Appendix C

RF Test Data for 2.4GWIFI (Conducted Measurement)

Product Name: Legends Pinball HDP

Test Model: HA9919A

Environmental Conditions

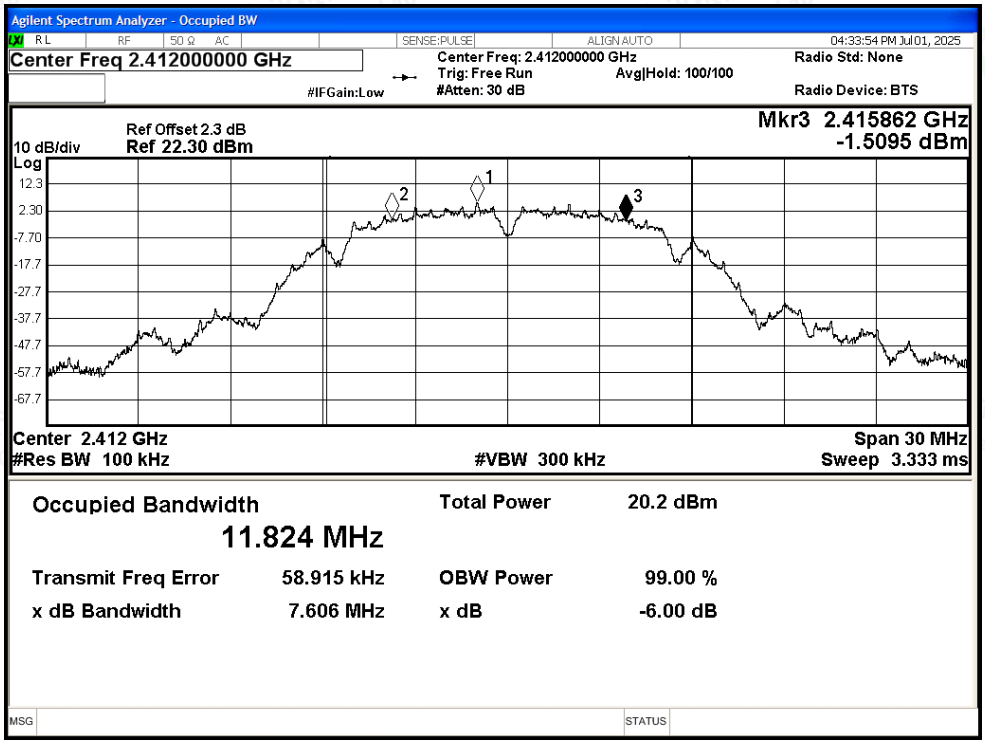
Temperature:	23.6°C
Relative Humidity:	52.8%
ATM Pressure:	100.0 kPa
Test Engineer:	Paddi Chen
Supervised by:	Nick Peng

C.1 -6dB Bandwidth

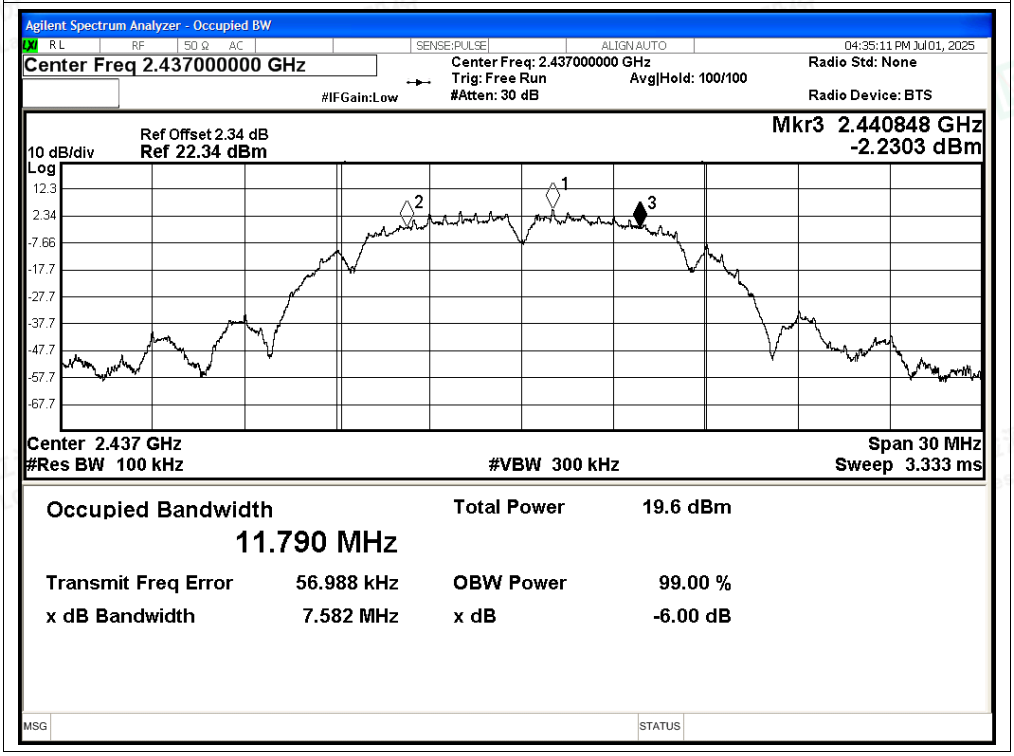
Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	b	2412	Ant1	7.606	>=0.5	Pass
NVNT	b	2437	Ant1	7.582	>=0.5	Pass
NVNT	b	2462	Ant1	8.566	>=0.5	Pass
NVNT	g	2412	Ant1	16.057	>=0.5	Pass
NVNT	g	2437	Ant1	16.348	>=0.5	Pass
NVNT	g	2462	Ant1	16.318	>=0.5	Pass
NVNT	n20	2412	Ant1	16.7	>=0.5	Pass
NVNT	n20	2437	Ant1	17.23	>=0.5	Pass
NVNT	n20	2462	Ant1	16.854	>=0.5	Pass
NVNT	n40	2422	Ant1	35.521	>=0.5	Pass
NVNT	n40	2437	Ant1	35.264	>=0.5	Pass
NVNT	n40	2452	Ant1	35.34	>=0.5	Pass

Test Graphs

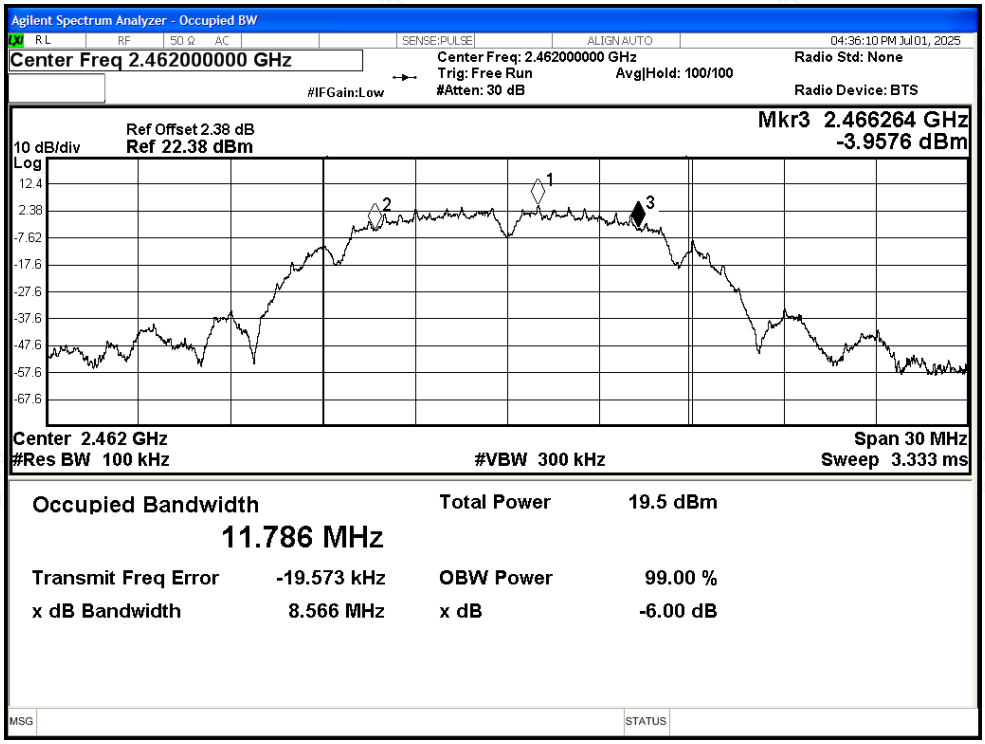
-6dB Bandwidth NVNT b 2412MHz Ant1



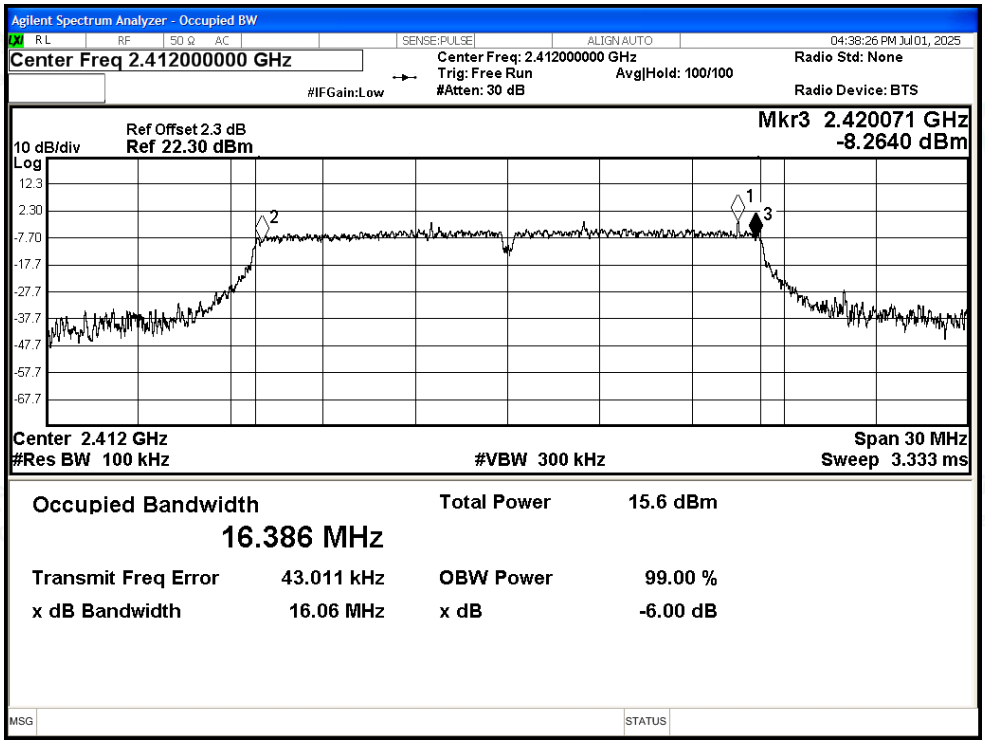
-6dB Bandwidth NVNT b 2437MHz Ant1



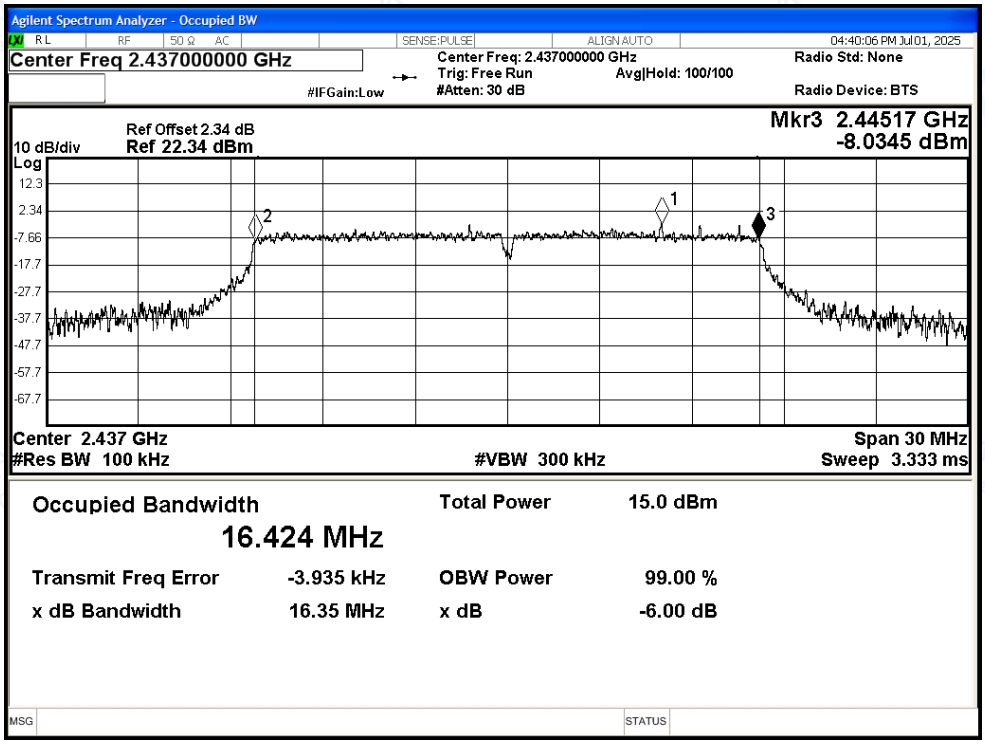
-6dB Bandwidth NVNT b 2462MHz Ant1



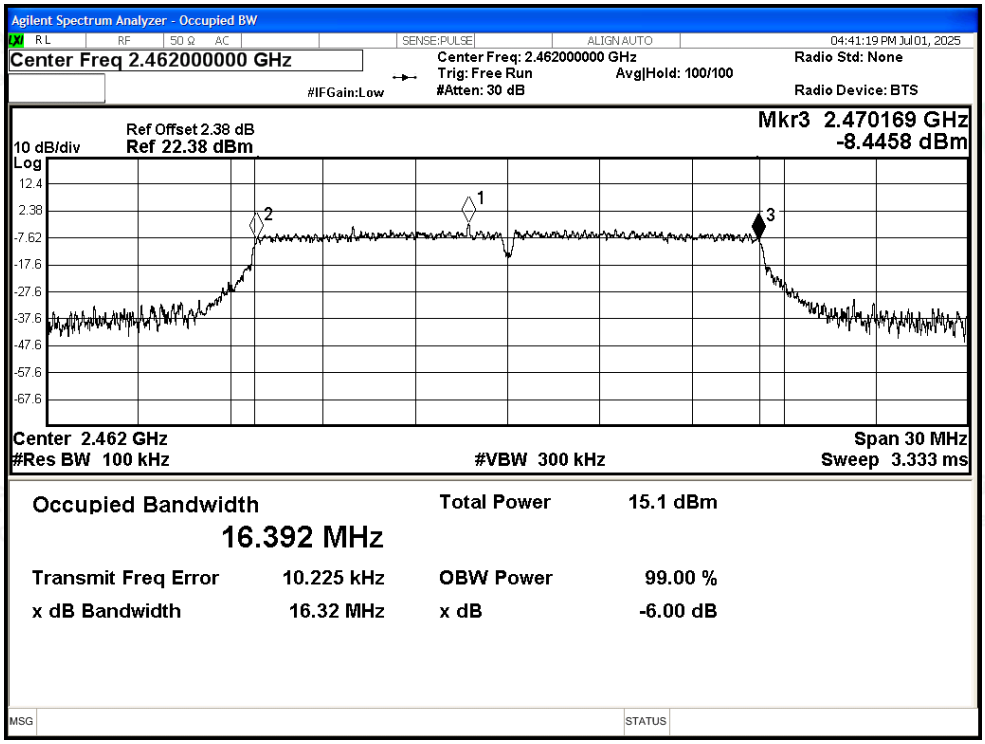
-6dB Bandwidth NVNT g 2412MHz Ant1



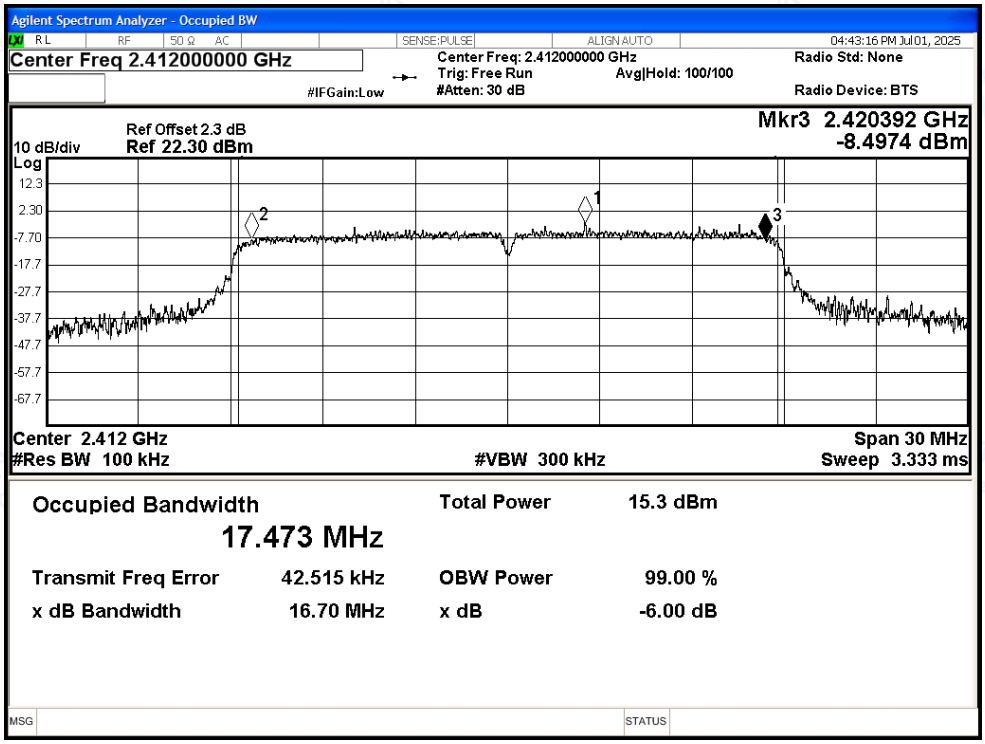
-6dB Bandwidth NVNT g 2437MHz Ant1



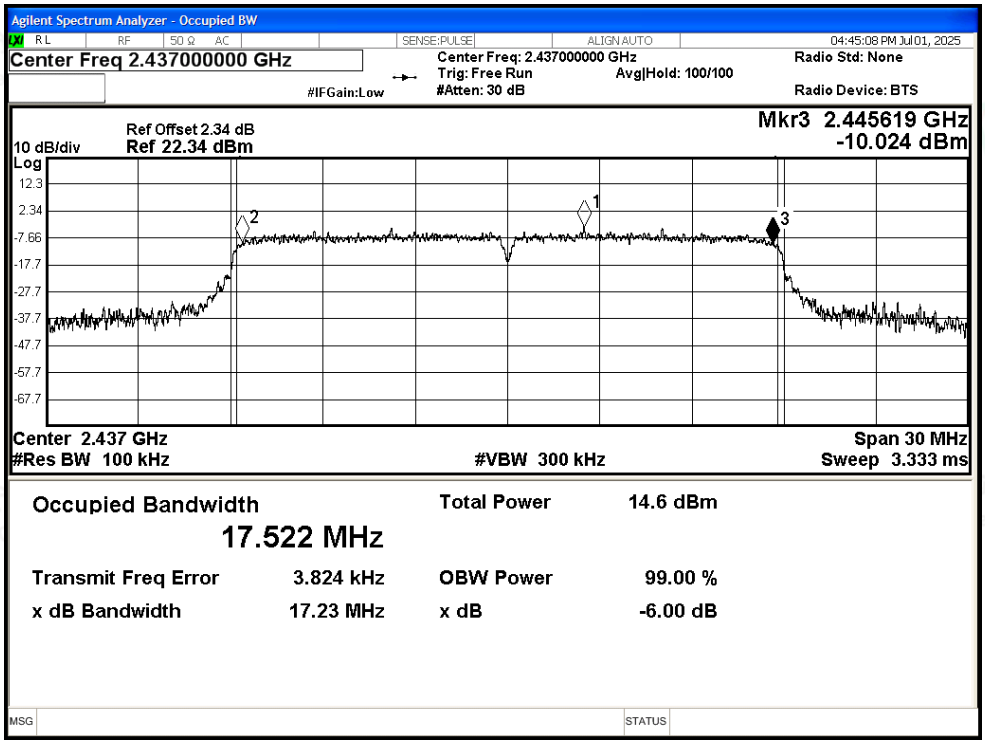
-6dB Bandwidth NVNT g 2462MHz Ant1



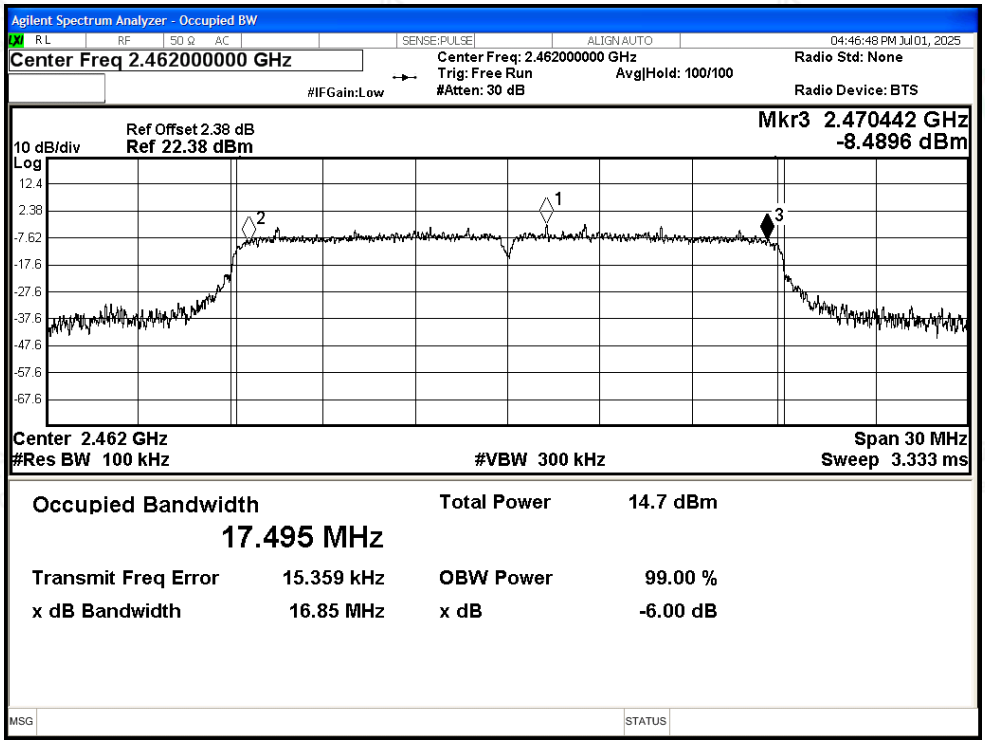
-6dB Bandwidth NVNT n20 2412MHz Ant1



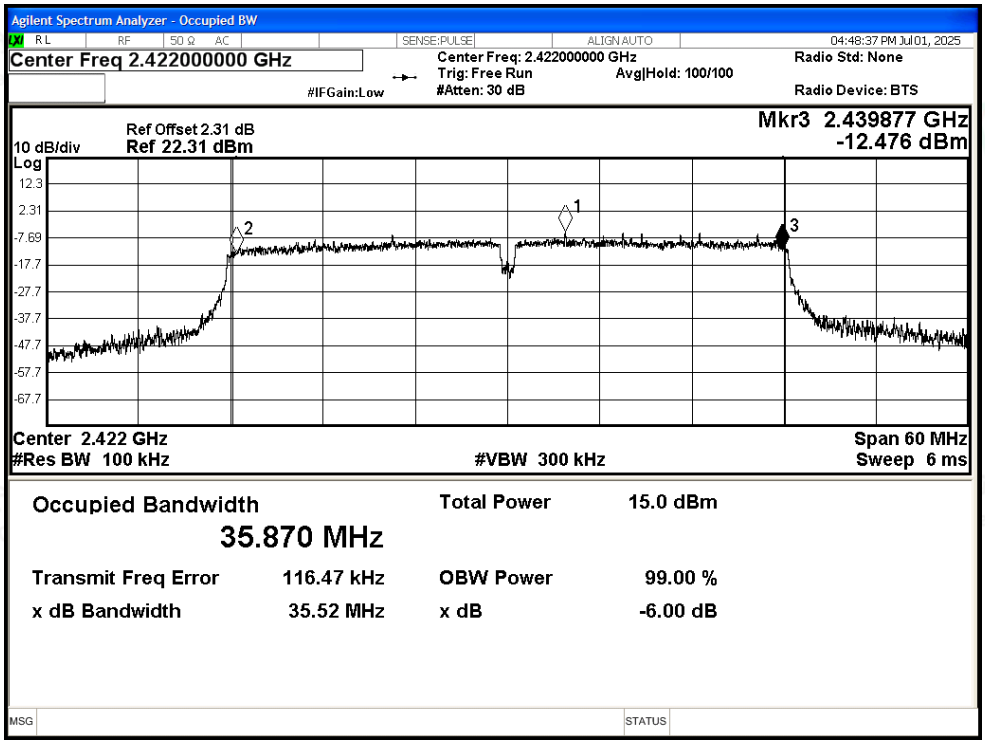
-6dB Bandwidth NVNT n20 2437MHz Ant1



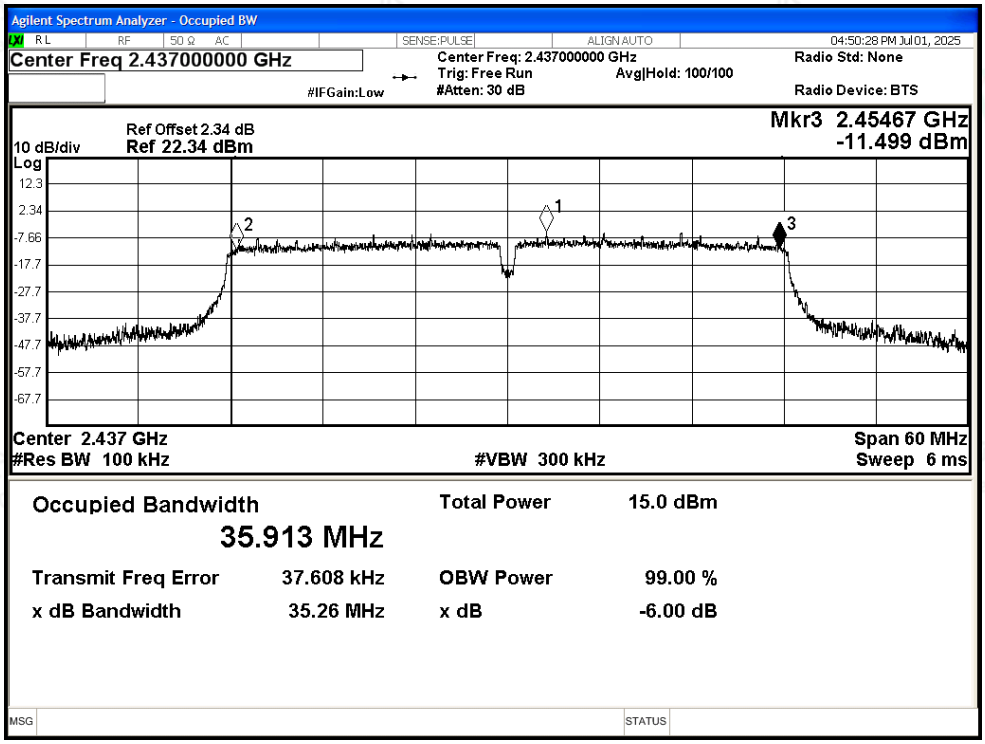
-6dB Bandwidth NVNT n20 2462MHz Ant1



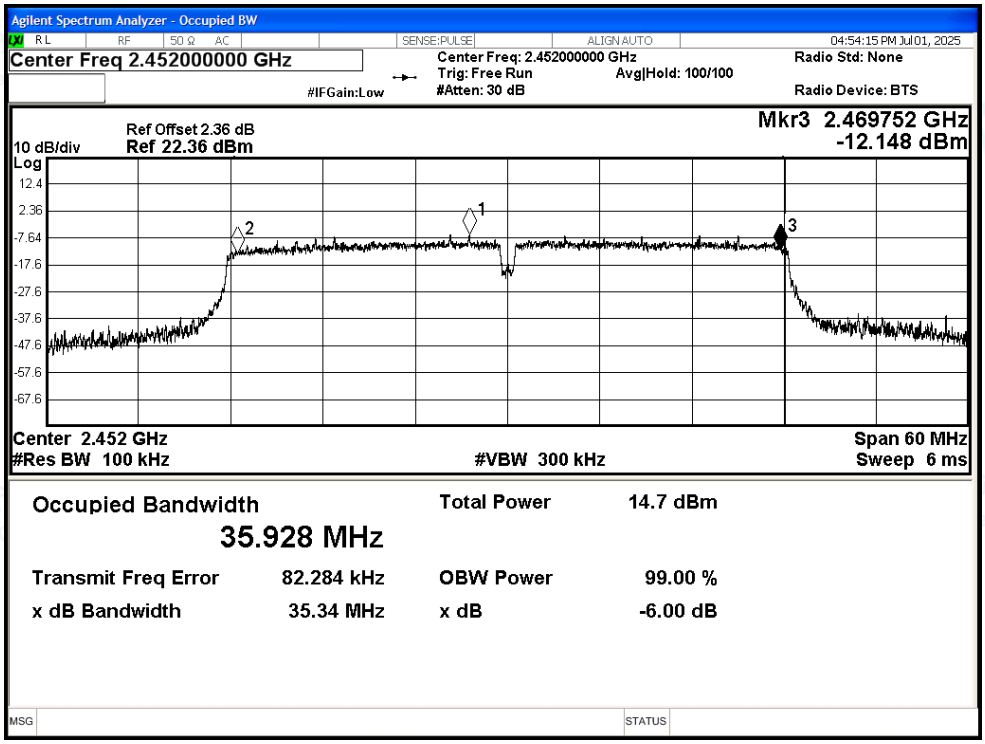
-6dB Bandwidth NVNT n40 2422MHz Ant1



-6dB Bandwidth NVNT n40 2437MHz Ant1



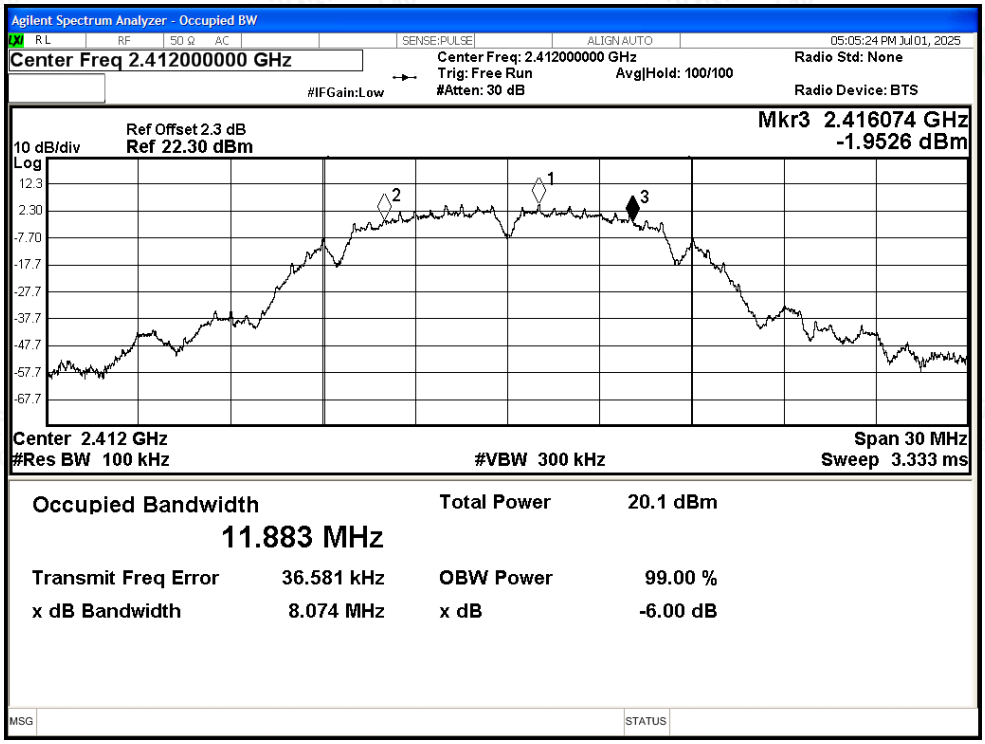
-6dB Bandwidth NVNT n40 2452MHz Ant1



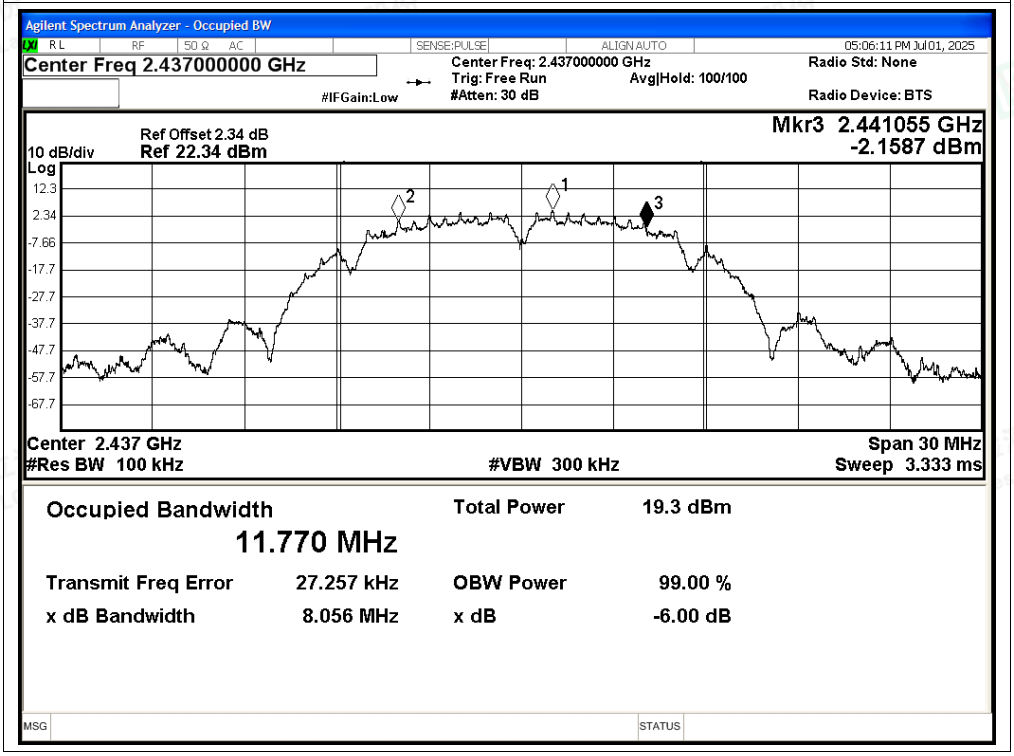
Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	b	2412	Ant2	8.074	>=0.5	Pass
NVNT	b	2437	Ant2	8.056	>=0.5	Pass
NVNT	b	2462	Ant2	8.567	>=0.5	Pass
NVNT	g	2412	Ant2	16.34	>=0.5	Pass
NVNT	g	2437	Ant2	16.313	>=0.5	Pass
NVNT	g	2462	Ant2	16.297	>=0.5	Pass
NVNT	n20	2412	Ant2	16.795	>=0.5	Pass
NVNT	n20	2437	Ant2	17.127	>=0.5	Pass
NVNT	n20	2462	Ant2	17.148	>=0.5	Pass
NVNT	n40	2422	Ant2	35.458	>=0.5	Pass
NVNT	n40	2437	Ant2	35.718	>=0.5	Pass
NVNT	n40	2452	Ant2	35.514	>=0.5	Pass

Test Graphs

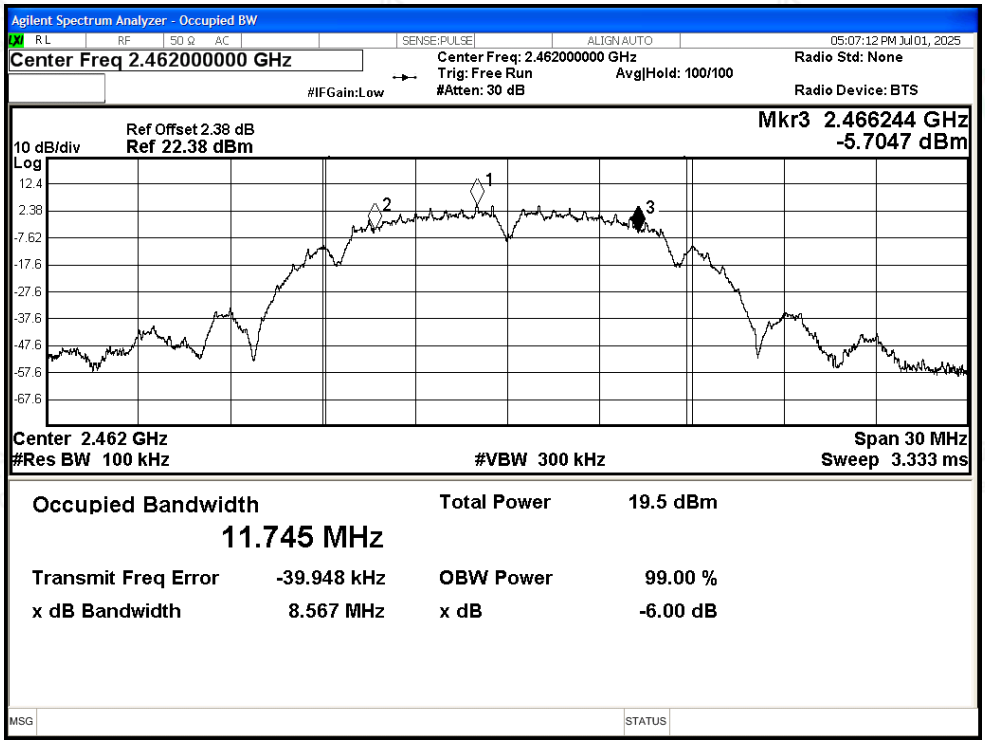
-6dB Bandwidth NVNT b 2412MHz Ant2



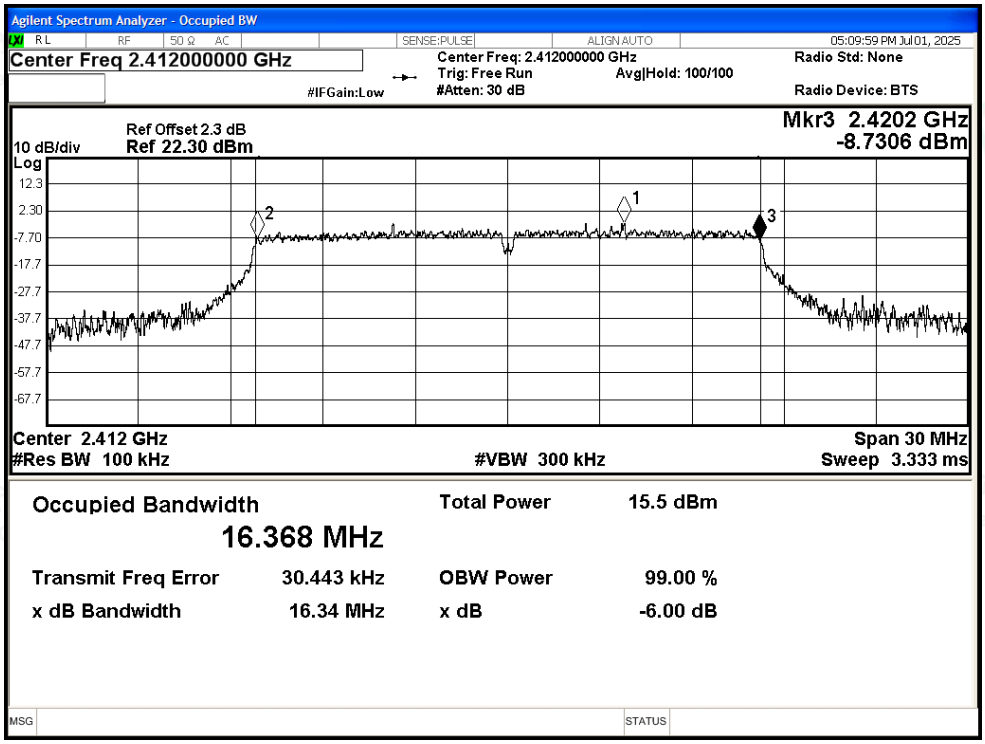
-6dB Bandwidth NVNT b 2437MHz Ant2



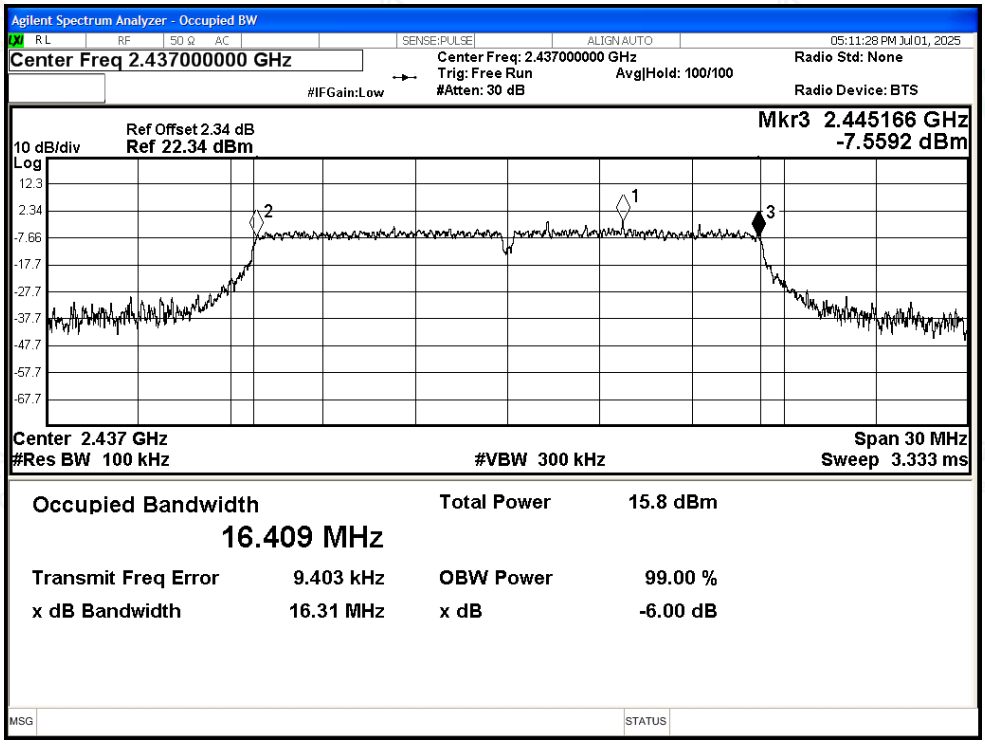
-6dB Bandwidth NVNT b 2462MHz Ant2



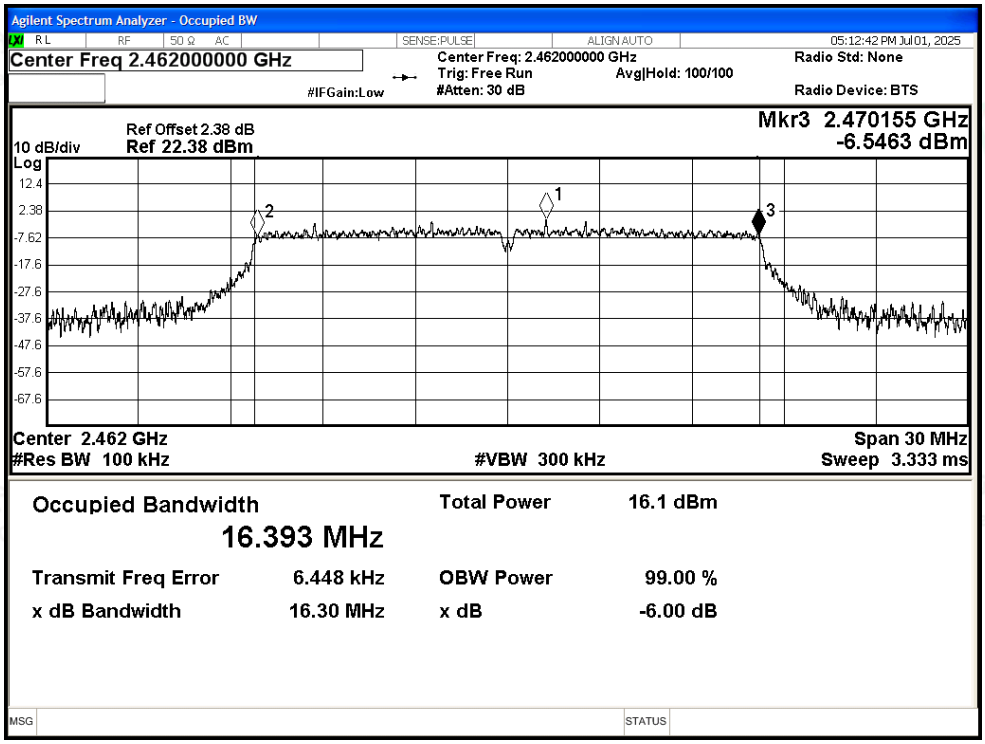
-6dB Bandwidth NVNT g 2412MHz Ant2



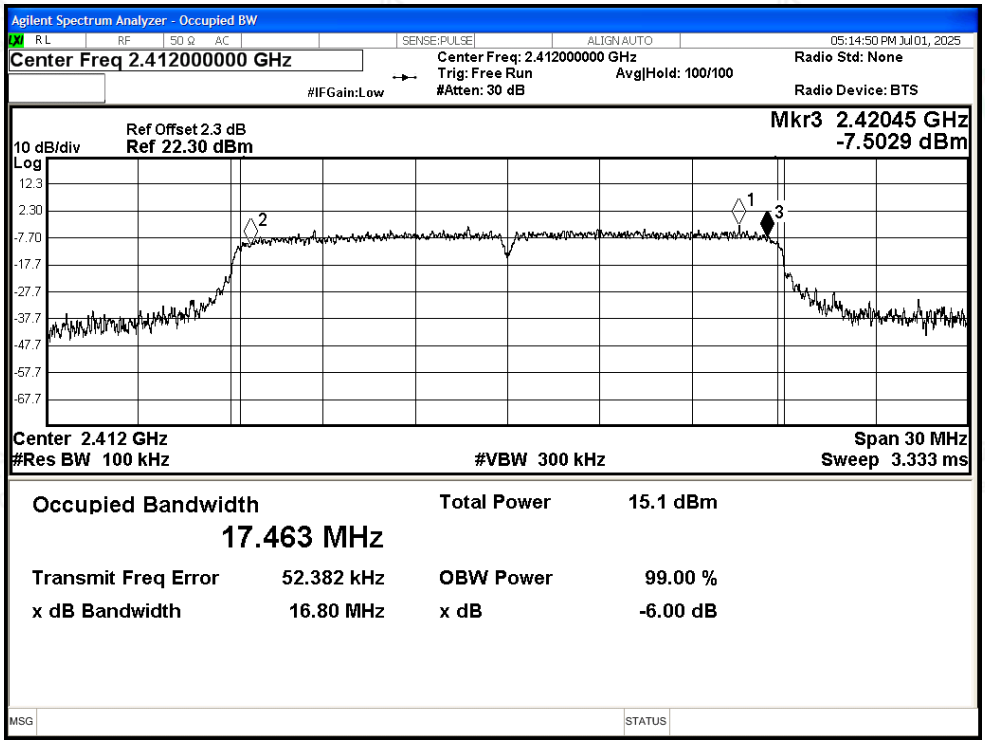
-6dB Bandwidth NVNT g 2437MHz Ant2



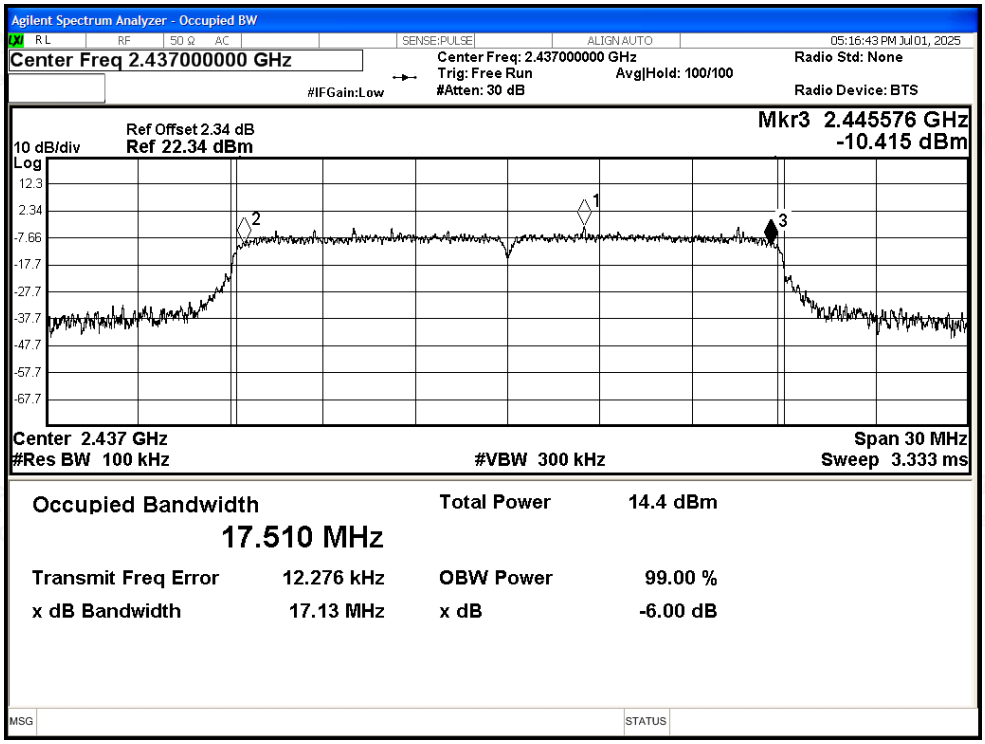
-6dB Bandwidth NVNT g 2462MHz Ant2



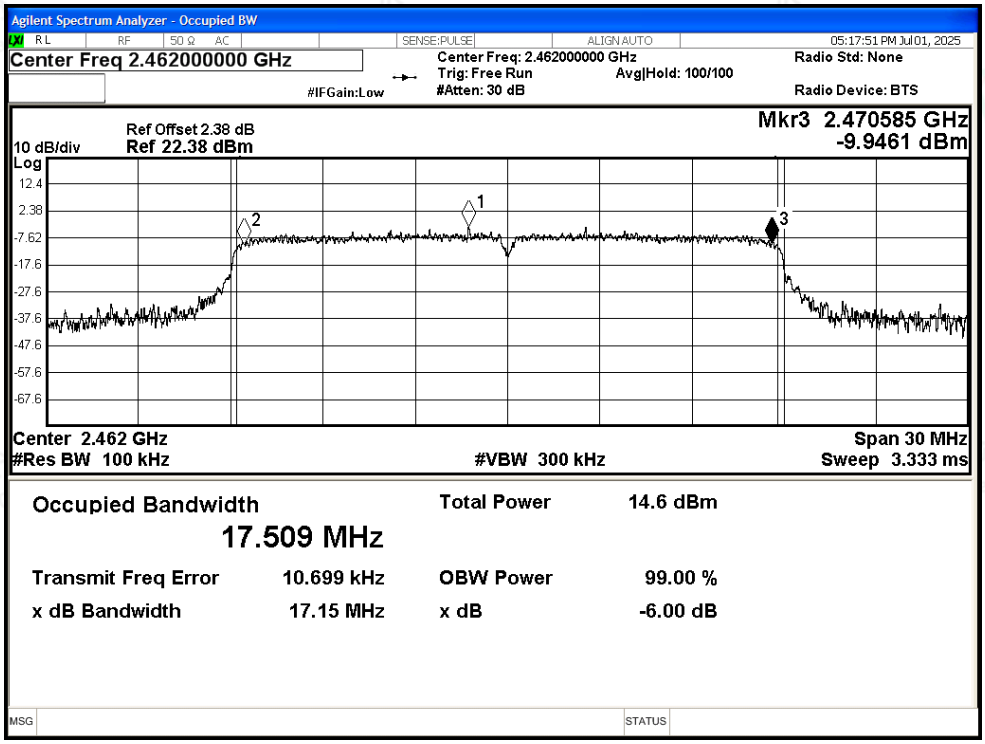
-6dB Bandwidth NVNT n20 2412MHz Ant2



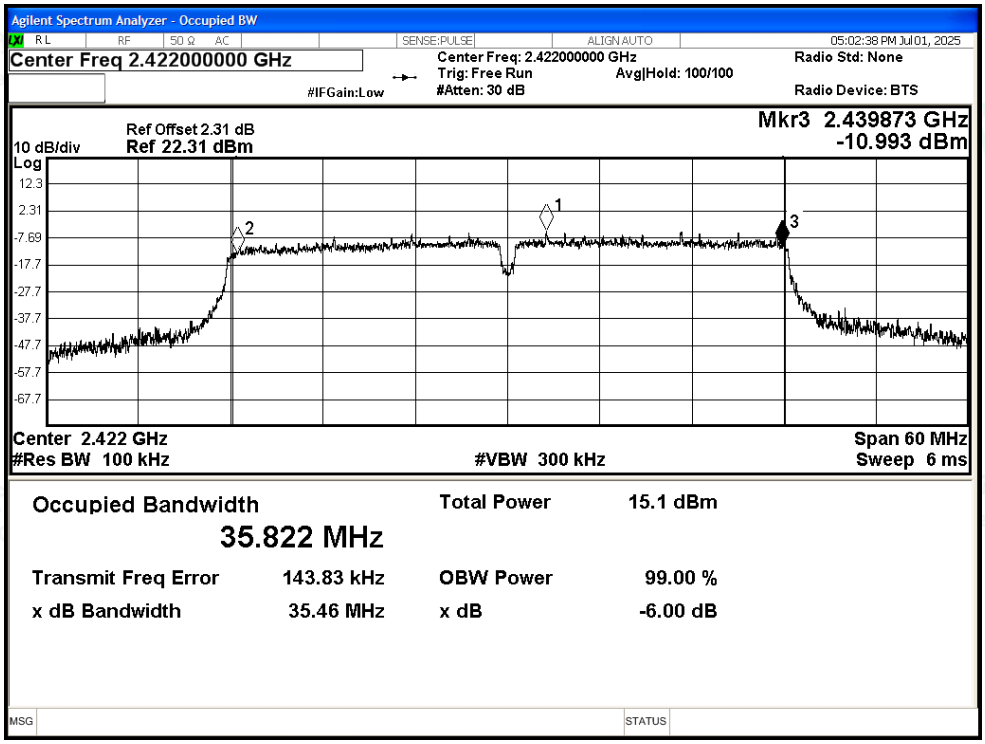
-6dB Bandwidth NVNT n20 2437MHz Ant2



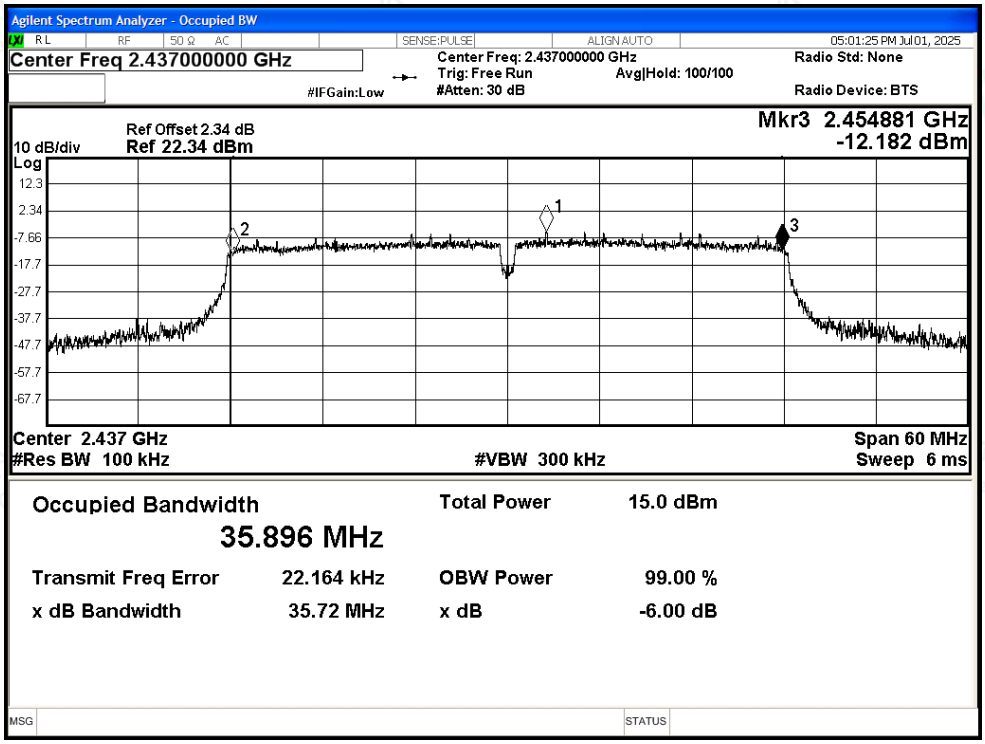
-6dB Bandwidth NVNT n20 2462MHz Ant2



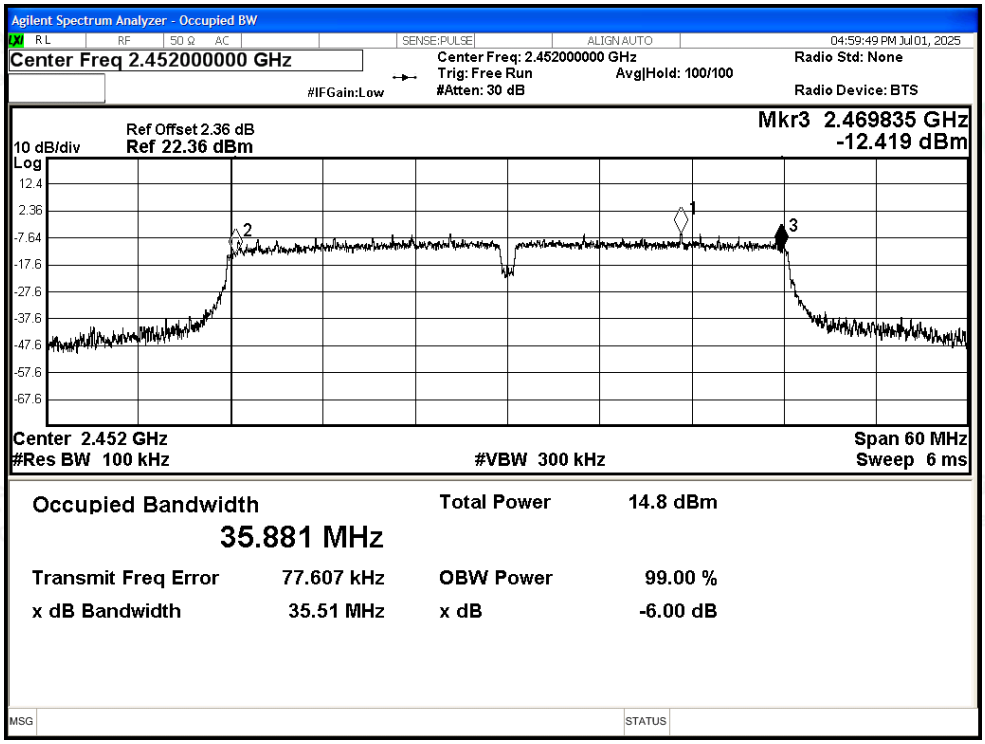
-6dB Bandwidth NVNT n40 2422MHz Ant2



-6dB Bandwidth NVNT n40 2437MHz Ant2



-6dB Bandwidth NVNT n40 2452MHz Ant2



C.2 Maximum Peak Conducted Output Power

Condition	Mode	Frequency (MHz)	Antenna	Total Power (dBm)	Limit (dBm)	Verdict
NVNT	b	2412	Ant1	15.3	30	Pass
NVNT	b	2437	Ant1	14.57	30	Pass
NVNT	b	2462	Ant1	14.59	30	Pass
NVNT	g	2412	Ant1	14.53	30	Pass
NVNT	g	2437	Ant1	13.78	30	Pass
NVNT	g	2462	Ant1	13.91	30	Pass
NVNT	n20	2412	Ant1	14.04	30	Pass
NVNT	n20	2437	Ant1	13.16	30	Pass
NVNT	n20	2462	Ant1	13.3	30	Pass
NVNT	n40	2422	Ant1	13.5	30	Pass
NVNT	n40	2437	Ant1	13.37	30	Pass
NVNT	n40	2452	Ant1	13.27	30	Pass

Condition	Mode	Frequency (MHz)	Antenna	Total Power (dBm)	Limit (dBm)	Verdict
NVNT	b	2412	Ant2	15.18	30	Pass
NVNT	b	2437	Ant2	14.22	30	Pass
NVNT	b	2462	Ant2	14.49	30	Pass
NVNT	g	2412	Ant2	14.3	30	Pass
NVNT	g	2437	Ant2	14.57	30	Pass
NVNT	g	2462	Ant2	14.94	30	Pass
NVNT	n20	2412	Ant2	13.82	30	Pass
NVNT	n20	2437	Ant2	12.89	30	Pass
NVNT	n20	2462	Ant2	13.23	30	Pass
NVNT	n40	2422	Ant2	13.59	30	Pass
NVNT	n40	2437	Ant2	13.46	30	Pass
NVNT	n40	2452	Ant2	13.28	30	Pass

MIMO

Condition	Mode	Frequency (MHz)	Conducted Power (dBm)			Limit (dBm)	Verdict
			Ant1	Ant2	Ant1+Ant2		
NVNT	n20	2412	14.04	13.82	16.94	30	Pass
NVNT	n20	2437	13.16	12.89	16.04	30	Pass
NVNT	n20	2462	13.3	13.23	16.28	30	Pass
NVNT	n40	2422	13.5	13.59	16.56	30	Pass
NVNT	n40	2437	13.37	13.46	16.43	30	Pass
NVNT	n40	2452	13.27	13.28	16.29	30	Pass

C.3 Maximum Power Spectral Density Level

Condition	Mode	Frequency (MHz)	Antenna	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	b	2412	Ant1	-9.18	8	Pass
NVNT	b	2437	Ant1	-8.29	8	Pass
NVNT	b	2462	Ant1	-6.39	8	Pass
NVNT	g	2412	Ant1	-16.56	8	Pass
NVNT	g	2437	Ant1	-17.18	8	Pass
NVNT	g	2462	Ant1	-17.38	8	Pass
NVNT	n20	2412	Ant1	-16.78	8	Pass
NVNT	n20	2437	Ant1	-17.74	8	Pass
NVNT	n20	2462	Ant1	-17.47	8	Pass
NVNT	n40	2422	Ant1	-19.38	8	Pass
NVNT	n40	2437	Ant1	-20.09	8	Pass
NVNT	n40	2452	Ant1	-20.46	8	Pass

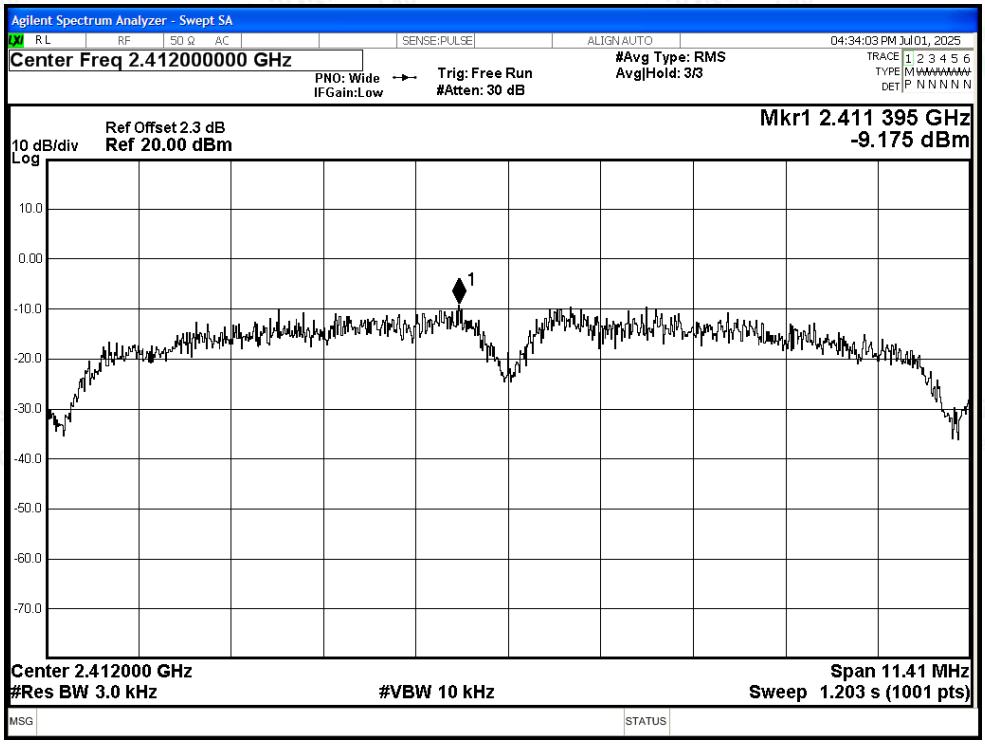
Condition	Mode	Frequency (MHz)	Antenna	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	b	2412	Ant2	-6.68	8	Pass
NVNT	b	2437	Ant2	-9.32	8	Pass
NVNT	b	2462	Ant2	-10.21	8	Pass
NVNT	g	2412	Ant2	-16.04	8	Pass
NVNT	g	2437	Ant2	-16.29	8	Pass
NVNT	g	2462	Ant2	-14.93	8	Pass
NVNT	n20	2412	Ant2	-16.63	8	Pass
NVNT	n20	2437	Ant2	-17.4	8	Pass
NVNT	n20	2462	Ant2	-16.34	8	Pass
NVNT	n40	2422	Ant2	-19.96	8	Pass
NVNT	n40	2437	Ant2	-19.93	8	Pass
NVNT	n40	2452	Ant2	-20.72	8	Pass

MIMO

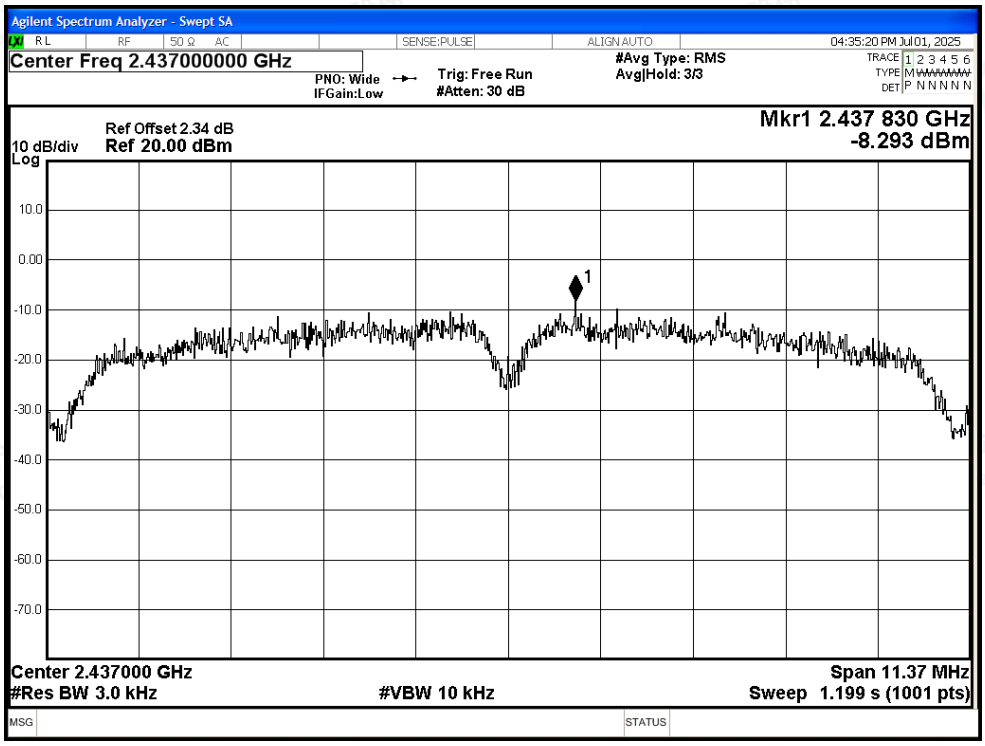
Condition	Mode	Frequency (MHz)	Conducted PSD (dBm/3kHz)			Limit (dBm)	Verdict
			Ant1	Ant2	Ant1+Ant2		
NVNT	n20	2412	-16.78	-16.63	-13.69	8	Pass
NVNT	n20	2437	-17.74	-17.4	-14.56	8	Pass
NVNT	n20	2462	-17.47	-16.34	-13.86	8	Pass
NVNT	n40	2422	-19.38	-19.96	-16.65	8	Pass
NVNT	n40	2437	-20.09	-19.93	-17.00	8	Pass
NVNT	n40	2452	-20.46	-20.72	-17.58	8	Pass

Test Graphs

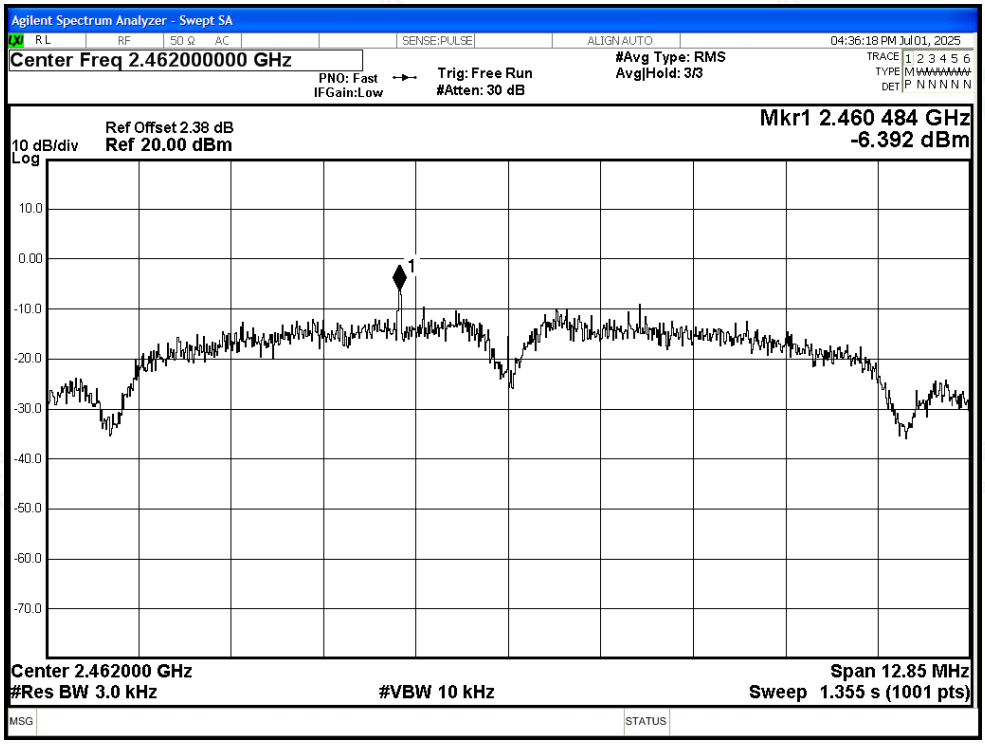
PSD NVNT b 2412MHz Ant1



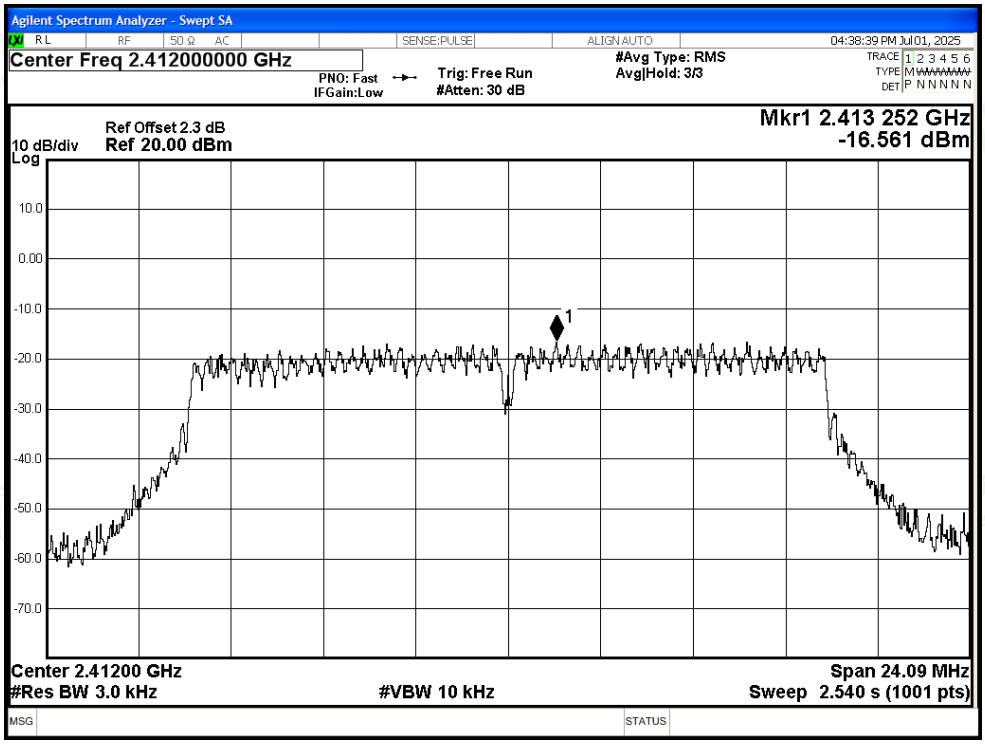
PSD NVNT b 2437MHz Ant1



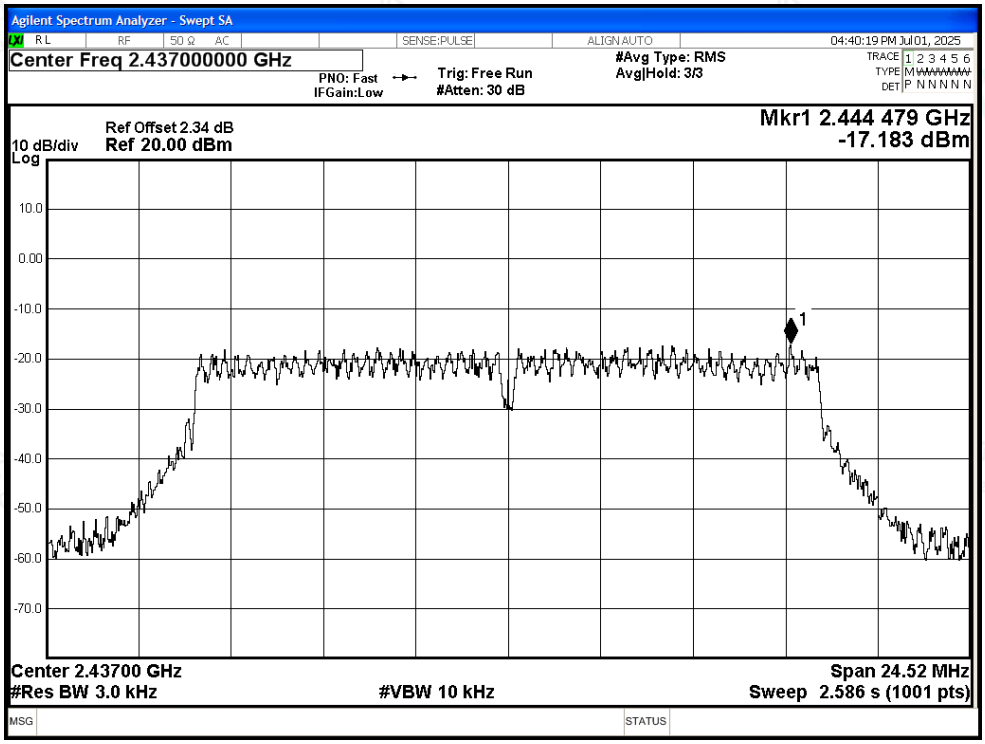
PSD NVNT b 2462MHz Ant1



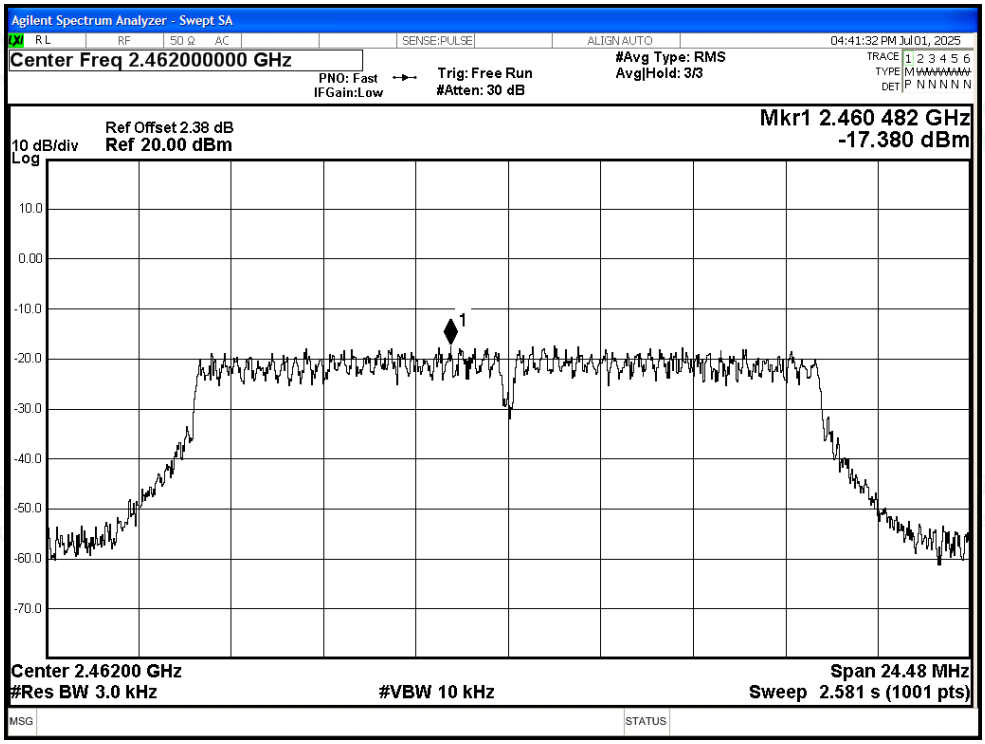
PSD NVNT g 2412MHz Ant1



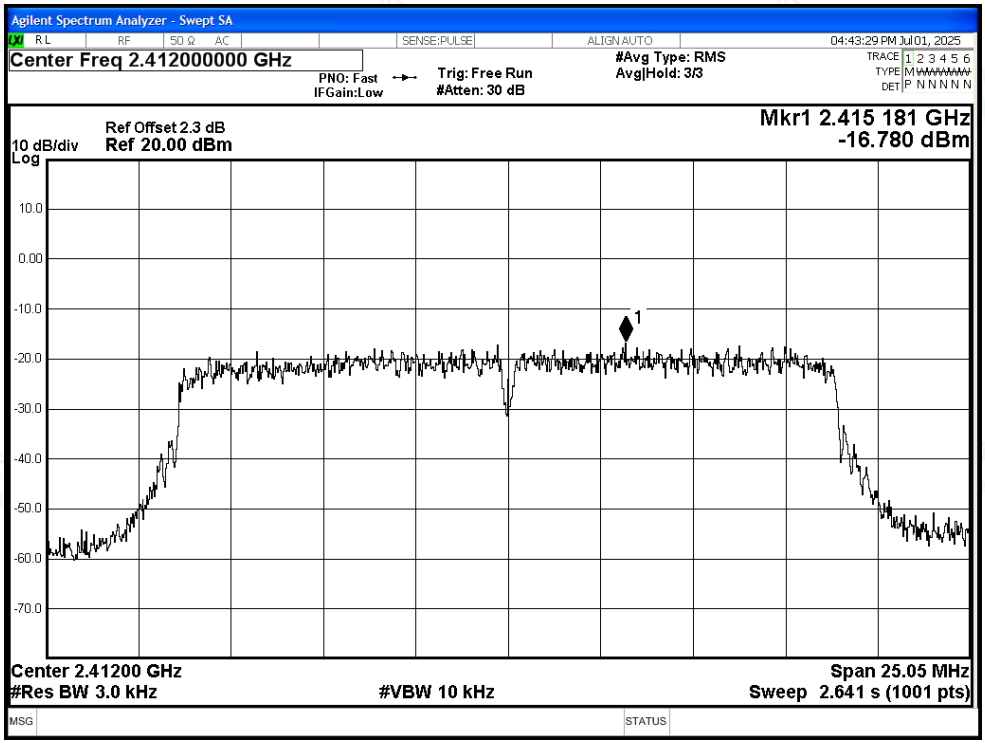
PSD NVNT g 2437MHz Ant1



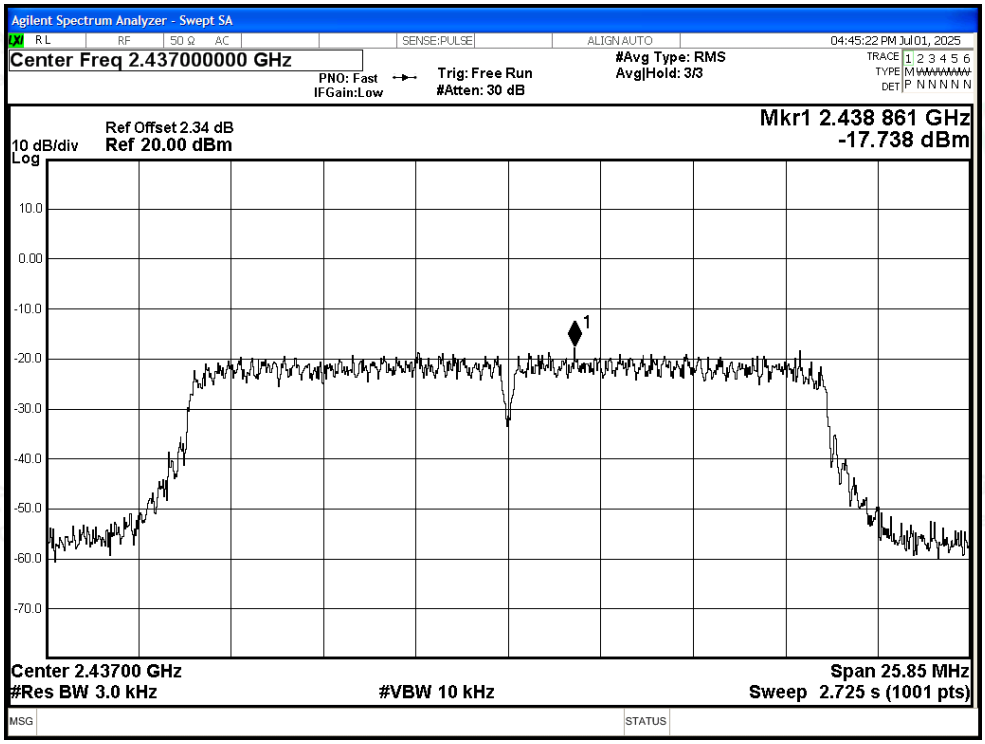
PSD NVNT g 2462MHz Ant1



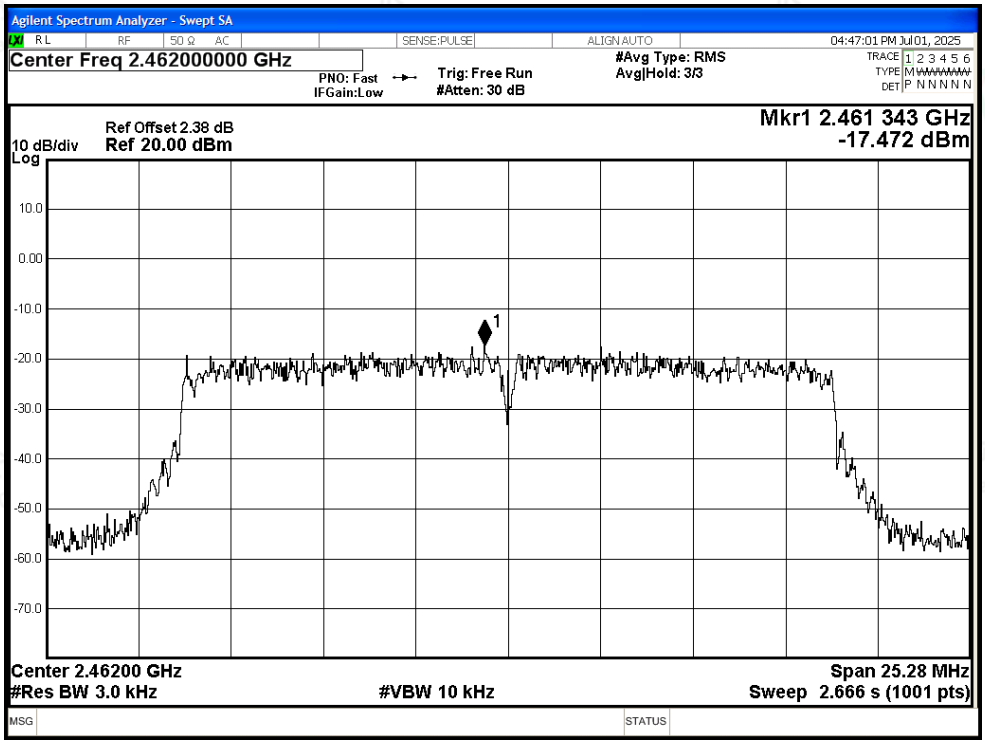
PSD NVNT n20 2412MHz Ant1



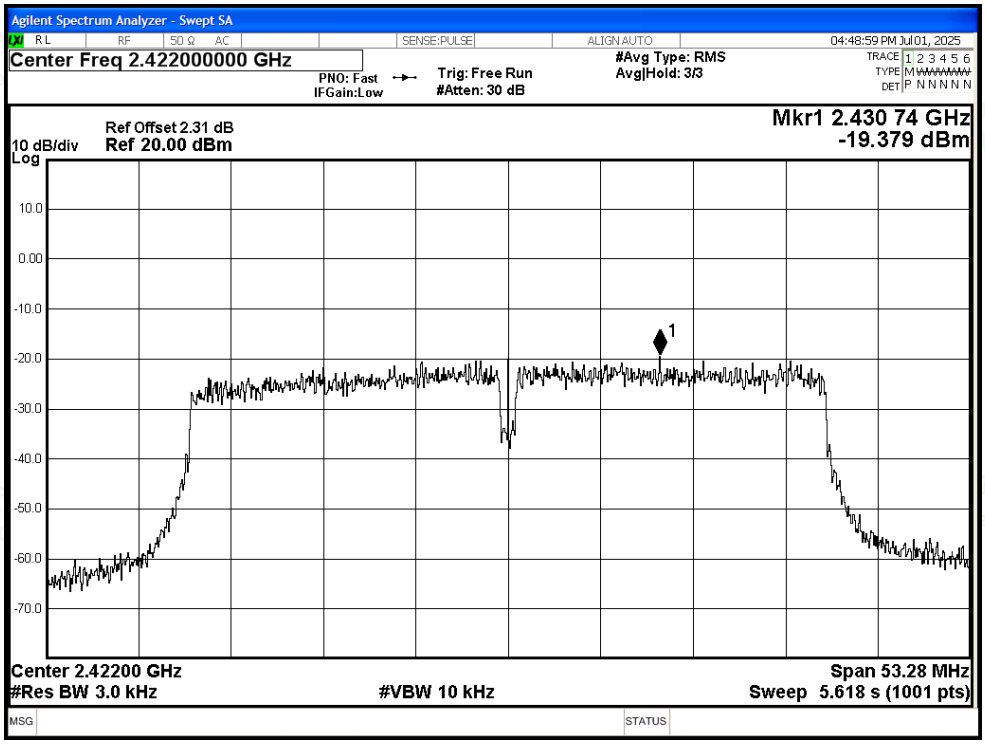
PSD NVNT n20 2437MHz Ant1



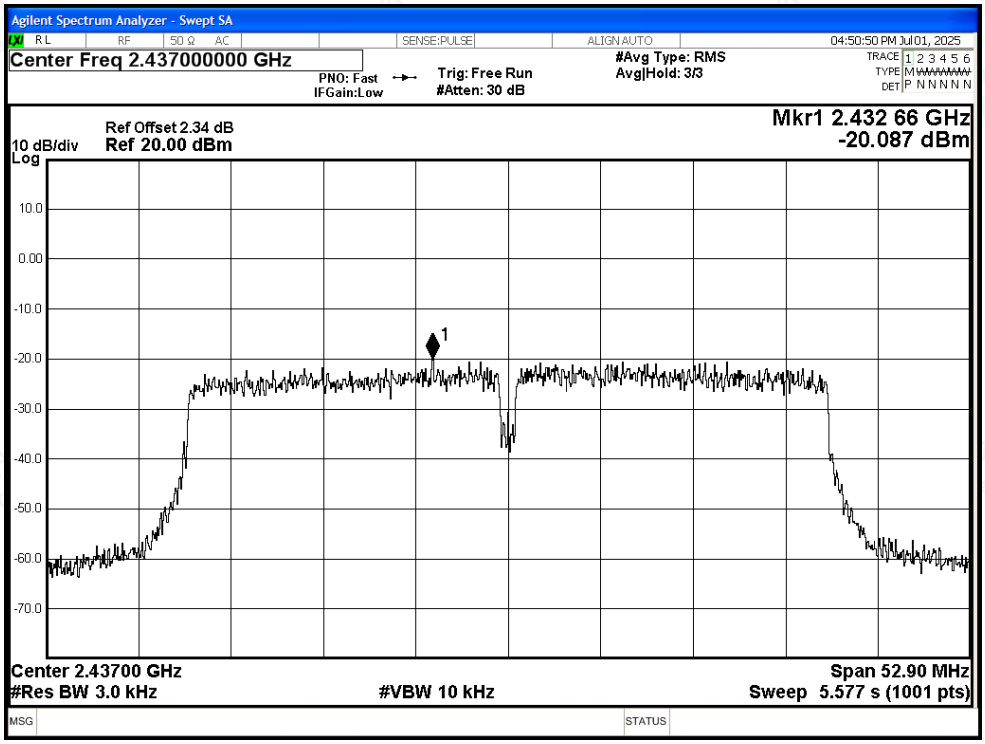
PSD NVNT n20 2462MHz Ant1



PSD NVNT n40 2422MHz Ant1



PSD NVNT n40 2437MHz Ant1



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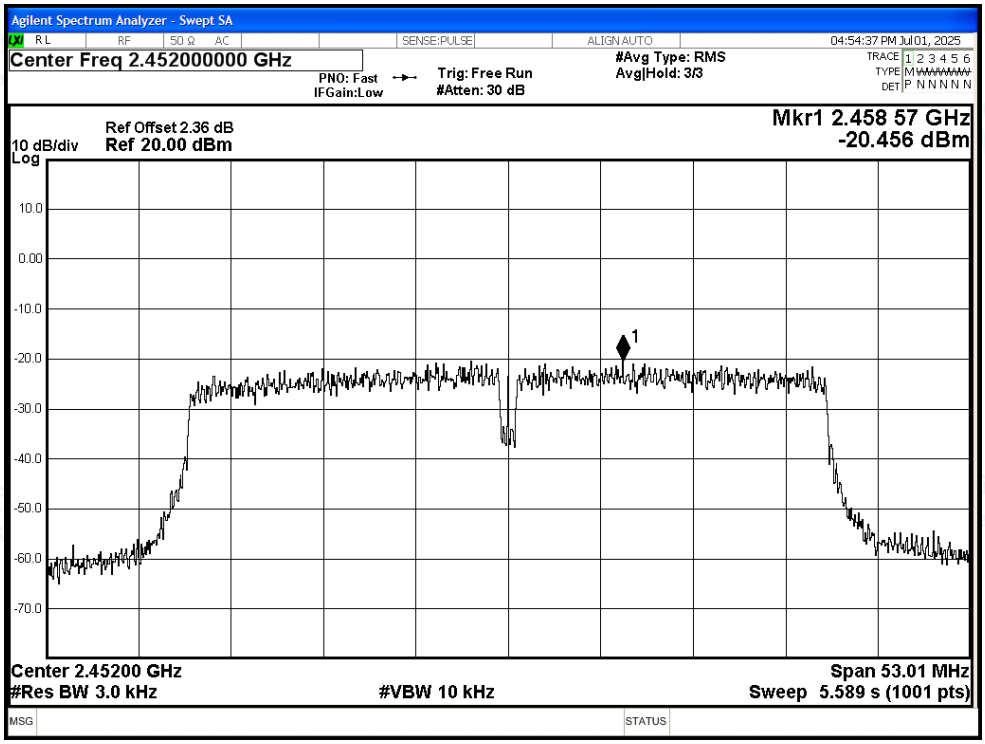
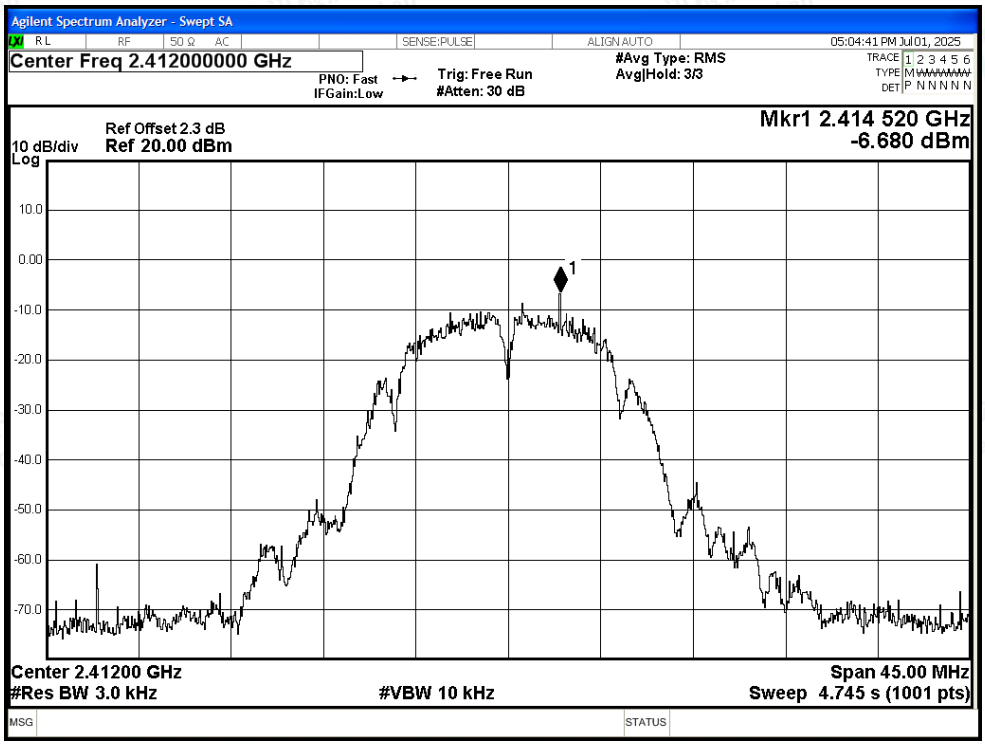
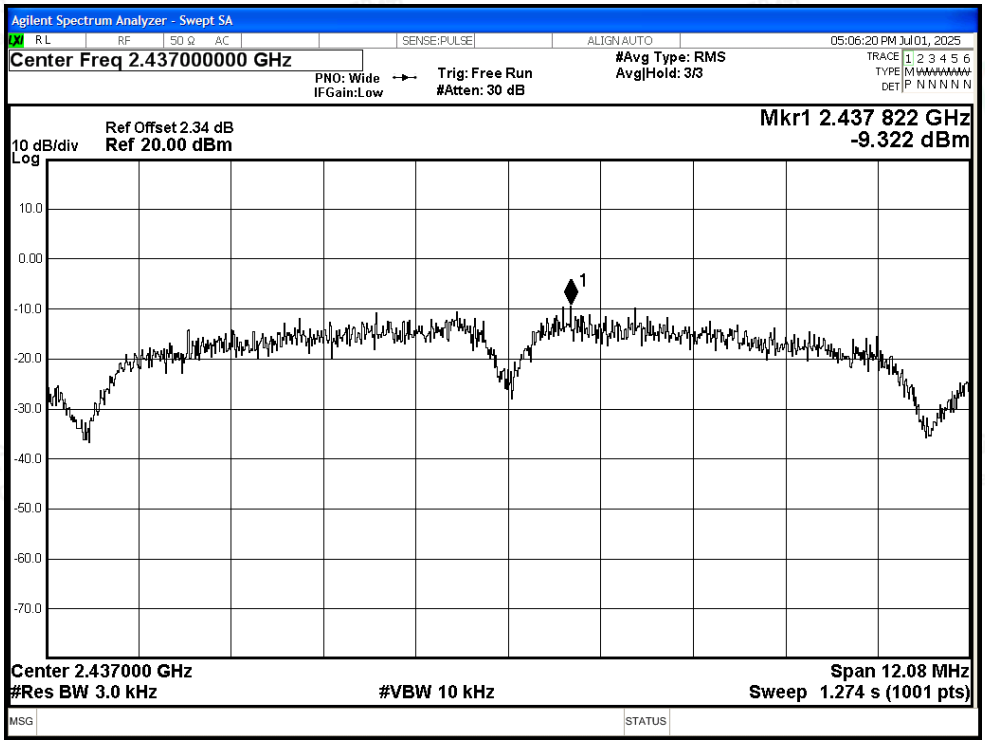


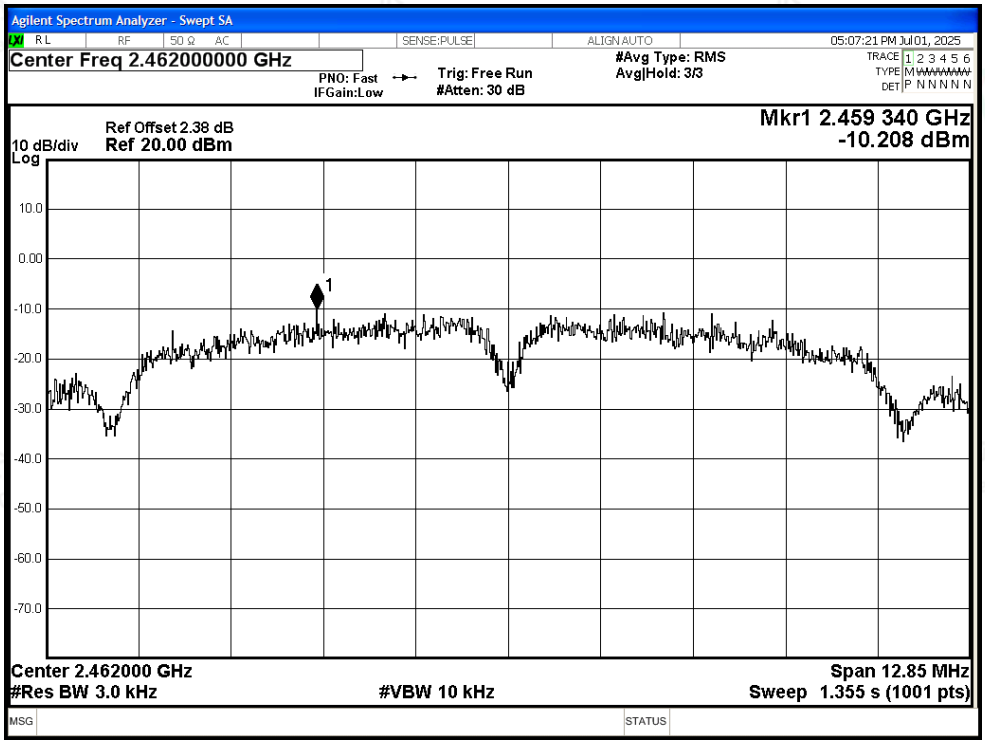
PSD NVNT b 2412MHz Ant2



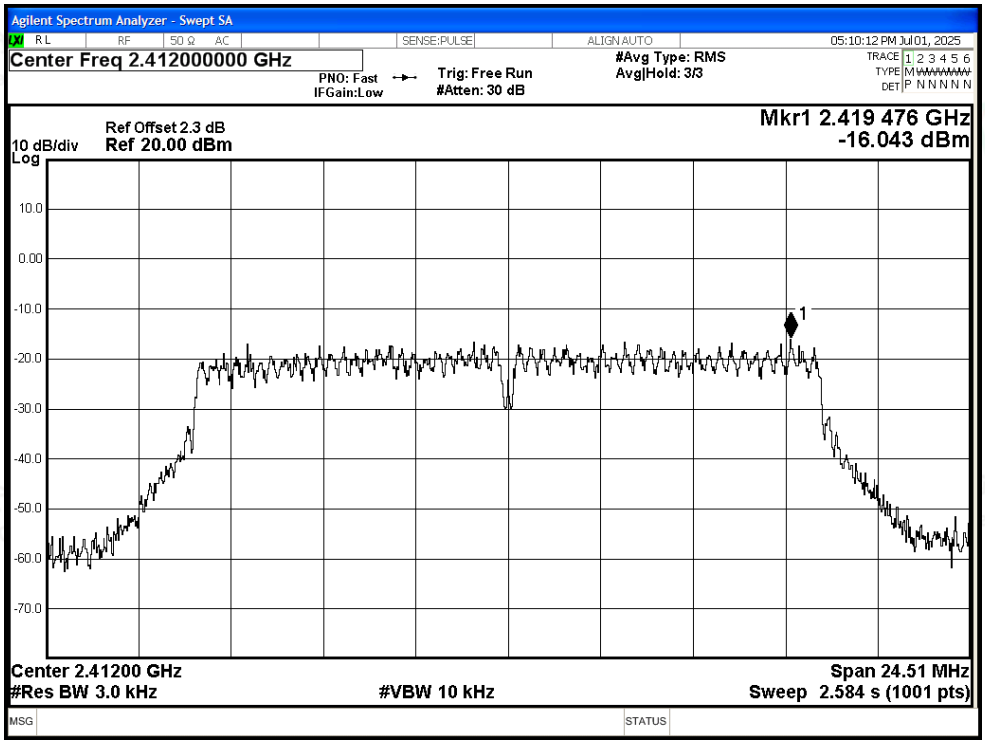
PSD NVNT b 2437MHz Ant2



PSD NVNT b 2462MHz Ant2



PSD NVNT g 2412MHz Ant2



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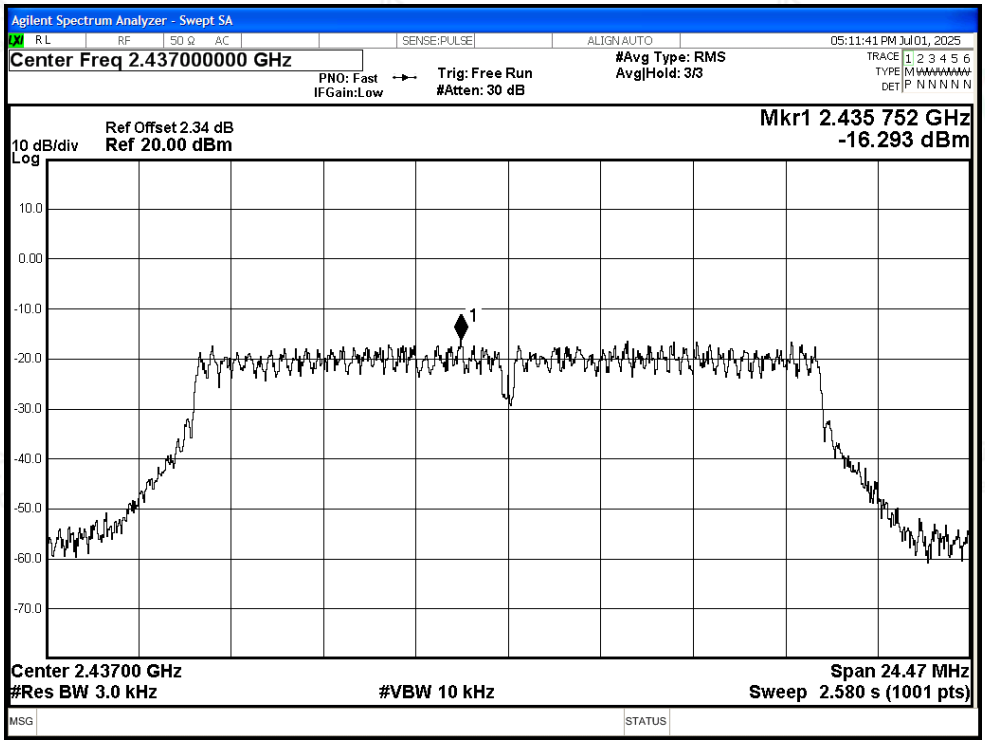

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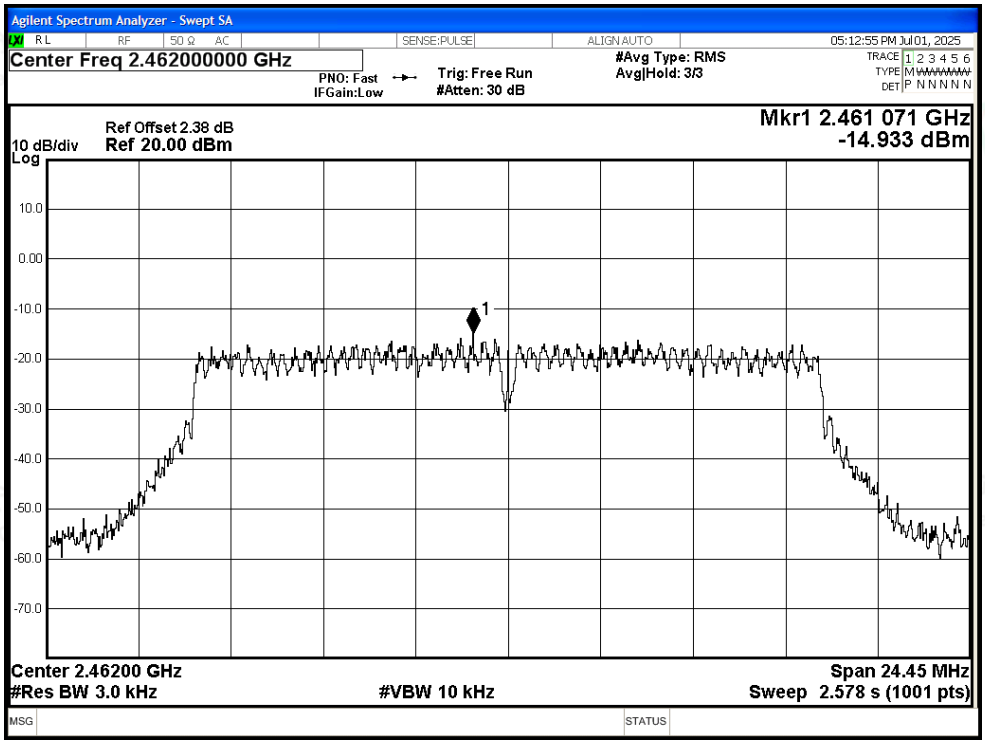
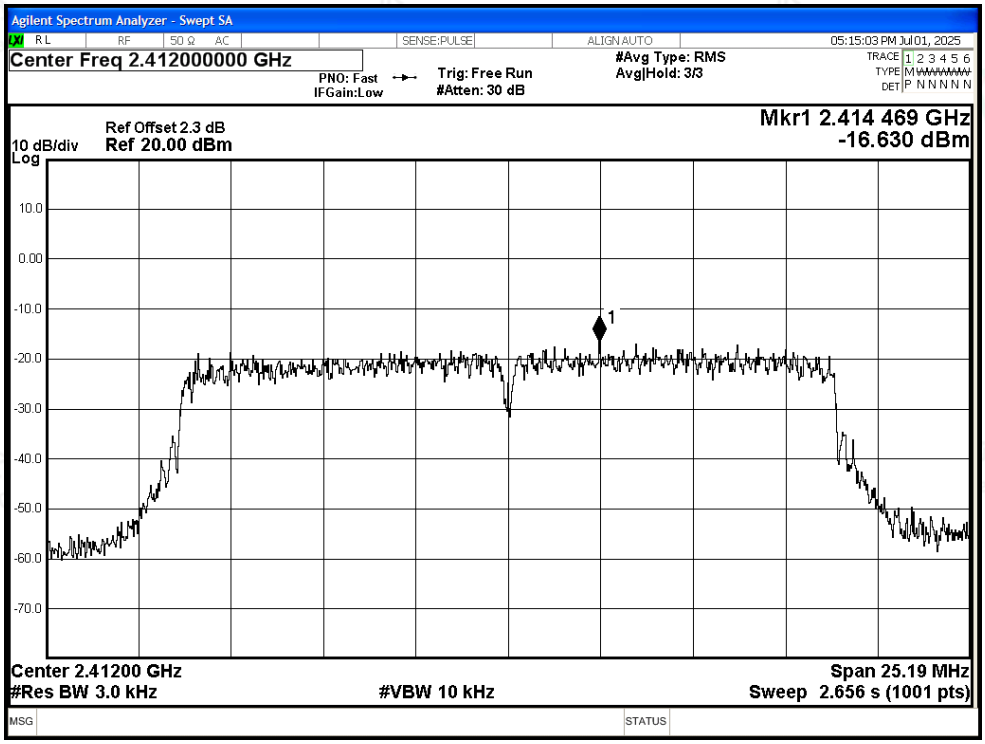


PSD NVNT n20 2412MHz Ant2



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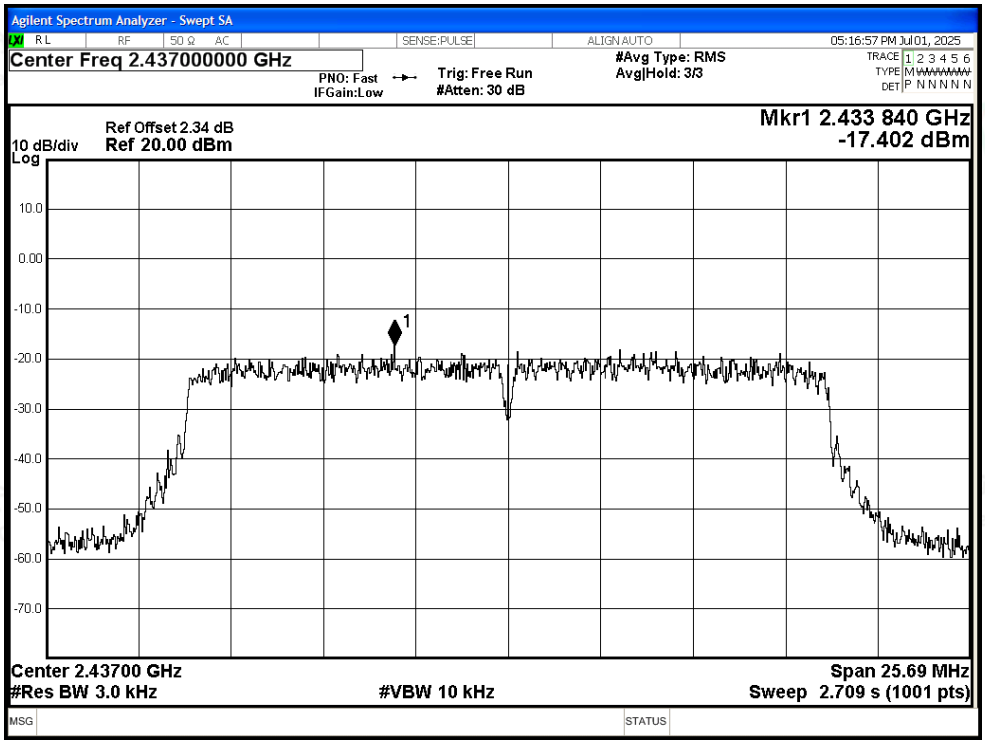

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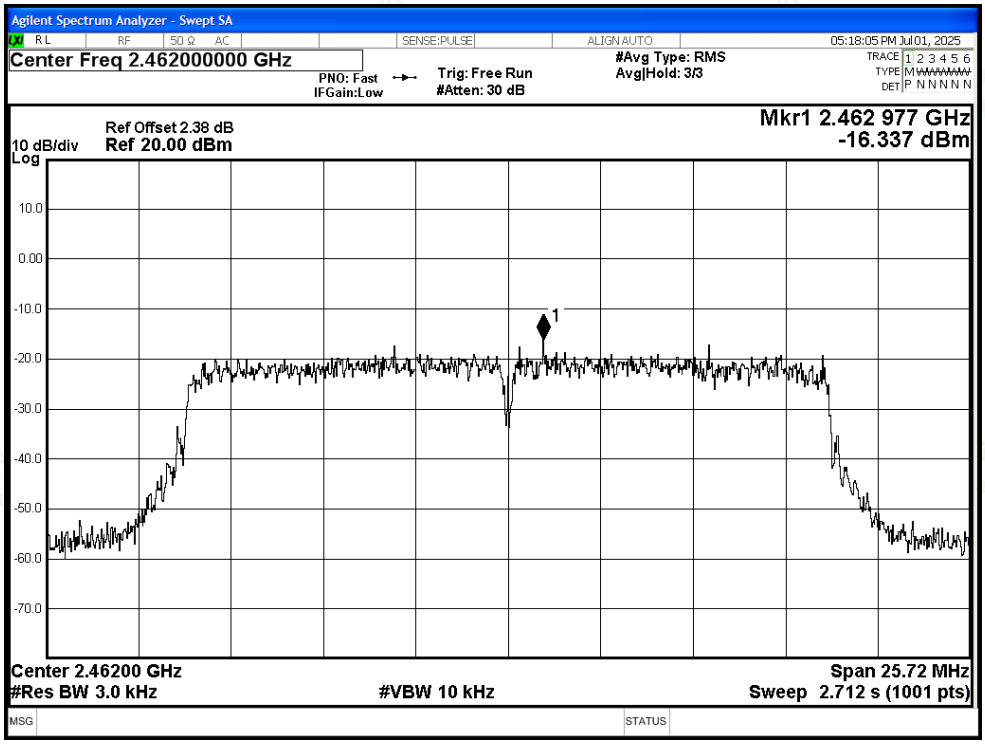
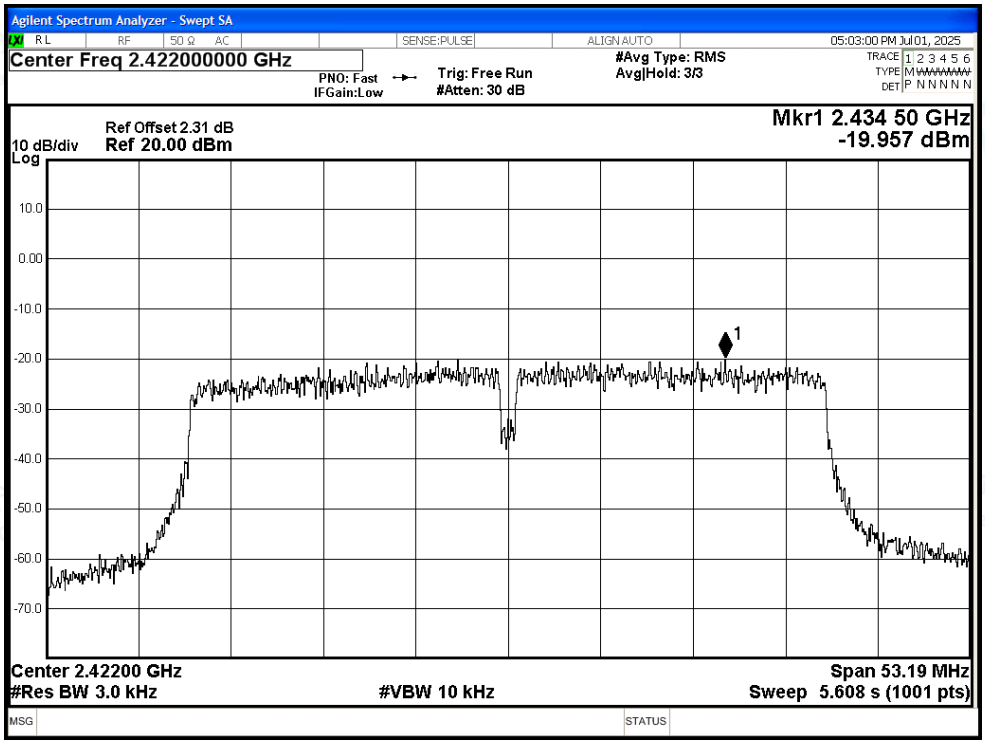
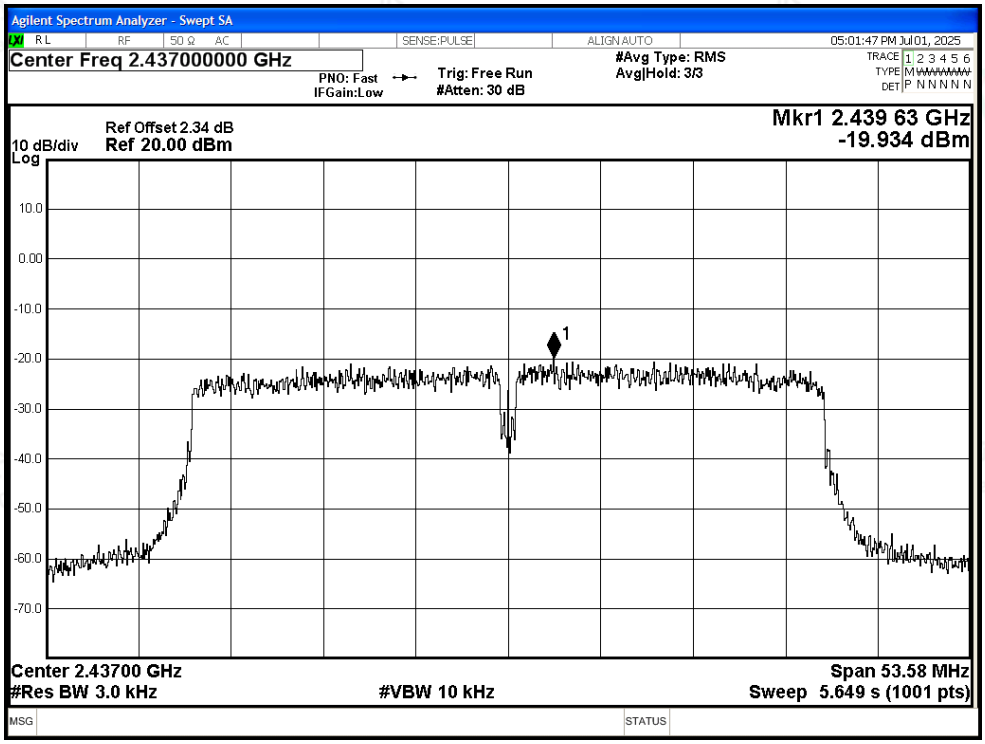


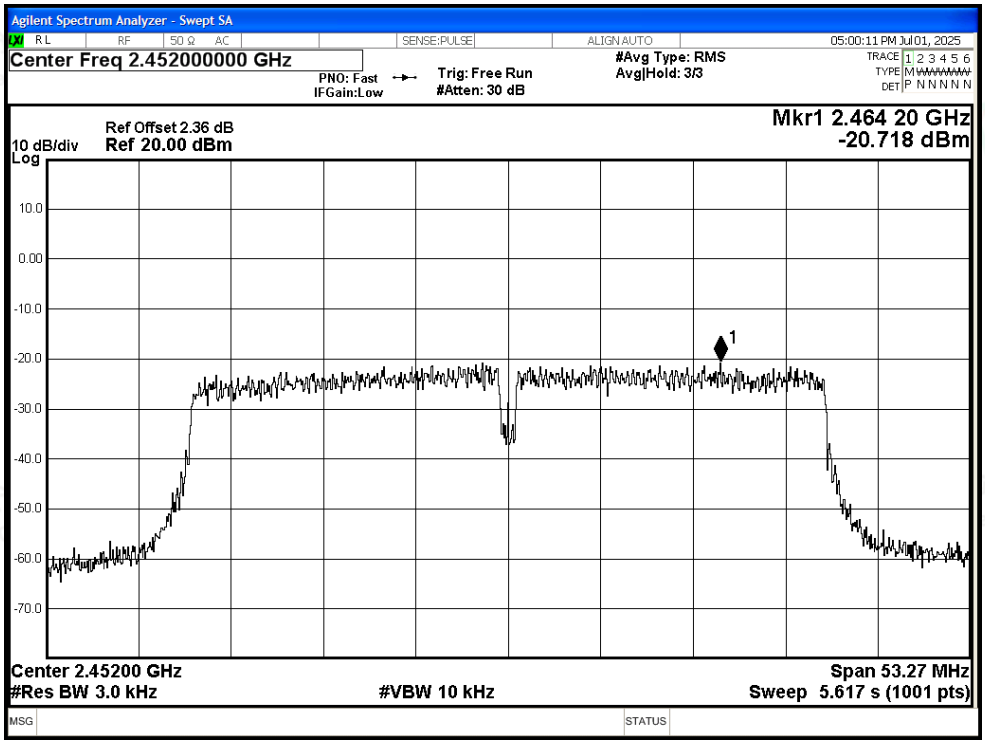
PSD NVNT n40 2422MHz Ant2



PSD NVNT n40 2437MHz Ant2



PSD NVNT n40 2452MHz Ant2

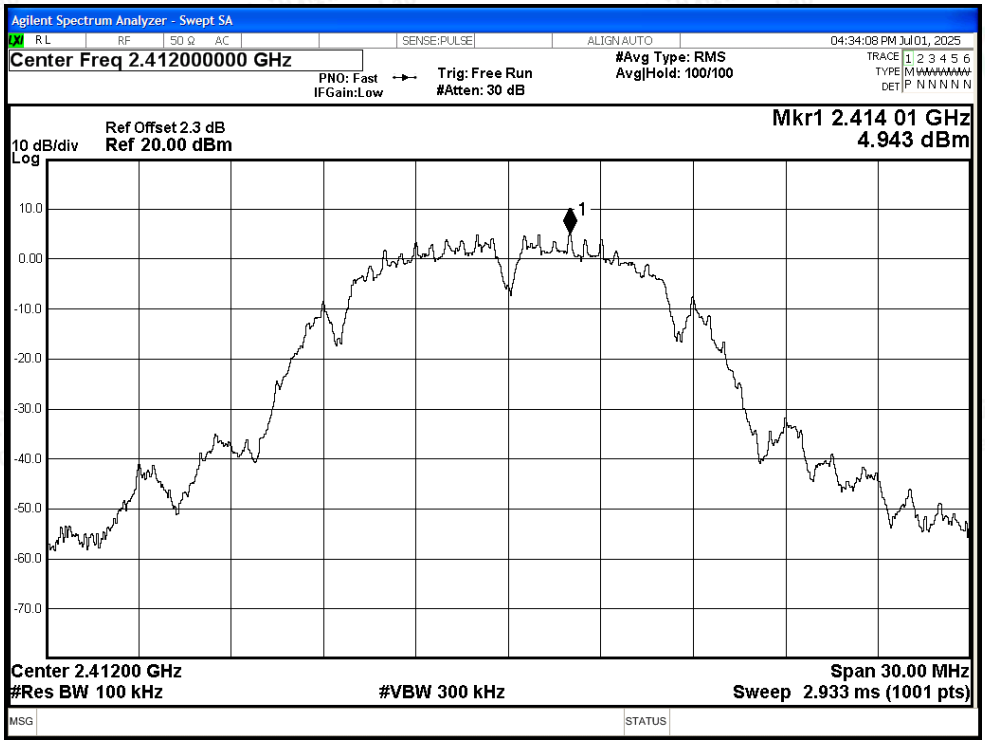


C.4 Band Edge

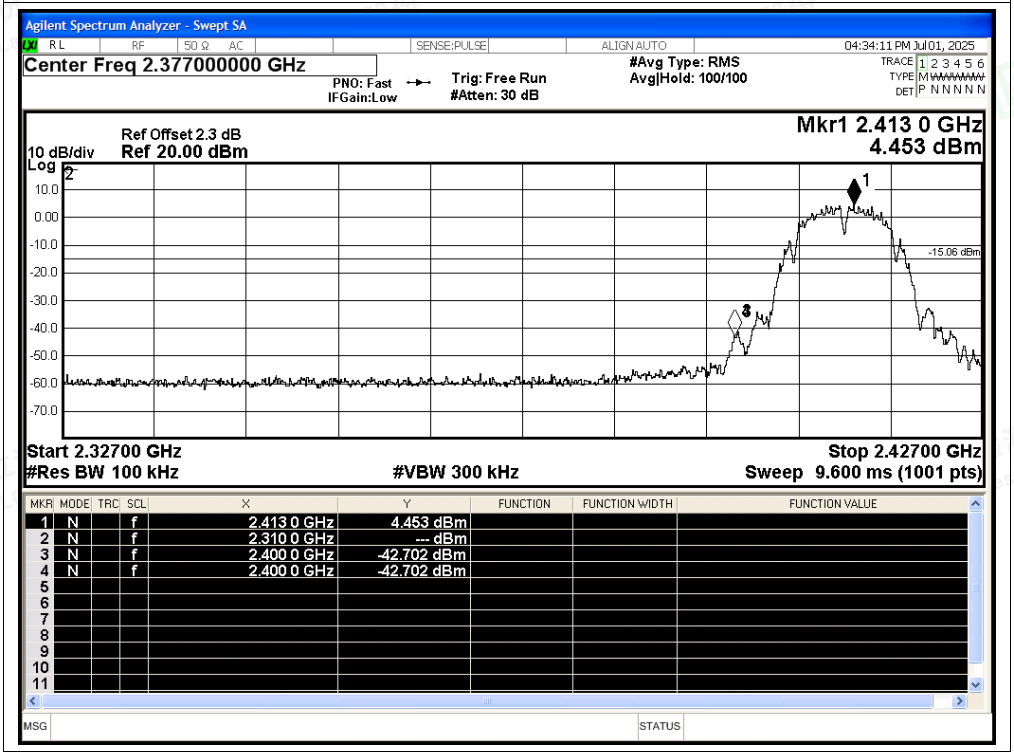
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	b	2412	Ant1	-47.65	-20	Pass
NVNT	b	2462	Ant1	-59.47	-20	Pass
NVNT	g	2412	Ant1	-32.53	-20	Pass
NVNT	g	2462	Ant1	-43.91	-20	Pass
NVNT	n20	2412	Ant1	-32.72	-20	Pass
NVNT	n20	2462	Ant1	-40.71	-20	Pass
NVNT	n40	2422	Ant1	-36.85	-20	Pass
NVNT	n40	2452	Ant1	-38.5	-20	Pass

Test Graphs

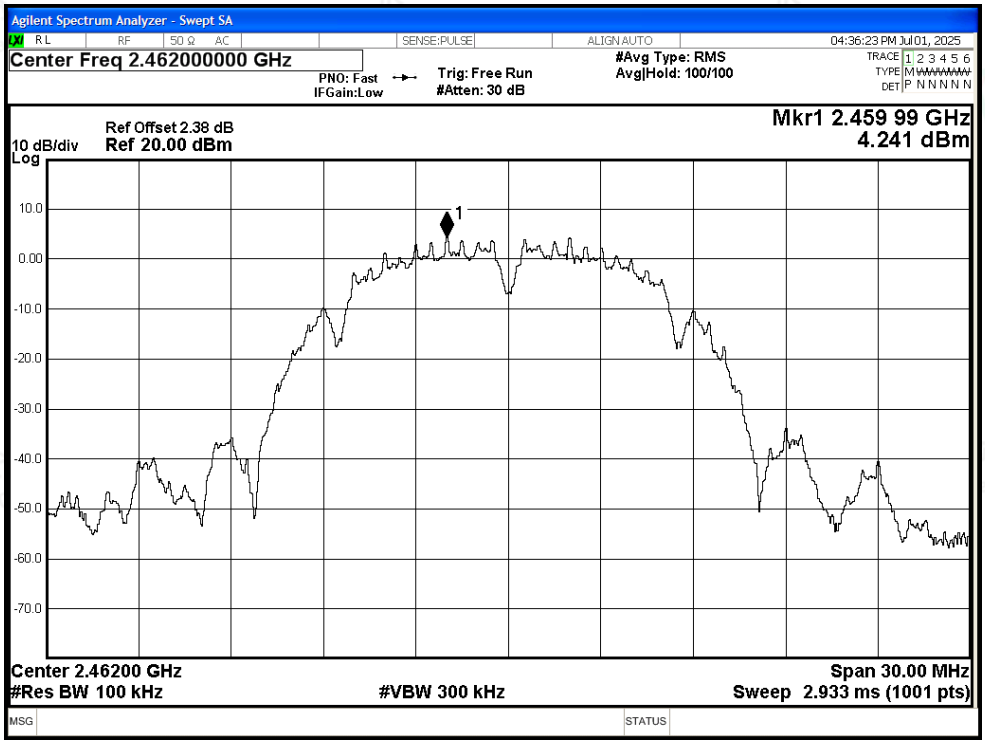
Band Edge NVNT b 2412MHz Ant1 Ref



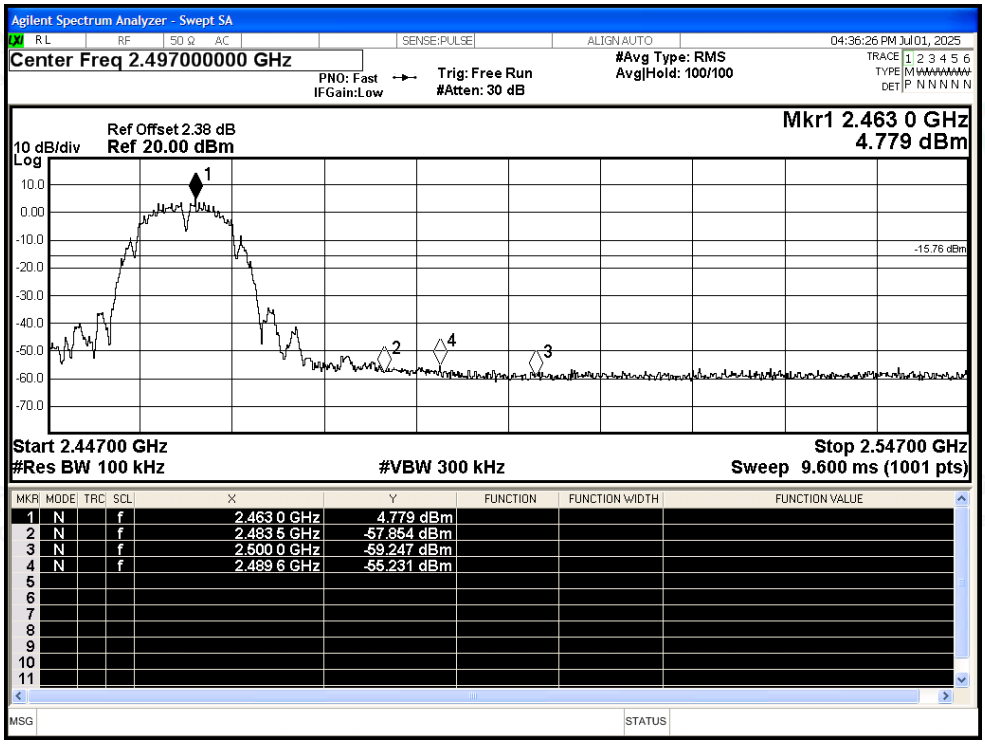
Band Edge NVNT b 2412MHz Ant1 Emission



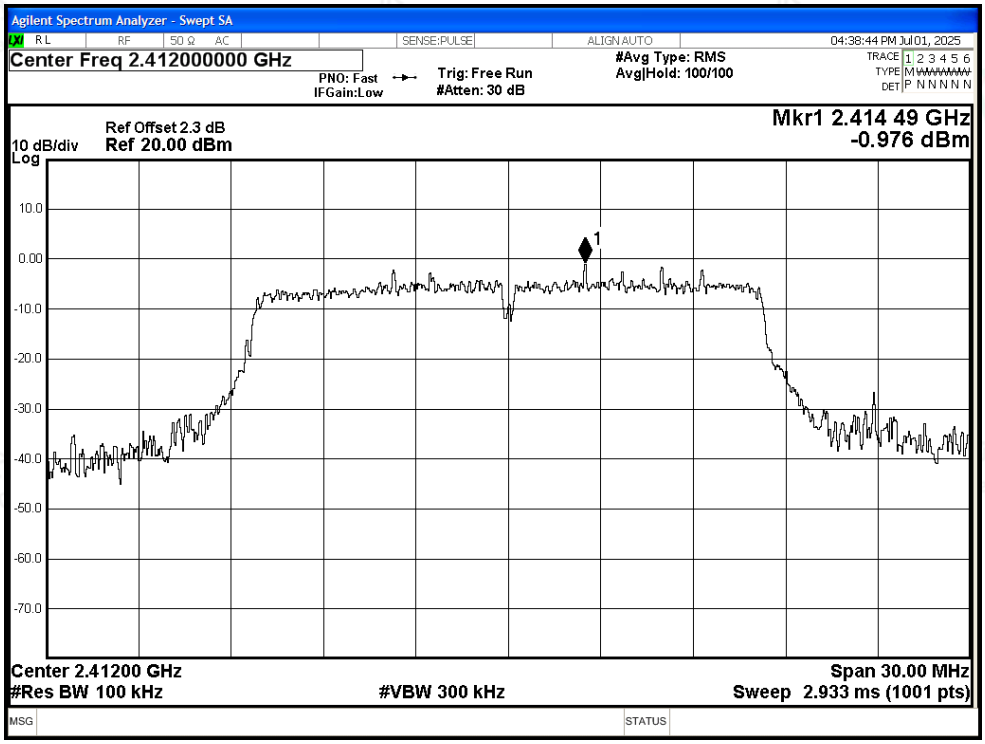
Band Edge NVNT b 2462MHz Ant1 Ref



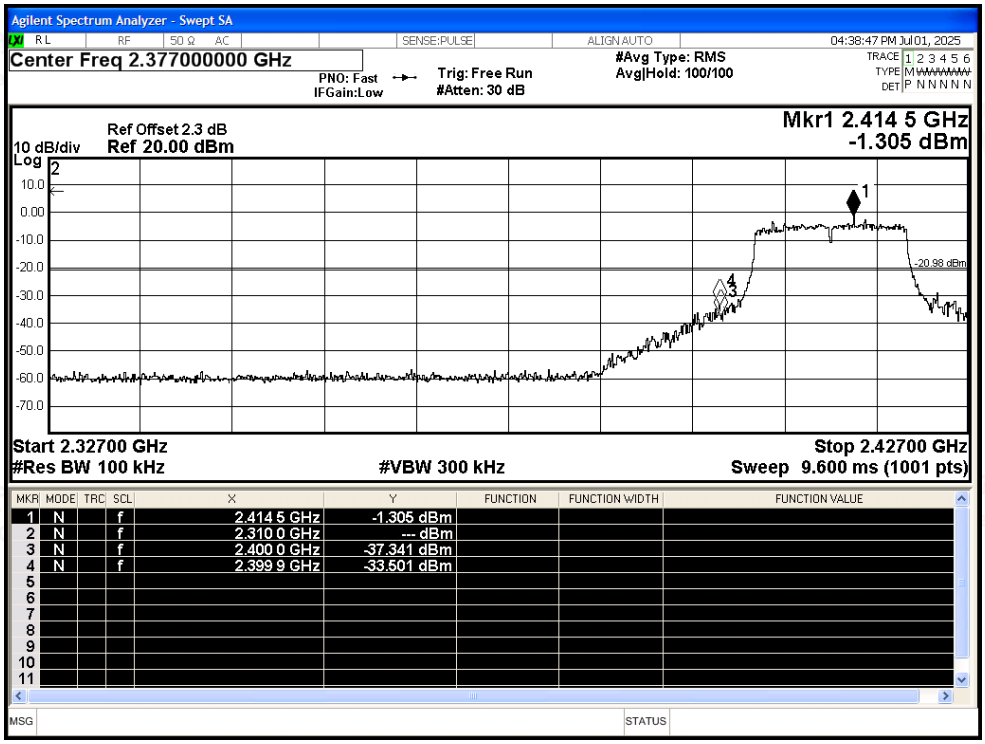
Band Edge NVNT b 2462MHz Ant1 Emission



Band Edge NVNT g 2412MHz Ant1 Ref

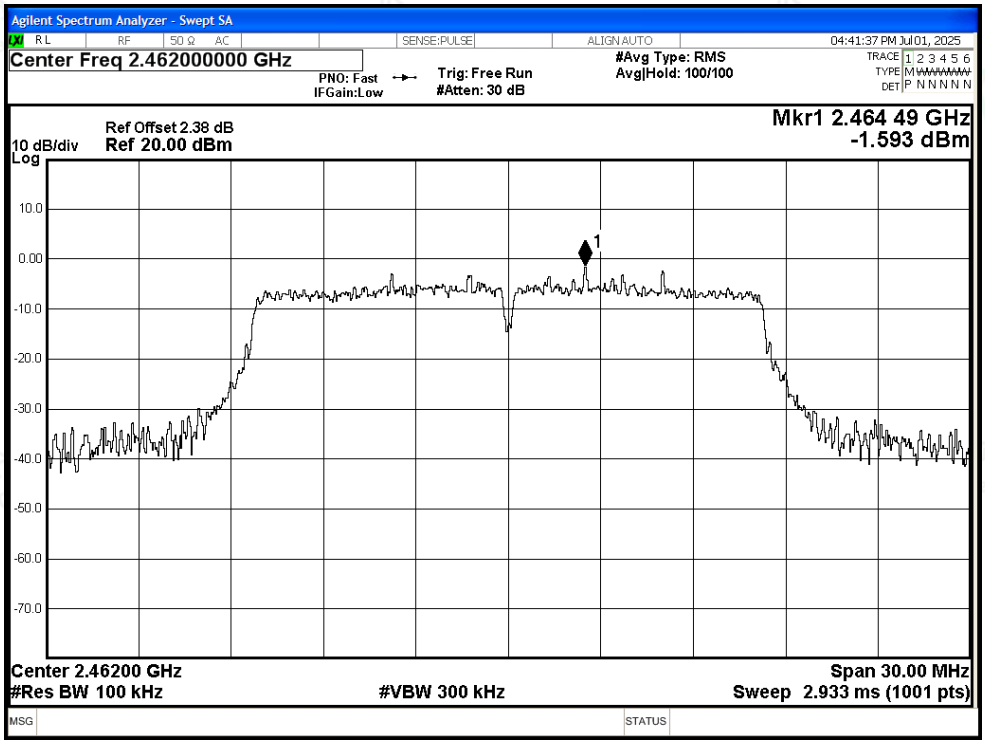


Band Edge NVNT g 2412MHz Ant1 Emission

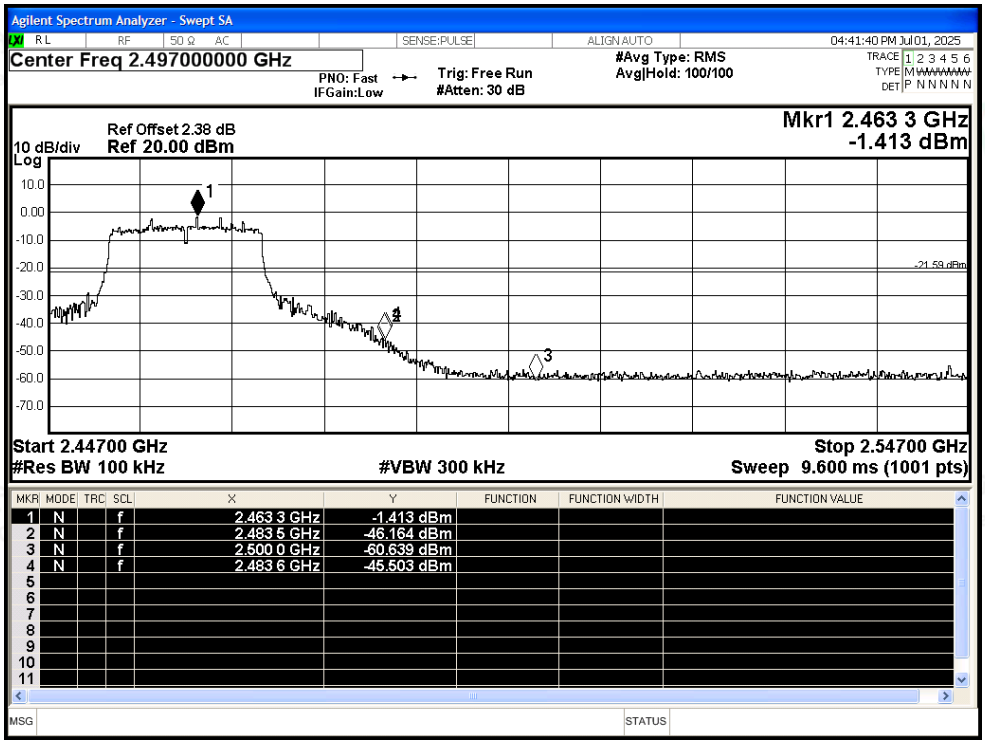


MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N		f	2.414 5 GHz	-1.305 dBm			
2	N		f	2.310 0 GHz	--- dBm			
3	N		f	2.400 0 GHz	-37.341 dBm			
4	N		f	2.399 9 GHz	-33.501 dBm			
5								
6								
7								
8								
9								
10								
11								

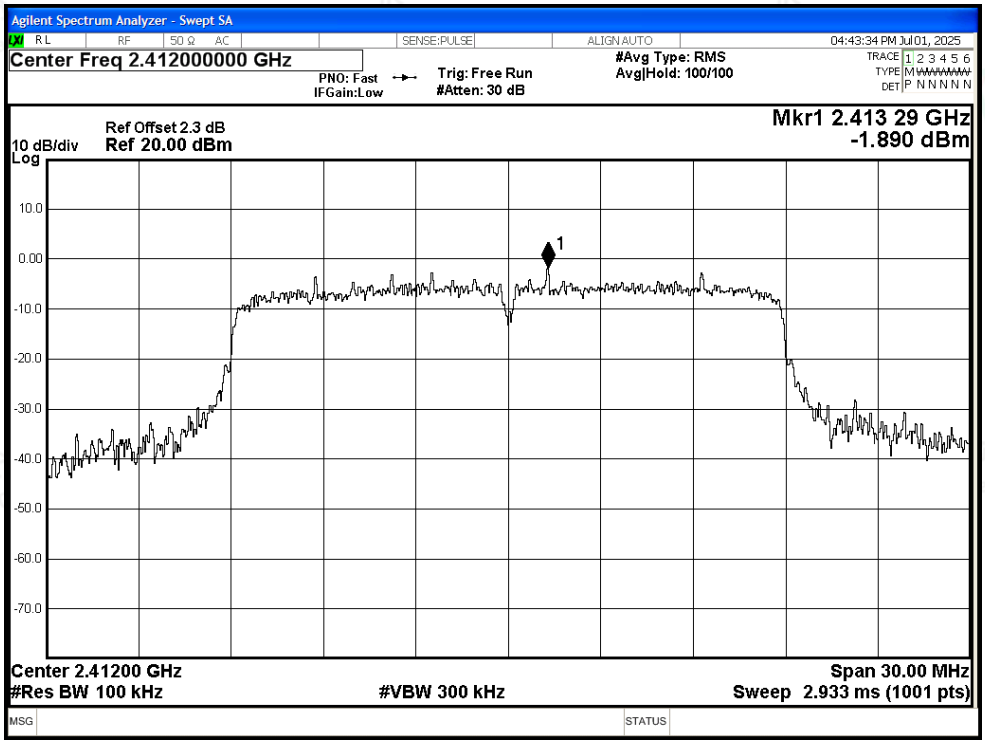
Band Edge NVNT g 2462MHz Ant1 Ref



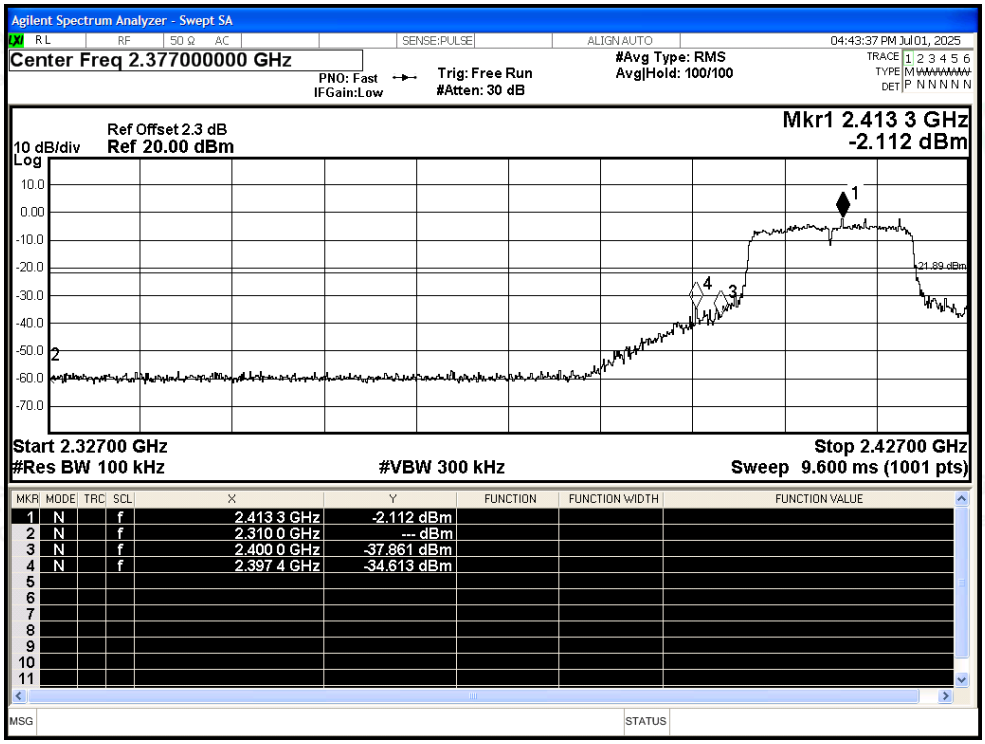
Band Edge NVNT g 2462MHz Ant1 Emission



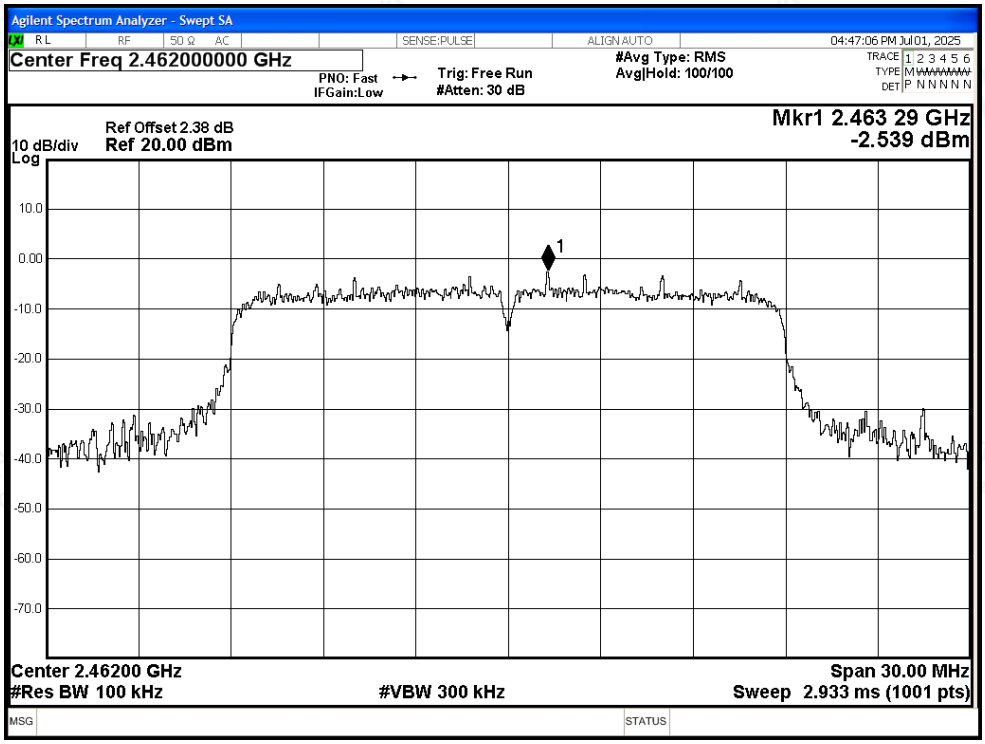
Band Edge NVNT n20 2412MHz Ant1 Ref



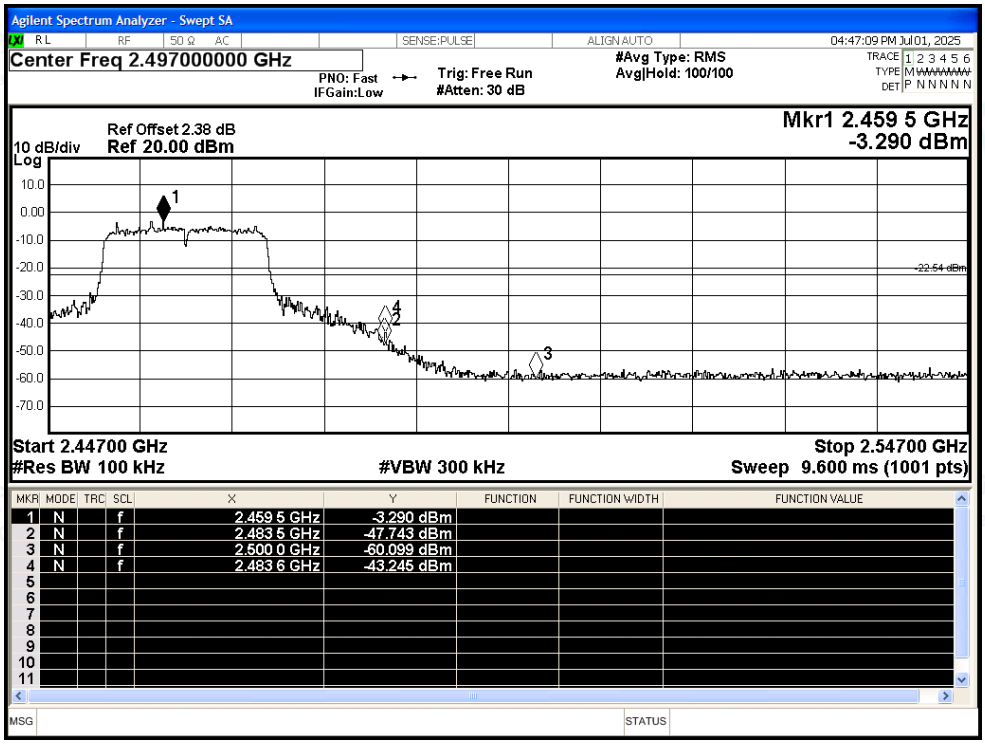
Band Edge NVNT n20 2412MHz Ant1 Emission



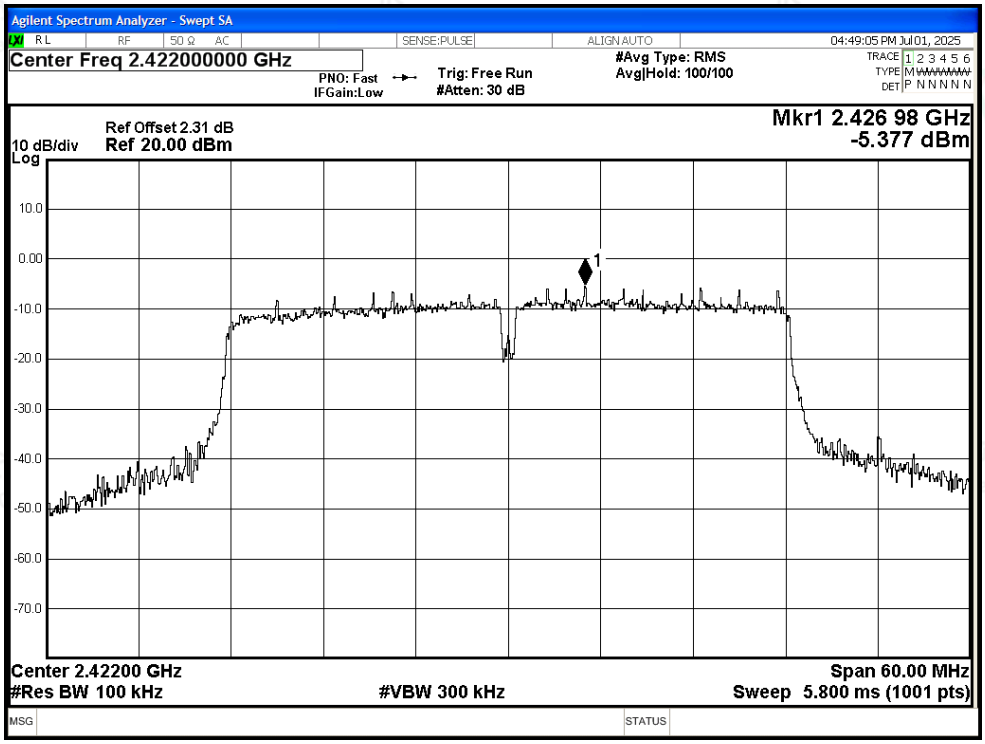
Band Edge NVNT n20 2462MHz Ant1 Ref



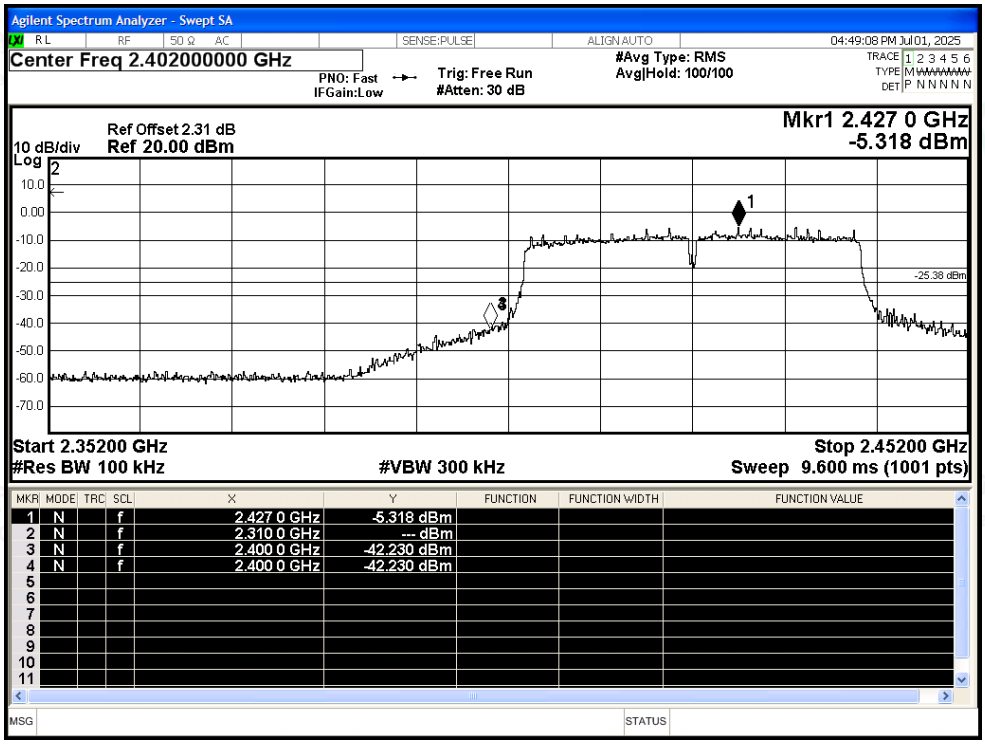
Band Edge NVNT n20 2462MHz Ant1 Emission



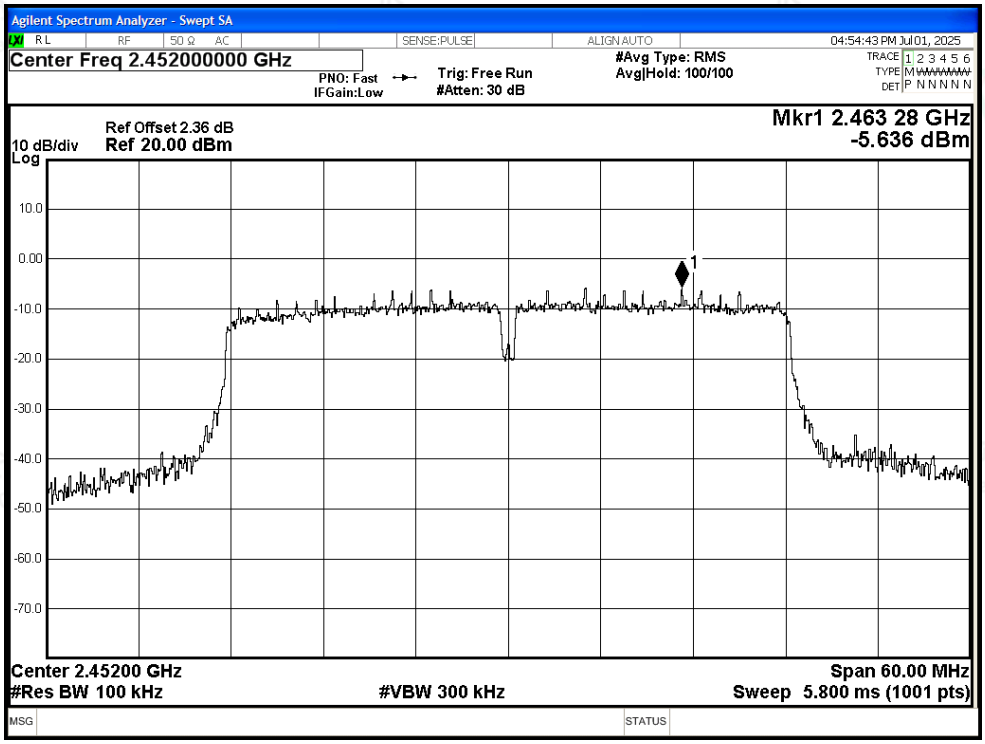
Band Edge NVNT n40 2422MHz Ant1 Ref



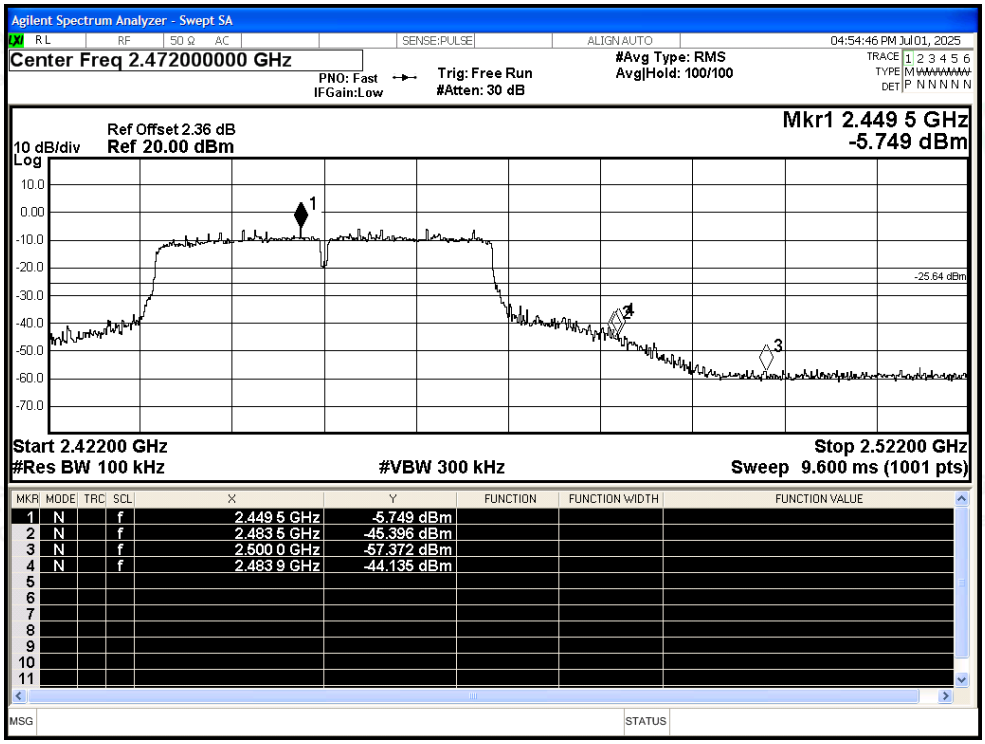
Band Edge NVNT n40 2422MHz Ant1 Emission



Band Edge NVNT n40 2452MHz Ant1 Ref



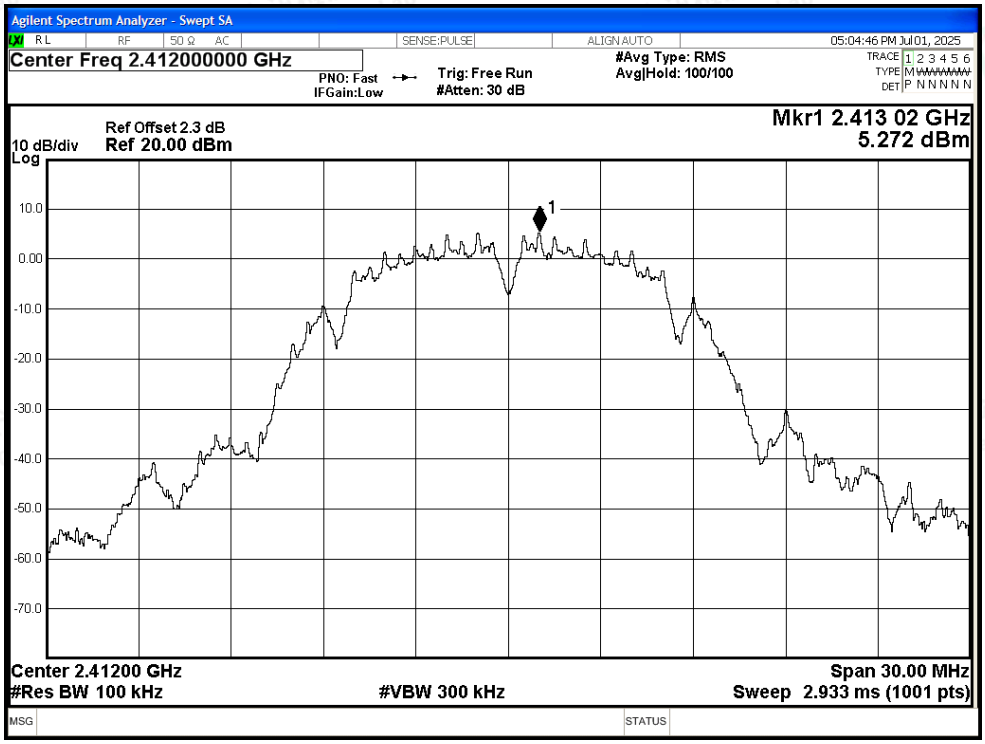
Band Edge NVNT n40 2452MHz Ant1 Emission



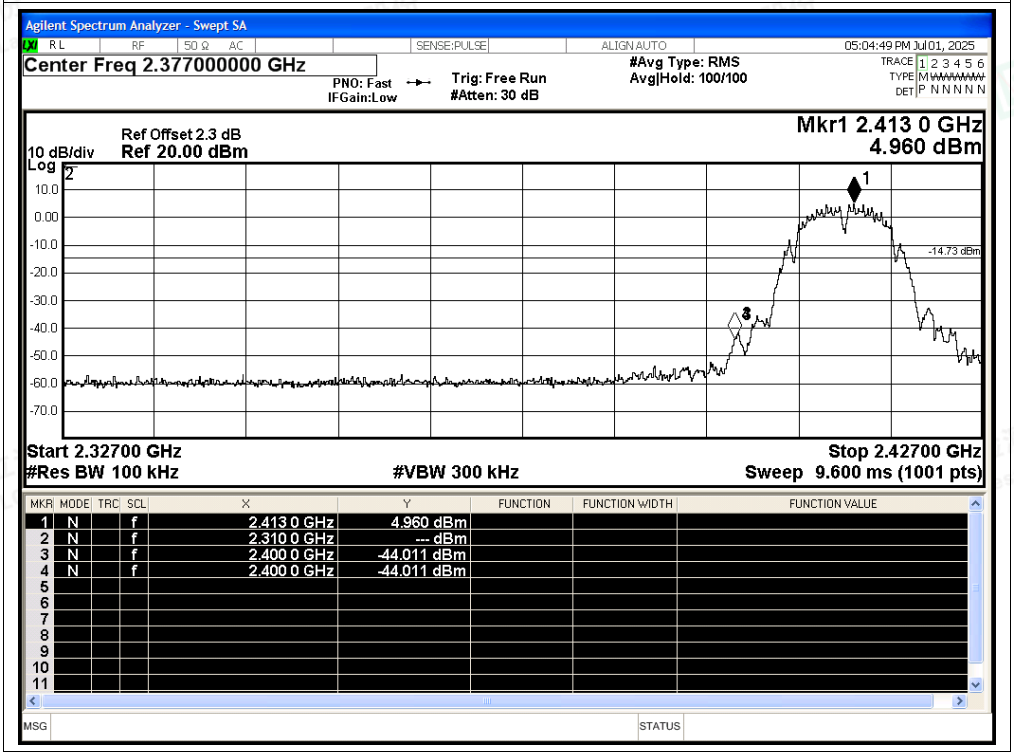
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	b	2412	Ant2	-49.28	-20	Pass
NVNT	b	2462	Ant2	-59.72	-20	Pass
NVNT	g	2412	Ant2	-33.96	-20	Pass
NVNT	g	2462	Ant2	-41.7	-20	Pass
NVNT	n20	2412	Ant2	-31.6	-20	Pass
NVNT	n20	2462	Ant2	-42.44	-20	Pass
NVNT	n40	2422	Ant2	-35.59	-20	Pass
NVNT	n40	2452	Ant2	-37.75	-20	Pass

Test Graphs

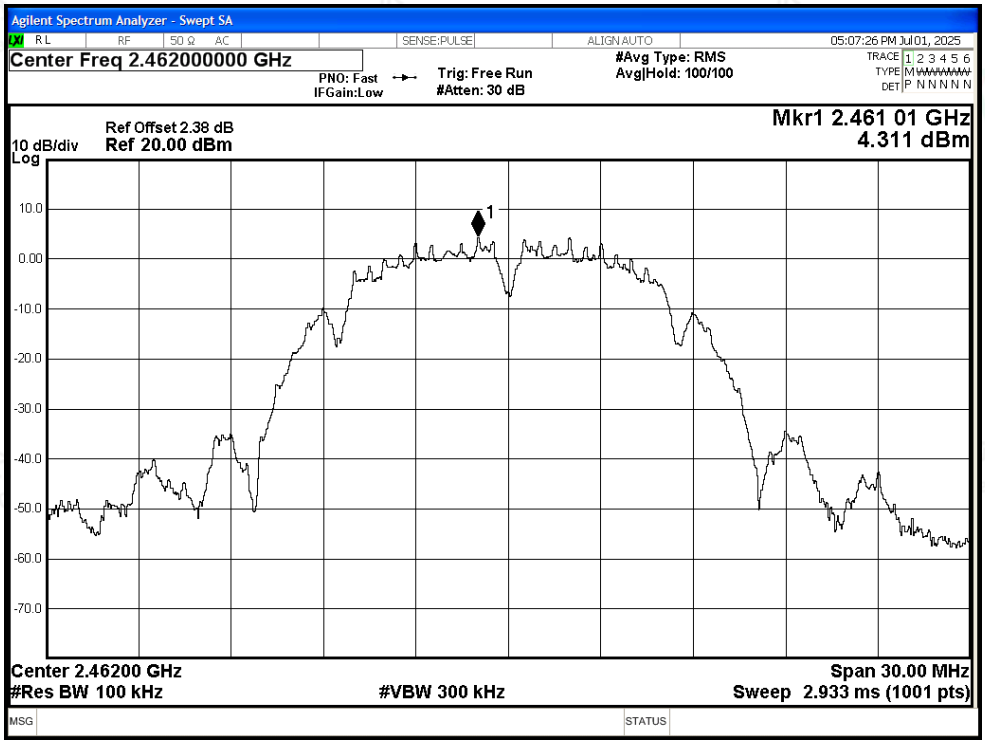
Band Edge NVNT b 2412MHz Ant2 Ref



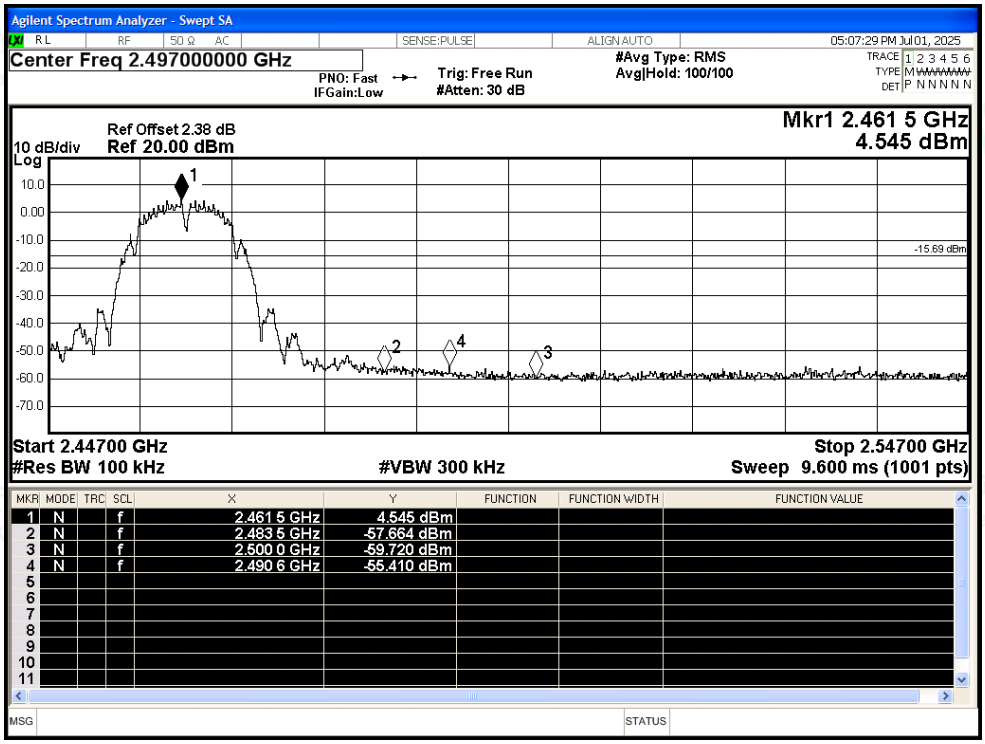
Band Edge NVNT b 2412MHz Ant2 Emission



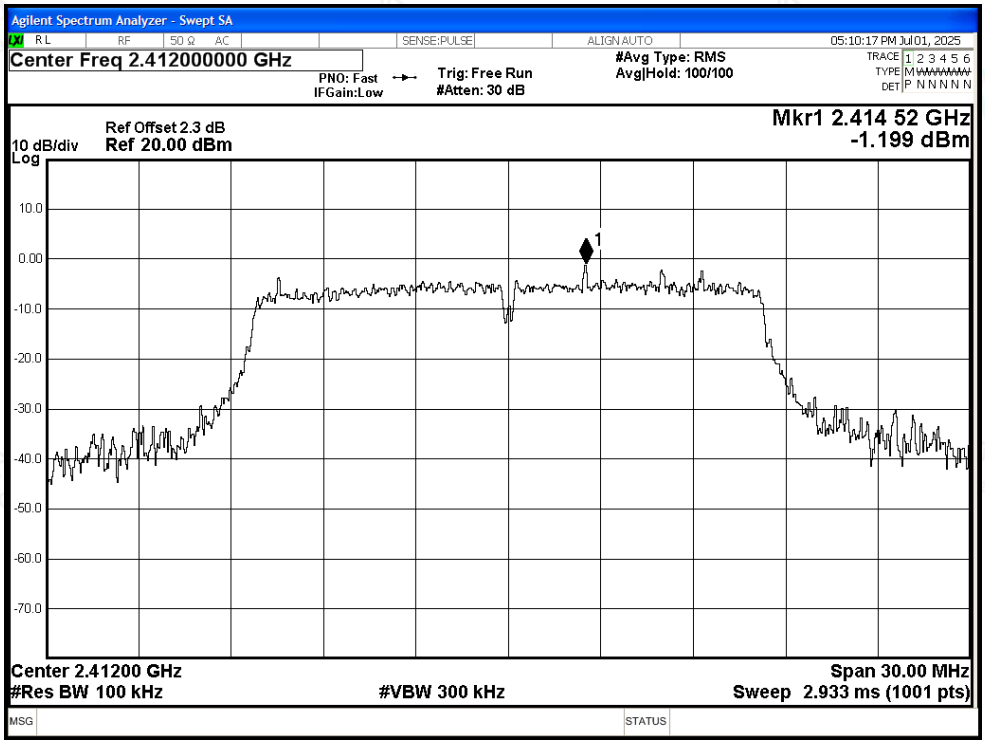
Band Edge NVNT b 2462MHz Ant2 Ref



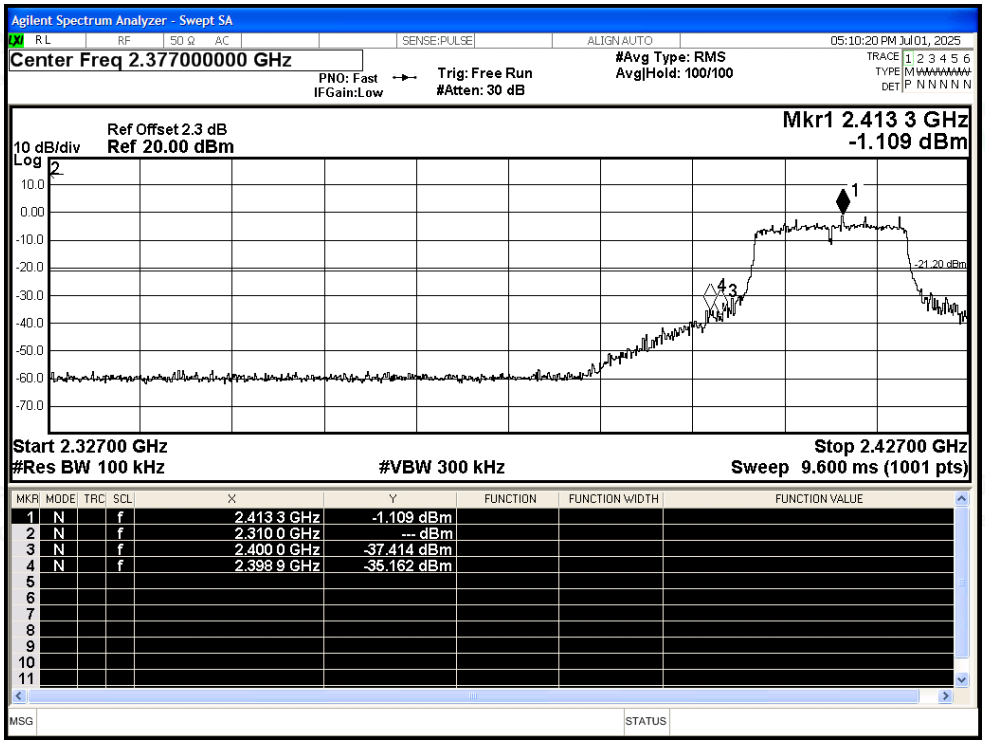
Band Edge NVNT b 2462MHz Ant2 Emission



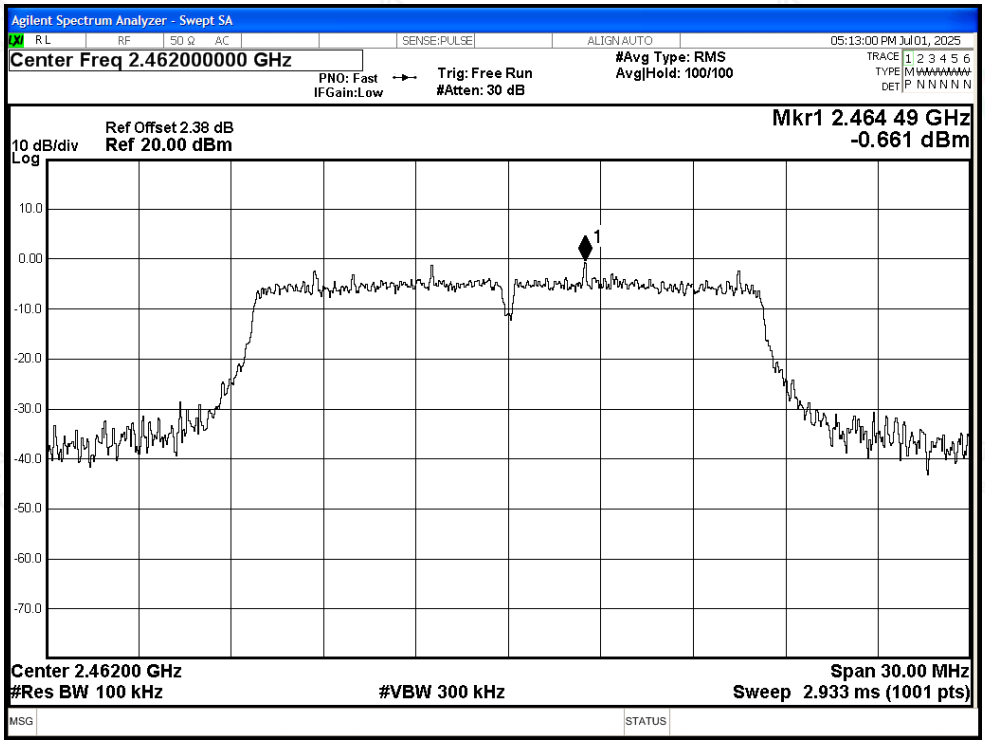
Band Edge NVNT g 2412MHz Ant2 Ref



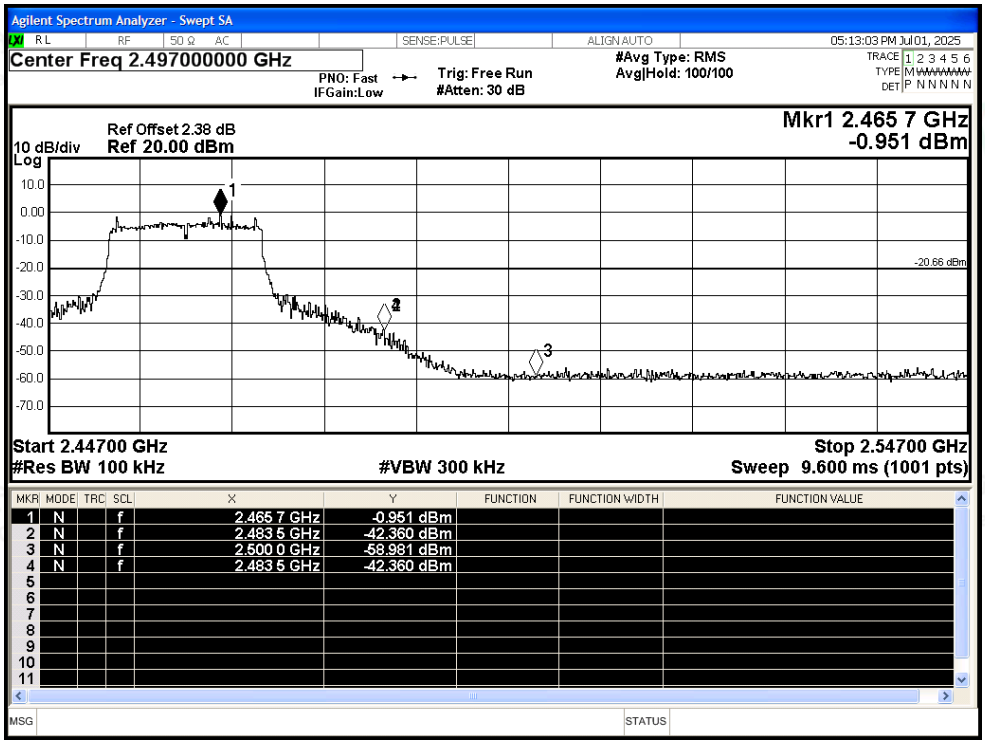
Band Edge NVNT g 2412MHz Ant2 Emission



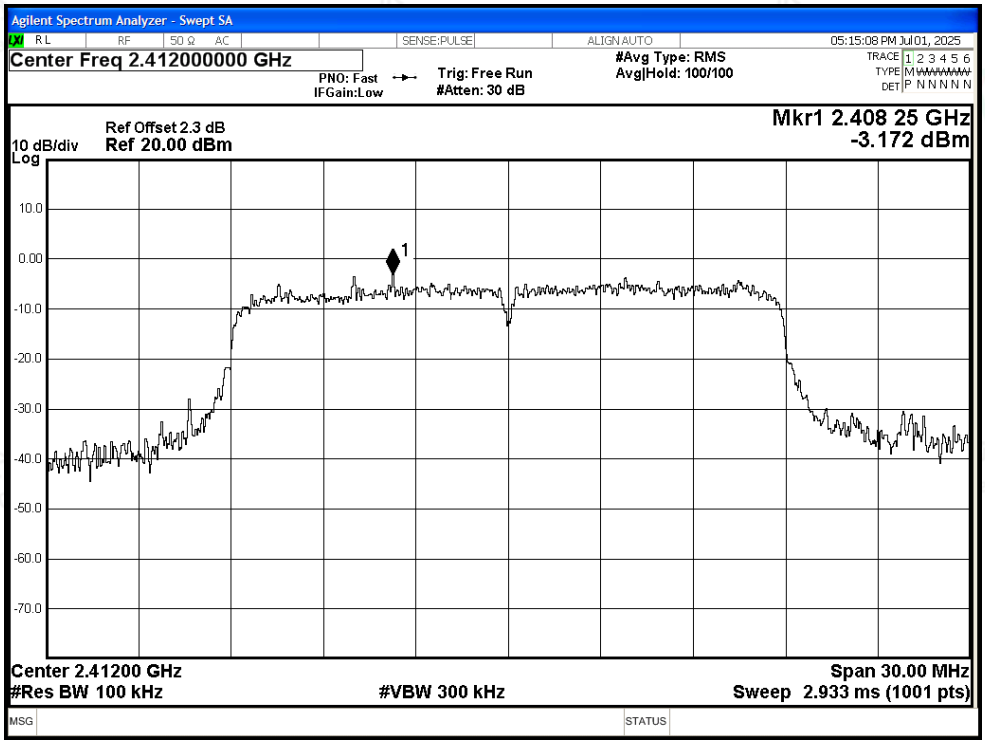
Band Edge NVNT g 2462MHz Ant2 Ref



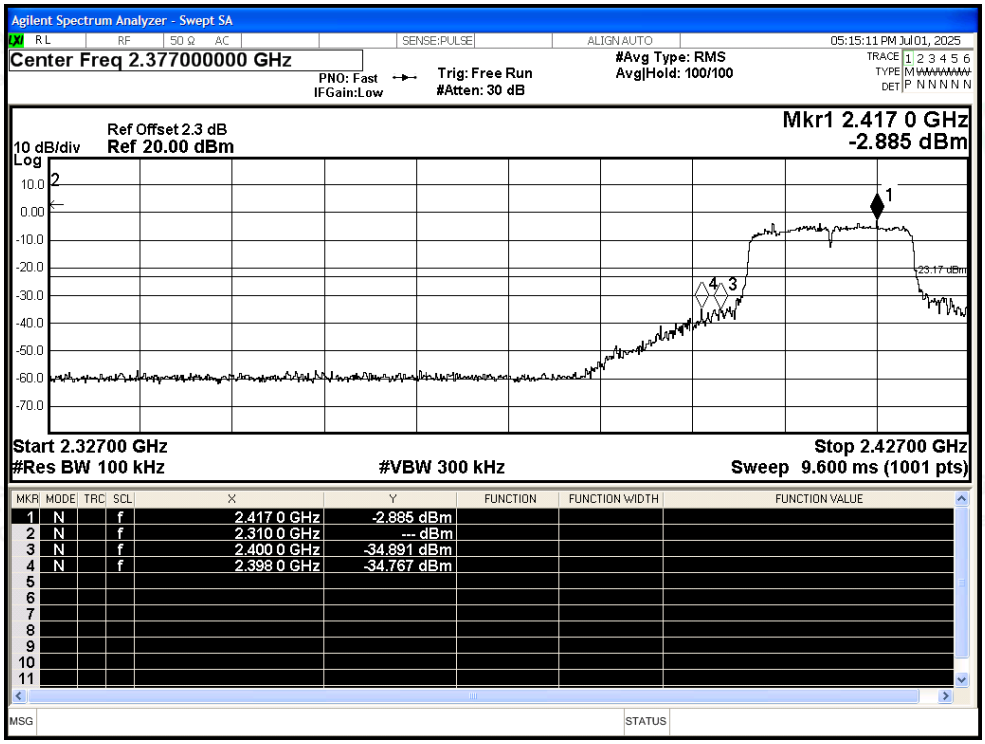
Band Edge NVNT g 2462MHz Ant2 Emission



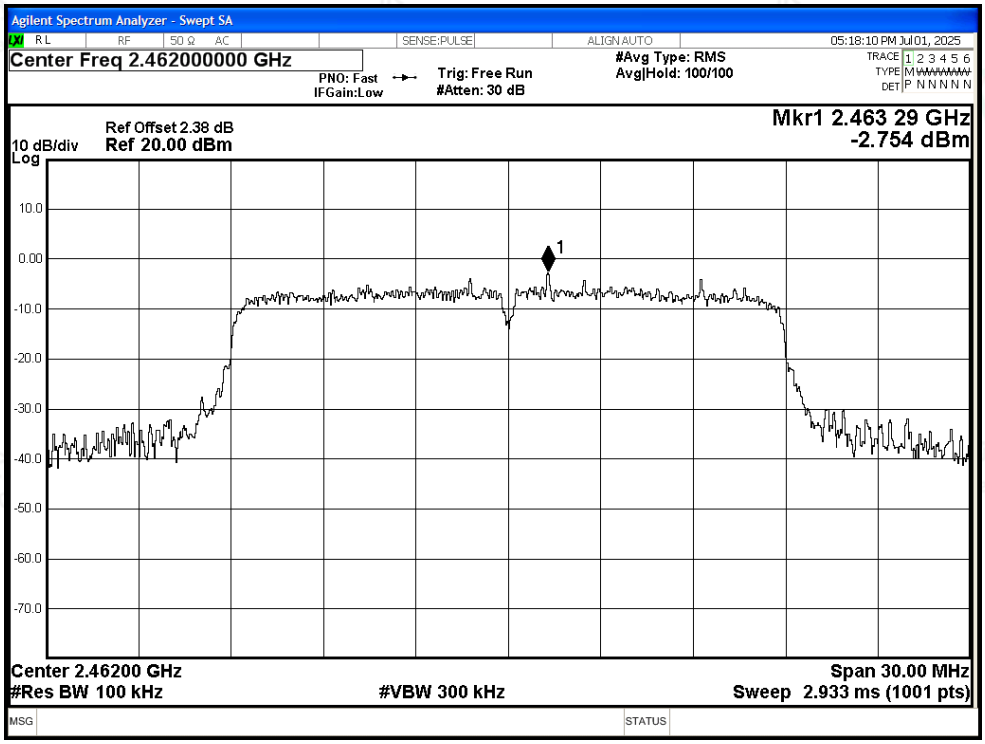
Band Edge NVNT n20 2412MHz Ant2 Ref



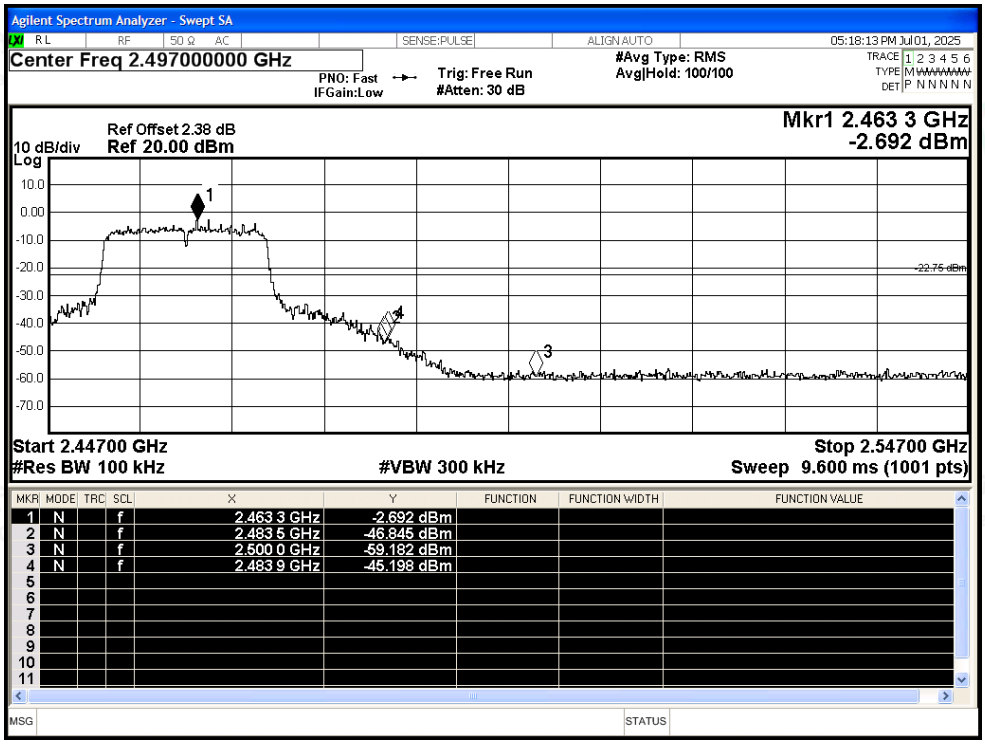
Band Edge NVNT n20 2412MHz Ant2 Emission



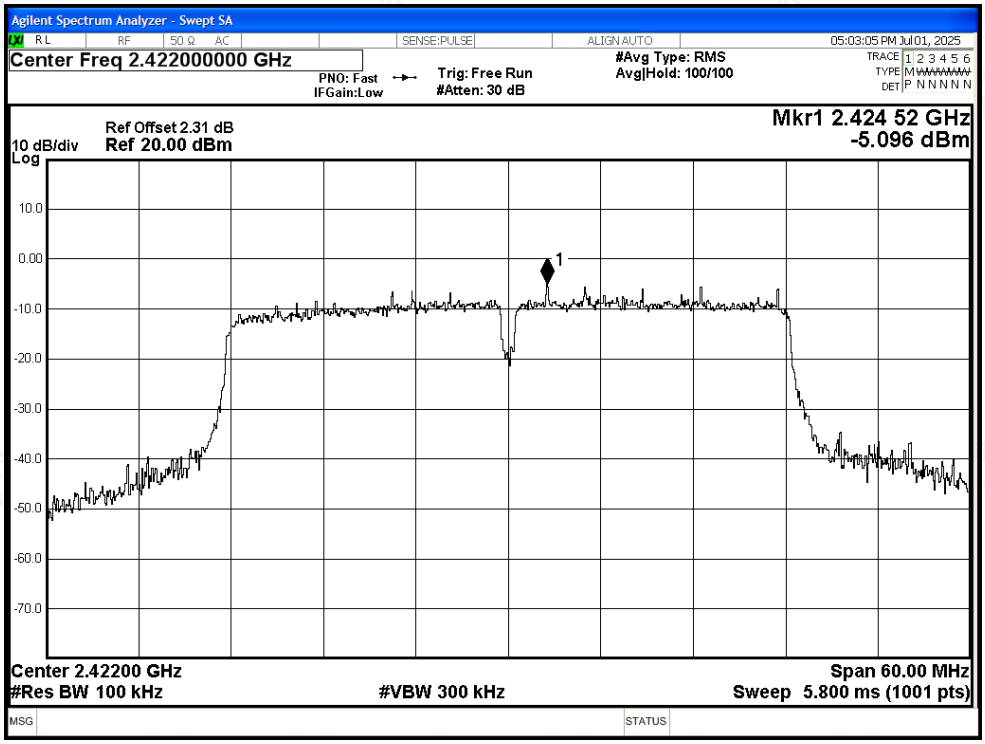
Band Edge NVNT n20 2462MHz Ant2 Ref



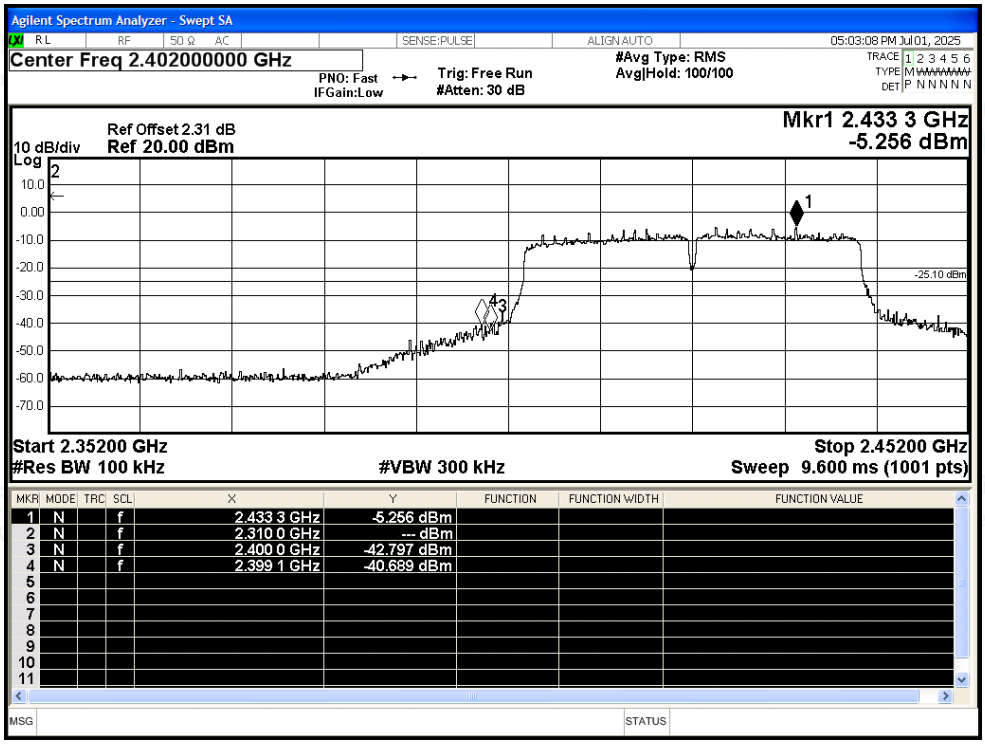
Band Edge NVNT n20 2462MHz Ant2 Emission



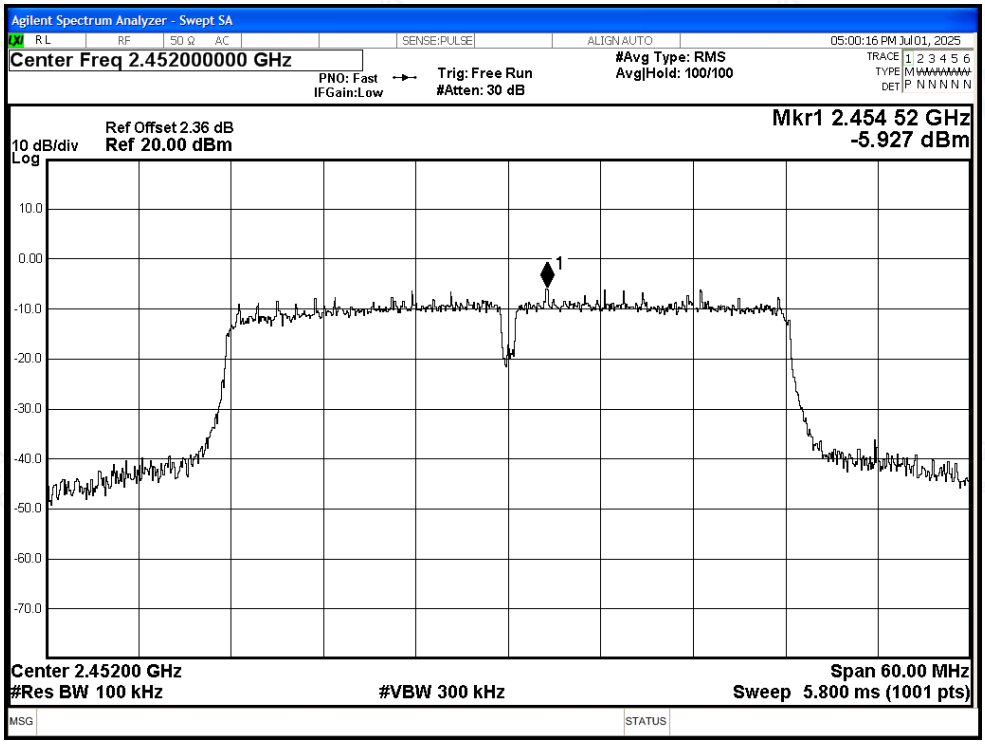
Band Edge NVNT n40 2422MHz Ant2 Ref



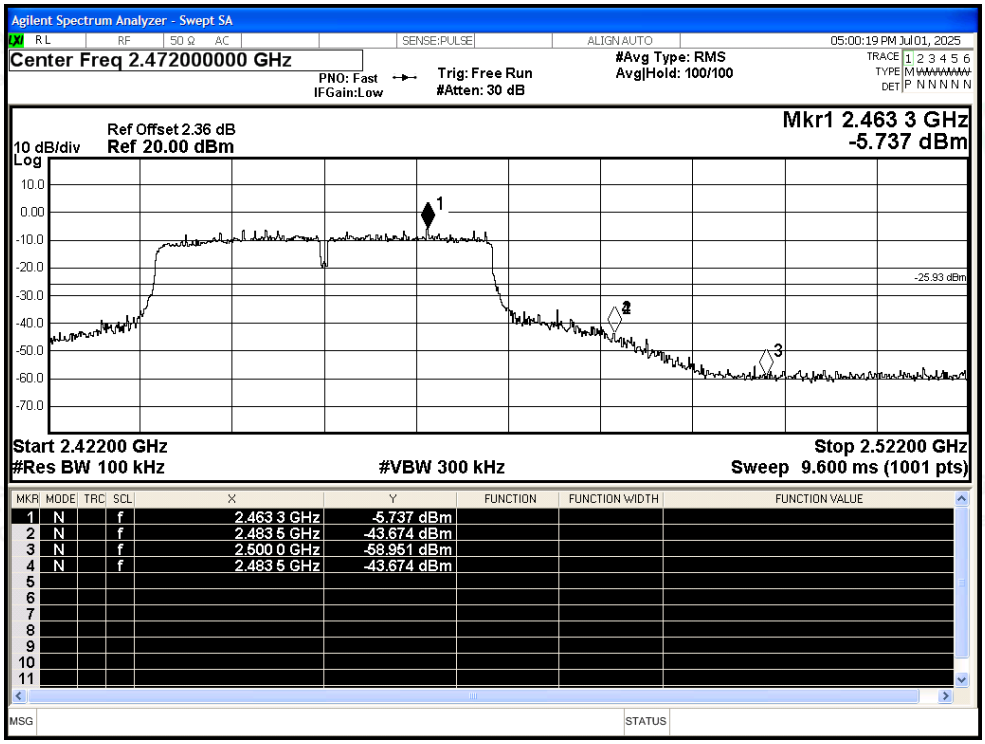
Band Edge NVNT n40 2422MHz Ant2 Emission



Band Edge NVNT n40 2452MHz Ant2 Ref



Band Edge NVNT n40 2452MHz Ant2 Emission

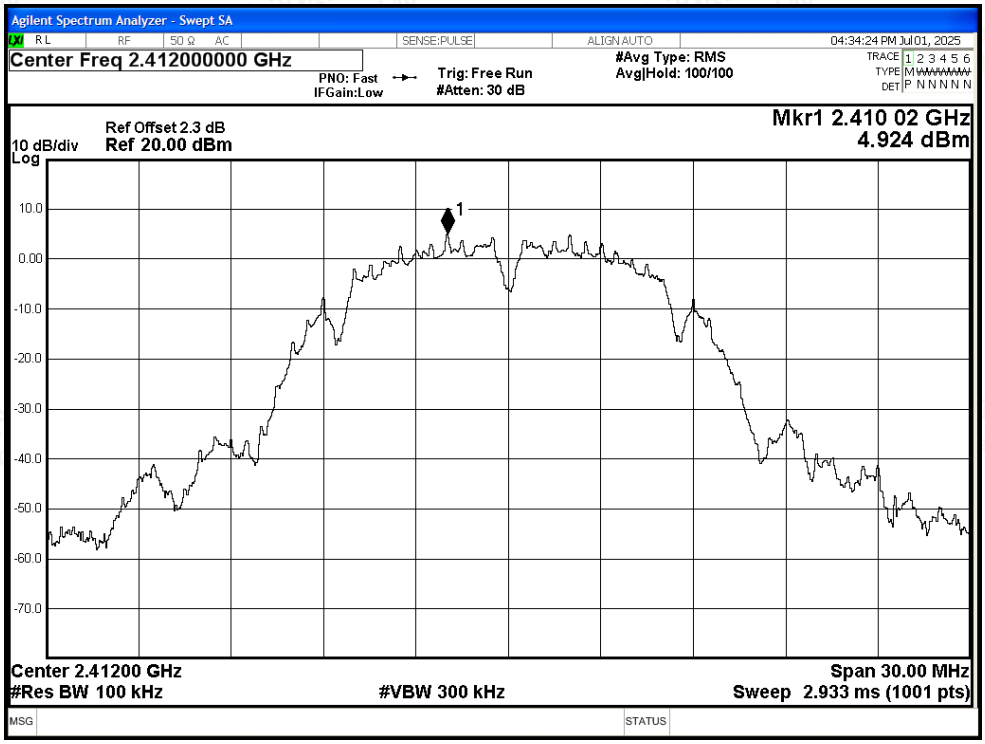


C.5 Conducted RF Spurious Emission

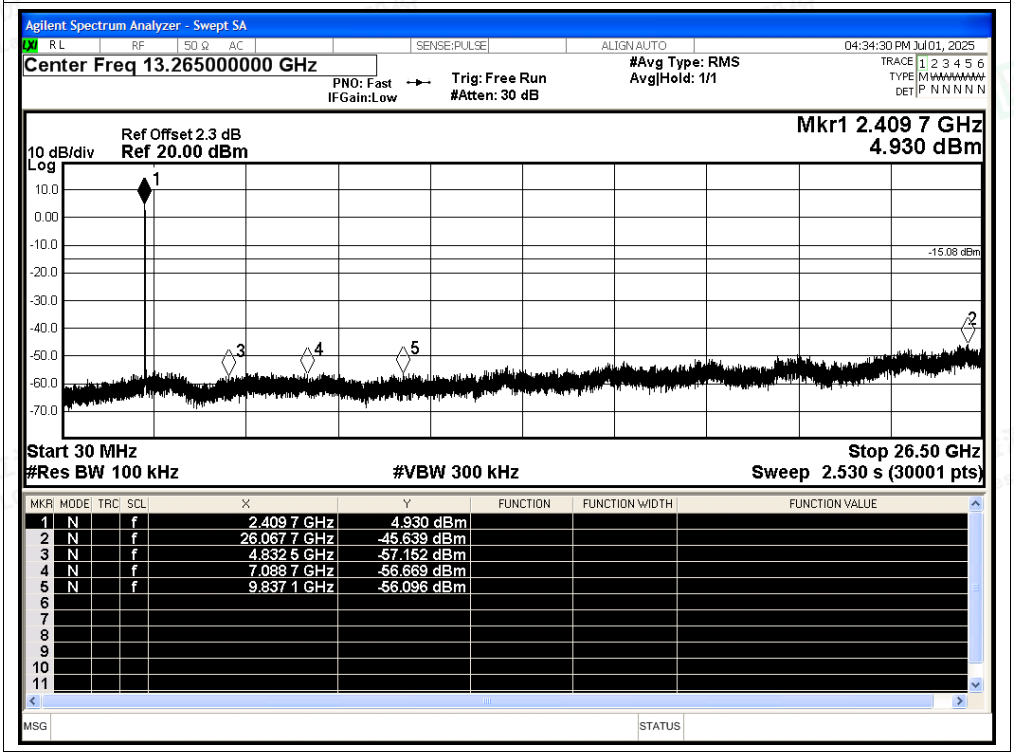
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	b	2412	Ant1	-50.56	-20	Pass
NVNT	b	2437	Ant1	-51.26	-20	Pass
NVNT	b	2462	Ant1	-49.98	-20	Pass
NVNT	g	2412	Ant1	-43.55	-20	Pass
NVNT	g	2437	Ant1	-43.32	-20	Pass
NVNT	g	2462	Ant1	-43.98	-20	Pass
NVNT	n20	2412	Ant1	-43.66	-20	Pass
NVNT	n20	2437	Ant1	-42.19	-20	Pass
NVNT	n20	2462	Ant1	-43.16	-20	Pass
NVNT	n40	2422	Ant1	-40.61	-20	Pass
NVNT	n40	2437	Ant1	-40.33	-20	Pass
NVNT	n40	2452	Ant1	-38.83	-20	Pass

Test Graphs

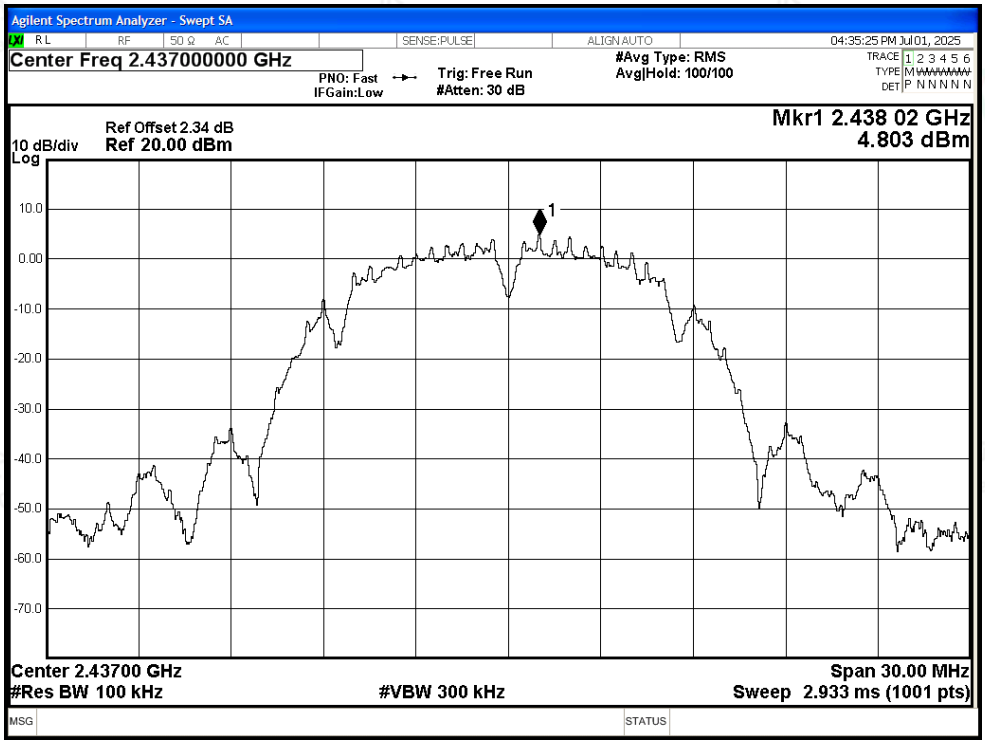
Tx. Spurious NVNT b 2412MHz Ant1 Ref



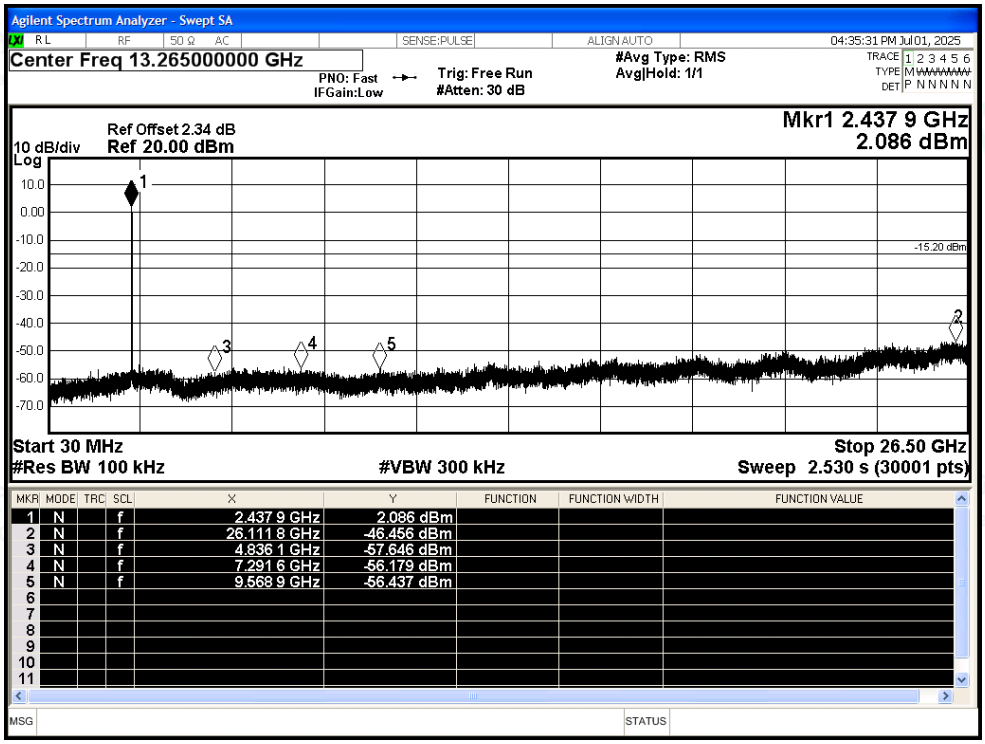
Tx. Spurious NVNT b 2412MHz Ant1 Emission



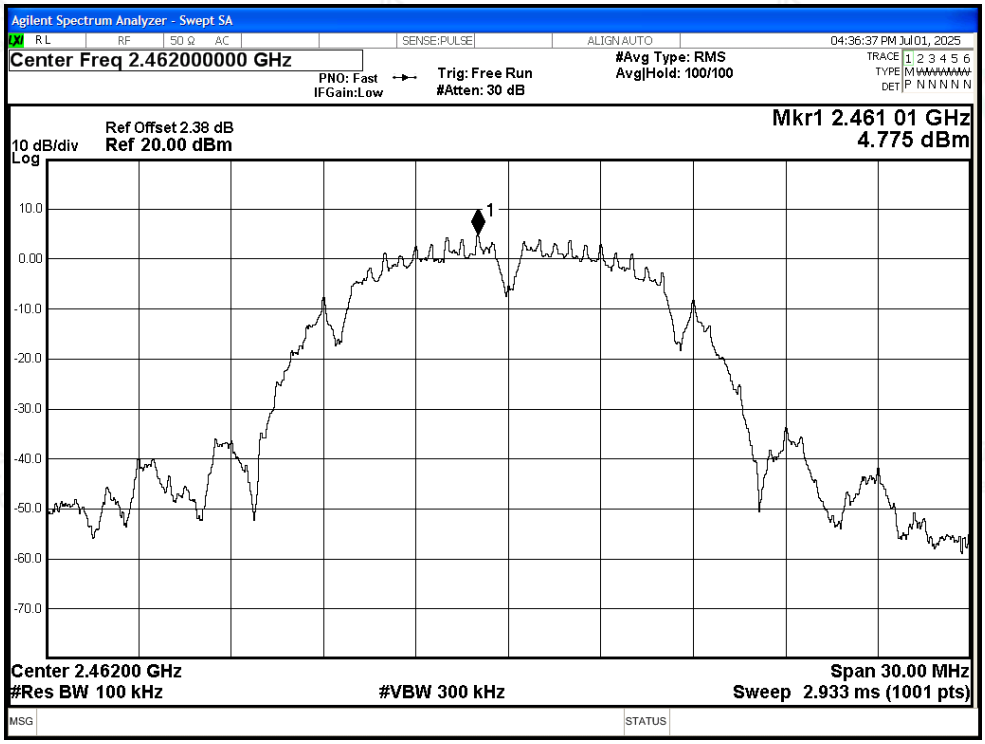
Tx. Spurious NVNT b 2437MHz Ant1 Ref



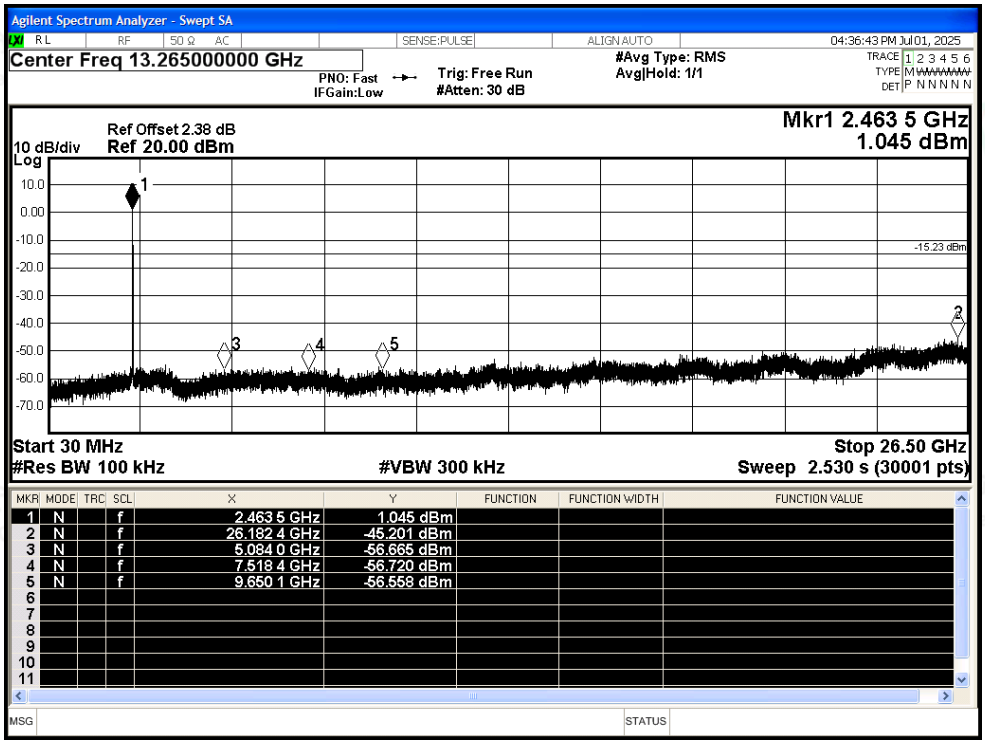
Tx. Spurious NVNT b 2437MHz Ant1 Emission



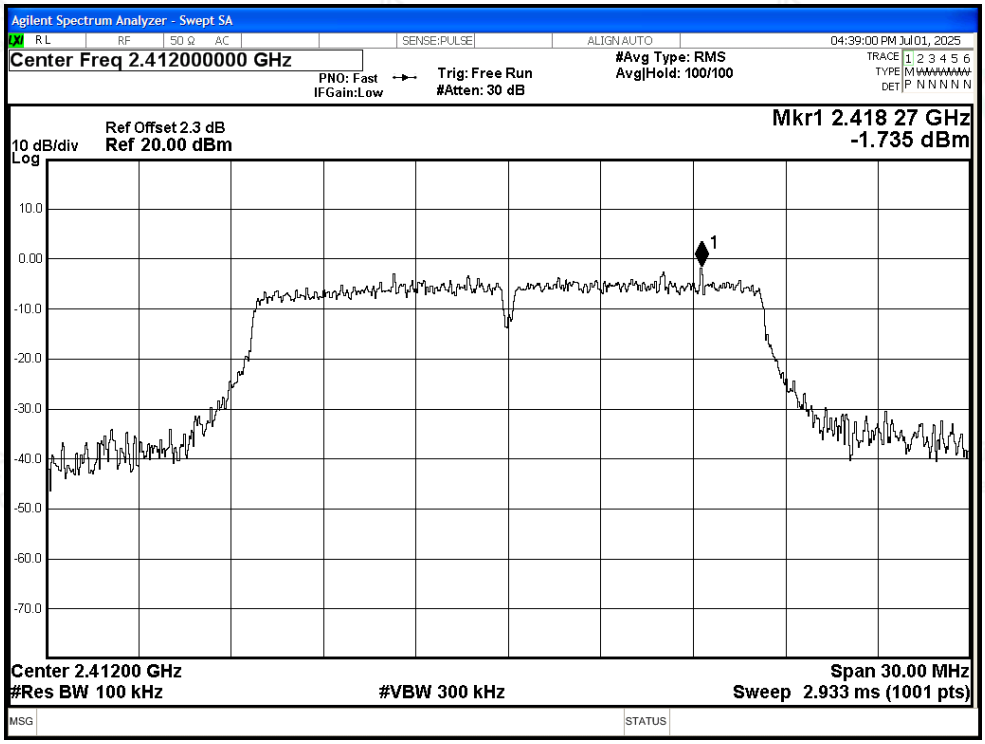
Tx. Spurious NVNT b 2462MHz Ant1 Ref



Tx. Spurious NVNT b 2462MHz Ant1 Emission



Tx. Spurious NVNT g 2412MHz Ant1 Ref



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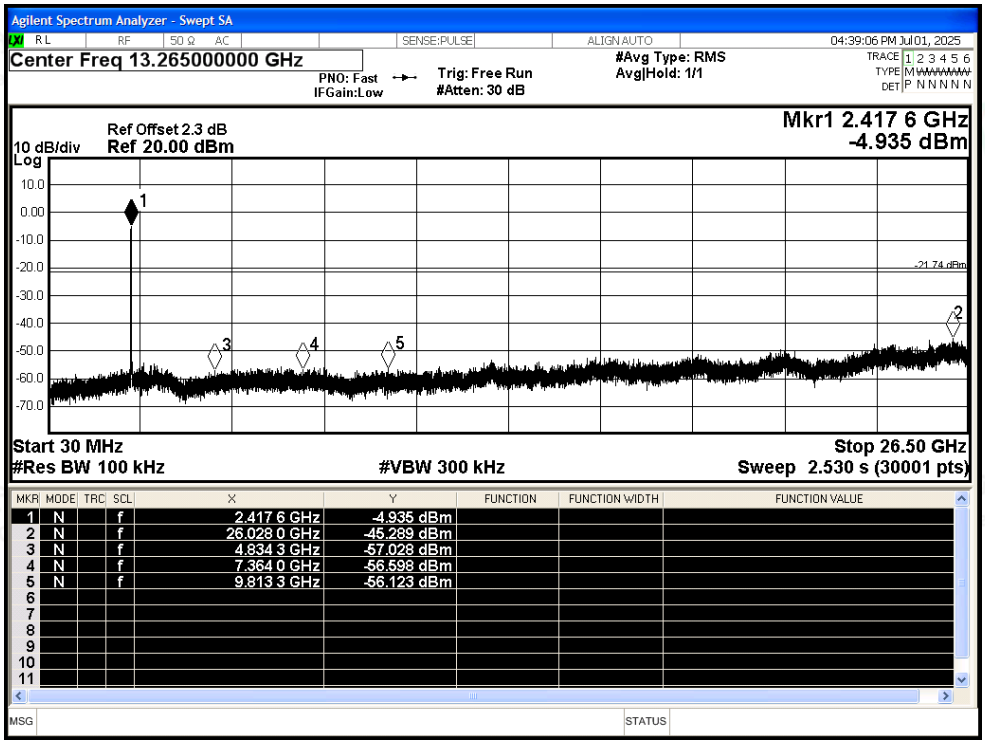

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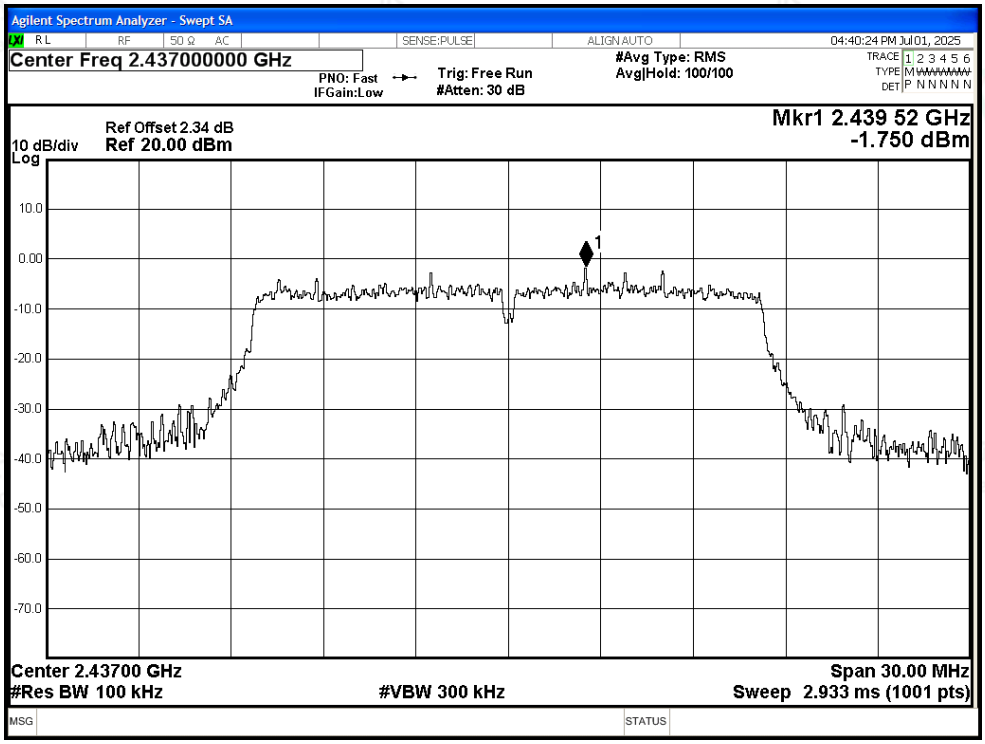

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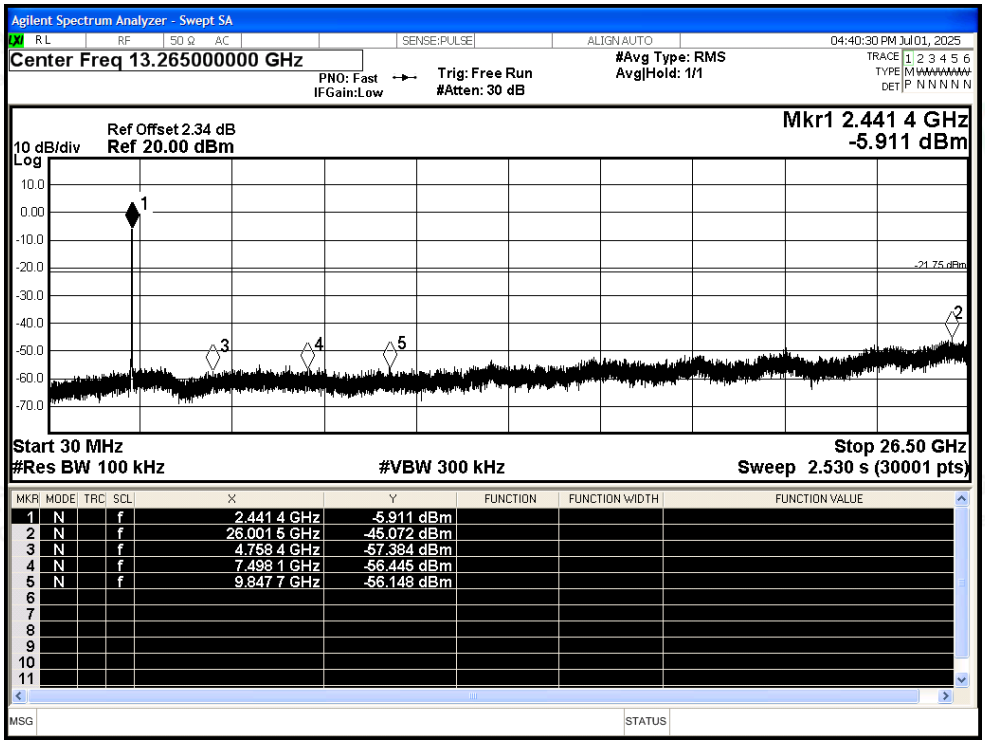
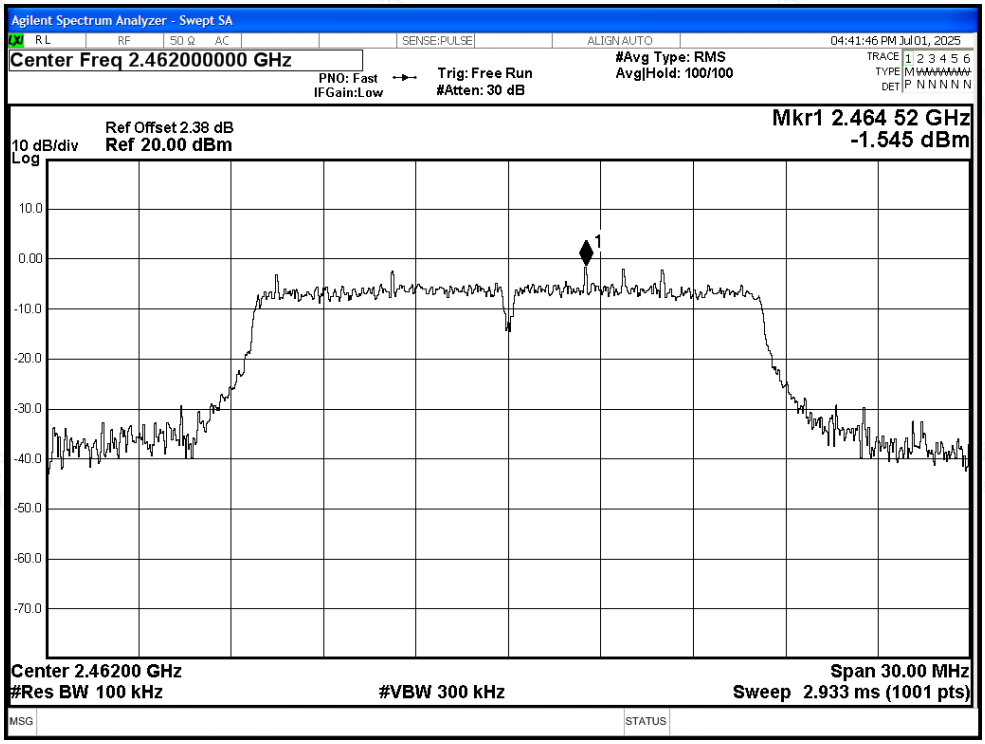
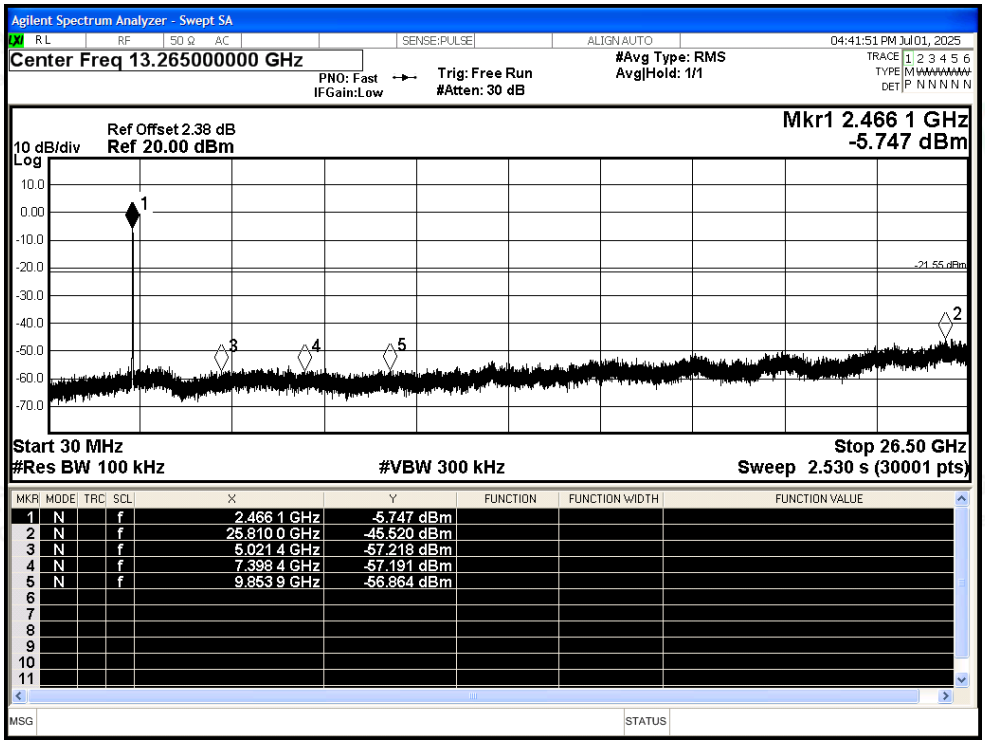


MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N		f	2.441 4 GHz	-5.911 dBm			
2	N		f	26.001 5 GHz	-45.072 dBm			
3	N		f	4.758 4 GHz	-57.384 dBm			
4	N		f	7.498 1 GHz	-56.445 dBm			
5	N		f	9.847 7 GHz	-56.148 dBm			
6								
7								
8								
9								
10								
11								

Tx. Spurious NVNT g 2462MHz Ant1 Ref

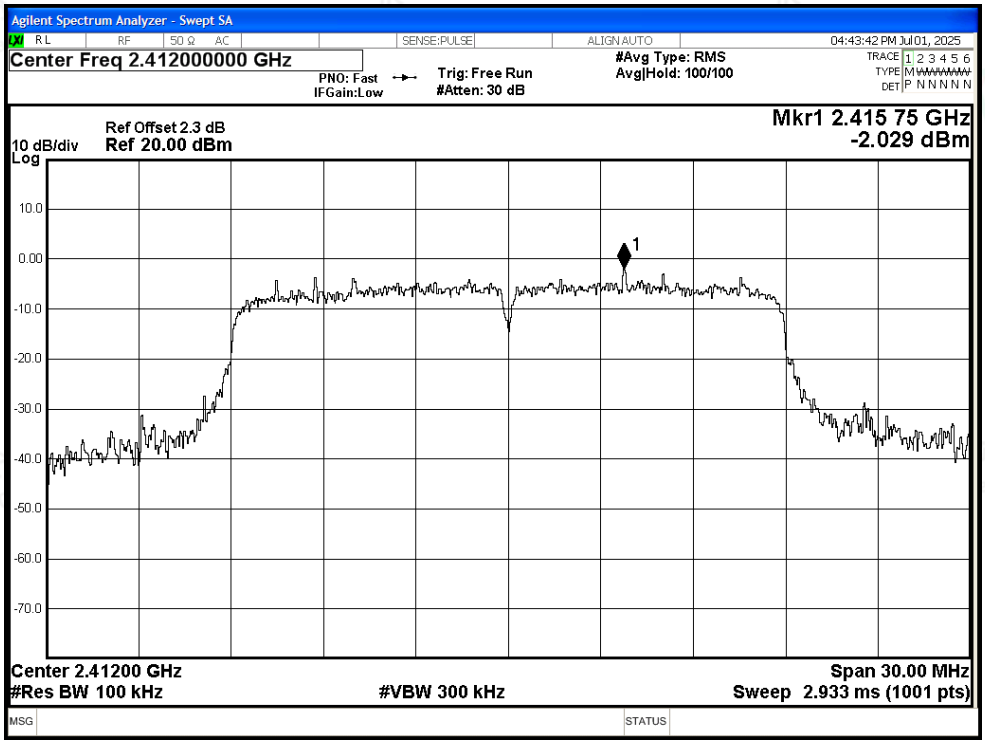


Tx. Spurious NVNT g 2462MHz Ant1 Emission



MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N		f	2.466 1 GHz	-5.747 dBm			
2	N		f	25.810 0 GHz	-45.520 dBm			
3	N		f	5.021 4 GHz	-57.218 dBm			
4	N		f	7.398 4 GHz	-57.191 dBm			
5	N		f	9.853 9 GHz	-56.864 dBm			
6								
7								
8								
9								
10								
11								

Tx. Spurious NVNT n20 2412MHz Ant1 Ref



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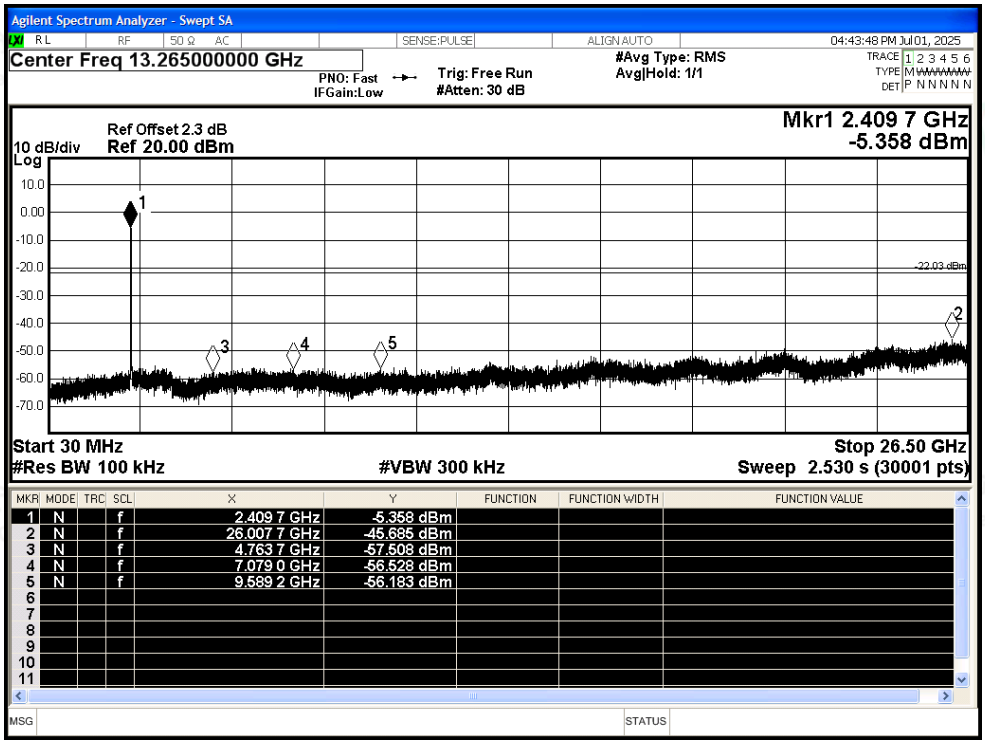
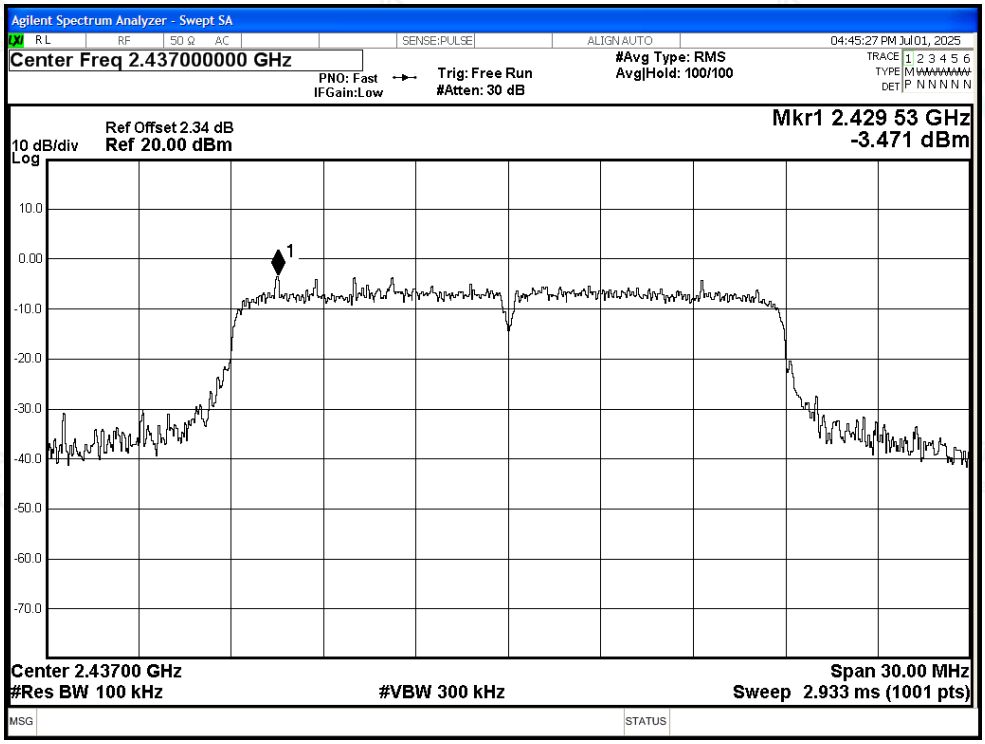
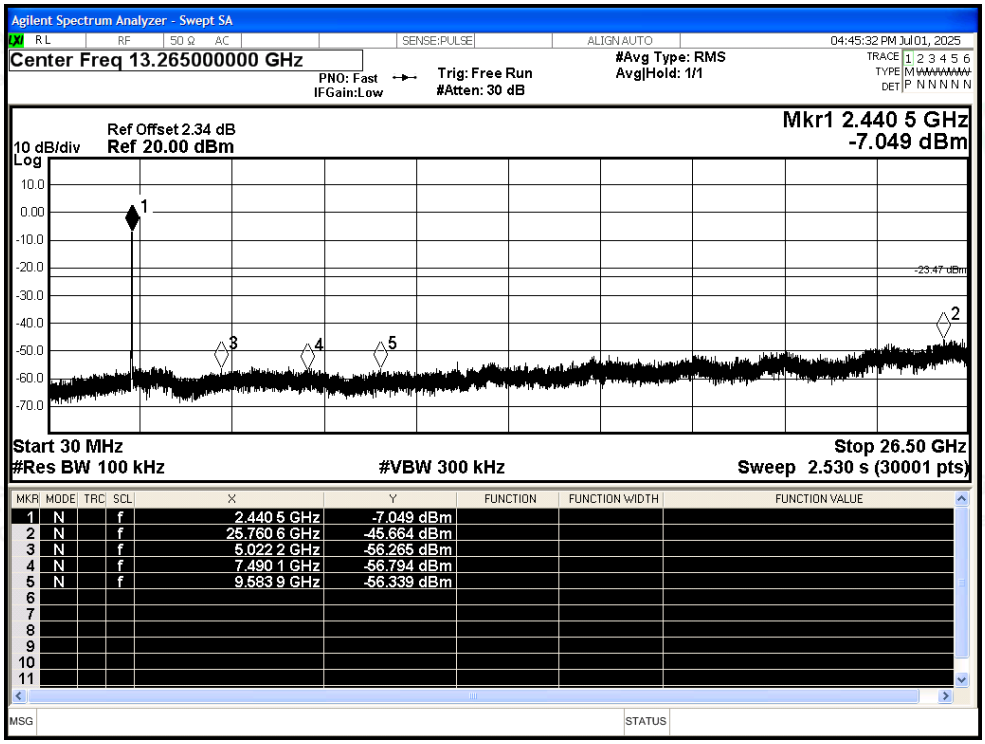


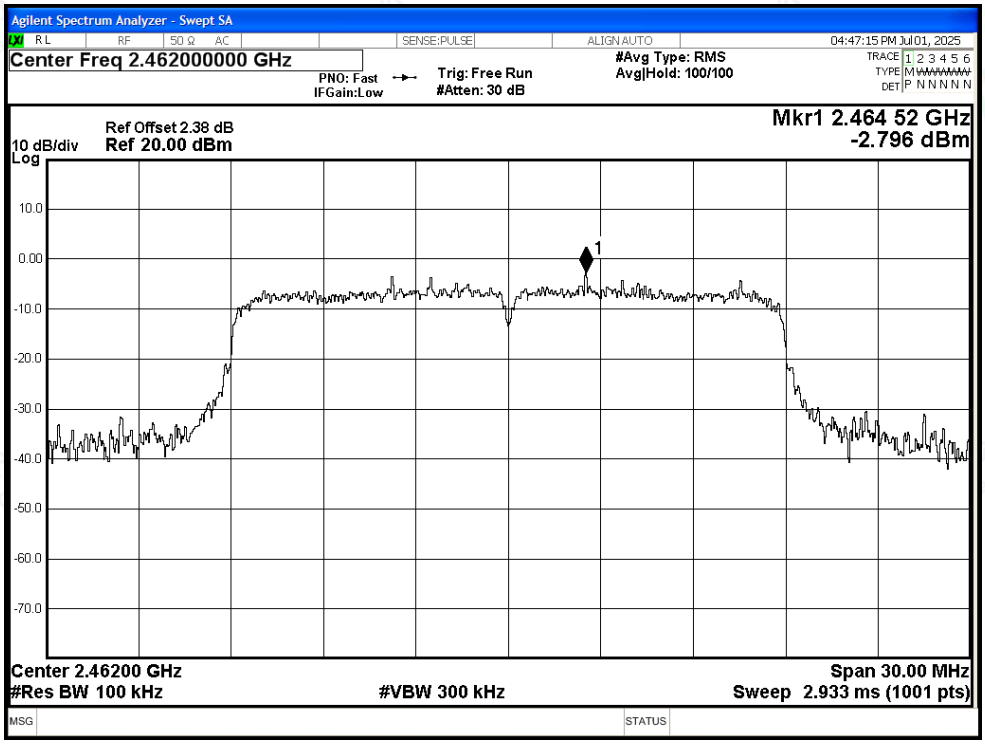
Tx. Spurious NVNT n20 2437MHz Ant1 Ref



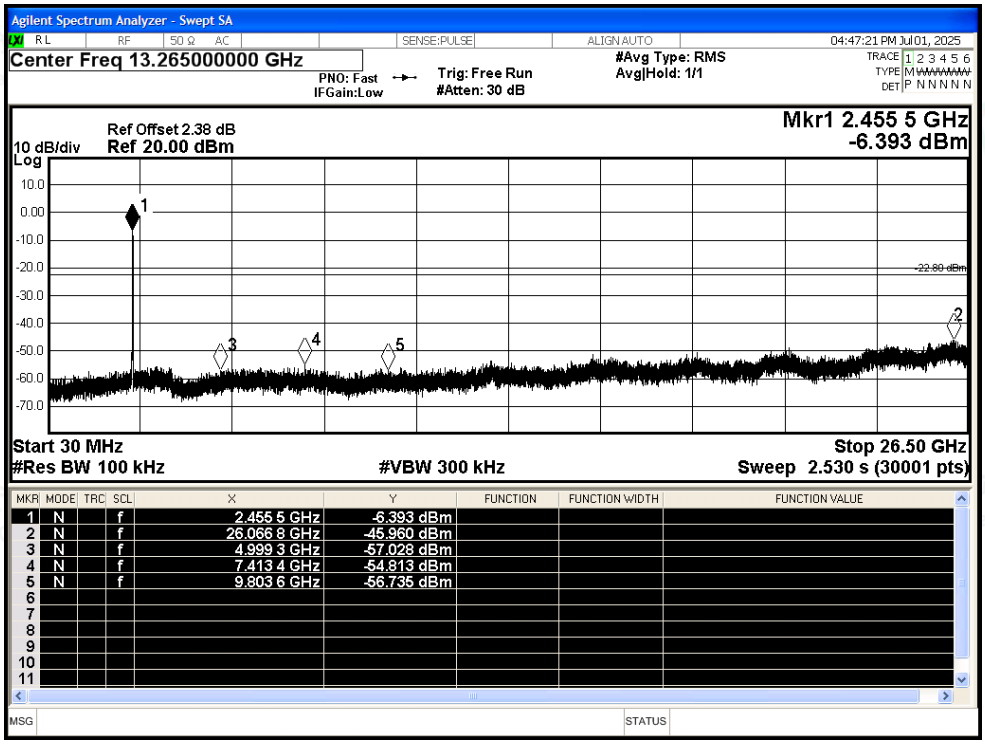
Tx. Spurious NVNT n20 2437MHz Ant1 Emission



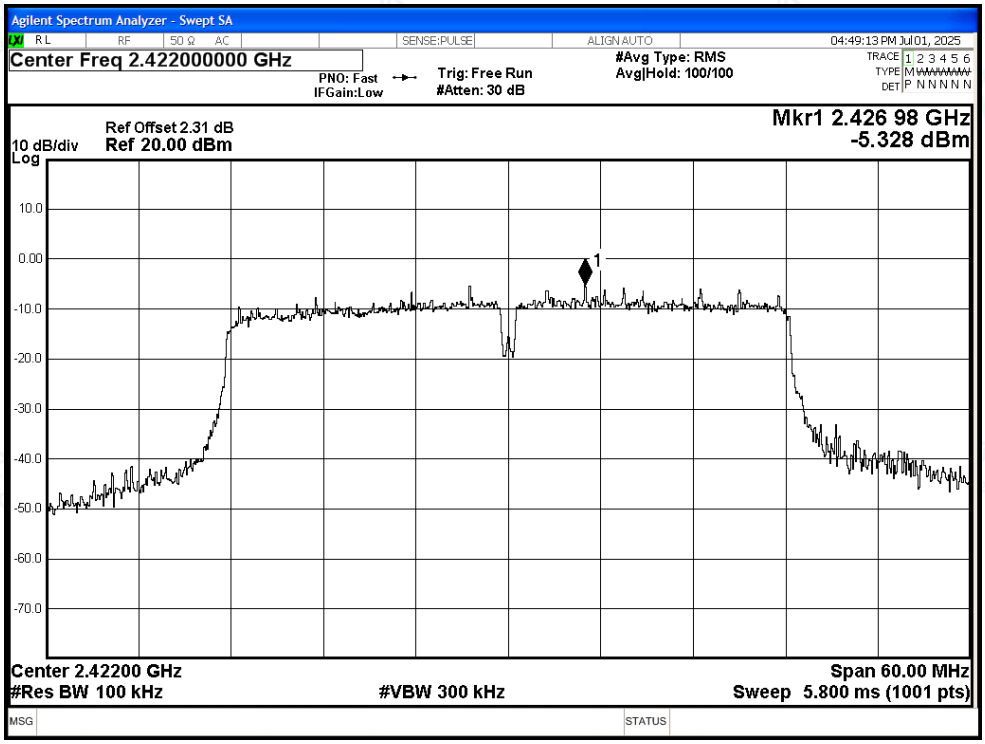
Tx. Spurious NVNT n20 2462MHz Ant1 Ref



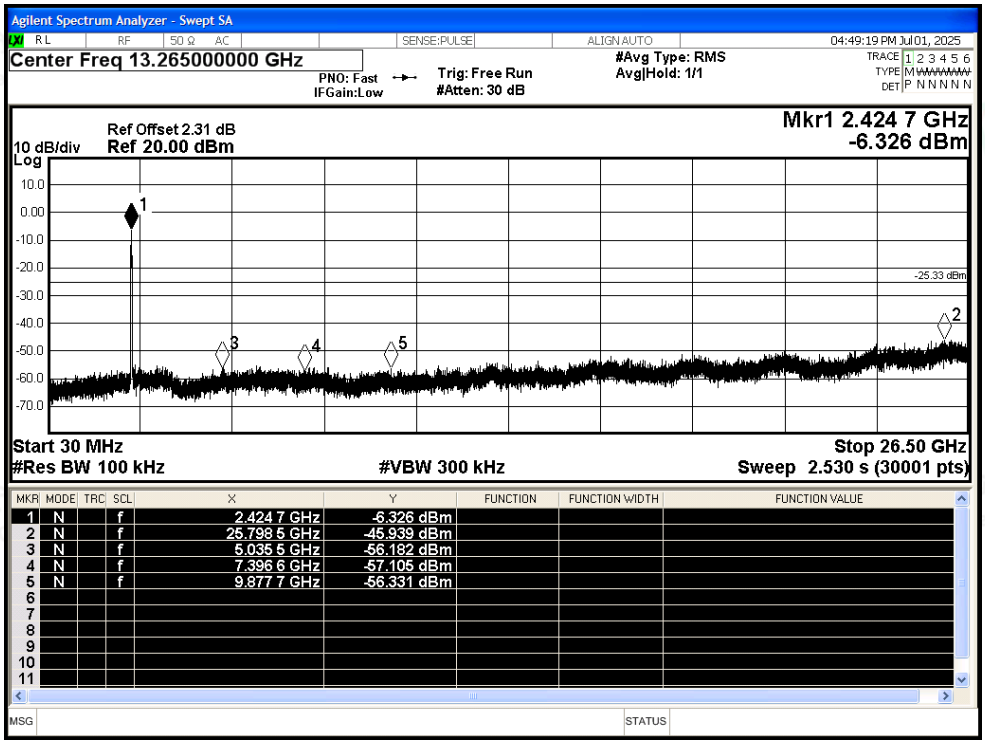
Tx. Spurious NVNT n20 2462MHz Ant1 Emission



Tx. Spurious NVNT n40 2422MHz Ant1 Ref



Tx. Spurious NVNT n40 2422MHz Ant1 Emission



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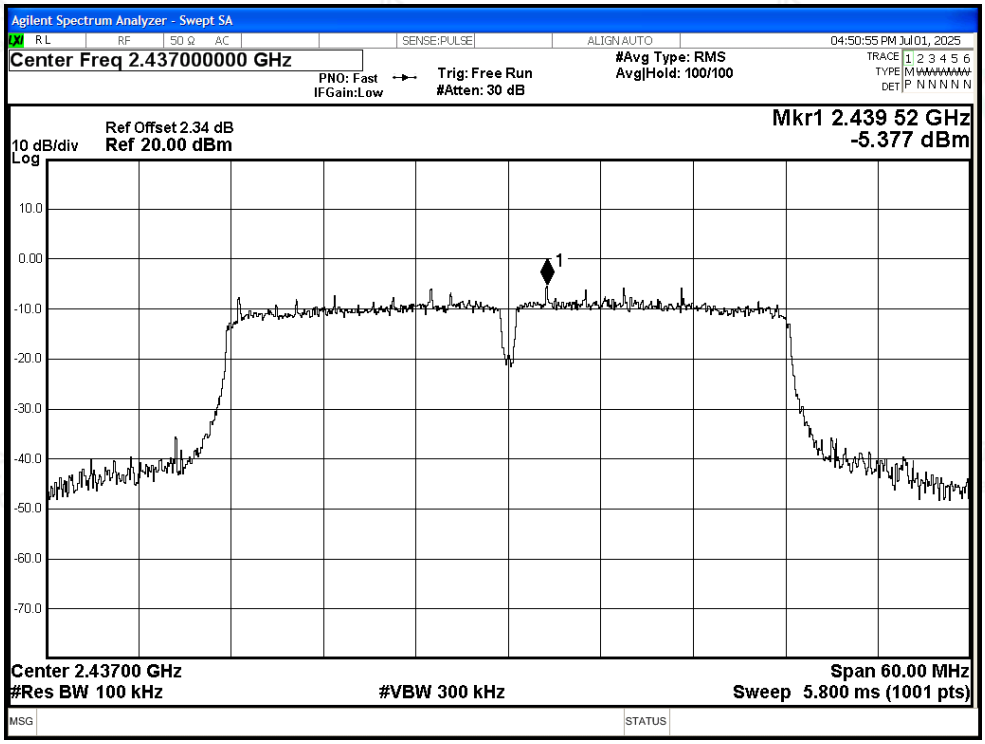
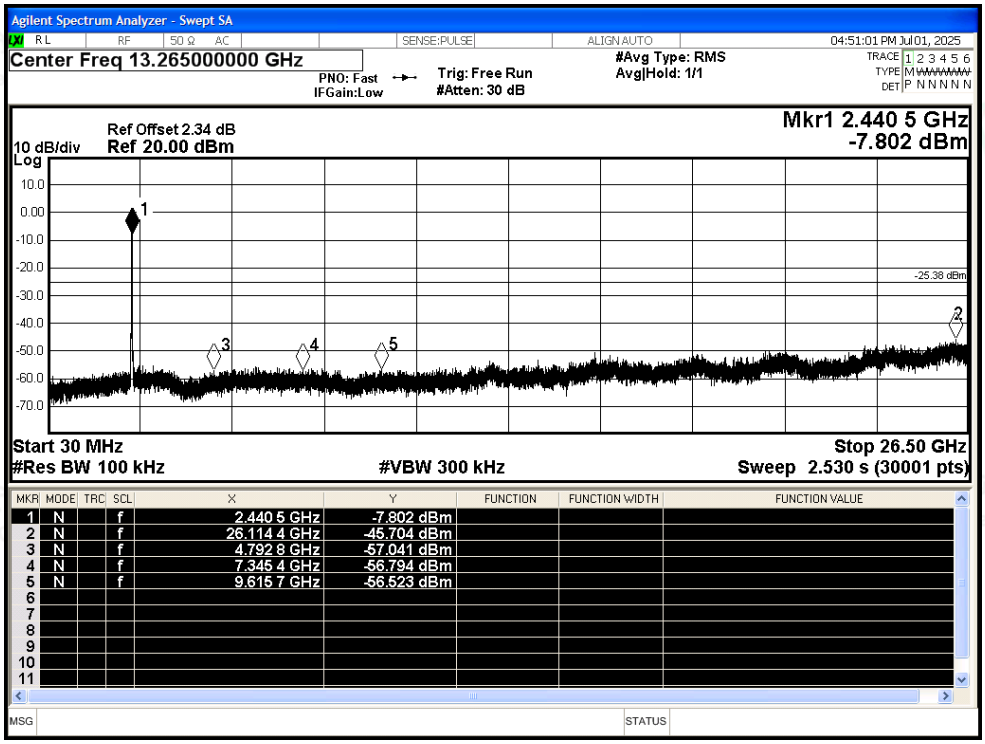
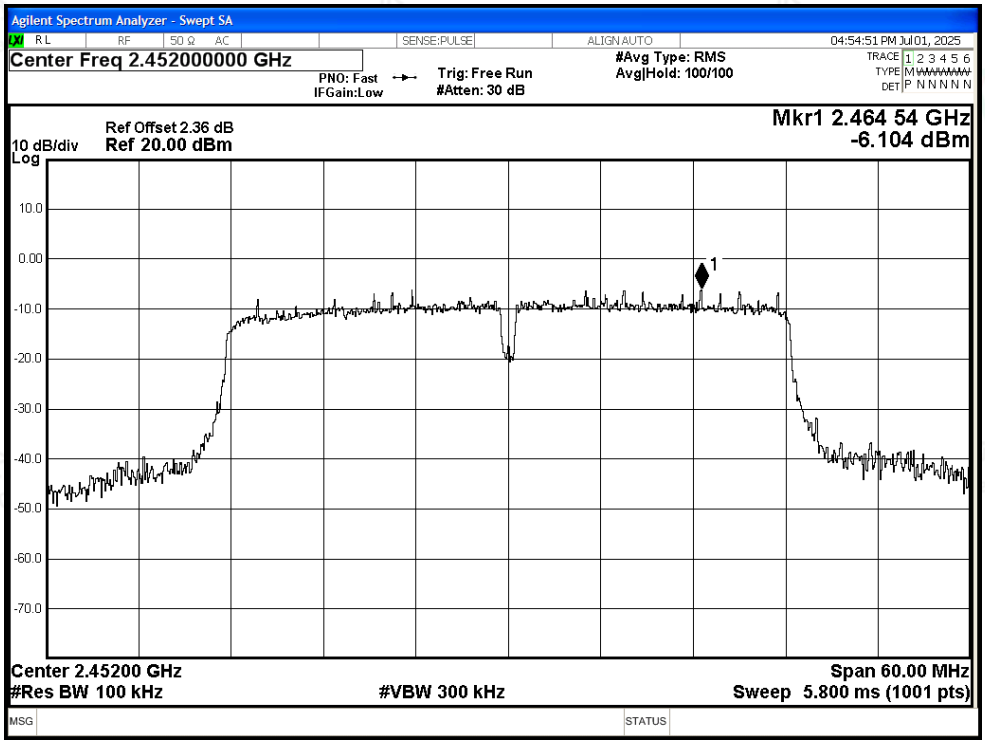


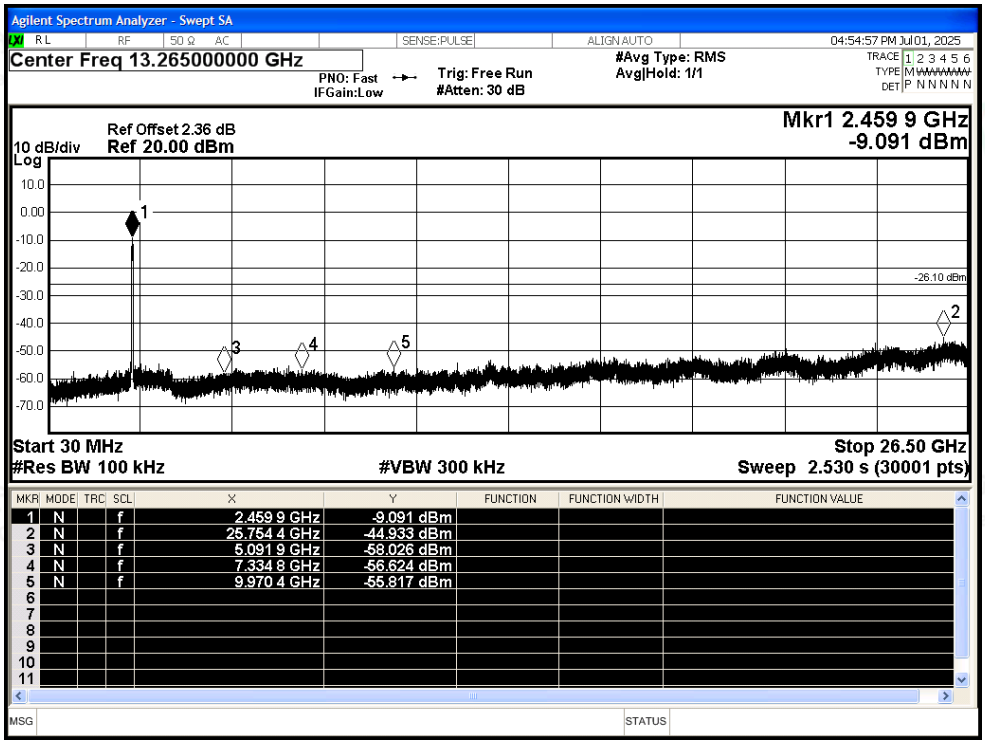
Tx. Spurious NVNT n40 2437MHz Ant1 Emission



Tx. Spurious NVNT n40 2452MHz Ant1 Ref



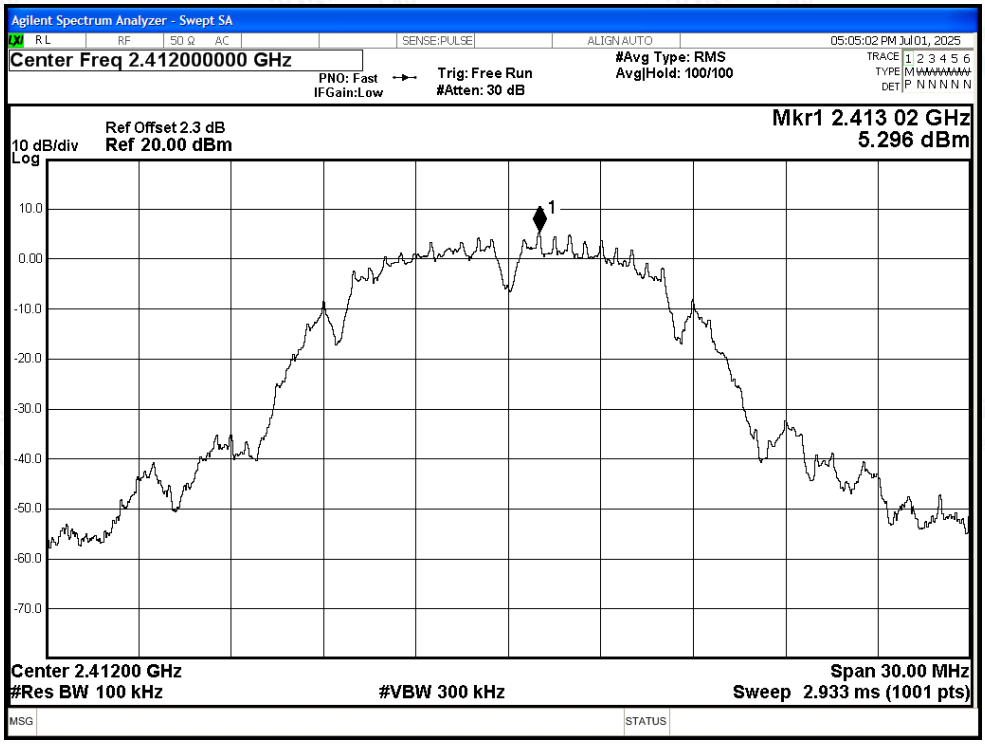
Tx. Spurious NVNT n40 2452MHz Ant1 Emission



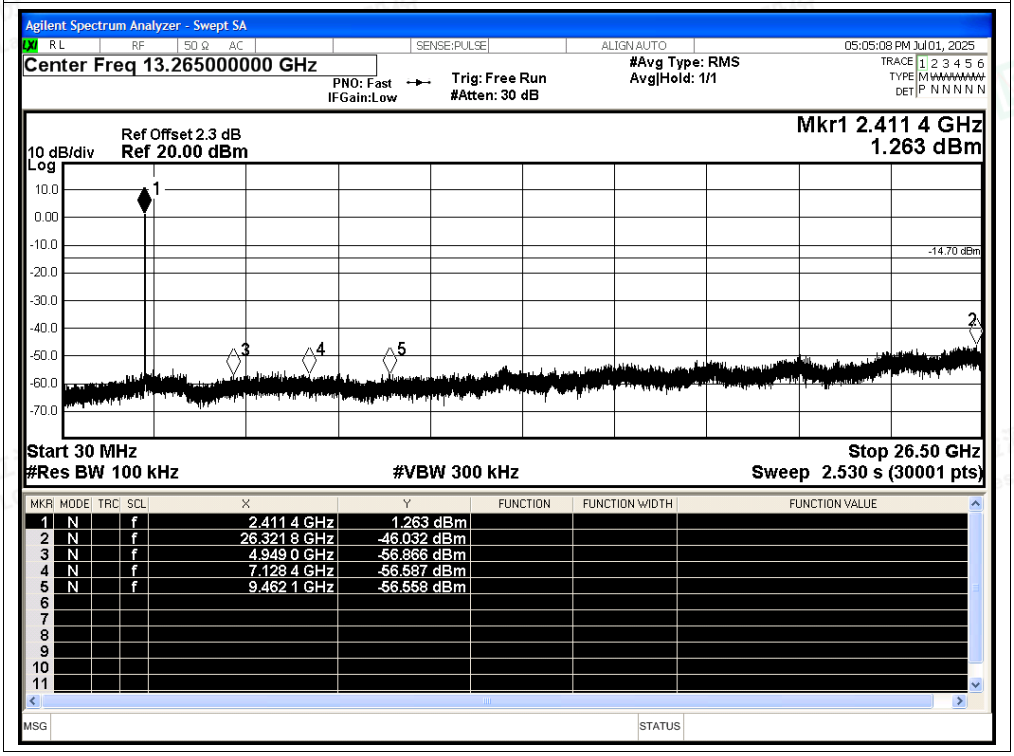
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	b	2412	Ant2	-51.33	-20	Pass
NVNT	b	2437	Ant2	-50.32	-20	Pass
NVNT	b	2462	Ant2	-50.59	-20	Pass
NVNT	g	2412	Ant2	-45.08	-20	Pass
NVNT	g	2437	Ant2	-44.96	-20	Pass
NVNT	g	2462	Ant2	-45.42	-20	Pass
NVNT	n20	2412	Ant2	-43.79	-20	Pass
NVNT	n20	2437	Ant2	-40.74	-20	Pass
NVNT	n20	2462	Ant2	-42.07	-20	Pass
NVNT	n40	2422	Ant2	-40.25	-20	Pass
NVNT	n40	2437	Ant2	-39.72	-20	Pass
NVNT	n40	2452	Ant2	-40.16	-20	Pass

Test Graphs

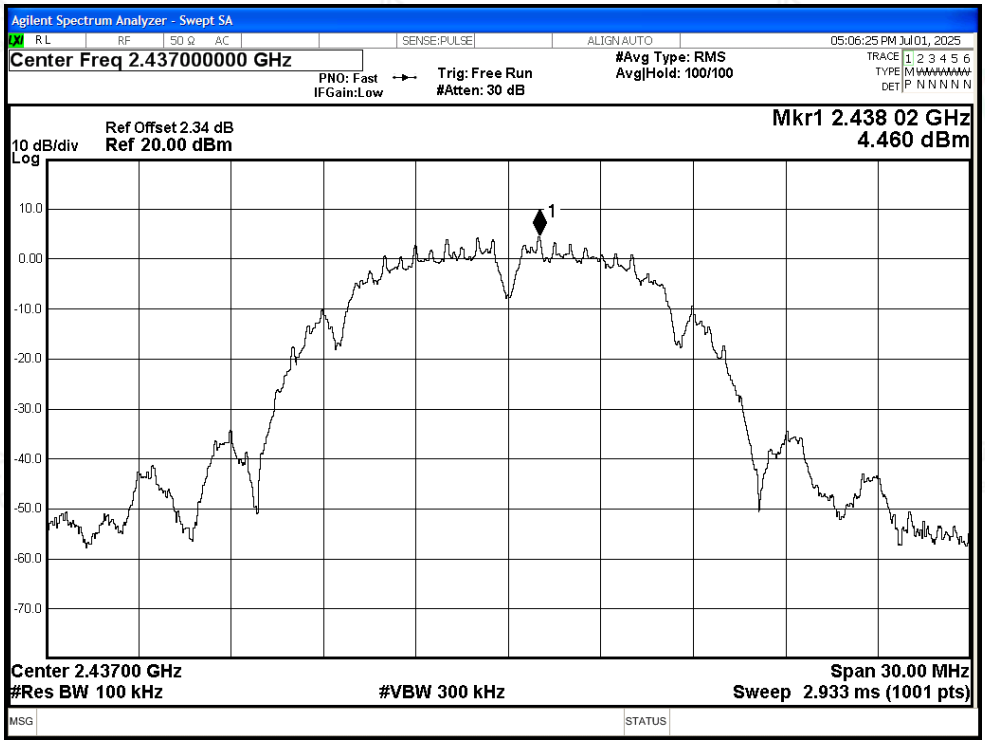
Tx. Spurious NVNT b 2412MHz Ant2 Ref



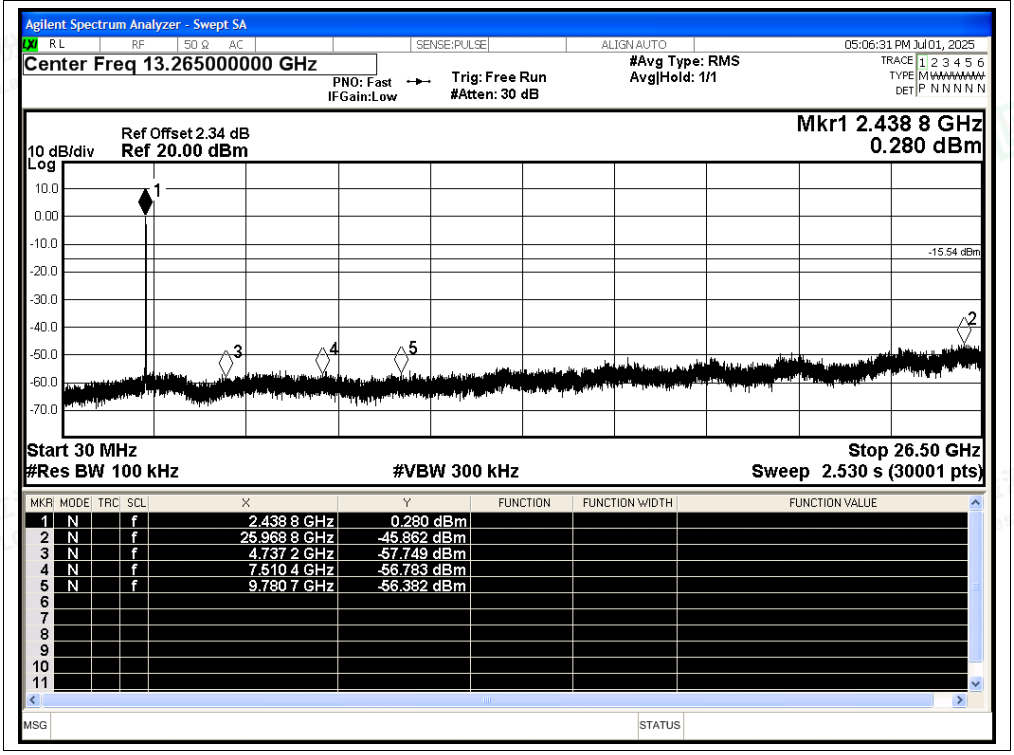
Tx. Spurious NVNT b 2412MHz Ant2 Emission



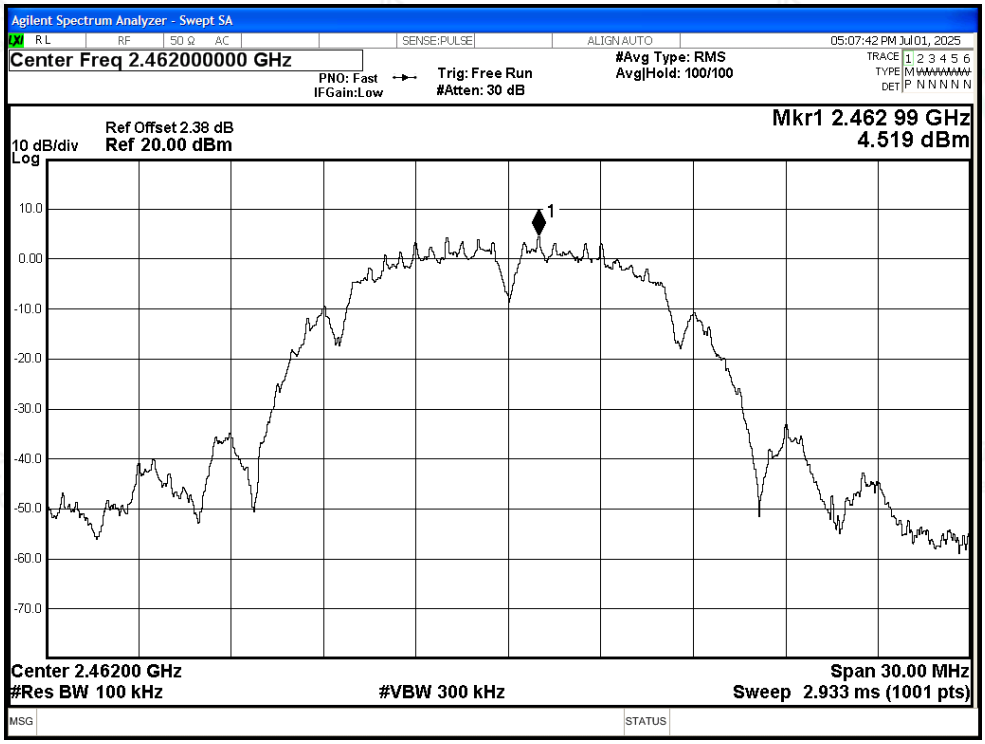
Tx. Spurious NVNT b 2437MHz Ant2 Ref



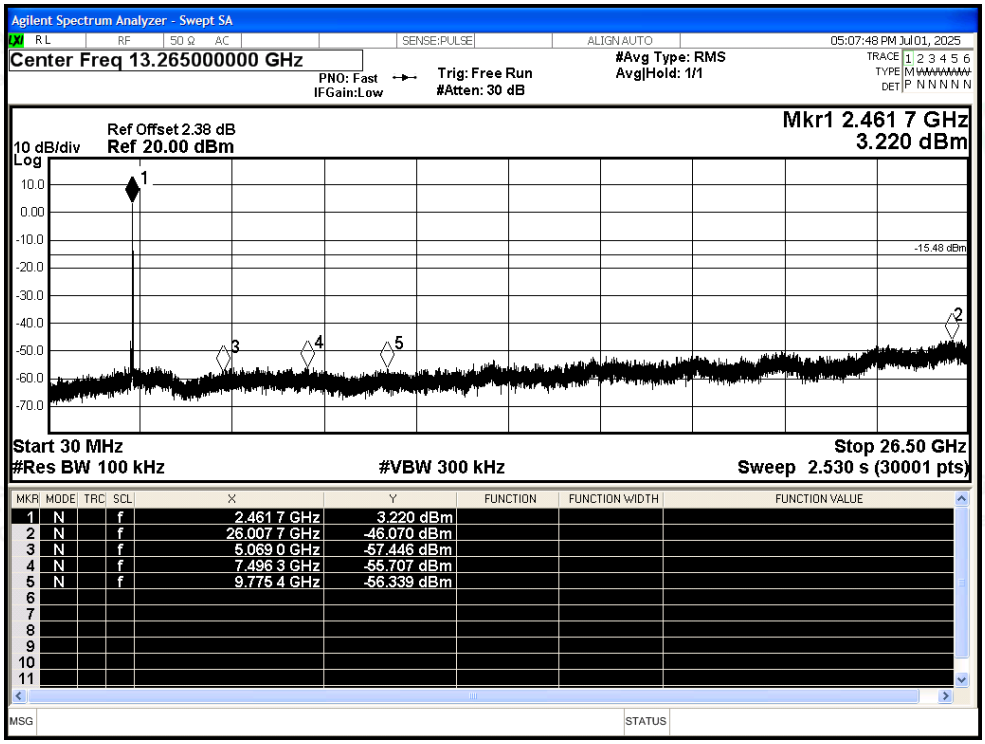
Tx. Spurious NVNT b 2437MHz Ant2 Emission



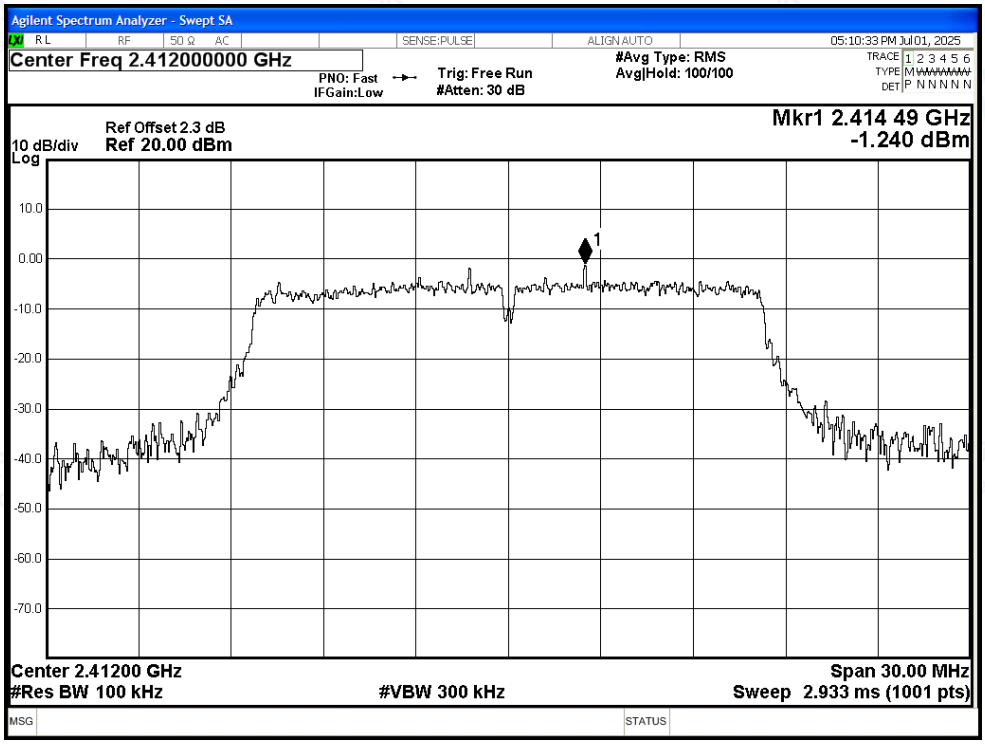
Tx. Spurious NVNT b 2462MHz Ant2 Ref



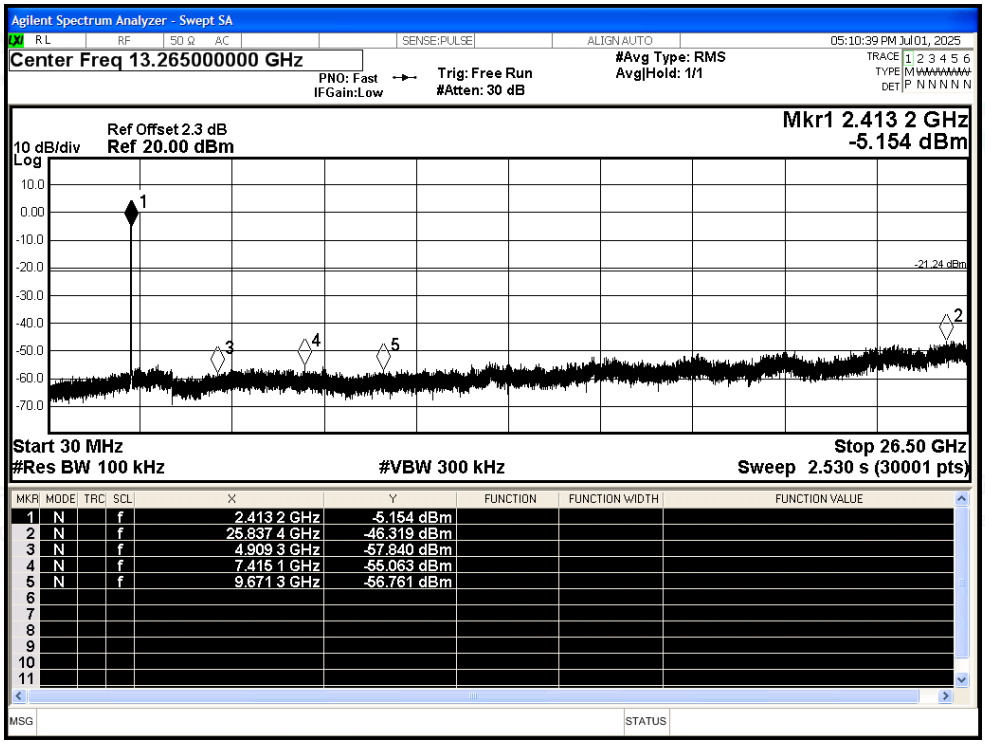
Tx. Spurious NVNT b 2462MHz Ant2 Emission



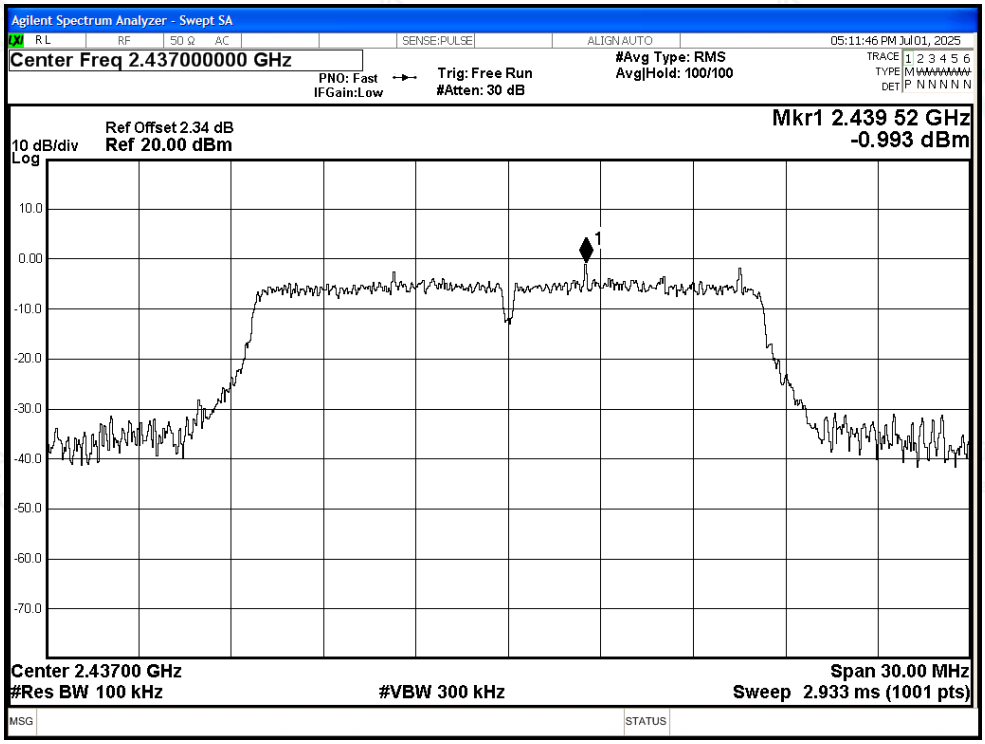
Tx. Spurious NVNT g 2412MHz Ant2 Ref



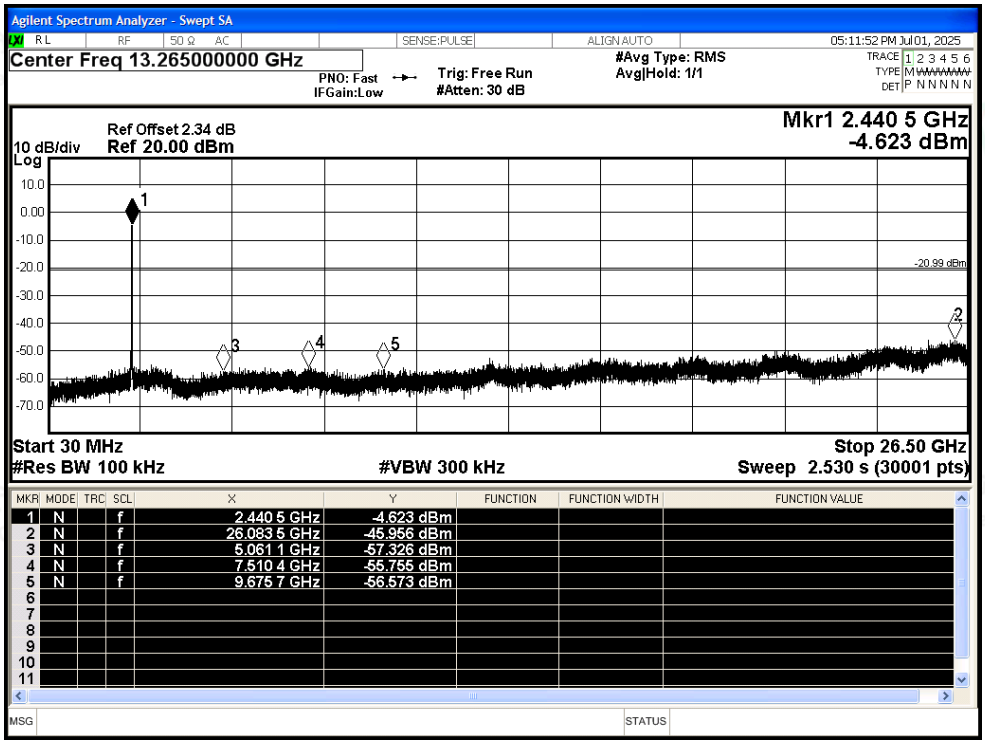
Tx. Spurious NVNT g 2412MHz Ant2 Emission



Tx. Spurious NVNT g 2437MHz Ant2 Ref

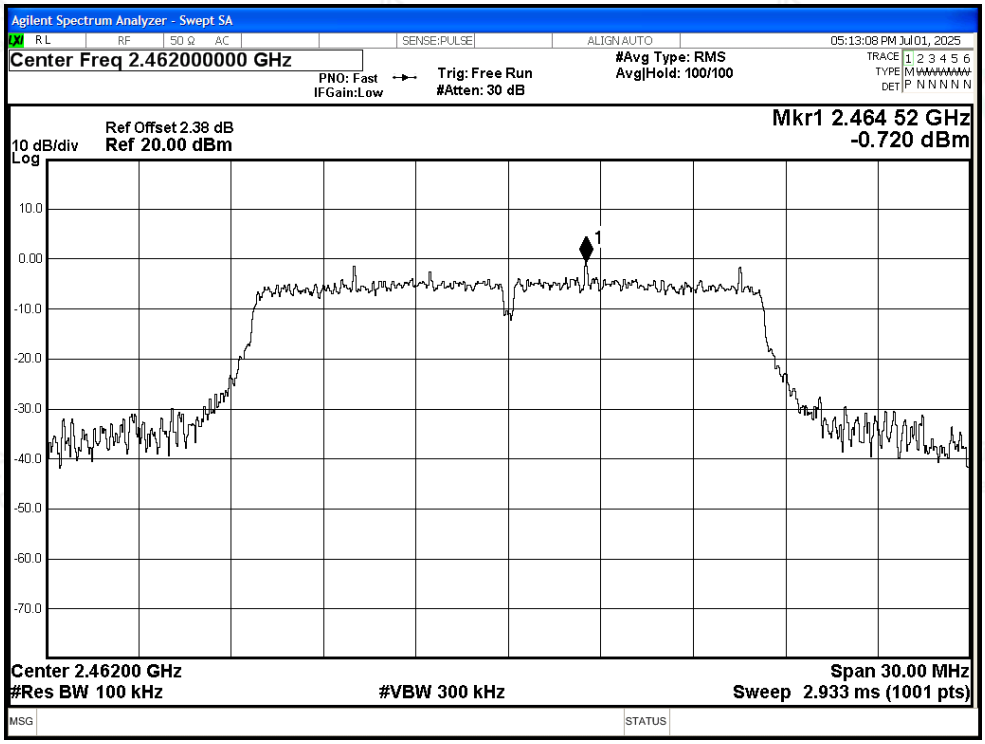


Tx. Spurious NVNT g 2437MHz Ant2 Emission

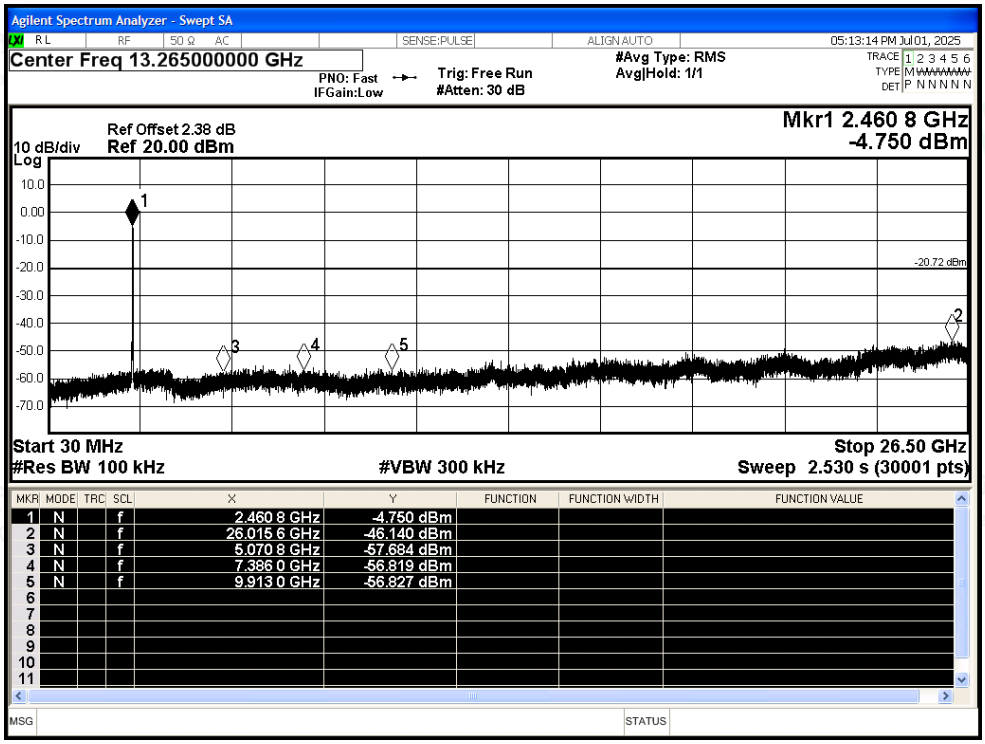


MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N		f	2.440 5 GHz	-4.623 dBm			
2	N		f	26.083 5 GHz	-45.956 dBm			
3	N		f	5.061 1 GHz	-57.326 dBm			
4	N		f	7.510 4 GHz	-55.755 dBm			
5	N		f	9.675 7 GHz	-56.573 dBm			
6								
7								
8								
9								
10								
11								

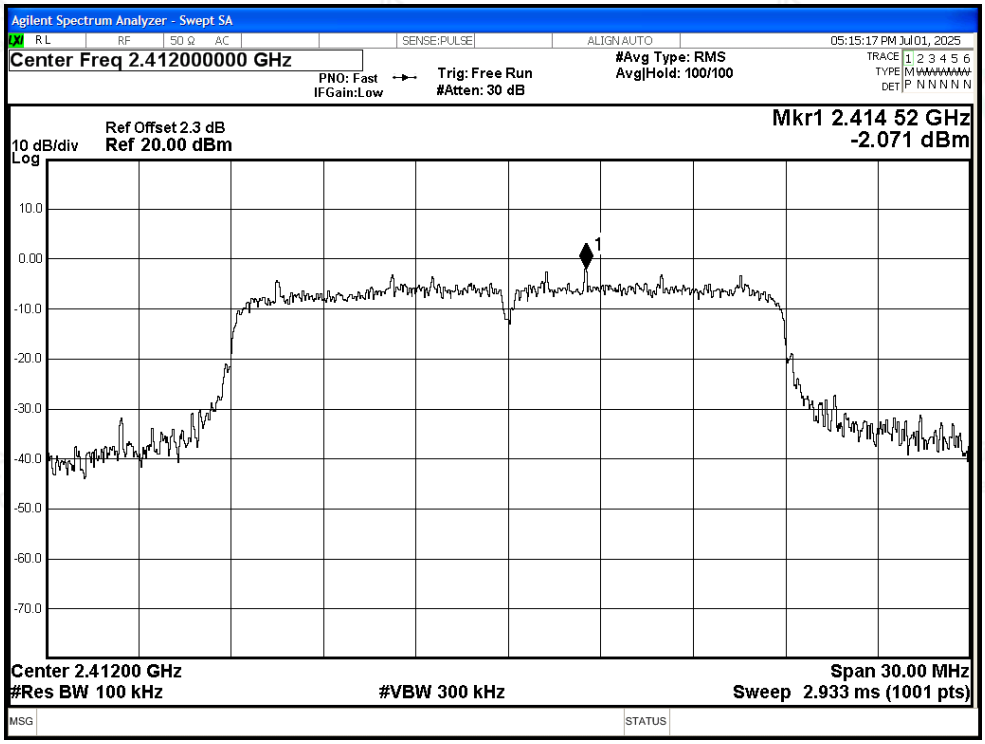
Tx. Spurious NVNT g 2462MHz Ant2 Ref



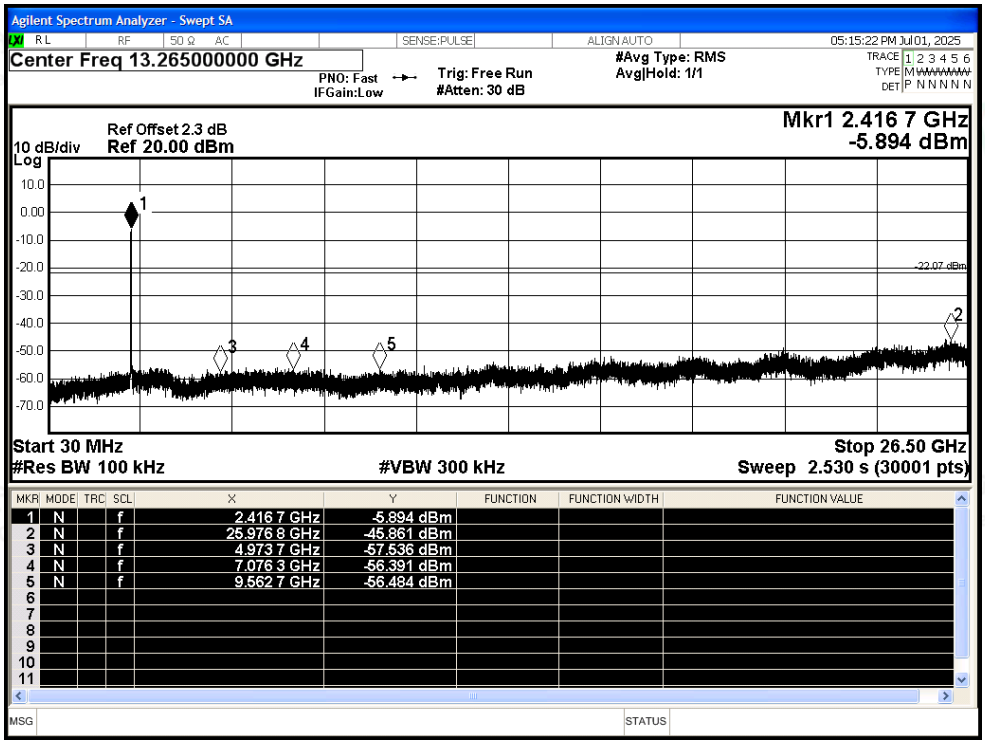
Tx. Spurious NVNT g 2462MHz Ant2 Emission



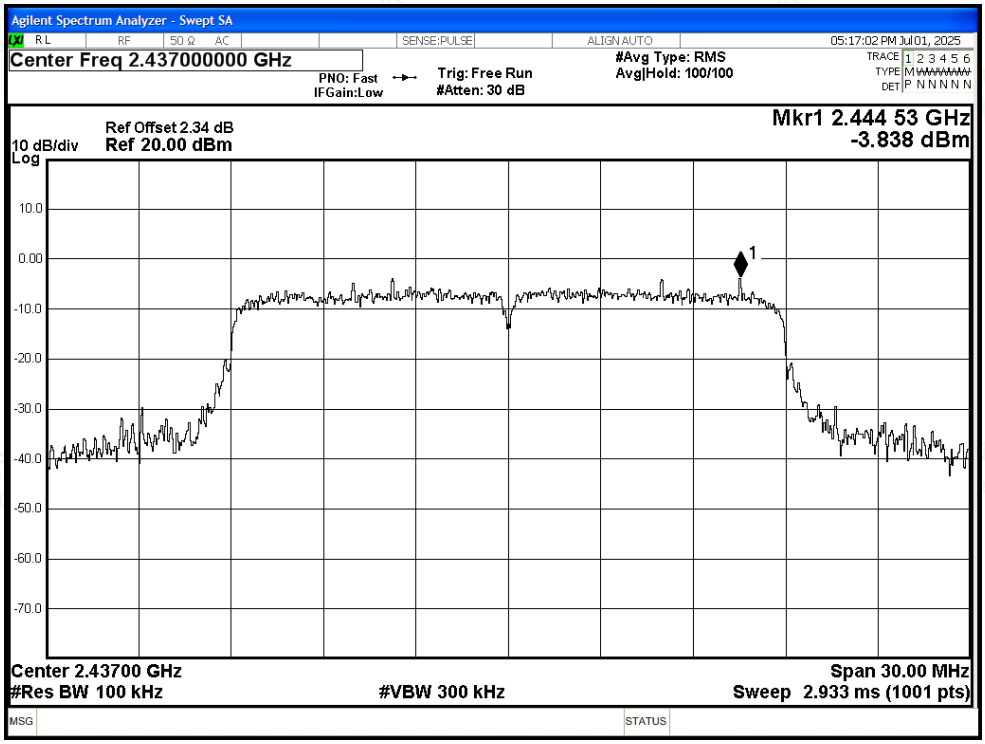
Tx. Spurious NVNT n20 2412MHz Ant2 Ref



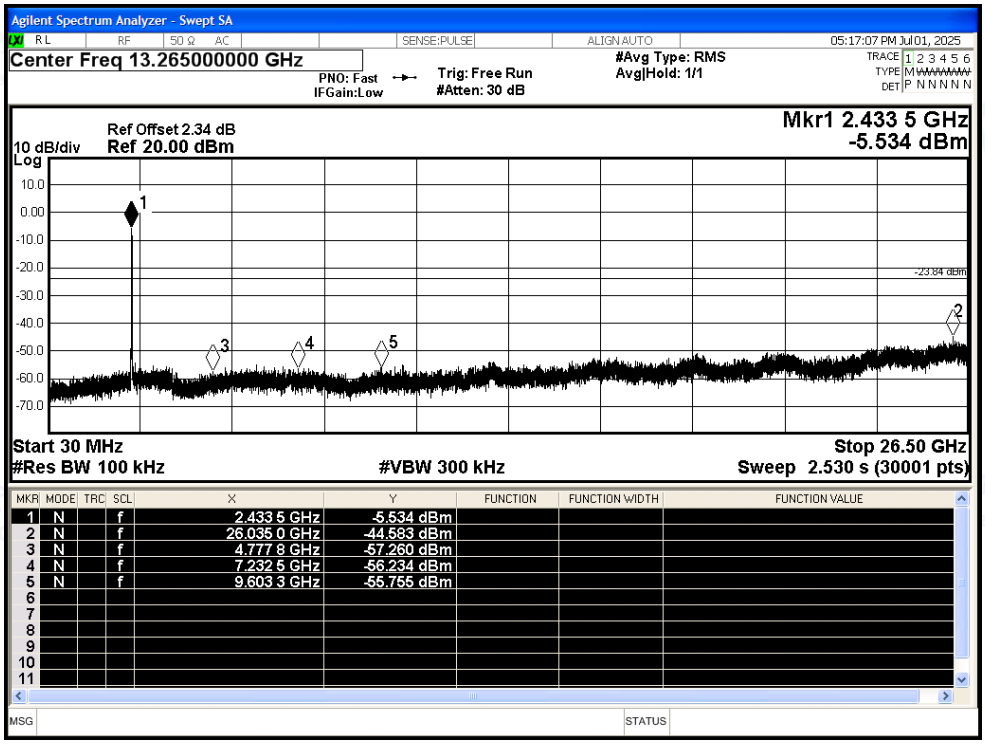
Tx. Spurious NVNT n20 2412MHz Ant2 Emission



Tx. Spurious NVNT n20 2437MHz Ant2 Ref



Tx. Spurious NVNT n20 2437MHz Ant2 Emission



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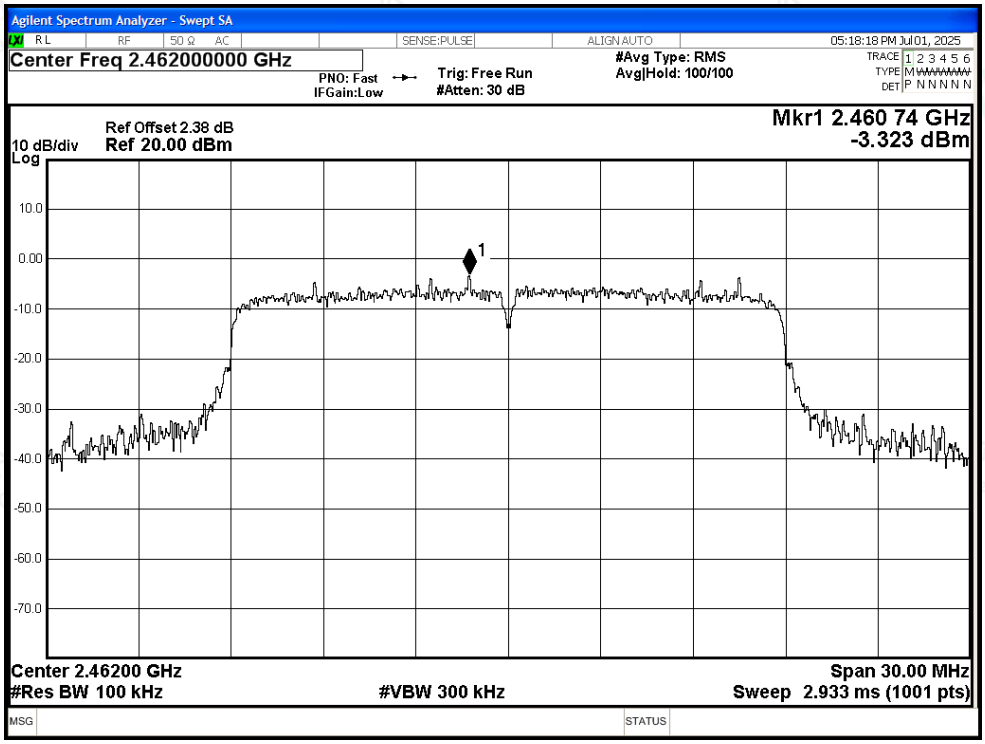
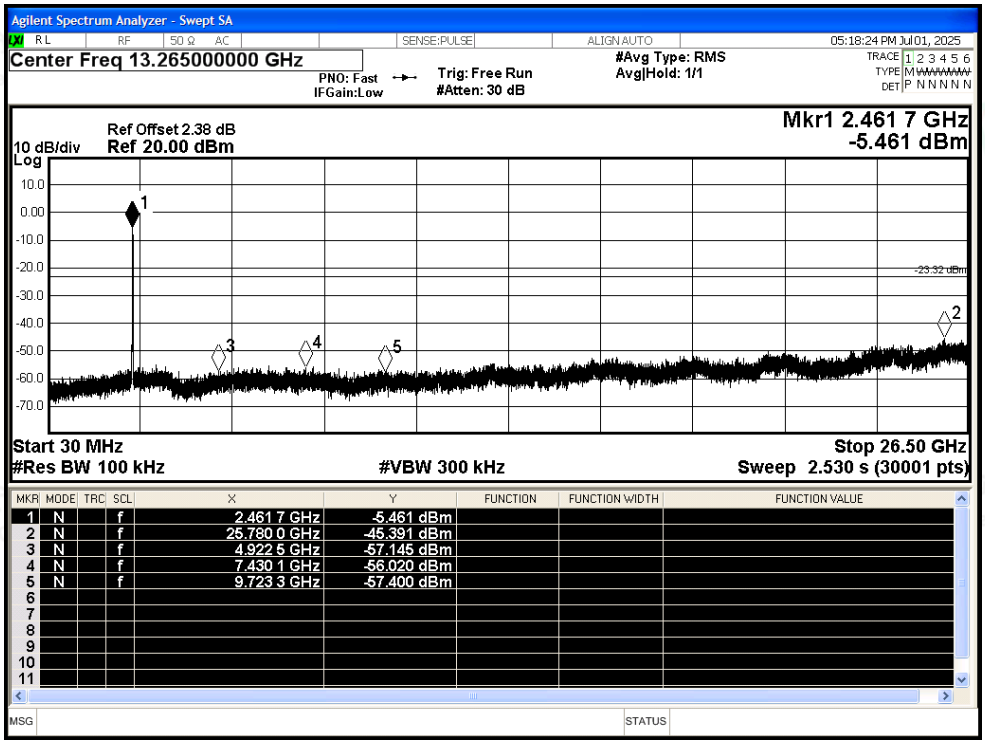
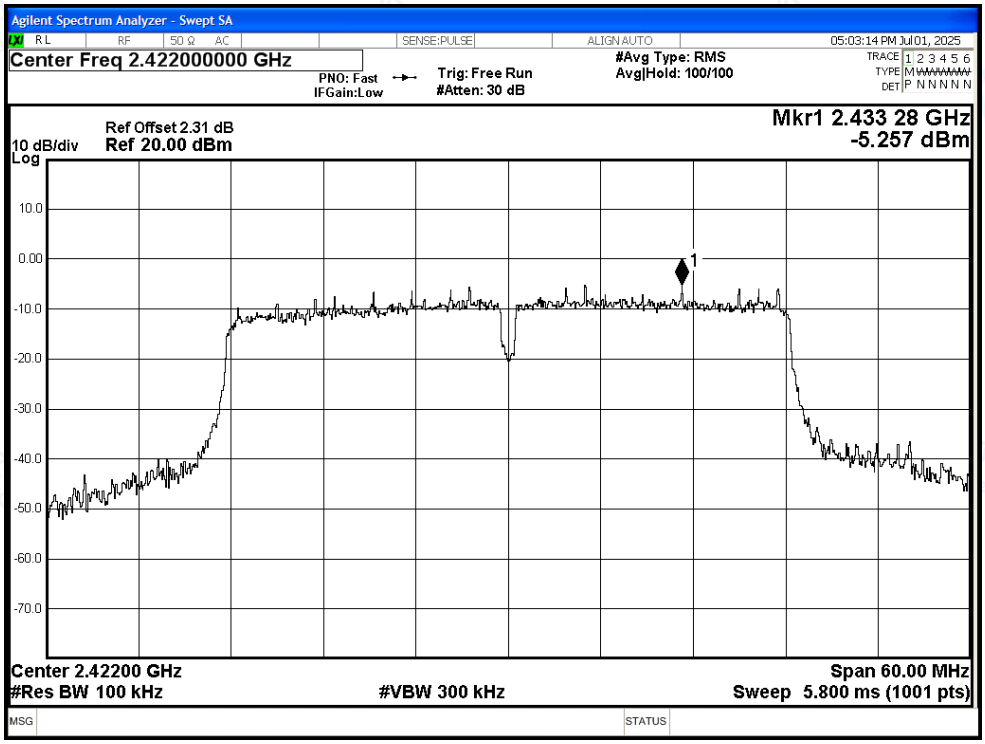


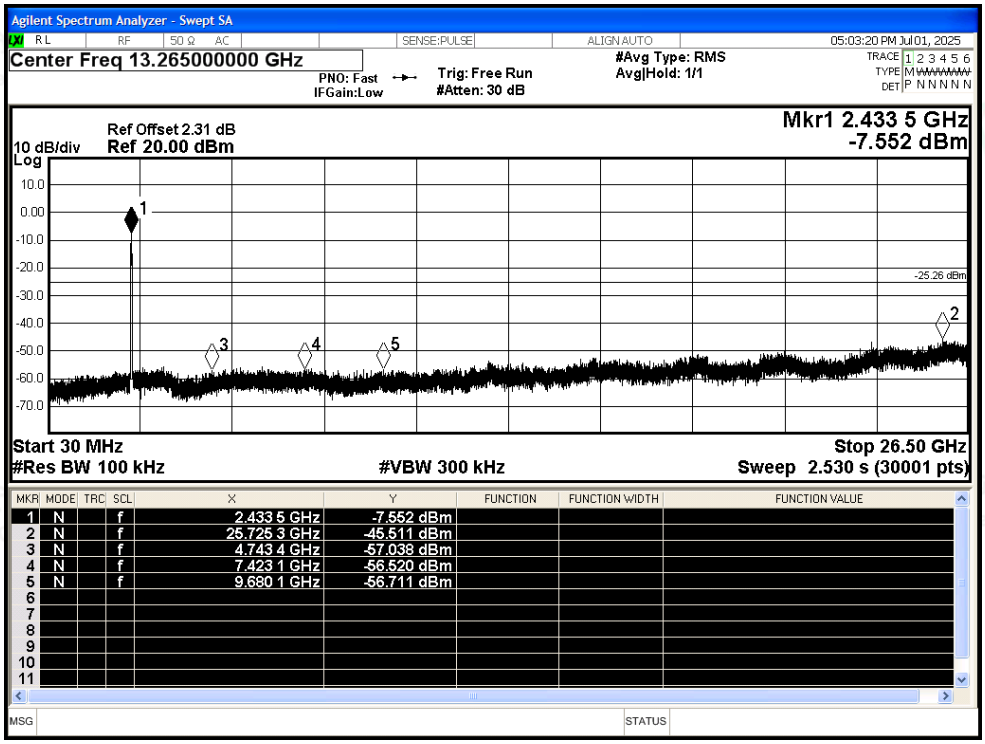
Tx. Spurious NVNT n20 2462MHz Ant2 Emission



Tx. Spurious NVNT n40 2422MHz Ant2 Ref



Tx. Spurious NVNT n40 2422MHz Ant2 Emission



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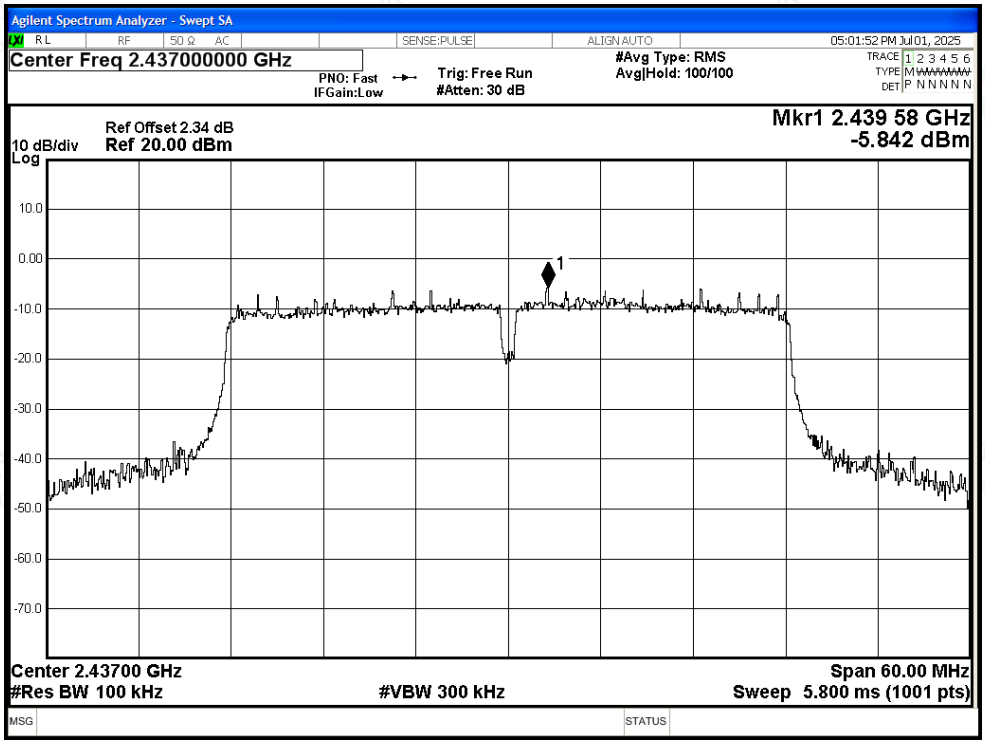
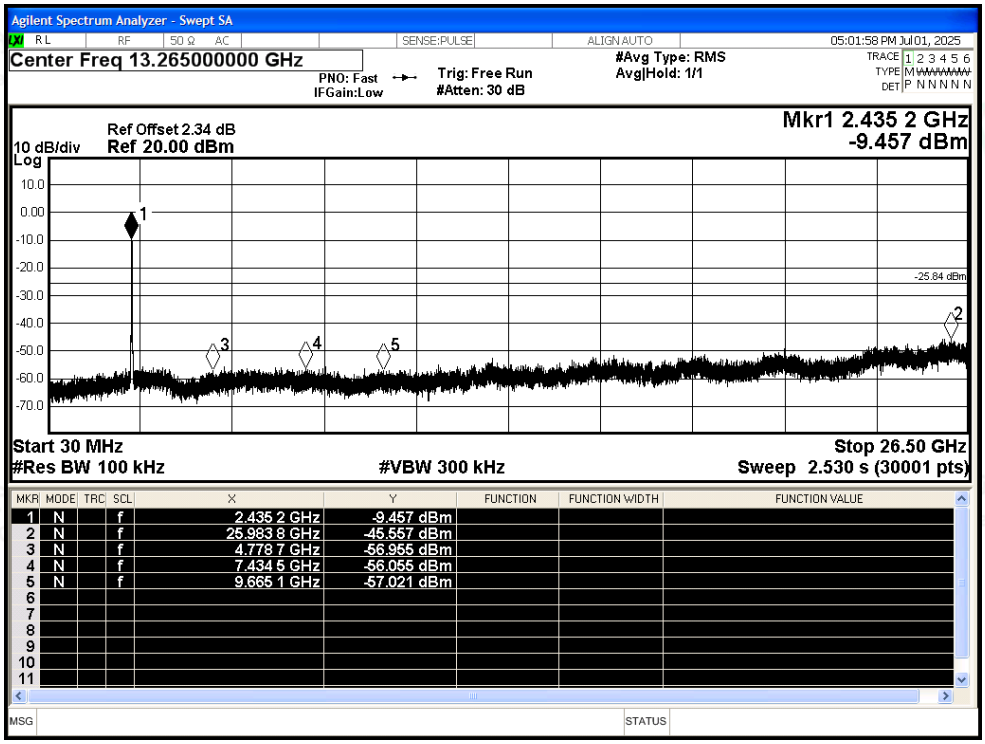


Tx. Spurious NVNT n40 2437MHz Ant2 Emission



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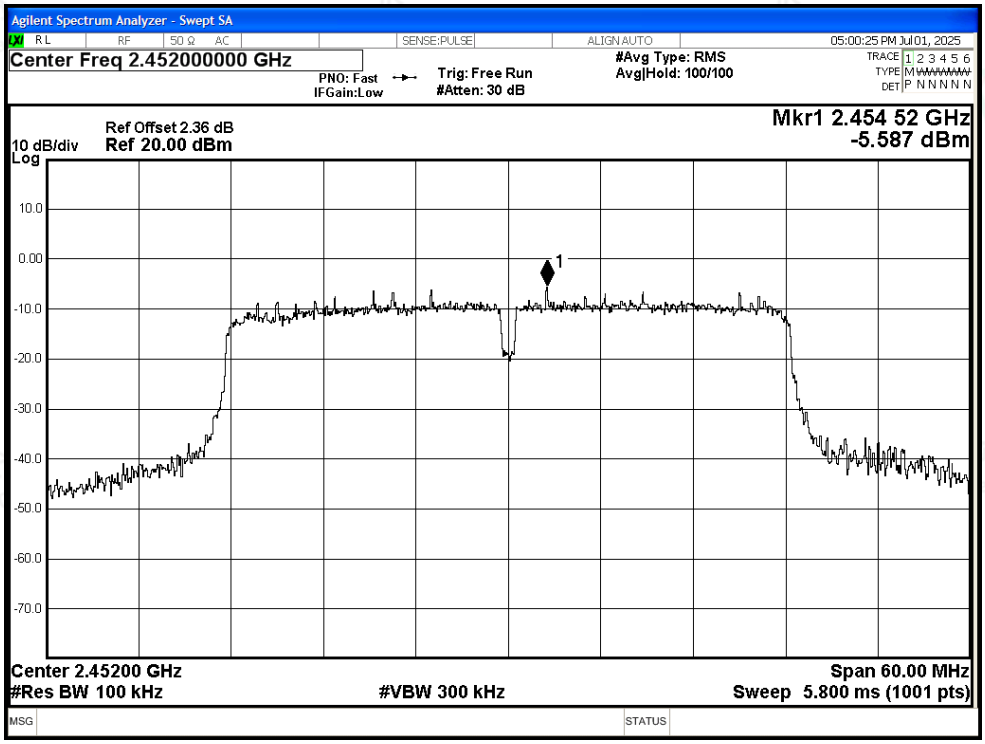
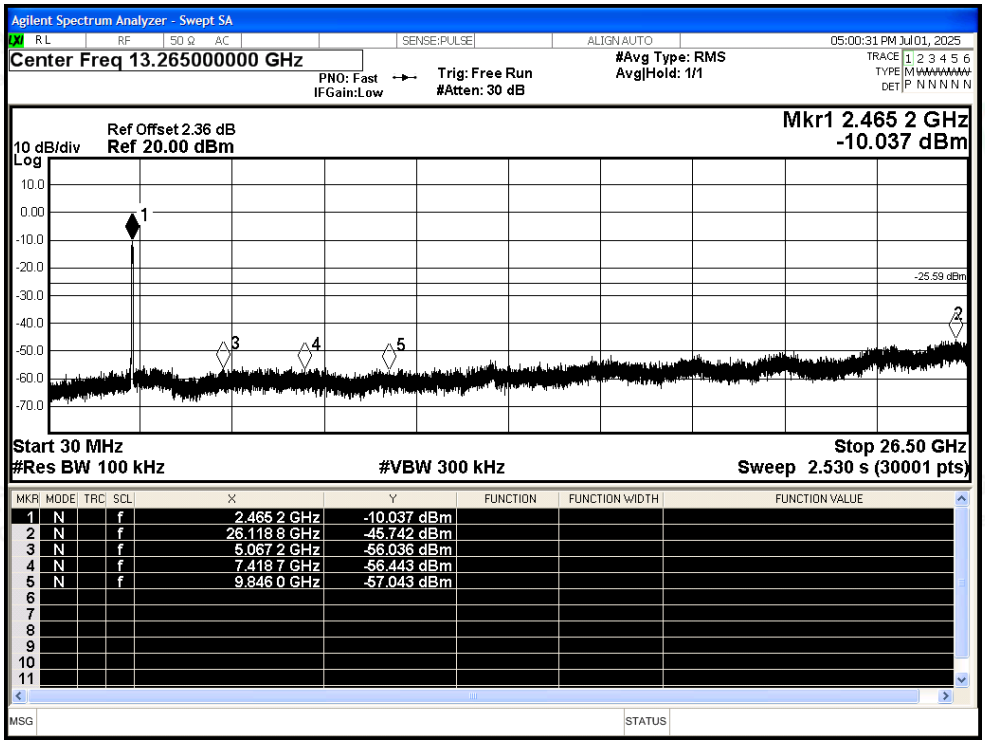


Tx. Spurious NVNT n40 2452MHz Ant2 Emission

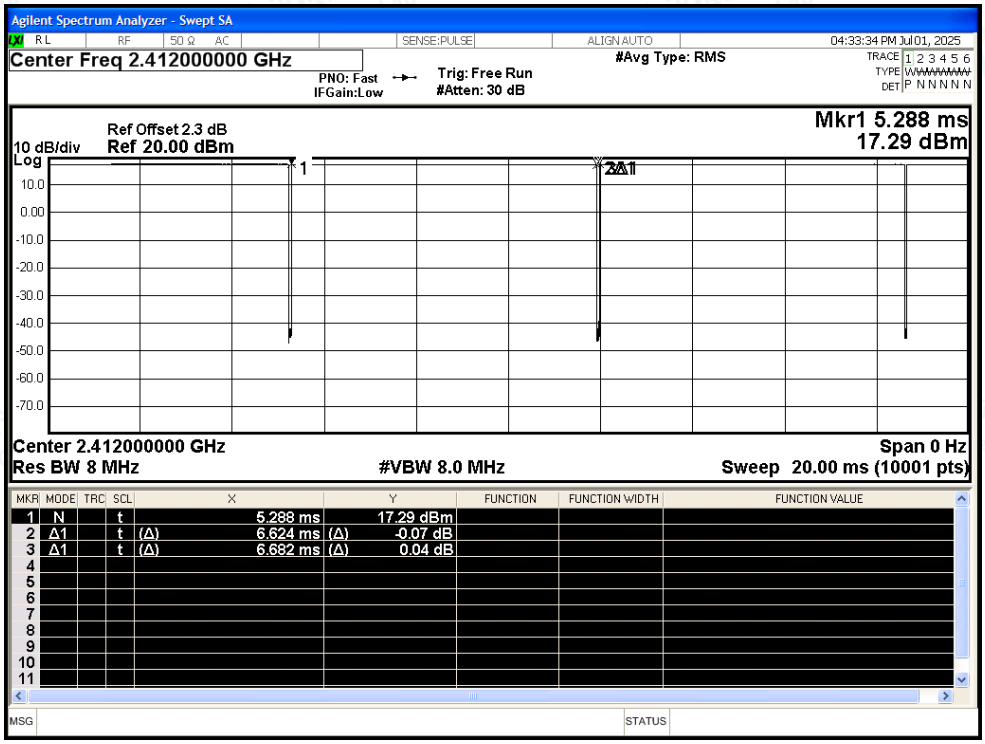


C.6 Duty Cycle

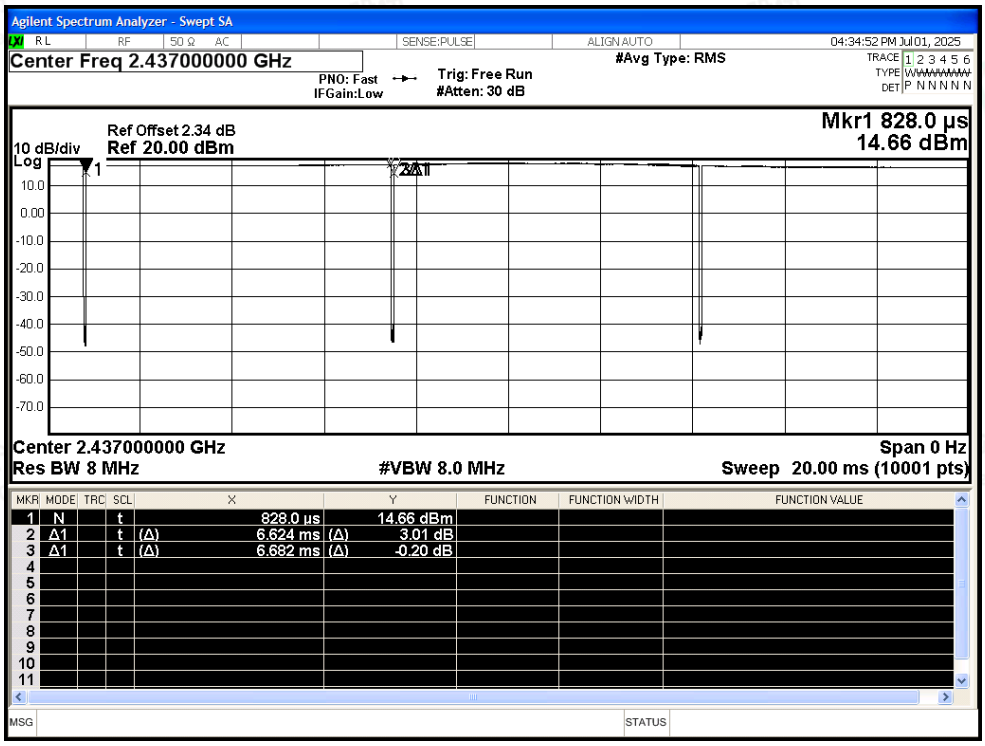
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	b	2412	Ant1	99.13	0	0.15
NVNT	b	2437	Ant1	99.13	0	0.15
NVNT	b	2462	Ant1	99.13	0	0.15
NVNT	g	2412	Ant1	97.75	0.1	0.37
NVNT	g	2437	Ant1	97.75	0.1	0.37
NVNT	g	2462	Ant1	97.75	0.1	0.37
NVNT	n20	2412	Ant1	97.33	0.12	0.44
NVNT	n20	2437	Ant1	97.33	0.12	0.44
NVNT	n20	2462	Ant1	97.25	0.12	0.44
NVNT	n40	2422	Ant1	94.7	0.24	0.9
NVNT	n40	2437	Ant1	94.71	0.24	0.9
NVNT	n40	2452	Ant1	94.7	0.24	0.9

Test Graphs

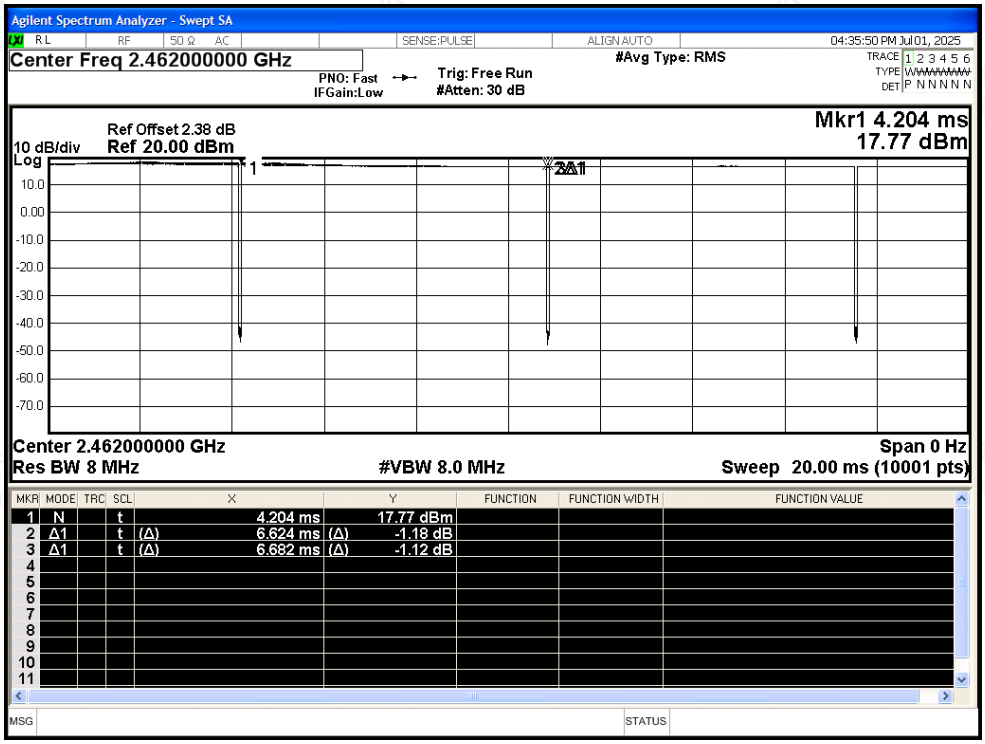
Duty Cycle NVNT b 2412MHz Ant1



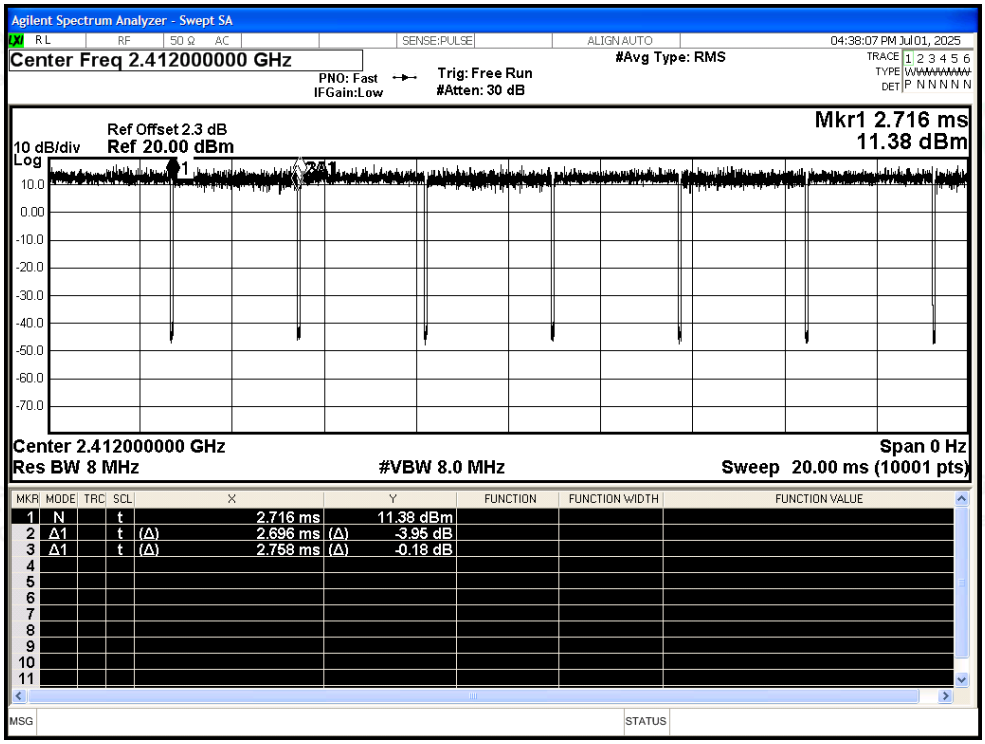
Duty Cycle NVNT b 2437MHz Ant1



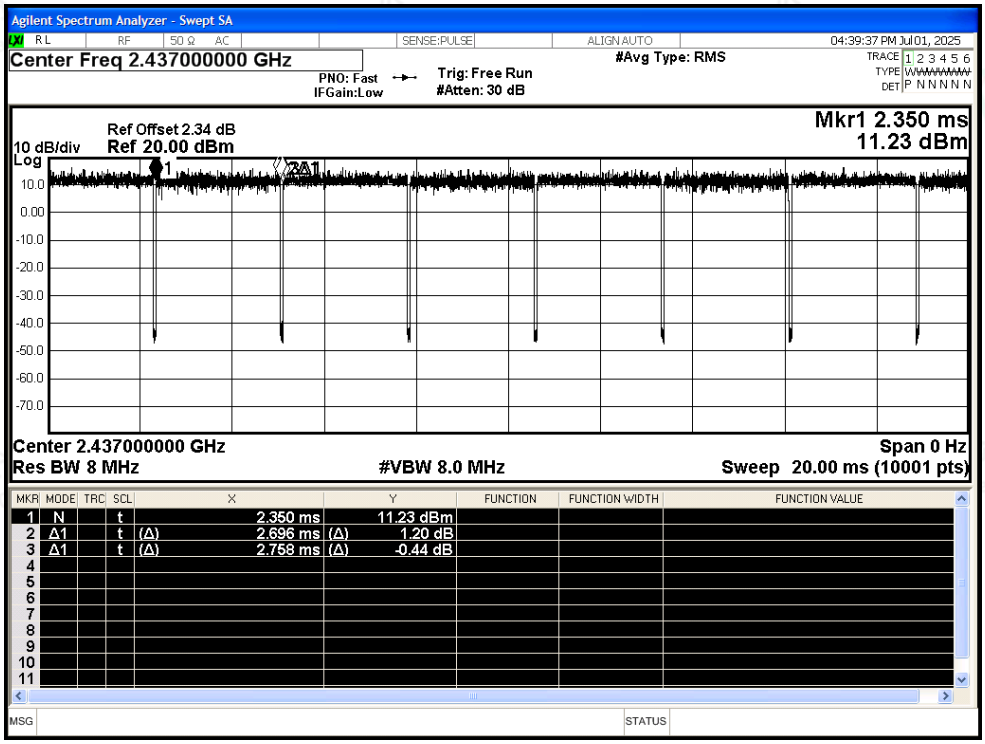
Duty Cycle NVNT b 2462MHz Ant1



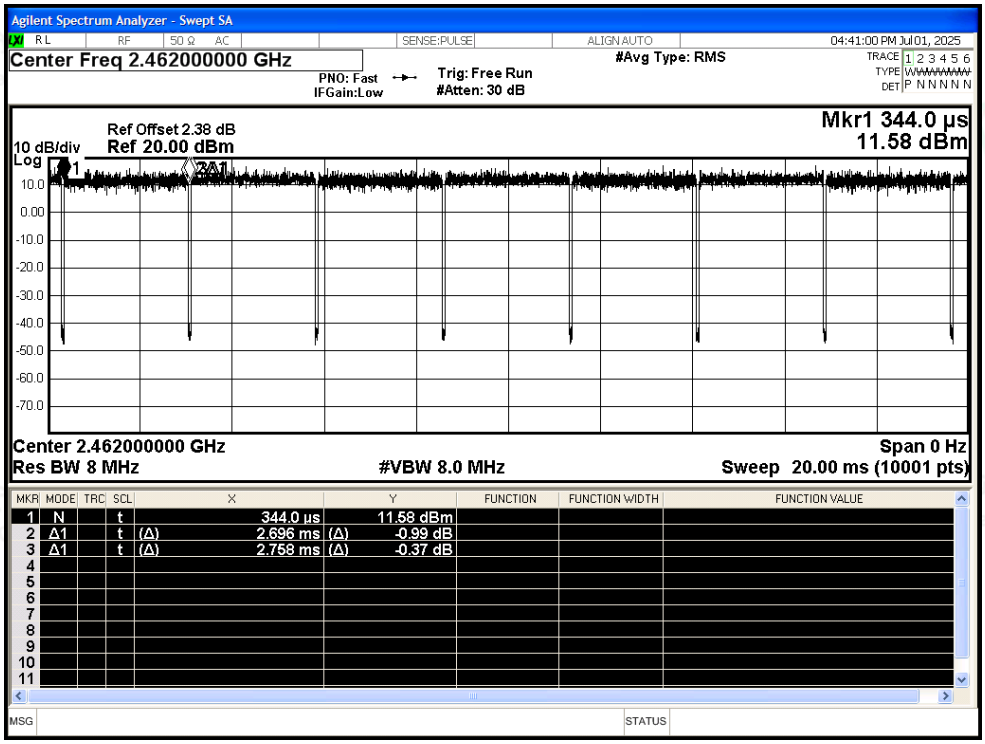
Duty Cycle NVNT g 2412MHz Ant1



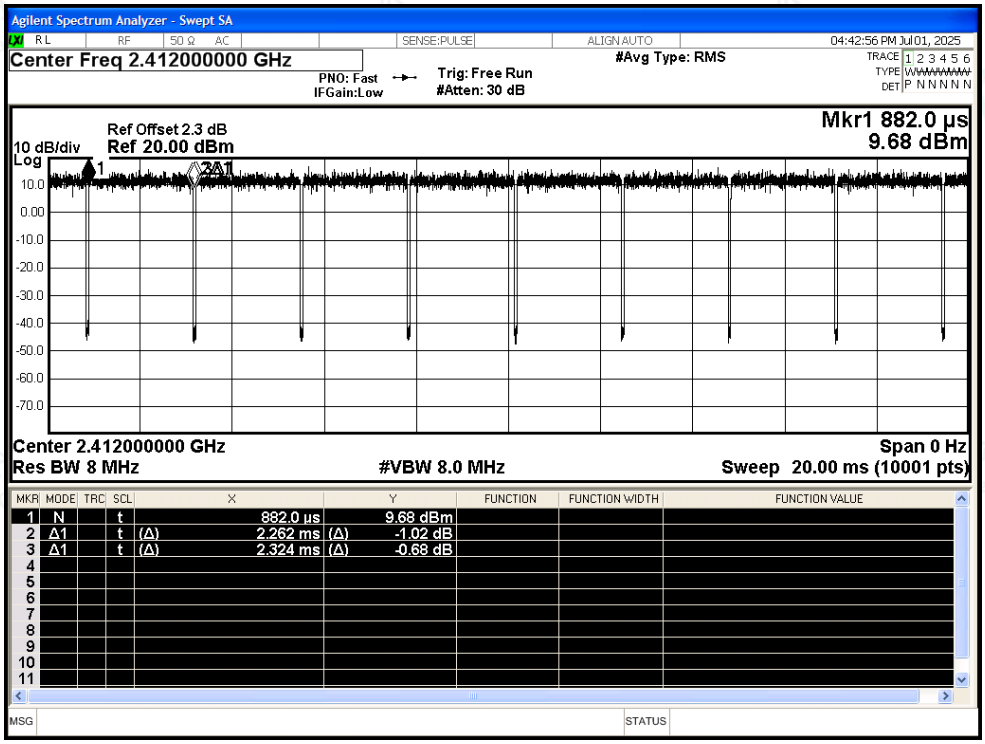
Duty Cycle NVNT g 2437MHz Ant1



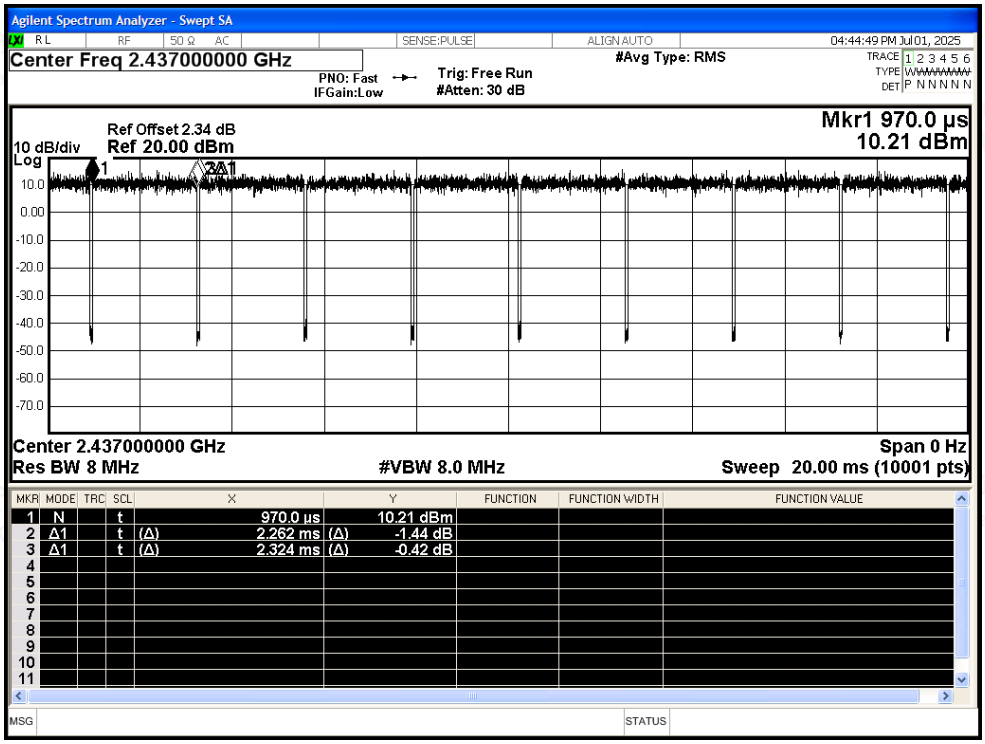
Duty Cycle NVNT g 2462MHz Ant1



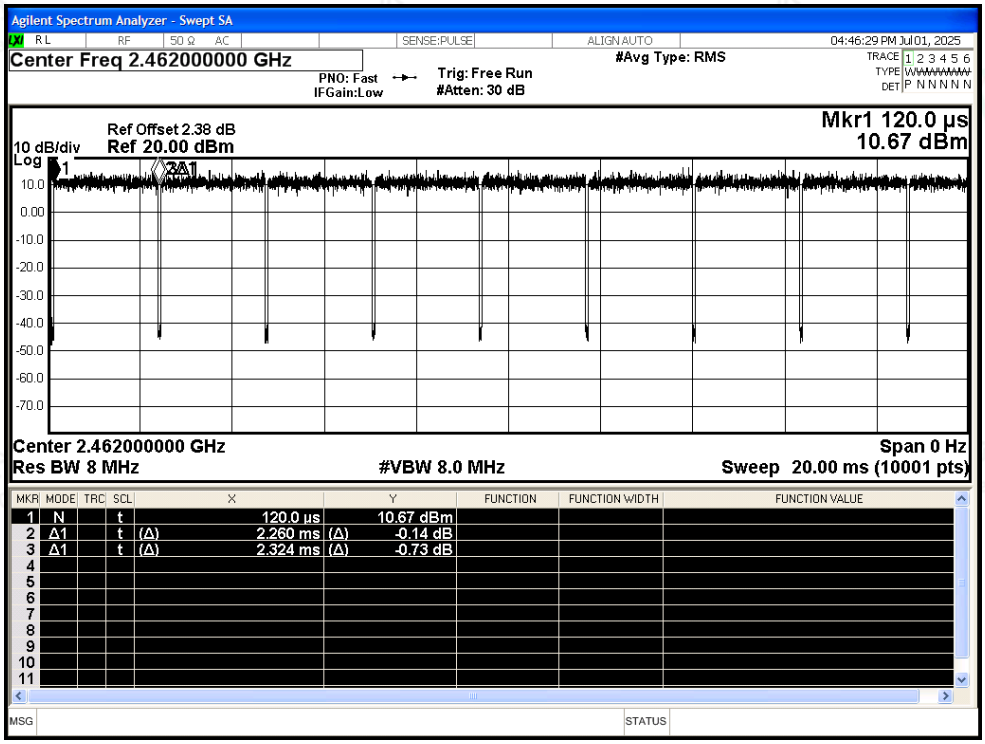
Duty Cycle NVNT n20 2412MHz Ant1



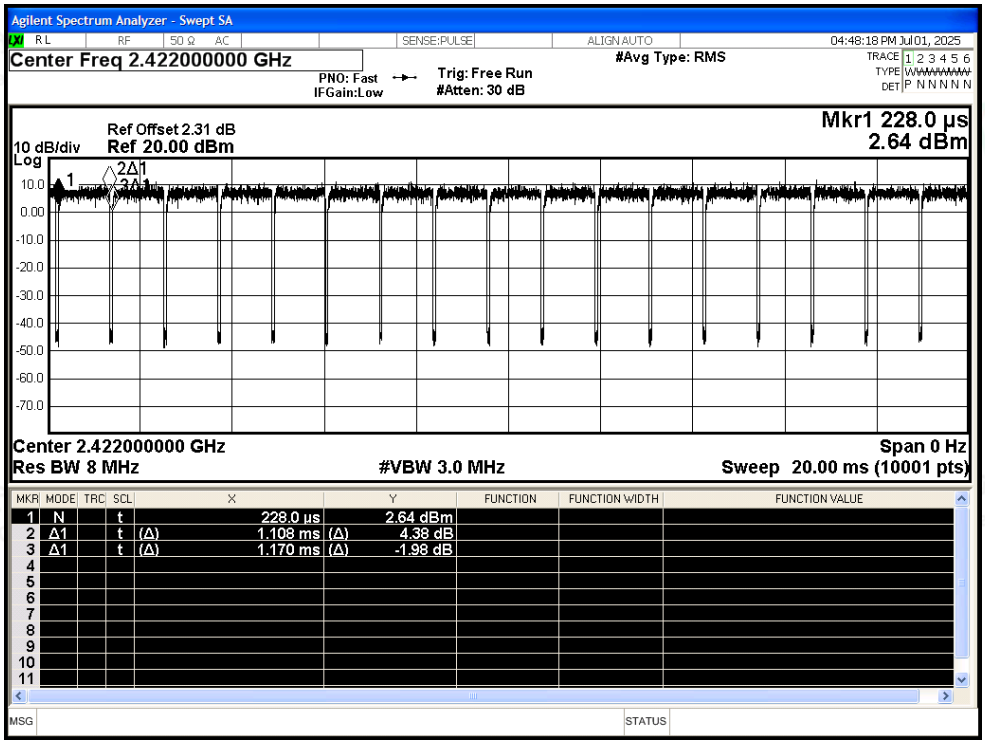
Duty Cycle NVNT n20 2437MHz Ant1



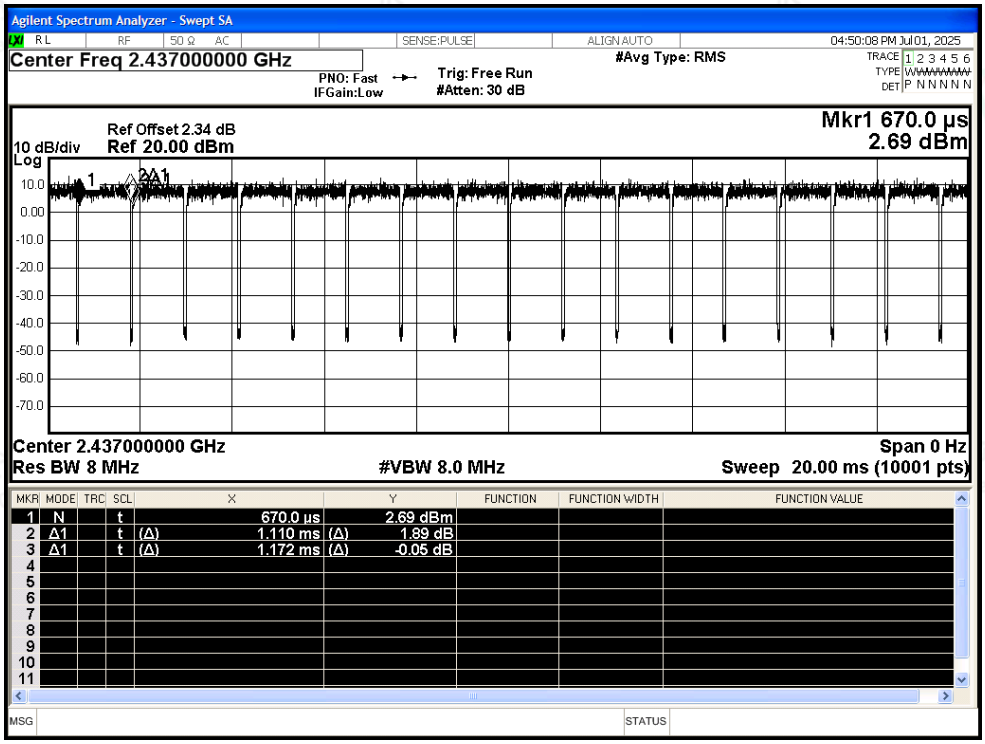
Duty Cycle NVNT n20 2462MHz Ant1



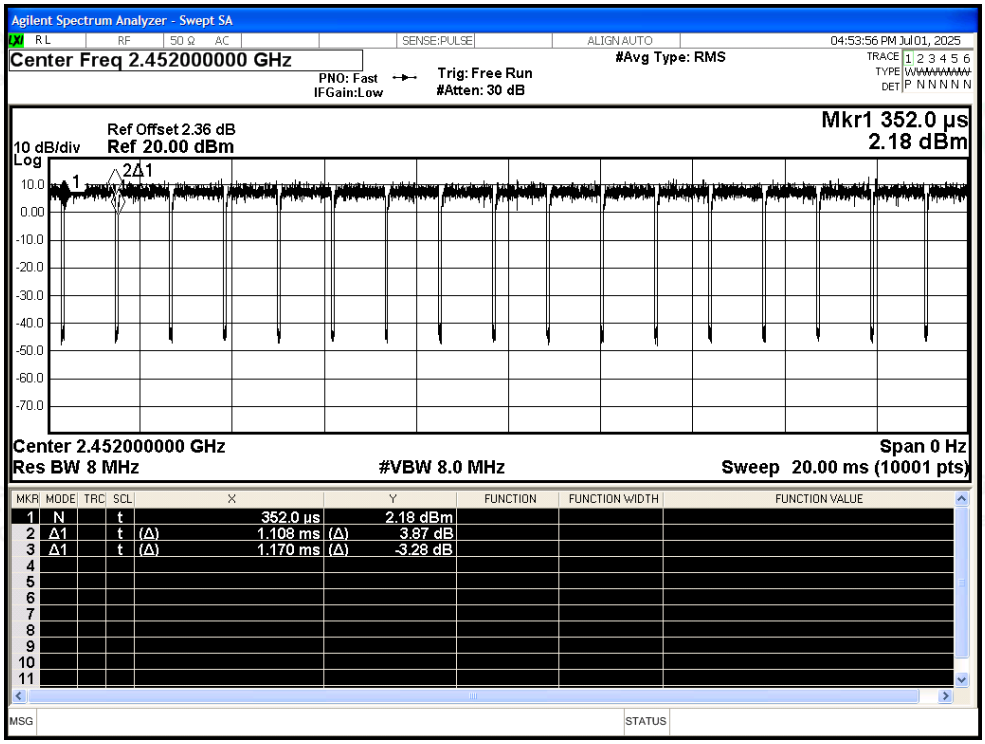
Duty Cycle NVNT n40 2422MHz Ant1



Duty Cycle NVNT n40 2437MHz Ant1



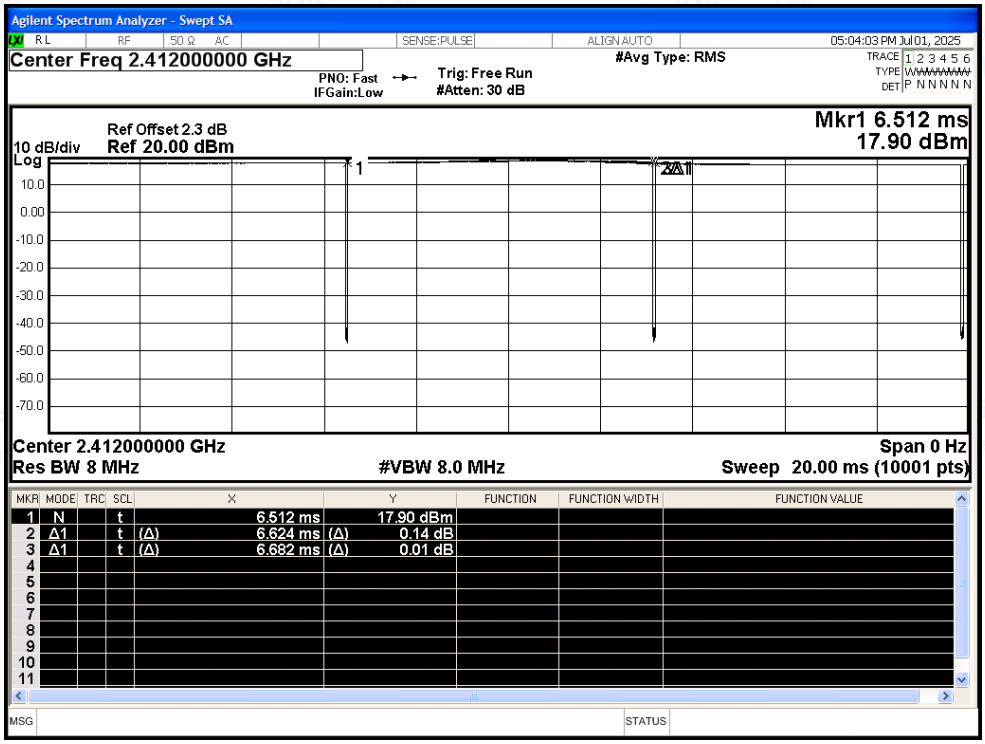
Duty Cycle NVNT n40 2452MHz Ant1



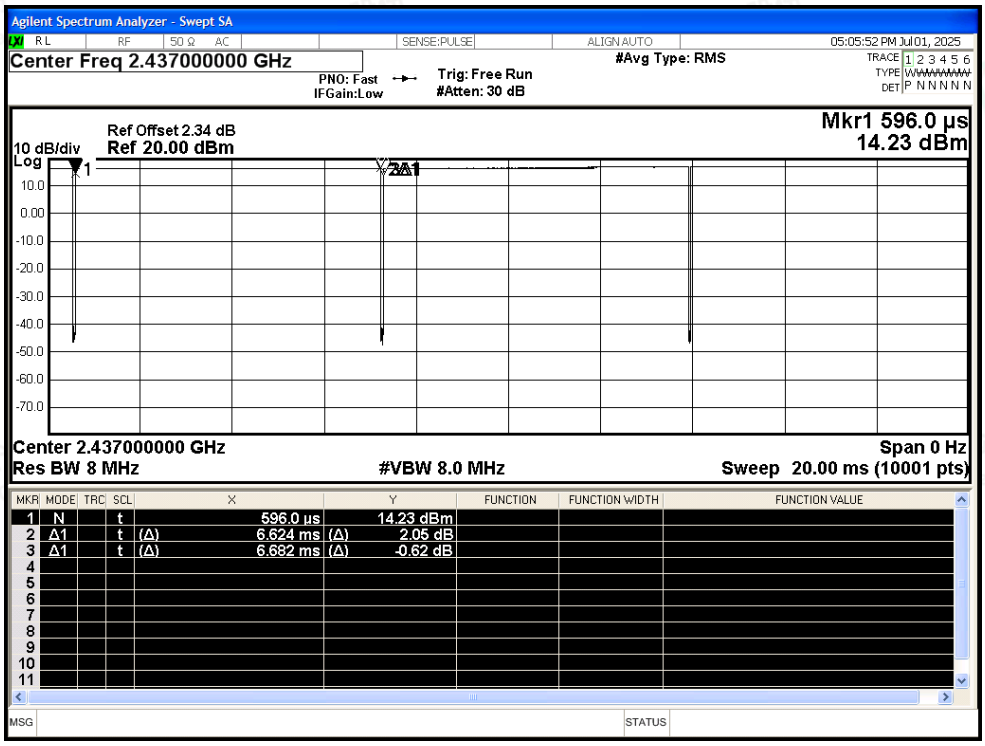
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	b	2412	Ant2	99.13	0	0.15
NVNT	b	2437	Ant2	99.13	0	0.15
NVNT	b	2462	Ant2	99.16	0	0.15
NVNT	g	2412	Ant2	97.68	0.1	0.37
NVNT	g	2437	Ant2	97.75	0.1	0.37
NVNT	g	2462	Ant2	97.68	0.1	0.37
NVNT	n20	2412	Ant2	97.33	0.12	0.44
NVNT	n20	2437	Ant2	97.33	0.12	0.44
NVNT	n20	2462	Ant2	97.25	0.12	0.44
NVNT	n40	2422	Ant2	94.7	0.24	0.9
NVNT	n40	2437	Ant2	94.7	0.24	0.9
NVNT	n40	2452	Ant2	94.71	0.24	0.9

Test Graphs

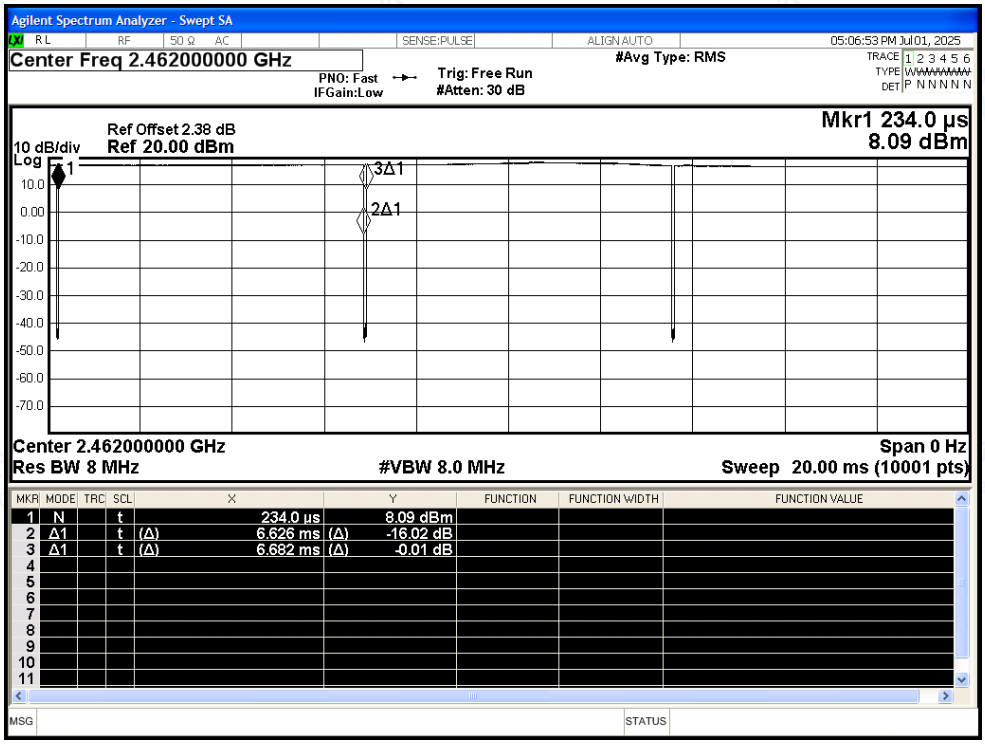
Duty Cycle NVNT b 2412MHz Ant2



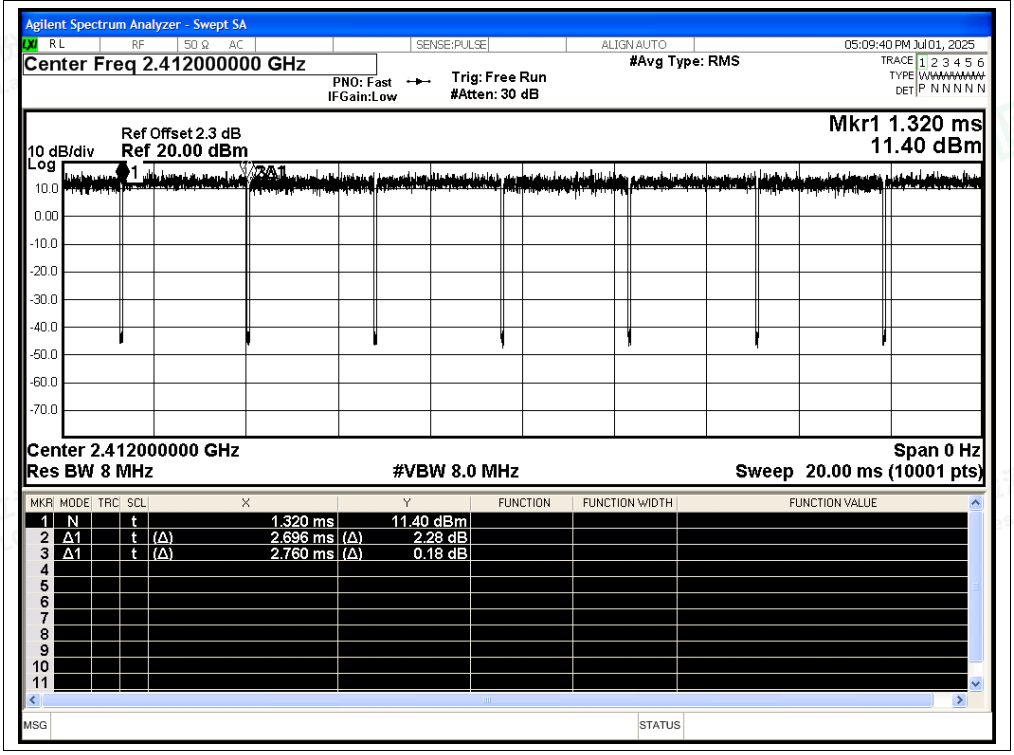
Duty Cycle NVNT b 2437MHz Ant2



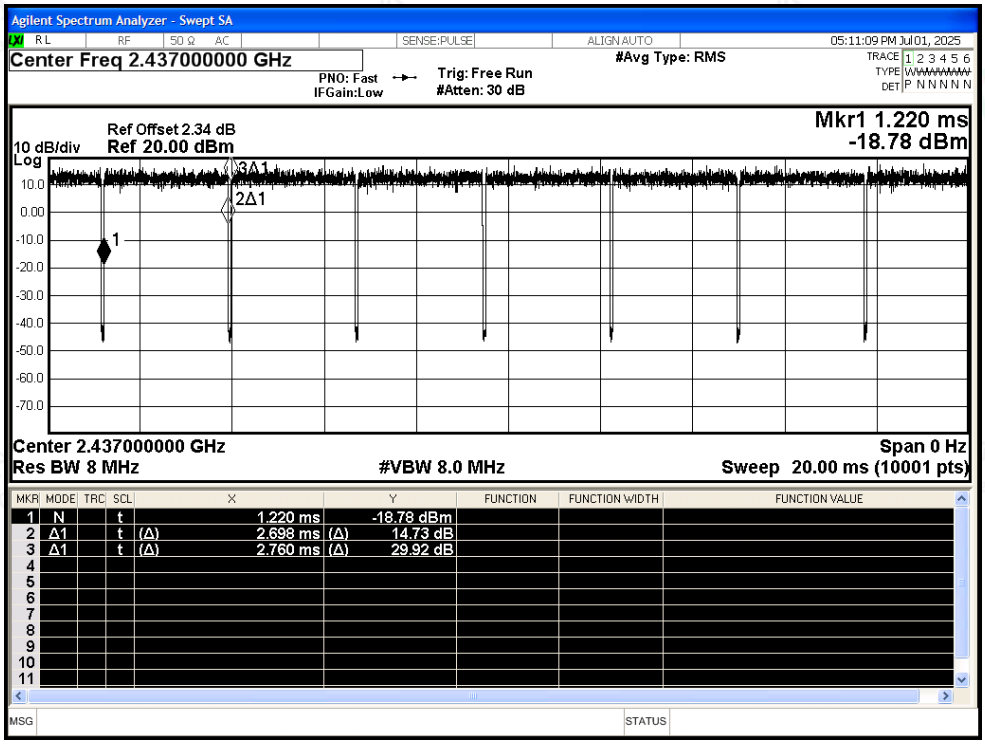
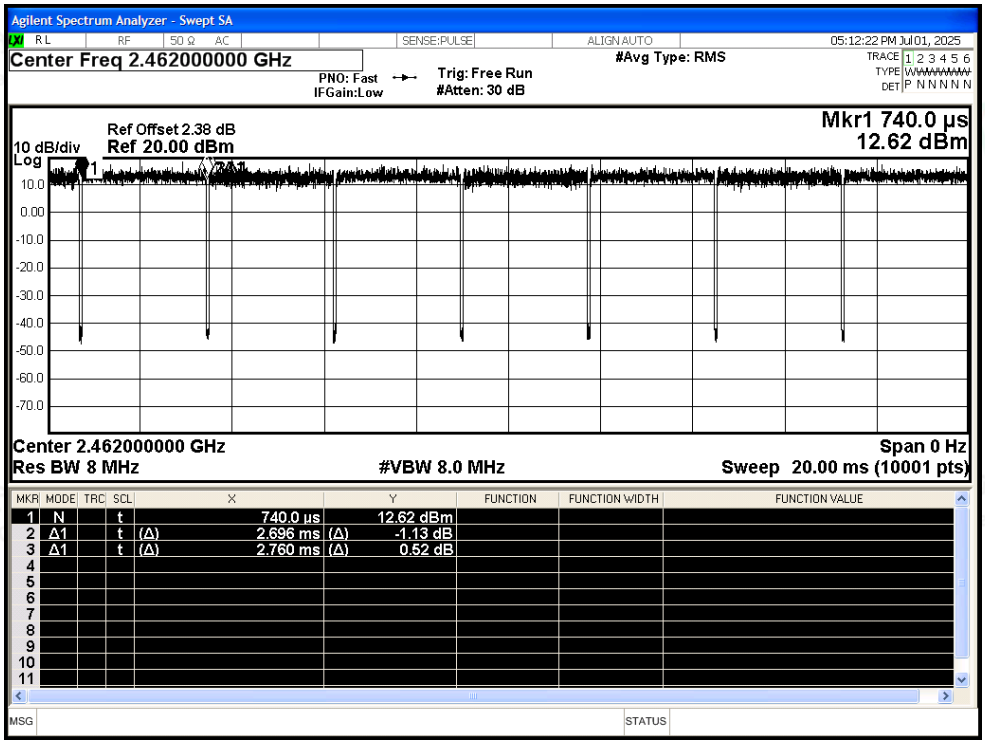
Duty Cycle NVNT b 2462MHz Ant2



Duty Cycle NVNT g 2412MHz Ant2



Duty Cycle NVNT g 2437MHz Ant2



Duty Cycle NVNT g 2462MHz Ant2