Appendix D

RF Test Data for 5.2GWIFI (Conducted Measurement)

Product Name: Wireless Carplay

Test Model: Q1S

Environmental Conditions

Temperature:	23.7°C
Relative Humidity:	54.2%
ATM Pressure:	100.0 kPa
Test Engineer:	Zhang hai
Supervised by:	Fengliu Tang

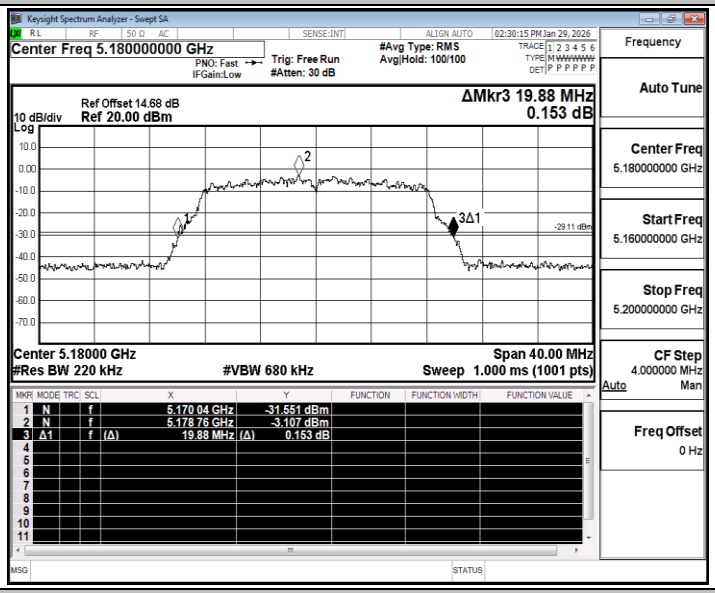
D.1 Emission Bandwidth

Test Result

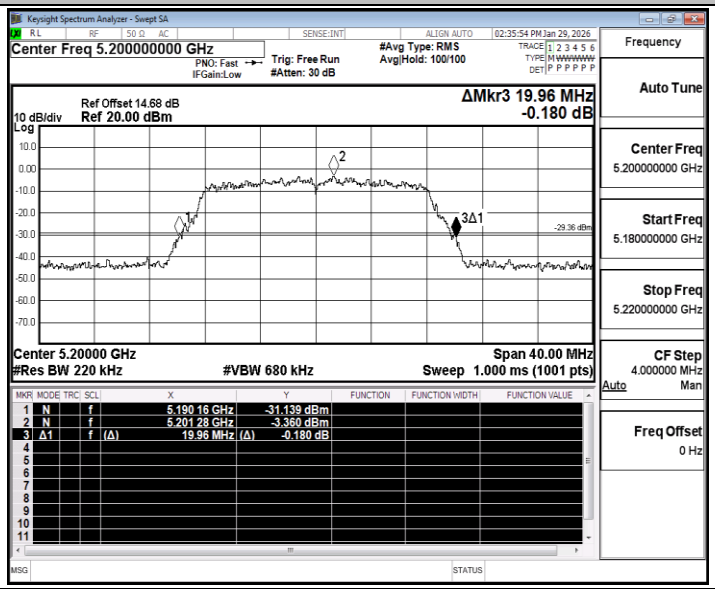
TestMode	Antenna	Freq (MHz)	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit [MHz]	Verdict
11A	Ant1	5180	19.880	5170.040	5189.920	---	---
		5200	19.960	5190.160	5210.120	---	---
		5240	19.440	5230.320	5249.760	---	---
11N20SISO	Ant1	5180	20.160	5169.920	5190.080	---	---
		5200	19.880	5190.000	5209.880	---	---
		5240	19.920	5230.040	5249.960	---	---
11N40SISO	Ant1	5190	40.000	5169.840	5209.840	---	---
		5230	39.600	5210.480	5250.080	---	---

Test Graphs

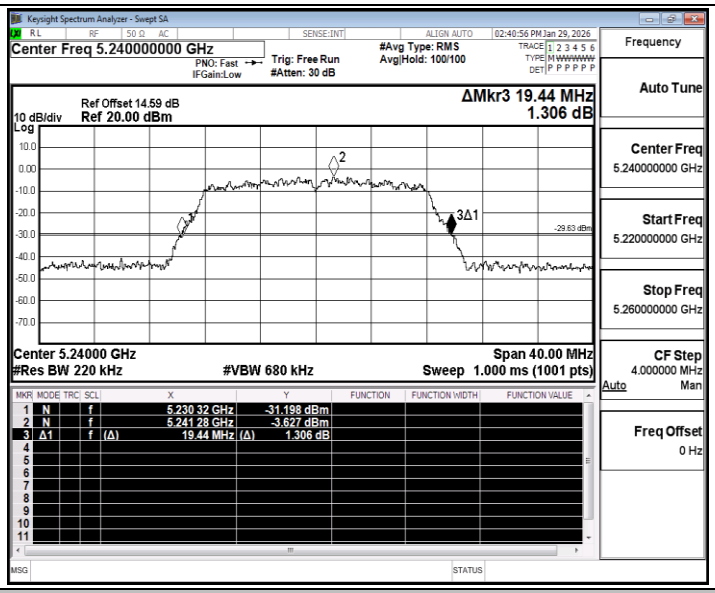
11A_Ant1_5180



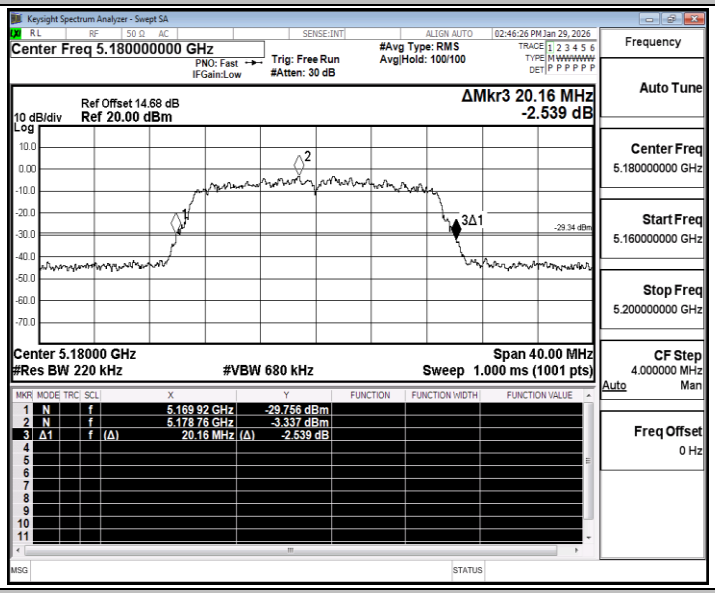
11A_Ant1_5200



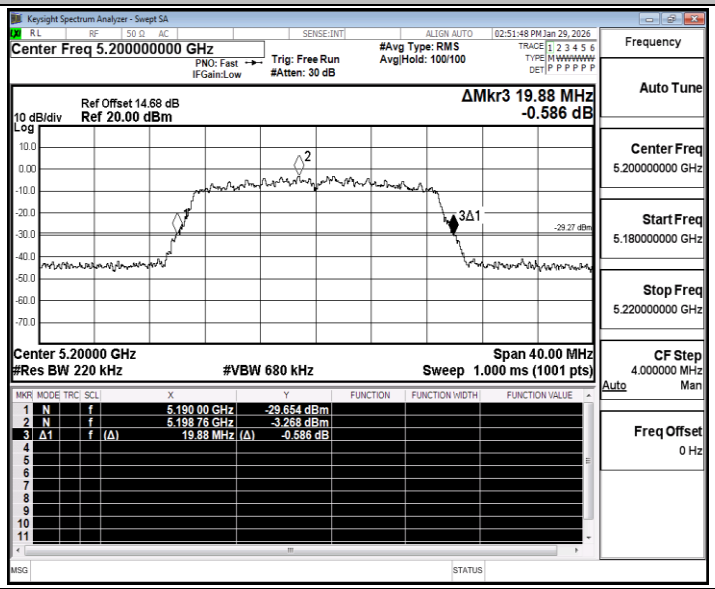
11A_Ant1_5240



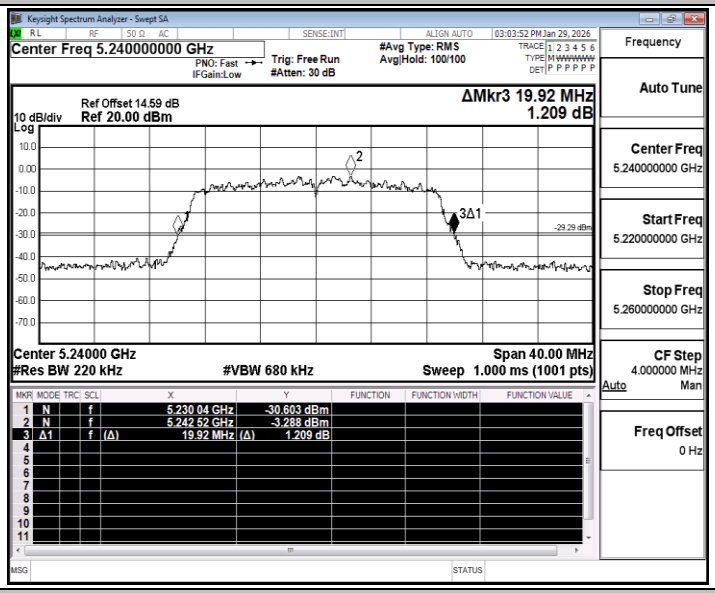
11N20SISO_Ant1_5180



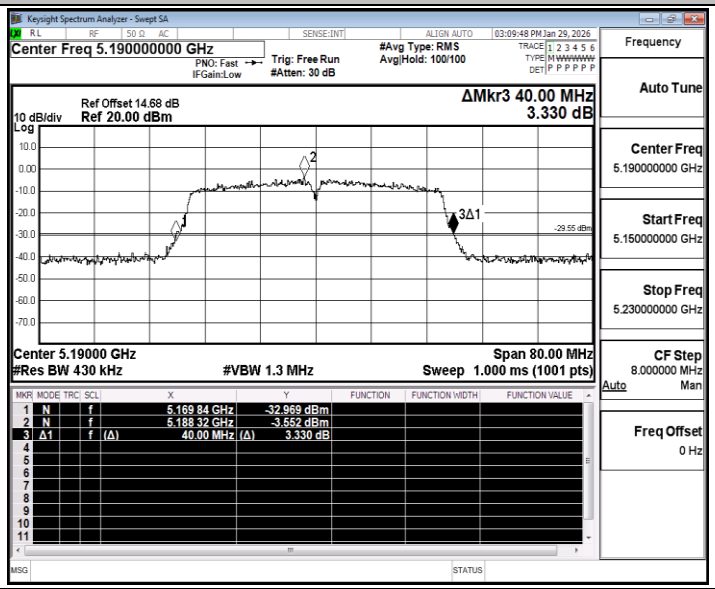
11N20SISO_Ant1_5200



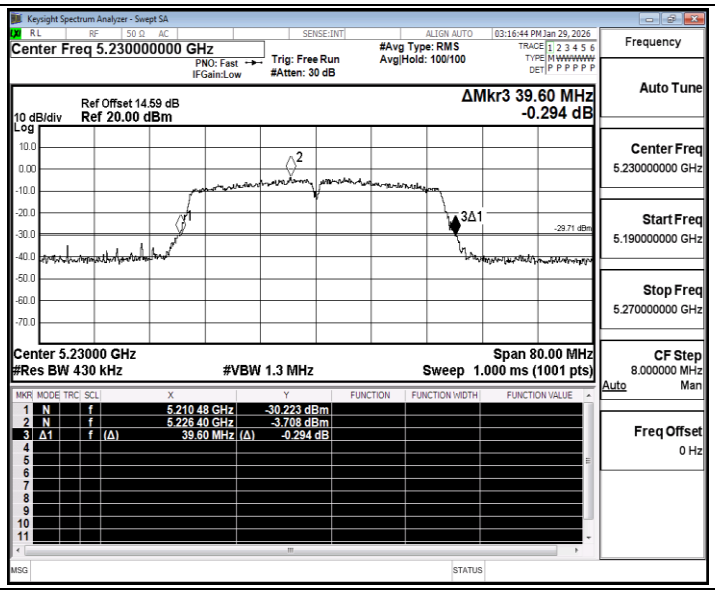
11N20SISO_Ant1_5240



11N40SISO_Ant1_5190



11N40SISO_Ant1_5230


Keysight Spectrum Analyzer - Swept SA
Center Freq 5.230000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 100/100
03:16:44 PM Jan 29, 2026
Ref Offset 14.59 dB
10 dB/div
Log
Ref 20.00 dBm
ΔMkr3 39.60 MHz
-0.294 dB
-29.71 dBm
Center 5.23000 GHz
#Res BW 430 kHz
#VBW 1.3 MHz
Span 80.00 MHz
Sweep 1.000 ms (1001 pts)
1 N 1 f 5.210 48 GHz -30.223 dBm
2 N 1 f 5.226 40 GHz -3.708 dBm
3 Δ1 1 f (Δ) 39.60 MHz (Δ) -0.294 dB
Frequency
Auto Tune
Center Freq
5.230000000 GHz
Start Freq
5.190000000 GHz
Stop Freq
5.270000000 GHz
CF Step
8.000000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

B.2 Maximum conducted output power

Test Result Power

Test Mode	Antenna	Freq (MHz)	Measured Power [dBm]	DC Factor [dB]	Result [dBm]	Limit [dBm]	Verdict
11A	Ant1	5180	5.53	1.63	7.16	≤24.00	PASS
		5200	5.00	1.25	6.25	≤24.00	PASS
		5240	5.20	1.35	6.55	≤24.00	PASS
11N20SISO	Ant1	5180	5.47	1.51	6.98	≤24.00	PASS
		5200	5.65	1.51	7.16	≤24.00	PASS
		5240	5.16	1.25	6.41	≤24.00	PASS
11N40SISO	Ant1	5190	4.36	1.76	6.12	≤24.00	PASS
		5230	4.93	2.34	7.27	≤24.00	PASS

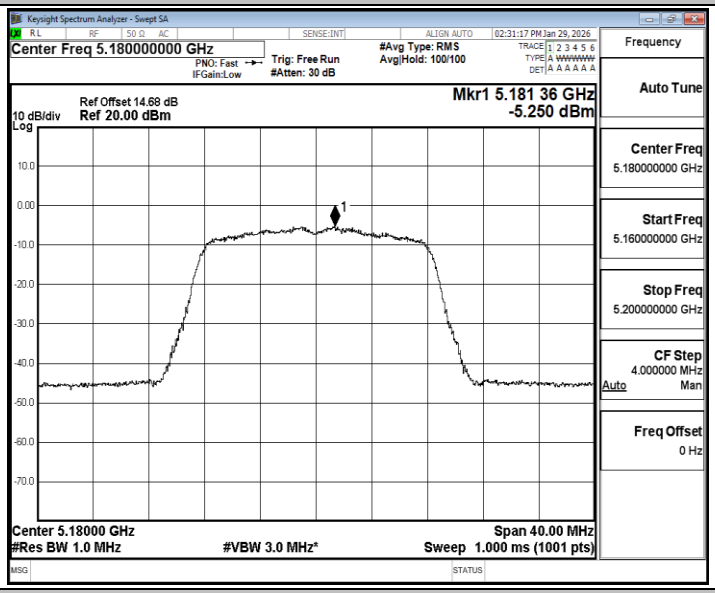
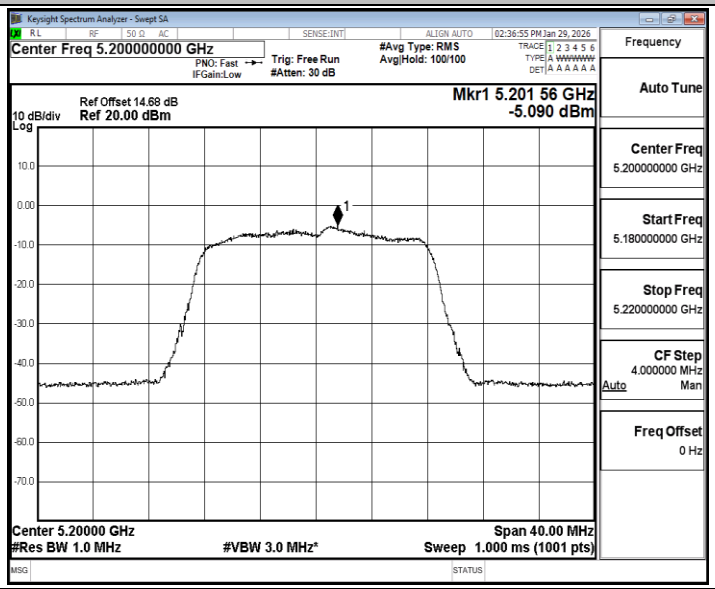
B.3 Maximum power spectral density

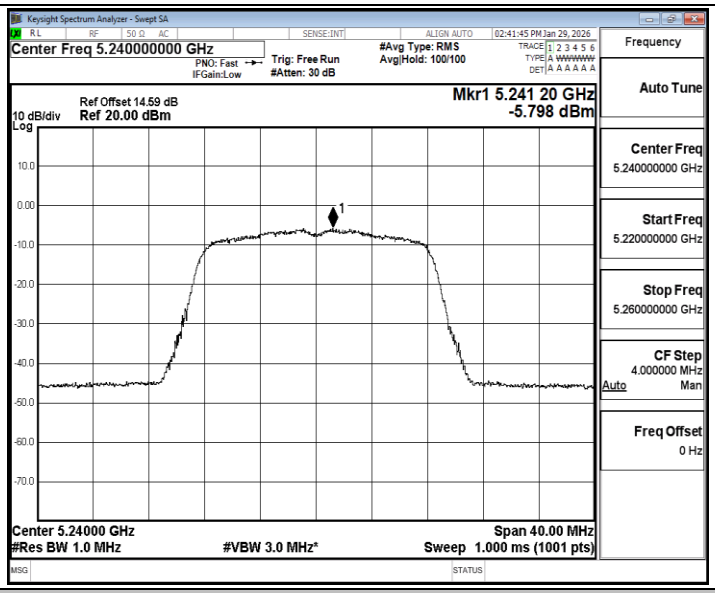
Test Result

TestMode	Antenna	Freq (MHz)	Raw Data [dBm/MHz]	DC Factor	RBW Factor	Result [dBm/MHz]	Limit [dBm/MHz]	Verdict
11A	Ant1	5180	-5.25	1.63	0.00	-3.62	≤11.00	PASS
		5200	-5.09	1.25	0.00	-3.84	≤11.00	PASS
		5240	-5.8	1.35	0.00	-4.45	≤11.00	PASS
11N20SISO	Ant1	5180	-5.68	1.51	0.00	-4.17	≤11.00	PASS
		5200	-5.39	1.51	0.00	-3.88	≤11.00	PASS
		5240	-5.54	1.25	0.00	-4.29	≤11.00	PASS
11N40SISO	Ant1	5190	-9.15	1.76	0.00	-7.39	≤11.00	PASS
		5230	-8.29	2.34	0.00	-5.95	≤11.00	PASS

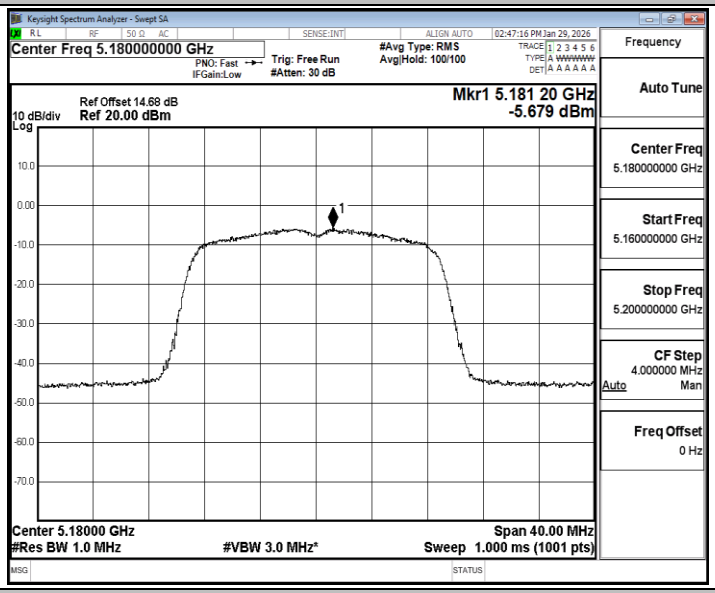
Note：1.The Result and Limit Unit is dBm/500 kHz in the band 5.725–5.85 GHz.

Test Graphs

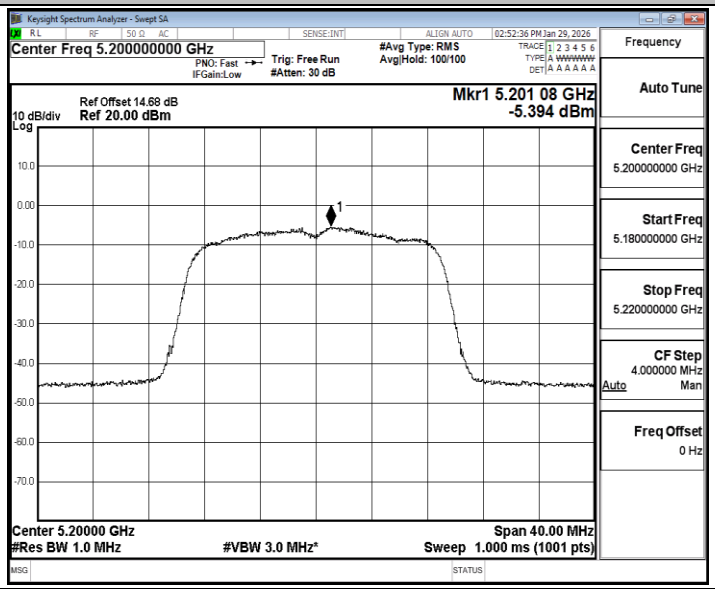
11A_Ant1_5180

11A_Ant1_5200

11A_Ant1_5240



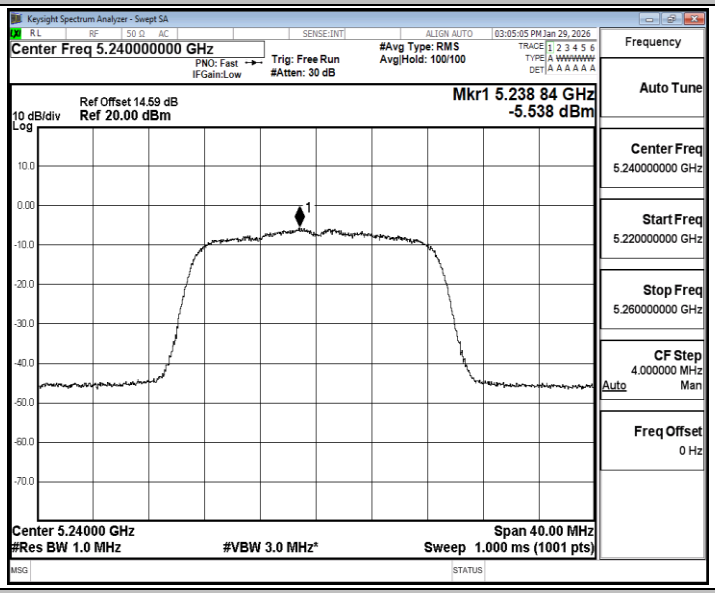
11N20SISO_Ant1_5180



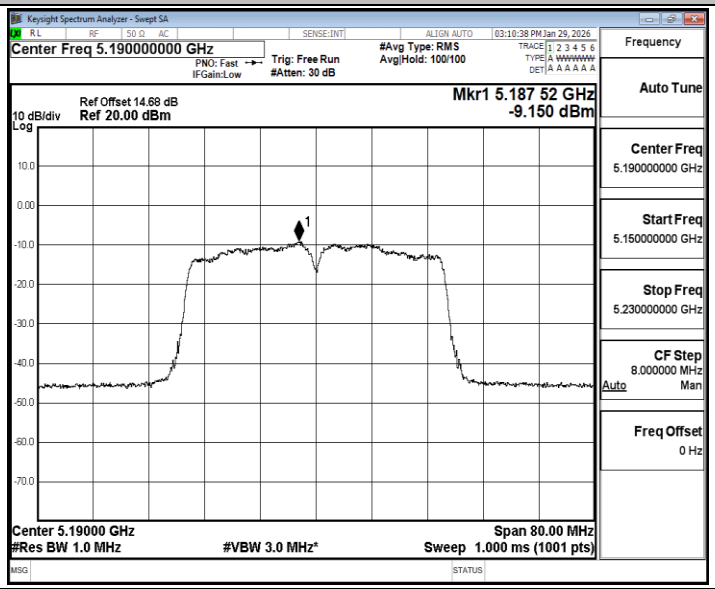
11N20SISO_Ant1_5200



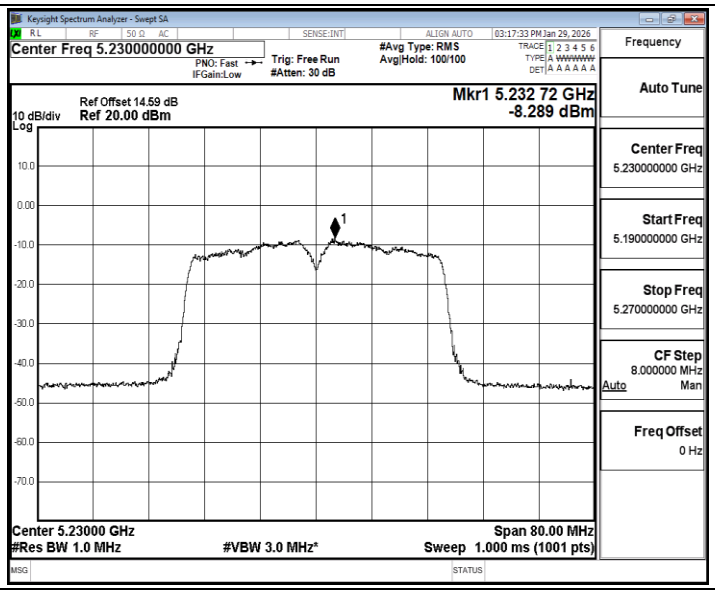
11N20SISO_Ant1_5240



11N40SISO_Ant1_5190



11N40SISO_Ant1_5230


Keysight Spectrum Analyzer - Swept SA
Center Freq 5.230000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 100/100
03:17:33 PM Jan 29, 2026
Frequency
Auto Tune
Ref Offset 14.59 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 5.232 72 GHz
-8.289 dBm
Center Freq
5.230000000 GHz
Start Freq
5.190000000 GHz
Stop Freq
5.270000000 GHz
CF Step
8.000000 MHz
Auto
Man
Freq Offset
0 Hz
Center 5.23000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Span 80.00 MHz
Sweep 1.000 ms (1001 pts)

B.4 Emissions in Restricted Bands

Test Result

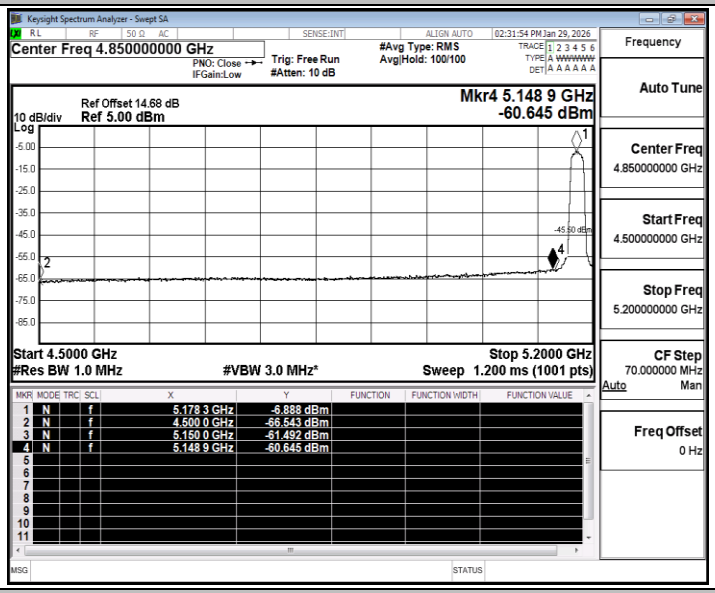
Test Mode	Antenna	ChName	Freq (MHz)	Detector	Freq [MHz]	Result [dBm]	Limit [dBm]	Gain [dBi]	DC Factor [dB]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
11A	Ant1	Low	5180	AV	4500.000	-66.54	≤-45.50	2.67	1.63	32.96	≤54	PASS
				AV	5148.900	-60.65	≤-45.50	2.67	1.63	38.85	≤54	PASS
				AV	5150.000	-61.49	≤-45.50	2.67	1.63	38.01	≤54	PASS
				Peak	4500.000	-58.94	≤-23.87	2.67	0.00	38.93	≤74	PASS
				Peak	5130.700	-50.88	≤-23.87	2.67	0.00	46.99	≤74	PASS
				Peak	5150.000	-50.38	≤-23.87	2.67	0.00	47.49	≤74	PASS
		High	5240	AV	5350.000	-63.27	≤-45.22	2.67	1.35	35.95	≤54	PASS
				AV	5357.280	-62.33	≤-45.22	2.67	1.35	36.89	≤54	PASS
				AV	5460.000	-64.92	≤-45.22	2.67	1.35	34.30	≤54	PASS
				Peak	5350.000	-53.65	≤-23.87	2.67	0.00	44.22	≤74	PASS
				Peak	5389.440	-51.54	≤-23.87	2.67	0.00	46.33	≤74	PASS
				Peak	5460.000	-56.58	≤-23.87	2.67	0.00	41.29	≤74	PASS
11N20	Ant1	Low	5180	AV	4500.000	-66.6	≤-45.38	2.67	1.51	32.78	≤54	PASS
				AV	5149.600	-60.71	≤-45.38	2.67	1.51	38.67	≤54	PASS
				AV	5150.000	-61.46	≤-45.38	2.67	1.51	37.92	≤54	PASS
				Peak	4500.000	-58.5	≤-23.87	2.67	0.00	39.37	≤74	PASS
				Peak	5137.700	-51.19	≤-23.87	2.67	0.00	46.68	≤74	PASS
				Peak	5150.000	-53.42	≤-23.87	2.67	0.00	44.45	≤74	PASS
		High	5240	AV	5350.000	-62.78	≤-45.12	2.67	1.25	36.34	≤54	PASS
				AV	5355.600	-62.16	≤-45.12	2.67	1.25	36.96	≤54	PASS
				AV	5460.000	-64.8	≤-45.12	2.67	1.25	34.32	≤54	PASS
				Peak	5350.000	-53.9	≤-23.87	2.67	0.00	43.97	≤74	PASS
				Peak	5362.560	-51.81	≤-23.87	2.67	0.00	46.06	≤74	PASS
				Peak	5460.000	-56.01	≤-23.87	2.67	0.00	41.86	≤74	PASS
11N40	Ant1	Low	5190	AV	4500.000	-66.78	≤-45.63	2.67	1.76	32.85	≤54	PASS
				AV	5133.500	-53.13	≤-45.63	2.67	1.76	46.50	≤54	PASS
				AV	5150.000	-61.79	≤-45.63	2.67	1.76	37.84	≤54	PASS
				Peak	4500.000	-56.95	≤-23.87	2.67	0.00	40.92	≤74	PASS
				Peak	5032.700	-41.15	≤-23.87	2.67	0.00	56.72	≤74	PASS
				Peak	5150.000	-54.88	≤-23.87	2.67	0.00	42.99	≤74	PASS
		High	5230	AV	5350.000	-62.82	≤-46.21	2.67	2.34	37.39	≤54	PASS
				AV	5357.300	-62.21	≤-46.21	2.67	2.34	38.00	≤54	PASS
				AV	5460.000	-65.13	≤-46.21	2.67	2.34	35.08	≤54	PASS
				Peak	5350.000	-53.74	≤-23.87	2.67	0.00	44.13	≤74	PASS
				Peak	5430.880	-41.35	≤-23.87	2.67	0.00	56.52	≤74	PASS
				Peak	5460.000	-56.14	≤-23.87	2.67	0.00	41.73	≤74	PASS

Note：

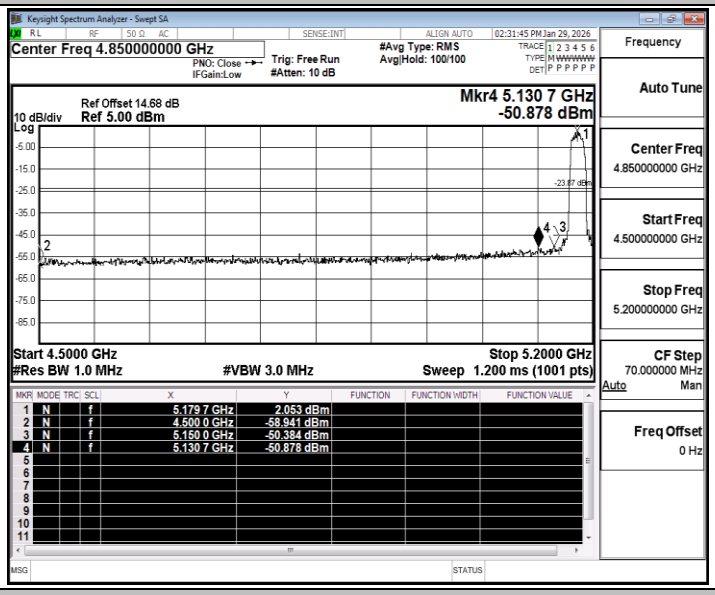
1. The Antenna Gain is compensated in the graph.
2. For transmitters operating in 5150-5350 GHz band and 5470-5725 GHz band: The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

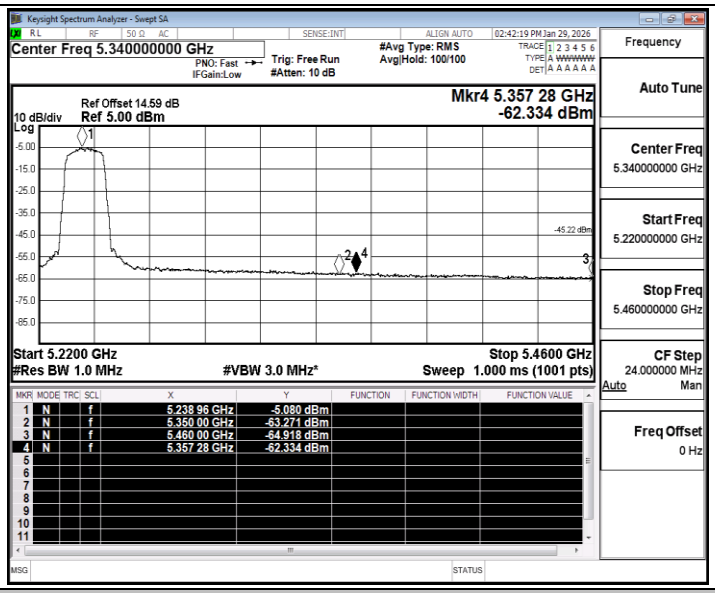
11A_Ant1_Low_5180_AV



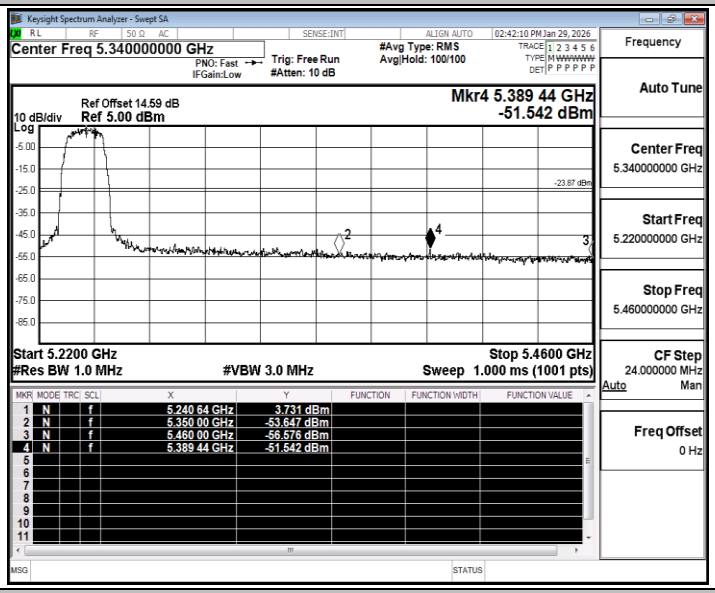
11A_Ant1_Low_5180_Peak



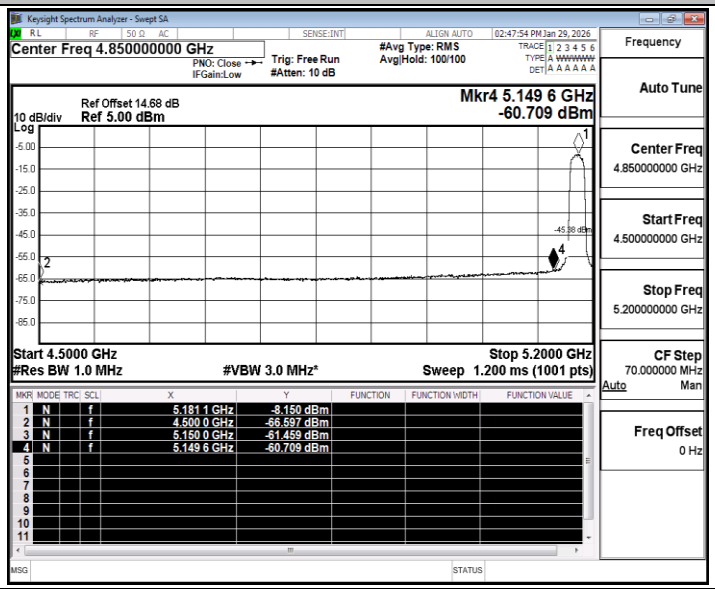
11A_Ant1_High_5240_AV



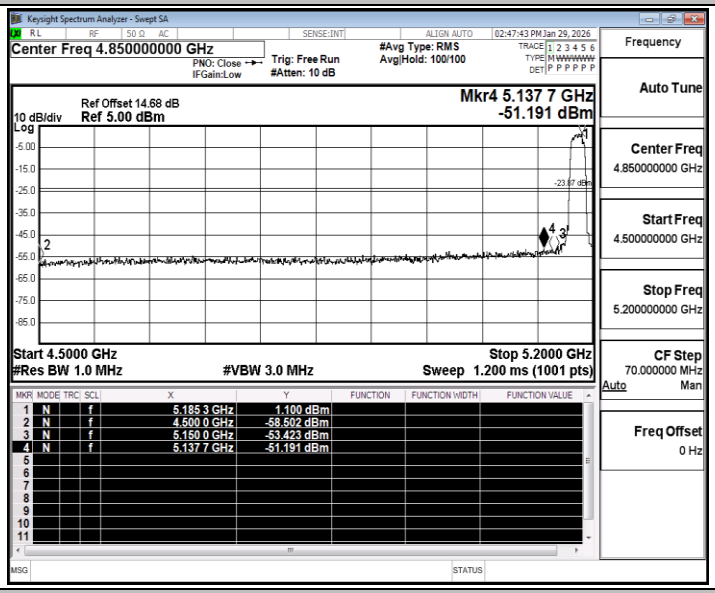
11A_Ant1_High_5240_Peak



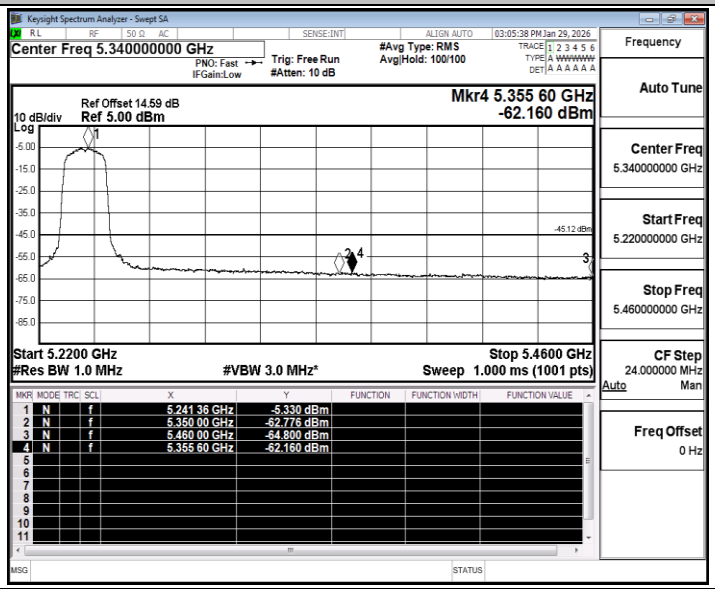
11N20SISO_Ant1_Low_5180_AV



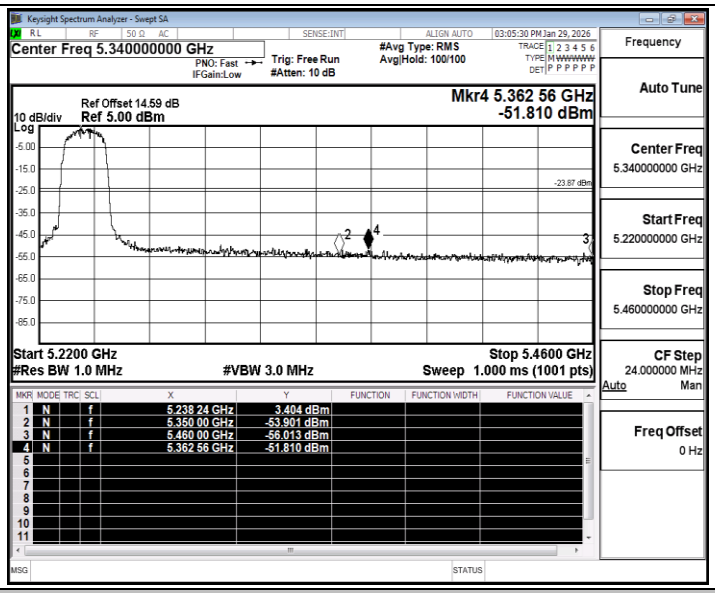
11N20SISO_Ant1_Low_5180_Peak



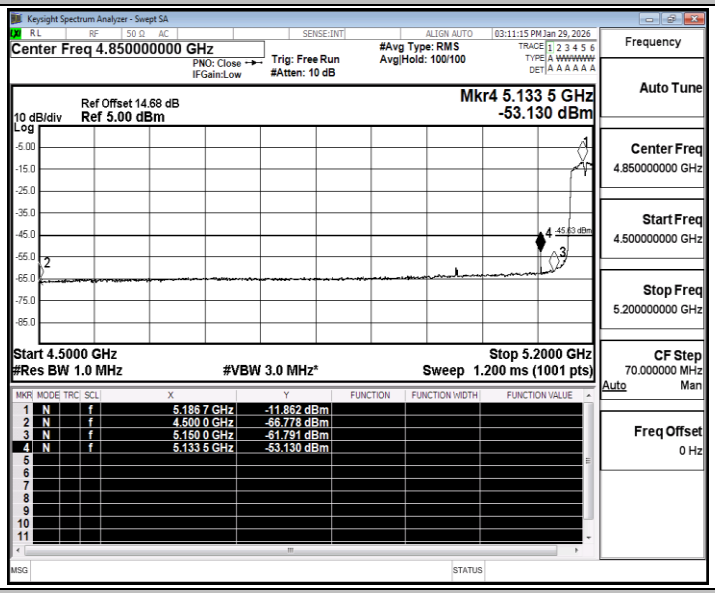
11N20SISO_Ant1_High_5240_AV



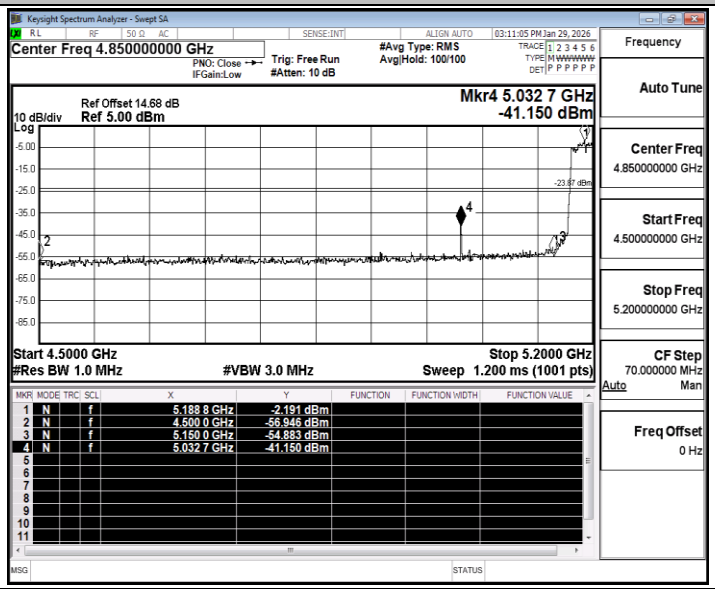
11N20SISO_Ant1_High_5240_Peak

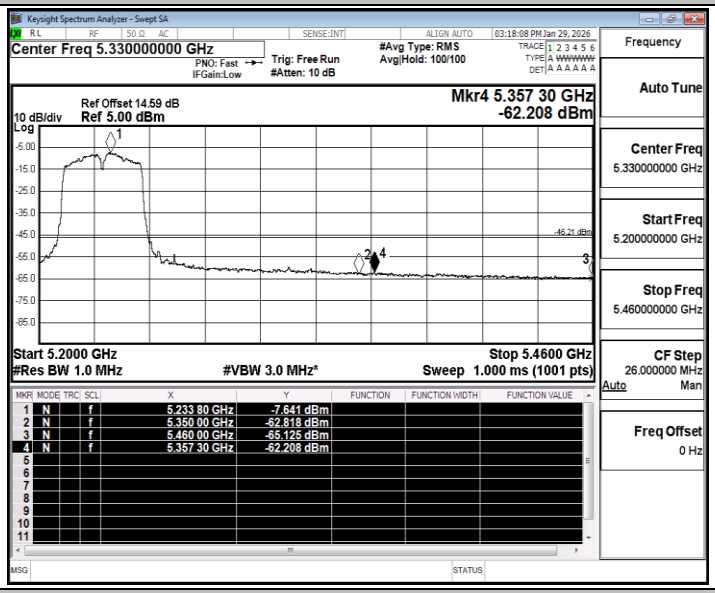


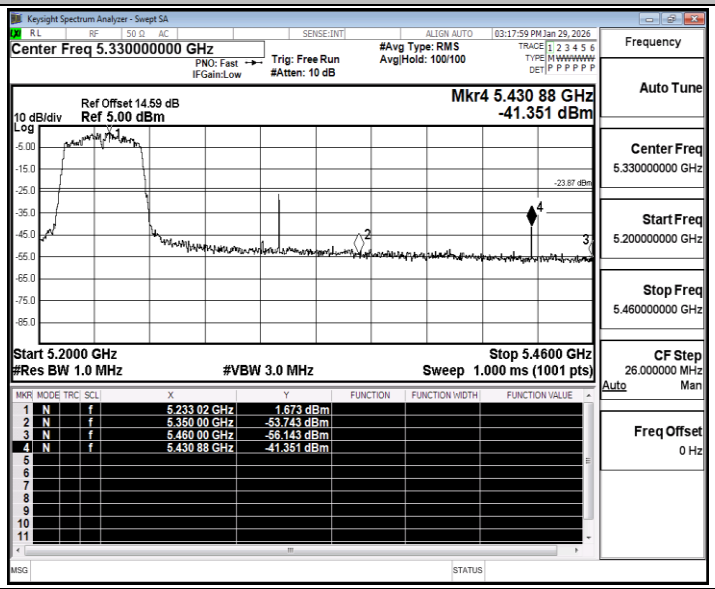
11N40SISO_Ant1_Low_5190_AV



11N40SISO_Ant1_Low_5190_Peak



11N40SISO_Ant1_High_5230_AV


11N40SISO_Ant1_High_5230_Peak


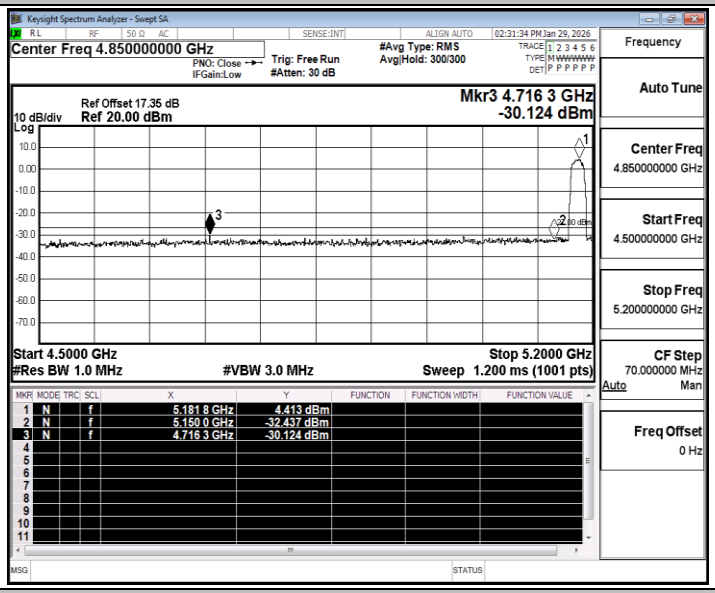
Band edge measurements

Test Result

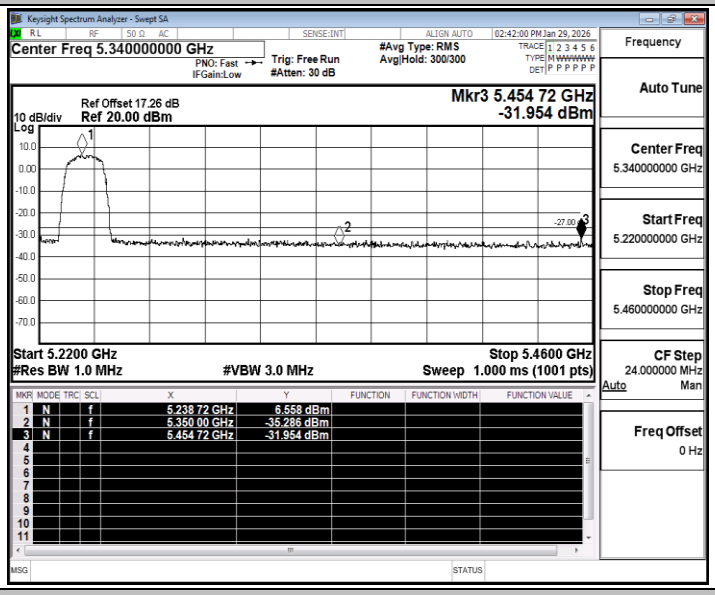
TestMode	Antenna	ChName	Freq (MHz)	Result[dBm]	Limit[dBm]	Verdict
11A	Ant1	Low	5180	-30.12	≤-27	PASS
		High	5240	-31.95	≤-27	PASS
11N20SISO	Ant1	Low	5180	-31.08	≤-27	PASS
		High	5240	-32.21	≤-27	PASS
11N40SISO	Ant1	Low	5190	-29.28	≤-27	PASS
		High	5230	-32.86	≤-27	PASS

Test Graphs

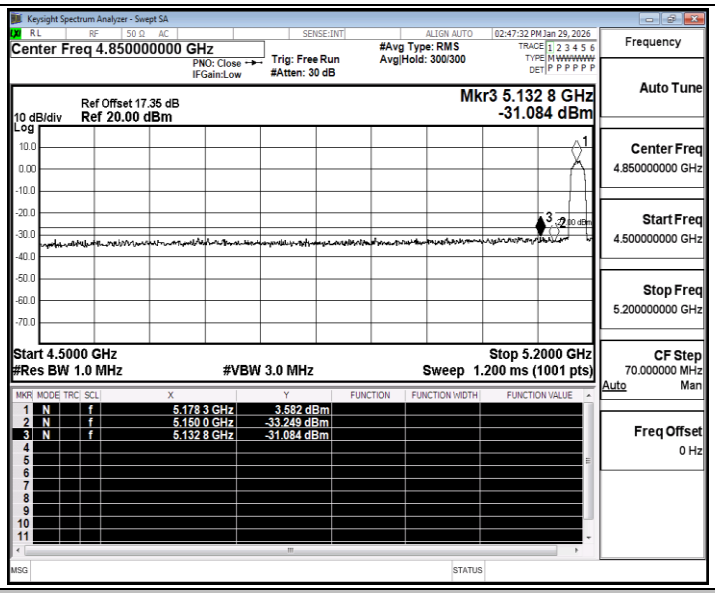
11A_Ant1_Low_5180



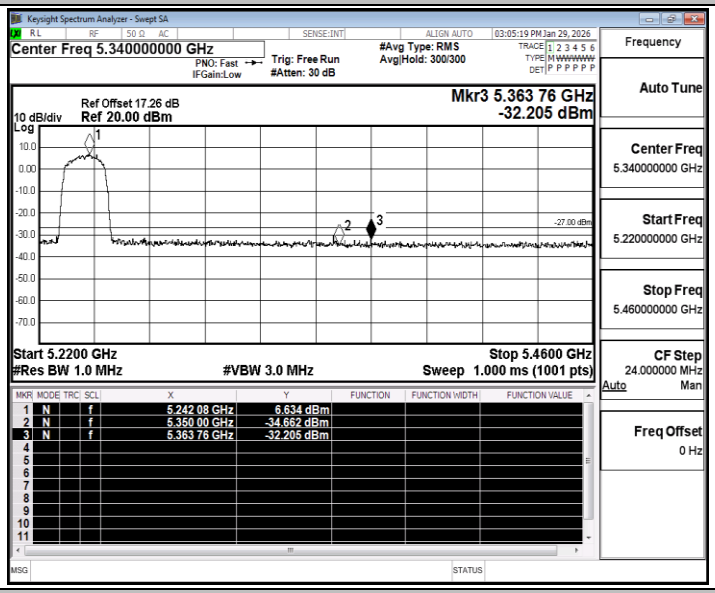
11A_Ant1_High_5240



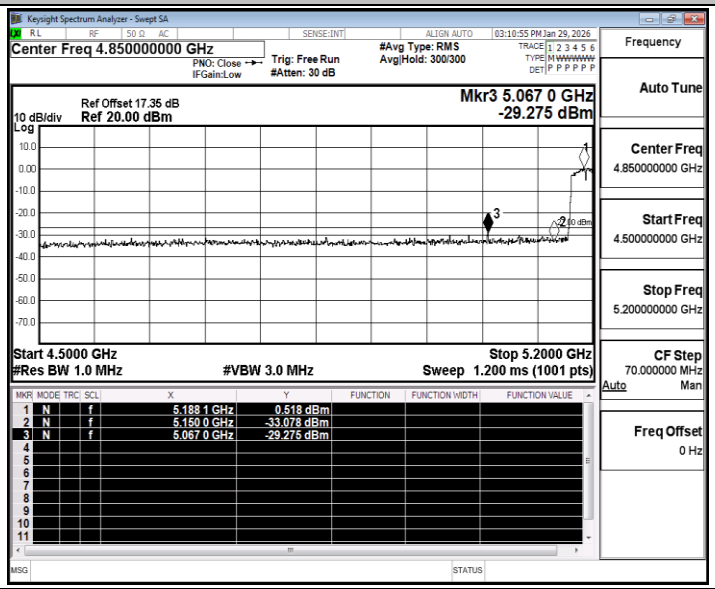
11N20SISO_Ant1_Low_5180

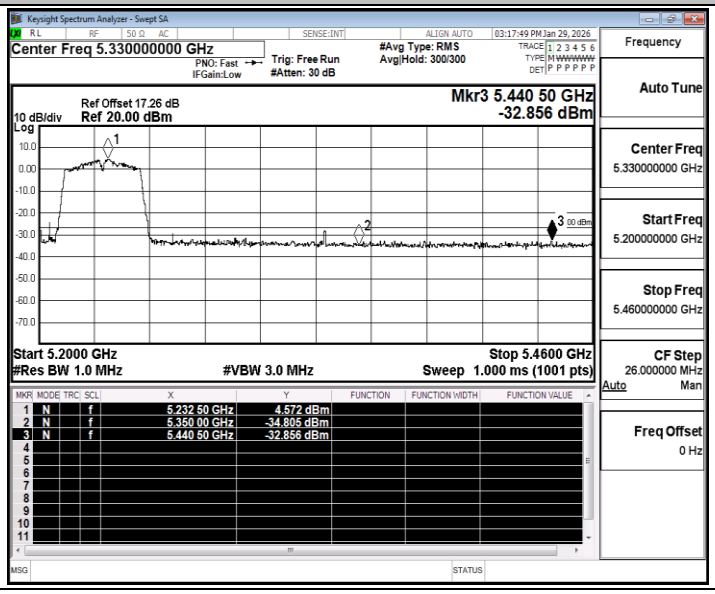


11N20SISO_Ant1_High_5240



11N40SISO_Ant1_Low_5190



11N40SISO_Ant1_High_5230


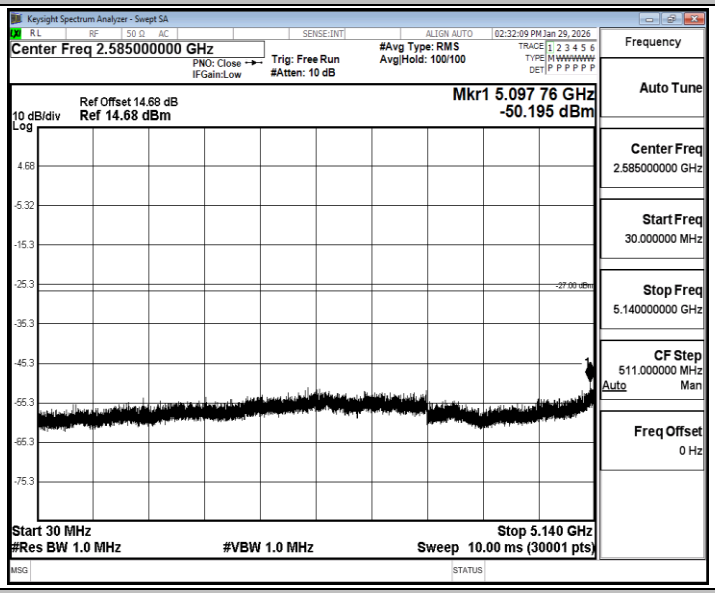
Conducted Spurious Emission

Test Result

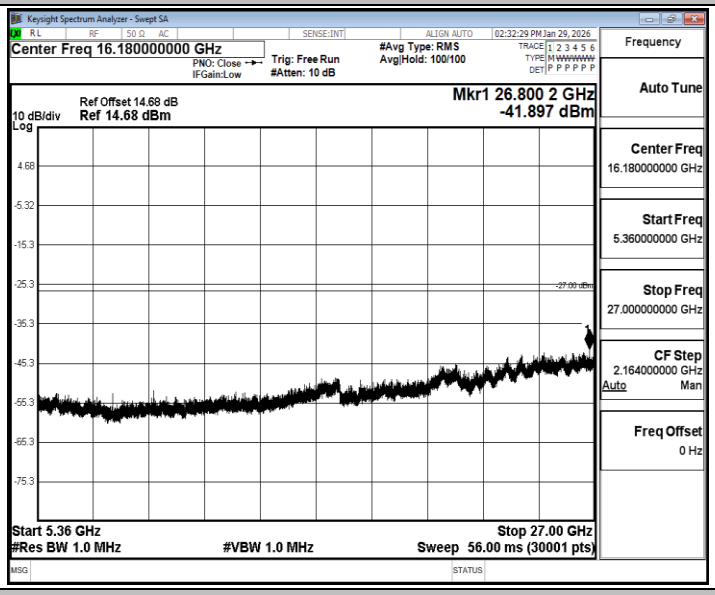
TestMode	Antenna	Freq (MHz)	FreqRange [MHz]	Max. Fre [MHz]	Max. Level [dBm]	Limit [dBm]	Verdict
11A	Ant1	5180	30~5140	5097.76	-50.2	≤-27	PASS
			5360~40000	26800.19	-41.9	≤-27	PASS
		5200	30~5140	2567.29	-50.22	≤-27	PASS
			5360~40000	26953.83	-41.84	≤-27	PASS
		5240	30~5140	3202.8	-50.53	≤-27	PASS
			5360~40000	26935.08	-42.35	≤-27	PASS
11N20SISO	Ant1	5180	30~5140	2579.38	-50.85	≤-27	PASS
			5360~40000	26908.39	-42.04	≤-27	PASS
		5200	30~5140	2758.23	-50.89	≤-27	PASS
			5360~40000	24898.03	-42.89	≤-27	PASS
		5240	30~5140	2664.03	-50.38	≤-27	PASS
			5360~40000	26492.18	-41.84	≤-27	PASS
11N40SISO	Ant1	5190	30~5140	5012.08	-41.97	≤-27	PASS
			5360~40000	5393.18	-41.18	≤-27	PASS
		5230	30~5140	5106.61	-36.29	≤-27	PASS
			5360~40000	5377.31	-42.42	≤-27	PASS

Test Graphs

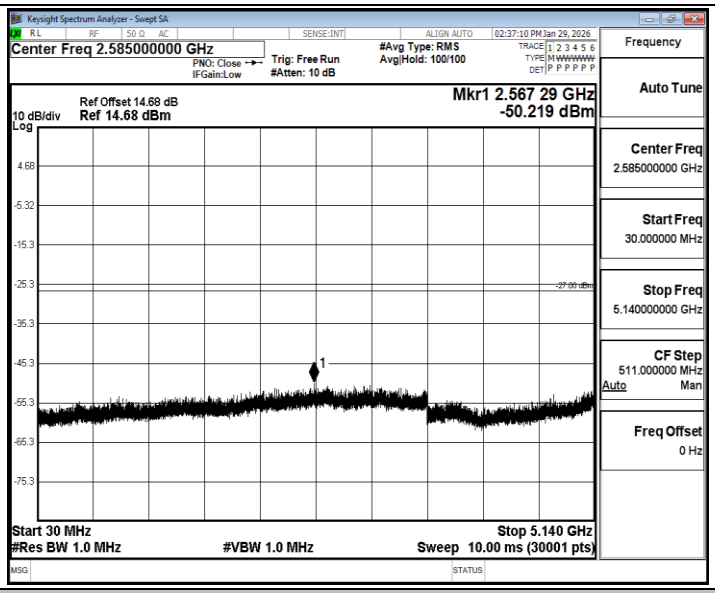
11A_Ant1_5180_30~5140



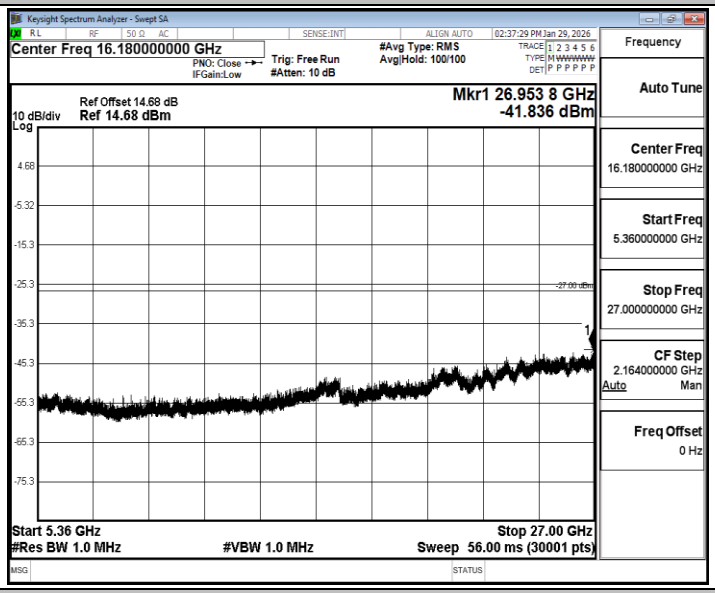
11A_Ant1_5180_5360~40000



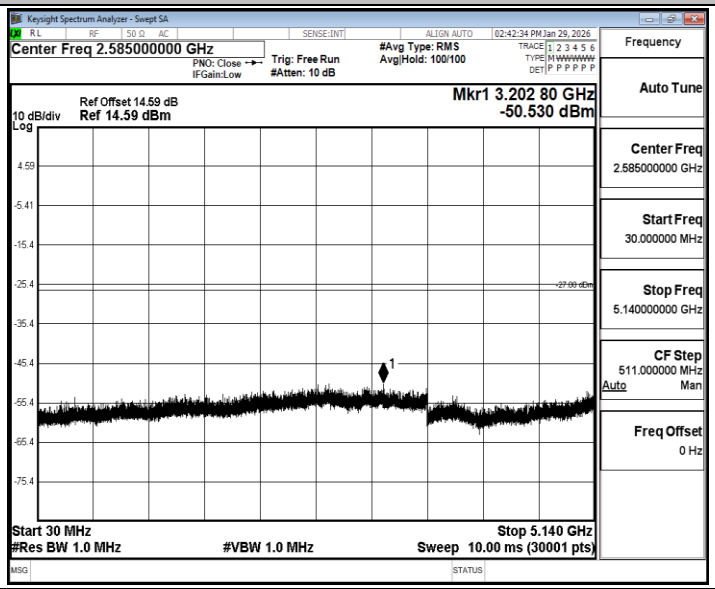
11A_Ant1_5200_30~5140



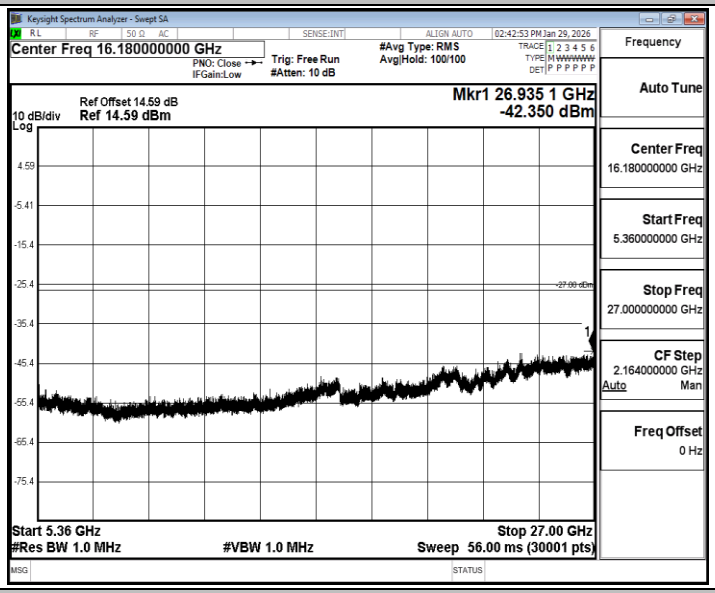
11A_Ant1_5200_5360~40000



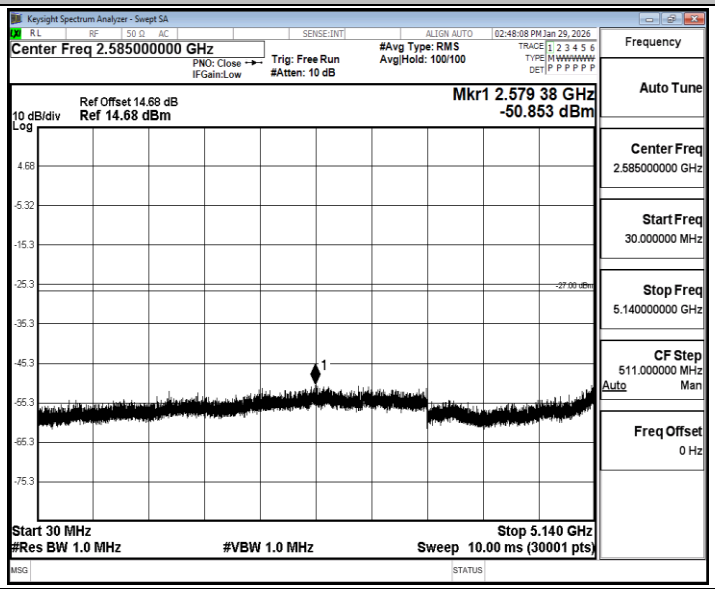
11A_Ant1_5240_30~5140



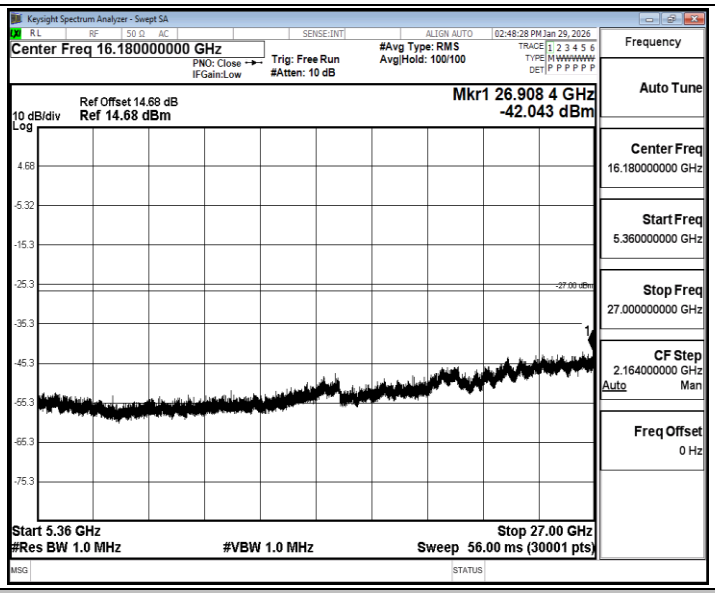
11A_Ant1_5240_5360~40000



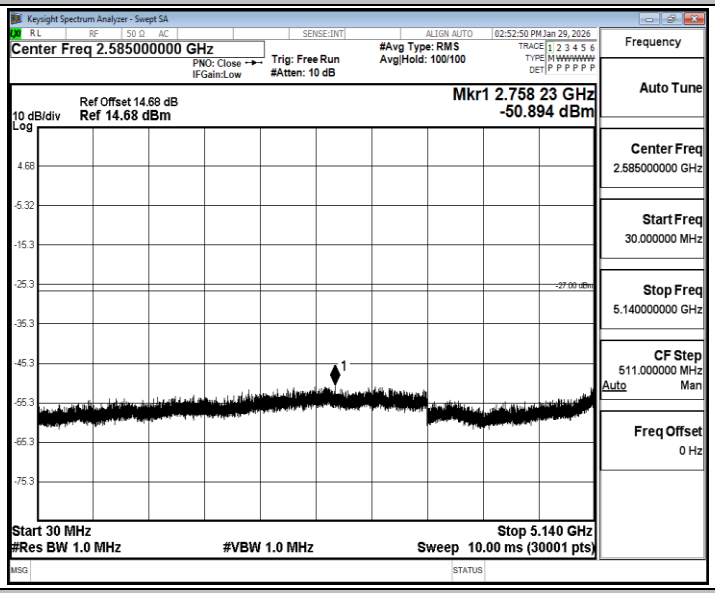
11N20SISO_Ant1_5180_30~5140



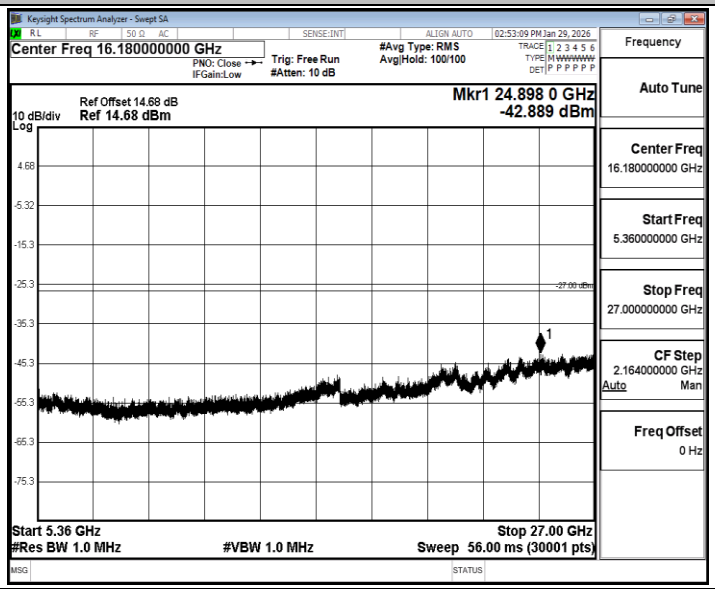
11N20SISO_Ant1_5180_5360~40000



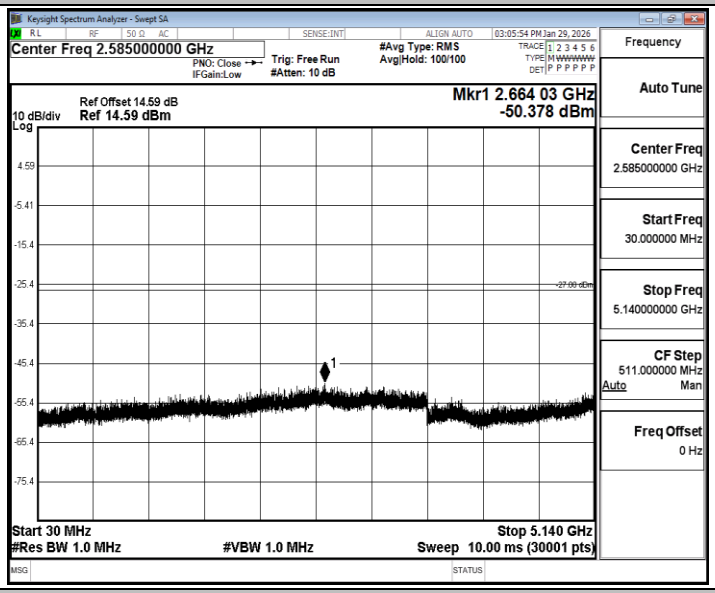
11N20SISO_Ant1_5200_30~5140



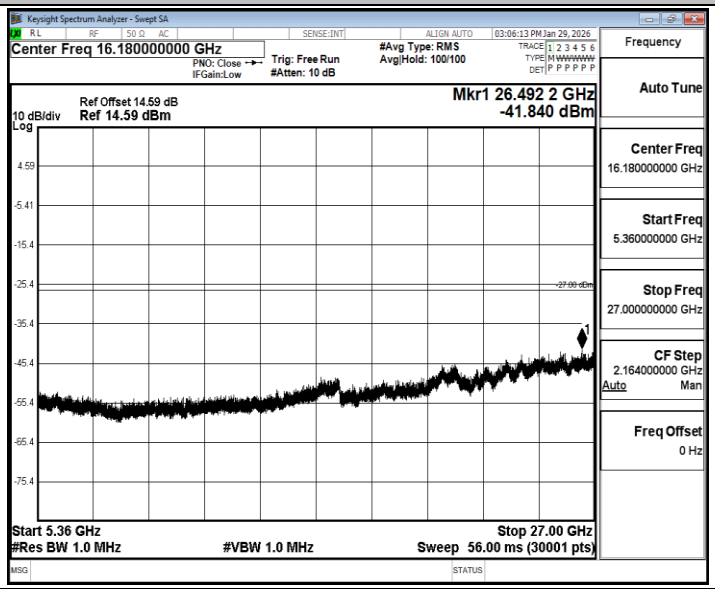
11N20SISO_Ant1_5200_5360~40000



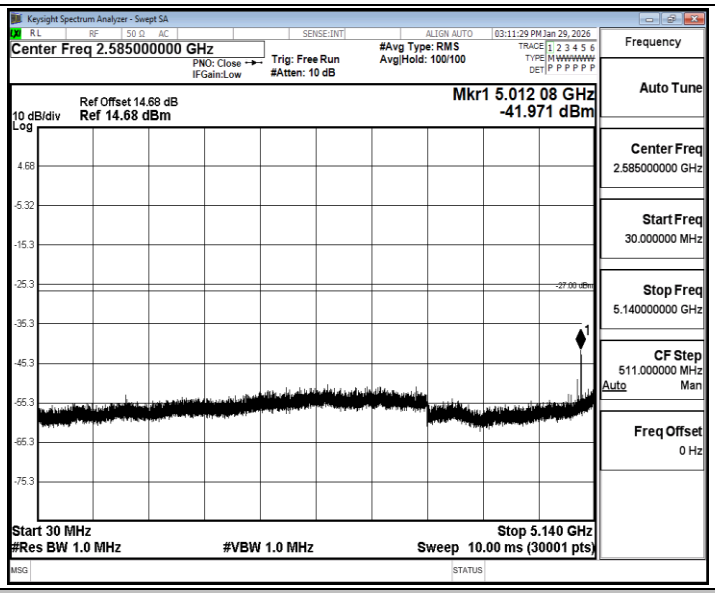
11N20SISO_Ant1_5240_30~5140



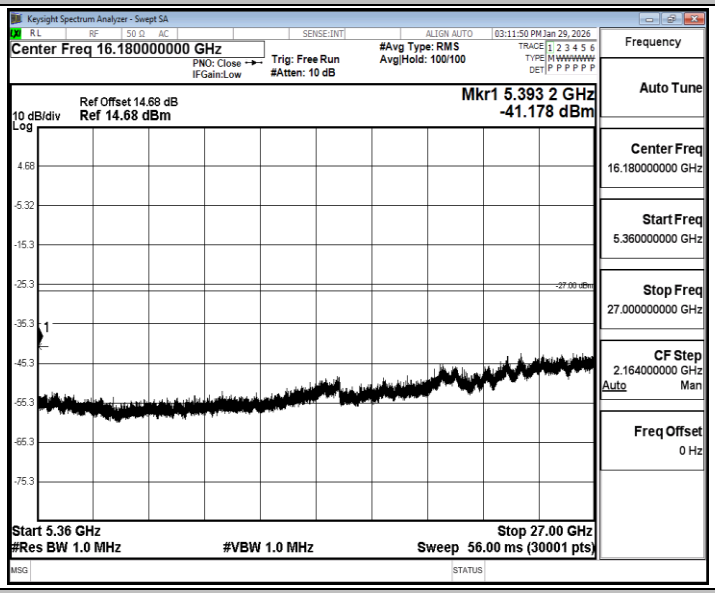
11N20SISO_Ant1_5240_5360~40000



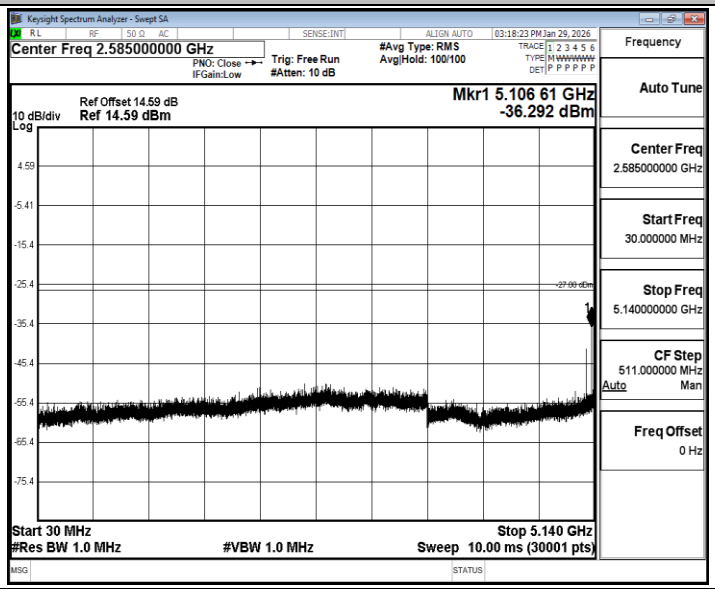
11N40SISO_Ant1_5190_30~5140

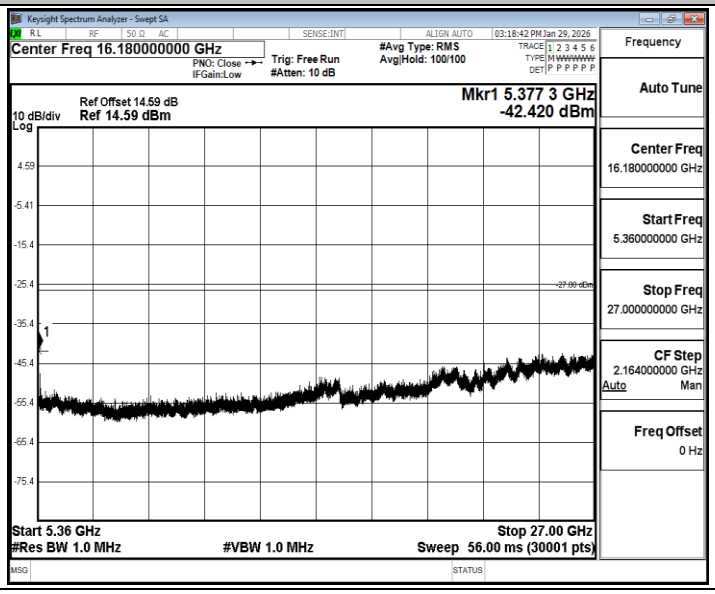


11N40SISO_Ant1_5190_5360~40000



11N40SISO_Ant1_5230_30~5140



11N40SISO_Ant1_5230_5360~40000


B.5 Frequency Stability

Test Result

Voltage								
TestMode	Antenna	Freq (MHz)	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
11A	Ant1	5180	NV	NT	0.00	0.000000	20	PASS
			LV	NT	0.00	0.000000	20	PASS
			HV	NT	-20000.00	-3.861004	20	PASS
		5200	NV	NT	-20000.00	-3.846154	20	PASS
			LV	NT	0.00	0.000000	20	PASS
			HV	NT	0.00	0.000000	20	PASS
		5240	NV	NT	0.00	0.000000	20	PASS
			LV	NT	0.00	0.000000	20	PASS
			HV	NT	0.00	0.000000	20	PASS
11N20SISO	Ant1	5180	NV	NT	-40000.00	-7.722008	20	PASS
			LV	NT	0.00	0.000000	20	PASS
			HV	NT	0.00	0.000000	20	PASS
		5200	NV	NT	0.00	0.000000	20	PASS
			LV	NT	20000.00	3.846154	20	PASS
			HV	NT	-20000.00	-3.846154	20	PASS
		5240	NV	NT	0.00	0.000000	20	PASS
			LV	NT	-20000.00	-3.816794	20	PASS
			HV	NT	0.00	0.000000	20	PASS
11N40SISO	Ant1	5190	NV	NT	0.00	0.000000	20	PASS
			LV	NT	0.00	0.000000	20	PASS
			HV	NT	80000.00	15.414258	20	PASS
		5230	NV	NT	40000.00	7.648184	20	PASS
			LV	NT	0.00	0.000000	20	PASS
			HV	NT	0.00	0.000000	20	PASS

Temperature								
TestMode	Antenna	Freq(MHz)	Voltage [Vdc]	Temperature (℃)	Deviation (Hz)	Deviation (ppm)	Limit (ppm)	Verdict
11A	Ant1	5180	NV	-30	0.00	0.000000	20	PASS
			NV	-20	0.00	0.000000	20	PASS
			NV	-10	-20000.00	-3.861004	20	PASS
			NV	0	20000.00	3.861004	20	PASS
			NV	10	-20000.00	-3.861004	20	PASS
			NV	20	0.00	0.000000	20	PASS
			NV	30	0.00	0.000000	20	PASS
			NV	40	-20000.00	-3.861004	20	PASS

			NV	50	0.00	0.000000	20	PASS
		5200	NV	-30	0.00	0.000000	20	PASS
			NV	-20	0.00	0.000000	20	PASS
			NV	-10	-20000.00	-3.846154	20	PASS
			NV	0	0.00	0.000000	20	PASS
			NV	10	0.00	0.000000	20	PASS
			NV	20	0.00	0.000000	20	PASS
			NV	30	-20000.00	-3.846154	20	PASS
			NV	40	0.00	0.000000	20	PASS
			NV	50	0.00	0.000000	20	PASS
		5240	NV	-30	0.00	0.000000	20	PASS
			NV	-20	0.00	0.000000	20	PASS
			NV	-10	0.00	0.000000	20	PASS
			NV	0	0.00	0.000000	20	PASS
			NV	10	0.00	0.000000	20	PASS
			NV	20	-20000.00	-3.816794	20	PASS
			NV	30	0.00	0.000000	20	PASS
			NV	40	-20000.00	-3.816794	20	PASS
			NV	50	0.00	0.000000	20	PASS
11N20SISO	Ant1	5180	NV	-30	0.00	0.000000	20	PASS
			NV	-20	0.00	0.000000	20	PASS
			NV	-10	0.00	0.000000	20	PASS
			NV	0	0.00	0.000000	20	PASS
			NV	10	0.00	0.000000	20	PASS
			NV	20	0.00	0.000000	20	PASS
			NV	30	0.00	0.000000	20	PASS
			NV	40	0.00	0.000000	20	PASS
			NV	50	20000.00	3.861004	20	PASS
		5200	NV	-30	20000.00	3.846154	20	PASS
			NV	-20	-20000.00	-3.846154	20	PASS
			NV	-10	40000.00	7.692308	20	PASS
			NV	0	-20000.00	-3.846154	20	PASS
			NV	10	-20000.00	-3.846154	20	PASS
			NV	20	0.00	0.000000	20	PASS
			NV	30	0.00	0.000000	20	PASS
			NV	40	-20000.00	-3.846154	20	PASS
			NV	50	-20000.00	-3.846154	20	PASS
		5240	NV	-30	-20000.00	-3.816794	20	PASS
			NV	-20	0.00	0.000000	20	PASS
			NV	-10	-20000.00	-3.816794	20	PASS
			NV	0	-20000.00	-3.816794	20	PASS
			NV	10	0.00	0.000000	20	PASS

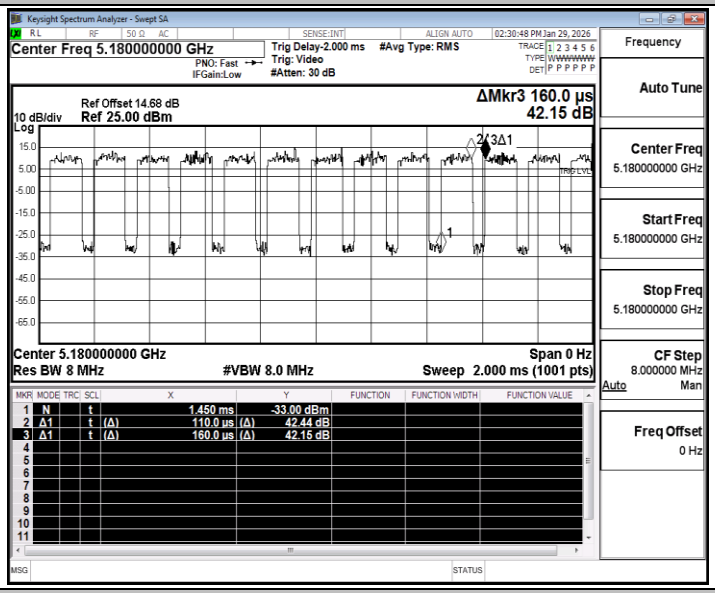
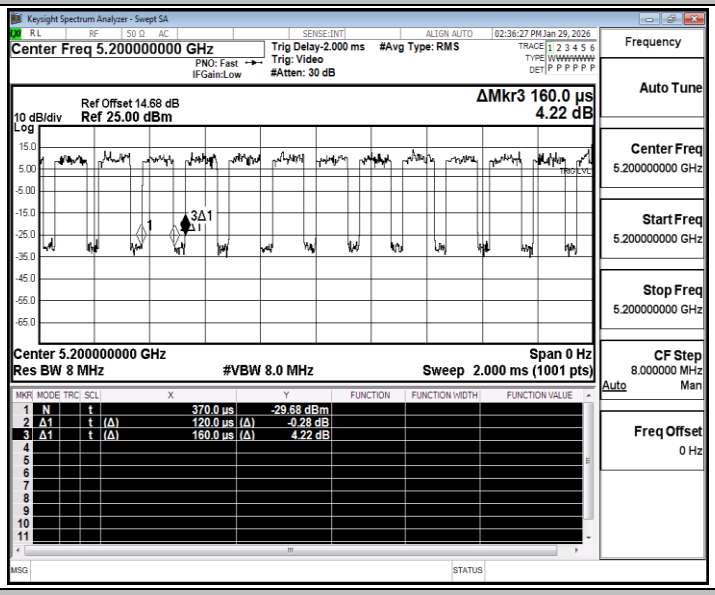
			NV	20	0.00	0.000000	20	PASS
			NV	30	20000.00	3.816794	20	PASS
			NV	40	0.00	0.000000	20	PASS
			NV	50	-20000.00	-3.816794	20	PASS
11N40SISO	Ant1	5190	NV	-30	0.00	0.000000	20	PASS
			NV	-20	40000.00	7.707129	20	PASS
			NV	-10	0.00	0.000000	20	PASS
			NV	0	40000.00	7.707129	20	PASS
			NV	10	40000.00	7.707129	20	PASS
			NV	20	40000.00	7.707129	20	PASS
			NV	30	0.00	0.000000	20	PASS
			NV	40	0.00	0.000000	20	PASS
			NV	50	40000.00	7.707129	20	PASS
		5230	NV	-30	0.00	0.000000	20	PASS
			NV	-20	0.00	0.000000	20	PASS
			NV	-10	40000.00	7.648184	20	PASS
			NV	0	-40000.00	-7.648184	20	PASS
			NV	10	40000.00	7.648184	20	PASS
			NV	20	40000.00	7.648184	20	PASS
			NV	30	40000.00	7.648184	20	PASS
			NV	40	0.00	0.000000	20	PASS
			NV	50	40000.00	7.648184	20	PASS

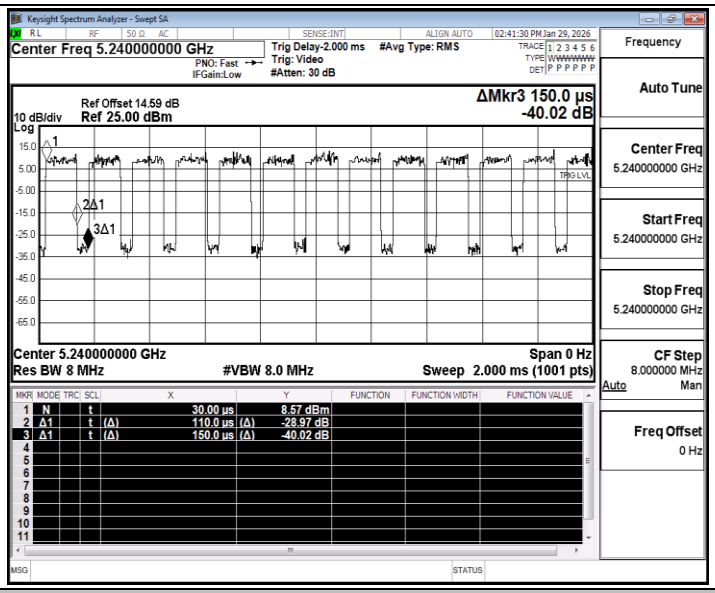
D.6 Duty Cycle

Test Result

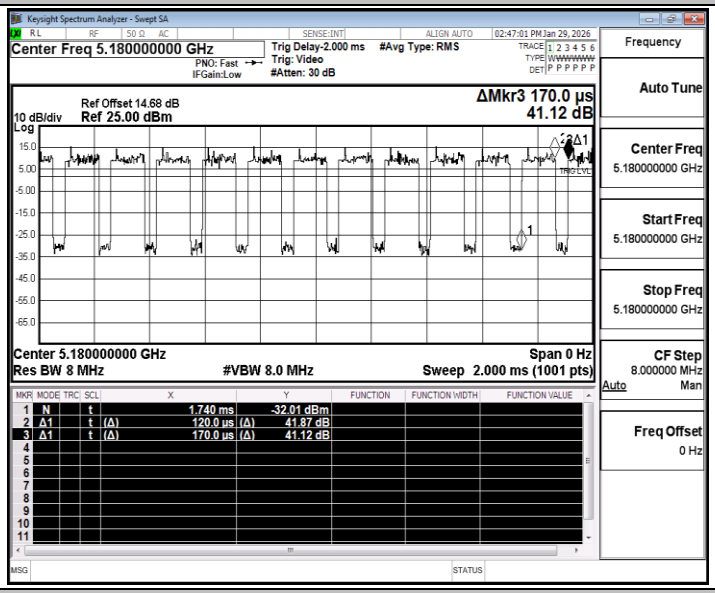
TestMode	Antenna	Freq (MHz)	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	DC Factor	Limit	Verdict
11A	Ant1	5180	0.11	0.16	68.75	1.63	---	---
		5200	0.12	0.16	75.00	1.25	---	---
		5240	0.11	0.15	73.33	1.35	---	---
11N20SISO	Ant1	5180	0.12	0.17	70.59	1.51	---	---
		5200	0.12	0.17	70.59	1.51	---	---
		5240	0.12	0.16	75.00	1.25	---	---
11N40SISO	Ant1	5190	0.08	0.12	66.67	1.76	---	---
		5230	0.07	0.12	58.33	2.34	---	---

Test Graphs

11A_Ant1_5180

11A_Ant1_5200

11A_Ant1_5240



11N20SISO_Ant1_5180



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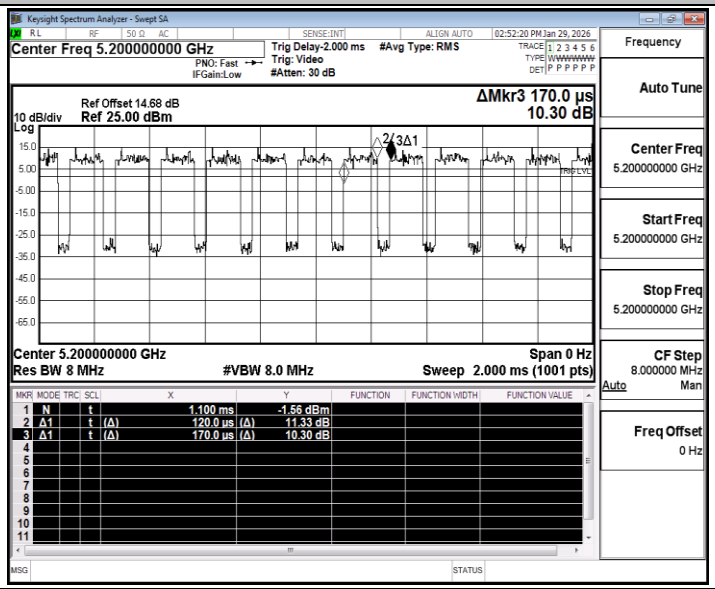
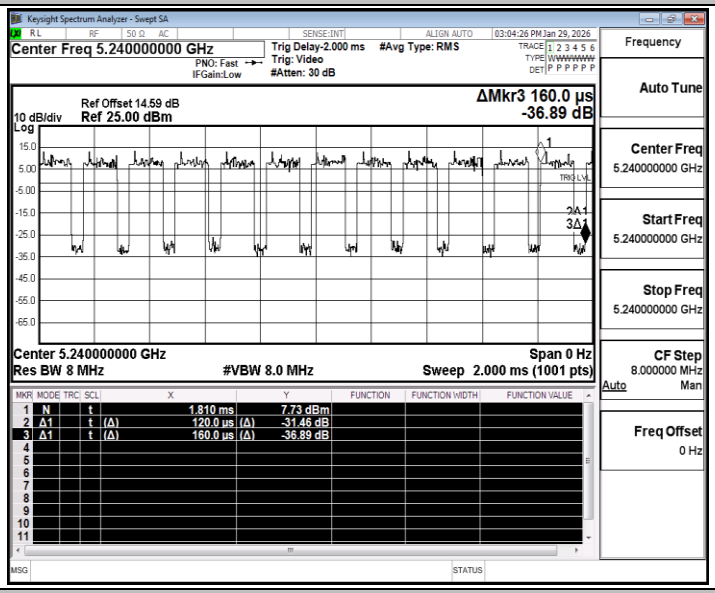
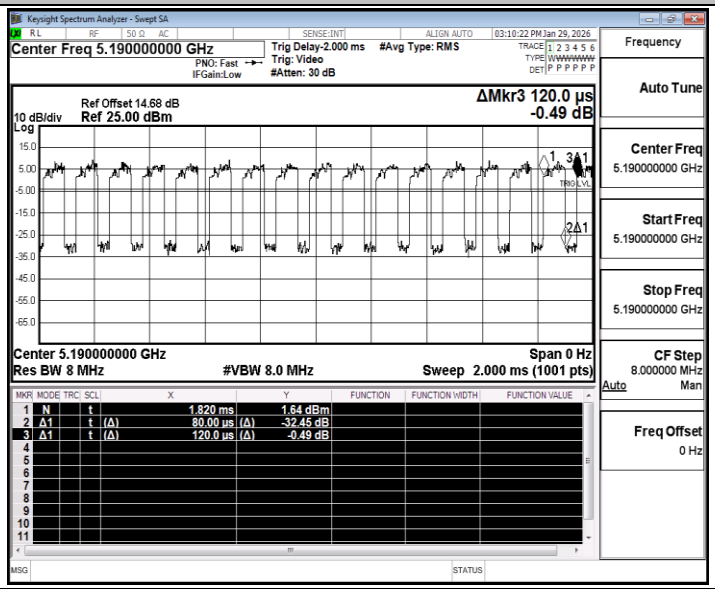


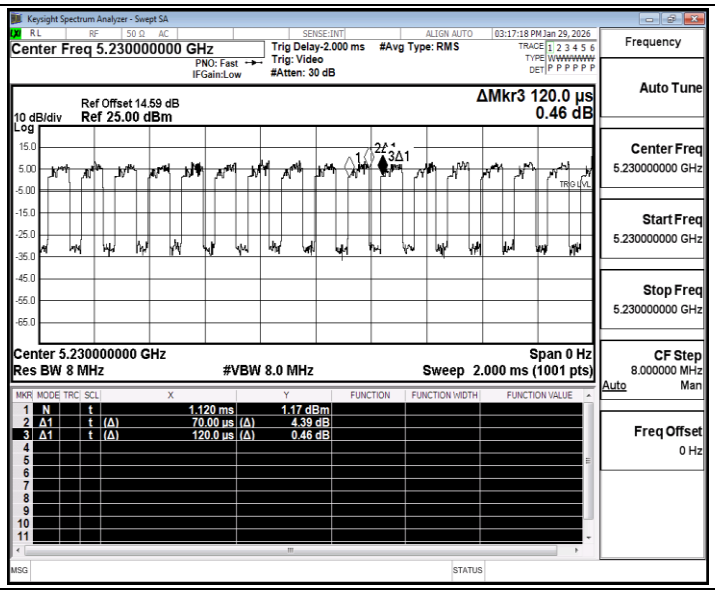
11N20SISO_Ant1_5240



11N40SISO_Ant1_5190



11N40SISO_Ant1_5230


Keysight Spectrum Analyzer - Swept SA
Center Freq 5.230000000 GHz
PNO: Fast
IFGain:Low
Trig Delay-2.000 ms
Trig: Video
#Avg Type: RMS
#Atten: 30 dB
03:17:18 PM Jan 29, 2026
Ref Offset 14.59 dB
10 dB/div
Ref 25.00 dBm
ΔMkr3 120.0 µs
0.46 dB
Center 5.230000000 GHz
Res BW 8 MHz
#VBW 8.0 MHz
Span 0 Hz
Sweep 2.000 ms (1001 pts)
1 N 1 t 1.120 ms 1.17 dBm
2 Δ1 t (Δ) 70.00 µs (Δ) 4.39 dB
3 Δ1 t (Δ) 120.0 µs (Δ) 0.46 dB
Frequency
Auto Tune
Center Freq
5.230000000 GHz
Start Freq
5.230000000 GHz
Stop Freq
5.230000000 GHz
CF Step
8.000000 MHz
Auto
Man
Freq Offset
0 Hz