



RF TEST REPORT

Applicant Honor Device Co., Ltd.

FCC ID 2AYGCHJC-LX9

Product Smart Phone

Model HJC-LX9

Report No. R2009H0243-R7V1

Issue Date January 28, 2021

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

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Version	Revision description	Issue Date
Rev.0	Initial issue of report.	December 18, 2020
Rev.1	Update FCC ID.	January 28, 2021
Note: This revised report (Report No. R2009H0243-R7V1) supersedes and replaces the previously issued report (Report No. R2009H0243-R7). Please discard or destroy the previously issued report and dispose of it accordingly.		

Summary of measurement results

Number	Test Case	Clause in FCC rules	Verdict
1	Average output power	15.407(a)	PASS
2	Occupied bandwidth	15.407(e)	PASS
3	Frequency stability	15.407(g)	PASS
4	Power spectral density	15.407(a)	PASS
5	Unwanted Emissions	15.407(b)	PASS
6	Conducted Emissions	15.207	PASS
Date of Testing: September 4, 2020 ~ October 25, 2020			
Date of Sample Received: September 3, 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 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
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E-mail: xukai@ta-shanghai.com

2. General Description of Equipment under Test

2.1. Applicant and Manufacturer Information

Applicant	Honor Device Co., Ltd.
Applicant address	Suite 3401, Unit A, Building 6, Shum Yip Sky Park, No. 8089, Hongli West Road, Xiangmihu Street, Futian District, Shenzhen, Guangdong 518040, People's Republic of China.
Manufacturer	Honor Device Co., Ltd.
Manufacturer address	Suite 3401, Unit A, Building 6, Shum Yip Sky Park, No. 8089, Hongli West Road, Xiangmihu Street, Futian District, Shenzhen, Guangdong 518040, People's Republic of China.

2.2. General information

EUT Description				
Model	HJC-LX9			
SN	019BRD208E001334			
Hardware Version	HL3JSCM			
Software Version	10.1.1.111(C900E01R1P1)			
Power Supply	Battery/AC adapter			
Antenna Type	Internal Antenna			
Antenna Gain	Frequency (MHz)	Gain (dBi)	Frequency (MHz)	Gain (dBi)
	5180	-2.14	5580	-1.61
	5200	-2.20	5600	-1.68
	5220	-2.14	5620	-1.32
	5240	-1.68	5640	-0.93
	5260	-1.52	5660	-1.02
	5280	-1.70	5680	-1.53
	5300	-1.47	5700	-1.62
	5320	-1.29	5745	-0.47
	5500	-1.75	5765	-0.38
	5520	-1.99	5785	0.14
	5540	-2.26	5805	0.23
	5560	-1.98	5825	0.01
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 802.11ac (VHT20/VHT40/VHT80): OFDM
Max. Output Power	18.97dBm
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:	0 ° C to 35° C
Operating voltage range:	3.6 V to 4.4 V
State DC voltage:	3.8V

EUT Accessory

Accessory	Model	Manufacture	No.
Adapter	HW-110600E00	Honor Device Co., Ltd.	1
	HW-110600B00	Honor Device Co., Ltd.	2
	HW-110600U00	Honor Device Co., Ltd.	3
	HW-110600A00	Honor Device Co., Ltd.	4
	HW-110600E02	Honor Device Co., Ltd.	5
	HW-110600B02	Honor Device Co., Ltd.	6
	HW-110600U02	Honor Device Co., Ltd.	7
	HW-110600A02	Honor Device Co., Ltd.	8
	HW-110600C02	Honor Device Co., Ltd.	9
Battery	HB426589EEW	Honor Device Co., Ltd. (Manufacturer: SCUD (FUJIAN) Electronics Co., Ltd.)	1
	HB426589EEW	Honor Device Co., Ltd. (Manufacturer: Sunwoda Electronic Co., Ltd.)	2
USB Cable	213-01011-0	MING JI ELECTRONICS CO., LTD.	1
	L99UC139-CS-H	LUXSHARE Precision Industry Co., Ltd	2
Earphone	MEND1532B528A11	Jiangxi Lianchuang Hongsheng Electronic Co. ,LTD	1
	EPAB542-2WH05-DH	FOXCONN INTERCONNECT TECHNOLOGY LIMITED	2
	1293-3283-3.5mm-339	Boluo County Quancheng Electronic Co. ,LTD	3

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/USB cable/ Battery/Earphone, each one should be applied throughout the compliance test respectively, and however, only the worst case (Adapter 1/USB cable 2/ Battery 1/Earphone 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.

Mode	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-2A	20 MHz	52	5260MHz
			56	5280MHz
			60	5300MHz
			64	5320MHz
		40 MHz	54	5270MHz
			62	5310MHz
		80 MHz	58	5290MHz
	U-NII-2C	20 MHz	100	5500MHz
			104	5520MHz
			108	5540MHz
			112	5560MHz
			116	5580MHz
			120	5600MHz
			124	5620MHz
			128	5640MHz
			132	5660MHz
			136	5680MHz
			140	5700MHz
		40 MHz	102	5510MHz
			110	5550MHz
			118	5590MHz
			126	5630MHz
			134	5670MHz
		80 MHz	106	5530MHz
			122	5610MHz
	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.

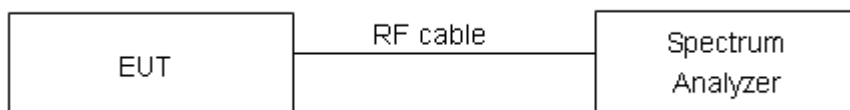
For U-NII-1/U-NII-2A/U-NII-2C, set RBW $\approx$ 1% OCB kHz, VBW $\geq$ 3 $\times$ RBW, measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 26 dB relative to the maximum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

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

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

Use the 99 % power bandwidth function of the instrument

Test Setup



Limits

Rule FCC Part §15.407(e)

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

Measurement Uncertainty

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

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

Mode	Channel/ Frequency (MHz)	99% bandwidth (MHz)	Minimum 26 dB bandwidth (MHz)	Conclusion
802.11a	36/5180	16.397	19.67	PASS
	40/5200	16.436	19.65	PASS
	48/5240	16.466	19.92	PASS
802.11n HT20	36/5180	17.550	20.03	PASS
	40/5200	17.588	20.22	PASS
	48/5240	17.575	19.97	PASS
802.11n HT40	38/5190	35.974	40.01	PASS
	46/5230	36.029	44.99	PASS
802.11ac VHT20	36/5180	17.520	19.74	PASS
	40/5200	17.559	20.09	PASS
	48/5240	17.544	19.93	PASS
802.11ac VHT40	38/5190	35.985	39.72	PASS
	46/5230	35.987	40.20	PASS
802.11ac VHT80	42/5210	75.229	80.35	PASS

U-NII-2A

Mode	Channel/ Frequency (MHz)	99% bandwidth (MHz)	Minimum 26 dB bandwidth (MHz)	Conclusion
802.11a	52/5260	16.411	19.79	PASS
	60/5300	16.409	19.87	PASS
	64/5320	16.453	19.67	PASS
802.11n HT20	52/5260	17.558	19.88	PASS
	60/5300	17.575	20.21	PASS
	64/5320	17.589	20.24	PASS
802.11n HT40	54/5270	35.976	40.20	PASS
	62/5310	35.924	40.29	PASS
802.11ac VHT20	52/5260	17.557	20.06	PASS
	60/5300	17.537	20.17	PASS
	64/5320	17.563	20.29	PASS
802.11ac VHT40	54/5270	35.918	40.02	PASS
	62/5310	35.924	40.42	PASS
802.11ac VHT80	58/5290	75.241	80.88	PASS



U-NII-2C

Mode	Channel/ Frequency (MHz)	99% bandwidth (MHz)	Minimum 26 dB bandwidth (MHz)	Conclusion
802.11a	100/5500	16.415	19.94	PASS
	104/5520	16.407	20.40	PASS
	120/5600	16.429	19.70	PASS
	136/5680	16.405	19.74	PASS
	140/5700	16.446	19.74	PASS
802.11n HT20	100/5500	17.559	19.97	PASS
	104/5520	17.601	20.64	PASS
	120/5600	17.598	23.77	PASS
	136/5680	17.590	21.57	PASS
	140/5700	17.533	19.95	PASS
802.11n HT40	102/5510	35.915	39.90	PASS
	110/5550	36.111	50.77	PASS
	118/5590	35.900	39.99	PASS
	126/5630	36.051	40.09	PASS
	134/5670	35.957	40.10	PASS
802.11ac VHT20	100/5500	17.561	20.27	PASS
	104/5520	17.553	20.26	PASS
	120/5600	17.587	20.04	PASS
	136/5680	17.580	20.02	PASS
	140/5700	17.557	20.21	PASS
802.11ac VHT40	102/5510	35.946	39.93	PASS
	110/5550	36.071	40.17	PASS
	118/5590	35.902	40.14	PASS
	126/5630	36.024	40.96	PASS
	134/5670	35.879	40.25	PASS
802.11ac VHT80	106/5530	75.213	80.60	PASS
	122/5610	75.295	80.48	PASS

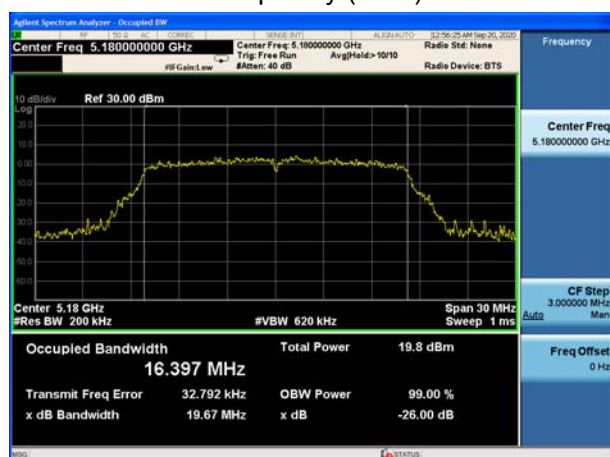


U-NII-3

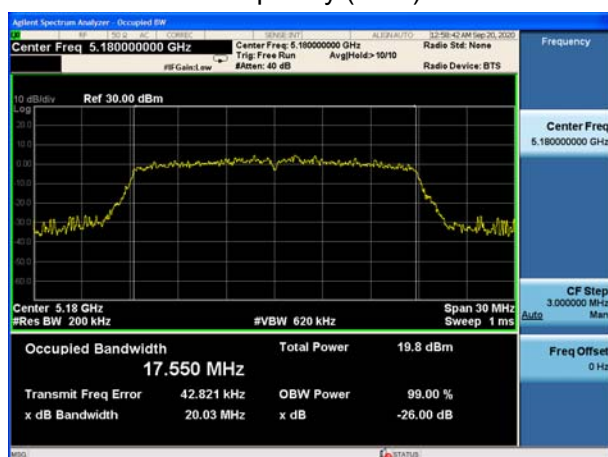
Mode	Channel/ Frequency (MHz)	99% bandwidth (MHz)	Minimum 6 dB bandwidth (MHz)	Limit (kHz)	Conclusion
802.11a	149/5745	16.390	14.91	500	PASS
	157/5785	16.418	15.04	500	PASS
	165/5825	16.458	15.69	500	PASS
802.11n HT20	149/5745	17.593	13.87	500	PASS
	157/5785	17.543	13.86	500	PASS
	165/5825	17.579	15.15	500	PASS
802.11n HT40	151/5755	36.026	35.12	500	PASS
	159/5795	36.020	32.65	500	PASS
802.11ac VHT20	149/5745	17.585	15.16	500	PASS
	157/5785	17.564	14.56	500	PASS
	165/5825	17.585	14.24	500	PASS
802.11ac VHT40	151/5755	35.937	35.13	500	PASS
	159/5795	35.990	33.91	500	PASS
802.11ac VHT80	155/5775	75.419	75.26	500	PASS



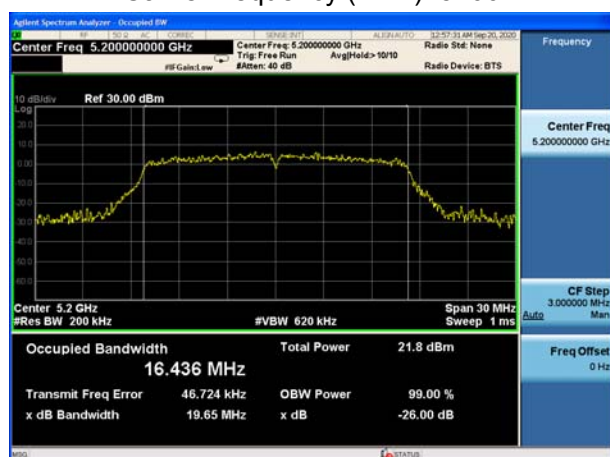
U-NII-1, 802.11a
Carrier frequency (MHz): 5180



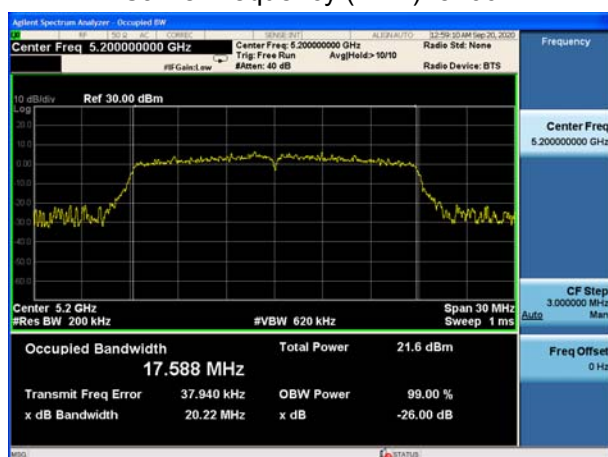
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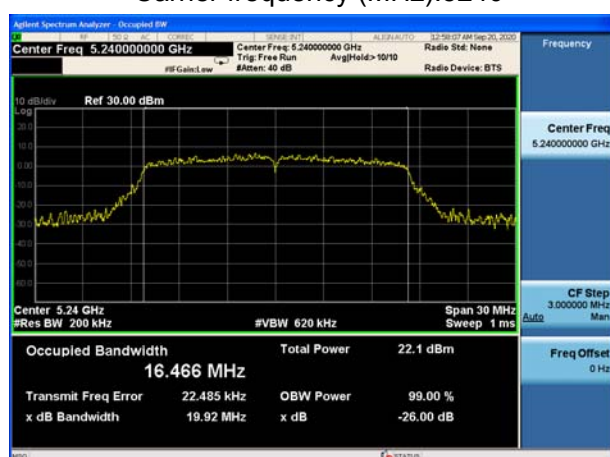
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Carrier frequency (MHz): 5200



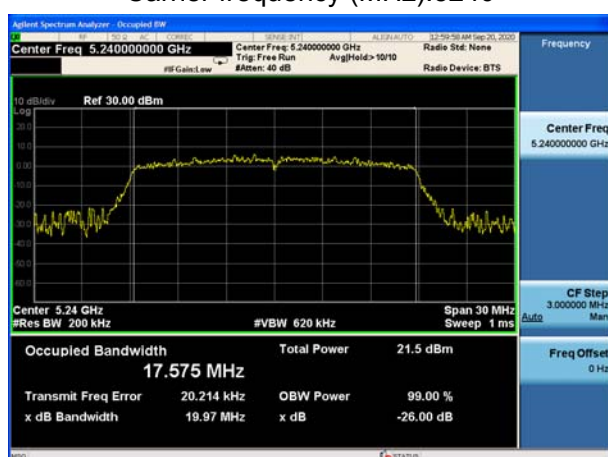
U-NII-1, 802.11n HT20
Carrier frequency (MHz): 5200



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

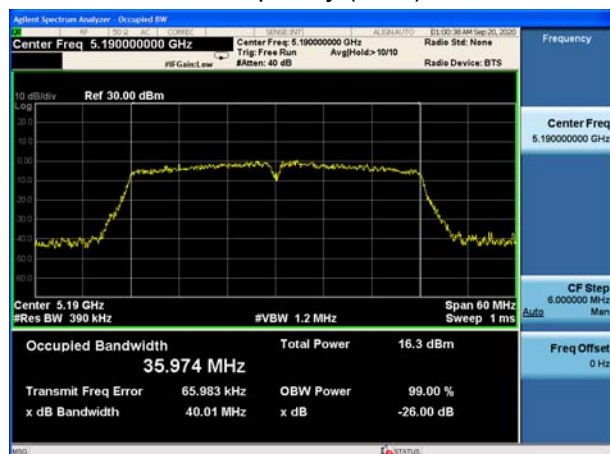


U-NII-1, 802.11n HT20
Carrier frequency (MHz): 5240

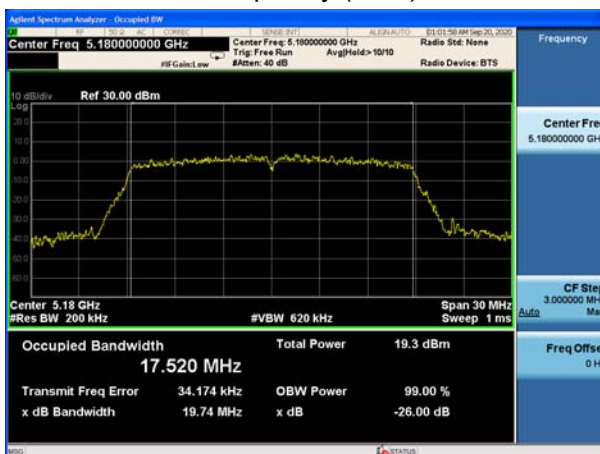




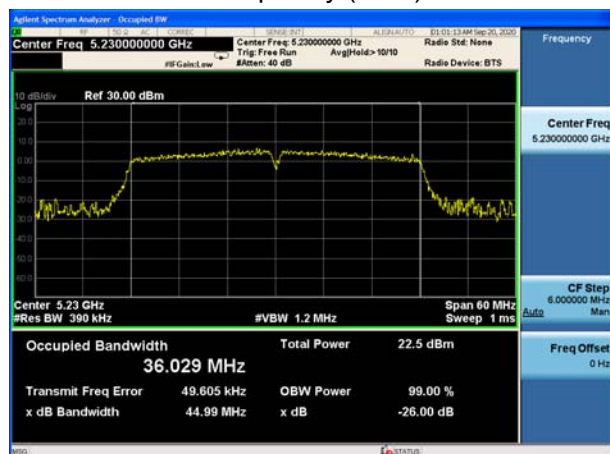
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Carrier frequency (MHz): 5190



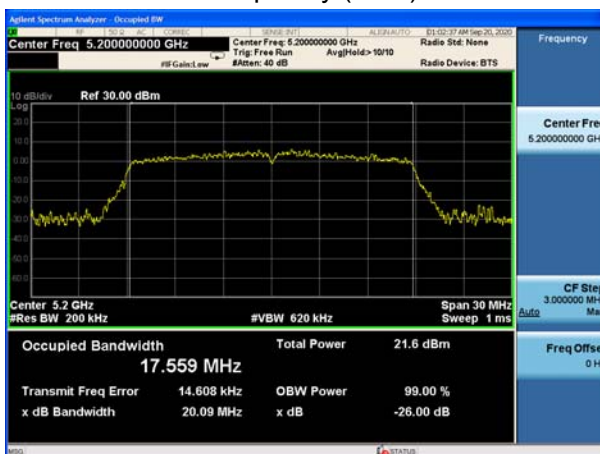
U-NII-1, 802.11ac VHT20
Carrier frequency (MHz): 5180



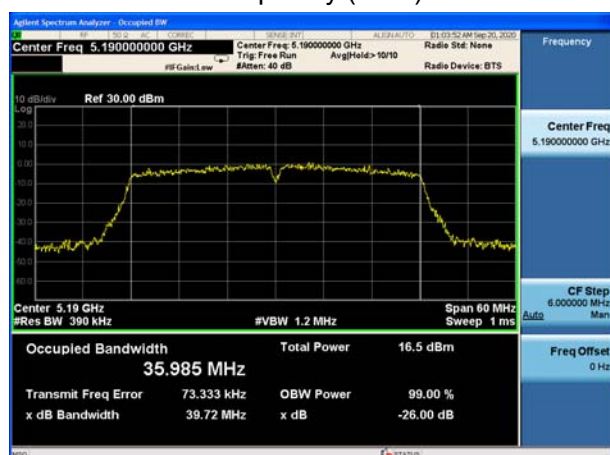
U-NII-1, 802.11n HT40
Carrier frequency (MHz): 5230



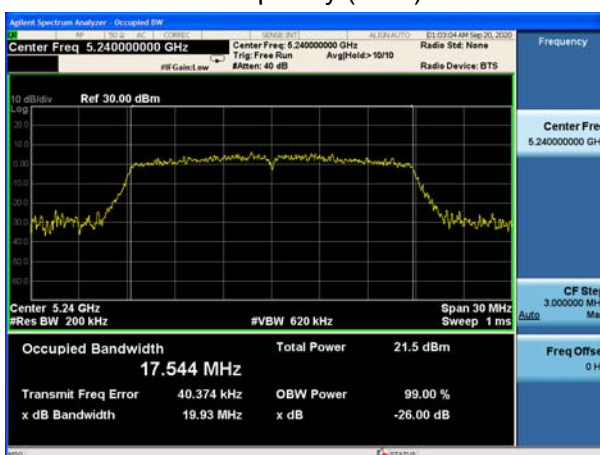
U-NII-1, 802.11ac VHT20
Carrier frequency (MHz): 5200



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

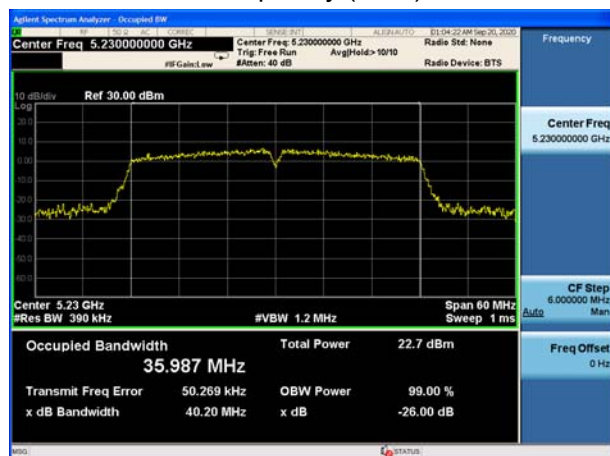


U-NII-1, 802.11ac VHT20
Carrier frequency (MHz): 5240

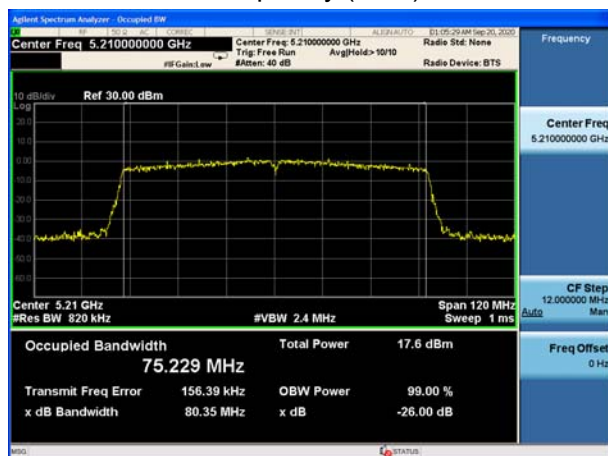




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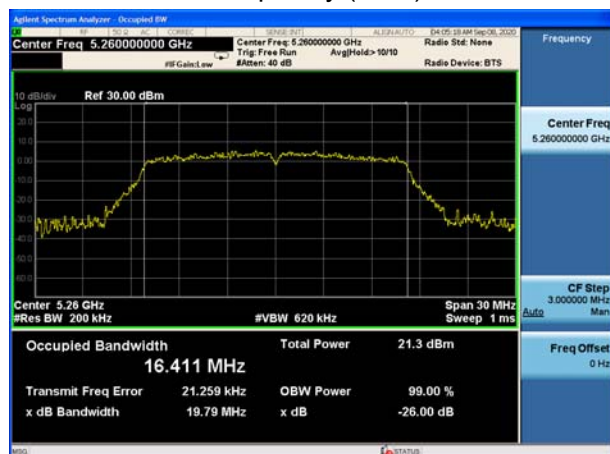


U-NII-1, 802.11ac VHT80
Carrier frequency (MHz): 5210





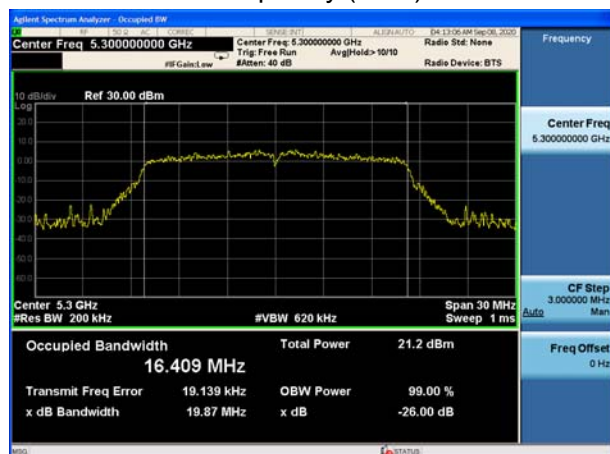
U-NII-2A, 802.11a
Carrier frequency (MHz): 5260



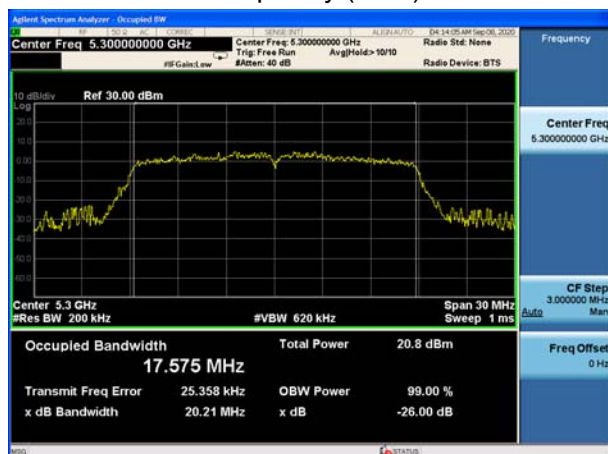
U-NII-2A, 802.11n HT20
Carrier frequency (MHz): 5260



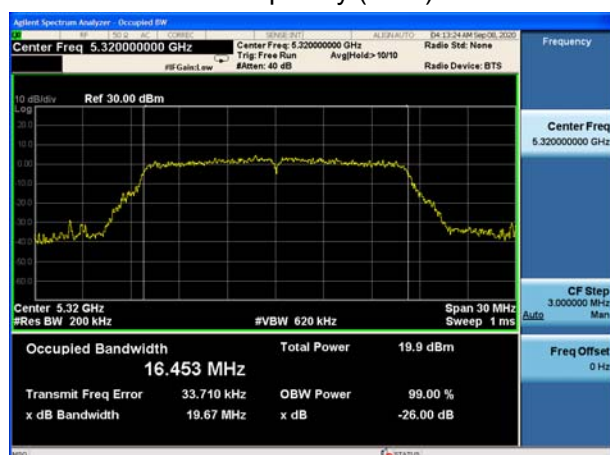
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Carrier frequency (MHz): 5300



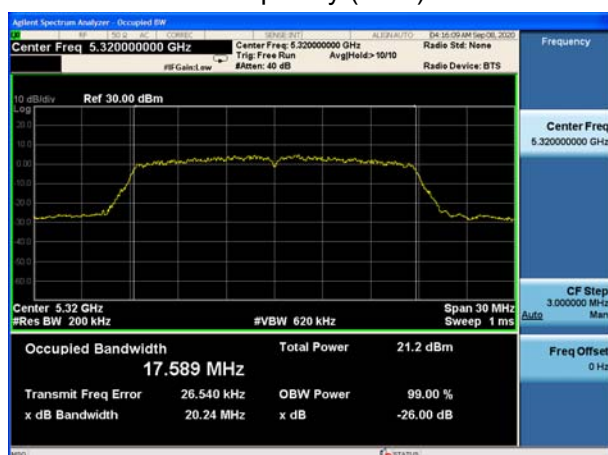
U-NII-2A, 802.11n HT20
Carrier frequency (MHz): 5300



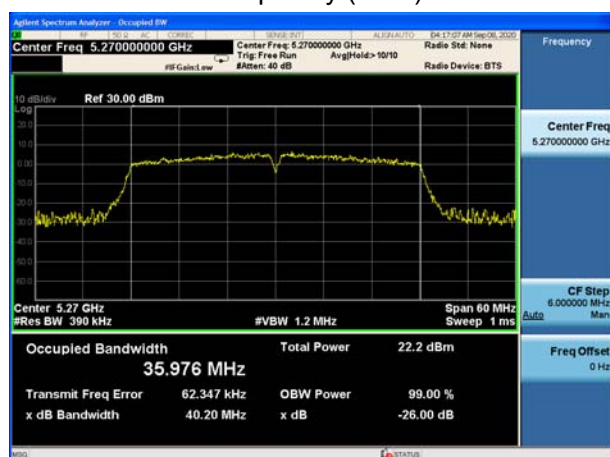
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Carrier frequency (MHz): 5320



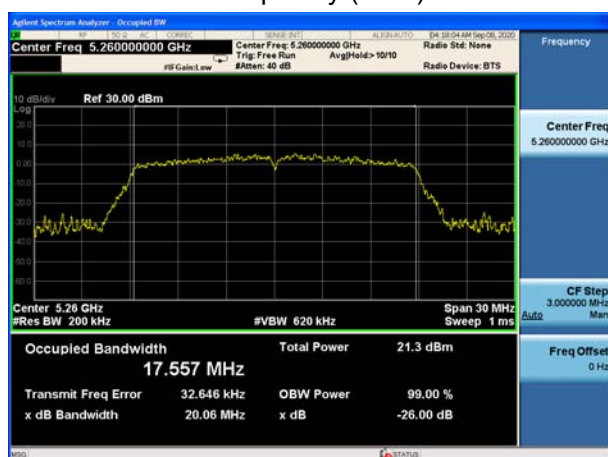
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Carrier frequency (MHz): 5320



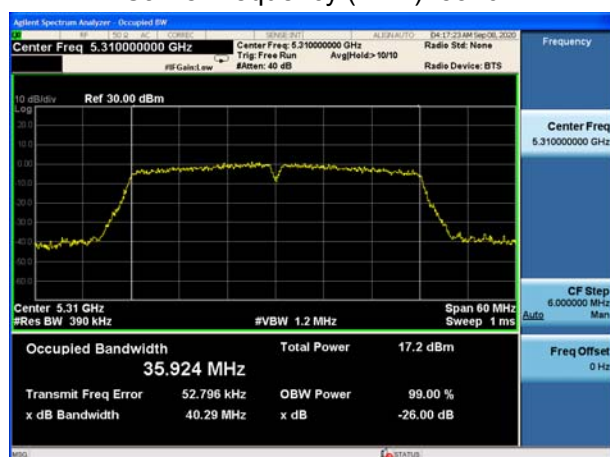
U-NII-2A, 802.11n HT40 Carrier frequency (MHz): 5270



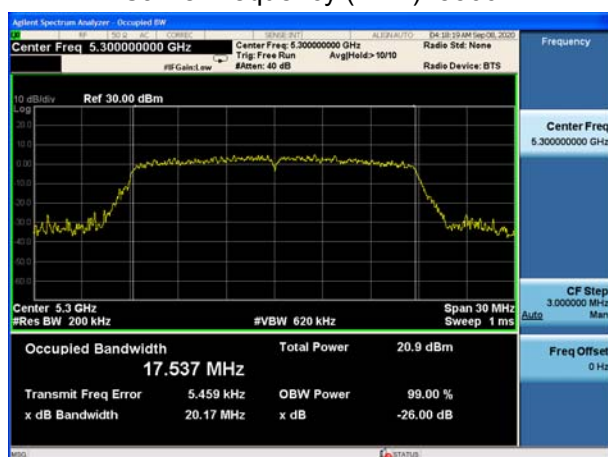
U-NII-2A, 802.11ac VHT20 Carrier frequency (MHz): 5260



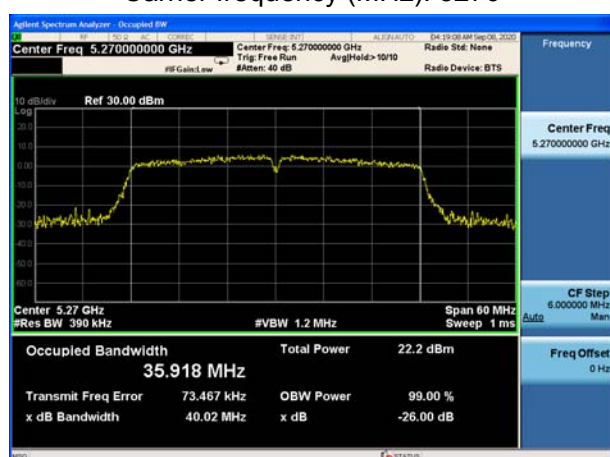
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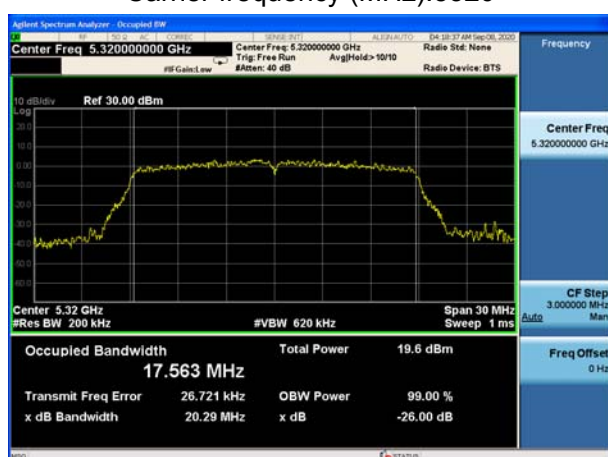
U-NII-2A, 802.11ac VHT20 Carrier frequency (MHz): 5300



U-NII-2A, 802.11ac VHT40 Carrier frequency (MHz): 5270

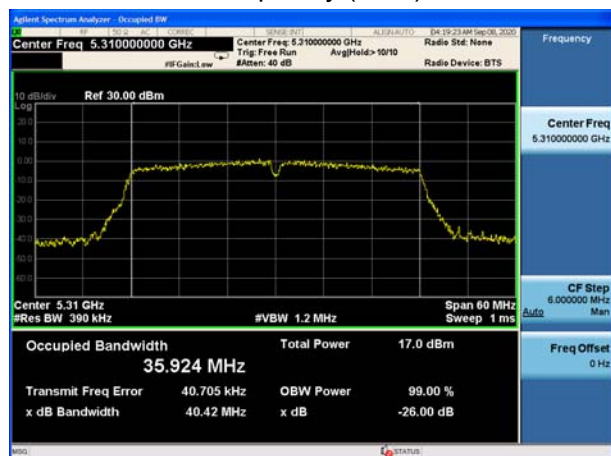


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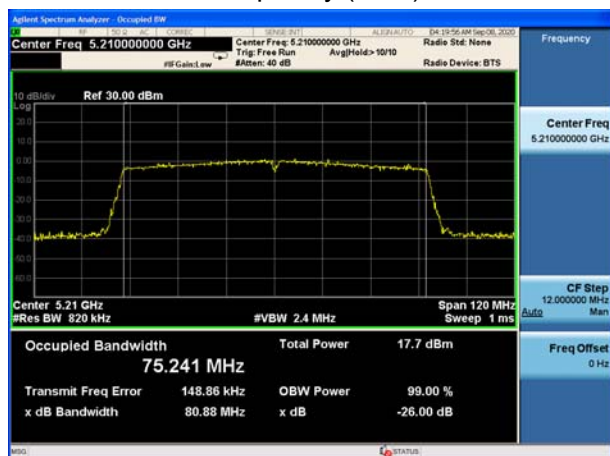




U-NII-2A, 802.11ac VHT40
Carrier frequency (MHz): 5310

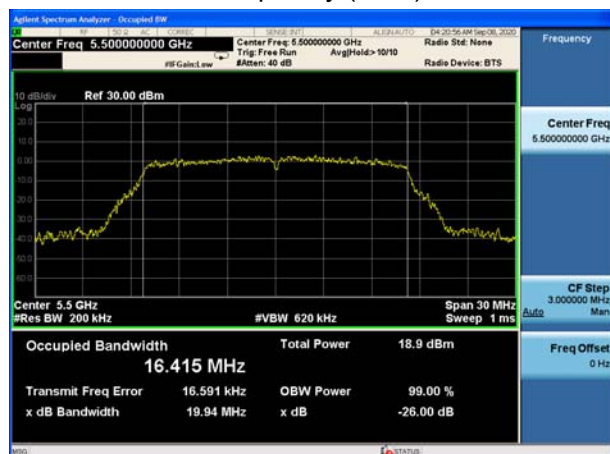


U-NII-2A, 802.11ac VHT80
Carrier frequency (MHz): 5290

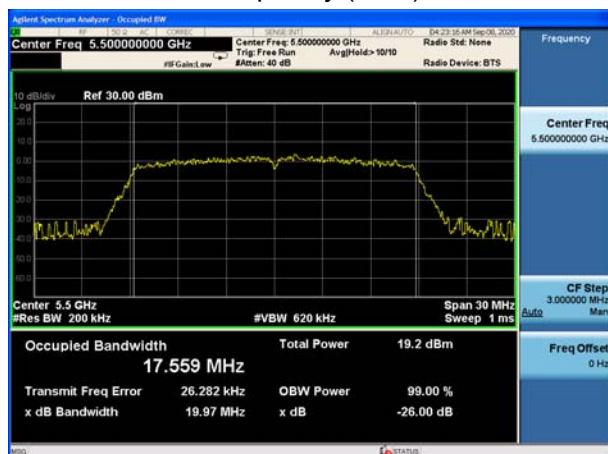




U-NII-2C, 802.11a
Carrier frequency (MHz): 5500



U-NII-2C, 802.11n HT20
Carrier frequency (MHz): 5500



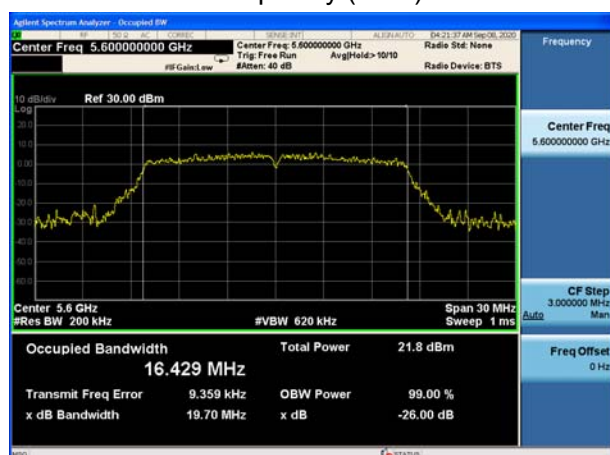
U-NII-2C, 802.11a
Carrier frequency (MHz): 5520



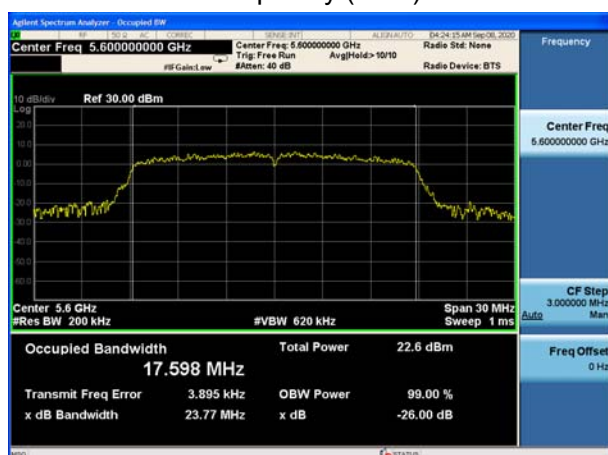
U-NII-2C, 802.11n HT20
Carrier frequency (MHz): 5520



U-NII-2C, 802.11a
Carrier frequency (MHz): 5600

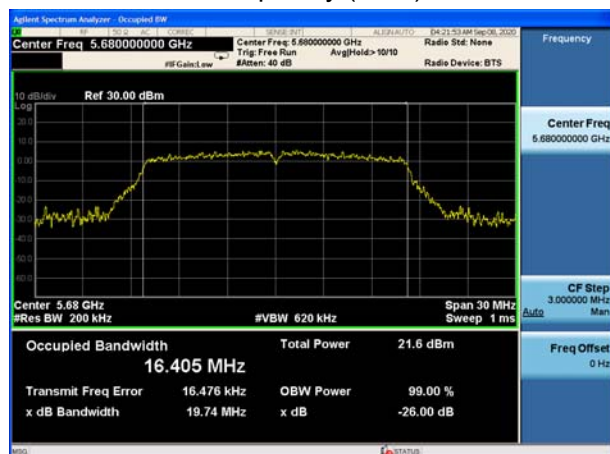


U-NII-2C, 802.11n HT20
Carrier frequency (MHz): 5600





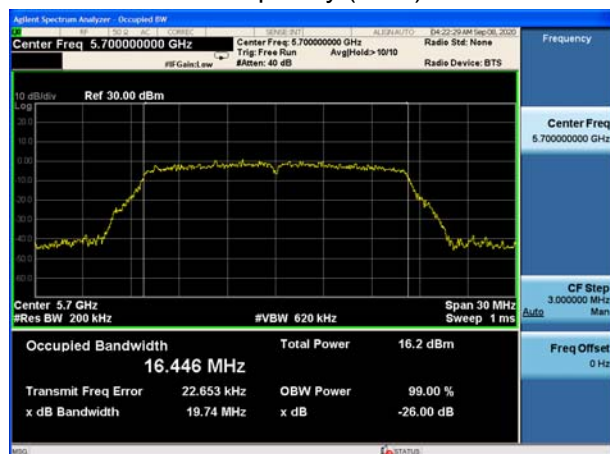
U-NII-2C, 802.11a
Carrier frequency (MHz): 5680



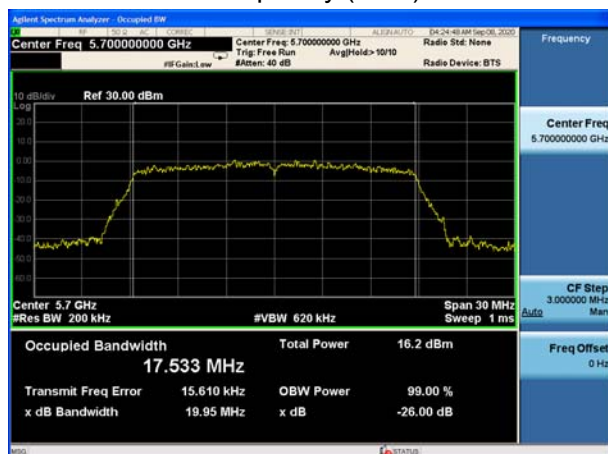
U-NII-2C, 802.11n HT20
Carrier frequency (MHz): 5680



U-NII-2C, 802.11a
Carrier frequency (MHz): 5700

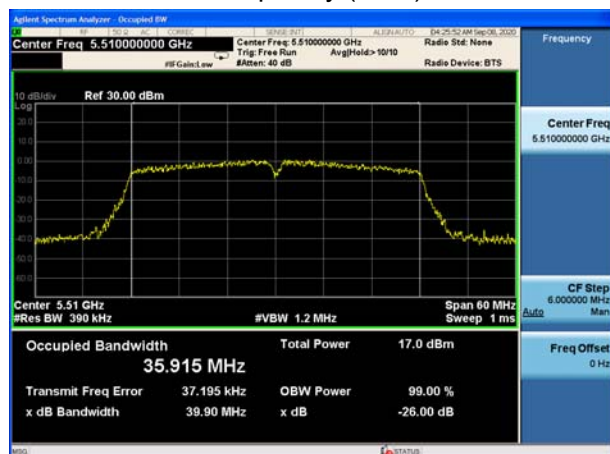


U-NII-2C, 802.11n HT20
Carrier frequency (MHz): 5700





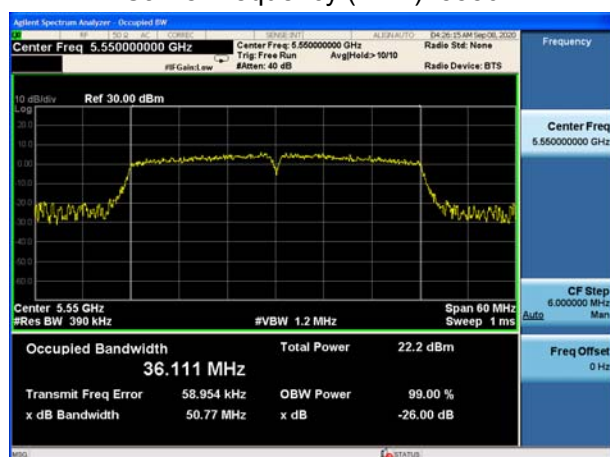
U-NII-2C, 802.11n HT40
Carrier frequency (MHz): 5510



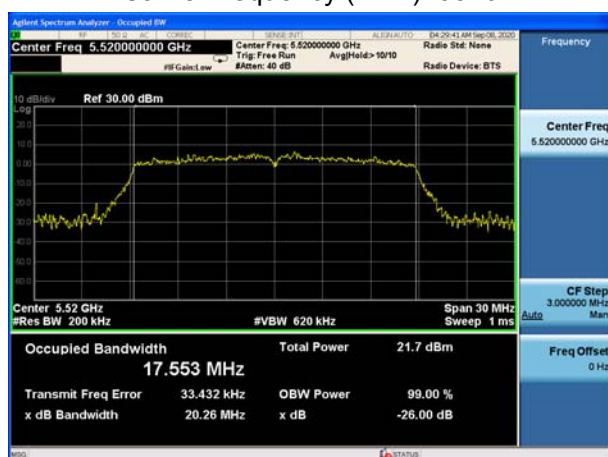
U-NII-2C, 802.11ac VHT20
Carrier frequency (MHz): 5500



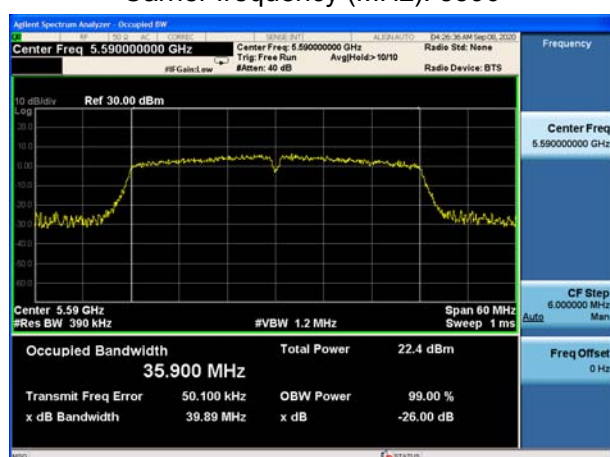
U-NII-2C, 802.11n HT40
Carrier frequency (MHz): 5550



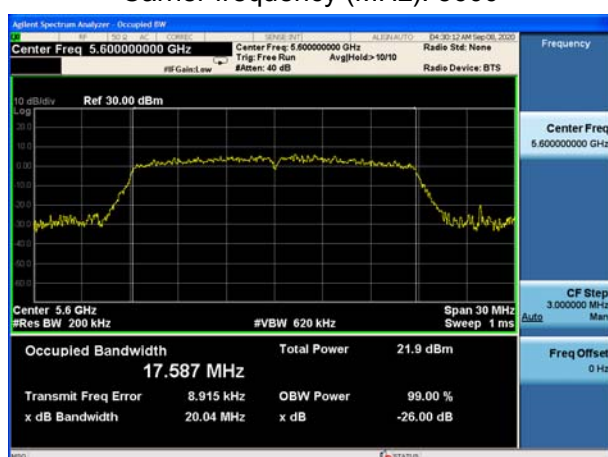
U-NII-2C, 802.11ac VHT20
Carrier frequency (MHz): 5520



U-NII-2C, 802.11n HT40
Carrier frequency (MHz): 5590

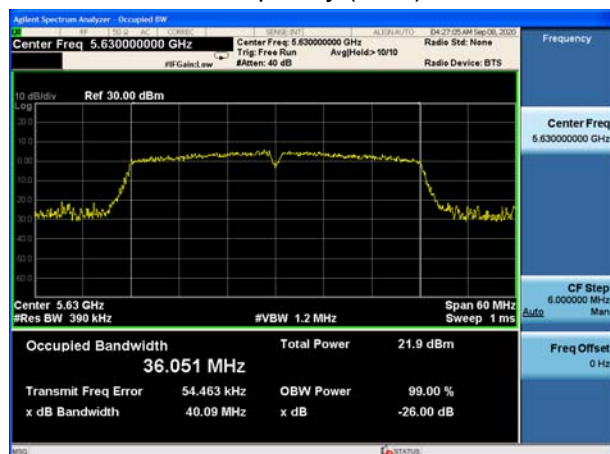


U-NII-2C, 802.11ac VHT20
Carrier frequency (MHz): 5600

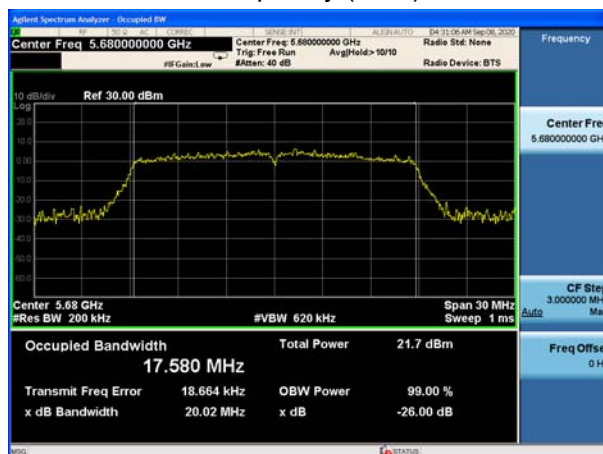




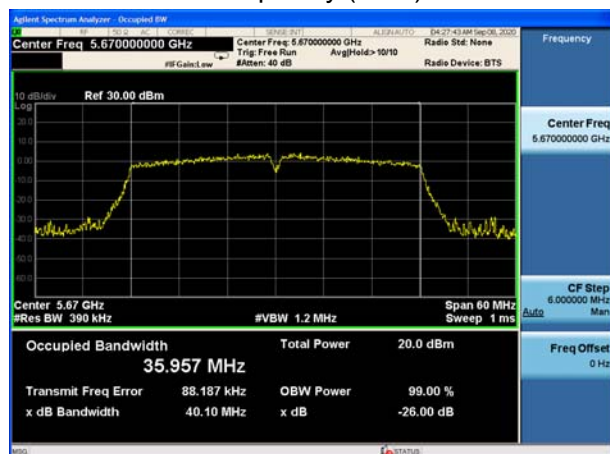
U-NII-2C, 802.11n HT40
Carrier frequency (MHz): 5630



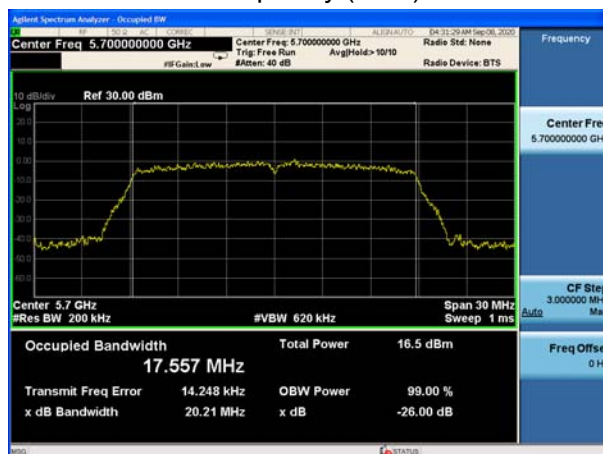
U-NII-2C, 802.11ac VHT20
Carrier frequency (MHz): 5680



U-NII-2C, 802.11n HT40
Carrier frequency (MHz): 5670

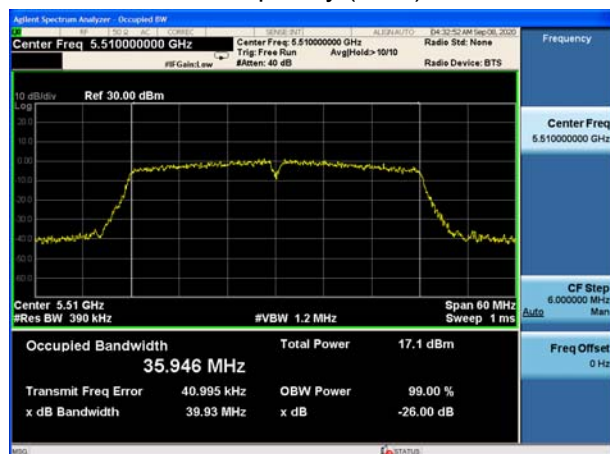


U-NII-2C, 802.11ac VHT20
Carrier frequency (MHz): 5700

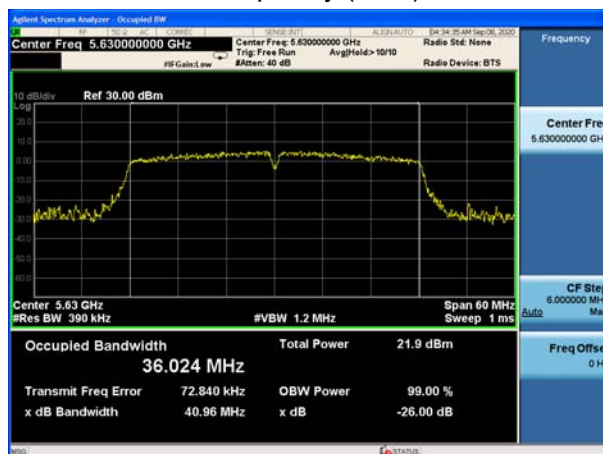




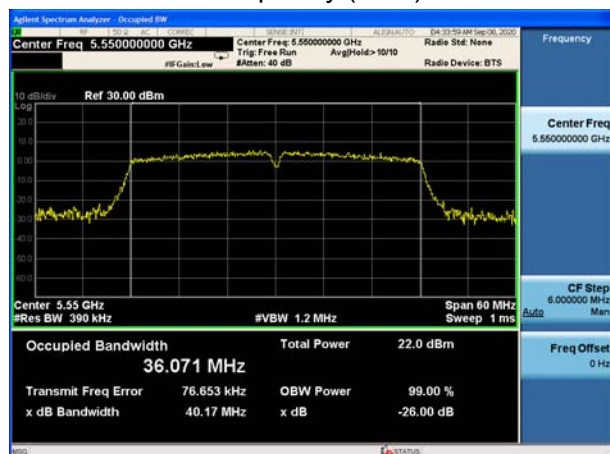
U-NII-2C, 802.11ac VHT40
Carrier frequency (MHz): 5510



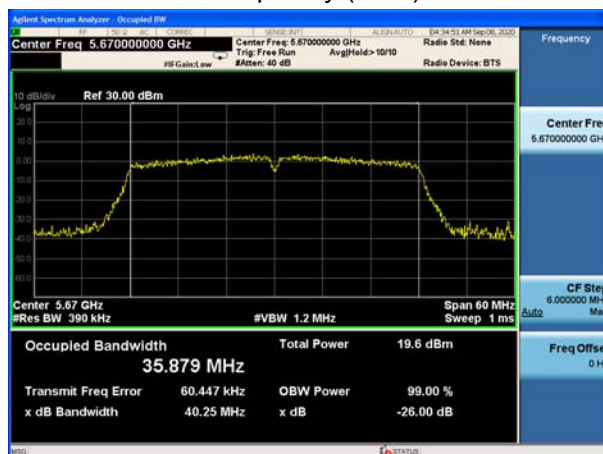
U-NII-2C, 802.11ac VHT40
Carrier frequency (MHz): 5630



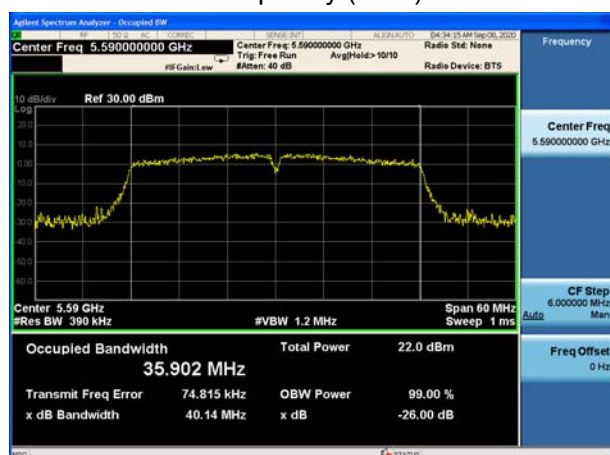
U-NII-2C, 802.11ac VHT40
Carrier frequency (MHz): 5550



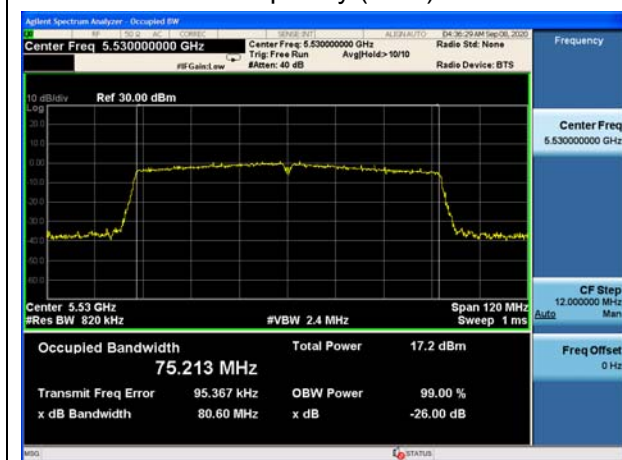
U-NII-2C, 802.11ac VHT40
Carrier frequency (MHz): 5670



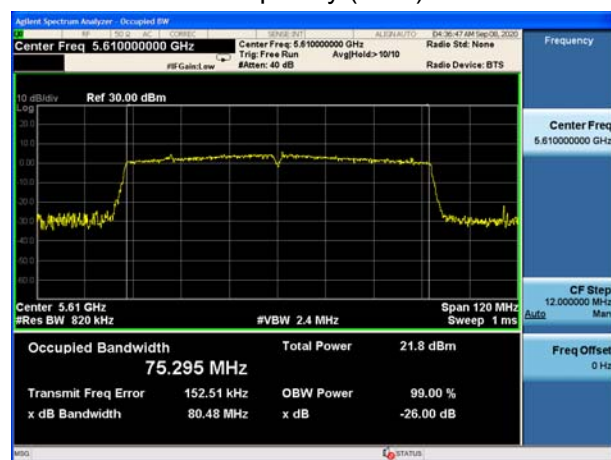
U-NII-2C, 802.11ac VHT40
Carrier frequency (MHz): 5590



U-NII-2C, 802.11ac VHT80
Carrier frequency (MHz): 5530



U-NII-2C, 802.11ac VHT80
Carrier frequency (MHz): 5610





99% bandwidth

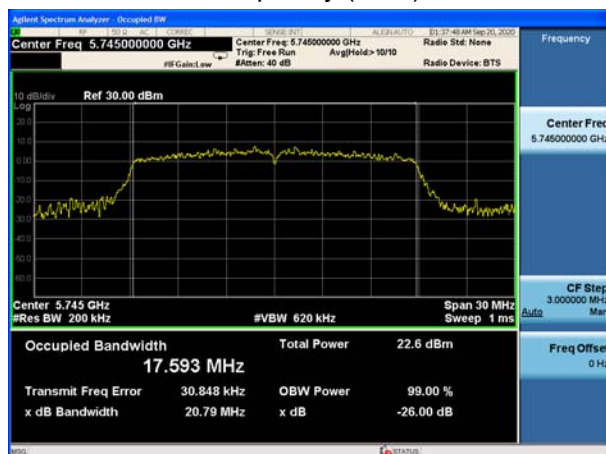
U-NII-3, 802.11a

Carrier frequency (MHz): 5745



U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5745



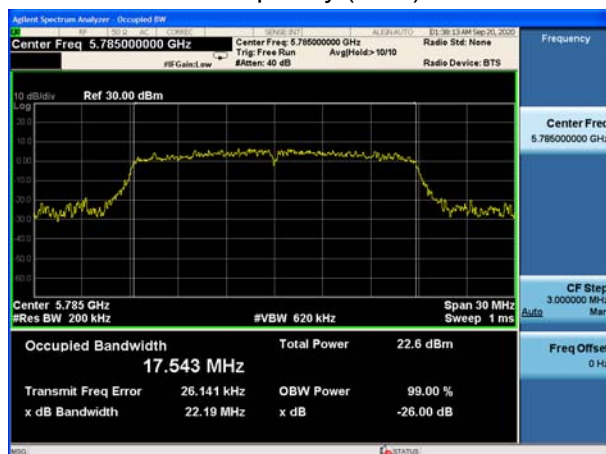
U-NII-3, 802.11a

Carrier frequency (MHz): 5785



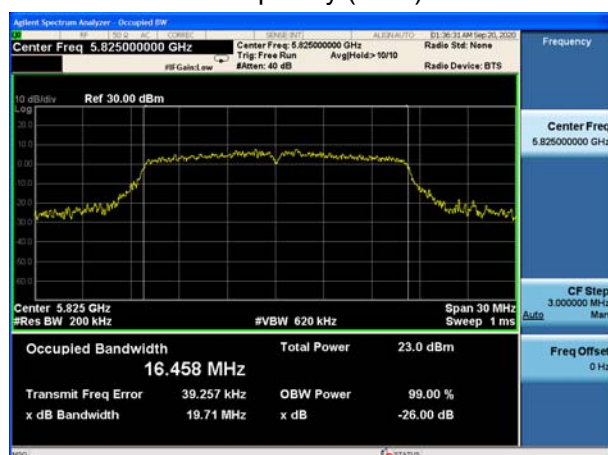
U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5785



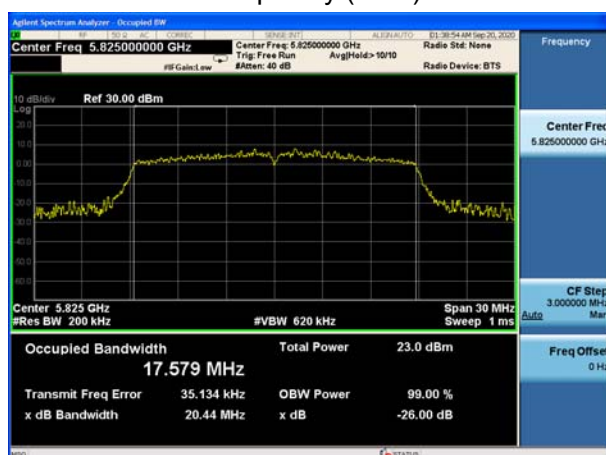
U-NII-3, 802.11a

Carrier frequency (MHz): 5825



U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5825





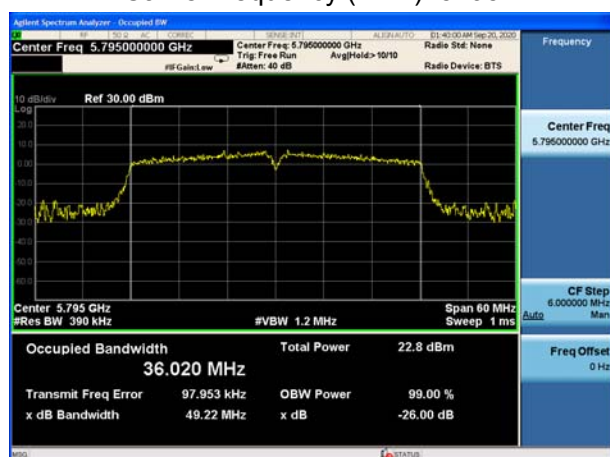
U-NII-3, 802.11n HT40
Carrier frequency (MHz): 5755



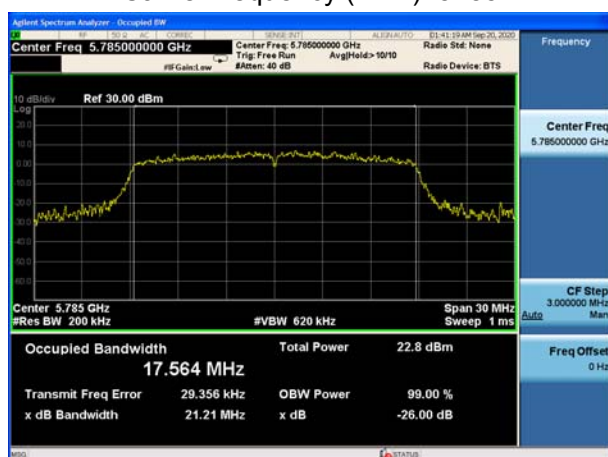
U-NII-3, 802.11ac VHT20
Carrier frequency (MHz): 5745



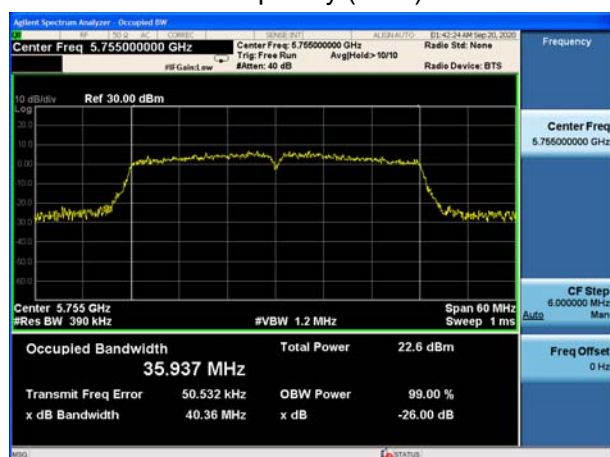
U-NII-3, 802.11n HT40
Carrier frequency (MHz): 5795



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



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

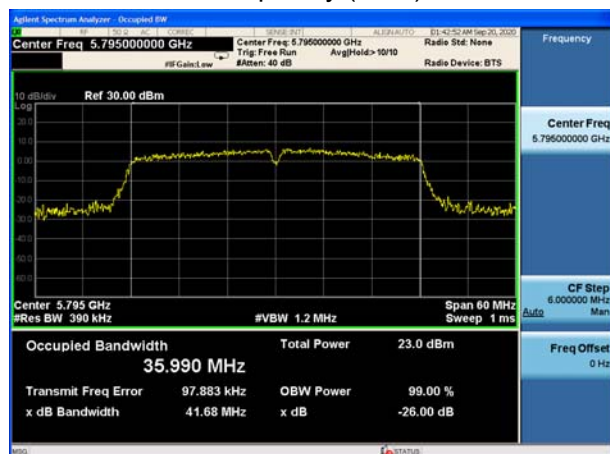


U-NII-3, 802.11ac VHT20
Carrier frequency (MHz): 5825

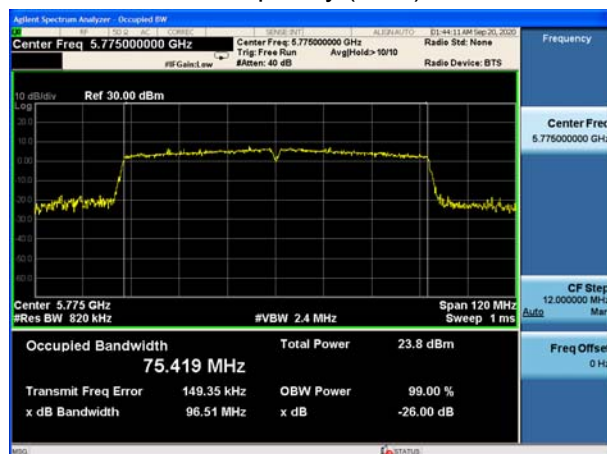




U-NII-3, 802.11ac VHT40
Carrier frequency (MHz): 5795



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

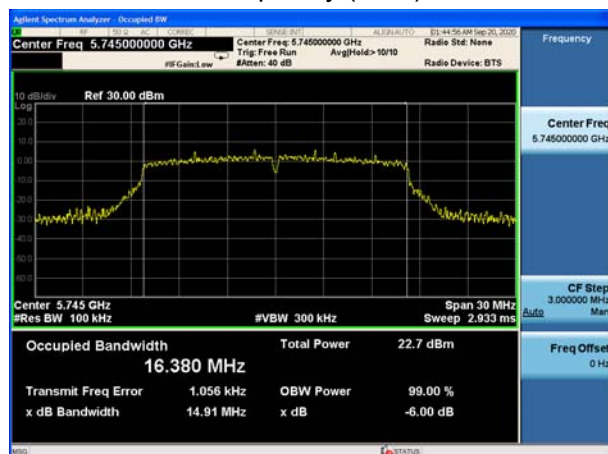




Minimum 6 dB bandwidth

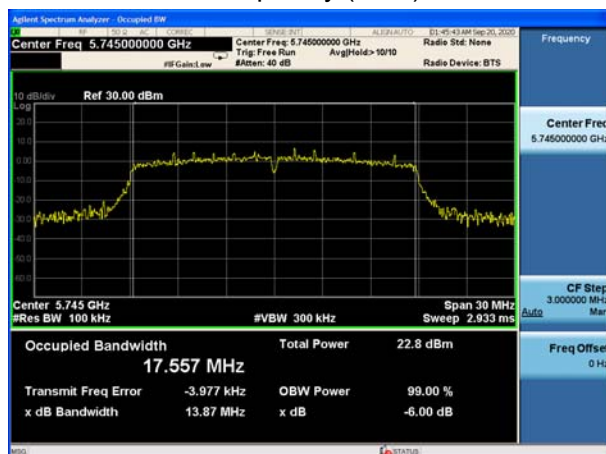
U-NII-3, 802.11a

Carrier frequency (MHz): 5745



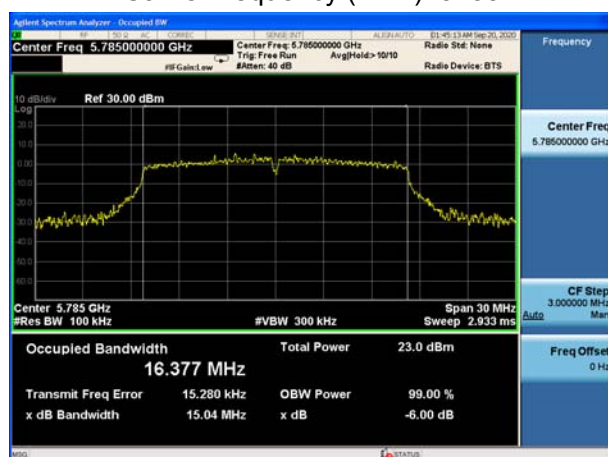
U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5745



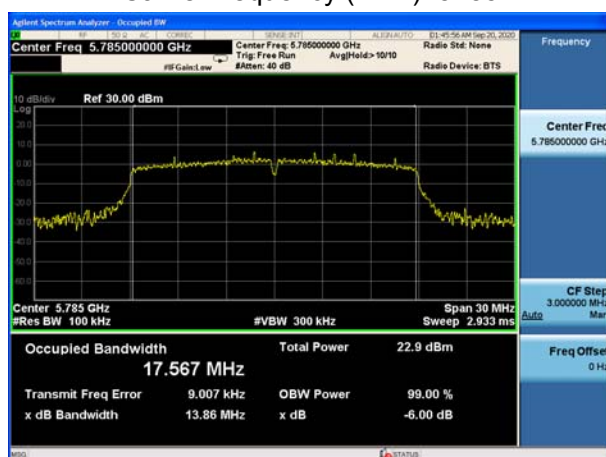
U-NII-3, 802.11a

Carrier frequency (MHz): 5785



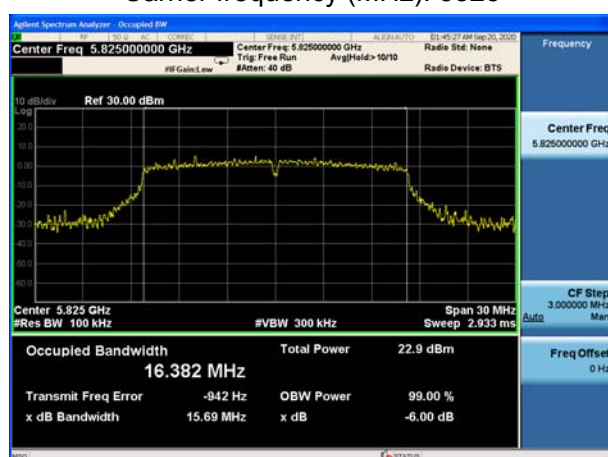
U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5785



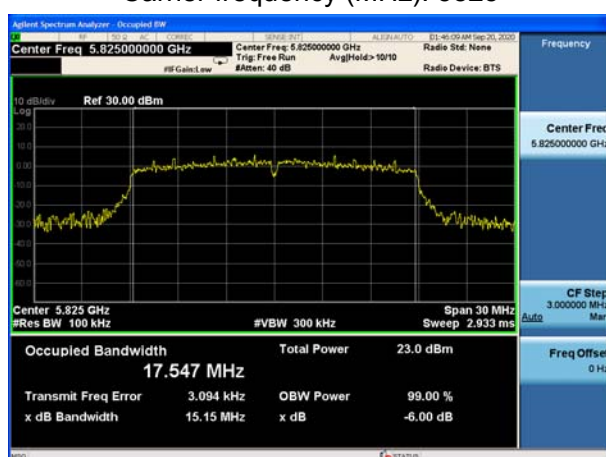
U-NII-3, 802.11a

Carrier frequency (MHz): 5825



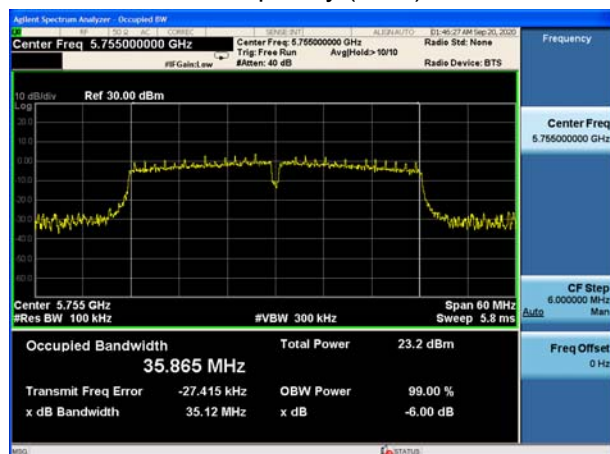
U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5825

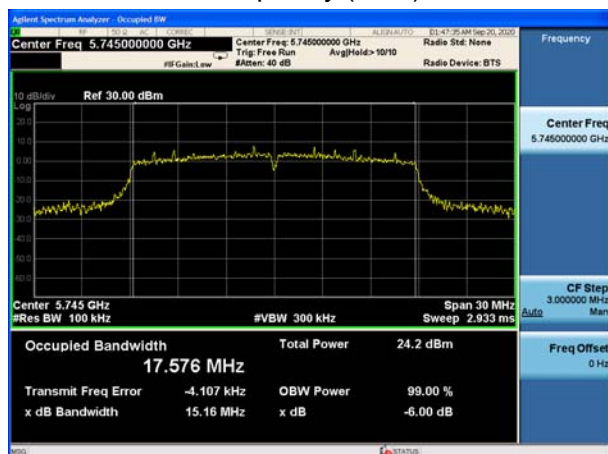




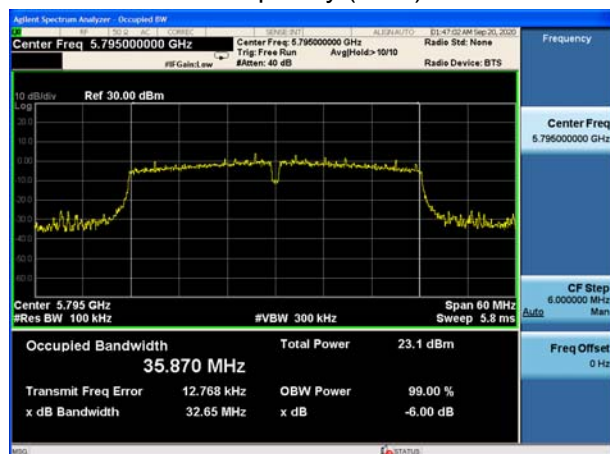
U-NII-3, 802.11n HT40
Carrier frequency (MHz): 5755



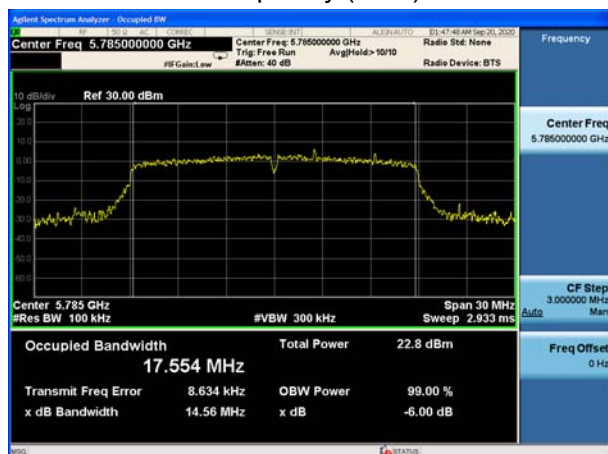
U-NII-3, 802.11ac VHT20
Carrier frequency (MHz): 5745



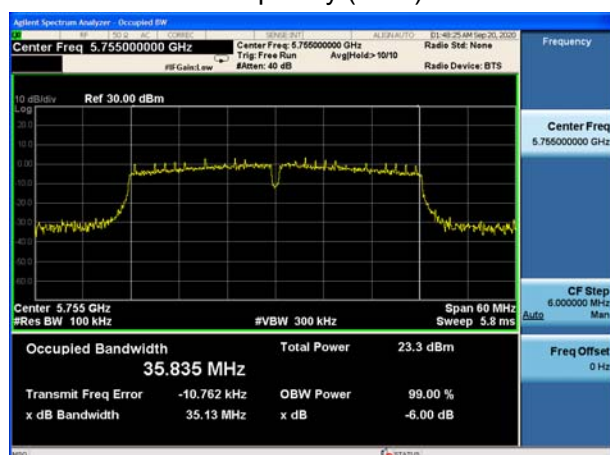
U-NII-3, 802.11n HT40
Carrier frequency (MHz): 5795



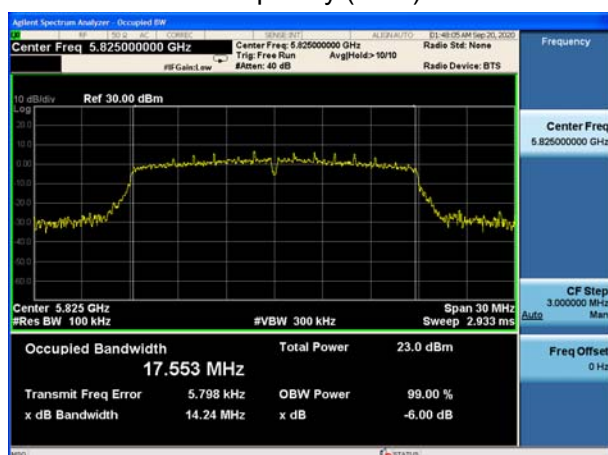
U-NII-3, 802.11ac VHT20
Carrier frequency (MHz): 5785



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

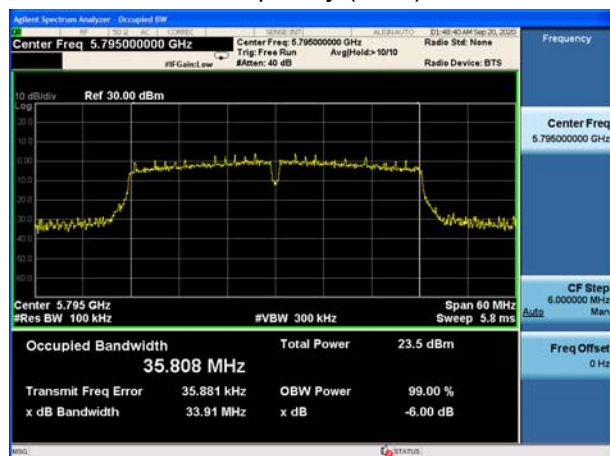


U-NII-3, 802.11ac VHT20
Carrier frequency (MHz): 5825

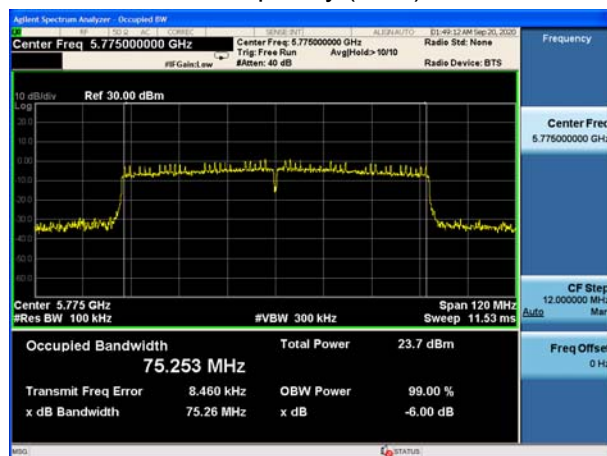




U-NII-3, 802.11ac VHT40
Carrier frequency (MHz): 5795



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



5.2. Average Power Output

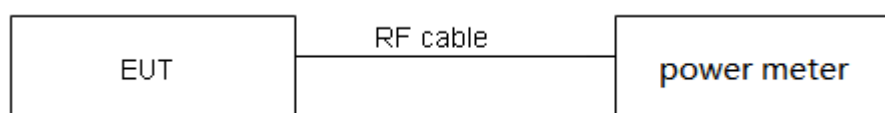
Ambient condition

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

Methods of Measurement

During the process of the testing, The EUT was connected to the average power meter through an external attenuator and a known loss cable. The EUT is max power transmission with proper modulation. We use Maximum average 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 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 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 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 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 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 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 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 colocated 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 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 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 output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum 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 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 output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Measurement Uncertainty

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

Test Results

Mode	T _{on} (ms)	T _(on+off) (ms)	Duty cycle	Duty cycle correction Factor(dB)
802.11a	1.39	1.43	0.97	0.13
802.11n HT20	1.30	1.34	0.96	0.16
802.11n HT40	1.25	1.30	0.97	0.14
802.11ac VHT20	1.31	1.36	0.97	0.14
802.11ac VHT40	1.26	1.31	0.96	0.16
802.11ac VHT80	0.60	0.65	0.93	0.31
Note: when Duty cycle ≥ 0.98 , Duty cycle correction Factor not required.				

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	19.79	23.96<24	23.96
		60/5300	19.87	23.98<24	23.98
		64/5320	19.67	23.94<24	23.94
	802.11n HT20	52/5260	19.88	23.98<24	23.98
		60/5300	20.21	24.06>24	24.00
		64/5320	20.24	24.06>24	24.00
	802.11n HT40	54/5270	40.20	27.04>24	24.00
		62/5310	40.29	27.05>24	24.00
	802.11ac VHT20	52/5260	20.06	24.02>24	24.00
		60/5300	20.17	24.05>24	24.00
		64/5320	20.29	24.07>24	24.00
	802.11ac VHT40	54/5270	40.02	27.02>24	24.00
		62/5310	40.42	27.07>24	24.00
802.11ac VHT80	58/5290	80.88	30.08>24	24.00	
U-NII-2C	802.11a	100/5500	19.94	24.00	24.00
		104/5520	20.40	24.10>24	24.00
		120/5600	19.70	23.94<24	23.94
		136/5680	19.74	23.95<24	23.95
		140/5700	19.74	23.95<24	23.95
	802.11n HT20	100/5500	19.97	24.00	24.00
		104/5520	20.64	24.15>24	24.00
		120/5600	23.77	24.76>24	24.00
		136/5680	21.57	24.34>24	24.00
		140/5700	19.95	24.00	24.00



	802.11n HT40	102/5510	39.90	27.01>24	24.00
		110/5550	50.77	28.06>24	24.00
		118/5590	39.99	27.02>24	24.00
		126/5630	40.09	27.03>24	24.00
		134/5670	40.10	27.03>24	24.00
	802.11ac VHT20	100/5500	20.27	24.07>24	24.00
		104/5520	20.26	24.07>24	24.00
		120/5600	20.04	24.02>24	24.00
		136/5680	20.02	24.01>24	24.00
		140/5700	20.21	24.06>24	24.00
	802.11ac VHT40	102/5510	39.93	27.01>24	24.00
		110/5550	40.17	27.04>24	24.00
		118/5590	40.14	27.04>24	24.00
		126/5630	40.96	27.12>24	24.00
		134/5670	40.25	27.05>24	24.00
	802.11ac VHT80	106/5530	80.60	30.06>24	24.00
		122/5610	80.48	30.06>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	13.23	13.36	24.00	PASS
	40/5200	14.91	15.04	24.00	PASS
	48/5240	14.73	14.86	24.00	PASS
802.11n HT20	36/5180	13.32	13.48	24.00	PASS
	40/5200	15.08	15.24	24.00	PASS
	48/5240	15.02	15.18	24.00	PASS
802.11n HT40	38/5190	10.44	10.58	24.00	PASS
	46/5230	16.09	16.23	24.00	PASS
802.11ac VHT20	36/5180	13.75	13.89	24.00	PASS
	40/5200	15.42	15.56	24.00	PASS
	48/5240	15.60	15.74	24.00	PASS
802.11ac VHT40	38/5190	10.30	10.46	24.00	PASS
	46/5230	16.06	16.22	24.00	PASS
802.11ac VHT80	42/5210	10.18	10.49	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	14.49	14.62	23.96	PASS
	60/5300	14.24	14.37	23.98	PASS
	64/5320	13.28	13.41	23.94	PASS
802.11n HT20	52/5260	14.72	14.88	23.98	PASS
	60/5300	14.48	14.64	24.00	PASS
	64/5320	13.46	13.62	24.00	PASS
802.11n HT40	54/5270	15.92	16.06	24.00	PASS
	62/5310	10.63	10.77	24.00	PASS
802.11ac VHT20	52/5260	15.17	15.31	24.00	PASS
	60/5300	14.98	15.12	24.00	PASS
	64/5320	14.04	14.18	24.00	PASS
802.11ac VHT40	54/5270	15.76	15.92	24.00	PASS
	62/5310	10.52	10.68	24.00	PASS
802.11ac VHT80	58/5290	10.72	11.03	24.00	PASS

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



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	13.27	13.40	24.00	PASS
	104/5520	16.35	16.48	24.00	PASS
	120/5600	18.84	18.97	23.94	PASS
	136/5680	15.46	15.59	23.95	PASS
	140/5700	10.34	10.47	23.95	PASS
802.11n HT20	100/5500	12.53	12.69	24.00	PASS
	104/5520	15.56	15.69	24.00	PASS
	120/5600	15.57	15.73	24.00	PASS
	136/5680	15.59	15.72	24.00	PASS
	140/5700	10.26	10.42	24.00	PASS
802.11n HT40	102/5510	11.24	11.38	24.00	PASS
	110/5550	16.04	16.17	24.00	PASS
	118/5590	16.13	16.27	24.00	PASS
	126/5630	16.01	16.14	24.00	PASS
	134/5670	13.94	14.08	24.00	PASS
802.11ac VHT20	100/5500	13.11	13.25	24.00	PASS
	104/5520	16.19	16.32	24.00	PASS
	120/5600	15.63	15.77	24.00	PASS
	136/5680	15.26	15.39	24.00	PASS
	140/5700	10.15	10.29	24.00	PASS
802.11ac VHT40	102/5510	10.63	10.79	24.00	PASS
	110/5550	15.53	15.66	24.00	PASS
	118/5590	15.71	15.87	24.00	PASS
	126/5630	15.42	15.55	24.00	PASS
	134/5670	13.39	13.55	24.00	PASS
802.11ac VHT80	106/5530	9.86	10.17	24.00	PASS
	122/5610	14.66	14.97	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	16.09	16.22	30.00	PASS
	157/5785	16.26	16.39	30.00	PASS
	165/5825	16.35	16.48	30.00	PASS
802.11n HT20	149/5745	15.94	16.10	30.00	PASS
	157/5785	16.12	16.28	30.00	PASS
	165/5825	16.32	16.48	30.00	PASS
802.11n HT40	151/5755	16.64	16.78	30.00	PASS
	159/5795	16.67	16.81	30.00	PASS
802.11ac VHT20	149/5745	16.16	16.30	30.00	PASS
	157/5785	16.14	16.28	30.00	PASS
	165/5825	16.29	16.43	30.00	PASS
802.11ac VHT40	151/5755	16.17	16.33	30.00	PASS
	159/5795	16.23	16.39	30.00	PASS
802.11ac VHT80	155/5775	16.12	16.43	30.00	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

- 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.
- 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.
- 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).
- Turn the EUT OFF and place it inside the environmental temperature chamber. For devices that have oscillator heaters, energize only the heater circuit.
- 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.
- 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.
- Measure the frequency at each of frequencies specified in 5.6.
- Switch OFF the EUT but do not switch OFF the oscillator heater.
- Lower the chamber temperature by not more than 10°C, and allow the temperature inside the chamber to stabilize.
- 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.

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



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

Limit

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

Measurement Uncertainty

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

**Test Results**

Voltage (V)	Temperature (°C)	U-NII-1 Test Results			
		5200MHz			
		1min	2min	5min	10min
3.8	-20	5199.997075	5199.988566	5199.983760	5199.975322
3.8	-10	5199.989323	5199.983126	5199.981816	5199.974303
3.8	0	5199.982920	5199.982410	5199.974531	5199.969951
3.8	10	5199.973393	5199.976198	5199.967003	5199.969139
3.8	20	5199.967578	5199.967872	5199.964616	5199.959823
3.8	30	5199.961365	5199.962956	5199.958186	5199.953251
3.8	40	5199.952080	5199.959116	5199.956669	5199.947604
3.8	50	5199.942650	5199.956493	5199.952727	5199.939778
3.6	20	5199.938993	5199.955003	5199.947966	5199.931254
4.4	20	5199.930631	5199.949465	5199.947639	5199.928255
MHz		-0.069369	-0.050535	-0.052361	-0.071745
PPM		-13.340113	-9.718339	-10.069368	-13.797126

Voltage (V)	Temperature (°C)	U-NII-2A Test Results			
		5300MHz			
		1min	2min	5min	10min
3.8	-20	5300.002125	5299.996581	5299.992826	5299.985732
3.8	-10	5300.001295	5299.987063	5299.988800	5299.976820
3.8	0	5300.000117	5299.986966	5299.984858	5299.969249
3.8	10	5299.996445	5299.983713	5299.976811	5299.962898
3.8	20	5299.988768	5299.977799	5299.972557	5299.957786
3.8	30	5299.984757	5299.975069	5299.970121	5299.950909
3.8	40	5299.981392	5299.968779	5299.967333	5299.942635
3.8	50	5299.981350	5299.966691	5299.966474	5299.940437
3.6	20	5299.974087	5299.961397	5299.962792	5299.937514
4.4	20	5299.966690	5299.957524	5299.958341	5299.937348
MHz		-0.033310	-0.042476	-0.041659	-0.062652
PPM		-6.284885	-8.014273	-7.860111	-11.821208



Voltage (V)	Temperature (°C)	U-NII-2C Test Results			
		5580MHz			
		1min	2min	5min	10min
3.8	-20	5580.005322	5579.999201	5579.989607	5579.983138
3.8	-10	5579.998054	5579.991612	5579.985300	5579.976798
3.8	0	5579.994844	5579.988261	5579.984105	5579.973574
3.8	10	5579.987752	5579.987060	5579.976135	5579.972037
3.8	20	5579.977846	5579.978205	5579.967361	5579.965501
3.8	30	5579.972593	5579.968523	5579.965083	5579.961503
3.8	40	5579.970215	5579.966037	5579.964924	5579.958815
3.8	50	5579.961389	5579.959079	5579.964477	5579.956932
3.6	20	5579.953622	5579.955716	5579.961918	5579.953308
4.4	20	5579.943680	5579.950690	5579.954032	5579.950278
MHz		-0.056320	-0.049310	-0.045968	-0.049722
PPM		-10.093267	-8.836935	-8.237947	-8.910707

Voltage (V)	Temperature (°C)	U-NII-3 Test Results			
		5785MHz			
		1min	2min	5min	10min
3.8	-20	5784.991976	5784.989342	5784.980765	5784.973052
3.8	-10	5784.988189	5784.985841	5784.974493	5784.965414
3.8	0	5784.985548	5784.980240	5784.965154	5784.962055
3.8	10	5784.982128	5784.978370	5784.965016	5784.958045
3.8	20	5784.974809	5784.972889	5784.956484	5784.950119
3.8	30	5784.968749	5784.965246	5784.950235	5784.947168
3.8	40	5784.961191	5784.955974	5784.941453	5784.938115
3.8	50	5784.951239	5784.950918	5784.937617	5784.933785
3.6	20	5784.946283	5784.942972	5784.935886	5784.932368
4.4	20	5784.944107	5784.938860	5784.930308	5784.924910
MHz		-0.055893	-0.061140	-0.069692	-0.075090
PPM		-9.661779	-10.568699	-12.047020	-12.980145

5.4. Power Spectral Density

Ambient condition

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

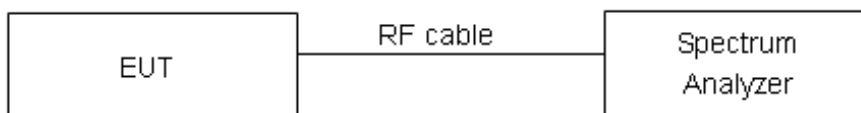
Method of Measurement

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 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 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 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 output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum 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	11dBm/MHz
5.25-5.35 GHz and 5.47-5.725 GHz	11dBm/MHz
5725-5850	30dBm/500kHz

Measurement Uncertainty

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

**Test Results:**

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

U-NII-1

Mode	Channel/ Frequency (MHz)	Read Value (dBm /MHz)	Power Spectral Density (dBm /MHz)	Limit (dBm /MHz)	Conclusion
802.11a	36/5180	3.05	3.18	11.00	PASS
	40/5200	5.52	5.65	11.00	PASS
	48/5240	5.78	5.91	11.00	PASS
802.11n HT20	36/5180	3.49	3.65	11.00	PASS
	40/5200	5.27	5.43	11.00	PASS
	48/5240	4.72	4.88	11.00	PASS
802.11n HT40	38/5190	-3.27	-3.13	11.00	PASS
	46/5230	2.90	3.04	11.00	PASS
802.11ac VHT20	36/5180	2.82	2.96	11.00	PASS
	40/5200	4.80	4.93	11.00	PASS
	48/5240	4.86	5.00	11.00	PASS
802.11ac VHT40	38/5190	-3.27	-3.11	11.00	PASS
	46/5230	2.84	3.00	11.00	PASS
802.11ac VHT80	42/5210	-5.95	-5.64	11.00	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	5.21	5.34	11.00	PASS
	60/5300	5.39	5.52	11.00	PASS
	64/5320	4.71	4.84	11.00	PASS
802.11n HT20	52/5260	5.53	5.68	11.00	PASS
	60/5300	5.20	5.36	11.00	PASS
	64/5320	4.37	4.53	11.00	PASS
802.11n HT40	54/5270	3.34	3.49	11.00	PASS
	62/5310	-1.81	-1.67	11.00	PASS
802.11ac VHT20	52/5260	5.09	5.23	11.00	PASS
	60/5300	4.53	4.67	11.00	PASS
	64/5320	3.73	3.87	11.00	PASS
802.11ac VHT40	54/5270	2.78	2.94	11.00	PASS
	62/5310	-2.21	-2.04	11.00	PASS
802.11ac VHT80	58/5290	-3.65	-3.34	11.00	PASS



U-NII-2C

Mode	Channel/ Frequency (MHz)	Read Value (dBm /MHz)	Power Spectral Density (dBm /MHz)	Limit (dBm /MHz)	Conclusion
802.11a	100/5500	3.18	3.31	11.00	PASS
	104/5520	6.48	6.60	11.00	PASS
	120/5600	6.00	6.13	11.00	PASS
	136/5680	5.75	5.88	11.00	PASS
	140/5700	0.38	0.51	11.00	PASS
802.11n HT20	100/5500	6.09	6.24	11.00	PASS
	104/5520	2.70	2.86	11.00	PASS
	120/5600	5.52	5.68	11.00	PASS
	136/5680	4.88	5.03	11.00	PASS
	140/5700	-0.12	0.04	11.00	PASS
802.11n HT40	102/5510	-1.84	-1.70	11.00	PASS
	110/5550	2.64	2.79	11.00	PASS
	118/5590	2.86	3.00	11.00	PASS
	126/5630	2.03	2.18	11.00	PASS
	134/5670	0.18	0.32	11.00	PASS
802.11ac VHT20	100/5500	2.56	2.70	11.00	PASS
	104/5520	5.85	5.98	11.00	PASS
	120/5600	5.50	5.64	11.00	PASS
	136/5680	5.40	5.53	11.00	PASS
	140/5700	0.07	0.21	11.00	PASS
802.11ac VHT40	102/5510	-1.84	-1.68	11.00	PASS
	110/5550	2.66	2.83	11.00	PASS
	118/5590	3.04	3.20	11.00	PASS
	126/5630	2.03	2.19	11.00	PASS
	134/5670	0.35	0.51	11.00	PASS
802.11ac VHT80	106/5530	-5.89	-5.58	11.00	PASS
	122/5610	-1.66	-1.35	11.00	PASS



U-NII-3

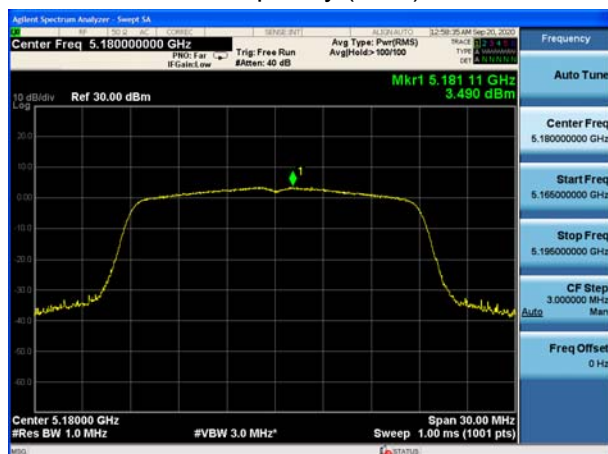
Mode	Channel/ Frequency (MHz)	Read Value (dBm/470kHz)	Power Spectral Density (dBm/500kHz)	Limit (dBm/500kHz)	Conclusion
802.11a	149/5745	3.52	3.92	30.00	PASS
	157/5785	3.61	4.01	30.00	PASS
	165/5825	3.65	4.05	30.00	PASS
802.11n HT20	149/5745	3.08	3.51	30.00	PASS
	157/5785	3.31	3.74	30.00	PASS
	165/5825	3.11	3.54	30.00	PASS
802.11n HT40	151/5755	0.02	0.44	30.00	PASS
	159/5795	0.18	0.60	30.00	PASS
802.11ac VHT20	149/5745	2.89	3.30	30.00	PASS
	157/5785	3.05	3.46	30.00	PASS
	165/5825	3.53	3.94	30.00	PASS
802.11ac VHT40	151/5755	-0.15	0.28	30.00	PASS
	159/5795	-0.06	0.38	30.00	PASS
802.11ac VHT80	155/5775	-3.44	-2.87	30.00	PASS
Note: PSD=Read Value+ Duty cycle+10*LOG(500/470) correction factor					



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



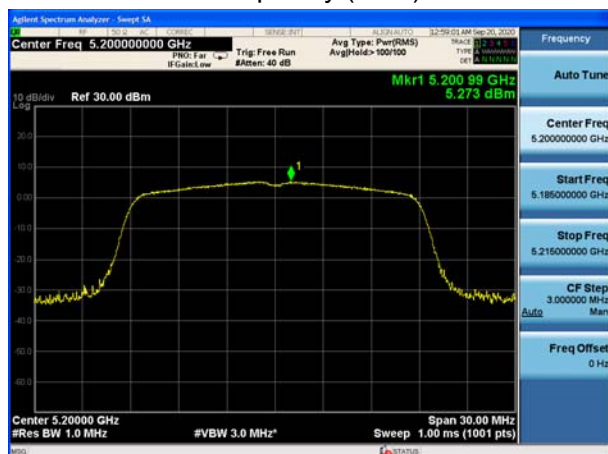
U-NII-1, 802.11n HT20
Carrier frequency (MHz): 5180



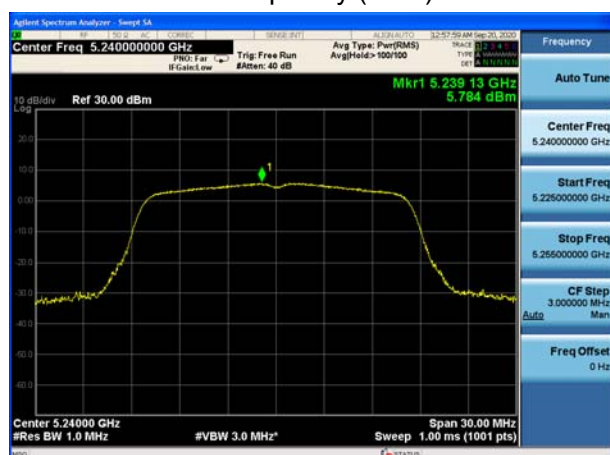
U-NII-1, 802.11a
Carrier frequency (MHz): 5200



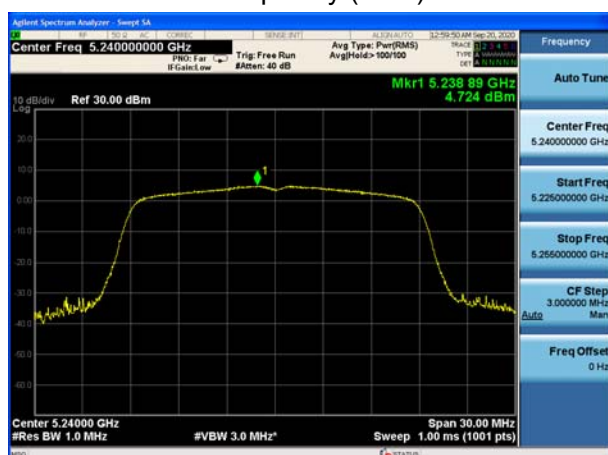
U-NII-1, 802.11n HT20
Carrier frequency (MHz): 5200



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

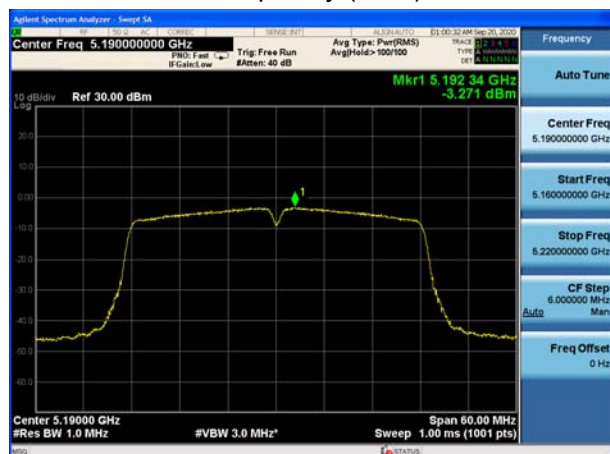


U-NII-1, 802.11n HT20
Carrier frequency (MHz):5240

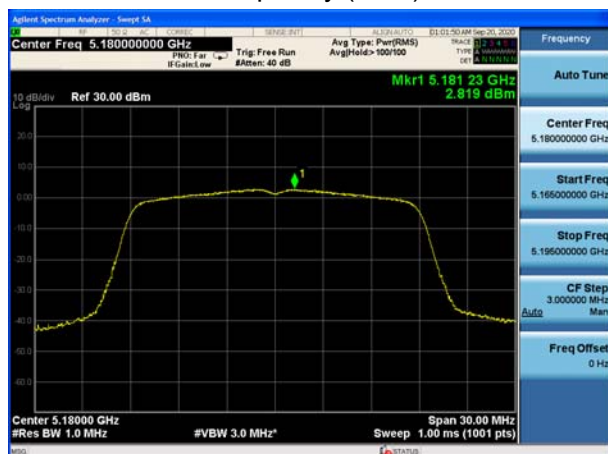




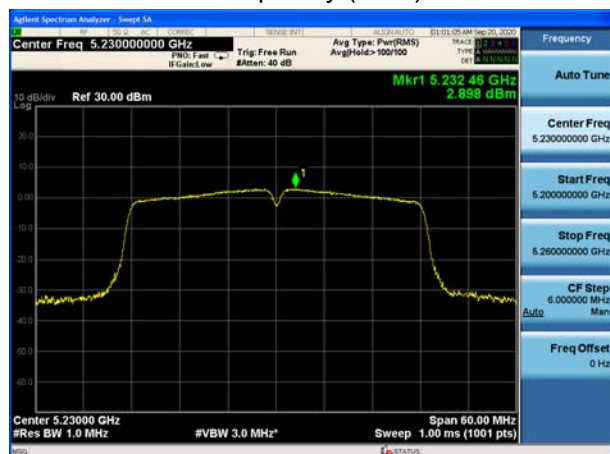
U-NII-1, 802.11n HT40
Carrier frequency (MHz): 5190



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



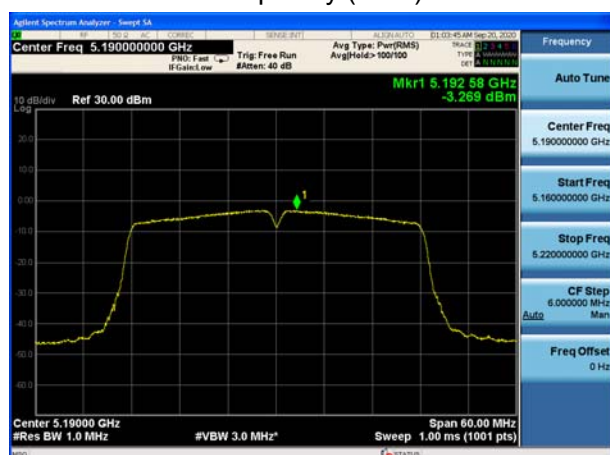
U-NII-1, 802.11n HT40
Carrier frequency (MHz): 5230



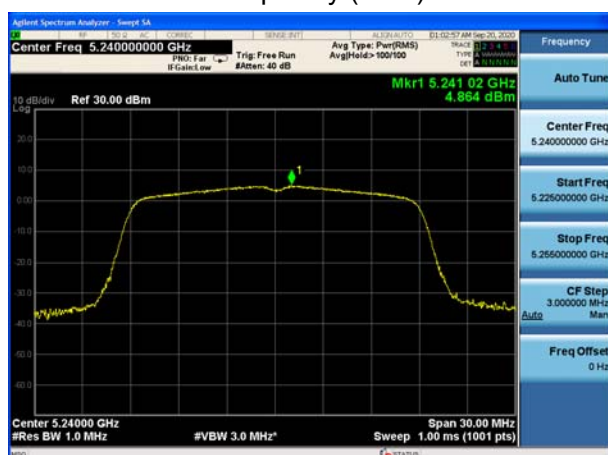
U-NII-1, 802.11ac VHT20
Carrier frequency (MHz): 5200



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

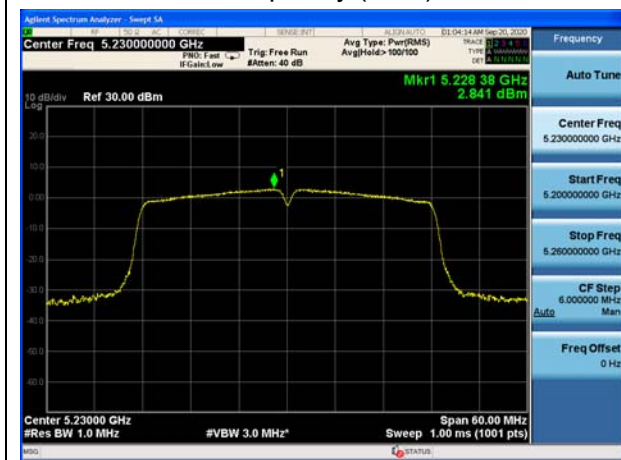


U-NII-1, 802.11ac VHT20
Carrier frequency (MHz): 5240

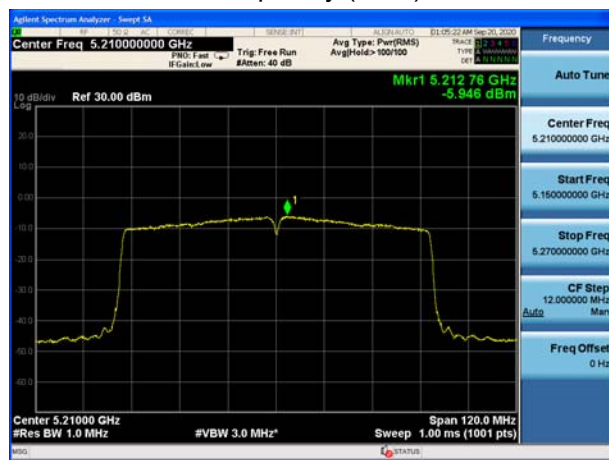




U-NII-1, 802.11ac VHT40
Carrier frequency (MHz): 5230



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

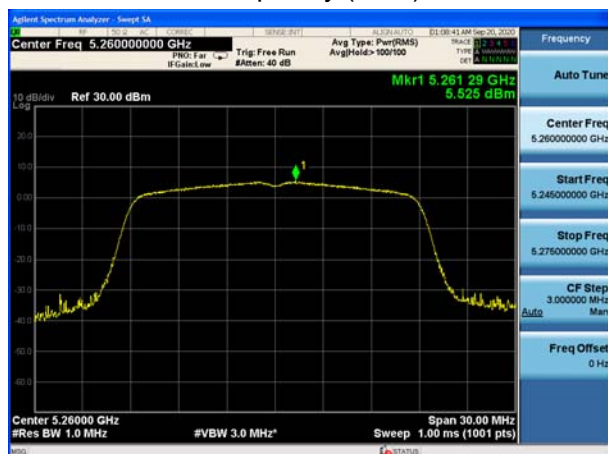




U-NII-2A, 802.11a
Carrier frequency (MHz): 5260



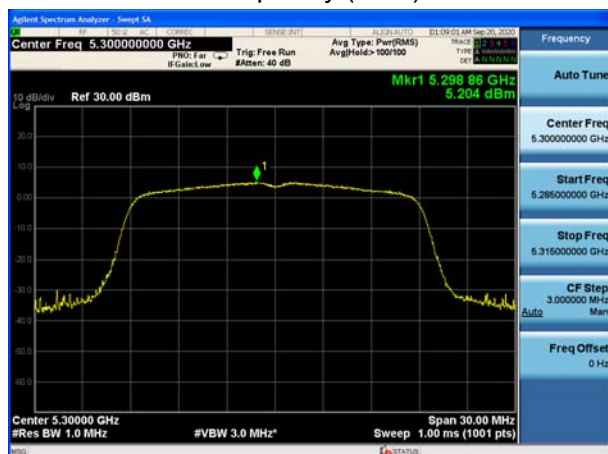
U-NII-2A, 802.11n HT20
Carrier frequency (MHz): 5260



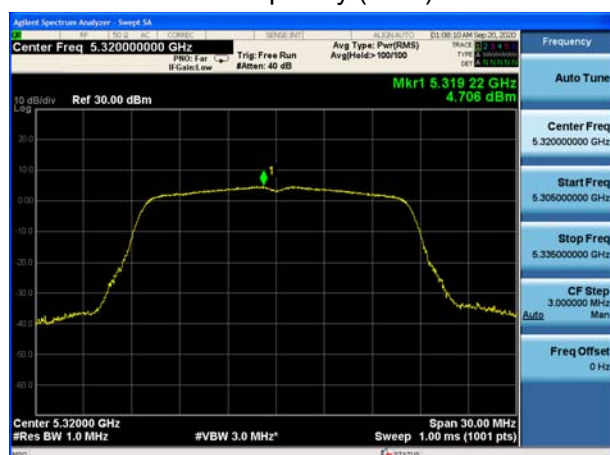
U-NII-2A, 802.11a
Carrier frequency (MHz): 5300



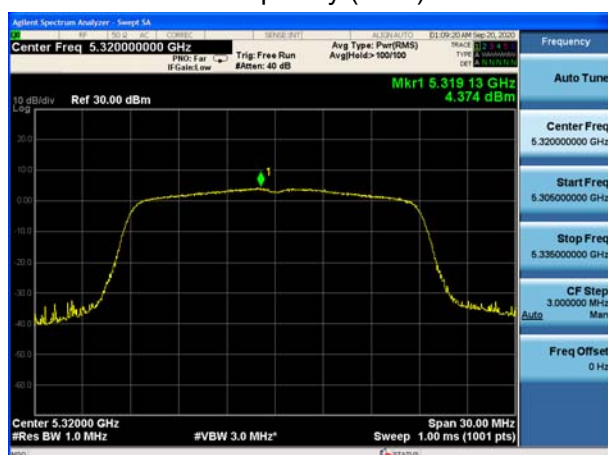
U-NII-2A, 802.11n HT20
Carrier frequency (MHz): 5300



U-NII-2A, 802.11a
Carrier frequency (MHz): 5320

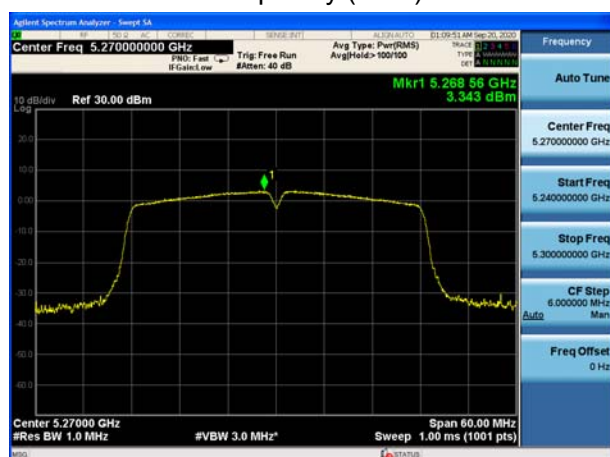


U-NII-2A, 802.11n HT20
Carrier frequency (MHz): 5320

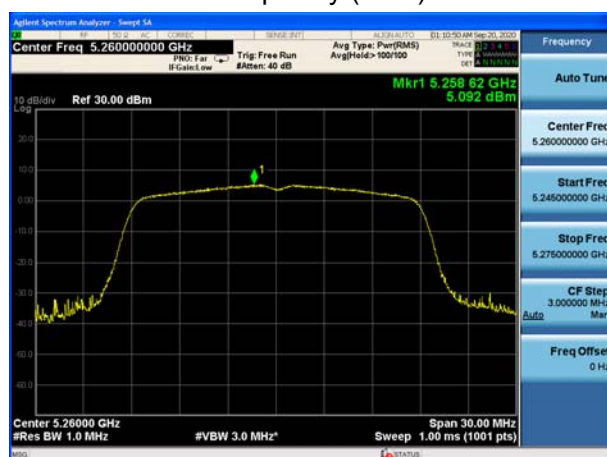




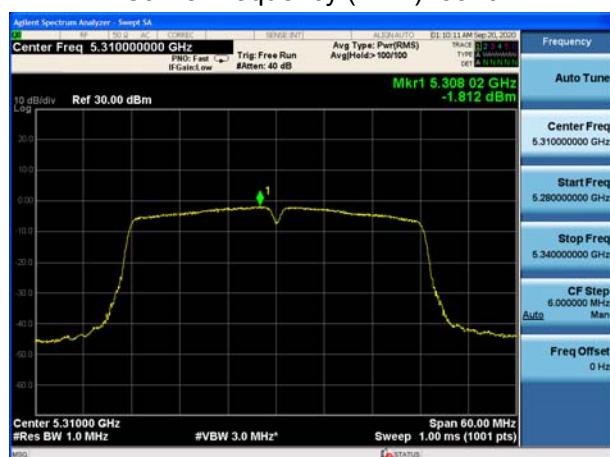
U-NII-2A, 802.11n HT40
Carrier frequency (MHz): 5270



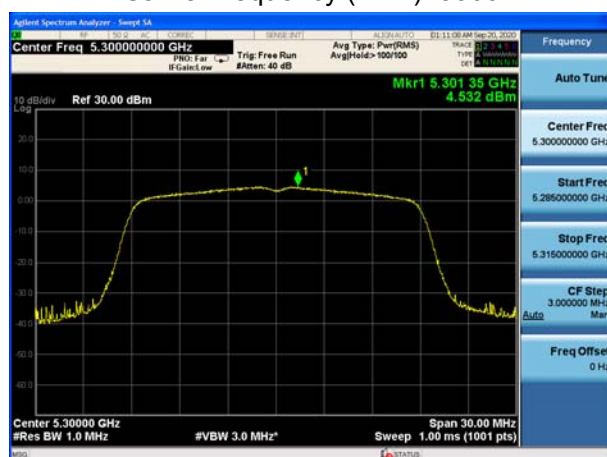
U-NII-2A, 802.11ac VHT20
Carrier frequency (MHz): 5260



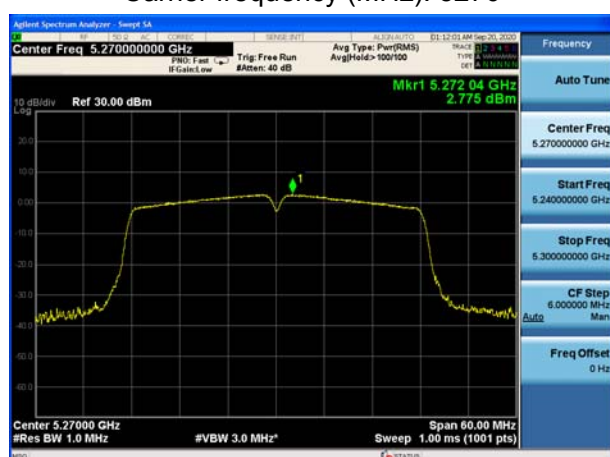
U-NII-2A, 802.11n HT40
Carrier frequency (MHz): 5310



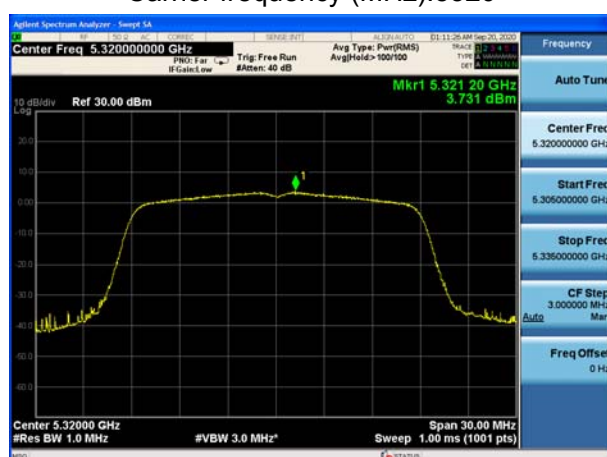
U-NII-2A, 802.11ac VHT20
Carrier frequency (MHz): 5300



U-NII-2A, 802.11ac VHT40
Carrier frequency (MHz): 5270

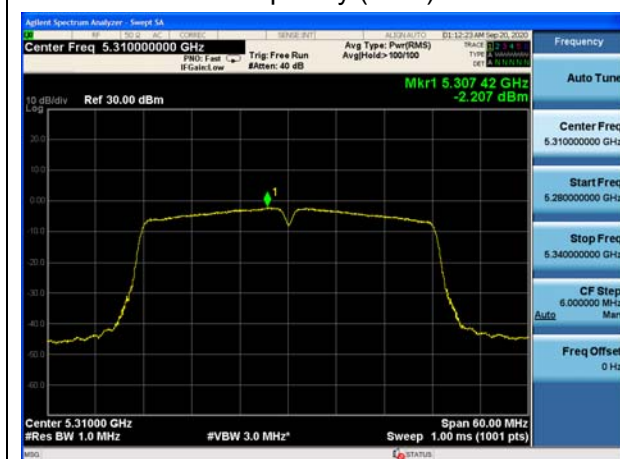


U-NII-2A, 802.11ac VHT20
Carrier frequency (MHz): 5320

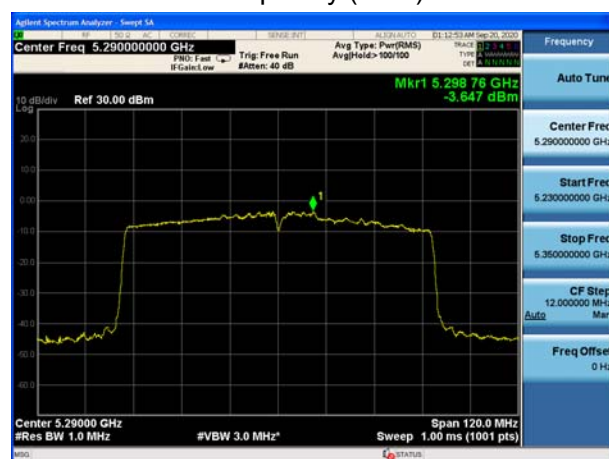




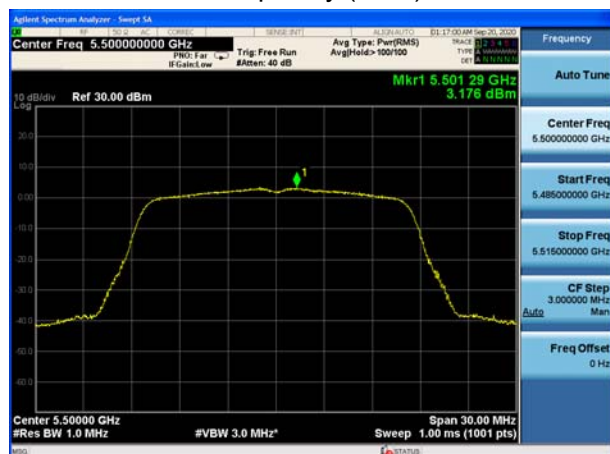
U-NII-2A, 802.11ac VHT40
Carrier frequency (MHz): 5310



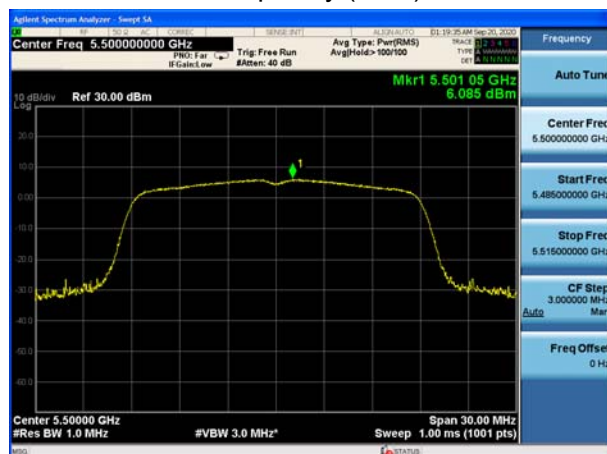
U-NII-2A, 802.11ac VHT80
Carrier frequency (MHz): 5290



U-NII-2C, 802.11a
Carrier frequency (MHz): 5500



U-NII-2C, 802.11n HT20
Carrier frequency (MHz): 5500



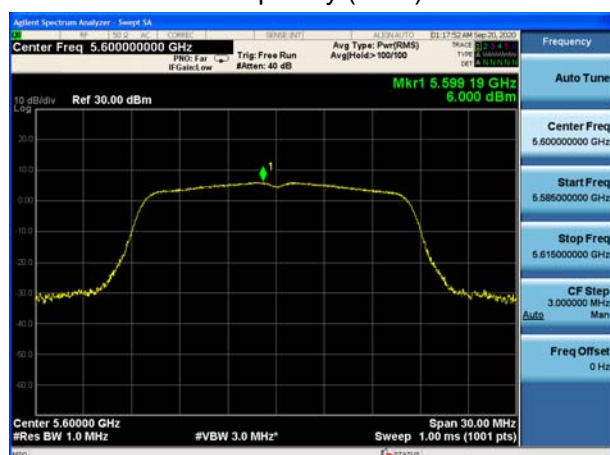
U-NII-2C, 802.11a
Carrier frequency (MHz): 5520



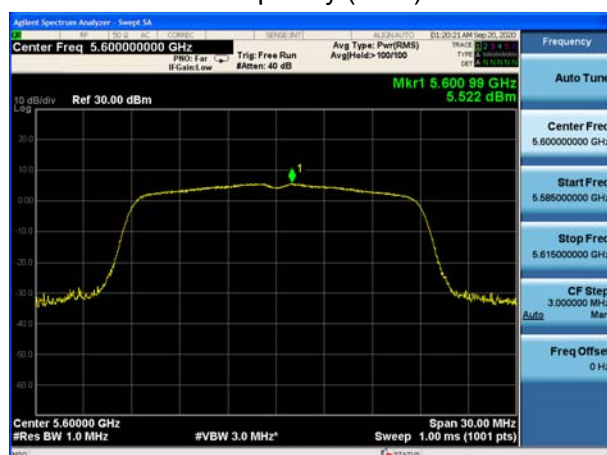
U-NII-2C, 802.11n HT20
Carrier frequency (MHz): 5520



U-NII-2C, 802.11a
Carrier frequency (MHz): 5600

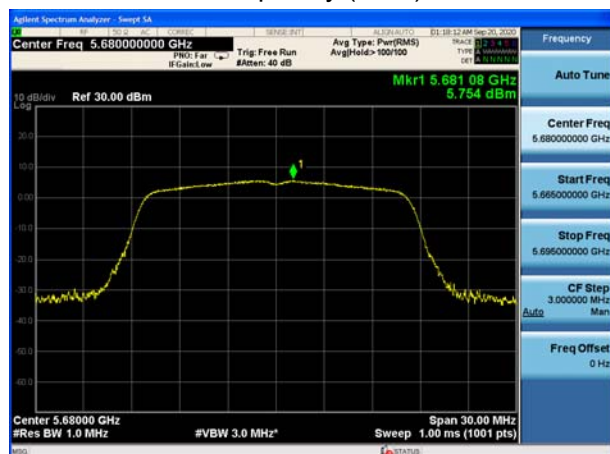


U-NII-2C, 802.11n HT20
Carrier frequency (MHz): 5600

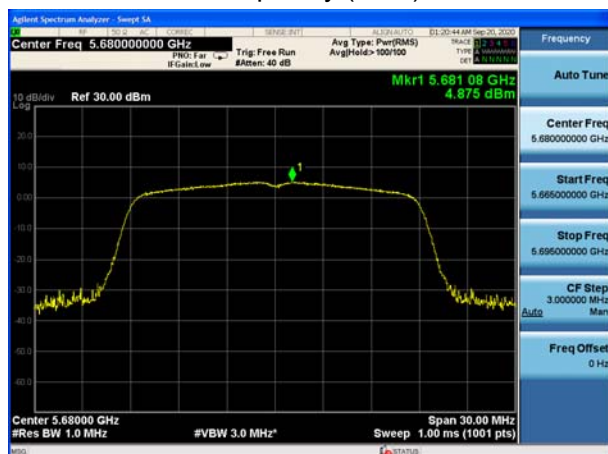




U-NII-2C, 802.11a
Carrier frequency (MHz): 5680



U-NII-2C, 802.11n HT20
Carrier frequency (MHz): 5680



U-NII-2C, 802.11a
Carrier frequency (MHz): 5700

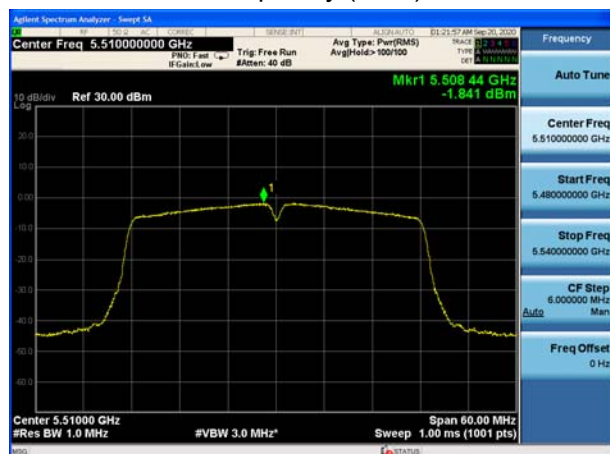


U-NII-2C, 802.11n HT20
Carrier frequency (MHz): 5700

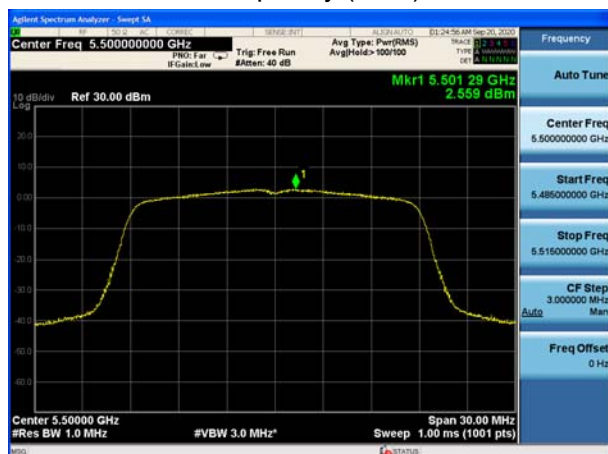




U-NII-2C, 802.11n HT40
Carrier frequency (MHz): 5510



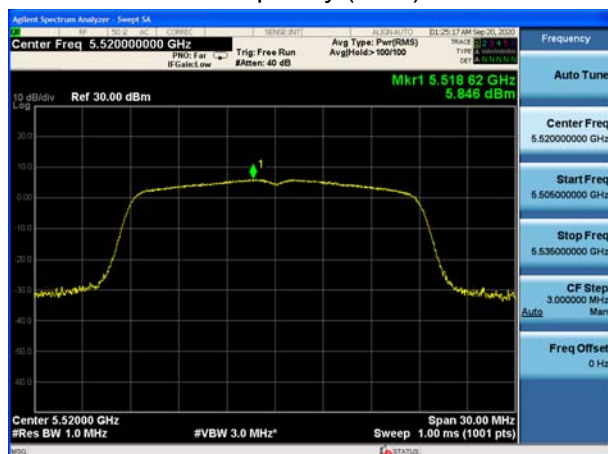
U-NII-2C, 802.11ac VHT20
Carrier frequency (MHz): 5500



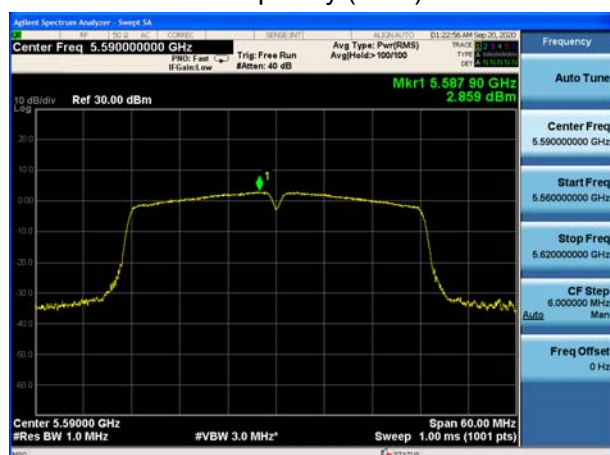
U-NII-2C, 802.11n HT40
Carrier frequency (MHz): 5550



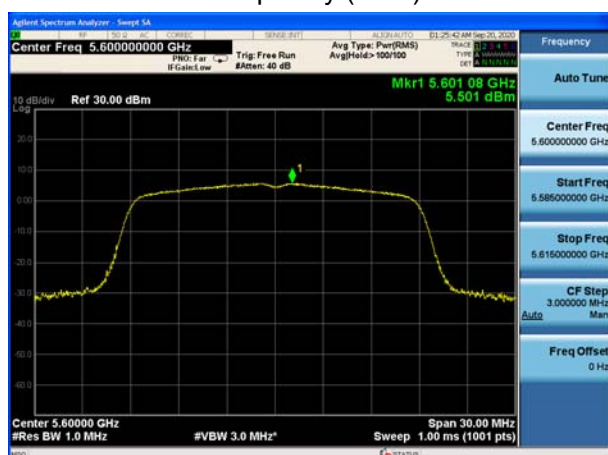
U-NII-2C, 802.11ac VHT20
Carrier frequency (MHz): 5520



U-NII-2C, 802.11n HT40
Carrier frequency (MHz): 5590

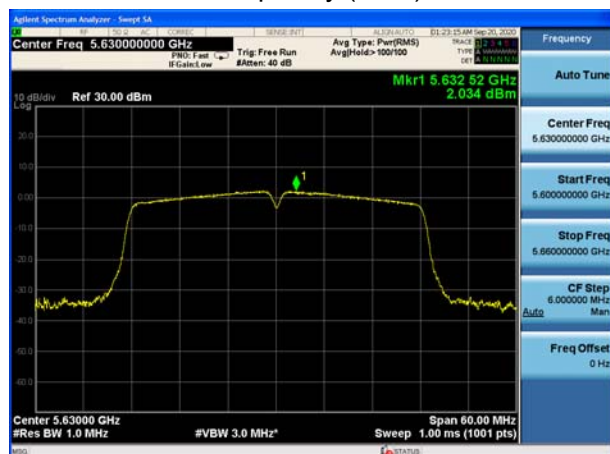


U-NII-2C, 802.11ac VHT20
Carrier frequency (MHz): 5600





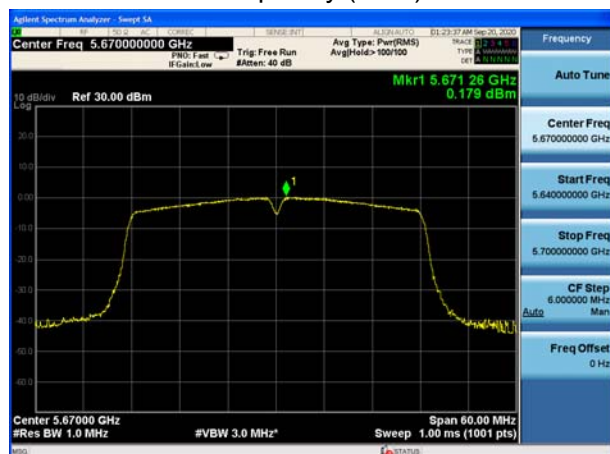
U-NII-2C, 802.11n HT40
Carrier frequency (MHz): 5630



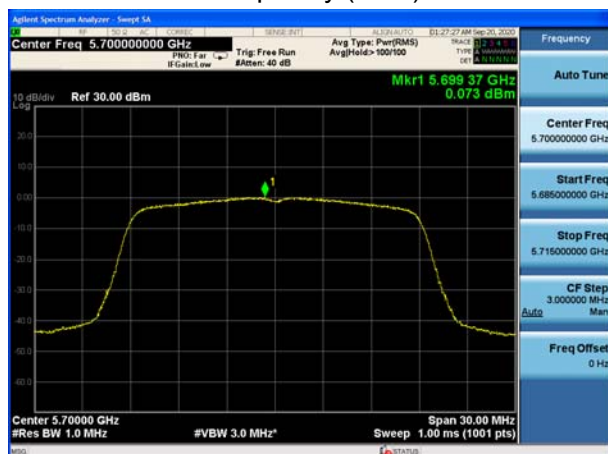
U-NII-2C, 802.11ac VHT20
Carrier frequency (MHz): 5680



U-NII-2C, 802.11n HT40
Carrier frequency (MHz): 5670

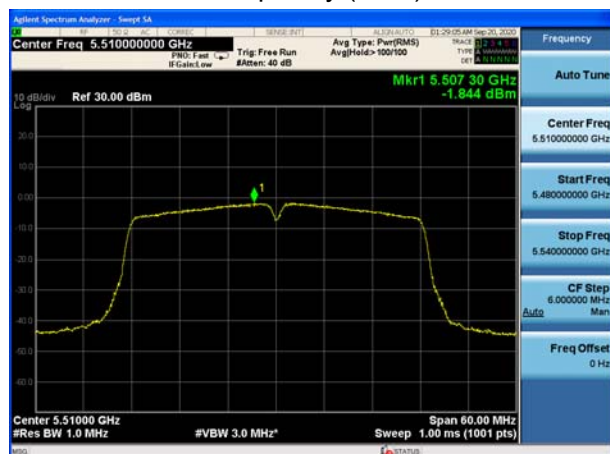


U-NII-2C, 802.11ac VHT20
Carrier frequency (MHz): 5700





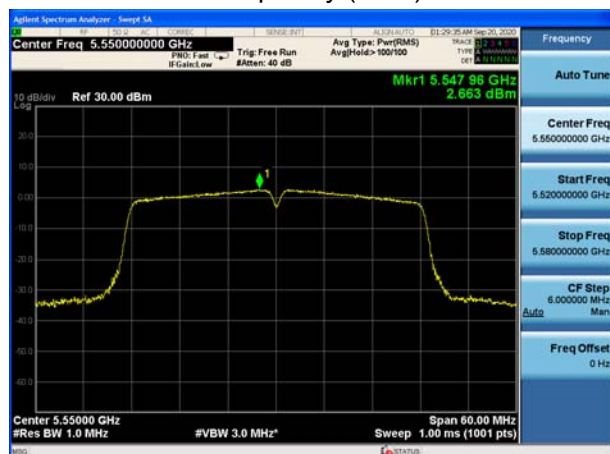
U-NII-2C, 802.11ac VHT40
Carrier frequency (MHz): 5510



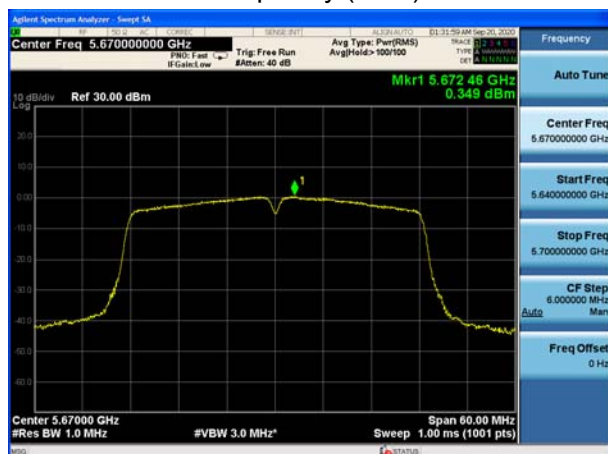
U-NII-2C, 802.11ac VHT40
Carrier frequency (MHz): 5630



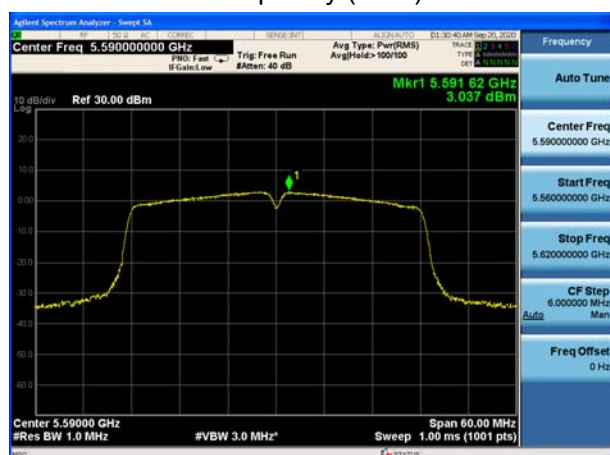
U-NII-2C, 802.11ac VHT40
Carrier frequency (MHz): 5550



U-NII-2C, 802.11ac VHT40
Carrier frequency (MHz): 5670

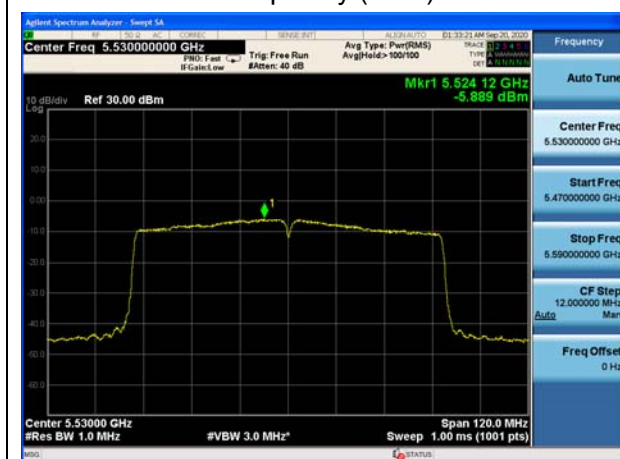


U-NII-2C, 802.11ac VHT40
Carrier frequency (MHz): 5590

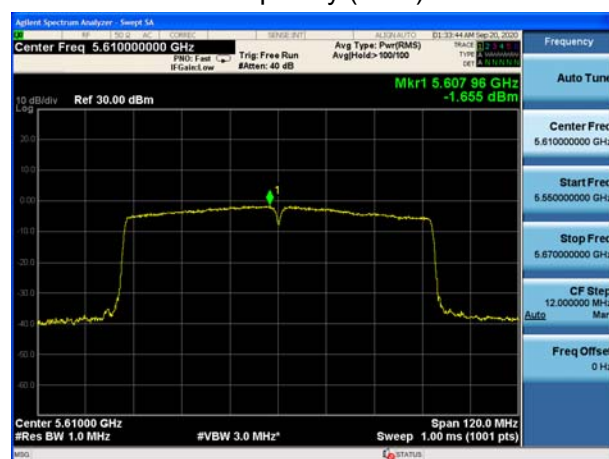




U-NII-2C, 802.11ac VHT80
Carrier frequency (MHz): 5530



U-NII-2C, 802.11ac VHT80
Carrier frequency (MHz): 5610





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



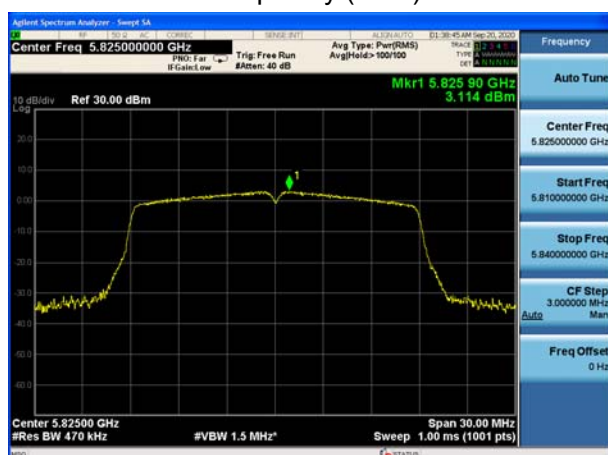
U-NII-3, 802.11n HT20
Carrier frequency (MHz): 5785

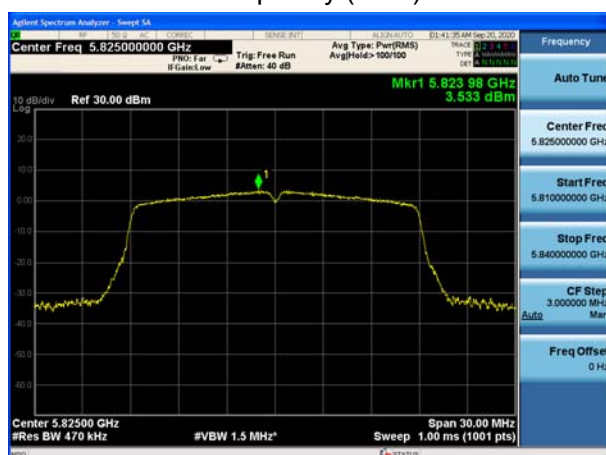
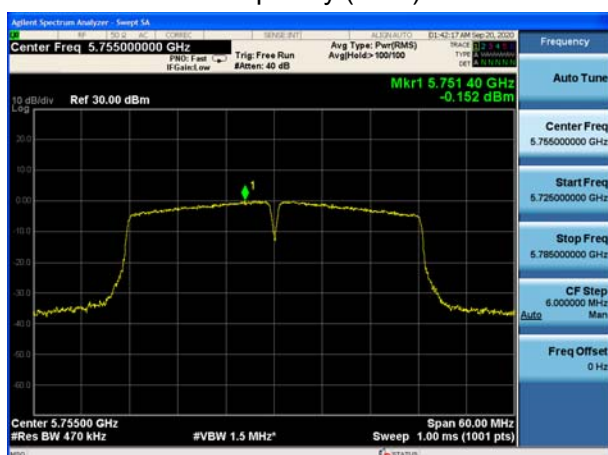
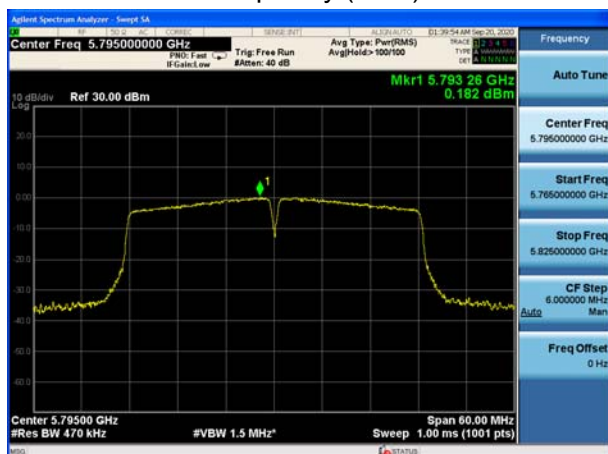
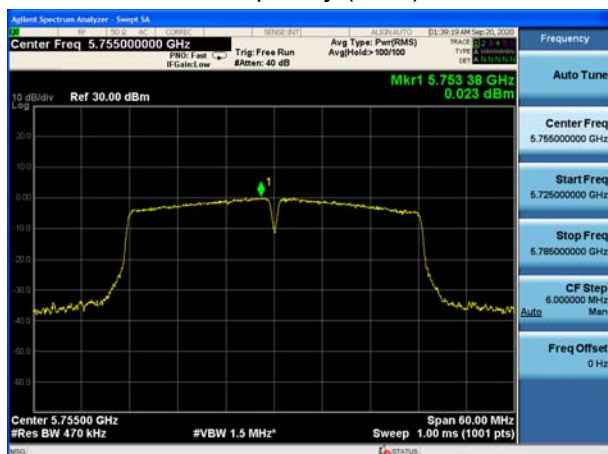


U-NII-3, 802.11a
Carrier frequency (MHz): 5825



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







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



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



5.5. Unwanted Emission

Ambient condition

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

Method of Measurement

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

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

Set the spectrum analyzer in the following:

9kHz~150 kHz

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

150 kHz~30MHz

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

Below 1GHz

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

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

Above 1GHz

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

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

Above 1GHz

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

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

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

e) Sweep time = auto.

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



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

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

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

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

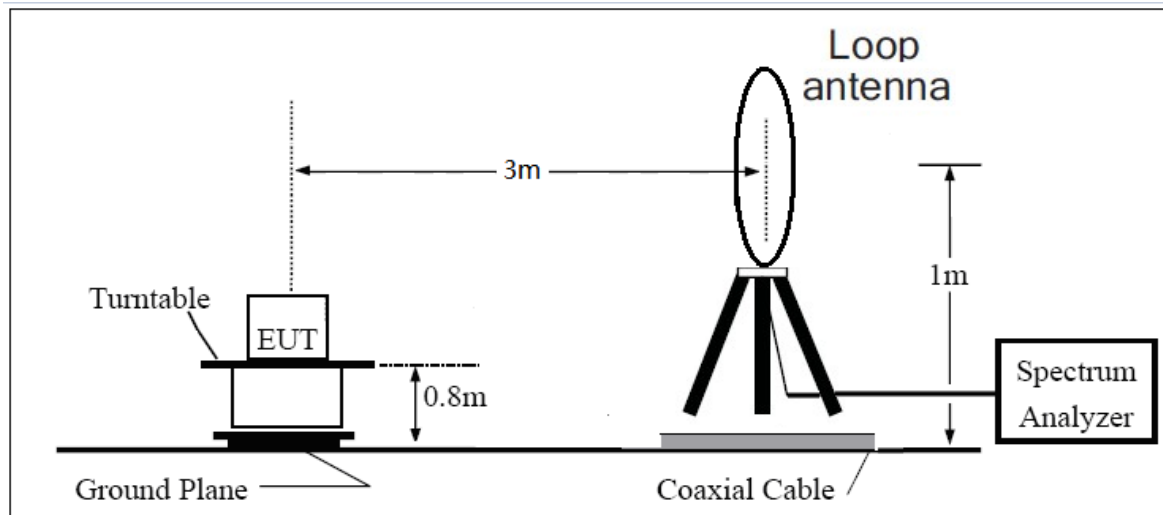
3) If a specific emission is demonstrated to be continuous (100% duty cycle) rather than turning ON and OFF with the transmit cycle, then no duty cycle correction is required for that emission.

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

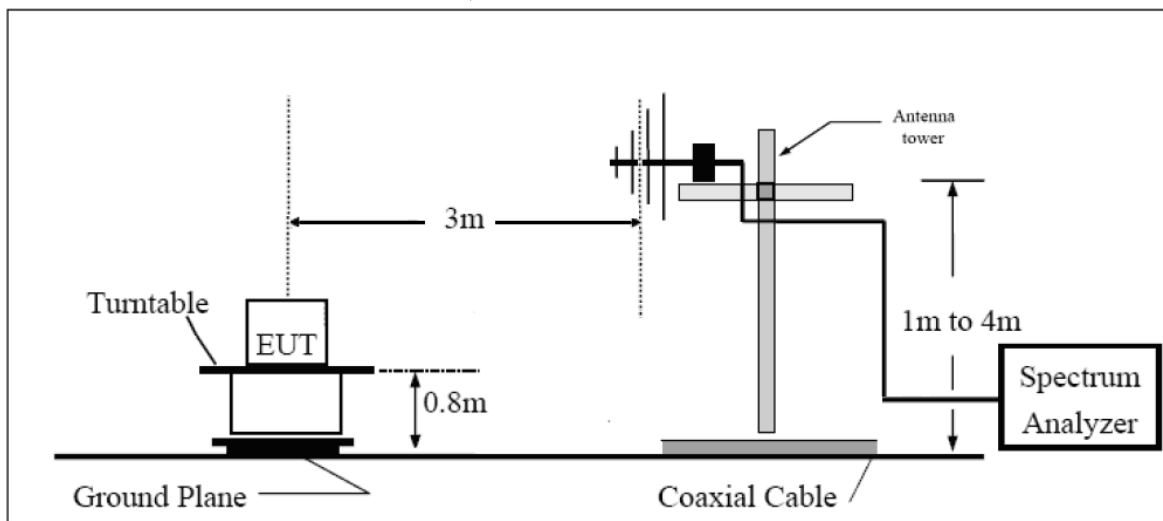
The field strength of spurious emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in stand-up position (Z axis) and the loop antenna is vertical, others antenna are vertical and horizontal.

The test is in transmitting mode.

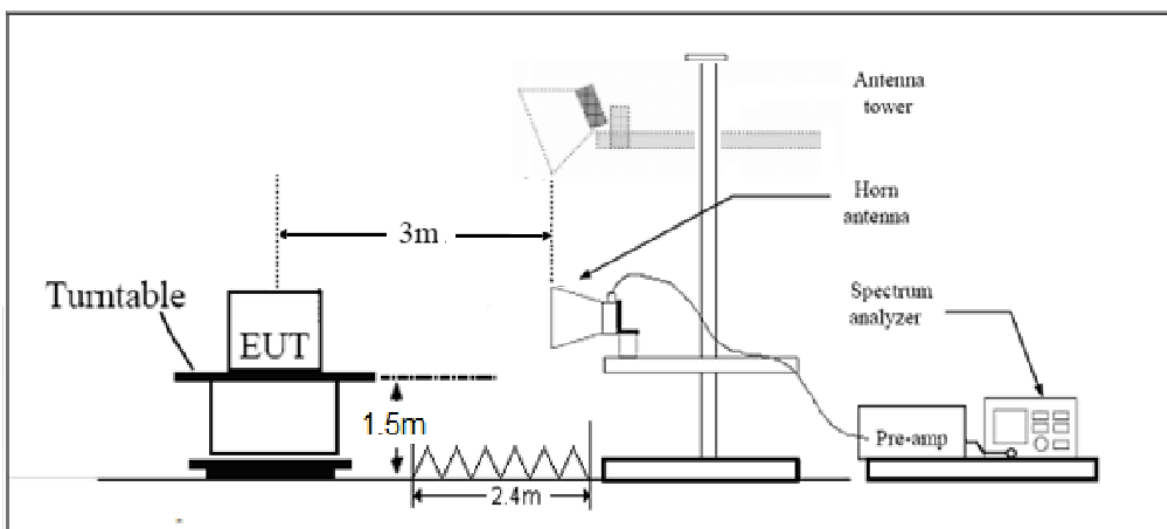
9KHz~~~30MHz



30MHz~~~ 1GHz



Above 1GHz



Note: Area side:2.4mX3.6m

Limits

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

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

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

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

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

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

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

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

Measurement Uncertainty

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

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