



## Appendix A

### RF Test Data for 2.4G WIFI (Conducted Measurement)

Product Name: Robotic Vacuum Cleaner

Test Model: A91+

#### Environmental Conditions

Temperature:	21.1° C
Relative Humidity:	52.2%
ATM Pressure:	100.0 kPa
Test Engineer:	Mark Chen
Supervised by:	Libin



## A.1 6dB Bandwidth

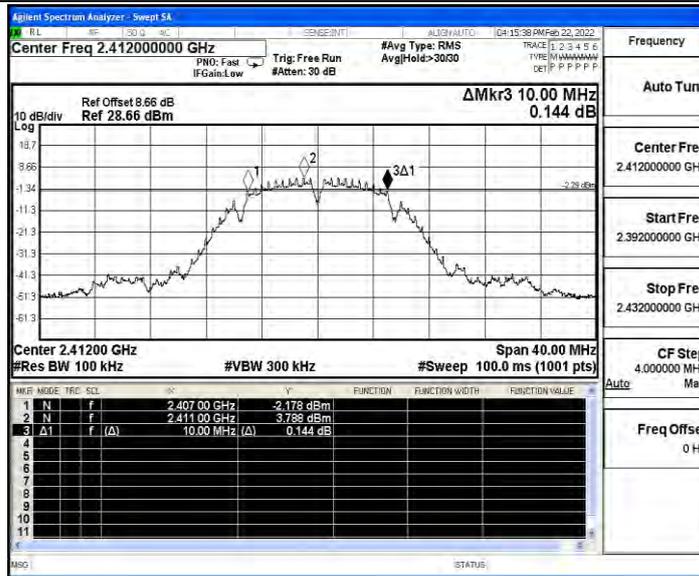
### Test Result

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	10.000	2407.000	2417.000	0.5	PASS
		2437	9.520	2432.440	2441.960	0.5	PASS
		2462	9.080	2457.440	2466.520	0.5	PASS
11G	Ant1	2412	16.320	2403.840	2420.160	0.5	PASS
		2437	16.360	2428.800	2445.160	0.5	PASS
		2462	16.360	2453.800	2470.160	0.5	PASS
11N20SISO	Ant1	2412	17.600	2403.200	2420.800	0.5	PASS
		2437	17.560	2428.200	2445.760	0.5	PASS
		2462	17.560	2453.200	2470.760	0.5	PASS
11N40SISO	Ant1	2422	36.240	2403.920	2440.160	0.5	PASS
		2437	36.080	2419.080	2455.160	0.5	PASS
		2452	35.920	2434.000	2469.920	0.5	PASS

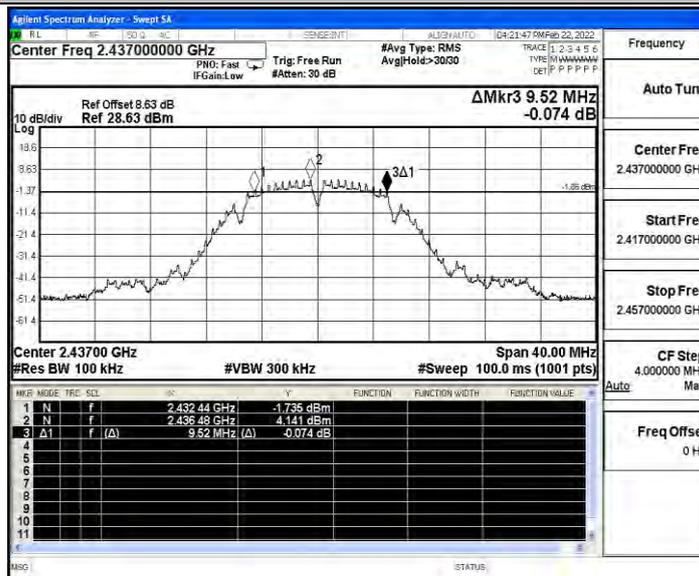


### Test Graphs

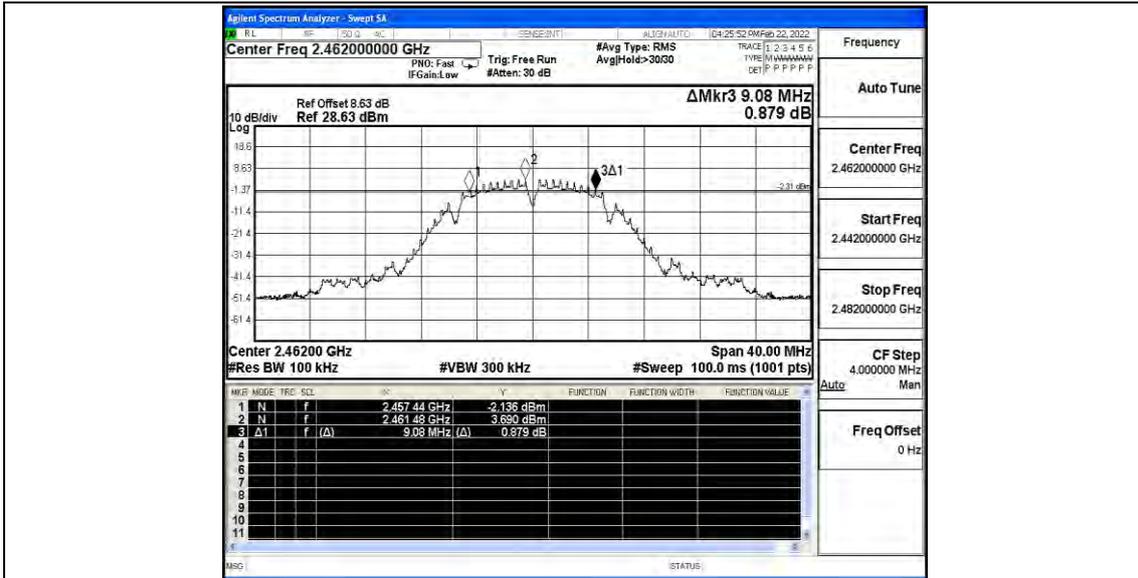
11B\_Ant1\_2412



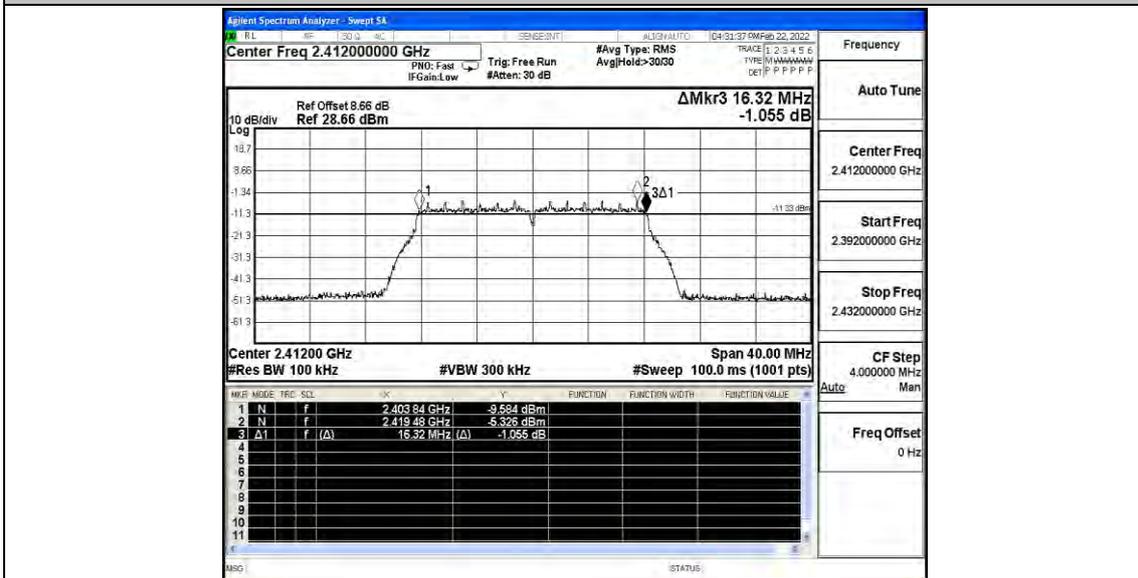
11B\_Ant1\_2437



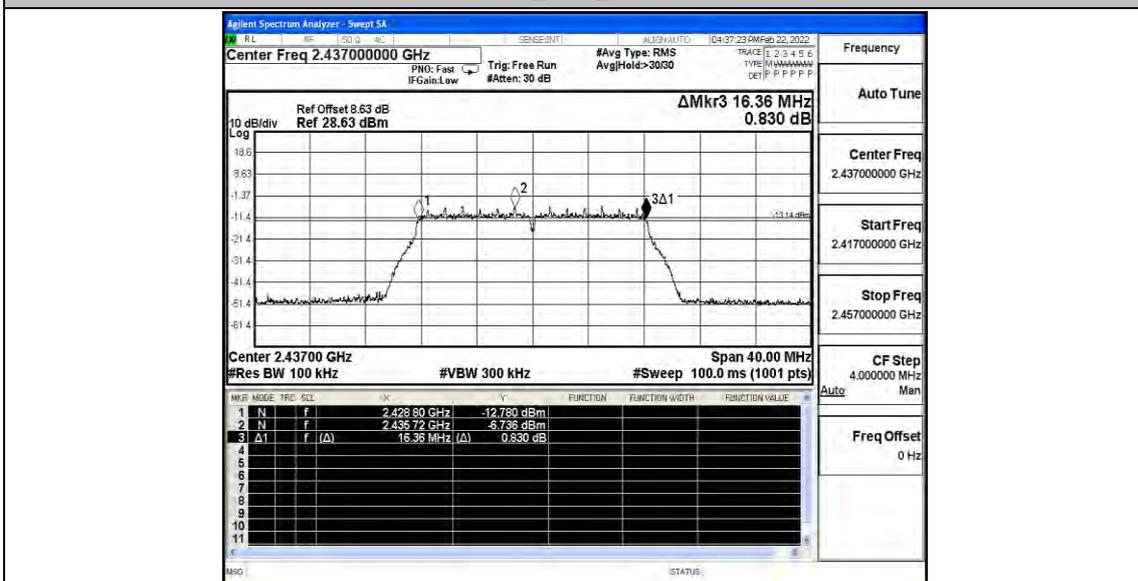
11B\_Ant1\_2462



11G\_Ant1\_2412

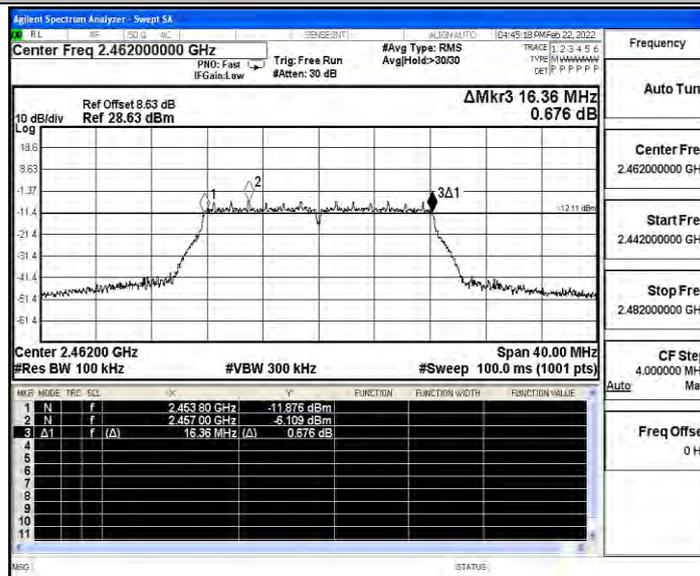


11G\_Ant1\_2437

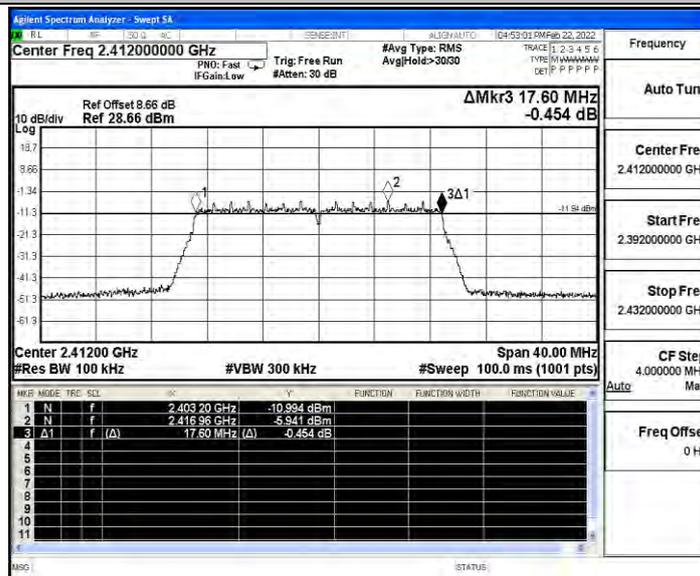




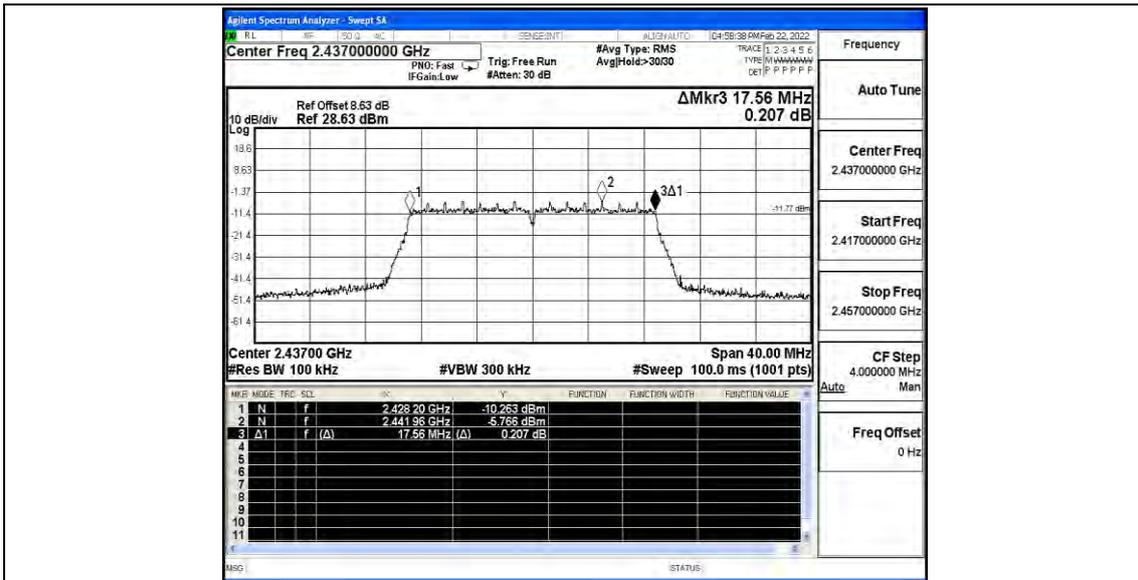
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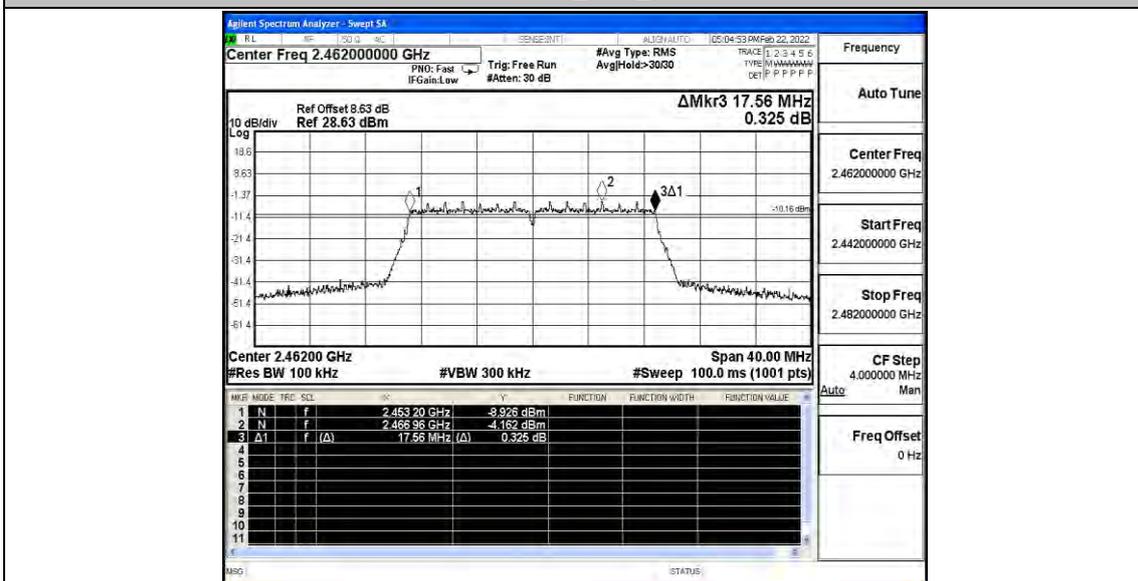
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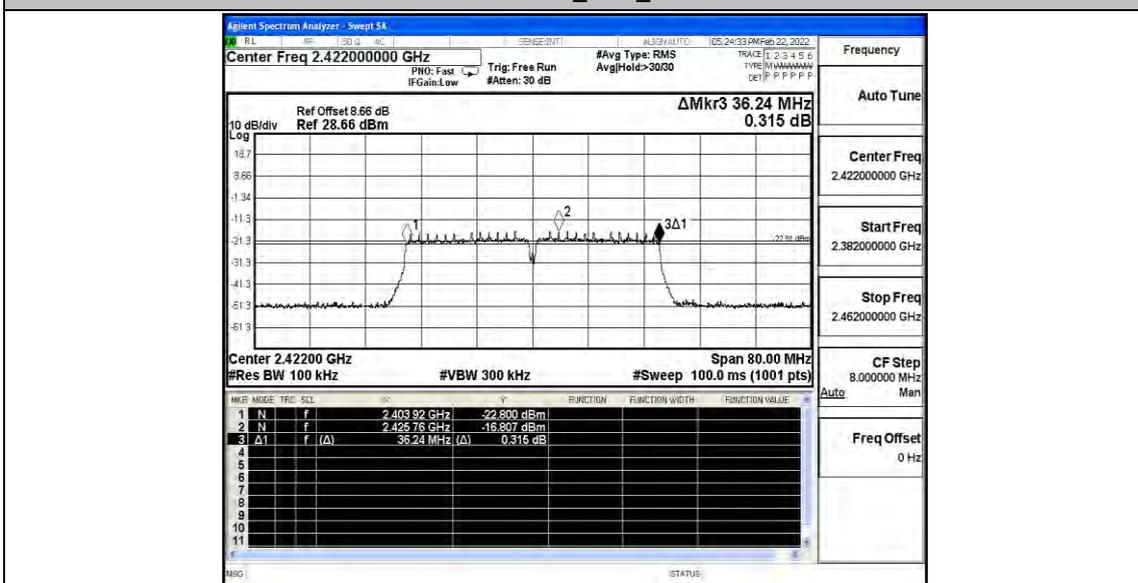
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11N20SISO\_Ant1\_2462

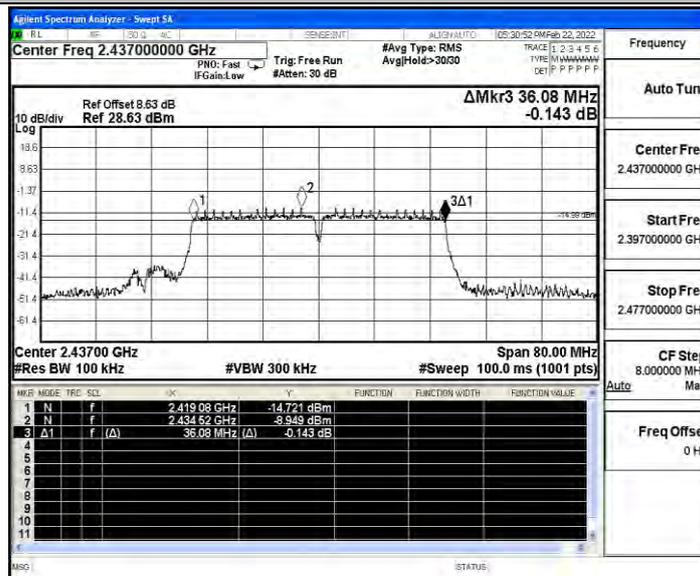


11N40SISO\_Ant1\_2422

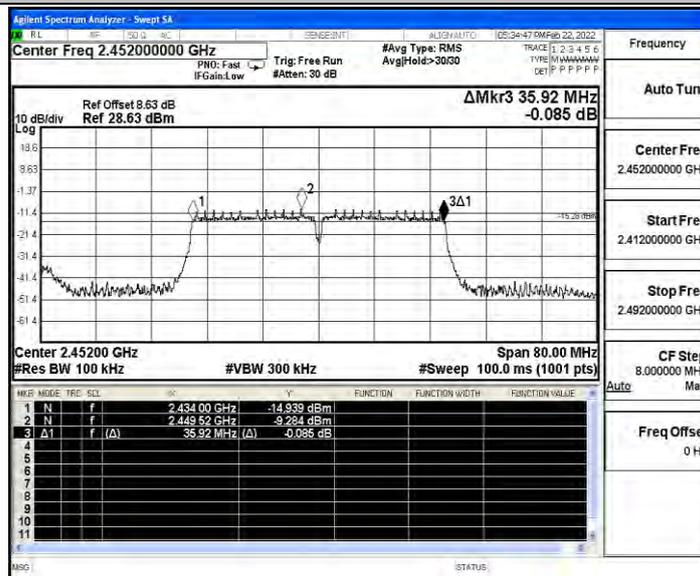




### 11N40SISO\_Ant1\_2437



### 11N40SISO\_Ant1\_2452





## A.2 Maximum conducted output power

### Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	2412	15.67	≤30.00	PASS
		2437	15.77	≤30.00	PASS
		2462	15.21	≤30.00	PASS
11G	Ant1	2412	14.82	≤30.00	PASS
		2437	13.69	≤30.00	PASS
		2462	13.43	≤30.00	PASS
11N20SISO	Ant1	2412	13.66	≤30.00	PASS
		2437	13.85	≤30.00	PASS
		2462	13.93	≤30.00	PASS
11N40SISO	Ant1	2422	13.35	≤30.00	PASS
		2437	13.19	≤30.00	PASS
		2452	12.89	≤30.00	PASS



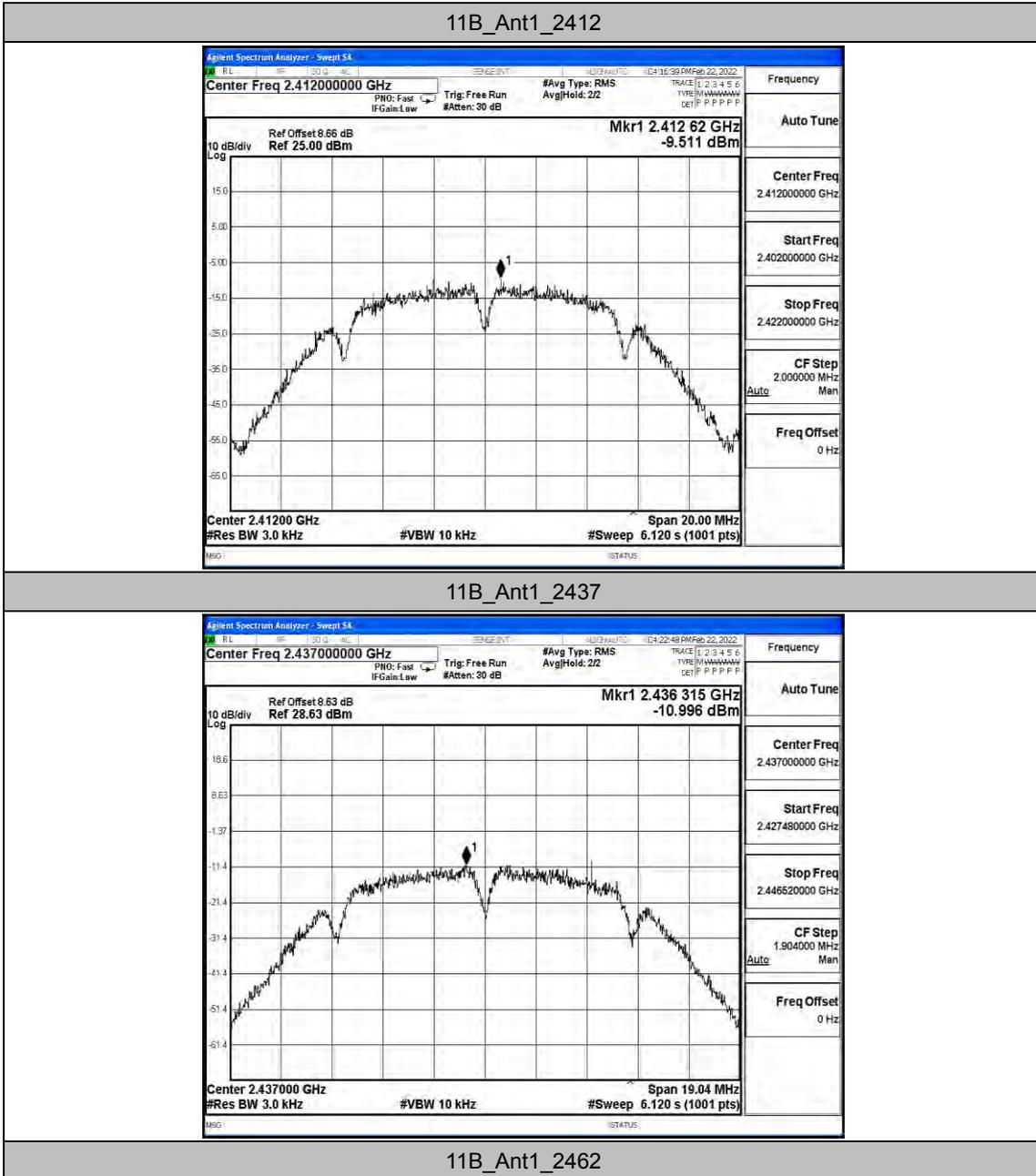
## A.3 Maximum power spectral density

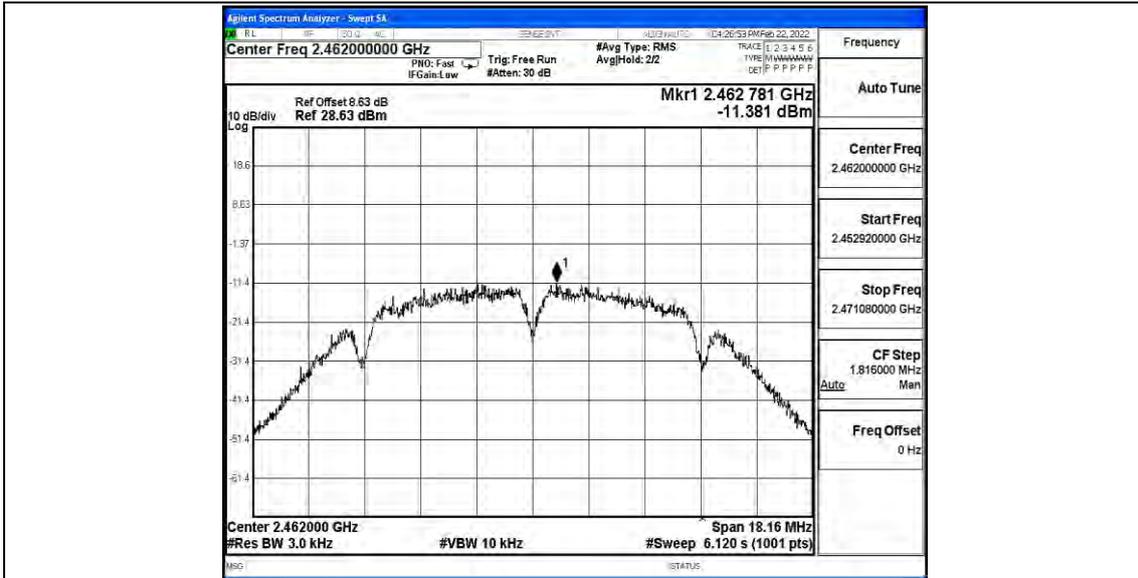
### Test Result

TestMode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-9.51	≤8.00	PASS
		2437	-11	≤8.00	PASS
		2462	-11.38	≤8.00	PASS
11G	Ant1	2412	-18.39	≤8.00	PASS
		2437	-20.12	≤8.00	PASS
		2462	-20.79	≤8.00	PASS
11N20SISO	Ant1	2412	-20.53	≤8.00	PASS
		2437	-19.86	≤8.00	PASS
		2462	-19.86	≤8.00	PASS
11N40SISO	Ant1	2422	-22.76	≤8.00	PASS
		2437	-22.58	≤8.00	PASS
		2452	-23.61	≤8.00	PASS

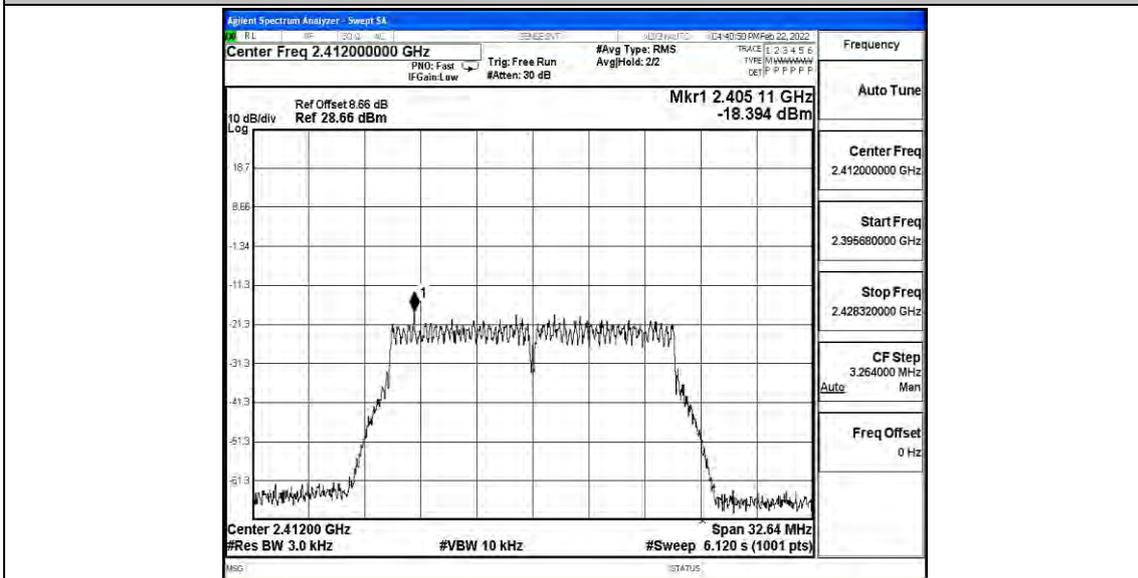


### Test Graphs

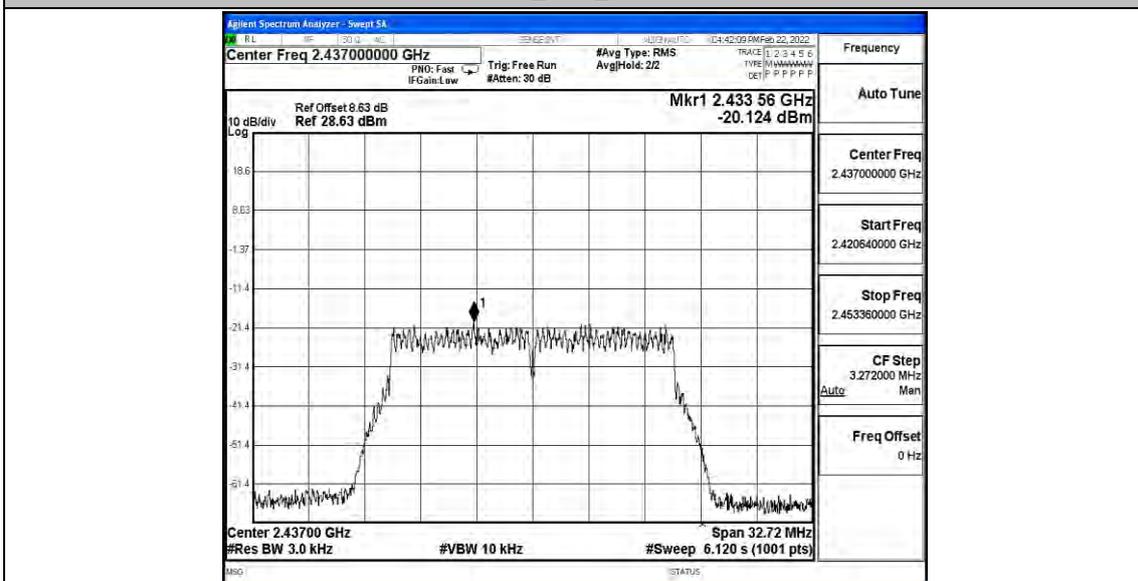




11G\_Ant1\_2412

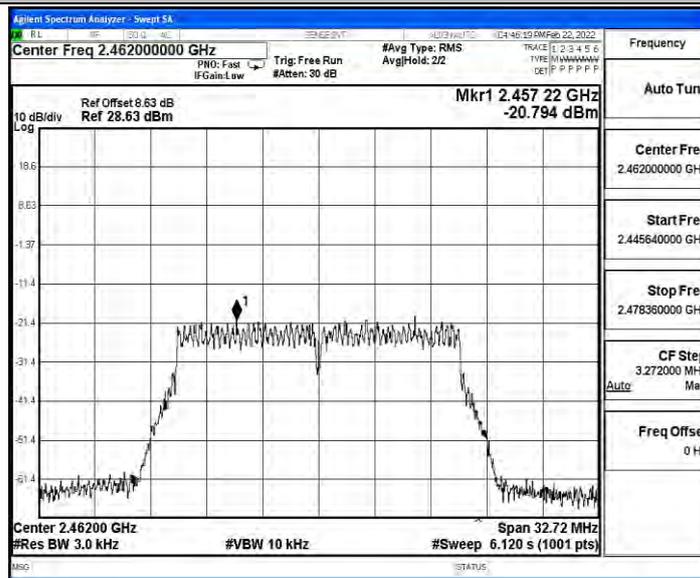


11G\_Ant1\_2437

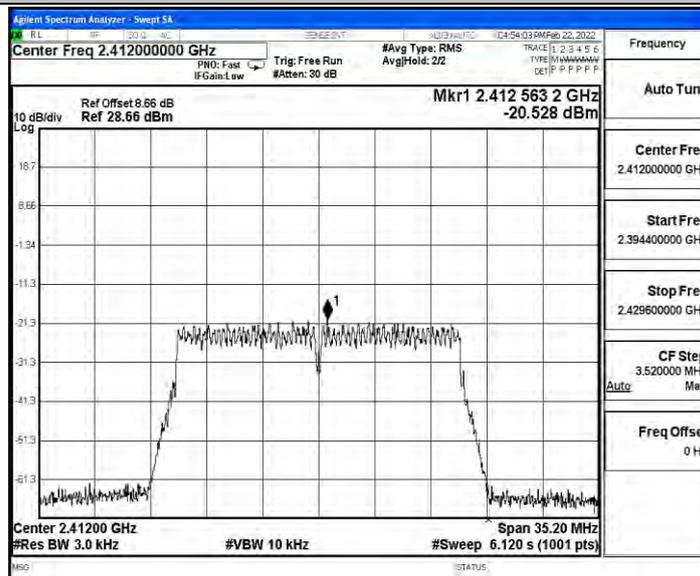




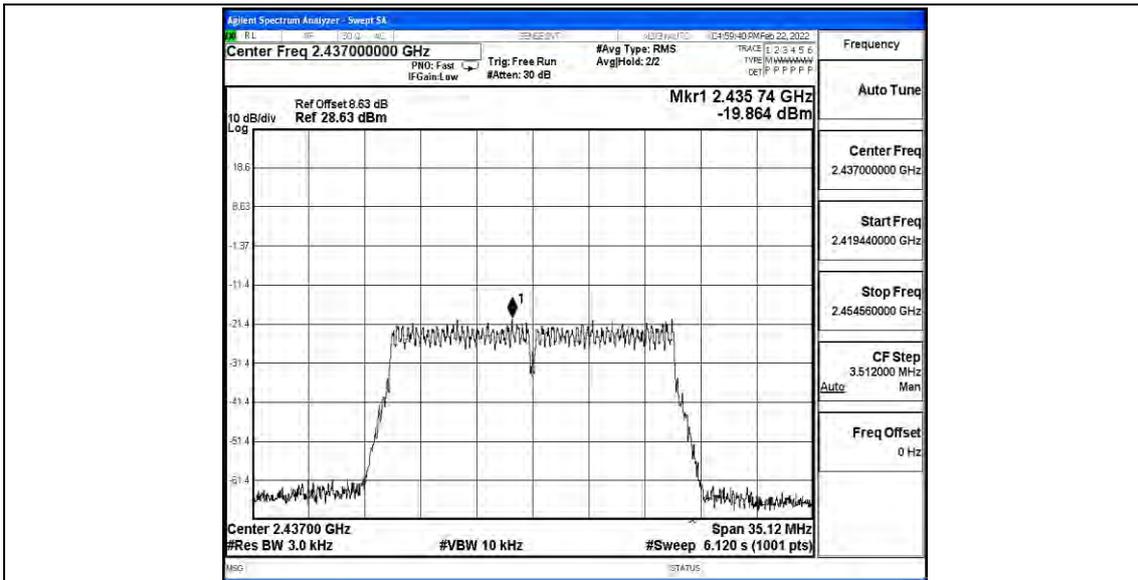
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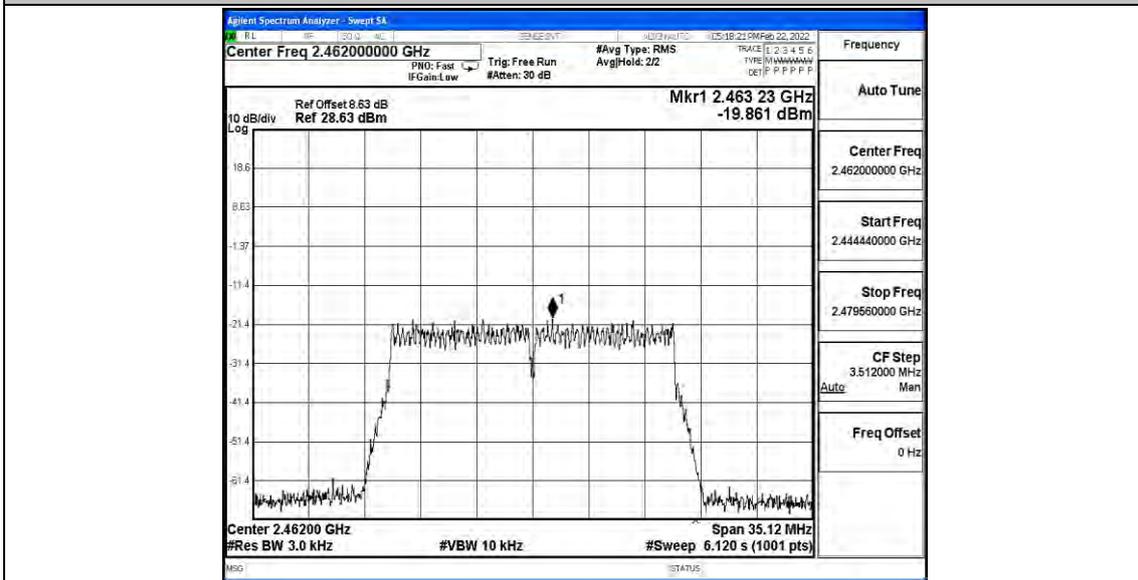
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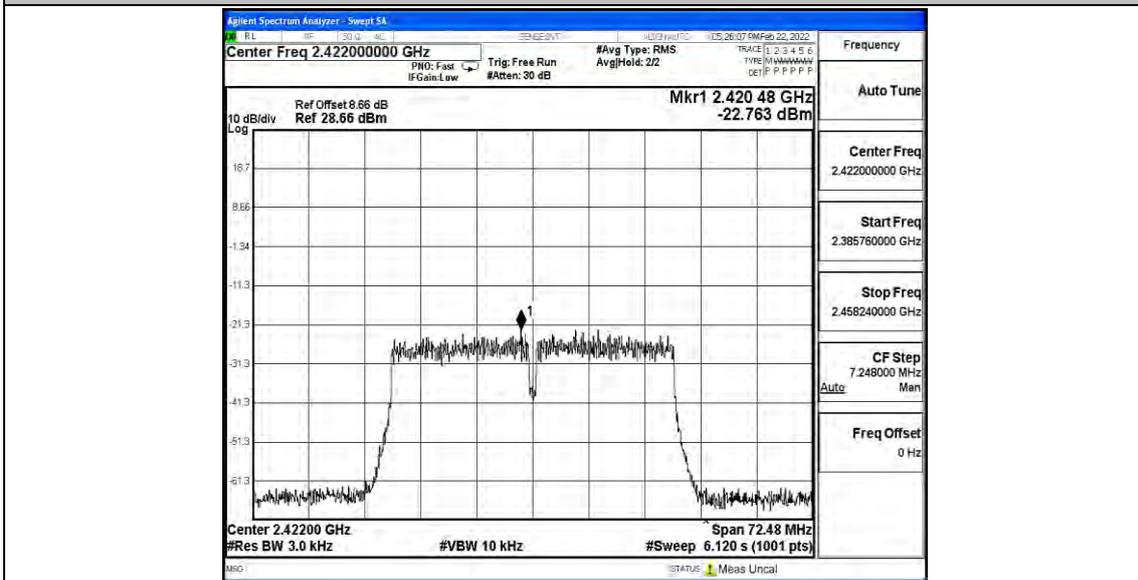
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11N20SISO\_Ant1\_2462

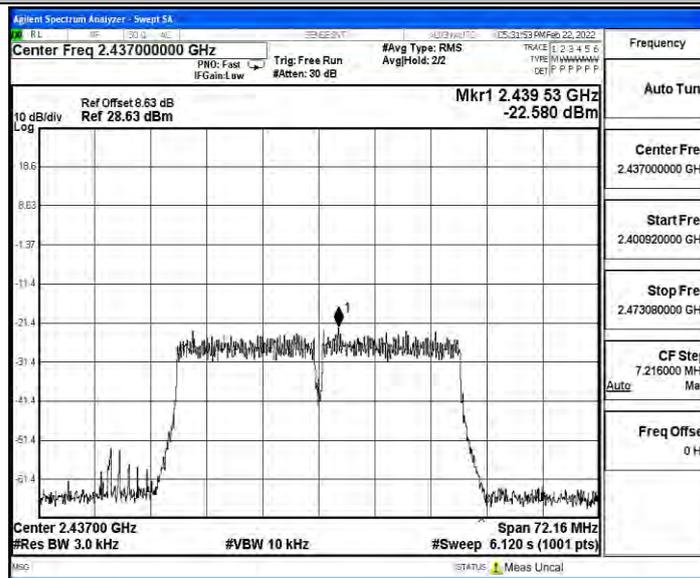


11N40SISO\_Ant1\_2422

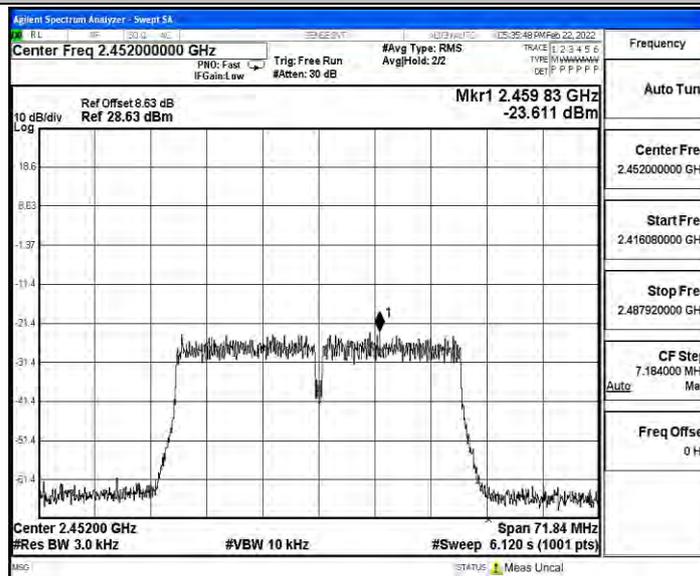




### 11N40SISO\_Ant1\_2437



### 11N40SISO\_Ant1\_2452





## A.4 Band edge measurements

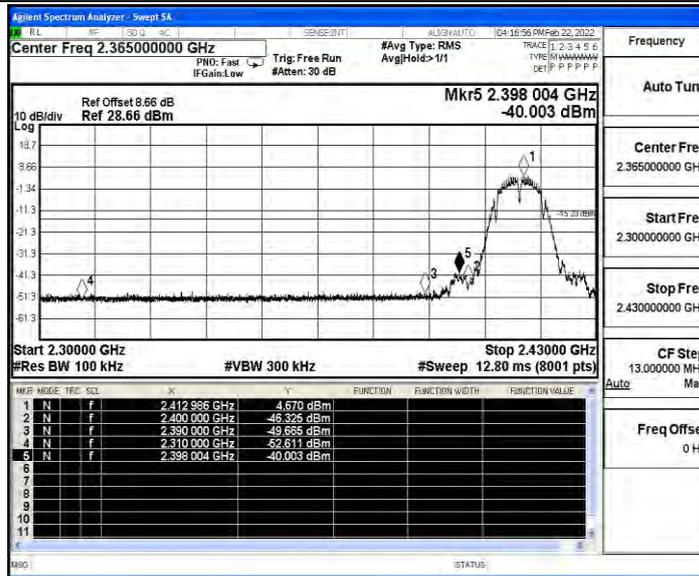
### Test Result

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	4.67	-40	≤-15.33	PASS
		High	2462	3.61	-47.6	≤-16.39	PASS
11G	Ant1	Low	2412	-5.39	-48.21	≤-25.39	PASS
		High	2462	-6.05	-48.12	≤-26.05	PASS
11N20SISO	Ant1	Low	2412	-5.62	-45.2	≤-25.62	PASS
		High	2462	-3.81	-47.75	≤-23.81	PASS
11N40SISO	Ant1	Low	2422	-8.72	-43.99	≤-28.72	PASS
		High	2452	-9.25	-44.24	≤-29.25	PASS

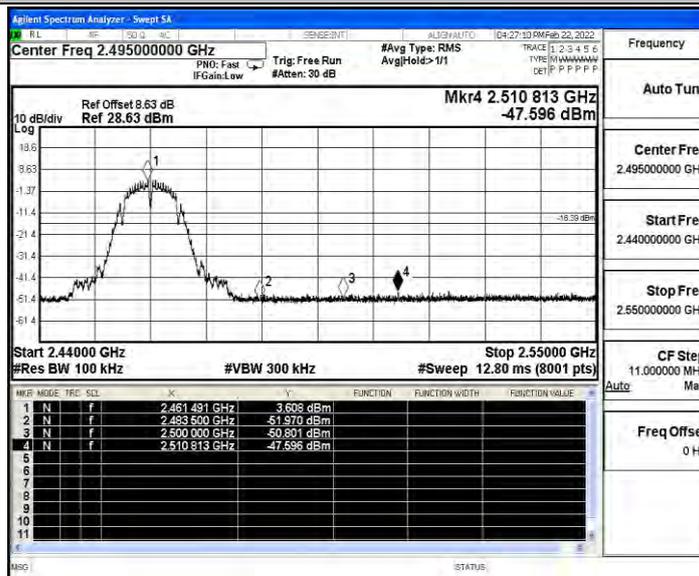


### Test Graphs

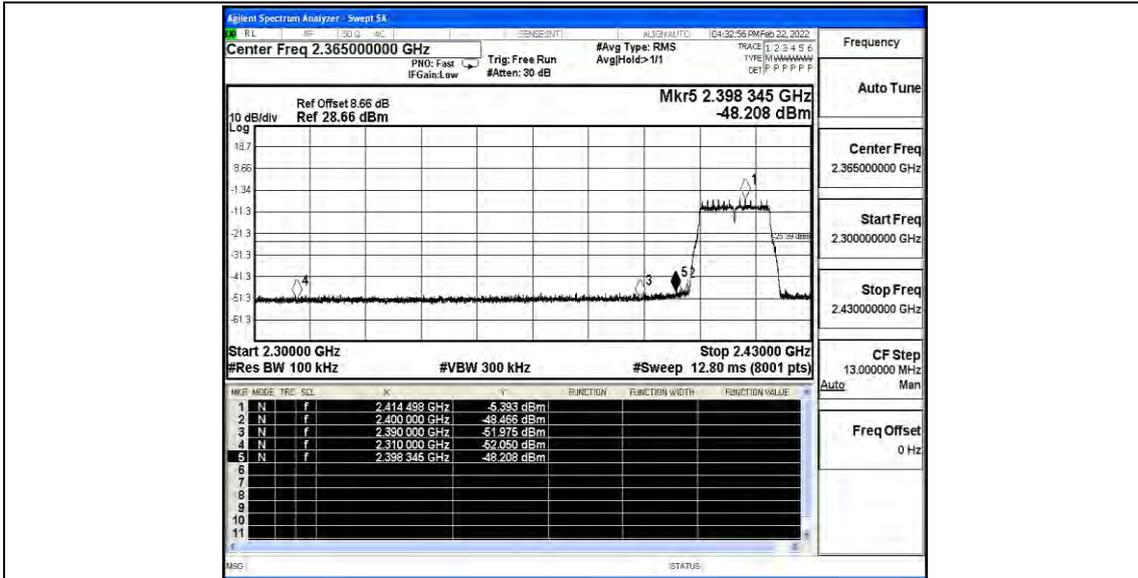
11B\_Ant1\_Low\_2412



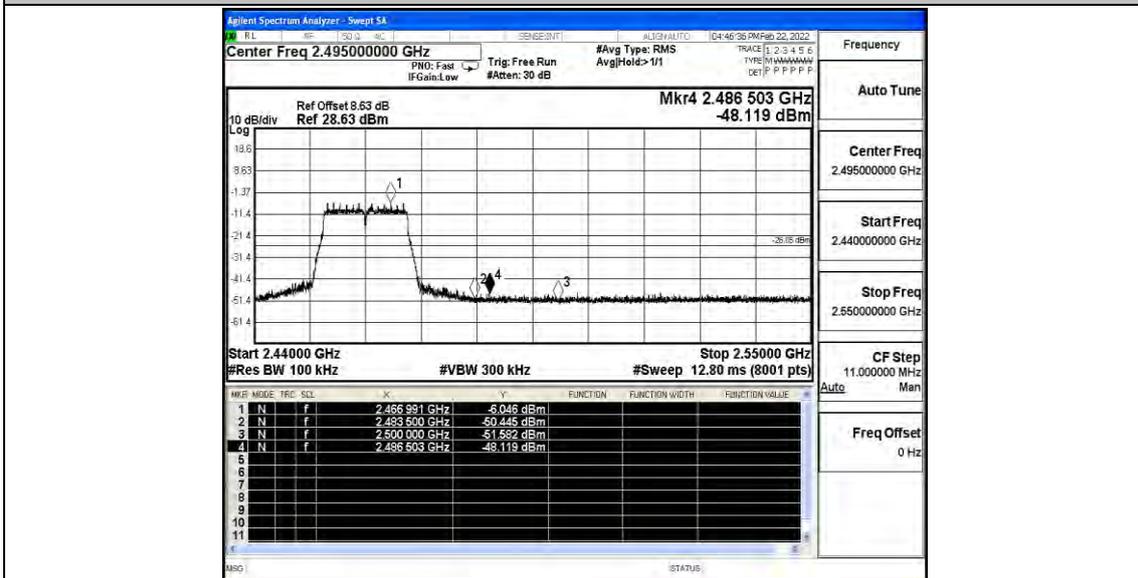
11B\_Ant1\_High\_2462



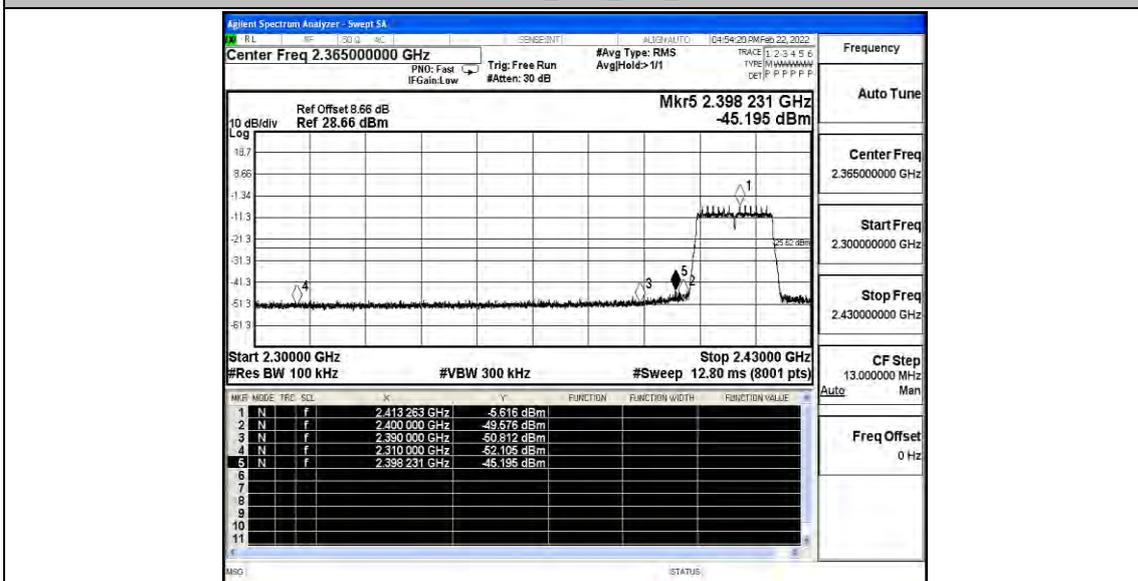
11G\_Ant1\_Low\_2412



11G\_Ant1\_High\_2462

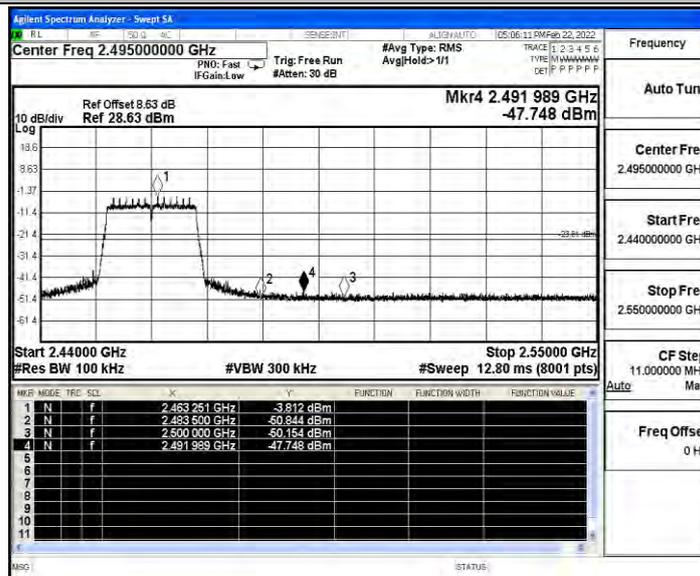


11N20SISO\_Ant1\_Low\_2412

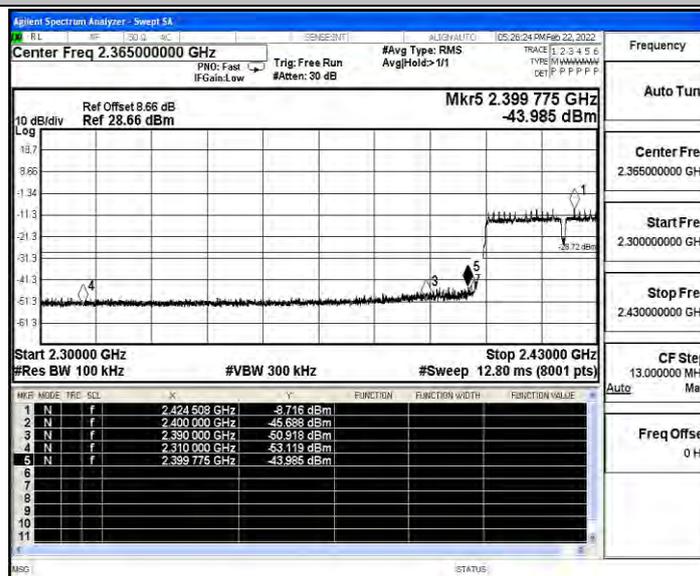




### 11N20SISO\_Ant1\_High\_2462



### 11N40SISO\_Ant1\_Low\_2422



### 11N40SISO\_Ant1\_High\_2452





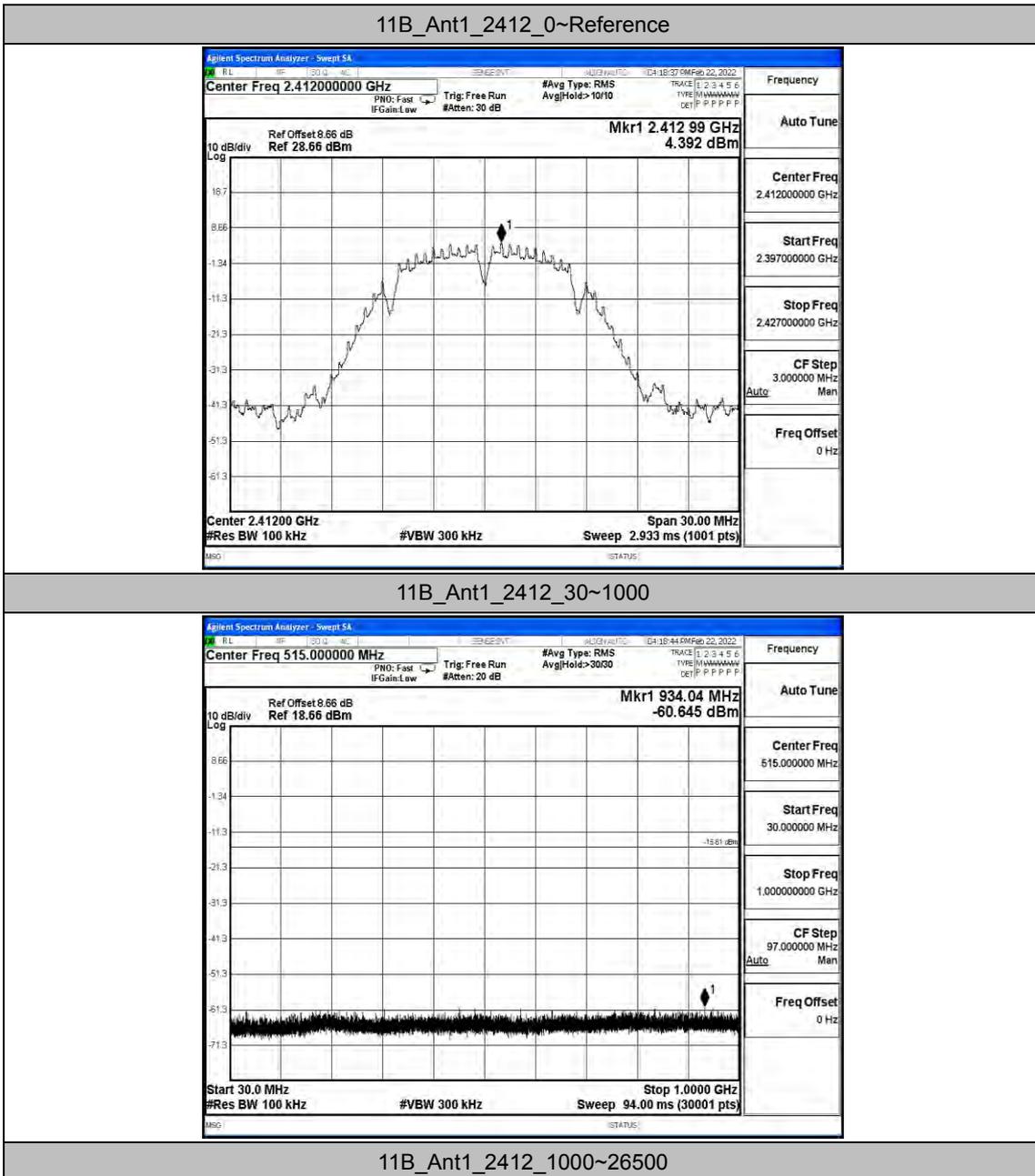
## A.5 Conducted Spurious Emission

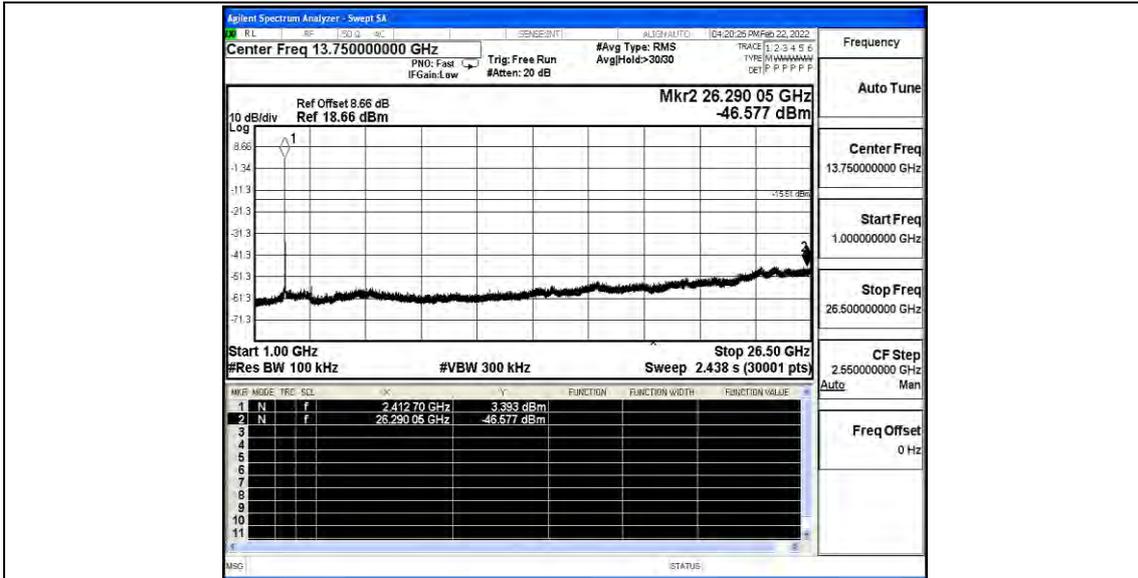
### Test Result

TestMode	Antenna	Channel	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	4.39	4.39	---	PASS
			30~1000	4.39	-60.65	≤-15.61	PASS
			1000~26500	4.39	-46.58	≤-15.61	PASS
		2437	Reference	3.93	3.93	---	PASS
			30~1000	3.93	-59.46	≤-16.07	PASS
			1000~26500	3.93	-46.26	≤-16.07	PASS
		2462	Reference	3.59	3.59	---	PASS
			30~1000	3.59	-60.57	≤-16.41	PASS
			1000~26500	3.59	-46.32	≤-16.41	PASS
11G	Ant1	2412	Reference	-5.18	-5.18	---	PASS
			30~1000	-5.18	-60.28	≤-25.18	PASS
			1000~26500	-5.18	-46.4	≤-25.18	PASS
		2437	Reference	-5.49	-5.49	---	PASS
			30~1000	-5.49	-59.69	≤-25.49	PASS
			1000~26500	-5.49	-42.92	≤-25.49	PASS
		2462	Reference	-5.63	-5.63	---	PASS
			30~1000	-5.63	-48.34	≤-25.63	PASS
			1000~26500	-5.63	-38.25	≤-25.63	PASS
11N20SISO	Ant1	2412	Reference	-5.43	-5.43	---	PASS
			30~1000	-5.43	-55.34	≤-25.43	PASS
			1000~26500	-5.43	-30.65	≤-25.43	PASS
		2437	Reference	-3.38	-3.38	---	PASS
			30~1000	-3.38	-61.07	≤-23.38	PASS
			1000~26500	-3.38	-39.88	≤-23.38	PASS
		2462	Reference	-3.64	-3.64	---	PASS
			30~1000	-3.64	-60.59	≤-23.64	PASS
			1000~26500	-3.64	-46.29	≤-23.64	PASS
11N40SISO	Ant1	2422	Reference	-8.64	-8.64	---	PASS
			30~1000	-8.64	-61.02	≤-28.64	PASS
			1000~26500	-8.64	-36.68	≤-28.64	PASS
		2437	Reference	-8.84	-8.84	---	PASS
			30~1000	-8.84	-60.71	≤-28.84	PASS
			1000~26500	-8.84	-46.28	≤-28.84	PASS
		2452	Reference	-9.23	-9.23	---	PASS
			30~1000	-9.23	-60.91	≤-29.23	PASS
			1000~26500	-9.23	-46.4	≤-29.23	PASS

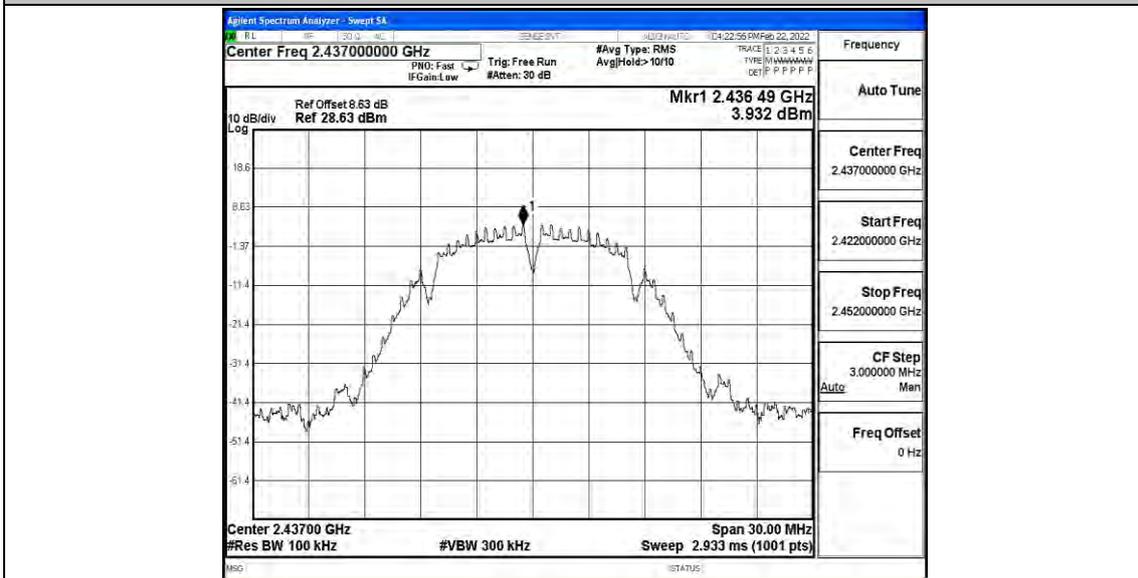


### Test Graphs

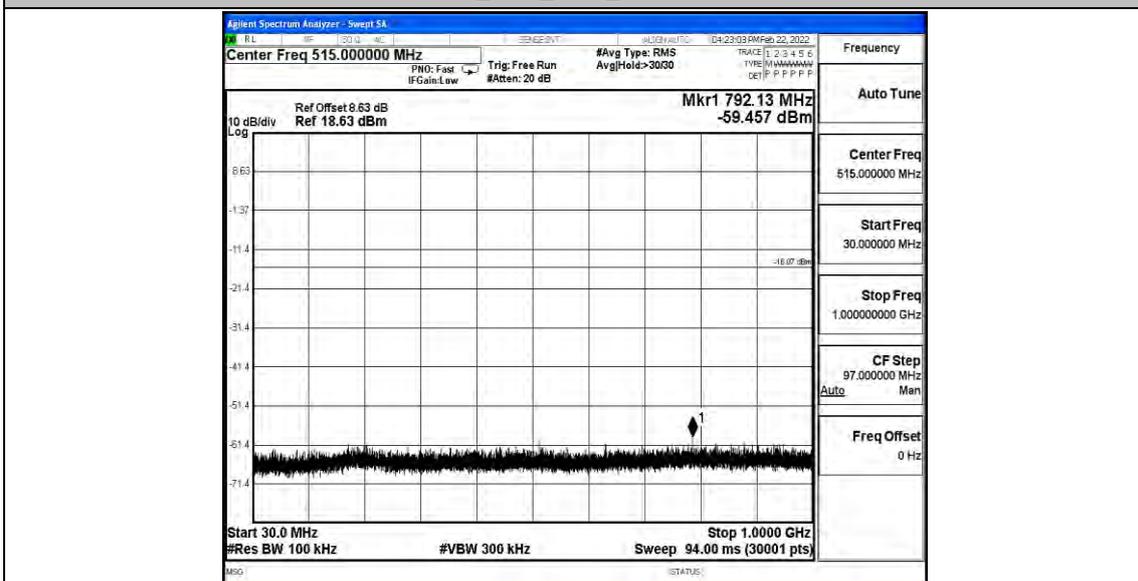




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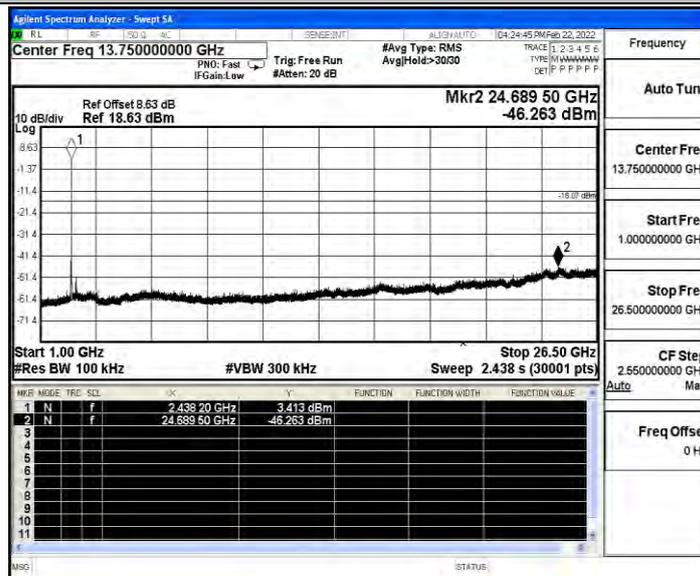


11B\_Ant1\_2437\_30~1000

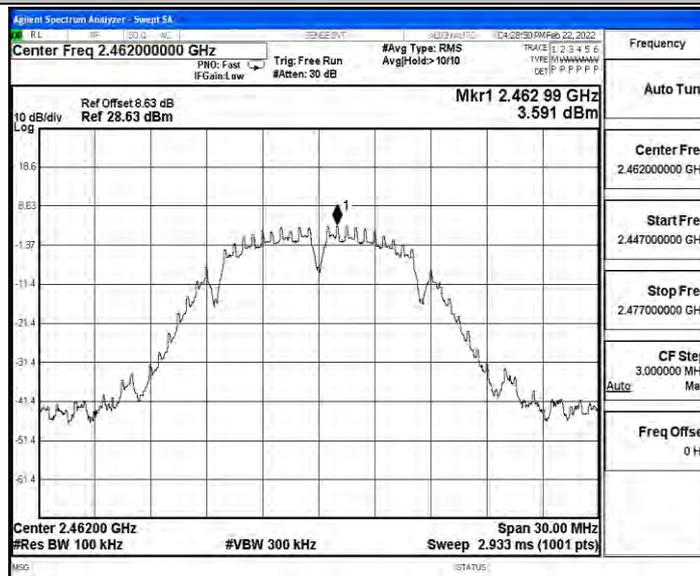




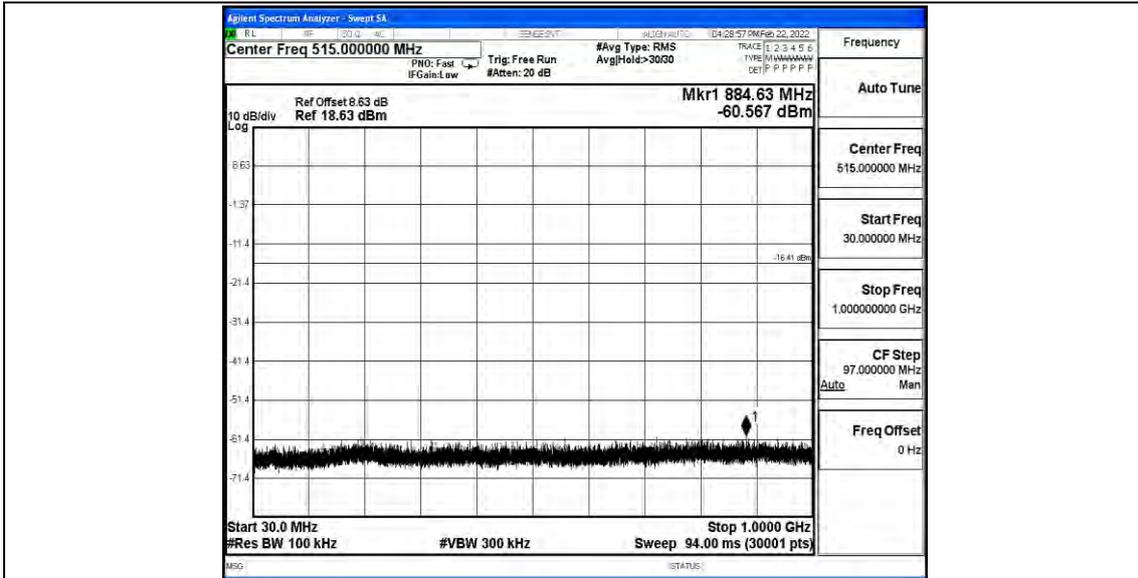
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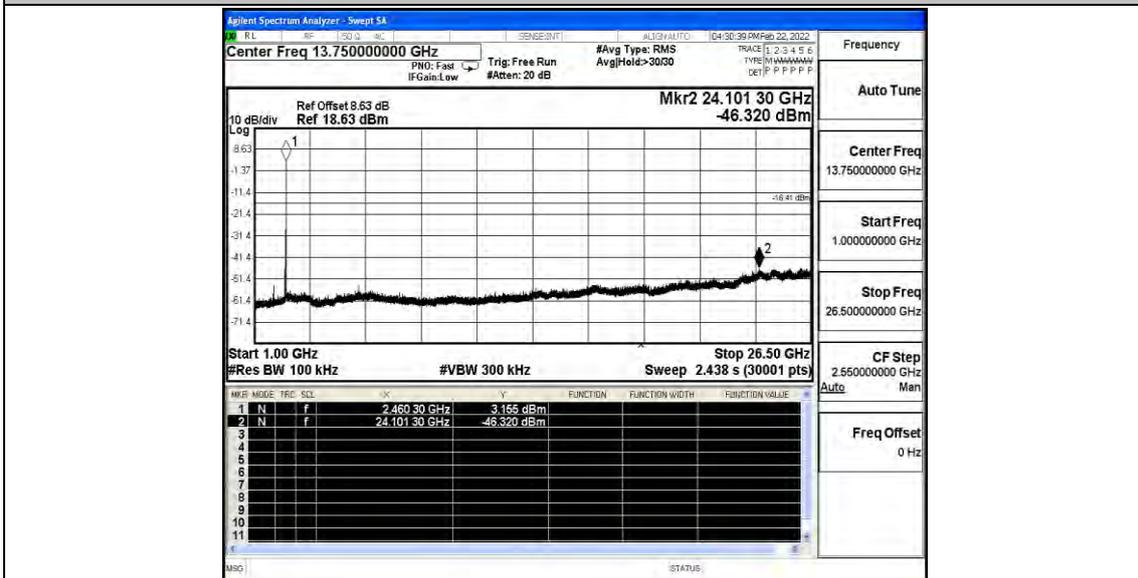
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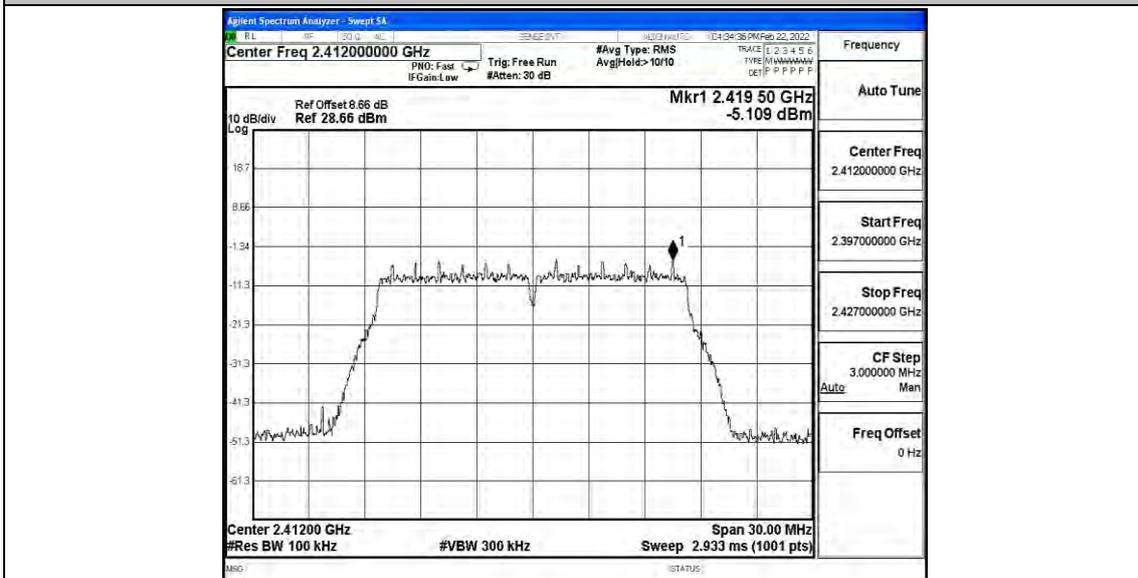
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11B\_Ant1\_2462\_1000~26500

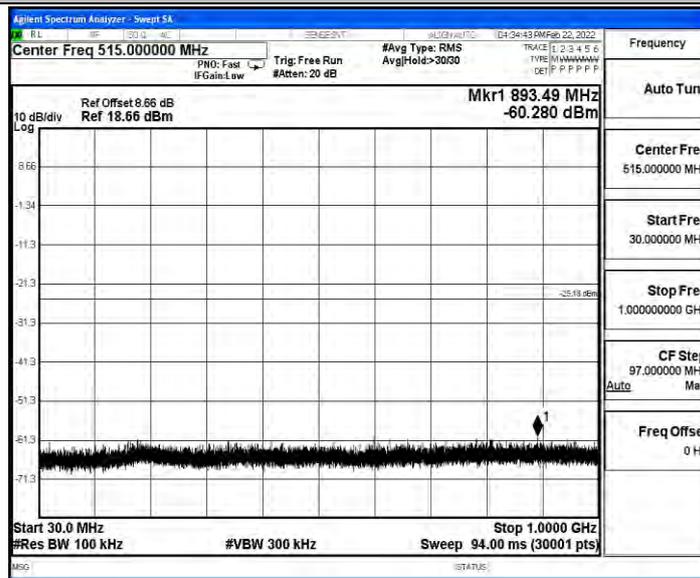


11G\_Ant1\_2412\_0~Reference

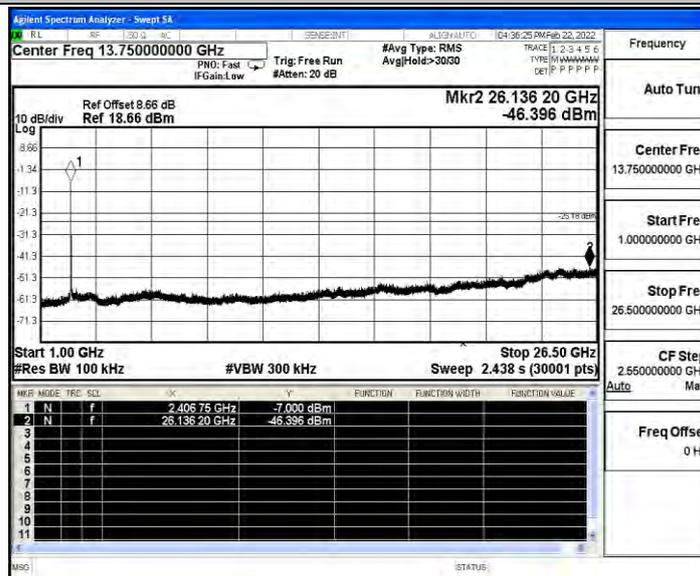




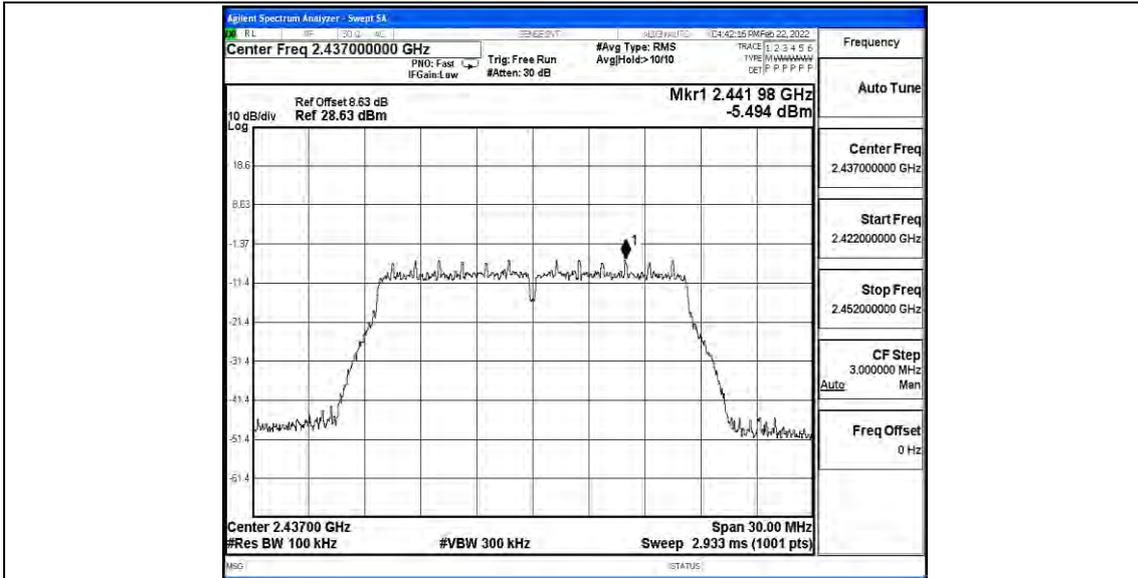
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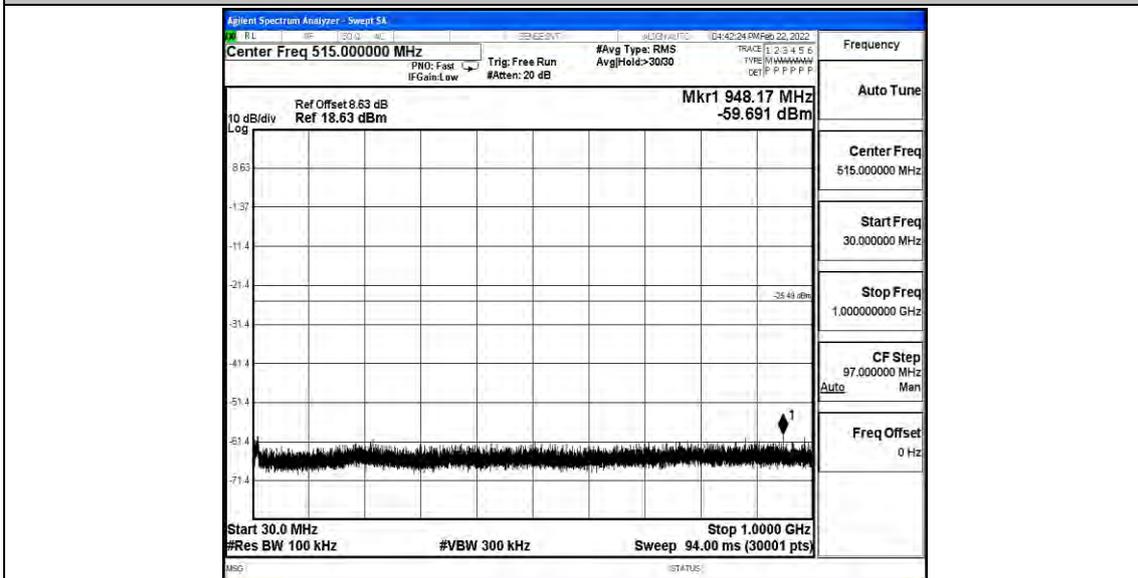
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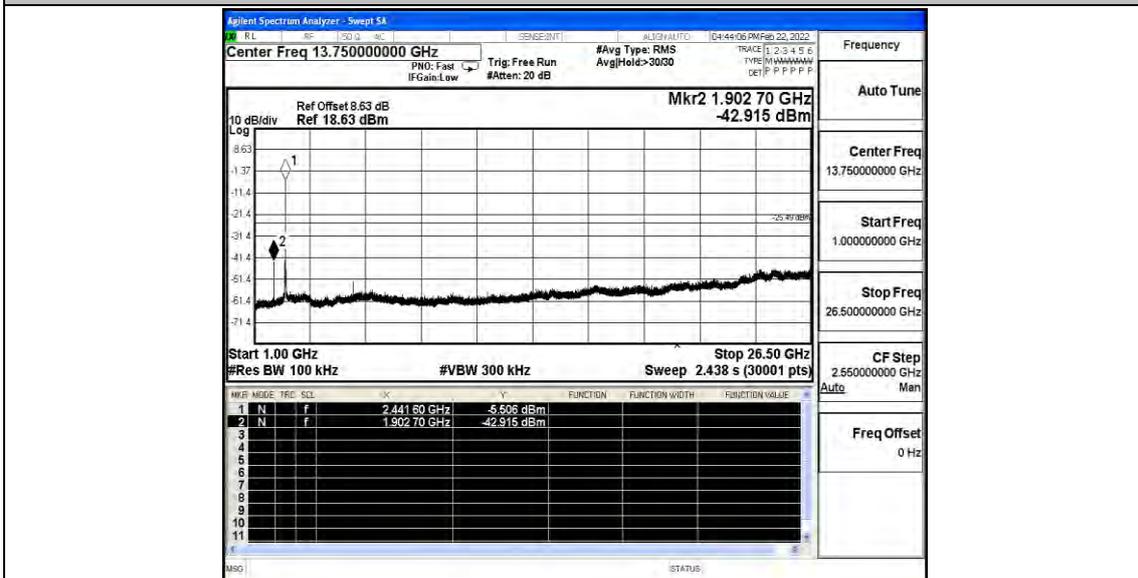
11G\_Ant1\_2437\_0~Reference



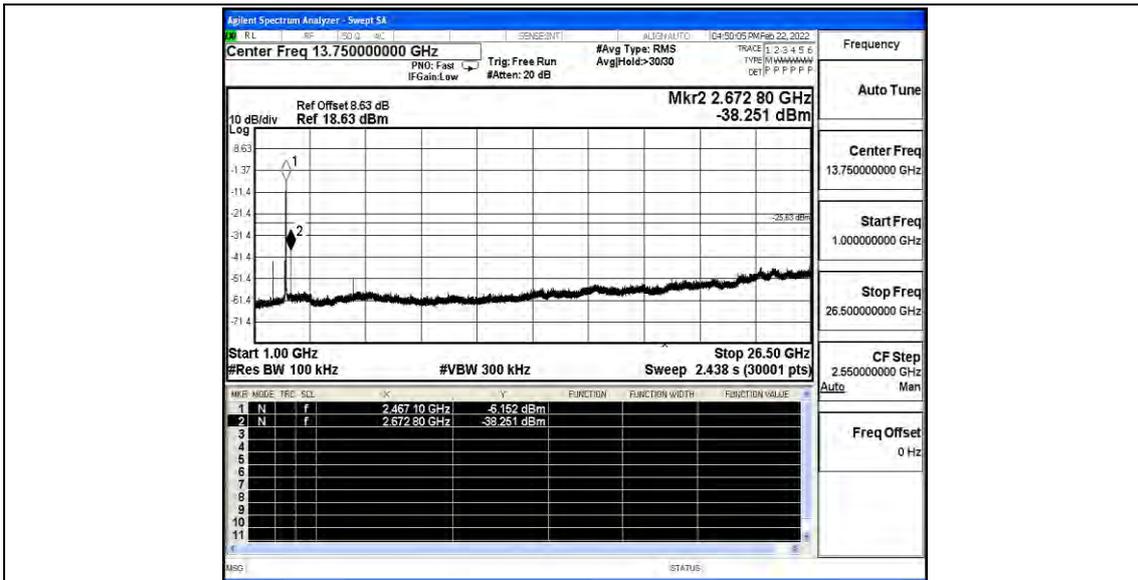
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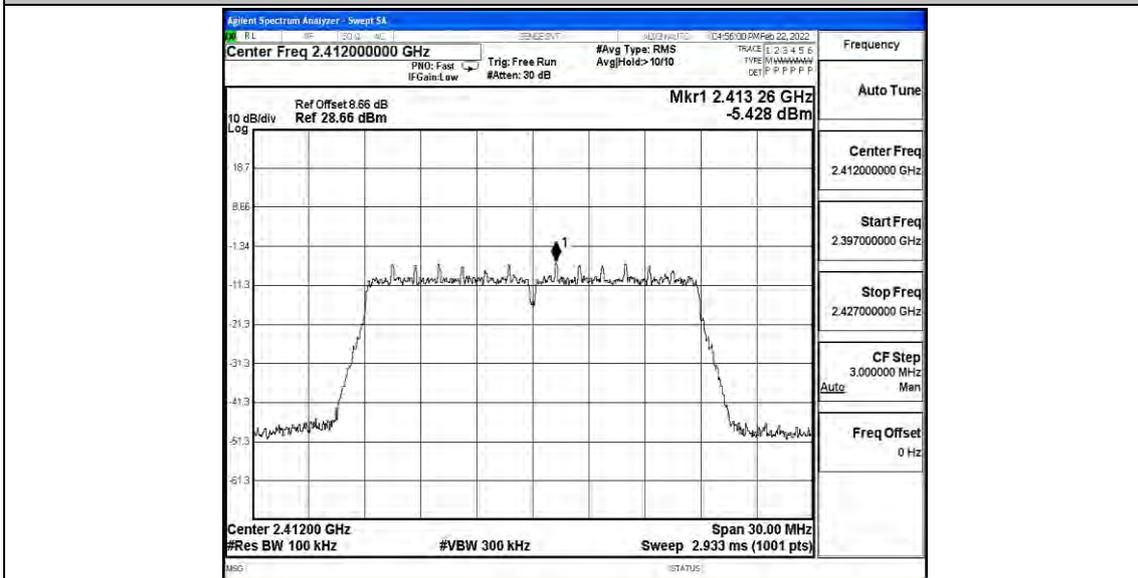
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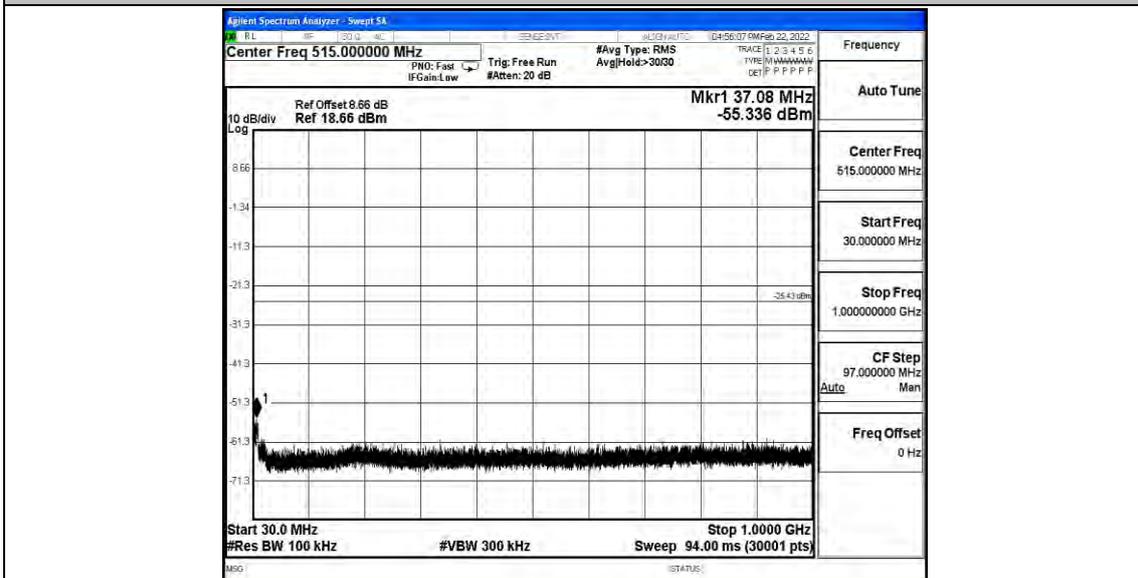




11N20SISO\_Ant1\_2412\_0~Reference

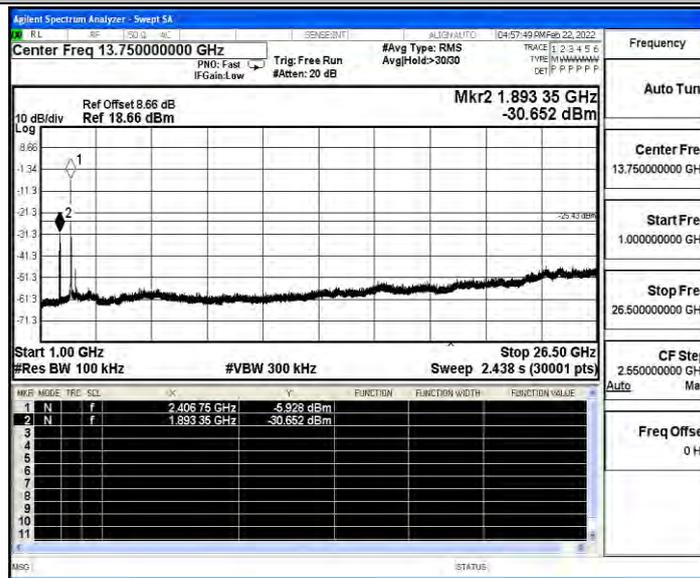


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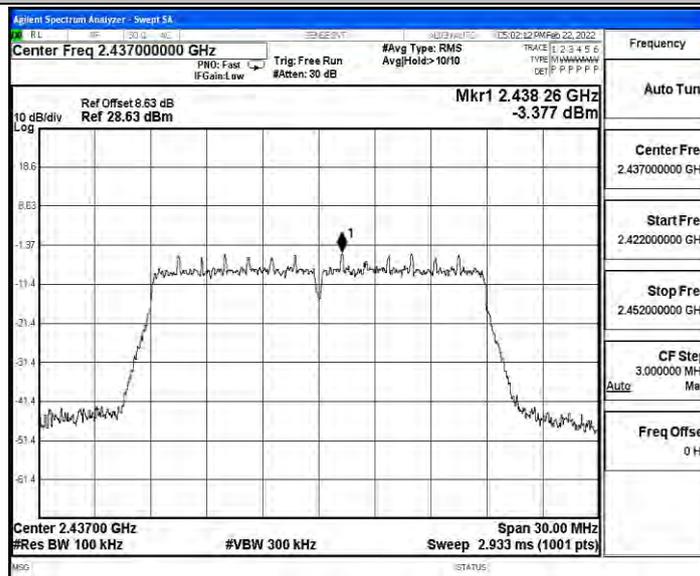




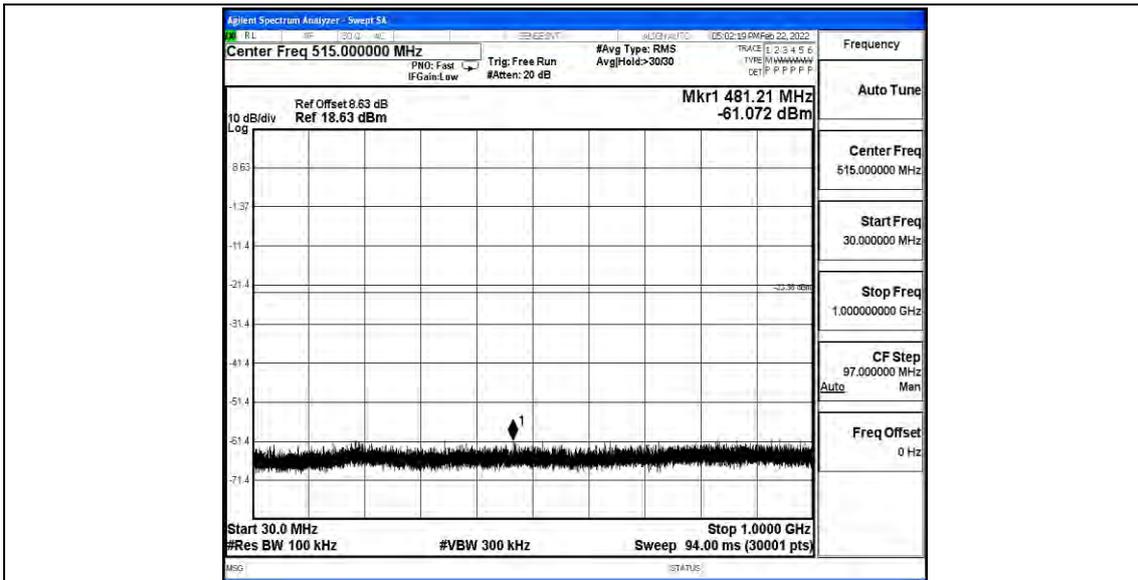
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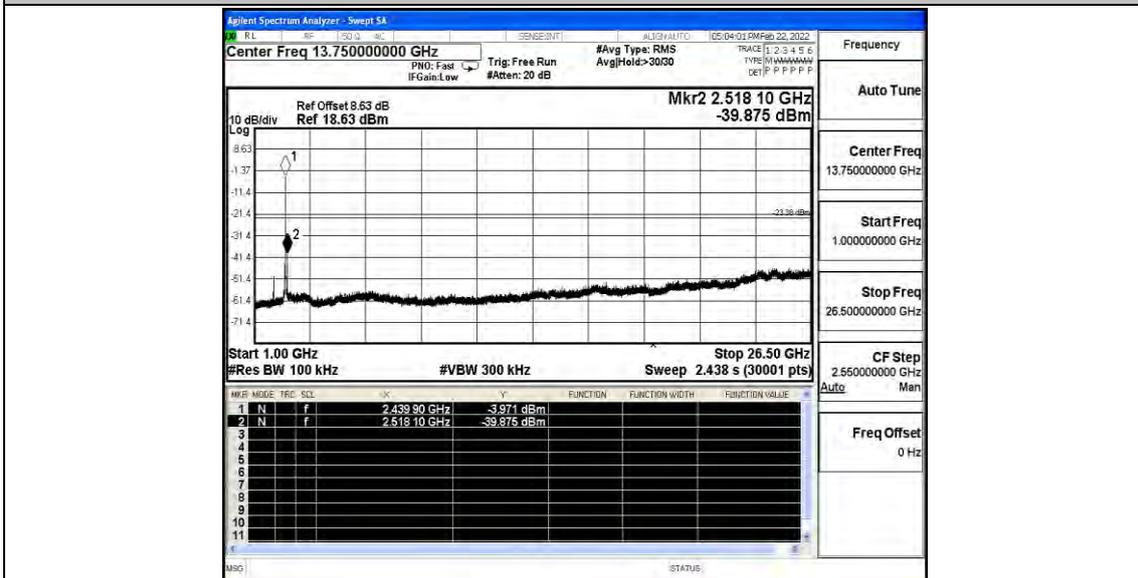
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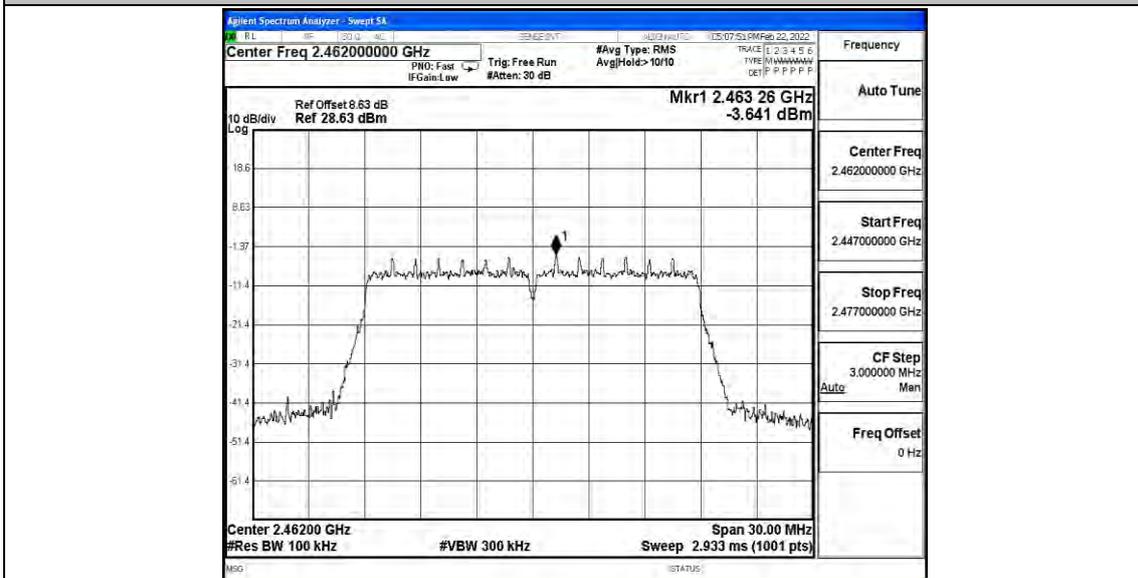
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11N20SISO\_Ant1\_2437\_1000~26500

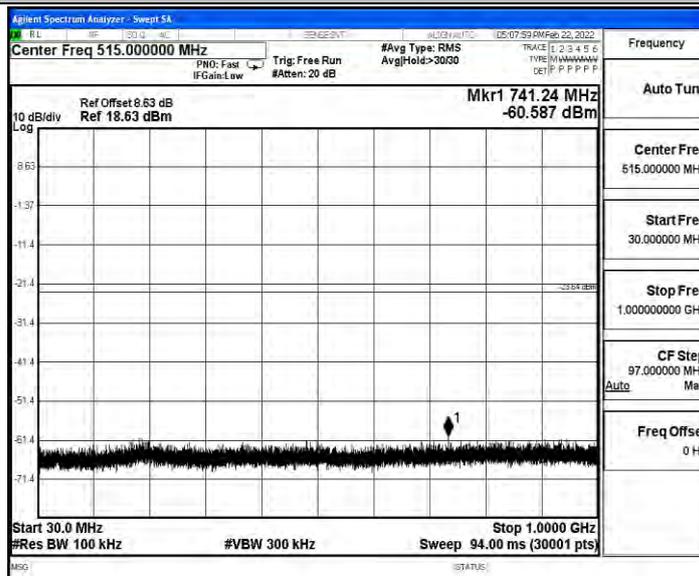


11N20SISO\_Ant1\_2462\_0~Reference

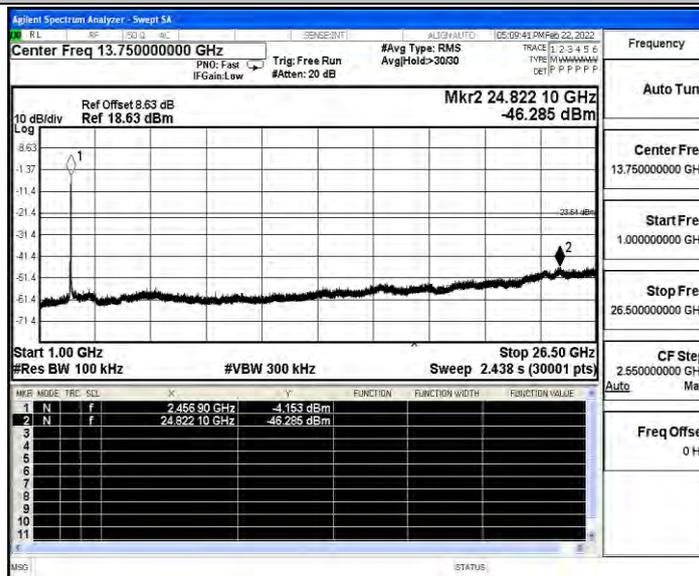




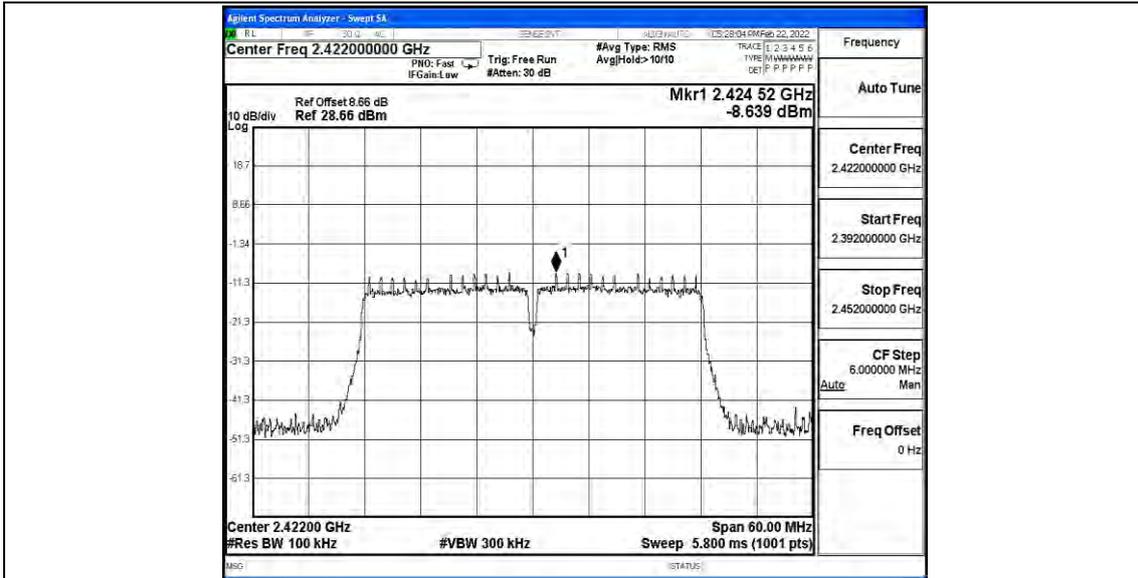
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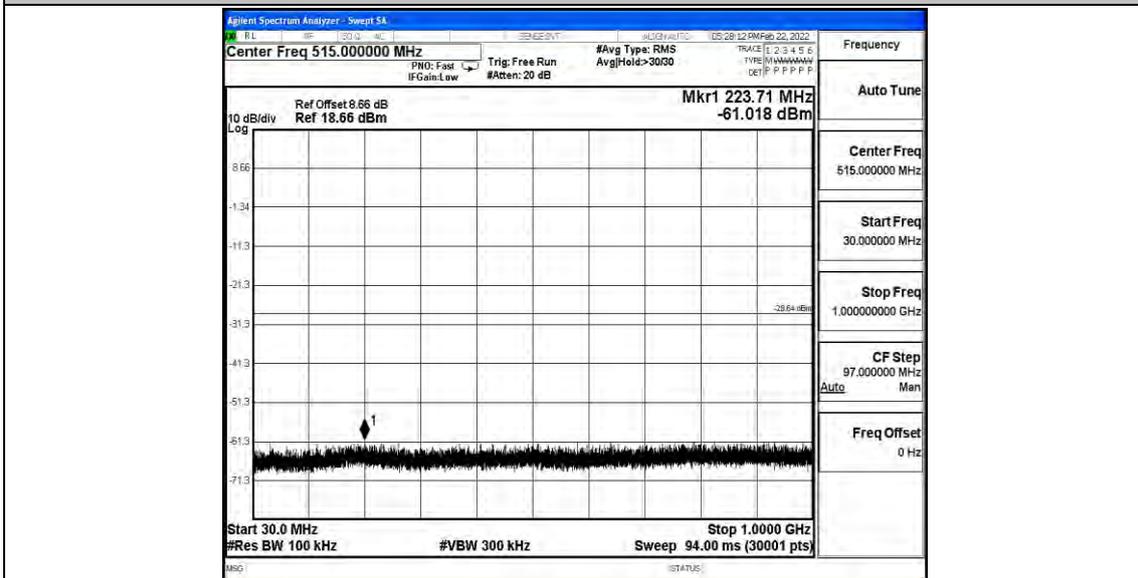
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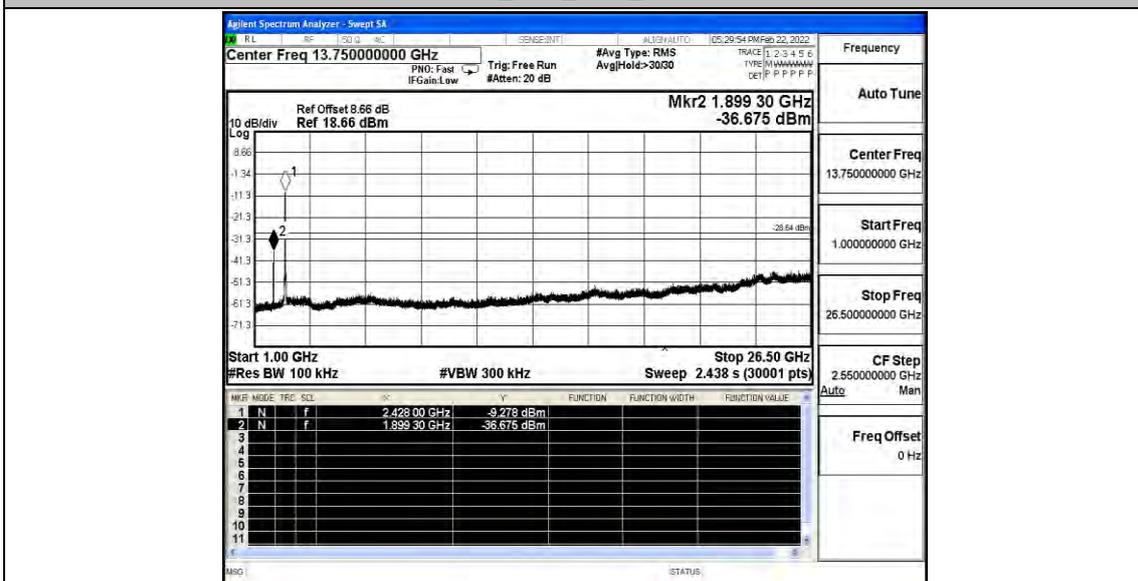
11N40SISO\_Ant1\_2422\_0~Reference



11N40SISO\_Ant1\_2422\_30~1000

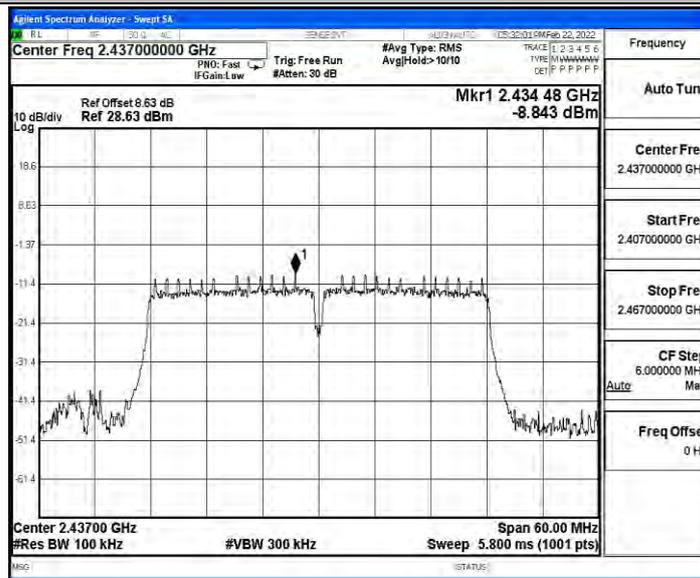


11N40SISO\_Ant1\_2422\_1000~26500

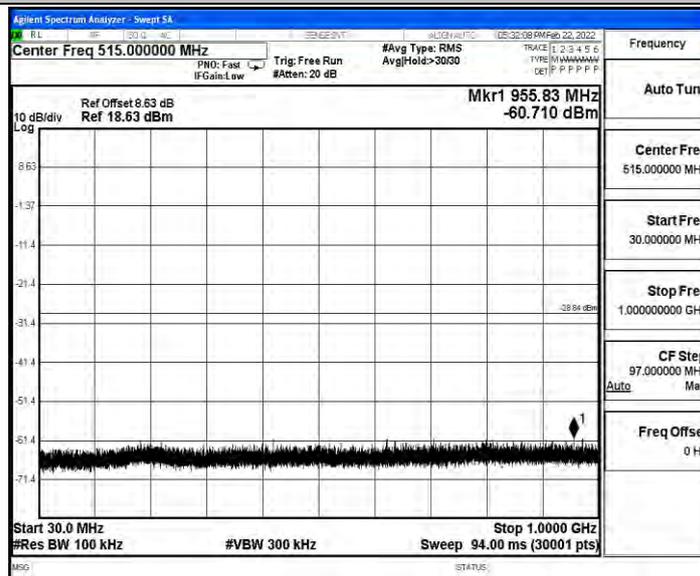




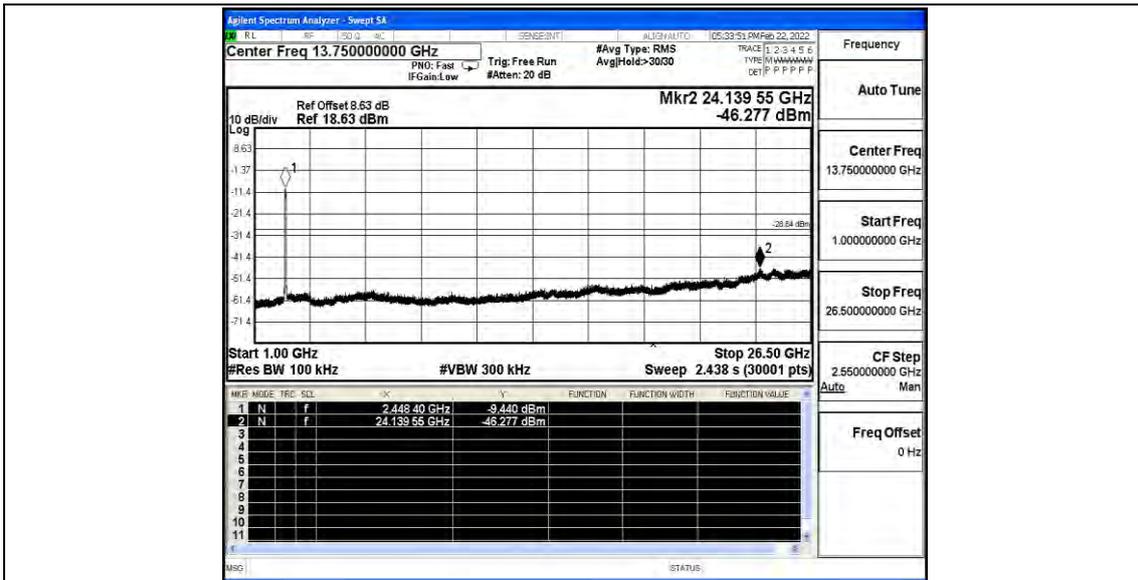
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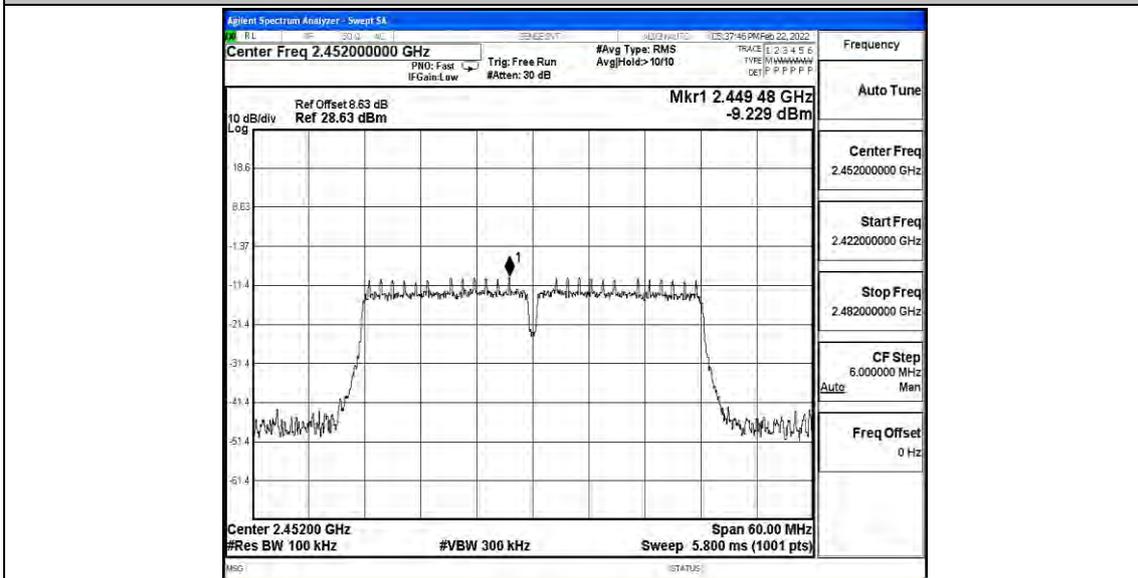
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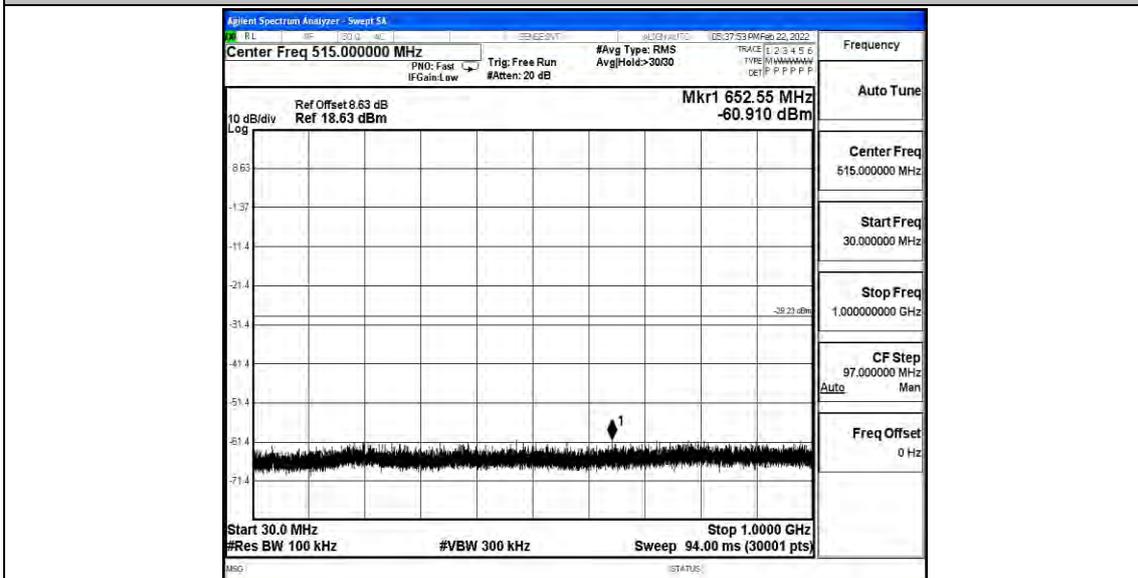
11N40SISO\_Ant1\_2437\_1000~26500



11N40SISO\_Ant1\_2452\_0~Reference

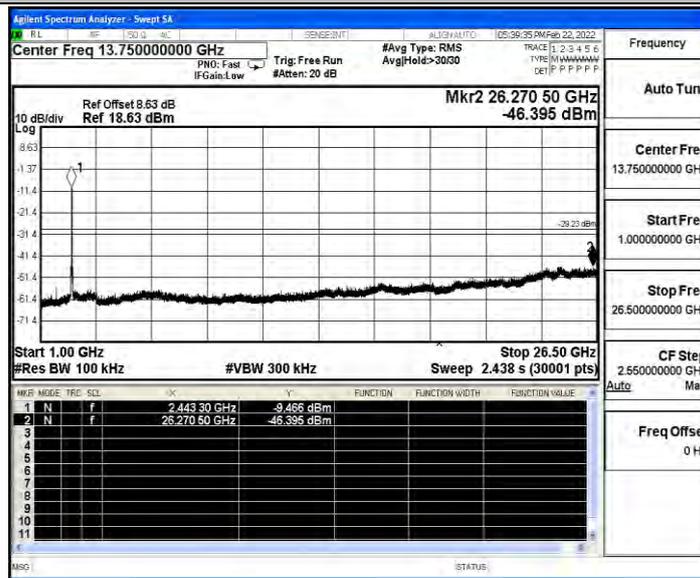


11N40SISO\_Ant1\_2452\_30~1000





11N40SISO\_Ant1\_2452\_1000~26500





## A.6 Duty Cycle

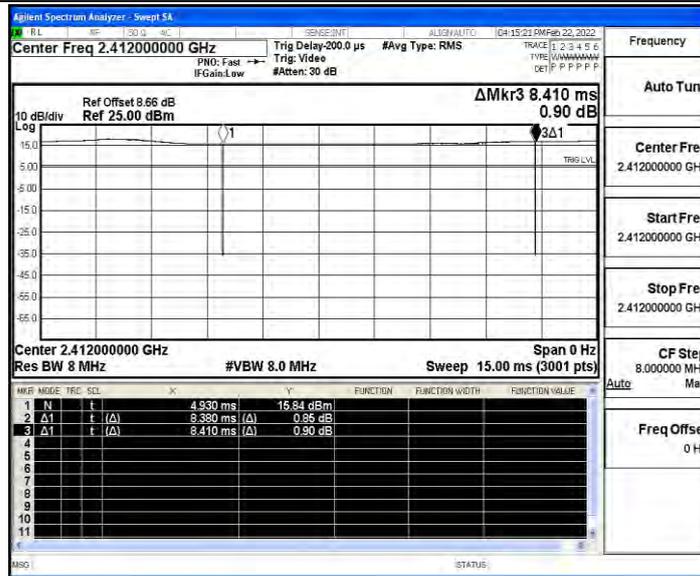
### Test Result

TestMode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Limit	Verdict
11B	Ant1	2412	8.38	8.41	99.64	---	---
		2437	8.38	8.41	99.64	---	---
		2462	8.38	8.41	99.64	---	---
11G	Ant1	2412	1.39	1.42	97.89	---	---
		2437	1.39	1.43	97.20	---	---
		2462	1.39	1.43	97.20	---	---
11N20SISO	Ant1	2412	1.30	1.34	97.01	---	---
		2437	1.30	1.34	97.01	---	---
		2462	1.30	1.33	97.74	---	---
11N40SISO	Ant1	2422	0.65	0.68	95.59	---	---
		2437	0.64	0.68	94.12	---	---
		2452	0.65	0.68	95.59	---	---

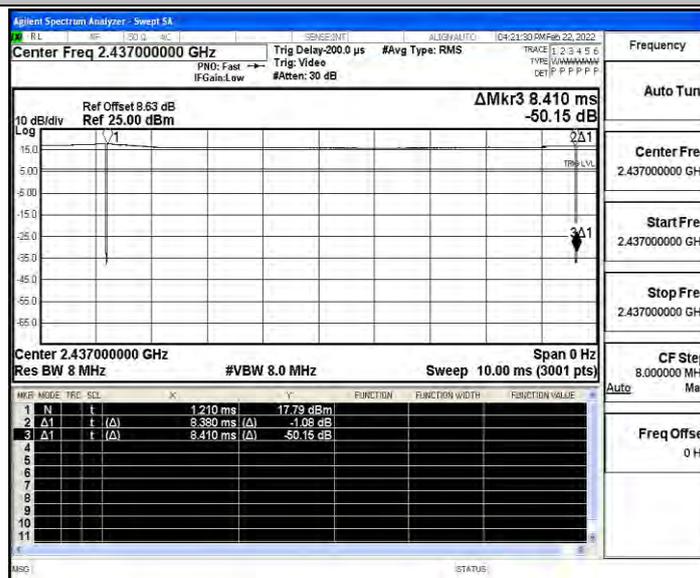


### Test Graphs

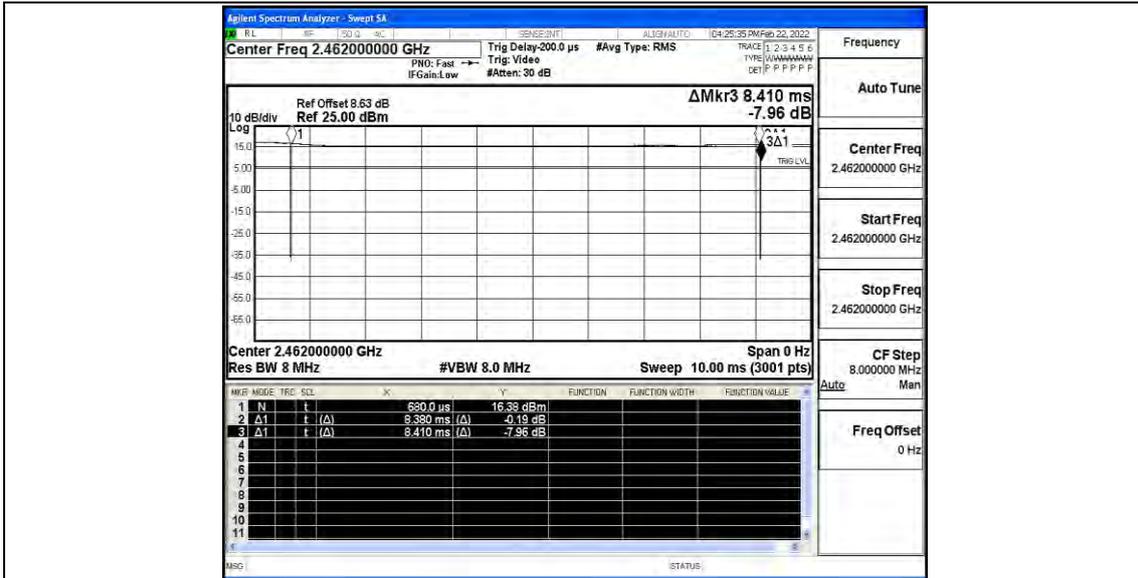
11B\_Ant1\_2412



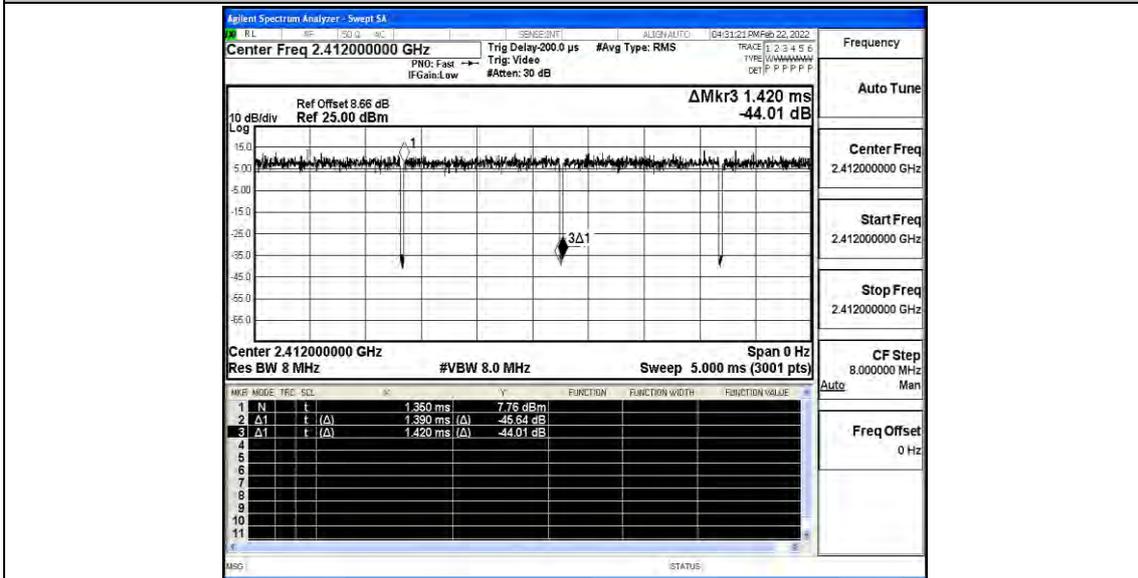
11B\_Ant1\_2437



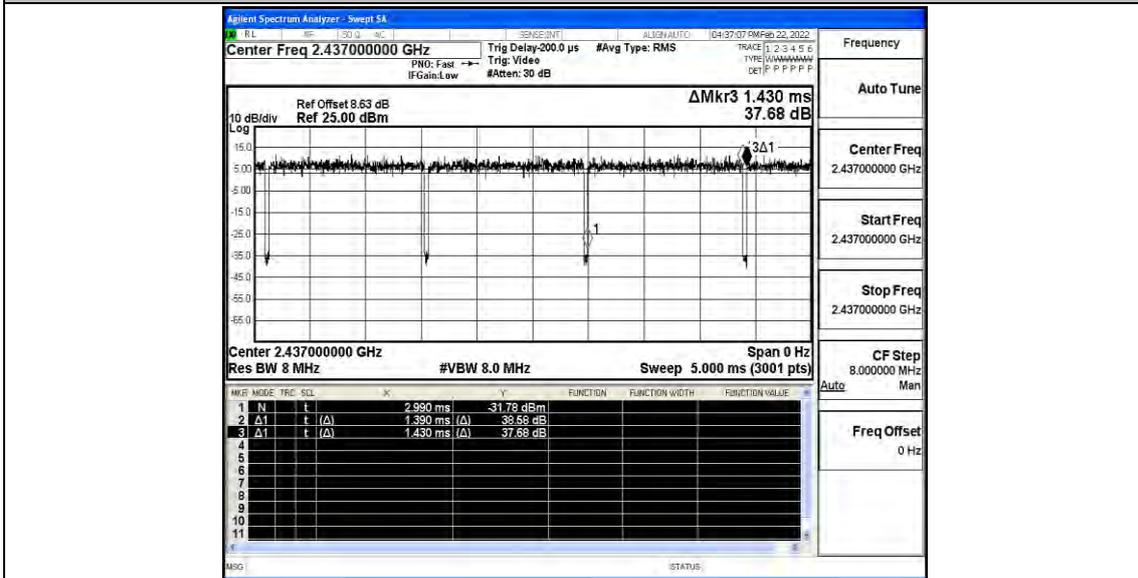
11B\_Ant1\_2462



11G\_Ant1\_2412

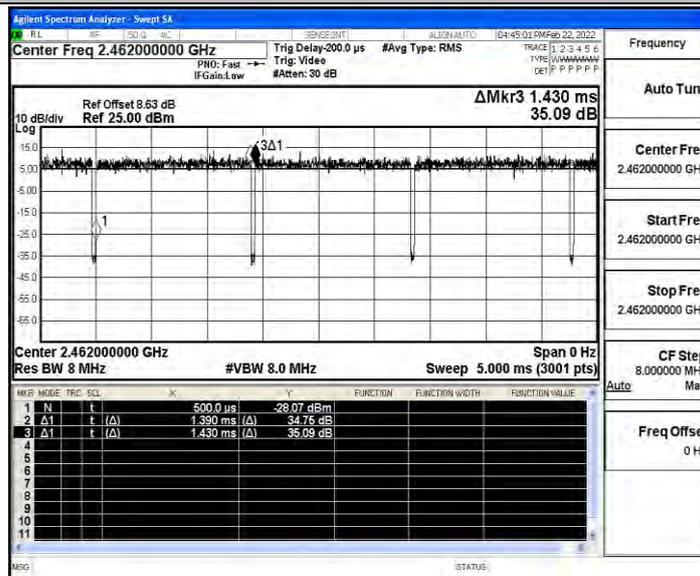


11G\_Ant1\_2437

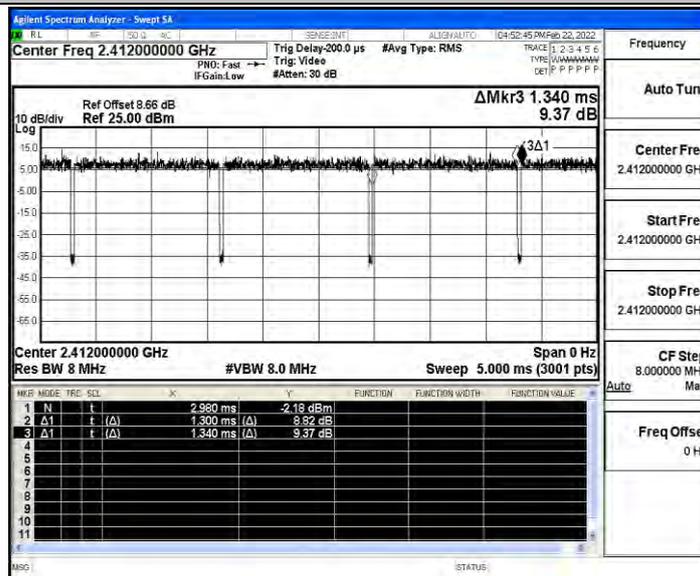




### 11G\_Ant1\_2462



### 11N20SISO\_Ant1\_2412



### 11N20SISO\_Ant1\_2437







## A.7 Emissions in Restricted Bands

### Test Result

TestMode	Channel	Detector	Freq. [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
11B	2412	AV	2310.000	-49	≤-41.20	46.20	≤54	PASS
		AV	2388.920	-47.8	≤-41.20	47.40	≤54	PASS
		AV	2390.000	-47.86	≤-41.20	47.34	≤54	PASS
		Peak	2310.000	-39.05	≤-21.20	56.15	≤74	PASS
		Peak	2381.900	-35.87	≤-21.20	59.33	≤74	PASS
		Peak	2390.000	-37.29	≤-21.20	57.91	≤74	PASS
	2462	AV	2483.500	-47.89	≤-41.20	47.31	≤54	PASS
		AV	2487.300	-47.85	≤-41.20	47.35	≤54	PASS
		AV	2500.000	-47.99	≤-41.20	47.21	≤54	PASS
		Peak	2483.500	-37.53	≤-21.20	57.67	≤74	PASS
		Peak	2498.300	-36.1	≤-21.20	59.10	≤74	PASS
		Peak	2500.000	-36.72	≤-21.20	58.48	≤74	PASS
11G	2412	AV	2310.000	-48.39	≤-41.20	46.81	≤54	PASS
		AV	2389.440	-47.28	≤-41.20	47.92	≤54	PASS
		AV	2390.000	-47.31	≤-41.20	47.89	≤54	PASS
		Peak	2310.000	-37.91	≤-21.20	57.29	≤74	PASS
		Peak	2314.170	-35.86	≤-21.20	59.34	≤74	PASS
		Peak	2390.000	-37.89	≤-21.20	57.31	≤74	PASS
	2462	AV	2483.500	-46.87	≤-41.20	48.33	≤54	PASS
		AV	2483.890	-46.83	≤-41.20	48.37	≤54	PASS
		AV	2500.000	-47.24	≤-41.20	47.96	≤54	PASS
		Peak	2483.500	-36.05	≤-21.20	59.15	≤74	PASS
		Peak	2484.440	-34.62	≤-21.20	60.58	≤74	PASS
		Peak	2500.000	-37.24	≤-21.20	57.96	≤74	PASS
11N20SIS O	2412	AV	2310.000	-48.52	≤-41.20	46.68	≤54	PASS
		AV	2389.830	-47.13	≤-41.20	48.07	≤54	PASS
		AV	2390.000	-47.23	≤-41.20	47.97	≤54	PASS
		Peak	2310.000	-37.75	≤-21.20	57.45	≤74	PASS
		Peak	2389.180	-35.43	≤-21.20	59.77	≤74	PASS
		Peak	2390.000	-36.66	≤-21.20	58.54	≤74	PASS
	2462	AV	2483.500	-46.28	≤-41.20	48.92	≤54	PASS
		AV	2483.670	-46.18	≤-41.20	49.02	≤54	PASS
		AV	2500.000	-46.99	≤-41.20	48.21	≤54	PASS
		Peak	2483.500	-30.1	≤-21.20	65.10	≤74	PASS
		Peak	2484.000	-31.63	≤-21.20	63.57	≤74	PASS
		Peak	2500.000	-36.24	≤-21.20	58.96	≤74	PASS
11N40SIS	2422	AV	2310.000	-48.37	≤-41.20	46.83	≤54	PASS



O		AV	2389.050	-45.16	$\leq -41.20$	50.04	$\leq 54$	PASS
		AV	2390.000	-45.45	$\leq -41.20$	49.75	$\leq 54$	PASS
		Peak	2310.000	-38.62	$\leq -21.20$	56.58	$\leq 74$	PASS
		Peak	2389.050	-29.22	$\leq -21.20$	65.98	$\leq 74$	PASS
		Peak	2390.000	-31.44	$\leq -21.20$	63.76	$\leq 74$	PASS
	2452	AV	2483.500	-45.05	$\leq -41.20$	50.15	$\leq 54$	PASS
		AV	2484.330	-44.85	$\leq -41.20$	50.35	$\leq 54$	PASS
		AV	2500.000	-46.71	$\leq -41.20$	48.49	$\leq 54$	PASS
		Peak	2483.500	-29	$\leq -21.20$	66.20	$\leq 74$	PASS
		Peak	2484.880	-28.13	$\leq -21.20$	67.07	$\leq 74$	PASS
		Peak	2500.000	-36.93	$\leq -21.20$	58.27	$\leq 74$	PASS

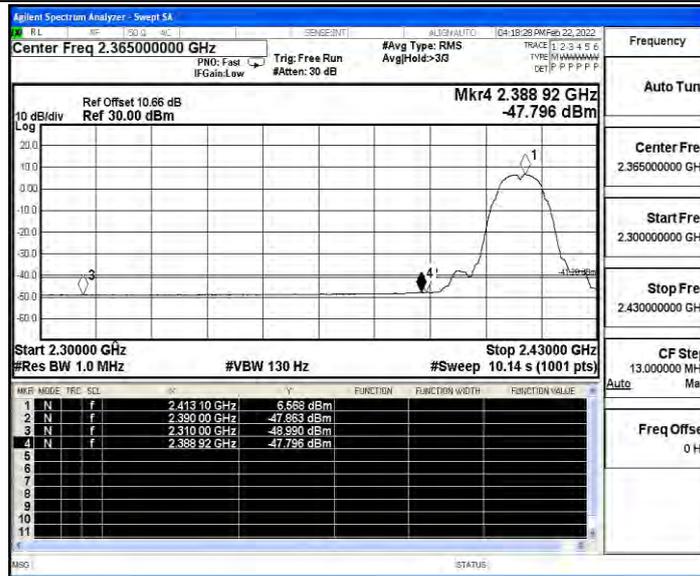
## Note:

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.

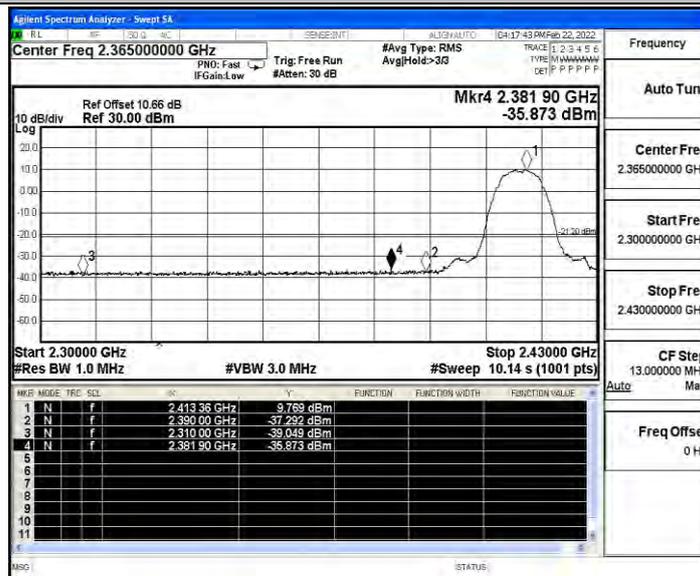


### Test Graphs

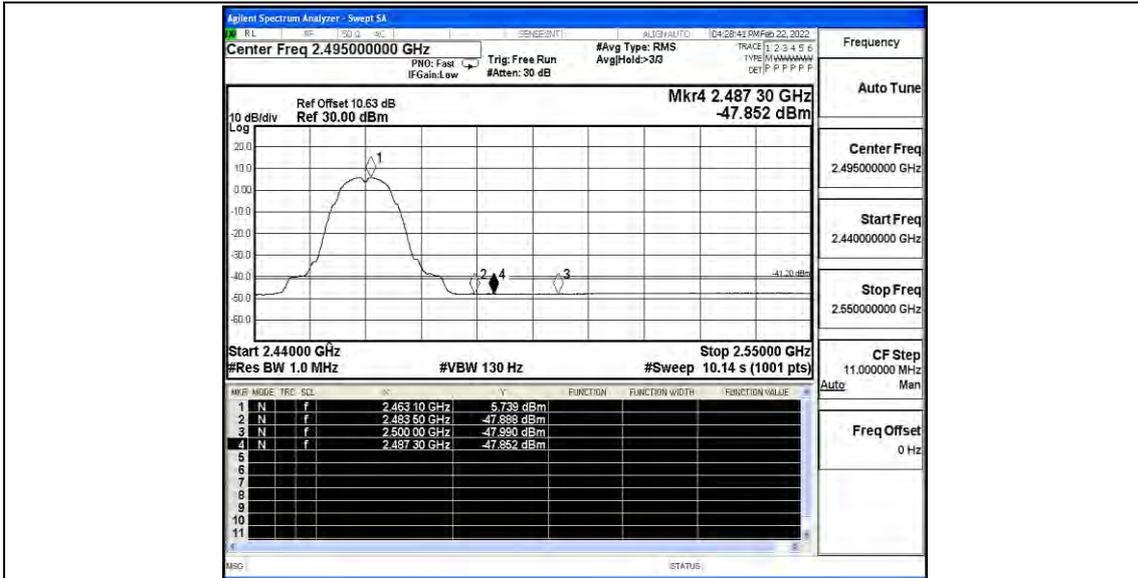
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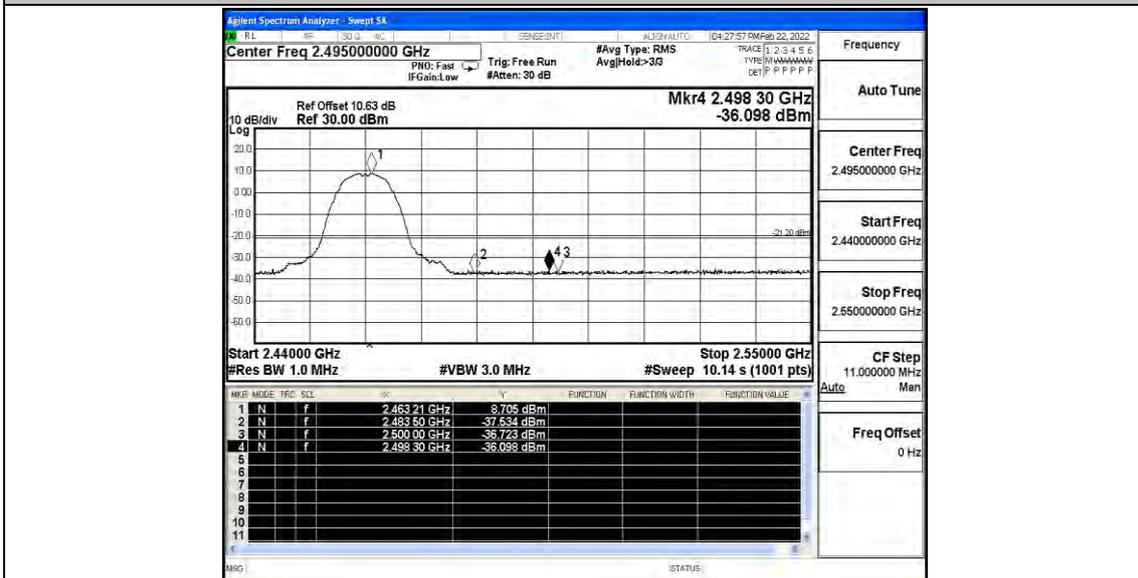
11B\_Ant1\_Low\_2412\_Peak



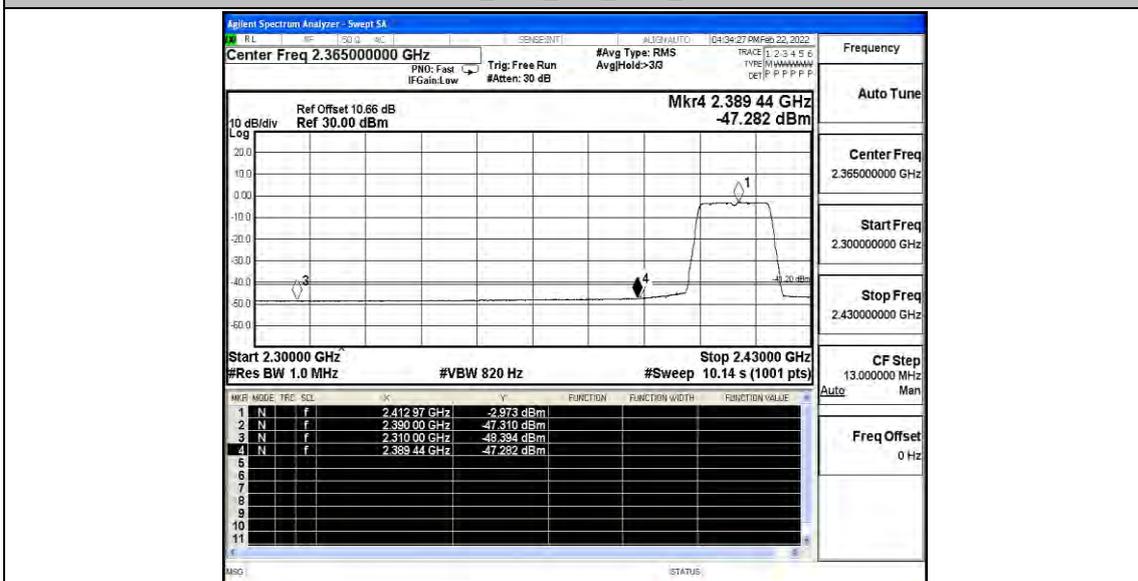
11B\_Ant1\_High\_2462\_AV



11B\_Ant1\_High\_2462\_Peak

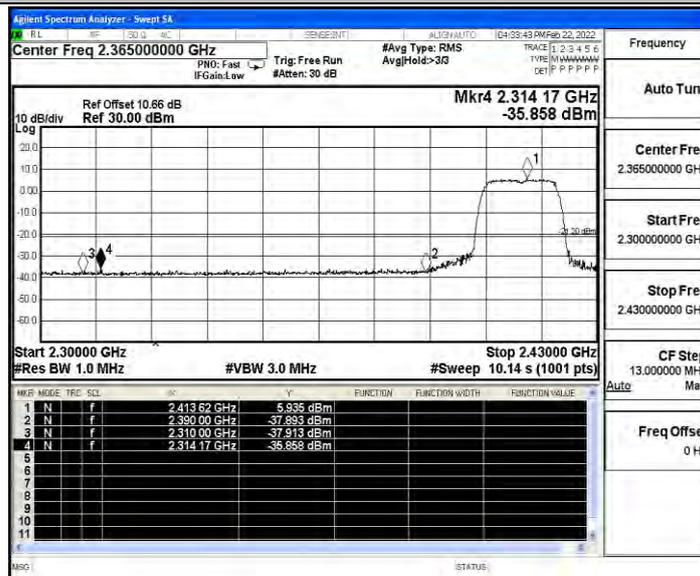


11G\_Ant1\_Low\_2412\_AV

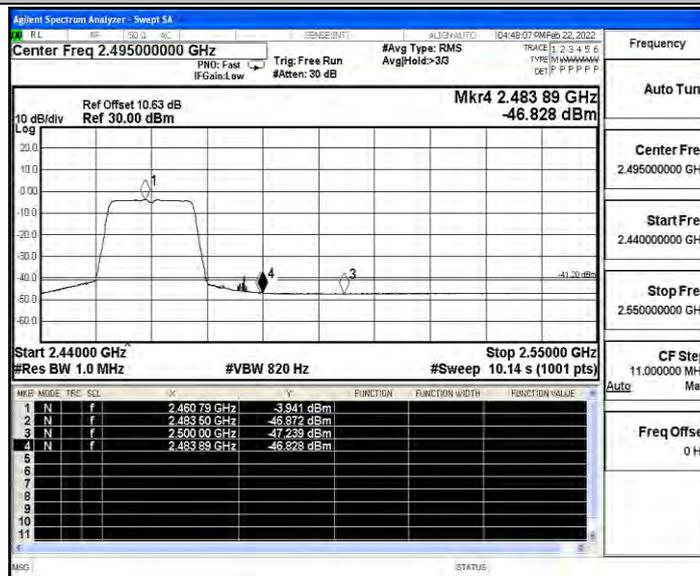




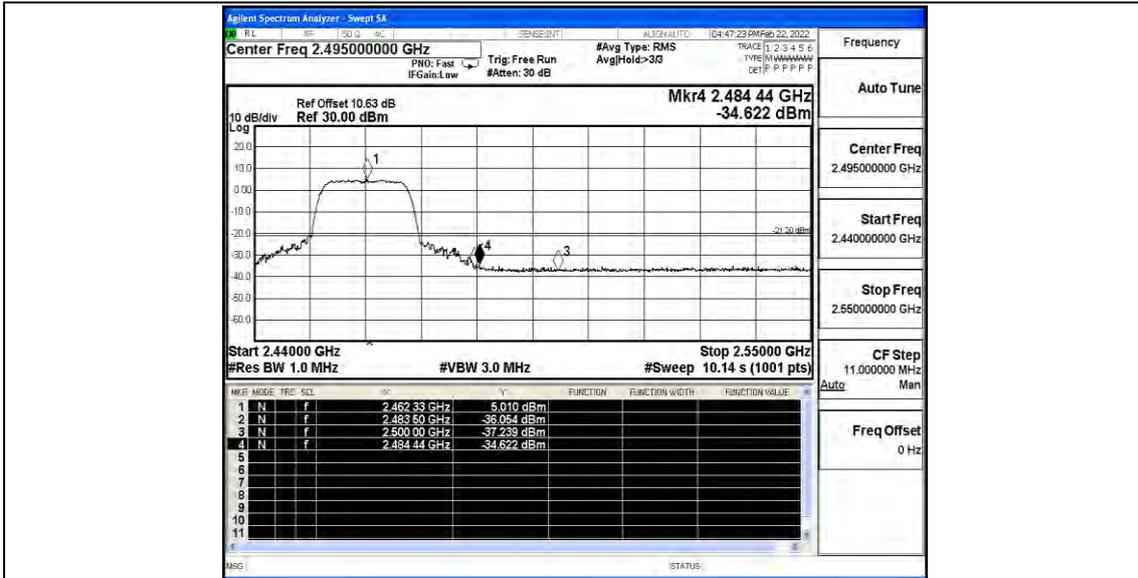
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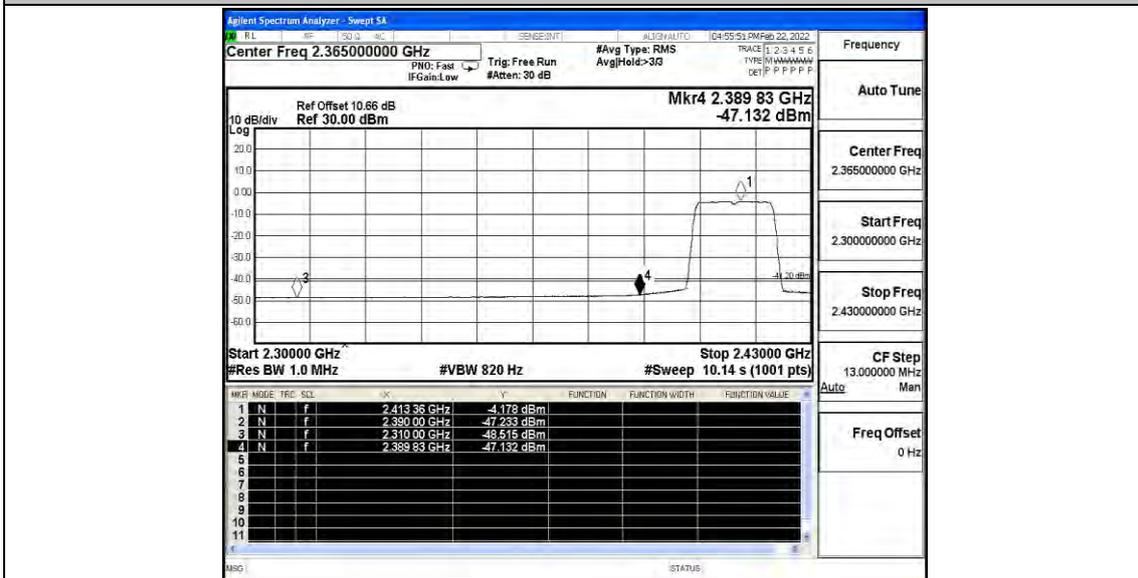
### 11G\_Ant1\_High\_2462\_AV



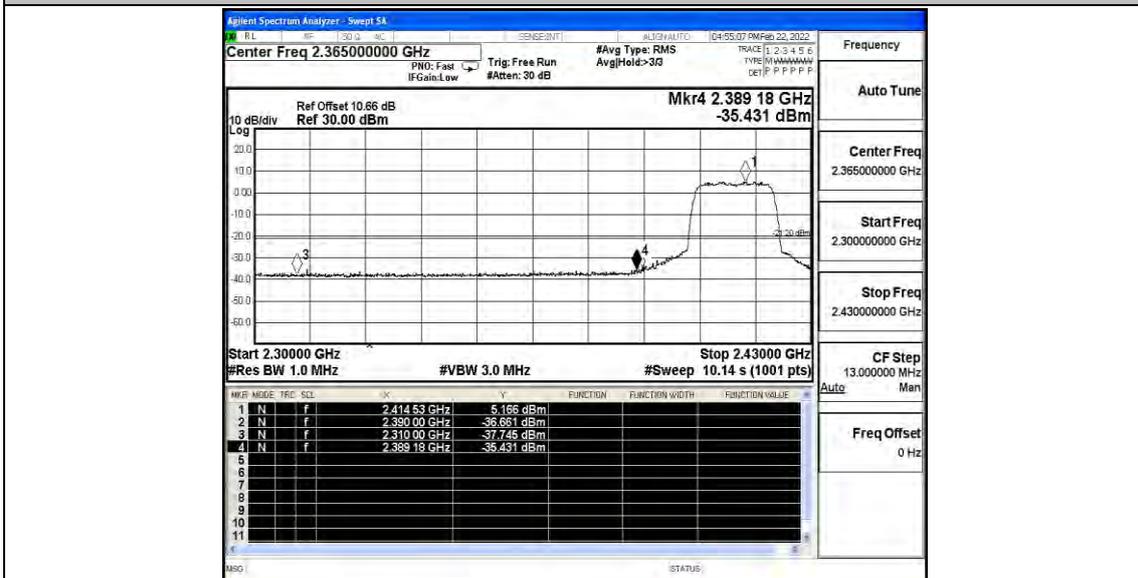
### 11G\_Ant1\_High\_2462\_Peak



11N20SISO\_Ant1\_Low\_2412\_AV

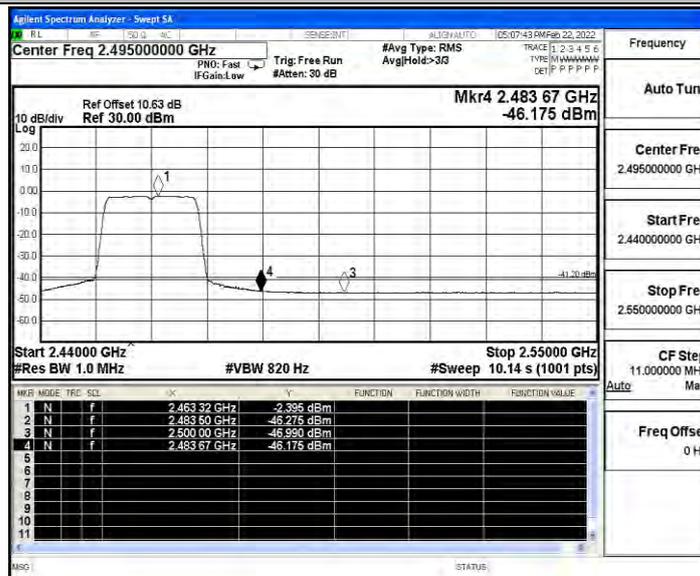


11N20SISO\_Ant1\_Low\_2412\_Peak

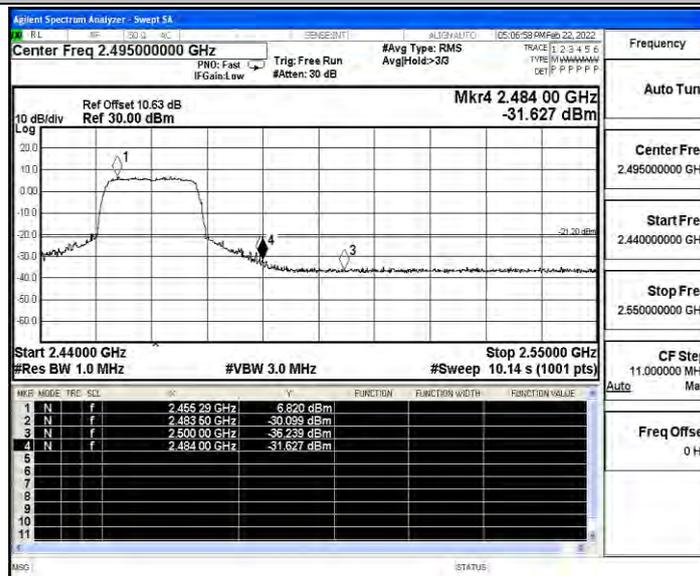




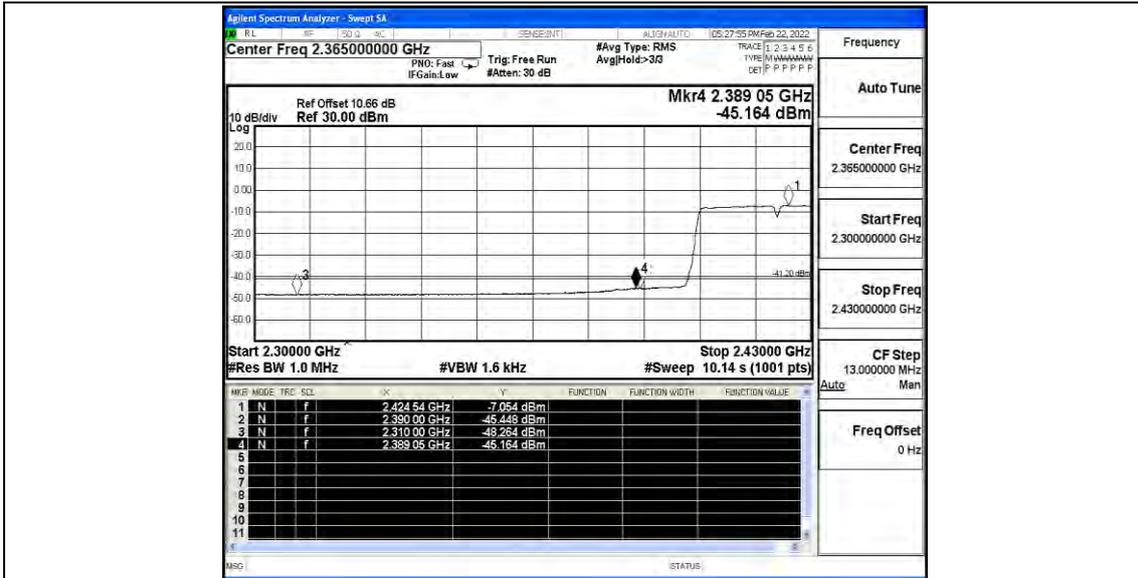
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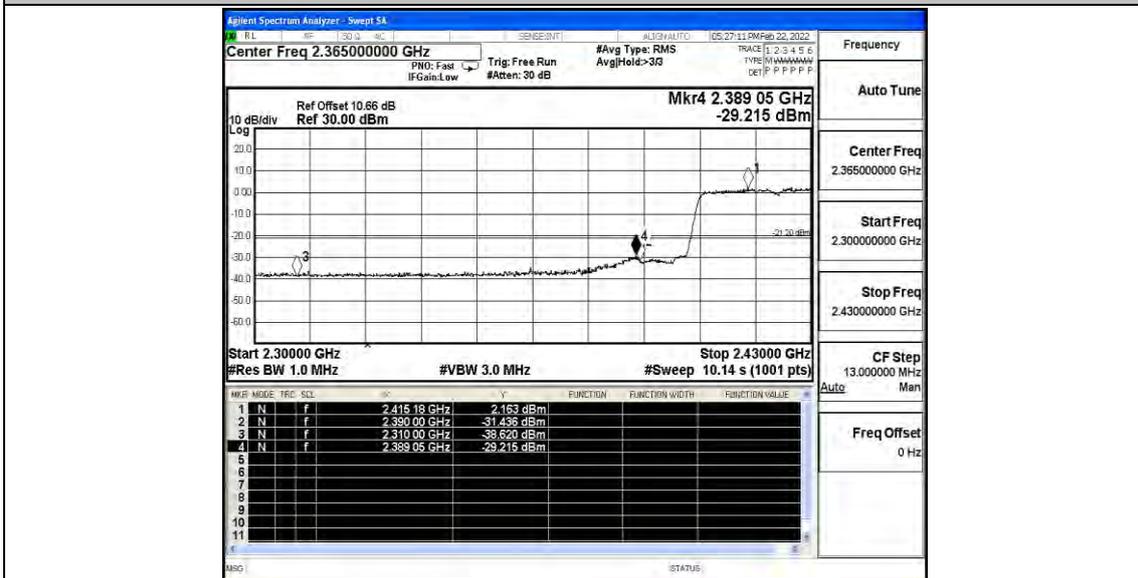
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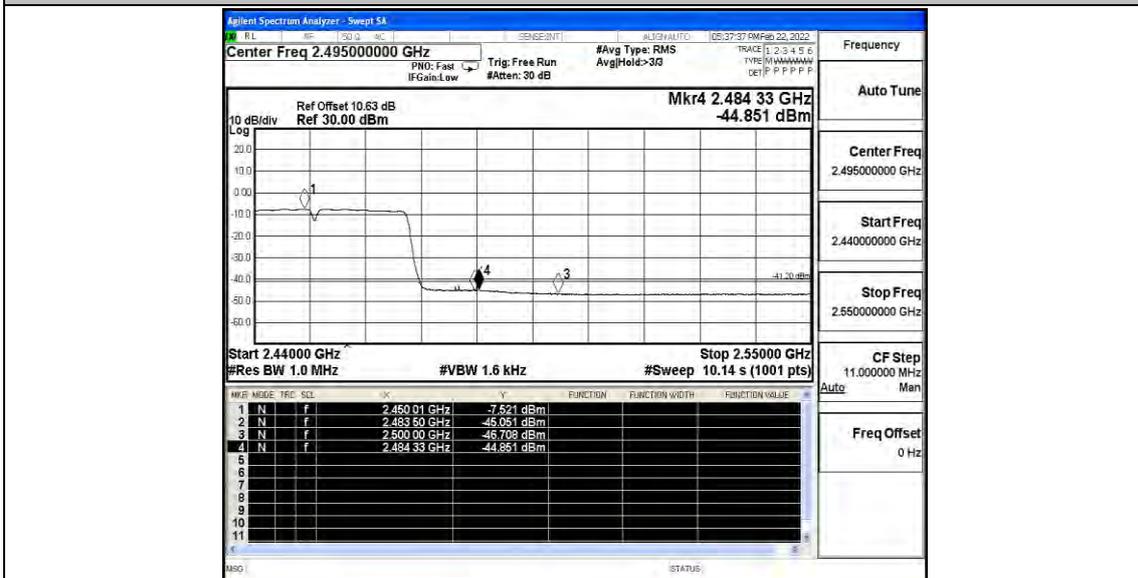
### 11N40SISO\_Ant1\_Low\_2422\_AV



11N40SISO\_Ant1\_Low\_2422\_Peak



11N40SISO\_Ant1\_High\_2452\_AV





### 11N40SISO\_Ant1\_High\_2452\_Peak

