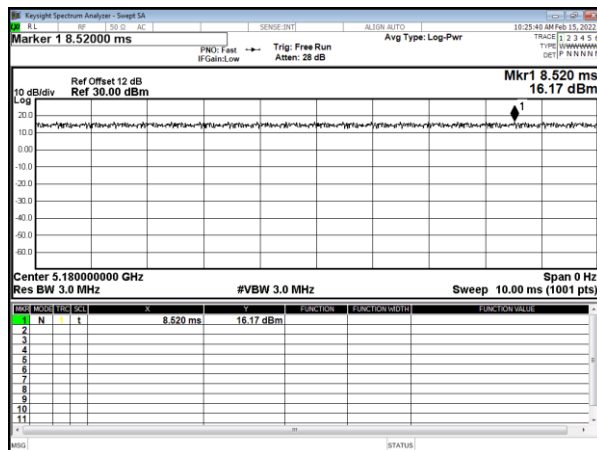
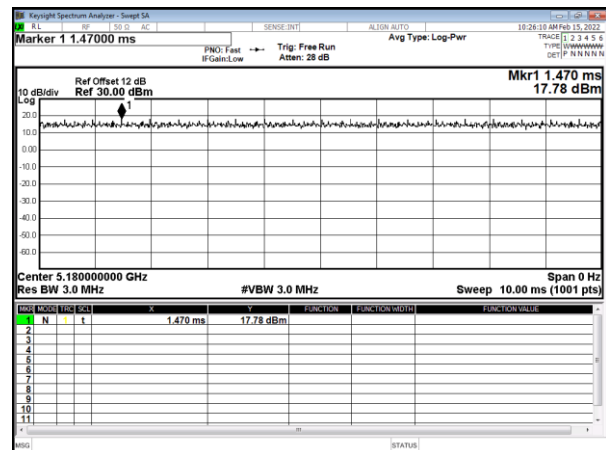




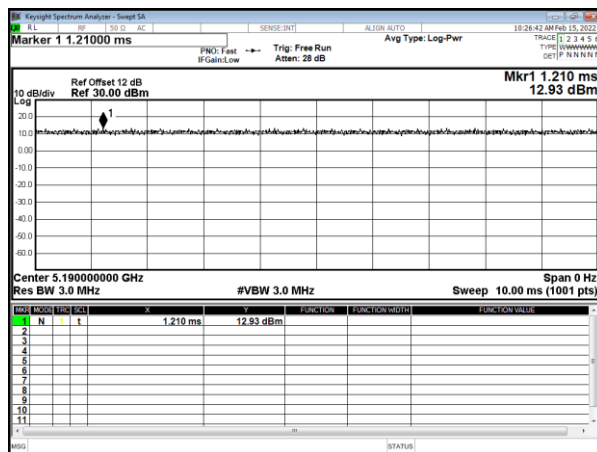
Modulation Type: 802.11a (6Mbps)



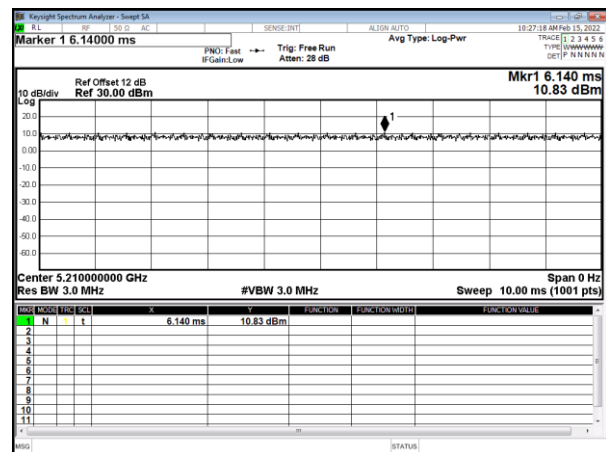
Modulation Type: 802.11ac VHT20 (6.5Mbps)



Modulation Type: 802.11ac VHT40 (13.5Mbps)



Modulation Type: 802.11ac VHT80 (29.3Mbps)





8. 6dB Bandwidth & 99% Occupied Bandwidth

8.1. Test Limit

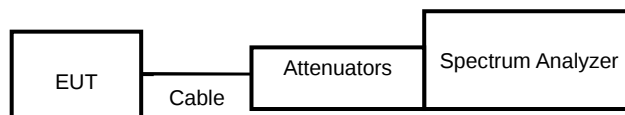
FCC §15.407

The minimum 6 dB bandwidth shall be at least 500 kHz.

8.2. Test Procedure

Reference to 789033 v02r01 General UNII Test Procedures New Rules v01: The transmitter output is connected to a spectrum analyzer with the RBW set to 100KHz, the VBW $\geq 3 \times$ RBW, peak detector and max hold.

8.3. Test Setup Layout



8.4. Test Result and Data (6dB Bandwidth)

In the 5.8GHz Band

Mode	Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)
			ANT A	ANT B	
802.11a	149	5745	16.57	16.53	0.50
	157	5785	16.54	16.56	0.50
	165	5825	16.58	16.54	0.50
802.11ac VHT20	149	5745	17.69	17.74	0.50
	157	5785	17.74	17.71	0.50
	165	5825	17.73	17.69	0.50
802.11ac VHT40	155	5755	36.52	36.52	0.50
	159	5795	36.52	36.53	0.50
802.11ac VHT80	155	5775	76.36	76.12	0.50

**8.5. Test Result and Data (99% Occupied Bandwidth)****In the 5.8GHz Band**

Mode	Channel	Frequency (MHz)	99% Bandwidth(MHz)	
			ANT A	ANT B
802.11a	149	5745	16.65	16.60
	157	5785	16.60	16.65
	165	5825	16.71	16.62
802.11ac VHT20	149	5745	17.78	17.73
	157	5785	17.73	17.74
	165	5825	17.76	17.75
802.11ac VHT40	155	5755	36.38	36.44
	159	5795	36.39	36.41
802.11ac VHT80	155	5775	75.47	75.54

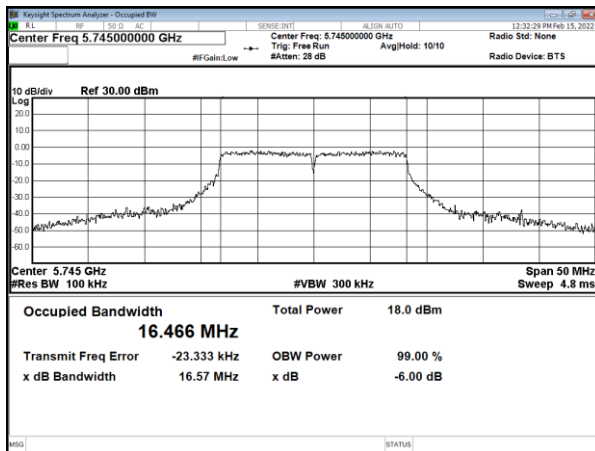


ANT A

6dB Bandwidth

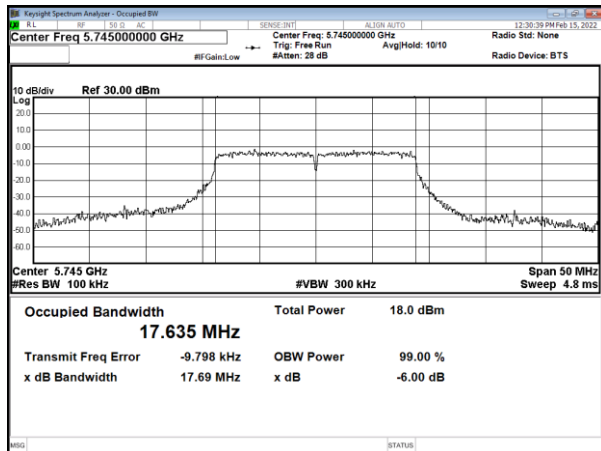
Modulation Type: 802.11a (6Mbps)

CH149

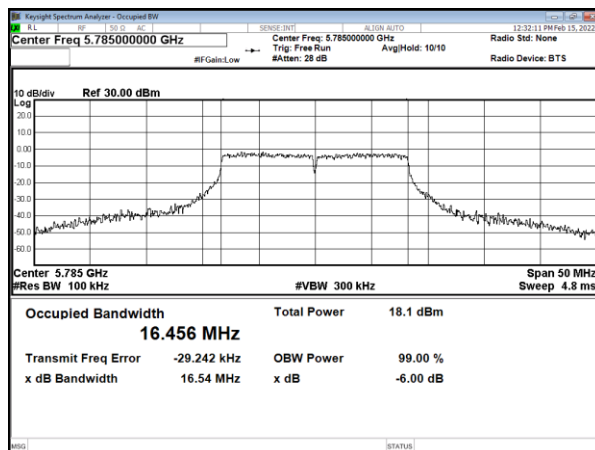


Modulation Type: 802.11ac, VHT20 (6.5Mbps)

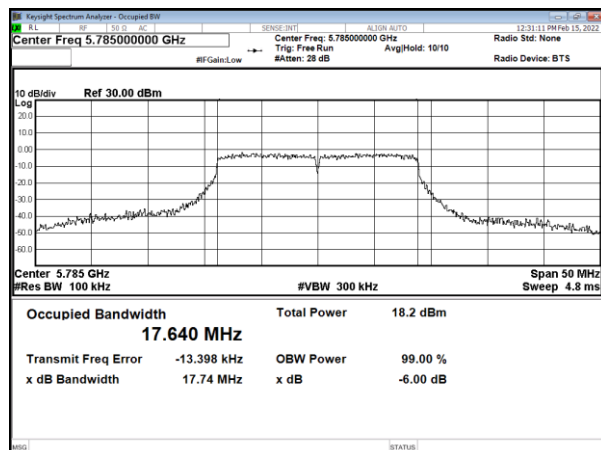
CH149



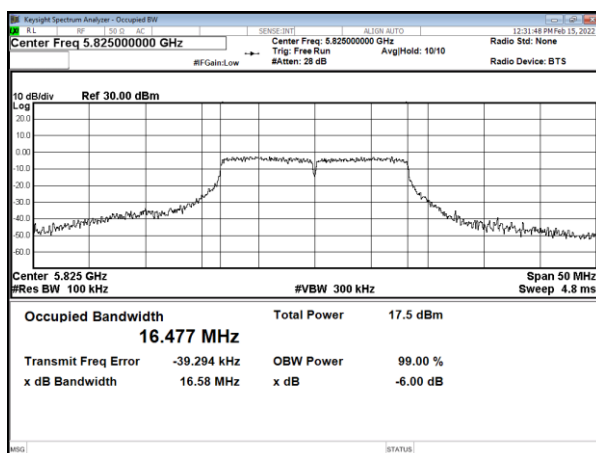
CH157



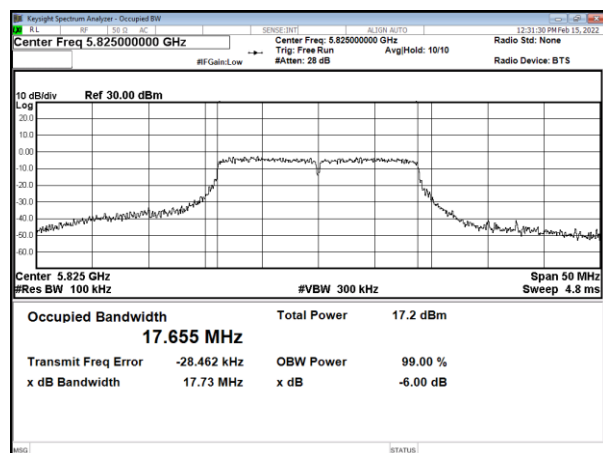
CH157



CH165

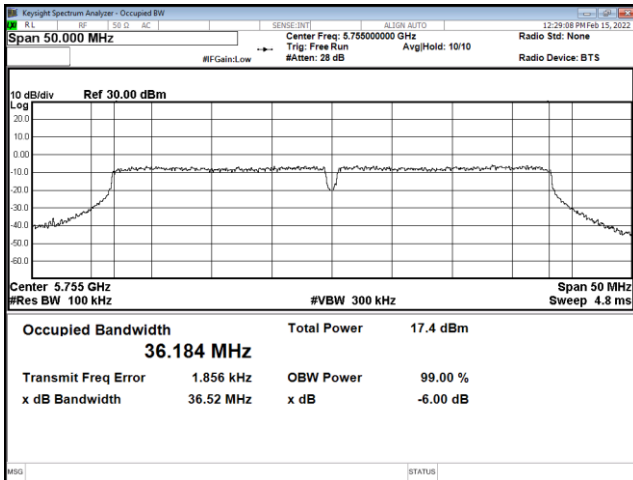


CH165

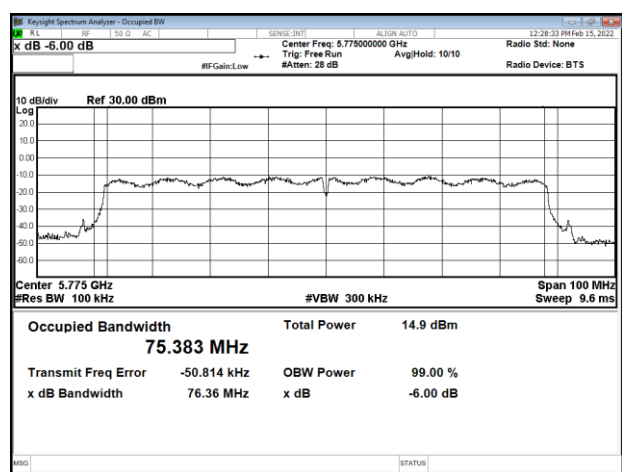




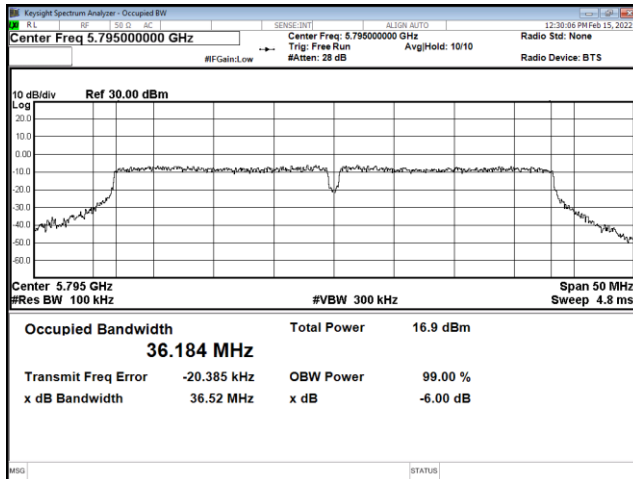
Modulation Type: 802.11ac, VHT40 (13.5Mbps)
CH151



Modulation Type: 802.11ac, VHT80 (29.3Mbps)
CH155



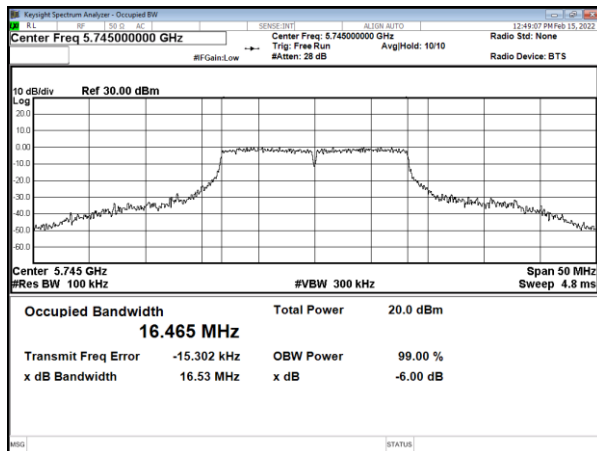
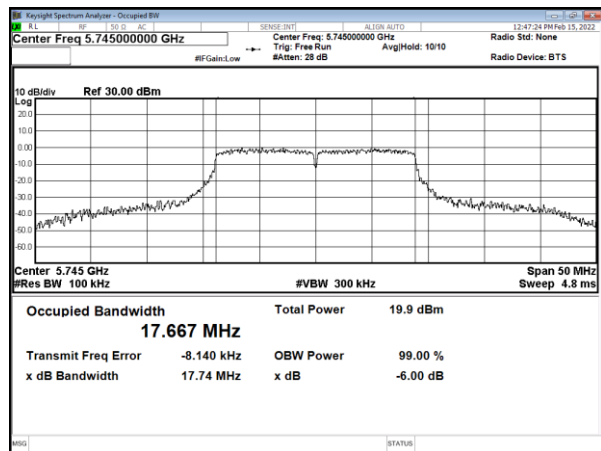
CH159



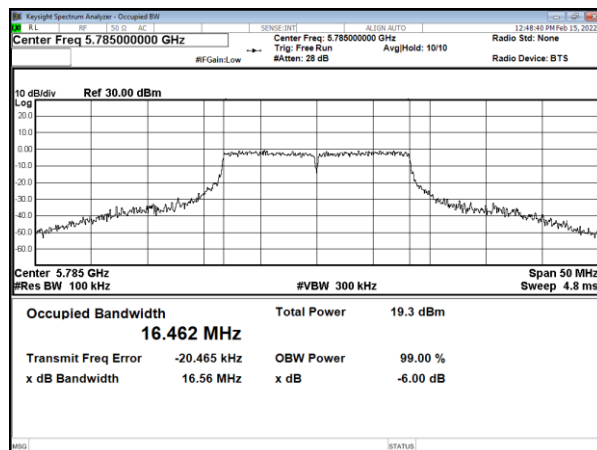


ANT B

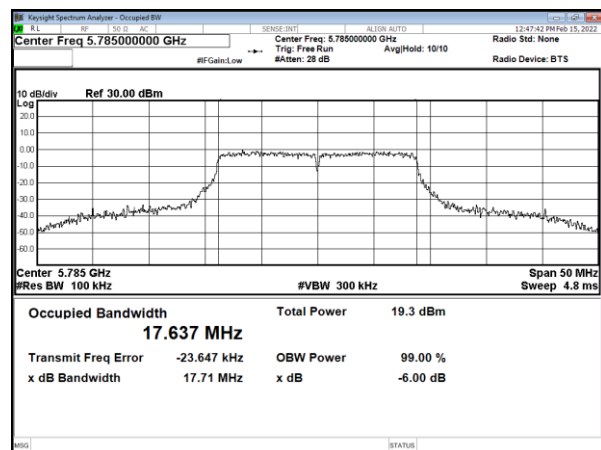
6dB Bandwidth

Modulation Type: 802.11a (6Mbps)
CH149Modulation Type: 802.11ac, VHT20 (6.5Mbps)
CH149

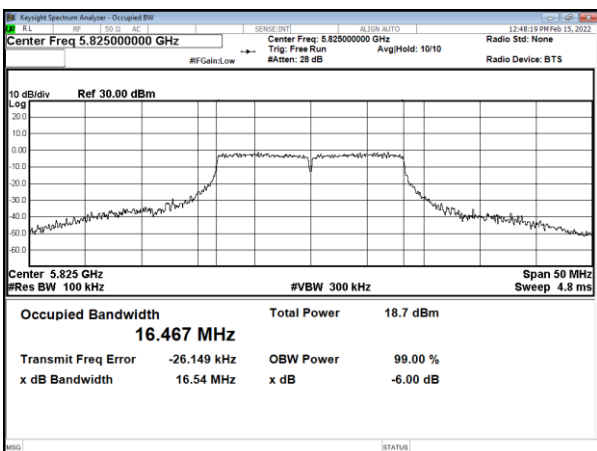
CH157



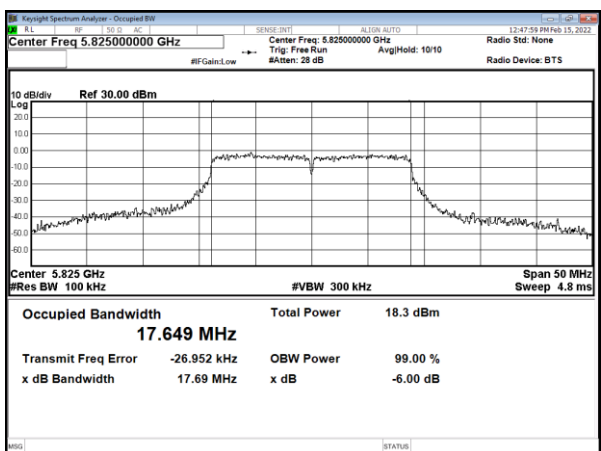
CH157

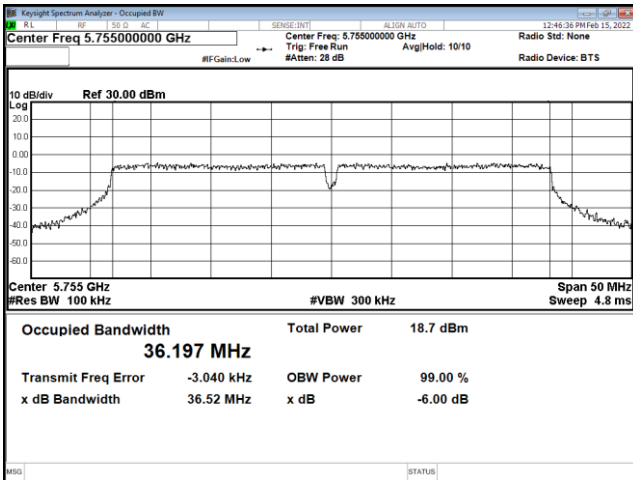
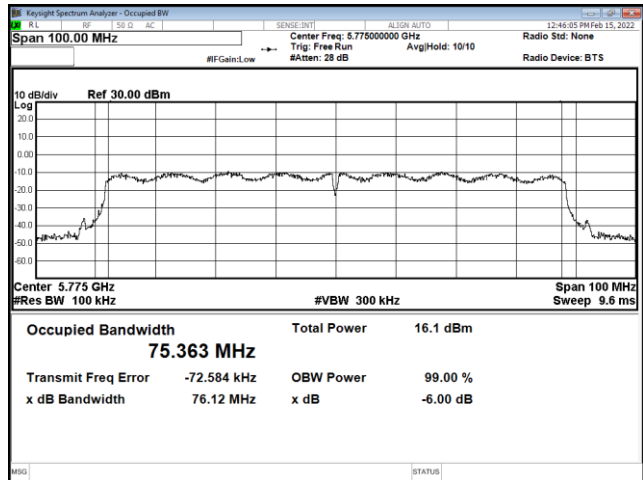


CH165

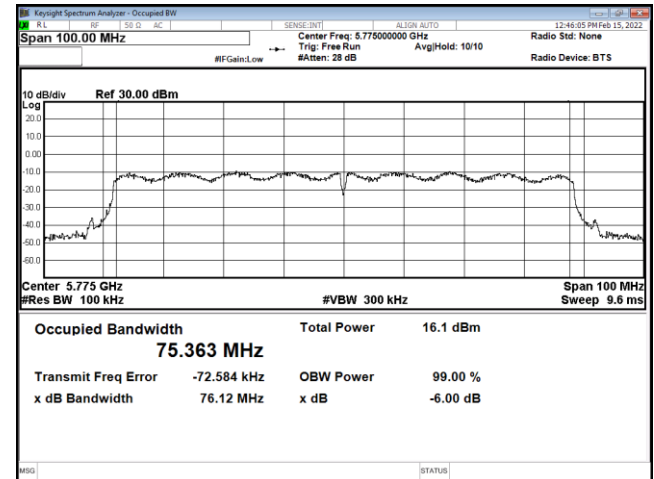
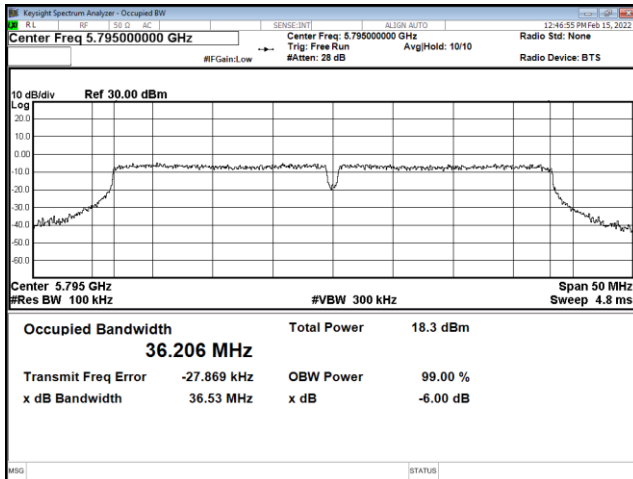


CH165



Modulation Type: 802.11ac, VHT40 (13.5Mbps)
CH151Modulation Type: 802.11ac, VHT80 (29.3Mbps)
CH155

CH159



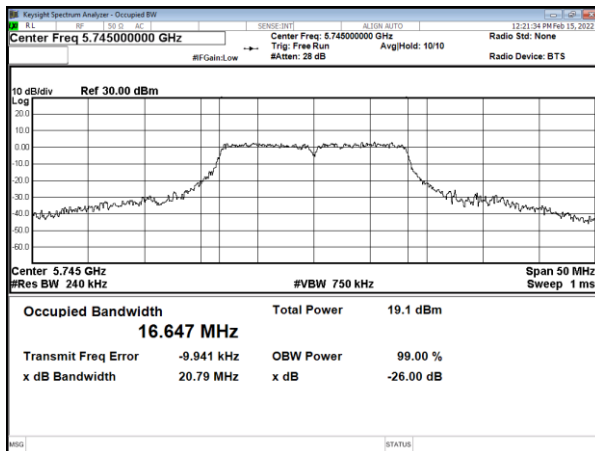
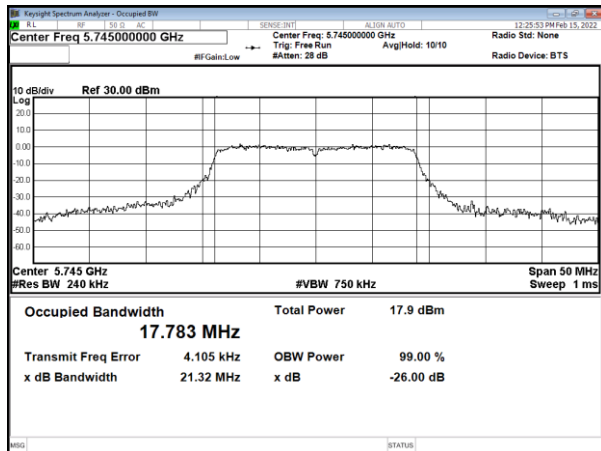


ANTA

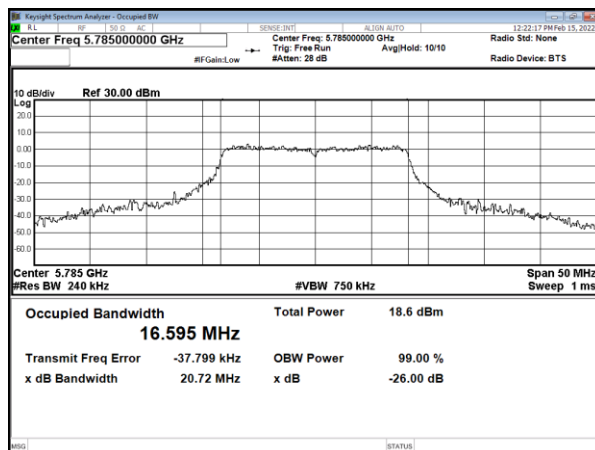
99% Occupied Bandwidth

Modulation Type: 802.11a (6Mbps)

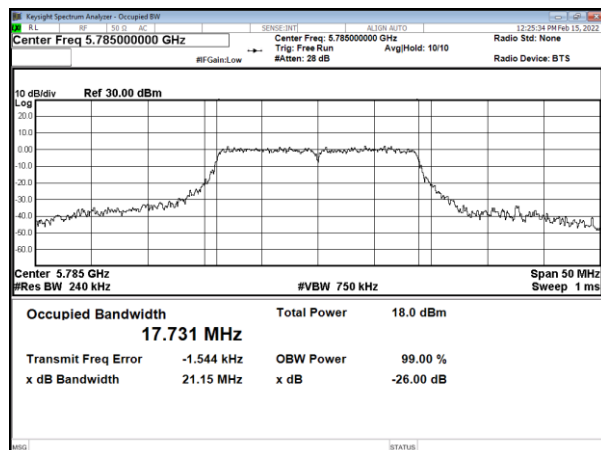
CH149

Modulation Type: 802.11ac, VHT20 (6.5Mbps)
CH149

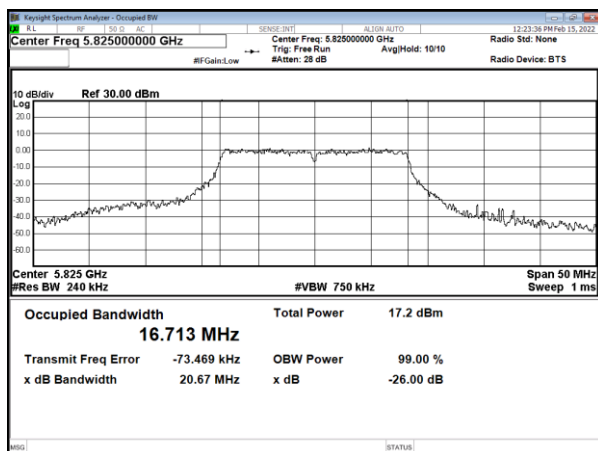
CH157



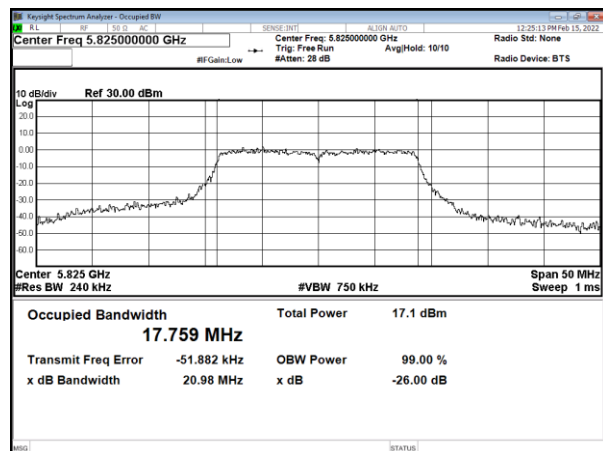
CH157

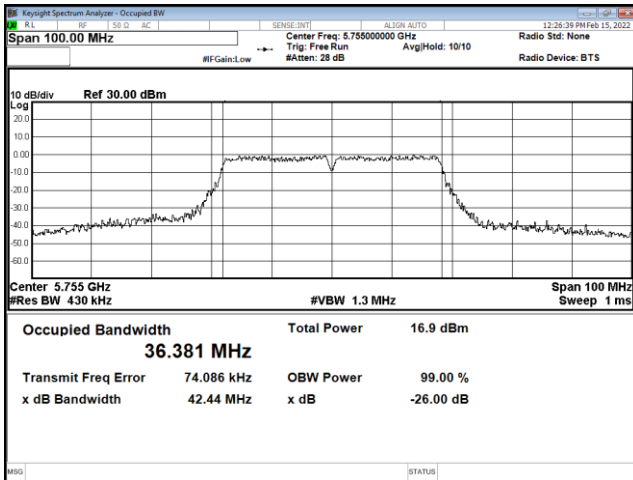
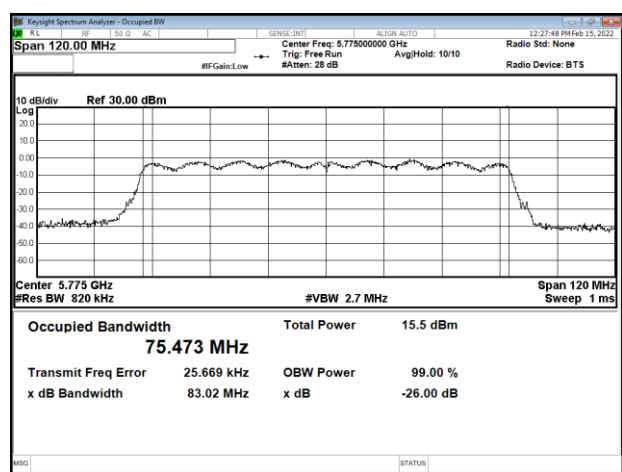


CH165

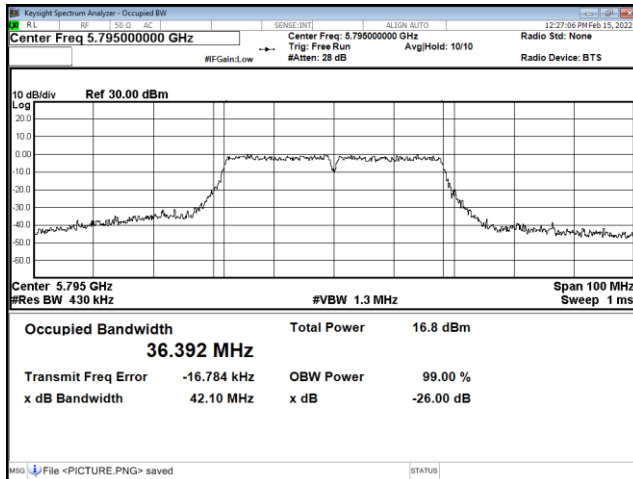


CH165



Modulation Type: 802.11ac, VHT40 (13.5Mbps)
CH151Modulation Type: 802.11ac, VHT80 (29.3Mbps)
CH155

CH159



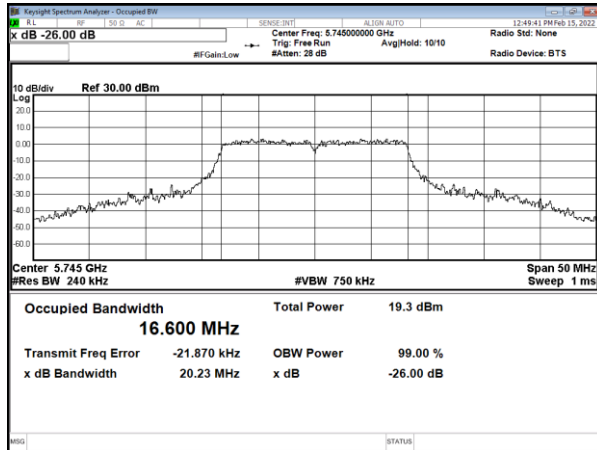


ANT B

99% Occupied Bandwidth

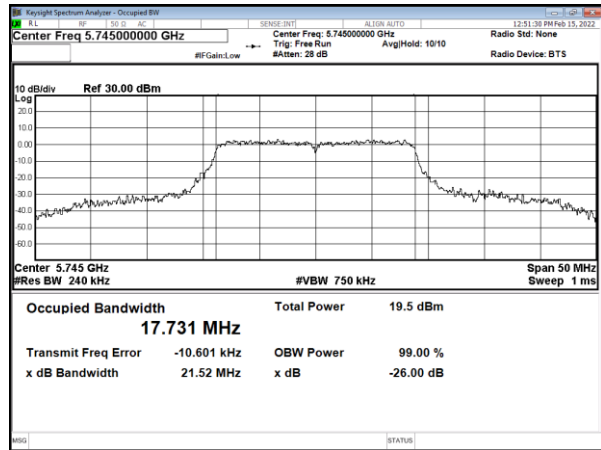
Modulation Type: 802.11a (6Mbps)

CH149

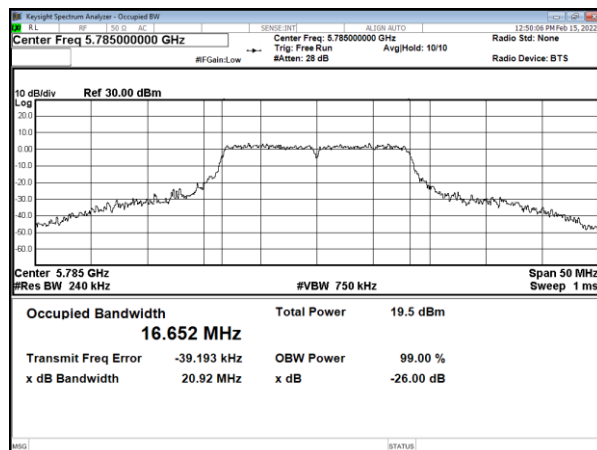


Modulation Type: 802.11ac, VHT20 (6.5Mbps)

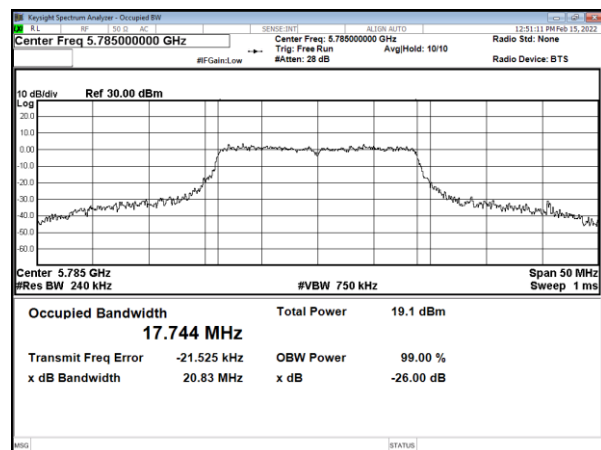
CH149



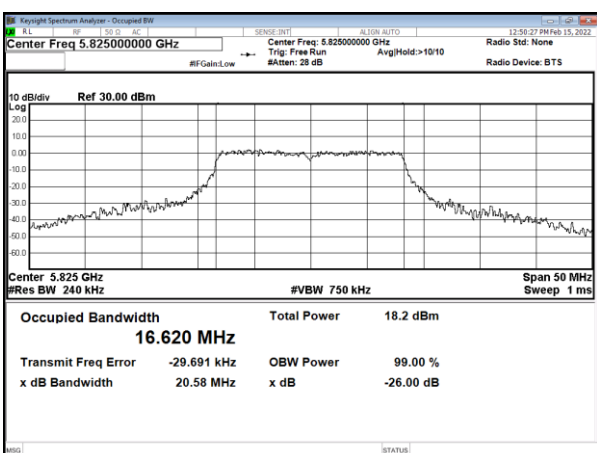
CH157



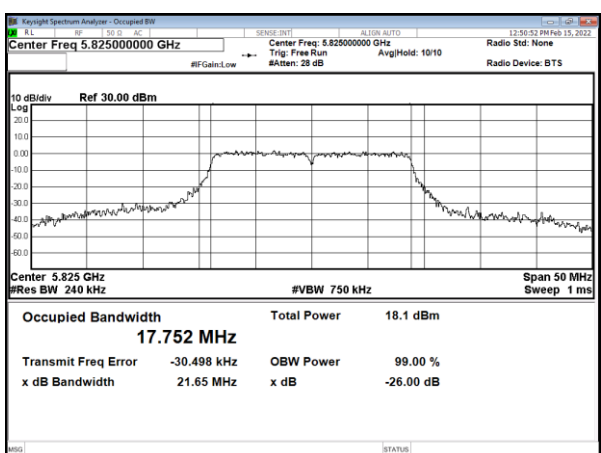
CH157



CH165

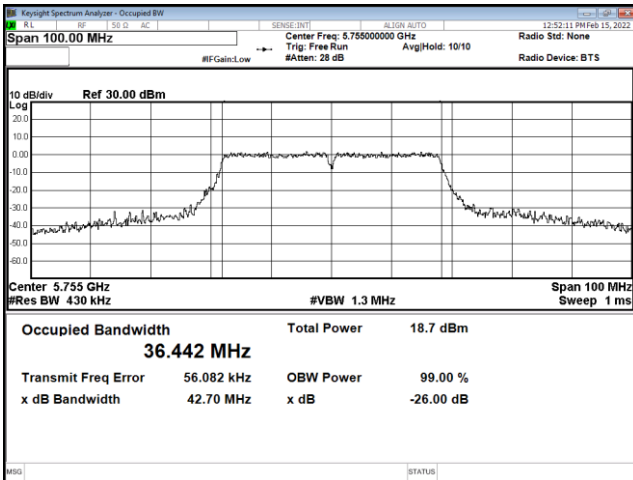


CH165

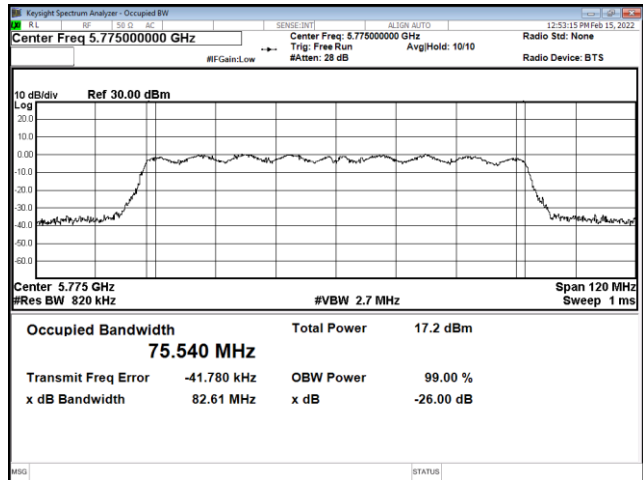




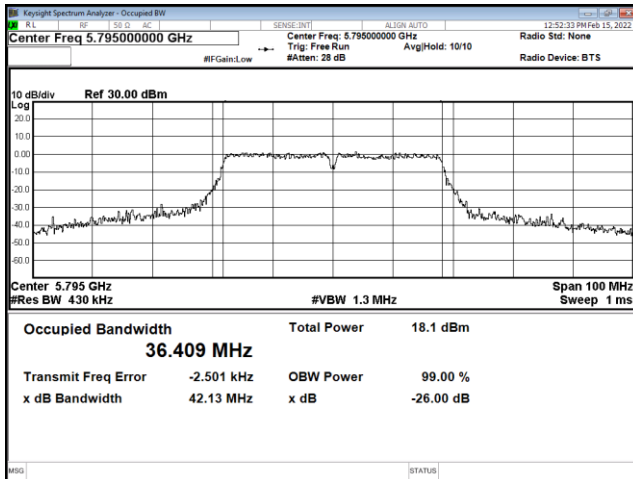
Modulation Type: 802.11ac, VHT40 (13.5Mbps)
CH151



Modulation Type: 802.11ac, VHT80 (29.3Mbps)
CH155



CH159





9. 26dB Bandwidth & 99% Occupied Bandwidth

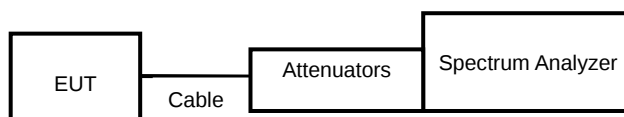
9.1. Test Limit

None; for reporting purposes only.

9.2. Test Procedure

Reference to 789033 v02r01 General UNII Test Procedures New Rules v01: The transmitter output is connected to a spectrum analyzer with the RBW = approximately 1% of the emission bandwidth, the VBW $\geq 3 \times$ RBW, peak detector and max hold.

9.3. Test Setup Layout





9.4. Test Result and Data (26dB Bandwidth)

In the 5.2G Band

Mode	Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
			ANT A	ANT B
802.11a	36	5180	20.87	22.65
	44	5220	20.98	22.85
	48	5240	21.15	22.53
802.11ac VHT20	36	5180	21.40	21.16
	44	5220	20.98	21.06
	48	5240	21.27	21.55
802.11ac VHT40	38	5190	42.80	42.30
	46	5230	42.43	42.92
802.11ac VHT80	42	5210	82.4	81.28

9.5. Test Result and Data (99% Occupied Bandwidth)

In the 5.2G Band

Mode	Channel	Frequency (MHz)	99% Bandwidth(MHz)	
			ANT A	ANT B
802.11a	36	5180	16.60	16.66
	44	5220	16.66	16.63
	48	5240	16.62	16.59
802.11ac VHT20	36	5180	17.78	17.76
	44	5220	17.77	17.74
	48	5240	17.73	17.70
802.11ac VHT40	38	5190	36.42	36.35
	46	5230	36.41	36.41
802.11ac VHT80	42	5210	75.54	75.41

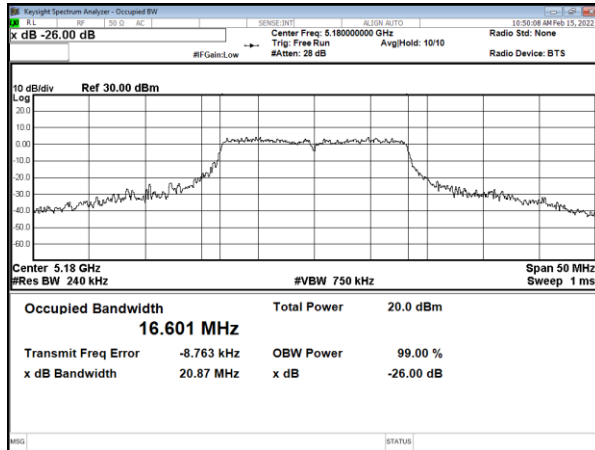


ANT A

26dB Bandwidth & 99% Occupied Bandwidth, UNII-1

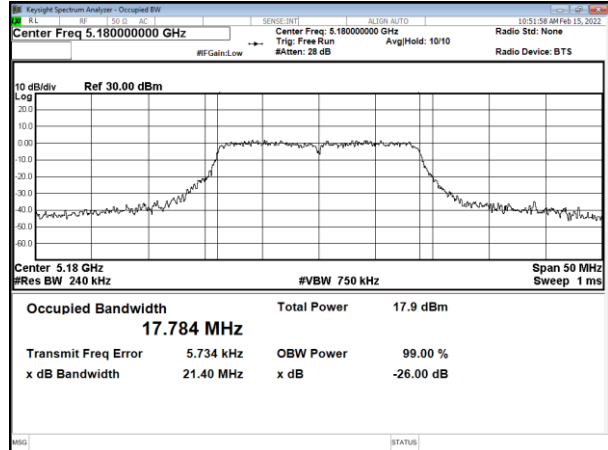
Modulation Standard: 802.11a (6Mbps)

CH36

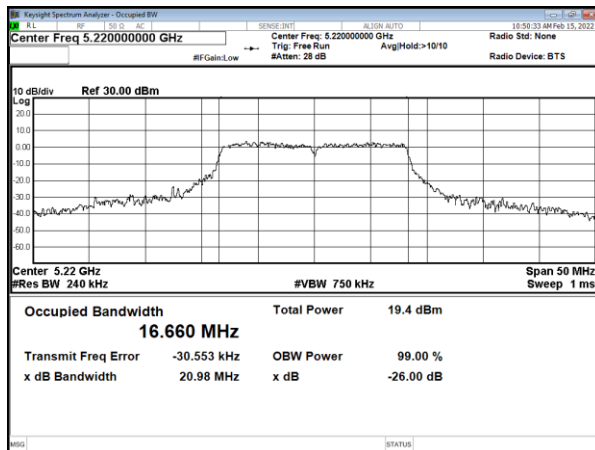


Modulation Standard: 802.11ac VHT20 (6.5Mbps)

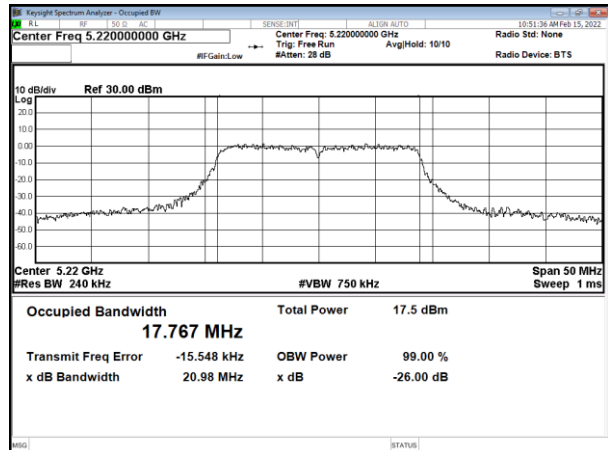
CH36



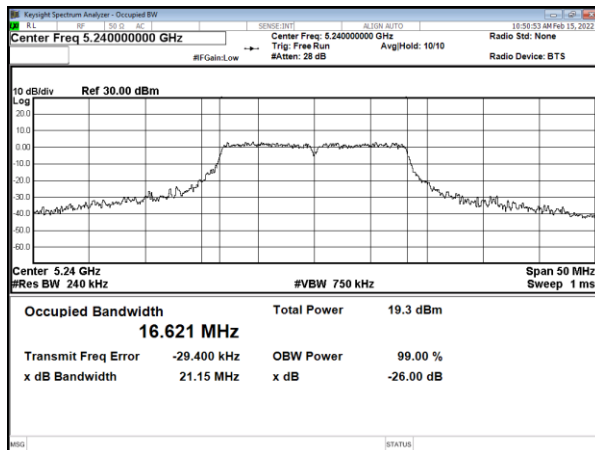
CH44



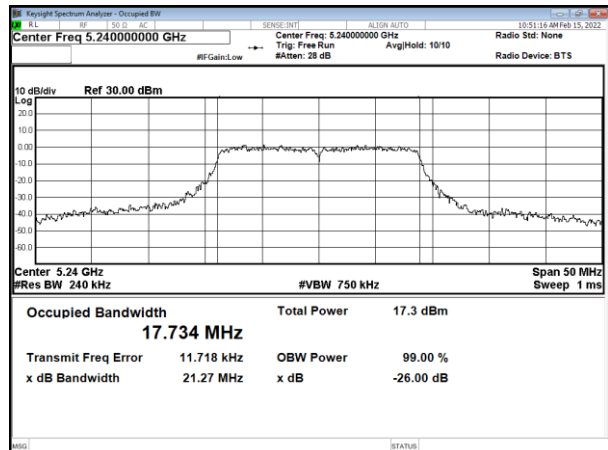
CH44



CH48



CH48

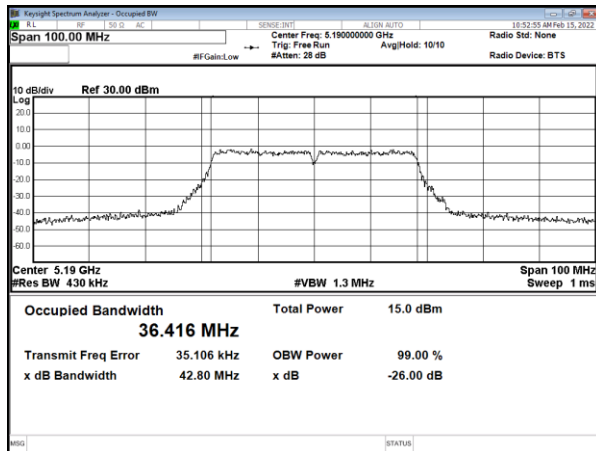




26dB Bandwidth & 99% Occupied Bandwidth, UNII-1

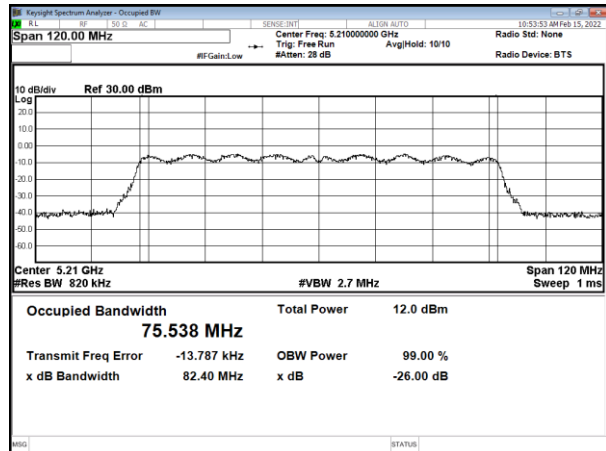
Modulation Standard: 802.11ac VHT40 (13.5Mbps)

CH38

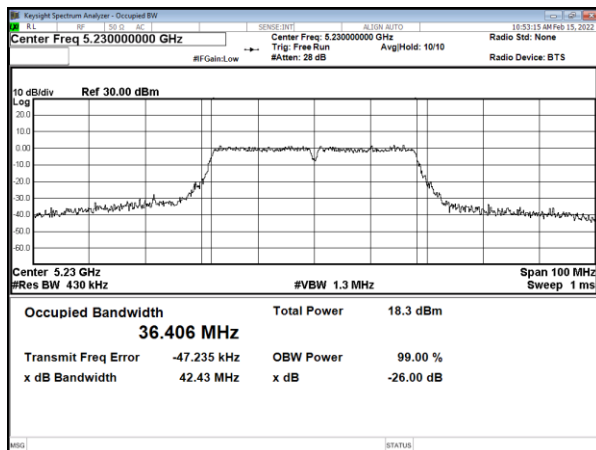


Modulation Standard: 802.11ac VHT80 (29.3Mbps)

CH42



CH46



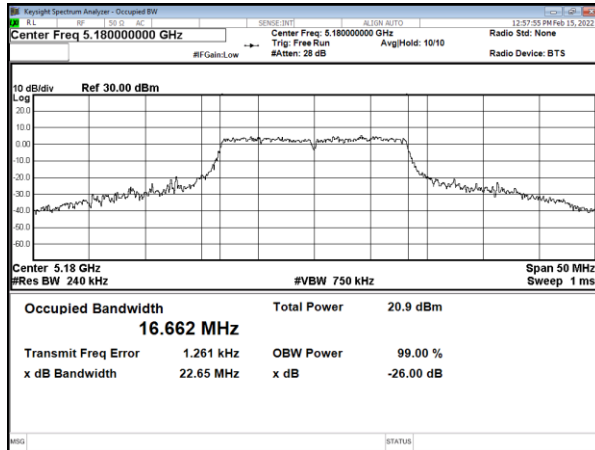


ANT B

26dB Bandwidth & 99% Occupied Bandwidth, UNII-1

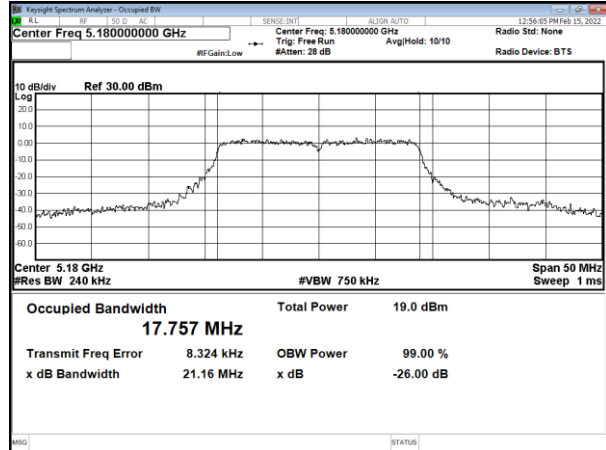
Modulation Standard: 802.11a (6Mbps)

CH36

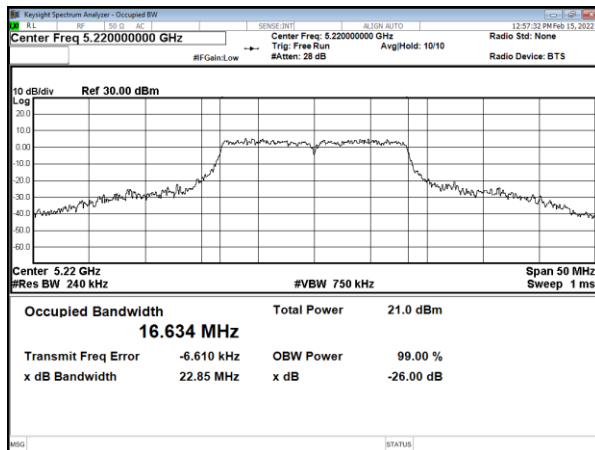


Modulation Standard: 802.11ac VHT20 (6.5Mbps)

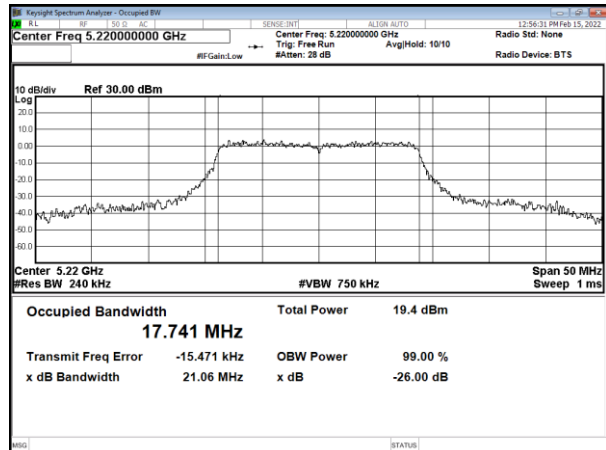
CH36



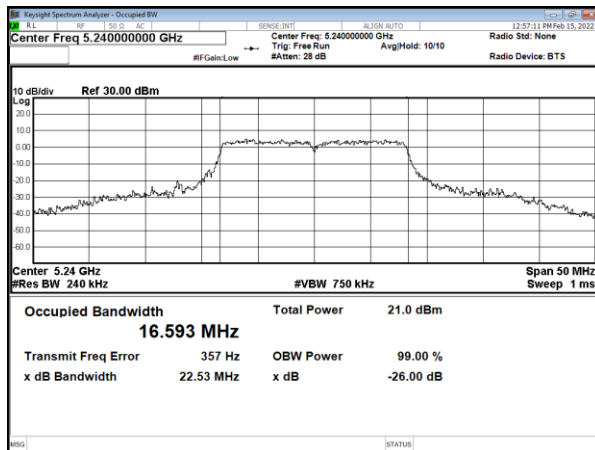
CH44



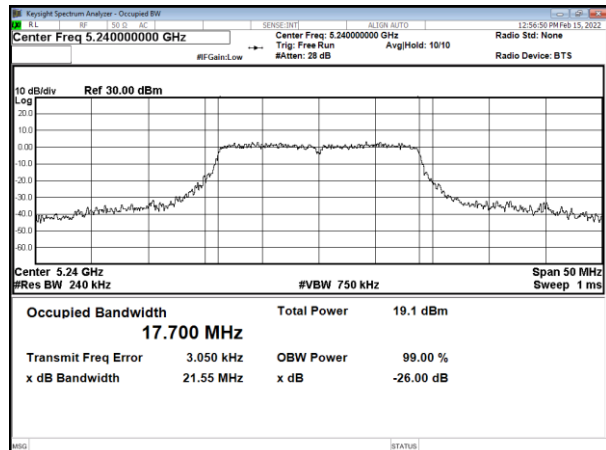
CH44



CH48



CH48

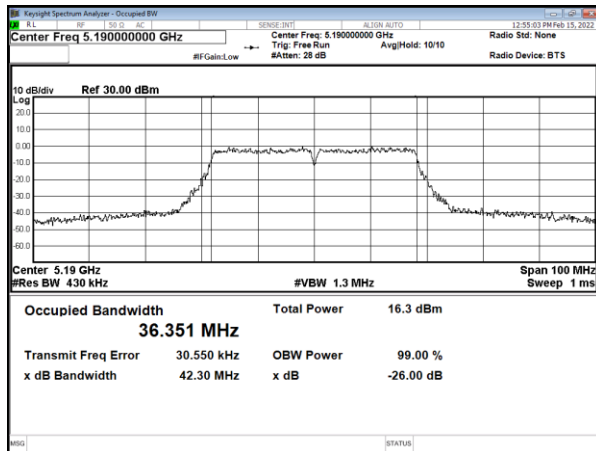




26dB Bandwidth & 99% Occupied Bandwidth, UNII-1

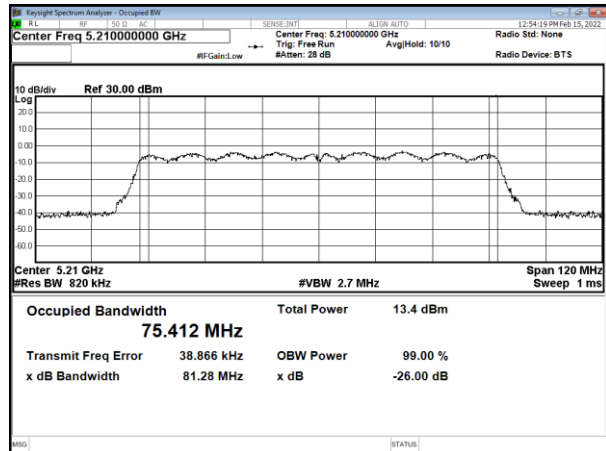
Modulation Standard: 802.11ac VHT40 (13.5Mbps)

CH38

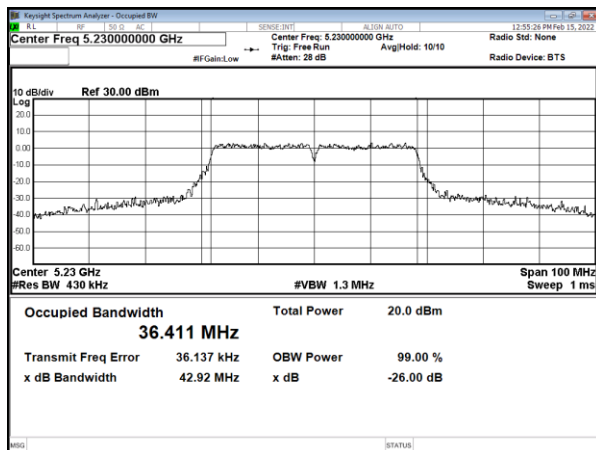


Modulation Standard: 802.11ac VHT80 (29.3Mbps)

CH42



CH46





10. Average Power

10.1. Test Limit

Output Power:

Frequency Band		Limit
☒	5.15~5.25GHz	
	Operating Mode	
☐	Outdoor access point	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm) provided the maximum antenna gain does not exceed 6 dBi. 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 30degrees as measured from the horizon must not exceed 125 mW (21 dBm).
☐	Indoor access point	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm) provided the maximum antenna gain does not exceed 6 dBi. 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.
☐	Fixed point-to-point access points	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm). 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.
☒	client devices	The maximum conducted output power over the frequency band of operation shall not exceed 250 mW (24dBm) provided the maximum antenna gain does not exceed 6 dBi. 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.



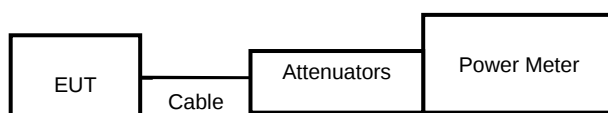
Frequency Band		Limit
☒	5.25-5.35 GHz	The maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW (24dBm) or 11 dBm $10 \log B$, where B is the 26 dB emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are 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.
☐	5.470-5.725 GHz	
☒	5.725~5.85 GHz	The maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm). 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. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power.

10.2.Test Procedure

The transmitter output is connected to a power meter.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

10.3.Test Setup Layout



**10.4. Test Result and Data****In the 5.2G Band**

Modulation Type	Data Rate	Setting	Channel	Frequency (MHz)	Avg Power Output (dBm)		Total Power (dBm)	Total Power (mW)	Power Limit (dBm)
					ANT A	ANT B	A+B	A+B	
11a	6 Mbps	62	36	5180	15.95	15.35	18.67	73.632	24.00
11a	6 Mbps	62	44	5220	15.23	15.35	18.30	67.619	24.00
11a	6 Mbps	62	48	5240	15.00	15.16	18.09	64.432	24.00
11n HT20	MCS 0	62	36	5180	12.13	13.04	15.62	36.468	24.00
11n HT20	MCS 0	62	44	5220	13.21	13.68	16.46	44.276	24.00
11n HT20	MCS 0	62	48	5240	12.96	13.27	16.13	41.002	24.00
11n HT40	MCS 0	62	38	5190	8.97	10.24	12.66	18.457	24.00
11n HT40	MCS 0	62	46	5230	12.13	14.13	16.25	42.213	24.00
11ac VHT20	NSS1-MCS0	62	36	5180	12.58	13.40	16.02	39.991	24.00
11ac VHT20	NSS1-MCS0	62	44	5220	13.34	13.78	16.58	45.456	24.00
11ac VHT20	NSS1-MCS0	62	48	5240	13.15	13.51	16.34	43.093	24.00
11ac VHT40	NSS1-MCS0	62	38	5190	9.06	10.55	12.88	19.404	24.00
11ac VHT40	NSS1-MCS0	62	46	5230	12.64	14.27	16.54	45.095	24.00
11ac VHT80	NSS1-MCS0	62	42	5210	5.43	6.56	9.04	8.020	24.00

In the 5.8G Band

Modulation Type	Data Rate	Setting	Channel	Frequency (MHz)	Avg Power Output (dBm)		Total Power (dBm)	Total Power (mW)	Power Limit (dBm)
					ANT A	ANT B	A+B	A+B	
11a	6 Mbps	62	149	5745	13.43	13.88	16.67	46.464	30.00
11a	6 Mbps	62	157	5785	13.43	13.72	16.59	45.580	30.00
11a	6 Mbps	62	165	5825	12.55	12.62	15.60	36.270	30.00
11n HT20	MCS 0	62	149	5745	13.24	13.97	16.63	46.032	30.00
11n HT20	MCS 0	62	157	5785	13.32	13.34	16.34	43.056	30.00
11n HT20	MCS 0	62	165	5825	13.27	12.41	15.87	38.651	30.00
11n HT40	MCS 0	62	151	5755	12.18	12.87	15.55	35.884	30.00
11n HT40	MCS 0	62	159	5795	11.94	12.46	15.22	33.251	30.00
11ac VHT20	NSS1-MCS0	62	149	5745	13.39	14.02	16.73	47.062	30.00
11ac VHT20	NSS1-MCS0	62	157	5785	13.45	13.51	16.49	44.570	30.00
11ac VHT20	NSS1-MCS0	62	165	5825	13.41	12.55	16.01	39.917	30.00
11ac VHT40	NSS1-MCS0	62	151	5755	12.21	12.99	15.63	36.541	30.00
11ac VHT40	NSS1-MCS0	62	159	5795	12.02	12.61	15.34	34.161	30.00
11ac VHT80	NSS1-MCS0	62	155	5775	10.17	10.35	13.27	21.238	30.00



11. Maximum Power Spectral Density

11.1. Test Limit

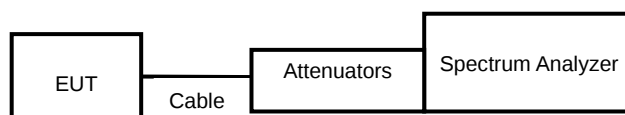
PSD:

Frequency Band		Limit
☒	5.15~5.25GHz	
	Operating Mode	
☐	Outdoor access point	17 dBm/MHz
☐	Indoor access point	17 dBm/MHz
☐	Fixed point-to-point access points	17 dBm/MHz
☒	client devices	11 dBm/MHz
☐	5.250~5.350 GHz	11 dBm/MHz
☐	5.470~5.725 GHz	11 dBm/MHz
☒	5.725~5.85 GHz	30 dBm/500kHz

11.2. Test Procedure

Reference to KDB789033 v02r01 General UNII Test Procedures New Rules.

11.3. Test Setup Layout



**11.4. Test Result and Data****In the 5.2G Band**

Modulation Type	CH	Freq. (MHz)	Meas PPSD (dBm/MHz)		Sum chain (dBm)	Duty Cycle CF(dB)	Total Corr'd PPSD (dBm/MHz)	PPSD Limit (dBm/MHz)
			ANT A	ANT B				
11a	36	5180	5.29	4.34	7.85	0.00	7.85	8.63
11a	44	5220	4.24	4.41	7.34	0.00	7.34	8.63
11a	48	5240	4.02	4.00	7.02	0.00	7.02	8.63
11ac VHT20	36	5180	2.92	2.26	5.61	0.00	5.61	8.63
11ac VHT20	44	5220	4.45	2.41	6.56	0.00	6.56	8.63
11ac VHT20	48	5240	4.21	2.37	6.40	0.00	6.40	8.63
11ac VHT40	38	5190	-3.81	-3.89	-0.84	0.00	-0.84	8.63
11ac VHT40	46	5230	-0.11	-0.05	2.93	0.00	2.93	8.63
11ac VHT80	42	5210	-9.34	-9.70	-6.51	0.00	-6.51	8.63

In the 5.8G Band

Modulation Type	CH	Freq. (MHz)	Meas PPSD (dBm/MHz)		Sum chain (dBm)	Duty Cycle CF(dB)	10log(500K Hz/RBW) CF (dB)	Total Corr'd PPSD (dBm/500kHz)	PPSD Limit (dBm/500kHz)
			ANT A	ANT B					
11a	149	5745	1.19	3.10	5.25	0.00	-3.01	2.24	27.32
11a	157	5785	1.65	2.99	5.38	0.00	-3.01	2.37	27.32
11a	165	5825	0.53	1.91	4.28	0.00	-3.01	1.27	27.32
11ac VHT20	149	5745	1.00	3.10	5.19	0.00	-3.01	2.18	27.32
11ac VHT20	157	5785	1.42	2.85	5.20	0.00	-3.01	2.19	27.32
11ac VHT20	165	5825	0.31	1.56	3.99	0.00	-3.01	0.98	27.32
11ac VHT40	151	5755	-3.14	-1.33	0.87	0.00	-3.01	-2.14	27.32
11ac VHT40	159	5795	-3.34	-1.57	0.65	0.00	-3.01	-2.36	27.32
11ac VHT80	155	5775	-7.33	-6.08	-3.65	0.00	-3.01	-6.66	27.32

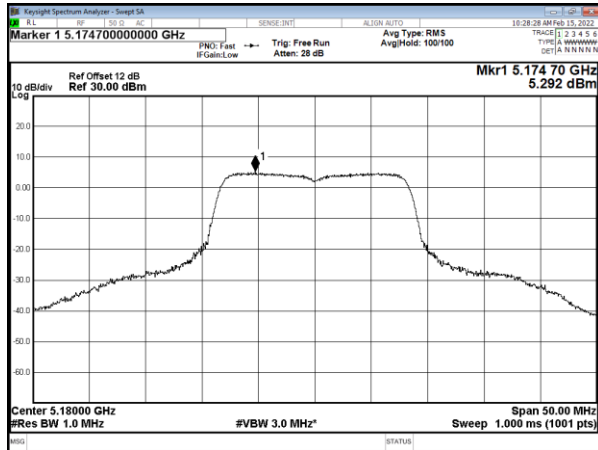


ANT A

5.2G, UNII-1

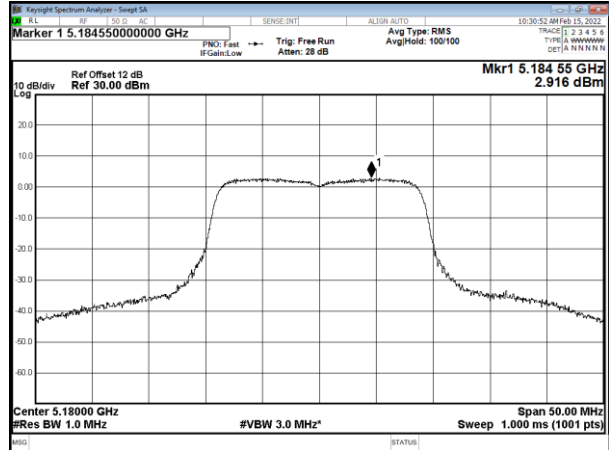
Modulation Standard: 802.11a (6Mbps)

CH36

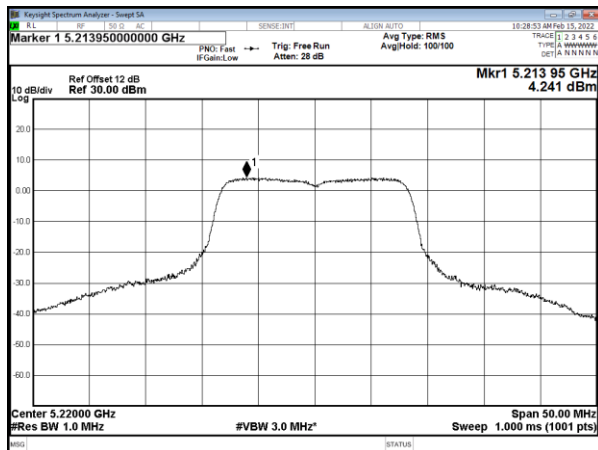


Modulation Standard: 802.11ac VHT20 (6.5Mbps)

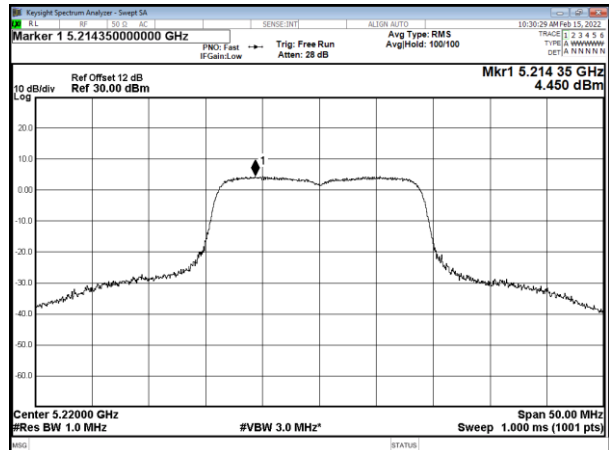
CH36



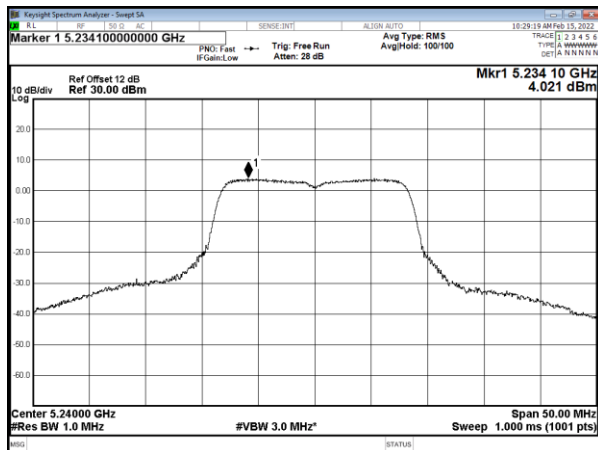
CH44



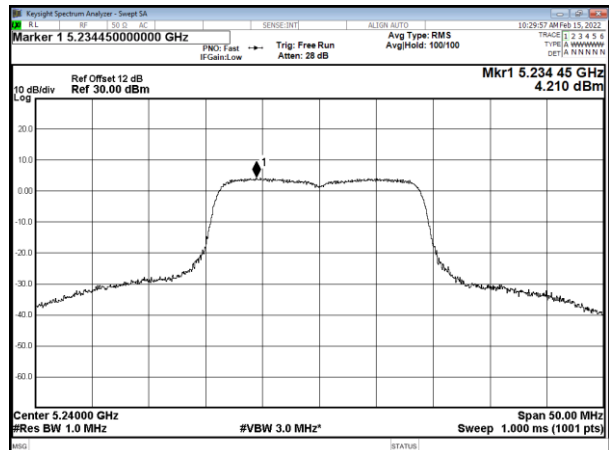
CH44



CH48



CH48

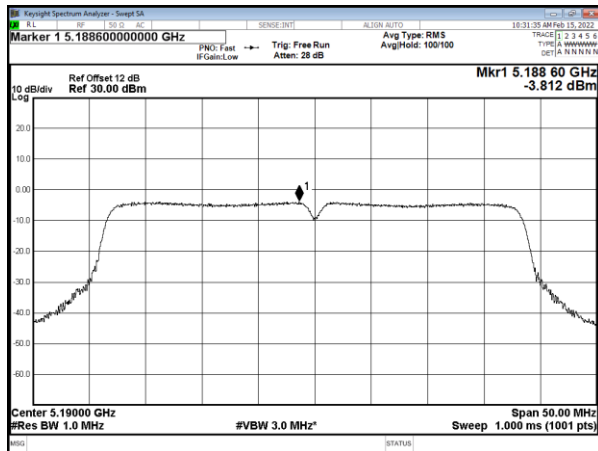




5.2G, UNII-1

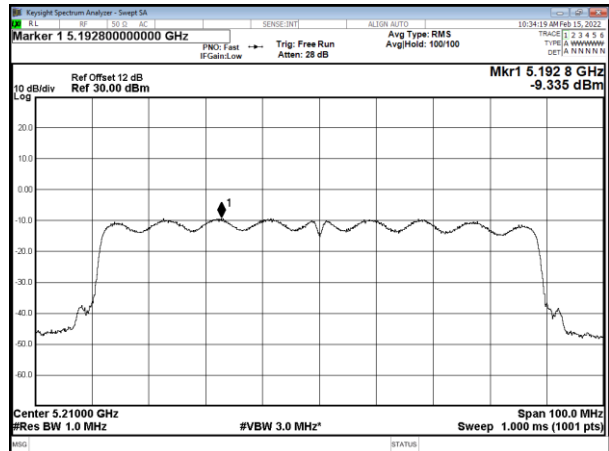
Modulation Standard: 802.11ac VHT40 (13.5Mbps)

CH38

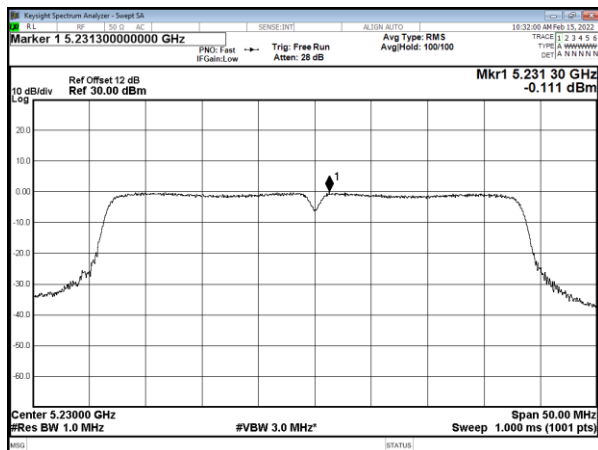


Modulation Standard: 802.11ac VHT80 (29.3Mbps)

CH42



CH46

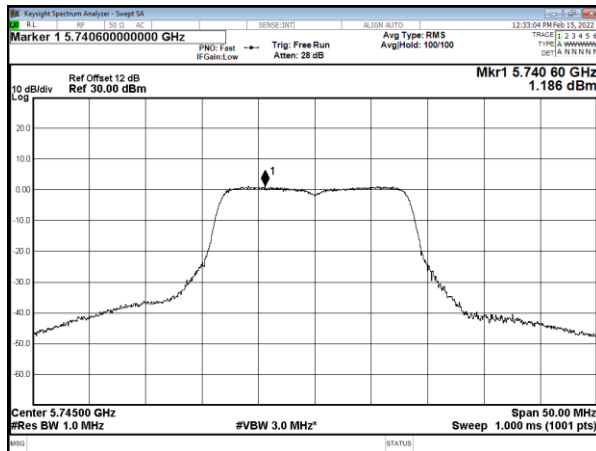




5.8G, UNII-3

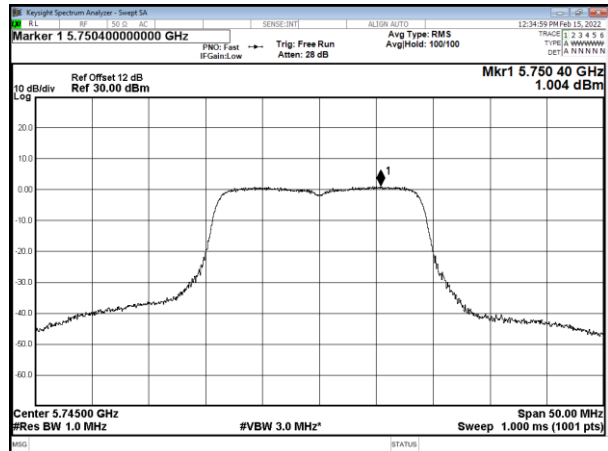
Modulation Standard: 802.11a (6Mbps)

CH149

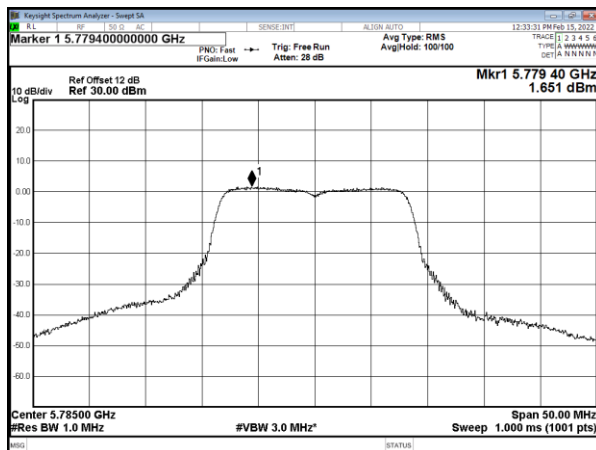


Modulation Standard: 802.11ac VHT20 (6.5Mbps)

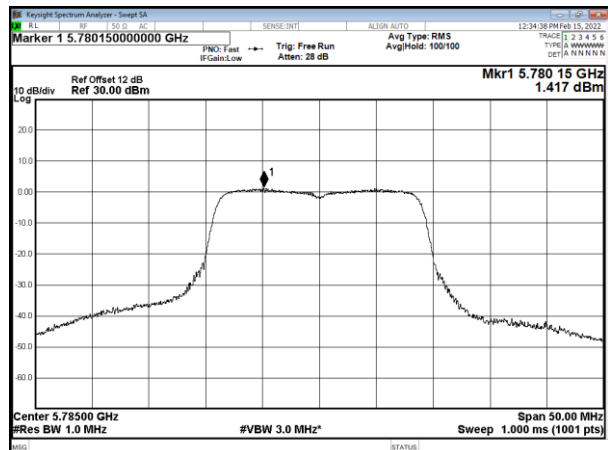
CH149



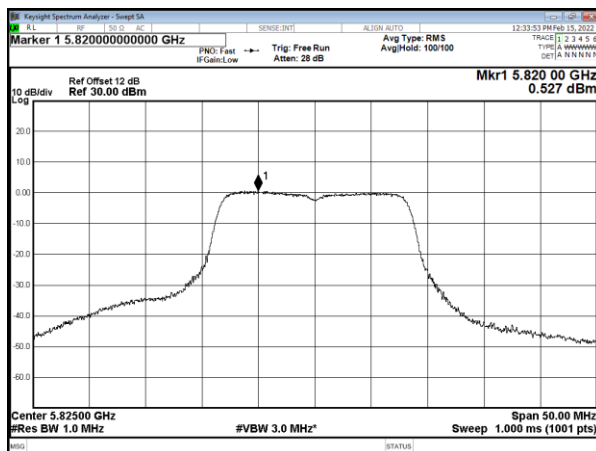
CH157



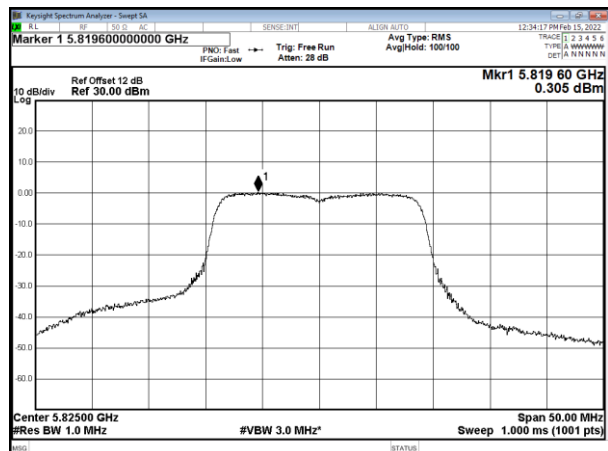
CH157



CH165



CH165

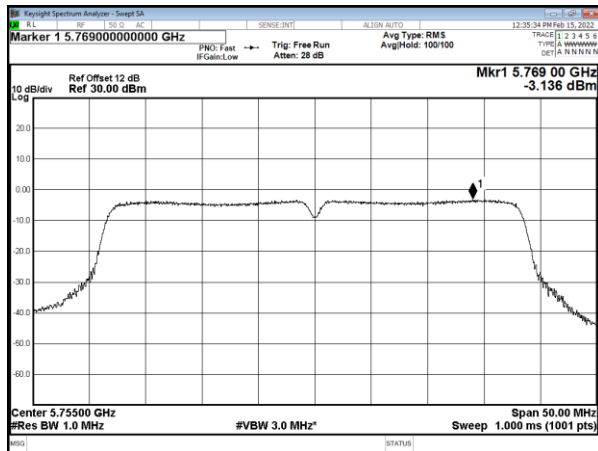




5.8G, UNII-3

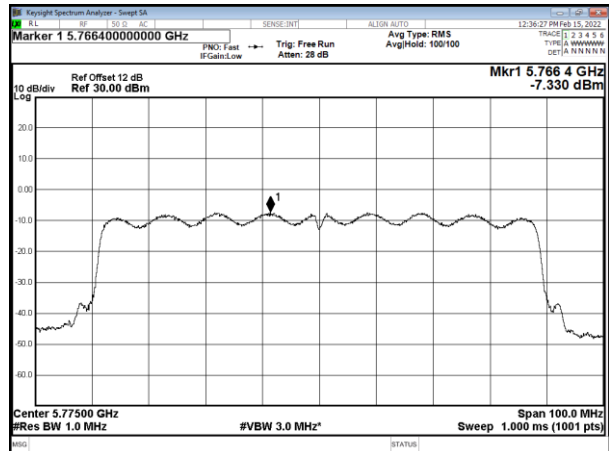
Modulation Standard: 802.11ac VHT40 (13.5Mbps)

CH151

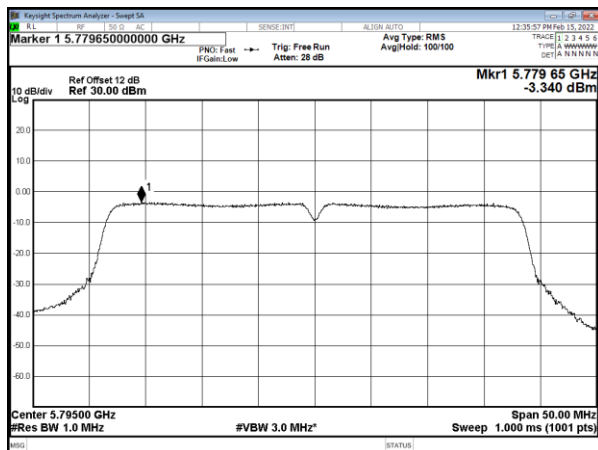


Modulation Standard: 802.11ac VHT80 (29.3Mbps)

CH155



CH159



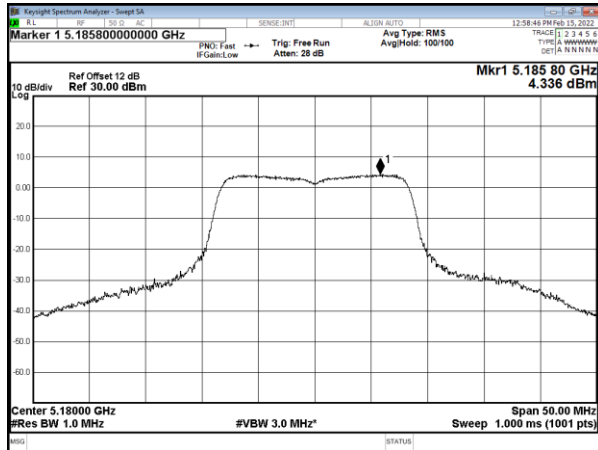


ANT B

5.2G, UNII-1

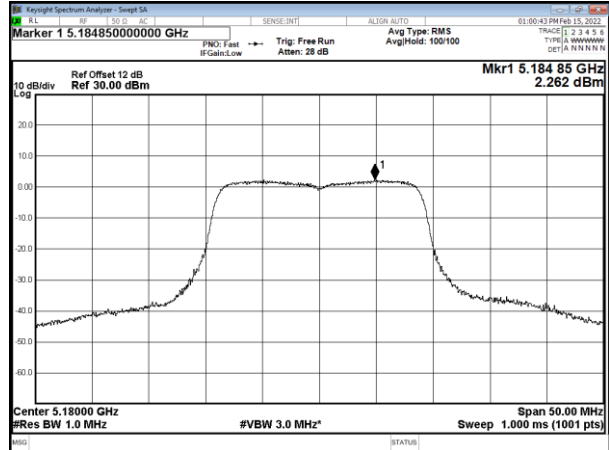
Modulation Standard: 802.11a (6Mbps)

CH36

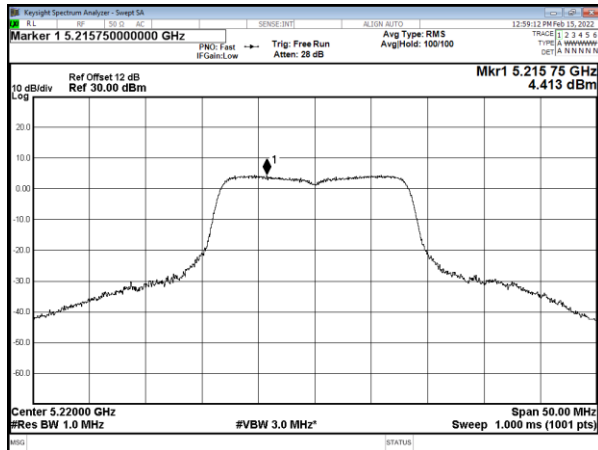


Modulation Standard: 802.11ac VHT20 (6.5Mbps)

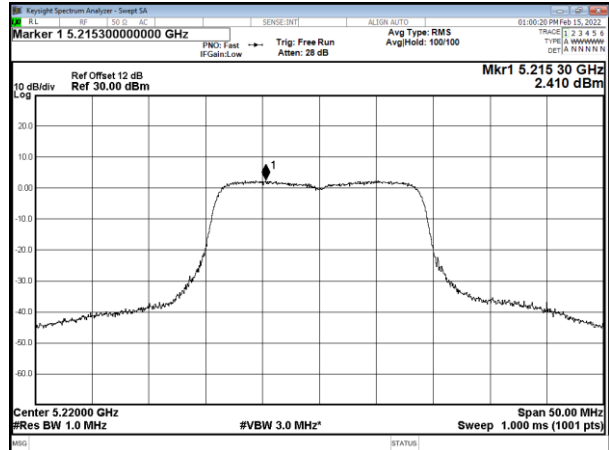
CH36



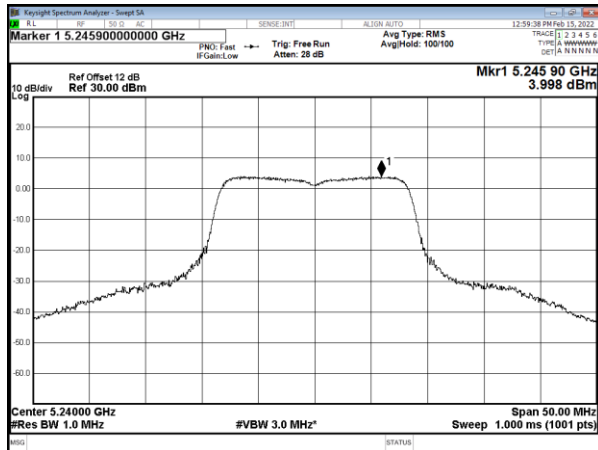
CH44



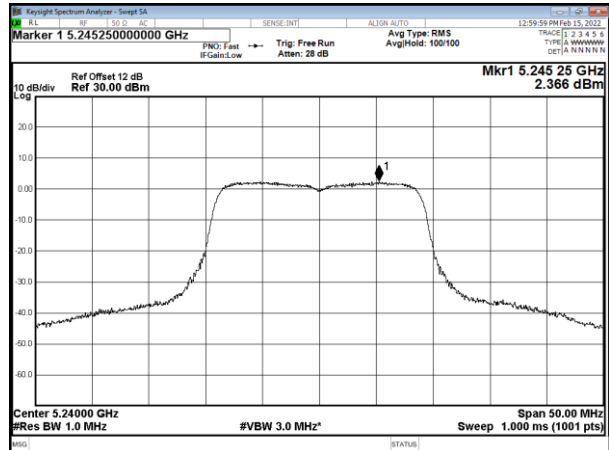
CH44



CH48



CH48

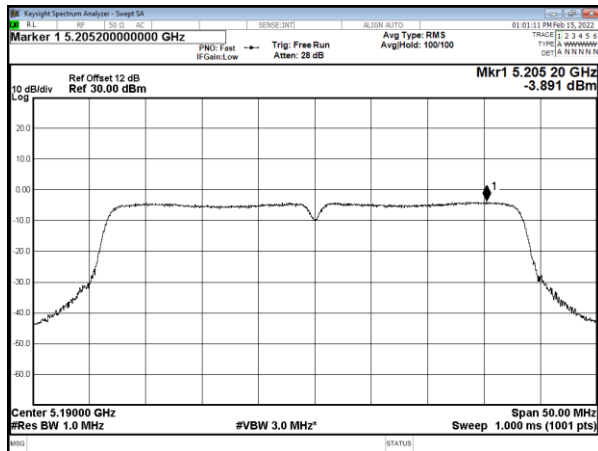




5.2G, UNII-1

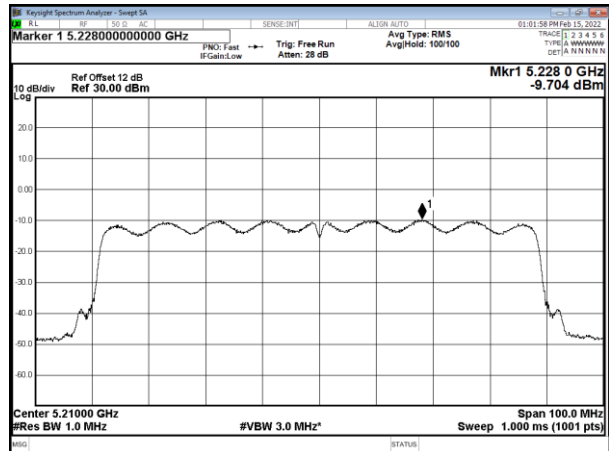
Modulation Standard: 802.11ac VHT40 (13.5Mbps)

CH38

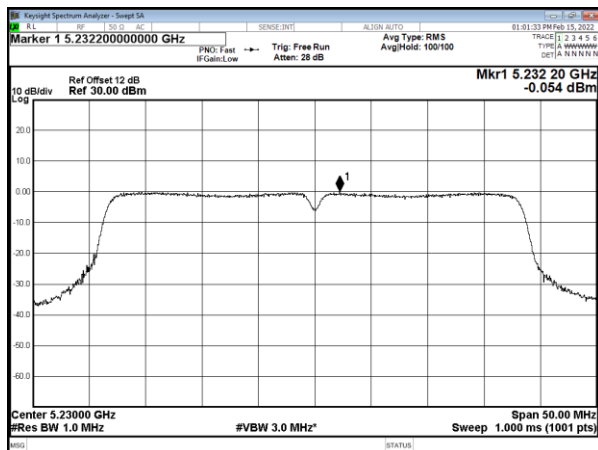


Modulation Standard: 802.11ac VHT80 (29.3Mbps)

CH42



CH46

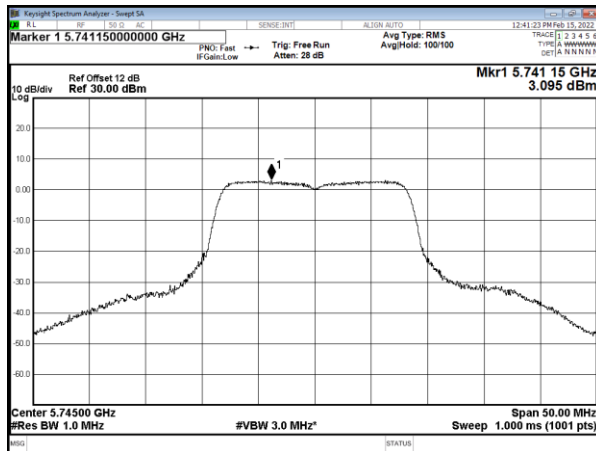




5.8G, UNII-3

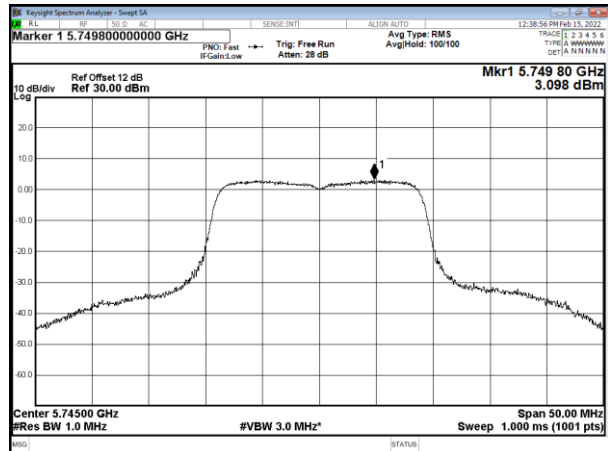
Modulation Standard: 802.11a (6Mbps)

CH149

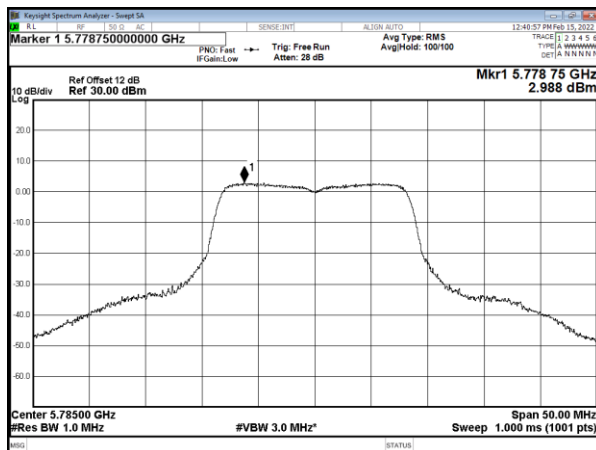


Modulation Standard: 802.11ac VHT20 (6.5Mbps)

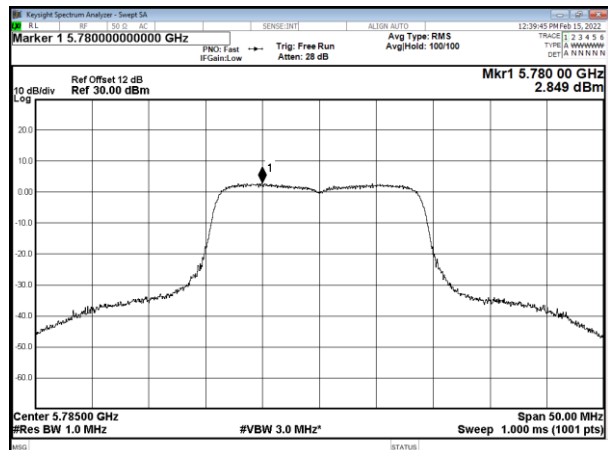
CH149



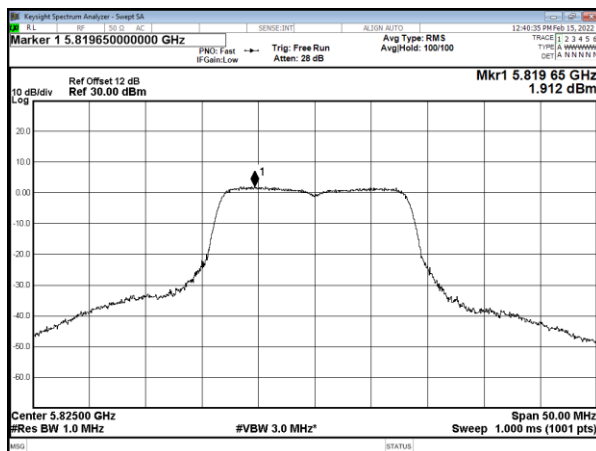
CH157



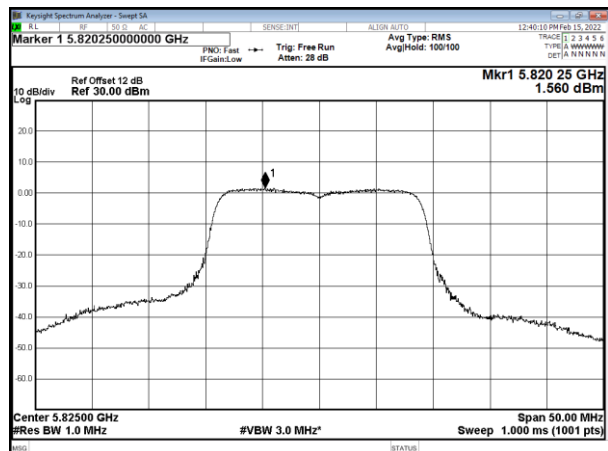
CH157



CH165



CH165

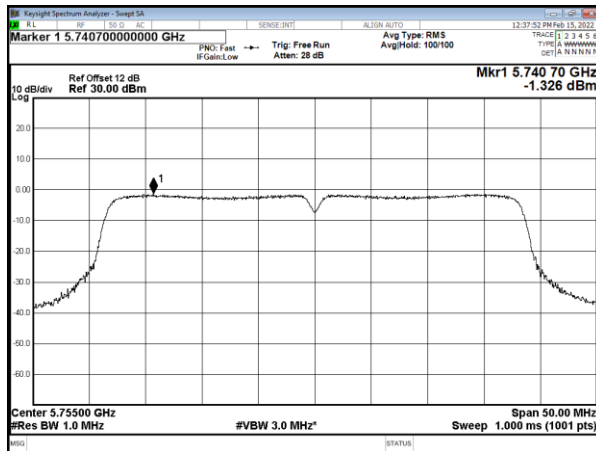




5.8G, UNII-3

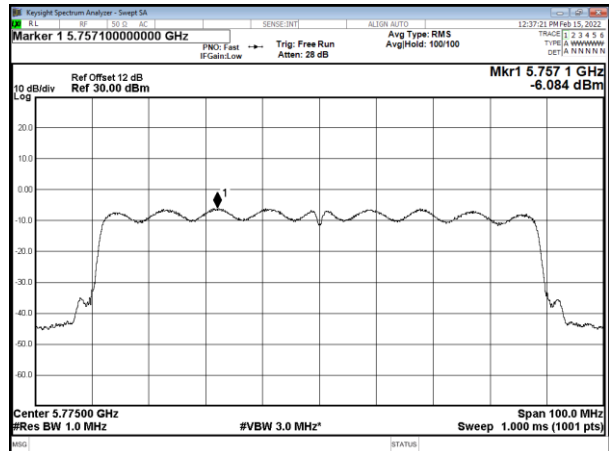
Modulation Standard: 802.11ac VHT40 (13.5Mbps)

CH151

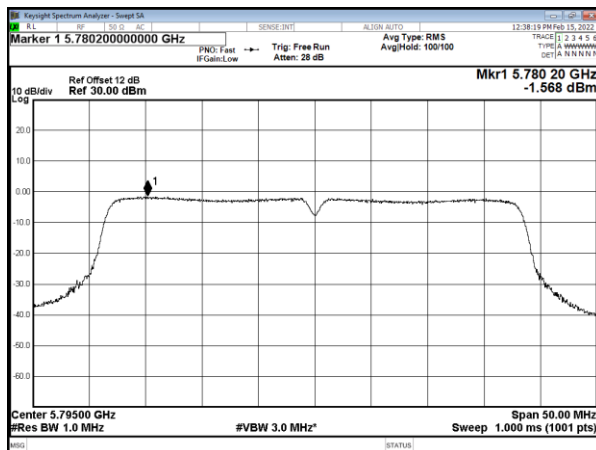


Modulation Standard: 802.11ac VHT80 (29.3Mbps)

CH155



CH159



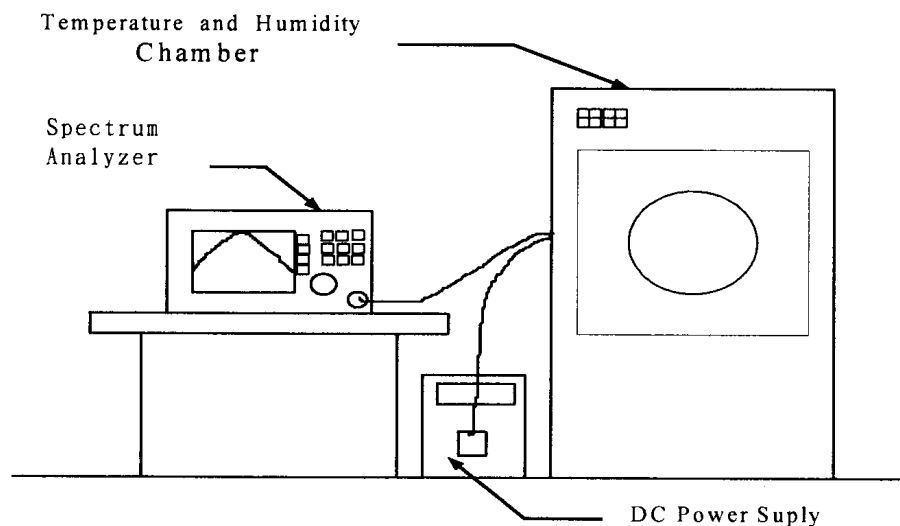


12. Frequency Stability

12.1. Test Procedure

1. The EUT was placed inside the Temperature and Humidity chamber.
2. The transmitter output was connected to spectrum analyzer.
3. Turn the EUT on and couple its output to a spectrum analyzer.
4. Turn the EUT off and set the chamber to the highest temperature specified.
5. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
6. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
7. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

12.2. Test Setup Layout



**12.3. Test Result and Data**

Operating frequency: 5180 MHz							
Temp	Power supply	2 minute		5 minute		10 minute	
(°C)	(V)	(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
45	13.8	5179.9948	-0.000100	5179.9976	-0.000046	5180.0088	0.000170
	12	5179.9947	-0.000102	5179.9978	-0.000042	5180.0079	0.000153
	10.2	5179.9944	-0.000108	5179.9979	-0.000041	5180.0077	0.000149
30	13.8	5179.9946	-0.000104	5179.9977	-0.000044	5180.0075	0.000145
	12	5179.995	-0.000097	5179.9974	-0.000050	5180.0076	0.000147
	10.2	5179.9952	-0.000093	5179.9972	-0.000054	5180.0074	0.000143
20	13.8	5179.9954	-0.000089	5179.9969	-0.000060	5180.0077	0.000149
	12	5179.9953	-0.000091	5179.9963	-0.000071	5180.0078	0.000151
	10.2	5179.9951	-0.000095	5179.9966	-0.000066	5180.0075	0.000145
10	13.8	5179.9948	-0.000100	5179.9964	-0.000069	5180.008	0.000154
	12	5179.9947	-0.000102	5179.9967	-0.000064	5180.0082	0.000158
	10.2	5179.9953	-0.000091	5179.997	-0.000058	5180.0081	0.000156
0	13.8	5179.9956	-0.000085	5179.9969	-0.000060	5180.0083	0.000160
	12	5179.9954	-0.000089	5179.9968	-0.000062	5180.0085	0.000164
	10.2	5179.9951	-0.000095	5179.9972	-0.000054	5180.0087	0.000168

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 user's manual.

-----End of the report -----