



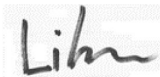
Appendix A

RF Test Data for 2.4G WIFI (Conducted Measurement)

Product Name: 3D Printer

Test Model: Adventurer 4

Environmental Conditions

Temperature:	23.5℃
Relative Humidity:	52.2%
ATM Pressure:	100.0 kPa
Test Engineer:	 Mark Chen
Supervised by:	 Li Huan



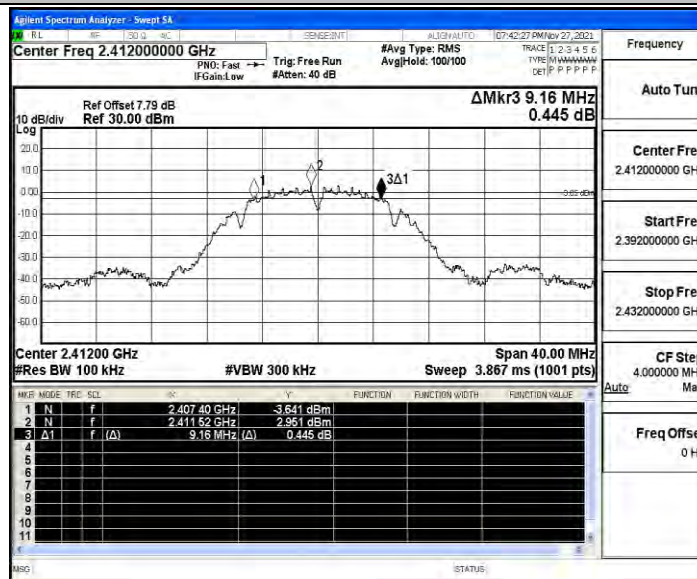
A.1 DTS Bandwidth

Test Result

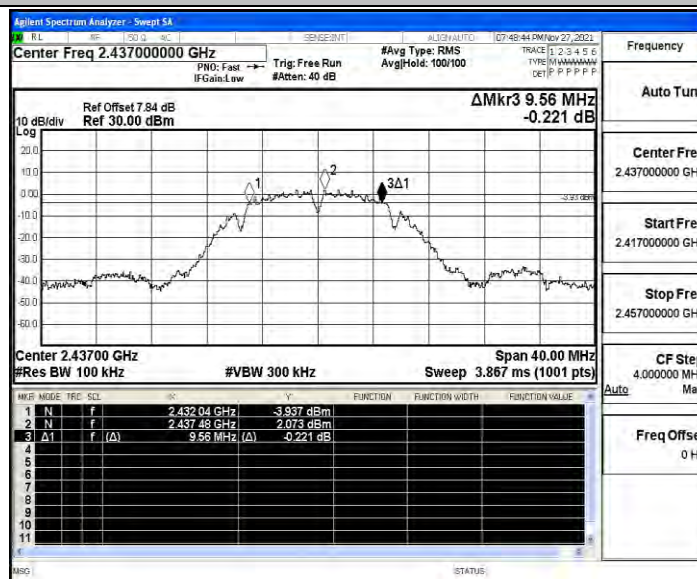
TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	9.160	2407.400	2416.560	0.5	PASS
		2437	9.560	2432.040	2441.600	0.5	PASS
		2462	9.160	2457.440	2466.600	0.5	PASS
11G	Ant1	2412	12.360	2405.680	2418.040	0.5	PASS
		2437	15.760	2429.040	2444.800	0.5	PASS
		2462	12.280	2455.640	2467.920	0.5	PASS
11N20SISO	Ant1	2412	14.760	2405.640	2420.400	0.5	PASS
		2437	15.480	2429.440	2444.920	0.5	PASS
		2462	15.200	2454.360	2469.560	0.5	PASS
11N40SISO	Ant1	2422	35.200	2404.400	2439.600	0.5	PASS
		2437	31.440	2423.160	2454.600	0.5	PASS
		2452	34.000	2435.600	2469.600	0.5	PASS

Test Graphs

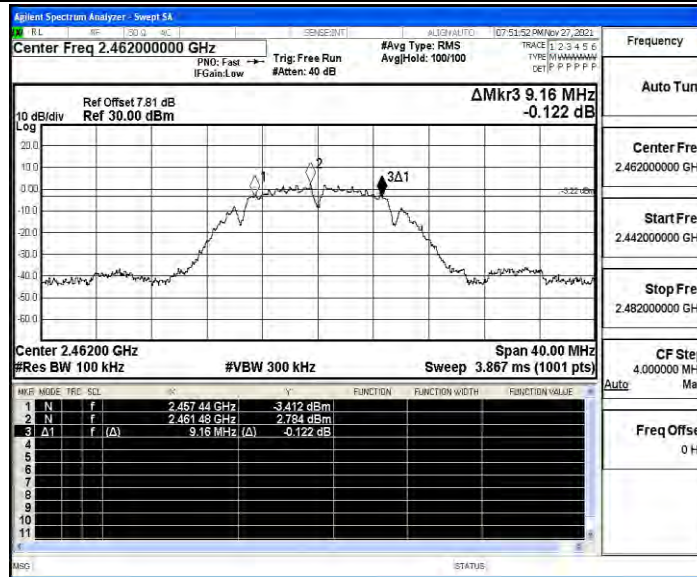
11B_Ant1_2412



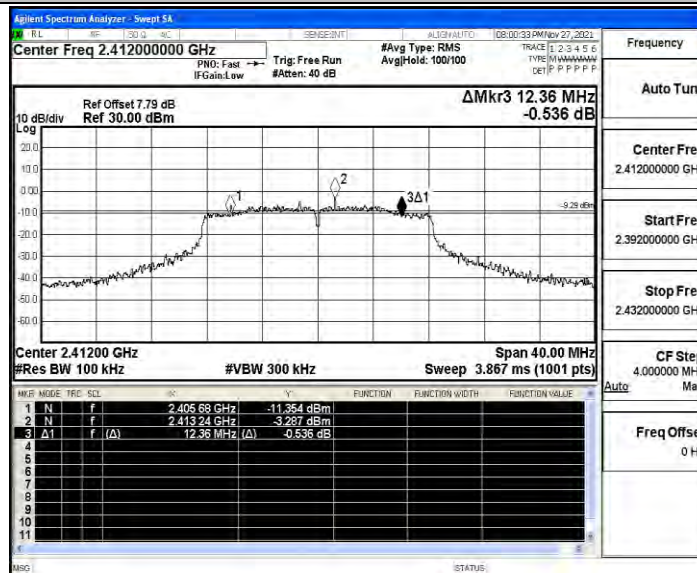
11B_Ant1_2437



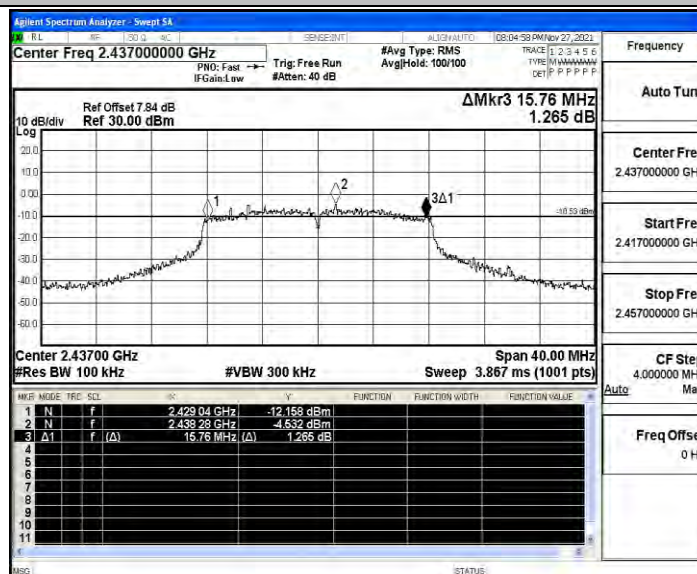
11B_Ant1_2462



11G_Ant1_2412

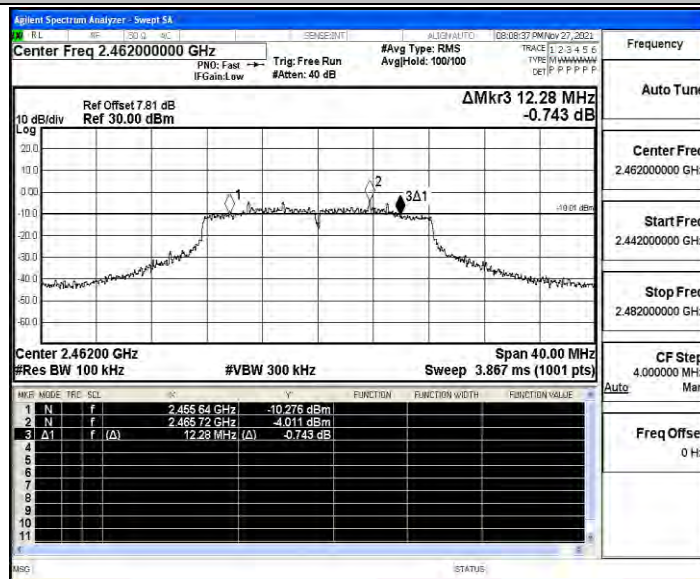


11G_Ant1_2437

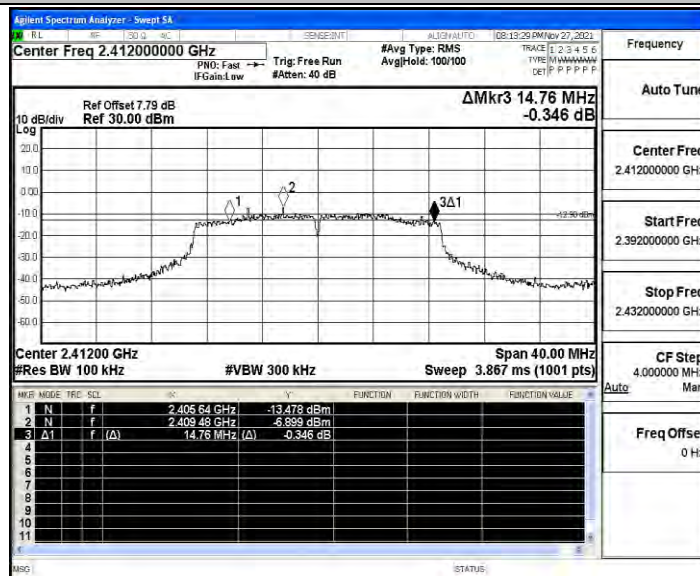




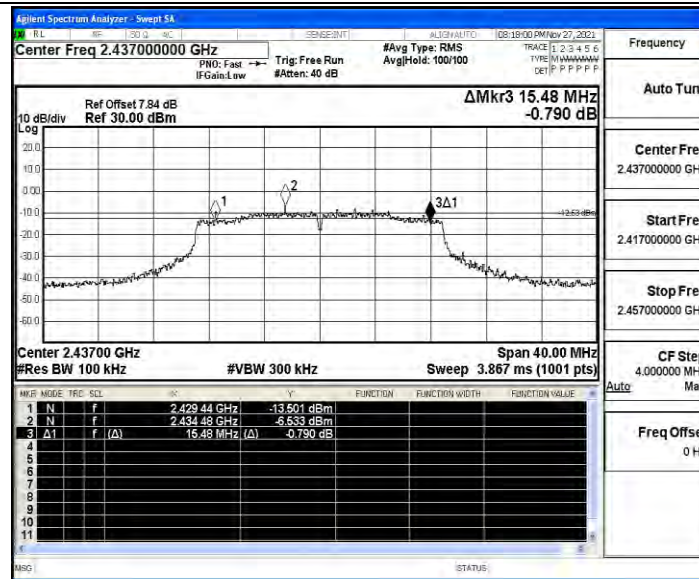
11G_Ant1_2462



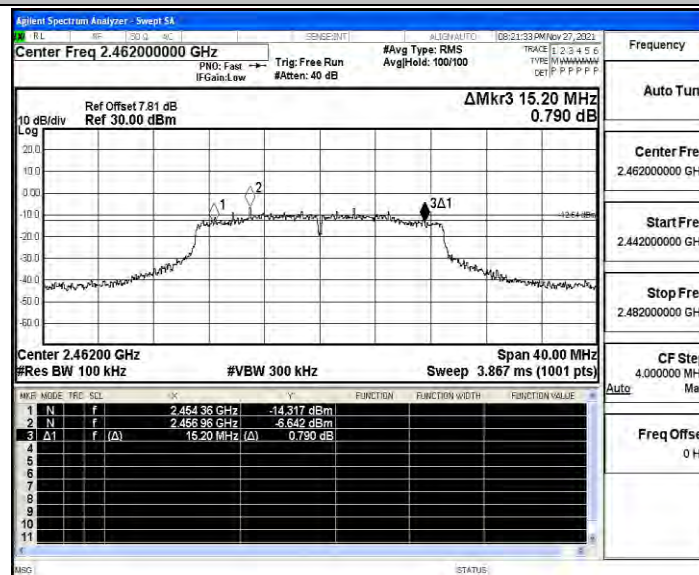
11N20SISO_Ant1_2412



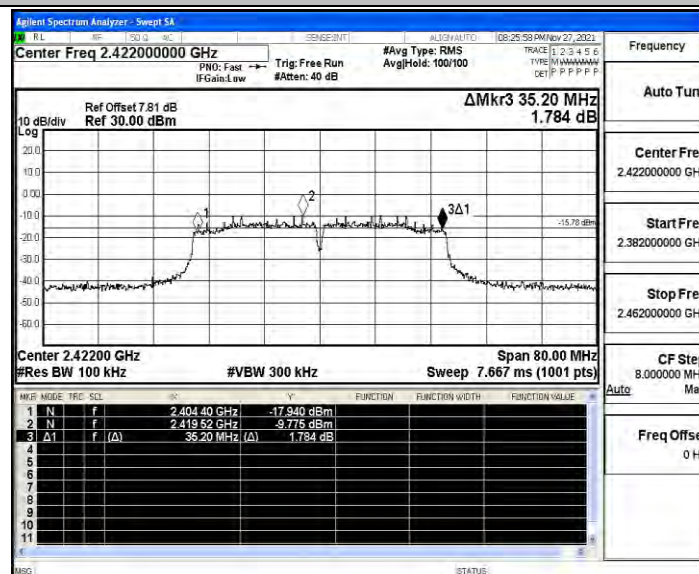
11N20SISO_Ant1_2437



11N20SISO_Ant1_2462

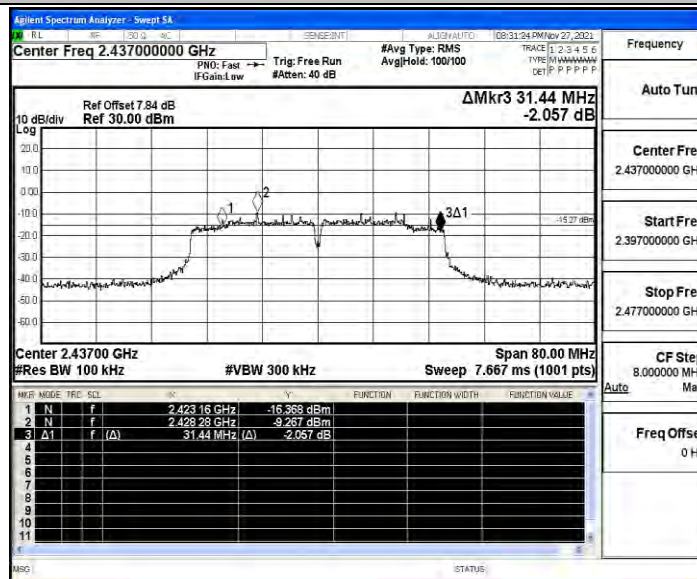


11N40SISO_Ant1_2422

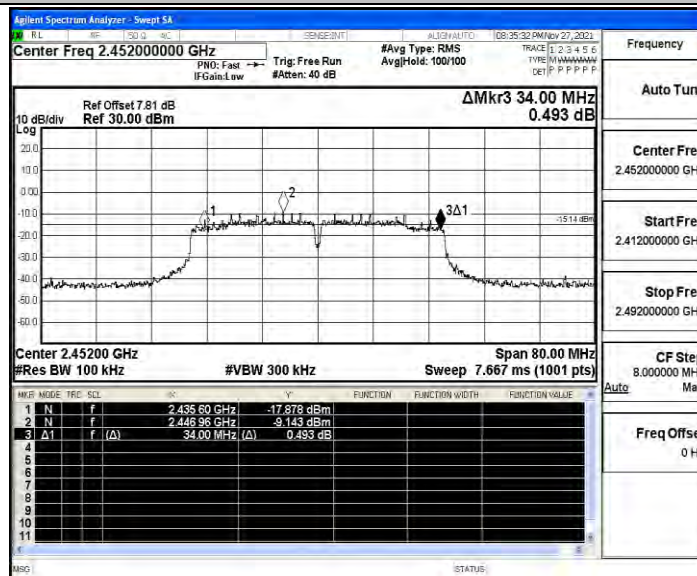




11N40SISO_Ant1_2437



11N40SISO_Ant1_2452





A.2 Maximum peak conducted output power

Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	2412	15.33	≤30	PASS
		2437	15.14	≤30	PASS
		2462	15.52	≤30	PASS
11G	Ant1	2412	14.28	≤30	PASS
		2437	14.20	≤30	PASS
		2462	14.07	≤30	PASS
11N20SISO	Ant1	2412	11.62	≤30	PASS
		2437	11.92	≤30	PASS
		2462	12.63	≤30	PASS
11N40SISO	Ant1	2422	11.77	≤30	PASS
		2437	11.90	≤30	PASS
		2452	11.88	≤30	PASS



A.3 Maximum power spectral density

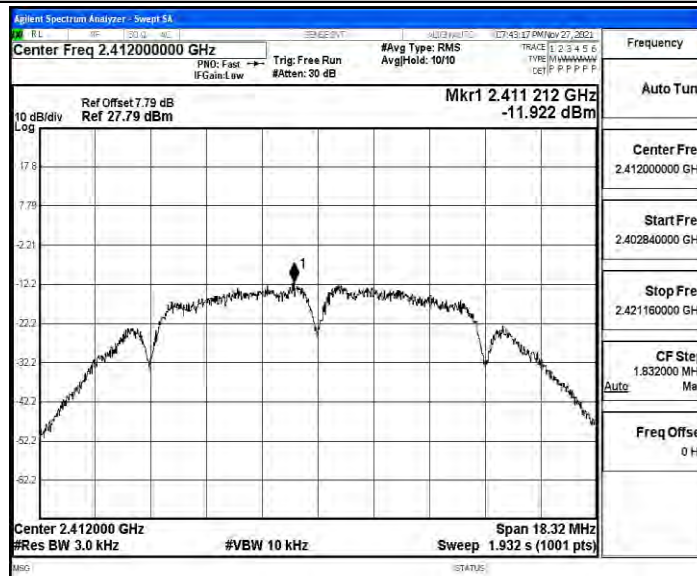
Test Result

TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-11.92	≤8	PASS
		2437	-12.03	≤8	PASS
		2462	-11.74	≤8	PASS
11G	Ant1	2412	-17.78	≤8	PASS
		2437	-17.61	≤8	PASS
		2462	-17.58	≤8	PASS
11N20SISO	Ant1	2412	-19.95	≤8	PASS
		2437	-19.56	≤8	PASS
		2462	-18.26	≤8	PASS
11N40SISO	Ant1	2422	-22.34	≤8	PASS
		2437	-22.18	≤8	PASS
		2452	-22.02	≤8	PASS

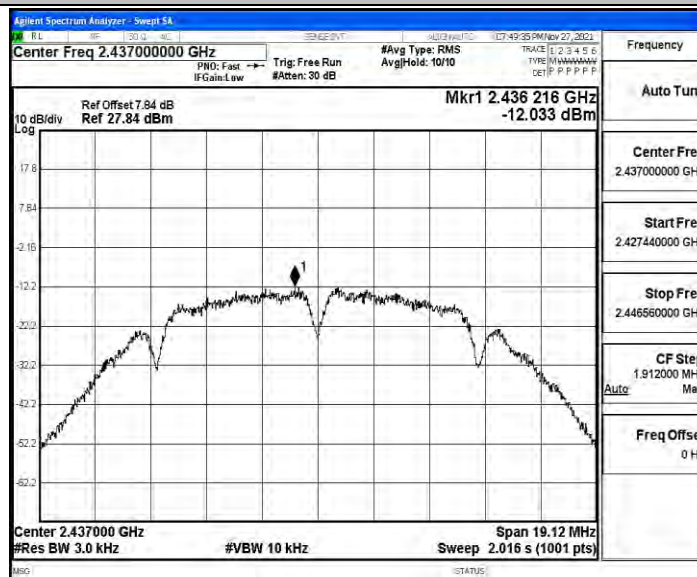


Test Graphs

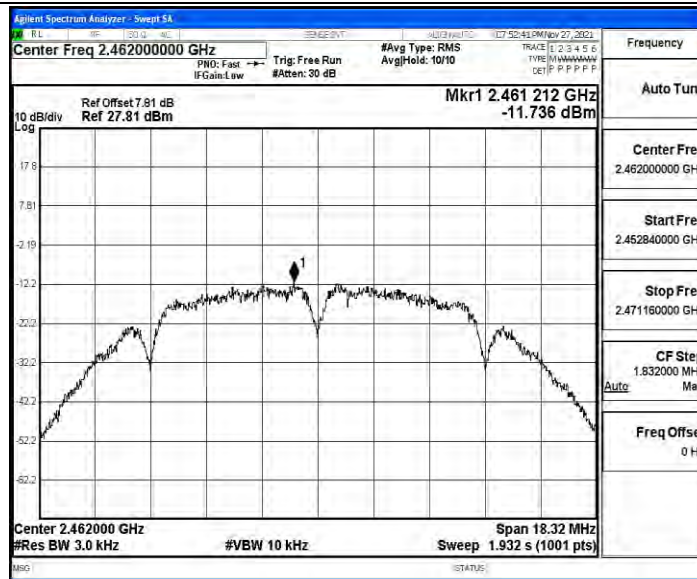
11B_Ant1_2412



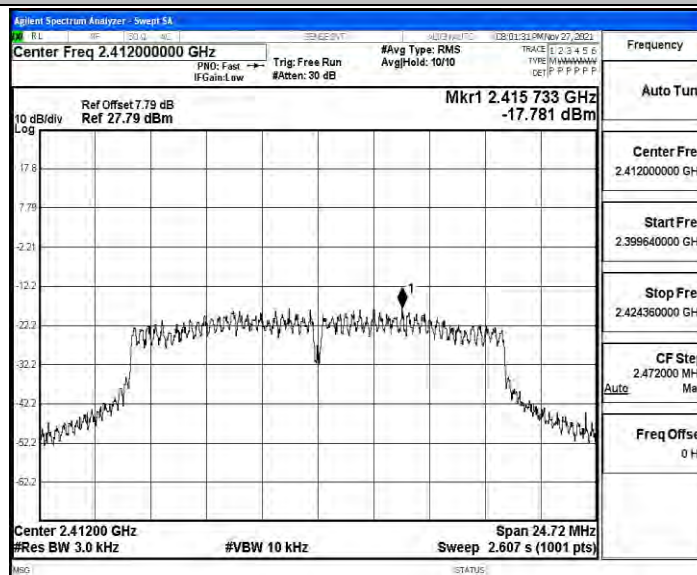
11B_Ant1_2437



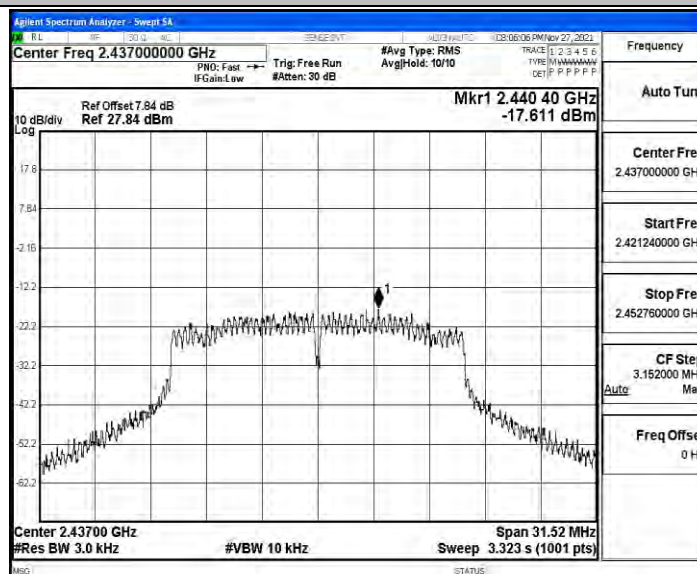
11B_Ant1_2462



11G_Ant1_2412

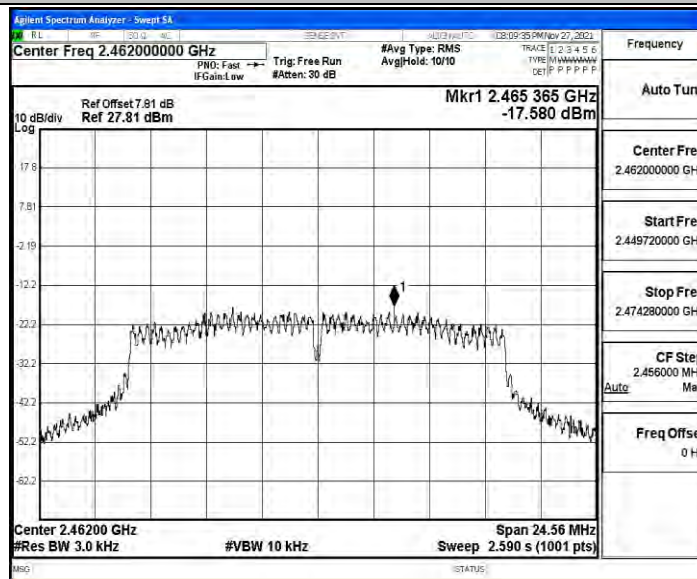


11G_Ant1_2437

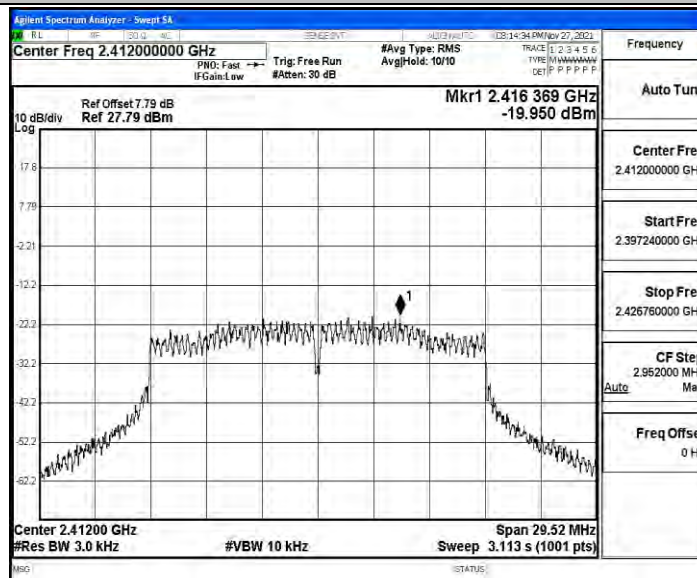




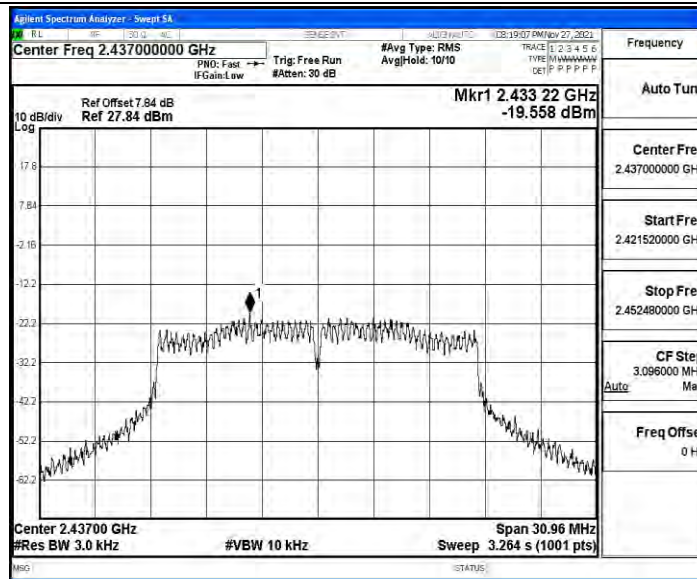
11G_Ant1_2462



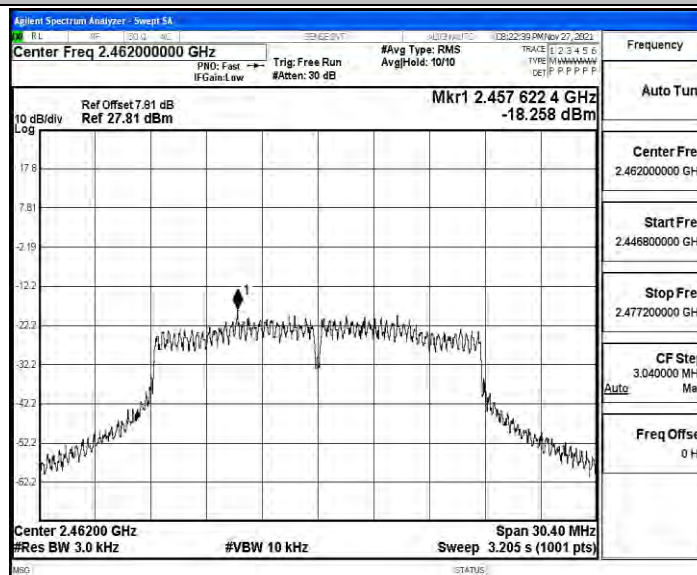
11N20SISO_Ant1_2412



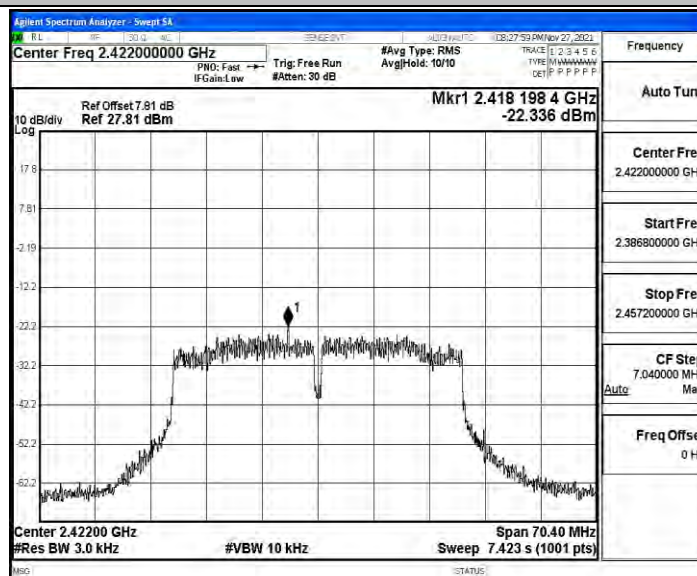
11N20SISO_Ant1_2437



11N20SISO_Ant1_2462

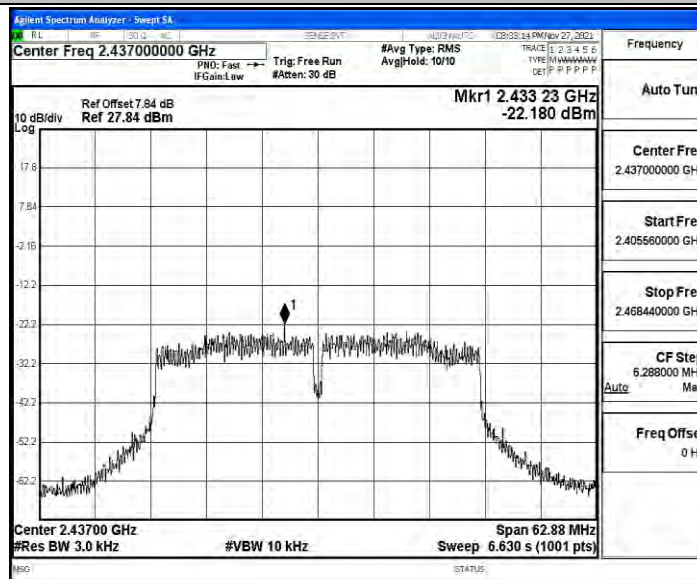


11N40SISO_Ant1_2422

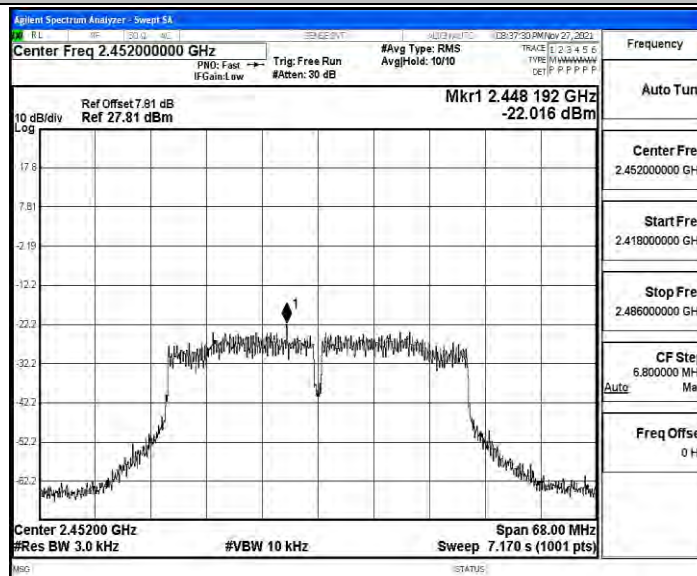




11N40SISO_Ant1_2437



11N40SISO_Ant1_2452





A.4 Band edge measurements

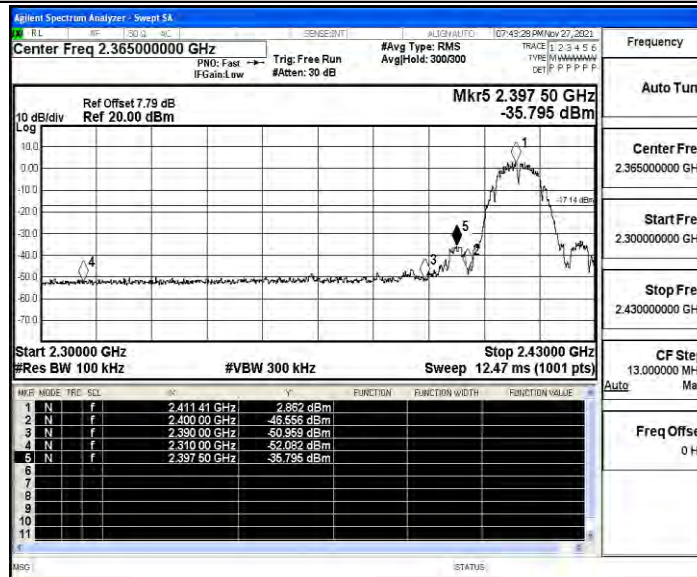
Test Result

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	2.86	-35.8	≤ -17.14	PASS
		High	2462	3.12	-45.83	≤ -16.88	PASS
11G	Ant1	Low	2412	-3.25	-33.53	≤ -23.25	PASS
		High	2462	-3.66	-48.36	≤ -23.66	PASS
11N20SISO	Ant1	Low	2412	-5.65	-36.06	≤ -25.65	PASS
		High	2462	-4.81	-48.39	≤ -24.81	PASS
11N40SISO	Ant1	Low	2422	-8.95	-39.05	≤ -28.95	PASS
		High	2452	-8.70	-46.13	≤ -28.7	PASS

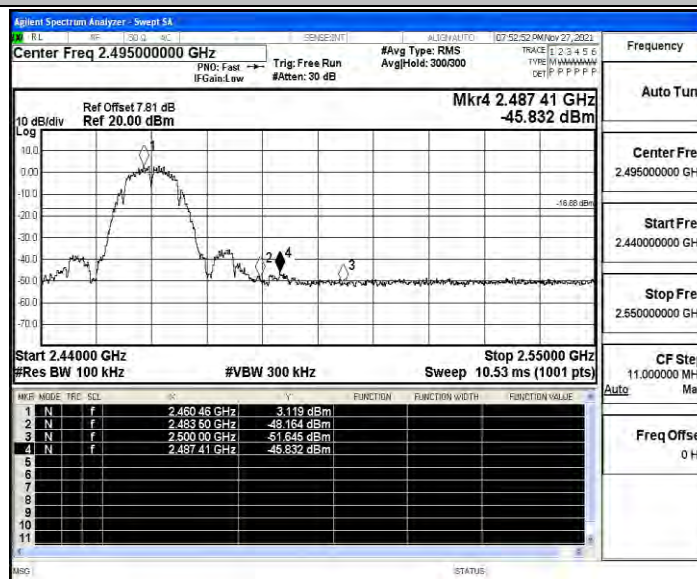


Test Graphs

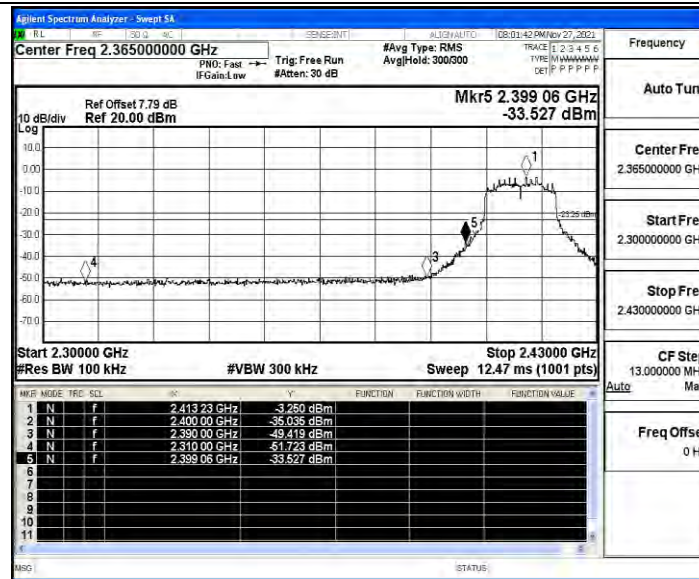
11B_Ant1_Low_2412



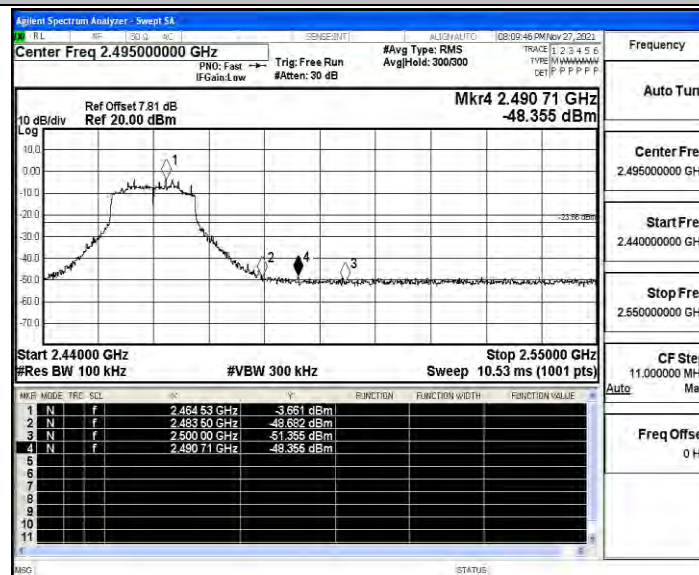
11B_Ant1_High_2462



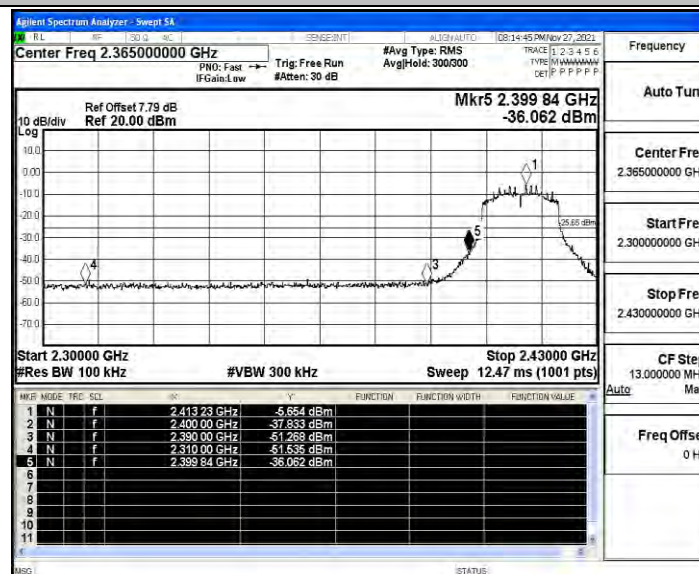
11G_Ant1_Low_2412



11G_Ant1_High_2462

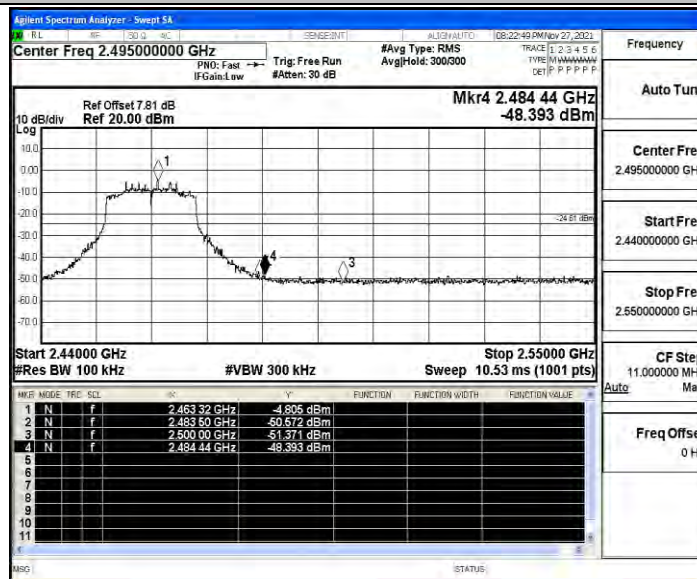


11N20SISO_Ant1_Low_2412

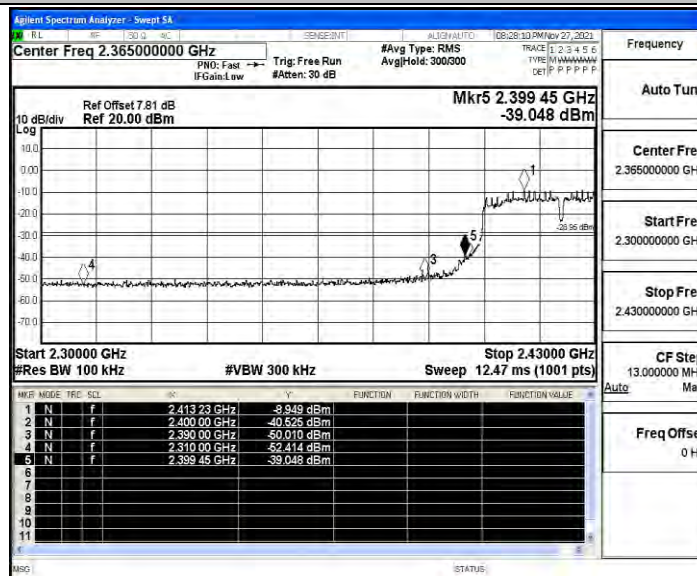




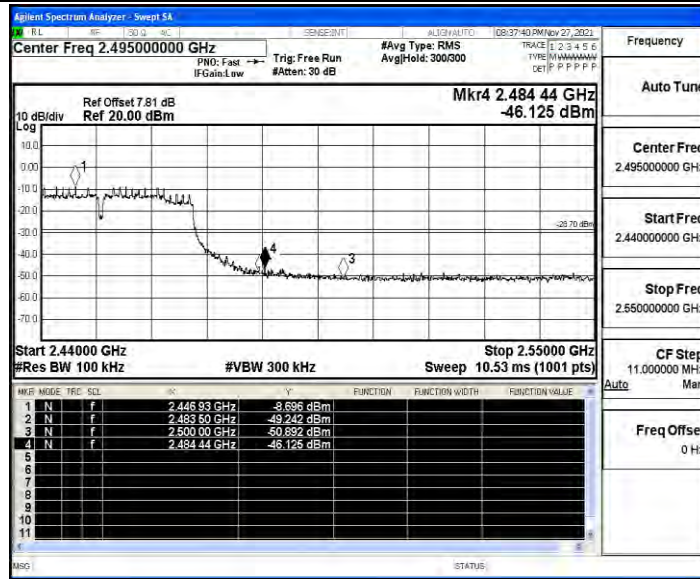
11N20SISO_Ant1_High_2462



11N40SISO_Ant1_Low_2422



11N40SISO_Ant1_High_2452





A.5 Conducted Spurious Emission

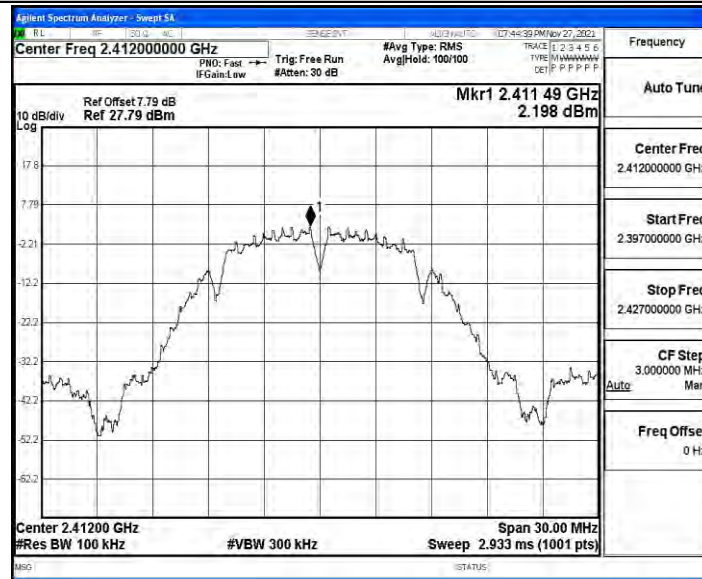
Test Result

TestMode	Antenna	Channel	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	2.20	2.20	---	PASS
			30~1000	2.20	-61.75	≤-17.8	PASS
			1000~26500	2.20	-46.7	≤-17.8	PASS
		2437	Reference	2.03	2.03	---	PASS
			30~1000	2.03	-61.15	≤-17.97	PASS
			1000~26500	2.03	-47.28	≤-17.97	PASS
		2462	Reference	3.37	3.37	---	PASS
			30~1000	3.37	-61.88	≤-16.63	PASS
			1000~26500	3.37	-46.83	≤-16.63	PASS
11G	Ant1	2412	Reference	-3.63	-3.63	---	PASS
			30~1000	-3.63	-61.49	≤-23.63	PASS
			1000~26500	-3.63	-47.2	≤-23.63	PASS
		2437	Reference	-3.03	-3.03	---	PASS
			30~1000	-3.03	-61.1	≤-23.03	PASS
			1000~26500	-3.03	-47.26	≤-23.03	PASS
		2462	Reference	-3.18	-3.18	---	PASS
			30~1000	-3.18	-62.01	≤-23.18	PASS
			1000~26500	-3.18	-47.19	≤-23.18	PASS
11N20SISO	Ant1	2412	Reference	-6.00	-6.00	---	PASS
			30~1000	-6.00	-61.75	≤-26	PASS
			1000~26500	-6.00	-47.43	≤-26	PASS
		2437	Reference	-5.64	-5.64	---	PASS
			30~1000	-5.64	-61.44	≤-25.64	PASS
			1000~26500	-5.64	-46.44	≤-25.64	PASS
		2462	Reference	-5.01	-5.01	---	PASS
			30~1000	-5.01	-61.53	≤-25.01	PASS
			1000~26500	-5.01	-47.08	≤-25.01	PASS
11N40SISO	Ant1	2422	Reference	-8.99	-8.99	---	PASS
			30~1000	-8.99	-61.73	≤-28.99	PASS
			1000~26500	-8.99	-46.15	≤-28.99	PASS
		2437	Reference	-8.99	-8.99	---	PASS
			30~1000	-8.99	-61.87	≤-28.99	PASS
			1000~26500	-8.99	-46.31	≤-28.99	PASS
		2452	Reference	-8.97	-8.97	---	PASS
			30~1000	-8.97	-60.99	≤-28.97	PASS
			1000~26500	-8.97	-46.88	≤-28.97	PASS

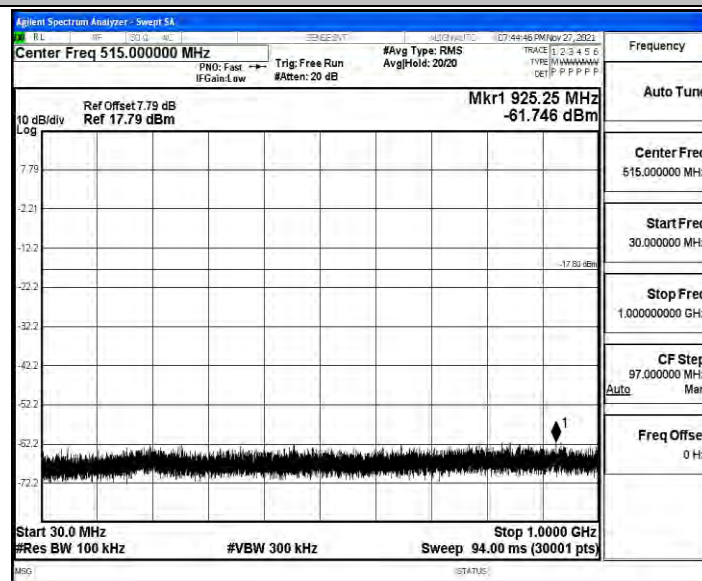


Test Graphs

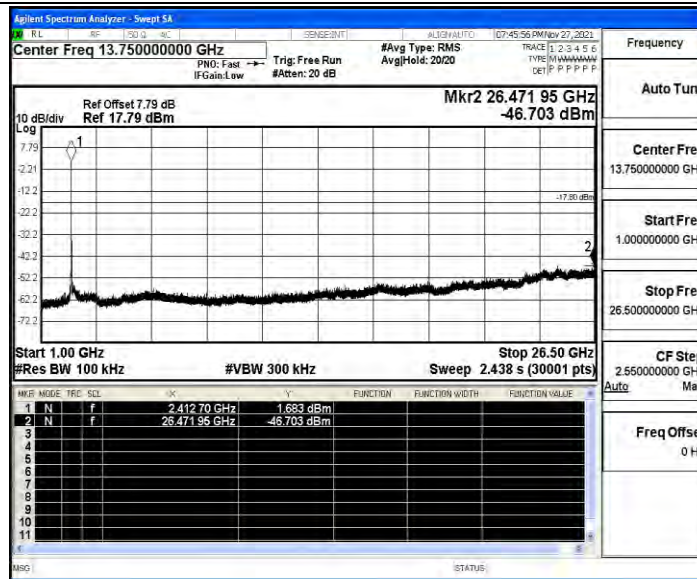
11B_Ant1_2412_0~Reference



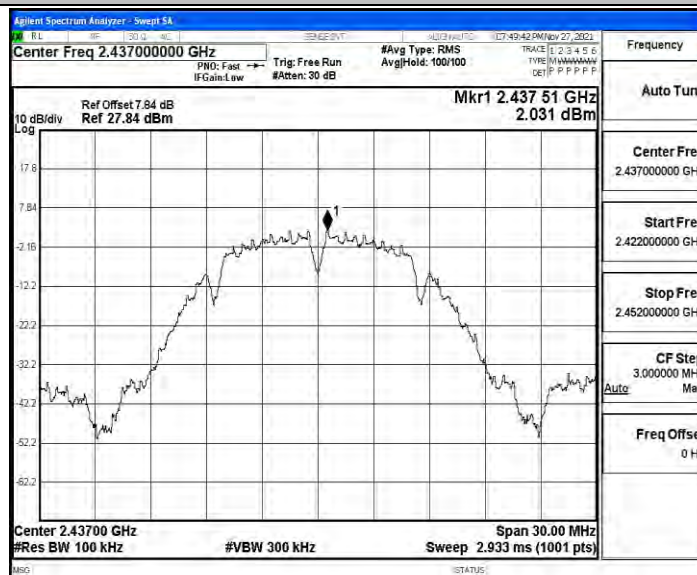
11B_Ant1_2412_30~1000



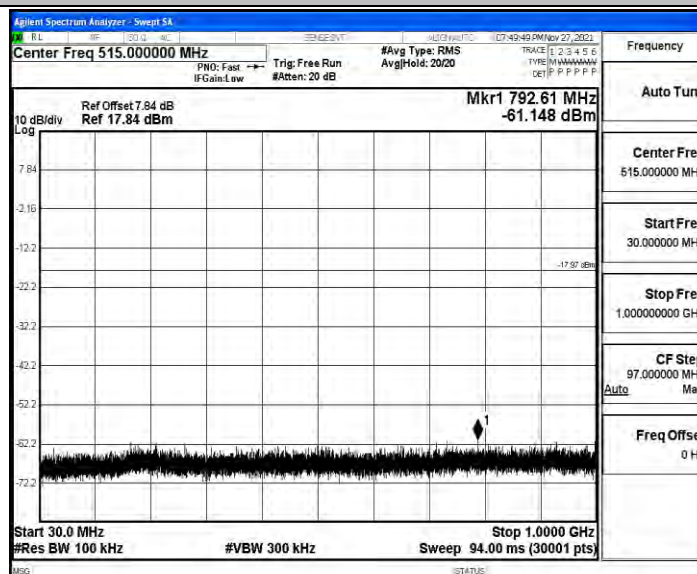
11B_Ant1_2412_1000~26500



11B_Ant1_2437_0~Reference

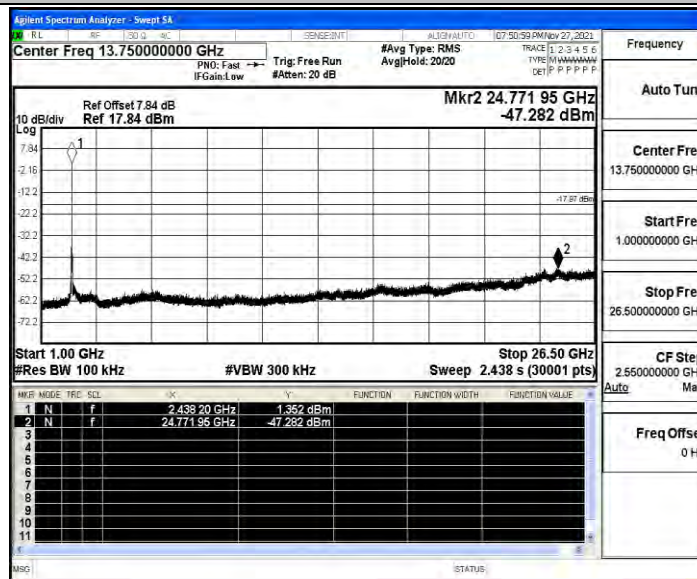


11B_Ant1_2437_30~1000

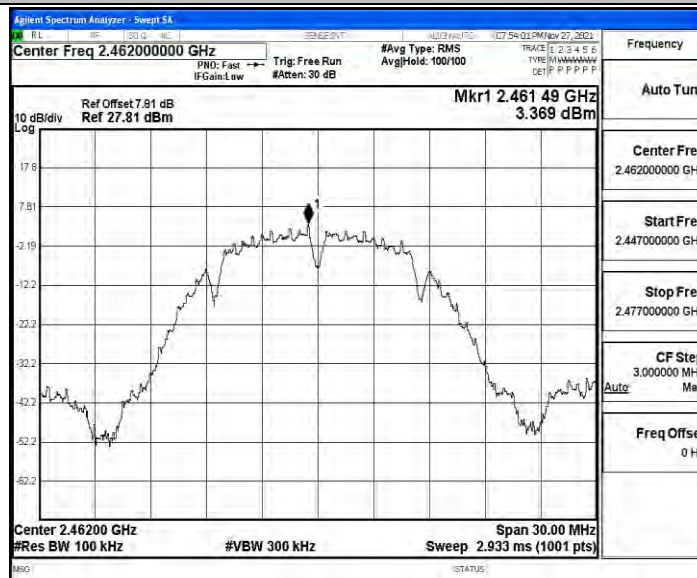




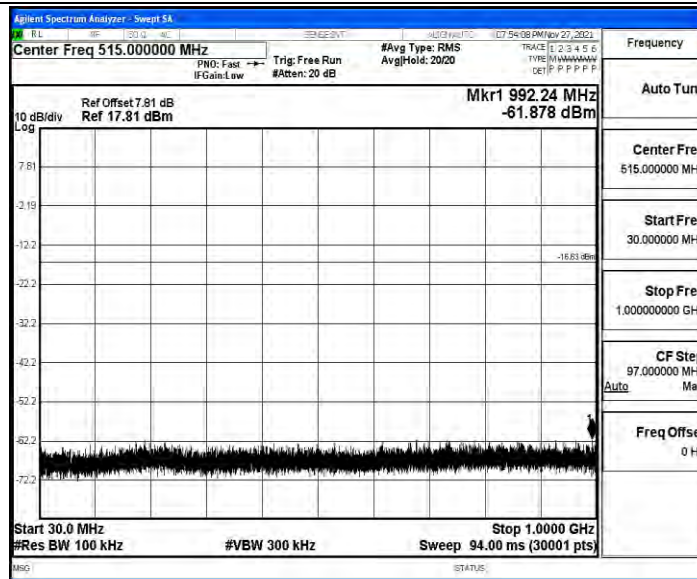
11B_Ant1_2437_1000~26500



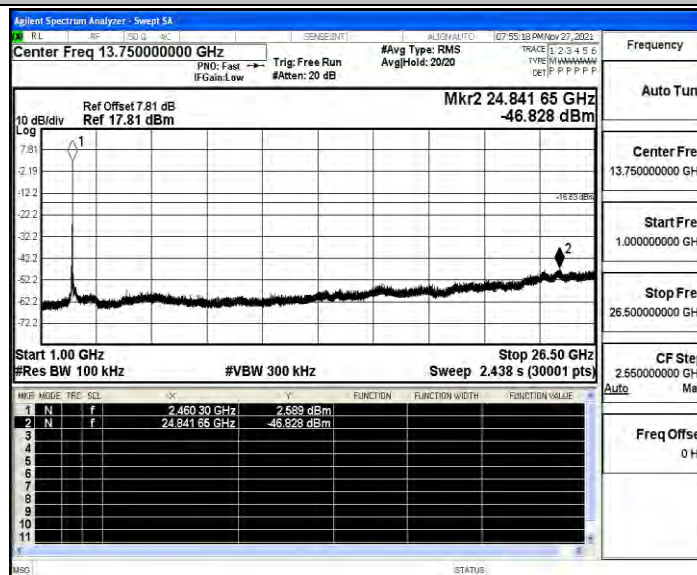
11B_Ant1_2462_0~Reference



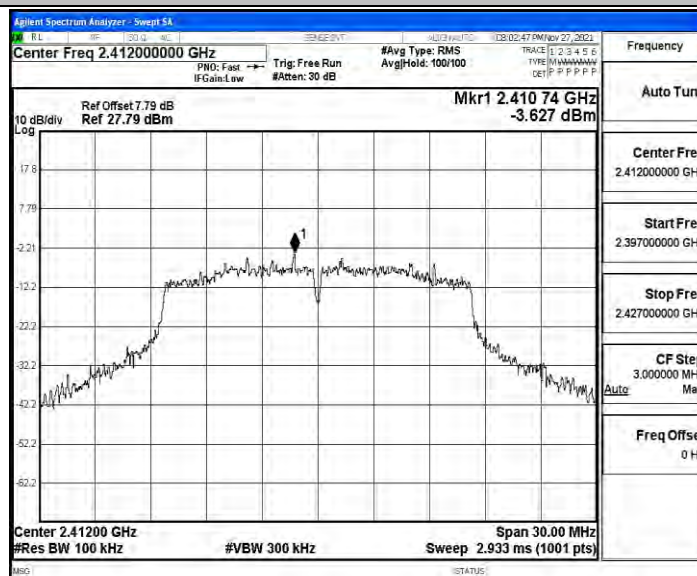
11B_Ant1_2462_30~1000

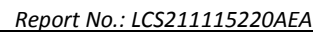


11B_Ant1_2462_1000~26500



11G_Ant1_2412_0~Reference





Agilent Spectrum Analyzer - Sweep SA

Center Freq 515.000000 MHz

Ref Offset 7.79 dB
Ref 17.79 dBm

Mkr1 527.87 MHz
-61.490 dBm

Start 30.0 MHz
#Res BW 100 kHz

Stop 1.0000 GHz
Sweep 94.00 ms (30001 pts)

Agilent Spectrum Analyzer - Sweep SA

IF L RF LO G AC

Center Freq 13.75000000 GHz

PRF: Fast IF Gain: Low

Trig: Free Run #Atten: 20 dB

#Avg Type: RMS Avg/Hold: 20/20

OB: 04/05 PM Nov 27, 2021

Trace 1: 2.34 G G

Type: M W W W W W W W

Det: P P P P P P

Frequency

Auto Tun

Center Freq

13.75000000 GHz

Start Freq

1.00000000 GHz

Stop Freq

26.50000000 GHz

CF Stop

2.65000000 GHz

Auto

Ma

Freq Offset

0 Hz

10 dB/div

Ref Offset 7.79 dB

Ref 17.79 dBm

Mkr2 24.723 50 GHz

-47.204 dBm

Log

7.79

-2.21

-12.2

-22.2

-32.2

-42.2

-52.2

-62.2

-72.2

Start 1.00 GHz

#Res BW 100 kHz

#VBW 300 kHz

Stop 26.50 GHz

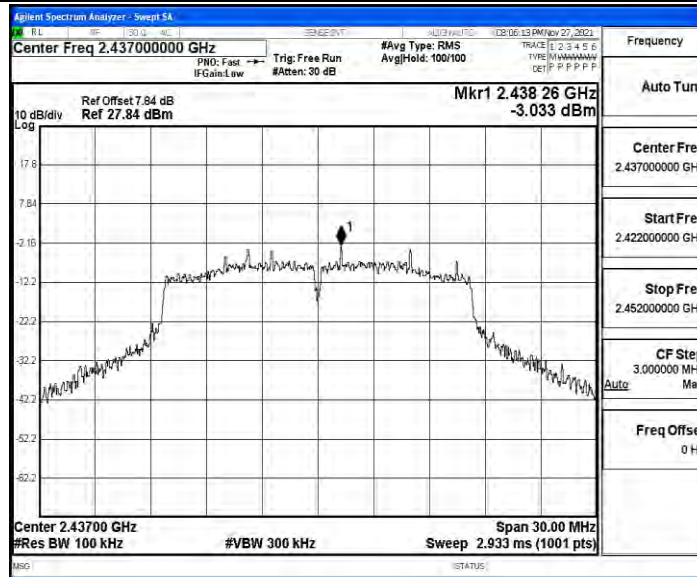
Sweep 2.438 s (30001 pts)

MKR	MIDG	FREQ	SCL	OFF	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N		F		2.410 16 GHz	-6.921 dBm		
2	N		F		24.723 50 GHz	-47.204 dBm		
3								
4								
5								
6								
7								
8								
9								
10								
11								

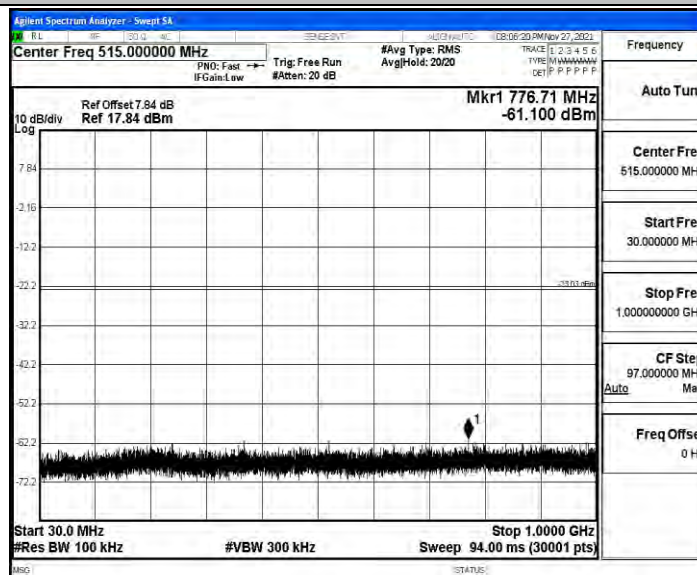
MS

STATUS

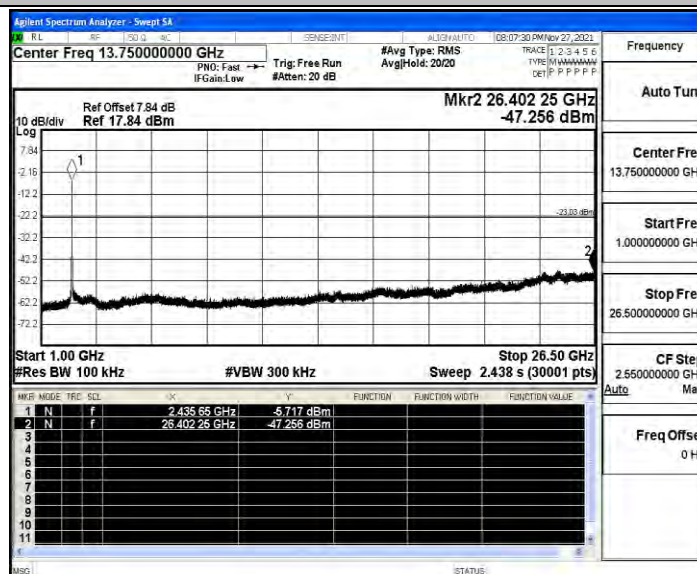
25 / 50



11G_Ant1_2437_30~1000

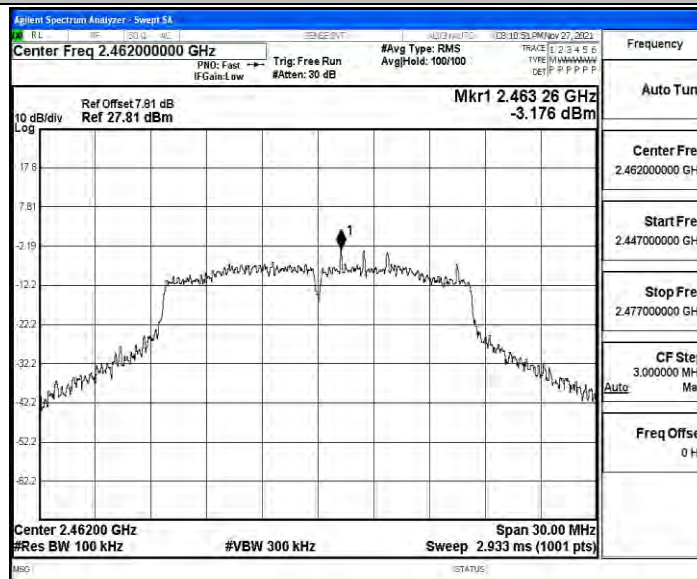


11G_Ant1_2437_1000~26500

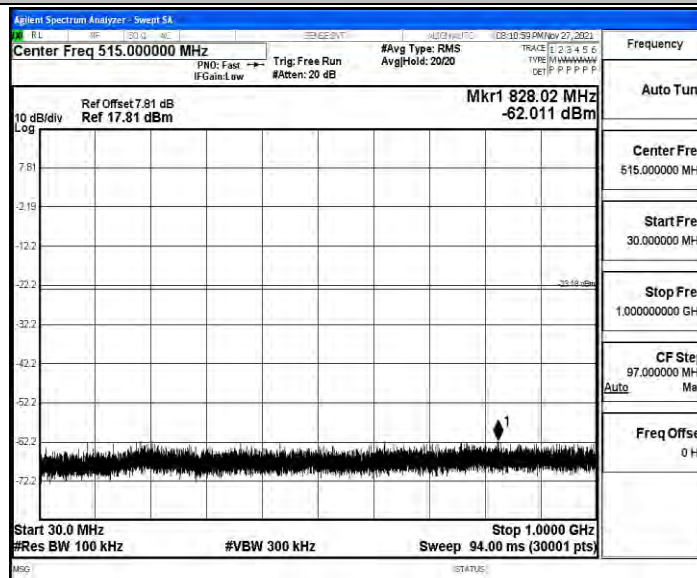




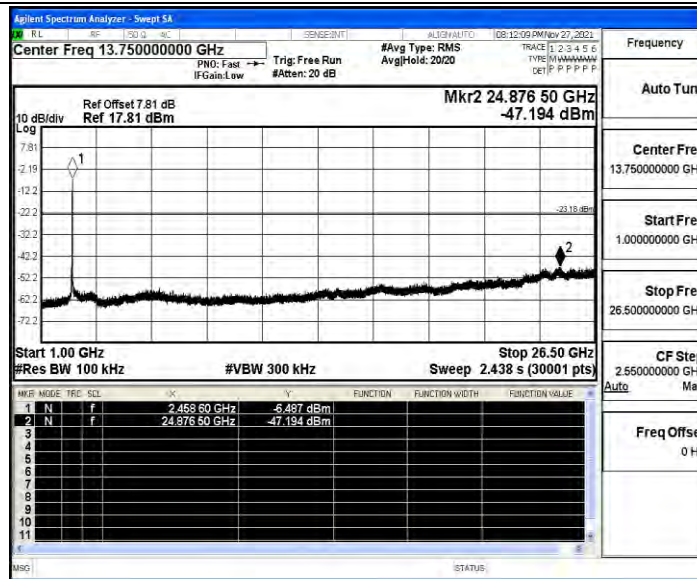
11G_Ant1_2462_0~Reference



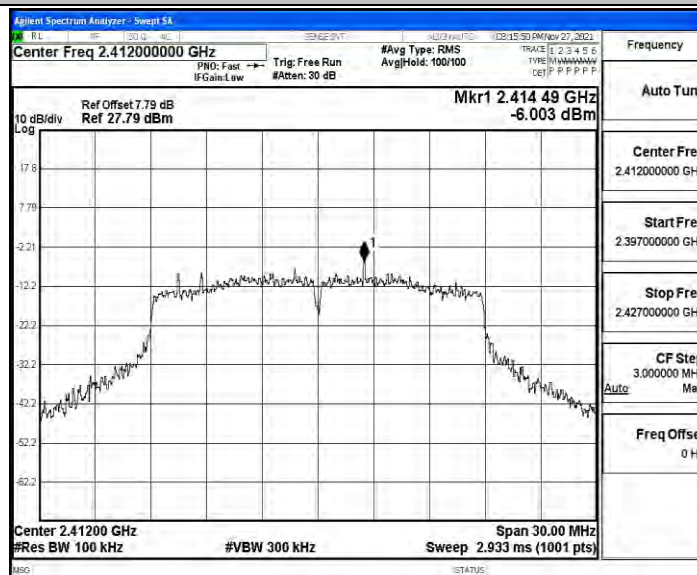
11G_Ant1_2462_30~1000



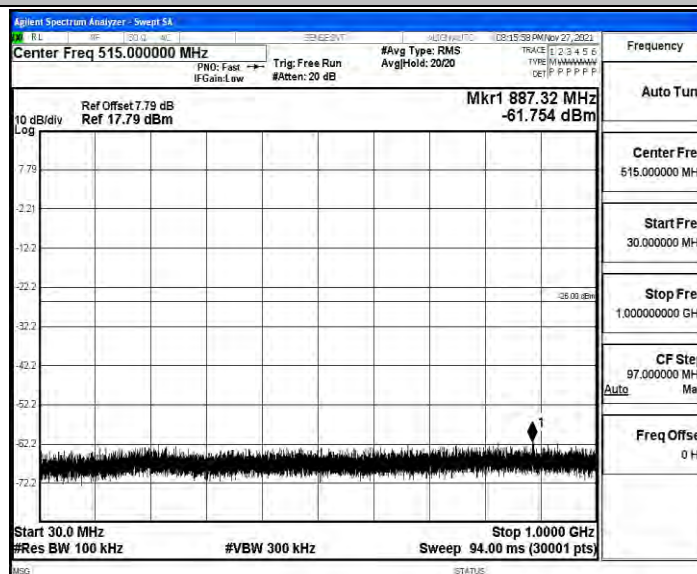
11G_Ant1_2462_1000~26500



11N20SISO_Ant1_2412_0~Reference

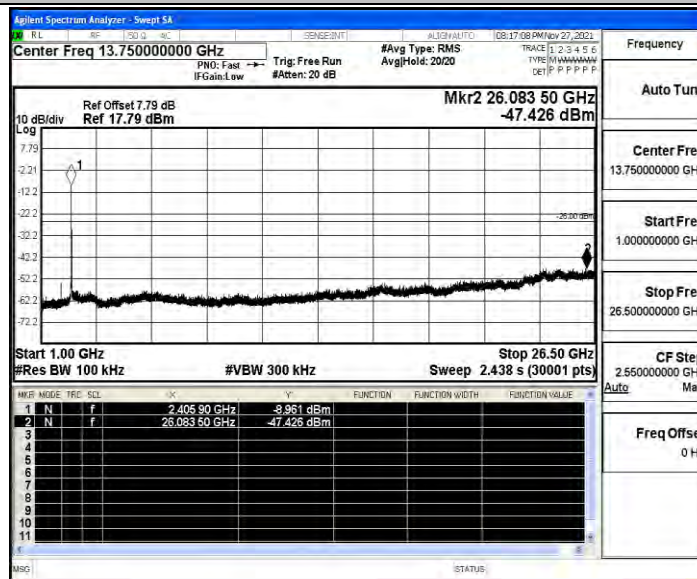


11N20SISO_Ant1_2412_30~1000

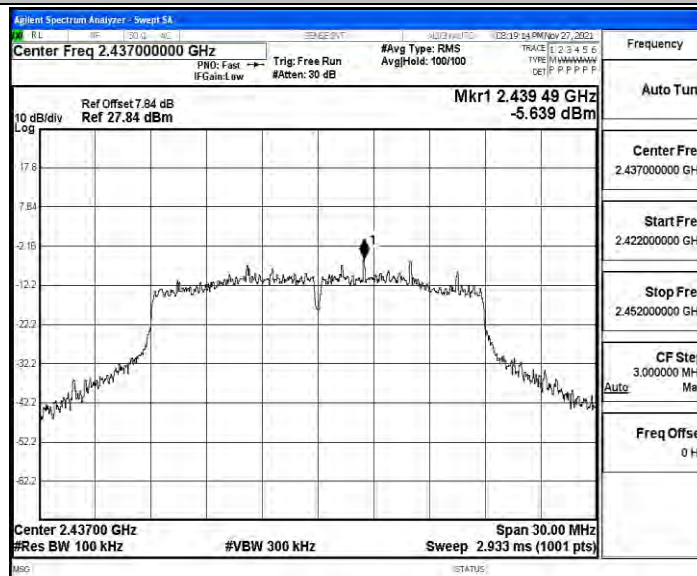




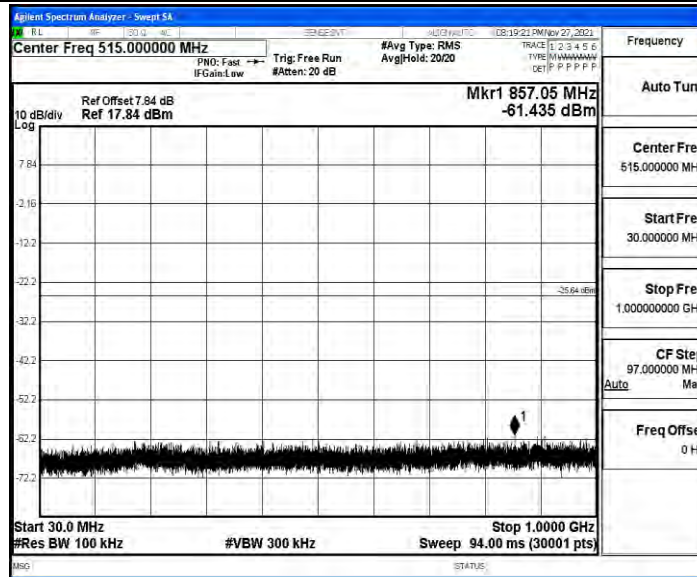
11N20SISO_Ant1_2412_1000~26500



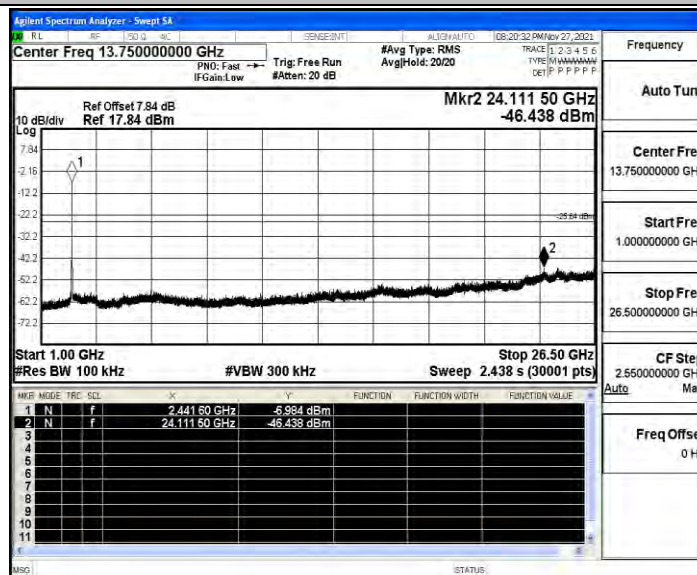
11N20SISO_Ant1_2437_0~Reference



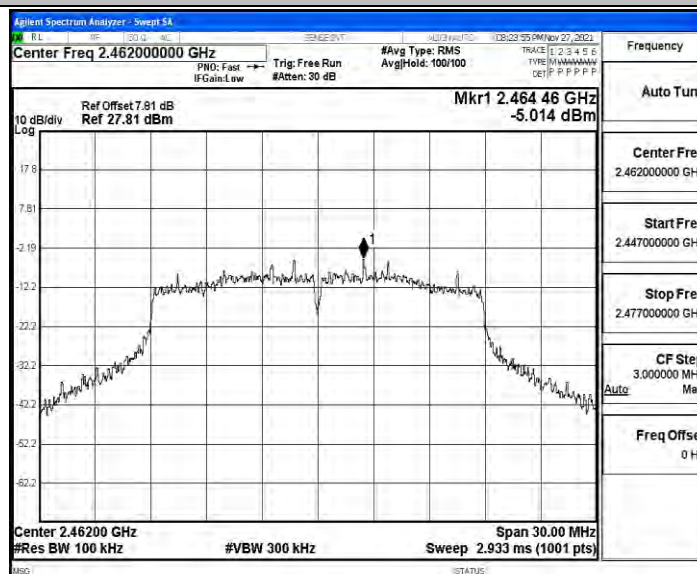
11N20SISO_Ant1_2437_30~1000



11N20SISO_Ant1_2437_1000~26500

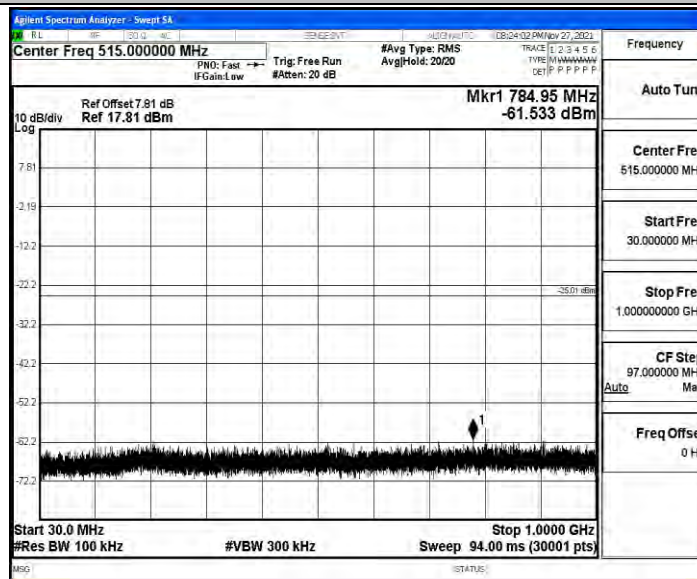


11N20SISO_Ant1_2462_0~Reference

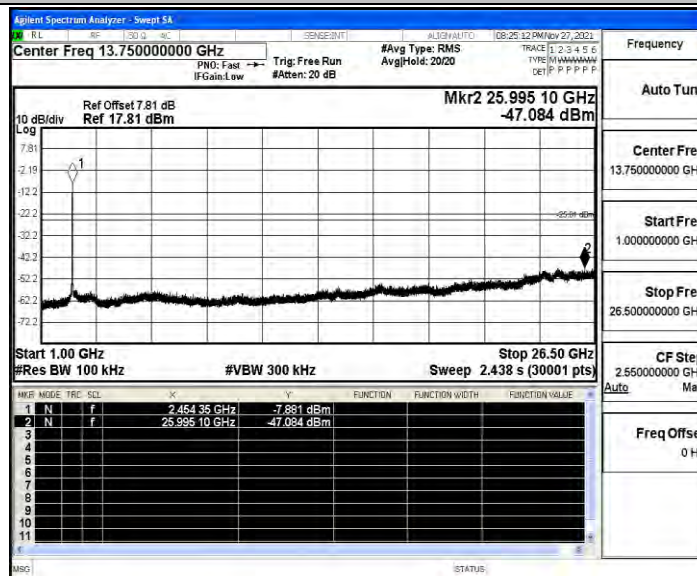




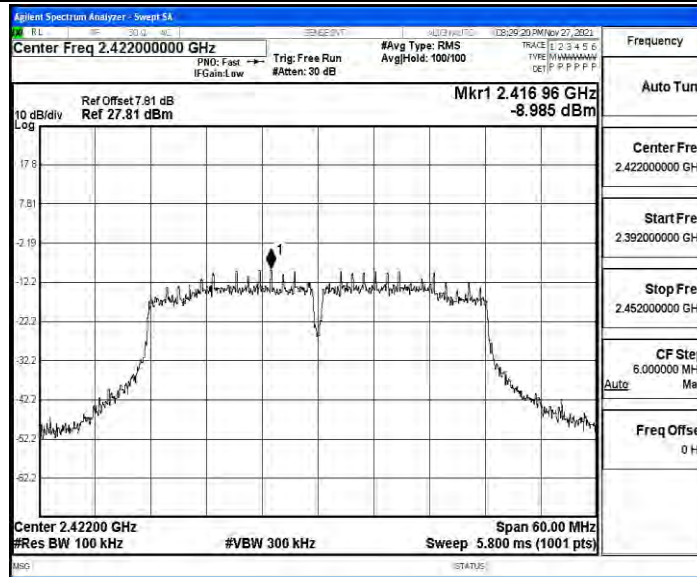
11N20SISO_Ant1_2462_30~1000



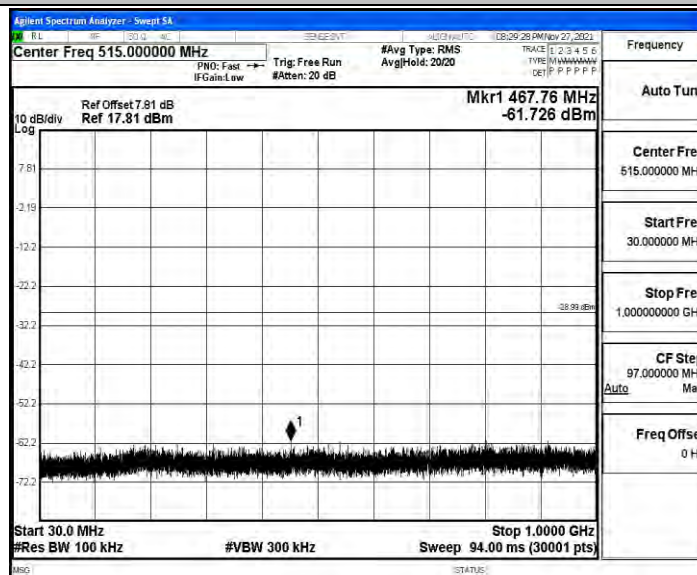
11N20SISO_Ant1_2462_1000~26500



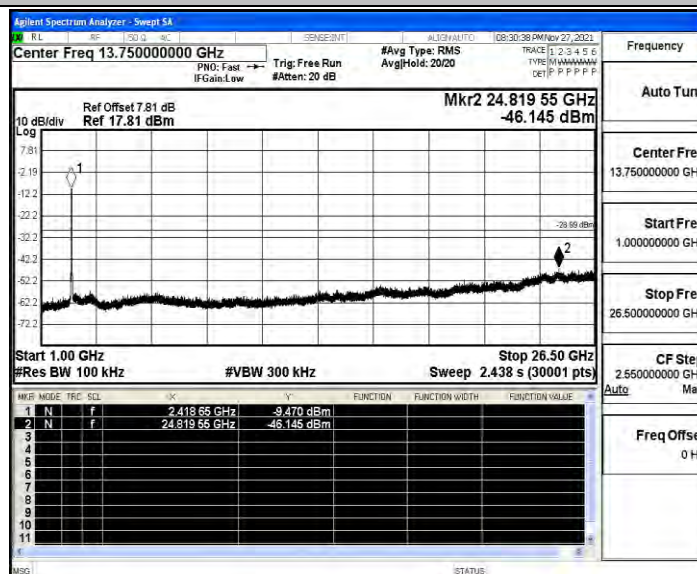
11N40SISO_Ant1_2422_0~Reference

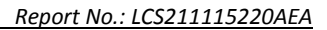


11N40SISO_Ant1_2422_30~1000



11N40SISO_Ant1_2422_1000~26500





Agilent Spectrum Analyzer - Sweep SA

Center Freq 2.437000000 GHz

Ref Offset 7.84 dB
Ref 27.84 dBm

Trig: Free Run
#Atten: 30 dB

#Avg Type: RMS
Avg/Hold: 100/100

Trace 1: 2.3456
Type: MWWWWWW
Det: P P P P P

Frequency

Auto Tun

Mkr1 2.430 70 GHz
-8.985 dBm

10 dB/div

Center Freq 2.437000000 GHz

Start Freq 2.437000000 GHz

Stop Freq 2.467000000 GHz

CF Stop 6.000000 MHz

Auto

Freq Offset 0 Hz

Center 2.437000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 60.00 MHz
Sweep 5.800 ms (1001 pts)

MSG (STATUS)

Agilent Spectrum Analyzer - Sweep SA

Center Freq 515.000000 MHz

Ref Offset 7.84 dB
Ref 17.84 dBm

Trig: Free Run
#Atten: 20 dB

#Avg Type: RMS
Avg/Hold: 2020

DATE/TIME: 08/30/20 PM Nov 27, 2021

Trace 1: 2 3 4 5 6
Type: WWWWWWWW
Det: P P P P P

10 dB/div

Log

7.84

-2.16

-12.2

-22.2

-32.2

-42.2

-52.2

-62.2

-72.2

Mkr1 208.90 MHz
-61.865 dBm

Start 30.0 MHz
#Res BW 100 kHz
#VBW 300 kHz

Stop 1.0000 GHz
Sweep 94.00 ms (30001 pts)

Frequency

Auto Tun

Center Freq
515.000000 MHz

Start Freq
30.000000 MHz

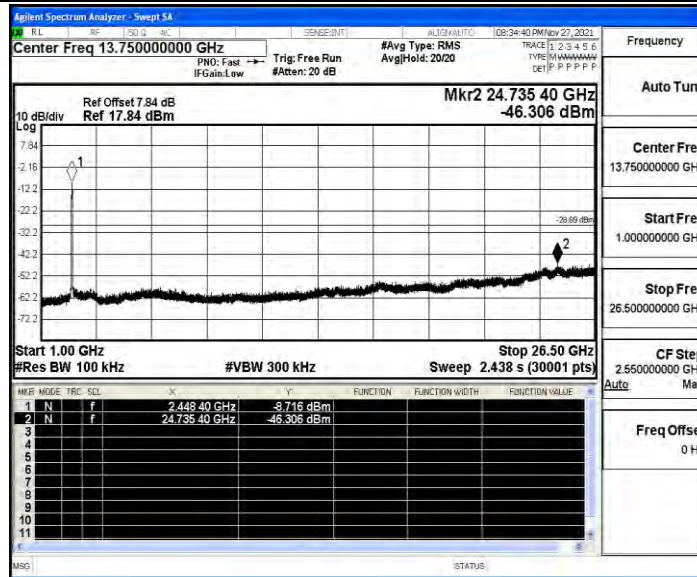
Stop Freq
1.000000000 GHz

CF Stop
97.000000 MHz

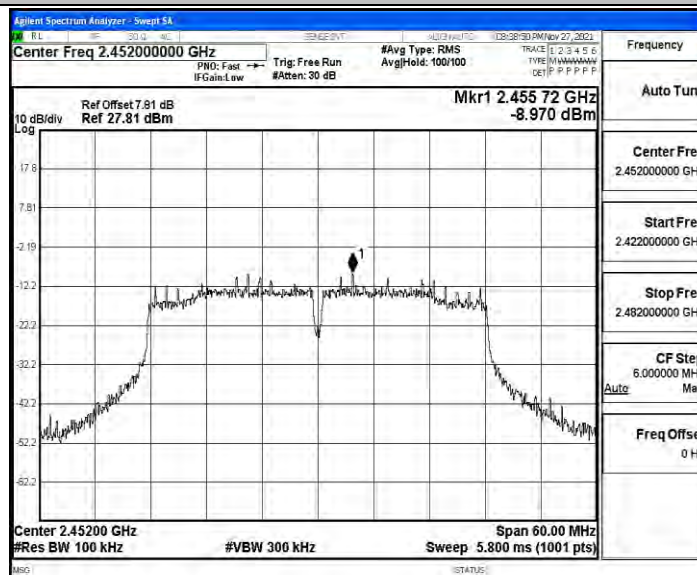
Auto

Freq Offset
0 Hz

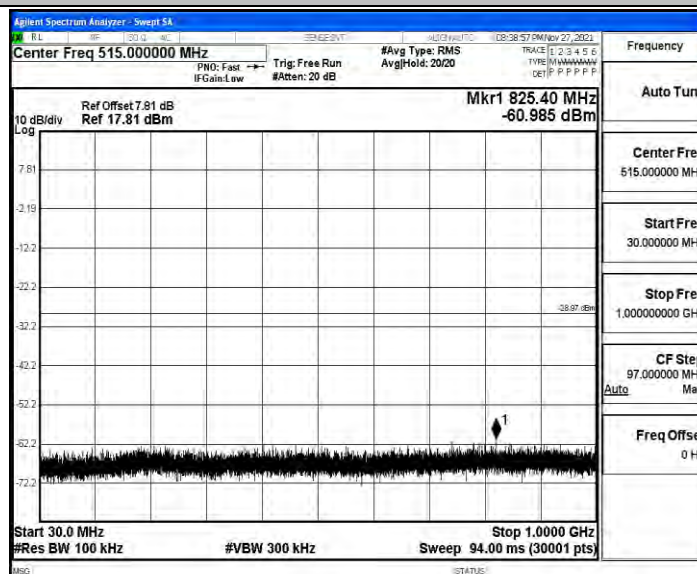
33 / 50



11N40SISO_Ant1_2452_0~Reference

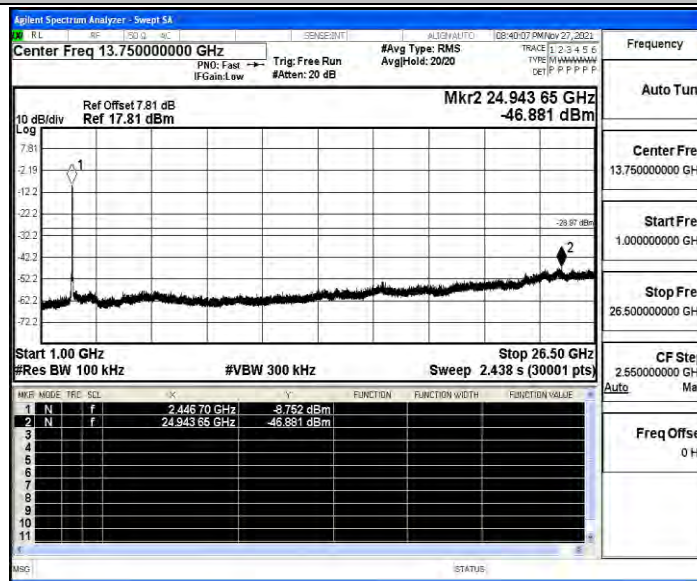


11N40SISO_Ant1_2452_30~1000





11N40SISO_Ant1_2452_1000~26500





A.6 Duty Cycle

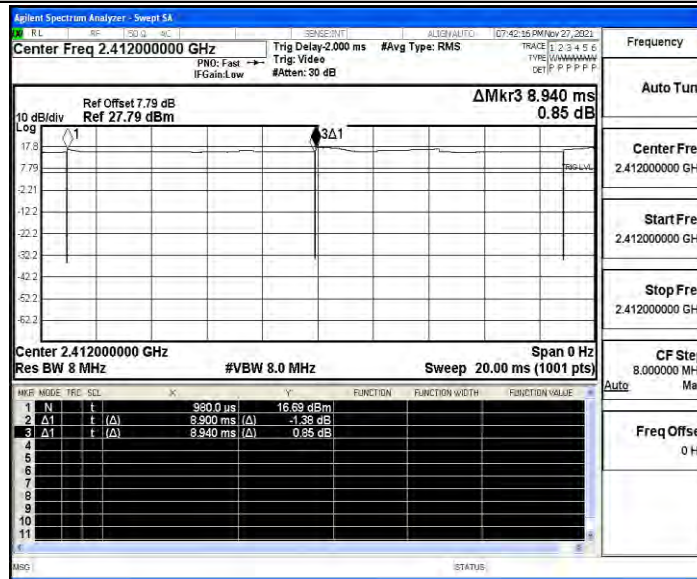
Test Result

TestMode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	1/T value [kHz]	Limit	Verdict
11B	Ant1	2412	8.90	8.94	99.55	0.11	---	PASS
		2437	8.90	8.94	99.55	0.11	---	PASS
		2462	8.90	8.94	99.55	0.11	---	PASS
11G	Ant1	2412	2.05	2.08	98.56	0.49	---	PASS
		2437	2.05	2.08	98.56	0.49	---	PASS
		2462	2.04	2.07	98.55	0.49	---	PASS
11N20SISO	Ant1	2412	1.91	1.94	98.45	0.52	---	PASS
		2437	1.91	1.94	98.45	0.52	---	PASS
		2462	1.91	1.94	98.45	0.52	---	PASS
11N40SISO	Ant1	2422	0.93	0.96	96.88	1.08	---	PASS
		2437	0.93	0.96	96.88	1.08	---	PASS
		2452	0.93	0.96	96.88	1.08	---	PASS

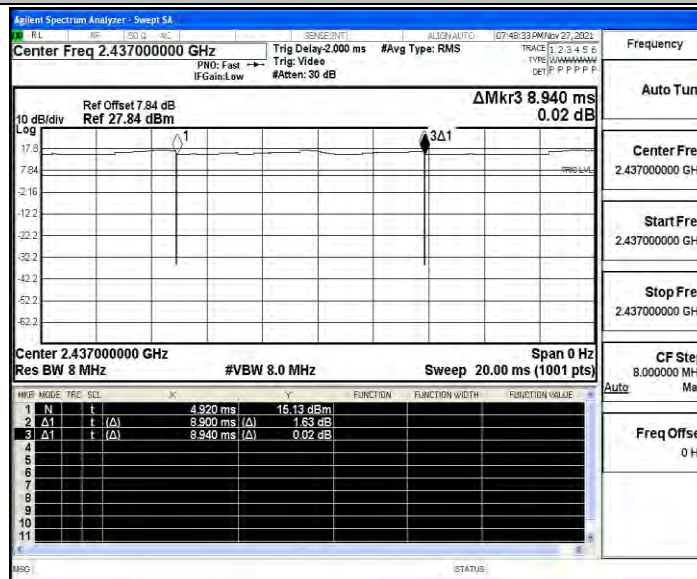


Test Graphs

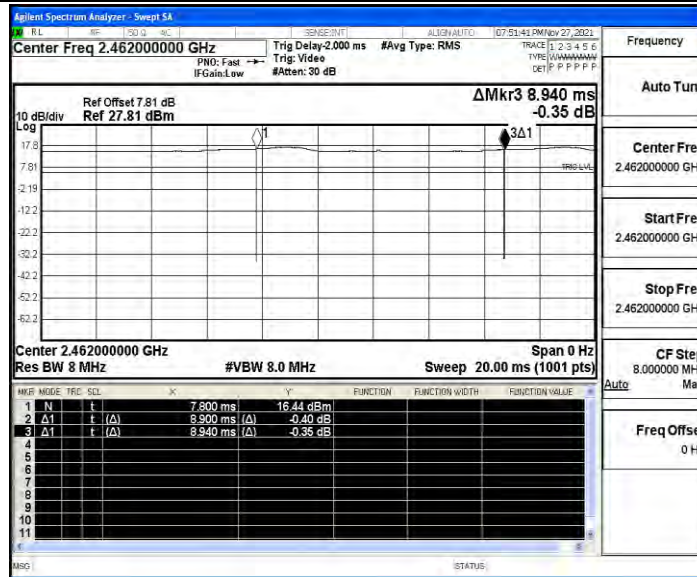
11B_Ant1_2412



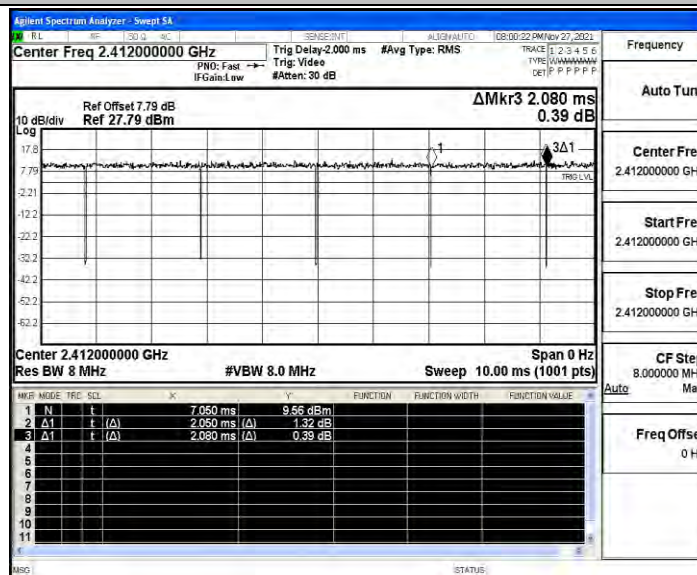
11B_Ant1_2437



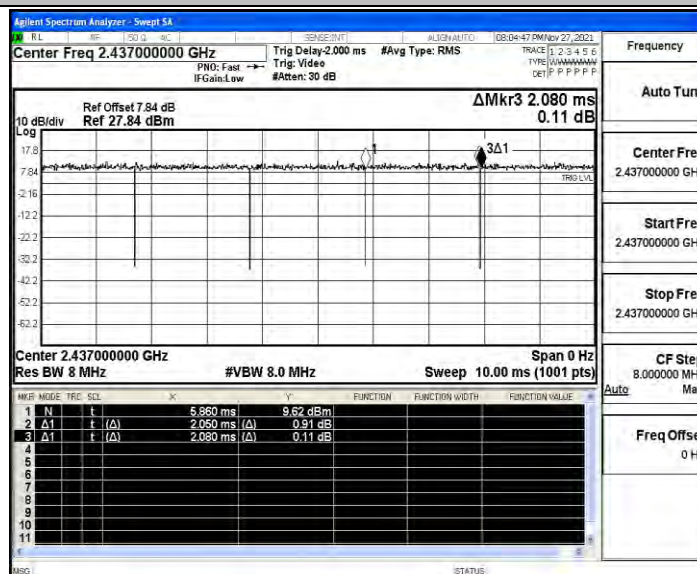
11B_Ant1_2462



11G_Ant1_2412

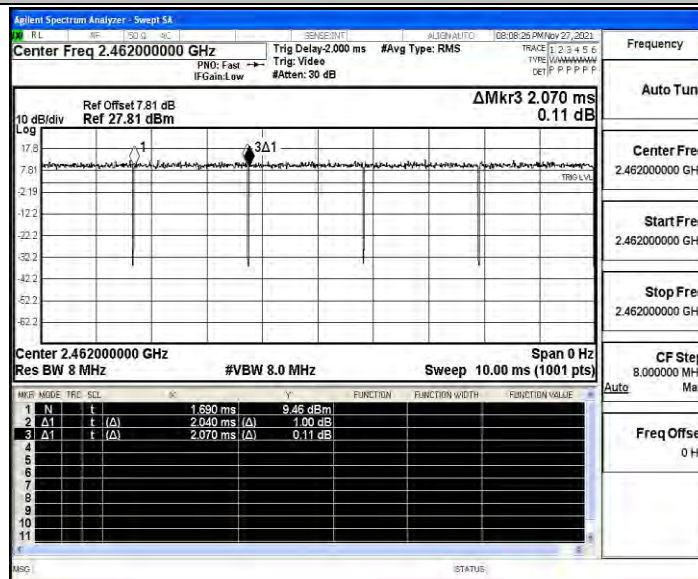


11G_Ant1_2437

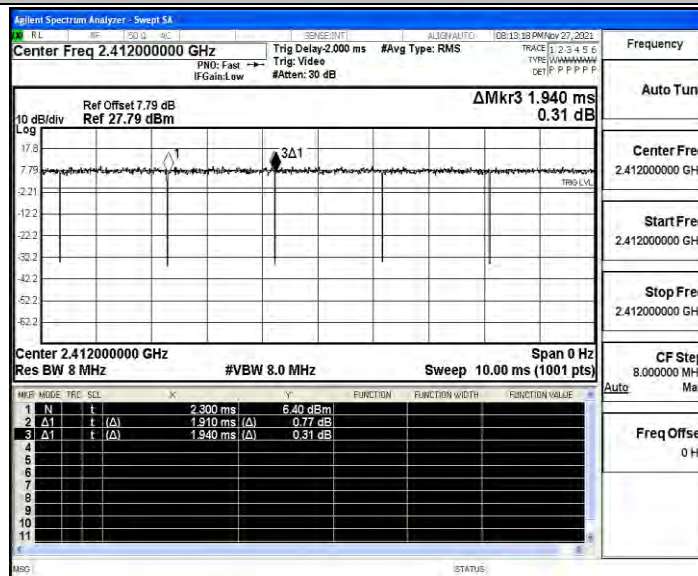




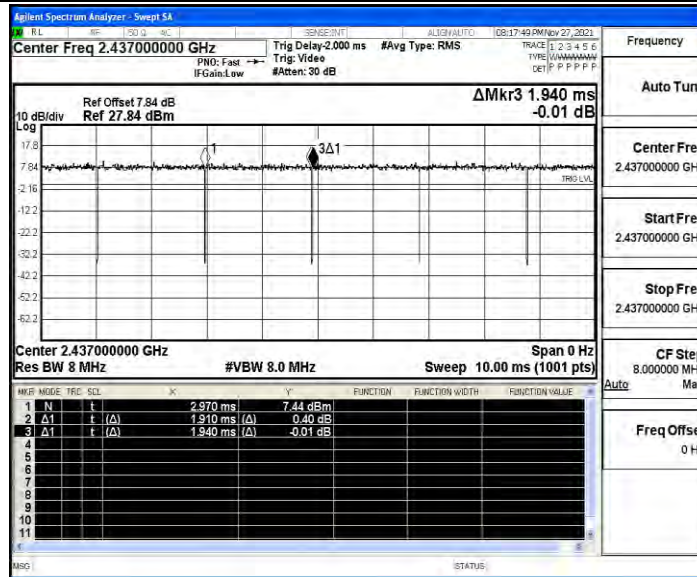
11G_Ant1_2462



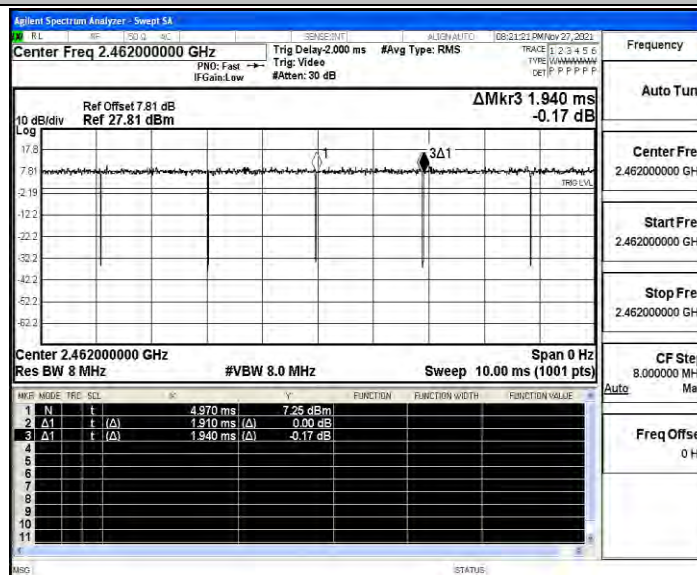
11N20SISO_Ant1_2412



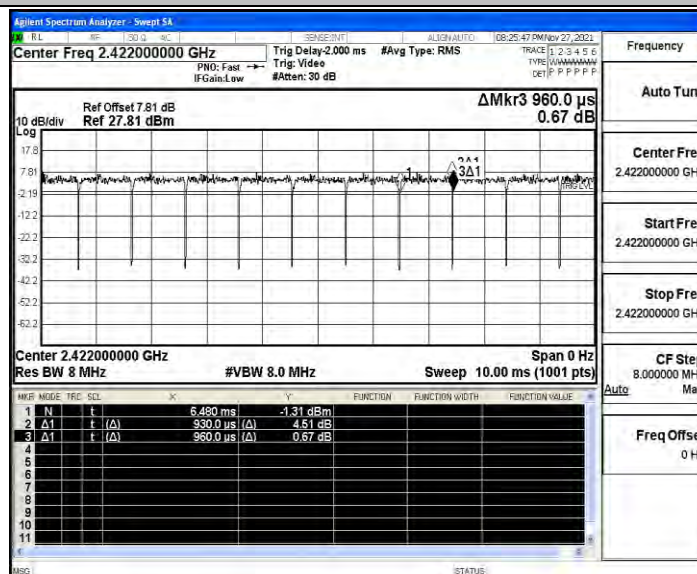
11N20SISO_Ant1_2437



11N20SISO_Ant1_2462

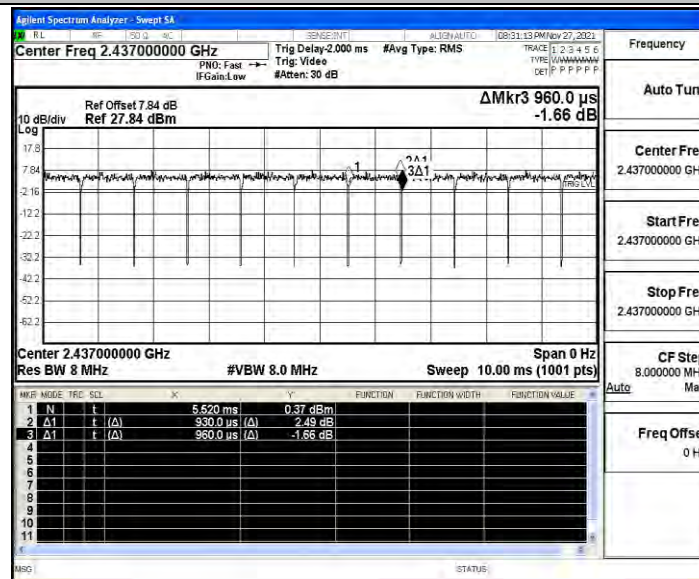


11N40SISO_Ant1_2422

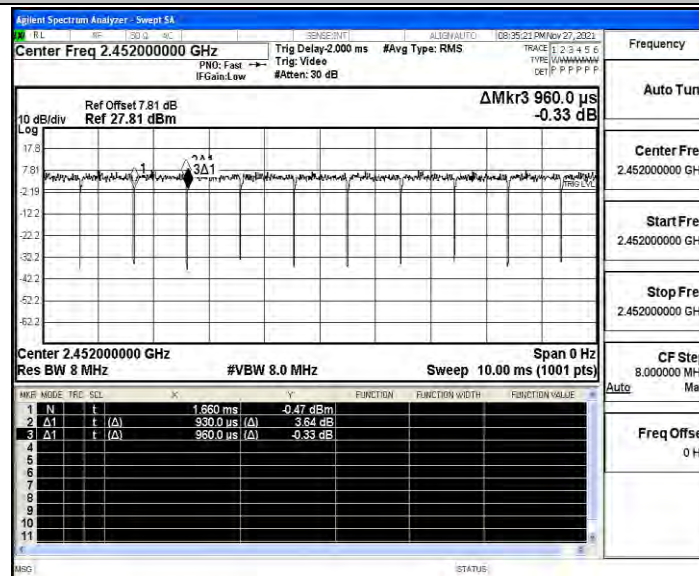




11N40SISO_Ant1_2437



11N40SISO_Ant1_2452





A.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	-49.1	≤-41.20	46.10	≤54	PASS
				AV	2386.840	-44.56	≤-41.20	50.64	≤54	PASS
				AV	2390.000	-47.36	≤-41.20	47.84	≤54	PASS
				Peak	2310.000	-43.12	≤-21.20	52.08	≤74	PASS
				Peak	2386.320	-38.72	≤-21.20	56.48	≤74	PASS
				Peak	2390.000	-41.63	≤-21.20	53.57	≤74	PASS
		High	2462	AV	2483.500	-45.71	≤-41.20	49.49	≤54	PASS
				AV	2487.740	-43.98	≤-41.20	51.22	≤54	PASS
				AV	2500.000	-47.47	≤-41.20	47.73	≤54	PASS
				Peak	2483.500	-40.38	≤-21.20	54.82	≤74	PASS
				Peak	2489.060	-36.86	≤-21.20	58.34	≤74	PASS
				Peak	2500.000	-42.74	≤-21.20	52.46	≤74	PASS
11G	Ant1	Low	2412	AV	2310.000	-48.91	≤-41.20	46.29	≤54	PASS
				AV	2389.960	-46.48	≤-41.20	48.72	≤54	PASS
				AV	2390.000	-46.48	≤-41.20	48.72	≤54	PASS
				Peak	2310.000	-45.76	≤-21.20	49.44	≤74	PASS
				Peak	2313.390	-39.22	≤-21.20	55.98	≤74	PASS
				Peak	2390.000	-41.79	≤-21.20	53.41	≤74	PASS
		High	2462	AV	2483.500	-45.34	≤-41.20	49.86	≤54	PASS
				AV	2483.560	-45.55	≤-41.20	49.65	≤54	PASS
				AV	2500.000	-47.52	≤-41.20	47.68	≤54	PASS
				Peak	2483.500	-41.11	≤-21.20	54.09	≤74	PASS
				Peak	2496.870	-38.48	≤-21.20	56.72	≤74	PASS
				Peak	2500.000	-42	≤-21.20	53.20	≤74	PASS
11N20SI SO	Ant1	Low	2412	AV	2310.000	-48.97	≤-41.20	46.23	≤54	PASS
				AV	2389.960	-47.56	≤-41.20	47.64	≤54	PASS
				AV	2390.000	-47.56	≤-41.20	47.64	≤54	PASS
				Peak	2310.000	-45.07	≤-21.20	50.13	≤74	PASS
				Peak	2367.600	-39.11	≤-21.20	56.09	≤74	PASS
				Peak	2390.000	-43.43	≤-21.20	51.77	≤74	PASS
		High	2462	AV	2483.500	-45.79	≤-41.20	49.41	≤54	PASS
				AV	2483.560	-45.81	≤-41.20	49.39	≤54	PASS
				AV	2500.000	-47.67	≤-41.20	47.53	≤54	PASS
				Peak	2483.500	-38.76	≤-21.20	56.44	≤74	PASS
				Peak	2483.670	-38.6	≤-21.20	56.60	≤74	PASS
				Peak	2500.000	-43.59	≤-21.20	51.61	≤74	PASS
11N40SI	Ant1	Low	2422	AV	2310.000	-48.69	≤-41.20	46.51	≤54	PASS



SO				AV	2389.180	-45.48	≤ -41.20	49.72	≤ 54	PASS
				AV	2390.000	-45.78	≤ -41.20	49.42	≤ 54	PASS
				Peak	2310.000	-42.38	≤ -21.20	52.82	≤ 74	PASS
				Peak	2389.180	-36.94	≤ -21.20	58.26	≤ 74	PASS
				Peak	2390.000	-39.24	≤ -21.20	55.96	≤ 74	PASS
		High	2452	AV	2483.500	-44.54	≤ -41.20	50.66	≤ 54	PASS
				AV	2484.110	-44.03	≤ -41.20	51.17	≤ 54	PASS
				AV	2500.000	-47.15	≤ -41.20	48.05	≤ 54	PASS
				Peak	2483.500	-38.29	≤ -21.20	56.91	≤ 74	PASS
				Peak	2486.420	-36.1	≤ -21.20	59.10	≤ 74	PASS
				Peak	2500.000	-40.23	≤ -21.20	54.97	≤ 74	PASS

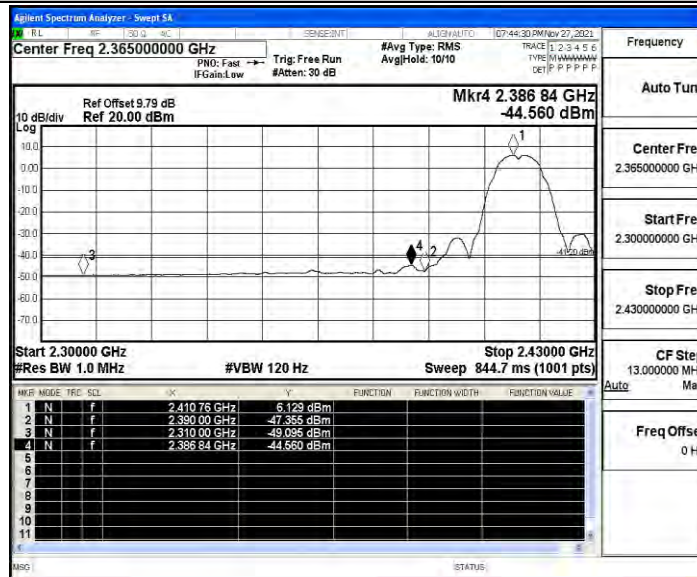
Note:

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.

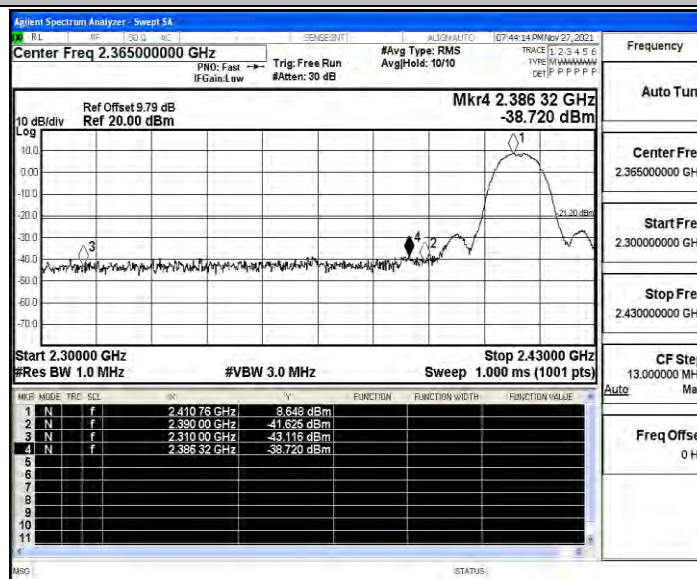


Test Graphs

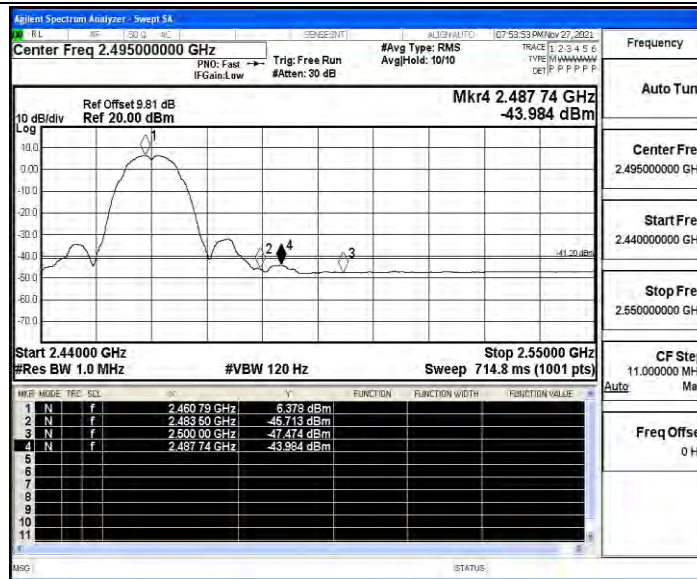
11B_Ant1_Low_2412_AV



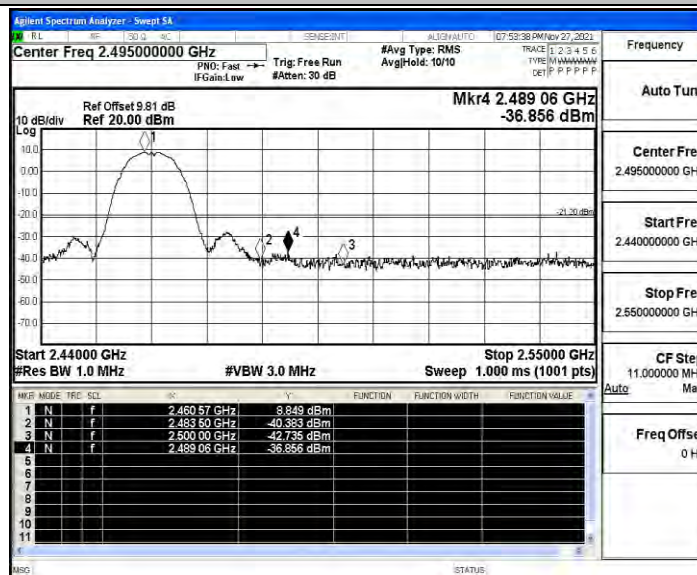
11B_Ant1_Low_2412_Peak



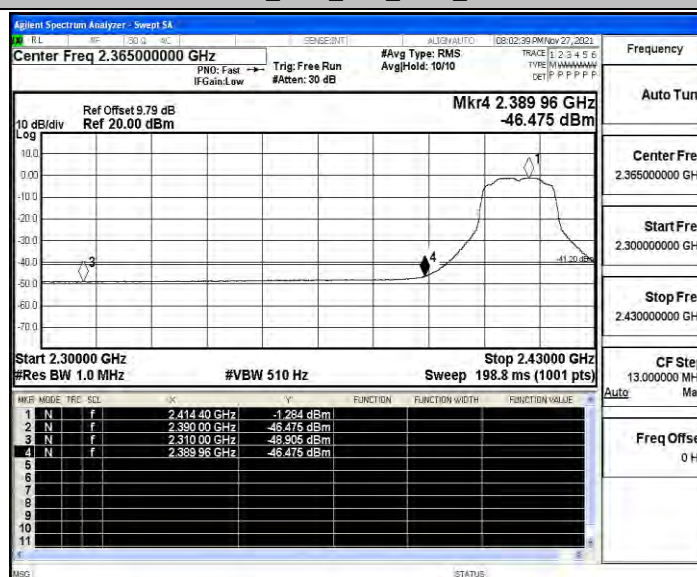
11B_Ant1_High_2462_AV



11B_Ant1_High_2462_Peak

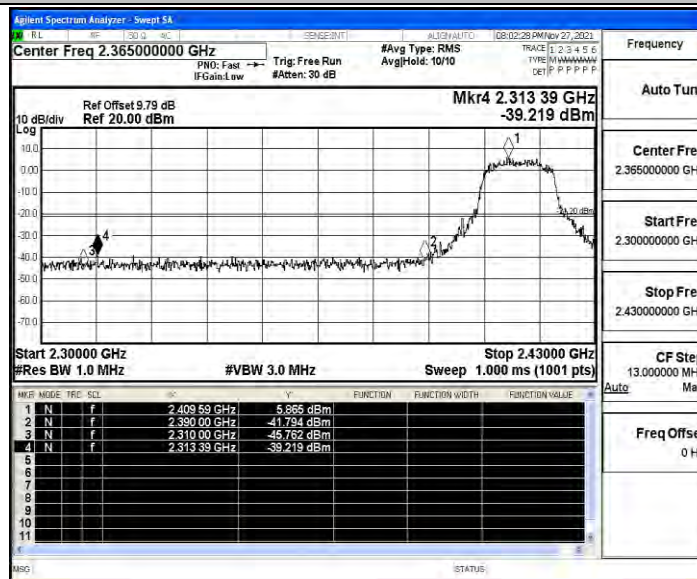


11G_Ant1_Low_2412_AV

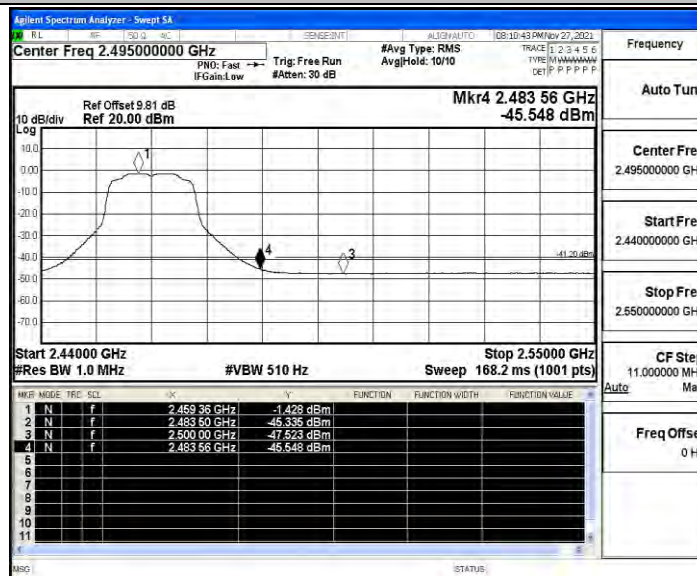




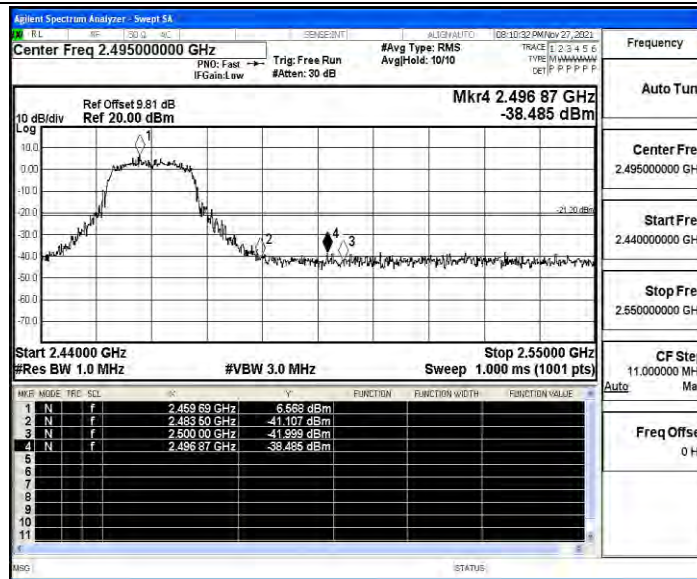
11G_Ant1_Low_2412_Peak



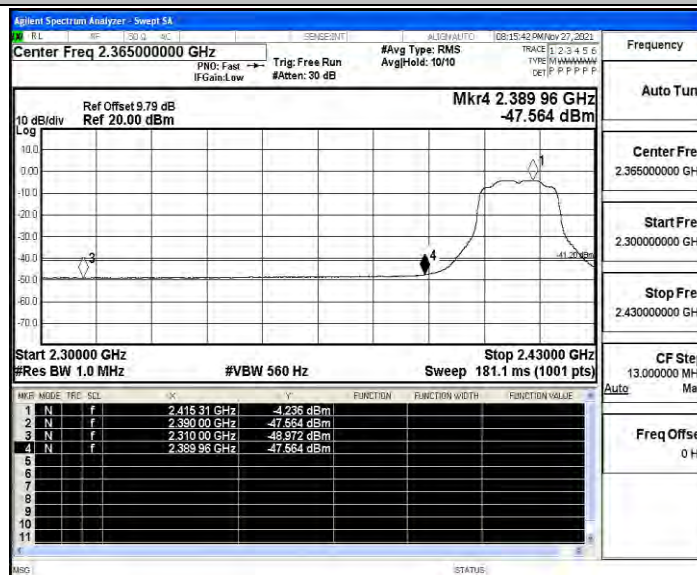
11G_Ant1_High_2462_AV



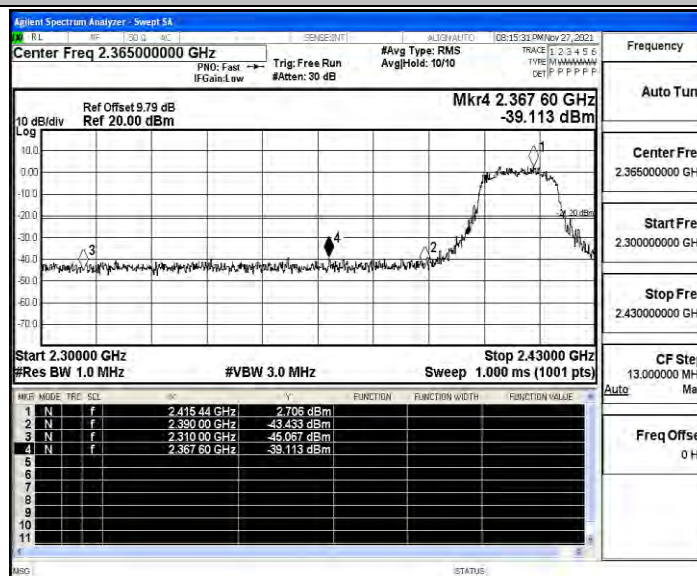
11G_Ant1_High_2462_Peak



11N20SISO_Ant1_Low_2412_AV

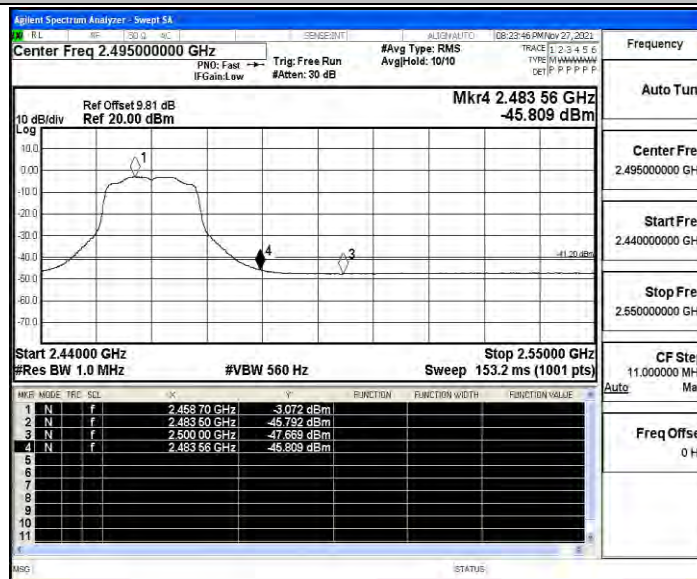


11N20SISO_Ant1_Low_2412_Peak

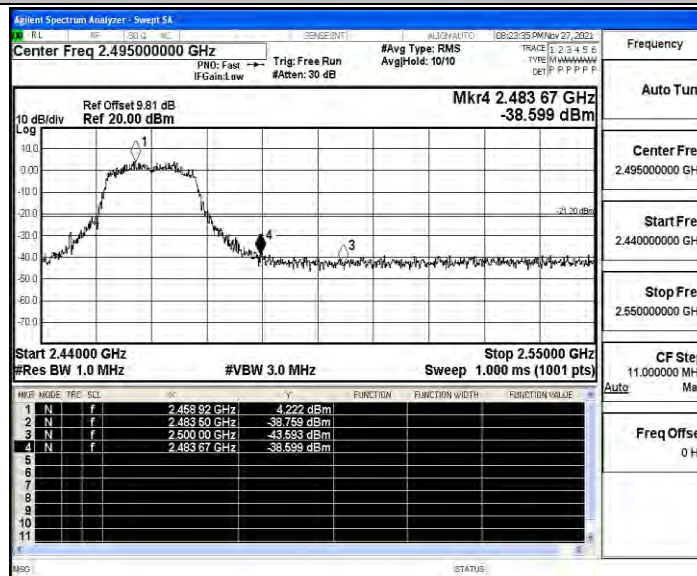




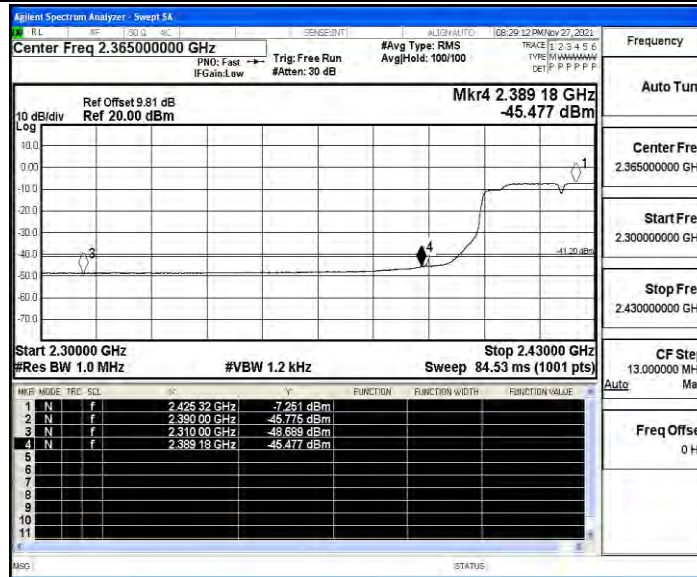
11N20SISO_Ant1_High_2462_AV



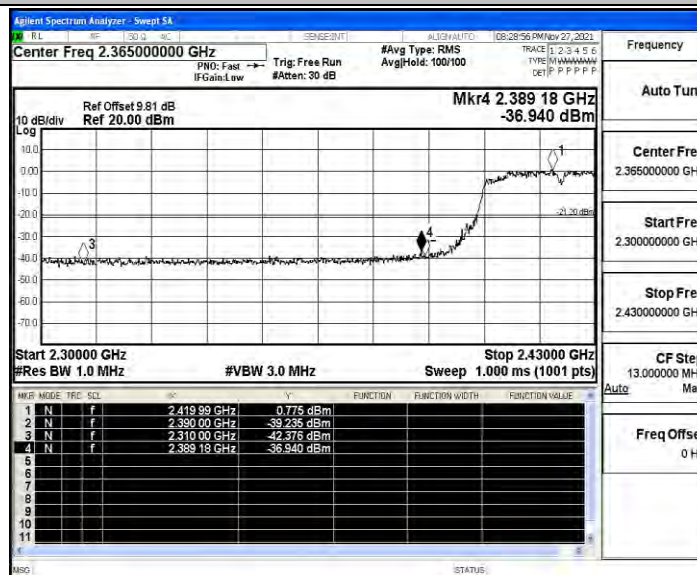
11N20SISO_Ant1_High_2462_Peak



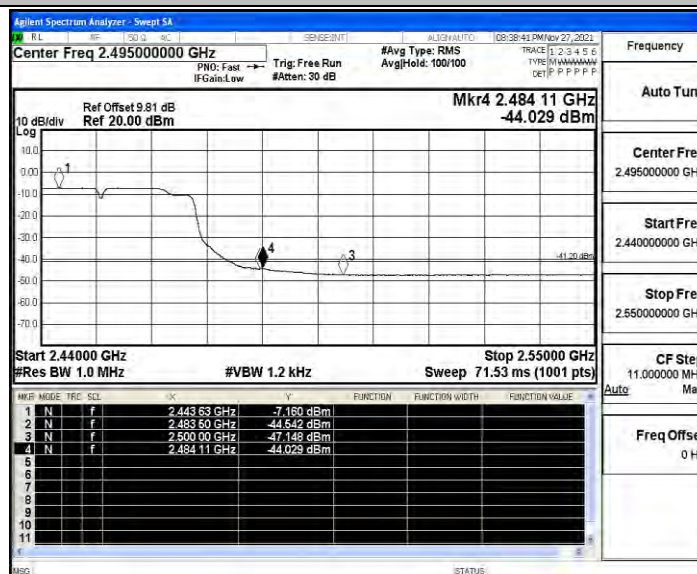
11N40SISO_Ant1_Low_2422_AV



11N40SISO_Ant1_Low_2422_Peak



11N40SISO_Ant1_High_2452_AV





11N40SISO_Ant1_High_2452_Peak

