Appendix A

RF Test Data for 2.4G WIFI (Conducted Measurement)

Product Name: Service Robot

Test Model: R2

Environmental Conditions

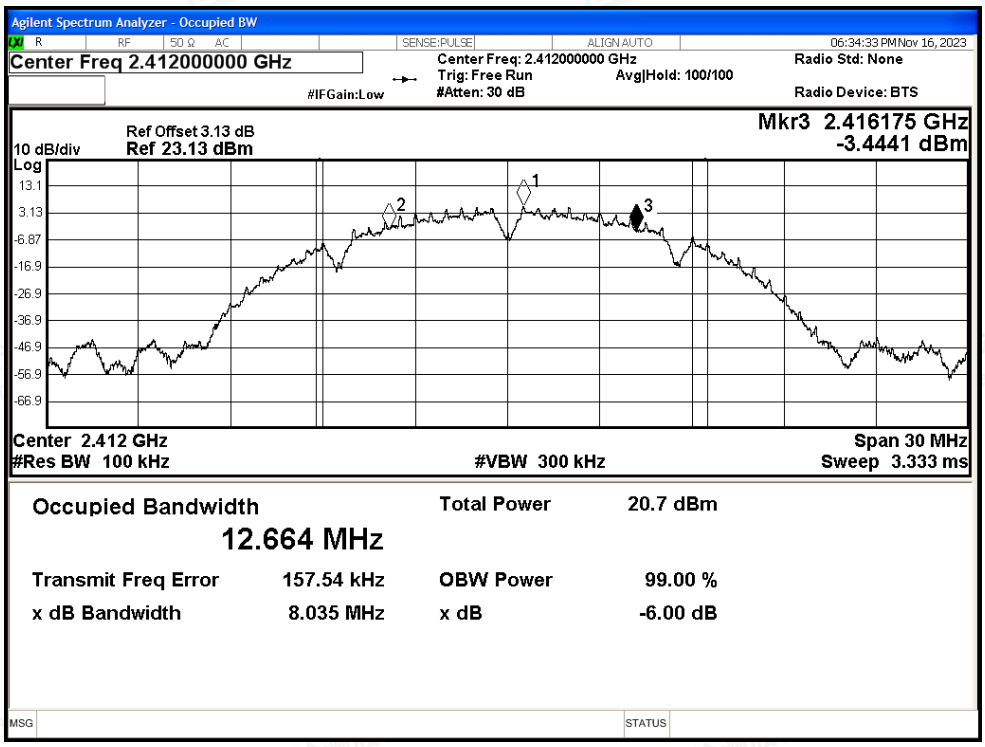
Temperature:	23.8° C
Relative Humidity:	52.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Joker Hu
Supervised by:	Ling Zhu

A.1 -6dB Bandwidth

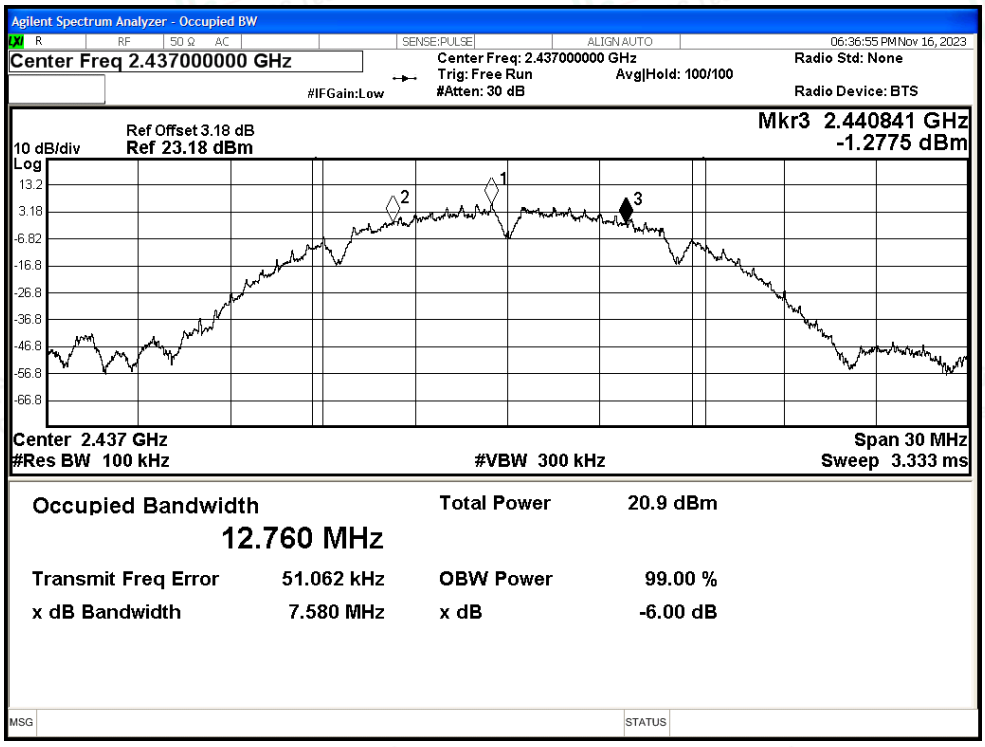
Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	b	2412	Ant1	8.035	>=0.5	Pass
NVNT	b	2437	Ant1	7.58	>=0.5	Pass
NVNT	b	2462	Ant1	7.585	>=0.5	Pass
NVNT	g	2412	Ant1	16.081	>=0.5	Pass
NVNT	g	2437	Ant1	15.296	>=0.5	Pass
NVNT	g	2462	Ant1	15.032	>=0.5	Pass
NVNT	n20	2412	Ant1	15.646	>=0.5	Pass
NVNT	n20	2437	Ant1	15.683	>=0.5	Pass
NVNT	n20	2462	Ant1	16.021	>=0.5	Pass

Test Graphs

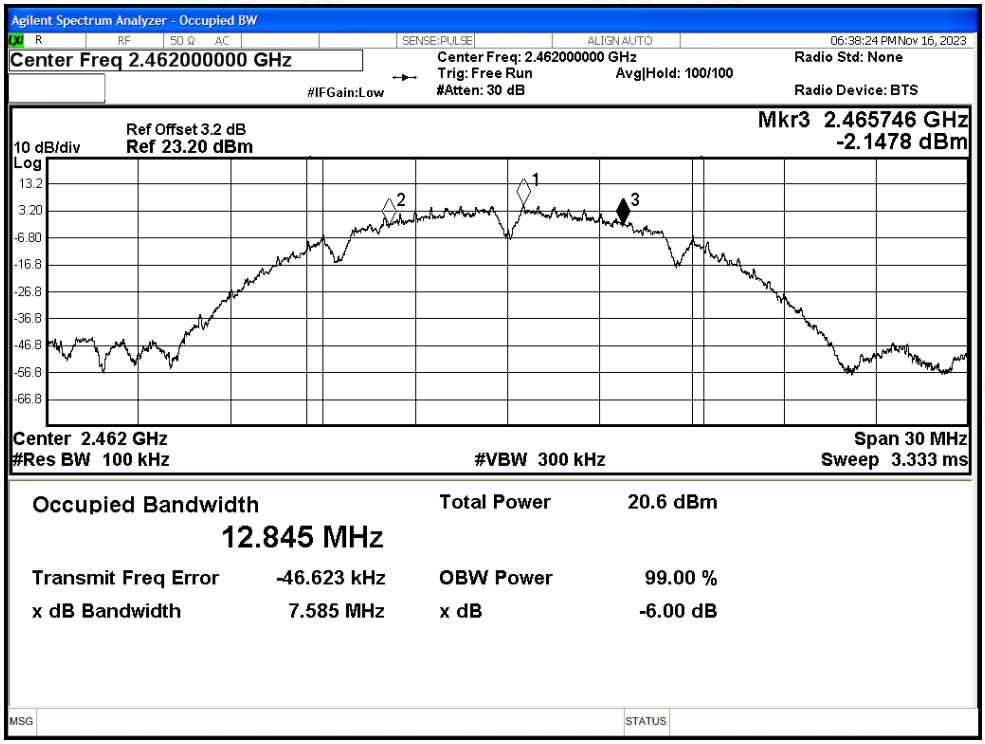
-6dB Bandwidth NVNT b 2412MHz Ant1



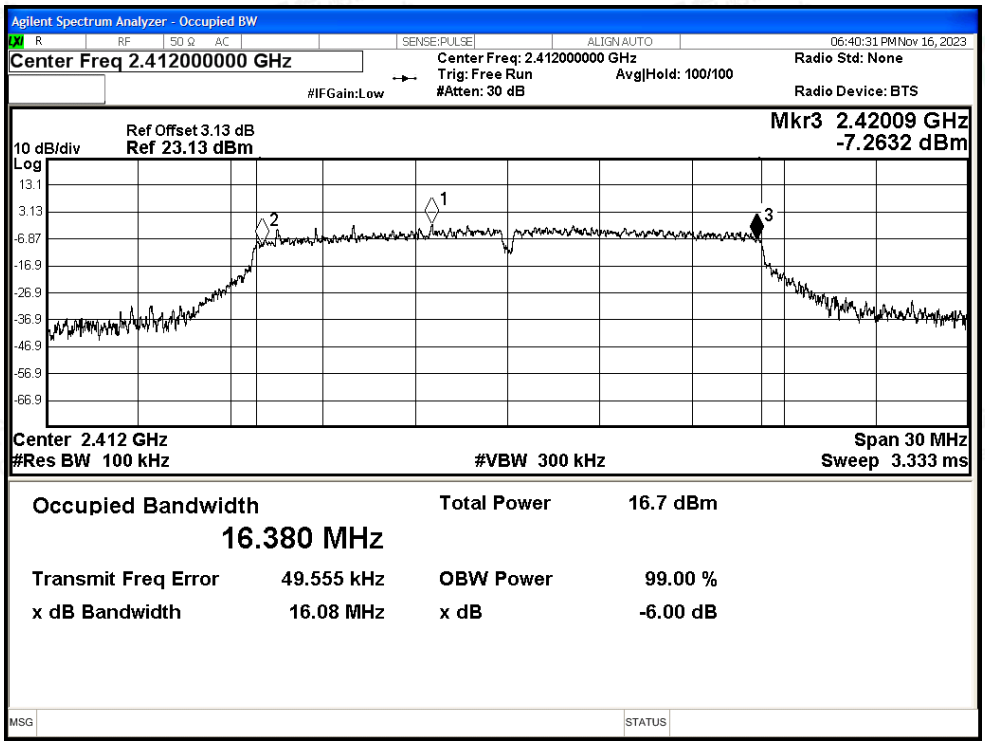
-6dB Bandwidth NVNT b 2437MHz Ant1



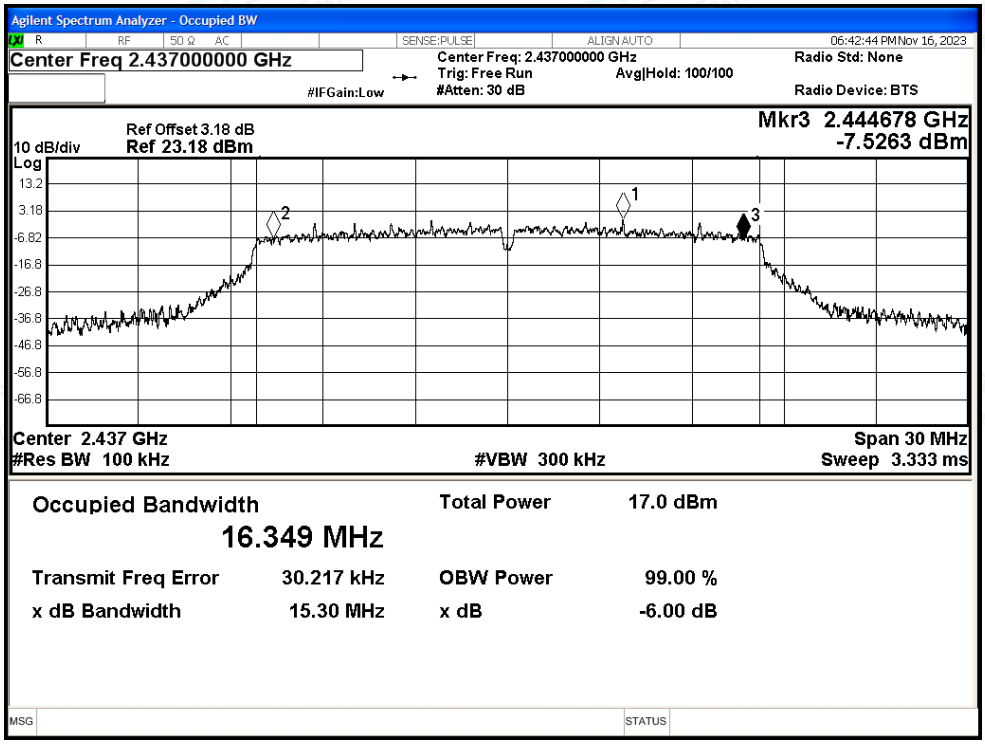
-6dB Bandwidth NVNT b 2462MHz Ant1



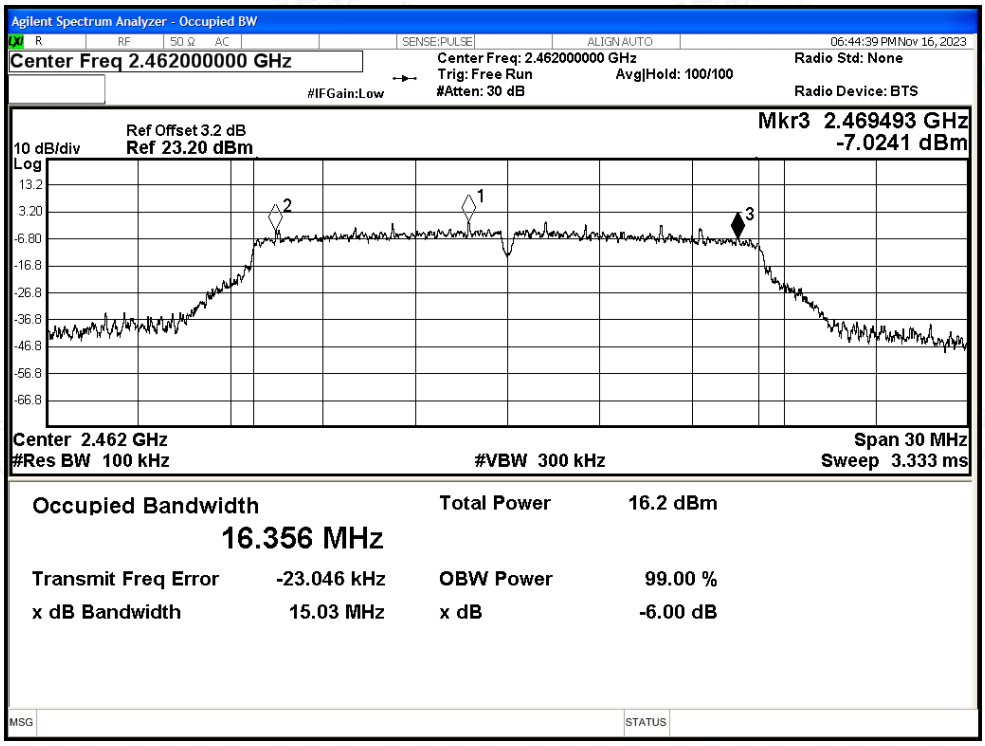
-6dB Bandwidth NVNT g 2412MHz Ant1



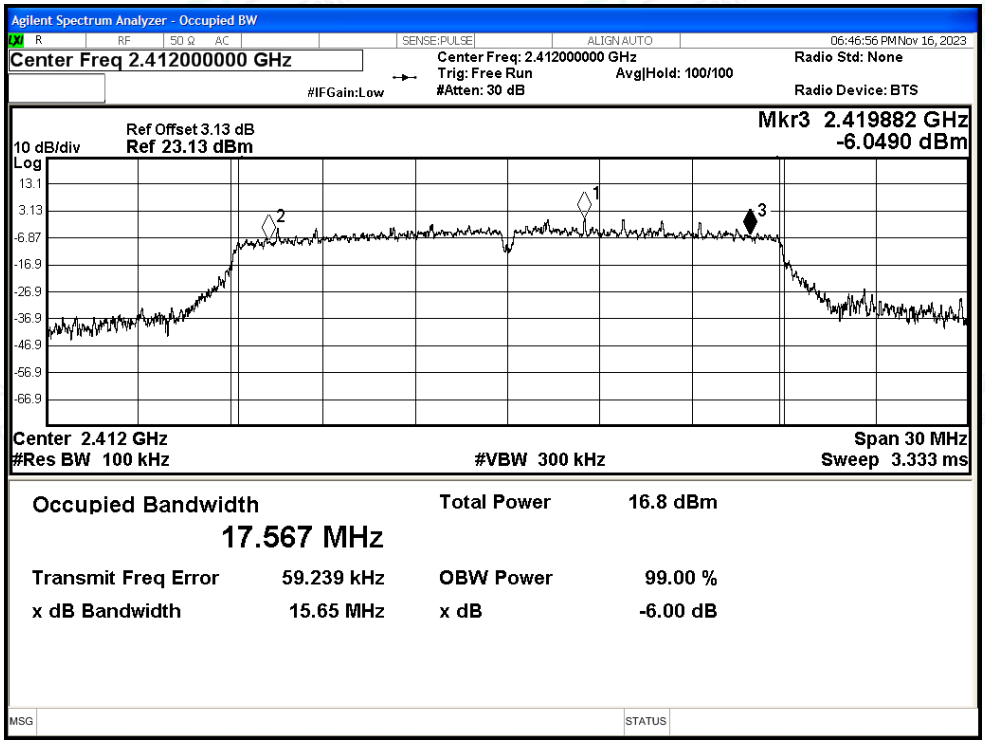
-6dB Bandwidth NVNT g 2437MHz Ant1



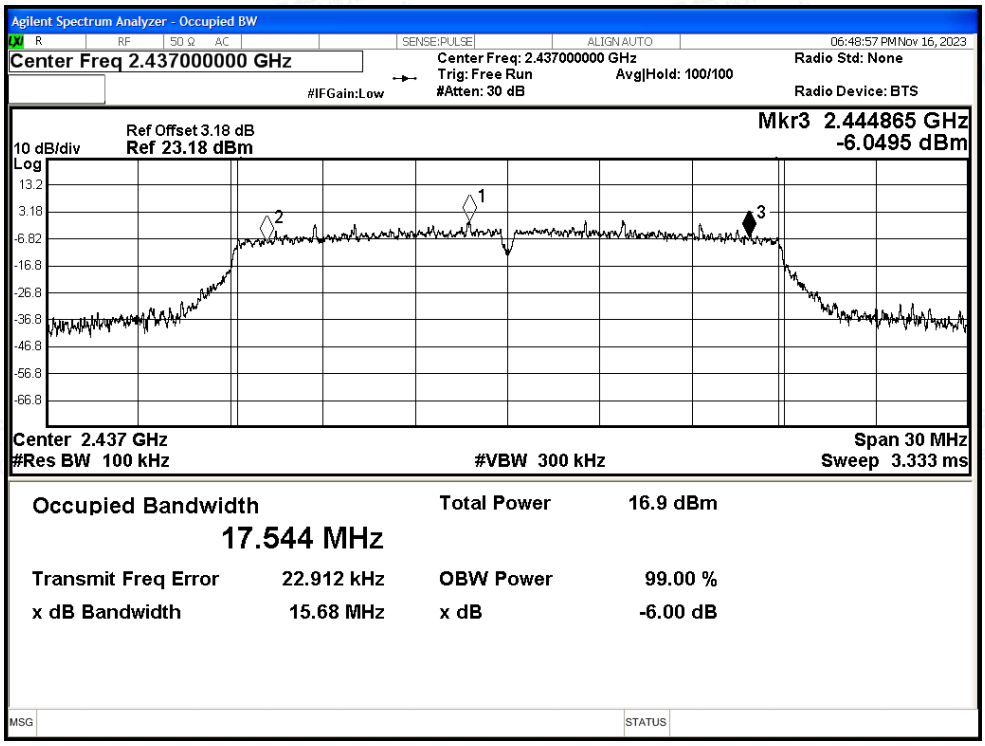
-6dB Bandwidth NVNT g 2462MHz Ant1



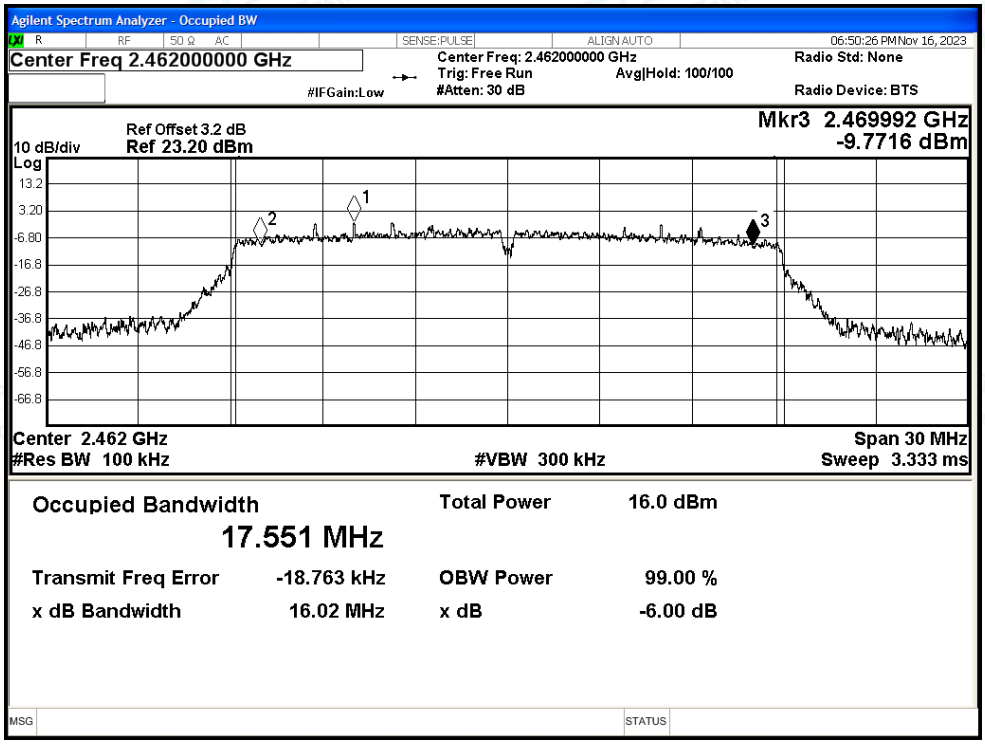
-6dB Bandwidth NVNT n20 2412MHz Ant1



-6dB Bandwidth NVNT n20 2437MHz Ant1



-6dB Bandwidth NVNT n20 2462MHz Ant1



A.2 Maximum conducted output power

Test Result Peak

TestMode	Antenna	Freq (MHz)	Peak Power[dBm]	Conducted Limit[dBm]	Verdict
11B	Ant1	2412	15.49	≤30.00	PASS
		2437	16.1	≤30.00	PASS
		2462	15.84	≤30.00	PASS
11G	Ant1	2412	15.52	≤30.00	PASS
		2437	15.76	≤30.00	PASS
		2462	14.94	≤30.00	PASS
11N20SISO	Ant1	2412	15.42	≤30.00	PASS
		2437	15.61	≤30.00	PASS
		2462	14.74	≤30.00	PASS

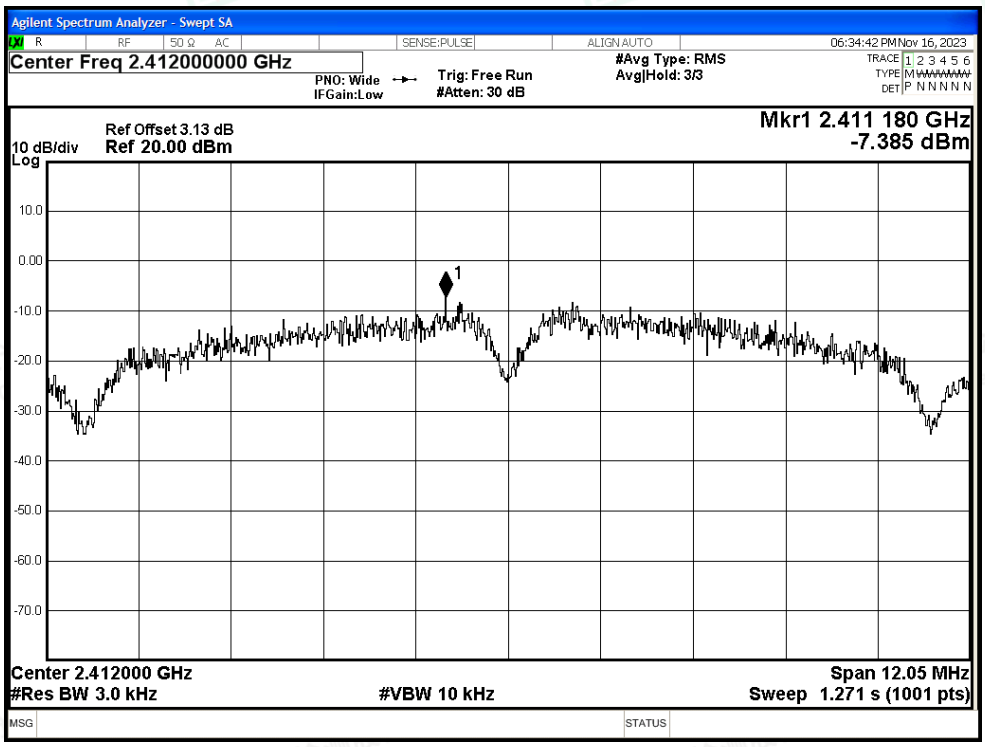
A.3 Maximum power spectral density

Test Result

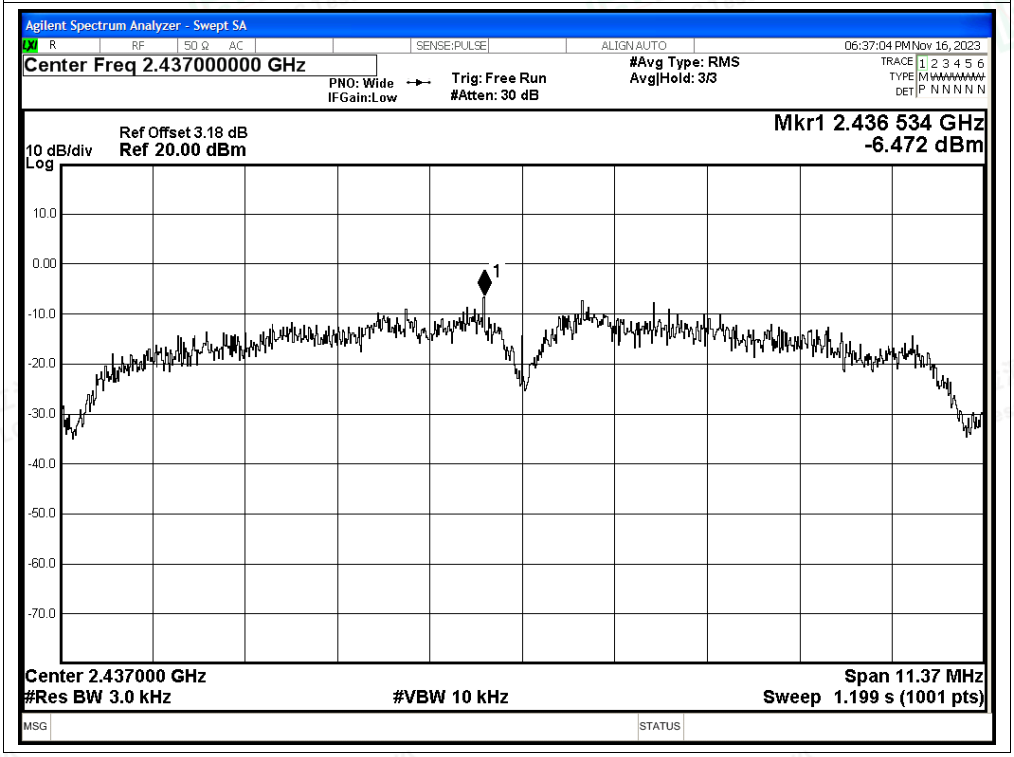
TestMode	Antenna	Freq (MHz)	Result [dBm/3kHz]	Limit [dBm/3kHz]	Verdict
11B	Ant1	2412	-7.39	≤8.00	PASS
		2437	-6.47	≤8.00	PASS
		2462	-8.54	≤8.00	PASS
11G	Ant1	2412	-13.64	≤8.00	PASS
		2437	-12.95	≤8.00	PASS
		2462	-14.17	≤8.00	PASS
11N20SISO	Ant1	2412	-14.69	≤8.00	PASS
		2437	-14.23	≤8.00	PASS
		2462	-15.28	≤8.00	PASS

Test Graphs

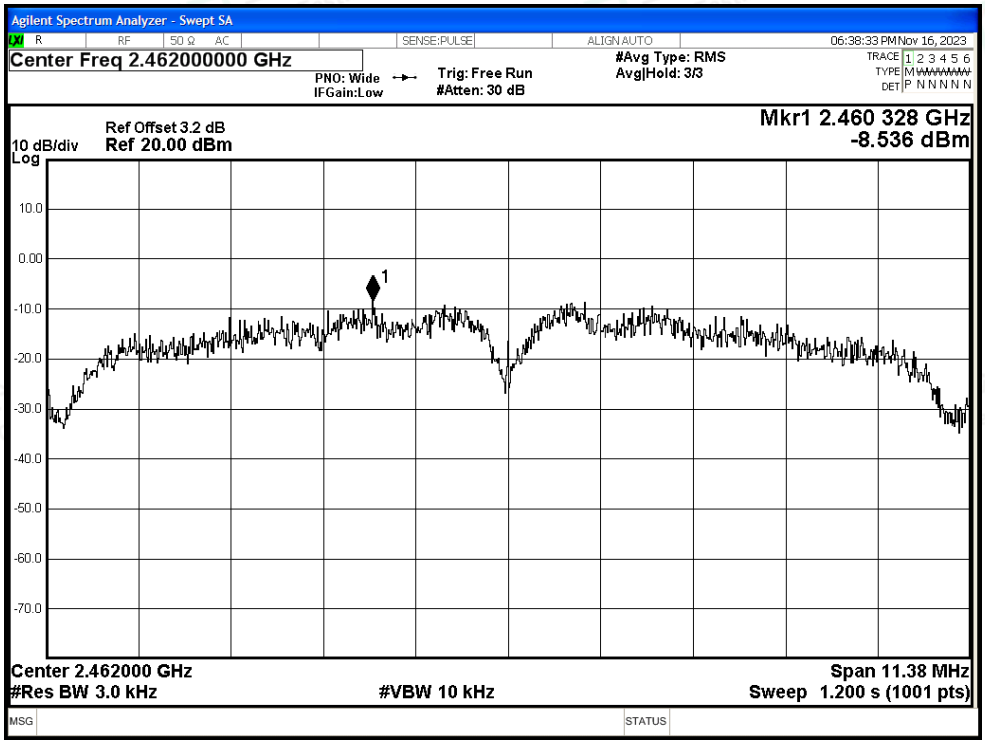
PSD NVNT b 2412MHz Ant1



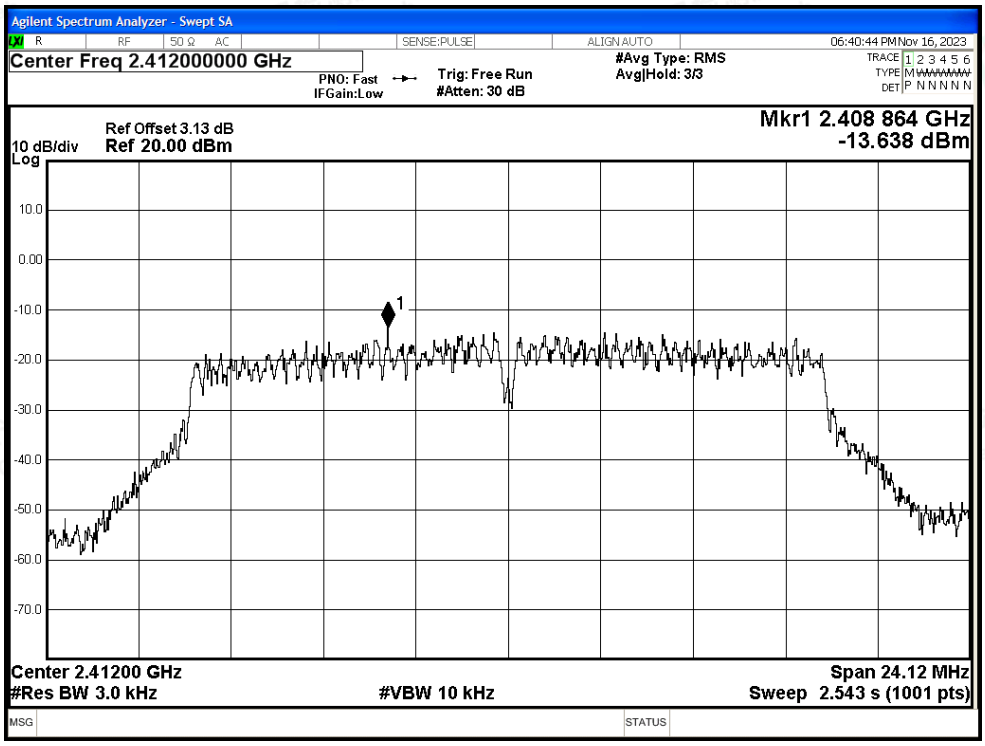
PSD NVNT b 2437MHz Ant1



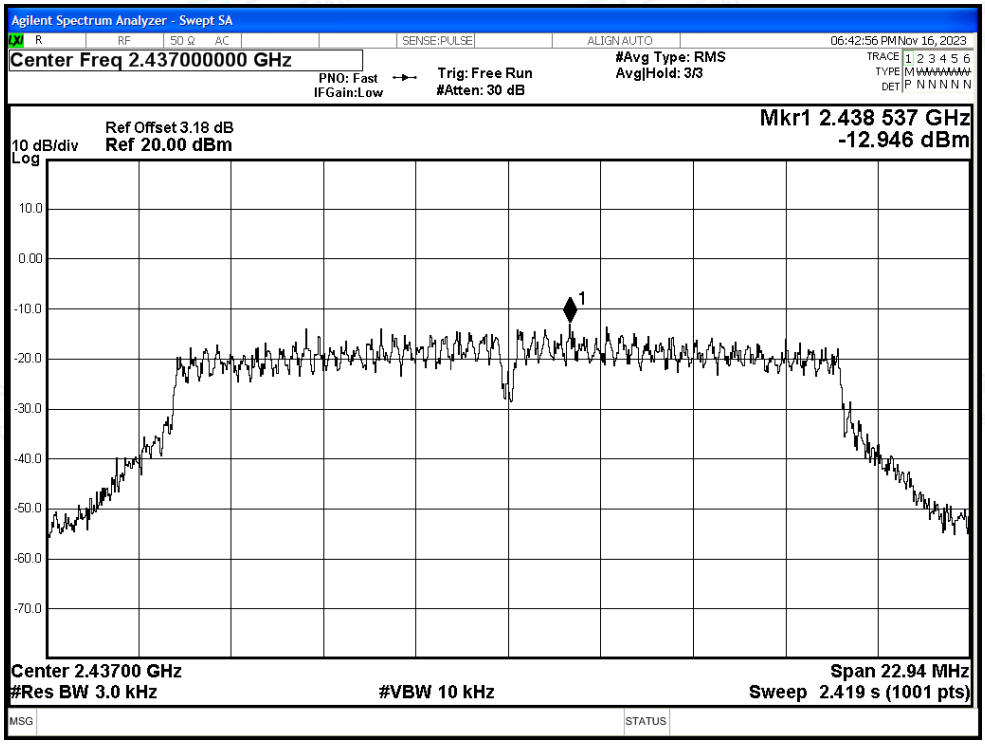
PSD NVNT b 2462MHz Ant1



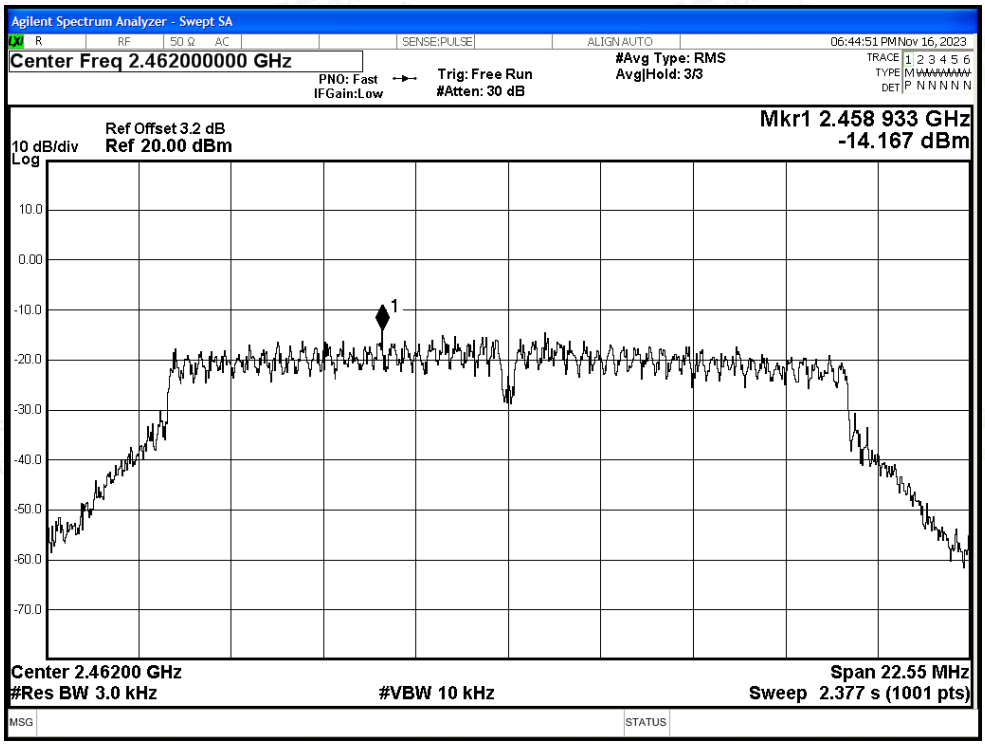
PSD NVNT g 2412MHz Ant1



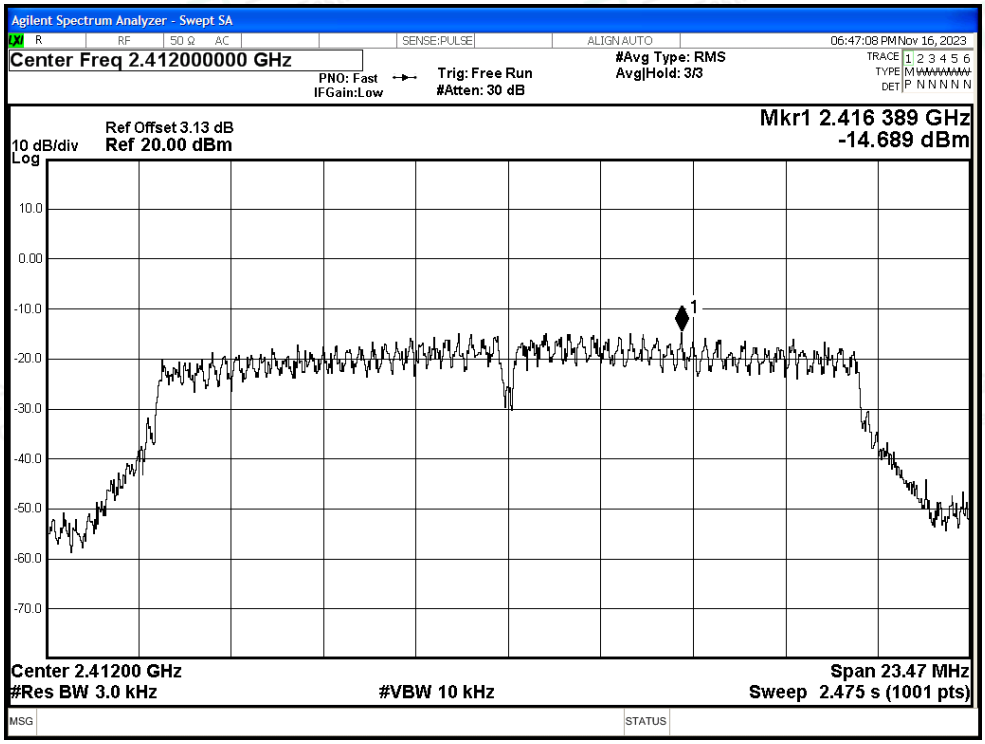
PSD NVNT g 2437MHz Ant1



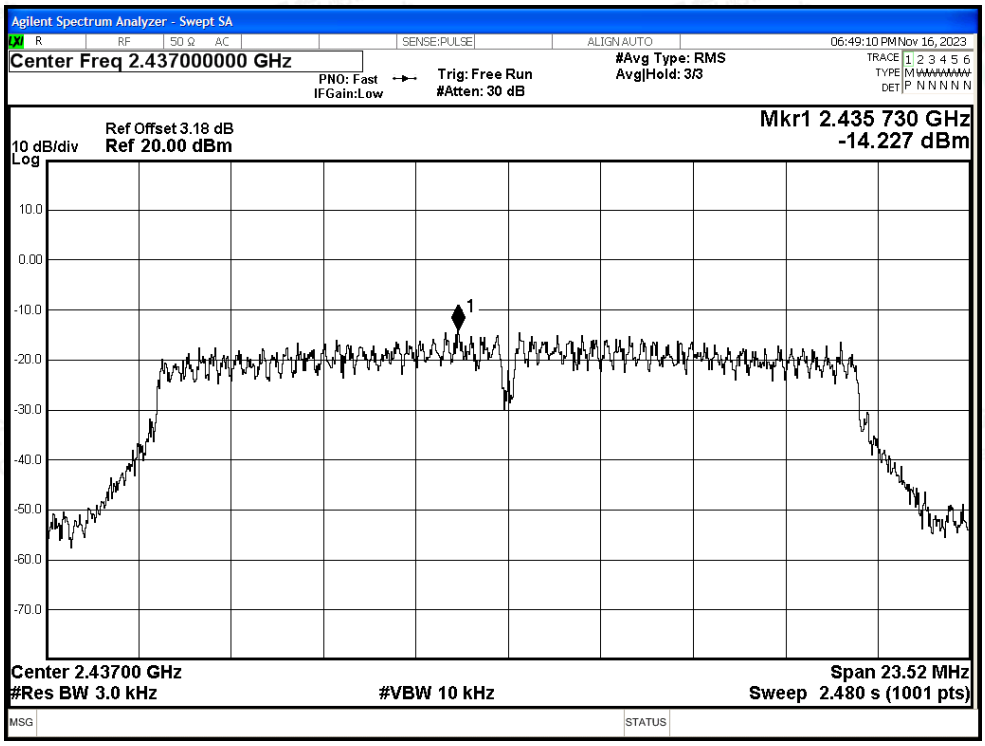
PSD NVNT g 2462MHz Ant1



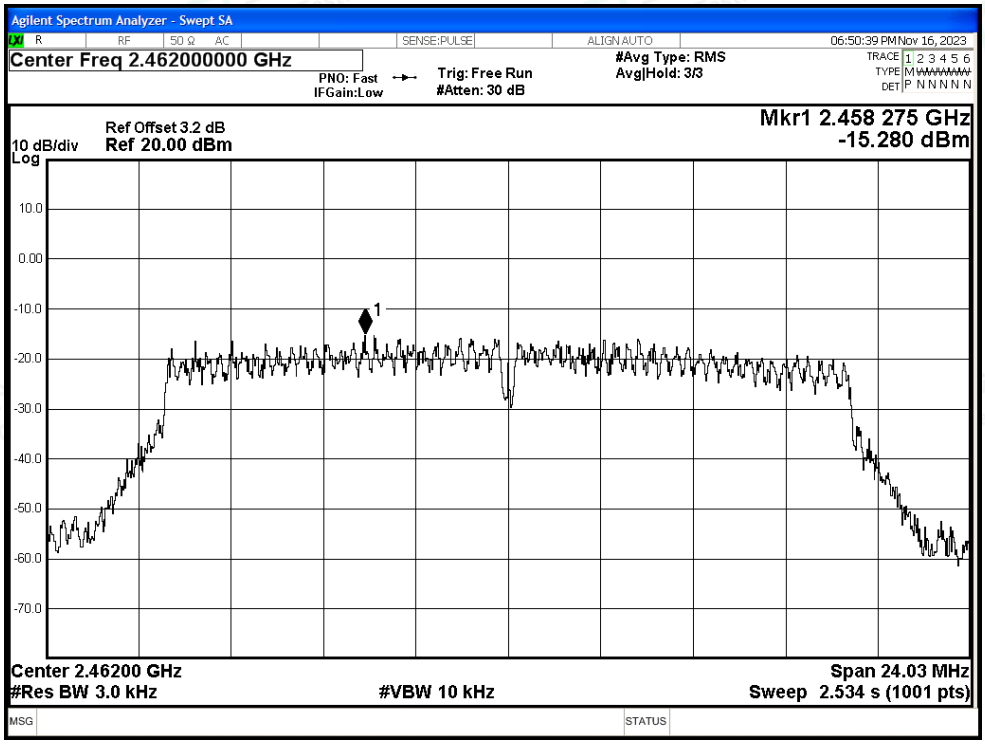
PSD NVNT n20 2412MHz Ant1



PSD NVNT n20 2437MHz Ant1



PSD NVNT n20 2462MHz Ant1

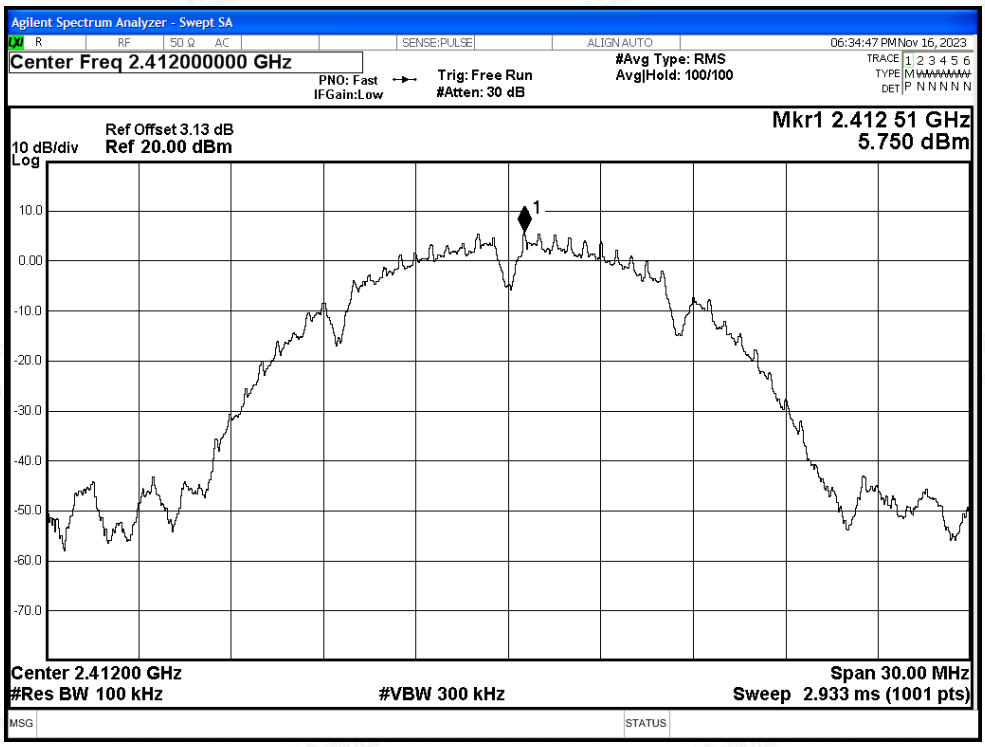


A.4 Band edge measurements

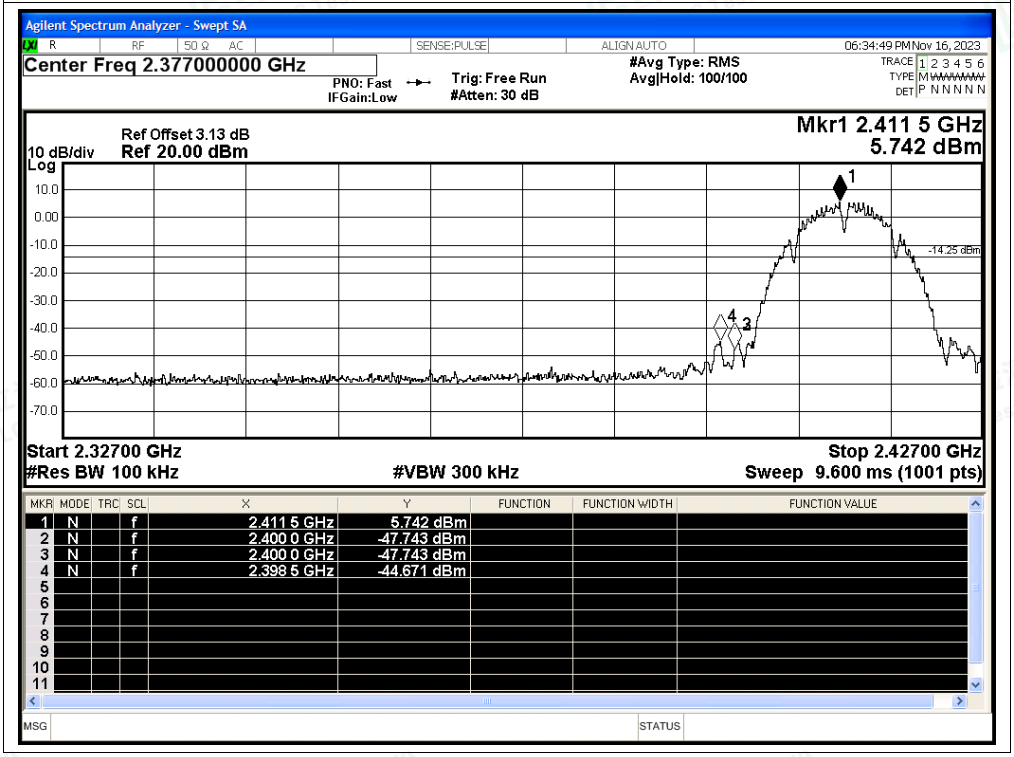
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	b	2412	Ant1	-50.42	-20	Pass
NVNT	b	2462	Ant1	-60.35	-20	Pass
NVNT	g	2412	Ant1	-32.71	-20	Pass
NVNT	g	2462	Ant1	-51.76	-20	Pass
NVNT	n20	2412	Ant1	-33.44	-20	Pass
NVNT	n20	2462	Ant1	-50.19	-20	Pass

Test Graphs

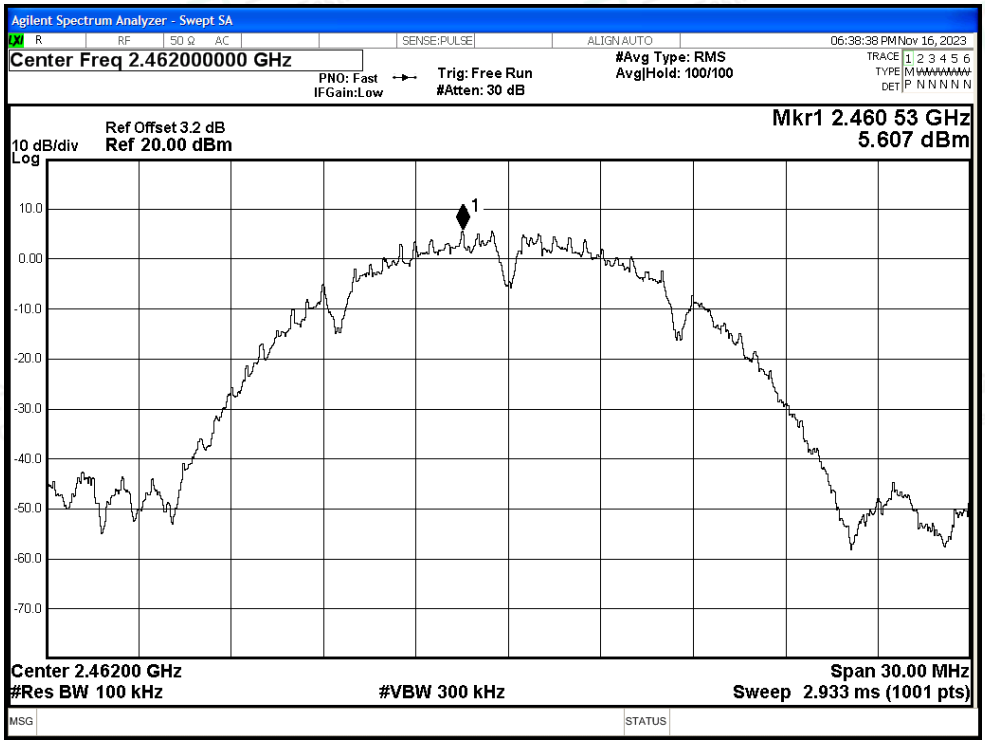
Band Edge NVNT b 2412MHz Ant1 Ref



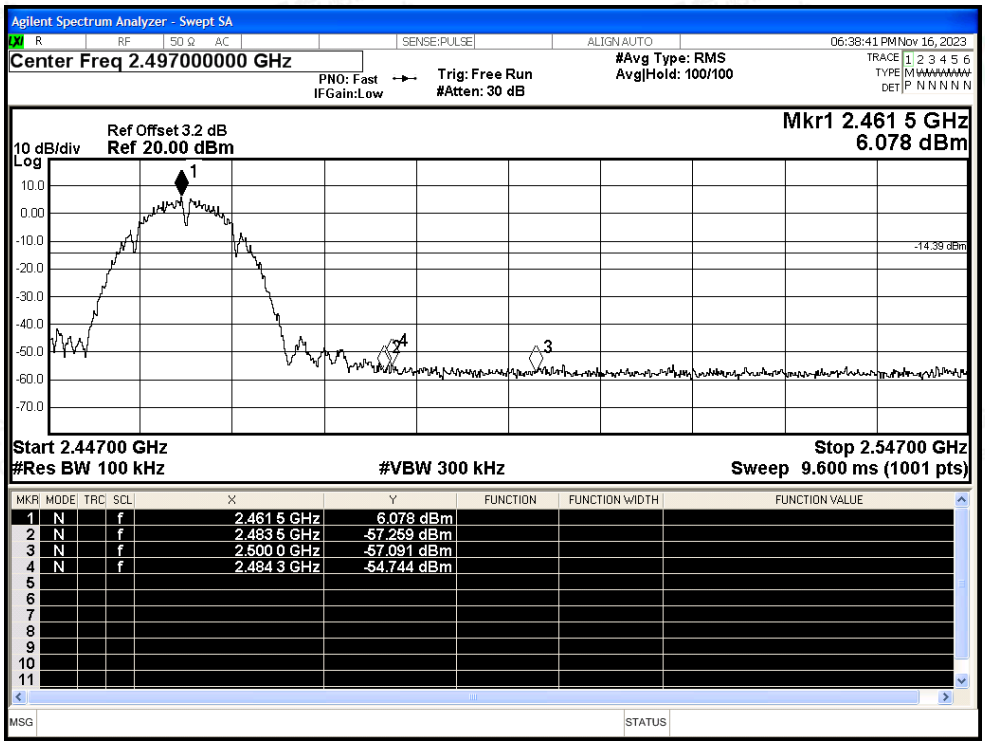
Band Edge NVNT b 2412MHz Ant1 Emission



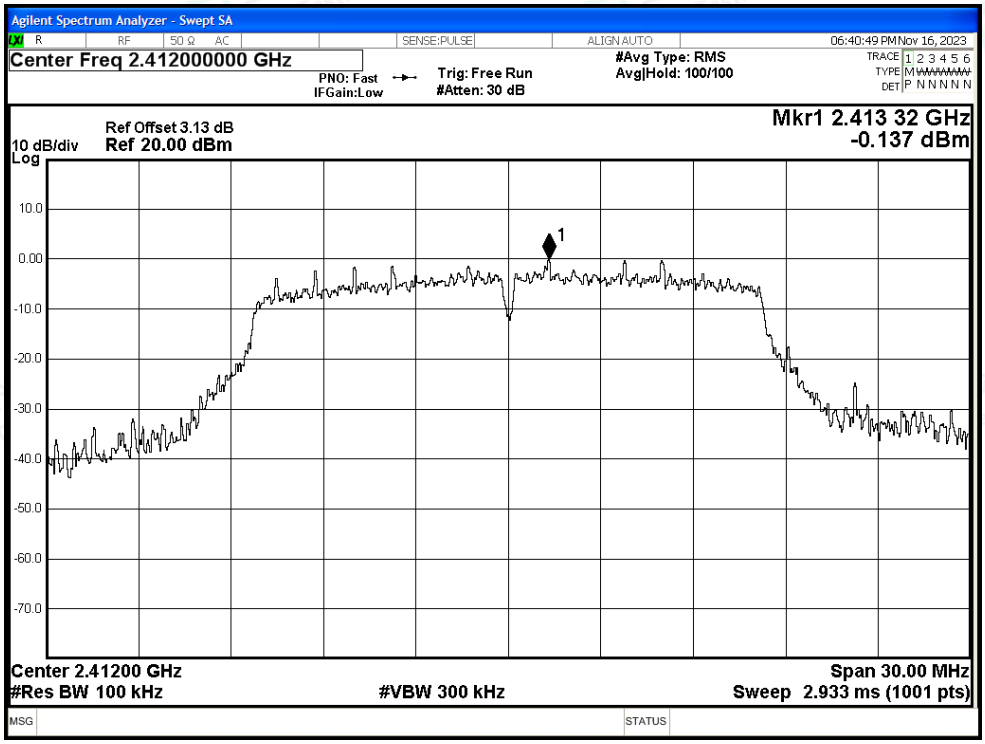
Band Edge NVNT b 2462MHz Ant1 Ref



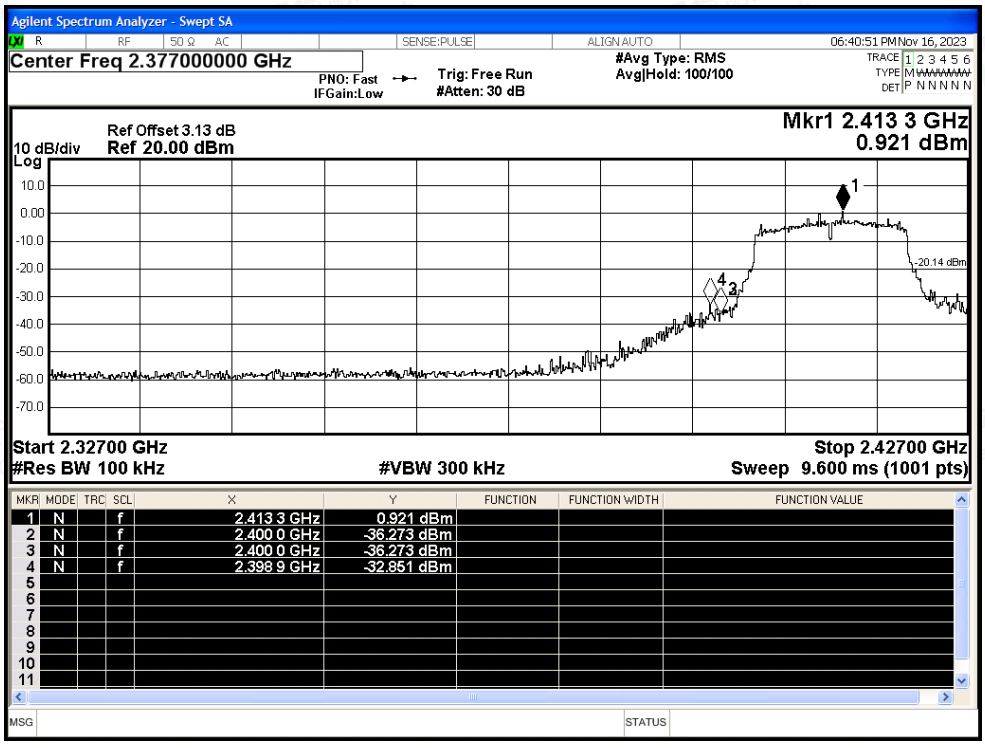
Band Edge NVNT b 2462MHz Ant1 Emission



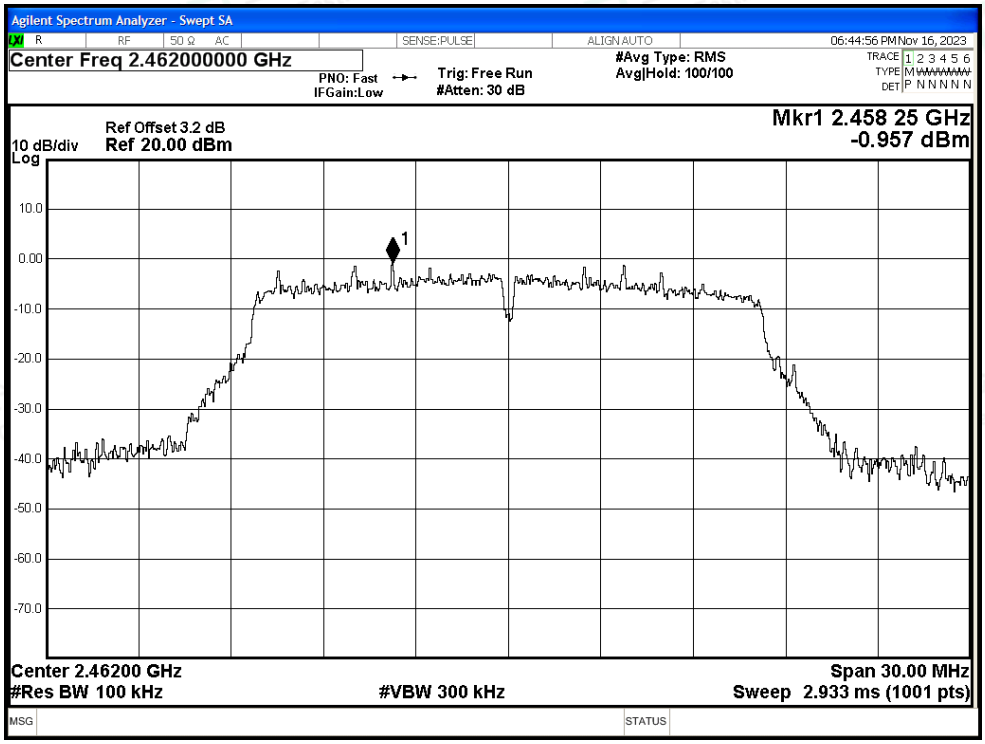
Band Edge NVNT g 2412MHz Ant1 Ref



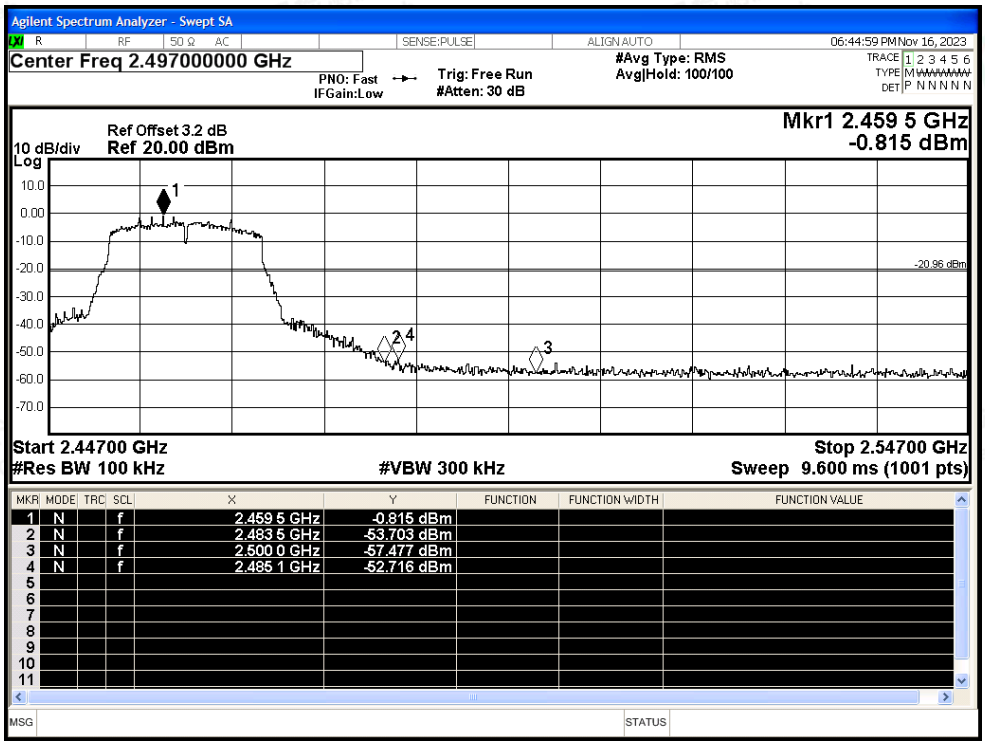
Band Edge NVNT g 2412MHz Ant1 Emission



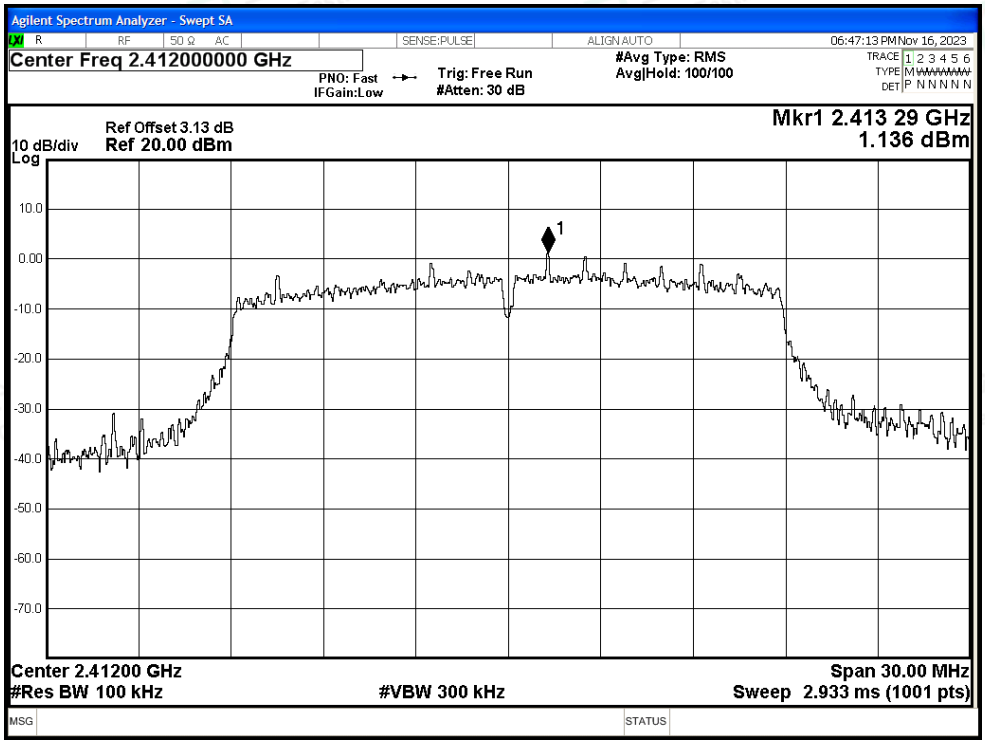
Band Edge NVNT g 2462MHz Ant1 Ref



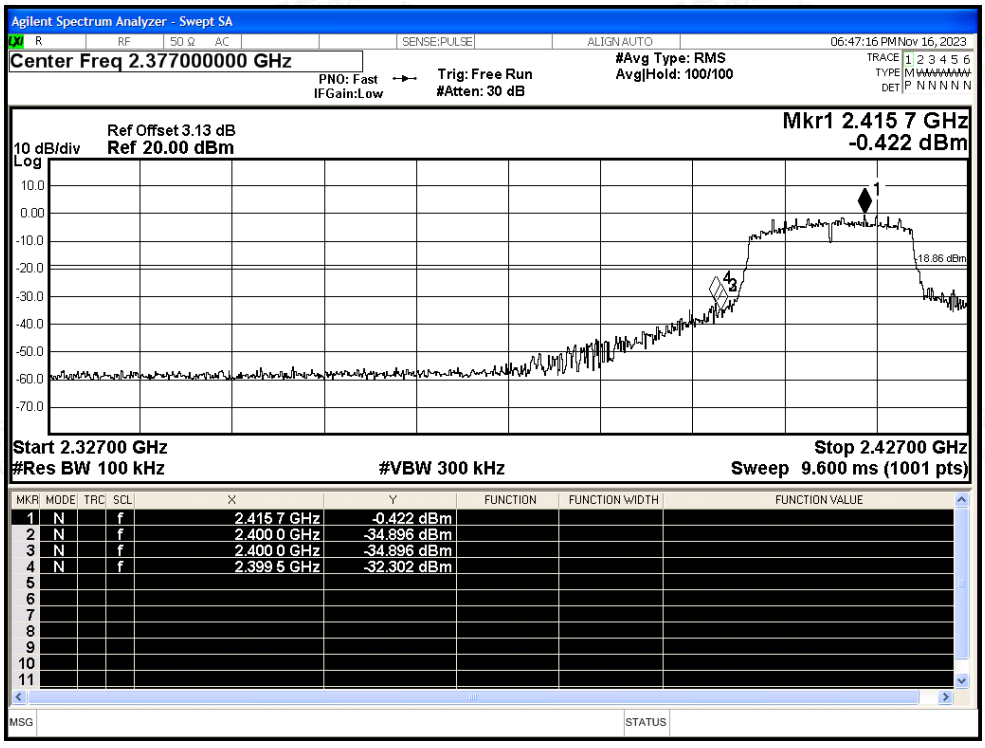
Band Edge NVNT g 2462MHz Ant1 Emission



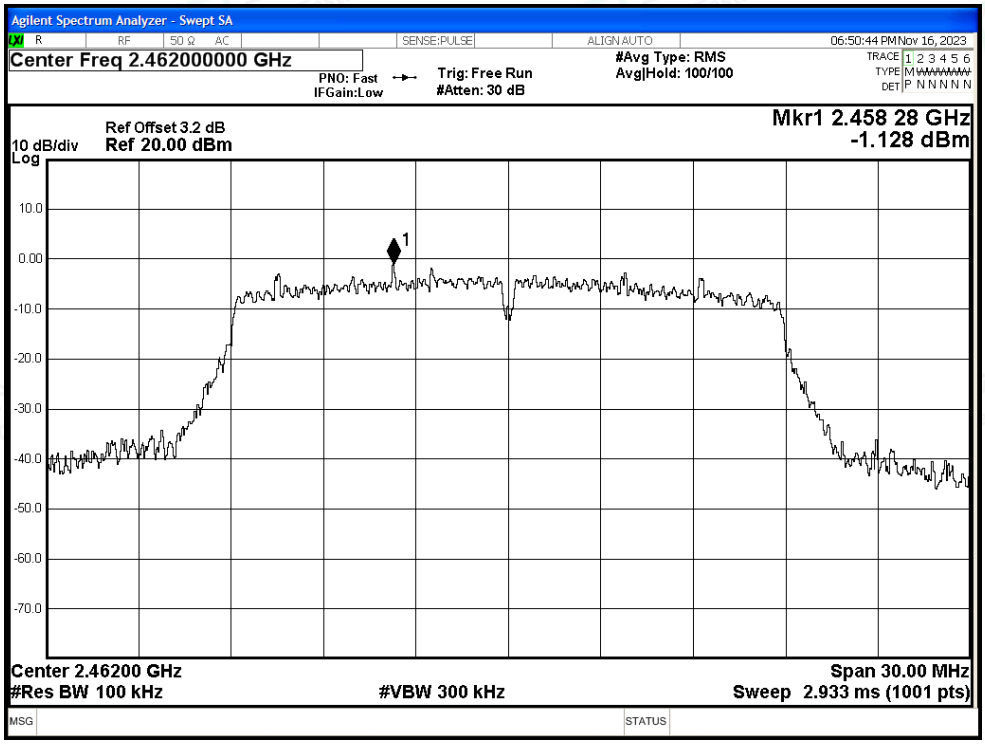
Band Edge NVNT n20 2412MHz Ant1 Ref



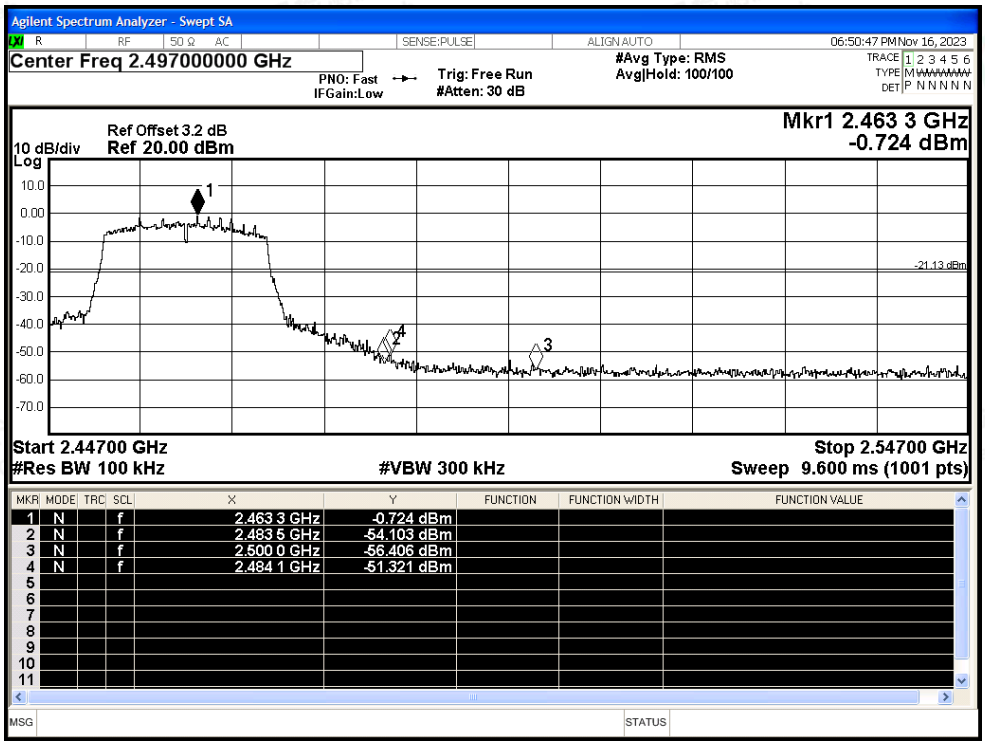
Band Edge NVNT n20 2412MHz Ant1 Emission



Band Edge NVNT n20 2462MHz Ant1 Ref



Band Edge NVNT n20 2462MHz Ant1 Emission

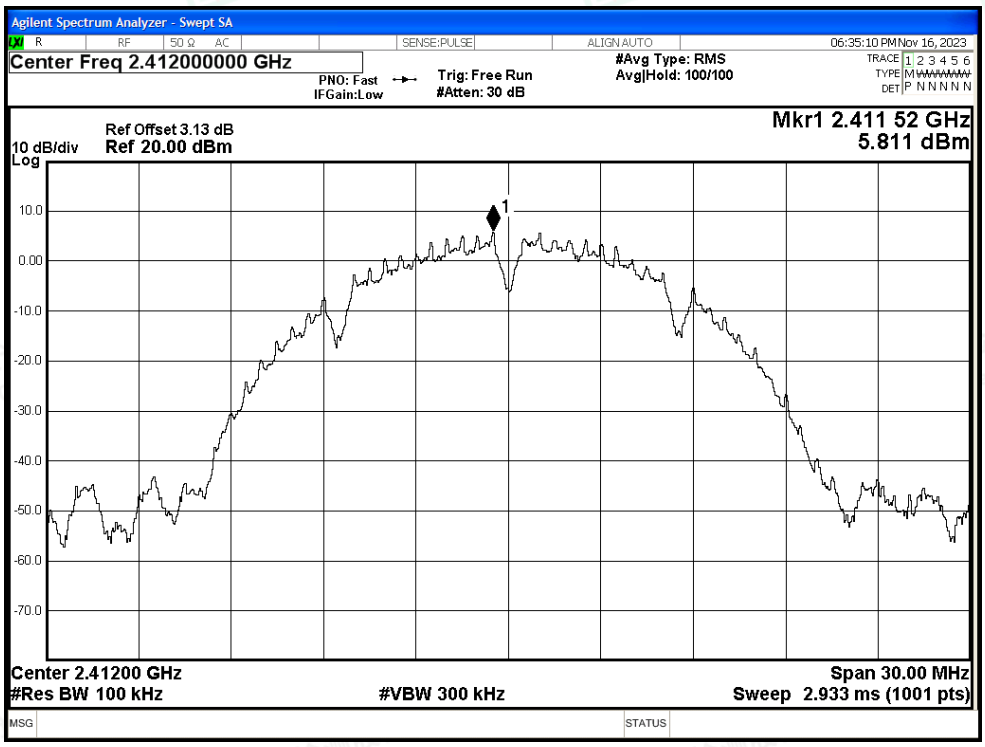


A.5 Conducted Spurious Emission

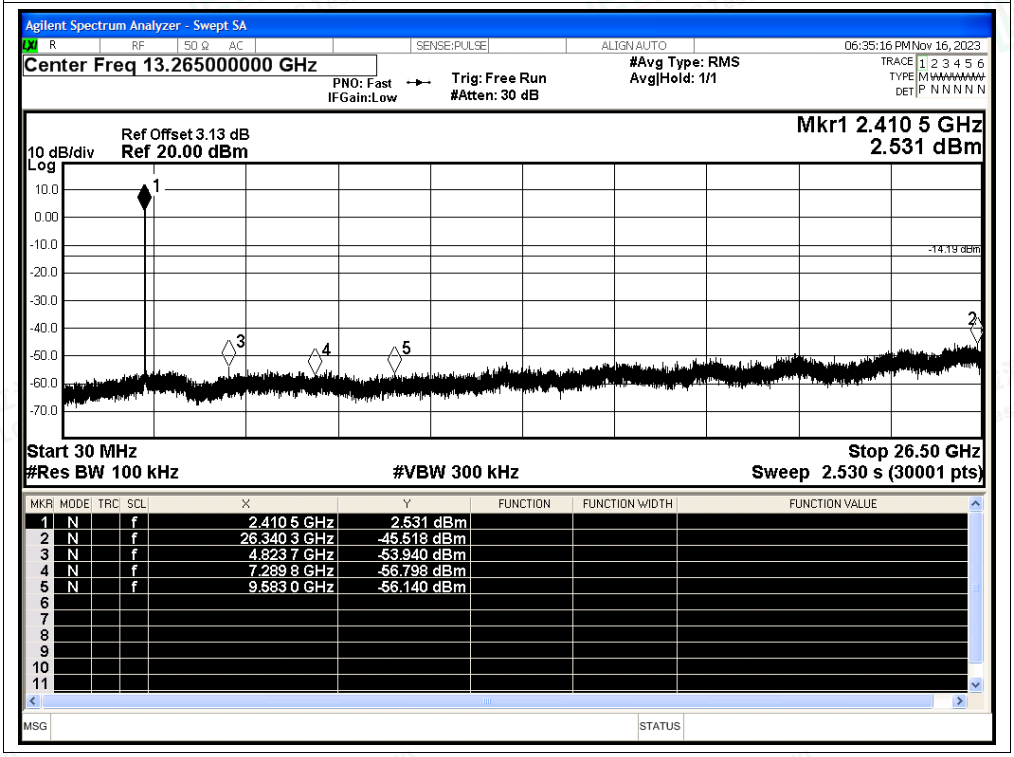
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	b	2412	Ant1	-51.33	-20	Pass
NVNT	b	2437	Ant1	-49.42	-20	Pass
NVNT	b	2462	Ant1	-49.88	-20	Pass
NVNT	g	2412	Ant1	-45.95	-20	Pass
NVNT	g	2437	Ant1	-46.01	-20	Pass
NVNT	g	2462	Ant1	-44.35	-20	Pass
NVNT	n20	2412	Ant1	-46.36	-20	Pass
NVNT	n20	2437	Ant1	-46.33	-20	Pass
NVNT	n20	2462	Ant1	-42.93	-20	Pass

Test Graphs

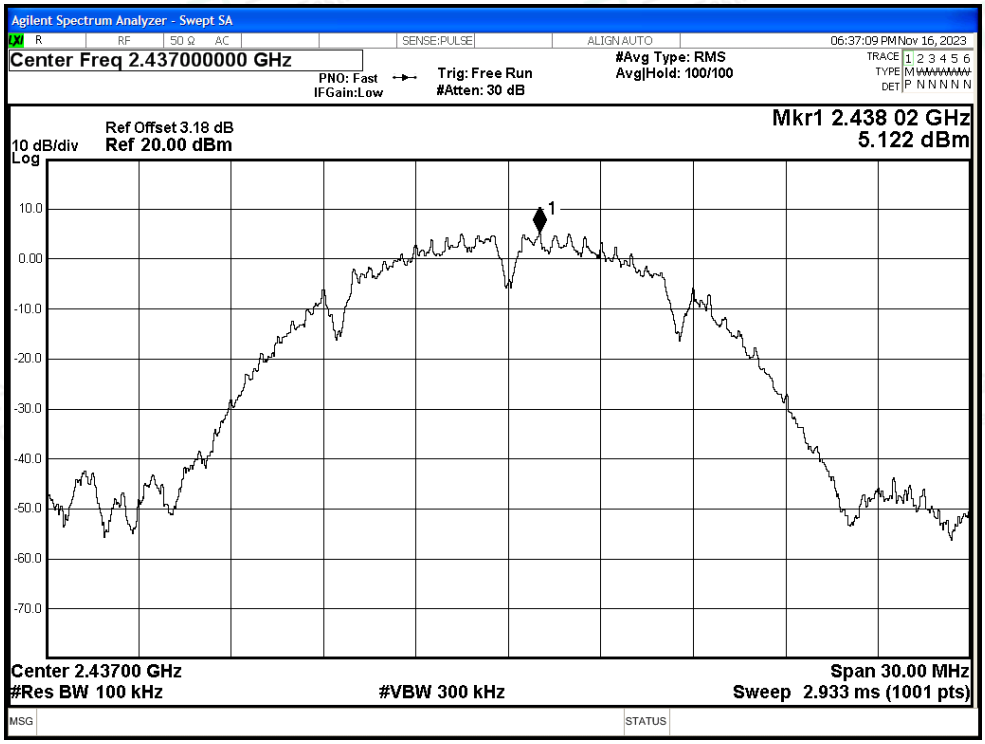
Tx. Spurious NVNT b 2412MHz Ant1 Ref



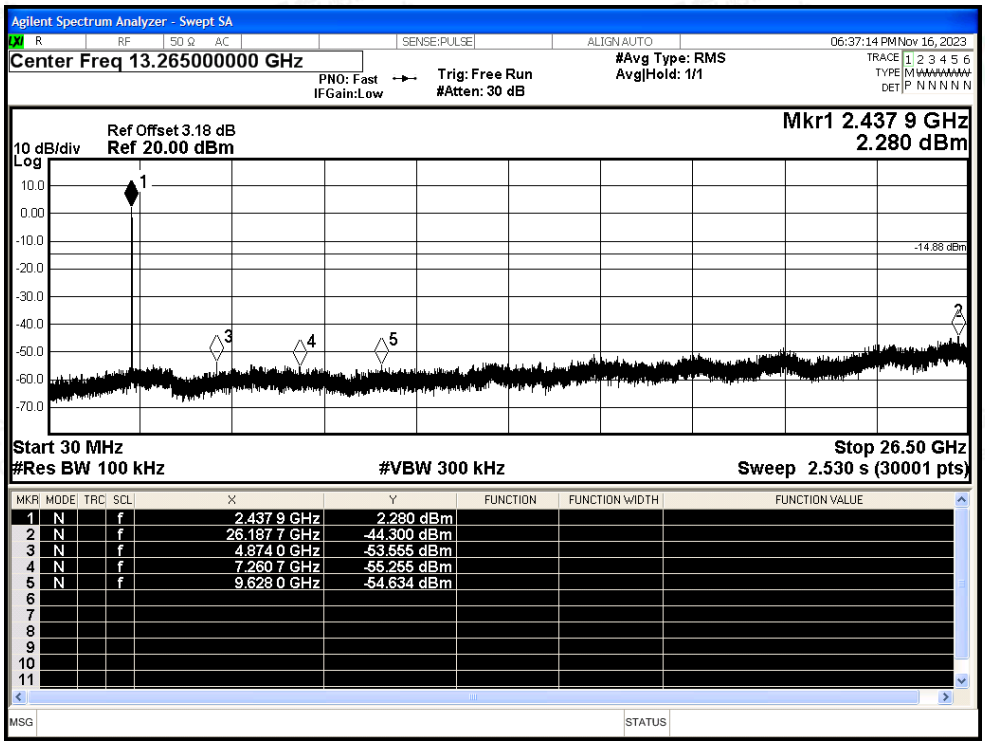
Tx. Spurious NVNT b 2412MHz Ant1 Emission



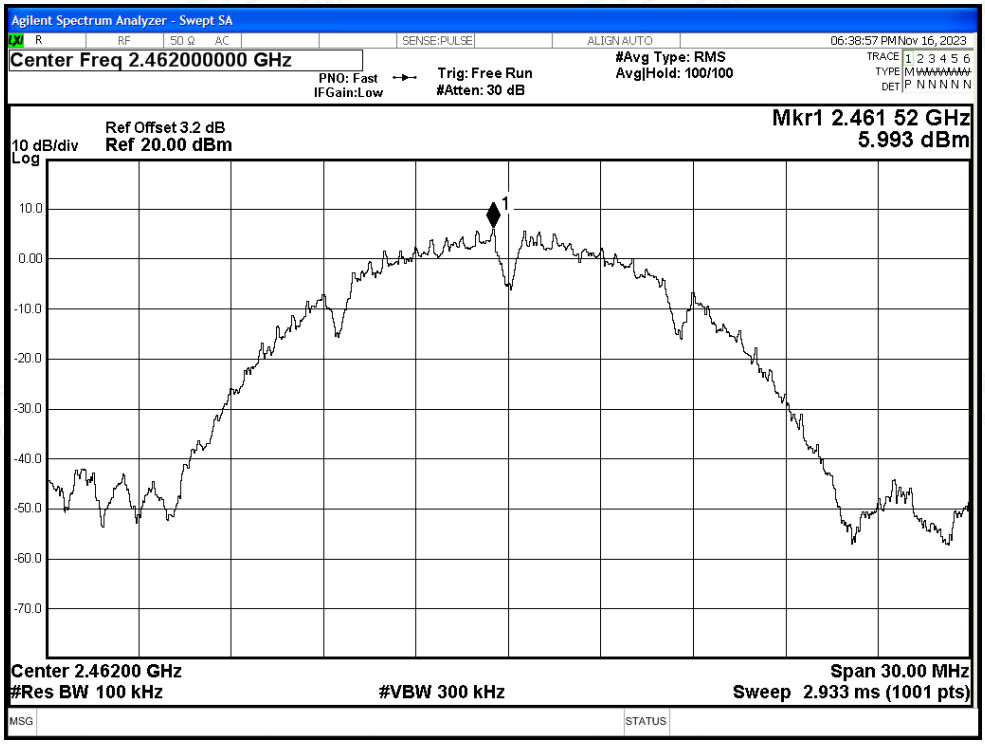
Tx. Spurious NVNT b 2437MHz Ant1 Ref



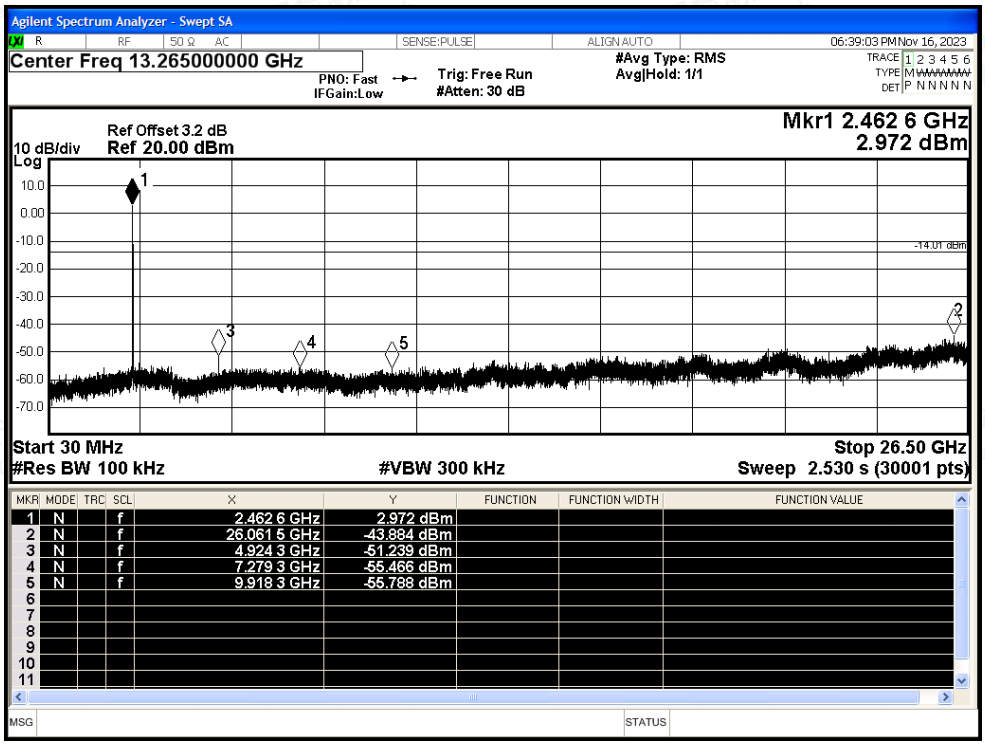
Tx. Spurious NVNT b 2437MHz Ant1 Emission



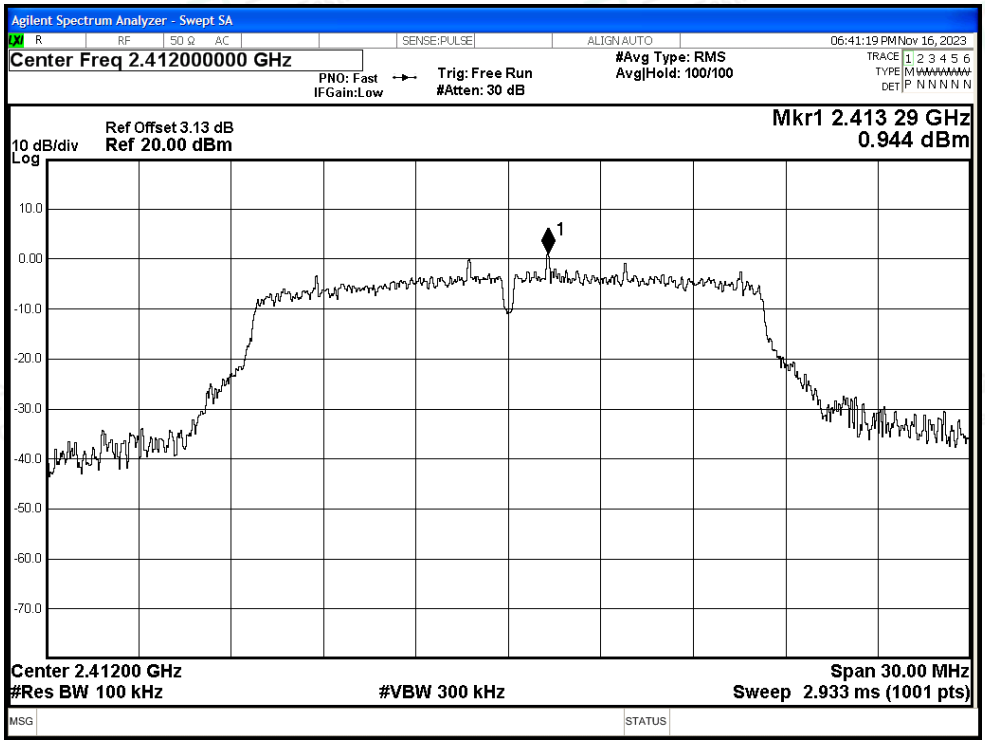
Tx. Spurious NVNT b 2462MHz Ant1 Ref



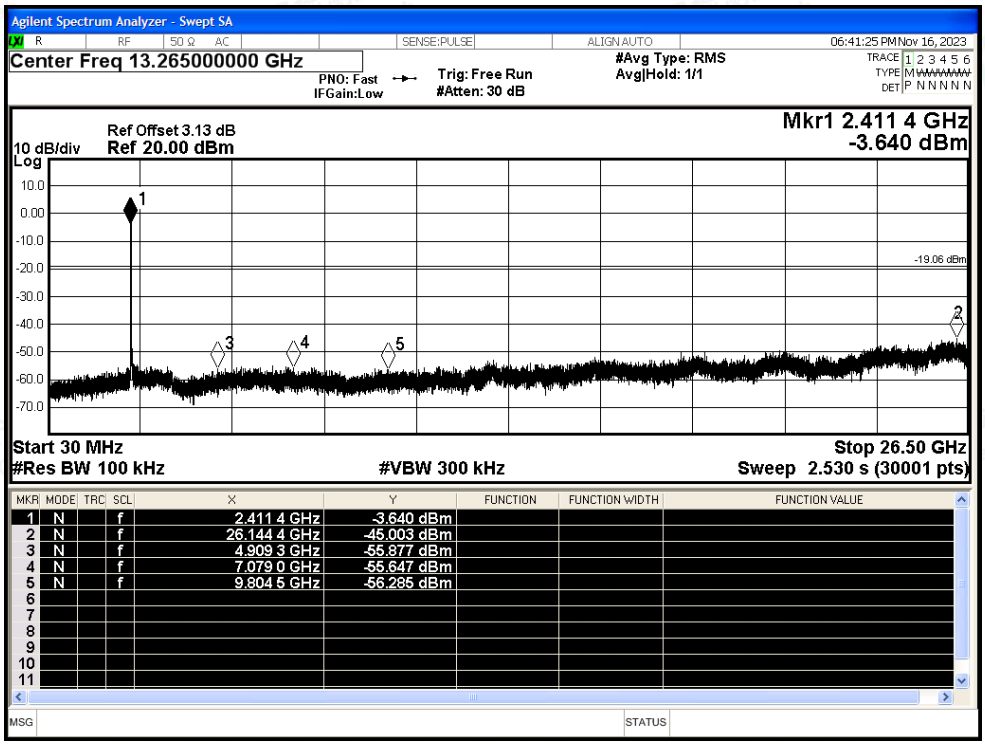
Tx. Spurious NVNT b 2462MHz Ant1 Emission



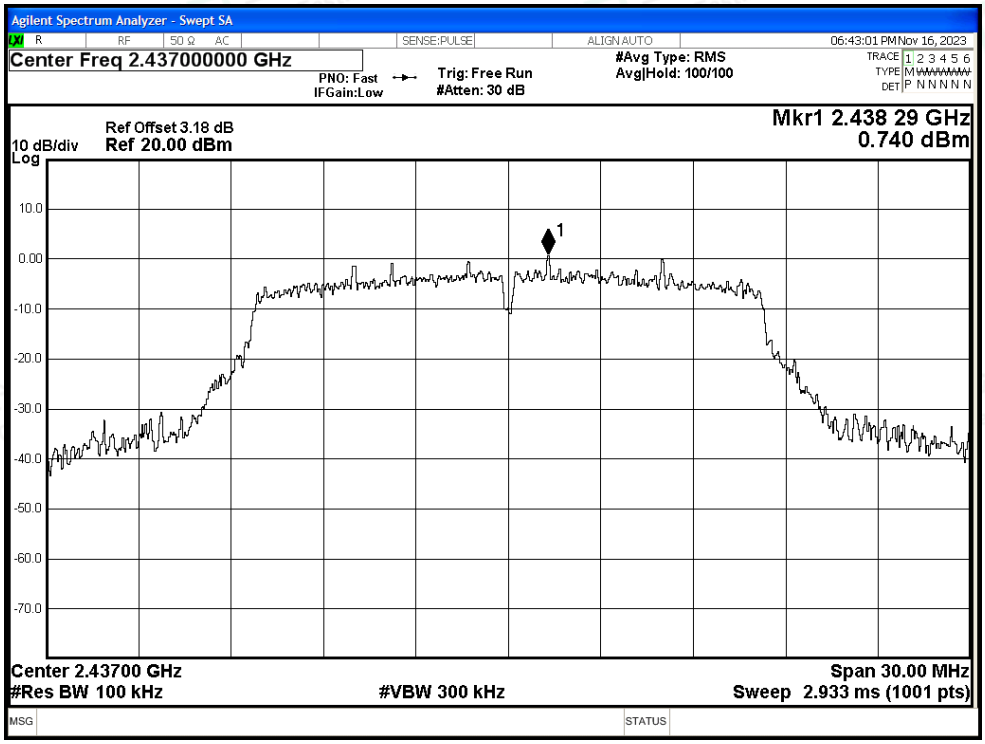
Tx. Spurious NVNT g 2412MHz Ant1 Ref



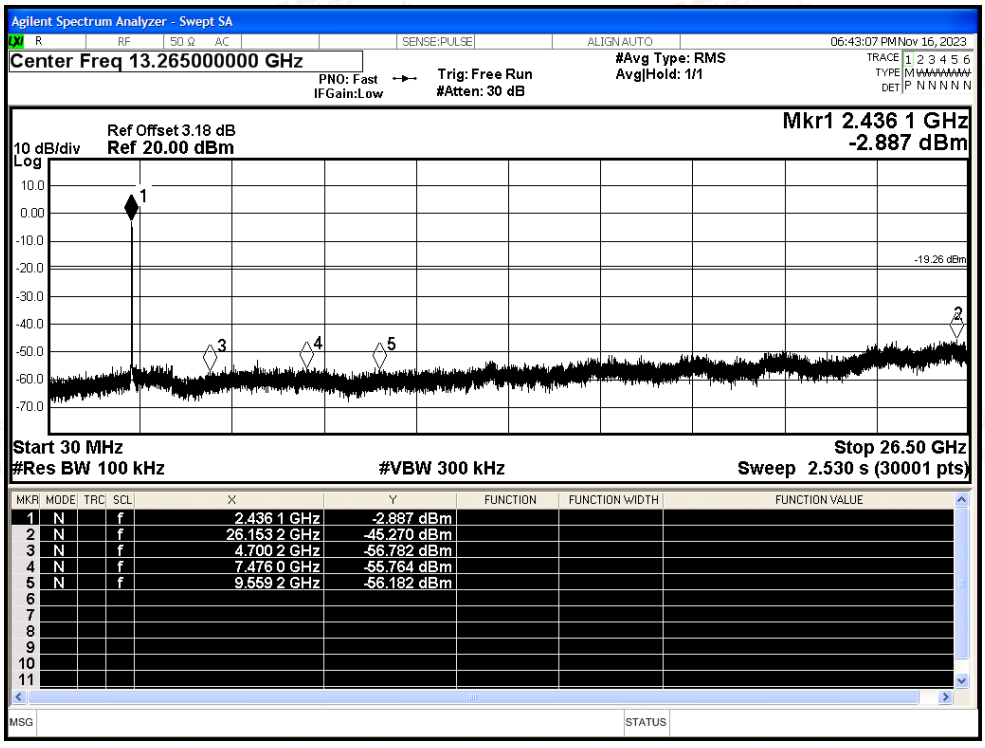
Tx. Spurious NVNT g 2412MHz Ant1 Emission



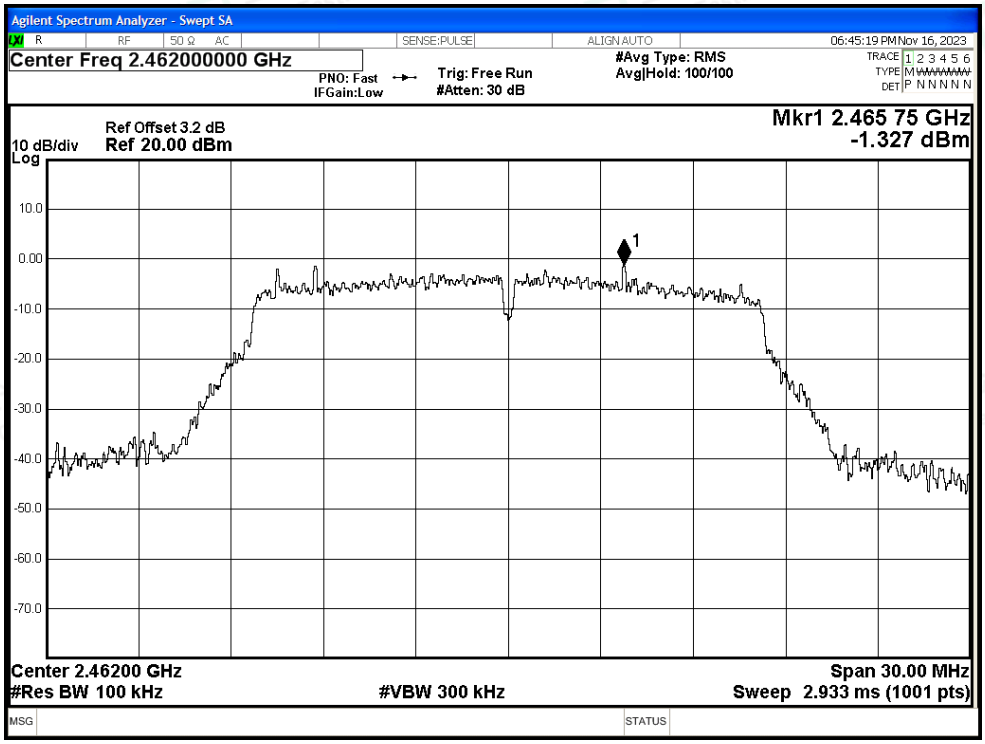
Tx. Spurious NVNT g 2437MHz Ant1 Ref



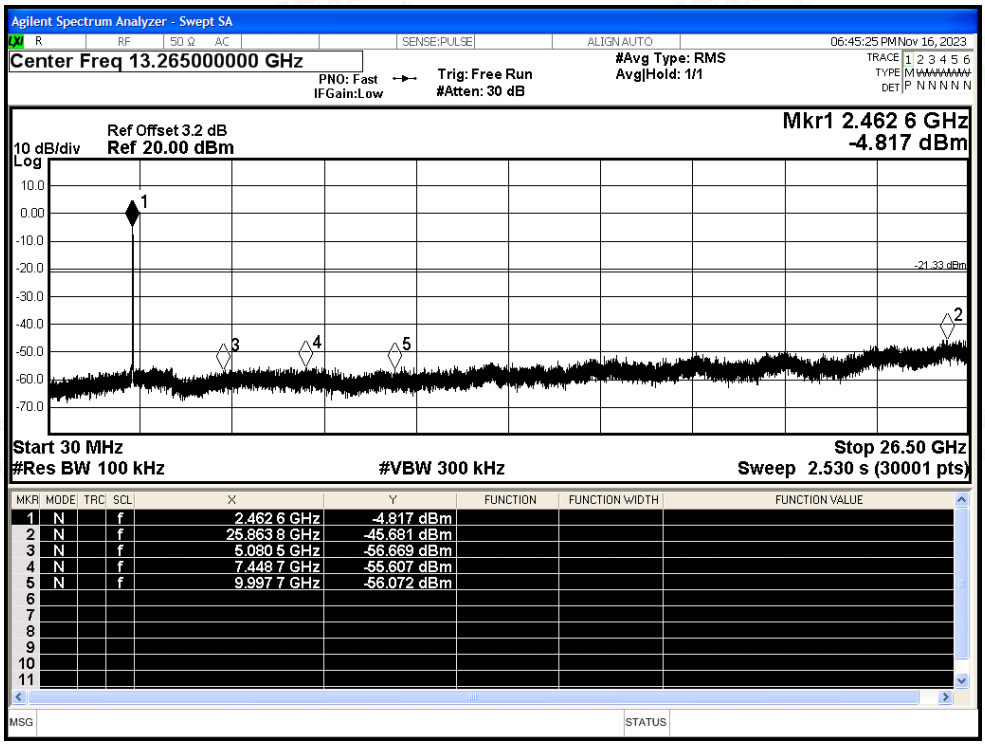
Tx. Spurious NVNT g 2437MHz Ant1 Emission



Tx. Spurious NVNT g 2462MHz Ant1 Ref

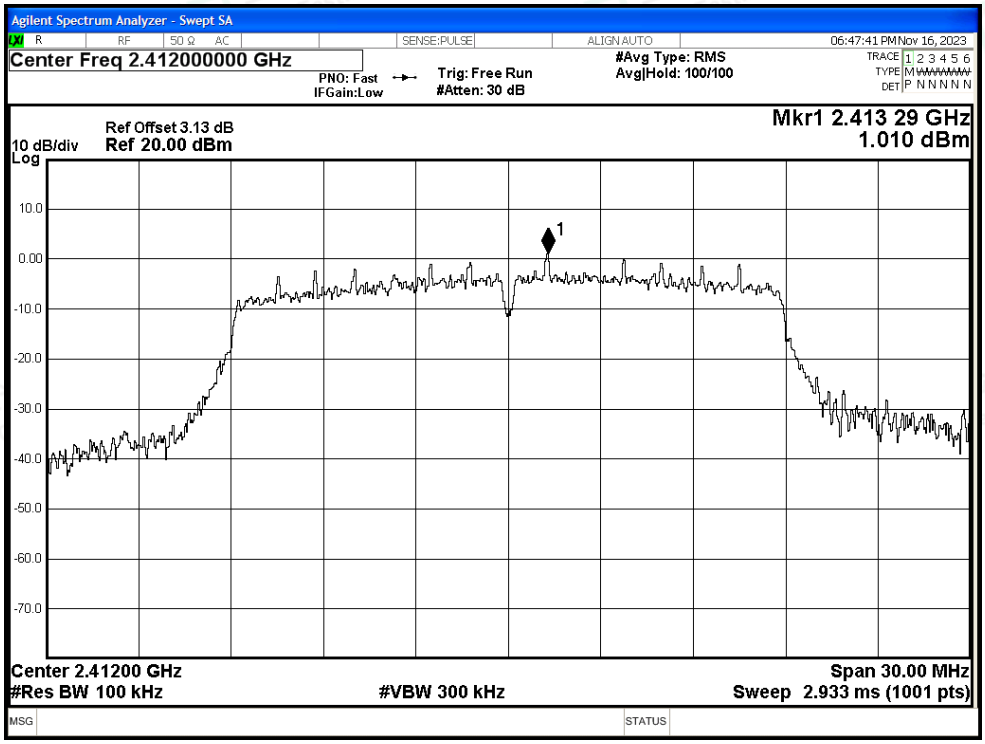


Tx. Spurious NVNT g 2462MHz Ant1 Emission

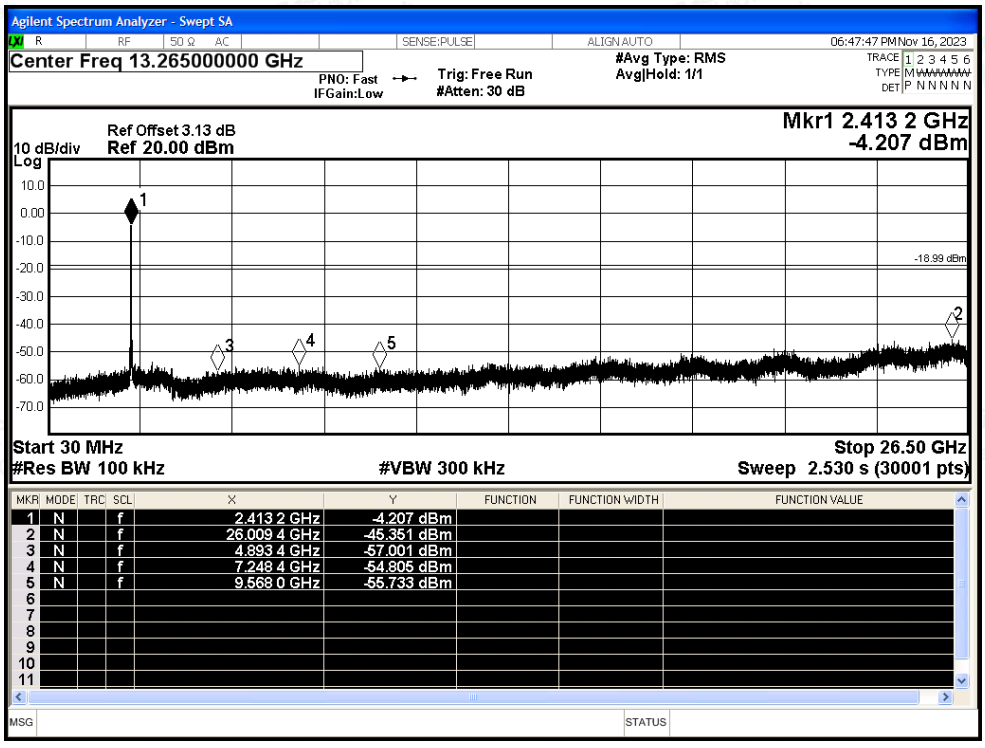


MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N		f	2.462 6 GHz	-4.817 dBm			
2	N		f	25.863 8 GHz	-45.681 dBm			
3	N		f	5.080 5 GHz	-56.669 dBm			
4	N		f	7.448 7 GHz	-55.607 dBm			
5	N		f	9.997 7 GHz	-56.072 dBm			
6								
7								
8								
9								
10								
11								

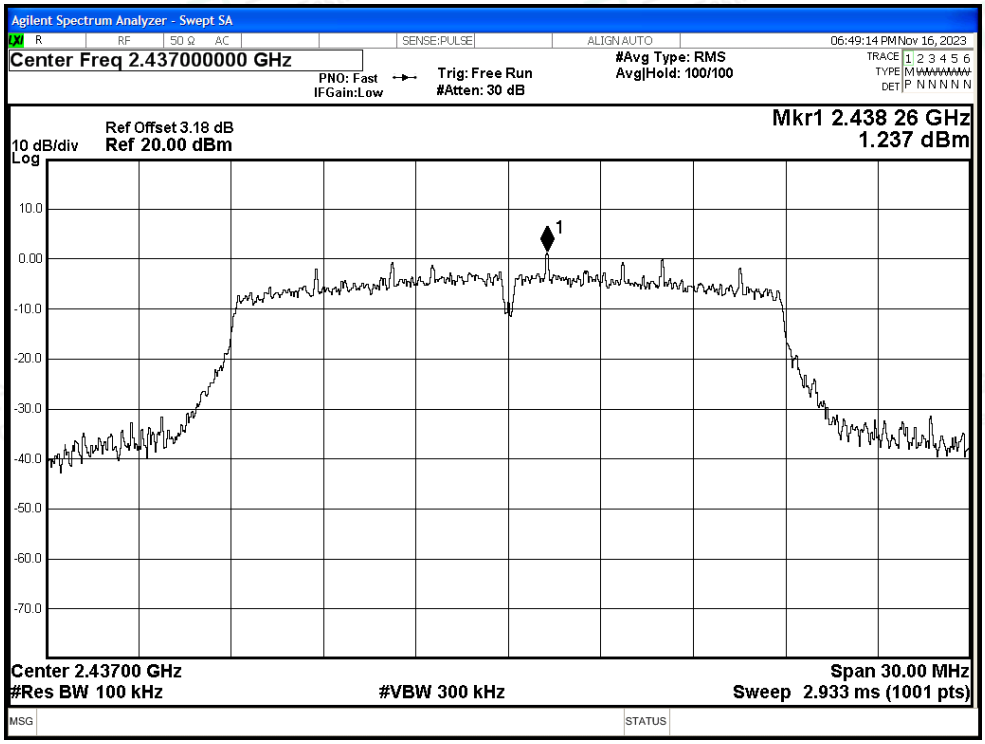
Tx. Spurious NVNT n20 2412MHz Ant1 Ref



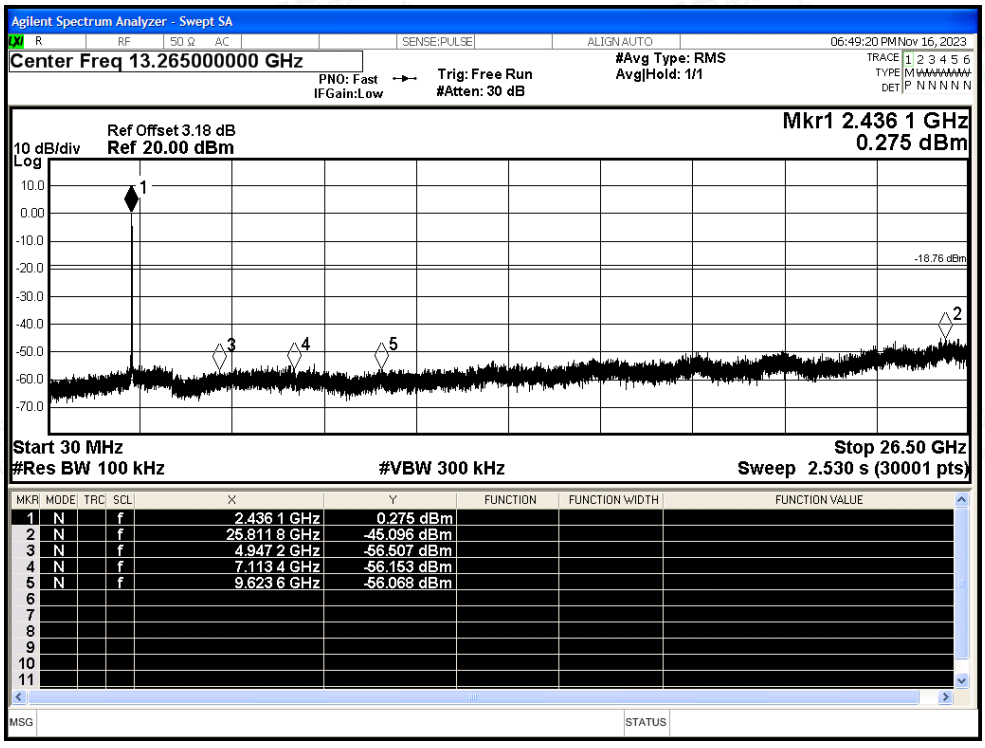
Tx. Spurious NVNT n20 2412MHz Ant1 Emission



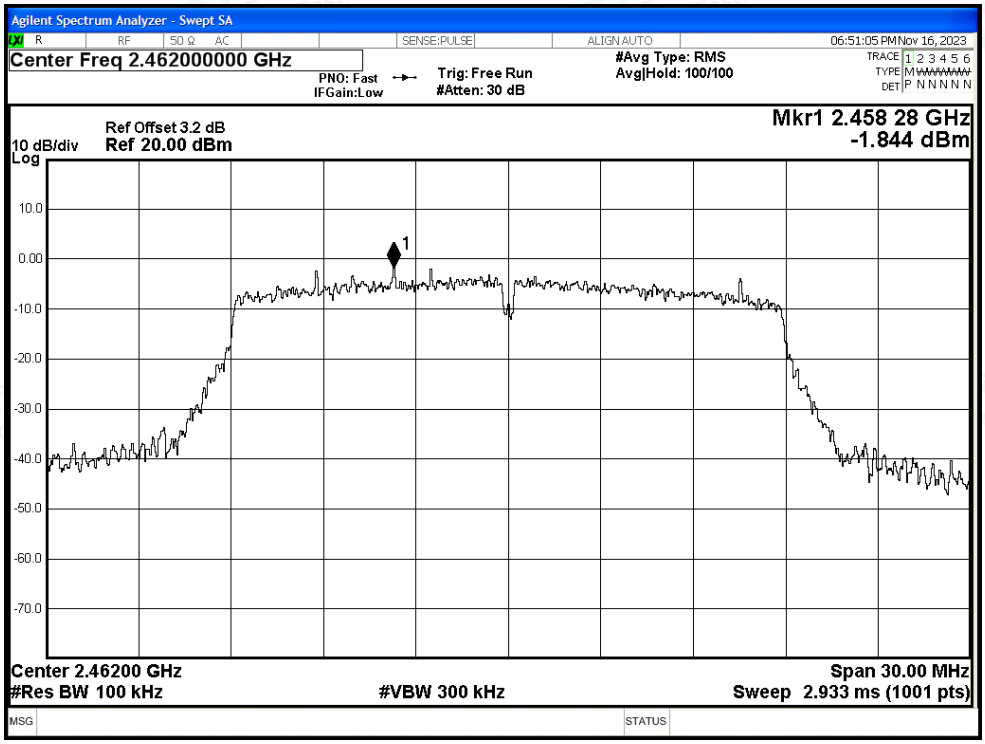
Tx. Spurious NVNT n20 2437MHz Ant1 Ref



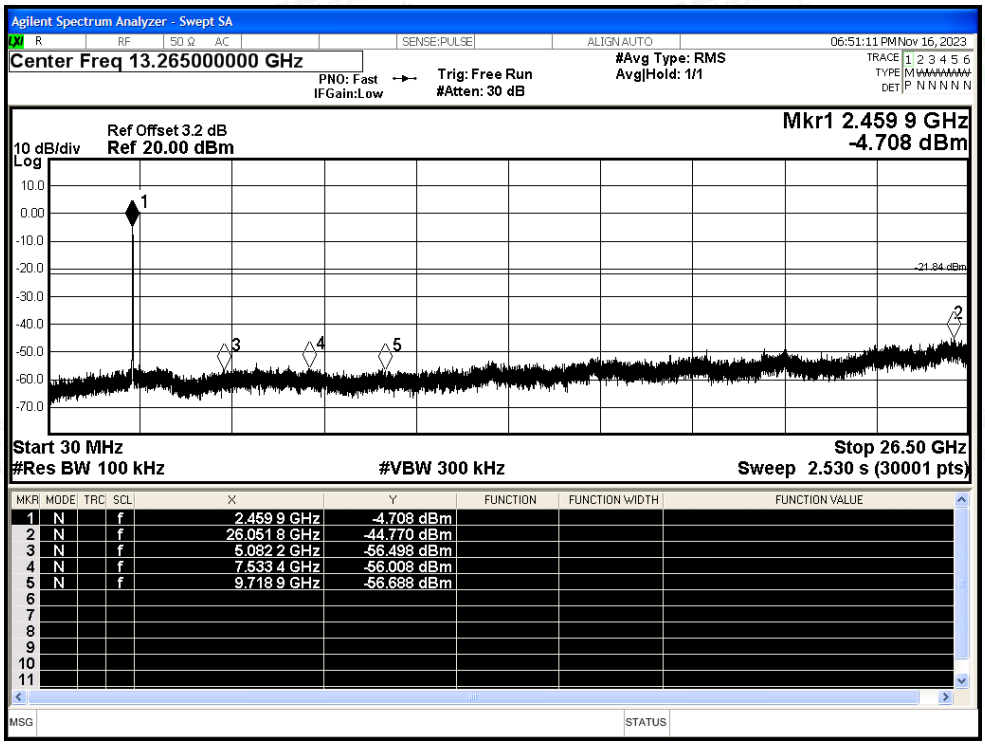
Tx. Spurious NVNT n20 2437MHz Ant1 Emission



Tx. Spurious NVNT n20 2462MHz Ant1 Ref



Tx. Spurious NVNT n20 2462MHz Ant1 Emission



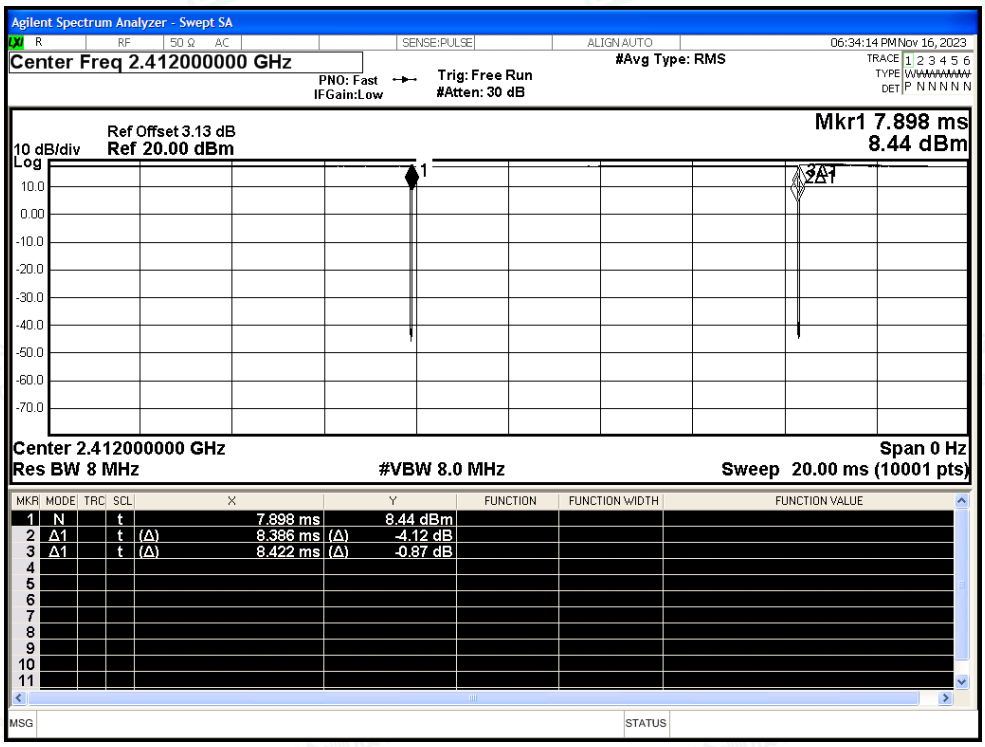
A.6 Duty Cycle

Test Result

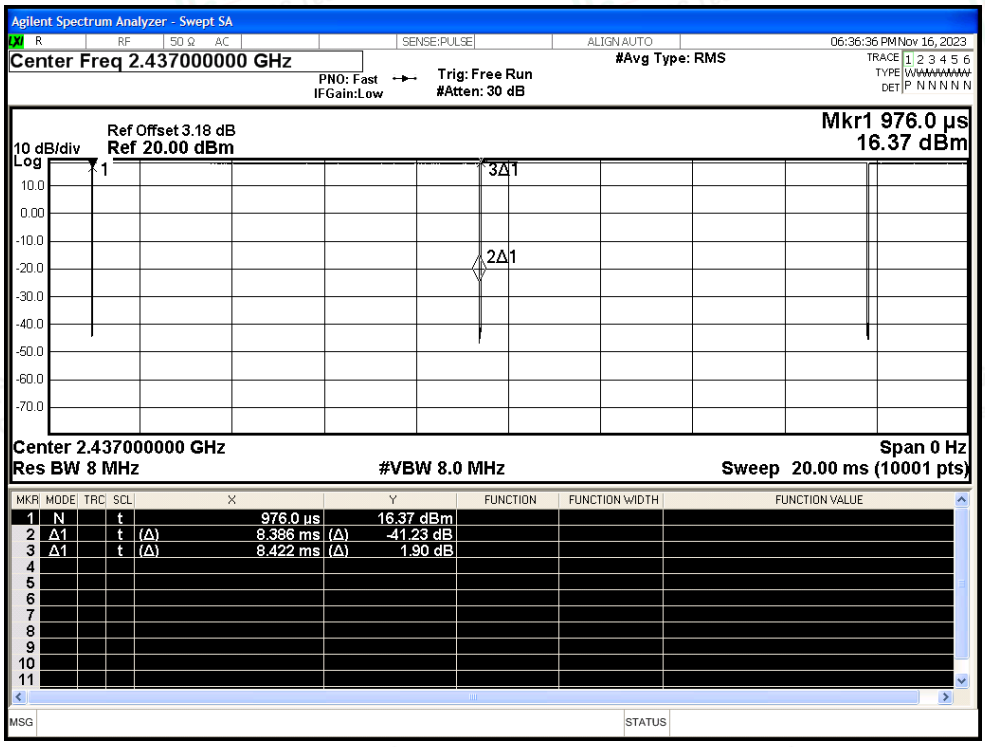
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	b	2412	Ant1	99.57	0	0.01
NVNT	b	2437	Ant1	99.57	0	0.01
NVNT	b	2462	Ant1	99.57	0	0.01
NVNT	g	2412	Ant1	96.94	0.13	0.72
NVNT	g	2437	Ant1	97.08	0.13	0.72
NVNT	g	2462	Ant1	97.08	0.13	0.72
NVNT	n20	2412	Ant1	96.73	0.14	0.77
NVNT	n20	2437	Ant1	96.88	0.14	0.77
NVNT	n20	2462	Ant1	96.73	0.14	0.77

Test Graphs

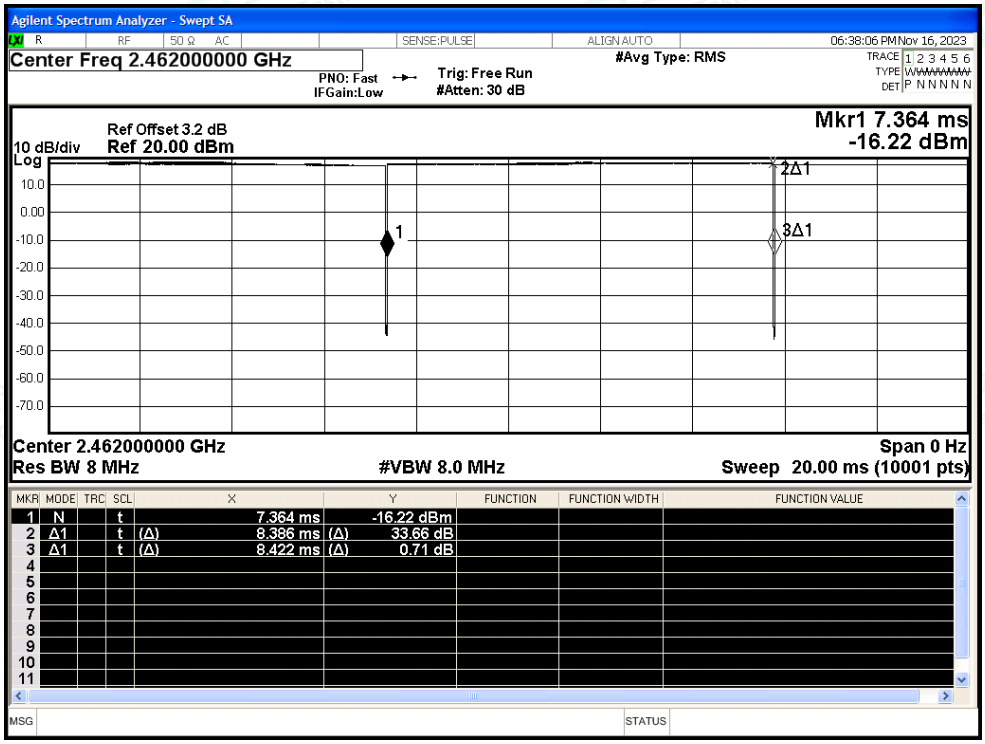
Duty Cycle NVNT b 2412MHz Ant1



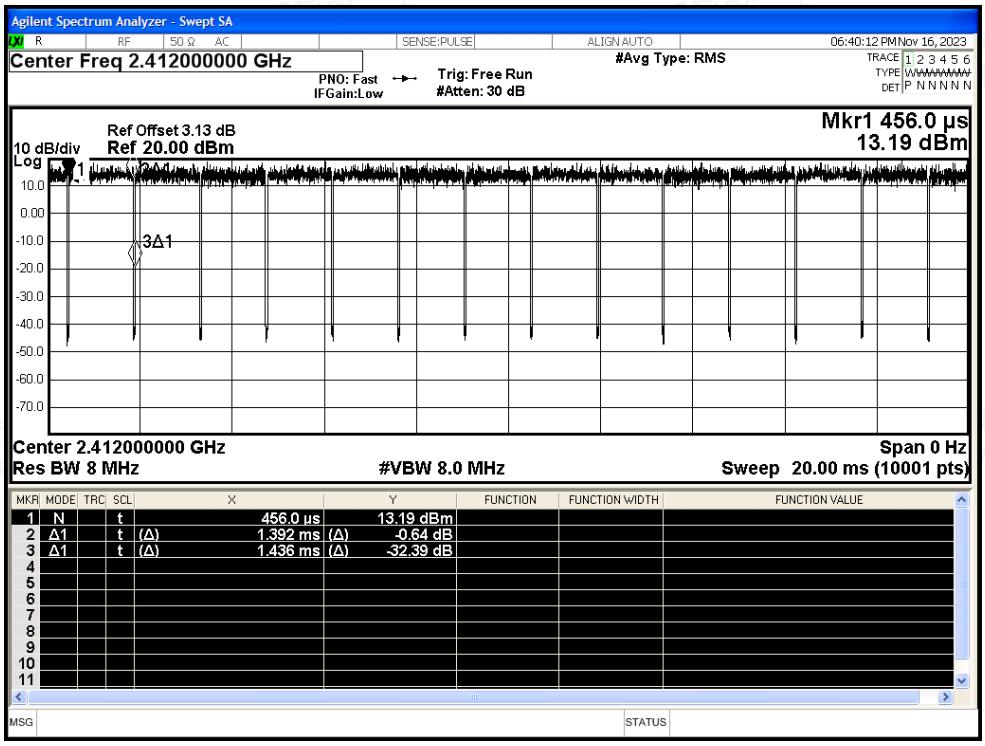
Duty Cycle NVNT b 2437MHz Ant1



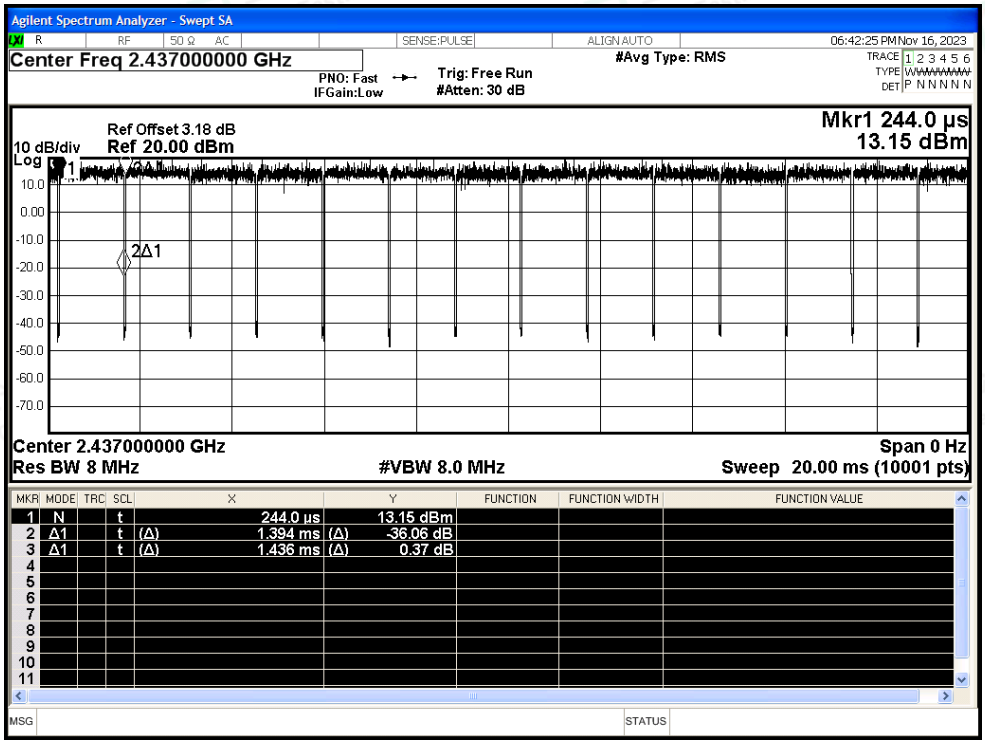
Duty Cycle NVNT b 2462MHz Ant1



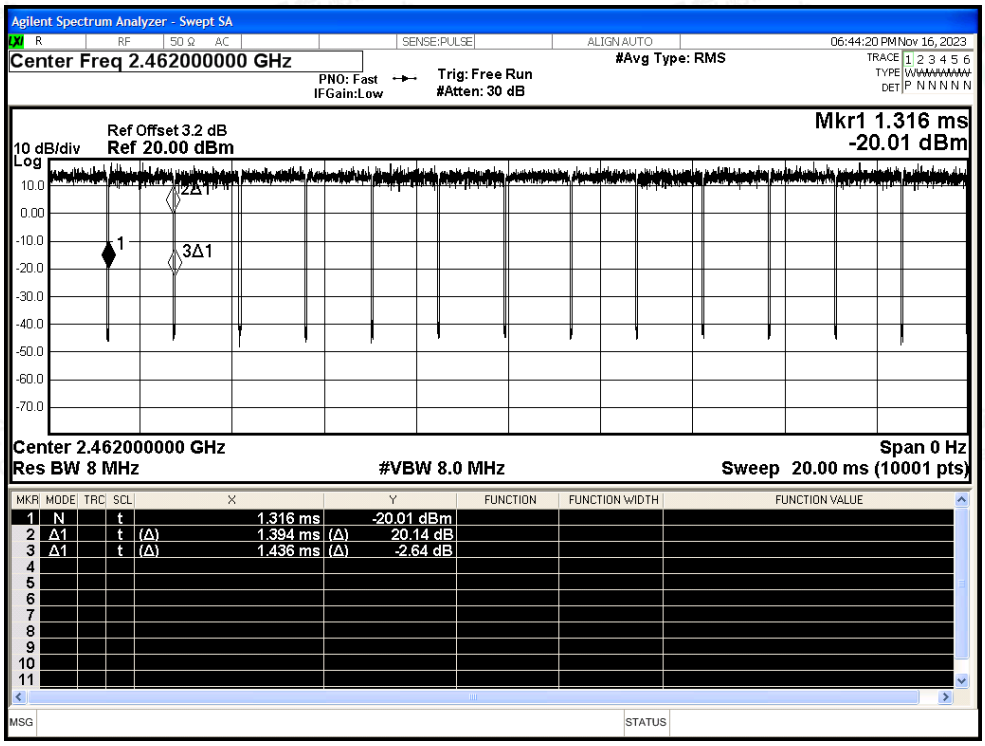
Duty Cycle NVNT g 2412MHz Ant1



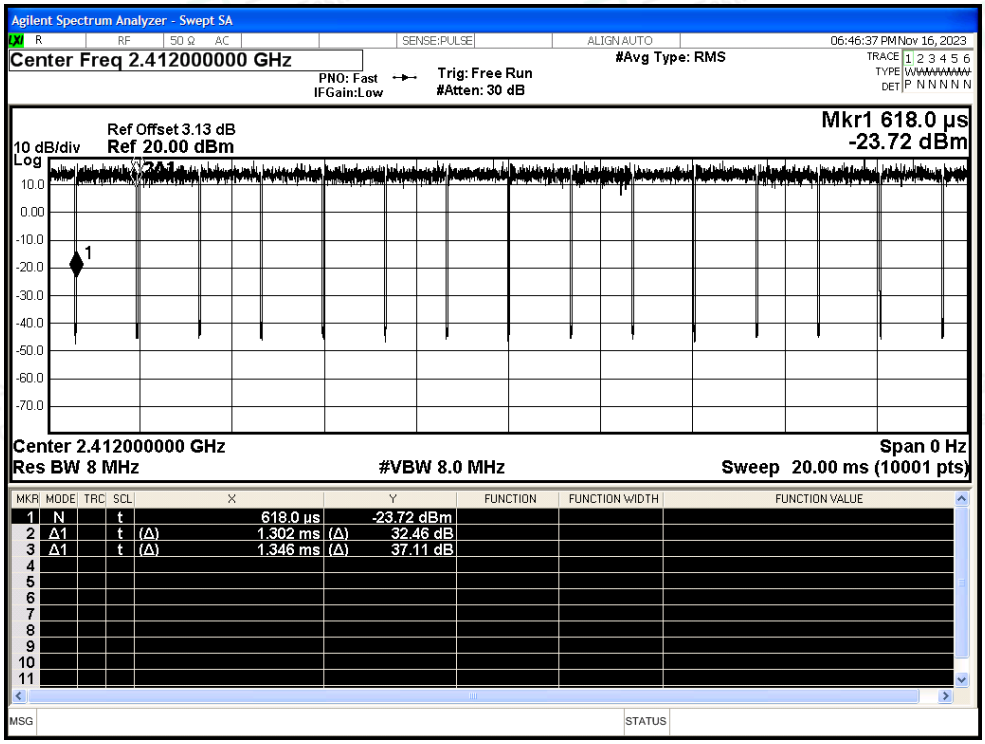
Duty Cycle NVNT g 2437MHz Ant1



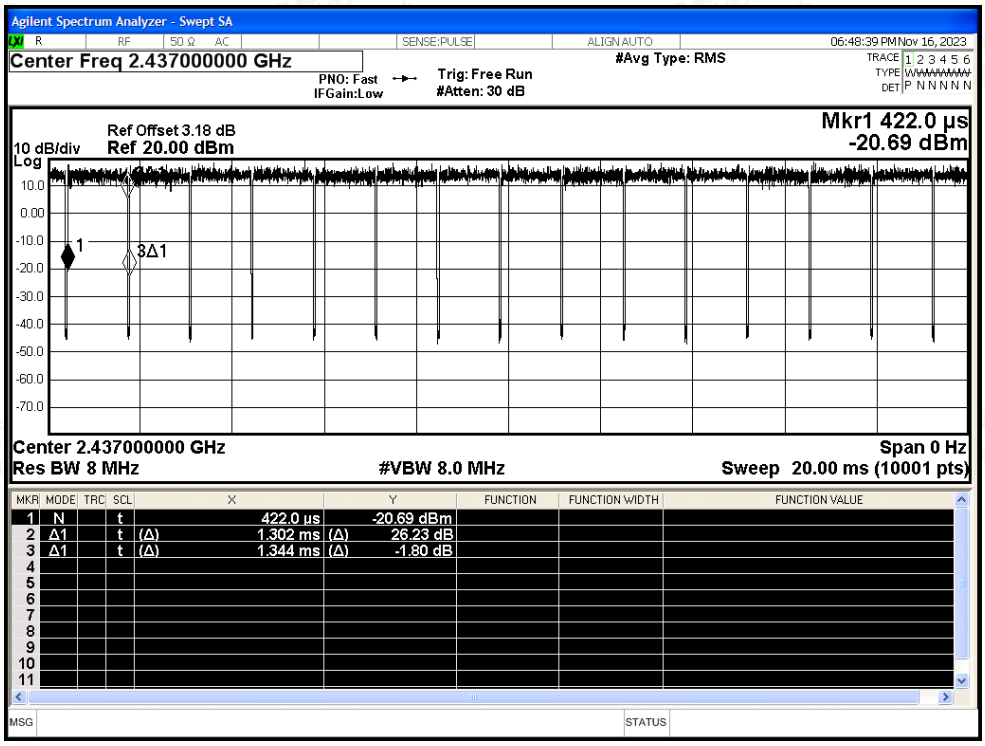
Duty Cycle NVNT g 2462MHz Ant1



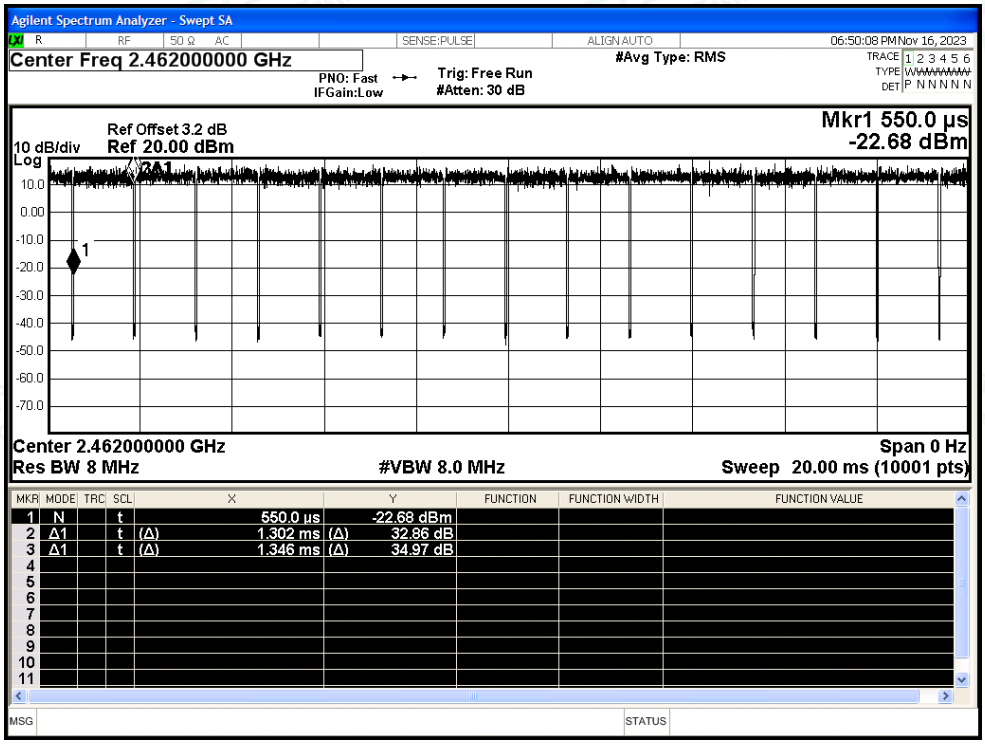
Duty Cycle NVNT n20 2412MHz Ant1



Duty Cycle NVNT n20 2437MHz Ant1



Duty Cycle NVNT n20 2462MHz Ant1

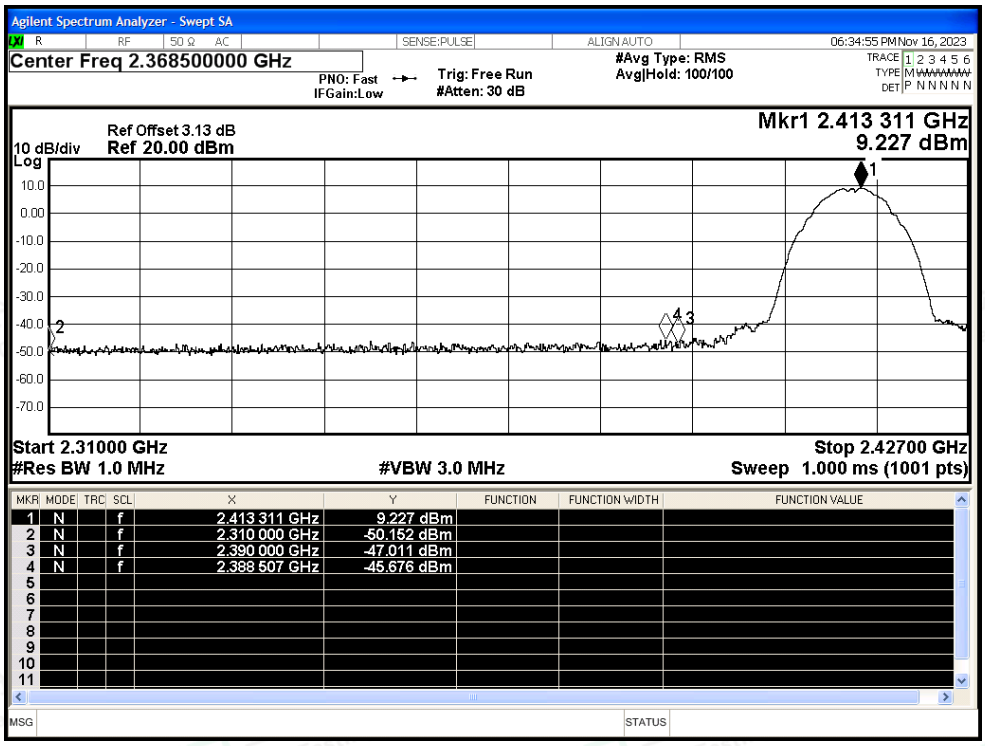


A.7 Emissions in Restricted Bands

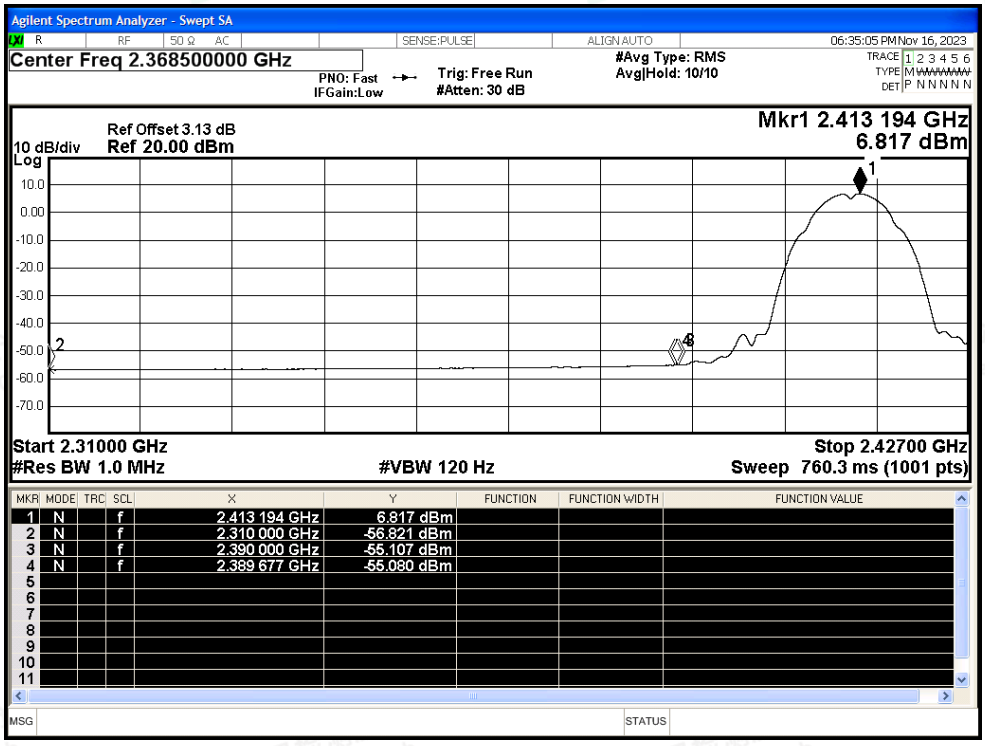
Condition	Mode	Frequency (MHz)	Antenna	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
NVNT	b	2412	Ant1	2310	-50.15	2.43	47.54	Peak	74	Pass
NVNT	b	2412	Ant1	2310	-56.82	2.43	40.87	Average	54	Pass
NVNT	b	2412	Ant1	2388.507	-45.68	2.43	52.01	Peak	74	Pass
NVNT	b	2412	Ant1	2389.677	-55.08	2.43	42.61	Average	54	Pass
NVNT	b	2412	Ant1	2390	-47.01	2.43	50.68	Peak	74	Pass
NVNT	b	2412	Ant1	2390	-55.11	2.43	42.58	Average	54	Pass
NVNT	b	2462	Ant1	2483.5	-45.79	2.43	51.9	Peak	74	Pass
NVNT	b	2462	Ant1	2483.5	-54.03	2.43	43.66	Average	54	Pass
NVNT	b	2462	Ant1	2497.244	-44.41	2.43	53.28	Peak	74	Pass
NVNT	b	2462	Ant1	2483.517	-54.03	2.43	43.66	Average	54	Pass
NVNT	b	2462	Ant1	2500	-48.39	2.43	49.3	Peak	74	Pass
NVNT	b	2462	Ant1	2500	-55.06	2.43	42.63	Average	54	Pass
NVNT	g	2412	Ant1	2310	-48.55	2.43	49.14	Peak	74	Pass
NVNT	g	2412	Ant1	2310	-56.39	2.43	41.3	Average	54	Pass
NVNT	g	2412	Ant1	2389.911	-37.01	2.43	60.68	Peak	74	Pass
NVNT	g	2412	Ant1	2388.624	-47.99	2.43	49.7	Average	54	Pass
NVNT	g	2412	Ant1	2390	-37.58	2.43	60.11	Peak	74	Pass
NVNT	g	2412	Ant1	2390	-49.72	2.43	47.97	Average	54	Pass
NVNT	g	2462	Ant1	2483.5	-42.34	2.43	55.35	Peak	74	Pass
NVNT	g	2462	Ant1	2483.5	-51.15	2.43	46.54	Average	54	Pass
NVNT	g	2462	Ant1	2484.312	-39.08	2.43	58.61	Peak	74	Pass
NVNT	g	2462	Ant1	2483.517	-51.15	2.43	46.54	Average	54	Pass
NVNT	g	2462	Ant1	2500	-47.26	2.43	50.43	Peak	74	Pass
NVNT	g	2462	Ant1	2500	-54.5	2.43	43.19	Average	54	Pass
NVNT	n20	2412	Ant1	2310	-49.77	2.43	47.92	Peak	74	Pass
NVNT	n20	2412	Ant1	2310	-56.38	2.43	41.31	Average	54	Pass
NVNT	n20	2412	Ant1	2389.677	-27.35	2.43	70.34	Peak	74	Pass
NVNT	n20	2412	Ant1	2389.677	-46.63	2.43	51.06	Average	54	Pass
NVNT	n20	2412	Ant1	2390	-27.11	2.43	70.58	Peak	74	Pass
NVNT	n20	2412	Ant1	2390	-46.97	2.43	50.72	Average	54	Pass
NVNT	n20	2462	Ant1	2483.5	-40.37	2.43	57.32	Peak	74	Pass
NVNT	n20	2462	Ant1	2483.5	-50.22	2.43	47.47	Average	54	Pass
NVNT	n20	2462	Ant1	2486.273	-37.08	2.43	60.61	Peak	74	Pass
NVNT	n20	2462	Ant1	2483.729	-50.04	2.43	47.65	Average	54	Pass
NVNT	n20	2462	Ant1	2500	-47.46	2.43	50.23	Peak	74	Pass
NVNT	n20	2462	Ant1	2500	-54.53	2.43	43.16	Average	54	Pass

Test Graphs

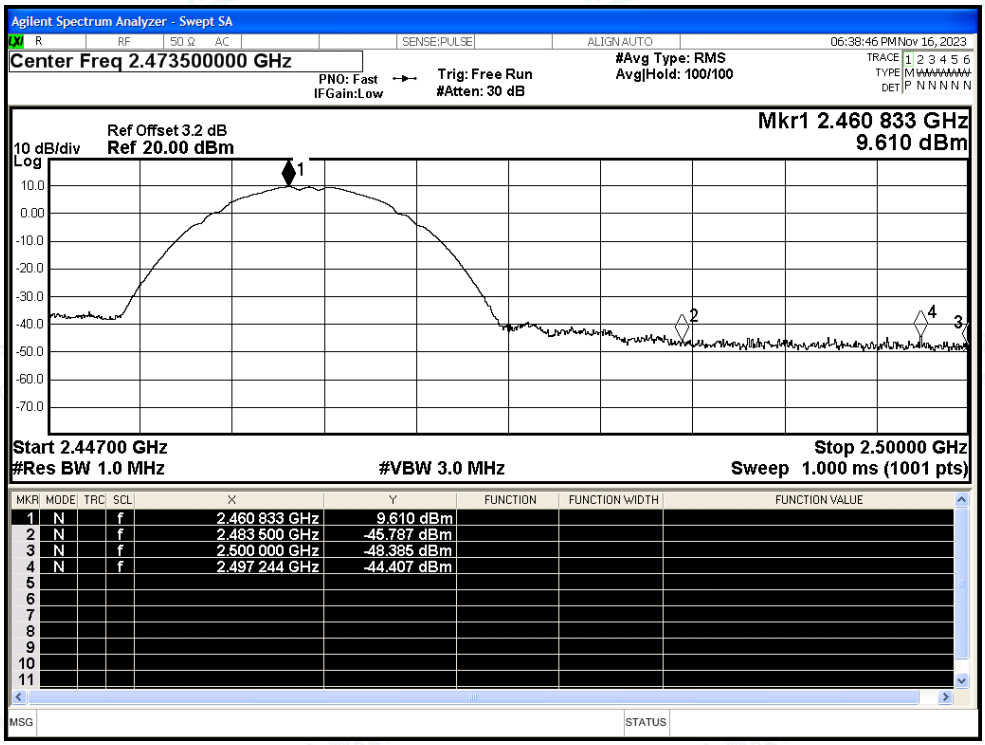
Restrict Band NVNT b 2412MHz Ant1 Peak



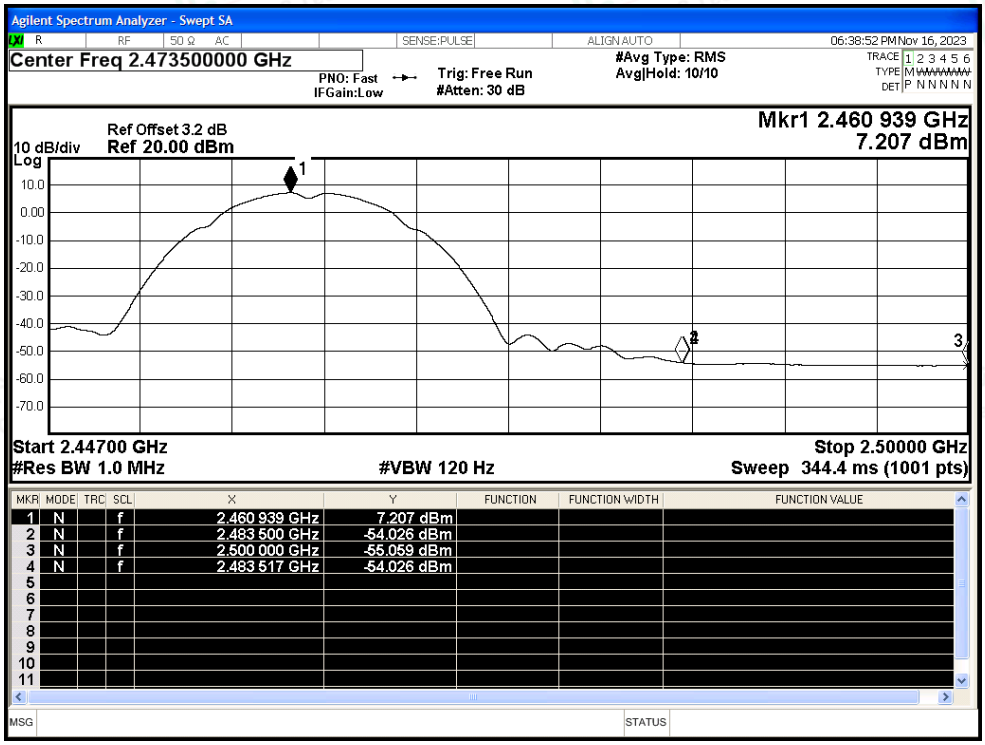
Restrict Band NVNT b 2412MHz Ant1 Average



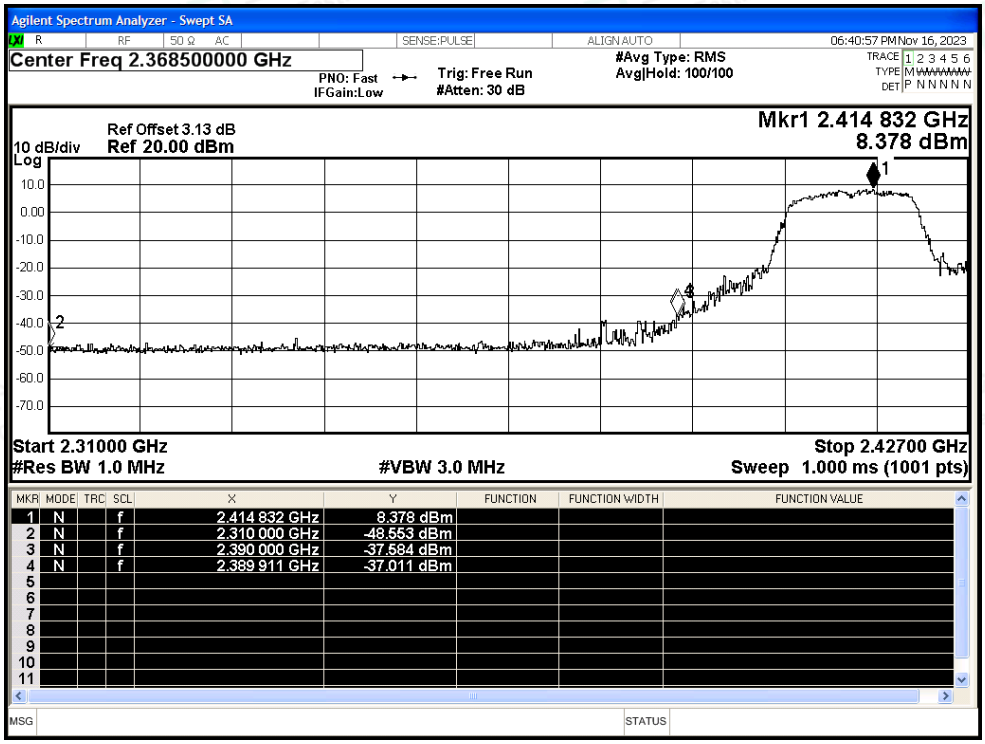
Restrict Band NVNT b 2462MHz Ant1 Peak



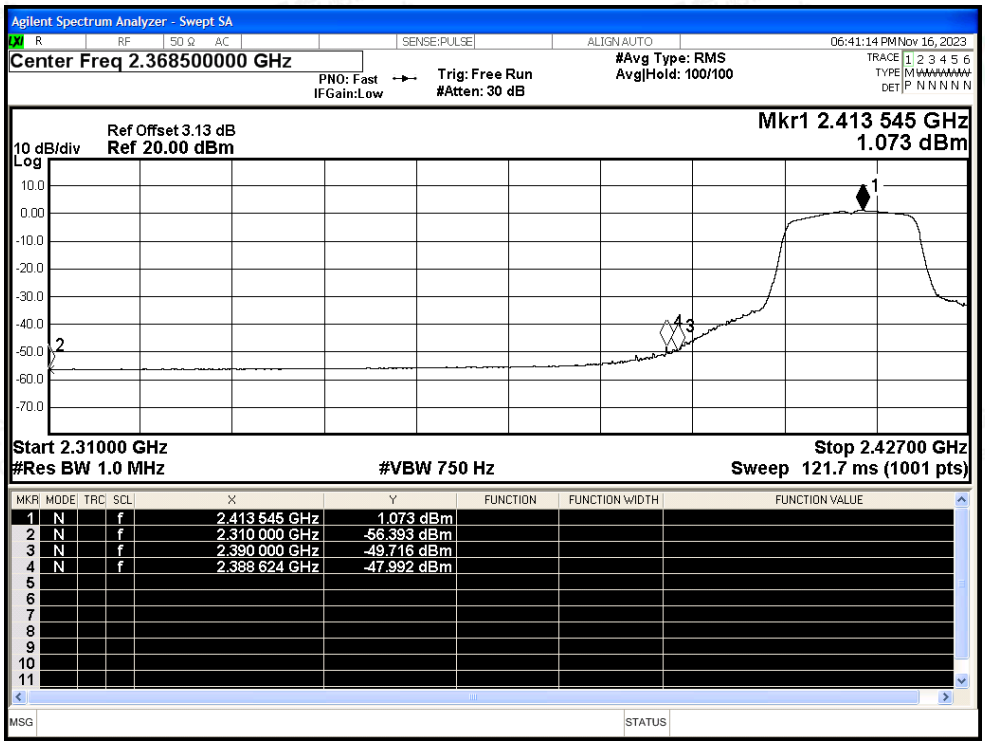
Restrict Band NVNT b 2462MHz Ant1 Average



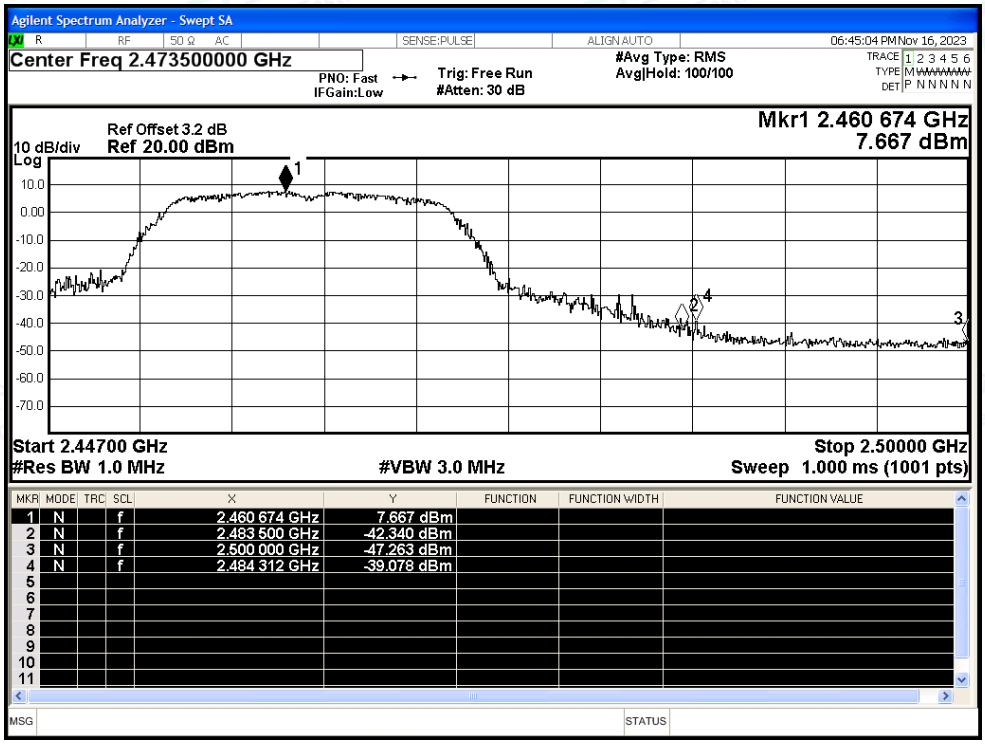
Restrict Band NVNT g 2412MHz Ant1 Peak



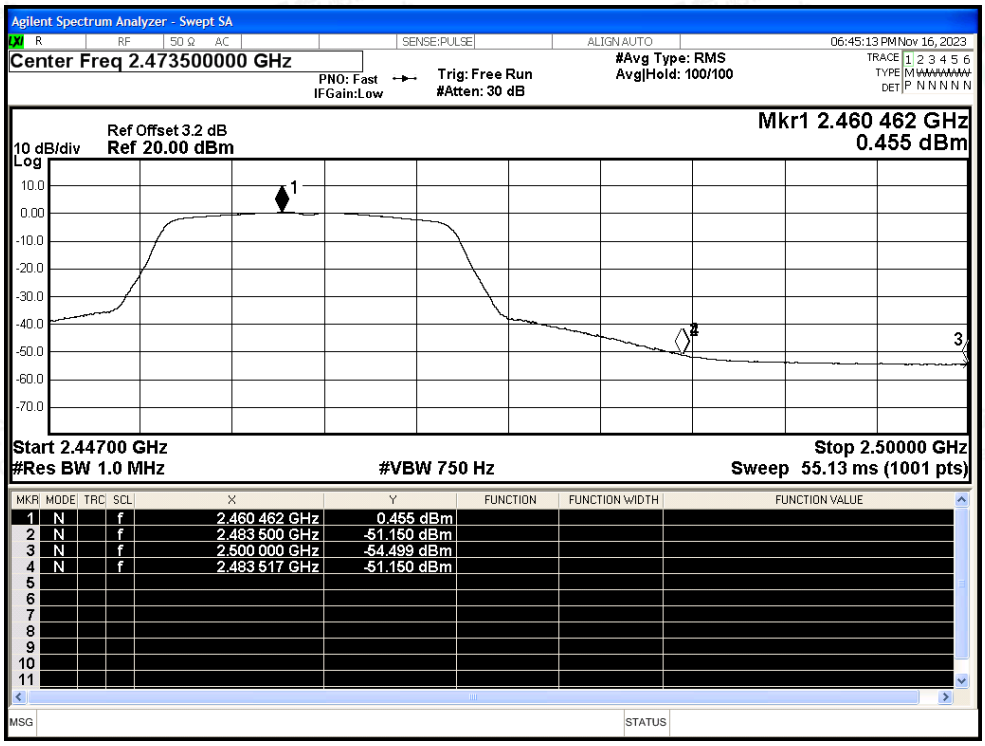
Restrict Band NVNT g 2412MHz Ant1 Average



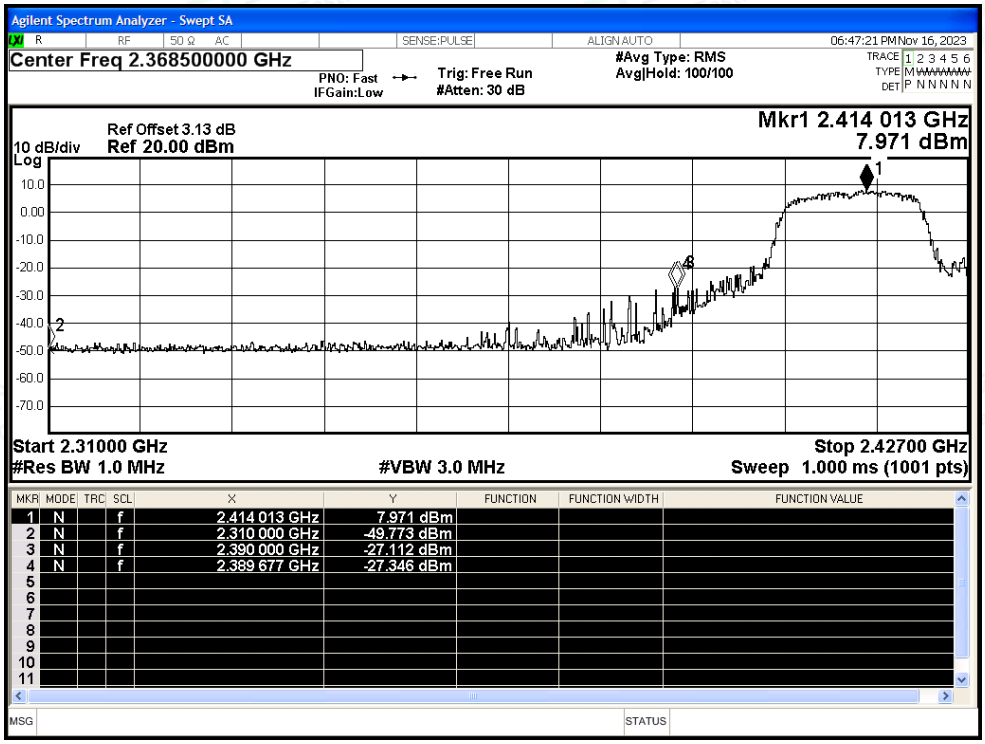
Restrict Band NVNT g 2462MHz Ant1 Peak



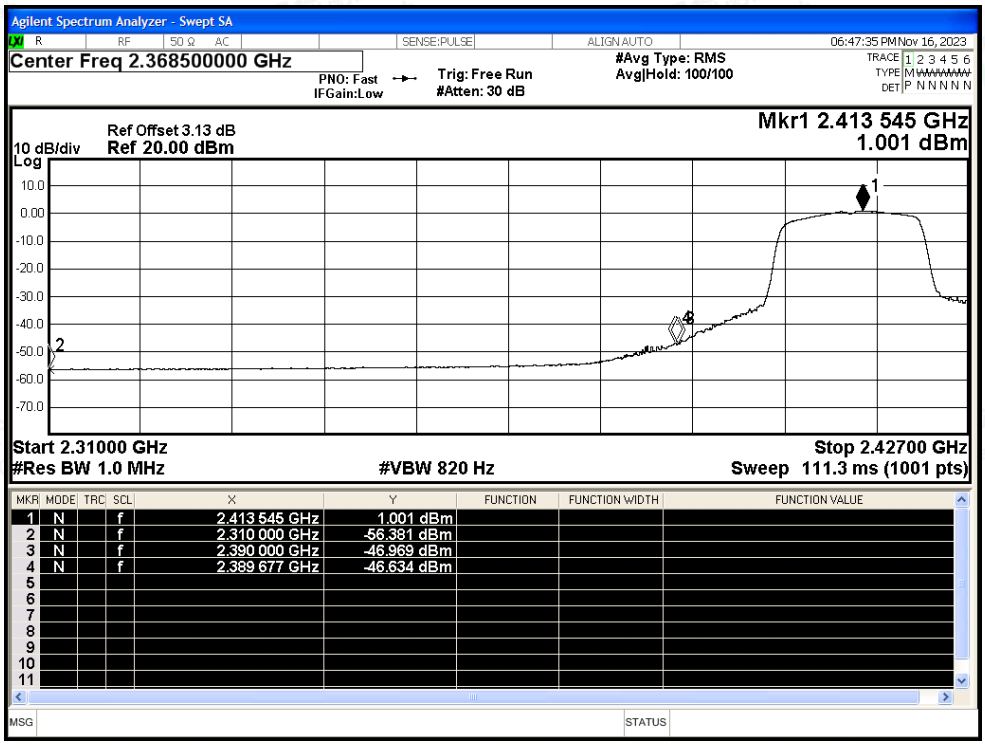
Restrict Band NVNT g 2462MHz Ant1 Average



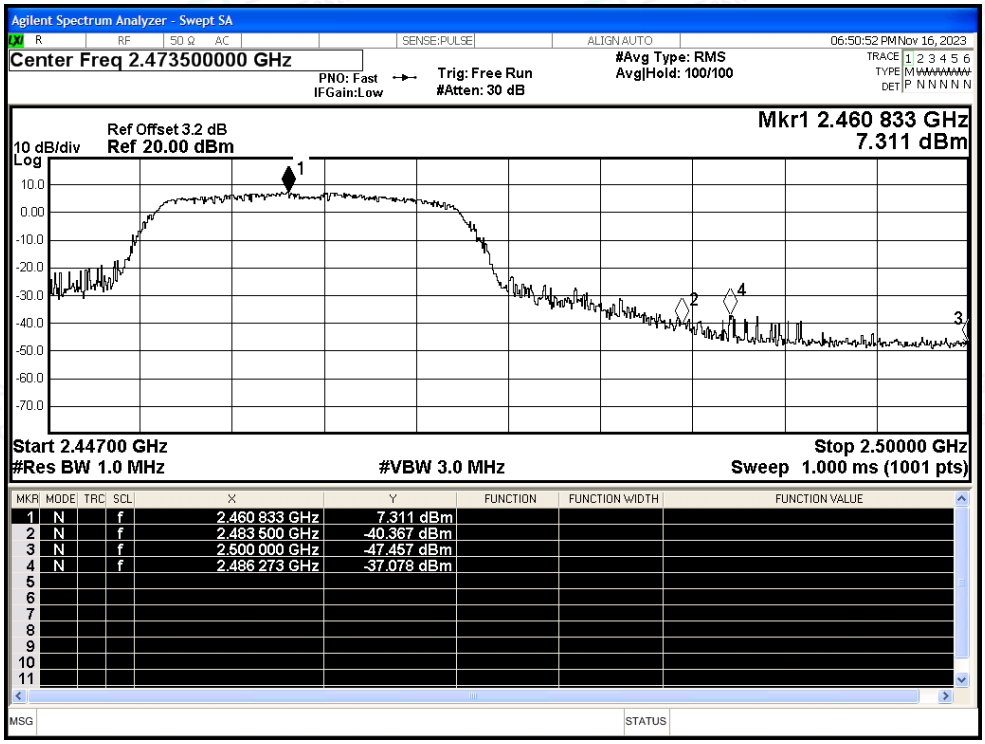
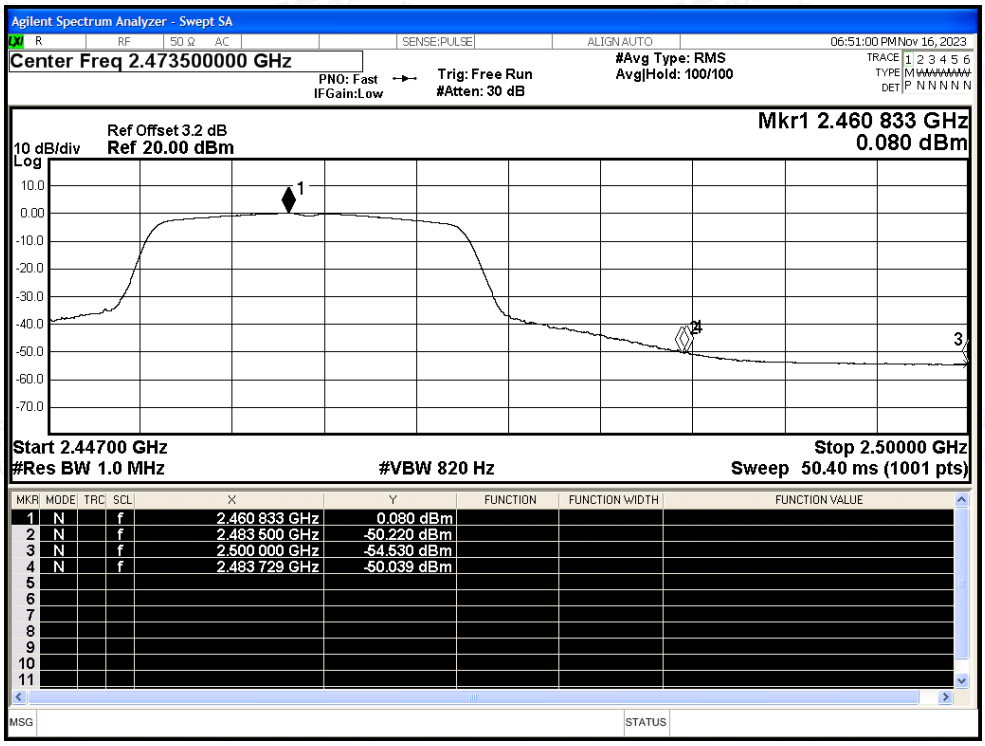
Restrict Band NVNT n20 2412MHz Ant1 Peak



Restrict Band NVNT n20 2412MHz Ant1 Average



Restrict Band NVNT n20 2462MHz Ant1 Peak



Restrict Band NVNT n20 2462MHz Ant1 Average