



802.11ac(VHT40)-5190



802.11ac(VHT40)-5230



802.11ac(VHT80)-5210



802.11n(HT20)-5180



802.11n(HT20)-5200



802.11n(HT20)-5240



802.11n(HT40)-5190



802.11n(HT40)-5230





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



802.11n(HT20)-5745



802.11n(HT20)-5785



802.11n(HT20)-5825



802.11n(HT40)-5795



802.11n(HT40)-5825



ANT2

802.11a-5745



802.11a-5785



802.11a-5825



802.11ac(VHT20)-5745



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802.11n(HT40)-5795



802.11n(HT40)-5825



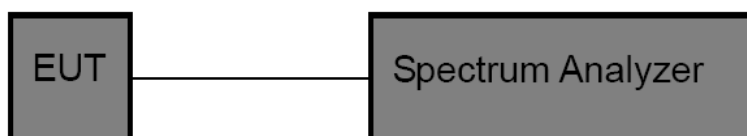


10 26DB & 6DB & 99% Emission Bandwidth Test

10.1 Test Standard

Test Standard	FCC Part15 C Section 15.407
	The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725-5.85 GHz band, the minimum bandwidth 6 dB bandwidth of U-NII devices shall be at least 500KHz. Measurements in the 5.15-5.25 GHz, 5.25-5.35 GHz, and the 5.47-5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth.

10.2 Test Setup



10.3 Test Procedure

The following procedure shall be used for measuring 6db bandwidth:

- Set RBW = 100KHz.
- Set the VBW > RBW.
- Detector = Peak.
- Trace mode = max hold.
- 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.

The following procedure shall be used for measuring (99 %) power bandwidth:

- Set center frequency to the nominal EUT channel center frequency.
- Set span = 1.5 times to 3.3 times the OBW.
- Set RBW = 1 % to 5 % of the OBW
- Set VBW $\geq 3 \cdot$ RBW
- 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.

The following procedure shall be used for measuring 26db bandwidth:

- 1) Set RBW = approximately 1% of the emission bandwidth.
- 2) Set the VBW > RBW.
- 3) Detector = Peak
- 4) Trace mode = max hold.
- 5) Measure the maximum width of the emission that is 26 dB down from the peak 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%.

10.4 Test Data

5150-5250MHz:

Test mode	Test Channel (MHz)	26dB Bandwidth (MHz)&ANT1	26dB Bandwidth (MHz)&ANT2
802.11a	5180	21.659	23.113
	5200	21.668	22.091
	5240	22.702	23.369
802.11ac20	5180	24.195	23.57
	5200	23.633	25.129
	5240	23.885	23.197
802.11ac40	5190	56.071	59.444
	5230	56.771	56.889
802.11ac80	5210	81.159	112.964
802.11n(HT20)	5180	24.092	23.601
	5200	24.428	23.334
	5240	27.28	23.089
802.11n(HT40)	5190	41.846	42.005
	5230	41.845	41.705

5725-5850MHz:

Test mode	Test Channel (MHz)	6dB Bandwidth (MHz)&ANT1	6dB Bandwidth (MHz)&ANT2
802.11a	5745	16.549	16.541
	5785	16.522	16.539
	5825	16.531	16.54
802.11ac20	5745	17.75	17.767
	5785	17.756	17.753
	5825	17.743	17.751
802.11ac40	5755	36.396	36.443
	5795	36.533	36.521
802.11ac80	5775	75.988	76.333
802.11n(HT20)	5745	17.763	17.735
	5785	17.8	17.756
	5825	17.817	17.736
802.11n(HT40)	5755	36.484	36.441
	5795	36.467	36.452

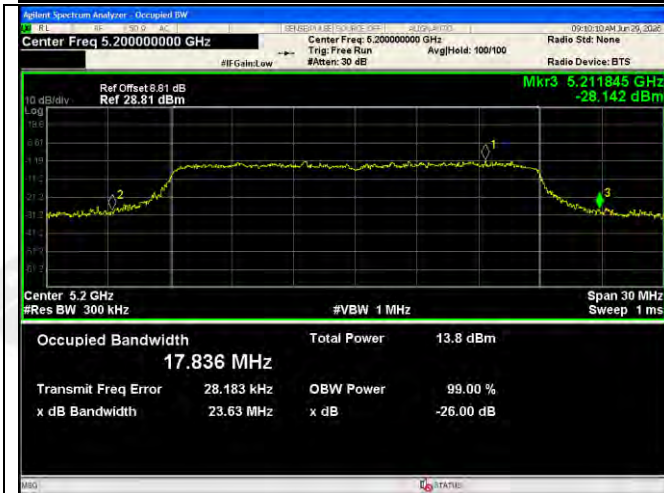


Test Graph:

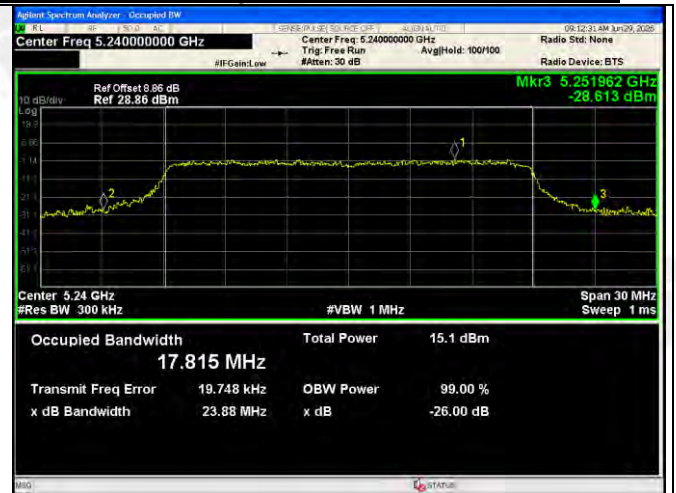
5150-5250MHz

ANT1





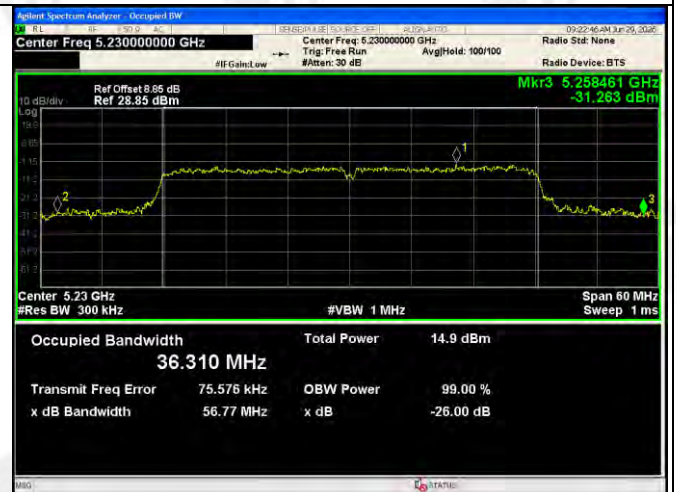
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802.11ac(VHT40)-5230



802.11ac(VHT80)-5210



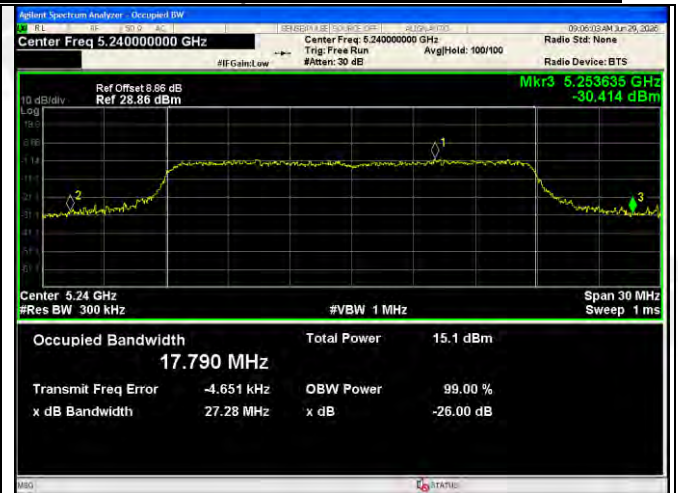
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802.11n(HT20)-5200



802.11n(HT20)-5240



802.11n(HT40)-5190

802.11n(HT40)-5230





ANT2

802.11a-5180



802.11a-5200



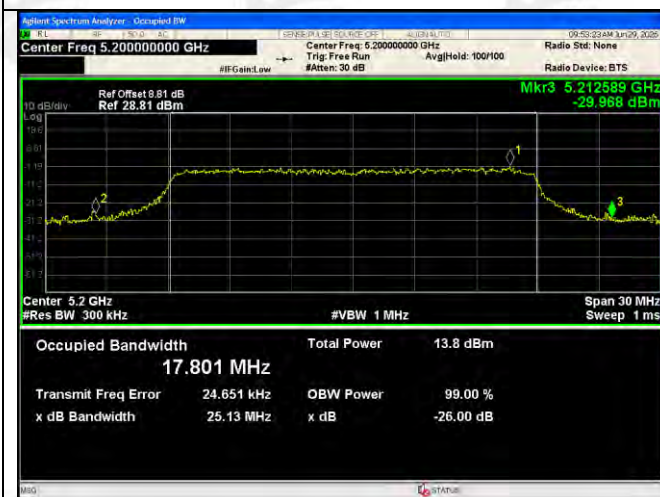
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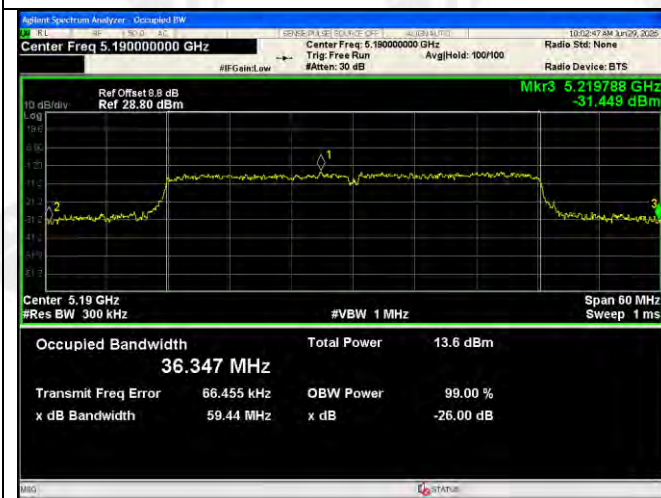


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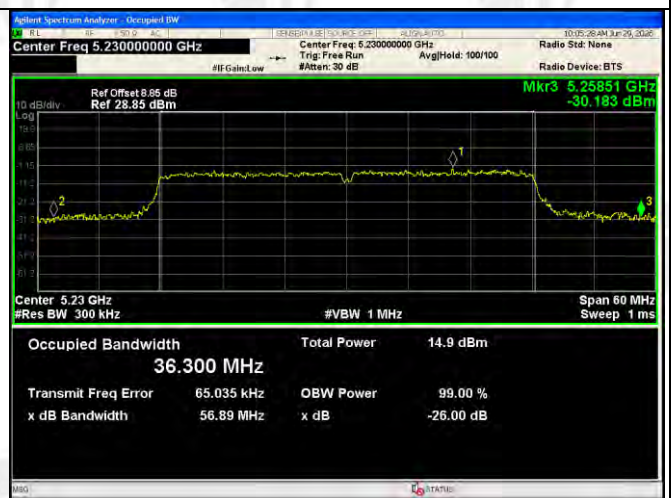




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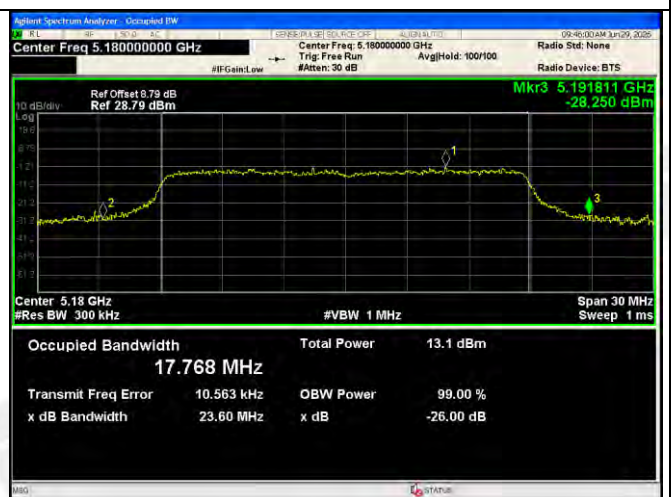
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802.11ac(VHT80)-5210



802.11n(HT20)-5180



802.11n(HT20)-5200



802.11n(HT20)-5240



802.11n(HT40)-5190



802.11n(HT40)-5230







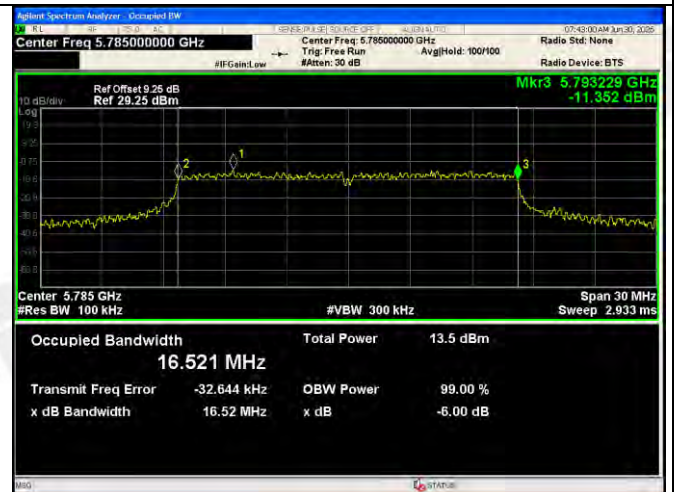
5725-5850MHz:

ANT1

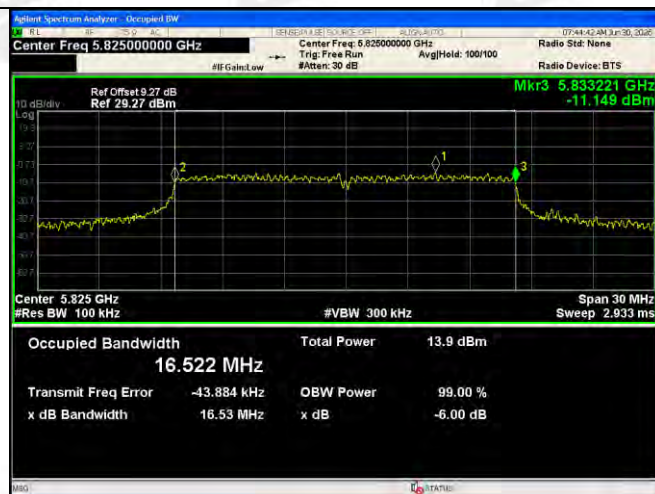
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802.11a-5785



802.11a-5825



802.11ac(VHT20)-5745



802.11ac(VHT20)-5785

802.11ac(VHT20)-5825



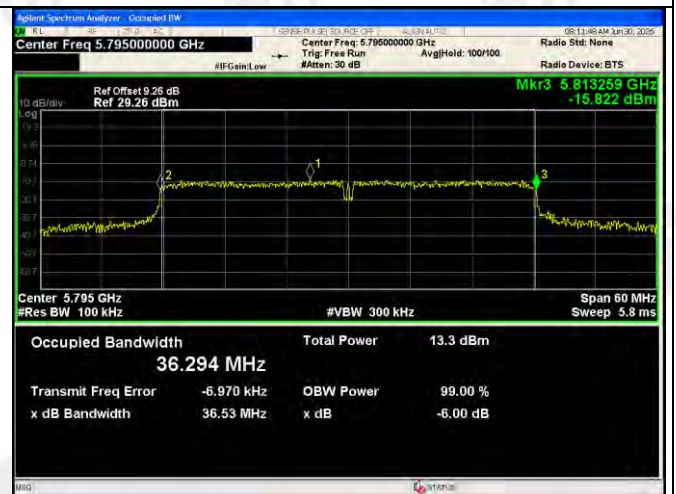
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802.11ac(VHT40)-5795



802.11ac(VHT80)-5775



802.11n(HT20)-5745



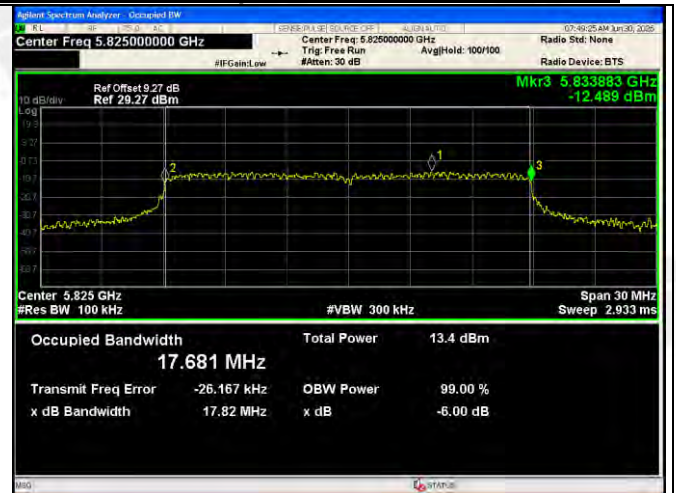
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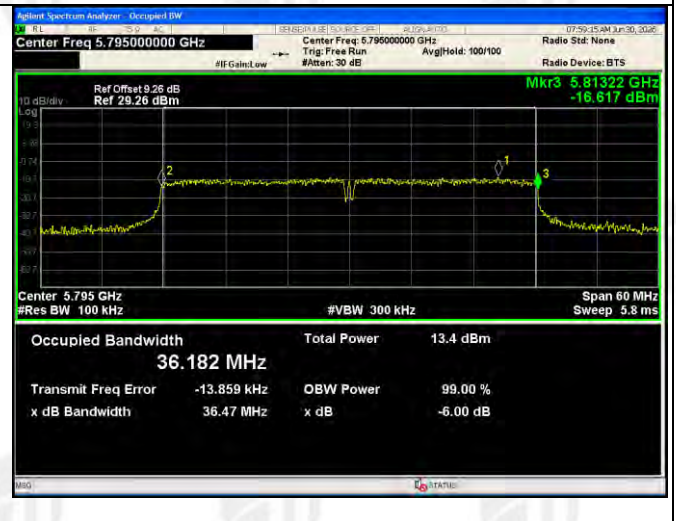
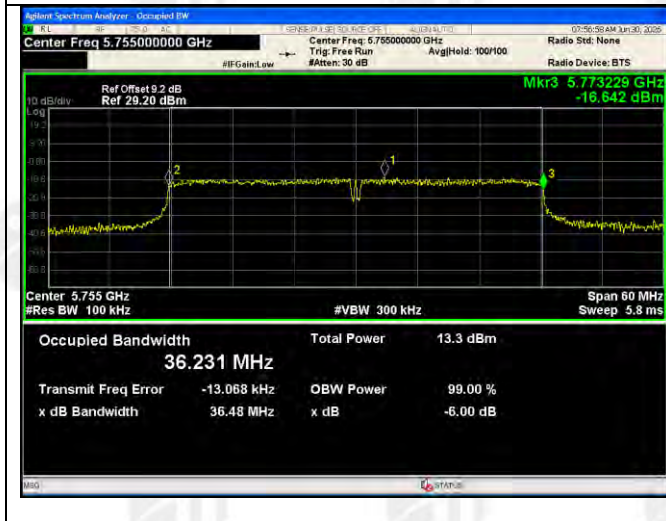
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802.11n(HT40)-5795



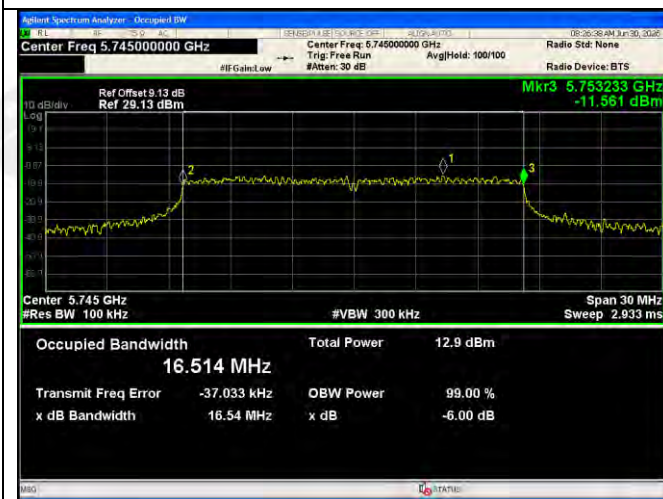
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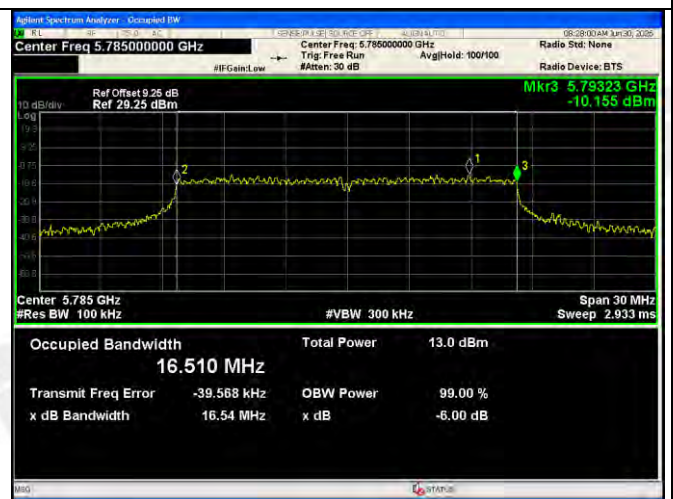


ANT2

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



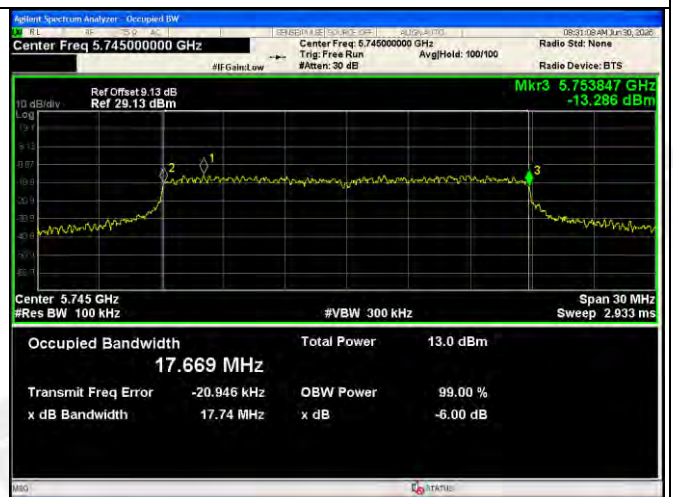
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802.11ac(VHT80)-5775



802.11n(HT20)-5745



802.11n(HT20)-5785

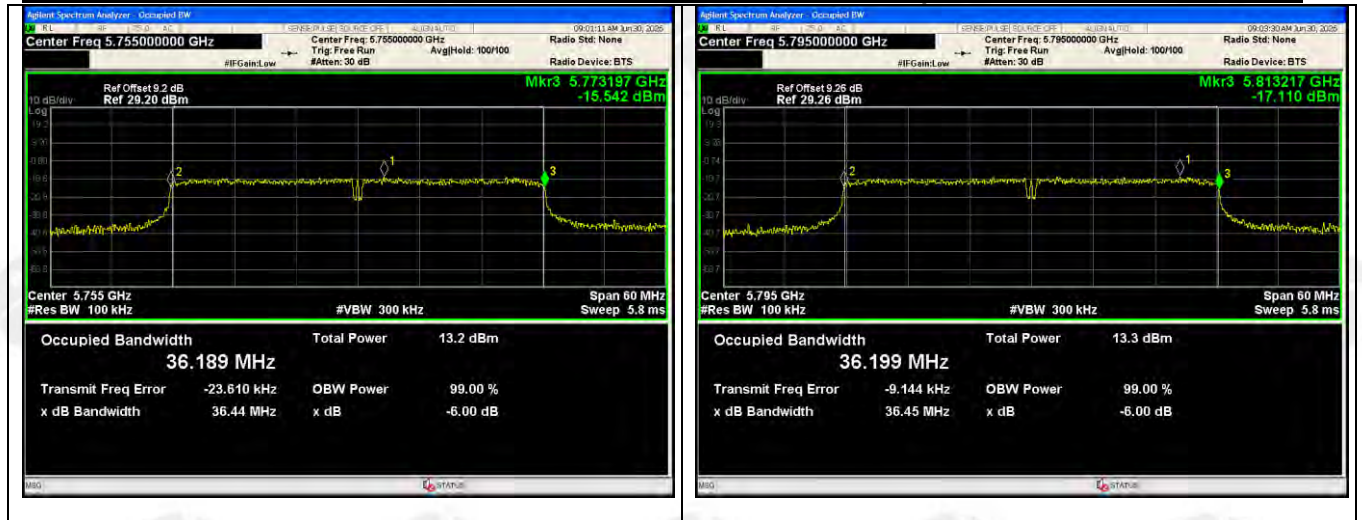


802.11n(HT20)-5825



802.11n(HT40)-5795

802.11n(HT40)-5825



11 Maximum Conducted Output Power

11.1 Test Standard and Limit

According to FCC §15.407

For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi.

If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).

For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi.

If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power.

For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power is required for each 1 dB of antenna gain in excess of 23 dBi. 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.

For 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.

If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

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.

If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

For the band 5.725-5.850 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power 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.

11.2 Test Setup





11.3 Test Procedure

The EUT was directly connected to the Power meter

1. Device Configuration

If possible, configure or modify the operation of the EUT so that it transmits continuously at its maximum power control level (see section II.B.).

The intent is to test at 100 percent duty cycle; however a small reduction in duty cycle (to no lower than 98 percent) is permitted if required by the EUT for amplitude control purposes. Manufacturers are expected to provide software to the test lab to permit such continuous operation.

b) If continuous transmission (or at least 98 percent duty cycle) cannot be achieved due to hardware limitations (e.g., overheating), the EUT shall be operated at its maximum power control level with the transmit duration as long as possible and the duty cycle as high as possible.

Measurement using a Power Meter(PM)

a) Method PM (Measurement using an RF average power meter):

(i) Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the following conditions are satisfied:

- The EUT is configured to transmit continuously or to transmit with a constant duty cycle.
- At all times when the EUT is transmitting, it must be transmitting at its maximum power control level.
- The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.

(i) If the transmitter does not transmit continuously, measure the duty cycle, x , of the transmitter output signal as described in IIL.B.

(ii) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.

(iv) Adjust the measurement in dBm by adding $10 \log (1/x)$ where x is the duty cycle (e.g. $10 \log (1/0.25)$ if the duty cycle is 25%).

b) Method PM-G (Measurement using a gated RF average power meter):

Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.



11.4 Test Data

5150-5250MHz:

Test mode1	Test Channel (MHz)	Output Power dBm ANT1	Output Power dBm ANT2	Output Power dBm Total	Limit dBm
802.11a	5180	12.132	11.633	/	30
	5200	12.513	12.174	/	30
	5240	13.773	13.929	/	30
802.11ac20	5180	11.849	11.911	14.890	30
	5200	12.383	12.355	15.379	30
	5240	13.659	13.663	16.671	30
802.11ac40	5190	11.762	11.847	14.815	30
	5230	13.225	13.208	16.227	30
802.11ac80	5210	12.489	12.023	15.273	30
802.11n(HT20)	5180	11.87	11.698	14.795	30
	5200	12.428	12.336	15.393	30
	5240	13.681	13.712	16.707	30
802.11n(HT40)	5190	11.965	12.088	15.037	30
	5230	13.45	13.437	16.454	30

5725-5850MHz:

Test mode1	Test Channel (MHz)	Output Power dBm ANT1	Output Power dBm ANT2	Output Power dBm Total	Limit dBm
802.11a	5745	12.229	11.349	/	23.98
	5785	11.865	11.439	/	23.98
	5825	12.365	11.508	/	23.98
802.11ac20	5745	11.078	11.073	14.086	23.98
	5785	11.404	11.17	14.299	23.98
	5825	11.525	11.305	14.427	23.98
802.11ac40	5755	11.044	10.996	14.030	23.98
	5795	11.182	11.19	14.196	23.98
802.11ac80	5775	10.612	10.96	13.800	23.98
802.11n(HT20)	5745	11.444	11.094	14.283	23.98
	5785	11.5	11.218	14.372	23.98
	5825	11.64	10.995	14.340	23.98
802.11n(HT40)	5755	11.438	11.307	14.383	23.98
	5795	11.384	11.318	14.361	23.98

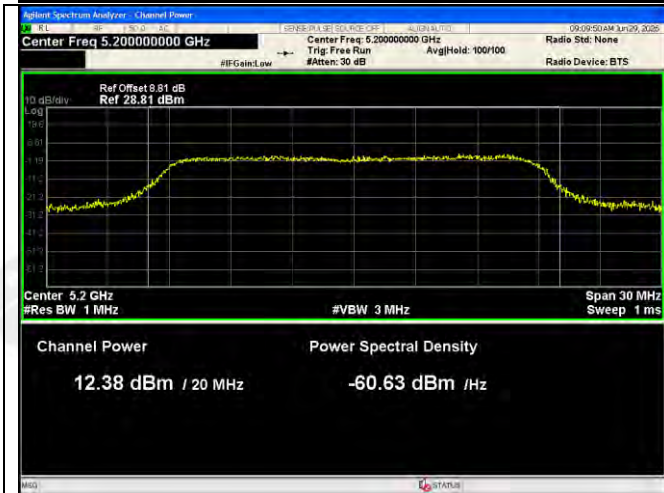


Test Graph:

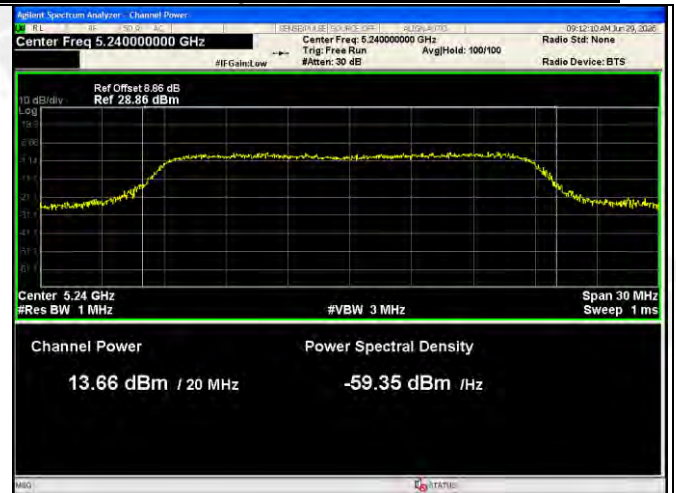
5150-5250MHz-Power

ANT1





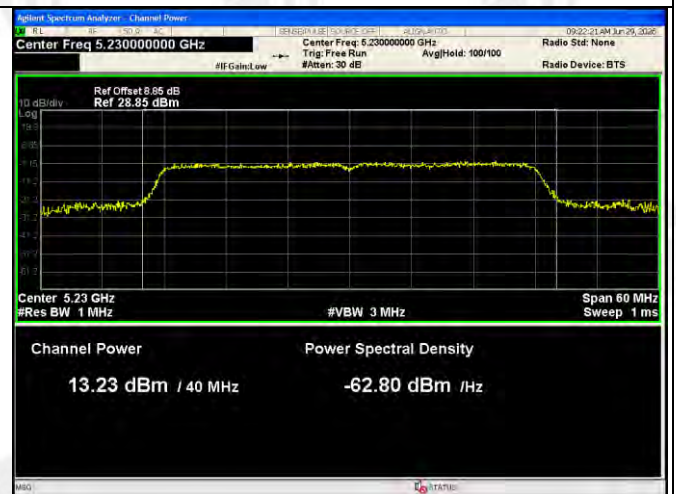
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802.11ac(VHT40)-5230



802.11ac(VHT80)-5210



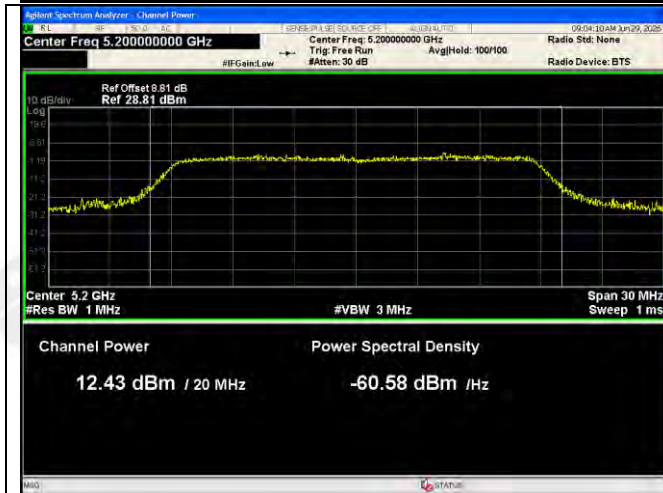
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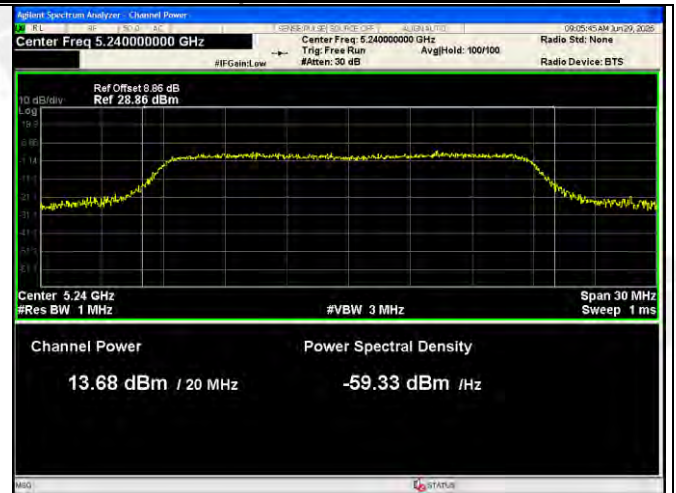
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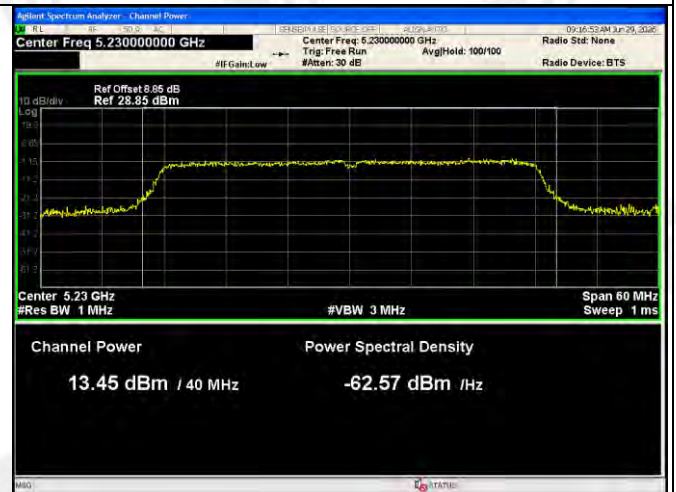
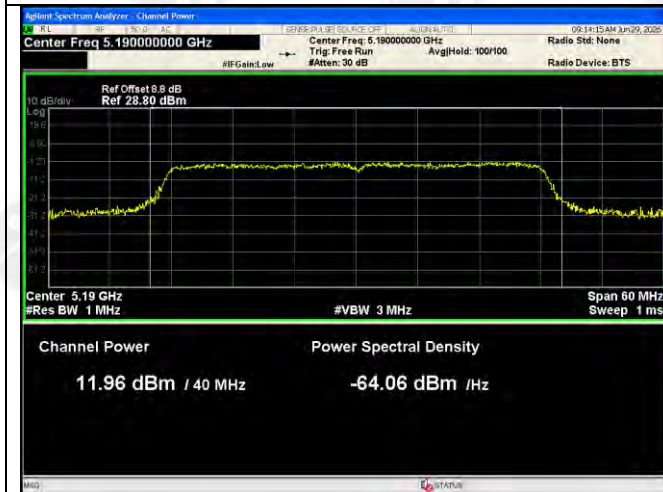
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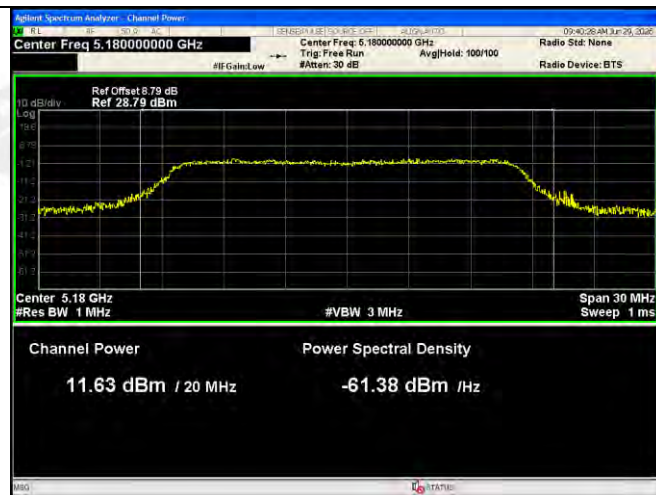
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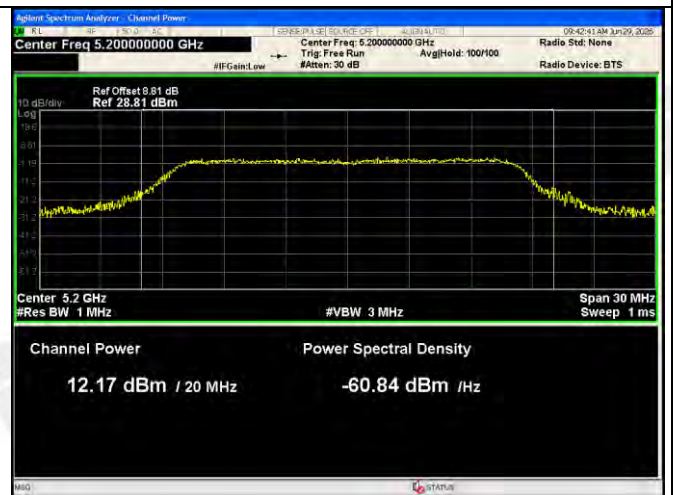


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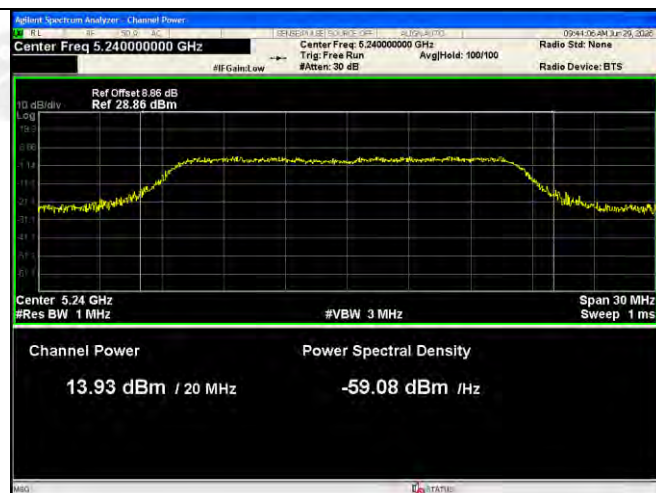
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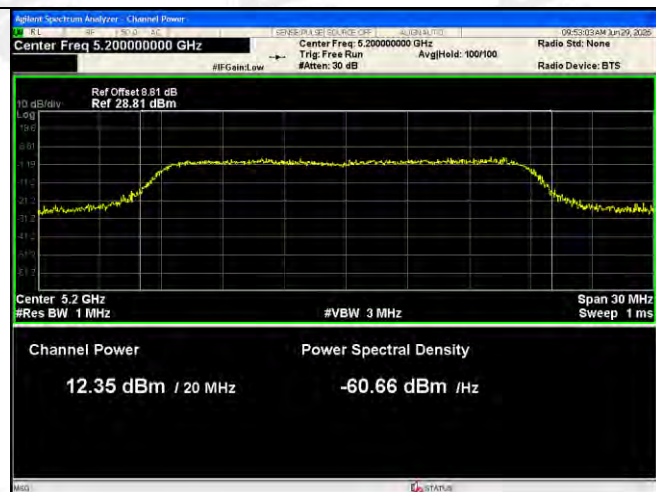
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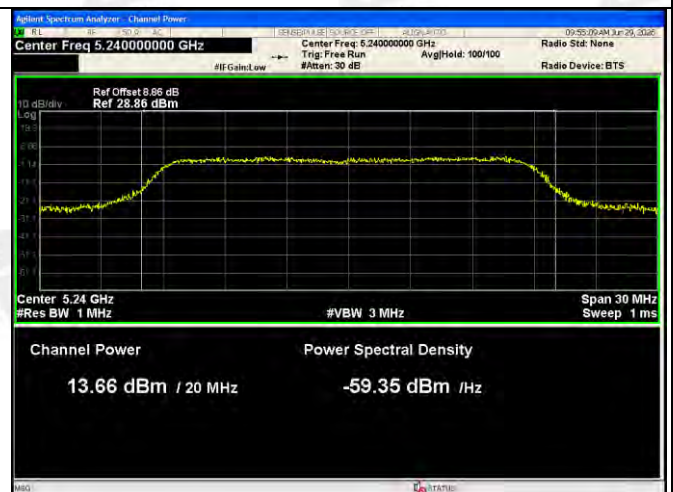
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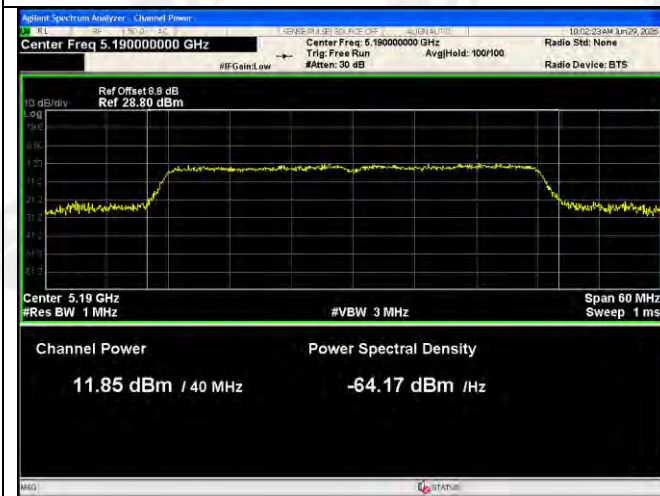


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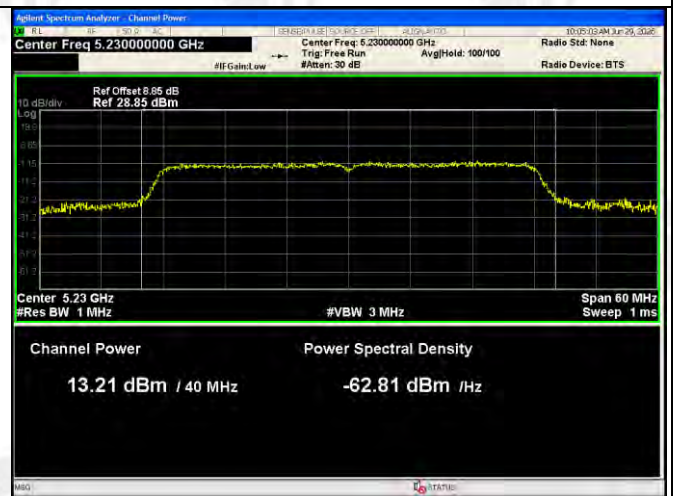




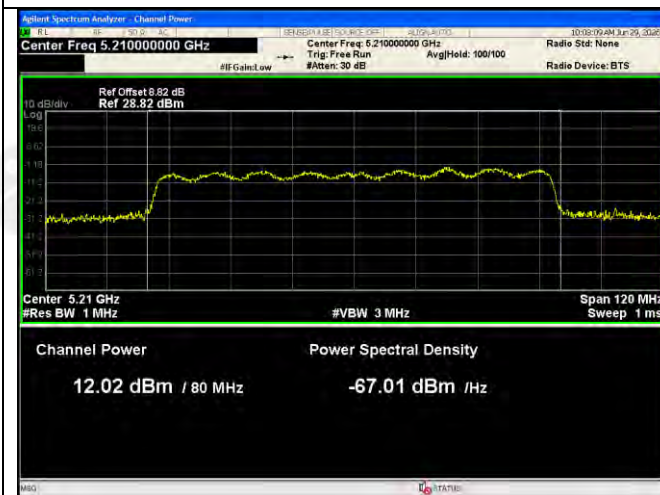
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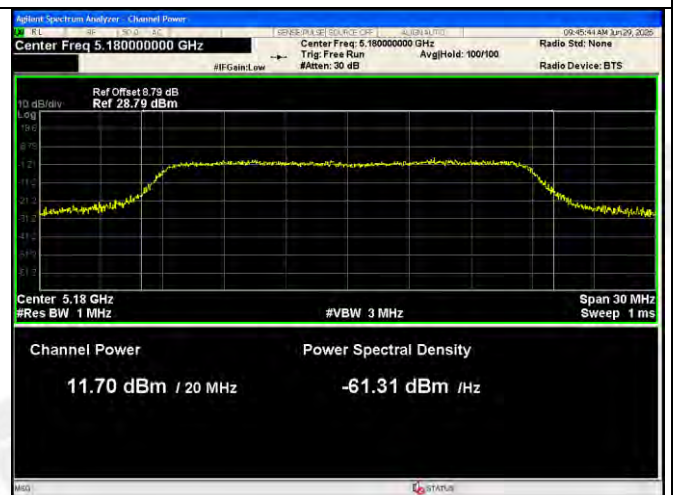
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802.11ac(VHT80)-5210



802.11n(HT20)-5180



802.11n(HT20)-5200

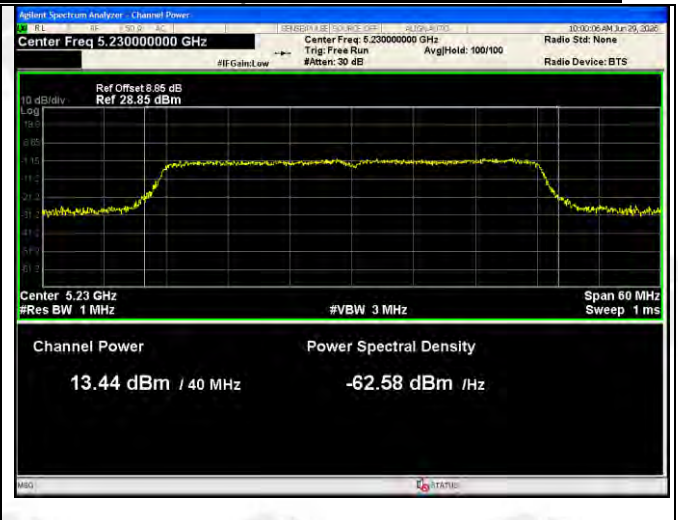
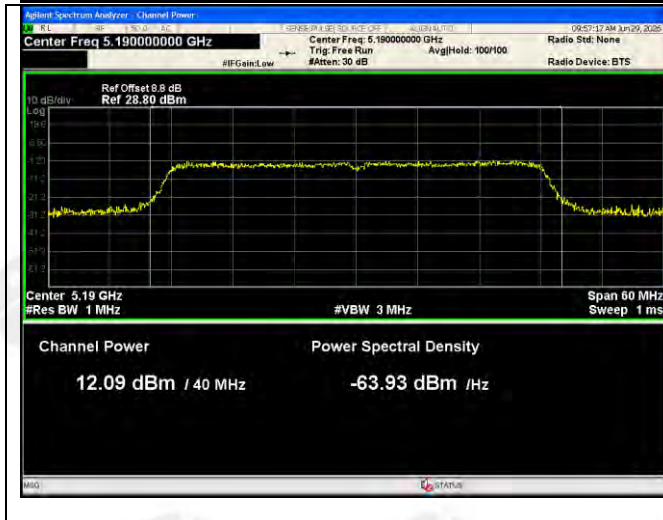


802.11n(HT20)-5240



802.11n(HT40)-5190

802.11n(HT40)-5230





5725-5850MHz:-Power

ANT1

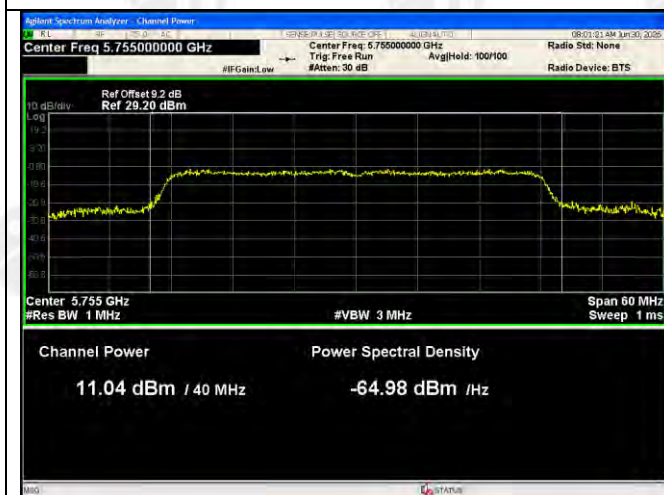




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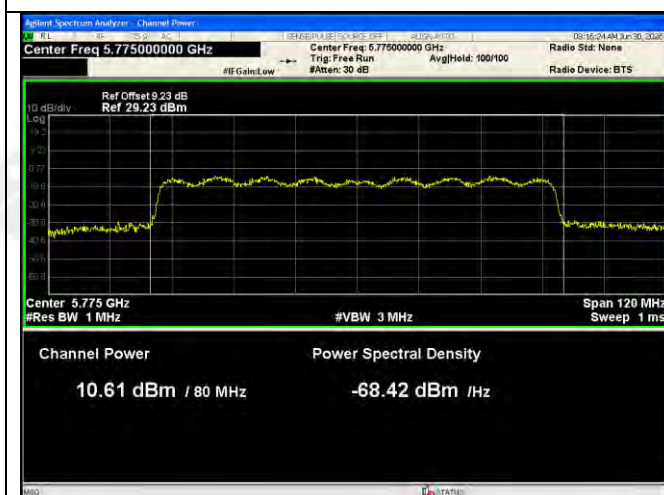
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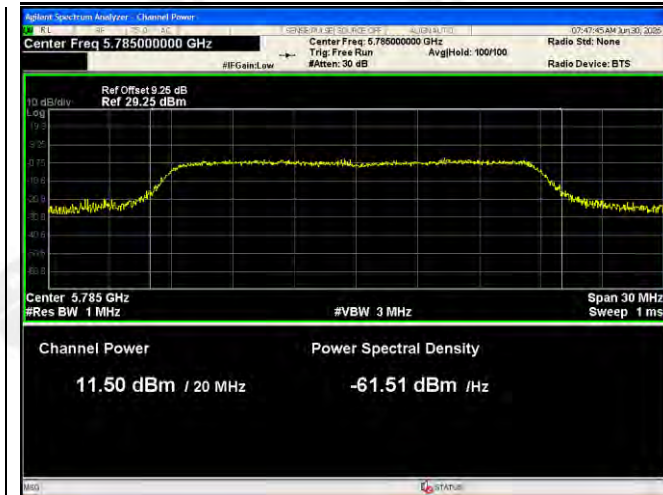
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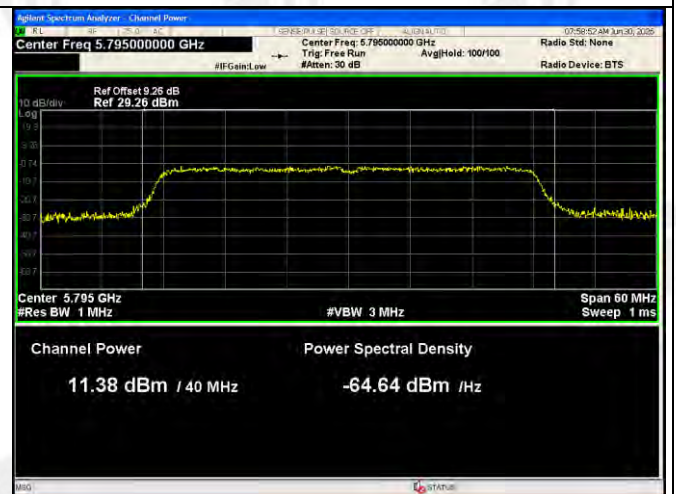
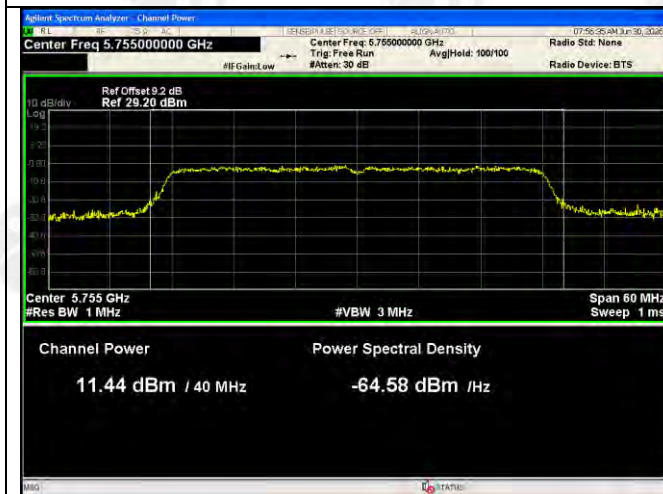
802.11n(HT20)-5825



802.11n(HT40)-5795



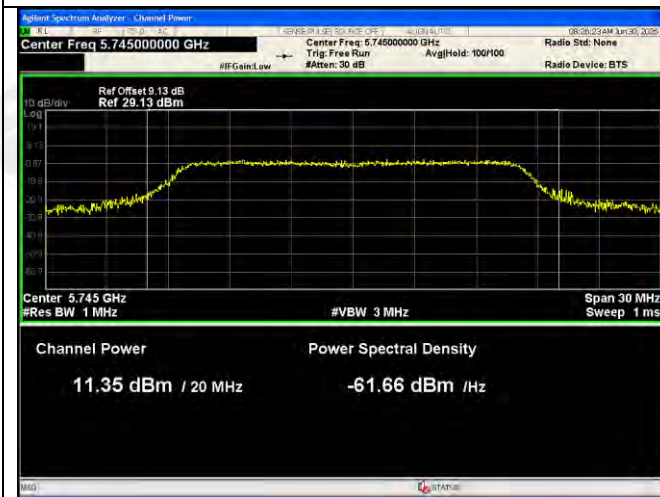
802.11n(HT40)-5825



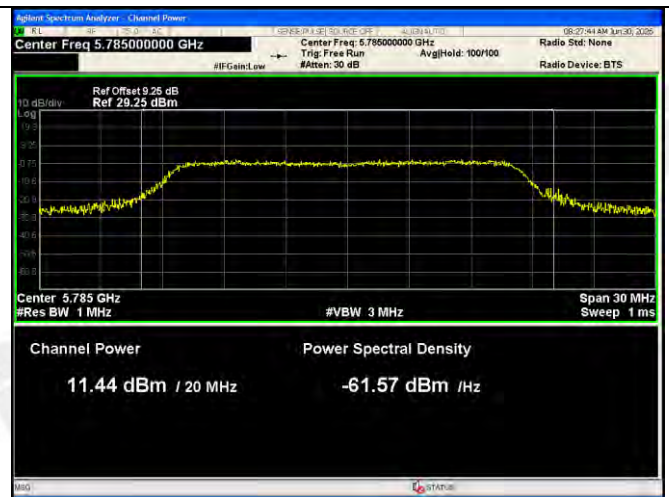


ANT2

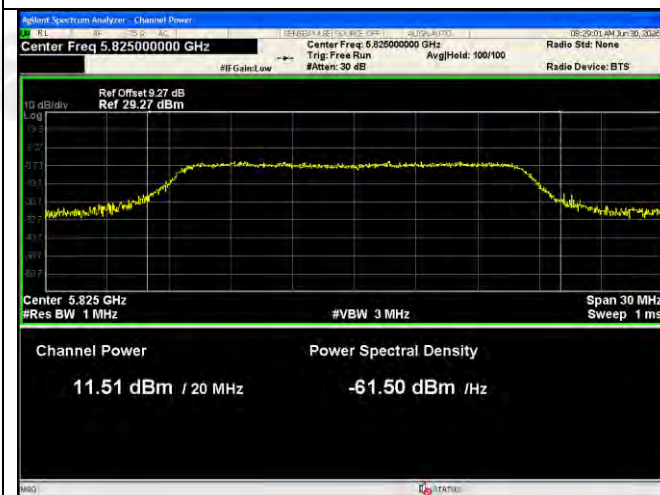
802.11a-5745



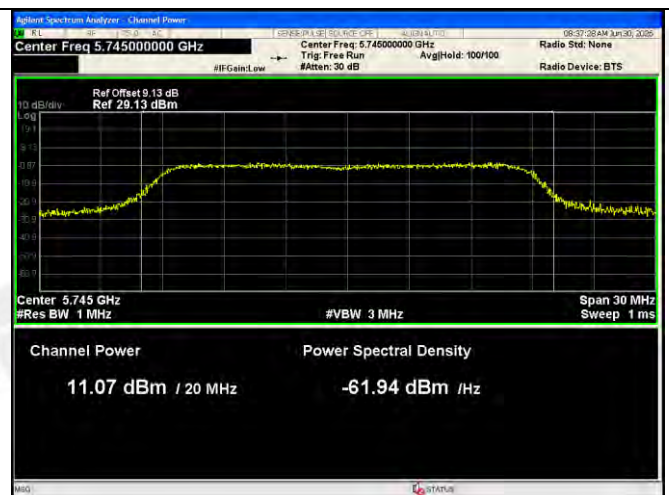
802.11a-5785



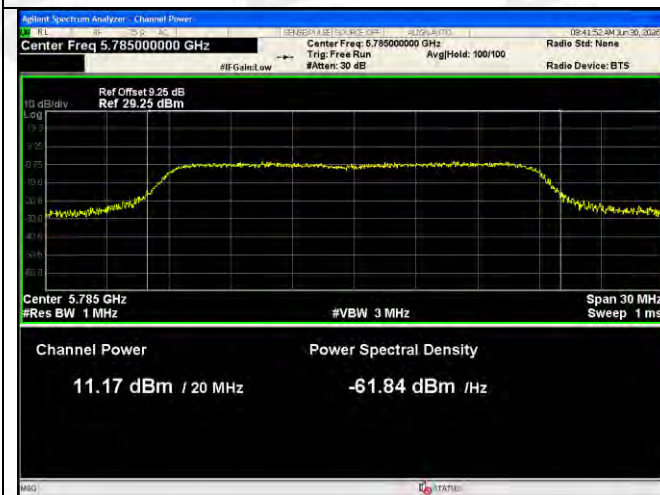
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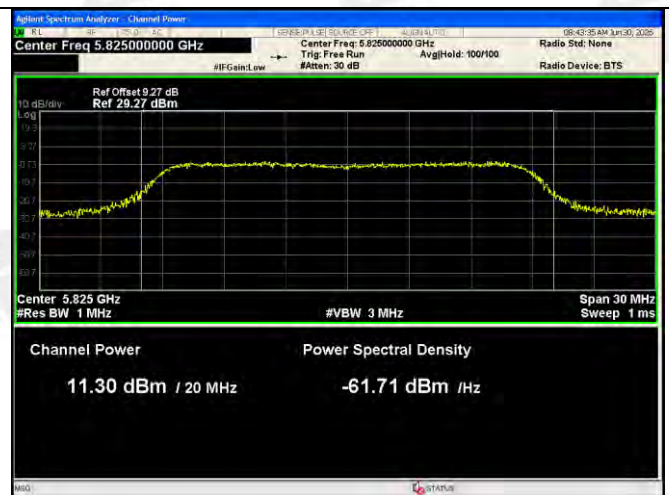
802.11ac(VHT20)-5745



802.11ac(VHT20)-5785

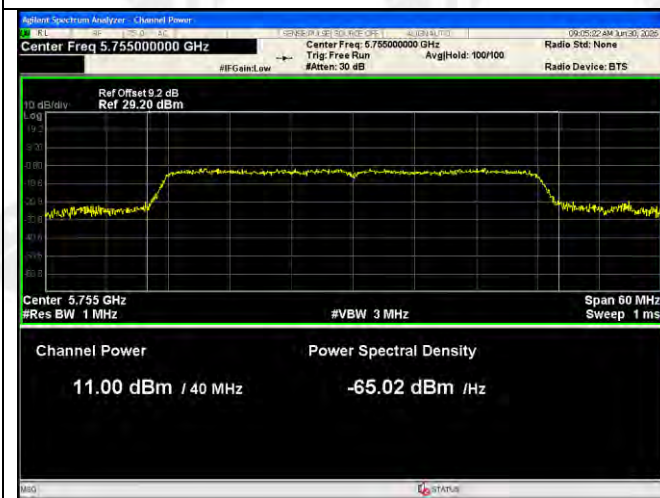


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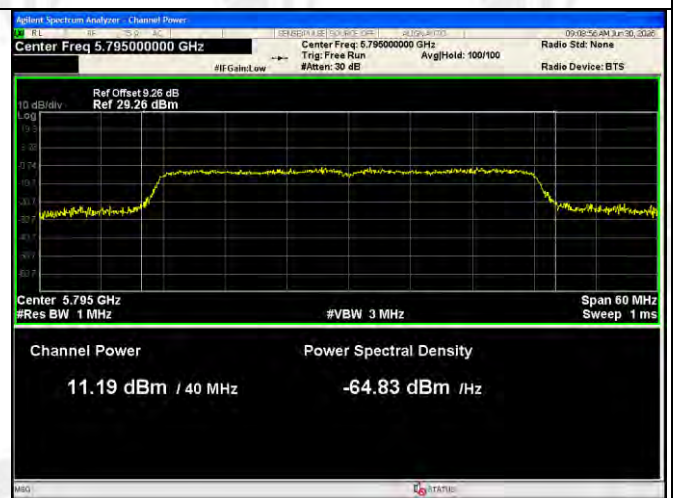




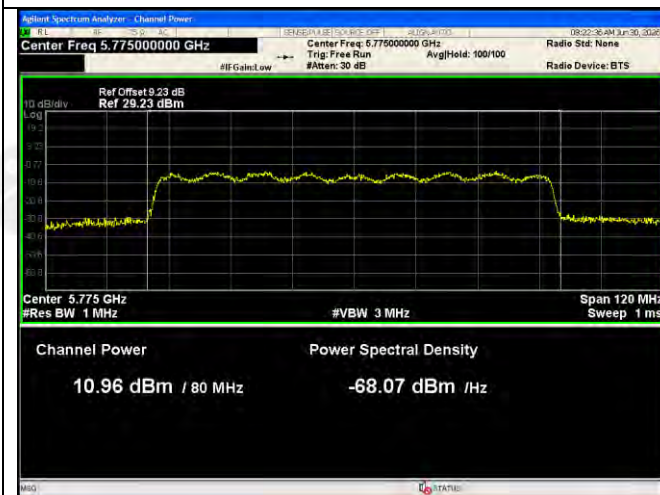
802.11ac(VHT40)-5755



802.11ac(VHT40)-5795



802.11ac(VHT80)-5775



802.11n(HT20)-5745



802.11n(HT20)-5785

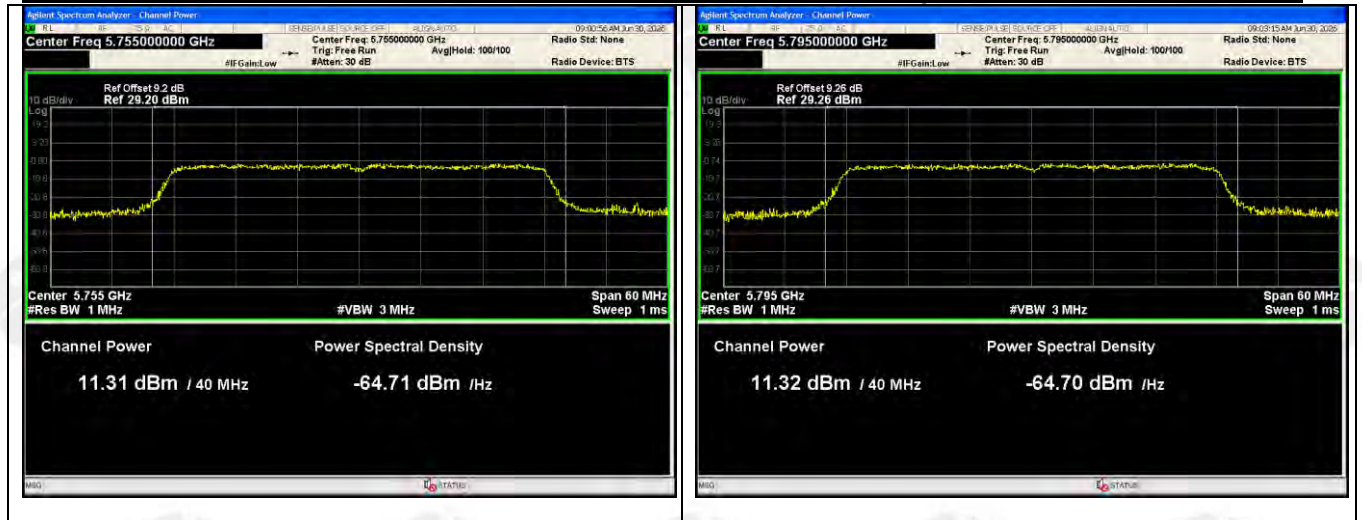


802.11n(HT20)-5825



802.11n(HT40)-5795

802.11n(HT40)-5825





12 Out of Band Emissions and Spurious Emission

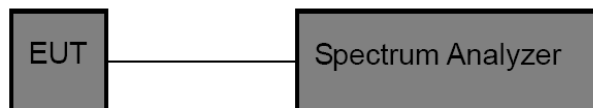
12.1 Test Standard and Limit

According to FCC §15.407(b)

Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

- (1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.
- (2) For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of -27 dBm/MHz.

12.2 Test Setup



12.3 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW of spectrum analyzer to 1 MHz with a convenient frequency span.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

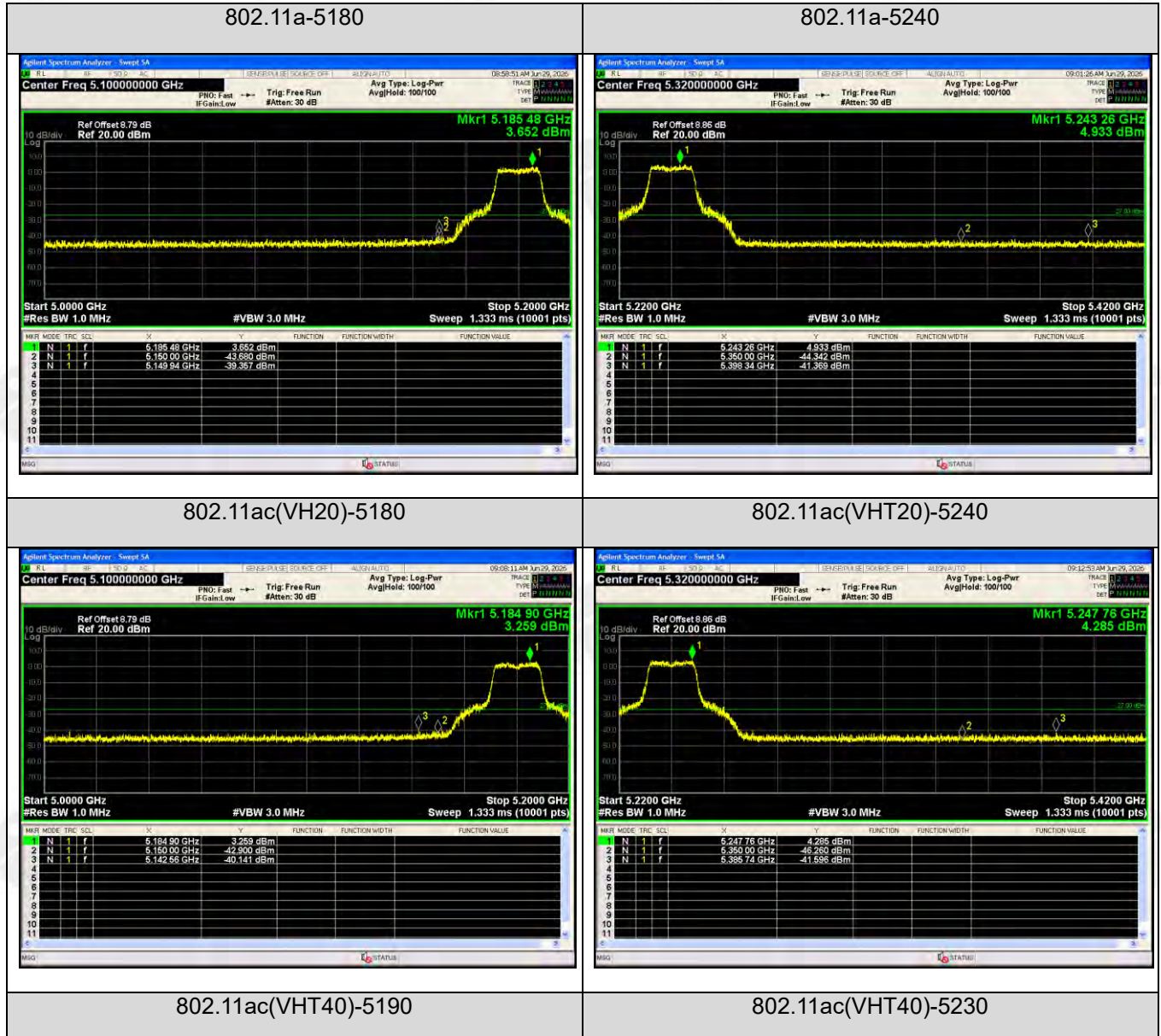


12.4 Test Data

Test Graph

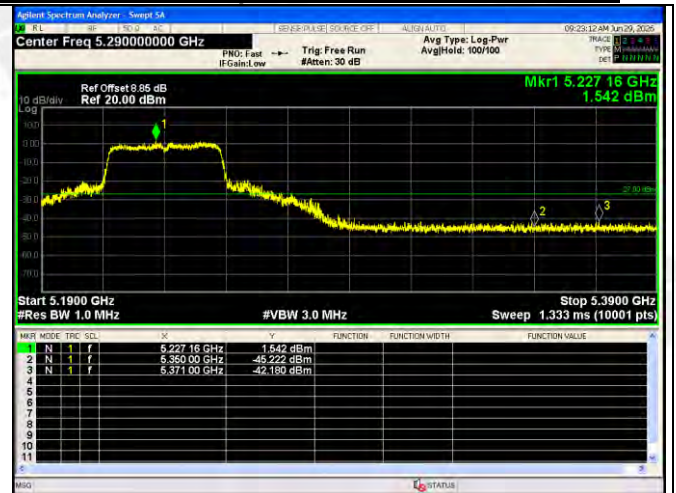
5150-5250MHz:

ANT 1

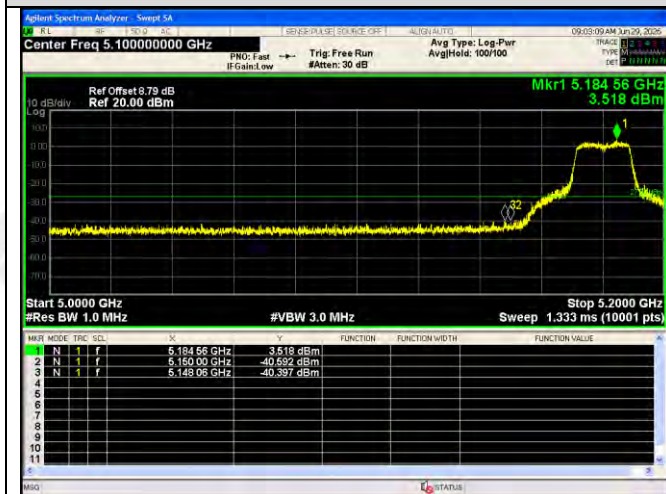




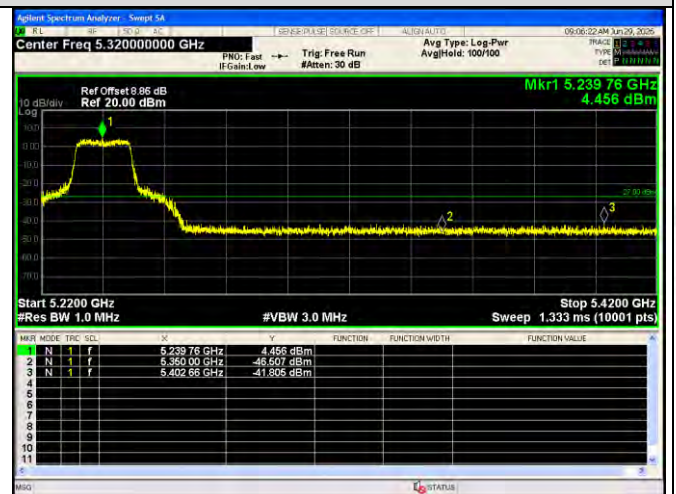
802.11n(HT20)-5180



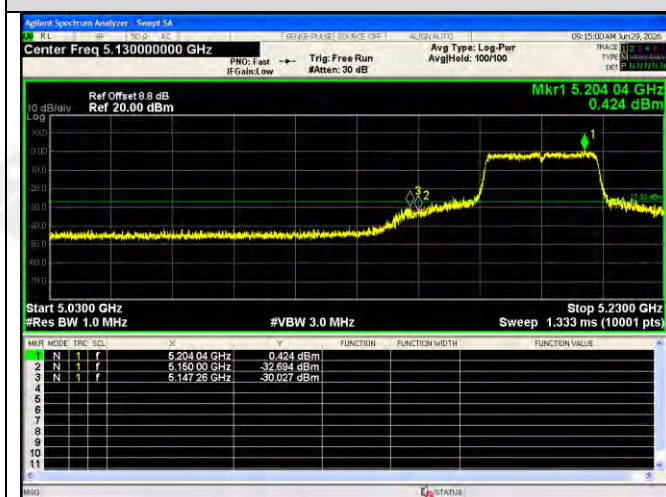
802.11n(HT20)-5240



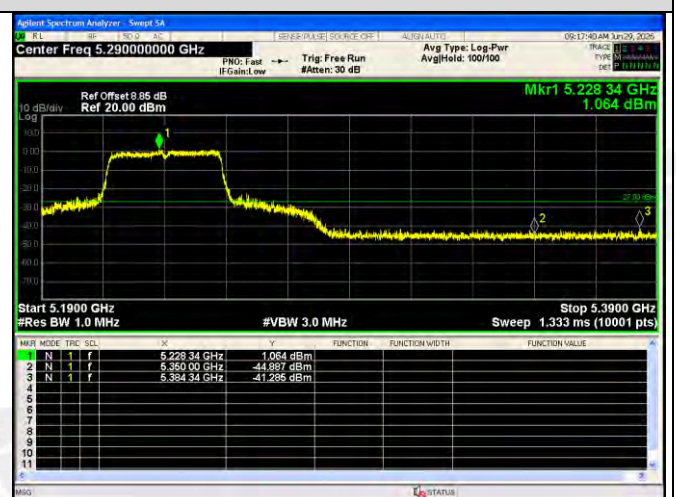
802.11n(HT40)-5190



802.11n(HT40)-5230



802.11ac(VHT80)-5210

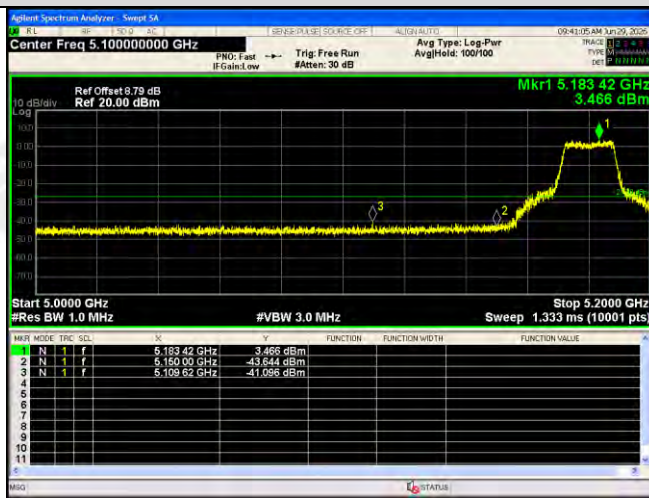




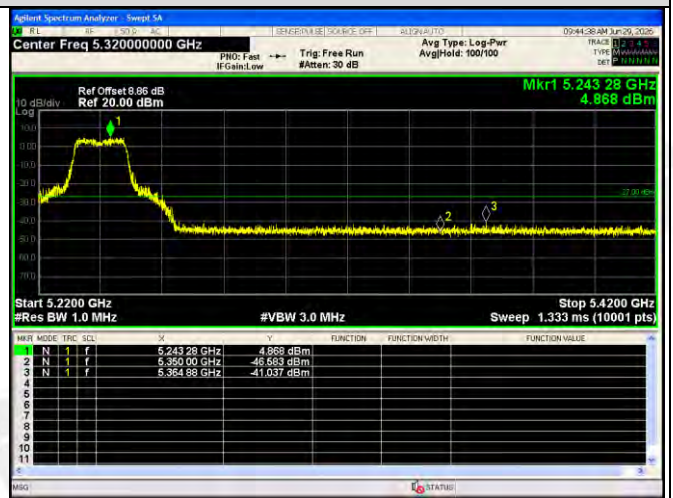


ANT 2

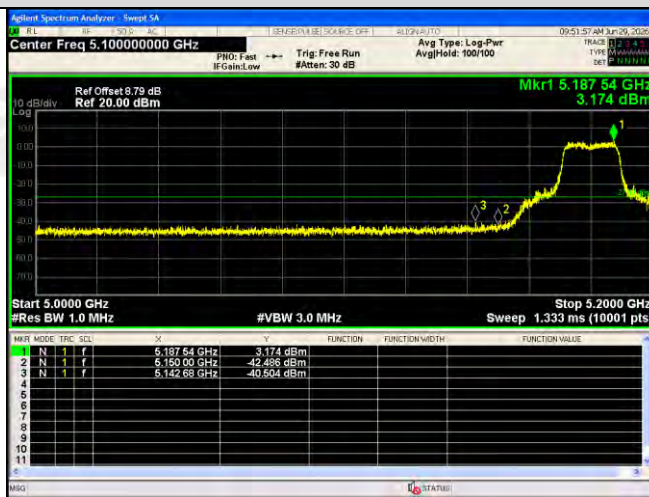
802.11a-5180



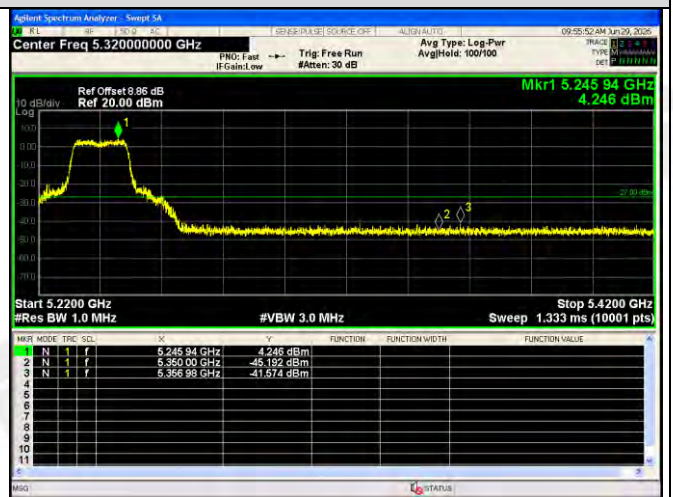
802.11a-5240



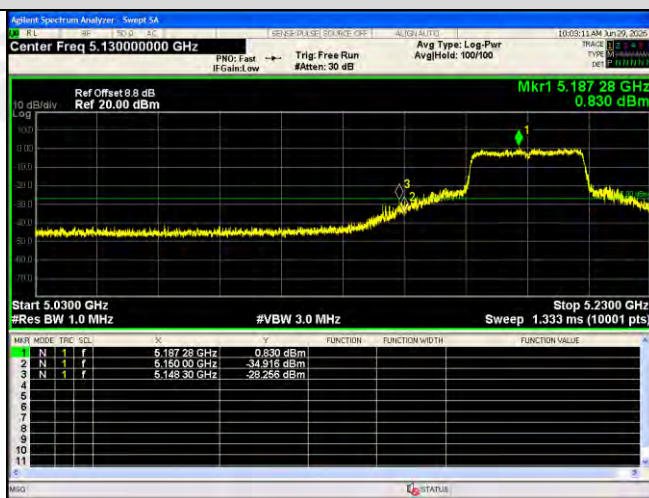
802.11ac(VHT20)-5180



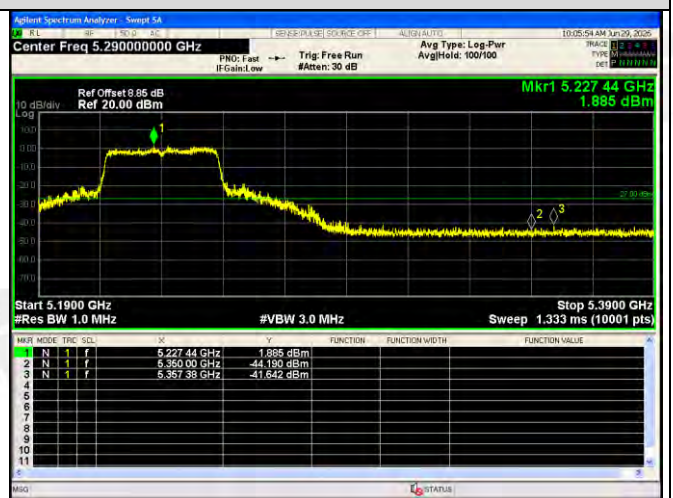
802.11ac(VHT20)-5240



802.11ac(VHT40)-5190



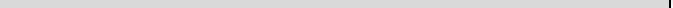
802.11ac(VHT40)-5230



802.11n(HT20)-5180

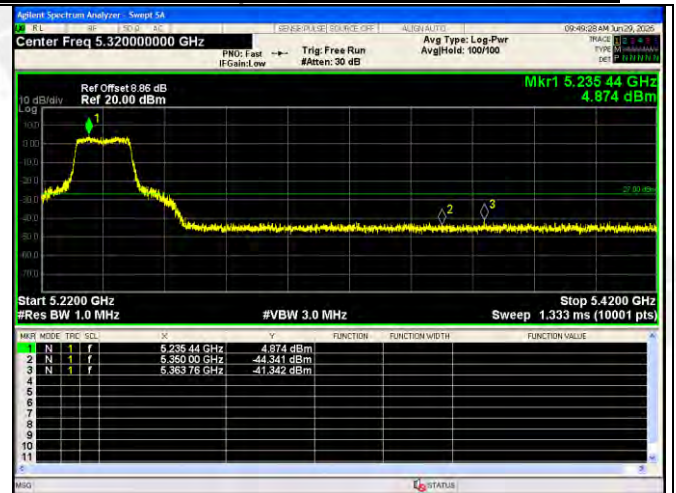


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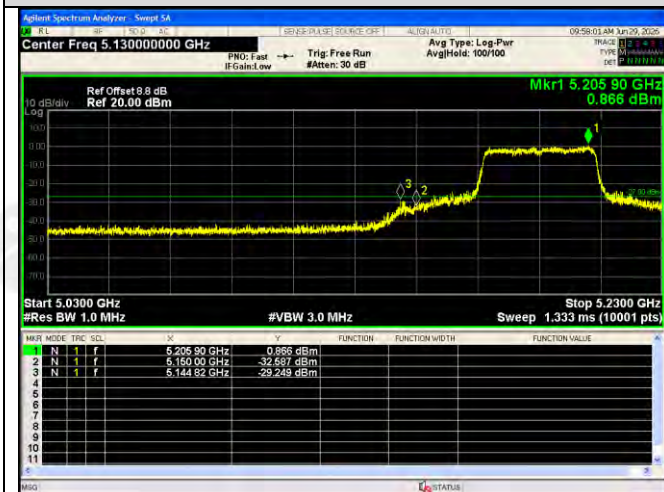




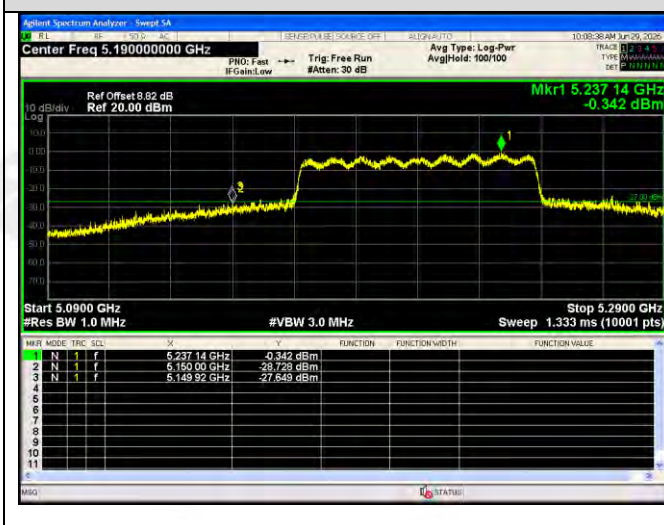
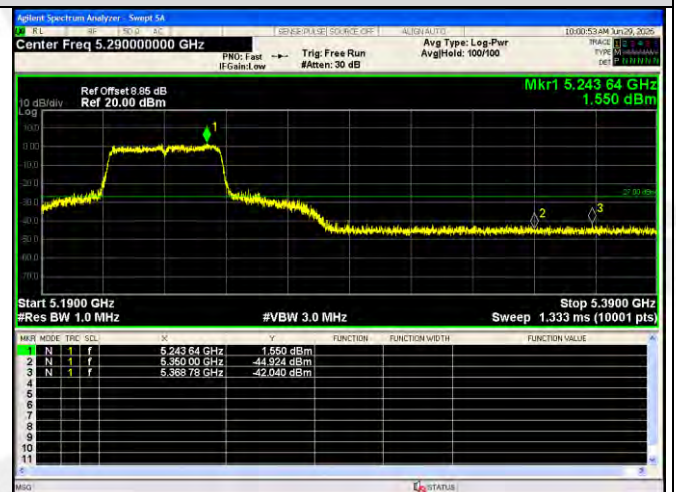
802.11n(HT40)-5190



802.11n(HT40)-5230



802.11ac(VHT80)-5210





5725-5850MHz

ANT1

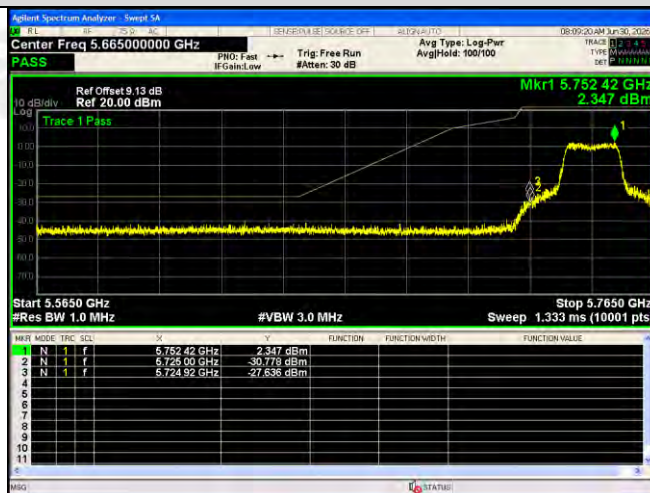
802.11a-5745



802.11a-5825



802.11ac(VHT20)-5745



802.11ac(VHT20)-5825



802.11ac(VHT40)-5755



802.11ac(VHT40)-5795





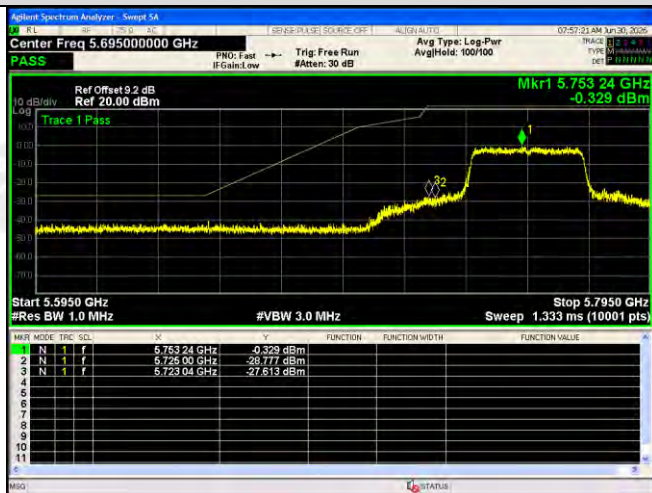
802.11(n20)-5745



802.11(n20)-5825



802.11(n40)-5755



802.11(n40)-5795



802.11ac(VHT80)-5775



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ANT2

802.11a-5745



802.11a-5825



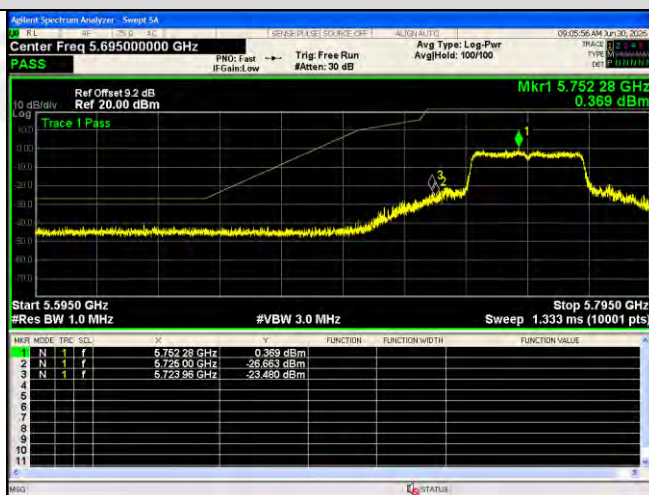
802.11ac(VHT20)-5745



802.11ac(VHT20)-5825



802.11ac(VHT40)-5755

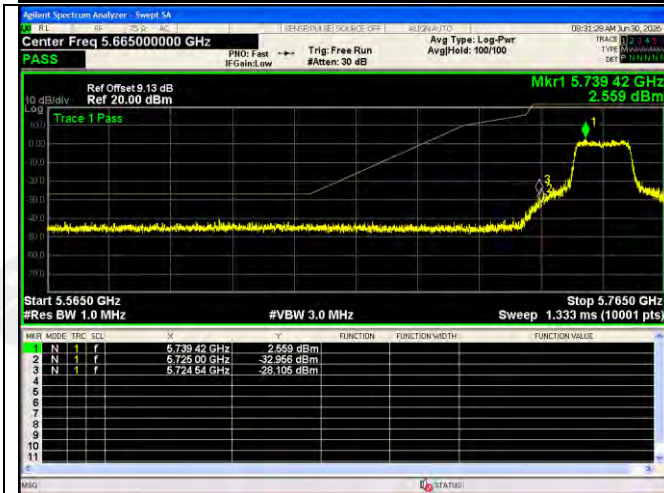


802.11ac(VHT40)-5795



802.11(n20)-5745

802.11(n20)-5825



802.11(n40)-5755



802.11(n40)-5795



802.11ac(VHT80)-5775



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/

13 Frequency Stability Measurement

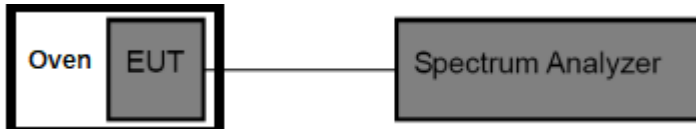
13.1 Test Standard and Limit

FCC

Manufactures 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.

The transmitter center frequency tolerance shall be ± 20 ppm maximum for the 5 GHz band (IEEE 802.11n specification).

13.2 Test Setup



13.3 Test Procedure

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.
5. f_c is declaring of channel frequency. Then the frequency error formula is $(f_c - f) / f_c \times 10^6$ ppm and the limit is less than ± 20 ppm (IEEE 802.11n specification).
6. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
7. Extreme temperature is $-20^\circ\text{C} \sim 50^\circ\text{C}$.

13.4 Test Data

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	5180.0003	5180	0.0003	0.0518
		V max (V)	132	5180.0209	5180	0.0209	4.0396
		V min (V)	108	5180.1061	5180	0.1061	20.4895
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	5180.0166	5180	0.0166	3.2094
		T (°C)	10	5180.0087	5180	0.0087	1.6851
		T (°C)	20	5180.0293	5180	0.0293	5.6506
		T (°C)	30	5180.0217	5180	0.0217	4.1931
		T (°C)	40	5180.0076	5180	0.0076	1.4688
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	5200.0091	5200	0.0091	1.7506
		V max (V)	132	5200.0505	5200	0.0505	9.7020
		V min (V)	108	5200.0362	5200	0.0362	6.9697
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	5200.0326	5200	0.0326	6.2636
		T (°C)	10	5200.0050	5200	0.0050	0.9701
		T (°C)	20	5200.0149	5200	0.0149	2.8726
		T (°C)	30	5200.0095	5200	0.0095	1.8178
		T (°C)	40	5200.0362	5200	0.0362	6.9654
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	5240.0307	5240	0.0307	5.8633
		V max (V)	132	5240.0246	5240	0.0246	4.7024
		V min (V)	108	5240.0180	5240	0.0180	3.4407
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	5240.0221	5240	0.0221	4.2153
		T (°C)	10	5240.0445	5240	0.0445	8.4987
		T (°C)	20	5240.0374	5240	0.0374	7.1345
		T (°C)	30	5240.0060	5240	0.0060	1.1373
		T (°C)	40	5240.0288	5240	0.0288	5.4990
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	5745.0327	5745	0.0327	5.6972
		V max (V)	132	5745.0586	5745	0.0586	10.1977
		V min (V)	108	5745.0327	5745	0.0327	5.6972
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	5745.0275	5745	0.0275	4.7859
		T (°C)	10	5745.0230	5745	0.0230	4.0082
		T (°C)	20	5745.0061	5745	0.0061	1.0554
		T (°C)	30	5745.0409	5745	0.0409	7.1203
		T (°C)	40	5745.0793	5745	0.0793	13.8012
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	5785.0121	5785	0.0121	2.0853
		V max (V)	132	5785.0031	5785	0.0031	0.5361
		V min (V)	108	5785.0203	5785	0.0203	3.5160
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	5785.0733	5785	0.0733	12.6628
		T (°C)	10	5785.0412	5785	0.0412	7.1216
		T (°C)	20	5785.0064	5785	0.0064	1.0982
		T (°C)	30	5785.0116	5785	0.0116	2.0006
		T (°C)	40	5785.0277	5785	0.0277	4.7930
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	5825.0704	5825	0.0704	12.0842
		V max (V)	132	5825.0105	5825	0.0105	1.8100
		V min (V)	108	5825.0006	5825	0.0006	0.1094
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	5825.0230	5825	0.0230	3.9547
		T (°C)	10	5825.0308	5825	0.0308	5.2890
		T (°C)	20	5825.0694	5825	0.0694	11.9110
		T (°C)	30	5825.0071	5825	0.0071	1.2274
		T (°C)	40	5825.0212	5825	0.0212	3.6373
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	5180.0415	5180	0.0415	8.0090
		V max (V)	132	5180.0706	5180	0.0706	13.6324
		V min (V)	108	5180.0572	5180	0.0572	11.0423
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	5180.0215	5180	0.0215	4.1556
		T (°C)	10	5180.0516	5180	0.0516	9.9641
		T (°C)	20	5180.0398	5180	0.0398	7.6758
		T (°C)	30	5180.0036	5180	0.0036	0.6949
		T (°C)	40	5180.0708	5180	0.0708	13.6680
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	5200.0247	5200	0.0247	4.7584
		V max (V)	132	5200.0899	5200	0.0899	17.2814
		V min (V)	108	5200.0665	5200	0.0665	12.7831
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	5200.0235	5200	0.0235	4.5253
		T (°C)	10	5200.0450	5200	0.0450	8.6483
		T (°C)	20	5200.0084	5200	0.0084	1.6205
		T (°C)	30	5200.0408	5200	0.0408	7.8510
		T (°C)	40	5200.0910	5200	0.0910	17.4963
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	5240.0114	5240	0.0114	2.1696
		V max (V)	132	5240.0061	5240	0.0061	1.1687
		V min (V)	108	5240.0734	5240	0.0734	14.0012
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	5240.0393	5240	0.0393	7.5081
		T (°C)	10	5240.0435	5240	0.0435	8.2946
		T (°C)	20	5240.0592	5240	0.0592	11.2926
		T (°C)	30	5240.0444	5240	0.0444	8.4750
		T (°C)	40	5240.0743	5240	0.0743	14.1704
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	5745.0245	5745	0.0245	4.2579
		V max (V)	132	5745.0479	5745	0.0479	8.3430
		V min (V)	108	5745.0220	5745	0.0220	3.8295
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	5745.0281	5745	0.0281	4.8996
		T (°C)	10	5745.0701	5745	0.0701	12.2057
		T (°C)	20	5745.0768	5745	0.0768	13.3620
		T (°C)	30	5745.0544	5745	0.0544	9.4757
		T (°C)	40	5745.0742	5745	0.0742	12.9098
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	5785.0687	5785	0.0687	11.8738
		V max (V)	132	5785.0572	5785	0.0572	9.8838
		V min (V)	108	5785.0665	5785	0.0665	11.4900
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	5785.0406	5785	0.0406	7.0133
		T (°C)	10	5785.0534	5785	0.0534	9.2342
		T (°C)	20	5785.0632	5785	0.0632	10.9169
		T (°C)	30	5785.0234	5785	0.0234	4.0477
		T (°C)	40	5785.0775	5785	0.0775	13.3926
		T (°C)	50	5785.0803	5785	0.0803	13.8726
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	5825.0062	5825	0.0062	1.0697
		V max (V)	132	5825.0696	5825	0.0696	11.9540
		V min (V)	108	5825.0629	5825	0.0629	10.8034
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	5825.0217	5825	0.0217	3.7291
		T (°C)	10	5825.0601	5825	0.0601	10.3187
		T (°C)	20	5825.0897	5825	0.0897	15.3999
		T (°C)	30	5825.0246	5825	0.0246	4.2238
		T (°C)	40	5825.0871	5825	0.0871	14.9554
Limits				±20ppm			
Result				Complies			

14 Antenna Requirement

14.1 Test Standard and Requirement

Test Standard	FCC Part15 Section 15.203
Requirement	1) 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.

14.2 Antenna Connected Construction

The antenna is Internal Antenna which permanently attached, and the best case gain of the antenna is Ant1:WiFi (5.2G): 2.48dBi, WiFi (5.8G): 3.45dBi; Ant2: WiFi (5.2G): 2.92dBi, WiFi (5.8G): 2.22dBi.

It complies with the standard requirement.



15 TEST SETUP & EUT PHOTOGRAPH

Reference to EUT photo attachment for details.

----- End of Report -----