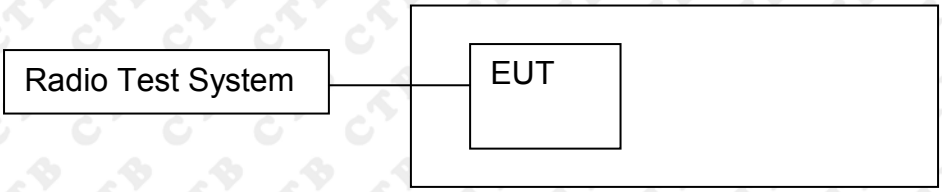
10. EMISSION BANDWIDTH& OCCUPIED BANDWIDTH

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	19.273
	5200	19.707
	5240	19.996
802.11ac20	5180	21.593
	5200	21.505
	5240	21.616
802.11ac40	5190	40.817
	5230	40.508
802.11ac80	5210	80.877
802.11n(HT20)	5180	20.911
	5200	21.1
	5240	20.578
802.11n(HT40)	5190	39.06
	5230	39.351
802.11ax20	5180	21.755
	5200	21.562
	5240	21.737
802.11ax40	5190	41.124
	5230	40.603
802.11ax80	5210	81.035

Test mode Ant 2	Test Channel (MHz)	26dB Bandwidth (MHz)
802.11a	5180	20.022
	5200	20.189
	5240	19.812
802.11ac20	5180	21.671
	5200	21.427
	5240	20.865
802.11ac40	5190	40.403
	5230	40.355
802.11ac80	5210	80.679
802.11n(HT20)	5180	20.299
	5200	20.726
	5240	20.704
802.11n(HT40)	5190	38.96
	5230	39.387
802.11ax20	5180	21.834
	5200	22.077
	5240	21.451
802.11ax40	5190	41.1
	5230	40.506
802.11ax80	5210	80.763

5725-5850 MHz

Test mode Ant 1	Test Channel (MHz)	6dB Bandwidth (MHz)	Result
802.11a	5745	16.49	Pass
	5785	16.437	Pass
	5825	16.466	Pass
802.11ac20	5745	17.752	Pass
	5785	17.709	Pass
	5825	17.692	Pass
802.11ac40	5755	36.489	Pass
	5795	36.448	Pass
802.11ac80	5775	76.56	Pass
802.11n(HT20)	5745	17.747	Pass
	5785	17.712	Pass
	5825	17.672	Pass
802.11n(HT40)	5755	36.411	Pass
	5795	36.43	Pass
802.11ax20	5745	17.705	Pass
	5785	17.749	Pass
	5825	17.686	Pass
802.11ax40	5755	36.472	Pass
	5795	36.481	Pass
802.11ax80	5775	76.569	Pass

Test mode Ant 2	Test Channel (MHz)	6dB Bandwidth (MHz)	Result
802.11a	5745	16.504	Pass
	5785	16.496	Pass
	5825	16.486	Pass
802.11ac20	5745	17.663	Pass
	5785	17.73	Pass
	5825	17.731	Pass
802.11ac40	5755	36.16	Pass
	5795	36.456	Pass
802.11ac80	5775	76.548	Pass
802.11n(HT20)	5745	17.691	Pass
	5785	17.742	Pass
	5825	17.736	Pass
802.11n(HT40)	5755	36.478	Pass
	5795	36.484	Pass
802.11ax20	5745	18.996	Pass
	5785	19.05	Pass
	5825	19.035	Pass
802.11ax40	5755	37.719	Pass
	5795	37.915	Pass
802.11ax80	5775	78.151	Pass

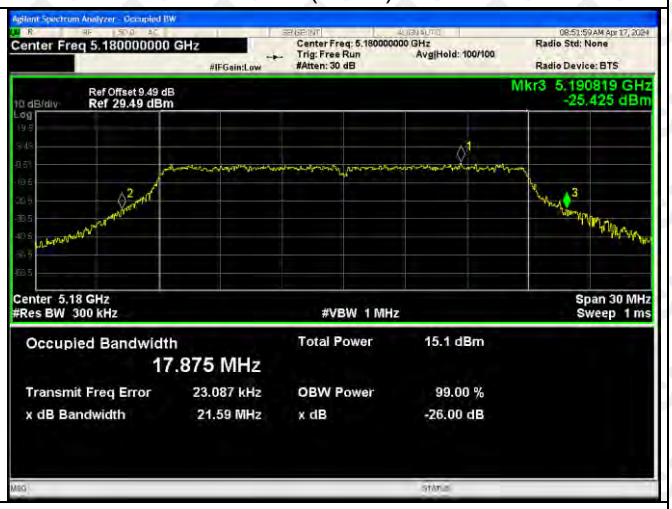
Test Graph ANT 1

802.11a-5180

802.11a-5200

802.11a-5240

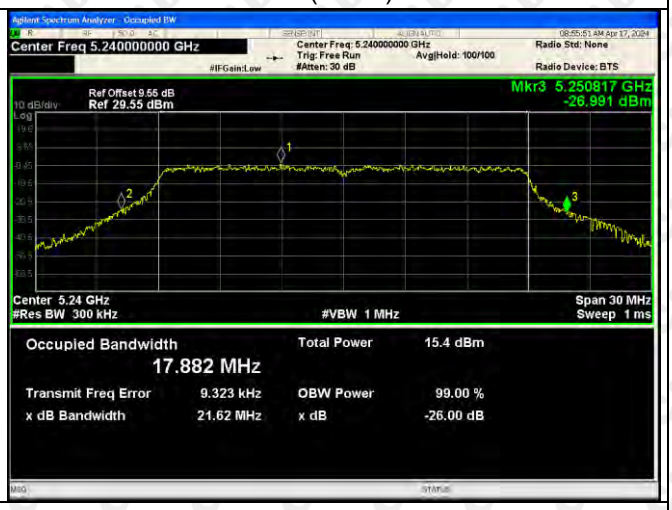
802.11ac(VH20)-5180



802.11ac(VH20)-5200

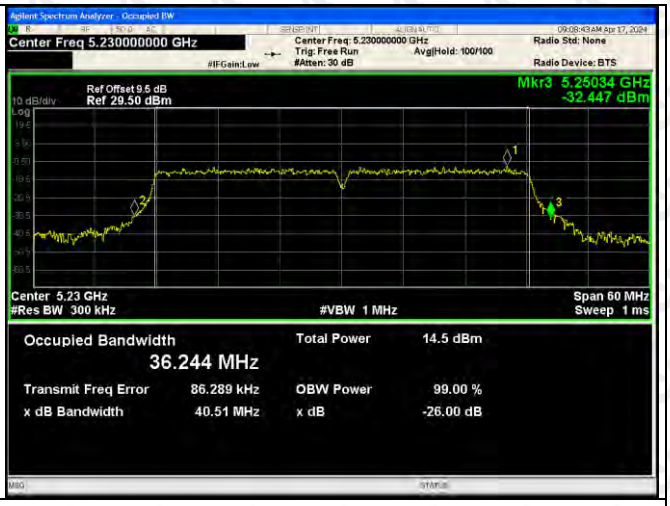
802.11ac(VH20)-5240

802.11ac(VH40)-5190

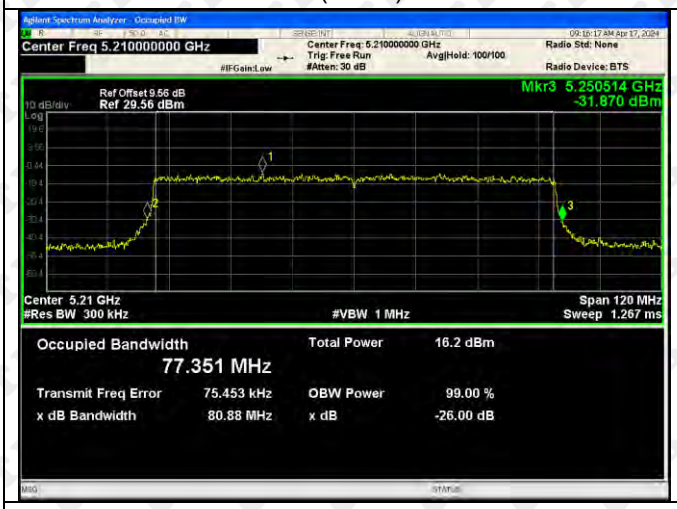


802.11ac(VH40)-5230

802.11ac(VH80)-5210



802.11n(HT20)-5180



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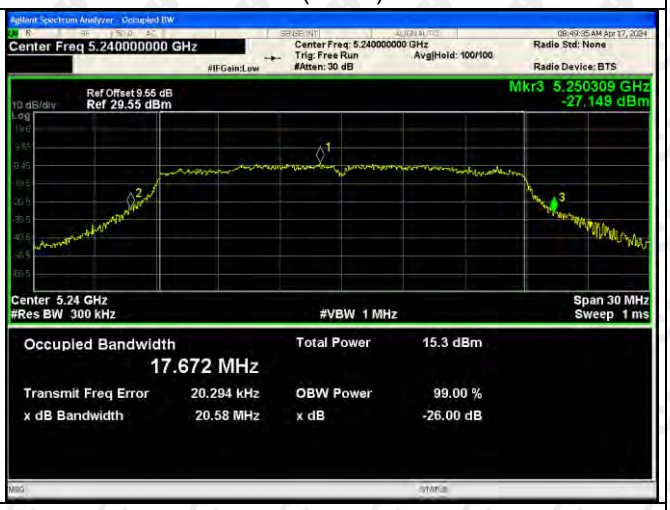
802.11n(HT20)-5240

802.11n(HT40)-5190



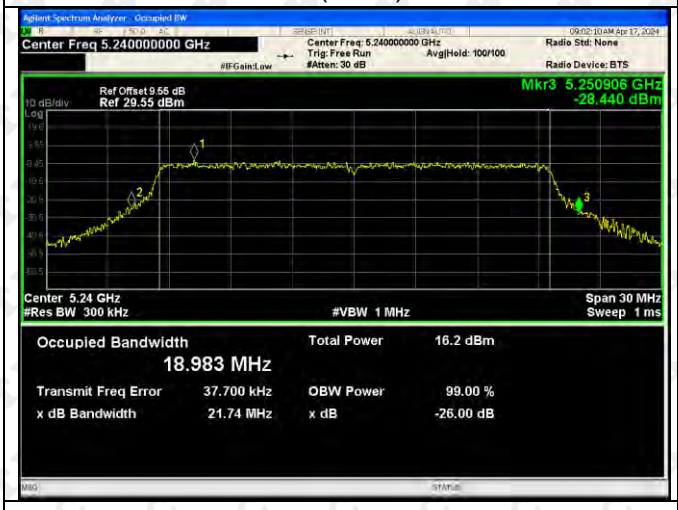
802.11n(HT40)-5230

802.11ax(VH20)-5180

802.11ax(VH20)-5200

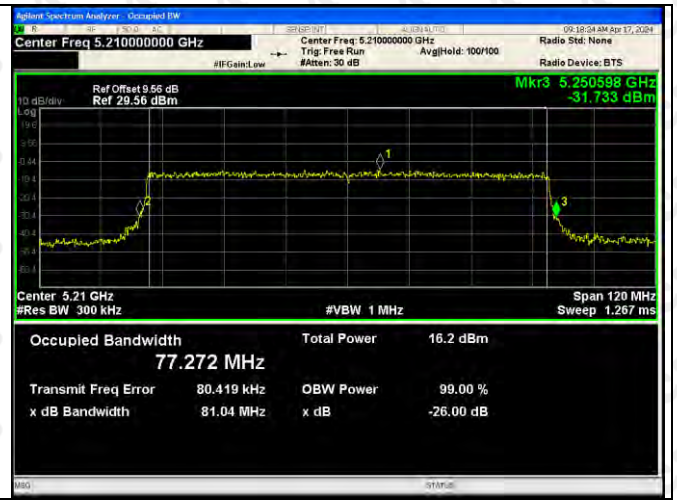
802.11ax(VH20)-5240

802.11ax(VH40)-5190



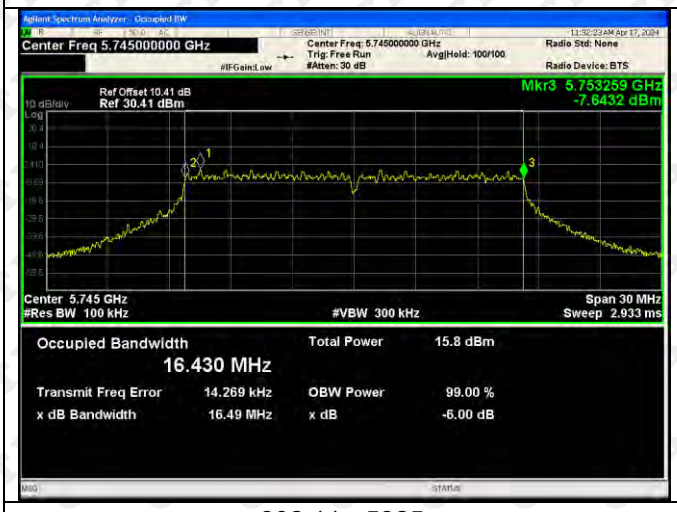
802.11ax(VH40)-5230

802.11ax(VH80)-5210

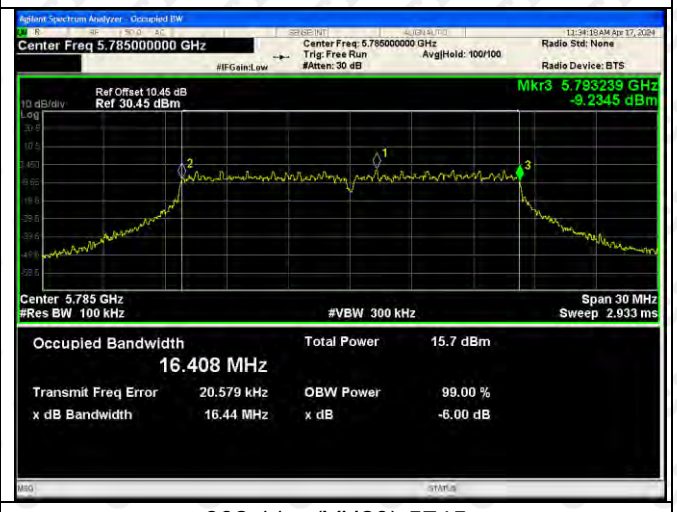


ANT1:
5725-5850MHz

802.11a-5745



802.11a-5785

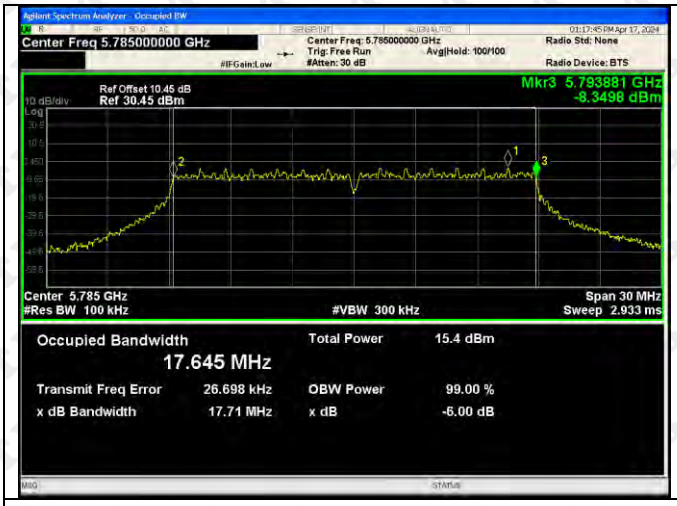


802.11a-5825

802.11ac(VH20)-5745

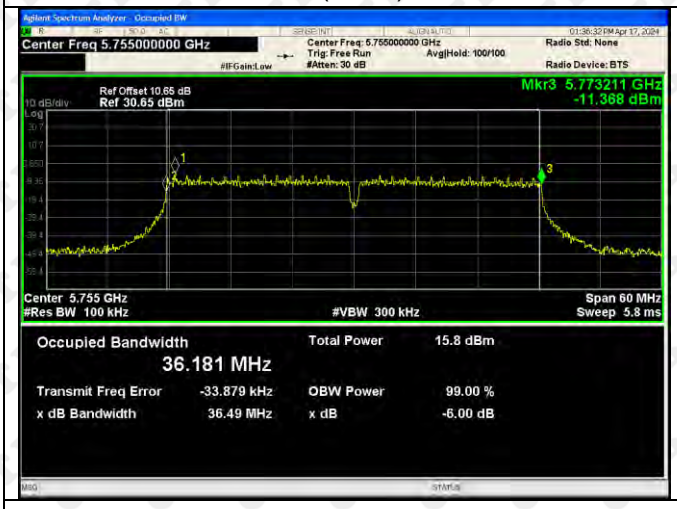
802.11ac(VH20)-5785

802.11ac(VH20)-5825

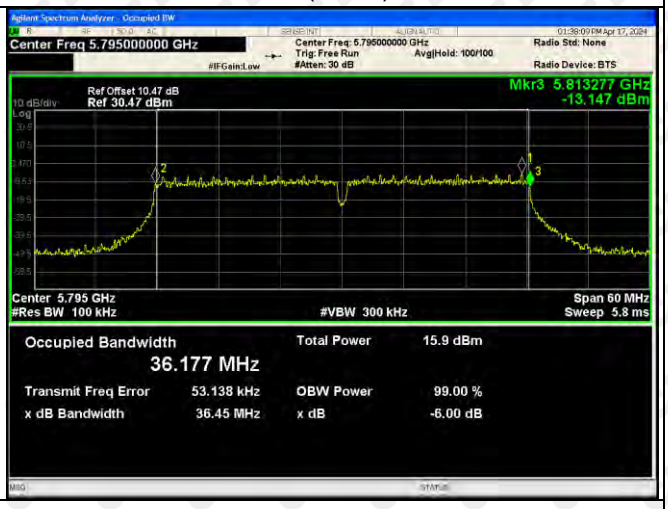


802.11ac(VH40)-5755

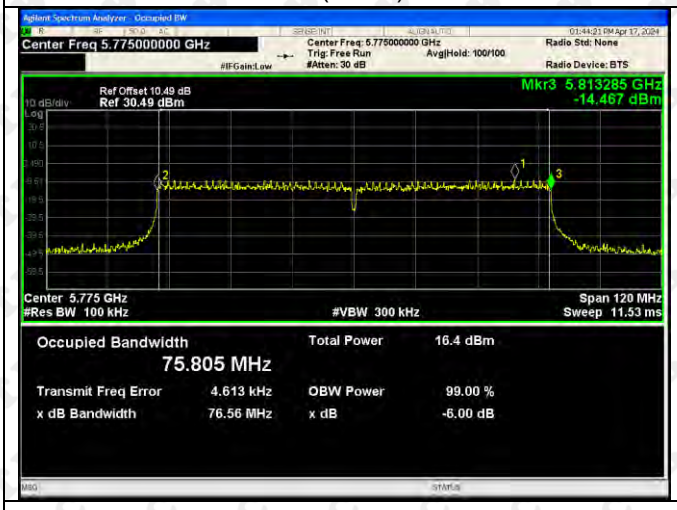
802.11ac(VH40)-5795



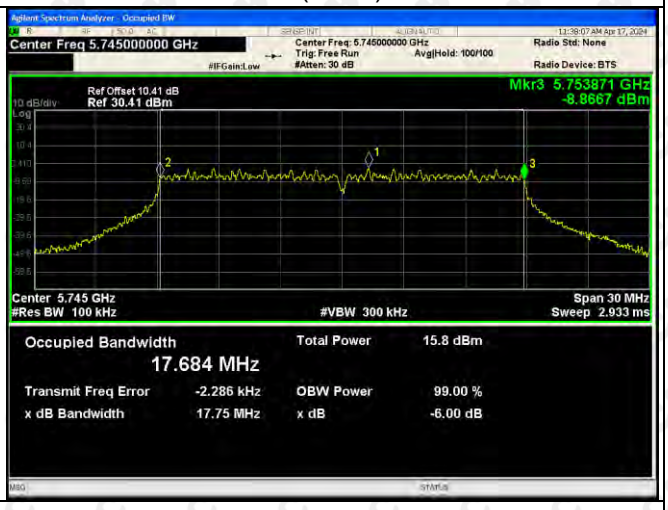
802.11ac(VH80)-5775



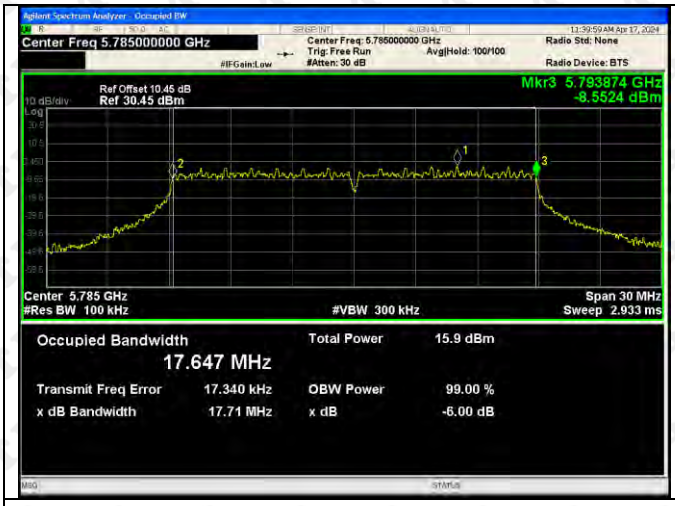
802.11n(HT20)-5745



802.11n(HT20)-5785

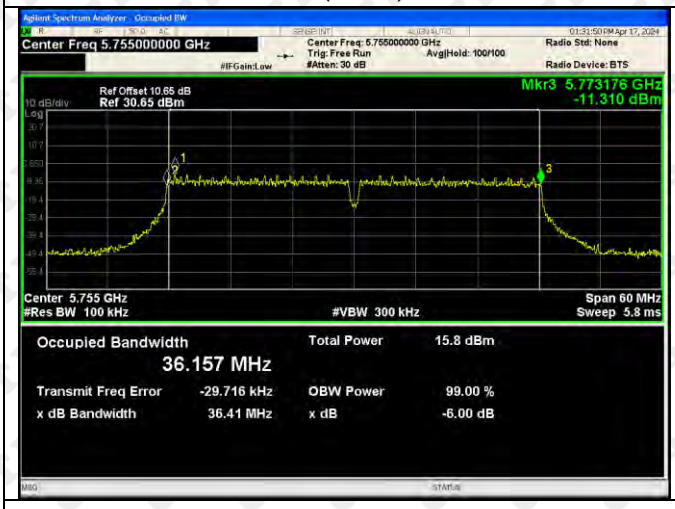


802.11n(HT20)-5825

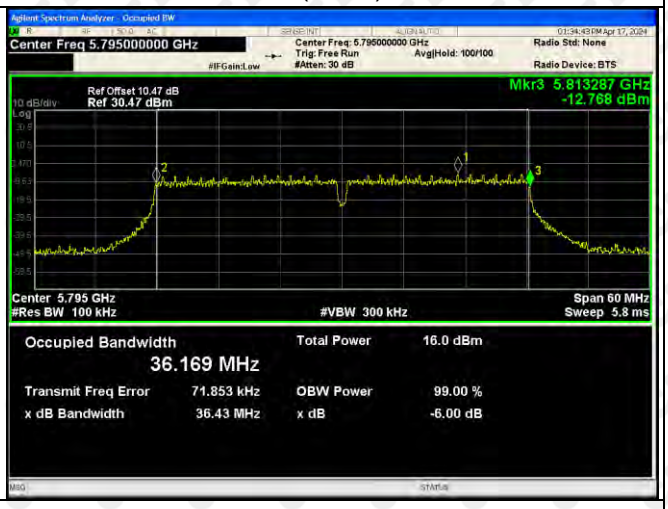


5802.11n(HT40)-5755

802.11n(HT40)-5795

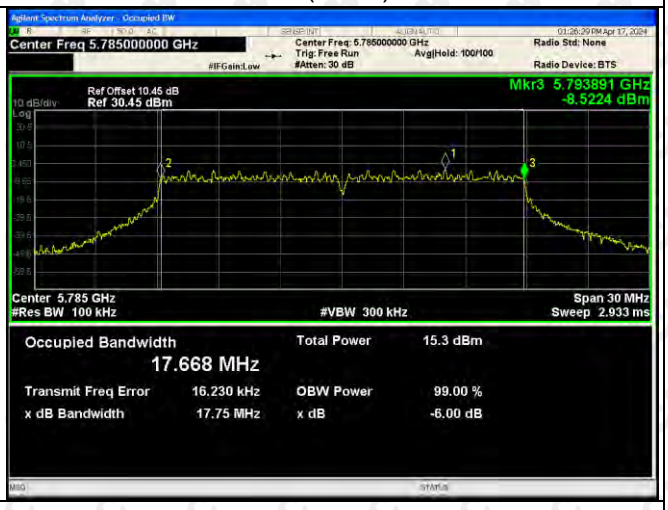


802.11ax(VH20)-5745



802.11ax(VH20)-5785

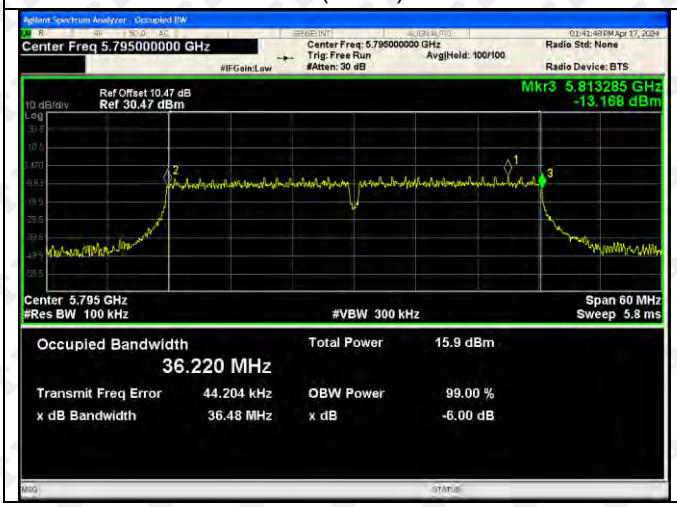
802.11ax(VH20)-5825

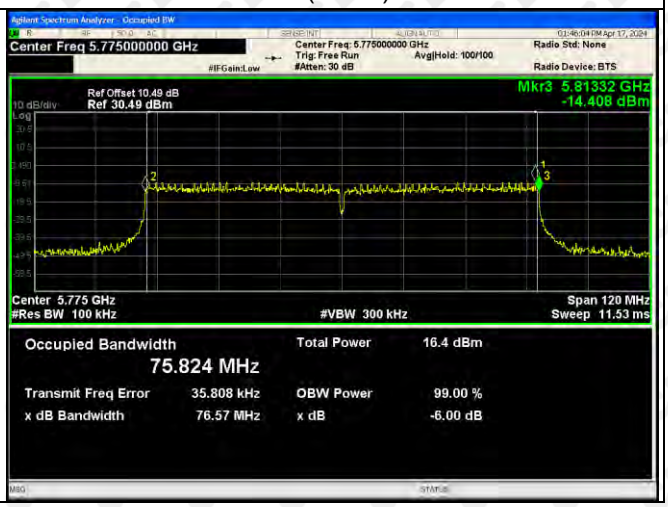


802.11ax(VH40)-5755

802.11ax(VH40)-5795

802.11ax(VH80)-5775





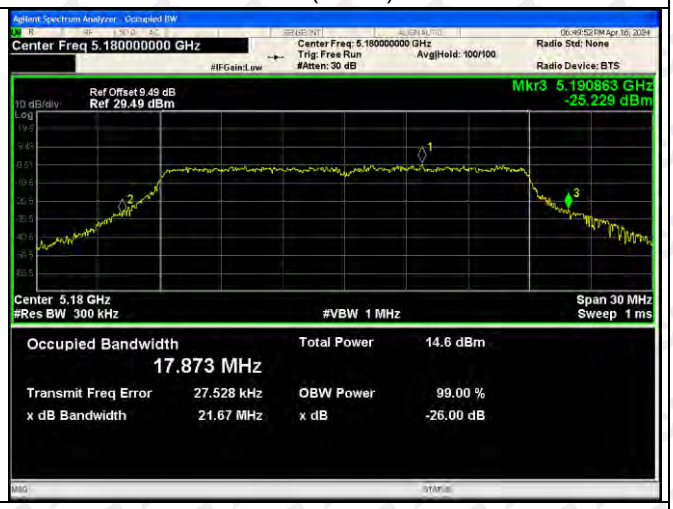
Test Graph ANT 2

802.11a-5180

802.11a-5200

802.11a-5240

802.11ac(VH20)-5180



802.11ac(VH20)-5200

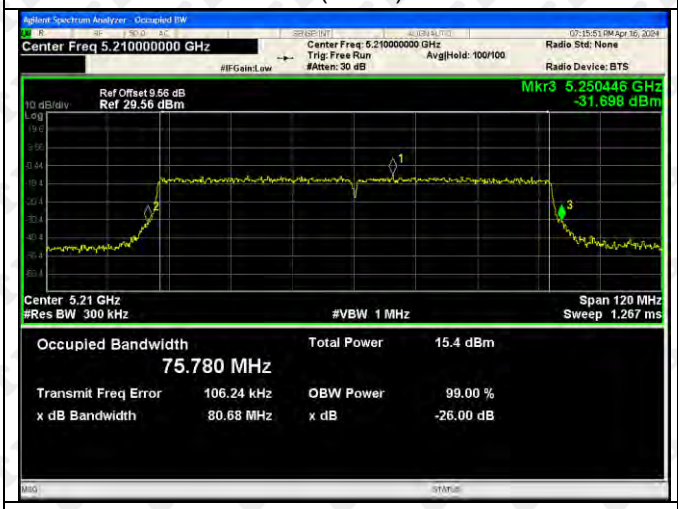
802.11ac(VH20)-5240

802.11ac(VH40)-5190

802.11ac(VH40)-5230

802.11ac(VH80)-5210

802.11n(HT20)-5180



802.11n(HT20)-5200

802.11n(HT20)-5240

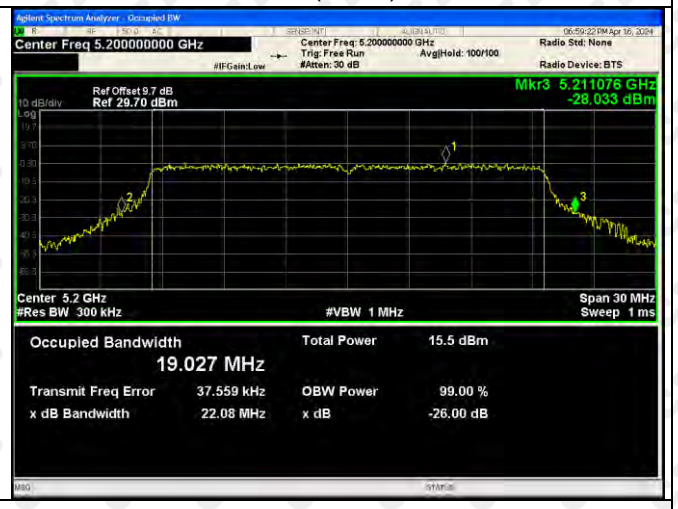
802.11n(HT40)-5190

802.11n(HT40)-5230

802.11ax(VH20)-5180

802.11ax(VH20)-5200

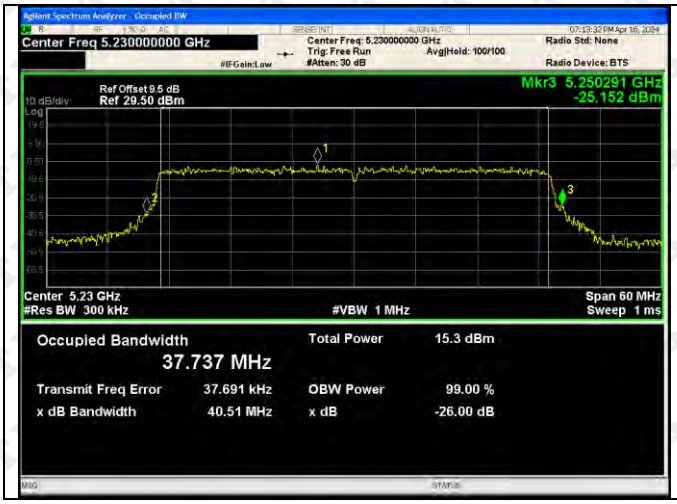
802.11ax(VH20)-5240

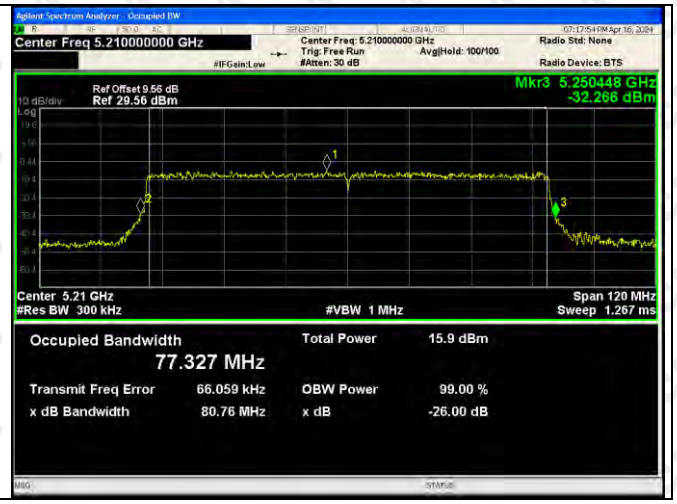


802.11ax(VH40)-5190

802.11ax(VH40)-5230

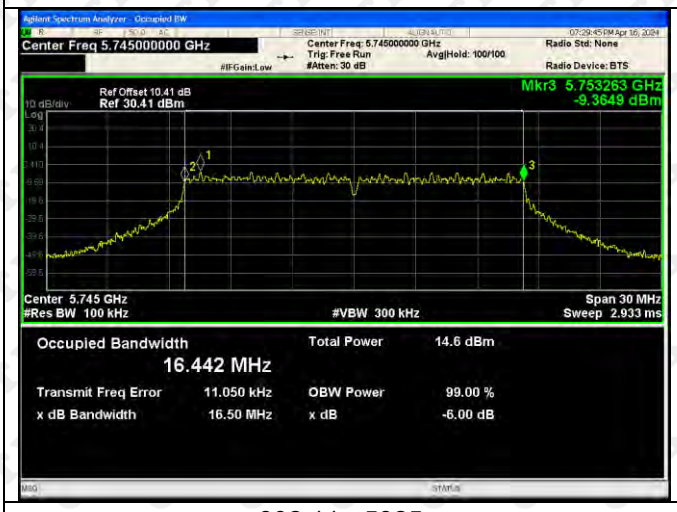
802.11ax(VH80)-5210



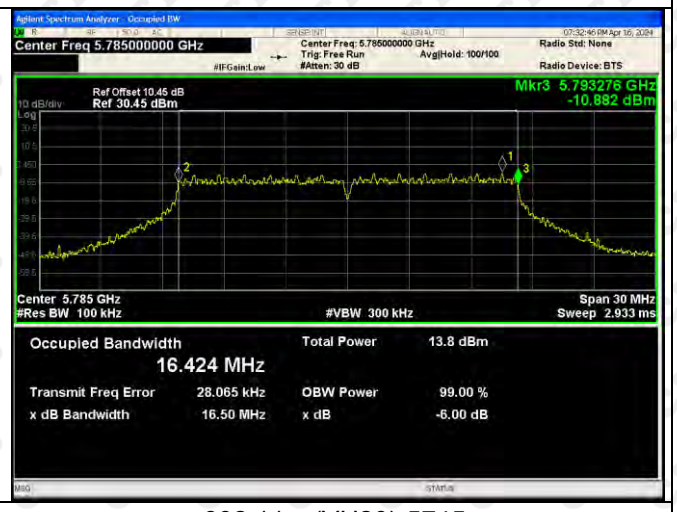


ANT2:
5725-5850MHz

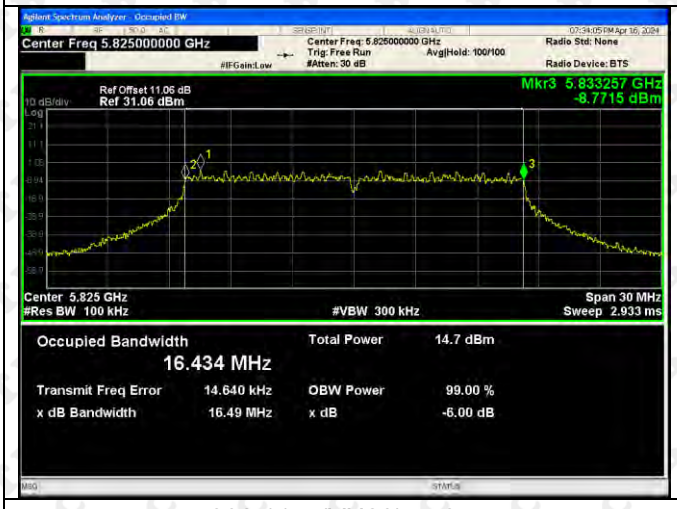
802.11a-5745



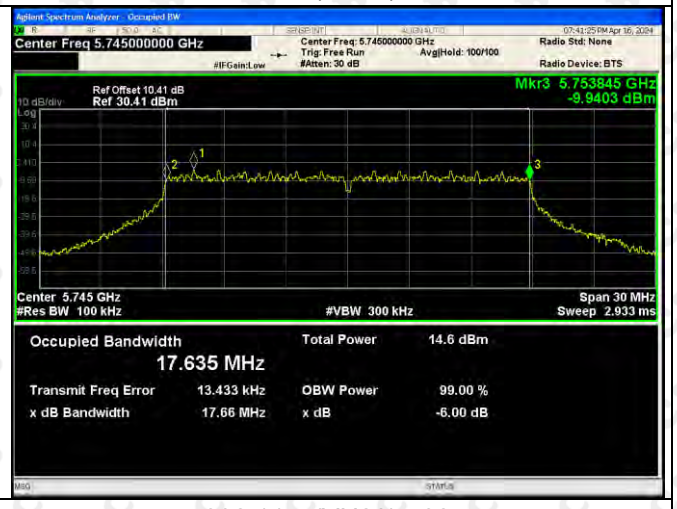
802.11a-5785



802.11a-5825



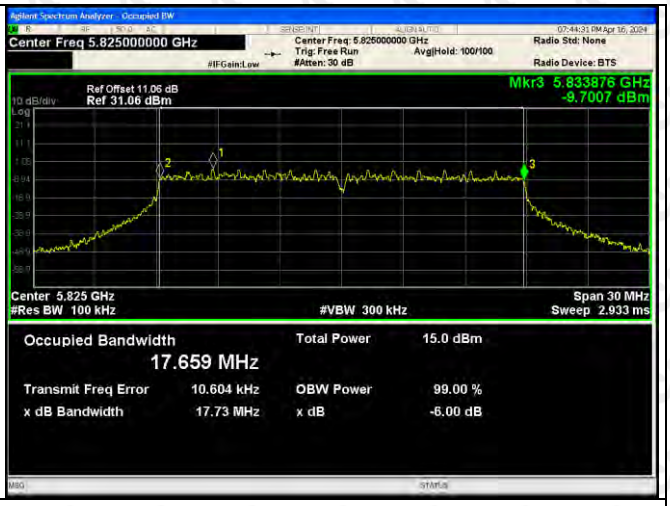
802.11ac(VH20)-5745



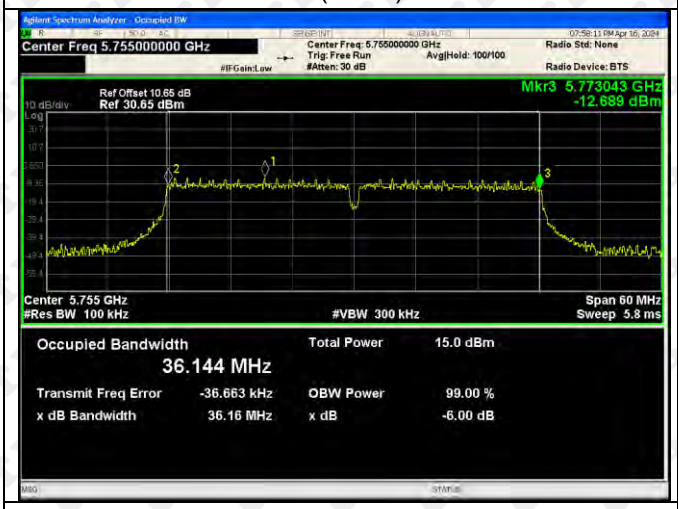
802.11ac(VH20)-5785

802.11ac(VH20)-5825

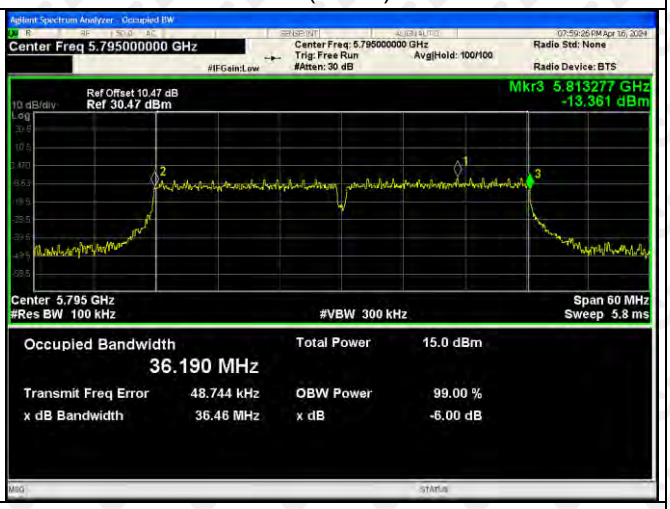
802.11ac(VH40)-5755



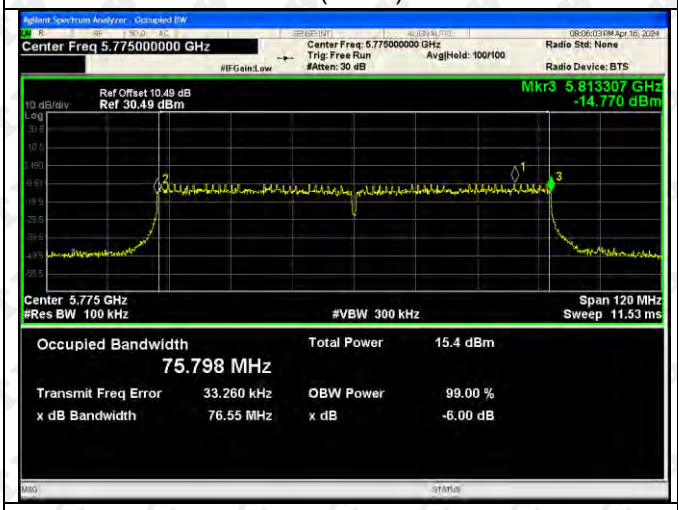
802.11ac(VH40)-5795



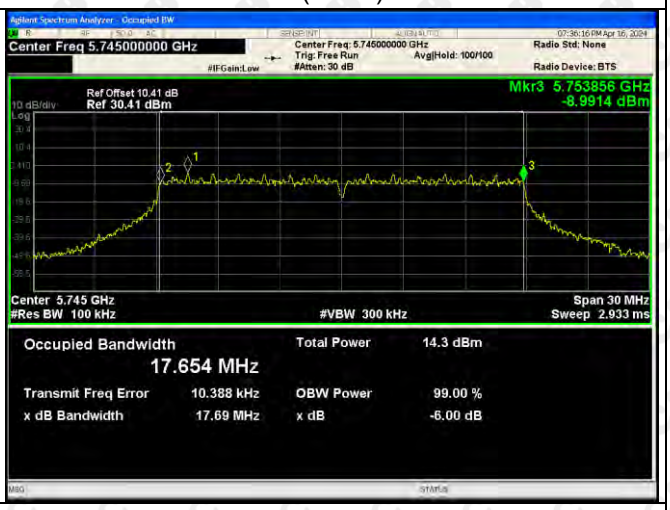
802.11ac(VH80)-5775



802.11n(HT20)-5745

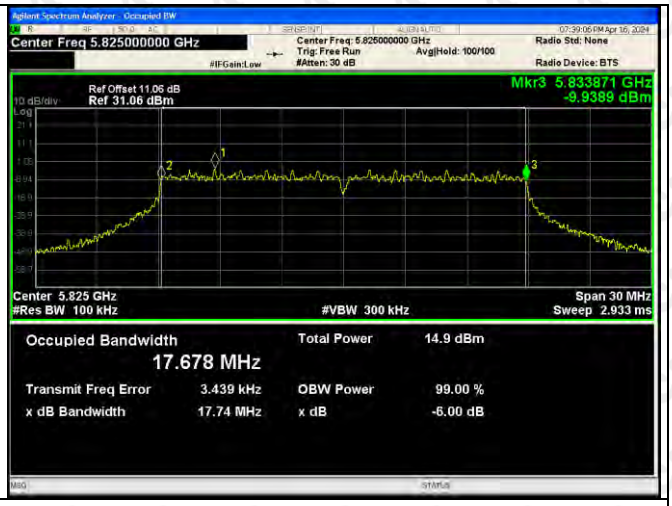


802.11n(HT20)-5785

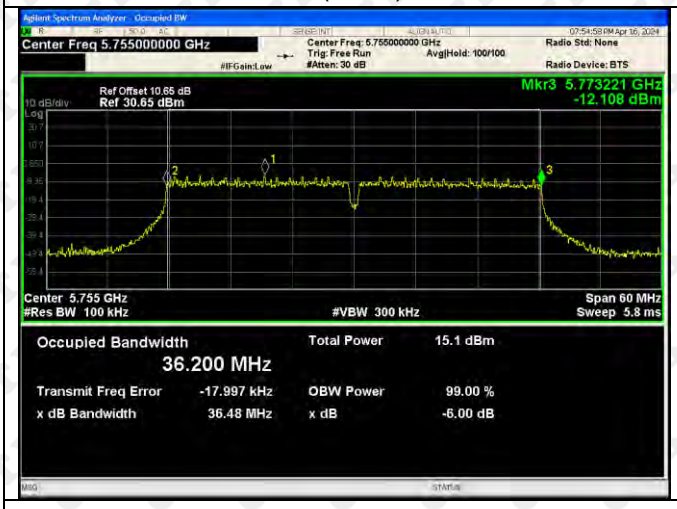


802.11n(HT20)-5825

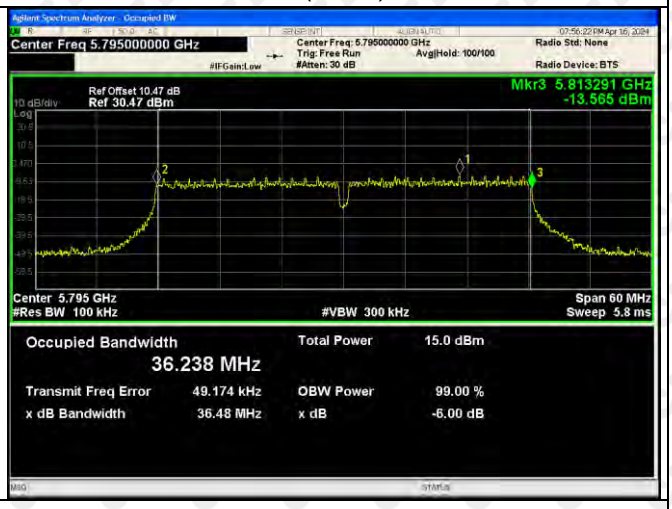
5802.11n(HT40)-5755



802.11n(HT40)-5795



802.11ax(VH20)-5745



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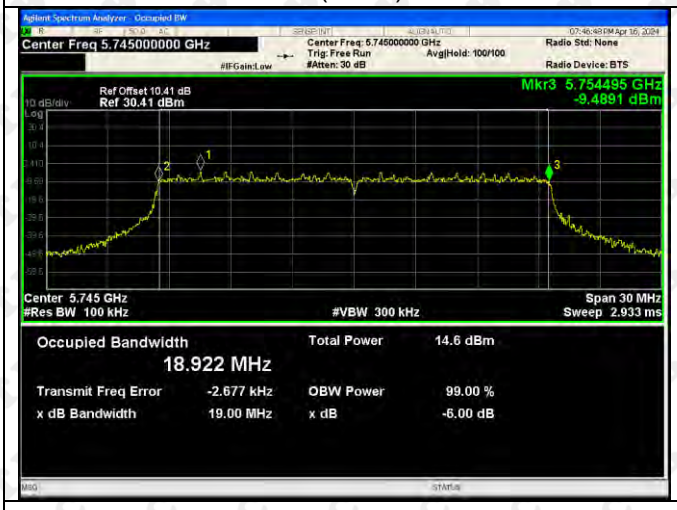
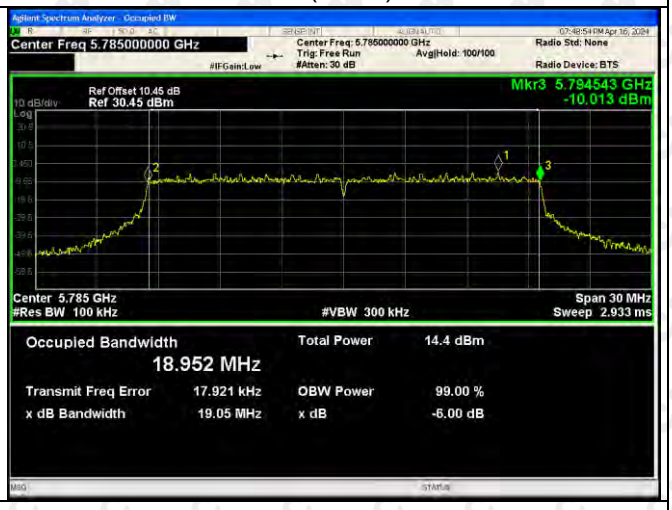


802.11ax(VH20)-5825



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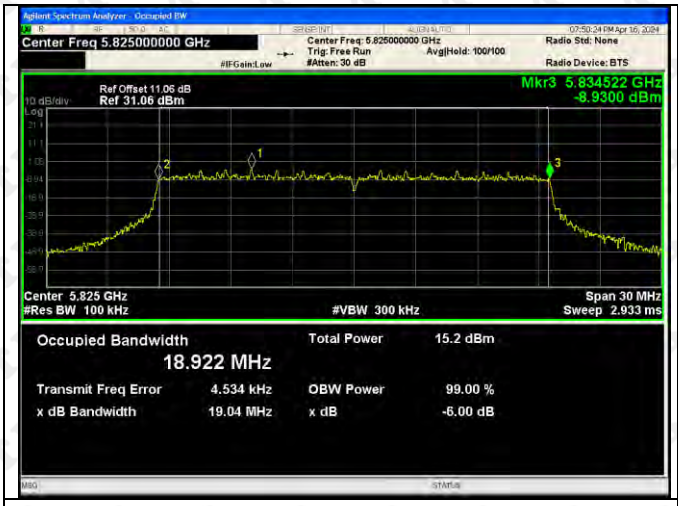
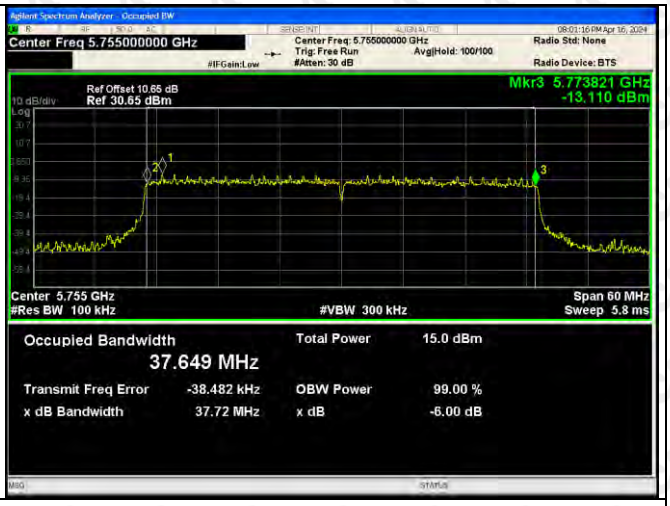


802.11ax(VH40)-5795



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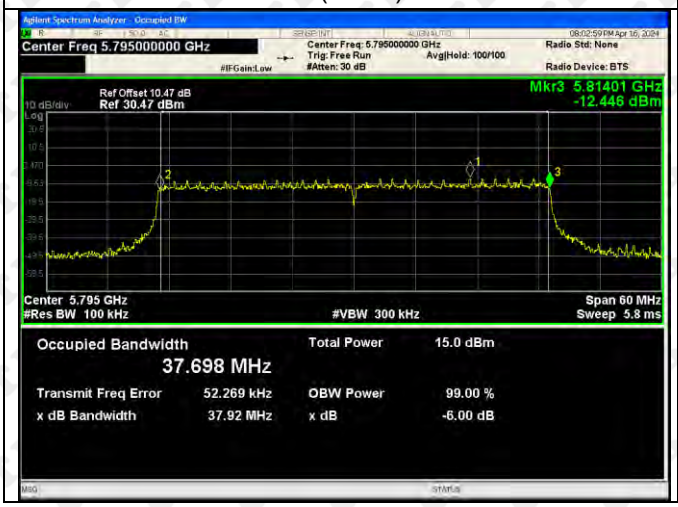
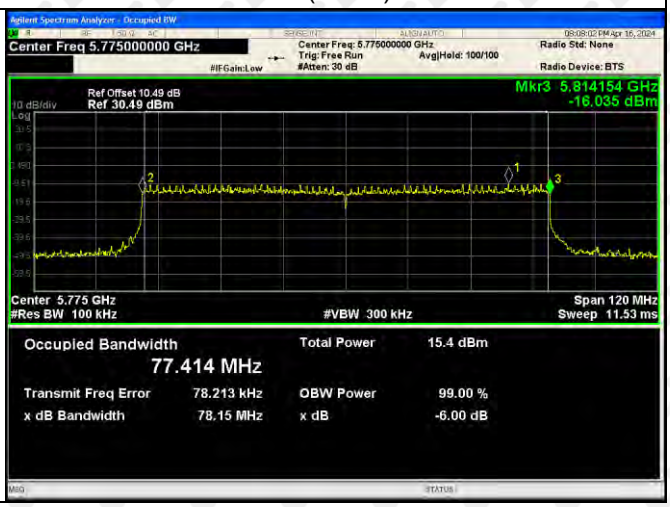
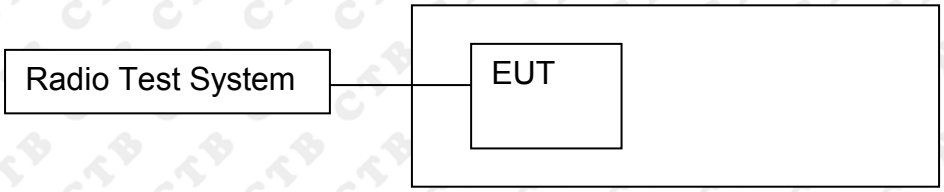




11. POWER SPECTRAL DENSITY

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	-2.157	-2.938	/	11	Pass
	5200	-1.759	-2.505	/	11	Pass
	5240	-1.897	-2.677	/	11	Pass
802.11ac(VH20)	5180	-3.216	-3.589	14.344	11	Pass
	5200	-3.034	-3.578	14.438	11	Pass
	5240	-2.971	-3.591	-0.260	11	Pass
802.11ac(VH40)	5190	-6.857	-6.653	-3.744	11	Pass
	5230	-7.231	-6.702	-3.948	11	Pass
802.11ac(VH80)	5230	-9.707	-9.914	-6.799	11	Pass
802.11n(VH20)	5180	-2.681	-2.675	0.332	11	Pass
	5200	-2.001	-2.447	0.792	11	Pass
	5240	-1.785	-2.59	0.841	11	Pass
802.11n(VH40)	5190	-7.674	-5.6	14.344	11	Pass
	5230	-6.096	-6.201	14.438	11	Pass
802.11ax(VH20)	5180	-3.243	-3.691	-0.451	11	Pass
	5200	-3.04	-3.438	-0.224	11	Pass
	5240	-2.771	-3.673	-0.188	11	Pass
802.11ax(VH40)	5190	-6.789	-6.954	-3.860	11	Pass
	5230	-6.966	-7.119	-4.032	11	Pass
802.11ax(VH80)	5210	-9.44	-9.795	-6.604	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	-5.874	-7.132	/	30	Pass
	5785	-5.534	-7.805	/	30	Pass
	5825	-5.128	-6.874	/	30	Pass
802.11ac(VH20)	5745	-5.684	-7.205	14.344	30	Pass
	5785	-6.506	-7.589	14.438	30	Pass
	5825	-5.421	-6.441	-2.891	30	Pass
802.11ac(VH40)	5755	-9.01	-10.054	-6.490	30	Pass
	5795	-8.835	-9.608	-6.194	30	Pass
802.11ac(VH80)	5795	-12.365	-13.065	-9.691	30	Pass
802.11n(VH20)	5775	-5.632	-7.449	-3.436	30	Pass
	5745	-5.79	-7.361	-3.495	30	Pass
	5785	-4.586	-6.613	-2.472	30	Pass
802.11n(VH40)	5825	-9.087	-9.392	-6.227	30	Pass
	5755	-8.802	-10.004	-6.351	30	Pass
802.11ax(VH20)	5745	-6.233	-7.219	14.344	30	Pass
	5785	-6.088	-7.361	14.438	30	Pass
	5825	-5.504	-6.357	-2.899	30	Pass
802.11ax(VH40)	5755	-9.197	-10.179	-6.650	30	Pass
	5795	-9.099	-10.324	-6.658	30	Pass
802.11ax(VH80)	5775	-12.078	-13.248	-9.613	30	Pass

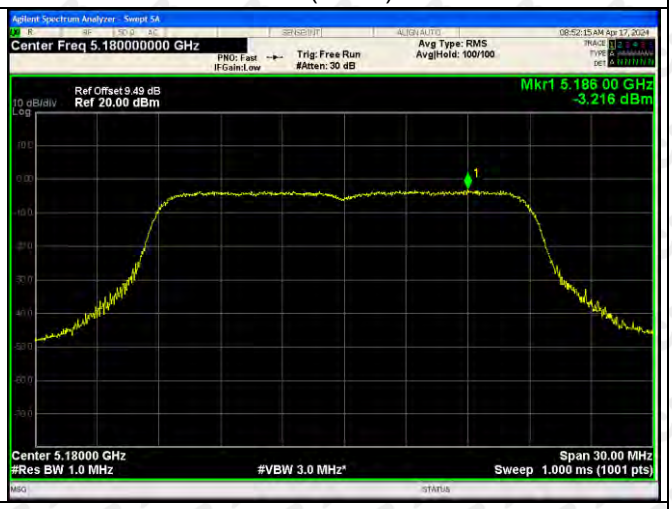
ANT 1

802.11a-5180

802.11a-5200

802.11a-5240

802.11ac(VH20)-5180



802.11ac(VH20)-5200

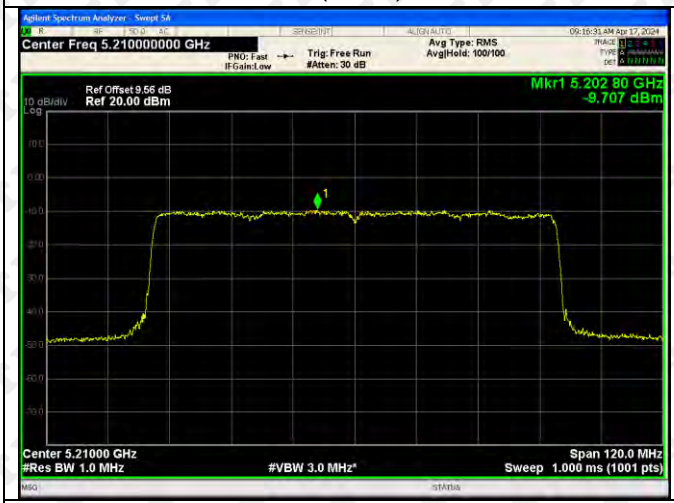
802.11ac(VH20)-5240

802.11ac(VH40)-5190

802.11ac(VH40)-5230

802.11ac(VH80)-5210

802.11n(HT20)-5180



802.11n(HT20)-5200

802.11n(HT20)-5240

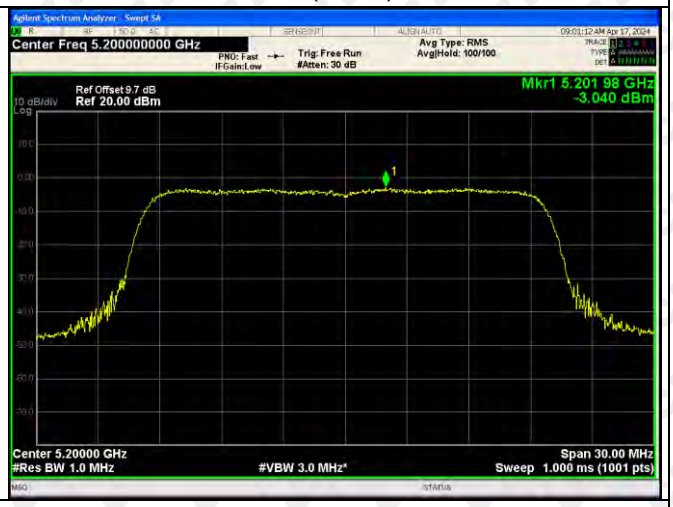
802.11n(HT40)-5190

802.11n(HT40)-5230

802.11ax(VH20)-5180

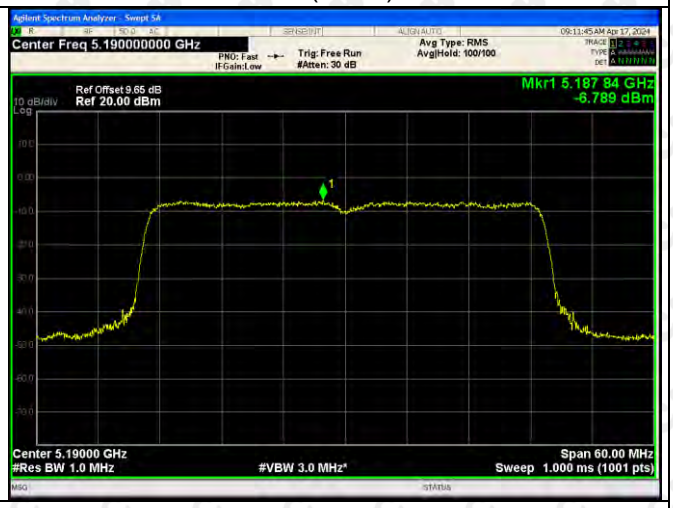
802.11ax(VH20)-5200

802.11ax(VH20)-5240



802.11ax(VH40)-5190

802.11ax(VH40)-5230



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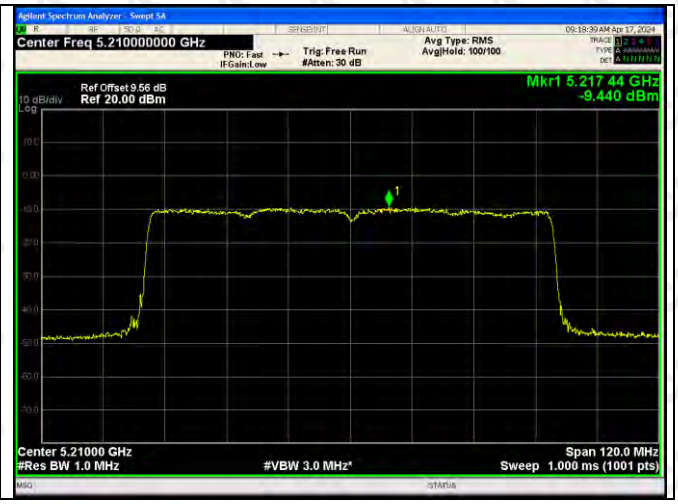
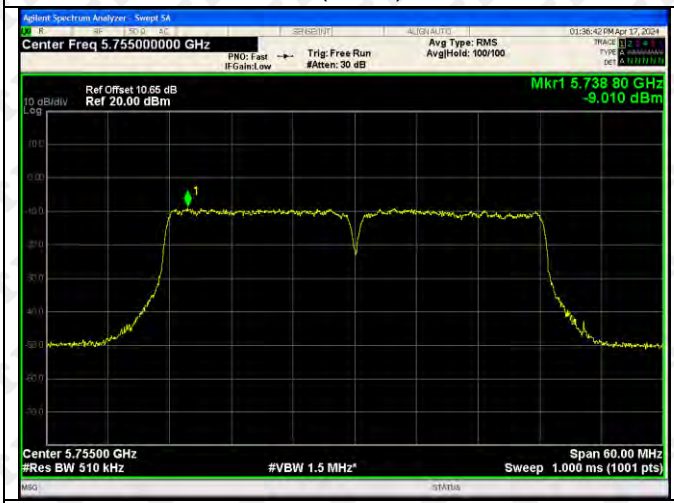


ANT1:

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



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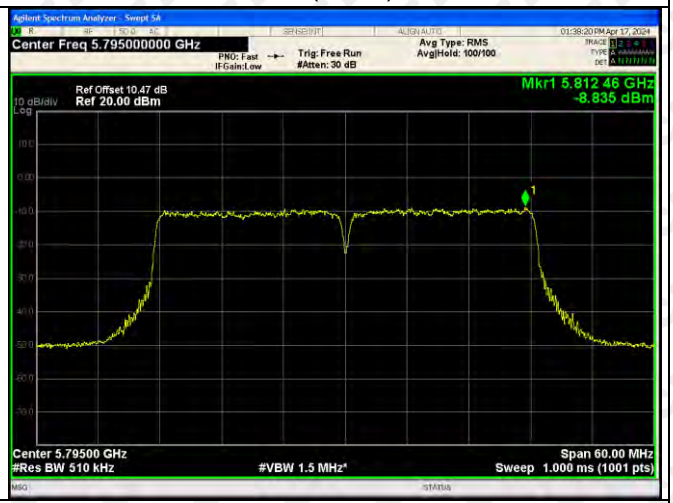

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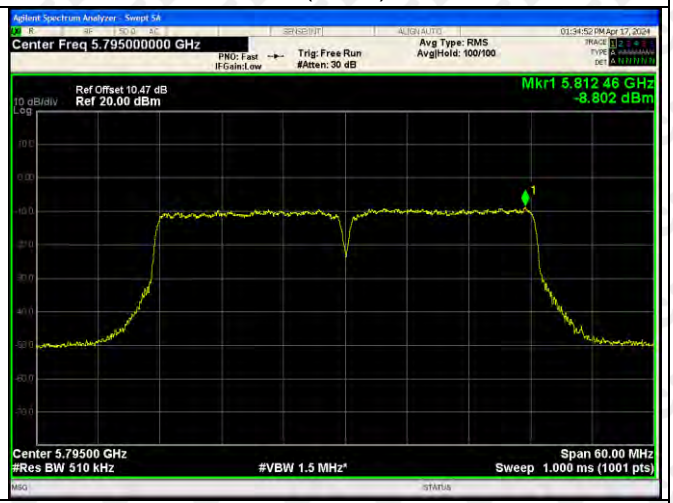
802.11n(HT20)-5785

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

ANT 2

802.11a-5180

802.11a-5200

802.11a-5240

802.11ac(VH20)-5180

802.11ac(VH20)-5200

802.11ac(VH20)-5240

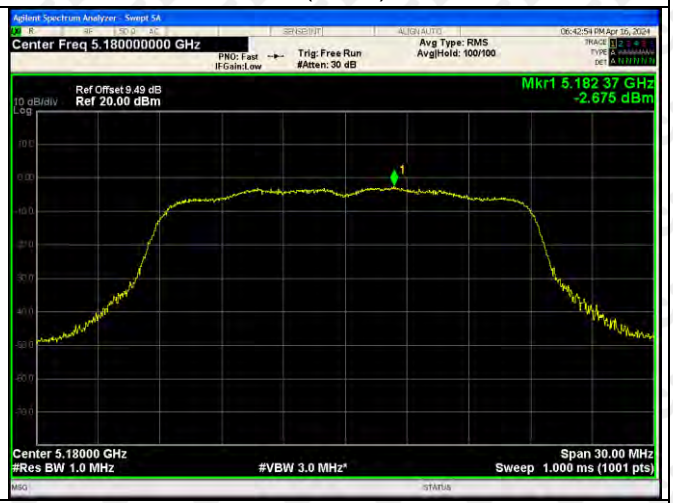
802.11ac(VH40)-5190

802.11ac(VH40)-5230

802.11ac(VH80)-5210

802.11n(HT20)-5180

802.11n(HT20)-5200



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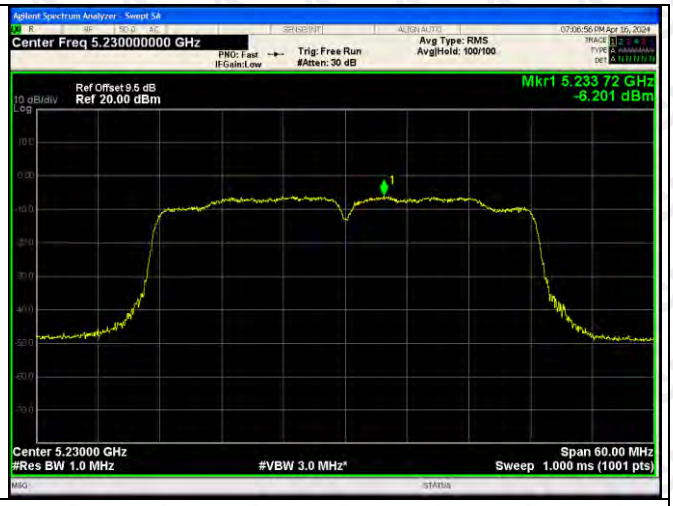
802.11n(HT40)-5190

802.11n(HT40)-5230

802.11ax(VH20)-5180

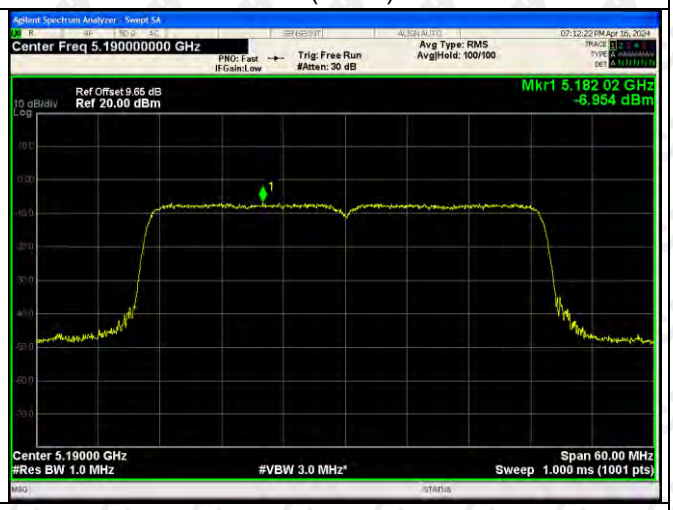


802.11ax(VH20)-5200

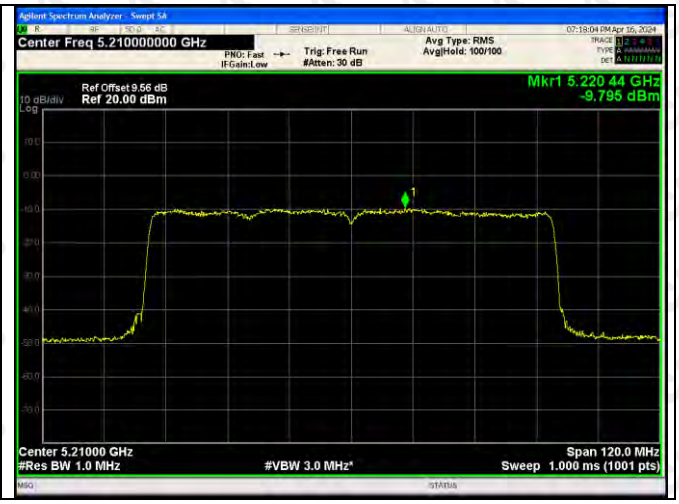
802.11ax(VH20)-5240

802.11ax(VH40)-5190

802.11ax(VH40)-5230



802.11ax(VH80)-5210



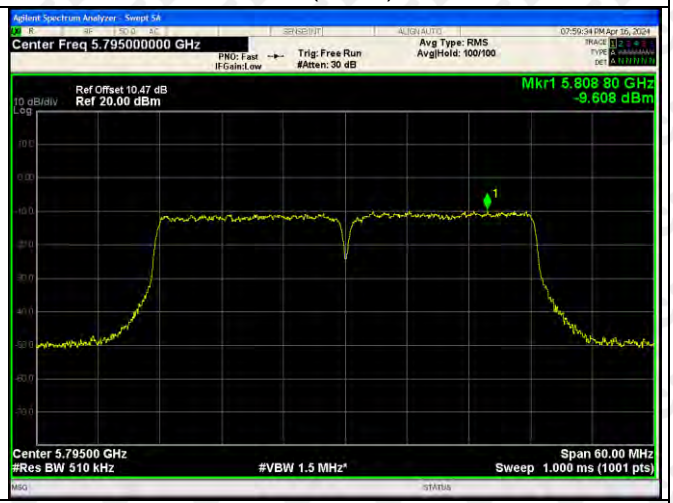
ANT2:

802.11a-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

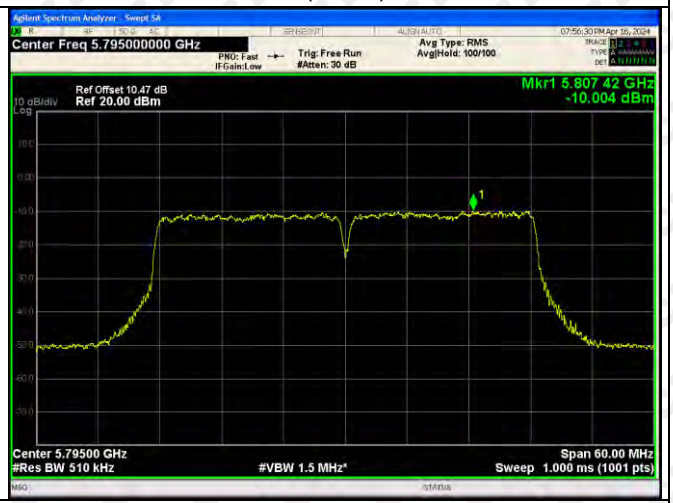
802.11n(HT20)-5785

802.11n(HT20)-5825

5802.11n(HT40)-5755

802.11n(HT40)-5795

802.11ax(VH20)-5745



802.11ax(VH20)-5785

802.11ax(VH20)-5825

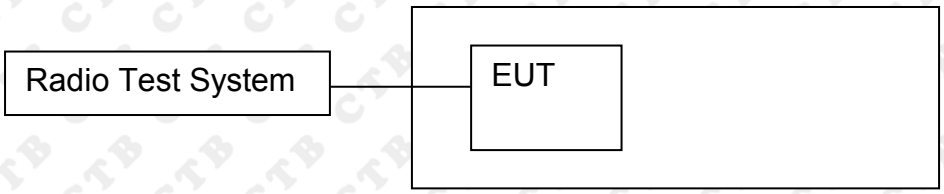
802.11ax(VH40)-5755

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

TX Frequency (5150-5250MHz)
ANT1
Voltage vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
T nom (°C)	20	V nom (V)	7.60	5180.0630	5180	0.0630	12.1645
		V max (V)	8.36	5180.0446	5180	0.0446	8.6117
		V min (V)	6.84	5180.0031	5180	0.0031	0.6027
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	7.6	T (°C)	0	5180.0311	5180	0.0311	6.0049
		T (°C)	10	5180.0454	5180	0.0454	8.7609
		T (°C)	20	5180.0019	5180	0.0019	0.3700
		T (°C)	30	5180.0268	5180	0.0268	5.1763
		T (°C)	40	5180.0446	5180	0.0446	8.6029
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)	7.60	5200.0431	5200	0.0431	8.2951
		V max (V)	8.36	5200.0293	5200	0.0293	5.6373
		V min (V)	6.84	5200.0350	5200	0.0350	6.7288
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	7.6	T (°C)	0	5200.0025	5200	0.0025	0.4888
		T (°C)	10	5200.0093	5200	0.0093	1.7801
		T (°C)	20	5200.0063	5200	0.0063	1.2158
		T (°C)	30	5200.0082	5200	0.0082	1.5830
		T (°C)	40	5200.0159	5200	0.0159	3.0561
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)	7.60	5240.0345	5240	0.0345	6.5784
		V max (V)	8.36	5240.0378	5240	0.0378	7.2087
		V min (V)	6.84	5240.0515	5240	0.0515	9.8253
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	7.6	T (°C)	0	5240.0086	5240	0.0086	1.6449
		T (°C)	10	5240.0265	5240	0.0265	5.0661
		T (°C)	20	5240.0352	5240	0.0352	6.7191
		T (°C)	30	5240.0295	5240	0.0295	5.6251
		T (°C)	40	5240.0397	5240	0.0397	7.5857
Limits				±20ppm			
Result				Complies			

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)	7.60	5745.0563	5745	0.0563	9.7932
		V max (V)	8.36	5745.0593	5745	0.0593	10.3168
		V min (V)	6.84	5745.0563	5745	0.0563	9.7932
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	7.6	T (°C)	0	5745.0524	5745	0.0524	9.1262
		T (°C)	10	5745.0674	5745	0.0674	11.7406
		T (°C)	20	5745.0377	5745	0.0377	6.5680
		T (°C)	30	5745.0846	5745	0.0846	14.7222
		T (°C)	40	5745.0268	5745	0.0268	4.6600
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)	7.60	5785.0057	5785	0.0057	0.9881
		V max (V)	8.36	5785.0151	5785	0.0151	2.6026
		V min (V)	7.84	5785.0298	5785	0.0298	5.1448
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	7.6	T (°C)	0	5785.0169	5785	0.0169	2.9228
		T (°C)	10	5785.0308	5785	0.0308	5.3261
		T (°C)	20	5785.0187	5785	0.0187	3.2264
		T (°C)	30	5785.0110	5785	0.0110	1.8995
		T (°C)	40	5785.0699	5785	0.0699	12.0783
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)	7.60	5825.0159	5825	0.0159	2.7361
		V max (V)	8.36	5825.0259	5825	0.0259	4.4462
		V min (V)	6.84	5825.0549	5825	0.0549	9.4196
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	7.6	T (°C)	0	5825.0135	5825	0.0135	2.3251
		T (°C)	10	5825.0680	5825	0.0680	11.6723
		T (°C)	20	5825.0793	5825	0.0793	13.6063
		T (°C)	30	5825.0412	5825	0.0412	7.0664
		T (°C)	40	5825.0539	5825	0.0539	9.2498
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)	7.60	5180.0598	5180	0.0598	11.5528
		V max (V)	8.36	5180.0499	5180	0.0499	9.6372
		V min (V)	6.84	5180.0068	5180	0.0068	1.3188
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5180MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	7.6	T (°C)	0	5180.0780	5180	0.0780	15.0526
		T (°C)	10	5180.0090	5180	0.0090	1.7350
		T (°C)	20	5180.0425	5180	0.0425	8.2127
		T (°C)	30	5180.0192	5180	0.0192	3.7089
		T (°C)	40	5180.0536	5180	0.0536	10.3433
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)	7.60	5200.0313	5200	0.0313	6.0255
		V max (V)	8.36	5200.0876	5200	0.0876	16.8473
		V min (V)	6.84	5200.0110	5200	0.0110	2.1195
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5200MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	7.6	T (°C)	0	5200.0932	5200	0.0932	17.9190
		T (°C)	10	5200.0416	5200	0.0416	8.0080
		T (°C)	20	5200.0049	5200	0.0049	0.9446
		T (°C)	30	5200.0858	5200	0.0858	16.4998
		T (°C)	40	5200.0599	5200	0.0599	11.5118
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)	7.60	5240.0807	5240	0.0807	15.4052
		V max (V)	8.36	5240.0065	5240	0.0065	1.2366
		V min (V)	6.84	5240.0676	5240	0.0676	12.8985
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5240MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	7.6	T (°C)	0	5240.0158	5240	0.0158	3.0061
		T (°C)	10	5240.0845	5240	0.0845	16.1184
		T (°C)	20	5240.0026	5240	0.0026	0.4986
		T (°C)	30	5240.0039	5240	0.0039	0.7473
		T (°C)	40	5240.0247	5240	0.0247	4.7130
Limits				±20ppm			
Result				Complies			

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)	7.60	5745.0152	5745	0.0152	2.6418
		V max (V)	8.36	5745.0146	5745	0.0146	2.5419
		V min (V)	6.84	5745.0191	5745	0.0191	3.3260
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5745MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	7.6	T (°C)	0	5745.0734	5745	0.0734	12.7762
		T (°C)	10	5745.0897	5745	0.0897	15.6191
		T (°C)	20	5745.0732	5745	0.0732	12.7347
		T (°C)	30	5745.0503	5745	0.0503	8.7504
		T (°C)	40	5745.0443	5745	0.0443	7.7039
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)	7.60	5785.0067	5785	0.0067	1.1628
		V max (V)	8.36	5785.0436	5785	0.0436	7.5402
		V min (V)	6.84	5785.0660	5785	0.0660	11.4154
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5785MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	7.6	T (°C)	0	5785.0627	5785	0.0627	10.8319
		T (°C)	10	5785.0248	5785	0.0248	4.2885
		T (°C)	20	5785.0139	5785	0.0139	2.4083
		T (°C)	30	5785.0841	5785	0.0841	14.5308
		T (°C)	40	5785.0023	5785	0.0023	0.4056
		T (°C)	50	5785.0865	5785	0.0865	14.9564
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)	7.60	5825.0840	5825	0.0840	14.4161
		V max (V)	8.36	5825.0626	5825	0.0626	10.7469
		V min (V)	6.84	5825.0889	5825	0.0889	15.2572
Limits				±20ppm			
Result				Complies			

Temperature vs. Frequency Stability

TEST CONDITIONS				Reference Frequency：5825MHz			
				f	fc	Max. Deviation (MHz)	Max. Deviation (ppm)
V nom (V)	7.6	T (°C)	0	5825.0569	5825	0.0569	9.7676
		T (°C)	10	5825.0535	5825	0.0535	9.1867
		T (°C)	20	5825.0316	5825	0.0316	5.4212
		T (°C)	30	5825.0846	5825	0.0846	14.5276
		T (°C)	40	5825.0545	5825	0.0545	9.3496
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 FPC antenna and no consideration of replacement. The best case gain of the antenna is WiFi (5.2G):Ant1: 3.94dBi, Ant2: 3.94dBi, WiFi (5.8G):Ant1: 5.17dBi, Ant2: 5.17dBi

15. EUT TEST SETUP PHOTOGRAPHS

Radiated Emission

Below 1G

Above 1G

Conducted Emission

※※※※※ **END OF REPORT** ※※※※※