Appendix B

RF Test Data for 2.4GWIFI (Conducted Measurement)

Product Name: Control Box

Test Model: EW020

Environmental Conditions

Temperature:	23.8° C
Relative Humidity:	52.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Taylor Hu
Supervised by:	Li Huan

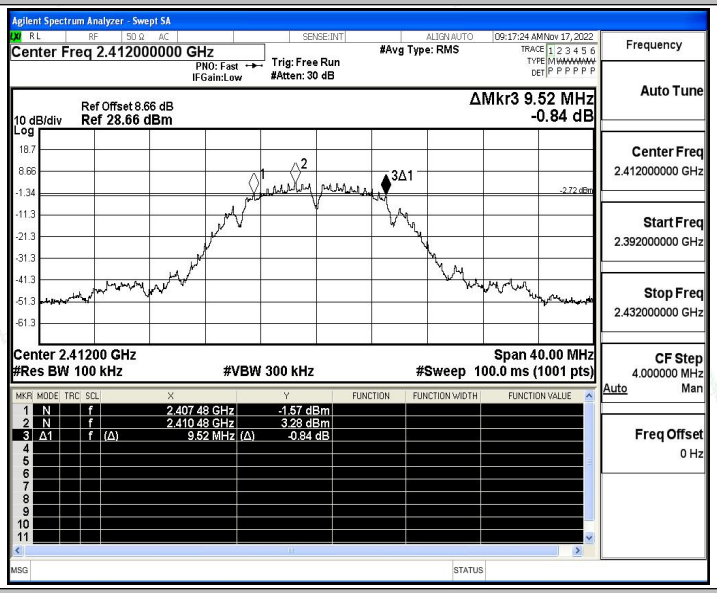
B.1 DTS Bandwidth

Test Result

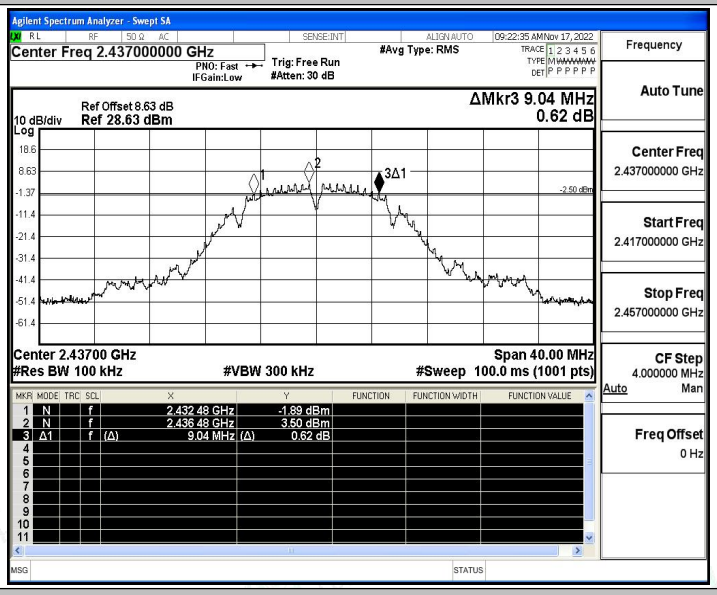
TestMode	Antenna	Freq(MHz)	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	9.520	2407.480	2417.000	0.5	PASS
		2437	9.040	2432.480	2441.520	0.5	PASS
		2462	9.520	2457.480	2467.000	0.5	PASS
11G	Ant1	2412	16.320	2403.840	2420.160	0.5	PASS
		2437	16.320	2428.840	2445.160	0.5	PASS
		2462	16.320	2453.840	2470.160	0.5	PASS
11N20SISO	Ant1	2412	17.560	2403.200	2420.760	0.5	PASS
		2437	17.600	2428.200	2445.800	0.5	PASS
		2462	17.600	2453.200	2470.800	0.5	PASS

Test Graphs

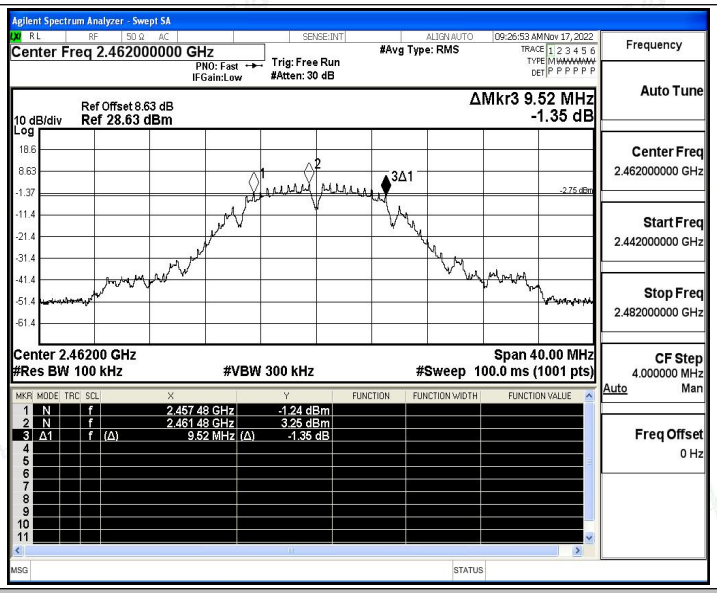
11B_Ant1_2412



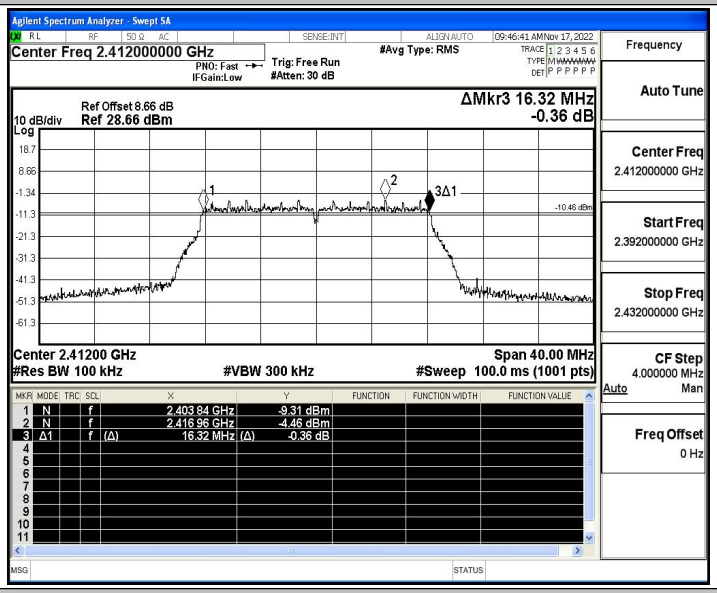
11B_Ant1_2437



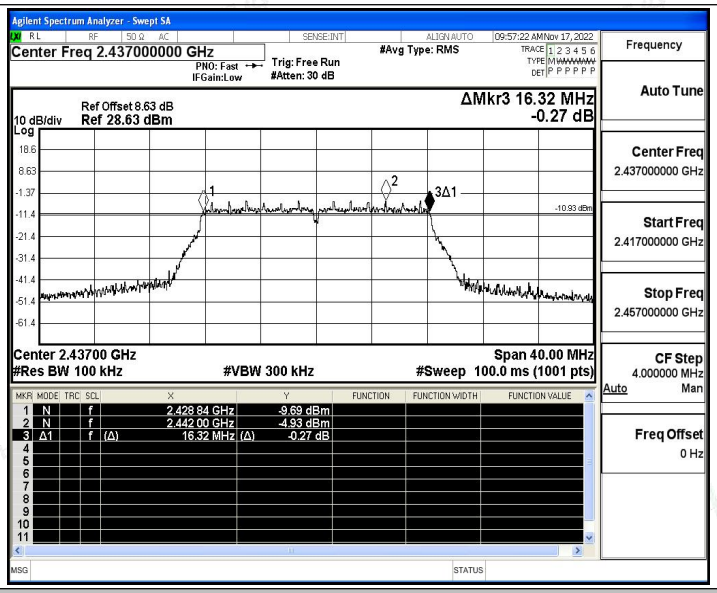
11B_Ant1_2462



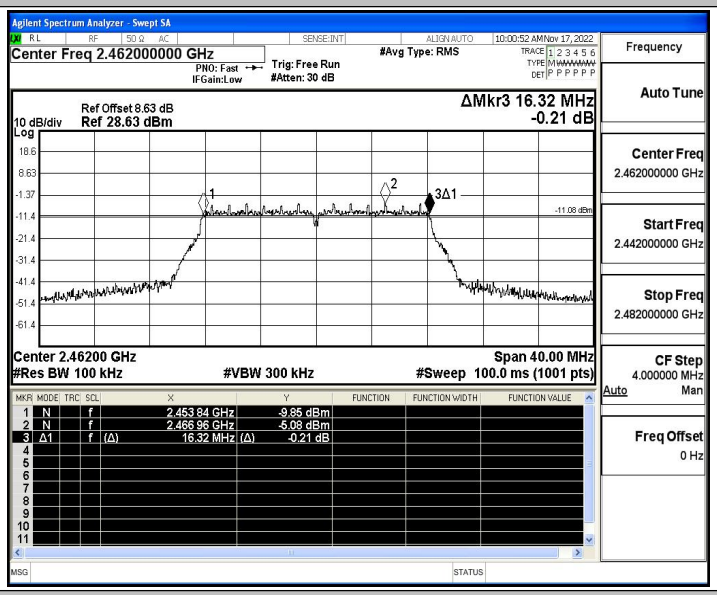
11G_Ant1_2412



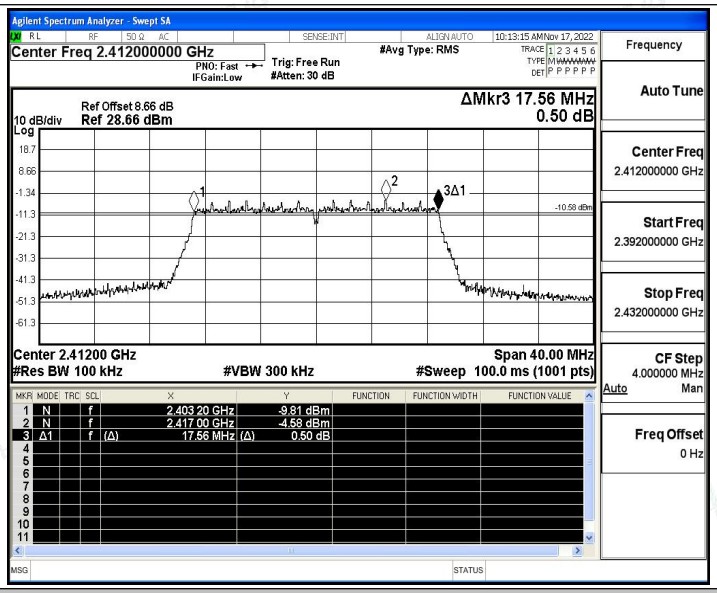
11G_Ant1_2437



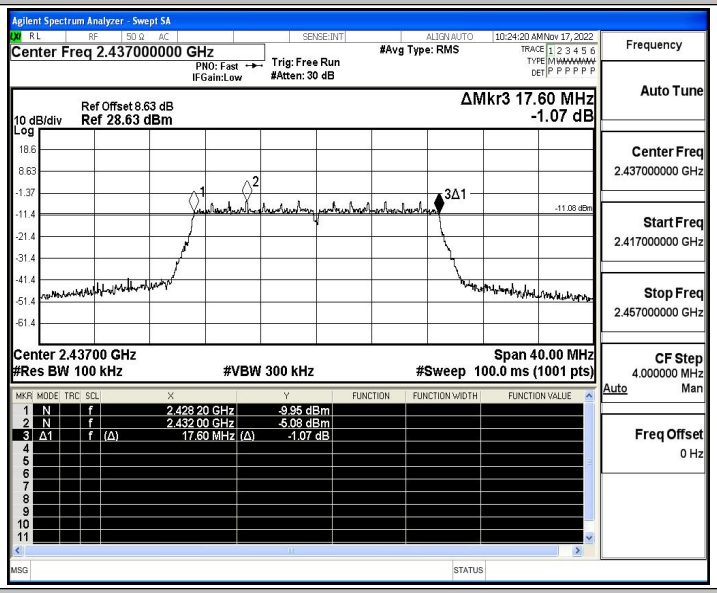
11G_Ant1_2462



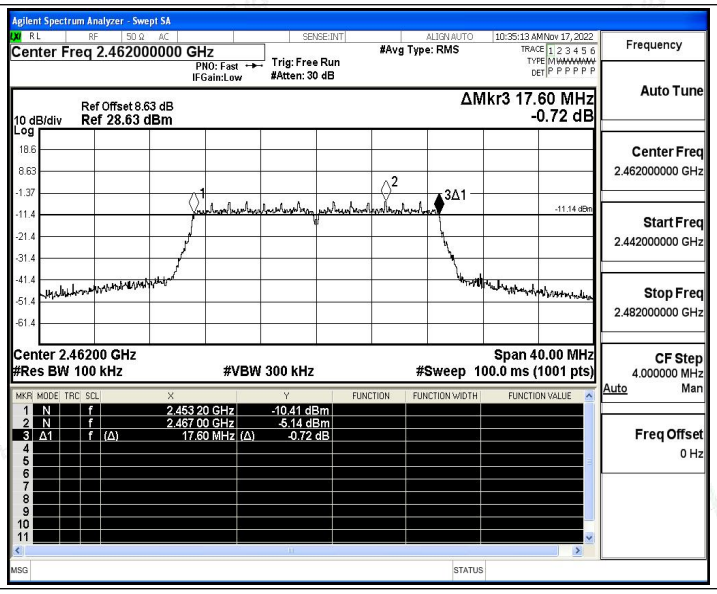
11N20SISO_Ant1_2412



11N20SISO_Ant1_2437



11N20SISO_Ant1_2462


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.462000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
10:35:13 AM Nov 17, 2022
Ref Offset 8.63 dB
10 dB/div Ref 28.63 dBm
Log
ΔMkr3 17.60 MHz
-0.72 dB
-11.14 dBm
Center 2.46200 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 40.00 MHz
#Sweep 100.0 ms (1001 pts)
1 N f 2.453 20 GHz -10.41 dBm
2 N f 2.467 00 GHz -5.14 dBm
3 Δ1 f (Δ) 17.60 MHz (Δ) -0.72 dB
Frequency
Auto Tune
Center Freq 2.462000000 GHz
Start Freq 2.442000000 GHz
Stop Freq 2.482000000 GHz
CF Step 4.000000 MHz
Auto Man
Freq Offset 0 Hz

B.2 Maximum conducted output power

Test Result

TestMode	Antenna	Freq(MHz)	Peak Power[dBm]	Conducted Limit[dBm]	Verdict
11B	Ant1	2412	15.70	≤30.00	PASS
		2437	15.25	≤30.00	PASS
		2462	14.92	≤30.00	PASS
11G	Ant1	2412	15.09	≤30.00	PASS
		2437	14.65	≤30.00	PASS
		2462	14.35	≤30.00	PASS
11N20SISO	Ant1	2412	14.99	≤30.00	PASS
		2437	14.56	≤30.00	PASS
		2462	14.39	≤30.00	PASS

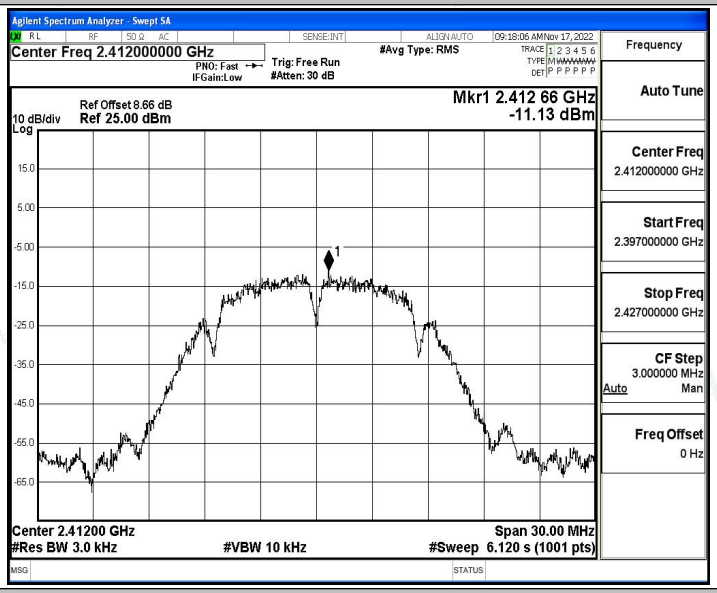
B.3 Maximum power spectral density

Test Result

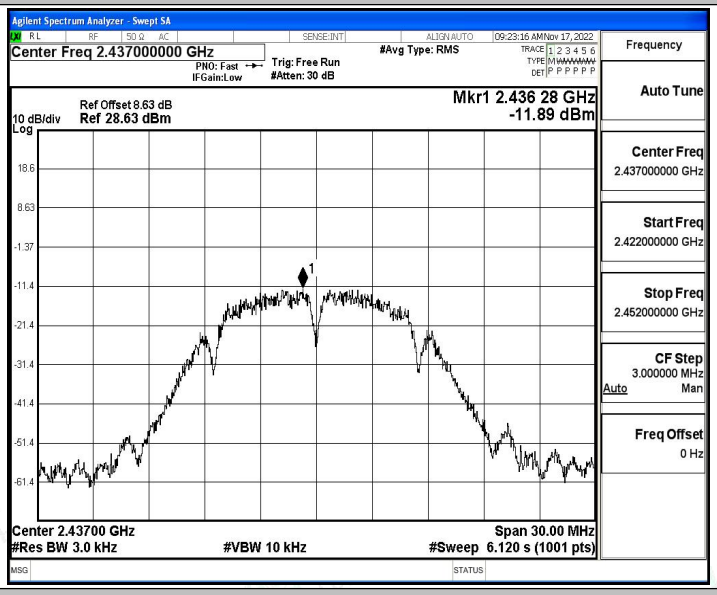
TestMode	Antenna	Freq(MHz)	Result [dBm/3-100kHz]	Limit [dBm/3kHz]	Verdict
11B	Ant1	2412	-11.13	≤8.00	PASS
		2437	-11.89	≤8.00	PASS
		2462	-12.09	≤8.00	PASS
11G	Ant1	2412	-19.05	≤8.00	PASS
		2437	-18.92	≤8.00	PASS
		2462	-19.12	≤8.00	PASS
11N20SISO	Ant1	2412	-19.45	≤8.00	PASS
		2437	-19.01	≤8.00	PASS
		2462	-19.56	≤8.00	PASS

Test Graphs

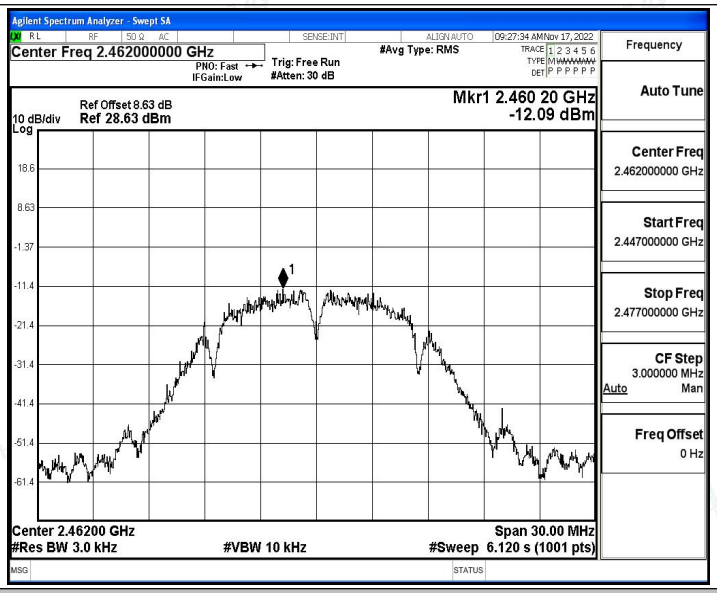
11B_Ant1_2412



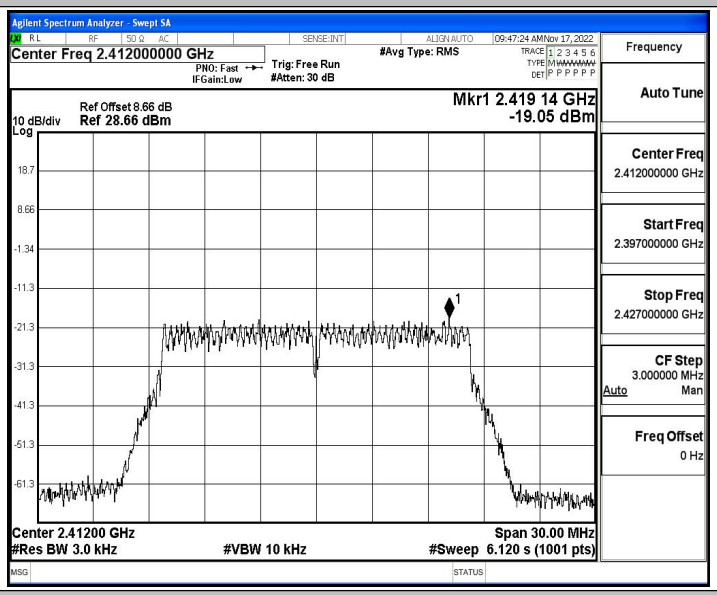
11B_Ant1_2437



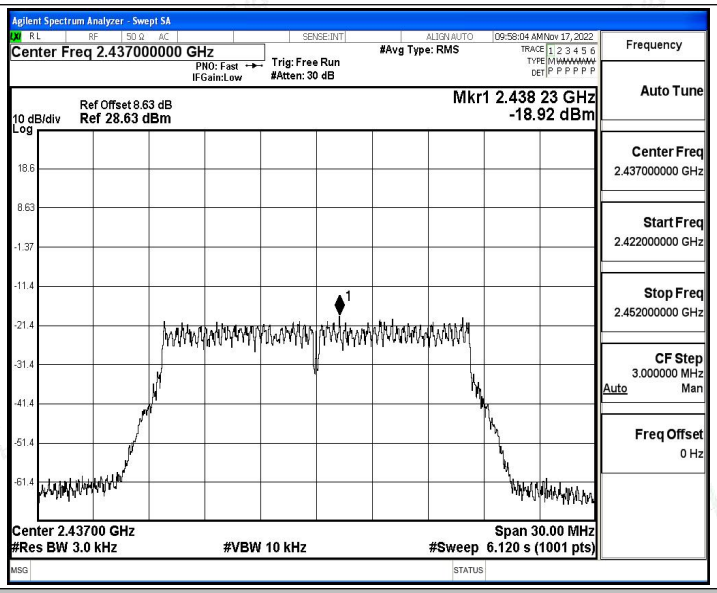
11B_Ant1_2462



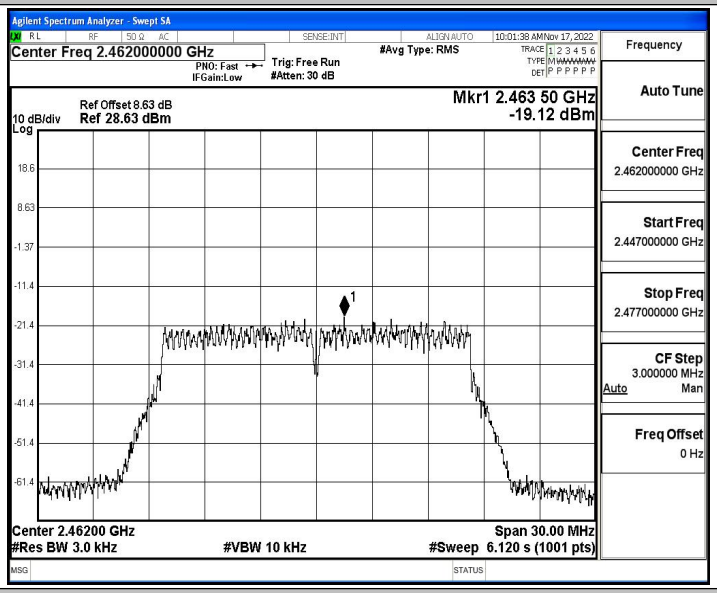
11G_Ant1_2412



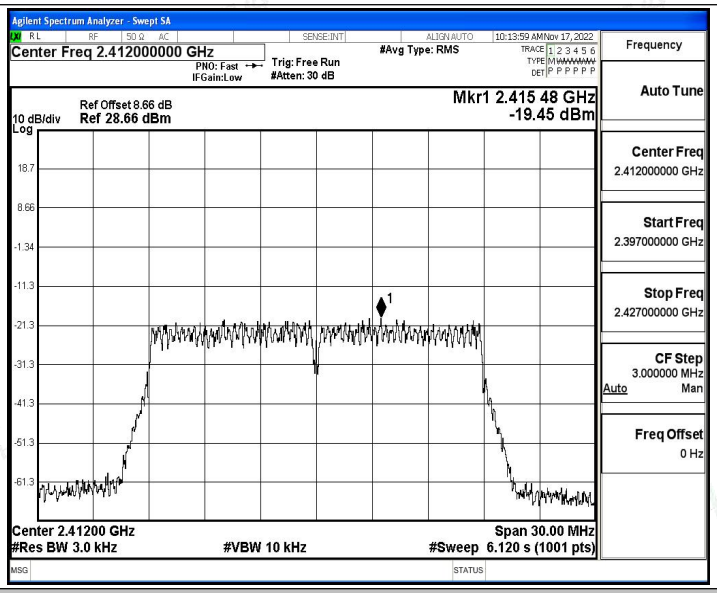
11G_Ant1_2437



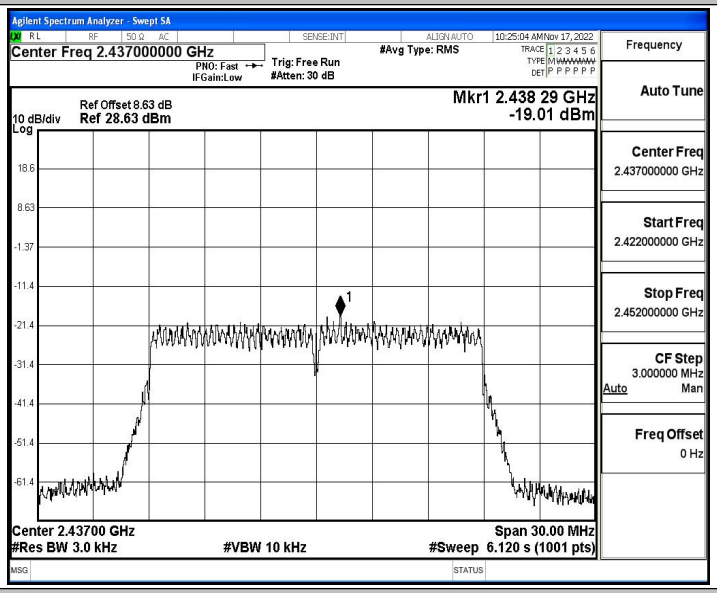
11G_Ant1_2462



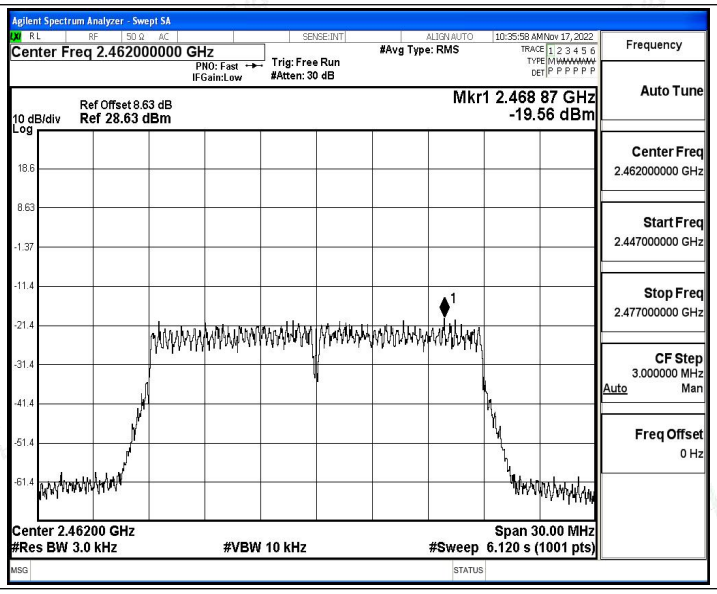
11N20SISO_Ant1_2412



11N20SISO_Ant1_2437



11N20SISO_Ant1_2462


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.462000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
10:35:58 AM Nov 17, 2022
Ref Offset 8.63 dB
10 dB/div Ref 28.63 dBm
Log
Mkr1 2.468 87 GHz
-19.56 dBm
18.6
8.63
-1.37
-11.4
-21.4
-31.4
-41.4
-51.4
-61.4
Center 2.46200 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 30.00 MHz
#Sweep 6.120 s (1001 pts)
Frequency
Auto Tune
Center Freq
2.462000000 GHz
Start Freq
2.447000000 GHz
Stop Freq
2.477000000 GHz
CF Step
3.000000 MHz
Auto Man
Freq Offset
0 Hz

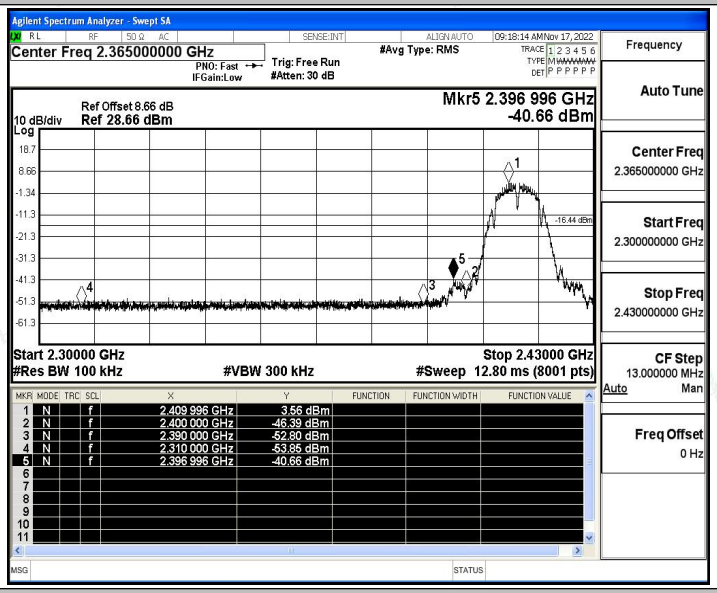
B.4 Band edge measurements

Test Result

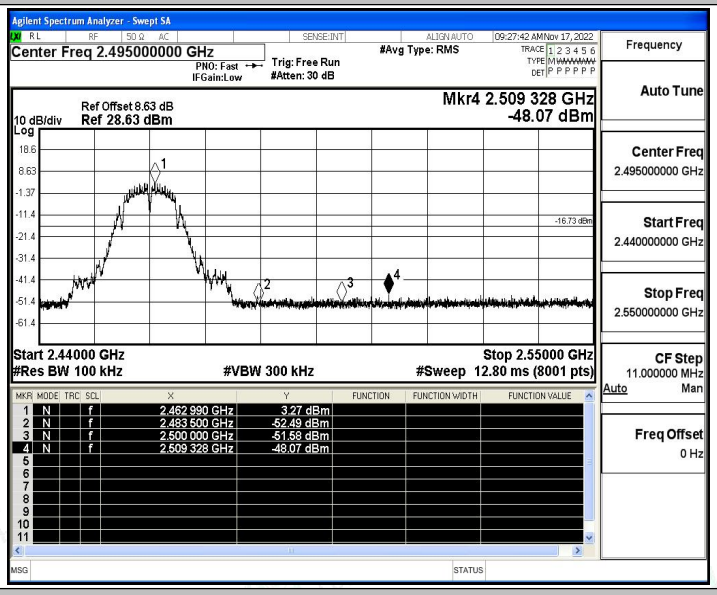
TestMode	Antenna	ChName	Freq(MHz)	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	3.56	-40.66	≤-16.44	PASS
		High	2462	3.27	-48.07	≤-16.73	PASS
11G	Ant1	Low	2412	-4.50	-43.29	≤-24.5	PASS
		High	2462	-5.01	-48.15	≤-25.01	PASS
11N20SISO	Ant1	Low	2412	-4.51	-43.55	≤-24.51	PASS
		High	2462	-6.04	-48.05	≤-26.04	PASS

Test Graphs

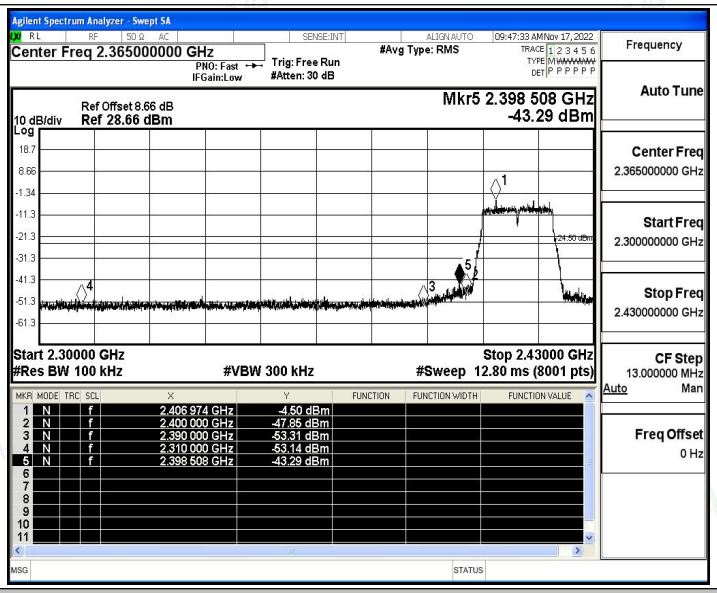
11B_Ant1_Low_2412



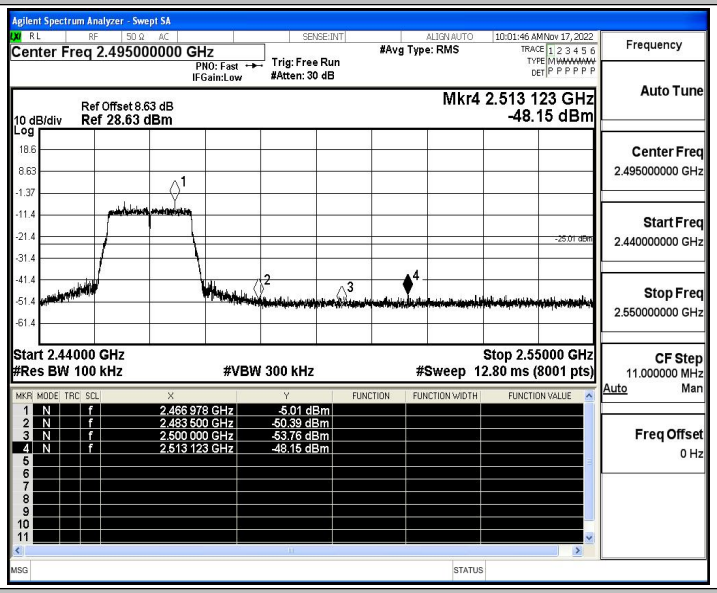
11B_Ant1_High_2462



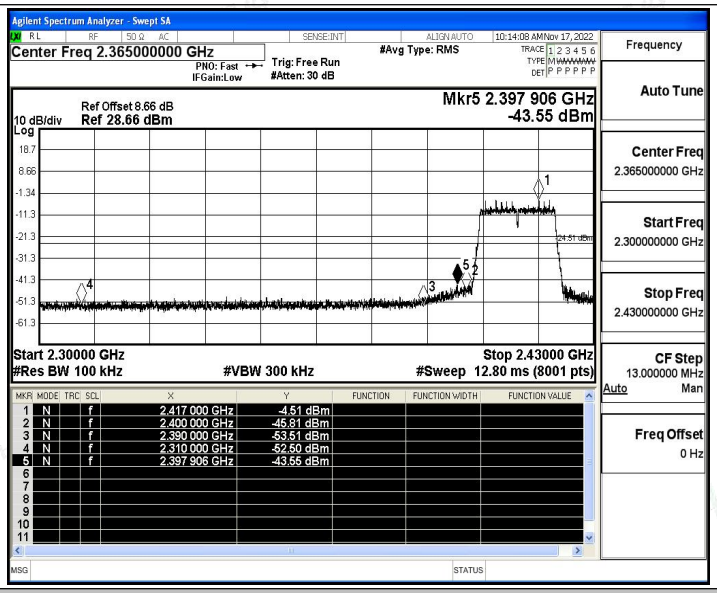
11G_Ant1_Low_2412



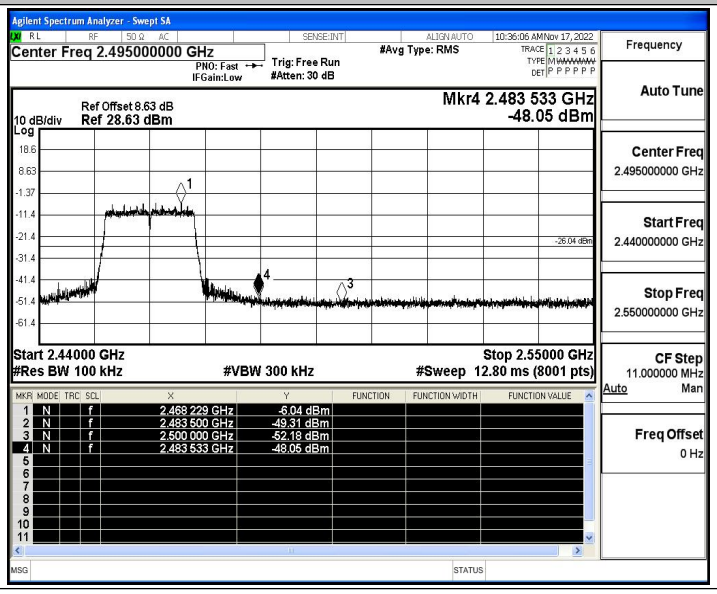
11G_Ant1_High_2462



11N20SISO_Ant1_Low_2412



11N20SISO_Ant1_High_2462



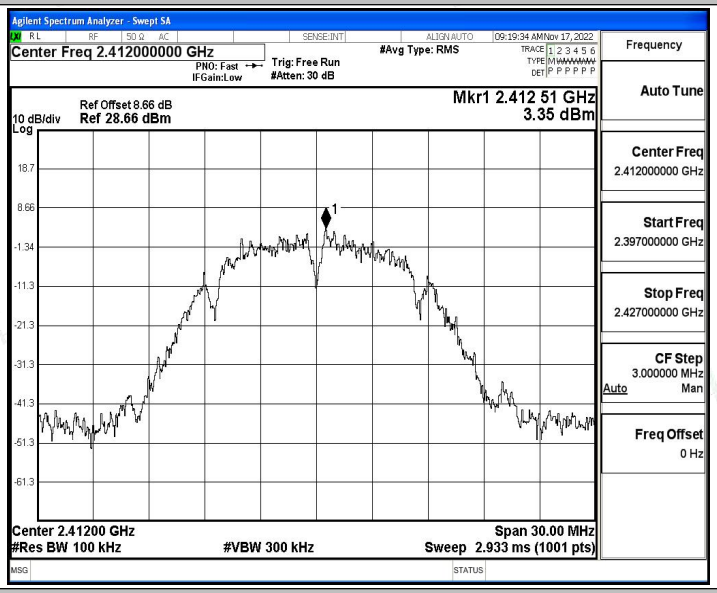
B.5 Conducted Spurious Emission

Test Result

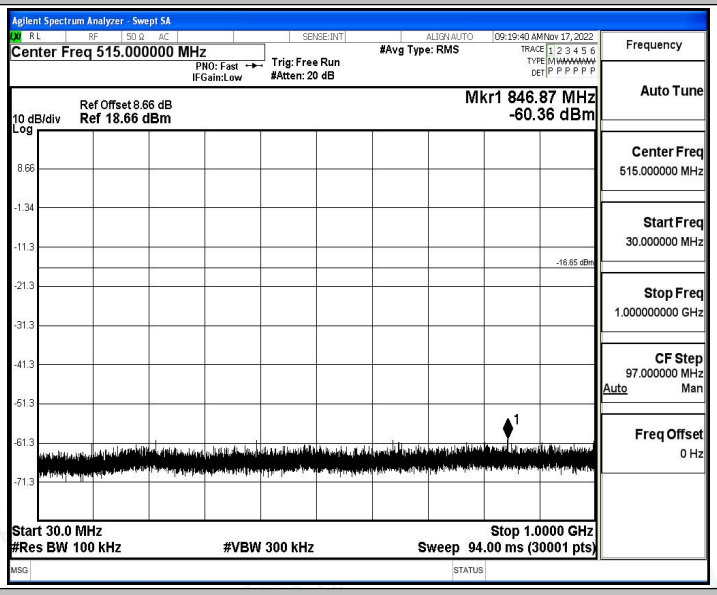
TestMode	Antenna	Freq(MHz)	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	3.35	3.35	---	PASS
			30~1000	3.35	-60.36	≤-16.65	PASS
			1000~26500	3.35	-45.87	≤-16.65	PASS
		2437	Reference	2.65	2.65	---	PASS
			30~1000	2.65	-59.9	≤-17.35	PASS
			1000~26500	2.65	-46.31	≤-17.35	PASS
		2462	Reference	1.91	1.91	---	PASS
			30~1000	1.91	-60.54	≤-18.09	PASS
			1000~26500	1.91	-46	≤-18.09	PASS
11G	Ant1	2412	Reference	-4.88	-4.88	---	PASS
			30~1000	-4.88	-60.88	≤-24.88	PASS
			1000~26500	-4.88	-46.46	≤-24.88	PASS
		2437	Reference	-7.34	-7.34	---	PASS
			30~1000	-7.34	-60.57	≤-27.34	PASS
			1000~26500	-7.34	-46.38	≤-27.34	PASS
		2462	Reference	-5.42	-5.42	---	PASS
			30~1000	-5.42	-59.86	≤-25.42	PASS
			1000~26500	-5.42	-45.85	≤-25.42	PASS
11N20SISO	Ant1	2412	Reference	-5.09	-5.09	---	PASS
			30~1000	-5.09	-61.21	≤-25.09	PASS
			1000~26500	-5.09	-45.77	≤-25.09	PASS
		2437	Reference	-6.85	-6.85	---	PASS
			30~1000	-6.85	-55.94	≤-26.85	PASS
			1000~26500	-6.85	-46.38	≤-26.85	PASS
		2462	Reference	-5.92	-5.92	---	PASS
			30~1000	-5.92	-60.9	≤-25.92	PASS
			1000~26500	-5.92	-46.43	≤-25.92	PASS

Test Graphs

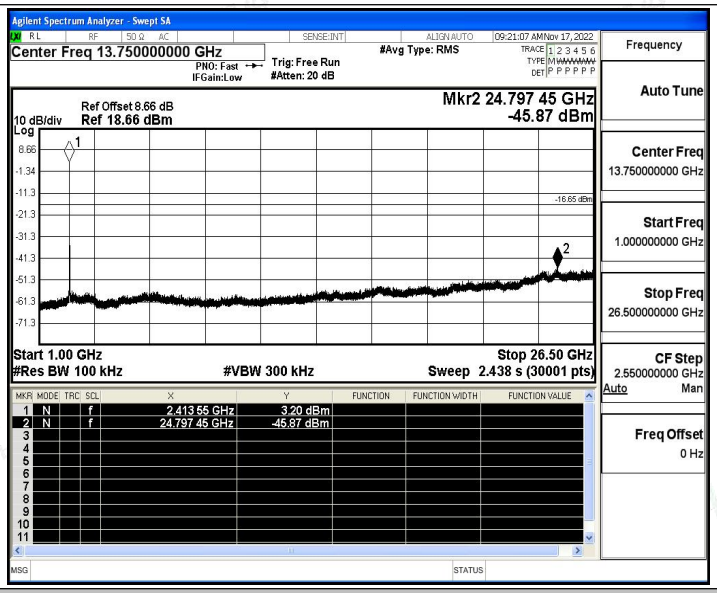
11B_Ant1_2412_0~Reference



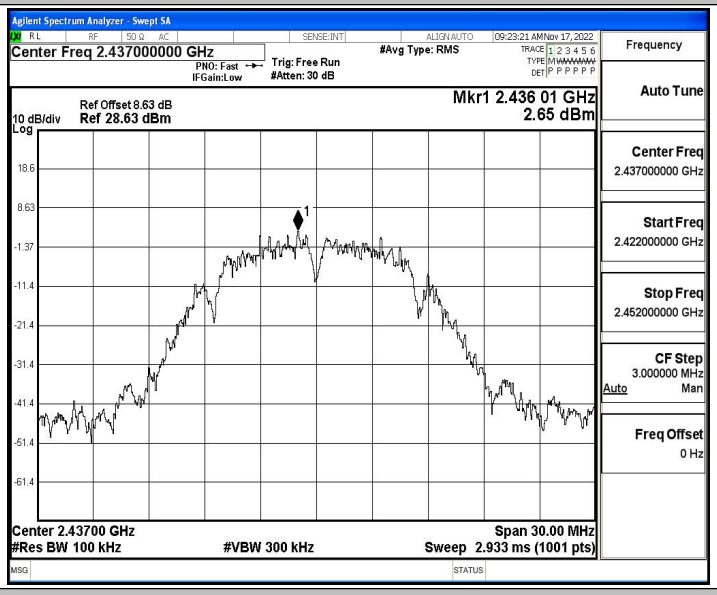
11B_Ant1_2412_30~1000



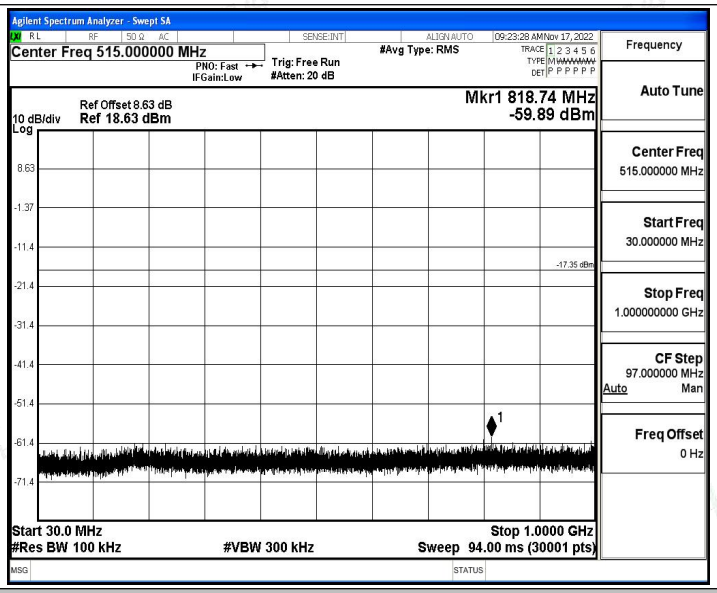
11B_Ant1_2412_1000~26500



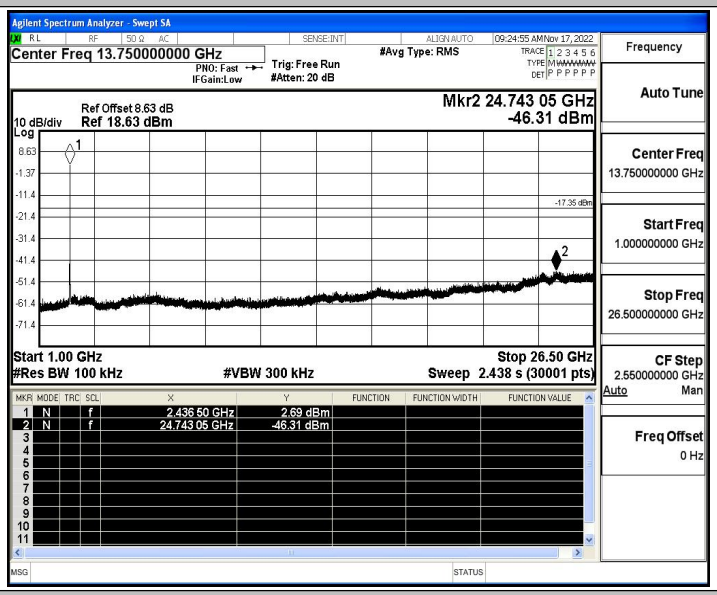
11B_Ant1_2437_0~Reference



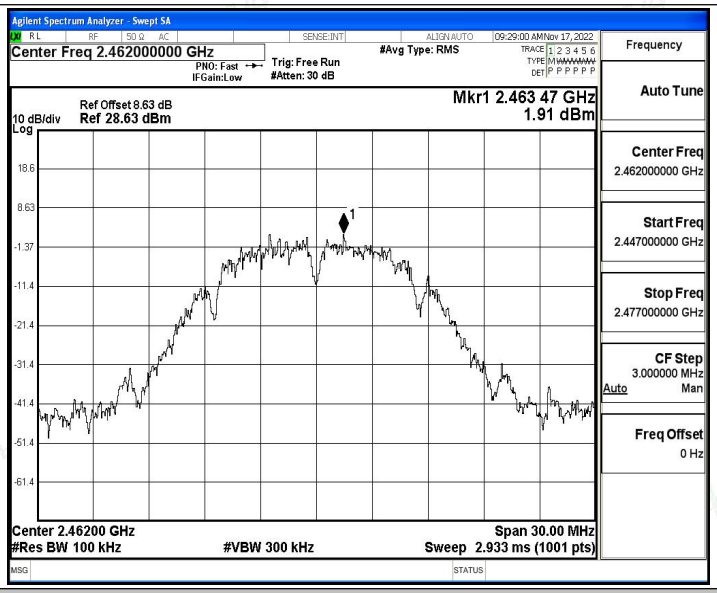
11B_Ant1_2437_30~1000



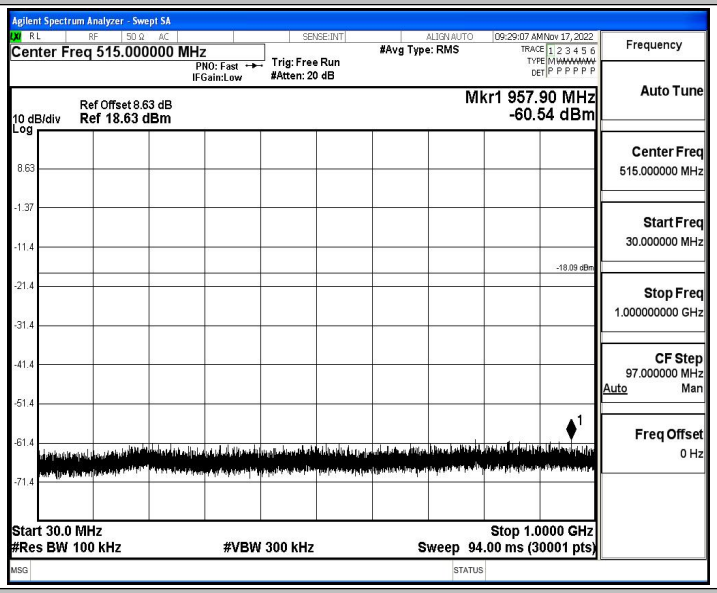
11B_Ant1_2437_1000~26500



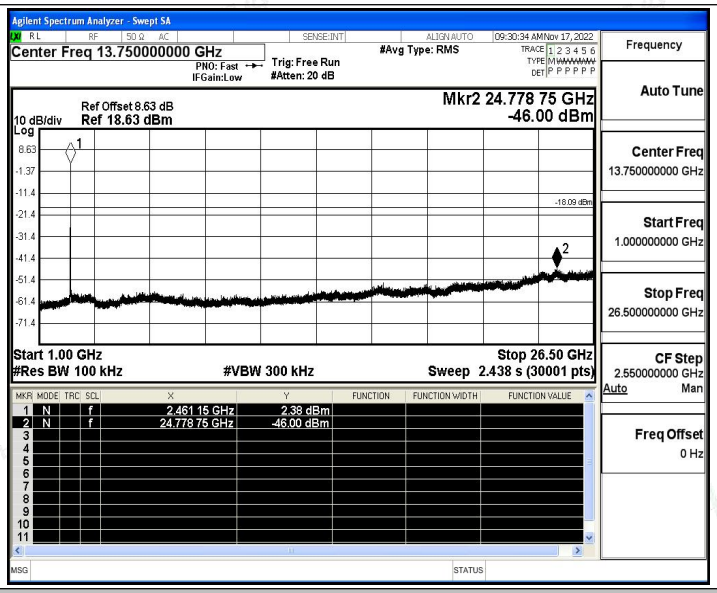
11B_Ant1_2462_0~Reference



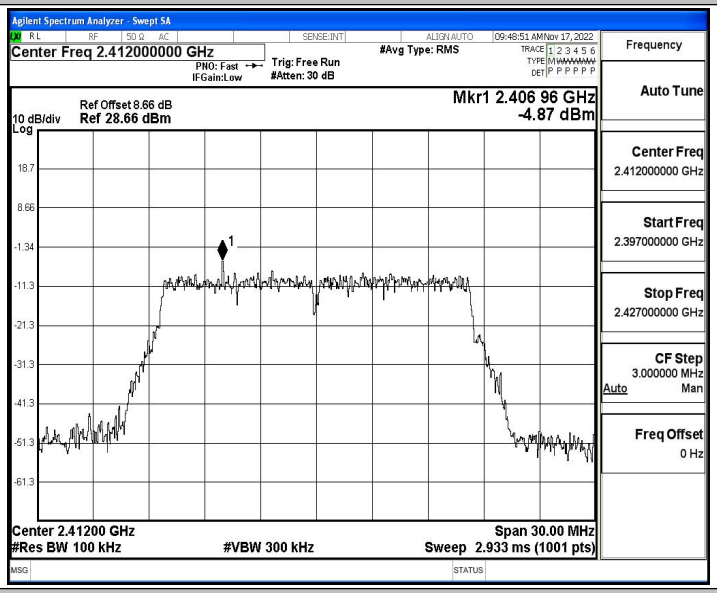
11B_Ant1_2462_30~1000



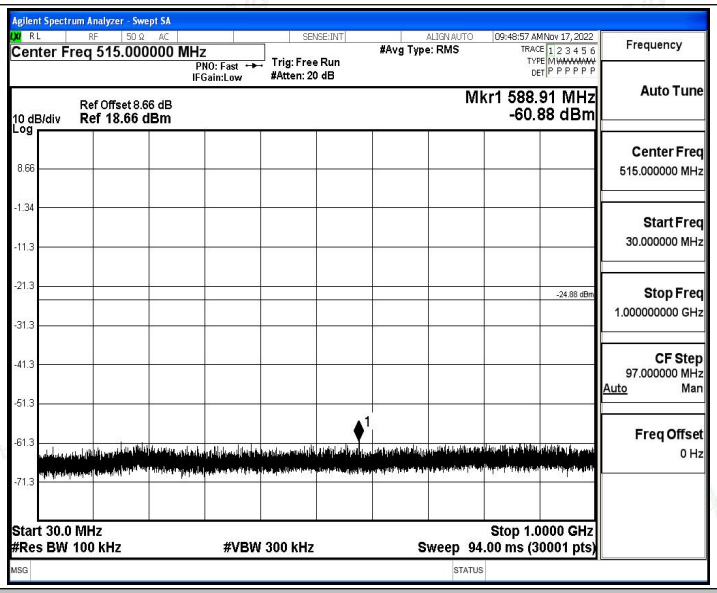
11B_Ant1_2462_1000~26500



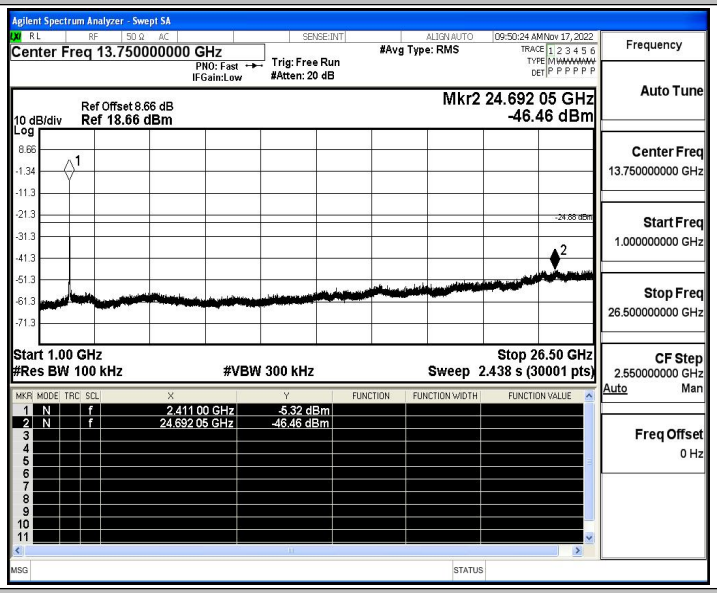
11G_Ant1_2412_0~Reference



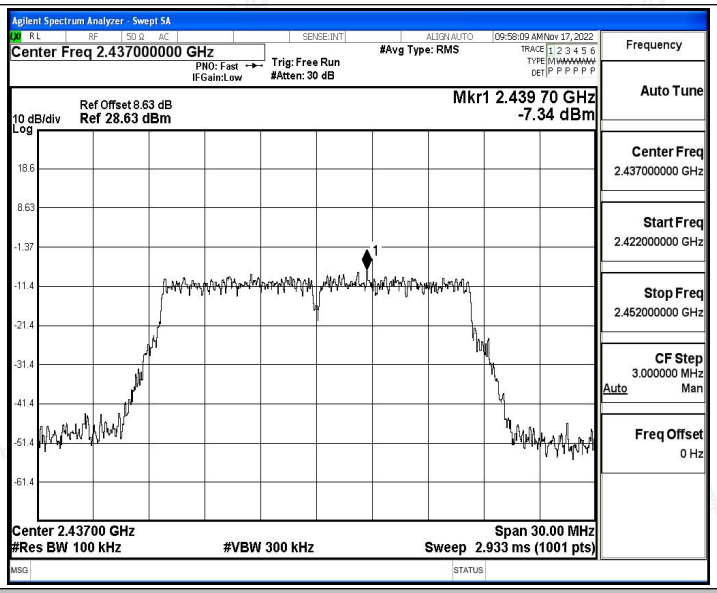
11G_Ant1_2412_30~1000



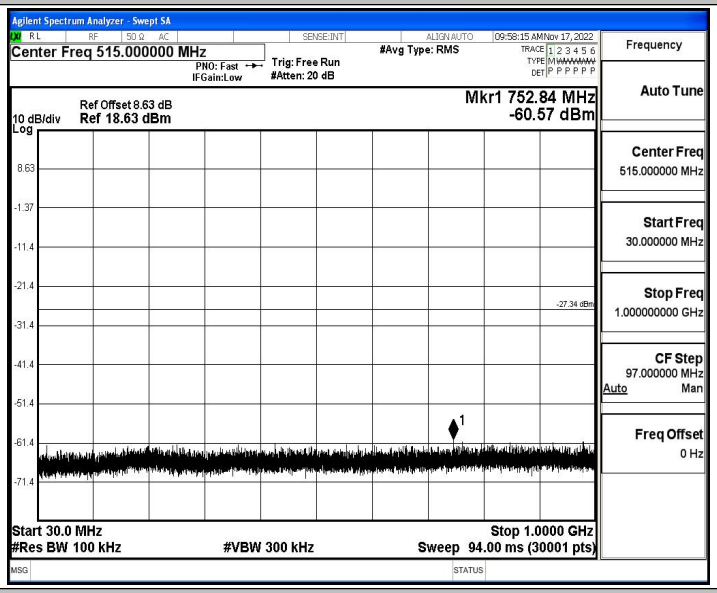
11G_Ant1_2412_1000~26500



11G_Ant1_2437_0~Reference



11G_Ant1_2437_30~1000



11G_Ant1_2437_1000~26500