RF TEST REPORT

Applicant	Huawei Technologies Co., Ltd.
FCC ID	QISAGS2-L09
Product	Tablet
Model	AGS2-L09
Report No.	R1806H0068-R6V1
Issue Date	July 5, 2018

TA Technology (Shanghai) Co., Ltd. tested the above equipment in accordance with the requirements in **FCC CFR47 Part 15E (2018)**. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Zhengqiang Zhou

Performed by: Zhengqiang Zhou

Kai Xu

Approved by: Kai Xu

TA Technology (Shanghai) Co., Ltd.

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Summary of measurement results

Number	Summary of measurements of results	Clause in FCC rules	Verdict
1	Average conducted output power	15.407(a)	PASS
2	Occupied bandwidth	15.407(e)	PASS
3	Frequency stability	15.407(g)	PASS
4	Maximum power spectral density	15.407(a)	PASS
5	Unwanted Emissions	15.407(b)	PASS
6	Conducted Emissions	15.207	PASS
Date of Testing: June 6, 2018 ~ June 22, 2018			

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

CNAS (accreditation number: L2264)

TA Technology (Shanghai) Co., Ltd. has obtained the accreditation of China National Accreditation Service for Conformity Assessment (CNAS).

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.

IC (recognition number is 8510A)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Canada to perform electromagnetic emission measurement.

VCCI (recognition number is C-4595, T-2154, R-4113, G-10766)

TA Technology (Shanghai) Co., Ltd. has been listed by industry Japan to perform electromagnetic emission measurement.

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

Client Information

Applicant	Huawei Technologies Co., Ltd.
Applicant address	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.China.
Manufacturer	Huawei Technologies Co., Ltd.
Manufacturer address	Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.China.

General information

EUT Description	
Model	AGS2-L09
IMEI	004401721143986
Hardware Version	A6t6e
Software Version	AGS2-L09 8.0.0.1(SP1C432log）
Power Supply	Battery/AC adapter
Antenna Type	Internal Antenna
Antenna Gain	1 dBi
additional beamforming gain	NA
Test Mode(s)	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. Conducted Power	4.25 dBm
Operating Frequency Range(s)	U-NII-1: 5150-5250MHz U-NII-2A:5250-5350MHz U-NII-2C:5470-5725MHz U-NII-3: 5725-5850MHz
Operating temperature range:	0° C to 35° C
Operating voltage range:	3.6V to 4.3 V
State DC voltage:	3.8V
EUT Accessory	

Adapter 1	Manufacturer: Huawei Technologies Co., Ltd. Model: HW-050100E01
Adapter 2	Manufacturer: Huawei Technologies Co., Ltd. Model: HW-050100B01
Adapter 3	Manufacturer: Huawei Technologies Co., Ltd. Model: HW-050100A01
Adapter 4	Manufacturer: Huawei Technologies Co., Ltd. Model: HW-050100U01
Battery	Manufacturer: Huawei Technologies Co., Ltd. (SCUD) Model: HB2899C0ECW-C
USB Extend Cable	100cm Cable, Signal Cable, USB2.0, 5V 1A
Note: The information of the EUT is declared by the manufacturer.	

3. Applied Standards

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

FCC CFR47 Part 15E (2018) Unlicensed National Information Infrastructure Devices

ANSI C63.10 (2013)

KDB 789033 D02 General UNII Test Procedures New Rules v02r01

KDB 662911 D01 Multiple Transmitter Output v02r01

4. Test Configuration

Test Mode

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

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

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

Worst-case data rates are shown as following table.

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

Wireless Technology and Frequency Range

Wireless Technology		Bandwidth	Channel	Frequency
Wi-Fi	U-NII-1	20 MHz	36	5180MHz
			40	5200MHz
			44	5220MHz
			48	5240MHz
		40 MHz	38	5190MHz
			46	5230MHz
		80 MHz	42	5210MHz
	U-NII-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
			144	5720MHz
		40 MHz	102	5510MHz
			110	5550MHz
			118	5590MHz
			126	5630MHz
			134	5670MHz
			142	5710MHz
		80 MHz	106	5530MHz
			122	5610MHz
			138	5690MHz
	U-NII-3	20 MHz	149	5745MHz
			153	5765MHz
			157	5785MHz

			161	5805MHz
			165	5825MHz
		40 MHz	151	5755MHz
			159	5795MHz
		80 MHz	155	5775MHz
Does this device support TPC Function? ☐Yes ☒No				
Does this device support TDWR Band? ☒Yes ☐No				

5. Test Case Results

5.1. Occupied Bandwidth

Ambient condition

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

Method of Measurement

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

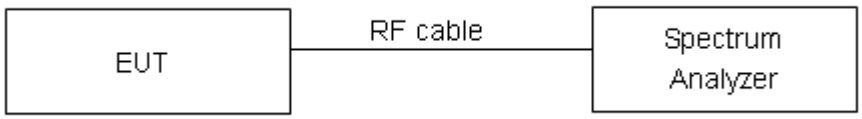
For U-NII-1, set RBW ≈1% OCB kHz, VBW ≥ 3 × RBW, measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 26 dB relative to the maximum level measured in the fundamental emission.

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

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

Use the 99 % power bandwidth function of the instrument

Test Setup



Limits

Rule FCC Part §15.407(e)

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

Measurement Uncertainty

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

Test Results:

U-NII-1

Network Standards	Carrier frequency (MHz)	99% bandwidth (MHz)	Minimum 26 dB bandwidth (MHz)	Conclusion
802.11a	5180	16.503	19.50	PASS
	5200	16.525	19.26	PASS
	5240	16.515	19.01	PASS
802.11n HT20	5180	17.615	19.99	PASS
	5200	17.610	19.80	PASS
	5240	17.613	19.85	PASS
802.11n HT40	5190	35.956	39.28	PASS
	5230	35.930	38.95	PASS
802.11ac VHT20	5180	17.626	19.87	PASS
	5200	17.617	20.06	PASS
	5240	17.621	19.67	PASS
802.11ac VHT40	5190	35.985	39.13	PASS
	5230	35.965	38.82	PASS
802.11ac VHT80	5210	74.964	79.87	PASS

U-NII-2A

Network Standards	Carrier frequency (MHz)	99% bandwidth (MHz)	Minimum 26 dB bandwidth (MHz)	Conclusion
802.11a	5260	16.499	19.41	PASS
	5300	16.522	19.22	PASS
	5320	16.530	19.31	PASS
802.11n HT20	5260	17.594	19.87	PASS
	5300	17.617	19.85	PASS
	5320	17.612	19.76	PASS
802.11n HT40	5270	35.959	38.76	PASS
	5310	35.973	39.06	PASS
802.11ac VHT20	5260	17.610	19.89	PASS
	5300	17.622	19.60	PASS
	5320	17.622	19.76	PASS
802.11ac VHT40	5270	35.966	38.93	PASS
	5310	35.954	39.18	PASS
802.11ac VHT80	5290	74.959	80.24	PASS

U-NII-2C

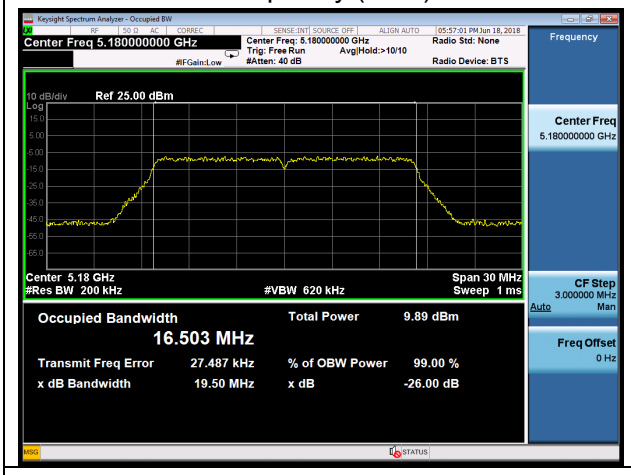
Network Standards	Carrier frequency (MHz)	99% bandwidth (MHz)	Minimum 26 dB bandwidth (MHz)	Conclusion
802.11a	5500	16.522	19.23	PASS
	5580	16.508	19.13	PASS
	5700	16.496	19.13	PASS
	5720	16.539	19.30	PASS
802.11n HT20	5500	17.614	19.82	PASS
	5580	17.603	20.23	PASS
	5700	17.640	19.83	PASS
	5720	17.619	19.92	PASS
802.11n HT40	5510	36.000	39.50	PASS
	5550	36.005	38.78	PASS
	5670	35.972	39.30	PASS
	5710	35.958	39.08	PASS
802.11ac VHT20	5500	17.634	19.89	PASS
	5580	17.630	19.59	PASS
	5700	17.617	19.66	PASS
	5720	17.605	19.83	PASS
802.11ac VHT40	5510	35.979	39.28	PASS
	5550	35.967	39.06	PASS
	5670	35.986	39.34	PASS
	5710	35.966	39.03	PASS
802.11ac VHT80	5530	75.054	80.36	PASS
	5690	75.072	80.52	PASS

U-NII-3

Network Standards	Carrier frequency (MHz)	99% bandwidth (MHz)	Minimum 6 dB bandwidth (MHz)	Limit (kHz)	Conclusion
802.11a	5745	16.523	16.38	500	PASS
	5785	16.518	16.37	500	PASS
	5825	16.507	16.38	500	PASS
802.11n HT20	5745	17.623	17.60	500	PASS
	5785	17.630	17.62	500	PASS
	5825	17.661	17.61	500	PASS
802.11n HT40	5755	35.943	35.18	500	PASS
	5795	35.968	35.54	500	PASS
802.11ac VHT20	5745	17.632	17.61	500	PASS
	5785	17.633	17.61	500	PASS
	5825	17.649	17.62	500	PASS
802.11ac VHT40	5755	35.947	35.17	500	PASS
	5795	36.019	35.34	500	PASS
802.11ac VHT80	5775	74.915	75.20	500	PASS

U-NII-1, 802.11a

Carrier frequency (MHz): 5180



U-NII-1, 802.11n HT20

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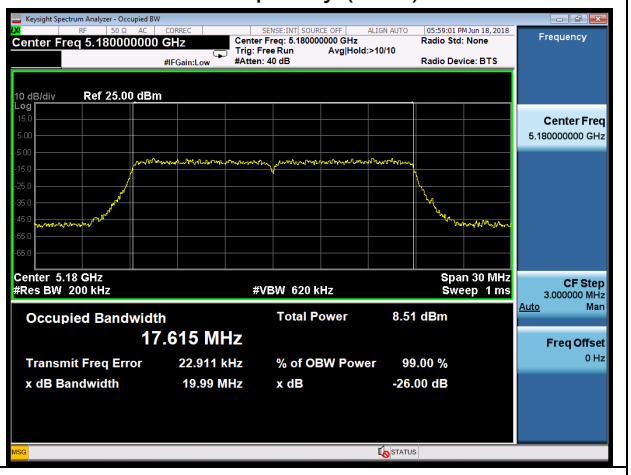

U-NII-1, 802.11a

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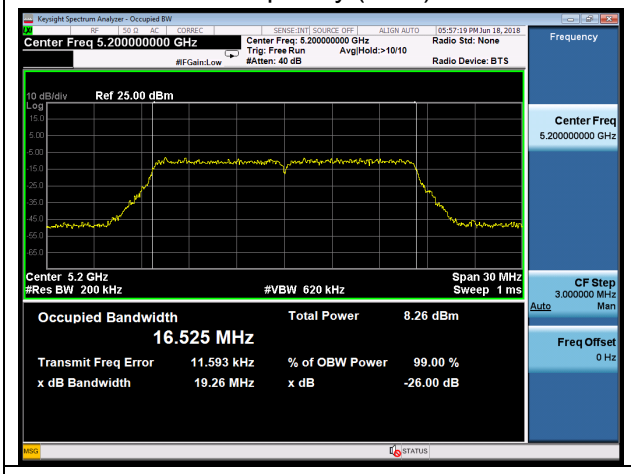

U-NII-1, 802.11n HT20

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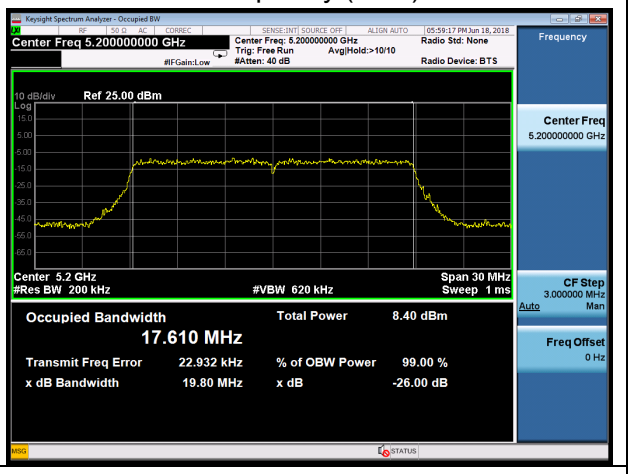
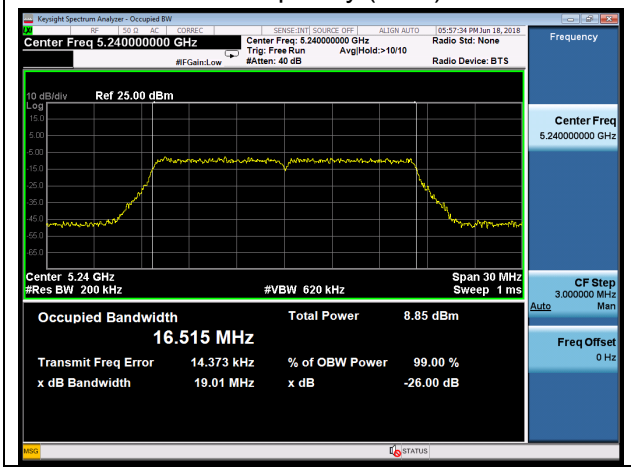


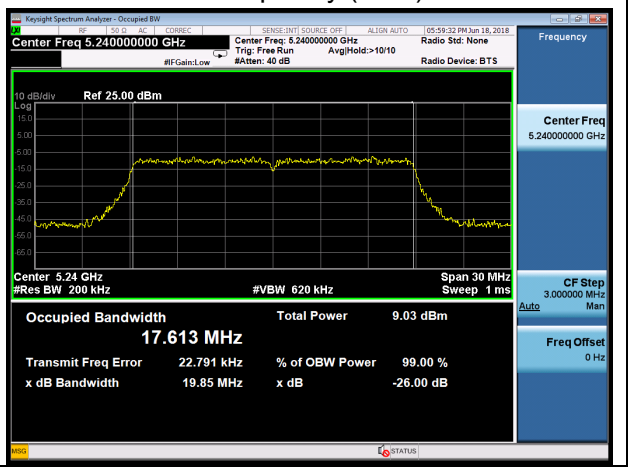
U-NII-1, 802.11a

Carrier frequency (MHz):5240



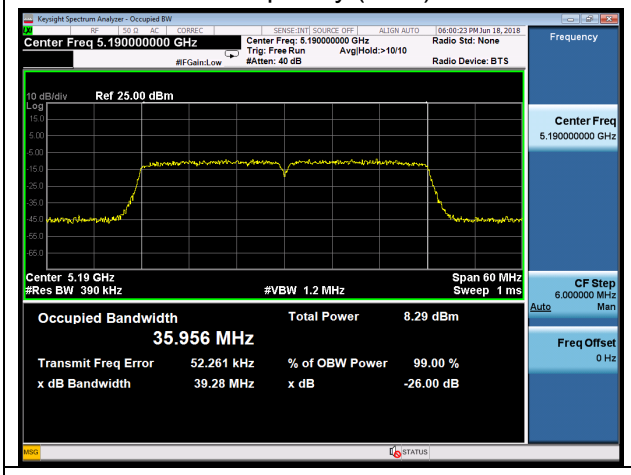
U-NII-1, 802.11n HT20

Carrier frequency (MHz):5240



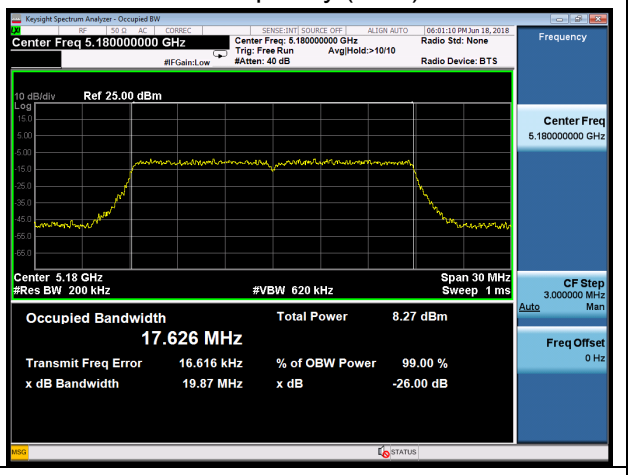
U-NII-1, 802.11n HT40

Carrier frequency (MHz): 5190



U-NII-1, 802.11ac VHT20

Carrier frequency (MHz): 5180



U-NII-1, 802.11n HT40

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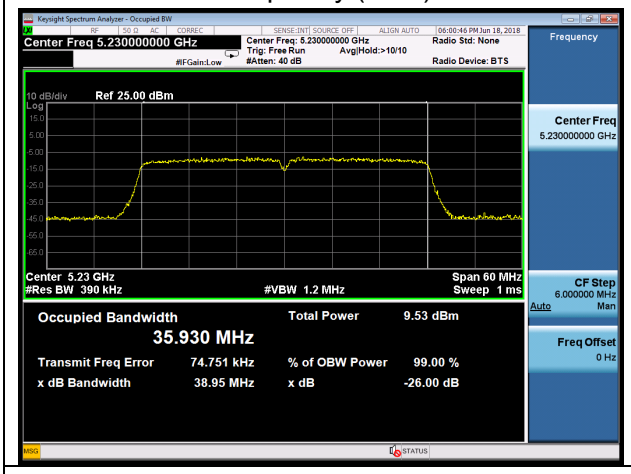

U-NII-1, 802.11ac VHT20

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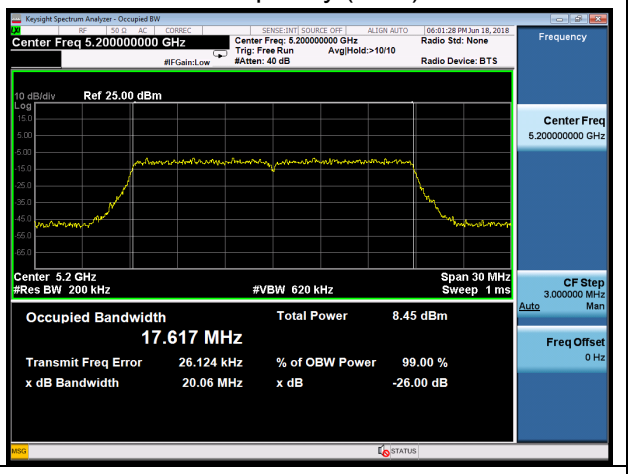
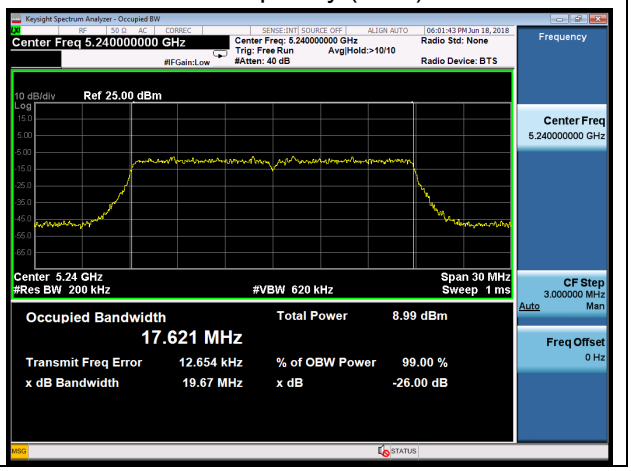


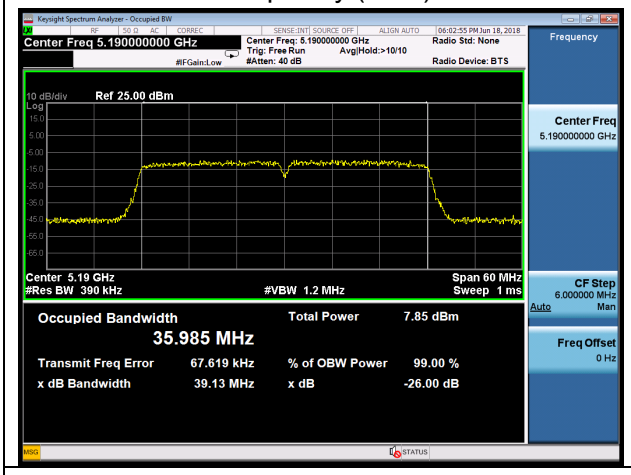
U-NII-1, 802.11ac VHT20

Carrier frequency (MHz):5240



U-NII-1, 802.11ac VHT40

Carrier frequency (MHz): 5190



U-NII-1, 802.11ac VHT80

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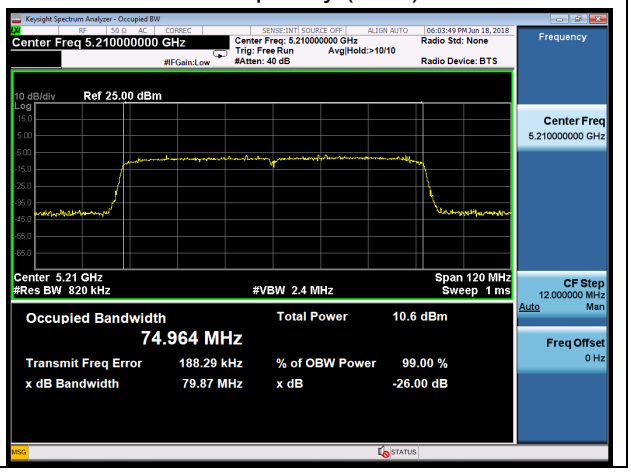
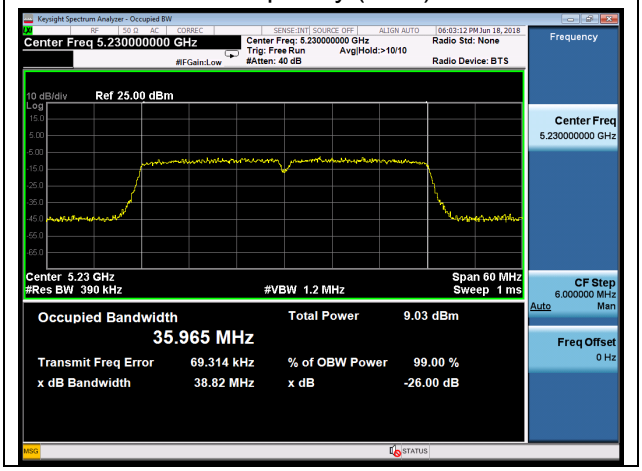


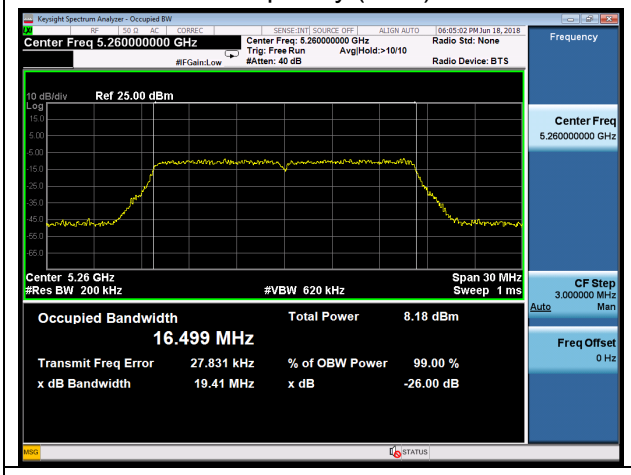
U-NII-1, 802.11ac VHT40

Carrier frequency (MHz): 5230



U-NII-2A, 802.11a

Carrier frequency (MHz): 5260



U-NII-2A, 802.11n HT20

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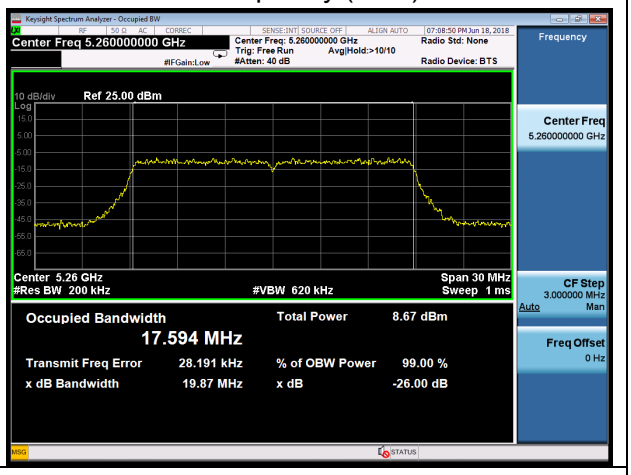

U-NII-2A, 802.11a

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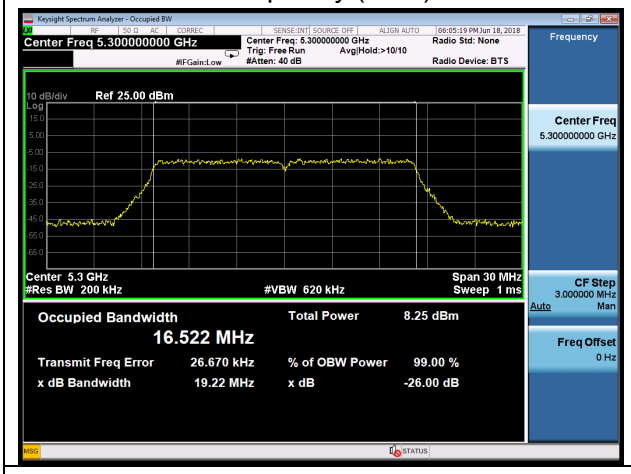

U-NII-2A, 802.11n HT20

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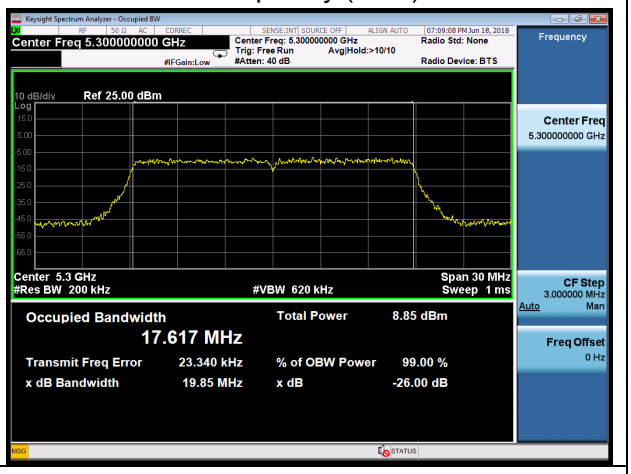
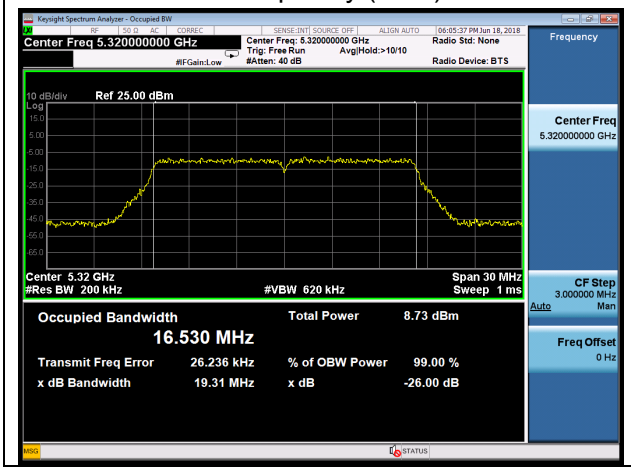


U-NII-2A, 802.11a

Carrier frequency (MHz):5320



U-NII-2A, 802.11n HT20

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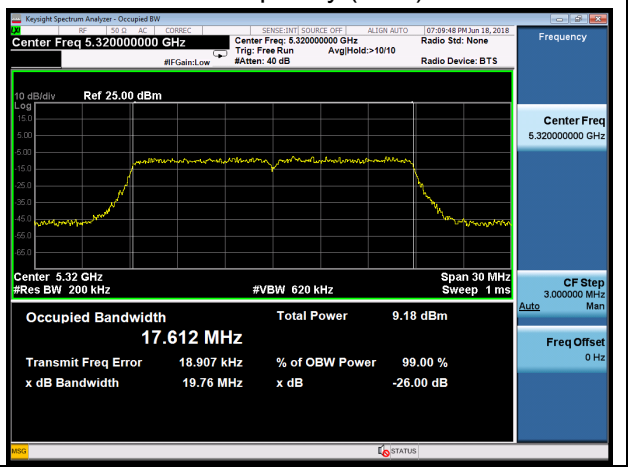
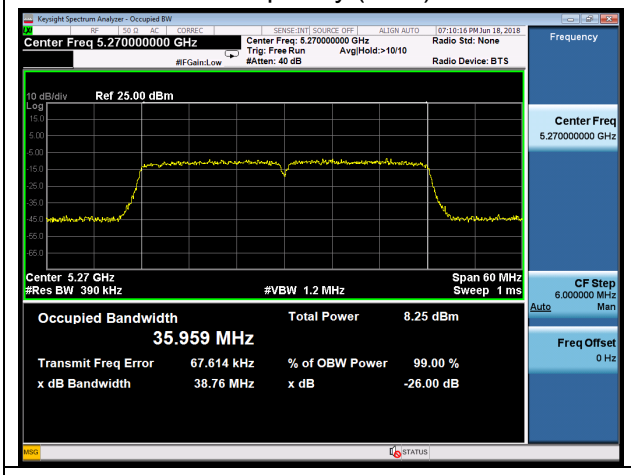


U-NII-2A, 802.11n HT40

Carrier frequency (MHz): 5270



U-NII-2A, 802.11ac VHT20

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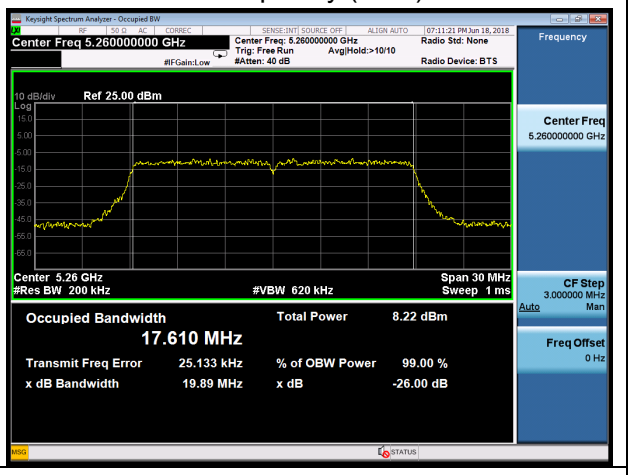

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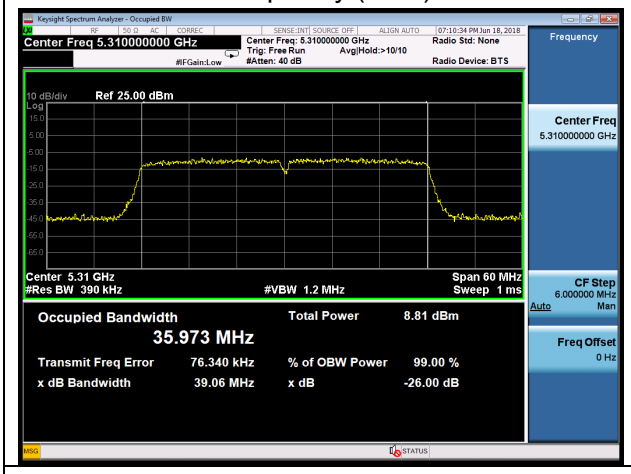

U-NII-2A, 802.11ac VHT20

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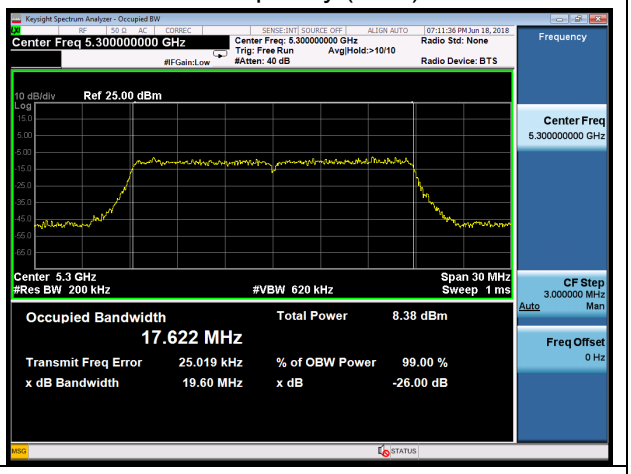

U-NII-2A, 802.11ac VHT20

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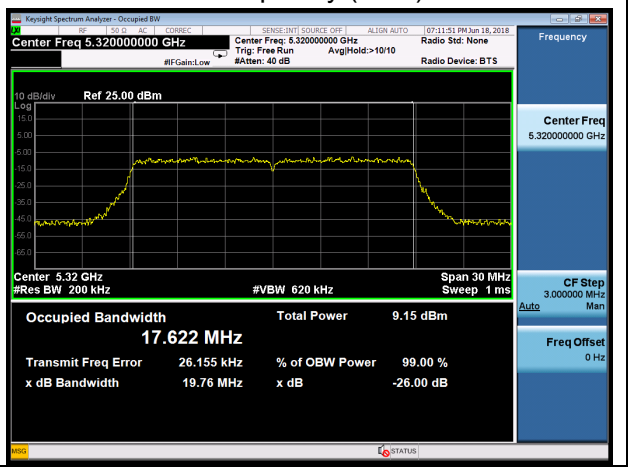

U-NII-2A, 802.11ac VHT40

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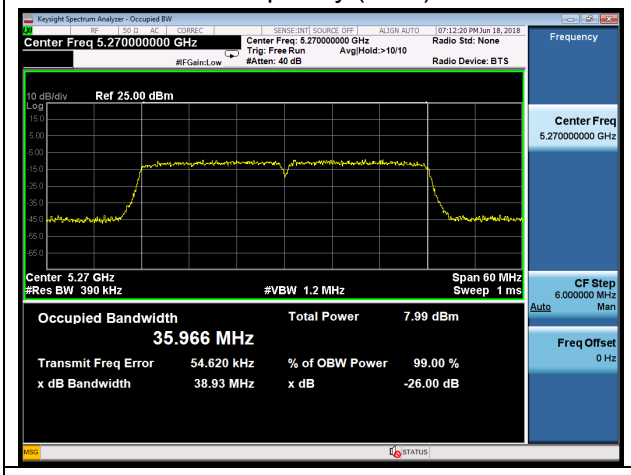
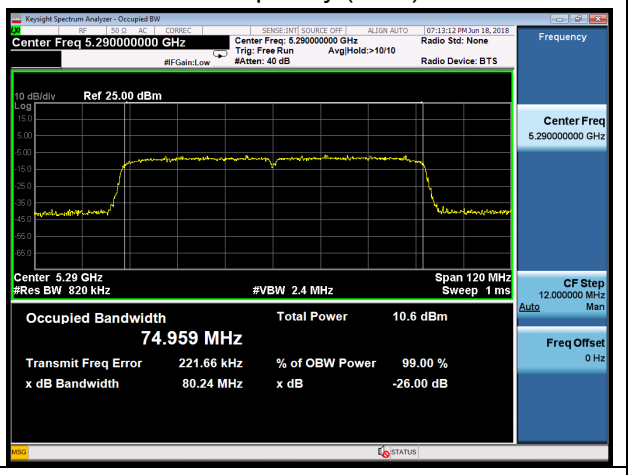


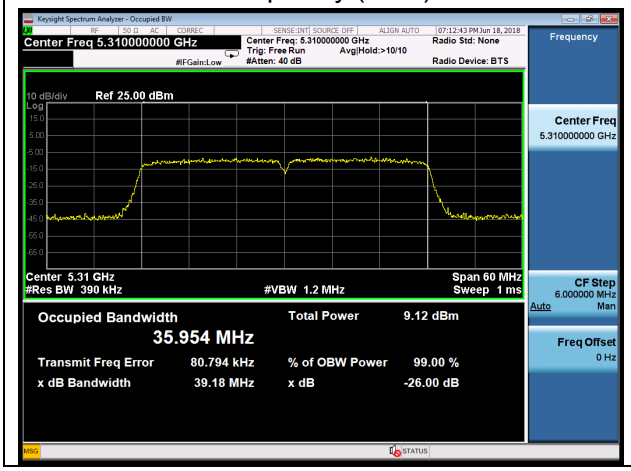
U-NII-2A, 802.11ac VHT80

Carrier frequency (MHz): 5290



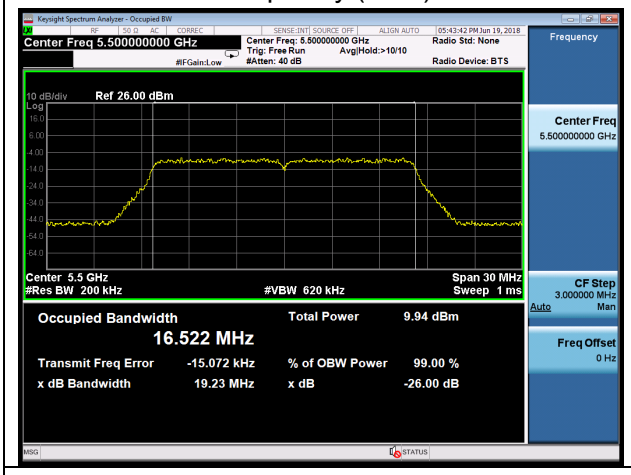
U-NII-2A, 802.11ac VHT40

Carrier frequency (MHz): 5310



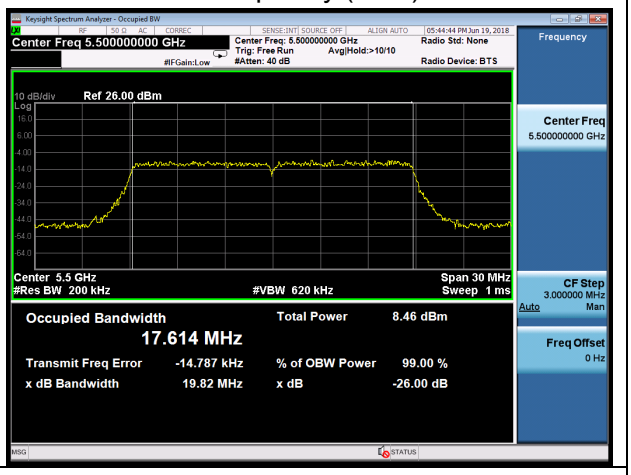
U-NII-2C, 802.11a

Carrier frequency (MHz): 5500



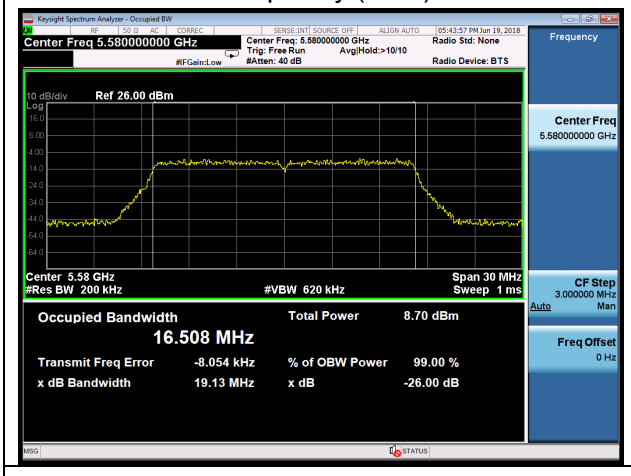
U-NII-2C, 802.11n HT20

Carrier frequency (MHz): 5500



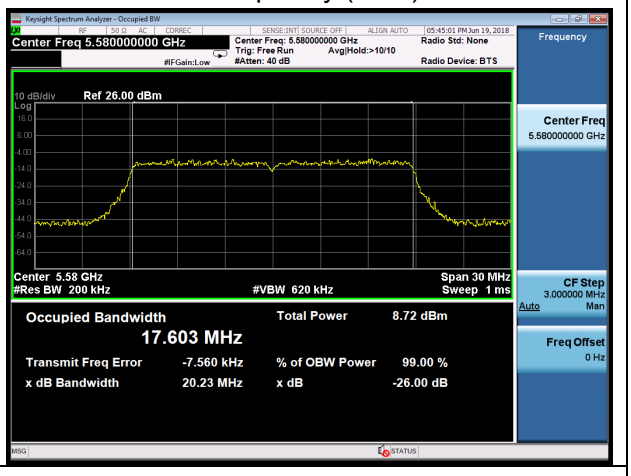
U-NII-2C, 802.11a

Carrier frequency (MHz): 5580



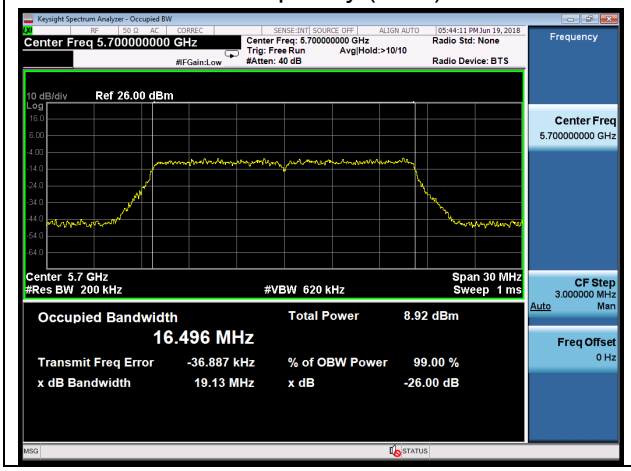
U-NII-2C, 802.11n HT20

Carrier frequency (MHz): 5580



U-NII-2C, 802.11a

Carrier frequency (MHz):5700

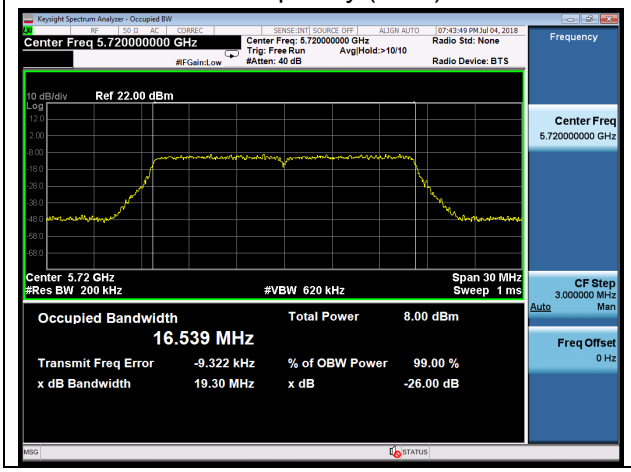


U-NII-2C, 802.11n HT20

Carrier frequency (MHz):5700

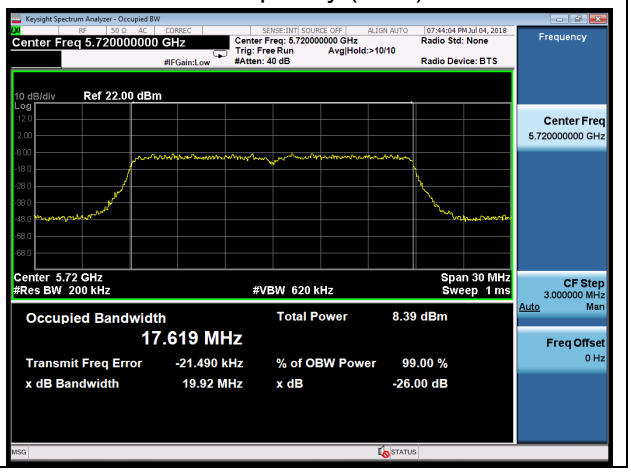
U-NII-2C, 802.11a

Carrier frequency (MHz):5720



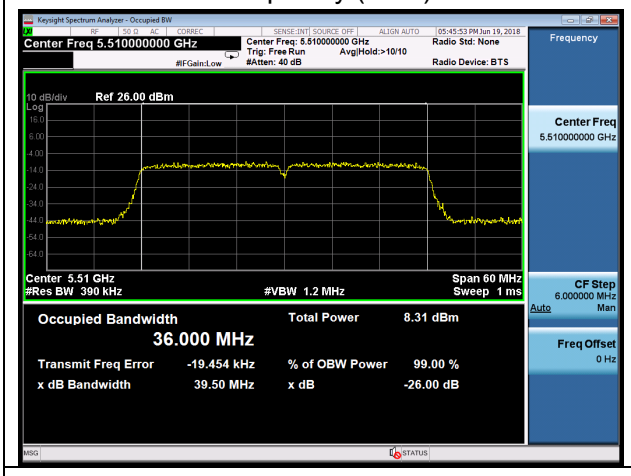
U-NII-2C, 802.11n HT20

Carrier frequency (MHz):5720



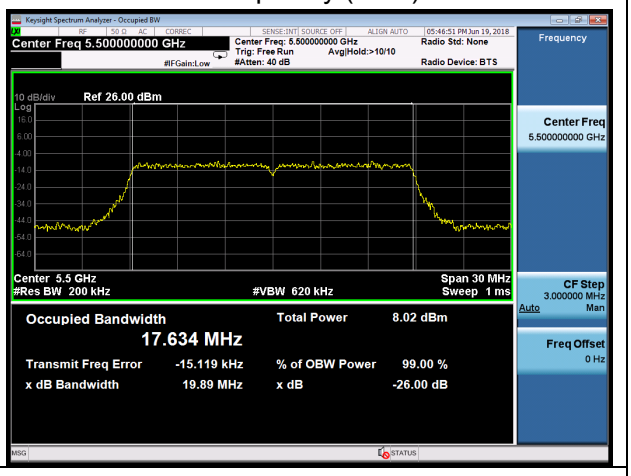
U-NII-2C, 802.11n HT40

Carrier frequency (MHz): 5510



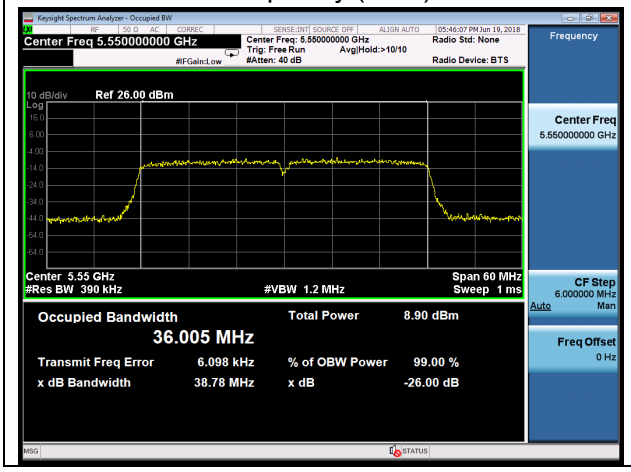
U-NII-2C, 802.11ac VHT20

Carrier frequency (MHz): 5500



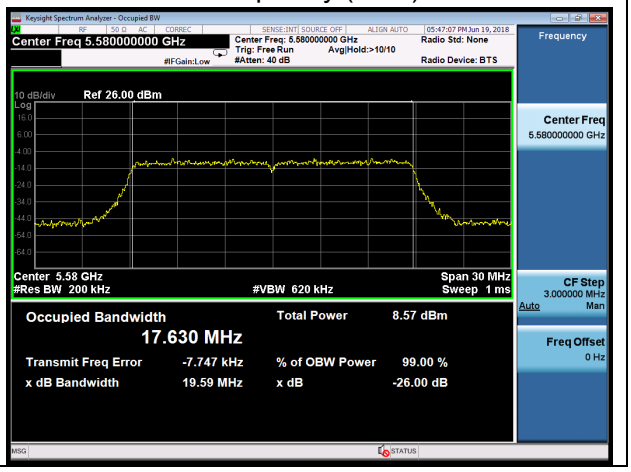
U-NII-2C, 802.11n HT40

Carrier frequency (MHz): 5550



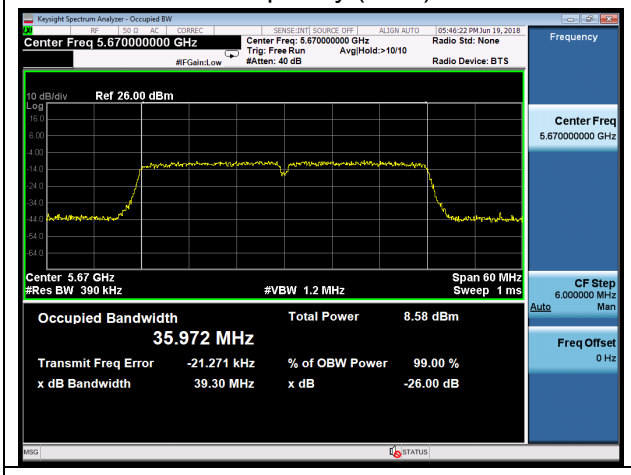
U-NII-2C, 802.11ac VHT20

Carrier frequency (MHz): 5580



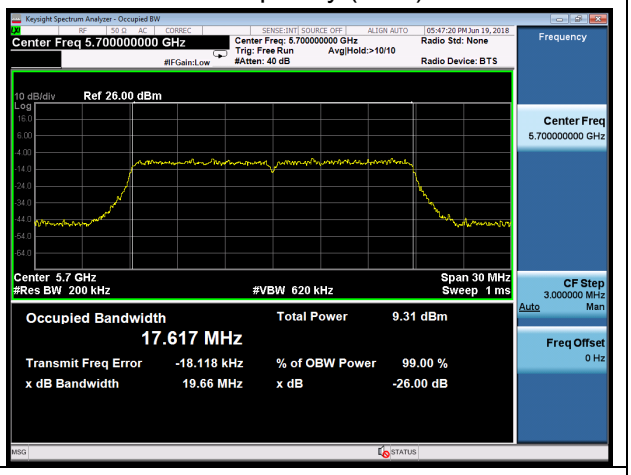
U-NII-2C, 802.11n HT40

Carrier frequency (MHz): 5670



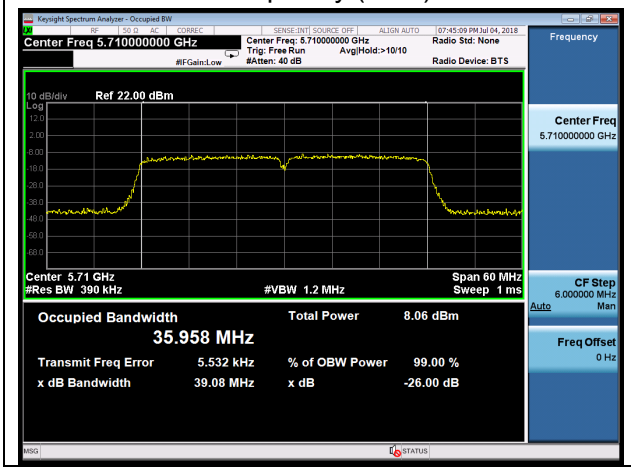
U-NII-2C, 802.11ac VHT20

Carrier frequency (MHz):5700



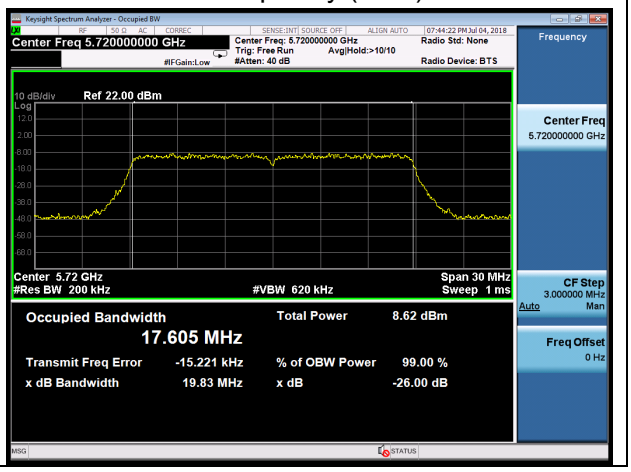
U-NII-2C, 802.11n HT40

Carrier frequency (MHz): 5710

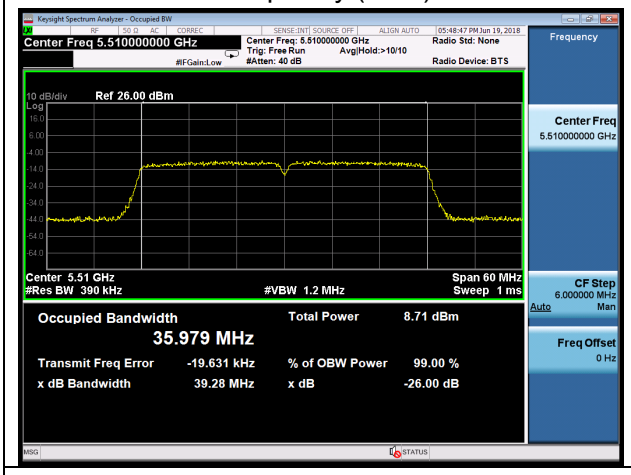


U-NII-2C, 802.11ac VHT20

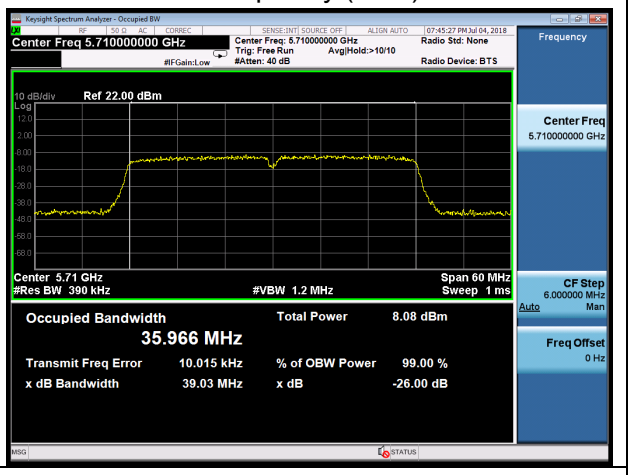
Carrier frequency (MHz):5720



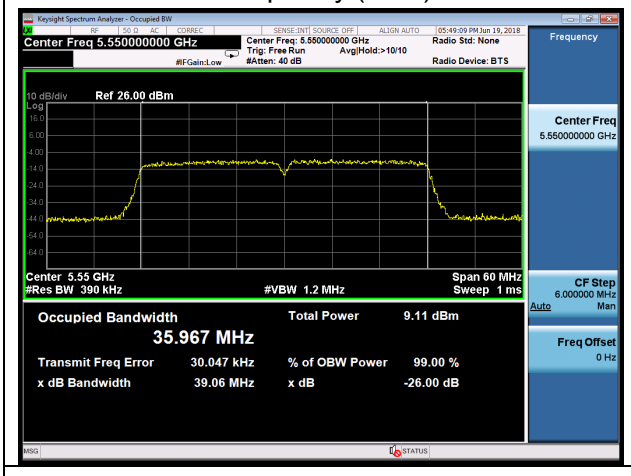
U-NII-2C, 802.11ac VHT40
Carrier frequency (MHz): 5510



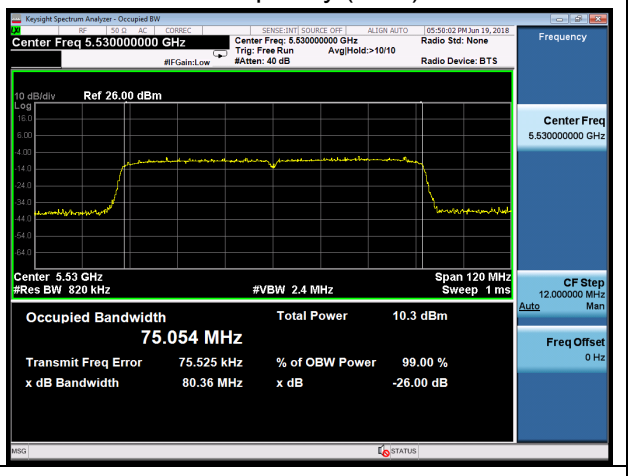
U-NII-2C, 802.11ac VHT40
Carrier frequency (MHz): 5710



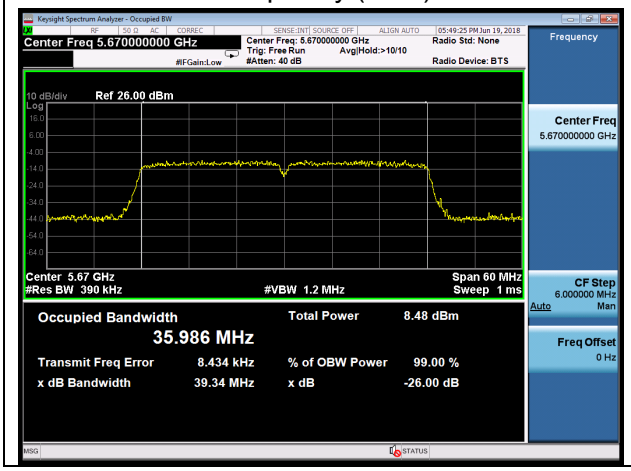
U-NII-2C, 802.11ac VHT40
Carrier frequency (MHz): 5550



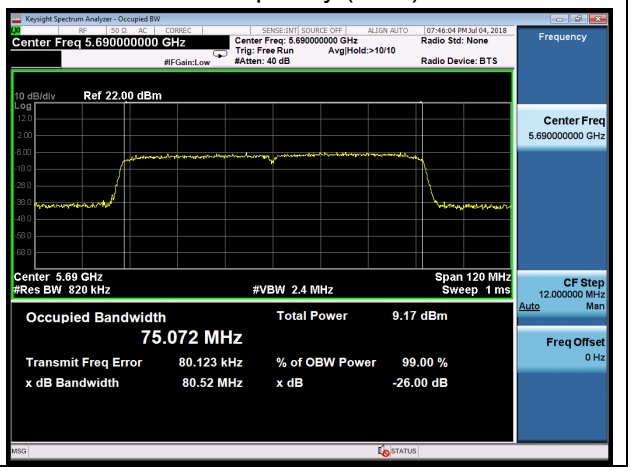
U-NII-2C, 802.11ac VHT80
Carrier frequency (MHz): 5530



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



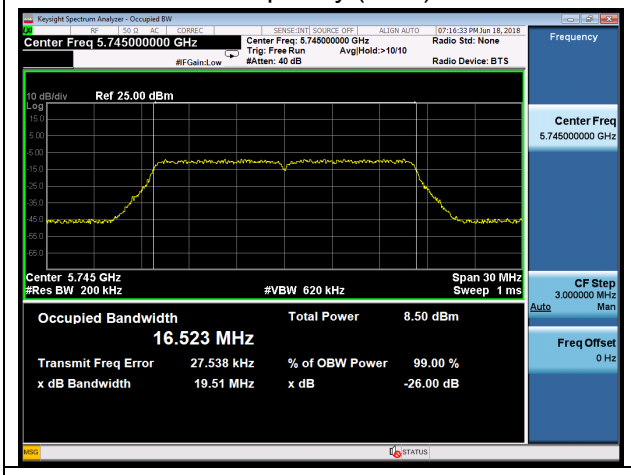
U-NII-2C, 802.11ac VHT80
Carrier frequency (MHz): 5690



99% bandwidth

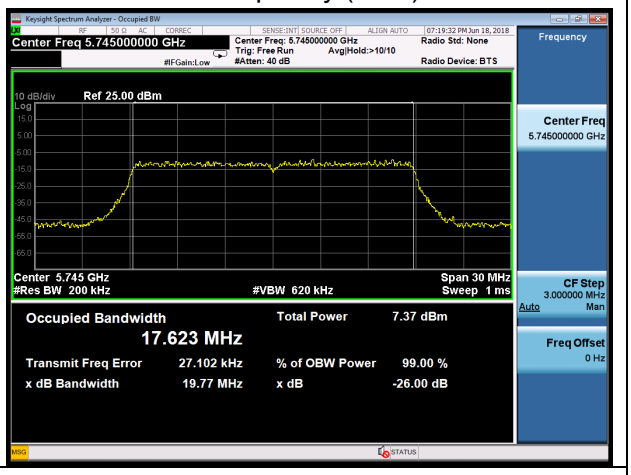
U-NII-3, 802.11a

Carrier frequency (MHz): 5745



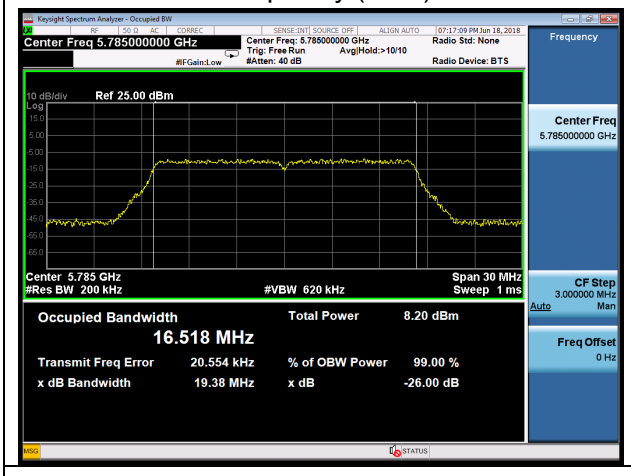
U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5745



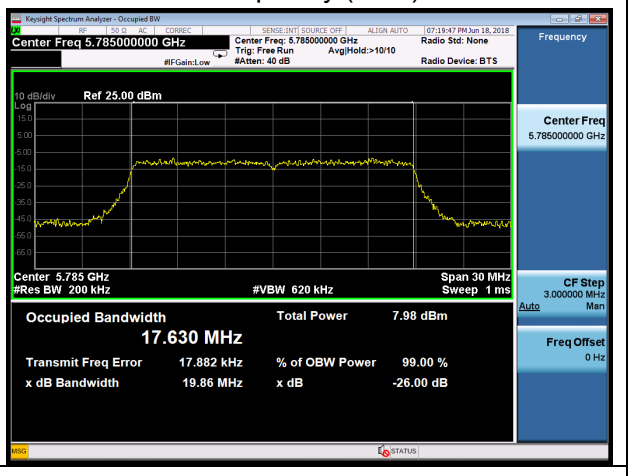
U-NII-3, 802.11a

Carrier frequency (MHz): 5785



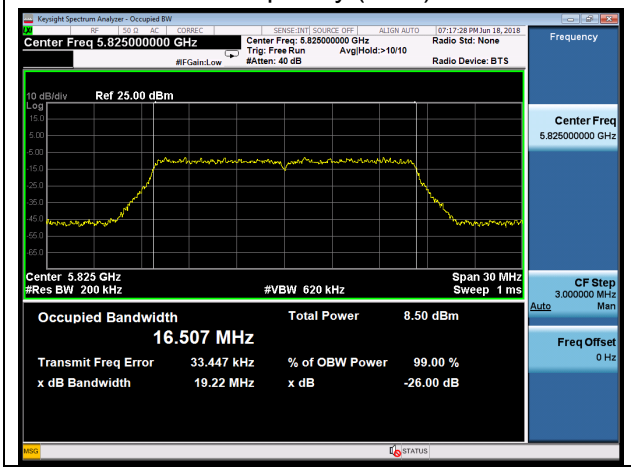
U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5785



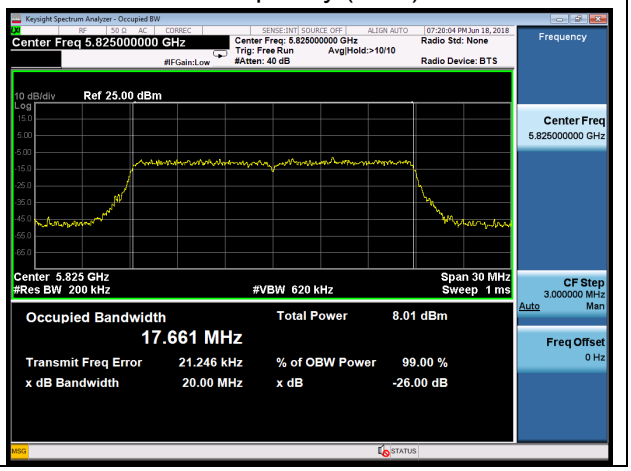
U-NII-3, 802.11a

Carrier frequency (MHz): 5825



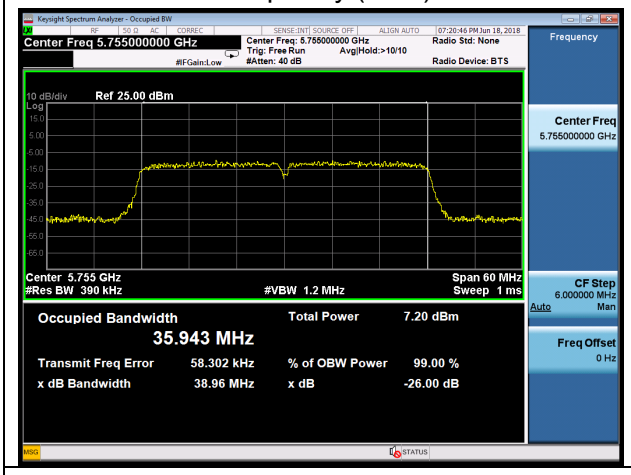
U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5825



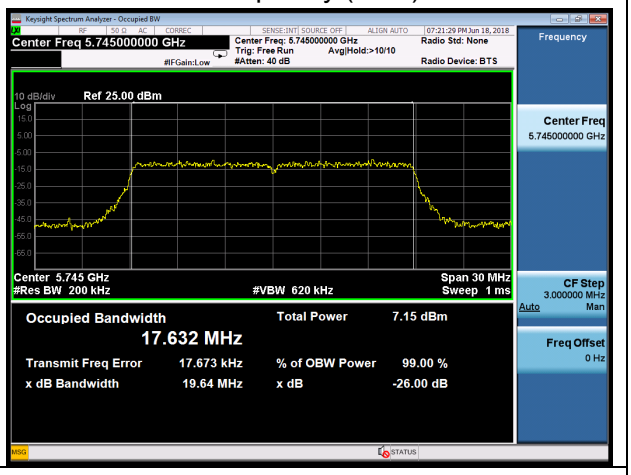
U-NII-3, 802.11n HT40

Carrier frequency (MHz): 5755



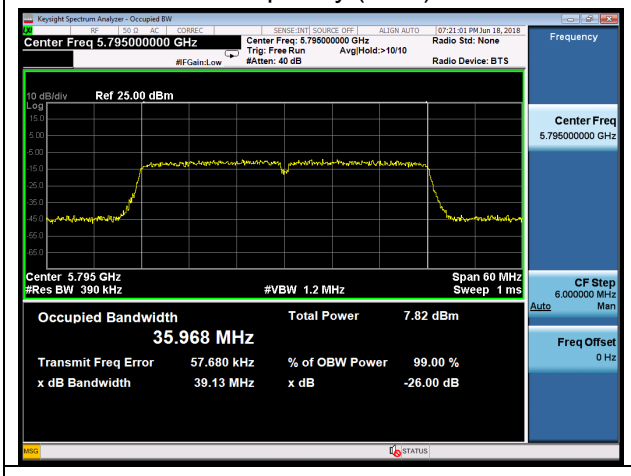
U-NII-3, 802.11ac VHT20

Carrier frequency (MHz): 5745



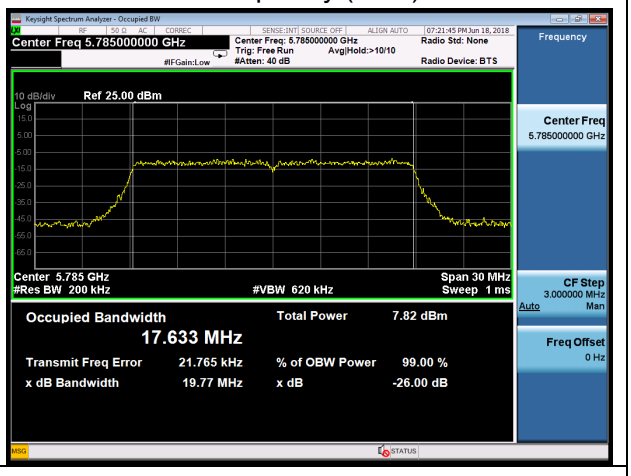
U-NII-3, 802.11n HT40

Carrier frequency (MHz): 5795



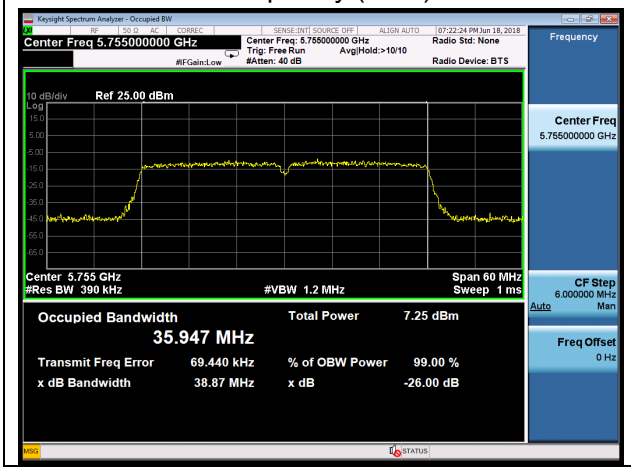
U-NII-3, 802.11ac VHT20

Carrier frequency (MHz): 5785



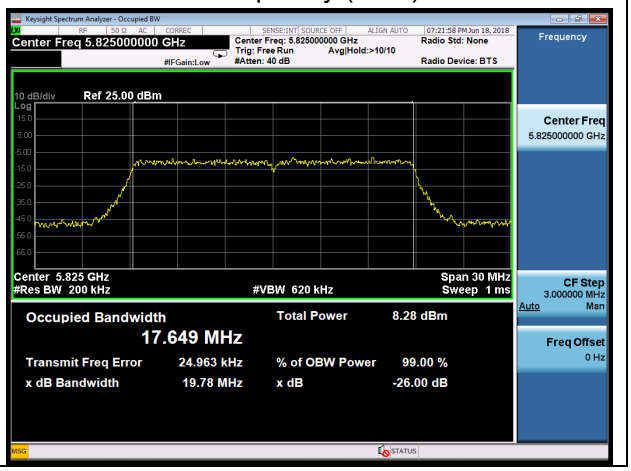
U-NII-3, 802.11ac VHT40

Carrier frequency (MHz): 5755



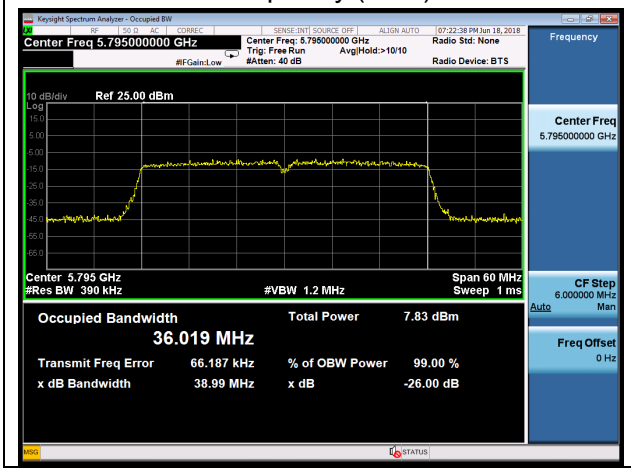
U-NII-3, 802.11ac VHT20

Carrier frequency (MHz): 5825



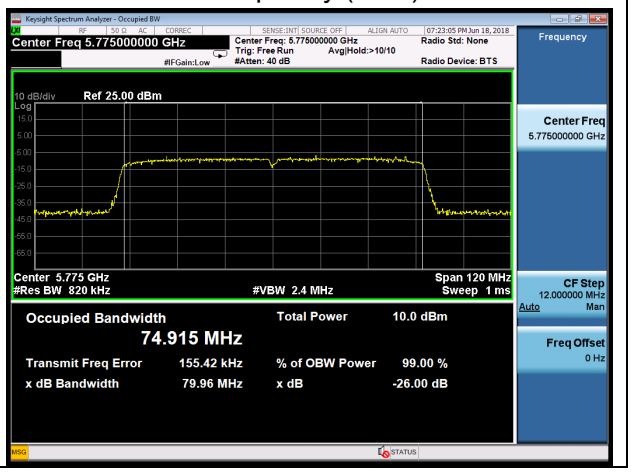
U-NII-3, 802.11ac VHT40

Carrier frequency (MHz): 5795



U-NII-3, 802.11ac VHT80

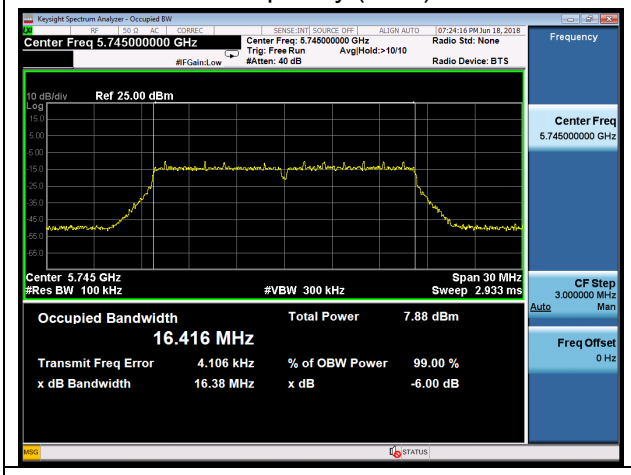
Carrier frequency (MHz): 5775



Minimum 6 dB bandwidth

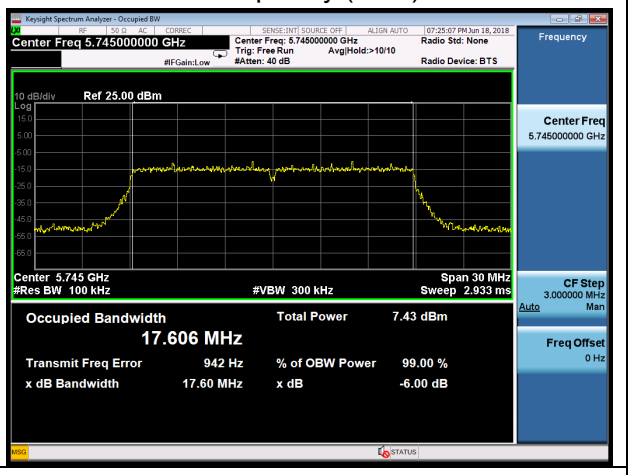
U-NII-3, 802.11a

Carrier frequency (MHz): 5745



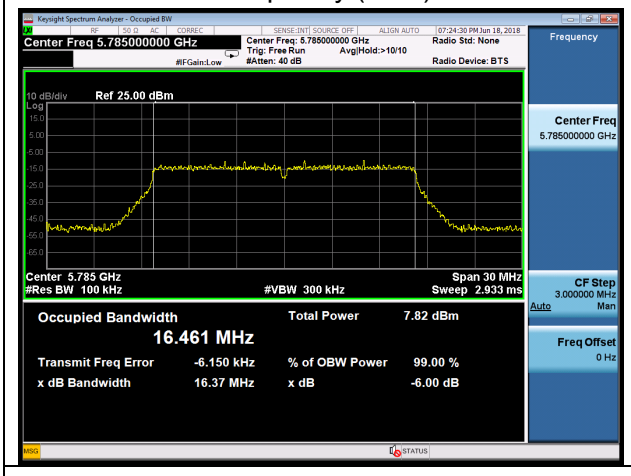
U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5745



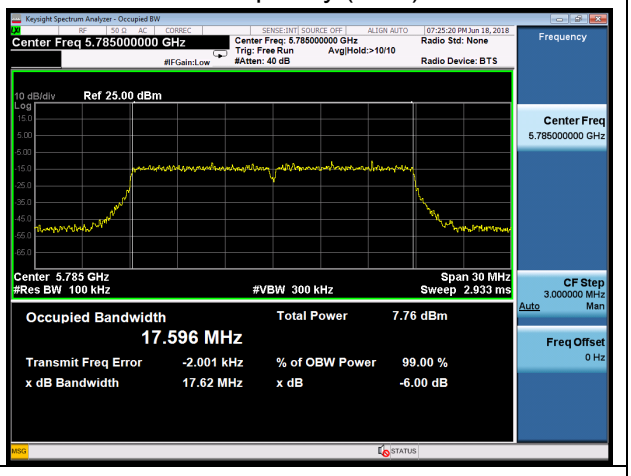
U-NII-3, 802.11a

Carrier frequency (MHz): 5785



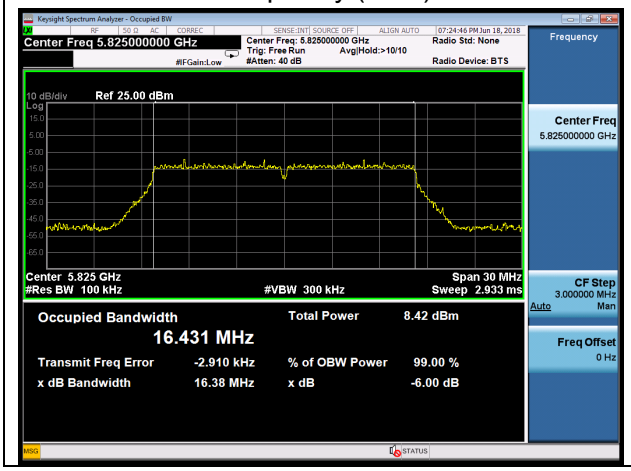
U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5785



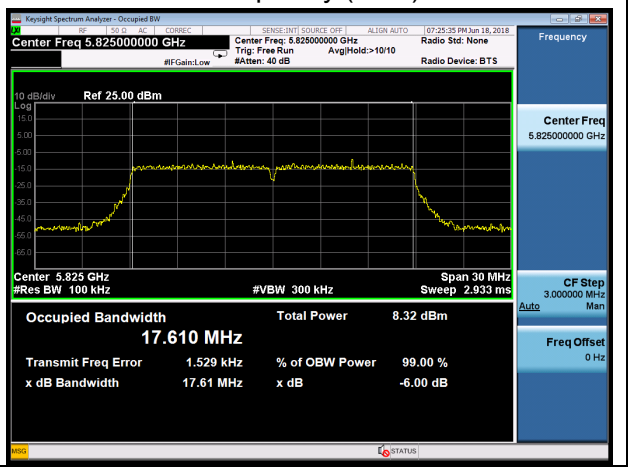
U-NII-3, 802.11a

Carrier frequency (MHz): 5825



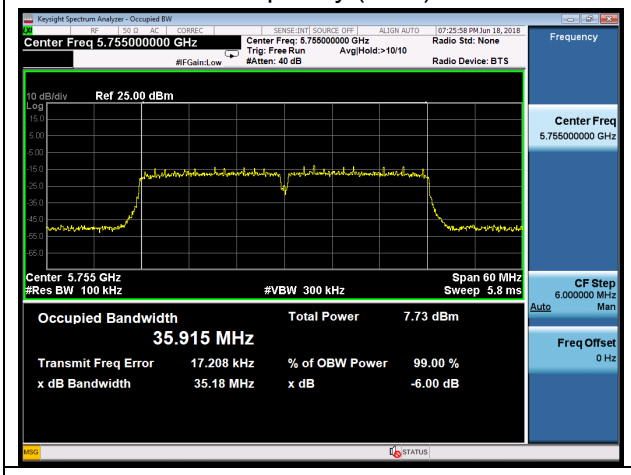
U-NII-3, 802.11n HT20

Carrier frequency (MHz): 5825



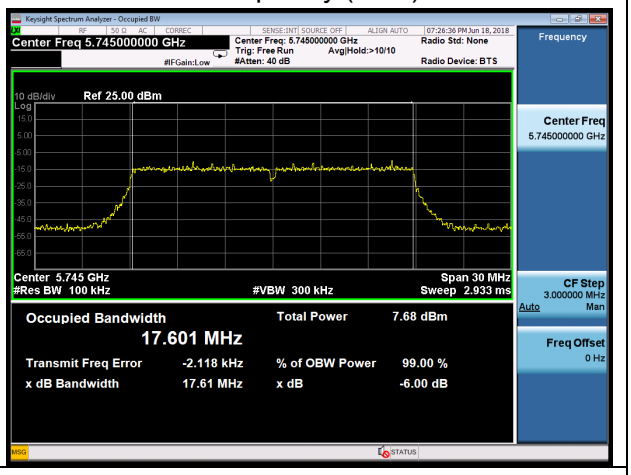
U-NII-3, 802.11n HT40

Carrier frequency (MHz): 5755



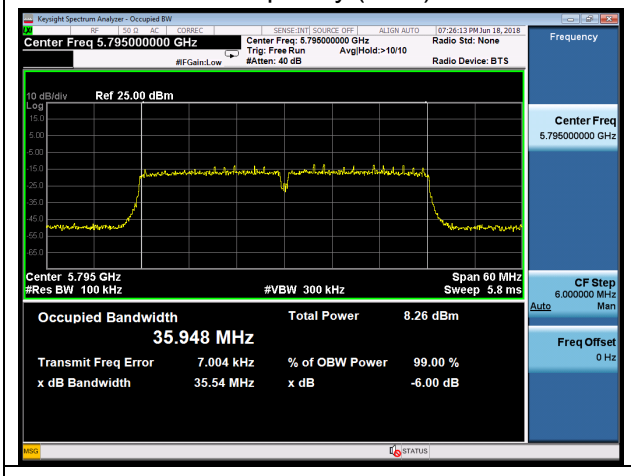
U-NII-3, 802.11ac VHT20

Carrier frequency (MHz): 5745



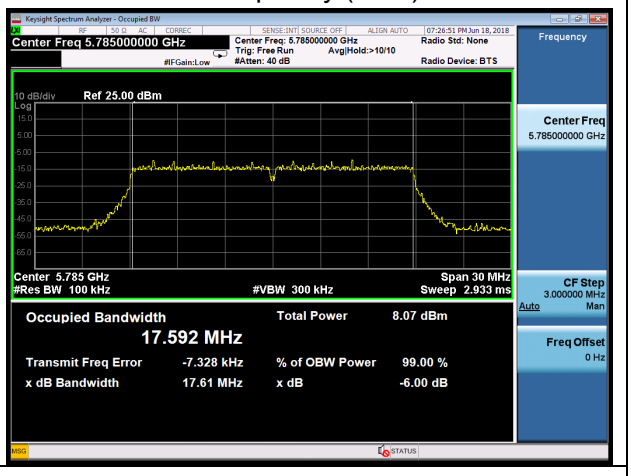
U-NII-3, 802.11n HT40

Carrier frequency (MHz): 5795



U-NII-3, 802.11ac VHT20

Carrier frequency (MHz): 5785

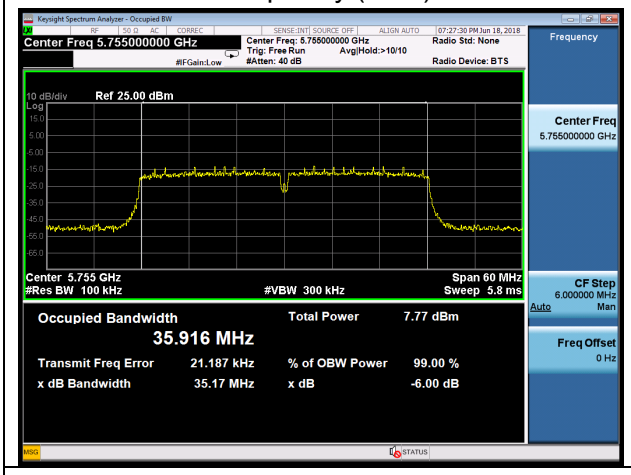


U-NII-3, 802.11ac VHT20

Carrier frequency (MHz): 5825

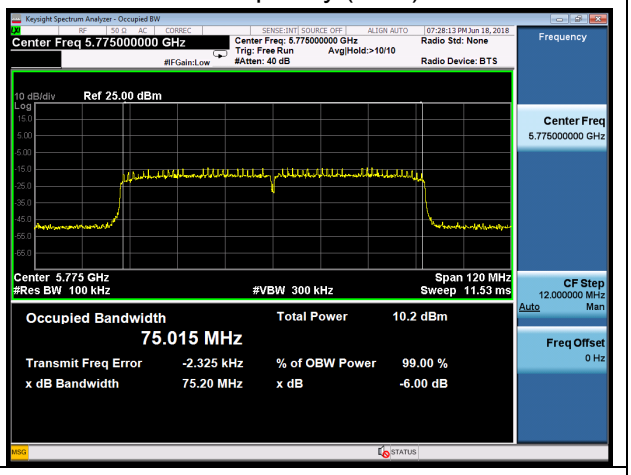
U-NII-3, 802.11ac VHT40

Carrier frequency (MHz): 5755



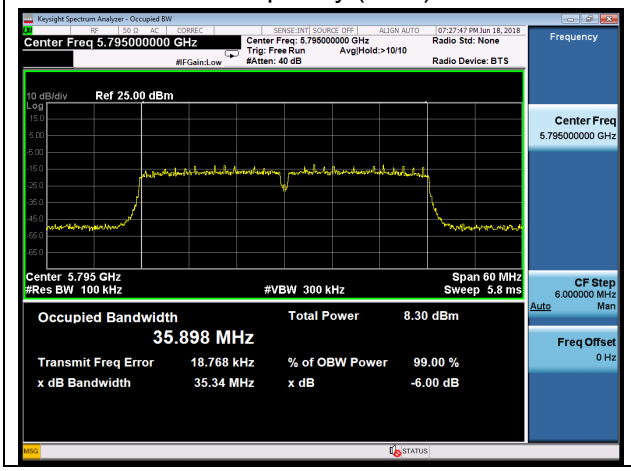
U-NII-3, 802.11ac VHT80

Carrier frequency (MHz): 5775



U-NII-3, 802.11ac VHT40

Carrier frequency (MHz): 5795



5.2. Average Power Output –Conducted

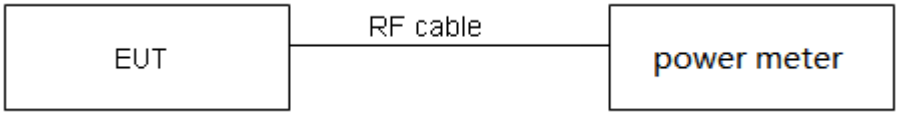
Ambient condition

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

Methods of Measurement

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

Test Setup



Limits

Rule FCC Part 15.407(a)(1)(2)(3)
For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Measurement Uncertainty

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

Test Results

Band	T_{on} (ms)	$T_{(on+off)}$ (ms)	Duty cycle	Duty cycle correction Factor(dB)
802.11a	2.06	2.10	0.98	NA
802.11n HT20	1.92	1.97	0.98	NA
802.11n HT40	0.94	0.99	0.95	0.22
802.11ac VHT20	1.94	1.98	0.98	NA
802.11ac VHT40	0.95	1.00	0.95	0.21
802.11ac VHT80	0.46	0.48	0.97	0.15
Note: when Duty cycle>0.98, Duty cycle correction Factor not required.				

Single Antenna Power Index												
Packet Type	**CH36**	**CH40**	**CH48**	**CH52**	**CH60**	**CH64**	**CH 100**	**CH 116**	**CH 140**	**CH 144**	**CH 157**	**CH 165**
802.11a	5	5	5	5	5	5	5	5	5	5	5	5
802.11n HT20	5	5	5	5	5	5	5	5	5	5	5	5
802.11ac VHT20	5	5	5	5	5	5	5	5	5	5	5	5
Packet Type	**CH38**	**CH46**	**CH54**	**CH62**	**CH 102**	**CH 110**	**CH 134**	**CH 142**	**CH 151**	**CH 159**	/	/
802.11n HT40	5	5	5	5	5	5	5	5	5	5	/	/
802.11ac VHT40	5	5	5	5	5	5	5	5	5	5	/	/
Packet Type	**CH42**	**CH58**	**CH 106**	**CH 122**	**CH 138**	**CH 155**	/	/	/	/	/	/
802.11ac VHT80	5	5	5	5	5	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	19.41	23.88 <24	23.88
		60/5300	19.22	23.84 <24	23.84
		64/5320	19.31	23.86 <24	23.86
	802.11n HT20	52/5260	19.87	23.98 <24	23.98
		60/5300	19.85	23.98 <24	23.98
		64/5320	19.76	23.96 <24	23.96
	802.11n HT40	54/5270	38.76	26.88 >24	24.00
		62/5310	39.06	26.92 >24	24.00
	802.11ac VHT20	52/5260	19.89	23.99 <24	23.99
		60/5300	19.60	23.92 <24	23.92
		64/5320	19.76	23.96 <24	23.96
	802.11ac VHT40	54/5270	38.93	26.90 >24	24.00
		62/5310	39.18	26.93 >24	24.00
	802.11ac VHT80	58/5290	80.24	30.04 >24	24.00
U-NII-2C	802.11a	100/5500	19.23	23.84 <24	23.84
		116/5580	19.13	23.82 <24	23.82
		140/5700	19.13	23.82 <24	23.82
		144/5720	19.3	23.86 <24	23.86
	802.11n HT20	100/5500	19.82	23.97 <24	23.97
		116/5580	20.23	24.06 >24	24.00
		140/5700	19.83	23.97 <24	23.97
		144/5720	19.92	23.99 <24	23.99
	802.11n HT40	102/5510	39.50	26.97 >24	24.00
		110/5550	38.78	26.89 >24	24.00
		134/5670	39.30	26.94 >24	24.00
		142/5710	39.08	26.92 >24	24.00
	802.11ac VHT20	100/5500	19.89	23.99 <24	23.99
		116/5580	19.59	23.92 <24	23.92
		140/5700	19.66	23.94 <24	23.94
		144/5720	19.83	23.97 <24	23.97
	802.11ac VHT40	102/5510	39.28	26.94 >24	24.00
		110/5550	39.06	26.92 >24	24.00
		134/5670	39.34	26.95 >24	24.00
		142/5710	39.03	26.91 >24	24.00
	802.11ac VHT80	106/5530	80.36	30.05 >24	24.00
		138/5690	80.52	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	3.22	3.22	24	PASS
	40/5200	3.55	3.55	24	PASS
	48/5240	4.16	4.16	24	PASS
802.11n HT20	36/5180	3.27	3.27	24	PASS
	40/5200	3.48	3.48	24	PASS
	48/5240	4.24	4.24	24	PASS
802.11n HT40	38/5190	3.01	3.23	24	PASS
	46/5230	3.62	3.84	24	PASS
802.11ac VHT20	36/5180	3.28	3.28	24	PASS
	40/5200	3.58	3.58	24	PASS
	48/5240	4.25	4.25	24	PASS
802.11ac VHT40	38/5190	2.94	3.15	24	PASS
	46/5230	3.62	3.83	24	PASS
802.11ac VHT80	42/5210	3.77	3.92	24	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	2.73	2.73	23.88	PASS
	60/5300	3.30	3.30	23.84	PASS
	64/5320	3.77	3.77	23.86	PASS
802.11n HT20	52/5260	2.76	2.76	23.98	PASS
	60/5300	3.41	3.41	23.98	PASS
	64/5320	3.84	3.84	23.96	PASS
802.11n HT40	54/5270	2.55	2.77	24.00	PASS
	62/5310	3.13	3.35	24.00	PASS
802.11ac VHT20	52/5260	2.86	2.86	23.99	PASS
	60/5300	3.47	3.47	23.92	PASS
	64/5320	3.87	3.87	23.96	PASS
802.11ac VHT40	54/5270	2.55	2.76	24.00	PASS
	62/5310	3.05	3.26	24.00	PASS
802.11ac VHT80	58/5290	4.05	4.20	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	3.46	3.46	23.84	PASS
	116/5580	3.74	3.74	23.82	PASS
	140/5700	3.22	3.22	23.82	PASS
	144/5720	3.11	3.11	23.86	PASS
802.11n HT20	100/5500	3.54	3.54	23.97	PASS
	116/5580	3.68	3.68	24.00	PASS
	140/5700	3.33	3.33	23.97	PASS
	144/5720	3.05	3.05	23.99	PASS
802.11n HT40	102/5510	3.04	3.26	24.00	PASS
	110/5550	3.77	3.99	24.00	PASS
	134/5670	2.85	3.07	24.00	PASS
	142/5710	2.67	2.89	24.00	PASS
802.11ac VHT20	100/5500	3.49	3.49	23.99	PASS
	116/5580	3.66	3.66	23.92	PASS
	140/5700	3.27	3.27	23.94	PASS
	144/5720	3.11	3.11	23.97	PASS
802.11ac VHT40	102/5510	3.16	3.37	24.00	PASS
	110/5550	3.75	3.96	24.00	PASS
	134/5670	2.88	3.09	24.00	PASS
	142/5710	2.77	2.98	24.00	PASS
802.11ac VHT80	106/5530	2.86	3.01	24.00	PASS
	138/5690	2.64	2.79	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	2.96	2.96	30	PASS
	157/5785	3.55	3.55	30	PASS
	165/5825	3.77	3.77	30	PASS
802.11n HT20	149/5745	2.98	2.98	30	PASS
	157/5785	3.54	3.54	30	PASS
	165/5825	3.84	3.84	30	PASS
802.11n HT40	151/5755	2.57	2.79	30	PASS
	159/5795	3.01	3.23	30	PASS
802.11ac VHT20	149/5745	3.05	3.05	30	PASS
	157/5785	3.59	3.59	30	PASS
	165/5825	3.86	3.86	30	PASS
802.11ac VHT40	151/5755	2.66	2.87	30	PASS
	159/5795	3.08	3.29	30	PASS
802.11ac VHT80	155/5775	4.03	4.18	30	PASS
Note: Average Power with duty factor = Average Power Measured +Duty cycle correction factor					

5.3. Frequency Stability

Ambient condition

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

Method of Measurement

1. Frequency stability with respect to ambient temperature

a) Supply the EUT with a nominal ac voltage or install a new or fully charged battery in the EUT. If possible, a dummy load shall be connected to the EUT because an antenna near the metallic walls of an environmental test chamber could affect the output frequency of the EUT. If the EUT is equipped with a permanently attached, adjustable-length antenna, then the EUT shall be placed in the center of the chamber with the antenna adjusted to the shortest length possible. Turn ON the EUT and tune it to one of the number of frequencies shown in 5.6.

b) Couple the unlicensed wireless device output to the measuring instrument by connecting an antenna to the measuring instrument with a suitable length of coaxial cable and placing the measuring antenna near the EUT (e.g., 15 cm away), or by connecting a dummy load to the measuring instrument, through an attenuator if necessary.

c) Adjust the location of the measurement antenna and the controls on the measurement instrument to obtain a suitable signal level (i.e., a level that will not overload the measurement instrument but is strong enough to allow measurement of the operating or fundamental frequency of the EUT).

d) Turn the EUT OFF and place it inside the environmental temperature chamber. For devices that have oscillator heaters, energize only the heater circuit.

e) Set the temperature control on the chamber to the highest specified in the regulatory requirements for the type of device and allow the oscillator heater and the chamber temperature to stabilize.

f) While maintaining a constant temperature inside the environmental chamber, turn the EUT ON and record the operating frequency at startup, and at 2 minutes, 5 minutes, and 10 minutes after the EUT is energized. Four measurements in total are made.

g) Measure the frequency at each of frequencies specified in 5.6.

h) Switch OFF the EUT but do not switch OFF the oscillator heater.

i) Lower the chamber temperature by not more that 10 C, and allow the temperature inside the chamber to stabilize.

j) Repeat step f) through step i) down to the lowest specified temperature.

2. Frequency stability when varying supply voltage

Unless otherwise specified, these tests shall be made at ambient room temperature (+15 C to +25 C). An antenna shall be connected to the antenna output terminals of the EUT if possible. If the EUT is equipped with or uses an adjustable-length antenna, then it shall be fully extended.

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

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

Limit

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

Measurement Uncertainty

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

Test Results

Voltage (V)	Temperature (°C)	U-NII-1 Test Results			
		5200MHz			
		1min	2min	5min	10min
3.8V	0	5199.990744	5199.987172	5199.982720	5199.982471
3.8V	5	5199.993150	5199.980809	5199.981458	5199.980654
3.8V	10	5199.986907	5199.977443	5199.974642	5199.975560
3.8V	15	5199.977025	5199.969208	5199.972802	5199.971323
3.8V	20	5199.969003	5199.966344	5199.965911	5199.965912
3.8V	25	5199.967932	5199.965103	5199.965146	5199.956580
3.8V	30	5199.961070	5199.964629	5199.958238	5199.956559
3.8V	35	5199.956069	5199.957661	5199.952138	5199.954735
3.6V	25	5199.946243	5199.950171	5199.944031	5199.948167
4.3V	25	5199.938351	5199.944738	5199.937287	5199.947404
MHz		-0.061649	-0.055262	-0.062713	-0.052596
PPM		-11.855573	-10.627367	-12.060162	-10.114671

Voltage (V)	Temperature (°C)	U-NII-2A Test Results			
		5300MHz			
		1min	2min	5min	10min
3.8V	0	5300.005587	5299.999984	5299.998710	5299.998218
3.8V	5	5300.005180	5299.996385	5299.994353	5299.995333
3.8V	10	5299.995857	5299.994367	5299.985157	5299.987207
3.8V	15	5299.992886	5299.986359	5299.981304	5299.978073
3.8V	20	5299.983647	5299.983689	5299.977679	5299.972690
3.8V	25	5299.975108	5299.982188	5299.972426	5299.965110
3.8V	30	5299.968313	5299.976408	5299.966265	5299.962328
3.8V	35	5299.959350	5299.969541	5299.962836	5299.960434
3.6V	25	5299.950212	5299.967591	5299.960956	5299.959408
4.3V	25	5299.947066	5299.963989	5299.952750	5299.950742
MHz		-0.052934	-0.036011	-0.047250	-0.049258
PPM		-9.987582	-6.794536	-8.915140	-9.293972

Voltage (V)	Temperature (°C)	U-NII-2C Test Results			
		5580MHz			
		1min	2min	5min	10min
3.8V	0	5580.007816	5580.006991	5579.997569	5579.994029
3.8V	5	5580.003105	5579.999878	5579.993541	5579.984401
3.8V	10	5579.996158	5579.990314	5579.992303	5579.984190
3.8V	15	5579.990026	5579.985386	5579.987211	5579.982995
3.8V	20	5579.983669	5579.983089	5579.984685	5579.978071
3.8V	25	5579.974824	5579.980915	5579.979890	5579.972473
3.8V	30	5579.965754	5579.972054	5579.975376	5579.963045
3.8V	35	5579.959924	5579.962791	5579.968535	5579.962742
3.6V	25	5579.957436	5579.954651	5579.968393	5579.959100
4.3V	25	5579.954499	5579.954209	5579.965620	5579.949488
MHz		-0.045501	-0.045791	-0.034380	-0.050512
PPM		-8.154265	-8.206304	-6.161341	-9.052276

Voltage (V)	Temperature (°C)	U-NII-3 Test Results			
		5785MHz			
		1min	2min	5min	10min
3.8V	0	5784.992307	5784.992271	5784.982388	5784.980189
3.8V	5	5784.991100	5784.985351	5784.981242	5784.974656
3.8V	10	5784.987400	5784.978558	5784.978259	5784.970574
3.8V	15	5784.986891	5784.975465	5784.974480	5784.966151
3.8V	20	5784.979239	5784.971938	5784.969434	5784.963607
3.8V	25	5784.970134	5784.971113	5784.968428	5784.957372
3.8V	30	5784.967853	5784.966938	5784.959865	5784.955899
3.8V	35	5784.958635	5784.965352	5784.957604	5784.947300
3.6V	25	5784.958125	5784.958194	5784.954180	5784.943833
4.3V	25	5784.950682	5784.957774	5784.945424	5784.937726
MHz		-0.049318	-0.042226	-0.054576	-0.062274
PPM		-8.525171	-7.299262	-9.434032	-10.764660

5.4. Power Spectral Density

Ambient condition

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

Method of Measurement

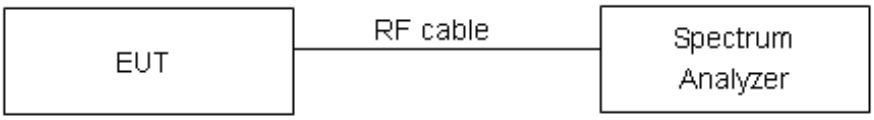
The EUT was connected to the spectrum analyzer through an external attenuator (20dB) and a known loss cable.

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

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

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

Test setup



Limits

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

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

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

Measurement Uncertainty

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

Test Results:

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

U-NII-1

Network Standards	Channel Number	Read Value (dBm /MHz)	Power Spectral Density (dBm /MHz)	Limit (dBm /MHz)	Conclusion
802.11a	36	-9.16	-9.16	11	PASS
	40	-9.44	-9.44	11	PASS
	48	-8.49	-8.49	11	PASS
802.11n HT20	36	-9.55	-9.55	11	PASS
	40	-9.30	-9.30	11	PASS
	48	-8.68	-8.68	11	PASS
802.11n HT40	38	-12.93	-12.71	11	PASS
	46	-12.22	-12.01	11	PASS
802.11ac VHT20	36	-9.58	-9.58	11	PASS
	40	-9.91	-9.91	11	PASS
	48	-8.86	-8.86	11	PASS
802.11ac VHT40	38	-13.05	-12.84	11	PASS
	46	-12.16	-11.94	11	PASS
802.11ac VHT80	42	-14.96	-14.81	11	PASS

U-NII-2A

Network Standards	Channel Number	Read Value (dBm /MHz)	Power Spectral Density (dBm /MHz)	Limit (dBm /MHz)	Conclusion
802.11a	52	-9.50	-9.50	11	PASS
	60	-8.90	-8.90	11	PASS
	64	-8.72	-8.72	11	PASS
802.11n HT20	52	-10.26	-10.26	11	PASS
	60	-9.28	-9.28	11	PASS
	64	-9.02	-9.02	11	PASS
802.11n HT40	54	-13.15	-12.94	11	PASS
	62	-12.11	-11.90	11	PASS
802.11ac VHT20	52	-10.23	-10.23	11	PASS
	60	-9.17	-9.17	11	PASS
	64	-8.74	-8.74	11	PASS
802.11ac VHT40	54	-13.07	-13.07	11	PASS
	62	-12.33	-12.12	11	PASS
802.11ac VHT80	58	-15.45	-15.30	11	PASS

U-NII-2C

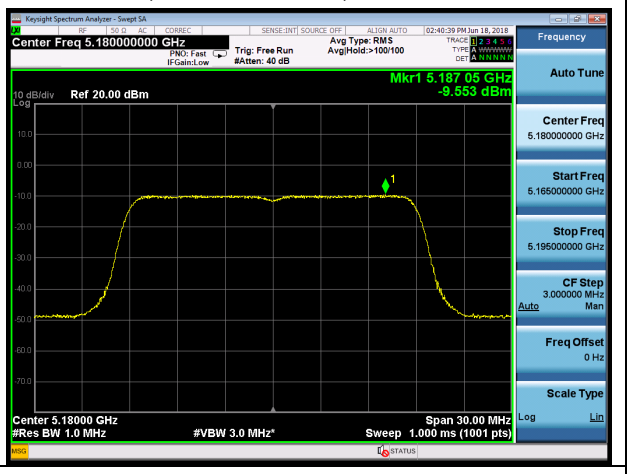
Network Standards	Channel Number	Read Value (dBm /MHz)	Power Spectral Density (dBm /MHz)	Limit (dBm /MHz)	Conclusion
802.11a	100	-8.81	-8.81	11	PASS
	116	-8.48	-8.48	11	PASS
	140	-8.53	-8.53	11	PASS
	144	-8.98	-8.98	11	PASS
802.11n HT20	100	-9.58	-9.58	11	PASS
	116	-9.02	-9.02	11	PASS
	140	-8.36	-8.36	11	PASS
	144	-10.05	-10.05	11	PASS
802.11n HT40	102	-12.38	-12.16	11	PASS
	110	-11.71	-11.49	11	PASS
	134	-12.13	-11.92	11	PASS
	142	-13.34	-13.13	11	PASS
802.11ac VHT20	100	-9.47	-9.47	11	PASS
	116	-8.50	-8.50	11	PASS
	140	-8.53	-8.53	11	PASS
	144	-9.50	-9.50	11	PASS
802.11ac VHT40	102	-12.60	-12.39	11	PASS
	110	-11.38	-11.16	11	PASS
	134	-12.33	-12.12	11	PASS
	142	-13.78	-13.57	11	PASS
802.11ac VHT80	106	-14.53	-14.38	11	PASS
	138	-16.61	-16.47	11	PASS

U-NII-3

Network Standards	Channel Number	Read Value (dBm/500kHz)	Power Spectral Density (dBm/500kHz)	Limit (dBm/500kHz)	Conclusion
802.11a	149	-12.52	-12.52	30	PASS
	157	-12.08	-12.08	30	PASS
	165	-11.71	-11.71	30	PASS
802.11n HT20	149	-12.85	-12.85	30	PASS
	157	-12.42	-12.42	30	PASS
	165	-12.12	-12.12	30	PASS
802.11n HT40	151	-16.21	-16.00	30	PASS
	159	-15.72	-15.50	30	PASS
802.11ac VHT20	149	-12.85	-12.85	30	PASS
	157	-12.37	-12.37	30	PASS
	165	-11.91	-11.91	30	PASS
802.11ac VHT40	151	-16.07	-15.85	30	PASS
	159	-15.89	-15.68	30	PASS
802.11ac VHT80	155	-17.28	-17.13	30	PASS

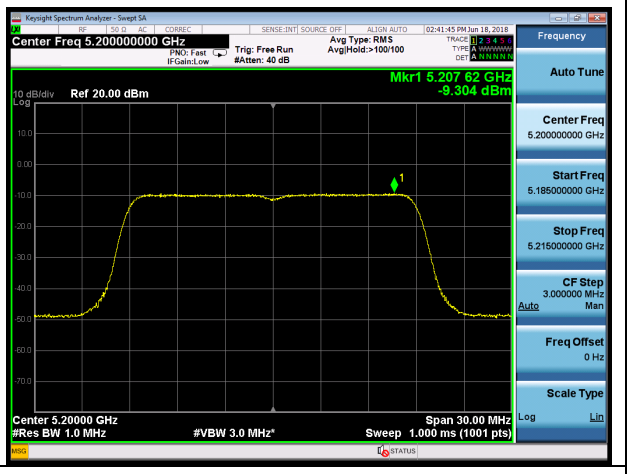
U-NII-1, 802.11a, Channel No.: 36

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



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

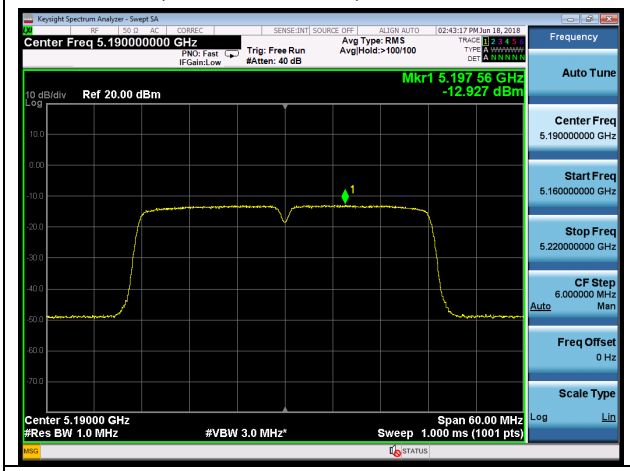
U-NII-1, 802.11n HT20, Channel No.: 40



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

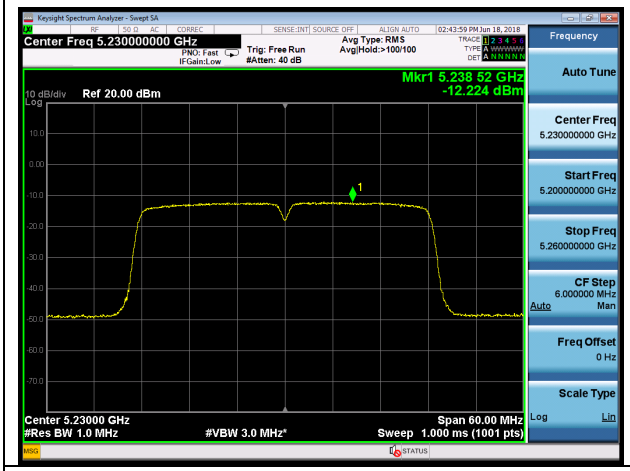
U-NII-1, 802.11n HT20, Channel No.: 48

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



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

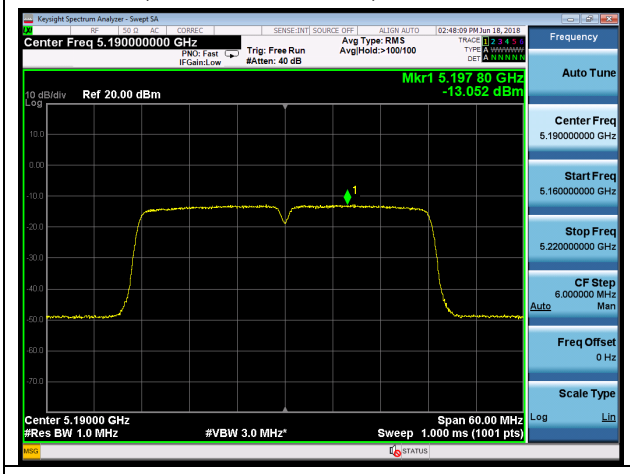
U-NII-1, 802.11n HT40, Channel No.: 46



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

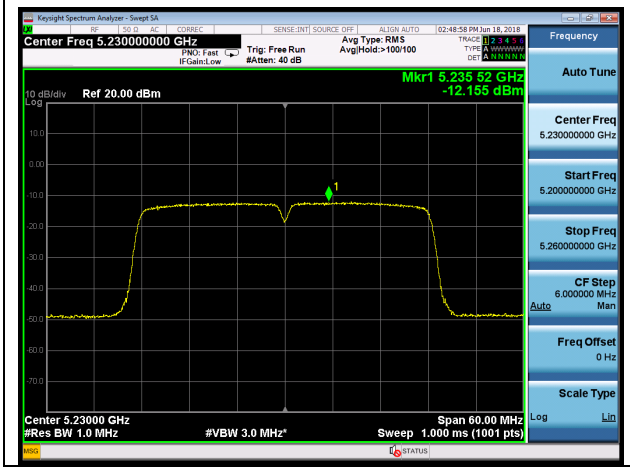
U-NII-1, 802.11ac VHT20, Channel No.: 48

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



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

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



U-NII-2A, 802.11a, Channel No.: 52

U-NII-2A, 802.11n HT20, Channel No.: 52

U-NII-2A, 802.11a, Channel No.: 60

U-NII-2A, 802.11n HT20, Channel No.: 60

U-NII-2A, 802.11a, Channel No.: 64

U-NII-2A, 802.11n HT20, Channel No.: 64