RF TEST REPORT

Applicant	HMD Global Oy
FCC ID	2AJOTTA-1223
Product	mobile phone
Brand	Nokia
Model	TA-1223
Report No.	R2001A0040-R5
Issue Date	March 13, 2020

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

Performed by: Peng Tao

Approved by: Kai Xu

TA Technology (Shanghai) Co., Ltd.

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TABLE OF CONTENT

Summary of measurement results

Number	Test Case	Clause in FCC rules	Verdict
1	Average conducted 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: January 16, 2020 ~ February 28, 2020			
Note: 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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Telephone:	+86-021-50791141/2/3
Fax:	+86-021-50791141/2/3-8000
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E-mail:	xukai@ta-shanghai.com

2. General Description of Equipment under Test

2.1. Applicant and Manufacturer Information

Applicant	HMD Global Oy
Applicant address	Bertel Jungin aukio 9,02600 ESPOO. FINLAND
Manufacturer	HMD Global Oy
Manufacturer address	Bertel Jungin aukio 9,02600 ESPOO. FINLAND

2.2. General information

EUT Description	
Model	TA-1223
IMEI	IMEI 1:355795100012570 IMEI 2:355795100015342
Hardware Version	LLDM528
Software Version	LLDB7749
Power Supply	Battery/AC adapter
Antenna Type	Internal Antenna
Antenna Gain	-1 dBi
Directional Gain	NA
Test Mode(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	13.05 dBm
Operating Frequency Range(s)	U-NII-1: 5150-5250MHz U-NII-3: 5725-5850MHz
Operating temperature range:	-10 ° C to 55° C
Operating voltage range:	3.6 V to 4.4 V
State DC voltage:	3.8V
EUT Accessory	
Adapter 1	Manufacturer: SHENZHEN TIANYIN ELECTRONICS CO.,LTD. Model: CH-21E
Adapter 2	Manufacturer: Jiangsu Chenyang Electron Co., Ltd. Model: AD-10WE
Adapter 3	Manufacturer: SHENZHEN TIANYIN ELECTRONICS CO.,LTD. Model: CH-21U
Adapter 4	Manufacturer: SHENZHEN TIANYIN ELECTRONICS CO.,LTD.

	Model: CH-21N
Adapter 5	Manufacturer: SHENZHEN TIANYIN ELECTRONICS CO.,LTD. Model: CH-21X
Adapter 6	Manufacturer: SHENZHEN TIANYIN ELECTRONICS CO.,LTD. Model: CH-21A
Adapter 7	Manufacturer: DONGGUAN AOHAI POWER TECHNOLOGY CO.,LTD. Model: AD-10WR
Adapter 8	Manufacturer: SHENZHEN TIANYIN ELECTRONICS CO.,LTD. Model: CH-21B
Battery 1	Manufacturer: Jiade Energy Technology（Zhuhai）Co., Ltd. Model: LC-620U
Battery 2	Manufacturer: Veken Model: LC-620U
Earphone 1	Manufacturer: Huizhou New Leader Industry Co., Ltd. Model: NLD-EM300M-03SF
Earphone 2	Manufacturer: Xiaolin Electronics Model: XL-5178
USB Cable 1	Manufacturer: Xiamen Li Qi Electronics Co., Ltd. Model: LQ03500090
USB Cable 2	Manufacturer: Saibao (Jiangxi) Industrial Co. , Ltd. Model: SLQ-A125A
Note:1. The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant. 2. There is more than one Adapter, Battery, Earphone and USB Cable, each one should be applied throughout the compliance test respectively, and however, only the worst case (Adapter 1, Battery 1) will be recorded in this report.	

3. Applied Standards

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

Test standards:

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

ANSI C63.10 (2013)

Reference standard:

KDB 789033 D02 General UNII Test Procedures New Rules v02r01

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 lie-down position (X 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.

Band	**Data Rate**
802.11a	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT20	MCS0
802.11ac VHT40	MCS0
802.11ac VHT80	MCS0

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.

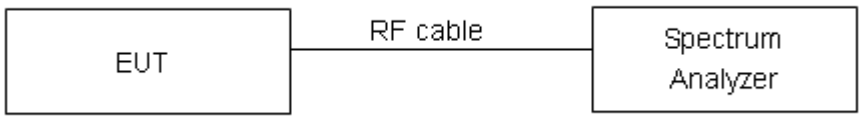
For U-NII-1/U-NII-2A/U-NII-2C, set RBW ≈1% OCB kHz, VBW ≥ 3 × RBW, measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 26 dB relative to the maximum level measured in the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

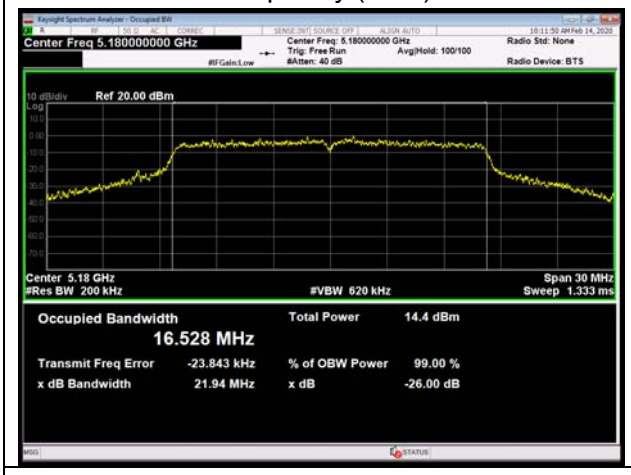
Network Standards	Carrier frequency (MHz)	99% bandwidth (MHz)	Minimum 26 dB bandwidth (MHz)	Conclusion
802.11a	5180	16.5281	21.9426	PASS
	5200	16.5077	22.0102	PASS
	5240	16.5145	21.6928	PASS
802.11n HT20	5180	17.726	22.3361	PASS
	5200	17.734	22.8089	PASS
	5240	17.740	22.9183	PASS
802.11n HT40	5190	36.1752	41.3039	PASS
	5230	36.1697	41.3574	PASS
802.11ac VHT20	5180	17.7371	22.552	PASS
	5200	17.7656	22.3901	PASS
	5240	17.7488	22.4892	PASS
802.11ac VHT40	5190	36.1919	41.5015	PASS
	5230	36.1797	40.8428	PASS
802.11ac VHT80	5210	75.6845	94.4759	PASS

U-NII-3

Network Standards	Carrier frequency (MHz)	99% bandwidth (MHz)	Minimum 6 dB bandwidth (MHz)	Limit (kHz)	Conclusion
802.11a	5745	16.5576	14.0895	500	PASS
	5785	16.5382	14.3711	500	PASS
	5825	16.5189	15.4422	500	PASS
802.11n HT20	5745	17.7391	16.8012	500	PASS
	5785	17.7708	16.5267	500	PASS
	5825	17.7879	14.0575	500	PASS
802.11n HT40	5755	36.2287	35.2988	500	PASS
	5795	36.1885	35.7118	500	PASS
802.11ac VHT20	5745	17.795	17.1691	500	PASS
	5785	17.7786	15.4312	500	PASS
	5825	17.7387	16.1835	500	PASS
802.11ac VHT40	5755	36.1474	34.9106	500	PASS
	5795	36.1688	35.7217	500	PASS
802.11ac VHT80	5775	75.6797	75.1421	500	PASS

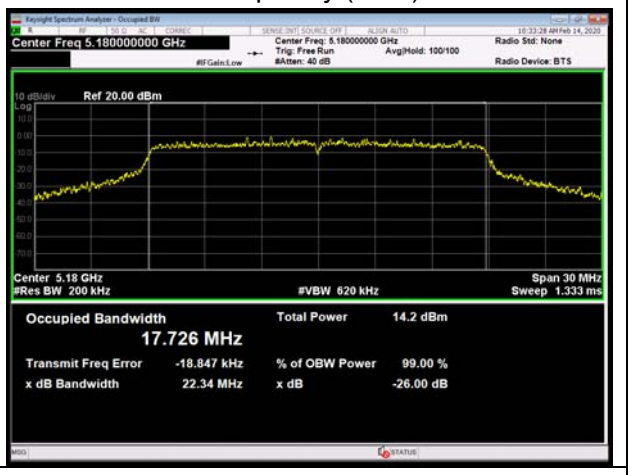
U-NII-1, 802.11a

Carrier frequency (MHz): 5180



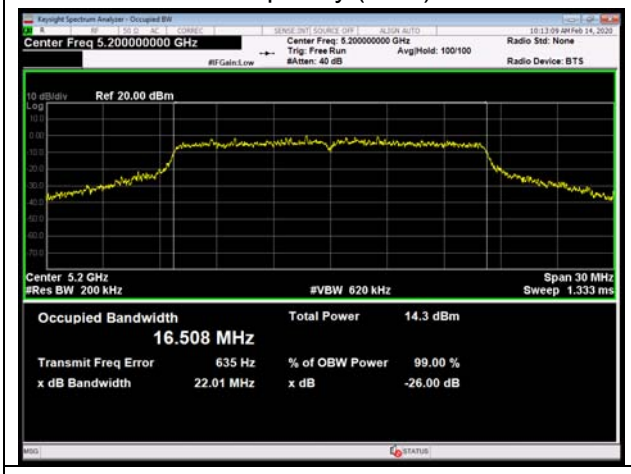
U-NII-1, 802.11n HT20

Carrier frequency (MHz): 5180



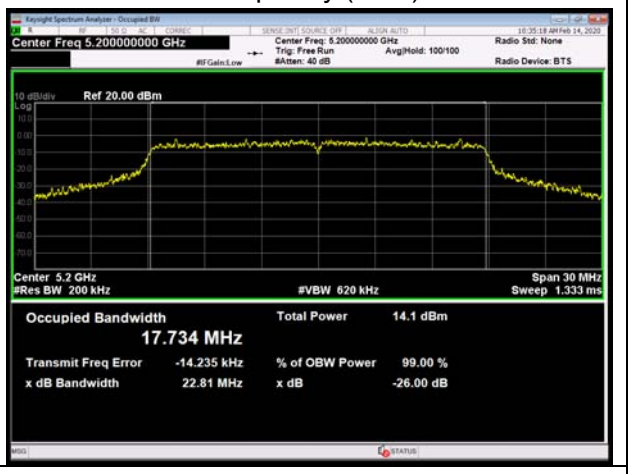
U-NII-1, 802.11a

Carrier frequency (MHz): 5200



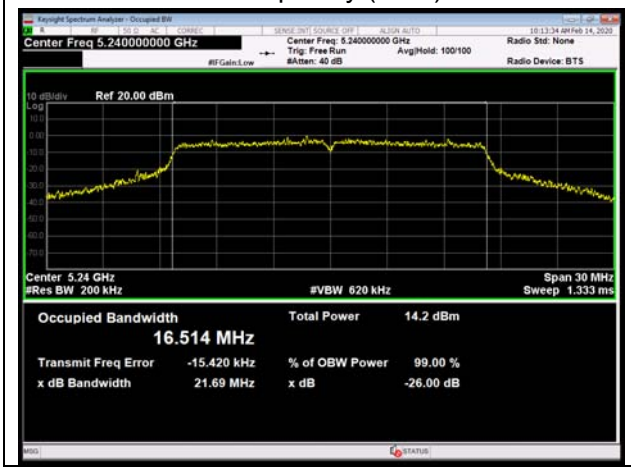
U-NII-1, 802.11n HT20

Carrier frequency (MHz): 5200



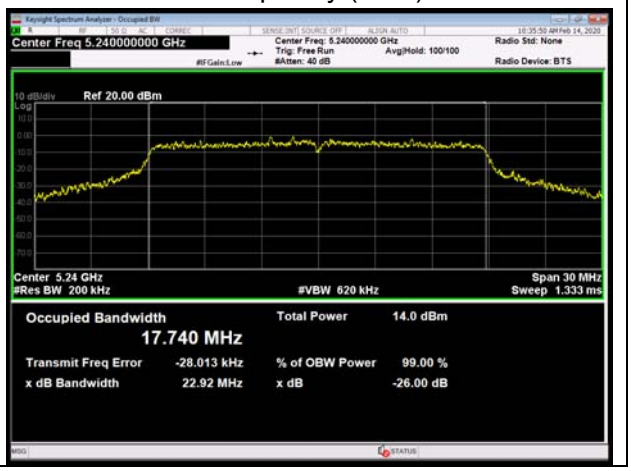
U-NII-1, 802.11a

Carrier frequency (MHz):5240



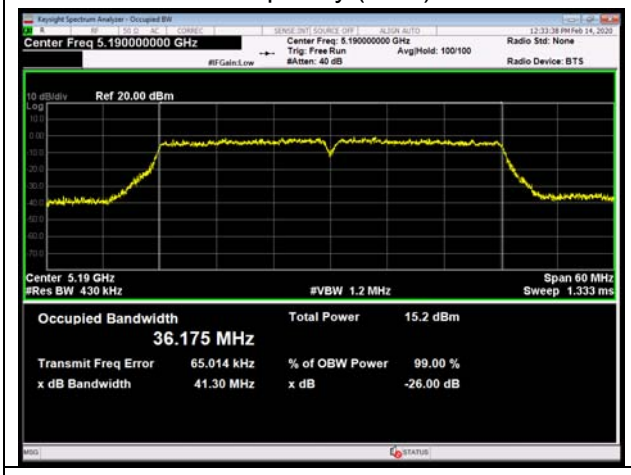
U-NII-1, 802.11n HT20

Carrier frequency (MHz):5240



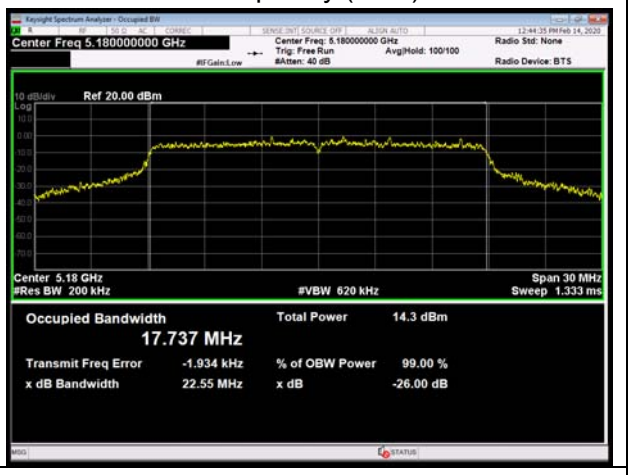
U-NII-1, 802.11n HT40

Carrier frequency (MHz): 5190



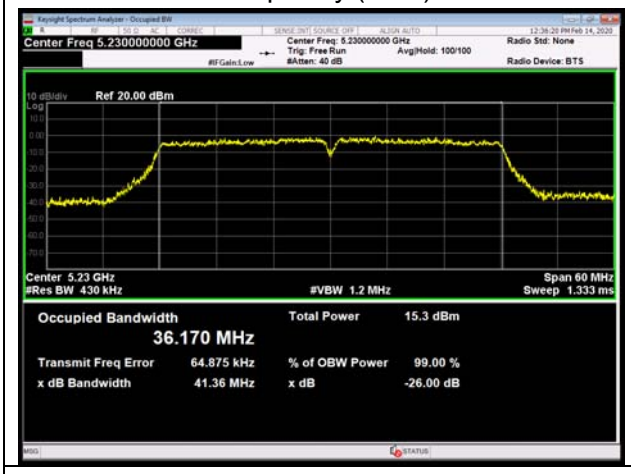
U-NII-1, 802.11ac VHT20

Carrier frequency (MHz): 5180



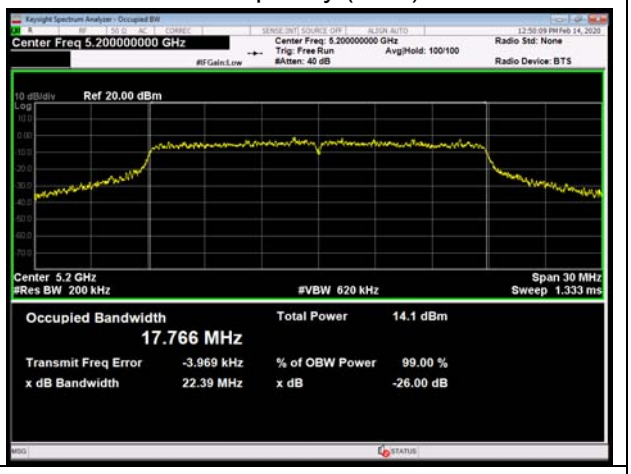
U-NII-1, 802.11n HT40

Carrier frequency (MHz): 5230



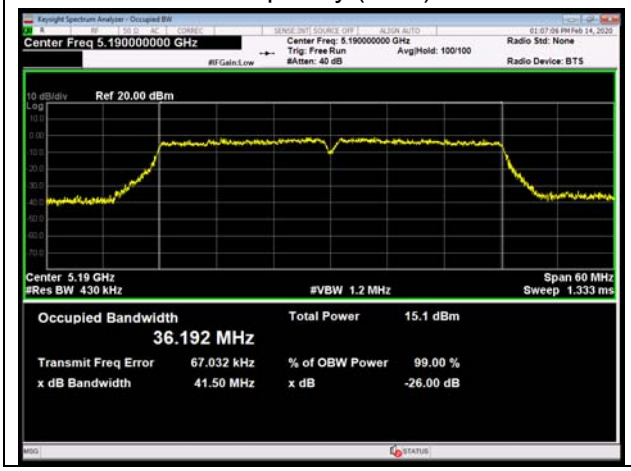
U-NII-1, 802.11ac VHT20

Carrier frequency (MHz): 5200



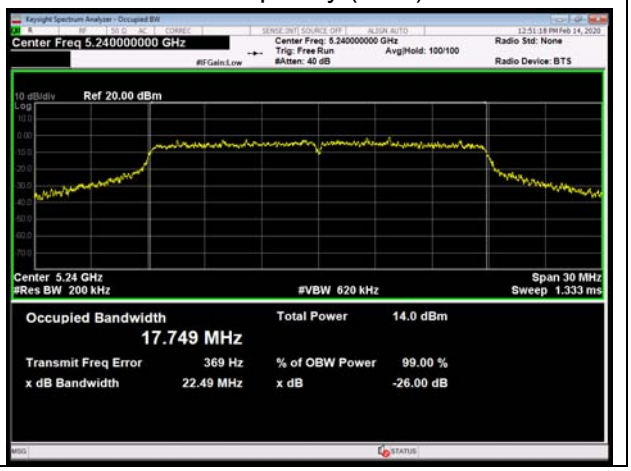
U-NII-1, 802.11ac VHT40

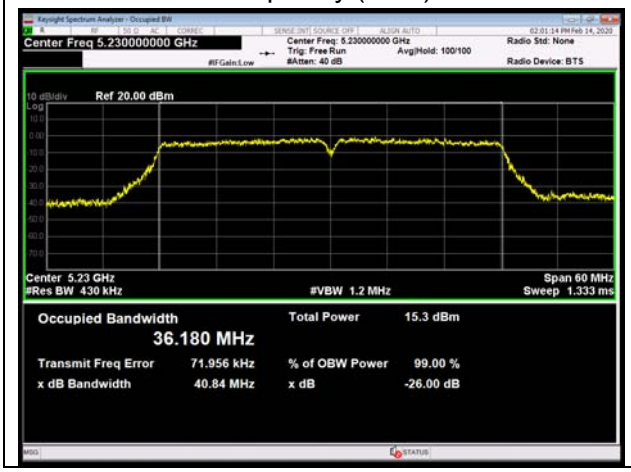
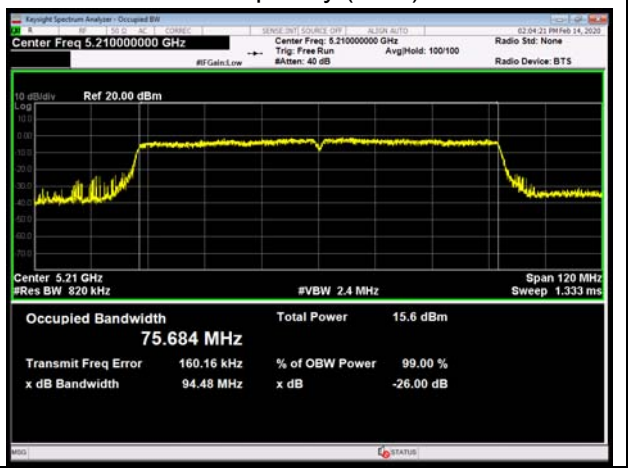
Carrier frequency (MHz): 5190



U-NII-1, 802.11ac VHT20

Carrier frequency (MHz):5240

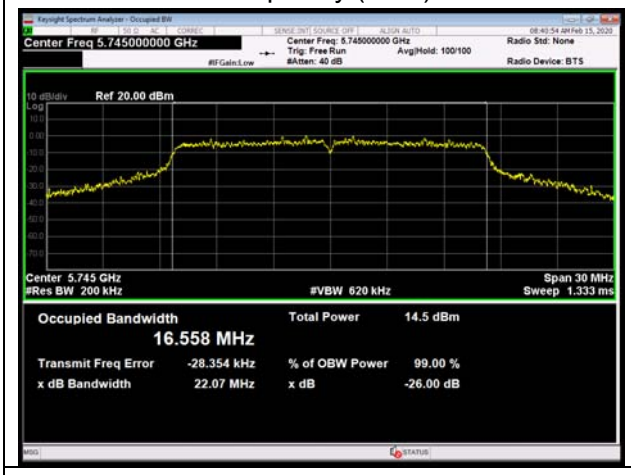


U-NII-1, 802.11ac VHT40 Carrier frequency (MHz): 5230	U-NII-1, 802.11ac VHT80 Carrier frequency (MHz): 5210
	

99% bandwidth

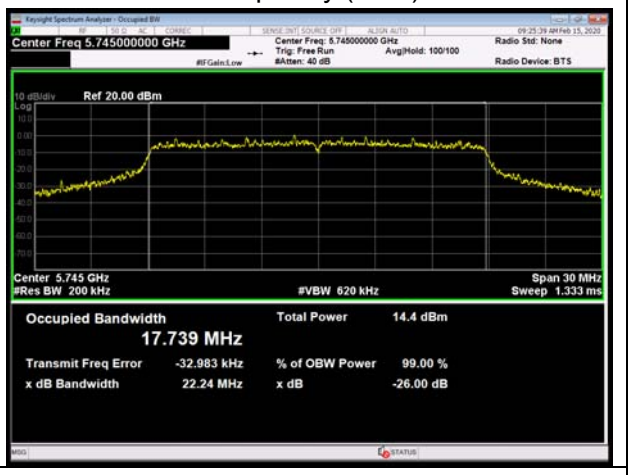
U-NII-3, 802.11a

Carrier frequency (MHz): 5745



U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5745

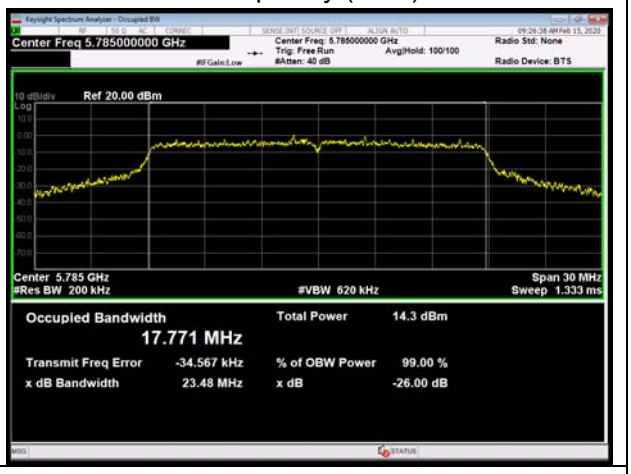


U-NII-3, 802.11a

Carrier frequency (MHz): 5785

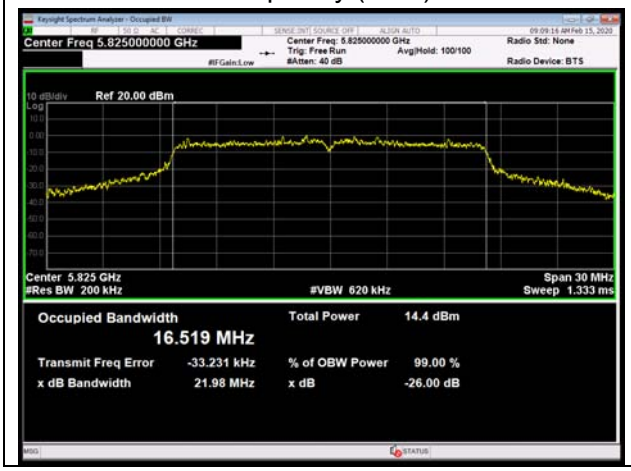
U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5785



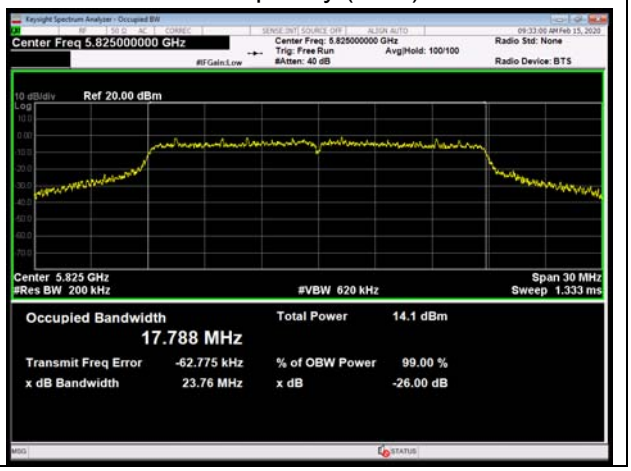
U-NII-3, 802.11a

Carrier frequency (MHz): 5825



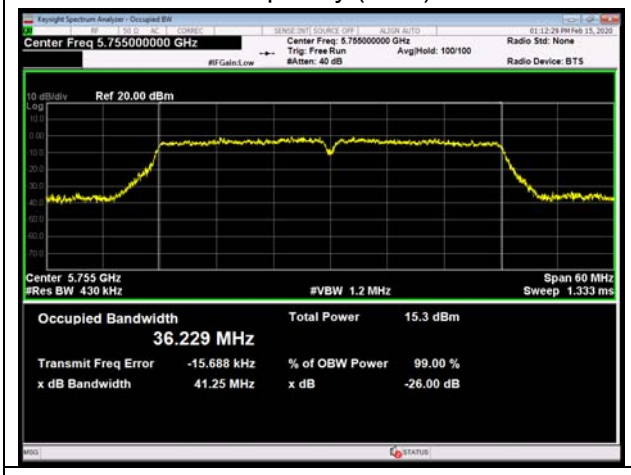
U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5825



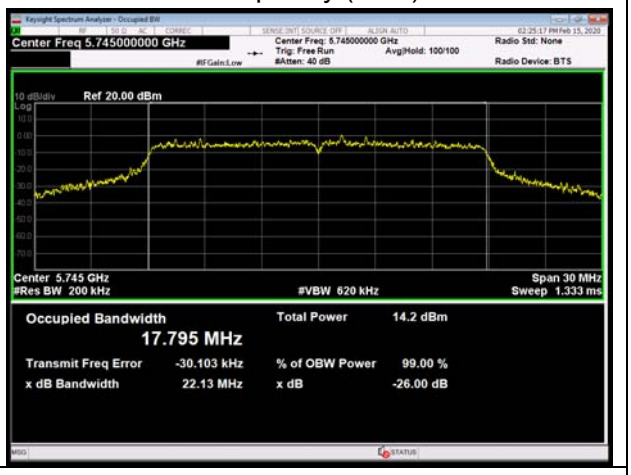
U-NII-3, 802.11n HT40

Carrier frequency (MHz): 5755



U-NII-3, 802.11ac VHT20

Carrier frequency (MHz): 5745

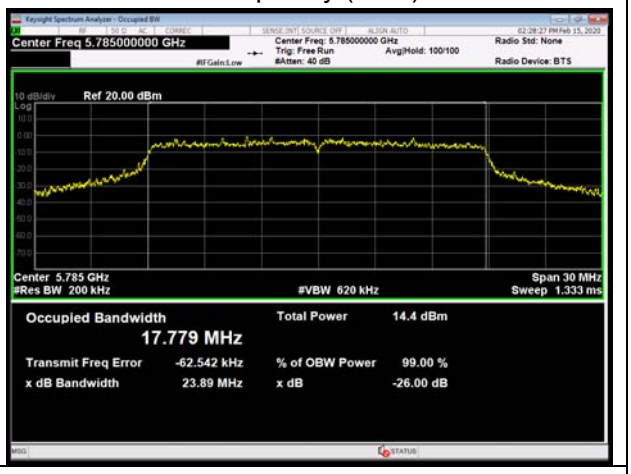


U-NII-3, 802.11n HT40

Carrier frequency (MHz): 5795

U-NII-3, 802.11ac VHT20

Carrier frequency (MHz): 5785



U-NII-3, 802.11ac VHT40

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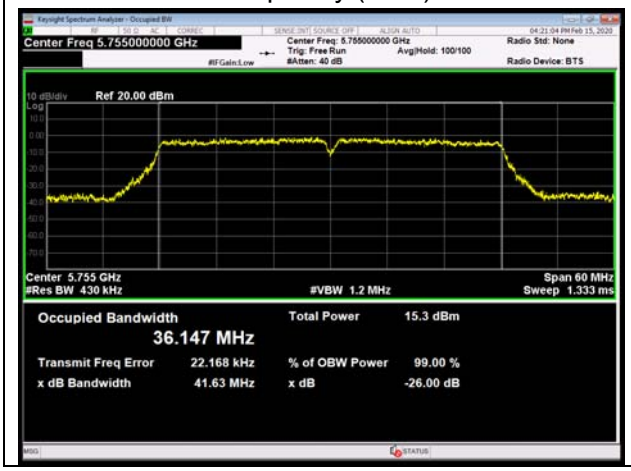
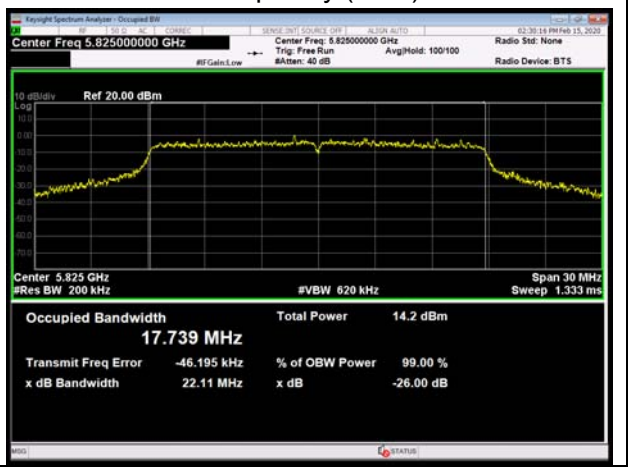
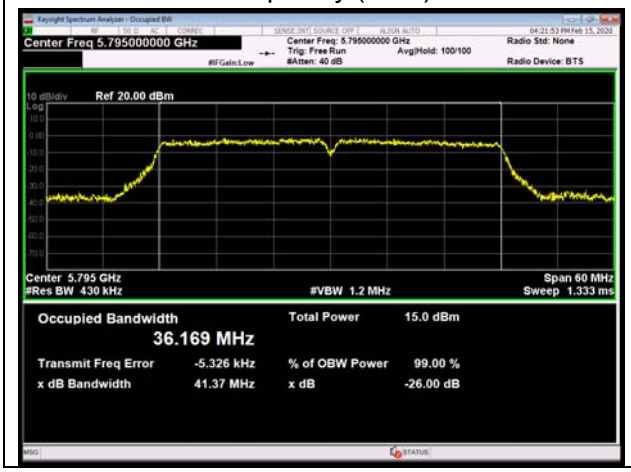
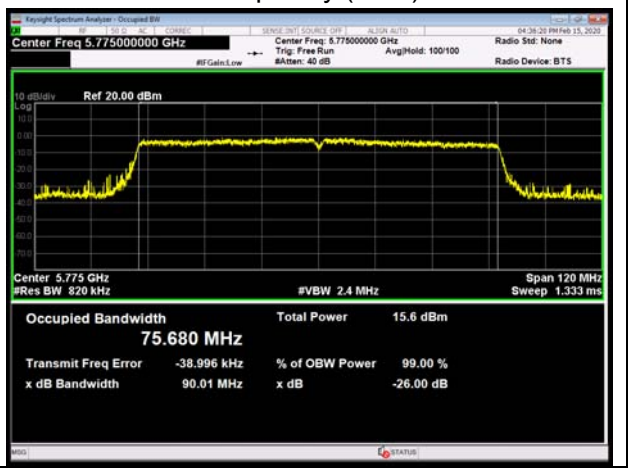


U-NII-3, 802.11ac VHT20

Carrier frequency (MHz): 5825

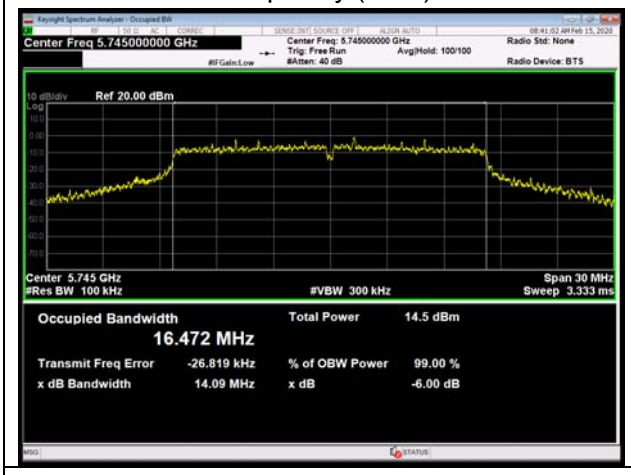


U-NII-3, 802.11ac VHT40 Carrier frequency (MHz): 5795	U-NII-3, 802.11ac VHT80 Carrier frequency (MHz): 5775
	

Minimum 6 dB bandwidth

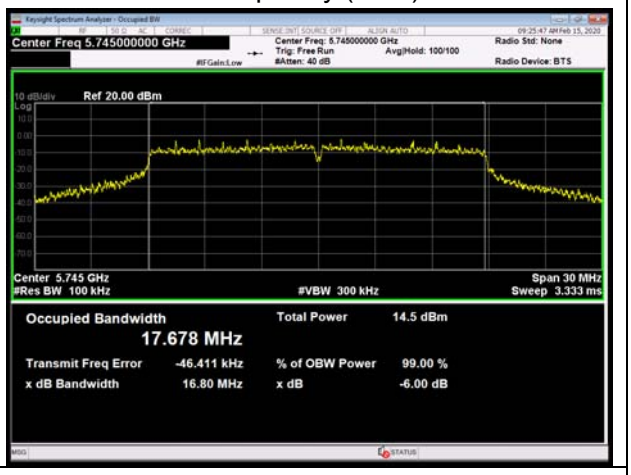
U-NII-3, 802.11a

Carrier frequency (MHz): 5745



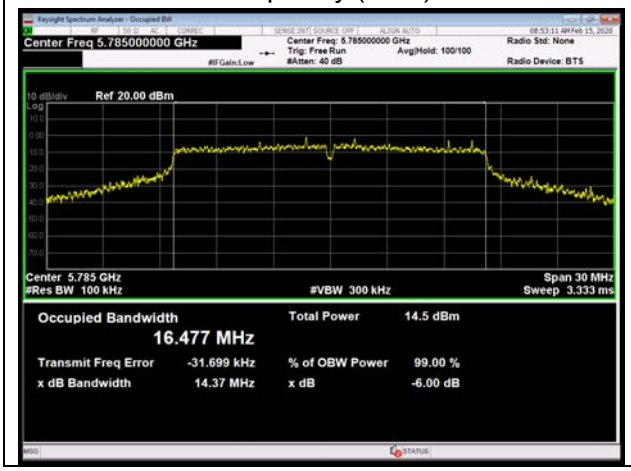
U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5745



U-NII-3, 802.11a

Carrier frequency (MHz): 5785



U-NII-3, 802.11n HT20

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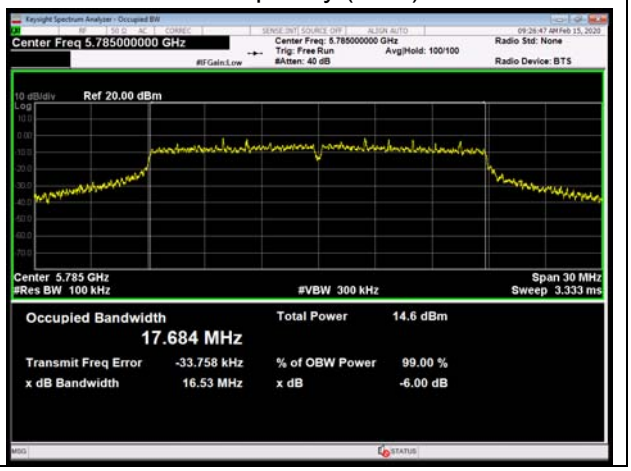
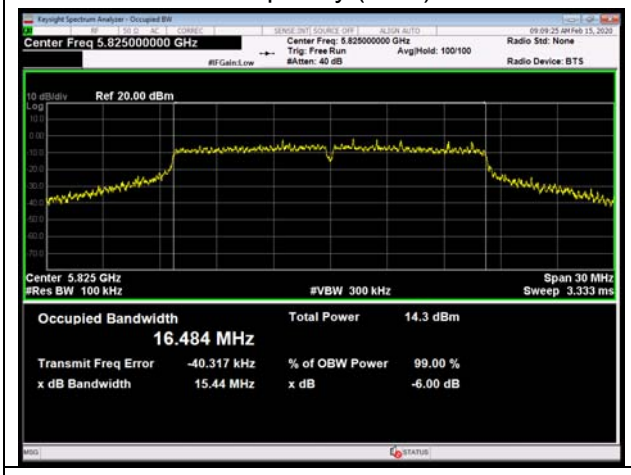


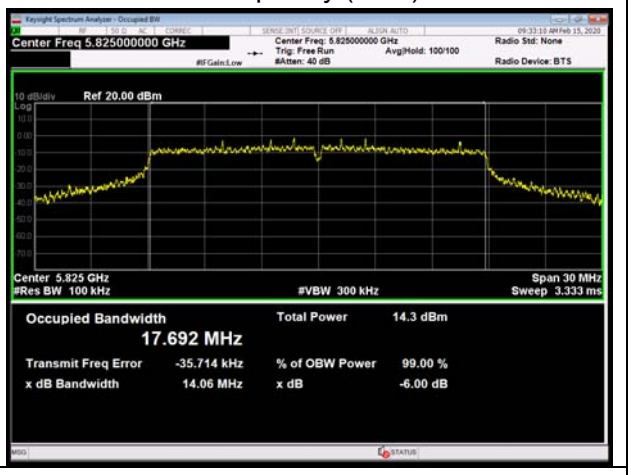
U-NII-3, 802.11a

Carrier frequency (MHz): 5825



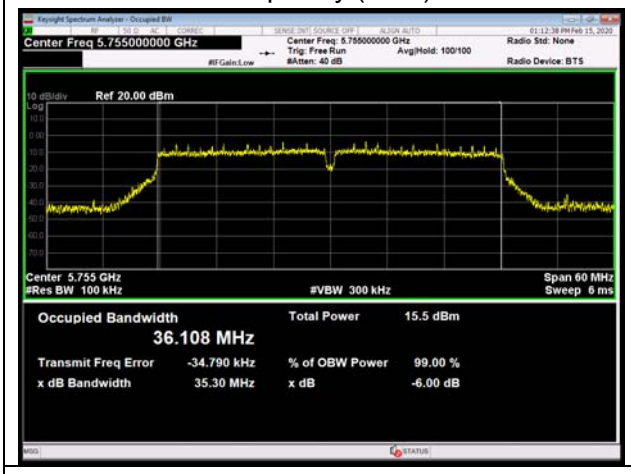
U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5825



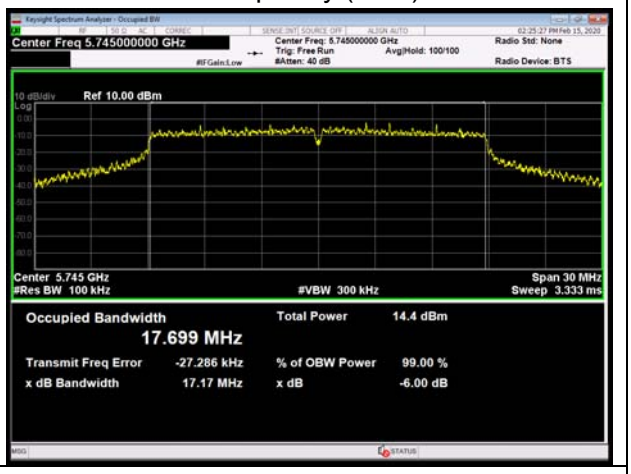
U-NII-3, 802.11n HT40

Carrier frequency (MHz): 5755



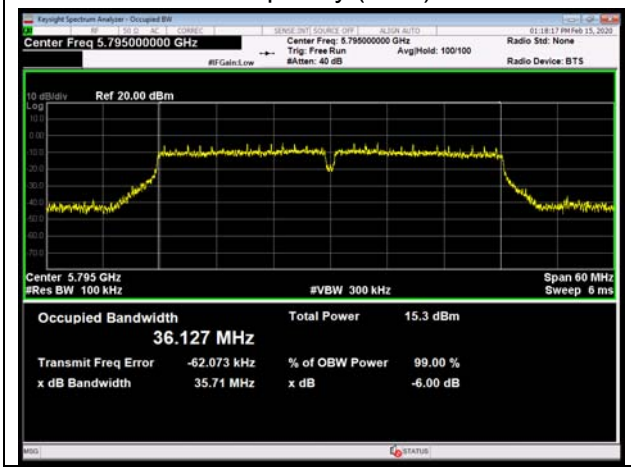
U-NII-3, 802.11ac VHT20

Carrier frequency (MHz): 5745



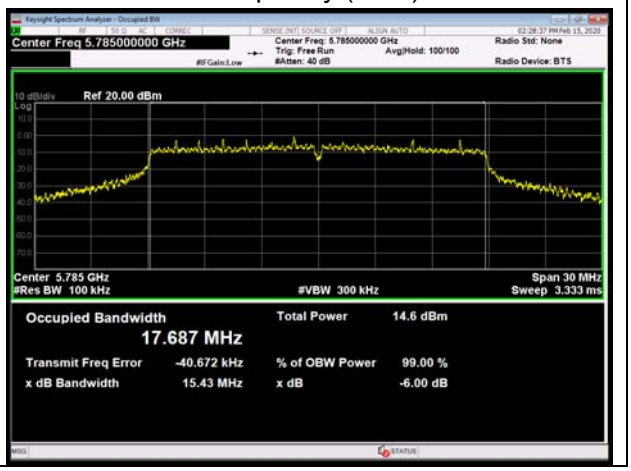
U-NII-3, 802.11n HT40

Carrier frequency (MHz): 5795



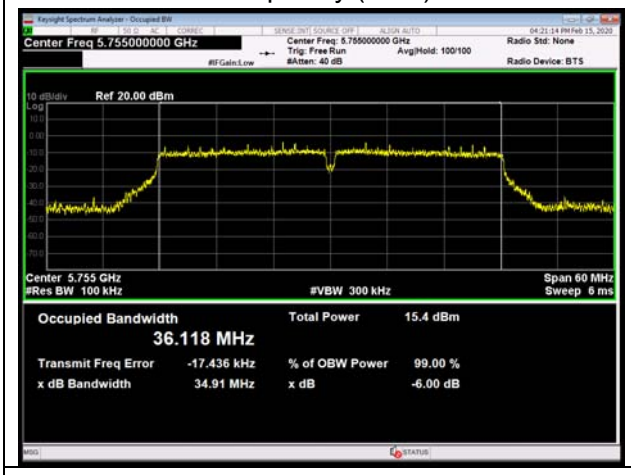
U-NII-3, 802.11ac VHT20

Carrier frequency (MHz): 5785



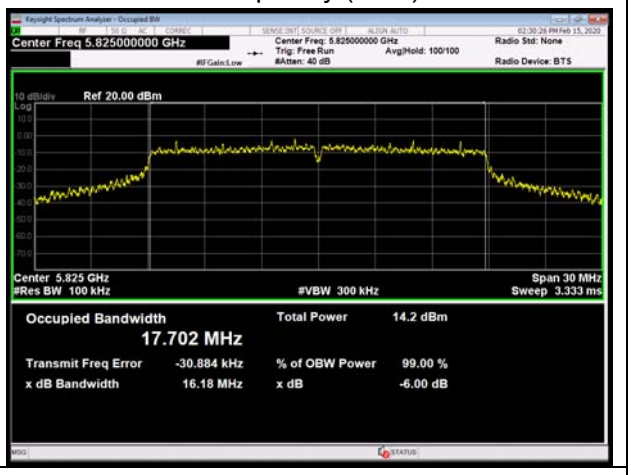
U-NII-3, 802.11ac VHT40

Carrier frequency (MHz): 5755



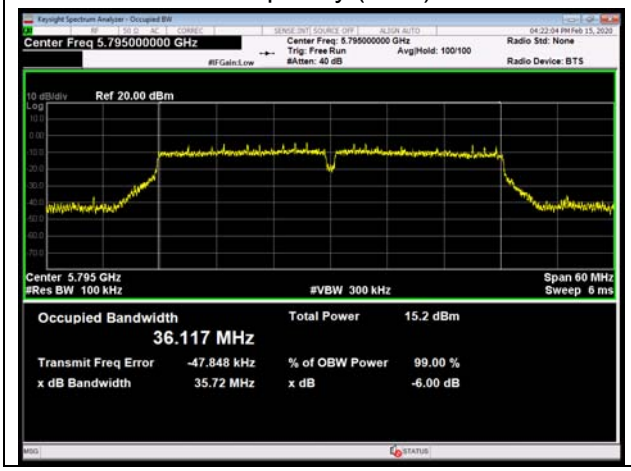
U-NII-3, 802.11ac VHT20

Carrier frequency (MHz): 5825



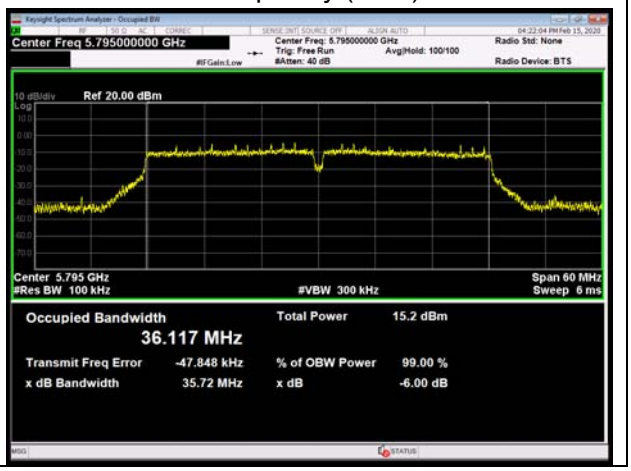
U-NII-3, 802.11ac VHT40

Carrier frequency (MHz): 5795



U-NII-3, 802.11ac VHT80

Carrier frequency (MHz): 5775



5.2. Average Power Output –Conducted

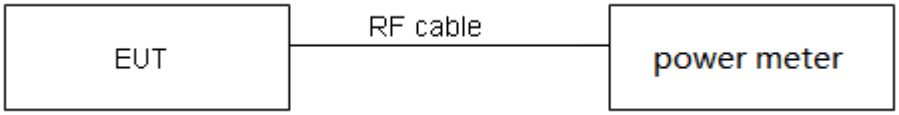
Ambient condition

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

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 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

Band	T_{on} (ms)	$T_{(on+off)}$ (ms)	Duty cycle	Duty cycle correction Factor(dB)
802.11a	2.06	2.10	0.98	NA
802.11n HT20	1.93	1.97	0.98	NA
802.11n HT40	0.95	0.98	0.96	0.16
802.11ac VHT20	1.94	1.98	0.98	0.00
802.11ac VHT40	0.95	0.99	0.96	0.16
802.11ac VHT80	0.46	0.50	0.92	0.36
Note: when Duty cycle>0.98, Duty cycle correction Factor not required.				

Single Antenna Power Index						
Packet Type	**CH36**	**CH40**	**CH48**	**CH149**	**CH157**	**CH165**
802.11a	14	14	14	14	14	14
802.11n HT20	14	14	14	14	14	14
802.11ac VHT20	14	14	14	14	14	14
Packet Type	**CH38**	**CH46**	**CH151**	**CH159**	**/**	**/**
802.11n HT40	14	14	14	14	/	/
802.11ac VHT40	14	14	14	14	/	/
Packet Type	**CH42**	**CH155**	**/**	**/**	**/**	**/**
802.11ac VHT80	14	14	/	/	/	/

U-NII-1

Network Standards	Channel/ Frequency (MHz)	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11a	36/5180	12.11	12.11	24	PASS
	40/5200	12.04	12.04	24	PASS
	48/5240	12.07	12.07	24	PASS
802.11n HT20	36/5180	12.17	12.17	24	PASS
	40/5200	11.89	11.89	24	PASS
	48/5240	12.06	12.06	24	PASS
802.11n HT40	38/5190	12.76	12.92	24	PASS
	46/5230	12.66	12.82	24	PASS
802.11ac VHT20	36/5180	12.09	12.09	24	PASS
	40/5200	11.85	11.85	24	PASS
	48/5240	12.03	12.03	24	PASS
802.11ac VHT40	38/5190	12.68	12.84	24	PASS
	46/5230	12.63	12.79	24	PASS
802.11ac VHT80	42/5210	12.33	12.69	24	PASS
Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor					

U-NII-3

Network Standards	Channel/ Frequency (MHz)	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11a	149/5745	12.22	12.22	30	PASS
	157/5785	12.26	12.26	30	PASS
	165/5825	12.05	12.05	30	PASS
802.11n HT20	149/5745	12.16	12.16	30	PASS
	157/5785	12.11	12.11	30	PASS
	165/5825	11.92	11.92	30	PASS
802.11n HT40	151/5755	12.89	13.05	30	PASS
	159/5795	12.64	12.80	30	PASS
802.11ac VHT20	149/5745	12.13	12.13	30	PASS
	157/5785	12.23	12.23	30	PASS
	165/5825	11.88	11.88	30	PASS
802.11ac VHT40	151/5755	12.87	13.03	30	PASS
	159/5795	12.68	12.84	30	PASS
802.11ac VHT80	155/5775	12.31	12.67	30	PASS
Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor					

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
3.8	-10	5199.996819	5199.989580	5199.986150	5199.977237
3.8	0	5199.994496	5199.987734	5199.977859	5199.972605
3.8	5	5199.993384	5199.986271	5199.976191	5199.970181
3.8	10	5199.991816	5199.984381	5199.969967	5199.962811
3.8	20	5199.987457	5199.978409	5199.969181	5199.956759
3.8	30	5199.978572	5199.975861	5199.964175	5199.951062
3.8	40	5199.975490	5199.974275	5199.954963	5199.941958
3.8	55	5199.972650	5199.967716	5199.949975	5199.939788
3.6	20	5199.965223	5199.966567	5199.945590	5199.933136
4.4	20	5199.958455	5199.957332	5199.944262	5199.927961
MHz		-0.041545	-0.042668	-0.055738	-0.072039
PPM		-7.989392	-8.205476	-10.718918	-13.853565

Voltage (V)	Temperature (°C)	U-NII-3 Test Results			
		5785MHz			
		1min	2min	5min	10min
3.8	-10	5785.004758	5785.000774	5785.000715	5784.994655
3.8	0	5784.996707	5784.997038	5784.993508	5784.992044
3.8	5	5784.990028	5784.992830	5784.993243	5784.987248
3.8	10	5784.985031	5784.986861	5784.992148	5784.980110
3.8	20	5784.978572	5784.985849	5784.987035	5784.977412
3.8	30	5784.975485	5784.983793	5784.983863	5784.973484
3.8	40	5784.968667	5784.983074	5784.977502	5784.968743
3.8	55	5784.963721	5784.980331	5784.974604	5784.965810
3.6	20	5784.955417	5784.977676	5784.969771	5784.962311
4.4	20	5784.954224	5784.972001	5784.962750	5784.955147
MHz		-0.045776	-0.027999	-0.037250	-0.044853
PPM		-7.912918	-4.839996	-6.439016	-7.753401

5.4. Power Spectral Density

Ambient condition

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

Method of Measurement

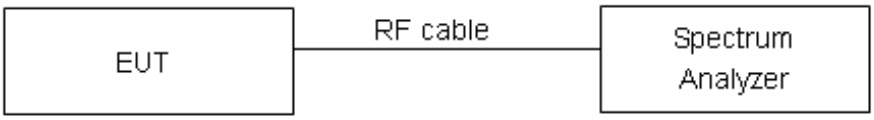
The EUT was connected to the spectrum analyzer through an external attenuator (20dB) and a known loss cable.

Set RBW = 500 kHz, VBW =1.5MHz for the band 5.725-5.85 GHz

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

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 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz 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:

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

U-NII-1

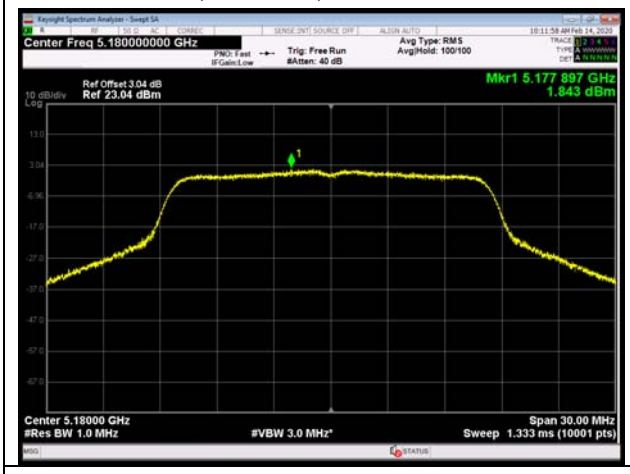
Network Standards	Channel Number	Read Value (dBm /MHz)	Power Spectral Density (dBm /MHz)	Limit (dBm /MHz)	Conclusion
802.11a	36	1.84	1.84	11	PASS
	40	2.04	2.04	11	PASS
	48	1.65	1.65	11	PASS
802.11n HT20	36	1.56	1.56	11	PASS
	40	1.16	1.16	11	PASS
	48	1.15	1.15	11	PASS
802.11n HT40	38	-0.89	-0.73	11	PASS
	46	-0.62	-0.45	11	PASS
802.11ac VHT20	36	1.58	1.58	11	PASS
	40	1.47	1.47	11	PASS
	48	1.33	1.33	11	PASS
802.11ac VHT40	38	-0.99	-0.83	11	PASS
	46	-0.70	-0.54	11	PASS
802.11ac VHT80	42	-4.31	-3.95	11	PASS

U-NII-3

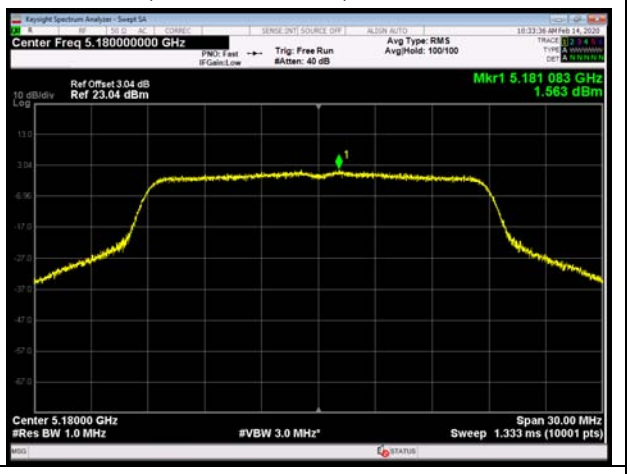
Network Standards	Channel Number	Read Value (dBm/500kHz)	Power Spectral Density (dBm/500kHz)	Limit (dBm/500kHz)	Conclusion
802.11a	149	-0.87	-0.87	30	PASS
	157	-0.76	-0.76	30	PASS
	165	-0.97	-0.97	30	PASS
802.11n HT20	149	-1.38	-1.38	30	PASS
	157	-1.52	-1.52	30	PASS
	165	-1.36	-1.36	30	PASS
802.11n HT40	151	-3.73	-3.57	30	PASS
	159	-3.70	-3.54	30	PASS
802.11ac VHT20	149	-1.45	-1.45	30	PASS
	157	-1.29	-1.29	30	PASS

	165	-1.52	-1.52	30	PASS
802.11ac VHT40	151	-3.77	-3.61	30	PASS
	159	-3.89	-3.73	30	PASS
802.11ac VHT80	155	-7.12	-6.75	30	PASS

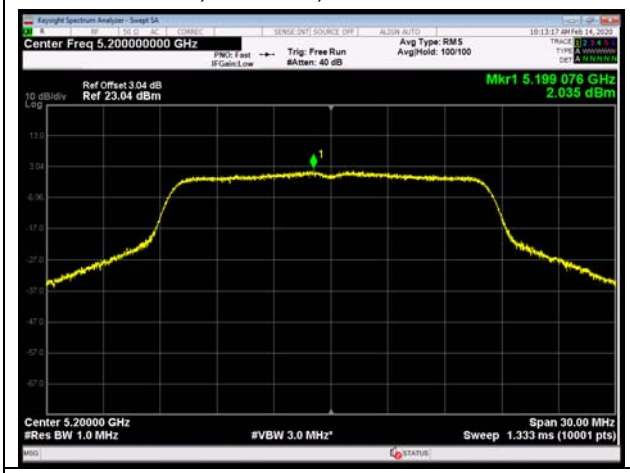
U-NII-1, 802.11a, Channel No.: 36



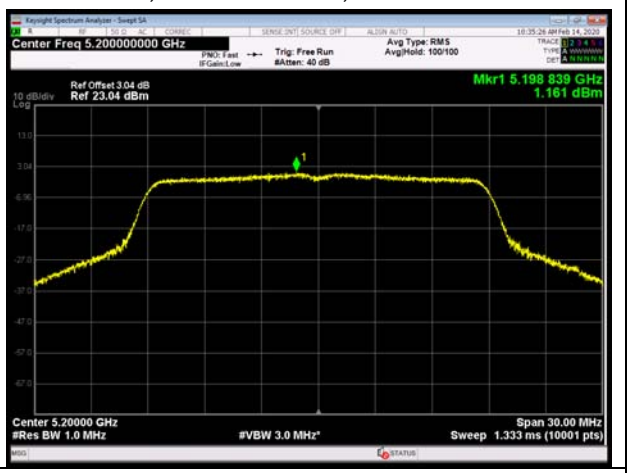
U-NII-1, 802.11n HT20, Channel No.: 36



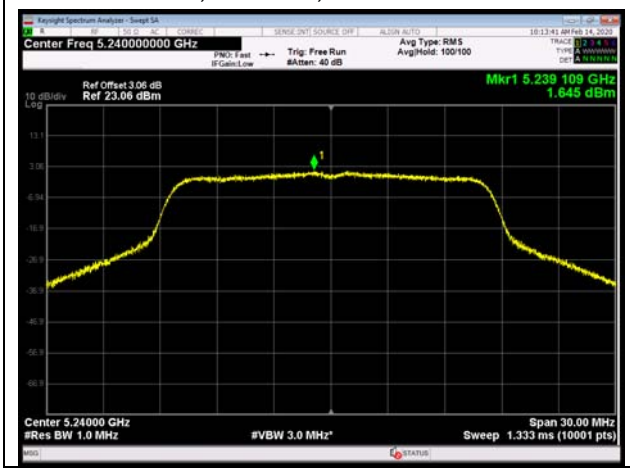
U-NII-1, 802.11a, Channel No.: 40



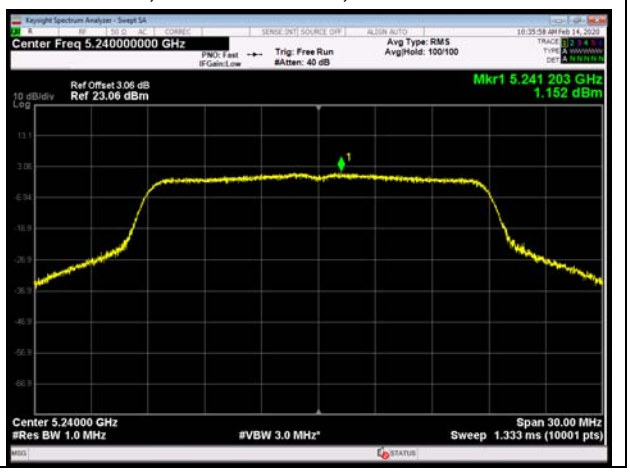
U-NII-1, 802.11n HT20, Channel No.: 40



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

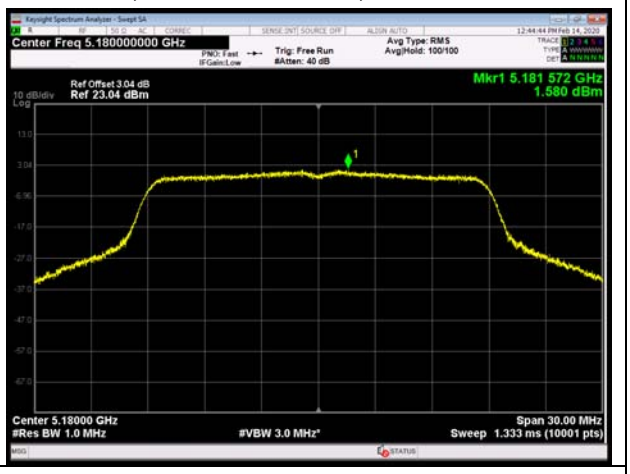


U-NII-1, 802.11n HT20, Channel No.: 48

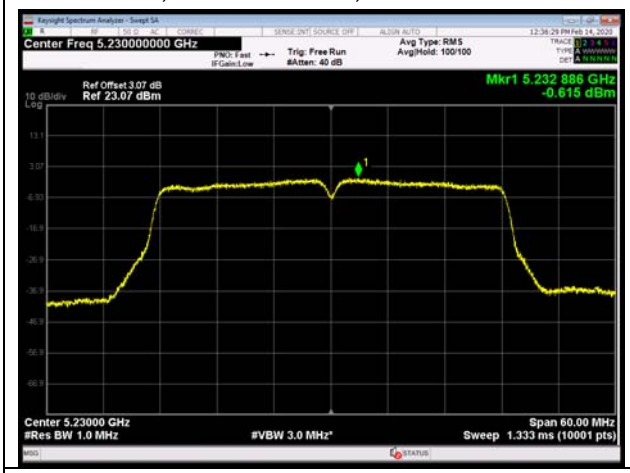


U-NII-1, 802.11n HT40, Channel No.: 38

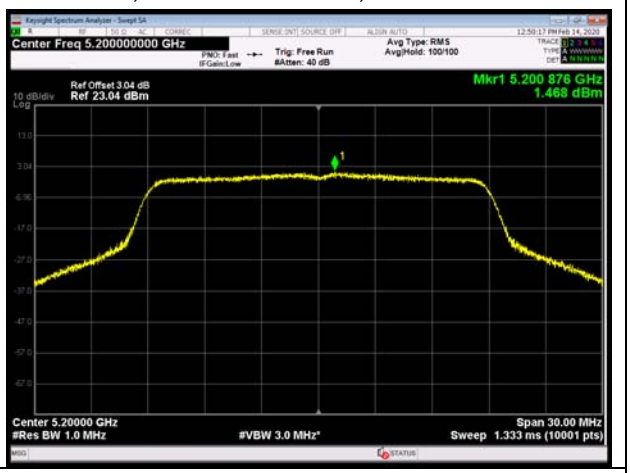
U-NII-1, 802.11ac VHT20, Channel No.: 36



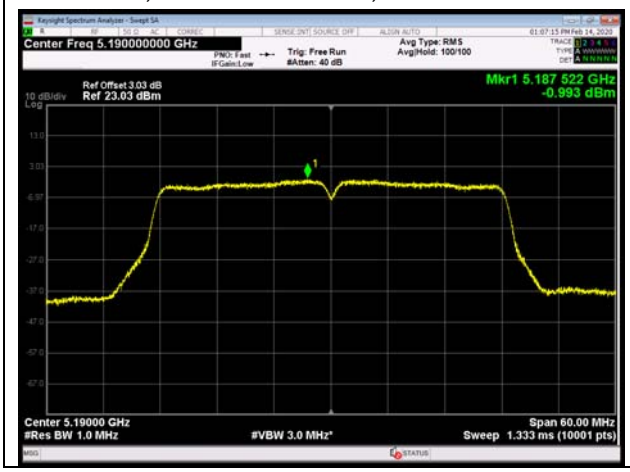
U-NII-1, 802.11n HT40, Channel No.: 46



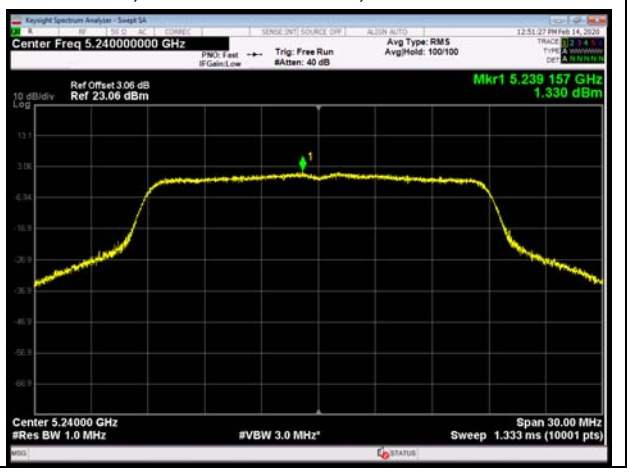
U-NII-1, 802.11ac VHT20, Channel No.: 40



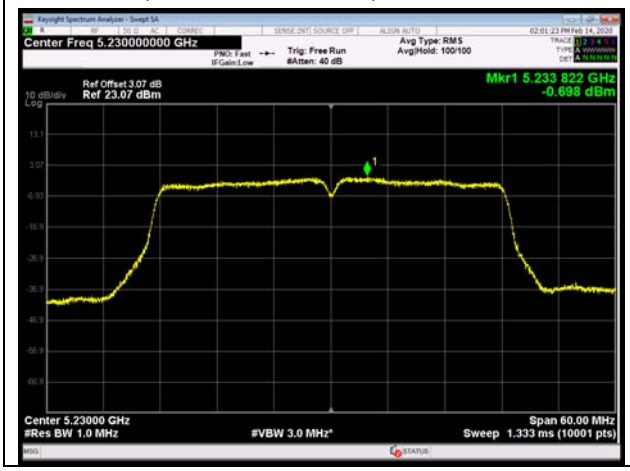
U-NII-1, 802.11ac VHT40, Channel No.: 38



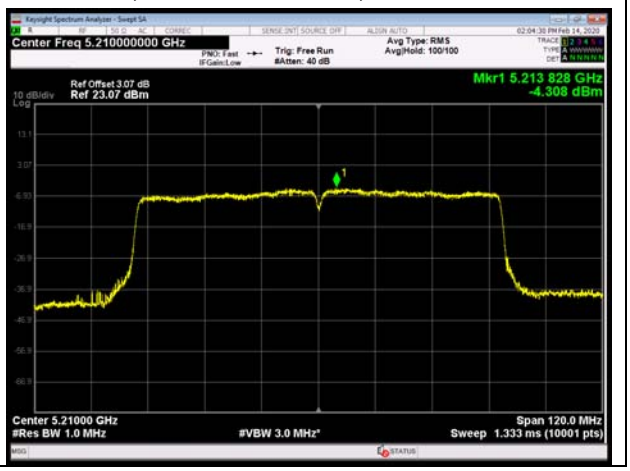
U-NII-1, 802.11ac VHT20, Channel No.: 48



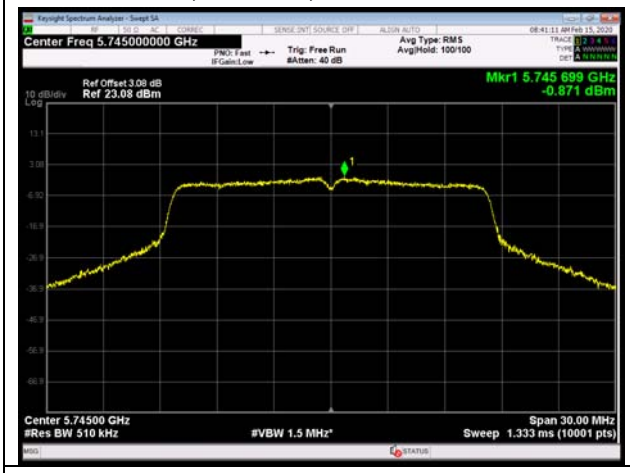
U-NII-1, 802.11ac VHT40, Channel No.: 46



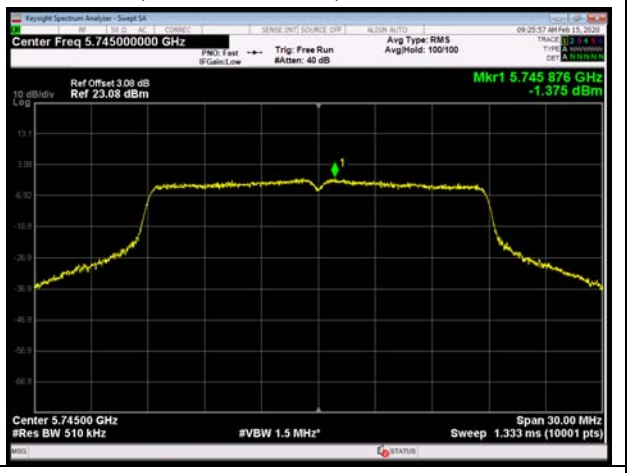
U-NII-1, 802.11ac VHT80, Channel No.: 42



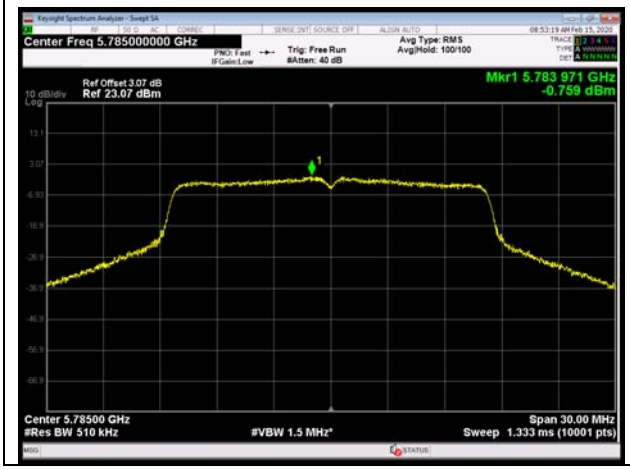
U-NII-3, 802.11a, Channel No.: 149



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



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



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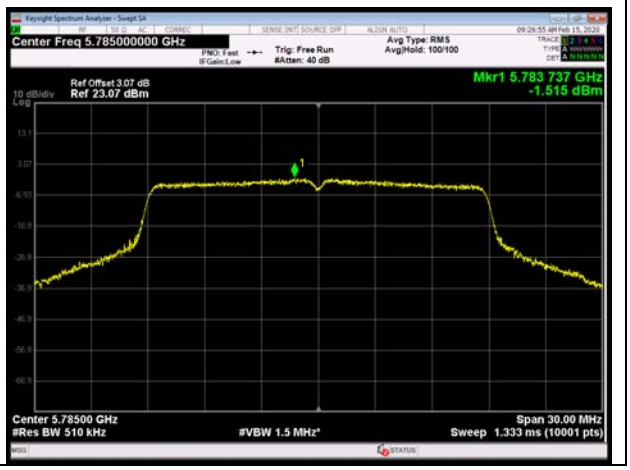
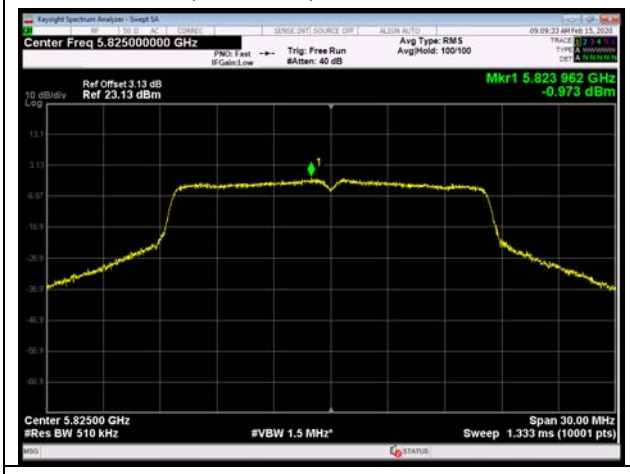
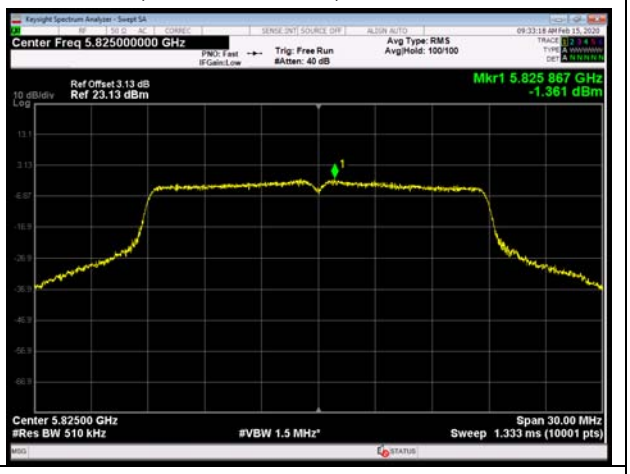


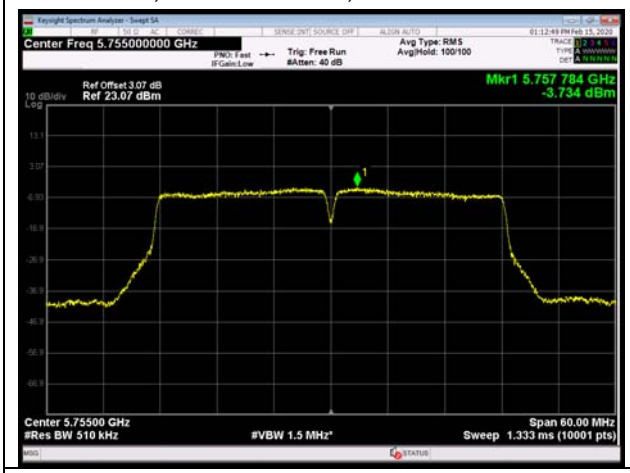
U-NII-3, 802.11a, Channel No.: 165



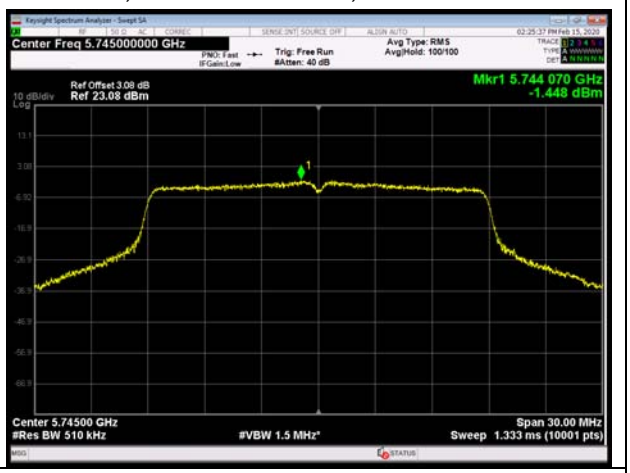
U-NII-3, 802.11n HT20, Channel No.: 165



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



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



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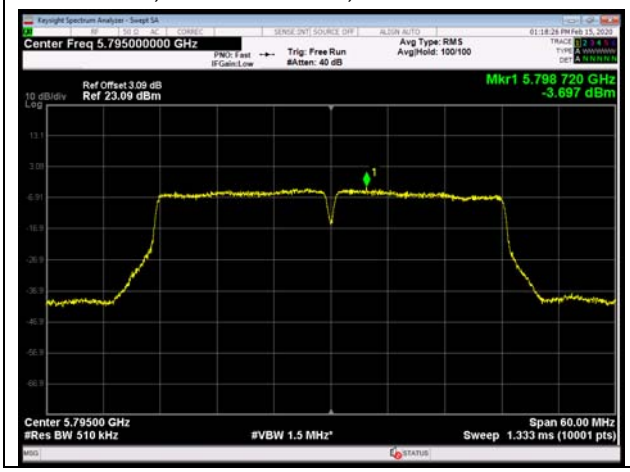
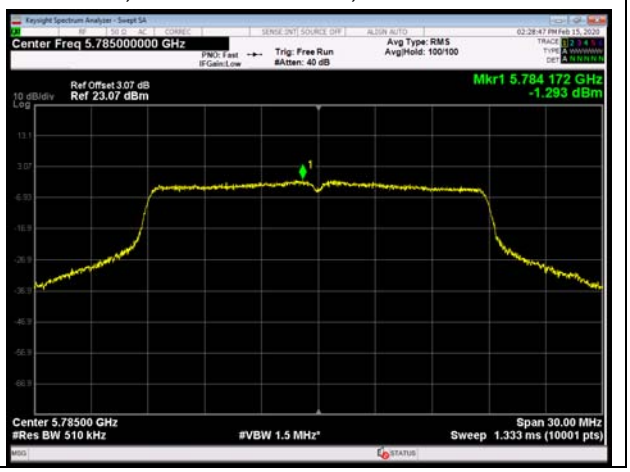
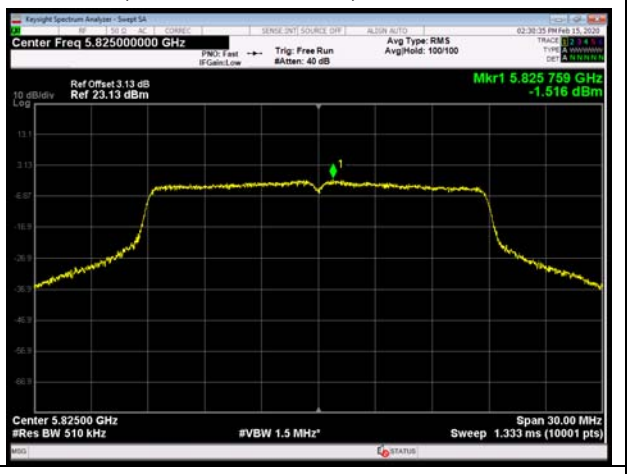


U-NII-3, 802.11ac VHT20, Channel No.: 157



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

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



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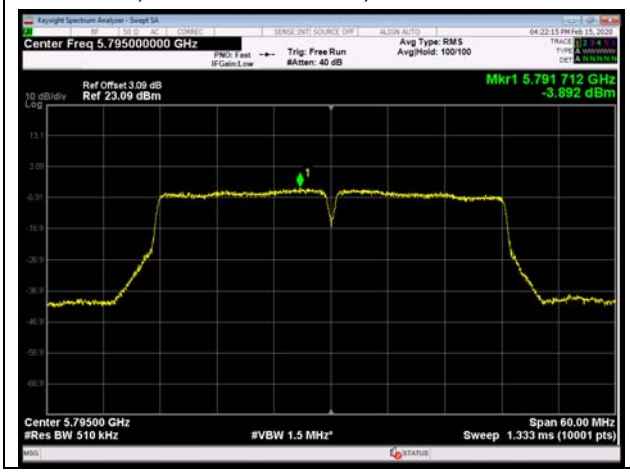
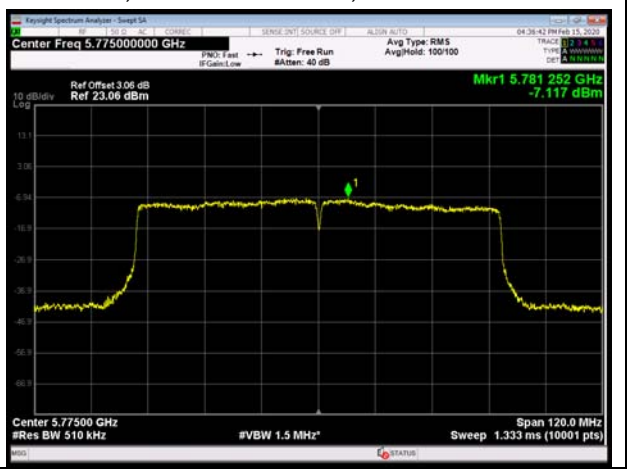


U-NII-3, 802.11ac VHT80, Channel No.: 155



5.5. Unwanted Emission

Ambient condition

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

Method of Measurement

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

During the test, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turntable shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing.
Set the spectrum analyzer in the following:
Below 1GHz (detector: Peak and Quasi-Peak)
RBW=100kHz / VBW=300kHz / Sweep=AUTO
Above 1GHz (detector: Peak):
I) Peak emission levels are measured by setting the instrument as follows:
1) RBW = 1 MHz.
2) VBW ≥ [3 × RBW]
3) Detector = peak.
4) Sweep time = auto.
5) Trace mode = max hold.
6) Allow sweeps to continue until the trace stabilizes. Note that if the transmission is not continuous, then the time required for the trace to stabilize will increase by a factor of approximately 1 / D, where D is the duty cycle.

II) Average emission levels are measured by setting the instrument as follows:
a) RBW = 1 MHz.
b) VBW ≥ [3 × RBW].
c) Detector = RMS (power averaging), if [span / (# of points in sweep)] ≤ RBW / 2. Satisfying this condition can require increasing the number of points in the sweep or reducing the span. If the condition is not satisfied, then the detector mode shall be set to peak.
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.

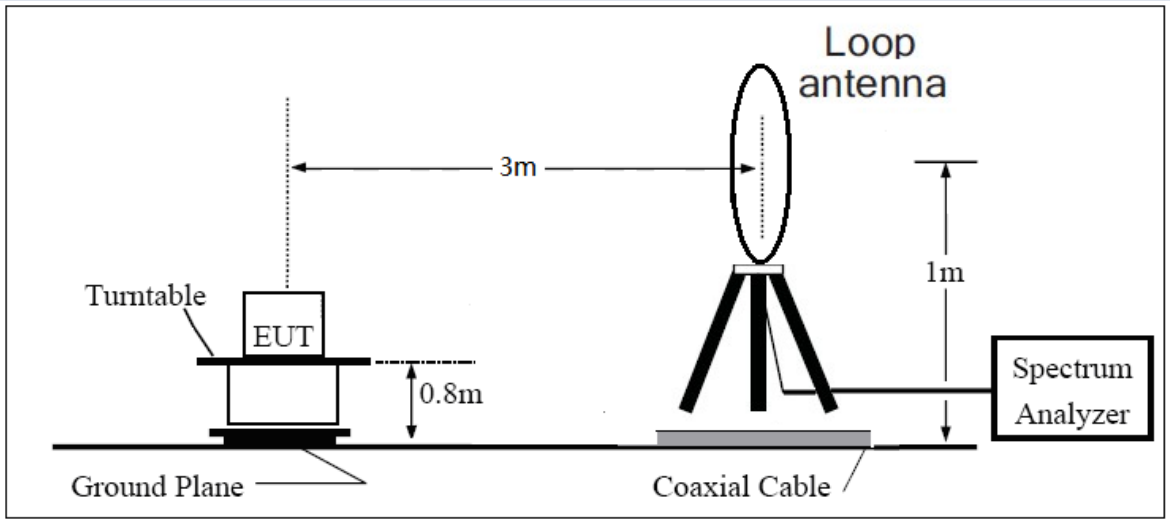
3) If a specific emission is demonstrated to be continuous (100% duty cycle) rather than turning ON and OFF with the transmit cycle, then no duty cycle correction is required for that emission.

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.

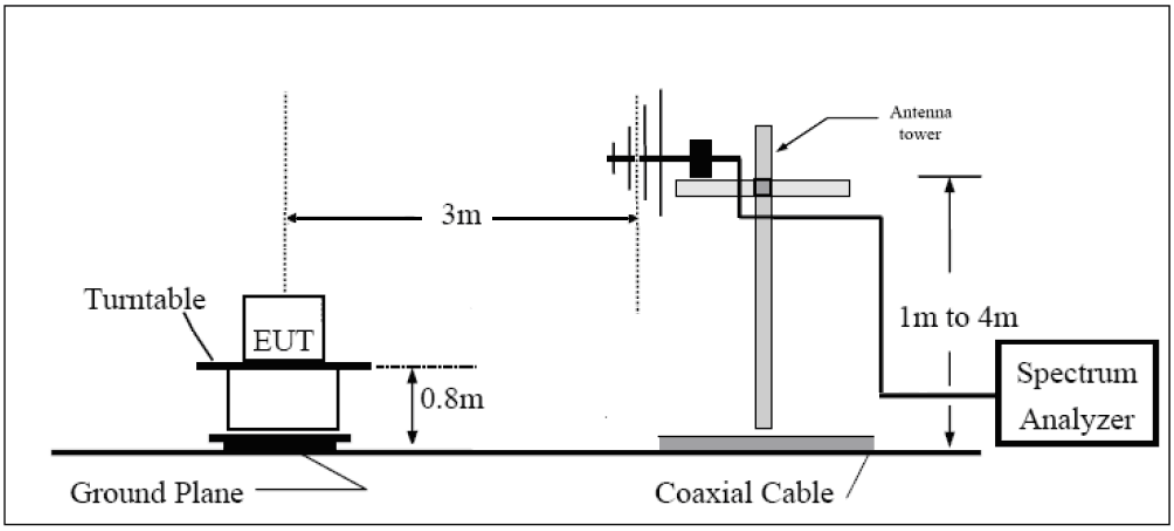
The field strength of spurious emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in stand-up position (Z axis) and the loop antenna is vertical, others antenna are vertical and horizontal.

The test is in transmitting mode.

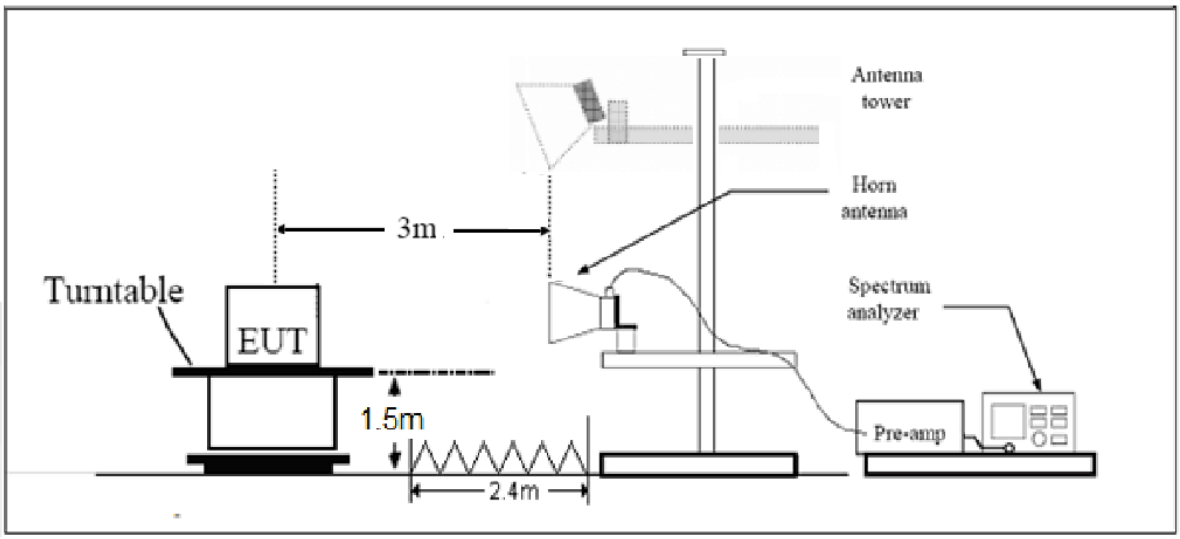
9KHz~~~30MHz



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).

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	4.02 dB
200MHz-1GHz	3.28 dB
1GHz-18G	3.70 dB
18GHz-26.5GHz	5.78 dB
26.5G-40GHz	5.82 dB

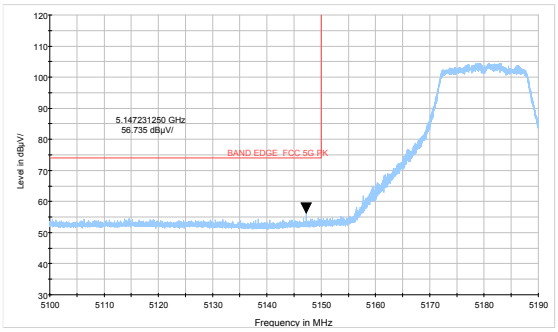
Test Results:

The modulation and bandwidth are similar for 802.11n mode for 20MHz/40MHz and 802.11ac mode for V20MHz/V40MHz, therefore investigated worst case to representative mode in test report.

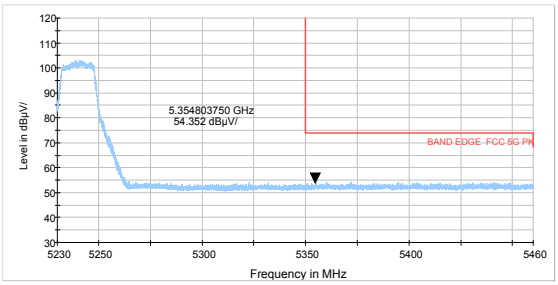
The signal beyond the limit is carrier.

U-NII-1

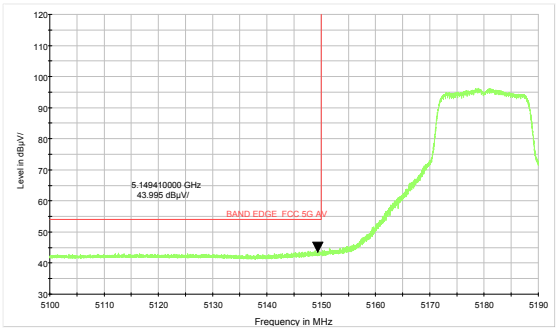
802.11a-Channel 36: Peak



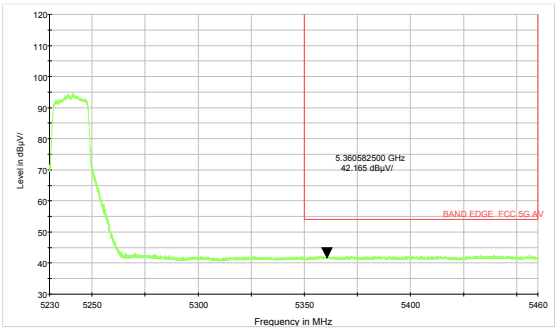
802.11a-Channel 48: Peak



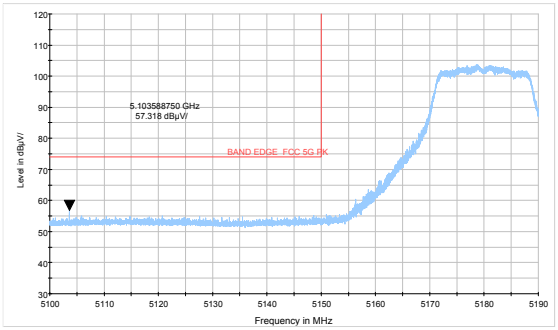
802.11a-Channel 36: Average



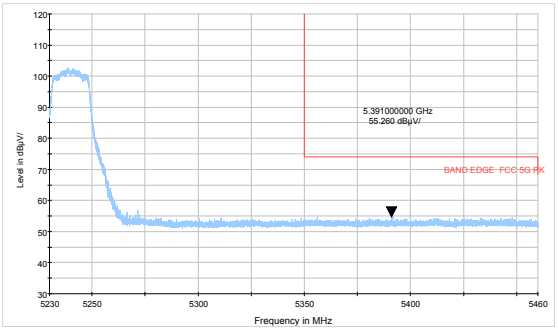
802.11a-Channel 48: Average



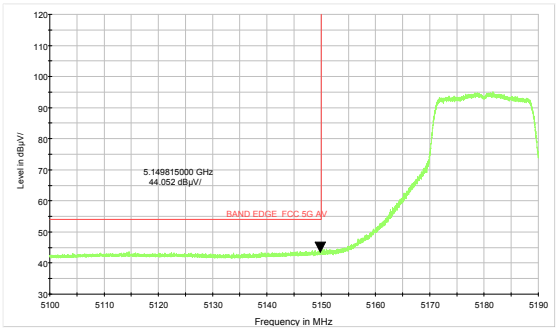
802.11n HT20-Channel 36: Peak



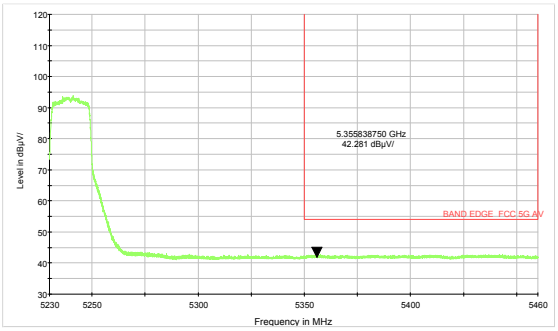
802.11n HT20-Channel 48: Peak



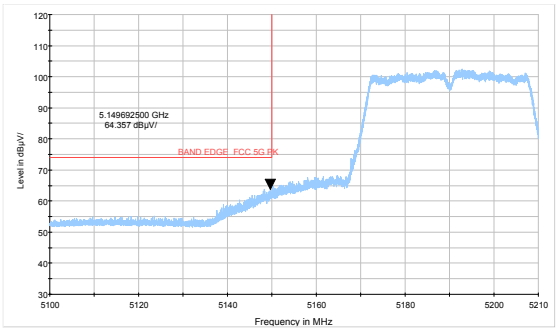
802.11n HT20-Channel 36: Average



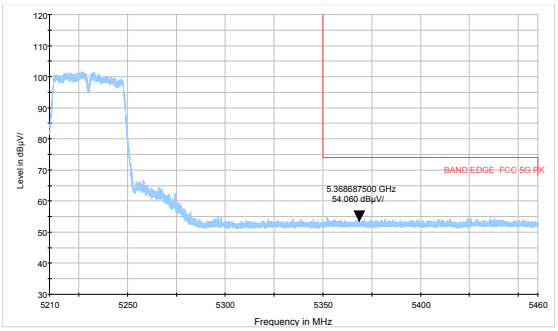
802.11n HT20-Channel 48: Average



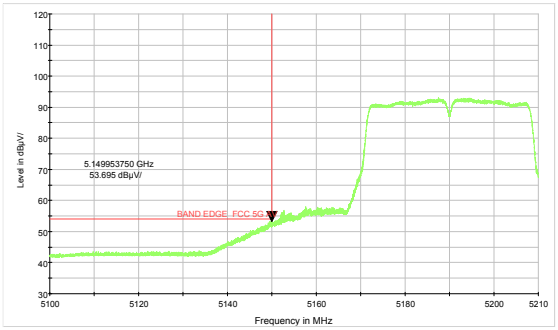
802.11n HT40-Channel 38: Peak



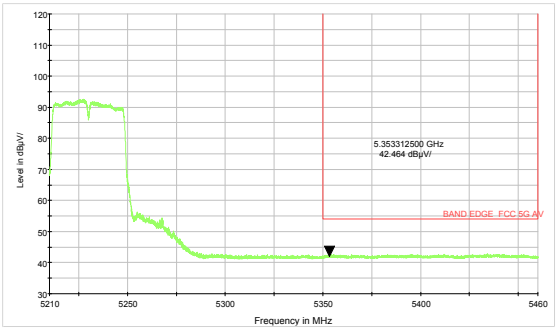
802.11n HT40-Channel 46: Peak



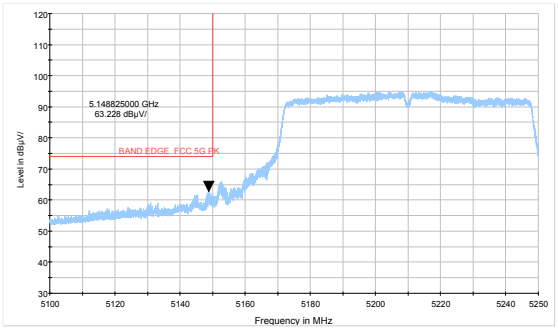
802.11n HT40-Channel 38: Average



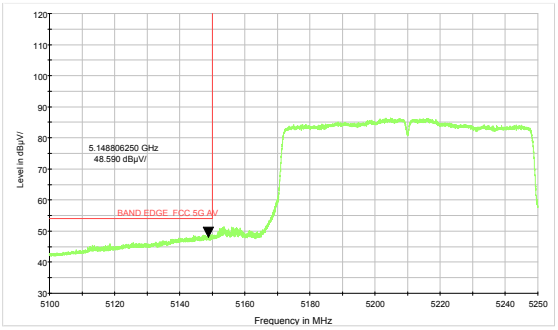
802.11n HT40-Channel 46: Average



802.11ac VHT80 –Channel 42: Peak

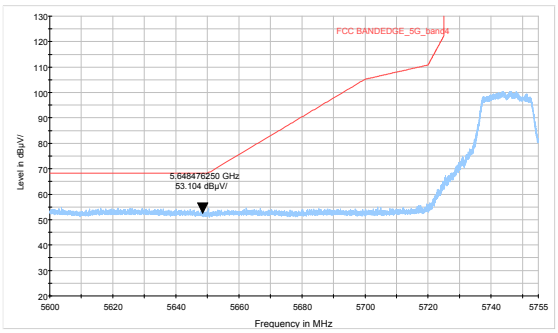


802.11ac VHT80- Channel 42: Average

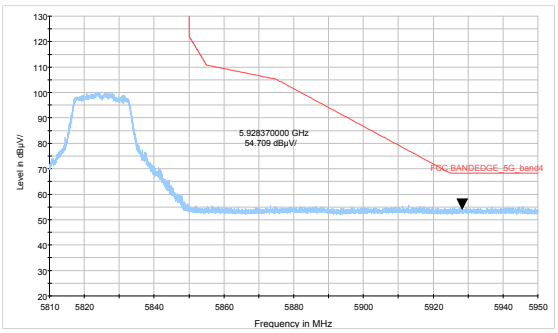


U-NII-3

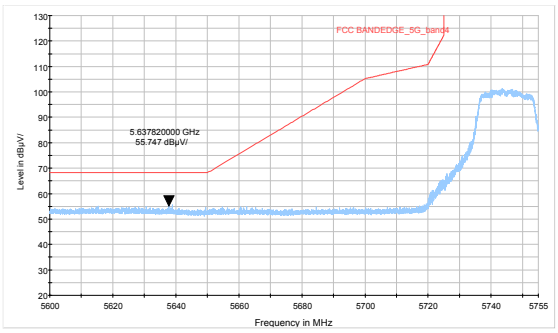
802.11a-Channel 149: Peak



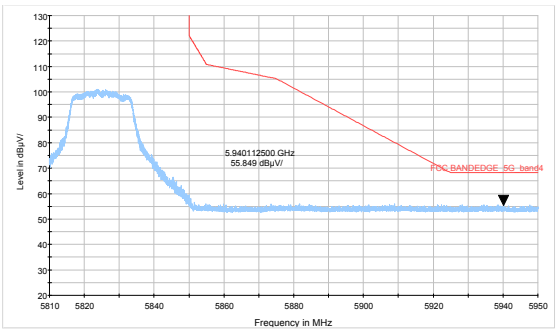
802.11a-Channel 165: Peak



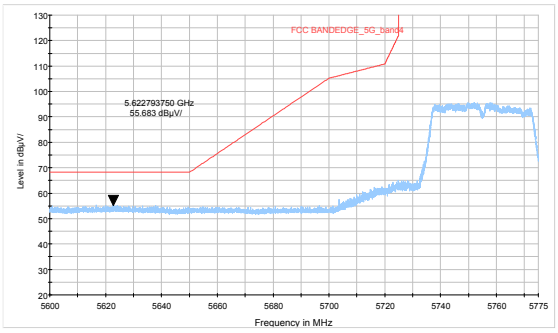
802.11n HT20-Channel 149: Peak



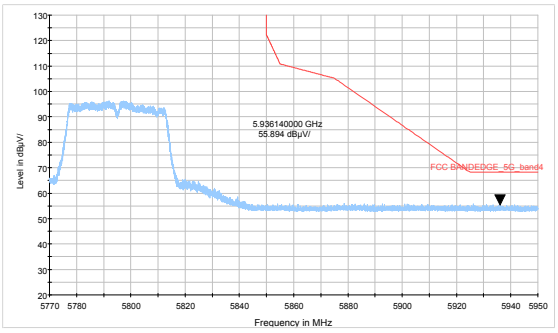
802.11n HT20-Channel 165: Peak



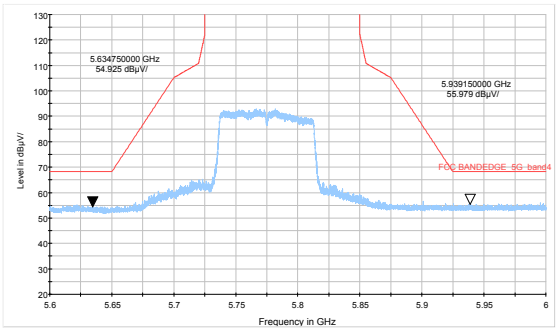
802.11n HT40-Channel 151: Peak



802.11n HT40-Channel 159: Peak



802.11ac VHT80- Channel 155: Peak



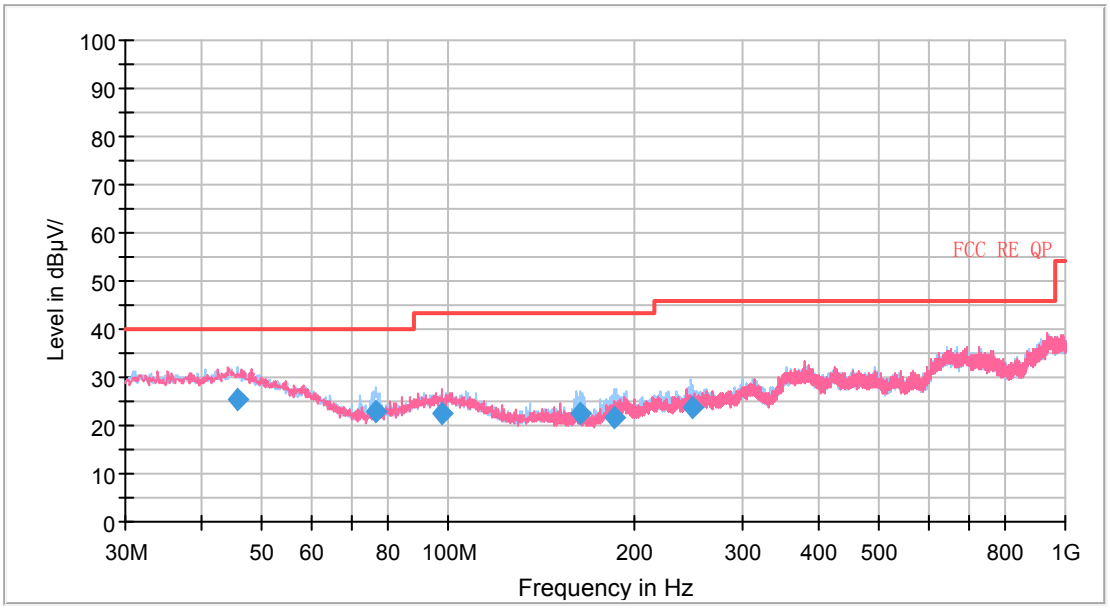
Result of RE

Test result

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

During the test, the Radiates Emission from 30MHz to 1GHz was performed in all modes with all channels, 802.11n (HT40) CH159 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.

Continuous TX mode:



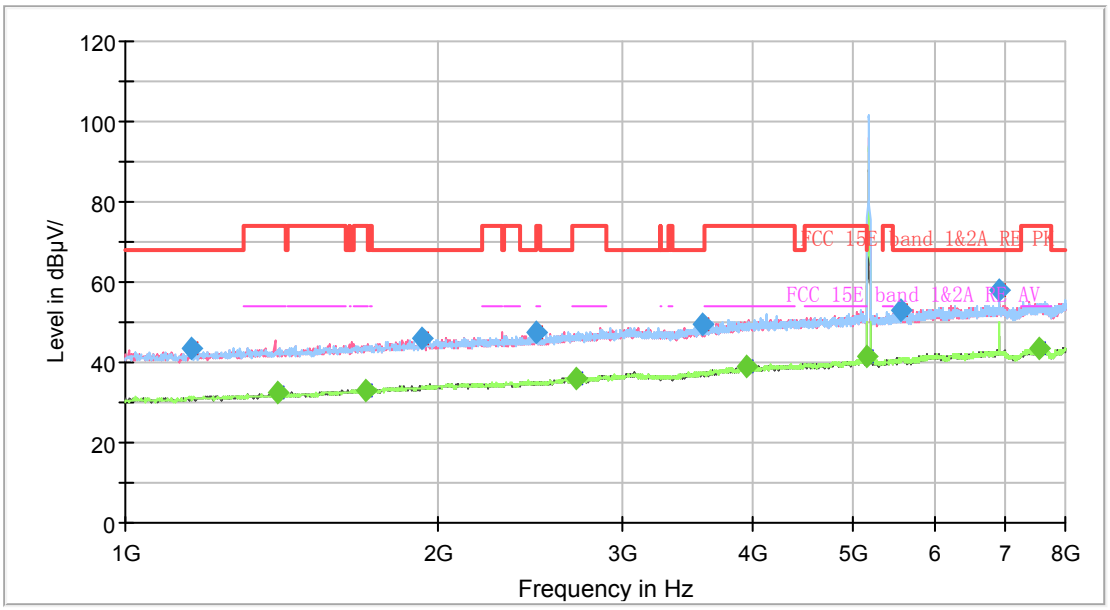
Radiates Emission from 30MHz to 1GHz

Frequency (MHz)	Quasi-Peak (dBuV/m)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)	Margin (dB)	Limit (dBuV/m)
45.687147	25.44	184.0	H	181.0	3.1	14.56	40.00
76.327653	22.75	223.0	H	15.0	-6.5	17.25	40.00
97.694303	22.39	210.0	V	213.0	-3.2	21.11	43.50
163.608456	22.32	125.0	H	156.0	-6.8	21.18	43.50
186.265522	21.62	125.0	H	162.0	-5.5	21.88	43.50
248.466750	23.74	109.0	H	314.0	-4.0	22.26	46.00

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

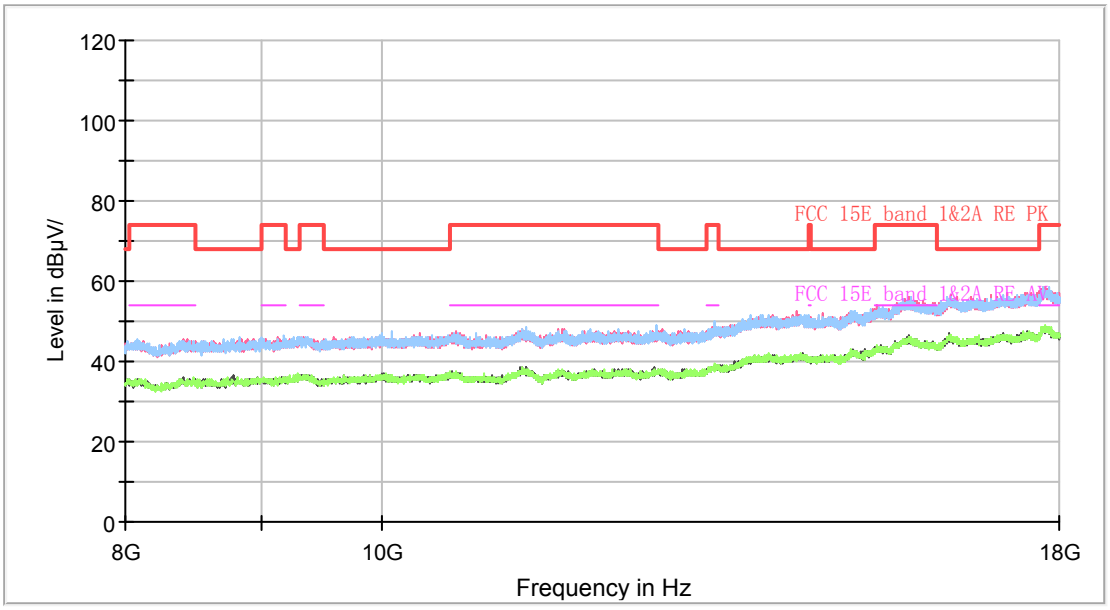
2. Margin = Limit – Quasi-Peak

802.11a CH36



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz

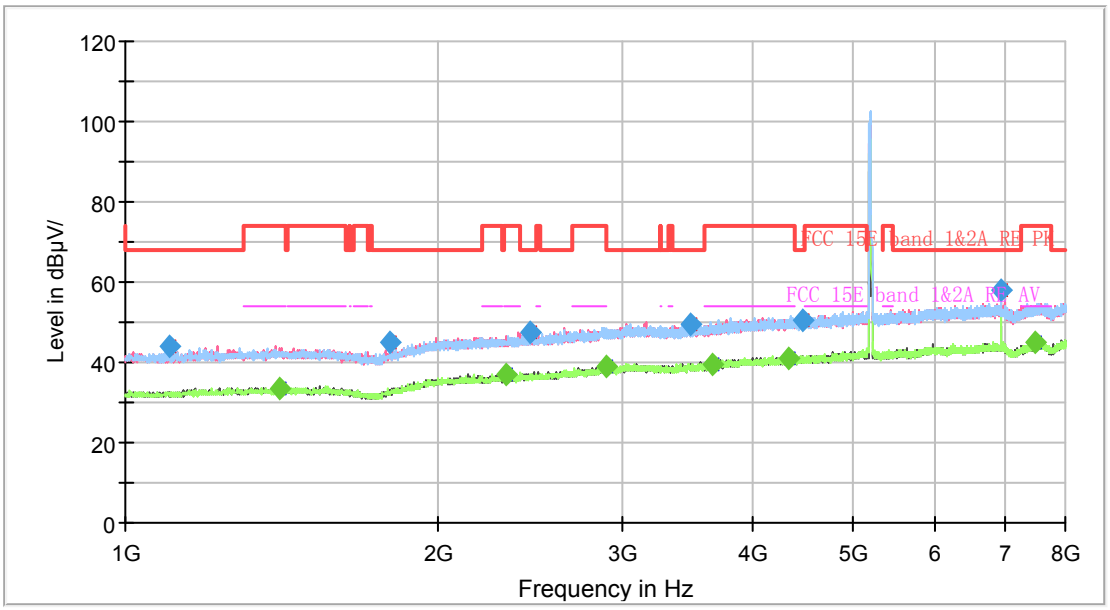


Radiates Emission from 8GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1158.200000	43.67	---	68.20	24.53	200.0	V	164.0	0.0
1401.800000	---	32.28	54.00	21.72	200.0	H	179.0	1.0
1700.000000	---	33.23	54.00	20.77	200.0	H	270.0	2.5
1931.000000	46.24	---	68.20	21.96	200.0	H	126.0	3.5
2477.000000	47.63	---	68.20	20.57	200.0	H	47.0	5.7
2716.400000	---	36.22	54.00	17.78	200.0	V	96.0	6.7
3591.400000	49.37	---	68.20	18.83	100.0	V	121.0	9.2
3947.000000	---	39.01	54.00	14.99	100.0	H	161.0	10.6
5149.600000	---	41.74	54.00	12.26	100.0	H	156.0	13.3
5573.800000	52.93	---	68.20	15.27	100.0	H	310.0	14.4
6906.600000	58.10	---	68.20	10.10	100.0	H	167.0	16.1
7550.600000	---	43.40	54.00	10.60	200.0	V	128.0	17.4

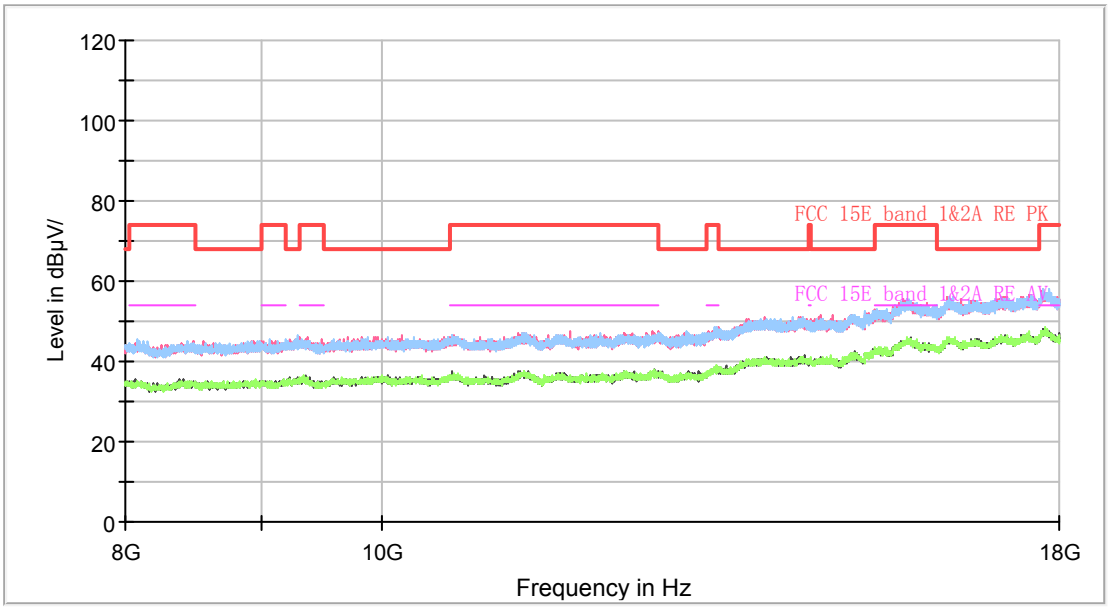
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11a CH40



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz

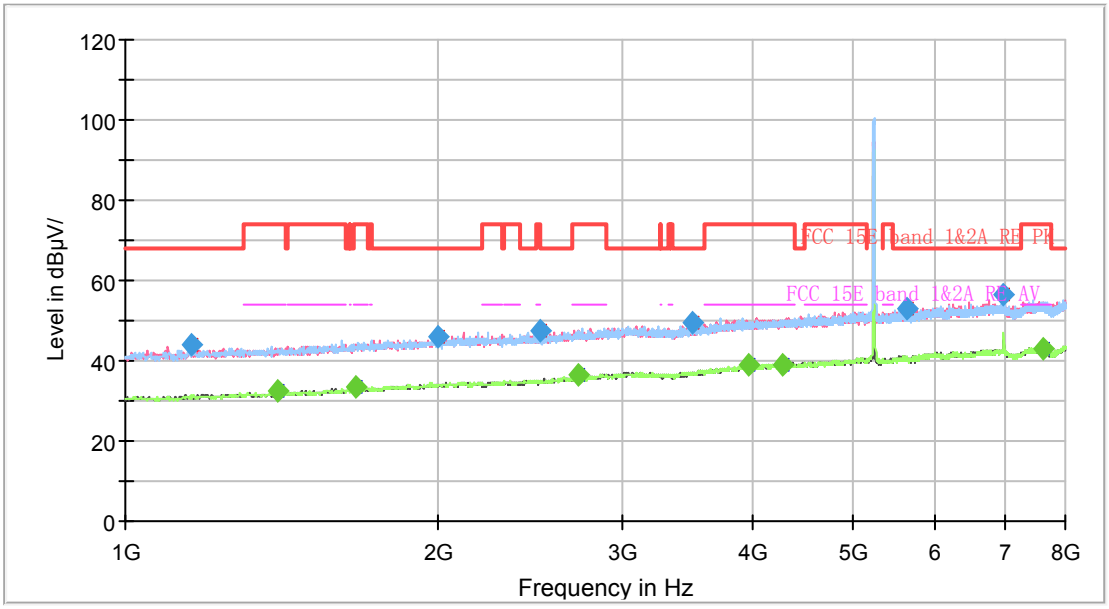


Radiates Emission from 8GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1102.375000	43.93	---	68.20	24.27	200.0	V	121.0	-0.7
1404.250000	---	33.54	54.00	20.46	200.0	V	313.0	1.0
1795.375000	44.80	---	68.20	23.40	200.0	H	168.0	2.9
2318.625000	---	36.96	54.00	17.04	200.0	V	68.0	5.0
2443.750000	47.34	---	68.20	20.86	200.0	H	257.0	5.4
2899.625000	---	39.16	54.00	14.84	100.0	H	223.0	7.5
3499.000000	49.45	---	68.20	18.75	200.0	V	298.0	8.9
3667.875000	---	39.55	54.00	14.45	200.0	V	94.0	9.7
4343.375000	---	41.19	54.00	12.81	100.0	H	177.0	11.5
4475.500000	50.73	---	68.20	17.47	100.0	V	0.0	11.6
6933.375000	58.09	---	68.20	10.11	100.0	H	207.0	16.2
7500.375000	---	45.12	54.00	8.88	200.0	V	21.0	17.3

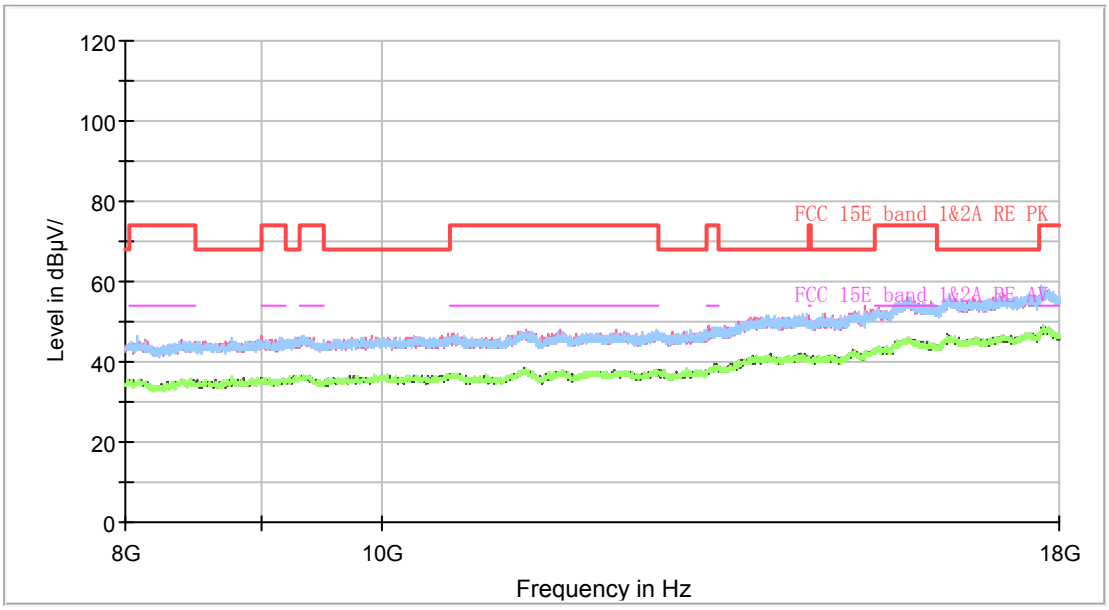
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11a CH48



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz

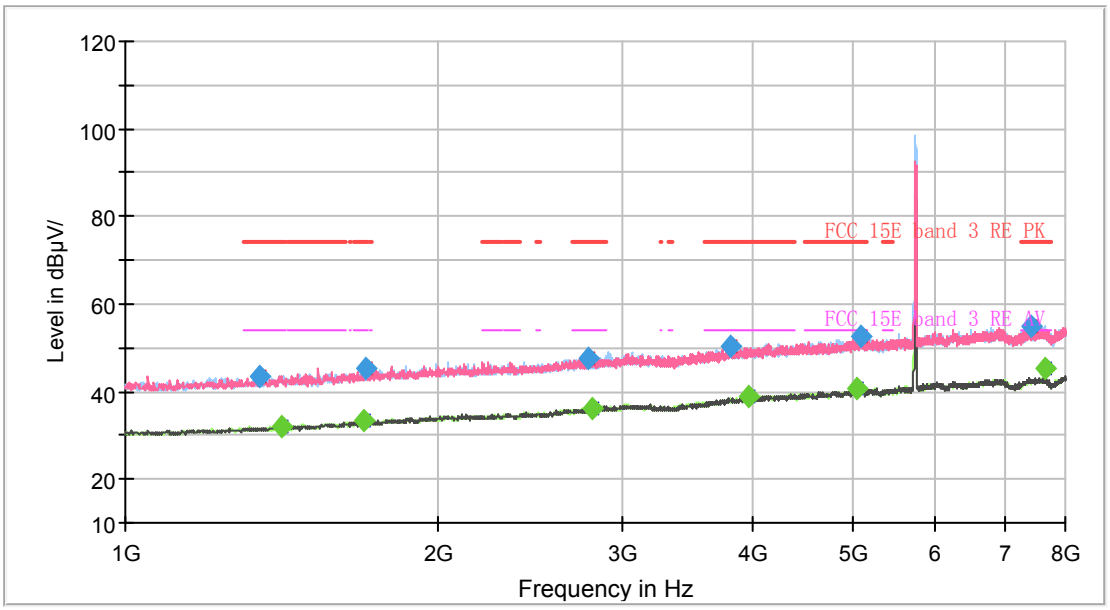


Radiates Emission from 8GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1156.800000	43.78	---	68.20	24.42	200.0	V	191.0	0.0
1400.400000	---	32.55	54.00	21.45	100.0	H	179.0	1.0
1665.000000	---	33.28	54.00	20.72	100.0	V	219.0	2.2
1995.400000	45.75	---	68.20	22.45	200.0	V	143.0	3.9
2502.200000	47.53	---	68.20	20.67	100.0	H	59.0	5.6
2723.400000	---	36.26	54.00	17.74	100.0	V	253.0	6.8
3506.000000	49.28	---	68.20	18.92	100.0	V	342.0	8.9
3973.600000	---	38.83	54.00	15.17	100.0	V	81.0	10.7
4280.200000	---	39.06	54.00	14.94	200.0	V	317.0	11.2
5625.600000	52.89	---	68.20	15.31	100.0	V	352.0	14.3
6986.400000	56.65	---	68.20	11.55	100.0	H	195.0	16.3
7612.200000	---	43.23	54.00	10.77	100.0	V	59.0	17.6

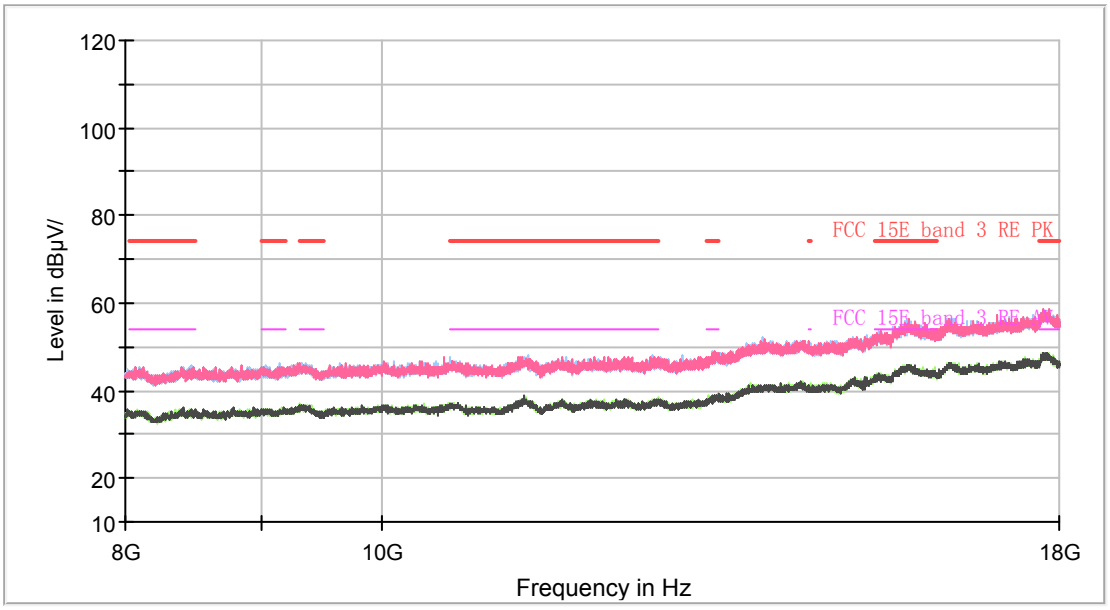
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11a CH149



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz

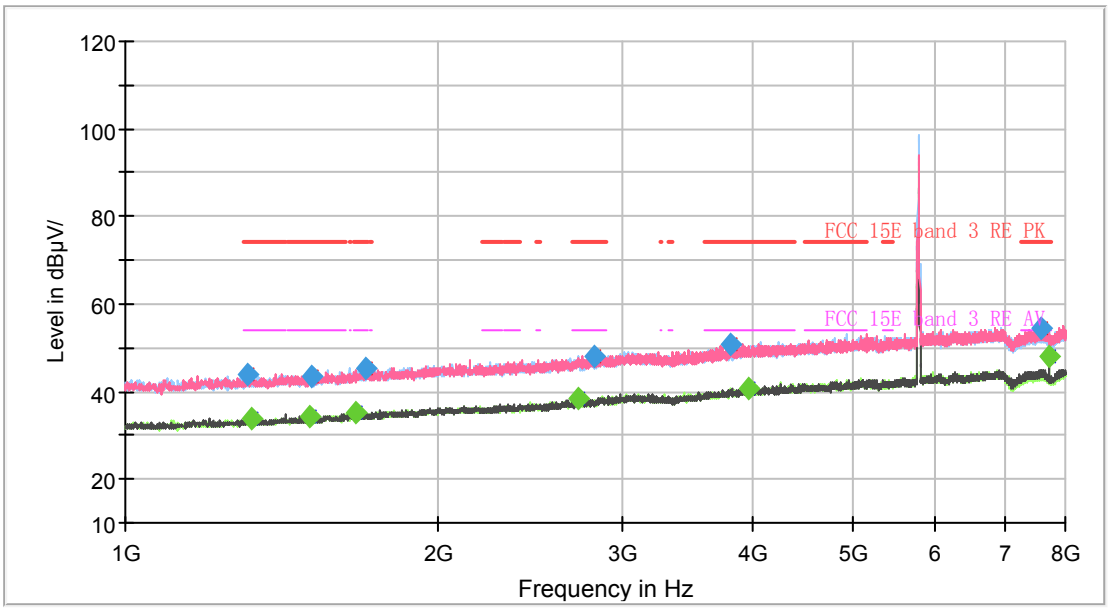


Radiates Emission from 8GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1348.600000	43.52	---	74.00	30.48	100.0	H	328.0	0.7
1410.200000	---	32.08	54.00	21.92	100.0	V	74.0	1.1
1693.000000	---	33.29	54.00	20.71	200.0	V	337.0	2.4
1701.400000	45.30	---	74.00	28.70	200.0	V	180.0	2.5
2786.400000	47.78	---	74.00	26.22	100.0	H	339.0	6.8
2808.800000	---	36.21	54.00	17.79	100.0	H	199.0	7.0
3816.800000	50.11	---	74.00	23.89	200.0	V	117.0	10.3
3966.600000	---	38.71	54.00	15.29	100.0	V	208.0	10.7
5055.800000	---	40.66	54.00	13.34	200.0	H	317.0	13.3
5092.200000	52.56	---	74.00	21.44	100.0	H	307.0	13.6
7434.400000	54.78	---	74.00	19.22	200.0	V	180.0	17.2
7661.200000	---	45.40	54.00	8.60	100.0	H	243.0	17.7

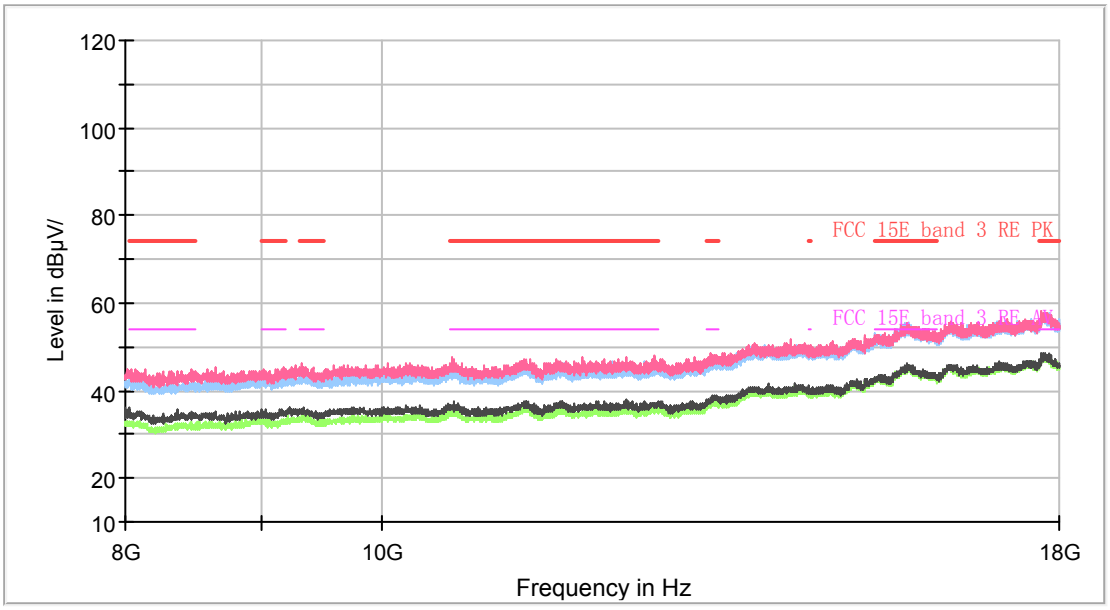
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11a CH157



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz

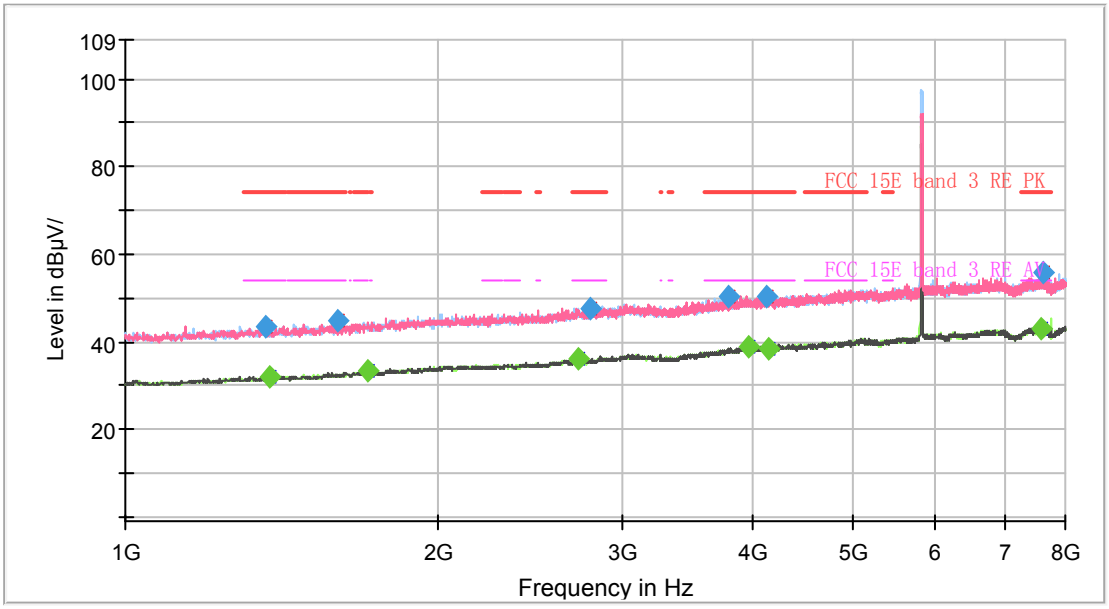


Radiates Emission from 8GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1312.375000	43.92	---	74.00	30.08	100.0	H	250.0	0.7
1320.250000	---	33.95	54.00	20.05	100.0	H	217.0	0.7
1504.875000	---	34.09	54.00	19.91	200.0	V	151.0	1.4
1508.375000	43.46	---	74.00	30.54	100.0	H	50.0	1.4
1666.750000	---	35.00	54.00	19.00	200.0	V	305.0	2.2
1700.875000	45.43	---	74.00	28.57	200.0	H	0.0	2.5
2720.250000	---	38.21	54.00	15.79	200.0	V	229.0	6.8
2824.375000	48.02	---	74.00	25.98	200.0	V	275.0	7.0
3814.875000	51.01	---	74.00	22.99	200.0	V	162.0	10.2
3967.125000	---	40.70	54.00	13.30	200.0	V	24.0	10.7
7584.375000	54.43	---	74.00	19.57	100.0	V	246.0	17.5
7713.875000	---	48.02	54.00	5.98	100.0	H	5.0	17.6

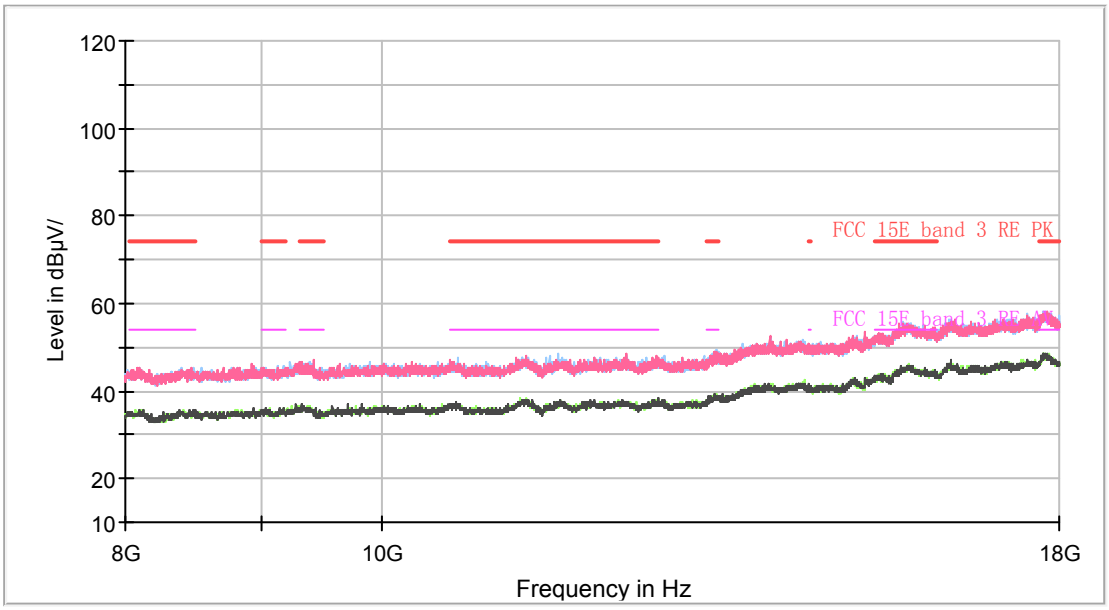
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11a CH165



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz

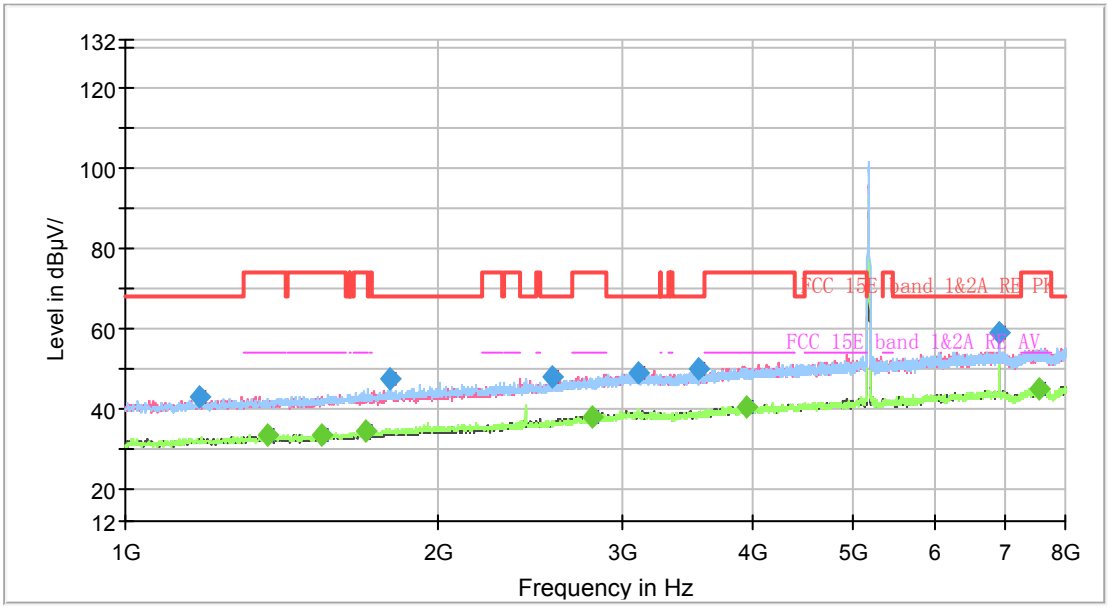


Radiates Emission from 8GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1361.200000	43.37	---	74.00	30.63	200.0	V	346.0	0.8
1375.200000	---	32.13	54.00	21.87	100.0	V	163.0	0.8
1597.800000	44.99	---	74.00	29.01	100.0	V	50.0	1.8
1709.800000	---	33.24	54.00	20.76	200.0	H	140.0	2.5
2723.400000	---	36.25	54.00	17.75	200.0	H	135.0	6.8
2797.600000	47.61	---	74.00	26.39	100.0	V	121.0	7.0
3794.400000	50.55	---	74.00	23.45	100.0	H	212.0	10.1
3975.000000	---	38.69	54.00	15.31	100.0	H	265.0	10.7
4140.200000	50.40	---	74.00	23.60	200.0	H	280.0	11.0
4151.400000	---	38.55	54.00	15.45	200.0	H	166.0	11.0
7585.600000	---	43.13	54.00	10.87	100.0	V	254.0	17.5
7613.600000	55.93	---	74.00	18.07	100.0	H	270.0	17.6

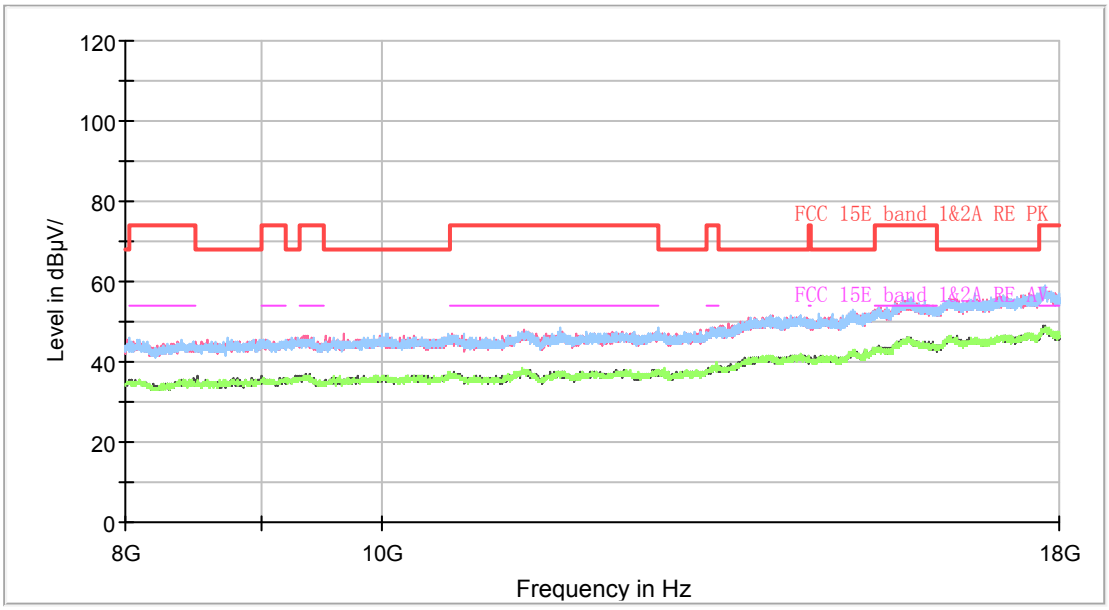
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT20) CH36



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz

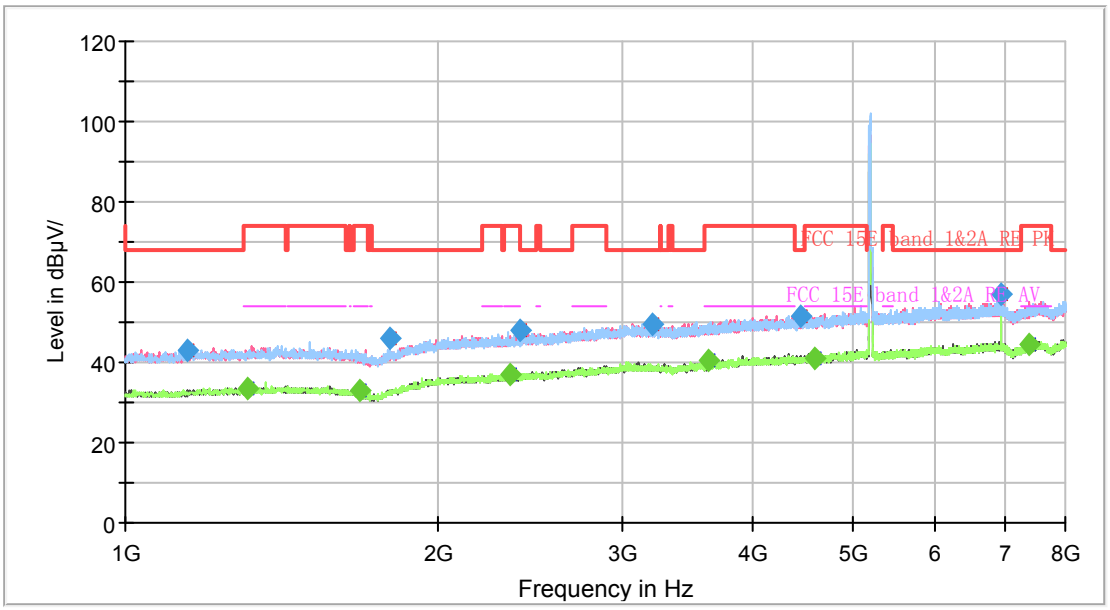


Radiates Emission from 8GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1178.500000	42.87	---	68.20	25.33	100.0	H	230.0	0.1
1368.375000	---	33.28	54.00	20.72	100.0	H	263.0	0.8
1546.000000	---	33.37	54.00	20.63	100.0	H	266.0	1.6
1704.375000	---	34.62	54.00	19.38	100.0	H	211.0	2.6
1798.875000	47.30	---	68.20	20.90	100.0	H	152.0	3.0
2568.000000	47.80	---	68.20	20.40	100.0	V	169.0	6.0
2806.000000	---	38.20	54.00	15.80	100.0	V	165.0	7.0
3115.750000	48.90	---	68.20	19.30	200.0	H	56.0	8.3
3548.000000	49.95	---	68.20	18.25	100.0	H	167.0	9.0
3946.125000	---	40.59	54.00	13.41	200.0	H	0.0	10.6
6907.125000	59.20	---	68.20	9.00	100.0	H	208.0	16.2
7552.875000	---	45.19	54.00	8.81	200.0	V	216.0	17.4

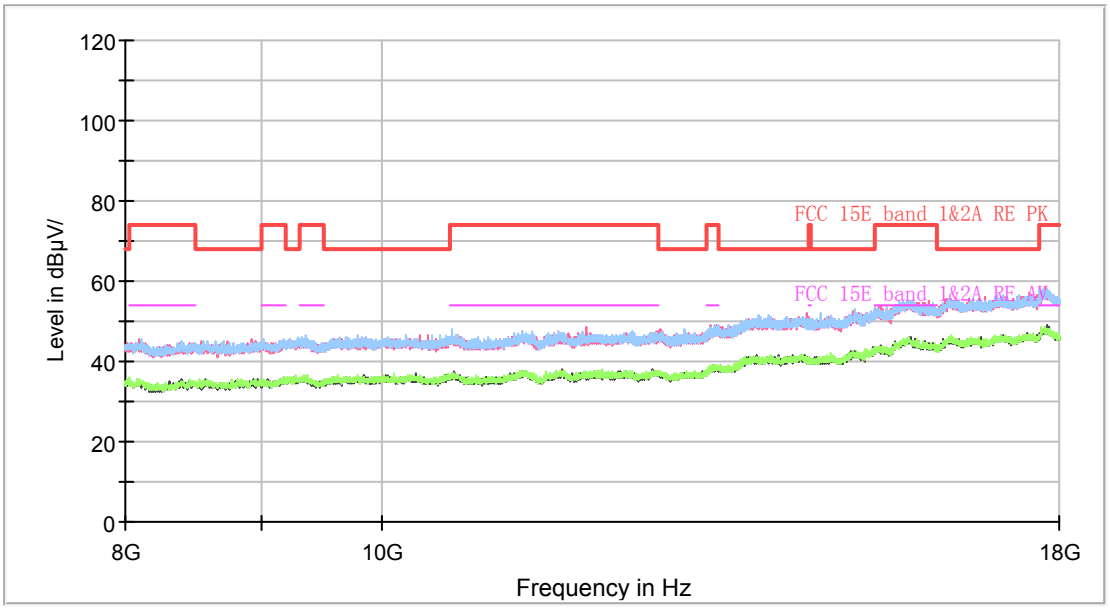
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT20) CH40



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz

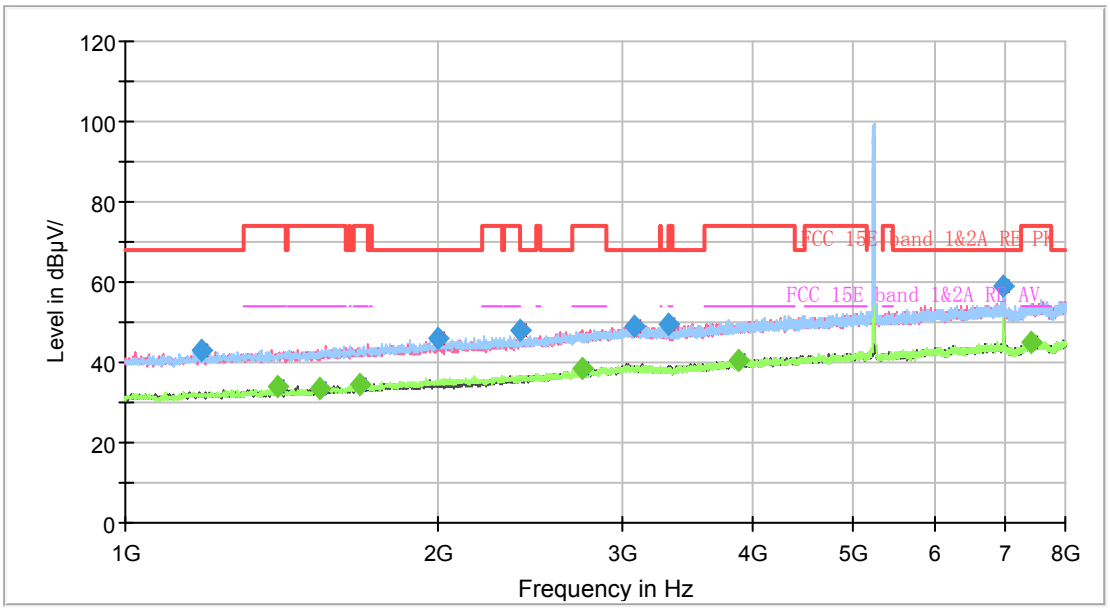


Radiates Emission from 8GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1145.250000	42.99	---	68.20	25.21	200.0	H	282.0	-0.2
1312.375000	---	33.28	54.00	20.72	200.0	V	163.0	0.7
1676.375000	---	32.77	54.00	21.23	100.0	V	70.0	2.2
1795.375000	45.82	---	68.20	22.38	200.0	V	231.0	2.9
2343.125000	---	36.88	54.00	17.12	200.0	V	22.0	5.1
2396.500000	47.87	---	68.20	20.33	200.0	V	178.0	5.2
3215.500000	49.54	---	68.20	18.66	200.0	V	29.0	8.3
3639.875000	---	40.53	54.00	13.47	100.0	H	41.0	9.5
4452.750000	51.27	---	68.20	16.93	100.0	V	234.0	11.5
4594.500000	---	41.20	54.00	12.80	100.0	V	146.0	11.8
6933.375000	57.23	---	68.20	10.97	100.0	H	177.0	16.2
7384.000000	---	44.52	54.00	9.48	100.0	V	74.0	17.2

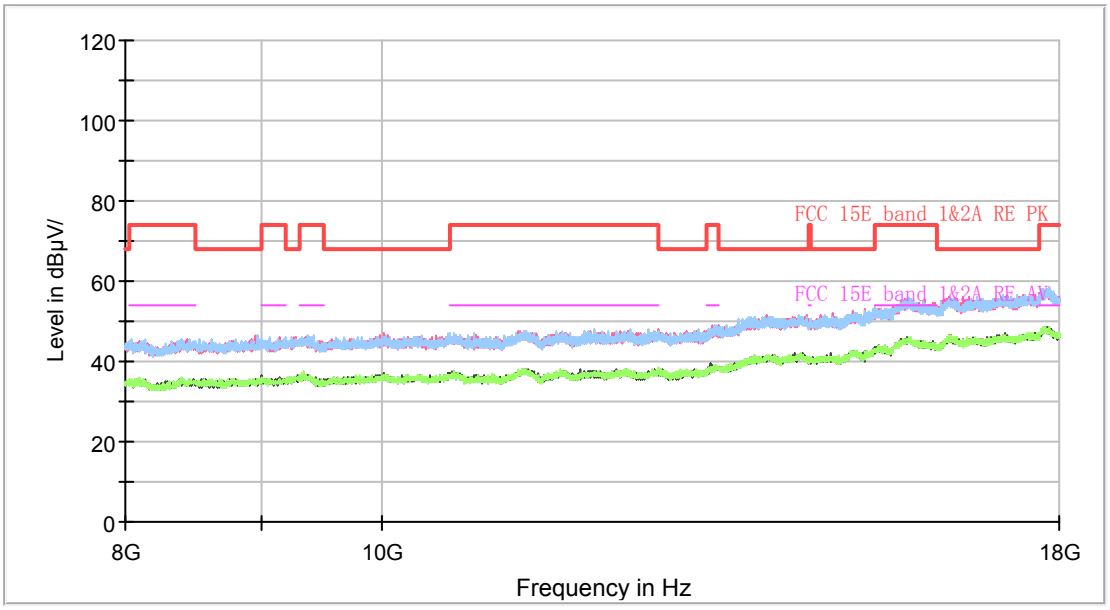
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT20) CH48



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz

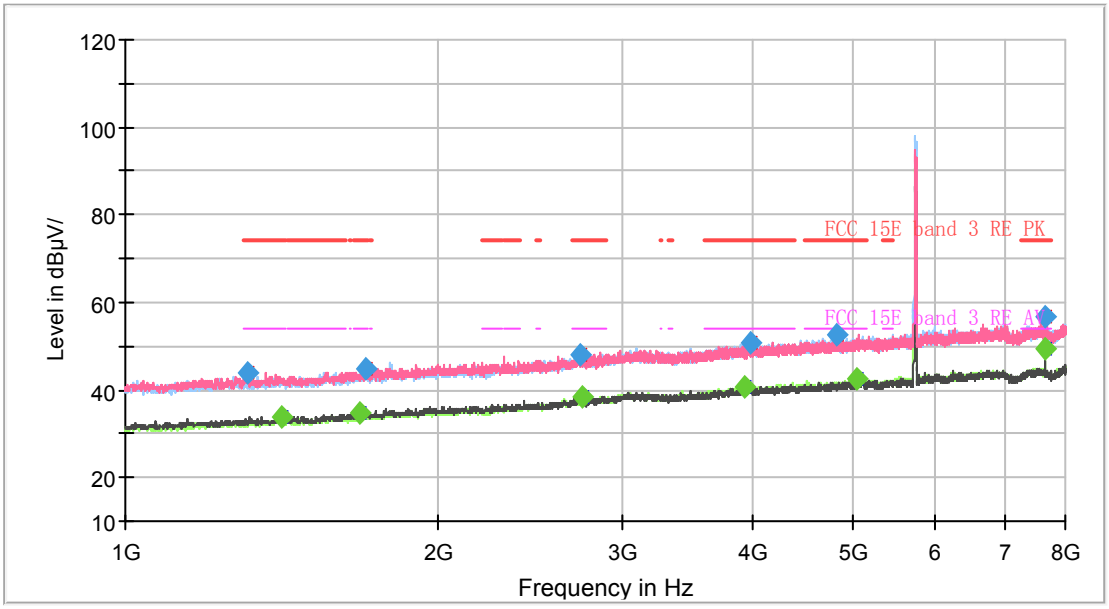


Radiates Emission from 8GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1182.875000	42.77	---	68.20	25.43	100.0	V	0.0	0.1
1402.500000	---	33.91	54.00	20.09	200.0	H	356.0	1.0
1538.125000	---	33.34	54.00	20.66	200.0	V	268.0	1.5
1682.500000	---	34.37	54.00	19.63	100.0	H	284.0	2.2
1994.875000	46.17	---	68.20	22.03	200.0	H	42.0	3.8
2393.000000	48.17	---	68.20	20.03	200.0	V	189.0	5.2
2747.375000	---	38.47	54.00	15.53	200.0	V	73.0	6.7
3087.750000	49.11	---	68.20	19.09	100.0	V	13.0	8.4
3328.375000	49.62	---	68.20	18.58	100.0	H	95.0	8.3
3879.625000	---	40.52	54.00	13.48	200.0	V	12.0	10.4
6987.625000	59.02	---	68.20	9.18	100.0	H	205.0	16.3
7422.500000	---	45.11	54.00	8.89	200.0	V	234.0	17.2

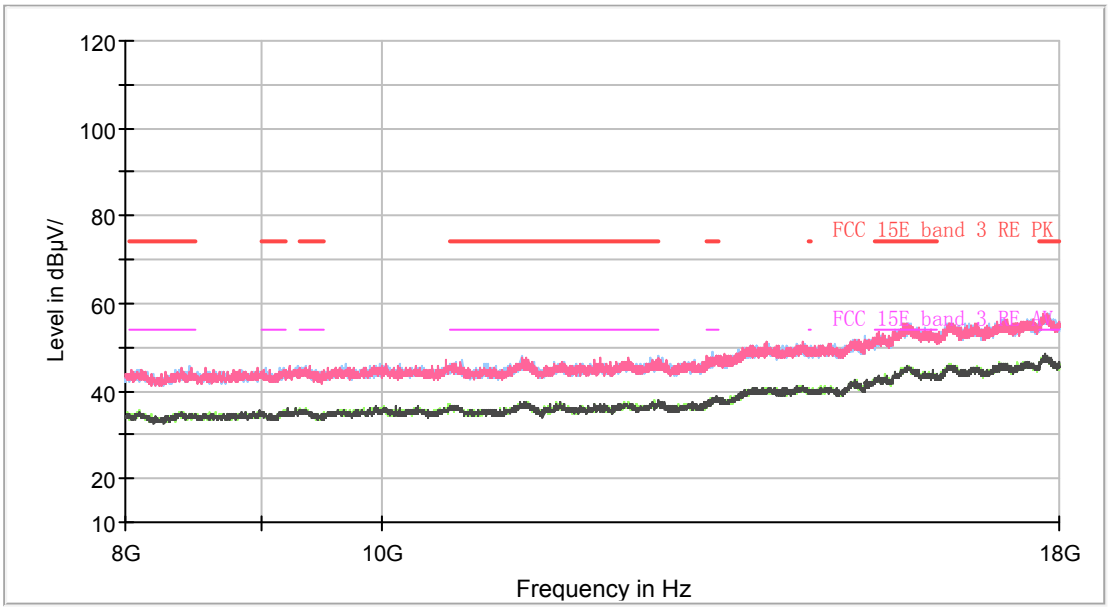
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT20) CH149



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz

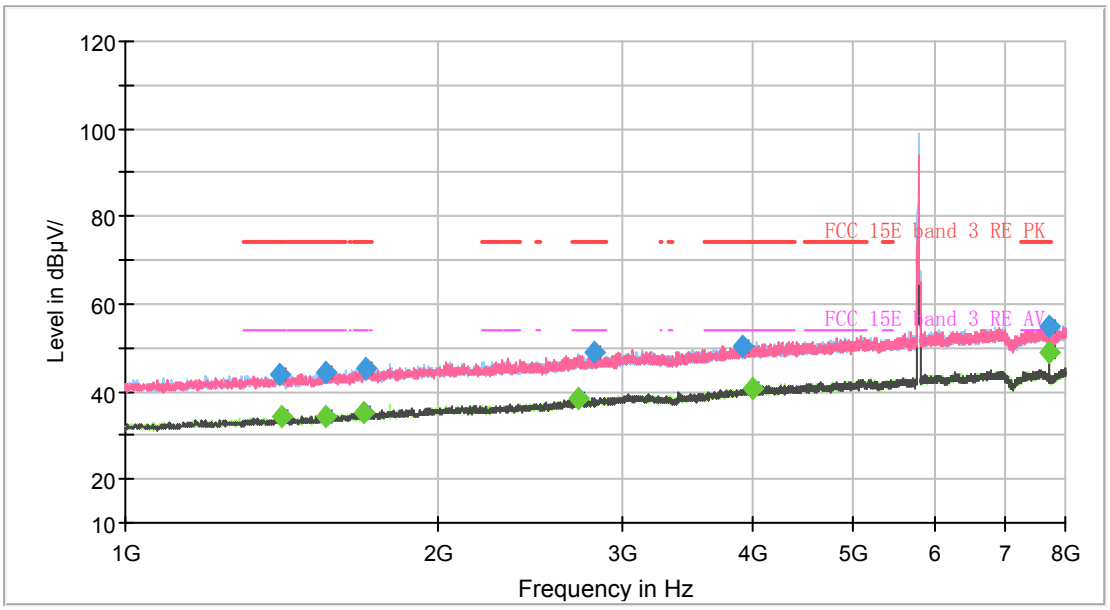


Radiates Emission from 8GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1311.500000	43.93	---	74.00	30.07	200.0	V	16.0	0.6
1412.125000	---	33.75	54.00	20.25	200.0	V	115.0	1.1
1679.000000	---	34.97	54.00	19.03	200.0	V	134.0	2.2
1703.500000	44.63	---	74.00	29.37	200.0	V	107.0	2.5
2733.375000	47.95	---	74.00	26.05	200.0	H	165.0	6.8
2751.750000	---	38.39	54.00	15.61	200.0	H	135.0	6.7
3943.500000	---	40.52	54.00	13.48	200.0	H	317.0	10.6
3981.125000	50.76	---	74.00	23.24	200.0	V	224.0	10.7
4820.250000	52.80	---	74.00	21.20	100.0	H	39.0	12.6
5051.250000	---	42.51	54.00	11.49	100.0	H	158.0	13.3
7660.500000	56.56	---	74.00	17.44	100.0	H	210.0	17.7
7660.500000	---	49.35	54.00	4.65	100.0	H	210.0	17.7

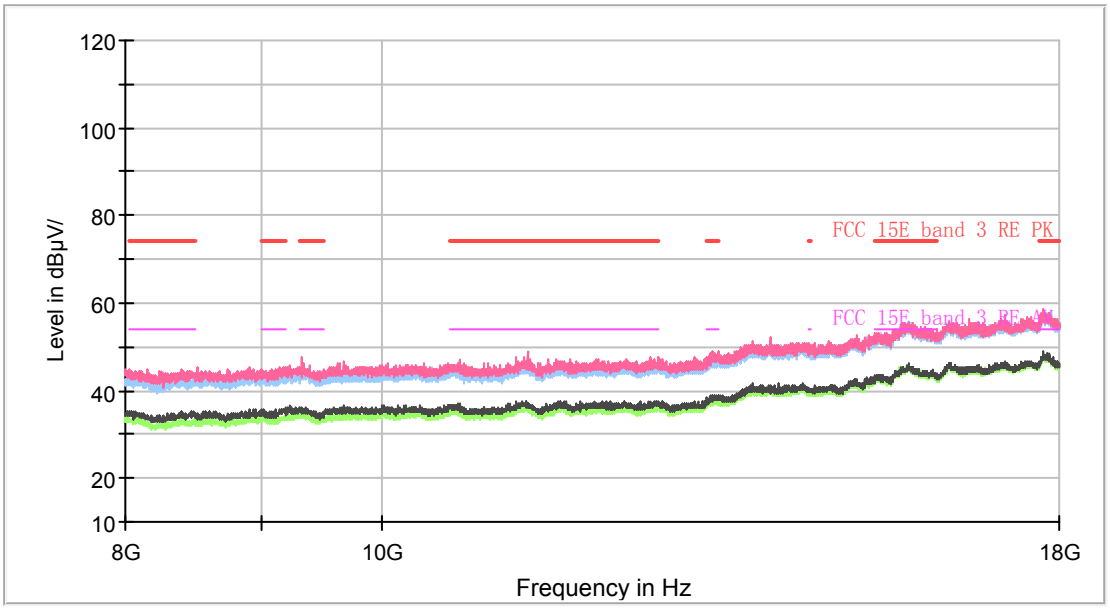
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT20) CH157



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz

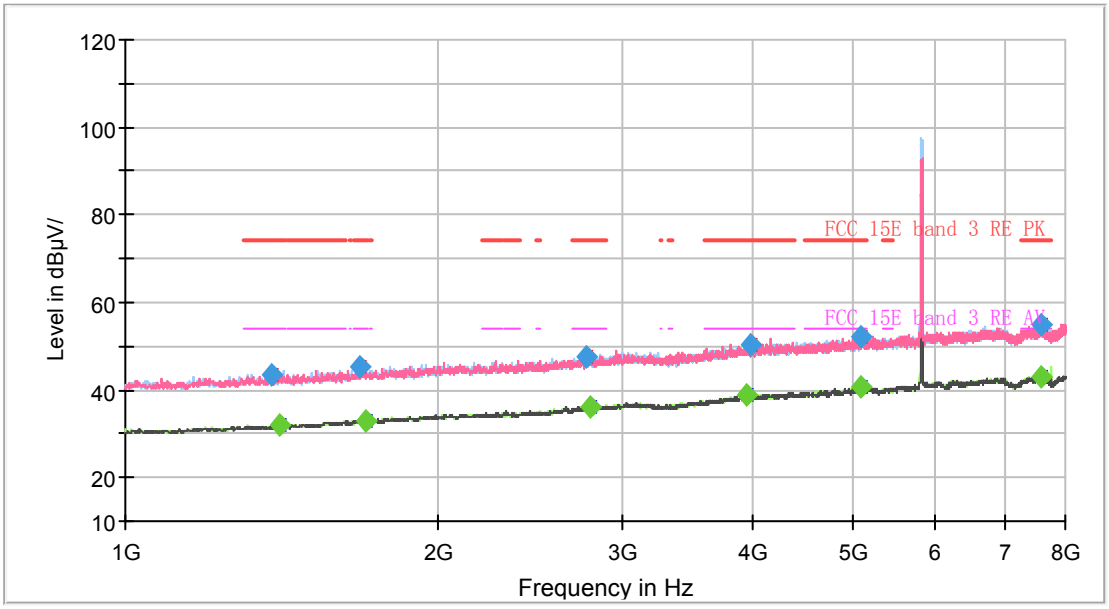


Radiates Emission from 8GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1407.750000	44.13	---	74.00	29.87	200.0	H	66.0	1.1
1413.000000	---	34.19	54.00	19.81	200.0	H	172.0	1.1
1554.750000	---	34.25	54.00	19.75	200.0	V	5.0	1.8
1560.875000	44.51	---	74.00	29.49	100.0	H	247.0	1.9
1698.250000	---	35.10	54.00	18.90	200.0	V	205.0	2.5
1704.375000	45.29	---	74.00	28.71	100.0	H	65.0	2.6
2727.250000	---	38.38	54.00	15.62	100.0	H	80.0	6.8
2816.500000	49.03	---	74.00	24.97	200.0	V	149.0	7.0
3912.875000	50.27	---	74.00	23.73	200.0	H	168.0	10.5
3998.625000	---	40.83	54.00	13.17	200.0	V	15.0	10.7
7713.875000	---	48.84	54.00	5.16	100.0	H	335.0	17.6
7713.875000	55.10	---	74.00	18.90	100.0	H	335.0	17.6

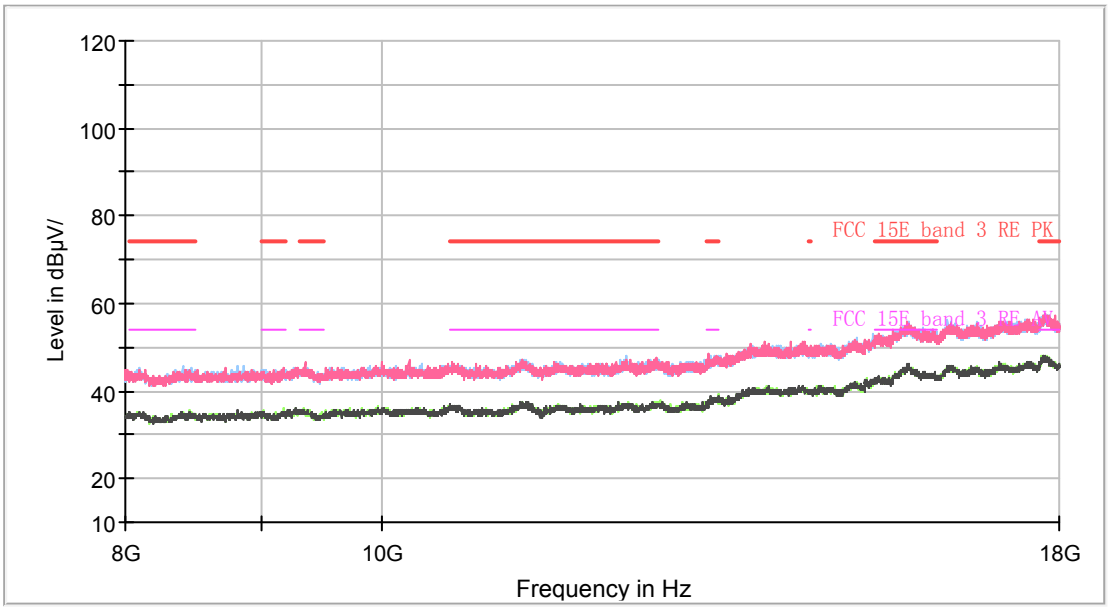
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT20) CH165



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz

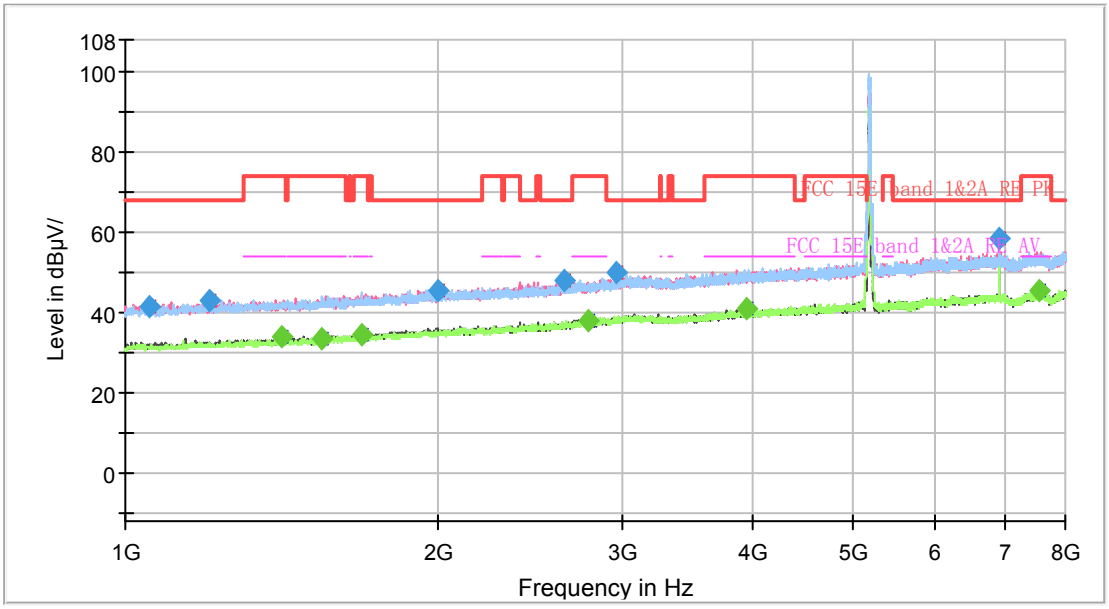


Radiates Emission from 8GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1385.000000	43.65	---	74.00	30.35	100.0	H	167.0	0.8
1408.800000	---	32.05	54.00	21.95	200.0	H	2.0	1.1
1681.800000	45.18	---	74.00	28.82	200.0	H	66.0	2.2
1701.400000	---	33.12	54.00	20.88	200.0	V	340.0	2.5
2771.000000	47.42	---	74.00	26.58	100.0	H	348.0	6.7
2803.200000	---	36.12	54.00	17.88	200.0	H	123.0	7.0
3949.800000	---	38.69	54.00	15.31	100.0	V	29.0	10.6
3980.600000	50.16	---	74.00	23.84	200.0	V	255.0	10.7
5082.400000	---	40.55	54.00	13.45	100.0	H	295.0	13.5
5083.800000	52.25	---	74.00	21.75	100.0	H	0.0	13.5
7577.200000	54.84	---	74.00	19.16	200.0	V	201.0	17.5
7580.000000	---	43.10	54.00	10.90	100.0	V	40.0	17.5

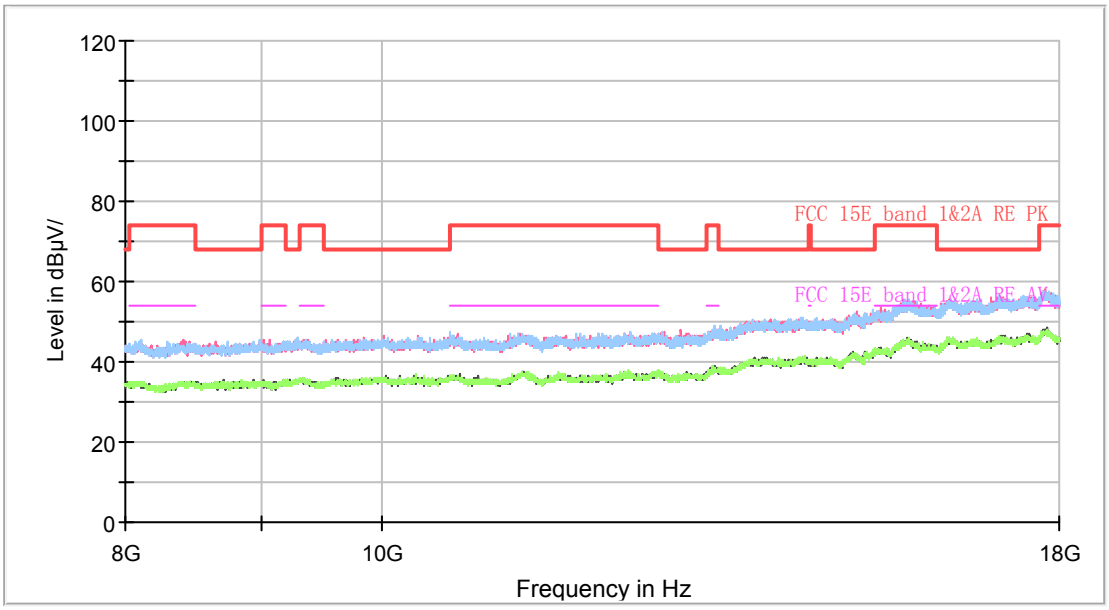
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT40) CH38



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz

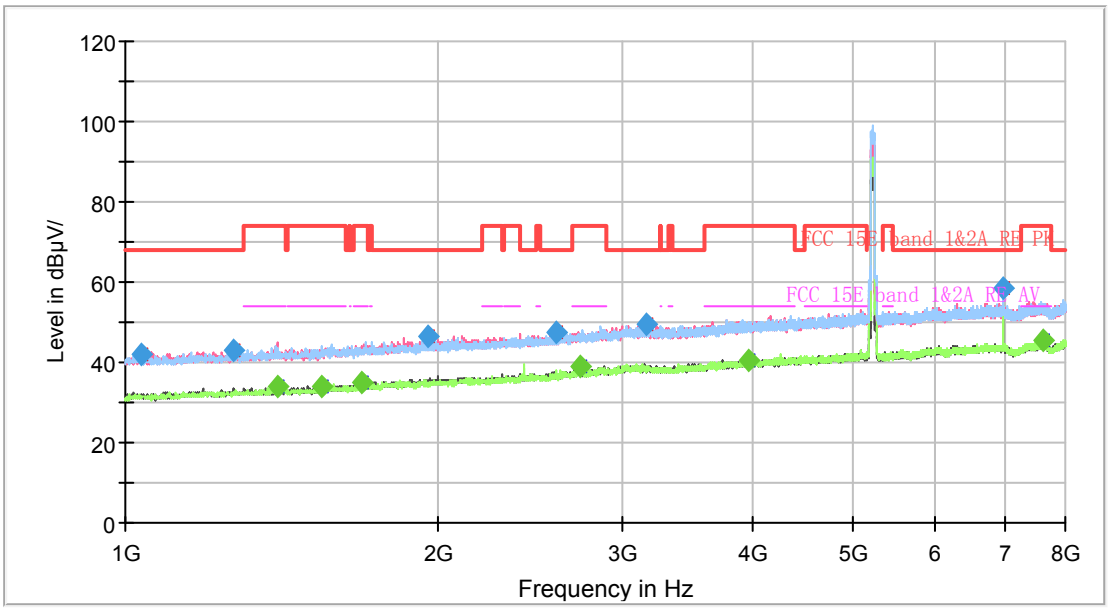


Radiates Emission from 8GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1056.000000	41.68	---	68.20	26.52	100.0	V	130.0	-0.9
1203.000000	43.01	---	68.20	25.19	100.0	V	145.0	0.0
1411.250000	---	33.79	54.00	20.21	100.0	V	126.0	1.1
1546.000000	---	33.50	54.00	20.50	100.0	V	13.0	1.6
1684.250000	---	34.42	54.00	19.58	100.0	V	27.0	2.2
1994.875000	45.62	---	68.20	22.58	100.0	V	293.0	3.8
2642.375000	47.87	---	68.20	20.33	100.0	H	168.0	6.3
2781.500000	---	38.21	54.00	15.79	100.0	H	346.0	6.8
2968.750000	49.81	---	68.20	18.39	100.0	H	301.0	7.9
3955.750000	---	40.82	54.00	13.19	100.0	H	9.0	10.6
6920.250000	58.36	---	68.20	9.84	100.0	H	210.0	16.2
7548.500000	---	45.31	54.00	8.69	100.0	H	255.0	17.4

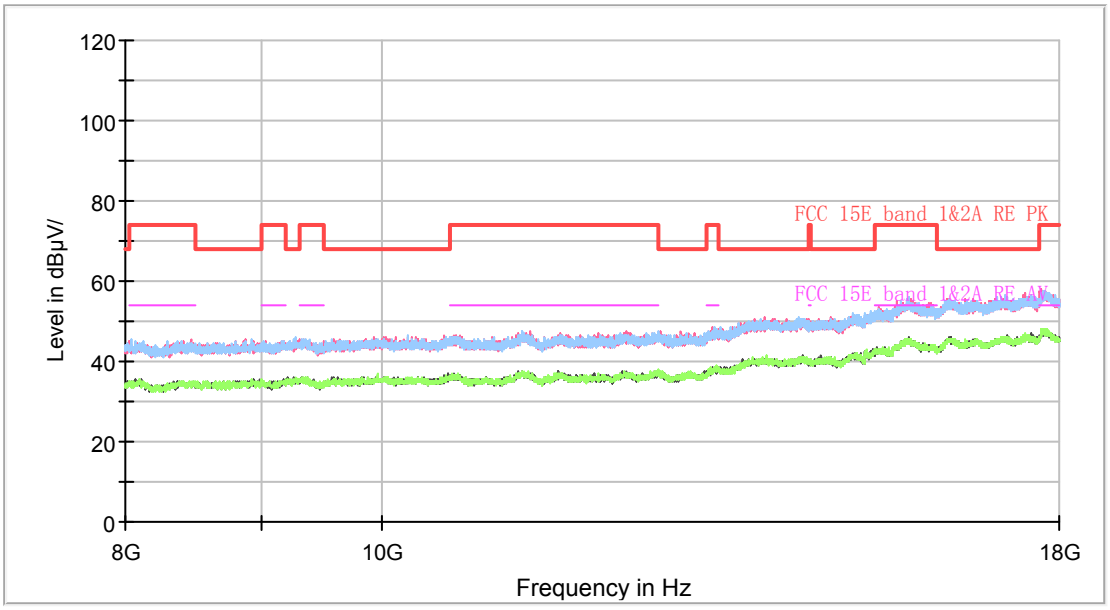
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT40) CH46



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz

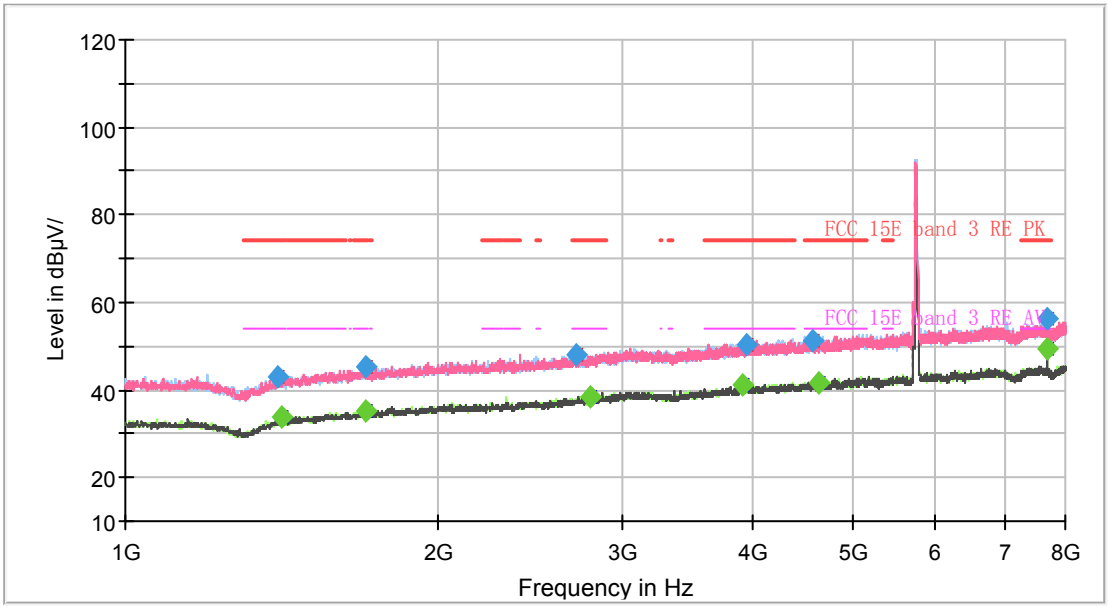


Radiates Emission from 8GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1035.875000	41.85	---	68.20	26.35	100.0	V	209.0	-1.0
1272.125000	42.96	---	68.20	25.24	200.0	H	88.0	0.4
1398.125000	---	34.24	54.00	19.76	100.0	V	153.0	1.0
1542.500000	---	34.03	54.00	19.97	100.0	H	231.0	1.5
1687.750000	---	34.84	54.00	19.16	200.0	V	177.0	2.3
1956.375000	46.40	---	68.20	21.80	200.0	V	310.0	3.8
2593.375000	47.42	---	68.20	20.78	200.0	V	61.0	5.9
2735.125000	---	38.79	54.00	15.21	200.0	V	236.0	6.8
3166.500000	49.25	---	68.20	18.95	200.0	H	77.0	8.3
3974.125000	---	40.46	54.00	13.54	100.0	H	310.0	10.7
6973.625000	58.58	---	68.20	9.62	100.0	H	208.0	16.3
7629.875000	---	45.39	54.00	8.61	100.0	V	213.0	17.7

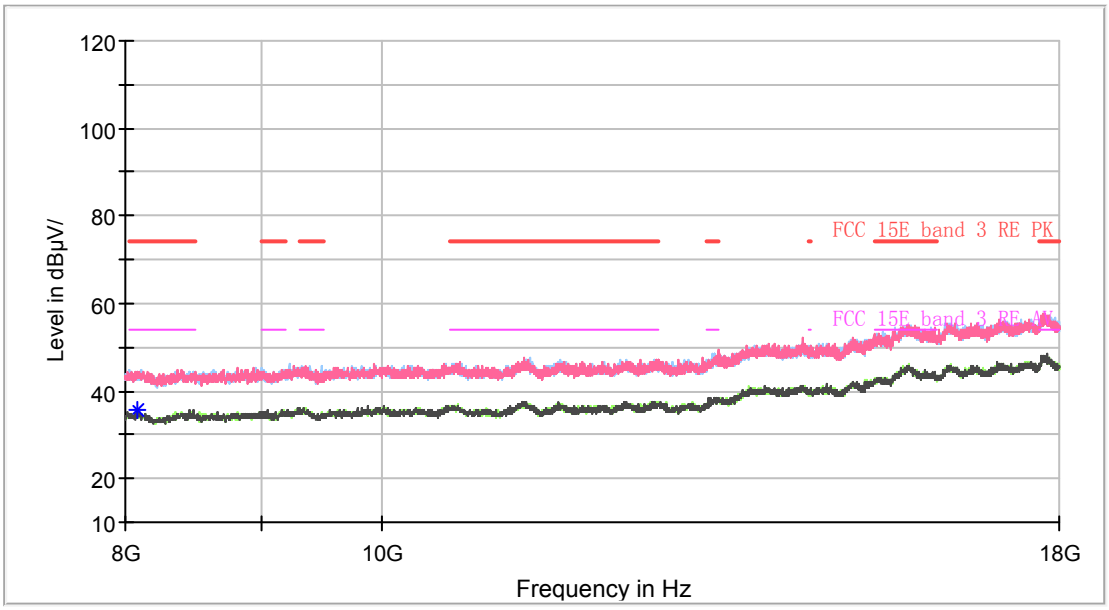
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT40) CH151



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz

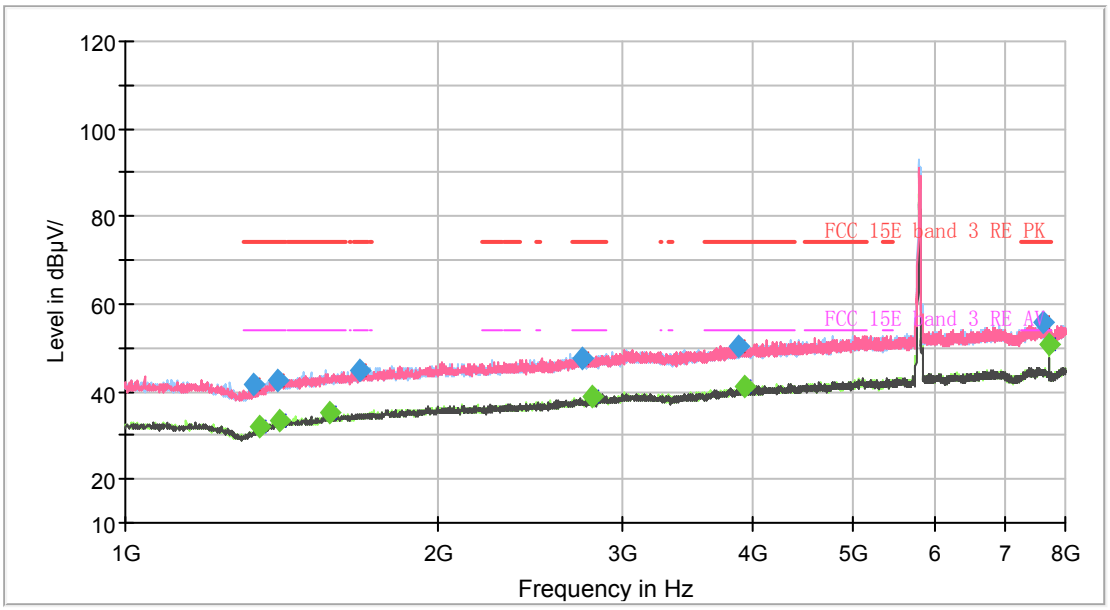


Radiates Emission from 8GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1403.375000	43.01	---	74.00	30.99	100.0	H	265.0	1.0
1412.125000	---	33.66	54.00	20.34	200.0	V	324.0	1.1
1703.500000	45.34	---	74.00	28.66	200.0	V	347.0	2.5
1706.125000	---	35.41	54.00	18.59	200.0	V	148.0	2.6
2708.875000	48.07	---	74.00	25.93	100.0	V	264.0	6.6
2792.000000	---	38.43	54.00	15.57	100.0	V	224.0	6.9
3919.000000	---	41.03	54.00	12.97	200.0	H	29.0	10.6
3948.750000	50.50	---	74.00	23.50	100.0	V	275.0	10.6
4581.375000	51.45	---	74.00	22.55	100.0	H	177.0	11.9
4635.625000	---	41.85	54.00	12.15	200.0	H	5.0	12.1
7673.625000	---	49.57	54.00	4.43	100.0	H	352.0	17.7
7673.625000	56.22	---	74.00	17.78	100.0	H	352.0	17.7

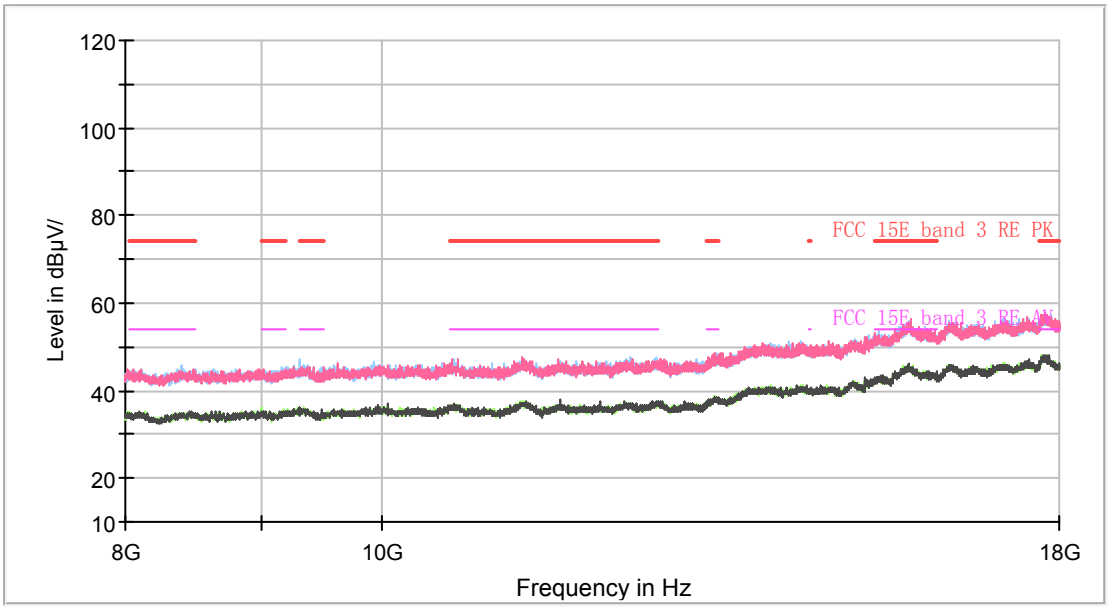
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11n (HT40) CH159



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz

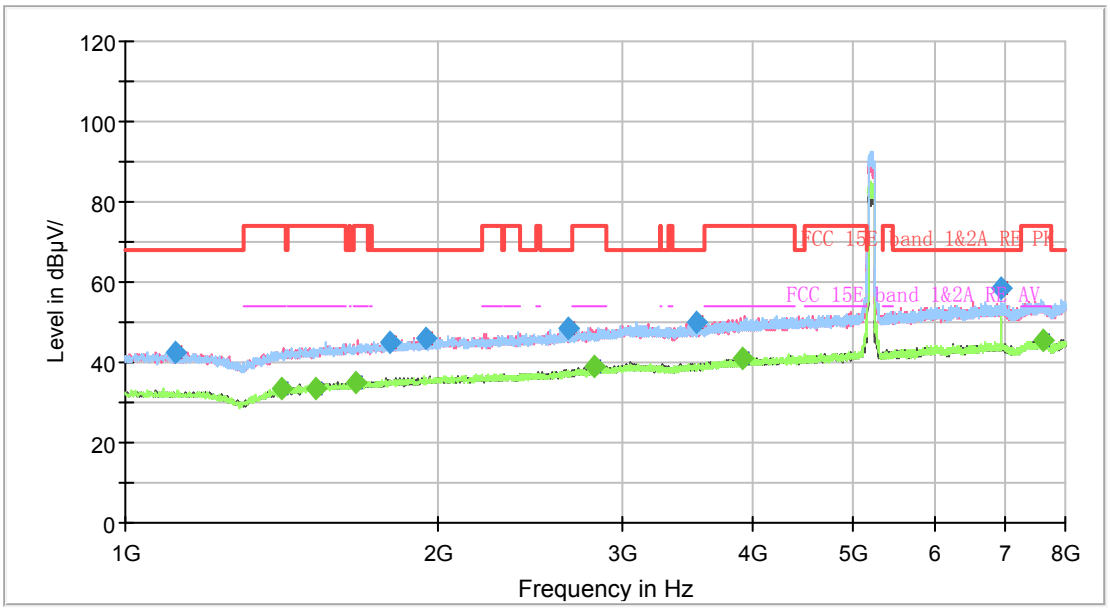


Radiates Emission from 8GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1328.125000	41.43	---	74.00	32.57	100.0	V	59.0	0.7
1343.000000	---	31.94	54.00	22.06	200.0	H	312.0	0.7
1402.500000	42.64	---	74.00	31.36	100.0	V	179.0	1.0
1406.875000	---	33.25	54.00	20.75	100.0	V	221.0	1.1
1568.750000	---	35.10	54.00	18.90	200.0	V	112.0	1.8
1680.750000	44.84	---	74.00	29.16	100.0	V	48.0	2.2
2750.000000	47.80	---	74.00	26.20	200.0	V	6.0	6.7
2806.875000	---	38.77	54.00	15.23	100.0	V	0.0	7.0
3887.500000	50.52	---	74.00	23.48	200.0	H	37.0	10.4
3943.500000	---	41.16	54.00	12.84	200.0	V	355.0	10.6
7623.750000	55.65	---	74.00	18.35	200.0	H	81.0	17.6
7727.000000	---	50.59	54.00	3.41	100.0	H	344.0	17.6

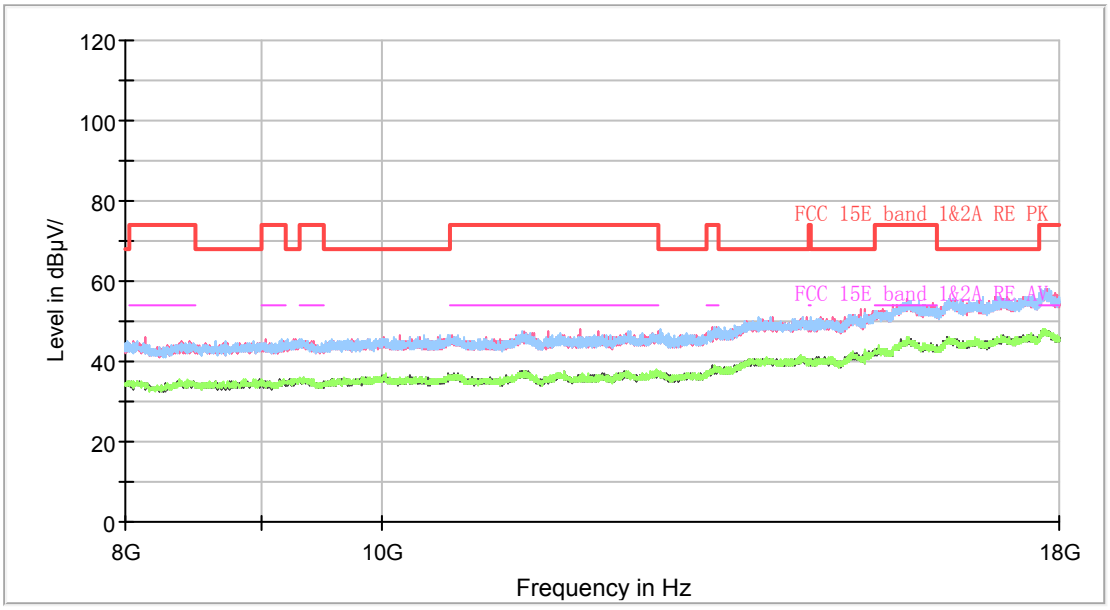
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11ac (HT80) CH42



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz

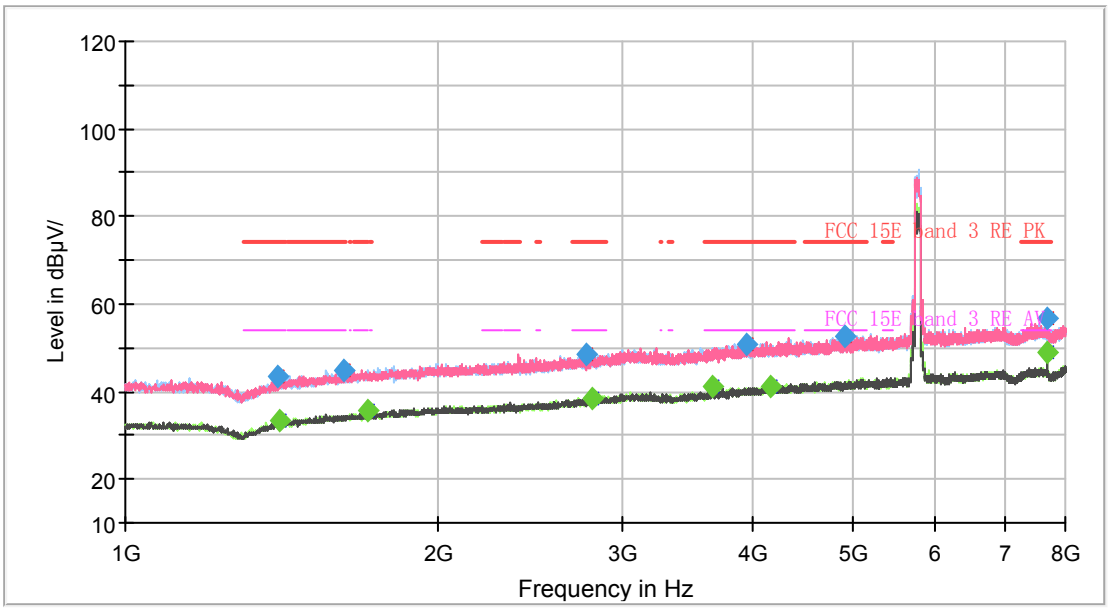


Radiates Emission from 8GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1119.000000	42.59	---	68.20	25.61	100.0	V	338.0	-0.7
1410.375000	---	33.33	54.00	20.67	200.0	V	161.0	1.1
1522.375000	---	33.72	54.00	20.28	100.0	H	1.0	1.4
1664.125000	---	35.19	54.00	18.81	200.0	H	358.0	2.2
1792.750000	45.07	---	68.20	23.13	200.0	H	271.0	2.9
1945.000000	46.16	---	68.20	22.04	200.0	H	142.0	3.7
2659.875000	48.29	---	68.20	19.91	100.0	V	356.0	6.2
2816.500000	---	38.88	54.00	15.12	100.0	V	304.0	7.0
3544.500000	49.78	---	68.20	18.42	100.0	H	124.0	9.0
3918.125000	---	40.88	54.00	13.12	100.0	H	234.0	10.6
6947.375000	58.50	---	68.20	9.70	100.0	H	77.0	16.2
7636.000000	---	45.64	54.00	8.36	100.0	H	101.0	17.7

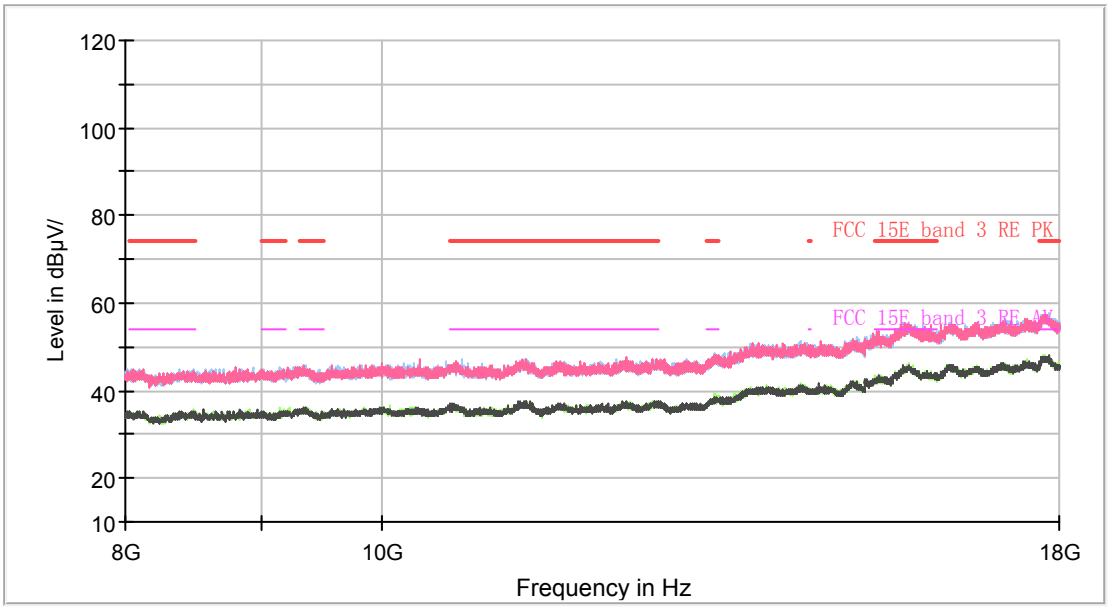
Remark: 1. Correction Factor = Antenna factor+ Insertion loss (cable loss + amplifier gain)

802.11ac (HT80) CH155



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz



Radiates Emission from 8GHz to 18GHz

Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1398.125000	43.40	---	74.00	30.60	200.0	V	168.0	1.0
1405.125000	---	33.15	54.00	20.85	200.0	H	21.0	1.0
1618.625000	44.95	---	74.00	29.05	200.0	V	327.0	1.9
1709.625000	---	35.58	54.00	18.42	200.0	H	28.0	2.5
2771.000000	48.57	---	74.00	25.43	100.0	V	21.0	6.7
2807.750000	---	38.54	54.00	15.46	100.0	V	120.0	7.0
3658.250000	---	41.05	54.00	12.95	100.0	H	285.0	9.6
3954.875000	50.70	---	74.00	23.30	200.0	H	83.0	10.6
4173.625000	---	40.94	54.00	13.06	100.0	H	234.0	11.0
4921.750000	52.60	---	74.00	21.40	200.0	V	0.0	12.9
7700.750000	---	48.76	54.00	5.24	100.0	H	350.0	17.6
7700.750000	56.52	---	74.00	17.48	100.0	H	350.0	17.6

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

5.6. Conducted Emission

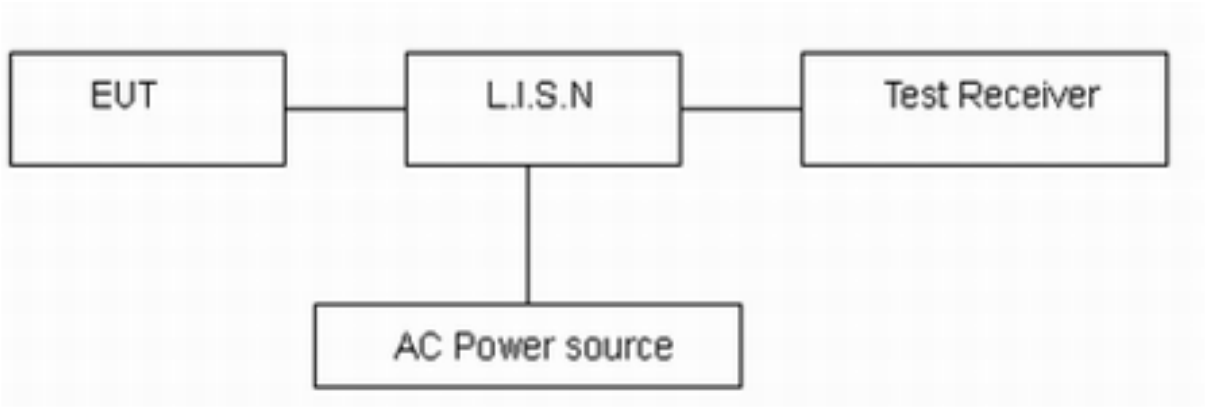
Ambient condition

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 C63.10-2013.Connect the AC power line of the EUT to the LISN Use EMI receiver to detect the average and Quasi-peak value. RBW is set to 9kHz, VBW is set to 30kHz The measurement result should include both L line and N line.
The test is in transmitting mode.

Test Setup



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

Limits

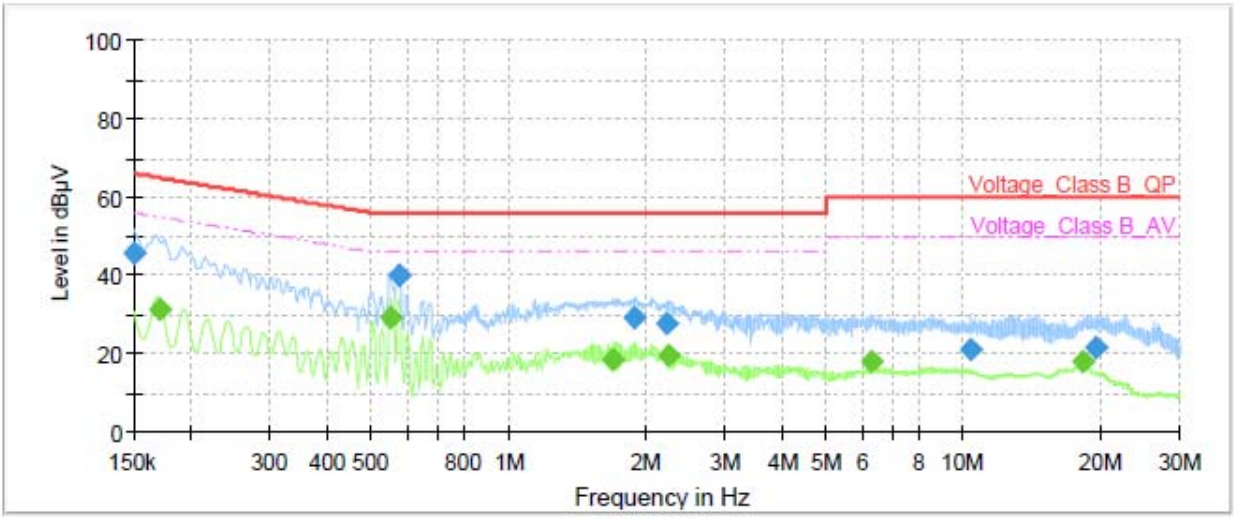
Frequency (MHz)	Conducted Limits(dBμV)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56 *	56 to 46*
0.5 - 5	56	46
5 - 30	60	50
*: Decreases with the logarithm of the frequency.		

Measurement Uncertainty

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

Test Results:

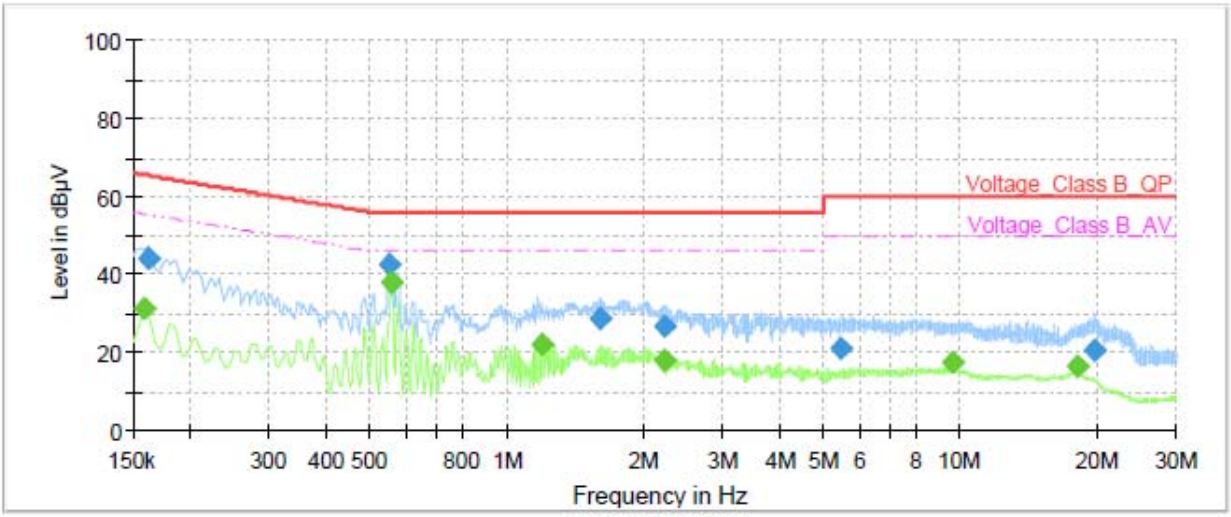
Following plots, Blue trace uses the peak detection and Green trace uses the average detection. During the test, the Conducted Emission was performed in all modes with all channels, 802.11n (HT40) CH159 are selected as the worst condition. The test data of the worst-case condition was recorded in this report.



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.15	45.73	---	66.00	20.27	1000.0	9.000	L1	ON	19
0.17	---	31.46	54.95	23.49	1000.0	9.000	L1	ON	19
0.55	---	29.12	46.00	16.88	1000.0	9.000	L1	ON	19
0.57	40.20	---	56.00	15.80	1000.0	9.000	L1	ON	19
1.69	---	18.60	46.00	27.40	1000.0	9.000	L1	ON	19
1.89	29.22	---	56.00	26.78	1000.0	9.000	L1	ON	19
2.24	27.93	---	56.00	28.07	1000.0	9.000	L1	ON	19
2.27	---	19.51	46.00	26.49	1000.0	9.000	L1	ON	19
6.28	---	17.79	50.00	32.21	1000.0	9.000	L1	ON	19
10.39	21.19	---	60.00	38.81	1000.0	9.000	L1	ON	19
18.31	---	17.90	50.00	32.10	1000.0	9.000	L1	ON	20
19.61	21.72	---	60.00	38.28	1000.0	9.000	L1	ON	20

Remark: Correct factor=cable loss + LISN factor

L line Conducted Emission from 150 KHz to 30 MHz



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.16	---	31.23	55.52	24.29	1000.0	9.000	N	ON	19
0.16	44.23	---	65.40	21.17	1000.0	9.000	N	ON	19
0.55	42.33	---	56.00	13.67	1000.0	9.000	N	ON	19
0.56	---	37.70	46.00	8.30	1000.0	9.000	N	ON	19
1.20	---	21.99	46.00	24.01	1000.0	9.000	N	ON	19
1.61	28.69	---	56.00	27.31	1000.0	9.000	N	ON	19
2.23	26.85	---	56.00	29.15	1000.0	9.000	N	ON	19
2.23	---	18.19	46.00	27.81	1000.0	9.000	N	ON	19
5.48	20.94	---	60.00	39.06	1000.0	9.000	N	ON	19
9.65	---	17.55	50.00	32.45	1000.0	9.000	N	ON	19
18.06	---	16.44	50.00	33.56	1000.0	9.000	N	ON	19
19.91	20.69	---	60.00	39.31	1000.0	9.000	N	ON	19

Remark: Correct factor=cable loss + LISN factor

N line Conducted Emission from 150 KHz to 30 MHz

6. Main Test Instruments

Name	Manufacturer	Type	Serial Number	Calibration Date	Expiration Date
Spectrum Analyzer	R&S	FSV40	15195-01-00	2019-05-19	2020-05-18
EMI Test Receiver	R&S	ESCI	100948	2019-05-19	2020-05-18
Loop Antenna	SCHWARZBECK	FMZB1519	1519-047	2017-09-26	2020-09-25
TRILOG Broadband Antenna	SCHWARZBECK	VULB 9163	9163-201	2017-11-18	2020-11-17
Double Ridged Waveguide Horn Antenna	R&S	HF907	100126	2018-07-07	2020-07-06
Standard Gain Horn	ETS-Lindgren	3160-09	00102643	2018-06-20	2020-06-19
Standard Gain Horn	STEATITE	QSH-SL-26-40 -K-15	16779	2017-07-20	2020-07-19
Broadband Horn Antenna	SCHWARZBECK	BBHA 9120D	430	2018-07-07	2020-07-06
EMI Test Receiver	R&S	ESR	101667	2019-05-19	2020-05-18
LISN	R&S	ENV216	101171	2018-12-15	2021-12-14
Spectrum Analyzer	KEYSIGHT	N9020A	MY54420163	2019-12-15	2020-12-14
RF Cable	Agilent	SMA 15cm	0001	2019-12-13	2020-06-12
TEMPERATURE CHAMBER	WEISS	VT4002	582261194500 10	2019-12-15	2020-12-14
WLAN AP	Cisco	Air-AP1262N-A-K9	LDK102073 (FCC ID)	/	/
AV Power Meter	R&S	NRP	104306	2019-05-19	2020-05-18
Power Probe	R&S	NRP-Z21	104799	2019-05-19	2020-05-18
DC Power Supply	GWINSTEK	GPS-3030D	GEP882653	2019-05-19	2020-05-18
Software	R&S	EMC32	9.26.0	/	/

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