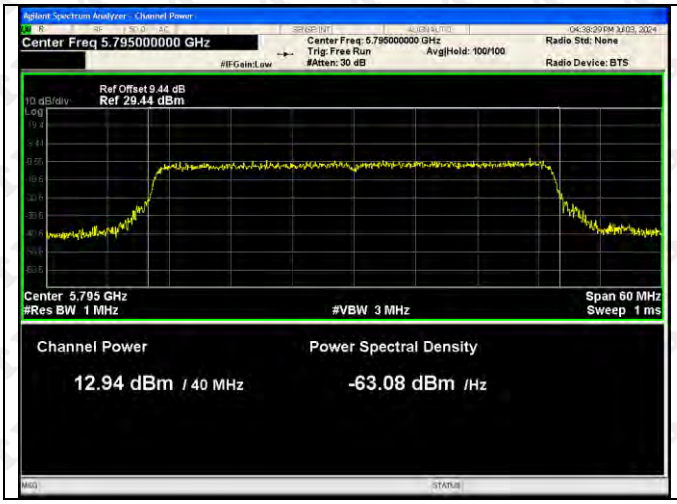
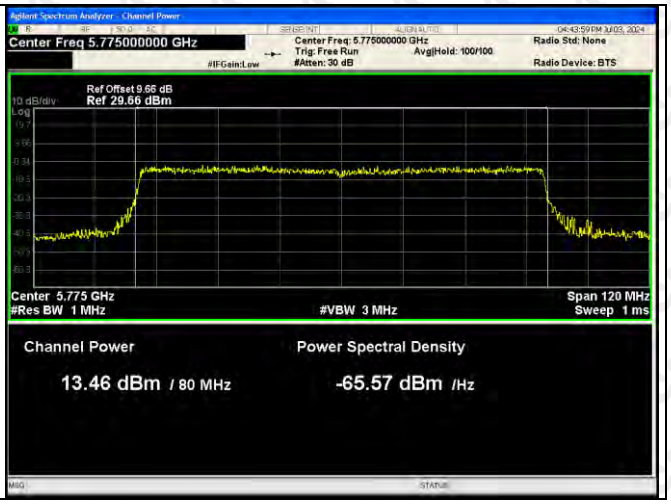
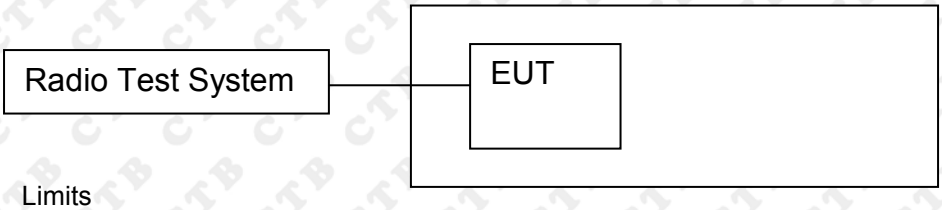

Agilent Spectrum Analyzer - Channel Power
Center Freq 5.795000000 GHz
Center Freq: 5.795000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Ref Offset 9.44 dB
10 dB/div
Ref 29.44 dBm
Center 5.795 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 60 MHz
Sweep 1 ms
Channel Power
12.94 dBm / 40 MHz
Power Spectral Density
-63.08 dBm /Hz


Agilent Spectrum Analyzer - Channel Power
Center Freq 5.775000000 GHz
Center Freq: 5.775000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
Ref Offset 9.66 dB
10 dB/div
Ref 29.66 dBm
Center 5.775 GHz
#Res BW 1 MHz
#VBW 3 MHz
Span 120 MHz
Sweep 1 ms
Channel Power
13.46 dBm / 80 MHz
Power Spectral Density
-65.57 dBm /Hz

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	19.344
	5200	19.974
	5240	19.071
802.11ac20	5180	20.585
	5200	20.862
	5240	20.493
802.11ac40	5190	39.717
	5230	39.537
802.11ac80	5210	79.298
802.11n(HT20)	5180	22.022
	5200	21.453
	5240	21.785
802.11n(HT40)	5190	40.324
	5230	40.229
802.11ax20	5180	81.135
	5200	20.588
	5240	20.018
802.11ax40	5190	20.362
	5230	41.806
802.11ax80	5210	42.013

Test mode Ant 2	Test Channel (MHz)	26dB Bandwidth (MHz)
802.11a	5180	19.734
	5200	20.169
	5240	19.779
802.11ac20	5180	21.785
	5200	21.586
	5240	21.559
802.11ac40	5190	39.162
	5230	39.341
802.11ac80	5210	80.553
802.11n(HT20)	5180	20.753
	5200	20.941
	5240	21.129
802.11n(HT40)	5190	39.54
	5230	38.857
802.11ax20	5180	21.659
	5200	22.045
	5240	21.358
802.11ax40	5190	40.457
	5230	40.547
802.11ax80	5210	81.145

5725-5850 MHz

Test mode Ant 1	Test Channel (MHz)	6dB Bandwidth (MHz)	Result
802.11a	5745	16.493	Pass
	5785	16.474	Pass
	5825	16.502	Pass
802.11ac20	5745	17.707	Pass
	5785	17.728	Pass
	5825	17.664	Pass
802.11ac40	5755	36.465	Pass
	5795	36.466	Pass
802.11ac80	5775	76.574	Pass
802.11n(HT20)	5745	18.951	Pass
	5785	19.029	Pass
	5825	19.02	Pass
802.11n(HT40)	5755	37.761	Pass
	5795	38.108	Pass
802.11ax20	5745	78.103	Pass
	5785	17.697	Pass
	5825	17.721	Pass
802.11ax40	5755	17.687	Pass
	5795	36.492	Pass
802.11ax80	5775	36.455	Pass

Test mode Ant 2	Test Channel (MHz)	6dB Bandwidth (MHz)	Result
802.11a	5745	16.521	Pass
	5785	16.458	Pass
	5825	16.501	Pass
802.11ac20	5745	17.688	Pass
	5785	17.755	Pass
	5825	17.714	Pass
802.11ac40	5755	36.492	Pass
	5795	36.449	Pass
802.11ac80	5775	76.52	Pass
802.11n(HT20)	5745	18.975	Pass
	5785	18.94	Pass
	5825	18.999	Pass
802.11n(HT40)	5755	38.04	Pass
	5795	38.134	Pass
802.11ax20	5745	78.129	Pass
	5785	17.694	Pass
	5825	17.747	Pass
802.11ax40	5755	17.732	Pass
	5795	36.39	Pass
802.11ax80	5775	36.386	Pass

Test Graph ANT 1

802.11a-5180

802.11a-5200

802.11a-5240

802.11ac(VH20)-5180

802.11ac(VH20)-5200

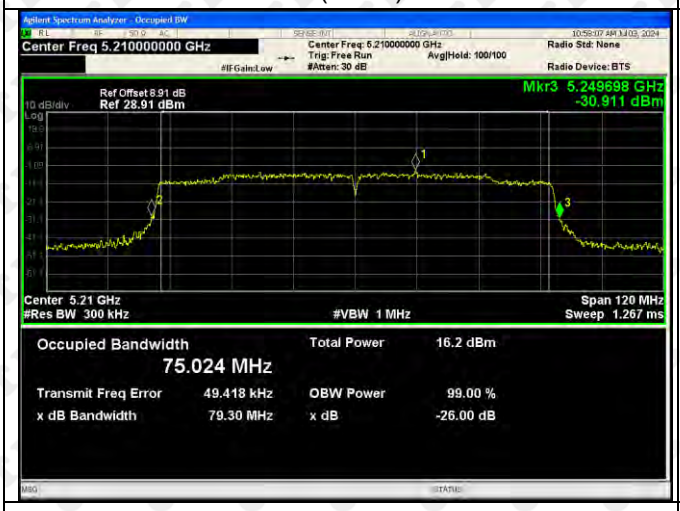
802.11ac(VH20)-5240

802.11ac(VH40)-5190

802.11ac(VH40)-5230

802.11ac(VH80)-5210

802.11n(HT20)-5180



802.11n(HT20)-5200

802.11n(HT20)-5240

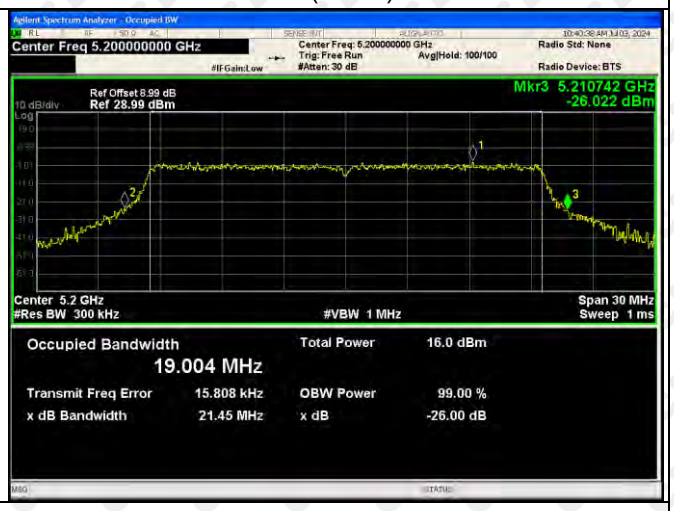
802.11n(HT40)-5190

802.11n(HT40)-5230

802.11ax(VH20)-5180

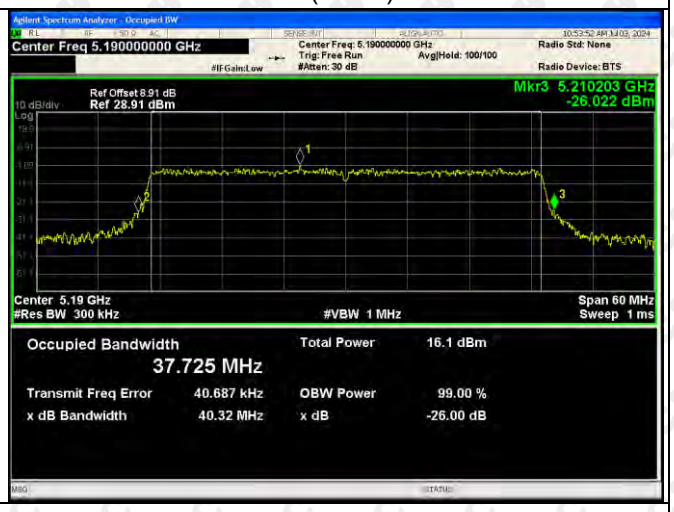
802.11ax(VH20)-5200

802.11ax(VH20)-5240

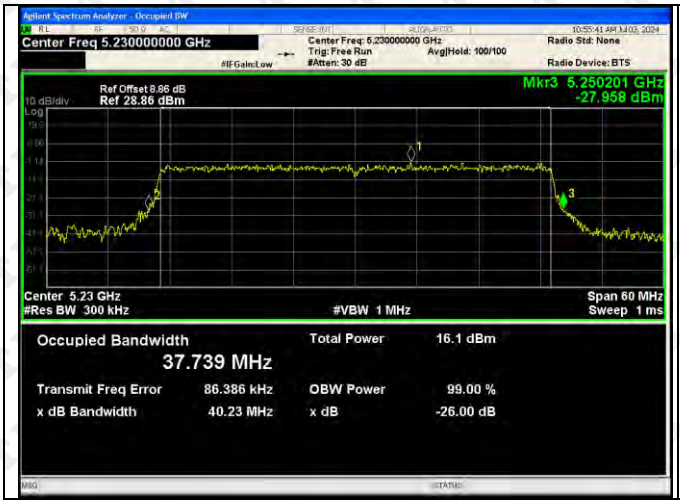


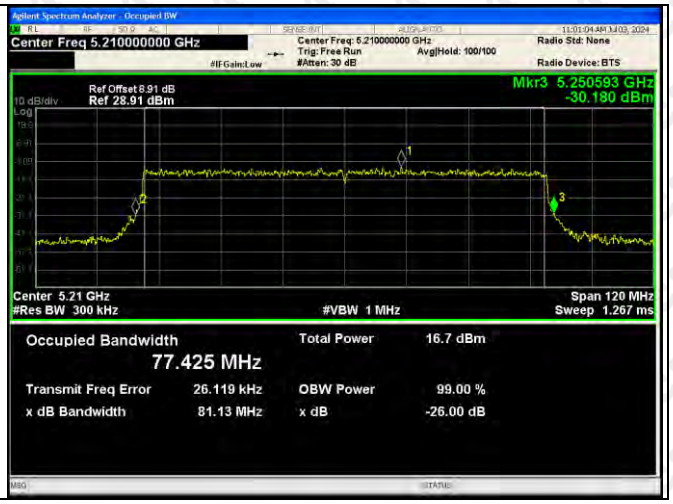
802.11ax(VH40)-5190

802.11ax(VH40)-5230



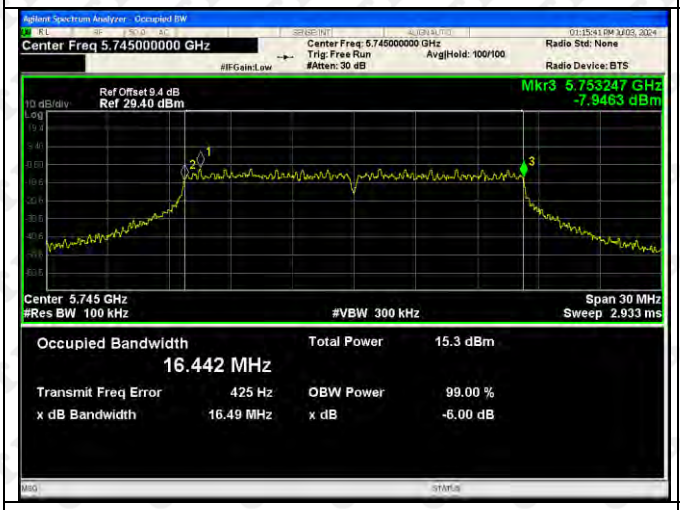
802.11ax(VH80)-5210



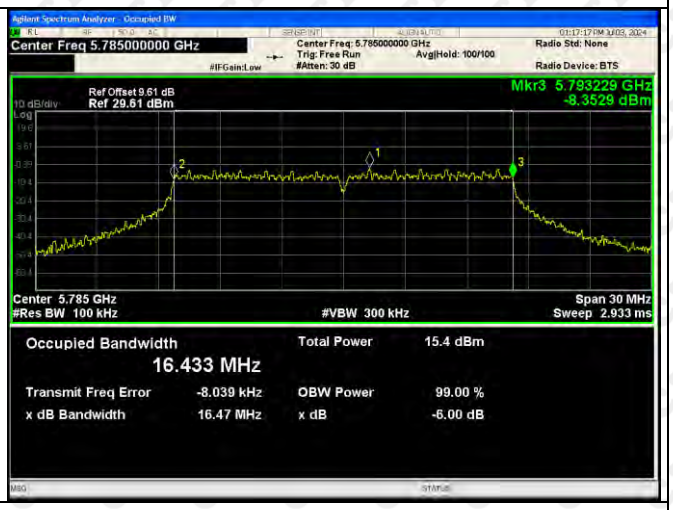


ANT1:
5725-5850MHz

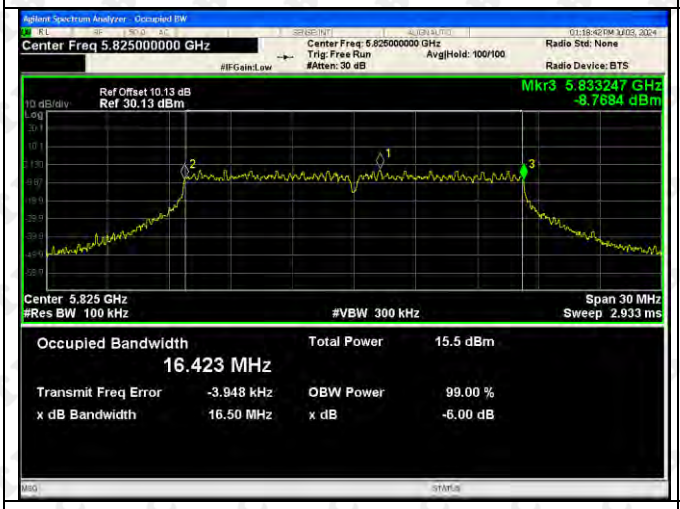
802.11a-5745



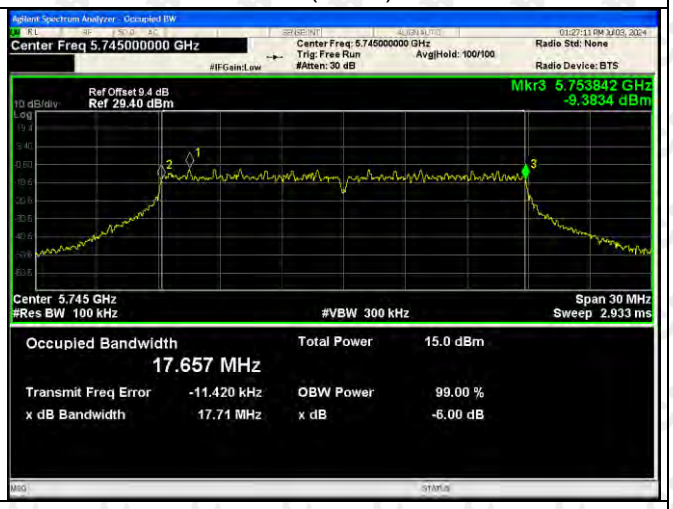
802.11a-5785



802.11a-5825



802.11ac(VH20)-5745

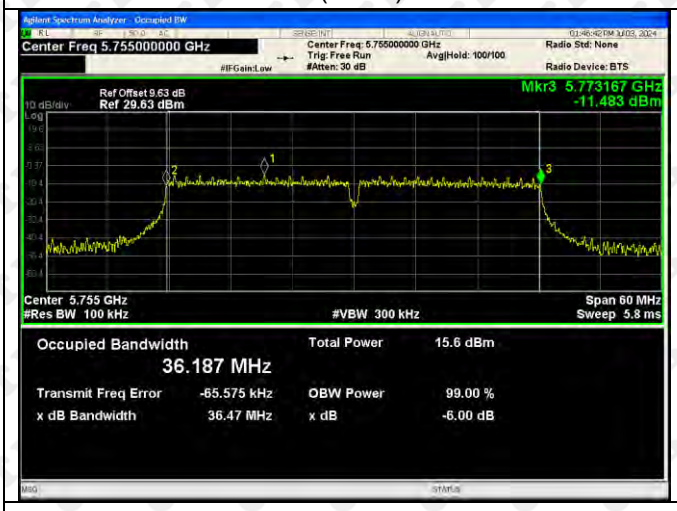


802.11ac(VH20)-5785

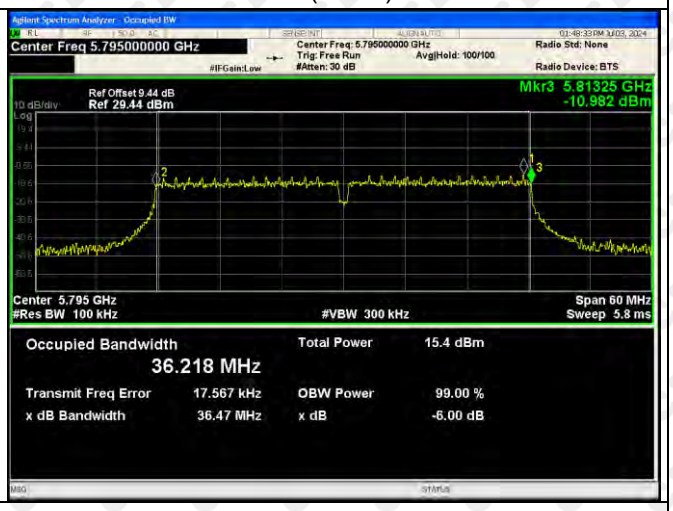
802.11ac(VH20)-5825

802.11ac(VH40)-5755

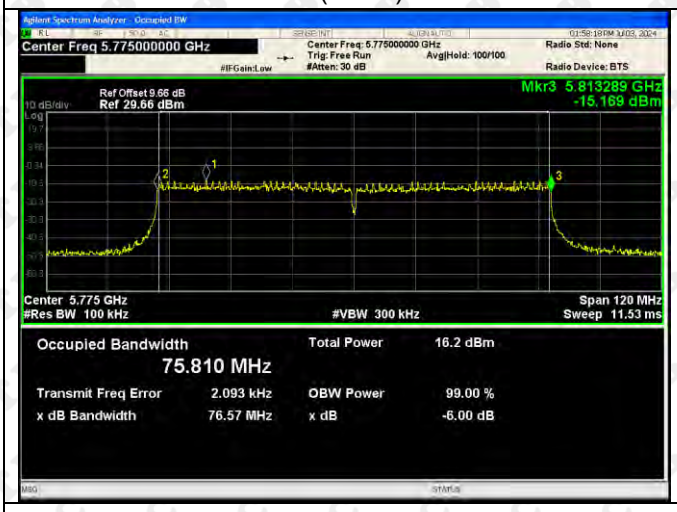
802.11ac(VH40)-5795



802.11ac(VH80)-5775



802.11n(HT20)-5745

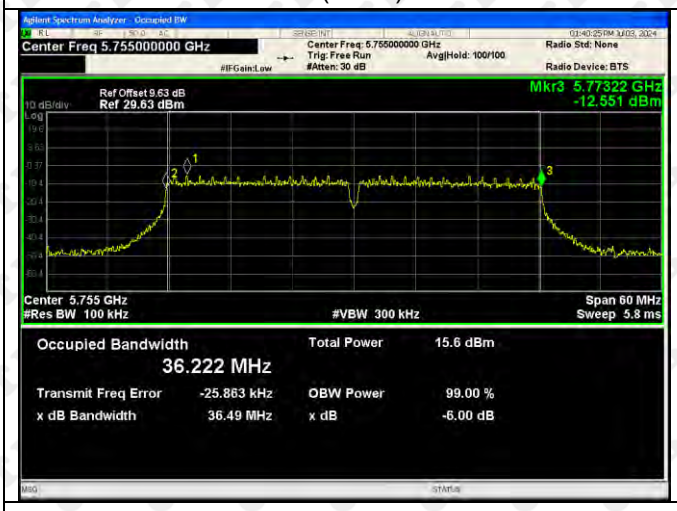


802.11n(HT20)-5785

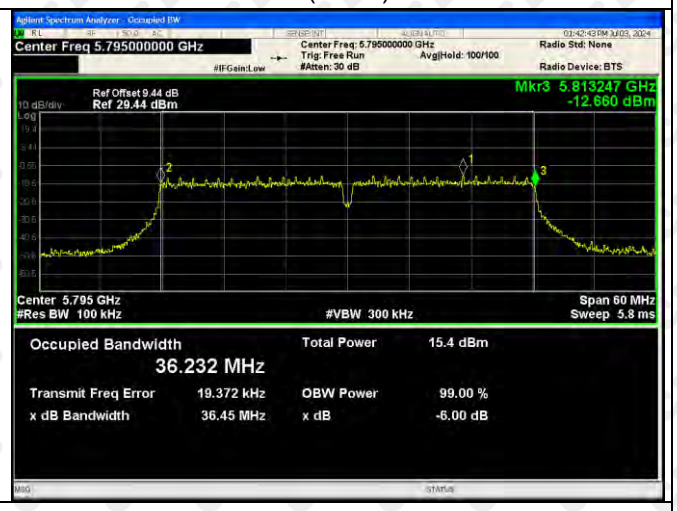
802.11n(HT20)-5825

5802.11n(HT40)-5755

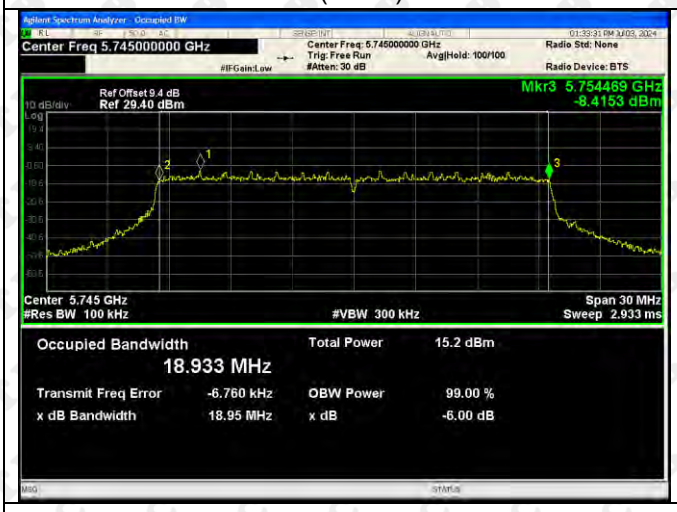
802.11n(HT40)-5795



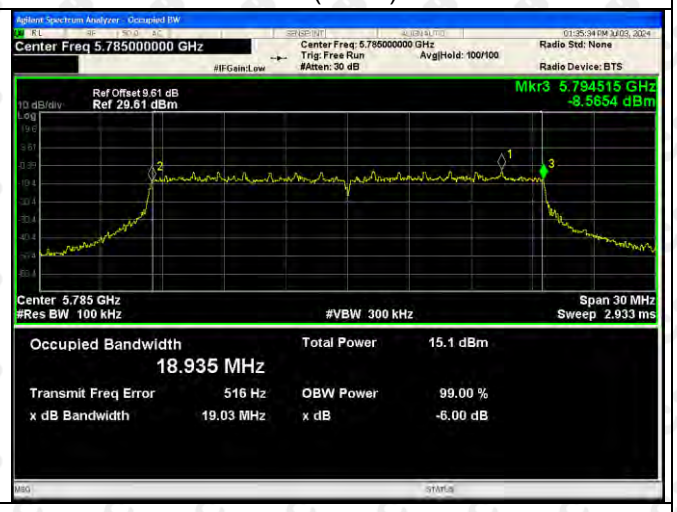
802.11ax(VH20)-5745



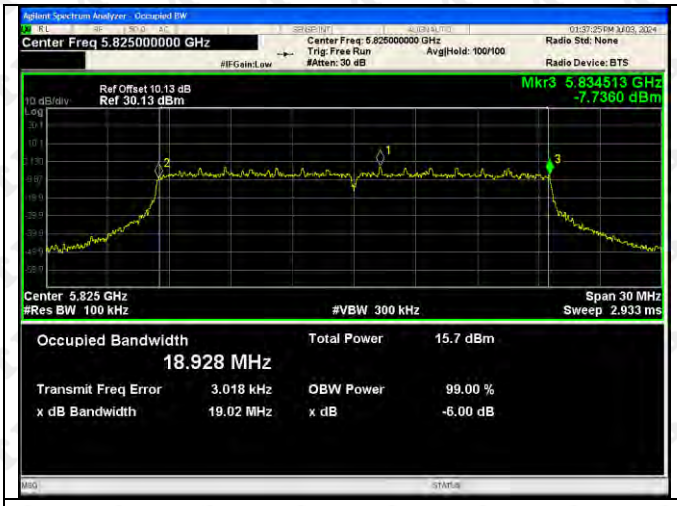
802.11ax(VH20)-5785



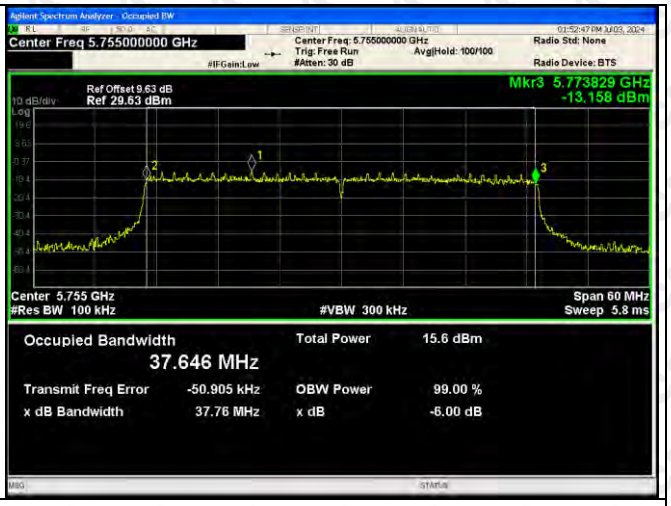
802.11ax(VH20)-5825



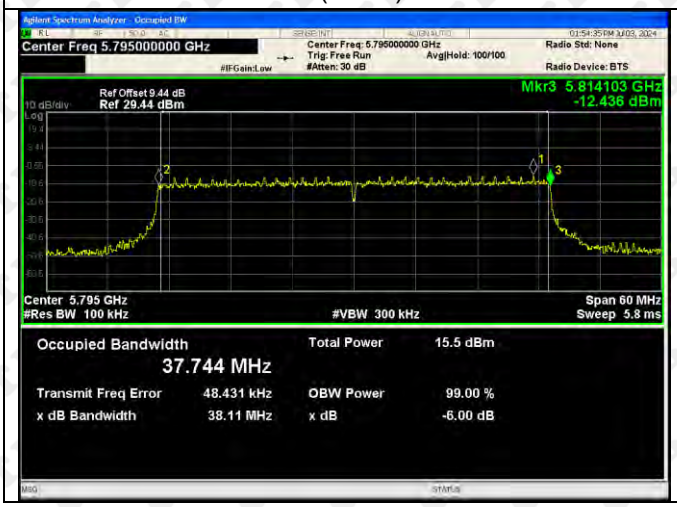
802.11ax(VH40)-5755

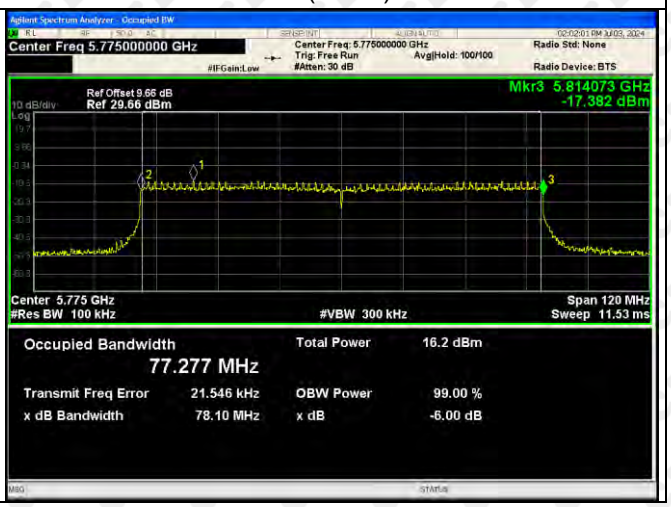


802.11ax(VH40)-5795



802.11ax(VH80)-5775





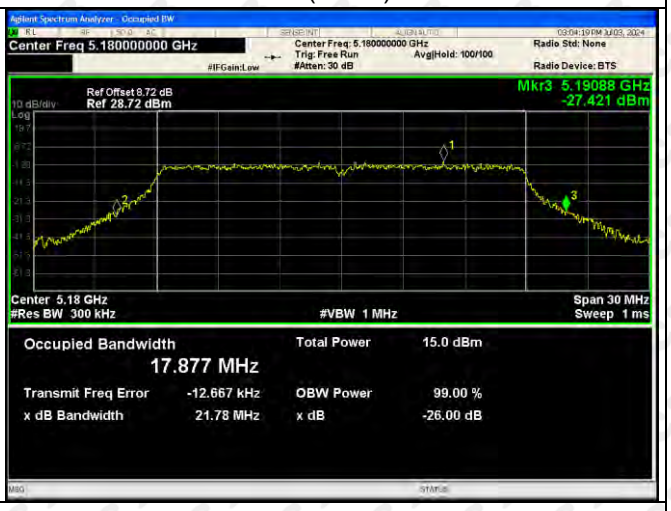
Test Graph ANT 2

802.11a-5180

802.11a-5200

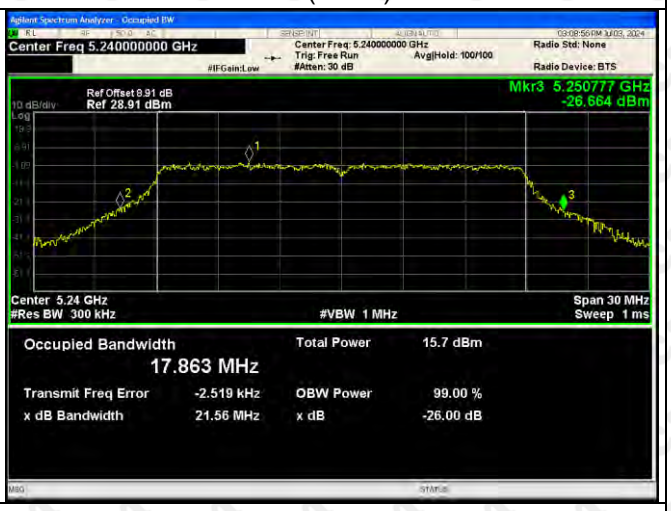
802.11a-5240

802.11ac(VH20)-5180



802.11ac(VH20)-5200

802.11ac(VH20)-5240

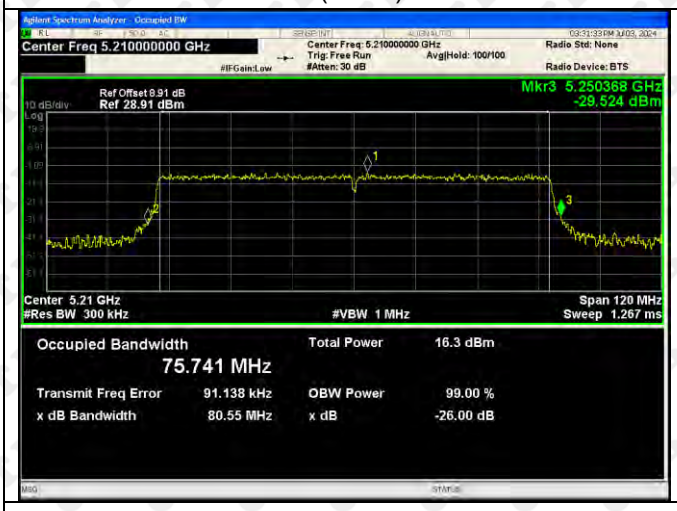


802.11ac(VH40)-5190

802.11ac(VH40)-5230

802.11ac(VH80)-5210

802.11n(HT20)-5180



802.11n(HT20)-5200

802.11n(HT20)-5240

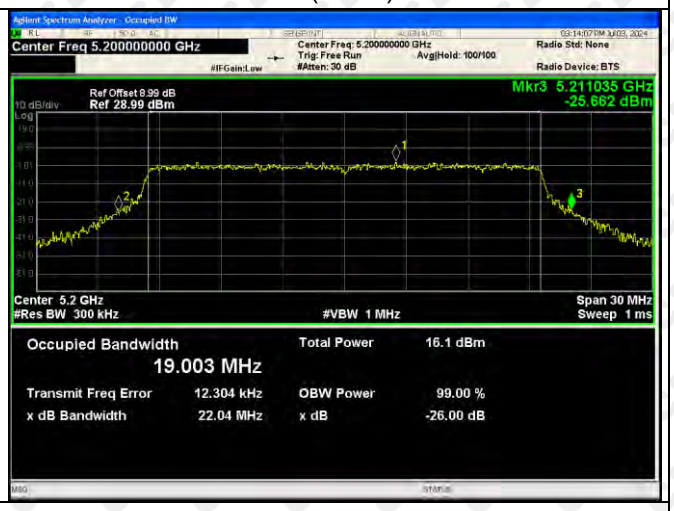
802.11n(HT40)-5190

802.11n(HT40)-5230

802.11ax(VH20)-5180

802.11ax(VH20)-5200

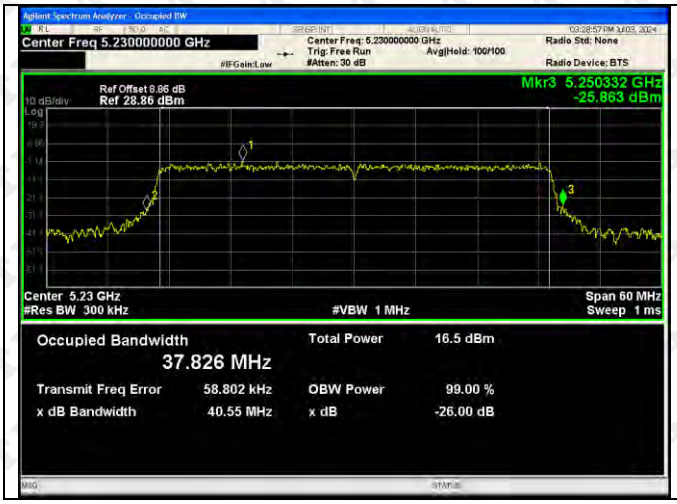
802.11ax(VH20)-5240

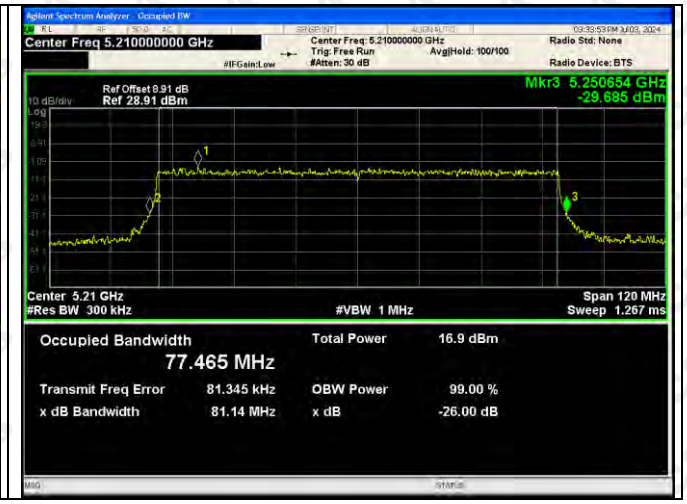


802.11ax(VH40)-5190

802.11ax(VH40)-5230

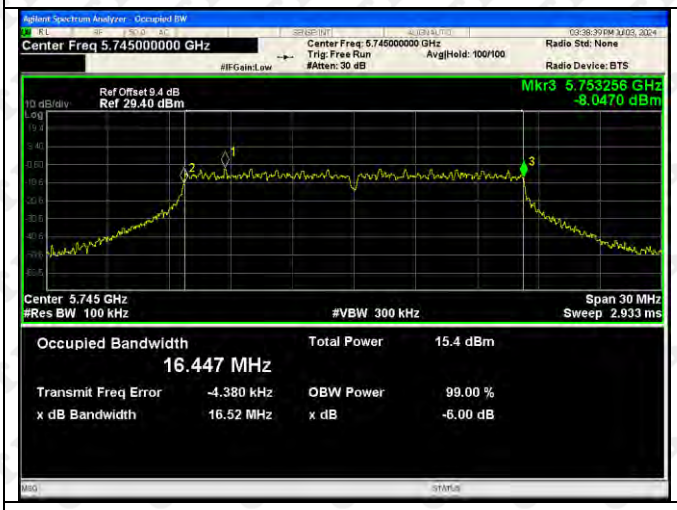
802.11ax(VH80)-5210



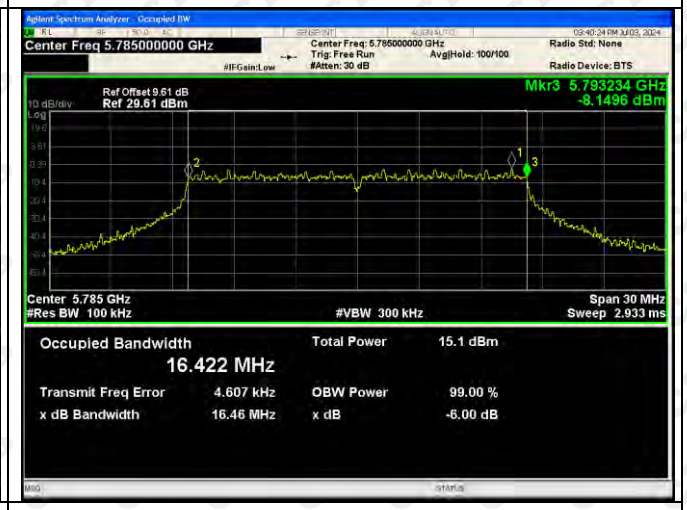


ANT2:
5725-5850MHz

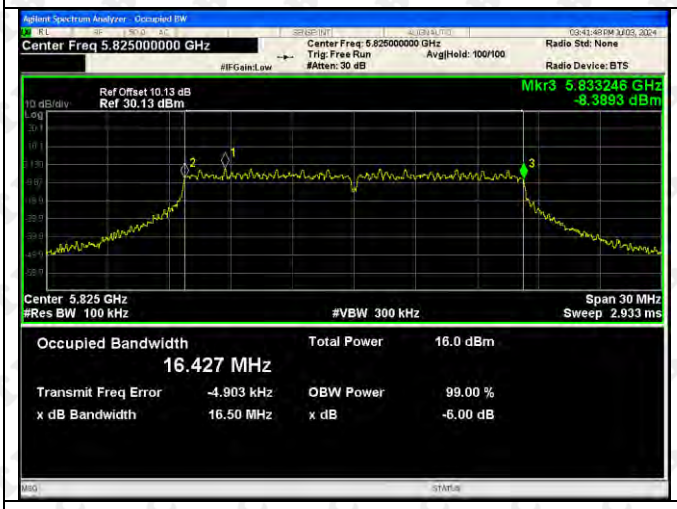
802.11a-5745



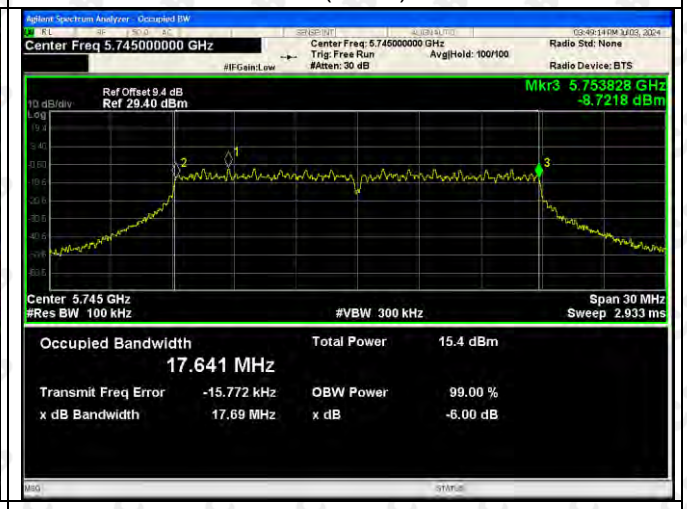
802.11a-5785



802.11a-5825



802.11ac(VH20)-5745



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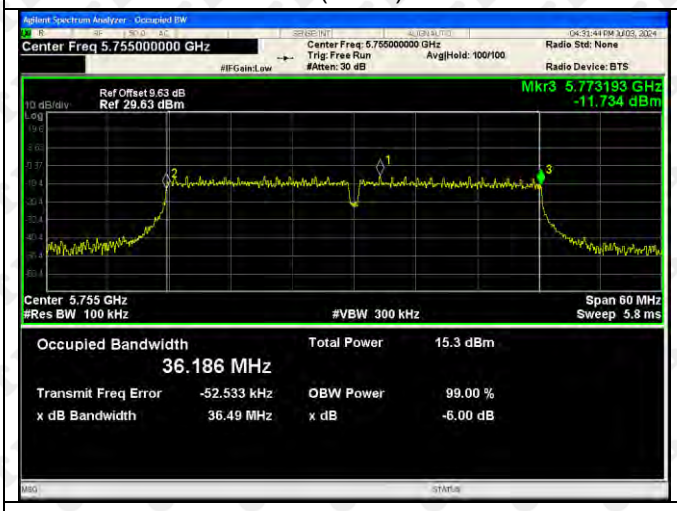
802.11ac(VH20)-5825

802.11ac(VH40)-5755

802.11ac(VH40)-5795



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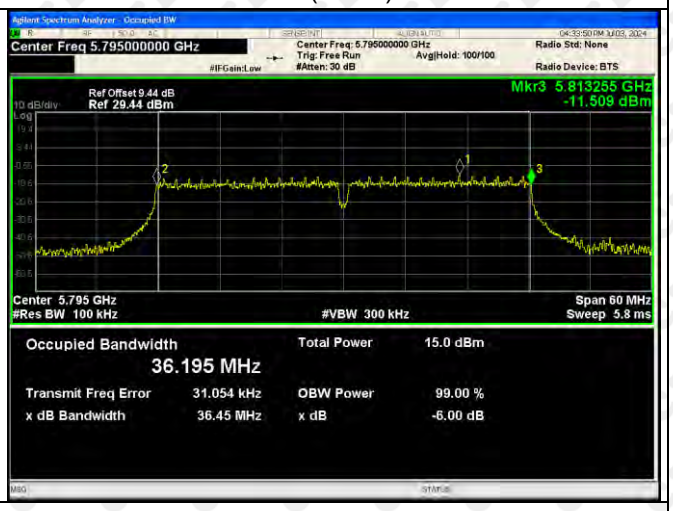

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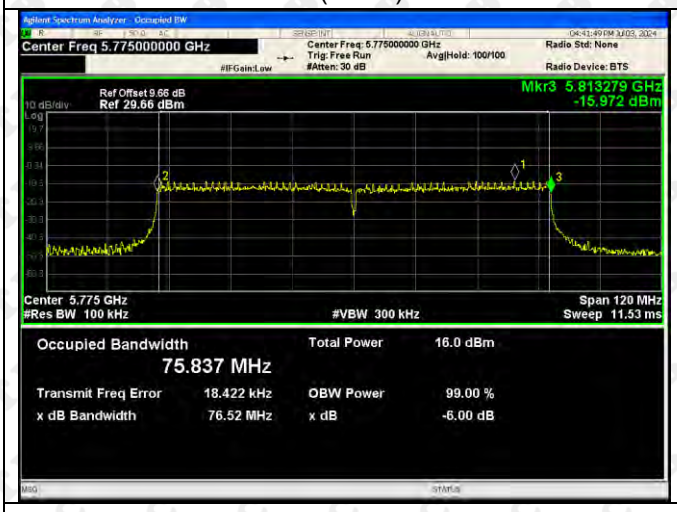

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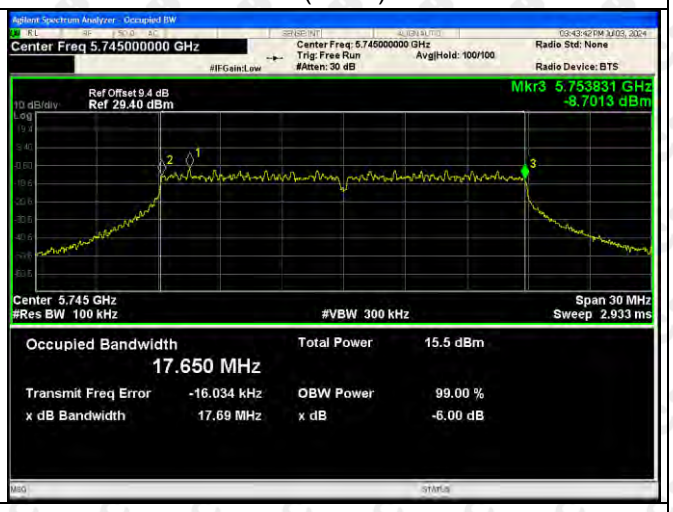

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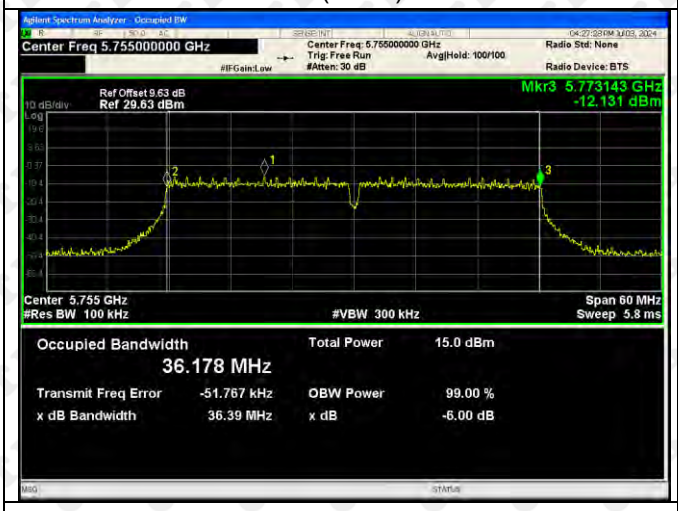
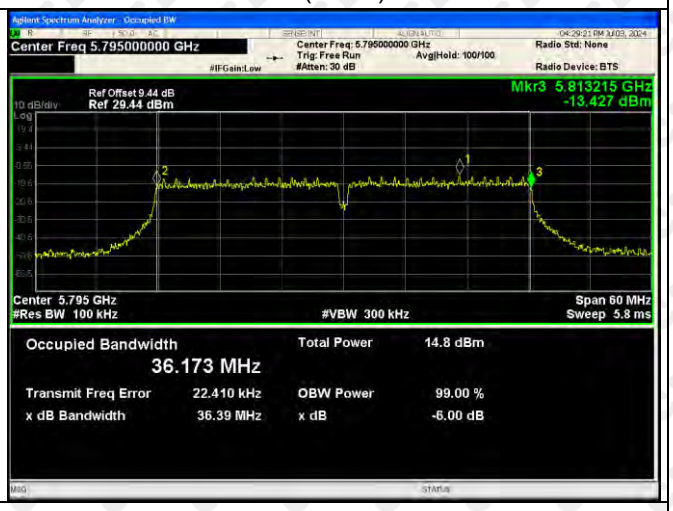
5802.11n(HT40)-5755

802.11n(HT40)-5795



802.11ax(VH20)-5745



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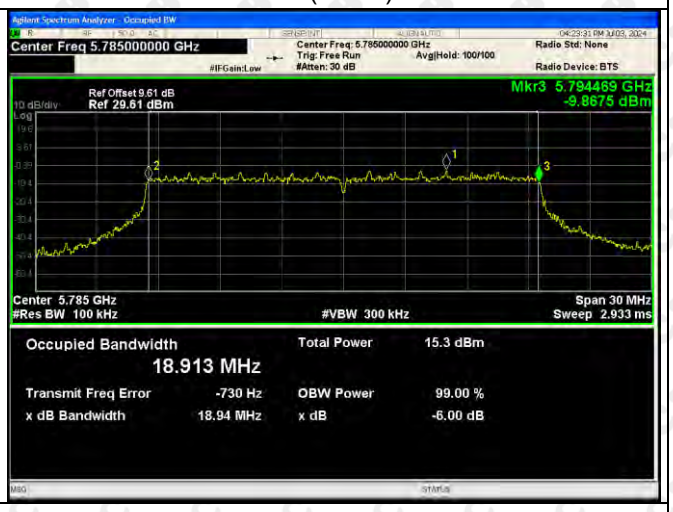
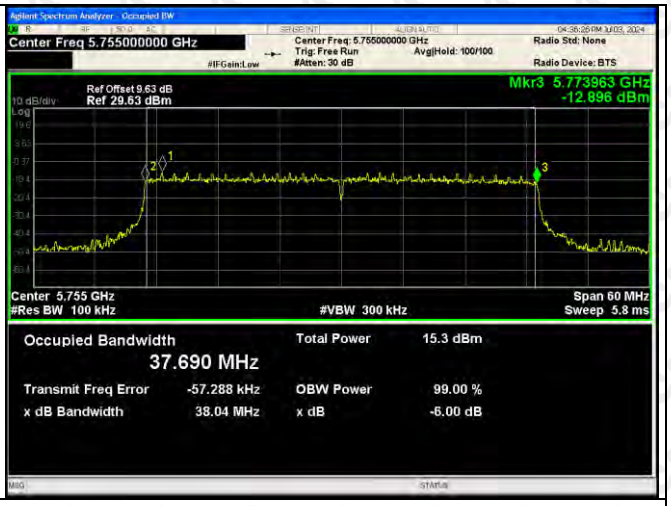
802.11ax(VH20)-5825

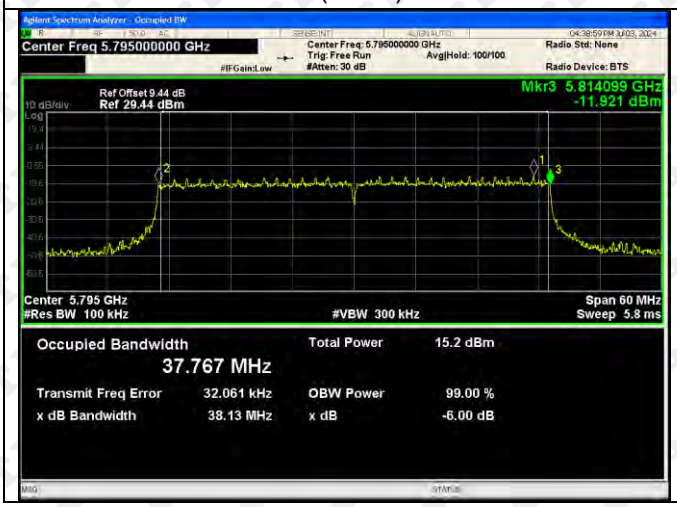


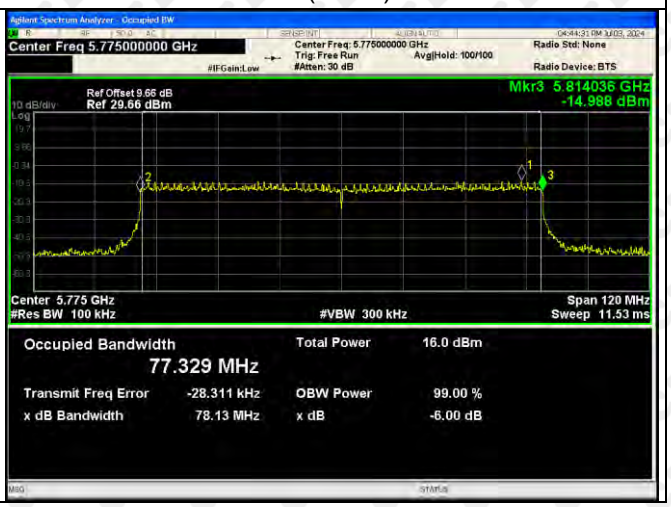
802.11ax(VH40)-5755



802.11ax(VH40)-5795

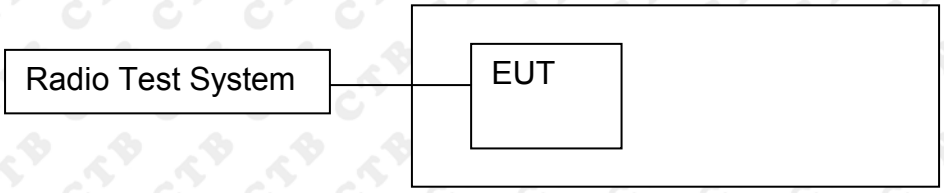
802.11ax(VH80)-5775





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	-2.121	-2.34	/	11	Pass
	5200	-1.98	-2.065	/	11	Pass
	5240	-1.835	-1.624	/	11	Pass
802.11ac(VH20)	5180	-2.295	-3.335	0.226	11	Pass
	5200	-2.127	-2.573	0.666	11	Pass
	5240	-1.773	-2.423	0.924	11	Pass
802.11ac(VH40)	5190	-5.394	-5.48	-2.426	11	Pass
	5230	-5.576	-5.05	-2.295	11	Pass
802.11ac(VH80)	5210	-8.34	-8.867	-5.585	11	Pass
802.11n(VH20)	5180	-3.455	-2.404	0.113	11	Pass
	5200	-3.358	-2.18	0.281	11	Pass
	5240	-3.117	-1.696	0.662	11	Pass
802.11n(VH40)	5190	-5.999	-5.519	-2.742	11	Pass
	5230	-6.464	-5.229	-2.792	11	Pass
802.11ax(VH20)	5180	-9.202	-3.807	-2.705	11	Pass
	5200	-2.487	-3.156	0.202	11	Pass
	5240	-1.958	-3.078	0.528	11	Pass
802.11ax(VH40)	5190	-1.871	-6.357	-0.549	11	Pass
	5230	-5.488	-5.681	-2.573	11	Pass
802.11ax(VH80)	5210	-5.478	-8.885	-3.845	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	-6.316	-6.114	/	30	Pass
	5785	-6.214	-6.493	/	30	Pass
	5825	-6.289	-5.322	/	30	Pass
802.11ac(VH20)	5745	-6.558	-6.268	-3.400	30	Pass
	5785	-6.729	-6.714	-3.711	30	Pass
	5825	-6.219	-5.62	-2.899	30	Pass
802.11ac(VH40)	5755	-9.574	-9.692	-6.622	30	Pass
	5795	-9.526	-10.156	-6.819	30	Pass
802.11n(VH20)	5775	-12.441	-12.649	-9.533	30	Pass
	5745	-6.806	-6.095	-3.426	30	Pass
	5785	-6.566	-6.881	-3.710	30	Pass
802.11n(VH40)	5825	-6.298	-5.79	-3.026	30	Pass
	5755	-9.145	-9.801	-6.450	30	Pass
802.11ac(VH80)	5795	-9.394	-10.003	-6.678	30	Pass
802.11ax(VH20)	5745	-12.665	-12.634	-9.639	30	Pass
	5785	-6.515	-6.121	-3.303	30	Pass
	5825	-6.826	-6.36	-3.576	30	Pass
802.11ax(VH40)	5755	-6.123	-5.595	-2.841	30	Pass
	5795	-9.233	-10.033	-6.604	30	Pass
802.11ax(VH80)	5775	-9.17	-9.675	-6.405	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

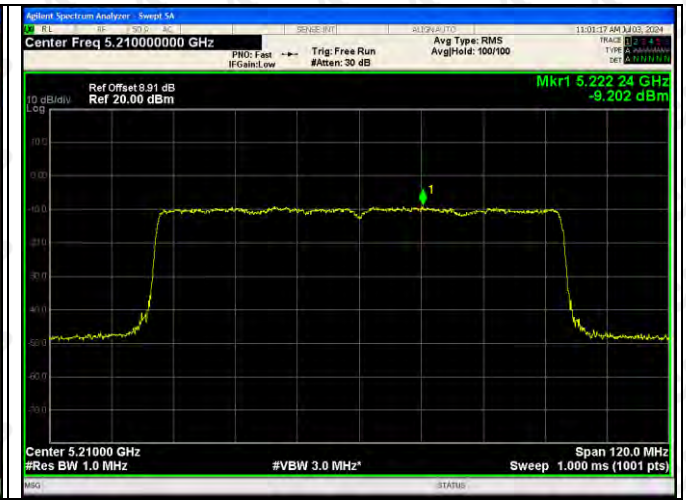
802.11ax(VH20)-5200

802.11ax(VH20)-5240

802.11ax(VH40)-5190

802.11ax(VH40)-5230

802.11ax(VH80)-5210



ANT1:

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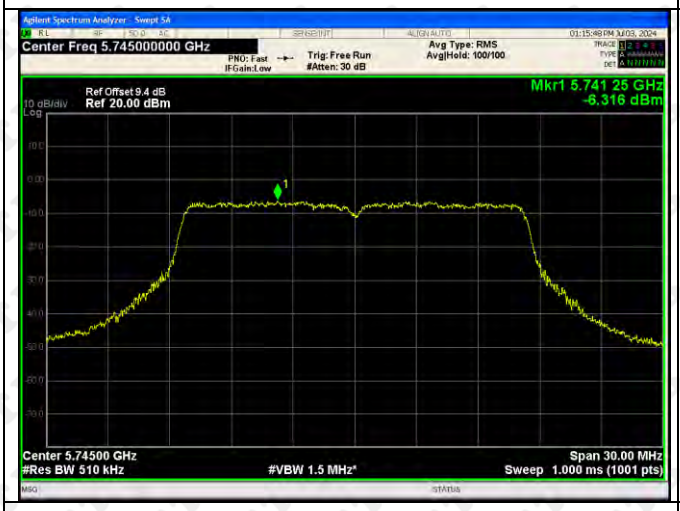	
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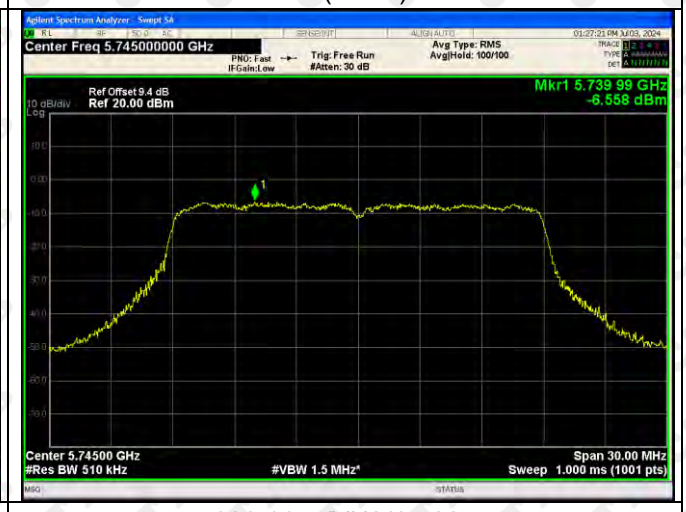
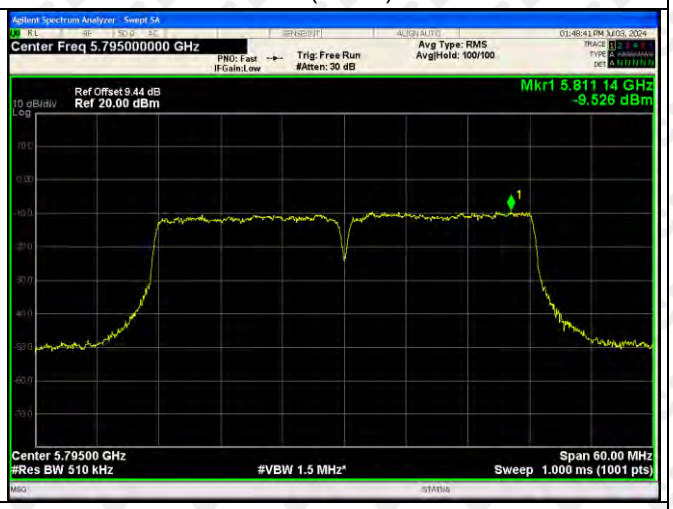
	
802.11ac(VH20)-5785	802.11ac(VH20)-5825

802.11ac(VH40)-5755

802.11ac(VH40)-5795

802.11ac(VH80)-5775



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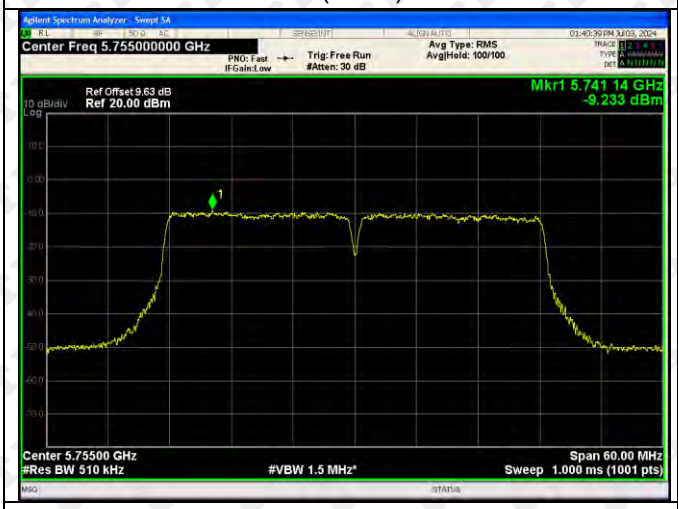
802.11n(HT20)-5785

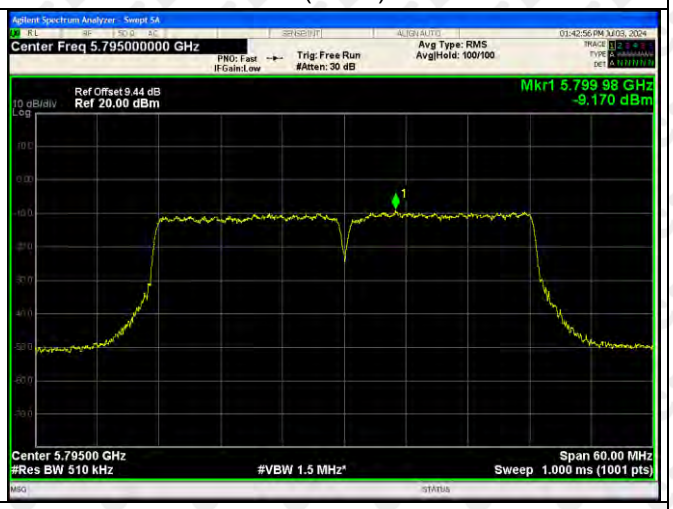
802.11n(HT20)-5825

5802.11n(HT40)-5755

802.11n(HT40)-5795



802.11ax(VH20)-5745



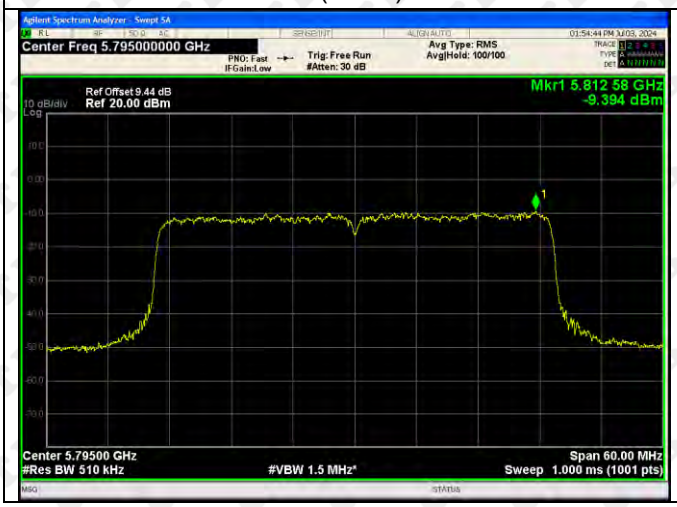
802.11ax(VH20)-5785

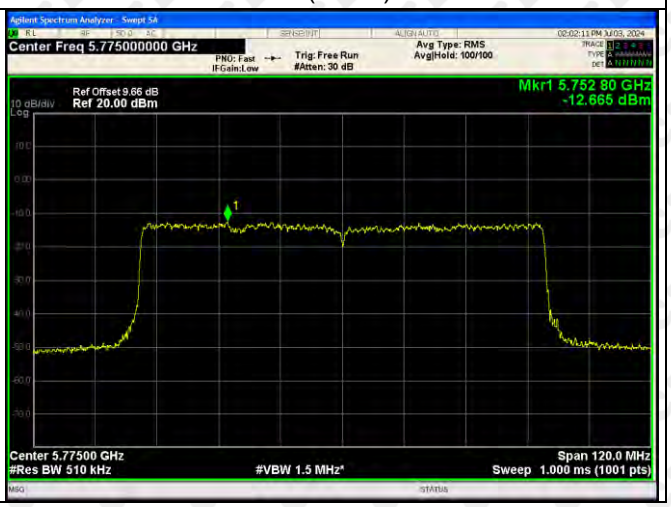
802.11ax(VH20)-5825

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

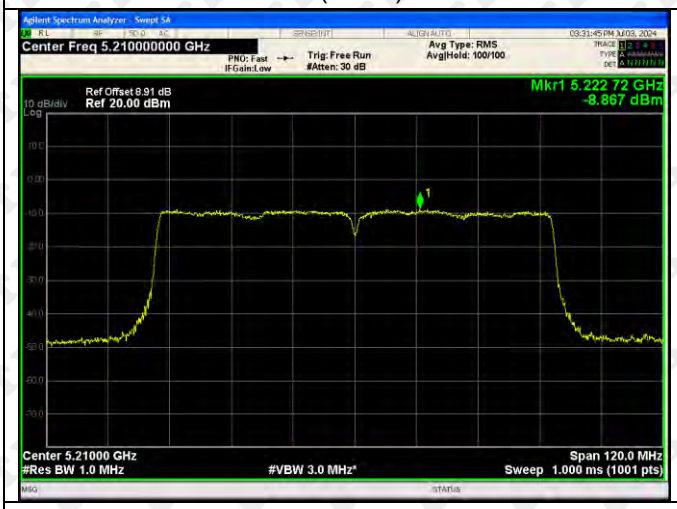
802.11ac(VH20)-5240

802.11ac(VH40)-5190

802.11ac(VH40)-5230

802.11ac(VH80)-5210

802.11n(HT20)-5180



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802.11n(HT20)-5240

802.11n(HT40)-5190

802.11n(HT40)-5230

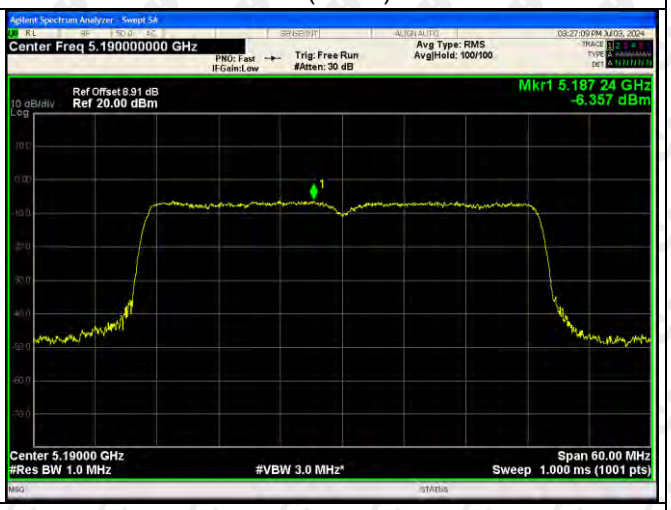
802.11ax(VH20)-5180

802.11ax(VH20)-5200

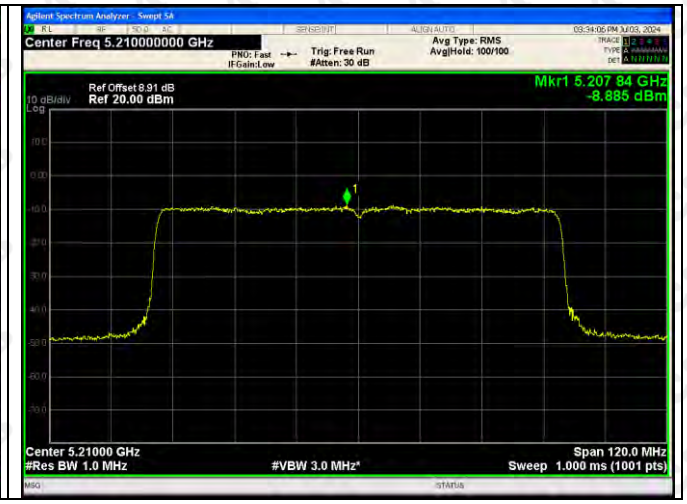
802.11ax(VH20)-5240

802.11ax(VH40)-5190

802.11ax(VH40)-5230



802.11ax(VH80)-5210



ANT2:

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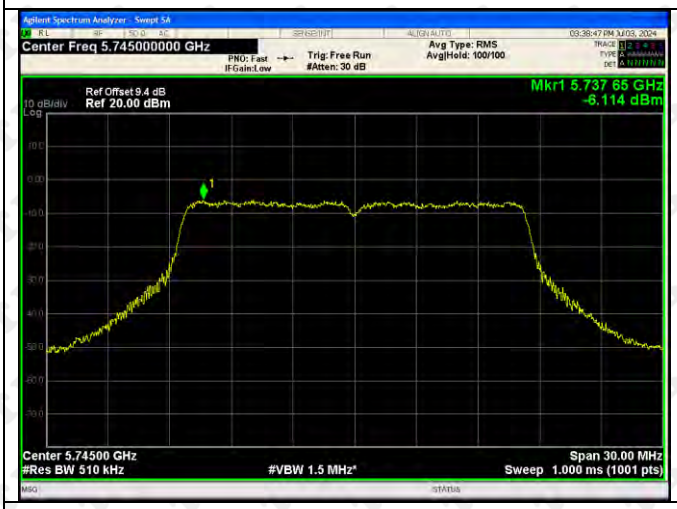
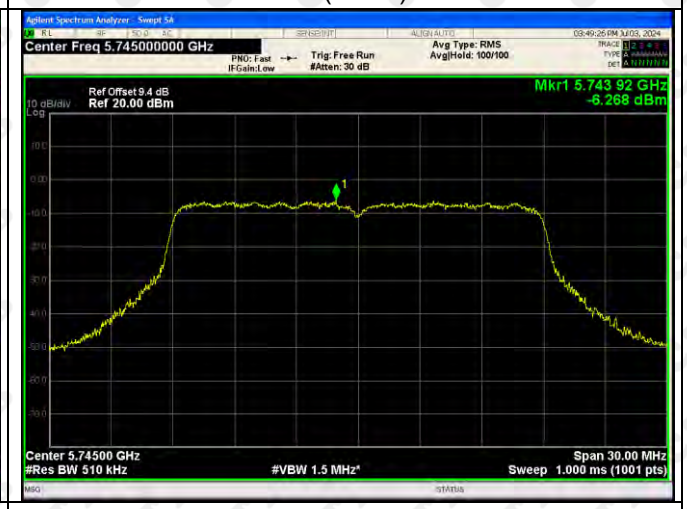
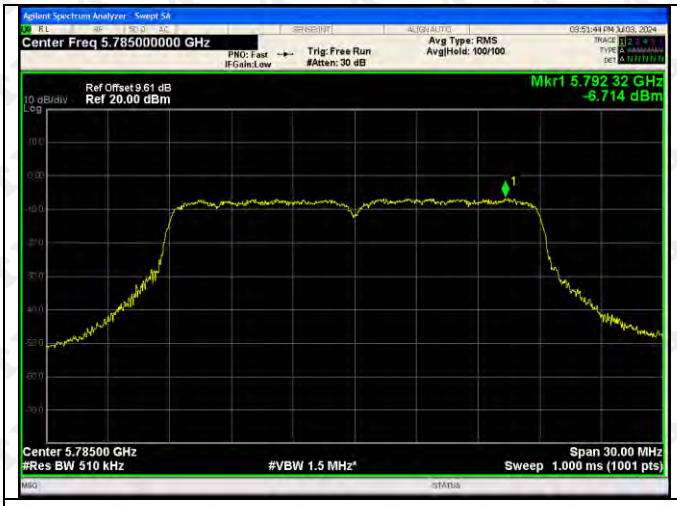
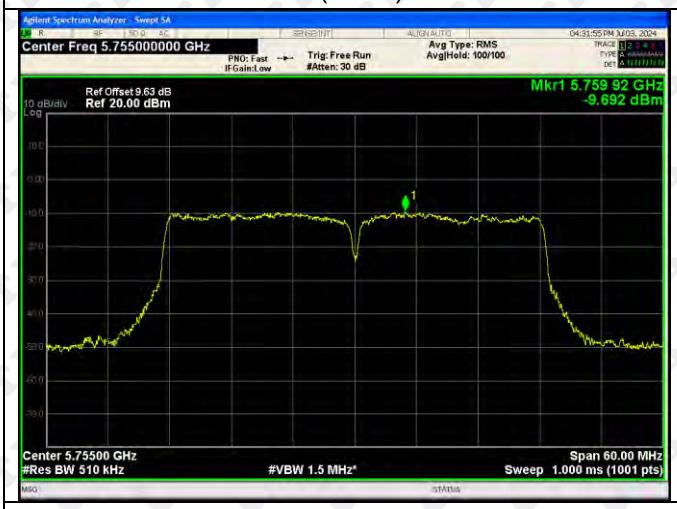
	
802.11a-5825	802.11ac(VH20)-5745
	
802.11ac(VH20)-5785	802.11ac(VH20)-5825



802.11ac(VH40)-5755

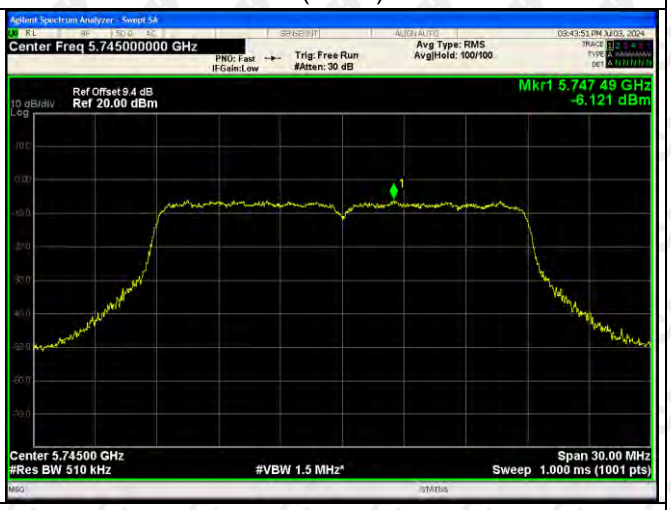
802.11ac(VH40)-5795



802.11ac(VH80)-5775

802.11n(HT20)-5745

802.11n(HT20)-5785



802.11n(HT20)-5825

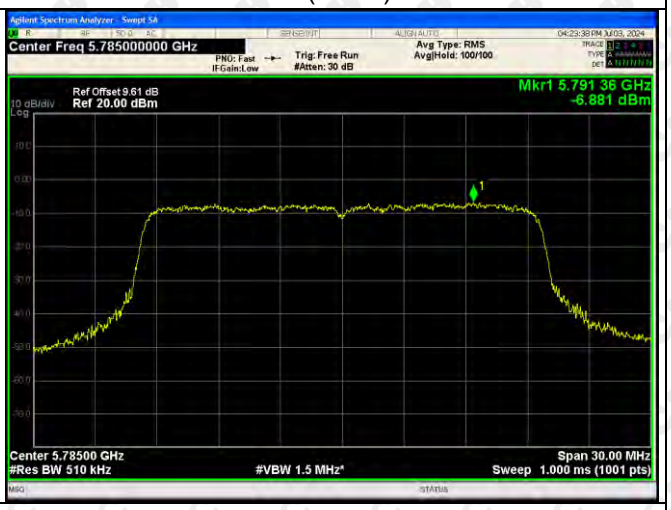
5802.11n(HT40)-5755

802.11n(HT40)-5795

802.11ax(VH20)-5745

802.11ax(VH20)-5785

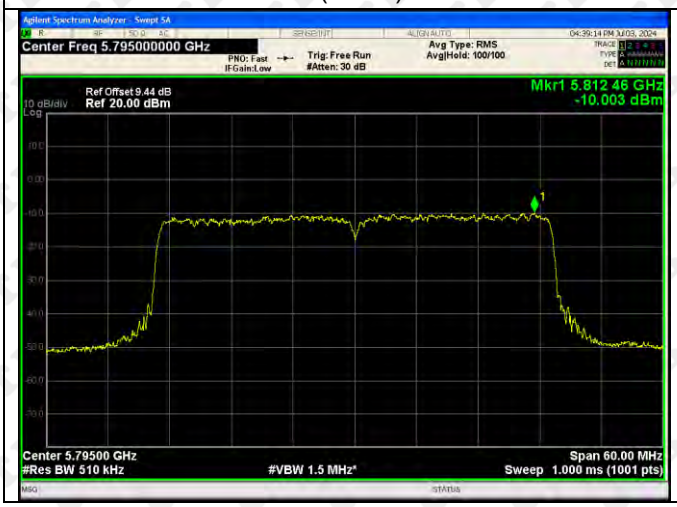
802.11ax(VH20)-5825



802.11ax(VH40)-5755

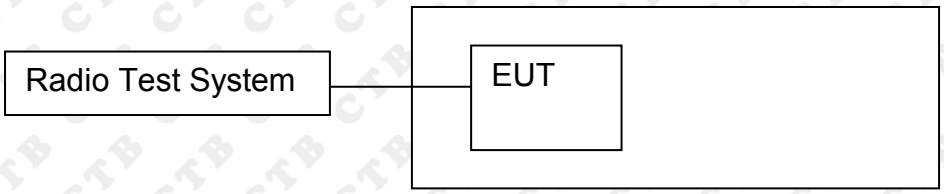
802.11ax(VH40)-5795

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)	120	5180.0775	5180	0.0775	14.9675
		V max (V)	132	5180.1019	5180	0.1019	19.6658
		V min (V)	108	5180.0421	5180	0.0421	8.1268
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	5180.0341	5180	0.0341	6.5859
		T (°C)	10	5180.0298	5180	0.0298	5.7464
		T (°C)	20	5180.0032	5180	0.0032	0.6271
		T (°C)	30	5180.0369	5180	0.0369	7.1173
		T (°C)	40	5180.0314	5180	0.0314	6.0623
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	5200.0495	5200	0.0495	9.5233
		V max (V)	132	5200.0061	5200	0.0061	1.1798
		V min (V)	108	5200.0535	5200	0.0535	10.2840
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	5200.0177	5200	0.0177	3.4129
		T (°C)	10	5200.0116	5200	0.0116	2.2305
		T (°C)	20	5200.0258	5200	0.0258	4.9639
		T (°C)	30	5200.0071	5200	0.0071	1.3574
		T (°C)	40	5200.0338	5200	0.0338	6.4914
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	5240.0259	5240	0.0259	4.9336
		V max (V)	132	5240.0464	5240	0.0464	8.8597
		V min (V)	108	5240.0206	5240	0.0206	3.9361
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	5240.0214	5240	0.0214	4.0859
		T (°C)	10	5240.0410	5240	0.0410	7.8183
		T (°C)	20	5240.0500	5240	0.0500	9.5479
		T (°C)	30	5240.0432	5240	0.0432	8.2495
		T (°C)	40	5240.0474	5240	0.0474	9.0420
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)	120	5745.0845	5745	0.0845	14.7161
		V max (V)	132	5745.0105	5745	0.0105	1.8278
		V min (V)	108	5745.0845	5745	0.0845	14.7161
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	5745.0471	5745	0.0471	8.1986
		T (°C)	10	5745.0298	5745	0.0298	5.1953
		T (°C)	20	5745.0621	5745	0.0621	10.8041
		T (°C)	30	5745.0654	5745	0.0654	11.3851
		T (°C)	40	5745.0763	5745	0.0763	13.2762
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	5785.0851	5785	0.0851	14.7096
		V max (V)	132	5785.0387	5785	0.0387	6.6861
		V min (V)	108	5785.0776	5785	0.0776	13.4078
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	5785.0349	5785	0.0349	6.0310
		T (°C)	10	5785.0838	5785	0.0838	14.4926
		T (°C)	20	5785.0212	5785	0.0212	3.6616
		T (°C)	30	5785.0662	5785	0.0662	11.4355
		T (°C)	40	5785.0234	5785	0.0234	4.0416
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	5825.0499	5825	0.0499	8.5698
		V max (V)	132	5825.0509	5825	0.0509	8.7337
		V min (V)	108	5825.0451	5825	0.0451	7.7490
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	5825.0306	5825	0.0306	5.2562
		T (°C)	10	5825.0104	5825	0.0104	1.7849
		T (°C)	20	5825.0433	5825	0.0433	7.4368
		T (°C)	30	5825.0368	5825	0.0368	6.3188
		T (°C)	40	5825.0164	5825	0.0164	2.8129
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	5180.0258	5180	0.0258	4.9791
		V max (V)	132	5180.0653	5180	0.0653	12.6044
		V min (V)	108	5180.0231	5180	0.0231	4.4536
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	5180.0094	5180	0.0094	1.8212
		T (°C)	10	5180.0278	5180	0.0278	5.3648
		T (°C)	20	5180.0027	5180	0.0027	0.5144
		T (°C)	30	5180.0562	5180	0.0562	10.8446
		T (°C)	40	5180.0560	5180	0.0560	10.8111
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	5200.0858	5200	0.0858	16.5006
		V max (V)	132	5200.0925	5200	0.0925	17.7803
		V min (V)	108	5200.0552	5200	0.0552	10.6168
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	5200.0656	5200	0.0656	12.6098
		T (°C)	10	5200.0247	5200	0.0247	4.7428
		T (°C)	20	5200.0905	5200	0.0905	17.3973
		T (°C)	30	5200.0402	5200	0.0402	7.7383
		T (°C)	40	5200.0505	5200	0.0505	9.7036
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	5240.0395	5240	0.0395	7.5409
		V max (V)	132	5240.0212	5240	0.0212	4.0368
		V min (V)	108	5240.0164	5240	0.0164	3.1335
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	5240.0540	5240	0.0540	10.2988
		T (°C)	10	5240.0320	5240	0.0320	6.1027
		T (°C)	20	5240.0303	5240	0.0303	5.7854
		T (°C)	30	5240.0667	5240	0.0667	12.7316
		T (°C)	40	5240.0626	5240	0.0626	11.9546
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)	120	5745.0269	5745	0.0269	4.6763
		V max (V)	132	5745.0638	5745	0.0638	11.1106
		V min (V)	108	5745.0624	5745	0.0624	10.8651
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	5745.0041	5745	0.0041	0.7099
		T (°C)	10	5745.0319	5745	0.0319	5.5460
		T (°C)	20	5745.0207	5745	0.0207	3.6105
		T (°C)	30	5745.0239	5745	0.0239	4.1683
		T (°C)	40	5745.0477	5745	0.0477	8.2958
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	5785.0247	5785	0.0247	4.2665
		V max (V)	132	5785.0232	5785	0.0232	4.0171
		V min (V)	108	5785.0525	5785	0.0525	9.0822
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	5785.0419	5785	0.0419	7.2481
		T (°C)	10	5785.0499	5785	0.0499	8.6274
		T (°C)	20	5785.0665	5785	0.0665	11.5007
		T (°C)	30	5785.0022	5785	0.0022	0.3870
		T (°C)	40	5785.0579	5785	0.0579	10.0169
		T (°C)	50	5785.0651	5785	0.0651	11.2597
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	5825.0876	5825	0.0876	15.0436
		V max (V)	132	5825.0424	5825	0.0424	7.2754
		V min (V)	108	5825.0409	5825	0.0409	7.0147
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	5825.0245	5825	0.0245	4.2136
		T (°C)	10	5825.0161	5825	0.0161	2.7682
		T (°C)	20	5825.0748	5825	0.0748	12.8484
		T (°C)	30	5825.0676	5825	0.0676	11.6093
		T (°C)	40	5825.0348	5825	0.0348	5.9823
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.

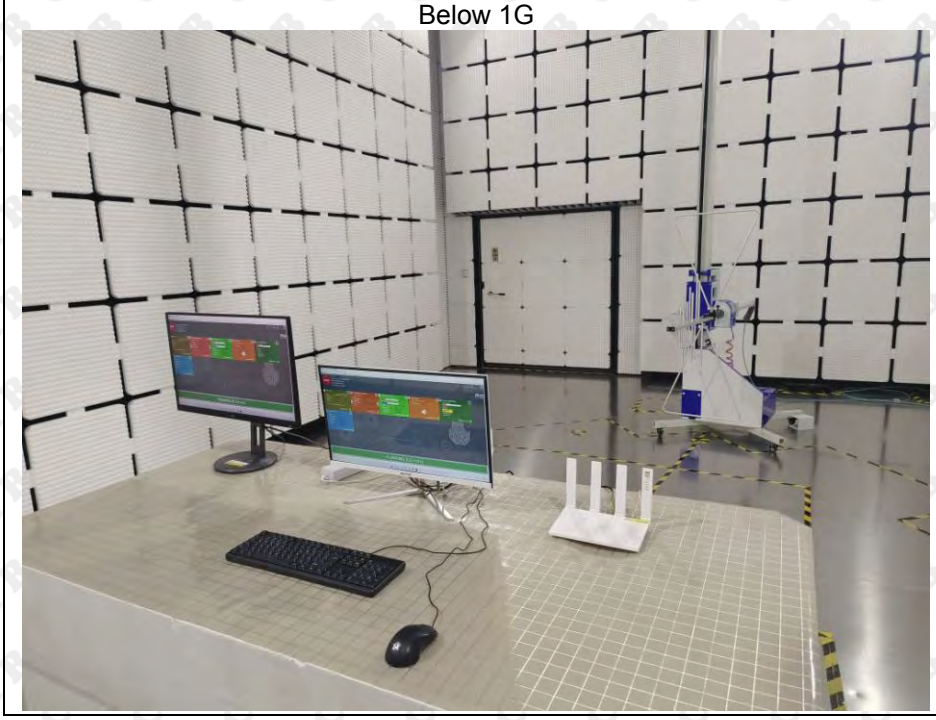
EUT Antenna:

The antenna is FPC antenna and no consideration of replacement. The best case gain of the antenna is WiFi (5.2G):Ant1: 2.11dBi, Ant2: 2.11dBi, WiFi (5.8G):Ant1: 2.97dBi, Ant2: 2.97dBi.

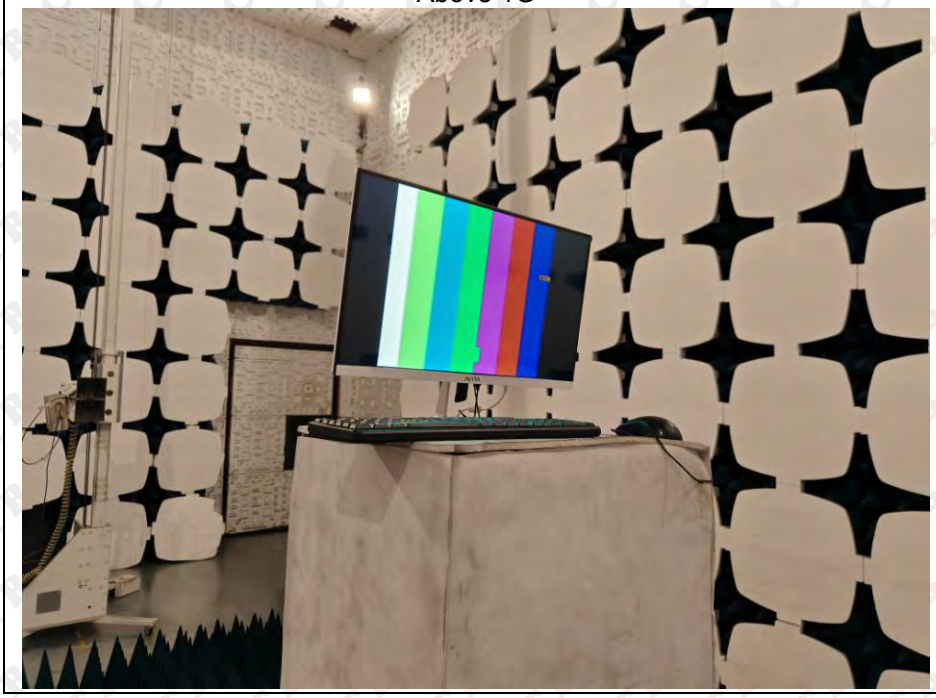
15. EUT TEST SETUP PHOTOGRAPHS

Radiated Emission

Below 1G



Above 1G



Conducted Emission

※※※※※ **END OF REPORT** ※※※※※