RF TEST REPORT

Applicant	Quectel Wireless Solutions Co., Ltd
FCC ID	XMR20SC200RWF
Product	Smart Module
Brand	Quectel
Model	SC200R-WF
Report No.	R2010A0716-R3
Issue Date	December 8, 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.

Prepared by: Peng Tao *Approved by: Kai Xu*

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Summary of measurement results

Number	Test Case	Clause in FCC rules	Verdict
1	Average output powe	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 2, 2020 ~ November 18, 2020			
Date of Sample Received: October 30, 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.			

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1. Test Laboratory

1.1. Notes of the test report

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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

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2. General Description of Equipment under Test

2.1. Applicant and Manufacturer Information

Applicant	Quectel Wireless Solutions Co., Ltd
Applicant address	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233
Manufacturer	Quectel Wireless Solutions Co., Ltd
Manufacturer address	Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233

2.2. General information

EUT Description	
Model	SC200R-WF
SN	E18671975000050
Hardware Version	R1.0
Software Version	SC200RWFNAR04A02
Power Supply	External power supply
Antenna Type	The EUT don't have standard Antenna. The Antenna used for testing in this report is the after-market accessory.
Antenna Gain	5150MHz-5250MHz: -0.9dBi 5250MHz-5350MHz: -0.9dBi 5470MHz-5725MHz: 0.65dBi 5725MHz-5850MHz: 1.1dBi
Directional Gain	NA
Test Band	U-NII-1(5150MHz-5250MHz); U-NII-2A(5250MHz-5350MHz) U-NII-2C(5470MHz-5725MHz); U-NII-3(5725MHz-5850MHz)
Modulation Type	802.11a/n (HT20/HT40) :OFDM
Max. Conducted Power	15.98dBm
Operating Frequency Range(s)	U-NII-1: 5150MHz-5250MHz U-NII-2A:5250MHz -5350MHz U-NII-2C:5470MHz-5725MHz U-NII-3: 5725MHz -5850MHz
Operating temperature range:	-35 ° C to 75° C
Operating voltage range:	3.55 V to 4.2 V
State DC voltage:	3.8V
Note:1. The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant.	

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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

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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.

Mode	Data Rate
802.11a	6 Mbps
802.11n HT20	MCS0
802.11n HT40	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
	U-NII-2A	20 MHz	52	5260MHz
			56	5280MHz
			60	5300MHz
			64	5320MHz
		40 MHz	54	5270MHz
			62	5310MHz
	U-NII-2C	20 MHz	100	5500MHz
			104	5520MHz
			108	5540MHz
			112	5560MHz
			116	5580MHz
			120	5600MHz
			124	5620MHz

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			128	5640MHz
			132	5660MHz
			136	5680MHz
			140	5700MHz
		40 MHz	102	5510MHz
			110	5550MHz
			118	5590MHz
			126	5630MHz
			134	5670MHz
			142	5710MHz
	U-NII-3	20 MHz	149	5745MHz
			153	5765MHz
			157	5785MHz
			161	5805MHz
			165	5825MHz
		40 MHz	151	5755MHz
			159	5795MHz
Does this device support TPC Function? ☐Yes ☒No				
Does this device support TDWR Band? ☒Yes ☐No				

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5. Test Case Results

5.1. Occupied Bandwidth

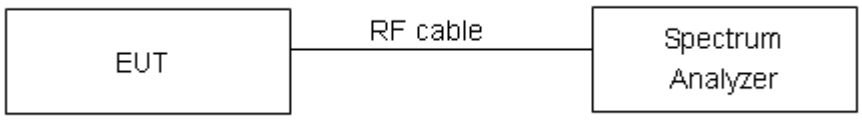
Ambient condition

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.

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Test Results:

U-NII-1

Mode	Channel/Frequency (MHz)	99% bandwidth (MHz)	Minimum 26 dB bandwidth (MHz)	Conclusion
802.11a	36/5180	16.733	21.79	PASS
	40/5200	16.686	21.47	PASS
	48/5240	16.757	21.37	PASS
802.11n HT20	36/5180	17.834	21.98	PASS
	40/5200	17.838	21.94	PASS
	48/5240	17.806	21.22	PASS
802.11n HT40	38/5190	36.172	42.81	PASS
	46/5230	36.167	42.74	PASS

U-NII-2A

Mode	Channel/Frequency (MHz)	99% bandwidth (MHz)	Minimum 26 dB bandwidth (MHz)	Conclusion
802.11a	52/5260	16.817	22.26	PASS
	60/5300	16.732	21.64	PASS
	64/5320	16.725	21.90	PASS
802.11n HT20	52/5260	17.821	21.98	PASS
	60/5300	17.818	22.21	PASS
	64/5320	17.815	22.29	PASS
802.11n HT40	54/5270	36.125	42.66	PASS
	62/5310	36.161	42.75	PASS

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U-NII-2C

Mode	Channel/Frequency (MHz)	99% bandwidth (MHz)	Minimum 26 dB bandwidth (MHz)	Conclusion
802.11a	100/5500	16.794	21.75	PASS
	120/5600	16.726	21.85	PASS
	140/5700	16.704	21.54	PASS
	144/5720	16.728	21.33	PASS
802.11n HT20	100/5500	17.830	21.96	PASS
	120/5600	17.845	21.79	PASS
	140/5700	17.833	22.00	PASS
	144/5720	17.849	21.67	PASS
802.11n HT40	102/5510	36.177	42.46	PASS
	118/5590	36.103	42.62	PASS
	134/5670	36.146	43.54	PASS
	142/5710	36.157	42.40	PASS

U-NII-3

Mode	Channel/Frequency (MHz)	99% bandwidth (MHz)	Minimum 6 dB bandwidth (MHz)	Limit (MHz)	Conclusion
802.11a	149/5745	16.764	16.44	0.5	PASS
	157/5785	16.744	16.38	0.5	PASS
	165/5825	16.680	16.42	0.5	PASS
802.11n HT20	149/5745	17.808	17.60	0.5	PASS
	157/5785	17.811	17.63	0.5	PASS
	165/5825	17.825	17.65	0.5	PASS
802.11n HT40	151/5755	36.169	35.47	0.5	PASS
	159/5795	36.076	35.35	0.5	PASS

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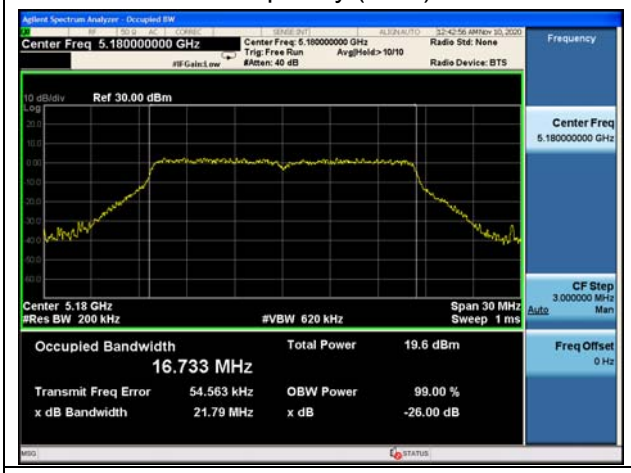
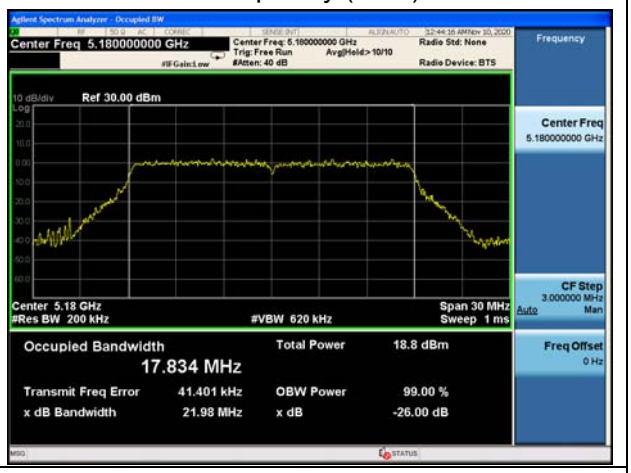
U-NII-1, 802.11a

Carrier frequency (MHz): 5180



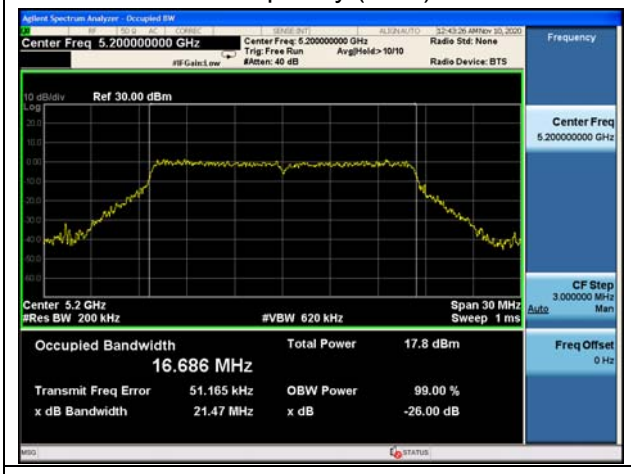
U-NII-1, 802.11n HT20

Carrier frequency (MHz): 5180



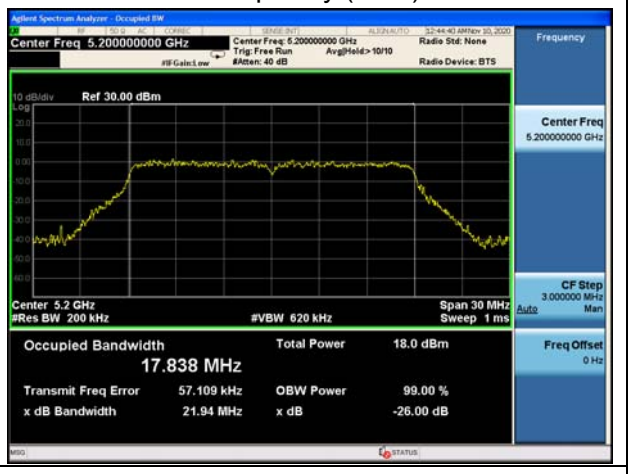
U-NII-1, 802.11a

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

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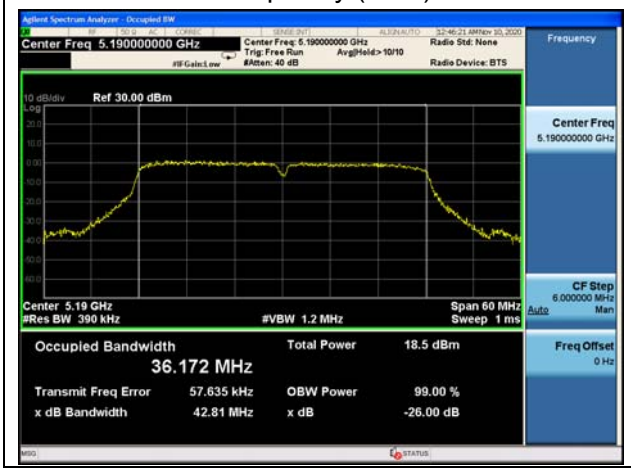
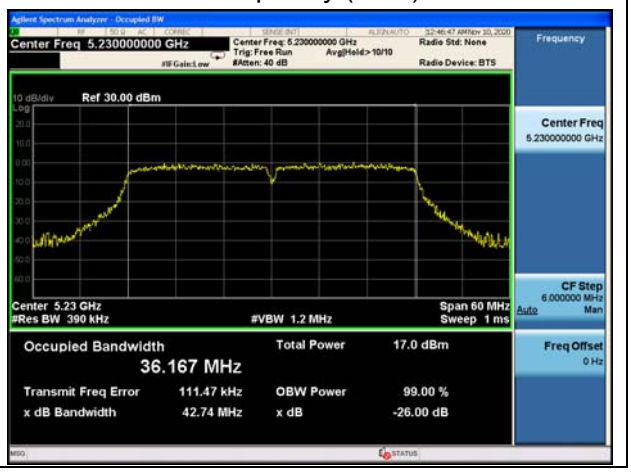
U-NII-1, 802.11n HT40

Carrier frequency (MHz): 5190



U-NII-1, 802.11n HT40

Carrier frequency (MHz): 5230



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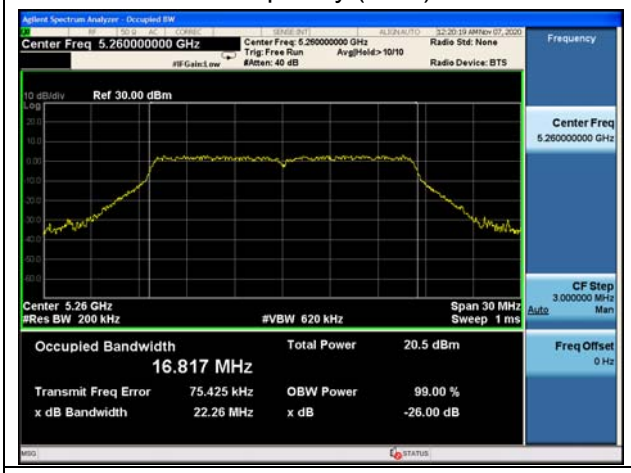
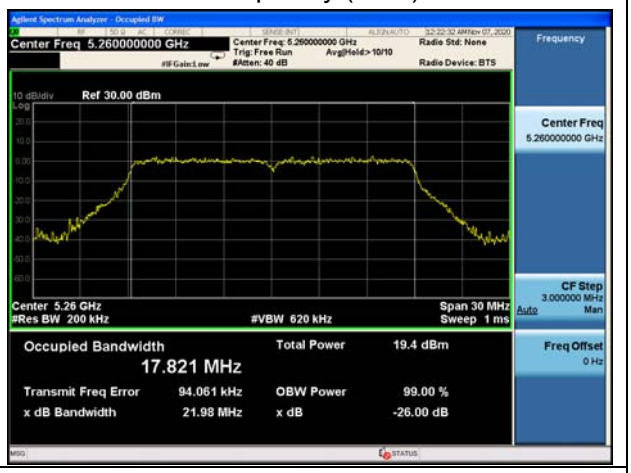
U-NII-2A, 802.11a

Carrier frequency (MHz): 5260



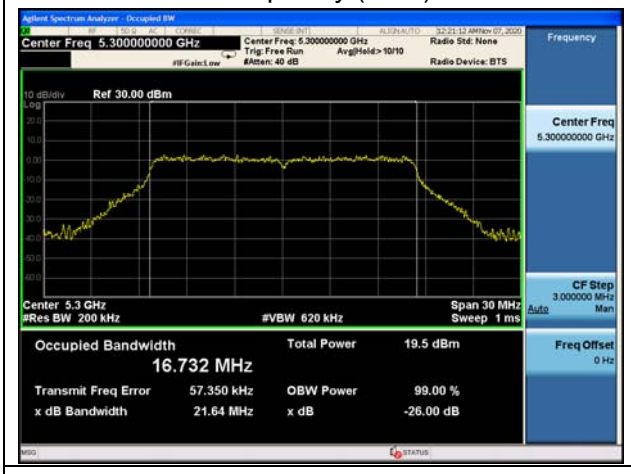
U-NII-2A, 802.11n HT20

Carrier frequency (MHz): 5260



U-NII-2A, 802.11a

Carrier frequency (MHz): 5300

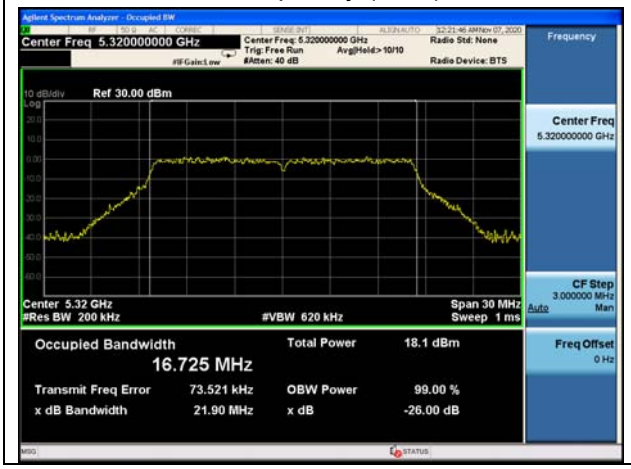


U-NII-2A, 802.11n HT20

Carrier frequency (MHz): 5300

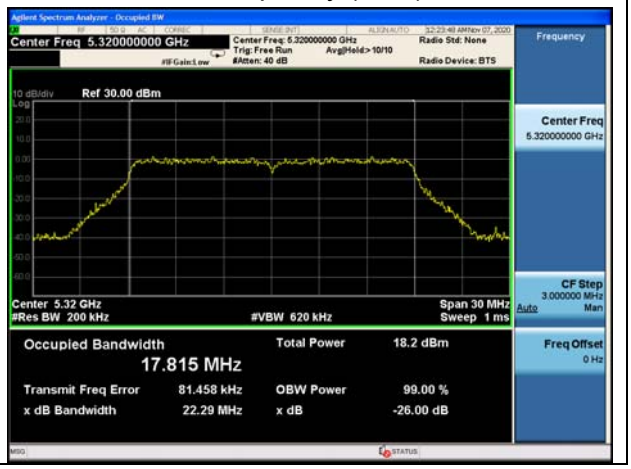
U-NII-2A, 802.11a

Carrier frequency (MHz):5320



U-NII-2A, 802.11n HT20

Carrier frequency (MHz):5320



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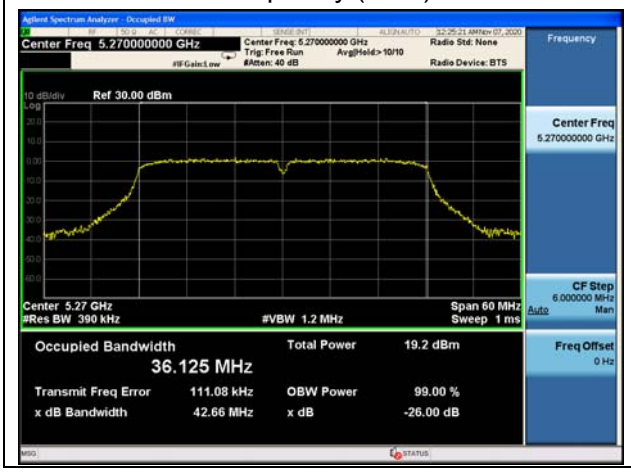
U-NII-2A, 802.11n HT40

Carrier frequency (MHz): 5270



U-NII-2A, 802.11n HT40

Carrier frequency (MHz): 5310

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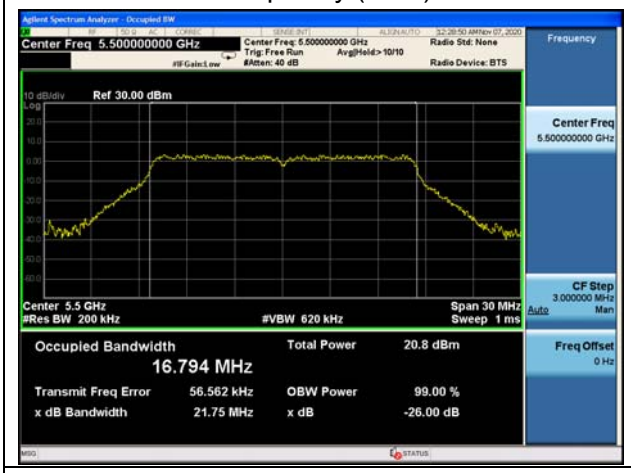
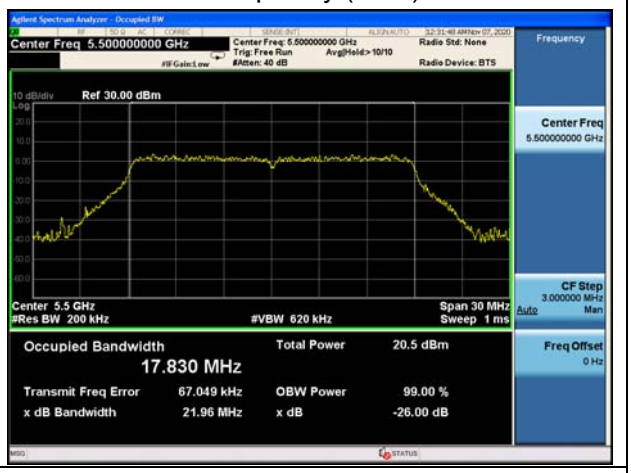
U-NII-2C, 802.11a

Carrier frequency (MHz): 5500



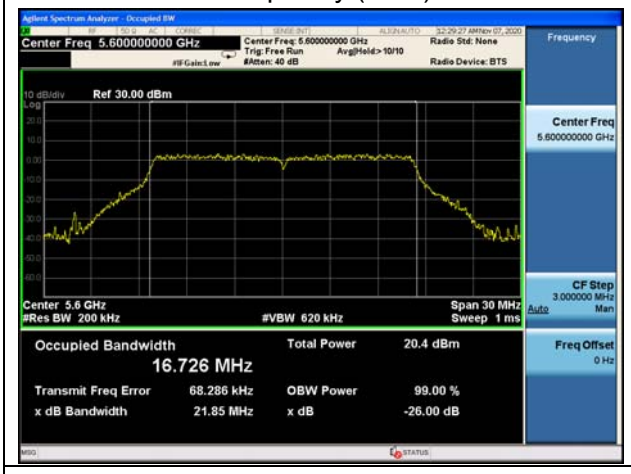
U-NII-2C, 802.11n HT20

Carrier frequency (MHz): 5500



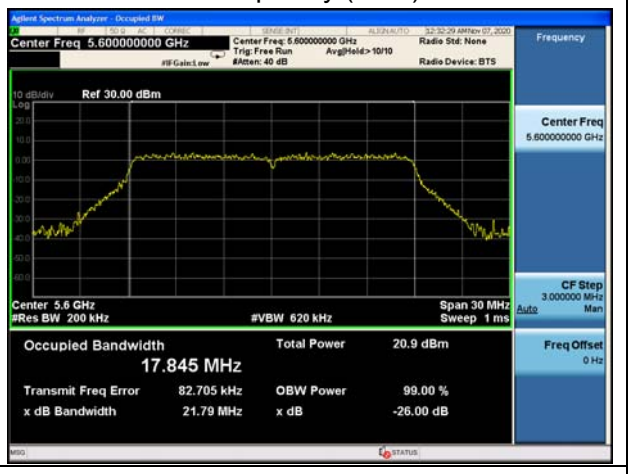
U-NII-2C, 802.11a

Carrier frequency (MHz): 5600



U-NII-2C, 802.11n HT20

Carrier frequency (MHz): 5600



U-NII-2C, 802.11a

Carrier frequency (MHz):5700

U-NII-2C, 802.11n HT20

Carrier frequency (MHz):5700

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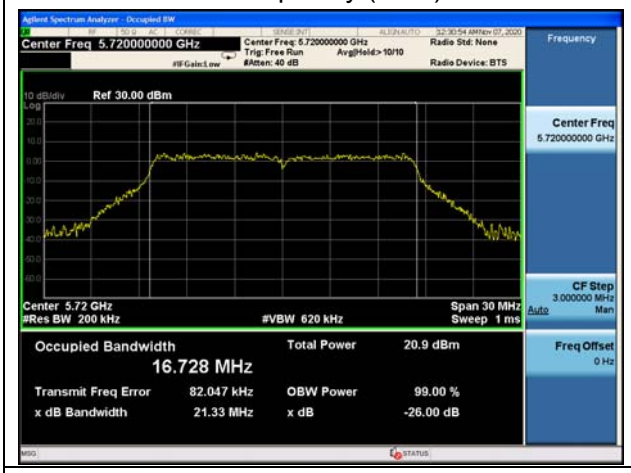
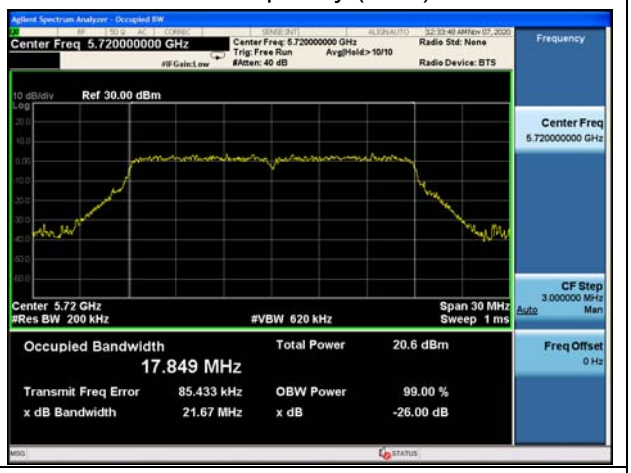
U-NII-2C, 802.11a

Carrier frequency (MHz):5720



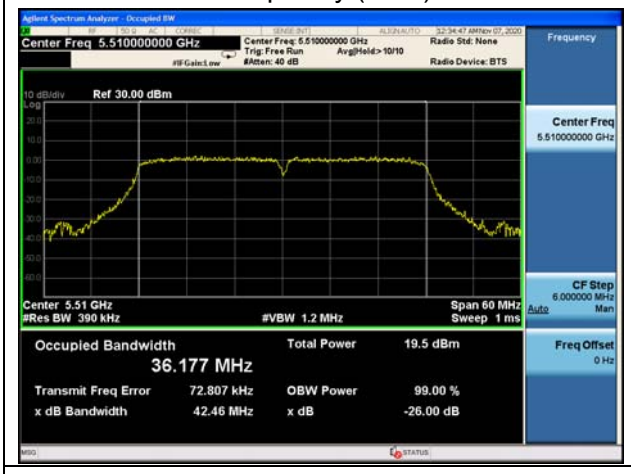
U-NII-2C, 802.11n HT20

Carrier frequency (MHz):5720



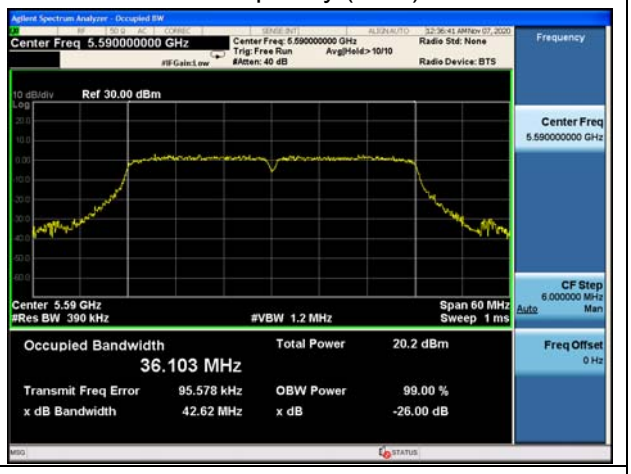
U-NII-2C, 802.11n HT40

Carrier frequency (MHz): 5510



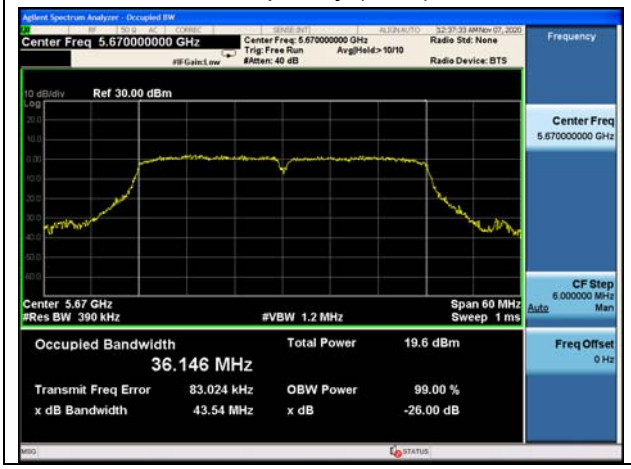
U-NII-2C, 802.11n HT40

Carrier frequency (MHz): 5590



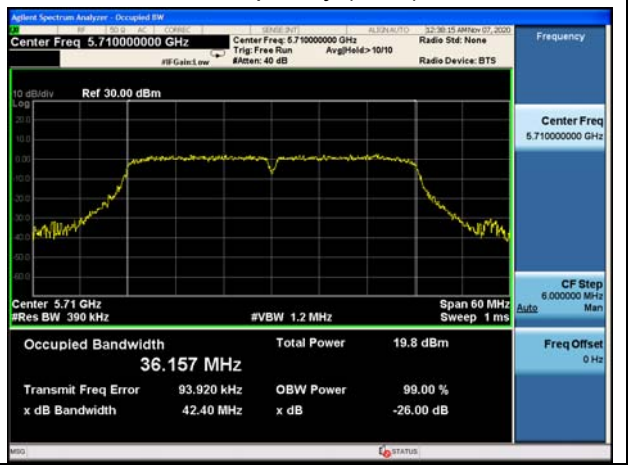
U-NII-2C, 802.11n HT40

Carrier frequency (MHz): 5670



U-NII-2C, 802.11n HT40

Carrier frequency (MHz): 5710



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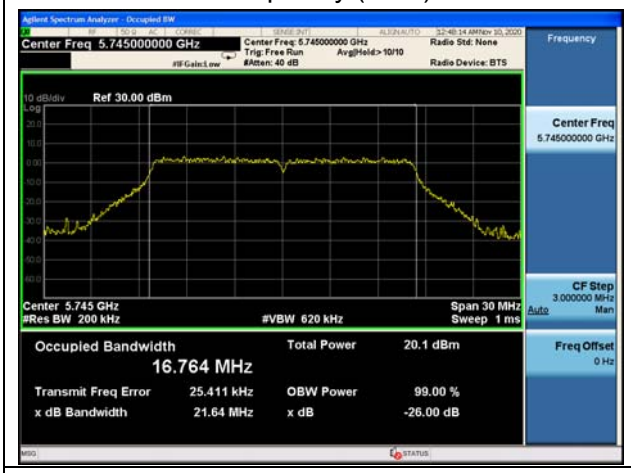
99% bandwidth

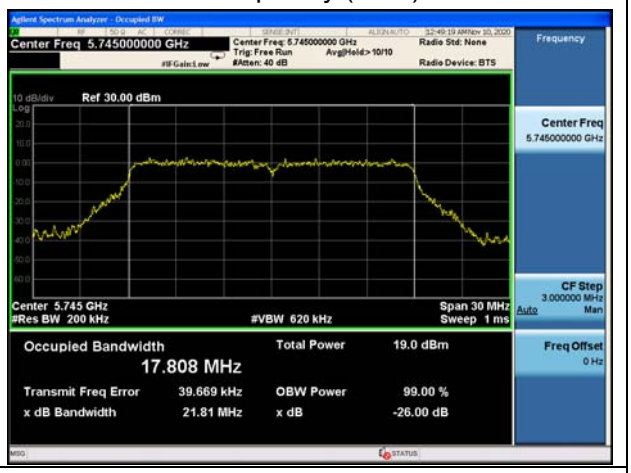
U-NII-3, 802.11a

Carrier frequency (MHz): 5745



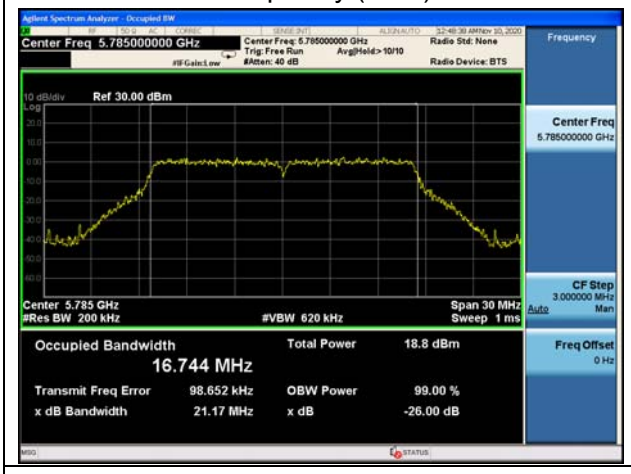
U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5745



U-NII-3, 802.11a

Carrier frequency (MHz): 5785



U-NII-3, 802.11n HT20

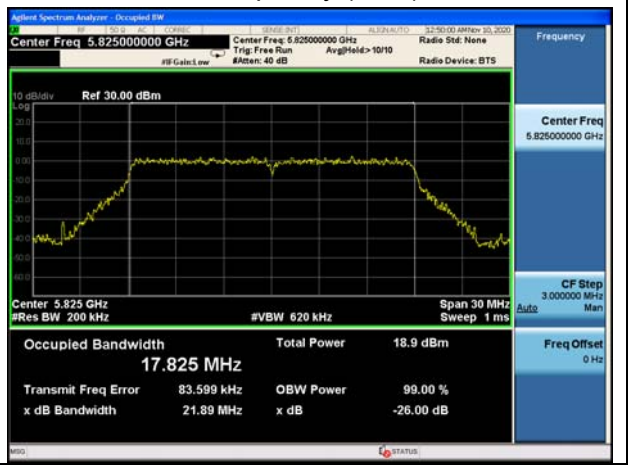
Carrier frequency (MHz): 5785

U-NII-3, 802.11a

Carrier frequency (MHz): 5825

U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5825



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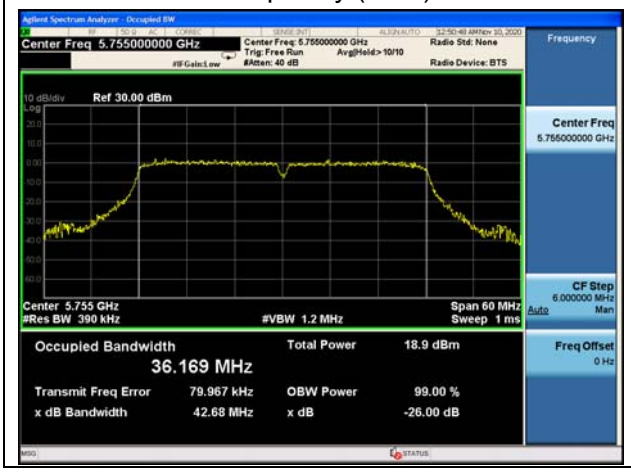
U-NII-3, 802.11n HT40

Carrier frequency (MHz): 5755



U-NII-3, 802.11n HT40

Carrier frequency (MHz): 5795

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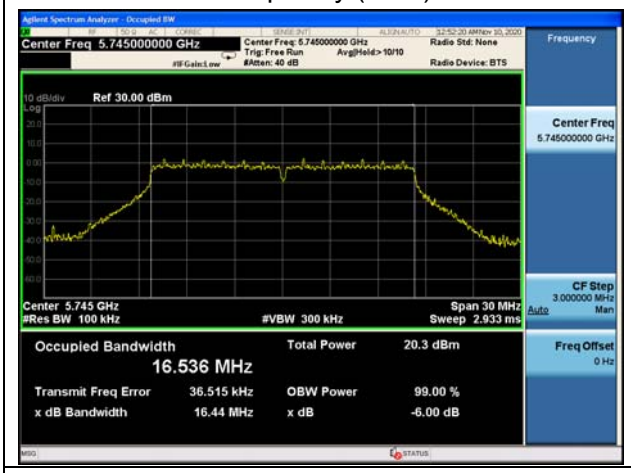
Minimum 6 dB bandwidth

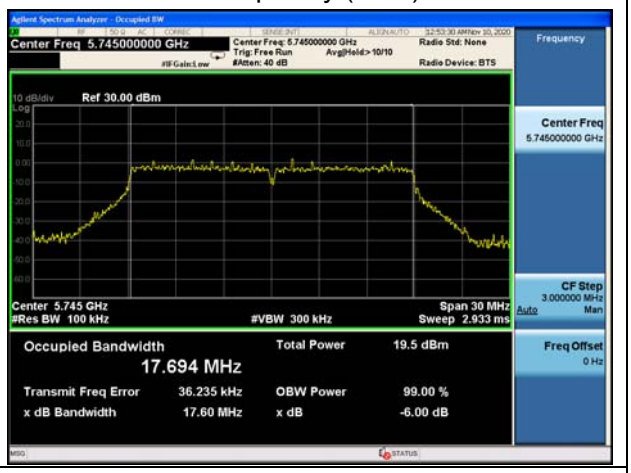
U-NII-3, 802.11a

Carrier frequency (MHz): 5745



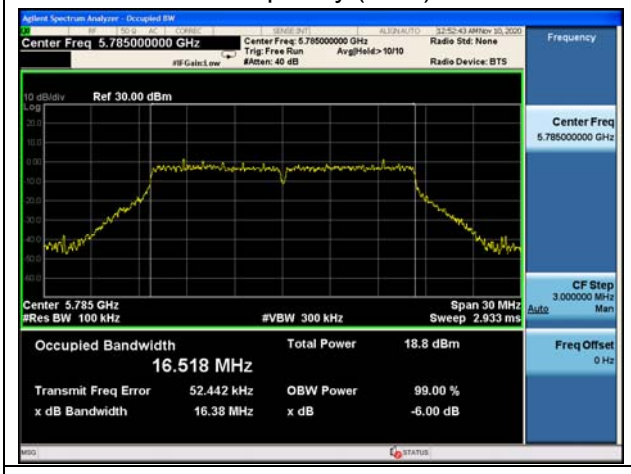
U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5745



U-NII-3, 802.11a

Carrier frequency (MHz): 5785

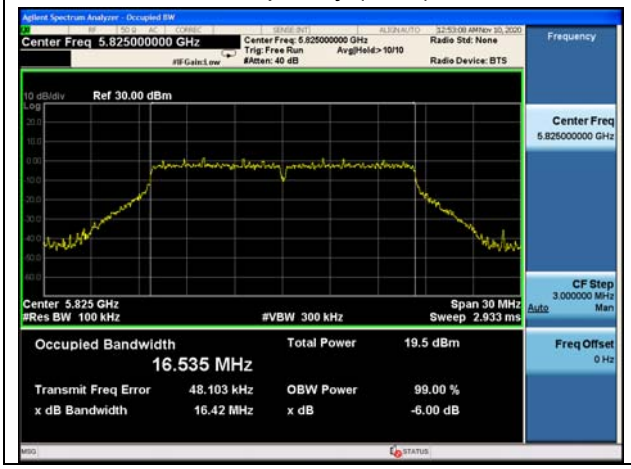


U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5785

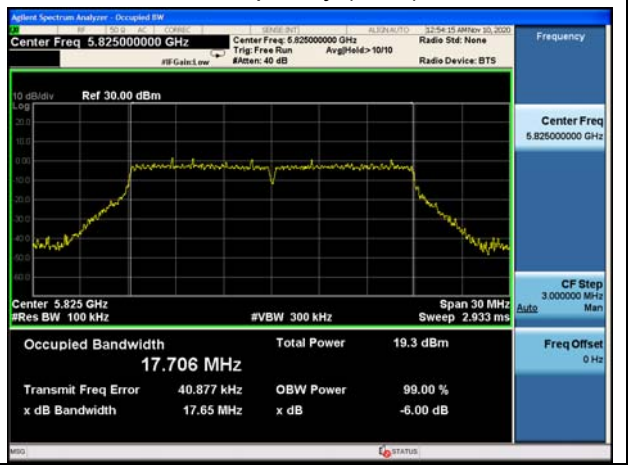
U-NII-3, 802.11a

Carrier frequency (MHz): 5825



U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5825



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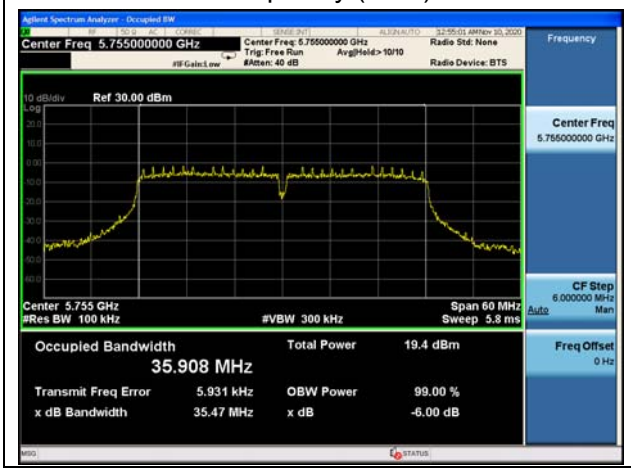
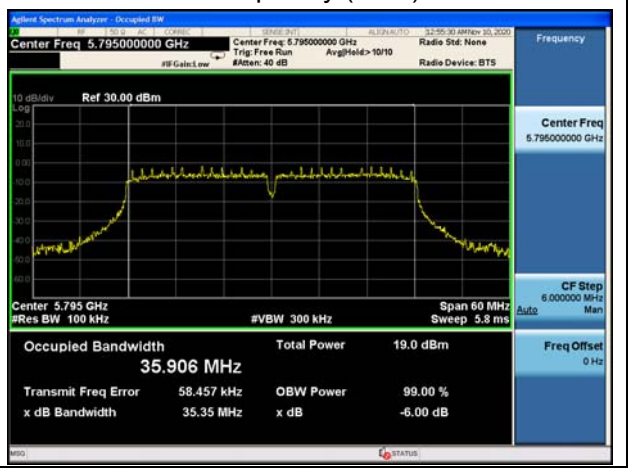
U-NII-3, 802.11n HT40

Carrier frequency (MHz): 5755



U-NII-3, 802.11n HT40

Carrier frequency (MHz): 5795



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5.2. Average Power Output

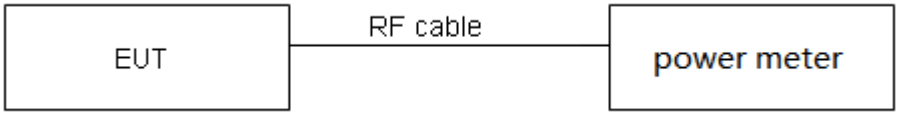
Ambient condition

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

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

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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.

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Test Results

Mode	T_{on} (ms)	$T_{(on+off)}$ (ms)	Duty cycle	Duty cycle correction Factor(dB)
802.11a	1.37	1.39	0.99	NA
802.11n HT20	1.27	1.29	0.99	NA
802.11n HT40	0.64	0.65	0.97	0.12
Note: when Duty cycle⩾0.98, Duty cycle correction Factor not required.				

Single Antenna Power Index													
Mode	**CH36**	**CH40**	**CH48**	**CH52**	**CH60**	**CH64**	**CH100**	**CH120**	**CH140**	**CH144**	**CH149**	**CH157**	**CH165**
802.11a	15	15	15	15	15	15	15	15	15	15	15	15	15
802.11n HT20	14	14	14	14	14	14	14	14	14	14	14	14	14
Packet Type	**CH38**	**CH46**	**CH54**	**CH62**	**CH102**	**CH118**	**CH134**	**CH142**	**CH151**	**CH159**	/	/	/
802.11n HT40	14	14	14	14	14	14	14	14	14	14	/	/	/

Network Standards		Channel/Frequency (MHz)	B=26 dB bandwidth (MHz)	Limit 11 dBm + 10 log B (dBm)	Final Limit(dBm)
U-NII-2A	802.11a	52/5260	22.26	24.48 >24	24.00
		60/5300	21.64	24.35 >24	24.00
		64/5320	21.90	24.40 >24	24.00
	802.11n HT20	52/5260	21.98	24.42 >24	24.00
		60/5300	22.21	24.47 >24	24.00
		64/5320	22.29	24.48 >24	24.00
	802.11n HT40	54/5270	42.66	27.30 >24	24.00
		62/5310	42.75	27.31 >24	24.00
U-NII-2C	802.11a	100/5500	21.75	24.37 >24	24.00
		120/5600	21.85	24.39 >24	24.00
		140/5700	21.54	24.33 >24	24.00
		144/5720	21.33	24.29 >24	24.00
	802.11n HT20	100/5500	21.96	24.42 >24	24.00
		120/5600	21.79	24.38 >24	24.00
		140/5700	22.00	24.42 >24	24.00
		144/5720	21.67	24.36 >24	24.00
	802.11n HT40	102/5510	42.46	27.28 >24	24.00
		118/5590	42.62	27.30 >24	24.00
		134/5670	43.54	27.39 >24	24.00

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		142/5710	42.40	27.27 >24	24.00
Note: 250mW=24dBm					

U-NII-1

Network Standards	Channel/ Frequency (MHz)	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11a	36/5180	14.25	14.25	24.00	PASS
	40/5200	13.35	13.35	24.00	PASS
	48/5240	13.98	13.98	24.00	PASS
802.11n HT20	36/5180	13.37	13.37	24.00	PASS
	40/5200	12.42	12.42	24.00	PASS
	48/5240	12.91	12.91	24.00	PASS
802.11n HT40	38/5190	12.15	12.27	24.00	PASS
	46/5230	11.36	11.48	24.00	PASS
Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor					

U-NII-2A

Network Standards	Channel/ Frequency (MHz)	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11a	52/5260	14.51	14.51	24.00	PASS
	60/5300	13.74	13.74	24.00	PASS
	64/5320	13.42	13.42	24.00	PASS
802.11n HT20	52/5260	13.83	13.83	24.00	PASS
	60/5300	13.07	13.07	24.00	PASS
	64/5320	12.52	12.52	24.00	PASS
802.11n HT40	54/5270	12.54	12.66	24.00	PASS
	62/5310	12.02	12.14	24.00	PASS
Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor					

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U-NII-2C

Network Standards	Channel/ Frequency (MHz)	Average Power Measured (dBm)	Average Power with duty factor (dBm)	Limit (dBm)	Conclusion
802.11a	100/5500	15.36	15.36	24.00	PASS
	120/5600	15.84	15.84	24.00	PASS
	140/5700	15.92	15.92	24.00	PASS
	144/5720	15.98	15.98	24.00	PASS
802.11n HT20	100/5500	14.53	14.53	24.00	PASS
	120/5600	14.82	14.82	24.00	PASS
	140/5700	15.03	15.03	24.00	PASS
	144/5720	15.20	15.20	24.00	PASS
802.11n HT40	102/5510	13.04	13.16	24.00	PASS
	118/5590	13.83	13.95	24.00	PASS
	134/5670	13.42	13.54	24.00	PASS
	142/5710	14.02	14.14	24.00	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	15.27	15.27	30.00	PASS
	157/5785	14.94	14.94	30.00	PASS
	165/5825	15.63	15.63	30.00	PASS
802.11n HT20	149/5745	14.43	14.43	30.00	PASS
	157/5785	14.12	14.12	30.00	PASS
	165/5825	14.94	14.94	30.00	PASS
802.11n HT40	151/5755	13.06	13.18	30.00	PASS
	159/5795	13.02	13.14	30.00	PASS
Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor					

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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.

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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

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Test Results

Voltage (V)	Temperature (°C)	U-NII-1 Test Results			
		5200MHz			
		1min	2min	5min	10min
3.8	-20	5199.999952	5199.991545	5199.988159	5199.987393
3.8	-10	5199.997804	5199.983513	5199.980140	5199.978994
3.8	0	5199.991951	5199.982519	5199.977035	5199.974540
3.8	10	5199.984791	5199.975064	5199.972310	5199.974350
3.8	20	5199.981263	5199.973014	5199.968165	5199.967705
3.8	30	5199.978600	5199.972430	5199.965276	5199.965020
3.8	40	5199.969118	5199.963536	5199.960575	5199.955244
3.8	50	5199.959925	5199.954446	5199.955541	5199.948428
3.55	20	5199.956372	5199.952535	5199.948419	5199.941378
4.2	20	5199.948666	5199.943133	5199.945122	5199.934473
MHz		-0.051334	-0.056867	-0.054878	-0.065527
PPM		-9.871986	-10.935969	-10.553471	-12.601366

Voltage (V)	Temperature (°C)	U-NII-2A Test Results			
		5300MHz			
		1min	2min	5min	10min
3.8	-20	5299.992972	5299.986668	5299.984985	5299.980621
3.8	-10	5299.984133	5299.977885	5299.978988	5299.978827
3.8	0	5299.983751	5299.968488	5299.976665	5299.973393
3.8	10	5299.981781	5299.965239	5299.968714	5299.969383
3.8	20	5299.974042	5299.962882	5299.963543	5299.965154
3.8	30	5299.967537	5299.954573	5299.954963	5299.960511
3.8	40	5299.959086	5299.944928	5299.944989	5299.953115
3.8	50	5299.953665	5299.943197	5299.943535	5299.951718
3.55	20	5299.948025	5299.941855	5299.936645	5299.948561
4.2	20	5299.943660	5299.938520	5299.936563	5299.948141
MHz		-0.056340	-0.061480	-0.063437	-0.051859
PPM		-10.630258	-11.600000	-11.969268	-9.784734

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Voltage (V)	Temperature (°C)	U-NII-2C Test Results			
		5580MHz			
		1min	2min	5min	10min
3.8	-20	5580.000311	5579.997163	5579.993096	5579.983574
3.8	-10	5579.993771	5579.994426	5579.988583	5579.977678
3.8	0	5579.986315	5579.985083	5579.982297	5579.976375
3.8	10	5579.983952	5579.975217	5579.980322	5579.972797
3.8	20	5579.983165	5579.974930	5579.974642	5579.968600
3.8	30	5579.977664	5579.965502	5579.971703	5579.961790
3.8	40	5579.971680	5579.957818	5579.966100	5579.961375
3.8	50	5579.965566	5579.949657	5579.962934	5579.956141
3.55	20	5579.963409	5579.947369	5579.955371	5579.955093
4.2	20	5579.958469	5579.942043	5579.952180	5579.947864
MHz		-0.041531	-0.057957	-0.047820	-0.052136
PPM		-7.442865	-10.386486	-8.569812	-9.343391

Voltage (V)	Temperature (°C)	U-NII-3 Test Results			
		5785MHz			
		1min	2min	5min	10min
3.8	-20	5785.001797	5784.996671	5784.990503	5784.981432
3.8	-10	5784.994551	5784.995107	5784.980695	5784.974856
3.8	0	5784.986169	5784.993484	5784.976825	5784.964948
3.8	10	5784.976661	5784.987466	5784.967604	5784.958270
3.8	20	5784.976048	5784.980064	5784.967250	5784.949521
3.8	30	5784.975991	5784.970192	5784.966067	5784.947816
3.8	40	5784.968948	5784.961490	5784.958348	5784.946542
3.8	50	5784.960918	5784.958134	5784.957805	5784.938683
3.55	20	5784.951284	5784.955670	5784.948467	5784.934891
4.2	20	5784.948173	5784.952181	5784.943060	5784.930594
MHz		-0.051827	-0.047819	-0.056940	-0.069406
PPM		-8.958908	-8.266009	-9.842723	-11.997530

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5.4. Power Spectral Density

Ambient condition

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

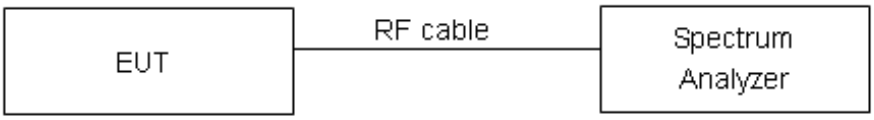
Method of Measurement

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

Set RBW = 1MHz, VBW =3MHz for the band 5.150-5.250GHz, 5.250-5.350GHz, 5.470-5.725GHz.
Set RBW = 470kHz, VBW =1.5MHz for the band 5.725-5.850GHz

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

Test setup



Limits

Rule FCC Part 15.407(a)(1)/ Part 15.407(a)(2) / Part 15.407(a)(3)
For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
(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.

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

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

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

Measurement Uncertainty

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

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Test Results:

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

U-NII-1

Mode	Channel/Frequency (MHz)	Read Value (dBm /MHz)	Power Spectral Density (dBm /MHz)	Limit (dBm /MHz)	Conclusion
802.11a	36/5180	2.70	2.70	11	PASS
	40/5200	2.33	2.33	11	PASS
	48/5240	2.71	2.71	11	PASS
802.11n HT20	36/5180	1.78	1.78	11	PASS
	40/5200	1.18	1.18	11	PASS
	48/5240	2.24	2.24	11	PASS
802.11n HT40	38/5190	-2.08	-1.96	11	PASS
	46/5230	-3.00	-2.88	11	PASS

U-NII-2A

Mode	Channel/Frequency (MHz)	Read Value (dBm /MHz)	Power Spectral Density (dBm /MHz)	Limit (dBm /MHz)	Conclusion
802.11a	52/5260	3.40	3.40	11	PASS
	60/5300	2.49	2.49	11	PASS
	64/5320	1.75	1.75	11	PASS
802.11n HT20	52/5260	1.86	1.86	11	PASS
	60/5300	1.31	1.31	11	PASS
	64/5320	0.66	0.66	11	PASS
802.11n HT40	54/5270	-2.52	-2.40	11	PASS
	62/5310	-2.54	-2.41	11	PASS

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U-NII-2C

Mode	Channel/Frequency (MHz)	Read Value (dBm /MHz)	Power Spectral Density (dBm /MHz)	Limit (dBm /MHz)	Conclusion
802.11a	100/5500	3.39	3.39	11	PASS
	120/5600	4.29	4.29	11	PASS
	140/5700	4.19	4.19	11	PASS
	144/5720	4.58	4.58	11	PASS
802.11n HT20	100/5500	2.62	2.62	11	PASS
	120/5600	3.14	3.14	11	PASS
	140/5700	2.97	2.97	11	PASS
	144/5720	3.82	3.82	11	PASS
802.11n HT40	102/5510	-1.29	-1.17	11	PASS
	118/5590	-0.37	-0.25	11	PASS
	134/5670	-0.81	-0.69	11	PASS
	142/5710	-0.27	-0.15	11	PASS

U-NII-3

Mode	Channel/Frequency (MHz)	Read Value (dBm/470kHz)	Power Spectral Density (dBm/500kHz)	Limit (dBm/500kHz)	Conclusion
802.11a	149/5745	0.29	0.56	30	PASS
	157/5785	0.39	0.66	30	PASS
	165/5825	0.91	1.18	30	PASS
802.11n HT20	149/5745	-0.08	0.19	30	PASS
	157/5785	-1.50	-1.23	30	PASS
	165/5825	-0.24	0.03	30	PASS
802.11n HT40	151/5755	-4.34	-3.94	30	PASS
	159/5795	-4.29	-3.90	30	PASS
Note: PSD=Read Value+ Duty cycle+10*LOG(500/470) correction factor.					

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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

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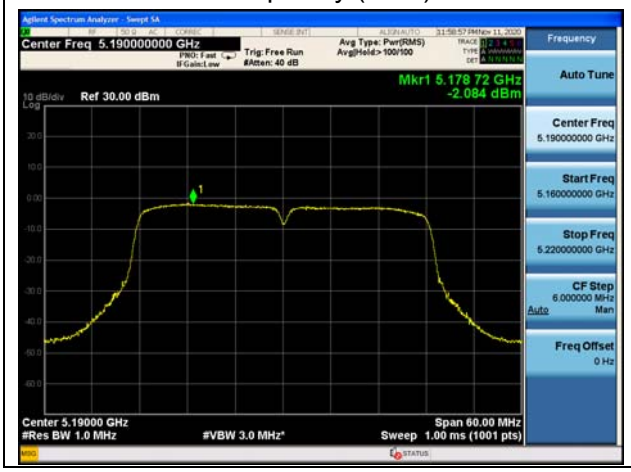
U-NII-1, 802.11n HT40 Carrier frequency (MHz): 5190	U-NII-1, 802.11n HT40 Carrier frequency (MHz): 5230
	

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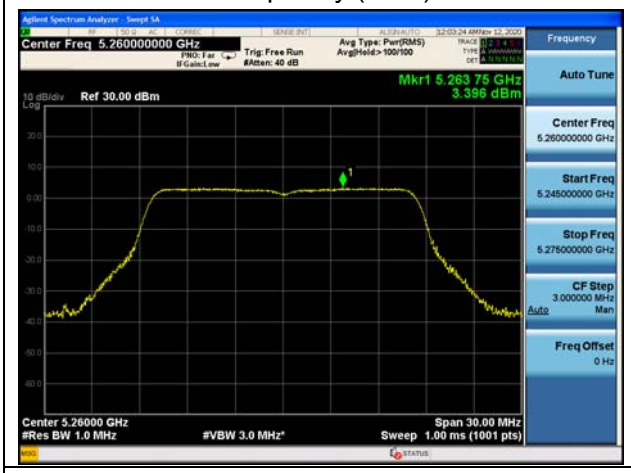
U-NII-2A, 802.11a

Carrier frequency (MHz): 5260

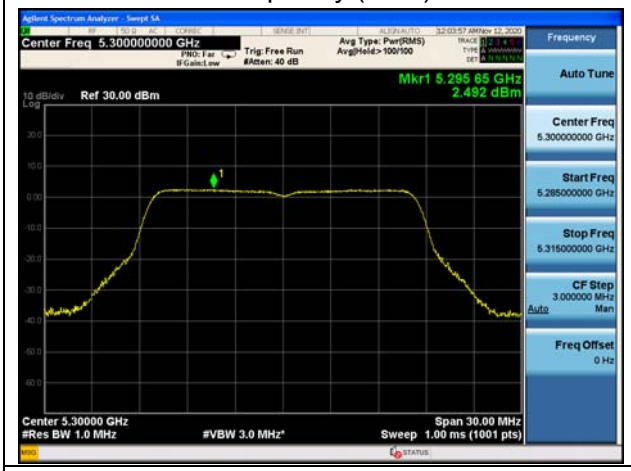


U-NII-2A, 802.11n HT20

Carrier frequency (MHz): 5260

U-NII-2A, 802.11a

Carrier frequency (MHz): 5300

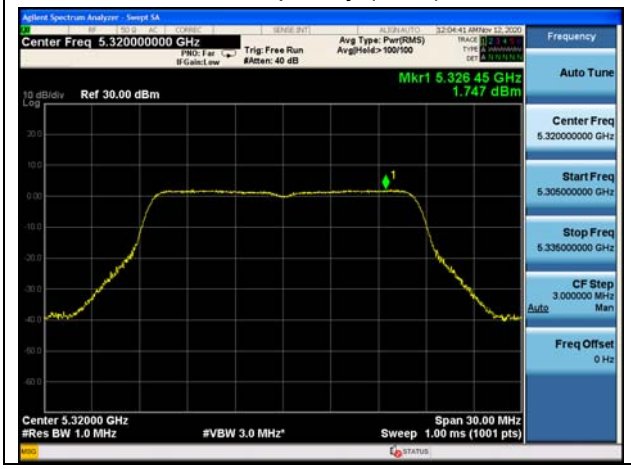


U-NII-2A, 802.11n HT20

Carrier frequency (MHz): 5300

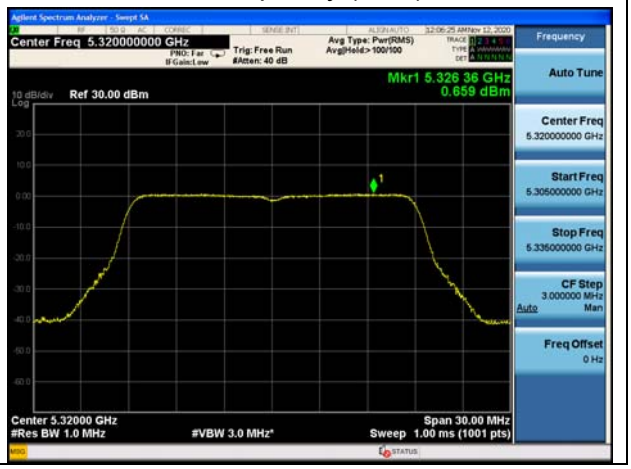
U-NII-2A, 802.11a

Carrier frequency (MHz):5320



U-NII-2A, 802.11n HT20

Carrier frequency (MHz):5320



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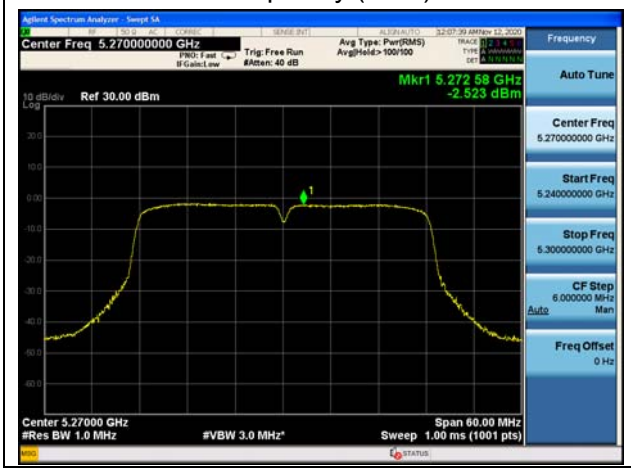
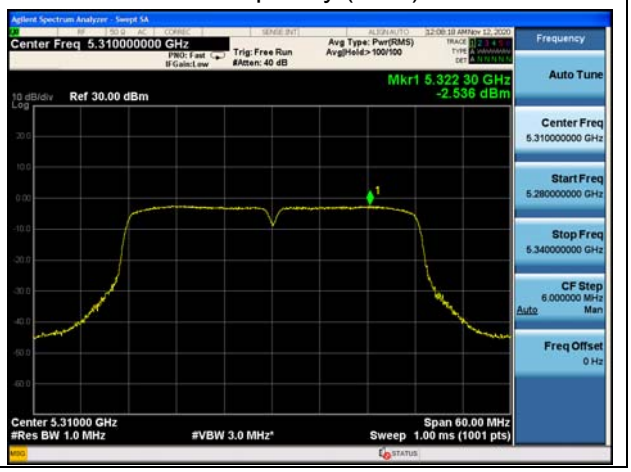
U-NII-2A, 802.11n HT40 Carrier frequency (MHz): 5270	U-NII-2A, 802.11n HT40 Carrier frequency (MHz): 5310
	

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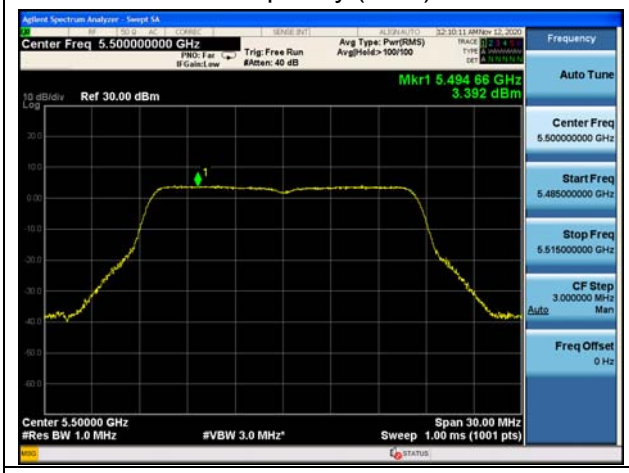
U-NII-2C, 802.11a

Carrier frequency (MHz): 5500

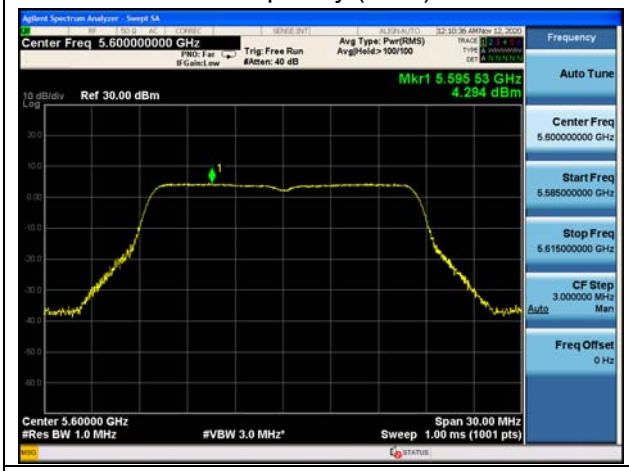


U-NII-2C, 802.11n HT20

Carrier frequency (MHz): 5500

U-NII-2C, 802.11a

Carrier frequency (MHz): 5600

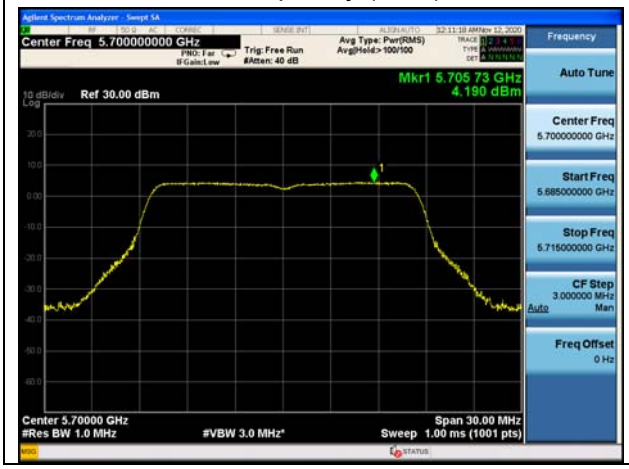


U-NII-2C, 802.11n HT20

Carrier frequency (MHz): 5600

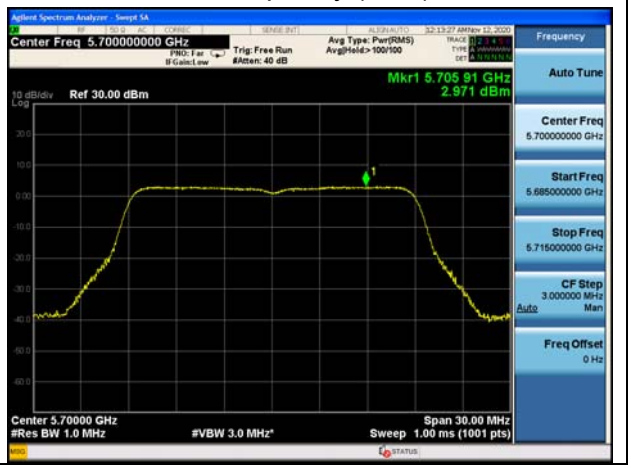
U-NII-2C, 802.11a

Carrier frequency (MHz):5700



U-NII-2C, 802.11n HT20

Carrier frequency (MHz):5700



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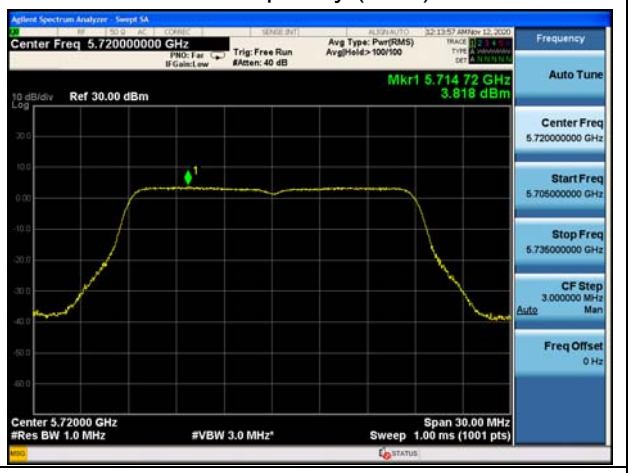
U-NII-2C, 802.11a

Carrier frequency (MHz):5720

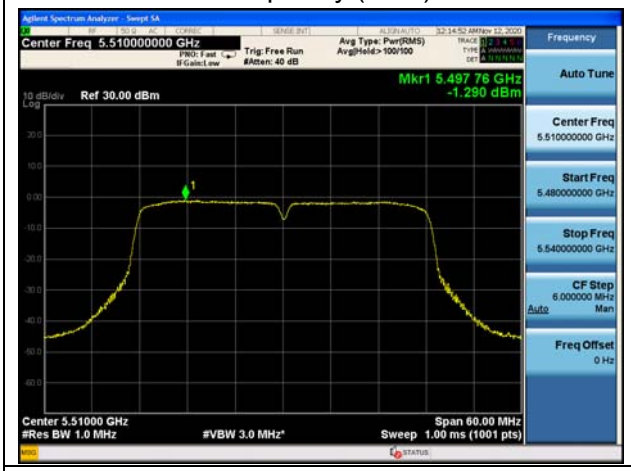
U-NII-2C, 802.11n HT20

Carrier frequency (MHz):5720



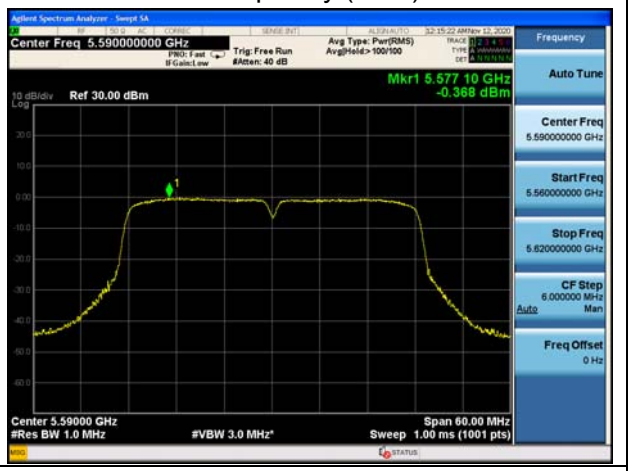
U-NII-2C, 802.11n HT40

Carrier frequency (MHz): 5510



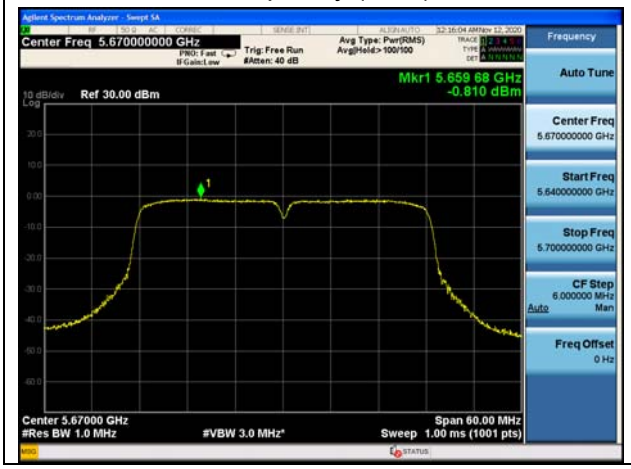
U-NII-2C, 802.11n HT40

Carrier frequency (MHz): 5590



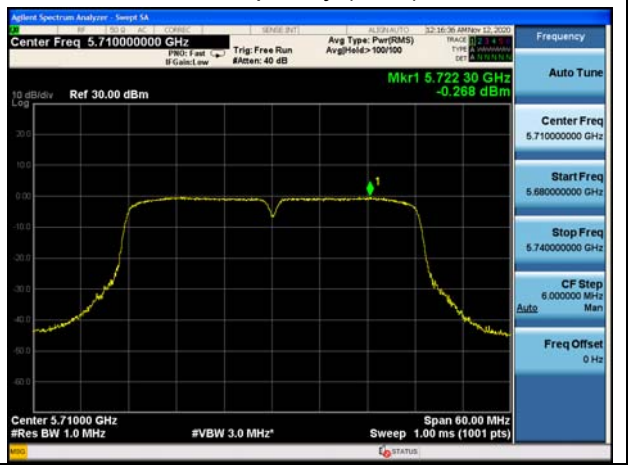
U-NII-2C, 802.11n HT40

Carrier frequency (MHz): 5670



U-NII-2C, 802.11n HT40

Carrier frequency (MHz): 5710



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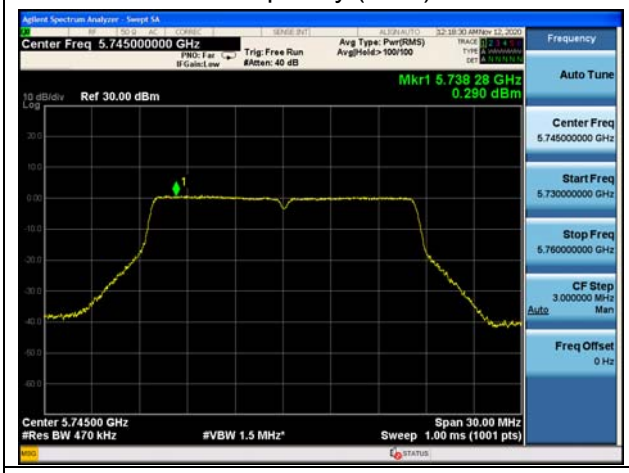
U-NII-3, 802.11a

Carrier frequency (MHz): 5745

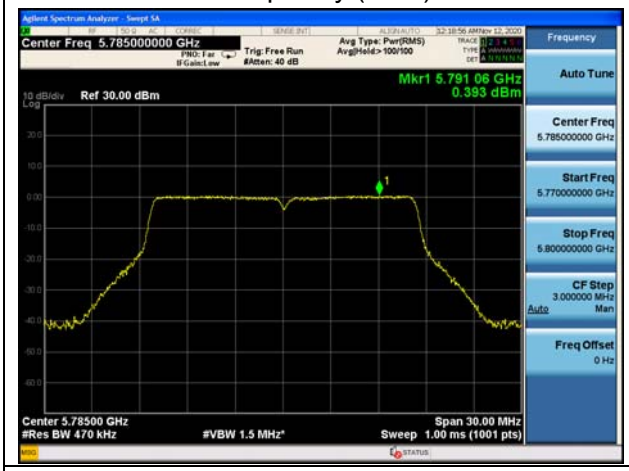


U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5745

U-NII-3, 802.11a

Carrier frequency (MHz): 5785

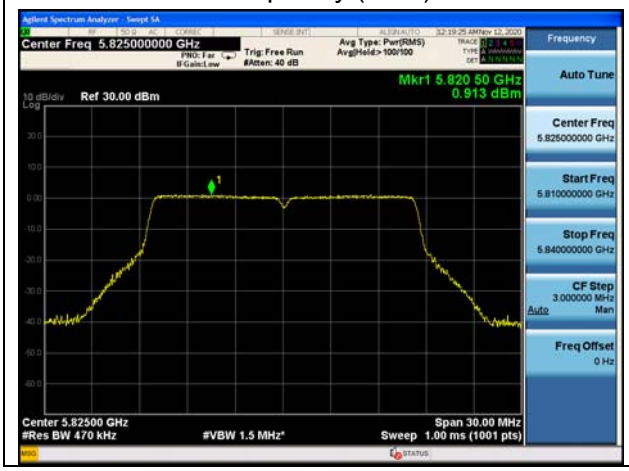


U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5785

U-NII-3, 802.11a

Carrier frequency (MHz): 5825



U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5825

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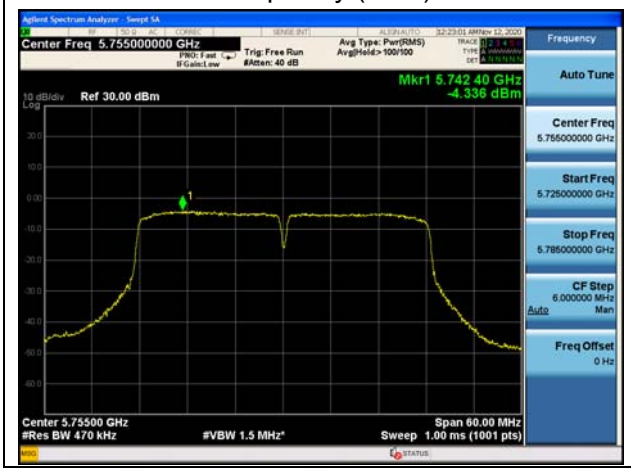
U-NII-3, 802.11n HT40 Carrier frequency (MHz): 5755	U-NII-3, 802.11n HT40 Carrier frequency (MHz): 5795
	

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5.5. Unwanted Emission

Ambient condition

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

Method of Measurement

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

During the test, the height of receive antenna shall be moved from 1 to 4 meters, and the antenna shall be performed under horizontal and vertical polarization. The turntable shall be rotated from 0 to 360 degrees for detecting the maximum of radiated spurious signal level. The measurements shall be repeated with orthogonal polarization of the test antenna. The data of cable loss and antenna factor has been calibrated in full testing frequency range before the testing.
Set the spectrum analyzer in the following:
9kHz~150 kHz
RBW=200Hz, VBW=1kHz/ Sweep=AUTO
150 kHz~30MHz
RBW=9KHz, VBW=30KHz,/ Sweep=AUTO
Below 1GHz
RBW=100kHz / VBW=300kHz / Sweep=AUTO
a) Peak emission levels are measured by setting the instrument as follows:
Above 1GHz
PEAK: RBW=1MHz VBW=3MHz/ Sweep=AUTO
b) Average emission levels are measured by setting the instrument as follows:
Above 1GHz
AVERAGE: RBW=1MHz / VBW=3MHz / Sweep=AUTO
c) Detector: The measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.
d) Averaging type = power (i.e., rms) (As an alternative, the detector and averaging type may be set for linear voltage averaging. Some instruments require linear display mode to use linear voltage averaging. Log or dB averaging shall not be used.)
e) Sweep time = auto.
f) Perform a trace average of at least 100 traces if the transmission is continuous. If the transmission is not continuous, then the number of traces shall be increased by a factor of 1 / D, where D is the duty cycle. For example, with 50% duty cycle, at least 200 traces shall be averaged. (If a specific

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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.

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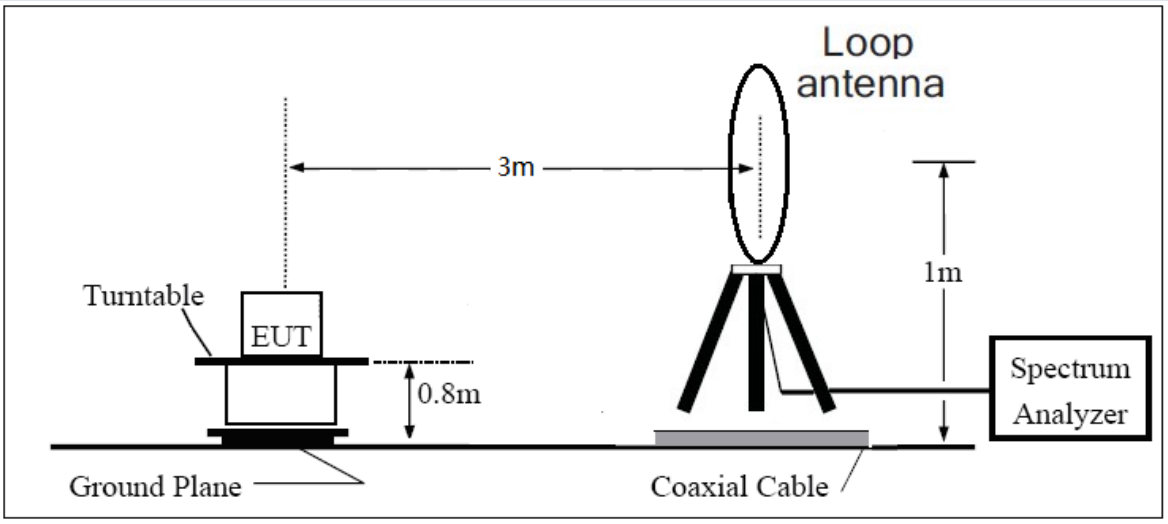
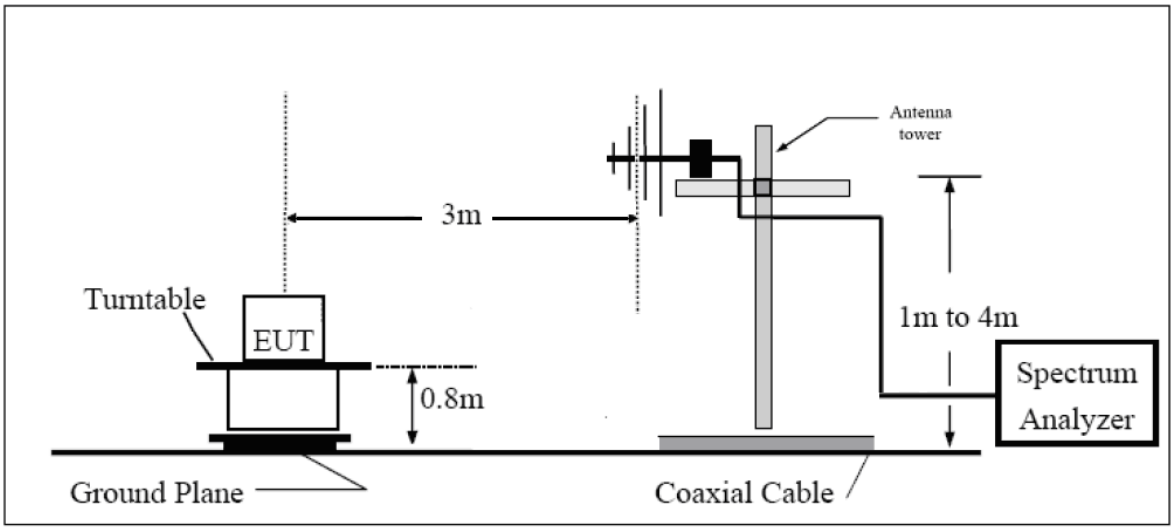
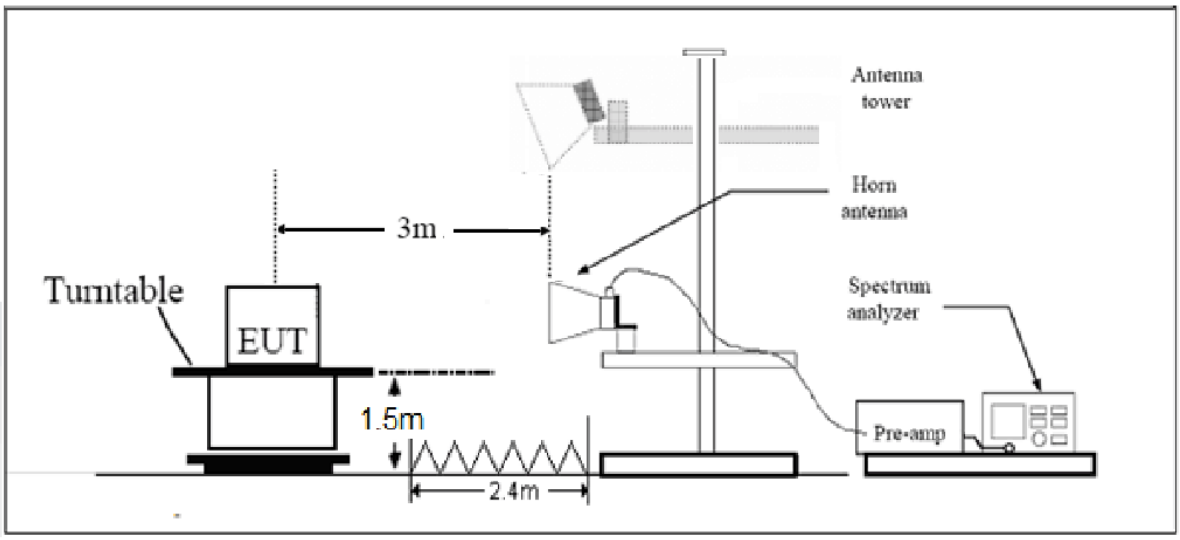
9KHz~30MHz



30MHz~ 1GHz



Above 1GHz



Note: Area side:2.4mX3.6m

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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

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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

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Test Results:

The signal beyond the limit is carrier.

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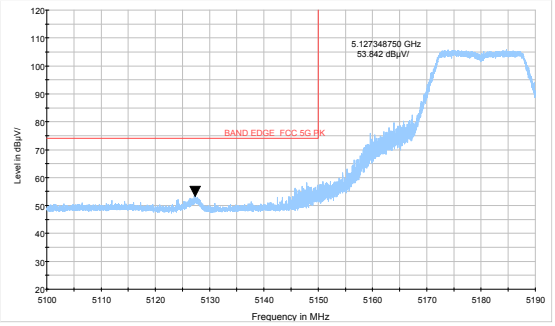
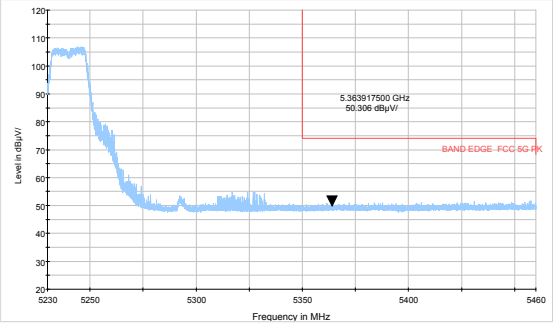
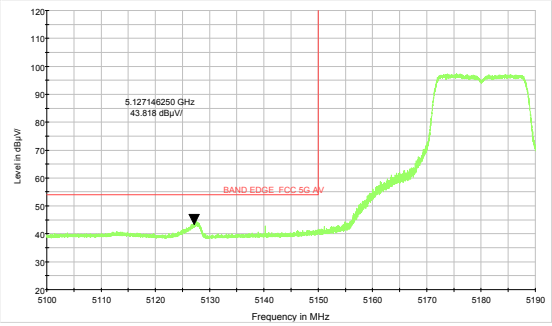
802.11a-Channel 36: Peak



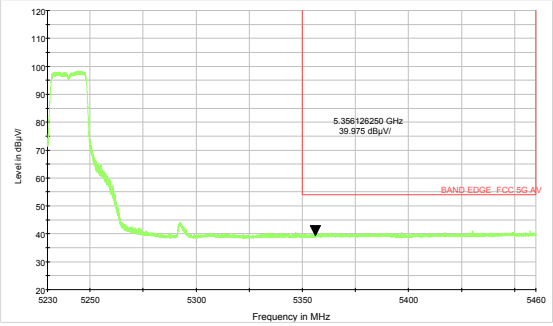
802.11a-Channel 48: Peak



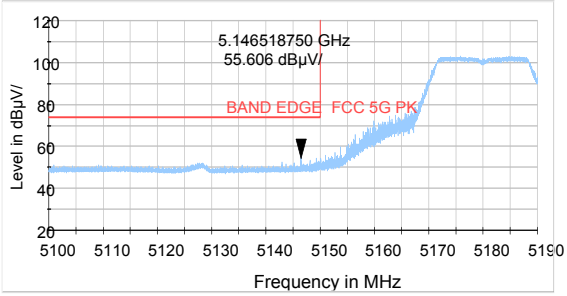
802.11a-Channel 36: Average



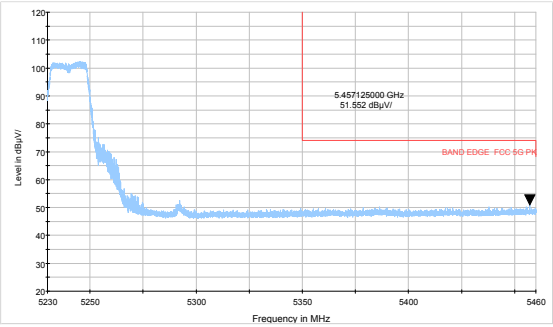
802.11a-Channel 48: Average



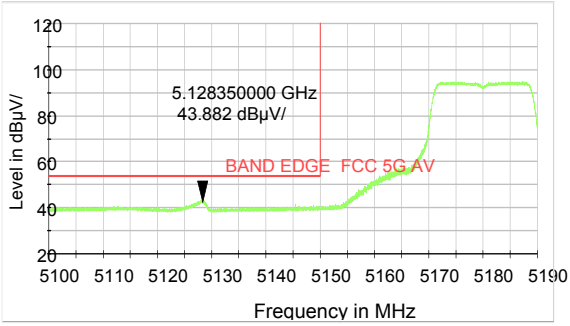
802.11n HT20-Channel 36: Peak



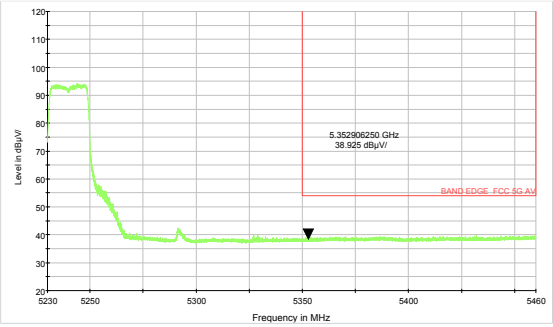
802.11n HT20-Channel 48: Peak



802.11n HT20-Channel 36: Average



802.11n HT20-Channel 48: Average



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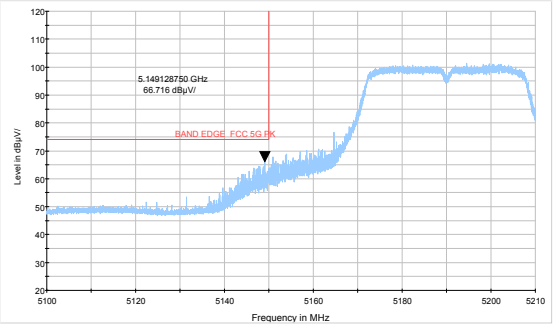
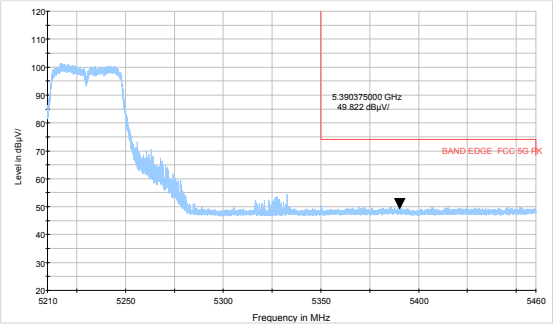
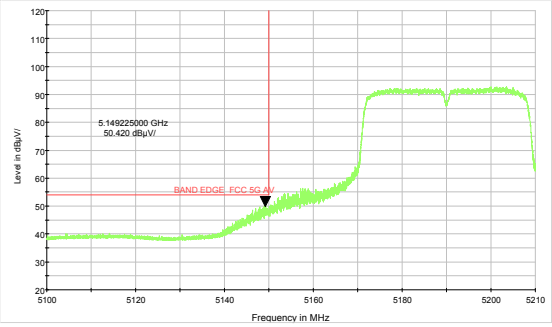
802.11n HT40-Channel 38: Peak



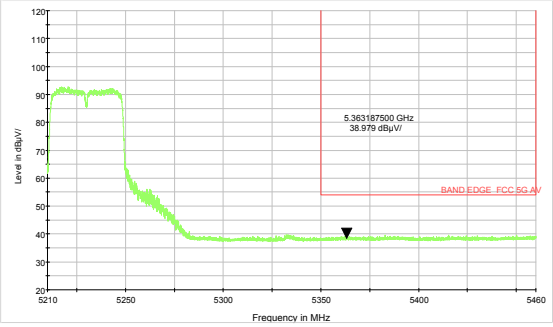
802.11n HT40-Channel 46: Peak



802.11n HT40-Channel 38: Average



802.11n HT40-Channel 46: Average



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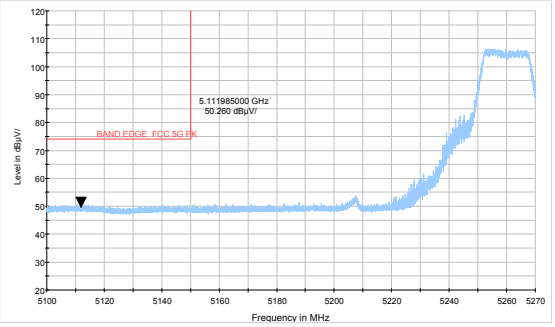
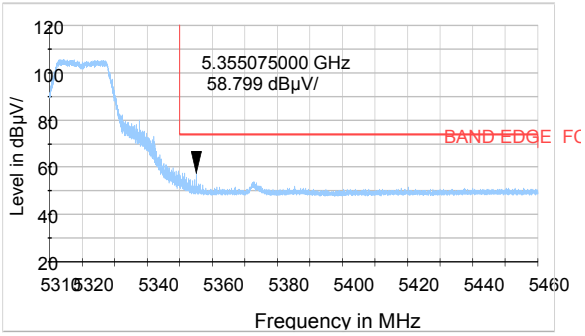
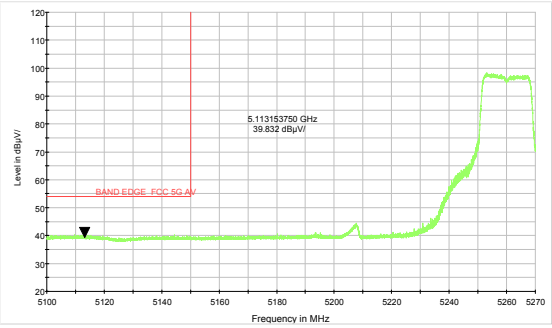
802.11a-Channel 52: Peak



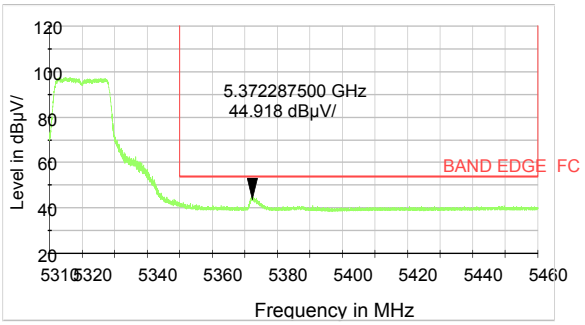
802.11a-Channel 64: Peak



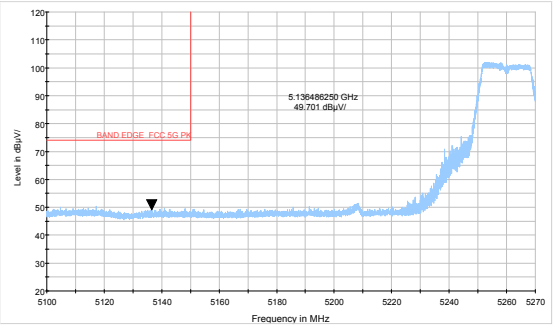
802.11a-Channel 52: Average



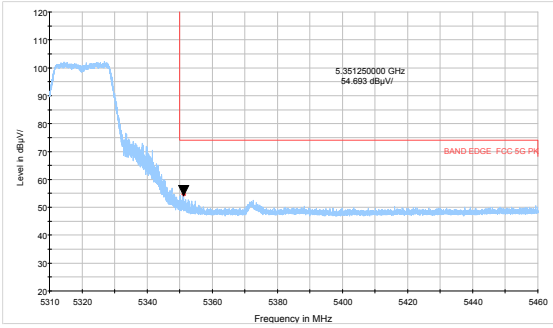
802.11a-Channel 64: Average



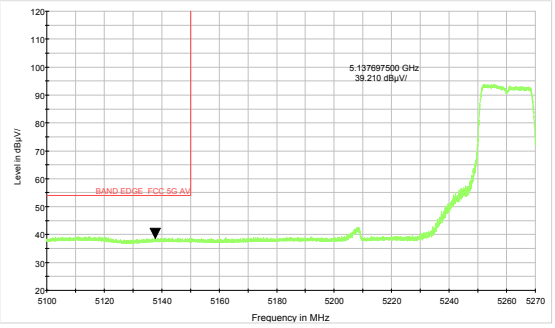
802.11n HT20-Channel 52: Peak



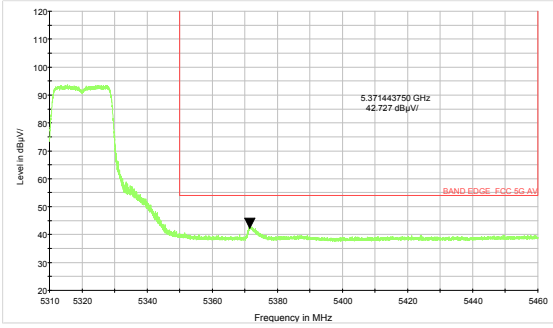
802.11n HT20-Channel 64: Peak



802.11n HT20-Channel 52: Average



802.11n HT20-Channel 64: Average



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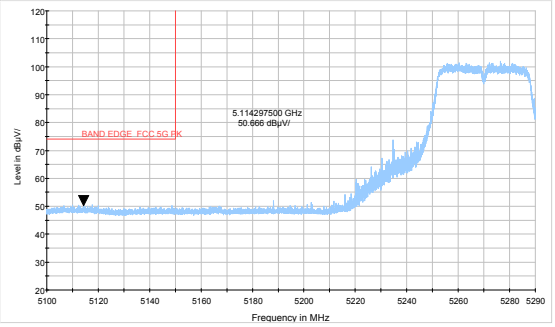
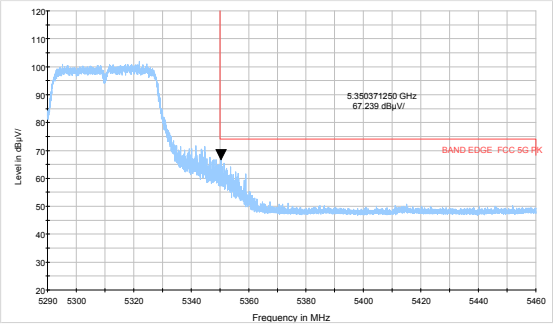
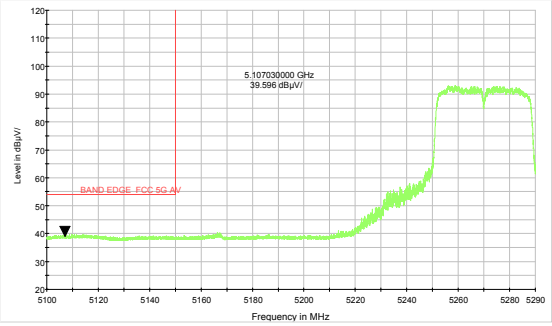
802.11n HT40-Channel 54: Peak



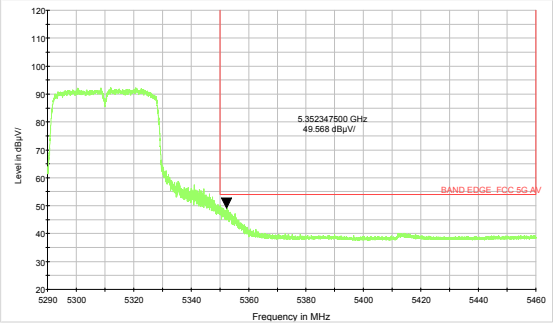
802.11n HT40-Channel 62: Peak



802.11n HT40-Channel 54: Average



802.11n HT40-Channel 62: Average



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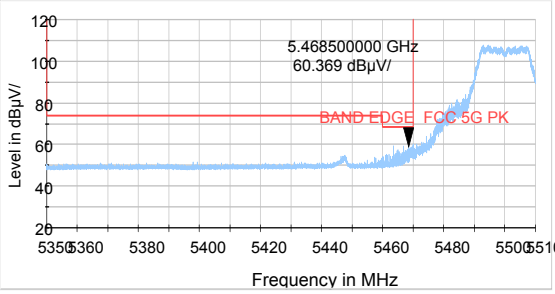
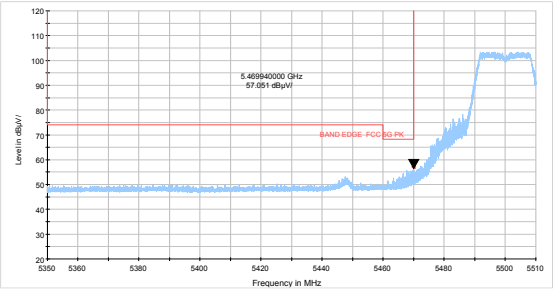
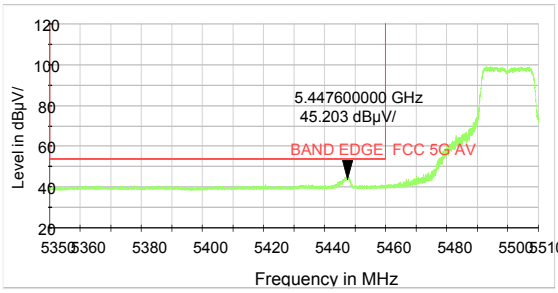
802.11a-Channel 100: Peak



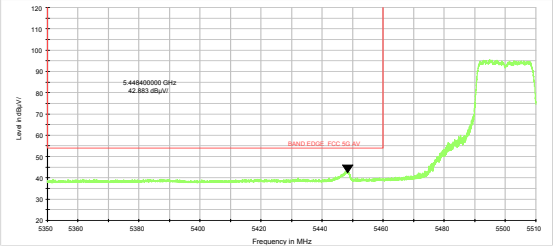
802.11n HT20-Channel 100: Peak



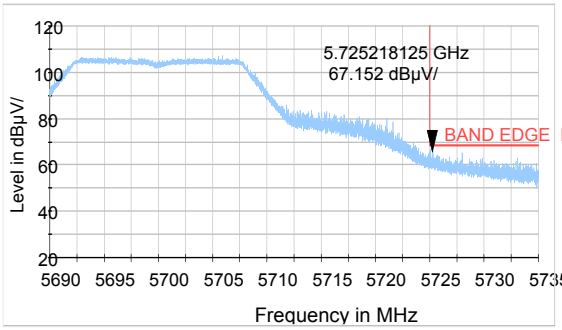
802.11a-Channel 100: Average



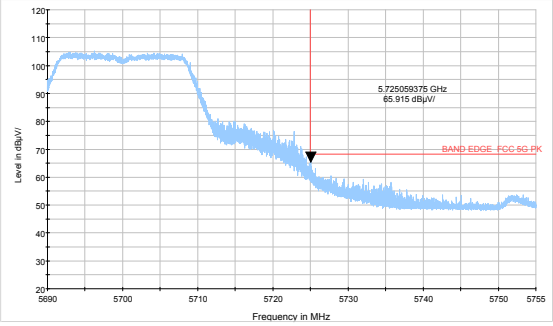
802.11n HT20-Channel 100: Average



802.11a-Channel 140: Peak



802.11n HT20-Channel 140: Peak



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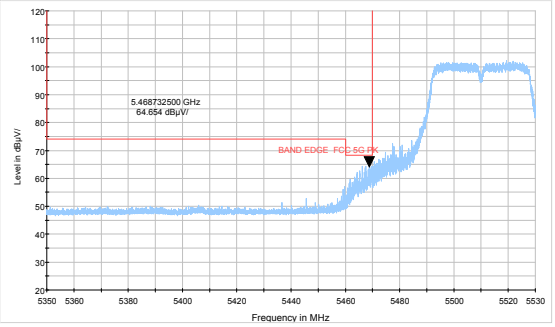
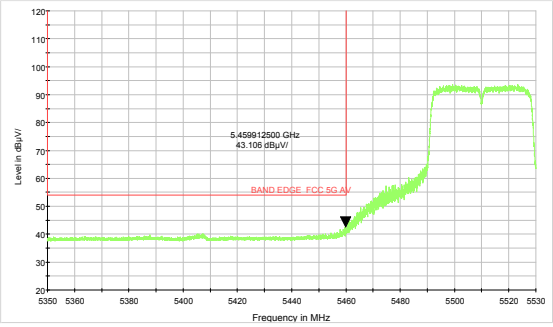
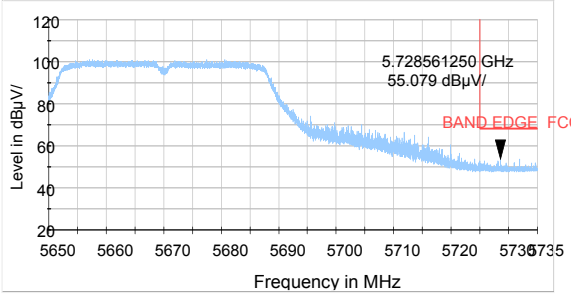
802.11n HT40-Channel 102: Peak



802.11n HT40-Channel 102: Average



802.11n HT40-Channel 134: Peak



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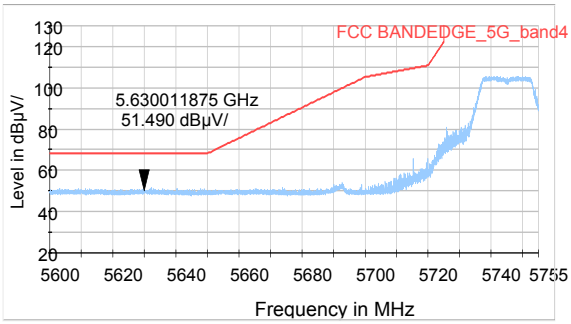
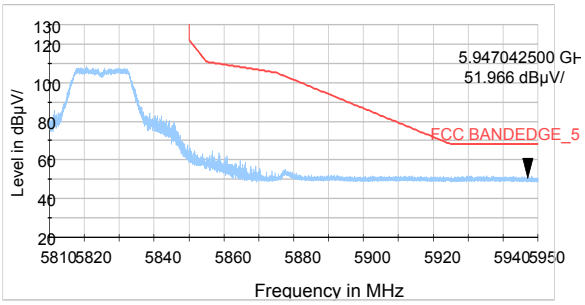
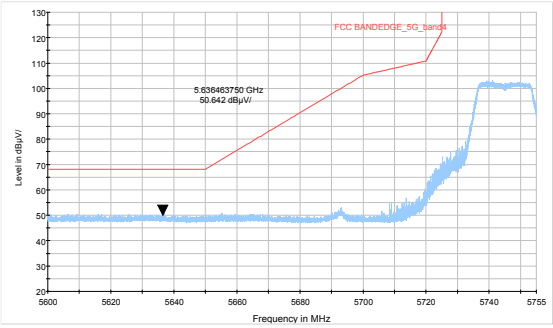
802.11a-Channel 149: Peak



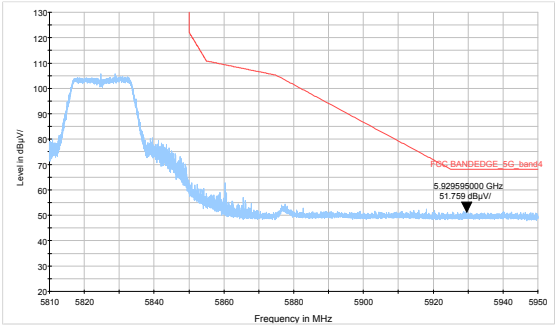
802.11a-Channel 165: Peak



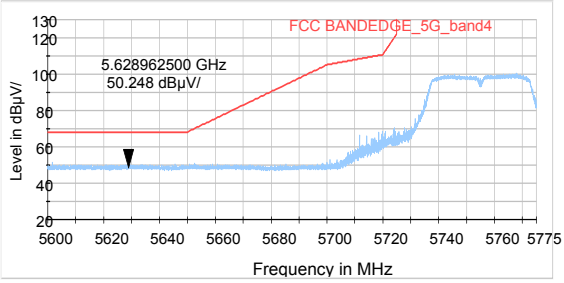
802.11n HT20-Channel 149: Peak



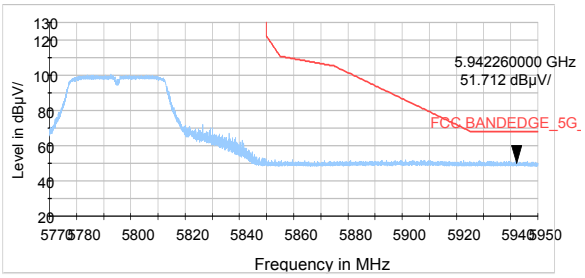
802.11n HT20-Channel 165: Peak



802.11n HT40-Channel 151: Peak



802.11n HT40-Channel 159: Peak



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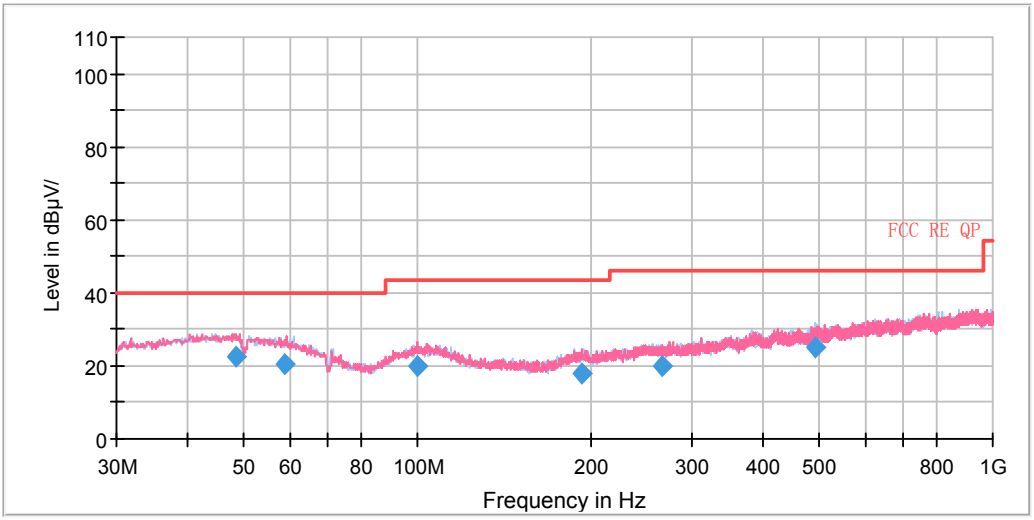
Result of RE

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)
48.302500	22.47	122.0	V	25.0	-0.7	17.53	40.00
58.621250	20.71	184.0	V	37.0	-2.7	19.29	40.00
100.000000	19.84	222.0	V	248.0	-5.0	23.66	43.50
192.675000	18.14	225.0	V	191.0	-6.3	25.36	43.50
266.718750	19.84	184.0	V	290.0	-5.1	26.16	46.00
492.527500	25.00	100.0	H	109.0	-0.4	21.00	46.00

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

2. Margin = Limit – Quasi-Peak

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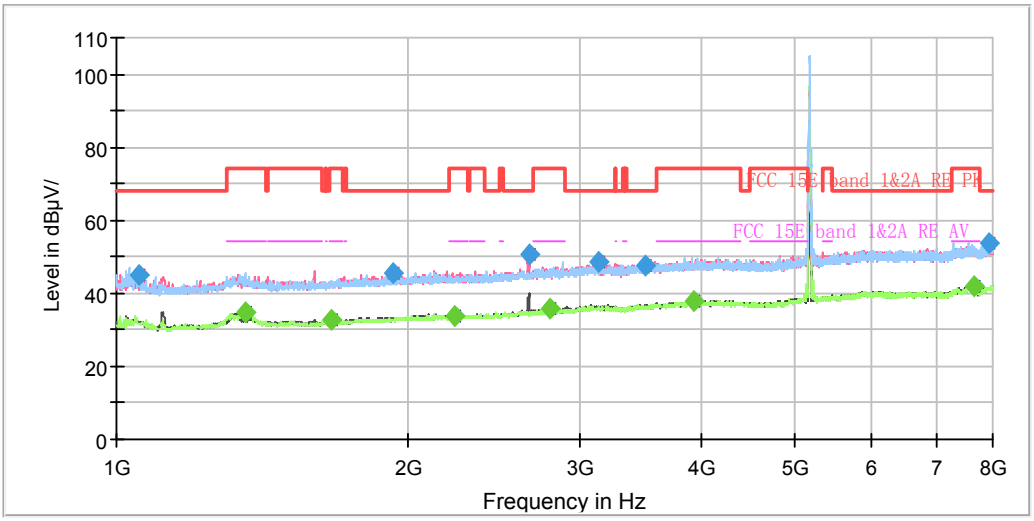
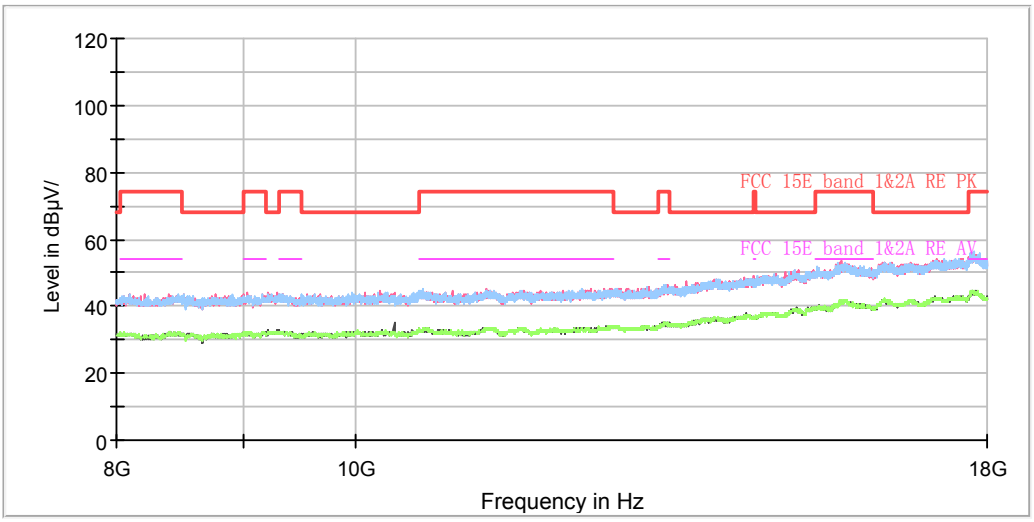
802.11a CH36



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz



Radiates Emission from 8GHz to 18GHz

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Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1056.000000	45.15	---	68.20	23.05	200.0	H	250.0	-8.5
1360.500000	---	34.90	54.00	19.10	200.0	H	242.0	-6.9
1662.375000	---	32.70	54.00	21.30	200.0	H	43.0	-5.2
1924.875000	45.79	---	68.20	22.41	100.0	V	64.0	-3.9
2234.625000	---	33.68	54.00	20.32	100.0	H	294.0	-2.6
2659.875000	50.41	---	68.20	17.79	200.0	V	2.0	-0.7
2800.750000	---	35.87	54.00	18.13	200.0	V	89.0	0.1
3142.875000	48.45	---	68.20	19.75	200.0	V	128.0	1.6
3506.000000	47.82	---	68.20	20.38	200.0	H	220.0	2.3
3941.750000	---	37.64	54.00	16.36	200.0	V	149.0	3.9
7647.375000	---	41.86	54.00	12.14	100.0	H	252.0	10.2
7928.250000	53.92	---	68.20	14.28	100.0	V	36.0	10.4

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

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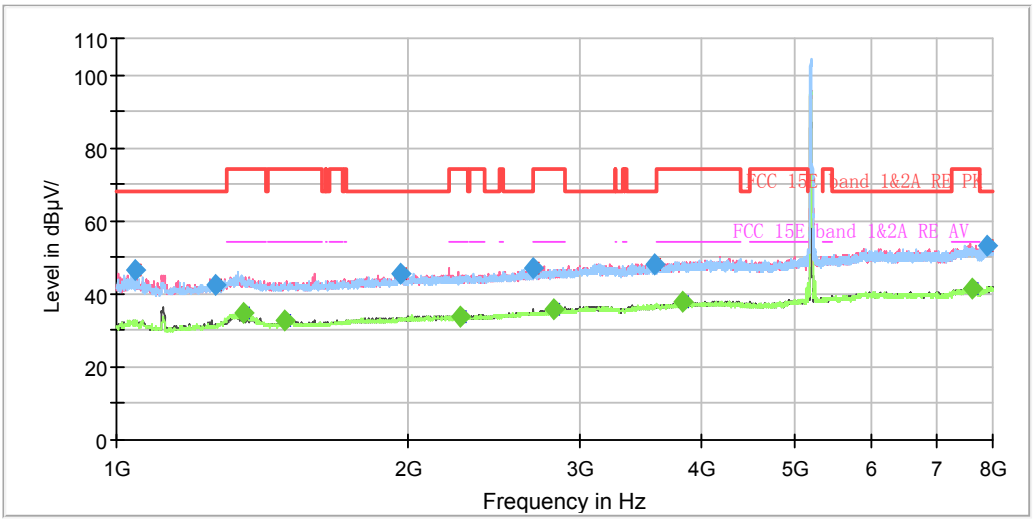
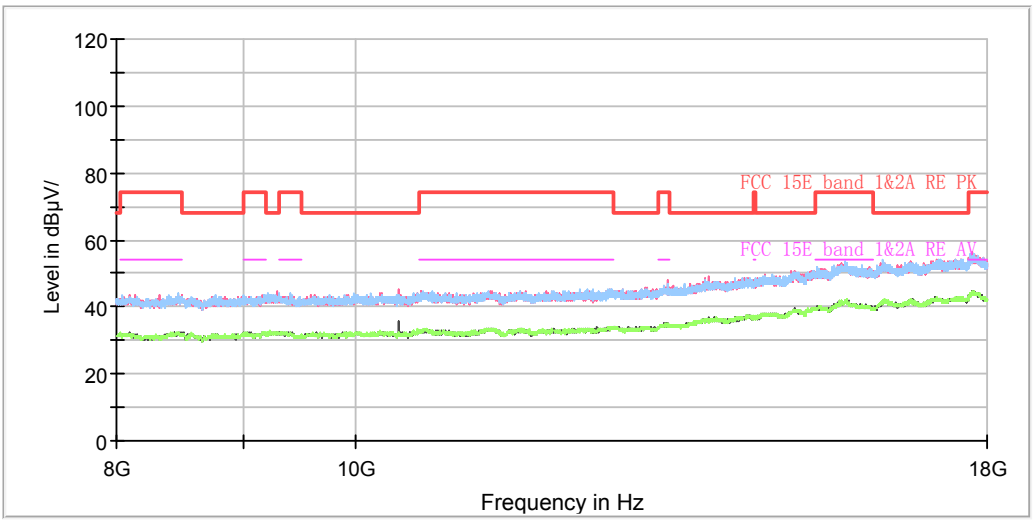
802.11a CH40



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



Radiates Emission from 8GHz to 18GHz

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Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1043.750000	46.68	---	68.20	21.52	100.0	H	315.0	-8.6
1265.125000	42.53	---	68.20	25.67	100.0	V	249.0	-7.4
1350.000000	---	34.77	54.00	19.23	200.0	H	238.0	-7.0
1487.375000	---	32.72	54.00	21.28	100.0	V	168.0	-6.2
1966.000000	45.41	---	68.20	22.79	100.0	H	234.0	-3.5
2258.250000	---	33.79	54.00	20.21	100.0	H	288.0	-2.4
2682.625000	46.90	---	68.20	21.30	100.0	V	244.0	-0.6
2827.000000	---	35.57	54.00	18.43	200.0	V	93.0	0.2
3583.000000	48.25	---	68.20	19.95	200.0	V	215.0	2.9
3839.375000	---	37.65	54.00	16.35	200.0	H	249.0	3.7
7605.375000	---	41.69	54.00	12.31	100.0	H	304.0	10.1
7896.750000	53.10	---	68.20	15.10	100.0	H	46.0	10.3

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

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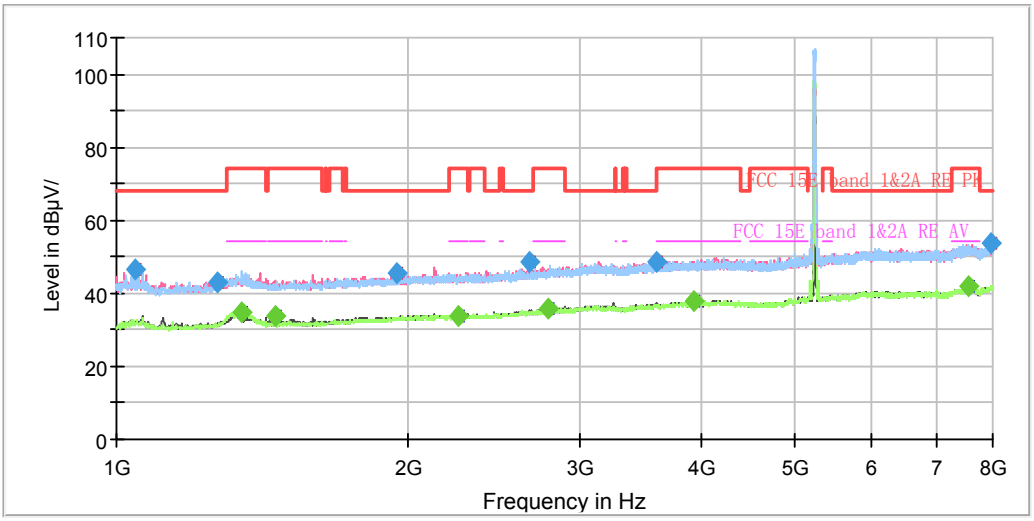
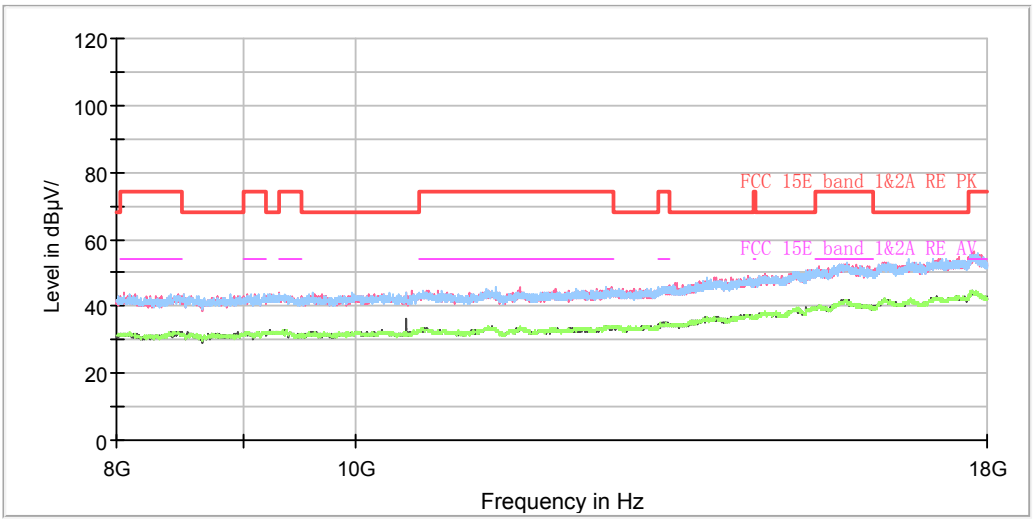
802.11a CH48



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz



Radiates Emission from 8GHz to 18GHz

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Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1044.625000	46.73	---	68.20	21.47	100.0	H	327.0	-8.6
1269.500000	43.14	---	68.20	25.06	100.0	H	208.0	-7.4
1348.250000	---	34.95	54.00	19.05	200.0	H	235.0	-7.0
1455.000000	---	33.61	54.00	20.39	200.0	V	260.0	-6.4
1946.750000	45.38	---	68.20	22.82	100.0	V	83.0	-3.7
2250.375000	---	33.80	54.00	20.20	200.0	V	232.0	-2.4
2662.500000	48.41	---	68.20	19.79	200.0	V	132.0	-0.7
2783.250000	---	35.89	54.00	18.11	200.0	V	320.0	0.0
3594.375000	48.51	---	68.20	19.69	200.0	V	238.0	3.1
3942.625000	---	37.90	54.00	16.10	100.0	V	76.0	3.9
7538.000000	---	41.70	54.00	12.30	200.0	H	251.0	10.0
7970.250000	53.61	---	68.20	14.59	100.0	V	59.0	10.4

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

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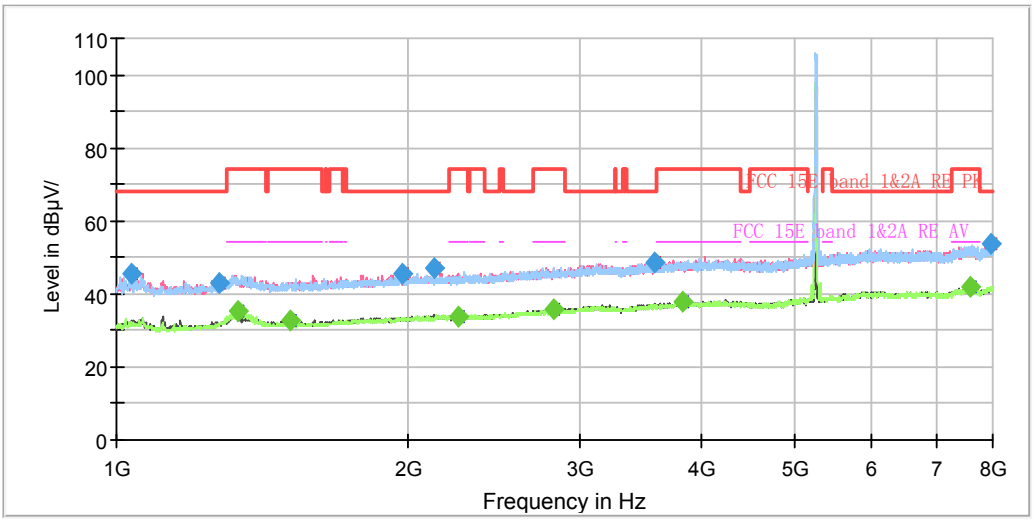
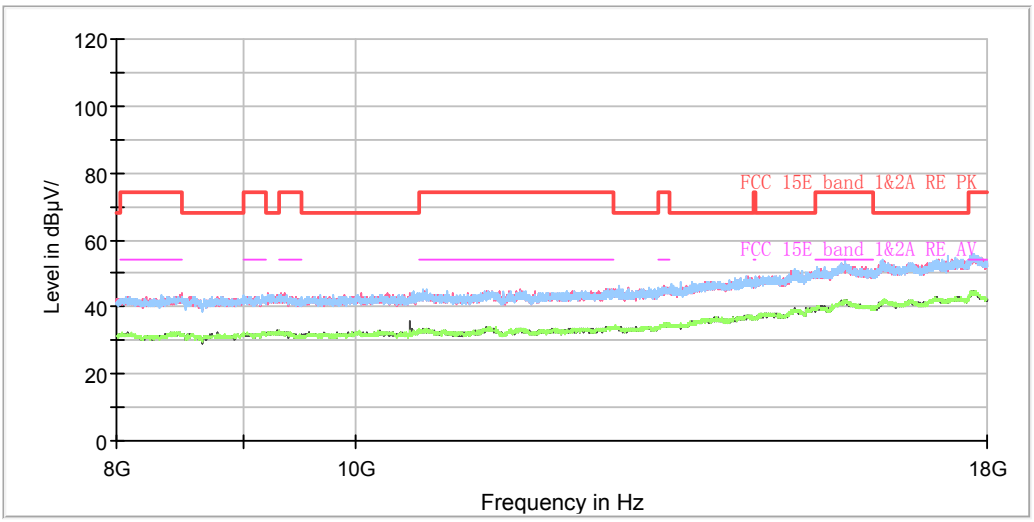
802.11a CH52



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz



Radiates Emission from 8GHz to 18GHz

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Frequency (MHz)	Peak (dBuV/m)	Average (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Polarization	Azimuth (deg)	Correct Factor (dB)
1034.125000	45.53	---	68.20	22.67	200.0	H	243.0	-8.7
1275.625000	42.99	---	68.20	25.21	200.0	H	68.0	-7.4
1336.875000	---	35.16	54.00	18.84	200.0	H	243.0	-7.0
1511.875000	---	32.77	54.00	21.23	200.0	V	273.0	-6.1
1973.875000	45.50	---	68.20	22.70	200.0	H	183.0	-3.5
2127.000000	47.01	---	68.20	21.19	200.0	V	331.0	-2.8
2249.500000	---	33.75	54.00	20.25	200.0	V	157.0	-2.4
2821.750000	---	35.67	54.00	18.33	200.0	V	87.0	0.2
3584.750000	48.47	---	68.20	19.73	200.0	V	257.0	2.9
3840.250000	---	37.65	54.00	16.35	200.0	V	251.0	3.7
7595.750000	---	41.80	54.00	12.20	100.0	V	271.0	10.1
7969.375000	53.63	---	68.20	14.57	200.0	V	174.0	10.4

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

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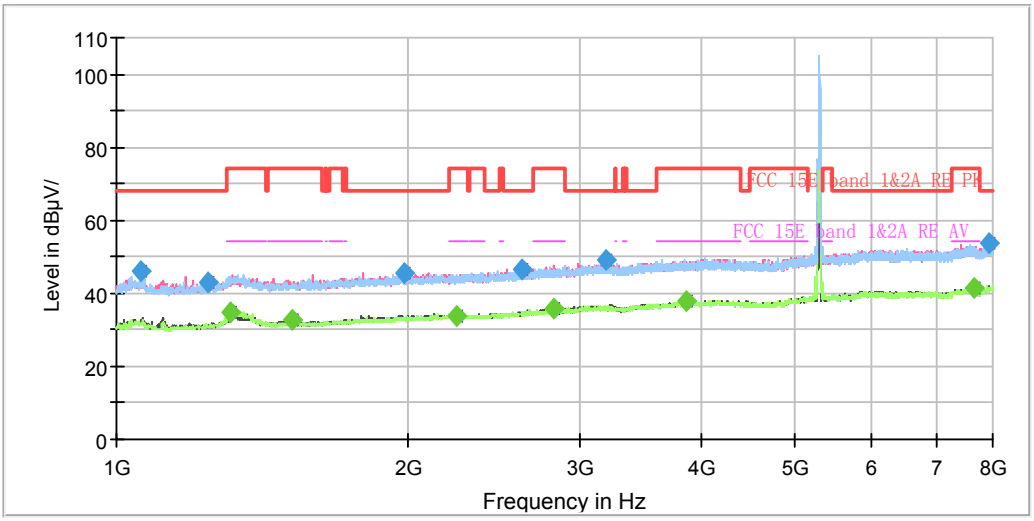
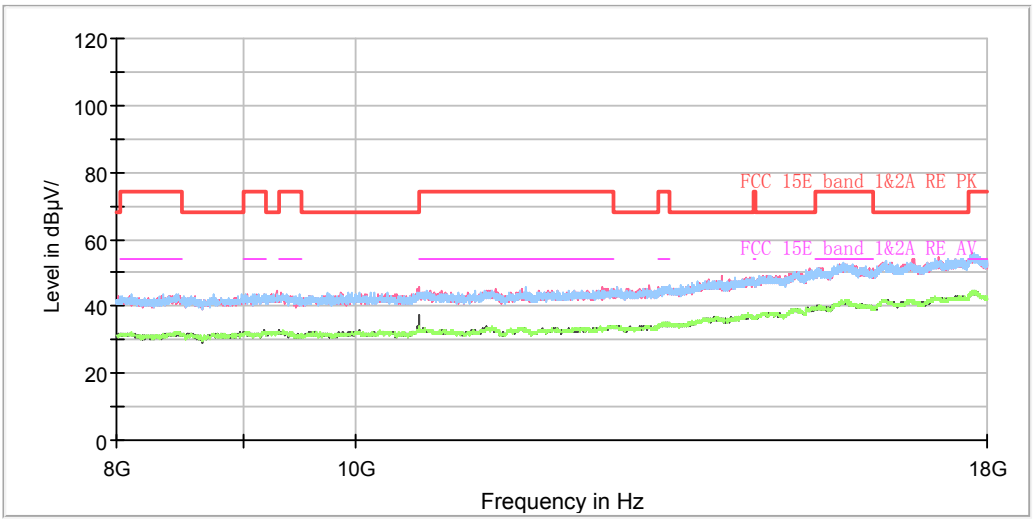
802.11a CH60



Note: The signal beyond the limit is carrier.

Radiates Emission from 1GHz to 8GHz



Radiates Emission from 8GHz to 18GHz

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