

Appendix A

RF Test Data for 2.4GWIFI (Conducted Measurement)

Product Name: Dash cam

Test Model: A2S

Environmental Conditions

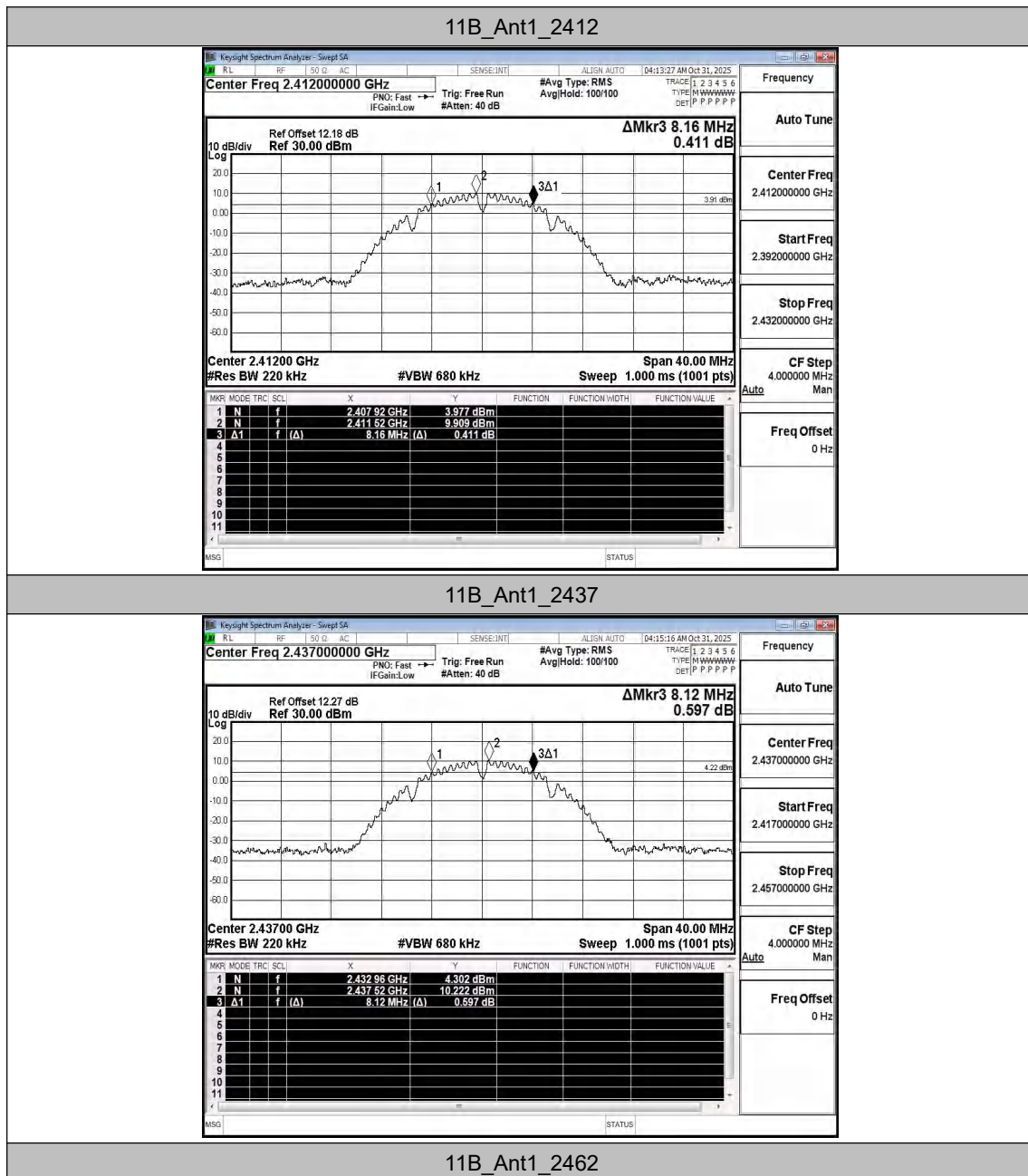
Temperature:	23.8° C
Relative Humidity:	52.4%
ATM Pressure:	100.0 kPa
Test Engineer:	Jone Lee
Supervised by:	Fengliu Tang

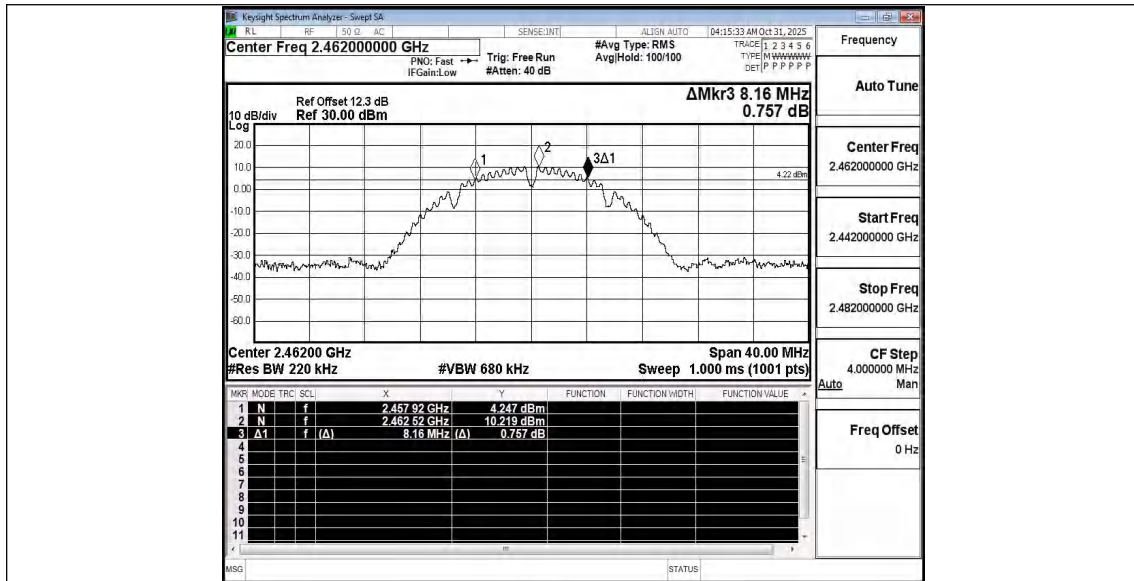
A.1 -6dB Bandwidth

Test Result

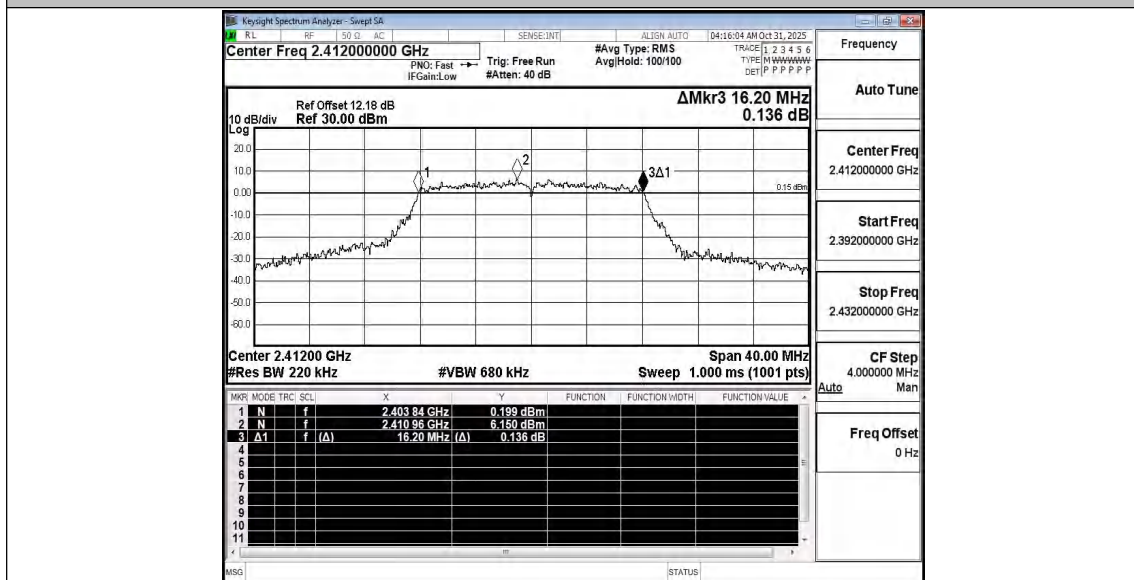
TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	8.160	2407.920	2416.080	0.5	PASS
		2437	8.120	2432.960	2441.080	0.5	PASS
		2462	8.160	2457.920	2466.080	0.5	PASS
11G	Ant1	2412	16.200	2403.840	2420.040	0.5	PASS
		2437	15.680	2429.400	2445.080	0.5	PASS
		2462	16.200	2453.880	2470.080	0.5	PASS
11N20SISO	Ant1	2412	17.280	2403.280	2420.560	0.5	PASS
		2437	17.160	2428.480	2445.640	0.5	PASS
		2462	17.480	2453.280	2470.760	0.5	PASS
11N40SISO	Ant1	2422	36.000	2404.160	2440.160	0.5	PASS
		2437	34.480	2420.280	2454.760	0.5	PASS
		2452	35.680	2434.320	2470.000	0.5	PASS

Test Graphs

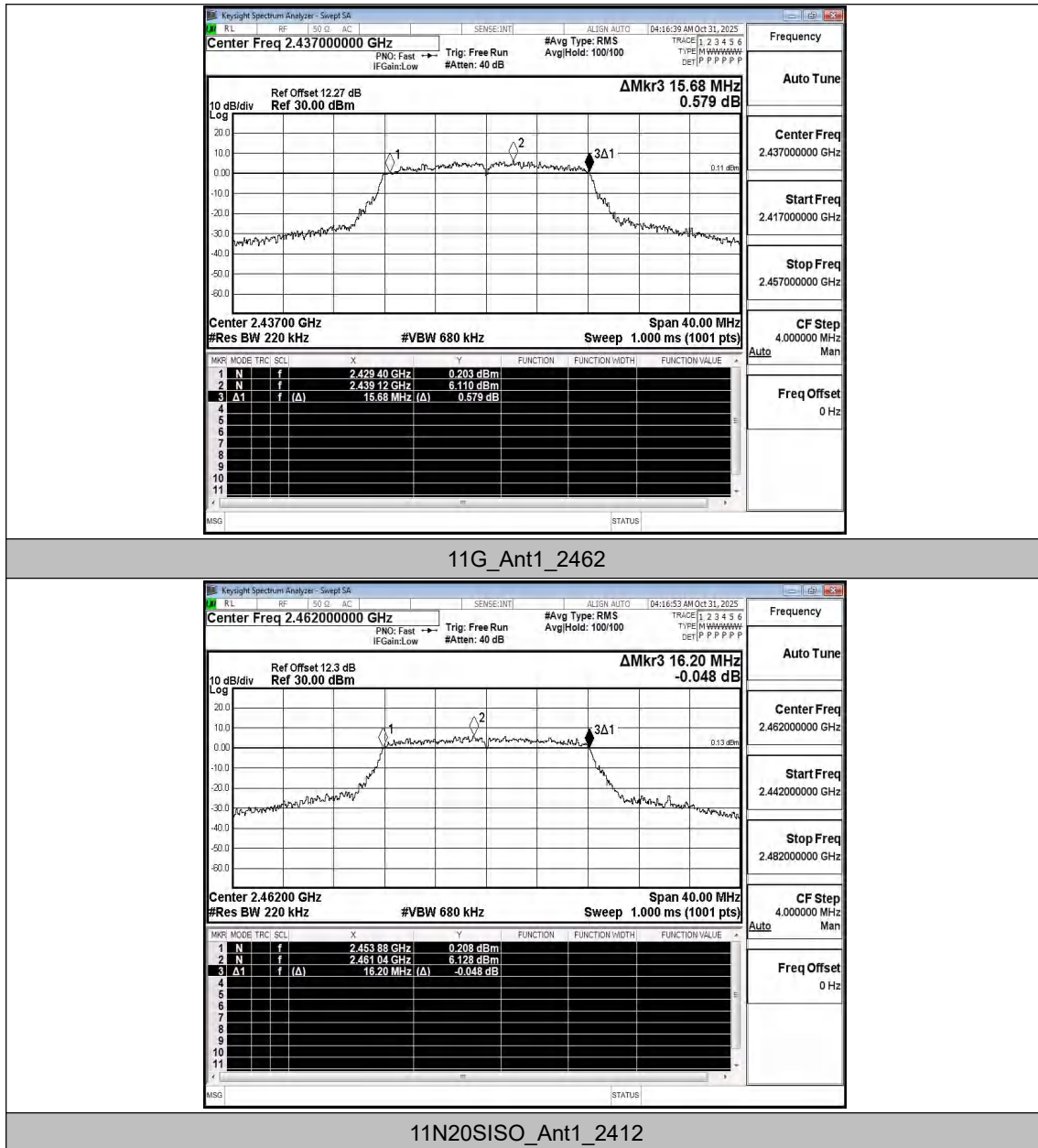


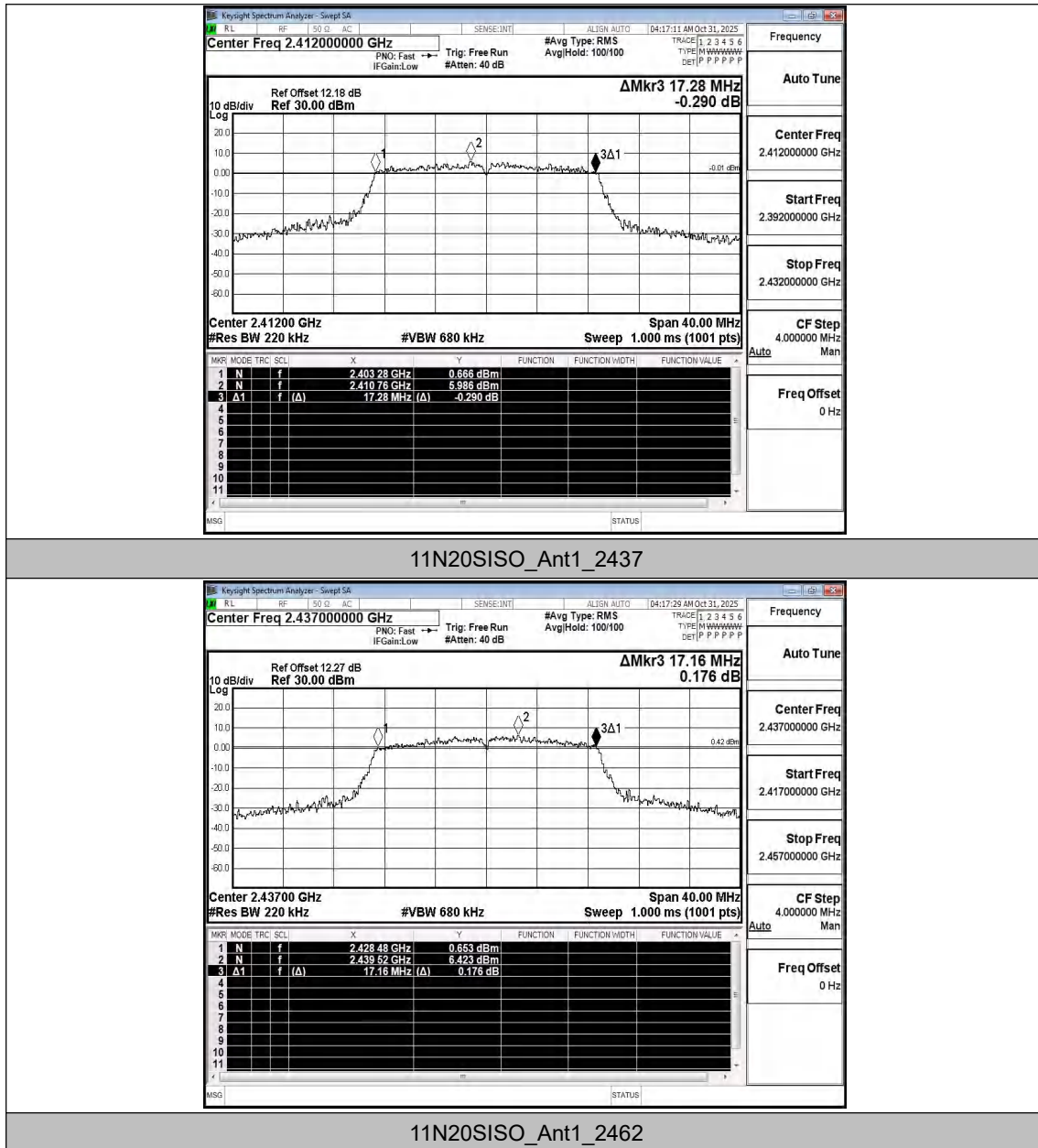


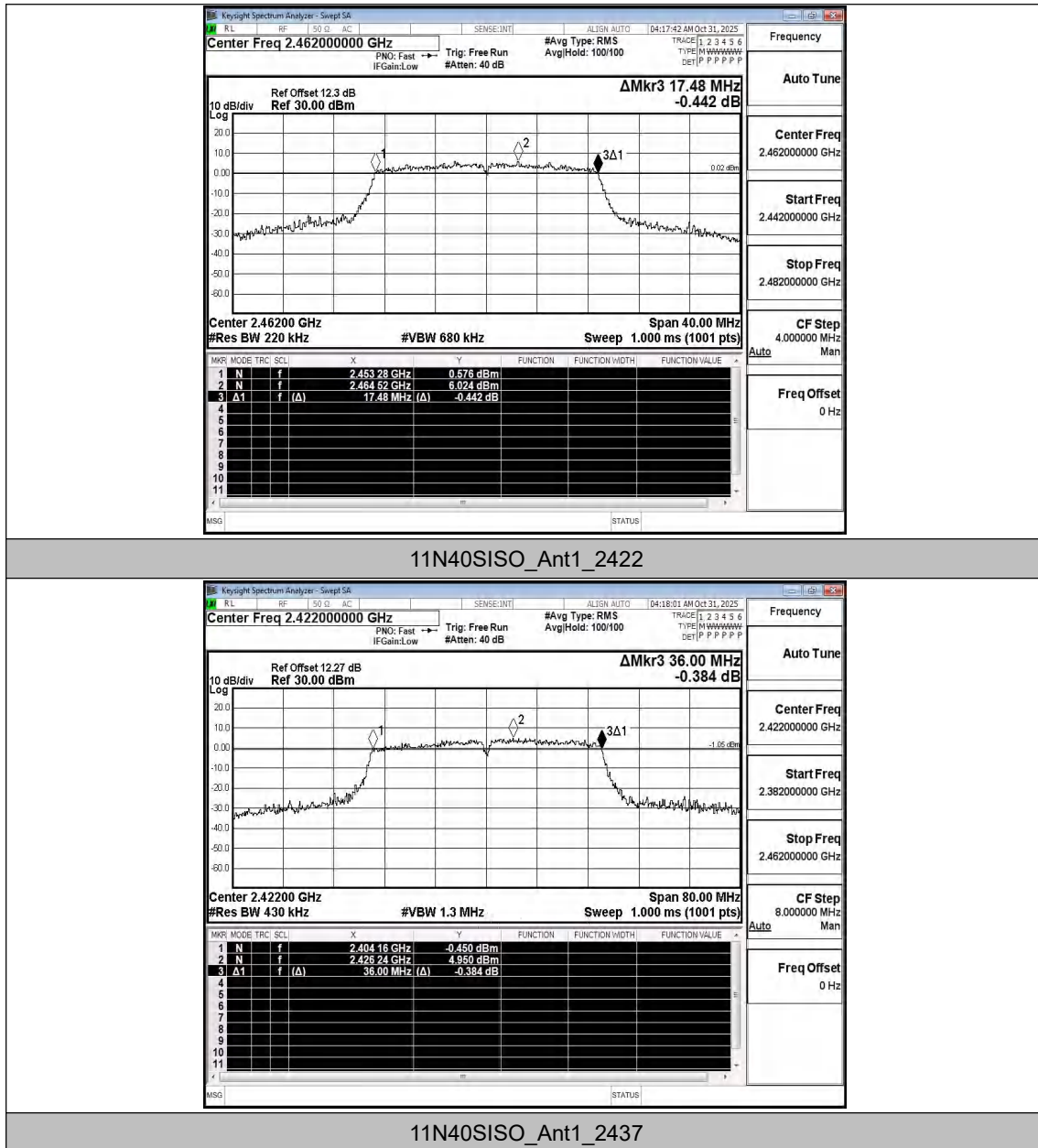
11G_Ant1_2412

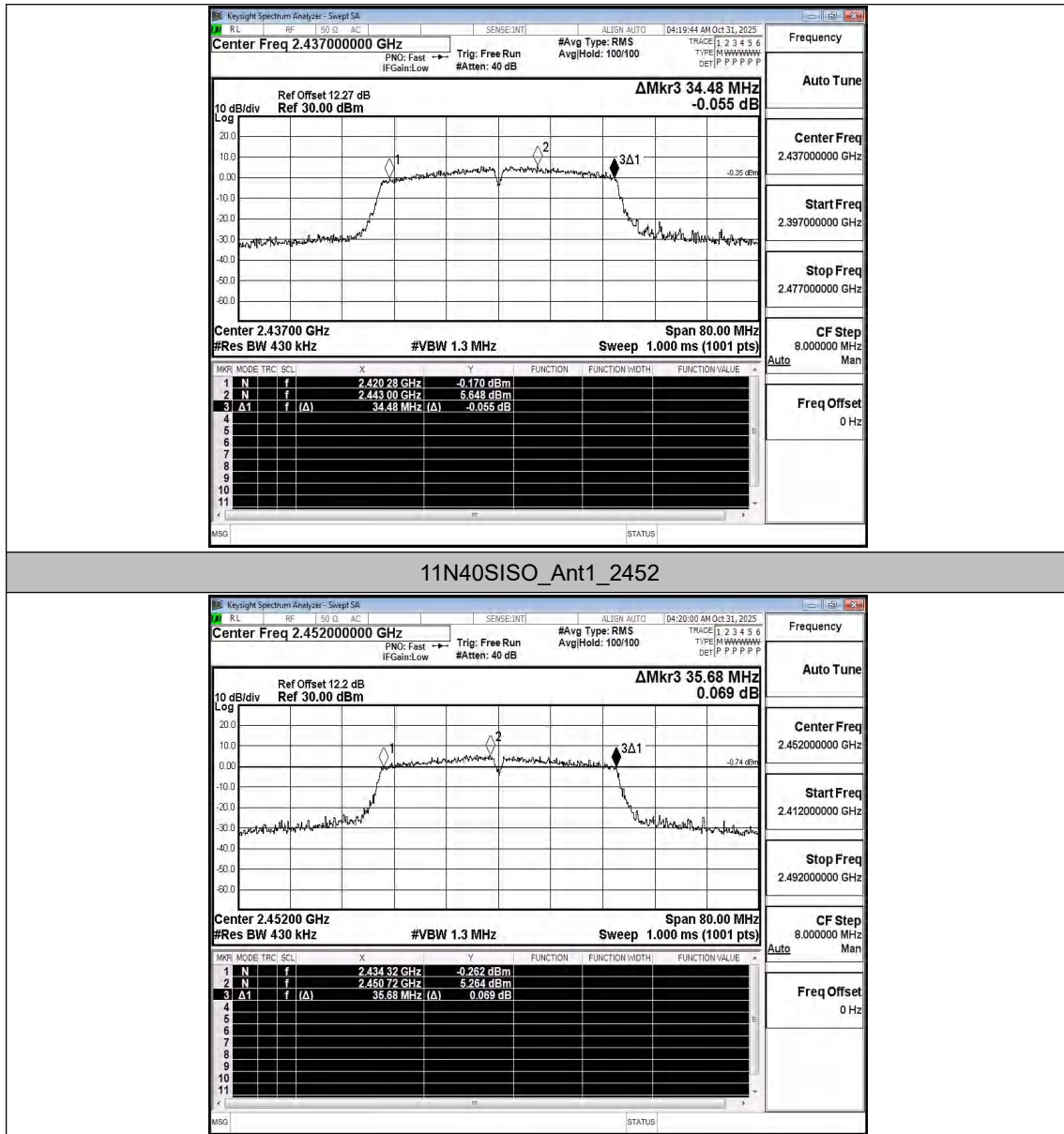


11G_Ant1_2437









A.2 Maximum Peak Conducted Output Power

Test Result Peak

TestMode	Antenna	Frequency[MHz]	Set Power	Peak Power[dBm]	Conducted Limit[dBm]	Verdict
11B	Ant1	2412	NA	16.26	≤30.00	PASS
		2437	NA	16.69	≤30.00	PASS
		2462	NA	16.52	≤30.00	PASS
11G	Ant1	2412	NA	14.77	≤30.00	PASS
		2437	NA	15.16	≤30.00	PASS
		2462	NA	14.96	≤30.00	PASS
11N20SISO	Ant1	2412	NA	14.54	≤30.00	PASS
		2437	NA	14.69	≤30.00	PASS
		2462	NA	14.49	≤30.00	PASS
11N40SISO	Ant1	2422	NA	14.08	≤30.00	PASS
		2437	NA	14.48	≤30.00	PASS
		2452	NA	14.15	≤30.00	PASS

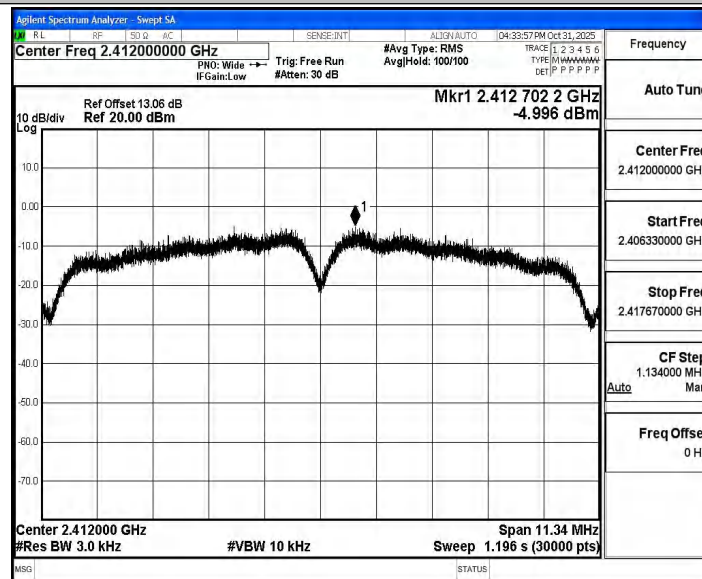
A.3 Maximum power spectral density

Test Result

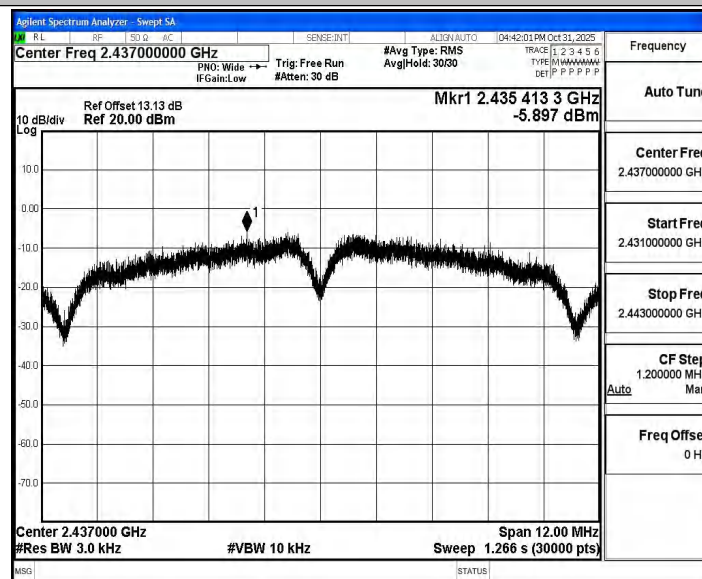
TestMode	Antenna	Frequency[MHz]	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-5.00	≤8.00	PASS
		2437	-5.90	≤8.00	PASS
		2462	-6.06	≤8.00	PASS
11G	Ant1	2412	-9.49	≤8.00	PASS
		2437	-10.22	≤8.00	PASS
		2462	-10.00	≤8.00	PASS
11N20SISO	Ant1	2412	-10.51	≤8.00	PASS
		2437	-10.42	≤8.00	PASS
		2462	-10.88	≤8.00	PASS
11N40SISO	Ant1	2422	-14.42	≤8.00	PASS
		2437	-12.95	≤8.00	PASS
		2452	-13.32	≤8.00	PASS

Test Graphs

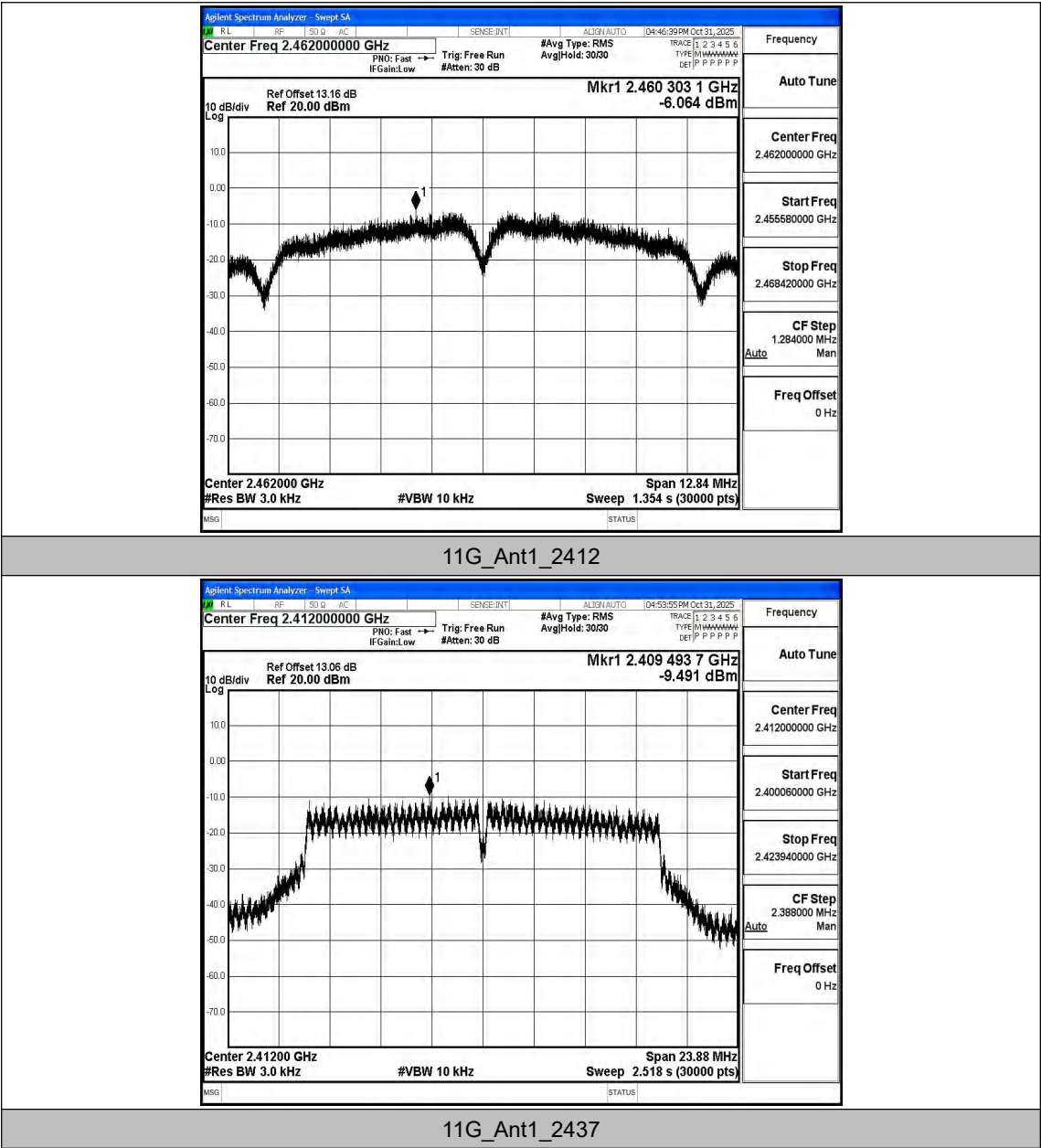
11B_Ant1_2412

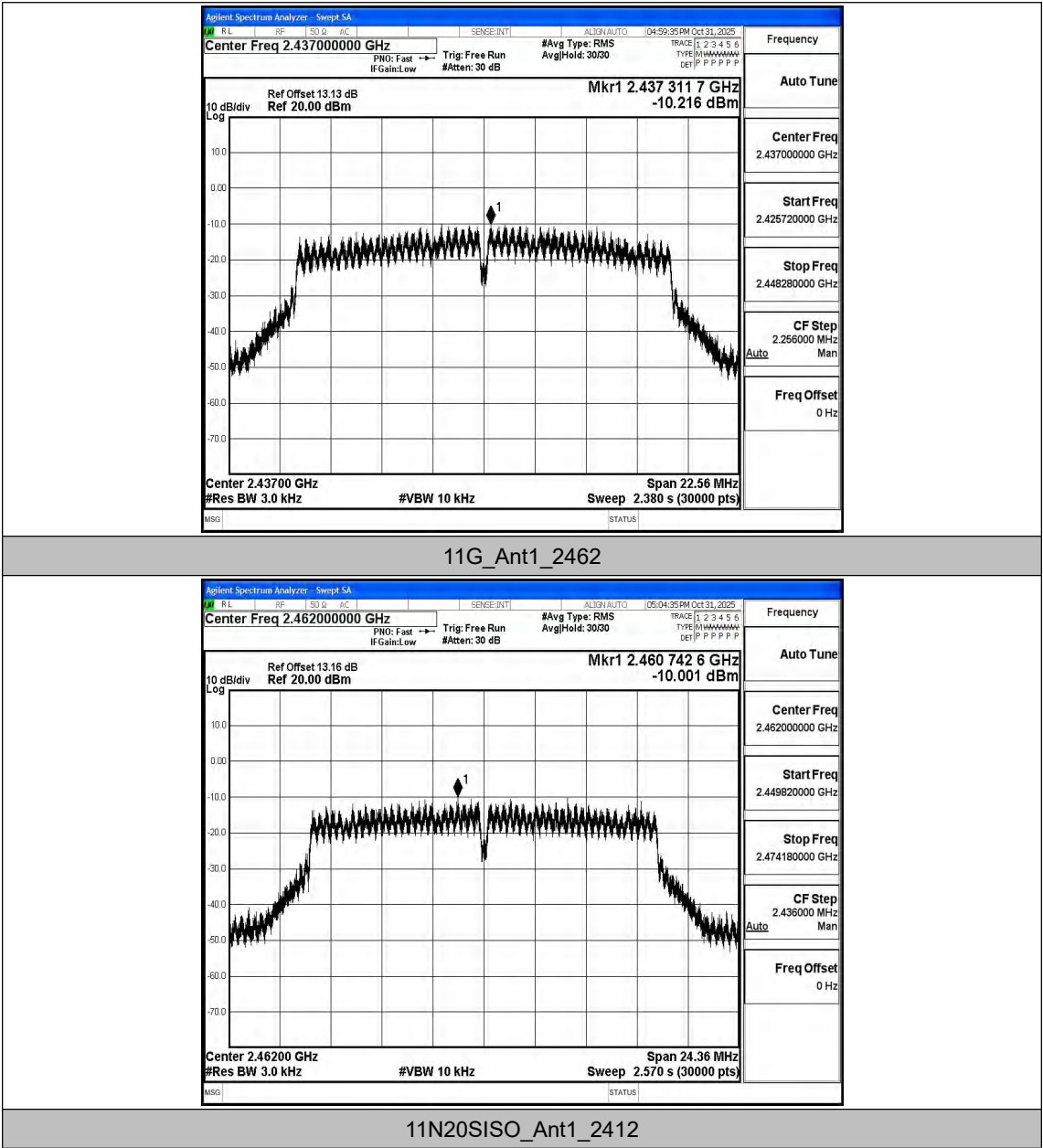


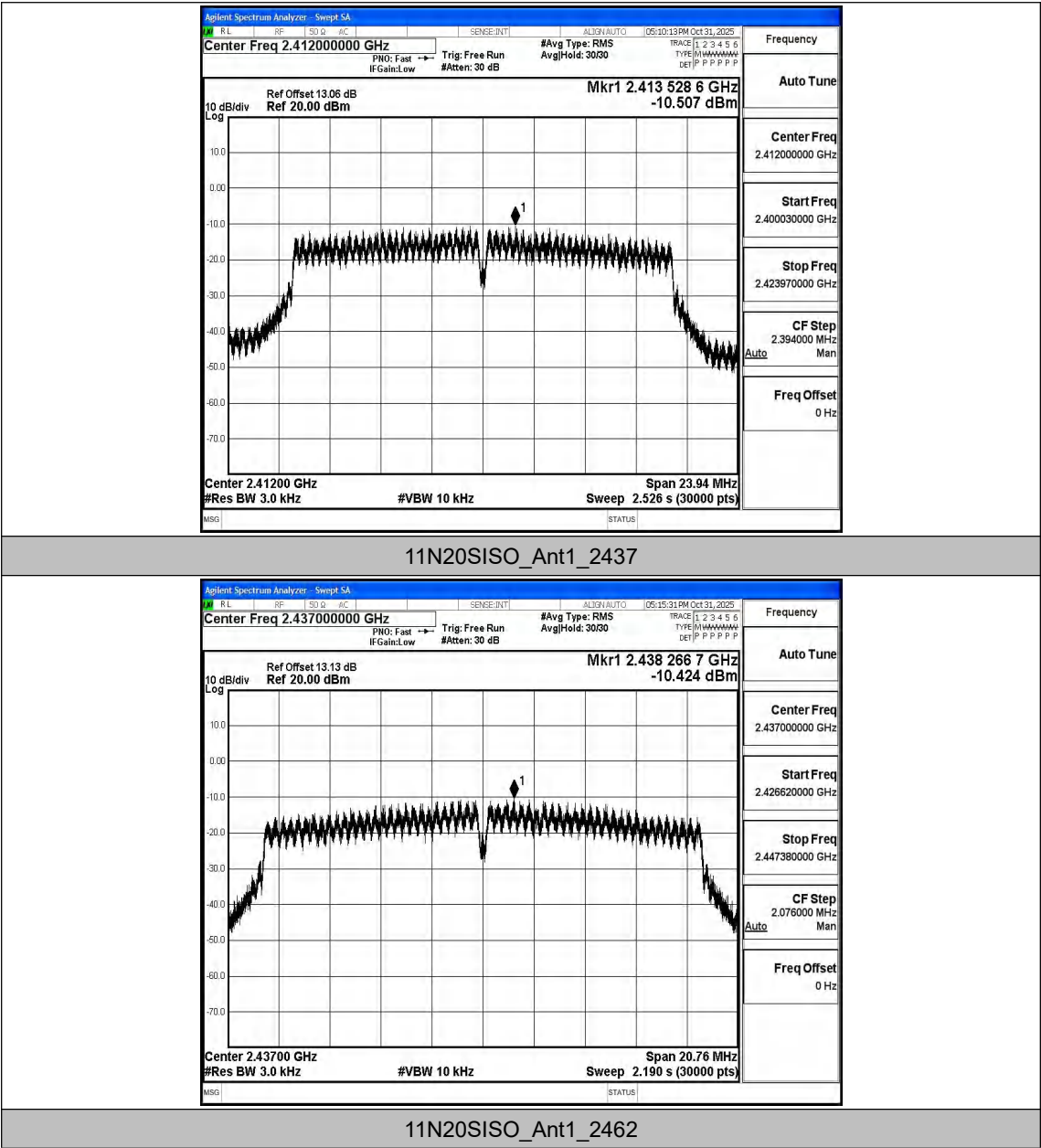
11B_Ant1_2437

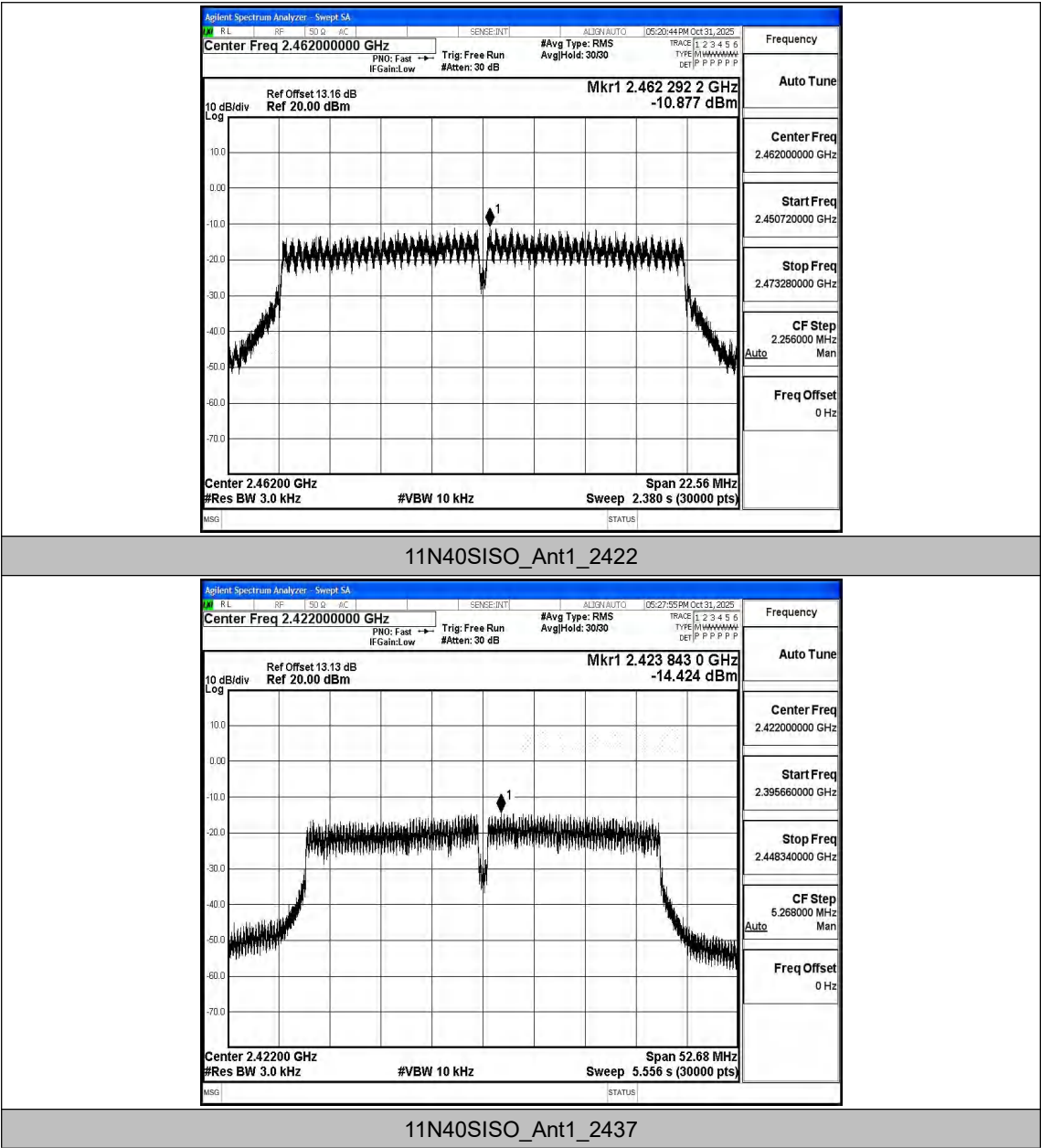


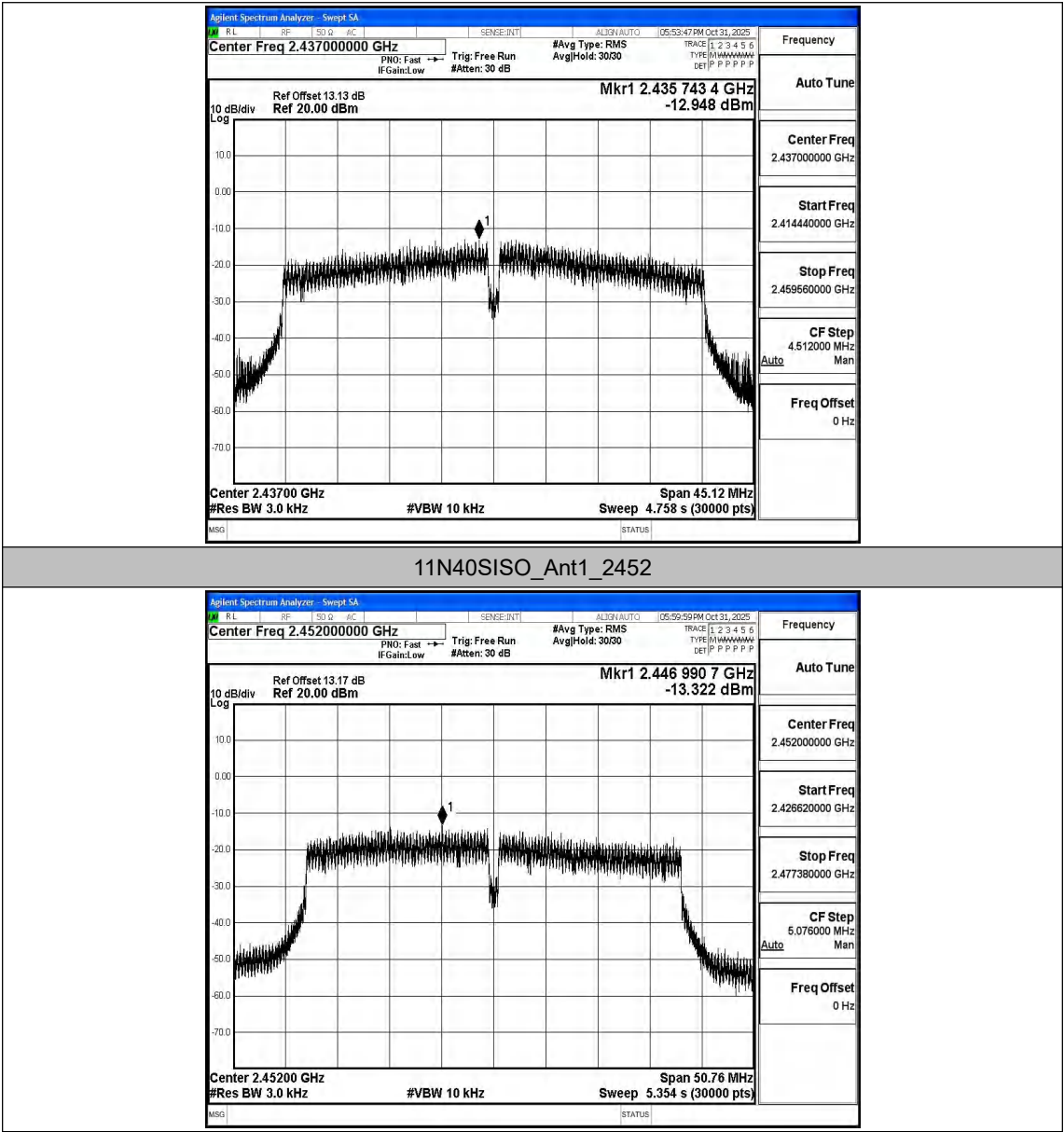
11B_Ant1_2462









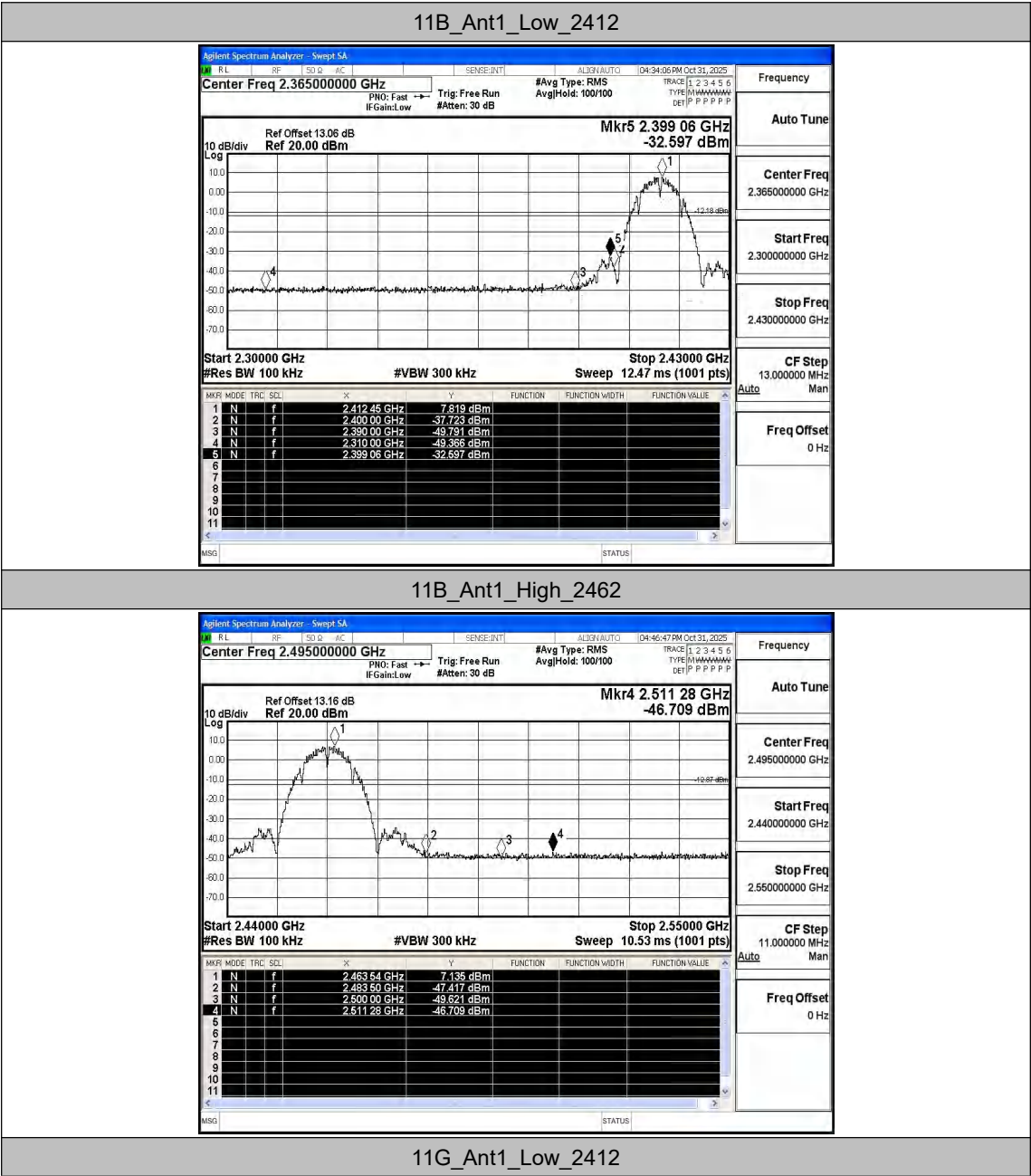


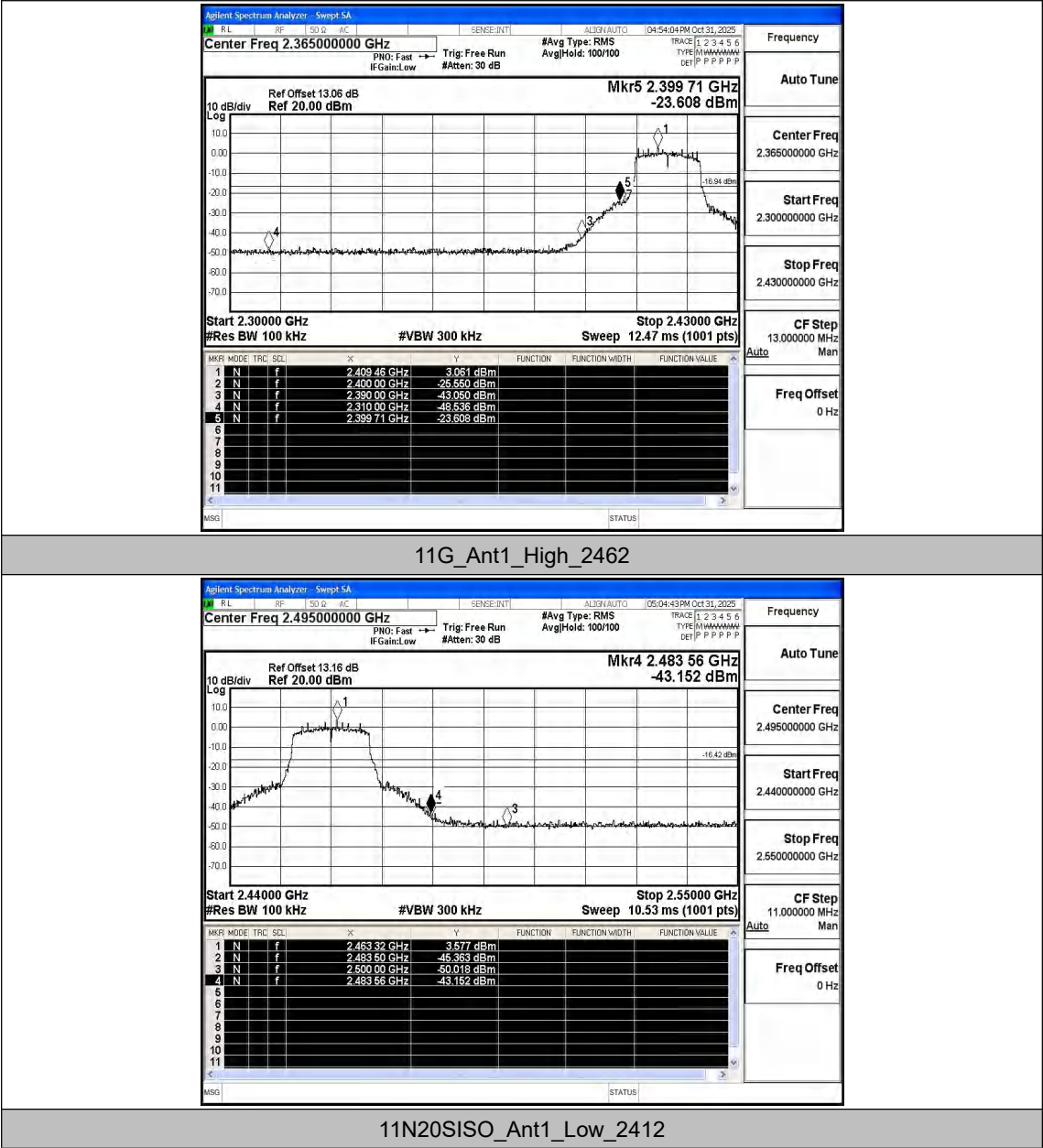
A.4 Band edge measurements

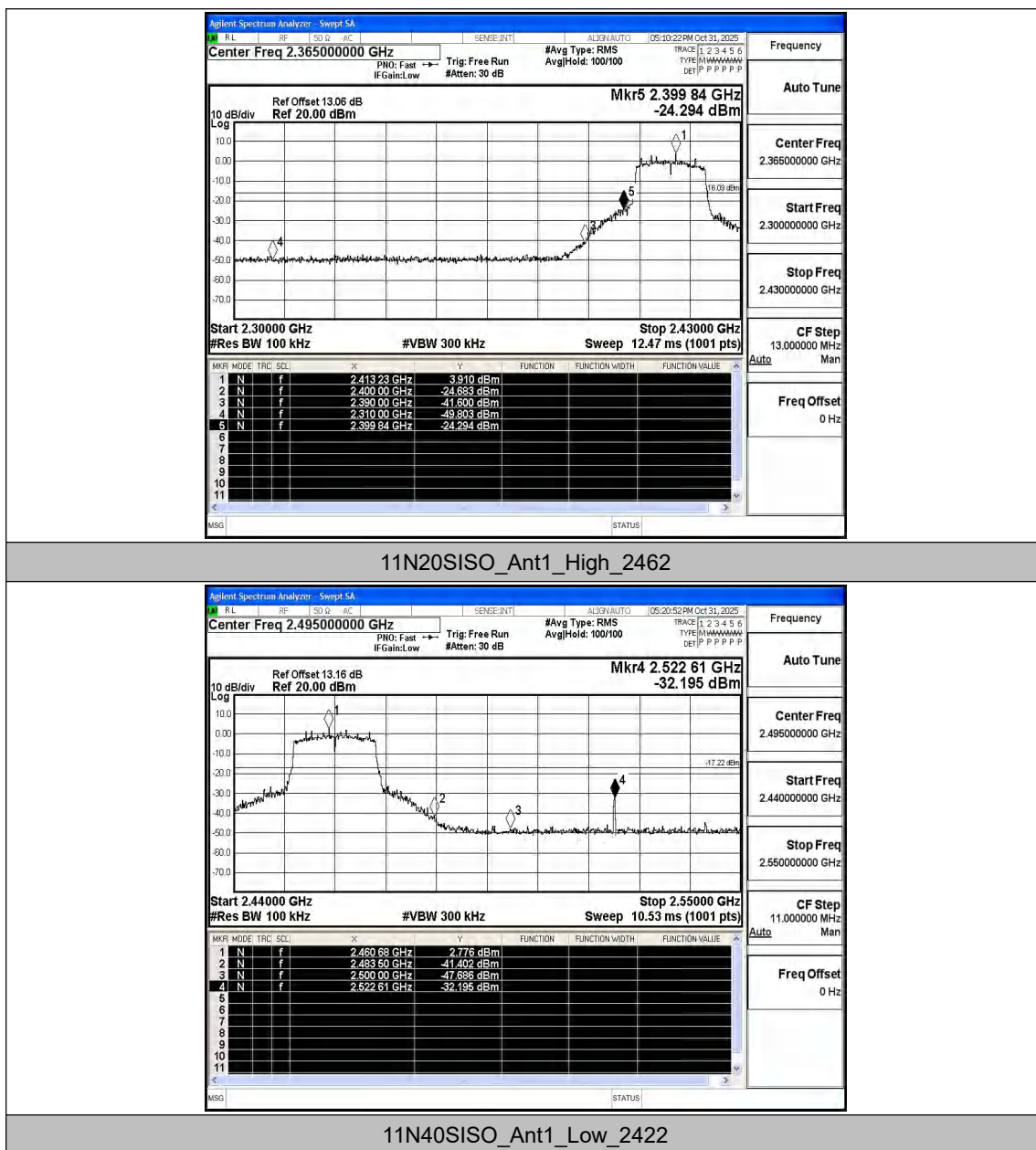
Test Result

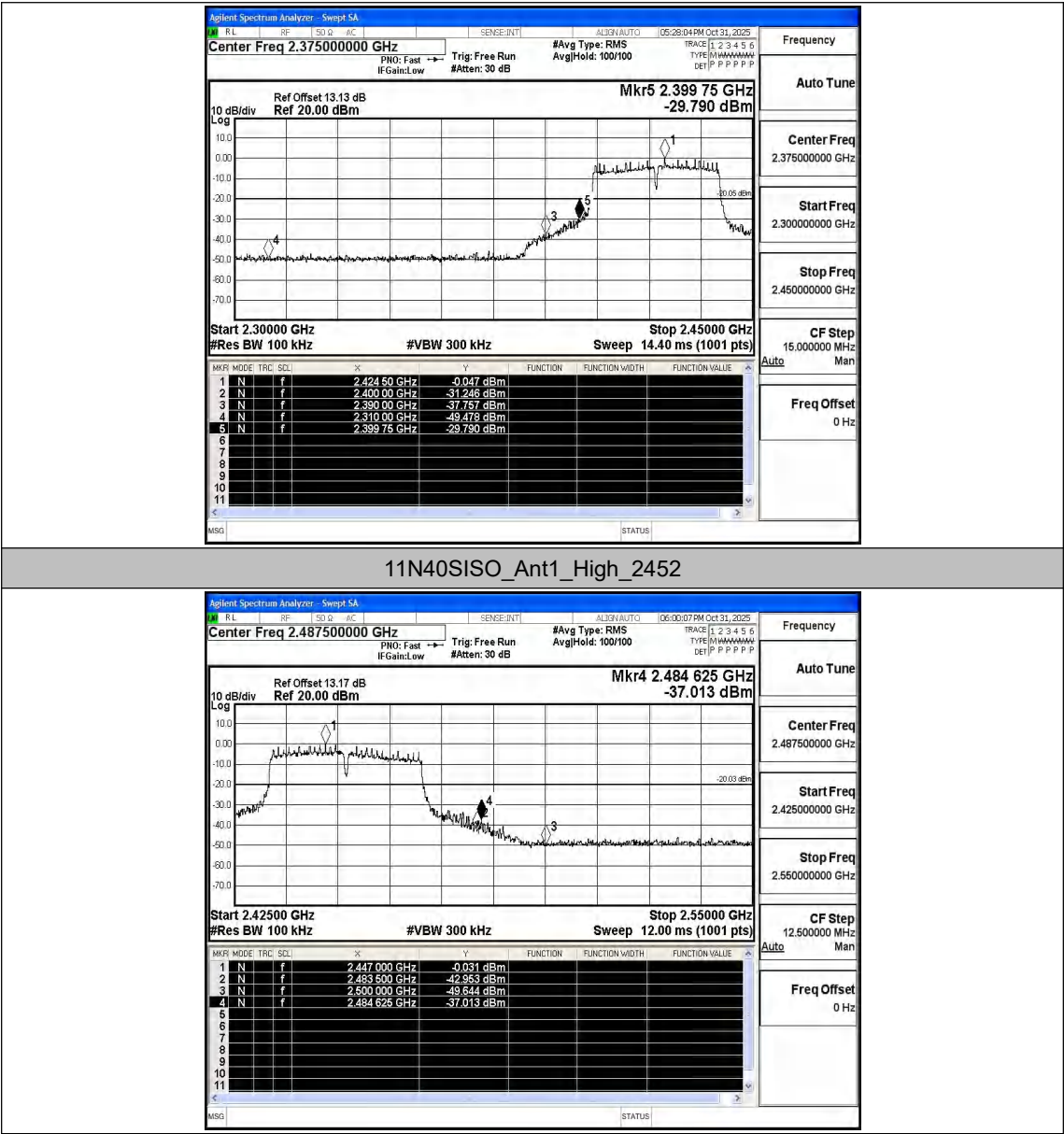
TestMode	Antenna	Channel Name	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	7.82	-32.6	≤-12.18	PASS
		High	2462	7.14	-46.71	≤-12.87	PASS
11G	Ant1	Low	2412	3.06	-23.61	≤-16.94	PASS
		High	2462	3.58	-43.15	≤-16.42	PASS
11N20SISO	Ant1	Low	2412	3.91	-24.29	≤-16.09	PASS
		High	2462	2.78	-32.2	≤-17.22	PASS
11N40SISO	Ant1	Low	2422	-0.05	-29.79	≤-20.05	PASS
		High	2452	-0.03	-37.01	≤-20.03	PASS

Test Graphs







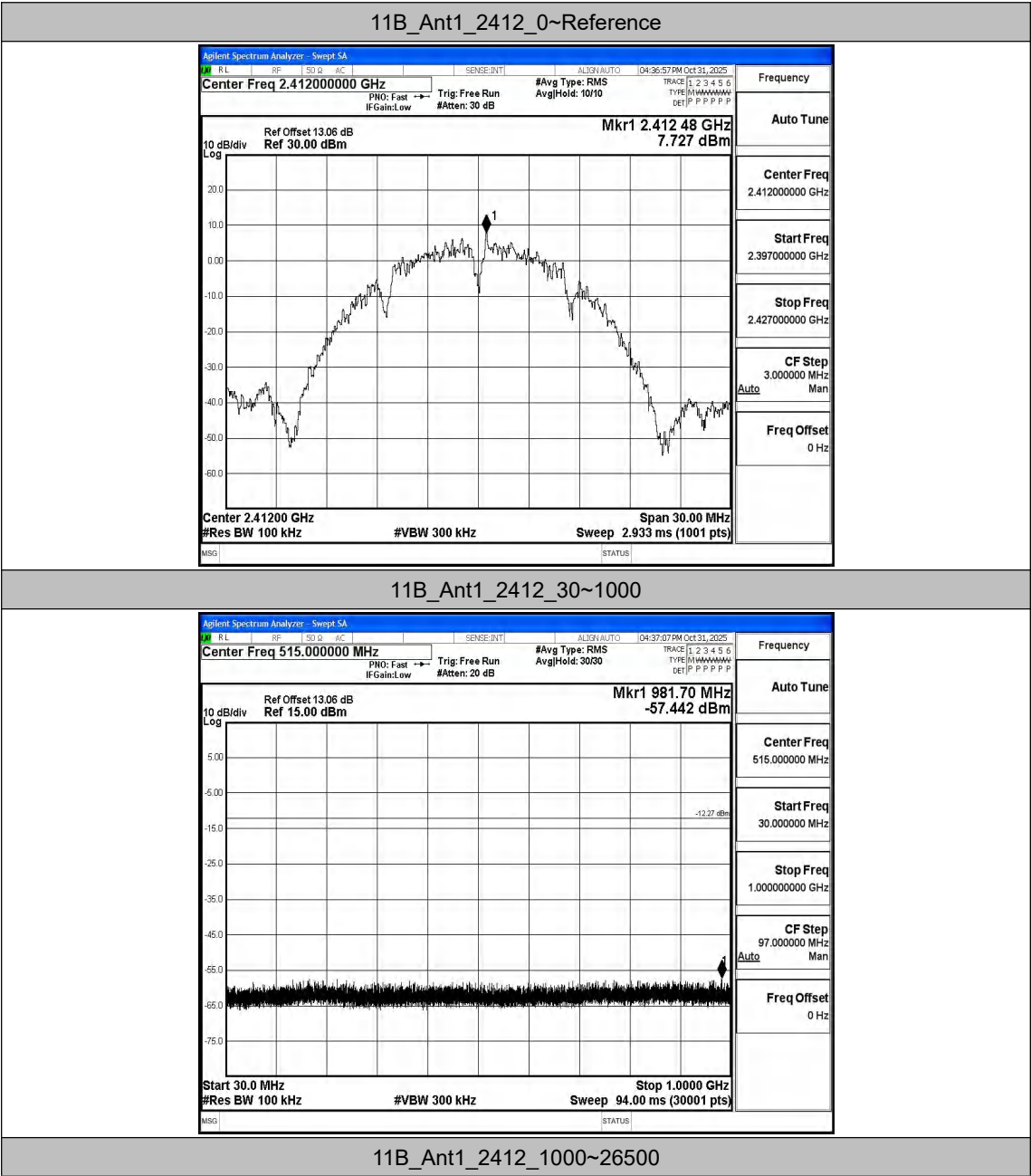


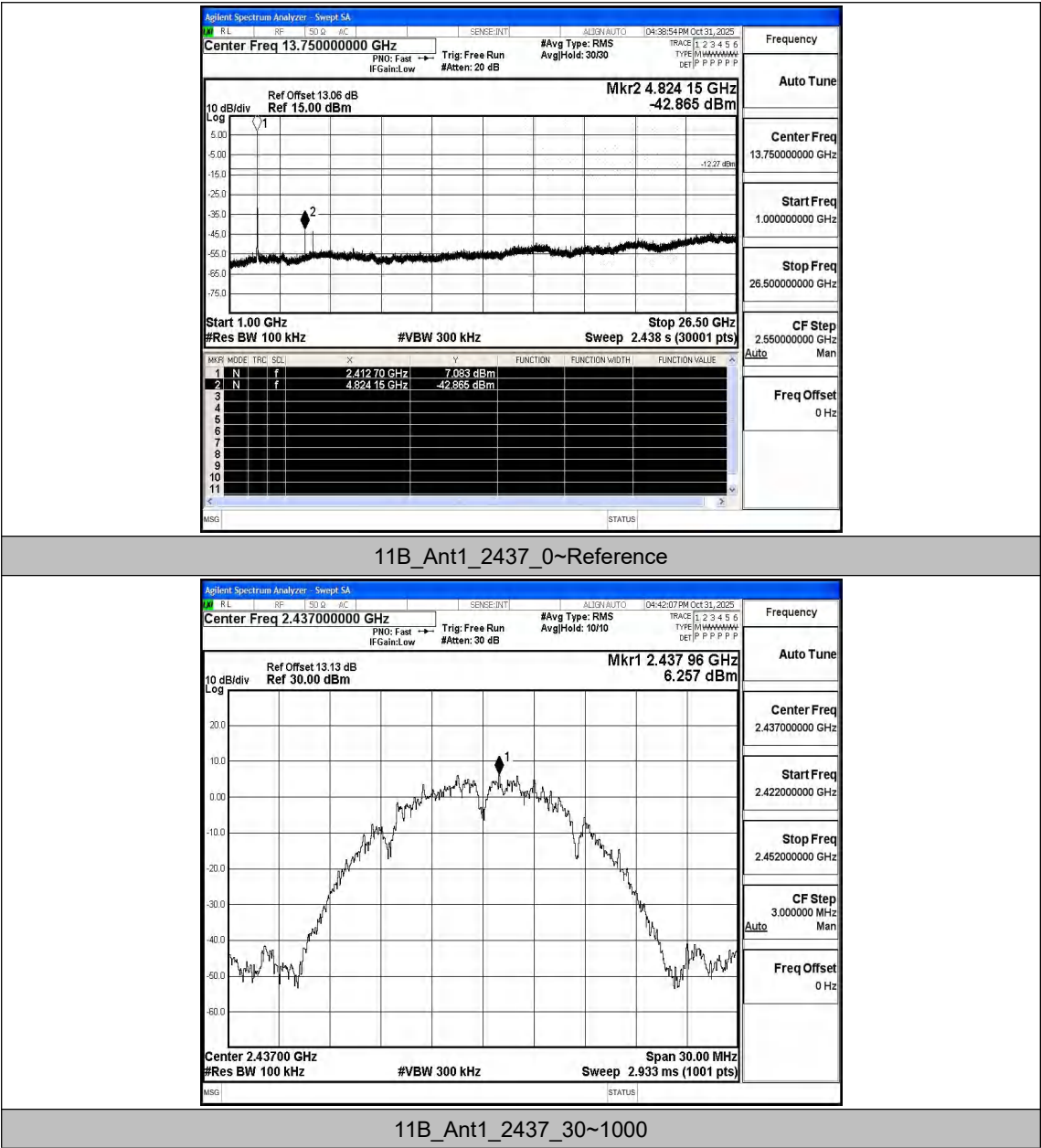
A.5 Conducted Spurious Emission

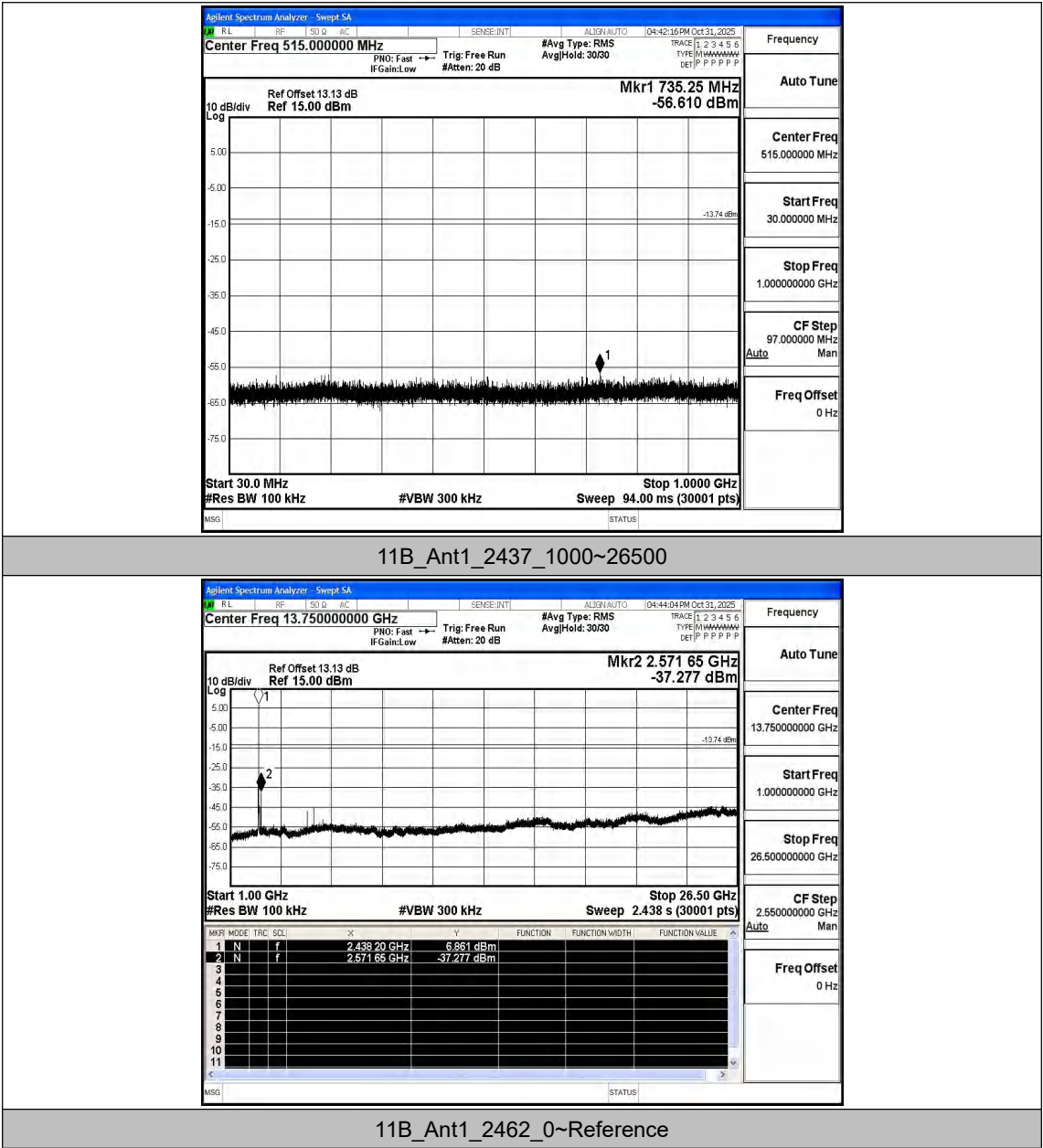
Test Result

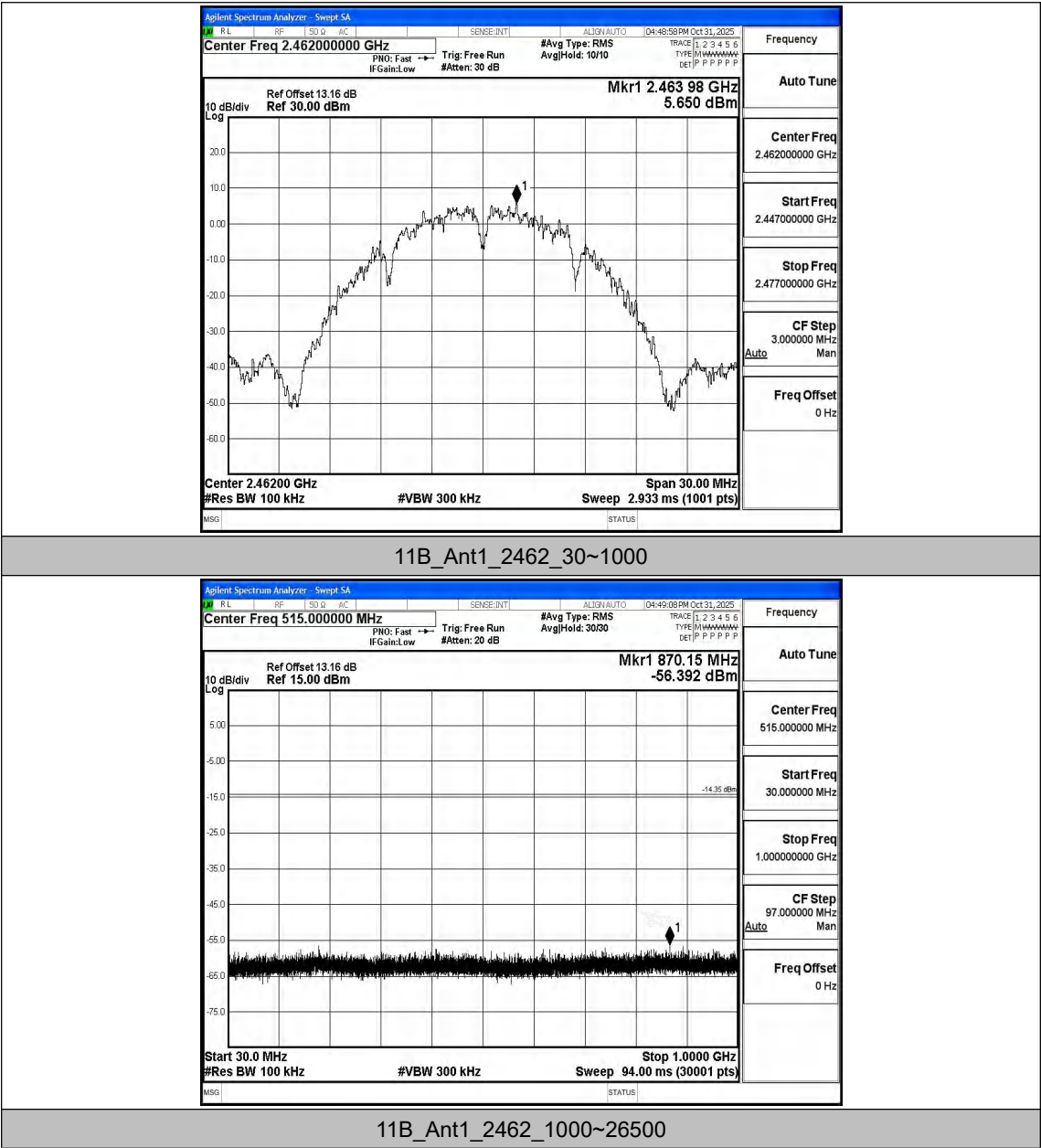
TestMode	Antenna	Frequency[MHz]	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	7.73	7.73	---	PASS
			30~1000	7.73	-57.44	≤-12.27	PASS
			1000~26500	7.73	-42.87	≤-12.27	PASS
		2437	Reference	6.26	6.26	---	PASS
			30~1000	6.26	-56.61	≤-13.74	PASS
			1000~26500	6.26	-37.28	≤-13.74	PASS
		2462	Reference	5.65	5.65	---	PASS
			30~1000	5.65	-56.39	≤-14.35	PASS
			1000~26500	5.65	-43.12	≤-14.35	PASS
11G	Ant1	2412	Reference	3.59	3.59	---	PASS
			30~1000	3.59	-57.2	≤-16.41	PASS
			1000~26500	3.59	-44.5	≤-16.41	PASS
		2437	Reference	0.38	0.38	---	PASS
			30~1000	0.38	-56.35	≤-19.62	PASS
			1000~26500	0.38	-43.45	≤-19.62	PASS
		2462	Reference	0.31	0.31	---	PASS
			30~1000	0.31	-56.82	≤-19.69	PASS
			1000~26500	0.31	-44.73	≤-19.69	PASS
11N20SISO	Ant1	2412	Reference	2.43	2.43	---	PASS
			30~1000	2.43	-57.66	≤-17.57	PASS
			1000~26500	2.43	-42.88	≤-17.57	PASS
		2437	Reference	0.04	0.04	---	PASS
			30~1000	0.04	-56.84	≤-19.96	PASS
			1000~26500	0.04	-42.95	≤-19.96	PASS
		2462	Reference	1.17	1.17	---	PASS
			30~1000	1.17	-57.3	≤-18.83	PASS
			1000~26500	1.17	-43.98	≤-18.83	PASS
11N40SISO	Ant1	2422	Reference	-3.89	-3.89	---	PASS
			30~1000	-3.89	-56.84	≤-23.89	PASS
			1000~26500	-3.89	-42.42	≤-23.89	PASS
		2437	Reference	-0.99	-0.99	---	PASS
			30~1000	-0.99	-56.02	≤-20.99	PASS
			1000~26500	-0.99	-44.55	≤-20.99	PASS
		2452	Reference	0.02	0.02	---	PASS
			30~1000	0.02	-56.08	≤-19.98	PASS
			1000~26500	0.02	-43.86	≤-19.98	PASS

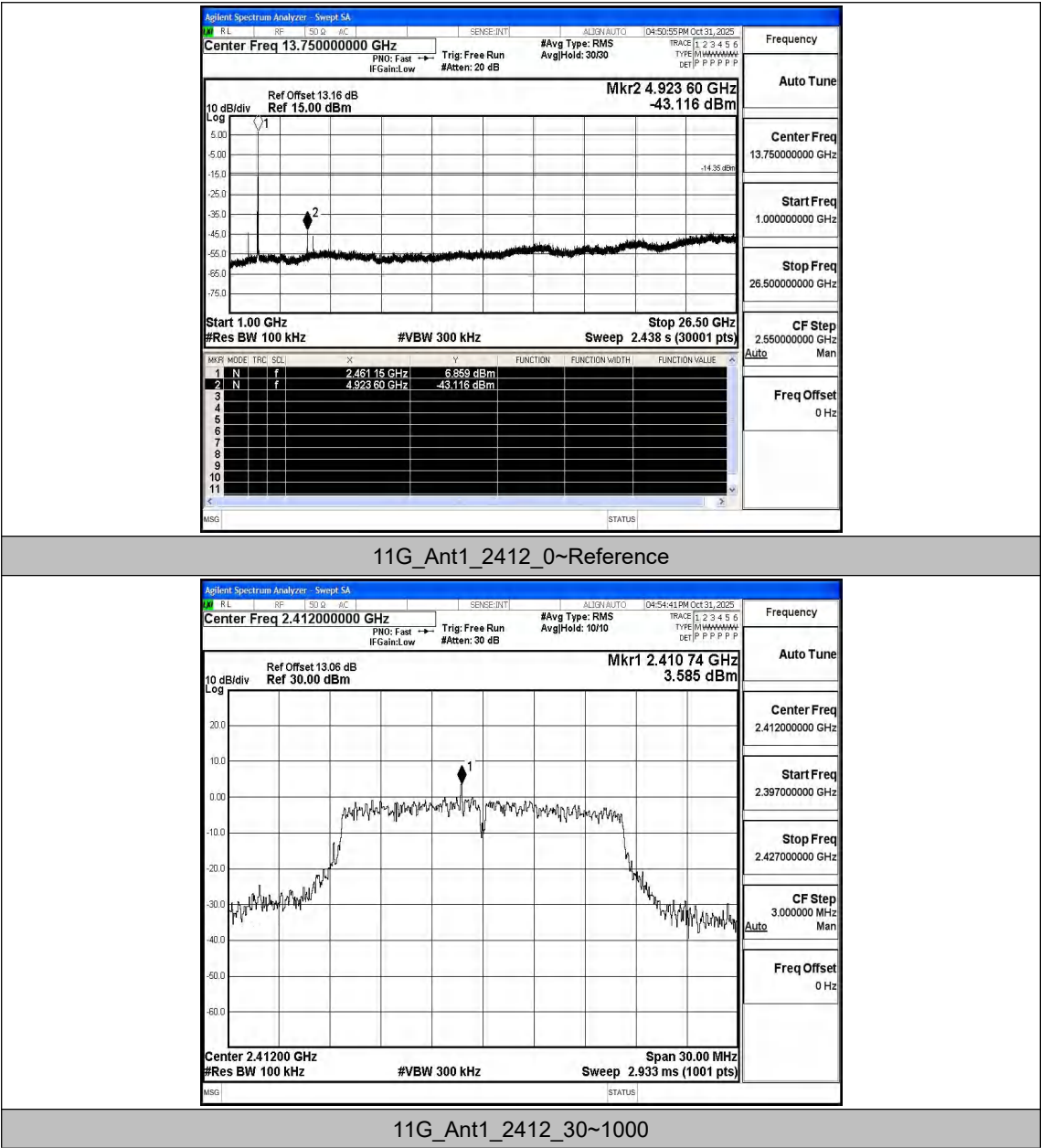
Test Graphs

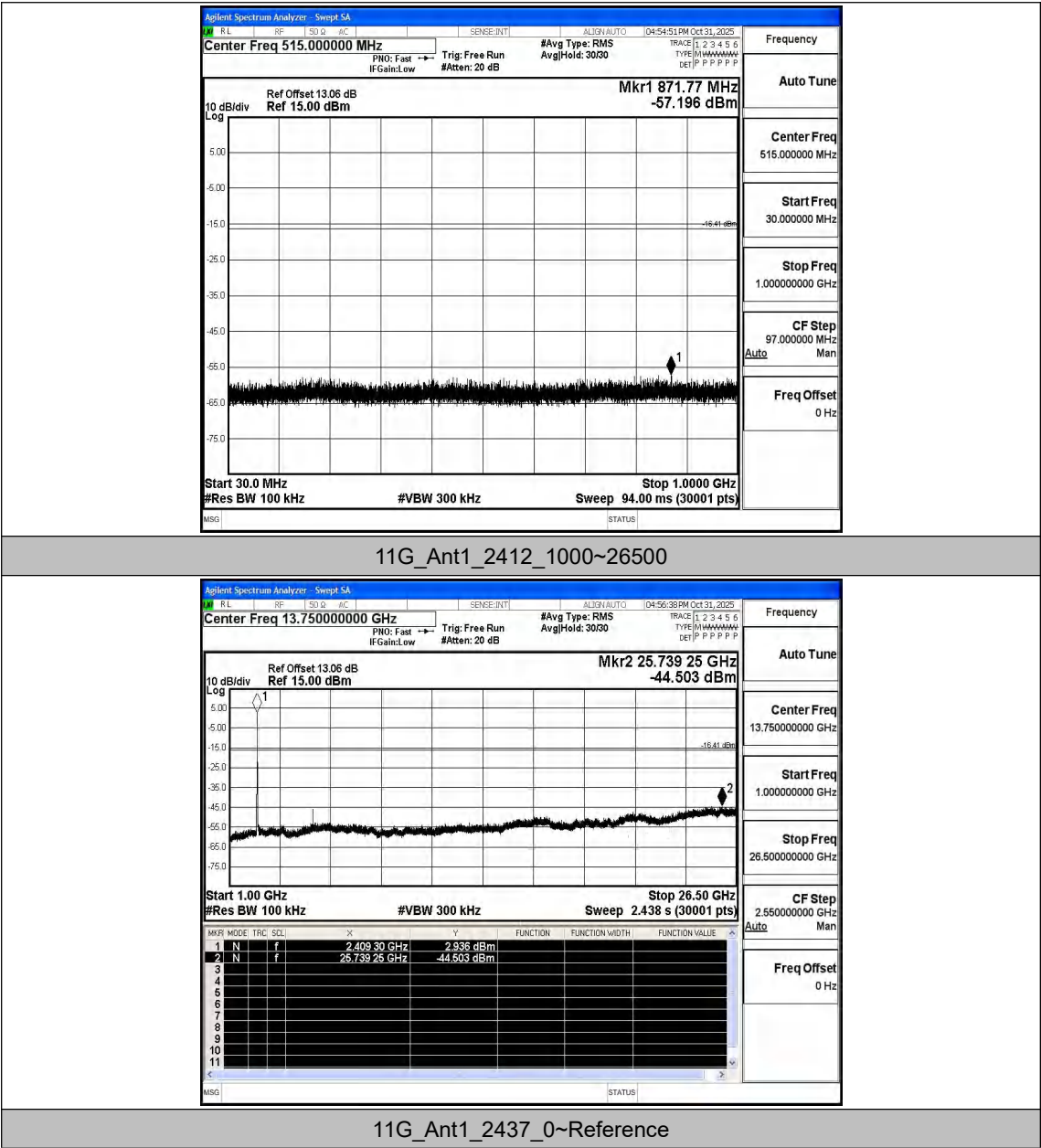


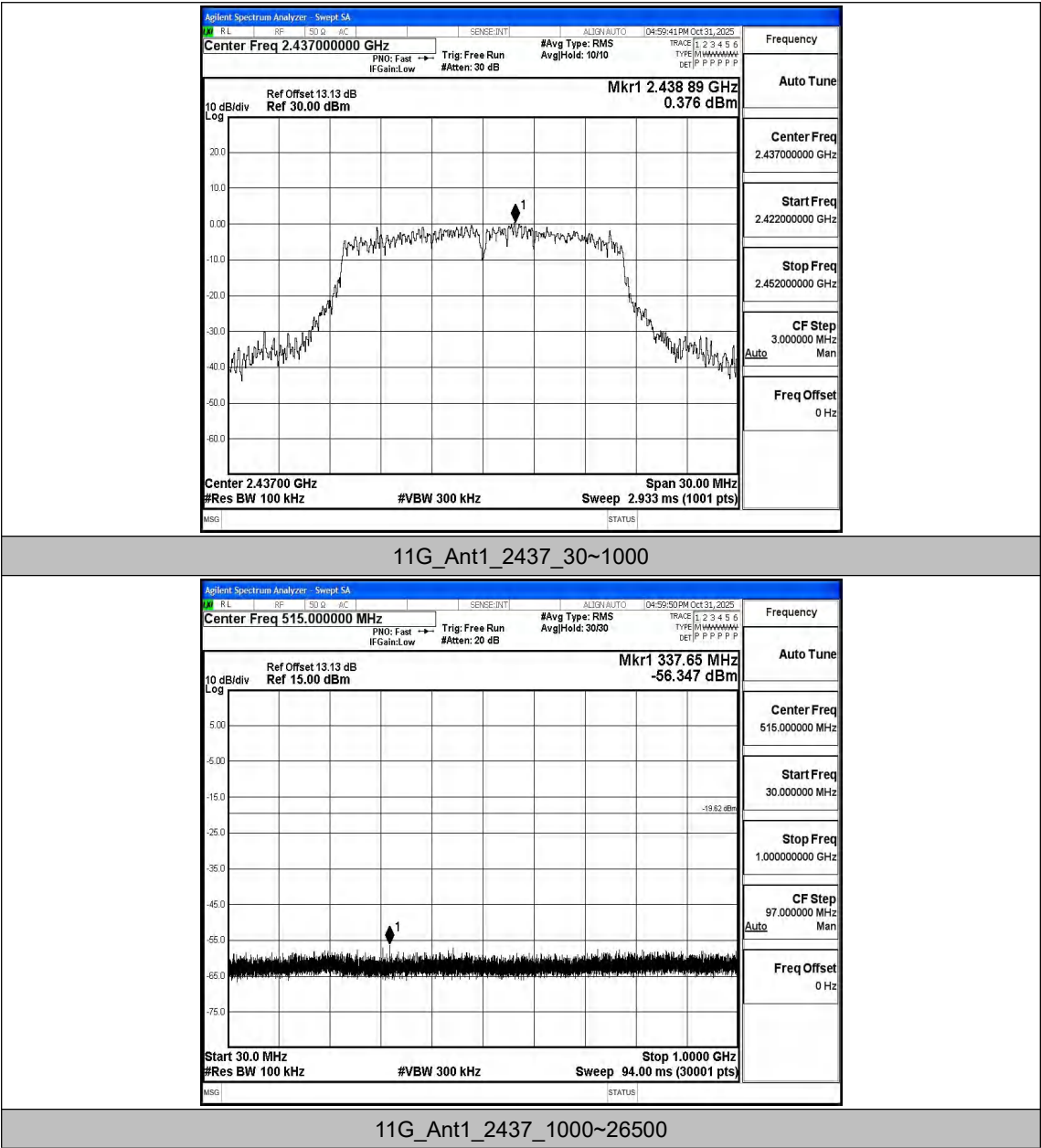


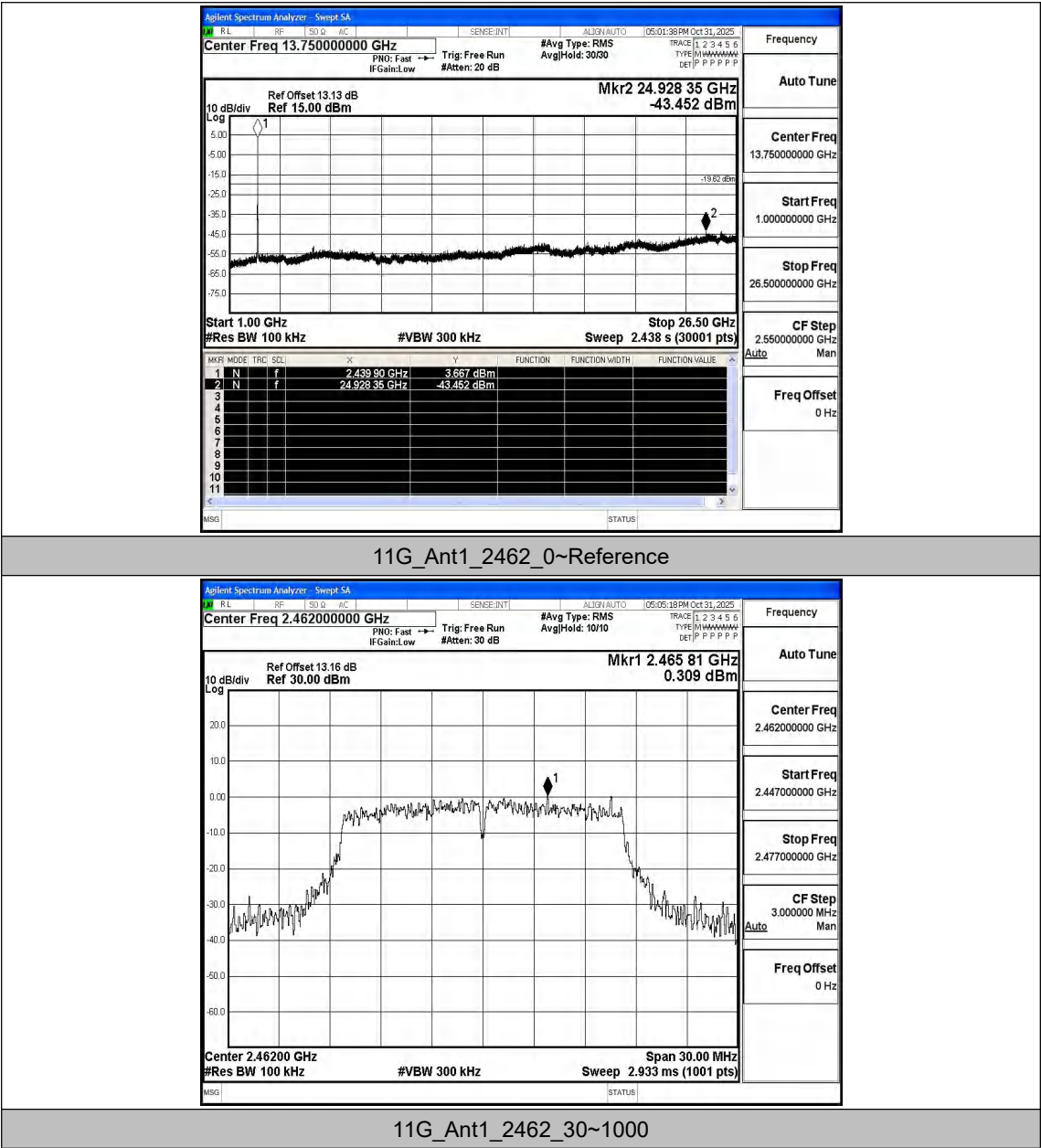


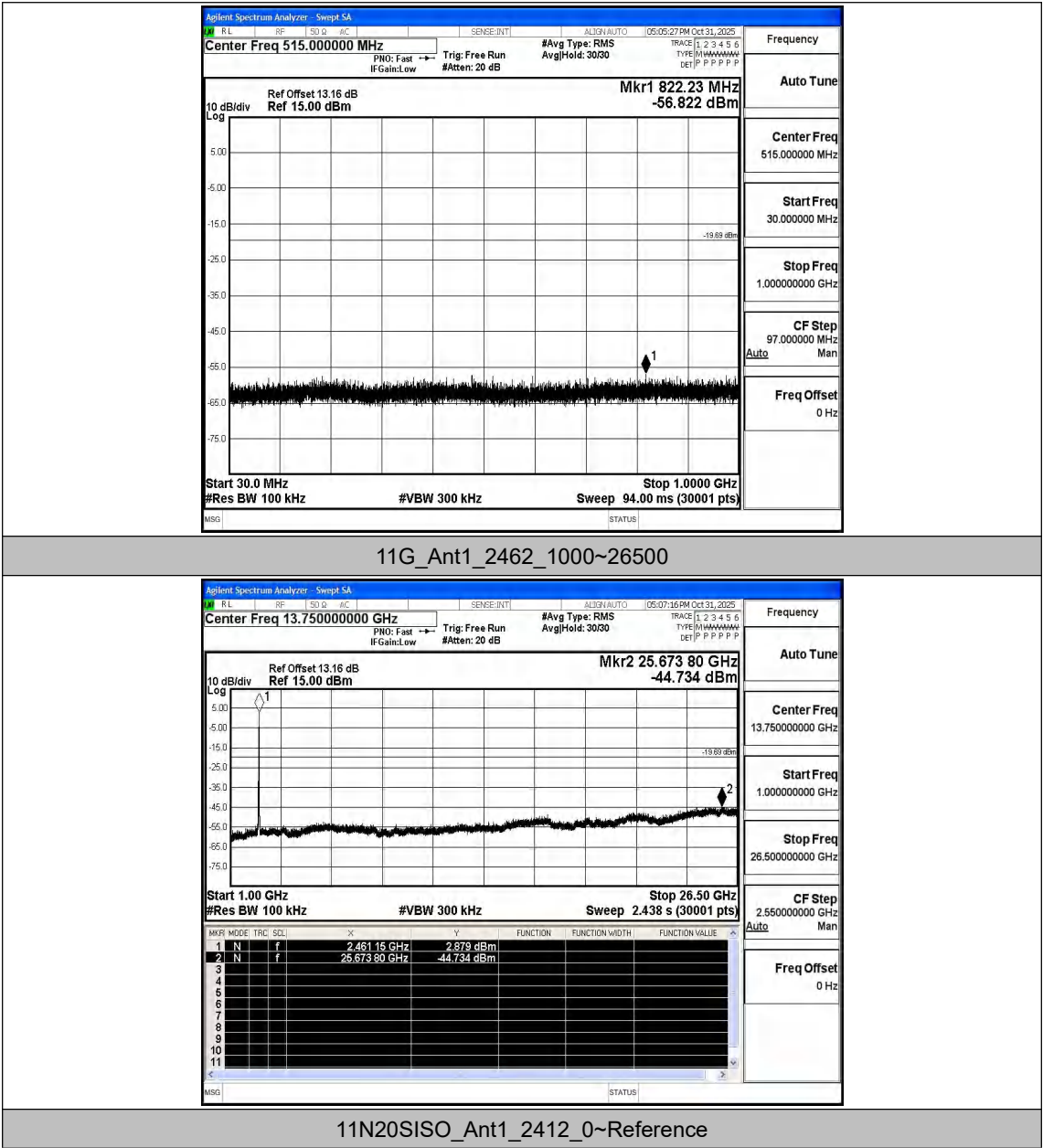


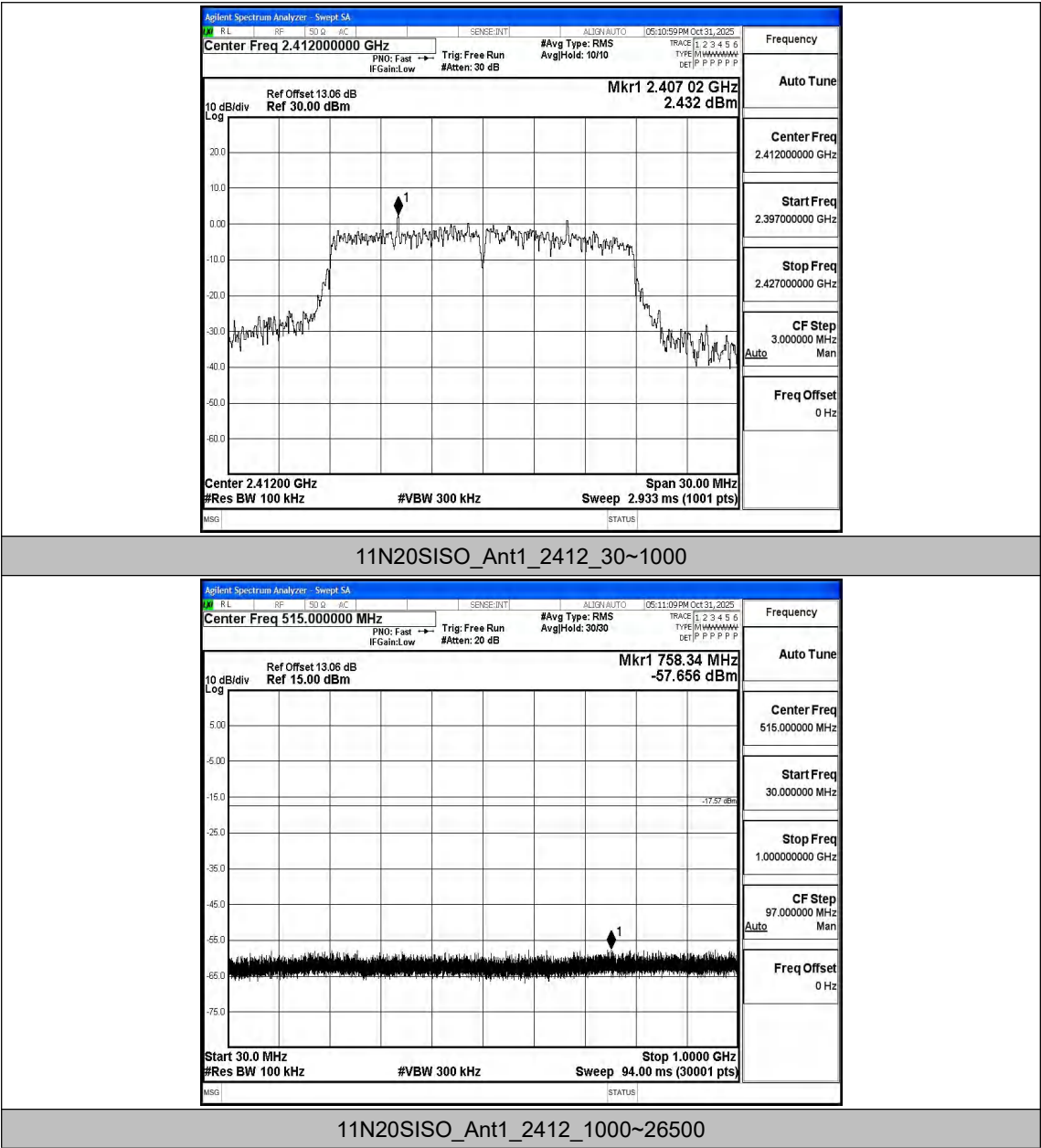


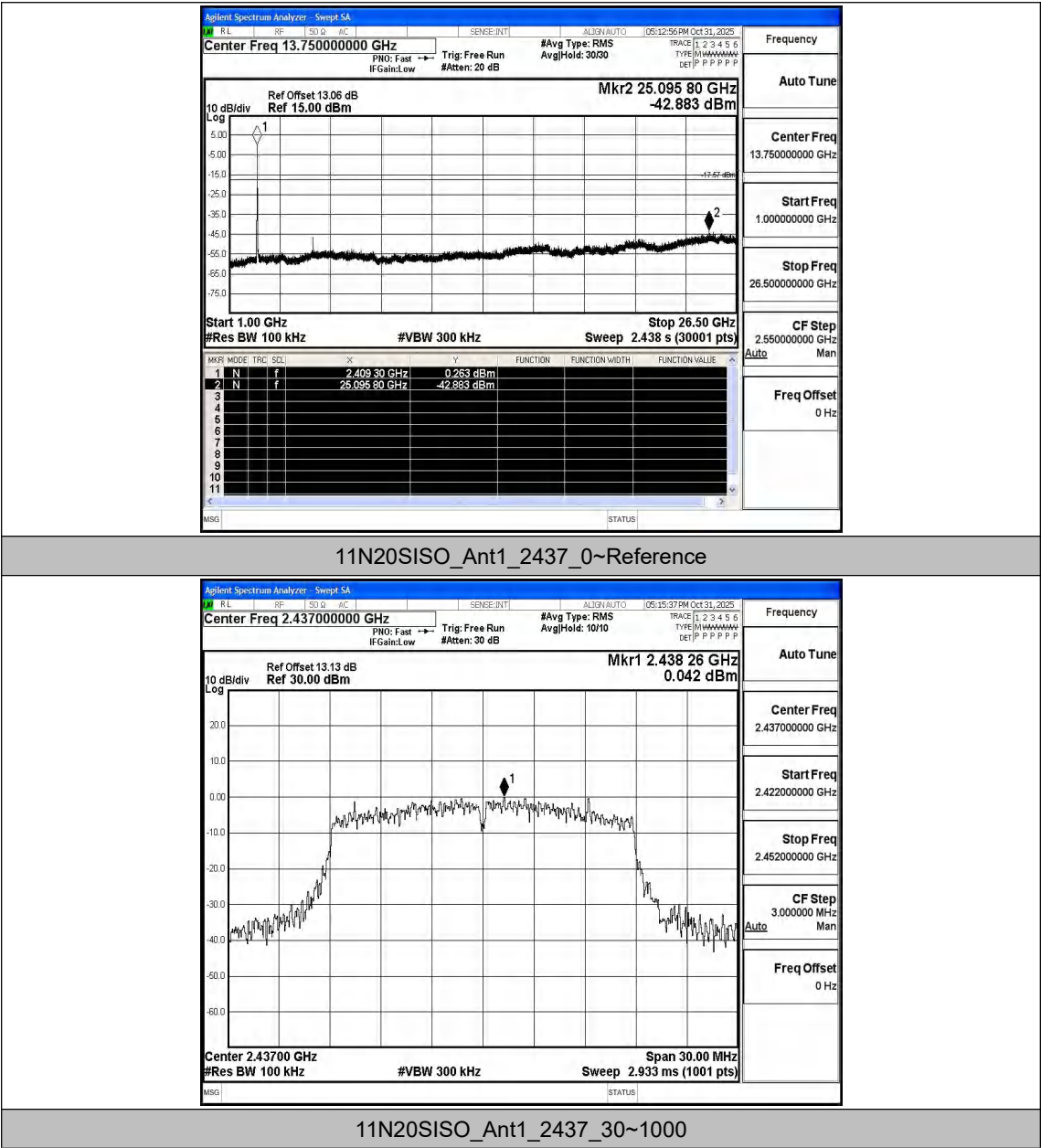


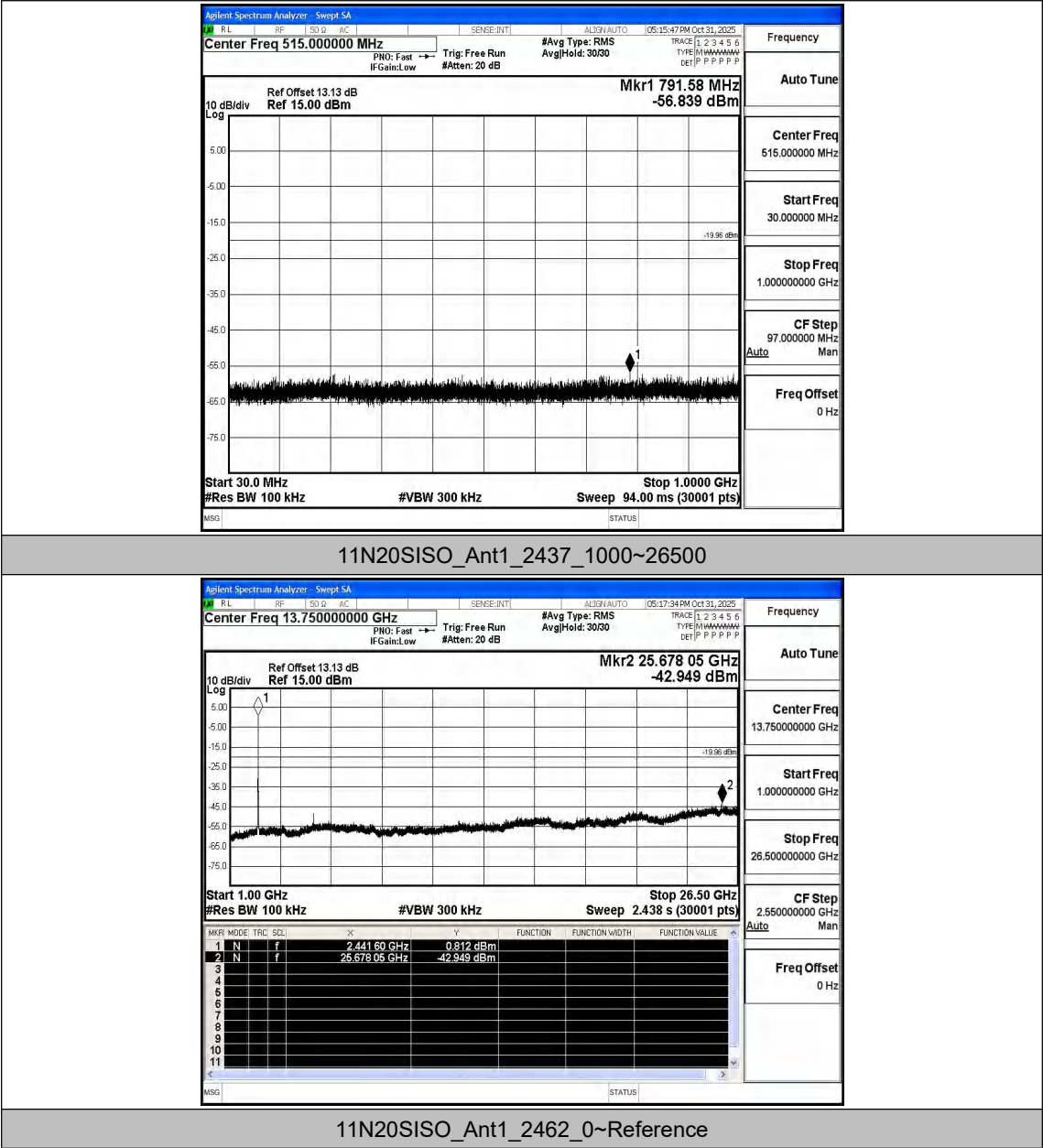


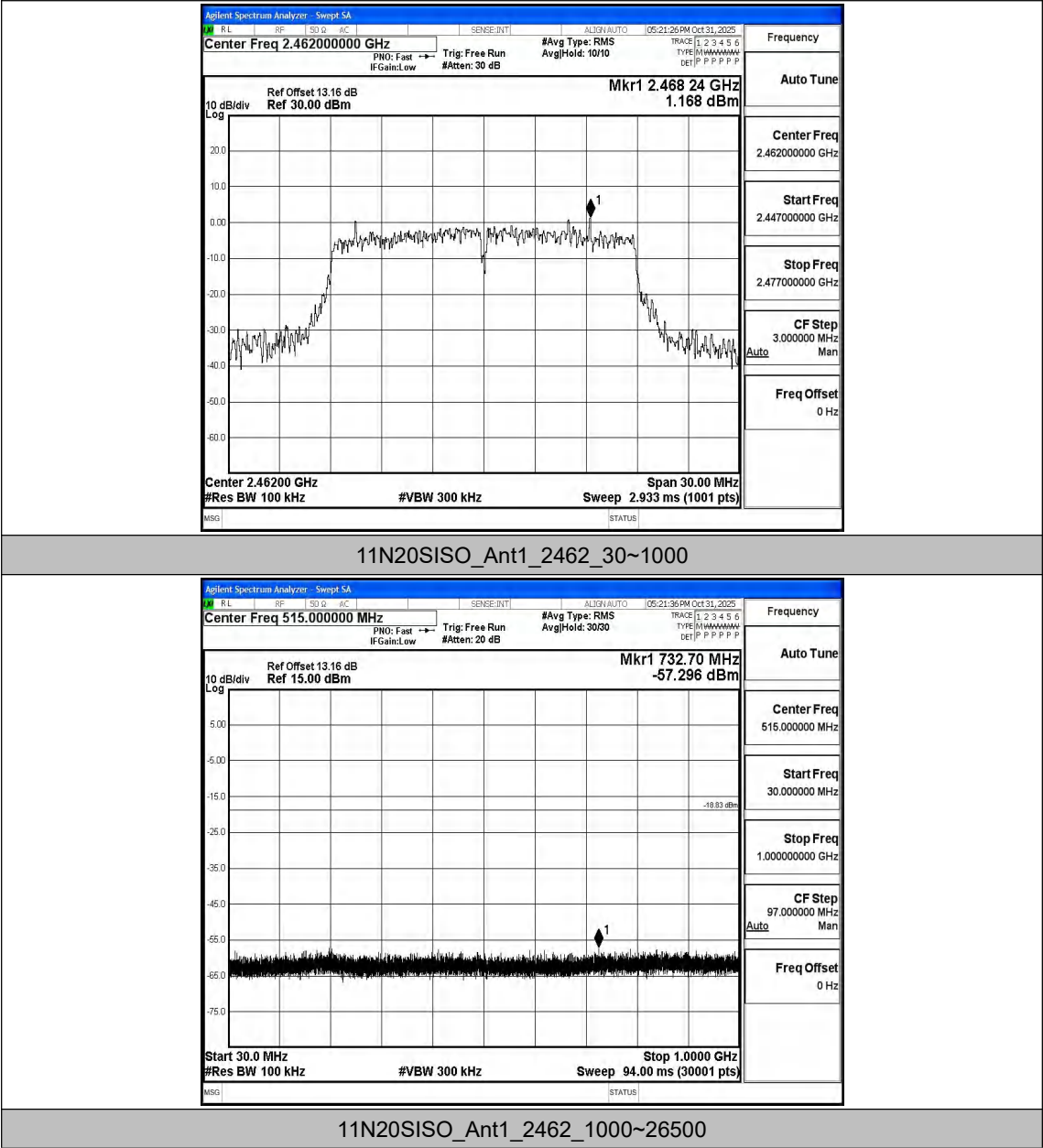


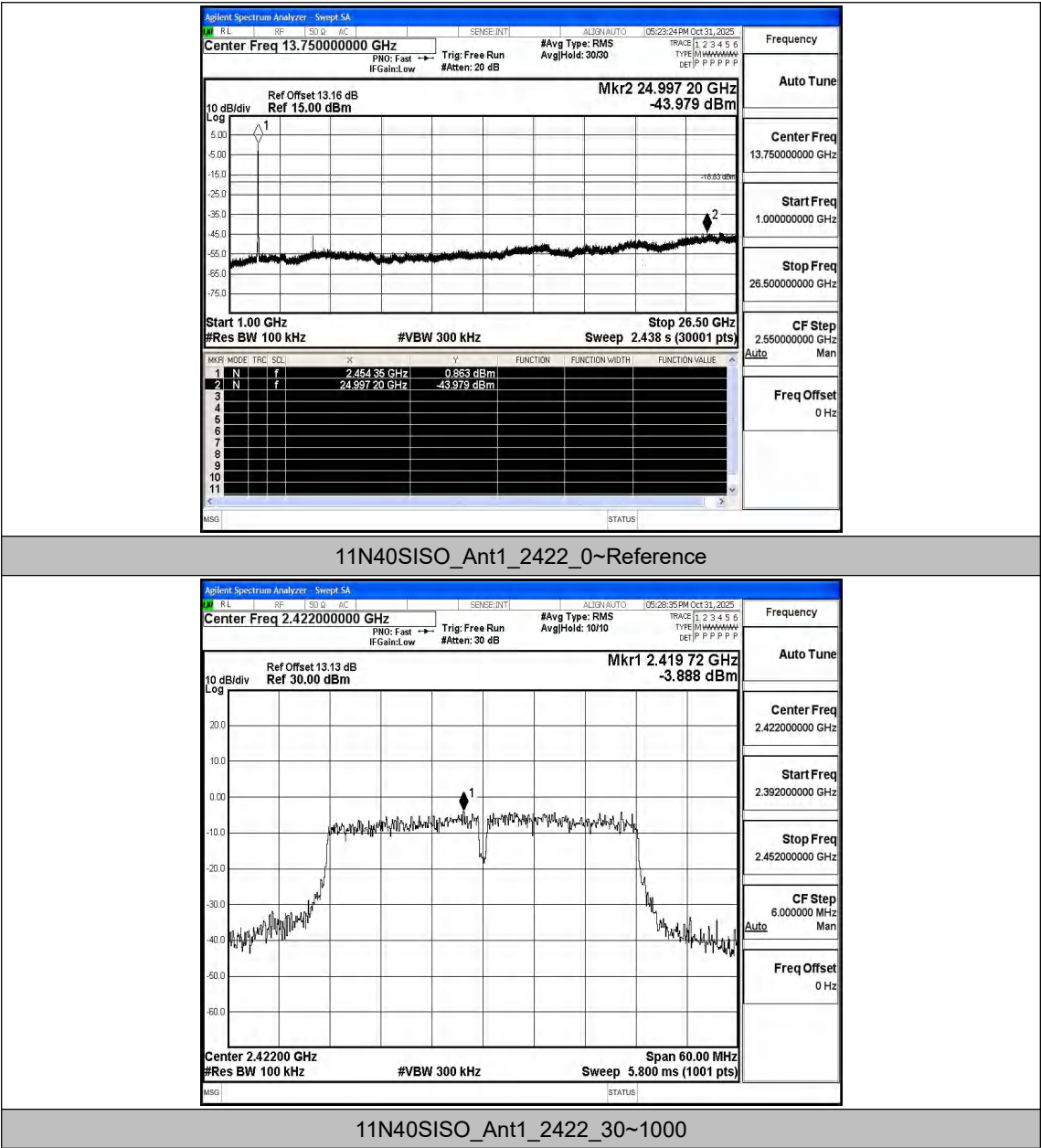


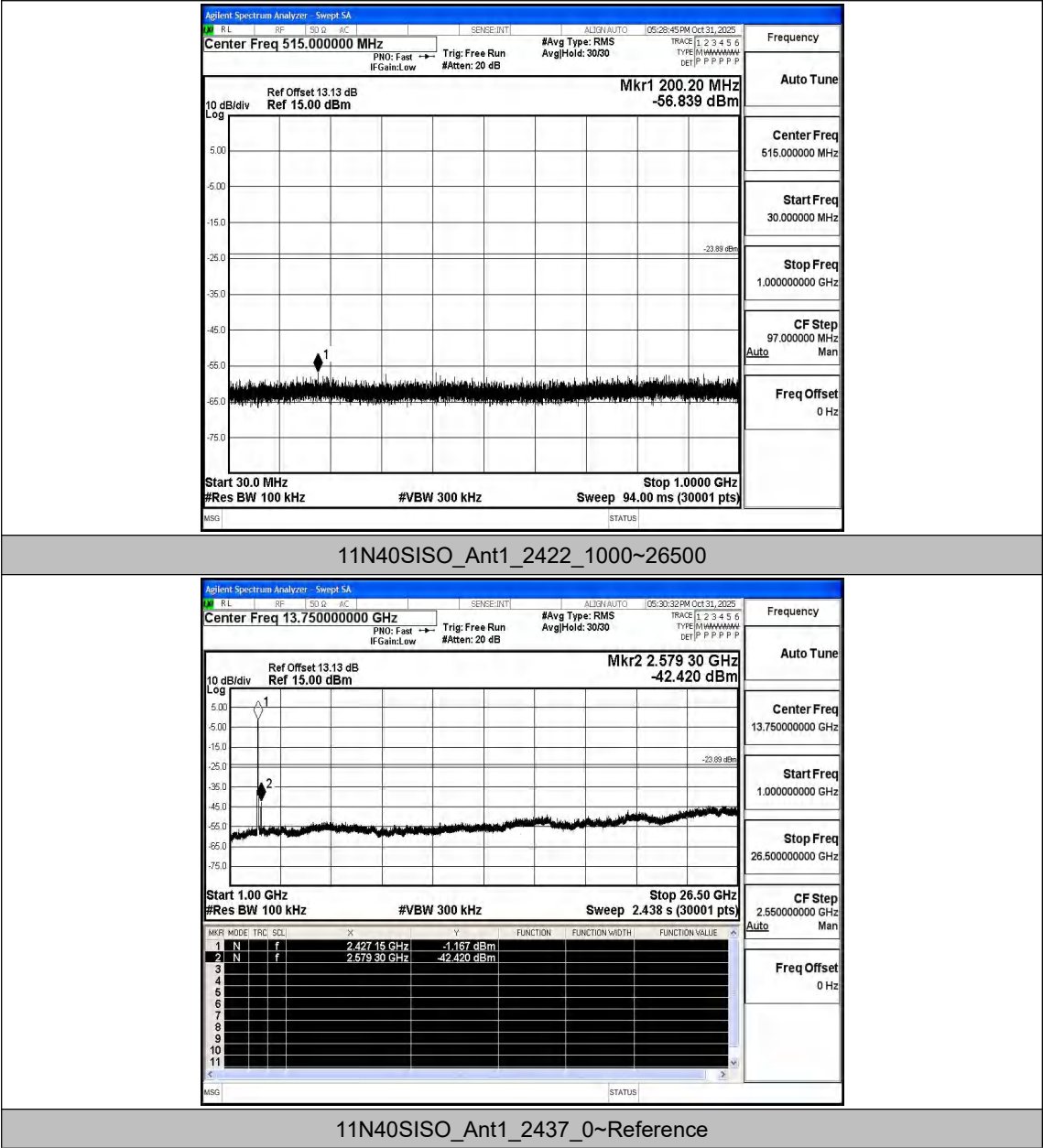


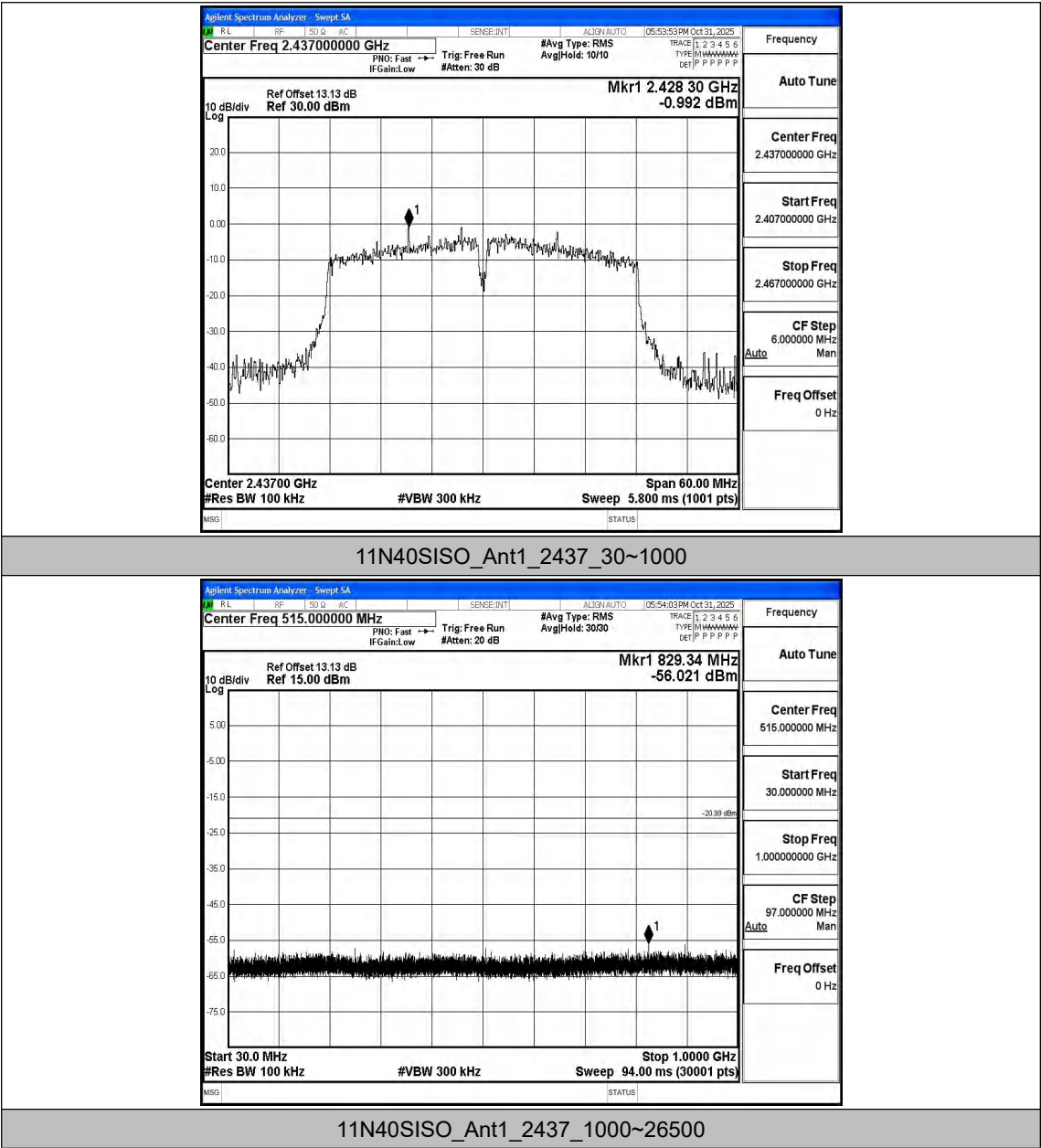


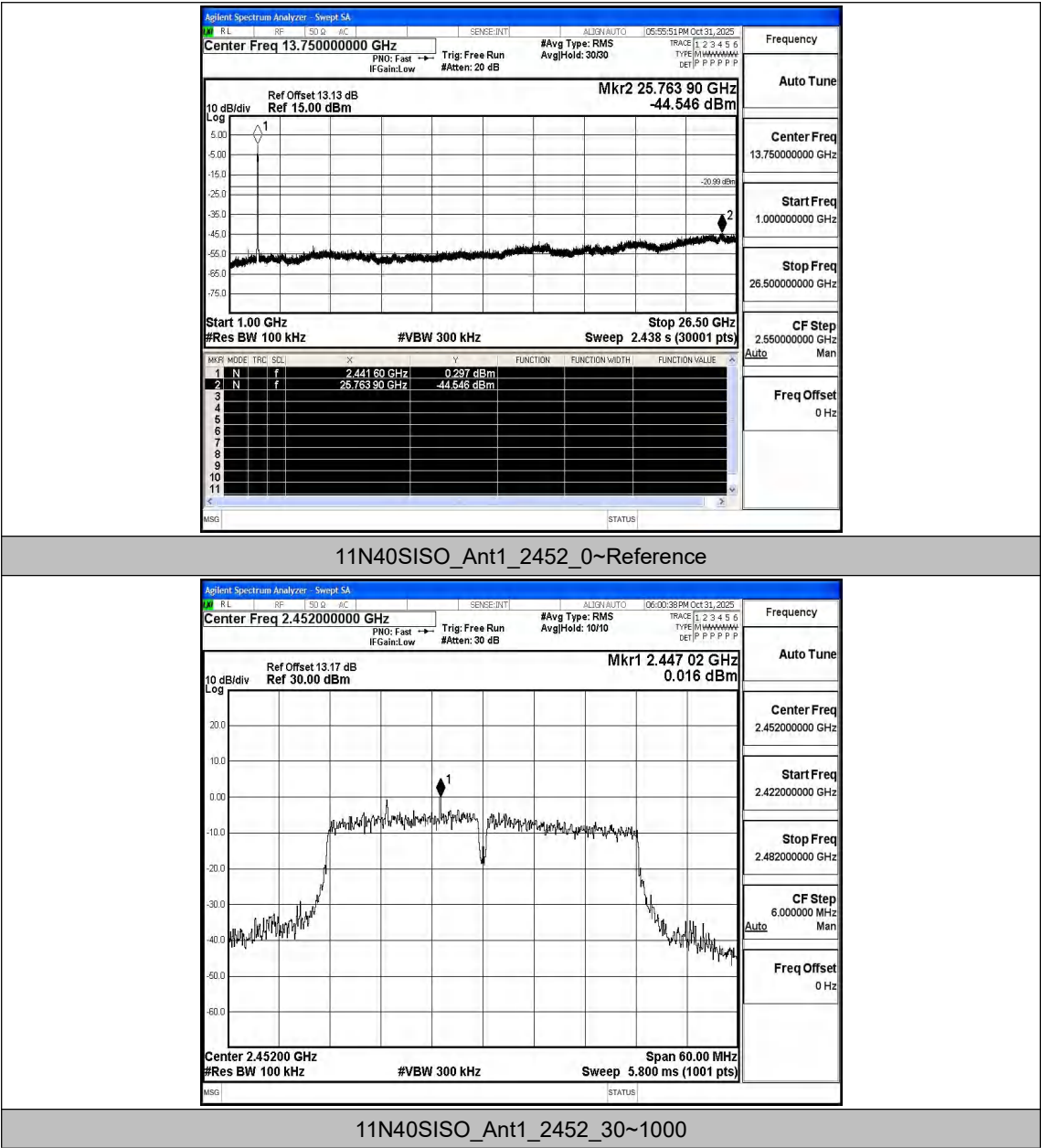


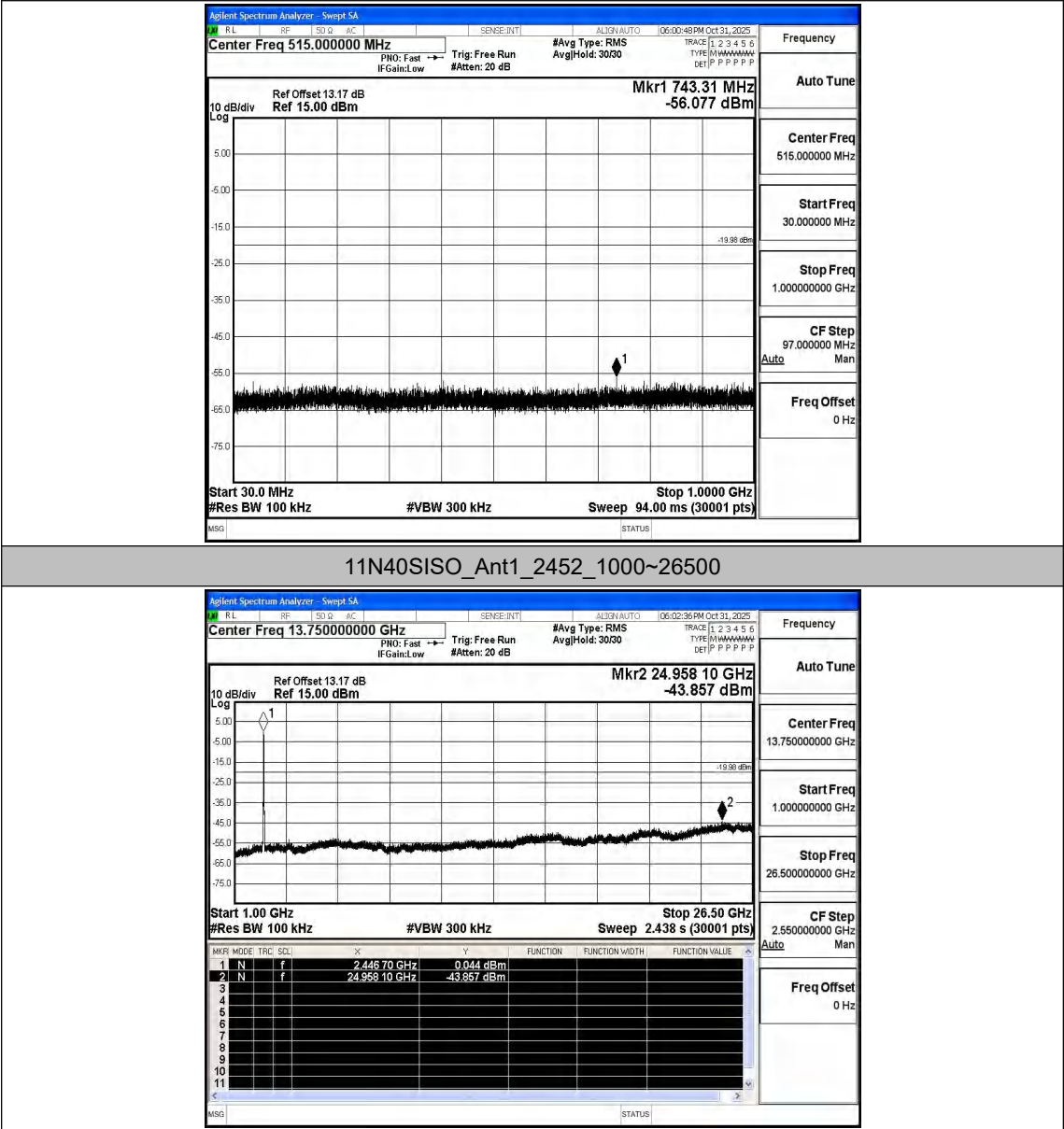










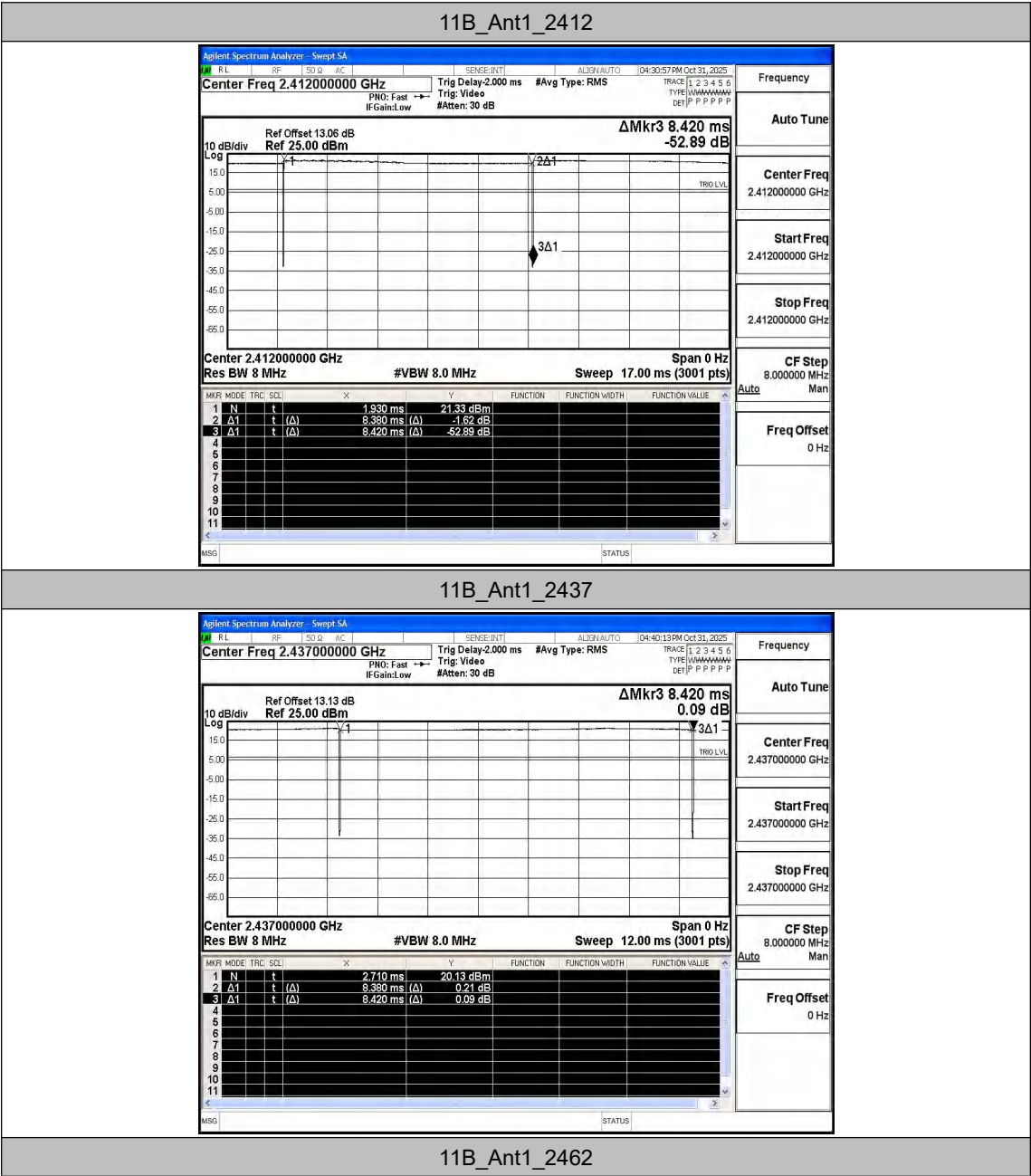


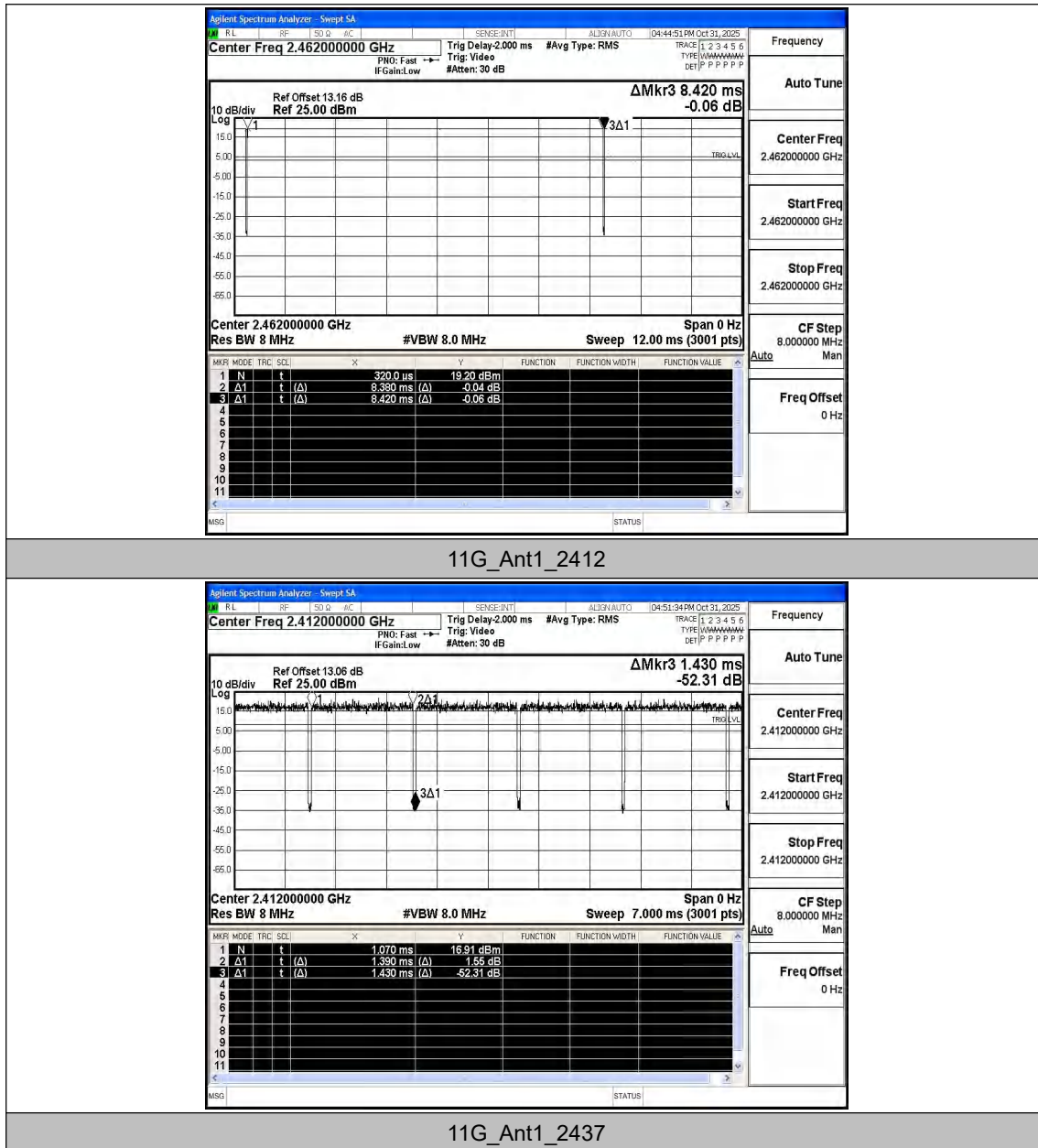
A.6 Duty Cycle

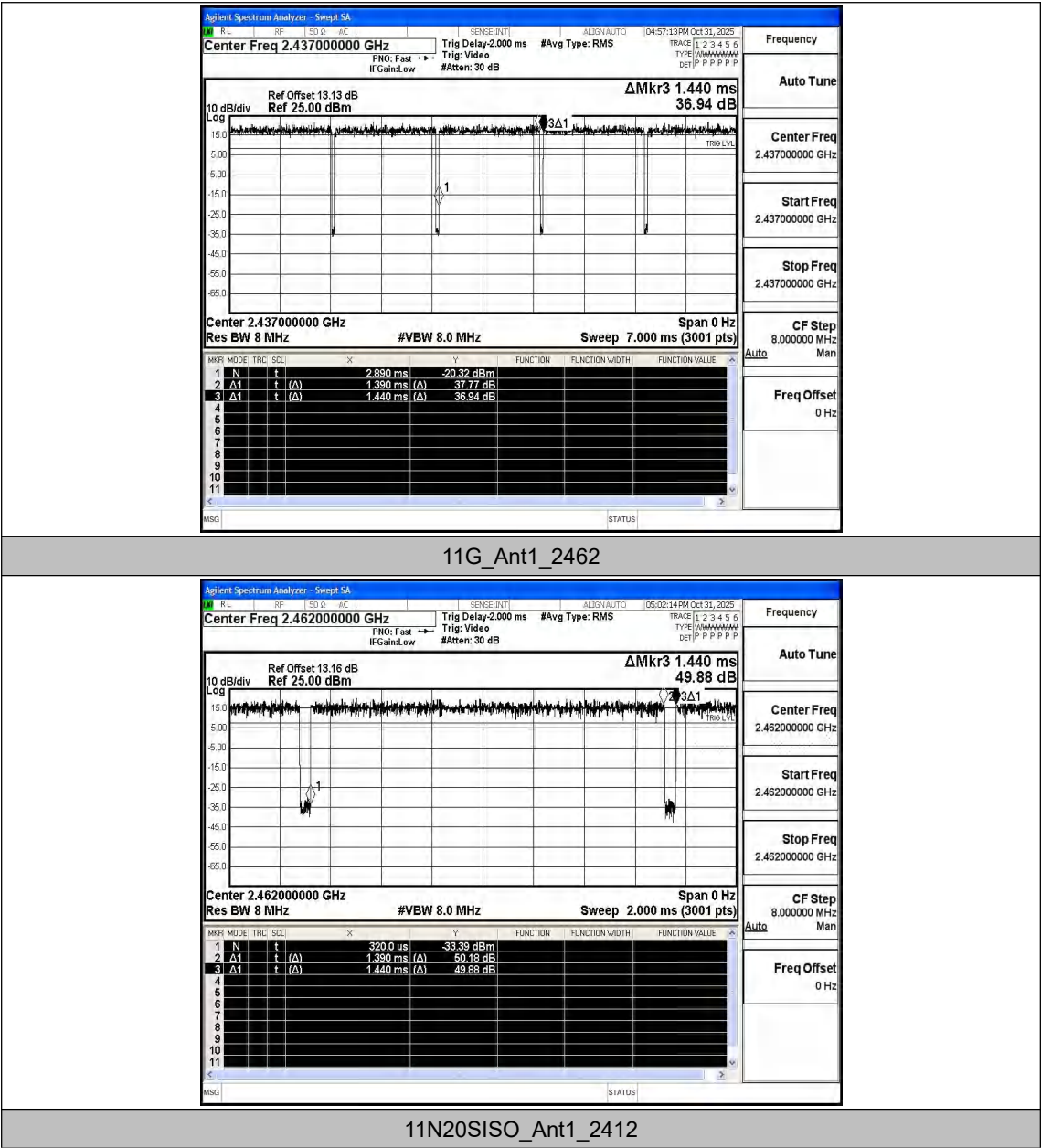
Test Result

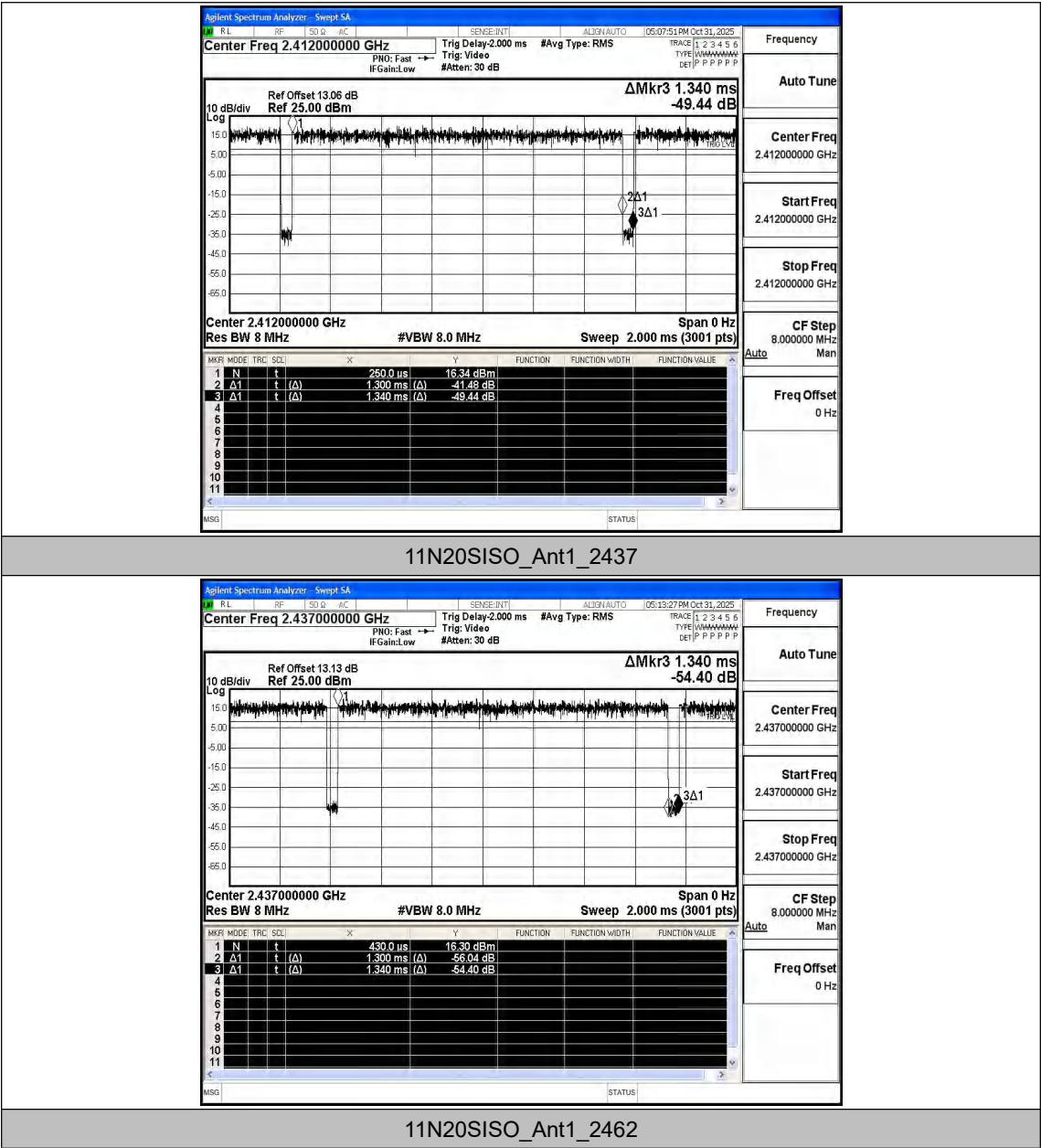
TestMode	Antenna	Frequency[MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]
11B	Ant1	2412	8.38	8.42	99.52
		2437	8.38	8.42	99.52
		2462	8.38	8.42	99.52
11G	Ant1	2412	1.39	1.43	97.20
		2437	1.39	1.44	96.53
		2462	1.39	1.44	96.53
11N20SISO	Ant1	2412	1.30	1.34	97.01
		2437	1.30	1.34	97.01
		2462	1.30	1.34	97.01
11N40SISO	Ant1	2422	0.65	0.69	94.20
		2437	0.64	0.69	92.75
		2452	0.65	0.69	94.20

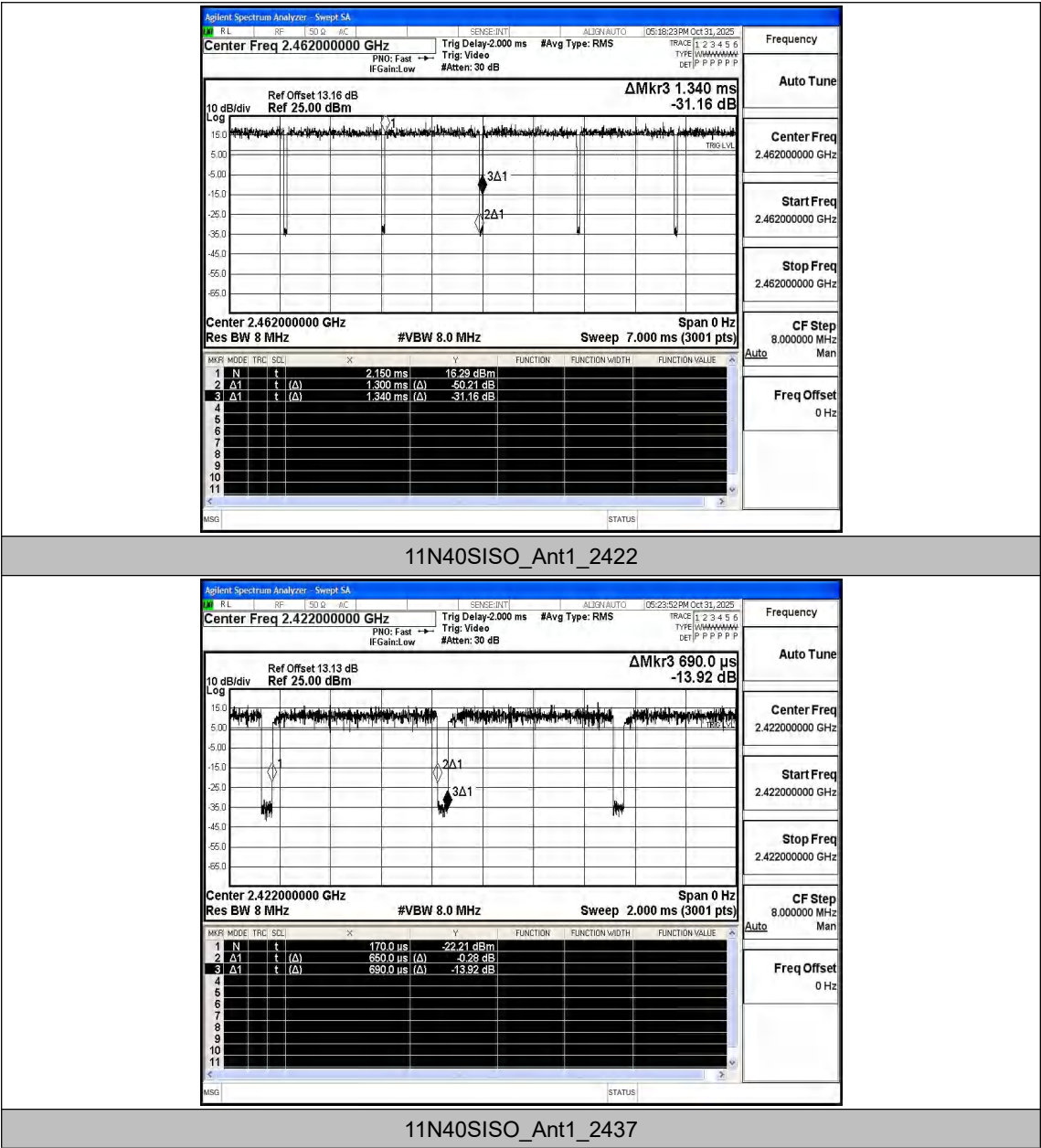
Test Graphs

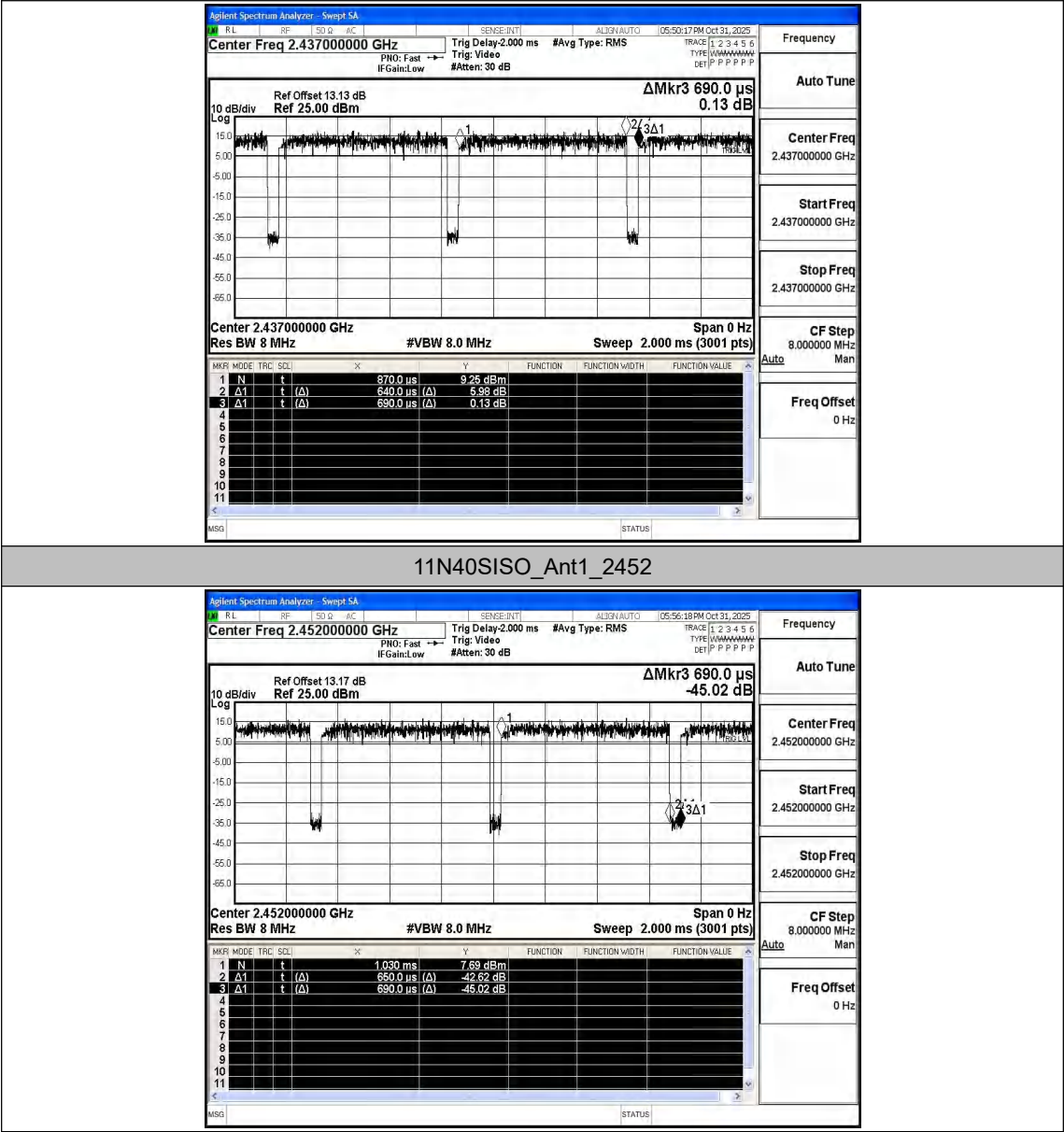












11N40SISO_Ant1_2452

Agilent Spectrum Analyzer - Sweep SA

Center Freq 2.452000000 GHz

Ref Offset 13.17 dB

Ref 25.00 dBm

10 dB/div

LOG

15.0

6.00

-5.00

-15.0

-25.0

-35.0

-45.0

-55.0

-65.0

Center 2.452000000 GHz

Res BW 8 MHz

#VBW 8.0 MHz

Sweep 2.000 ms (3001 pts)

Span 0 Hz

CF Step 8.000000 MHz

Auto

Man

CF Step

8.000000 MHz

Auto

Man

Freq Offset

0 Hz

MSG

STATUS

Trig Delay: 2.000 ms

#Avg Type: RMS

Trig: Video

#Atten: 30 dB

ΔMkr3 690.0 μs

-45.02 dB

1

2

3

4

5

6

7

8

9

10

11

MARKER	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	t		1.030 ms	7.69 dBm			
2	Δ1	t	(Δ)	650.0 μs (Δ)	-42.62 dB			
3	Δ1	t	(Δ)	690.0 μs (Δ)	-45.02 dB			
4								
5								
6								
7								
8								
9								
10								
11								

A.7 Emissions in Restricted Bands

Test Result

TestMode	Antenna	ChName	Frequenc y[MHz]	Detector	Freq [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
11B	Ant1	Low	2412	AV	2310.000	-45.84	≤-41.20	49.36	≤54	PASS
				AV	2386.970	-44.12	≤-41.20	51.08	≤54	PASS
				AV	2390.000	-44.92	≤-41.20	50.28	≤54	PASS
				Peak	2310.000	-40.76	≤-21.20	54.44	≤74	PASS
				Peak	2385.540	-35.97	≤-21.20	59.23	≤74	PASS
				Peak	2390.000	-38.46	≤-21.20	56.74	≤74	PASS
		High	2462	AV	2483.500	-44.21	≤-41.20	50.99	≤54	PASS
				AV	2483.560	-44.3	≤-41.20	50.90	≤54	PASS
				AV	2500.000	-45.24	≤-41.20	49.96	≤54	PASS
				Peak	2483.500	-36.89	≤-21.20	58.31	≤74	PASS
				Peak	2484.220	-35.82	≤-21.20	59.38	≤74	PASS
				Peak	2500.000	-38.7	≤-21.20	56.50	≤74	PASS
11G	Ant1	Low	2412	AV	2310.000	-45.34	≤-41.20	49.86	≤54	PASS
				AV	2389.440	-42.96	≤-41.20	52.24	≤54	PASS
				AV	2390.000	-42.97	≤-41.20	52.23	≤54	PASS
				Peak	2310.000	-38.55	≤-21.20	56.65	≤74	PASS
				Peak	2389.700	-31.56	≤-21.20	63.64	≤74	PASS
				Peak	2390.000	-32.15	≤-21.20	63.05	≤74	PASS
		High	2462	AV	2483.500	-42.25	≤-41.20	52.95	≤54	PASS
				AV	2483.560	-42.44	≤-41.20	52.76	≤54	PASS
				AV	2500.000	-44.79	≤-41.20	50.41	≤54	PASS
				Peak	2483.500	-35.27	≤-21.20	59.93	≤74	PASS
				Peak	2487.300	-32.66	≤-21.20	62.54	≤74	PASS
				Peak	2500.000	-38.56	≤-21.20	56.64	≤74	PASS
11N20SIS O	Ant1	Low	2412	AV	2310.000	-45.33	≤-41.20	49.87	≤54	PASS
				AV	2389.960	-43.14	≤-41.20	52.06	≤54	PASS
				AV	2390.000	-43.14	≤-41.20	52.06	≤54	PASS
				Peak	2310.000	-38.71	≤-21.20	56.49	≤74	PASS
				Peak	2389.310	-29.43	≤-21.20	65.77	≤74	PASS
				Peak	2390.000	-36.52	≤-21.20	58.68	≤74	PASS
		High	2462	AV	2483.500	-42.59	≤-41.20	52.61	≤54	PASS
				AV	2484.000	-42.67	≤-41.20	52.53	≤54	PASS
				AV	2500.000	-44.73	≤-41.20	50.47	≤54	PASS
				Peak	2483.500	-34.59	≤-21.20	60.61	≤74	PASS
				Peak	2484.770	-32.26	≤-21.20	62.94	≤74	PASS

				Peak	2500.000	-36.38	≤-21.20	58.82	≤74	PASS
11N40SIS O	Ant1	Low	2422	AV	2310.000	-44.9	≤-41.20	50.30	≤54	PASS
				AV	2389.850	-43.53	≤-41.20	51.67	≤54	PASS
				AV	2390.000	-43.62	≤-41.20	51.58	≤54	PASS
				Peak	2310.000	-37.35	≤-21.20	57.85	≤74	PASS
				Peak	2375.450	-35.6	≤-21.20	59.60	≤74	PASS
				Peak	2390.000	-35.38	≤-21.20	59.82	≤74	PASS
		High	2452	AV	2483.500	-41.74	≤-41.20	53.46	≤54	PASS
				AV	2483.625	-41.65	≤-41.20	53.55	≤54	PASS
				AV	2500.000	-44.48	≤-41.20	50.72	≤54	PASS
				Peak	2483.500	-34.27	≤-21.20	60.93	≤74	PASS
				Peak	2485.875	-29.32	≤-21.20	65.88	≤74	PASS
				Peak	2500.000	-37.28	≤-21.20	57.92	≤74	PASS

Note:

1. The Antenna Gain is compensated in the graph.
2. 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

