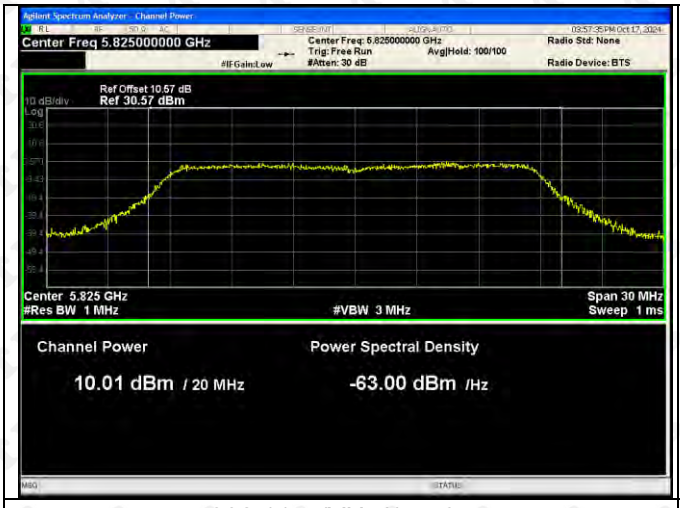
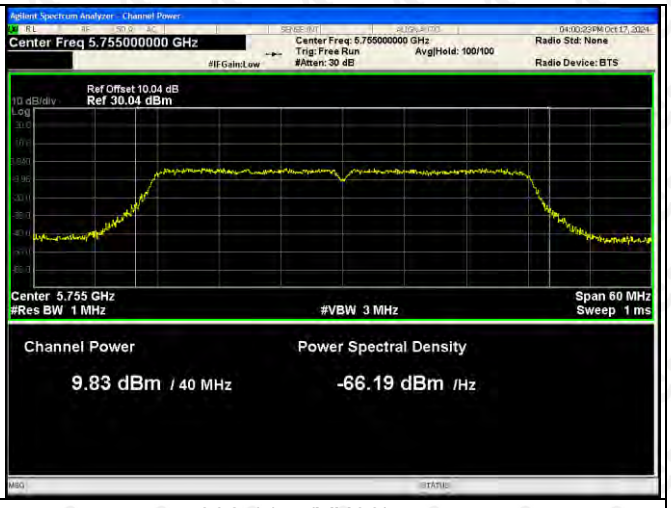
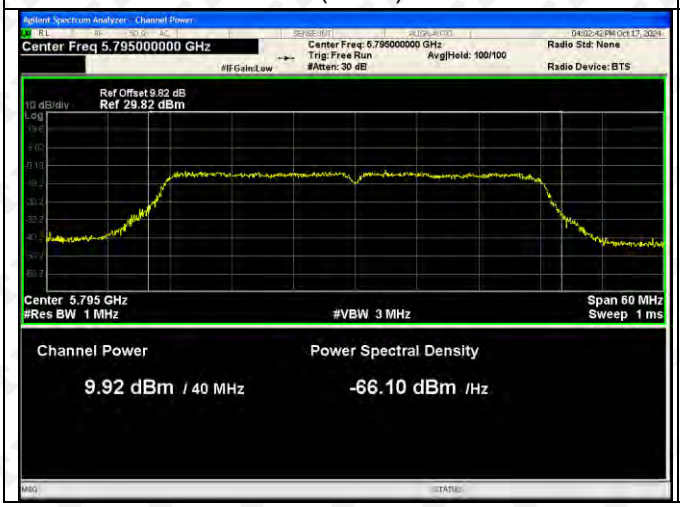
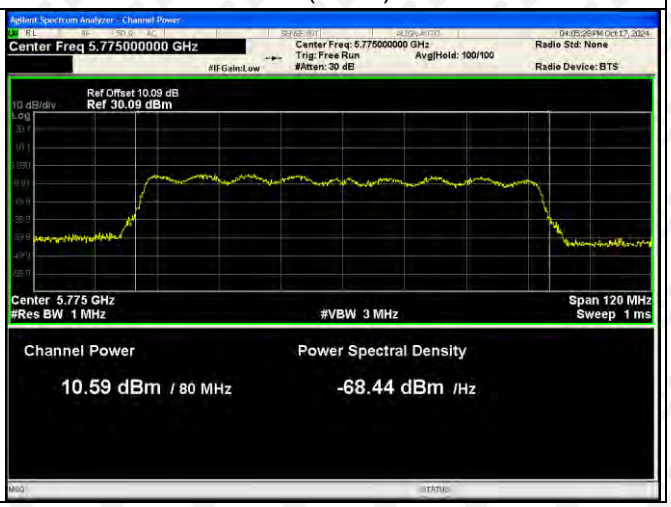


802.11ax(VH40)-5795



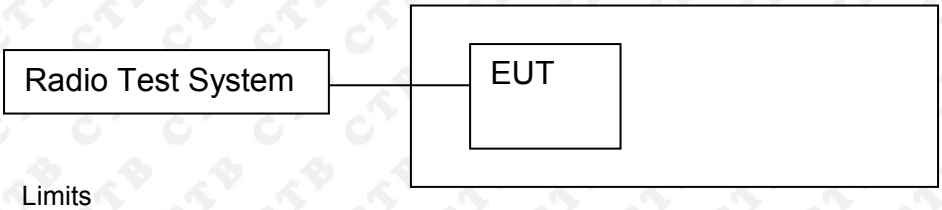
802.11ax(VH80)-5775





10. EMISSION BANDWIDTH& OCCUPIED BANDWIDTH

10.1 Block Diagram Of Test Setup



10.2 Limits

(1) For the band 5.15-5.25 GHz.

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

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

10.3 Test Procedure

According to KDB789033 D02v02r01 sectionE, the following is the measurement procedure.

1. Emission Bandwidth (EBW)
a) Set RBW = approximately 1% of the emission bandwidth.
b) Set the VBW > RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
2. Minimum Emission Bandwidth for the band 5.725−5.85 GHz
Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 kHz for the band 5.725−5.85 GHz. The following procedure shall be used for measuring this bandwidth:
a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3 * RBW.
c) Detector = Peak.
d) Trace mode = max hold.

e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) 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 in this section. For devices that use channel aggregation refer to III.A and III.C for determining emission bandwidth.

D. 99% Occupied Bandwidth

The 99% occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5% of the total mean power of the given emission. Measurement of the 99% occupied bandwidth is *required* only as a condition for using the optional band-edge measurement techniques described in II.G.3.d). Measurements of 99% occupied bandwidth may also optionally be used in lieu of the EBW to define the minimum frequency range over which the 789033 D02 General UNII Test Procedures New Rules v02r01 Page 4 spectrum is integrated when measuring maximum conducted output power as described in II.E. However, the EBW must be measured to determine bandwidth dependent limits on maximum conducted output power in accordance with Section 15.407(a).
The following procedure shall be used for measuring (99%) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.

2. Set span = 1.5 times to 5.0 times the OBW.

3. Set RBW = 1% to 5% of the OBW

4. Set VBW ≥ 3 * RBW

5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.

6. Use the 99% power bandwidth function of the instrument (if available).

7. If the instrument does not have a 99% power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

10.4 Test Results

Test mode ANT 1	Test Channel (MHz)	26dB Bandwidth (MHz)
802.11a	5180	20.55
	5200	20.686
	5240	21.137
802.11ac20	5180	21.553
	5200	21.512
	5240	21.385
802.11ac40	5190	40.978
	5230	41.1
802.11ac80	5210	78.843
802.11n(HT20)	5180	20.834
	5200	21.288
	5240	21.23
802.11n(HT40)	5190	41.4
	5230	41.308
802.11ax20	5180	21.173
	5200	21.172
	5240	21.116
802.11ax40	5190	40.35
	5230	40.974
802.11ax80	5210	79.304

Test mode ANT 2	Test Channel (MHz)	26dB Bandwidth (MHz)
802.11a	5180	21.001
	5200	21.154
	5240	20.984
802.11ac20	5180	20.832
	5200	20.845
	5240	21.014
802.11ac40	5190	43.876
	5230	40.484
802.11ac80	5210	79.621
802.11n(HT20)	5180	21.066
	5200	21.573
	5240	21.457
802.11n(HT40)	5190	40.742
	5230	40.91
802.11ax20	5180	21.19
	5200	21.215
	5240	20.957
802.11ax40	5190	41.428
	5230	41.181
802.11ax80	5210	81.576

5725-5850 MHz

Test mode Ant 1	Test Channel (MHz)	6dB Bandwidth (MHz)	Result
802.11a	5745	16.525	Pass
	5785	16.516	Pass
	5825	16.517	Pass
802.11ac(VH20)	5745	17.821	Pass
	5785	17.785	Pass
	5825	17.733	Pass
802.11ac(VH40)	5755	36.416	Pass
	5795	36.467	Pass
802.11ac(VH80)	5775	75.807	Pass
802.11n(VH20)	5745	17.707	Pass
	5785	17.717	Pass
	5825	17.725	Pass
802.11n(VH40)	5755	36.482	Pass
	5795	36.568	Pass
802.11ax20	5745	17.741	Pass
	5785	17.776	Pass
	5825	17.776	Pass
802.11ax40	5755	36.47	Pass
	5795	36.468	Pass
802.11ax80	5775	75.492	Pass

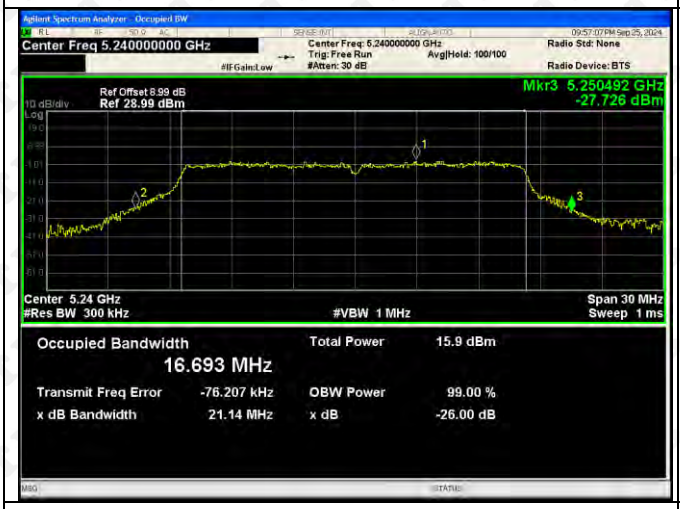
Test mode Ant 2	Test Channel (MHz)	6dB Bandwidth (MHz)	Result
802.11a	5745	16.505	Pass
	5785	16.532	Pass
	5825	16.531	Pass
802.11ac(VH20)	5745	17.813	Pass
	5785	17.838	Pass
	5825	17.814	Pass
802.11ac(VH40)	5755	36.423	Pass
	5795	36.488	Pass
802.11ac(VH80)	5775	76.071	Pass
802.11n(VH20)	5745	17.738	Pass
	5785	17.723	Pass
	5825	17.718	Pass
802.11n(VH40)	5755	36.54	Pass
	5795	36.586	Pass
802.11ax20	5745	17.767	Pass
	5785	17.762	Pass
	5825	17.785	Pass
802.11ax40	5755	36.477	Pass
	5795	36.427	Pass
802.11ax80	5775	76.093	Pass

5180-5240MHz
ANT 1

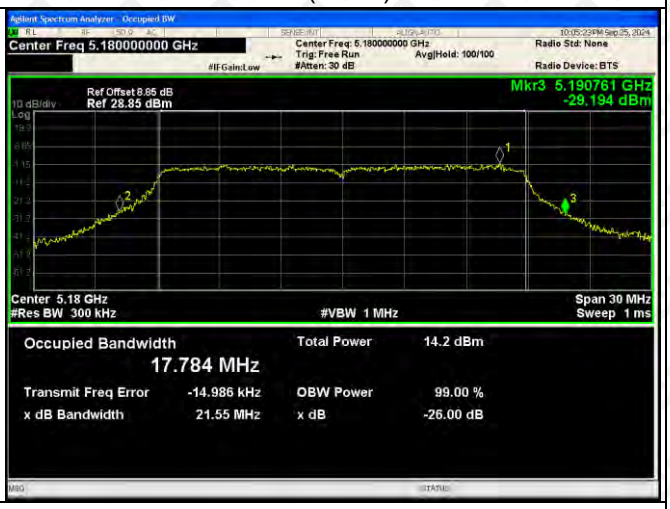
802.11a-5180

802.11a-5200

802.11a-5240



802.11ac(VH20)-5180



802.11ac(VH20)-5200

802.11ac(VH20)-5240

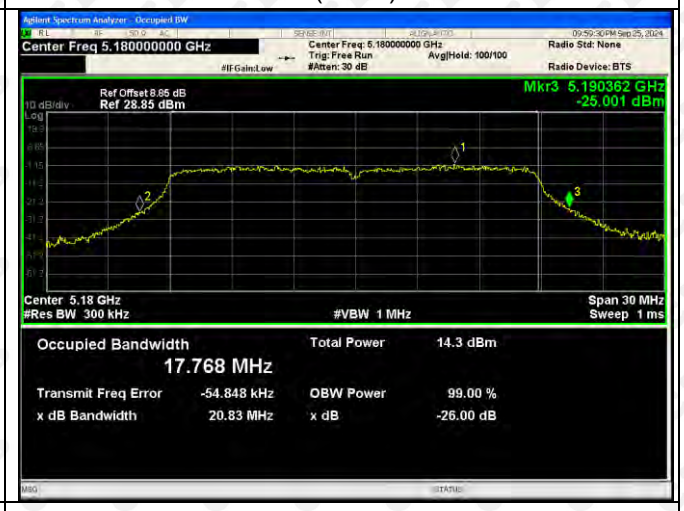
802.11ac(VH40)-5190

802.11ac(VH40)-5230

802.11ac(VH80)-5210

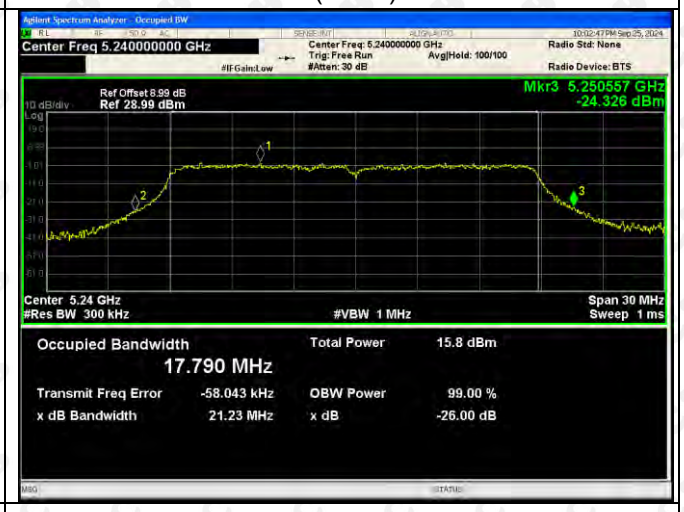
802.11n(HT20)-5180

802.11n(HT20)-5200



802.11n(HT20)-5240

802.11n(HT40)-5190

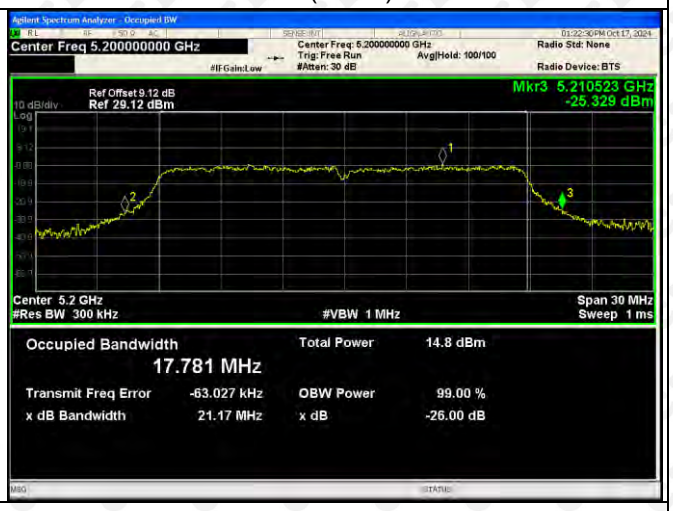


802.11n(HT40)-5230

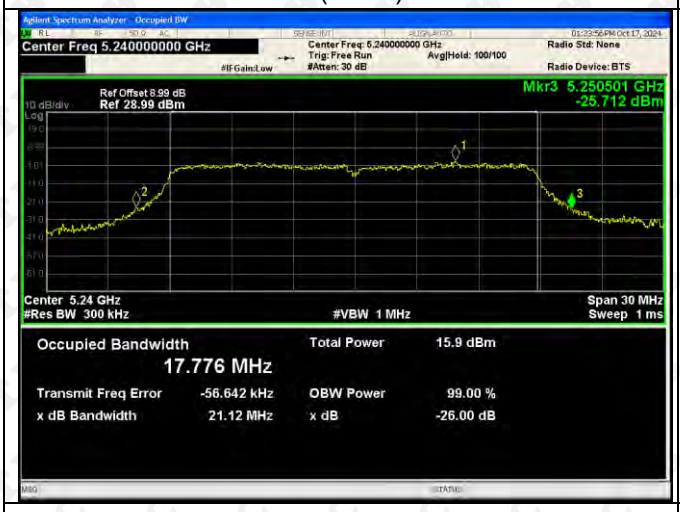
802.11ax(VH20)-5180

802.11ax(VH20)-5200

802.11ax(VH20)-5240

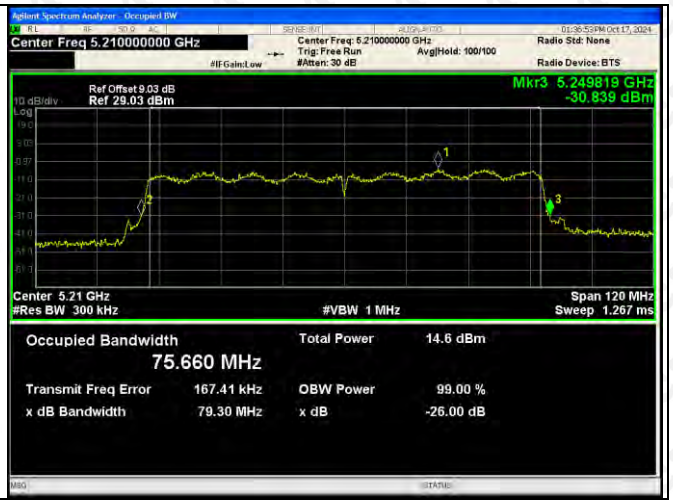


802.11ax(VH40)-5190



802.11ax(VH40)-5230

802.11ax(VH80)-5210



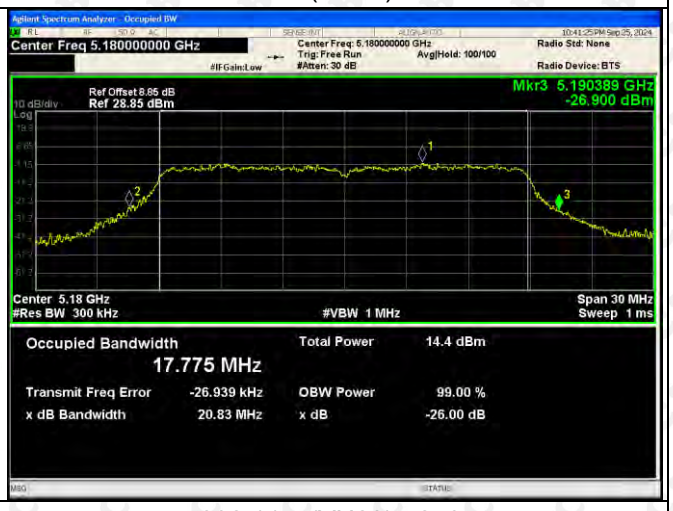
ANT2

802.11a-5180

802.11a-5200

802.11a-5240

802.11ac(VH20)-5180

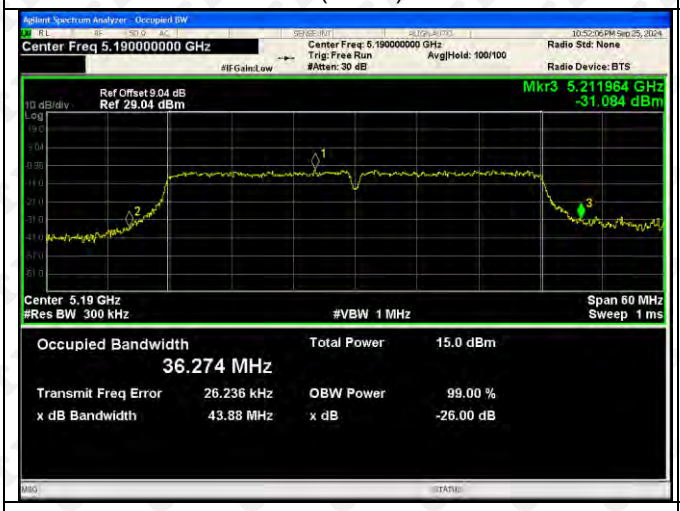


802.11ac(VH20)-5200

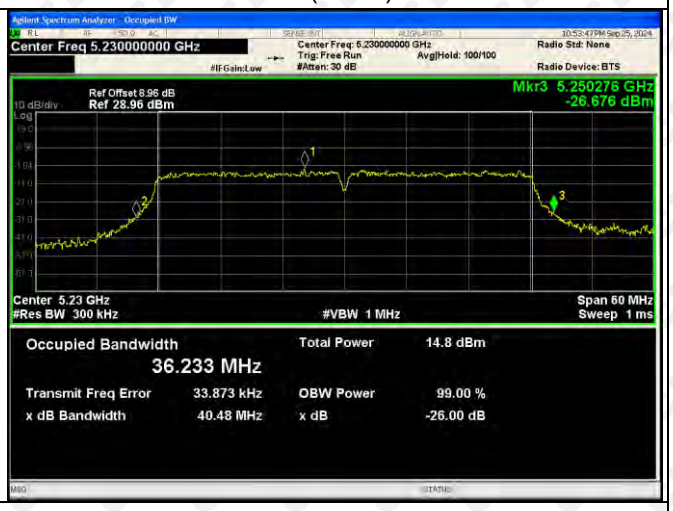
802.11ac(VH20)-5240

802.11ac(VH40)-5190

802.11ac(VH40)-5230

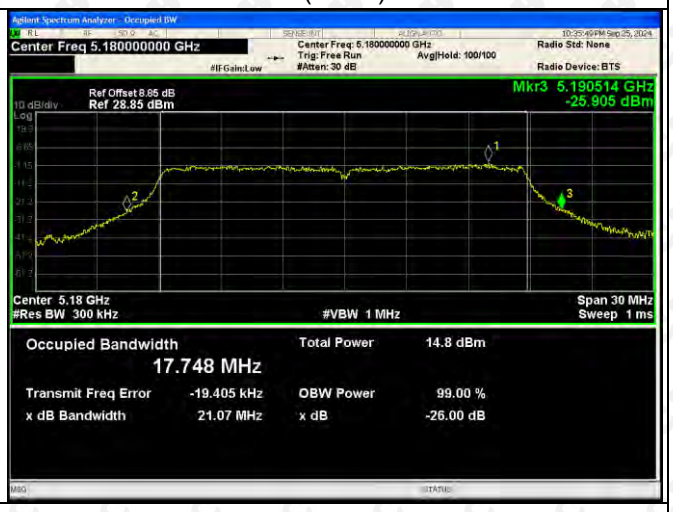


802.11ac(VH80)-5210



802.11n(HT20)-5180

802.11n(HT20)-5200

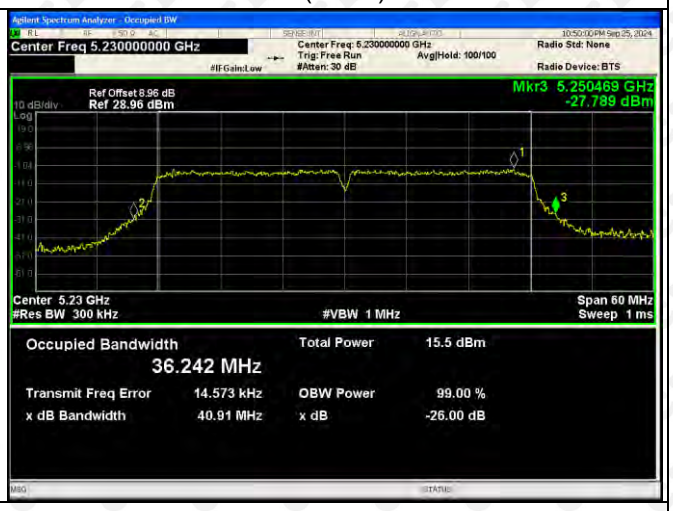


802.11n(HT20)-5240

802.11n(HT40)-5190

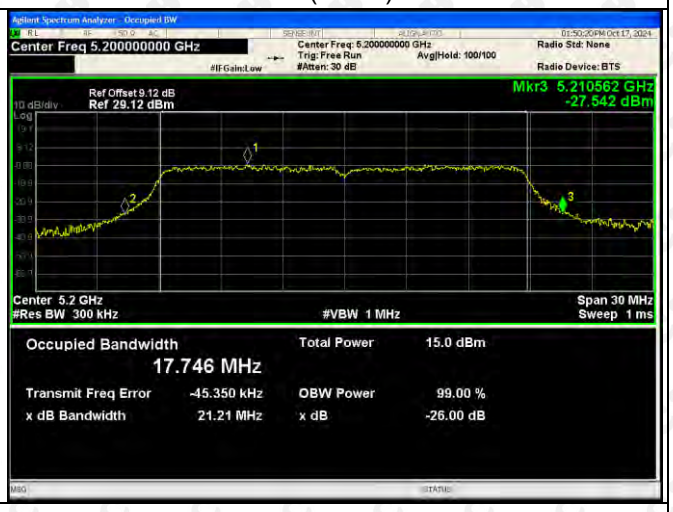
802.11n(HT40)-5230

802.11ax(VH20)-5180



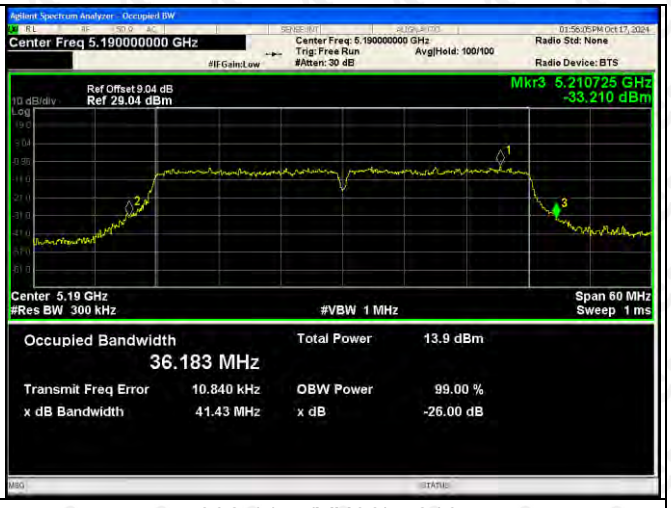
802.11ax(VH20)-5200

802.11ax(VH20)-5240

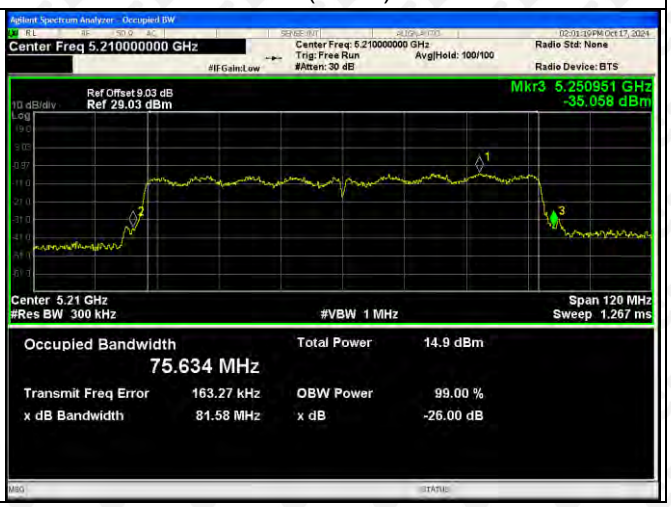


802.11ax(VH40)-5190

802.11ax(VH40)-5230

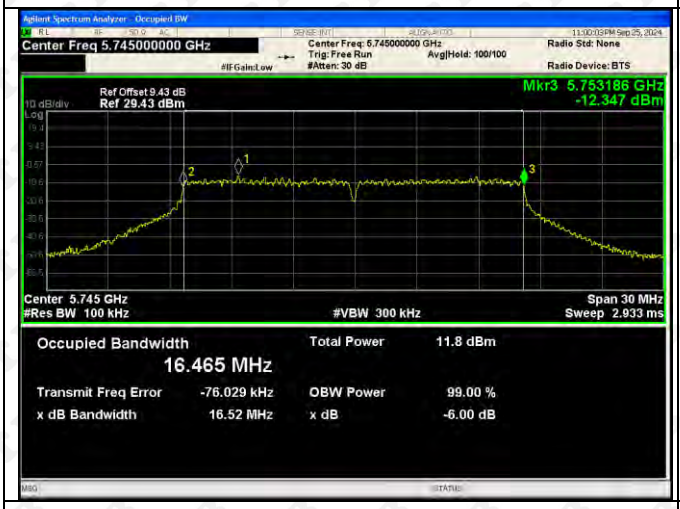


802.11ax(VH80)-5210

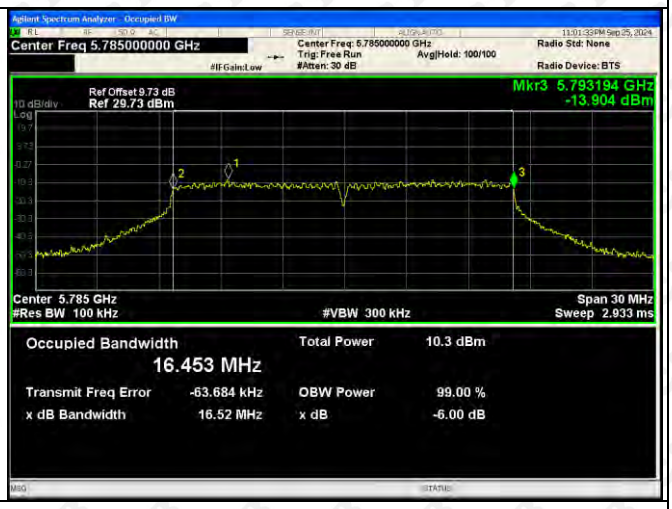


5745-5825MHz
ANT 1:

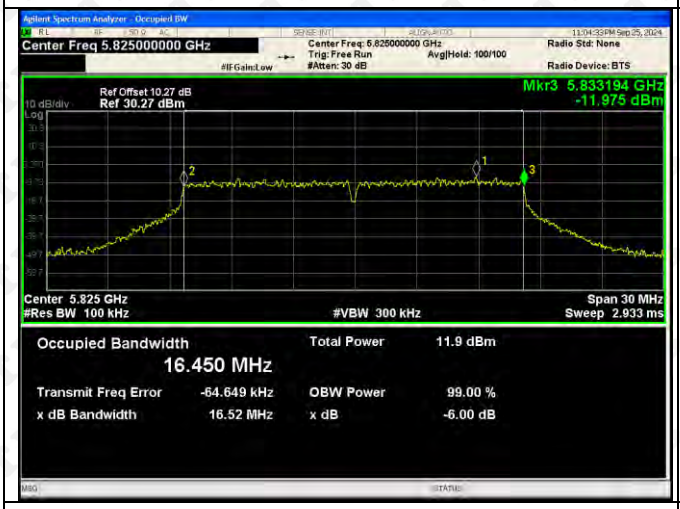
802.11a-5745



802.11a-5785

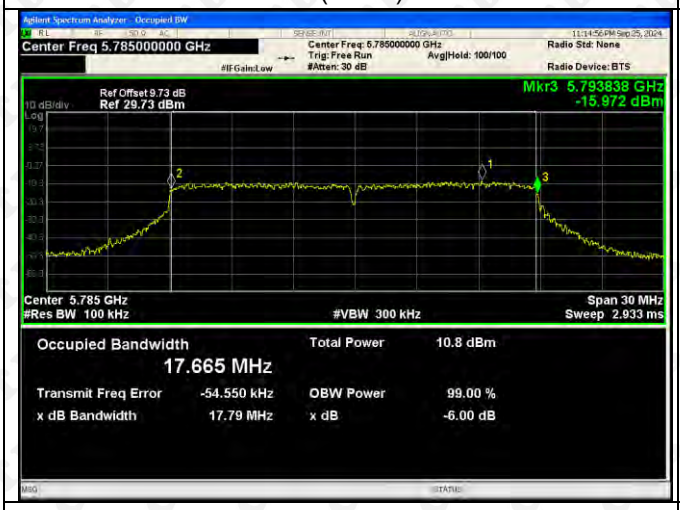


802.11a-5825

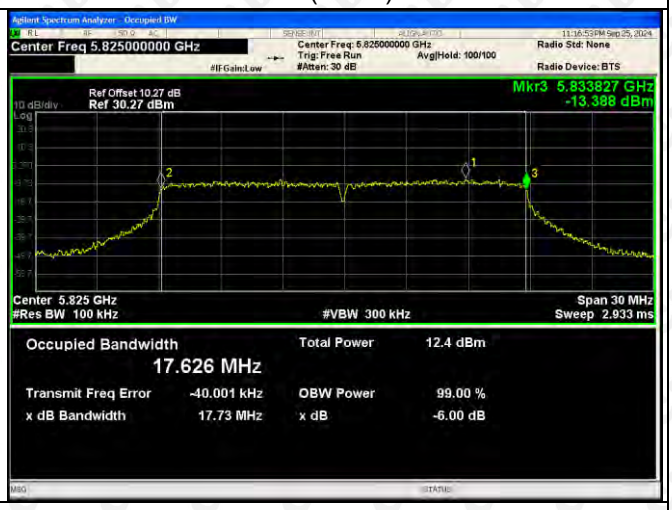


802.11ac(VH20)-5745

802.11ac(VH20)-5785



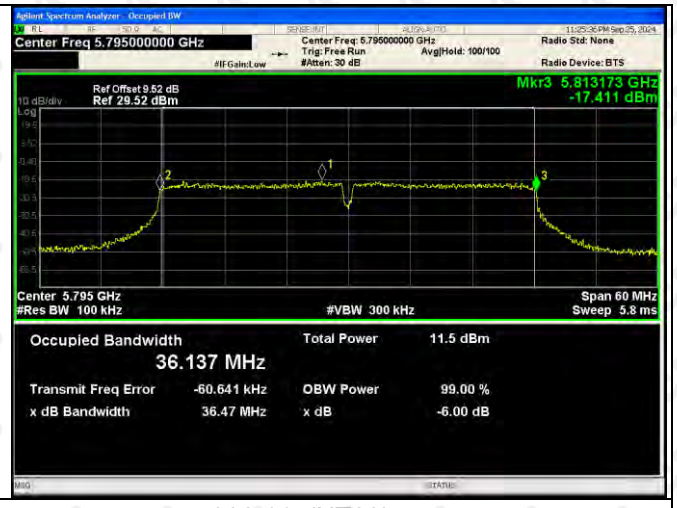
802.11ac(VH20)-5825



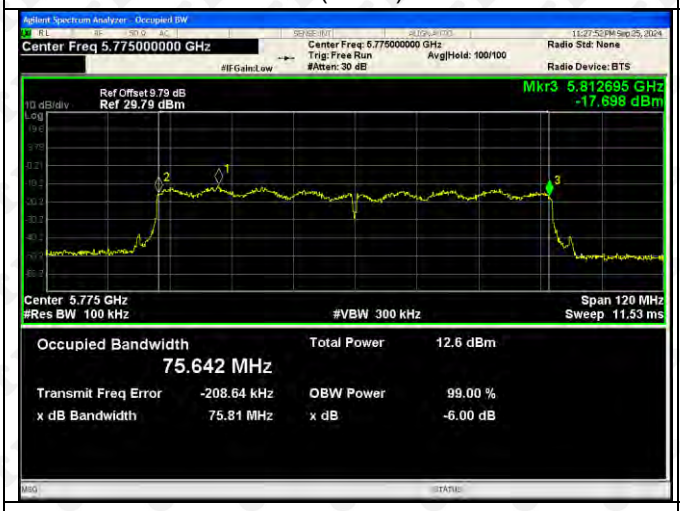
802.11ac(VH40)-5755

802.11ac(VH40)-5795

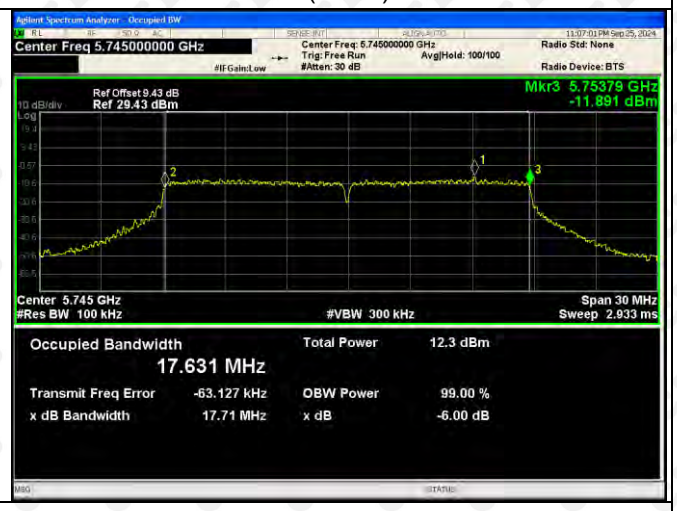
802.11ac(VH80)-5775



802.11n(HT20)-5745



802.11n(HT20)-5785

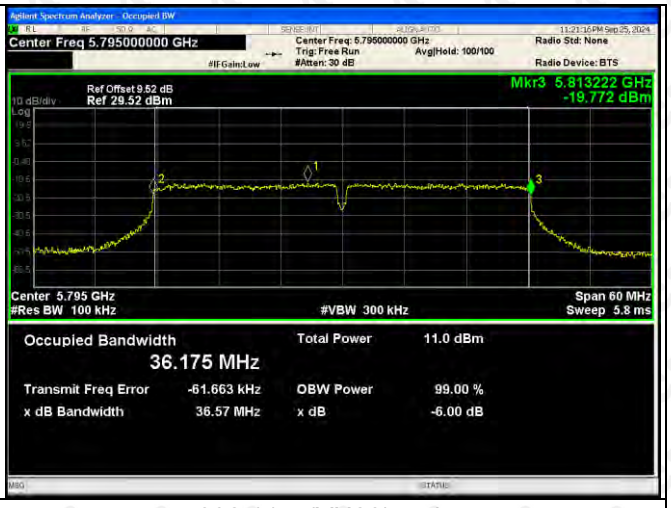


802.11n(HT20)-5825

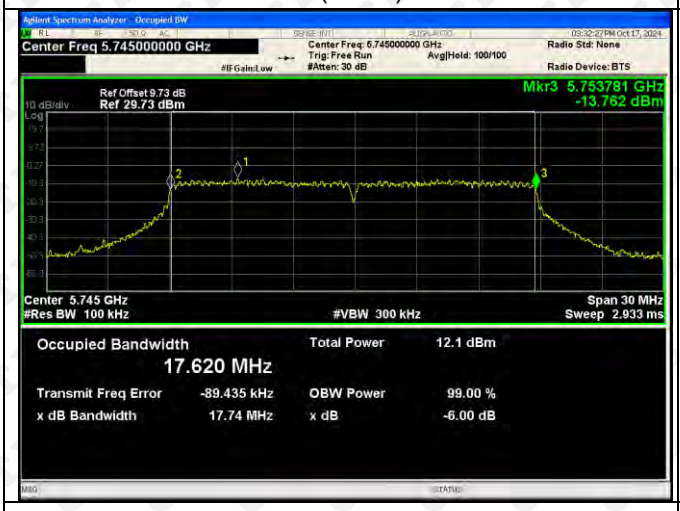
5802.11n(HT40)-5755

802.11n(HT40)-5795

802.11ax(VH20)-5745

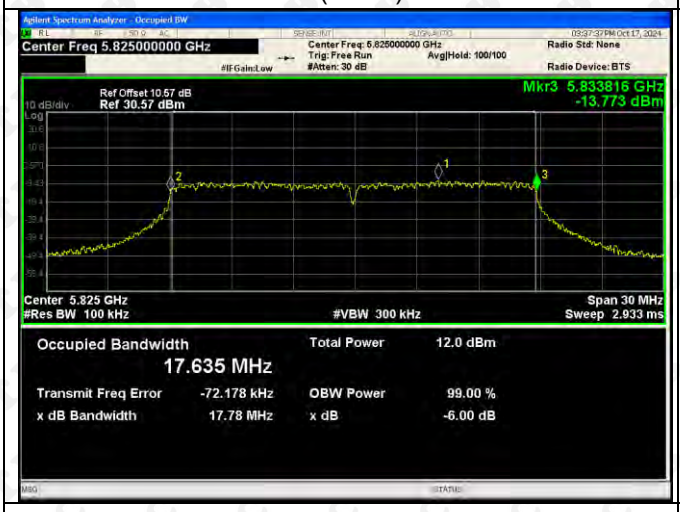


802.11ax(VH20)-5785

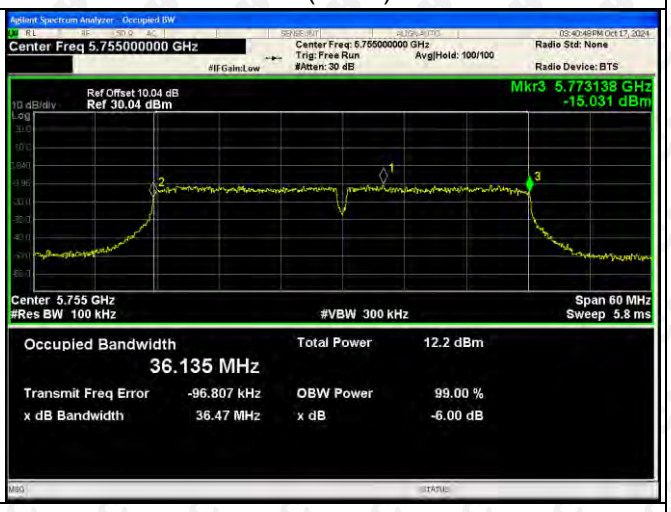


802.11ax(VH20)-5825

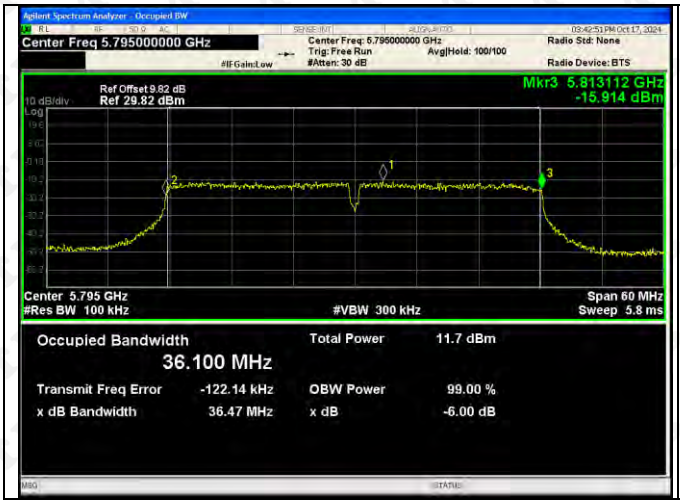
802.11ax(VH40)-5755

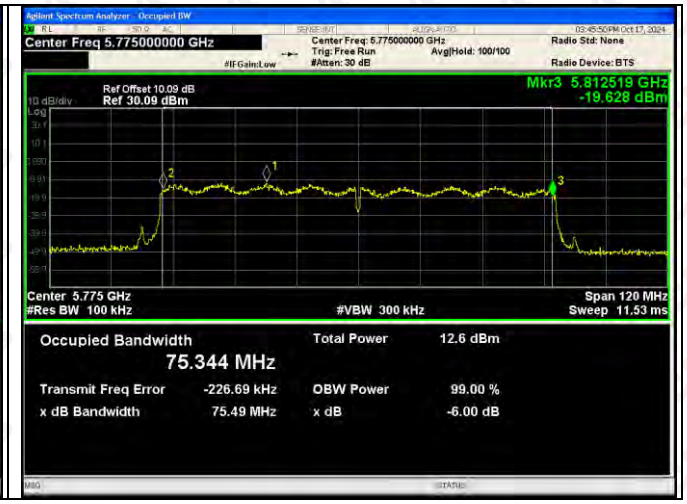


802.11ax(VH40)-5795

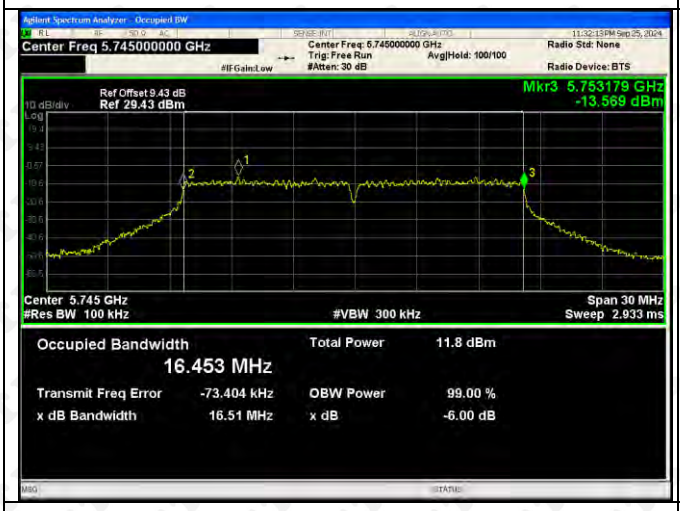
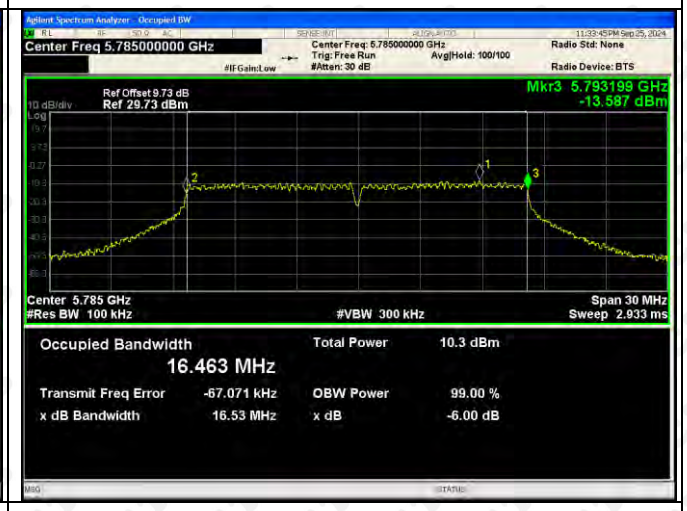
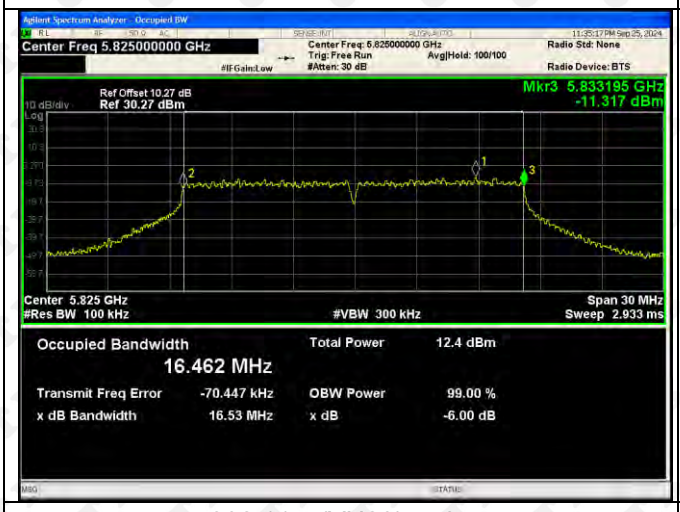


802.11ax(VH80)-5775



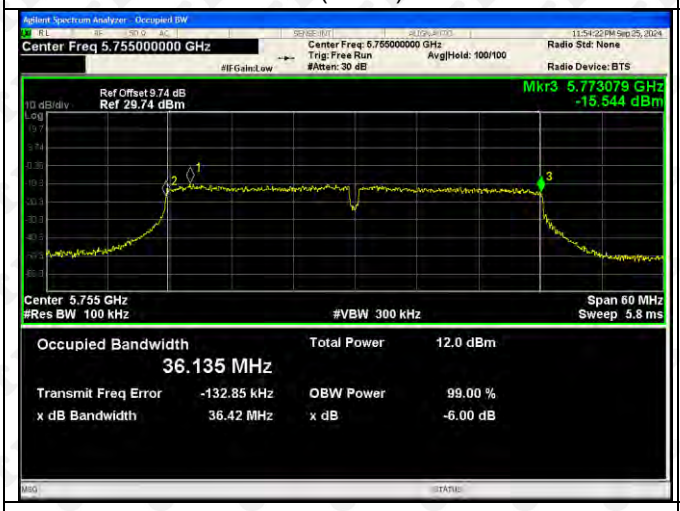


ANT2:

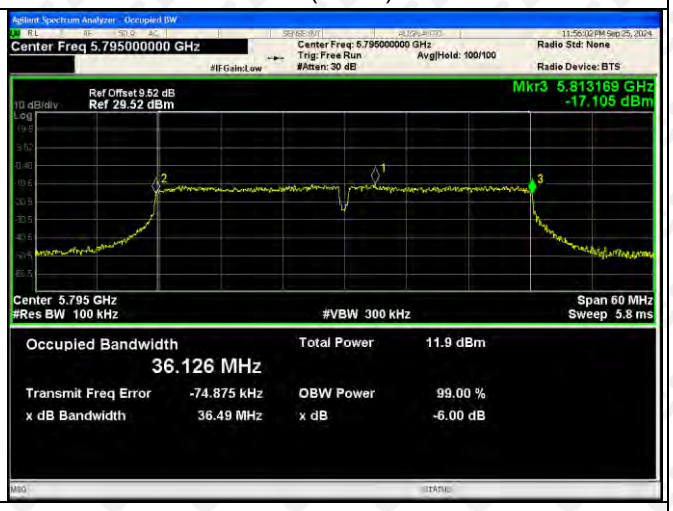
802.11a-5745	802.11a-5785
	
802.11a-5825	802.11ac(VH20)-5745
	
802.11ac(VH20)-5785	802.11ac(VH20)-5825

802.11ac(VH40)-5755

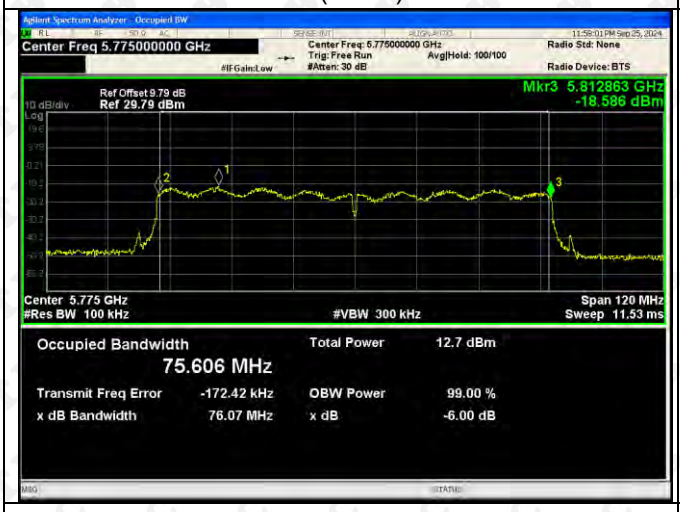
802.11ac(VH40)-5795



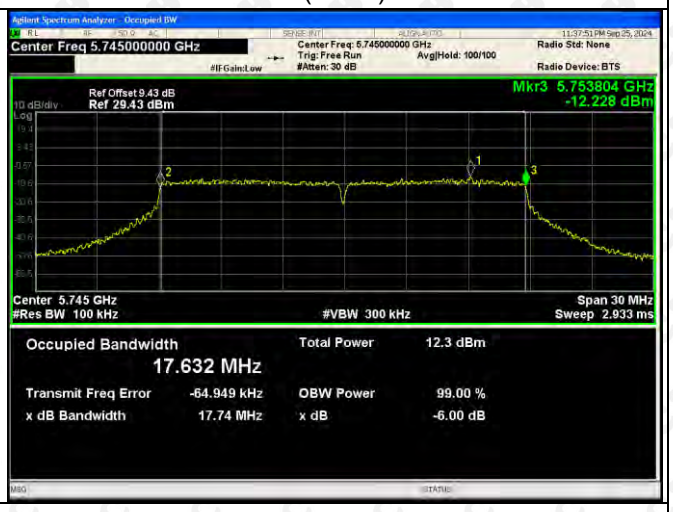
802.11ac(VH80)-5775



802.11n(HT20)-5745



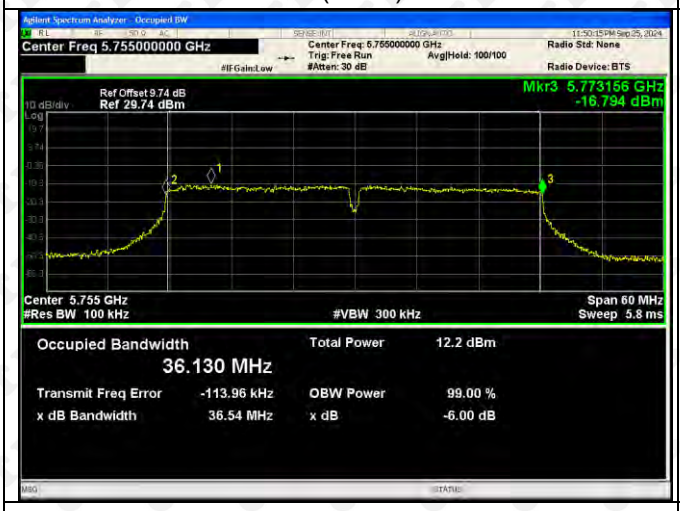
802.11n(HT20)-5785



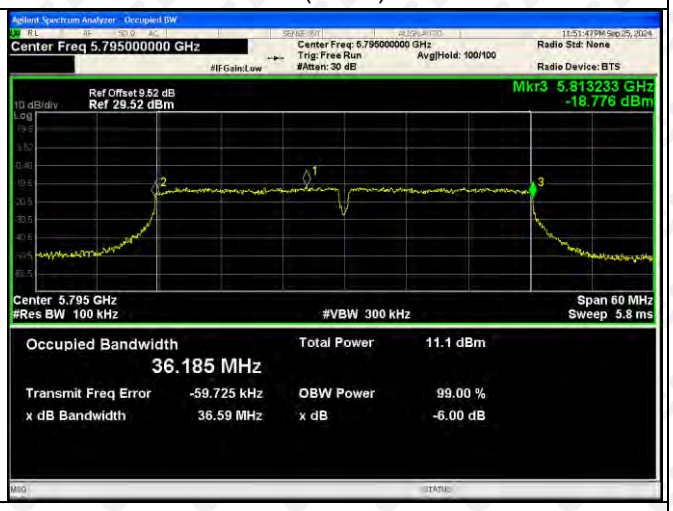
802.11n(HT20)-5825

5802.11n(HT40)-5755

802.11n(HT40)-5795



802.11ax(VH20)-5745

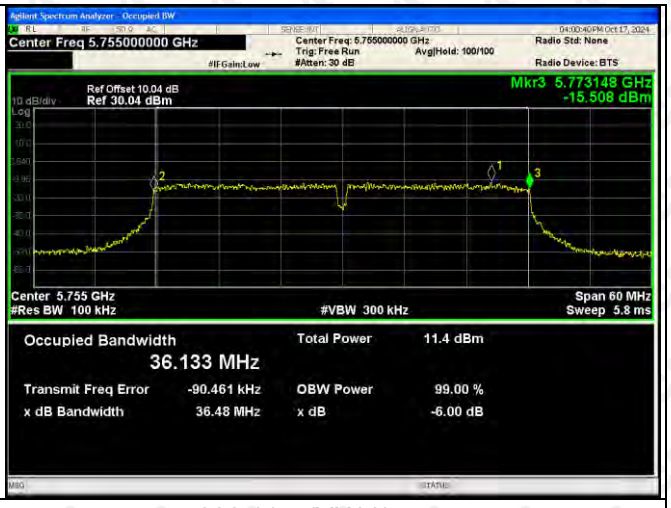


802.11ax(VH20)-5785

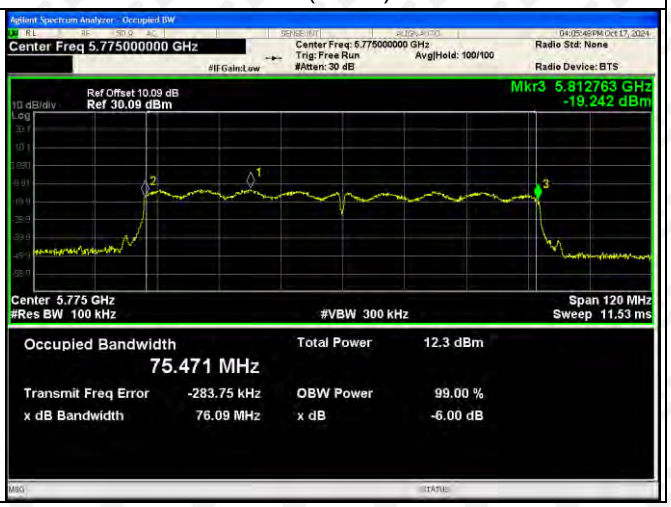
802.11ax(VH20)-5825

802.11ax(VH40)-5755

802.11ax(VH40)-5795

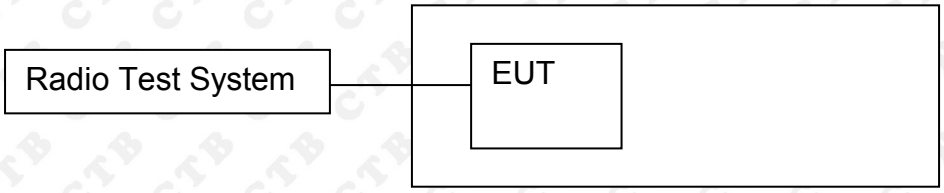


802.11ax(VH80)-5775



11. POWER SPECTRAL DENSITY

11.1 Block Diagram Of Test Setup



11.2 Limit

(1) For the band 5.15-5.25 GHz.

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

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

11.3 Test procedure

According to KDB789033 D02v02r01 sectionE, the following is the measurement procedure.

For devices operating in the bands 5.15−5.25 GHz, 5.25−5.35 GHz, and 5.47−5.725 GHz, the preceding procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in Section 15.407(a)(5). For devices operating in the band 5.725−5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of RBWs less than 1 MHz, or 500 kHz, “provided that the measured power is integrated over the full reference bandwidth” to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 kHz bandwidth, the following adjustments to the procedures apply:
a) Set RBW ≥ 1/*T*, where *T* is defined in II.B.I.a).

b) Set VBW ≥ 3 RBW.

c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10 log (500 kHz/RBW) to the measured result, whereas RBW (<500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.

d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10 log (1MHz/RBW) to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.

e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.
Note: As a practical matter, it is recommended to use reduced RBW of 100 kHz for the II.F.5.c) and II.F.5.d), since RBW=100 kHz is available on nearly all spectrum analyzers.

11.4 Test Result

ANT 1+ANT2

Test mode	Test Channel (MHz)	PSD [dBm/MHz] ANT 1	PSD [dBm/MHz] ANT 2	PSD [dBm/MHz] Total	Limit (dBm/MHz)	Result
802.11a	5180	-2.416	-2.806	/	11	Pass
	5200	-2.081	-2.285	/	11	Pass
	5240	-1.177	-1.269	/	11	Pass
802.11ac(VH20)	5180	-3.057	-2.729	0.120	11	Pass
	5200	-2.761	-2.564	0.349	11	Pass
	5240	-2.215	-2.63	0.593	11	Pass
802.11ac(VH40)	5190	-5.747	-5.411	-2.565	11	Pass
	5230	-5.082	-5.913	-2.467	11	Pass
802.11n(VH20)	5180	-6.93	-6.863	-3.886	11	Pass
	5200	-2.91	-2.562	0.278	11	Pass
	5240	-2.574	-1.955	0.757	11	Pass
802.11n(VH40)	5190	-1.736	-2.265	1.018	11	Pass
	5230	-5.651	-5.733	-2.682	11	Pass
802.11ac(VH80)	5230	-5.849	-5.206	-2.505	11	Pass
802.11ax(VH20)	5180	-2.824	-2.903	0.147	11	Pass
	5200	-2.821	-2.436	0.386	11	Pass
	5240	-1.466	-2.781	0.936	11	Pass
802.11ax(VH40)	5190	-5.732	-6.667	-3.164	11	Pass
	5230	-4.64	-5.389	-1.988	11	Pass
802.11ax(VH80)	5210	-7.594	-6.985	-4.269	11	Pass

Test mode	Test Channel (MHz)	PSD [dBm/MHz] ANT 1	PSD [dBm/MHz] ANT 2	PSD [dBm/MHz] Total	Limit (dBm)	Result
802.11a	5745	-8.326	-8.45	/	30	Pass
	5785	-9.643	-9.778	/	30	Pass
	5825	-7.849	-7.203	/	30	Pass
802.11ac(VH20)	5745	-8.453	-8.203	-5.316	30	Pass
	5785	-9.318	-9.495	-6.395	30	Pass
	5825	-7.706	-8.045	-4.862	30	Pass
802.11ac(VH40)	5755	-9.745	-11.196	-7.400	30	Pass
	5795	-11.782	-11.486	-8.621	30	Pass
802.11n(VH20)	5775	-12.372	-12.685	-9.515	30	Pass
	5745	-8.473	-8.183	-5.315	30	Pass
	5785	-9.65	-8.848	-6.220	30	Pass
802.11n(VH40)	5825	-7.706	-7.247	-4.460	30	Pass
	5755	-11.365	-11.552	-8.447	30	Pass
802.11ac(VH80)	5795	-12.646	-12.63	-9.628	30	Pass
802.11ax(VH20)	5745	-8.36	-8.238	-5.288	30	Pass
	5785	-8.401	-8.308	-5.344	30	Pass
	5825	-8.128	-8.634	-5.363	30	Pass
802.11ax(VH40)	5755	-11.658	-12.123	-8.874	30	Pass
	5795	-11.815	-11.682	-8.738	30	Pass
802.11ax(VH80)	5775	-13.054	-12.768	-9.898	30	Pass

5180-5240MHz
ANT 1

802.11a-5180

802.11a-5200

802.11a-5240

802.11ac(VH20)-5180

802.11ac(VH20)-5200

802.11ac(VH20)-5240

802.11ac(VH40)-5190

802.11ac(VH40)-5230

802.11ac(VH80)-5210

802.11n(HT20)-5180

802.11n(HT20)-5200

802.11n(HT20)-5240

802.11n(HT40)-5190

802.11n(HT40)-5230

802.11ax(VH20)-5180

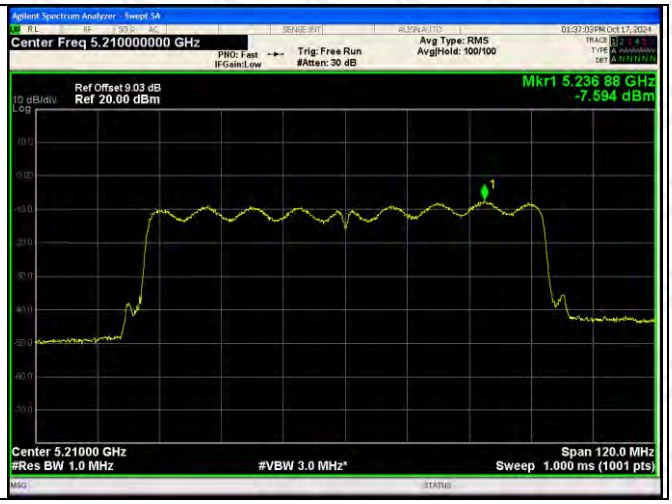
802.11ax(VH20)-5200

802.11ax(VH20)-5240

802.11ax(VH40)-5190

802.11ax(VH40)-5230

802.11ax(VH80)-5210



ANT2

802.11a-5180

802.11a-5200

802.11a-5240

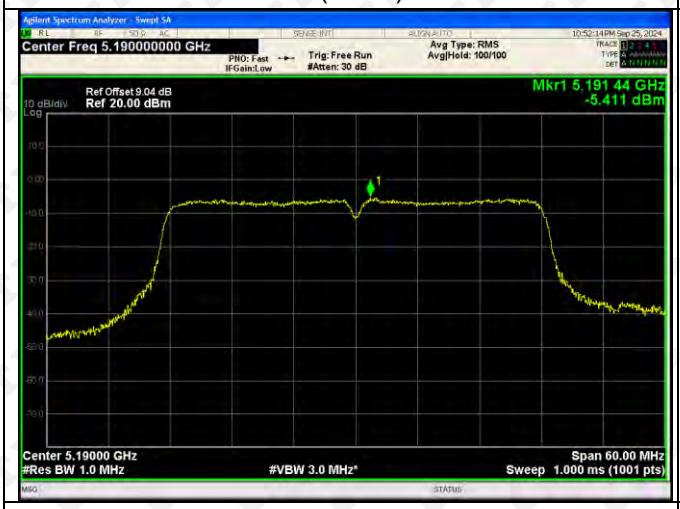
802.11ac(VH20)-5180

802.11ac(VH20)-5200

802.11ac(VH20)-5240

802.11ac(VH40)-5190

802.11ac(VH40)-5230



802.11ac(VH80)-5210

802.11n(HT20)-5180

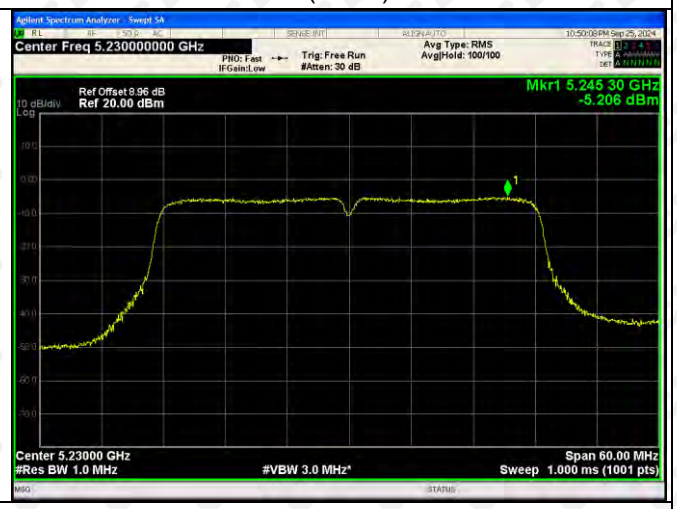
802.11n(HT20)-5200

802.11n(HT20)-5240

802.11n(HT40)-5190

802.11n(HT40)-5230

802.11ax(VH20)-5180



802.11ax(VH20)-5200

802.11ax(VH20)-5240

802.11ax(VH40)-5190

802.11ax(VH40)-5230

802.11ax(VH80)-5210

5745-5825MHz
ANT 1:

802.11a-5745

802.11a-5785

802.11a-5825

802.11ac(VH20)-5745

802.11ac(VH20)-5785

802.11ac(VH20)-5825

802.11ac(VH40)-5755

802.11ac(VH40)-5795

802.11ac(VH80)-5775

802.11n(HT20)-5745

802.11n(HT20)-5785

802.11n(HT20)-5825

5802.11n(HT40)-5755

802.11n(HT40)-5795

802.11ax(VH20)-5745

802.11ax(VH20)-5785

802.11ax(VH20)-5825

802.11ax(VH40)-5755

802.11ax(VH40)-5795

802.11ax(VH80)-5775

ANT2:

802.11a-5745	802.11a-5785
802.11a-5825	802.11ac(VH20)-5745
802.11ac(VH20)-5785	802.11ac(VH20)-5825

802.11ac(VH40)-5755

802.11ac(VH40)-5795

802.11ac(VH80)-5775

802.11n(HT20)-5745

802.11n(HT20)-5785

802.11n(HT20)-5825

5802.11n(HT40)-5755

802.11n(HT40)-5795

802.11ax(VH20)-5745

802.11ax(VH20)-5785

802.11ax(VH20)-5825

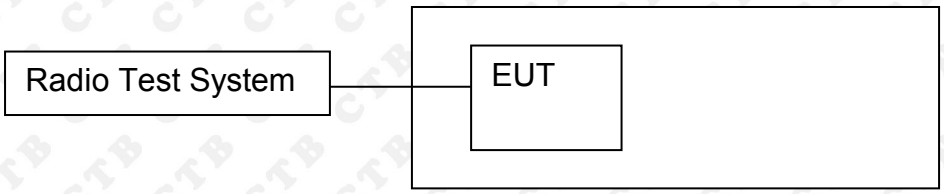
802.11ax(VH40)-5755

802.11ax(VH40)-5795

802.11ax(VH80)-5775

12. FREQUENCY STABILITY

12.1 Block Diagram Of Test Setup



12.2 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.

12.3 Test procedure

1. The EUT was placed inside temperature chamber and powered and powered by nominal DC voltage.

2. Set EUT as normal operation.

3. Turn the EUT on and couple its output to spectrum.

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 and measure the operating frequency.

6. Repeat step with the temperature chamber set to the lowest temperature.

12.4 Test Result

ANT1:

TX Frequency (5150-5250MHz)

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120	5180.0878	5180	0.0878	16.9503
		V max (V)	132	5180.0169	5180	0.0169	3.2648
		V min (V)	108	5180.0816	5180	0.0816	15.7515
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	0	5180.0505	5180	0.0505	9.7583
		T (°C)	10	5180.0060	5180	0.0060	1.1630
		T (°C)	20	5180.0056	5180	0.0056	1.0896
		T (°C)	30	5180.0247	5180	0.0247	4.7604
		T (°C)	40	5180.0136	5180	0.0136	2.6213
Limits				±20ppm			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120	5200.0492	5200	0.0492	9.4535
		V max (V)	132	5200.0012	5200	0.0012	0.2223
		V min (V)	108	5200.0351	5200	0.0351	6.7521
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	0	5200.0193	5200	0.0193	3.7179
		T (°C)	10	5200.0215	5200	0.0215	4.1266
		T (°C)	20	5200.0339	5200	0.0339	6.5114
		T (°C)	30	5200.0362	5200	0.0362	6.9621
		T (°C)	40	5200.0023	5200	0.0023	0.4505
Limits				±20ppm			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120	5240.0515	5240	0.0515	9.8311
		V max (V)	132	5240.0342	5240	0.0342	6.5223
		V min (V)	108	5240.0378	5240	0.0378	7.2182
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	0	5240.0468	5240	0.0468	8.9281
		T (°C)	10	5240.0412	5240	0.0412	7.8591
		T (°C)	20	5240.0217	5240	0.0217	4.1417
		T (°C)	30	5240.0233	5240	0.0233	4.4411
		T (°C)	40	5240.0358	5240	0.0358	6.8378
Limits				±20ppm			
Result				Complies			

ANT2:

TX Frequency (5150-5250MHz)

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120	5180.0383	5180	0.0383	7.3885
		V max (V)	132	5180.0827	5180	0.0827	15.9741
		V min (V)	108	5180.0010	5180	0.0010	0.1871
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	0	5180.0617	5180	0.0617	11.9032
		T (°C)	10	5180.0309	5180	0.0309	5.9696
		T (°C)	20	5180.0251	5180	0.0251	4.8385
		T (°C)	30	5180.0195	5180	0.0195	3.7725
		T (°C)	40	5180.0097	5180	0.0097	1.8744
Limits				±20ppm			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120	5200.0282	5200	0.0282	5.4160
		V max (V)	132	5200.0676	5200	0.0676	13.0029
		V min (V)	108	5200.0089	5200	0.0089	1.7083
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	0	5200.0248	5200	0.0248	4.7656
		T (°C)	10	5200.0068	5200	0.0068	1.3085
		T (°C)	20	5200.0598	5200	0.0598	11.4950
		T (°C)	30	5200.0165	5200	0.0165	3.1800
		T (°C)	40	5200.0487	5200	0.0487	9.3668
Limits				±20ppm			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120	5240.0230	5240	0.0230	4.3843
		V max (V)	132	5240.0812	5240	0.0812	15.5007
		V min (V)	108	5240.0787	5240	0.0787	15.0196
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	0	5240.0308	5240	0.0308	5.8722
		T (°C)	10	5240.0597	5240	0.0597	11.3843
		T (°C)	20	5240.0547	5240	0.0547	10.4380
		T (°C)	30	5240.0864	5240	0.0864	16.4970
		T (°C)	40	5240.0167	5240	0.0167	3.1952
Limits				±20ppm			
Result				Complies			

ANT1:

TX Frequency (5725-5850MHz)

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120	5745.0818	5745	0.0818	14.2321
		V max (V)	132	5745.0006	5745	0.0006	0.1070
		V min (V)	108	5745.0818	5745	0.0818	14.2321
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	0	5745.0909	5745	0.0909	15.8248
		T (°C)	10	5745.0454	5745	0.0454	7.9088
		T (°C)	20	5745.0280	5745	0.0280	4.8797
		T (°C)	30	5745.0267	5745	0.0267	4.6536
		T (°C)	40	5745.0154	5745	0.0154	2.6810
Limits				±20ppm			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120	5785.0200	5785	0.0200	3.4537
		V max (V)	132	5785.0281	5785	0.0281	4.8614
		V min (V)	108	5785.0902	5785	0.0902	15.5914
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	0	5785.0049	5785	0.0049	0.8457
		T (°C)	10	5785.0441	5785	0.0441	7.6157
		T (°C)	20	5785.0489	5785	0.0489	8.4580
		T (°C)	30	5785.0330	5785	0.0330	5.7071
		T (°C)	40	5785.0859	5785	0.0859	14.8430
Limits				±20ppm			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120	5825.0271	5825	0.0271	4.6580
		V max (V)	132	5825.0747	5825	0.0747	12.8318
		V min (V)	108	5825.0822	5825	0.0822	14.1140
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	0	5825.0078	5825	0.0078	1.3384
		T (°C)	10	5825.0843	5825	0.0843	14.4678
		T (°C)	20	5825.0447	5825	0.0447	7.6712
		T (°C)	30	5825.0233	5825	0.0233	3.9949
		T (°C)	40	5825.0681	5825	0.0681	11.6977
Limits				±20ppm			
Result				Complies			

ANT2:

TX Frequency (5725-5850MHz)

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120	5745.0461	5745	0.0461	8.0267
		V max (V)	132	5745.0588	5745	0.0588	10.2338
		V min (V)	108	5745.0234	5745	0.0234	4.0695
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	0	5745.0614	5745	0.0614	10.6859
		T (°C)	10	5745.0019	5745	0.0019	0.3229
		T (°C)	20	5745.0580	5745	0.0580	10.1034
		T (°C)	30	5745.0324	5745	0.0324	5.6465
		T (°C)	40	5745.0091	5745	0.0091	1.5901
Limits				±20ppm			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120	5785.0336	5785	0.0336	5.8052
		V max (V)	132	5785.0196	5785	0.0196	3.3929
		V min (V)	108	5785.0867	5785	0.0867	14.9871
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	0	5785.0564	5785	0.0564	9.7571
		T (°C)	10	5785.0120	5785	0.0120	2.0710
		T (°C)	20	5785.0037	5785	0.0037	0.6456
		T (°C)	30	5785.0067	5785	0.0067	1.1642
		T (°C)	40	5785.0136	5785	0.0136	2.3492
		T (°C)	50	5785.0687	5785	0.0687	11.8680
Limits				±20ppm			
Result				Complies			

Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	120	5825.0415	5825	0.0415	7.1192
		V max (V)	132	5825.0055	5825	0.0055	0.9440
		V min (V)	108	5825.0126	5825	0.0126	2.1556
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	120	T (°C)	0	5825.0135	5825	0.0135	2.3105
		T (°C)	10	5825.0069	5825	0.0069	1.1876
		T (°C)	20	5825.0288	5825	0.0288	4.9380
		T (°C)	30	5825.0515	5825	0.0515	8.8489
		T (°C)	40	5825.0354	5825	0.0354	6.0718
Limits				±20ppm			
Result				Complies			

13. OPERATION IN THE ABSENCE OF INFORMATION TO THE TRANSMIT

13.1 Requirement

15.407(c) requirement:
The device shall automatically discontinue transmission in case of either absence of information to transmit or operational failure. These provisions are not intended to preclude the transmission of control or signal ling information or the use of repetitive codes used by certain digital technologies to complete frame or burst intervals. Applicants shall include in their application for equipment authorization a description of how this requirement is met.

13.2 Test Results

Operation in the absence of information to the transmit:

While the EUT is not transmitting any information, the EUT can automatically discontinue transmission and become standby mode for power saving. The EUT can detect the controlling
signal of ASK message transmitting from remote device and verify whether it shall resend or
discontinue transmission. (manufacturer declare)

14. ANTENNA REQUIREMENT

15.203 requirement:
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.
15.247(b) (4) requirement:
The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:

The antenna is External antenna and no consideration of replacement. The best case gain of the antenna is 5.2GHz: ANT1: 2.56dBi, ANT2: 2.56dBi, 5.8GHz: ANT1: 3.43dBi, ANT2:3.43dBi

15. EUT TEST SETUP PHOTOGRAPHS

Spurious emissions

Below 1GHz

Above 1GHz

Conducted Emission

※※※※※ **END OF REPORT** ※※※※※