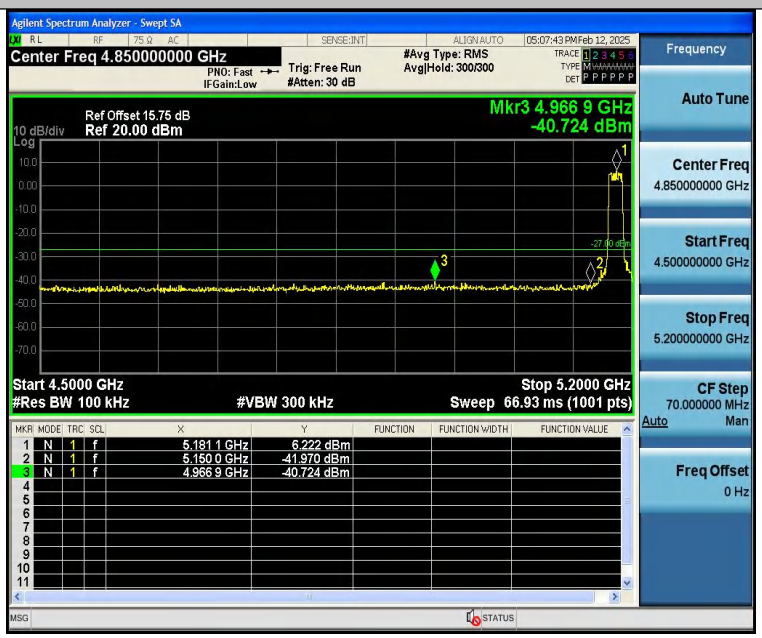
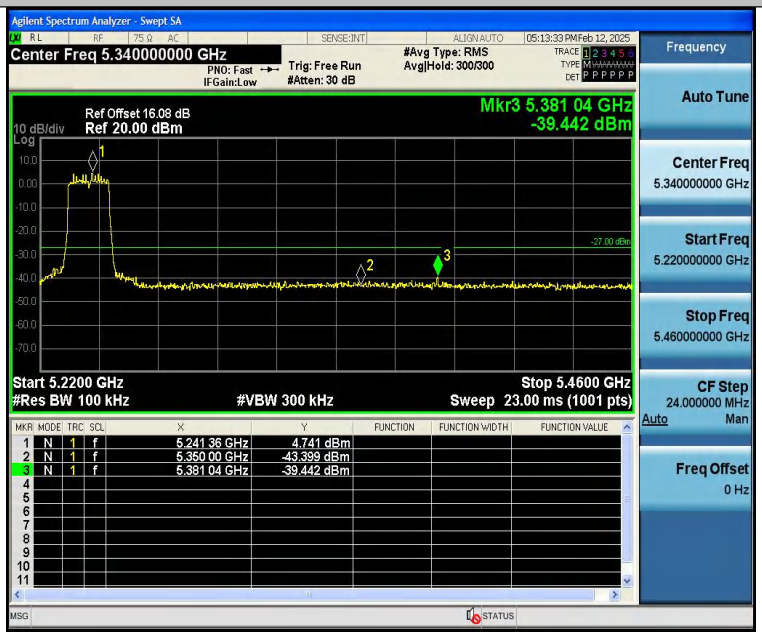
Ant4:

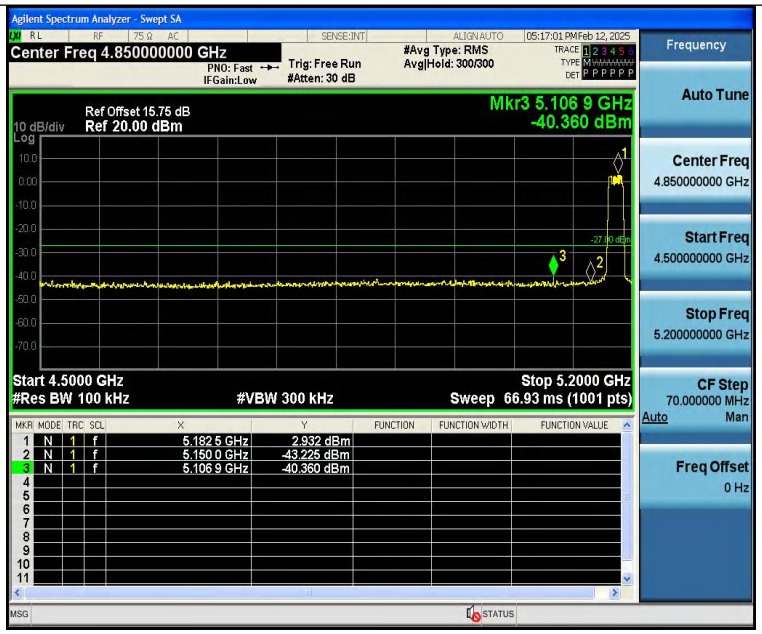
11A-Ant4-5180-PASS



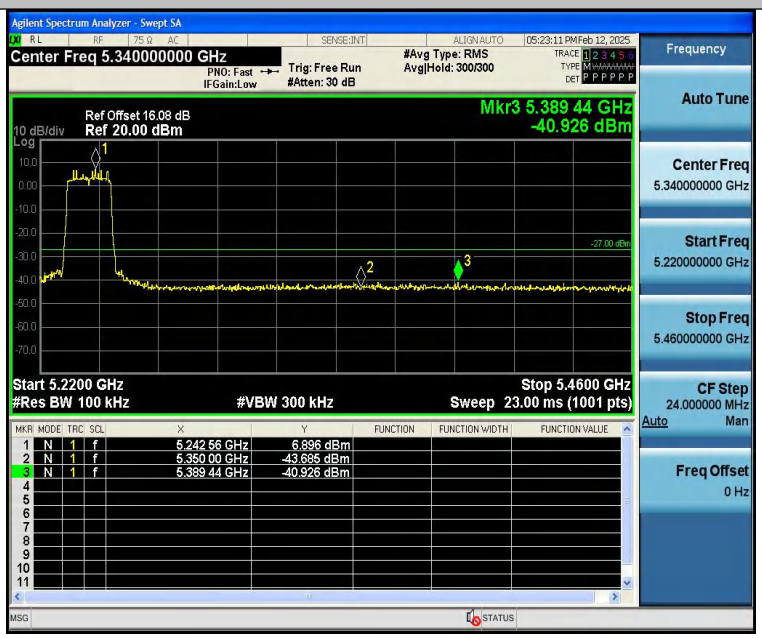
11A-Ant4-5240-PASS



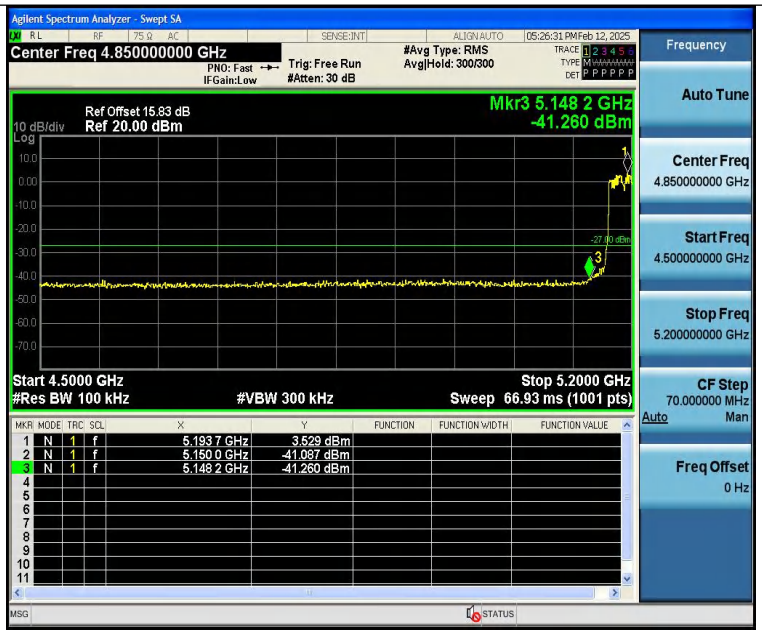
11N20SISO-Ant4-5180-PASS



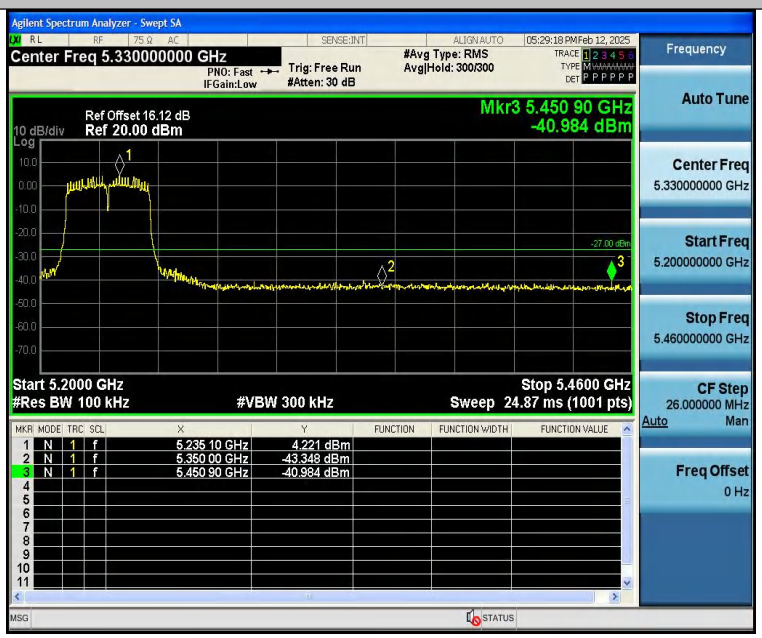
11N20SISO-Ant4-5240-PASS



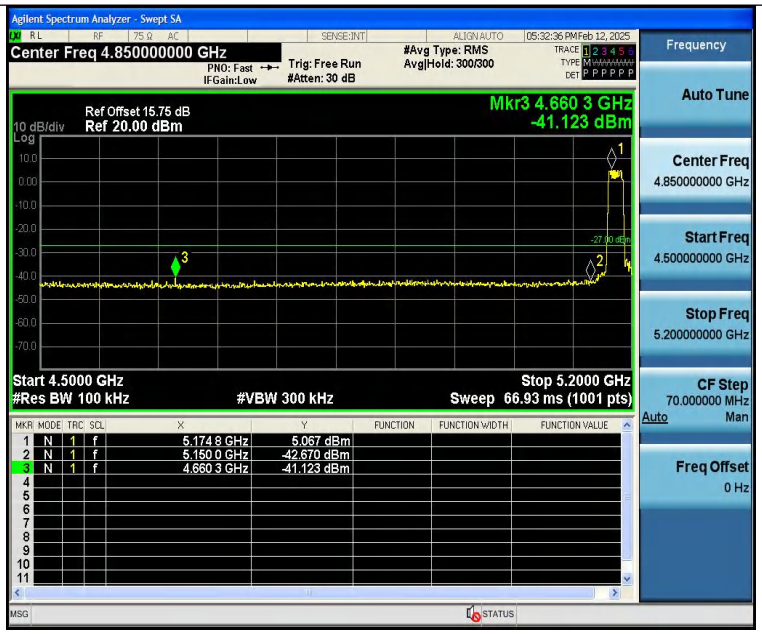
11N40SISO-Ant4-5190-PASS



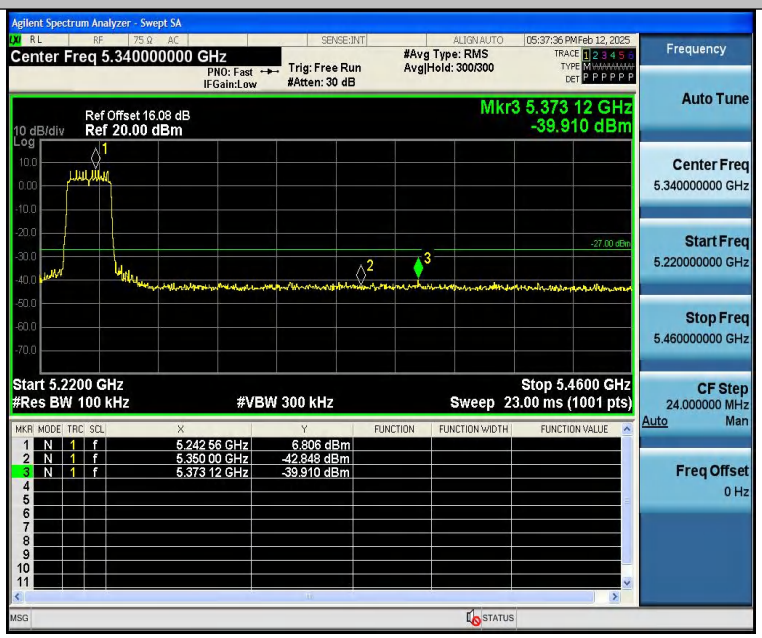
11N40SISO-Ant4-5230-PASS



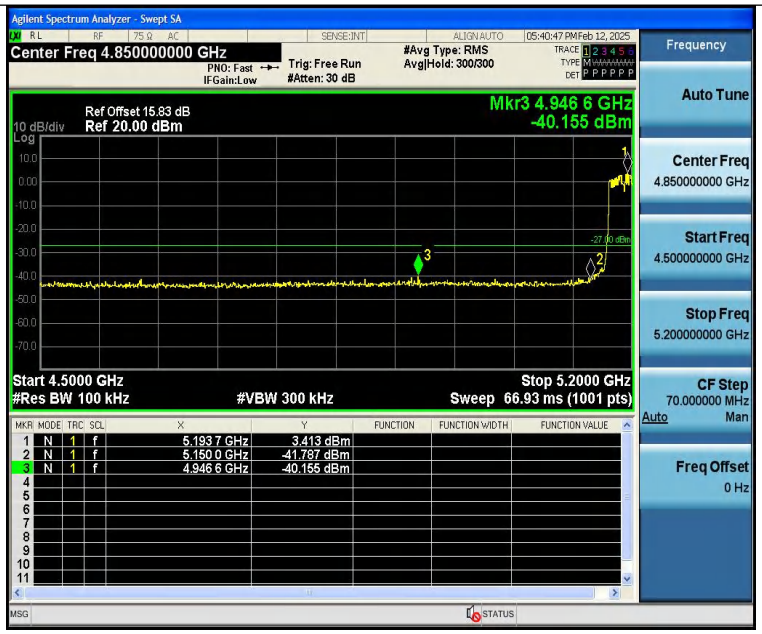
11AC20SISO-Ant4-5180-PASS



11AC20SISO-Ant4-5240-PASS



11AC40SISO-Ant4-5190-PASS



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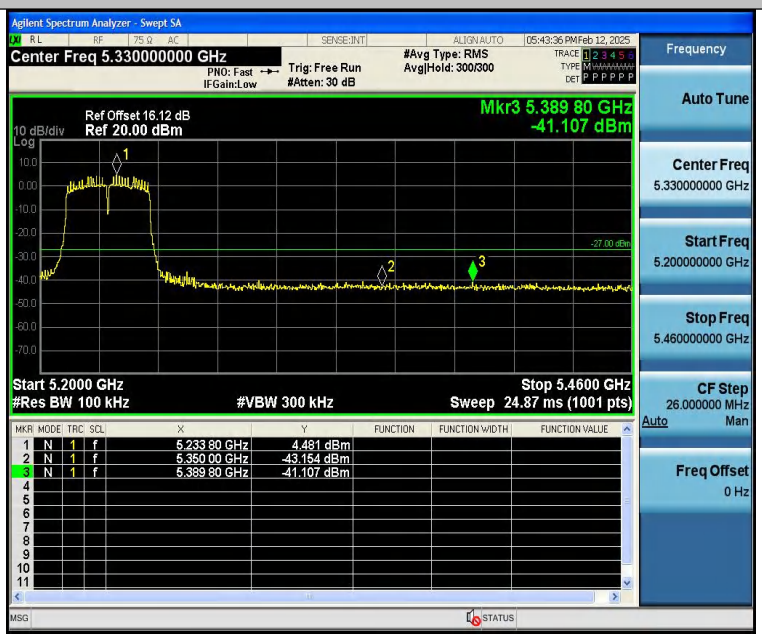
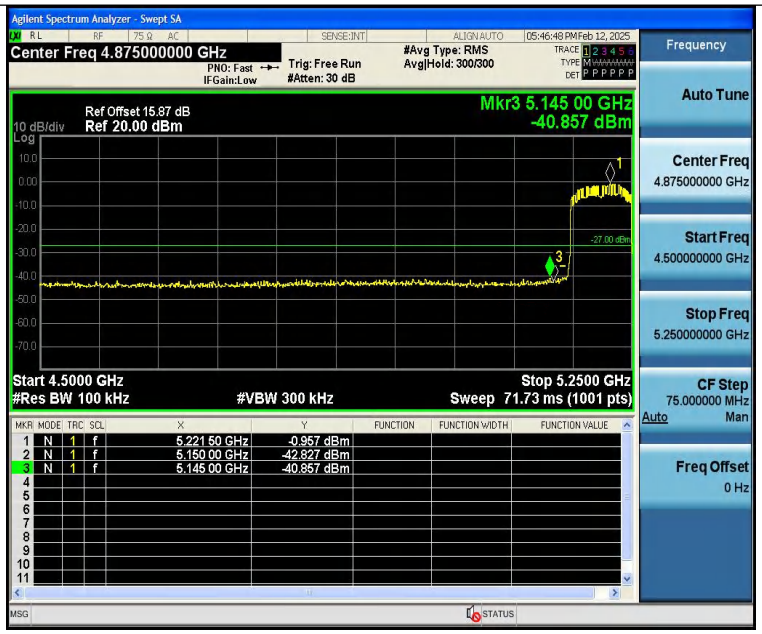
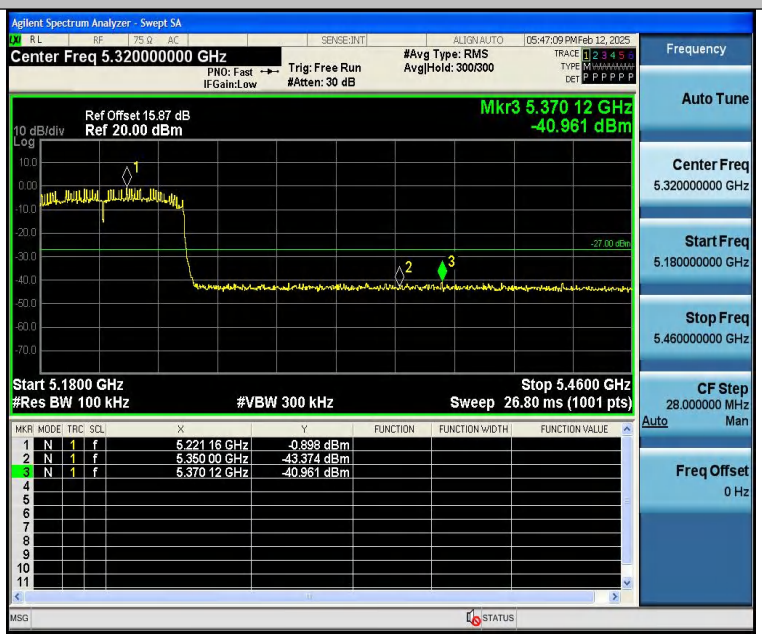


11AC80SISO-Ant4-5210-PASS

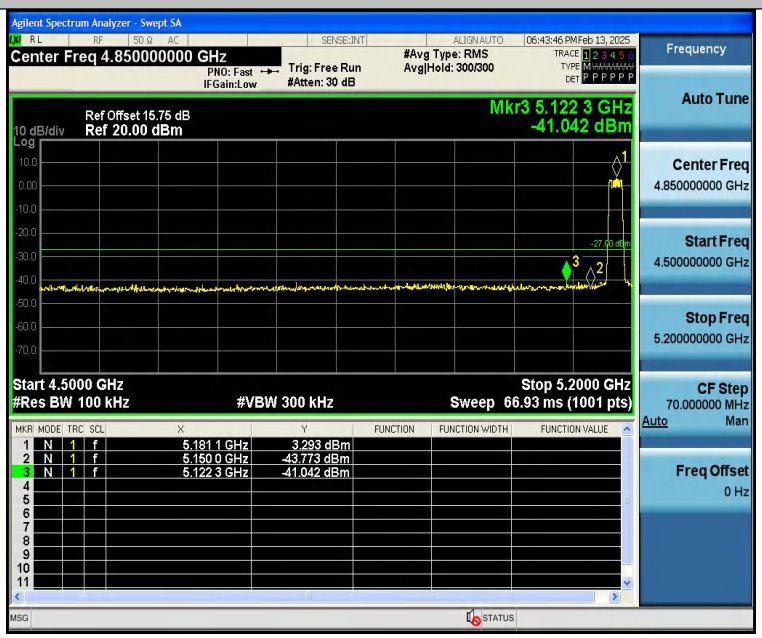


11AC80SISO-Ant4-5210-PASS

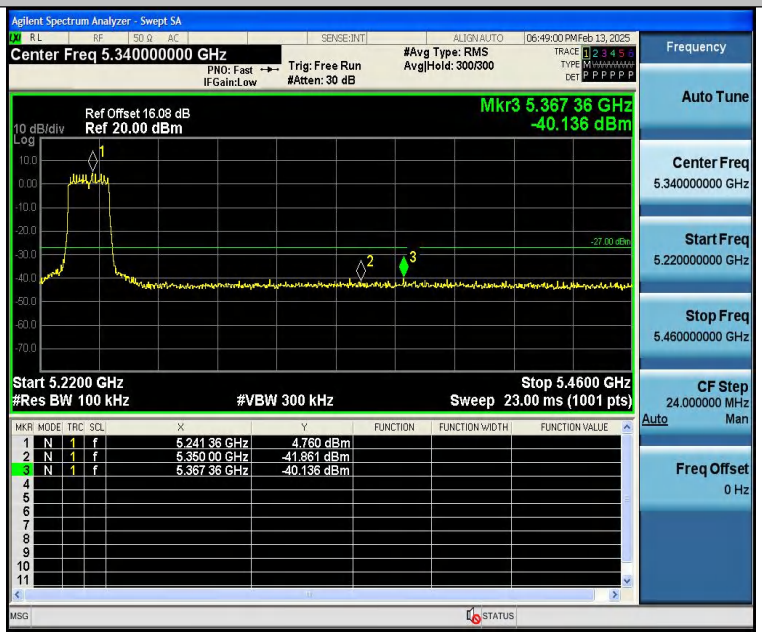


Ant5:

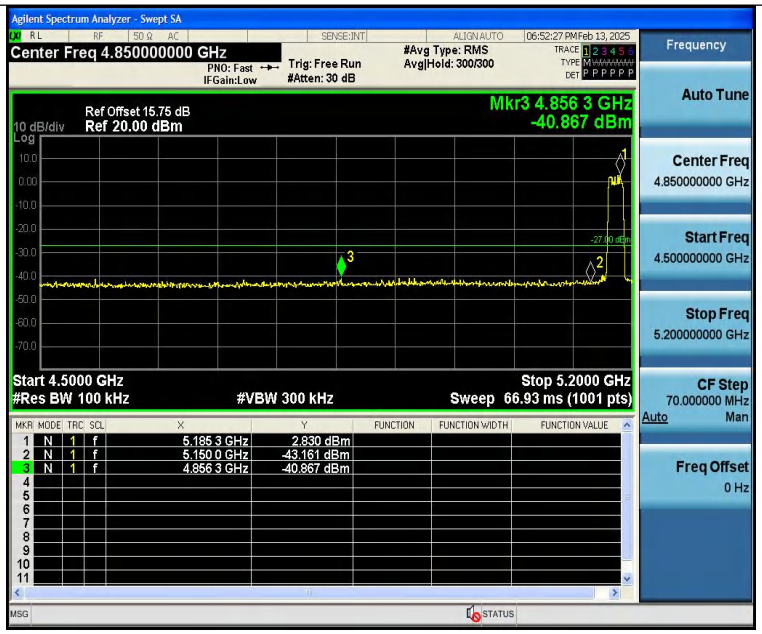
11A-Ant5-5180-PASS



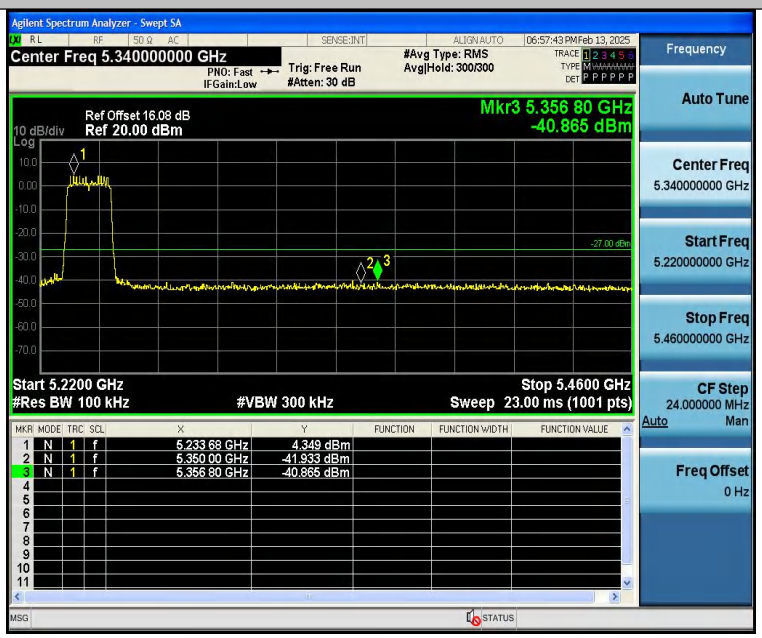
11A-Ant5-5240-PASS



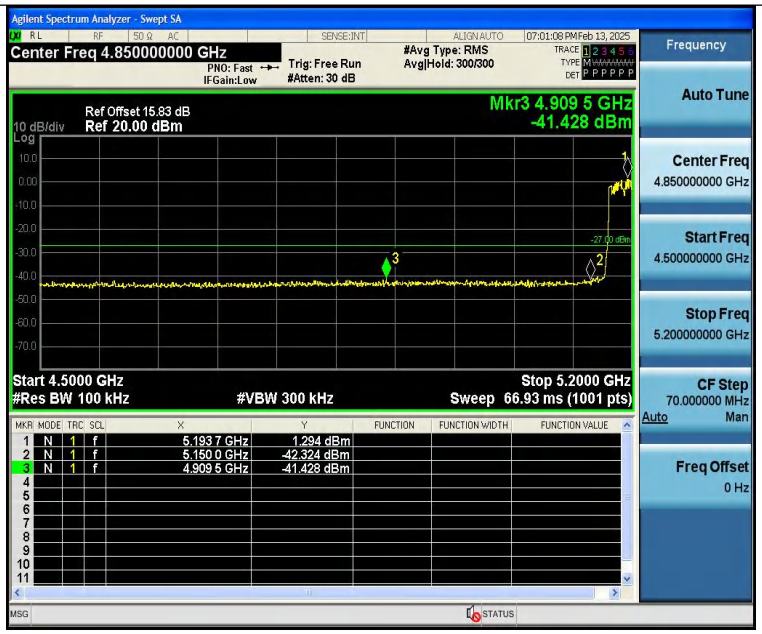
11N20SISO-Ant5-5180-PASS



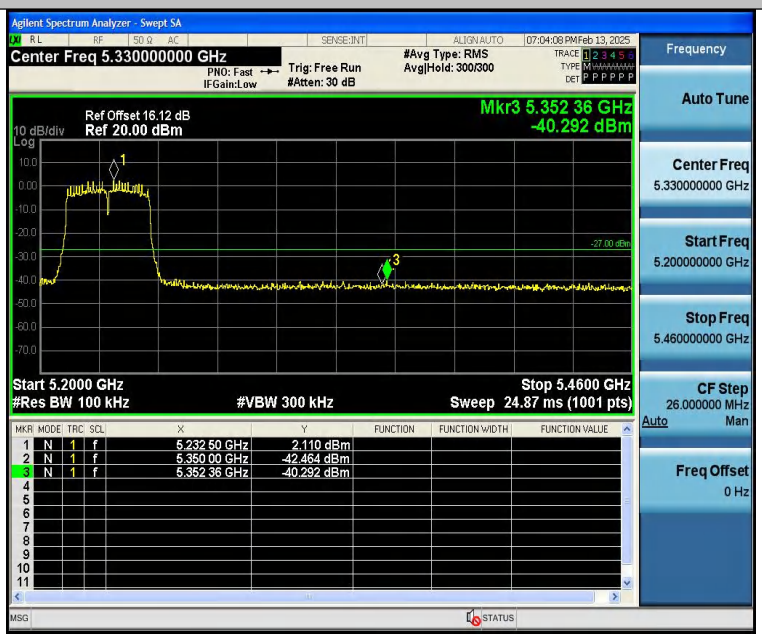
11N20SISO-Ant5-5240-PASS



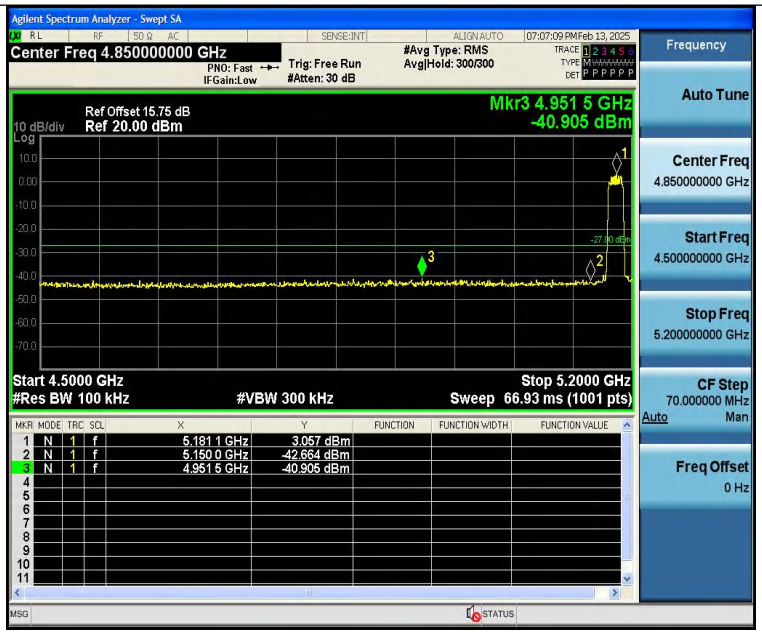
11N40SISO-Ant5-5190-PASS



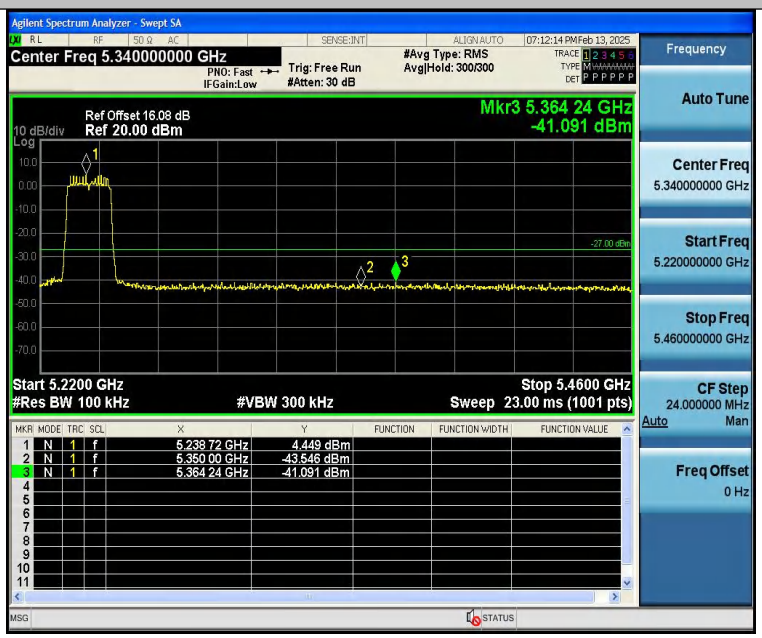
11N40SISO-Ant5-5230-PASS



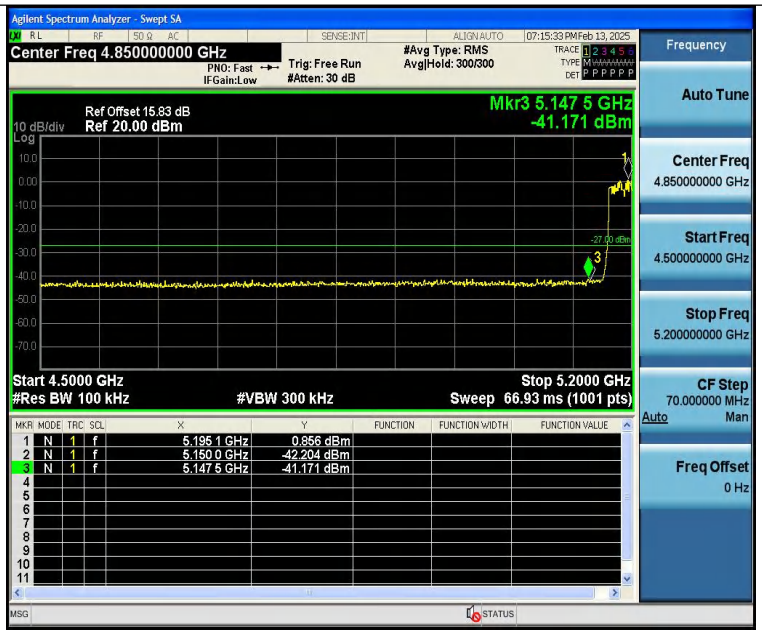
11AC20SISO-Ant5-5180-PASS



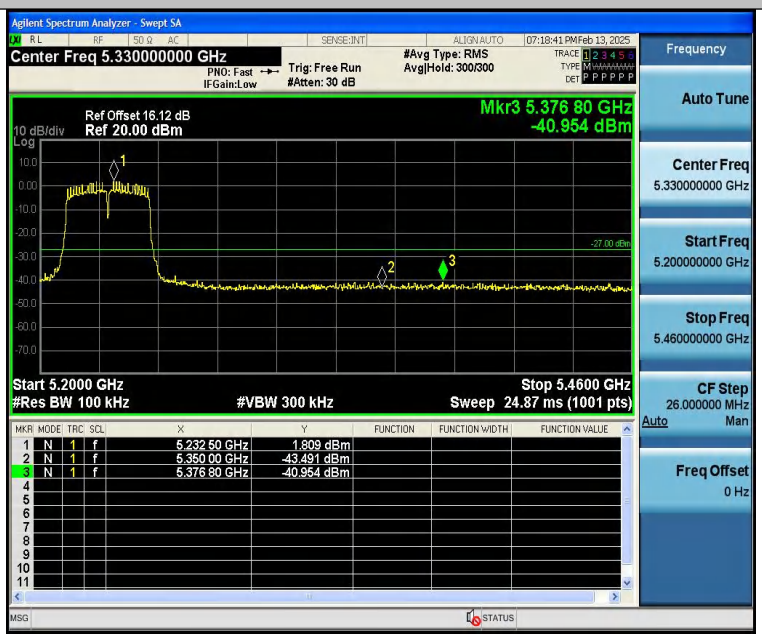
11AC20SISO-Ant5-5240-PASS



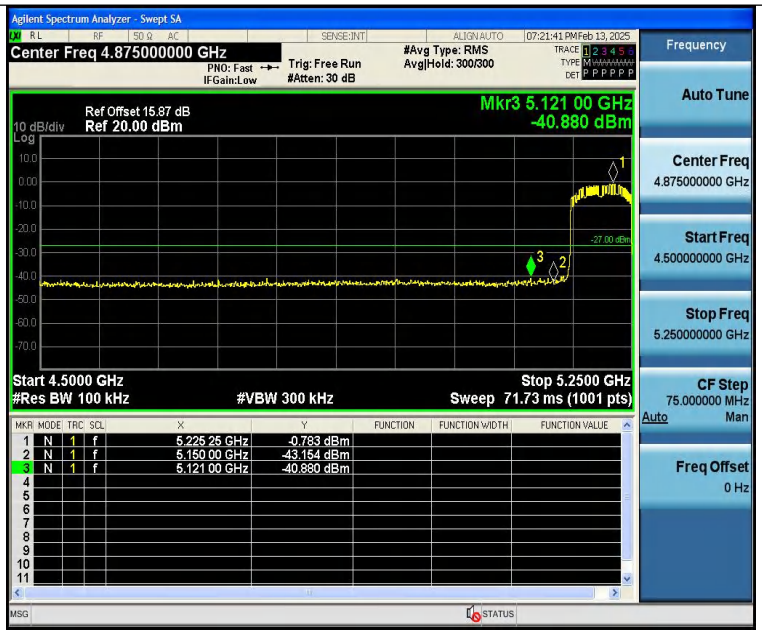
11AC40SISO-Ant5-5190-PASS



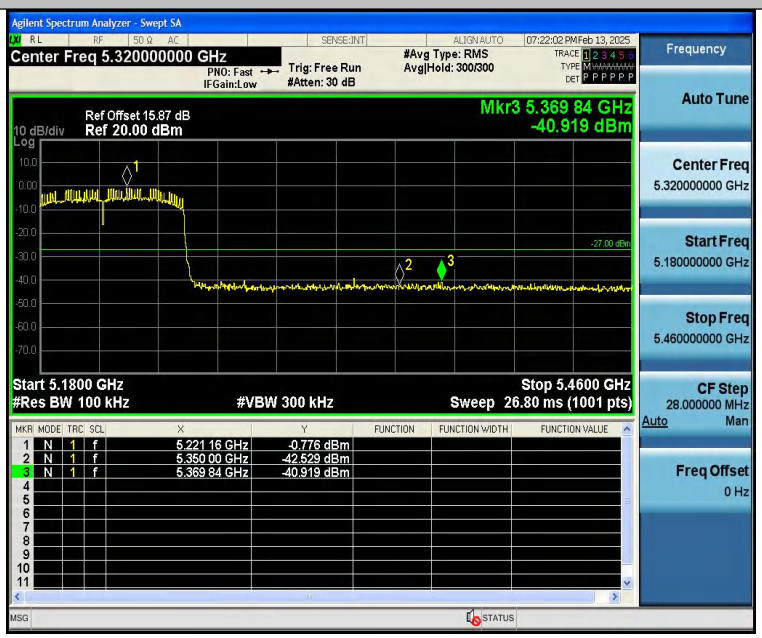
11AC40SISO-Ant5-5230-PASS



11AC80SISO-Ant5-5210-PASS



11AC80SISO-Ant5-5210-PASS



Note: The limits are based on EIRP, and the antenna gain and line loss are compensated to the instrument by the test system.

6.7 Restricted Band

Test Requirement : FCC Part15 E Section 15.407(b)

Test site : Measurement Distance: 3m

Test Limit :

Frequency	Limit (dBuV/m @3m)	Remark
Above 1GHz	74	Peak Value
	54	Average Value

Test Procedure:

1. The EUT was placed on a styrofoam table which is 1.5m above ground plane.

2. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions. The spectrum was investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.

5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.

6. Repeat above procedures until the measurements for all frequencies are complete.

7. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.

8. The test above 1GHz must be use the fully anechoic room, and the test below 1GHz use the half anechoic room

Test Result:

Worst case mode:		802.11a(6Mbps)		Test channel:		36		
NO.	Freq. [MHz]	level [dBμV/m]	Factor [dB]	Emission level [dBμV/m]	Limit [dBμV/m]	Over [dB]	Polarity	Detector Type
1	5150	50.45	6.53	56.98	74	17.02	H	Peak
2	5150	39.88	6.53	46.41	54	7.59	H	Average
3	5150	49.29	6.53	55.82	74	18.18	V	Peak
4	5150	38.44	6.53	44.97	54	9.03	V	Average

Worst case mode:		802.11a(6Mbps)		Test channel:		48		
NO.	Freq. [MHz]	level [dBμV/m]	Factor [dB]	Emission level [dBμV/m]	Limit [dBμV/m]	Over [dB]	Polarity	Detector Type
1	5350	50.38	6.56	56.94	74	17.06	H	Peak
2	5350	40.15	6.56	46.71	54	7.29	H	Average
3	5350	49.36	6.56	55.92	74	18.08	V	Peak
4	5350	38.36	6.56	44.92	54	9.08	V	Average

Note: Only recorded the worst case in the report.

7 Emission Bandwidth and Occupied Bandwidth

Test Requirement	:	FCC CFR47 Part 15 Section 15.407(a)(e)
Test Method	:	ANSI C63.10:2013
Test Limit		According to FCC §15.407(a), 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 are made over a reference bandwidth of 500 kHz or the 26 dB emission bandwidth of the device, whichever is less. 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. As per FCC §15.407(e): for equipment operating in the band 5725 – 5850 MHz, the minimum 6 dB bandwidth of U-NII devices shall be 500 kHz.

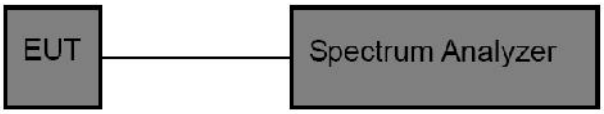
7.1 Test Procedure

According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01,
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%;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 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 15.407(a).

The following procedure shall be used for measuring (99 %) power bandwidth:
1. Set center frequency to the nominal EUT channel center frequency.
2. Set span = 1.5 times to 5.0 times the OBW.
3. Set RBW = 1 % to 5 % of the OBW
4. Set VBW ⩾ 3 • RBW
5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise,
peak detection and max hold mode (until the trace stabilizes) shall be used.
6. Use the 99 % power bandwidth function of the instrument (if available).
7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency.

The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.

7.2 Test Setup



7.3 Test Result

PASS

Pre-scan has been conducted to determine the worst-case mode from all possible combinations between available modulations / data rates and antenna ports.
Following channel was selected for the final test as listed below.

26 dB emission bandwidth:

Ant0:

TestMode	Antenna	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant0	5180	18.520	5170.800	5189.320	---	---
11A	Ant0	5200	18.520	5190.840	5209.360	---	---
11A	Ant0	5240	18.480	5230.760	5249.240	---	---
11N20SISO	Ant0	5180	19.280	5170.400	5189.680	---	---
11N20SISO	Ant0	5200	19.320	5190.360	5209.680	---	---
11N20SISO	Ant0	5240	19.400	5230.320	5249.720	---	---
11N40SISO	Ant0	5190	41.200	5169.600	5210.800	---	---
11N40SISO	Ant0	5230	40.400	5210.000	5250.400	---	---
11AC20SISO	Ant0	5180	19.400	5170.400	5189.800	---	---
11AC20SISO	Ant0	5200	19.440	5190.280	5209.720	---	---
11AC20SISO	Ant0	5240	19.200	5230.400	5249.600	---	---
11AC40SISO	Ant0	5190	40.880	5169.920	5210.800	---	---
11AC40SISO	Ant0	5230	40.880	5209.760	5250.640	---	---
11AC80SISO	Ant0	5210	80.640	5169.680	5250.320	---	---

Ant1:

TestMode	Antenna	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant1	5180	18.440	5170.800	5189.240	---	---
11A	Ant1	5200	18.480	5190.760	5209.240	---	---
11A	Ant1	5240	18.440	5230.800	5249.240	---	---
11N20SISO	Ant1	5180	19.280	5170.320	5189.600	---	---
11N20SISO	Ant1	5200	19.520	5190.200	5209.720	---	---
11N20SISO	Ant1	5240	19.400	5230.280	5249.680	---	---
11N40SISO	Ant1	5190	40.720	5169.600	5210.320	---	---
11N40SISO	Ant1	5230	40.560	5209.840	5250.400	---	---
11AC20SISO	Ant1	5180	19.200	5170.480	5189.680	---	---
11AC20SISO	Ant1	5200	19.320	5190.360	5209.680	---	---
11AC20SISO	Ant1	5240	19.400	5230.280	5249.680	---	---

11AC40SISO	Ant1	5190	40.160	5170.080	5210.240	---	---
11AC40SISO	Ant1	5230	40.800	5209.760	5250.560	---	---
11AC80SISO	Ant1	5210	80.320	5170.160	5250.480	---	---

Ant2:

TestMode	Antenna	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant2	5180	18.520	5170.760	5189.280	---	---
11A	Ant2	5200	18.520	5190.800	5209.320	---	---
11A	Ant2	5240	18.360	5230.720	5249.080	---	---
11N20SISO	Ant2	5180	19.360	5170.360	5189.720	---	---
11N20SISO	Ant2	5200	19.520	5190.240	5209.760	---	---
11N20SISO	Ant2	5240	19.360	5230.360	5249.720	---	---
11N40SISO	Ant2	5190	40.880	5169.360	5210.240	---	---
11N40SISO	Ant2	5230	40.800	5209.440	5250.240	---	---
11AC20SISO	Ant2	5180	19.440	5170.200	5189.640	---	---
11AC20SISO	Ant2	5200	19.520	5190.160	5209.680	---	---
11AC20SISO	Ant2	5240	19.360	5230.280	5249.640	---	---
11AC40SISO	Ant2	5190	41.280	5169.200	5210.480	---	---
11AC40SISO	Ant2	5230	40.640	5209.760	5250.400	---	---
11AC80SISO	Ant2	5210	81.280	5169.840	5251.120	---	---

Ant3:

TestMode	Antenna	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant3	5180	18.240	5170.920	5189.160	---	---
11A	Ant3	5200	18.400	5190.800	5209.200	---	---
11A	Ant3	5240	18.360	5230.840	5249.200	---	---
11N20SISO	Ant3	5180	19.360	5170.400	5189.760	---	---
11N20SISO	Ant3	5200	19.320	5190.320	5209.640	---	---
11N20SISO	Ant3	5240	19.480	5230.280	5249.760	---	---
11N40SISO	Ant3	5190	40.720	5169.840	5210.560	---	---
11N40SISO	Ant3	5230	40.640	5209.520	5250.160	---	---
11AC20SISO	Ant3	5180	19.480	5170.320	5189.800	---	---
11AC20SISO	Ant3	5200	19.320	5190.400	5209.720	---	---
11AC20SISO	Ant3	5240	19.440	5230.280	5249.720	---	---
11AC40SISO	Ant3	5190	40.880	5169.840	5210.720	---	---
11AC40SISO	Ant3	5230	40.240	5209.920	5250.160	---	---
11AC80SISO	Ant3	5210	80.480	5169.840	5250.320	---	---

Ant4:

TestMode	Antenna	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant4	5180	18.560	5170.880	5189.440	---	---
11A	Ant4	5200	18.520	5190.800	5209.320	---	---
11A	Ant4	5240	18.360	5230.720	5249.080	---	---
11N20SISO	Ant4	5180	19.360	5170.320	5189.680	---	---
11N20SISO	Ant4	5200	19.480	5190.240	5209.720	---	---
11N20SISO	Ant4	5240	19.440	5230.200	5249.640	---	---
11N40SISO	Ant4	5190	40.480	5169.760	5210.240	---	---
11N40SISO	Ant4	5230	40.960	5209.520	5250.480	---	---

11AC20SISO	Ant4	5180	19.360	5170.400	5189.760	---	---
11AC20SISO	Ant4	5200	19.400	5190.400	5209.800	---	---
11AC20SISO	Ant4	5240	19.240	5230.400	5249.640	---	---
11AC40SISO	Ant4	5190	40.640	5170.080	5210.720	---	---
11AC40SISO	Ant4	5230	40.800	5209.680	5250.480	---	---
11AC80SISO	Ant4	5210	80.640	5170.000	5250.640	---	---

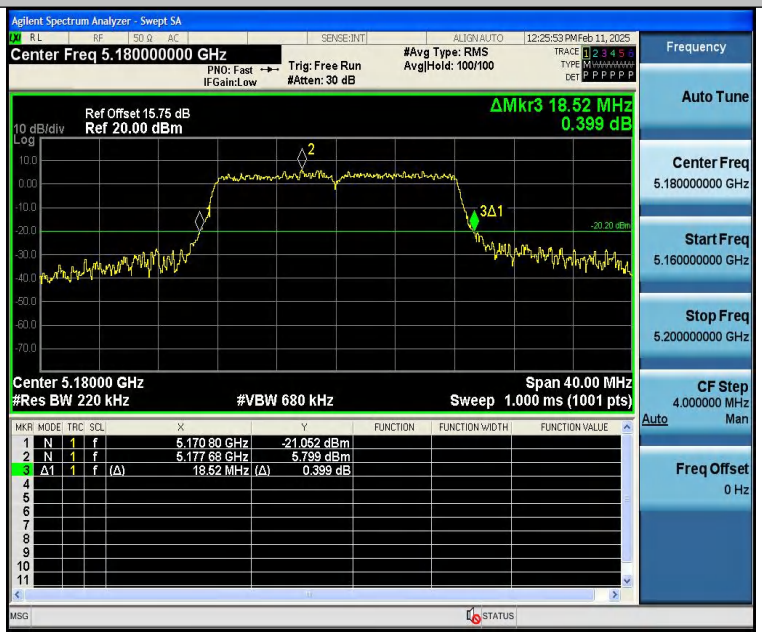
Ant5:

TestMode	Antenna	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A	Ant5	5180	18.600	5170.760	5189.360	---	---
11A	Ant5	5200	18.560	5190.800	5209.360	---	---
11A	Ant5	5240	18.520	5230.800	5249.320	---	---
11N20SISO	Ant5	5180	19.400	5170.320	5189.720	---	---
11N20SISO	Ant5	5200	19.480	5190.320	5209.800	---	---
11N20SISO	Ant5	5240	19.280	5230.360	5249.640	---	---
11N40SISO	Ant5	5190	40.400	5170.160	5210.560	---	---
11N40SISO	Ant5	5230	40.800	5209.440	5250.240	---	---
11AC20SISO	Ant5	5180	19.360	5170.400	5189.760	---	---
11AC20SISO	Ant5	5200	19.400	5190.280	5209.680	---	---
11AC20SISO	Ant5	5240	19.120	5230.440	5249.560	---	---
11AC40SISO	Ant5	5190	40.880	5170.000	5210.880	---	---
11AC40SISO	Ant5	5230	40.320	5209.920	5250.240	---	---
11AC80SISO	Ant5	5210	80.320	5170.000	5250.320	---	---

Test Graphs：

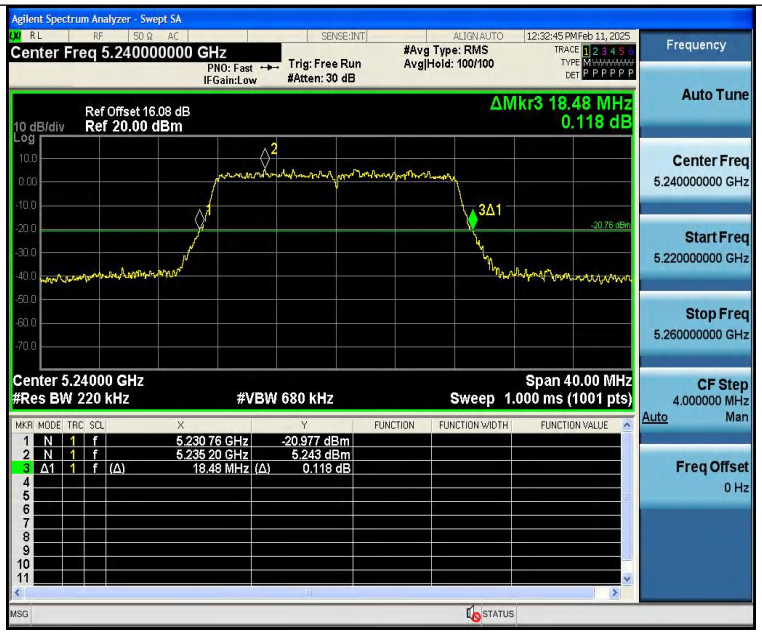
Ant0:

11A-Ant0-5180

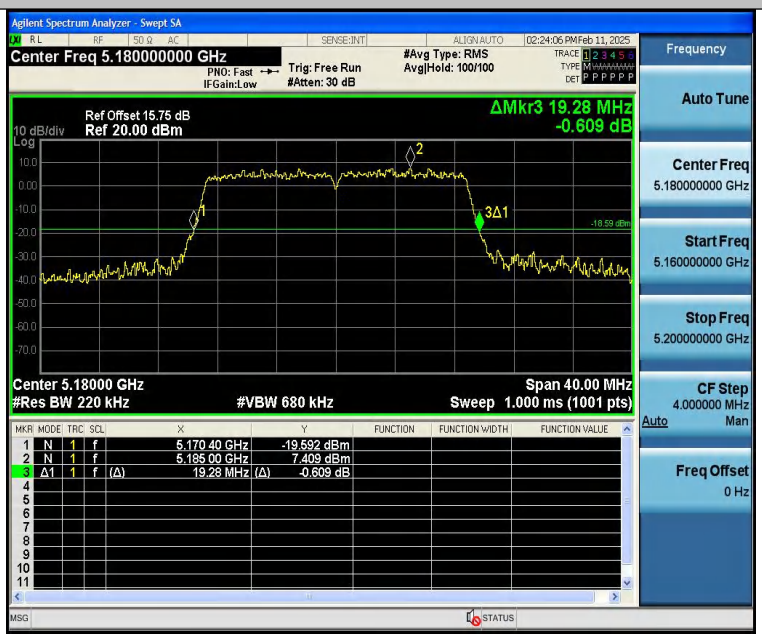


11A-Ant0-5200

11A-Ant0-5240

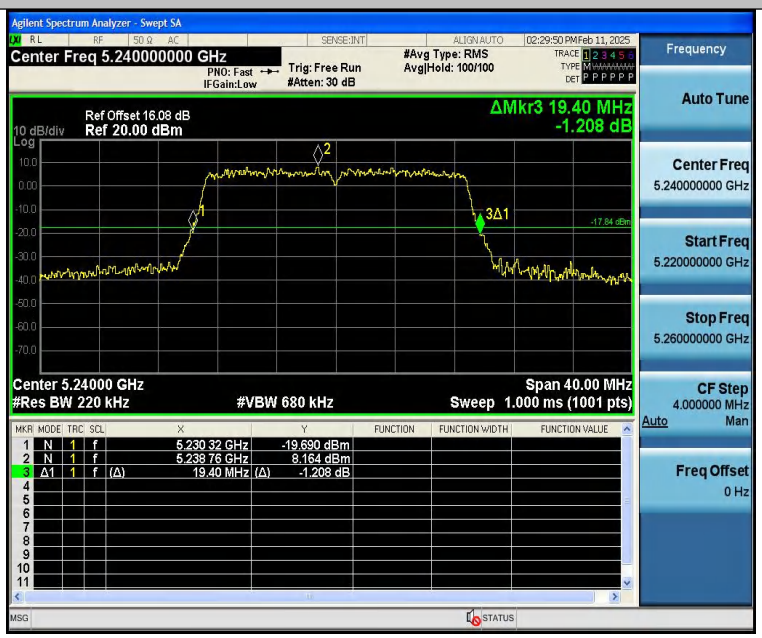


11N20SISO-Ant0-5180



11N20SISO-Ant0-5200

11N20SISO-Ant0-5240



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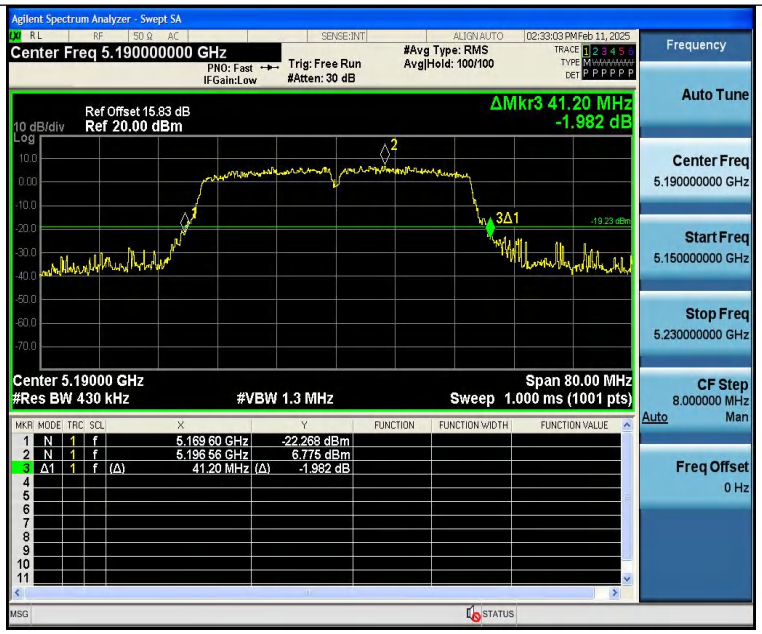
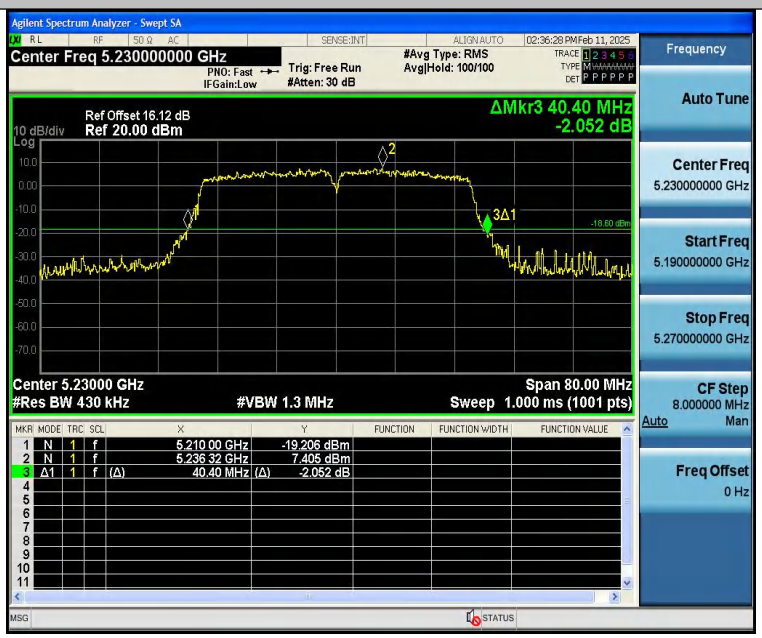
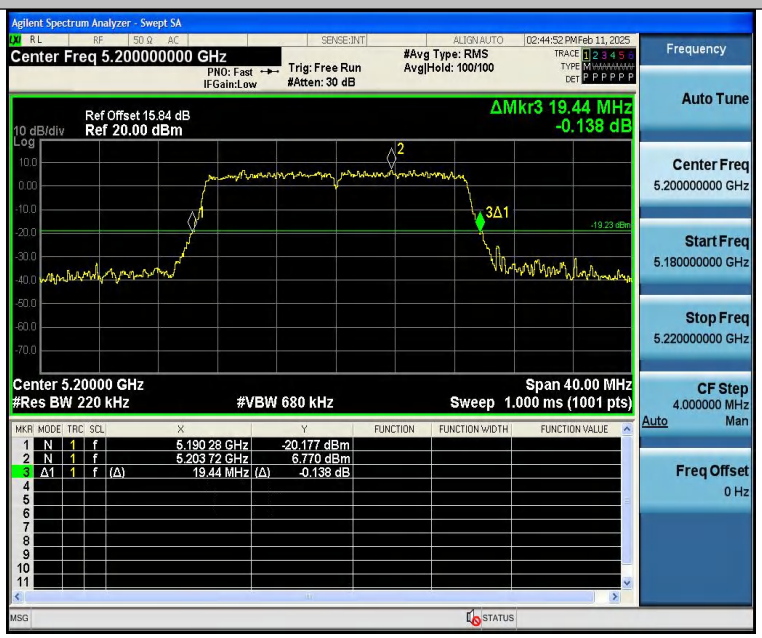


11N40SISO-Ant0-5230



11AC20SISO-Ant0-5180

11AC20SISO-Ant0-5200



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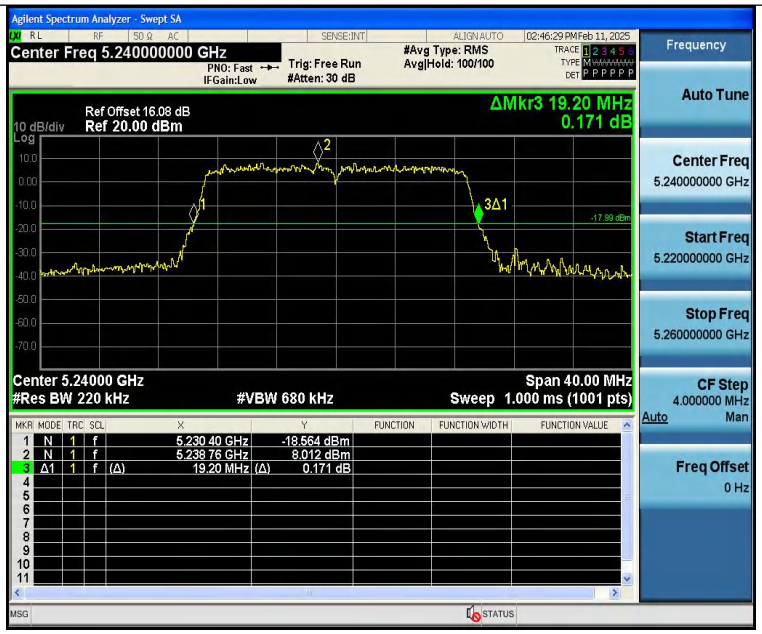

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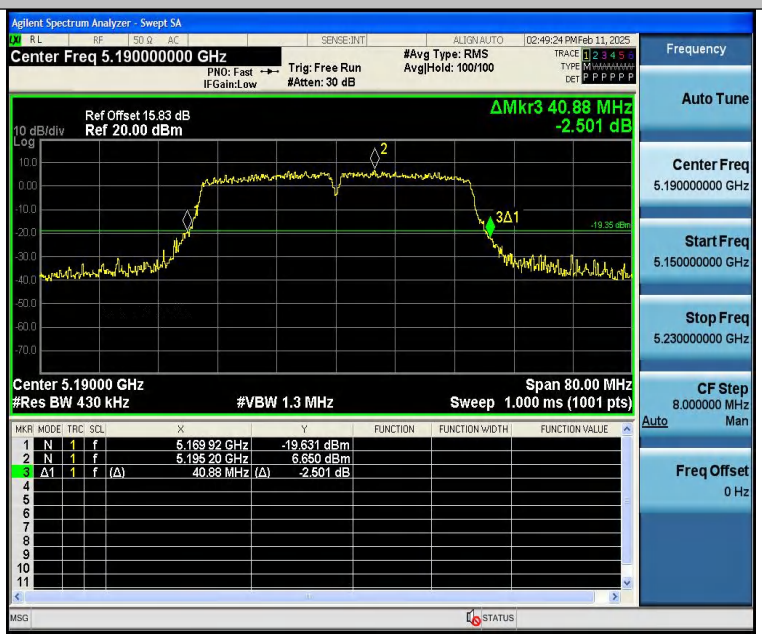
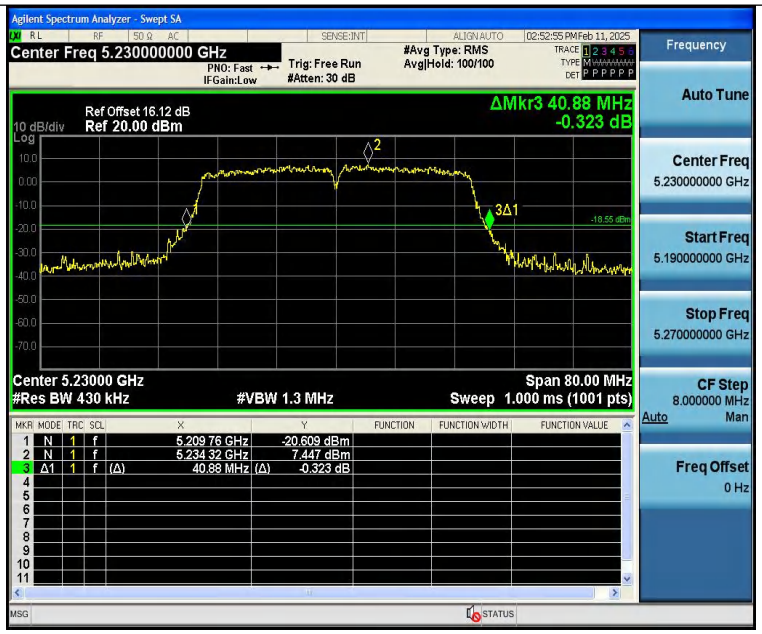
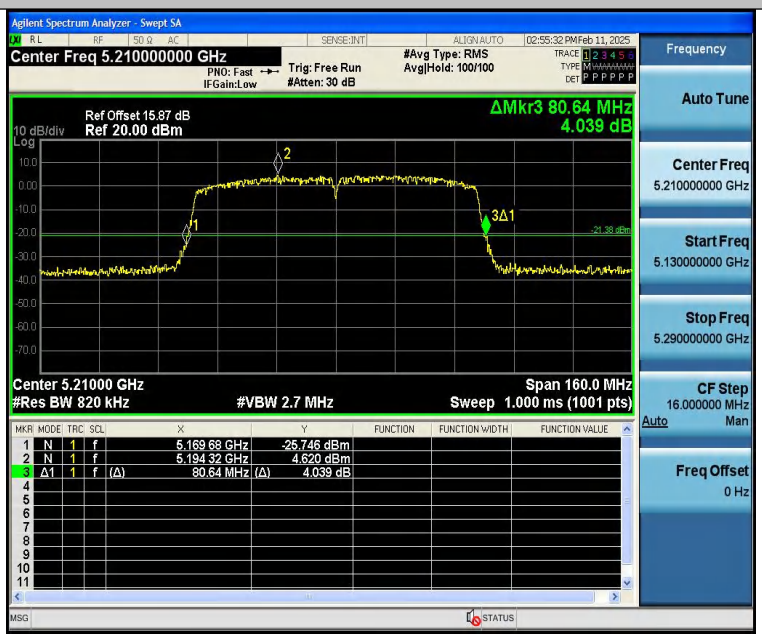


11AC40SISO-Ant0-5230



11AC80SISO-Ant0-5210



Ant1:

11A-Ant1-5180

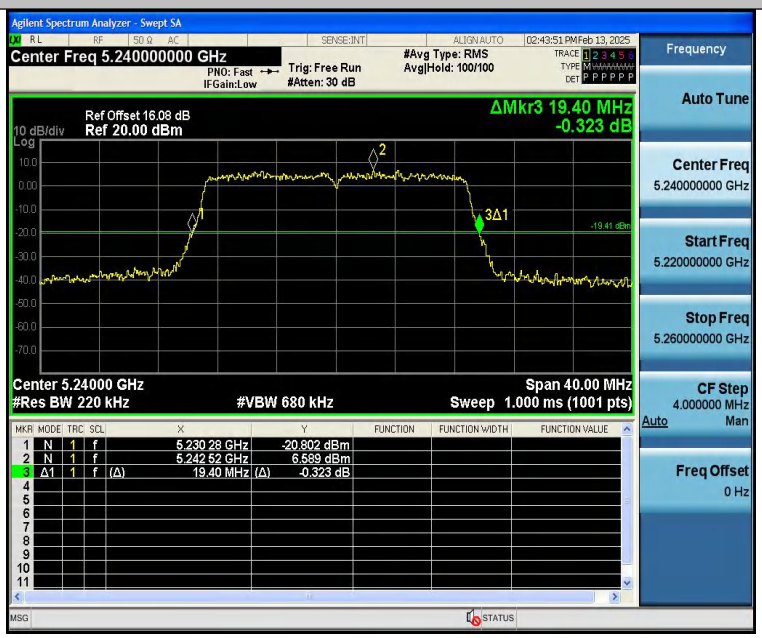
11A-Ant1-5200

11A-Ant1-5240

11N20SISO-Ant1-5180

11N20SISO-Ant1-5200

11N20SISO-Ant1-5240



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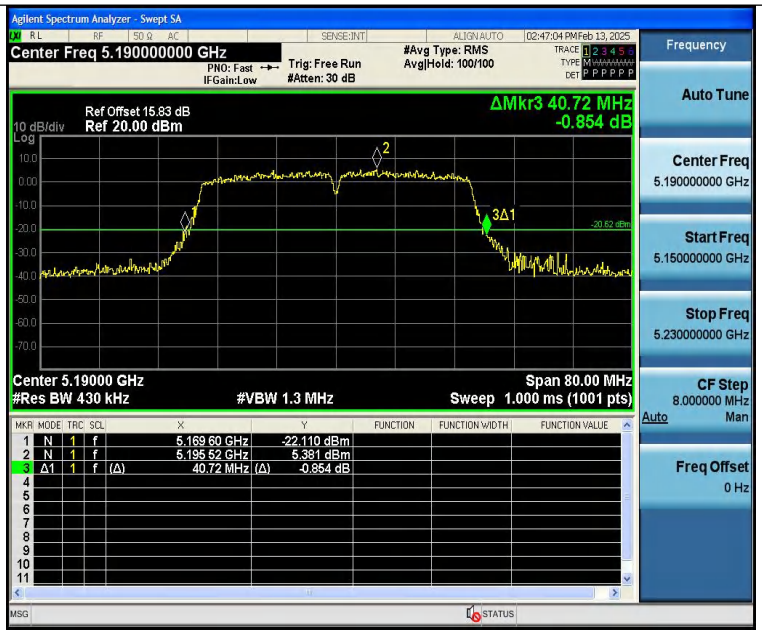
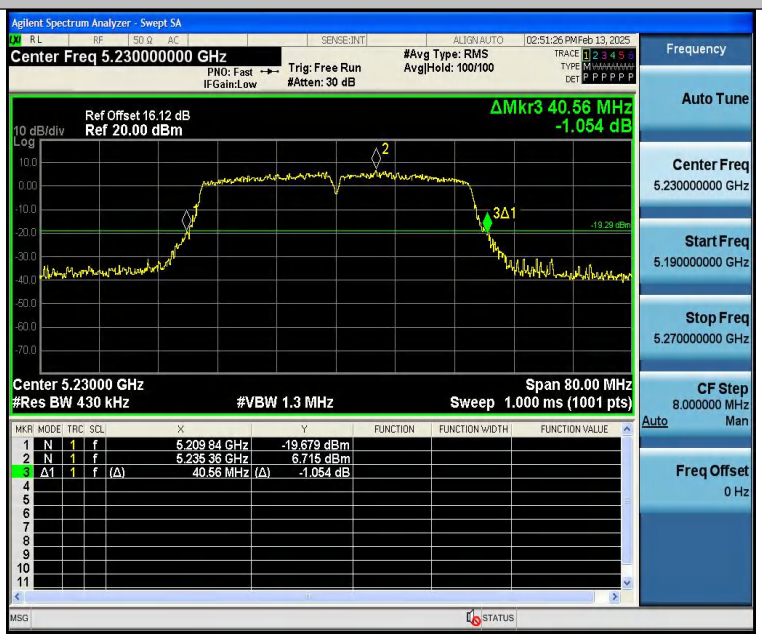


11N40SISO-Ant1-5230



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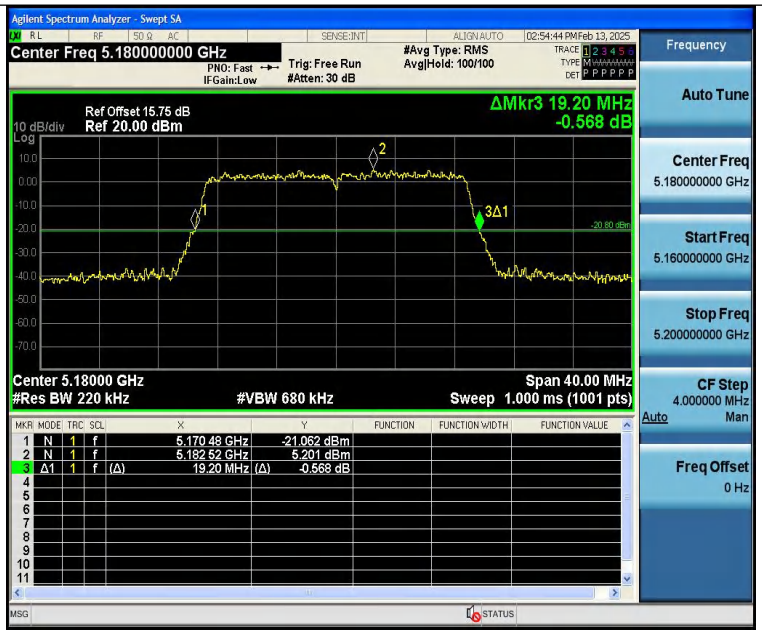
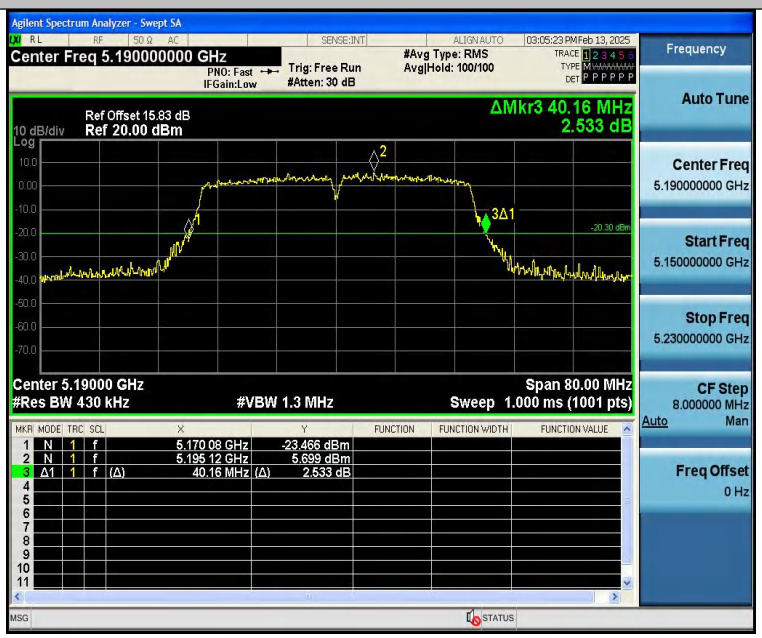


11AC20SISO-Ant1-5200

11AC20SISO-Ant1-5240

11AC40SISO-Ant1-5190



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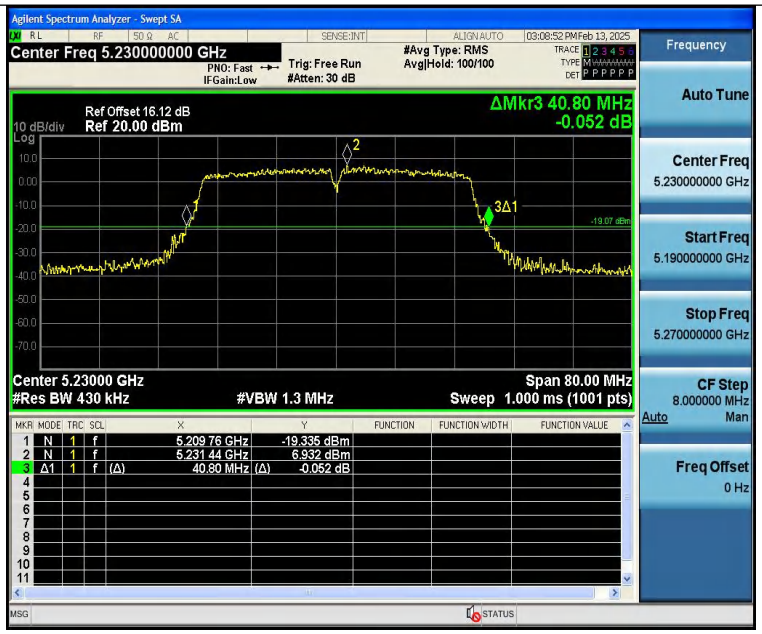
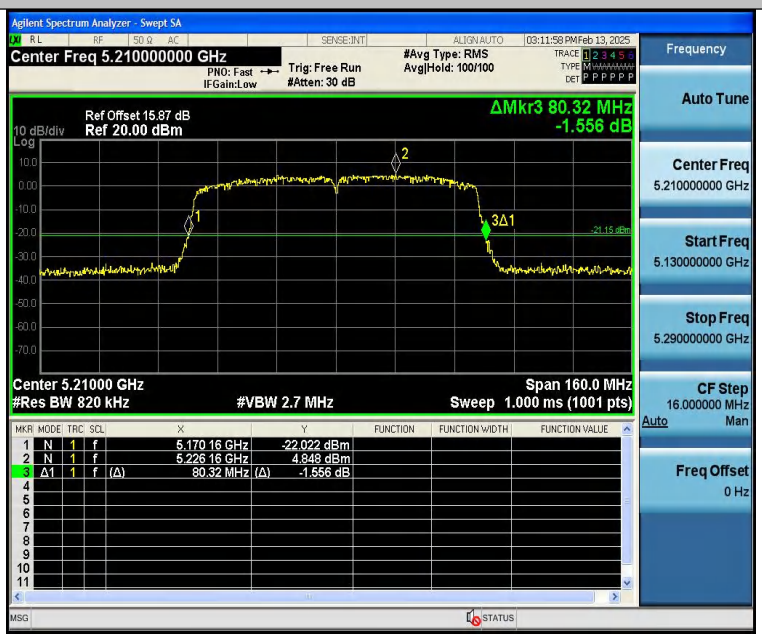


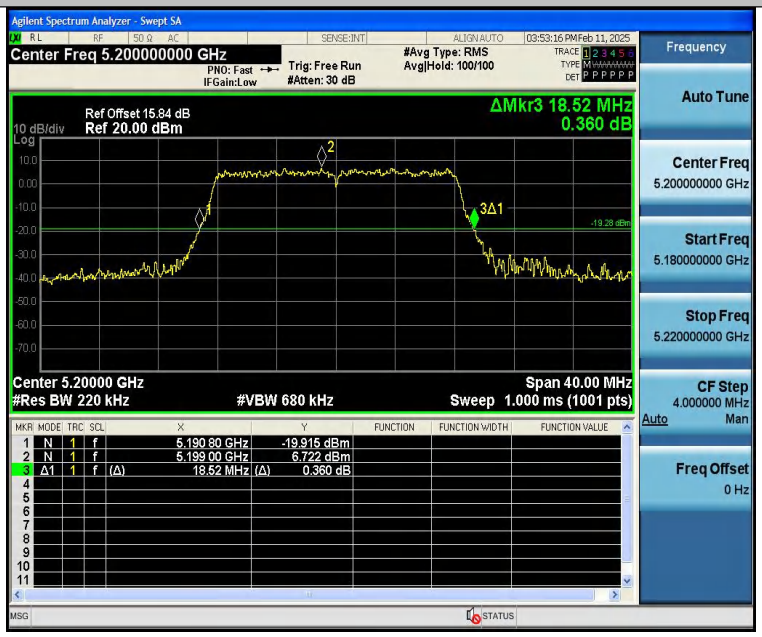
11AC80SISO-Ant1-5210



Ant2:

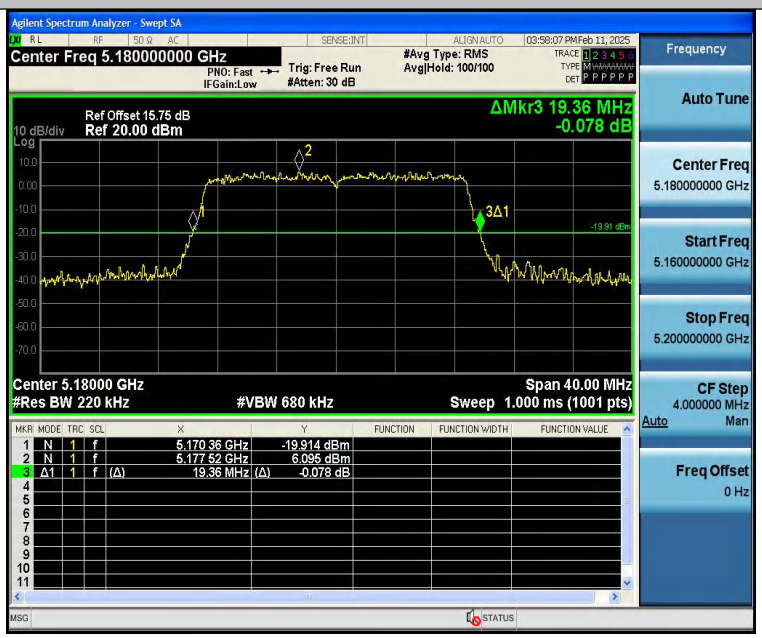
11A-Ant2-5180

11A-Ant2-5200



11A-Ant2-5240

11N20SISO-Ant2-5180



11N20SISO-Ant2-5200