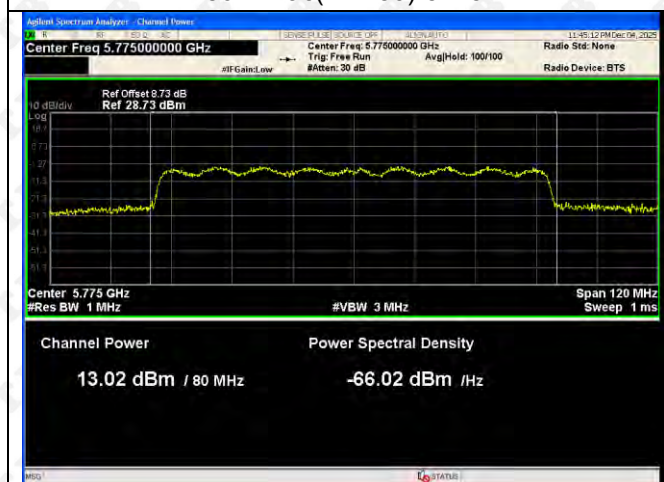




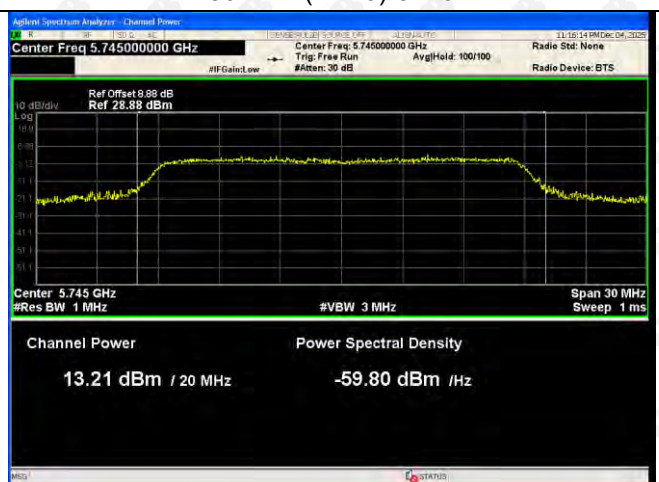
802.11ac(VHT80)-5775



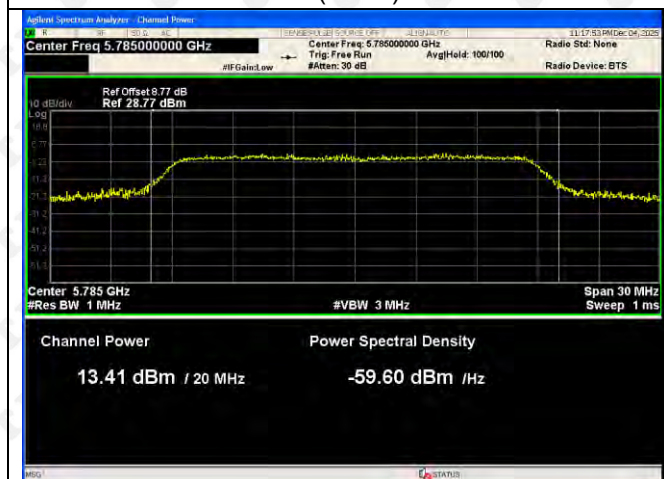
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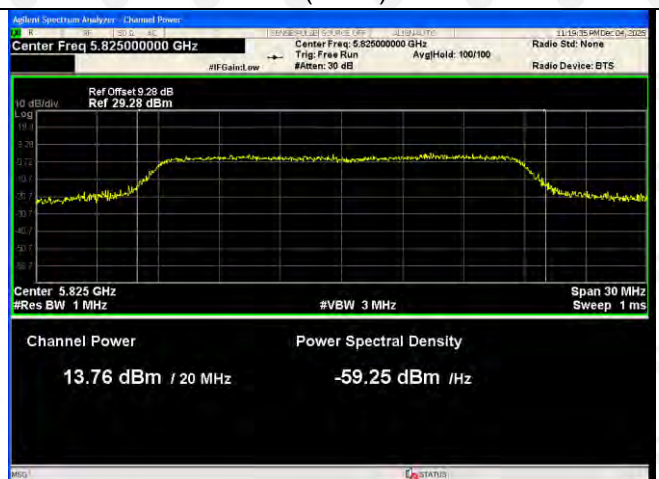
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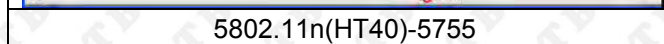
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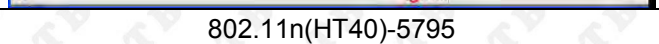
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802.11n(HT20)-5825



5802.11n(HT40)-5755



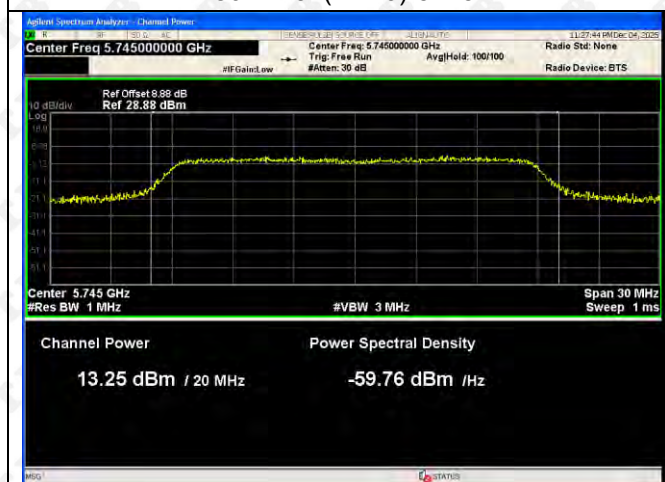
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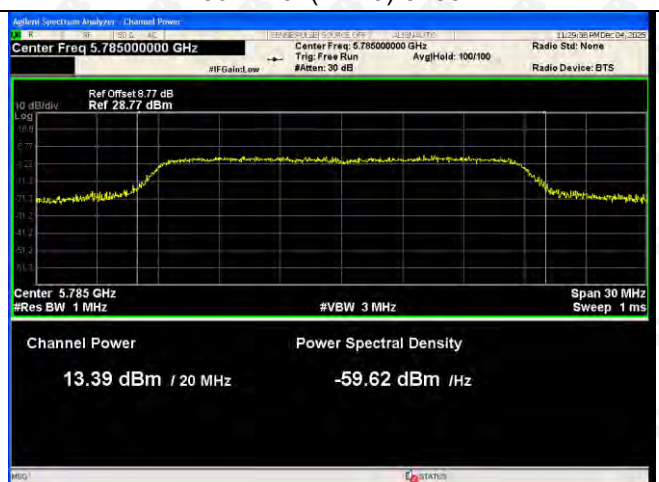
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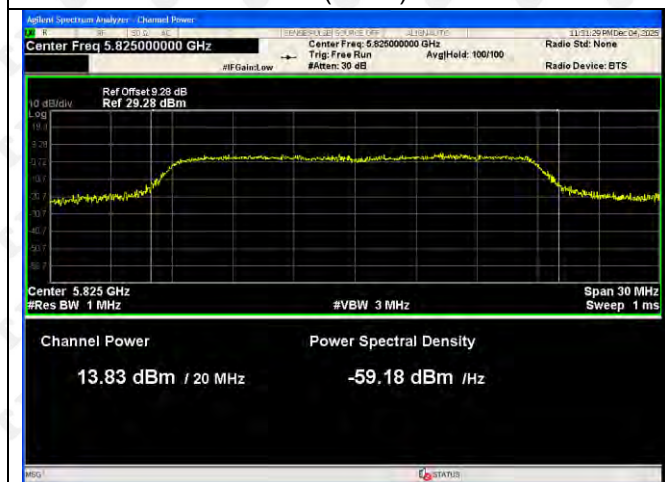
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802.11ax(HE20)-5825



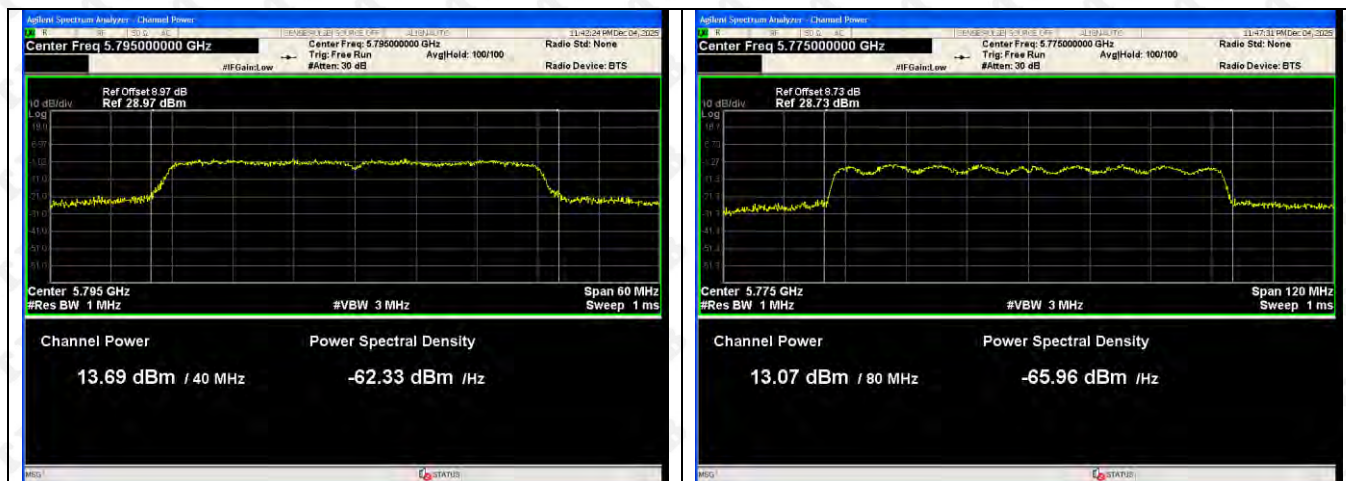
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802.11ax(HE40)-5795

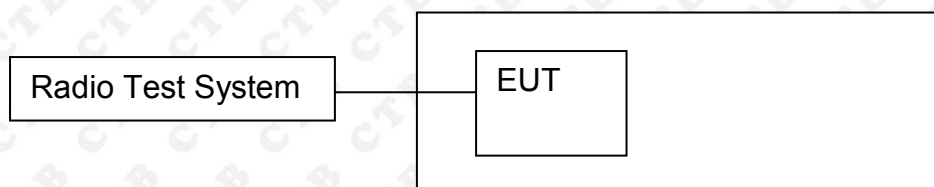


802.11ax(HE80)-5775



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 $11 \text{ dBm} + 10 \log B$, 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) $\geq 3 * \text{RBW}$.

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 $\geq 3 * RBW$
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

5150-5250MHz

Test mode Ant 1	Test Channel (MHz)	26dB Bandwidth (MHz)
802.11a	5180	22.932
	5200	22.467
	5240	21.708
802.11ac(VHT20)	5180	24.074
	5200	23.603
	5240	23.977
802.11ac(VHT40)	5190	55.61
	5230	56.78
802.11ac(VHT80)	5210	81.145
802.11n(HT20)	5180	27.631
	5200	25.456
	5240	22.582
802.11n(HT40)	5190	47.318
	5230	47.542
802.11ax(HE20)	5180	23.439
	5200	23.631
	5240	22.733
802.11ax(HE40)	5190	46.549
	5230	41.269
802.11ax(HE80)	5210	90.918

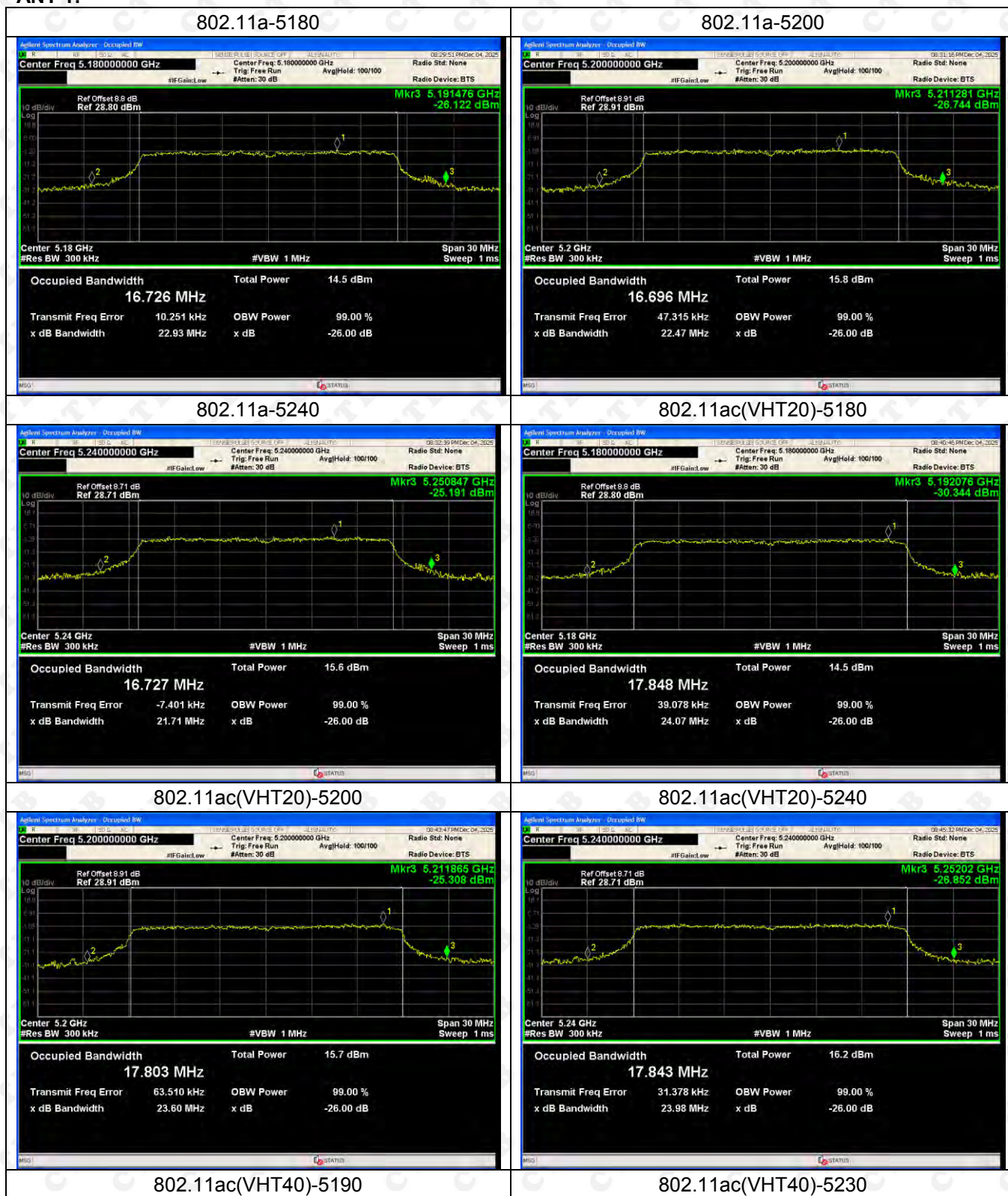
Test mode Ant 2	Test Channel (MHz)	26dB Bandwidth (MHz)
802.11a	5180	23.11
	5200	22.598
	5240	21.304
802.11ac(VHT20)	5180	24.463
	5200	22.429
	5240	22.257
802.11ac(VHT40)	5190	54.674
	5230	57.447
802.11ac(VHT80)	5210	79.089
802.11n(HT20)	5180	22.722
	5200	21.86
	5240	22.867
802.11n(HT40)	5190	45.487
	5230	42.223
802.11ax(HE20)	5180	23.762
	5200	21.228
	5240	21.125
802.11ax(HE40)	5190	41.838
	5230	40.408
802.11ax(HE80)	5210	88.641

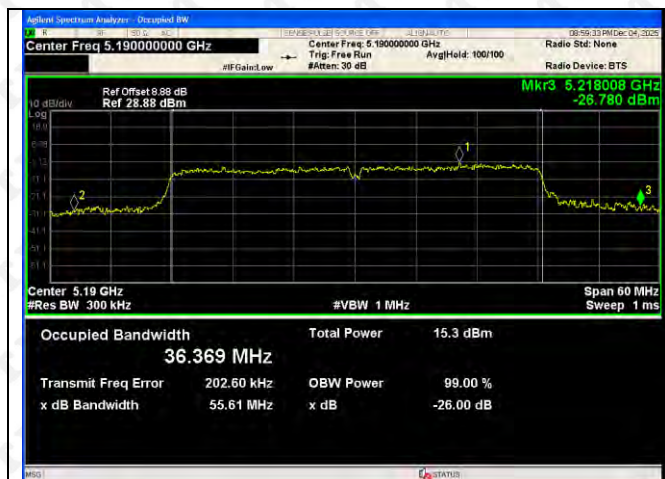
5725-5850 MHz

Test mode Ant 1	Test Channel (MHz)	6dB Bandwidth (MHz)	Result
802.11a	5745	16.505	Pass
	5785	16.519	Pass
	5825	16.538	Pass
802.11ac(VHT20)	5745	17.75	Pass
	5785	17.764	Pass
	5825	17.761	Pass
802.11ac(VHT40)	5755	36.513	Pass
	5795	36.453	Pass
802.11ac(VHT80)	5775	76.363	Pass
802.11n(HT20)	5745	17.764	Pass
	5785	17.689	Pass
	5825	17.735	Pass
802.11n(HT40)	5755	36.464	Pass
	5795	36.481	Pass
802.11ax(HE20)	5745	17.78	Pass
	5785	17.715	Pass
	5825	17.759	Pass
802.11ax(HE40)	5755	36.456	Pass
	5795	36.459	Pass
802.11ax(HE80)	5775	76.193	Pass

Test mode Ant 2	Test Channel (MHz)	6dB Bandwidth (MHz)	Result
802.11a	5745	16.52	Pass
	5785	16.516	Pass
	5825	16.508	Pass
802.11ac(VHT20)	5745	17.745	Pass
	5785	17.724	Pass
	5825	17.735	Pass
802.11ac(VHT40)	5755	36.491	Pass
	5795	36.48	Pass
802.11ac(VHT80)	5775	76.019	Pass
802.11n(HT20)	5745	17.732	Pass
	5785	17.764	Pass
	5825	17.764	Pass
802.11n(HT40)	5755	36.449	Pass
	5795	36.486	Pass
802.11ax(HE20)	5745	17.779	Pass
	5785	17.76	Pass
	5825	17.762	Pass
802.11ax(HE40)	5755	36.437	Pass
	5795	36.426	Pass
802.11ax(HE80)	5775	76.127	Pass

Test Graph
5150MHz ~5250MHz
ANT 1:

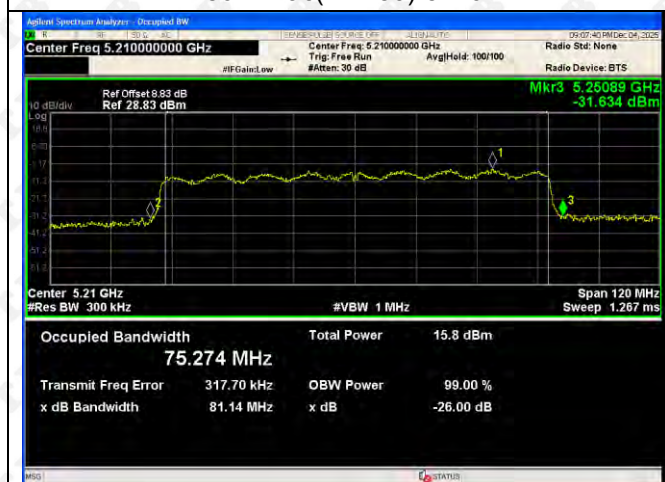




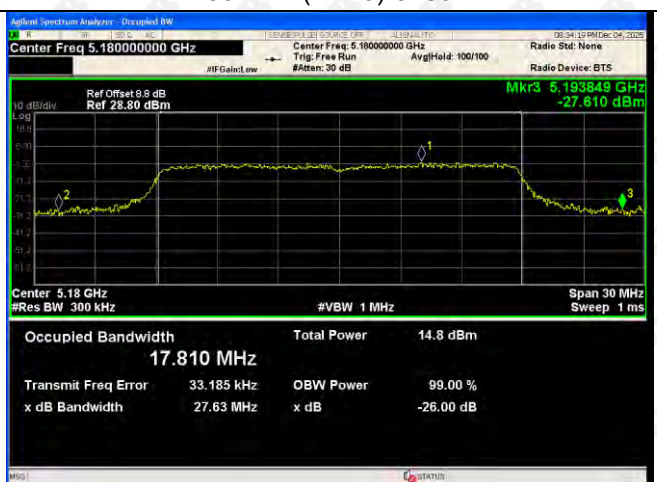
802.11ac(VHT80)-5210



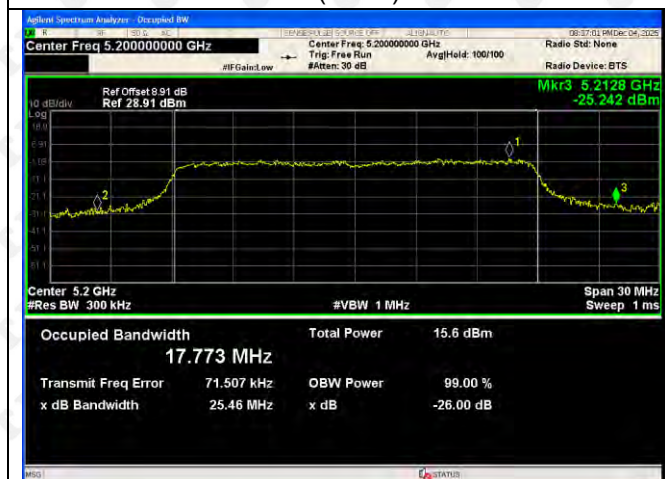
802.11n(HT20)-5180



802.11n(HT20)-5200



802.11n(HT20)-5240



802.11n(HT40)-5190



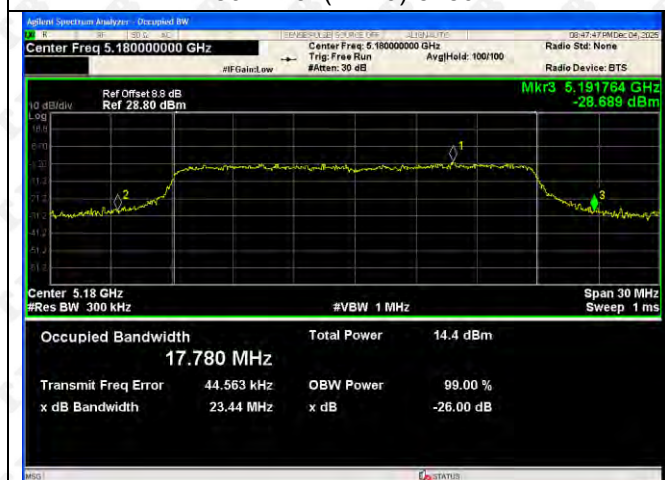
802.11n(HT40)-5230



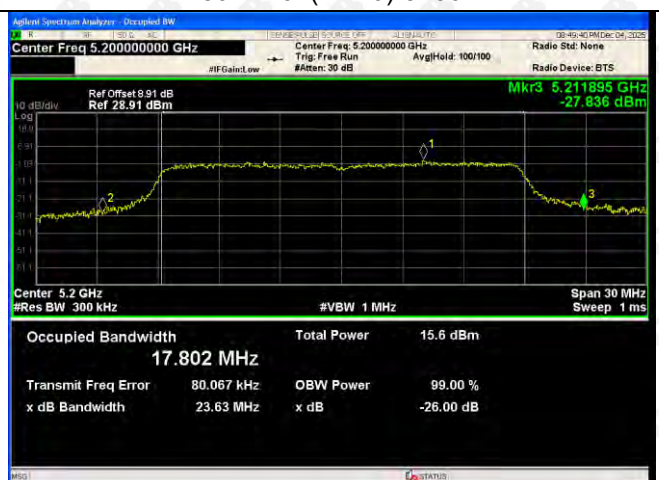
802.11ax(HE20)-5180



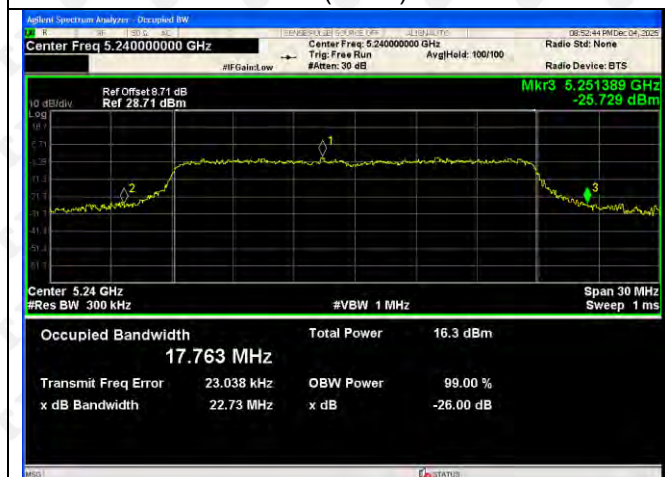
802.11ax(HE20)-5200



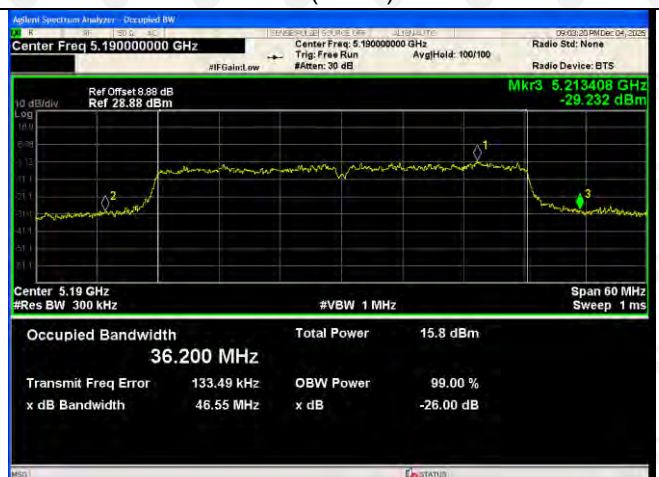
802.11ax(HE20)-5240



802.11ax(HE40)-5190



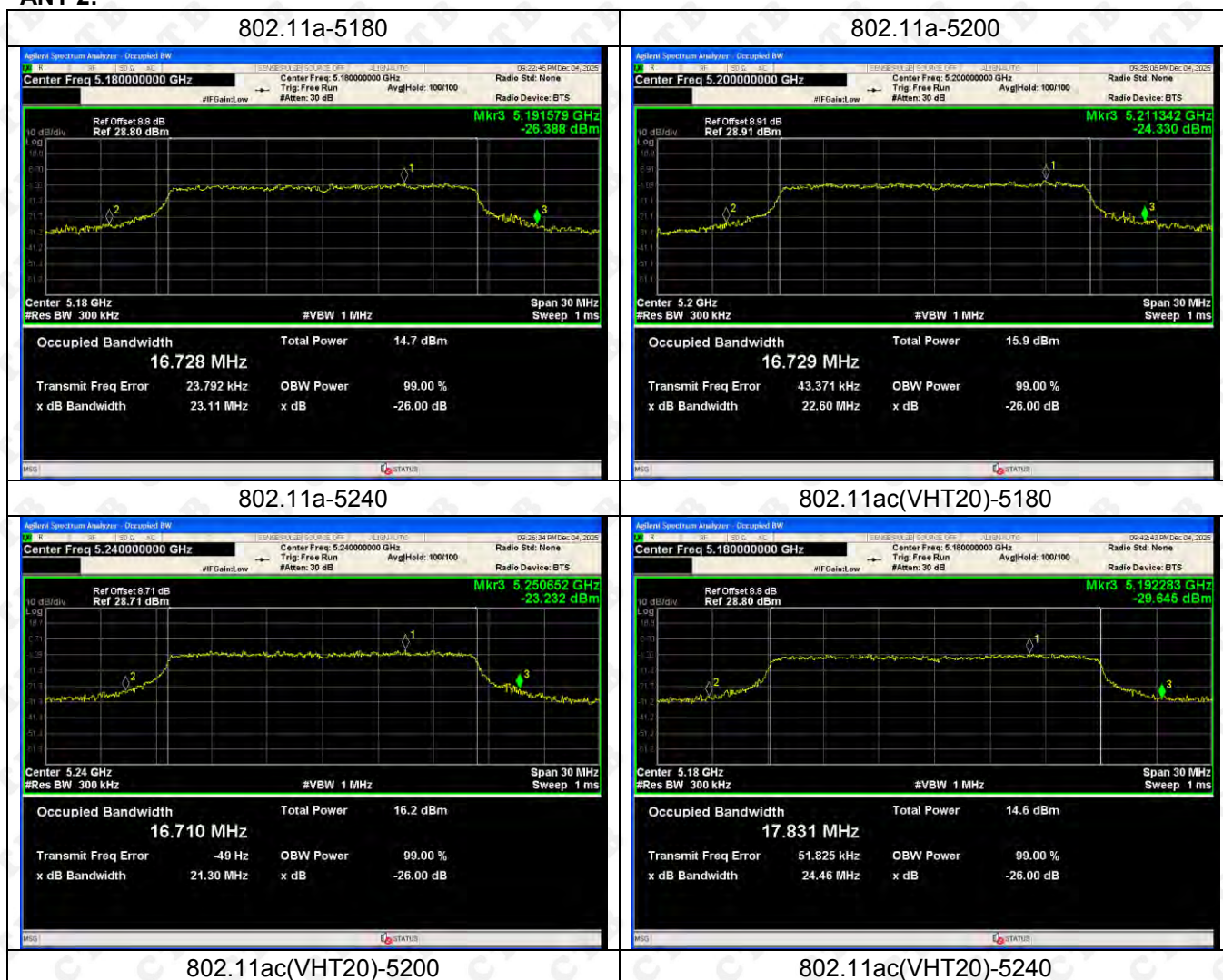
802.11ax(HE40)-5230

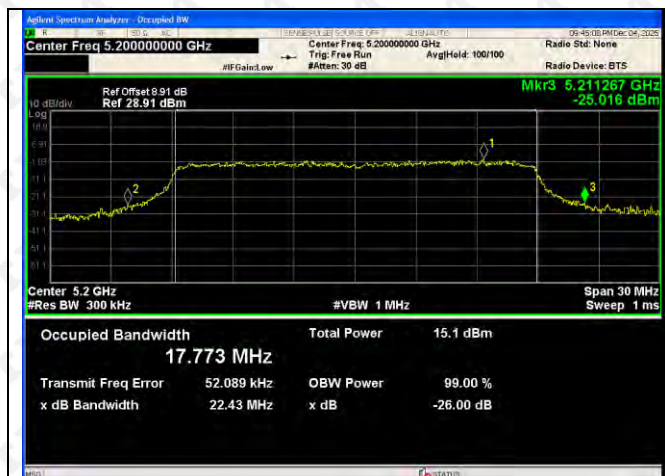


802.11ax(HE80)-5210

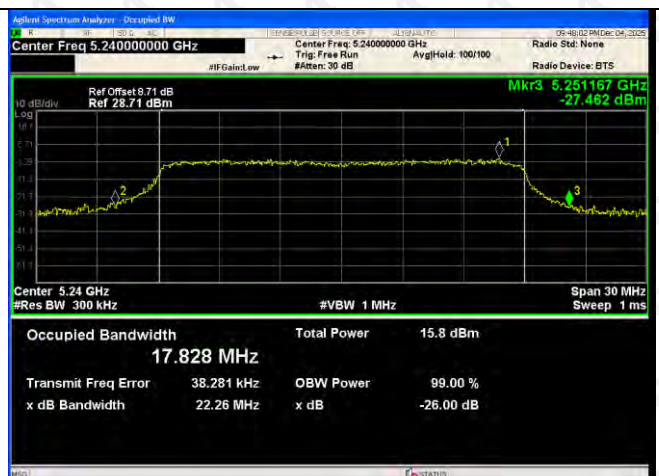


5150MHz ~5250MHz ANT 2:

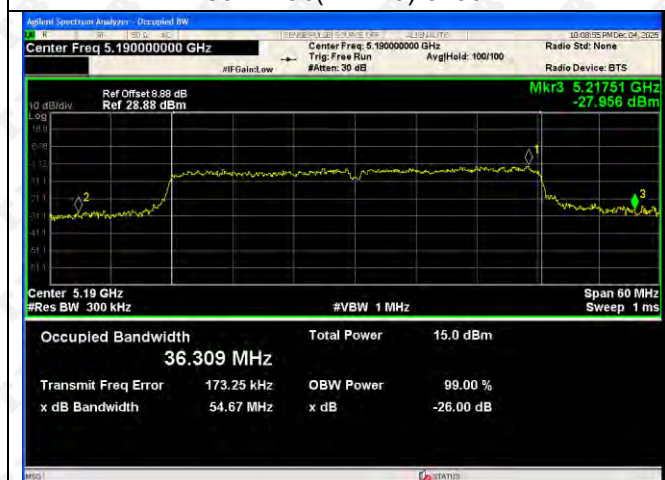




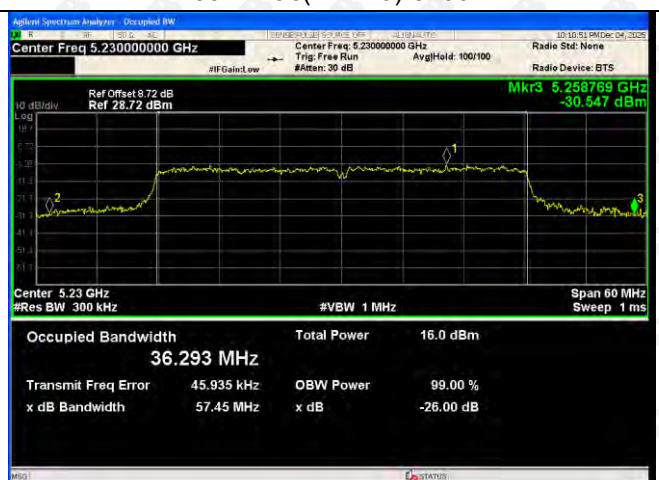
802.11ac(VHT40)-5190



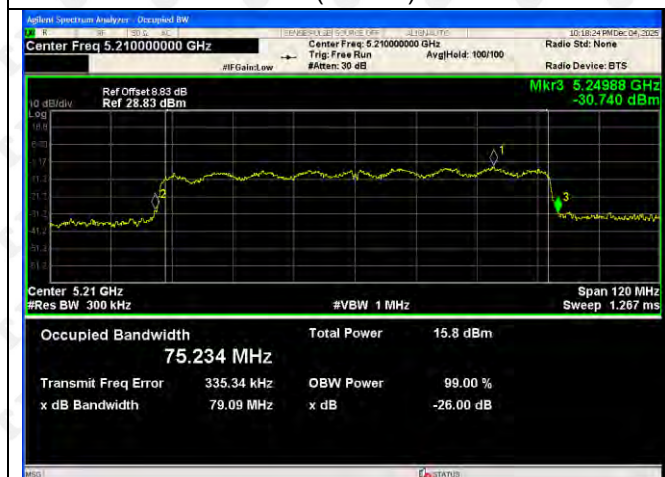
802.11ac(VHT40)-5230



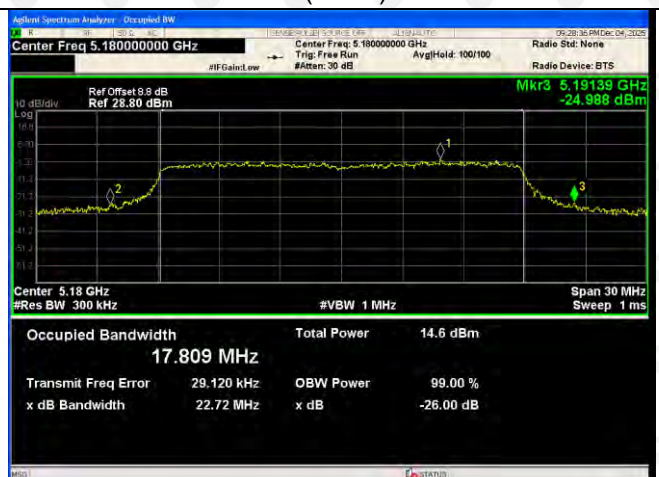
802.11ac(VHT80)-5210



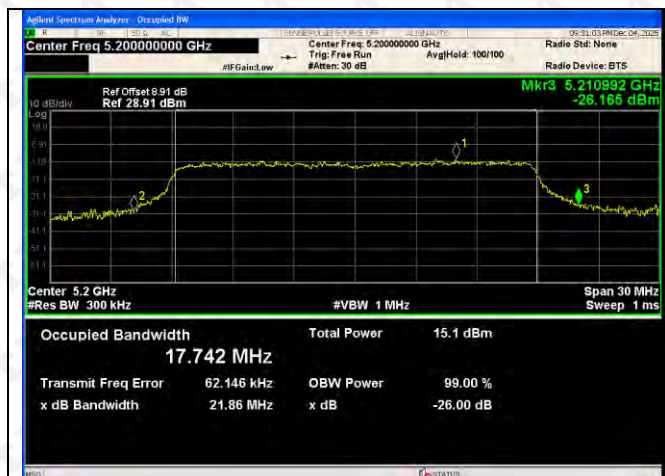
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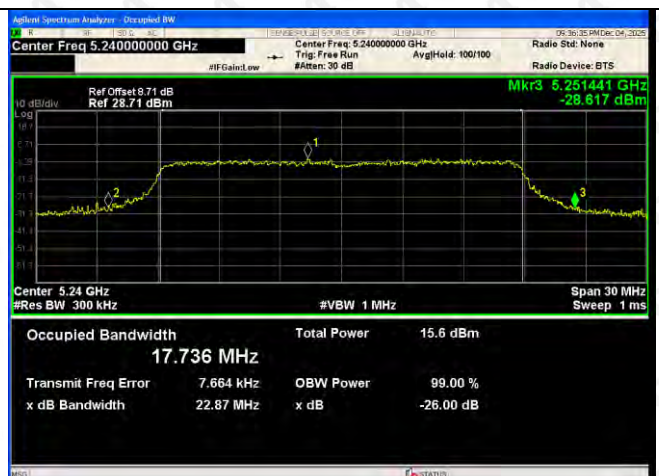
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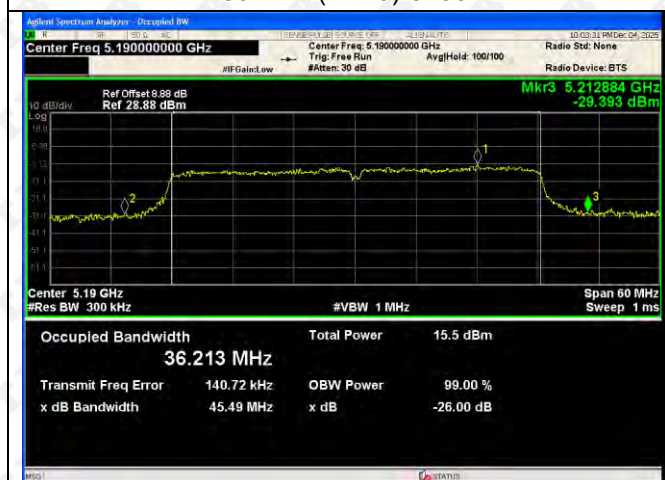
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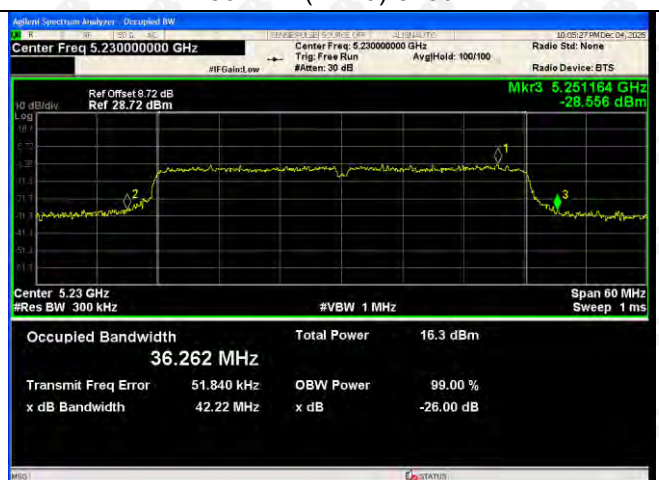
802.11n(HT40)-5190



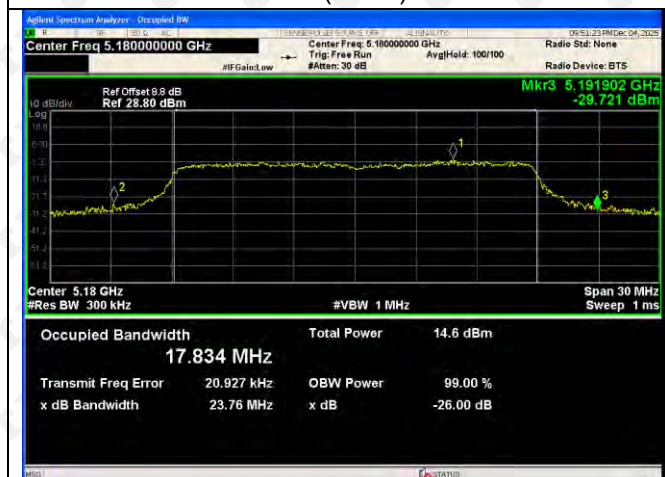
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802.11ax(HE20)-5180



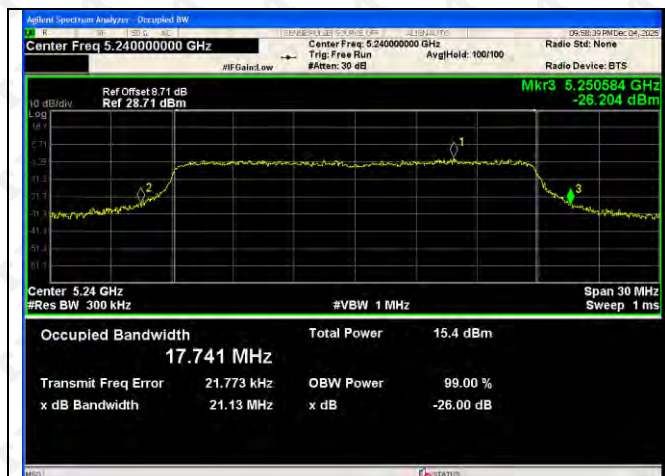
802.11ax(HE20)-5200



802.11ax(HE20)-5240



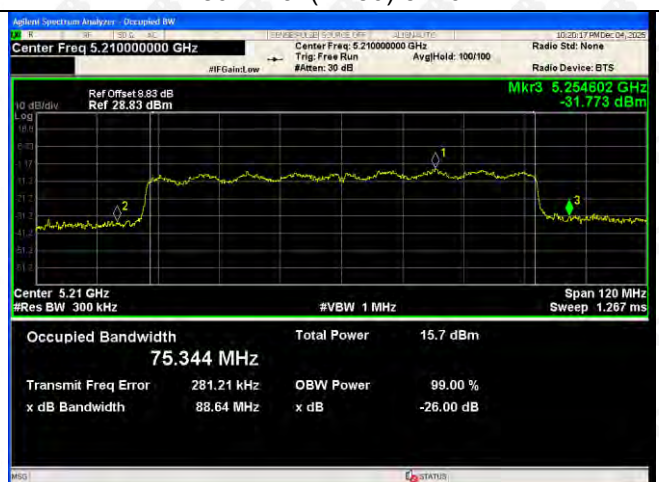
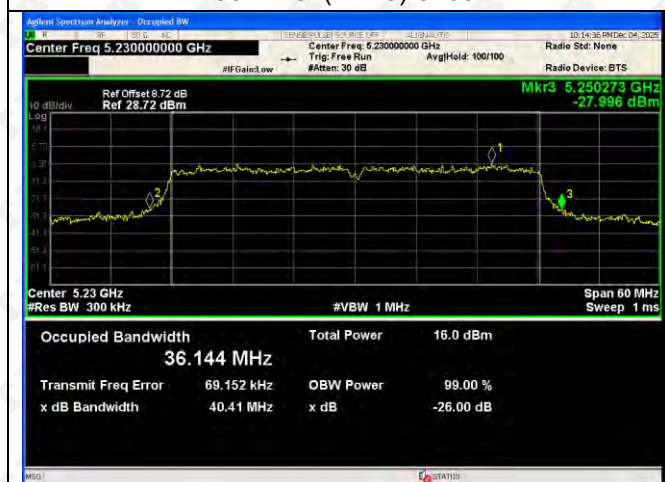
802.11ax(HE40)-5190



802.11ax(HE40)-5230



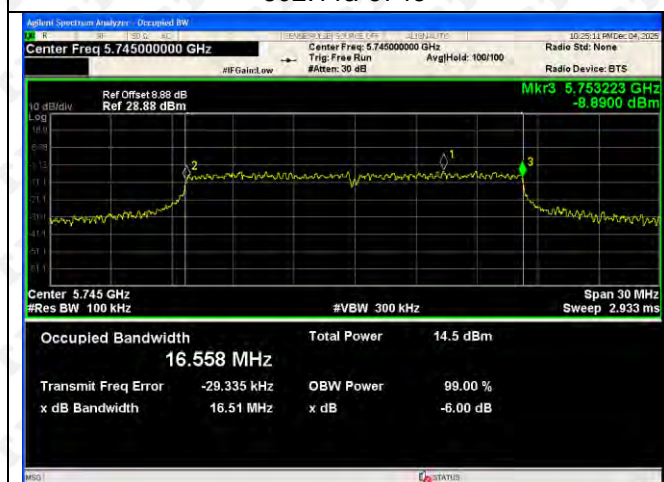
802.11ax(HE80)-5210



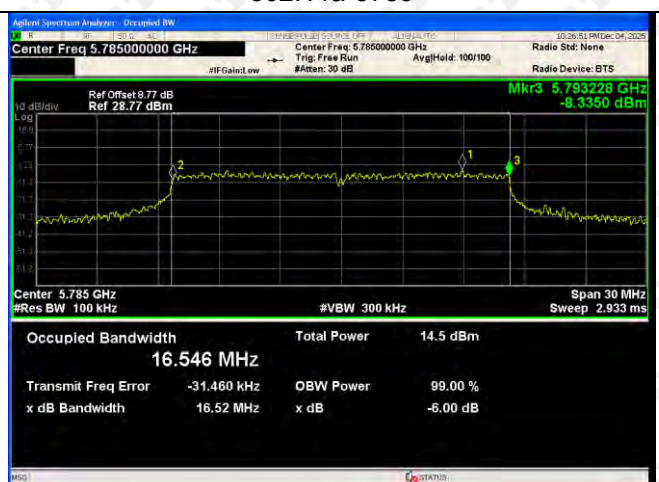
5725-5850MHz

ANT1:

802.11a-5745



802.11a-5785



802.11a-5825



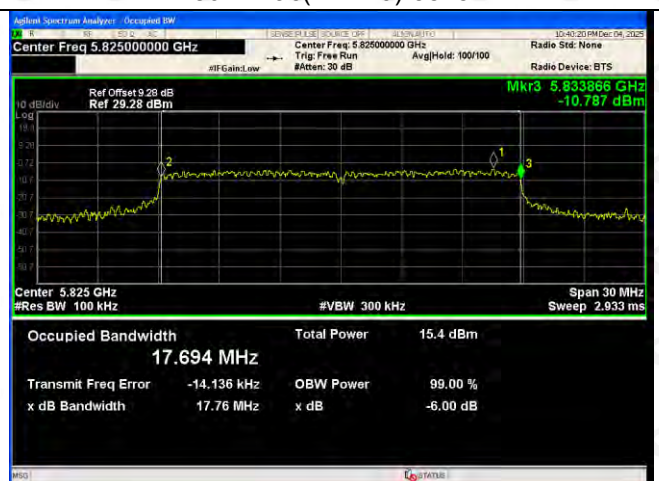
802.11ac(VHT20)-5745



802.11ac(VHT20)-5785



802.11ac(VHT20)-5825

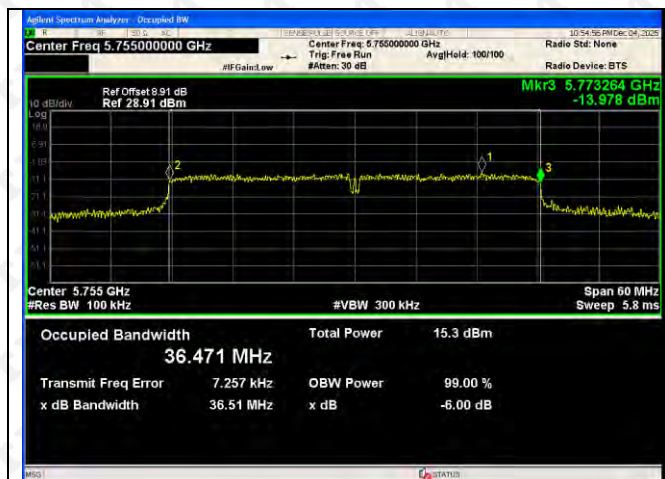


802.11ac(VHT40)-5755

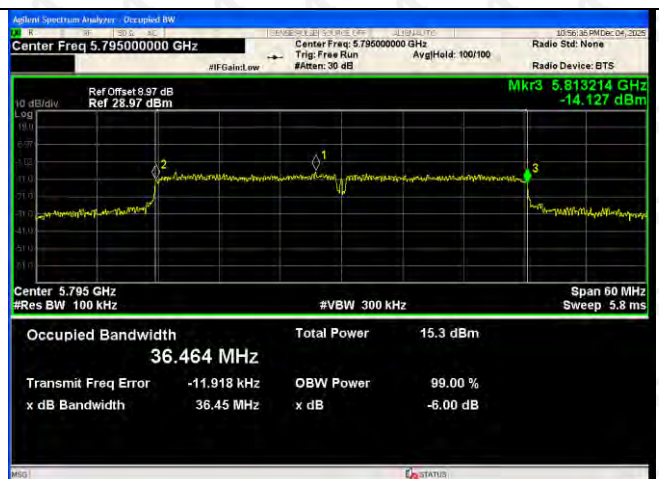


802.11ac(VHT40)-5795

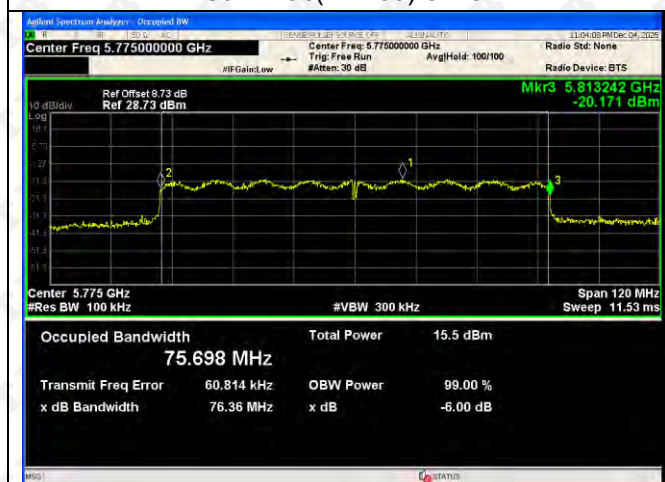




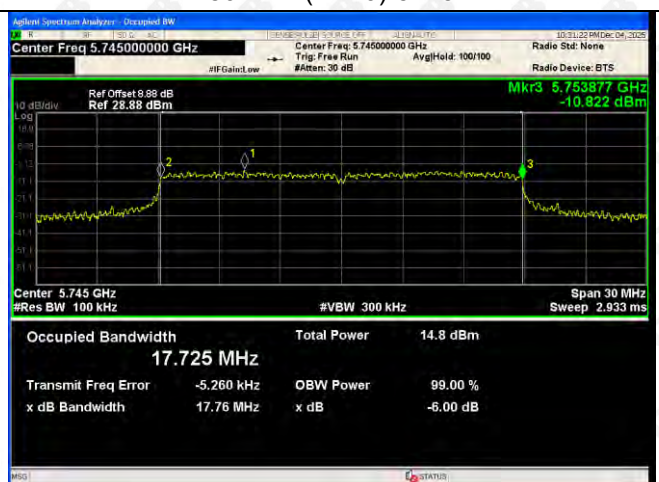
802.11ac(VHT80)-5775



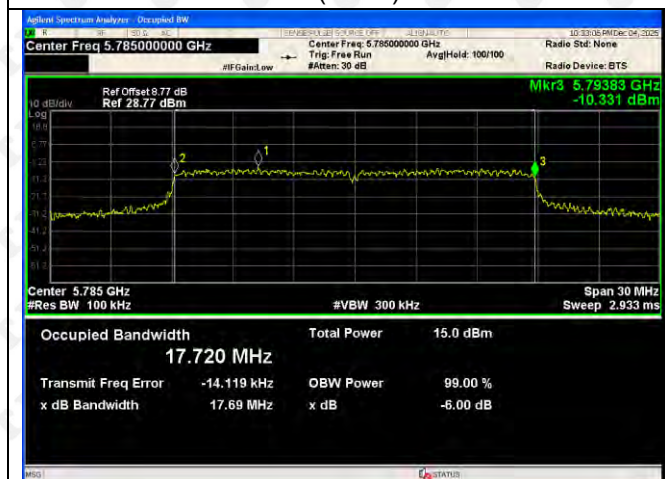
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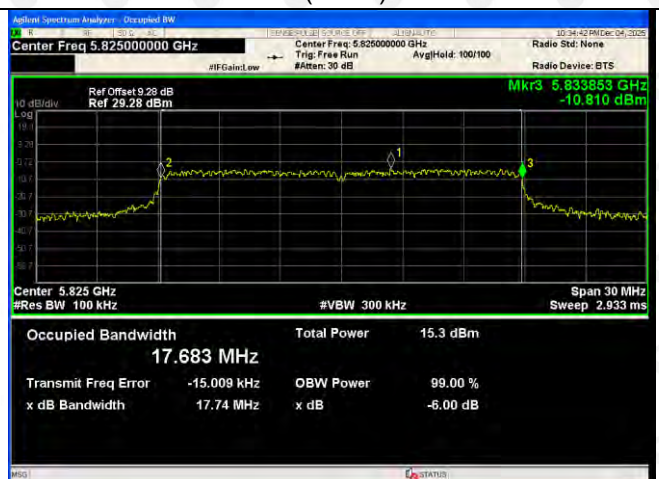
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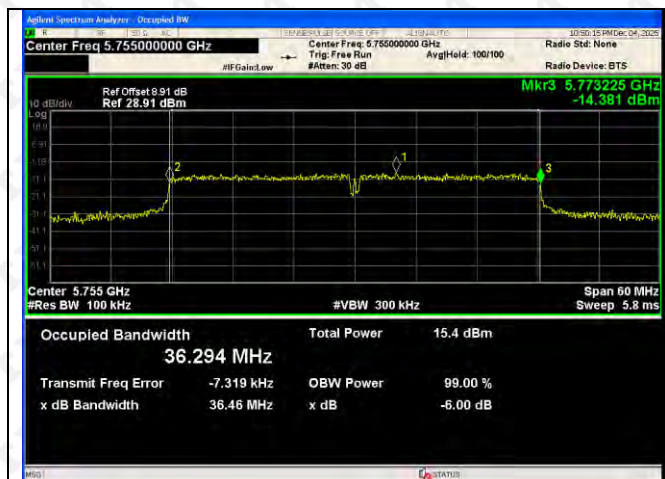
802.11n(HT20)-5825



5802.11n(HT40)-5755



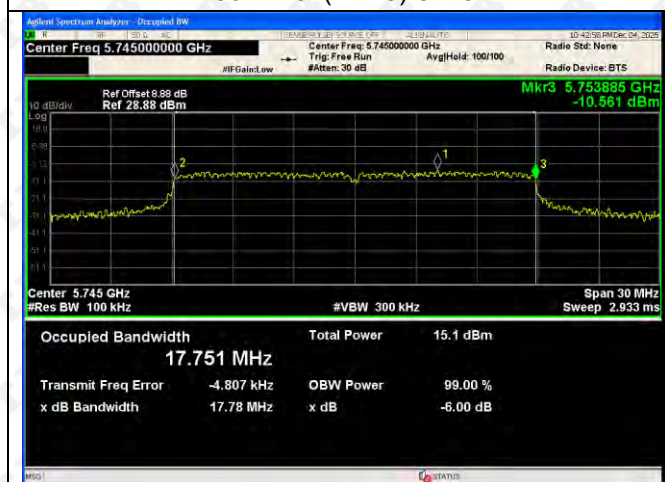
802.11n(HT40)-5795



802.11ax(HE20)-5745



802.11ax(HE20)-5785



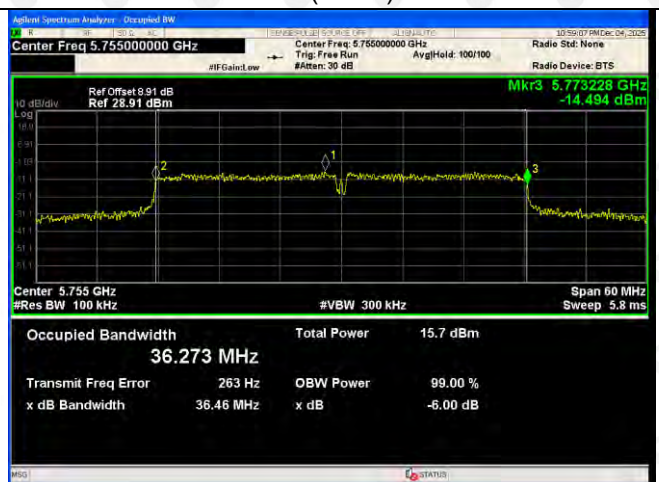
802.11ax(HE20)-5825



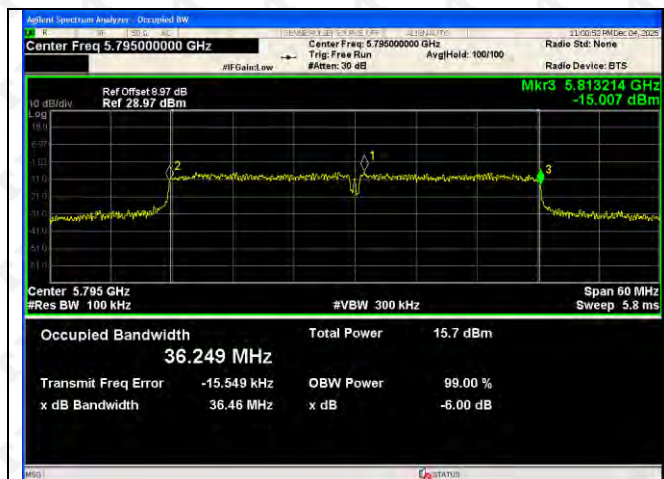
802.11ax(HE40)-5755



802.11ax(HE40)-5795



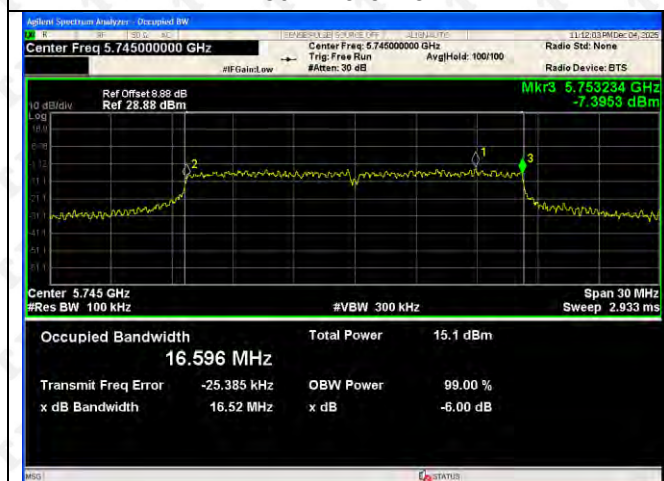
802.11ax(HE80)-5775



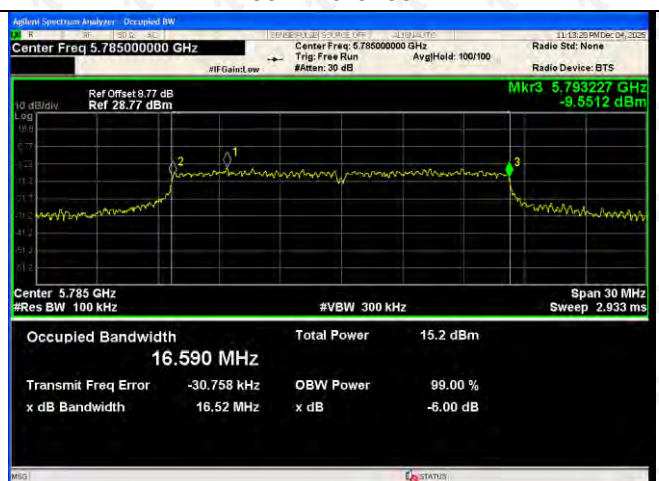
5725-5850MHz

ANT2:

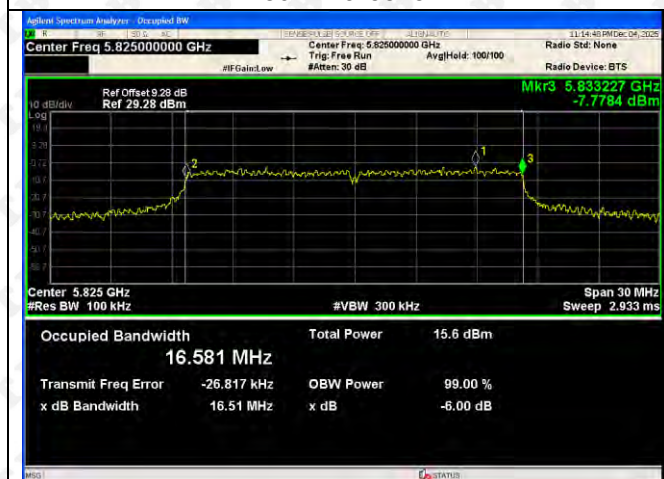
802.11a-5745



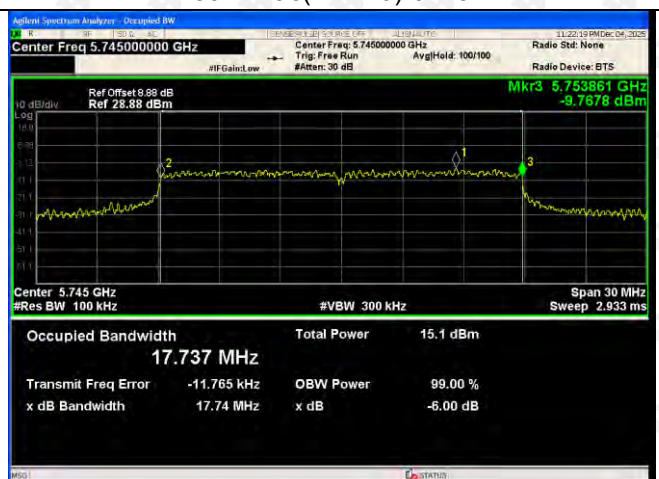
802.11a-5785



802.11a-5825



802.11ac(VHT20)-5745



802.11ac(VHT20)-5785

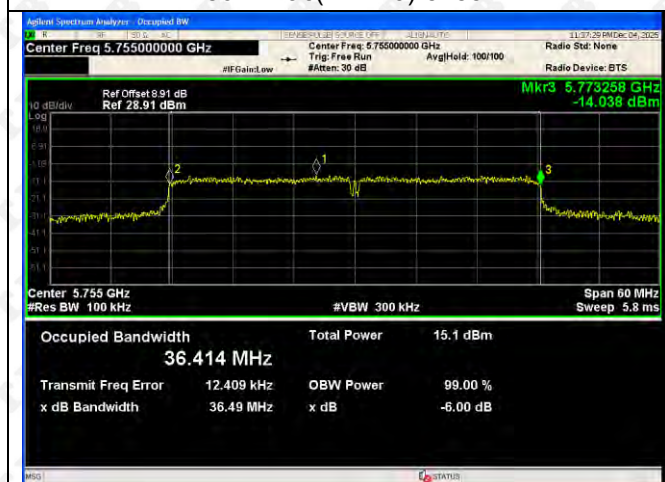
802.11ac(VHT20)-5825



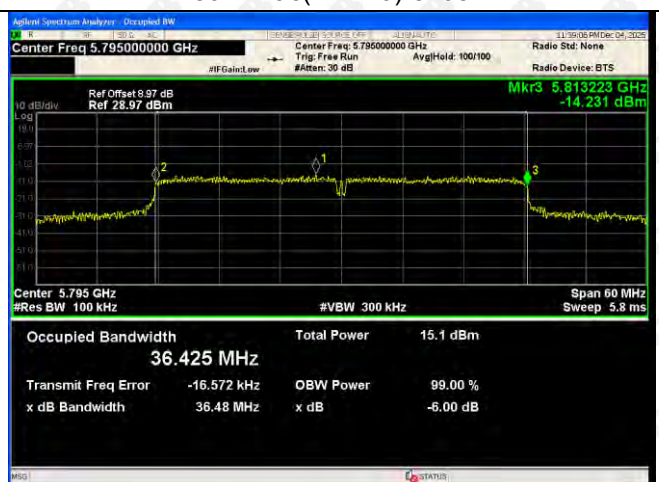
802.11ac(VHT40)-5755



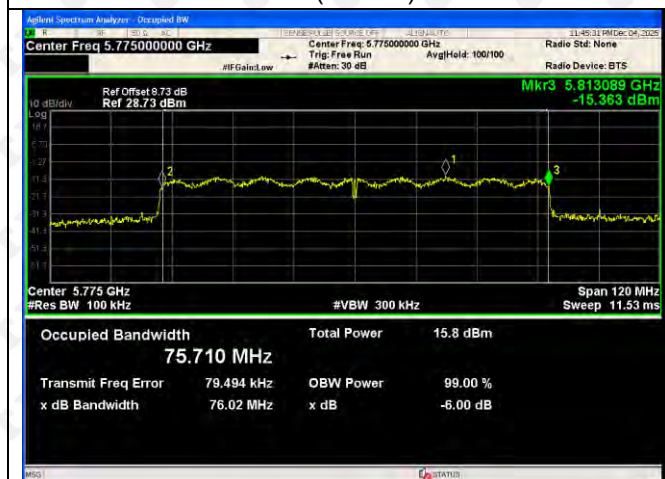
802.11ac(VHT40)-5795



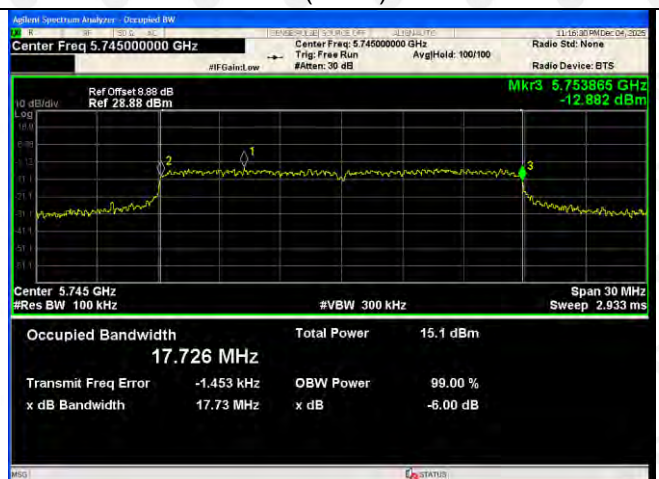
802.11ac(VHT80)-5755



802.11ac(VHT80)-5795



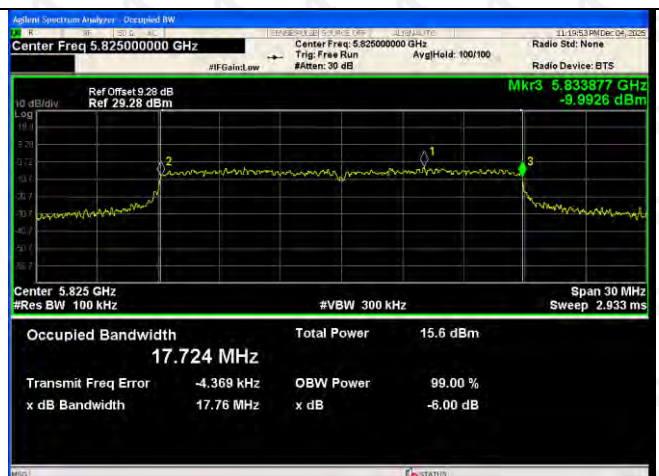
802.11n(HT20)-5785



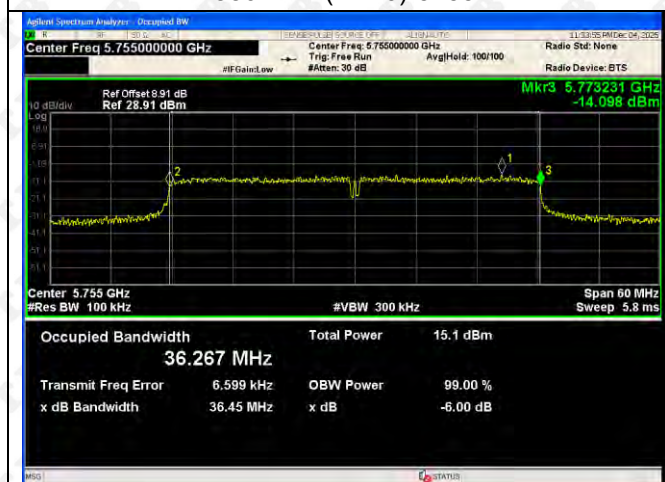
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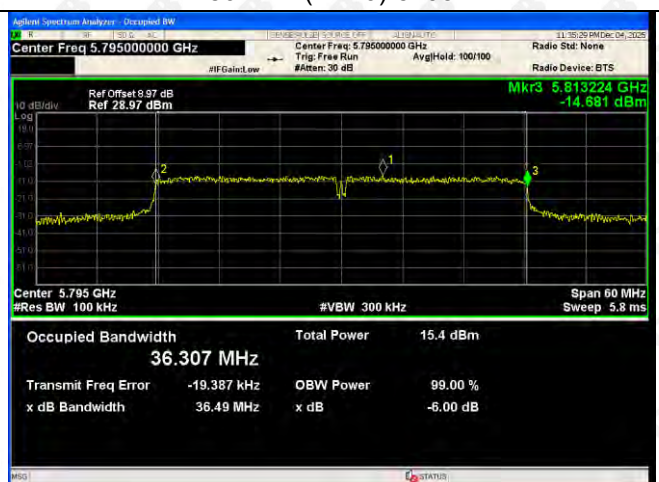
5802.11n(HT40)-5755



802.11n(HT40)-5795



802.11ax(HE20)-5745



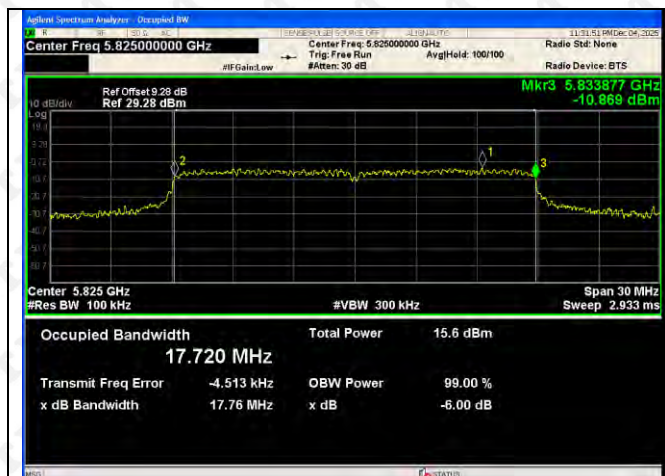
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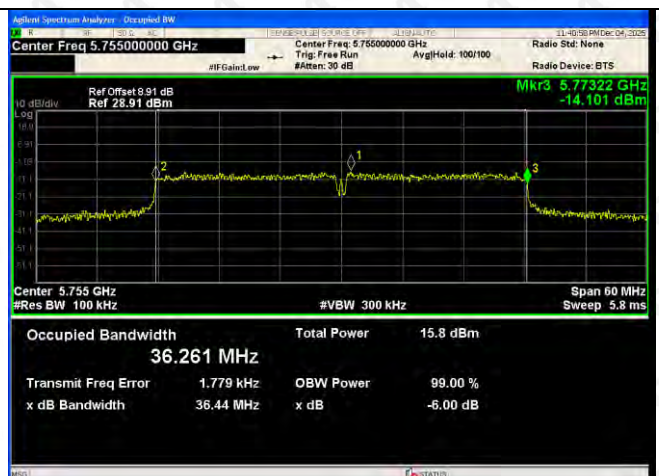
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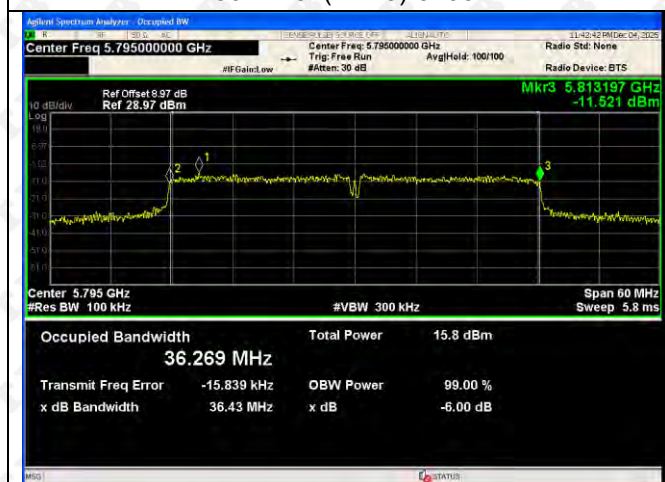
802.11ax(HE40)-5755



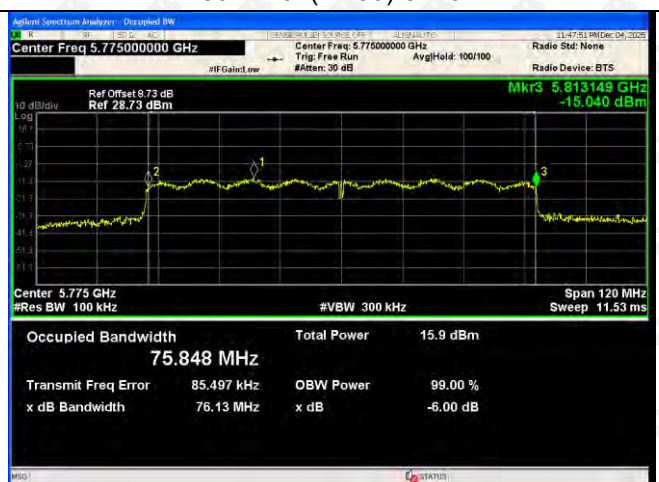
802.11ax(HE40)-5795



802.11ax(HE80)-5775



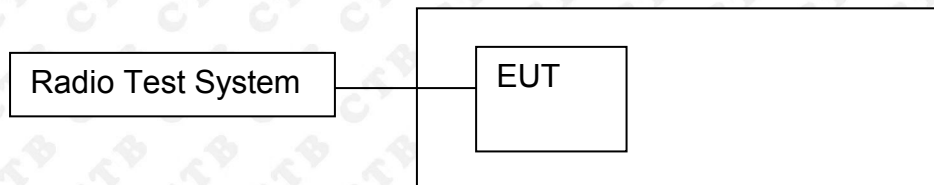
802.11ax(HE40)-5795



802.11ax(HE80)-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 $11 \text{ dBm} + 10 \log B$, 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 ($< 1 \text{ MHz}$, or $< 500 \text{ kHz}$) and integrated over 1 MHz, or 500 kHz bandwidth, the following adjustments to the procedures apply:

a) Set $\text{RBW} \geq 1/T$, where T is defined in II.B.I.a).

b) Set $\text{VBW} \geq 3 \text{ RBW}$.

c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add $10 \log (500 \text{ kHz}/\text{RBW})$ 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 $10 \log (1\text{MHz}/\text{RBW})$ 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

ANT1+ANT2

5150MHz ~5250MHz:

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	-2.565	-2.387	/	11	Pass
	5200	-1.33	-0.727	/	11	Pass
	5240	-1.542	-1.078	/	11	Pass
802.11ac(VHT20)	5180	-2.783	-2.639	0.300	11	Pass
	5200	-1.424	-2.008	1.304	11	Pass
	5240	-1.172	-1.651	1.605	11	Pass
802.11ac(VHT40)	5190	-4.753	-5.087	-1.906	11	Pass
	5230	-4.701	-4.8	-1.740	11	Pass
802.11ac(VHT80)	5230	-6.764	-6.689	-3.716	11	Pass
802.11n(HT20)	5180	-2.535	-2.835	0.328	11	Pass
	5200	-1.306	-2.051	1.348	11	Pass
	5240	-1.813	-1.764	1.222	11	Pass
802.11n(HT40)	5190	-4.295	-4.293	-1.284	11	Pass
	5230	-4.368	-4.1	-1.222	11	Pass
802.11ax(HE20)	5180	-2.893	-2.868	0.130	11	Pass
	5200	-1.446	-1.949	1.320	11	Pass
	5240	-1.104	-2.108	1.433	11	Pass
802.11ax(HE40)	5190	-4.254	-4.653	-1.439	11	Pass
	5230	-4.191	-4.831	-1.489	11	Pass
802.11ax(HE80)	5210	-6.937	-6.763	-3.839	11	Pass

5725-5850MHz:

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	-5.828	-5.245	/	30	Pass
	5785	-5.784	-5.112	/	30	Pass
	5825	-5.32	-4.608	/	30	Pass
802.11ac(VHT20)	5745	-6.002	-5.489	-2.728	30	Pass
	5785	-5.741	-5.389	-2.551	30	Pass
	5825	-5.2	-4.918	-2.046	30	Pass
802.11ac(VHT40)	5755	-8.757	-8.91	-5.823	30	Pass
	5795	-8.78	-8.954	-5.856	30	Pass
802.11ac(VHT80)	5795	-11.164	-11.183	-8.163	30	Pass
802.11n(HT20)	5745	-5.697	-5.498	-2.586	30	Pass
	5785	-5.792	-5.585	-2.677	30	Pass
	5825	-5.214	-4.952	-2.071	30	Pass
802.11n(HT40)	5755	-8.466	-8.611	-5.528	30	Pass
	5795	-8.371	-8.467	-5.408	30	Pass
802.11ax(HE20)	5745	-5.677	-5.626	-2.641	30	Pass
	5785	-5.417	-5.61	-2.502	30	Pass
	5825	-5.413	-4.895	-2.136	30	Pass
802.11ax(HE40)	5755	-8.398	-8.251	-5.314	30	Pass
	5795	-8.179	-8.027	-5.092	30	Pass
802.11ax(HE80)	5775	-11.144	-10.905	-8.013	30	Pass

ANT 1:





802.11ac(VHT80)-5210



802.11n(HT20)-5180



802.11n(HT20)-5200



802.11n(HT20)-5240



802.11n(HT40)-5190



802.11n(HT40)-5230



802.11ax(HE20)-5180



802.11ax(HE20)-5200



802.11ax(HE20)-5240



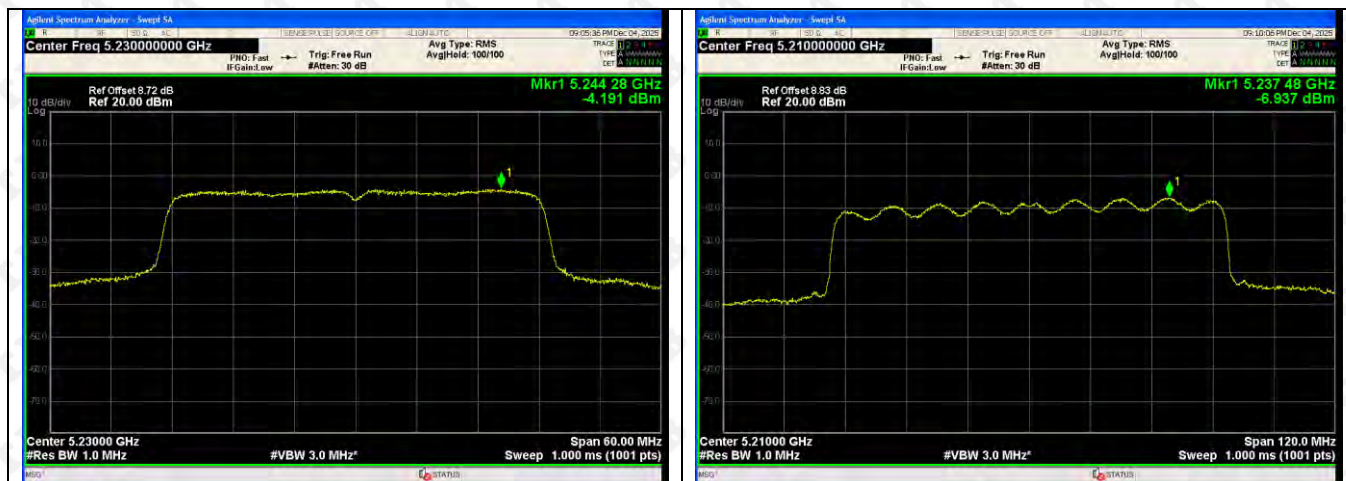
802.11ax(HE40)-5190



802.11ax(HE40)-5230



802.11ax(HE80)-5210



ANT 2:





802.11ac(VHT80)-5210



802.11n(HT20)-5180



802.11n(HT20)-5200



802.11n(HT20)-5240



802.11n(HT40)-5190



802.11n(HT40)-5230



802.11ax(HE20)-5180



802.11ax(HE20)-5200



802.11ax(HE20)-5240



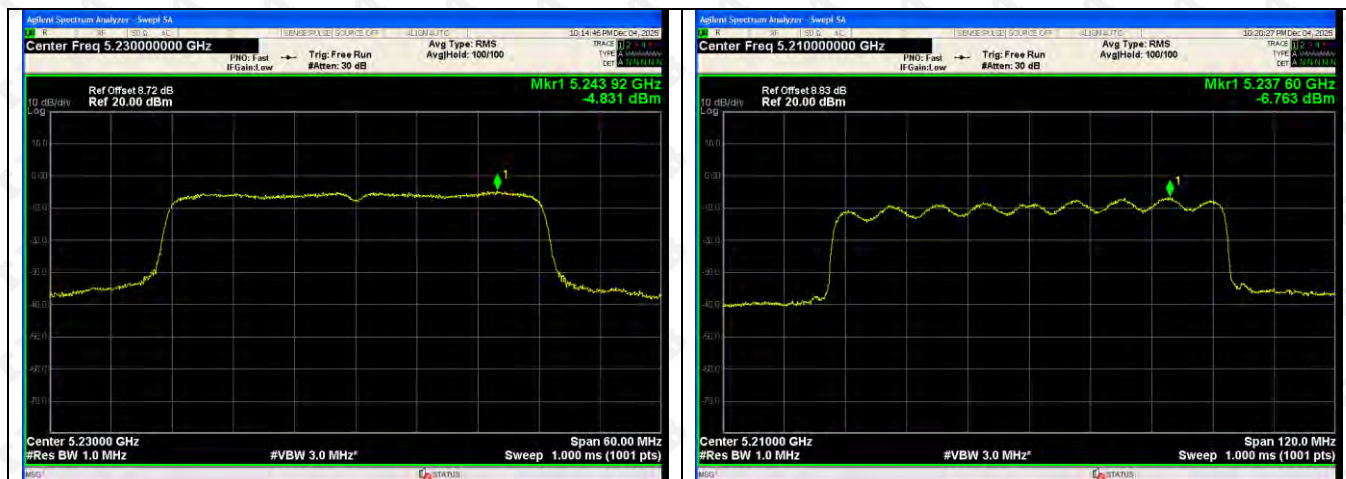
802.11ax(HE40)-5190



802.11ax(HE40)-5230

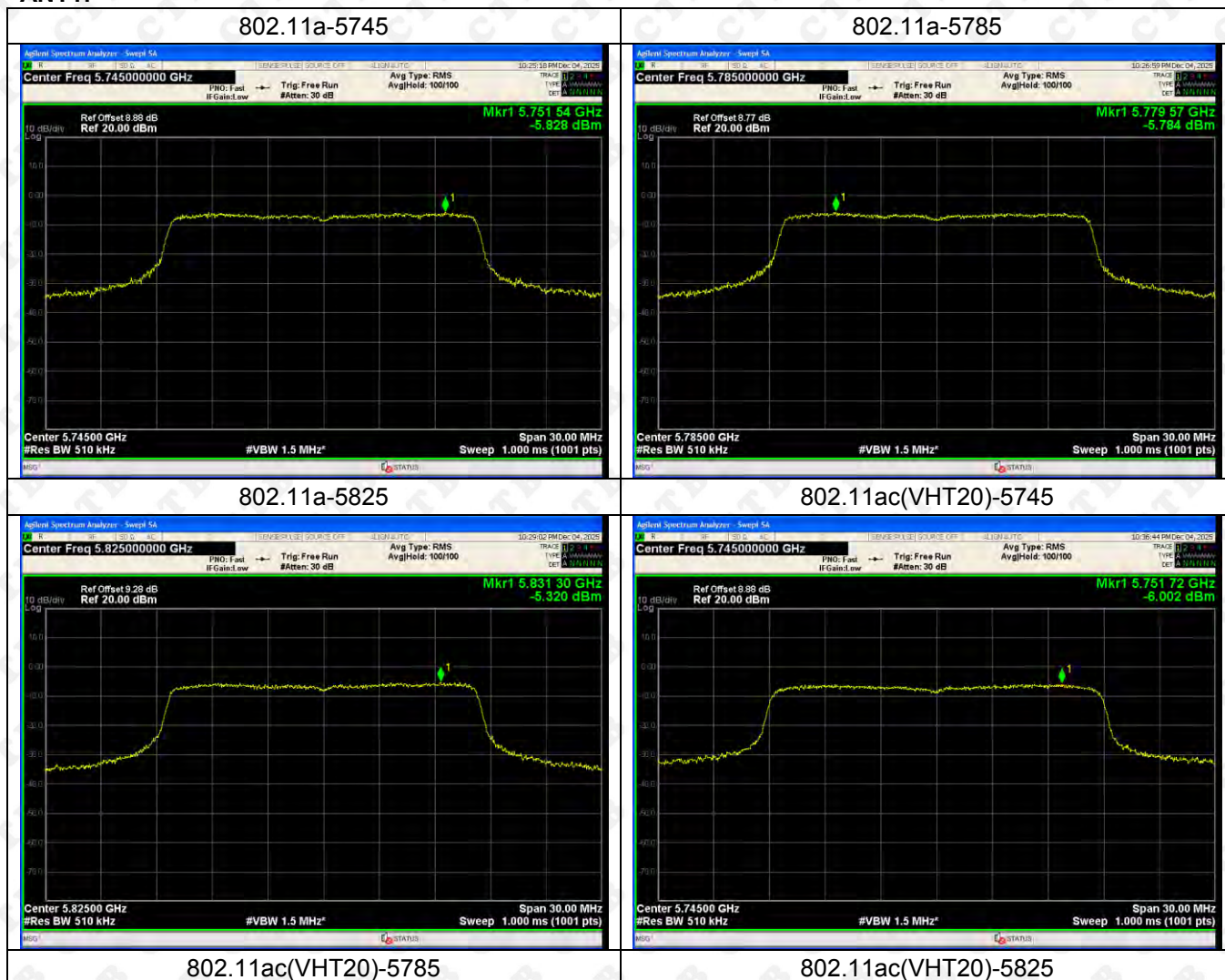


802.11ax(HE80)-5210



5725-5850MHz

ANT1:





802.11ac(VHT40)-5755



802.11ac(VHT40)-5795



802.11ac(VHT80)-5775



802.11n(HT20)-5745



802.11n(HT20)-5785



802.11n(HT20)-5825



5802.11n(HT40)-5755



802.11n(HT40)-5795



802.11ax(HE20)-5745



802.11ax(HE20)-5785



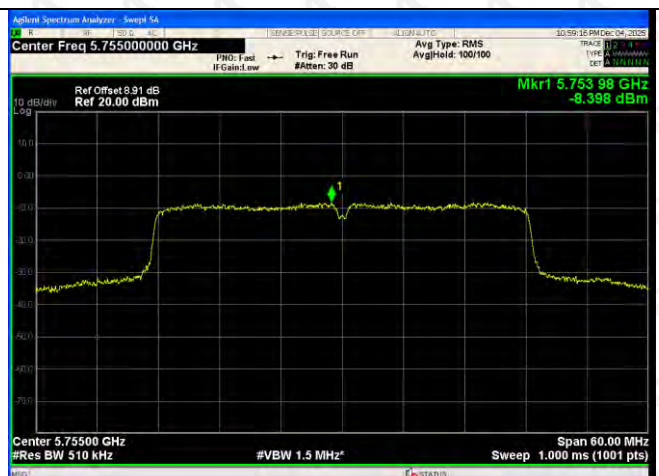
802.11ax(HE20)-5825



802.11ax(HE40)-5755



802.11ax(HE40)-5795



802.11ax(HE80)-5775



ANT2:

802.11a-5745



802.11a-5825

802.11a-5785



802.11ac(VHT20)-5745



802.11ac(VHT20)-5785



802.11ac(VHT20)-5825



802.11ac(VHT40)-5755



802.11ac(VHT40)-5795



802.11ac(VHT80)-5775



802.11n(HT20)-5745



802.11n(HT20)-5785



802.11n(HT20)-5825



5802.11n(HT40)-5755



802.11n(HT40)-5795



802.11ax(HE20)-5745



802.11ax(HE20)-5785



802.11ax(HE20)-5825



802.11ax(HE40)-5755



802.11ax(HE40)-5795

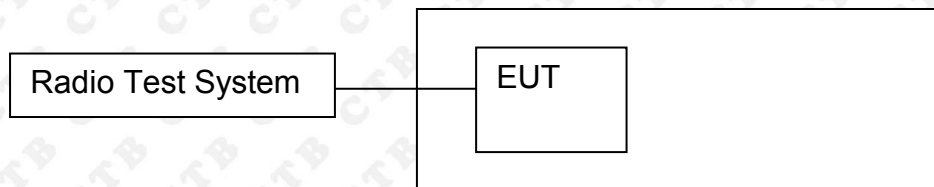


802.11ax(HE80)-5775



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	5180.0075	5180	0.0075	1.4491
		V max (V)	132	5180.0182	5180	0.0182	3.5111
		V min (V)	108	5180.0059	5180	0.0059	1.1413
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	5180.0269	5180	0.0269	5.1955
		T (°C)	10	5180.0170	5180	0.0170	3.2829
		T (°C)	20	5180.0486	5180	0.0486	9.3815
		T (°C)	30	5180.0431	5180	0.0431	8.3149
		T (°C)	40	5180.0156	5180	0.0156	3.0041
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	5200.0511	5200	0.0511	9.8363
		V max (V)	132	5200.0427	5200	0.0427	8.2196
		V min (V)	108	5200.0074	5200	0.0074	1.4225
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	5200.0258	5200	0.0258	4.9536
		T (°C)	10	5200.0149	5200	0.0149	2.8582
		T (°C)	20	5200.0294	5200	0.0294	5.6544
		T (°C)	30	5200.0244	5200	0.0244	4.6900
		T (°C)	40	5200.0426	5200	0.0426	8.1898
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	5240.0531	5240	0.0531	10.1247
		V max (V)	132	5240.0098	5240	0.0098	1.8724
		V min (V)	108	5240.0425	5240	0.0425	8.1171
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	5240.0180	5240	0.0180	3.4437
		T (°C)	10	5240.0342	5240	0.0342	6.5177
		T (°C)	20	5240.0518	5240	0.0518	9.8853
		T (°C)	30	5240.0049	5240	0.0049	0.9405
		T (°C)	40	5240.0161	5240	0.0161	3.0762
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	5180.0830	5180	0.0830	16.0199
		V max (V)	132	5180.0261	5180	0.0261	5.0360
		V min (V)	108	5180.0565	5180	0.0565	10.9046
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	5180.0858	5180	0.0858	16.5635
		T (°C)	10	5180.0531	5180	0.0531	10.2475
		T (°C)	20	5180.0626	5180	0.0626	12.0905
		T (°C)	30	5180.0693	5180	0.0693	13.3710
		T (°C)	40	5180.0467	5180	0.0467	9.0095
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	5200.0870	5200	0.0870	16.7374
		V max (V)	132	5200.0793	5200	0.0793	15.2551
		V min (V)	108	5200.0910	5200	0.0910	17.4908
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	5200.0263	5200	0.0263	5.0586
		T (°C)	10	5200.0463	5200	0.0463	8.9108
		T (°C)	20	5200.0414	5200	0.0414	7.9542
		T (°C)	30	5200.0693	5200	0.0693	13.3260
		T (°C)	40	5200.0079	5200	0.0079	1.5198
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	5240.0931	5240	0.0931	17.7681
		V max (V)	132	5240.0712	5240	0.0712	13.5815
		V min (V)	108	5240.0283	5240	0.0283	5.3919
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	5240.0151	5240	0.0151	2.8797
		T (°C)	10	5240.0894	5240	0.0894	17.0590
		T (°C)	20	5240.0076	5240	0.0076	1.4445
		T (°C)	30	5240.0362	5240	0.0362	6.9164
		T (°C)	40	5240.0171	5240	0.0171	3.2631
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	5745.0774	5745	0.0774	13.4649
		V max (V)	132	5745.0479	5745	0.0479	8.3423
		V min (V)	108	5745.0774	5745	0.0774	13.4649
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	5745.0004	5745	0.0004	0.0699
		T (°C)	10	5745.0415	5745	0.0415	7.2167
		T (°C)	20	5745.0698	5745	0.0698	12.1505
		T (°C)	30	5745.0105	5745	0.0105	1.8259
		T (°C)	40	5745.0775	5745	0.0775	13.4817
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	5785.0881	5785	0.0881	15.2292
		V max (V)	132	5785.0370	5785	0.0370	6.4040
		V min (V)	108	5785.0274	5785	0.0274	4.7324
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	5785.0194	5785	0.0194	3.3456
		T (°C)	10	5785.0445	5785	0.0445	7.6931
		T (°C)	20	5785.0552	5785	0.0552	9.5391
		T (°C)	30	5785.0480	5785	0.0480	8.2978
		T (°C)	40	5785.0679	5785	0.0679	11.7437
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	5825.0849	5825	0.0849	14.5763
		V max (V)	132	5825.0611	5825	0.0611	10.4950
		V min (V)	108	5825.0224	5825	0.0224	3.8484
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	5825.0466	5825	0.0466	7.9950
		T (°C)	10	5825.0588	5825	0.0588	10.1024
		T (°C)	20	5825.0399	5825	0.0399	6.8458
		T (°C)	30	5825.0456	5825	0.0456	7.8311
		T (°C)	40	5825.0418	5825	0.0418	7.1710
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	5745.0383	5745	0.0383	6.6600
		V max (V)	132	5745.0716	5745	0.0716	12.4587
		V min (V)	108	5745.0907	5745	0.0907	15.7922
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	5745.0148	5745	0.0148	2.5684
		T (°C)	10	5745.0826	5745	0.0826	14.3862
		T (°C)	20	5745.0061	5745	0.0061	1.0601
		T (°C)	30	5745.0042	5745	0.0042	0.7381
		T (°C)	40	5745.0552	5745	0.0552	9.6121
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	5785.0588	5785	0.0588	10.1707
		V max (V)	132	5785.0530	5785	0.0530	9.1614
		V min (V)	108	5785.0356	5785	0.0356	6.1601
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	5785.0562	5785	0.0562	9.7153
		T (°C)	10	5785.0920	5785	0.0920	15.9028
		T (°C)	20	5785.0835	5785	0.0835	14.4285
		T (°C)	30	5785.0045	5785	0.0045	0.7716
		T (°C)	40	5785.0611	5785	0.0611	10.5612
		T (°C)	50	5785.0446	5785	0.0446	7.7096
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	5825.0659	5825	0.0659	11.3094
		V max (V)	132	5825.0726	5825	0.0726	12.4587
		V min (V)	108	5825.0188	5825	0.0188	3.2352
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	5825.0463	5825	0.0463	7.9495
		T (°C)	10	5825.0221	5825	0.0221	3.7908
		T (°C)	20	5825.0060	5825	0.0060	1.0290
		T (°C)	30	5825.0474	5825	0.0474	8.1430
		T (°C)	40	5825.0757	5825	0.0757	12.9976
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
WiFi (5.2G): Ant1: 4.25dBi Ant2: 4.25dBi WiFi (5.8G): Ant1: 5.36dBi Ant2: 5.36dBi

15. EUT TEST SETUP PHOTOGRAPHS

Radiated Emission

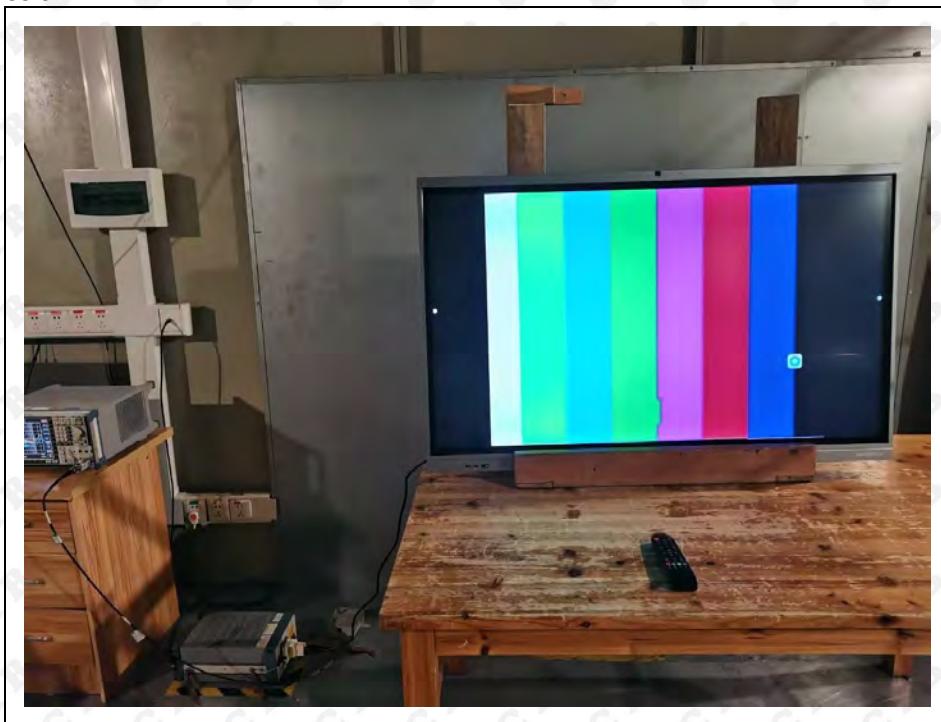
Below 1G



Above 1G



Conducted Emission



***** END OF REPORT *****