

Appendix A

RF Test Data for BT (Conducted Measurement)

Product Name: Wireless Diagnostics Module/Vehicle Communication Interface

Test Model: W02

Environmental Conditions

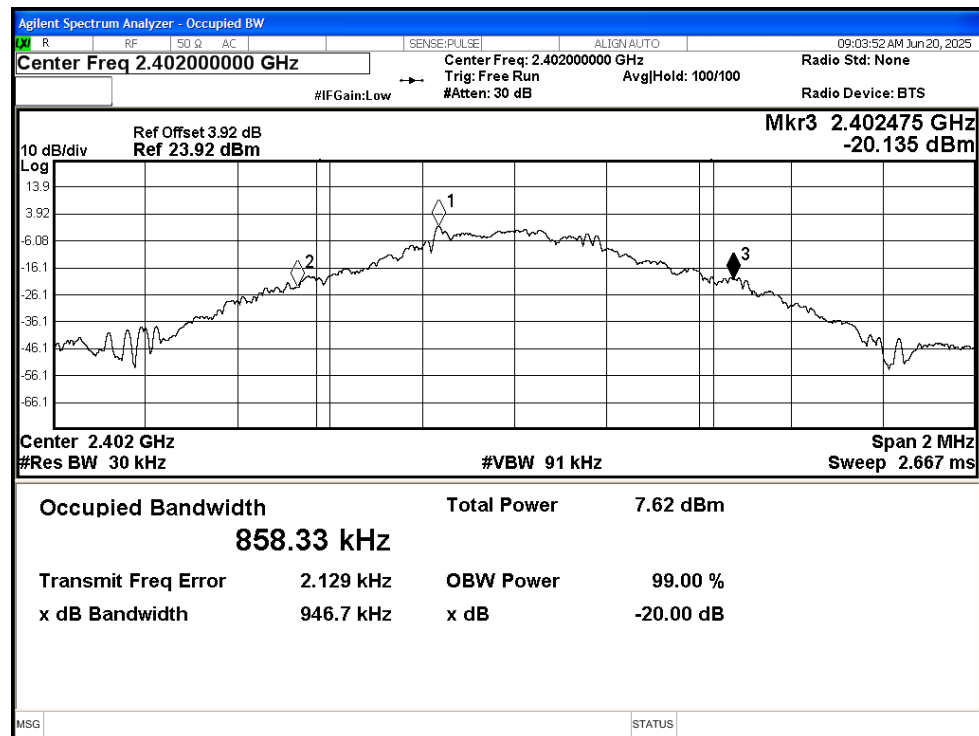
Temperature:	23.8°C
Relative Humidity:	52.3%
ATM Pressure:	100.0 kPa
Test Engineer:	Suichao Lai
Supervised by:	Yan Chen

A.1 -20dB Bandwidth

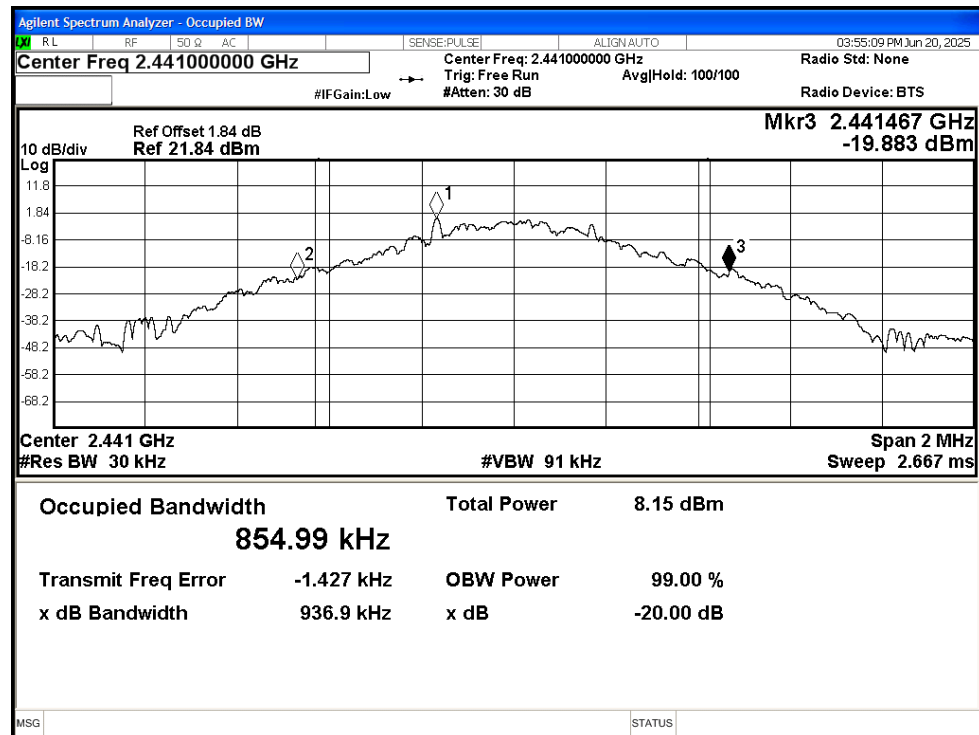
Condition	Mode	Frequency (MHz)	Antenna	-20 dB Bandwidth (MHz)	Limit -20 dB Bandwidth (MHz)	Verdict
NVNT	1-DH5	2402	Ant	0.947	N/A	Pass
NVNT	1-DH5	2441	Ant	0.937	N/A	Pass
NVNT	1-DH5	2480	Ant	1.001	N/A	Pass
NVNT	2-DH5	2402	Ant	1.286	N/A	Pass
NVNT	2-DH5	2441	Ant	1.301	N/A	Pass
NVNT	2-DH5	2480	Ant	1.3	N/A	Pass
NVNT	3-DH5	2402	Ant	1.311	N/A	Pass
NVNT	3-DH5	2441	Ant	1.306	N/A	Pass
NVNT	3-DH5	2480	Ant	1.294	N/A	Pass

Test Graphs

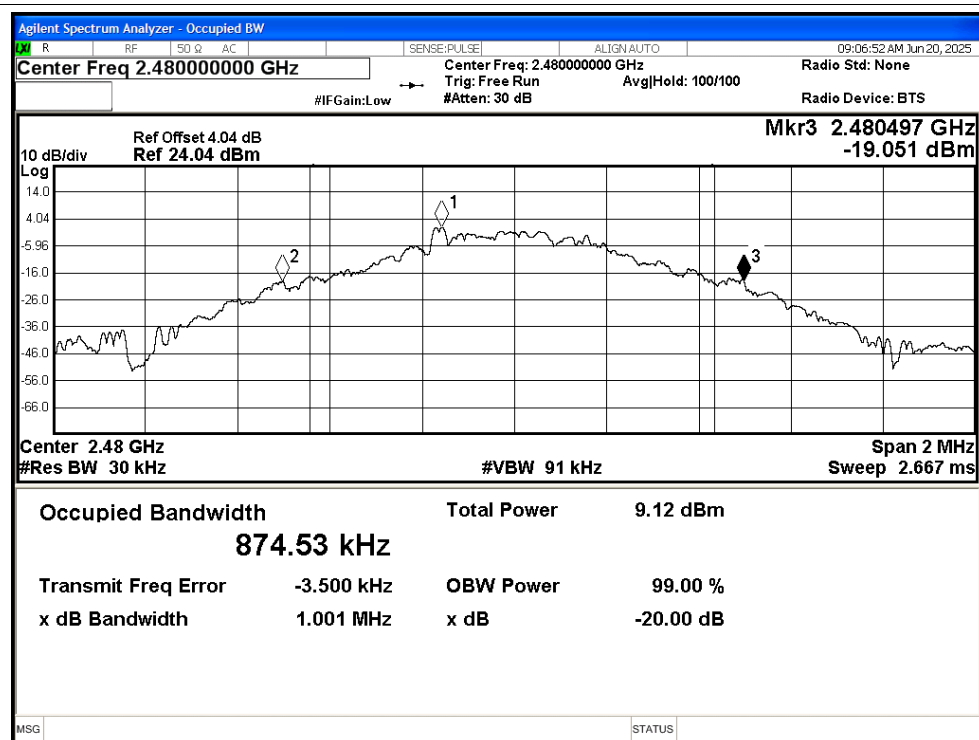
-20dB Bandwidth NVNT 1-DH5 2402MHz Ant



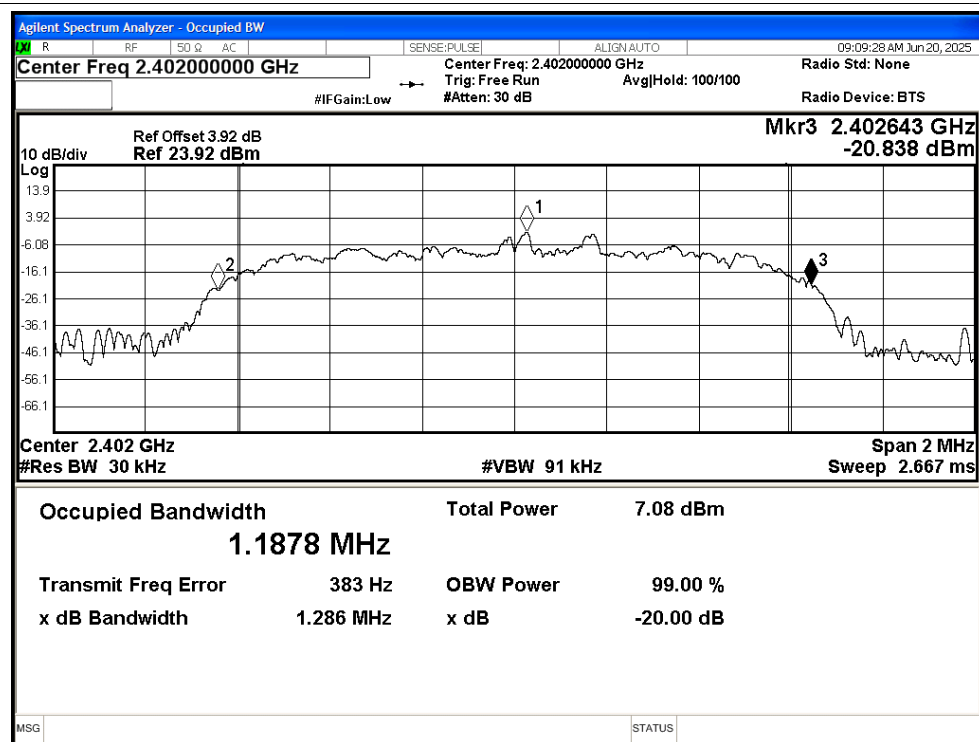
-20dB Bandwidth NVNT 1-DH5 2441MHz Ant



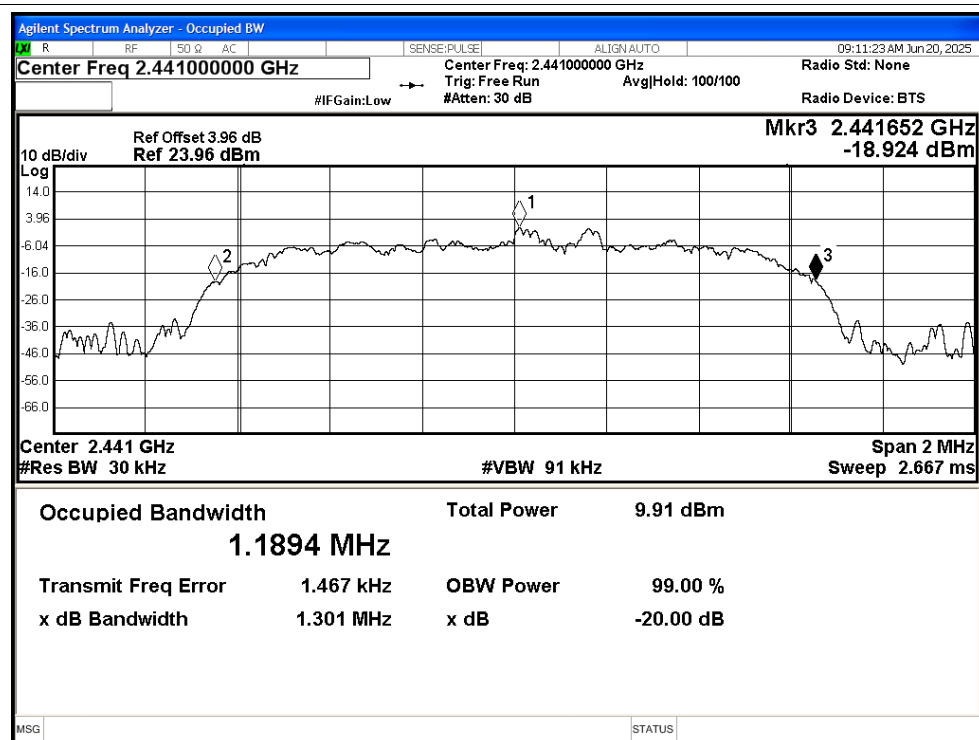
-20dB Bandwidth NVNT 1-DH5 2480MHz Ant



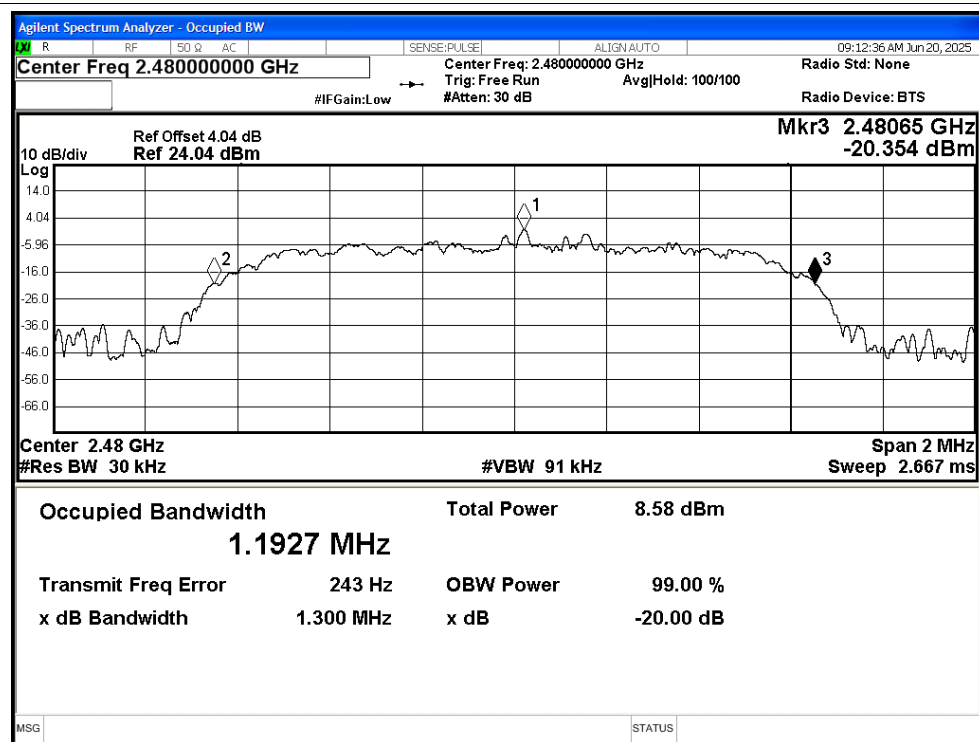
-20dB Bandwidth NVNT 2-DH5 2402MHz Ant



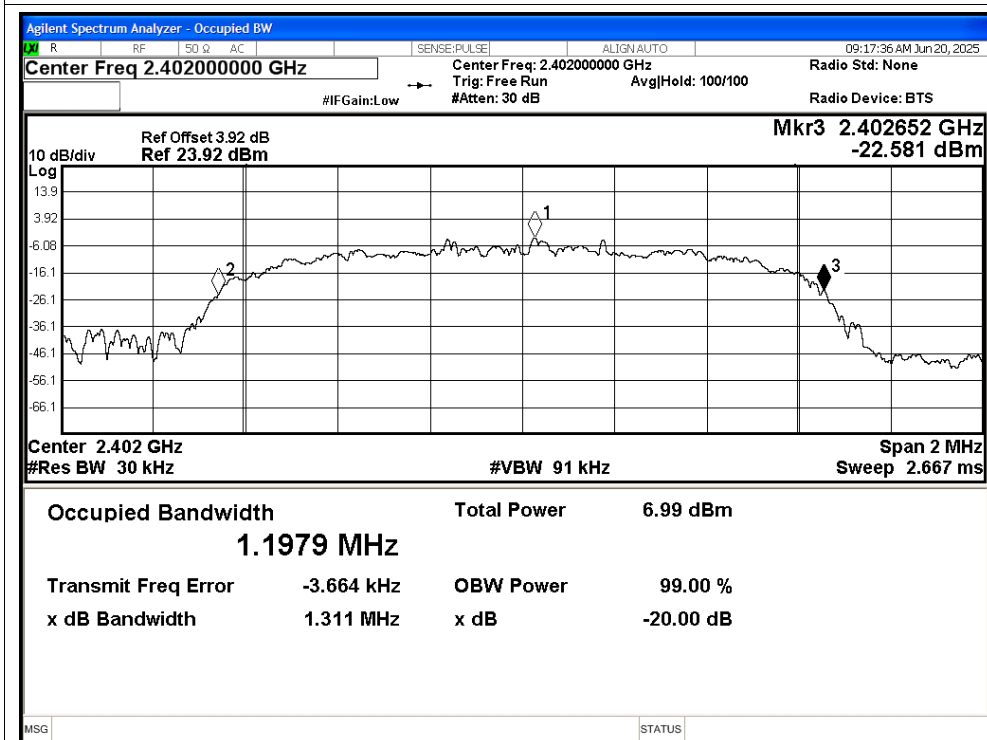
-20dB Bandwidth NVNT 2-DH5 2441MHz Ant



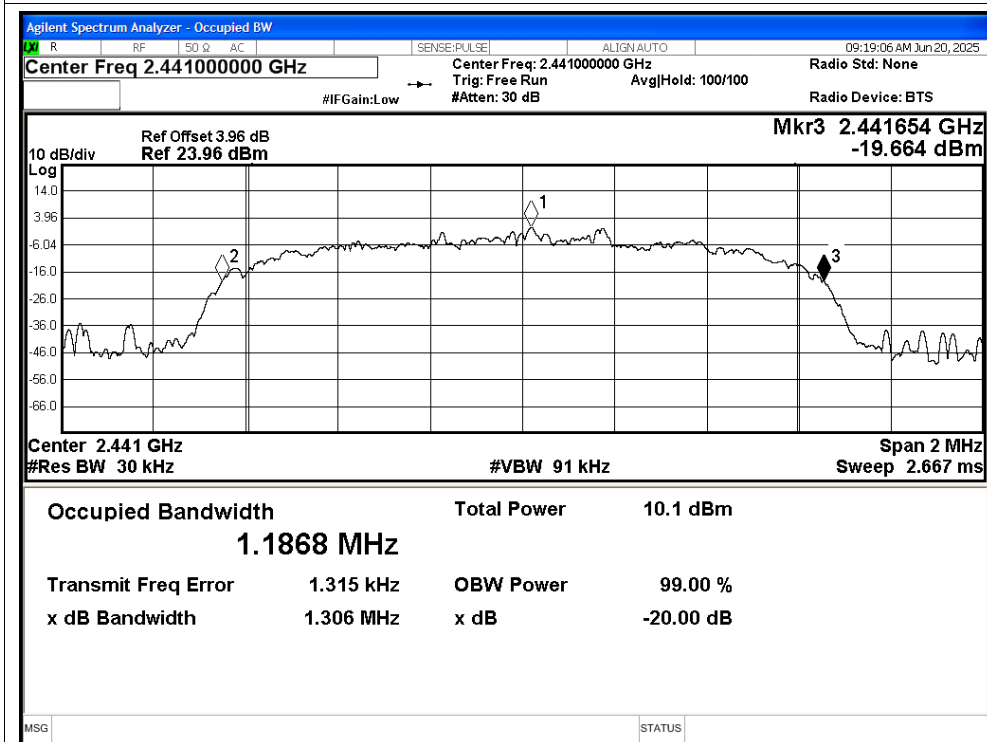
-20dB Bandwidth NVNT 2-DH5 2480MHz Ant

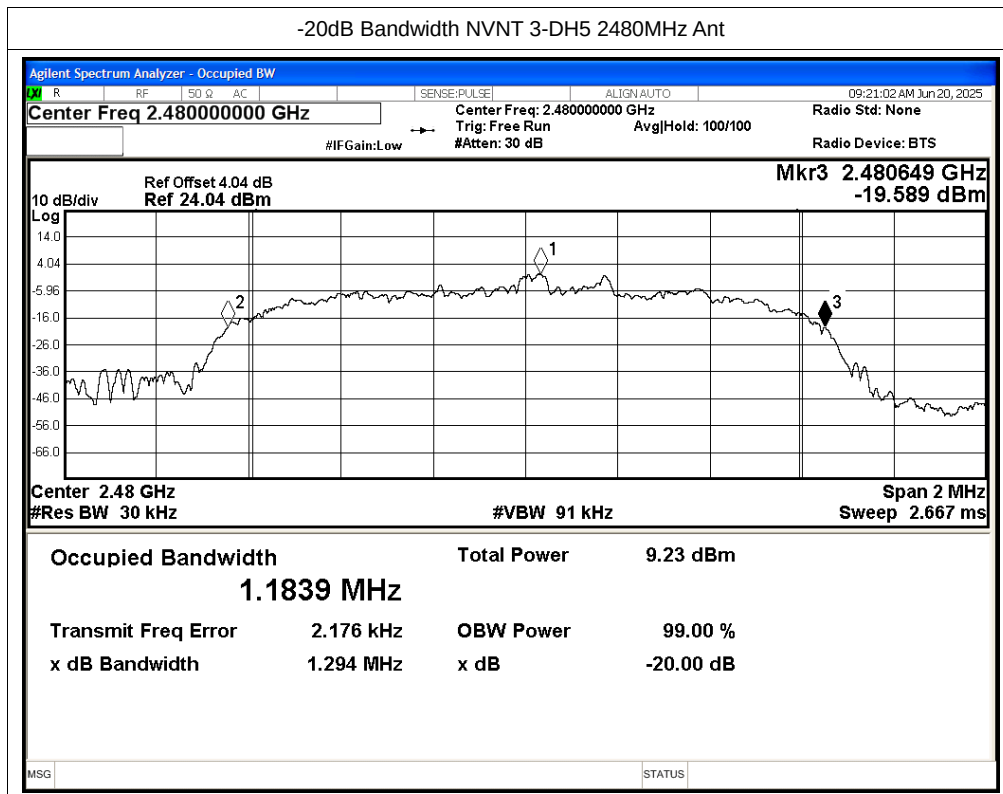


-20dB Bandwidth NVNT 3-DH5 2402MHz Ant



-20dB Bandwidth NVNT 3-DH5 2441MHz Ant



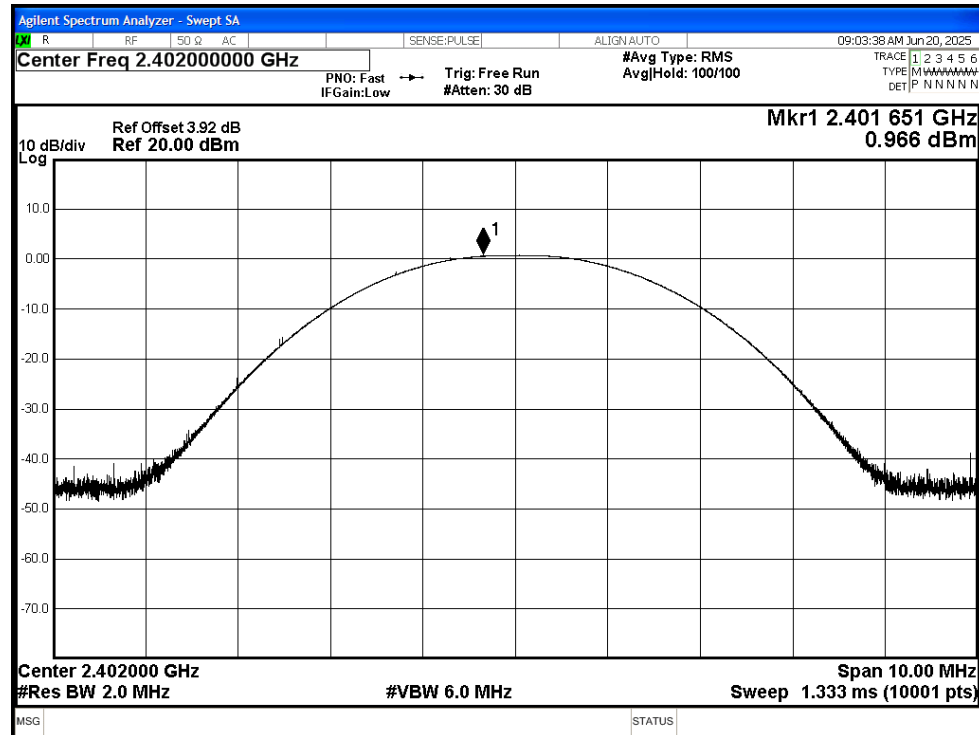


A.2 Maximum Peak Conducted Output Power

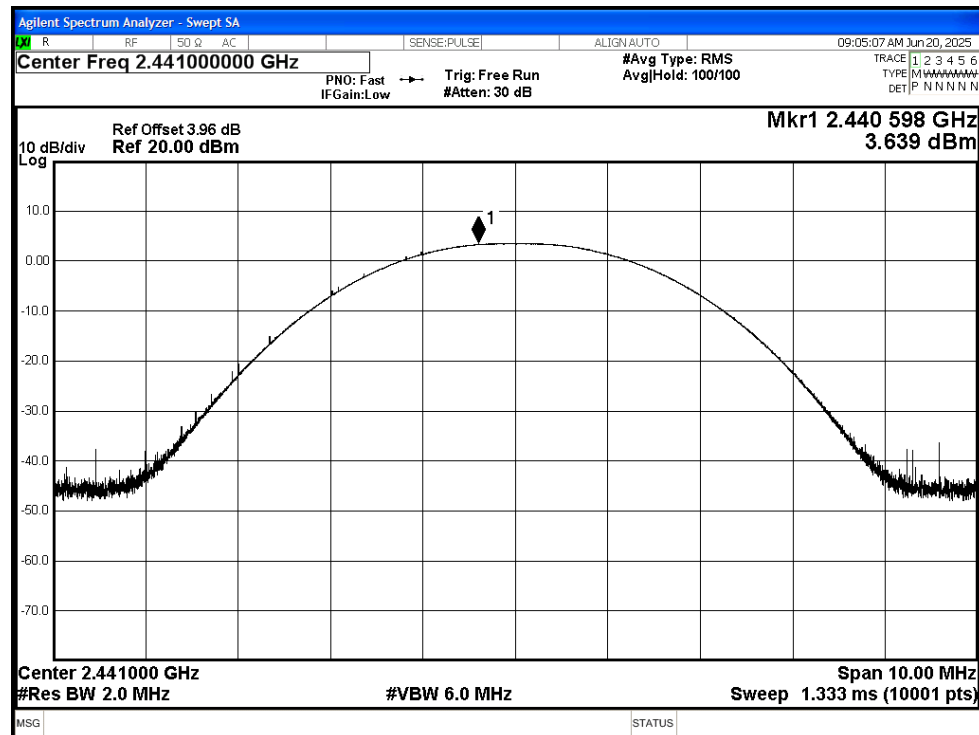
Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	1-DH5	2402	Ant	0.97	21	Pass
NVNT	1-DH5	2441	Ant	3.64	21	Pass
NVNT	1-DH5	2480	Ant	2.56	21	Pass
NVNT	2-DH5	2402	Ant	2.85	21	Pass
NVNT	2-DH5	2441	Ant	5.52	21	Pass
NVNT	2-DH5	2480	Ant	4.38	21	Pass
NVNT	3-DH5	2402	Ant	3.25	21	Pass
NVNT	3-DH5	2441	Ant	5.8	21	Pass
NVNT	3-DH5	2480	Ant	4.63	21	Pass

Test Graphs

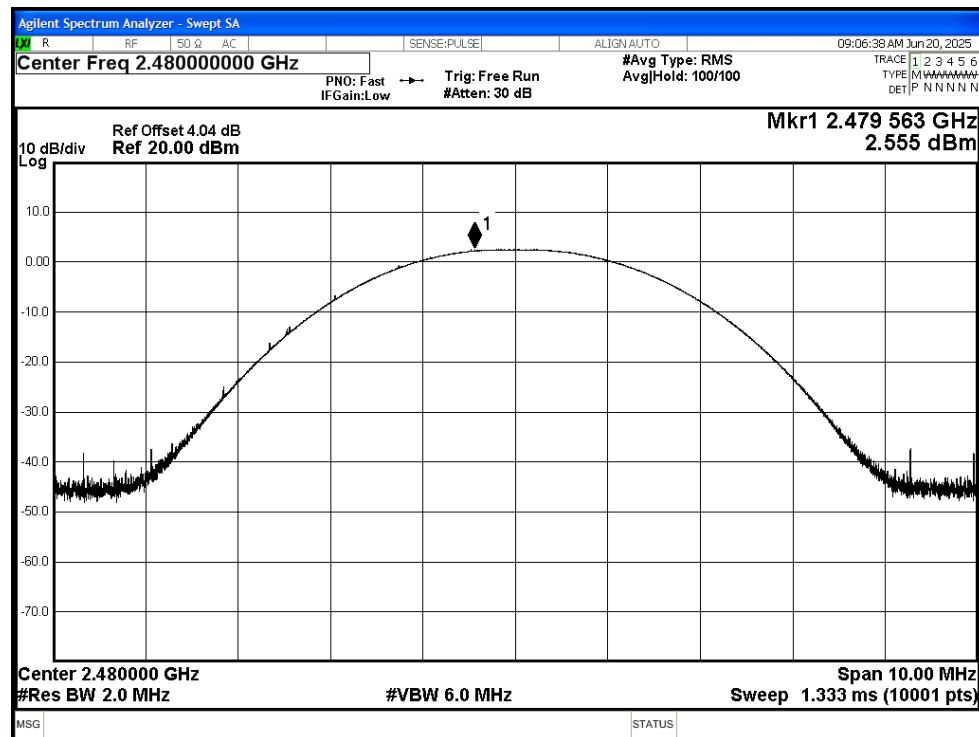
Power NVNT 1-DH5 2402MHz Ant



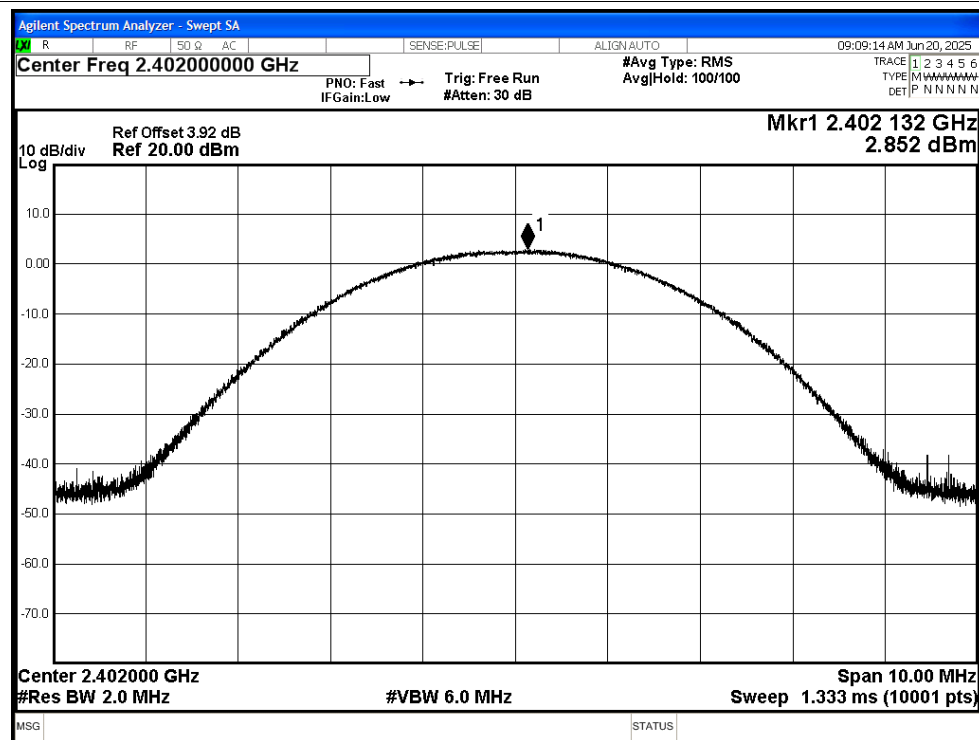
Power NVNT 1-DH5 2441MHz Ant



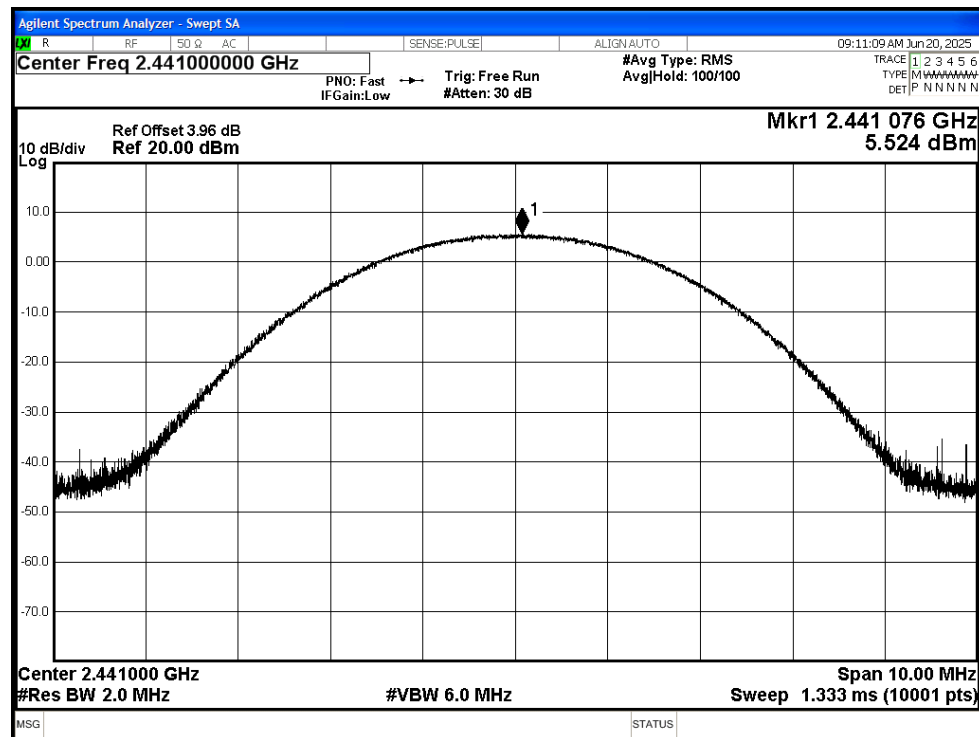
Power NVNT 1-DH5 2480MHz Ant



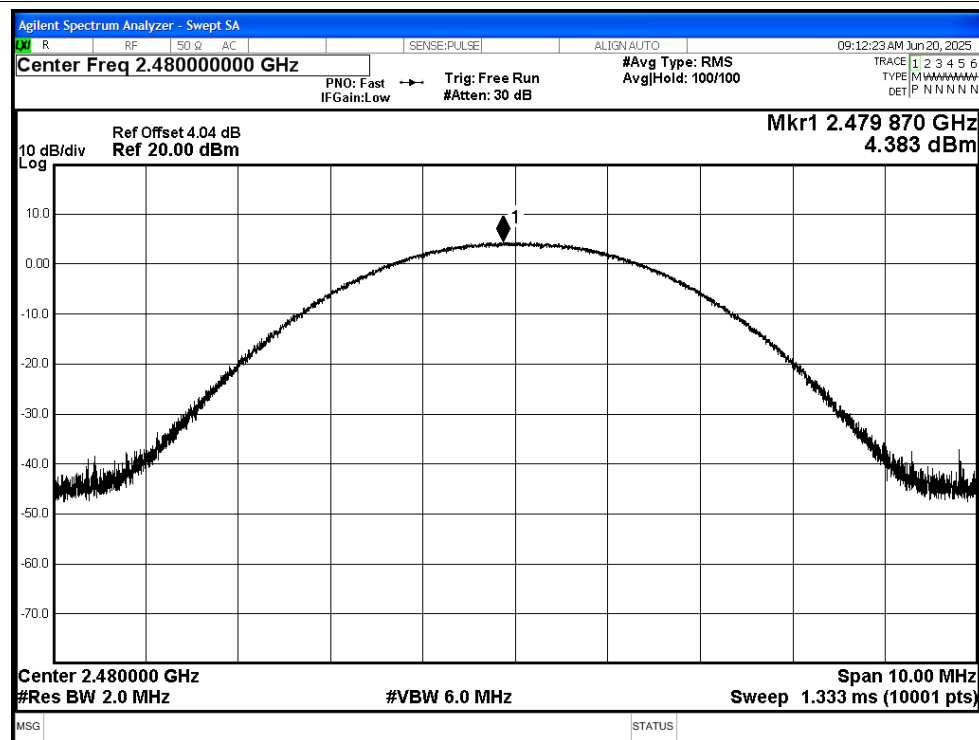
Power NVNT 2-DH5 2402MHz Ant

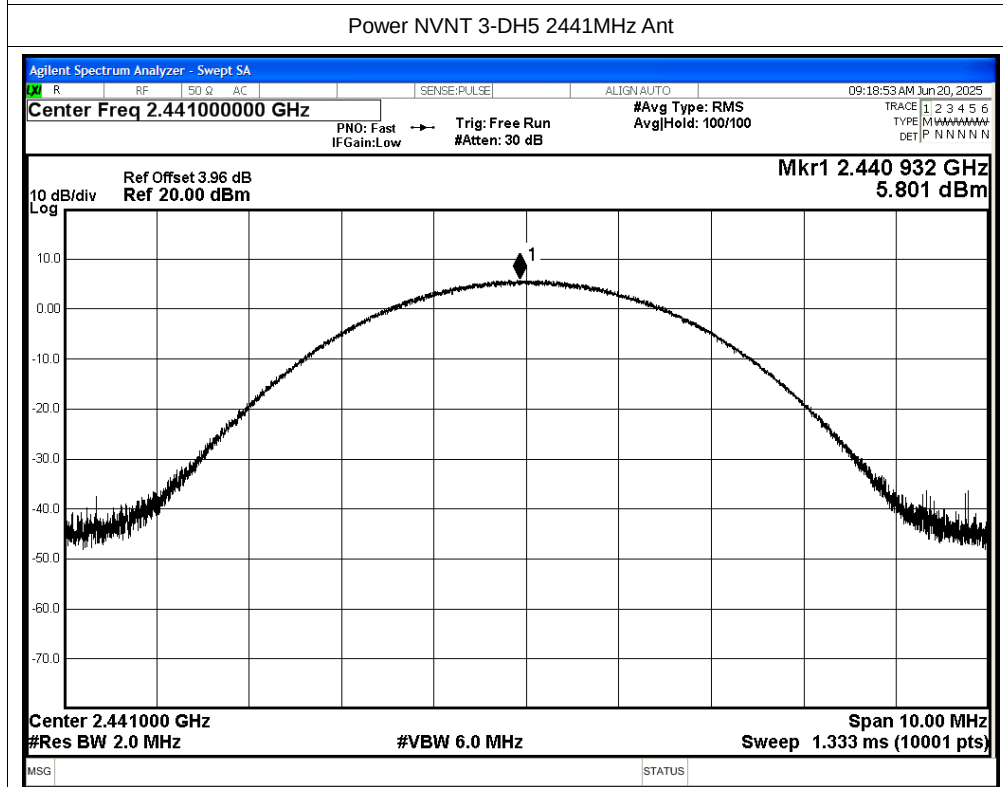
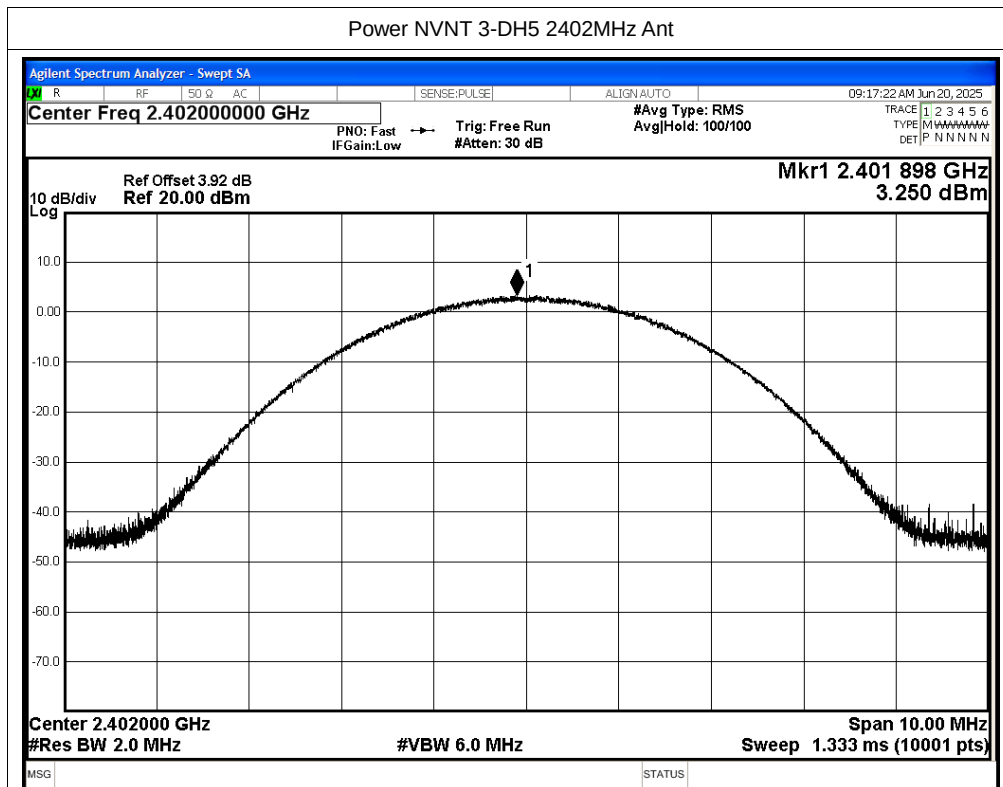


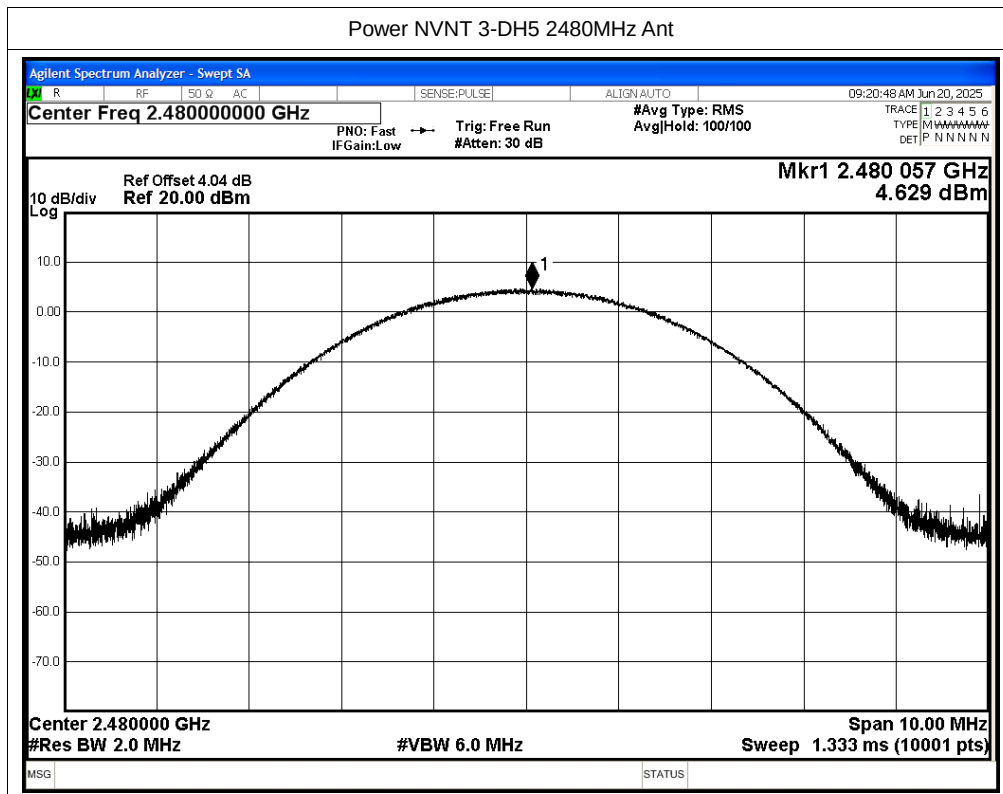
Power NVNT 2-DH5 2441MHz Ant



Power NVNT 2-DH5 2480MHz Ant





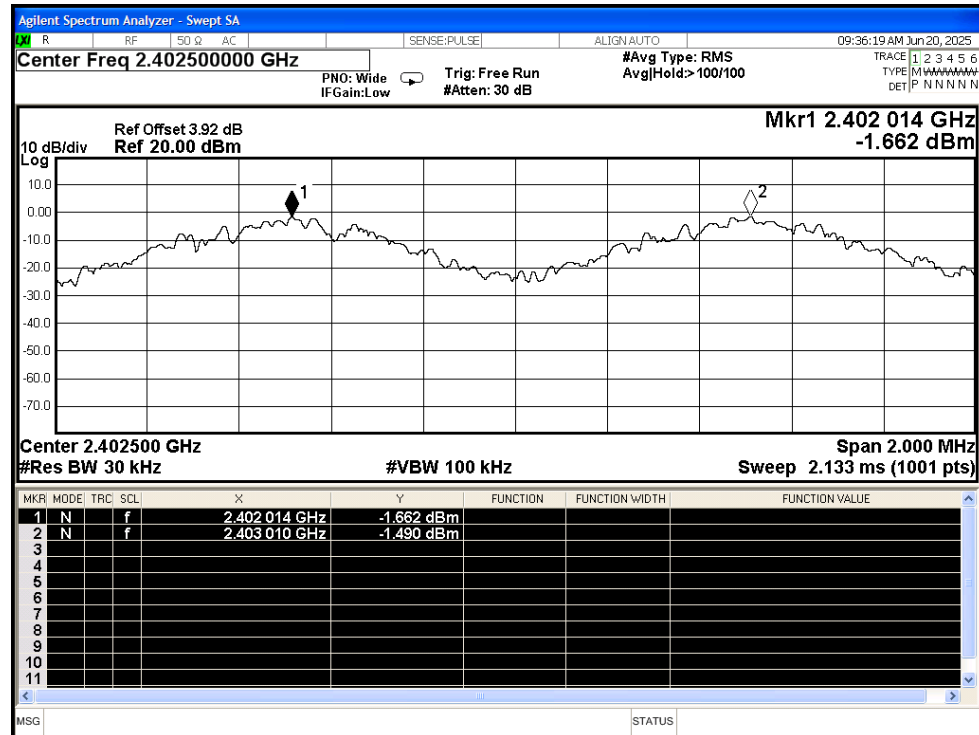


A.3 Carrier Frequencies Separation

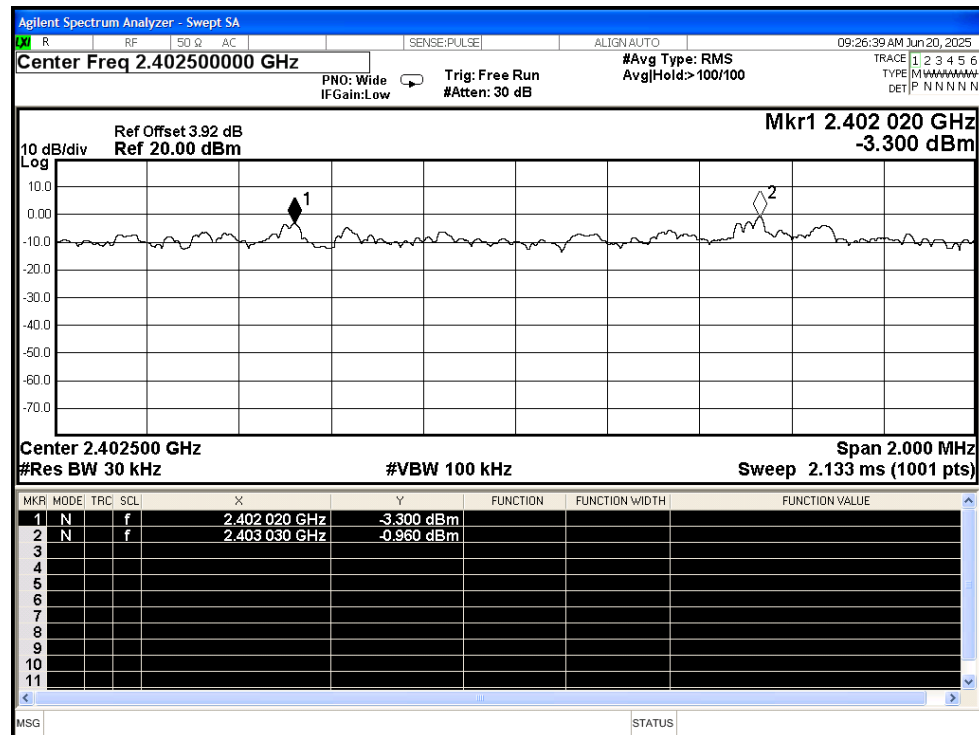
Condition	Mode	Antenna	Hopping Freq1 (MHz)	Hopping Freq2 (MHz)	HFS (MHz)	Limit (MHz)	Verdict
NVNT	1-DH5	Ant	2402.014	2403.01	0.996	0.667	Pass
NVNT	2-DH5	Ant	2402.02	2403.03	1.01	0.867	Pass
NVNT	3-DH5	Ant	2401.91	2403.116	1.206	0.874	Pass

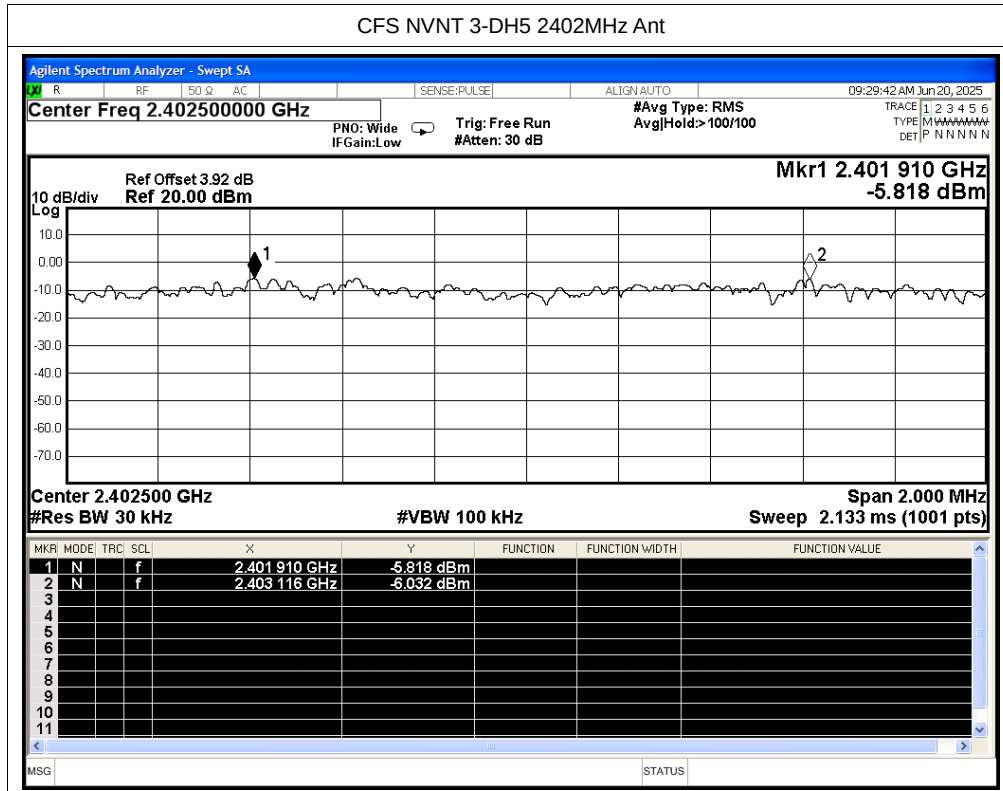
Test Graphs

CFS NVNT 1-DH5 2402MHz Ant



CFS NVNT 2-DH5 2402MHz Ant



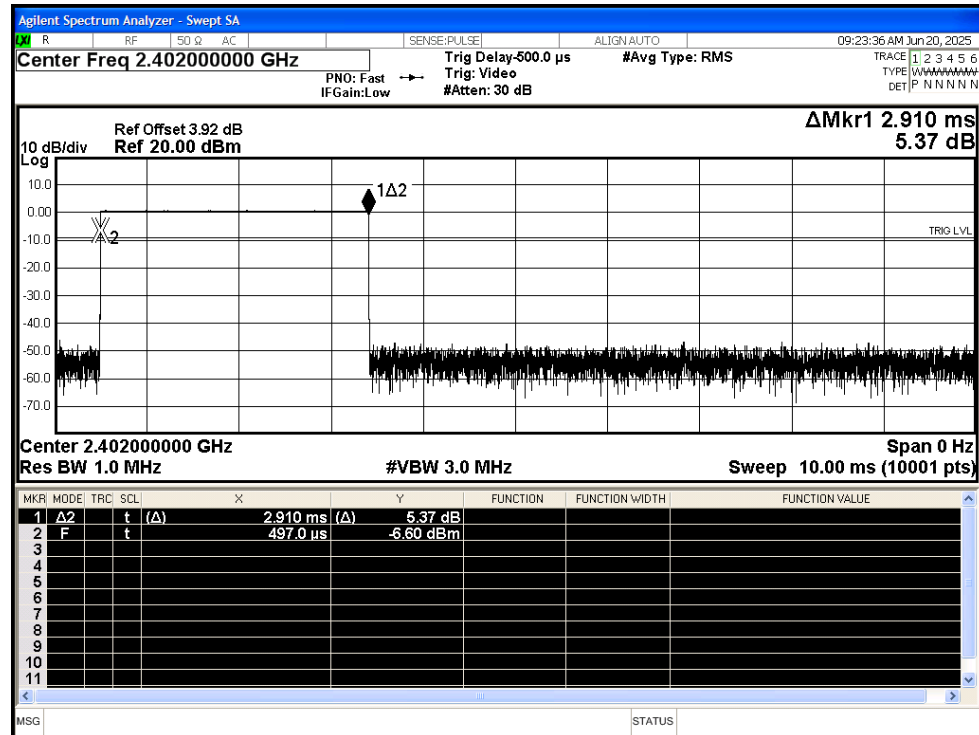


A.4 Dwell Time

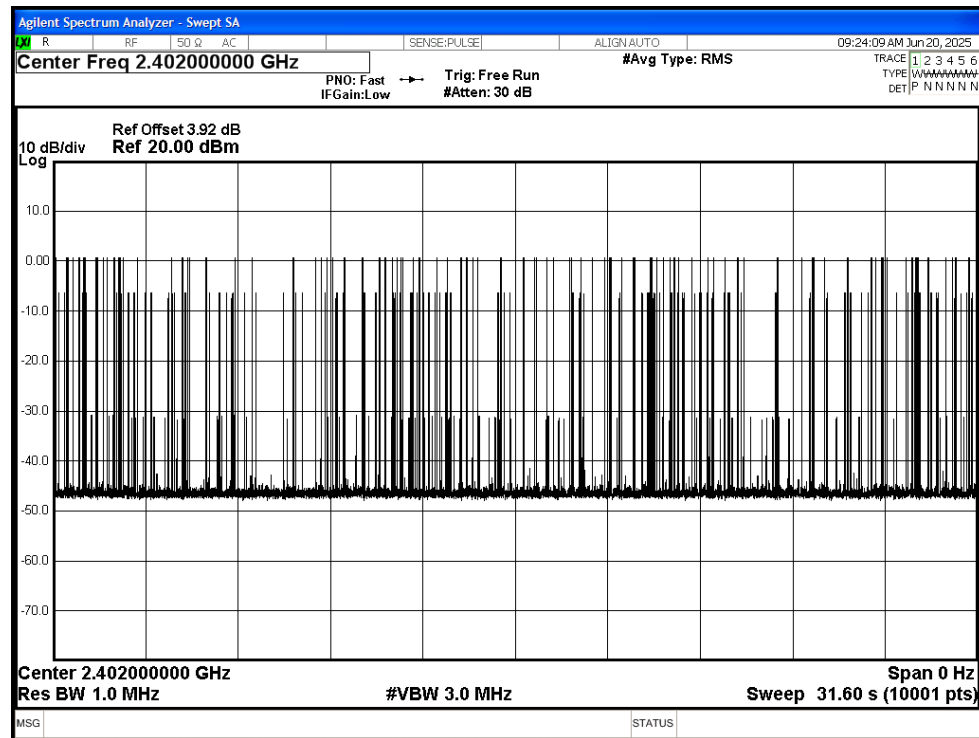
Condition	Mode	Frequency (MHz)	Antenna	Pulse Time (ms)	Total Dwell Time (ms)	Burst Count	Period Time (ms)	Limit (ms)	Verdict
NVNT	1-DH5	2402	Ant	2.91	317.19	109	31600	400	Pass
NVNT	2-DH5	2402	Ant	2.898	318.78	110	31600	400	Pass
NVNT	3-DH5	2402	Ant	2.897	263.627	91	31600	400	Pass

Test Graphs

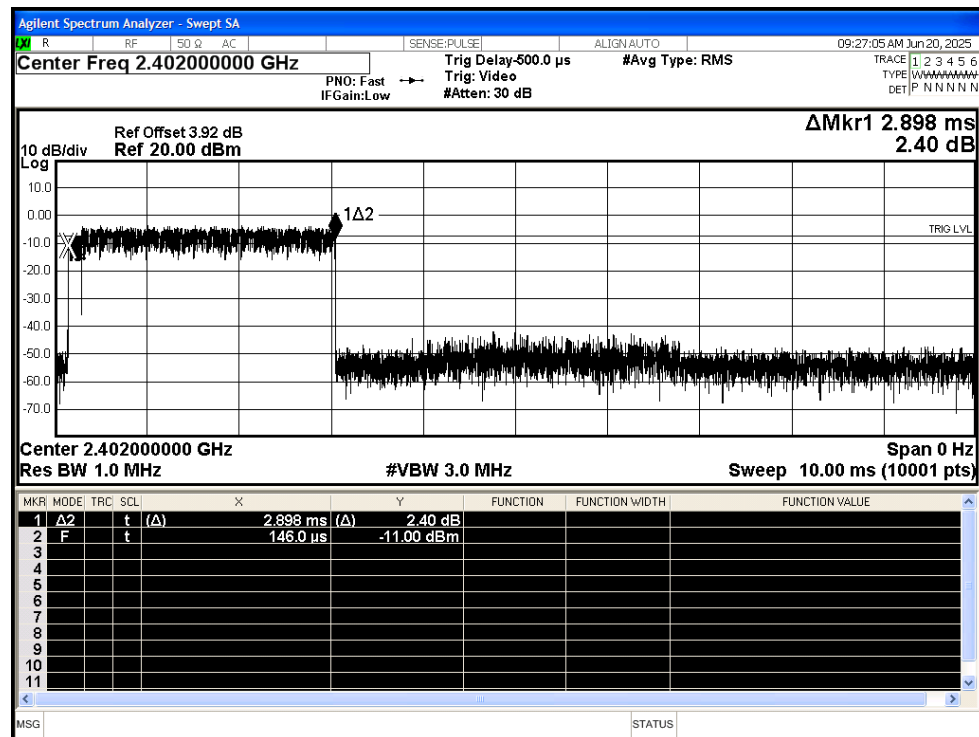
Dwell NVNT 1-DH5 2402MHz Ant One Burst



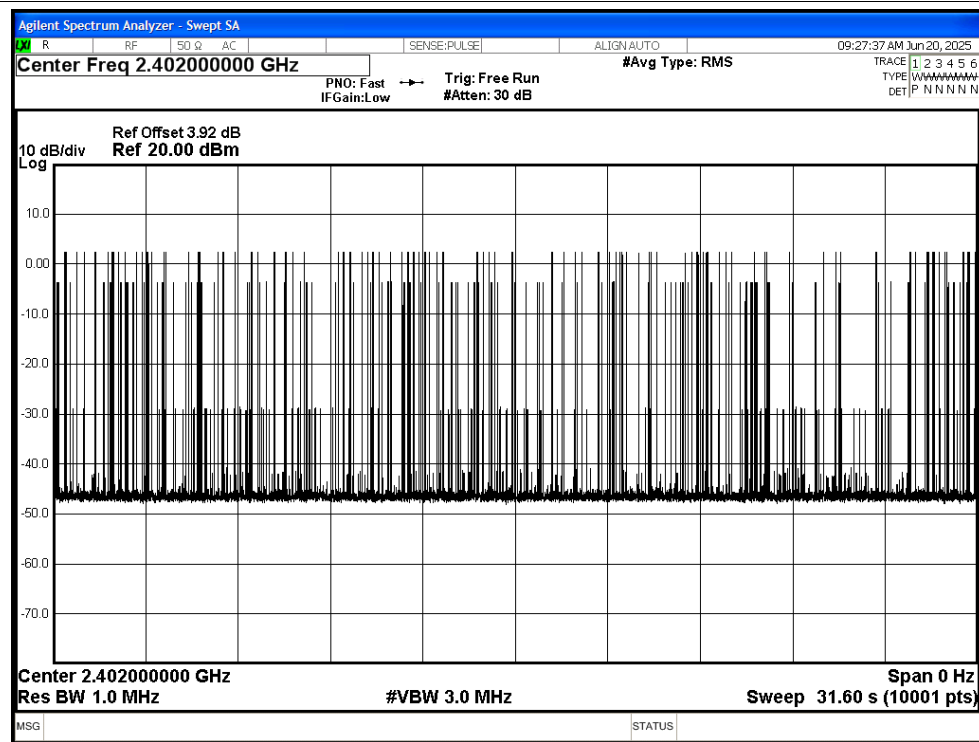
Dwell NVNT 1-DH5 2402MHz Ant Accumulated



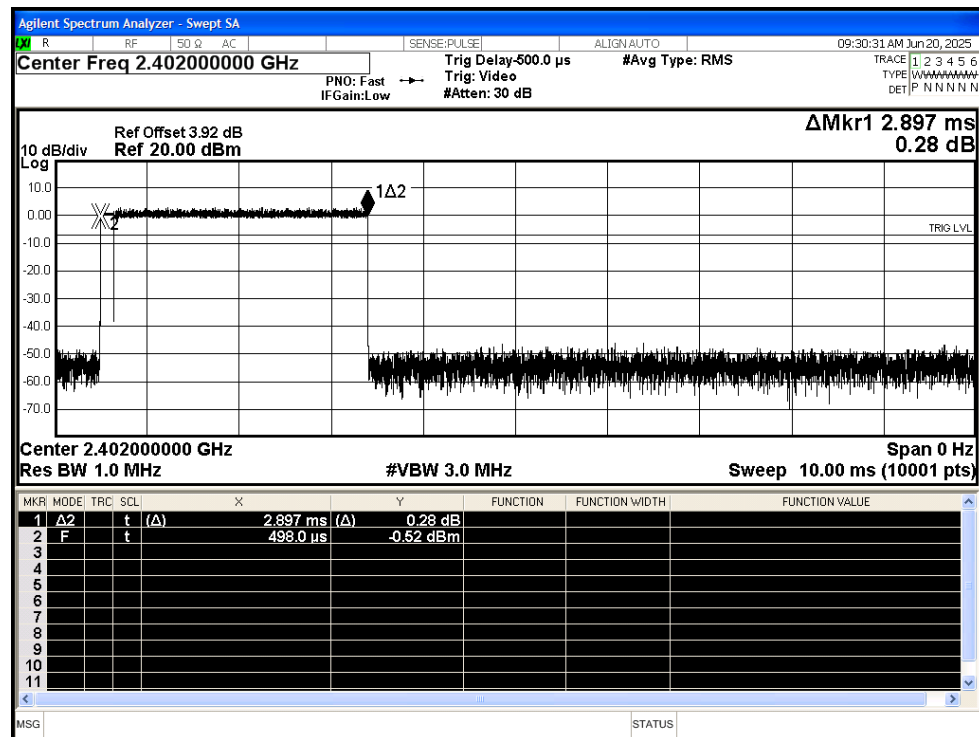
Dwell NVNT 2-DH5 2402MHz Ant One Burst



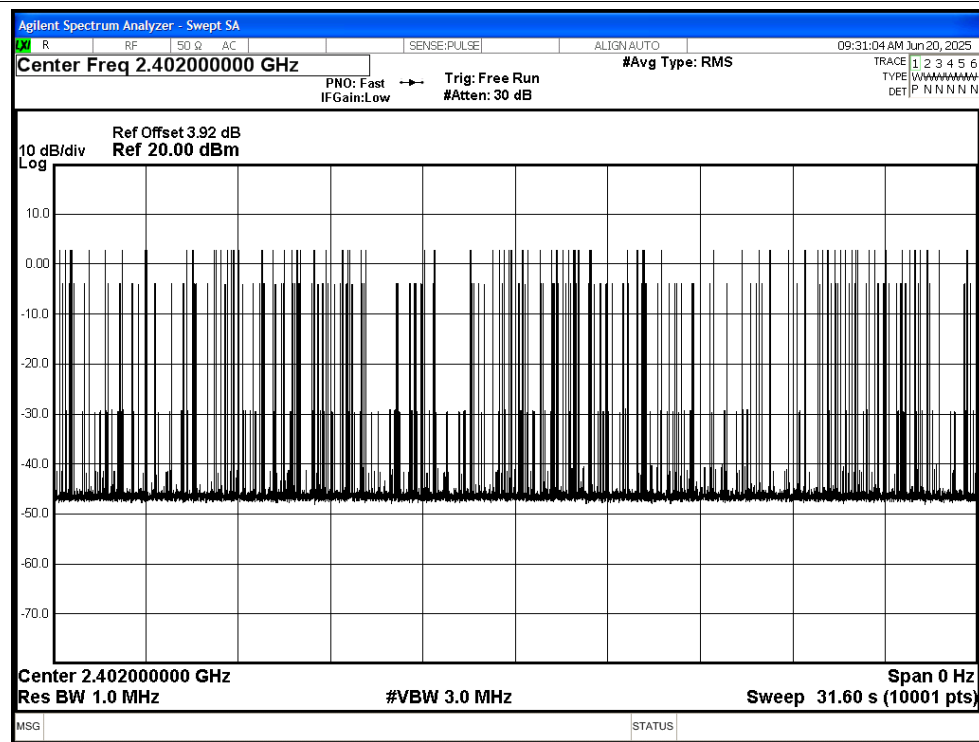
Dwell NVNT 2-DH5 2402MHz Ant Accumulated



Dwell NVNT 3-DH5 2402MHz Ant One Burst



Dwell NVNT 3-DH5 2402MHz Ant Accumulated

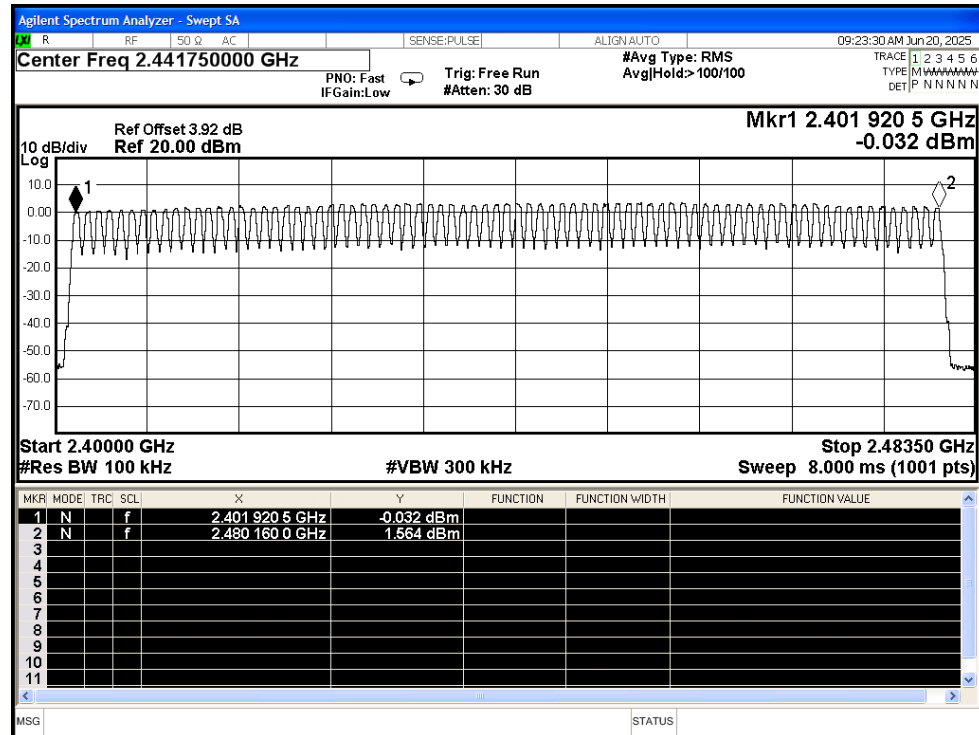


A.5 Number of Hopping Channel

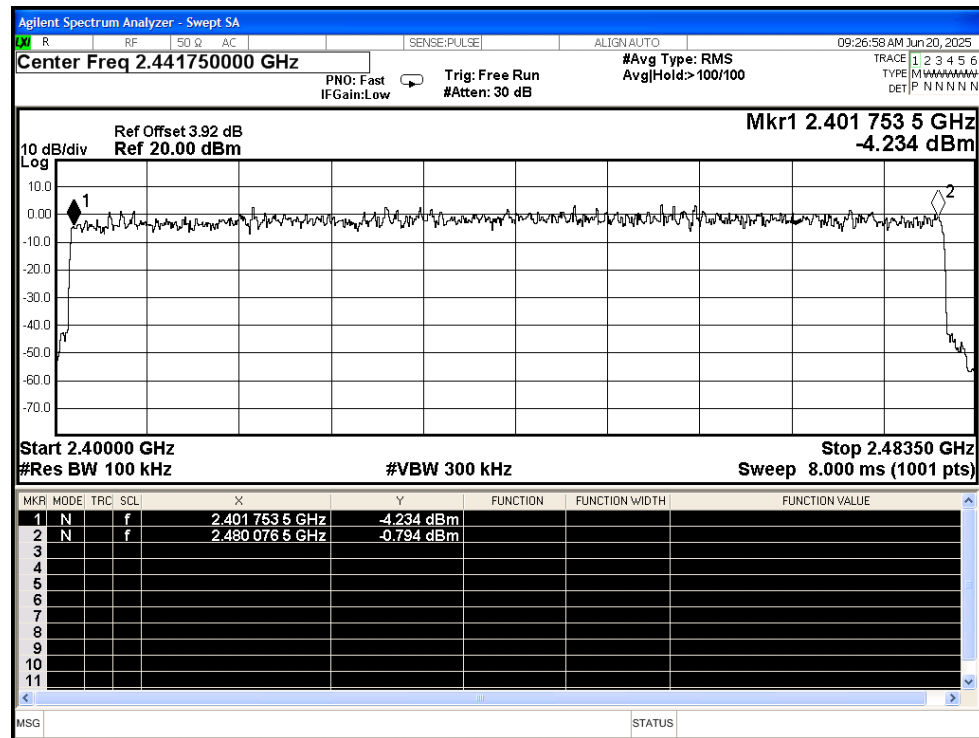
Condition	Mode	Antenna	Hopping Number	Limit	Verdict
NVNT	1-DH5	Ant	79	15	Pass
NVNT	2-DH5	Ant	79	15	Pass
NVNT	3-DH5	Ant	79	15	Pass

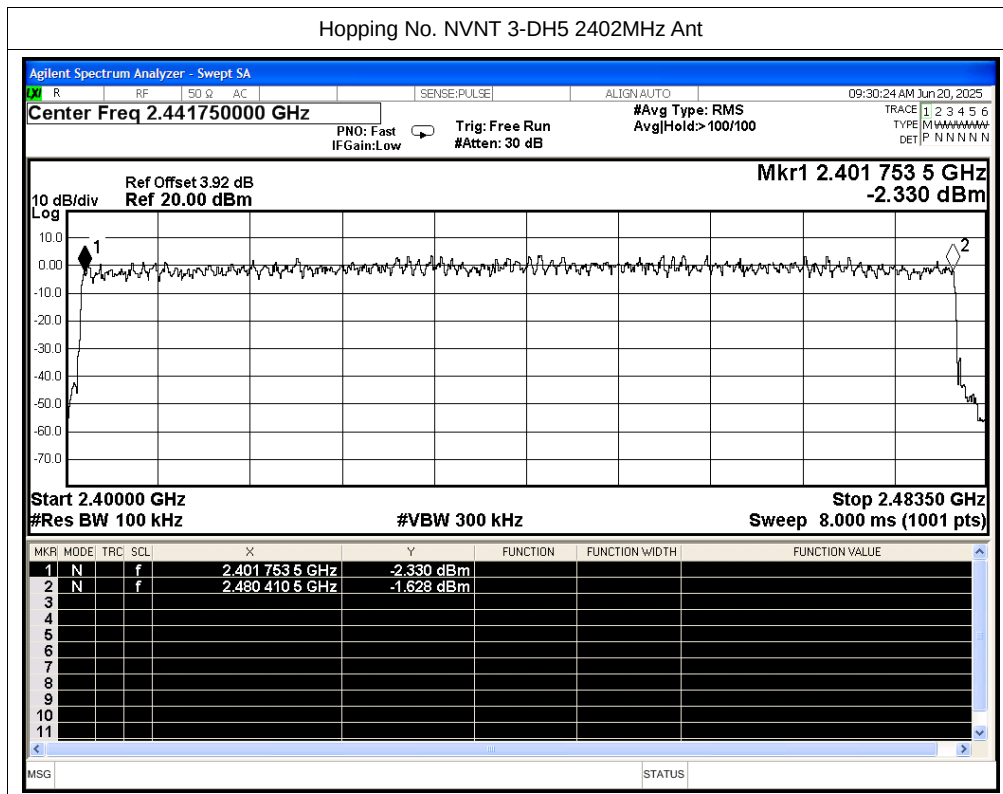
Test Graphs

Hopping No. NVNT 1-DH5 2402MHz Ant



Hopping No. NVNT 2-DH5 2402MHz Ant



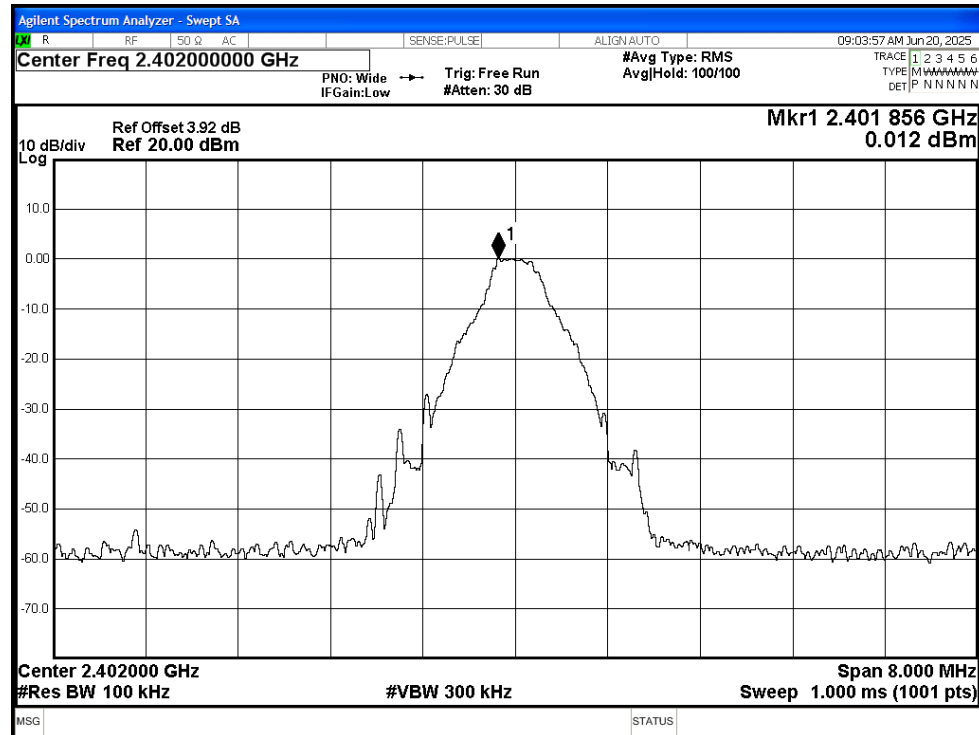


A.6 Band Edge

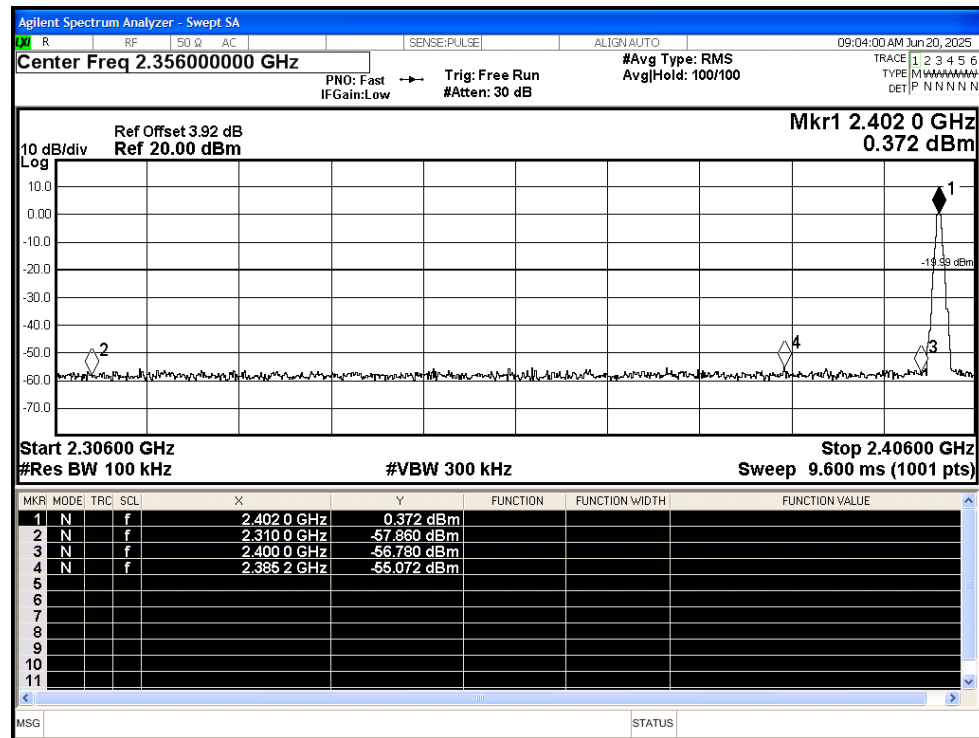
Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH5	2402	Ant	No-Hopping	-55.08	-20	Pass
NVNT	1-DH5	2480	Ant	No-Hopping	-56.43	-20	Pass
NVNT	2-DH5	2402	Ant	No-Hopping	-51.81	-20	Pass
NVNT	2-DH5	2480	Ant	No-Hopping	-55.57	-20	Pass
NVNT	3-DH5	2402	Ant	No-Hopping	-51.84	-20	Pass
NVNT	3-DH5	2480	Ant	No-Hopping	-54.36	-20	Pass

Test Graphs

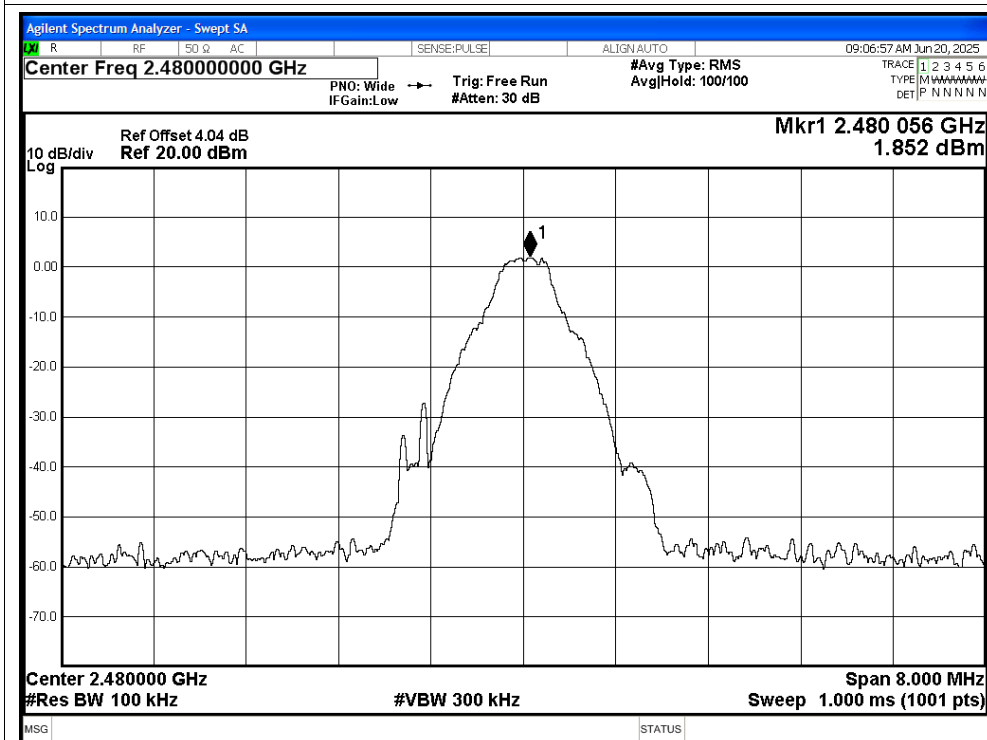
Band Edge NVNT 1-DH5 2402MHz Ant No-Hopping Ref



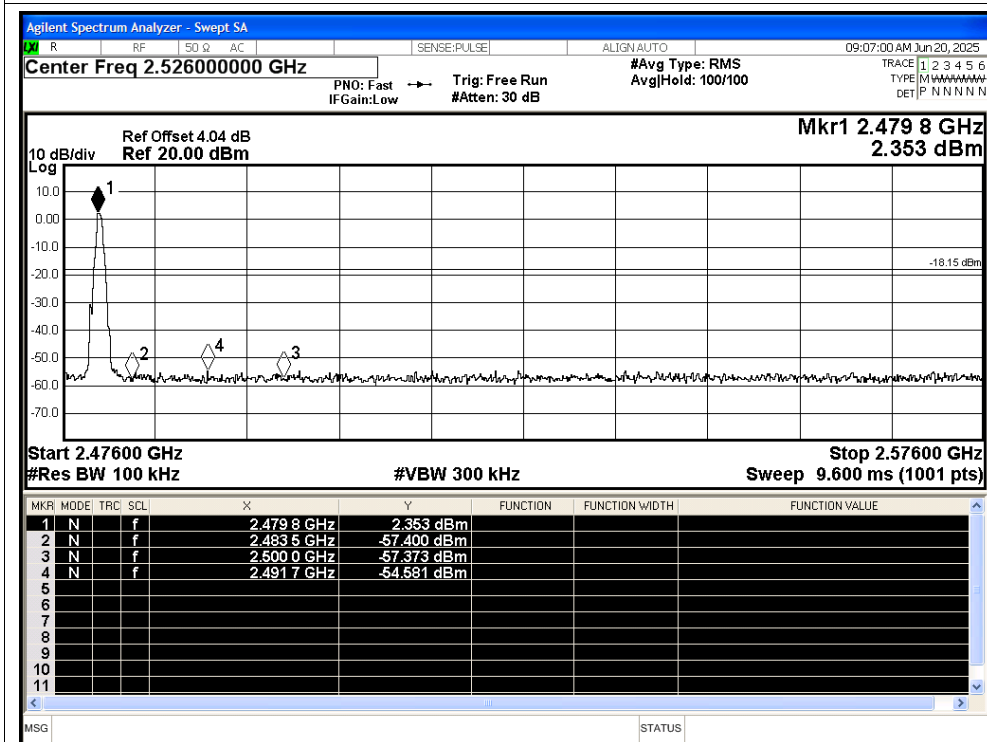
Band Edge NVNT 1-DH5 2402MHz Ant No-Hopping Emission



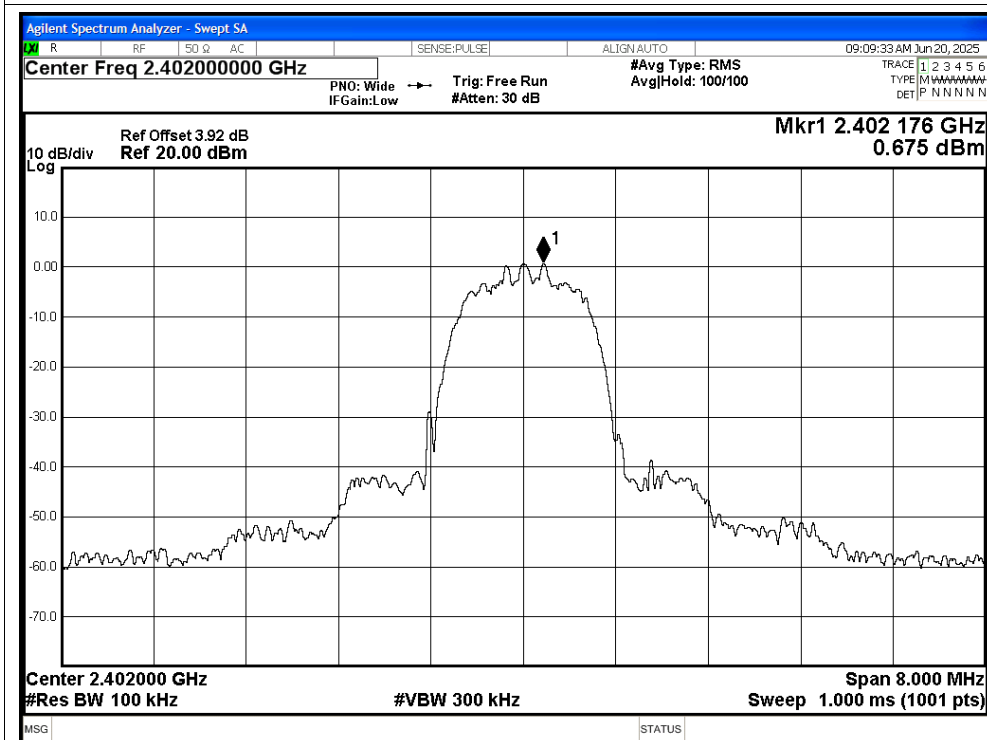
Band Edge NVNT 1-DH5 2480MHz Ant No-Hopping Ref



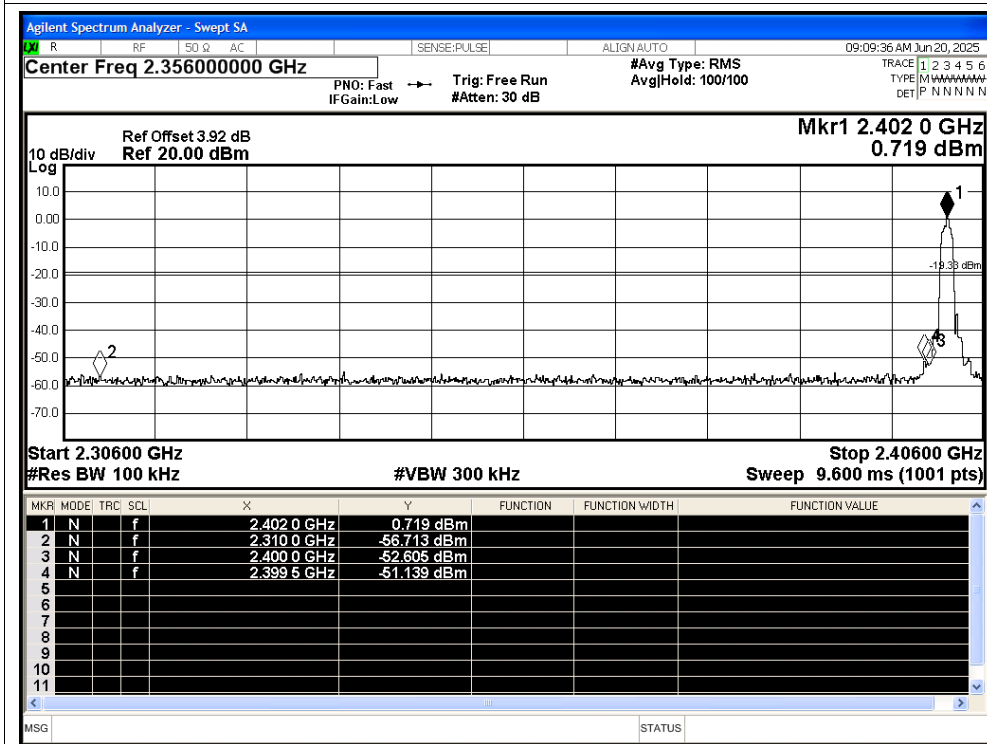
Band Edge NVNT 1-DH5 2480MHz Ant No-Hopping Emission



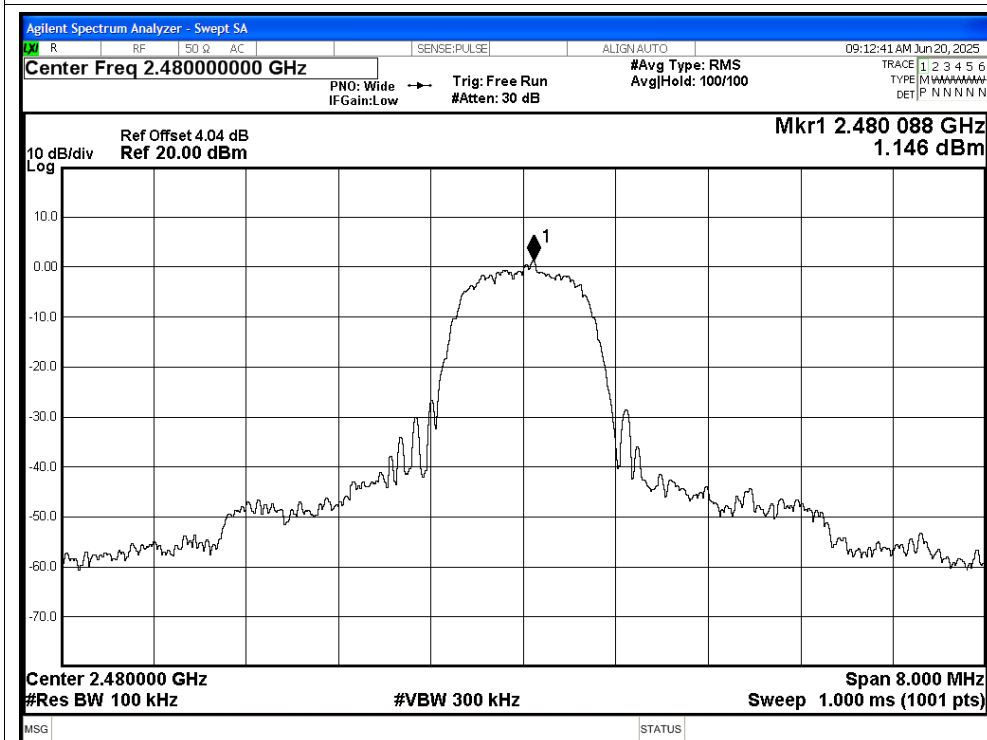
Band Edge NVNT 2-DH5 2402MHz Ant No-Hopping Ref



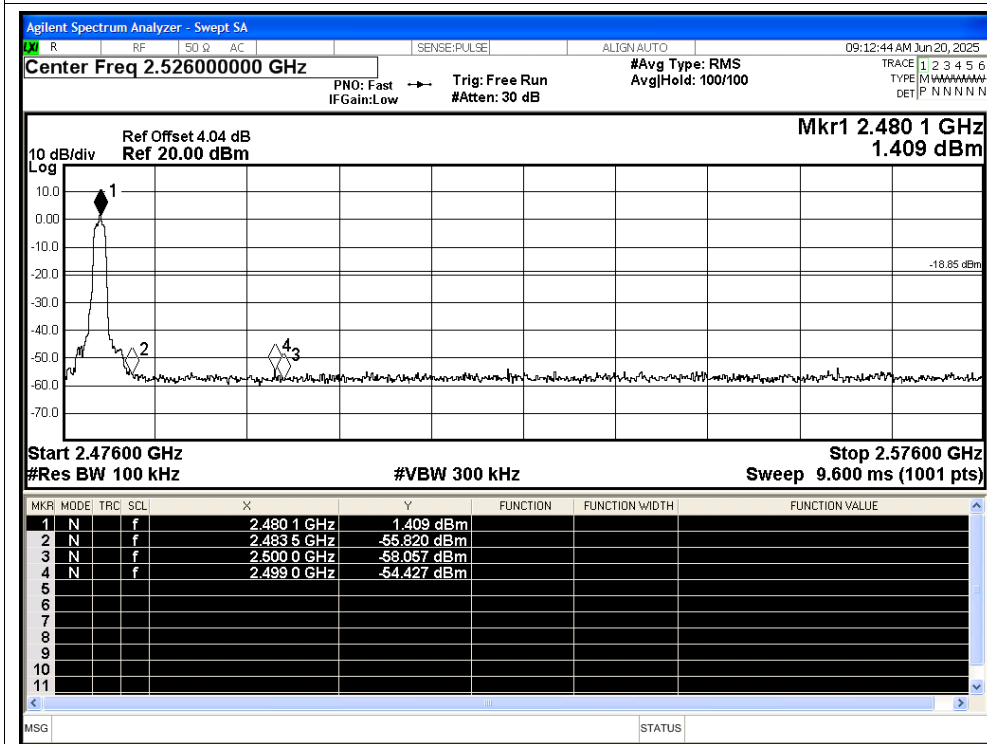
Band Edge NVNT 2-DH5 2402MHz Ant No-Hopping Emission



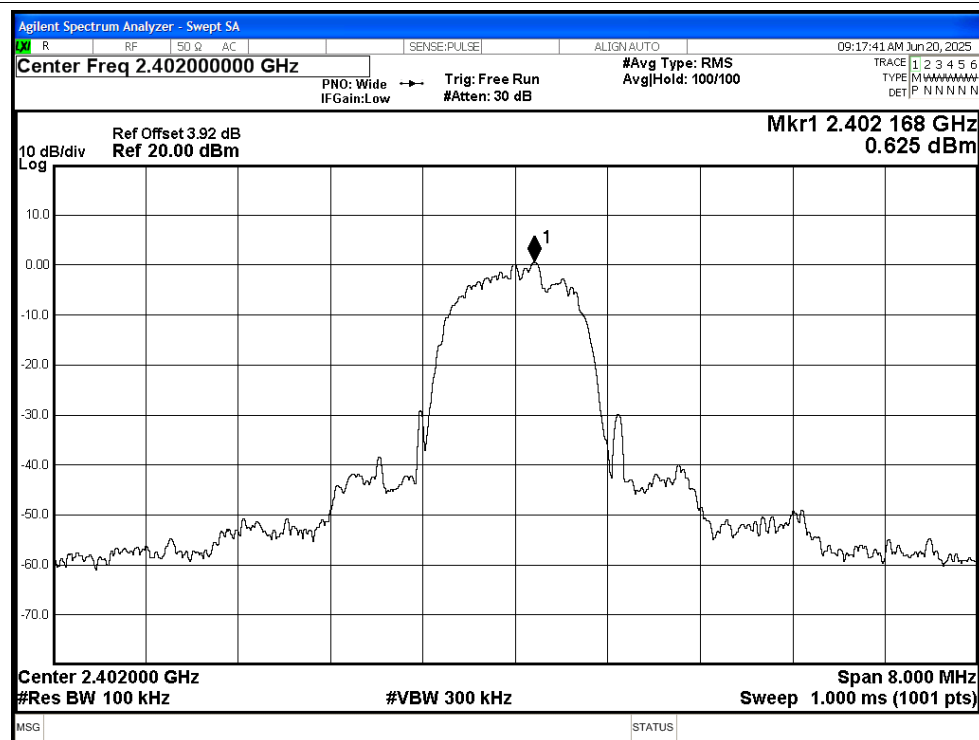
Band Edge NVNT 2-DH5 2480MHz Ant No-Hopping Ref



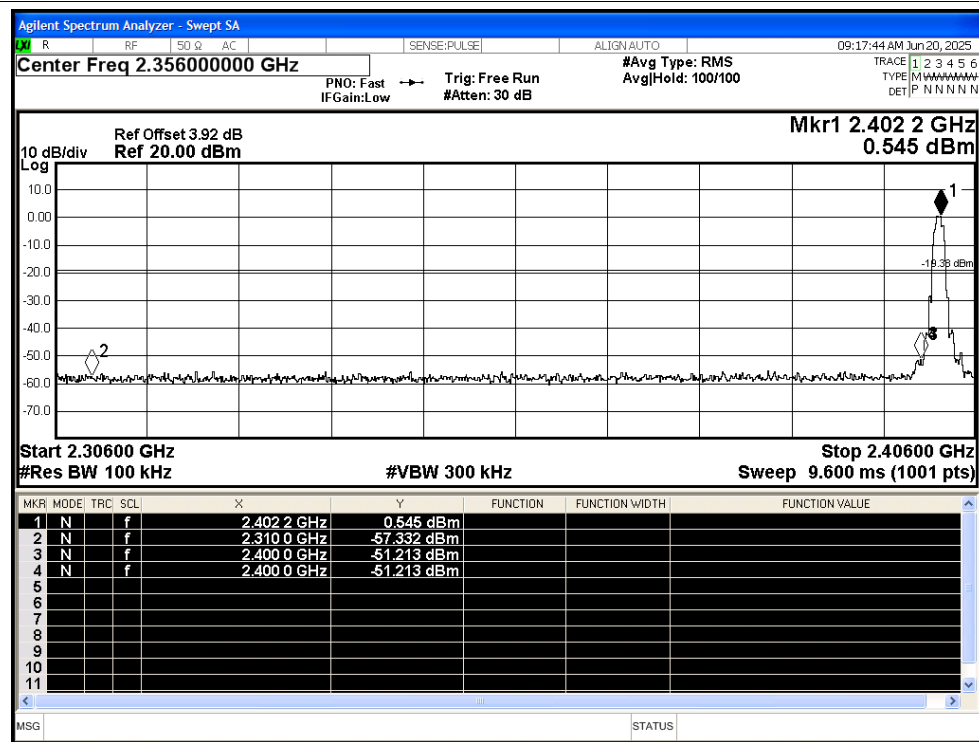
Band Edge NVNT 2-DH5 2480MHz Ant No-Hopping Emission



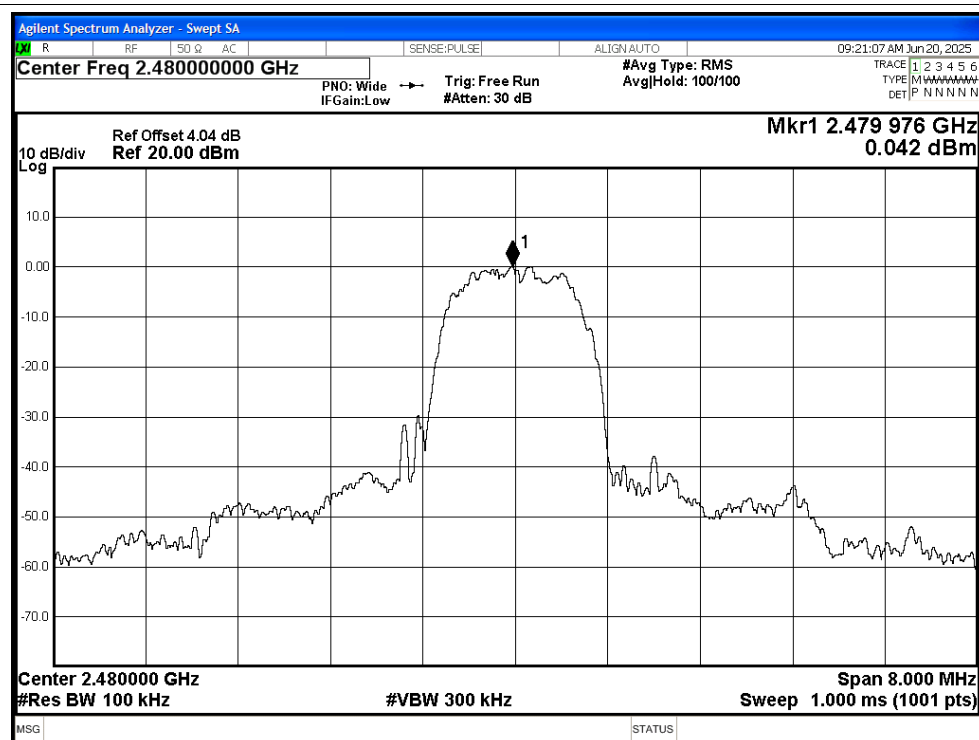
Band Edge NVNT 3-DH5 2402MHz Ant No-Hopping Ref



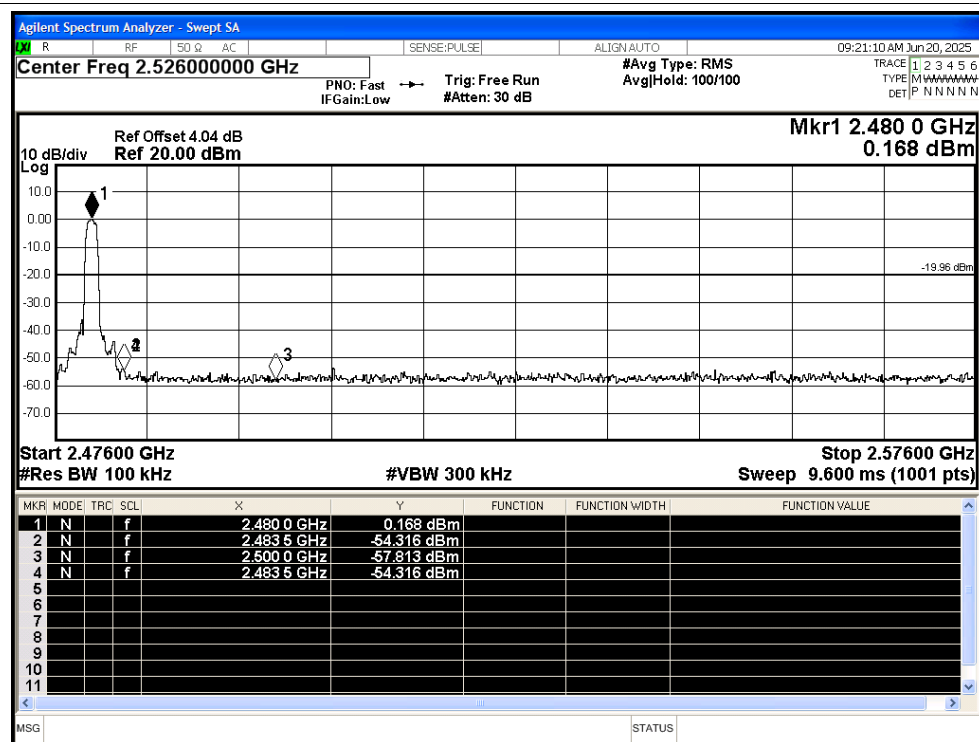
Band Edge NVNT 3-DH5 2402MHz Ant No-Hopping Emission



Band Edge NVNT 3-DH5 2480MHz Ant No-Hopping Ref



Band Edge NVNT 3-DH5 2480MHz Ant No-Hopping Emission

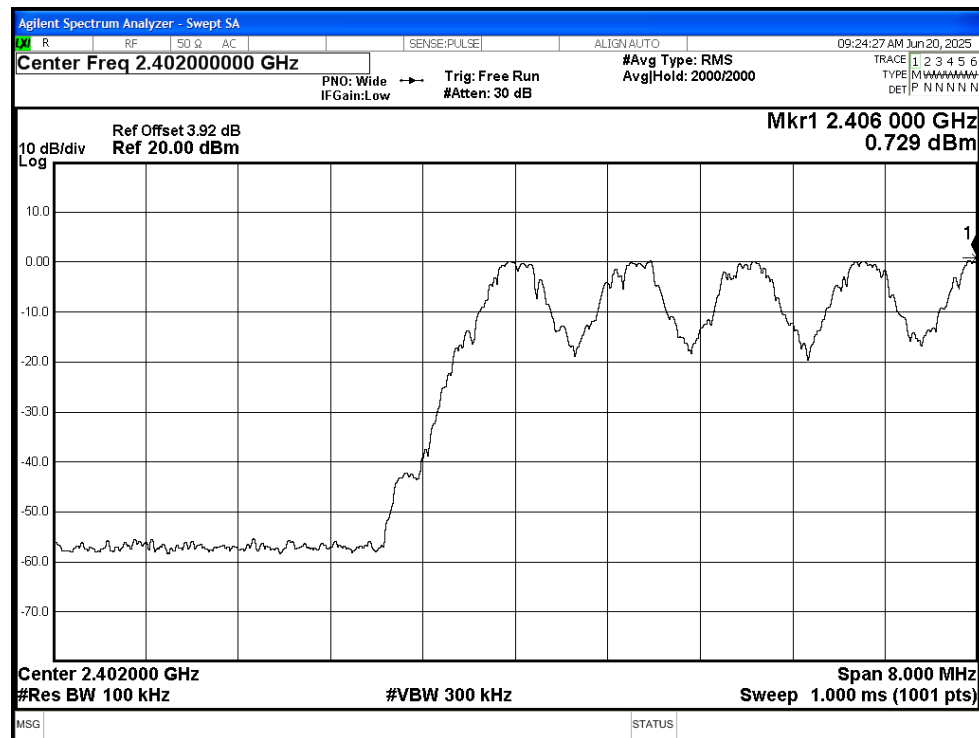


(Hopping)

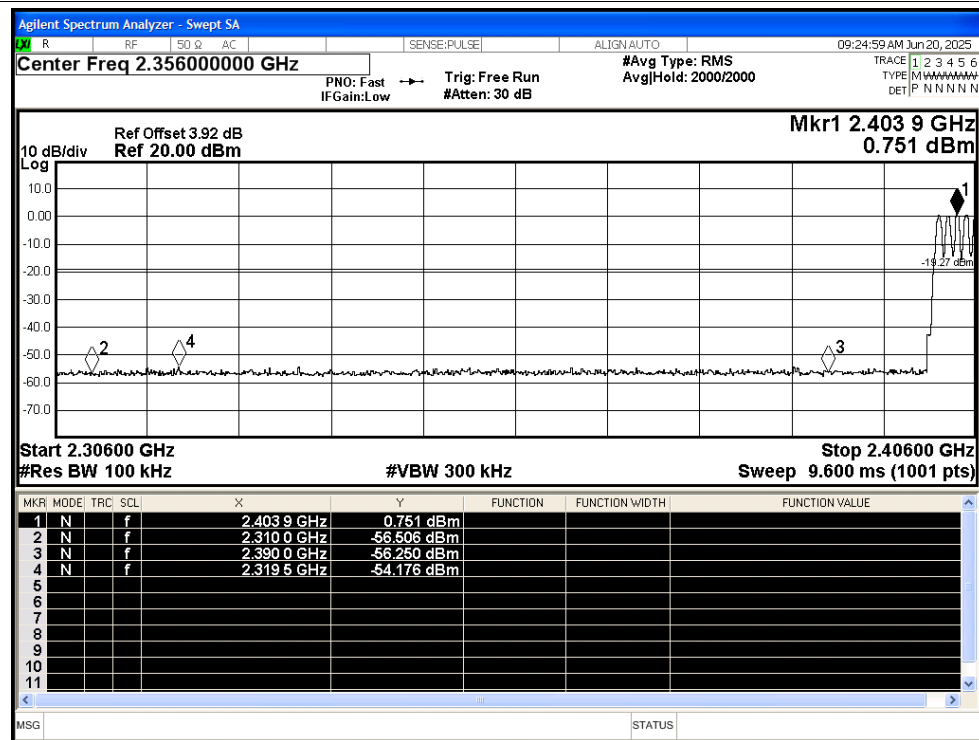
Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH5	2402	Ant	Hopping	-54.91	-20	Pass
NVNT	1-DH5	2480	Ant	Hopping	-56.01	-20	Pass
NVNT	2-DH5	2402	Ant	Hopping	-54.02	-20	Pass
NVNT	2-DH5	2480	Ant	Hopping	-55.85	-20	Pass
NVNT	3-DH5	2402	Ant	Hopping	-53.99	-20	Pass
NVNT	3-DH5	2480	Ant	Hopping	-55.82	-20	Pass

Test Graphs

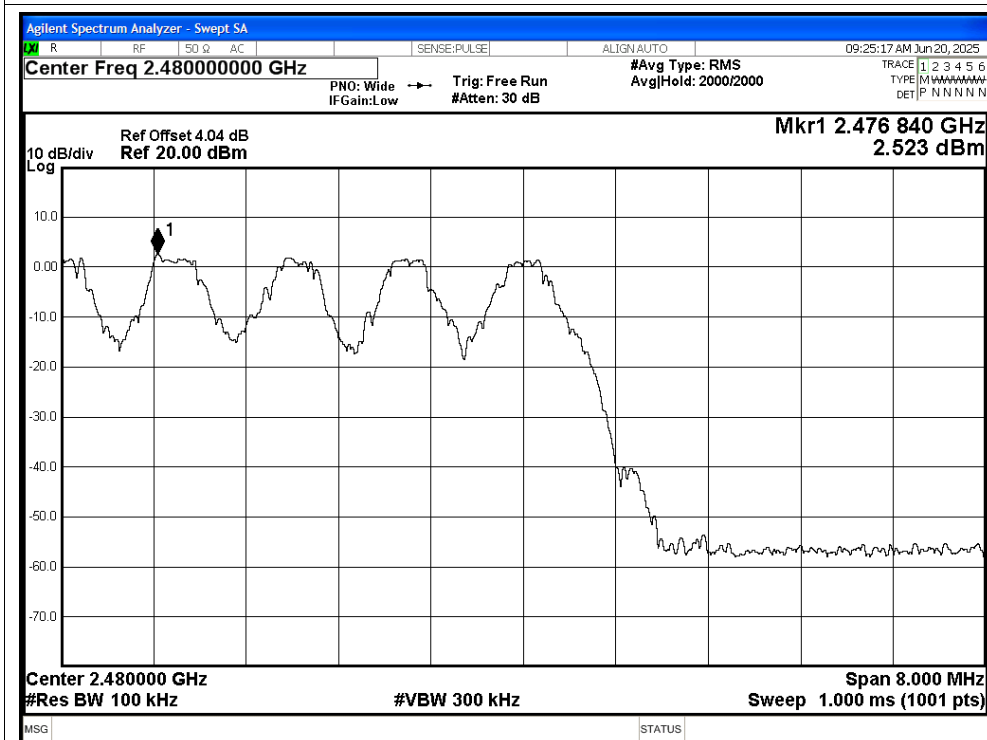
Band Edge(Hopping) NVNT 1-DH5 2402MHz Ant Hopping Ref



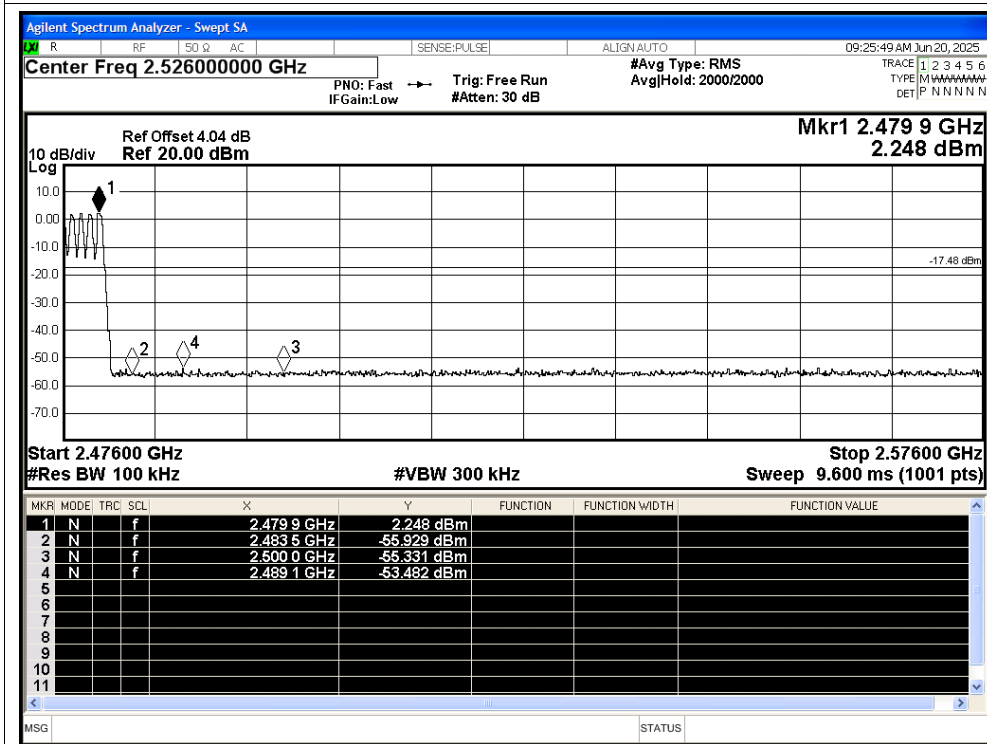
Band Edge(Hopping) NVNT 1-DH5 2402MHz Ant Hopping Emission



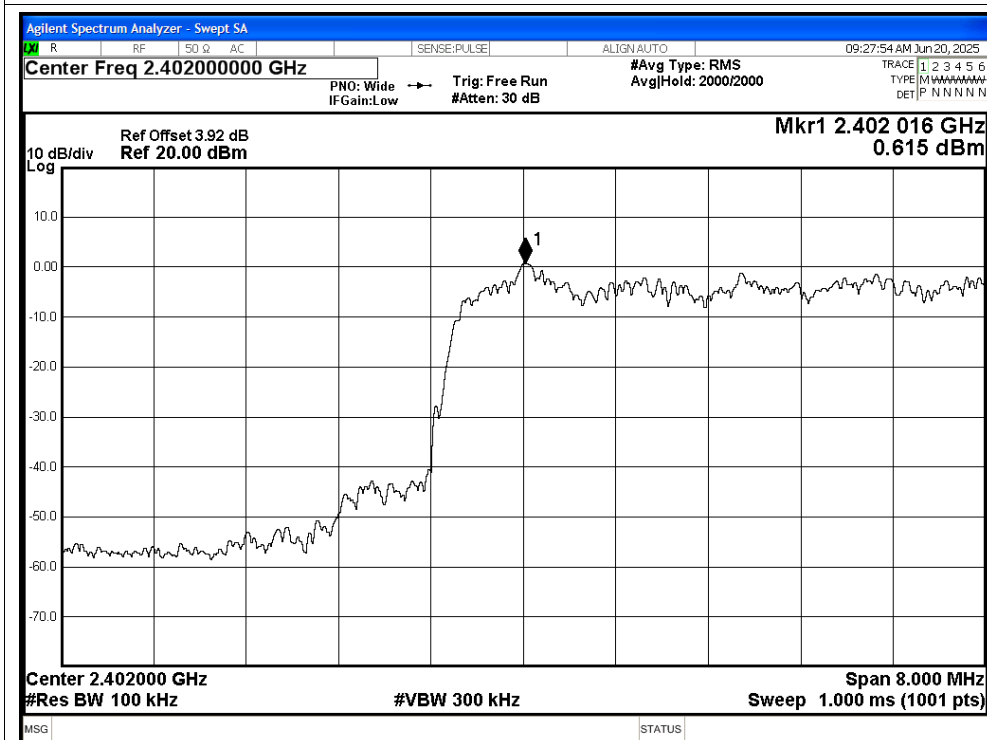
Band Edge(Hopping) NVNT 1-DH5 2480MHz Ant Hopping Ref



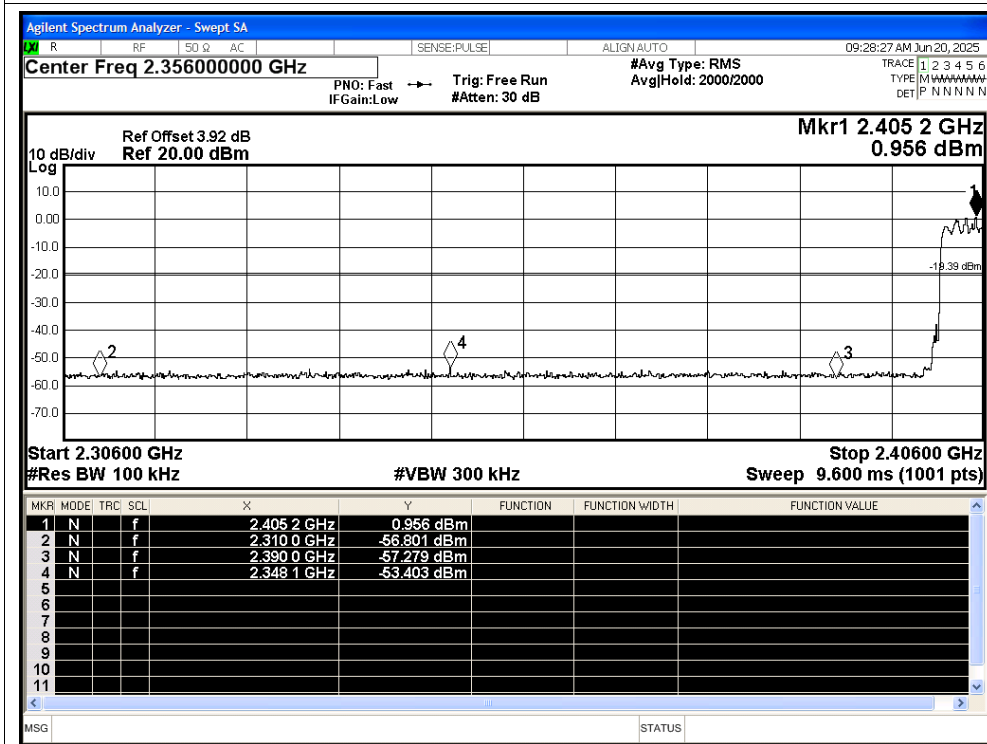
Band Edge(Hopping) NVNT 1-DH5 2480MHz Ant Hopping Emission



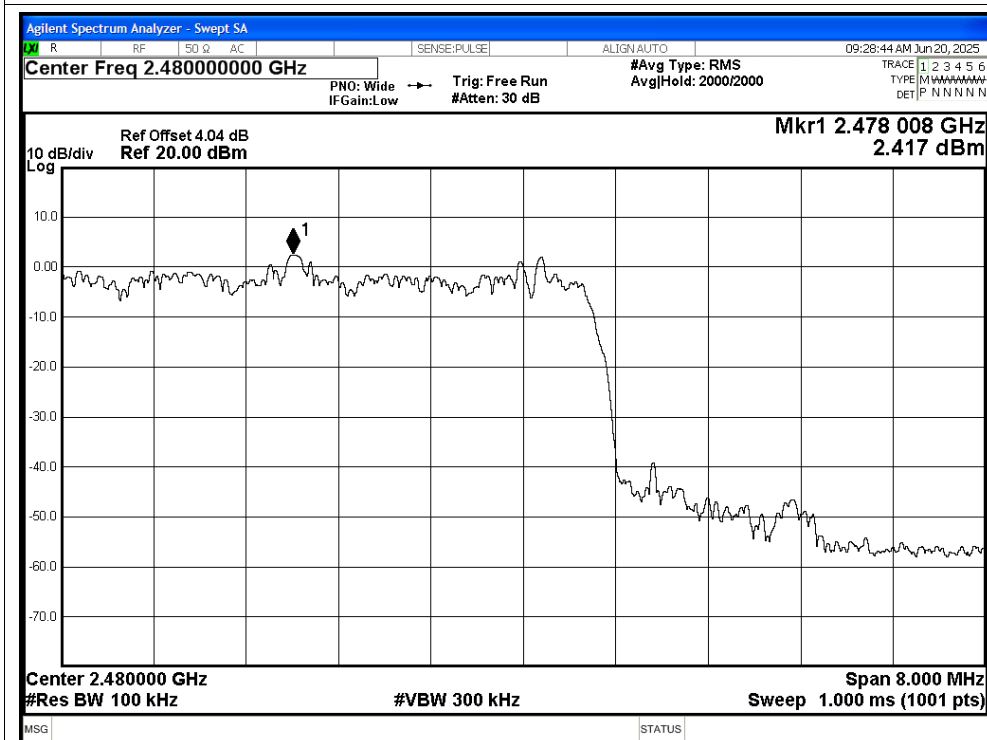
Band Edge(Hopping) NVNT 2-DH5 2402MHz Ant Hopping Ref



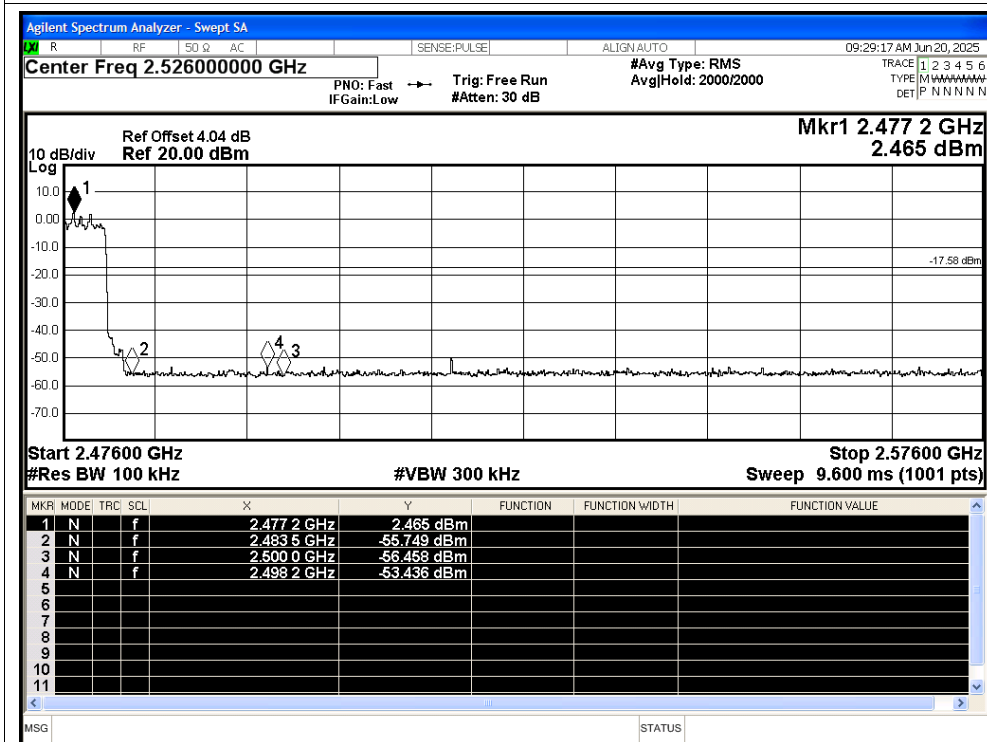
Band Edge(Hopping) NVNT 2-DH5 2402MHz Ant Hopping Emission



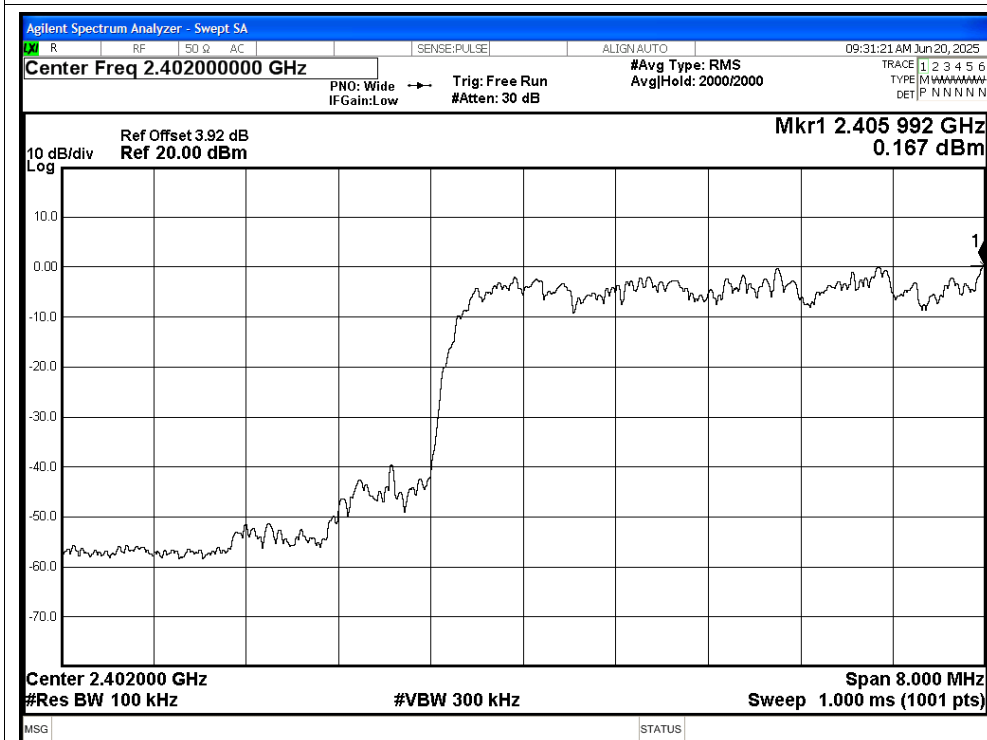
Band Edge(Hopping) NVNT 2-DH5 2480MHz Ant Hopping Ref



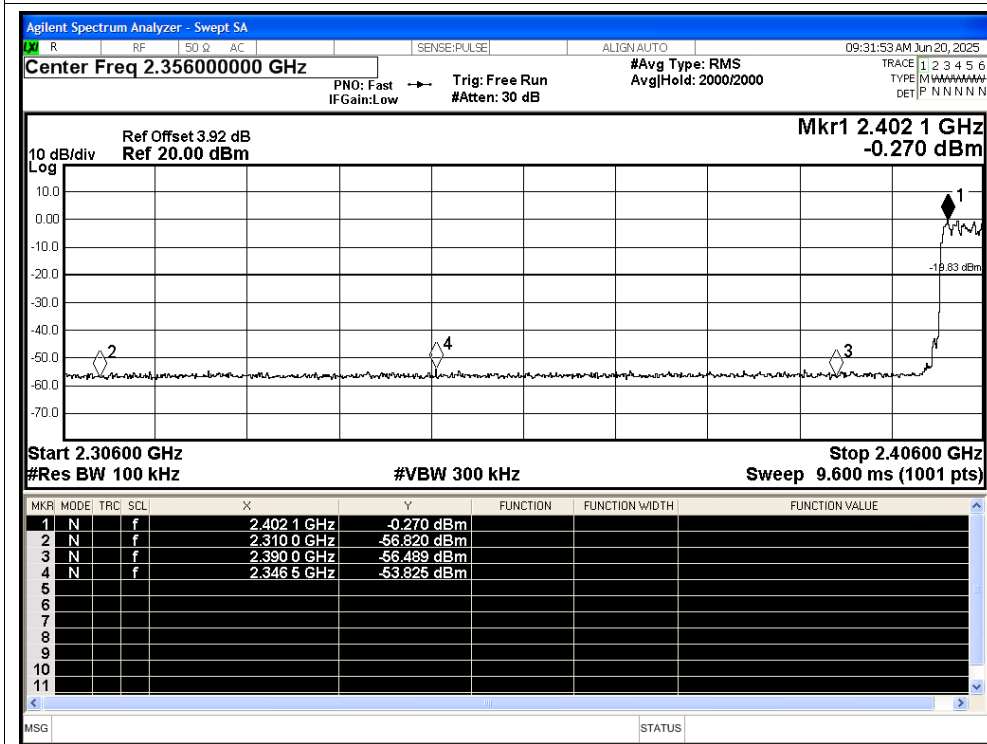
Band Edge(Hopping) NVNT 2-DH5 2480MHz Ant Hopping Emission



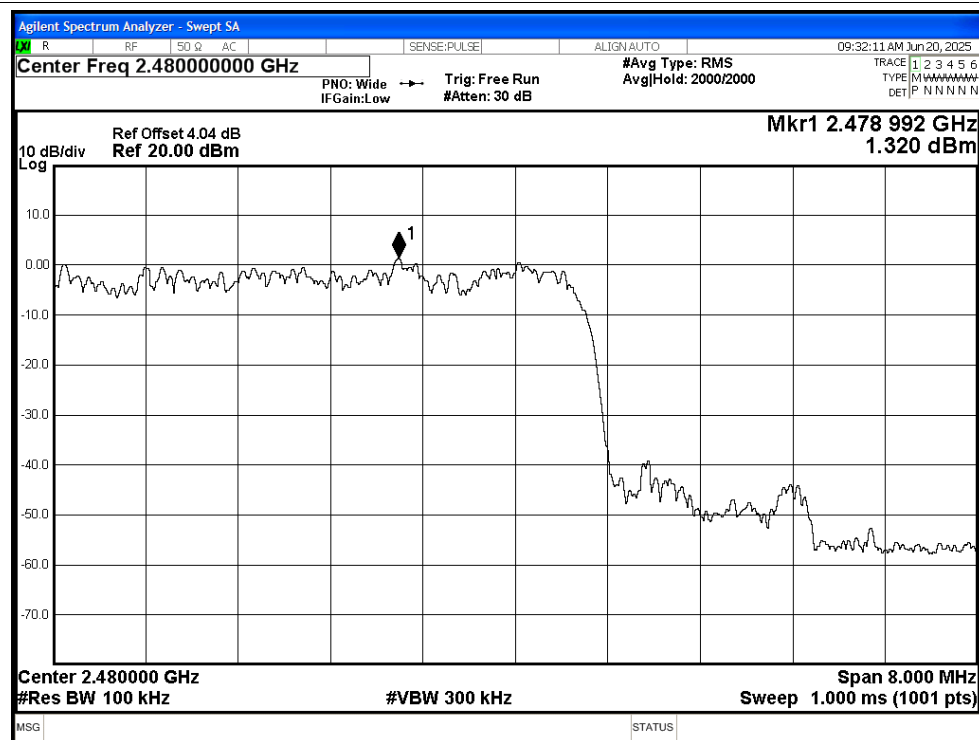
Band Edge(Hopping) NVNT 3-DH5 2402MHz Ant Hopping Ref



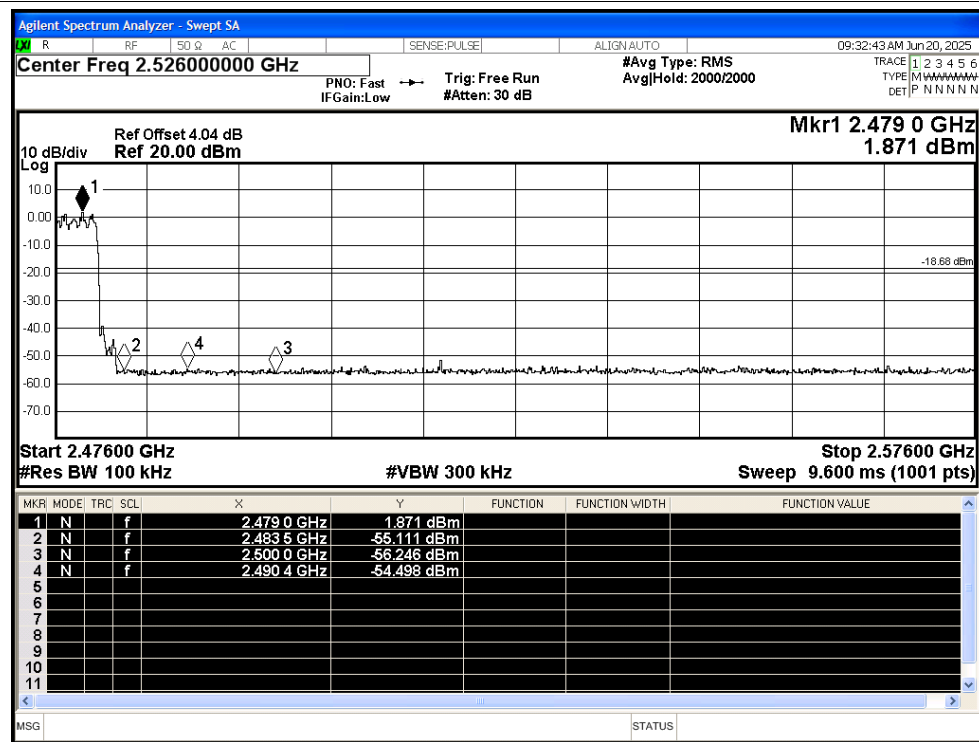
Band Edge(Hopping) NVNT 3-DH5 2402MHz Ant Hopping Emission



Band Edge(Hopping) NVNT 3-DH5 2480MHz Ant Hopping Ref



Band Edge(Hopping) NVNT 3-DH5 2480MHz Ant Hopping Emission

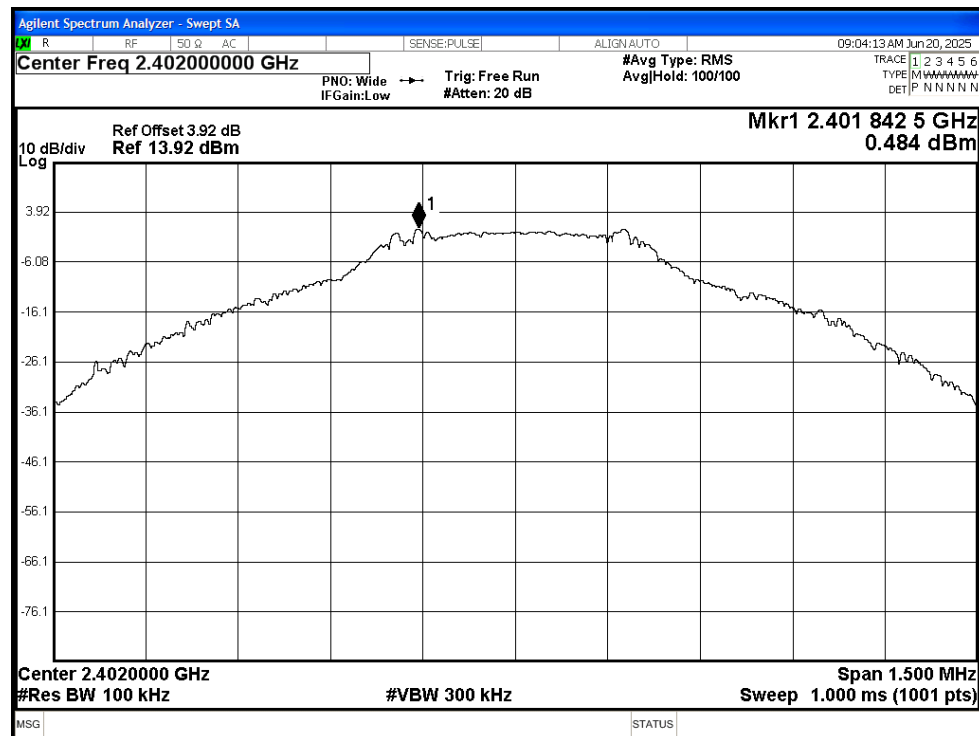


A.7 Conducted RF Spurious Emission

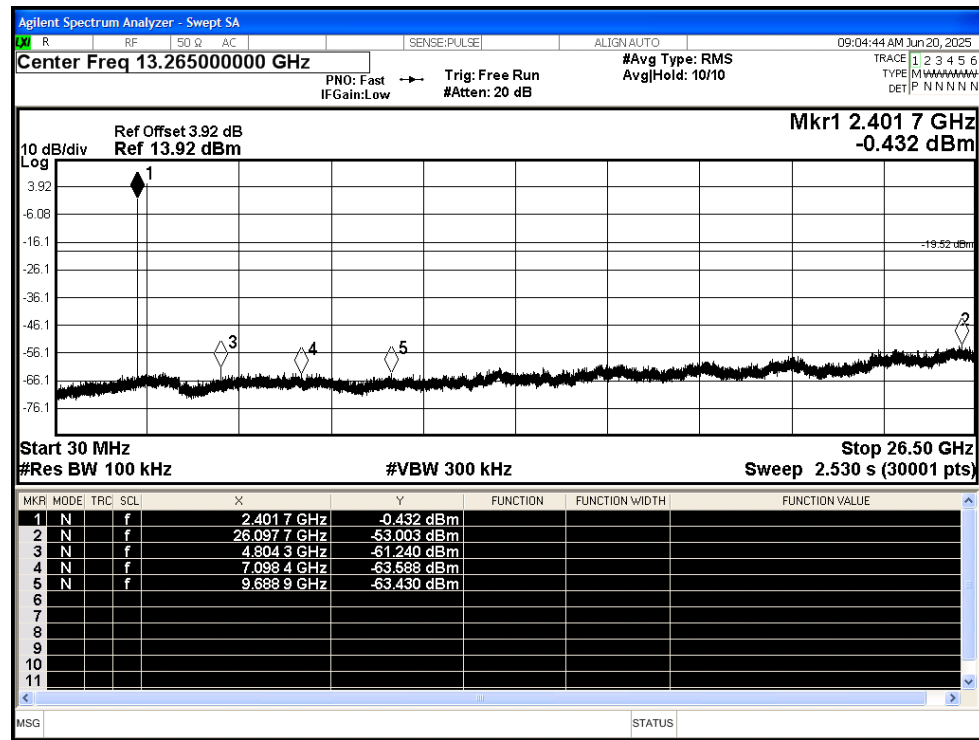
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH5	2402	Ant	-53.49	-20	Pass
NVNT	1-DH5	2441	Ant	-56.53	-20	Pass
NVNT	1-DH5	2480	Ant	-56.06	-20	Pass
NVNT	2-DH5	2402	Ant	-53.44	-20	Pass
NVNT	2-DH5	2441	Ant	-54.14	-20	Pass
NVNT	2-DH5	2480	Ant	-54.86	-20	Pass
NVNT	3-DH5	2402	Ant	-54.26	-20	Pass
NVNT	3-DH5	2441	Ant	-56.44	-20	Pass
NVNT	3-DH5	2480	Ant	-55.82	-20	Pass

Test Graphs

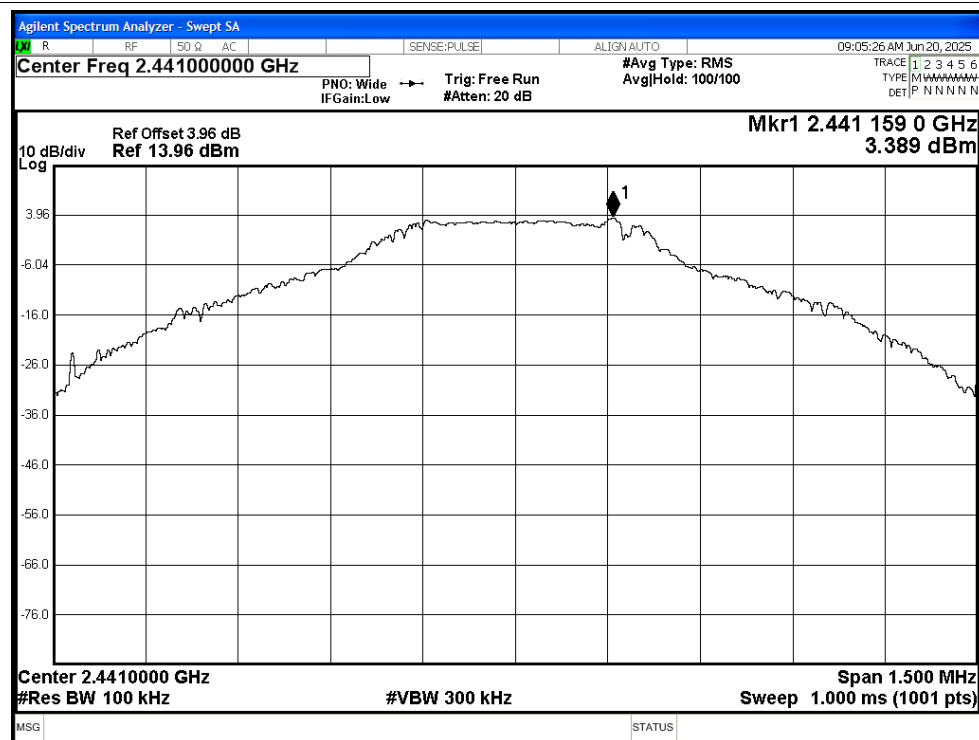
Tx. Spurious NVNT 1-DH5 2402MHz Ant Ref



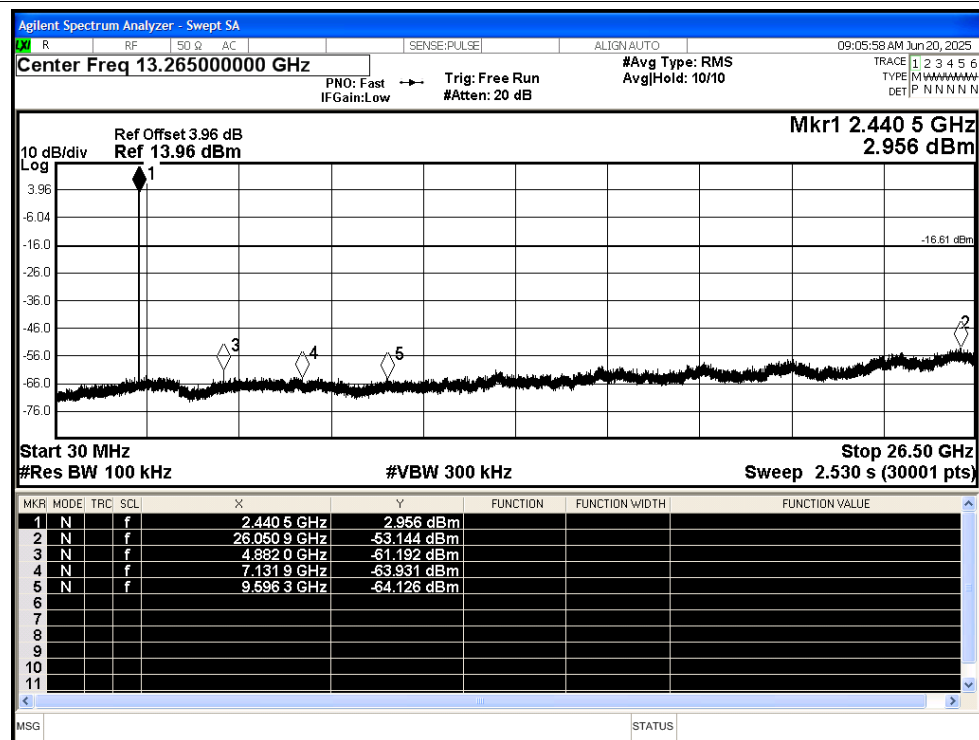
Tx. Spurious NVNT 1-DH5 2402MHz Ant Emission



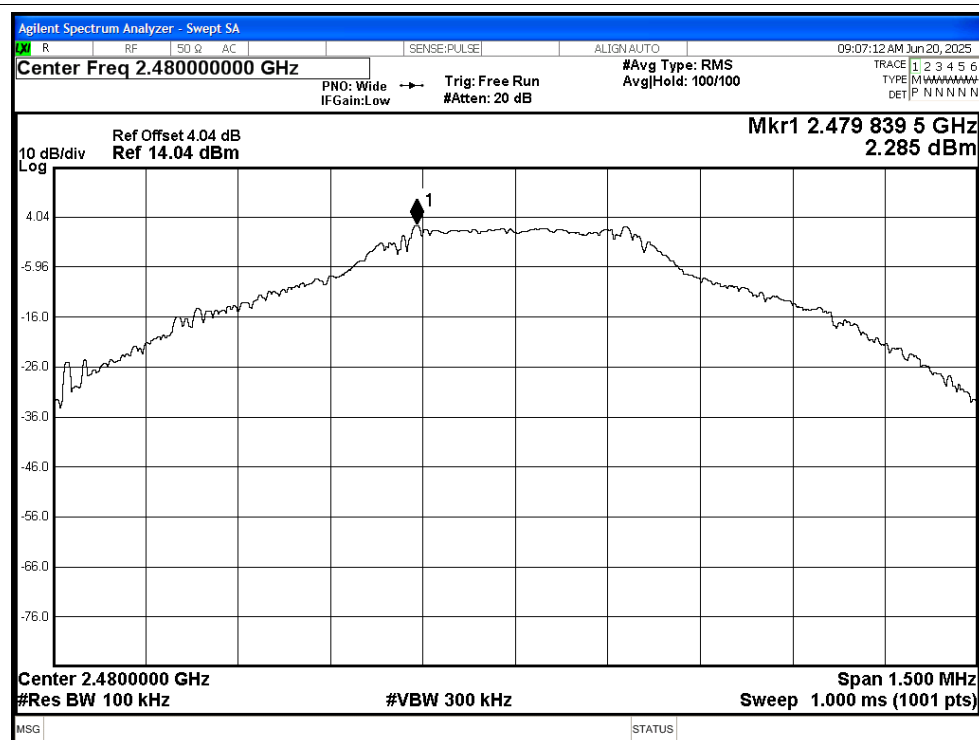
Tx. Spurious NVNT 1-DH5 2441MHz Ant Ref



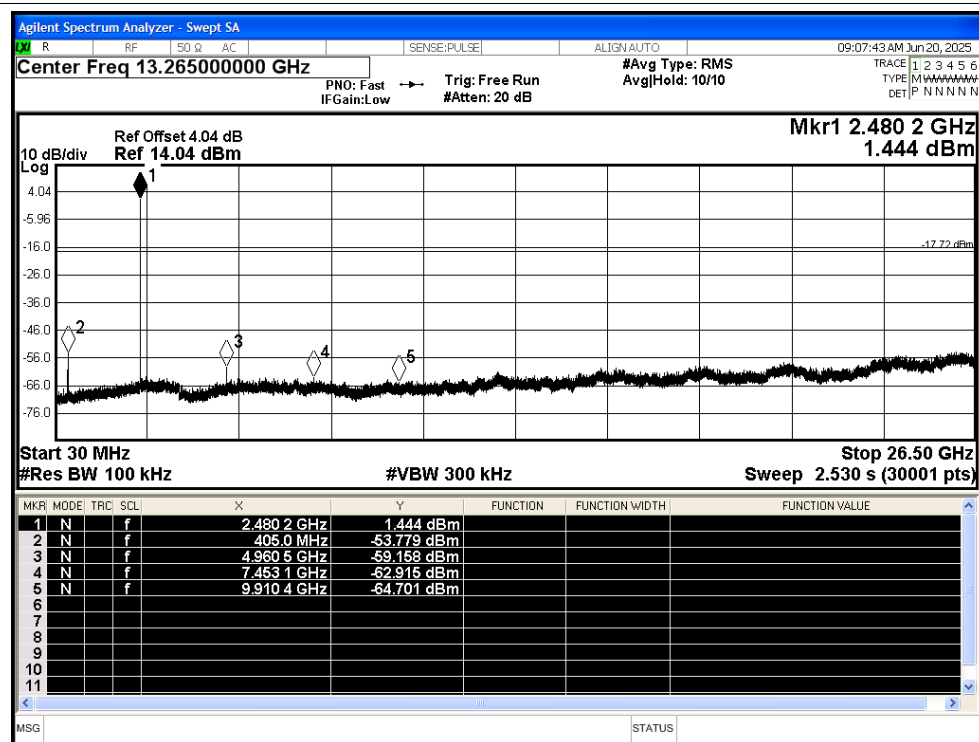
Tx. Spurious NVNT 1-DH5 2441MHz Ant Emission



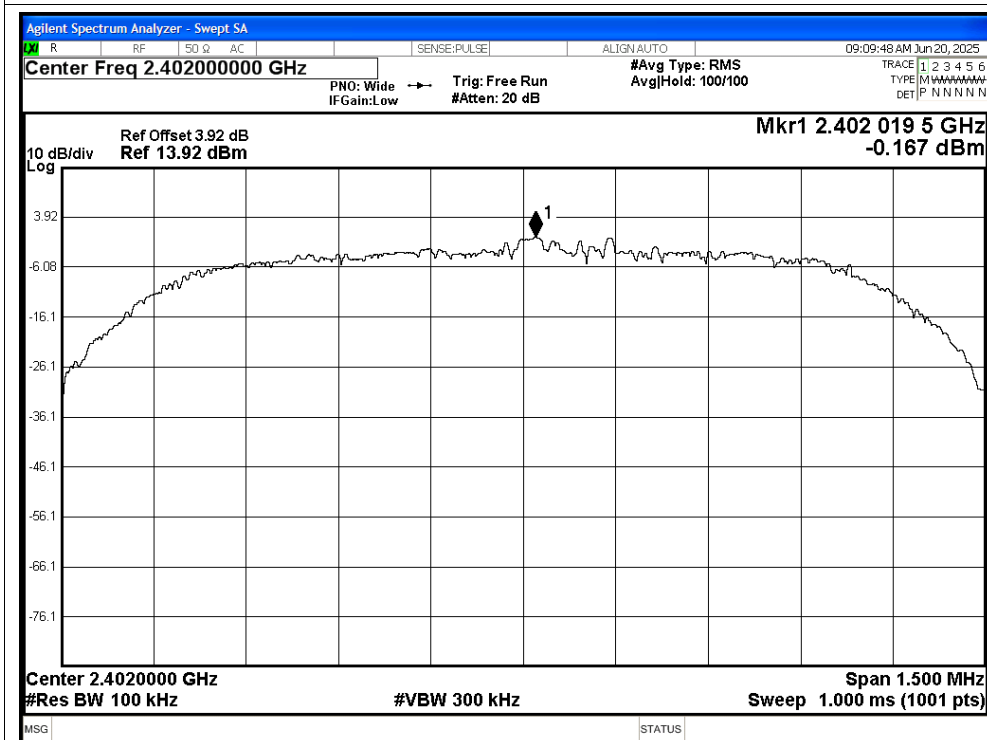
Tx. Spurious NVNT 1-DH5 2480MHz Ant Ref



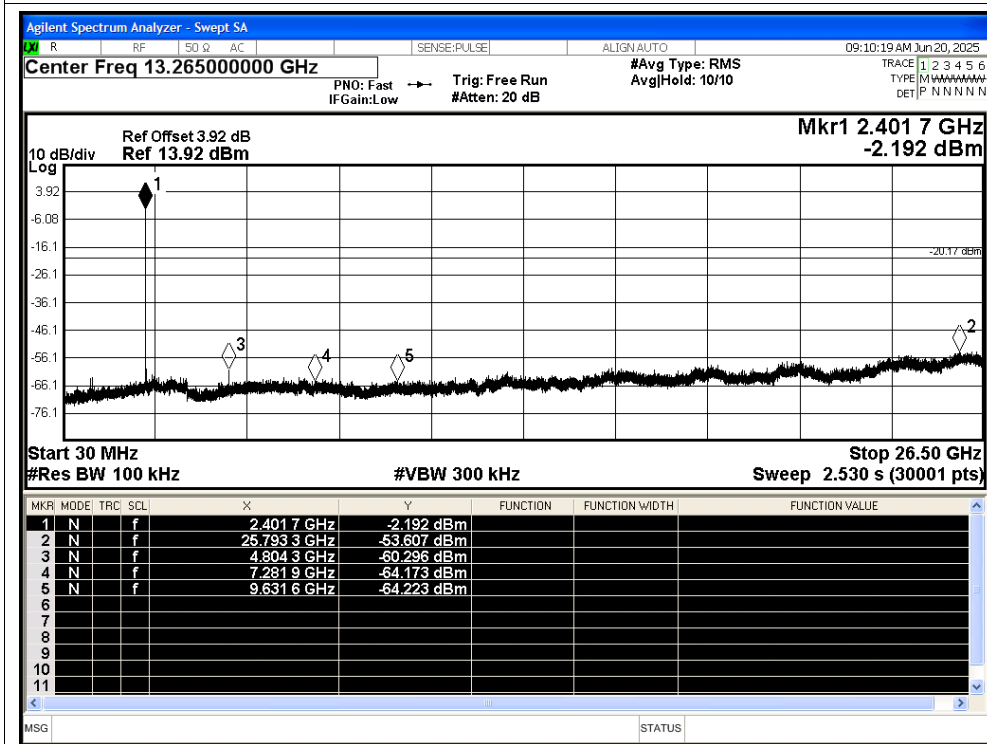
Tx. Spurious NVNT 1-DH5 2480MHz Ant Emission



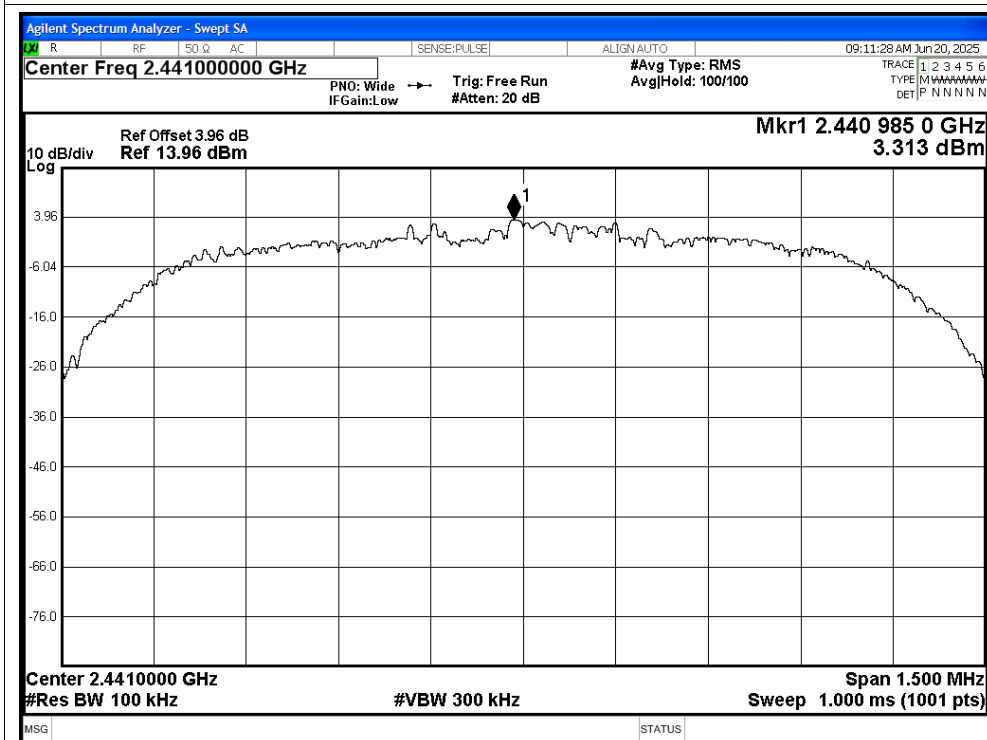
Tx. Spurious NVNT 2-DH5 2402MHz Ant Ref



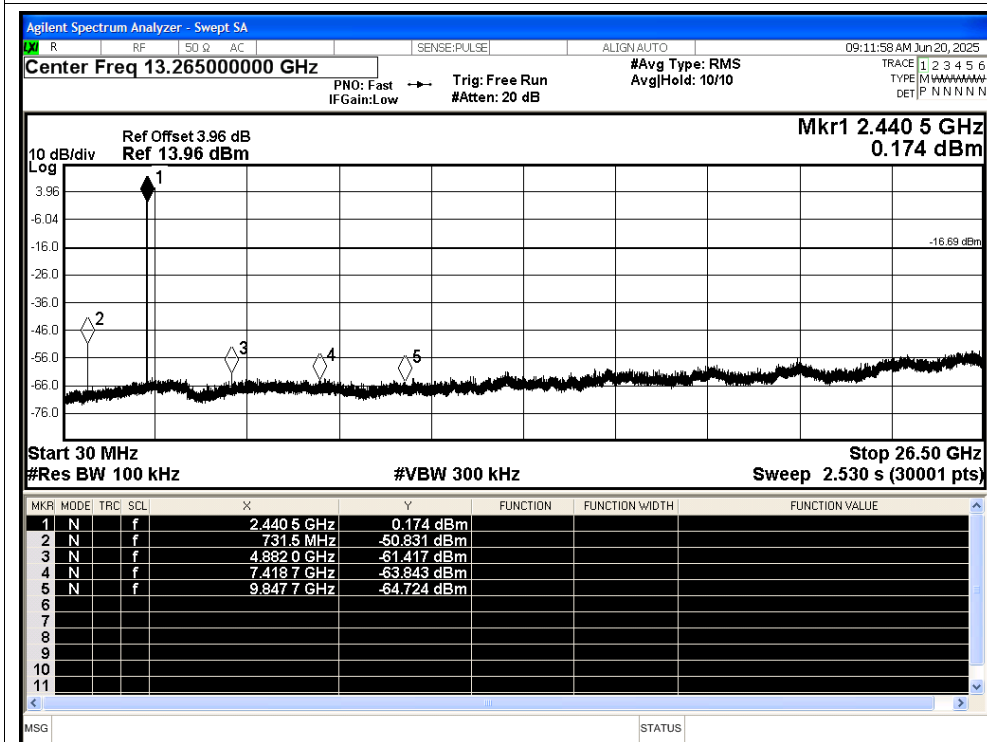
Tx. Spurious NVNT 2-DH5 2402MHz Ant Emission



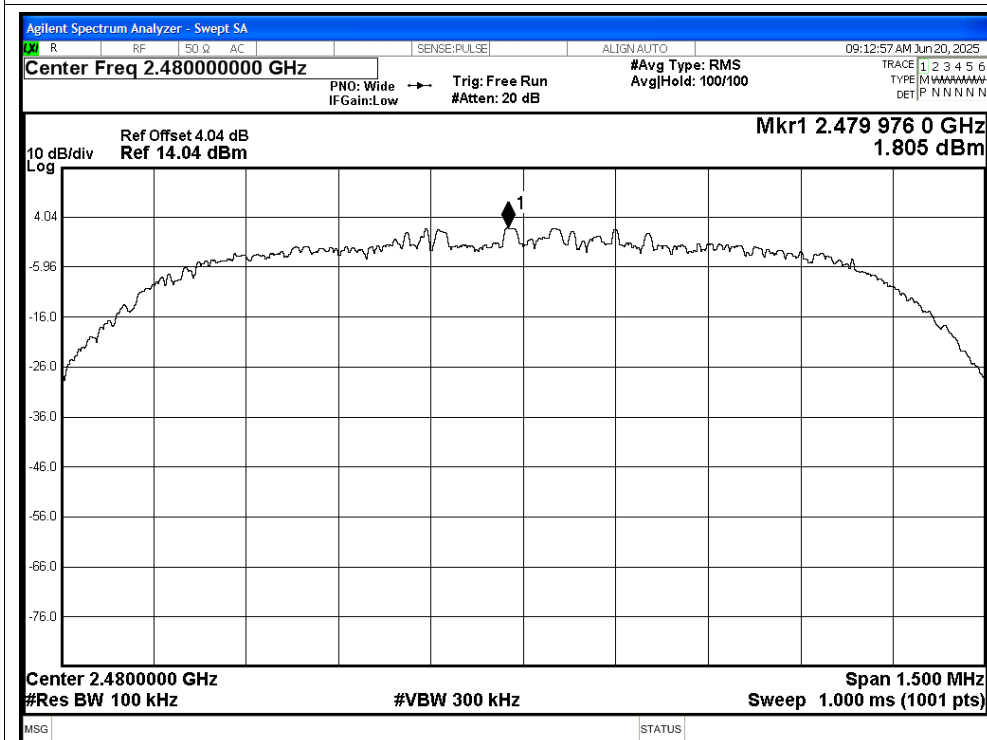
Tx. Spurious NVNT 2-DH5 2441MHz Ant Ref



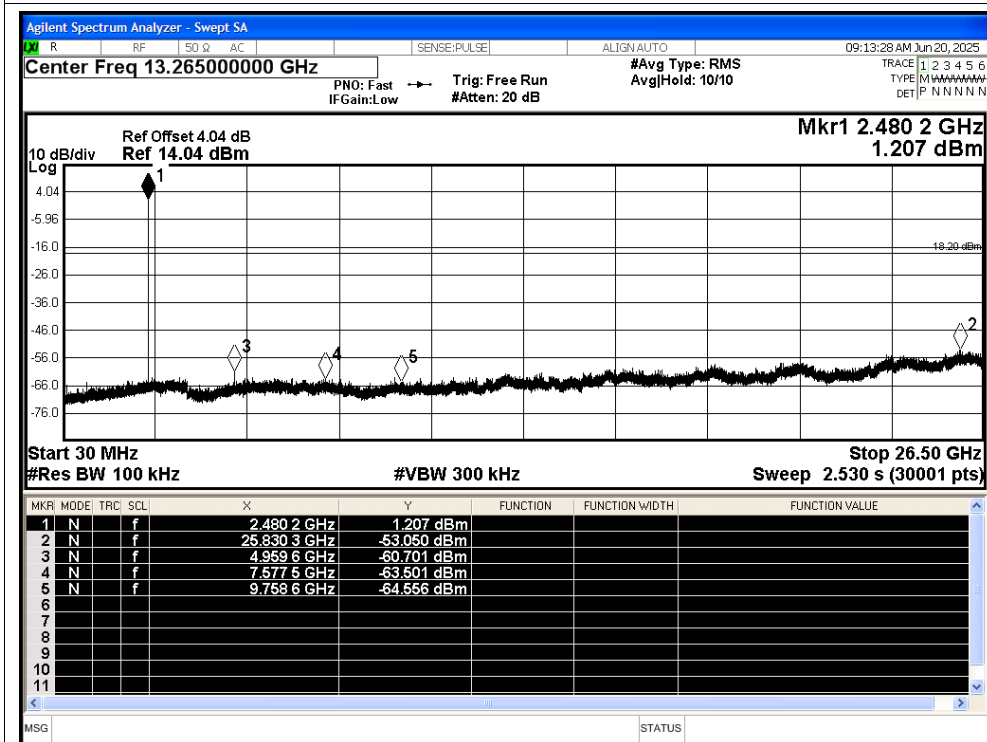
Tx. Spurious NVNT 2-DH5 2441MHz Ant Emission



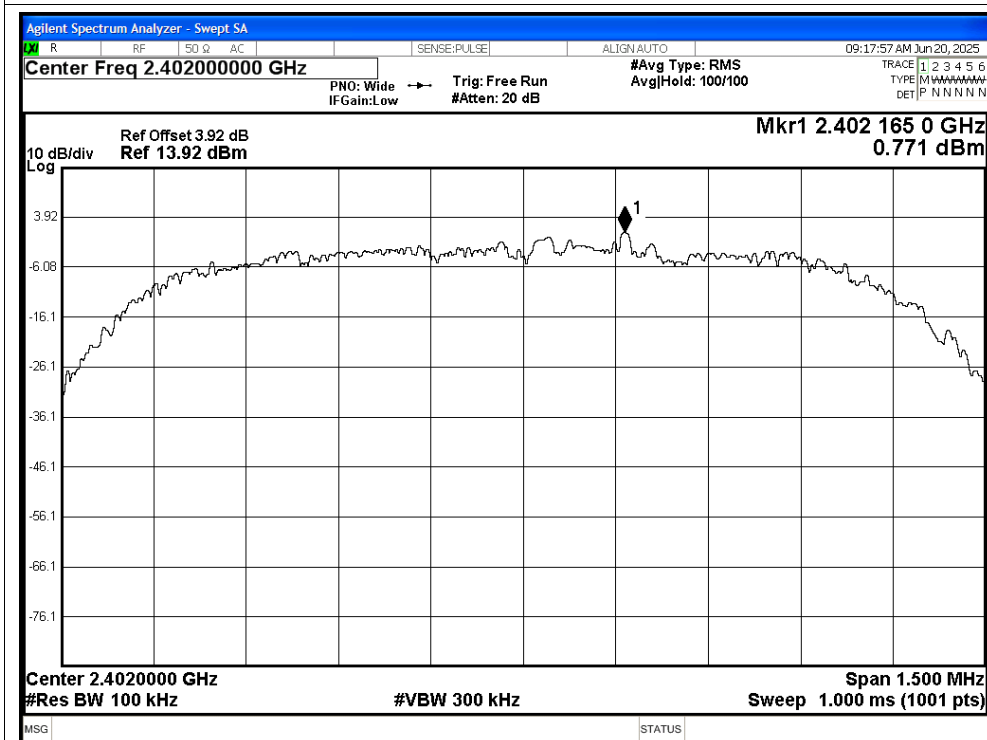
Tx. Spurious NVNT 2-DH5 2480MHz Ant Ref



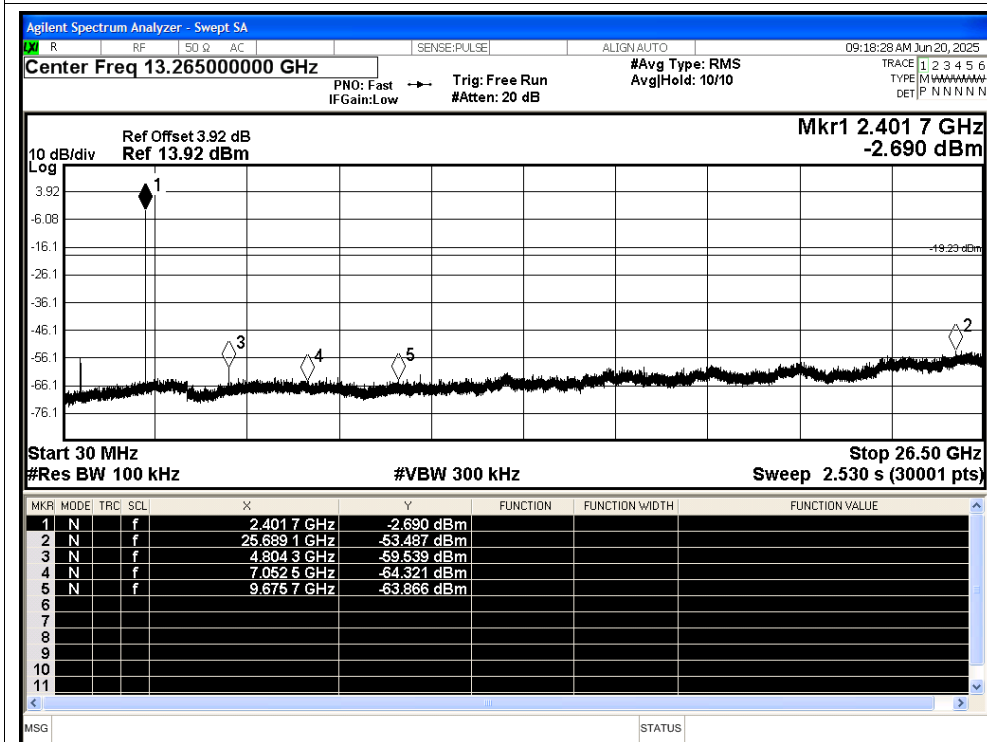
Tx. Spurious NVNT 2-DH5 2480MHz Ant Emission



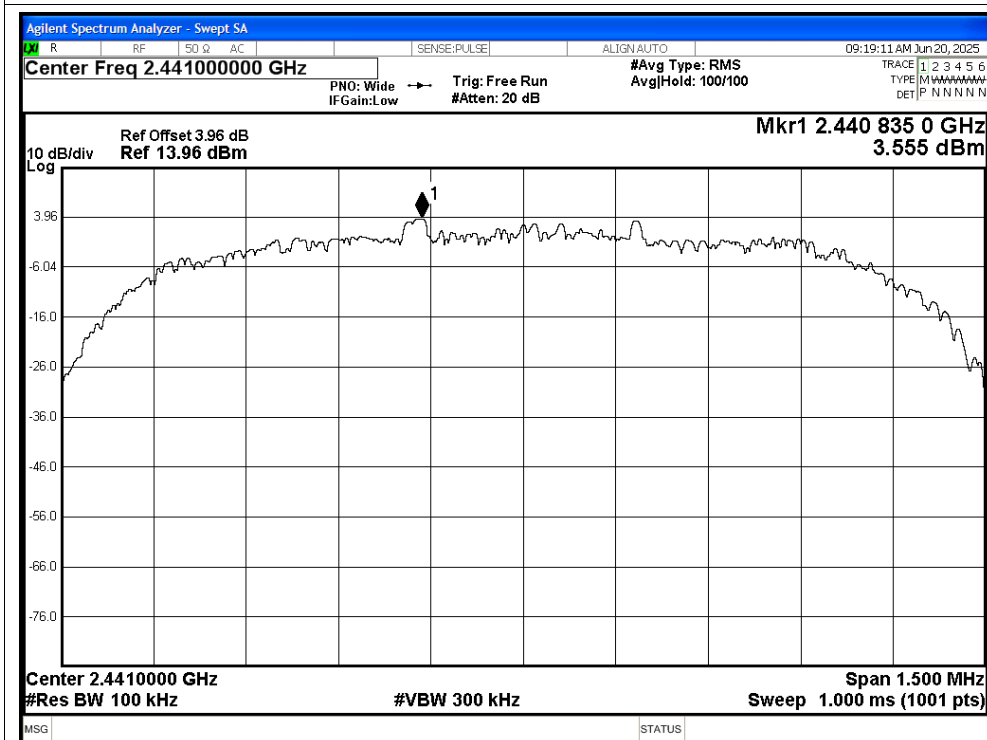
Tx. Spurious NVNT 3-DH5 2402MHz Ant Ref



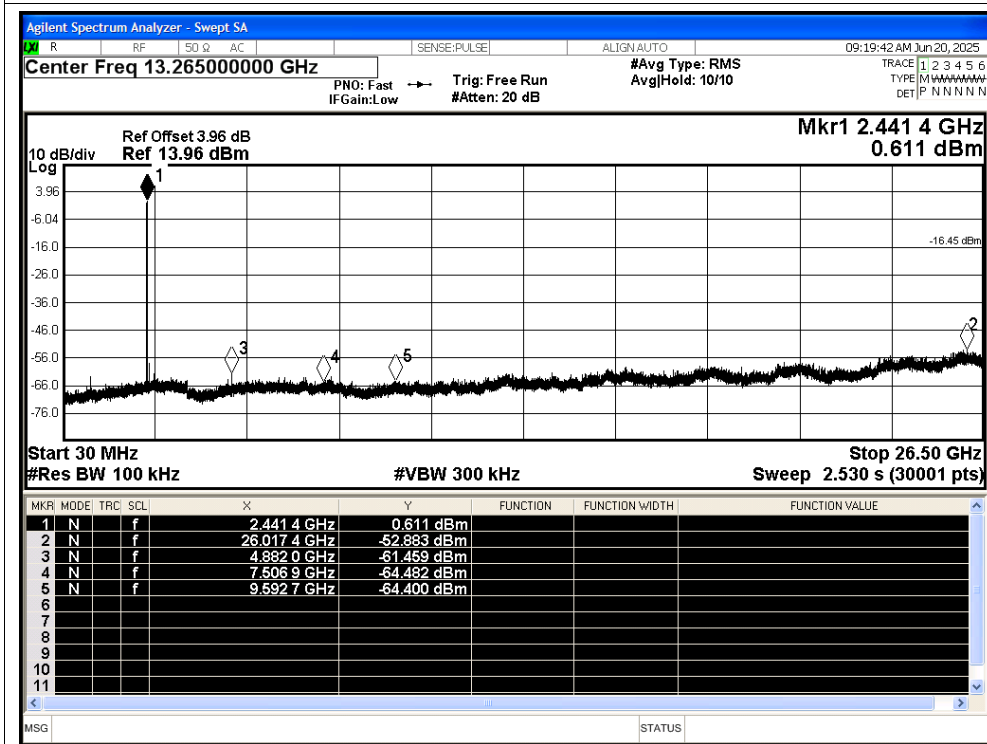
Tx. Spurious NVNT 3-DH5 2402MHz Ant Emission



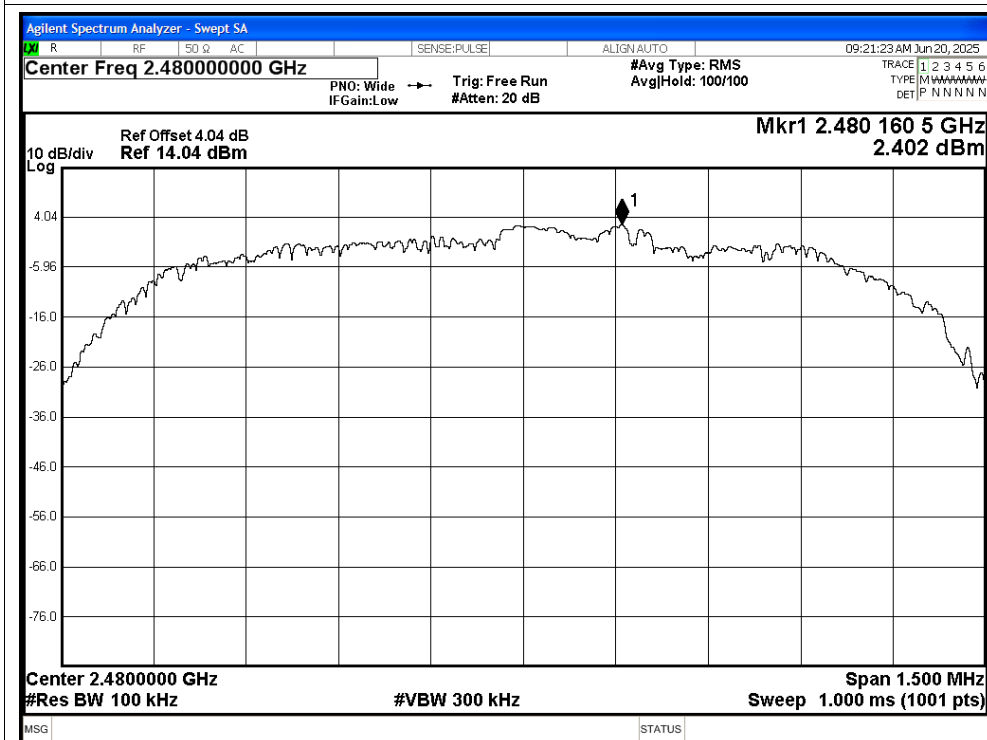
Tx. Spurious NVNT 3-DH5 2441MHz Ant Ref



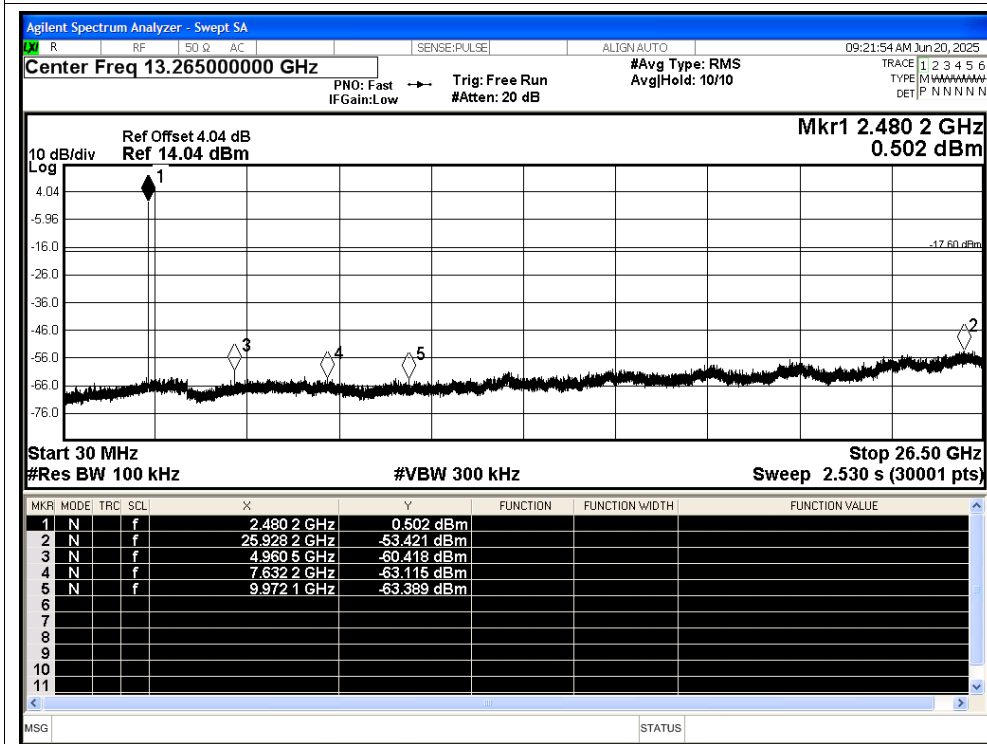
Tx. Spurious NVNT 3-DH5 2441MHz Ant Emission



Tx. Spurious NVNT 3-DH5 2480MHz Ant Ref



Tx. Spurious NVNT 3-DH5 2480MHz Ant Emission



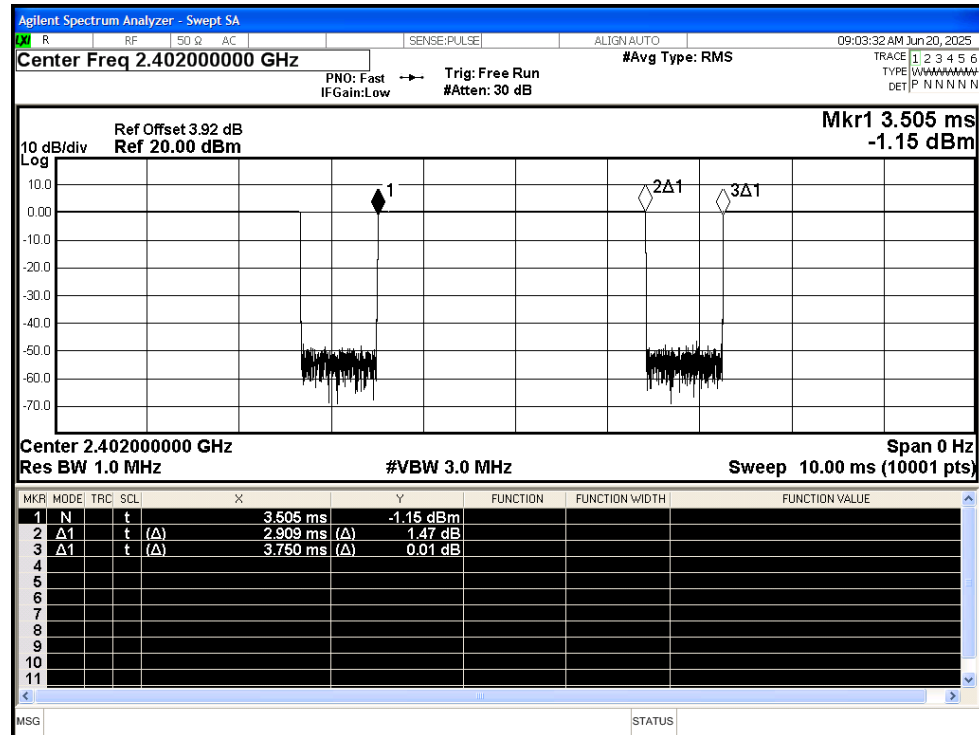
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N		f	2.480 2 GHz	0.502 dBm			
2	N		f	25.928 2 GHz	-63.421 dBm			
3	N		f	4.960 5 GHz	-60.418 dBm			
4	N		f	7.632 2 GHz	-63.115 dBm			
5	N		f	9.972 1 GHz	-63.389 dBm			
6								
7								
8								
9								
10								
11								

A.8 Duty Cycle

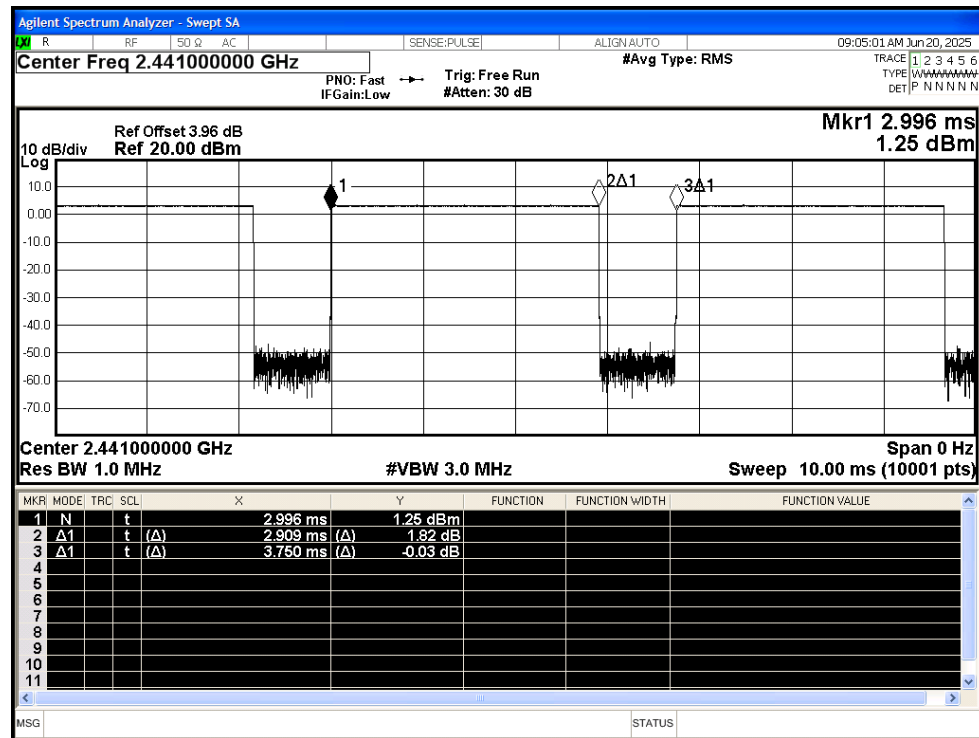
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	1-DH5	2402	Ant	77.57	1.1	0.34
NVNT	1-DH5	2441	Ant	77.57	1.1	0.34
NVNT	1-DH5	2480	Ant	77.6	1.1	0.34
NVNT	2-DH5	2402	Ant	77.57	1.1	0.34
NVNT	2-DH5	2441	Ant	76.38	1.17	0.36
NVNT	2-DH5	2480	Ant	76.37	1.17	0.36
NVNT	3-DH5	2402	Ant	76.35	1.17	0.36
NVNT	3-DH5	2441	Ant	76.37	1.17	0.36
NVNT	3-DH5	2480	Ant	97.22	0.12	7.14

Test Graphs

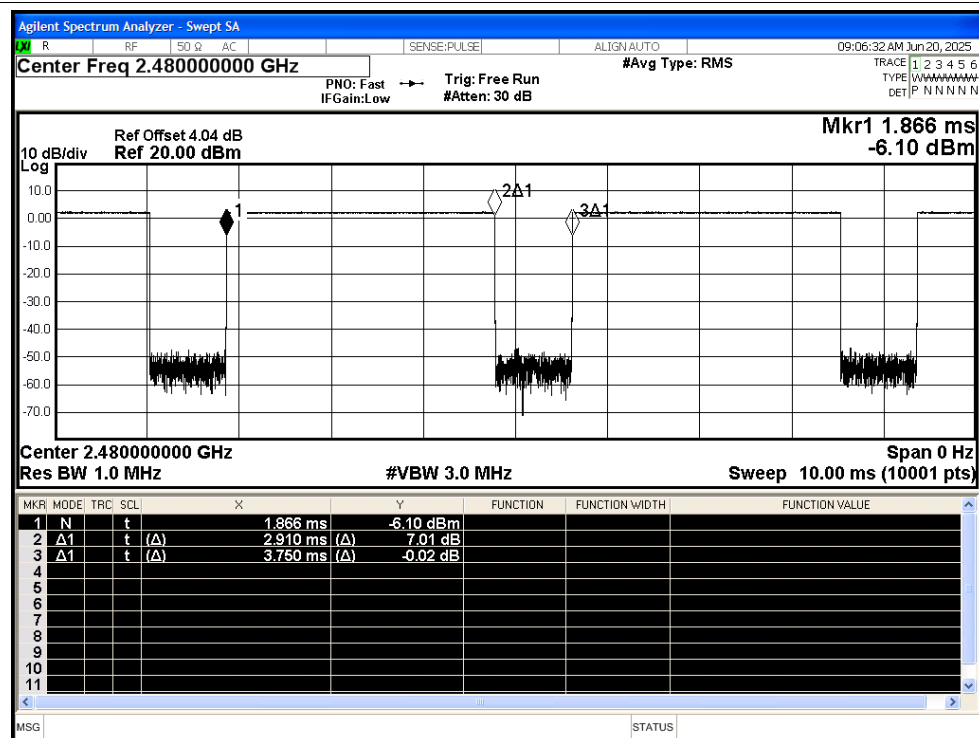
Duty Cycle NVNT 1-DH5 2402MHz Ant



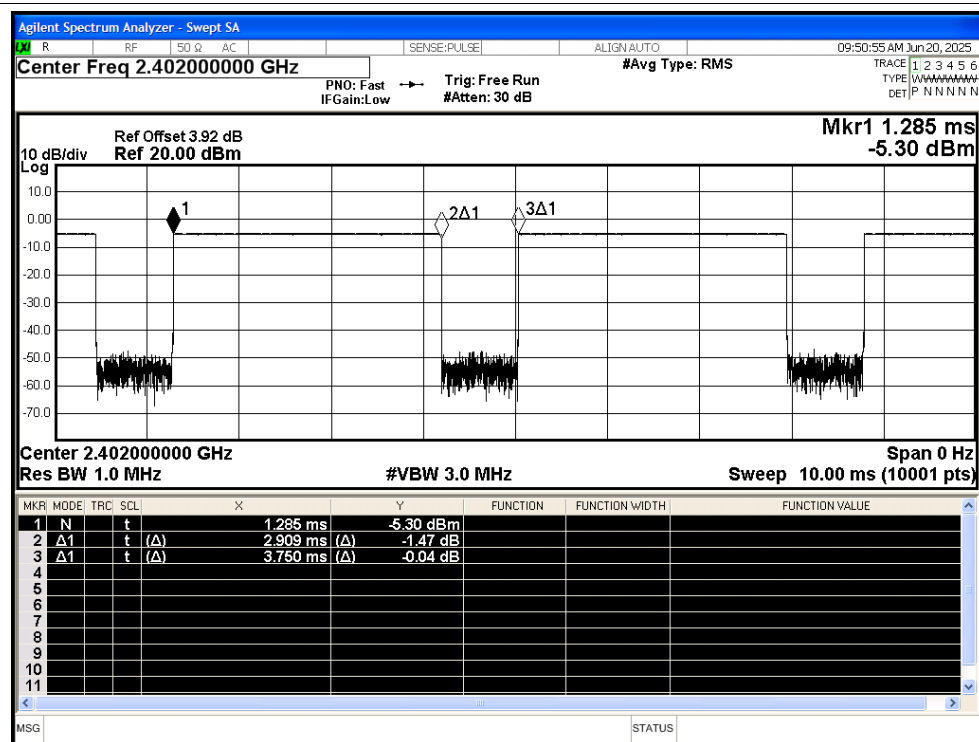
Duty Cycle NVNT 1-DH5 2441MHz Ant



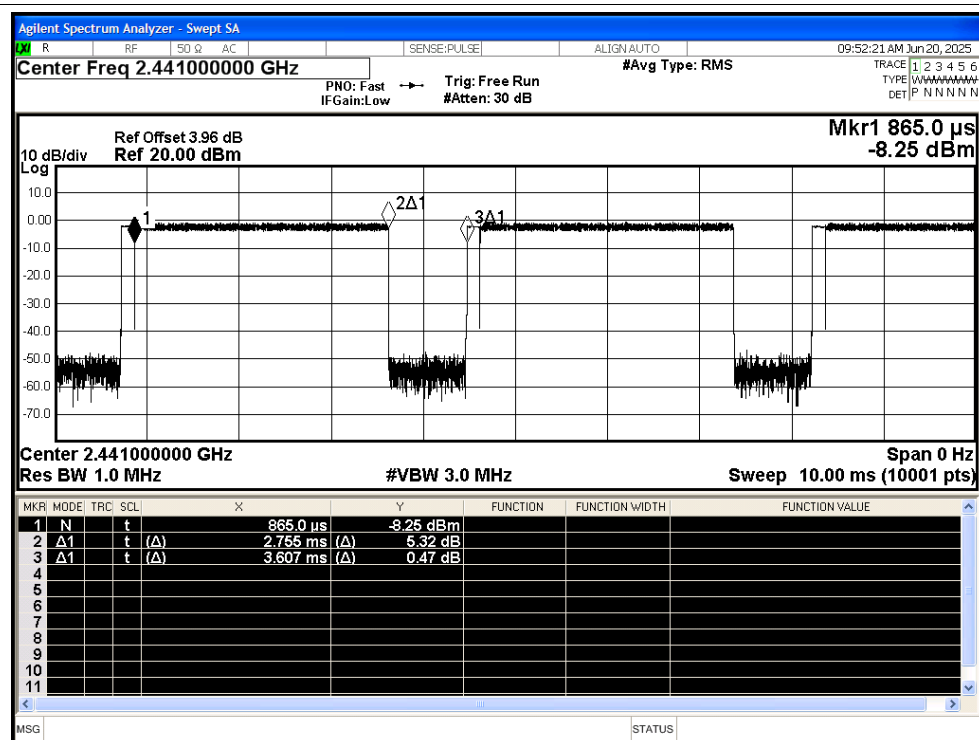
Duty Cycle NVNT 1-DH5 2480MHz Ant



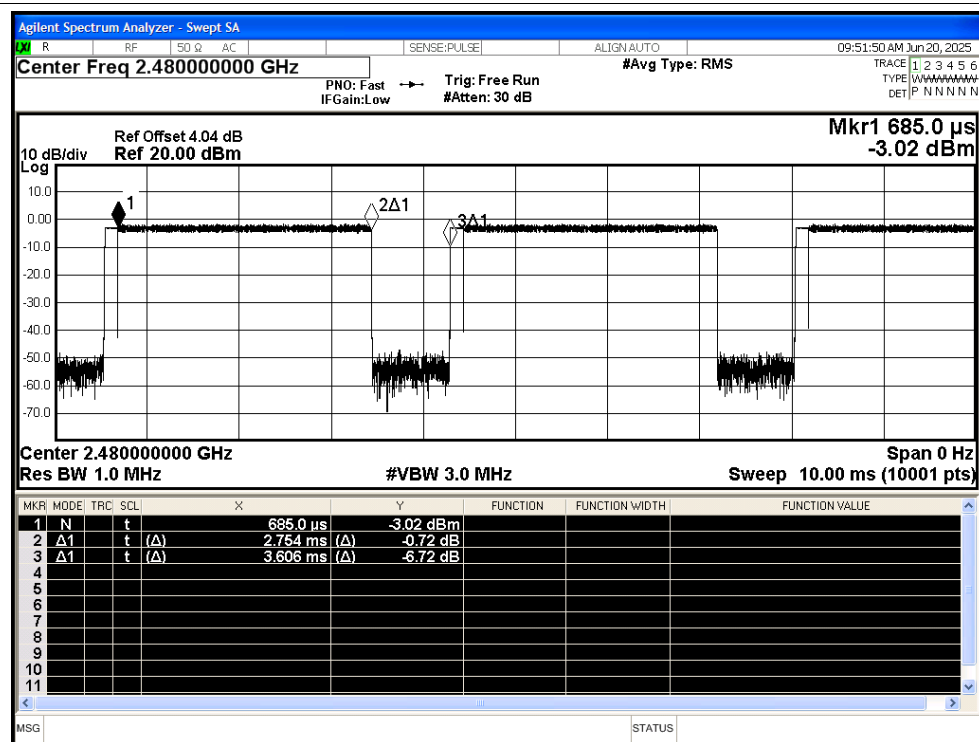
Duty Cycle NVNT 2-DH5 2402MHz Ant



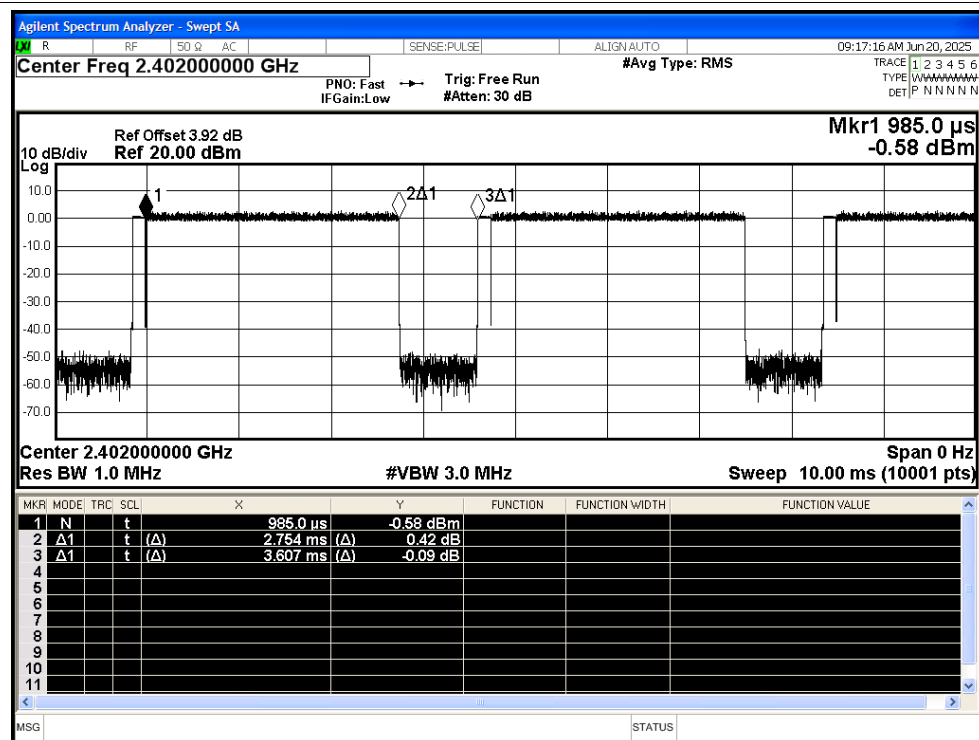
Duty Cycle NVNT 2-DH5 2441MHz Ant



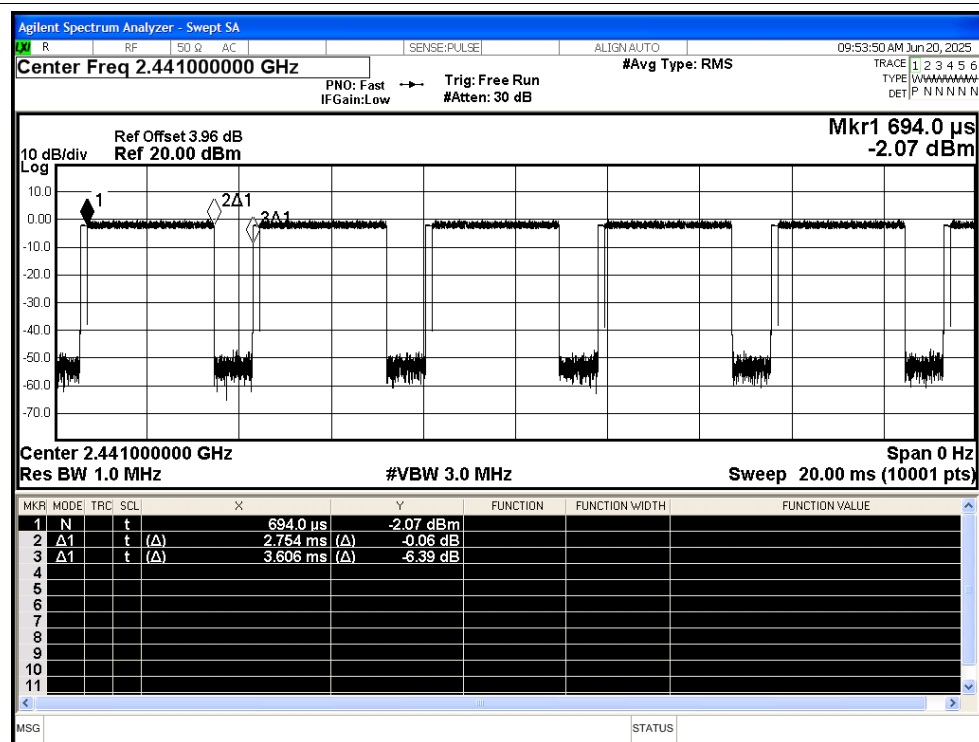
Duty Cycle NVNT 2-DH5 2480MHz Ant

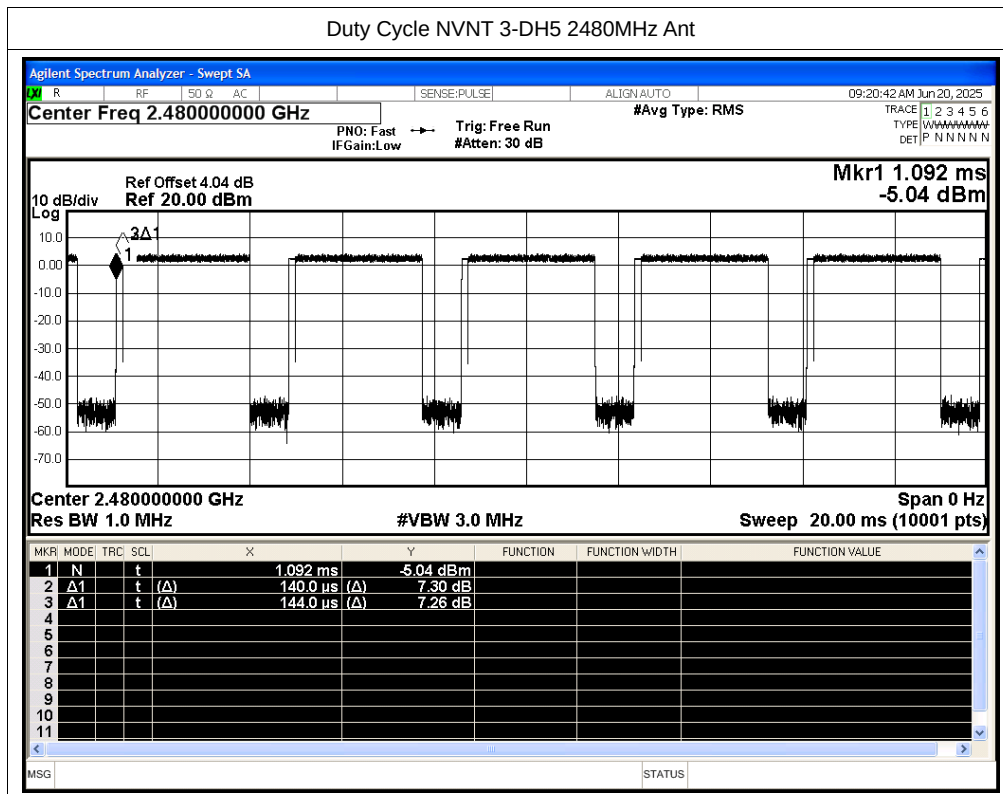


Duty Cycle NVNT 3-DH5 2402MHz Ant



Duty Cycle NVNT 3-DH5 2441MHz Ant



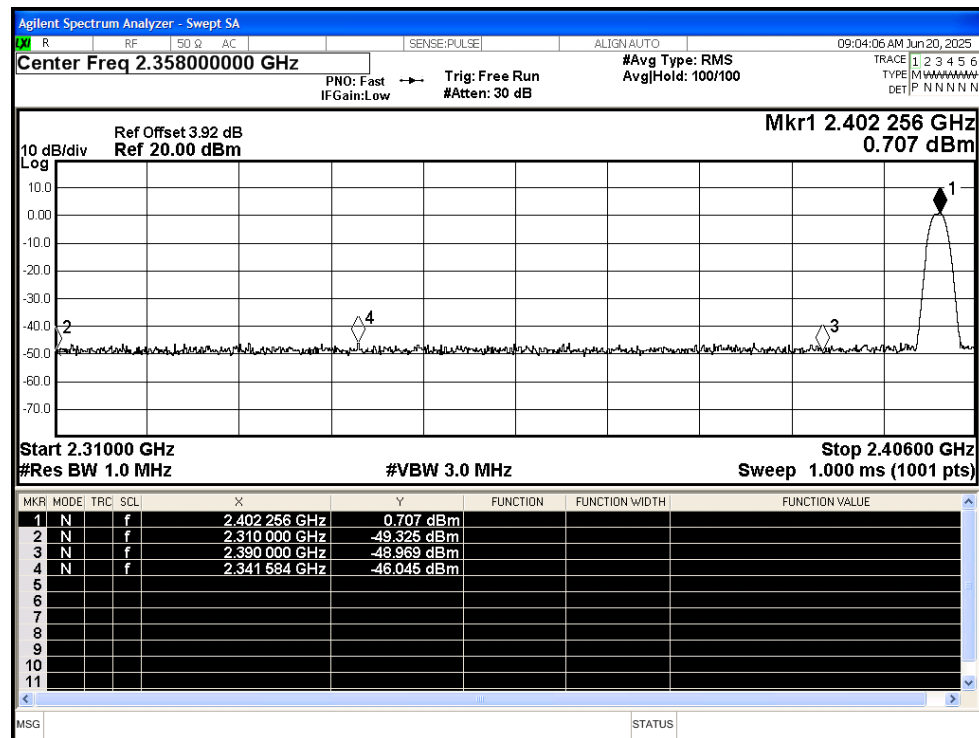


A.9 Restrict Band

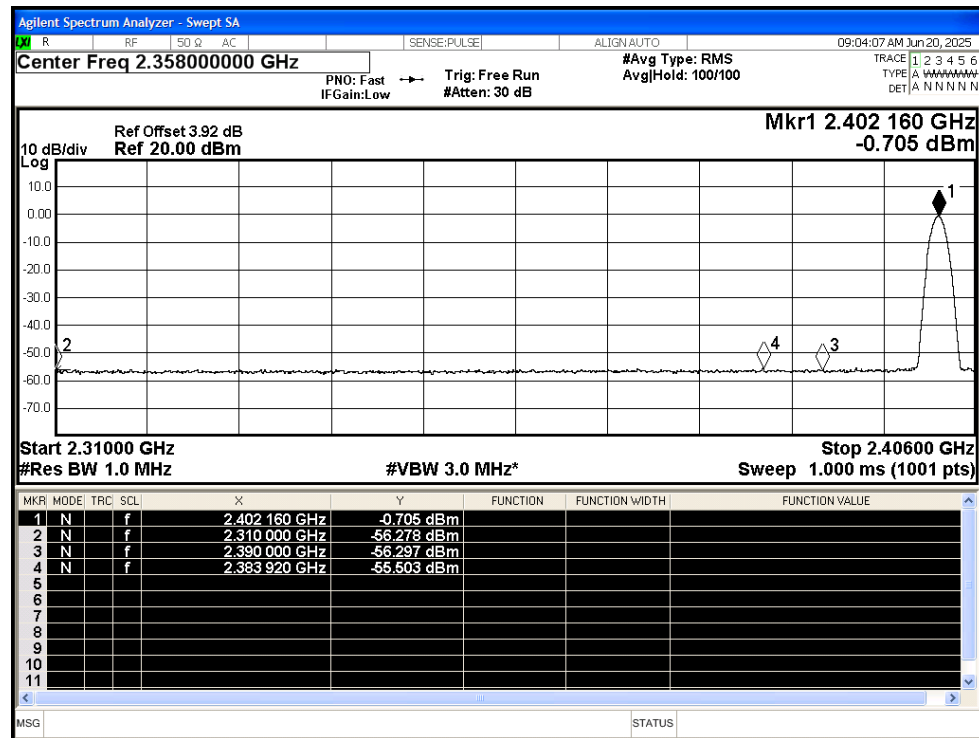
Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	Duty Factor (dB)	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
NVNT	1-DH5	2402	Ant	No-Hopping	2310	-49.33	2	-	47.93	Peak	74	Pass
NVNT	1-DH5	2402	Ant	No-Hopping	2310	-56.28	2	1.1	42.08	Average	54	Pass
NVNT	1-DH5	2402	Ant	No-Hopping	2341.584	-46.05	2	-	51.21	Peak	74	Pass
NVNT	1-DH5	2402	Ant	No-Hopping	2383.92	-55.5	2	1.1	42.86	Average	54	Pass
NVNT	1-DH5	2402	Ant	No-Hopping	2390	-48.97	2	-	48.29	Peak	74	Pass
NVNT	1-DH5	2402	Ant	No-Hopping	2390	-56.3	2	1.1	42.06	Average	54	Pass
NVNT	1-DH5	2480	Ant	No-Hopping	2483.5	-48.77	2	-	48.49	Peak	74	Pass
NVNT	1-DH5	2480	Ant	No-Hopping	2483.5	-55.42	2	1.1	42.94	Average	54	Pass
NVNT	1-DH5	2480	Ant	No-Hopping	2483.656	-42.03	2	-	55.23	Peak	74	Pass
NVNT	1-DH5	2480	Ant	No-Hopping	2496.04	-55.21	2	1.1	43.15	Average	54	Pass
NVNT	1-DH5	2480	Ant	No-Hopping	2500	-47.57	2	-	49.69	Peak	74	Pass
NVNT	1-DH5	2480	Ant	No-Hopping	2500	-56.39	2	1.1	41.97	Average	54	Pass
NVNT	2-DH5	2402	Ant	No-Hopping	2310	-49.54	2	-	47.72	Peak	74	Pass
NVNT	2-DH5	2402	Ant	No-Hopping	2310	-56.38	2	1.1	41.98	Average	54	Pass
NVNT	2-DH5	2402	Ant	No-Hopping	2376.816	-44.5	2	-	52.76	Peak	74	Pass
NVNT	2-DH5	2402	Ant	No-Hopping	2356.752	-55.83	2	1.1	42.53	Average	54	Pass
NVNT	2-DH5	2402	Ant	No-Hopping	2390	-48.84	2	-	48.42	Peak	74	Pass
NVNT	2-DH5	2402	Ant	No-Hopping	2390	-56.63	2	1.1	41.73	Average	54	Pass
NVNT	2-DH5	2480	Ant	No-Hopping	2483.5	-48.53	2	-	48.73	Peak	74	Pass
NVNT	2-DH5	2480	Ant	No-Hopping	2483.5	-55.46	2	1.17	42.97	Average	54	Pass
NVNT	2-DH5	2480	Ant	No-Hopping	2483.584	-44.67	2	-	52.59	Peak	74	Pass
NVNT	2-DH5	2480	Ant	No-Hopping	2483.944	-55.23	2	1.17	43.2	Average	54	Pass
NVNT	2-DH5	2480	Ant	No-Hopping	2500	-47.63	2	-	49.63	Peak	74	Pass
NVNT	2-DH5	2480	Ant	No-Hopping	2500	-55.46	2	1.17	42.97	Average	54	Pass
NVNT	3-DH5	2402	Ant	No-Hopping	2310	-48.05	2	-	49.21	Peak	74	Pass
NVNT	3-DH5	2402	Ant	No-Hopping	2310	-56.63	2	1.17	41.8	Average	54	Pass
NVNT	3-DH5	2402	Ant	No-Hopping	2318.256	-45.42	2	-	51.84	Peak	74	Pass
NVNT	3-DH5	2402	Ant	No-Hopping	2358.192	-55.82	2	1.17	42.61	Average	54	Pass
NVNT	3-DH5	2402	Ant	No-Hopping	2390	-48.11	2	-	49.15	Peak	74	Pass
NVNT	3-DH5	2402	Ant	No-Hopping	2390	-56.65	2	1.17	41.78	Average	54	Pass
NVNT	3-DH5	2480	Ant	No-Hopping	2483.5	-47.52	2	-	49.74	Peak	74	Pass
NVNT	3-DH5	2480	Ant	No-Hopping	2483.5	-55.55	2	0.12	41.83	Average	54	Pass
NVNT	3-DH5	2480	Ant	No-Hopping	2483.656	-45.3	2	-	51.96	Peak	74	Pass
NVNT	3-DH5	2480	Ant	No-Hopping	2483.896	-55.08	2	0.12	42.3	Average	54	Pass
NVNT	3-DH5	2480	Ant	No-Hopping	2500	-48.98	2	-	48.28	Peak	74	Pass
NVNT	3-DH5	2480	Ant	No-Hopping	2500	-56.4	2	0.12	40.98	Average	54	Pass

Test Graphs

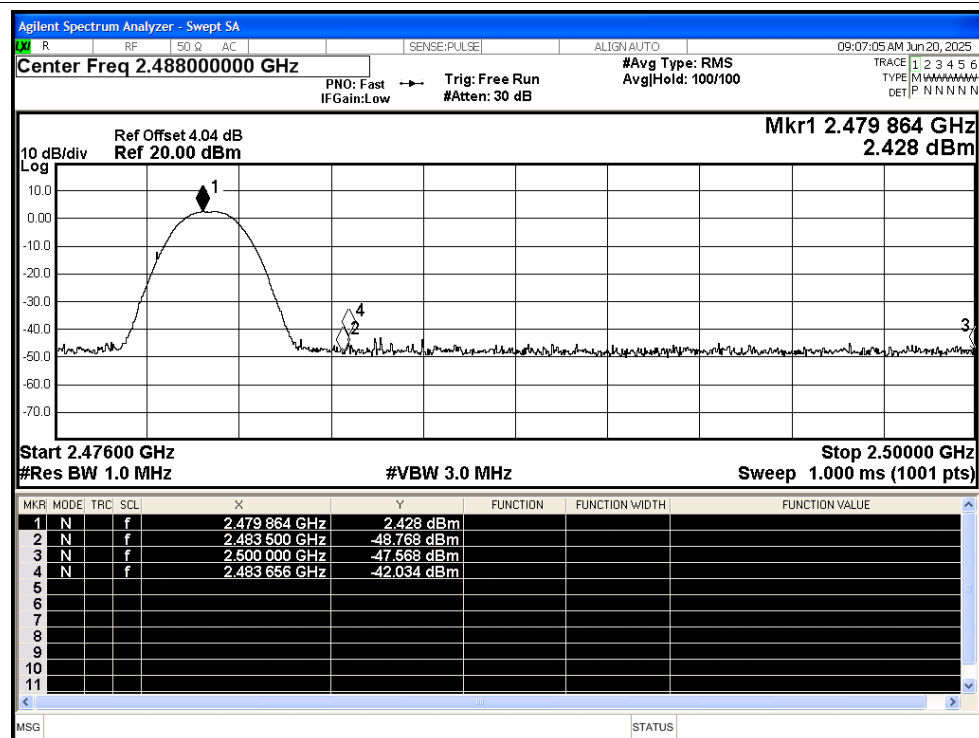
Restrict Band NVNT 1-DH5 2402MHz Ant No-Hopping Peak



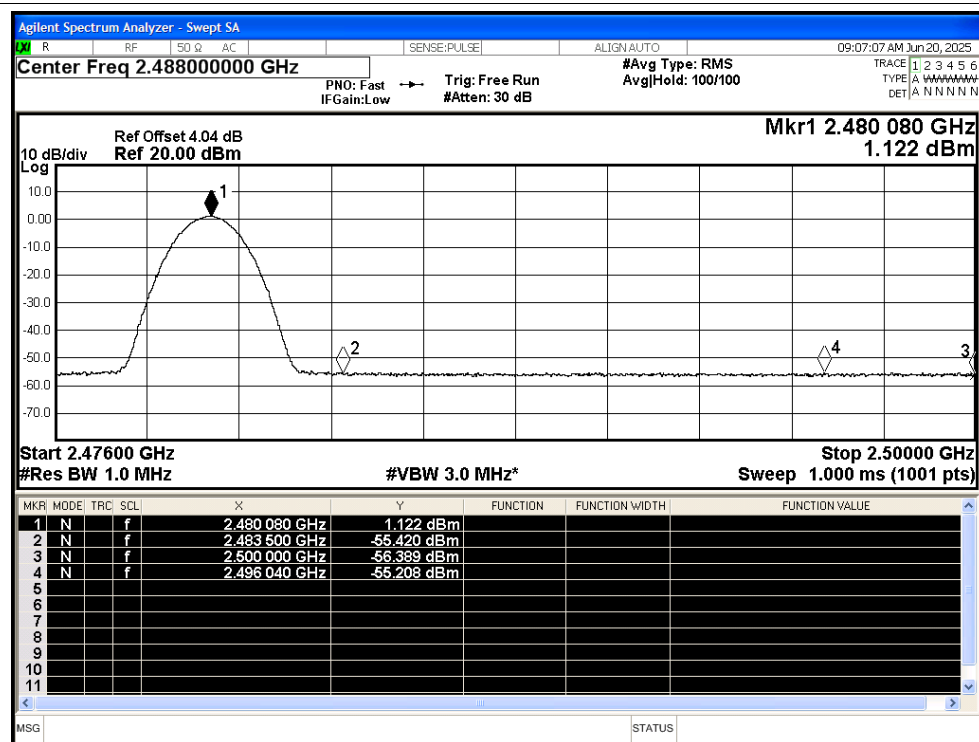
Restrict Band NVNT 1-DH5 2402MHz Ant No-Hopping Average



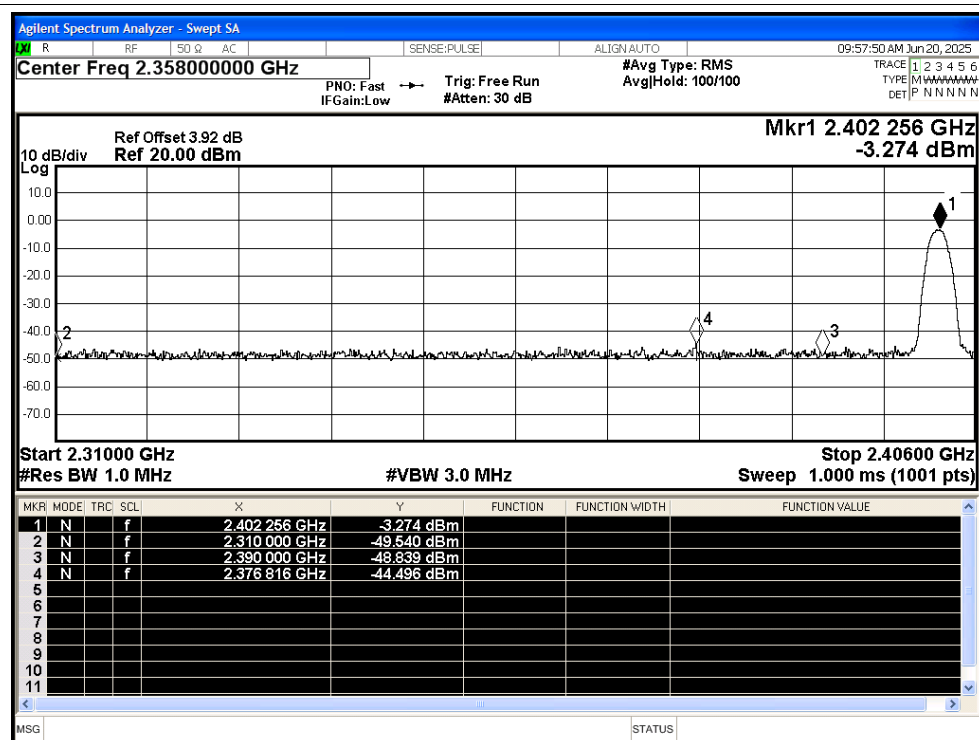
Restrict Band NVNT 1-DH5 2480MHz Ant No-Hopping Peak



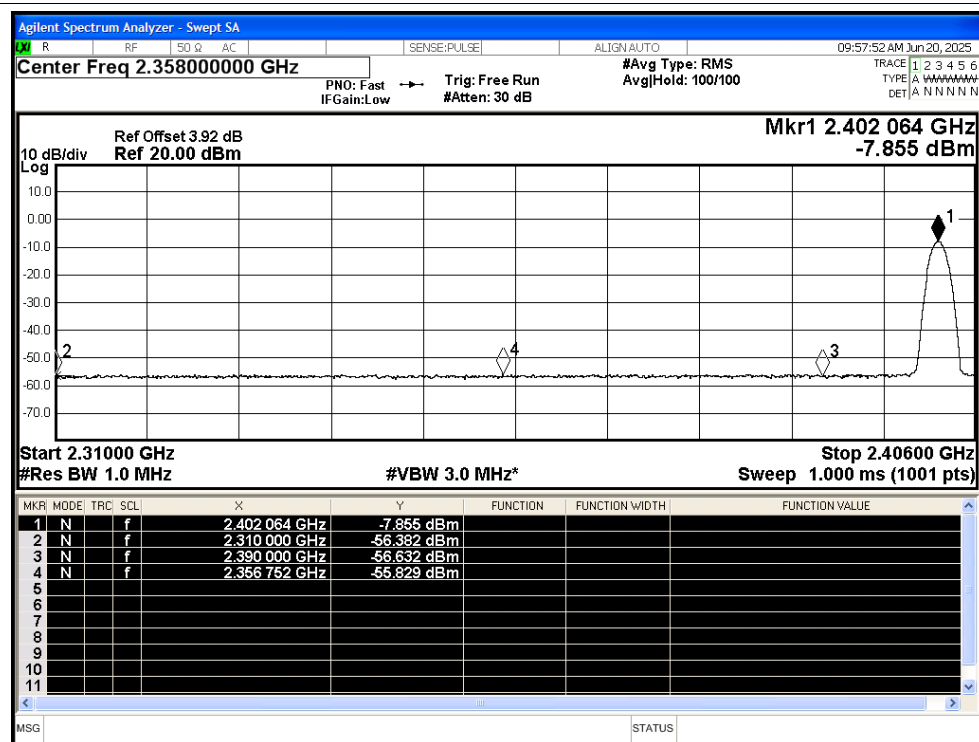
Restrict Band NVNT 1-DH5 2480MHz Ant No-Hopping Average



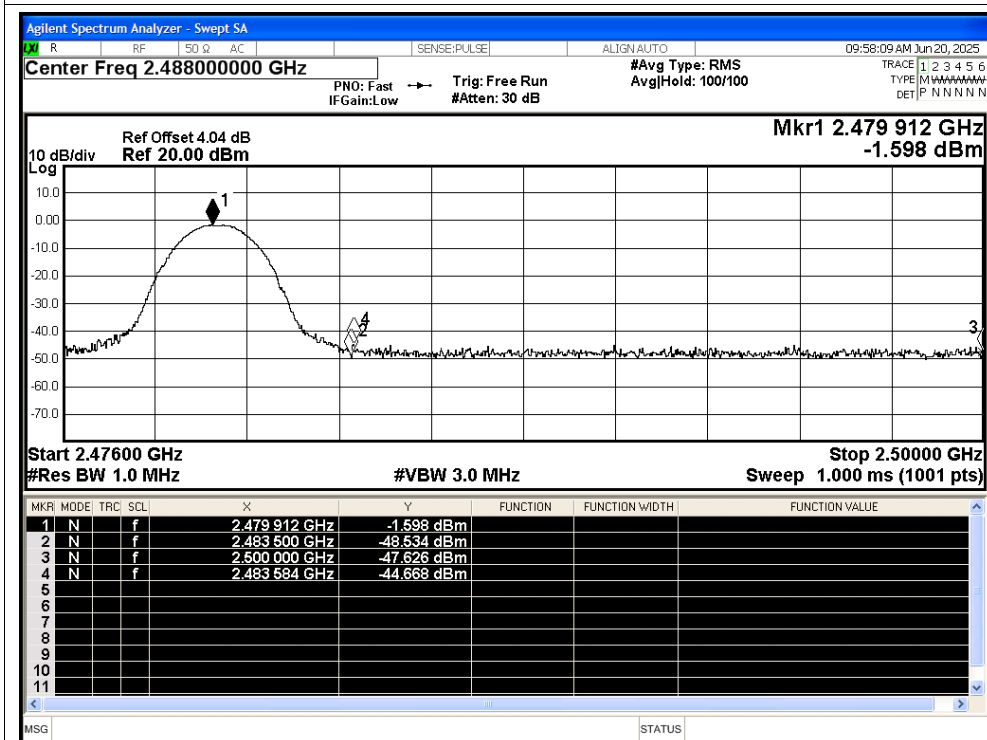
Restrict Band NVNT 2-DH5 2402MHz Ant No-Hopping Peak



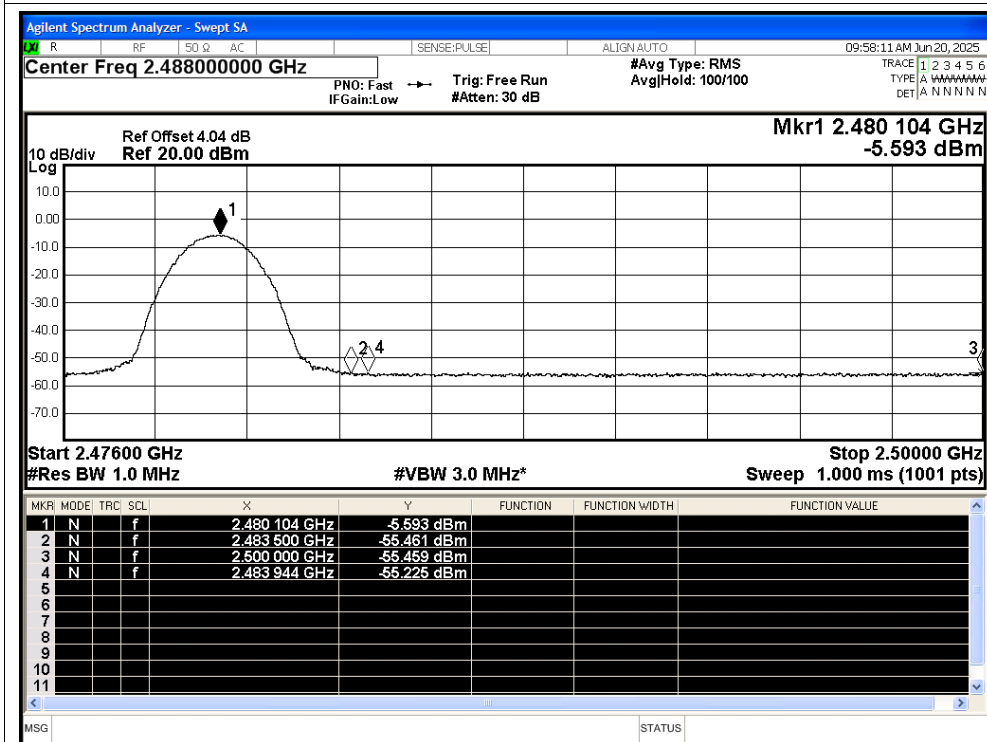
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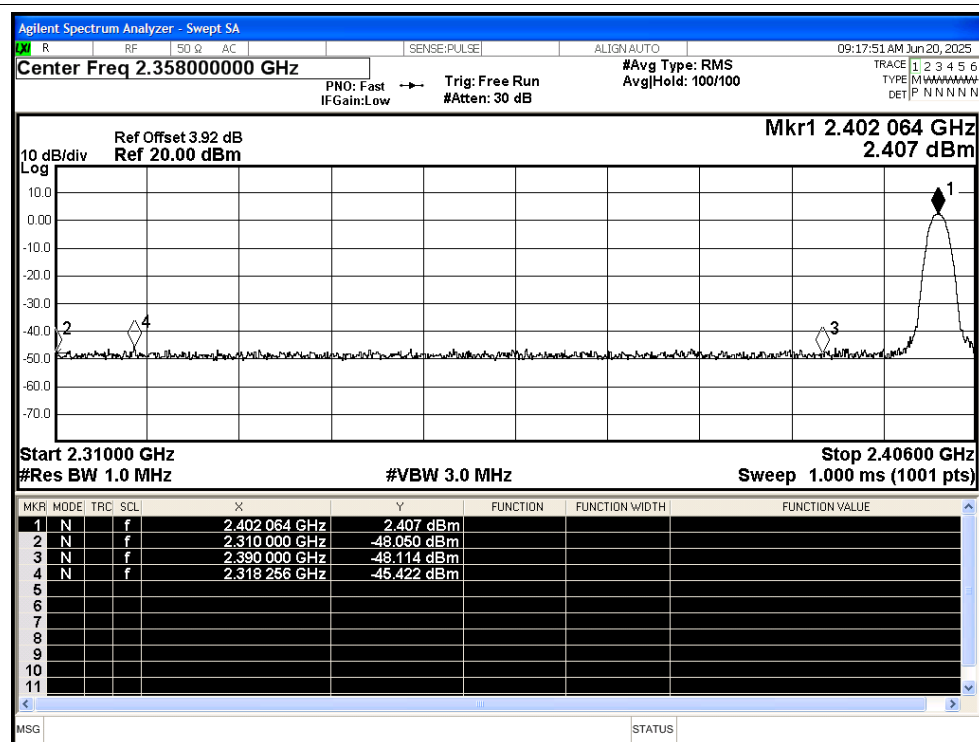
Restrict Band NVNT 2-DH5 2480MHz Ant No-Hopping Peak



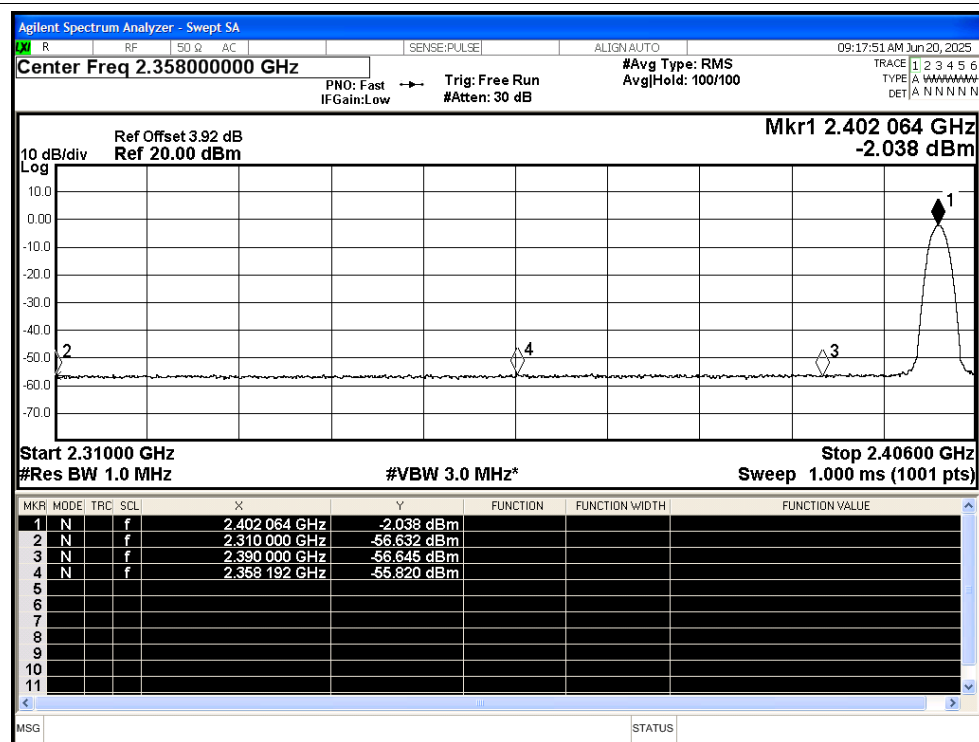
Restrict Band NVNT 2-DH5 2480MHz Ant No-Hopping Average



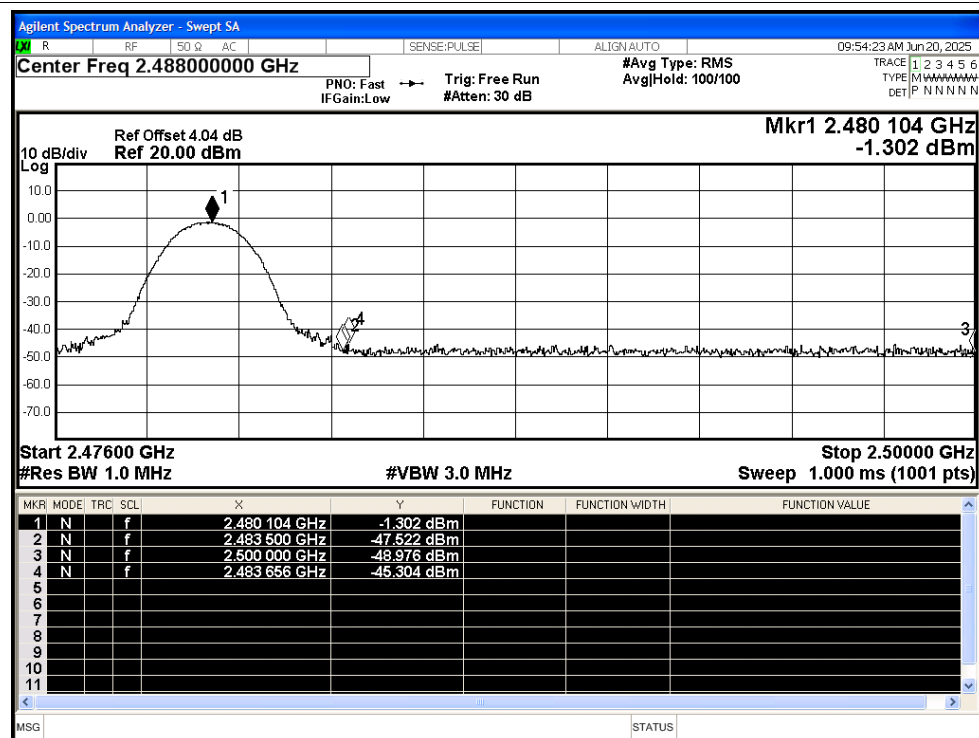
Restrict Band NVNT 3-DH5 2402MHz Ant No-Hopping Peak



Restrict Band NVNT 3-DH5 2402MHz Ant No-Hopping Average



Restrict Band NVNT 3-DH5 2480MHz Ant No-Hopping Peak



Restrict Band NVNT 3-DH5 2480MHz Ant No-Hopping Average

