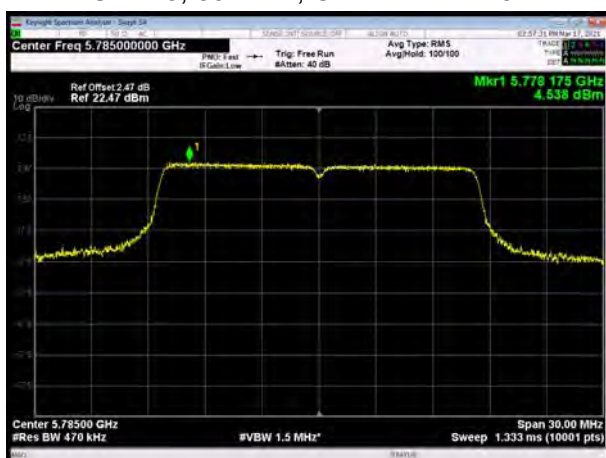
U-NII-3, 802.11a, Channel No.: 149



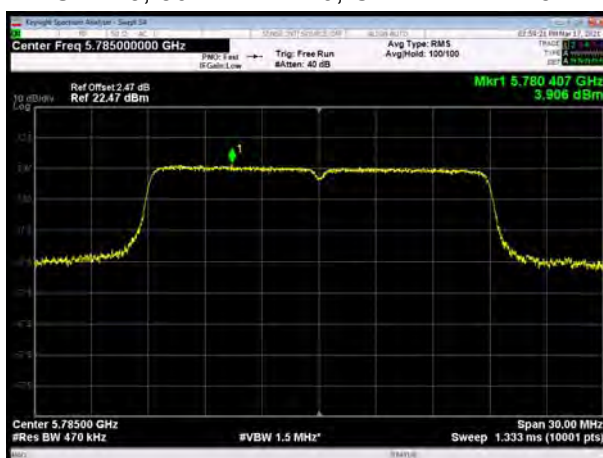
U-NII-3, 802.11n HT20, Channel No.: 149



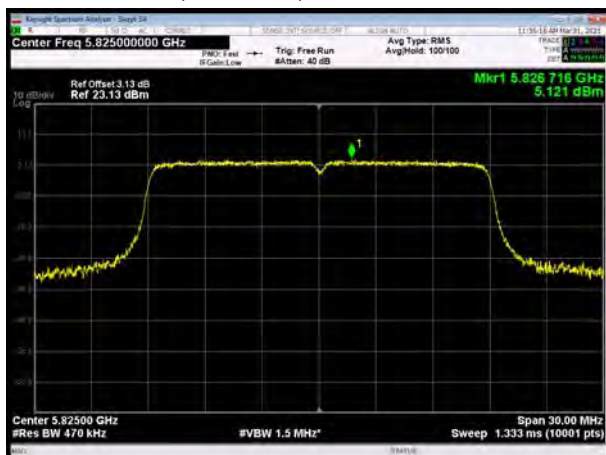
U-NII-3, 802.11a, Channel No.: 157



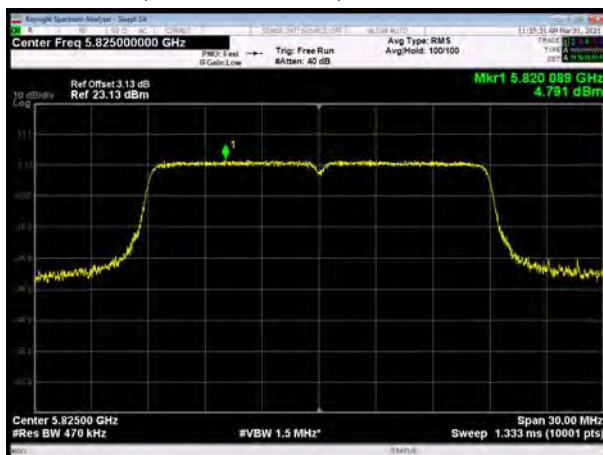
U-NII-3, 802.11n HT20, Channel No.: 157



U-NII-3, 802.11a, Channel No.: 165

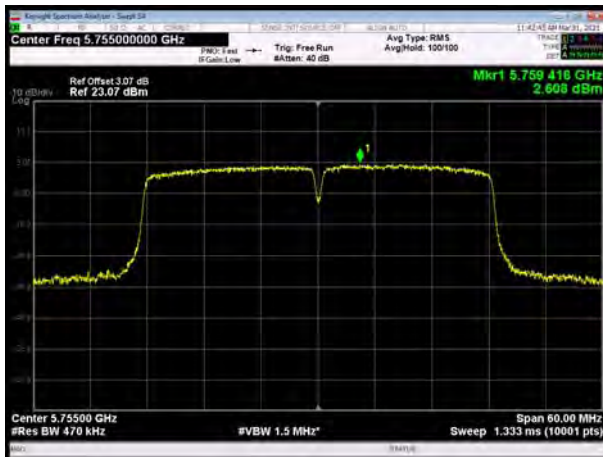


U-NII-3, 802.11n HT20, Channel No.: 165

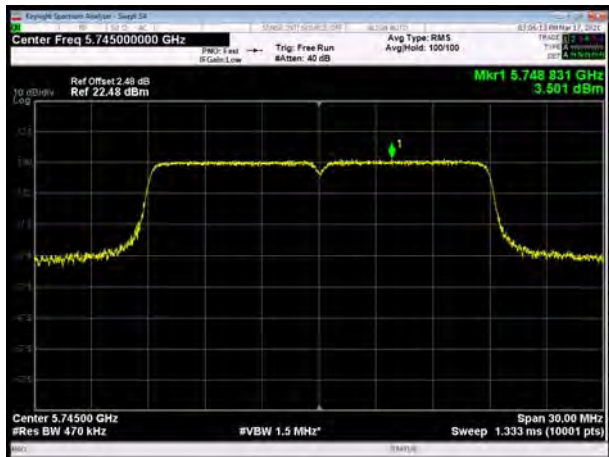




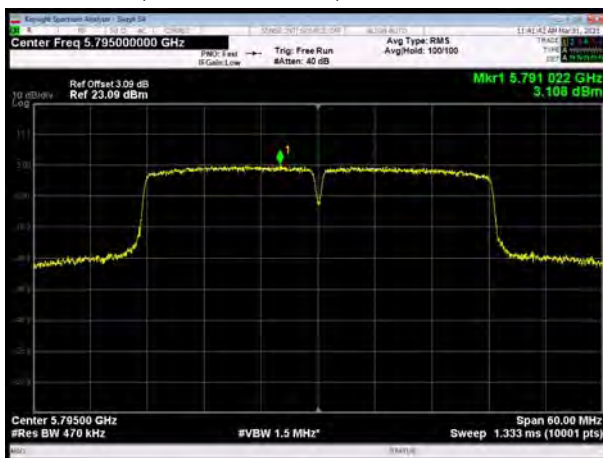
U-NII-3, 802.11n HT40, Channel No.: 151



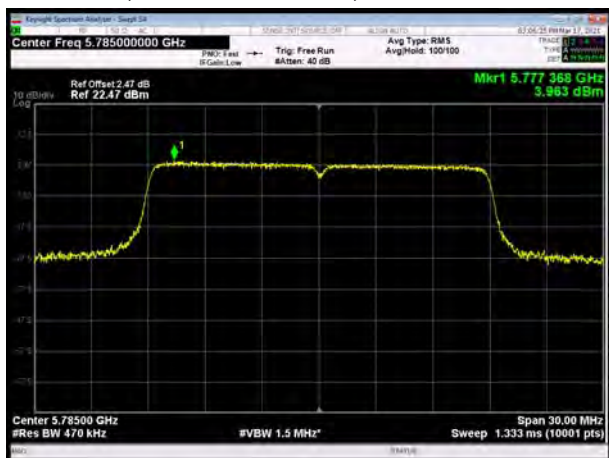
U-NII-3, 802.11ac VHT20, Channel No.: 149



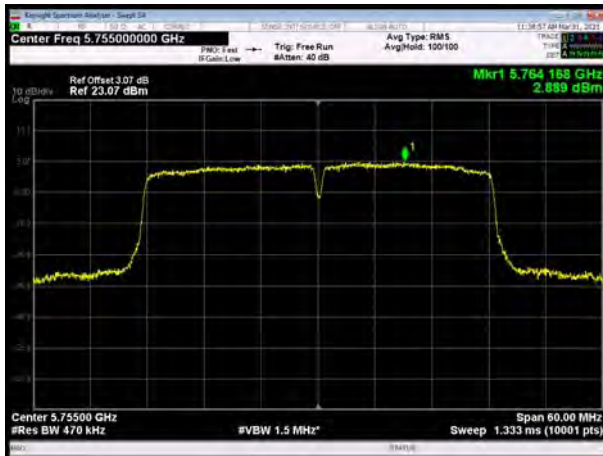
U-NII-3, 802.11n HT40, Channel No.: 159



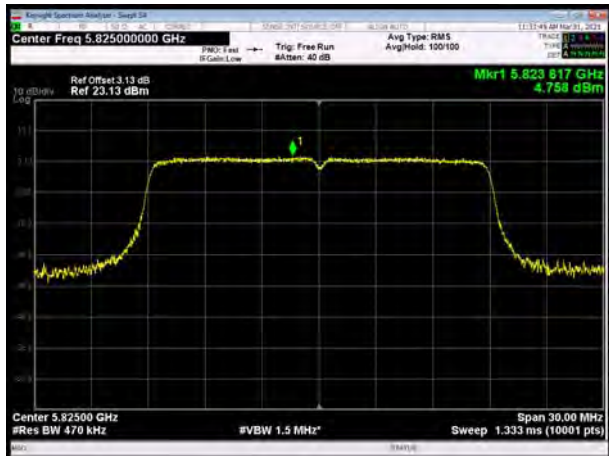
U-NII-3, 802.11ac VHT20, Channel No.: 157



U-NII-3, 802.11ac VHT40, Channel No.: 151

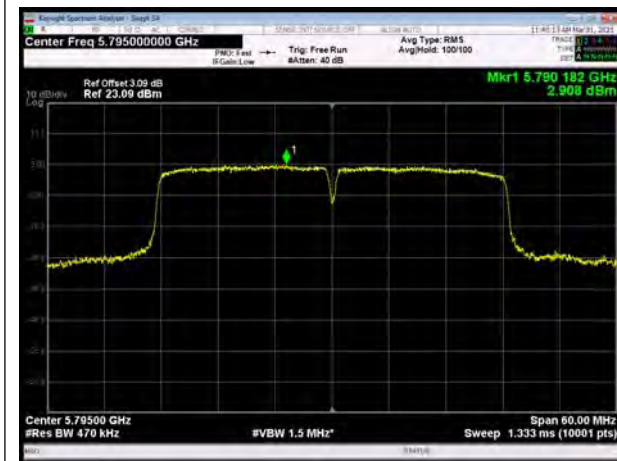


U-NII-3, 802.11ac VHT20, Channel No.: 165

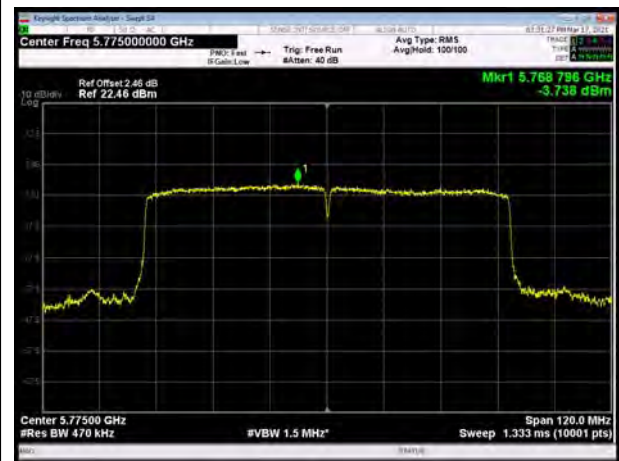




U-NII-3, 802.11ac VHT40, Channel No.: 159



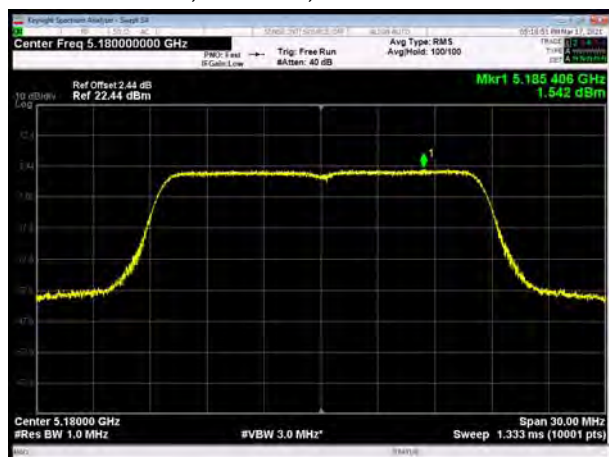
U-NII-3, 802.11ac VHT80, Channel No.: 155



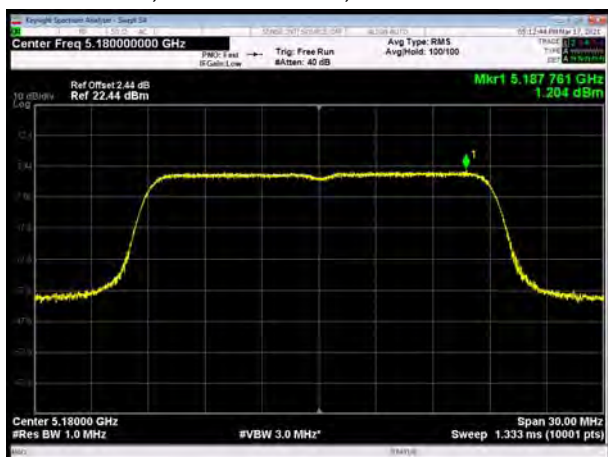


MIMO Antenna 2

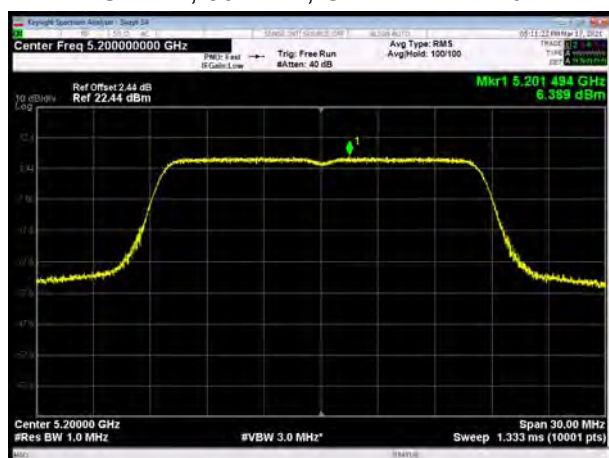
U-NII-1, 802.11a, Channel No.: 36



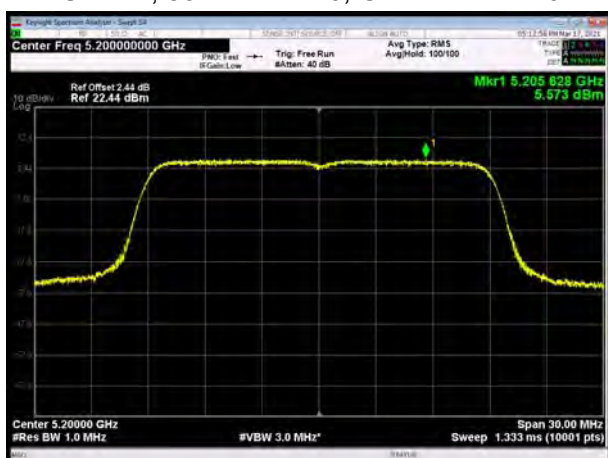
U-NII-1, 802.11n HT20, Channel No.: 36



U-NII-1, 802.11a, Channel No.: 40



U-NII-1, 802.11n HT20, Channel No.: 40



U-NII-1, 802.11a, Channel No.: 44

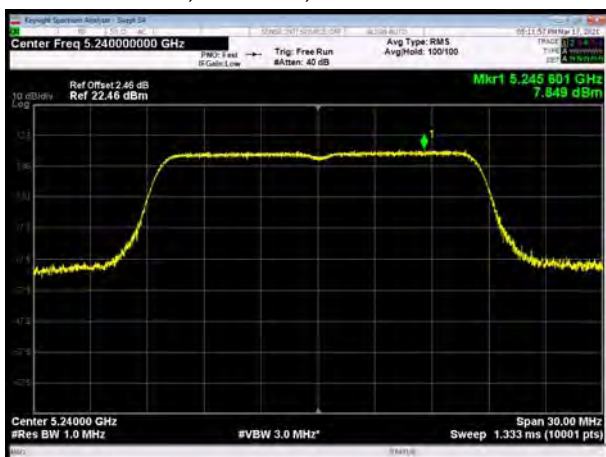


U-NII-1, 802.11n HT20, Channel No.: 44

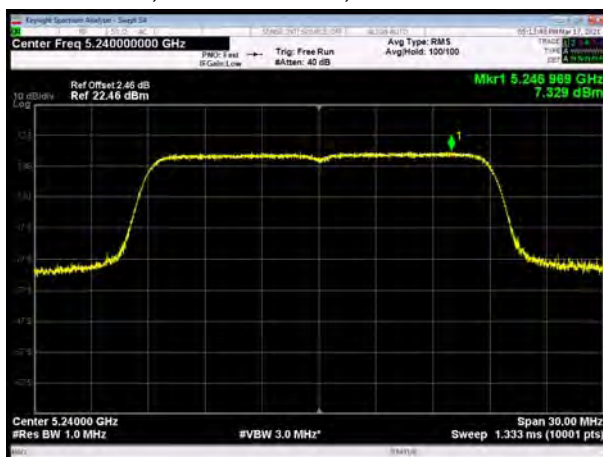




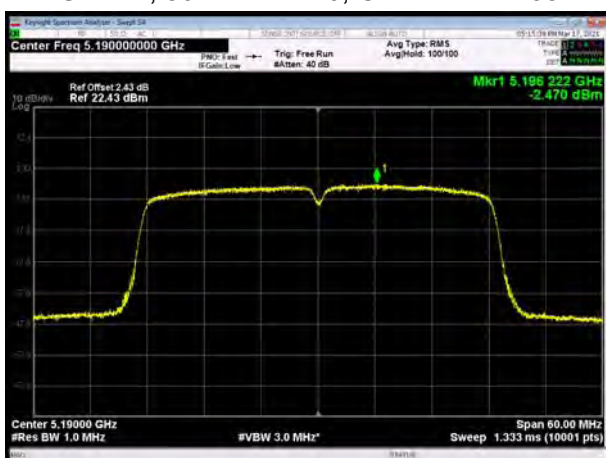
U-NII-1, 802.11a, Channel No.: 48



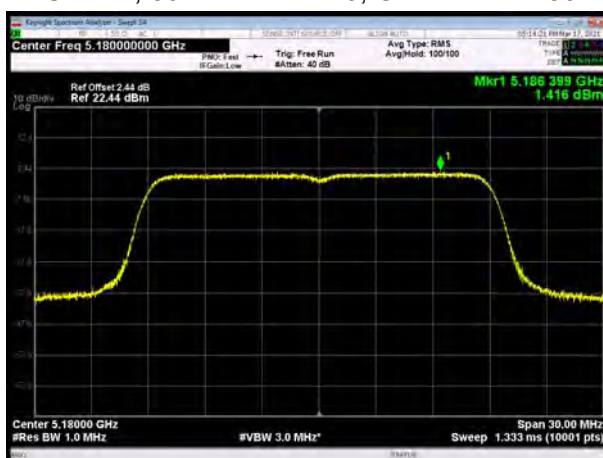
U-NII-1, 802.11n HT20, Channel No.: 48



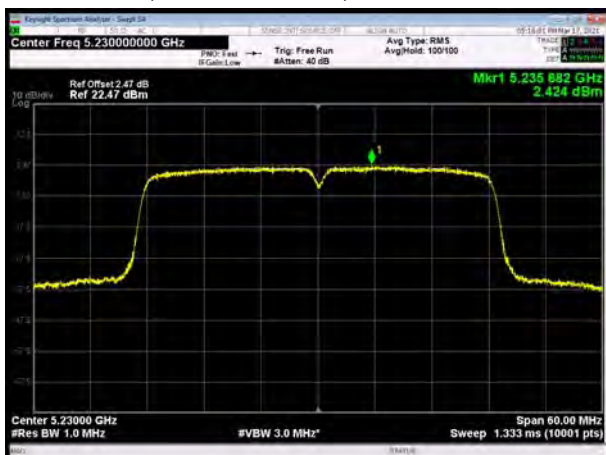
U-NII-1, 802.11n HT40, Channel No.: 38



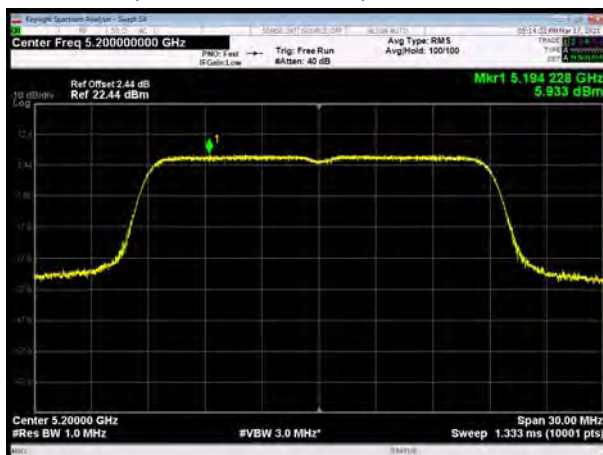
U-NII-1, 802.11ac VHT20, Channel No.: 36



U-NII-1, 802.11n HT40, Channel No.: 46

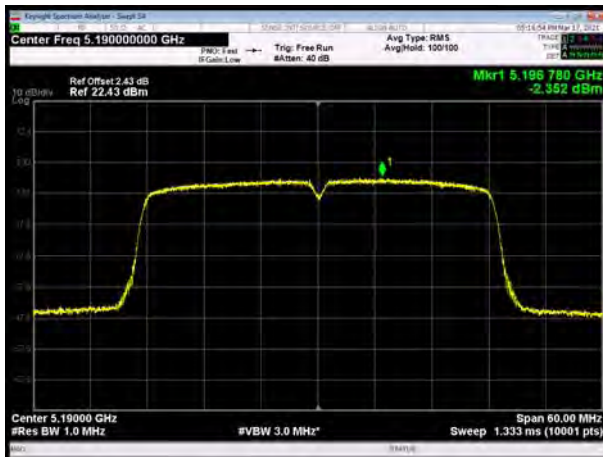


U-NII-1, 802.11ac VHT20, Channel No.: 40

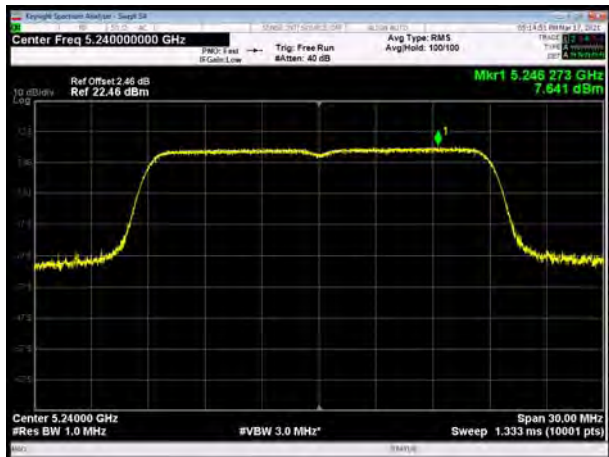




U-NII-1, 802.11ac VHT40, Channel No.: 38



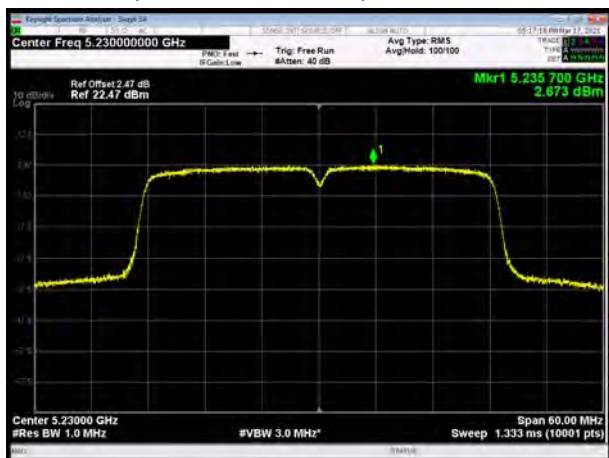
U-NII-1, 802.11ac VHT20, Channel No.: 48



U-NII-1, 802.11ac VHT20, Channel No.: 48



U-NII-1, 802.11ac VHT40, Channel No.: 46

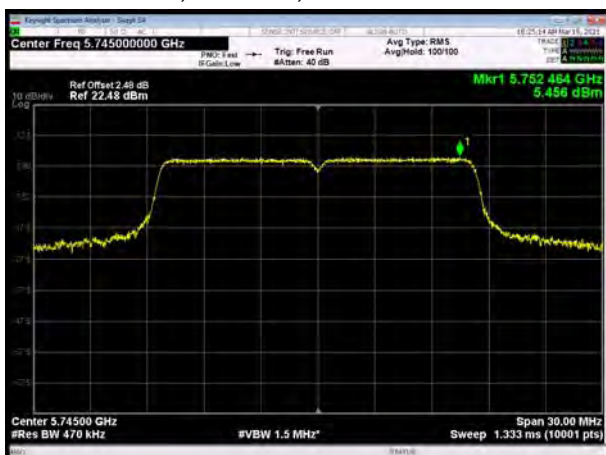


U-NII-1, 802.11ac VHT80, Channel No.: 42

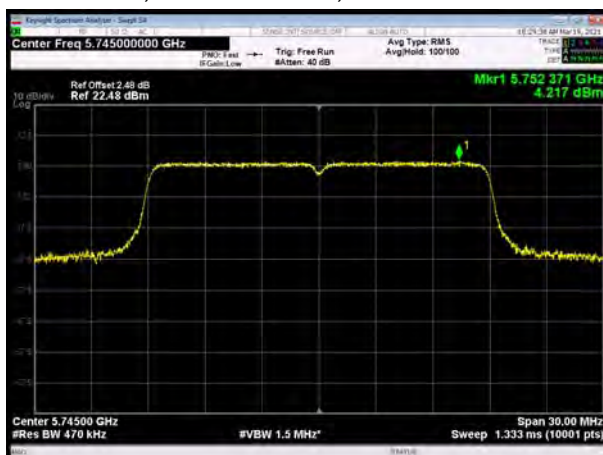




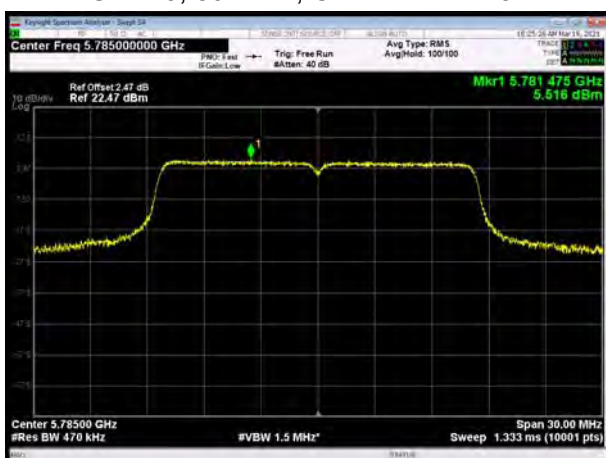
U-NII-3, 802.11a, Channel No.: 149



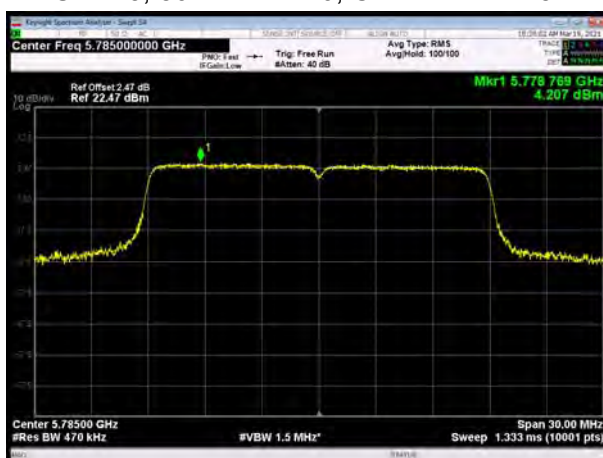
U-NII-3, 802.11n HT20, Channel No.: 149



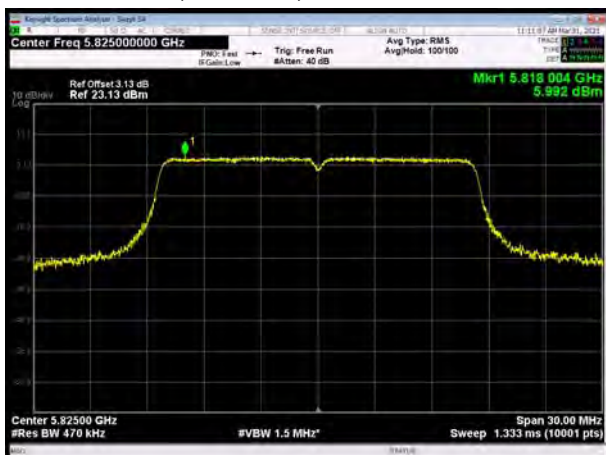
U-NII-3, 802.11a, Channel No.: 157



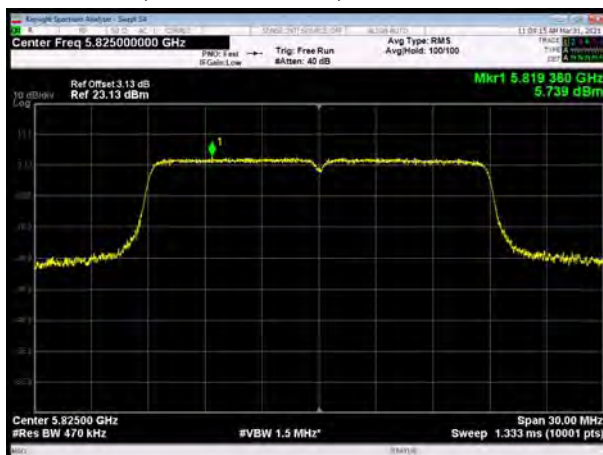
U-NII-3, 802.11n HT20, Channel No.: 157



U-NII-3, 802.11a, Channel No.: 165

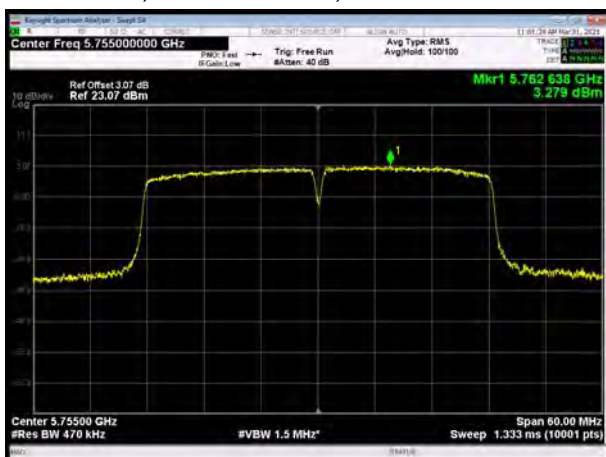


U-NII-3, 802.11n HT20, Channel No.: 165

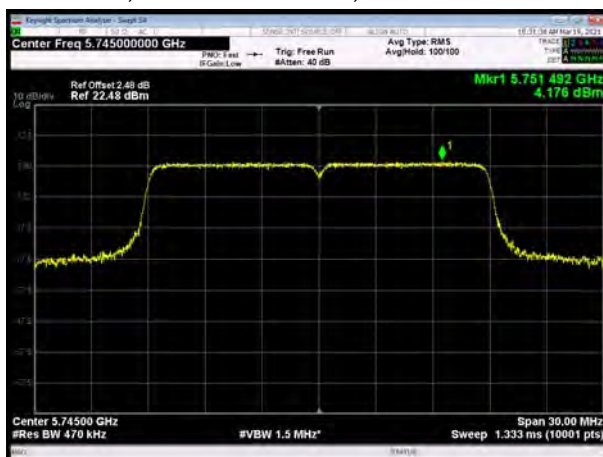




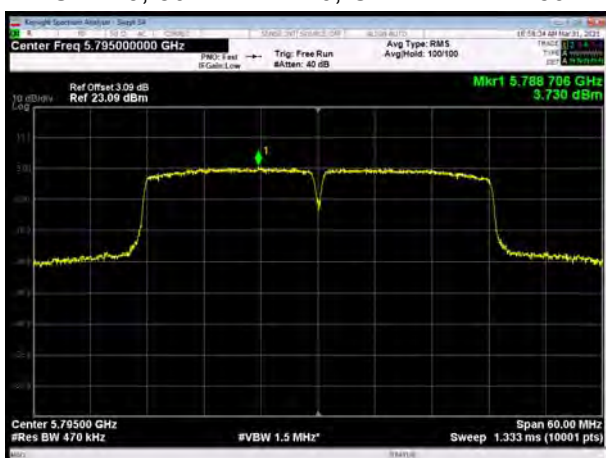
U-NII-3, 802.11n HT40, Channel No.: 151



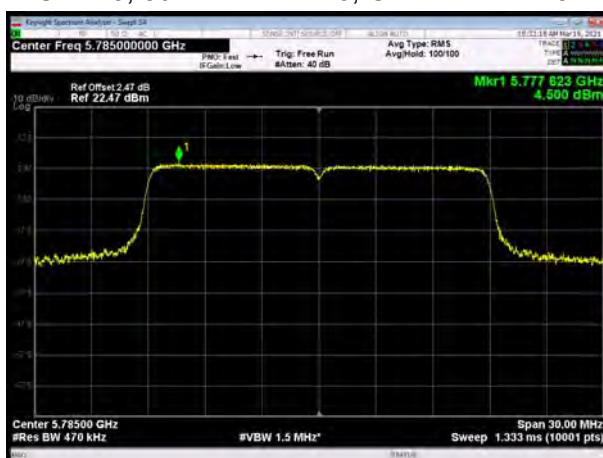
U-NII-3, 802.11ac VHT20, Channel No.: 149



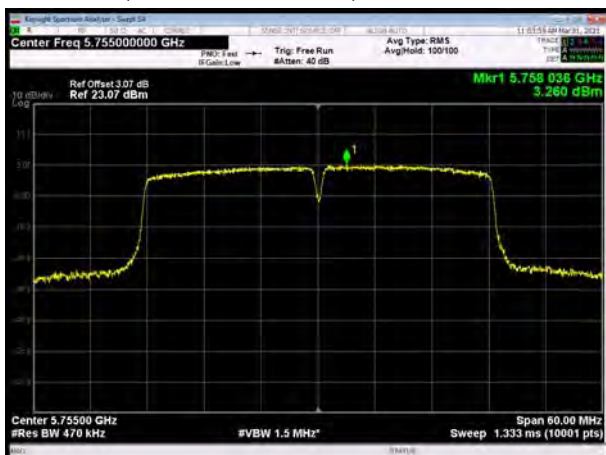
U-NII-3, 802.11n HT40, Channel No.: 159



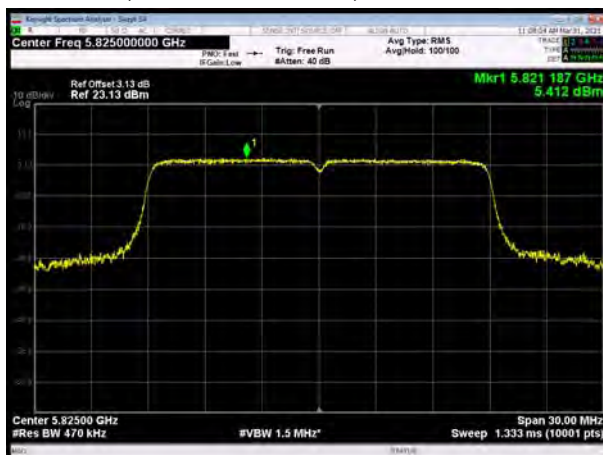
U-NII-3, 802.11ac VHT20, Channel No.: 157



U-NII-3, 802.11ac VHT40, Channel No.: 151

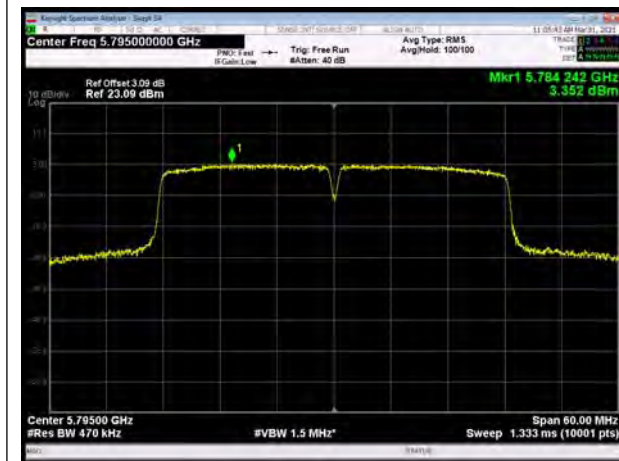


U-NII-3, 802.11ac VHT20, Channel No.: 165





U-NII-3, 802.11ac VHT40, Channel No.: 159



U-NII-3, 802.11ac VHT80, Channel No.: 155

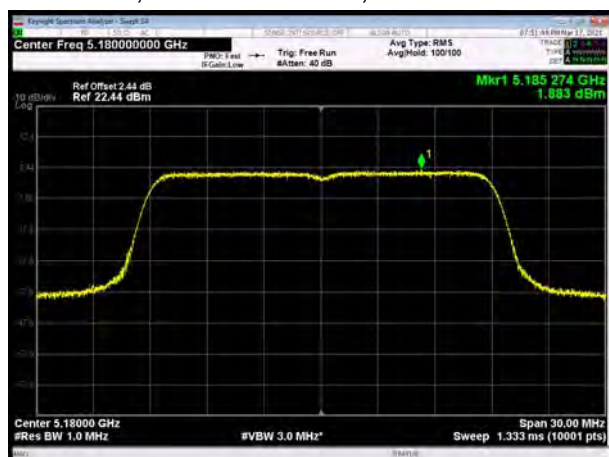




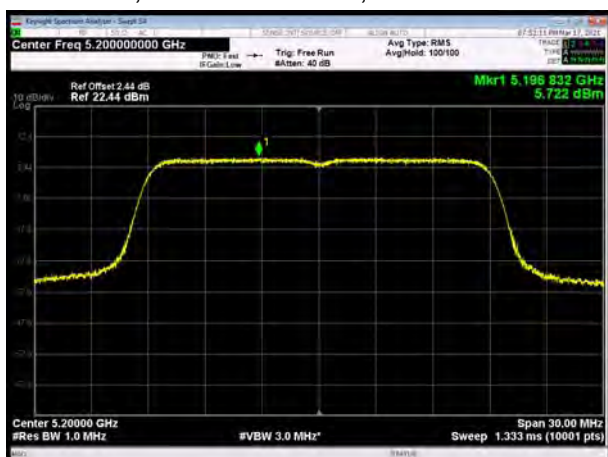
MIMO with Beamforming

MIMO Antenna 1

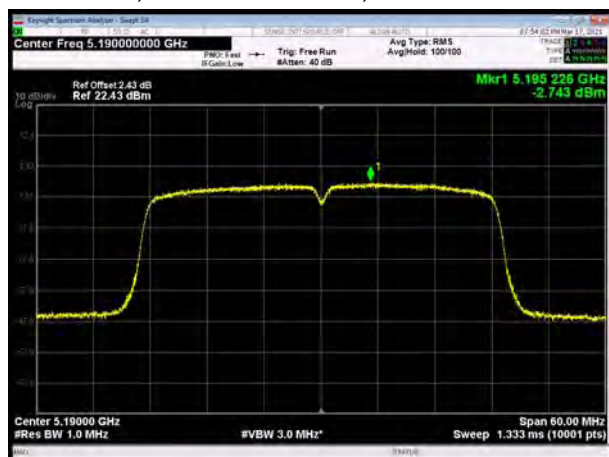
U-NII-1, 802.11ac VHT20, Channel No.: 36



U-NII-1, 802.11ac VHT20, Channel No.: 40



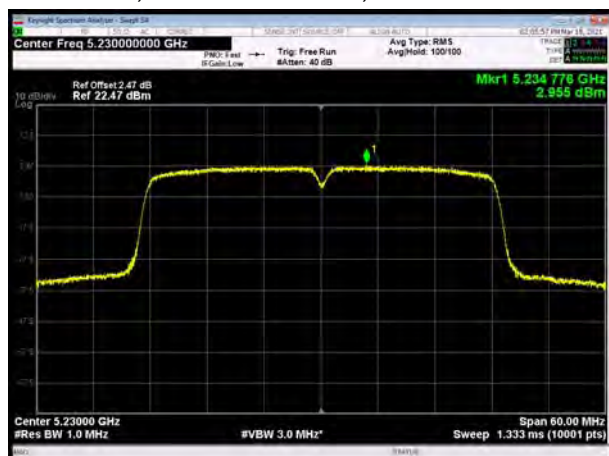
U-NII-1, 802.11ac VHT40, Channel No.: 38



U-NII-1, 802.11ac VHT20, Channel No.: 48



U-NII-1, 802.11ac VHT40, Channel No.: 46



U-NII-1, 802.11ac VHT80, Channel No.: 42



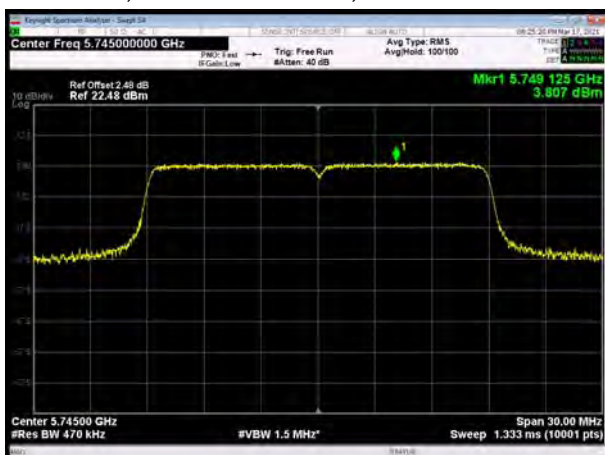


U-NII-1, 802.11ac VHT20, Channel No.: 44

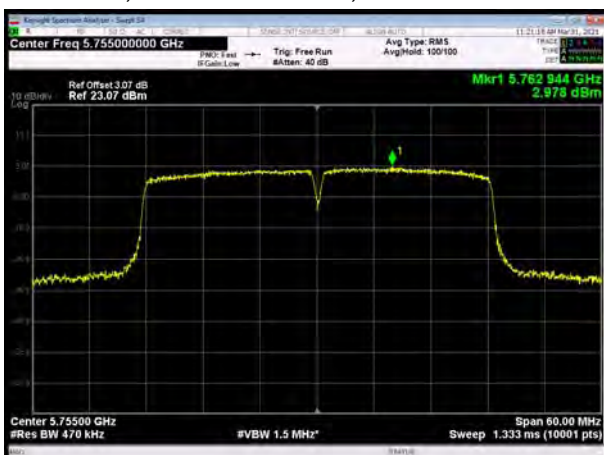




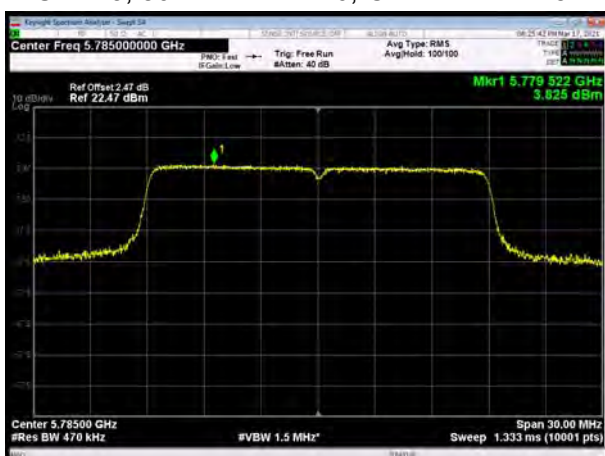
U-NII-3, 802.11ac VHT20, Channel No.: 149



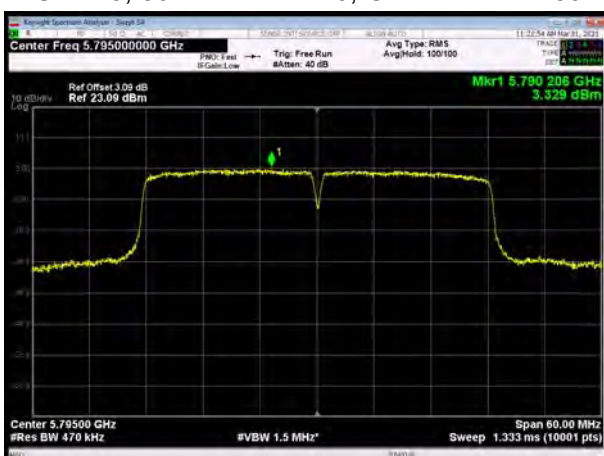
U-NII-3, 802.11ac VHT40, Channel No.: 151



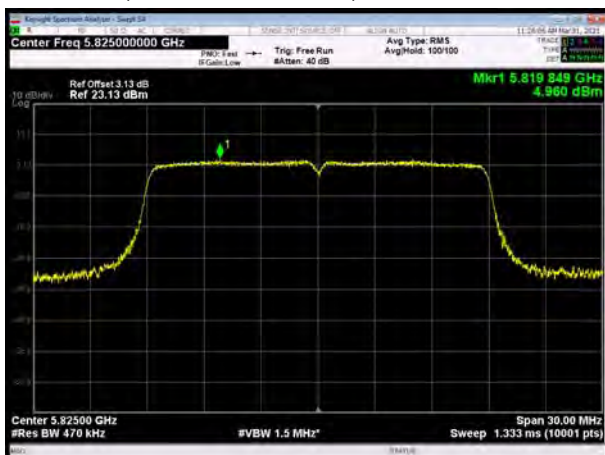
U-NII-3, 802.11ac VHT20, Channel No.: 157



U-NII-3, 802.11ac VHT40, Channel No.: 159



U-NII-3, 802.11ac VHT20, Channel No.: 165



U-NII-3, 802.11ac VHT80, Channel No.: 155



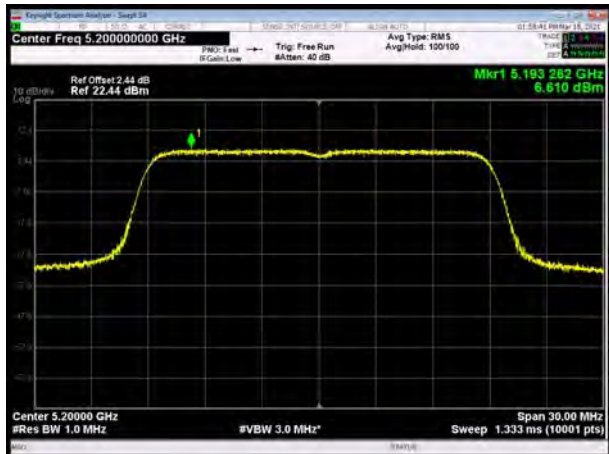


MIMO Antenna 2

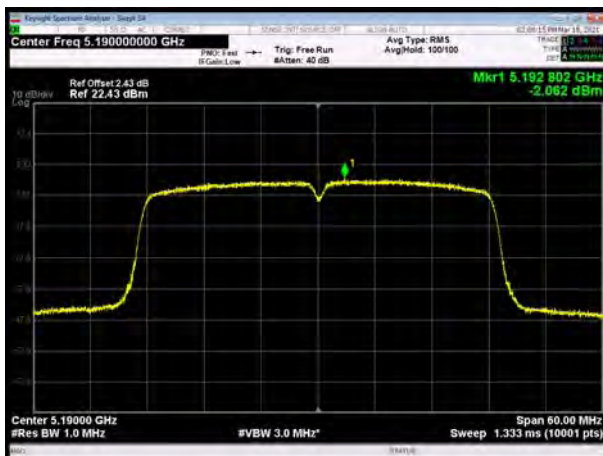
U-NII-1, 802.11ac VHT20, Channel No.: 36



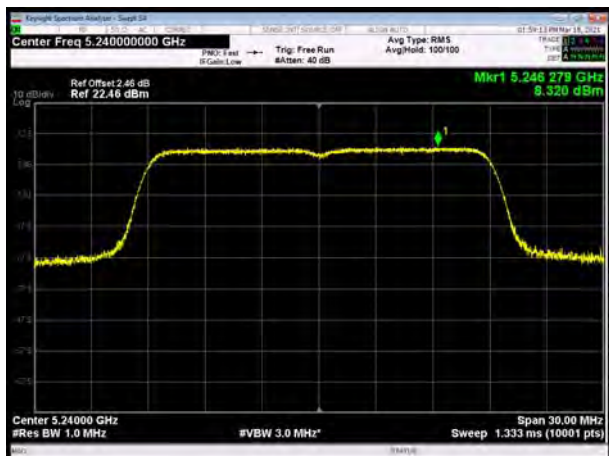
U-NII-1, 802.11ac VHT20, Channel No.: 40



U-NII-1, 802.11ac VHT40, Channel No.: 38



U-NII-1, 802.11ac VHT20, Channel No.: 48



U-NII-1, 802.11ac VHT40, Channel No.: 46



U-NII-1, 802.11ac VHT80, Channel No.: 42



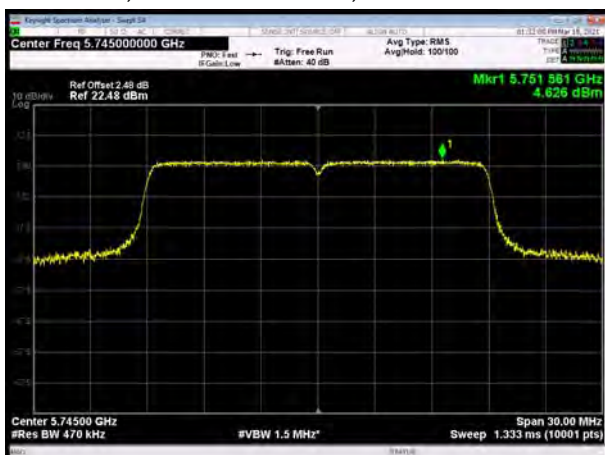


U-NII-1, 802.11ac VHT20, Channel No.: 44

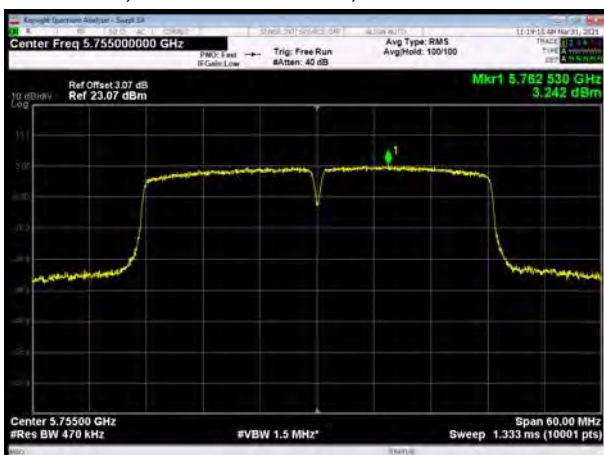




U-NII-3, 802.11ac VHT20, Channel No.: 149



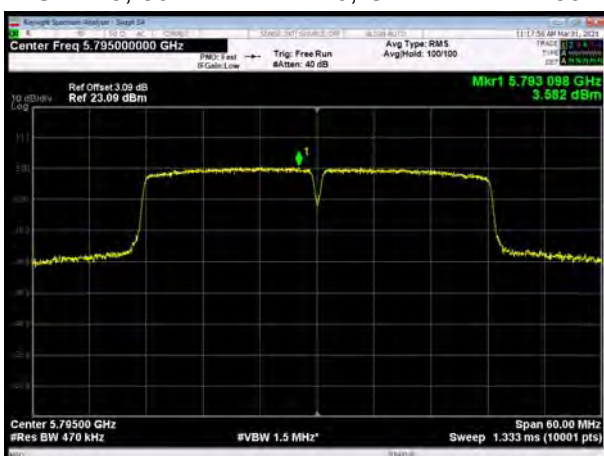
U-NII-3, 802.11ac VHT40, Channel No.: 151



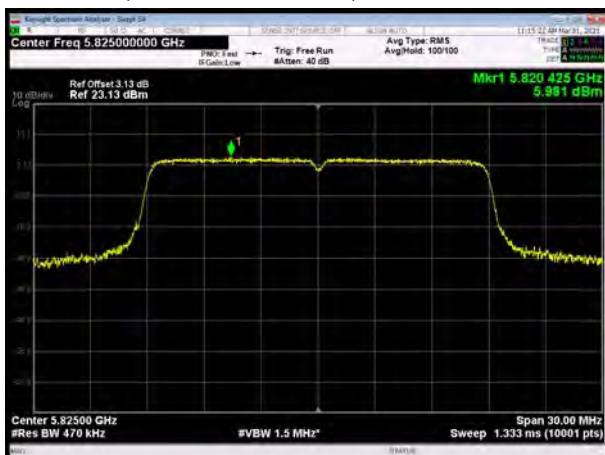
U-NII-3, 802.11ac VHT20, Channel No.: 157



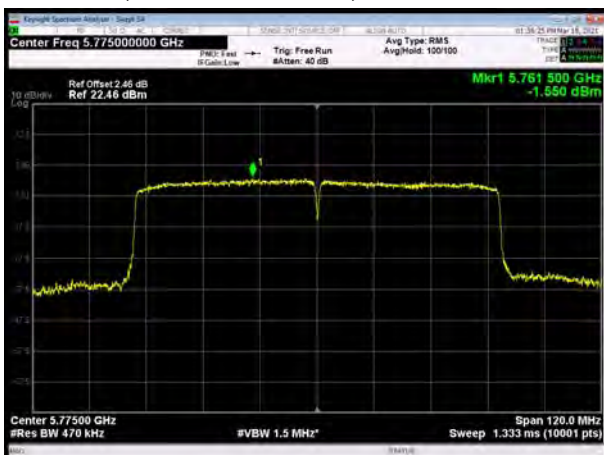
U-NII-3, 802.11ac VHT40, Channel No.: 159



U-NII-3, 802.11ac VHT20, Channel No.: 165



U-NII-3, 802.11ac VHT80, Channel No.: 155



5.5. Unwanted Emission

Ambient condition

Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

The test set-up was made in accordance to the general provisions of ANSI C63.10-2013. The Equipment Under Test (EUT) was set up on a non-conductive table in the semi-anechoic chamber. The test was performed at the distance of 3 m between the EUT and the receiving antenna. The radiated emissions measurements were made in a typical installation configuration. Sweep the whole frequency band range from 9kHz to the 10th harmonic of the carrier, and the emissions less than 20 dB below the permissible value are reported.

During the test, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turntable shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing.

Set the spectrum analyzer in the following:

9kHz~150 kHz

RBW=200Hz, VBW=1kHz/ Sweep=AUTO

150 kHz~30MHz

RBW=9KHz, VBW=30KHz,/ Sweep=AUTO

Below 1GHz

RBW=100kHz / VBW=300kHz / Sweep=AUTO

a) Peak emission levels are measured by setting the instrument as follows:

Above 1GHz

PEAK: RBW=1MHz VBW=3MHz/ Sweep=AUTO

b) Average emission levels are measured by setting the instrument as follows:

Above 1GHz

AVERAGE: RBW=1MHz / VBW=3MHz / Sweep=AUTO

c) Detector: The measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

d) Averaging type = power (i.e., rms) (As an alternative, the detector and averaging type may be set for linear voltage averaging. Some instruments require linear display mode to use linear voltage averaging. Log or dB averaging shall not be used.)

e) Sweep time = auto.

f) Perform a trace average of at least 100 traces if the transmission is continuous. If the transmission is not continuous, then the number of traces shall be increased by a factor of 1 / D, where D is the duty cycle. For example, with 50% duty cycle, at least 200 traces shall be averaged. (If a specific



emission is demonstrated to be continuous—i.e., 100% duty cycle—then rather than turning ON and OFF with the transmit cycle, at least 100 traces shall be averaged.)

g) If tests are performed with the EUT transmitting at a duty cycle less than 98%, then a correction factor shall be added to the measurement results prior to comparing with the emission limit, to compute the emission level that would have been measured had the test been performed at 100% duty cycle. The correction factor is computed as follows:

1) If power averaging (rms) mode was used in the preceding step e), then the correction factor is $[10 \log (1 / D)]$, where D is the duty cycle. For example, if the transmit duty cycle was 50%, then 3 dB shall be added to the measured emission levels.

2) If linear voltage averaging mode was used in the preceding step e), then the correction factor is $[20 \log (1 / D)]$, where D is the duty cycle. For example, if the transmit duty cycle was 50%, then 6 dB shall be added to the measured emission levels.

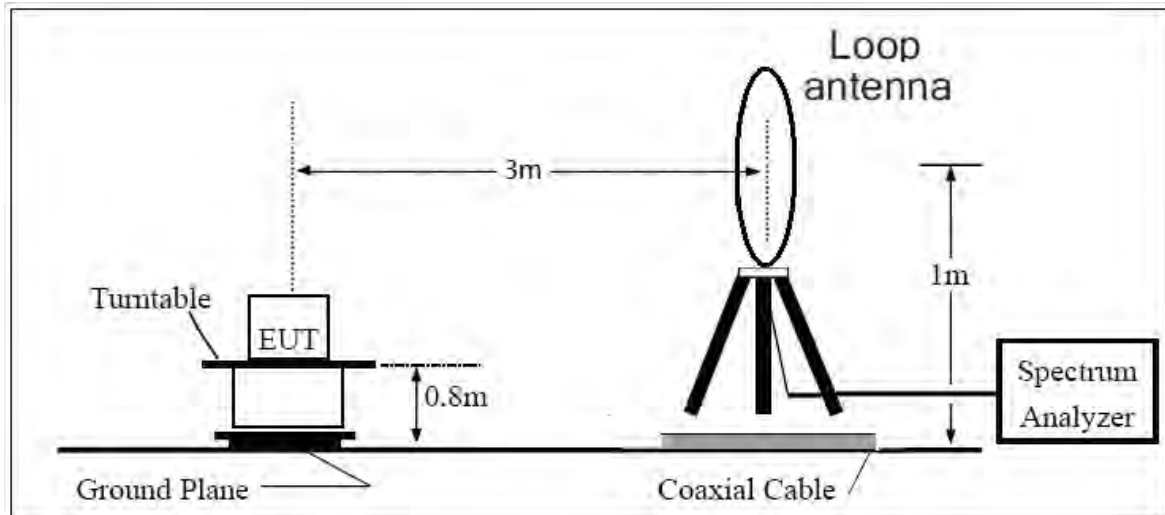
3) If a specific emission is demonstrated to be continuous (100% duty cycle) rather than turning ON and OFF with the transmit cycle, then no duty cycle correction is required for that emission.

Reduce the video bandwidth until no significant variations in the displayed signal are observed in subsequent traces, provided the video bandwidth is no less than 1 Hz. For regulatory requirements that specify averaging only over the transmit duration (e.g., digital transmission system [DTS] and Unlicensed National Information Infrastructure [U-NII]), the video bandwidth shall be greater than $[1 / (\text{minimum transmitter on time})]$ and no less than 1 Hz.

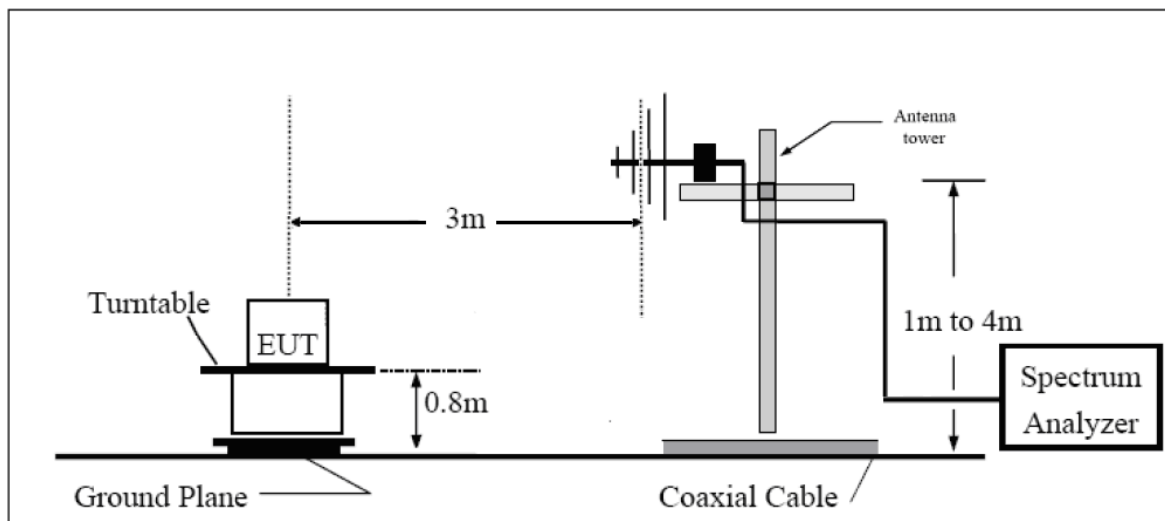
The field strength of spurious emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in stand-up position (Z axis) and the loop antenna is vertical, others antenna are vertical and horizontal.

The test is in transmitting mode.

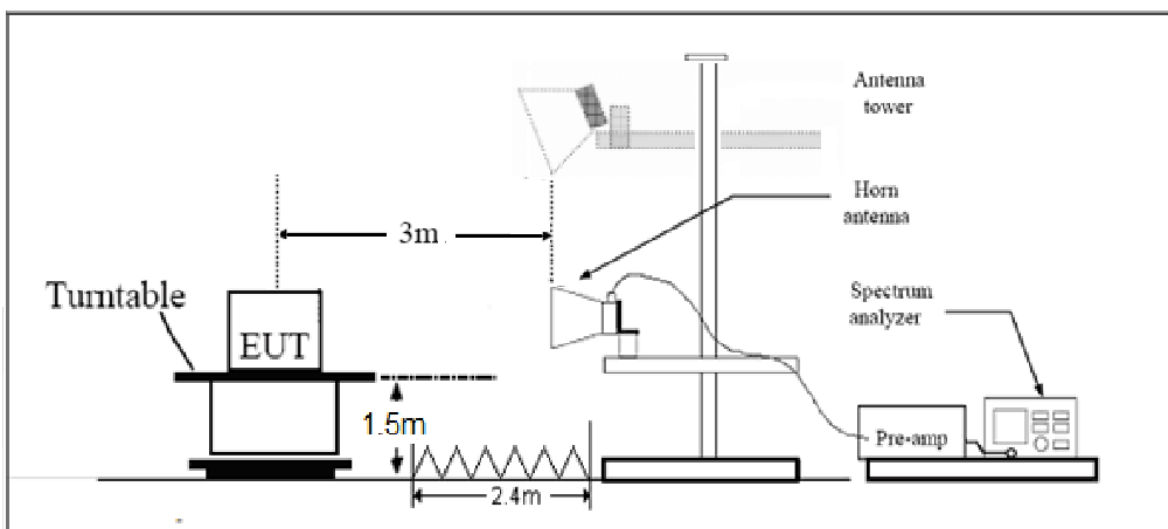
9KHz~~~30MHz



30MHz~~~ 1GHz



Above 1GHz



Note: Area side:2.4mX3.6m

Limits

- (1) For transmitters operating in the 5725-5850 MHz band: All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.
- (2) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz(68.2dBμV/m).
- (3) For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz(68.2dBμV/m).
- (4) For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz(68.2dBμV/m).

Note: the following formula is used to convert the EIRP to field strength

§1、 $E[\text{dB}\mu\text{V/m}] = \text{EIRP}[\text{dBm}] - 20 \log(d[\text{meters}]) + 104.77$, where E = field strength and

d = distance at which field strength limit is specified in the rules;

§2、 $E[\text{dB}\mu\text{V/m}] = \text{EIRP}[\text{dBm}] + 95.2$, for d = 3 meters

- (5) Unwanted spurious emissions fallen in restricted bands per FCC Part15.205 shall comply with the general field strength limits set forth in § 15.209 as below table.

Frequency of emission (MHz)	Field strength(uV/m)	Field strength(dBuV/m)
0.009–0.490	2400/F(kHz)	/
0.490–1.705	24000/F(kHz)	/
1.705–30.0	30	/
30-88	100	40
88-216	150	43.5
216-960	200	46
Above960	500	54

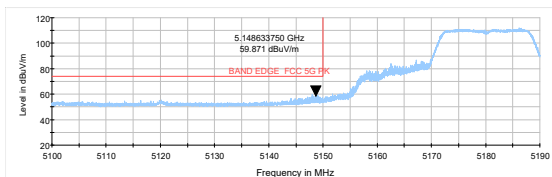
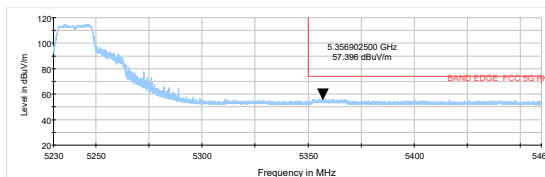
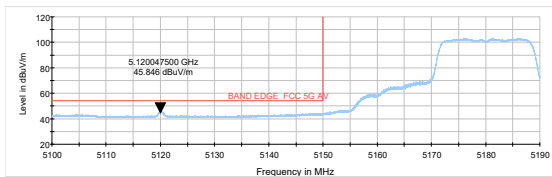
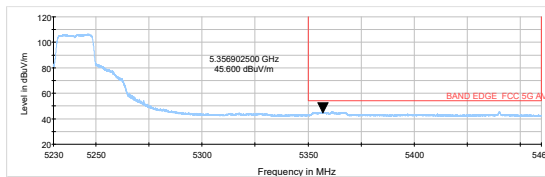
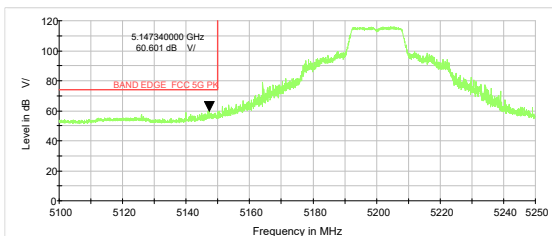
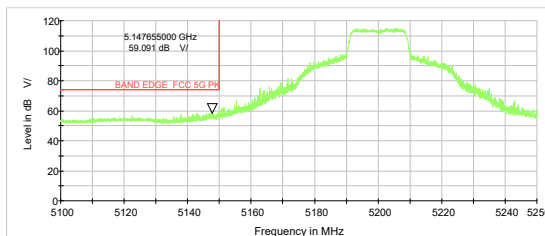
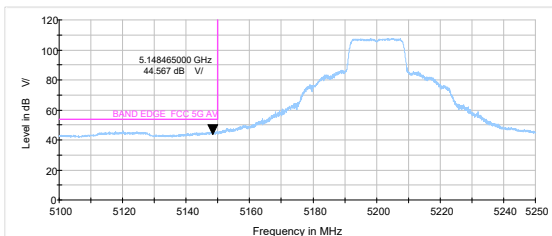
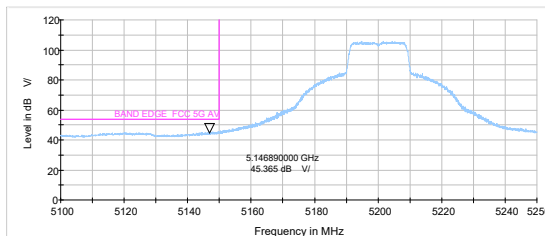
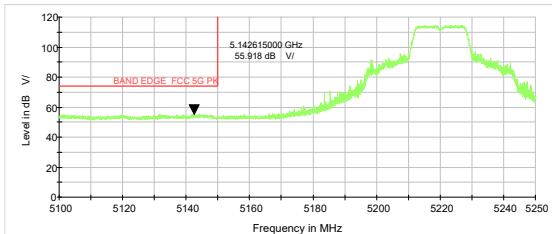
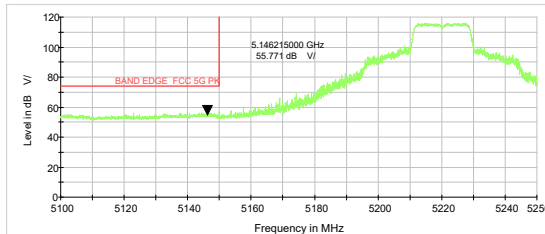


MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 -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

Measurement Uncertainty

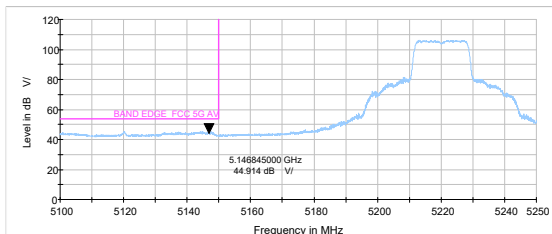
The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$.

Frequency	Uncertainty
9KHz-30MHz	3.55 dB
30MHz-200MHz	4.17 dB
200MHz-1GHz	4.84 dB
1-18GHz	4.35 dB
18-26.5GHz	5.90 dB
26.5GHz~40GHz	5.92 dB

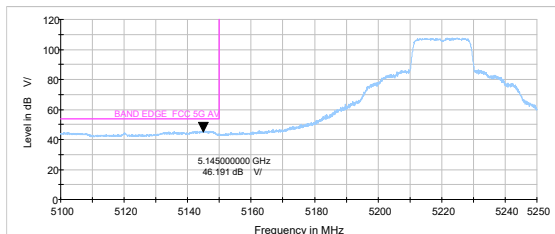
**Test Results:****The signal beyond the limit is carrier.****U-NII-1****802.11a-Channel 36: Peak****802.11a-Channel 48: Peak****802.11a-Channel 36: Average****802.11a-Channel 48: Average****802.11a-Channel 40: Peak****802.11n HT20-Channel 40: Peak****802.11a-Channel 40: Average****802.11n HT20-Channel 40: Average****802.11a-Channel 44: Peak****802.11n HT20-Channel 44: Peak**



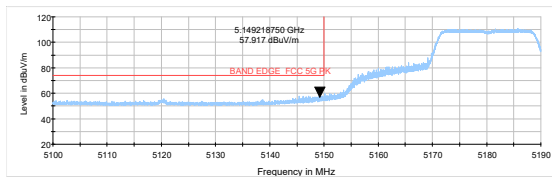
802.11a-Channel 44: Average



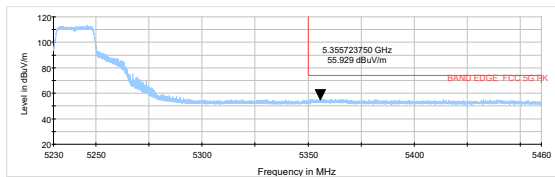
802.11n HT20-Channel 44: Average



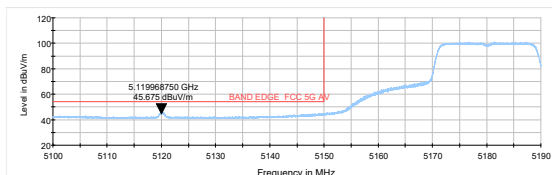
802.11n HT20-Channel 36: Peak



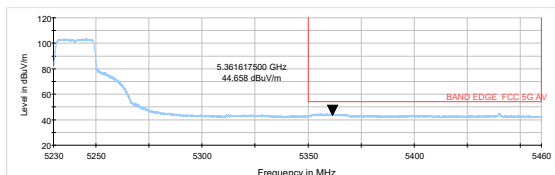
802.11n HT20-Channel 48: Peak



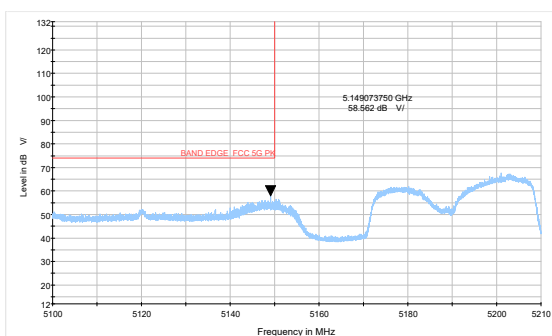
802.11n HT20-Channel 36: Average



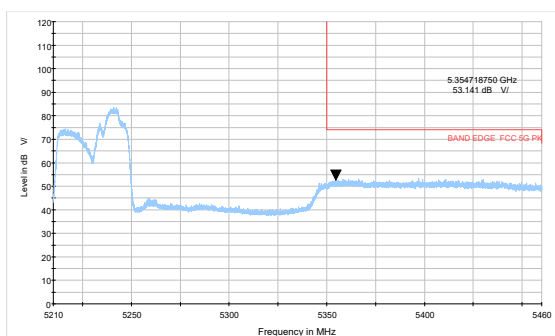
802.11n HT20-Channel 48: Average



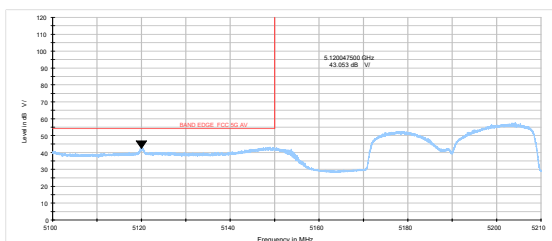
802.11n HT40-Channel 38: Peak



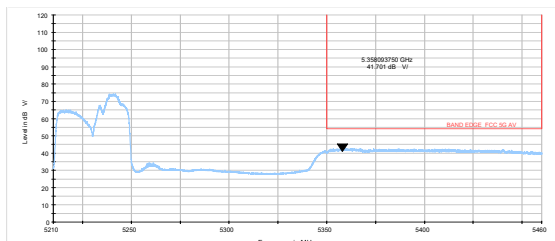
802.11n HT40-Channel 46: Peak



802.11n HT40-Channel 38: Average

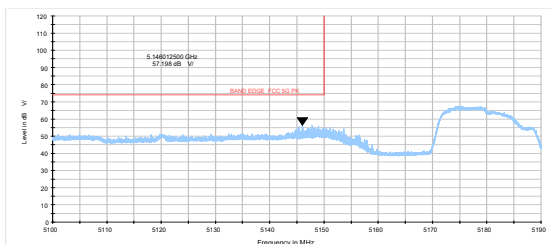


802.11n HT40-Channel 46: Average

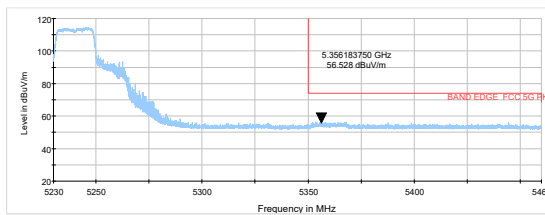




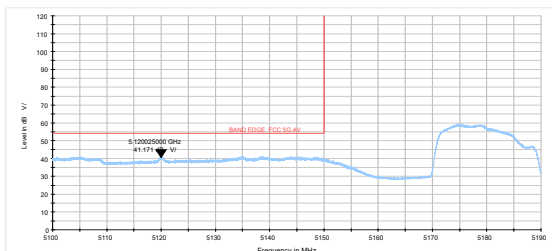
802.11ac VHT20 -Channel 36: Peak



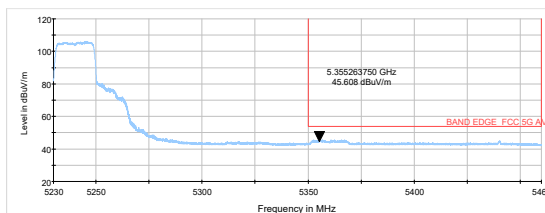
802.11ac VHT20 -Channel 48: Peak



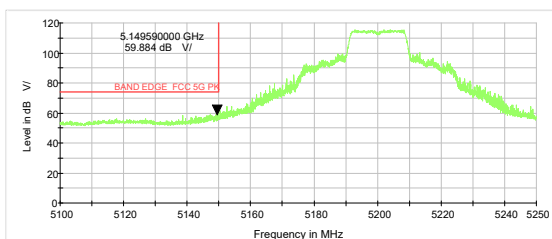
802.11ac VHT20-Channel 36: Average



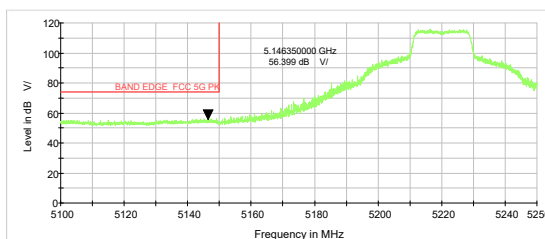
802.11ac VHT20 -Channel 48: Average



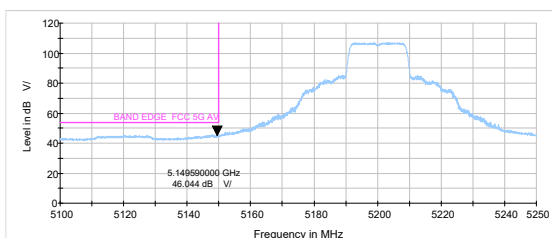
802.11ac VHT20-Channel 40:Peak



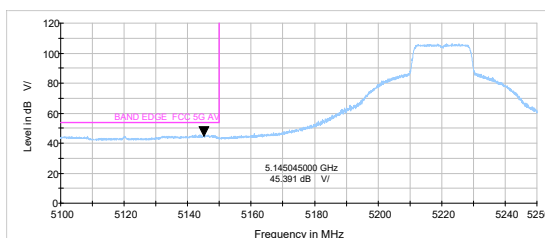
802.11ac VHT20 -Channel 44: Peak



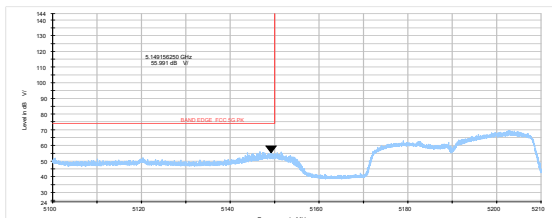
802.11ac VHT20-Channel 40:Average



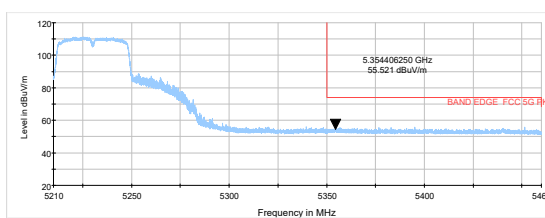
802.11ac VHT20 -Channel 44:Average



802.11ac VHT40-Channel 38: Peak

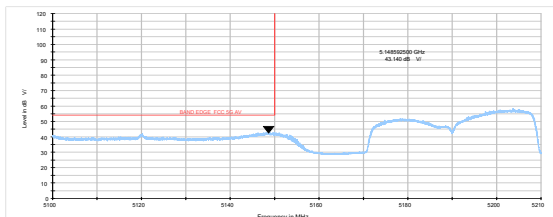


802.11ac VHT40-Channel 46: Peak

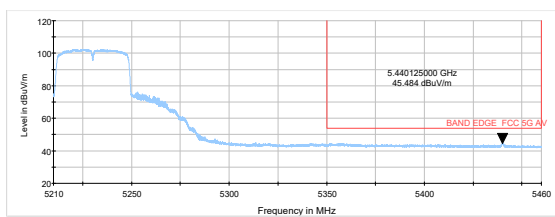




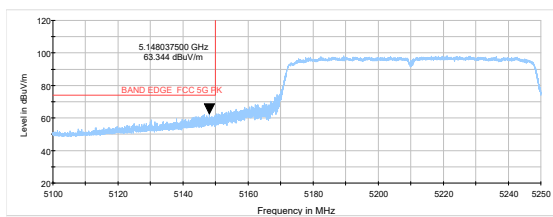
802.11ac VHT40-Channel 38: Average



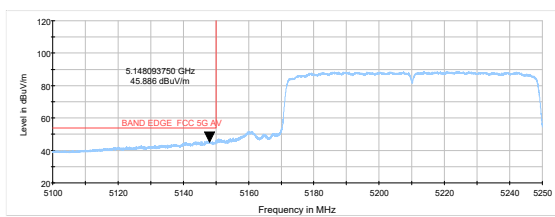
802.11ac VHT40-Channel 46: Average



802.11ac VHT80 -Channel 42: Peak

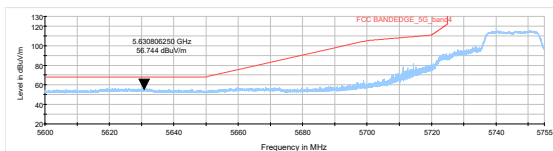


802.11ac VHT80- Channel 42: Average

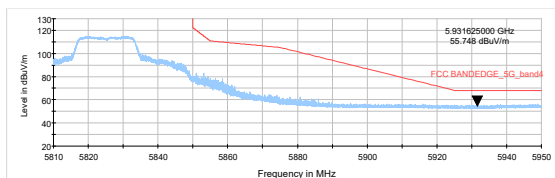


U-NII-3

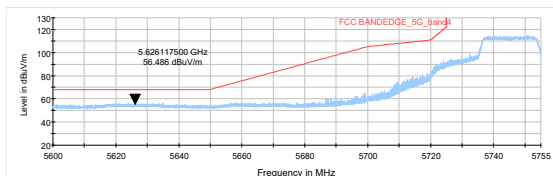
802.11a-Channel 149: Peak



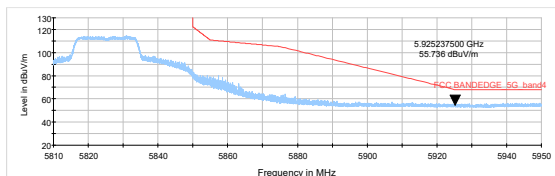
802.11a-Channel 165: Peak



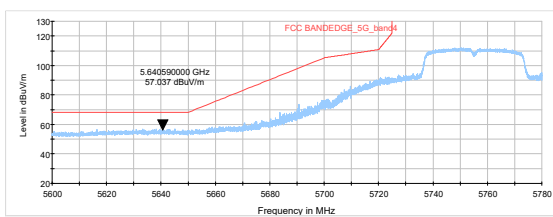
802.11n HT20-Channel 149: Peak



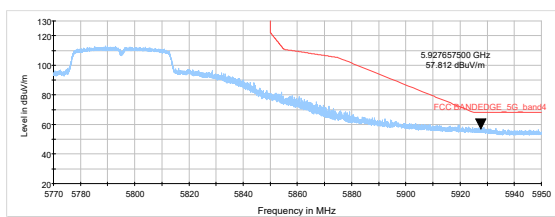
802.11n HT20-Channel 165: Peak



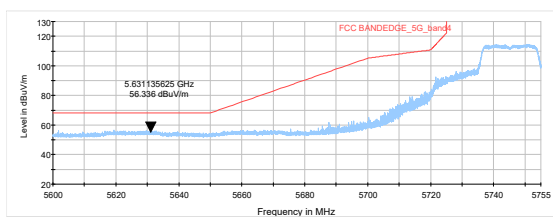
802.11n HT40-Channel 151: Peak



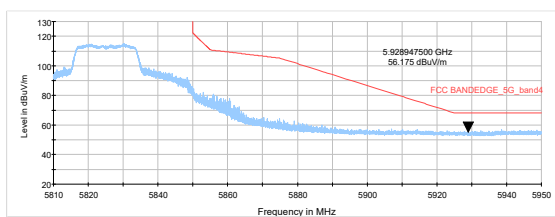
802.11n HT40-Channel 159: Peak

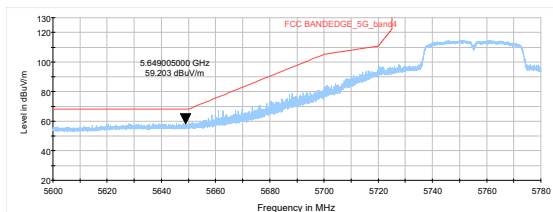
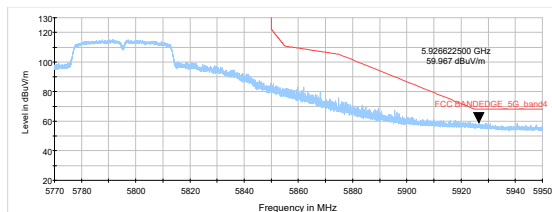
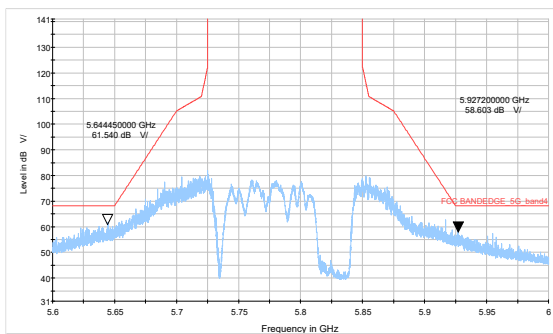


802.11ac VHT20-Channel 149: Peak



802.11ac VHT20-Channel 165: Peak



**802.11ac VHT40-Channel 151: Peak****802.11ac VHT40-Channel 159: Peak****802.11ac VHT80- Channel 155: Peak**

Result of RE

Test result

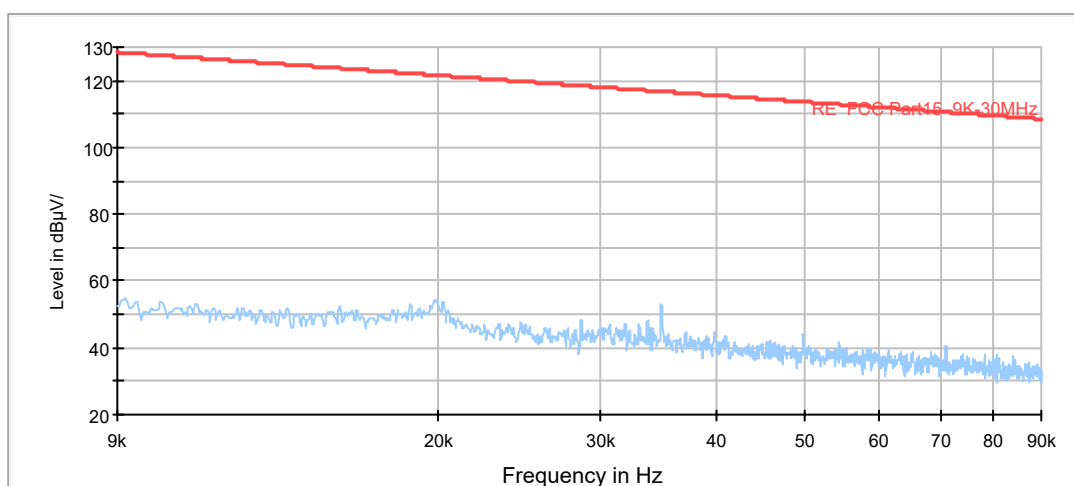
Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the Emissions in the frequency band 9kHz-30MHz and 26.5GHz-40GHz are more than 20dB below the limit are not reported.

After the pretest, MIMO was selected as the worst antenna. SISO Antenna 2 was selected as the worst SISO antenna.

During the test, the Radiates Emission from 30MHz to 1GHz was performed in all modes with all channels, 802.11n (HT20) CH40 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

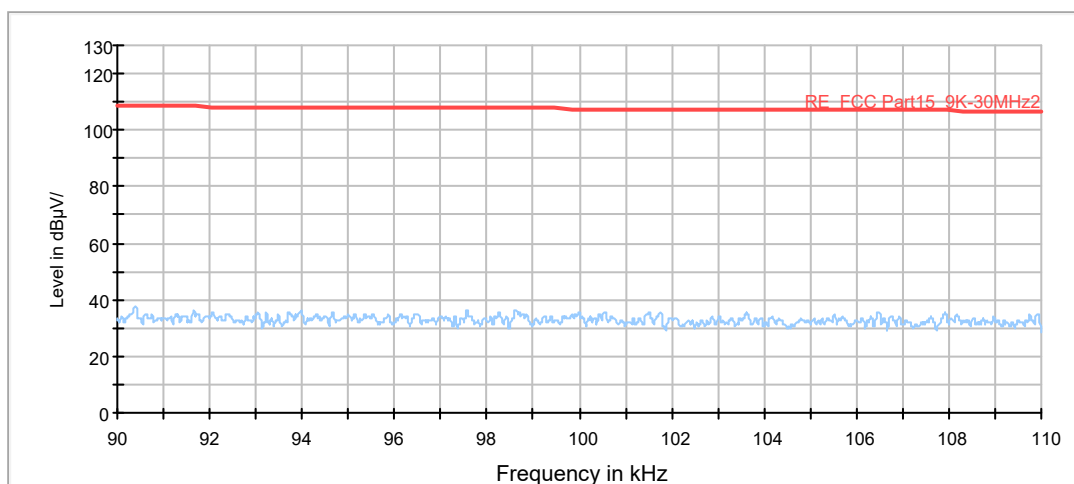
Continuous TX mode:

FCC RE 9K-90KHz AV



Radiates Emission from 9KHz to 90KHz

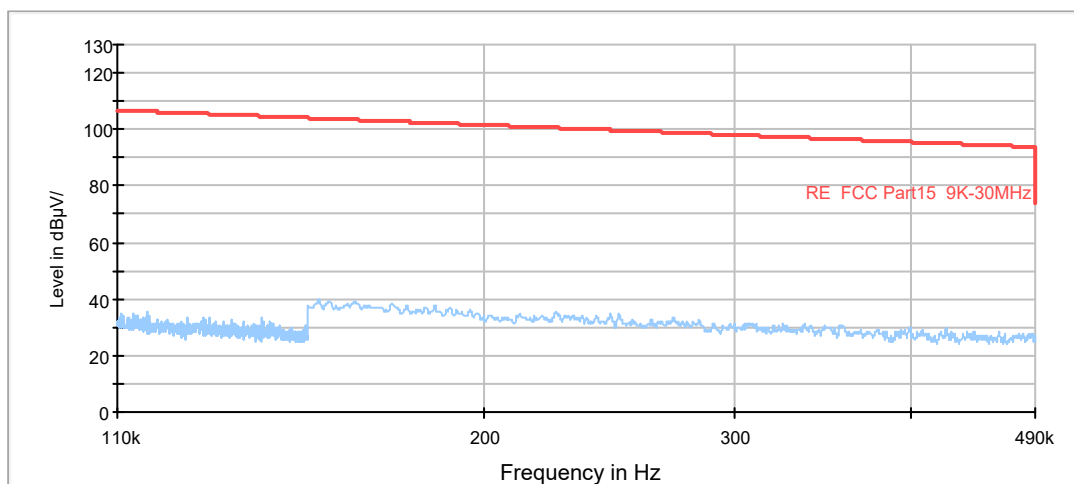
FCC RE 90K-110KHz QP



Radiates Emission from 90KHz to 110KHz

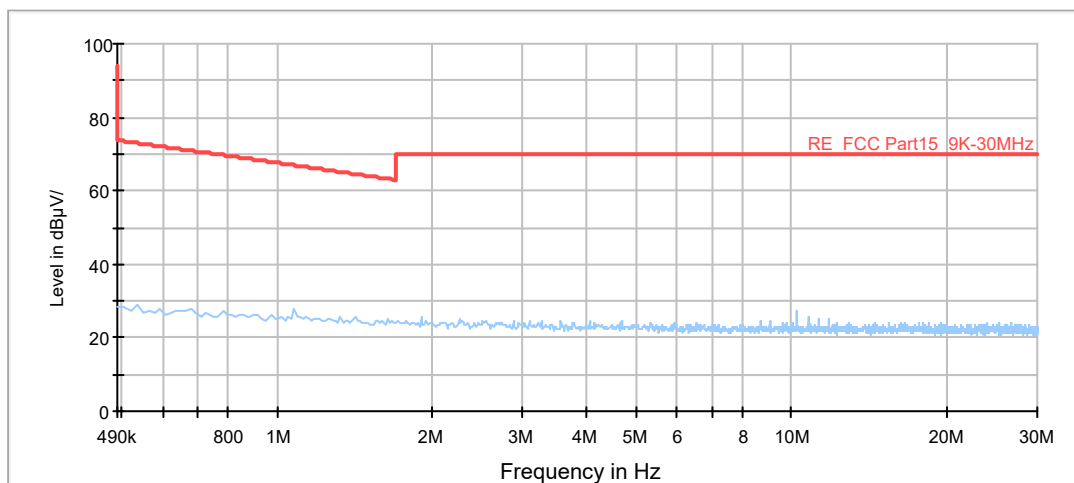


FCC RE 110K-490KHz AV

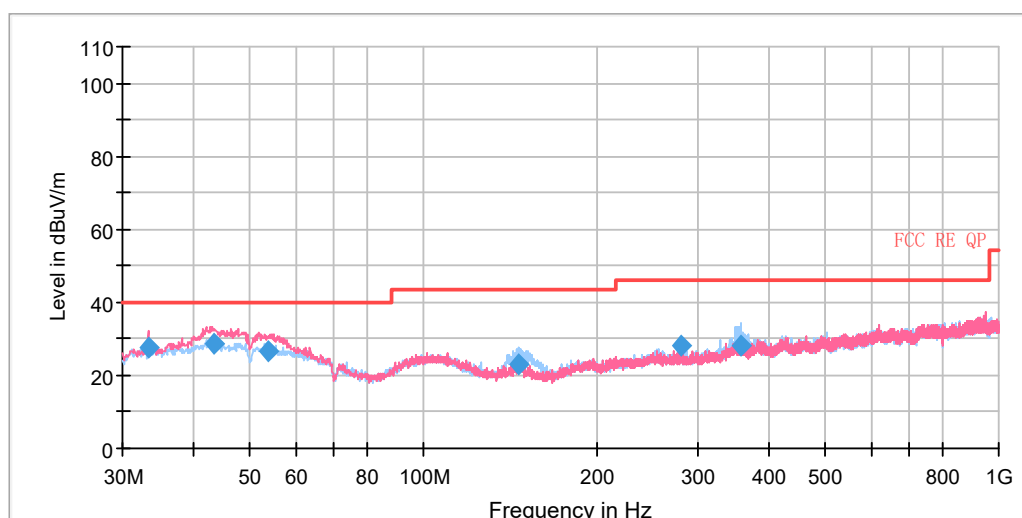


Radiates Emission from 110KHz to 490KHz

FCC RE 490K-30MHz QP



Radiates Emission from 490KHz to 30MHz



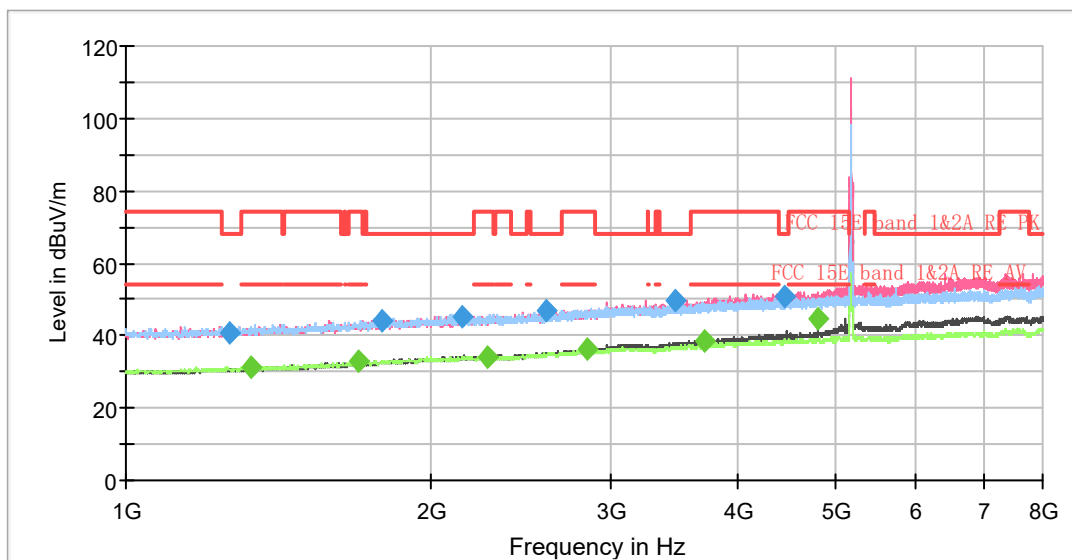
Radiates Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
33.353750	27.39	100.0	V	107.0	-1.2	12.61	40.00
43.133750	28.83	125.0	V	179.0	-0.3	11.17	40.00
53.727500	26.46	100.0	V	160.0	-1.7	13.54	40.00
146.677500	22.81	209.0	H	218.0	-9.5	20.69	43.50
280.017500	28.20	100.0	H	293.0	-4.8	17.80	46.00
356.287500	28.16	100.0	H	143.0	-3.3	17.84	46.00

Remark: 1. Correction Factor = Antenna factor+ Insertion loss(cable loss+amplifier gain)

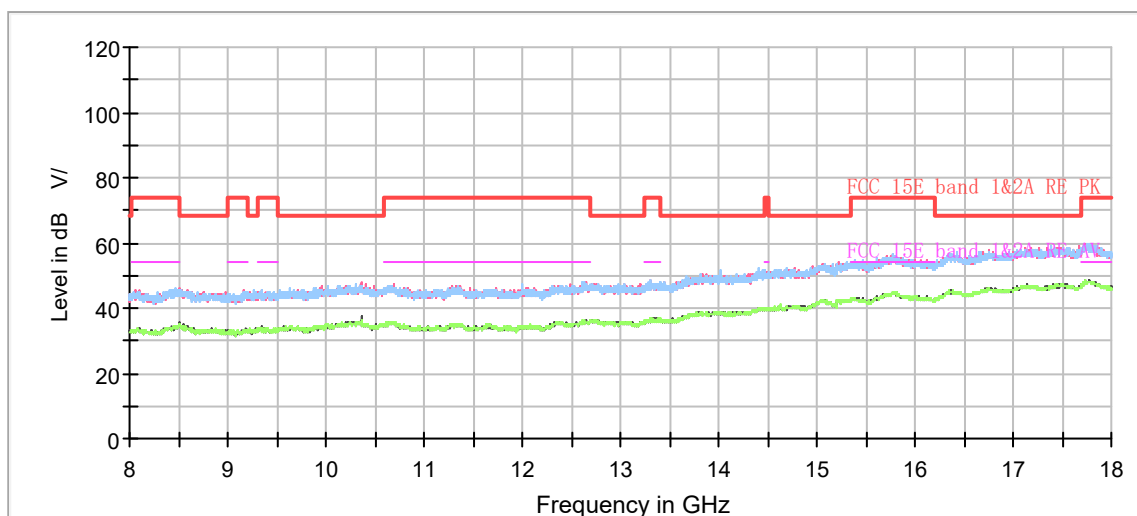
2. Margin = Limit – Quasi-Peak

802.11a CH36



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz



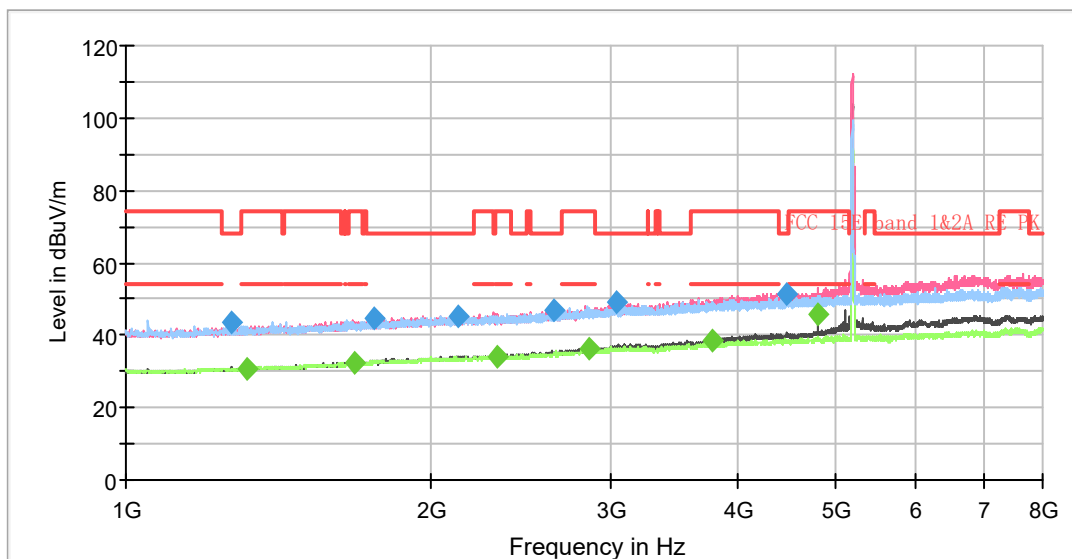
Radiates Emission from 8GHz to 18GHz



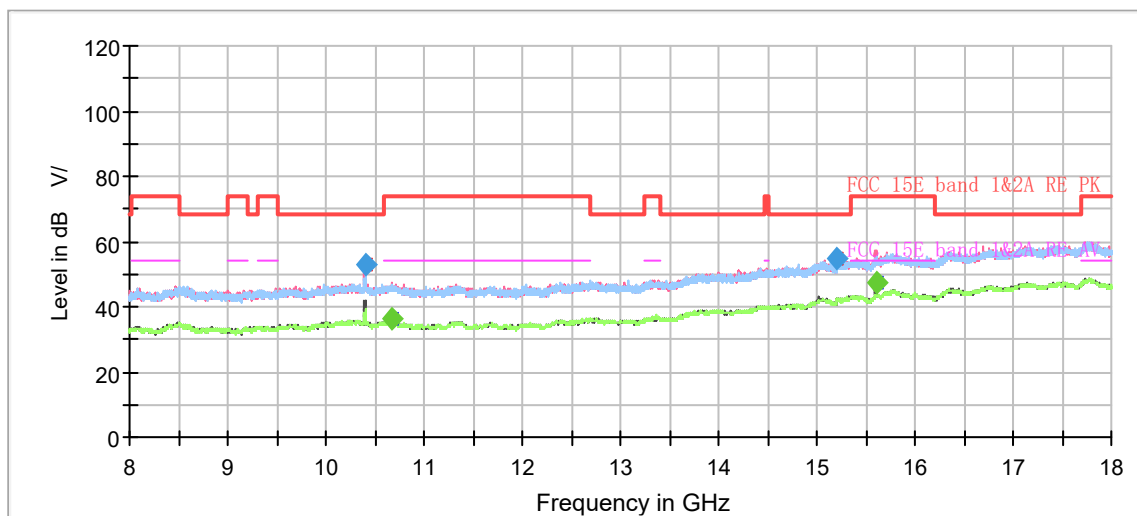
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1266.000000	40.95	---	68.20	27.25	100.0	V	273.0	-8.3
1326.375000	---	31.01	54.00	22.99	200.0	V	197.0	-7.1
1694.750000	---	32.67	54.00	21.33	200.0	V	20.0	-5.1
1787.500000	44.09	---	68.20	24.11	100.0	V	357.0	-4.5
2141.875000	45.21	---	68.20	22.99	200.0	H	239.0	-2.8
2269.625000	---	34.04	54.00	19.96	100.0	V	296.0	-2.3
2597.750000	46.64	---	68.20	21.56	100.0	V	261.0	-1.0
2845.375000	---	36.14	54.00	17.86	100.0	V	301.0	0.3
3470.125000	49.85	---	68.20	18.35	100.0	V	318.0	2.2
3708.125000	---	38.51	54.00	15.49	100.0	V	255.0	3.1
4454.500000	50.82	---	68.20	17.38	100.0	V	273.0	4.9
4800.125000	---	44.67	54.00	9.33	100.0	V	329.0	5.9

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11a CH40



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 8GHz



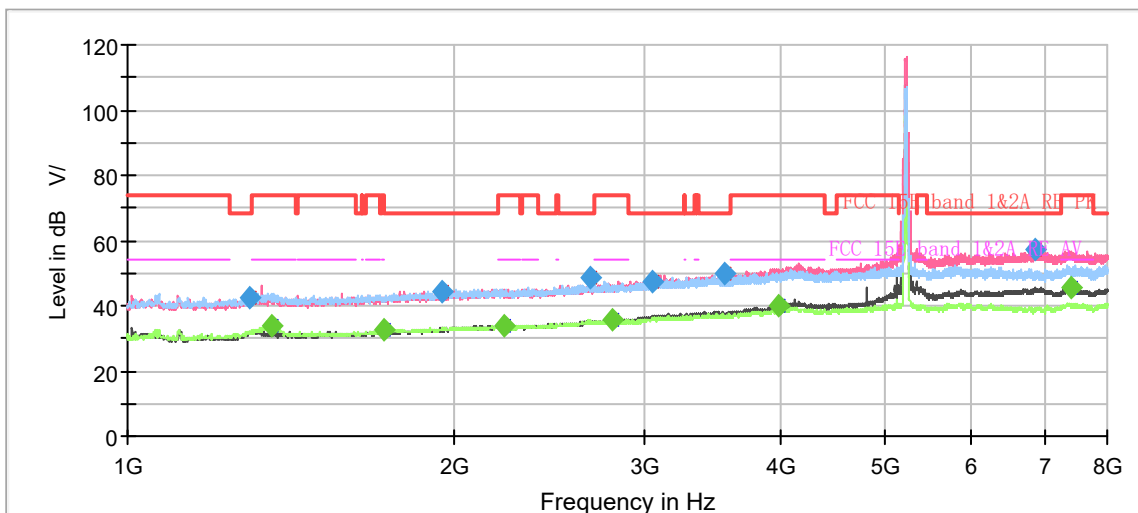
Radiates Emission from 8GHz to 18GHz



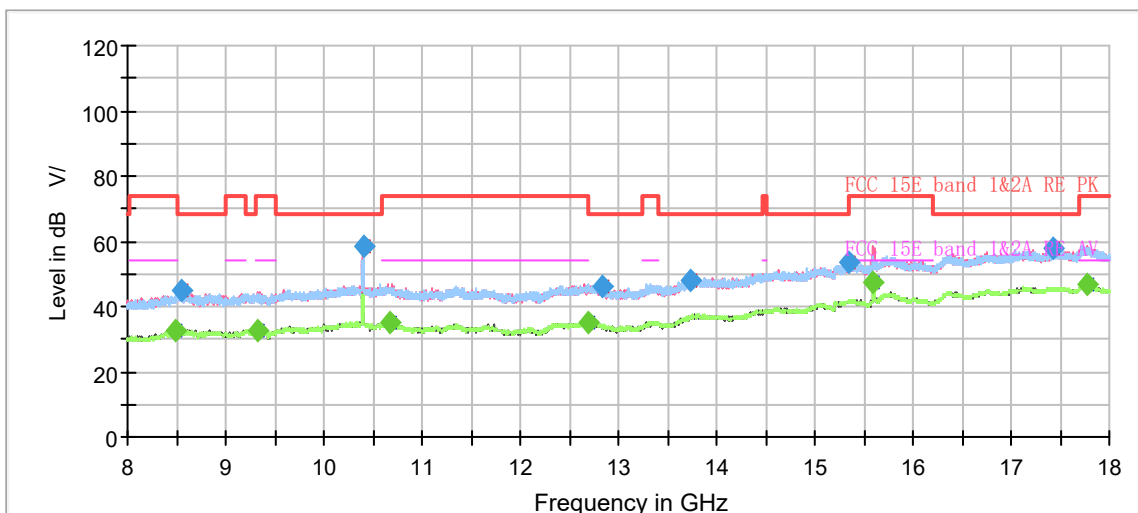
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1267.750000	43.76	---	68.20	24.44	200.0	H	342.0	-8.6
1318.500000	---	30.93	54.00	23.07	200.0	H	253.0	-7.1
1680.750000	---	32.38	54.00	21.62	100.0	V	107.0	-5.1
1759.500000	44.59	---	68.20	23.61	200.0	V	197.0	-4.7
2128.750000	45.40	---	68.20	22.80	100.0	V	329.0	-2.8
2323.875000	---	34.20	54.00	19.80	100.0	V	350.0	-2.2
2645.000000	47.10	---	68.20	21.10	200.0	H	231.0	-0.8
2856.750000	---	36.18	54.00	17.82	100.0	V	220.0	0.4
3048.375000	48.93	---	68.20	19.27	200.0	V	181.0	1.4
3786.000000	---	38.77	54.00	15.23	100.0	V	324.0	3.5
4469.375000	51.51	---	68.20	16.69	100.0	V	247.0	4.9
4800.125000	---	46.04	54.00	7.96	100.0	V	220.0	5.9

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11a CH44



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 8GHz



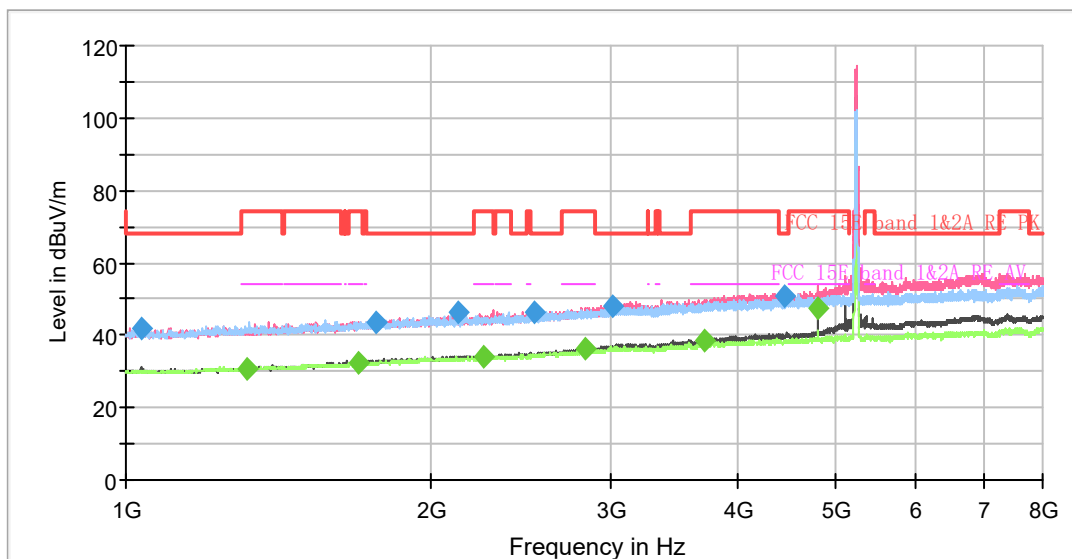
Radiates Emission from 8GHz to 18GHz



Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1296.625000	42.38	---	68.20	25.82	200.0	H	75.0	-6.8
1356.125000	---	33.62	54.00	20.38	200.0	H	75.0	-6.5
1720.125000	---	32.67	54.00	21.33	200.0	V	26.0	-4.4
1948.500000	44.34	---	68.20	23.86	100.0	V	2.0	-3.0
2219.750000	---	33.66	54.00	20.34	200.0	V	90.0	-1.7
2666.000000	48.69	---	68.20	19.51	200.0	H	279.0	0.4
2800.750000	---	35.90	54.00	18.10	200.0	V	31.0	0.9
3041.375000	47.13	---	68.20	21.07	200.0	V	8.0	2.2
3547.125000	49.89	---	68.20	18.31	200.0	V	31.0	3.8
3979.375000	---	40.14	54.00	13.86	200.0	V	2.0	6.0
6866.000000	57.30	---	68.20	10.90	200.0	V	55.0	10.6
7406.750000	---	45.56	54.00	8.44	200.0	V	130.0	11.5

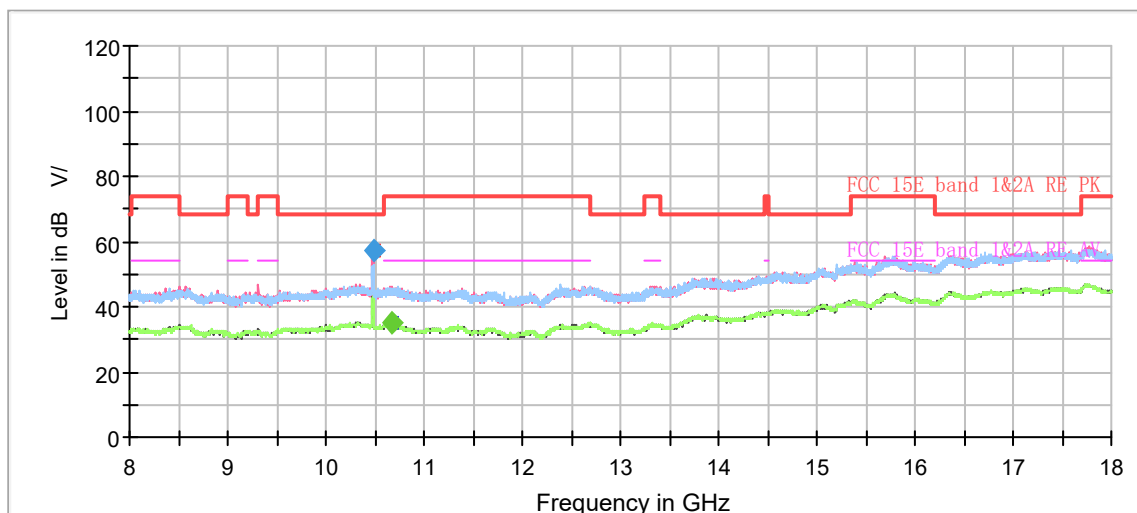
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11a CH48



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz



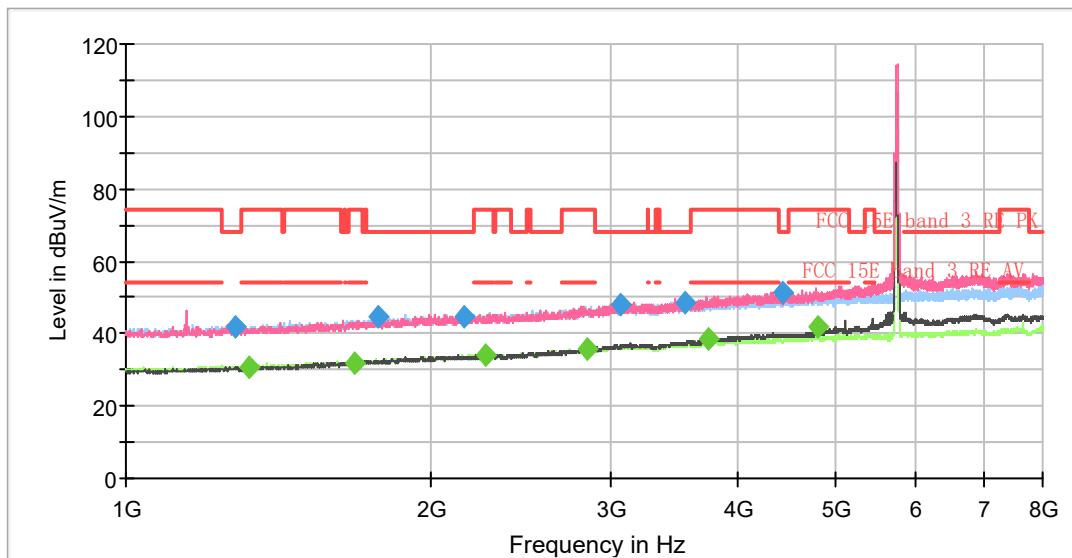
Radiates Emission from 8GHz to 18GHz



Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1035.875000	41.84	---	68.20	26.36	100.0	V	1.0	-8.6
1314.125000	---	30.85	54.00	23.15	100.0	H	265.0	-7.2
1691.250000	---	32.61	54.00	21.39	100.0	V	290.0	-5.1
1764.750000	43.56	---	68.20	24.64	100.0	V	238.0	-4.7
2120.875000	46.10	---	68.20	22.10	100.0	H	100.0	-2.9
2255.625000	---	34.04	54.00	19.96	200.0	V	192.0	-2.4
2529.500000	46.59	---	68.20	21.61	100.0	V	255.0	-1.3
2829.625000	---	36.23	54.00	17.77	200.0	V	120.0	0.2
3012.500000	47.92	---	68.20	20.28	100.0	V	178.0	1.2
3707.250000	---	38.32	54.00	15.68	100.0	V	290.0	3.1
4460.625000	50.79	---	68.20	17.41	100.0	V	238.0	4.9
4800.125000	---	47.31	54.00	6.69	100.0	V	227.0	5.9

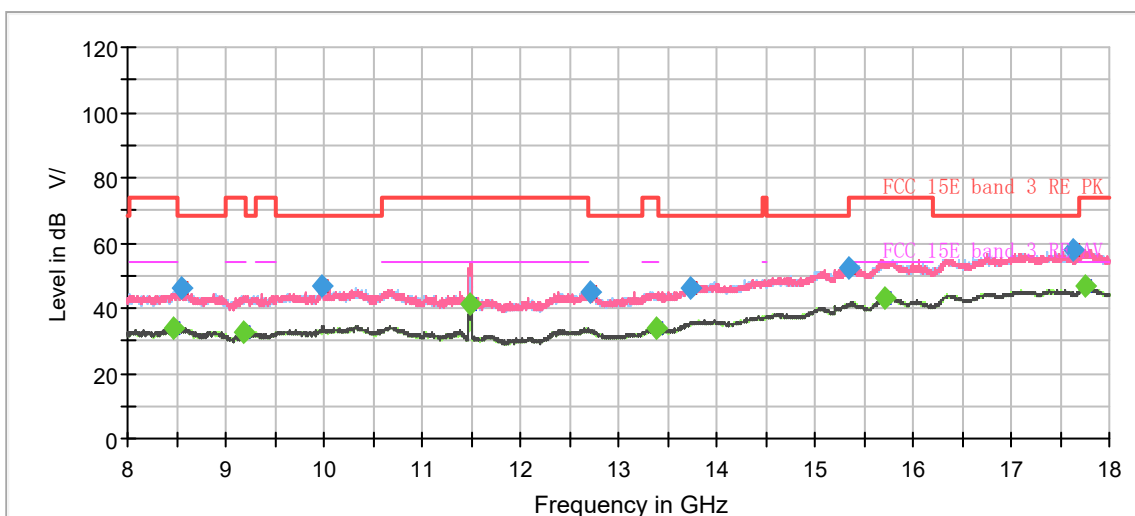
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11a CH149



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz



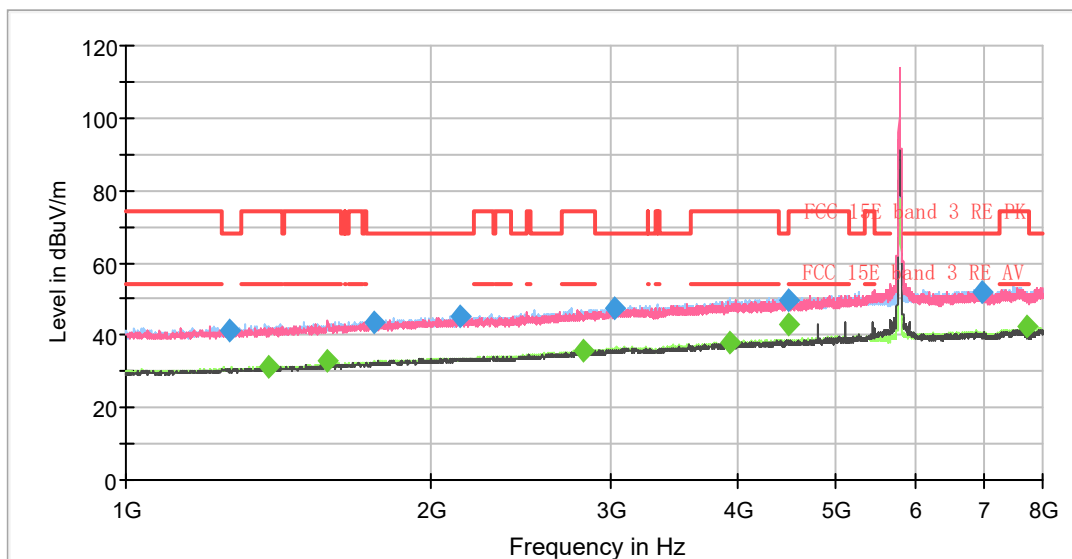
Radiates Emission from 8GHz to 18GHz



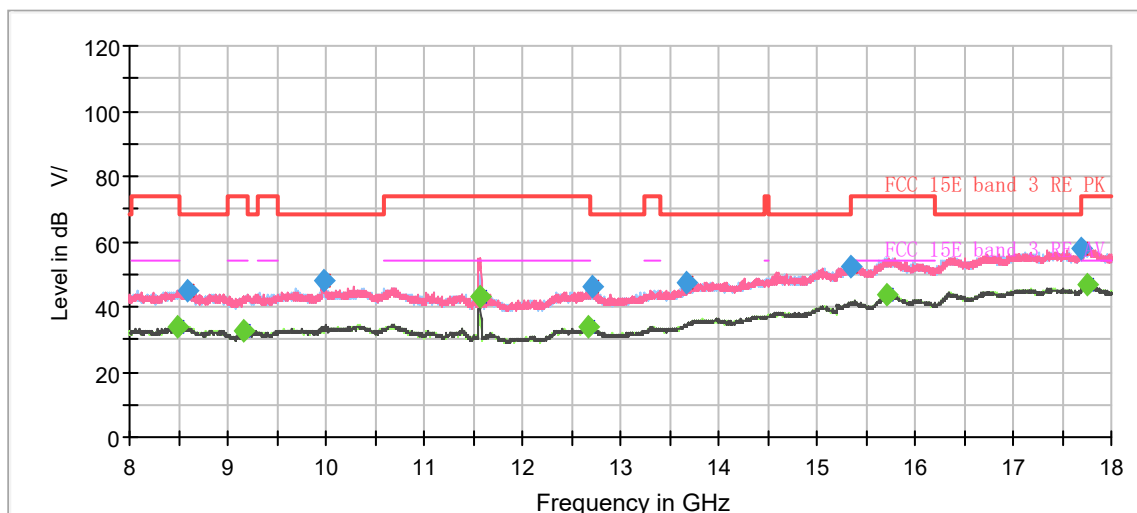
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1281.750000	41.87	---	68.20	26.33	200.0	H	244.0	-7.1
1322.875000	---	30.97	54.00	26.33	100.0	H	0.0	-7.1
1679.875000	---	31.97	54.00	22.03	100.0	H	252.0	-5.1
1772.625000	44.49	---	68.20	23.71	200.0	H	92.0	-5.1
2259.125000	---	34.09	54.00	19.91	200.0	V	267.0	-2.4
3550.625000	48.34	---	68.20	19.86	200.0	V	267.0	-2.4
2149.750000	44.83	---	68.20	23.37	100.0	H	0.0	0.3
2845.375000	---	35.74	54.00	18.26	200.0	H	356.0	0.3
3070.250000	48.07	---	68.20	20.13	100.0	V	0.0	3.1
3746.625000	---	38.58	54.00	15.42	200.0	V	352.0	3.2
4431.750000	51.52	---	68.20	16.68	200.0	V	275.0	7.2
4800.125000	---	41.70	54.00	12.30	100.0	V	0.0	6.6

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11a CH157



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 8GHz



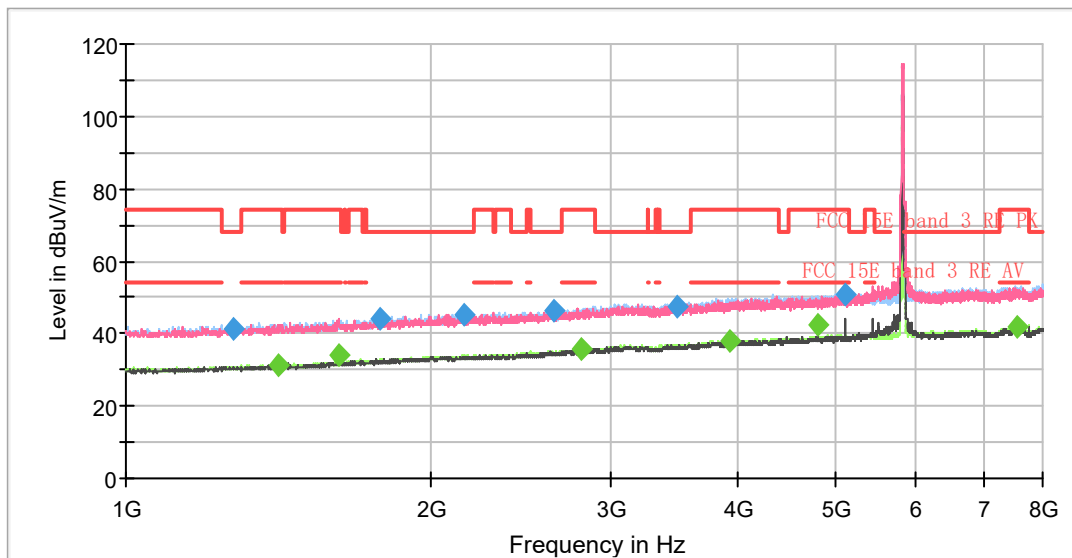
Radiates Emission from 8GHz to 18GHz



Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1265.125000	41.55	---	68.20	26.65	200.0	H	109.0	-6.9
1385.000000	---	31.50	54.00	22.50	100.0	H	242.0	-6.8
1579.250000	---	33.19	54.00	20.81	200.0	V	212.0	-5.7
1758.750000	43.28	---	68.20	24.92	200.0	V	317.0	-5.7
2137.500000	45.06	---	68.20	23.14	100.0	H	220.0	-0.2
2820.875000	---	35.72	54.00	18.28	200.0	H	44.0	0.2
3933.875000	---	38.09	54.00	15.91	100.0	H	301.0	3.9
3036.125000	47.65	---	68.20	20.55	100.0	H	301.0	3.9
4495.625000	49.71	---	54.00	18.49	100.0	V	349.0	7.2
4495.625000	---	42.79	68.20	18.49	100.0	V	349.0	7.2
6971.250000	51.92	---	68.20	16.28	100.0	H	247.0	9.8
7713.875000	---	42.16	54.00	11.84	100.0	H	290.0	10.2

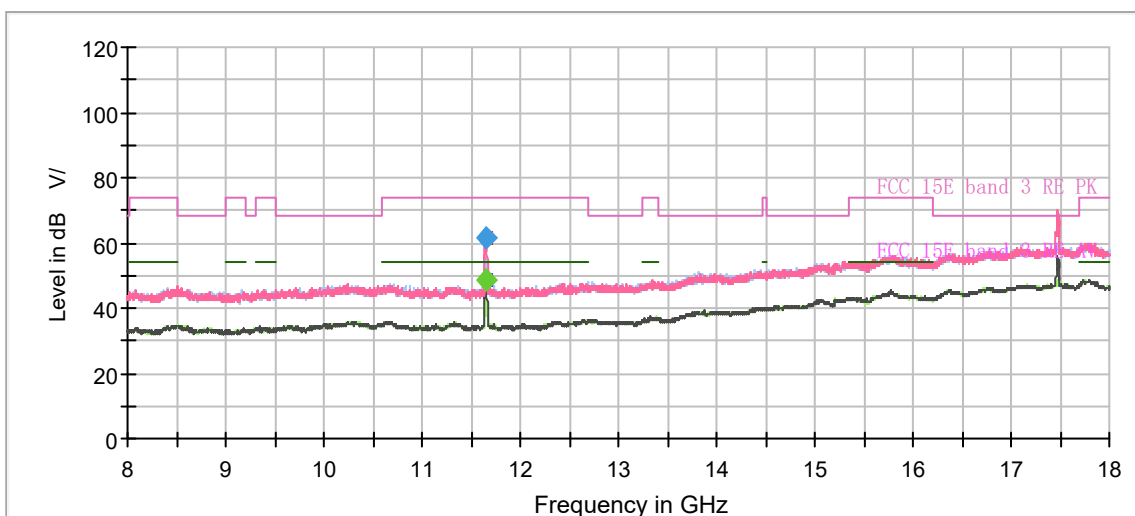
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11a CH165



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz



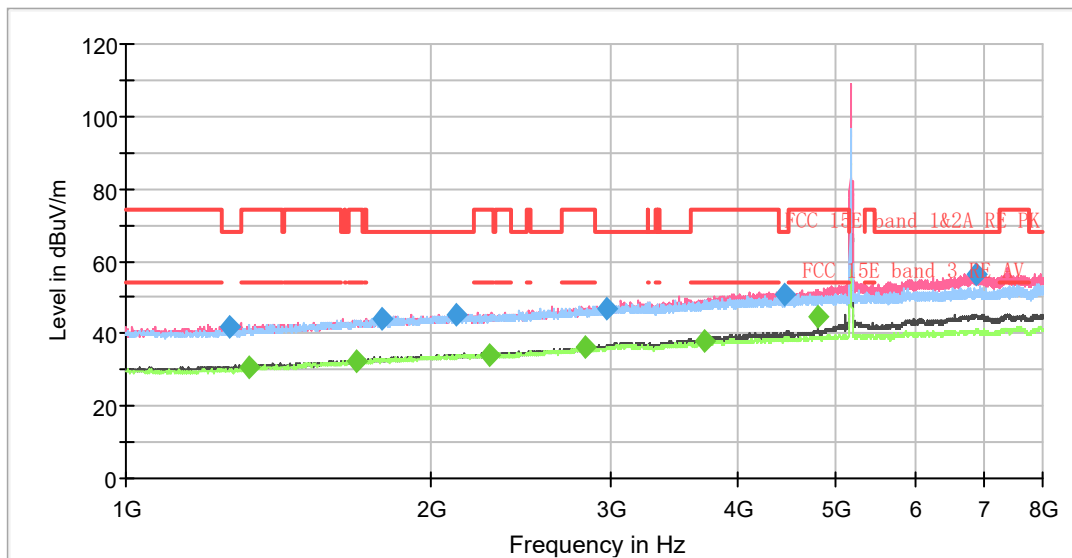
Radiates Emission from 8GHz to 18GHz



Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1276.500000	41.24	---	68.20	26.96	200.0	H	247.0	-6.9
1412.125000	---	31.36	54.00	22.64	200.0	H	67.0	-6.6
1619.500000	---	34.17	54.00	19.83	200.0	V	281.0	-5.5
1777.875000	44.10	---	68.20	24.10	100.0	V	25.0	-5.5
2815.625000	---	35.80	54.00	18.20	200.0	H	44.0	0.2
2148.875000	45.08	---	68.20	23.12	100.0	H	357.0	0.2
2644.125000	46.16	---	68.20	22.05	200.0	H	137.0	3.8
3940.000000	---	38.03	54.00	15.97	100.0	H	251.0	3.9
4800.125000	---	42.66	54.00	11.34	100.0	V	160.0	6.6
5120.375000	50.82	---	68.20	17.38	200.0	V	226.0	7.2
3486.750000	47.26	---	68.20	20.94	100.0	H	271.0	9.9
7561.625000	---	41.59	54.00	12.41	200.0	H	186.0	10.0

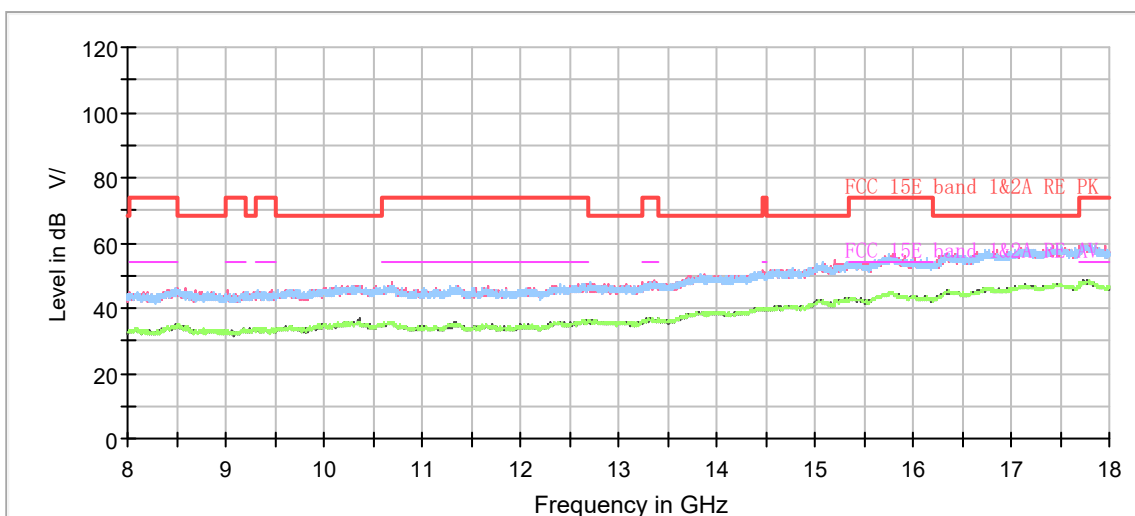
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT20) CH36



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz



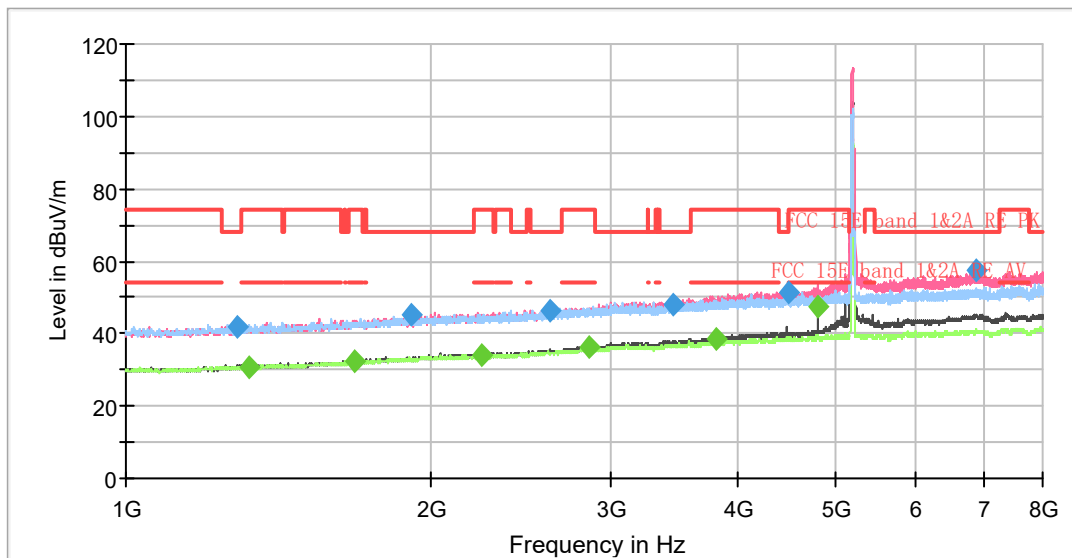
Radiates Emission from 8GHz to 18GHz



Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1264.250000	41.75	---	68.20	26.45	100.0	V	147.0	-7.8
1321.125000	---	30.79	54.00	23.21	100.0	V	153.0	-7.1
1684.250000	---	32.59	54.00	21.41	100.0	V	264.0	-5.1
1788.375000	43.99	---	68.20	24.21	200.0	V	29.0	-4.5
2113.875000	45.09	---	68.20	23.11	100.0	V	247.0	-2.9
2279.250000	---	34.14	54.00	19.86	100.0	V	247.0	-2.3
2837.500000	---	36.10	54.00	17.90	100.0	V	324.0	0.3
2970.500000	47.15	---	68.20	21.05	100.0	H	209.0	0.9
3716.875000	---	37.74	54.00	16.26	100.0	V	236.0	3.1
4452.750000	50.59	---	68.20	17.61	100.0	V	318.0	4.9
4800.125000	---	44.59	54.00	9.41	100.0	V	225.0	5.9
6887.875000	56.55	---	68.20	11.65	100.0	V	347.0	9.1

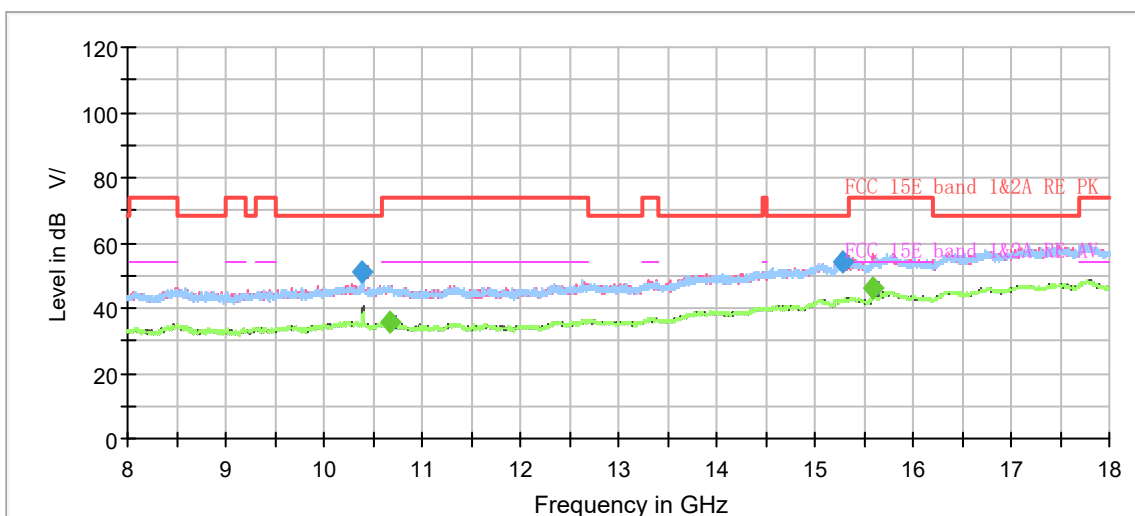
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT20) CH40



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz



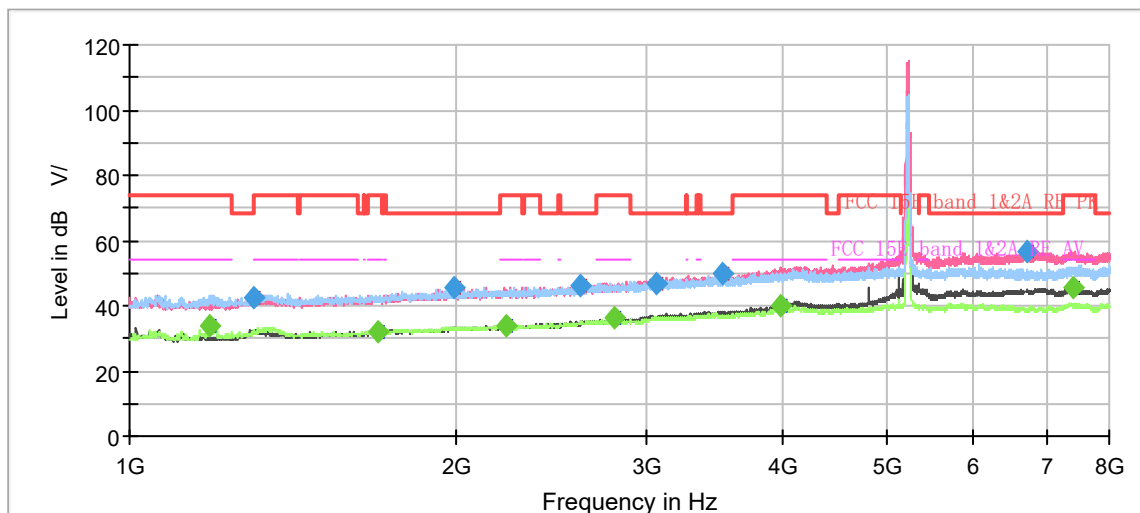
Radiates Emission from 8GHz to 18GHz



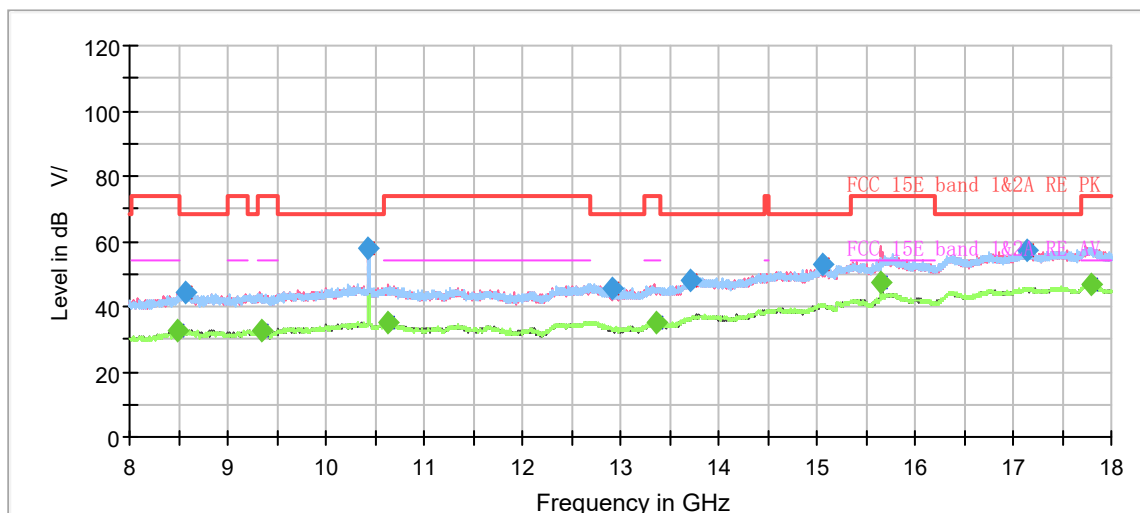
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1288.750000	42.07	---	68.20	26.13	100.0	H	83.0	-7.8
1321.125000	---	30.96	54.00	23.04	200.0	V	57.0	-7.1
1681.625000	---	32.42	54.00	21.58	200.0	V	2.0	-5.1
1909.125000	45.15	---	68.20	23.05	100.0	H	133.0	-3.9
2239.000000	---	33.95	54.00	20.05	100.0	V	275.0	-2.5
2617.875000	46.26	---	68.20	21.94	200.0	V	236.0	-0.9
2860.250000	---	36.28	54.00	17.72	200.0	V	184.0	0.5
3458.750000	48.24	---	68.20	19.96	200.0	V	63.0	2.2
3807.000000	---	38.70	54.00	15.30	100.0	V	307.0	3.5
4493.000000	51.45	---	68.20	16.75	200.0	V	292.0	5.0
4800.125000	---	47.46	54.00	6.54	100.0	V	219.0	5.9
6868.625000	57.35	---	68.20	10.85	100.0	V	198.0	9.1

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT20) CH44



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 8GHz



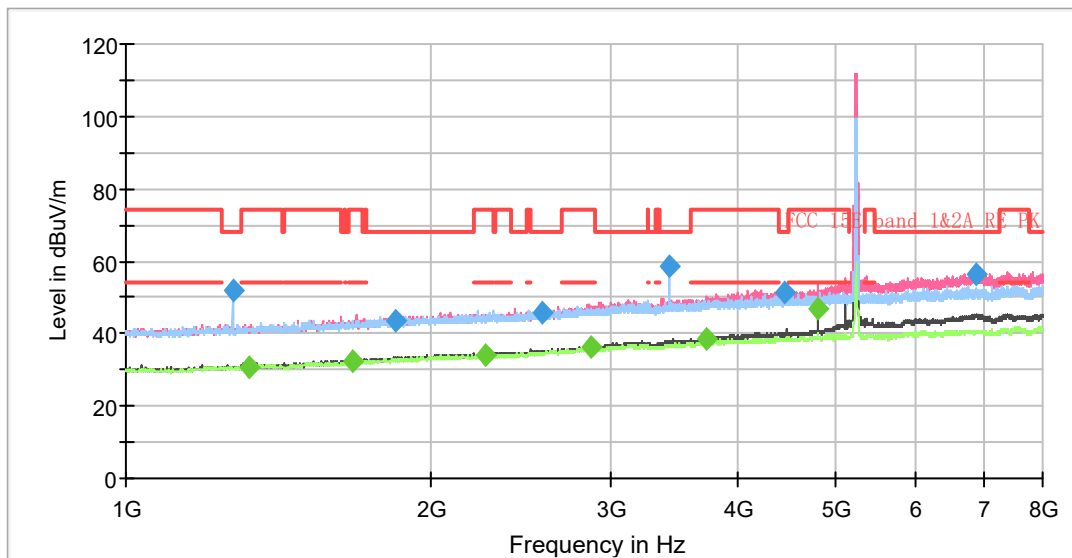
Radiates Emission from 8GHz to 18GHz



Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1184.625000	---	33.66	54.00	20.34	100.0	H	18.0	-7.4
1299.250000	42.42	---	68.20	25.78	200.0	H	65.0	-6.8
1693.875000	---	32.27	54.00	21.73	200.0	V	19.0	-4.5
1994.000000	45.51	---	68.20	22.69	100.0	H	0.0	-2.7
2224.125000	---	33.71	54.00	20.29	200.0	V	0.0	-1.7
2599.500000	46.40	---	68.20	21.80	200.0	V	48.0	0.0
2794.625000	---	36.14	54.00	17.86	200.0	V	24.0	0.9
3065.875000	46.98	---	68.20	21.22	100.0	V	182.0	2.4
3520.000000	49.54	---	68.20	18.66	100.0	V	0.0	3.8
3975.875000	---	39.87	54.00	14.13	100.0	V	273.0	6.0
6728.625000	56.38	---	68.20	11.82	200.0	V	7.0	10.5
7399.750000	---	45.68	54.00	8.32	200.0	V	1.0	11.5

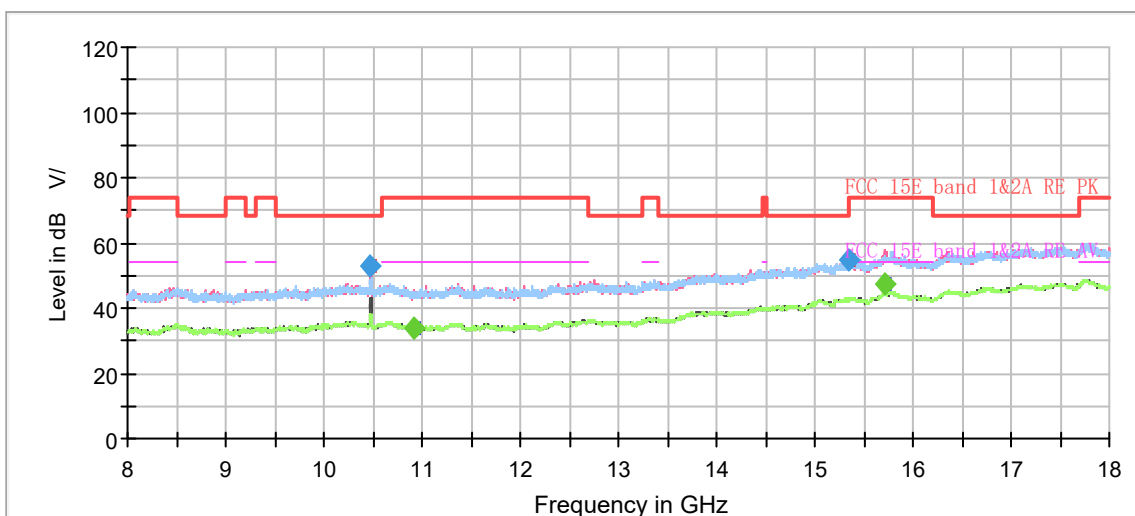
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT20) CH48



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz



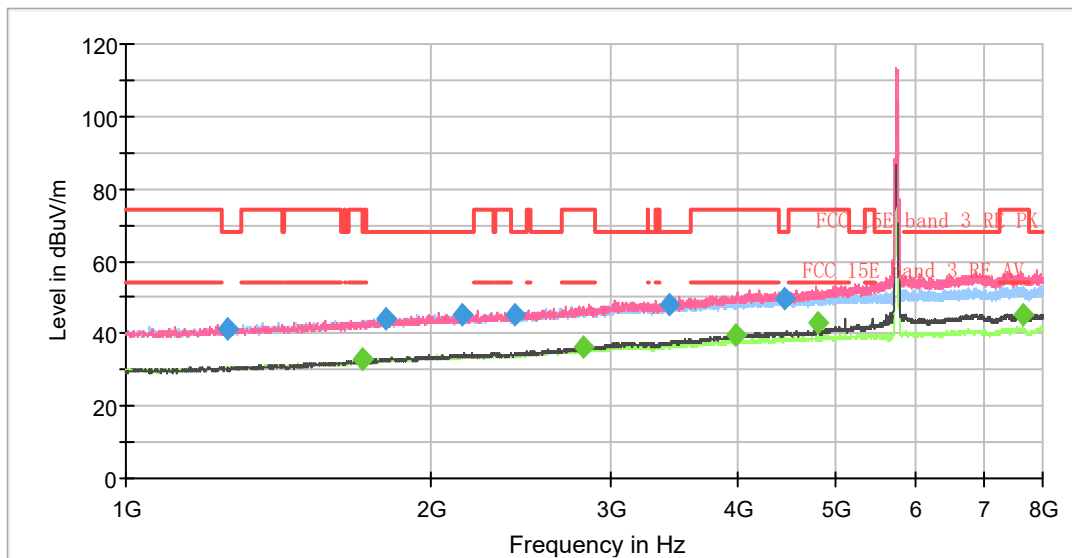
Radiates Emission from 8GHz to 18GHz



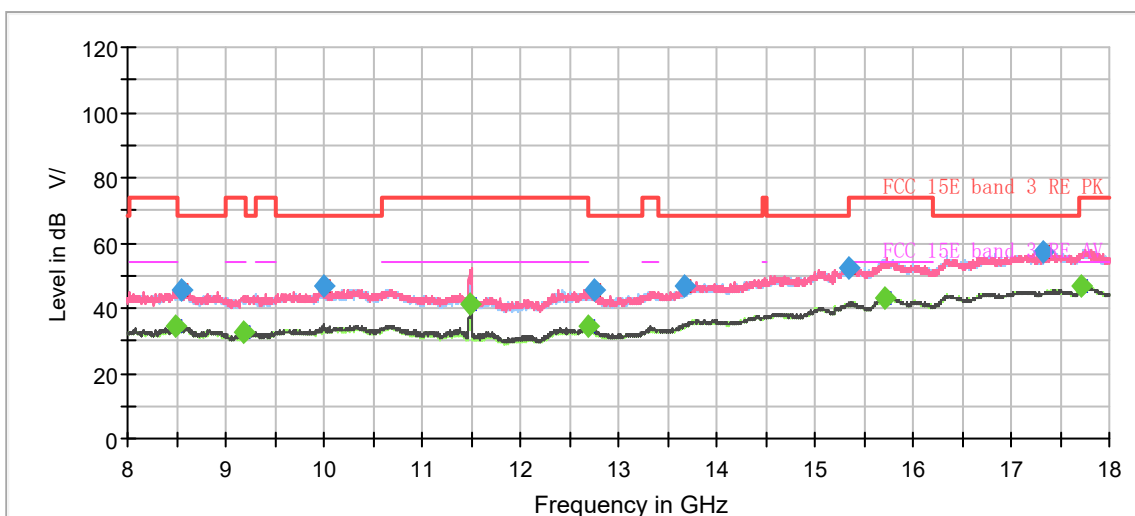
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1273.875000	51.75	---	68.20	16.45	200.0	H	339.0	-7.4
1322.000000	---	30.86	54.00	23.14	200.0	V	29.0	-7.1
1670.250000	---	32.45	54.00	21.55	200.0	V	61.0	-5.2
1847.875000	43.78	---	68.20	24.42	100.0	V	132.0	-4.3
2256.500000	---	34.01	54.00	19.99	200.0	V	112.0	-2.4
2568.875000	45.60	---	68.20	22.60	200.0	V	7.0	-1.1
2877.750000	---	36.28	54.00	17.72	200.0	V	78.0	0.5
3431.625000	58.68	---	68.20	9.52	100.0	H	9.0	2.0
3737.000000	---	38.25	54.00	15.75	100.0	V	115.0	3.1
4800.125000	---	46.68	54.00	17.25	100.0	V	217.0	5.9
4446.625000	51.35	---	68.20	16.85	100.0	V	217.0	5.9
6871.250000	56.25	---	68.20	11.95	100.0	V	354.0	9.1

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT20) CH149



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 8GHz



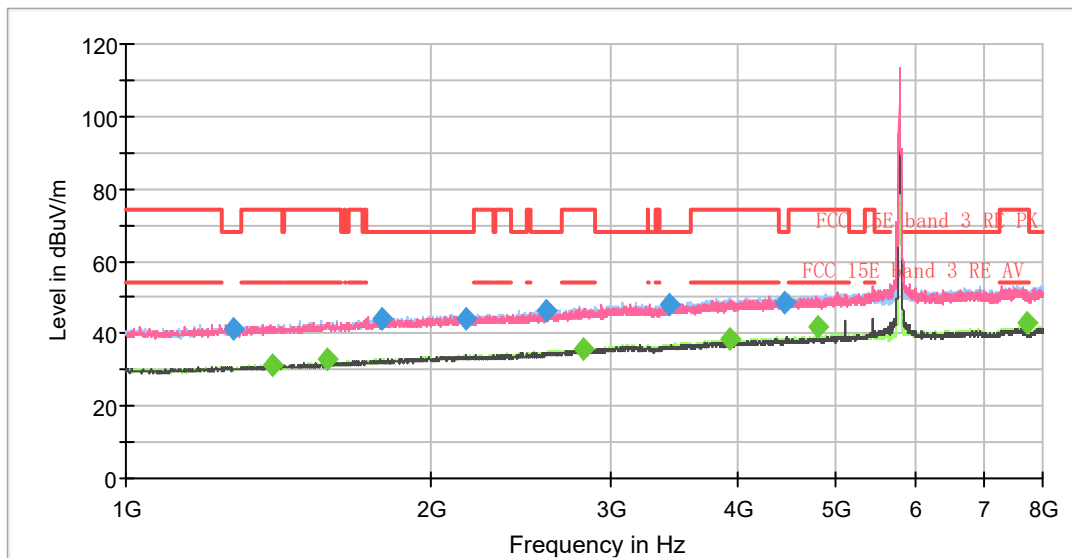
Radiates Emission from 8GHz to 18GHz



Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1257.250000	41.47	---	68.20	26.73	200.0	H	326.0	-6.9
1709.625000	---	32.69	54.00	21.31	200.0	H	247.0	-5.0
1801.500000	44.25	---	68.20	23.95	200.0	H	281.0	-5.0
1709.625000	---	32.69	54.00	21.31	200.0	H	247.0	-5.0
2144.450000	45.20	---	68.20	23.00	100.0	V	241.0	0.0
2821.750000	---	36.29	54.00	17.71	100.0	V	174.0	0.2
3991.625000	---	39.50	54.00	14.50	100.0	V	263.0	4.0
2417.875000	45.09	---	68.20	23.11	100.0	V	202.0	4.0
3436.000000	48.25	---	68.20	19.95	100.0	V	302.0	5.8
4800.125000	---	43.05	54.00	10.95	100.0	V	224.0	5.9
4458.875000	49.71	---	68.20	18.49	100.0	V	230.0	9.8
7660.500000	---	45.39	54.00	8.61	100.0	V	191.0	10.2

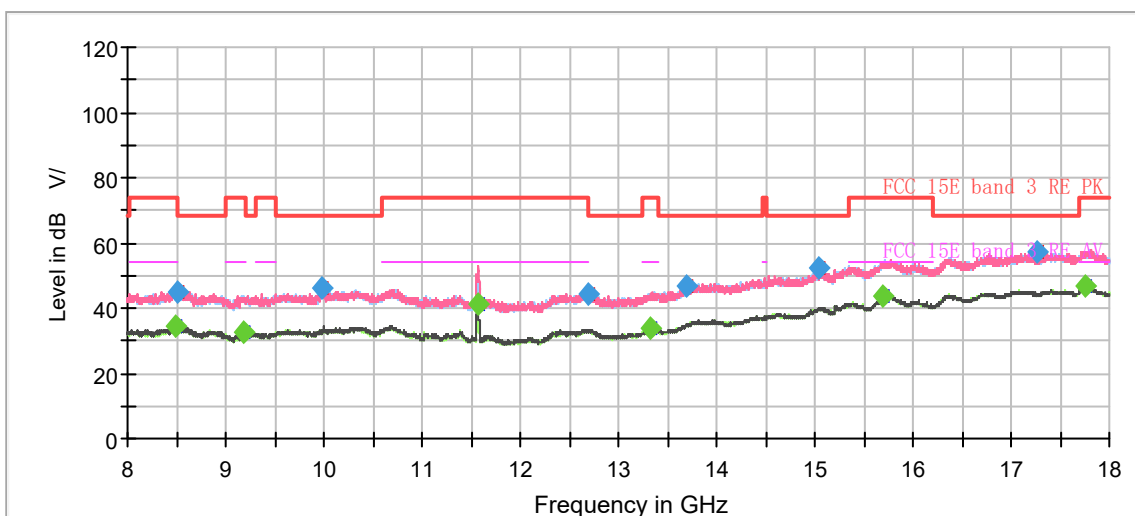
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT20) CH157



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz



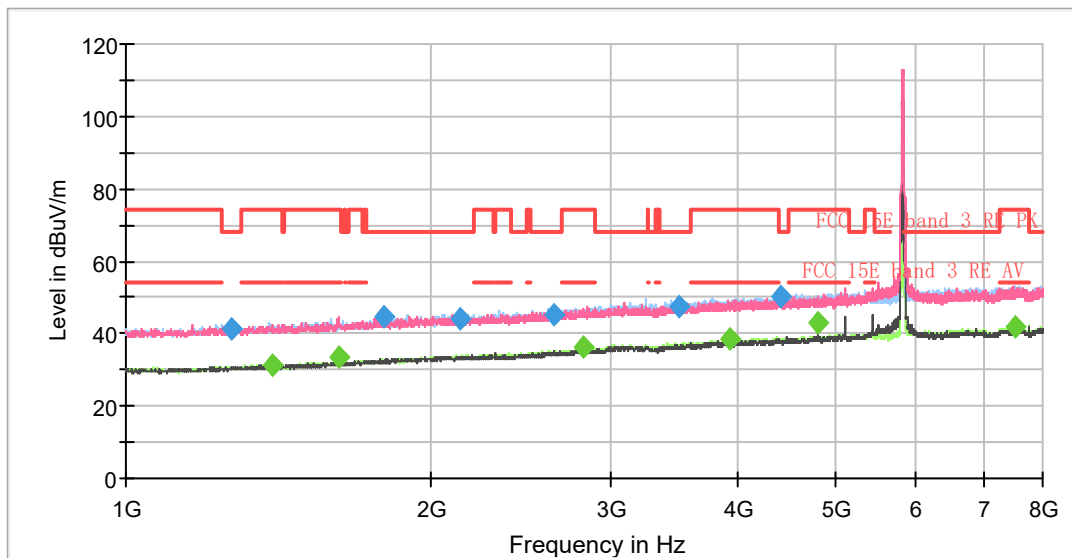
Radiates Emission from 8GHz to 18GHz



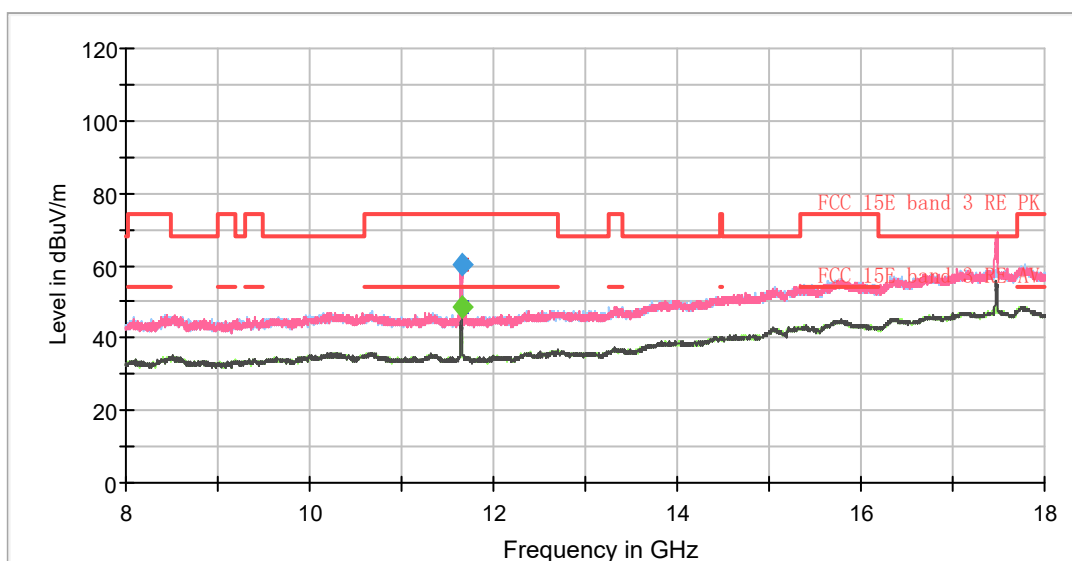
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1276.500000	41.49	---	68.20	26.71	200.0	V	62.0	-6.8
1397.250000	---	31.31	54.00	22.69	200.0	H	295.0	-6.7
1581.875000	---	33.10	54.00	20.90	200.0	V	169.0	-5.7
1788.375000	44.07	---	68.20	24.13	100.0	H	38.0	-5.1
2160.250000	44.05	---	68.20	24.15	100.0	H	105.0	0.1
2592.500000	46.56	---	68.20	21.64	200.0	H	140.0	3.8
2824.375000	---	35.65	54.00	18.35	100.0	H	252.0	0.2
3435.125000	48.21	---	68.20	19.99	100.0	H	144.0	5.8
3936.500000	---	38.26	54.00	15.74	100.0	H	105.0	3.9
4464.125000	48.65	---	68.20	19.55	100.0	H	105.0	10.0
4800.125000	---	41.69	54.00	12.31	100.0	V	226.0	5.9
7713.875000	---	42.82	54.00	11.18	100.0	V	13.0	10.2

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT20) CH165



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 8GHz



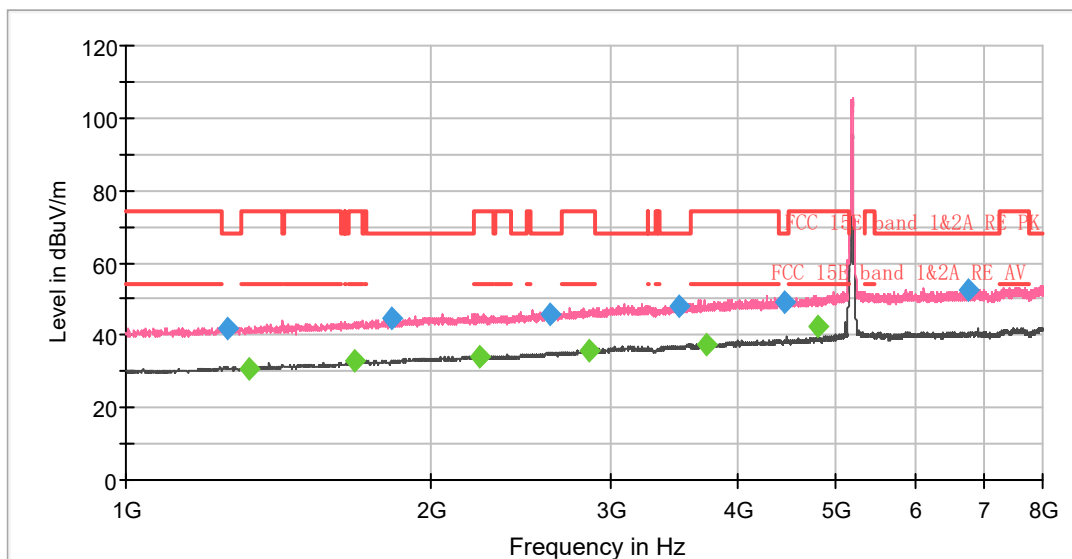
Radiates Emission from 8GHz to 18GHz



Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1272.125000	41.41	---	68.20	26.79	100.0	H	7.0	-6.8
1395.500000	---	31.45	54.00	22.55	200.0	H	96.0	-6.7
1620.375000	---	33.51	54.00	20.49	200.0	V	20.0	-5.5
1797.125000	44.42	---	68.20	23.78	200.0	V	198.0	-5.5
2821.750000	---	36.03	54.00	17.97	200.0	H	52.0	0.2
2137.500000	44.12	---	68.20	24.08	100.0	V	313.0	0.2
2643.250000	45.16	---	68.20	23.04	200.0	H	324.0	3.4
3943.500000	---	38.59	54.00	15.41	100.0	H	0.0	3.9
3509.500000	47.58	---	68.20	20.62	200.0	H	269.0	5.8
4800.125000	---	42.76	54.00	11.24	100.0	V	219.0	5.9
7508.250000	---	41.88	54.00	12.12	100.0	H	151.0	9.9
4419.500000	50.02	---	68.20	18.18	200.0	H	220.0	9.9

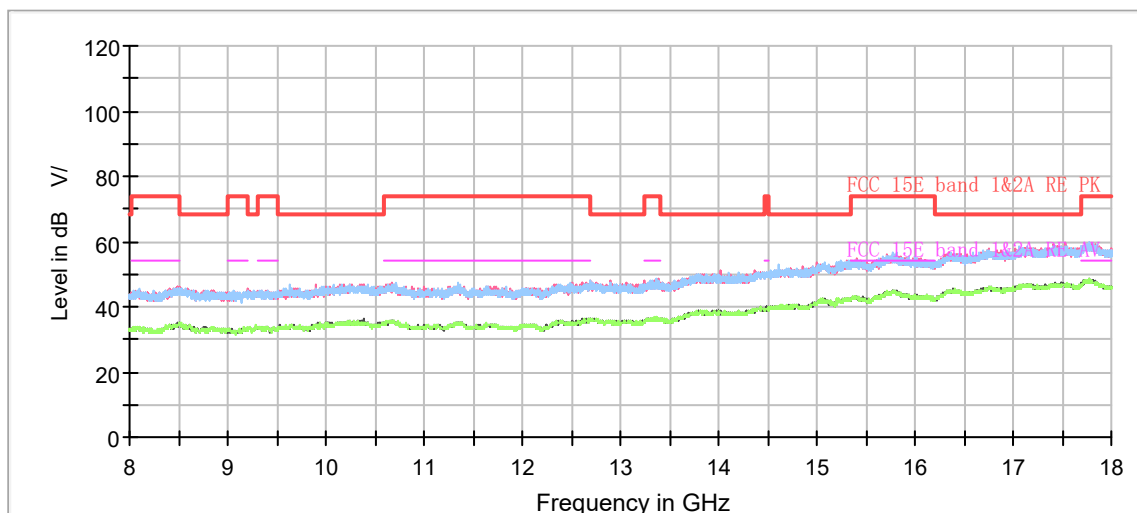
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT40) CH38



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz



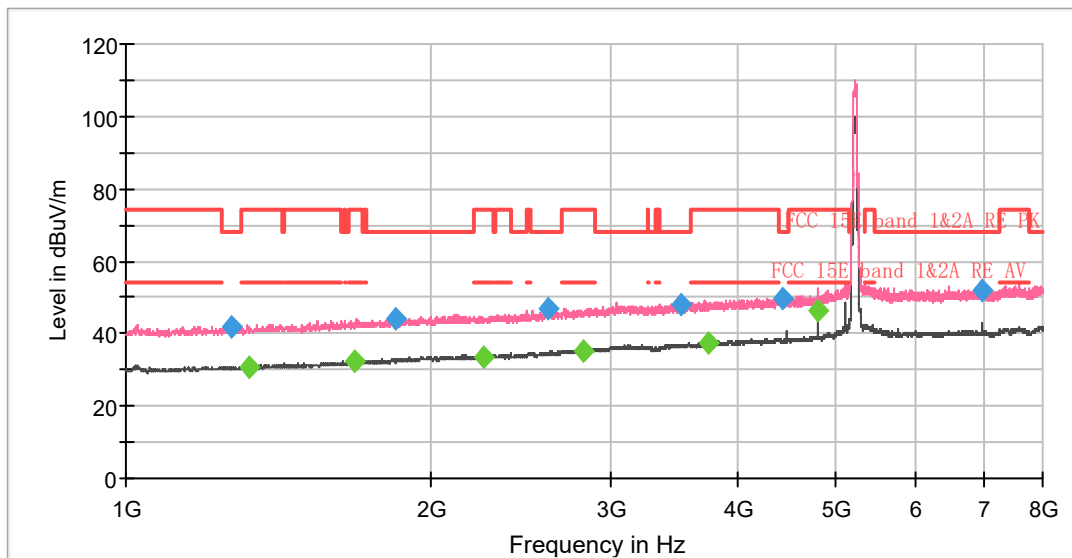
Radiates Emission from 8GHz to 18GHz



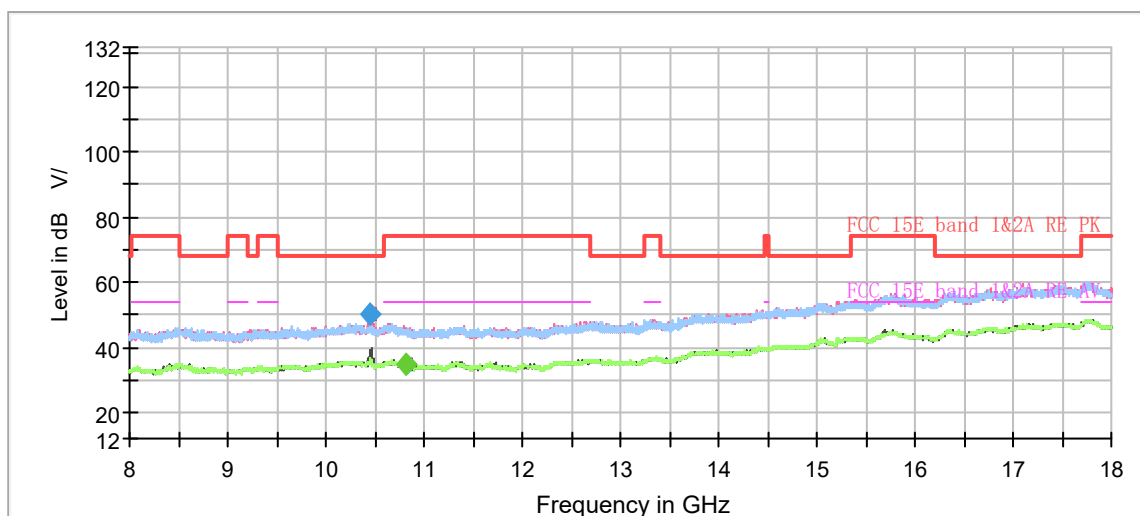
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1259.875000	41.95	---	68.20	26.25	100.0	V	254.0	-7.7
1322.875000	---	30.82	54.00	23.18	200.0	V	247.0	-7.1
1682.500000	---	32.92	54.00	21.08	300.0	V	359.0	-5.1
1825.125000	44.75	---	68.20	23.45	100.0	V	169.0	-4.2
2228.500000	---	34.13	54.00	19.87	300.0	V	202.0	-2.6
2620.500000	46.00	---	68.20	22.20	100.0	V	91.0	-0.9
2862.875000	---	35.68	54.00	18.32	200.0	V	12.0	0.5
3506.000000	48.06	---	68.20	20.14	200.0	V	74.0	2.3
3728.250000	---	37.40	54.00	16.60	200.0	V	135.0	3.1
4458.000000	49.33	---	68.20	18.87	300.0	V	113.0	4.9
4800.125000	---	42.32	54.00	11.68	100.0	V	249.0	5.9
6768.875000	52.35	---	68.20	15.85	300.0	V	269.0	9.0

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT40) CH46



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 8GHz



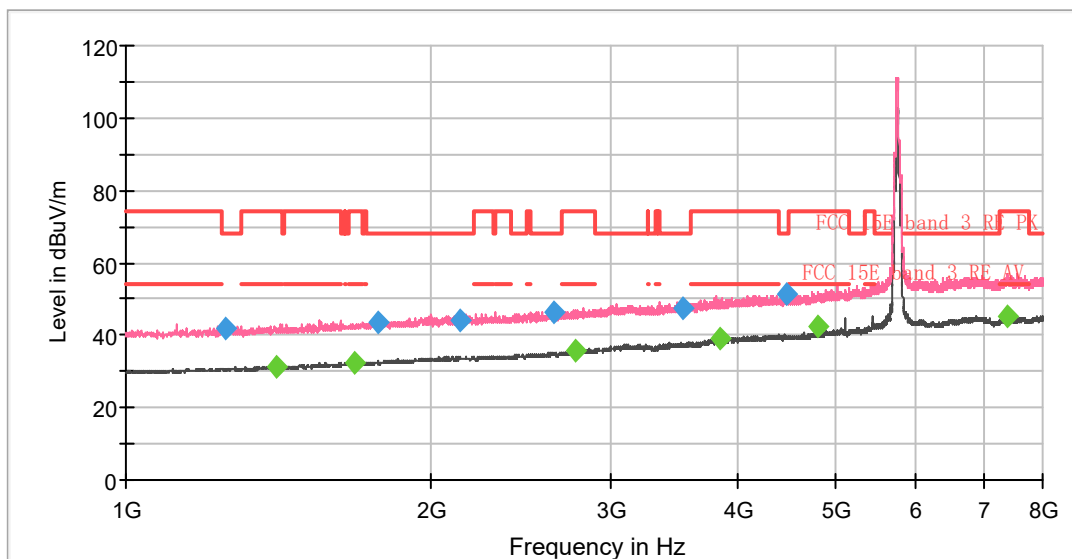
Radiates Emission from 8GHz to 18GHz



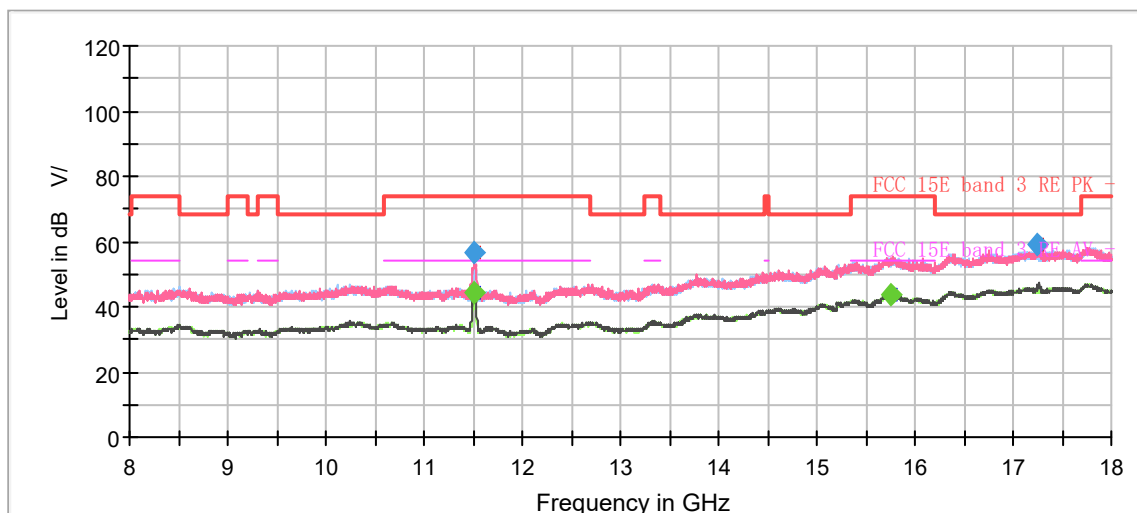
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1270.375000	41.60	---	68.20	26.60	200.0	V	16.0	-7.9
1319.375000	---	30.87	54.00	23.13	300.0	V	239.0	-7.1
1680.750000	---	32.36	54.00	21.64	300.0	V	306.0	-5.2
1840.000000	44.12	---	68.20	24.08	100.0	V	298.0	-4.3
2255.625000	---	33.67	54.00	20.33	300.0	V	347.0	-2.4
2610.000000	46.64	---	68.20	21.56	300.0	V	289.0	-0.9
2827.000000	---	35.30	54.00	18.70	300.0	V	217.0	0.2
3517.375000	48.10	---	68.20	20.10	300.0	V	273.0	2.4
3753.625000	---	37.55	54.00	16.45	300.0	V	352.0	3.2
4436.125000	49.89	---	68.20	18.31	300.0	V	0.0	4.9
4800.125000	---	46.40	54.00	7.60	100.0	V	241.0	5.9
6979.750000	51.96	---	68.20	16.24	100.0	V	0.0	9.2

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT40) CH151



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 8GHz



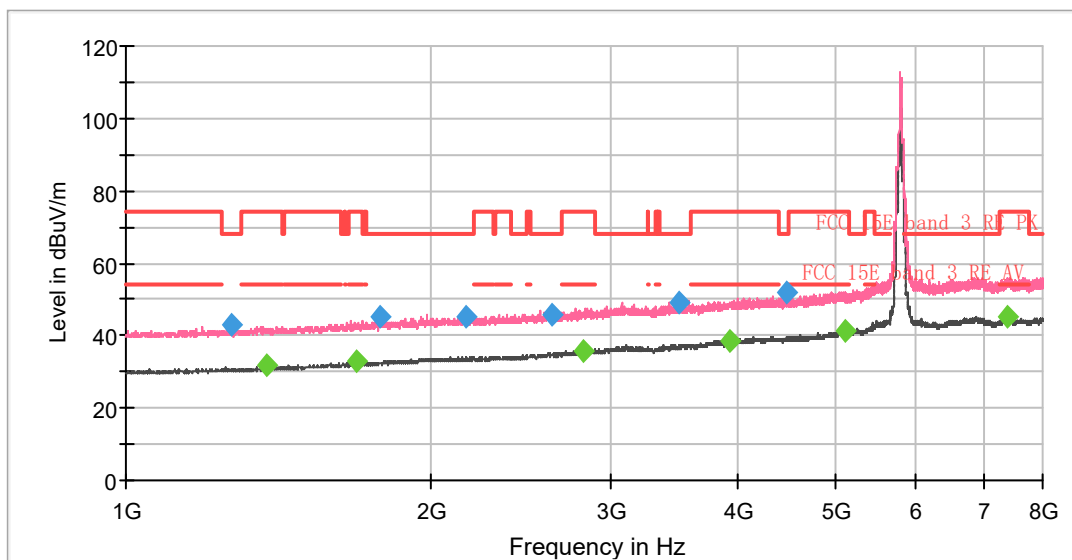
Radiates Emission from 8GHz to 18GHz



Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1252.875000	41.86	---	68.20	26.34	300.0	V	158.0	-7.0
1404.250000	---	31.42	54.00	22.58	300.0	V	293.0	-6.7
1768.250000	43.66	---	68.20	24.54	300.0	V	317.0	-5.5
1679.875000	---	32.57	54.00	21.43	200.0	V	70.0	-5.1
2777.125000	---	35.96	54.00	18.04	200.0	V	116.0	-0.1
2134.000000	44.24	---	68.20	23.96	200.0	V	87.0	0.2
2640.625000	46.20	---	68.20	22.00	200.0	V	99.0	3.5
3854.250000	---	39.12	54.00	14.88	200.0	V	81.0	3.7
4800.125000	---	42.64	54.00	11.36	100.0	V	240.0	5.9
3540.125000	47.47	---	68.20	20.73	200.0	V	25.0	6.6
7391.000000	---	45.00	54.00	9.00	200.0	V	14.0	9.8
4480.750000	51.27	---	68.20	16.93	200.0	V	9.0	9.8

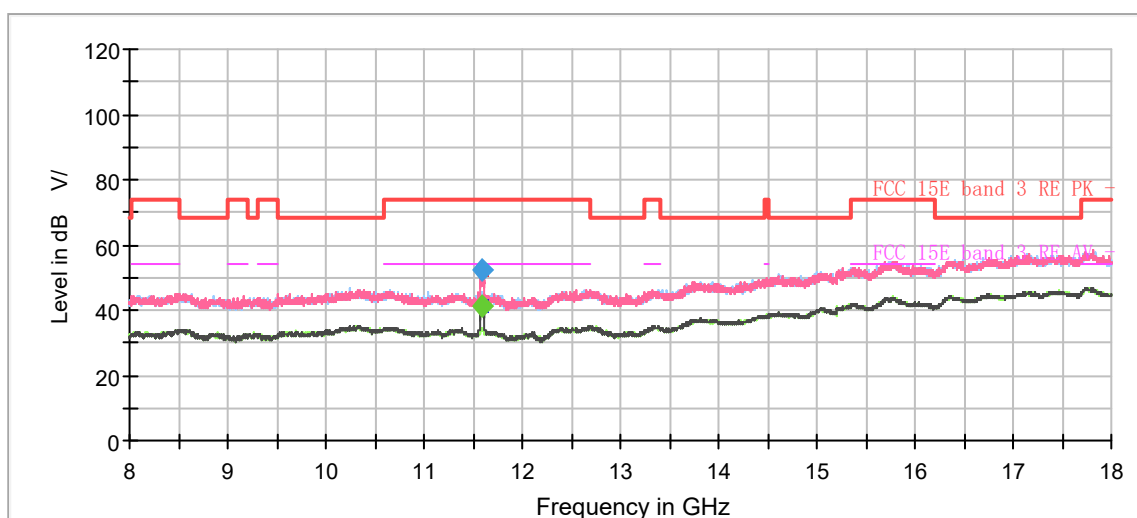
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT40) CH159



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz



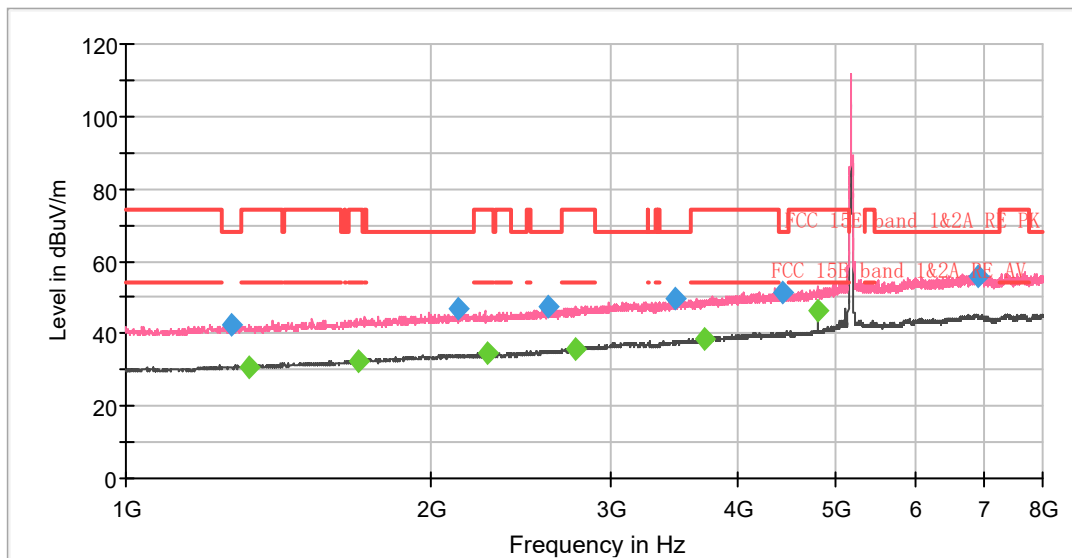
Radiates Emission from 8GHz to 18GHz



Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1273.000000	42.70	---	68.20	25.50	300.0	V	258.0	-6.7
1374.500000	---	31.54	54.00	22.46	300.0	V	214.0	-6.9
1689.500000	---	32.84	54.00	21.16	300.0	V	22.0	-5.1
1777.875000	45.05	---	68.20	23.15	200.0	V	260.0	-5.0
2160.250000	45.02	---	68.20	23.18	200.0	V	276.0	-0.1
2634.500000	45.73	---	68.20	22.47	200.0	V	338.0	3.9
2819.125000	---	35.65	54.00	18.35	300.0	V	16.0	0.2
3513.875000	48.94	---	68.20	19.26	200.0	V	288.0	6.5
3940.875000	---	38.65	68.20	15.35	200.0	V	276.0	3.9
4477.250000	52.11	---	68.20	16.09	200.0	V	276.0	10.2
5120.375000	---	41.47	54.00	12.53	100.0	V	129.0	6.6
7384.875000	---	45.05	68.20	8.95	200.0	V	260.0	9.8

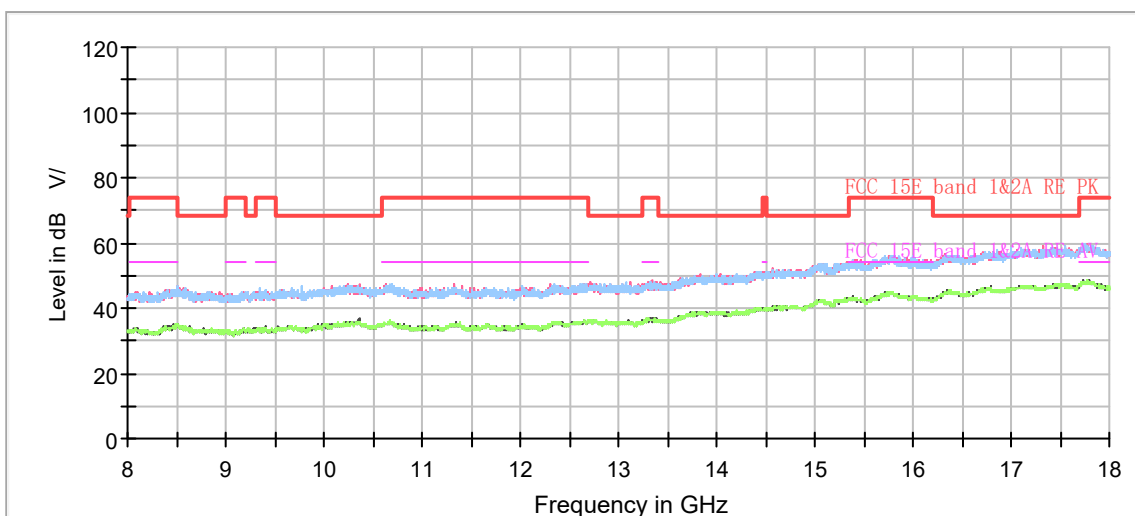
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11ac (HT20) CH36



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz



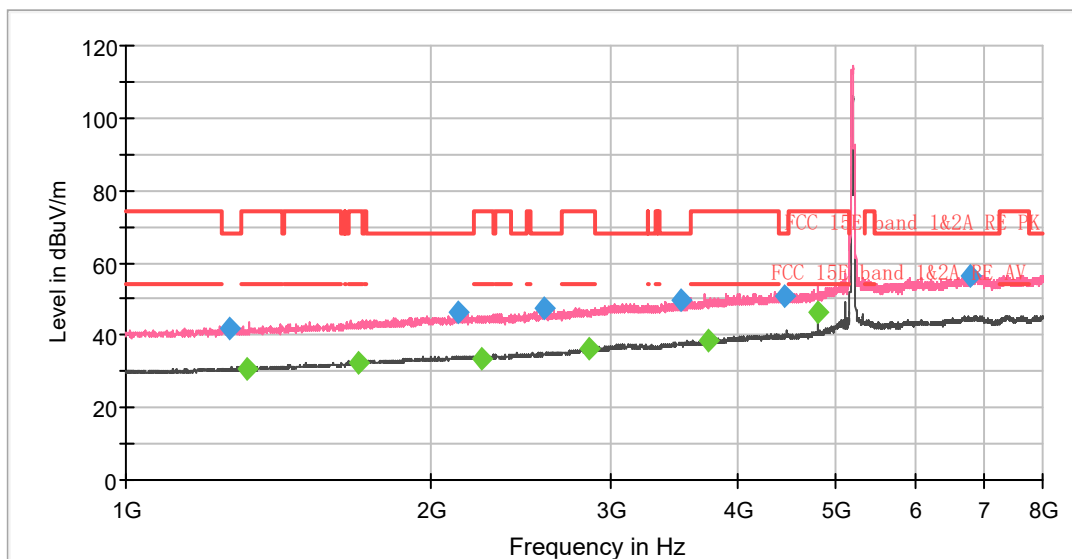
Radiates Emission from 8GHz to 18GHz



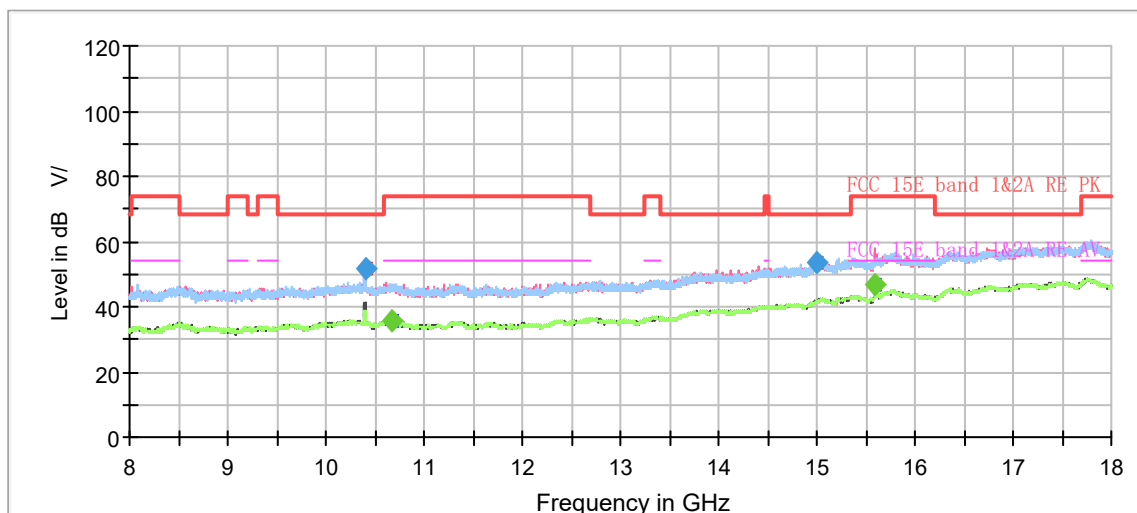
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1270.375000	42.43	---	68.20	25.77	200.0	V	278.0	-7.7
1324.625000	---	30.76	54.00	23.24	200.0	V	295.0	-7.1
1693.000000	---	32.45	54.00	21.55	200.0	V	295.0	-5.1
2121.750000	46.64	---	68.20	21.56	100.0	V	163.0	-2.9
2268.750000	---	34.46	54.00	19.54	200.0	V	278.0	-2.3
2603.000000	47.41	---	68.20	20.79	200.0	V	312.0	-1.0
2775.375000	---	35.91	54.00	18.09	200.0	V	328.0	-0.1
3478.875000	49.64	---	68.20	18.56	200.0	V	312.0	2.2
3723.000000	---	38.65	54.00	15.35	200.0	V	345.0	3.1
4444.875000	51.48	---	68.20	16.72	100.0	V	147.0	4.9
4800.125000	---	46.05	54.00	7.95	100.0	V	251.0	5.9
6919.375000	56.08	---	68.20	12.12	100.0	V	114.0	9.1

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11ac (HT20) CH40



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 8GHz



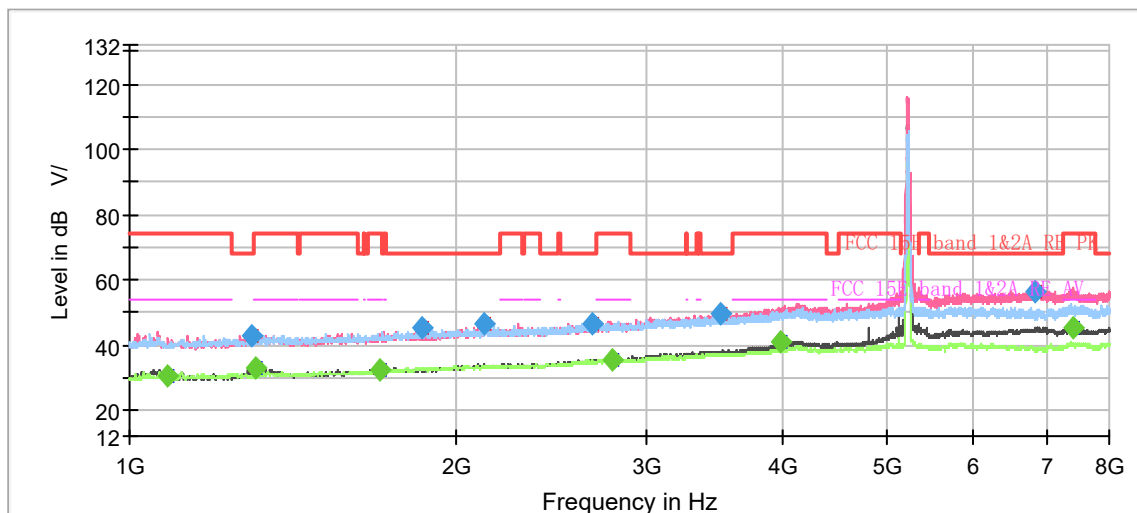
Radiates Emission from 8GHz to 18GHz



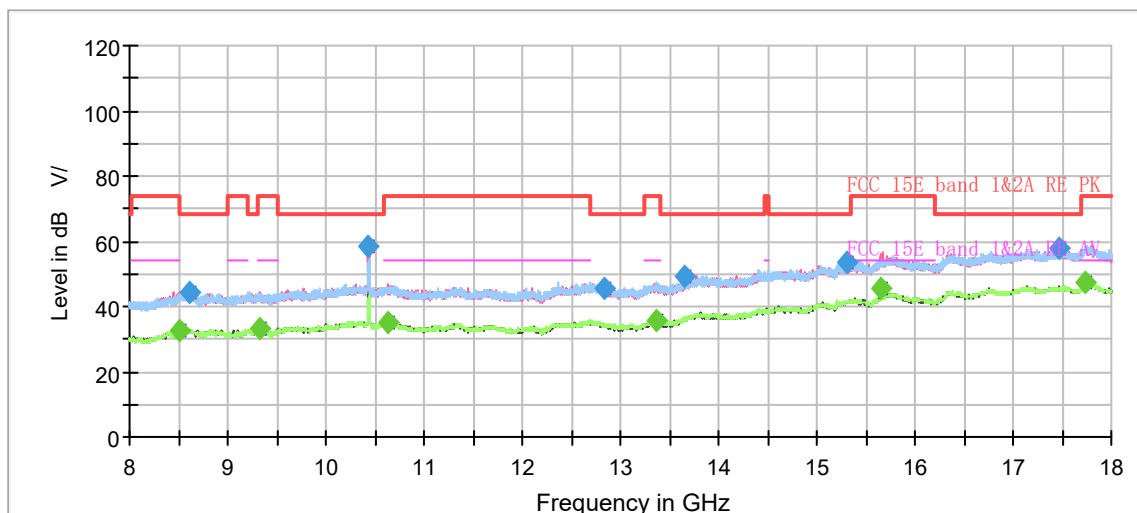
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1264.250000	41.93	---	68.20	26.27	300.0	V	166.0	-7.9
1317.625000	---	30.93	54.00	23.07	200.0	V	18.0	-7.1
1693.000000	---	32.54	54.00	21.46	200.0	V	67.0	-5.1
2129.625000	46.31	---	68.20	21.89	200.0	V	67.0	-2.8
2239.000000	---	33.69	54.00	20.31	200.0	V	73.0	-2.5
2584.625000	47.57	---	68.20	20.63	200.0	V	79.0	-1.0
2856.750000	---	36.35	54.00	17.65	200.0	V	67.0	0.4
3520.875000	49.86	---	68.20	18.34	200.0	V	13.0	2.4
3748.375000	---	38.76	54.00	15.24	200.0	V	67.0	3.2
4459.750000	50.81	---	68.20	17.39	100.0	V	308.0	5.9
4800.125000	---	46.47	68.20	7.53	100.0	V	308.0	5.9
6801.250000	56.45	---	68.20	11.75	200.0	V	95.0	9.1

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11ac (HT20) CH44



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 8GHz



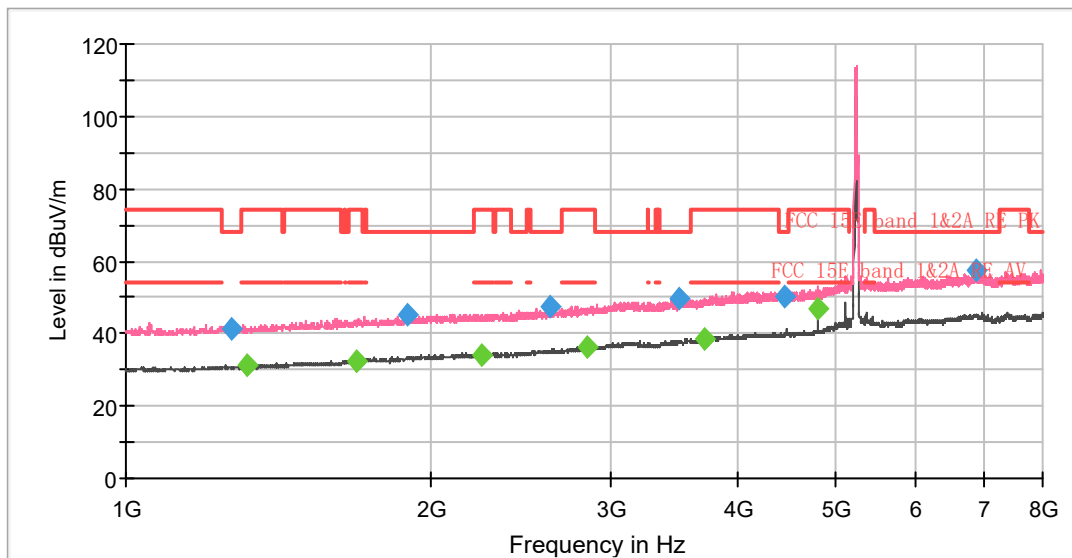
Radiates Emission from 8GHz to 18GHz



Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1084.875000	---	30.44	54.00	23.56	200.0	V	24.0	-7.9
1294.875000	42.63	---	68.20	25.57	200.0	V	292.0	-6.8
1308.000000	---	32.90	54.00	21.10	200.0	V	261.0	-6.7
1698.250000	---	32.52	54.00	21.48	200.0	V	24.0	-4.5
1861.000000	44.96	---	68.20	23.24	100.0	H	174.0	-3.5
2124.375000	46.25	---	68.20	21.95	200.0	V	174.0	-2.1
2671.250000	46.75	---	68.20	21.45	200.0	H	340.0	0.4
2792.000000	---	35.65	54.00	18.35	200.0	V	30.0	0.9
3505.125000	49.72	---	68.20	18.48	200.0	V	298.0	3.7
3984.625000	---	40.72	54.00	13.28	200.0	V	36.0	6.1
6840.625000	56.35	---	68.20	11.85	100.0	V	169.0	10.6
7414.625000	---	45.54	54.00	8.46	200.0	V	30.0	11.5

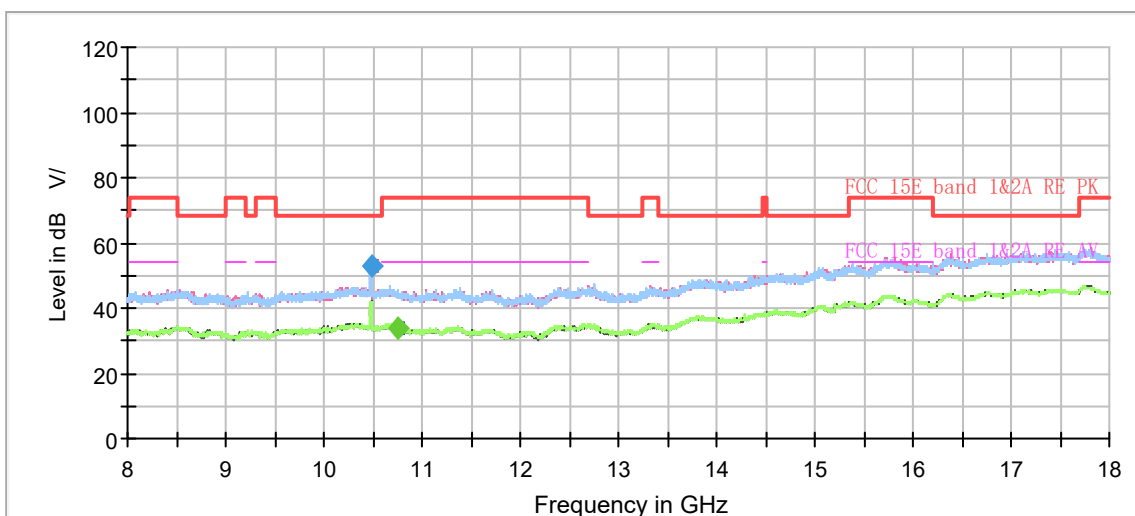
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11ac (HT20) CH48



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz



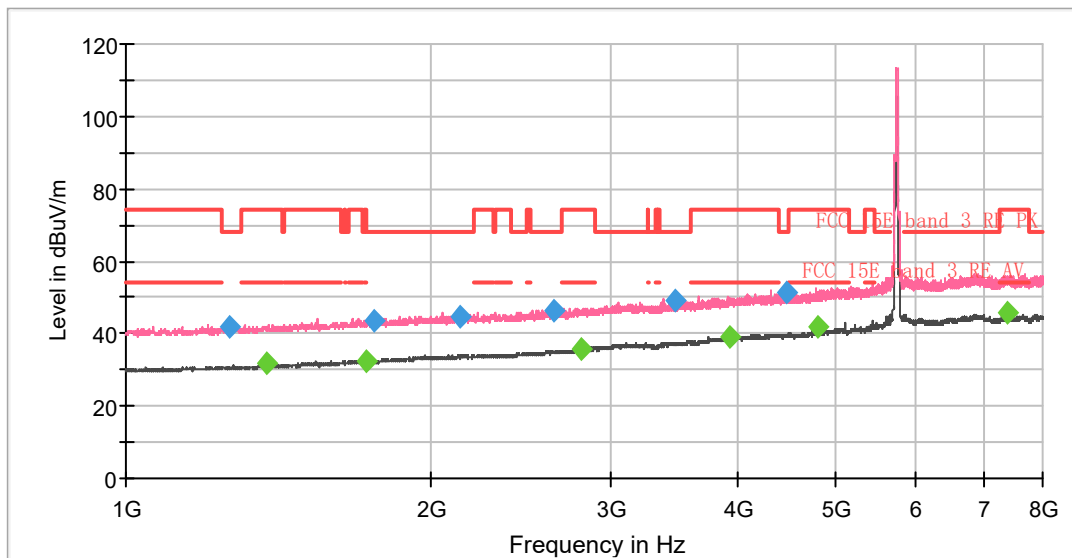
Radiates Emission from 8GHz to 18GHz



Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1268.625000	41.49	---	68.20	26.71	200.0	V	309.0	-8.5
1316.750000	---	31.05	54.00	22.95	200.0	V	126.0	-7.1
1684.250000	---	32.39	54.00	21.61	100.0	V	147.0	-5.1
1892.500000	44.94	---	68.20	23.26	200.0	V	65.0	-4.0
2239.000000	---	34.10	54.00	19.90	200.0	V	22.0	-2.5
2616.125000	47.30	---	68.20	20.90	200.0	V	114.0	-0.9
2845.375000	---	36.30	54.00	17.70	200.0	V	98.0	0.3
3513.000000	49.70	---	68.20	18.50	200.0	V	331.0	2.4
3709.875000	---	38.64	54.00	15.36	100.0	V	291.0	3.1
4800.125000	---	46.96	54.00	7.04	100.0	V	246.0	5.9
4452.750000	50.49	---	68.20	17.71	100.0	V	246.0	5.9
6889.625000	57.60	---	68.20	10.60	100.0	V	279.0	9.1

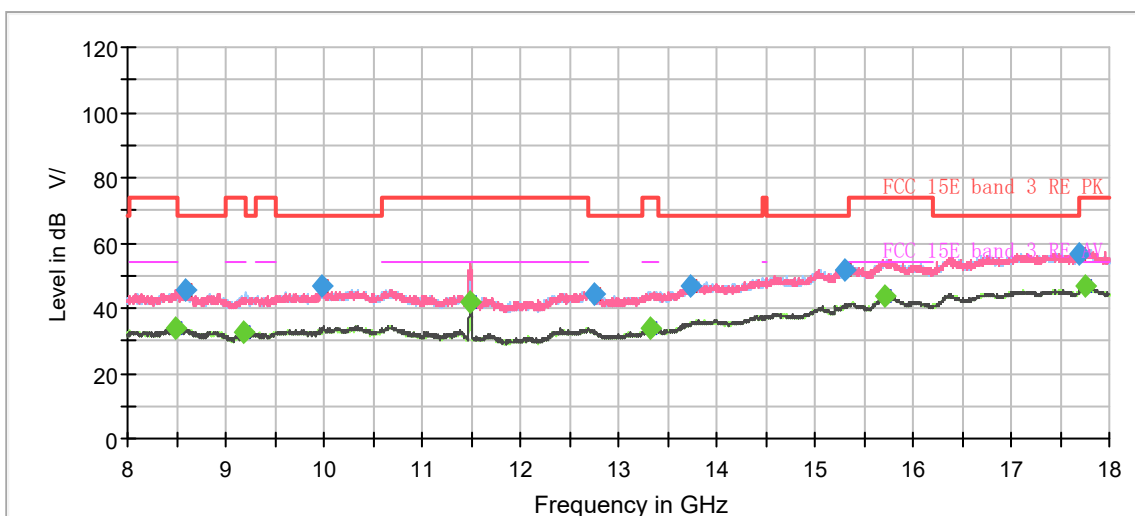
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11ac (HT20) CH149



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz



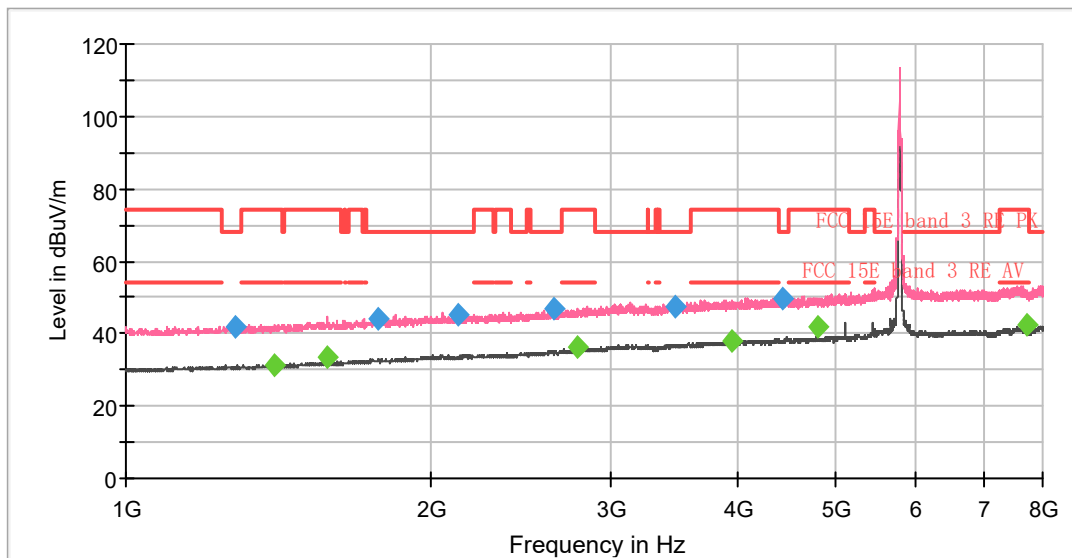
Radiates Emission from 8GHz to 18GHz



Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1266.000000	41.72	---	68.20	26.48	200.0	V	66.0	-7.2
1375.375000	---	31.66	54.00	22.34	300.0	V	151.0	-6.8
1721.875000	---	32.64	54.00	21.36	300.0	V	320.0	-4.9
1758.625000	43.41	---	68.20	29.71	100.0	V	271.0	-5.1
2134.000000	44.71	---	68.20	23.49	100.0	V	293.0	-0.3
2642.375000	46.31	---	68.20	21.89	200.0	V	54.0	2.9
2813.875000	---	35.92	54.00	18.08	200.0	V	83.0	0.2
3480.625000	48.86	---	68.20	19.34	200.0	V	26.0	6.6
3934.750000	---	39.20	54.00	14.80	200.0	V	60.0	3.9
4475.500000	51.23	---	68.20	16.88	200.0	V	83.0	10.2
4800.125000	---	41.64	54.00	12.36	100.0	V	244.0	5.9
7396.250000	---	45.75	54.00	8.25	200.0	V	206.0	9.8

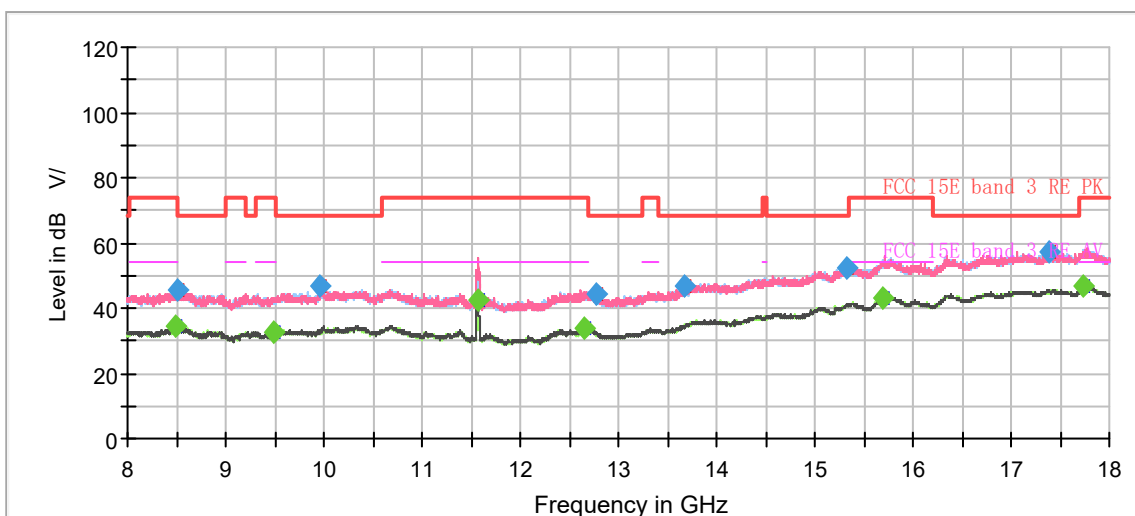
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11ac (HT20) CH157



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz



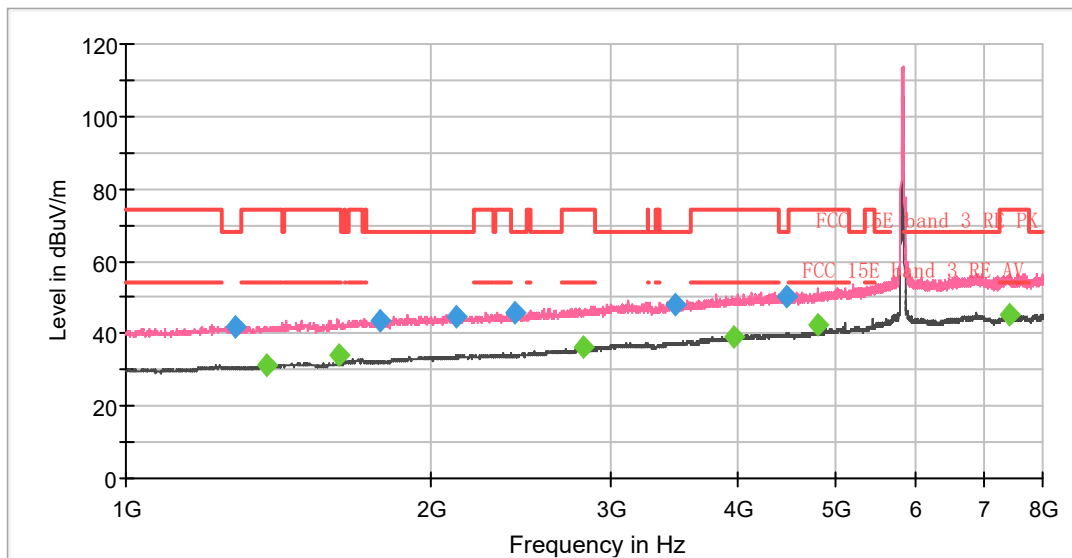
Radiates Emission from 8GHz to 18GHz



Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1282.625000	41.82	---	68.20	26.38	300.0	V	34.0	-6.9
1399.000000	---	31.32	54.00	22.68	300.0	V	74.0	-6.7
1771.750000	44.04	---	68.20	24.16	200.0	V	231.0	-5.7
1579.250000	---	33.26	54.00	20.74	200.0	V	241.0	-5.7
2781.500000	---	36.03	54.00	17.97	300.0	V	34.0	0.0
2124.375000	45.26	---	68.20	22.94	300.0	V	281.0	0.2
2640.625000	46.77	---	68.20	21.43	300.0	V	7.0	3.8
3951.375000	---	37.92	54.00	16.08	300.0	V	176.0	3.9
4800.125000	---	41.84	54.00	12.16	100.0	V	250.0	5.9
3469.250000	47.18	---	68.20	21.02	100.0	V	98.0	5.9
4432.625000	49.66	---	68.20	18.54	100.0	V	245.0	10.2
7713.875000	---	42.67	54.00	11.33	100.0	V	70.0	10.2

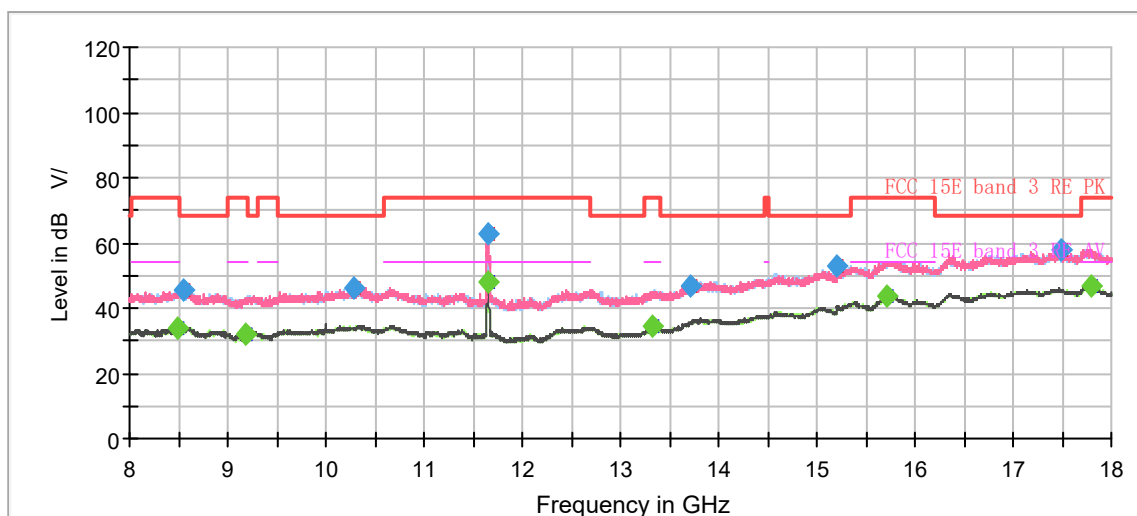
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11ac (HT20) CH165



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz



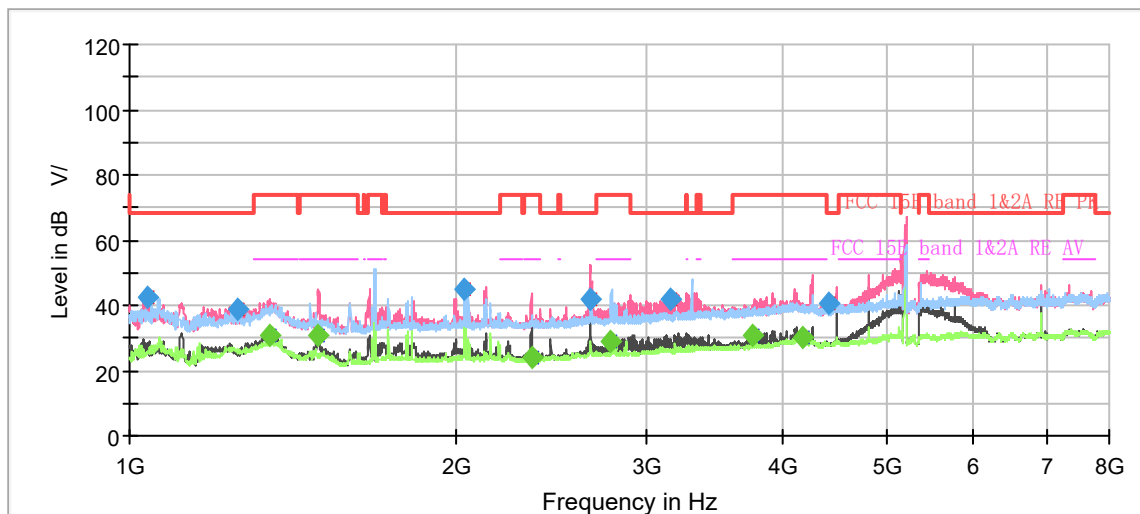
Radiates Emission from 8GHz to 18GHz



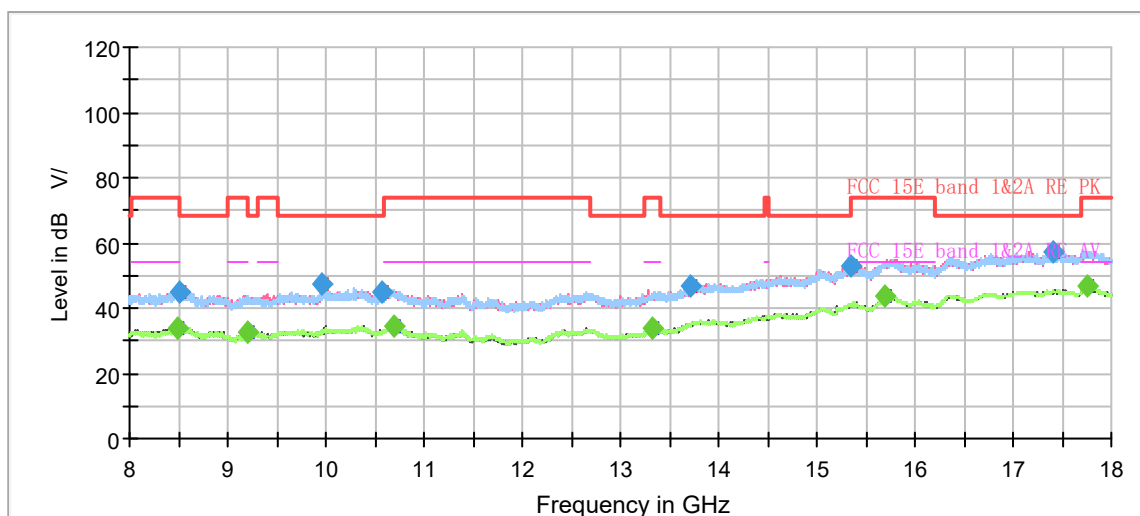
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1283.500000	41.97	---	68.20	26.23	100.0	V	289.0	-6.9
1376.250000	---	31.30	54.00	22.70	300.0	V	264.0	-6.8
1619.500000	---	33.97	54.00	20.03	200.0	V	249.0	-5.5
1780.500000	43.36	---	68.20	24.84	200.0	V	356.0	-5.5
2114.750000	44.73	---	68.20	23.47	200.0	V	22.0	0.1
2819.125000	---	36.32	54.00	17.68	200.0	V	208.0	0.2
2411.750000	45.68	---	68.20	22.52	200.0	V	40.0	3.5
3975.875000	---	39.31	54.00	14.69	200.0	V	0.0	3.9
4800.125000	---	42.15	54.00	11.85	100.0	V	248.0	5.9
3480.625000	48.28	---	68.20	19.92	200.0	V	101.0	6.6
7403.250000	---	45.13	54.00	8.87	200.0	V	89.0	9.8
4475.500000	50.47	---	68.20	17.73	200.0	V	107.0	10.2

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11ac (HT40) CH38



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 8GHz



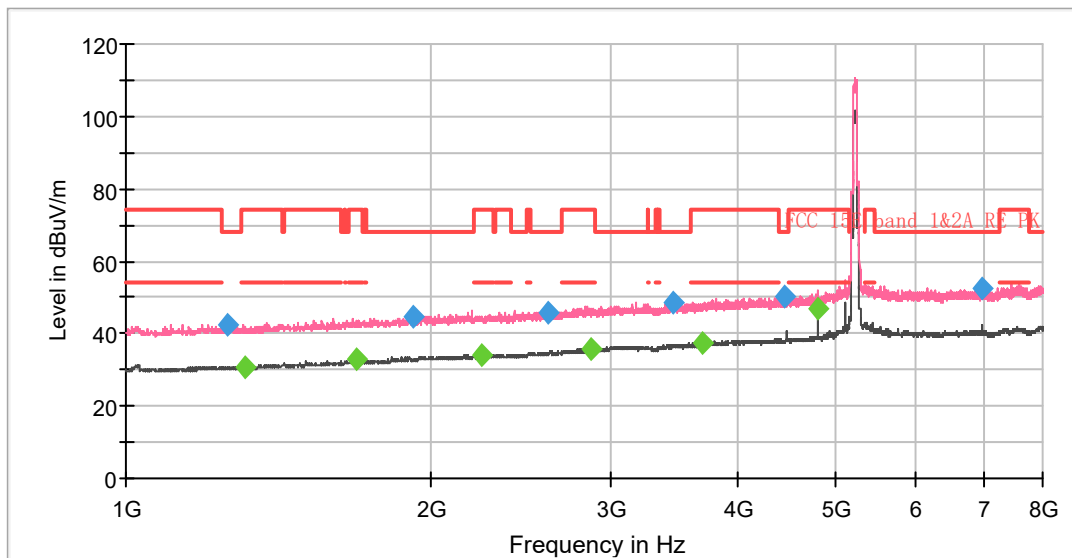
Radiates Emission from 8GHz to 18GHz



Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1037.625000	42.48	---	68.20	25.72	200.0	V	119.0	-18.2
1257.250000	38.51	---	68.20	29.69	100.0	V	95.0	-17.0
1349.125000	---	31.05	54.00	22.95	100.0	V	89.0	-16.5
1491.750000	---	30.66	54.00	23.34	200.0	V	55.0	-15.6
2037.750000	44.77	---	68.20	23.43	200.0	H	135.0	-12.5
2346.625000	---	23.80	54.00	30.20	200.0	H	32.0	-11.3
2659.000000	41.58	---	68.20	26.62	200.0	H	348.0	-9.6
2780.625000	---	28.75	54.00	25.25	200.0	H	14.0	-9.1
3149.875000	41.78	---	68.20	26.42	200.0	V	257.0	-7.5
3758.875000	---	30.51	54.00	23.49	100.0	V	95.0	-5.2
4170.125000	---	30.45	54.00	23.55	100.0	V	140.0	-3.4
4417.750000	40.38	---	68.20	27.82	100.0	V	44.0	-3.8

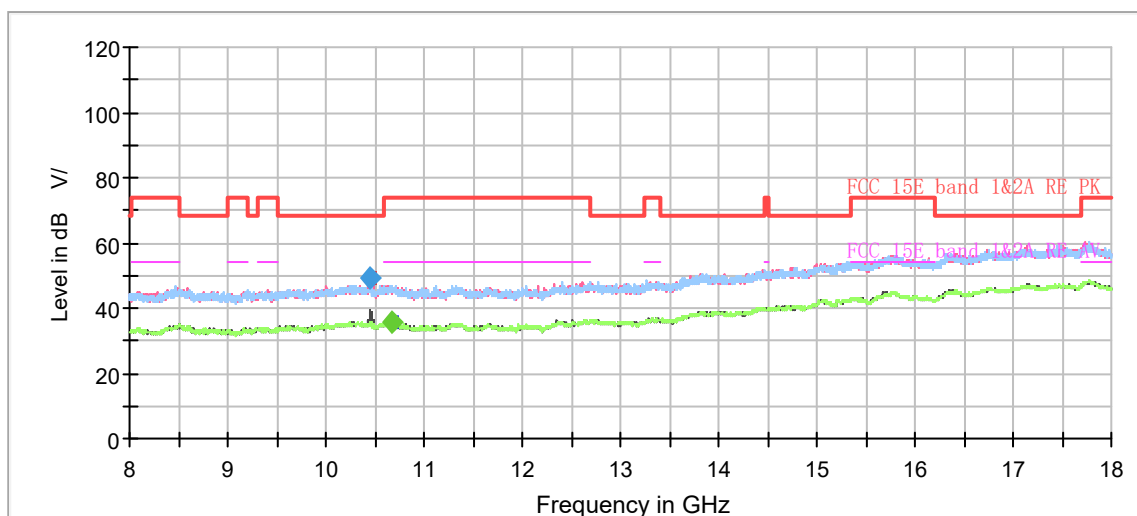
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11ac (HT40) CH46



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz



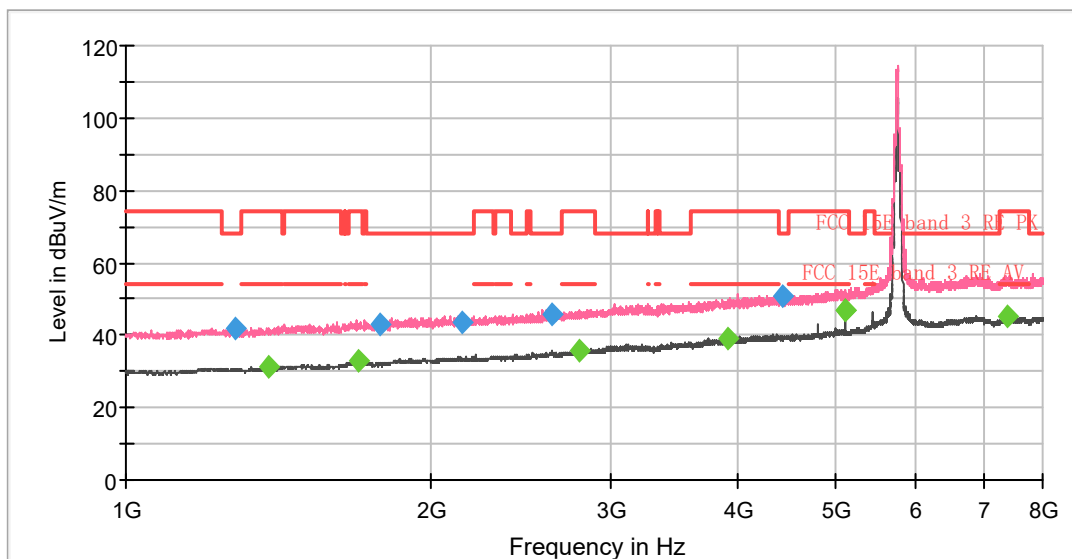
Radiates Emission from 8GHz to 18GHz



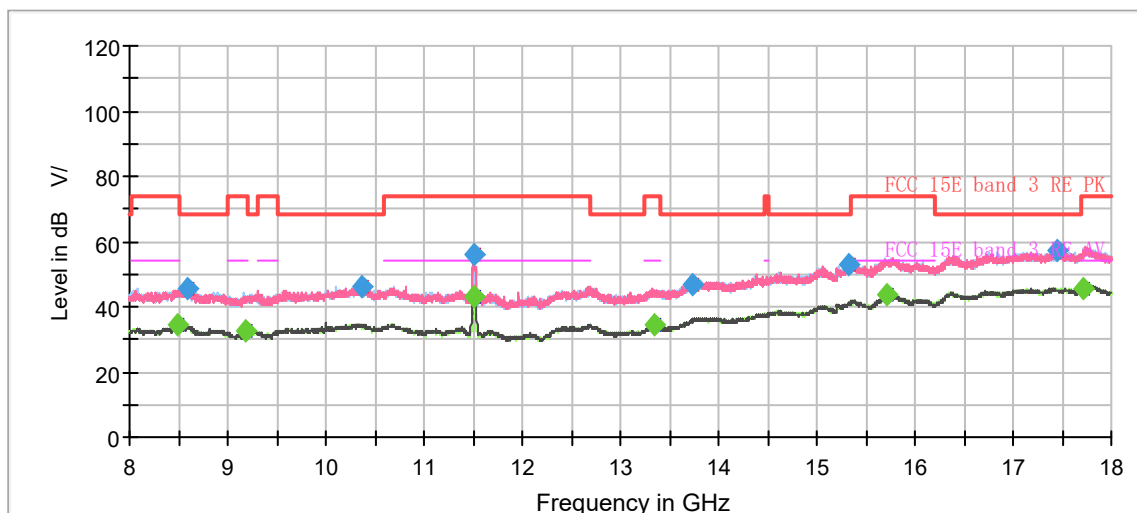
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1259.000000	42.41	---	68.20	25.79	300.0	V	271.0	-7.8
1310.625000	---	30.84	54.00	23.16	300.0	V	317.0	-7.2
1687.750000	---	32.66	54.00	21.34	200.0	V	96.0	-5.1
1923.125000	44.82	---	68.20	23.38	300.0	V	345.0	-3.9
2237.250000	---	34.04	54.00	19.96	300.0	V	160.0	-2.5
2604.750000	46.00	---	68.20	22.20	300.0	V	221.0	-0.9
2866.375000	---	35.69	54.00	18.31	200.0	V	157.0	0.5
3457.000000	48.51	---	68.20	19.69	200.0	V	58.0	2.2
3706.375000	---	37.37	54.00	16.63	300.0	V	122.0	3.1
4447.500000	50.36	---	68.20	17.84	300.0	V	21.0	4.9
4800.125000	---	46.82	54.00	7.18	100.0	V	244.0	5.9
6966.625000	52.35	---	68.20	15.85	200.0	V	0.0	9.1

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11ac (HT40) CH151



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 8GHz



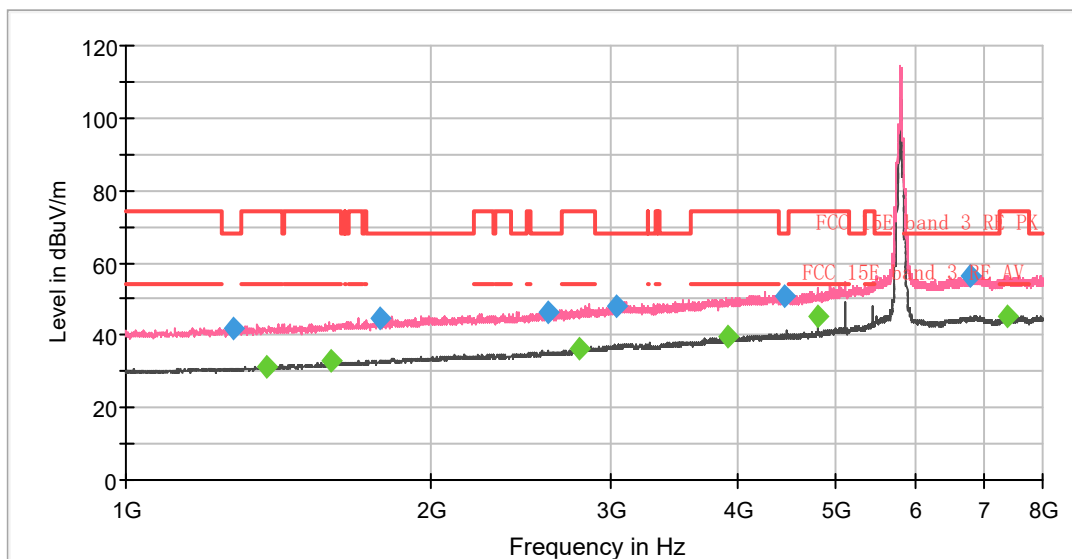
Radiates Emission from 8GHz to 18GHz



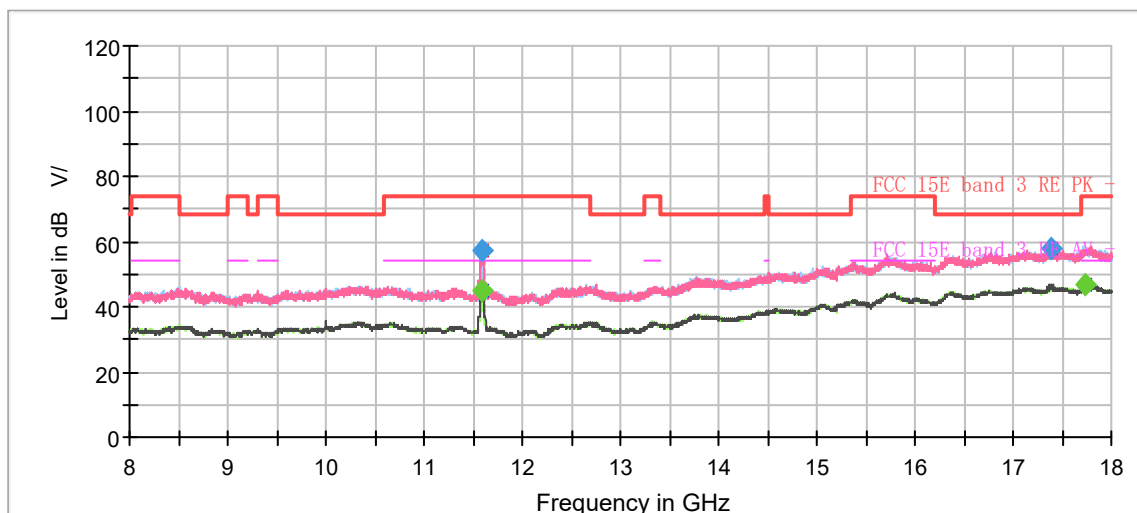
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1379.750000	---	31.15	54.00	22.85	300.0	V	151.0	-6.8
1280.875000	41.95	---	68.20	26.25	200.0	V	25.0	-6.7
1782.250000	43.08	---	68.20	25.12	100.0	V	269.0	-5.1
1695.625000	---	32.84	54.00	21.16	300.0	V	81.0	-5.1
2146.250000	43.77	---	68.20	24.43	200.0	V	295.0	0.0
2796.375000	---	35.92	54.00	18.08	200.0	V	354.0	0.1
3912.000000	---	39.31	54.00	14.69	200.0	V	284.0	3.8
2634.500000	45.93	---	68.20	22.27	200.0	V	25.0	3.9
5120.375000	---	46.84	54.00	20.02	100.0	V	252.0	6.6
5120.375000	---	46.84	54.00	7.16	100.0	V	252.0	6.6
4445.750000	50.74	---	68.20	17.46	200.0	V	184.0	9.8
7374.375000	---	45.18	54.00	8.82	200.0	V	295.0	9.8

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11ac (HT40) CH159



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 8GHz



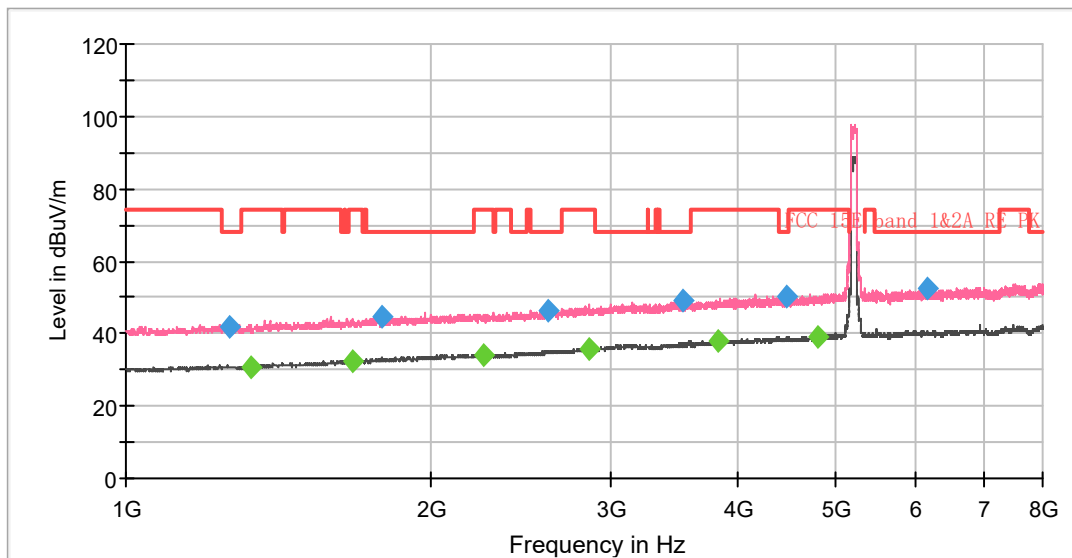
Radiates Emission from 8GHz to 18GHz



Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1378.000000	---	31.49	54.00	22.51	100.0	V	258.0	-6.8
1276.500000	41.77	---	68.20	26.46	300.0	V	118.0	-6.6
1591.500000	---	33.02	54.00	20.98	100.0	V	275.0	-5.6
1781.375000	44.60	---	68.20	23.60	100.0	V	141.0	-5.1
2792.875000	---	36.21	54.00	17.79	200.0	V	0.0	0.0
2601.250000	46.13	---	68.20	22.08	300.0	V	13.0	0.1
3916.375000	---	39.48	54.00	14.52	100.0	V	46.0	3.8
3044.875000	47.84	---	68.20	20.36	100.0	V	75.0	3.9
4453.625000	51.06	---	68.20	17.34	100.0	V	169.0	6.6
4800.125000	---	45.33	68.20	8.68	100.0	V	169.0	6.6
6790.750000	56.38	---	68.20	11.82	100.0	V	14.0	9.8
7396.250000	---	45.27	54.00	8.73	200.0	V	322.0	9.8

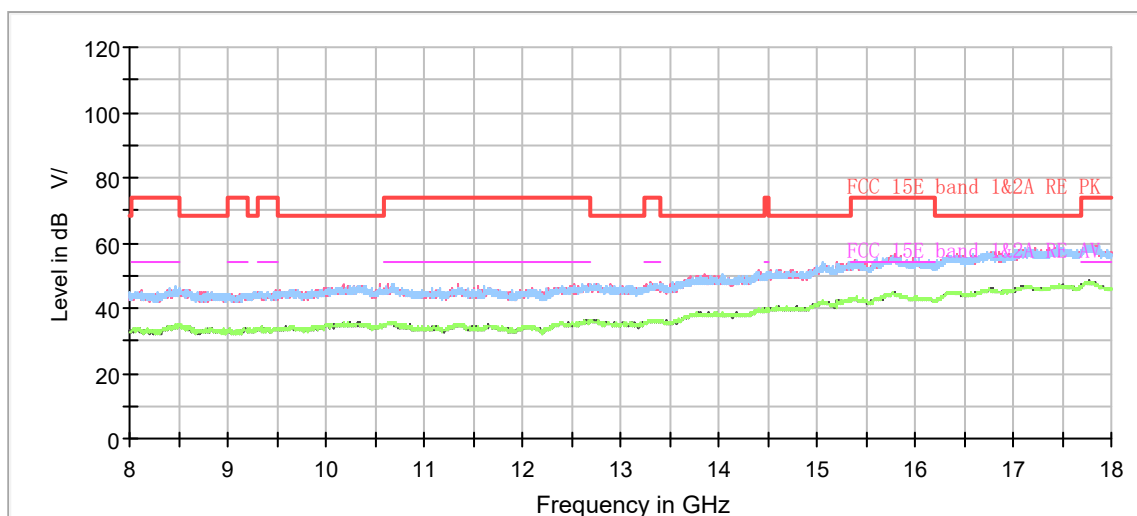
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11ac (HT80) CH42



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz



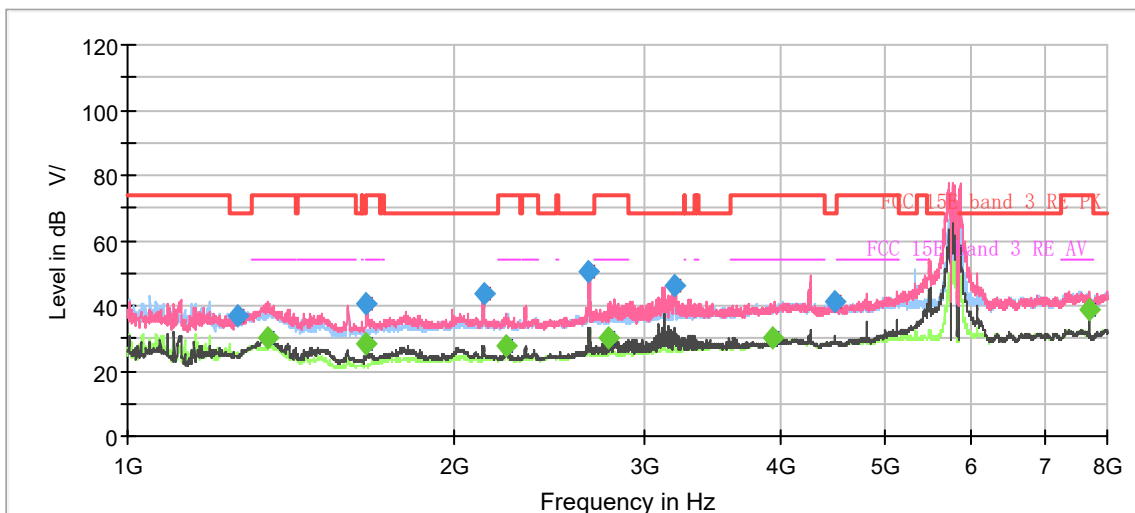
Radiates Emission from 8GHz to 18GHz



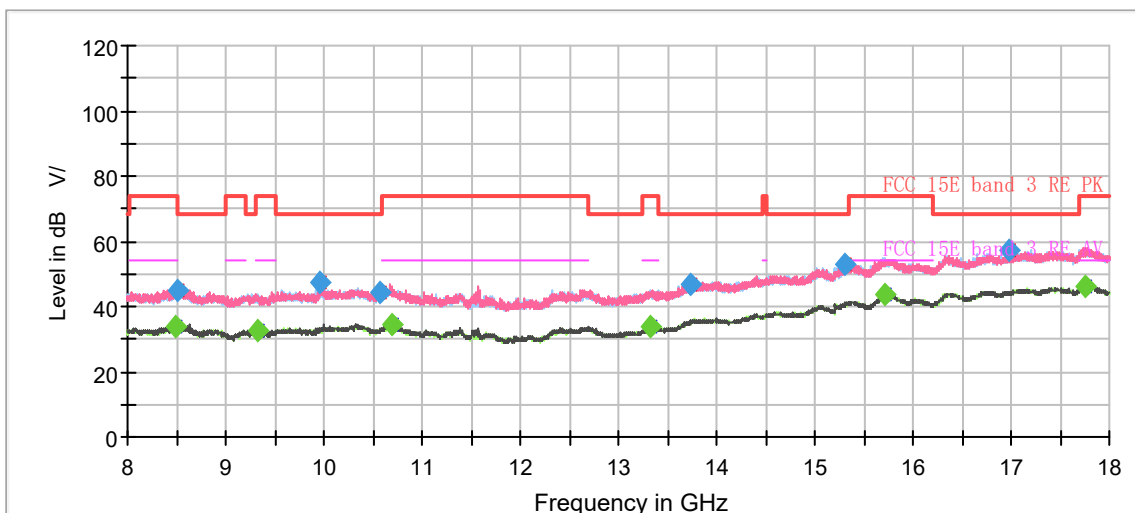
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1262.500000	41.65	---	68.20	26.55	300.0	V	359.0	-7.9
1327.250000	---	30.74	54.00	23.26	200.0	V	28.0	-7.1
1673.750000	---	32.50	54.00	21.50	100.0	V	172.0	-5.1
1784.000000	44.72	---	68.20	23.48	100.0	V	0.0	-3.5
2248.625000	---	34.13	54.00	19.87	200.0	V	22.0	-2.4
2601.250000	46.44	---	68.20	21.76	300.0	V	219.0	-1.0
2855.000000	---	35.70	54.00	18.30	300.0	V	291.0	0.4
3537.500000	49.05	---	68.20	19.15	300.0	V	1.0	2.5
3831.500000	---	37.78	54.00	16.22	200.0	V	39.0	3.6
4468.500000	50.12	---	68.20	18.08	200.0	V	253.0	4.9
4800.125000	---	39.32	54.00	14.68	100.0	V	221.0	5.9
6159.875000	52.59	---	68.20	15.61	300.0	V	353.0	8.1

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11ac (HT80) CH155



Note: The signal beyond the limit is carrier.
Radiates Emission from 1GHz to 8GHz



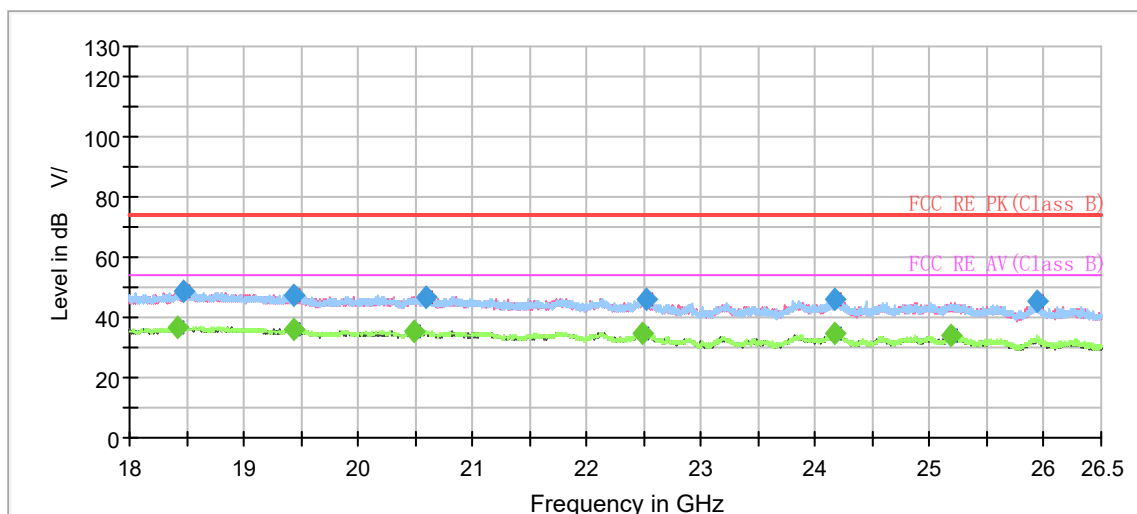
Radiates Emission from 8GHz to 18GHz



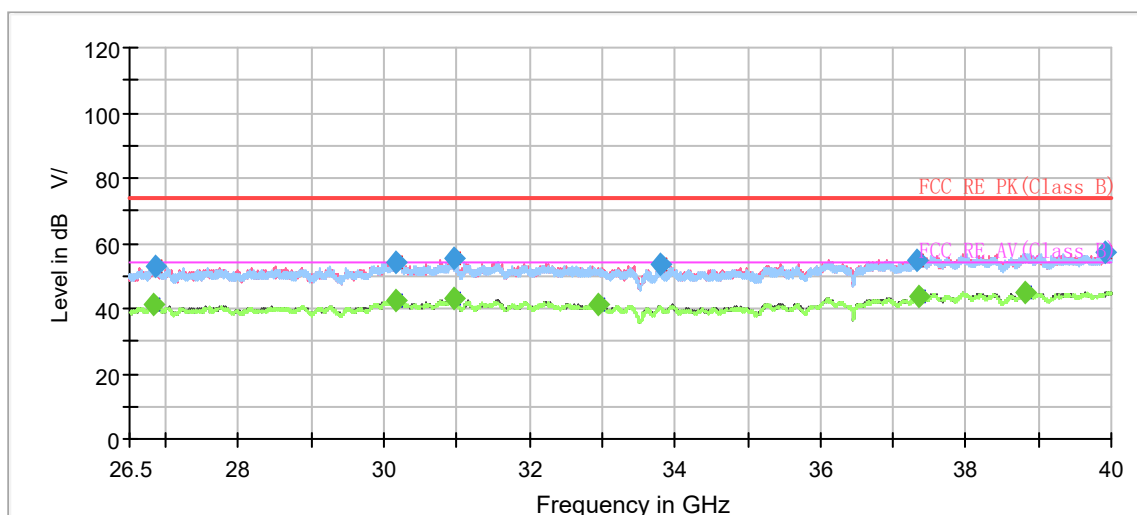
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1262.500000	36.66	---	68.20	31.54	200.0	V	60.0	-16.9
1344.750000	---	30.36	54.00	23.64	100.0	V	92.0	-16.5
1659.750000	40.43	---	68.20	27.77	100.0	V	0.0	-14.7
1661.500000	---	28.36	54.00	25.64	100.0	V	36.0	-14.7
2127.875000	43.91	---	68.20	24.29	200.0	V	264.0	-12.1
2234.625000	---	27.50	54.00	26.50	200.0	V	90.0	-11.7
2659.000000	50.67	---	68.20	17.53	100.0	V	36.0	-9.6
2778.000000	---	29.97	54.00	24.03	100.0	V	85.0	-9.1
3189.250000	46.43	---	68.20	21.77	200.0	V	90.0	-7.4
3932.125000	---	30.28	54.00	23.72	100.0	V	36.0	-4.3
4479.875000	40.95	---	68.20	27.25	100.0	V	92.0	-3.6
7700.750000	---	38.58	54.00	15.42	100.0	H	213.0	1.3

Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

During the test, the Radiates Emission from 18GHz to 40GHz was performed in all modes with all channels, 802.11n (HT20) CH40 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.



Radiates Emission from 18GHz to 26.5GHz



Radiates Emission from 26.5GHz to 40GHz

5.6. Conducted Emission

Ambient condition

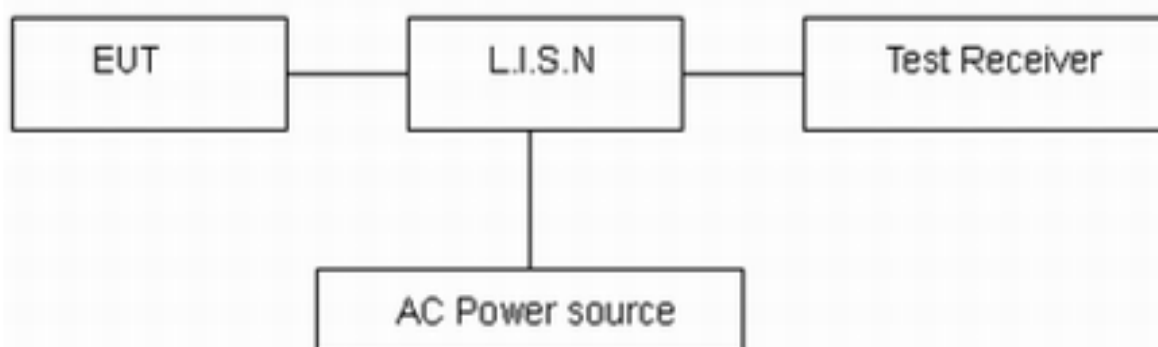
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Methods of Measurement

The EUT IS placed on a non-metallic table of 80cm height above the horizontal metal reference ground plane. During the test, the EUT was operating in its typical mode. The test method is according to ANSI C63.10-2013. Connect the AC power line of the EUT to the LISN Use EMI receiver to detect the average and Quasi-peak value. RBW is set to 9kHz, VBW is set to 30kHz The measurement result should include both L line and N line.

The test is in transmitting mode.

Test Setup



Note: AC Power source is used to change the voltage 110V/60Hz.

Limits

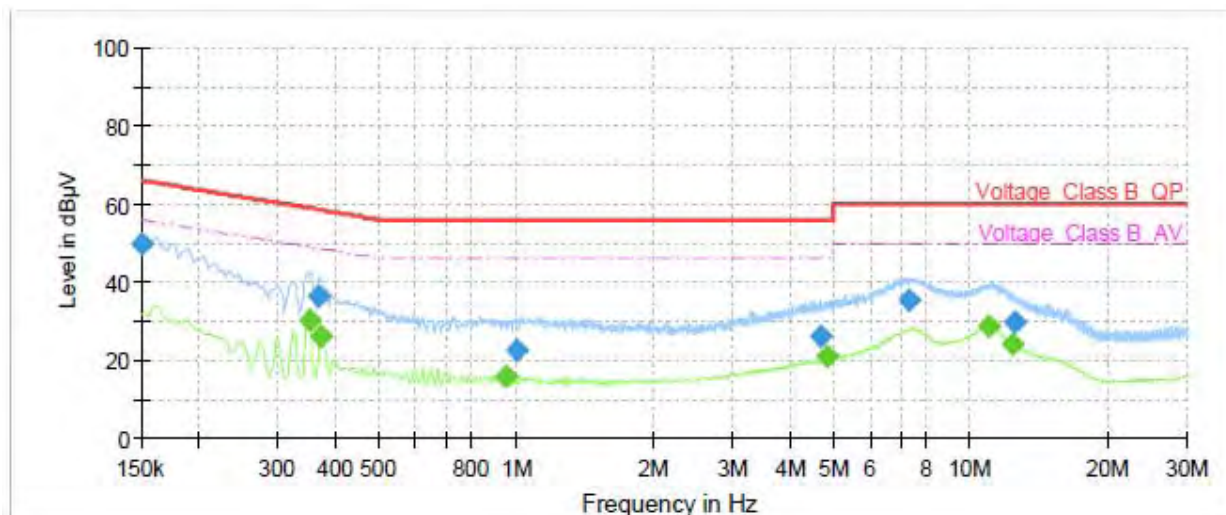
Frequency (MHz)	Conducted Limits(dBμV)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46*
0.5 - 5	56	46
5 - 30	60	50
*: Decreases with the logarithm of the frequency.		

Measurement Uncertainty

The assessed measurement uncertainty to ensure 95% confidence level for the normal distribution is with the coverage factor $k = 1.96$, $U = 2.69$ dB.

Test Results:

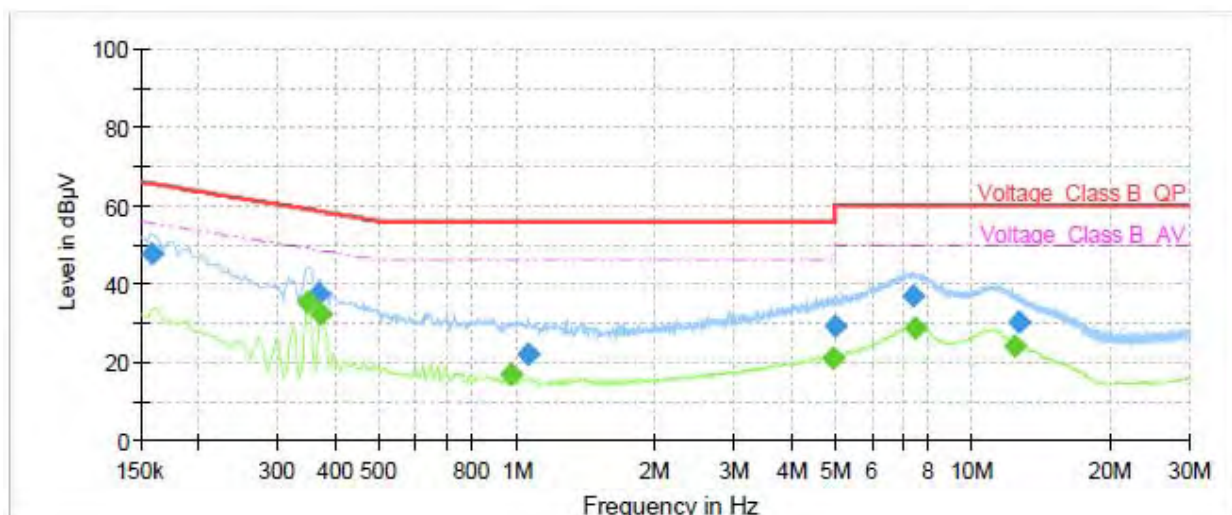
Following plots, Blue trace uses the peak detection and Green trace uses the average detection. During the test, the Conducted Emission was performed in all modes with all channels, 802.11n (HT20) CH40 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.



Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.15	49.80	---	66.00	16.20	70.0	9.000	L1	ON	21
0.35	---	30.18	48.96	18.78	70.0	9.000	L1	ON	21
0.37	36.24	---	58.54	22.30	70.0	9.000	L1	ON	21
0.37	---	26.35	48.44	22.09	70.0	9.000	L1	ON	21
0.95	---	16.08	46.00	29.92	70.0	9.000	L1	ON	20
1.00	22.76	---	56.00	33.24	70.0	9.000	L1	ON	20
4.67	26.32	---	56.00	29.68	70.0	9.000	L1	ON	19
4.85	---	20.78	46.00	25.22	70.0	9.000	L1	ON	19
7.30	35.24	---	60.00	24.76	70.0	9.000	L1	ON	20
11.03	---	28.67	50.00	21.33	70.0	9.000	L1	ON	20
12.41	---	24.10	50.00	25.90	70.0	9.000	L1	ON	20
12.45	29.73	---	60.00	30.27	70.0	9.000	L1	ON	20

Remark: Correct factor=cable loss + LISN factor

L line Conducted Emission from 150 KHz to 30 MHz



Frequency (MHz)	QuasiPeak (dBμV)	Average (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.16	47.59	---	65.52	17.93	70.0	9.000	N	ON	21
0.35	---	35.26	49.01	13.75	70.0	9.000	N	ON	21
0.37	37.38	---	58.54	21.16	70.0	9.000	N	ON	21
0.37	---	32.26	48.44	16.18	70.0	9.000	N	ON	21
0.97	---	16.91	46.00	29.09	70.0	9.000	N	ON	20
1.06	22.06	---	56.00	33.94	70.0	9.000	N	ON	20
4.93	---	20.98	46.00	25.02	70.0	9.000	N	ON	19
4.98	29.00	---	56.00	27.00	70.0	9.000	N	ON	19
7.44	37.11	---	60.00	22.89	70.0	9.000	N	ON	20
7.46	---	28.84	50.00	21.16	70.0	9.000	N	ON	20
12.41	---	24.33	50.00	25.67	70.0	9.000	N	ON	20
12.63	30.19	---	60.00	29.81	70.0	9.000	N	ON	20

Remark: Correct factor=cable loss + LISN factor

N line Conducted Emission from 150 KHz to 30 MHz



6. Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Spectrum Analyzer	R&S	FSV40	15195-01-00	2020-05-18	2021-05-17
EMI Test Receiver	R&S	ESCI	100948	2020-05-18	2021-05-17
Loop Antenna	SCHWARZBECK	FMZB1519	1519-047	2020-04-02	2023-04-01
TRILOG Broadband Antenna	SCHWARZBECK	VULB 9163	391	2019-12-16	2021-12-15
Horn Antenna	R&S	HF907	102723	2018-08-11	2021-08-10
Horn Antenna	ETS-Lindgren	3160-09	00102643	2018-06-20	2021-06-19
Standard Gain Horn	STEATITE	QSH-SL-26-40 -K-15	16779	2019-12-24	2022-12-23
Broadband Horn Antenna	SCHWARZBECK	BBHA 9120D	430	2018-07-07	2021-07-06
EMI Test Receiver	R&S	ESR	101667	2020-05-18	2021-05-17
LISN	R&S	ENV216	101171	2018-12-15	2021-12-14
Spectrum Analyzer	KEYSIGHT	N9020A	MY54420163	2020-12-14	2021-12-13
RF Cable	Agilent	SMA 15cm	0001	2020-12-11	2021-6-10
TEMPERATURE CHAMBER	WEISS	VT4002	582261194500 10	2020-12-14	2021-12-13
Power Meter	R&S	NRP2	104306	2020-05-18	2021-05-17
Power Sensor	R&S	NRP-Z21	104799	2020-05-18	2021-05-17
DC Power Supply	GWINSTEK	GPS-3030D	GEP882653	2020-05-18	2021-05-17
Software	R&S	EMC32	9.26.0	/	/

*****END OF REPORT *****



ANNEX A: The EUT Appearance

The EUT Appearance are submitted separately.



ANNEX B: Test Setup Photos

The Test Setup Photos are submitted separately.