



Appendix B

RF Test Data for 2.4G WIFI (Conducted Measurement)

Product Name: smart bulb

Trade Mark: N/A

Test Model: GU10 CCT 2-A LENS

Environmental Conditions

Temperature:	21.1 ° C
Relative Humidity:	52.2%
ATM Pressure:	100.0 kPa
Test Engineer:	Monkey Li
Supervised by:	Li Huan



B.1 DTS Bandwidth

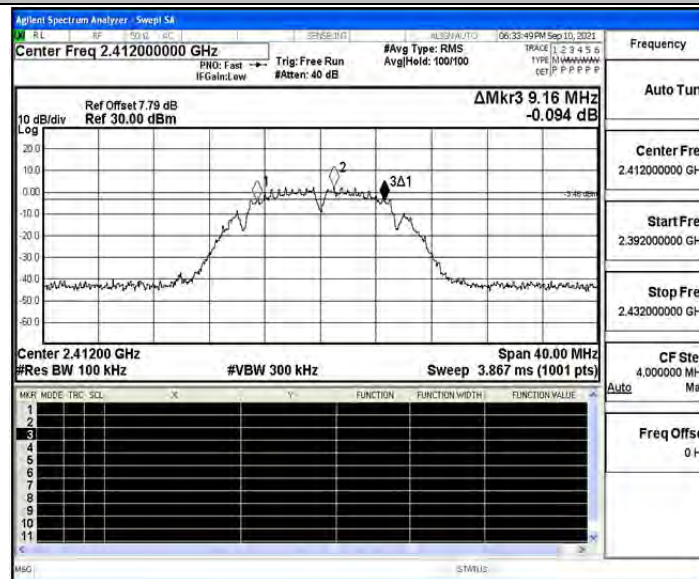
Test Result

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	9.160	2407.440	2416.600	0.5	PASS
		2437	9.160	2432.920	2442.080	0.5	PASS
		2462	9.640	2456.920	2466.560	0.5	PASS
11G	Ant1	2412	16.440	2403.760	2420.200	0.5	PASS
		2437	16.480	2428.800	2445.280	0.5	PASS
		2462	14.600	2453.760	2468.360	0.5	PASS
11N20SISO	Ant1	2412	17.680	2403.160	2420.840	0.5	PASS
		2437	17.640	2428.200	2445.840	0.5	PASS
		2462	16.480	2453.120	2469.600	0.5	PASS
11N40SISO	Ant1	2422	35.840	2404.400	2440.240	0.5	PASS
		2437	35.440	2419.400	2454.840	0.5	PASS
		2452	35.280	2434.320	2469.600	0.5	PASS

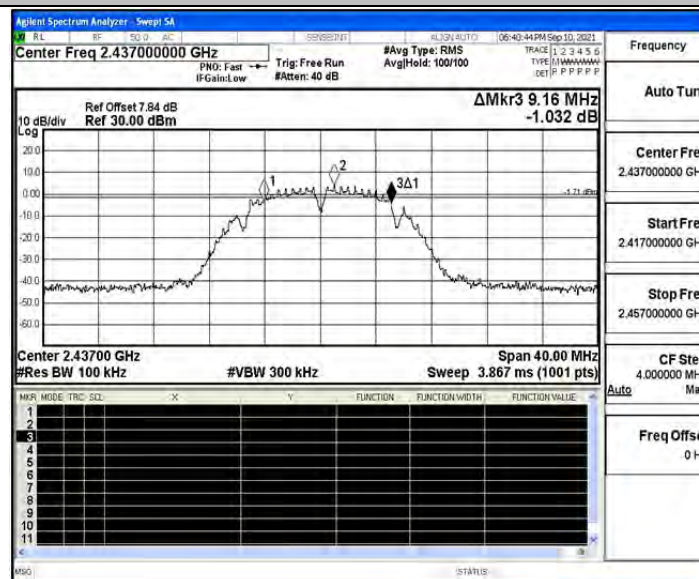


Test Graphs

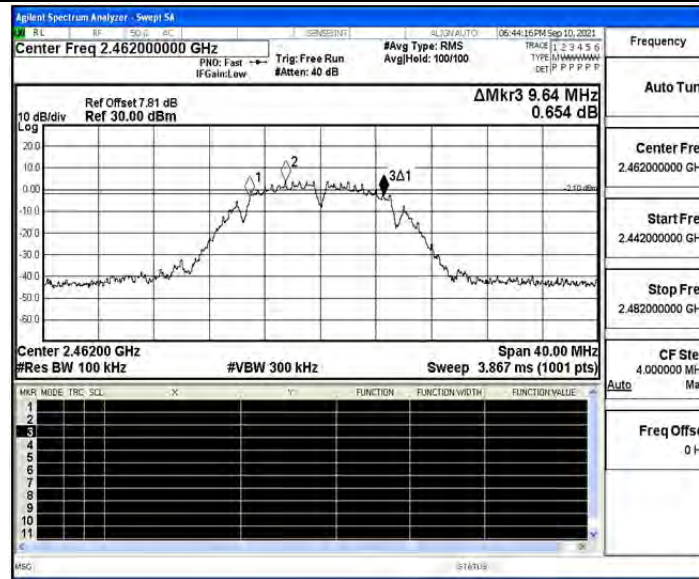
11B_Ant1_2412



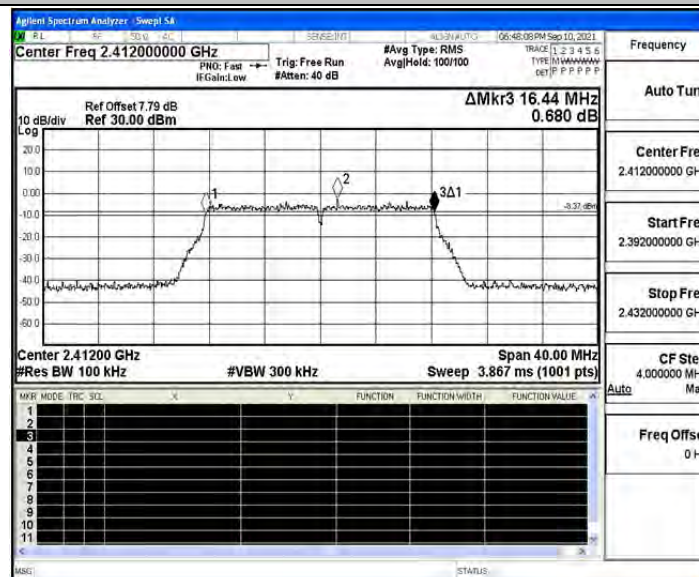
11B_Ant1_2437



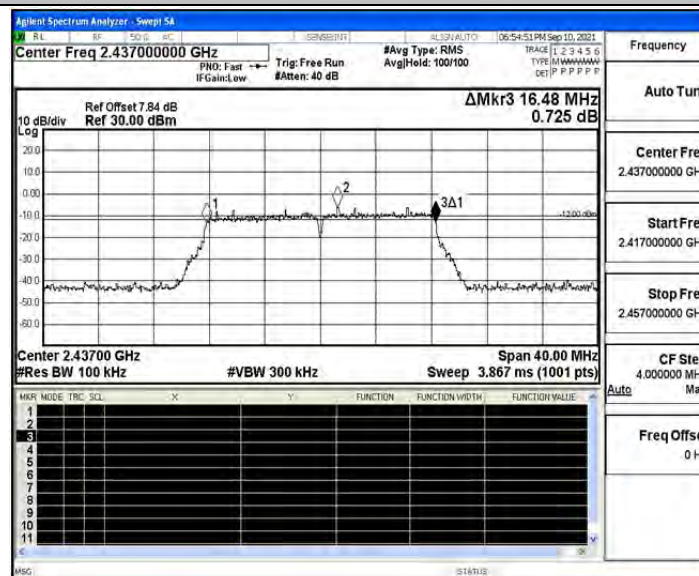
11B_Ant1_2462



11G_Ant1_2412

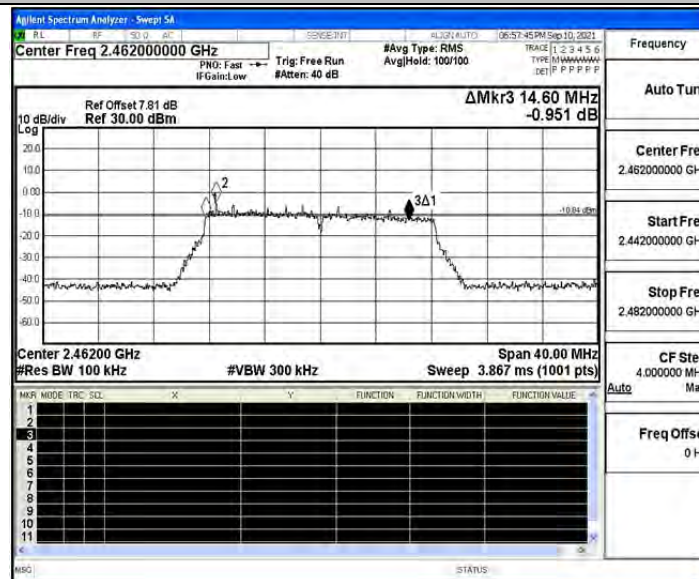


11G_Ant1_2437

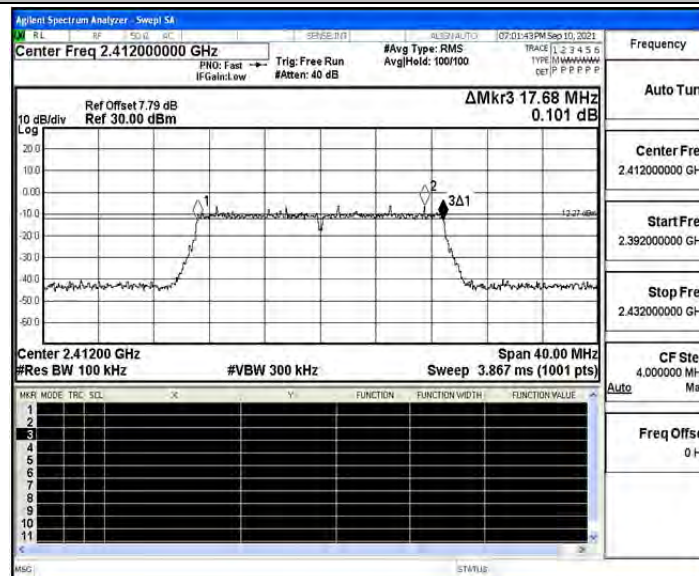




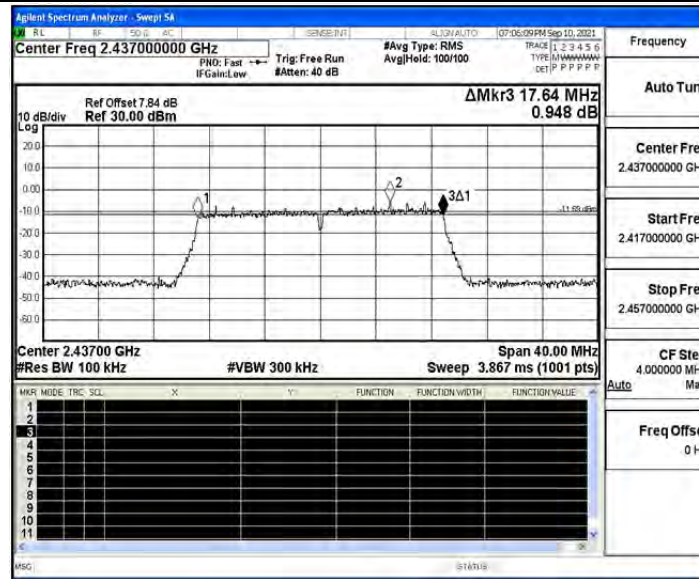
11G_Ant1_2462



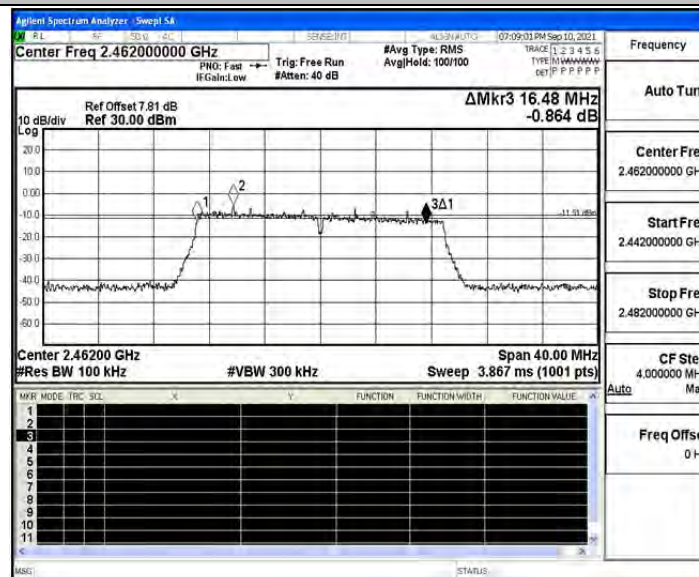
11N20SISO_Ant1_2412



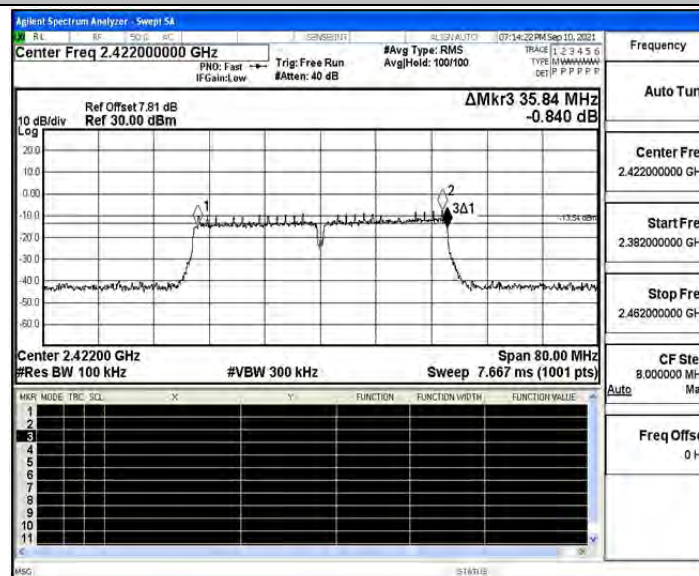
11N20SISO_Ant1_2437



11N20SISO_Ant1_2462

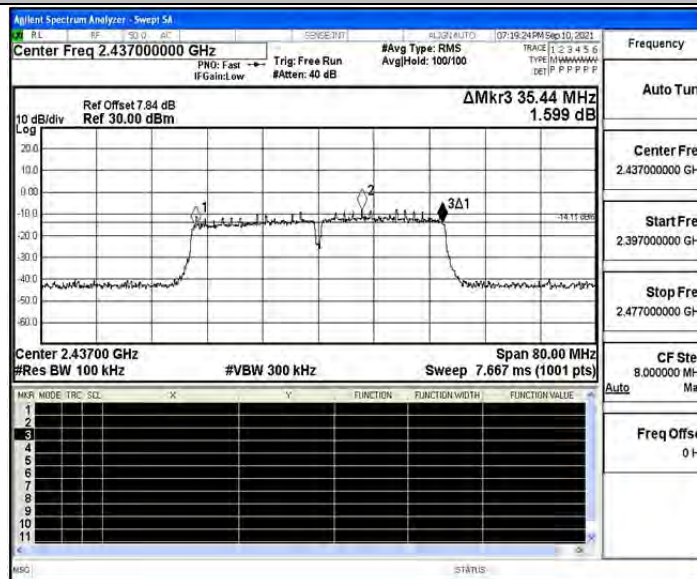


11N40SISO_Ant1_2422

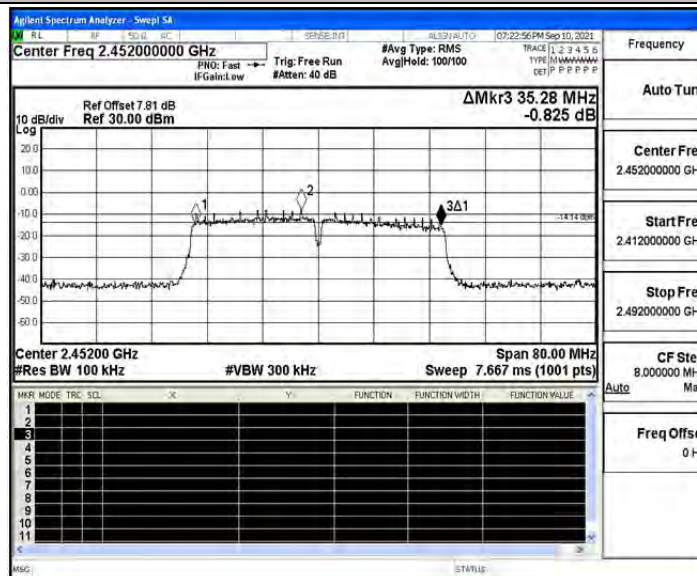




11N40SISO_Ant1_2437



11N40SISO_Ant1_2452





B.2 Maximum peak conducted output power

Test Result

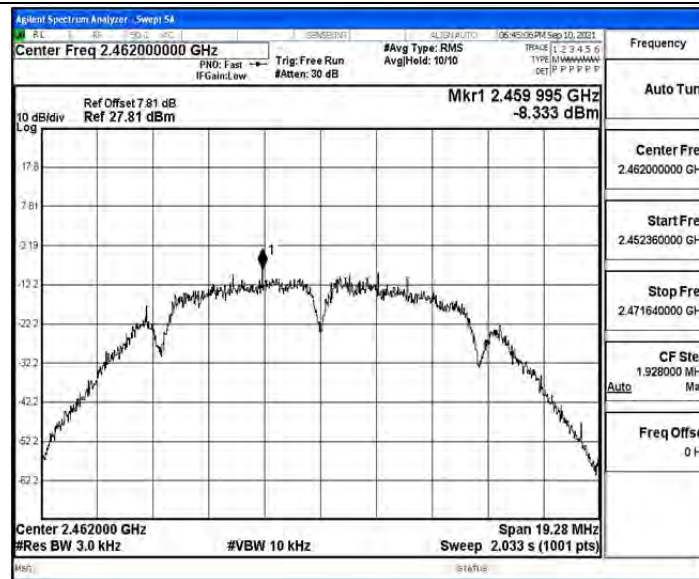
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	2412	16.19	≤ 30	PASS
		2437	15.89	≤ 30	PASS
		2462	16.17	≤ 30	PASS
11G	Ant1	2412	12.36	≤ 30	PASS
		2437	12.51	≤ 30	PASS
		2462	12.18	≤ 30	PASS
11N20SISO	Ant1	2412	12.51	≤ 30	PASS
		2437	12.54	≤ 30	PASS
		2462	12.32	≤ 30	PASS
11N40SISO	Ant1	2422	12.47	≤ 30	PASS
		2437	12.62	≤ 30	PASS
		2452	12.41	≤ 30	PASS



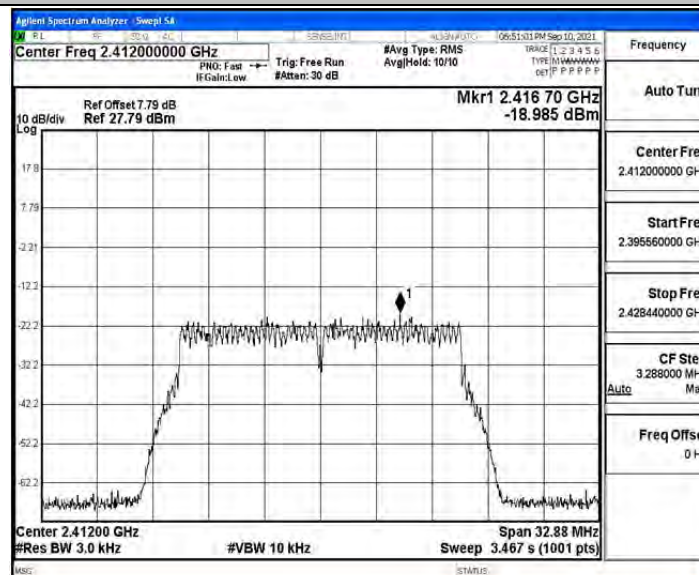
B.3 Maximum power spectral density

Test Result

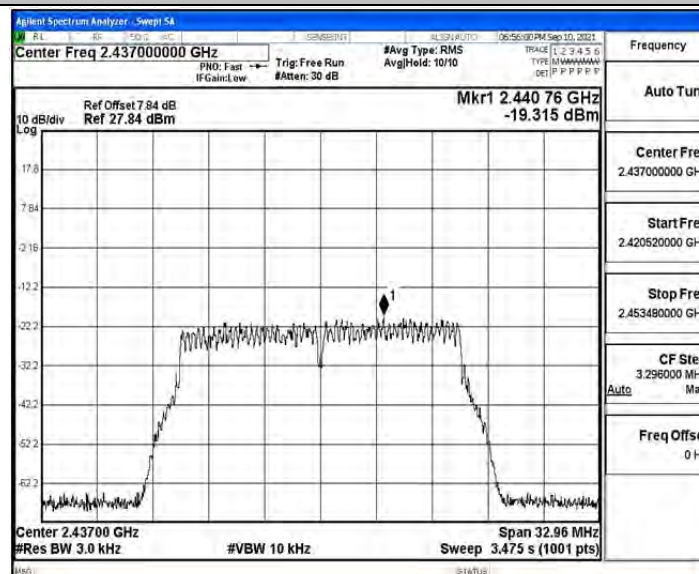
TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-2.96	≤8	PASS
		2437	-6.64	≤8	PASS
		2462	-8.33	≤8	PASS
11G	Ant1	2412	-18.99	≤8	PASS
		2437	-19.32	≤8	PASS
		2462	-19.42	≤8	PASS
11N20SISO	Ant1	2412	-19.98	≤8	PASS
		2437	-18.5	≤8	PASS
		2462	-18.93	≤8	PASS
11N40SISO	Ant1	2422	-22.18	≤8	PASS
		2437	-21.57	≤8	PASS
		2452	-21.42	≤8	PASS



11G_Ant1_2412

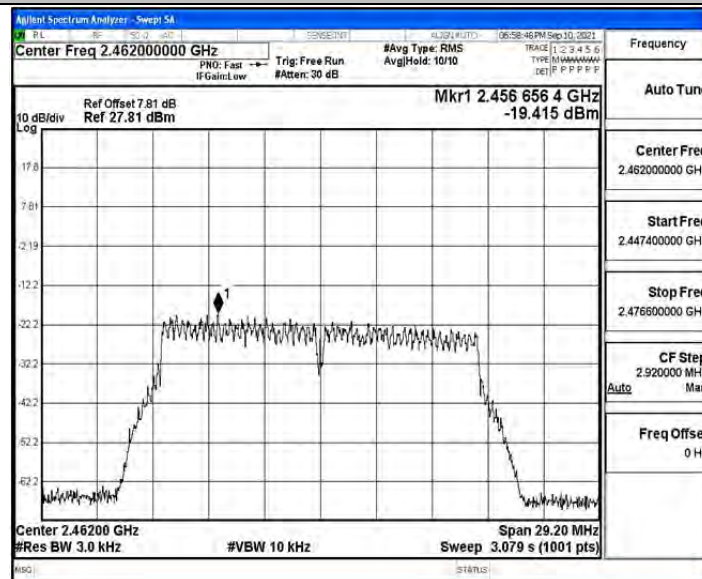


11G_Ant1_2437

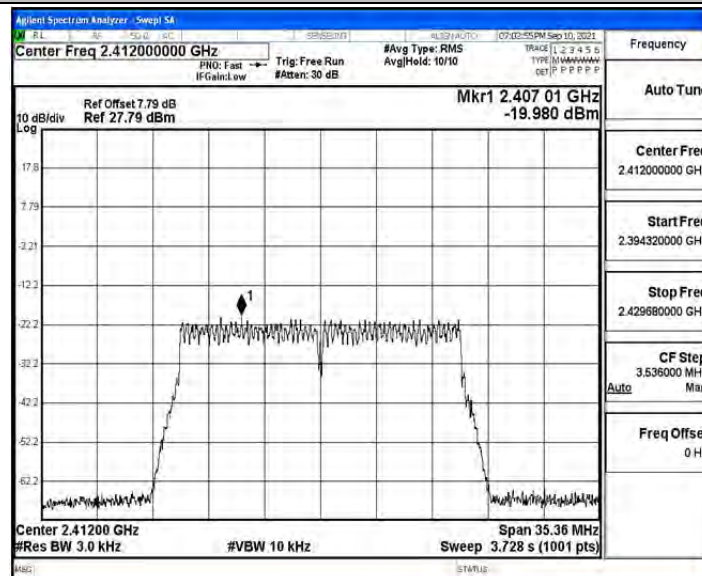




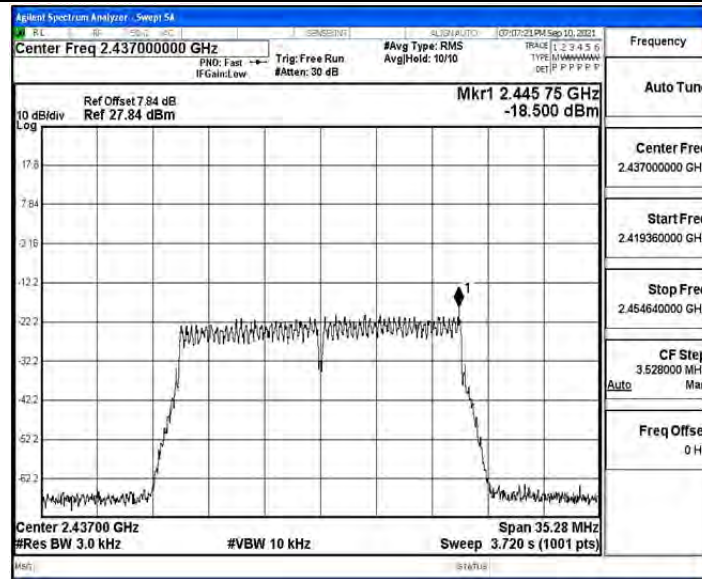
11G_Ant1_2462



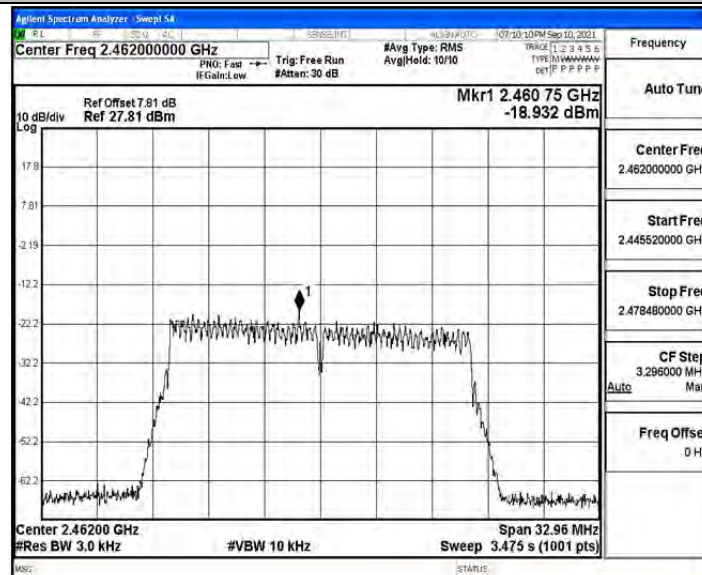
11N20SISO_Ant1_2412



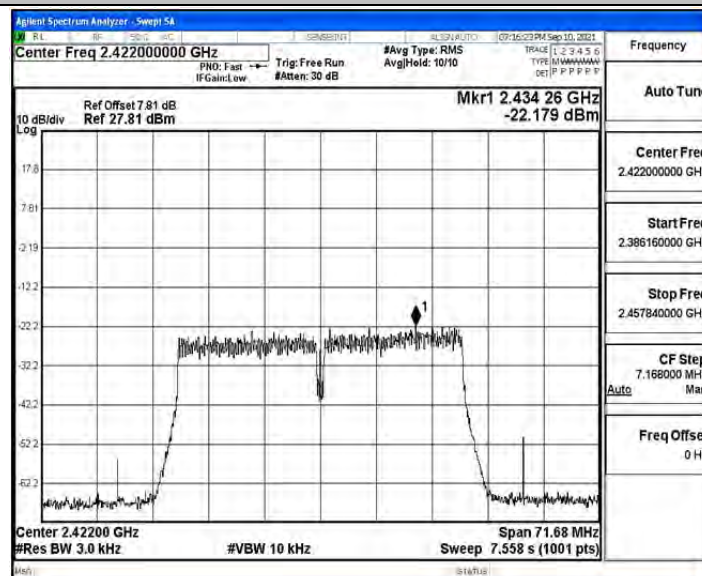
11N20SISO_Ant1_2437



11N20SISO_Ant1_2462

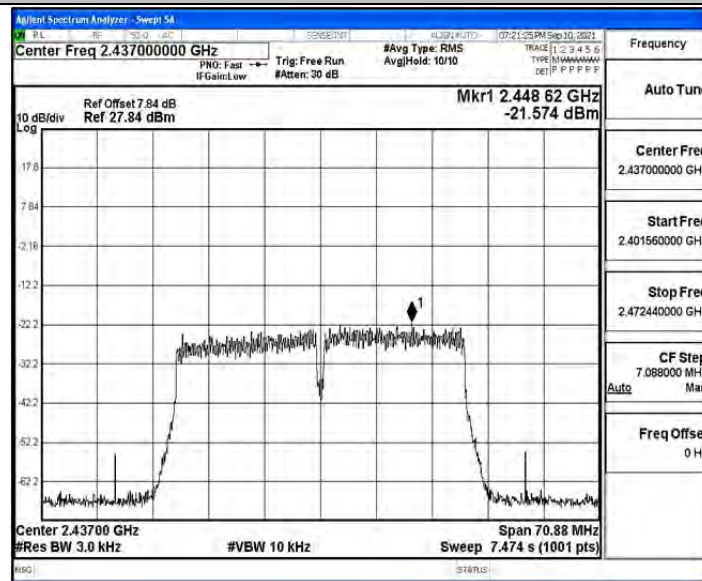


11N40SISO_Ant1_2422

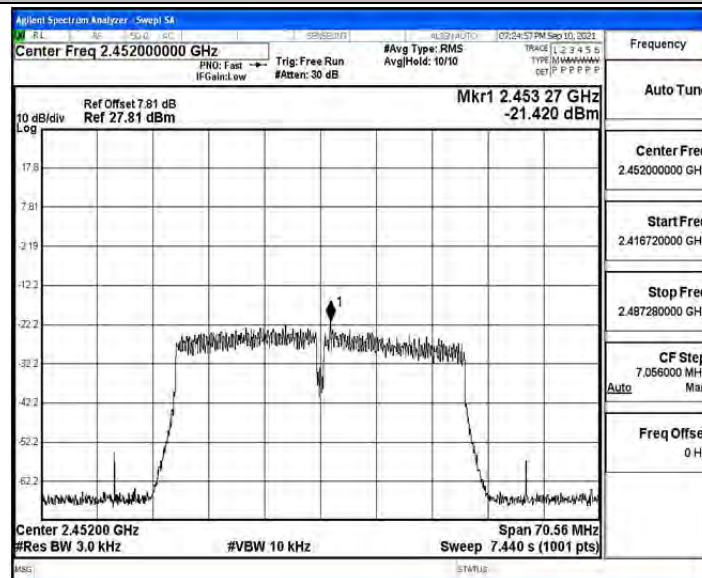




11N40SISO_Ant1_2437



11N40SISO_Ant1_2452



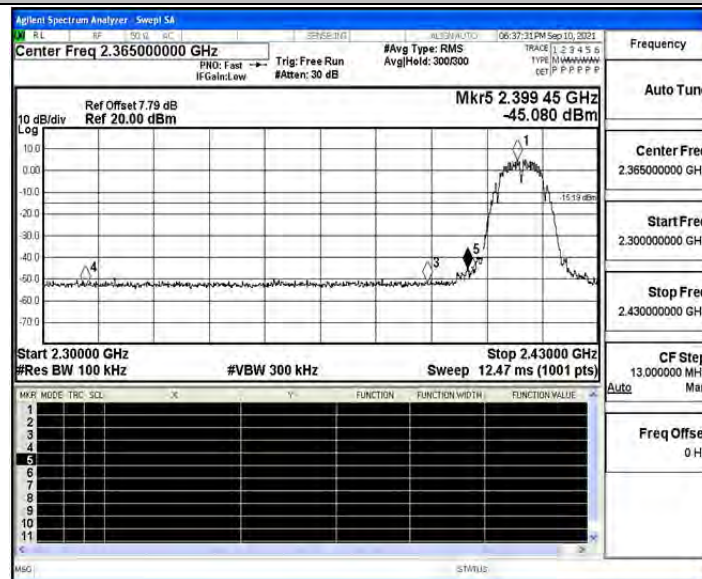


B.4 Band edge measurements

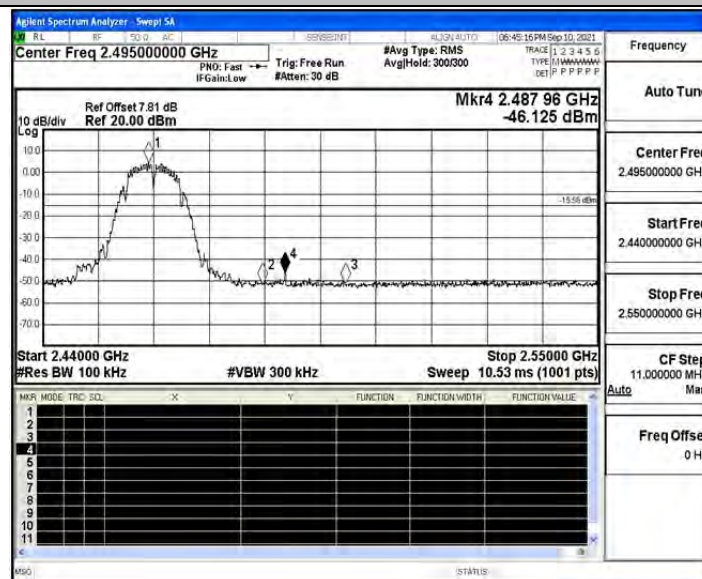
Test Result

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	4.81	-45.08	≤ -15.19	PASS
		High	2462	4.45	-46.13	≤ -15.56	PASS
11G	Ant1	Low	2412	-5.80	-49.81	≤ -25.8	PASS
		High	2462	-4.93	-46.65	≤ -24.93	PASS
11N20SISO	Ant1	Low	2412	-6.21	-48.9	≤ -26.21	PASS
		High	2462	-5.26	-47.41	≤ -25.26	PASS
11N40SISO	Ant1	Low	2422	-8.97	-48.12	≤ -28.97	PASS
		High	2452	-8.07	-48.85	≤ -28.07	PASS

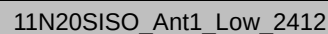
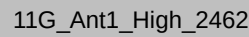
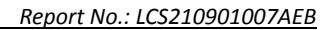
11B_Ant1_Low_2412



11B_Ant1_High_2462

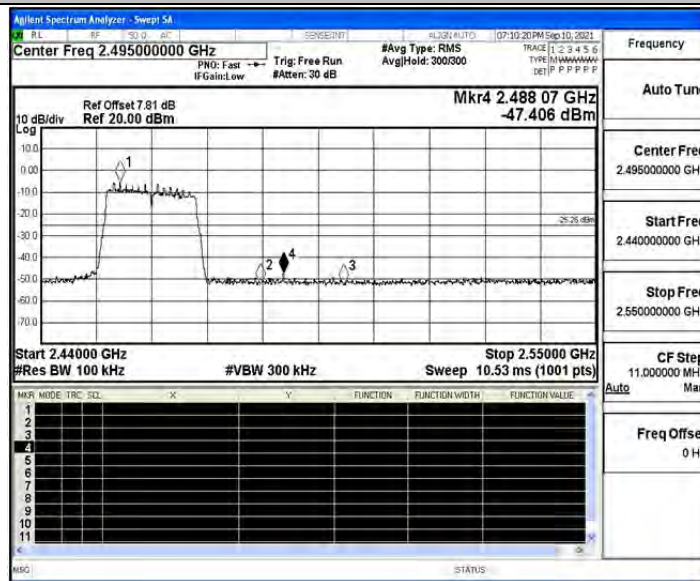


11G Ant1 Low 2412

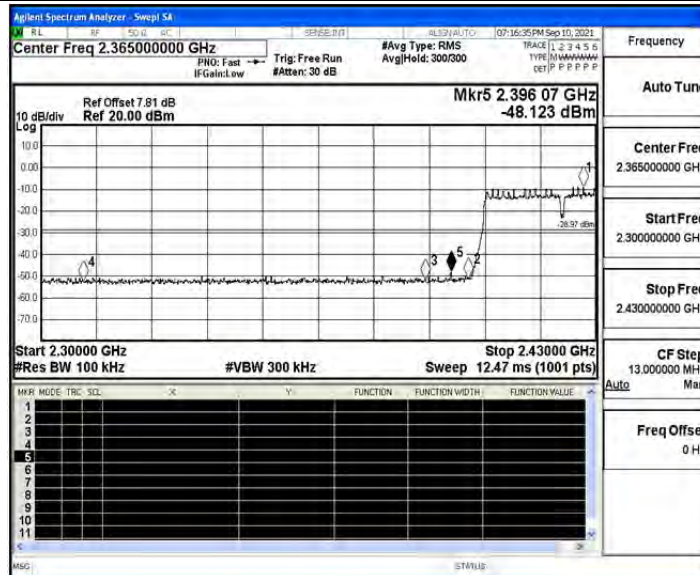




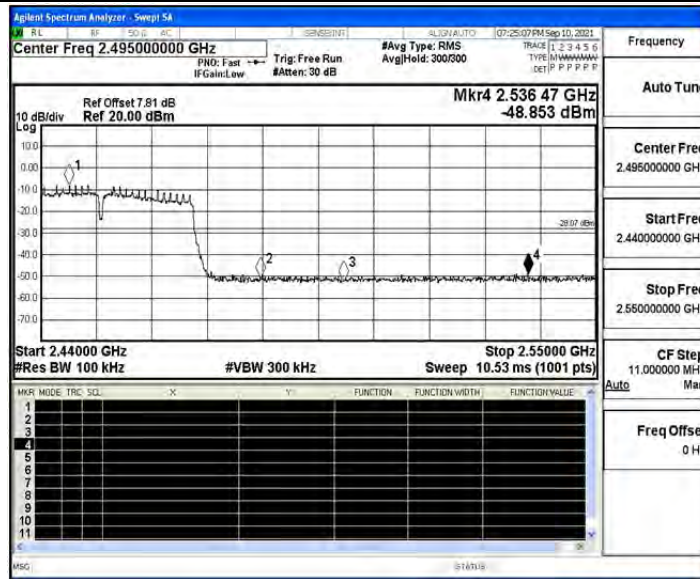
11N20SISO_Ant1_High_2462



11N40SISO_Ant1_Low_2422



11N40SISO_Ant1_High_2452





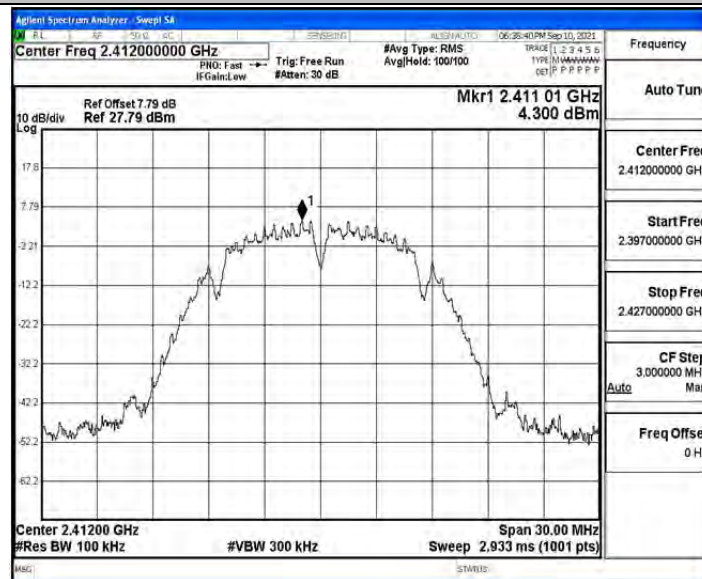
B.5 Conducted Spurious Emission

Test Result

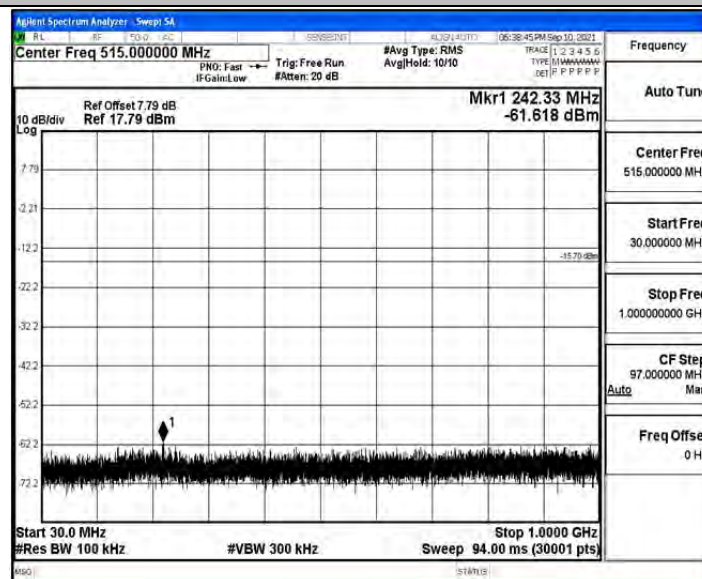
TestMode	Antenna	Channel	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	4.30	4.30	---	PASS
			30~1000	4.30	-61.62	≤-15.7	PASS
			1000~26500	4.30	-47.32	≤-15.7	PASS
		2437	Reference	3.63	3.63	---	PASS
			30~1000	3.63	-61.75	≤-16.37	PASS
			1000~26500	3.63	-47.23	≤-16.37	PASS
		2462	Reference	4.28	4.28	---	PASS
			30~1000	4.28	-61.37	≤-15.72	PASS
			1000~26500	4.28	-47.31	≤-15.72	PASS
11G	Ant1	2412	Reference	-6.23	-6.23	---	PASS
			30~1000	-6.23	-62.07	≤-26.23	PASS
			1000~26500	-6.23	-47.47	≤-26.23	PASS
		2437	Reference	-6.14	-6.14	---	PASS
			30~1000	-6.14	-62.34	≤-26.14	PASS
			1000~26500	-6.14	-47.54	≤-26.14	PASS
		2462	Reference	-5.84	-5.84	---	PASS
			30~1000	-5.84	-61.11	≤-25.84	PASS
			1000~26500	-5.84	-47.43	≤-25.84	PASS
11N20SISO	Ant1	2412	Reference	-6.08	-6.08	---	PASS
			30~1000	-6.08	-62.02	≤-26.08	PASS
			1000~26500	-6.08	-47.16	≤-26.08	PASS
		2437	Reference	-5.74	-5.74	---	PASS
			30~1000	-5.74	-61.82	≤-25.74	PASS
			1000~26500	-5.74	-47.96	≤-25.74	PASS
		2462	Reference	-6.17	-6.17	---	PASS
			30~1000	-6.17	-62.29	≤-26.17	PASS
			1000~26500	-6.17	-47.5	≤-26.17	PASS
11N40SISO	Ant1	2422	Reference	-8.21	-8.21	---	PASS
			30~1000	-8.21	-62.06	≤-28.21	PASS
			1000~26500	-8.21	-47.42	≤-28.21	PASS
		2437	Reference	-8.14	-8.14	---	PASS
			30~1000	-8.14	-61.64	≤-28.14	PASS
			1000~26500	-8.14	-46.81	≤-28.14	PASS
		2452	Reference	-8.08	-8.08	---	PASS
			30~1000	-8.08	-60.85	≤-28.08	PASS
			1000~26500	-8.08	-47.43	≤-28.08	PASS

Test Graphs

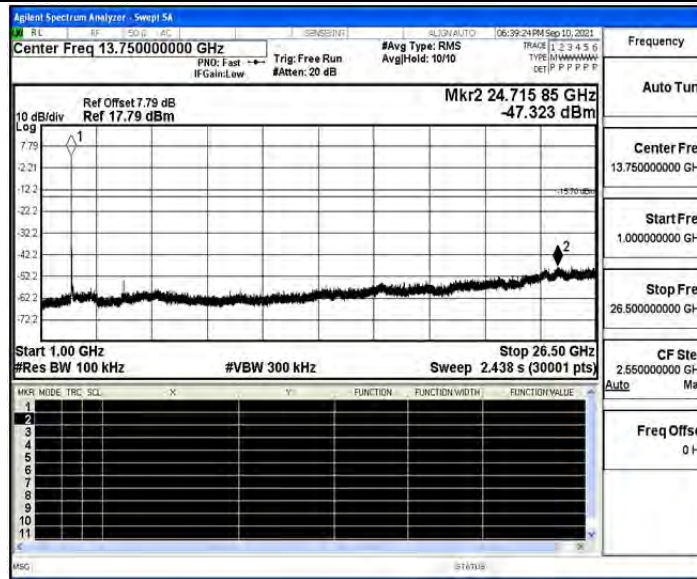
11B_Ant1_2412_0~Reference



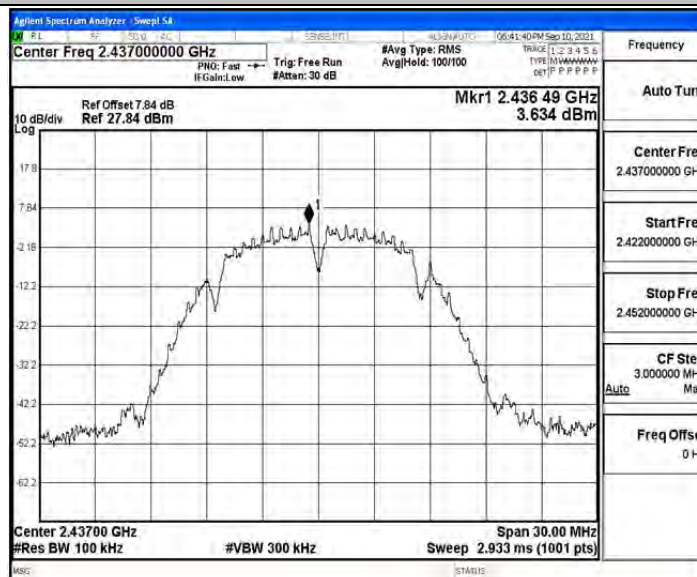
11B_Ant1_2412_30~1000



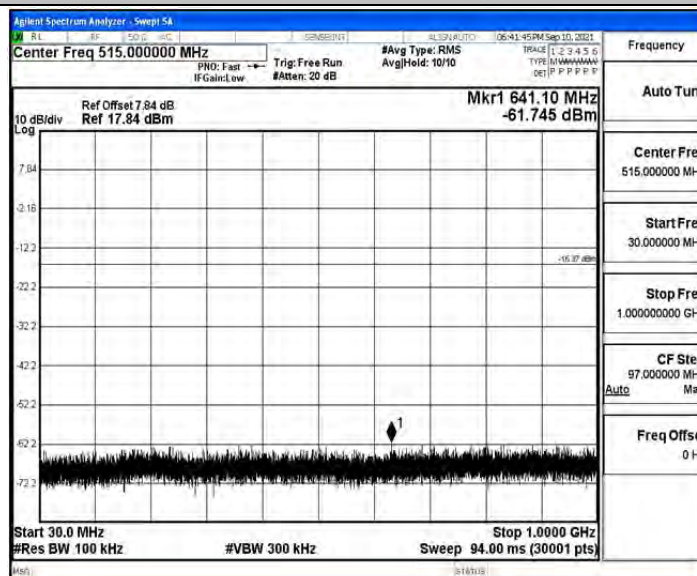
11B_Ant1_2412_1000~26500



11B_Ant1_2437_0~Reference

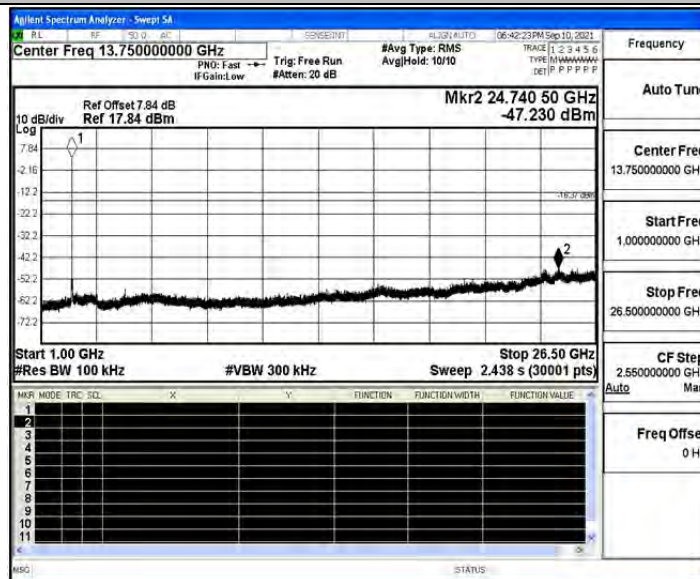


11B_Ant1_2437_30~1000

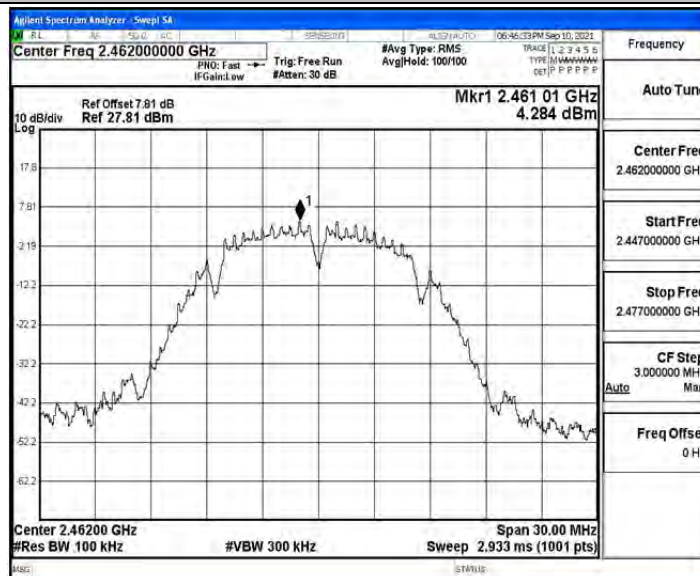




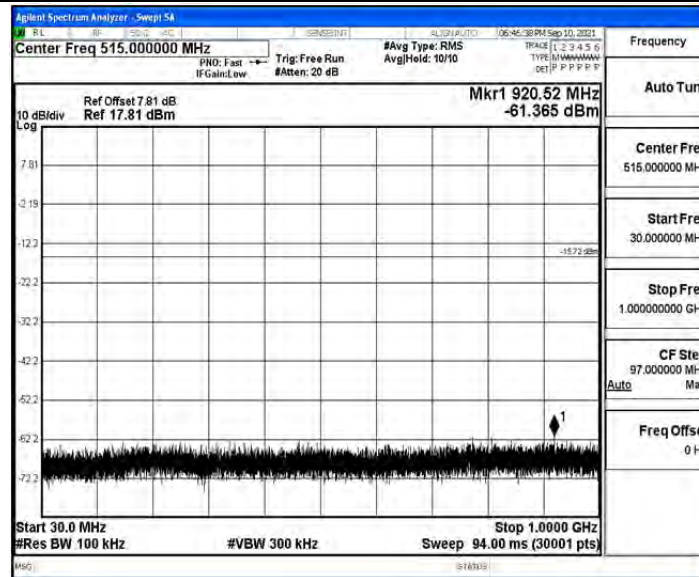
11B_Ant1_2437_1000~26500



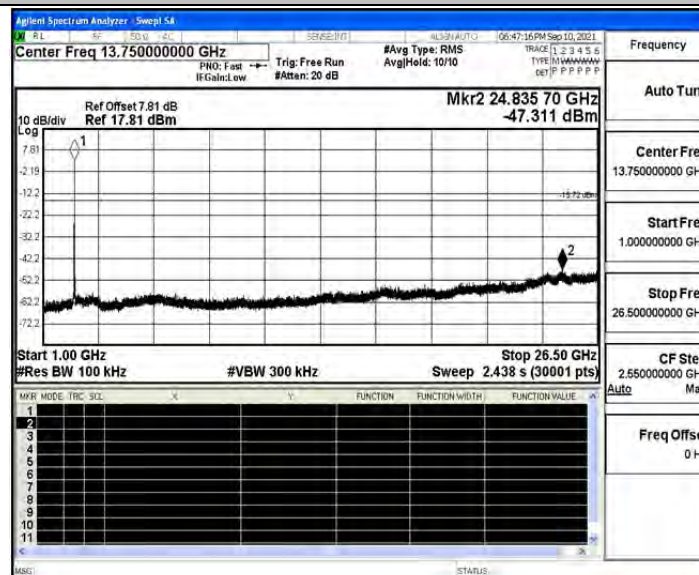
11B_Ant1_2462_0~Reference



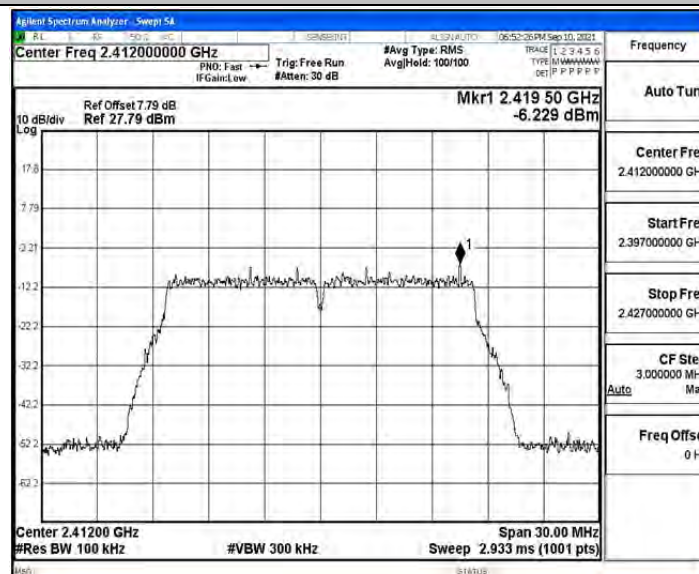
11B_Ant1_2462_30~1000



11B_Ant1_2462_1000~26500

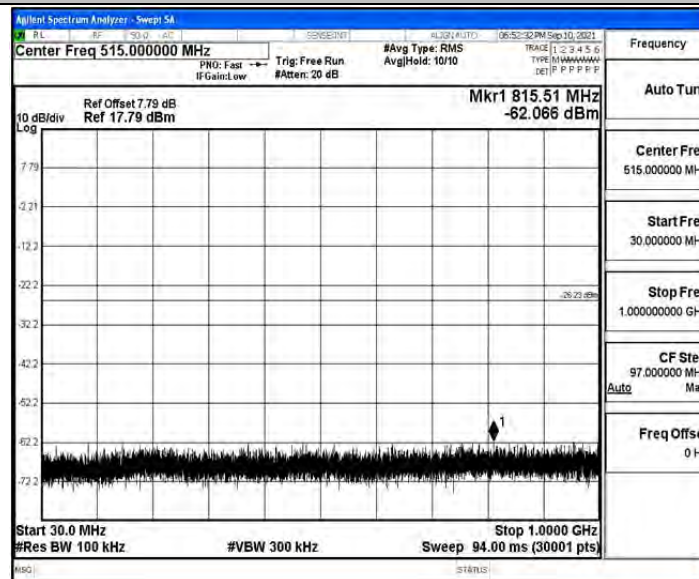


11G_Ant1_2412_0~Reference

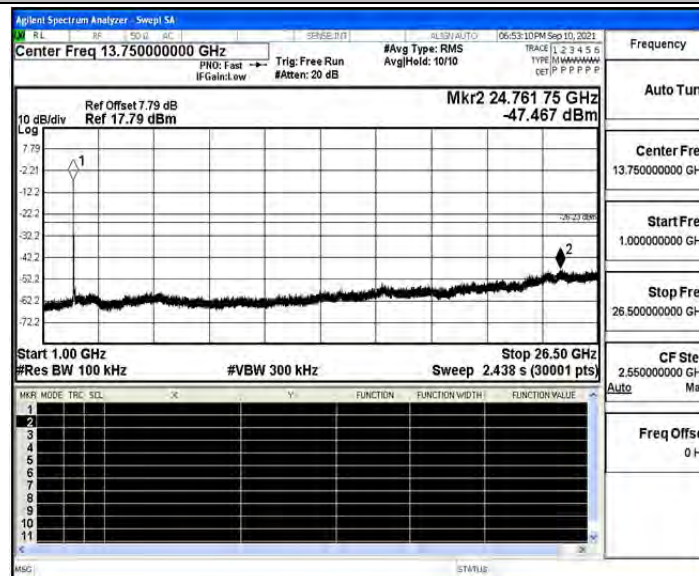




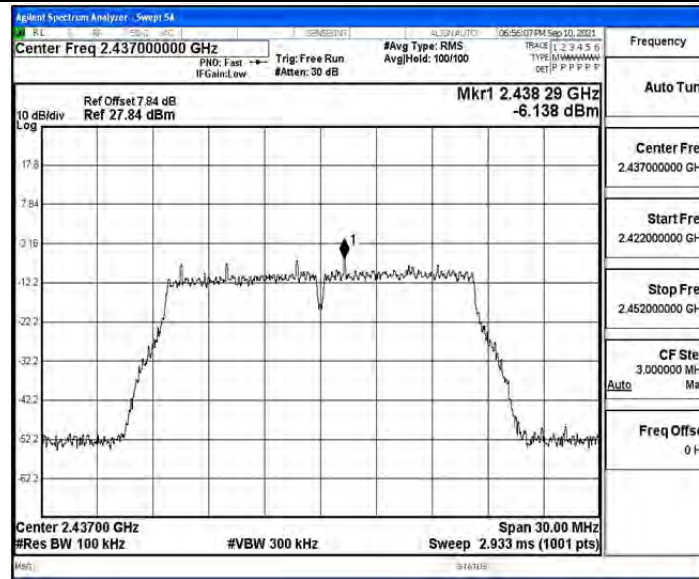
11G_Ant1_2412_30~1000



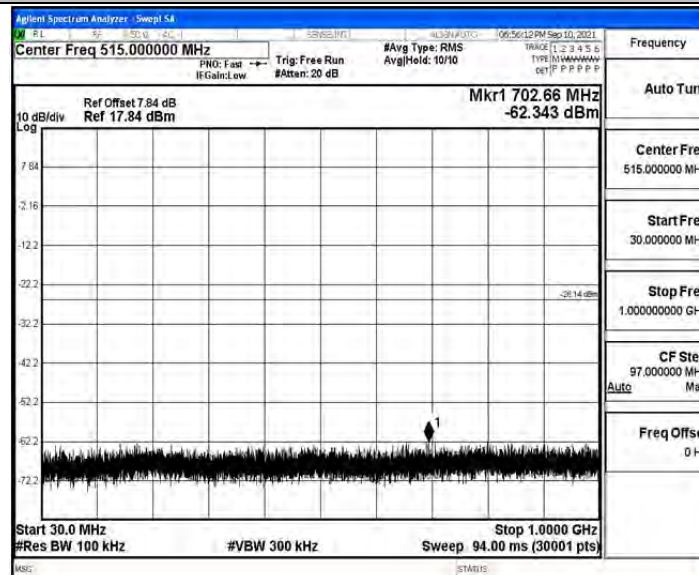
11G_Ant1_2412_1000~26500



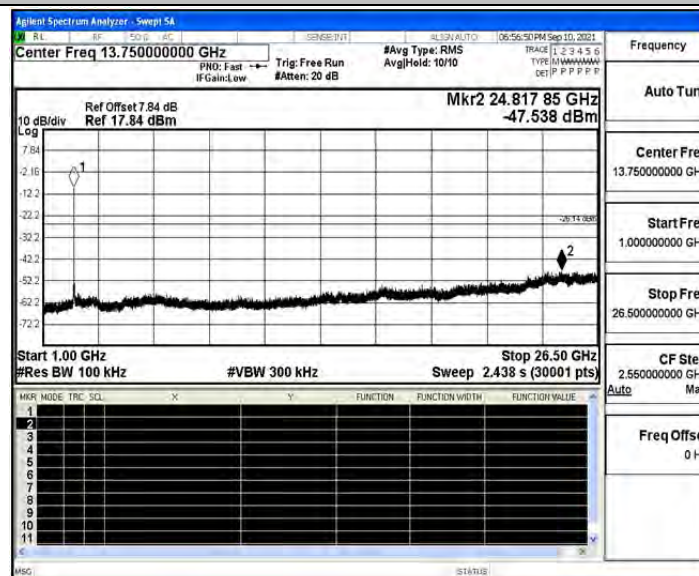
11G_Ant1_2437_0~Reference



11G_Ant1_2437_30~1000

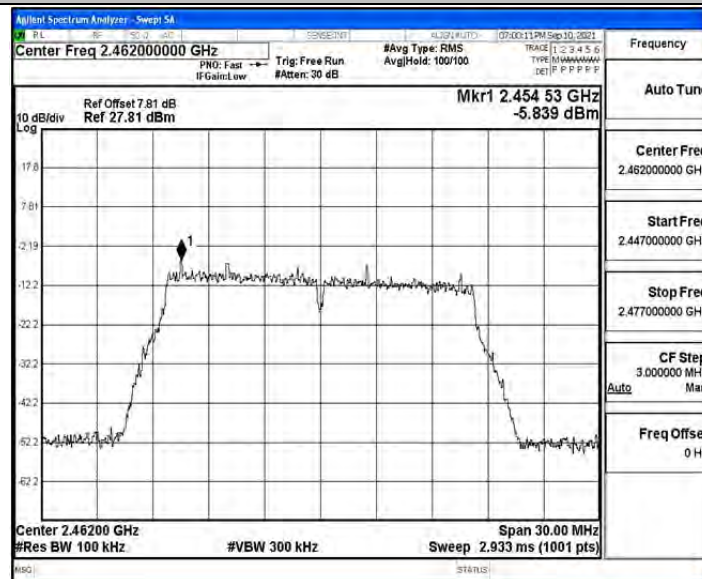


11G_Ant1_2437_1000~26500

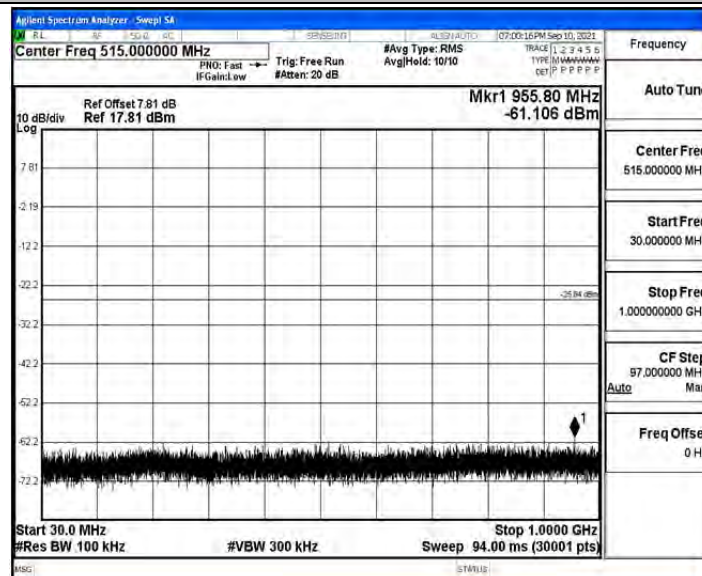




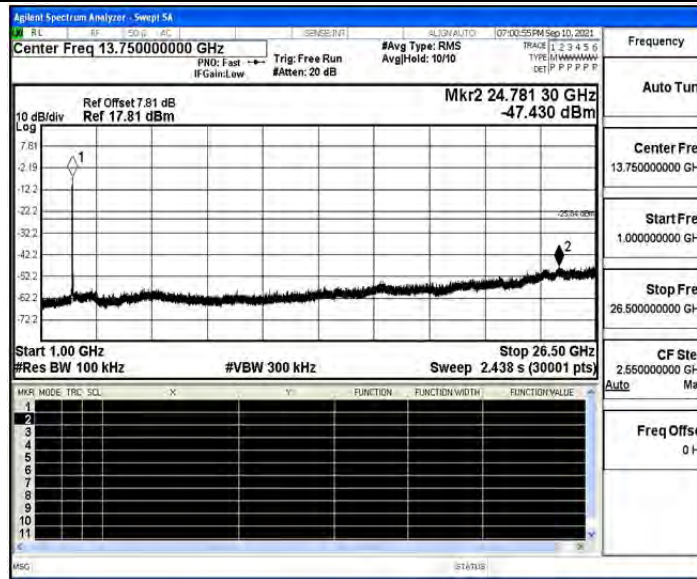
11G_Ant1_2462_0~Reference



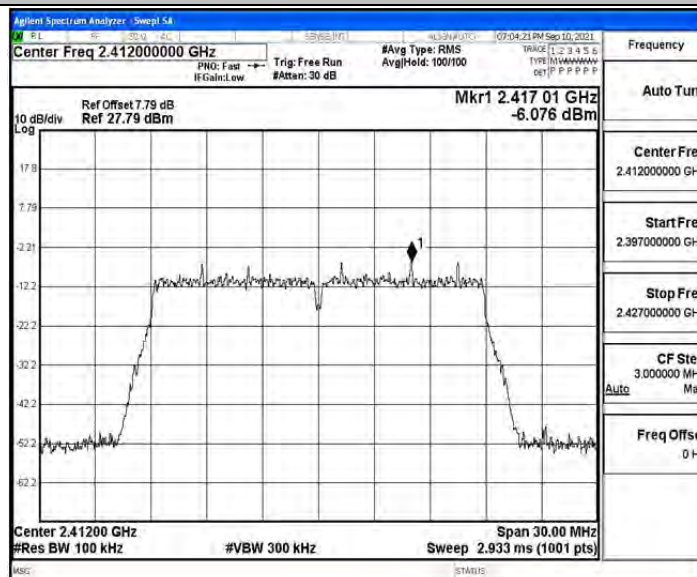
11G_Ant1_2462_30~1000



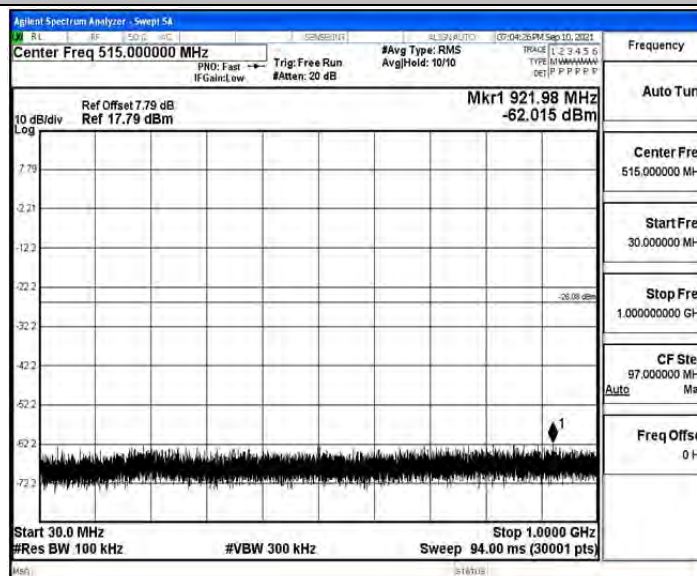
11G_Ant1_2462_1000~26500



11N20SISO_Ant1_2412_0~Reference

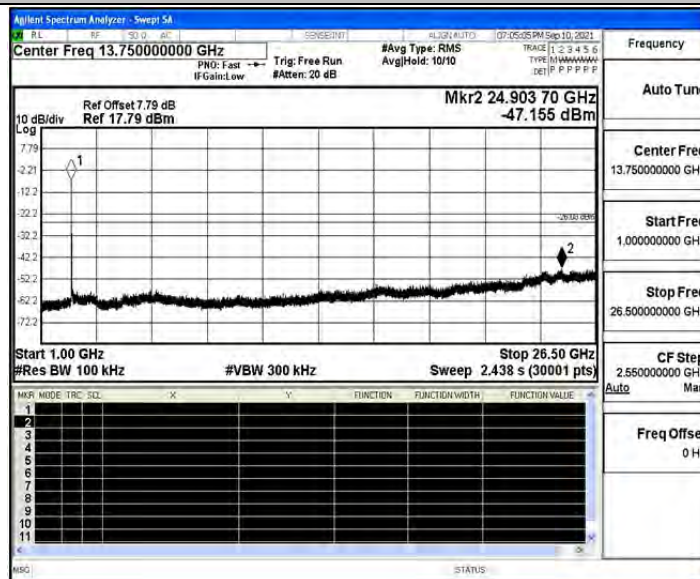


11N20SISO_Ant1_2412_30~1000

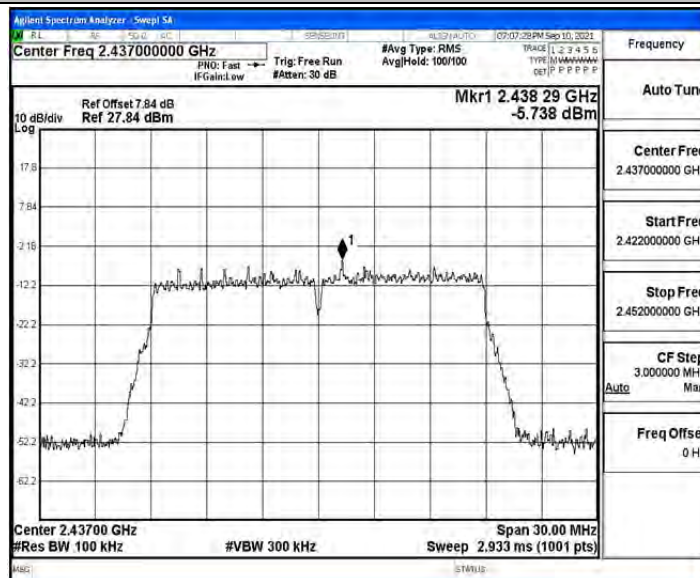




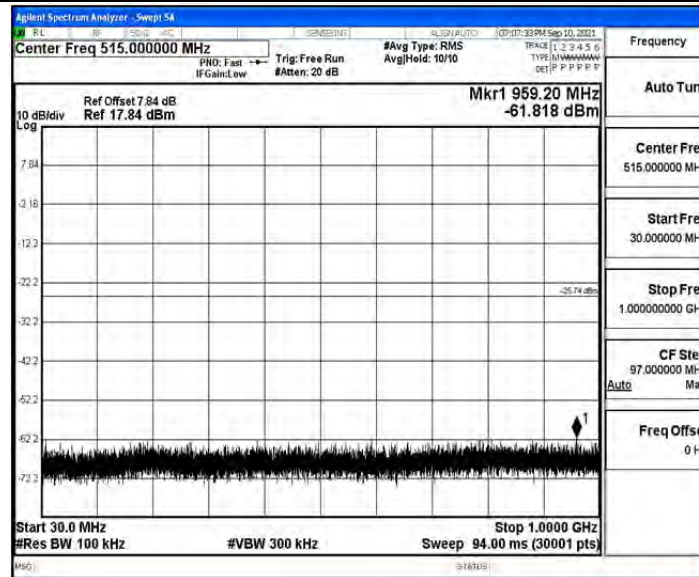
11N20SISO_Ant1_2412_1000~26500



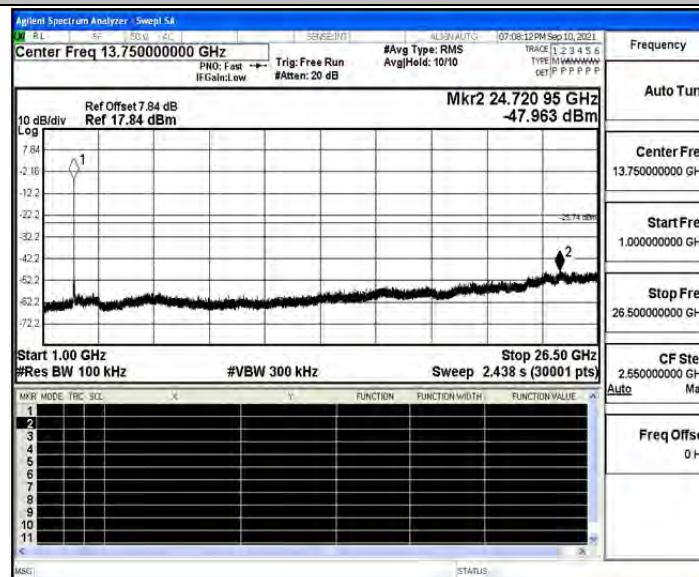
11N20SISO_Ant1_2437_0~Reference



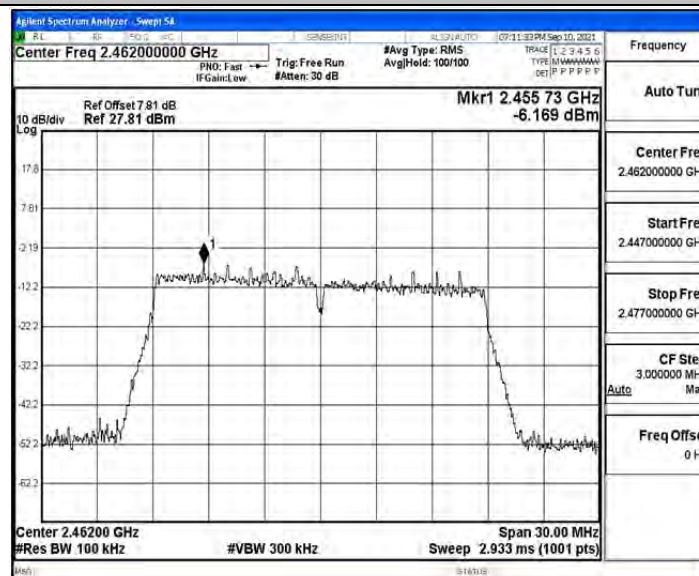
11N20SISO_Ant1_2437_30~1000



11N20SISO_Ant1_2437_1000~26500

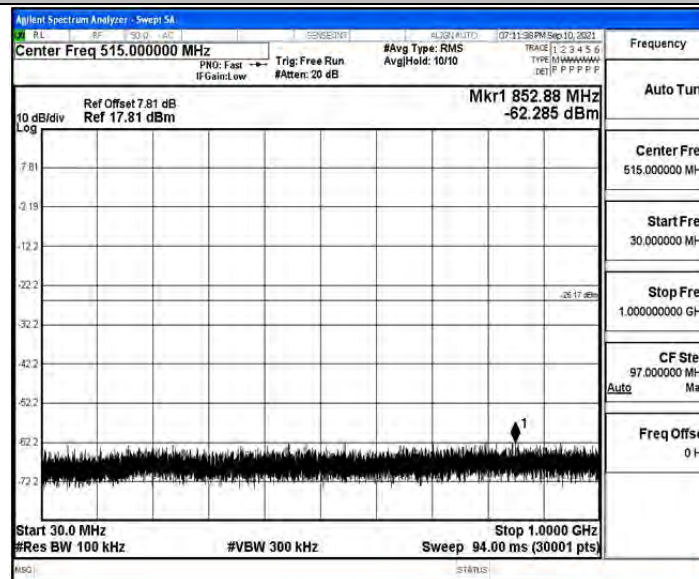


11N20SISO_Ant1_2462_0~Reference

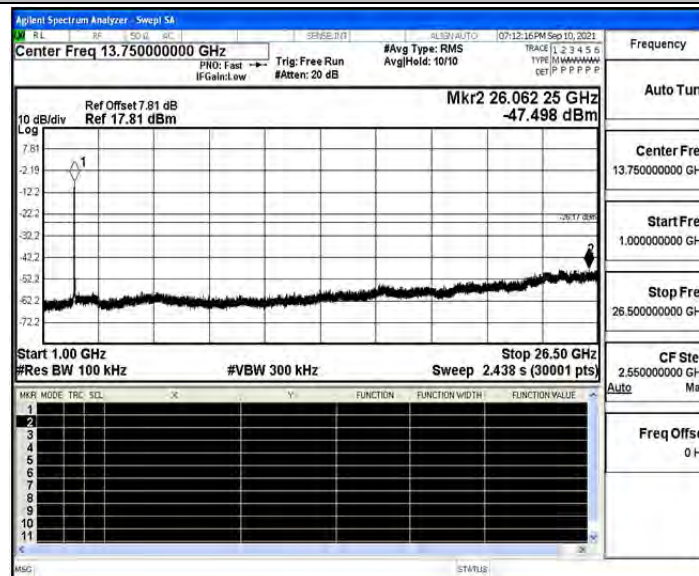




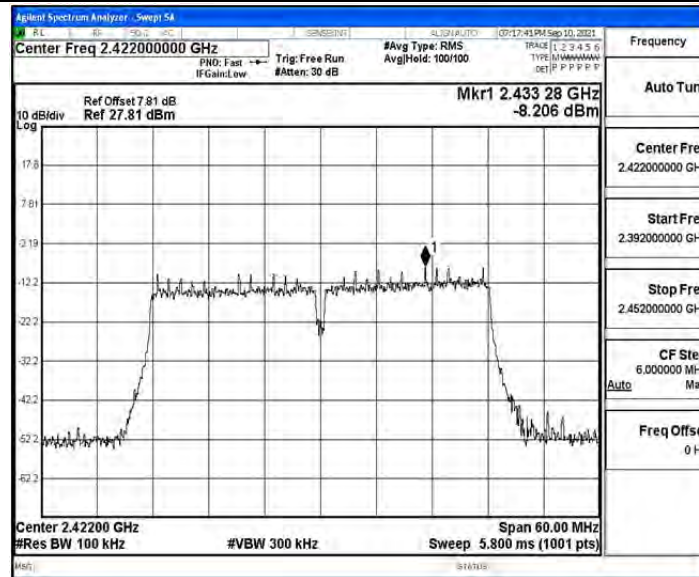
11N20SISO_Ant1_2462_30~1000



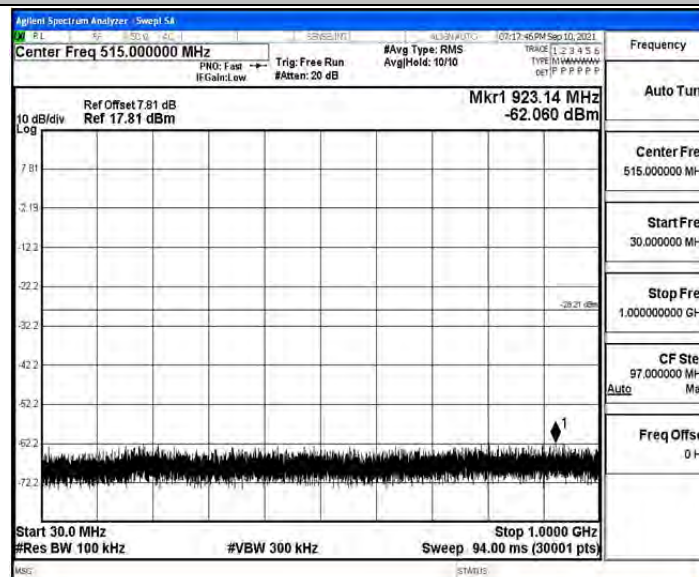
11N20SISO_Ant1_2462_1000~26500



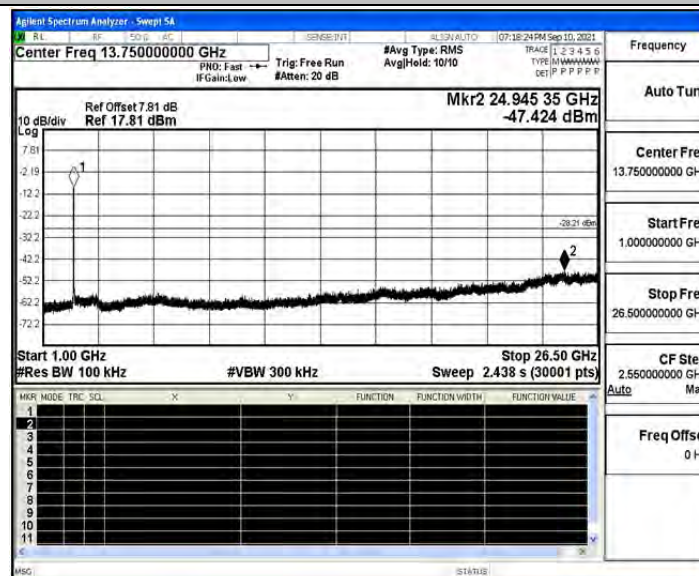
11N40SISO_Ant1_2422_0~Reference



11N40SISO_Ant1_2422_30~1000

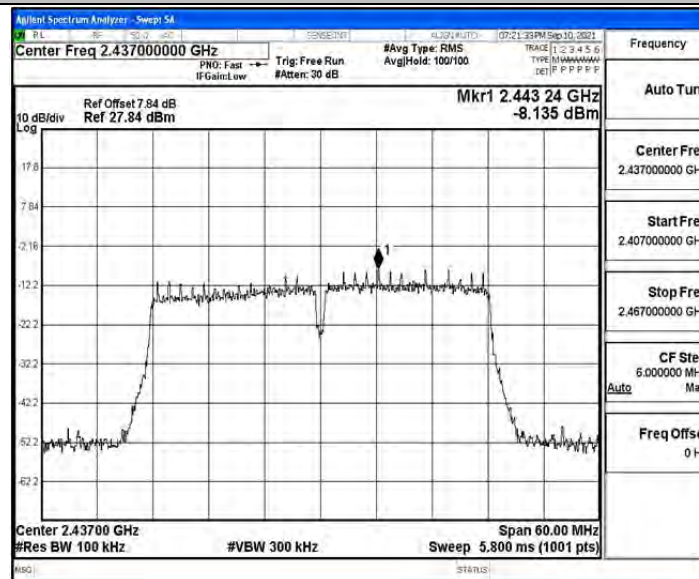


11N40SISO_Ant1_2422_1000~26500

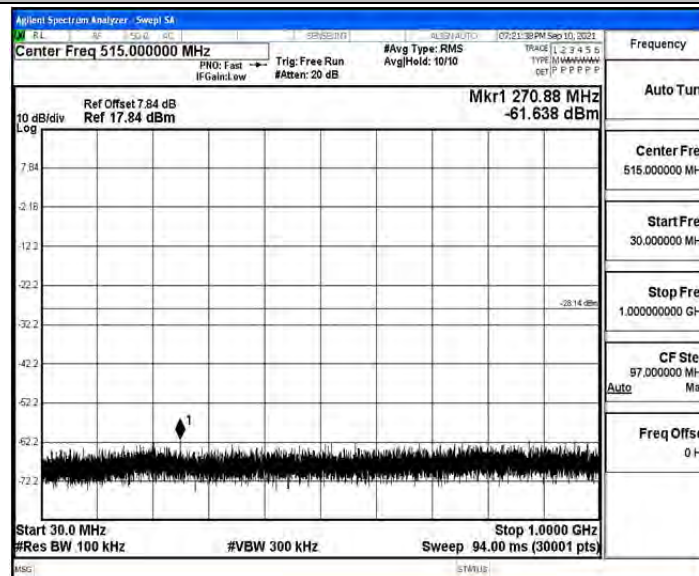




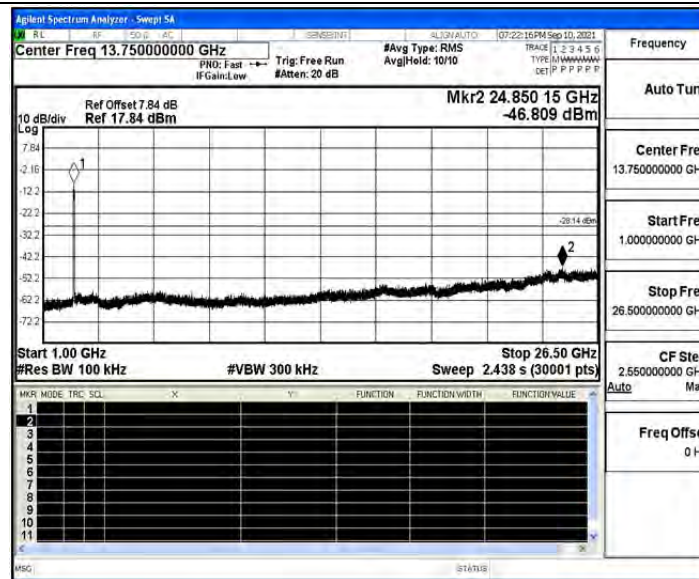
11N40SISO_Ant1_2437_0~Reference



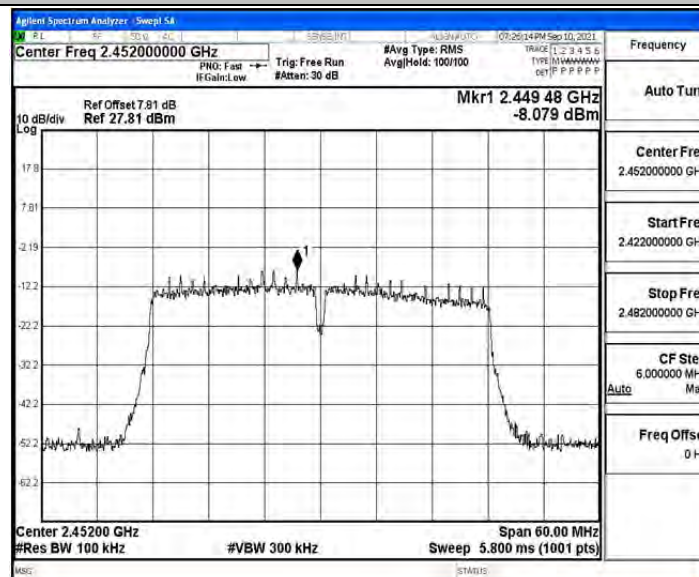
11N40SISO_Ant1_2437_30~1000



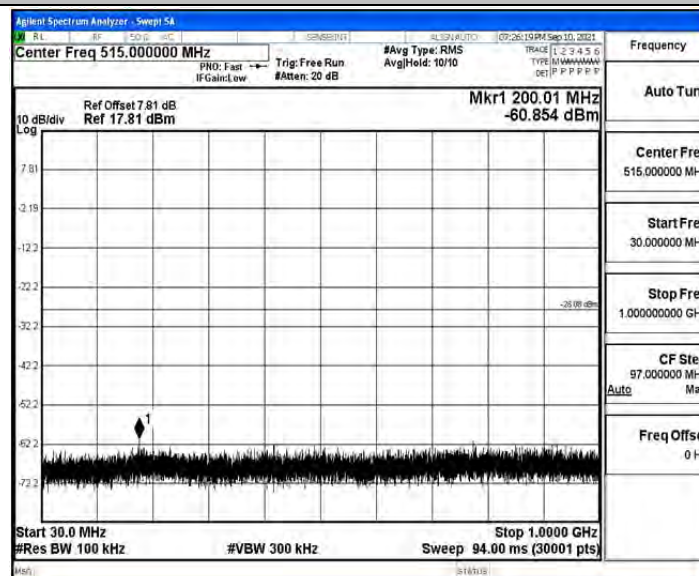
11N40SISO_Ant1_2437_1000~26500



11N40SISO_Ant1_2452_0~Reference

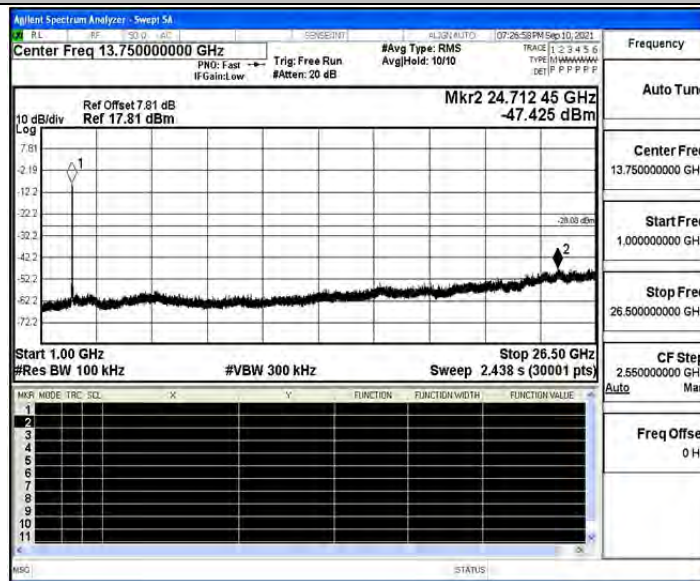


11N40SISO_Ant1_2452_30~1000





11N40SISO_Ant1_2452_1000-26500





B.6 Duty Cycle

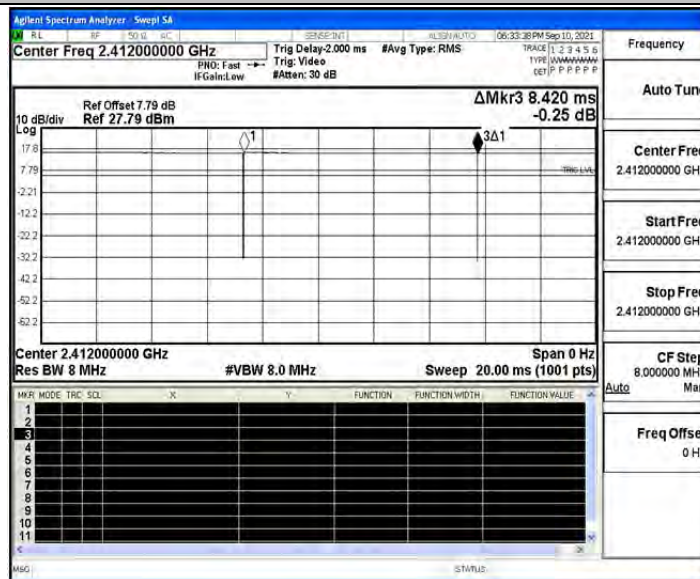
Test Result

TestMode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Limit	Verdict
11B	Ant1	2412	8.38	8.42	99.52	---	PASS
		2437	30.00	30.00	100.00	---	PASS
		2462	16.78	16.83	99.70	---	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

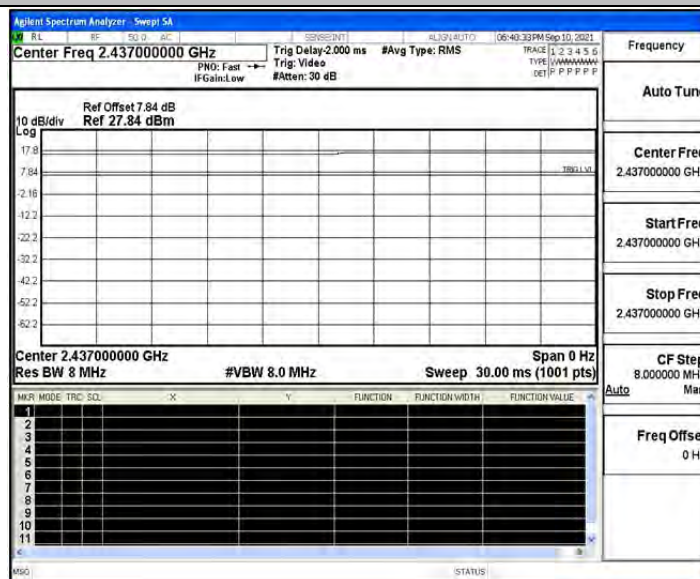


Test Graphs

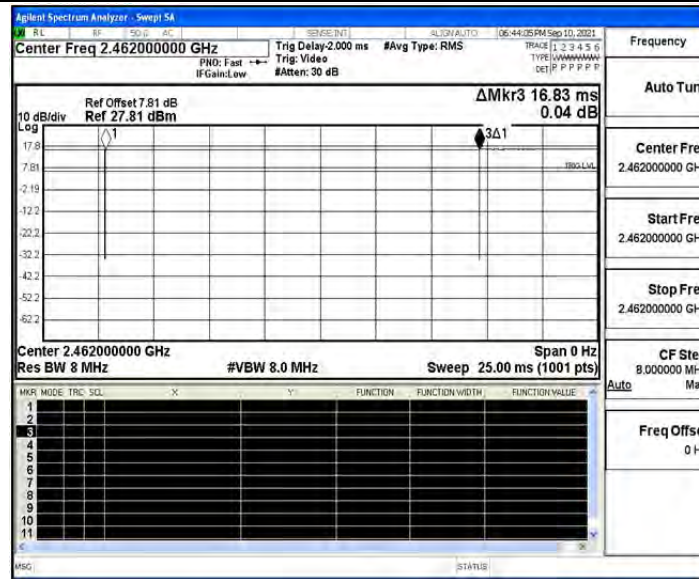
11B_Ant1_2412



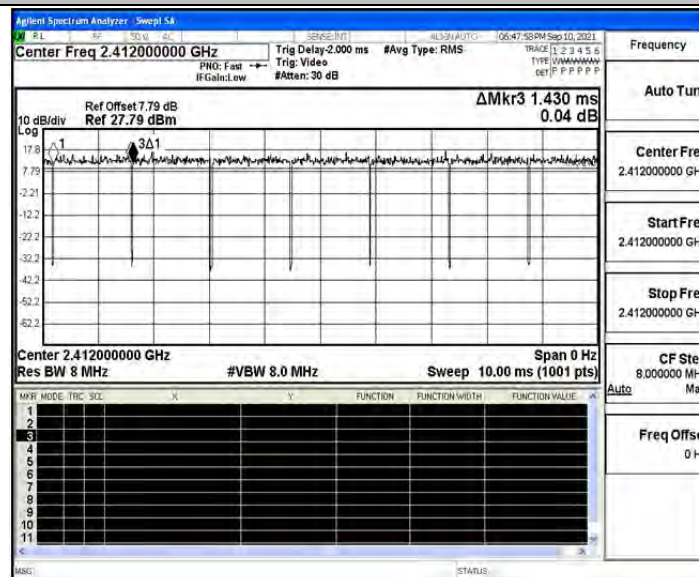
11B_Ant1_2437



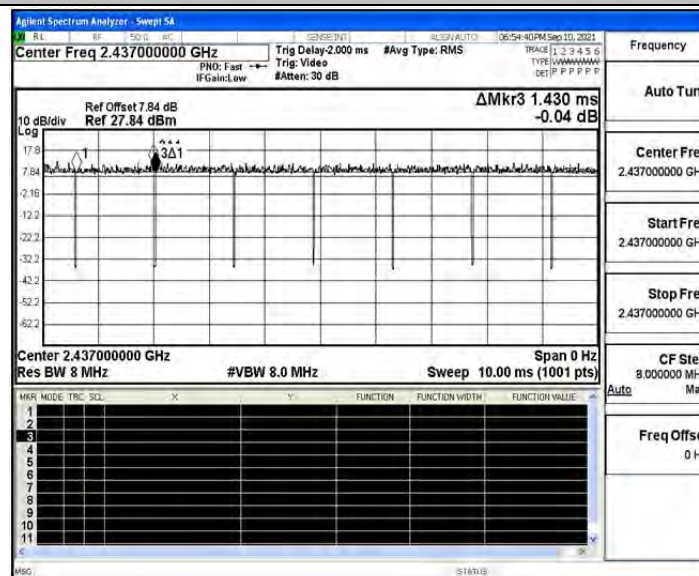
11B_Ant1_2462



11G_Ant1_2412

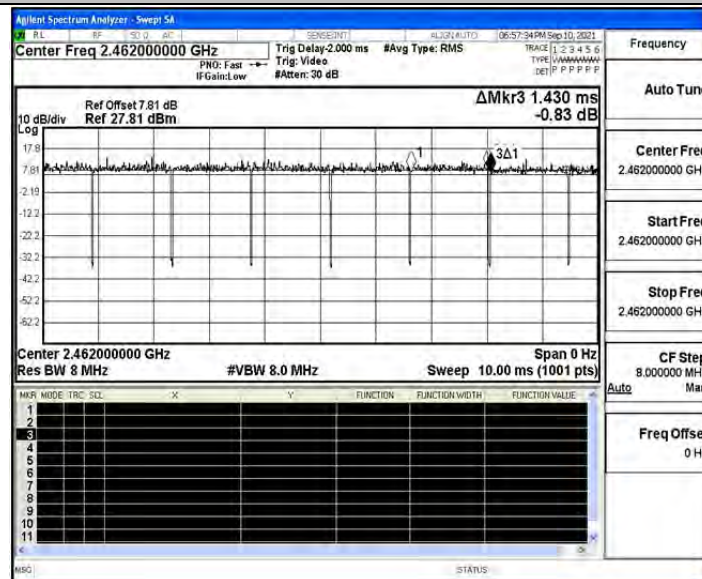


11G_Ant1_2437

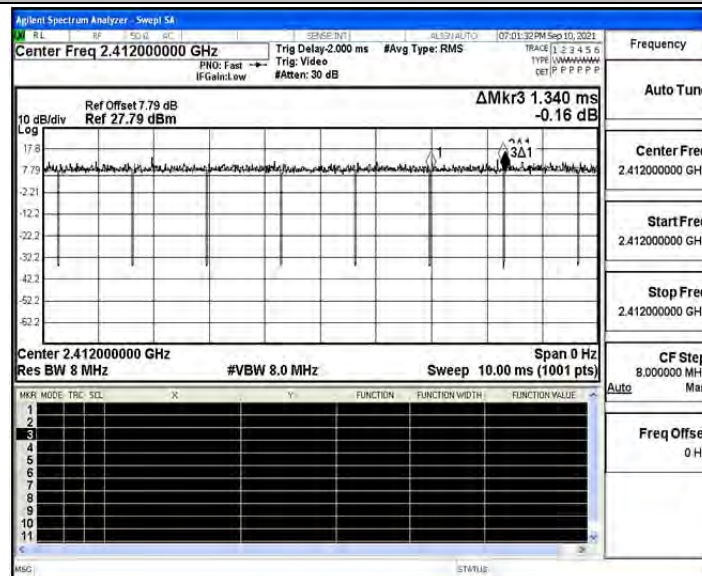




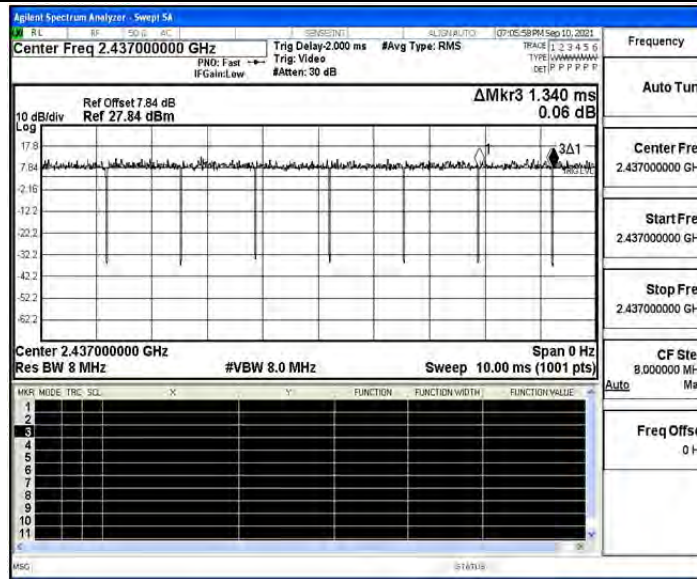
11G_Ant1_2462



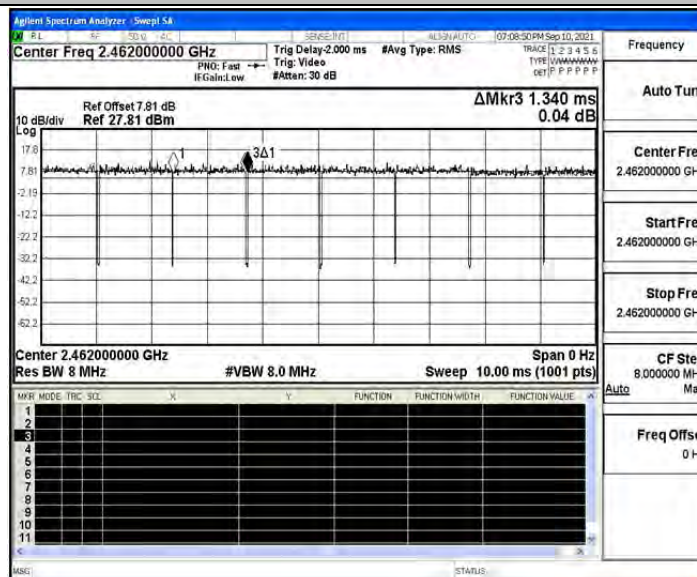
11N20SISO_Ant1_2412



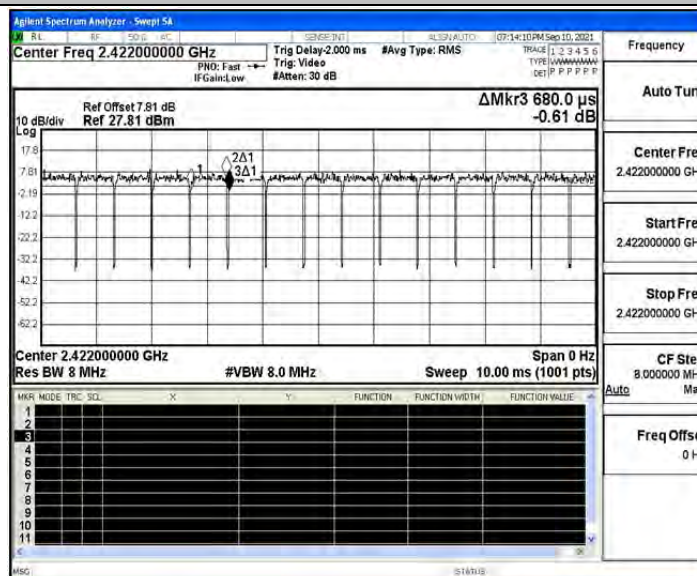
11N20SISO_Ant1_2437

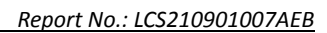


11N20SISO_Ant1_2462



11N40SISO_Ant1_2422





Agilent Spectrum Analyzer - Sweep SA

Center Freq 2.437000000 GHz

Ref Offset 7.84 dB
Ref 27.84 dBm

Trig Delay: 2.000 ms
Trig: Video
IF Gain: low
#Atten: 30 dB

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

Frequency

Auto Tun

Center Freq
2.437000000 GHz

Start Freq
2.437000000 GHz

Stop Freq
2.437000000 GHz

CF Step
9.000000 MHz

Freq Offset
0 Hz

17.9
12.9
7.9
-2.9
-12.9
-22.9
-32.9
-42.9
-52.9
-62.9

Log

10 dB/div

$\Delta MkR3$ 680.0 μ s
-1.21 dB

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11

MNR MODE TRC SQL -X- Y- FUNCTION FUNCTION WIDTH FUNCTION VALUE

MSO

STATUS

[illegible]



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	2389.700	-48.88	≤-41.20	46.32	≤54	PASS
				AV	2390.000	-48.93	≤-41.20	46.27	≤54	PASS
				Peak	2310.000	-44.78	≤-21.20	50.42	≤74	PASS
				Peak	2365.260	-38.88	≤-21.20	56.32	≤74	PASS
				Peak	2390.000	-42.91	≤-21.20	52.29	≤74	PASS
		High	2462	AV	2483.500	-47.8	≤-41.20	47.40	≤54	PASS
				AV	2487.960	-45.84	≤-41.20	49.36	≤54	PASS
				AV	2500.000	-48.4	≤-41.20	46.80	≤54	PASS
				Peak	2483.500	-41.54	≤-21.20	53.66	≤74	PASS
				Peak	2486.200	-39.39	≤-21.20	55.81	≤74	PASS
				Peak	2500.000	-42.29	≤-21.20	52.91	≤74	PASS
11G	Ant1	Low	2412	AV	2310.000	-48.77	≤-41.20	46.43	≤54	PASS
				AV	2389.310	-48.27	≤-41.20	46.93	≤54	PASS
				AV	2390.000	-48.44	≤-41.20	46.76	≤54	PASS
				Peak	2310.000	-41.68	≤-21.20	53.52	≤74	PASS
				Peak	2364.220	-39.22	≤-21.20	55.98	≤74	PASS
				Peak	2390.000	-42.04	≤-21.20	53.16	≤74	PASS
		High	2462	AV	2483.500	-47.65	≤-41.20	47.55	≤54	PASS
				AV	2487.960	-45.36	≤-41.20	49.84	≤54	PASS
				AV	2500.000	-47.76	≤-41.20	47.44	≤54	PASS
				Peak	2483.500	-42.18	≤-21.20	53.02	≤74	PASS
				Peak	2483.890	-38.07	≤-21.20	57.13	≤74	PASS
				Peak	2500.000	-41.3	≤-21.20	53.90	≤74	PASS
11N20SI SO	Ant1	Low	2412	AV	2310.000	-48.92	≤-41.20	46.28	≤54	PASS
				AV	2383.850	-48.22	≤-41.20	46.98	≤54	PASS
				AV	2390.000	-48.42	≤-41.20	46.78	≤54	PASS
				Peak	2310.000	-42.11	≤-21.20	53.09	≤74	PASS
				Peak	2332.110	-38.91	≤-21.20	56.29	≤74	PASS
				Peak	2390.000	-41.52	≤-21.20	53.68	≤74	PASS
		High	2462	AV	2483.500	-47.39	≤-41.20	47.81	≤54	PASS
				AV	2487.960	-45.57	≤-41.20	49.63	≤54	PASS
				AV	2500.000	-47.78	≤-41.20	47.42	≤54	PASS
				Peak	2483.500	-41.22	≤-21.20	53.98	≤74	PASS
				Peak	2491.040	-38.42	≤-21.20	56.78	≤74	PASS
				Peak	2500.000	-40.52	≤-21.20	54.68	≤74	PASS



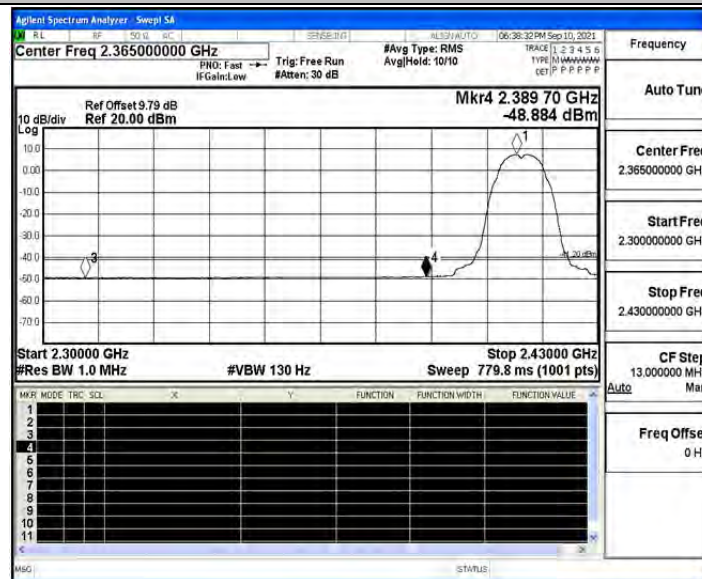
11N40SI SO	Ant1	Low	2422	AV	2310.000	-48.46	≤ -41.20	46.74	≤ 54	PASS
				AV	2388.270	-47.94	≤ -41.20	47.26	≤ 54	PASS
				AV	2390.000	-48	≤ -41.20	47.20	≤ 54	PASS
				Peak	2310.000	-42.26	≤ -21.20	52.94	≤ 74	PASS
				Peak	2341.860	-38.99	≤ -21.20	56.21	≤ 74	PASS
				Peak	2390.000	-41.28	≤ -21.20	53.92	≤ 74	PASS
		High	2452	AV	2483.500	-47.41	≤ -41.20	47.79	≤ 54	PASS
				AV	2486.090	-47.14	≤ -41.20	48.06	≤ 54	PASS
				AV	2500.000	-47.37	≤ -41.20	47.83	≤ 54	PASS
				Peak	2483.500	-41.32	≤ -21.20	53.88	≤ 74	PASS
				Peak	2485.760	-38.05	≤ -21.20	57.15	≤ 74	PASS
				Peak	2500.000	-40.8	≤ -21.20	54.40	≤ 74	PASS

Note:

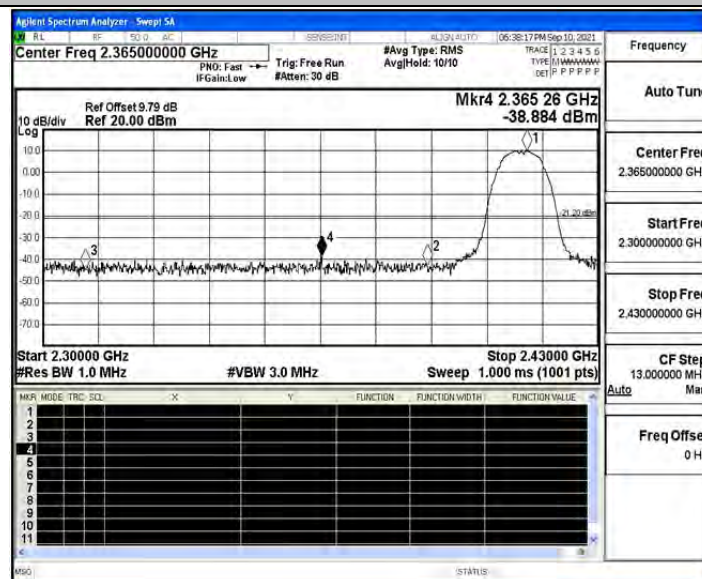
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

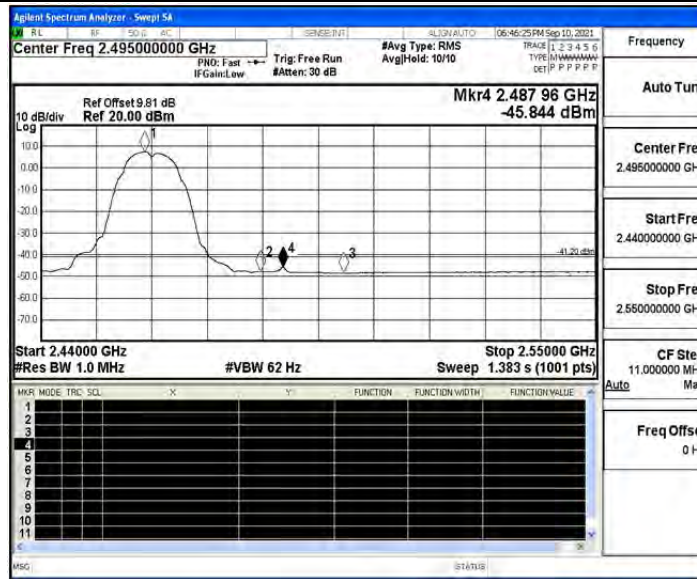
11B_Ant1_Low_2412_AV



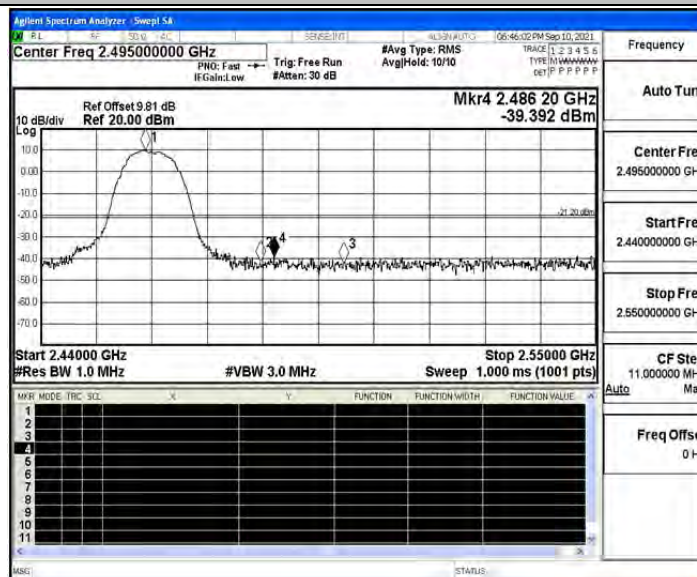
11B_Ant1_Low_2412_Peak



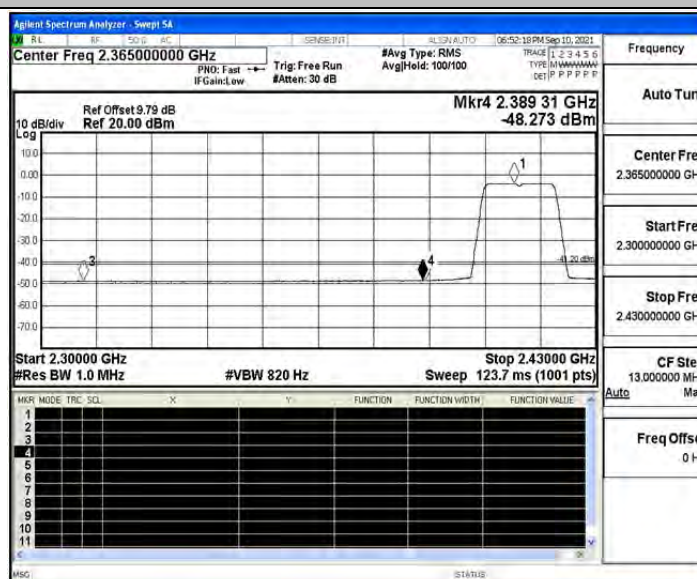
11B_Ant1_High_2462_AV

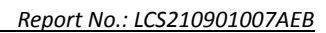


11B_Ant1_High_2462_Peak



11G_Ant1_Low_2412_AV





The screenshot displays the Agilent Spectrum Analyzer interface during a sweep. The main window shows a frequency spectrum from 2.30000 GHz to 2.43000 GHz. A prominent signal is visible at approximately 2.365 GHz, labeled as "Mkr4 2.364 22 GHz -39.225 dBm". The plot has a resolution bandwidth (RBW) of 1.0 MHz and a video bandwidth (VBW) of 3.0 MHz. The center frequency is set to 2.365000000 GHz. The Y-axis represents power in dBm, ranging from -70 to 10. The X-axis represents frequency in GHz.

Metric	Value
Center Freq	2.365000000 GHz
Start Freq	2.300000000 GHz
Stop Freq	2.430000000 GHz
CF Step	13.000000 MHz
Freq Offset	0 Hz
Ref Offset	9.79 dB
Ref Power	20.00 dBm
Avg Type	RMS
Avg Hold	100/100
Trig	Free Run
Atten	30 dB
PNO	Fast
IF Gain	Low
Sweep	1.000 ms (1001 pts)
#Res BW	1.0 MHz
#VBW	3.0 MHz

Agilent Spectrum Analyzer - Sweep SA

RL RF SSB GC SFBASE:0 Hz

Center Freq 2.495000000 GHz

Ref Offset 9.81 dB
Ref 20.00 dBm

Trig: Free Run
#Atten: 30 dB

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

07/20/03 09:51 Sep 10, 2001

Trace 1 [2 3 4 5 6]

TYPE [WAAAAAAAA]
DET [P P P P P]

Frequency

Auto Tun

Center Freq
2.495000000 GHz

Start Freq
2.440000000 GHz

Stop Freq
2.550000000 GHz

CF Stop
11.000000 MHz

Auto

Freq Offset
0 Hz

10 dB/div

Log

Mkr4 2.487 96 GHz
-45.362 dBm

1

2

3

4

Start 2.440000 GHz
#Res BW 1.0 MHz

#VBW 820 Hz

Sweep 104.6 ms (1001 pts)

Stop 2.550000 GHz

MKR MODE TRG SEL

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FUNCTION

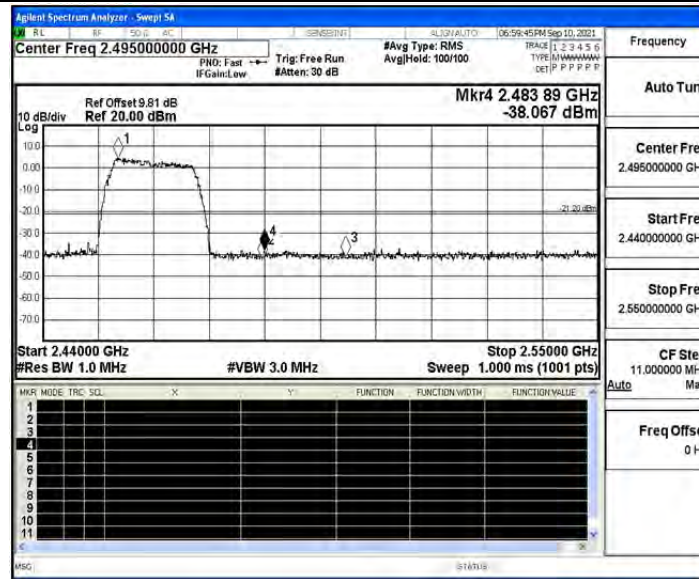
FUNCTION WIDTH

FUNCTION VALUE

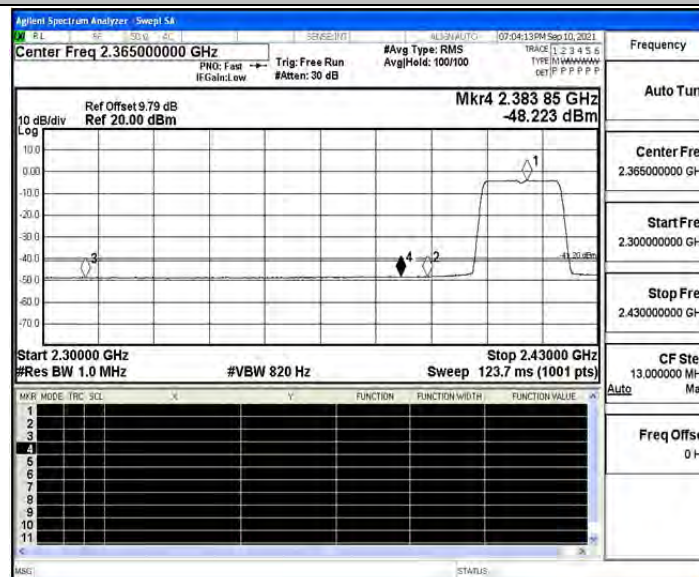
MS

STAT1

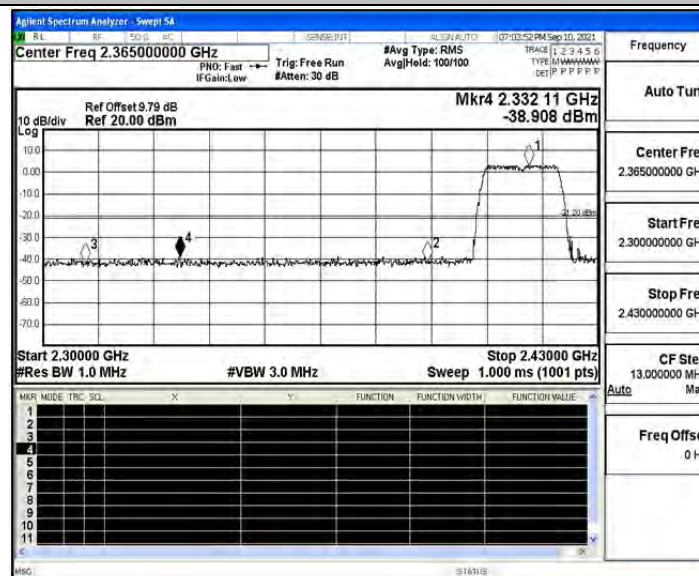
46 / 50

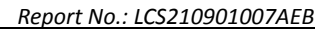


11N20SISO_Ant1_Low_2412_AV



11N20SISO_Ant1_Low_2412_Peak



[illegible]

Agilent Spectrum Analyzer - Sweep SA

Center Freq 2.495000000 GHz

Ref Offset 9.81 dB
Ref 20.00 dBm

Trig: Free Run
#Attenu: 30 dB

#Avg Type: RMS
AvgHold: 100/100

07/31/06 PM Sep 10, 2021

TRACE 1 2 3 4 5
TYPE (M) (W) (A) (V) (P)
DET P P P P P

Frequency

Auto

Center Freq
2.495000000 GHz

Start Freq
2.440000000 GHz

Stop Freq
2.560000000 GHz

CF Stop
11.000000 MHz

Auto

Freq Offset
0 Hz

Mkr4 2.491 04 GHz
-38.425 dBm

Start 2.440000 GHz
#Res BW 1.0 MHz

#BW 3.0 MHz

Stop 2.550000 GHz
Sweep 1.000 ms (1001 pts)

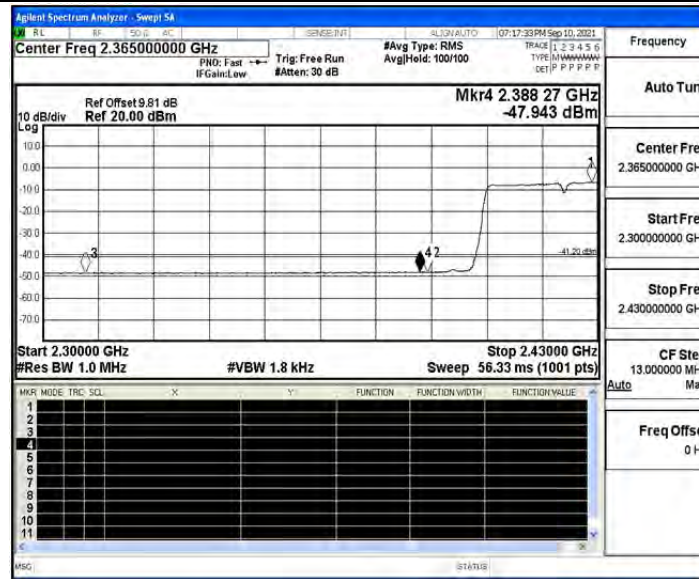
MKR MODE TRG SEL X Y FUNCTION FUNCTION WIDTH FUNCTION VALUE

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11

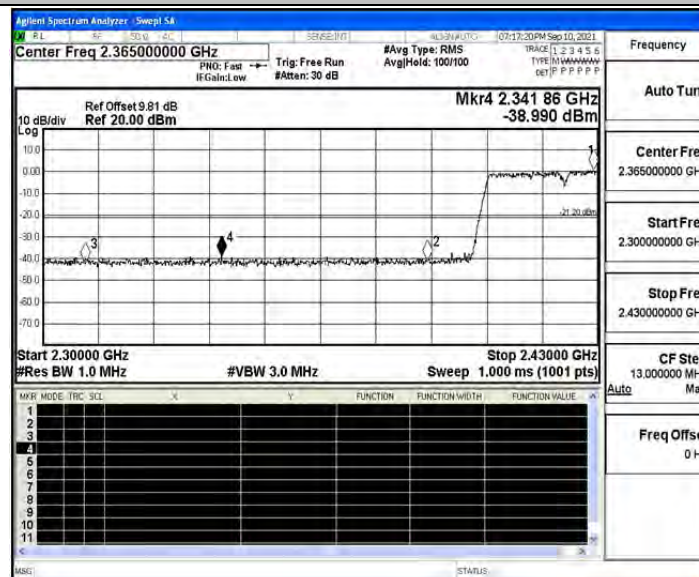
MSG

STATUS

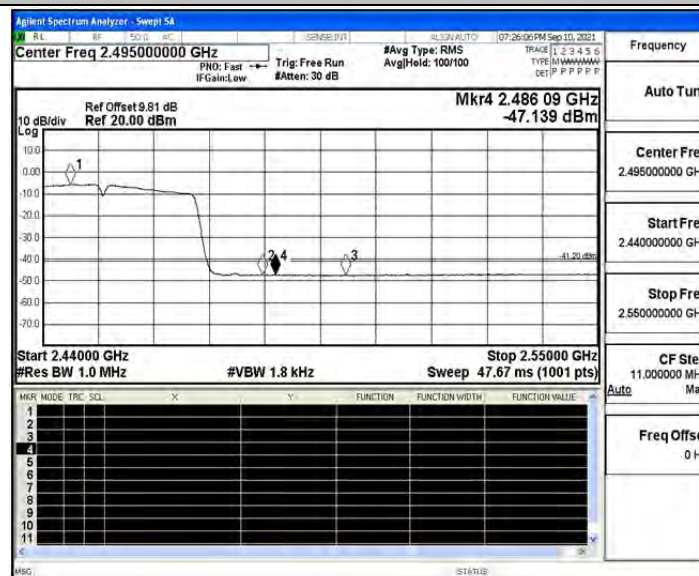
48 / 50



11N40SISO_Ant1_Low_2422_Peak



11N40SISO_Ant1_High_2452_AV





11N40SISO_Ant1_High_2452_Peak

