



Appendix B

RF Test Data for 2.4G WIFI (Conducted Measurement)

Product Name: Enor E

Test Model: WBTWNER

Environmental Conditions

Temperature:	23.7° C
Relative Humidity:	52.3%
ATM Pressure:	100.0 kPa
Test Engineer:	monkey.Li
Supervised by:	Libin



B.1 6dB Bandwidth

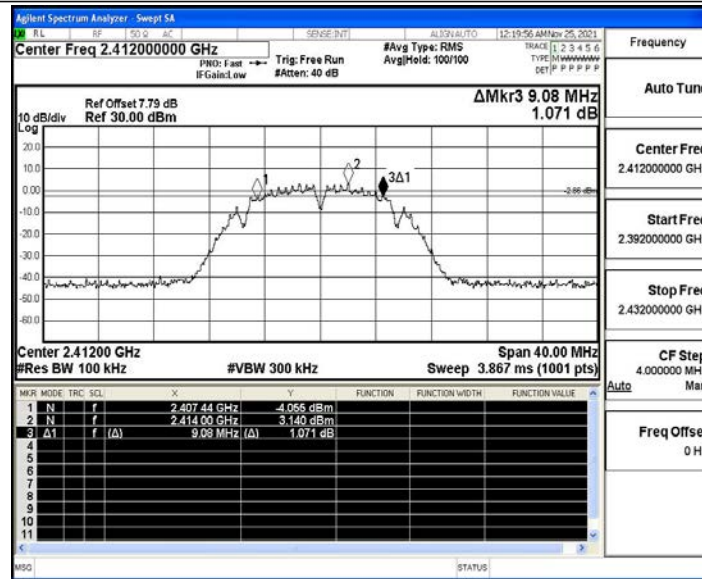
Test Result

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	9.080	2407.440	2416.520	0.5	PASS
		2437	9.160	2432.440	2441.600	0.5	PASS
		2462	9.240	2457.320	2466.560	0.5	PASS
11G	Ant1	2412	16.400	2403.800	2420.200	0.5	PASS
		2437	16.160	2429.040	2445.200	0.5	PASS
		2462	15.880	2453.720	2469.600	0.5	PASS
11N20SISO	Ant1	2412	17.680	2403.160	2420.840	0.5	PASS
		2437	17.280	2428.560	2445.840	0.5	PASS
		2462	16.440	2453.160	2469.600	0.5	PASS
11N40SISO	Ant1	2422	35.840	2404.400	2440.240	0.5	PASS
		2437	34.400	2420.600	2455.000	0.5	PASS
		2452	34.000	2434.320	2468.320	0.5	PASS

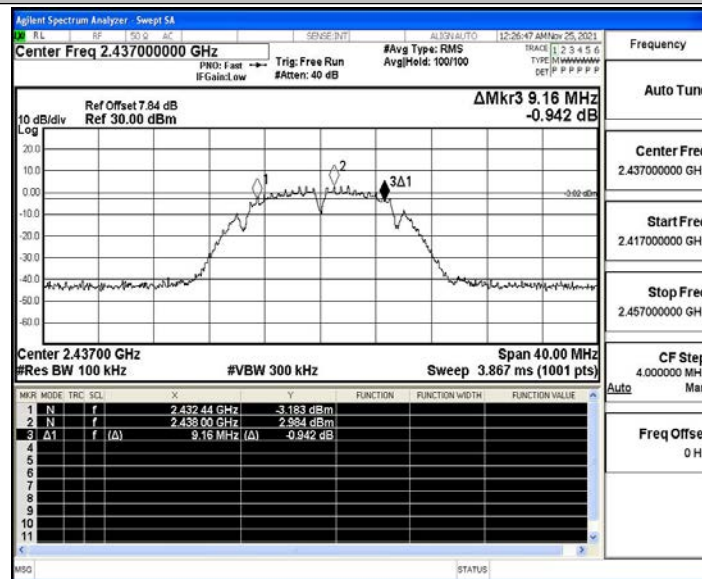


Test Graphs

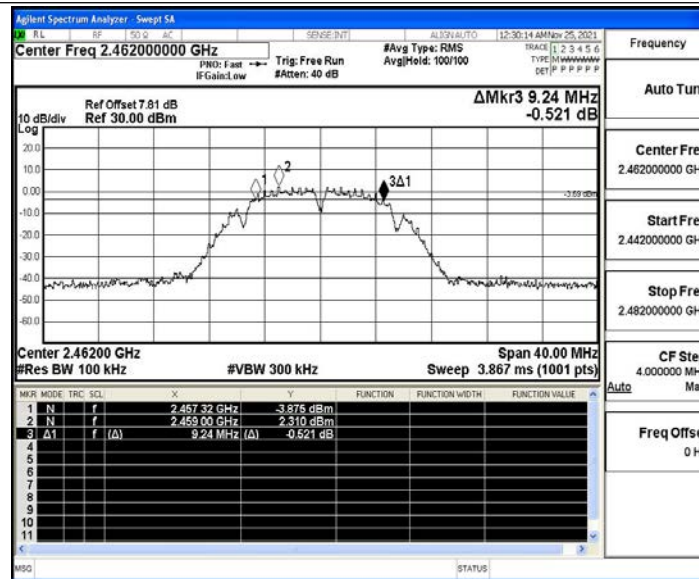
11B_Ant1_2412



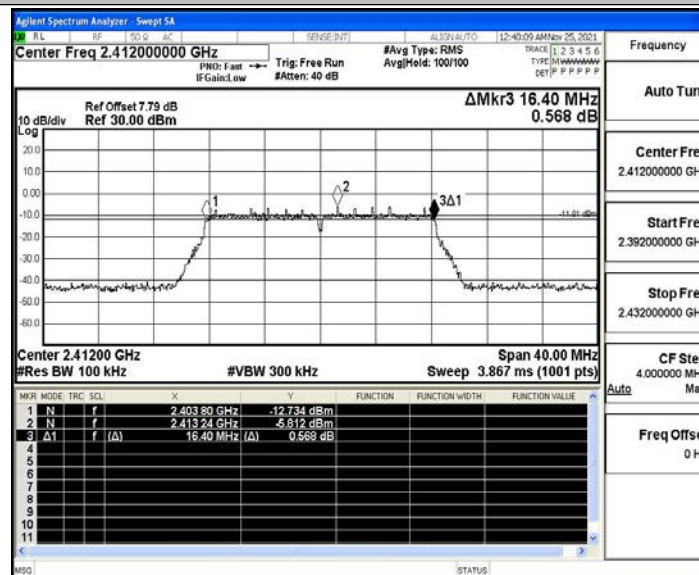
11B_Ant1_2437



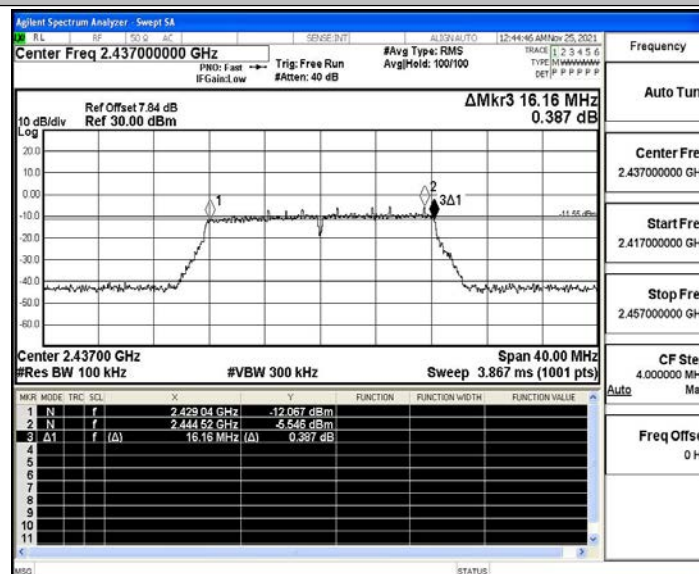
11B_Ant1_2462



11G_Ant1_2412

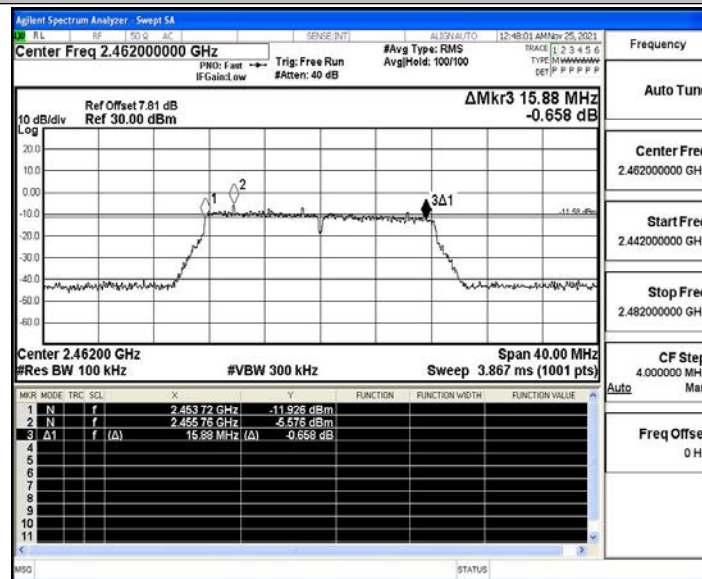


11G_Ant1_2437

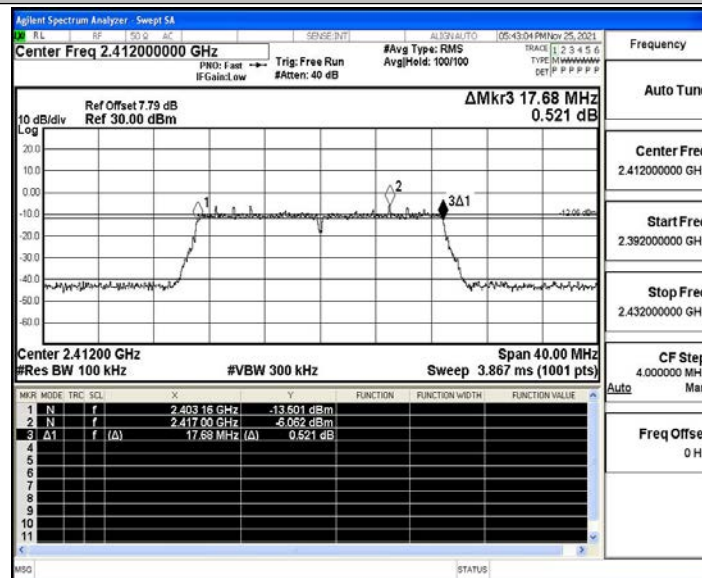




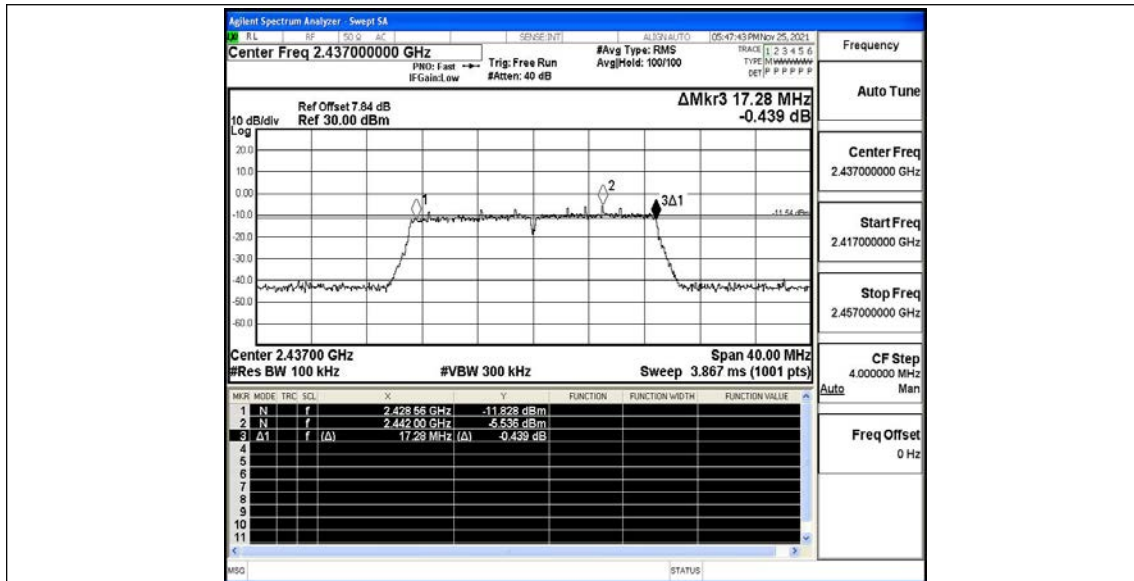
11G_Ant1_2462



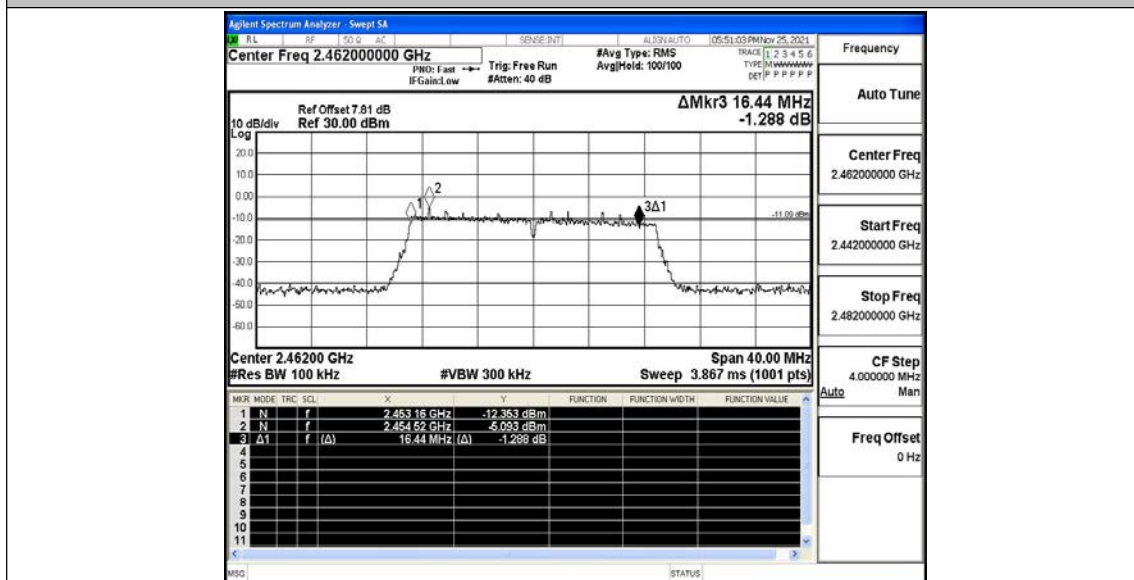
11N20SISO_Ant1_2412



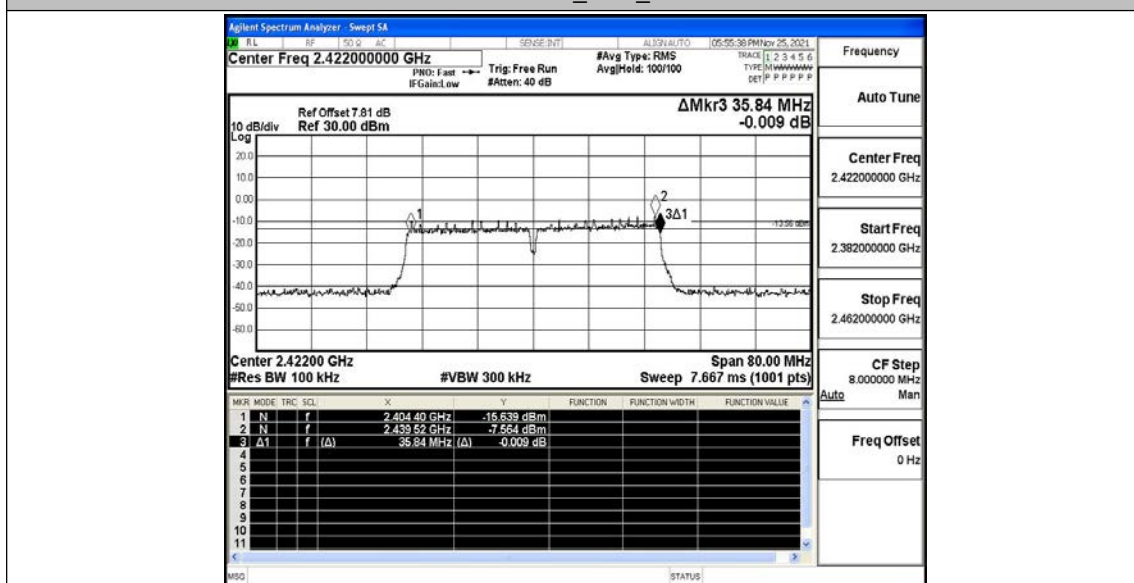
11N20SISO_Ant1_2437



11N20SISO_Ant1_2462

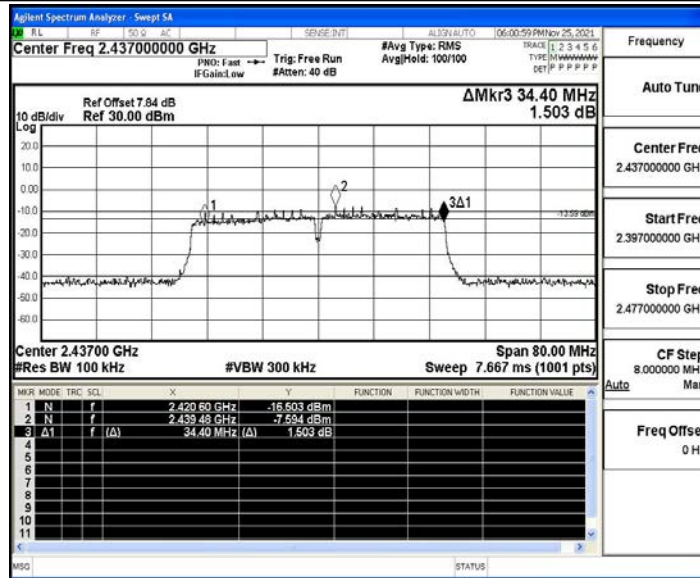


11N40SISO_Ant1_2422

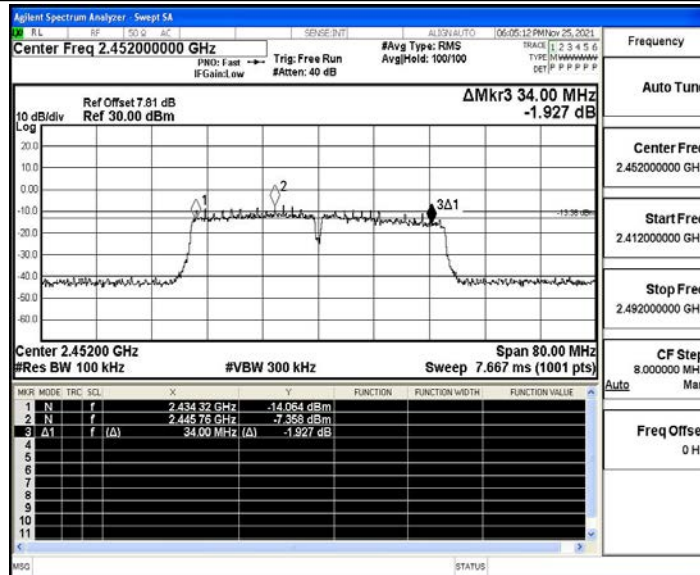




11N40SISO_Ant1_2437



11N40SISO_Ant1_2452





B.2 Maximum conducted output power

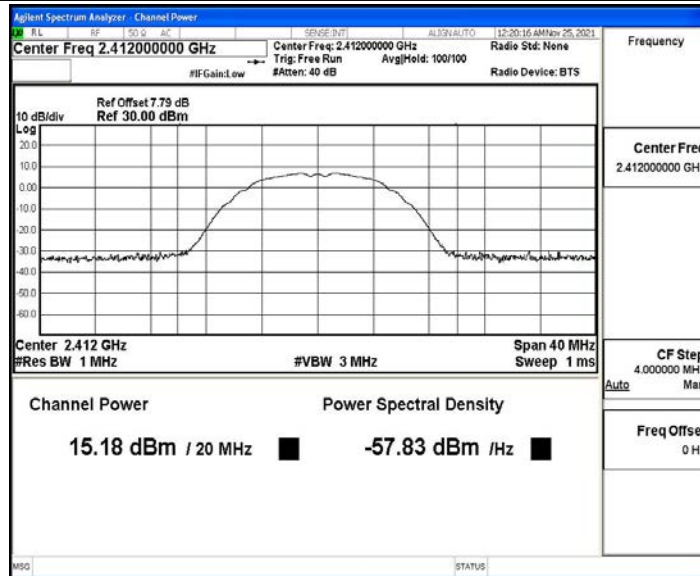
Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	2412	15.18	≤30	PASS
		2437	15.01	≤30	PASS
		2462	14.65	≤30	PASS
11G	Ant1	2412	12.51	≤30	PASS
		2437	12.56	≤30	PASS
		2462	12.16	≤30	PASS
11N20SISO	Ant1	2412	12.52	≤30	PASS
		2437	12.62	≤30	PASS
		2462	12.10	≤30	PASS
11N40SISO	Ant1	2422	12.69	≤30	PASS
		2437	12.86	≤30	PASS
		2452	12.73	≤30	PASS

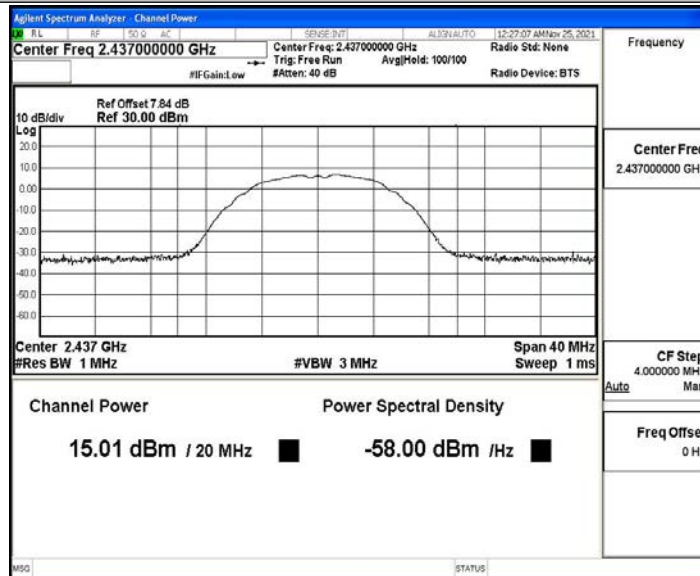


Test Graphs

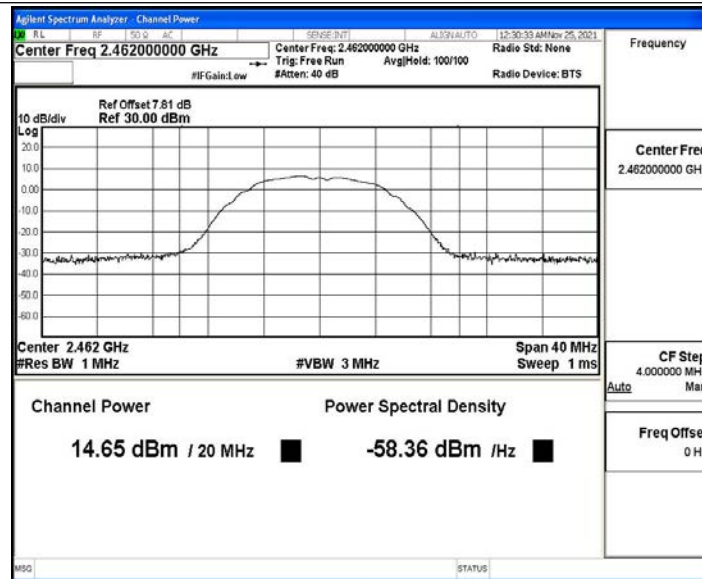
11B_Ant1_2412



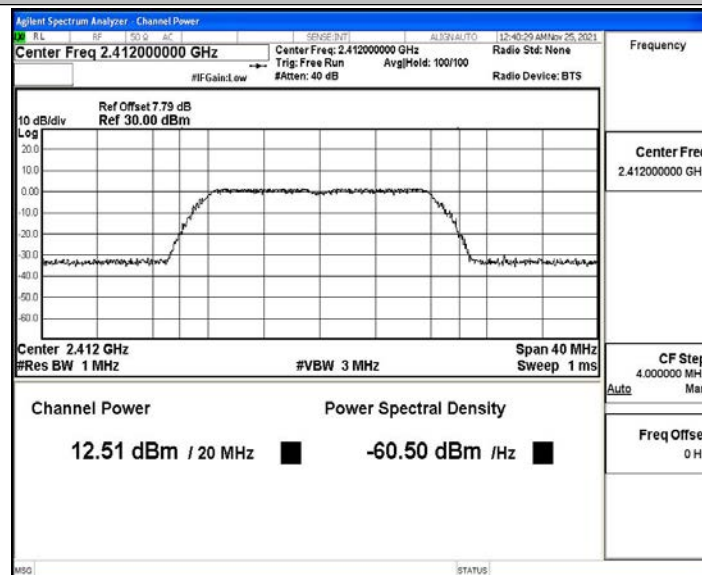
11B_Ant1_2437



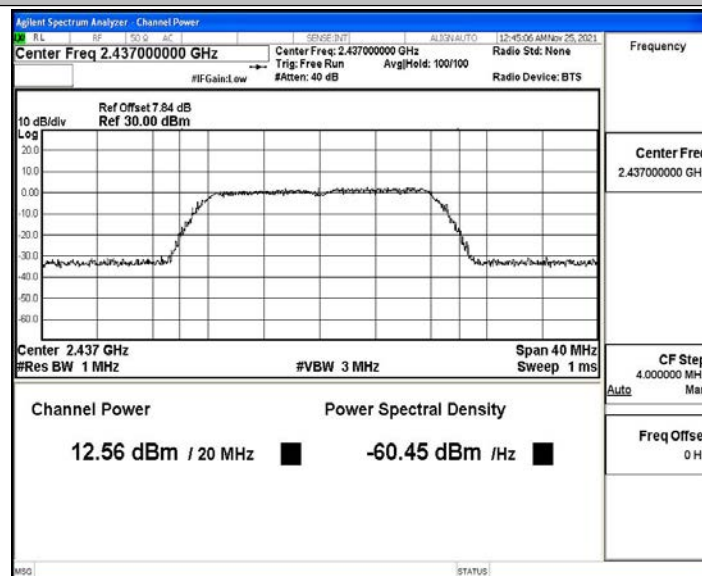
11B_Ant1_2462



11G_Ant1_2412

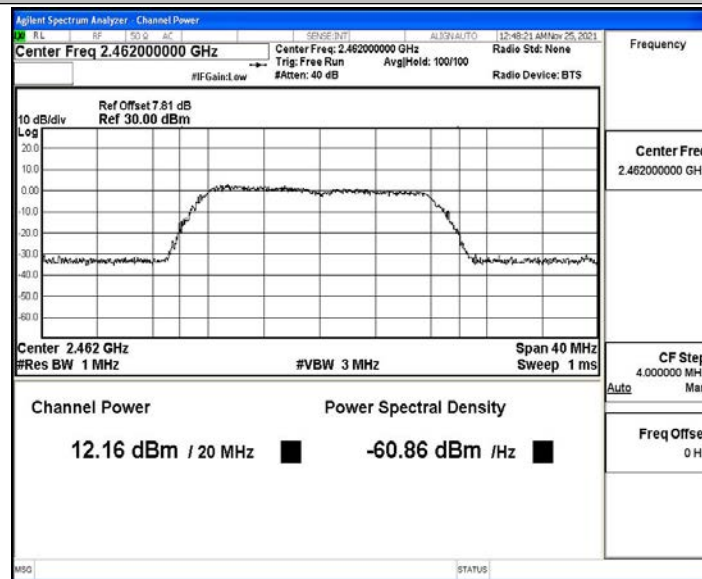


11G_Ant1_2437

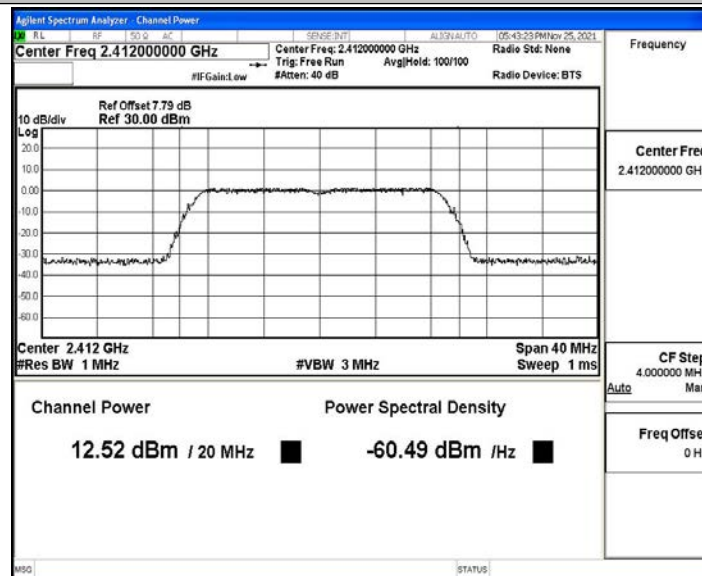




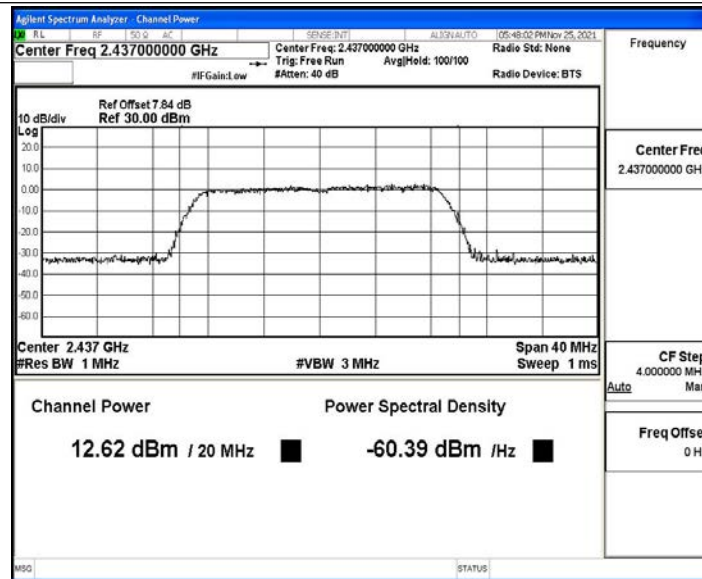
11G_Ant1_2462



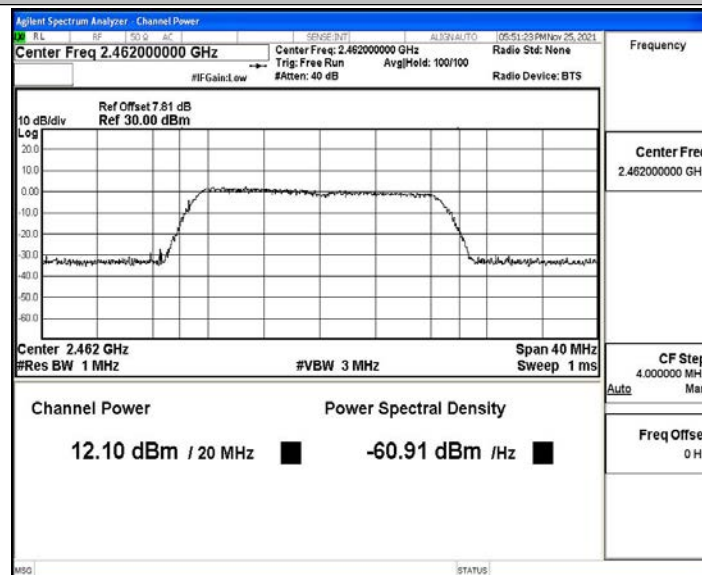
11N20SISO_Ant1_2412



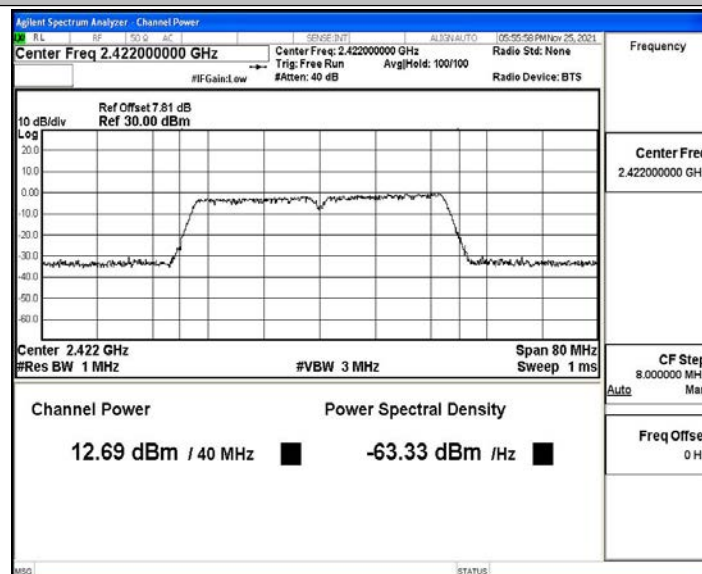
11N20SISO_Ant1_2437



11N20SISO_Ant1_2462

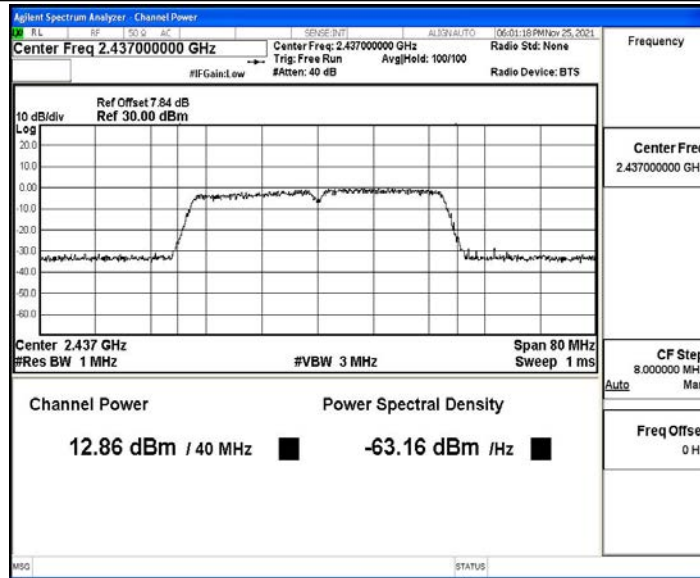


11N40SISO_Ant1_2422

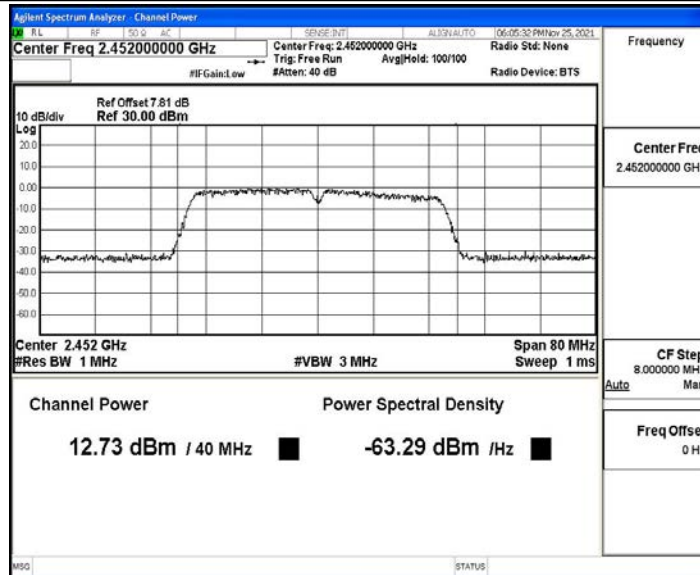




11N40SISO_Ant1_2437



11N40SISO_Ant1_2452





B.3 Maximum power spectral density

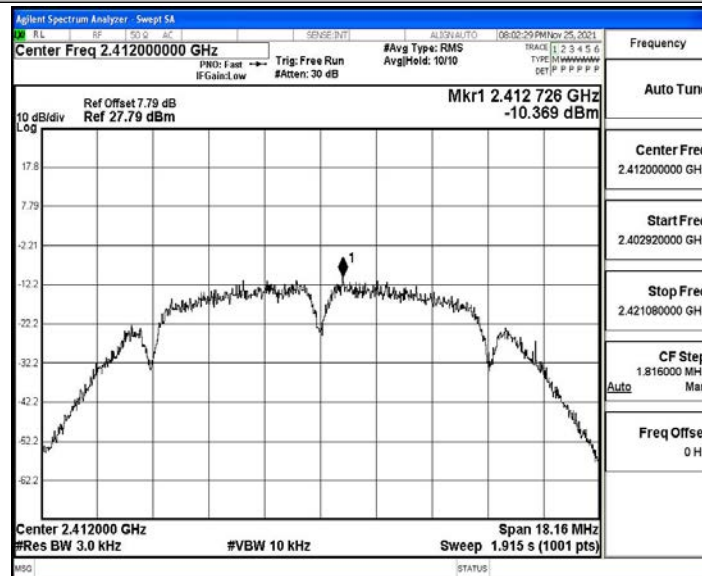
Test Result

TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-10.37	≤8	PASS
		2437	-11.17	≤8	PASS
		2462	-11.71	≤8	PASS
11G	Ant1	2412	-19.68	≤8	PASS
		2437	-18.83	≤8	PASS
		2462	-19.42	≤8	PASS
11N20SISO	Ant1	2412	-19.17	≤8	PASS
		2437	-19.76	≤8	PASS
		2462	-19.68	≤8	PASS
11N40SISO	Ant1	2422	-22.37	≤8	PASS
		2437	-21.56	≤8	PASS
		2452	-20.88	≤8	PASS

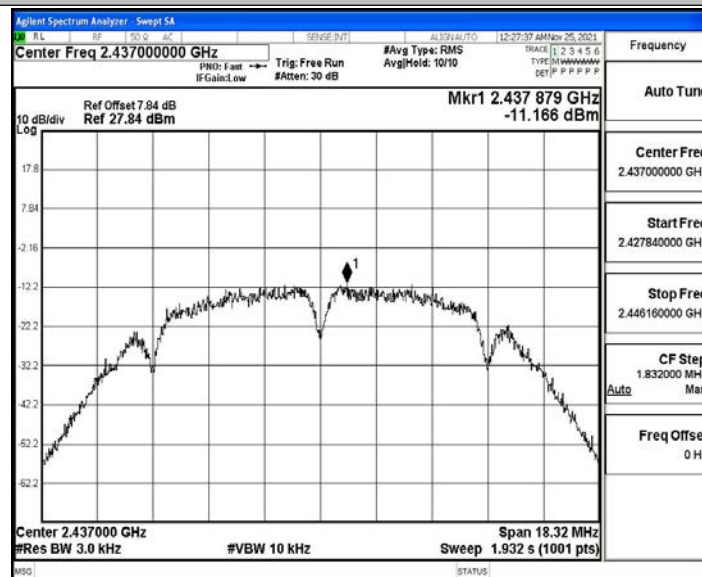


Test Graphs

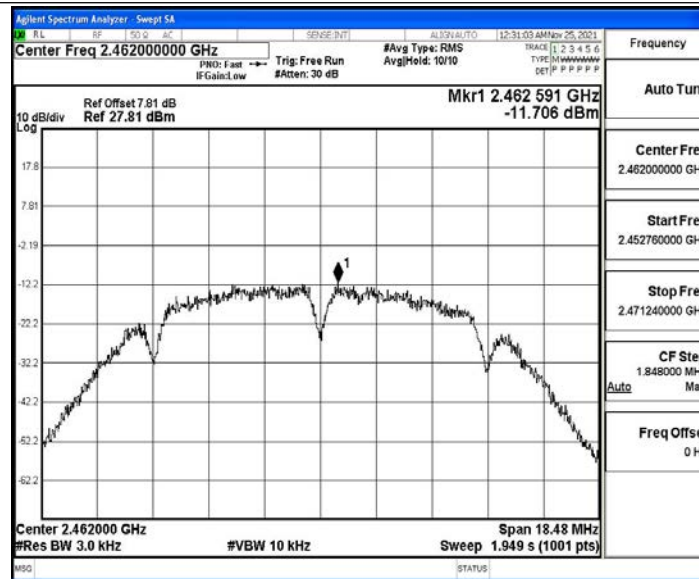
11B_Ant1_2412



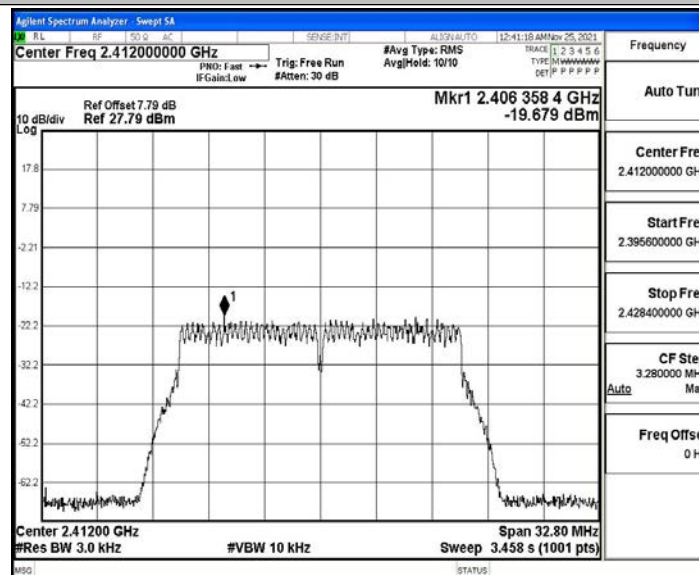
11B_Ant1_2437



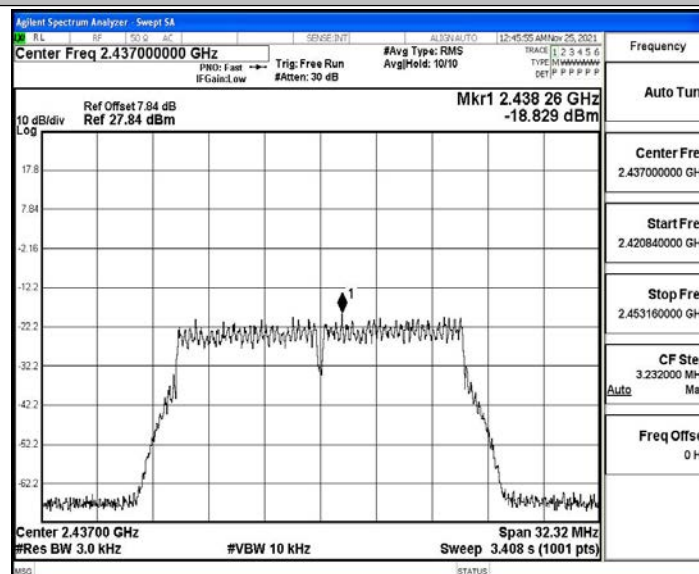
11B_Ant1_2462



11G_Ant1_2412

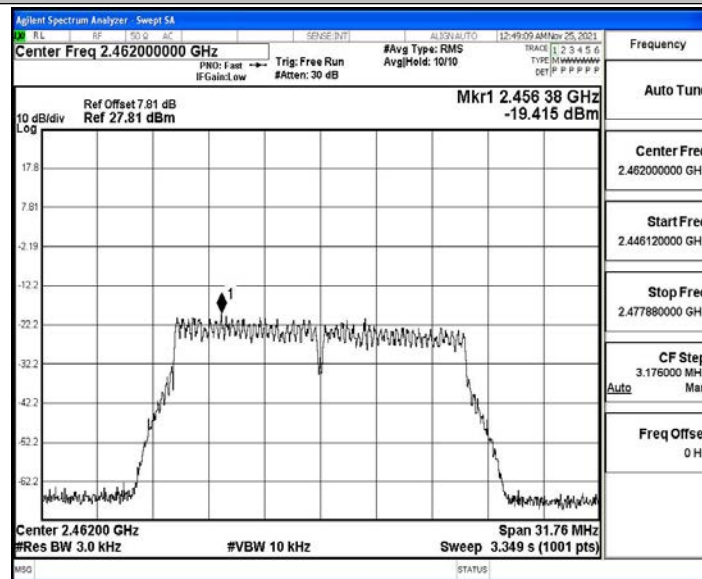


11G_Ant1_2437

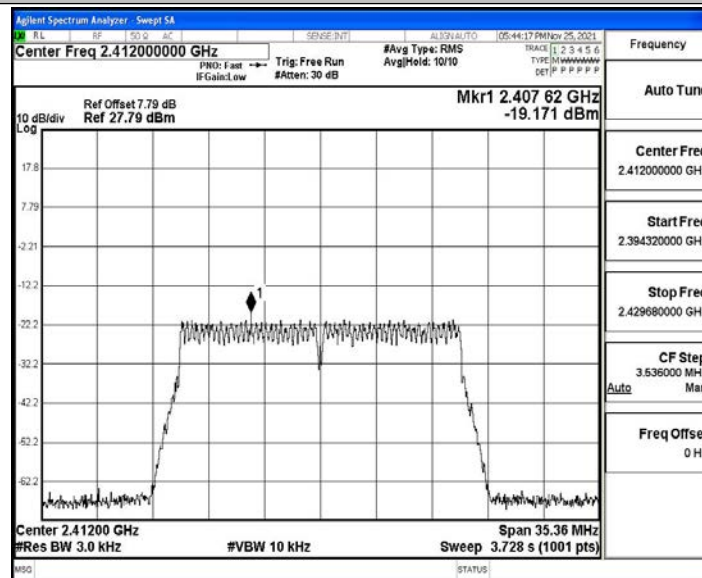




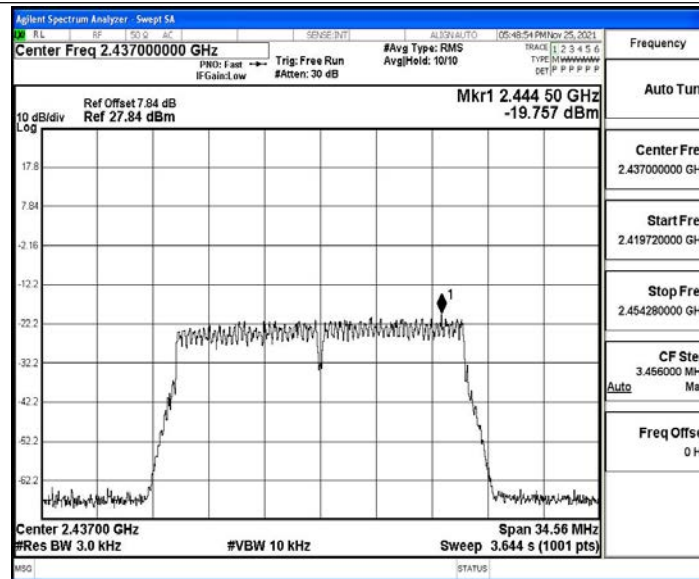
11G_Ant1_2462



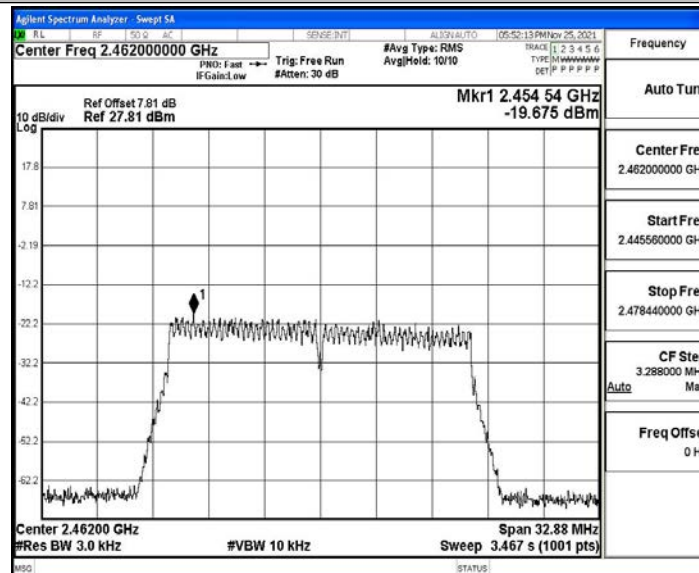
11N20SISO_Ant1_2412



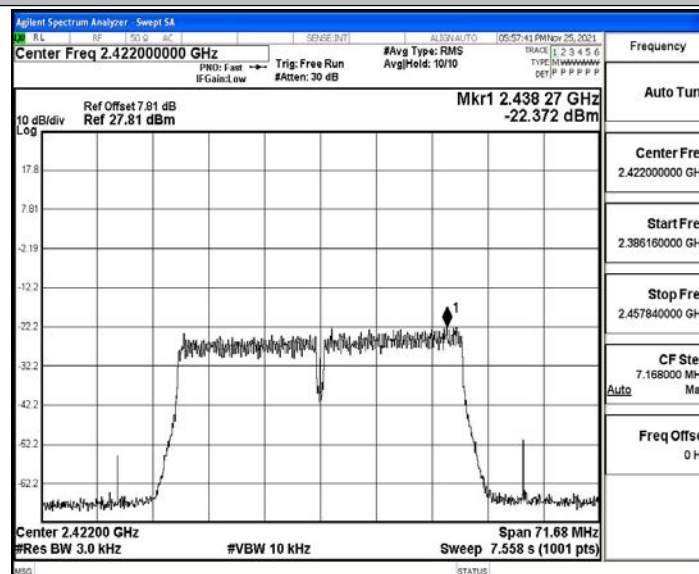
11N20SISO_Ant1_2437



11N20SISO_Ant1_2462



11N40SISO_Ant1_2422





Agilent Spectrum Analyzer - Sweep SA

REF: FLL BF 50 GHz AC SERGE INT ALIQUANTO 06:02:57 PM Nov 25, 2021
 Center Freq 2.43700000 GHz #Avg Type: RMS #Avg Field: 101/0
 PNO: Fast IF Gain: Low Trig: Free Run #Atten: 30 dB TYPE: MAAAAAAW DET: P P P P P P

Ref Offset 7.84 dB
 Ref 27.84 dBm
 Mkr1 2.442 022 4 GHz
 -21.564 dBm

Center Freq 2.43700000 GHz
 Start Freq 2.402600000 GHz
 Stop Freq 2.471400000 GHz
 CF Step 6.880000 MHz
 Auto Mar
 Freq Offset 0 Hz
 Span 68.80 MHz
 #Res BW 3.0 kHz #VBW 10 kHz Sweep 7.254 s (1001 pts)

Agilent Spectrum Analyzer - Sweep SA

F1 L F2 BW F3 GC AC [] SERGE INT ALIQUANTO 06:07:10 PM Nov 25, 2021
 Center Freq 2.45200000 GHz #Avg Type: RMS #Res BW 3.0 kHz #VBW 10 kHz Span 68.00 MHz
 Trig: Free Run #Atten: 30 dB Avg/Field: 10/10 Sweep 7.170 s (1001 pts)
 PWD: Fast IF Gain: Low DEF: P P P P P

Ref Offset 7.81 dB
 Ref 27.81 dBm
 Mkr1 2.449 484 GHz
 -20.879 dBm

10 dB/div
 Log
 17.8
 7.81
 -2.19
 -12.2
 -22.2
 -32.2
 -42.2
 -52.2
 -62.2

Center 2.45200 GHz
 #Res BW 3.0 kHz
 #VBW 10 kHz
 Span 68.00 MHz
 Sweep 7.170 s (1001 pts)

Frequency
 Auto Tuning
 Center Freq
 2.45200000 GHz
 Start Freq
 2.41800000 GHz
 Stop Freq
 2.48600000 GHz
 CF Step
 6.800000 MHz
 Auto
 Freq Offset
 0 Hz



B.4 Band edge measurements

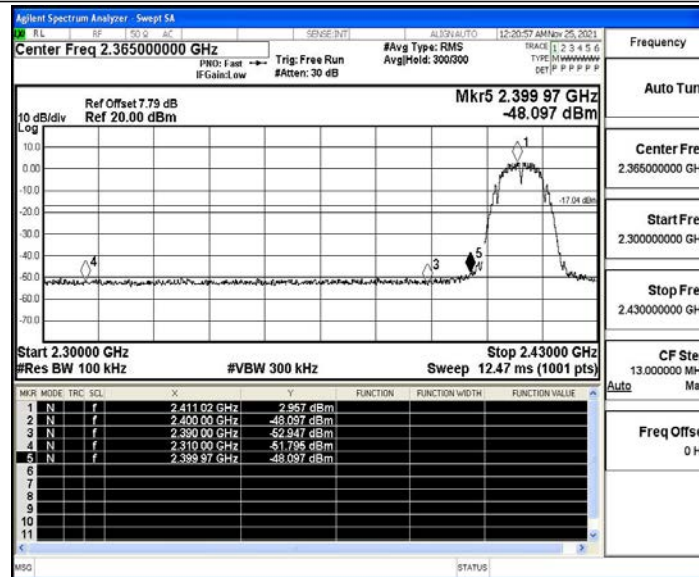
Test Result

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	2.96	-48.1	≤ -17.04	PASS
		High	2462	2.88	-48.09	≤ -17.12	PASS
11G	Ant1	Low	2412	-6.06	-49.86	≤ -26.06	PASS
		High	2462	-5.63	-46.97	≤ -25.63	PASS
11N20SISO	Ant1	Low	2412	-5.78	-48.7	≤ -25.78	PASS
		High	2462	-5.28	-47.25	≤ -25.28	PASS
11N40SISO	Ant1	Low	2422	-8.95	-48.75	≤ -28.95	PASS
		High	2452	-7.48	-47.77	≤ -27.48	PASS

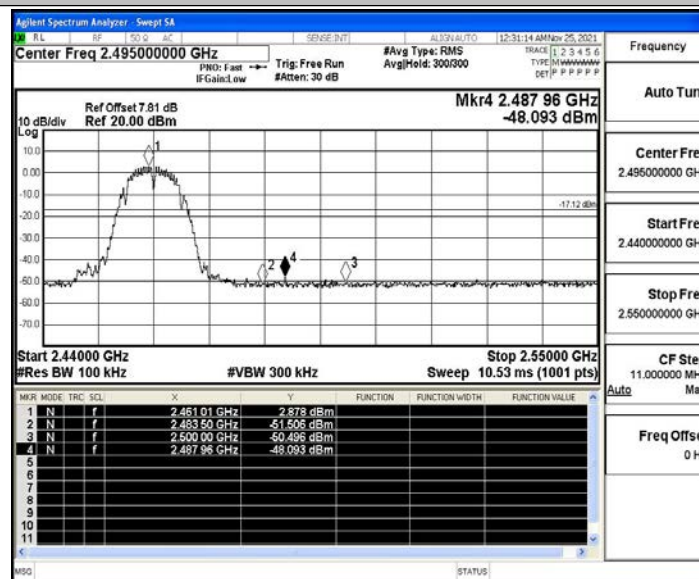


Test Graphs

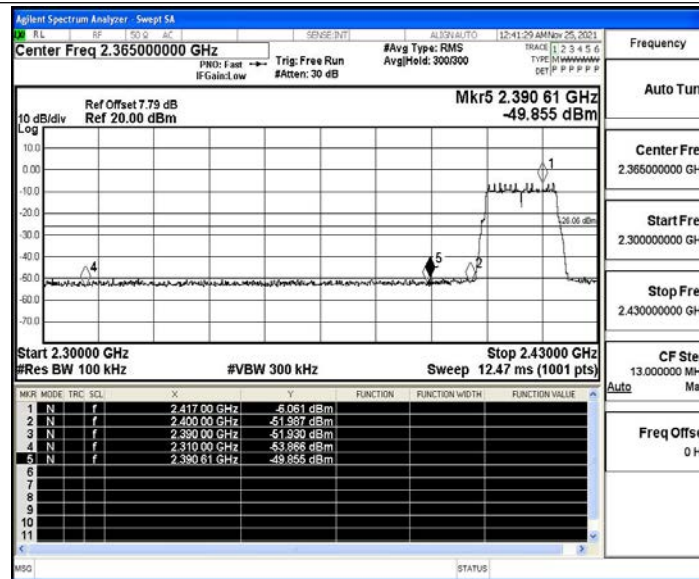
11B_Ant1_Low_2412



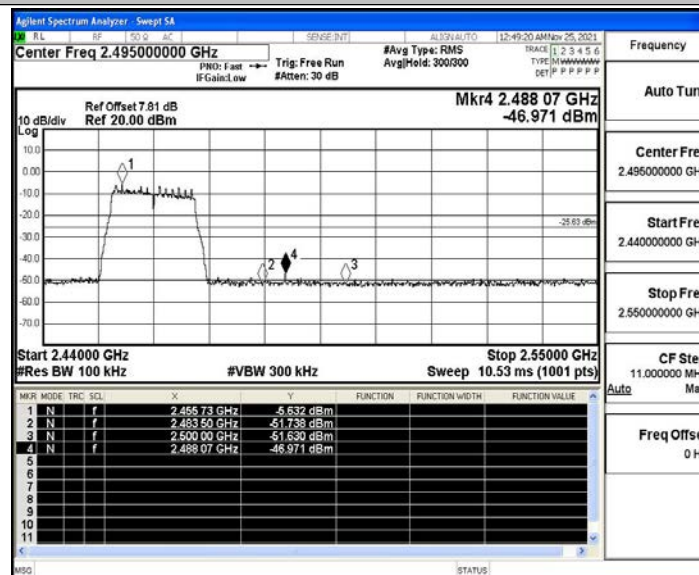
11B_Ant1_High_2462



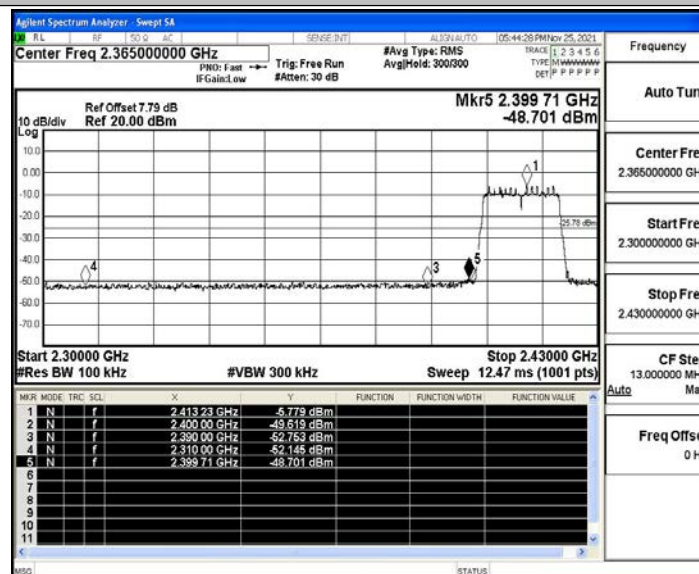
11G_Ant1_Low_2412



11G_Ant1_High_2462

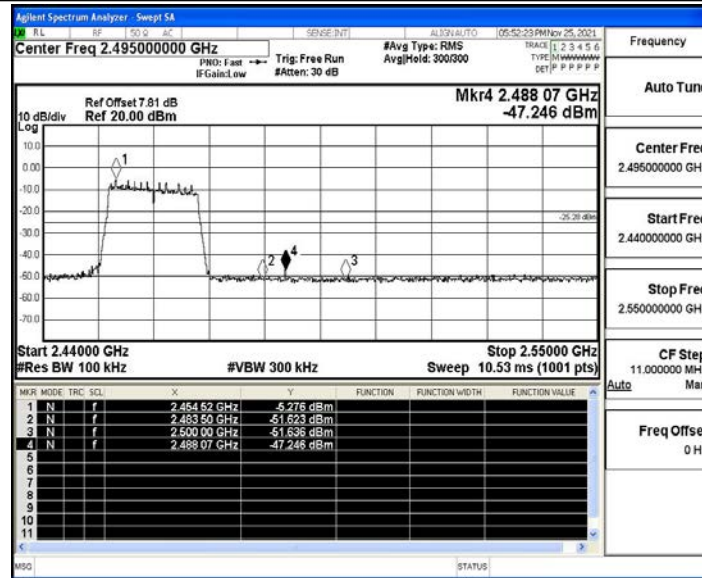


11N20SISO_Ant1_Low_2412

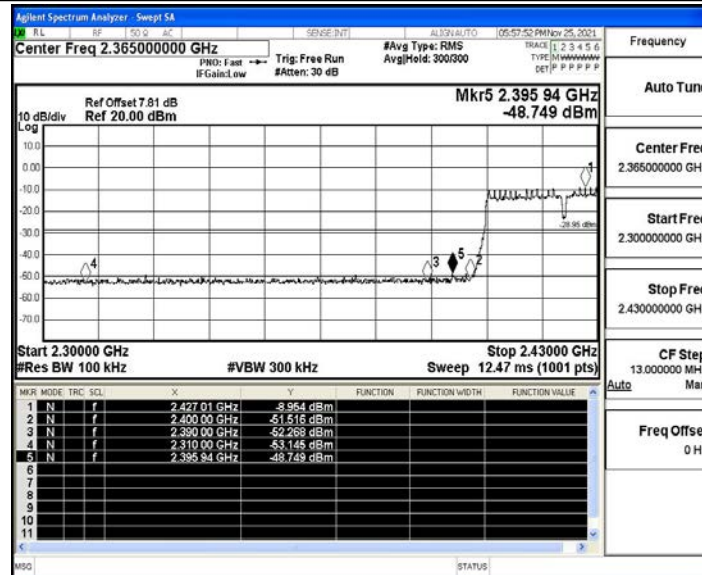




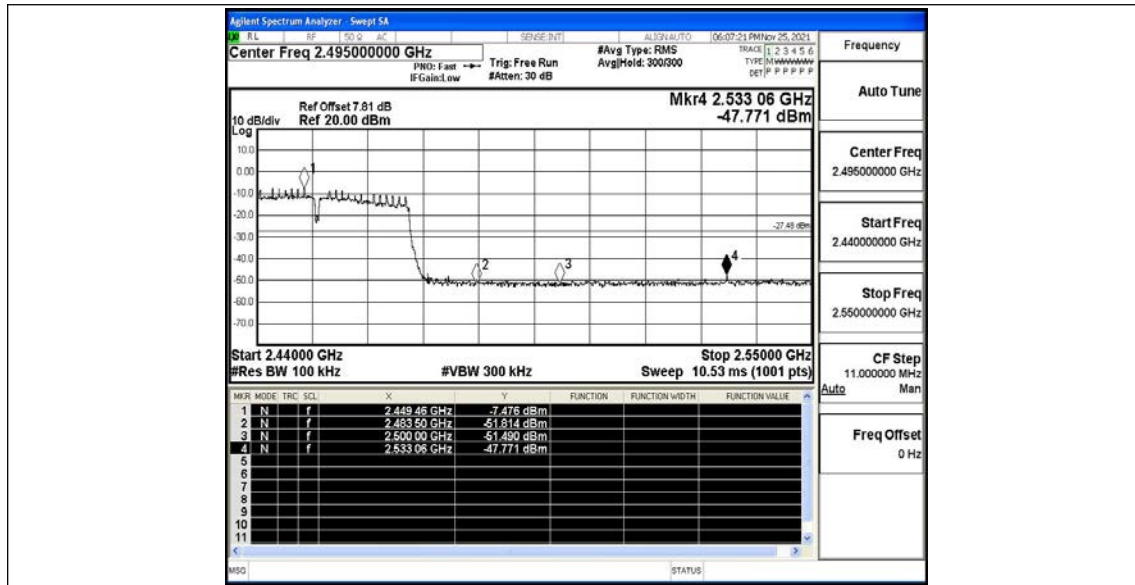
11N20SISO_Ant1_High_2462



11N40SISO_Ant1_Low_2422



11N40SISO_Ant1_High_2452





B.5 Conducted Spurious Emission

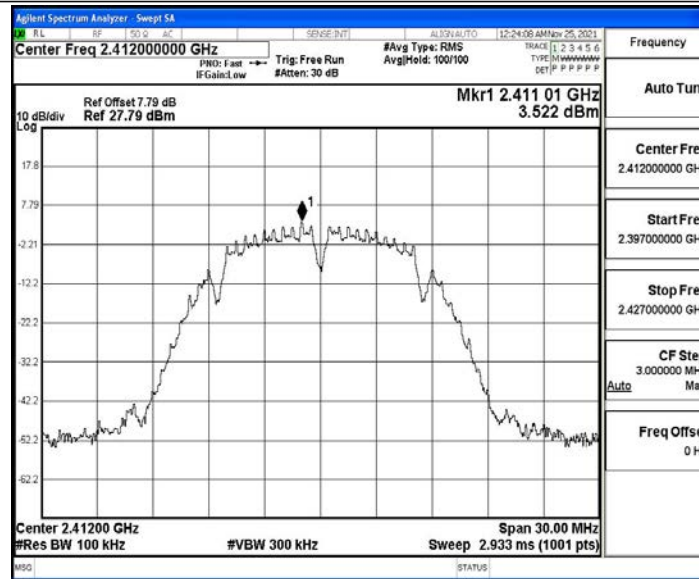
Test Result

TestMode	Antenna	Channel	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	3.52	3.52	---	PASS
			30~1000	3.52	-61.82	≤-16.48	PASS
			1000~26500	3.52	-46.09	≤-16.48	PASS
		2437	Reference	2.77	2.77	---	PASS
			30~1000	2.77	-61.17	≤-17.23	PASS
			1000~26500	2.77	-47.03	≤-17.23	PASS
		2462	Reference	2.89	2.89	---	PASS
			30~1000	2.89	-60.45	≤-17.11	PASS
			1000~26500	2.89	-47.15	≤-17.11	PASS
11G	Ant1	2412	Reference	-6.72	-6.72	---	PASS
			30~1000	-6.72	-61.22	≤-26.72	PASS
			1000~26500	-6.72	-47.44	≤-26.72	PASS
		2437	Reference	-5.51	-5.51	---	PASS
			30~1000	-5.51	-61.11	≤-25.51	PASS
			1000~26500	-5.51	-46.76	≤-25.51	PASS
		2462	Reference	-5.80	-5.80	---	PASS
			30~1000	-5.80	-60.59	≤-25.8	PASS
			1000~26500	-5.80	-47.14	≤-25.8	PASS
11N20SISO	Ant1	2412	Reference	-6.26	-6.26	---	PASS
			30~1000	-6.26	-61.68	≤-26.26	PASS
			1000~26500	-6.26	-47.03	≤-26.26	PASS
		2437	Reference	-5.53	-5.53	---	PASS
			30~1000	-5.53	-61.2	≤-25.53	PASS
			1000~26500	-5.53	-46.54	≤-25.53	PASS
		2462	Reference	-5.48	-5.48	---	PASS
			30~1000	-5.48	-61.48	≤-25.48	PASS
			1000~26500	-5.48	-47.37	≤-25.48	PASS
11N40SISO	Ant1	2422	Reference	-7.65	-7.65	---	PASS
			30~1000	-7.65	-61.71	≤-27.65	PASS
			1000~26500	-7.65	-45.87	≤-27.65	PASS
		2437	Reference	-7.90	-7.90	---	PASS
			30~1000	-7.90	-60.79	≤-27.9	PASS
			1000~26500	-7.90	-45.38	≤-27.9	PASS
		2452	Reference	-7.65	-7.65	---	PASS
			30~1000	-7.65	-61.49	≤-27.65	PASS
			1000~26500	-7.65	-47.04	≤-27.65	PASS

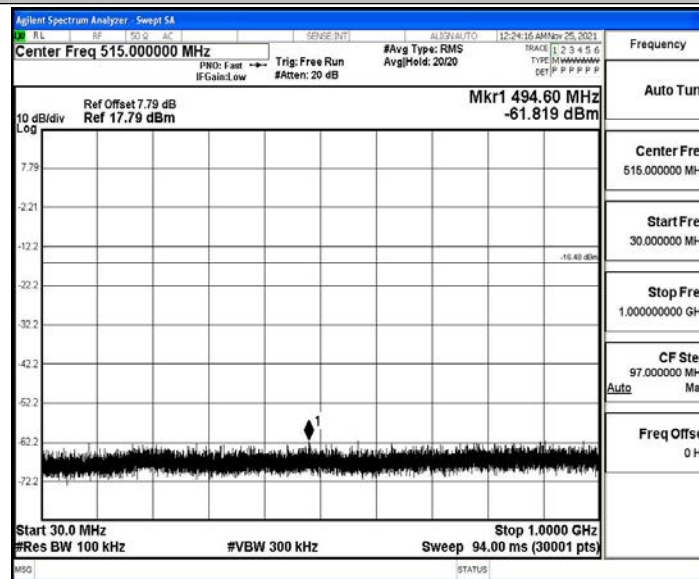


Test Graphs

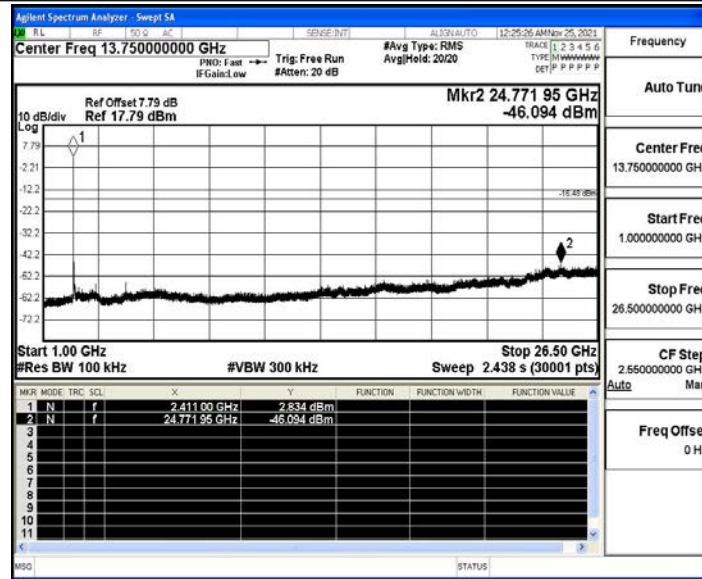
11B_Ant1_2412_0~Reference



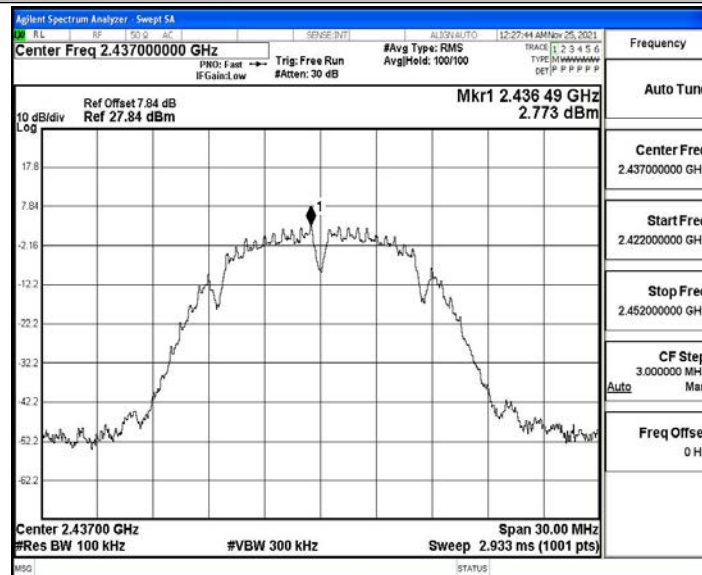
11B_Ant1_2412_30~1000



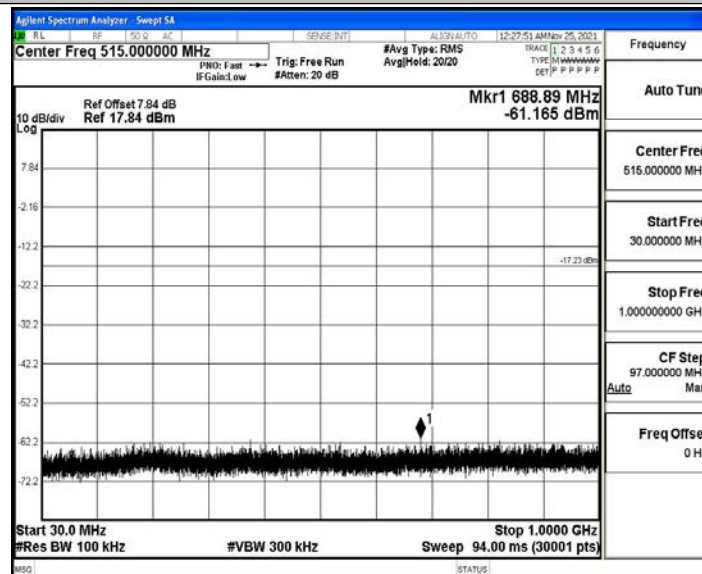
11B_Ant1_2412_1000~26500



11B_Ant1_2437_0~Reference

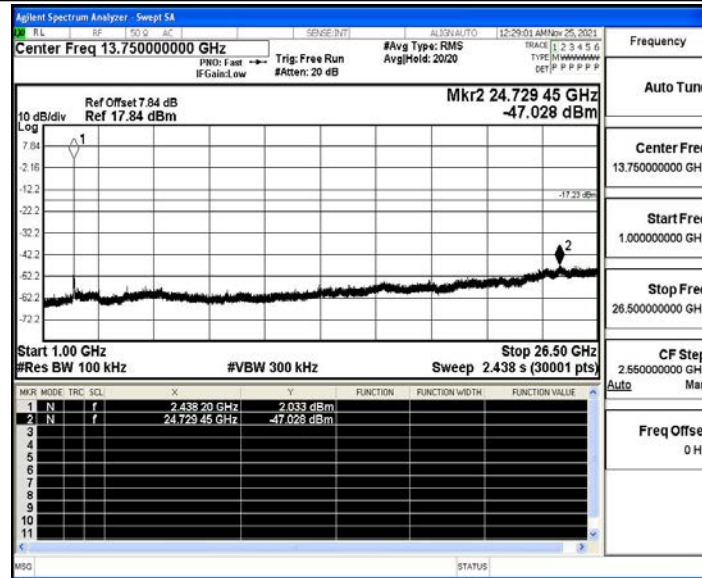


11B_Ant1_2437_30~1000

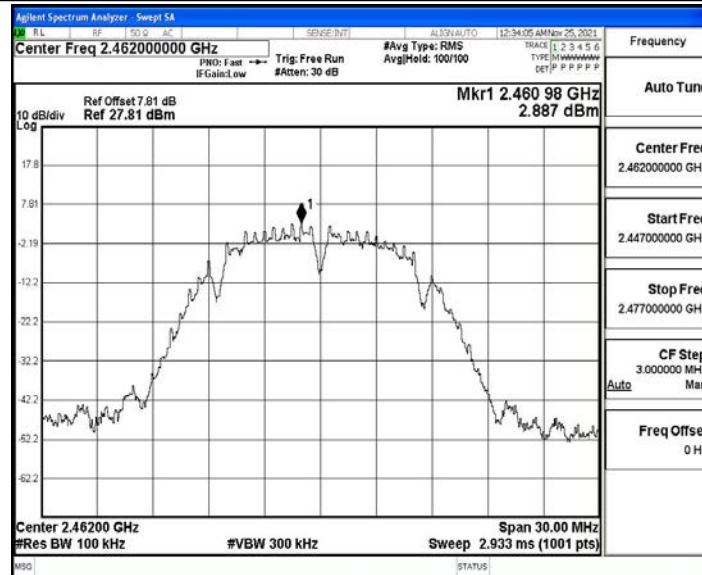




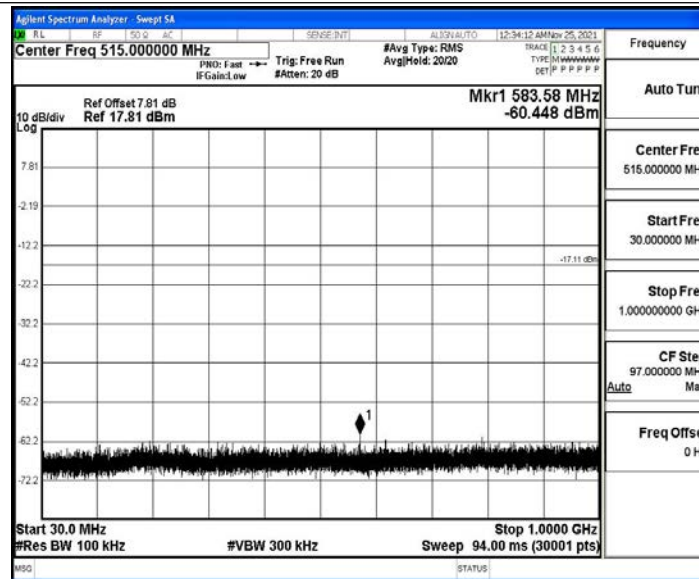
11B_Ant1_2437_1000~26500



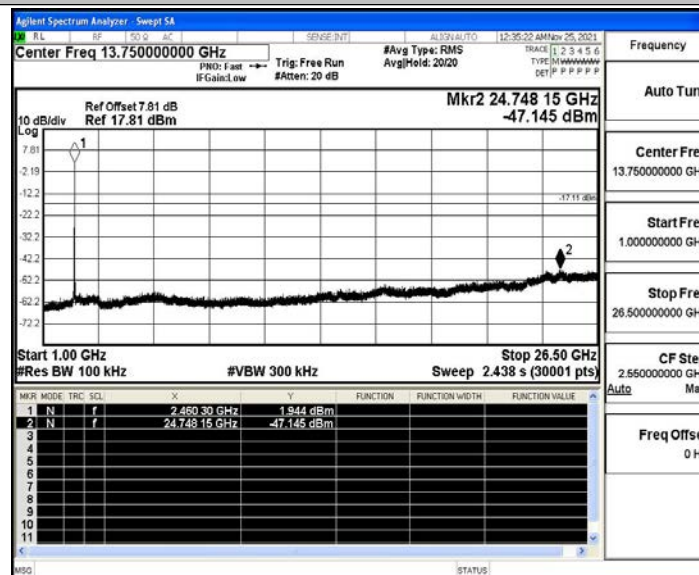
11B_Ant1_2462_0~Reference



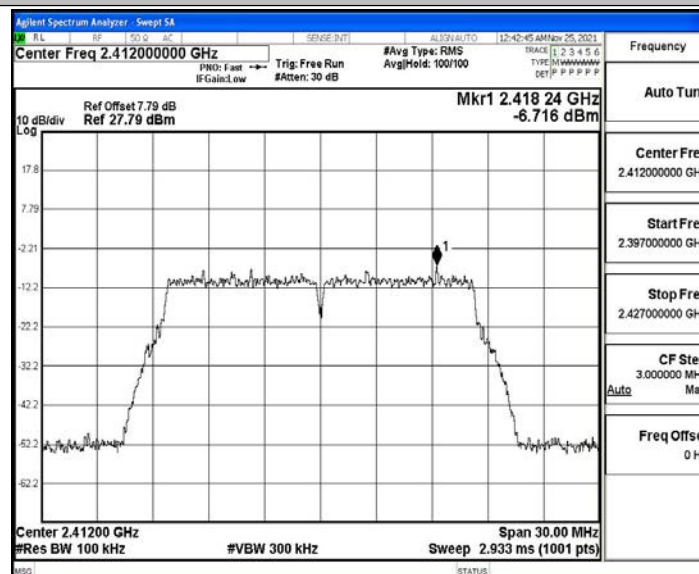
11B_Ant1_2462_30~1000



11B_Ant1_2462_1000~26500

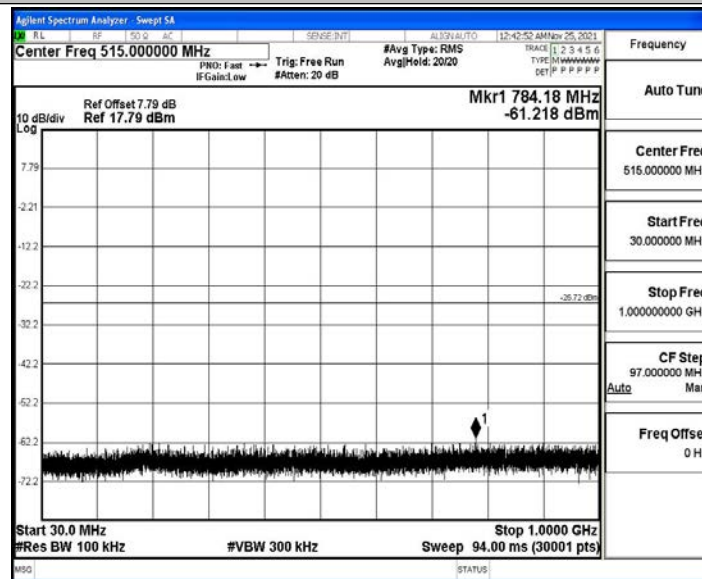


11G_Ant1_2412_0~Reference

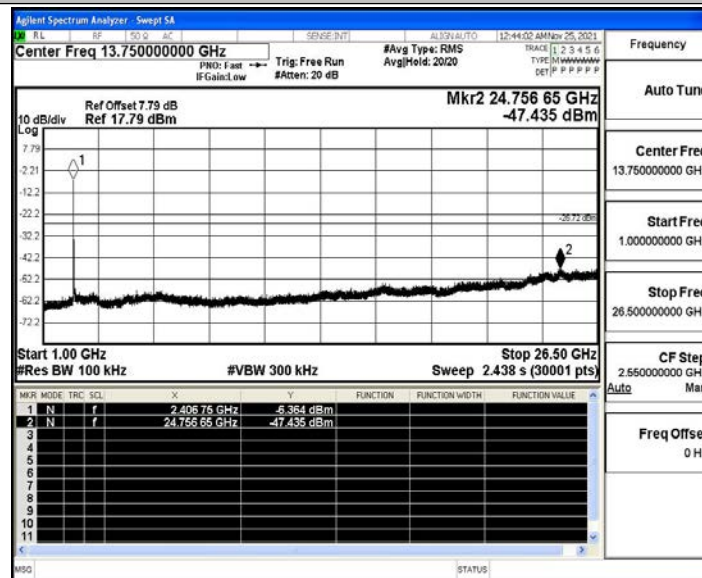




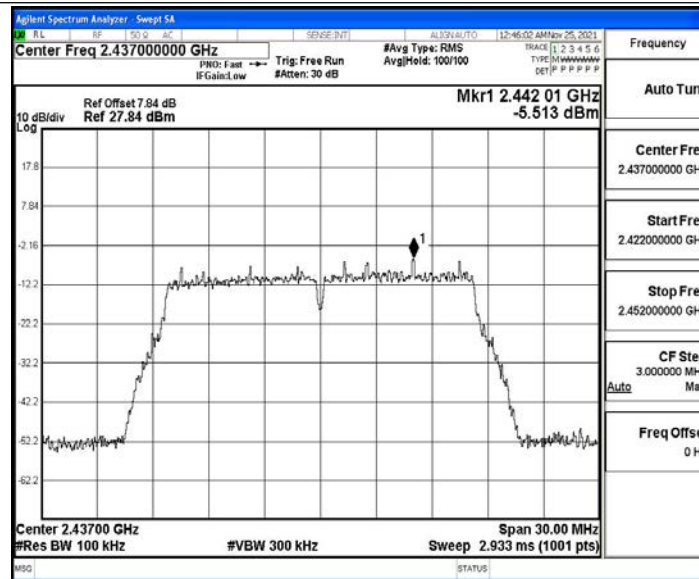
11G_Ant1_2412_30~1000



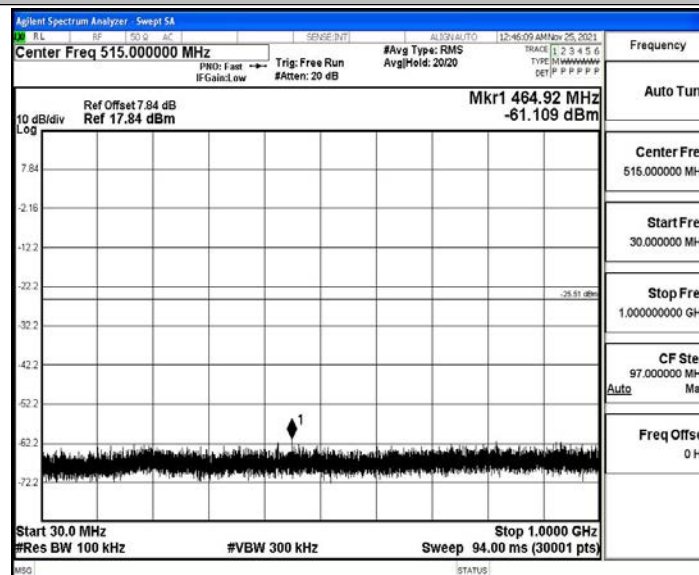
11G_Ant1_2412_1000~26500



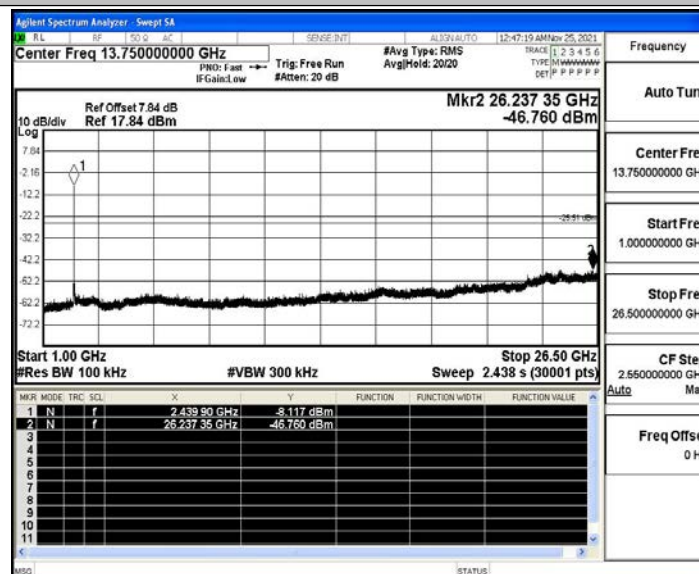
11G_Ant1_2437_0~Reference



11G_Ant1_2437_30~1000

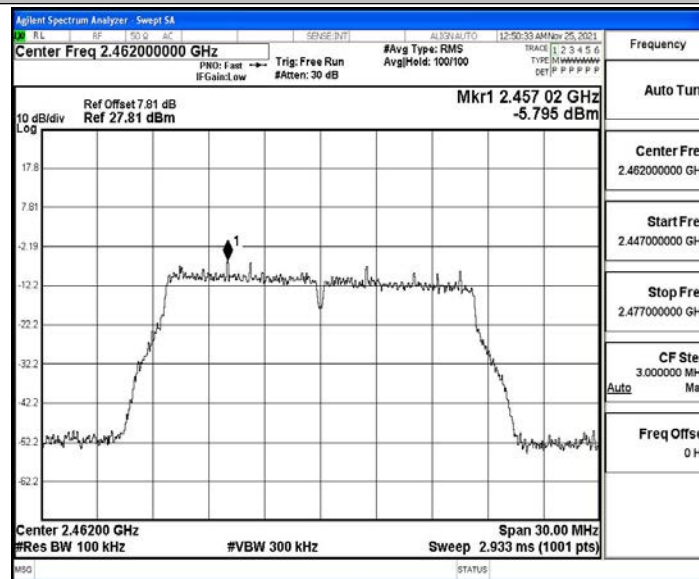


11G_Ant1_2437_1000~26500

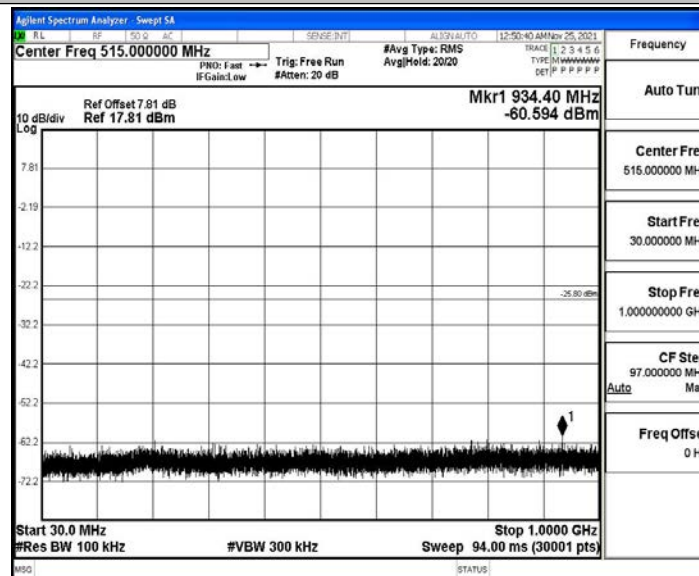




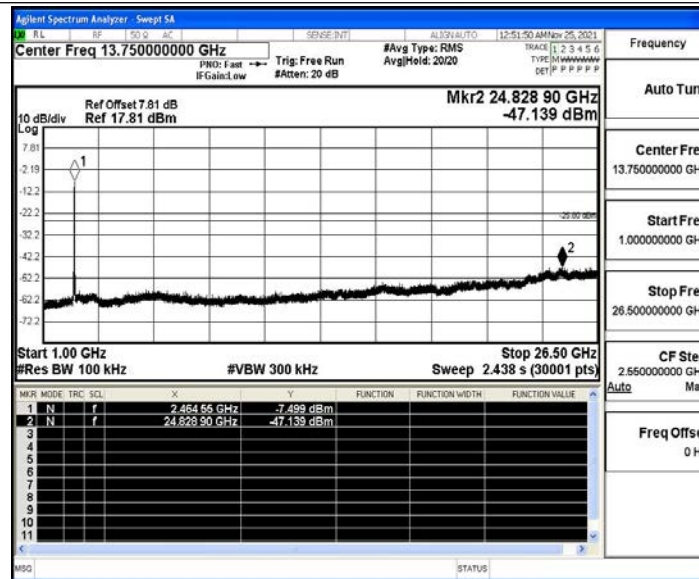
11G_Ant1_2462_0~Reference



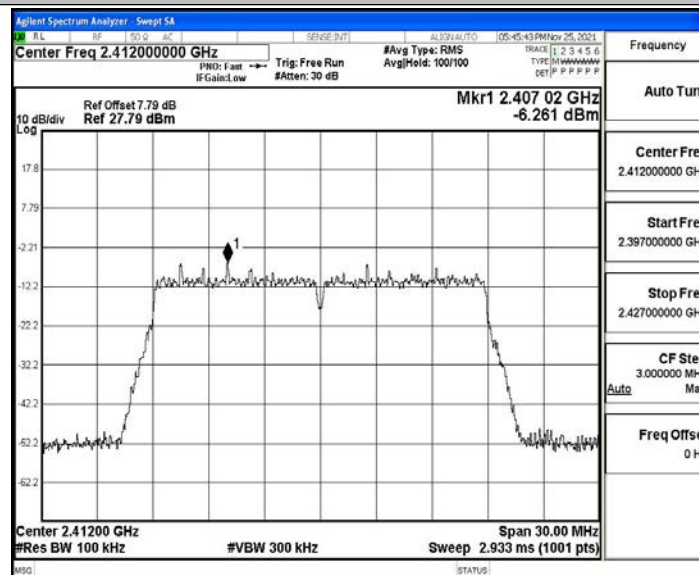
11G_Ant1_2462_30~1000



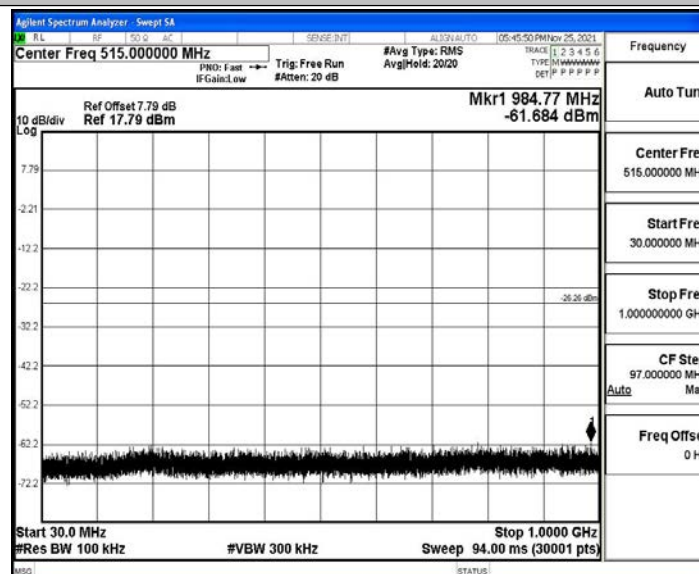
11G_Ant1_2462_1000~26500



11N20SISO_Ant1_2412_0~Reference

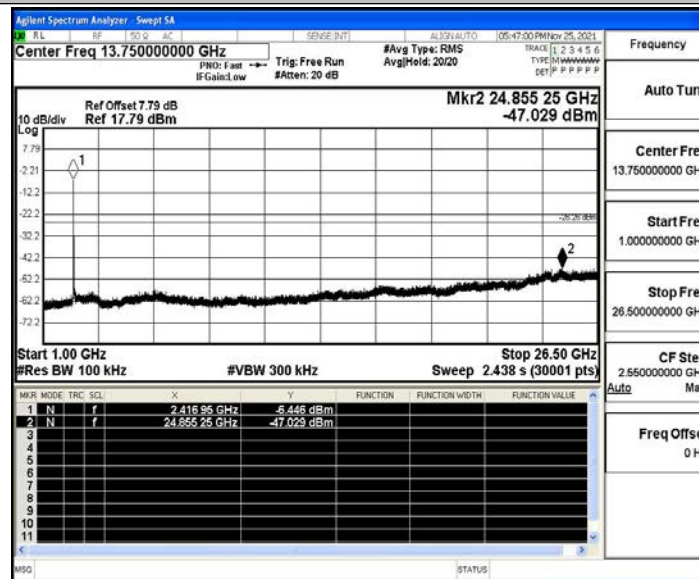


11N20SISO_Ant1_2412_30~1000

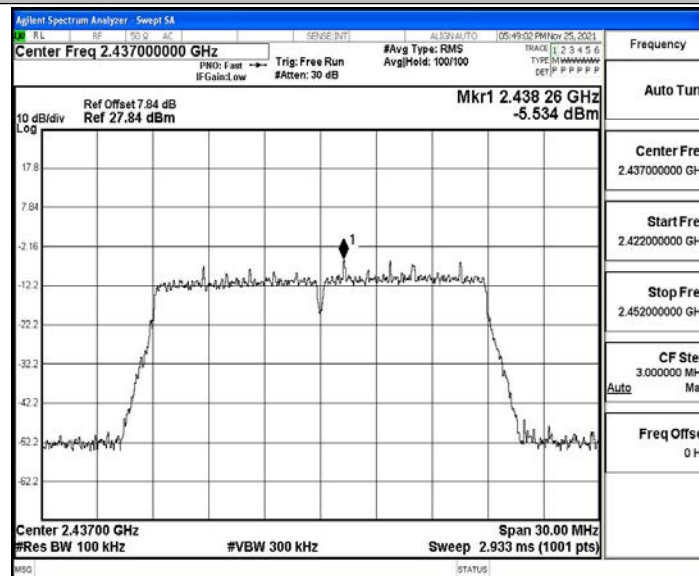




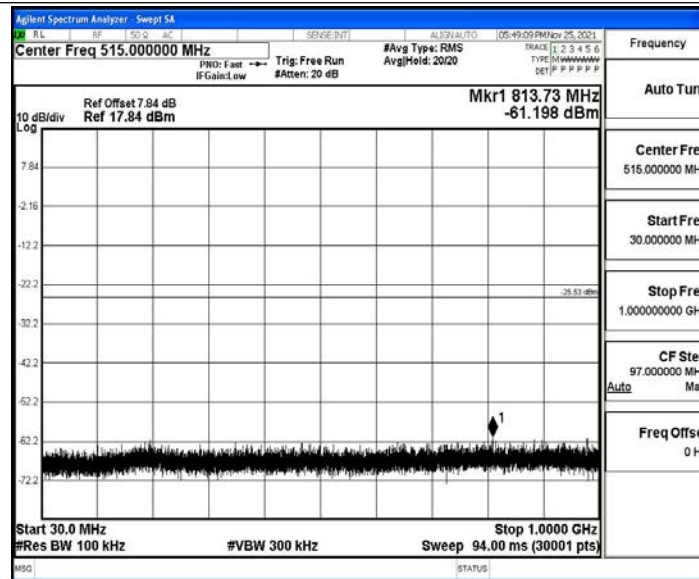
11N20SISO_Ant1_2412_1000~26500



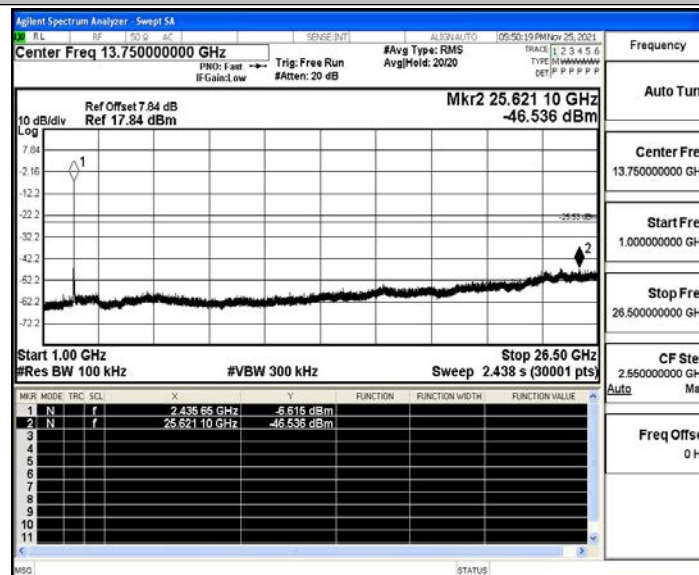
11N20SISO_Ant1_2437_0~Reference



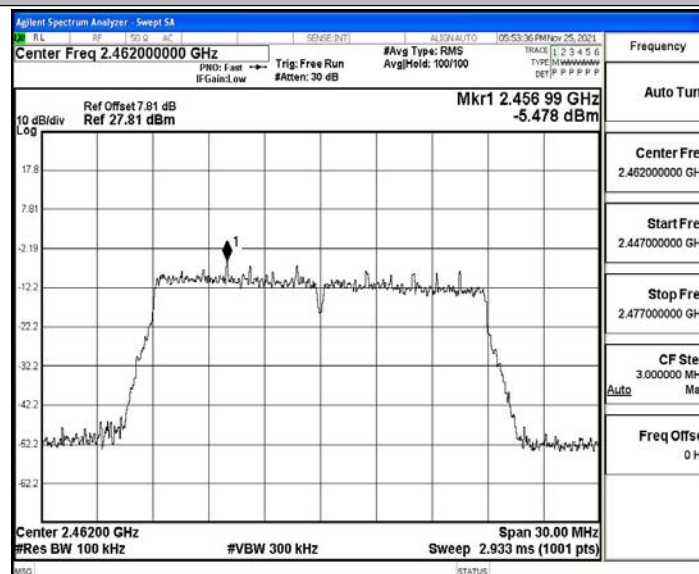
11N20SISO_Ant1_2437_30~1000



11N20SISO_Ant1_2437_1000~26500

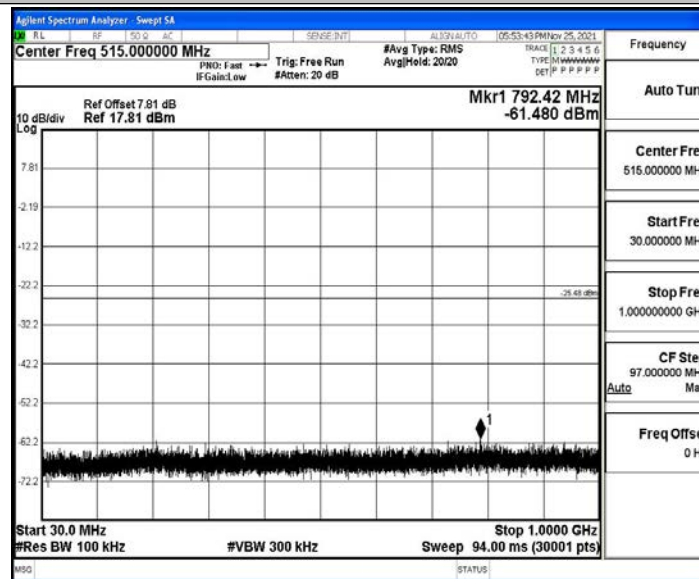


11N20SISO_Ant1_2462_0~Reference

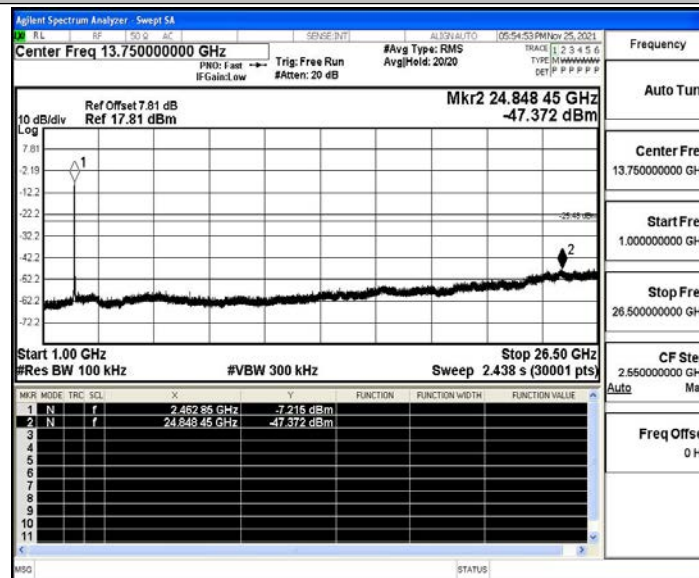




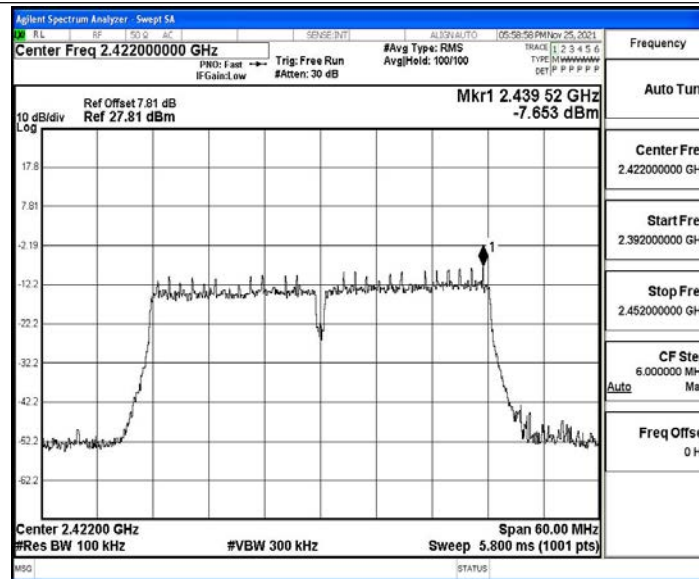
11N20SISO_Ant1_2462_30~1000



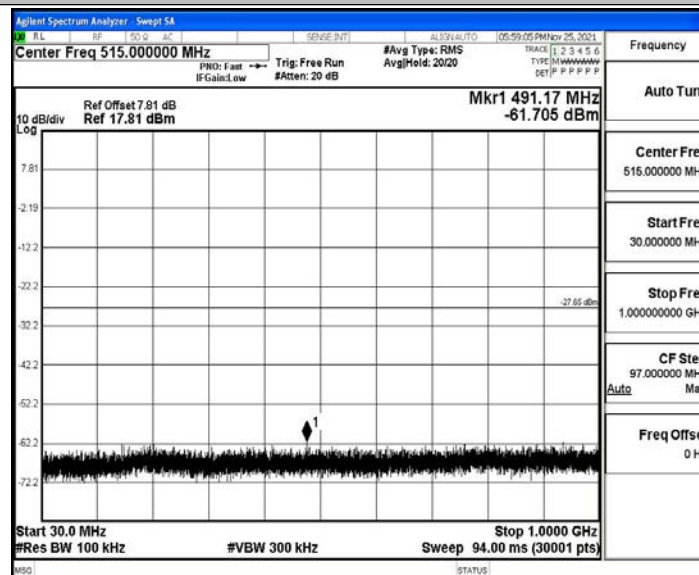
11N20SISO_Ant1_2462_1000~26500



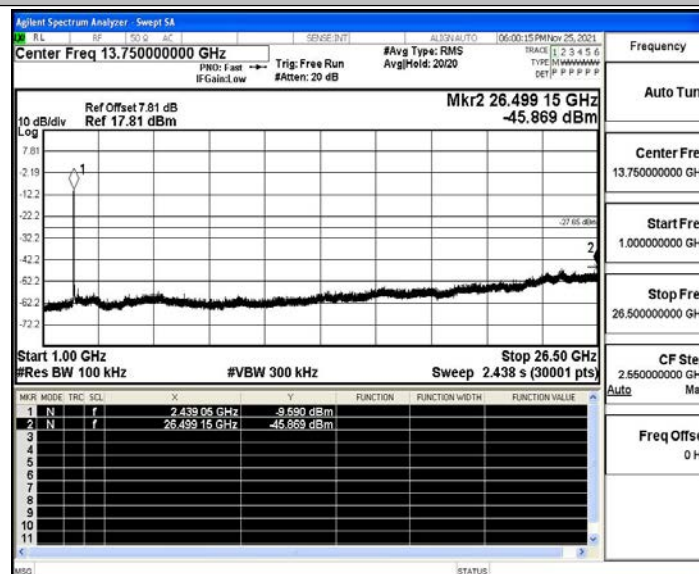
11N40SISO_Ant1_2422_0~Reference



11N40SISO_Ant1_2422_30~1000

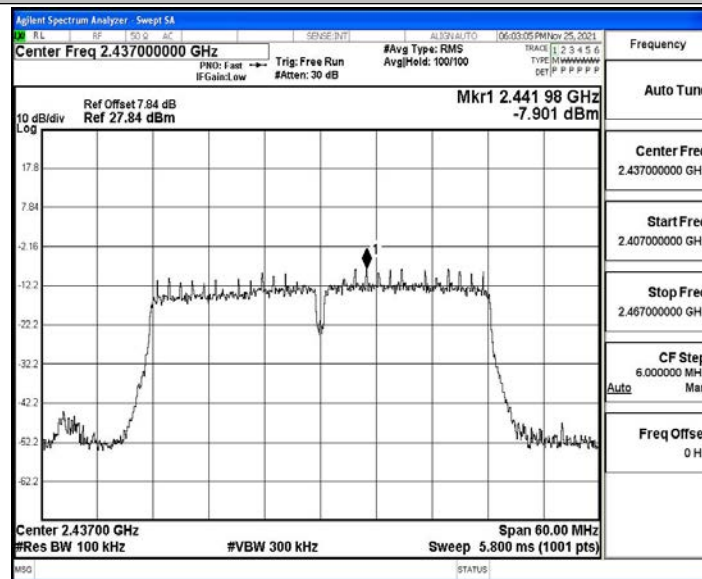


11N40SISO_Ant1_2422_1000~26500

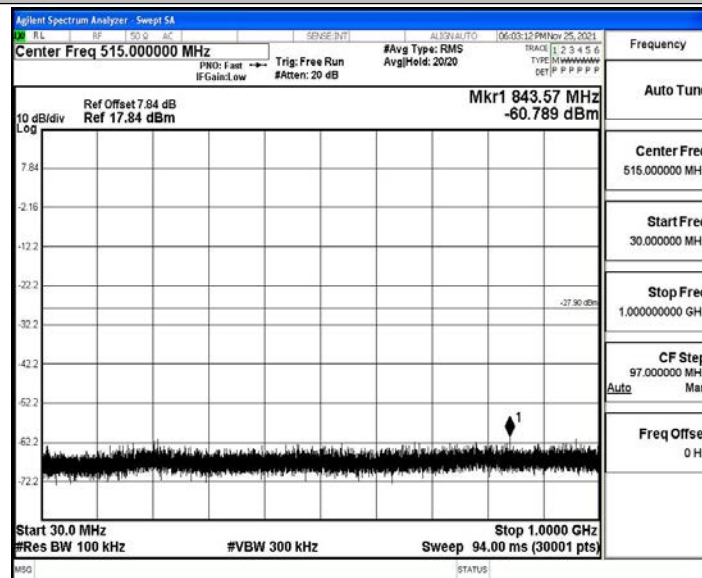




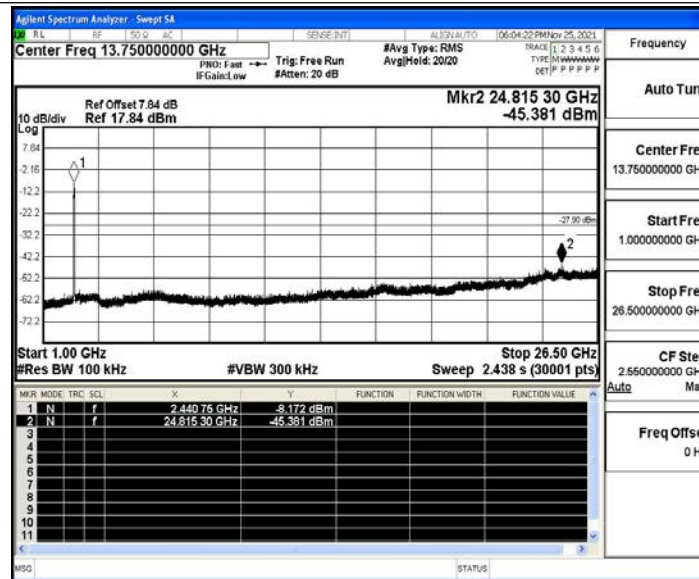
11N40SISO_Ant1_2437_0~Reference



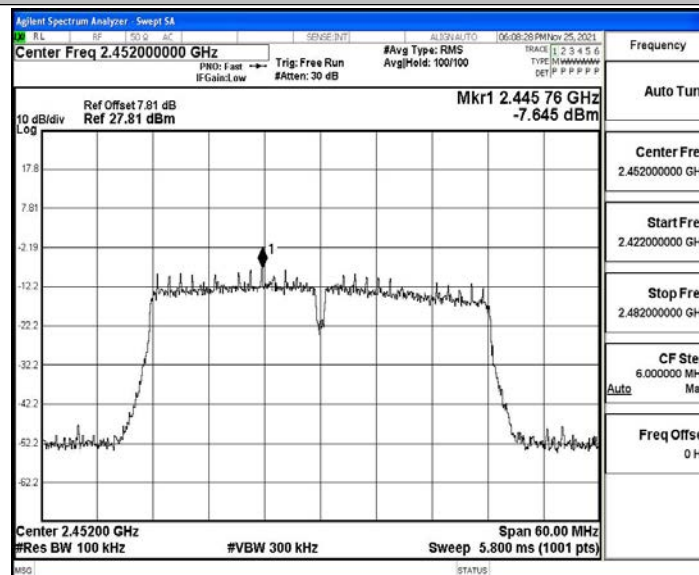
11N40SISO_Ant1_2437_30~1000



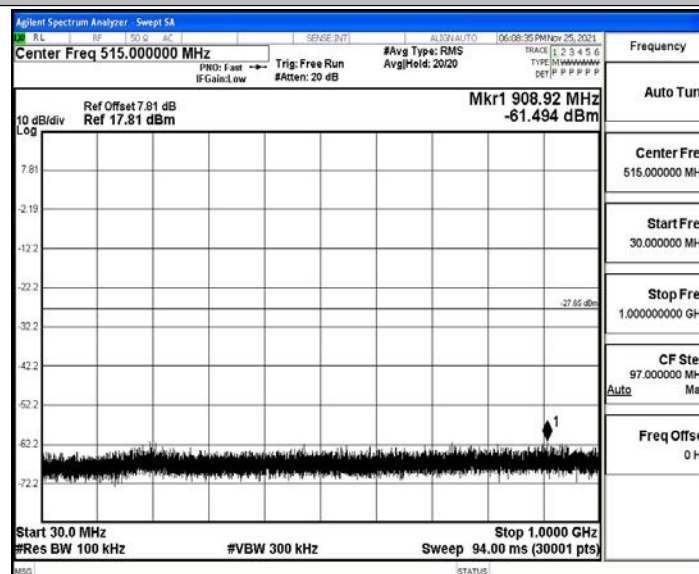
11N40SISO_Ant1_2437_1000~26500



11N40ISO_Ant1_2452_0~Reference

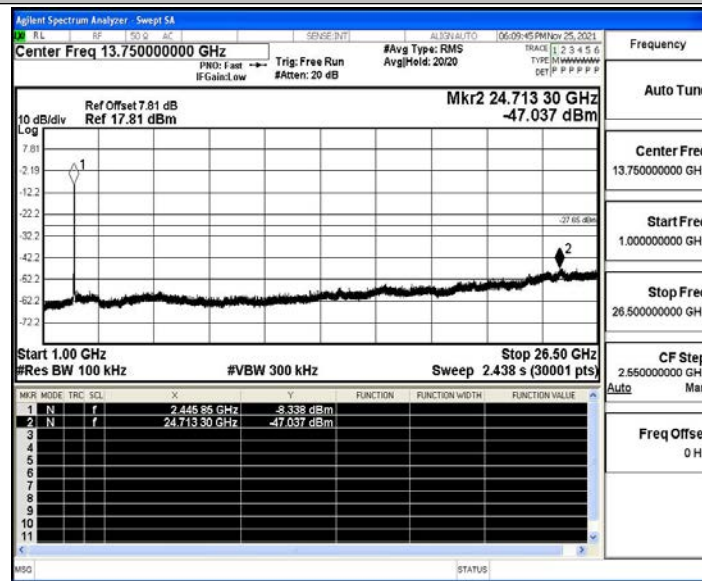


11N40ISO_Ant1_2452_30~1000





11N40SISO_Ant1_2452_1000~26500





B.6 Duty Cycle

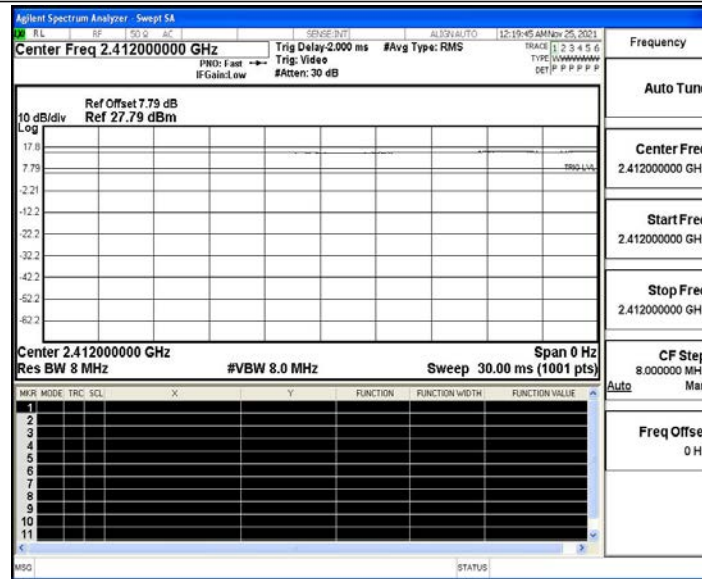
Test Result

TestMode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Limit	Verdict
11B	Ant1	2412	30.00	30.00	100.00	---	PASS
		2437	30.00	30.00	100.00	---	PASS
		2462	30.00	30.00	100.00	---	PASS
11G	Ant1	2412	1.39	1.43	97.20	---	PASS
		2437	1.39	1.43	97.20	---	PASS
		2462	1.39	1.43	97.20	---	PASS
11N20SISO	Ant1	2412	1.30	1.34	97.01	---	PASS
		2437	1.30	1.34	97.01	---	PASS
		2462	1.30	1.34	97.01	---	PASS
11N40SISO	Ant1	2422	0.64	0.68	94.12	---	PASS
		2437	0.64	0.68	94.12	---	PASS
		2452	0.64	0.68	94.12	---	PASS

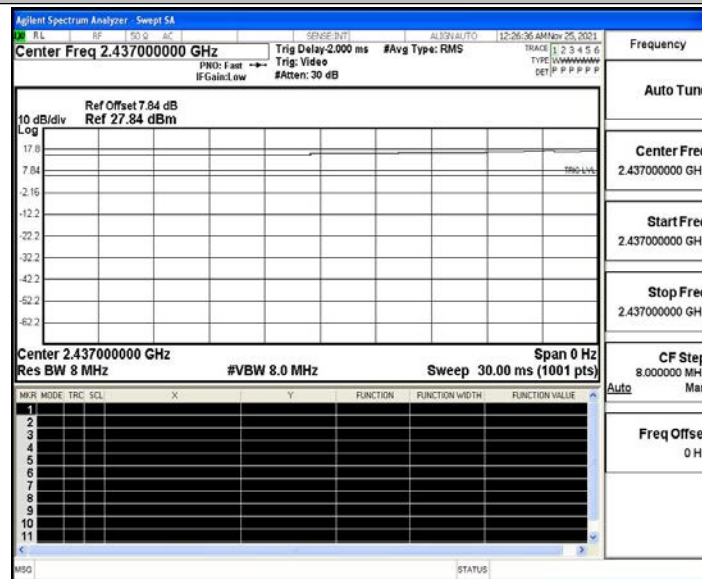


Test Graphs

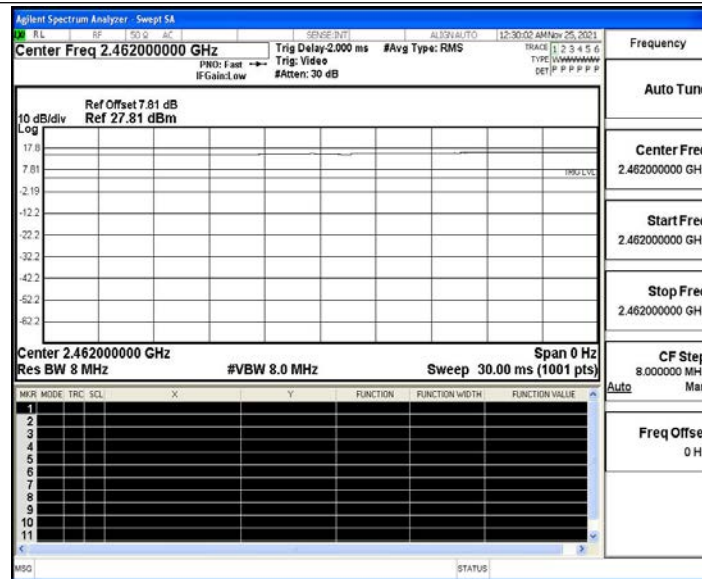
11B_Ant1_2412



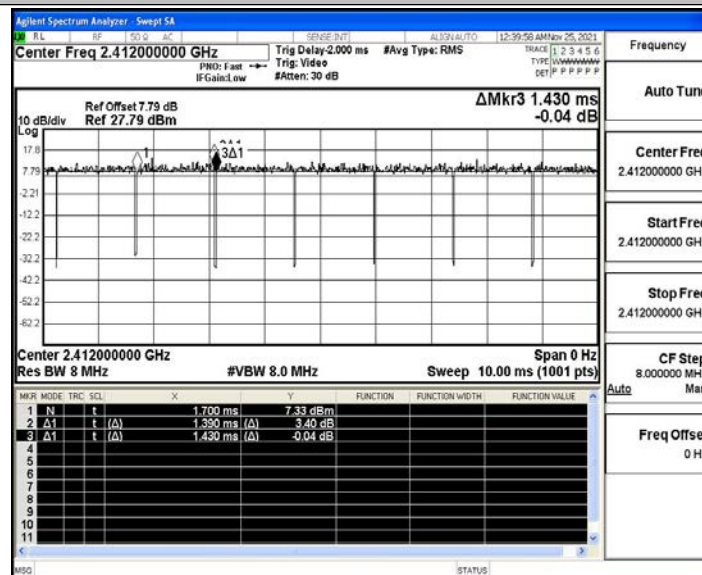
11B_Ant1_2437



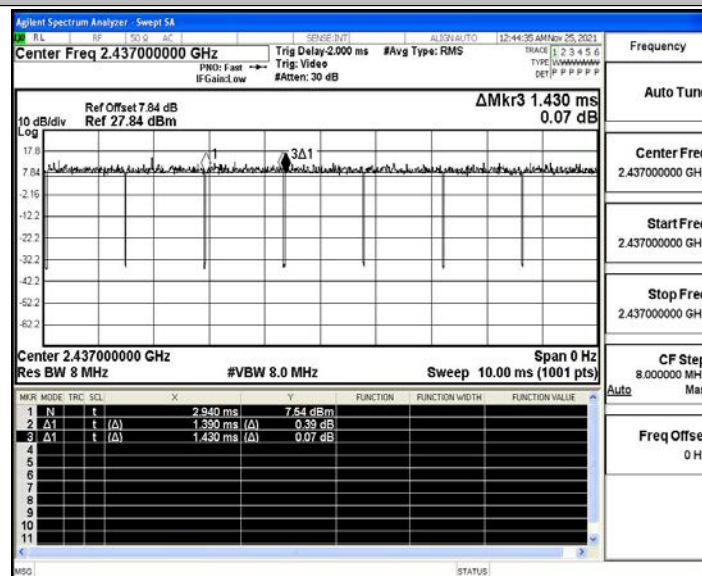
11B_Ant1_2462



11G_Ant1_2412



11G_Ant1_2437





Agilent Spectrum Analyzer - Sweep SA

RB 100 MHz 50 G ac SERVO INT AL32000000 12:47:50 AM Nov 25, 2001
 Center Freq 2.462000000 GHz Trig Delay 2.000 ms #Avg Type: RMS
 PNO: Fast IF Gain: Low #Atten: 30 dB
 BRAC 1 2 3 4 5 6
 TYPE: Normal
 DET: P P P P P P

Ref Offset 7.81 dB
 Ref 27.81 dBm
 ΔMkr3 1.430 ms
 0.11 dB

Center 2.462000000 GHz Span 0 Hz
 Res BW 8 MHz #VBW 8.0 MHz Sweep 10.00 ms (1001 pts)

MKR	MODE	TRIG	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	t		850.0 μs	6.91 dBm			
2	Δ1	t	(Δ)	1.390 ms (Δ)	0.72 dB			
3	Δ1	t	(Δ)	1.430 ms (Δ)	0.11 dB			
4								
5								
6								
7								
8								
9								
10								
11								

Frequency
 Auto Tuning
 Center Freq
 2.462000000 GHz
 Start Freq
 2.462000000 GHz
 Stop Freq
 2.462000000 GHz
 CF Step
 8.000000 MHz
 Auto
 Freq Offset
 0 Hz

Agilent Spectrum Analyzer - Sweep SA

Center Freq 2.412000000 GHz Trig Delay 2.000 ms #Avg Type: RMS Frequency

PNO: Fast IF Gain: Low #Atten: 30 dB Auto Tuning

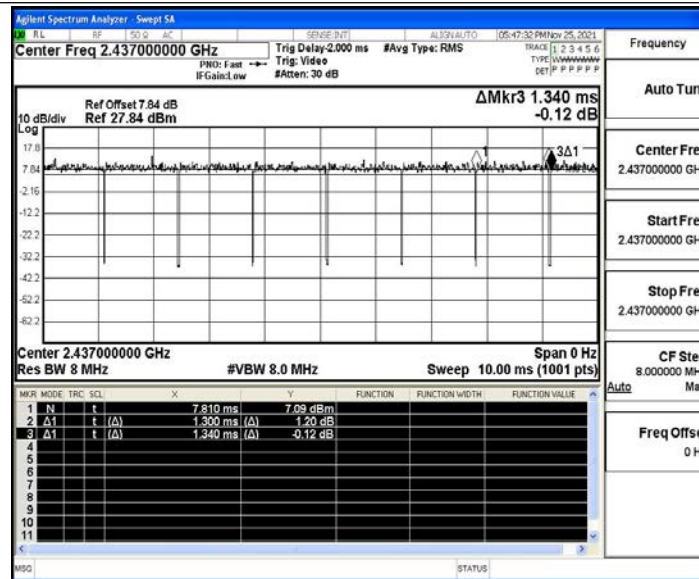
Ref Offset 7.79 dB ΔMkr 1.340 ms 0.09 dB

Log Ref 27.79 dBm

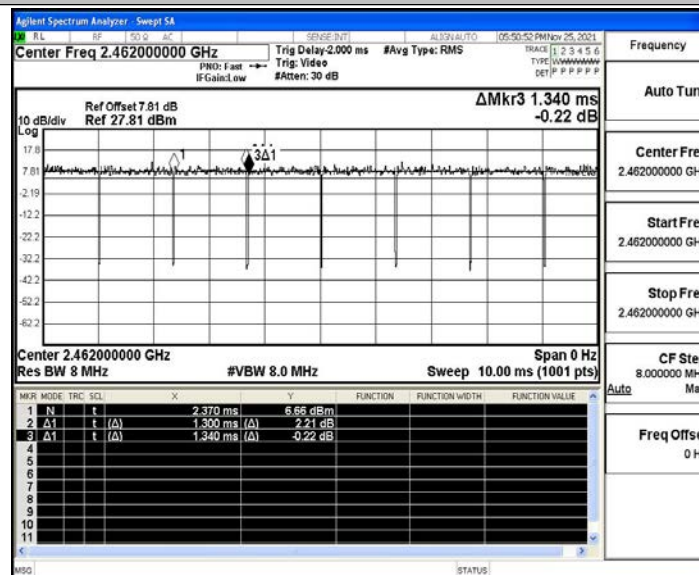
The figure shows a spectrum analyzer display. The main plot area has a logarithmic scale from -62.2 to 17.0 dBm. A signal is visible around -20 dBm. A peak marker is labeled 'ΔMkr 1.340 ms' and '0.09 dB'. The center frequency is 2.412000000 GHz. The span is 0 Hz. The resolution bandwidth (RBW) is 8 MHz. The sweep time is 10.00 ms (1001 pts). The video bandwidth (VBW) is 8.0 MHz.

MkR MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1 N	t	(A)	8.120 ms	7.64 dBm			
2 Δ1	t	(A)	1.300 ms (Δ)	-0.55 dB			
3 Δ1	t	(A)	1.340 ms (Δ)	0.09 dB			

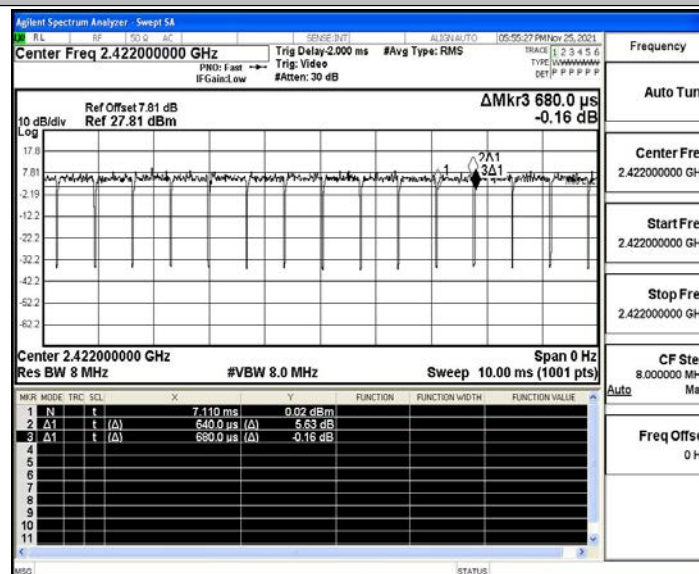
44 / 55



11N20SISO_Ant1_2462

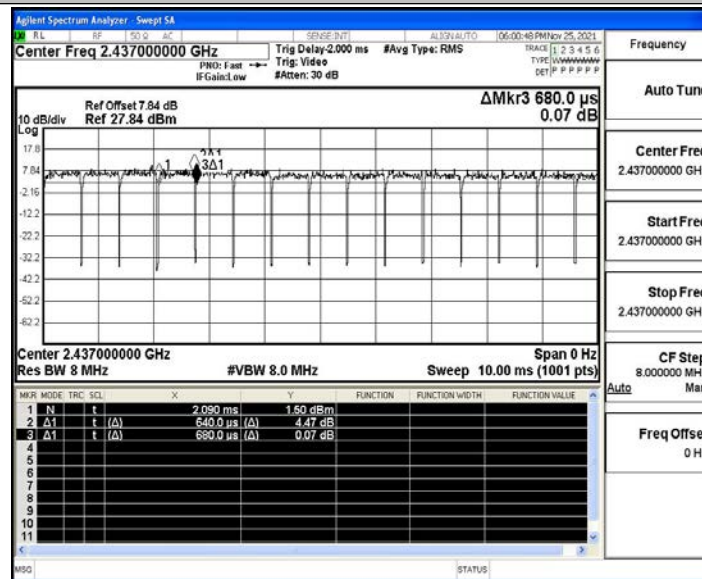


11N40SISO_Ant1_2422

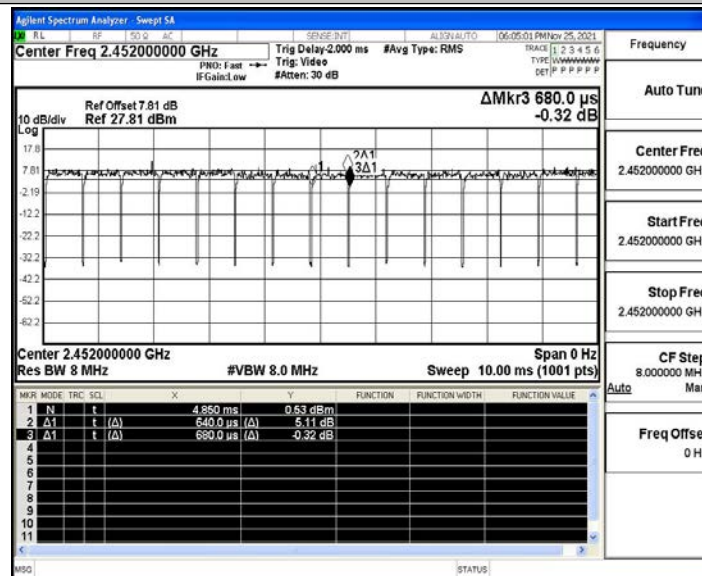




11N40SISO_Ant1_2437



11N40SISO_Ant1_2452





B.7 Emissions in Restricted Bands

Test Result

TestMode	Antenna	ChName	Channel	Detector	Freq. [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
11B	Ant1	Low	2412	AV	2310.000	-49.35	≤-41.20	45.85	≤54	PASS
				AV	2389.960	-48.89	≤-41.20	46.31	≤54	PASS
				AV	2390.000	-48.89	≤-41.20	46.31	≤54	PASS
				Peak	2310.000	-43.55	≤-21.20	51.65	≤74	PASS
				Peak	2316.510	-39.19	≤-21.20	56.01	≤74	PASS
				Peak	2390.000	-42.72	≤-21.20	52.48	≤74	PASS
		High	2462	AV	2483.500	-48.28	≤-41.20	46.92	≤54	PASS
				AV	2487.960	-46.97	≤-41.20	48.23	≤54	PASS
				AV	2500.000	-48.35	≤-41.20	46.85	≤54	PASS
				Peak	2483.500	-41.9	≤-21.20	53.30	≤74	PASS
				Peak	2498.960	-39.43	≤-21.20	55.77	≤74	PASS
				Peak	2500.000	-42.04	≤-21.20	53.16	≤74	PASS
11G	Ant1	Low	2412	AV	2310.000	-48.7	≤-41.20	46.50	≤54	PASS
				AV	2387.620	-48.3	≤-41.20	46.90	≤54	PASS
				AV	2390.000	-48.37	≤-41.20	46.83	≤54	PASS
				Peak	2310.000	-40.13	≤-21.20	55.07	≤74	PASS
				Peak	2357.850	-37.77	≤-21.20	57.43	≤74	PASS
				Peak	2390.000	-40.72	≤-21.20	54.48	≤74	PASS
		High	2462	AV	2483.500	-47.43	≤-41.20	47.77	≤54	PASS
				AV	2488.070	-45.63	≤-41.20	49.57	≤54	PASS
				AV	2500.000	-47.79	≤-41.20	47.41	≤54	PASS
				Peak	2483.500	-39.06	≤-21.20	56.14	≤74	PASS
				Peak	2488.070	-38.16	≤-21.20	57.04	≤74	PASS
				Peak	2500.000	-38.83	≤-21.20	56.37	≤74	PASS
11N20SIS O	Ant1	Low	2412	AV	2310.000	-48.73	≤-41.20	46.47	≤54	PASS
				AV	2388.270	-48.22	≤-41.20	46.98	≤54	PASS
				AV	2390.000	-48.31	≤-41.20	46.89	≤54	PASS
				Peak	2310.000	-41.24	≤-21.20	53.96	≤74	PASS
				Peak	2349.920	-38.69	≤-21.20	56.51	≤74	PASS
				Peak	2390.000	-42.56	≤-21.20	52.64	≤74	PASS
		High	2462	AV	2483.500	-47.39	≤-41.20	47.81	≤54	PASS
				AV	2488.070	-45.84	≤-41.20	49.36	≤54	PASS
				AV	2500.000	-47.91	≤-41.20	47.29	≤54	PASS
				Peak	2483.500	-39.66	≤-21.20	55.54	≤74	PASS
				Peak	2491.700	-37.95	≤-21.20	57.25	≤74	PASS
				Peak	2500.000	-41.74	≤-21.20	53.46	≤74	PASS
11N40SIS	Ant1	Low	2422	AV	2310.000	-48.58	≤-41.20	46.62	≤54	PASS



O				AV	2386.450	-47.93	≤-41.20	47.27	≤54	PASS
				AV	2390.000	-48.18	≤-41.20	47.02	≤54	PASS
				Peak	2310.000	-41.82	≤-21.20	53.38	≤74	PASS
				Peak	2377.870	-39.29	≤-21.20	55.91	≤74	PASS
				Peak	2390.000	-41.38	≤-21.20	53.82	≤74	PASS
		High	2452	AV	2483.500	-47.05	≤-41.20	48.15	≤54	PASS
				AV	2485.980	-46.95	≤-41.20	48.25	≤54	PASS
				AV	2500.000	-47.61	≤-41.20	47.59	≤54	PASS
				Peak	2483.500	-38.45	≤-21.20	56.75	≤74	PASS
				Peak	2485.980	-36.65	≤-21.20	58.55	≤74	PASS
				Peak	2500.000	-40.44	≤-21.20	54.76	≤74	PASS

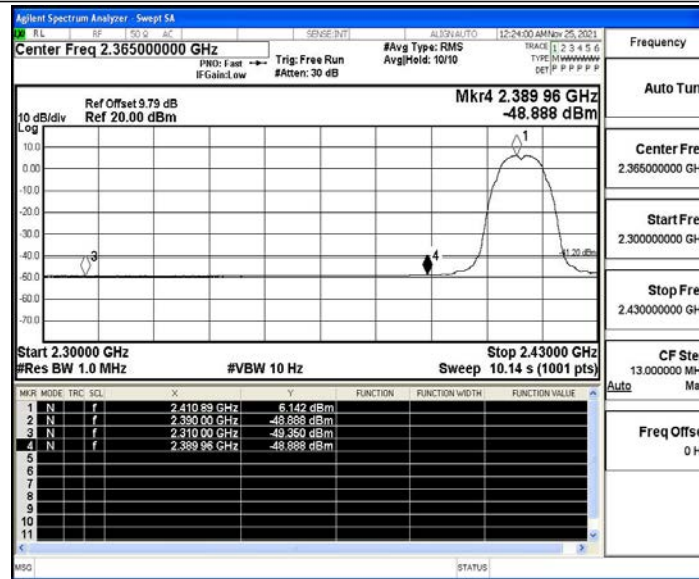
Note:

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.

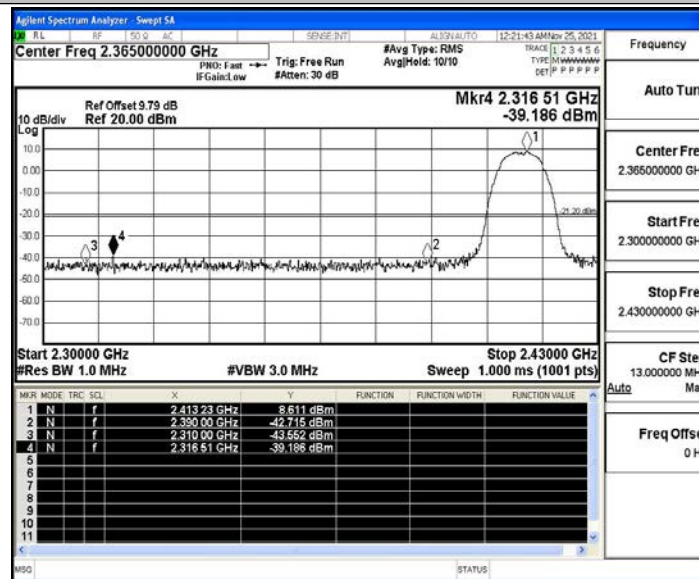


Test Graphs

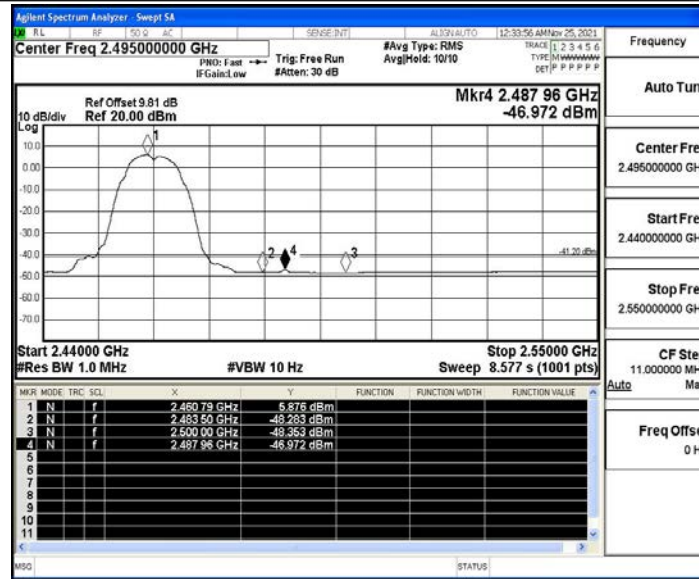
11B_Ant1_Low_2412_AV



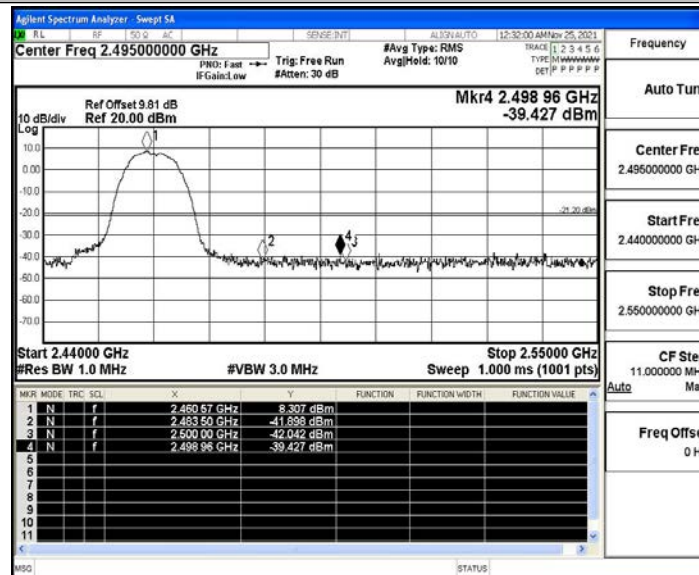
11B_Ant1_Low_2412_Peak



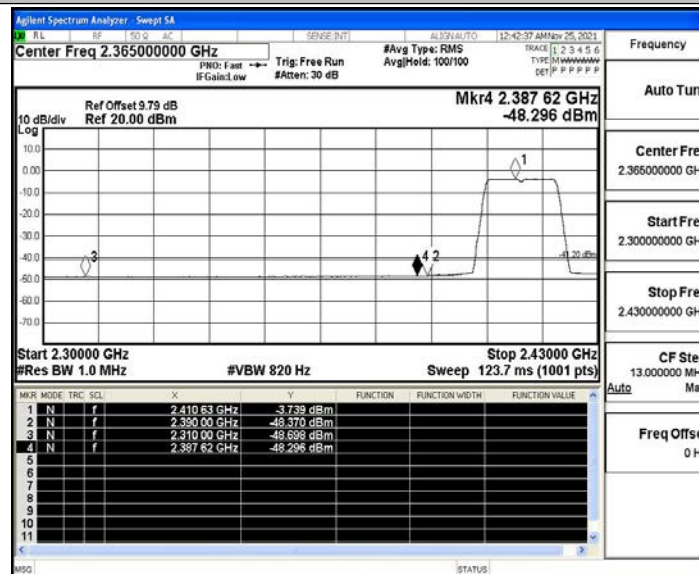
11B_Ant1_High_2462_AV



11B_Ant1_High_2462_Peak

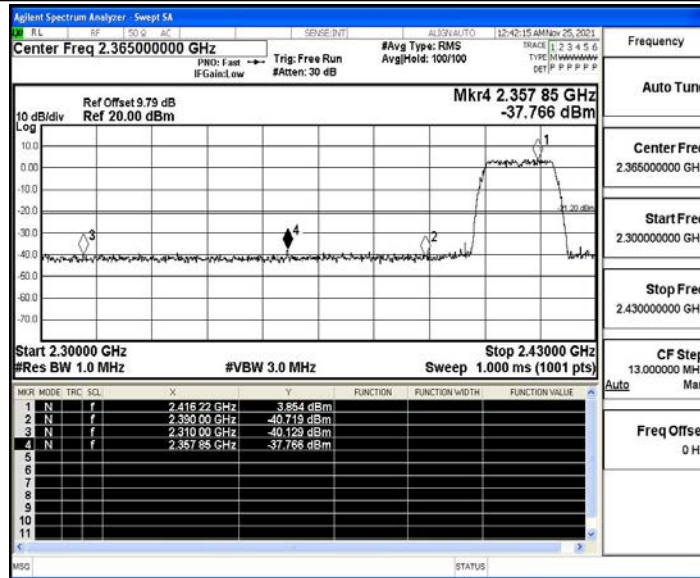


11G_Ant1_Low_2412_AV

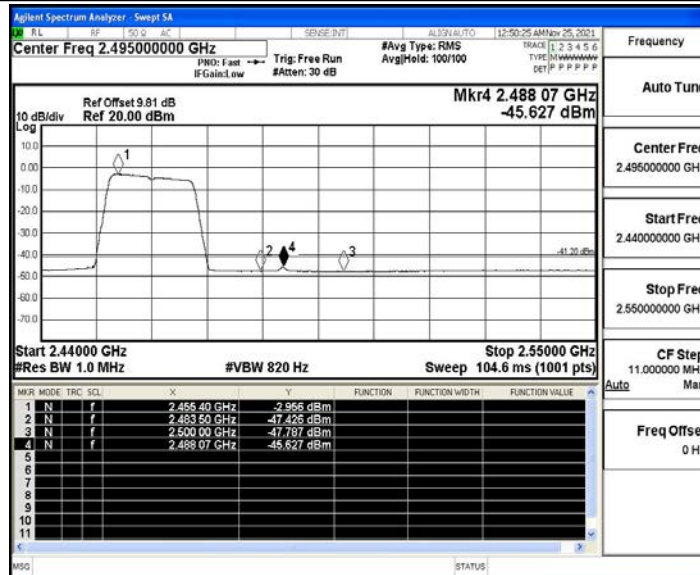




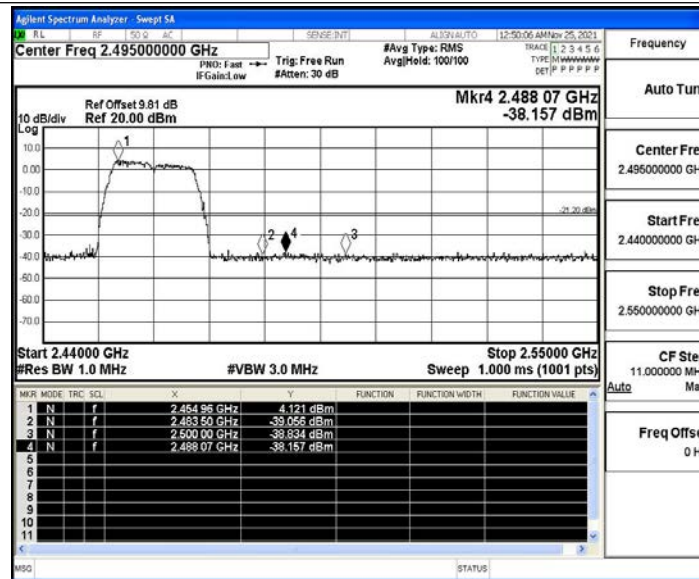
11G_Ant1_Low_2412_Peak



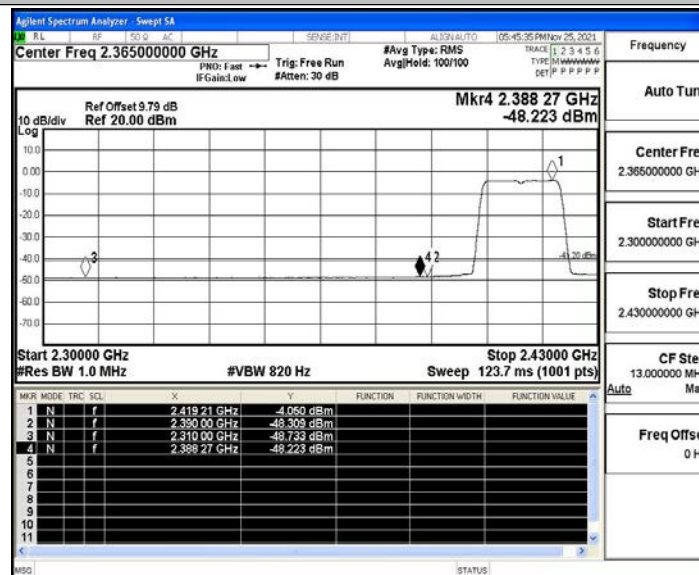
11G_Ant1_High_2462_AV



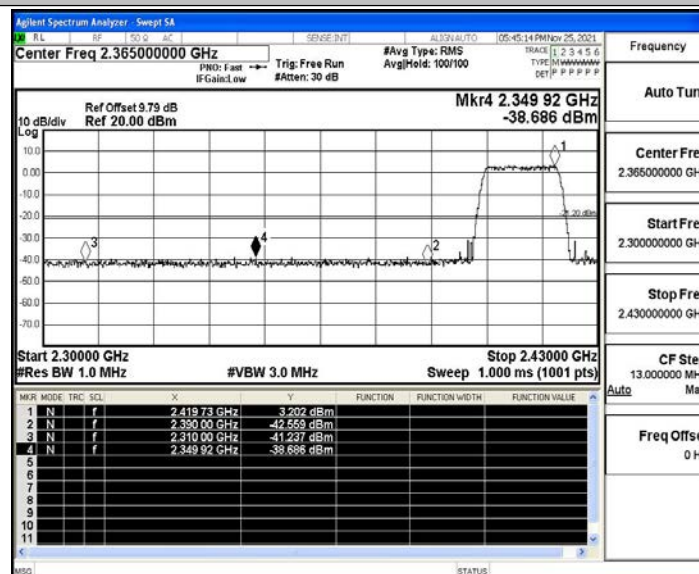
11G_Ant1_High_2462_Peak



11N20SISO_Ant1_Low_2412_AV

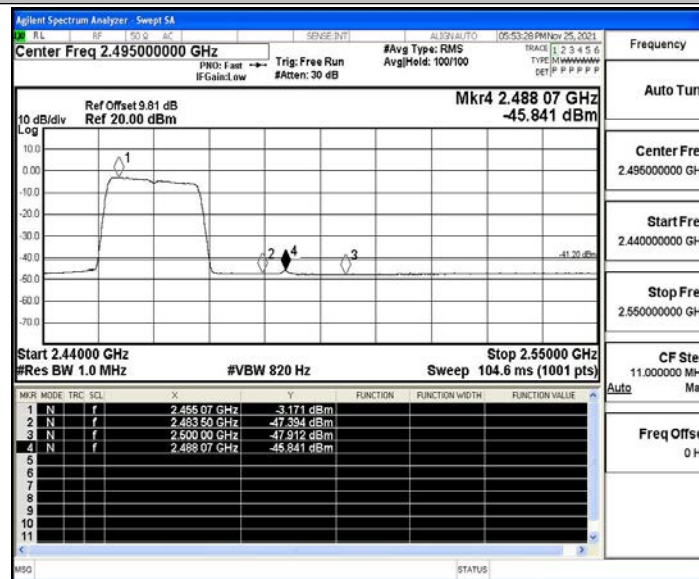


11N20SISO_Ant1_Low_2412_Peak

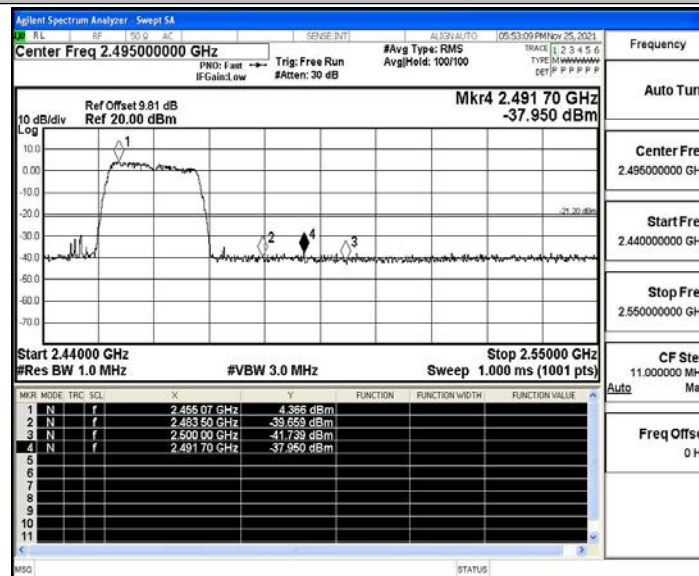




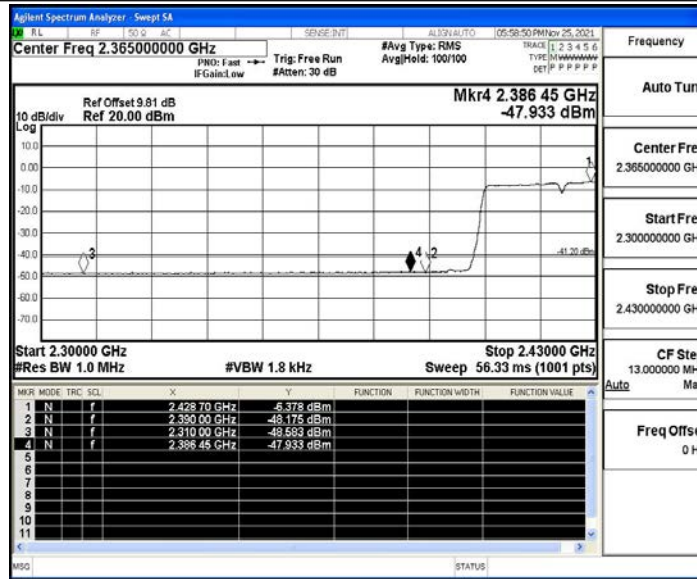
11N20SISO_Ant1_High_2462_AV



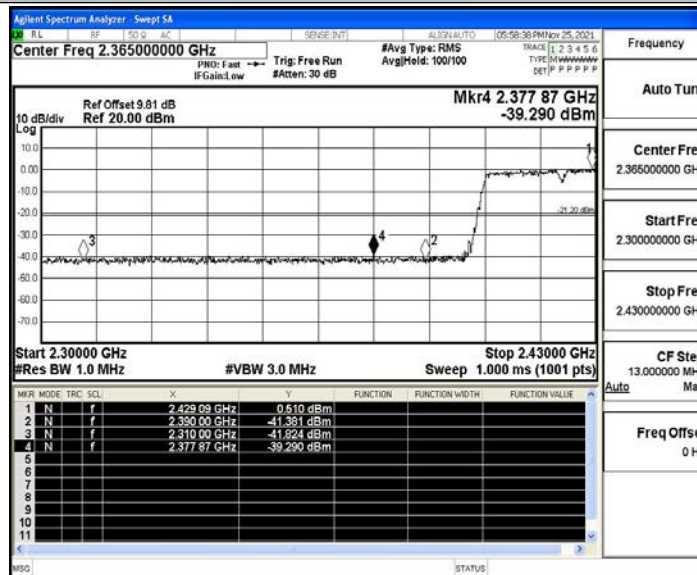
11N20SISO_Ant1_High_2462_Peak



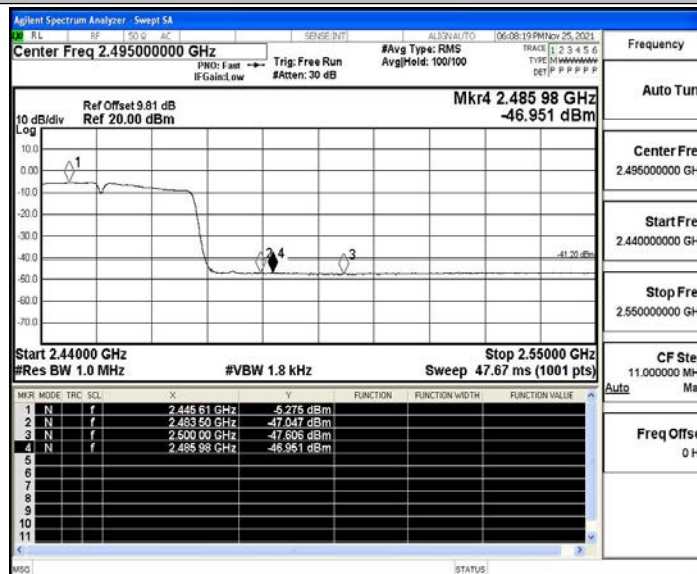
11N40SISO_Ant1_Low_2422_AV



11N40SISO_Ant1_Low_2422_Peak



11N40SISO_Ant1_High_2452_AV





11N40SISO_Ant1_High_2452_Peak

