



7. MAXIMUM CONDUCTED OUTPUT POWER

7.1 PPLIED PROCEDURES / LIMIT

According to FCC §15.407

The maximum conducted output power should not exceed:

Frequency Band(MHz)	Limit
5150~5250	250mW
5725~5850	1W

7.2 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.).

a) 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.

2. Measurement using a Spectrum Analyzer or EMI Receiver (SA)

Measurement of maximum conducted output power using a spectrum analyzer requires integrating the spectrum across a frequency span that encompasses, at a minimum, either the EBW or the 99-percent occupied bandwidth of the signal. However, the EBW must be used to determine bandwidth dependent limits on maximum conducted output power in accordance with § 15.407(a).

a) The test method shall be selected as follows: (i) Method SA-1 or SA-1 Alternative (averaging with the EUT transmitting at full power throughout each sweep) shall be applied if either of the following conditions can be satisfied:

- The EUT transmits continuously (or with a duty cycle ≥ 98 percent).
- Sweep triggering or gating can be implemented in a way that the device transmits at the maximum power control level throughout the duration of each of the instrument sweeps to be averaged. This condition can generally be achieved by triggering the instrument's sweep if the duration of the sweep (with the analyzer configured as in Method SA-1, below) is equal to or shorter than the duration T of each transmission from the EUT and if those transmissions exhibit full power throughout their durations.

(ii) Method SA-2 or SA-2 Alternative (averaging across on and off times of the EUT transmissions, followed by duty cycle correction) shall be applied if the conditions of (i) cannot be achieved and the transmissions exhibit a constant duty cycle during the measurement duration. Duty cycle will be considered to be constant if variations are less than ± 2 percent.

(iii) Method SA-3 (RMS detection with max hold) or SA-3 Alternative (reduced VBW with max hold) shall be applied if the conditions of (i) and (ii) cannot be achieved.

b) Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep): (i) Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.

(ii) Set RBW = 1 MHz.

(iii) Set VBW ≥ 3 MHz.

(iv) Number of points in sweep ≥ 2 Span / RBW. (This ensures that bin-to-bin spacing is \leq RBW/2, so that narrowband signals are not lost between frequency bins.)

(v) Sweep time = auto.

(vi) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.

(vii) If transmit duty cycle < 98 percent, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98 percent, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run".

(viii) Trace average at least 100 traces in power averaging (i.e., RMS) mode.



(ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument's band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum

7.3 DEVIATION FROM STANDARD

No deviation.

7.4 TEST SETUP



7.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



7.6 TEST RESULTS

Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1012 hPa	Test Voltage :	DC 3.8V
Test Mode :	TX		

Sub-band(5.2GHz): 5150-5250MHz

Mode	Frequency	Ant. 0 Power (dBm)	Ant. 1 Power (dBm)	Total Power (dBm)	Limit (dBm)
802.11 a	5180 MHz	5.38	5.25	8.33	24
	5200 MHz	5.27	5.21	8.25	24
	5240 MHz	5.18	5.17	8.19	24
802.11 ac20	5180 MHz	5.29	5.22	8.27	24
	5200 MHz	5.21	5.15	8.19	24
	5240 MHz	5.12	5.08	8.11	24
802.11 n20	5180 MHz	5.18	5.19	8.20	24
	5200 MHz	5.22	5.12	8.18	24
	5240 MHz	5.15	4.98	8.08	24
802.11 n40	5190 MHz	4.75	4.63	7.70	24
	5230 MHz	4.79	4.48	7.65	24
802.11 ac40	5190 MHz	4.83	4.77	7.81	24
	5230 MHz	4.78	4.52	7.66	24
802.11 ac80	5210 MHz	4.38	4.41	7.41	24

Sub-band(5.8GHz): 5725-5850MHz

Mode	Frequency	Ant. 0 Power (dBm)	Ant. 1 Power (dBm)	Total Power (dBm)	Limit (dBm)
802.11 a	5745 MHz	4.47	4.32	7.41	30
	5785 MHz	4.38	4.28	7.34	30
	5825 MHz	4.42	4.24	7.34	30
802.11 ac20	5745 MHz	4.36	4.26	7.32	30
	5785 MHz	4.29	4.18	7.25	30
	5825 MHz	4.33	4.15	7.25	30
802.11 n20	5745 MHz	4.28	4.11	7.21	30
	5785 MHz	4.22	4.04	7.14	30
	5825 MHz	4.17	4.16	7.18	30
802.11 n40	5755 MHz	3.77	3.85	6.82	30
	5795 MHz	3.85	3.62	6.75	30
802.11 ac40	5755 MHz	3.94	3.74	6.85	30
	5795 MHz	3.74	3.57	6.67	30
802.11 ac80	5775 MHz	3.58	3.42	6.51	30



8. OUT OF BAND EMISSIONS

8.1 APPLICABLE STANDARD

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.

8.2 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.

8.3 DEVIATION FROM STANDARD

No deviation.

8.4 TEST SETUP



8.5 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.



8.6 TEST RESULTS

Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1012 hPa	Test Voltage :	DC 3.8V

Sub-band(5.2GHz): 5150-5250MHz

Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
11a	5180	Ant. 0	-37.19	-27	Pass
11a	5240	Ant. 0	-45.21	-27	Pass
11a	5180	Ant. 1	-40.82	-27	Pass
11a	5240	Ant. 1	-45.61	-27	Pass
11ac20	5180	Ant. 0	-46	-27	Pass
11ac20	5240	Ant. 0	-45.95	-27	Pass
11ac20	5180	Ant. 1	-46.2	-27	Pass
11ac20	5240	Ant. 1	-44.98	-27	Pass
11n20	5180	Ant. 0	-45.92	-27	Pass
11n20	5240	Ant. 0	-45.18	-27	Pass
11n20	5180	Ant. 1	-45.63	-27	Pass
11n20	5240	Ant. 1	-45.37	-27	Pass
11n40	5190	Ant. 0	-39.14	-27	Pass
11n40	5230	Ant. 0	-45.3	-27	Pass
11n40	5190	Ant. 1	-39.88	-27	Pass
11n40	5230	Ant. 1	-46.4	-27	Pass
11ac40	5190	Ant. 0	-40.22	-27	Pass
11ac40	5230	Ant. 0	-45.16	-27	Pass
11ac40	5190	Ant. 1	-39.06	-27	Pass
11ac40	5230	Ant. 1	-45.73	-27	Pass



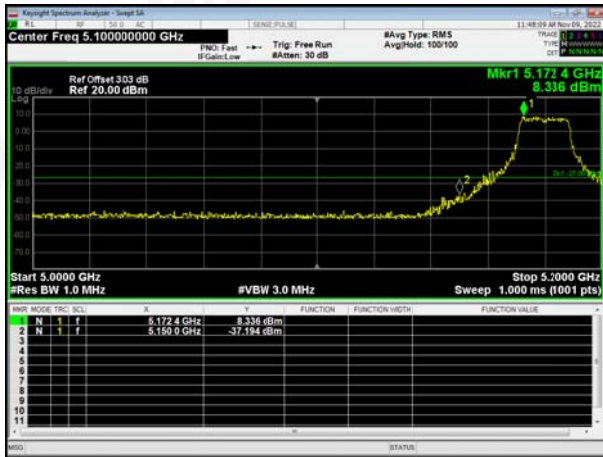
Sub-band(5.8GHz): 5725-5850MHz

Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
11a	5745	Ant. 0	-22.99	-27	Pass
11a	5825	Ant. 0	-32.65	-27	Pass
11a	5745	Ant. 1	-28.24	-27	Pass
11a	5825	Ant. 1	-37.12	-27	Pass
11ac20	5745	Ant. 0	-40.04	-27	Pass
11ac20	5825	Ant. 0	-44.72	-27	Pass
11ac20	5745	Ant. 1	-41.97	-27	Pass
11ac20	5825	Ant. 1	-45.78	-27	Pass
11n20	5745	Ant. 0	-38.42	-27	Pass
11n20	5825	Ant. 0	-45.35	-27	Pass
11n20	5745	Ant. 1	-39.86	-27	Pass
11n20	5825	Ant. 1	-45.65	-27	Pass
11n40	5755	Ant. 0	-34.37	-27	Pass
11n40	5795	Ant. 0	-43.54	-27	Pass
11n40	5755	Ant. 1	-36.18	-27	Pass
11n40	5795	Ant. 1	-45.42	-27	Pass
11ac40	5755	Ant. 0	-34.51	-27	Pass
11ac40	5795	Ant. 0	-44.69	-27	Pass
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11ac40	5795	Ant. 1	-45.55	-27	Pass

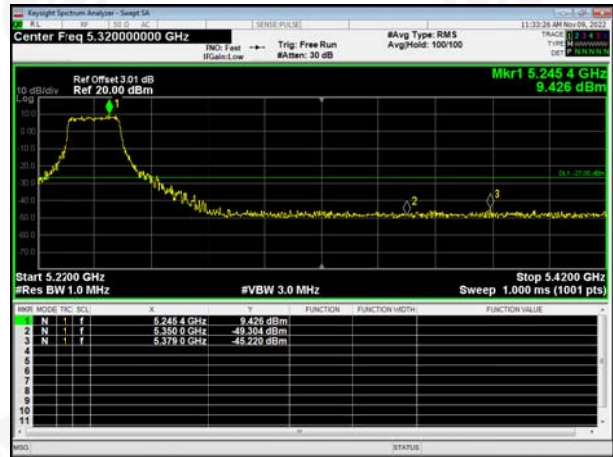


5.2GHz Band Edge

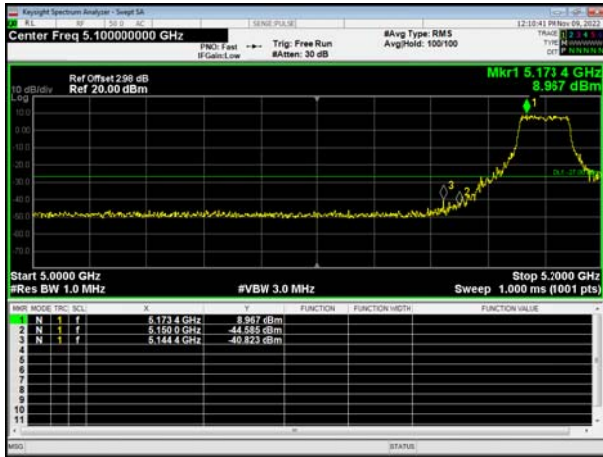
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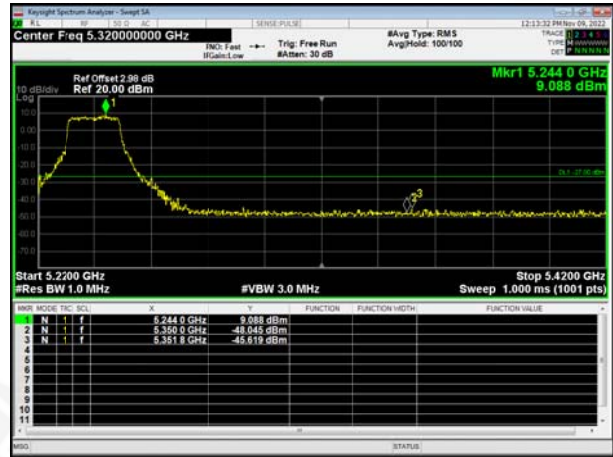
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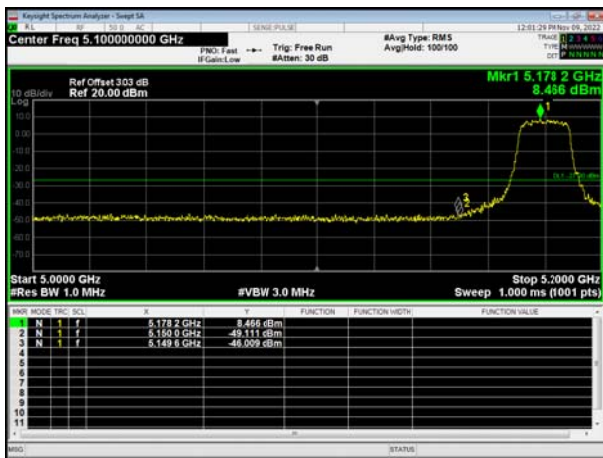
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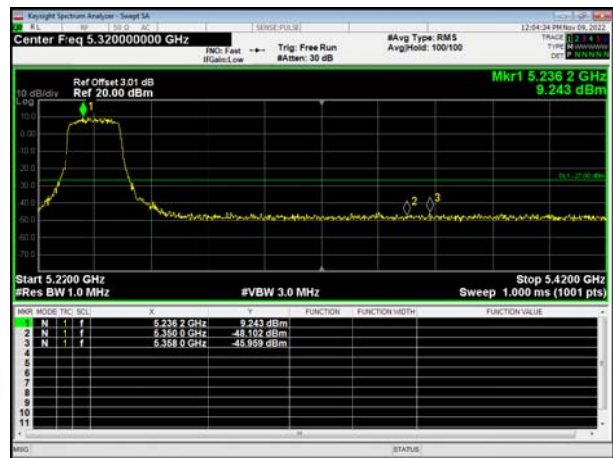
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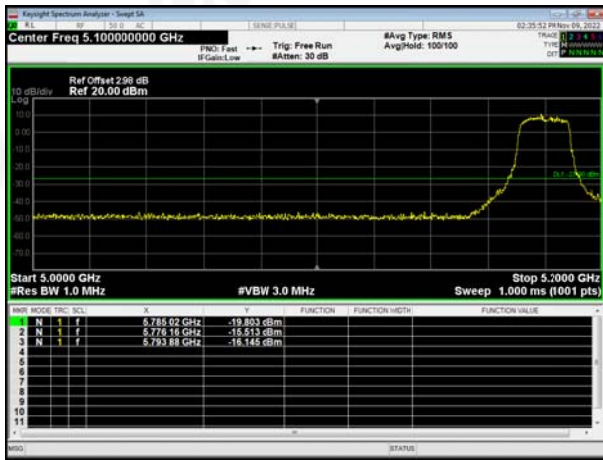


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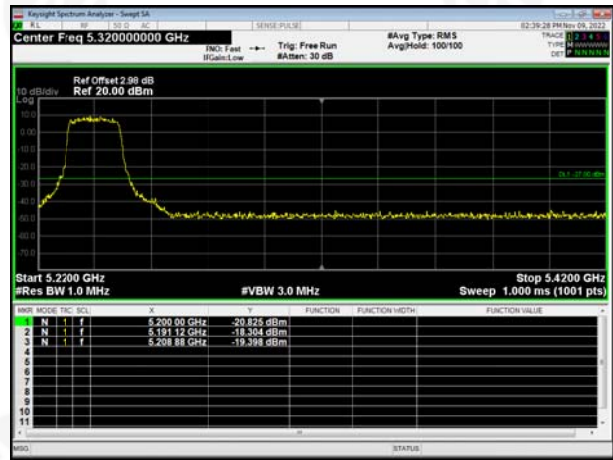




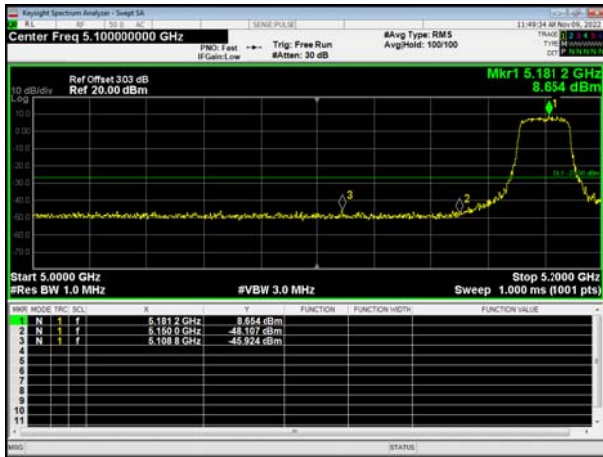
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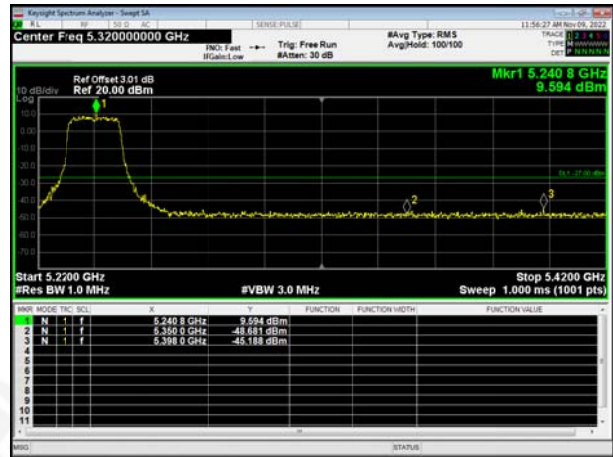
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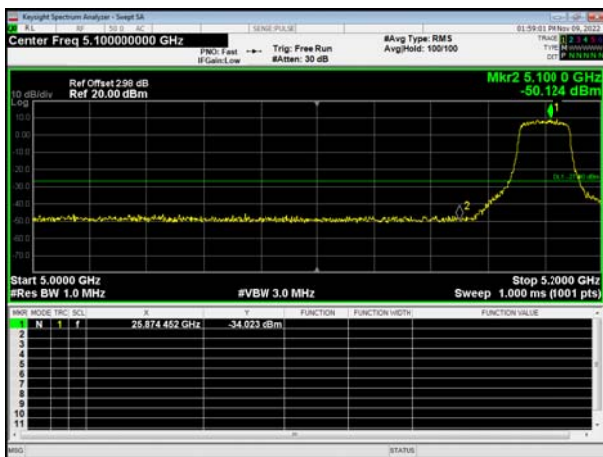
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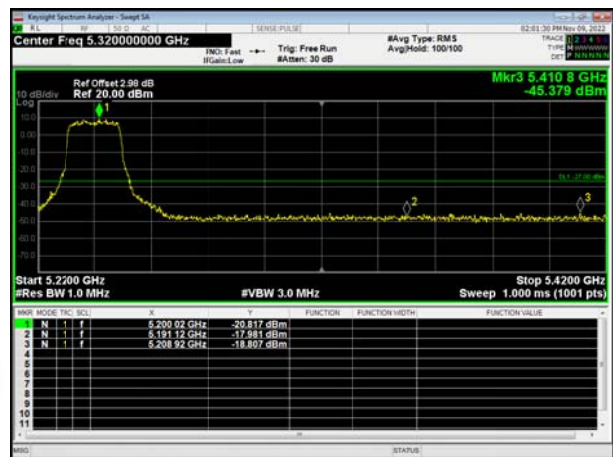
802.11n20Right Side, Ant. 0



802.11n20Left Side, Ant. 1

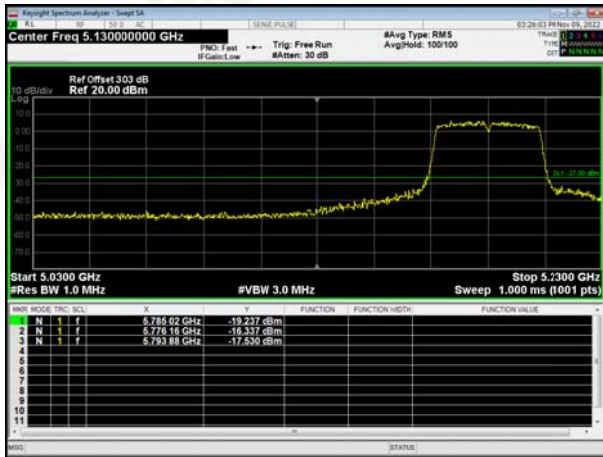


802.11n20Right Side, Ant. 1

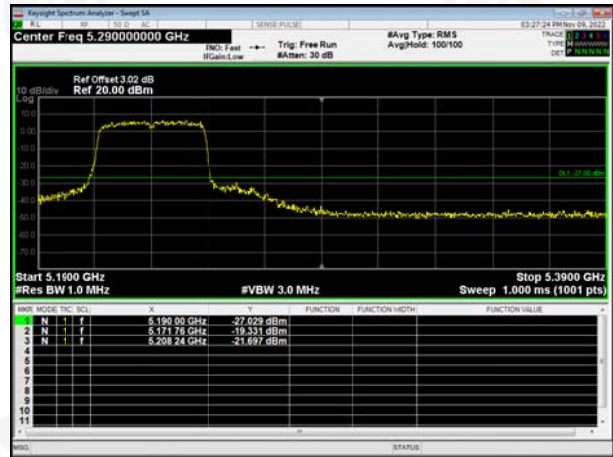




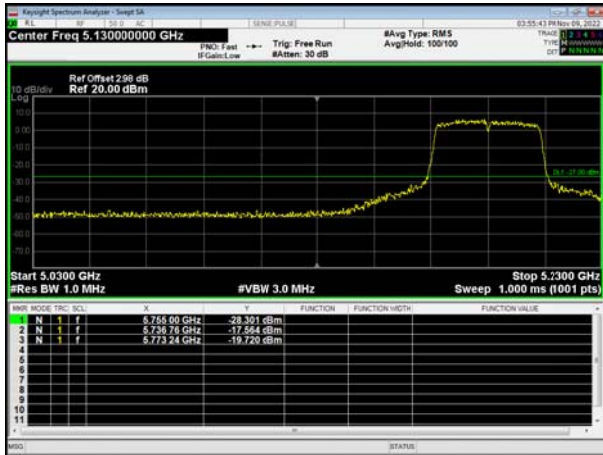
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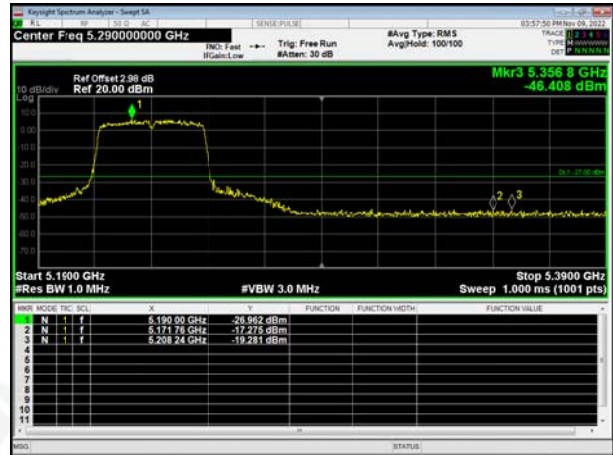
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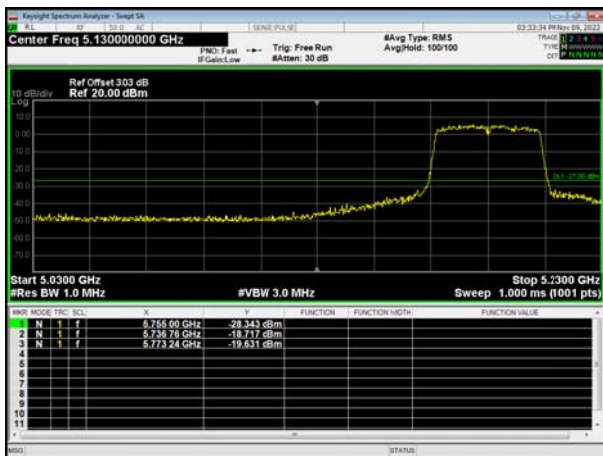
802.11n40Left Side, Ant. 1



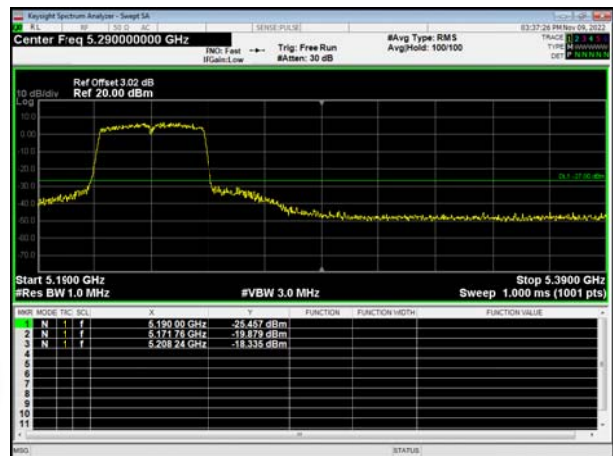
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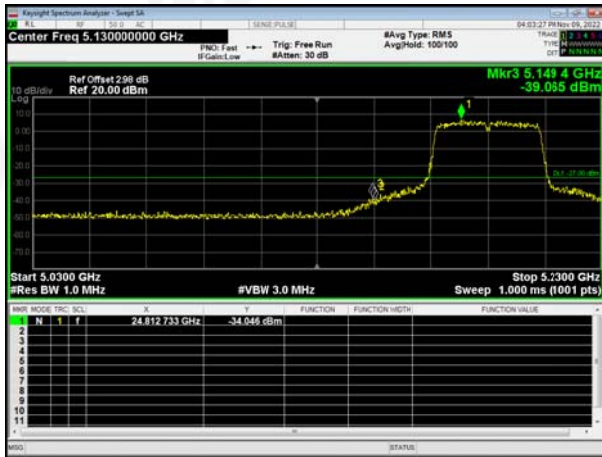


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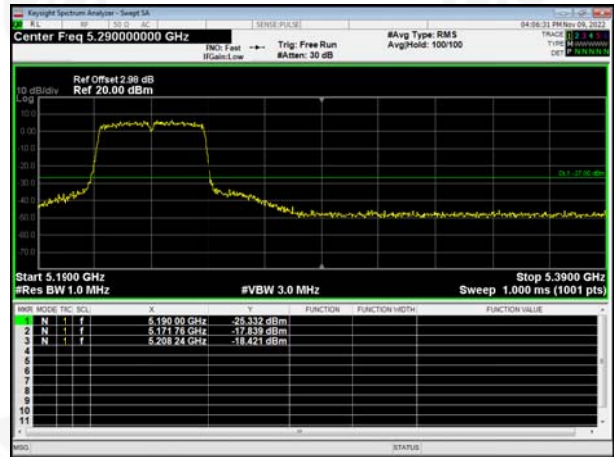




802.11ac40Left Side, Ant. 1



802.11ac40Right Side, Ant. 1

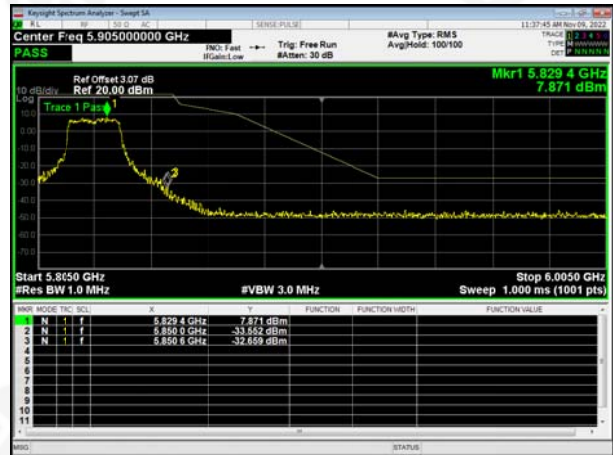
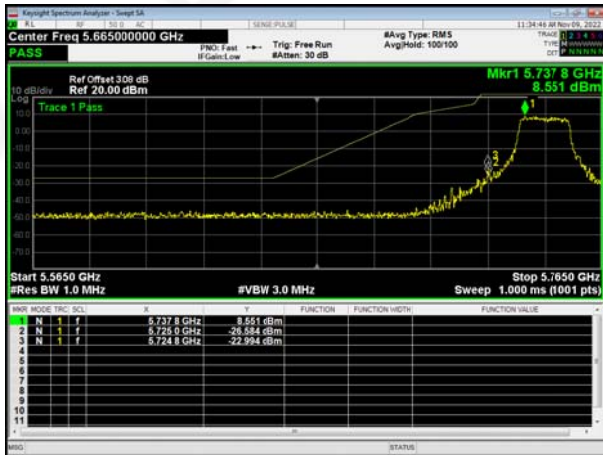




5.8GHz Band Edge

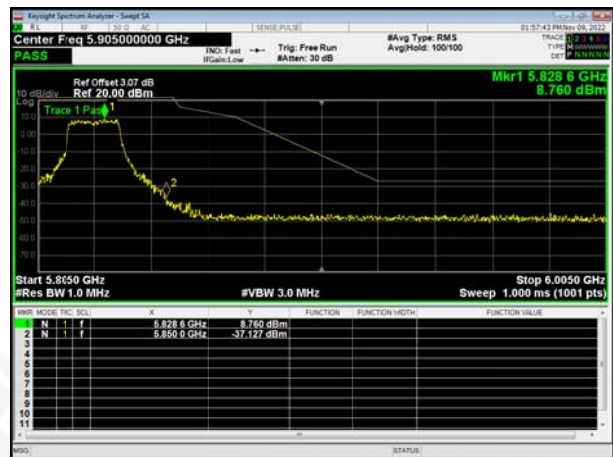
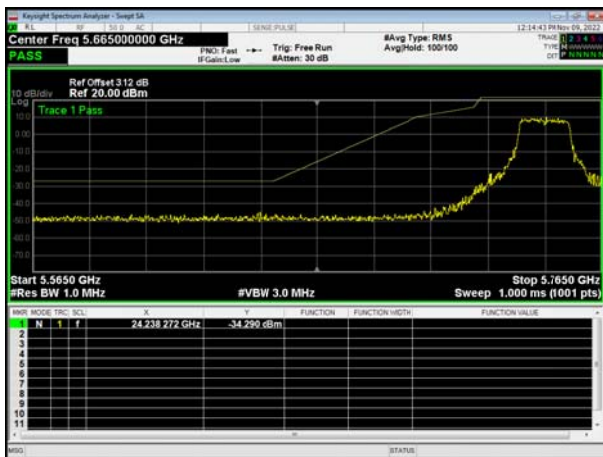
802.11a Left Side, Ant. 0

802.11a Right Side, Ant. 0



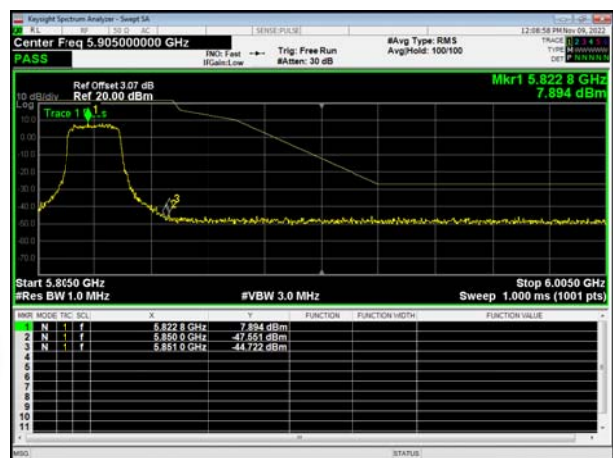
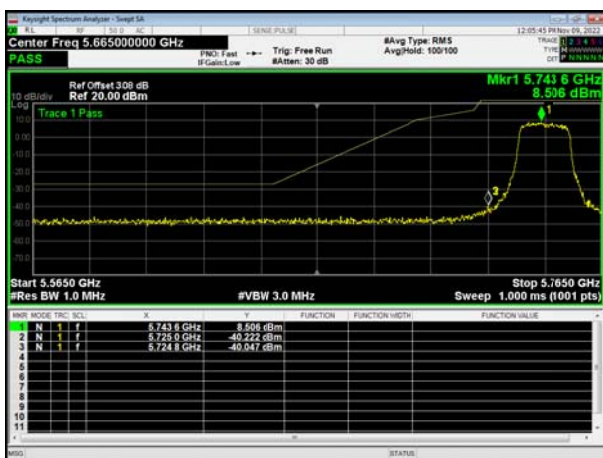
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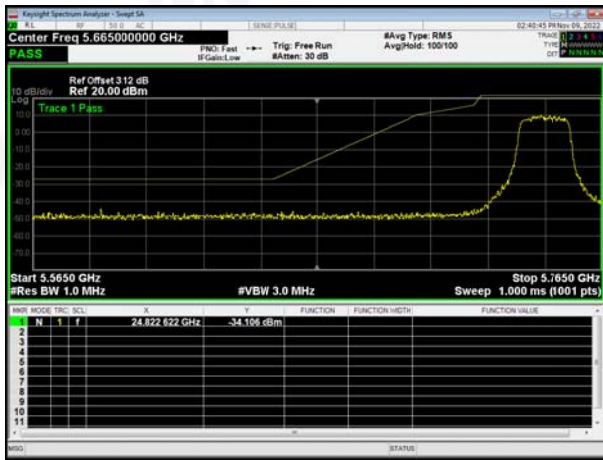
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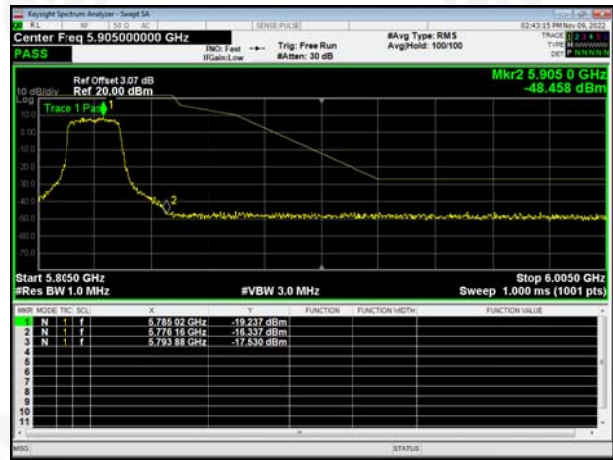




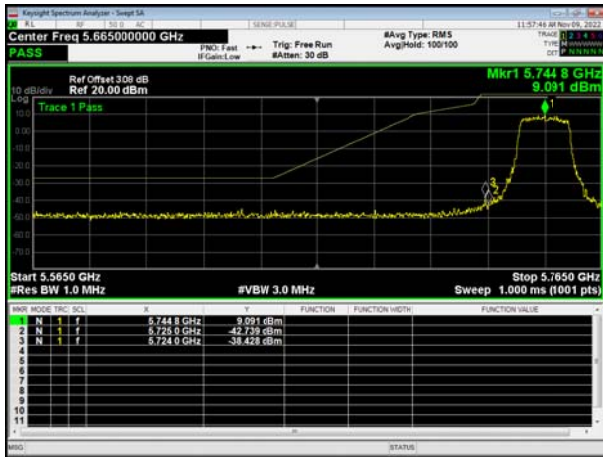
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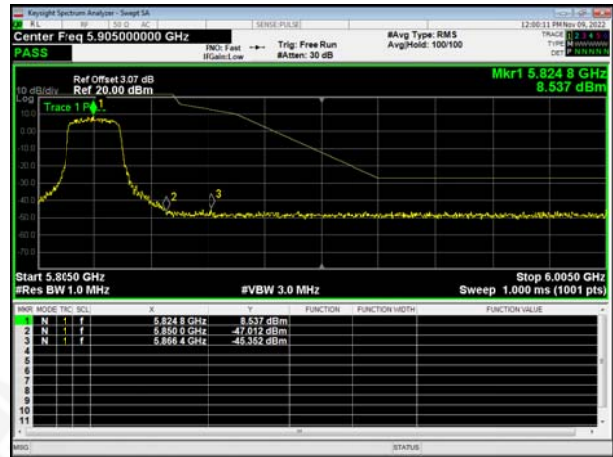
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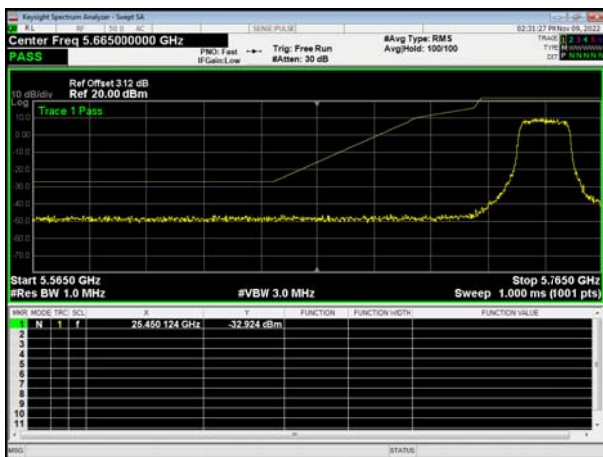
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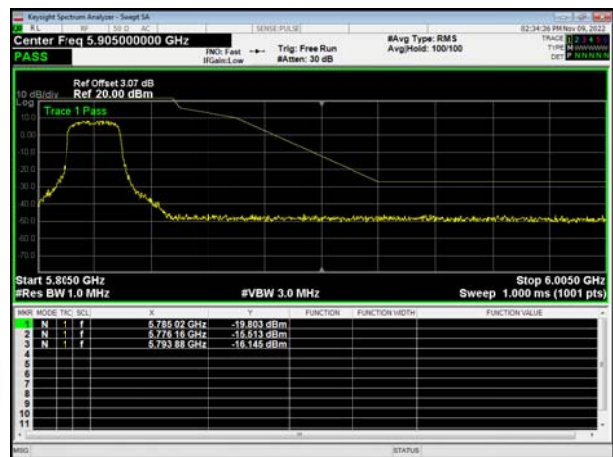
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802.11n20Left Side, Ant. 1

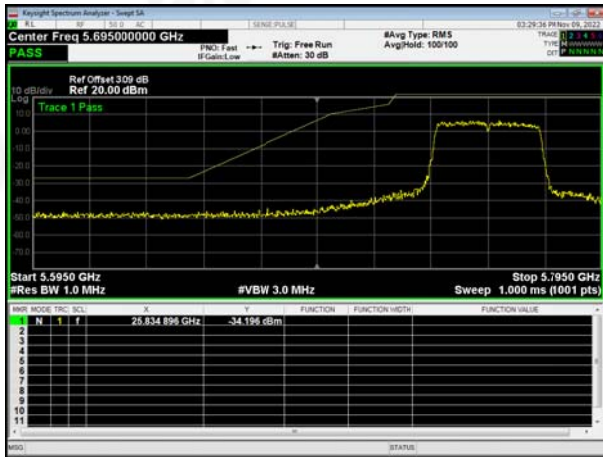


802.11n20Right Side, Ant. 1





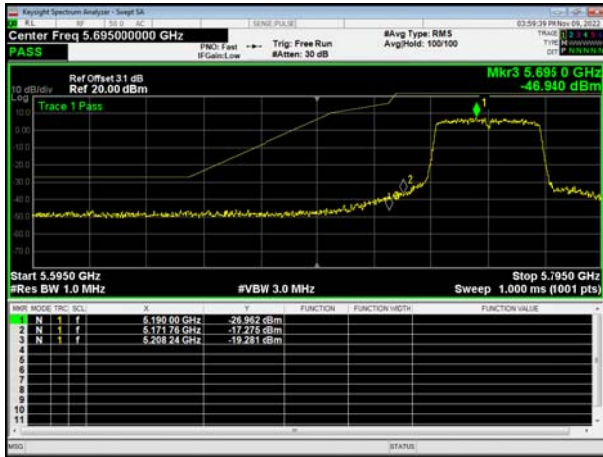
802.11n40Left Side, Ant. 0



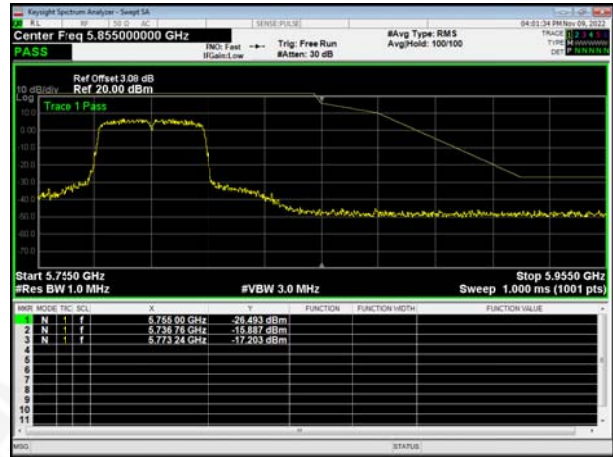
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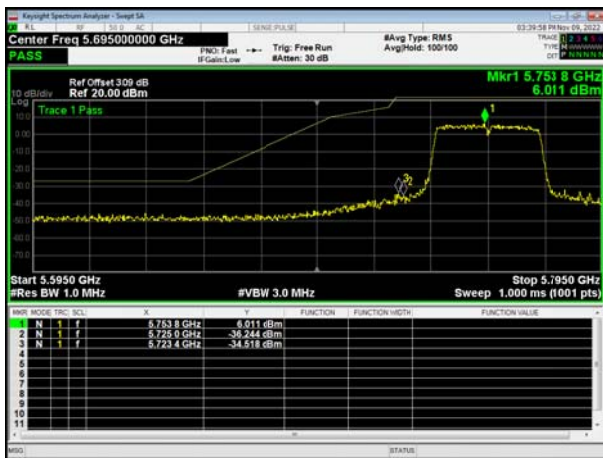
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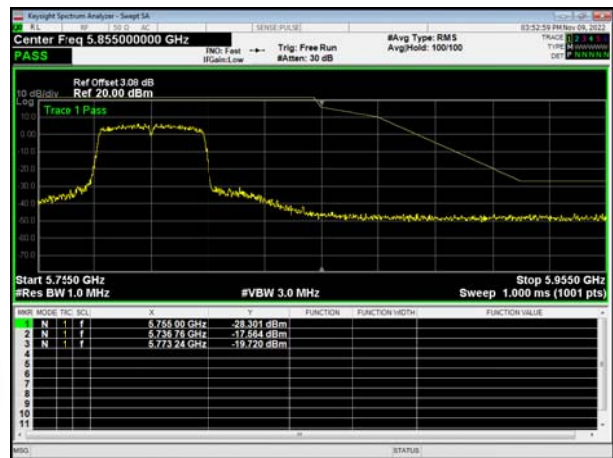
802.11n40Right Side, Ant. 1



802.11ac40Left Side, Ant. 0

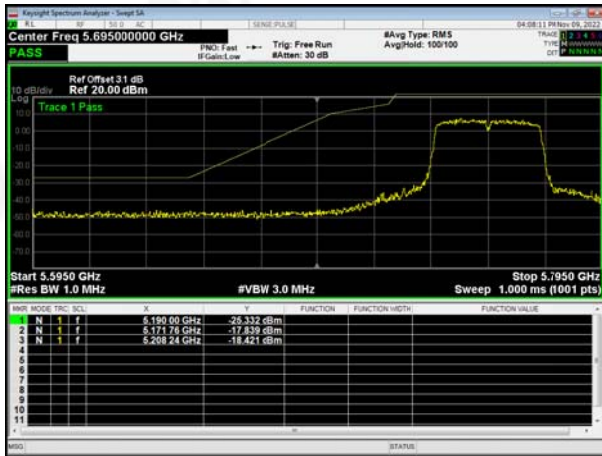


802.11ac40Right Side, Ant. 0





802.11ac40Left Side, Ant. 1



802.11ac40Right Side, Ant. 1





9.SPURIOUS RF CONDUCTED EMISSIONS

9.1 CONFORMANCE LIMIT

1. Below -20dB of the highest emission level in operating band.
2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.

9.2 MEASURING INSTRUMENTS

The Measuring equipment is listed in the section 6.3 of this test report.

9.3 TEST SETUP



9.4 TEST PROCEDURE

The Spurious RF conducted emissions compliance of RF radiated emission should be measured by following the guidance in ANSI C63.10-2013 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW=100kHz and VBW= 300KHz to measure the peak field strength, and measure frequency range from 30MHz to 26.5GHz.

9.5 TEST RESULTS

Remark: The measurement frequency range is from 30MHz to the 5th harmonic of the fundamental frequency. The lowest, middle and highest channels are tested to verify the spurious emissions and bandedge measurement data.



Sub-band(5.2GHz): 5150-5250MHz

Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
11a	5180	Ant1	-33.89	-27	Pass
11a	5200	Ant1	-33.66	-27	Pass
11a	5240	Ant1	-34.33	-27	Pass
11a	5180	Ant2	-33.55	-27	Pass
11a	5200	Ant2	-33.85	-27	Pass
11a	5240	Ant2	-34.29	-27	Pass
11ac20	5180	Ant1	-33.27	-27	Pass
11ac20	5200	Ant1	-33.74	-27	Pass
11ac20	5240	Ant1	-34.22	-27	Pass
11ac20	5180	Ant2	-33.03	-27	Pass
11ac20	5200	Ant2	-33.79	-27	Pass
11ac20	5240	Ant2	-34.1	-27	Pass
11n20	5180	Ant1	-33.09	-27	Pass
11n20	5200	Ant1	-33.8	-27	Pass
11n20	5240	Ant1	-33.69	-27	Pass
11n20	5180	Ant2	-34.72	-27	Pass
11n20	5200	Ant2	-32.75	-27	Pass
11n20	5240	Ant2	-32.92	-27	Pass
11n40	5190	Ant1	-33.88	-27	Pass
11n40	5230	Ant1	-34.19	-27	Pass
11n40	5190	Ant2	-32.7	-27	Pass
11n40	5230	Ant2	-33.45	-27	Pass
11ac40	5190	Ant1	-34.01	-27	Pass
11ac40	5230	Ant1	-34.01	-27	Pass
11ac40	5190	Ant2	-34.17	-27	Pass
11ac40	5230	Ant2	-34.43	-27	Pass
11ac80	5210	Ant1	-33.76	-27	Pass
11ac80	5210	Ant2	-34.07	-27	Pass



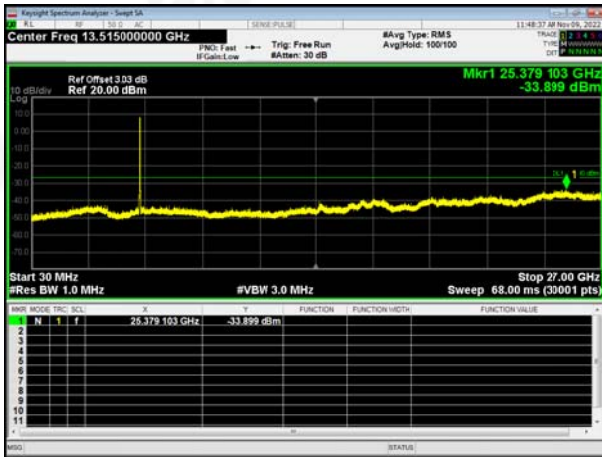
Sub-band(5.8GHz): 5725-5850MHz

Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
11a	5745	Ant1	-33.19	-27	Pass
11a	5785	Ant1	-33.8	-27	Pass
11a	5825	Ant1	-33.7	-27	Pass
11a	5745	Ant2	-33.77	-27	Pass
11a	5785	Ant2	-33.97	-27	Pass
11a	5825	Ant2	-34.02	-27	Pass
11ac20	5745	Ant1	-32.68	-27	Pass
11ac20	5785	Ant1	-33.18	-27	Pass
11ac20	5825	Ant1	-32.98	-27	Pass
11ac20	5745	Ant2	-33.58	-27	Pass
11ac20	5785	Ant2	-33.73	-27	Pass
11ac20	5825	Ant2	-34.05	-27	Pass
11n20	5745	Ant1	-33.72	-27	Pass
11n20	5785	Ant1	-33.99	-27	Pass
11n20	5825	Ant1	-34.13	-27	Pass
11n20	5745	Ant2	-33.62	-27	Pass
11n20	5785	Ant2	-33.39	-27	Pass
11n20	5825	Ant2	-33.96	-27	Pass
11n40	5755	Ant1	-34.01	-27	Pass
11n40	5795	Ant1	-34.06	-27	Pass
11n40	5755	Ant2	-34.36	-27	Pass
11n40	5795	Ant2	-34.04	-27	Pass
11ac40	5755	Ant1	-34.15	-27	Pass
11ac40	5795	Ant1	-33.21	-27	Pass
11ac40	5755	Ant2	-34.24	-27	Pass
11ac40	5795	Ant2	-33.96	-27	Pass
11ac80	5775	Ant1	-34.46	-27	Pass
11ac80	5775	Ant2	-33.8	-27	Pass

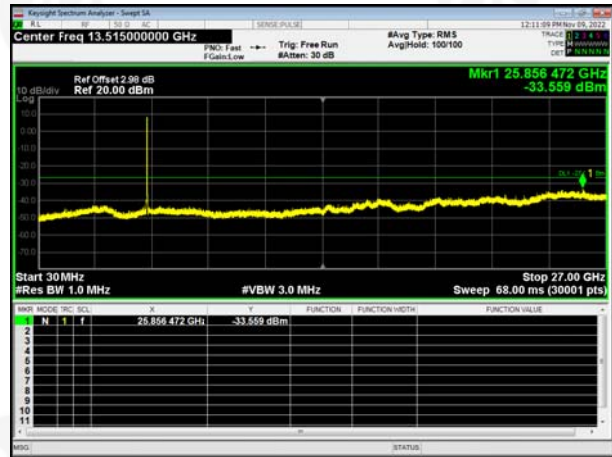


5.2GHz Spurious Emission

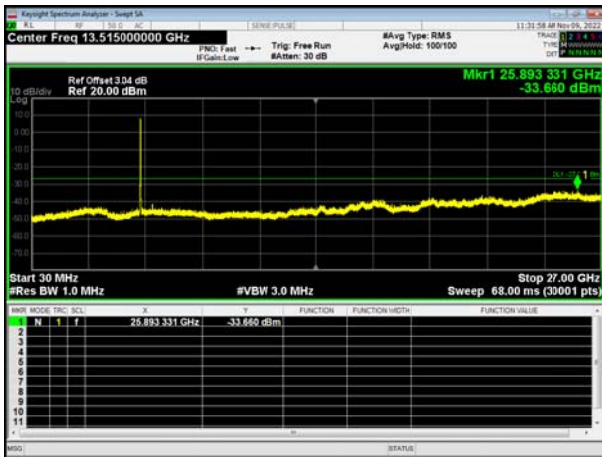
802.11a on channel 36 Ant. 0



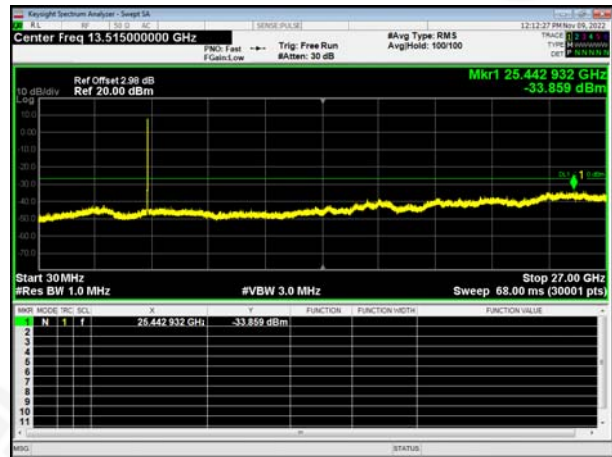
802.11a on channel 36 Ant. 1



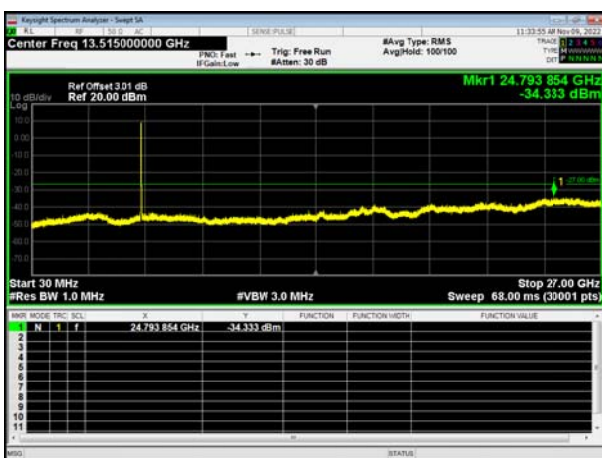
802.11a on channel 40 Ant. 0



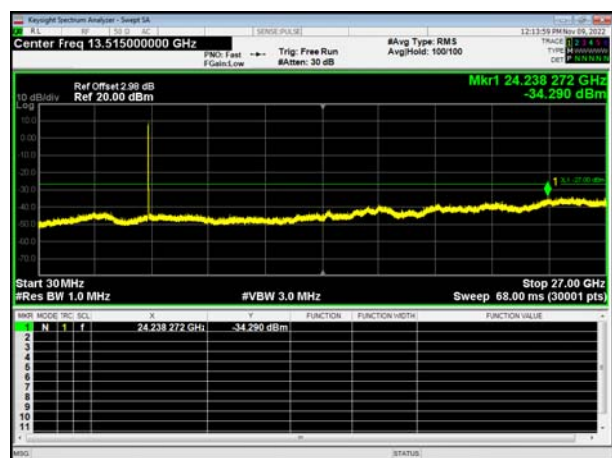
802.11a on channel 40 Ant. 1



802.11a on channel 48 Ant. 0



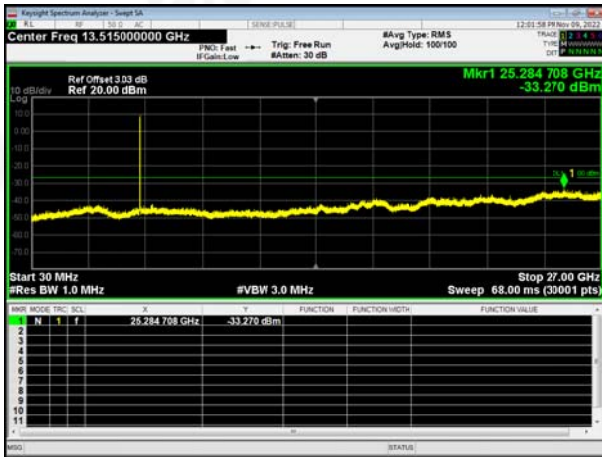
802.11a on channel 48 Ant. 1



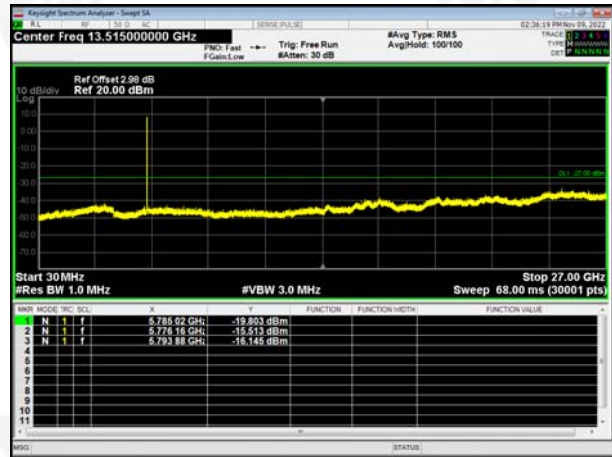


5.2GHz Spurious Emission

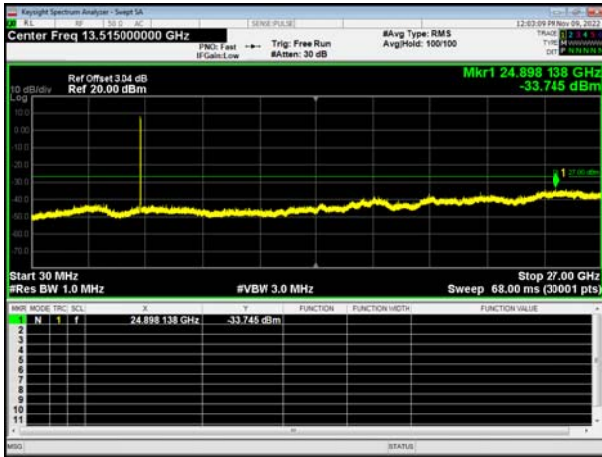
802.11ac20 on channel 36 Ant. 0



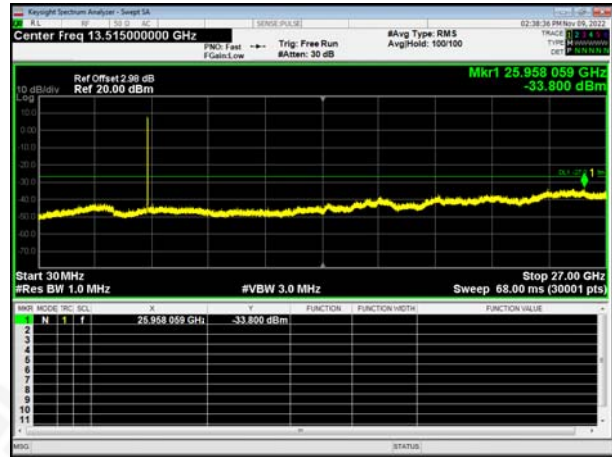
802.11ac20 on channel 36 Ant. 1



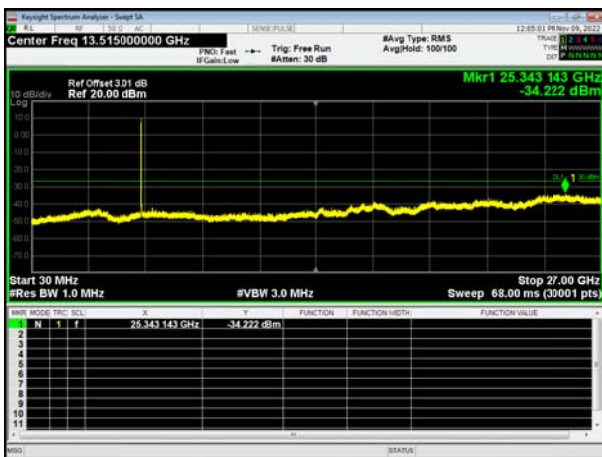
802.11ac20 on channel 40 Ant. 0



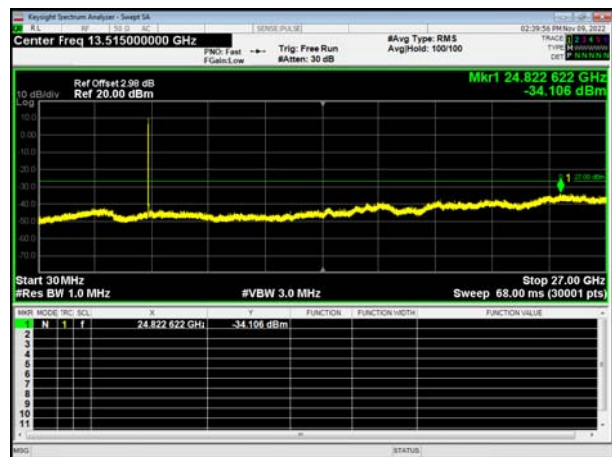
802.11ac20 on channel 40 Ant. 1



802.11ac20 on channel 48 Ant. 0

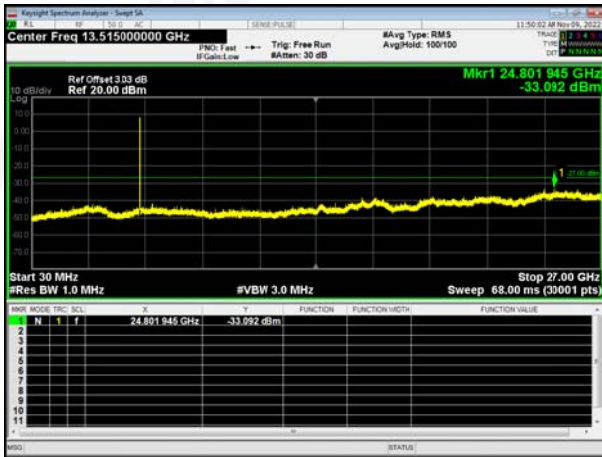


802.11ac20 on channel 48 Ant. 1

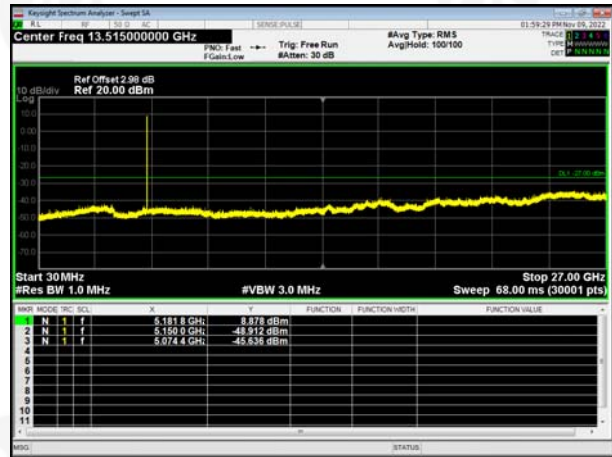




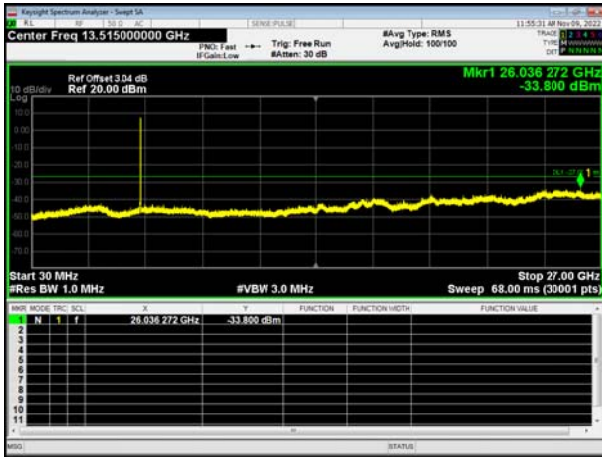
802.11n20 on channel 36 Ant. 0



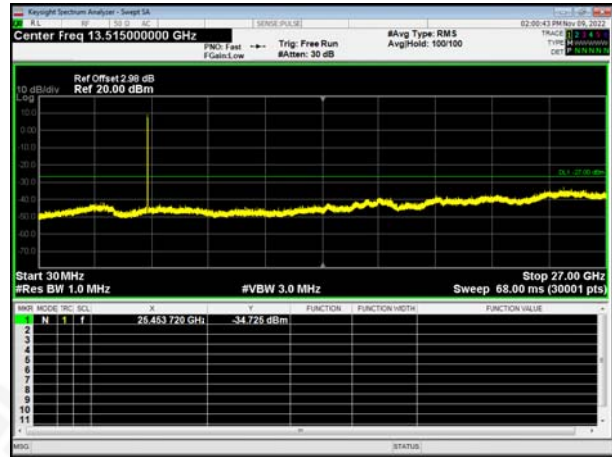
802.11n20 on channel 36 Ant. 1



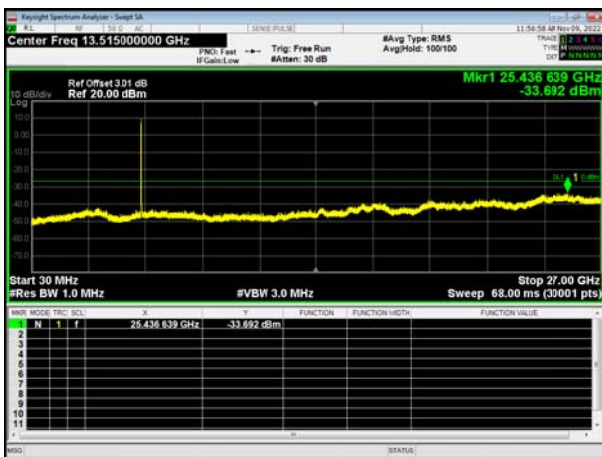
802.11n20 on channel 40 Ant. 0



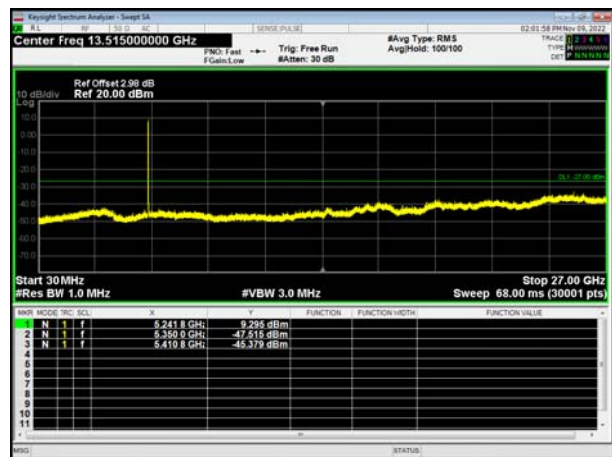
802.11n20 on channel 40 Ant. 1



802.11n20 on channel 48 Ant. 0

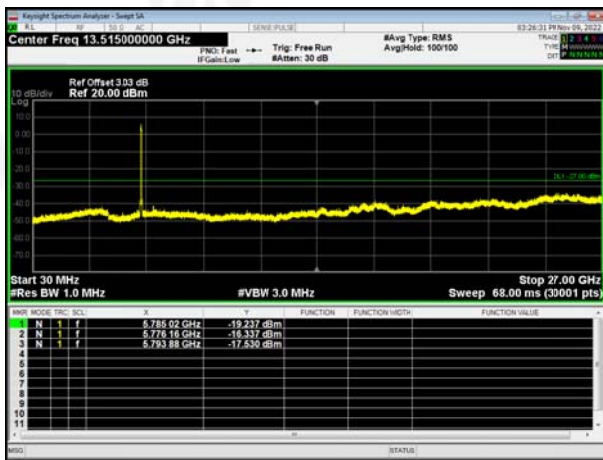


802.11n20 on channel 48 Ant. 1

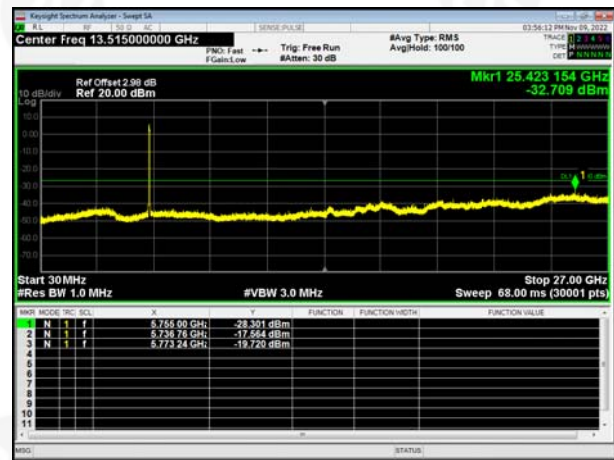




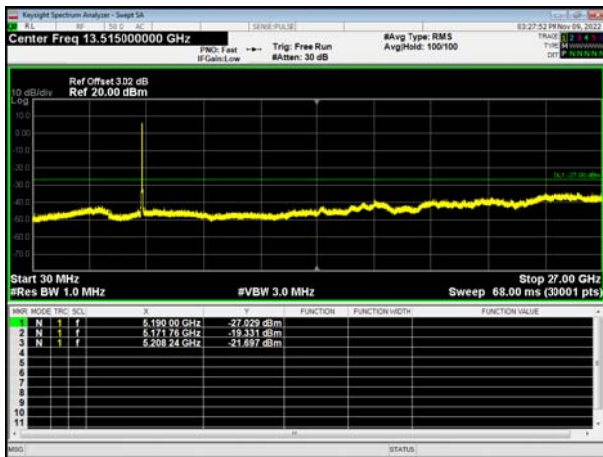
802.11n40 on channel 38Ant. 0



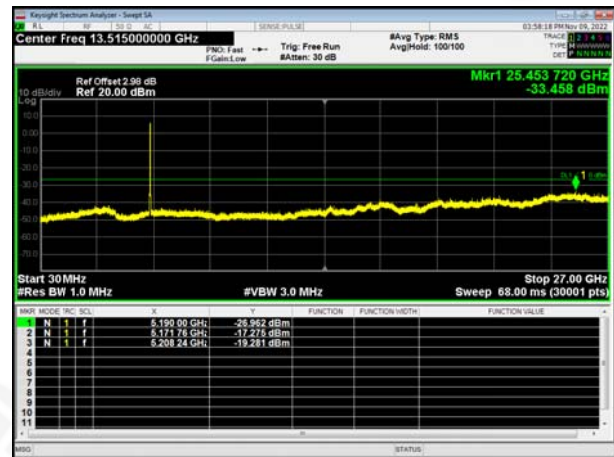
802.11n40 on channel 38Ant. 1



802.11n40 on channel 46Ant. 0

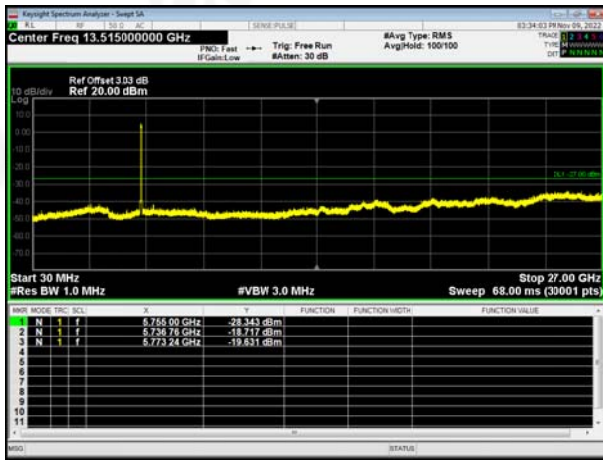


802.11n40 on channel 46Ant. 1

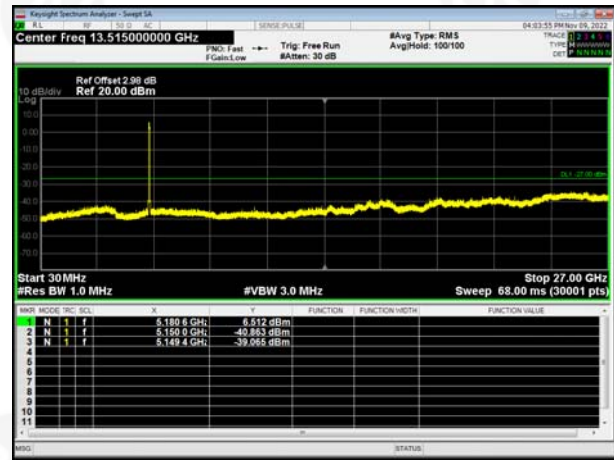




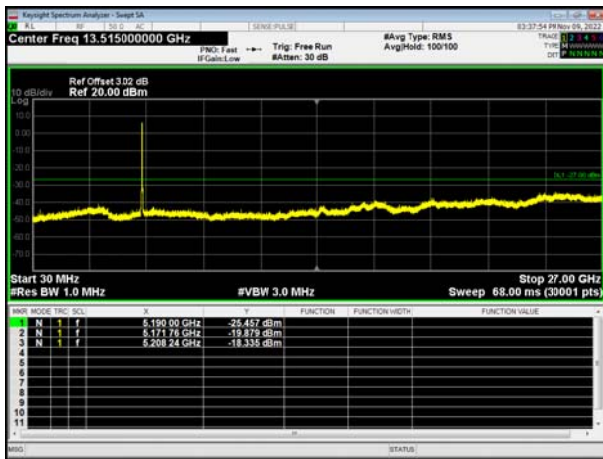
802.11ac40 on channel 38 Ant. 0



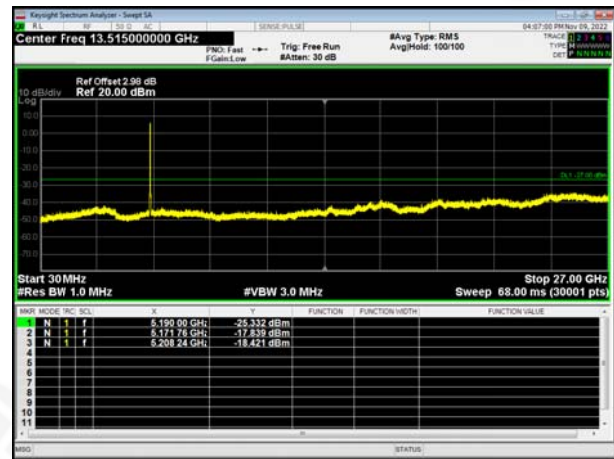
802.11ac40 on channel 38 Ant. 1



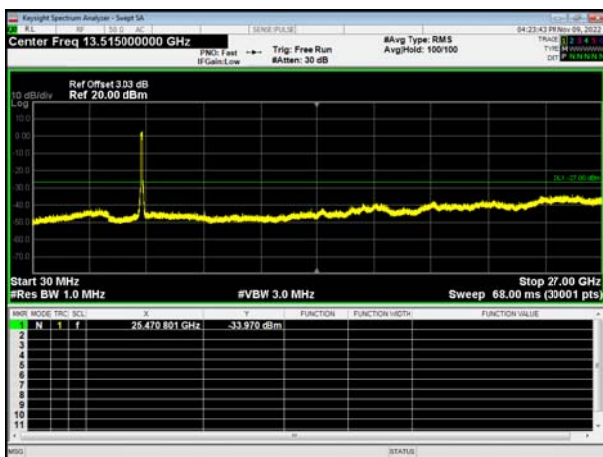
802.11ac40 on channel 46 Ant. 0



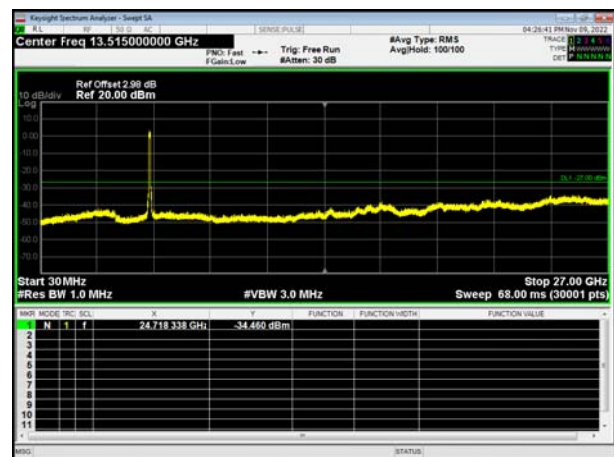
802.11ac40 on channel 46 Ant. 1



802.11ac80 on channel 42 Ant. 0



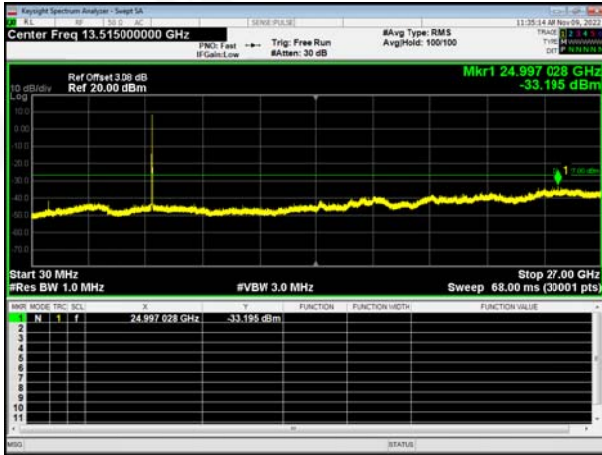
802.11ac80 on channel 42 Ant. 1



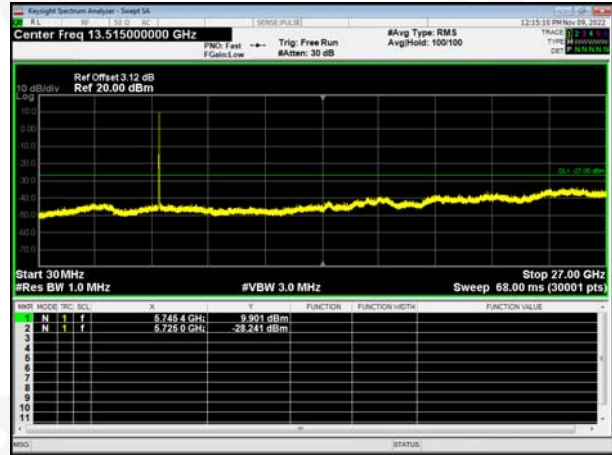


5.8GHz Spurious Emission

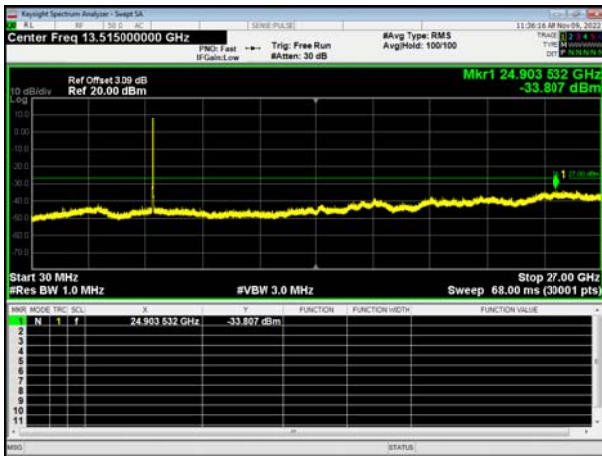
802.11a on channel 149 Ant. 0



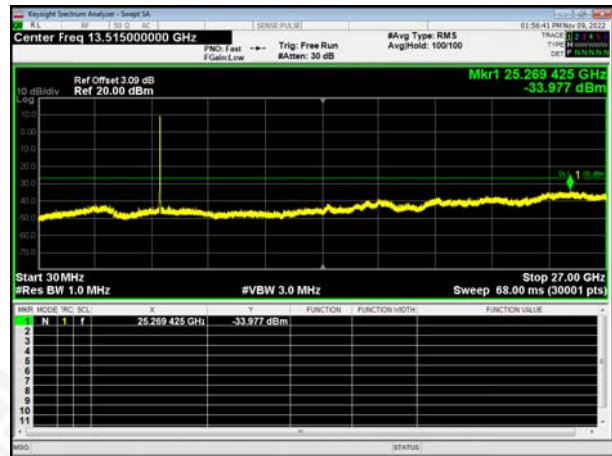
802.11a on channel 149 Ant. 1



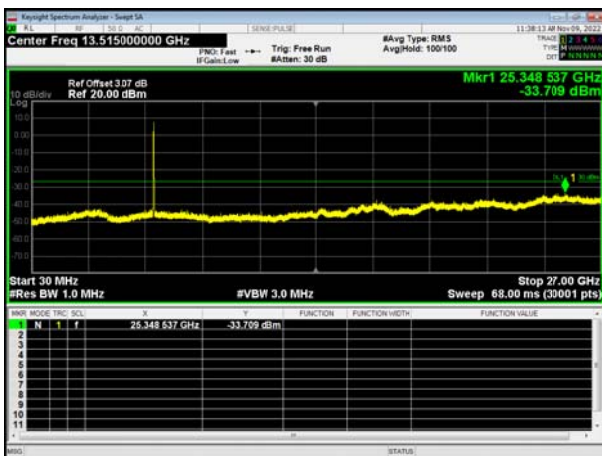
802.11a on channel 157 Ant. 0



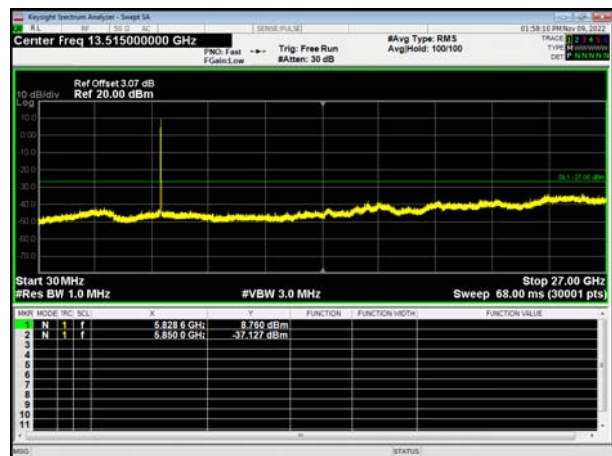
802.11a on channel 157 Ant. 1



802.11a on channel 165 Ant. 0

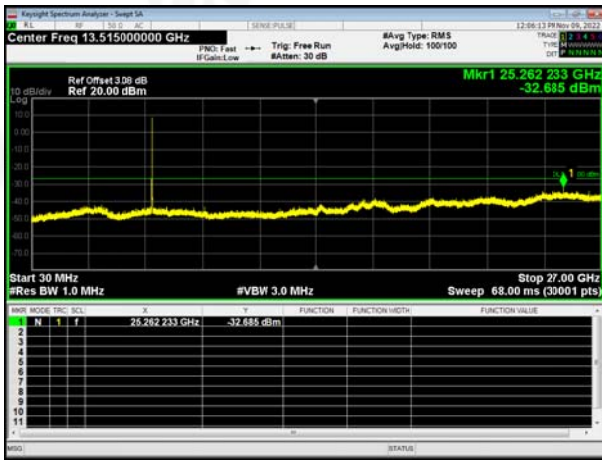


802.11a on channel 165 Ant. 1

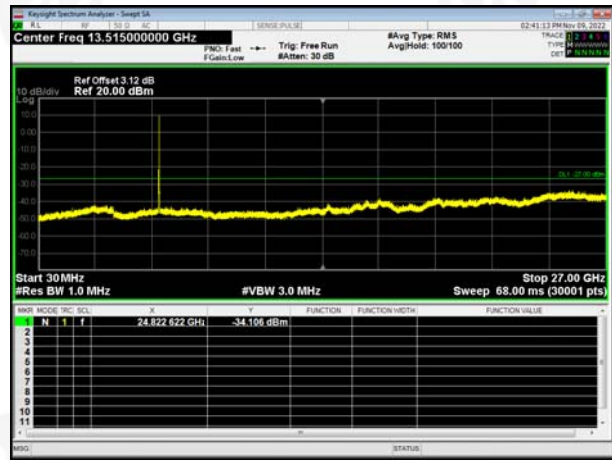




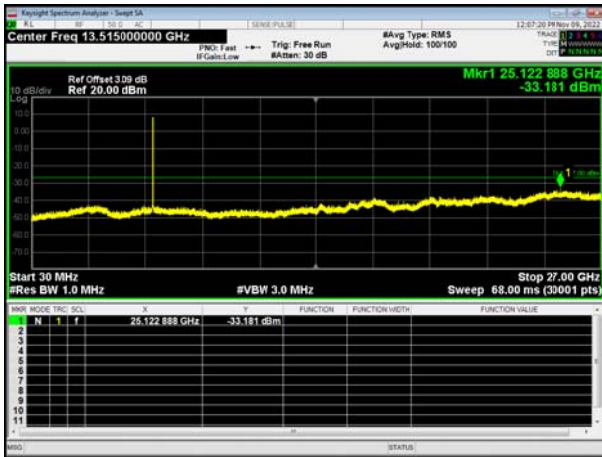
802.11ac20 on channel 149 Ant. 0



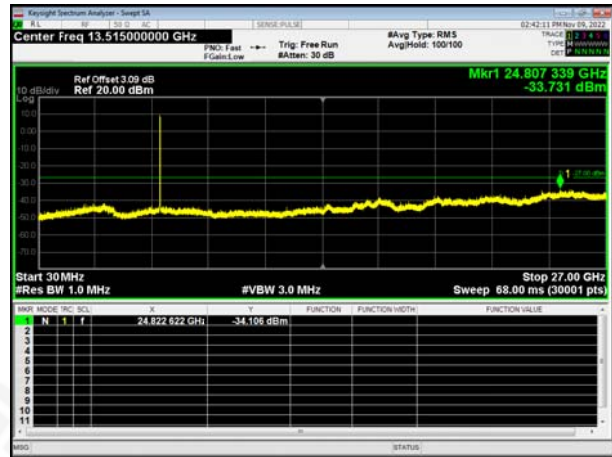
802.11ac20 on channel 149 Ant. 1



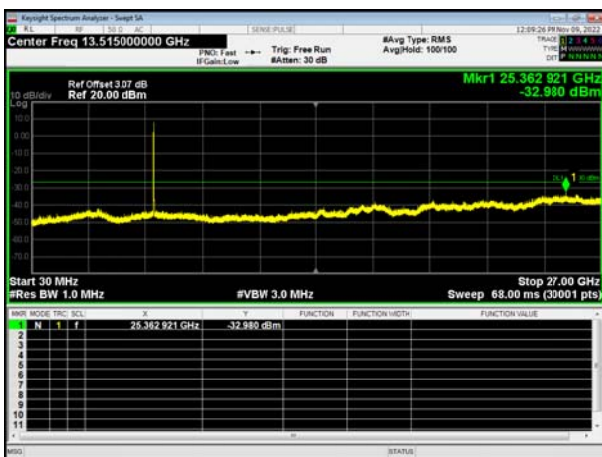
802.11ac20 on channel 157 Ant. 0



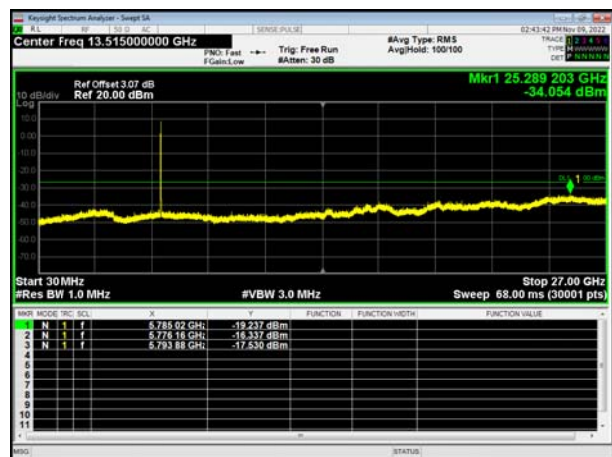
802.11ac20 on channel 157 Ant. 1



802.11ac20 on channel 165 Ant. 0

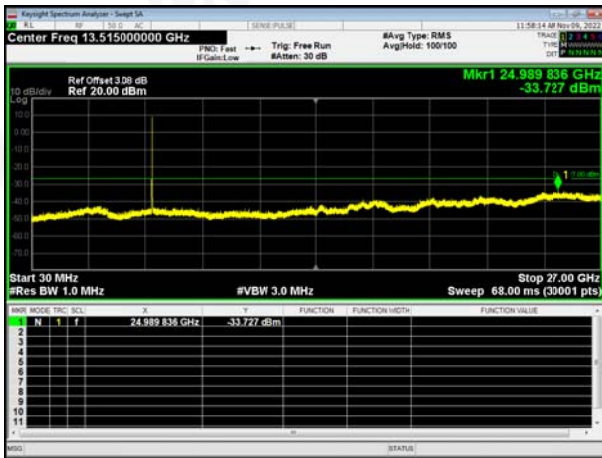


802.11ac20 on channel 165 Ant. 1

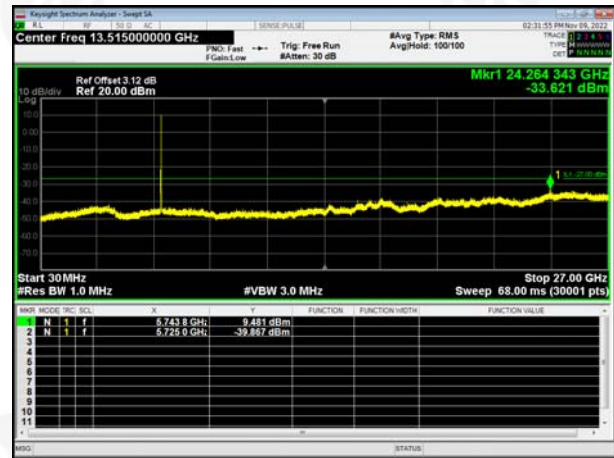




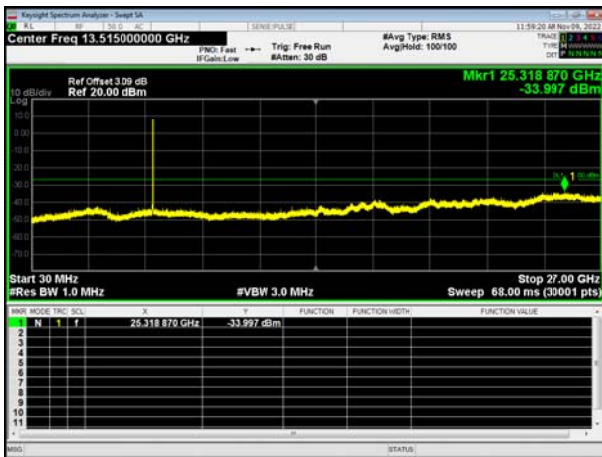
802.11n20 on channel 149 Ant. 0



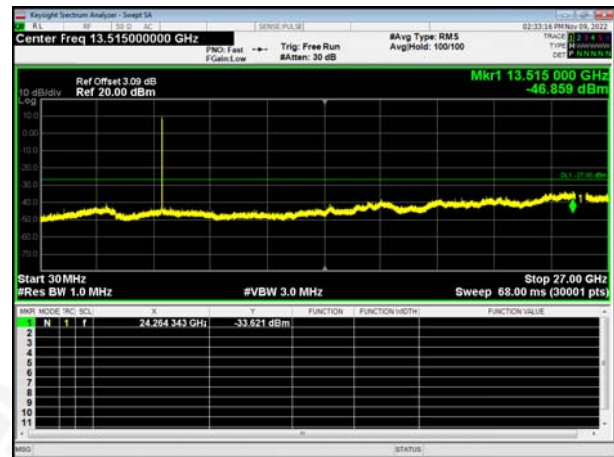
802.11n20 on channel 149 Ant. 1



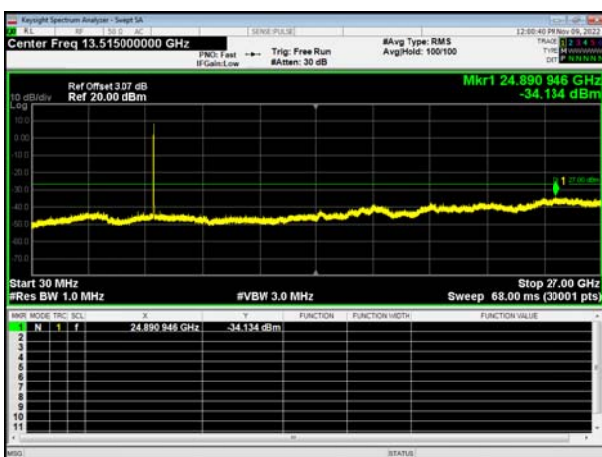
802.11n20 on channel 157 Ant. 0



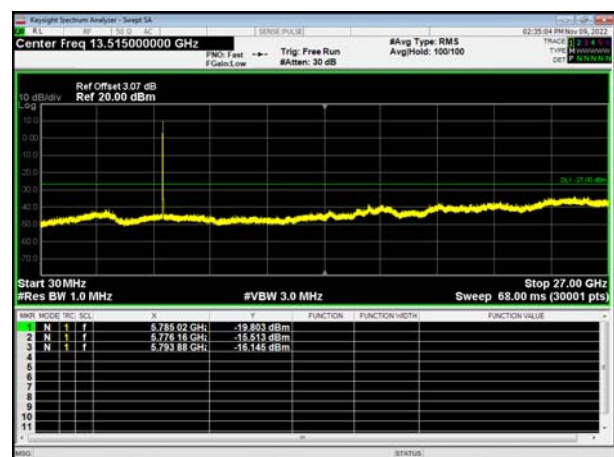
802.11n20 on channel 157 Ant. 1



802.11n20 on channel 165 Ant. 0

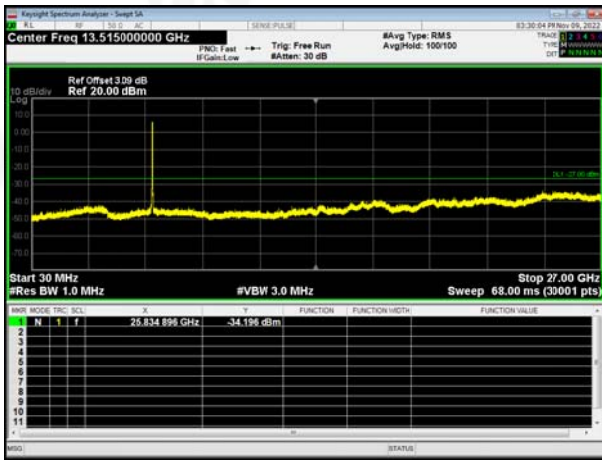


802.11n20 on channel 165 Ant. 1

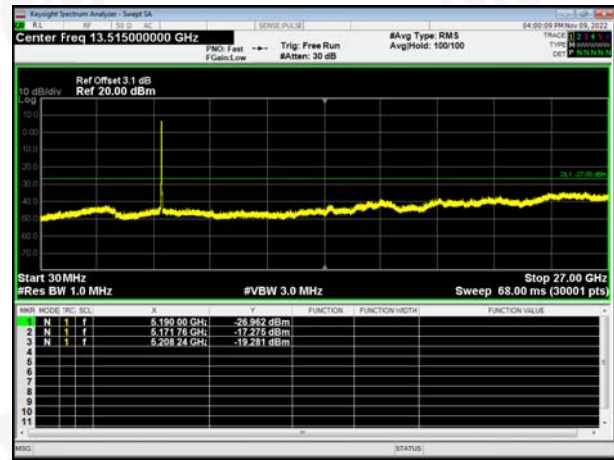




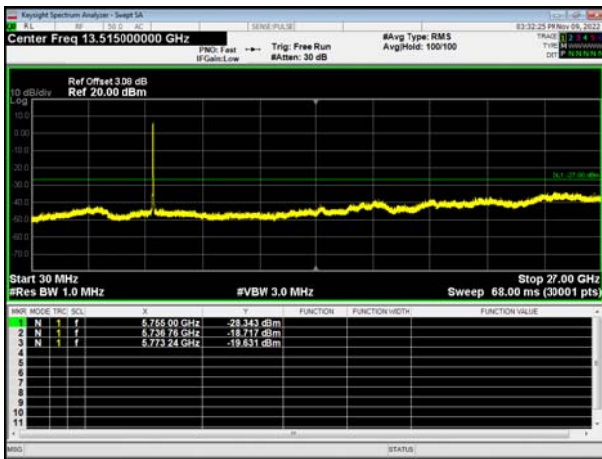
802.11n40 on channel 151 Ant. 0



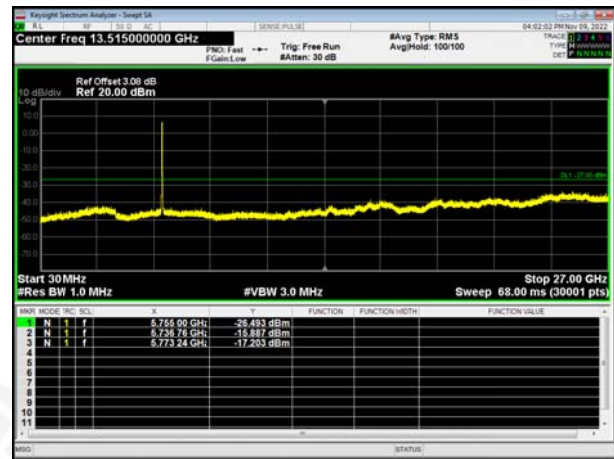
802.11n40 on channel 151 Ant. 1



802.11n40 on channel 159 Ant. 0

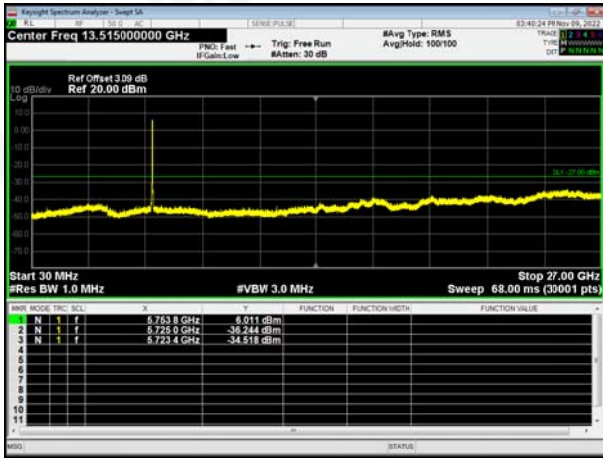


802.11n40 on channel 159 Ant. 1

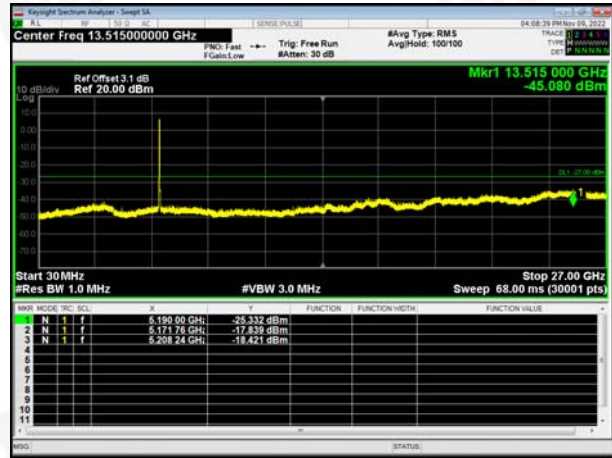




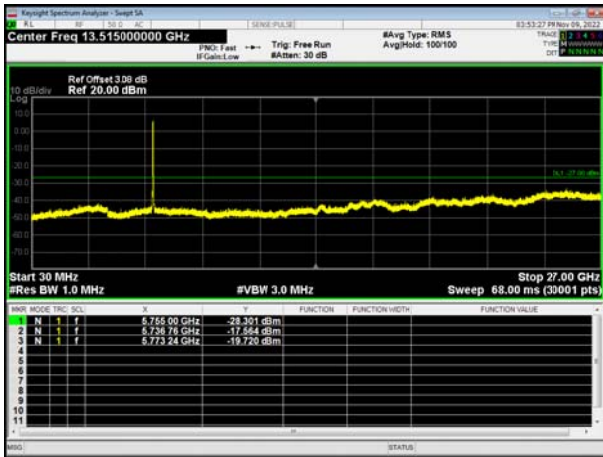
802.11ac40 on channel 151 Ant. 0



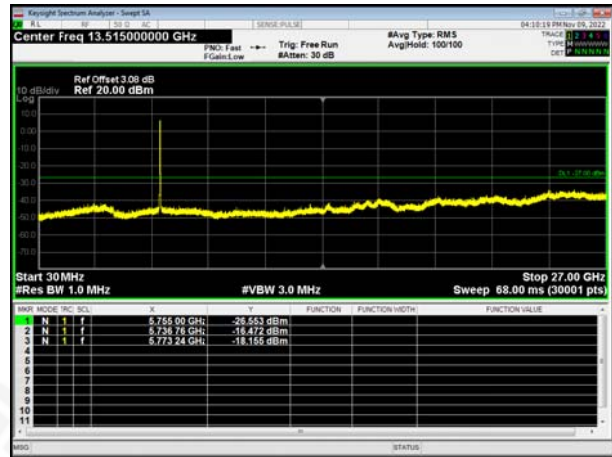
802.11ac40 on channel 151 Ant. 1



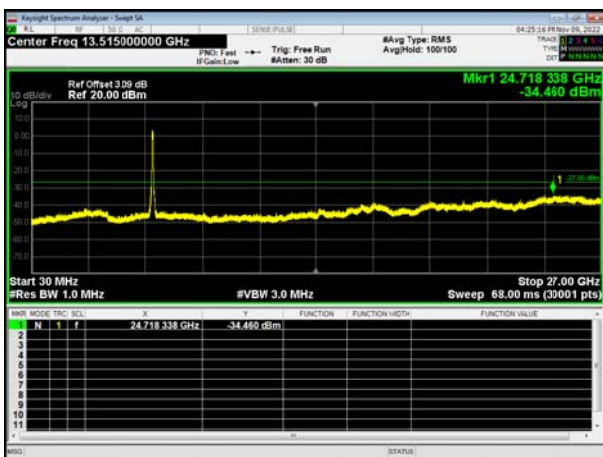
802.11ac40 on channel 159 Ant. 0



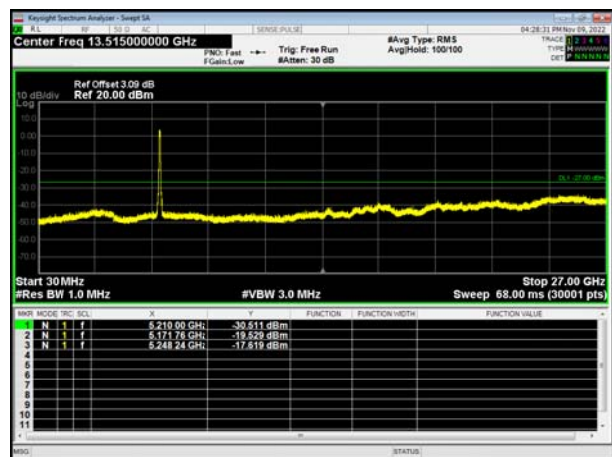
802.11ac40 on channel 159 Ant. 1



802.11ac80 on channel 155 Ant. 0



802.11ac80 on channel 155 Ant. 1





10. Frequency Stability Measurement

10.1 LIMIT

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).

10.2 TEST PROCEDURES

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. fc 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 $-20^{\circ}\text{C} \sim 70^{\circ}\text{C}$.

10.3 TEST SETUP LAYOUT



10.4 EUT OPERATION DURING TEST

The EUT was programmed to be in continuously un-modulation transmitting mode.

10.5 TEST RESULTS

Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1012 hPa	Test Voltage :	DC 3.8V
Test Mode :	TX		



5.2G

802.11a

Reference Frequency(Middle Channel): 5200 MHz				
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed		
		MCF		Error (ppm)
50	3.7	54		0.01038
40	3.7	52		0.01000
30	3.7	44		0.00846
20	3.7	35		0.00673
10	3.7	26		0.00500
0	3.7	23		0.00442
-10	3.7	21		0.00404
-20	3.7	35		0.00673
-30	3.7	47		0.00904

802.11ac20

Reference Frequency(Middle Channel): 5200 MHz				
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed		
		MCF		Error (ppm)
50	3.7	60		0.01154
40	3.7	53		0.01019
30	3.7	41		0.00788
20	3.7	33		0.00635
10	3.7	27		0.00519
0	3.7	24		0.00462
-10	3.7	21		0.00404
-20	3.7	33		0.00635
-30	3.7	47		0.00904



802.11n_HT20

Reference Frequency(Middle Channel): 5200MHz				
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed		
		MCF		Error (ppm)
50	3.7	54		0.01038
40	3.7	43		0.00827
30	3.7	33		0.00635
20	3.7	21		0.00404
10	3.7	24		0.00462
0	3.7	15		0.00288
-10	3.7	18		0.00346
-20	3.7	23		0.00442
-30	3.7	36		0.00692

802.11ac40

Reference Frequency(Middle Channel): 5190MHz				
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed		
		MCF		Error (ppm)
50	3.7	63		0.01214
40	3.7	54		0.01040
30	3.7	41		0.00790
20	3.7	46		0.00886
10	3.7	33		0.00636
0	3.7	31		0.00597
-10	3.7	32		0.00617
-20	3.7	46		0.00886
-30	3.7	54		0.01040



802.11n_HT40

Reference Frequency(Middle Channel): 5190MHz				
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed		
		MCF		Error (ppm)
50	3.7	62		0.01195
40	3.7	53		0.01021
30	3.7	45		0.00867
20	3.7	43		0.00829
10	3.7	35		0.00674
0	3.7	33		0.00636
-10	3.7	32		0.00617
-20	3.7	45		0.00867
-30	3.7	54		0.01040

802.11ac80

Reference Frequency(Middle Channel): 5210MHz				
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed		
		MCF		Error (ppm)
50	3.7	61		0.01171
40	3.7	53		0.01017
30	3.7	46		0.00883
20	3.7	43		0.00825
10	3.7	32		0.00614
0	3.7	34		0.00653
-10	3.7	32		0.00614
-20	3.7	47		0.00902
-30	3.7	53		0.01017



So, Frequency Stability Versus Input Voltage is:

802.11a

Reference Frequency(Middle Channel): 5200 MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency	Error (ppm)
20	3.7	42	0.00808
	3.3	41	0.00788
	4.2	39	0.00750

802.11ac20

Reference Frequency(Middle Channel): 5200 MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency	Error (ppm)
20	3.7	37	0.00712
	3.3	33	0.00635
	4.2	35	0.00673

802.11n_HT20

Reference Frequency(Middle Channel): 5200 MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency	Error (ppm)
20	3.7	43	0.00827
	3.3	37	0.00712
	4.2	41	0.00788

802.11ac40

Reference Frequency(Middle Channel): 5190 MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency	Error (ppm)
20	3.7	53	0.01021
	3.3	57	0.01098
	4.2	51	0.00983



802.11n_HT40

Reference Frequency(Middle Channel): 5190 MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency	Error (ppm)
20	3.7	62	0.01195
	3.3	60	0.01156
	4.2	58	0.01118

802.11ac80

Reference Frequency(Middle Channel): 5210 MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency	Error (ppm)
20	3.7	52	0.00998
	3.3	56	0.01075
	4.2	54	0.01036



5.8G

802.11a

Reference Frequency(Middle Channel): 5785 MHz				
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed		
		MCF		Error (ppm)
50	3.7	48		0.00830
40	3.7	46		0.00795
30	3.7	43		0.00743
20	3.7	33		0.00570
10	3.7	49		0.00847
0	3.7	25		0.00432
-10	3.7	33		0.00570
-20	3.7	37		0.00640
-30	3.7	26		0.00449

802.11ac20

Reference Frequency(Middle Channel): 5785 MHz				
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed		
		MCF		Error (ppm)
50	3.7	61		0.01054
40	3.7	54		0.00933
30	3.7	48		0.00830
20	3.7	34		0.00588
10	3.7	52		0.00899
0	3.7	25		0.00432
-10	3.7	36		0.00622
-20	3.7	32		0.00553
-30	3.7	26		0.00449



802.11n_HT20

Reference Frequency(Middle Channel): 5785 MHz				
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed		
		MCF		Error (ppm)
50	3.7	57		0.00985
40	3.7	46		0.00795
30	3.7	24		0.00415
20	3.7	32		0.00553
10	3.7	47		0.00812
0	3.7	25		0.00432
-10	3.7	31		0.00536
-20	3.7	25		0.00432
-30	3.7	33		0.00570

802.11ac40

Reference Frequency(Middle Channel): 5755 MHz				
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed		
		MCF		Error (ppm)
50	3.7	43		0.00747
40	3.7	34		0.00591
30	3.7	25		0.00434
20	3.7	35		0.00608
10	3.7	32		0.00556
0	3.7	46		0.00799
-10	3.7	32		0.00556
-20	3.7	26		0.00452
-30	3.7	20		0.00348



802.11n_HT40

Reference Frequency(Middle Channel): 5755 MHz				
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed		
		MCF		Error (ppm)
50	3.7	39		0.00678
40	3.7	34		0.00591
30	3.7	22		0.00382
20	3.7	33		0.00573
10	3.7	34		0.00591
0	3.7	56		0.00973
-10	3.7	42		0.00730
-20	3.7	36		0.00626
-30	3.7	33		0.00573

802.11ac80

Reference Frequency(Middle Channel): 5775 MHz				
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed		
		MCF		Error (ppm)
50	3.7	68		0.01177
40	3.7	53		0.00918
30	3.7	52		0.00900
20	3.7	44		0.00762
10	3.7	36		0.00623
0	3.7	32		0.00554
-10	3.7	29		0.00502
-20	3.7	21		0.00364
-30	3.7	36		0.00623



So, Frequency Stability Versus Input Voltage is:

802.11a

Reference Frequency(Middle Channel): 5785 MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency	Error (ppm)
20	3.7	53	0.00916
	3.3	46	0.00795
	4.2	52	0.00899

802.11ac20

Reference Frequency(Middle Channel): 5785 MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency	Error (ppm)
20	3.7	43	0.00743
	3.3	45	0.00778
	4.2	38	0.00657

802.11n_HT20

Reference Frequency(Middle Channel): 5785 MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency	Error (ppm)
20	3.7	58	0.01003
	3.3	54	0.00933
	4.2	47	0.00812

802.11ac40

Reference Frequency(Middle Channel): 5755 MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency	Error (ppm)
20	3.7	61	0.01060
	3.3	56	0.00973
	4.2	52	0.00904



802.11n_HT40

Reference Frequency(Middle Channel): 5755 MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency	Error (ppm)
20	3.7	37	0.00643
	3.3	32	0.00556
	4.2	27	0.00469

802.11ac80

Reference Frequency(Middle Channel): 5775 MHz			
Environment Temperature (°C)	Power Supplied (VDC)	Frequency Measure with Time Elapsed	
		Frequency	Error (ppm)
20	3.7	42	0.00727
	3.3	37	0.00641
	4.2	43	0.00745



11.ANTENNA REQUIREMENT

Standard requirement:	FCC Part15 C Section 15.203
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.
EUT Antenna:	
	The antenna is FPCBAntenna, the best case gain of the ANT. 0 is 2.63dBi and ANT. 1 is 3.38dBi, reference to the Internal Photos for details



12. TEST SETUP PHOTO

Reference to the Test Setup Photos.

13. EUT CONSTRUCTIONAL DETAILS

Reference to the External Photos and Internal Photos.

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