RF TEST REPORT

Applicant	Smawave Technology Co. ,Ltd
FCC ID	2AU8HSRT321
Product	Indoor CPE
Brand	smawave
Model	SRT321
Report No.	R2111A0978-R4
Issue Date	December 7, 2021

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 15E (2020)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

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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: November 20, 2021 ~ December 6, 2021 Date of Sample Received: November 5, 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
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E-mail:	xukai@ta-shanghai.com

2. General Description of Equipment under Test

2.1. Applicant and Manufacturer Information

Applicant	Smawave Technology Co. ,Ltd
Applicant address	3/F, Building 8, 1001 North Qinzhou Road, Xuhui District, Shanghai, China
Manufacturer	Smawave Technology Co. ,Ltd
Manufacturer address	3/F, Building 8, 1001 North Qinzhou Road, Xuhui District, Shanghai, China

2.2. General information

EUT Description			
Model	SRT321		
SN	RT321X02214300006		
Hardware Version	V1.0		
Software Version	ST_V2.1.4		
Power Supply	AC adapter		
Antenna Type	Internal Antenna		
Antenna Gain	Mode	Antenna 1	Antenna 2
	5150~5250 MHz	2.52	3.14
	5725~5850 MHz	3.17	2.84
Directional Gain	NA		
Operating Frequency Range(s)	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. Conducted Power	25.31 dBm		
Testing temperature range:	-20 ° C to 50° C		
Operating temperature range:	-20 ° C to 55° C		
Operating voltage range:	9 V to 14 V		
State DC voltage:	12V		
EUT Accessory			
Adapter	Manufacturer: SHENZHEN TOPOW ELECTRONICS CO.,LTD Model: BY-SKY120200U71L		
Note: 1. The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant. 2. This device support automatically discontinue transmission, while the device is not transmitting any information, the device can automatically discontinue transmission and become standby mode for power saving. The device can detect the controlling signal of ACK message transmitting from remote device and verify whether it shall resend or discontinue transmission.			

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 (2020) 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	CDD/MIMO
802.11a	6 Mbps	6 Mbps	6 Mbps
802.11n HT20	MCS0	MCS0	MCS8
802.11n HT40	MCS0	MCS0	MCS8
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	CDD/MIMO
Average conducted output power	O	O	O
Occupied bandwidth	--	--	O
Frequency stability	--	--	O
Power Spectral Density	O	O	O
Unwanted Emissions	--	--	802.11a 802.11n HT20/40 802.11ac VHT/80
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.

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				
Does this device support TDWR Band? ☐Yes ☒No				

5. Test Case Results

5.1. Occupied Bandwidth

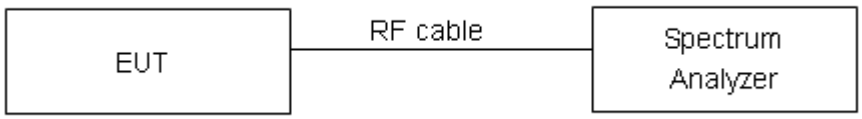
Ambient condition

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, set RBW ≈1% OCB kHz, VBW ≥ 3 × 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 ≥ 3 × 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	16.448	20.01	PASS
	5200	16.476	19.85	PASS
	5240	16.481	19.86	PASS
802.11n HT20	5180	17.527	19.98	PASS
	5200	17.564	20.25	PASS
	5240	17.570	20.40	PASS
802.11n HT40	5190	35.945	41.22	PASS
	5230	36.100	40.70	PASS
802.11ac VHT20	5180	17.569	20.00	PASS
	5200	17.573	20.04	PASS
	5240	17.575	20.03	PASS
802.11ac VHT40	5190	36.119	40.88	PASS
	5230	35.989	40.20	PASS
802.11ac VHT80	5210	75.885	81.30	PASS

U-NII-3

Mode	Carrier frequency (MHz)	99% bandwidth (MHz)	Minimum 6 dB bandwidth (MHz)	Limit (kHz)	Conclusion
802.11a	5745	18.269	14.70	500	PASS
	5785	18.134	15.07	500	PASS
	5825	17.849	13.80	500	PASS
802.11n HT20	5745	17.850	14.95	500	PASS
	5785	17.782	15.00	500	PASS
	5825	17.800	15.11	500	PASS
802.11n HT40	5755	36.961	35.06	500	PASS
	5795	36.909	33.82	500	PASS
802.11ac VHT20	5745	17.956	14.97	500	PASS
	5785	17.942	15.05	500	PASS
	5825	17.984	15.03	500	PASS
802.11ac VHT40	5755	36.805	35.06	500	PASS
	5795	36.968	33.85	500	PASS
802.11ac VHT80	5775	76.328	75.10	500	PASS

MIMO Antenna 1

U-NII-1, 802.11a

Carrier frequency (MHz): 5180

U-NII-1, 802.11n HT20

Carrier frequency (MHz): 5180

U-NII-1, 802.11a

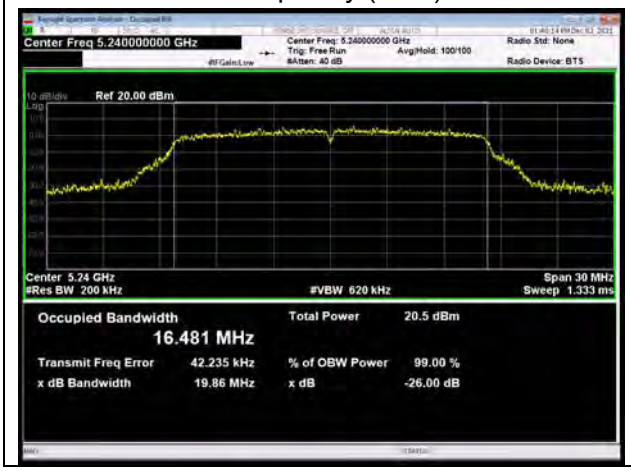
Carrier frequency (MHz): 5200

U-NII-1, 802.11n HT20

Carrier frequency (MHz): 5200

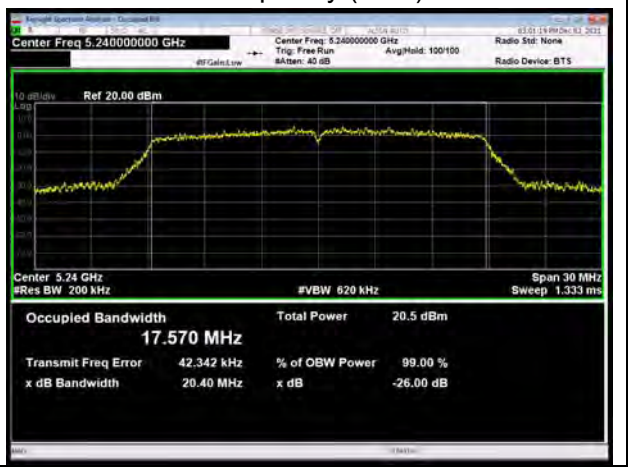
U-NII-1, 802.11a

Carrier frequency (MHz):5240



U-NII-1, 802.11n HT20

Carrier frequency (MHz):5240



U-NII-1, 802.11n HT40

Carrier frequency (MHz): 5190

U-NII-1, 802.11ac VHT20

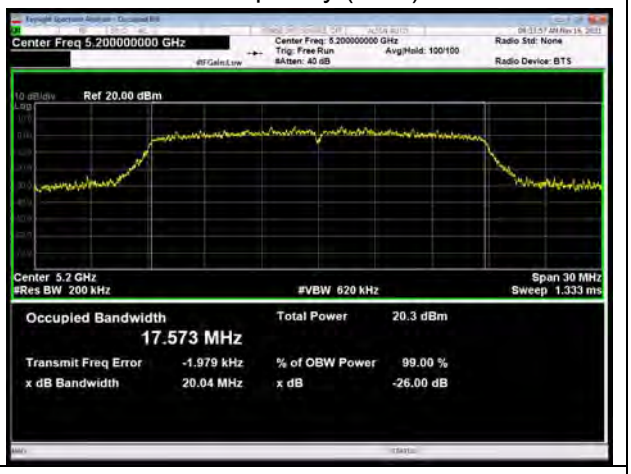
Carrier frequency (MHz): 5180

U-NII-1, 802.11n HT40

Carrier frequency (MHz): 5230

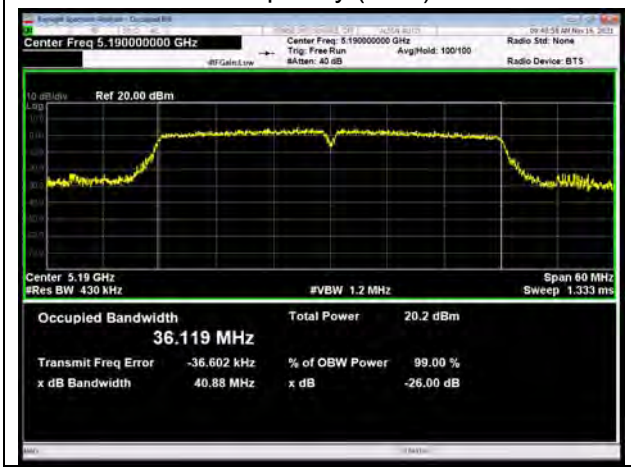
U-NII-1, 802.11ac VHT20

Carrier frequency (MHz): 5200



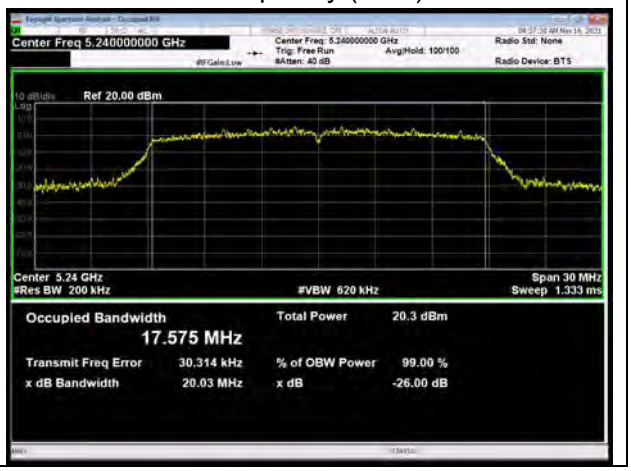
U-NII-1, 802.11ac VHT40

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
	

99% 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

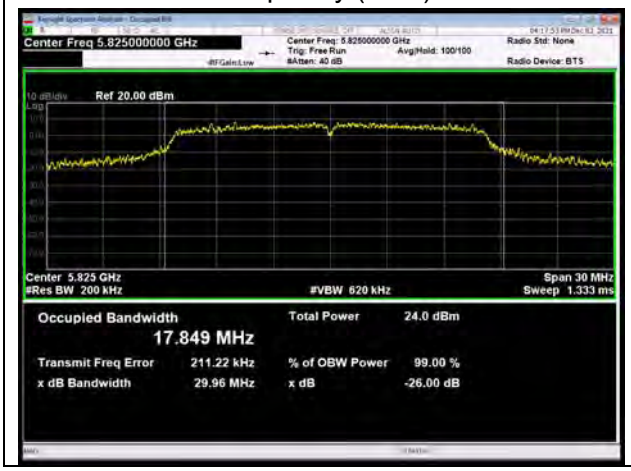
Carrier frequency (MHz): 5785

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
	

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

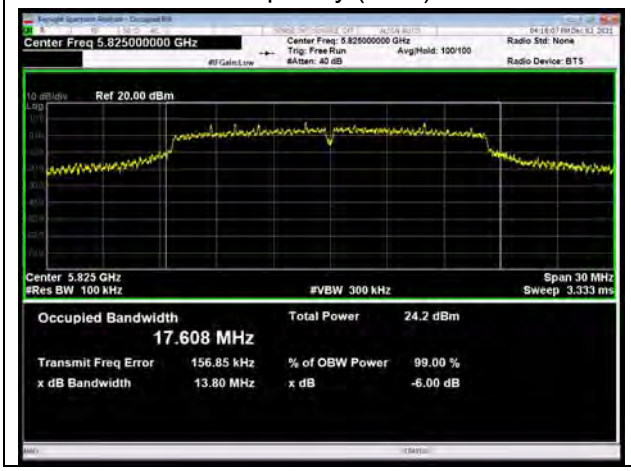
Carrier frequency (MHz): 5785

U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5785

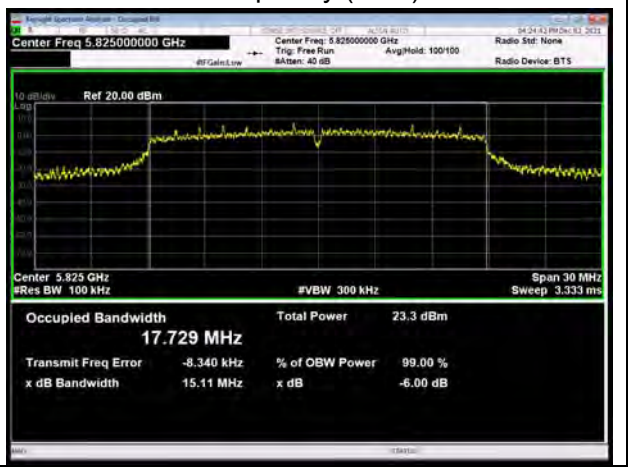
U-NII-3, 802.11a

Carrier frequency (MHz): 5825



U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5825



U-NII-3, 802.11n HT40

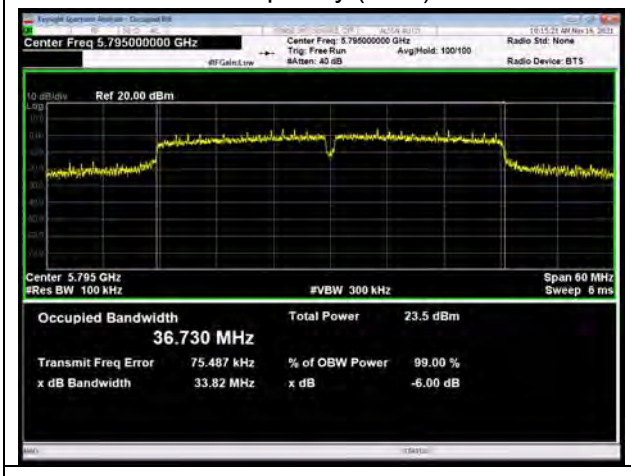
Carrier frequency (MHz): 5755

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

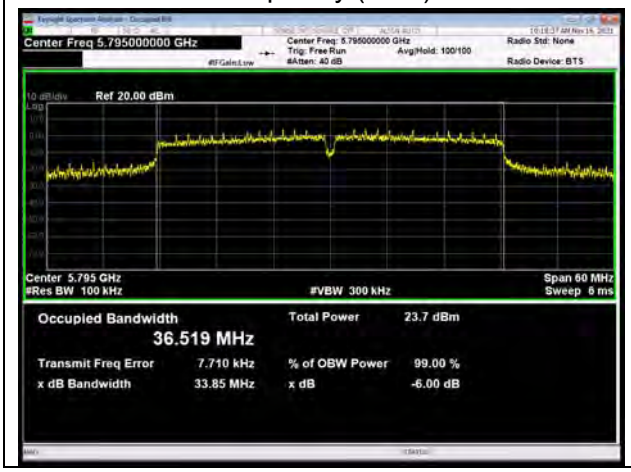
Carrier frequency (MHz): 5785

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

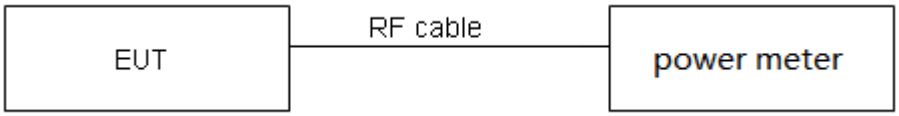
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

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 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 dB.

Test Results

Mode	T_{on} (ms)	$T_{(on+off)}$ (ms)	Duty cycle	Duty cycle correction Factor(dB)
802.11a	1.39	1.45	0.96	0.18
802.11n HT20	1.30	1.37	0.95	0.21
802.11n HT40	0.65	0.71	0.92	0.38
802.11ac VHT20	0.67	0.74	0.91	0.43
802.11ac VHT40	0.35	0.41	0.85	0.69
802.11ac VHT80	0.19	0.25	0.76	1.19
Note: when Duty cycle≥0.98, Duty cycle correction Factor not required.				

Power Index								
Channel	802.11a	802.11n HT20	802.11ac VHT20	Channel	802.11n HT40	802.11ac VHT40	Channel	802.11ac VHT80
CH36	16	17	18	CH38	14	18	CH42	13
CH40	16	17	18	CH46	14	18	/	/
CH48	16	17	18	/	/	/	/	/
CH149	19	19	20	CH151	20	20	CH155	20
CH157	19	19	20	CH159	20	20	/	/
CH165	19	19	20	/	/	/	/	/

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

SISO Antenna 1
U-NII-1

Test Mode	Channel/ Frequency (MHz)	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11a	36/5180	18.58	18.76	30	PASS
	40/5200	18.44	18.62	30	PASS
	48/5240	18.59	18.77	30	PASS
802.11n HT20	36/5180	18.39	18.60	30	PASS
	40/5200	18.29	18.50	30	PASS
	48/5240	18.52	18.73	30	PASS
802.11n HT40	38/5190	15.31	15.69	30	PASS
	46/5230	15.58	15.96	30	PASS
802.11ac VHT20	36/5180	14.86	15.29	30	PASS
	40/5200	14.11	14.54	30	PASS
	48/5240	14.53	14.96	30	PASS
802.11ac VHT40	38/5190	14.22	14.91	30	PASS
	46/5230	14.02	14.71	30	PASS
802.11ac VHT80	42/5210	13.73	14.92	30	PASS

U-NII-3

Test Mode	Channel/ Frequency (MHz)	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11a	149/5745	21.88	22.06	30	PASS
	157/5785	22.14	22.32	30	PASS
	165/5825	21.95	22.13	30	PASS
802.11n HT20	149/5745	21.14	21.35	30	PASS
	157/5785	21.26	21.47	30	PASS
	165/5825	21.15	21.36	30	PASS
802.11n HT40	151/5755	18.28	18.67	30	PASS
	159/5795	17.34	17.73	30	PASS
802.11ac VHT20	149/5745	17.97	18.40	30	PASS
	157/5785	17.58	18.01	30	PASS
	165/5825	17.91	18.34	30	PASS
802.11ac VHT40	151/5755	17.94	18.63	30	PASS
	159/5795	18.00	18.69	30	PASS
802.11ac VHT80	155/5775	17.21	18.40	30	PASS

SISO Antenna 2
U-NII-1

Test Mode	Channel/ Frequency (MHz)	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11a	36/5180	16.57	16.75	30	PASS
	40/5200	16.51	16.69	30	PASS
	48/5240	18.31	18.49	30	PASS
802.11n HT20	36/5180	16.35	16.56	30	PASS
	40/5200	16.36	16.57	30	PASS
	48/5240	18.06	18.27	30	PASS
802.11n HT40	38/5190	13.18	13.56	30	PASS
	46/5230	15.02	15.40	30	PASS
802.11ac VHT20	36/5180	15.36	15.79	30	PASS
	40/5200	15.14	15.57	30	PASS
	48/5240	16.44	16.87	30	PASS
802.11ac VHT40	38/5190	15.11	15.80	30	PASS
	46/5230	16.23	16.91	30	PASS
802.11ac VHT80	42/5210	11.53	12.72	30	PASS

U-NII-3

Test Mode	Channel/ Frequency (MHz)	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11a	149/5745	20.09	20.27	30	PASS
	157/5785	20.17	20.35	30	PASS
	165/5825	19.35	19.53	30	PASS
802.11n HT20	149/5745	19.17	19.38	30	PASS
	157/5785	19.20	19.41	30	PASS
	165/5825	18.40	18.61	30	PASS
802.11n HT40	151/5755	18.94	19.32	30	PASS
	159/5795	18.65	19.03	30	PASS
802.11ac VHT20	149/5745	18.71	19.15	30	PASS
	157/5785	18.51	18.94	30	PASS
	165/5825	18.29	18.72	30	PASS
802.11ac VHT40	151/5755	18.71	19.40	30	PASS
	159/5795	18.56	19.25	30	PASS
802.11ac VHT80	155/5775	18.01	19.20	30	PASS

MIMO

U-NII-1

Test Mode	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)			
U-NII-1 802.11a	36/5180	18.64	18.82	15.84	16.02	20.66	30.00	PASS
	44/5220	18.42	18.60	16.00	16.18	20.57	30.00	PASS
	48/5240	18.71	18.89	17.67	17.85	21.41	30.00	PASS
802.11n HT20	36/5180	18.50	18.71	15.59	15.80	20.50	30.00	PASS
	44/5220	18.37	18.58	15.93	16.14	20.54	30.00	PASS
	48/5240	18.68	18.89	17.62	17.83	21.40	30.00	PASS
802.11n HT40	38/5190	15.39	15.77	12.70	13.08	17.64	30.00	PASS
	46/5230	15.59	15.97	14.56	14.94	18.50	30.00	PASS
802.11ac VHT20	36/5180	18.21	18.64	16.11	16.55	20.73	30.00	PASS
	44/5220	18.18	18.61	16.34	16.77	20.80	30.00	PASS
	48/5240	18.24	18.67	18.05	18.49	21.59	30.00	PASS
802.11ac VHT40	38/5190	17.94	18.63	15.93	16.62	20.75	30.00	PASS
	46/5230	18.13	18.82	18.09	18.77	21.81	30.00	PASS
802.11ac VHT80	42/5210	13.63	14.82	10.97	12.16	16.70	30.00	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} + 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 $N_{ANT} \geq 5$.

3.If antenna gains are not equal, the user may use either of the following methods to calculate directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with G_{ANT} set equal to the gain of the antenna having the highest gain.

So directional gain = G_{ANT} + Array Gain =3.14+0=3.14dBi<6dBi. So the power limt 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	22.26	22.44	21.81	21.99	25.23	30.00	PASS
	157/5785	22.52	22.70	21.66	21.84	25.31	30.00	PASS
	165/5825	22.23	22.41	20.99	21.17	24.85	30.00	PASS
802.11n HT20	149/5745	21.36	21.57	20.87	21.08	24.34	30.00	PASS
	157/5785	21.48	21.69	20.60	20.81	24.28	30.00	PASS
	165/5825	21.32	21.53	19.98	20.19	23.92	30.00	PASS
802.11n HT40	151/5755	21.42	21.80	21.62	22.00	24.91	30.00	PASS
	159/5795	21.33	21.71	21.39	21.77	24.75	30.00	PASS
802.11ac VHT20	149/5745	20.89	21.32	21.34	21.78	24.56	30.00	PASS
	157/5785	20.97	21.40	21.12	21.55	24.48	30.00	PASS
	165/5825	20.82	21.25	20.66	21.10	24.18	30.00	PASS
802.11ac VHT40	151/5755	20.90	21.59	21.26	21.94	24.78	30.00	PASS
	159/5795	20.91	21.60	21.16	21.84	24.73	30.00	PASS
802.11ac VHT80	155/5775	20.22	21.41	20.50	21.69	24.56	30.00	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} + 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 $N_{ANT} \geq 5$.

3.If antenna gains are not equal, the user may use either of the following methods to calculate directional gain, provided that each transmit antenna is driven by only one spatial stream: Directional gain may be calculated by using the formulas applicable to equal gain antennas with GANT set equal to the gain of the antenna having the highest gain.

So directional gain = GANT + Array Gain =3.17+0=3.17dBi<6dBi. So the power limt is 30dBm.

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 that 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= 936Hz

Test Results

Voltage (V)	Temperature (°C)	U-NII-1 Test Results			
		5200MHz			
		1min	2min	5min	10min
12	-20	5199.998979	5199.992721	5199.987352	5199.984361
12	-10	5199.991621	5199.987116	5199.986344	5199.980979
12	0	5199.982559	5199.980213	5199.981191	5199.973596
12	10	5199.978721	5199.979231	5199.978511	5199.966628
12	20	5199.973186	5199.972448	5199.970583	5199.958076
12	30	5199.971135	5199.963060	5199.967986	5199.951794
12	40	5199.970684	5199.959280	5199.961627	5199.944621
12	50	5199.967450	5199.954830	5199.961415	5199.936217
9	20	5199.960215	5199.946455	5199.958934	5199.929003
14	20	5199.952089	5199.946415	5199.958481	5199.928048
Max. ΔMHz		-0.047911	-0.053585	-0.041519	-0.071952
PPM		-9.213580	-10.304758	-7.984512	-13.836886

Voltage (V)	Temperature (°C)	U-NII-3 Test Results			
		5785MHz			
		1min	2min	5min	10min
12	-20	5785.009979	5785.000053	5784.991628	5784.985193
12	-10	5785.006077	5784.992021	5784.990167	5784.980119
12	0	5784.997028	5784.985502	5784.986763	5784.975754
12	10	5784.988731	5784.978754	5784.986090	5784.972445
12	20	5784.979610	5784.975758	5784.984701	5784.962646
12	30	5784.971621	5784.967683	5784.975692	5784.955388
12	40	5784.966832	5784.965800	5784.972379	5784.954283
12	50	5784.957413	5784.964765	5784.962879	5784.946105
9	20	5784.952189	5784.964375	5784.959138	5784.942391
14	20	5784.950614	5784.958601	5784.952005	5784.934695
Max. ΔMHz		-0.049386	-0.041399	-0.047995	-0.065305
PPM		-8.536923	-7.156316	-8.296435	-11.288651

5.4. Power Spectral Density

Ambient condition

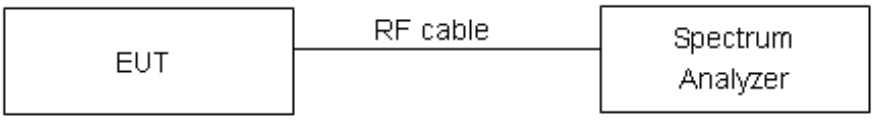
Temperature	Relative humidity	Pressure
23°C ~25°C	45%~50%	101.5kPa

Method of Measurement

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

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 the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500kHz band. If transmittingantennas 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/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= 0.75dB.

Test Results:

SISO Antenna 1

U-NII-1

Mode	Channel Number	Read Value (dBm /MHz)	Power Spectral Density (dBm /MHz)	Limit (dBm /MHz)	Conclusion
802.11a	36	9.09	9.27	17	PASS
	40	9.02	9.20	17	PASS
	48	9.01	9.19	17	PASS
802.11n HT20	36	8.55	8.76	17	PASS
	40	8.84	9.05	17	PASS
	48	8.92	9.13	17	PASS
802.11n HT40	38	2.33	2.71	17	PASS
	46	2.76	3.14	17	PASS
802.11ac VHT20	36	5.12	5.55	17	PASS
	40	3.55	3.98	17	PASS
	48	4.82	5.25	17	PASS
802.11ac VHT40	38	1.99	2.68	17	PASS
	46	1.12	1.81	17	PASS
802.11ac VHT80	42	-2.10	-0.91	17	PASS
Note: Power Spectral Density =Read Value+Duty cycle correction factor					

U-NII-3

Mode	Channel Number	Read Value (dBm/470kHz)	Power Spectral Density (dBm/500kHz)	Limit (dBm/500kHz)	Conclusion
802.11a	149	8.97	9.42	30	PASS
	157	9.67	10.12	30	PASS
	165	9.15	9.60	30	PASS
802.11n HT20	149	7.91	8.39	30	PASS
	157	8.30	8.78	30	PASS
	165	8.06	8.54	30	PASS
802.11n HT40	151	2.34	2.99	30	PASS
	159	1.46	2.11	30	PASS
802.11ac VHT20	149	4.97	5.67	30	PASS
	157	4.40	5.10	30	PASS
	165	4.89	5.59	30	PASS
802.11ac VHT40	151	2.26	3.22	30	PASS
	159	2.05	3.01	30	PASS
802.11ac VHT80	155	-2.05	-1.09	30	PASS
Note:PSD=Read Value+Duty cycle correction factor +10*LOG(500/470)					

SISO Antenna 2

U-NII-1

Mode	Channel Number	Read Value (dBm /MHz)	Power Spectral Density (dBm /MHz)	Limit (dBm /MHz)	Conclusion
802.11a	36	6.93	7.11	17	PASS
	40	6.84	7.02	17	PASS
	48	8.34	8.52	17	PASS
802.11n HT20	36	6.37	6.58	17	PASS
	40	6.54	6.75	17	PASS
	48	8.28	8.49	17	PASS
802.11n HT40	38	0.54	0.92	17	PASS
	46	2.04	2.42	17	PASS
802.11ac VHT20	36	5.41	5.84	17	PASS
	40	5.43	5.86	17	PASS
	48	6.84	7.27	17	PASS
802.11ac VHT40	38	2.44	3.13	17	PASS
	46	3.42	4.11	17	PASS
802.11ac VHT80	42	-4.16	-2.97	17	PASS
Note: Power Spectral Density =Read Value+Duty cycle correction factor					

U-NII-3

Mode	Channel Number	Read Value (dBm/470kHz)	Power Spectral Density (dBm/500kHz)	Limit (dBm/500kHz)	Conclusion
802.11a	149	7.15	7.60	30	PASS
	157	7.25	7.70	30	PASS
	165	6.68	7.13	30	PASS
802.11n HT20	149	6.31	6.79	30	PASS
	157	5.95	6.43	30	PASS
	165	5.37	5.85	30	PASS
802.11n HT40	151	3.15	3.80	30	PASS
	159	2.67	3.32	30	PASS
802.11ac VHT20	149	5.79	6.49	30	PASS
	157	5.55	6.25	30	PASS
	165	5.32	6.02	30	PASS
802.11ac VHT40	151	3.07	4.03	30	PASS
	159	2.99	3.95	30	PASS
802.11ac VHT80	155	-0.61	0.85	30	PASS
Note:PSD=Read Value+Duty cycle correction factor +10*LOG(500/470)					

MIMO

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	9.07	9.25	6.41	6.59	11.13	16.85	PASS
	40/5200	8.68	8.86	6.35	6.53	10.86	16.85	PASS
	48/5240	9.31	9.49	7.97	8.15	11.89	16.85	PASS
802.11n HT20	36/5180	8.65	8.86	5.64	5.85	10.62	16.85	PASS
	40/5200	8.53	8.74	6.11	6.32	10.70	16.85	PASS
	48/5240	8.73	8.94	7.64	7.85	11.44	16.85	PASS
802.11n HT40	38/5190	2.89	3.27	0.03	0.41	5.09	16.85	PASS
	46/5230	2.84	3.22	2.09	2.47	5.87	16.85	PASS
802.11ac VHT20	36/5180	8.11	8.54	6.44	6.87	10.80	16.85	PASS
	40/5200	8.49	8.92	6.68	7.11	11.12	16.85	PASS
	48/5240	8.40	8.83	8.23	8.66	11.76	16.85	PASS
802.11ac VHT40	38/5190	5.15	5.84	3.06	3.75	7.93	16.85	PASS
	46/5230	3.80	4.49	4.11	4.80	7.66	16.85	PASS
802.11ac VHT80	42/5210	-2.15	-0.96	-4.68	-3.49	0.97	16.85	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=10log(Nant/Nss)dB,so directional gain=GANT+Array Gain=3.14+10log(2/1)=6.15>6 dBi. So the PSD limt is 17-(directional gain-6 dBi) =17-(6.15-6)=16.85dBm.

U-NII-3

Mode	Channel/ Frequency (MHz)	Power Spectral Density				Total Power (dBm/ 500kHz)	Limit (dBm/ 500kHz)	Conclusion
		Antenna 1		Antenna 2				
		Read Value (dBm/ 500kHz)	PSD (dBm/ 500kHz)	Read Value (dBm/ 500kHz)	PSD (dBm/ 500kHz)			
U-NII-3 802.11a	149/5745	9.27	9.72	8.94	9.39	12.57	29.82	PASS
	157/5785	9.72	10.17	8.76	9.21	12.73	29.82	PASS
	165/5825	9.42	9.87	8.03	8.48	12.24	29.82	PASS
802.11n HT20	149/5745	7.52	8.00	7.70	8.18	11.10	29.82	PASS
	157/5785	8.52	9.00	7.43	7.91	11.50	29.82	PASS
	165/5825	8.34	8.82	6.70	7.18	11.09	29.82	PASS
802.11n HT40	151/5755	5.34	5.99	5.97	6.62	9.33	29.82	PASS
	159/5795	5.11	5.76	5.60	6.25	9.03	29.82	PASS
802.11ac VHT20	149/5745	7.86	8.56	8.49	9.19	11.90	29.82	PASS
	157/5785	7.92	8.62	8.10	8.80	11.72	29.82	PASS
	165/5825	7.94	8.64	7.62	8.32	11.49	29.82	PASS
802.11ac VHT40	151/5755	4.97	5.93	5.21	6.17	9.06	29.82	PASS
	159/5795	5.02	5.98	4.95	5.91	8.95	29.82	PASS
802.11ac VHT80	155/5775	0.92	2.38	1.86	3.32	5.89	29.82	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=10log(Nant/Nss)dB,so directional gain=GANT+Array Gain=3.17+10log(2/1)=6.18>6 dBi. So the PSD limt is 30-(directional gain-6 dBi) =30-(6.18-6) =29.82dBm.

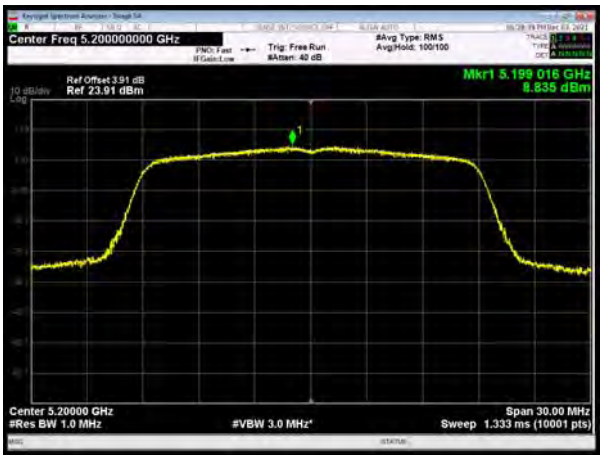
SISO Antenna 1

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

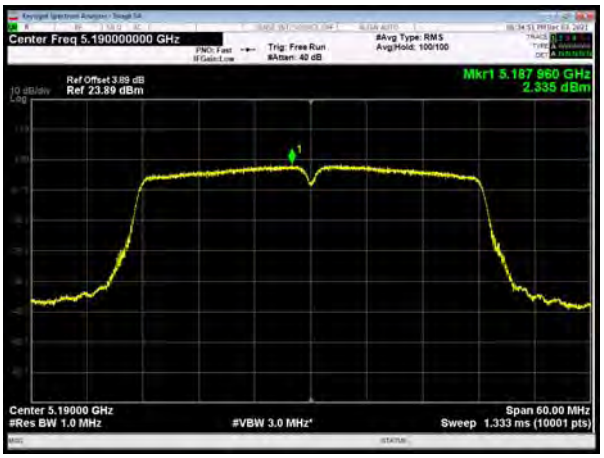
U-NII-1, 802.11n HT20, Channel No.: 40



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

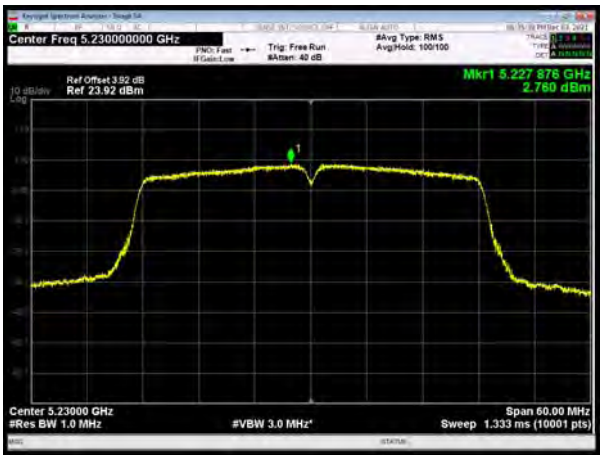
U-NII-1, 802.11n HT20, Channel No.: 48

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

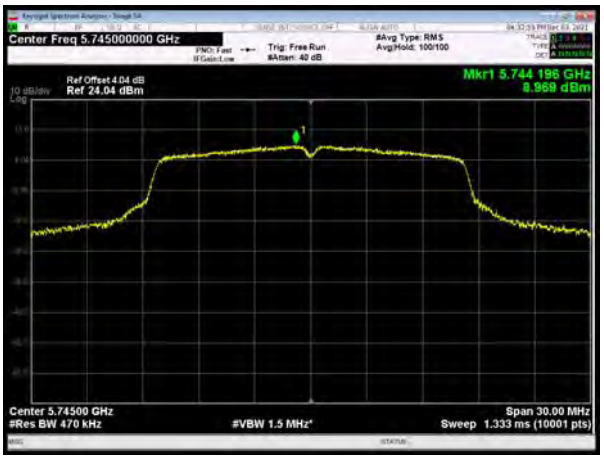
U-NII-1, 802.11ac VHT40, Channel No.: 38

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

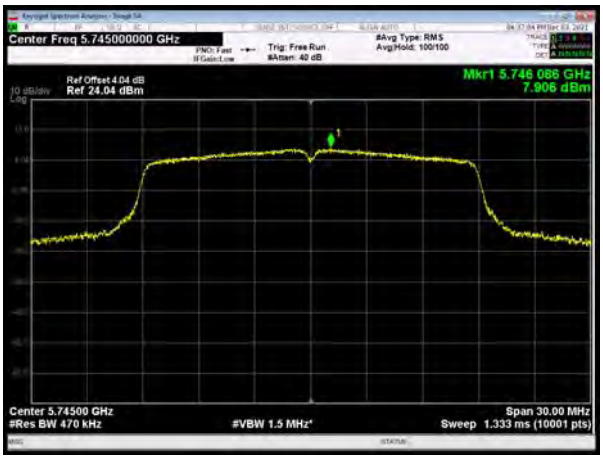
U-NII-1, 802.11ac VHT40, Channel No.: 46

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

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

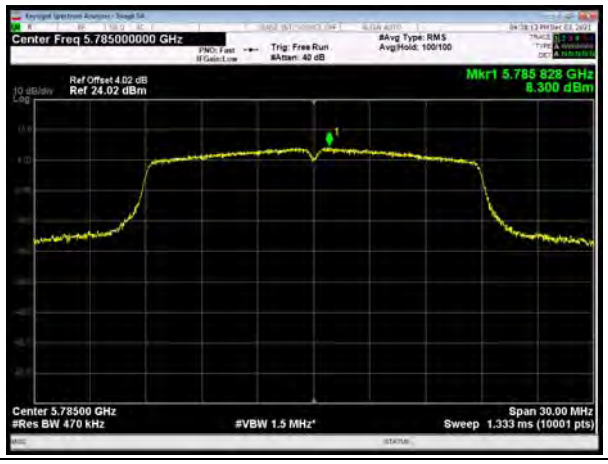


U-NII-3, 802.11n HT20, Channel No.: 149

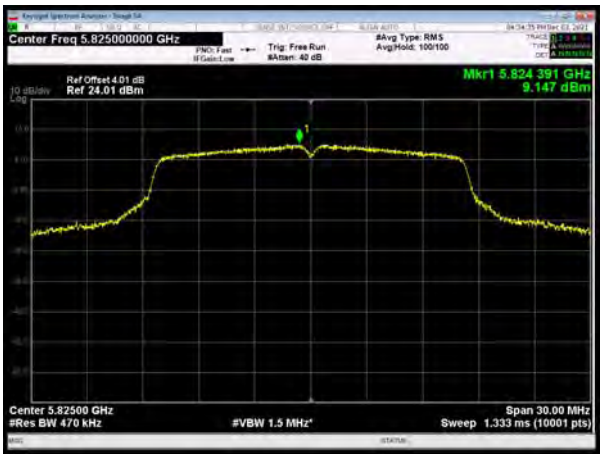


U-NII-3, 802.11a, Channel No.: 157

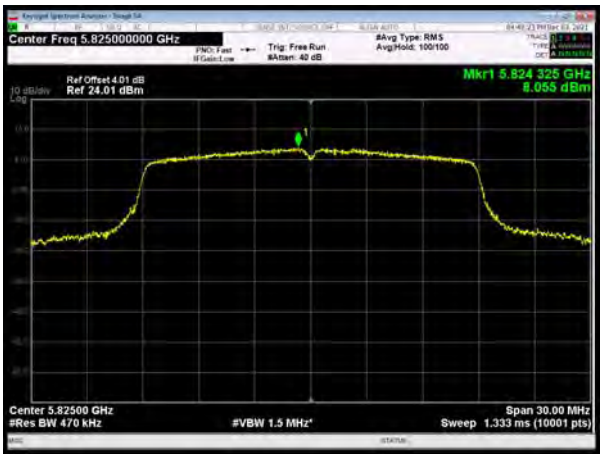
U-NII-3, 802.11n HT20, Channel No.: 157



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



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

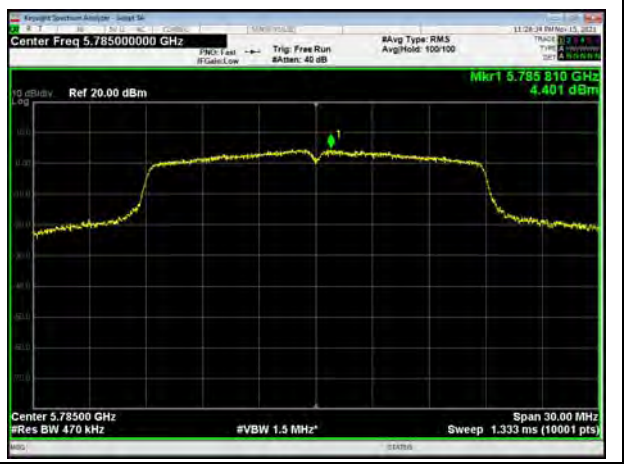


U-NII-3, 802.11n HT40, Channel No.: 151

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

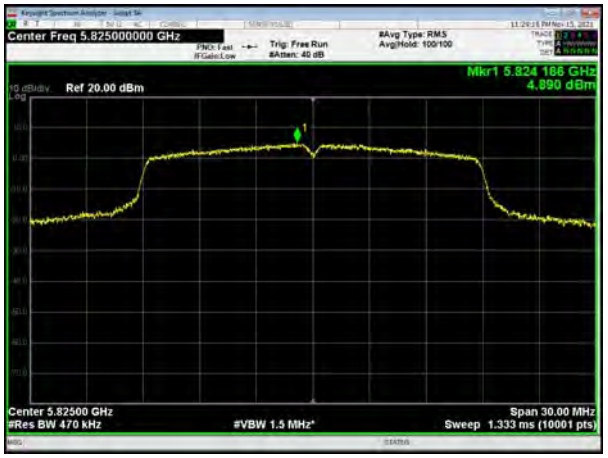
U-NII-3, 802.11n HT40, Channel No.: 159

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

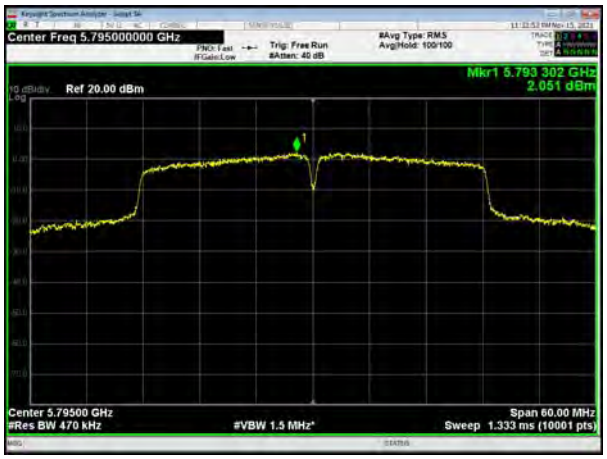


U-NII-3, 802.11ac VHT40, Channel No.: 151

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

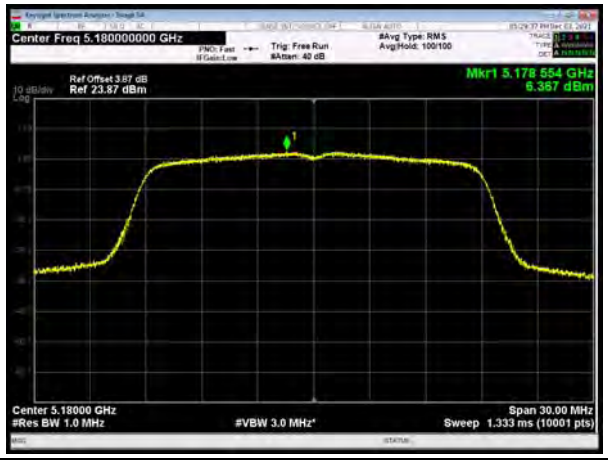
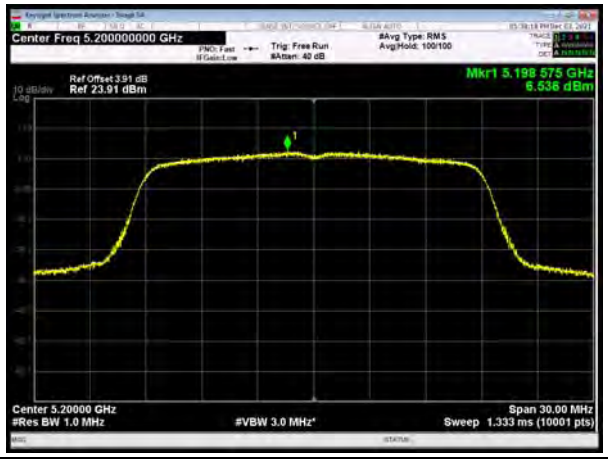


U-NII-3, 802.11ac VHT40, Channel No.: 159

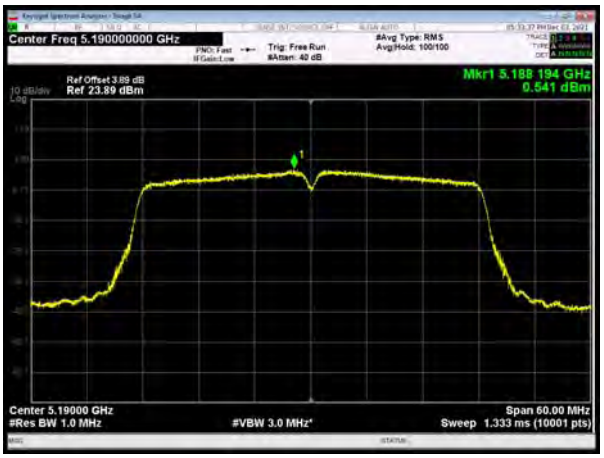


U-NII-3, 802.11ac VHT80, Channel No.: 155

SISO Antenna 2

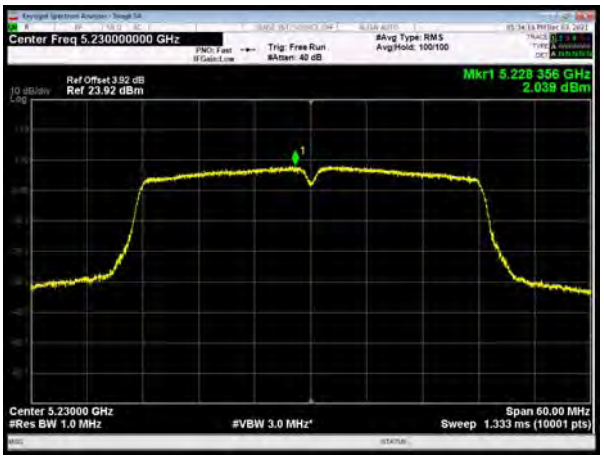
U-NII-1, 802.11a, Channel No.: 36	U-NII-1, 802.11n HT20, Channel No.: 36
	
U-NII-1, 802.11a, Channel No.: 40	U-NII-1, 802.11n HT20, Channel No.: 40
	
U-NII-1, 802.11a, Channel No.: 48	U-NII-1, 802.11n HT20, Channel No.: 48
	

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



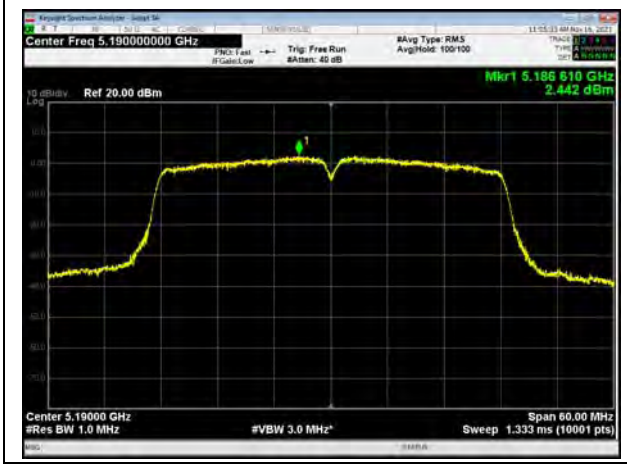
U-NII-1, 802.11ac VHT20, Channel No.: 36

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

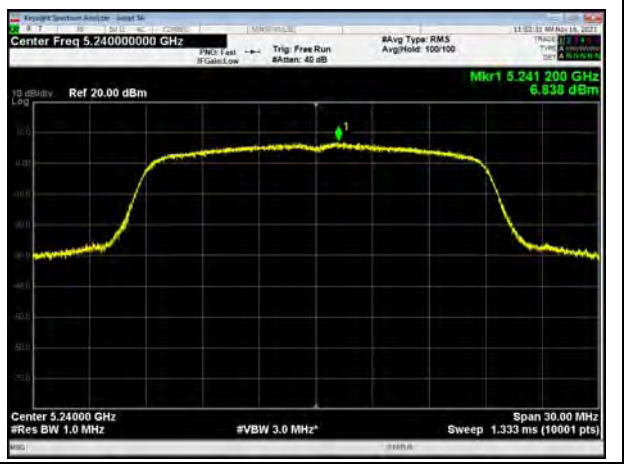


U-NII-1, 802.11ac VHT20, Channel No.: 40

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



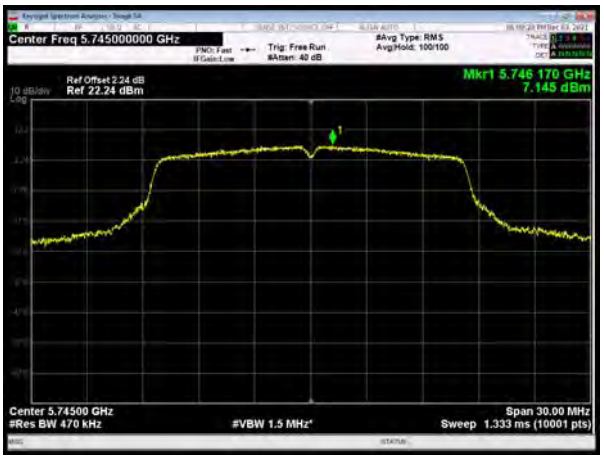
U-NII-1, 802.11ac VHT20, Channel No.: 48



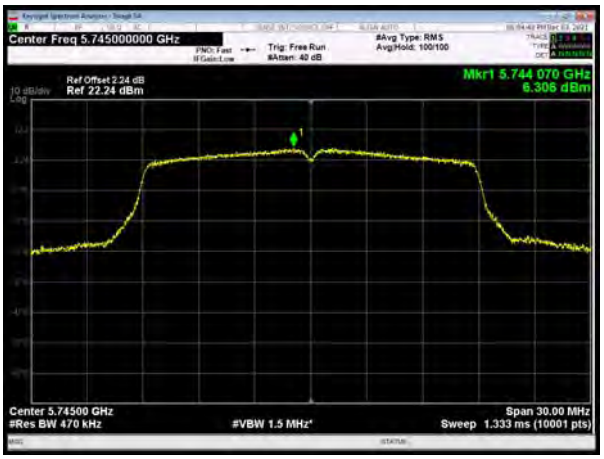
U-NII-1, 802.11ac VHT40, Channel No.: 46

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

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



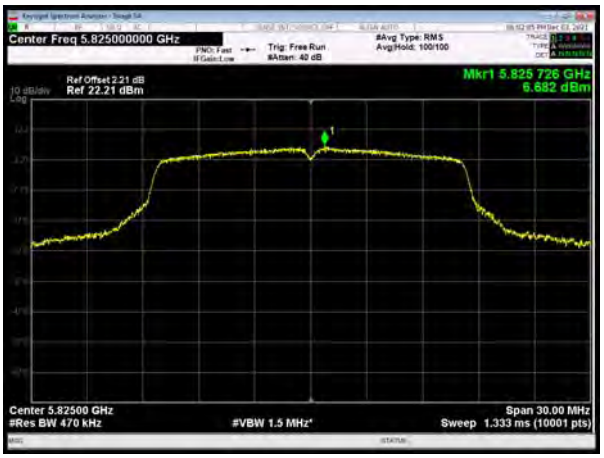
U-NII-3, 802.11n HT20, Channel No.: 149



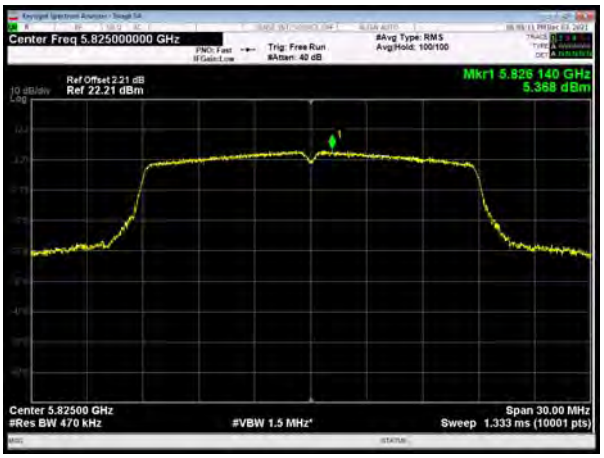
U-NII-3, 802.11a, Channel No.: 157

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

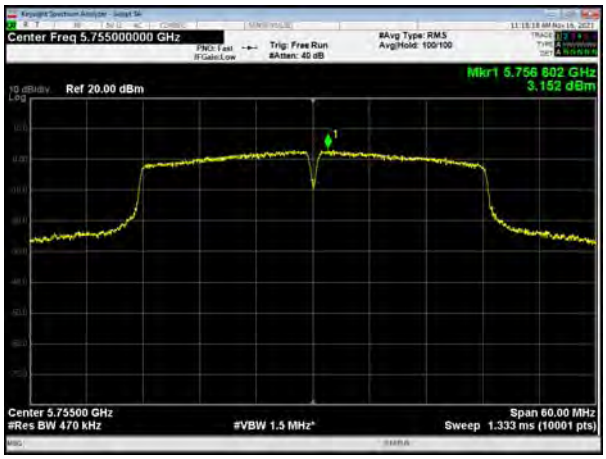
U-NII-3, 802.11a, Channel No.: 165



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

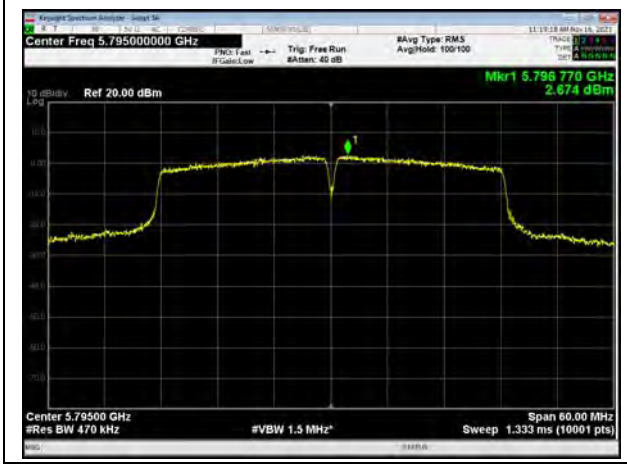


U-NII-3, 802.11n HT40, Channel No.: 151

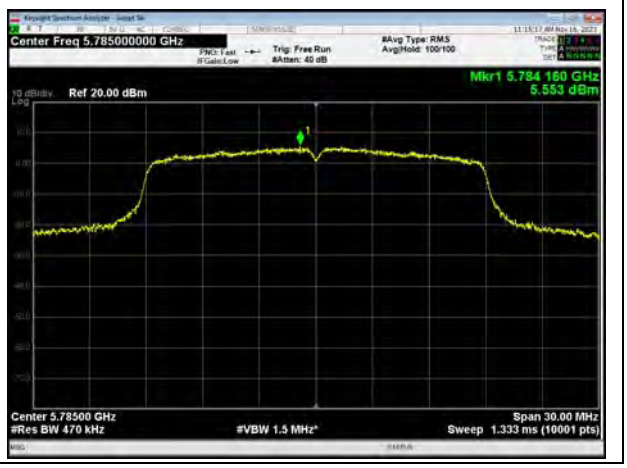


U-NII-3, 802.11ac VHT20, Channel No.: 149

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

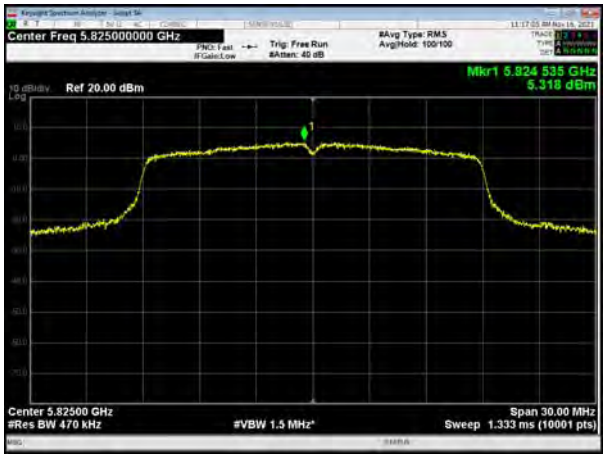


U-NII-3, 802.11ac VHT20, Channel No.: 157



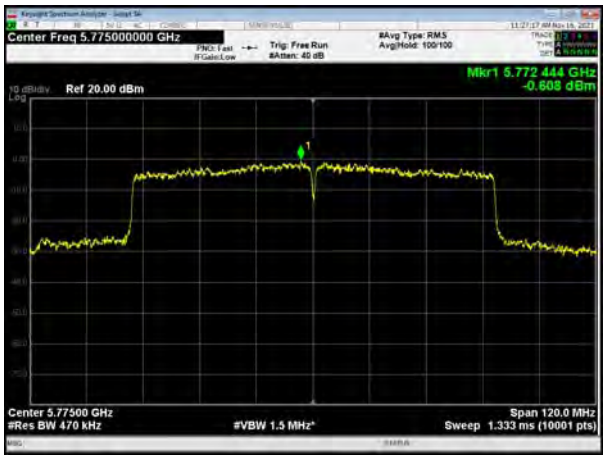
U-NII-3, 802.11ac VHT40, Channel No.: 151

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



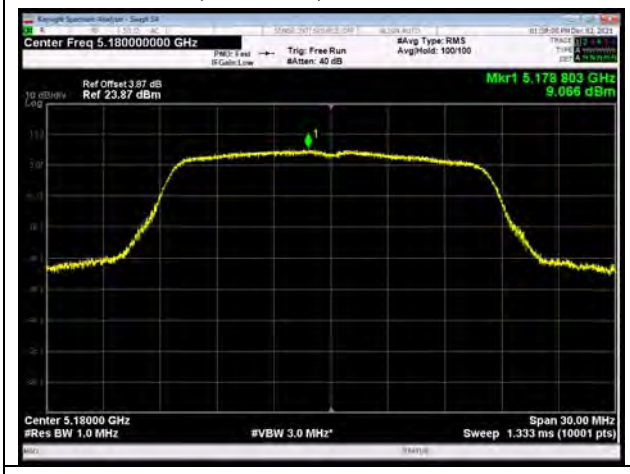
U-NII-3, 802.11ac VHT40, Channel No.: 159

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



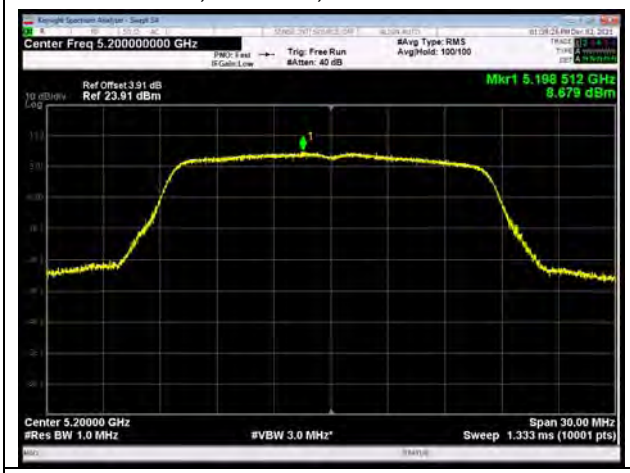
MIMO Antenna 1

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



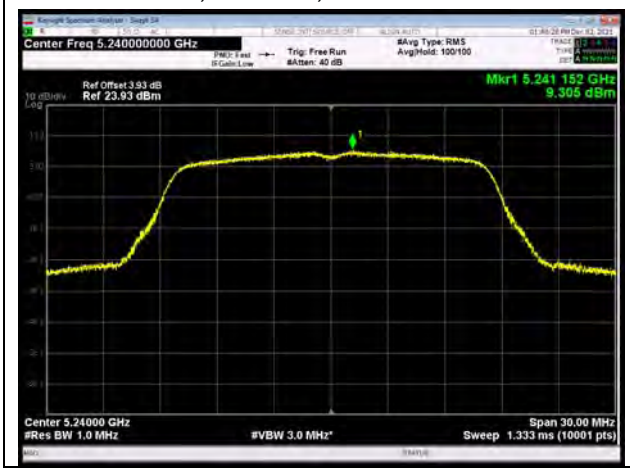
U-NII-1, 802.11n HT20, Channel No.: 36

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

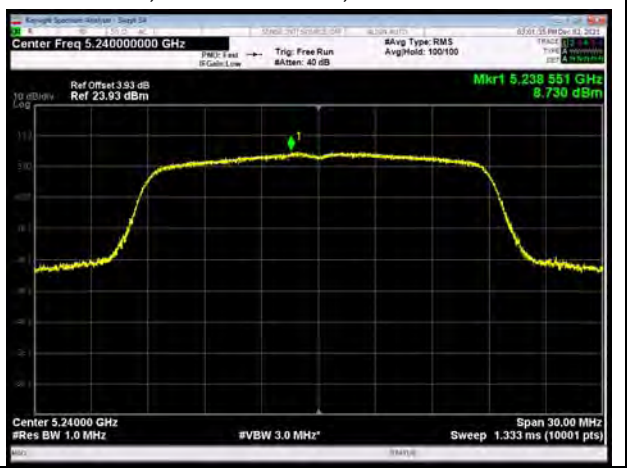


U-NII-1, 802.11n HT20, Channel No.: 40

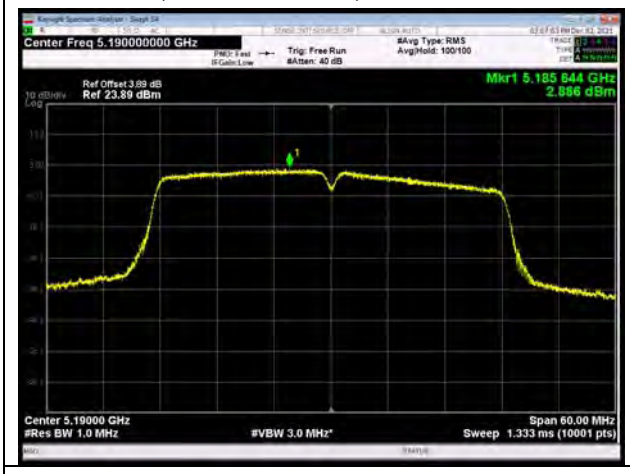
U-NII-1, 802.11a, Channel No.: 48



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

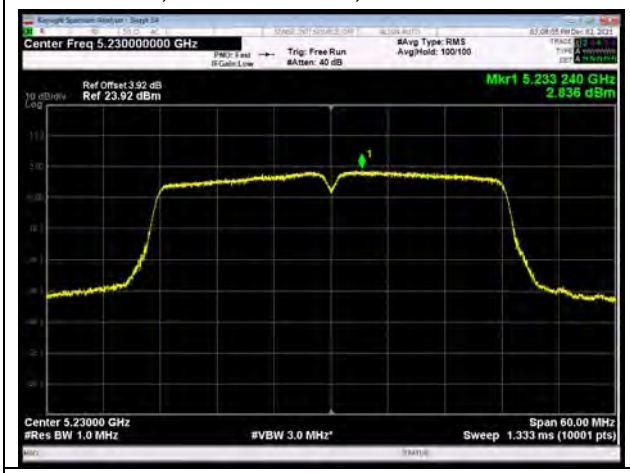


U-NII-1, 802.11n HT40, Channel No.: 38



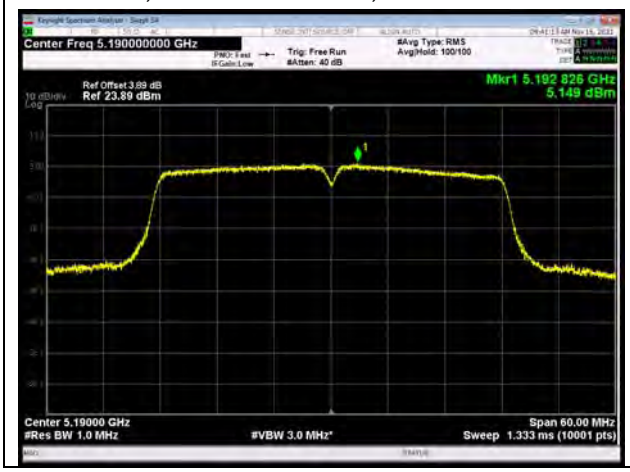
U-NII-1, 802.11ac VHT20, Channel No.: 36

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

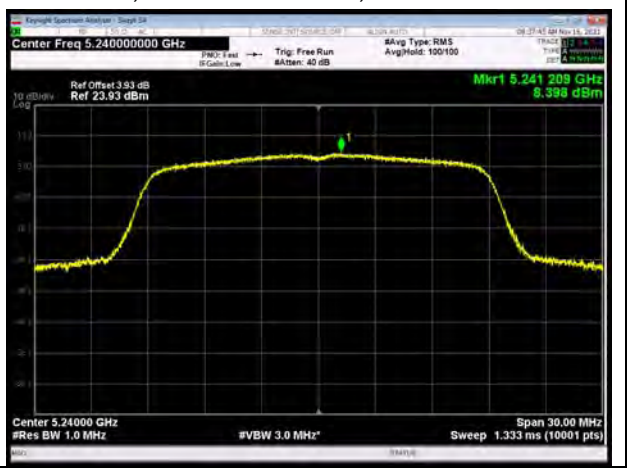


U-NII-1, 802.11ac VHT20, Channel No.: 40

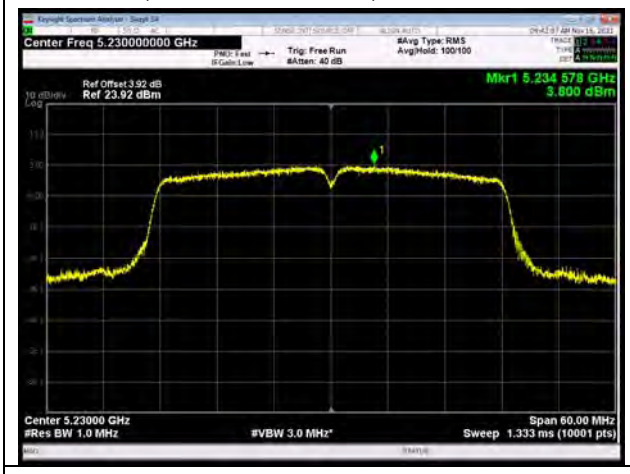
U-NII-1, 802.11ac VHT40, Channel No.: 38



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

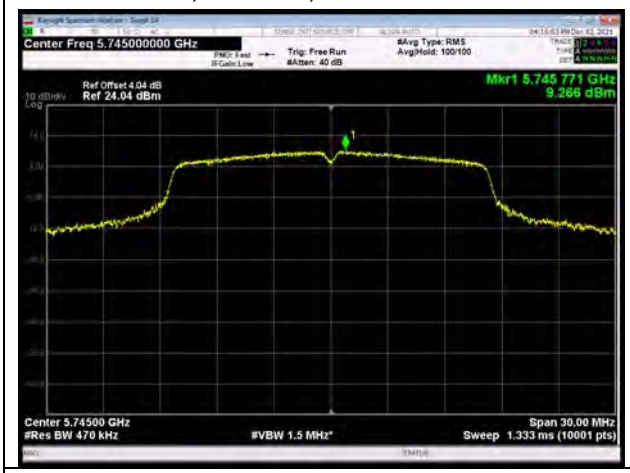


U-NII-1, 802.11ac VHT40, Channel No.: 46

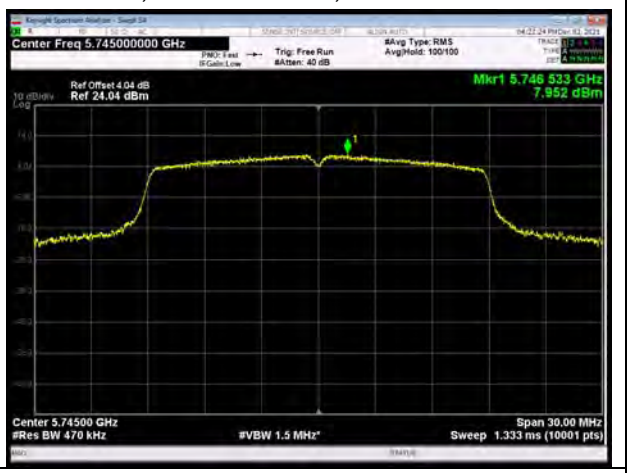


U-NII-1, 802.11ac VHT80, Channel No.: 42

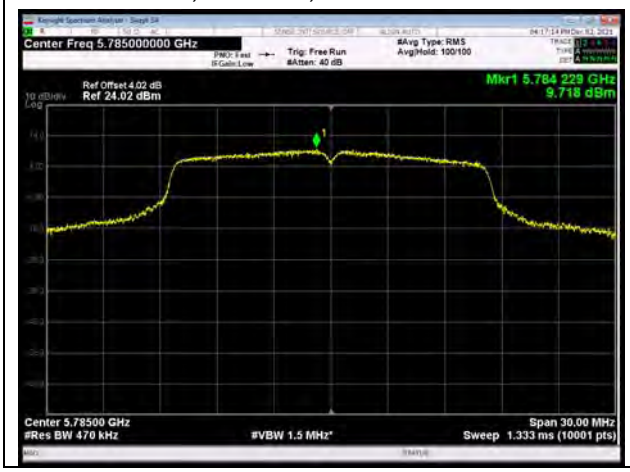
U-NII-3, 802.11a, Channel No.: 149



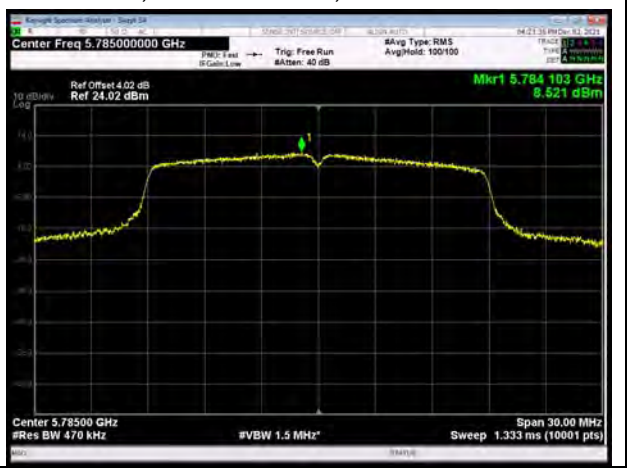
U-NII-3, 802.11n HT20, Channel No.: 149



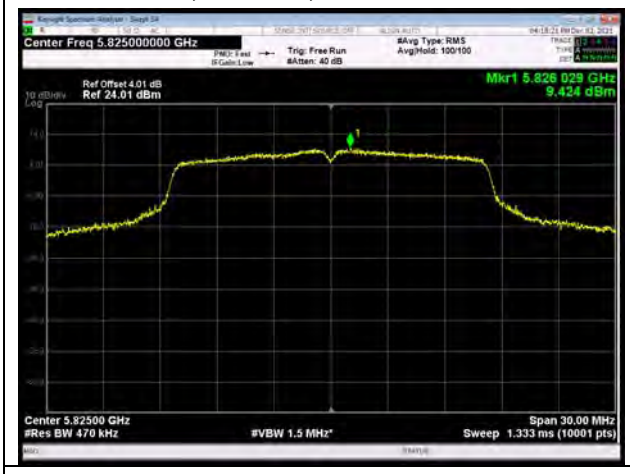
U-NII-3, 802.11a, Channel No.: 157



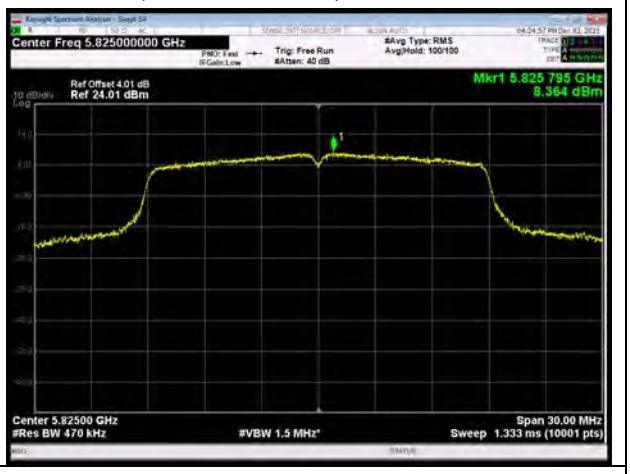
U-NII-3, 802.11n HT20, Channel No.: 157



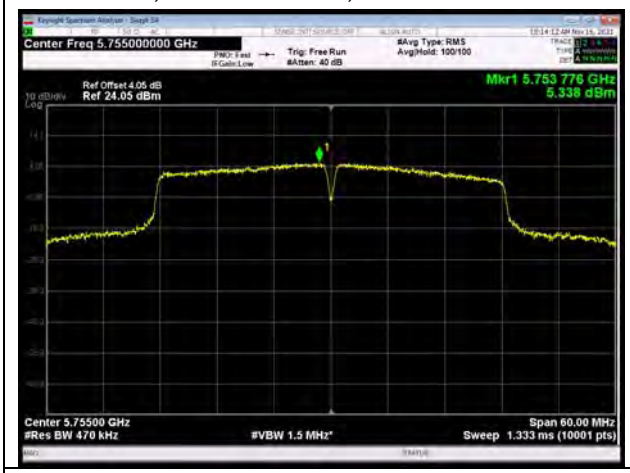
U-NII-3, 802.11a, Channel No.: 165



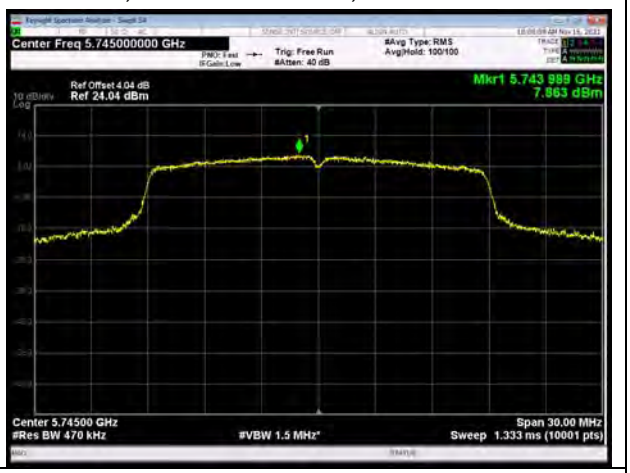
U-NII-3, 802.11n HT20, Channel No.: 165



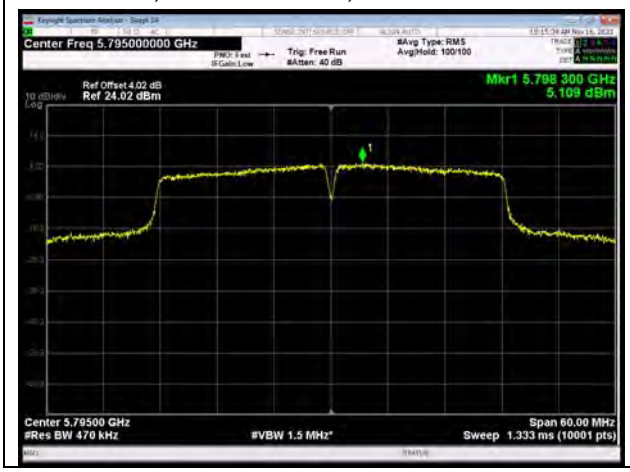
U-NII-3, 802.11n HT40, Channel No.: 151



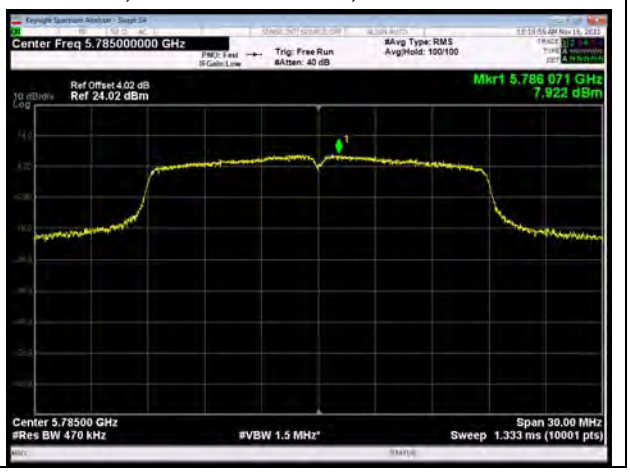
U-NII-3, 802.11ac VHT20, Channel No.: 149



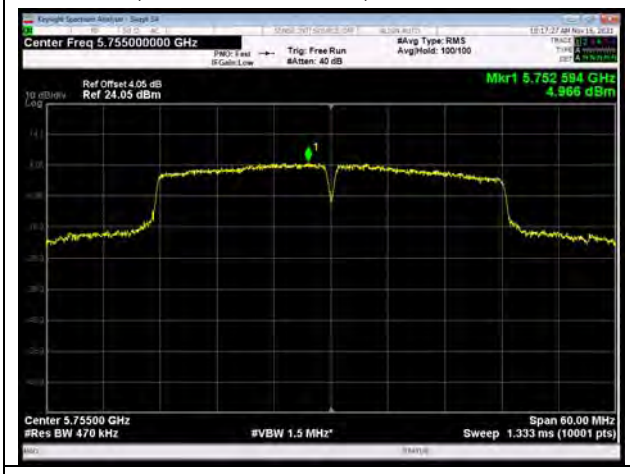
U-NII-3, 802.11n HT40, Channel No.: 159



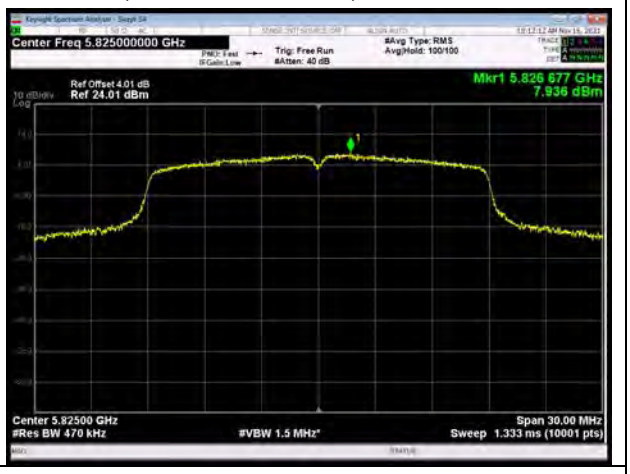
U-NII-3, 802.11ac VHT20, Channel No.: 157



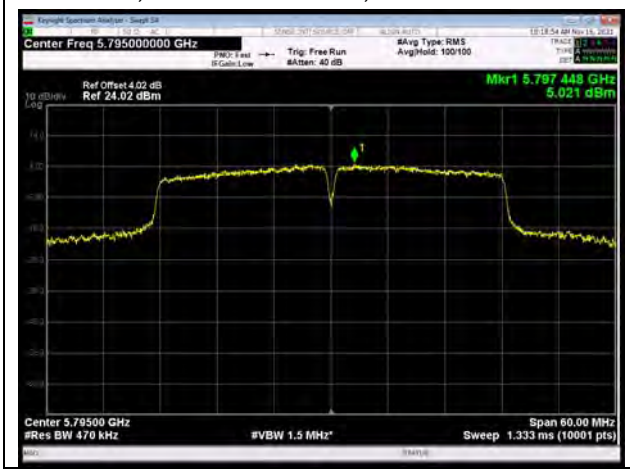
U-NII-3, 802.11ac VHT40, Channel No.: 151



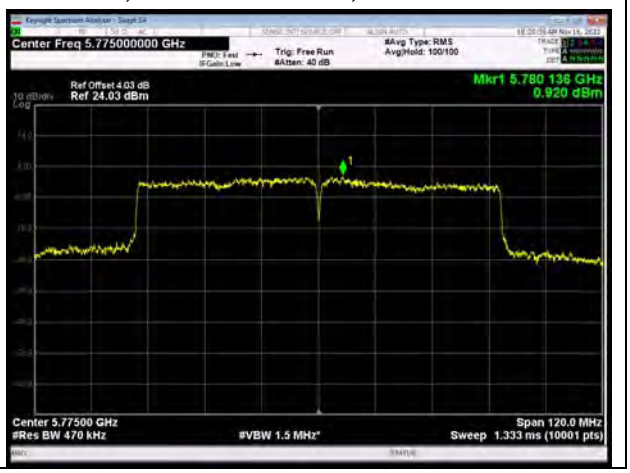
U-NII-3, 802.11ac VHT20, Channel No.: 165



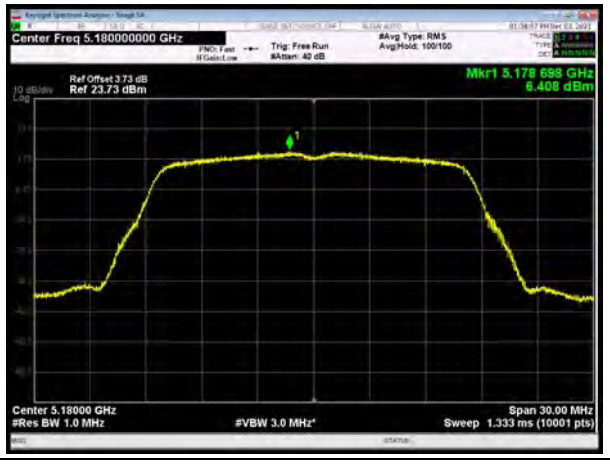
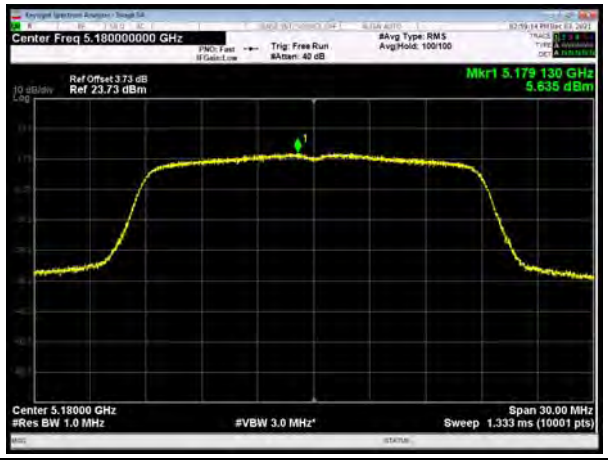
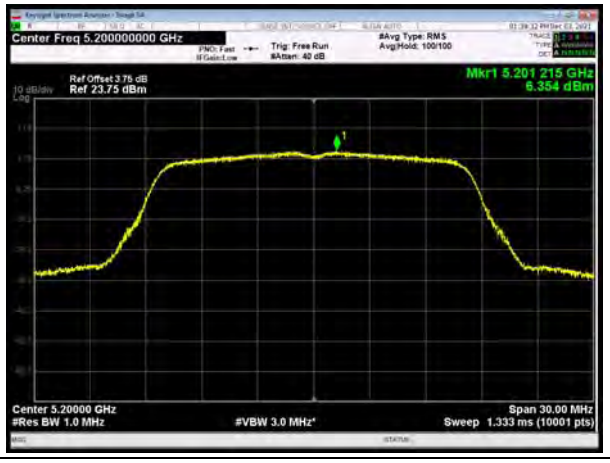
U-NII-3, 802.11ac VHT40, Channel No.: 159



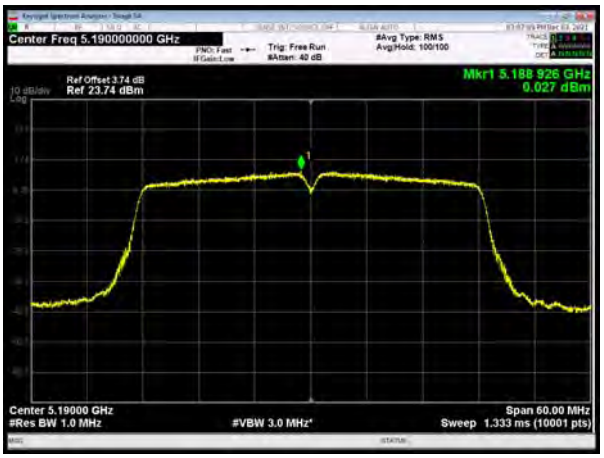
U-NII-3, 802.11ac VHT80, Channel No.: 155



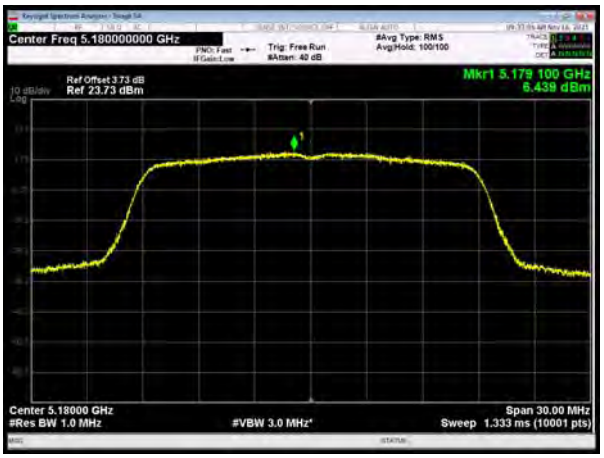
MIMO Antenna 2

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

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

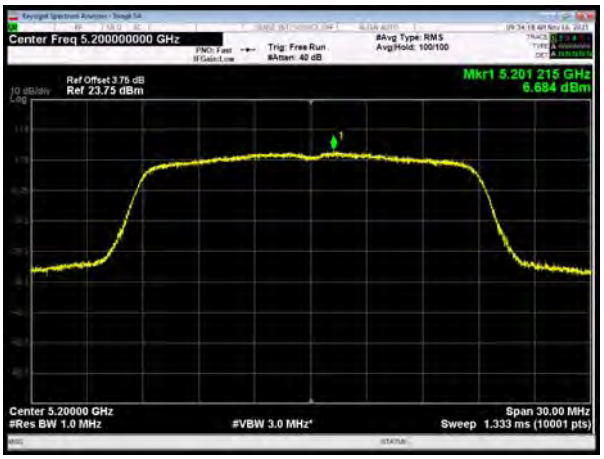


U-NII-1, 802.11ac VHT20, Channel No.: 36

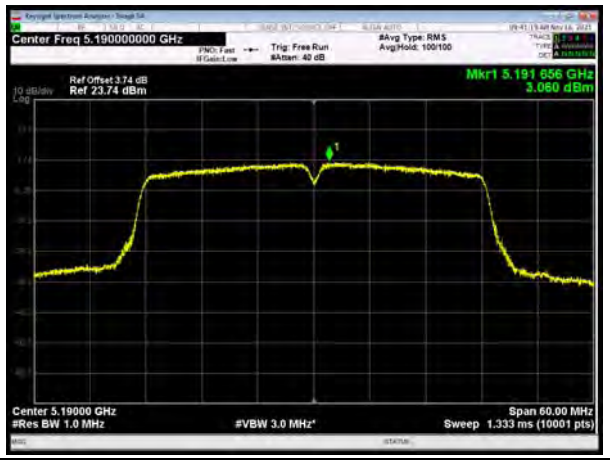


U-NII-1, 802.11n HT40, Channel No.: 46

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

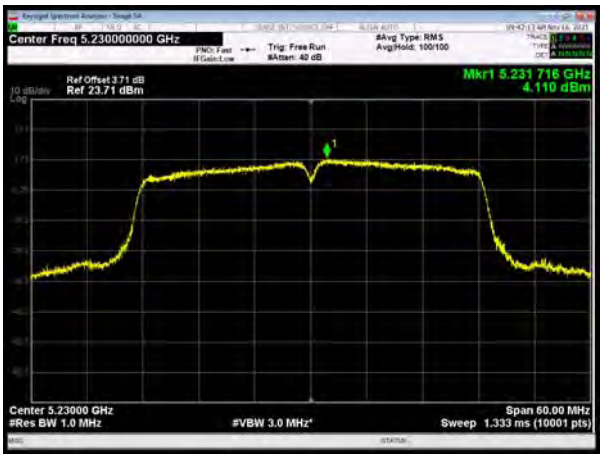


U-NII-1, 802.11ac VHT40, Channel No.: 38



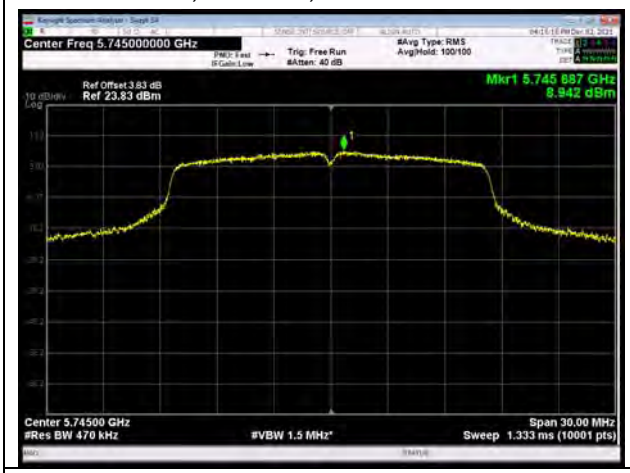
U-NII-1, 802.11ac VHT20, Channel No.: 48

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

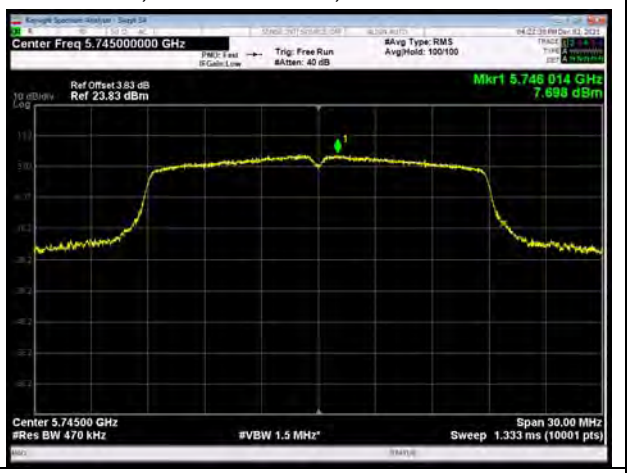


U-NII-1, 802.11ac VHT80, Channel No.: 42

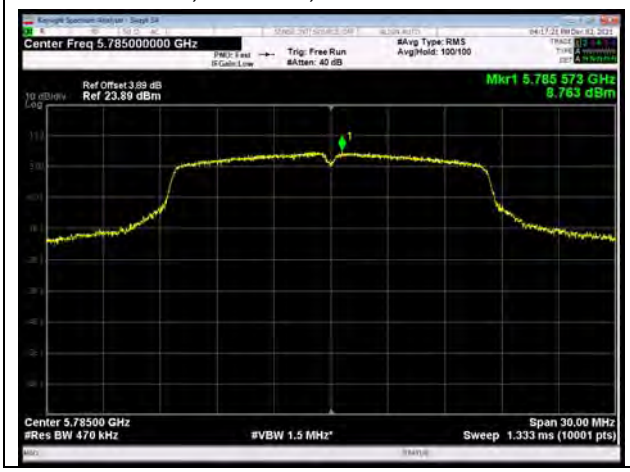
U-NII-3, 802.11a, Channel No.: 149



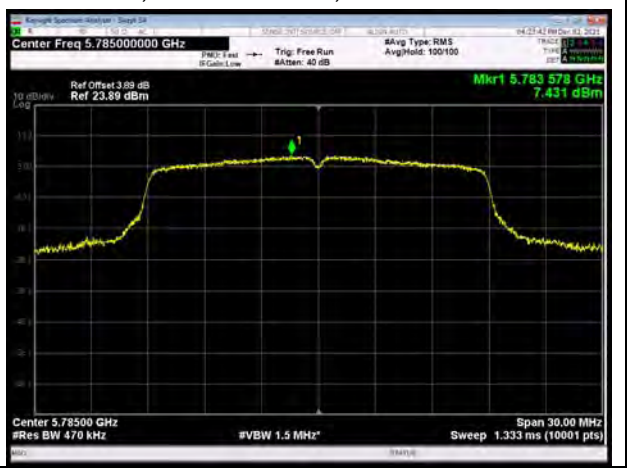
U-NII-3, 802.11n HT20, Channel No.: 149



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



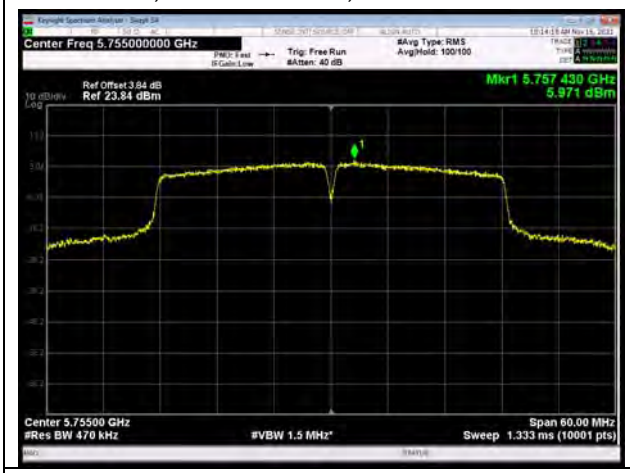
U-NII-3, 802.11n HT20, Channel No.: 157



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

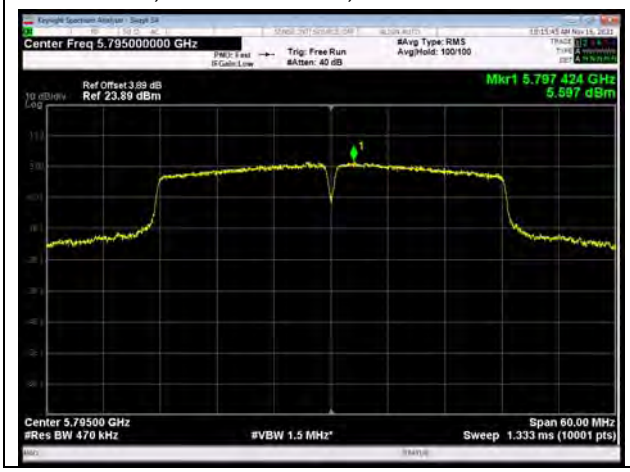
U-NII-3, 802.11n HT20, Channel No.: 165

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

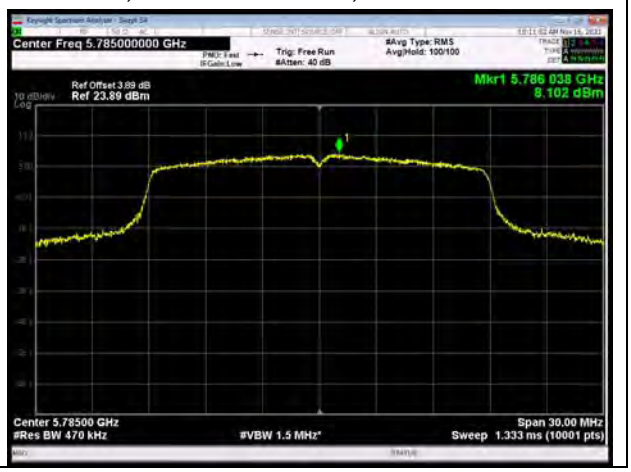


U-NII-3, 802.11ac VHT20, Channel No.: 149

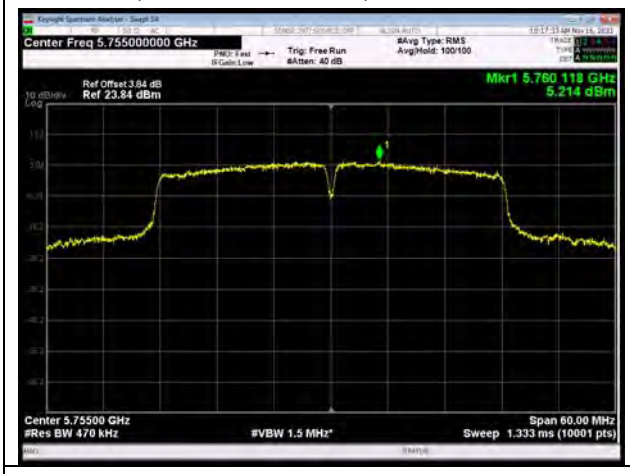
U-NII-3, 802.11n HT40, Channel No.: 159



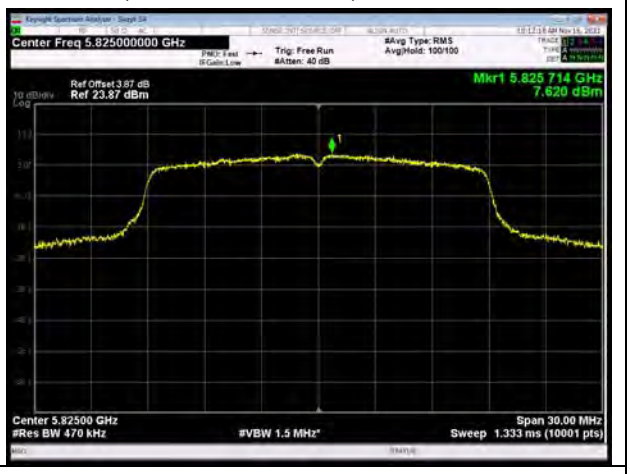
U-NII-3, 802.11ac VHT20, Channel No.: 157



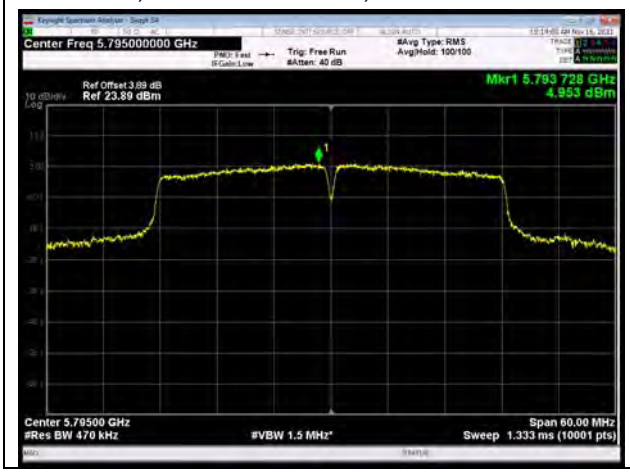
U-NII-3, 802.11ac VHT40, Channel No.: 151



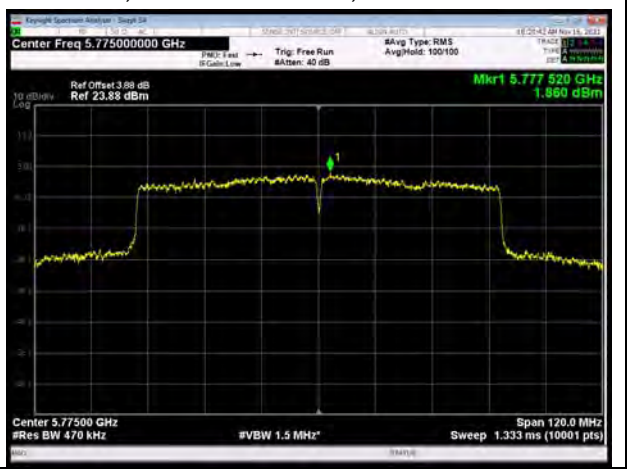
U-NII-3, 802.11ac VHT20, Channel No.: 165



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



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



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. 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.

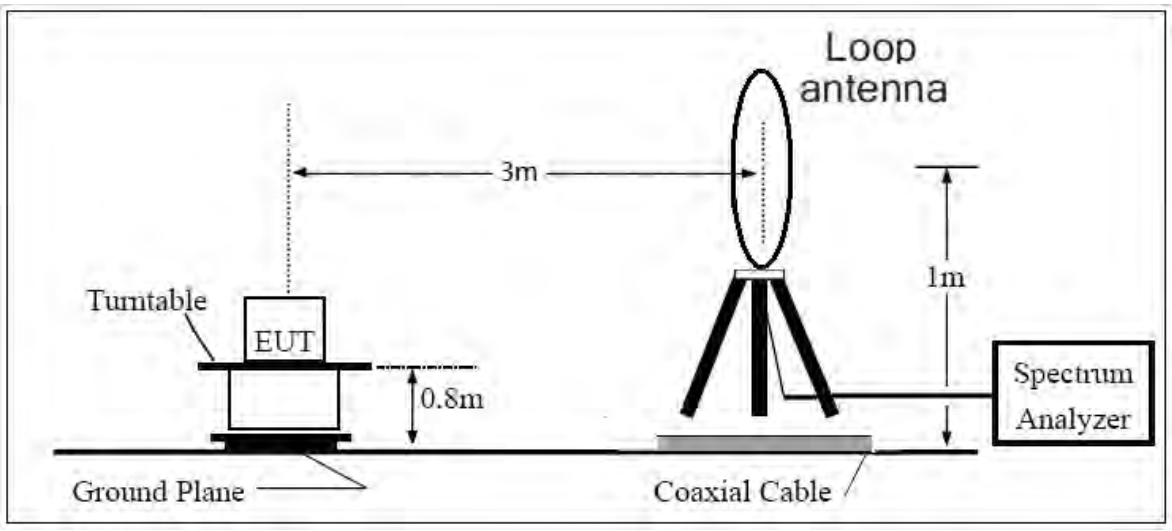
3) If a specific emission is demonstrated to be continuous (100% duty cycle) rather than turning ON and OFF with the transmit cycle, then no duty cycle correction is required for that emission.

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 / (minimum transmitter on time)] and no less than 1 Hz.

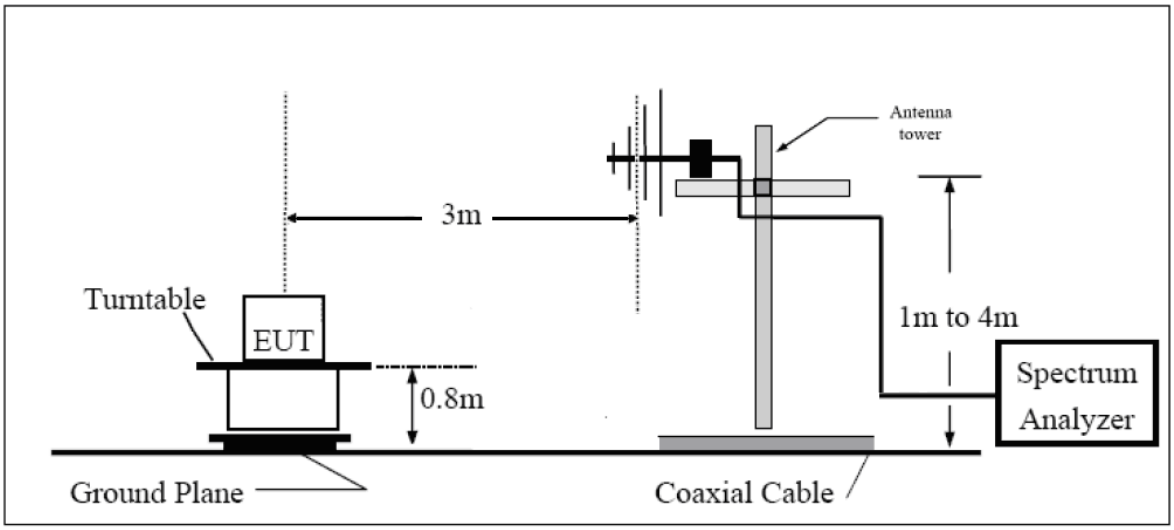
The field strength of spurious emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in stand-up position (Z axis) and the loop antenna is vertical, others antenna are vertical and horizontal.

The test is in transmitting mode.

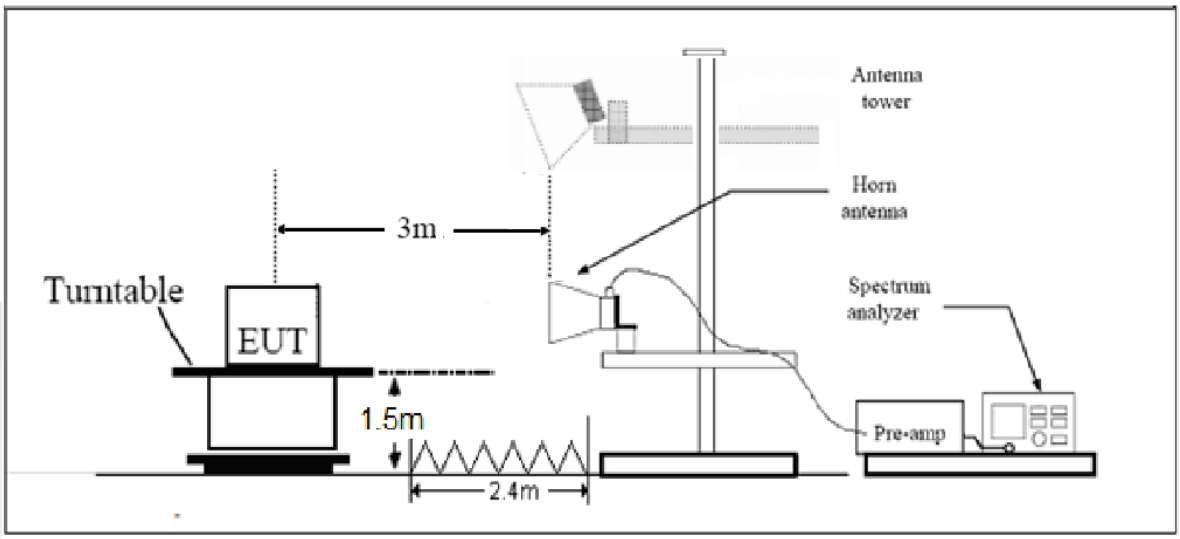
9KHz~~~30MHz



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[dBμV/m] = EIRP[dBm] - 20 log(d[meters]) + 104.77, where E = field strength and

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

§2、E[dBμV/m] = EIRP[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.

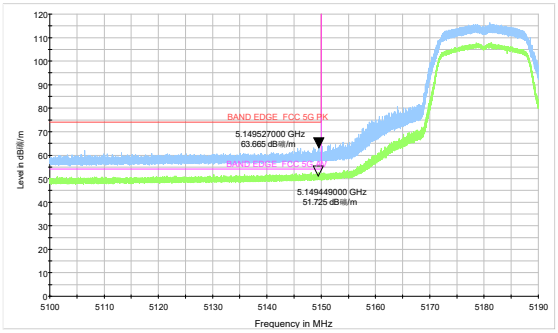
Frequency	Uncertainty
9KHz-30MHz	3.55 dB
30MHz-200MHz	4.17 dB
200MHz-1GHz	4.84 dB
1-18GHz	4.35 dB
18-26.5GHz	5.90 dB
26.5GHz~40GHz	5.92 dB

Test Results:

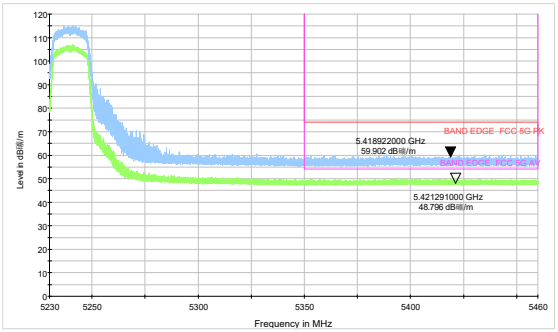
The modulation and bandwidth are similar for 802.11n mode for 20MHz/40MHz and 802.11ac mode for V80MHz/, therefore investigated worst case to representative mode in test report.

The signal beyond the limit is carrier.

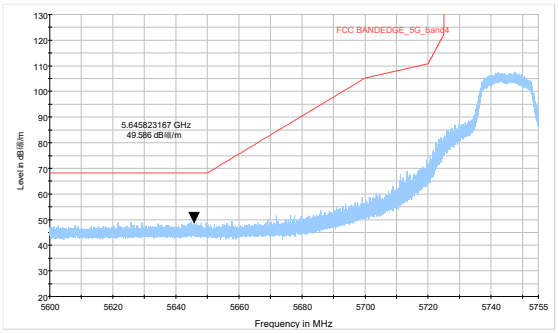
802.11a-Channel 36: Peak+ Average



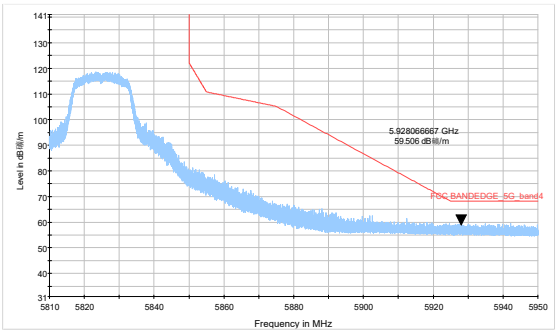
802.11a-Channel 48: Peak+ Average



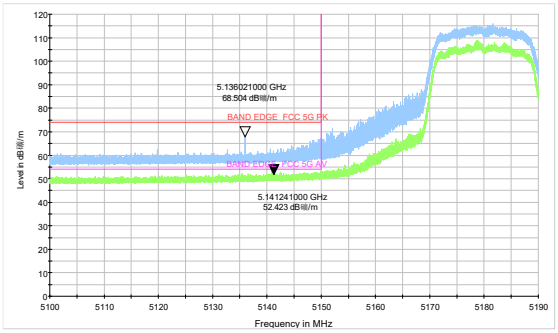
802.11a-Channel 149: Peak+ Average



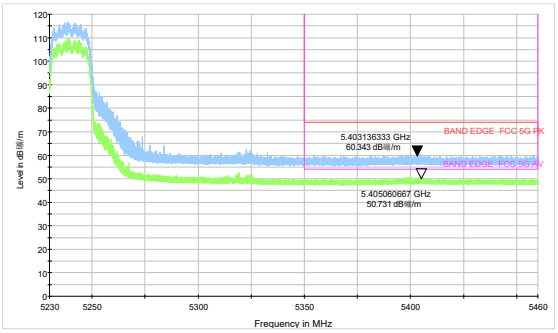
802.11a-Channel 165: Peak+ Average



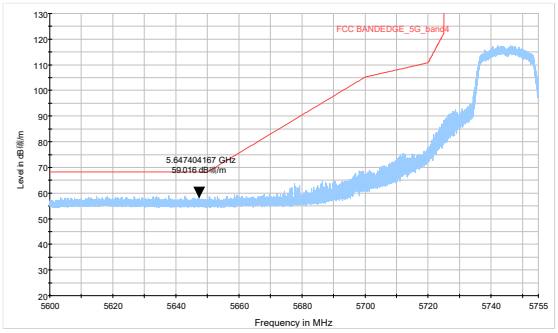
802.11n HT20-Channel 36: Peak+ Average



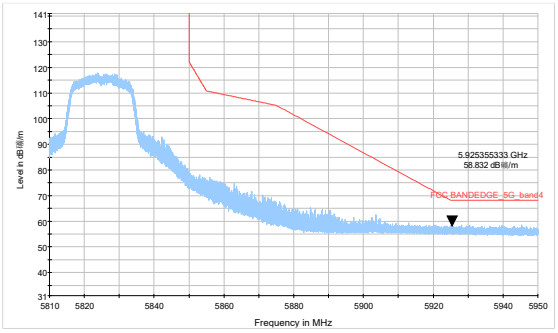
802.11n HT20-Channel 48: Peak+ Average



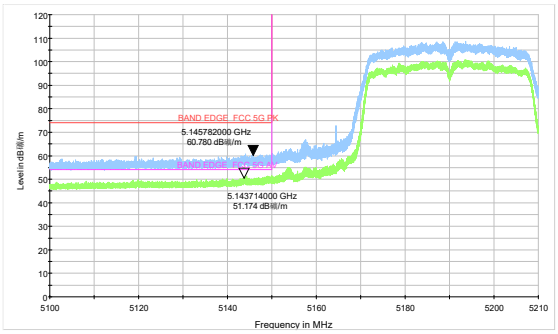
802.11n HT20-Channel 149: Peak



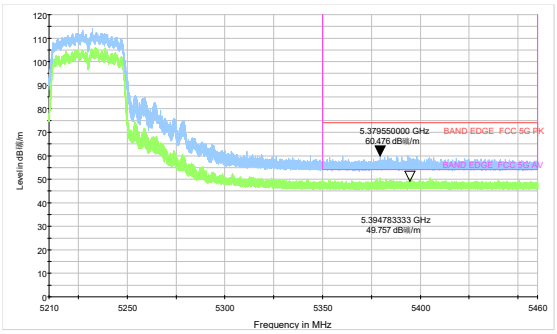
802.11n HT20-Channel 165: Peak



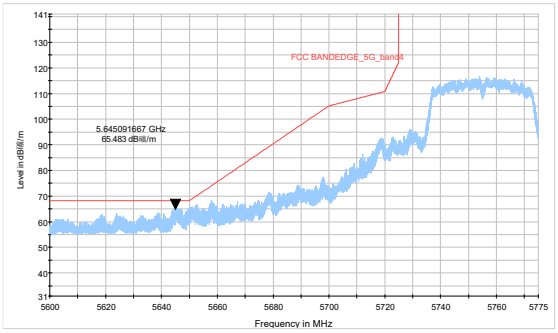
802.11n HT40-Channel 38: Peak+ Average



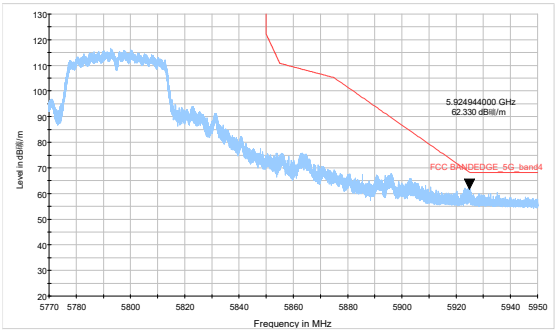
802.11n HT40-Channel 46: Peak+ Average



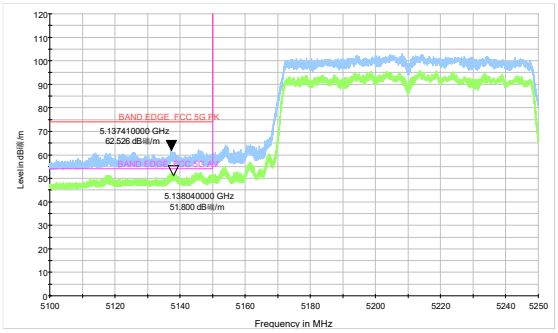
802.11n HT40-Channel 151: Peak



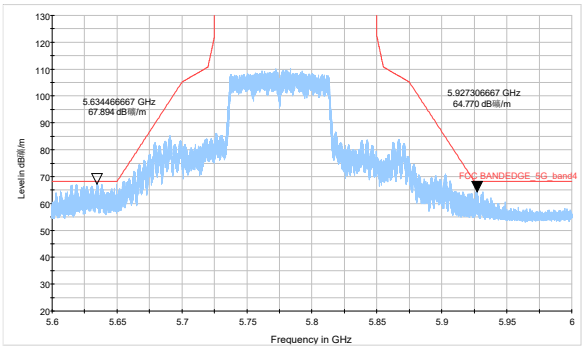
802.11n HT159-Channel 46: Peak



802.11ac VHT80 –Channel 42: Peak+ Average



802.11ac VHT80- Channel 155: Peak+ Average



Result of RE

Test result

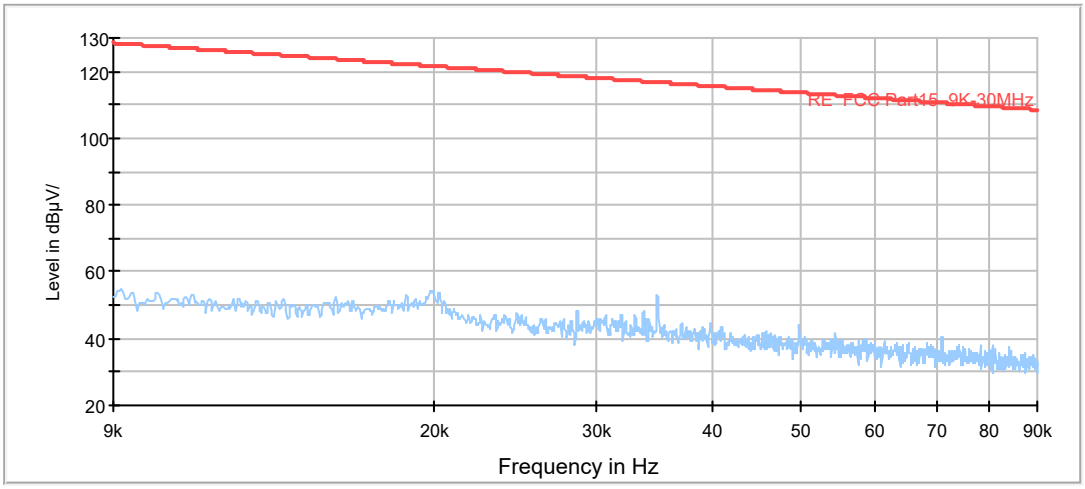
Sweep the whole frequency band through the range from 9kHz to the 10th harmonic of the carrier, the Emissions in the frequency band 9kHz-30MHz and 26.5GHz-40GHz are more than 20dB below the limit are not reported.

After the pretest, MIMO was selected as the worst antenna.

During the test, the Radiates Emission from 30MHz to 1GHz was performed in all modes with all channels, 802.11n(HT20), Channel 149 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

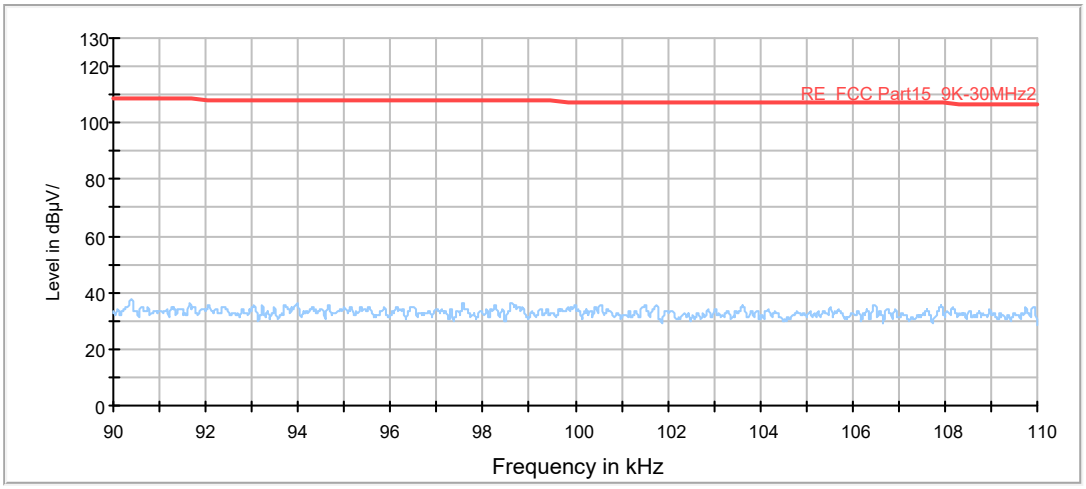
Continuous TX mode:

FCC RE 9K-90KHz AV



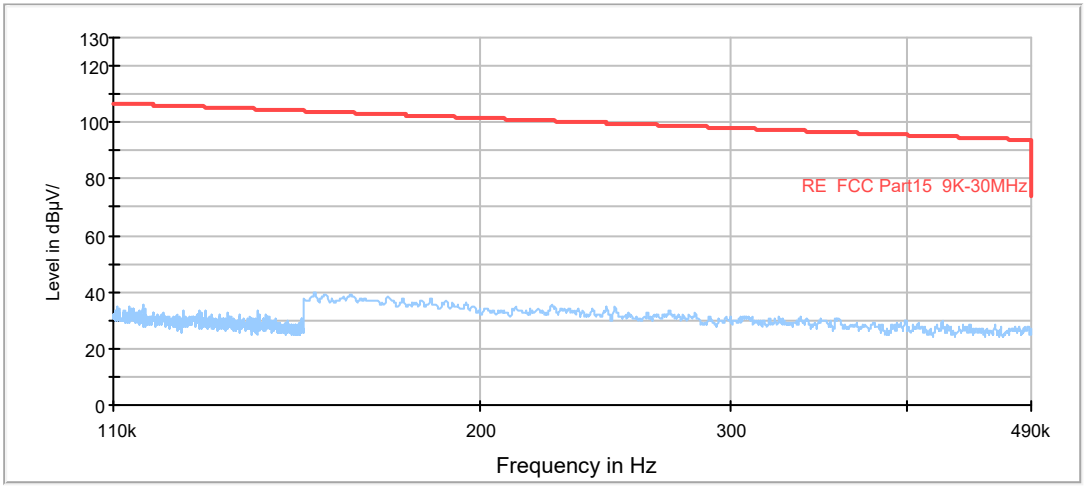
Radiates Emission from 9KHz to 90KHz

FCC RE 90K-110KHz QP



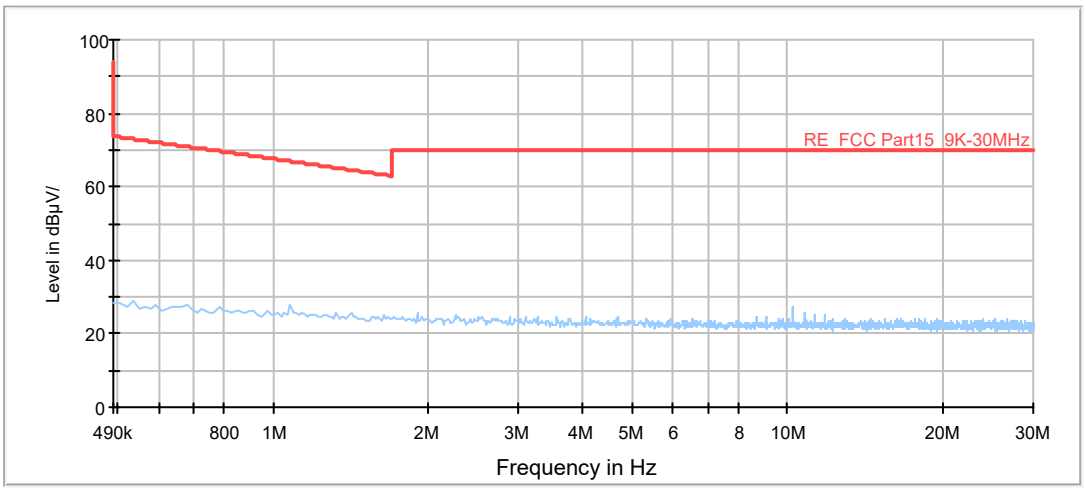
Radiates Emission from 90KHz to 110KHz

FCC RE 110K-490KHz AV

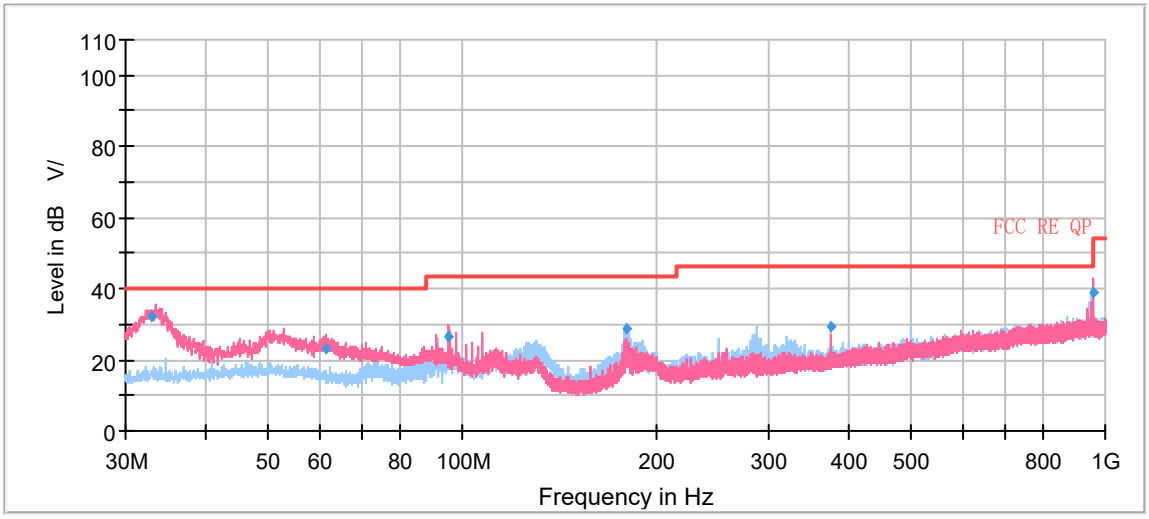


Radiates Emission from 110KHz to 490KHz

FCC RE 490K-30MHz QP



Radiates Emission from 490KHz to 30MHz



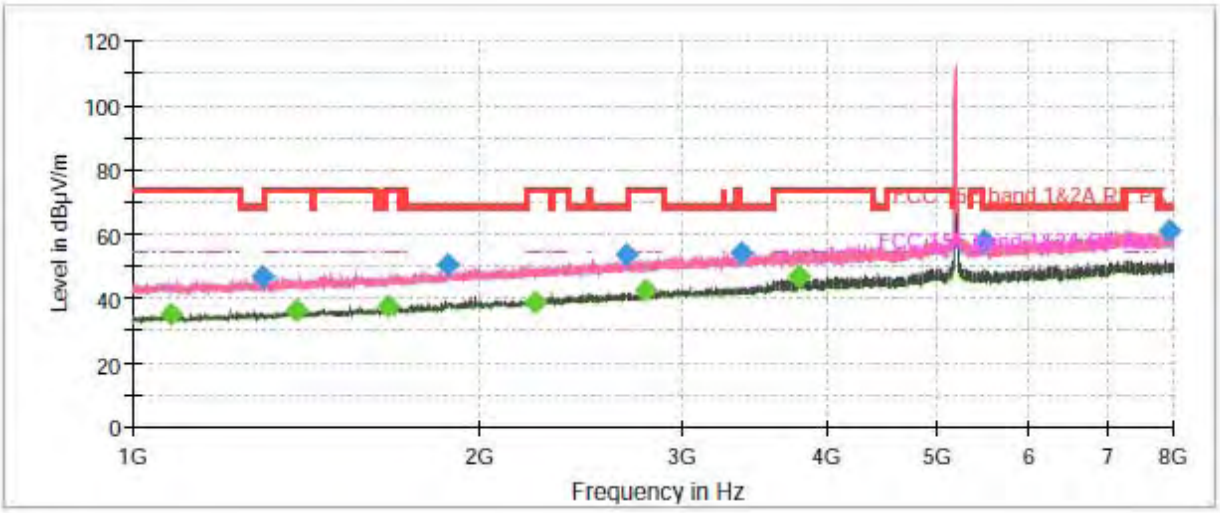
Radiates Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
32.907333	31.91	100.0	V	217.0	17	8.09	40.00
61.531000	23.40	100.0	V	22.0	19	16.60	40.00
95.507333	26.56	100.0	V	238.0	18	16.94	43.50
179.994333	28.57	175.0	H	257.0	16	14.93	43.50
375.004333	29.48	100.0	H	296.0	22	16.52	46.00
959.680333	38.80	100.0	V	295.0	31	7.20	46.00

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

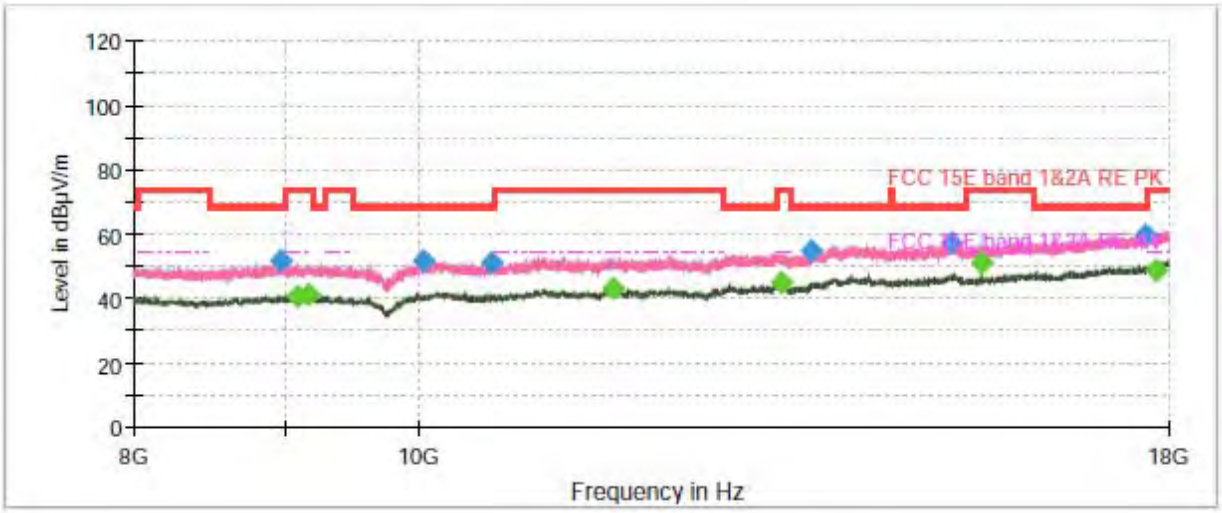
2. Margin = Limit – Quasi-Peak

802.11a CH36



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz

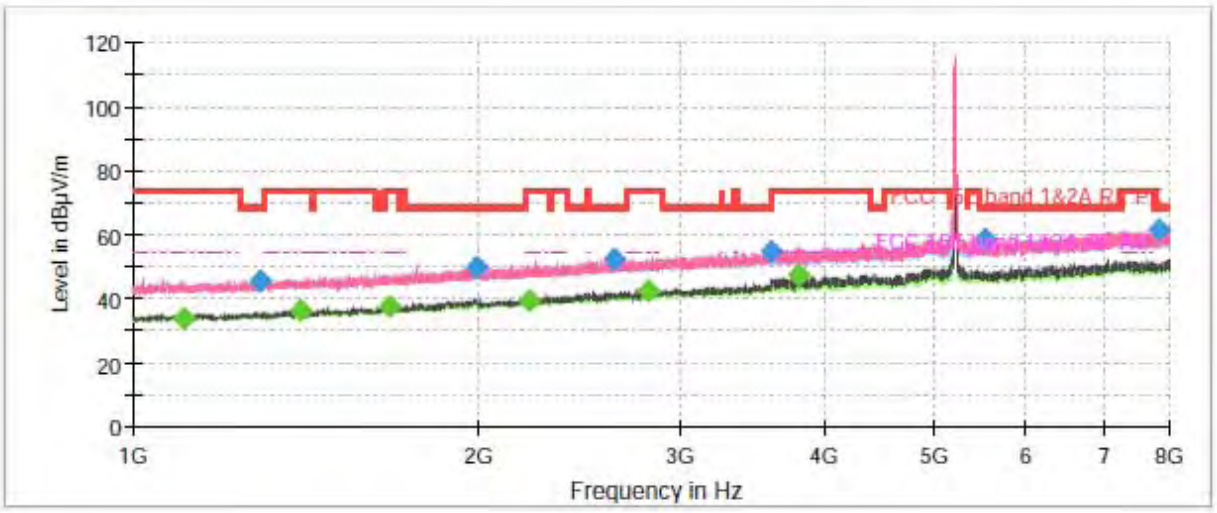


Radiates Emission from 8GHz to 18GHz

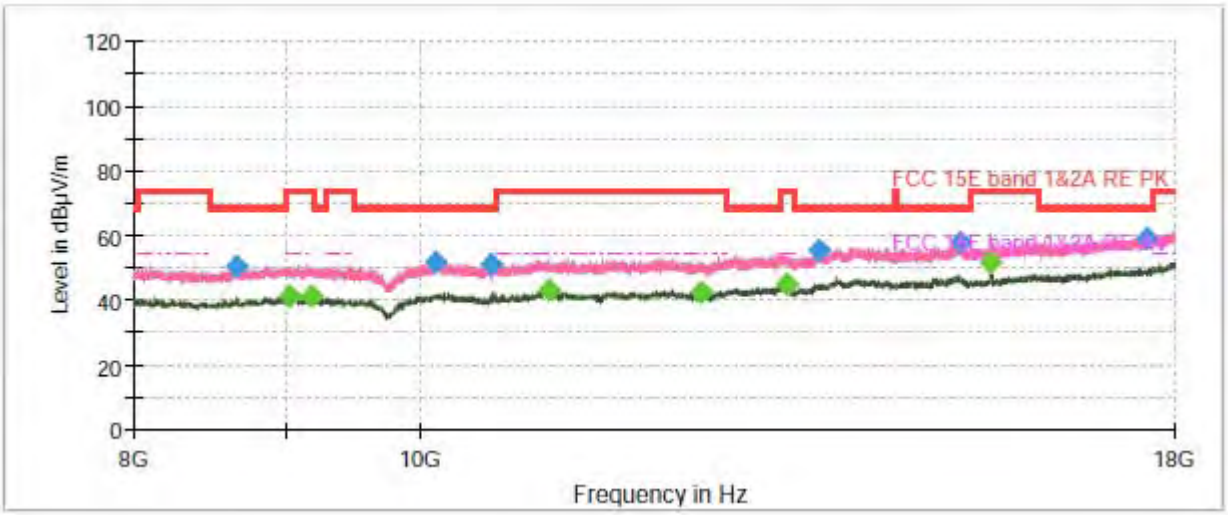
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1081.200000	---	34.91	54.00	19.09	200.0	V	89.0	-3.7
1294.466667	46.60	---	68.20	21.60	100.0	V	39.0	-3.0
1386.633333	---	36.48	54.00	17.52	200.0	V	348.0	-2.5
1668.733333	---	37.60	54.00	16.40	200.0	V	348.0	-1.1
1875.233333	50.55	---	68.20	17.65	200.0	V	348.0	0.2
2229.900000	---	38.95	54.00	15.05	200.0	V	348.0	1.1
2682.100000	53.44	---	68.20	14.76	200.0	V	348.0	2.9
2791.300000	---	42.20	54.00	11.80	200.0	V	348.0	3.3
3369.266667	54.41	---	68.20	13.79	200.0	V	348.0	5.1
3786.700000	---	46.93	54.00	7.07	200.0	V	348.0	6.4
5479.300000	57.86	---	68.20	10.34	200.0	V	348.0	9.0
7941.433333	61.09	---	68.20	7.11	200.0	V	348.0	12.4
15537.333333	---	50.79	54.00	3.21	200.0	H	335.0	13.1
17816.666667	---	48.73	54.00	5.27	200.0	H	161.0	15.0

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

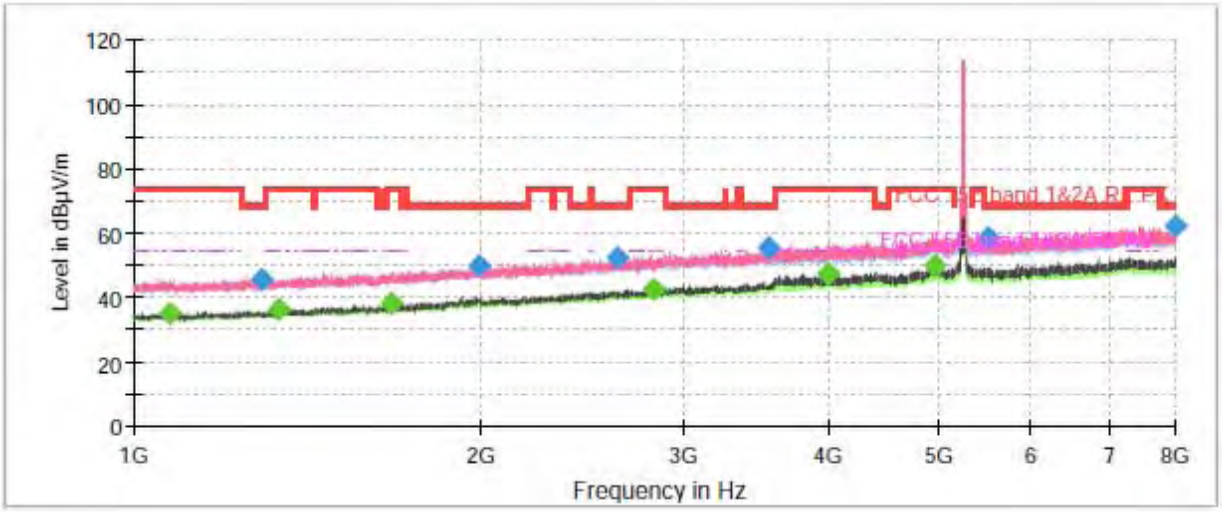


Radiates Emission from 8GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1105.233333	---	34.15	54.00	19.85	200.0	V	0.0	-3.8
1293.066667	45.72	---	68.20	22.48	200.0	V	0.0	-3.0
1401.333333	---	36.50	54.00	17.50	200.0	V	0.0	-2.6
1671.066667	---	37.77	54.00	16.23	200.0	V	0.0	-1.0
1989.333333	49.73	---	68.20	18.47	200.0	V	0.0	0.6
2214.966667	---	39.60	54.00	14.40	200.0	V	0.0	1.2
2627.733333	52.39	---	68.20	15.81	200.0	V	0.0	2.6
2815.100000	---	42.38	54.00	11.62	200.0	V	348.0	3.3
3594.666667	54.53	---	68.20	13.67	200.0	V	0.0	5.9
3797.666667	---	47.24	54.00	6.76	200.0	V	0.0	6.3
5521.766667	58.63	---	68.20	9.57	200.0	V	0.0	9.1
7838.766667	61.27	---	68.20	6.93	100.0	V	0.0	12.4
15596.666667	---	51.65	54.00	2.35	200.0	H	18.0	13.2

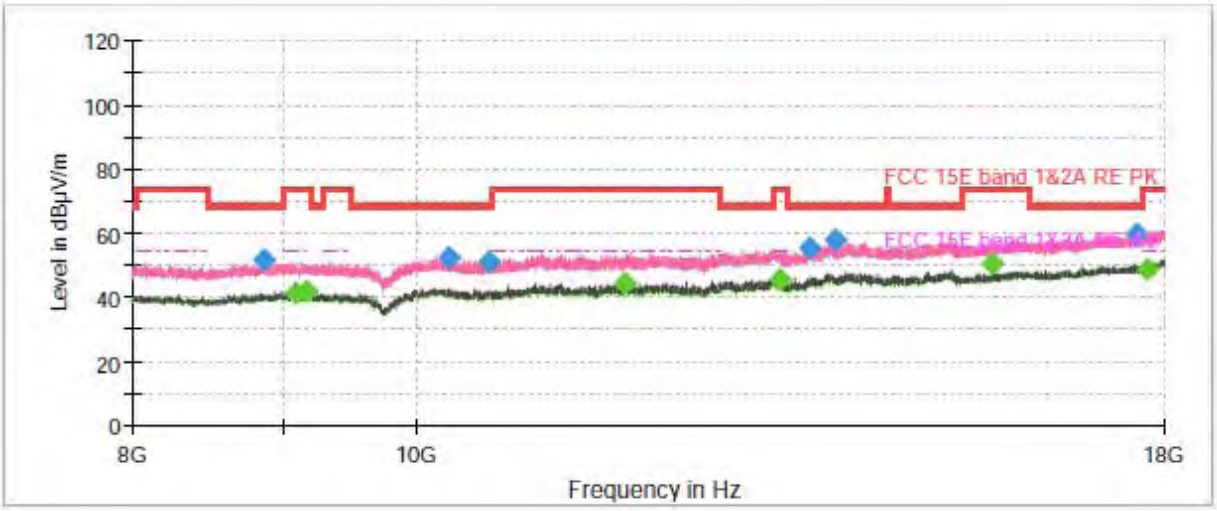
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11a CH48



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz

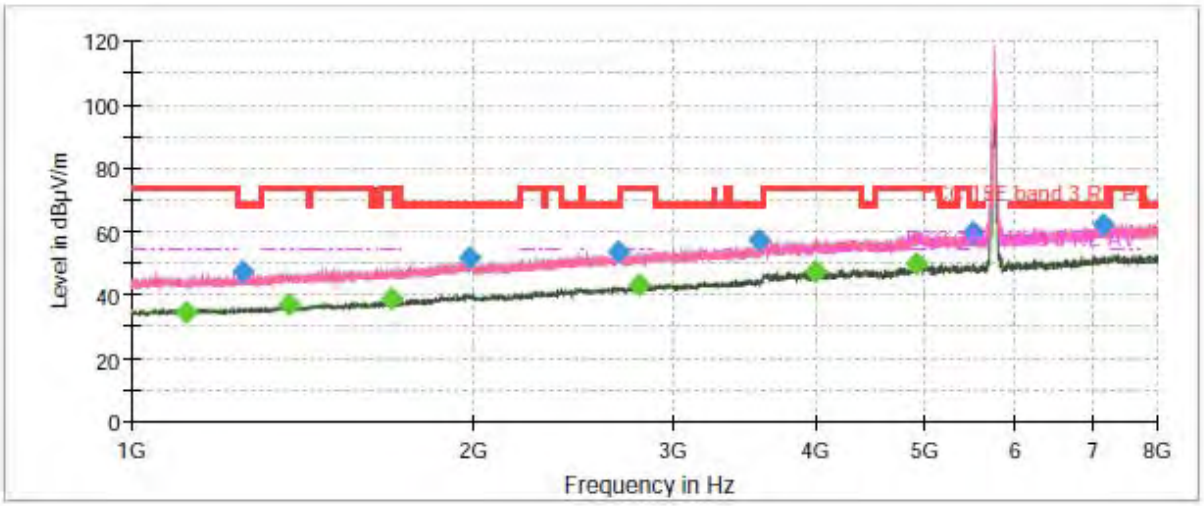


Radiates Emission from 8GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1077.000000	---	34.97	54.00	19.03	200.0	V	0.0	-3.7
1289.333333	45.62	---	68.20	22.58	200.0	H	162.0	-3.0
1332.500000	---	36.07	54.00	17.93	100.0	V	0.0	-2.8
1675.733333	---	38.01	54.00	15.99	200.0	V	0.0	-1.0
1990.966667	50.14	---	68.20	18.06	100.0	V	0.0	0.5
2624.000000	52.36	---	68.20	15.84	100.0	V	0.0	2.6
2824.900000	---	42.53	54.00	11.47	100.0	V	0.0	3.2
3544.500000	55.37	---	68.20	12.83	100.0	V	0.0	5.3
3997.633333	---	47.54	54.00	6.46	200.0	V	0.0	6.9
4954.766667	---	49.73	54.00	4.27	100.0	V	0.0	8.8
5508.466667	58.28	---	68.20	9.92	200.0	V	0.0	9.2
7986.933333	61.89	---	68.20	6.31	200.0	V	0.0	12.2

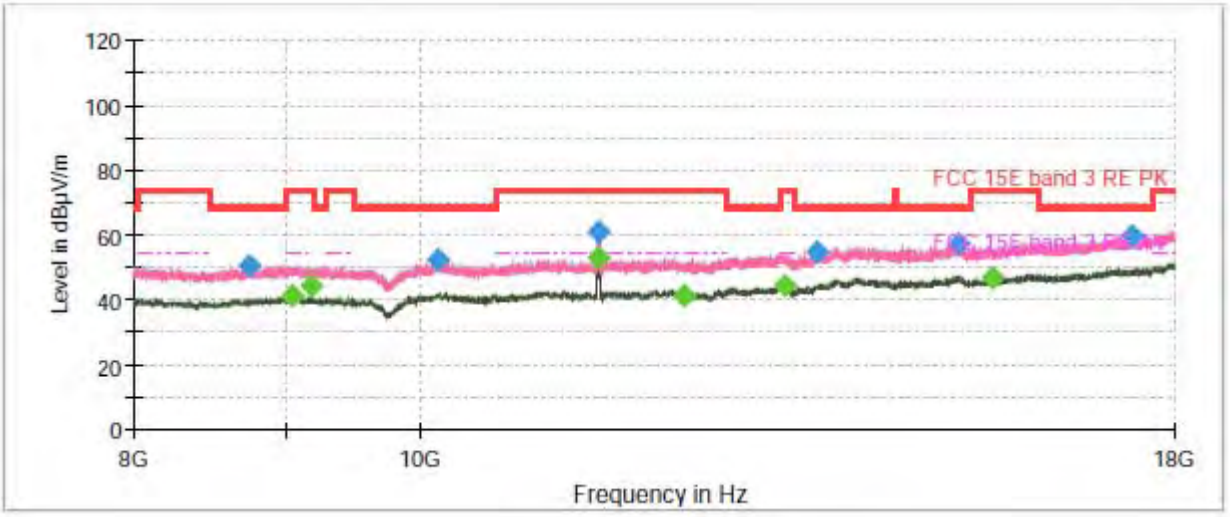
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11a CH149



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz

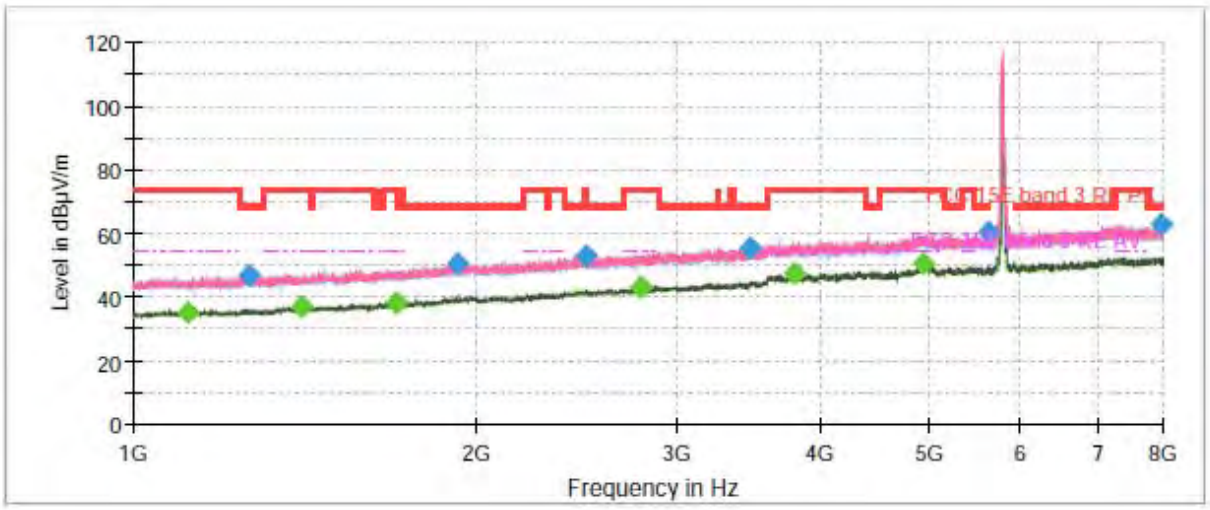


Radiates Emission from 8GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1115.500000	---	34.72	54.00	19.28	100.0	H	42.0	-3.9
1252.233333	47.55	---	68.20	20.65	200.0	V	120.0	-3.0
1373.333333	---	36.93	54.00	17.07	200.0	V	1.0	-2.3
1696.266667	---	38.53	54.00	15.47	200.0	V	67.0	-0.8
1980.233333	51.65	---	68.20	16.55	100.0	H	15.0	0.7
2679.300000	53.33	---	68.20	14.87	100.0	H	178.0	2.9
2800.166667	---	43.15	54.00	10.85	100.0	H	178.0	3.4
3568.300000	57.10	---	68.20	11.10	200.0	V	259.0	5.5
3999.733333	---	47.37	54.00	6.63	100.0	H	219.0	7.0
4900.633333	---	49.89	54.00	4.11	200.0	V	0.0	8.4
5497.033333	59.43	---	68.20	8.77	200.0	V	67.0	9.1
7158.366667	62.41	---	68.20	5.79	100.0	V	233.0	12.1
11484.333333	---	53.14	54.00	0.86	200.0	H	196.0	5.9

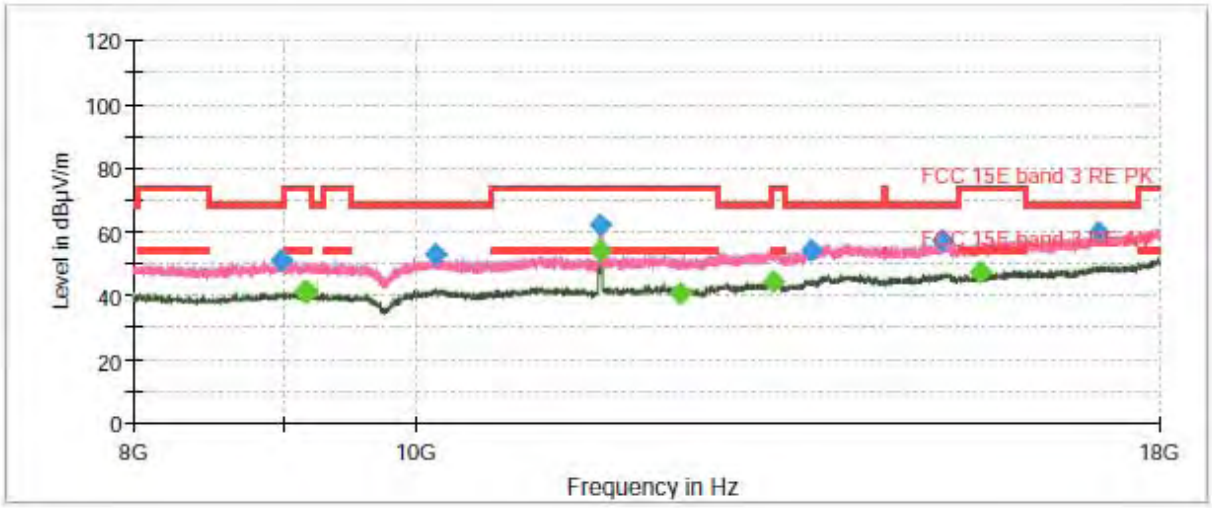
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11a CH157



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz

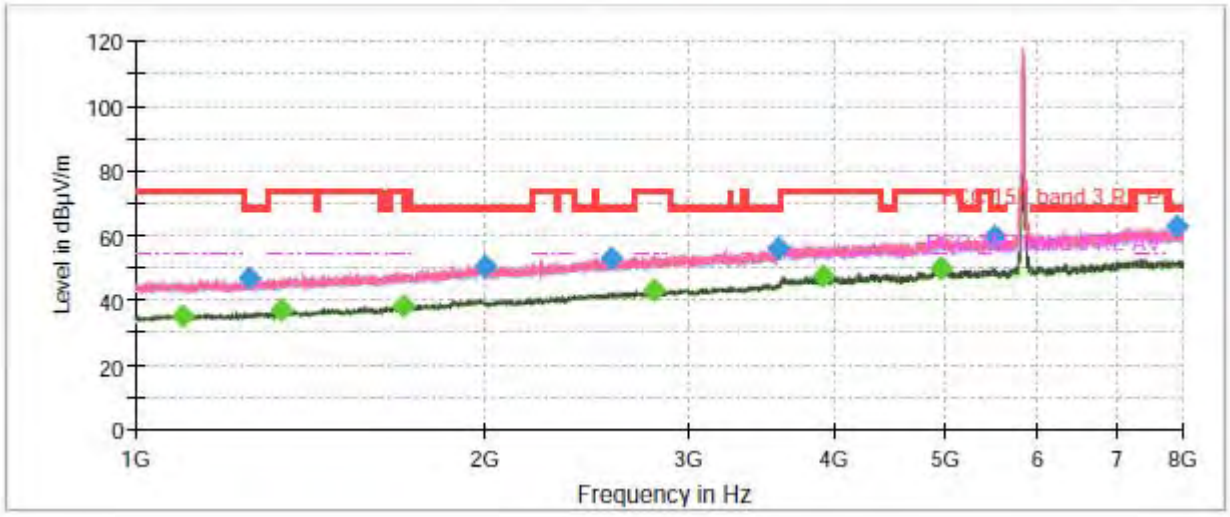


Radiates Emission from 8GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1117.600000	---	35.17	54.00	18.83	200.0	V	0.0	-3.9
1261.333333	46.63	---	68.20	21.57	100.0	H	165.0	-2.9
1404.366667	---	36.84	54.00	17.16	200.0	H	303.0	-2.6
1701.633333	---	38.16	54.00	15.84	100.0	V	321.0	-0.9
1927.500000	50.35	---	68.20	17.85	200.0	V	105.0	0.0
2500.100000	52.94	---	68.20	15.26	100.0	V	308.0	2.1
2781.266667	---	43.12	54.00	10.88	100.0	V	226.0	3.2
3470.766667	55.60	---	68.20	12.60	200.0	V	146.0	5.3
3793.700000	---	47.16	54.00	6.84	100.0	V	281.0	6.4
4930.033333	---	50.17	54.00	3.83	100.0	V	56.0	8.8
5626.300000	60.07	---	68.20	8.13	100.0	V	72.0	9.2
7963.366667	62.55	---	68.20	5.65	100.0	H	55.0	12.3
11568.000000	---	53.91	54.00	0.09	200.0	H	105.0	6.6

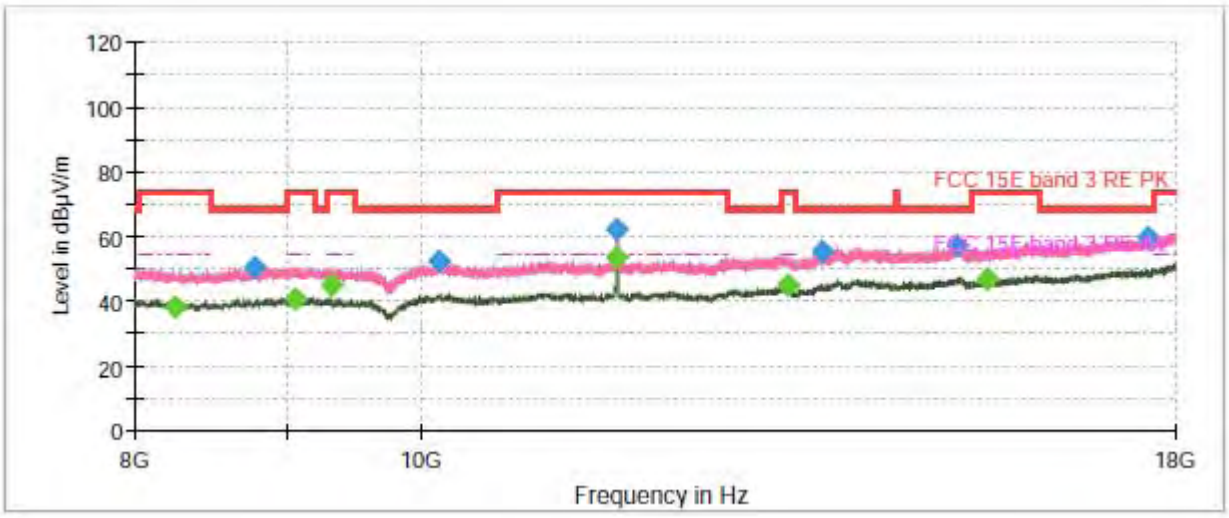
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11a CH165



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz

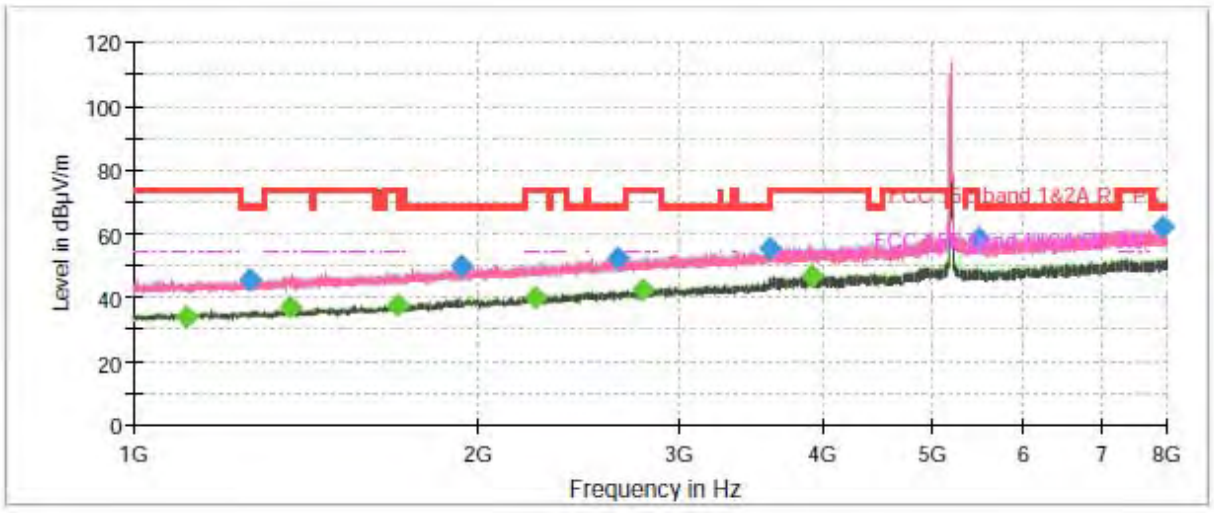


Radiates Emission from 8GHz to 18GHz

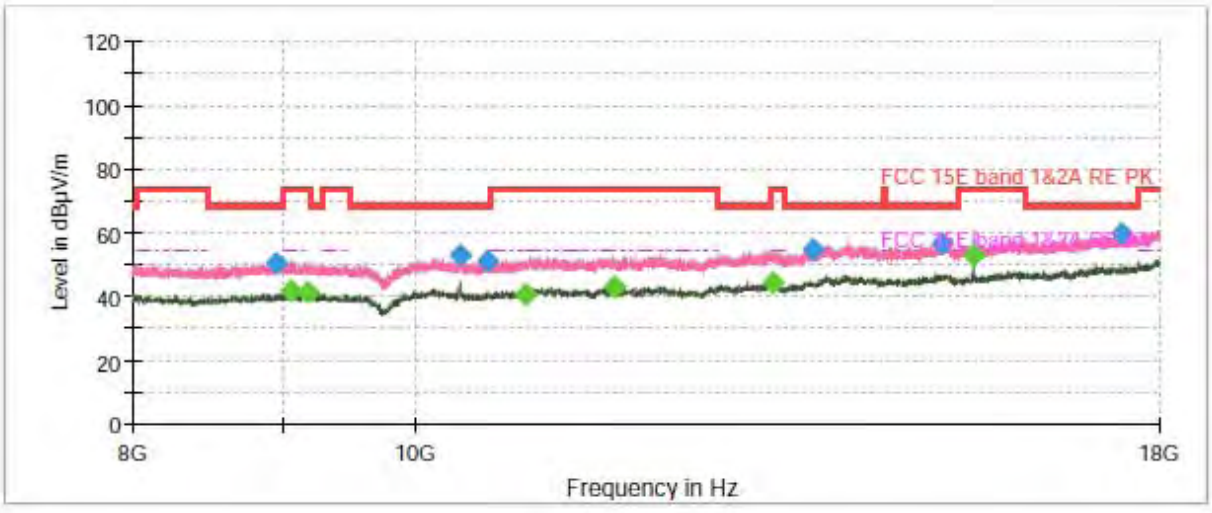
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1096.366667	---	34.98	54.00	19.02	100.0	H	37.0	-3.9
1253.166667	46.77	---	68.20	21.43	200.0	V	216.0	-3.0
1337.866667	---	37.00	54.00	17.00	100.0	H	0.0	-2.7
1699.066667	---	38.16	54.00	15.84	100.0	V	251.0	-0.9
1999.366667	50.74	---	68.20	17.46	100.0	V	197.0	0.5
2573.833333	53.02	---	68.20	15.18	100.0	H	106.0	2.3
2795.500000	---	42.93	54.00	11.07	100.0	H	121.0	3.4
3588.600000	55.87	---	68.20	12.33	100.0	H	165.0	5.9
3919.700000	---	47.65	54.00	6.35	100.0	V	359.0	6.4
4938.666667	---	49.99	54.00	4.01	100.0	V	321.0	8.8
5490.966667	59.70	---	68.20	8.50	200.0	H	346.0	9.1
7899.433333	62.62	---	68.20	5.58	100.0	V	170.0	12.3
11643.333333	---	53.28	54.00	0.72	200.0	H	114.0	6.8

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

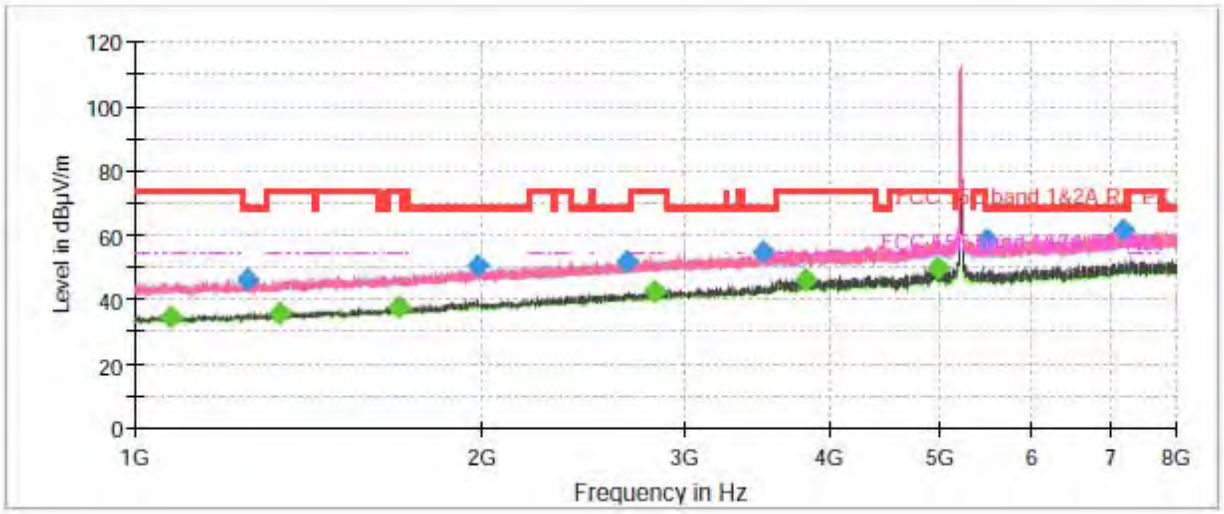


Radiates Emission from 8GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1110.833333	---	33.75	54.00	20.25	200.0	H	131.0	-4.0
1265.766667	45.55	---	68.20	22.65	100.0	V	29.0	-2.9
1368.200000	---	36.71	54.00	17.29	200.0	V	106.0	-2.2
1702.333333	---	37.82	54.00	16.18	200.0	V	106.0	-0.9
1936.833333	49.95	---	68.20	18.25	200.0	H	0.0	0.0
2244.133333	---	39.74	54.00	14.26	200.0	V	133.0	1.2
2644.066667	52.52	---	68.20	15.68	100.0	H	0.0	2.5
2786.633333	---	42.52	54.00	11.48	100.0	H	0.0	3.3
3598.166667	55.43	---	68.20	12.77	200.0	V	0.0	5.8
3915.733333	---	46.96	54.00	7.04	200.0	H	0.0	6.5
5476.266667	58.58	---	68.20	9.62	100.0	H	0.0	9.0
7928.600000	61.96	---	68.20	6.24	100.0	H	0.0	12.4
15532.666667	---	52.65	54.00	1.35	200.0	H	126.0	13.1

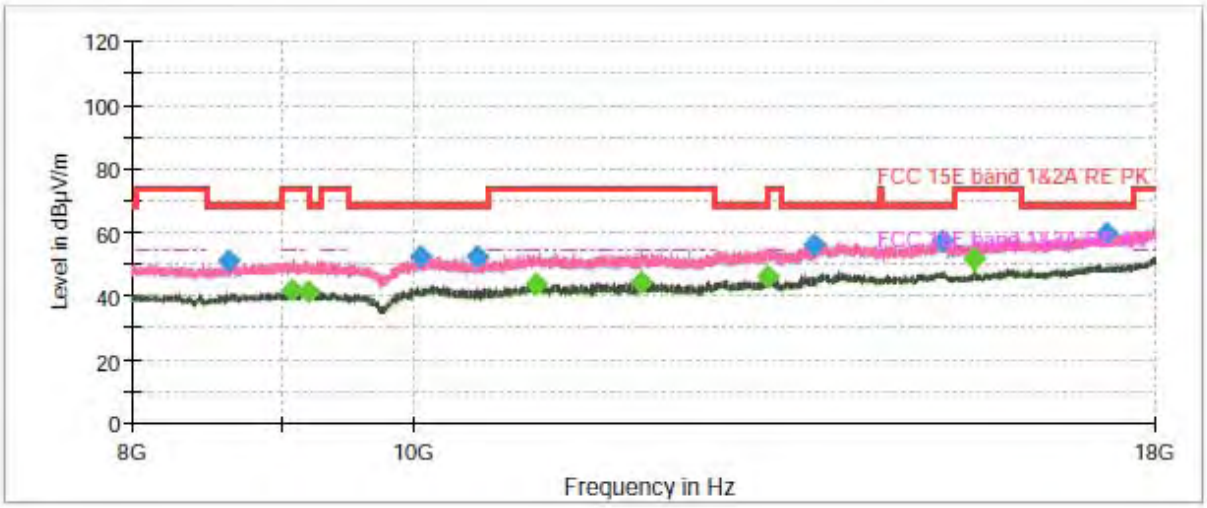
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT20) CH40



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz

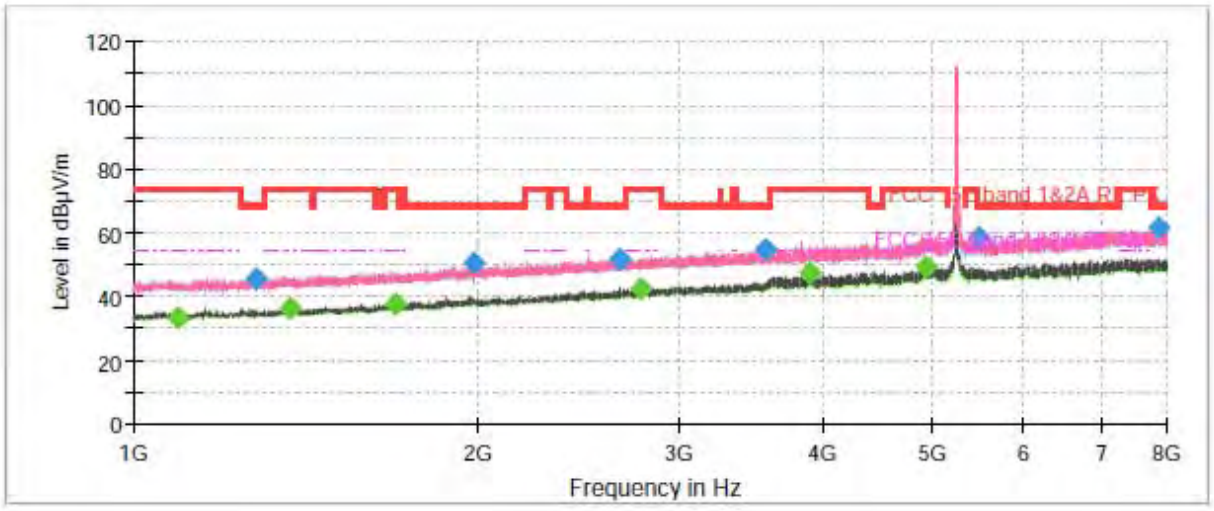


Radiates Emission from 8GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1076.766667	---	34.24	54.00	19.76	200.0	H	288.0	-3.7
1254.566667	46.00	---	68.20	22.20	200.0	V	0.0	-3.0
1336.000000	---	36.00	54.00	18.00	200.0	V	0.0	-2.7
1696.733333	---	37.56	54.00	16.44	200.0	V	0.0	-0.8
1981.633333	50.22	---	68.20	17.98	200.0	V	0.0	0.7
2671.133333	51.66	---	68.20	16.54	100.0	H	240.0	2.8
2820.000000	---	42.63	54.00	11.37	200.0	V	0.0	3.2
3499.466667	54.68	---	68.20	13.52	200.0	V	0.0	5.5
3821.700000	---	46.43	54.00	7.57	200.0	V	0.0	6.4
4979.266667	---	49.97	54.00	4.03	200.0	V	0.0	8.8
5483.733333	58.64	---	68.20	9.56	200.0	V	0.0	9.0
7186.366667	61.37	---	68.20	6.83	200.0	V	0.0	12.0
15596.666667	---	51.70	54.00	2.30	200.0	H	1.0	13.2

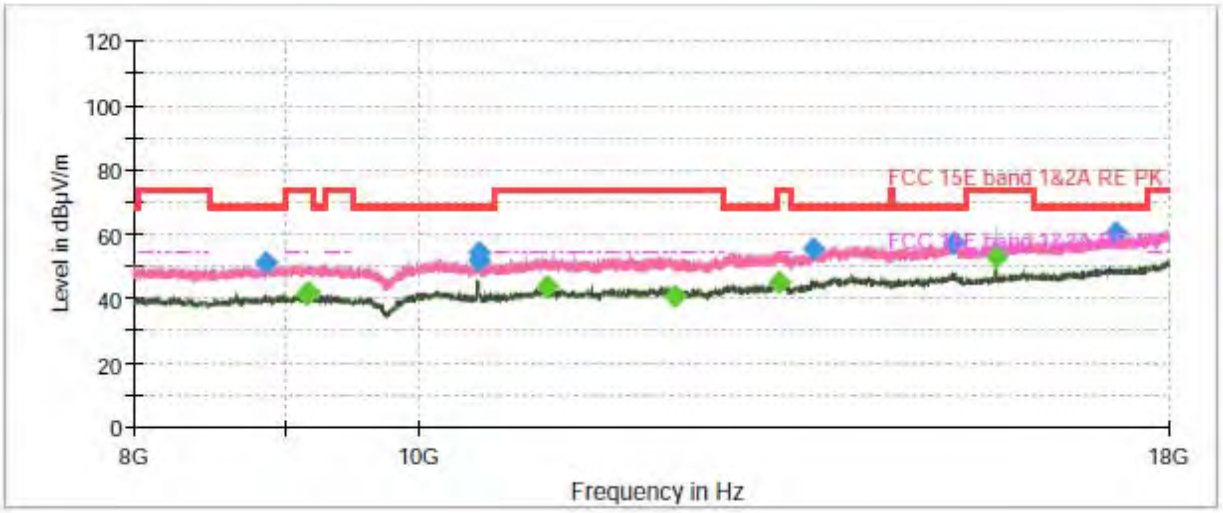
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT20) CH48



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz

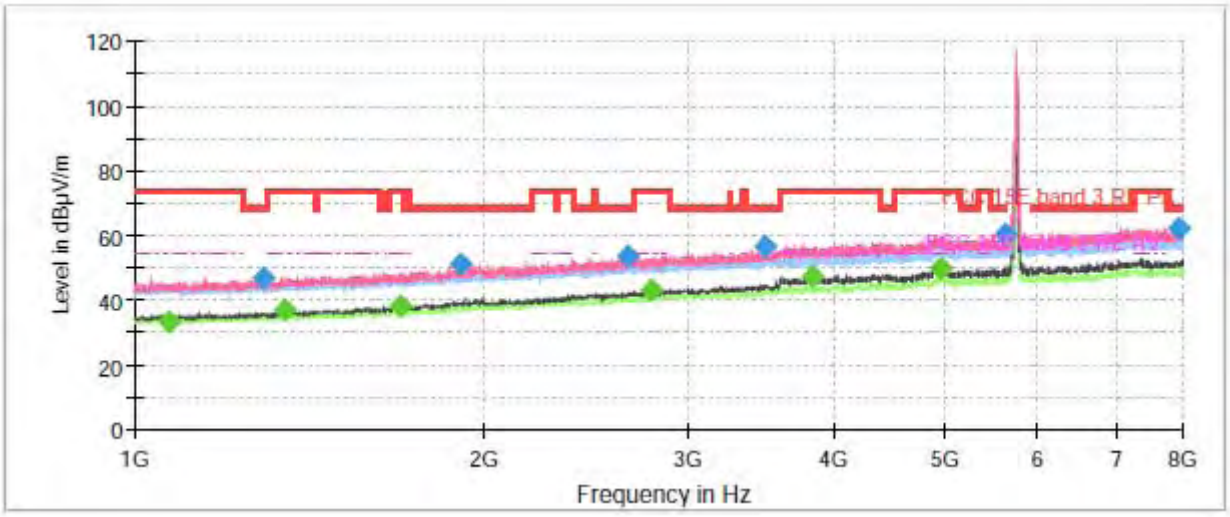


Radiates Emission from 8GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1093.566667	---	33.39	54.00	20.61	200.0	H	67.0	-3.9
1280.000000	45.45	---	68.20	22.75	200.0	H	134.0	-2.8
1369.600000	---	36.43	54.00	17.57	200.0	V	0.0	-2.2
1696.033333	---	37.62	54.00	16.38	200.0	V	0.0	-0.8
1982.100000	50.16	---	68.20	18.04	100.0	V	0.0	0.7
2658.766667	51.72	---	68.20	16.48	200.0	V	0.0	2.6
2771.233333	---	42.38	54.00	11.62	200.0	V	0.0	3.2
3571.333333	54.93	---	68.20	13.27	200.0	V	0.0	5.6
3906.400000	---	47.11	54.00	6.89	200.0	V	0.0	6.6
4917.433333	---	49.36	54.00	4.64	200.0	V	0.0	8.6
5488.633333	58.19	---	68.20	10.01	200.0	V	0.0	9.1
7867.466667	61.66	---	68.20	6.54	200.0	V	0.0	12.3
15721.000000	---	53.21	54.00	0.79	200.0	H	0.0	13.5

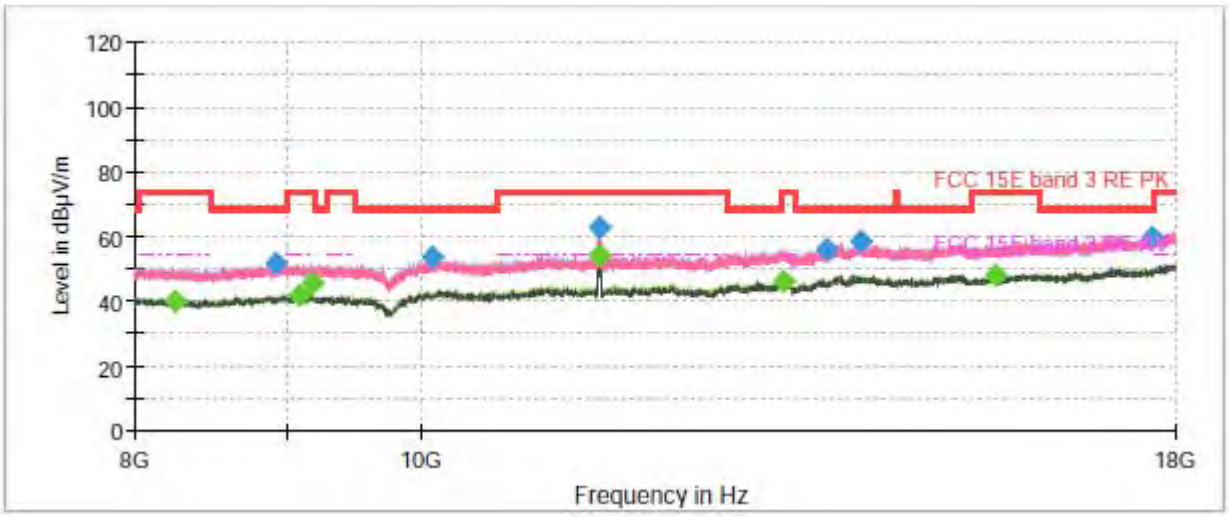
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT20) CH149



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz

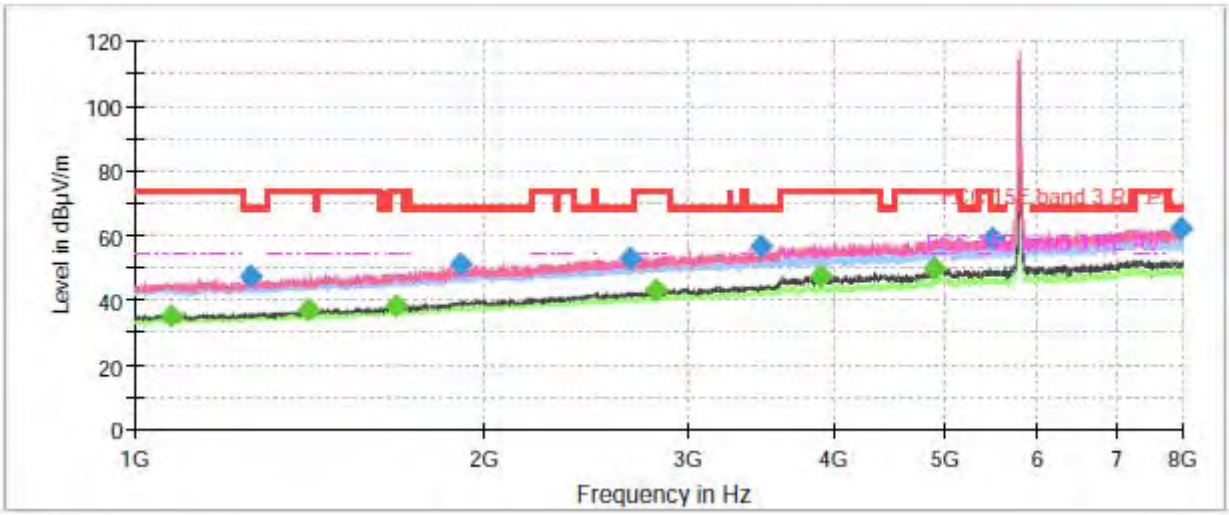


Radiates Emission from 8GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1068.600000	---	33.30	54.00	20.70	100.0	H	65.0	-3.7
1292.366667	46.92	---	68.20	21.28	100.0	V	0.0	-3.0
1345.800000	---	37.16	54.00	16.84	200.0	V	76.0	-2.6
1695.100000	---	38.10	54.00	15.90	200.0	V	63.0	-0.9
1910.933333	51.04	---	68.20	17.16	200.0	V	230.0	0.0
2661.100000	53.73	---	68.20	14.48	200.0	V	104.0	2.6
2787.800000	---	42.82	54.00	11.18	100.0	V	130.0	3.3
3497.833333	56.34	---	68.20	11.86	200.0	V	160.0	5.5
3831.966667	---	47.43	54.00	6.57	100.0	V	321.0	6.2
4954.066667	---	50.04	54.00	3.96	200.0	V	104.0	8.8
5623.266667	60.43	---	68.20	7.77	200.0	V	9.0	9.2
7919.033333	62.22	---	68.20	5.98	100.0	V	186.0	12.4
11496.000000	---	53.98	54.00	0.02	200.0	H	279.0	6.0

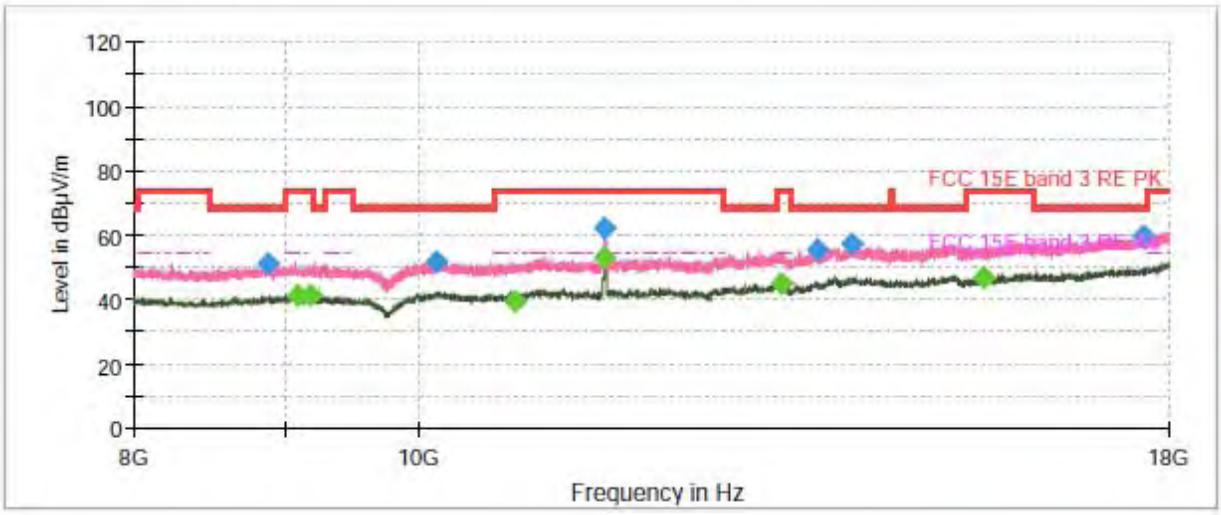
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT20) CH157



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz

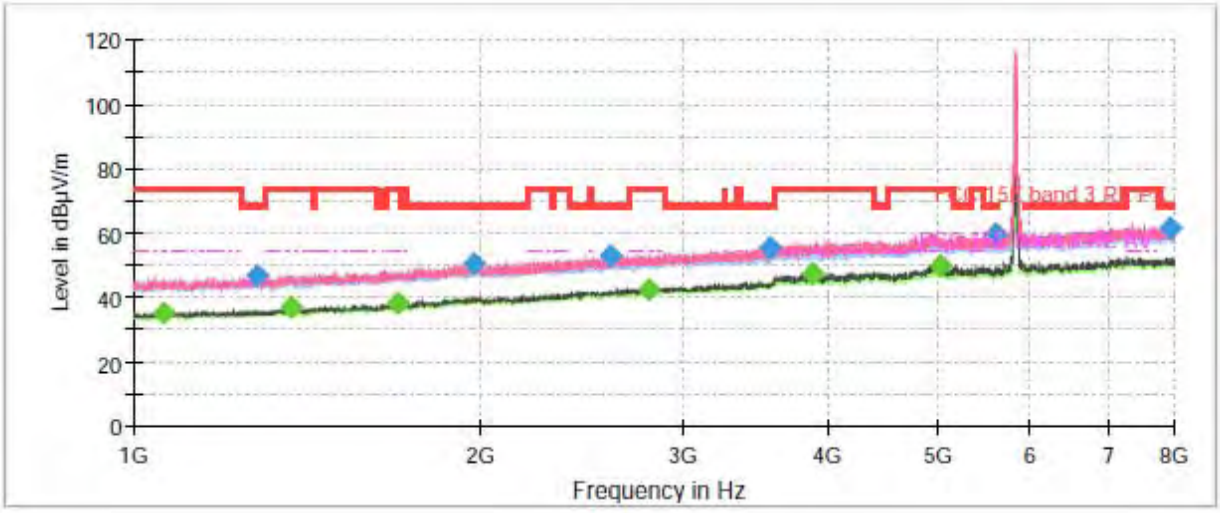


Radiates Emission from 8GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1074.433333	---	34.78	54.00	19.22	200.0	V	76.0	-3.7
1255.733333	47.15	---	68.20	21.05	200.0	V	158.0	-3.0
1411.600000	---	36.70	54.00	17.30	200.0	V	273.0	-2.5
1676.900000	---	38.31	54.00	15.69	200.0	V	0.0	-0.9
1910.000000	51.22	---	68.20	16.98	100.0	V	348.0	0.0
2676.266667	52.70	---	68.20	15.50	200.0	V	259.0	2.9
2814.633333	---	42.87	54.00	11.13	100.0	V	240.0	3.3
3462.366667	56.37	---	68.20	11.83	200.0	V	9.0	5.4
3898.700000	---	47.58	54.00	6.42	200.0	V	0.0	6.6
4882.200000	---	49.79	54.00	4.21	100.0	V	308.0	8.2
5484.433333	59.08	---	68.20	9.12	200.0	V	216.0	9.1
7963.366667	62.26	---	68.20	5.94	200.0	V	186.0	12.3
11568.666667	---	53.11	54.00	0.89	200.0	H	188.0	6.6

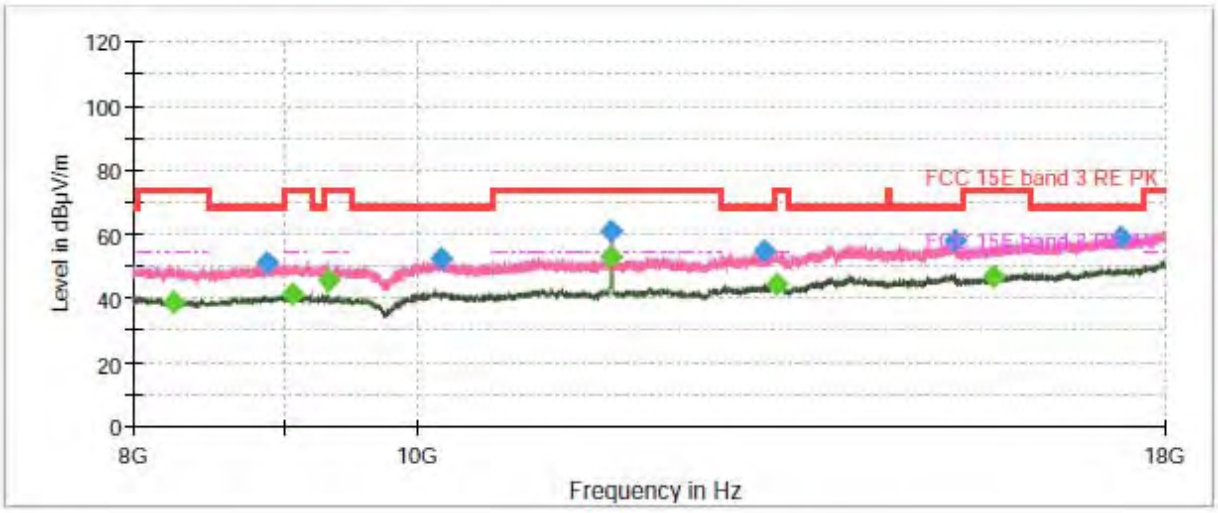
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT20) CH165



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz

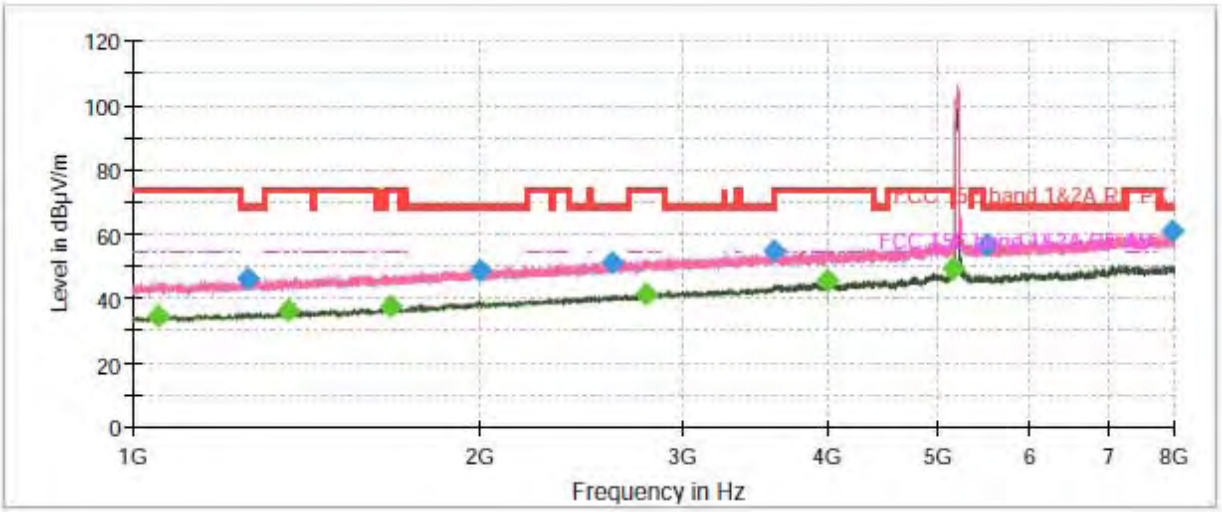


Radiates Emission from 8GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1061.133333	---	35.28	54.00	18.72	100.0	V	158.0	-3.6
1281.633333	46.51	---	68.20	21.69	200.0	H	302.0	-2.8
1372.400000	---	36.68	54.00	17.32	100.0	V	359.0	-2.3
1693.700000	---	38.06	54.00	15.94	100.0	V	212.0	-0.9
1974.866667	50.64	---	68.20	17.56	100.0	V	307.0	0.5
2588.300000	53.04	---	68.20	15.16	100.0	V	320.0	2.5
2801.100000	---	42.64	54.00	11.36	200.0	H	0.0	3.4
3562.233333	55.32	---	68.20	12.88	100.0	V	144.0	5.4
3883.066667	---	47.38	54.00	6.62	100.0	V	334.0	6.2
5000.966667	---	50.10	54.00	3.90	100.0	V	86.0	8.9
5602.033333	59.64	---	68.20	8.56	100.0	V	253.0	9.2
7940.033333	61.77	---	68.20	6.43	100.0	V	280.0	12.4
11644.333333	---	53.20	54.00	0.80	200.0	H	309.0	6.8

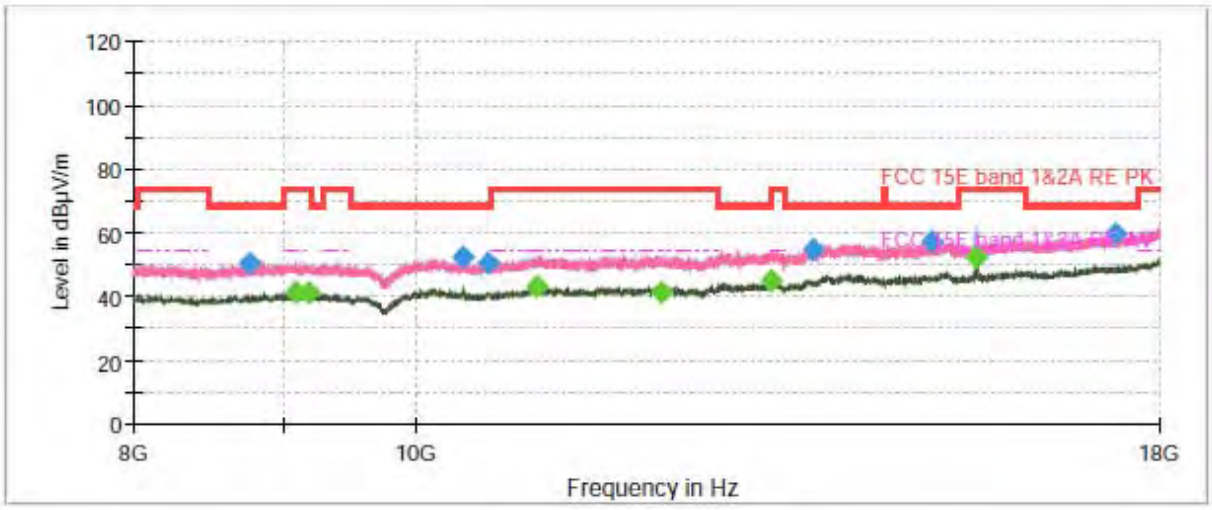
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT40) CH38



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz

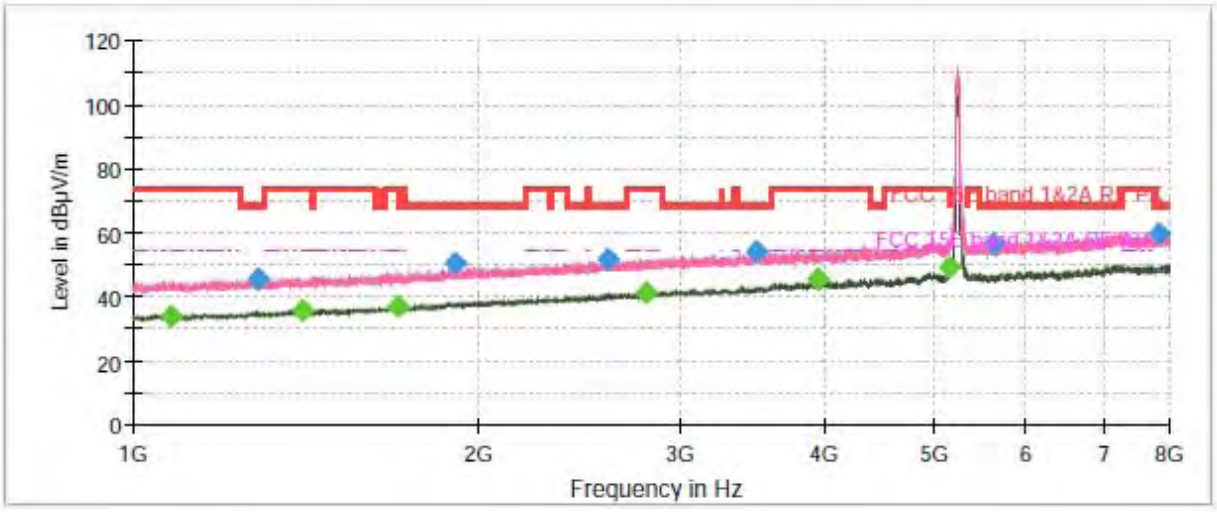


Radiates Emission from 8GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1051.333333	---	34.75	54.00	19.25	100.0	V	71.0	-3.7
1259.933333	46.10	---	68.20	22.10	100.0	H	25.0	-2.9
1361.666667	---	36.26	54.00	17.74	100.0	V	28.0	-2.3
1675.500000	---	37.47	54.00	16.53	100.0	V	0.0	-1.0
1999.833333	48.91	---	68.20	19.29	100.0	H	0.0	0.5
2604.633333	51.38	---	68.20	16.82	100.0	V	235.0	2.4
2791.300000	---	41.45	54.00	12.55	100.0	H	108.0	3.3
3599.100000	54.65	---	68.20	13.55	200.0	V	230.0	5.8
3995.766667	---	45.29	54.00	8.71	100.0	V	99.0	6.9
5148.666667	---	49.37	54.00	4.63	200.0	V	359.0	8.4
5497.033333	56.74	---	68.20	11.46	100.0	V	221.0	9.1
7949.600000	61.21	---	68.20	6.99	200.0	V	107.0	12.3
15575.333333	---	52.41	54.00	1.59	200.0	H	12.0	13.1

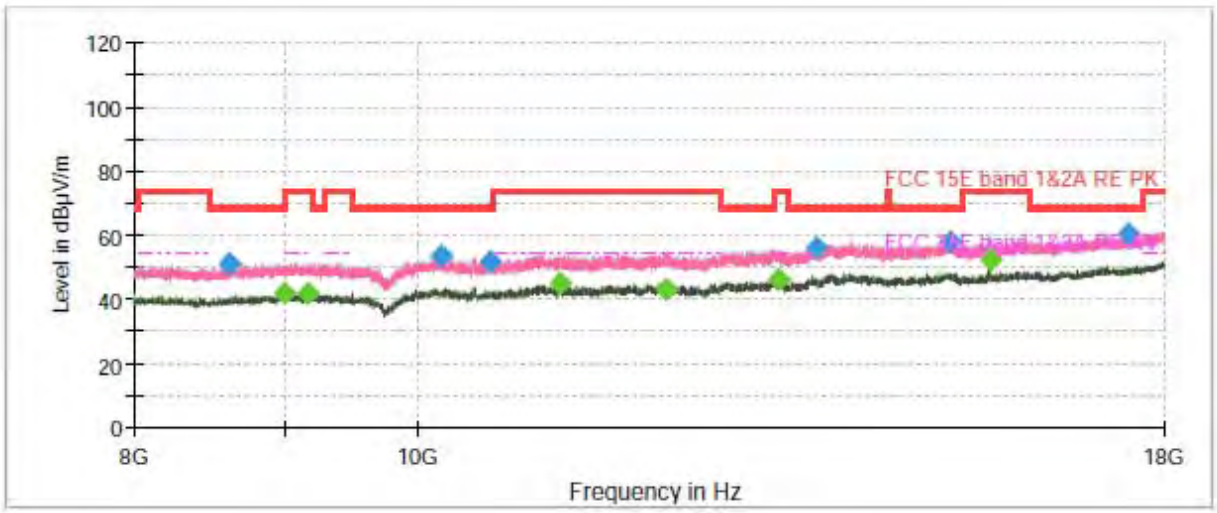
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT40) CH46



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz

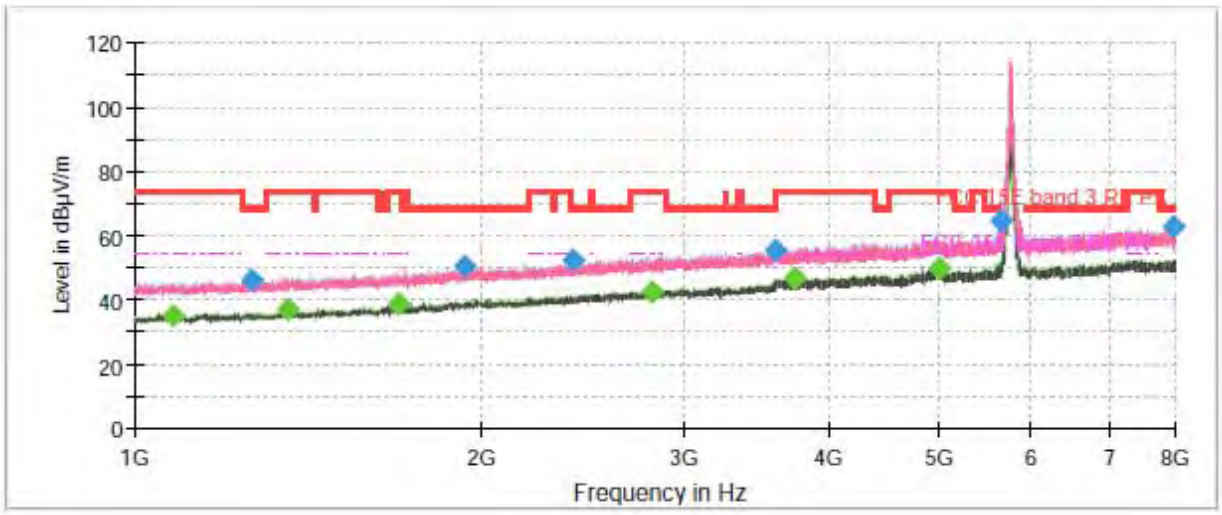


Radiates Emission from 8GHz to 18GHz

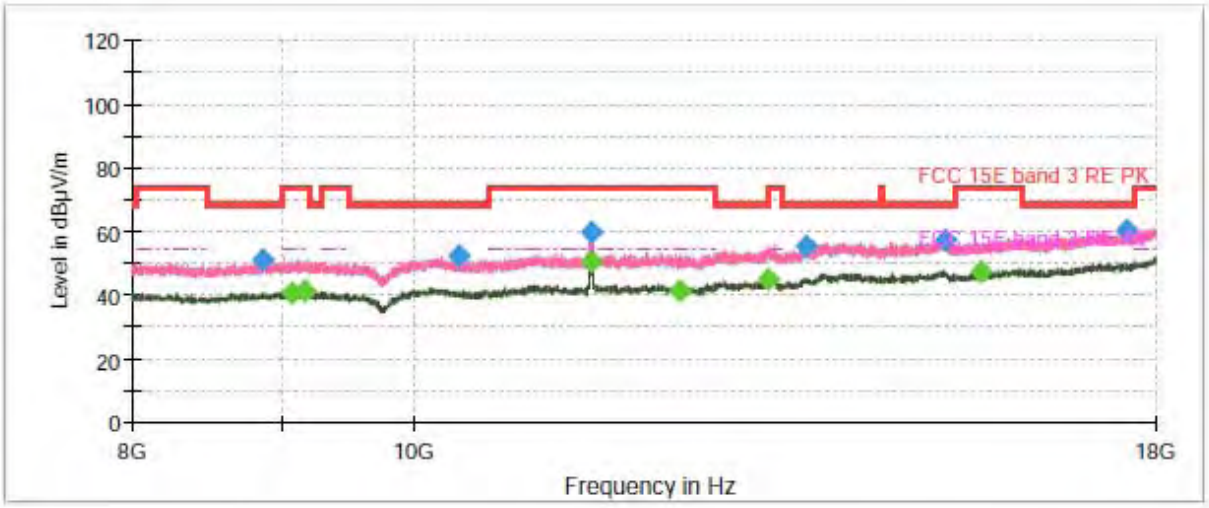
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1077.933333	---	34.07	54.00	19.93	200.0	H	0.0	-3.7
1287.233333	45.84	---	68.20	22.36	200.0	V	245.0	-2.9
1405.300000	---	35.98	54.00	18.02	200.0	H	284.0	-2.6
1702.100000	---	36.86	54.00	17.14	100.0	V	331.0	-0.9
1907.666667	50.51	---	68.20	17.69	200.0	H	145.0	0.0
2593.900000	51.62	---	68.20	16.58	200.0	V	245.0	2.6
2793.866667	---	41.33	54.00	12.67	100.0	H	91.0	3.4
3496.433333	53.99	---	68.20	14.21	200.0	H	297.0	5.5
3944.666667	---	45.25	54.00	8.75	200.0	H	243.0	6.2
5147.733333	---	48.96	54.00	5.04	100.0	H	0.0	8.4
5620.233333	56.87	---	68.20	11.33	200.0	V	217.0	9.3
7824.766667	59.67	---	68.20	8.53	200.0	H	60.0	12.2
15686.333333	---	52.15	54.00	1.85	200.0	H	0.0	13.4

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

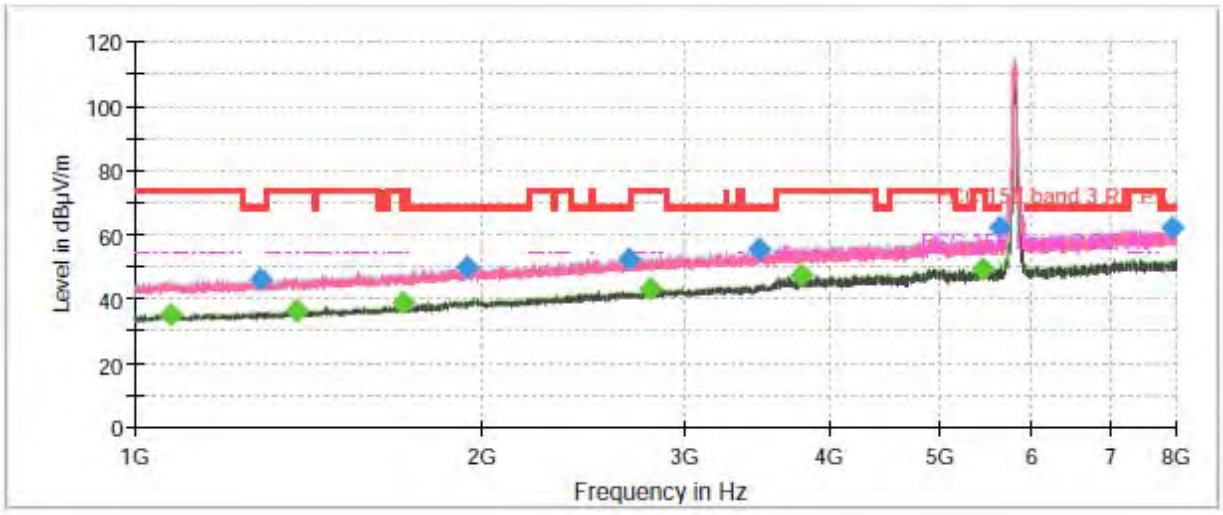


Radiates Emission from 8GHz to 18GHz

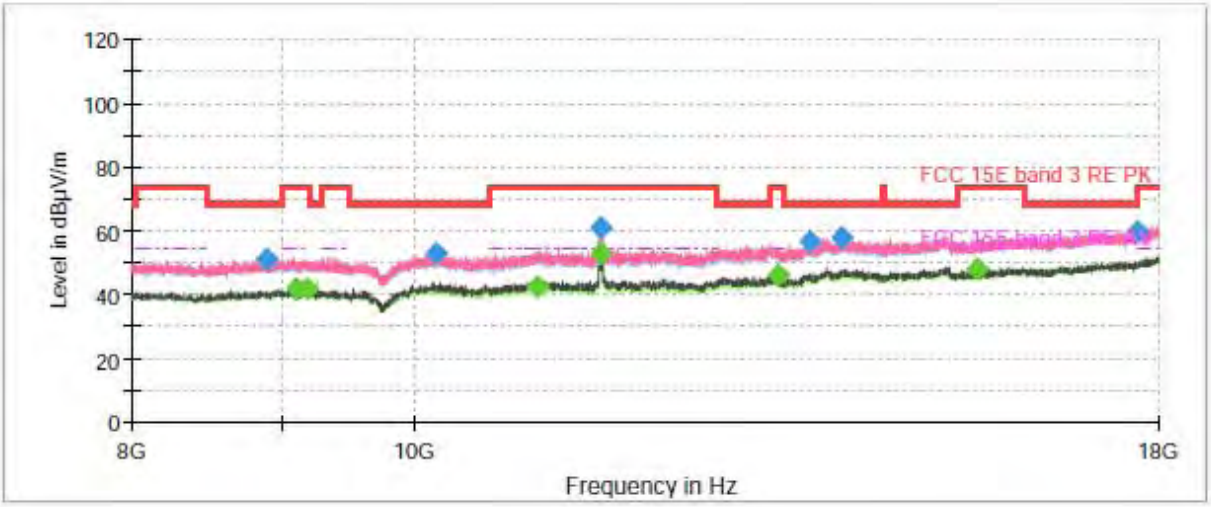
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1077.933333	---	35.22	54.00	18.78	200.0	H	0.0	-3.7
1261.333333	46.15	---	68.20	22.05	200.0	H	327.0	-2.9
1356.766667	---	36.68	54.00	17.32	200.0	H	0.0	-2.4
1696.733333	---	38.52	54.00	15.48	200.0	H	176.0	-0.8
1932.166667	50.55	---	68.20	17.65	200.0	H	342.0	0.0
2399.066667	52.52	---	68.20	15.68	200.0	H	295.0	1.7
2812.300000	---	42.68	54.00	11.32	100.0	V	0.0	3.3
3599.566667	55.36	---	68.20	12.84	200.0	V	0.0	5.8
3737.700000	---	46.98	54.00	7.02	200.0	H	356.0	5.9
5000.266667	---	49.73	54.00	4.27	100.0	V	0.0	8.9
5645.200000	64.58	---	68.20	3.62	200.0	H	356.0	8.9
7976.200000	62.80	---	68.20	5.40	100.0	V	0.0	12.3

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

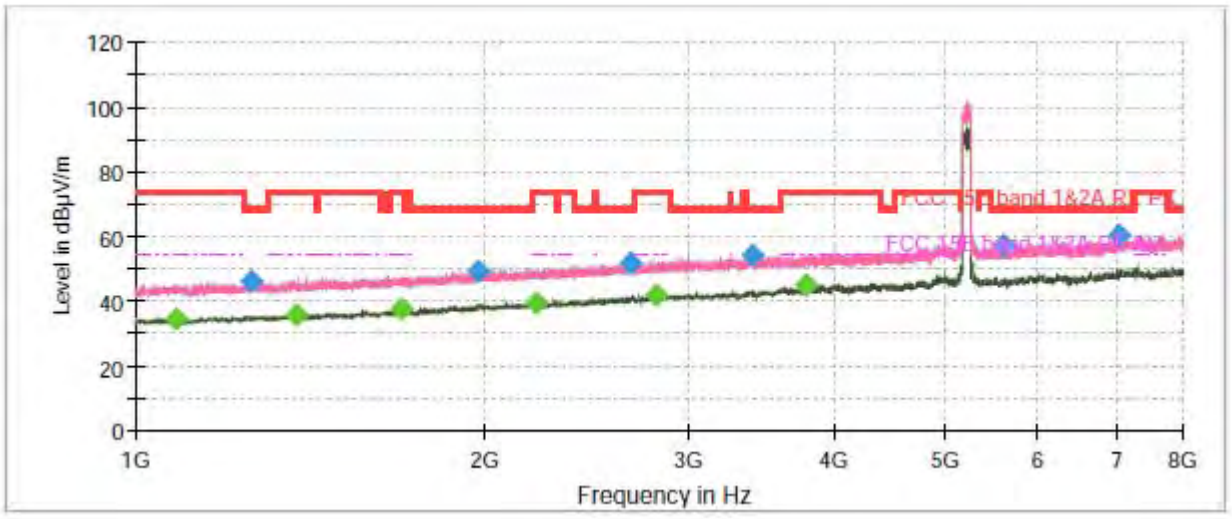


Radiates Emission from 8GHz to 18GHz

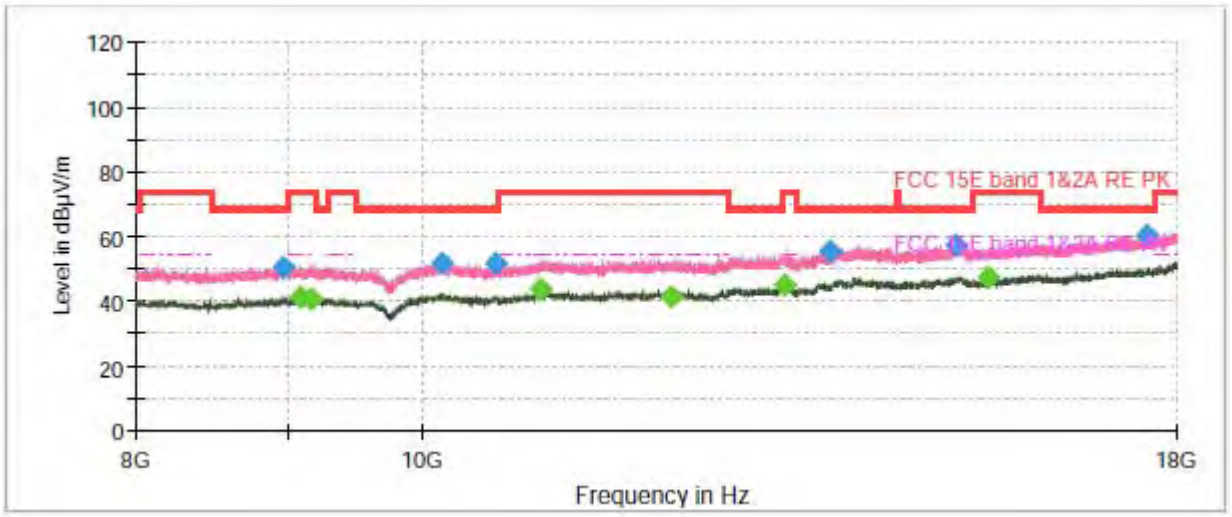
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1073.966667	---	35.06	54.00	18.94	200.0	H	327.0	-3.7
1286.533333	45.96	---	68.20	22.24	200.0	H	312.0	-2.9
1380.800000	---	36.55	54.00	17.45	200.0	V	0.0	-2.5
1708.166667	---	38.47	54.00	15.53	200.0	H	297.0	-1.0
1942.900000	50.07	---	68.20	18.13	200.0	H	252.0	0.1
2676.733333	52.55	---	68.20	15.65	200.0	H	327.0	2.9
2804.133333	---	43.03	54.00	10.97	200.0	H	341.0	3.4
3478.933333	55.14	---	68.20	13.06	200.0	H	341.0	5.3
3782.733333	---	47.49	54.00	6.51	200.0	V	0.0	6.3
5431.233333	---	49.50	54.00	4.50	200.0	H	327.0	8.9
5625.600000	62.27	---	68.20	5.93	200.0	H	355.0	9.2
7920.200000	62.18	---	68.20	6.02	200.0	H	327.0	12.4
11591.000000	---	52.79	54.00	1.21	200.0	H	126.0	6.7

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

802.11ac (VHT80) CH42



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

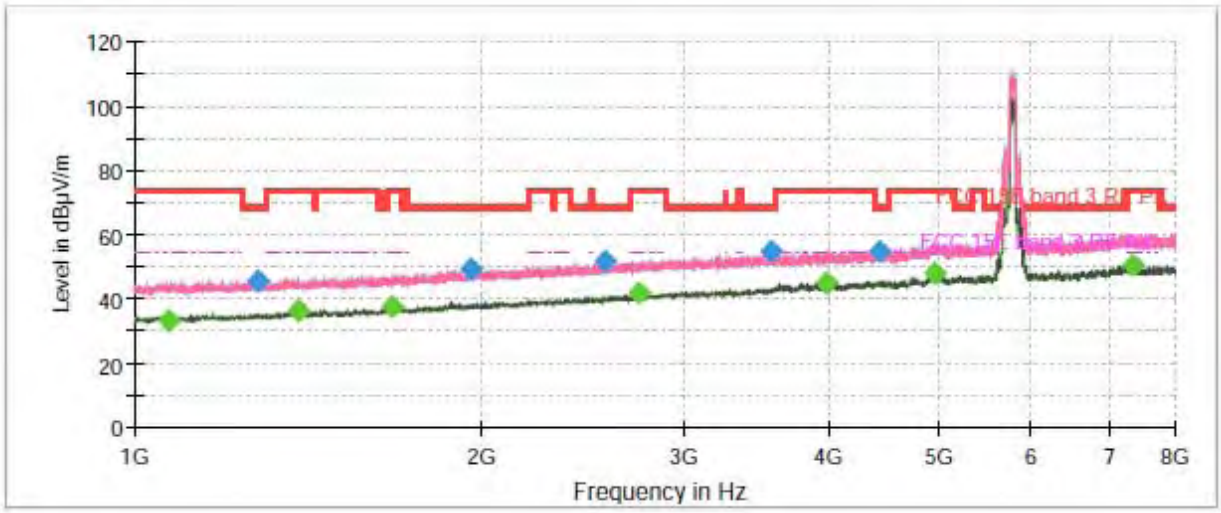


Radiates Emission from 8GHz to 18GHz

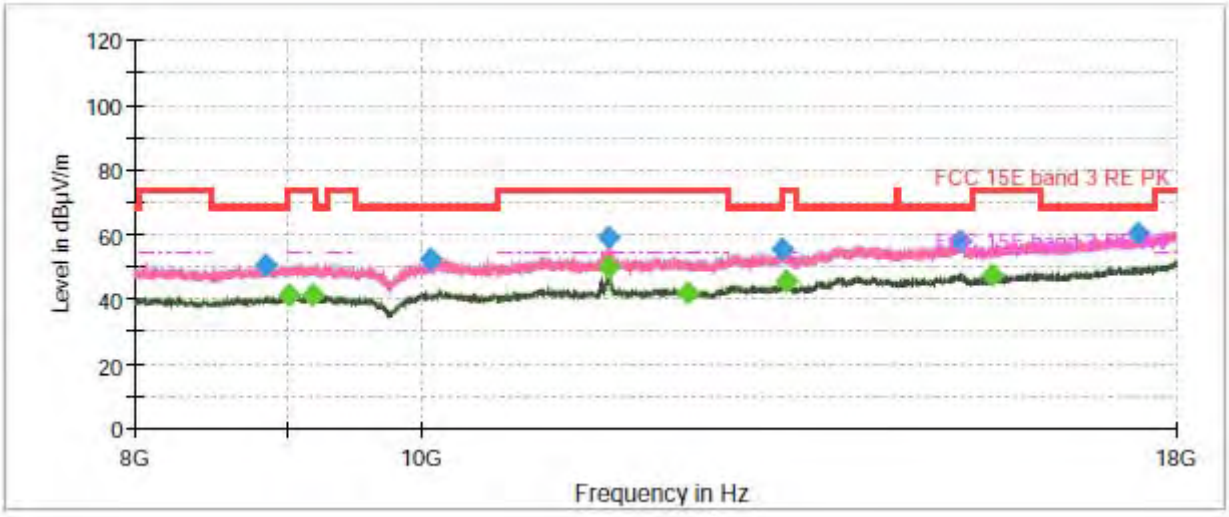
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1084.933333	---	34.73	54.00	19.27	100.0	V	183.0	-3.8
1257.133333	45.87	---	68.20	22.33	100.0	V	0.0	-3.0
1374.966667	---	35.81	54.00	18.19	100.0	H	10.0	-2.4
1693.933333	---	37.40	54.00	16.60	200.0	H	291.0	-0.9
1978.366667	49.13	---	68.20	19.07	200.0	V	217.0	0.6
2218.233333	---	39.38	54.00	14.62	200.0	H	304.0	1.2
2666.233333	51.74	---	68.20	16.46	100.0	V	305.0	2.7
2805.533333	---	41.64	54.00	12.36	200.0	H	334.0	3.4
3410.100000	54.21	---	68.20	13.99	100.0	H	122.0	5.1
3785.766667	---	44.97	54.00	9.03	100.0	V	211.0	6.4
5600.866667	57.42	---	68.20	10.78	200.0	H	334.0	9.2
7055.233333	60.08	---	68.20	8.12	200.0	H	155.0	11.8

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

802.11ac (VHT80) CH155



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

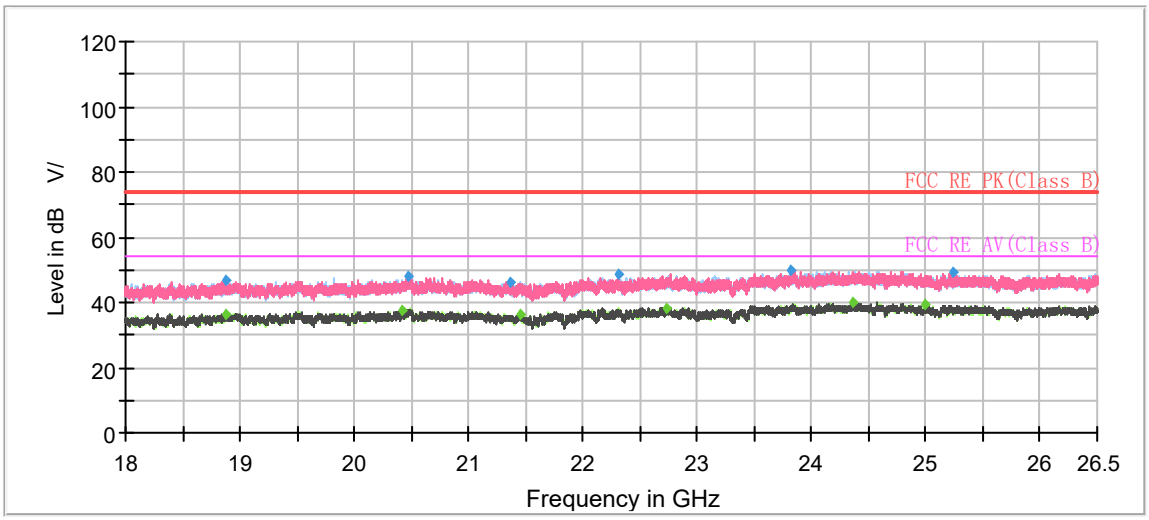


Radiates Emission from 8GHz to 18GHz

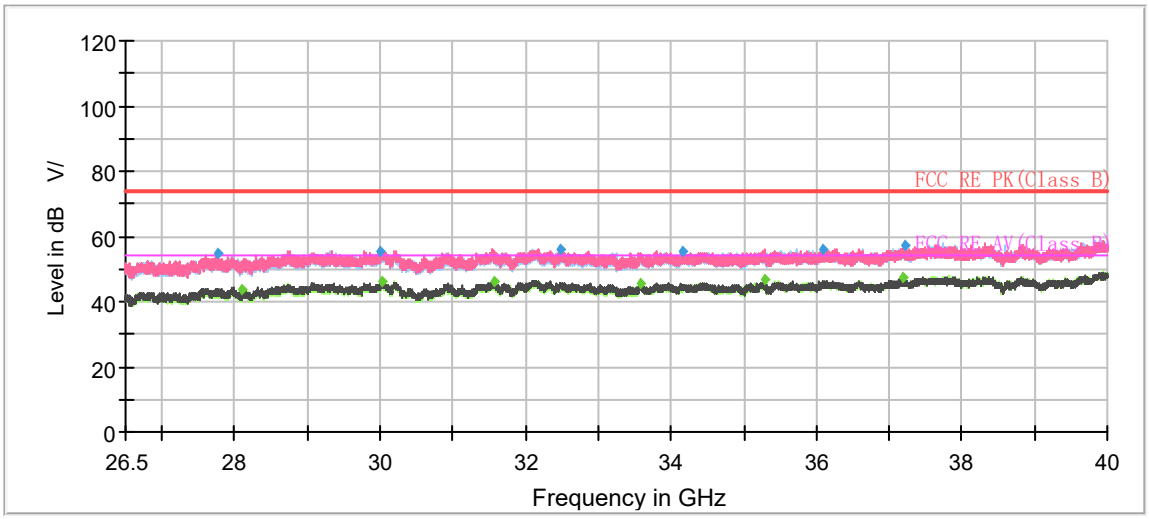
Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1068.366667	---	33.49	54.00	20.51	100.0	H	176.0	-3.7
1277.900000	45.65	---	68.20	22.55	200.0	V	148.0	-2.8
1385.466667	---	36.10	54.00	17.90	200.0	H	225.0	-2.5
1675.966667	---	37.28	54.00	16.72	200.0	V	135.0	-1.0
1954.800000	49.43	---	68.20	18.77	200.0	V	121.0	0.3
2562.866667	51.67	---	68.20	16.53	100.0	V	358.0	2.2
2741.833333	---	41.70	54.00	12.30	100.0	V	168.0	2.9
3568.066667	55.01	---	68.20	13.19	100.0	H	150.0	5.5
3985.500000	---	44.94	54.00	9.06	200.0	V	52.0	6.6
4433.500000	54.76	---	68.20	13.44	200.0	V	162.0	7.3
4940.066667	---	47.71	54.00	6.29	200.0	V	216.0	8.8
7339.900000	---	50.45	54.00	3.55	200.0	V	189.0	12.2

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), Channel 149 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

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
18883.716667	---	36.45	54.00	17.55	200.0	H	0.0	-2
18883.716667	46.57	---	74.00	27.43	200.0	H	0.0	-2
20425.616667	---	37.82	54.00	16.18	100.0	V	331.0	0
20468.683333	47.89	---	74.00	26.11	200.0	V	85.0	0
21356.650000	46.42	---	74.00	27.58	100.0	V	80.0	0
21449.866667	---	36.24	54.00	17.76	100.0	V	0.0	0
22316.583333	48.39	---	74.00	25.61	100.0	H	167.0	2
22730.250000	---	38.46	54.00	15.54	100.0	V	0.0	2
23825.333333	49.62	---	74.00	24.38	100.0	H	230.0	2
24362.250000	---	39.80	54.00	14.20	200.0	H	123.0	3
24993.233333	---	39.43	54.00	14.57	100.0	V	0.0	3
25244.266667	49.19	---	74.00	24.81	200.0	H	338.0	3

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

5.6. Conducted Emission

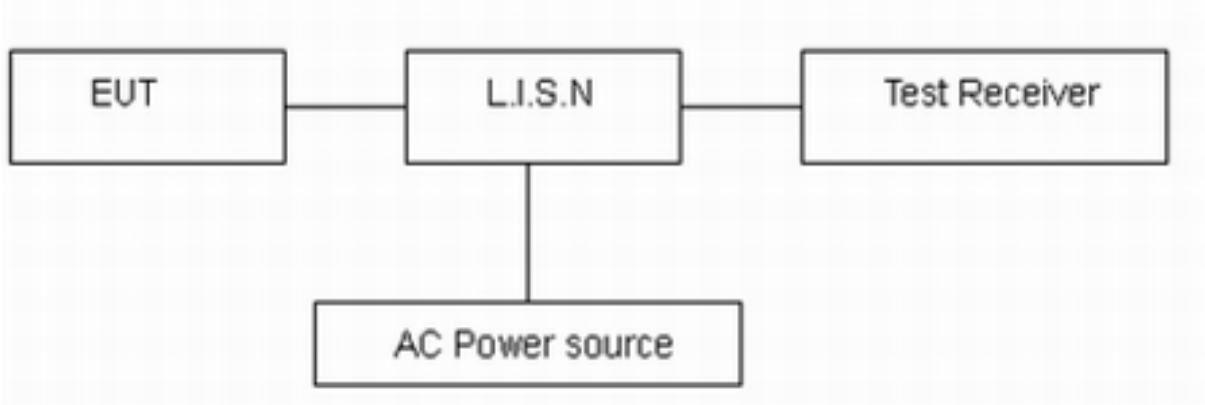
Ambient condition

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.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

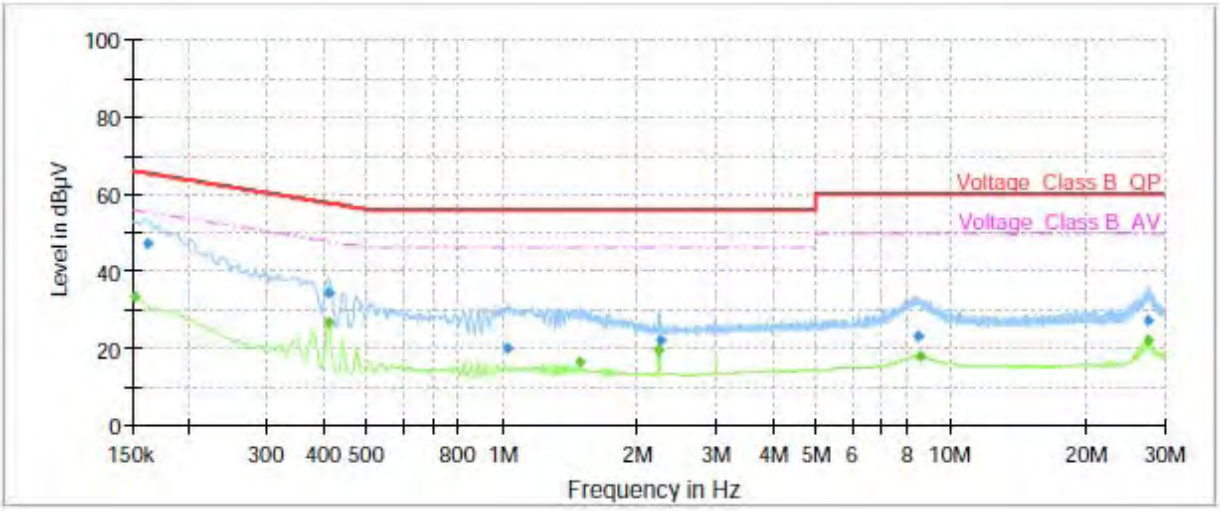
Frequency (MHz)	Conducted Limits(dBμV)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46*
0.5 - 5	56	46
5 - 30	60	50
*: Decreases with the logarithm of the frequency.		

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:

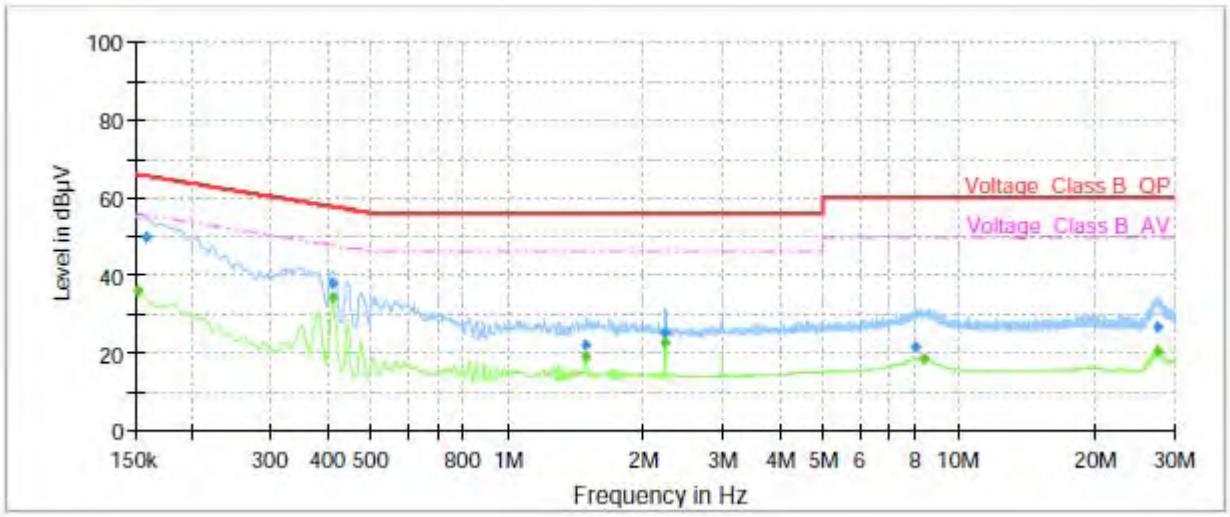
Following plots, Blue trace uses the peak detection and Green trace uses the average detection. During the test, the Conducted Emission was performed in all modes with all channels, 802.11n (HT20), Channel 149 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.15	---	33.27	55.88	22.61	70.0	9.000	L1	ON	21
0.16	47.10	---	65.40	18.30	70.0	9.000	L1	ON	21
0.41	---	26.80	47.67	20.87	70.0	9.000	L1	ON	20
0.41	34.51	---	57.63	23.12	70.0	9.000	L1	ON	20
1.03	19.88	---	56.00	36.12	70.0	9.000	L1	ON	20
1.49	---	16.56	46.00	29.44	70.0	9.000	L1	ON	20
2.24	---	19.38	46.00	26.62	70.0	9.000	L1	ON	19
2.24	22.00	---	56.00	34.00	70.0	9.000	L1	ON	19
8.47	23.33	---	60.00	36.67	70.0	9.000	L1	ON	20
8.50	---	18.12	50.00	31.88	70.0	9.000	L1	ON	20
27.38	27.29	---	60.00	32.71	70.0	9.000	L1	ON	20
27.38	---	22.07	50.00	27.93	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)
0.15	---	35.75	55.88	20.13	70.0	9.000	N	ON	21
0.16	49.56	---	65.52	15.96	70.0	9.000	N	ON	21
0.41	---	34.26	47.63	13.37	70.0	9.000	N	ON	20
0.41	37.76	---	57.63	19.87	70.0	9.000	N	ON	20
1.49	---	18.82	46.00	27.18	70.0	9.000	N	ON	20
1.49	21.96	---	56.00	34.04	70.0	9.000	N	ON	20
2.24	25.20	---	56.00	30.80	70.0	9.000	N	ON	20
2.24	---	22.66	46.00	23.34	70.0	9.000	N	ON	20
8.02	21.35	---	60.00	38.65	70.0	9.000	N	ON	20
8.40	---	18.38	50.00	31.62	70.0	9.000	N	ON	20
27.38	26.54	---	60.00	33.46	70.0	9.000	N	ON	20
27.38	---	20.41	50.00	29.59	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	FSV30	100815	2020-12-13	2021-12-12
Horn Antenna	Schwarzbeck	BBHA 9120D	1594	2020-12-17	2021-12-16
Spectrum Analyzer	KEYSIGHT	N9020A	MY54420163	2020-12-13	2021-12-12
Thermostat	ESPEC	SU-242	93000506	2020-12-13	2021-12-12
Power Sensor	R&S	NRP18S	101954	2021-05-15	2022-05-14
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.