



RF TEST REPORT

Applicant Quectel Wireless Solutions Co., Ltd

FCC ID XMR202102FC21

Product Wi-Fi&BT module

Model FC21

Report No. R2108A0712-R3

Issue Date September 7, 2021

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

Prepared by: Peng Tao

Approved by: Kai Xu

TA Technology (Shanghai) Co., Ltd.

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

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

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



TABLE OF CONTENT

1. Test Laboratory	4
1.1. Notes of the test report	4
1.2. Test facility	4
1.3. Testing Location.....	4
2. General Description of Equipment under Test	5
2.1. Applicant and Manufacturer Information	5
2.2. General information	5
3. Applied Standards.....	6
4. Test Configuration.....	7
5. Test Case Results.....	9
5.1. Occupied Bandwidth.....	9
5.2. Average Power Output	26
5.3. Frequency Stability	33
5.4. Power Spectral Density	37
5.5. Unwanted Emission	53
5.6. Conducted Emission.....	150
6. Main Test Instruments	153
ANNEX A: The EUT Appearance.....	155
ANNEX B: Test Setup Photos.....	156
ANNEX C: Product Change Description	157

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: April 26, 2021~ April 29, 2021 and July 9, 2021~ July 10, 2021			
Date of Sample Received: February 3, 2021			
Note: PASS: The EUT complies with the essential requirements in the standard. FAIL: The EUT does not comply with the essential requirements in the standard. All indications of Pass/Fail in this report are opinions expressed by TA Technology (Shanghai) Co., Ltd. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only.			

FC21 (Report No.: R2108A0712-R3) is a variant model of FC21 (Report No.:R2101A0021-R3V2). The differences between the two products are shown below.

Product Change Description		
Item	Original	Variant
Chip	QCA1023-0	QCA9377-3
MCN	QCA-1023-0-115WLNSP-TR/SR/HR-03-0	QCA-9377-3-115WLNSP-TR/SR/HR-03-0
MU-MIMO and TxBF client mode	Disable	Support
HW Version	R1.0	R1.1
SW Version	FC21SA-Q73	FC21SA-Q93
Others	The same	The same

There is only verified Average output power and tested Unwanted Emissions, and did not worsen, so they were not recorded in the report. The detailed product change description please refers to the Difference Declaration Letter.



1. Test Laboratory

1.1. Notes of the test report

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

1.2. Test facility

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

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

A2LA (Certificate Number: 3857.01)

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

1.3. Testing Location

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

2. General Description of Equipment under Test

2.1. Applicant and Manufacturer Information

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

2.2. General information

EUT Description		
Model	FC21	
SN:	E1821BN10000003	
Hardware Version	R1.1	
Software Version	FC21SA-Q93	
Power Supply	External power supply	
Antenna Type	External Antenna	
Antenna Gain	5150~5250 MHz	4.48dBi
	5250~5350 MHz	4.48dBi
	5470~5725 MHz	5.05dBi
	5725~5850 MHz	4.54dBi
Test Band	U-NII-1(5150MHz-5250MHz) U-NII-2A(5250MHz-5350MHz) U-NII-2C(5470MHz-5600MHz, 5650MHz-5725MHz) U-NII-3(5725MHz-5850MHz)	
Modulation Type	802.11a/n (HT20/HT40) : OFDM 802.11ac (VHT20/VHT40/VHT80): OFDM	
Max. Conducted Power	16.86 dBm	
Operating Frequency Range(s)	U-NII-1: 5150MHz-5250MHz U-NII-2A:5250MHz -5350MHz U-NII-2C: 5470MHz-5600MHz, 5650MHz-5725MHz U-NII-3: 5725MHz -5850MHz	
Extreme temperature range:	-20 ° C to 50° C	
Operating temperature range:	-40 ° C to 85° C	
Operating voltage range:	3.14 V to 3.46 V	
State DC voltage:	3.3V	
Note:1. The EUT is sent from the applicant to TA and the information of the EUT is declared by the applicant.		



3. Applied Standards

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

Test standards:

FCC CFR47 Part 15E (2020) Unlicensed National Information Infrastructure Devices

ANSI C63.10 (2013)

Reference standard:

KDB 789033 D02 General UNII Test Procedures New Rules v02r01

4. Test Configuration

Test Mode

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

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

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

Worst-case data rates are shown as following table.

Mode	Data Rate
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
			132	5660MHz
			136	5680MHz
			140	5700MHz
			144	5720MHz
		40 MHz	102	5510MHz
			110	5550MHz
			134	5670MHz
			142	5710MHz
		80 MHz	106	5530MHz
			138	5690MHz
		U-NII-3	20 MHz	149
	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.

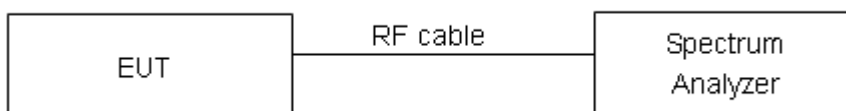
For U-NII-1/U-NII-2A/U-NII-2C, set RBW $\approx$ 1% OCB kHz, VBW $\geq 3 \times$ RBW, measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 26 dB relative to the maximum 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	Carrier frequency (MHz)	99% bandwidth (MHz)	Minimum 26 dB bandwidth (MHz)	Conclusion
802.11a	5180	16.295	20.27	PASS
	5200	16.316	20.66	PASS
	5240	16.309	19.72	PASS
802.11n HT20	5180	17.362	20.30	PASS
	5200	17.390	20.56	PASS
	5240	17.367	20.05	PASS
802.11n HT40	5190	35.828	41.03	PASS
	5230	35.937	41.79	PASS
802.11ac VHT20	5180	17.355	19.86	PASS
	5200	17.388	20.27	PASS
	5240	17.392	20.37	PASS
802.11ac VHT40	5190	35.835	40.79	PASS
	5230	35.877	40.98	PASS
802.11ac VHT80	5210	75.206	86.10	PASS

U-NII-2A

Mode	Carrier frequency (MHz)	99% bandwidth (MHz)	Minimum 26 dB bandwidth (MHz)	Conclusion
802.11a	5260	16.277	20.10	PASS
	5300	16.287	20.01	PASS
	5320	16.273	19.82	PASS
802.11n HT20	5260	17.368	19.92	PASS
	5300	17.382	20.36	PASS
	5320	17.360	19.77	PASS
802.11n HT40	5270	35.838	40.13	PASS
	5310	35.876	42.73	PASS
802.11ac VHT20	5260	17.360	19.93	PASS
	5300	17.371	19.99	PASS
	5320	17.403	19.92	PASS
802.11ac VHT40	5270	35.775	41.06	PASS
	5310	35.859	44.00	PASS
802.11ac VHT80	5290	75.034	83.33	PASS



U-NII-2C

Mode	Carrier frequency (MHz)	99% bandwidth (MHz)	Minimum 26 dB bandwidth (MHz)	Conclusion
802.11a	5500	16.270	19.87	PASS
	5580	16.268	19.39	PASS
	5700	16.295	19.44	PASS
	5720	16.317	19.91	PASS
802.11n HT20	5500	17.358	19.64	PASS
	5580	17.360	19.85	PASS
	5700	17.352	19.62	PASS
	5720	17.365	19.73	PASS
802.11n HT40	5510	35.812	40.67	PASS
	5550	35.817	40.32	PASS
	5670	35.835	41.30	PASS
	5710	35.816	40.69	PASS
802.11ac VHT20	5500	17.348	19.62	PASS
	5580	17.337	19.65	PASS
	5700	17.385	19.83	PASS
	5720	17.367	20.04	PASS
802.11ac VHT40	5510	35.838	40.75	PASS
	5550	35.866	41.41	PASS
	5670	35.822	42.57	PASS
	5710	35.781	40.08	PASS
802.11ac VHT80	5530	75.133	81.91	PASS
	5690	74.805	81.25	PASS

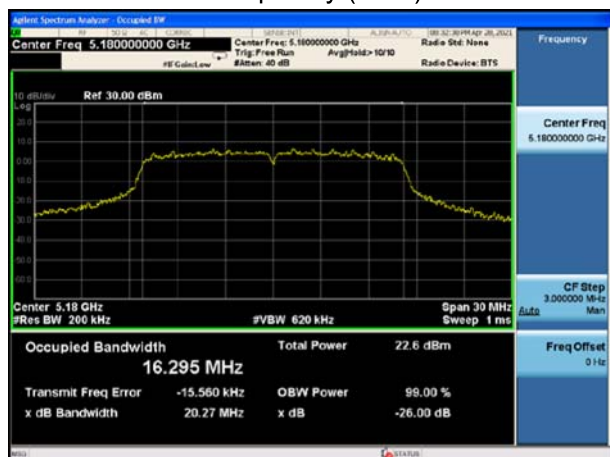
U-NII-3

Mode	Carrier frequency (MHz)	99% bandwidth (MHz)	Minimum 6 dB bandwidth (MHz)	Limit (kHz)	Conclusion
802.11a	5745	16.288	15.33	500	PASS
	5785	16.303	15.14	500	PASS
	5825	16.268	15.16	500	PASS
802.11n HT20	5745	17.386	15.13	500	PASS
	5785	17.361	15.16	500	PASS
	5825	17.352	15.17	500	PASS
802.11n HT40	5755	35.834	35.16	500	PASS
	5795	35.824	35.17	500	PASS
802.11ac	5745	17.377	15.15	500	PASS

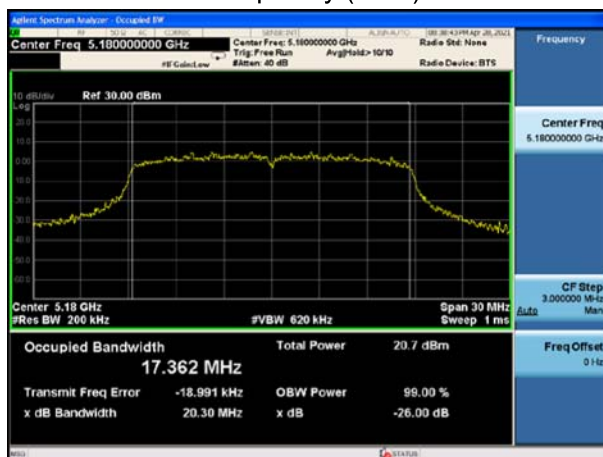


VHT20	5785	17.360	15.17	500	PASS
	5825	17.369	15.14	500	PASS
802.11ac VHT40	5755	35.820	35.16	500	PASS
	5795	35.788	35.14	500	PASS
802.11ac VHT80	5775	74.964	75.22	500	PASS

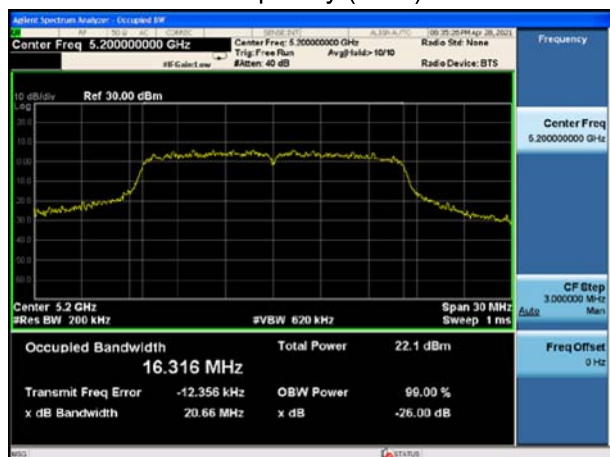
U-NII-1, 802.11a
Carrier frequency (MHz): 5180



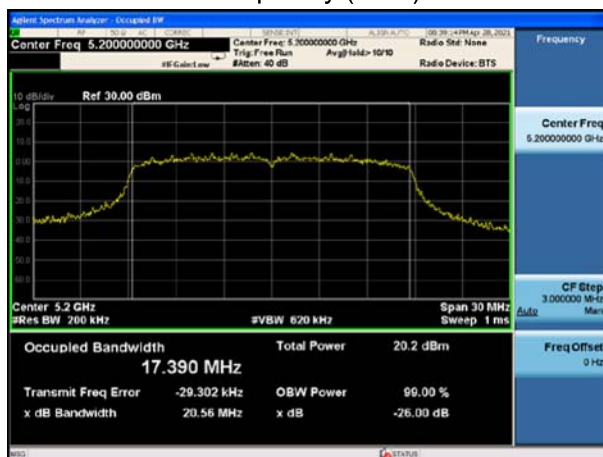
U-NII-1, 802.11n HT20
Carrier frequency (MHz): 5180



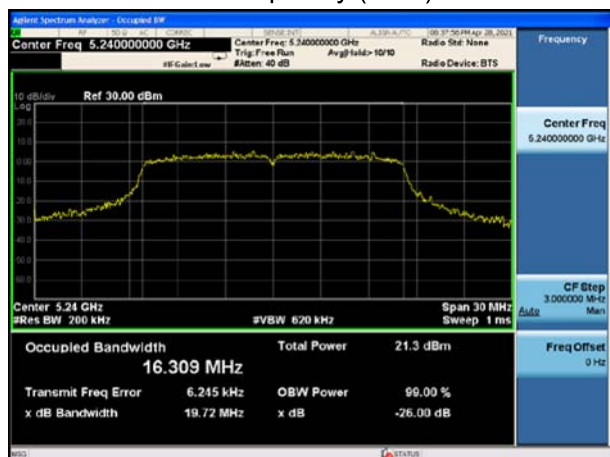
U-NII-1, 802.11a
Carrier frequency (MHz): 5200



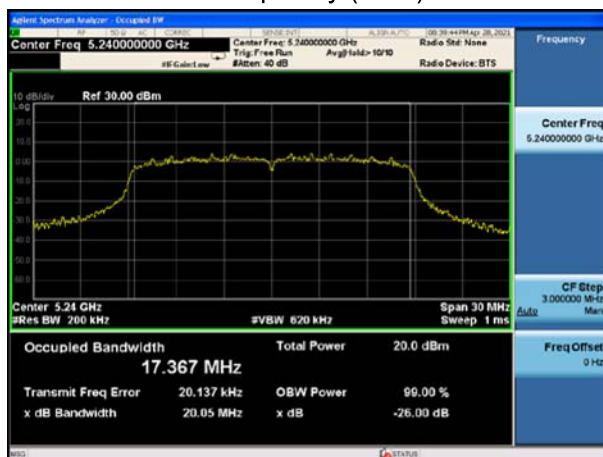
U-NII-1, 802.11n HT20
Carrier frequency (MHz): 5200



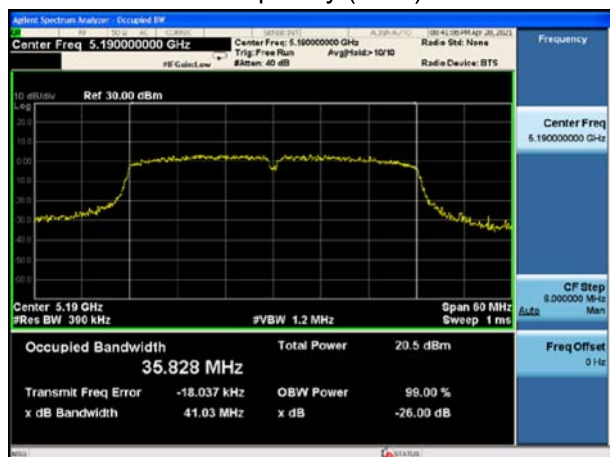
U-NII-1, 802.11a
Carrier frequency (MHz): 5240



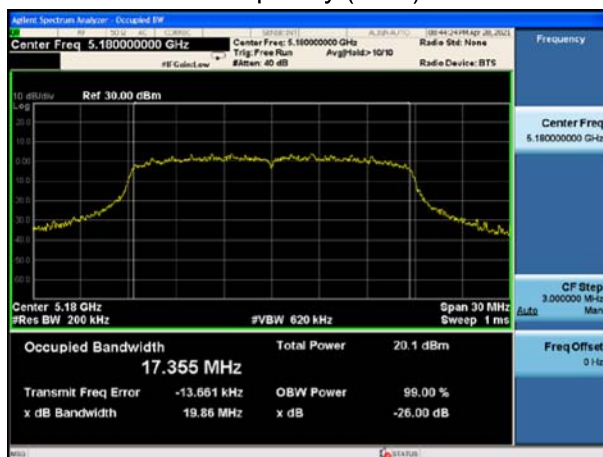
U-NII-1, 802.11n HT20
Carrier frequency (MHz): 5240



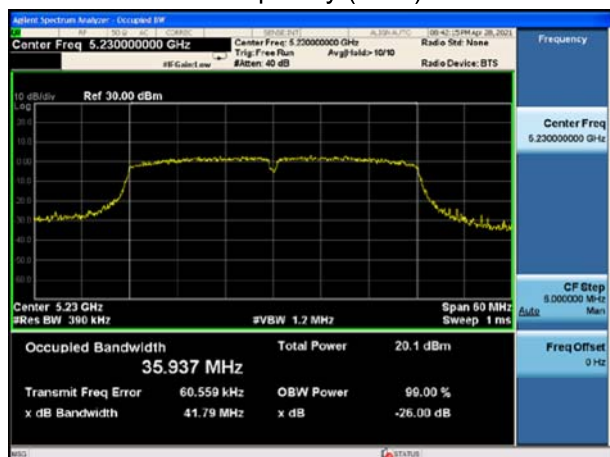
U-NII-1, 802.11n HT40
Carrier frequency (MHz): 5190



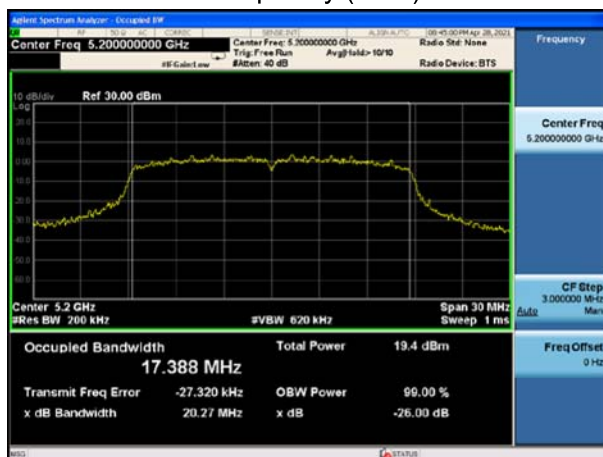
U-NII-1, 802.11ac VHT20
Carrier frequency (MHz): 5180



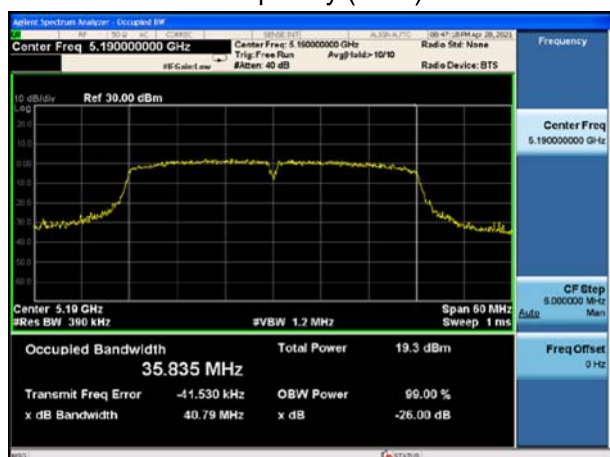
U-NII-1, 802.11n HT40
Carrier frequency (MHz): 5230



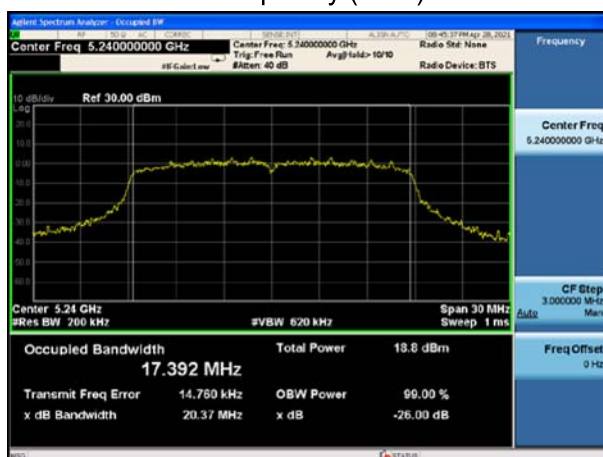
U-NII-1, 802.11ac VHT20
Carrier frequency (MHz): 5200



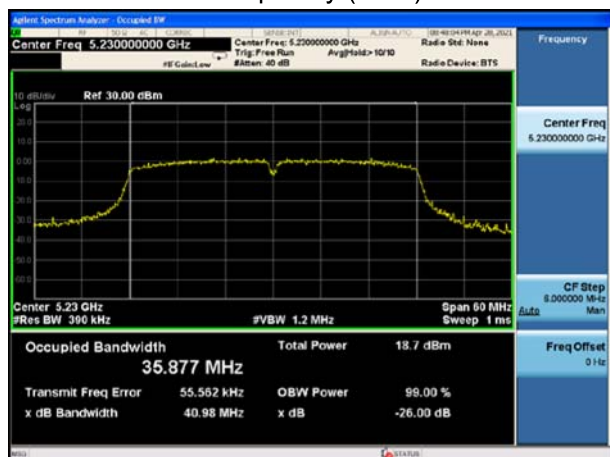
U-NII-1, 802.11ac VHT40
Carrier frequency (MHz): 5190



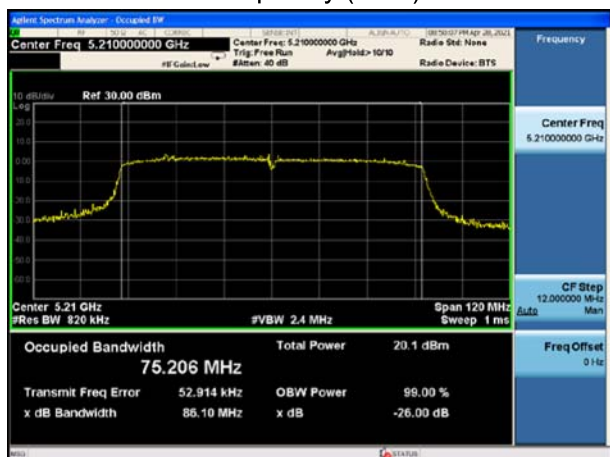
U-NII-1, 802.11ac VHT20
Carrier frequency (MHz): 5240



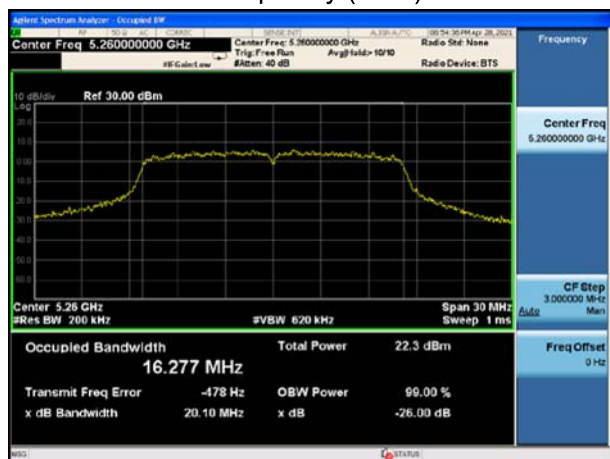
U-NII-1, 802.11ac VHT40 Carrier frequency (MHz): 5230



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



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



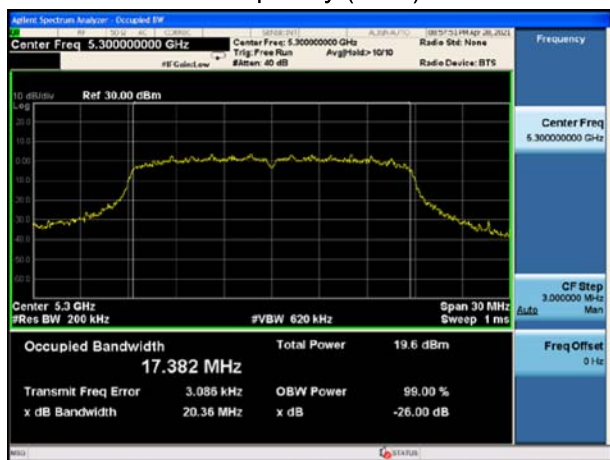
U-NII-2A, 802.11n HT20 Carrier frequency (MHz): 5260



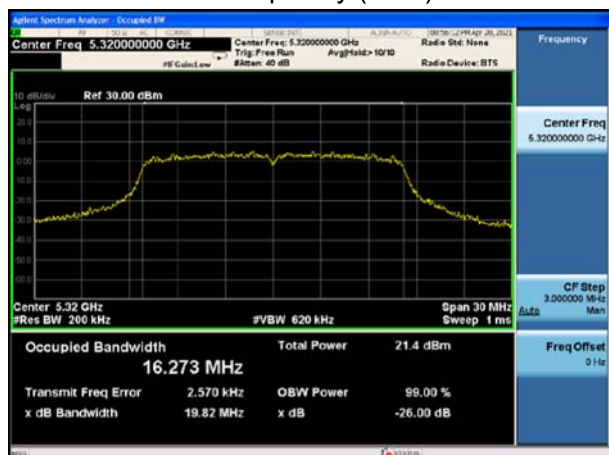
U-NII-2A, 802.11a Carrier frequency (MHz): 5300



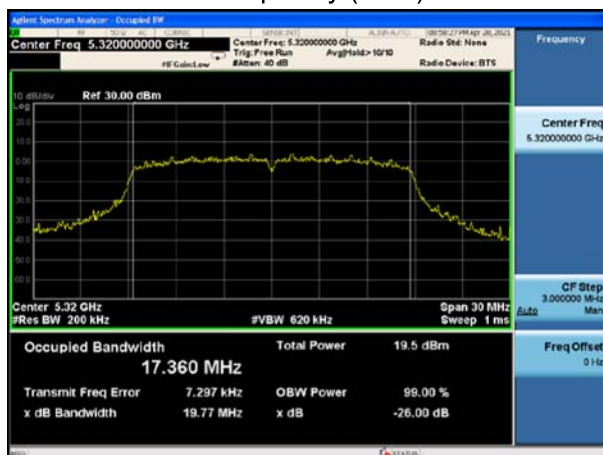
U-NII-2A, 802.11n HT20 Carrier frequency (MHz): 5300



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



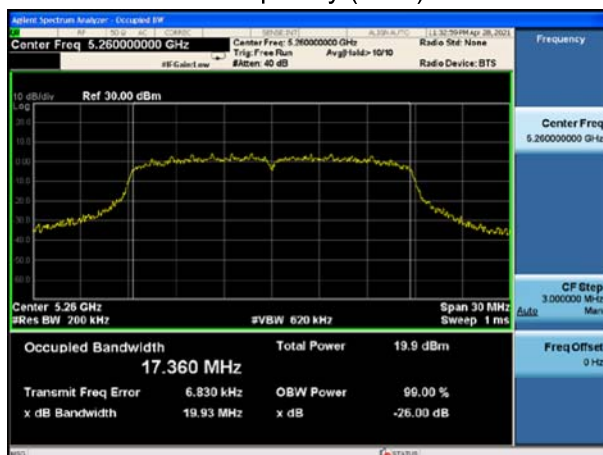
U-NII-2A, 802.11n HT20
Carrier frequency (MHz):5320



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



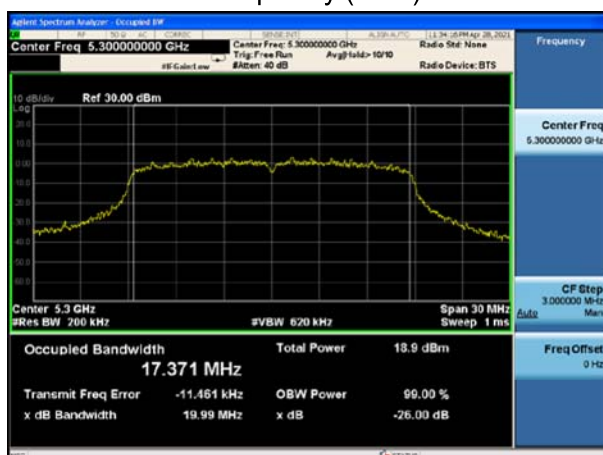
U-NII-2A, 802.11ac VHT20
Carrier frequency (MHz):5260



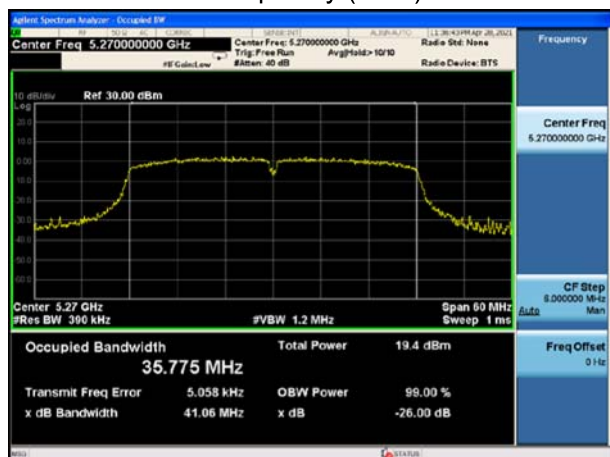
U-NII-2A, 802.11n HT40
Carrier frequency (MHz): 5310



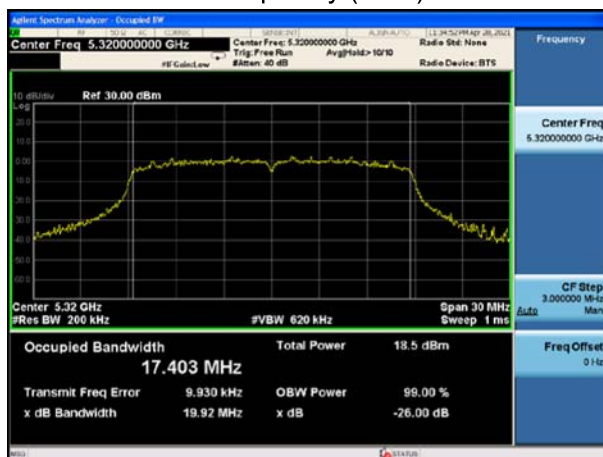
U-NII-2A, 802.11ac VHT20
Carrier frequency (MHz): 5300



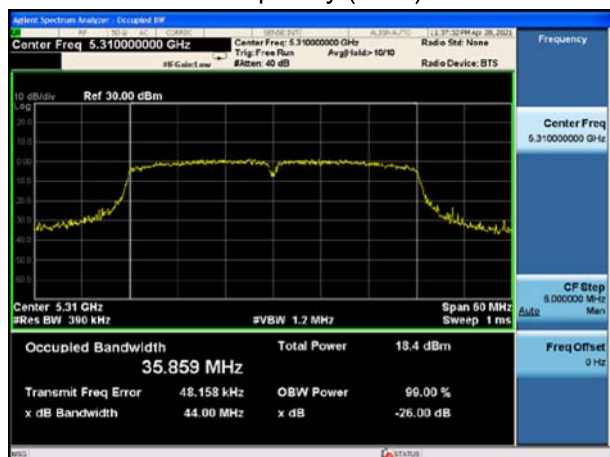
U-NII-2A, 802.11ac VHT40
Carrier frequency (MHz): 5270



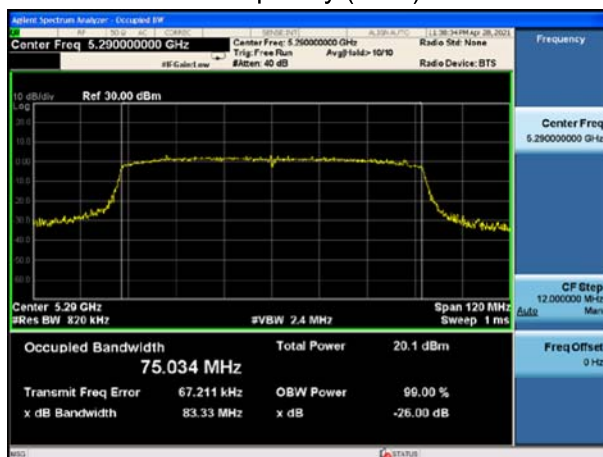
U-NII-2A, 802.11ac VHT20
Carrier frequency (MHz): 5320



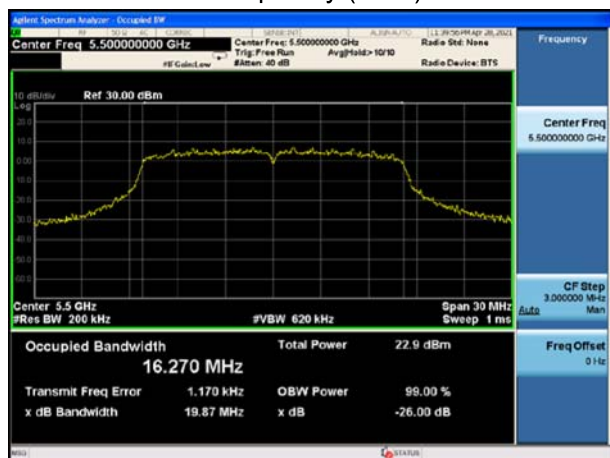
U-NII-2A, 802.11ac VHT40
Carrier frequency (MHz): 5310



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



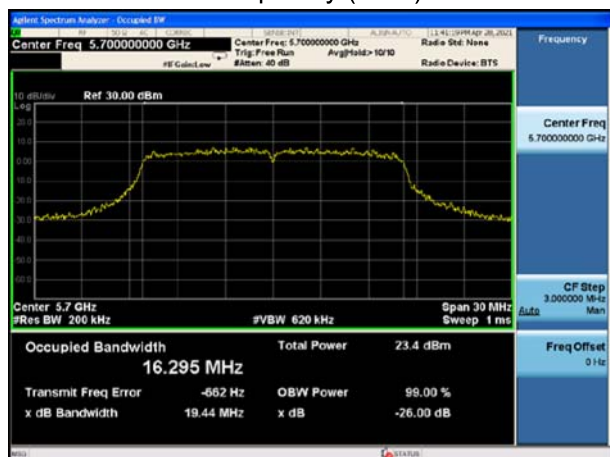
U-NII-2C, 802.11a
Carrier frequency (MHz): 5500



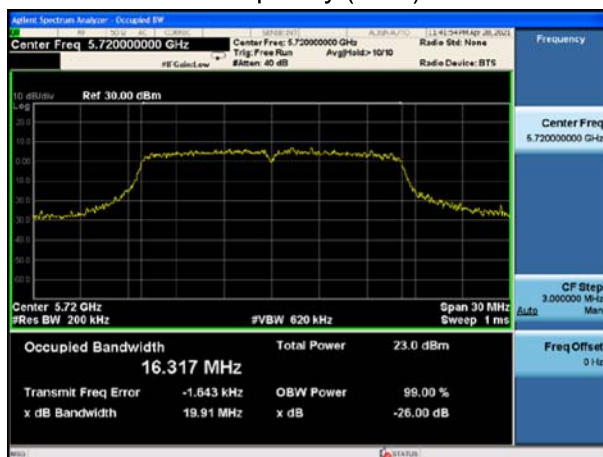
U-NII-2C, 802.11a
Carrier frequency (MHz): 5580



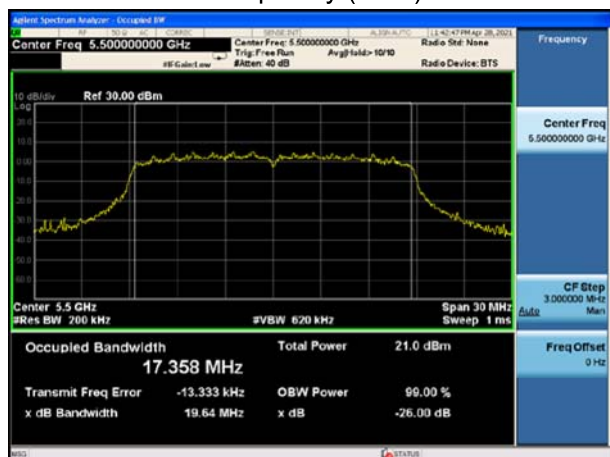
U-NII-2C, 802.11a
Carrier frequency (MHz): 5700



U-NII-2C, 802.11a
Carrier frequency (MHz): 5720



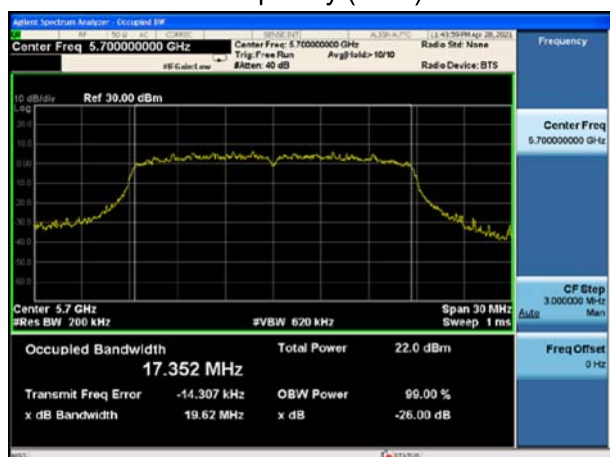
U-NII-2C, 802.11n HT20
Carrier frequency (MHz): 5500



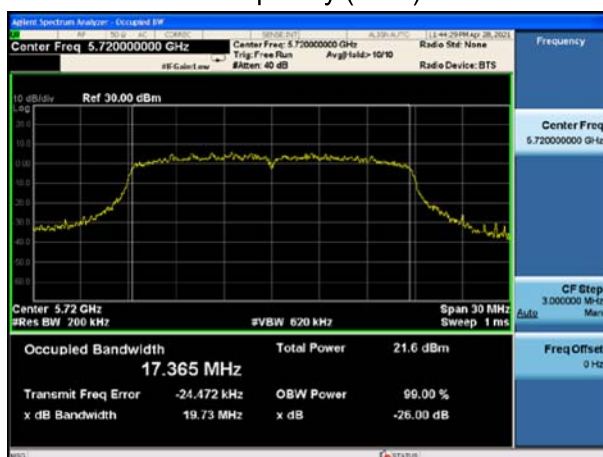
U-NII-2C, 802.11n HT20
Carrier frequency (MHz): 5580



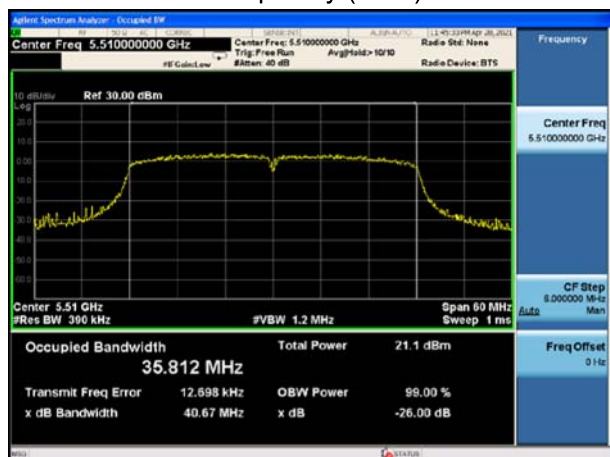
U-NII-2C, 802.11n HT20
Carrier frequency (MHz): 5700



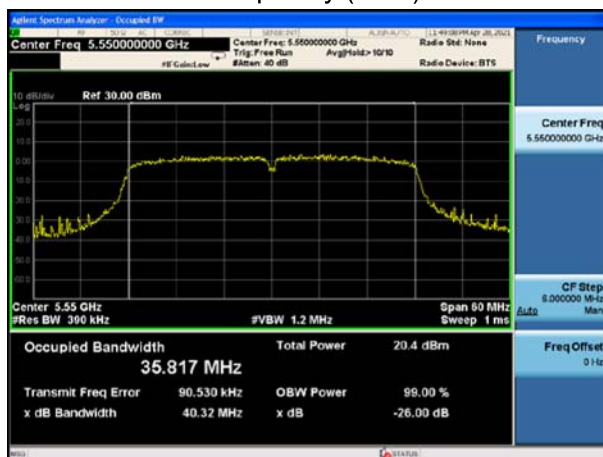
U-NII-2C, 802.11n HT20
Carrier frequency (MHz): 5720



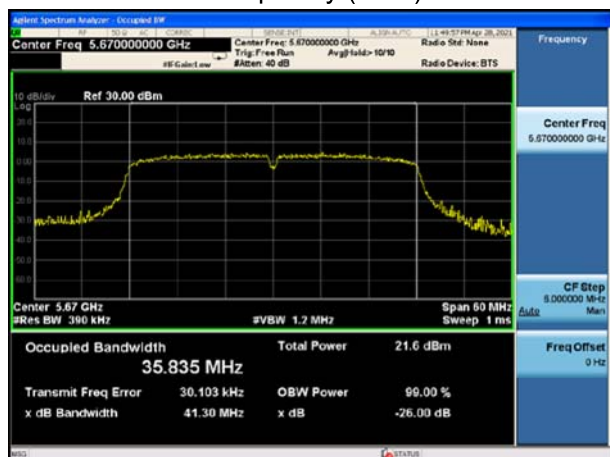
U-NII-2C, 802.11n HT40
Carrier frequency (MHz): 5510



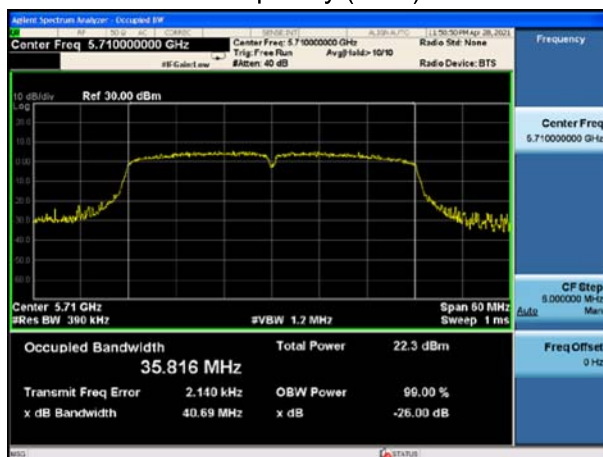
U-NII-2C, 802.11n HT40
Carrier frequency (MHz): 5550



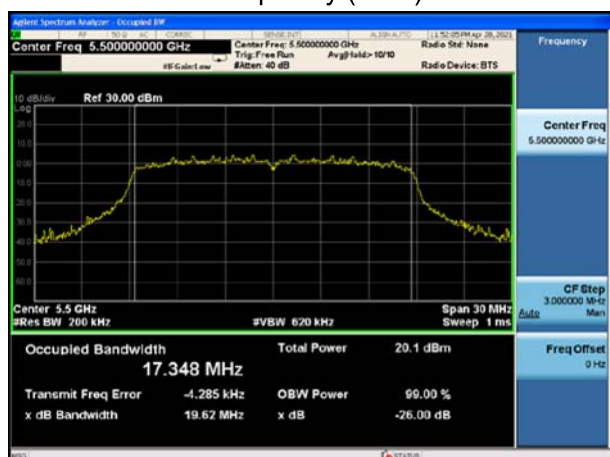
U-NII-2C, 802.11n HT40
Carrier frequency (MHz): 5670



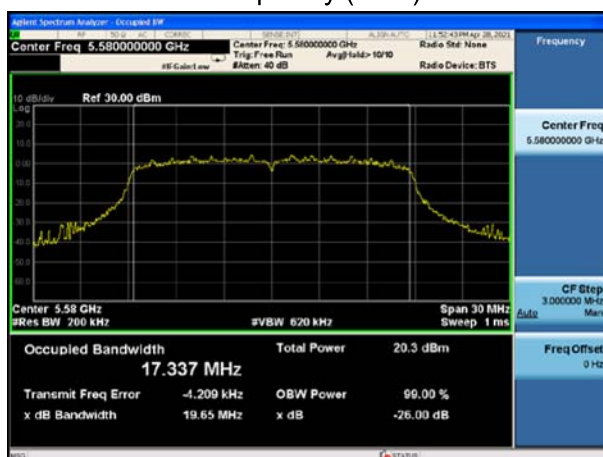
U-NII-2C, 802.11n HT40
Carrier frequency (MHz): 5710



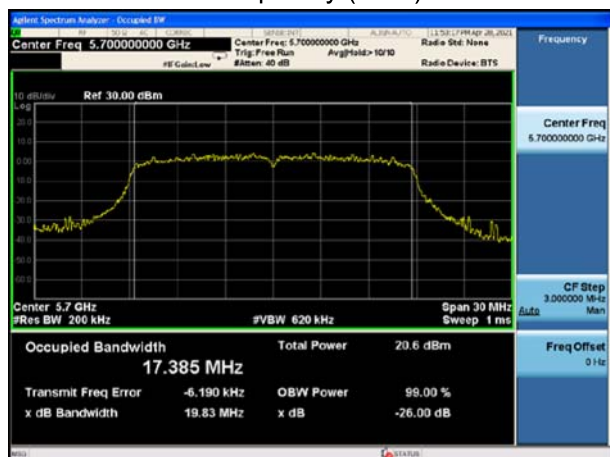
U-NII-2C, 802.11ac VHT20
Carrier frequency (MHz): 5500



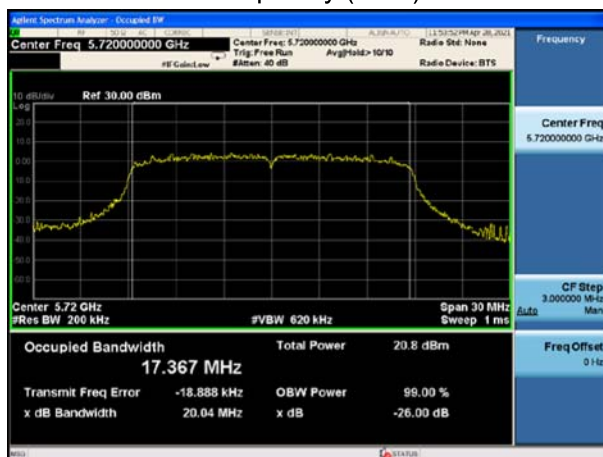
U-NII-2C, 802.11ac VHT20
Carrier frequency (MHz): 5580



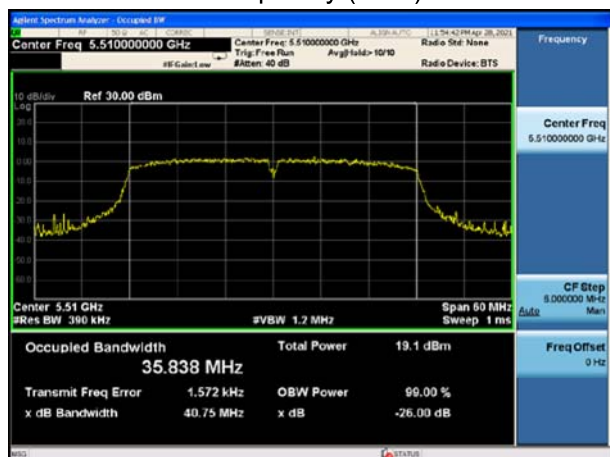
U-NII-2C, 802.11ac VHT20
Carrier frequency (MHz): 5700



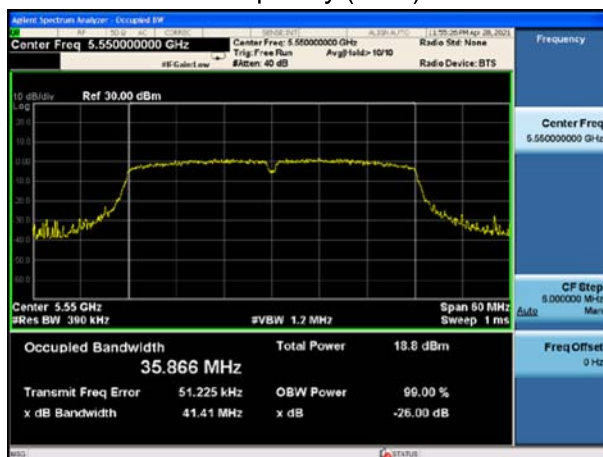
U-NII-2C, 802.11ac VHT20
Carrier frequency (MHz): 5720



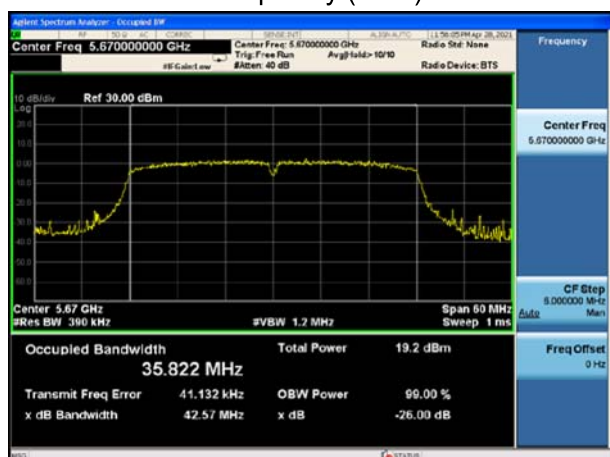
U-NII-2C, 802.11ac VHT40
Carrier frequency (MHz): 5510



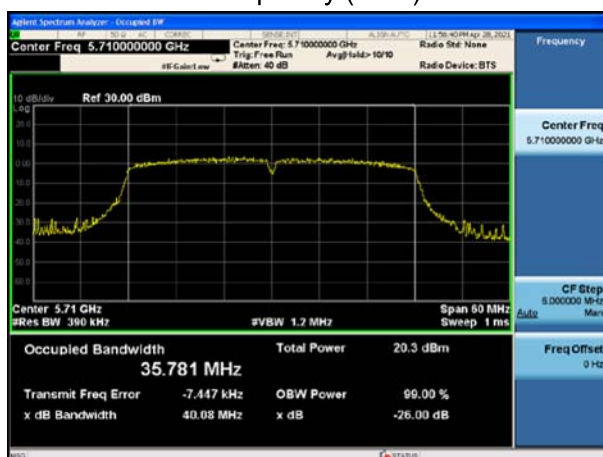
U-NII-2C, 802.11ac VHT40
Carrier frequency (MHz): 5550



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

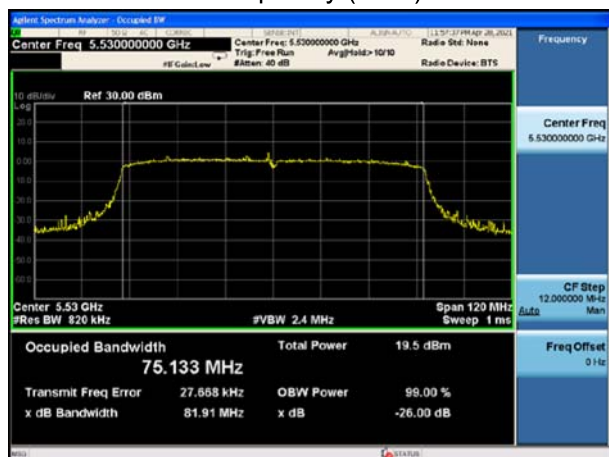


U-NII-2C, 802.11ac VHT40
Carrier frequency (MHz): 5710

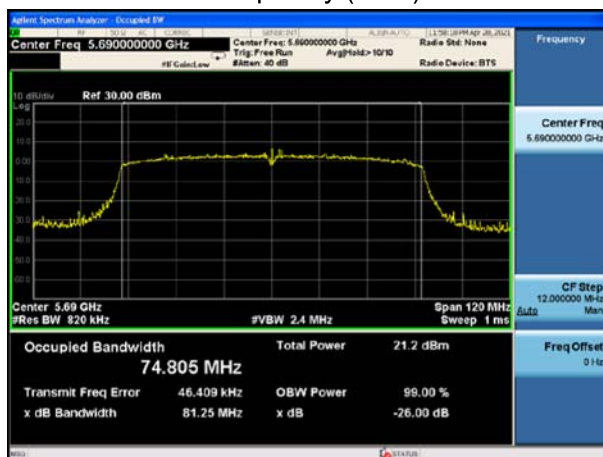




U-NII-2C, 802.11ac VHT80
Carrier frequency (MHz): 5530

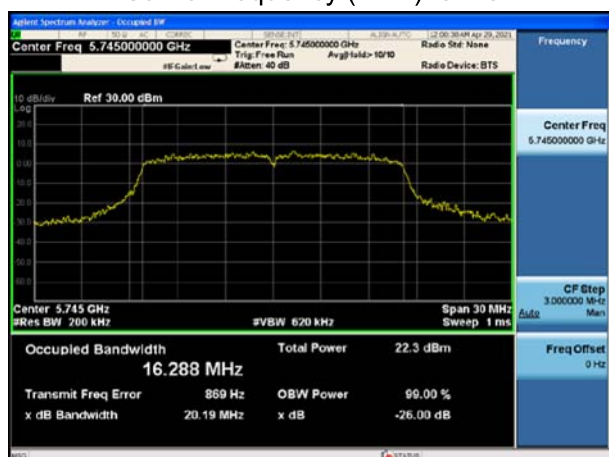


U-NII-2C, 802.11ac VHT80
Carrier frequency (MHz): 5690

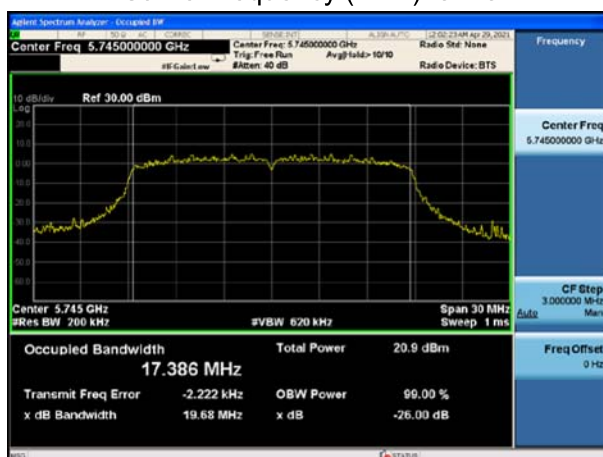


99% bandwidth

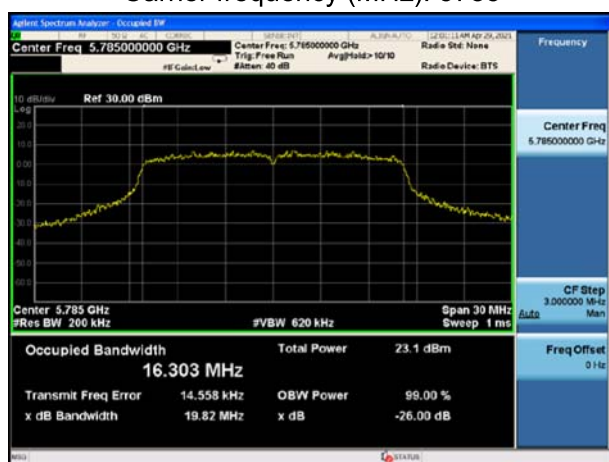
U-NII-3, 802.11a
Carrier frequency (MHz): 5745



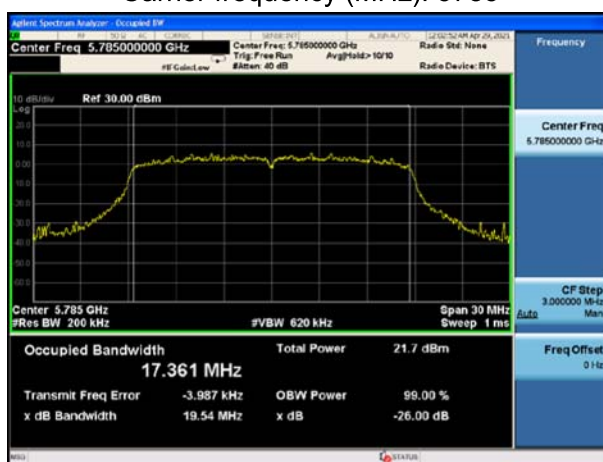
U-NII-3, 802.11n HT20
Carrier frequency (MHz): 5745



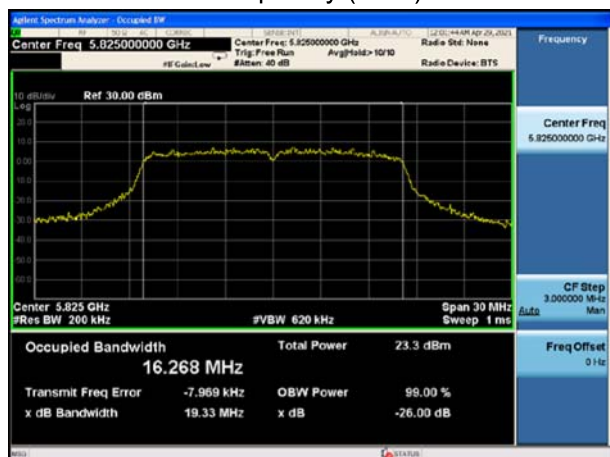
U-NII-3, 802.11a
Carrier frequency (MHz): 5785



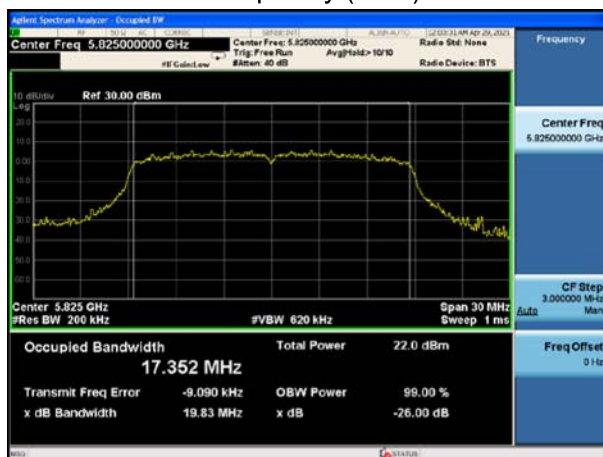
U-NII-3, 802.11n HT20
Carrier frequency (MHz): 5785



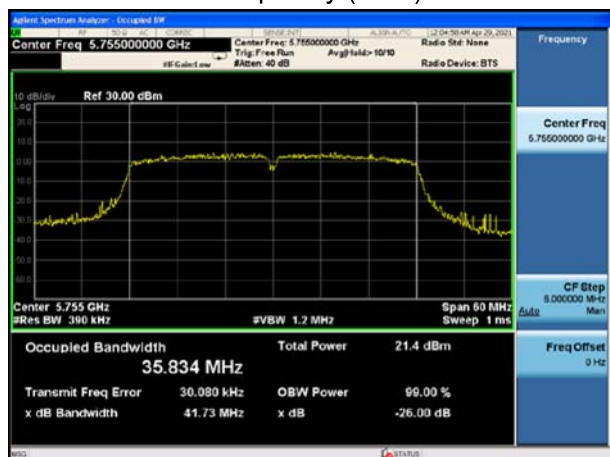
U-NII-3, 802.11a
Carrier frequency (MHz): 5825



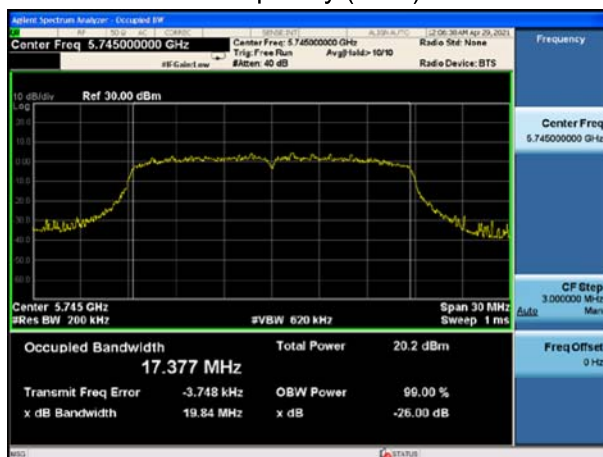
U-NII-3, 802.11n HT20
Carrier frequency (MHz): 5825



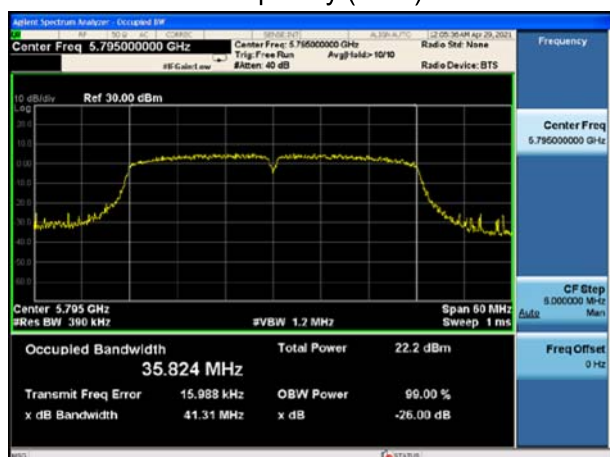
U-NII-3, 802.11n HT40
Carrier frequency (MHz): 5755



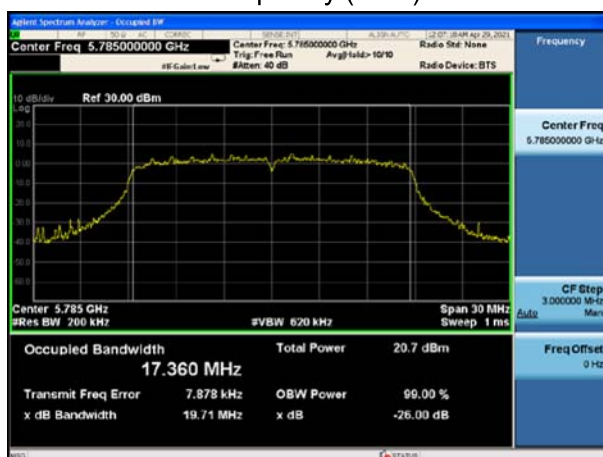
U-NII-3, 802.11ac VHT20
Carrier frequency (MHz): 5745



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



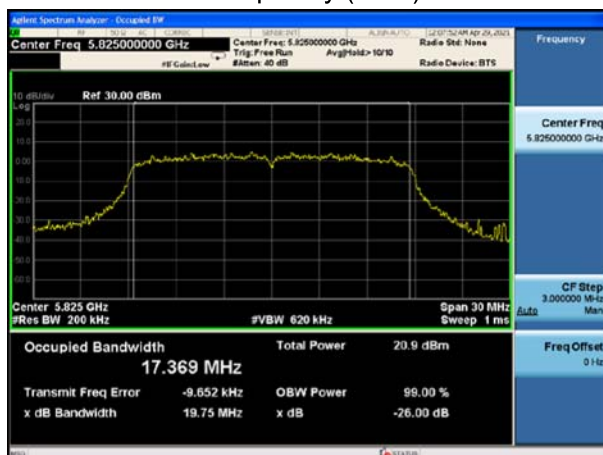
U-NII-3, 802.11ac VHT20
Carrier frequency (MHz): 5785



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



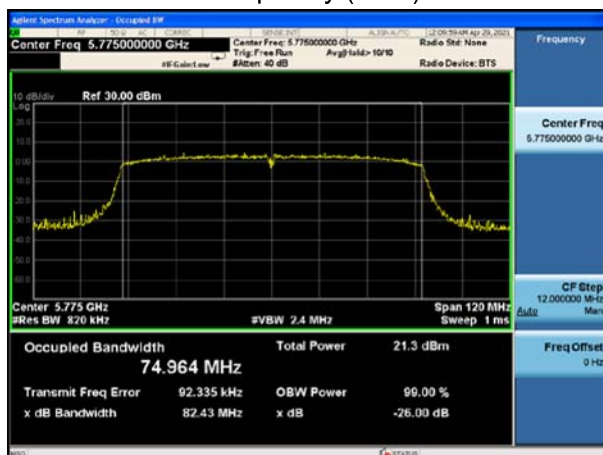
U-NII-3, 802.11ac VHT20
Carrier frequency (MHz): 5825



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

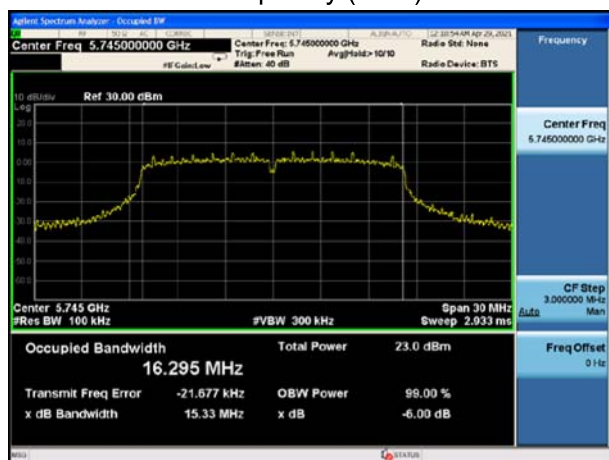


U-NII-3, 802.11ac VHT80
Carrier frequency (MHz): 5775

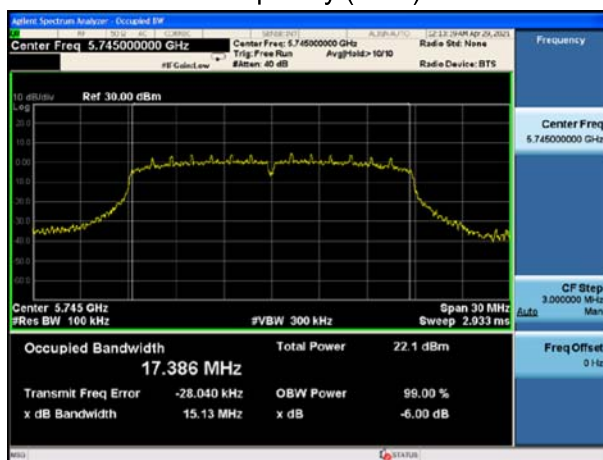


Minimum 6 dB bandwidth

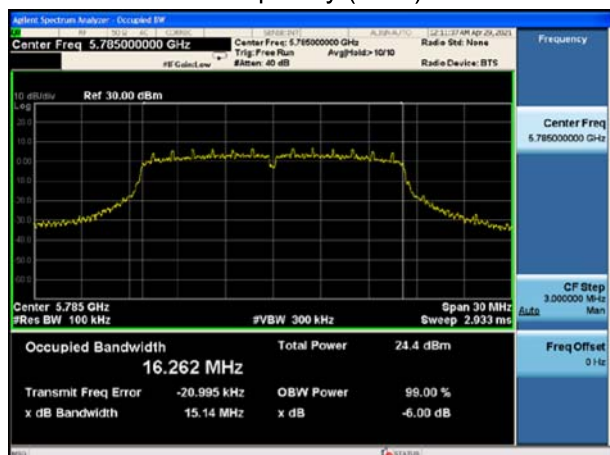
U-NII-3, 802.11a
Carrier frequency (MHz): 5745



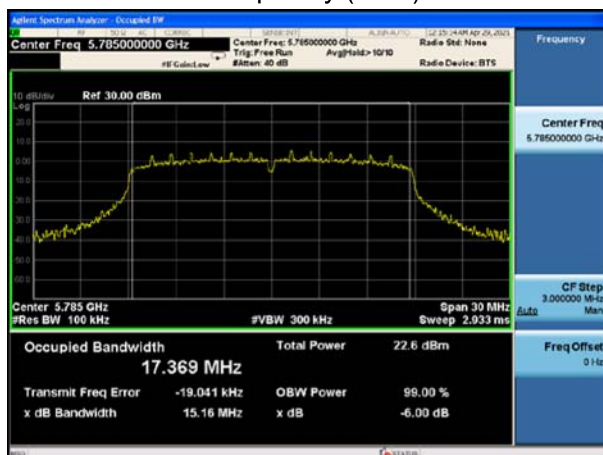
U-NII-3, 802.11n HT20
Carrier frequency (MHz): 5745



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



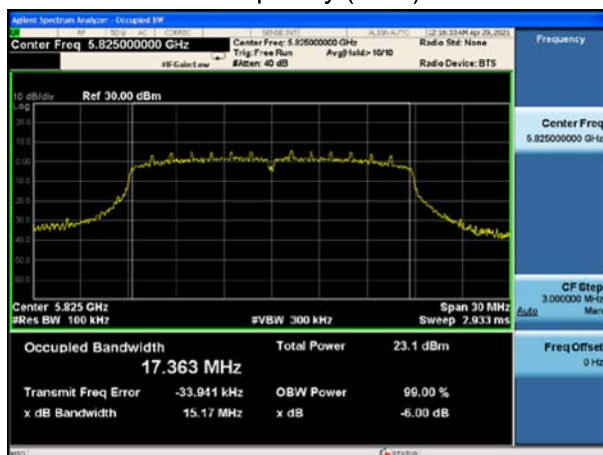
U-NII-3, 802.11n HT20
Carrier frequency (MHz): 5785



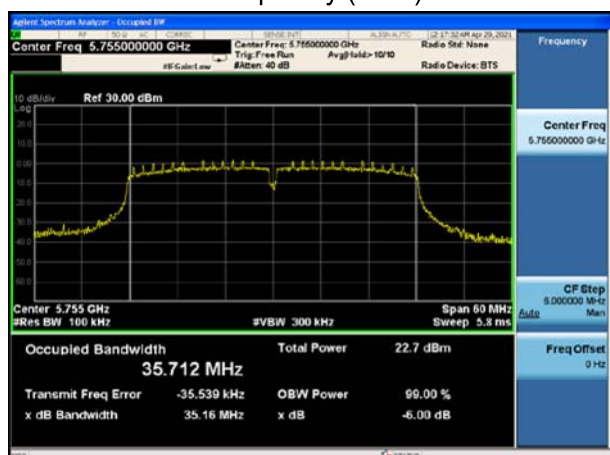
U-NII-3, 802.11a
Carrier frequency (MHz): 5825



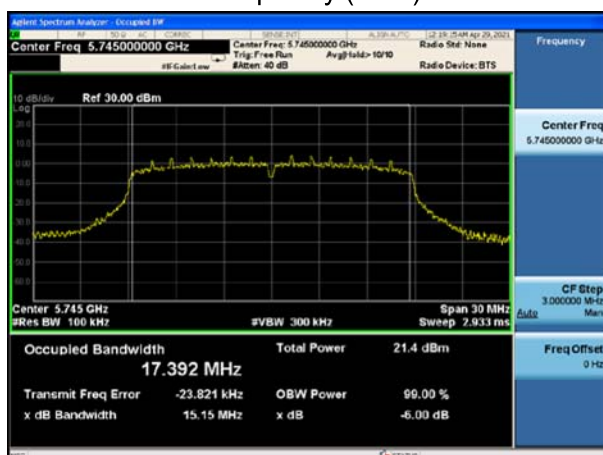
U-NII-3, 802.11n HT20
Carrier frequency (MHz): 5825



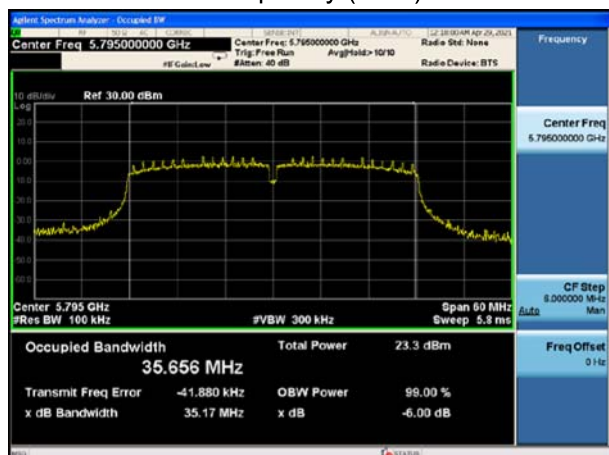
U-NII-3, 802.11n HT40
Carrier frequency (MHz): 5755



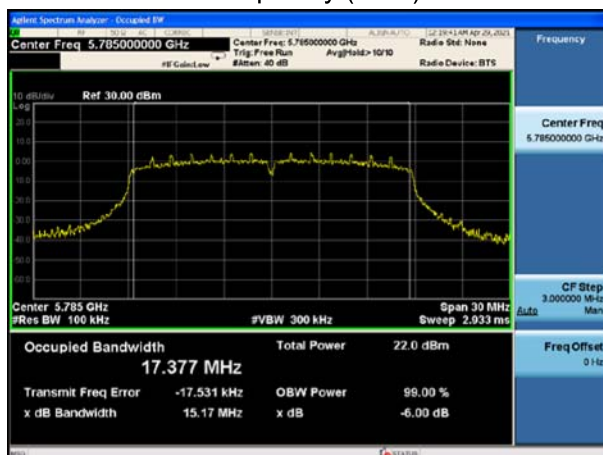
U-NII-3, 802.11ac VHT20
Carrier frequency (MHz): 5745



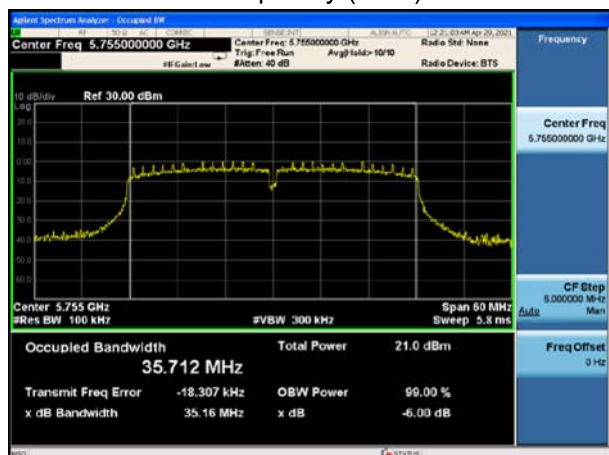
U-NII-3, 802.11n HT40
Carrier frequency (MHz): 5795



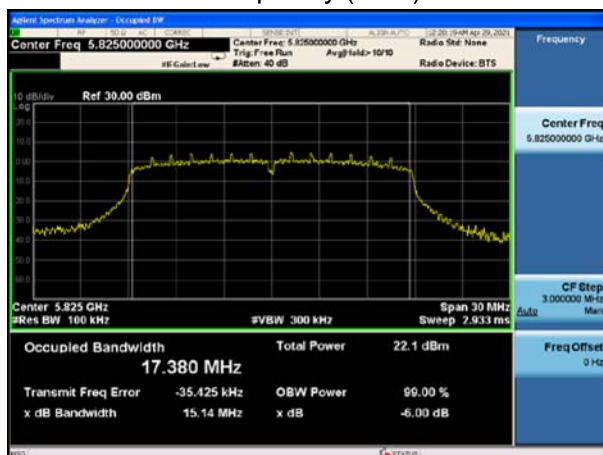
U-NII-3, 802.11ac VHT20
Carrier frequency (MHz): 5785



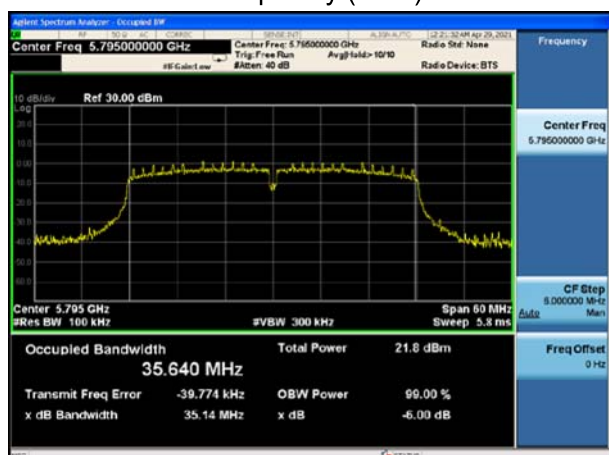
U-NII-3, 802.11ac VHT40
Carrier frequency (MHz): 5755



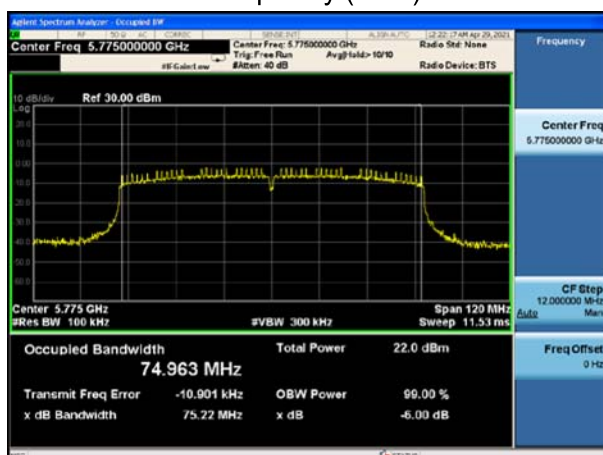
U-NII-3, 802.11ac VHT20
Carrier frequency (MHz): 5825



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



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



5.2. Average Power Output

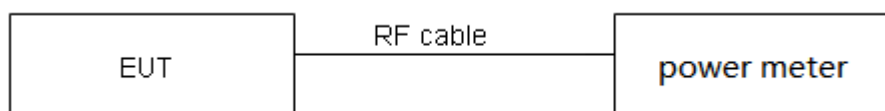
Ambient condition

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

Methods of Measurement

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

Test Setup



Limits

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

(1) For the band 5.15-5.25 GHz.

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

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

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

the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

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

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

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

Measurement Uncertainty

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



Test Results

Mode	T _{on} (ms)	T _(on+off) (ms)	Duty cycle	Duty cycle correction Factor(dB)
802.11a	2.03	2.14	0.95	0.23
802.11n HT20	1.88	2.05	0.92	0.37
802.11n HT40	0.93	1.08	0.86	0.65
802.11ac VHT20	1.91	2.02	0.95	0.24
802.11ac VHT40	0.94	1.10	0.85	0.72
802.11ac VHT80	0.46	0.59	0.78	1.10
Note: when Duty cycle ≥ 0.98 , Duty cycle correction Factor not required.				

Power Index								
Channel	802.11a	802.11n HT20	802.11ac VHT20	Channel	802.11n HT40	802.11ac VHT40	Channel	802.11ac VHT80
CH36	15	13.5	12.5	CH38	13.5	12	CH42	12
CH40	15	13.5	12.5	CH46	13.5	12	/	/
CH48	15	13.5	12.5	/	/	/	/	/
CH52	15	13.5	12.5	CH54	13.5	12	CH58	12
CH60	15	13.5	12.5	CH62	13.5	12	/	/
CH64	15	13.5	12.5	/	/	/	/	/
CH100	15	13.5	12.5	CH102	13.5	12	CH106	12
CH116	15	13.5	12.5	CH110	13.5	12	CH138	12
CH140	15	13.5	12.5	CH134	13.5	12	/	/
CH144	15	13.5	12.5	CH142	13.5	12	/	/
CH149	15	13.5	12.5	CH151	13.5	12	CH155	12
CH157	15	13.5	12.5	CH159	13.5	12	/	/
CH165	15	13.5	12.5	/	/	/	/	/



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	20.10	24.03>24	24.00
		60/5300	20.01	24.01>24	24.00
		64/5320	19.82	23.97<24	23.97
	802.11n HT20	52/5260	19.92	23.99<24	23.99
		60/5300	20.36	24.09>24	24.00
		64/5320	19.77	23.96<24	23.96
	802.11n HT40	54/5270	40.13	27.03>24	24.00
		62/5310	42.73	27.31>24	24.00
	802.11ac VHT20	52/5260	19.93	24.00	24.00
		60/5300	19.99	24.01>24	24.00
		64/5320	19.92	23.99<24	23.99
	802.11ac VHT40	54/5270	41.06	27.13>24	24.00
		62/5310	44.00	27.43>24	24.00
802.11ac VHT80	58/5290	83.33	30.21>24	24.00	
U-NII-2C	802.11a	100/5500	19.87	23.98<24	23.98
		116/5580	19.39	23.88<24	23.88
		140/5700	19.44	23.89<24	23.89
		144/5720	19.91	23.99<24	23.99
	802.11n HT20	100/5500	19.64	23.93<24	23.93
		116/5580	19.85	23.98<24	23.98
		140/5700	19.62	23.93<24	23.93
		144/5720	19.73	23.95<24	23.95
	802.11n HT40	102/5510	40.67	27.09>24	24.00
		110/5550	40.32	27.06>24	24.00
		134/5670	41.30	27.16>24	24.00
		142/5710	40.69	27.09>24	24.00
	802.11ac VHT20	100/5500	19.62	23.93<24	23.93
		116/5580	19.65	23.93<24	23.93
		140/5700	19.83	23.97<24	23.97
		144/5720	20.04	24.02>24	24.00
	802.11ac VHT40	102/5510	40.75	27.10>24	24.00
		110/5550	41.41	27.17>24	24.00
		134/5670	42.57	27.29>24	24.00
		142/5710	40.08	27.03>24	24.00
	802.11ac VHT80	106/5530	81.91	30.13>24	24.00
		138/5690	81.25	30.10>24	24.00

Note: 250mW=24dBm

Note: 250mW=24dBm



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

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	16.17	16.40	24	PASS
	40/5200	15.25	15.48	24	PASS
	48/5240	15.31	15.54	24	PASS
802.11n HT20	36/5180	14.24	14.61	24	PASS
	40/5200	13.58	13.95	24	PASS
	48/5240	13.75	14.12	24	PASS
802.11n HT40	38/5190	13.72	14.37	24	PASS
	46/5230	13.38	14.03	24	PASS
802.11ac VHT20	36/5180	13.62	13.86	24	PASS
	40/5200	12.63	12.87	24	PASS
	48/5240	12.71	12.95	24	PASS
802.11ac VHT40	38/5190	12.44	13.16	24	PASS
	46/5230	12.06	12.78	24	PASS
802.11ac VHT80	42/5210	12.08	13.18	24	PASS
Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor					