

Appendix A

RF Test Data for BT (Conducted Measurement)

Product Name: HCND-V4

Test Model: HCND-V4

Environmental Conditions

Temperature:	23.2°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	Ant1	0.939	N/A	Pass
NVNT	1-DH5	2441	Ant1	0.942	N/A	Pass
NVNT	1-DH5	2480	Ant1	1.023	N/A	Pass
NVNT	2-DH5	2402	Ant1	1.291	N/A	Pass
NVNT	2-DH5	2441	Ant1	1.292	N/A	Pass
NVNT	2-DH5	2480	Ant1	1.284	N/A	Pass
NVNT	3-DH5	2402	Ant1	1.291	N/A	Pass
NVNT	3-DH5	2441	Ant1	1.308	N/A	Pass
NVNT	3-DH5	2480	Ant1	1.309	N/A	Pass

Test Graphs

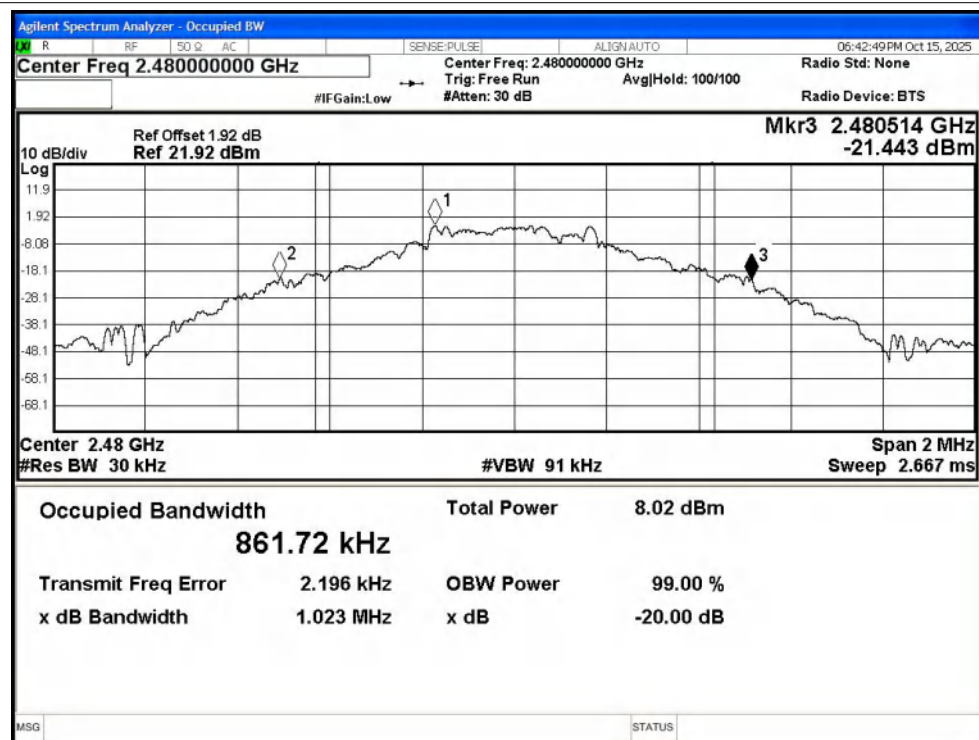
-20dB Bandwidth NVNT 1-DH5 2402MHz Ant1



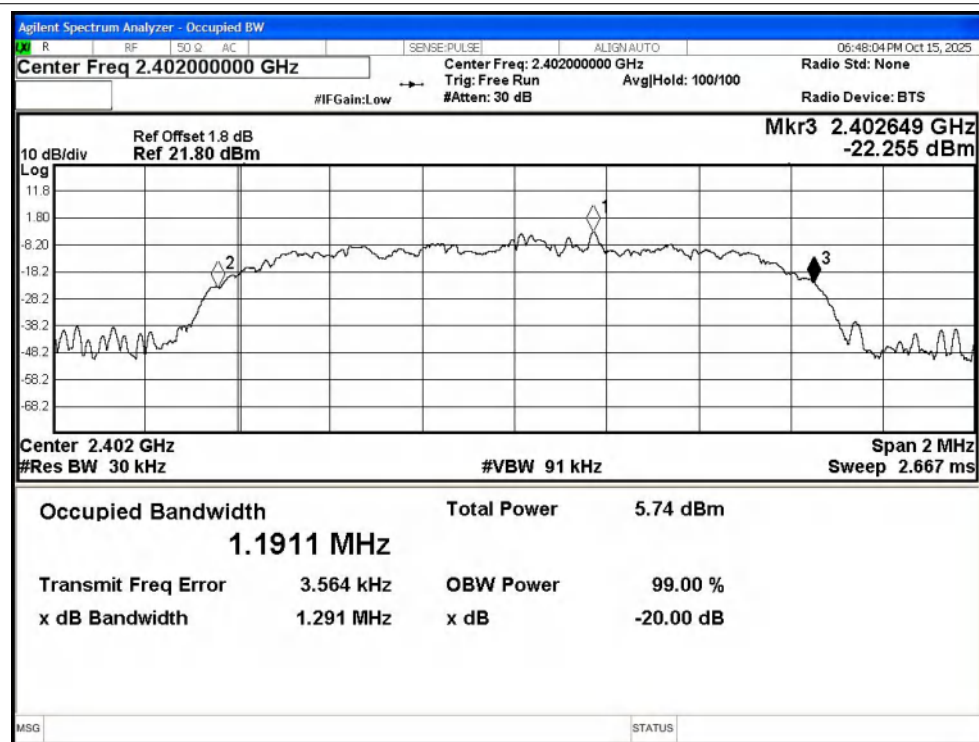
-20dB Bandwidth NVNT 1-DH5 2441MHz Ant1



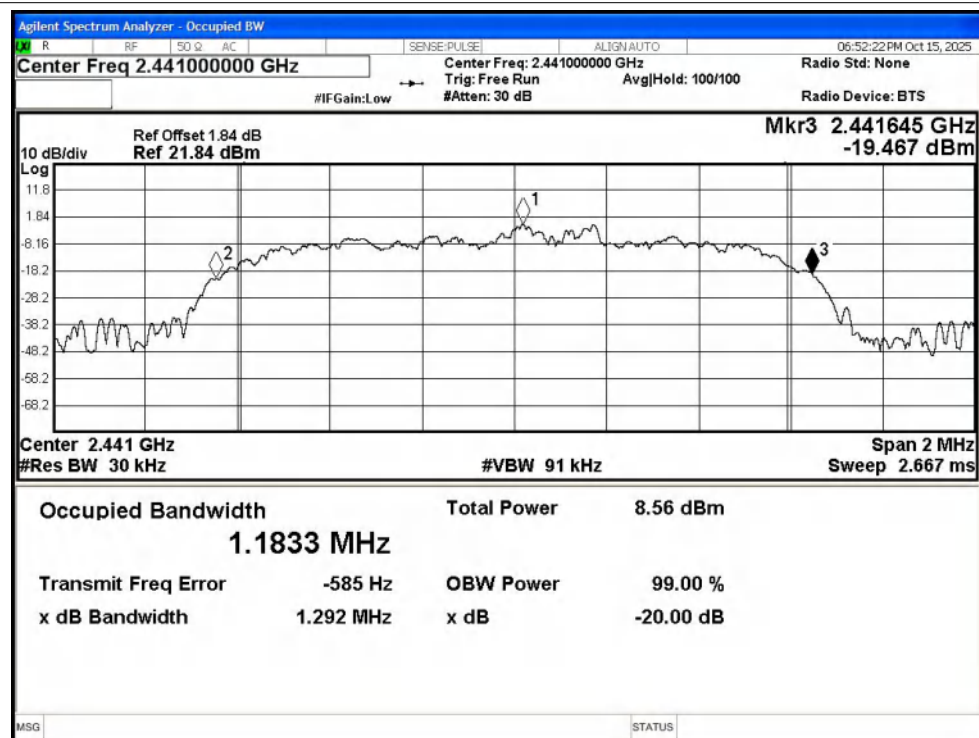
-20dB Bandwidth NVNT 1-DH5 2480MHz Ant1



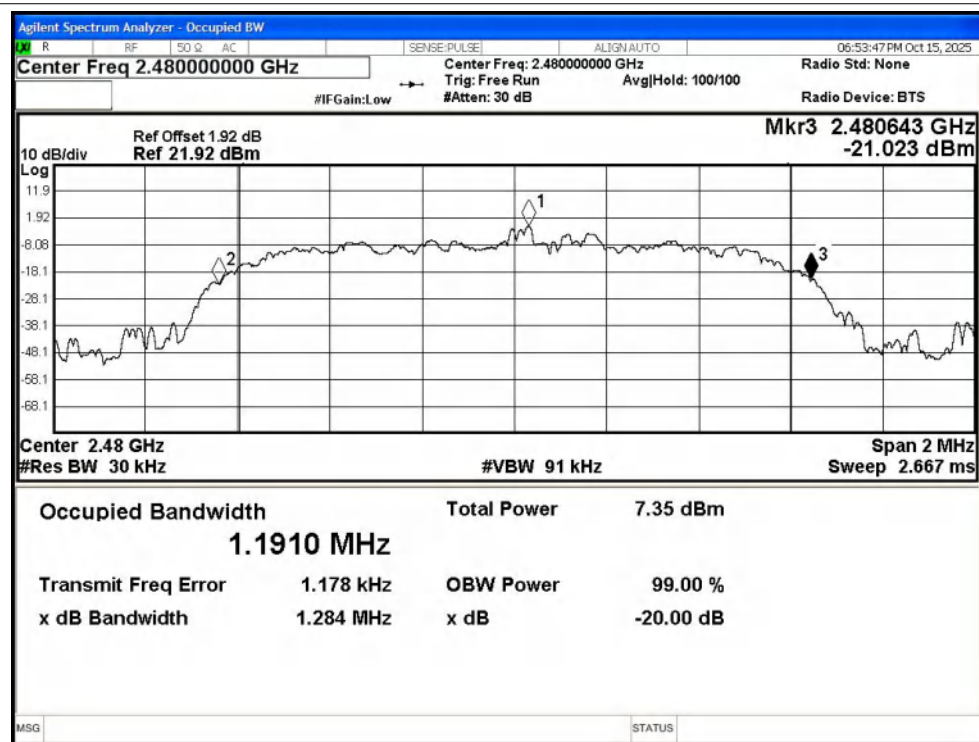
-20dB Bandwidth NVNT 2-DH5 2402MHz Ant1



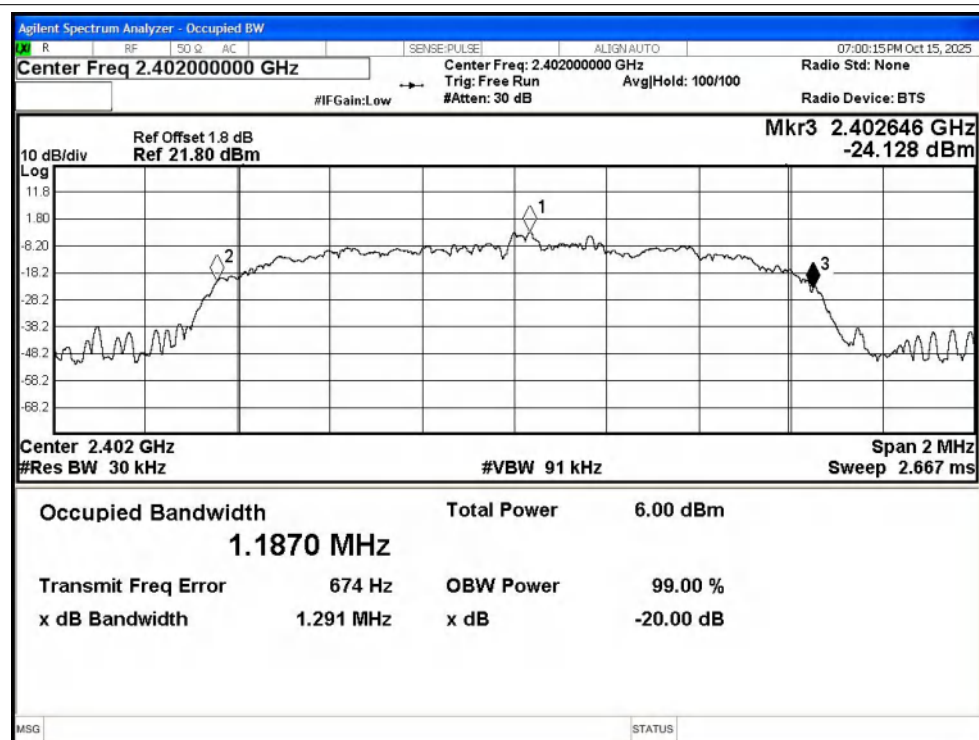
-20dB Bandwidth NVNT 2-DH5 2441MHz Ant1



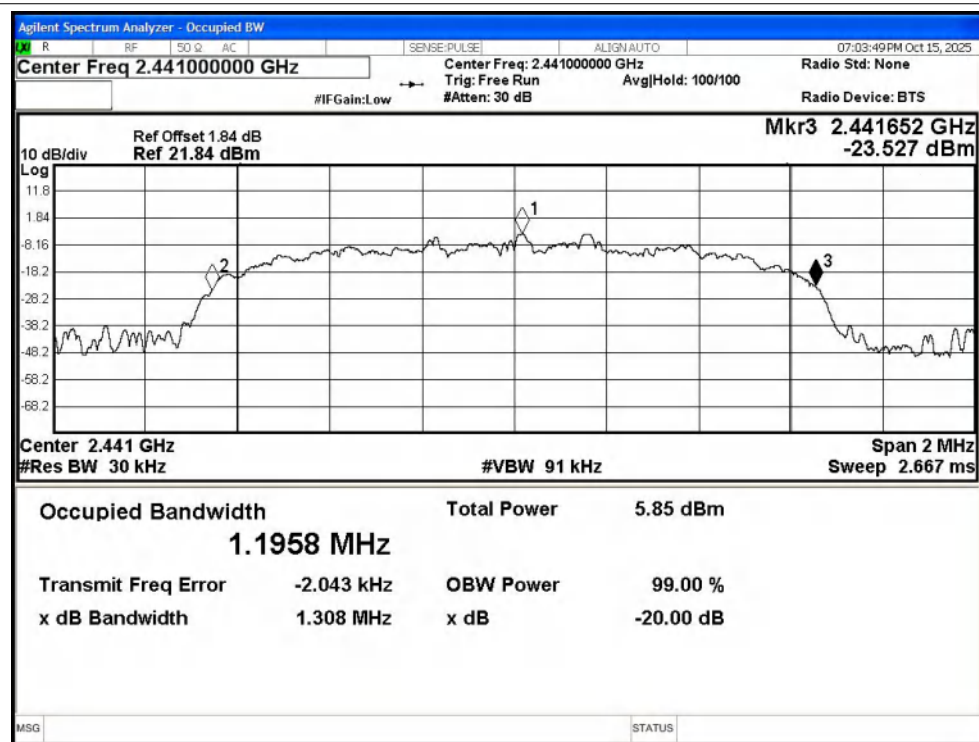
-20dB Bandwidth NVNT 2-DH5 2480MHz Ant1

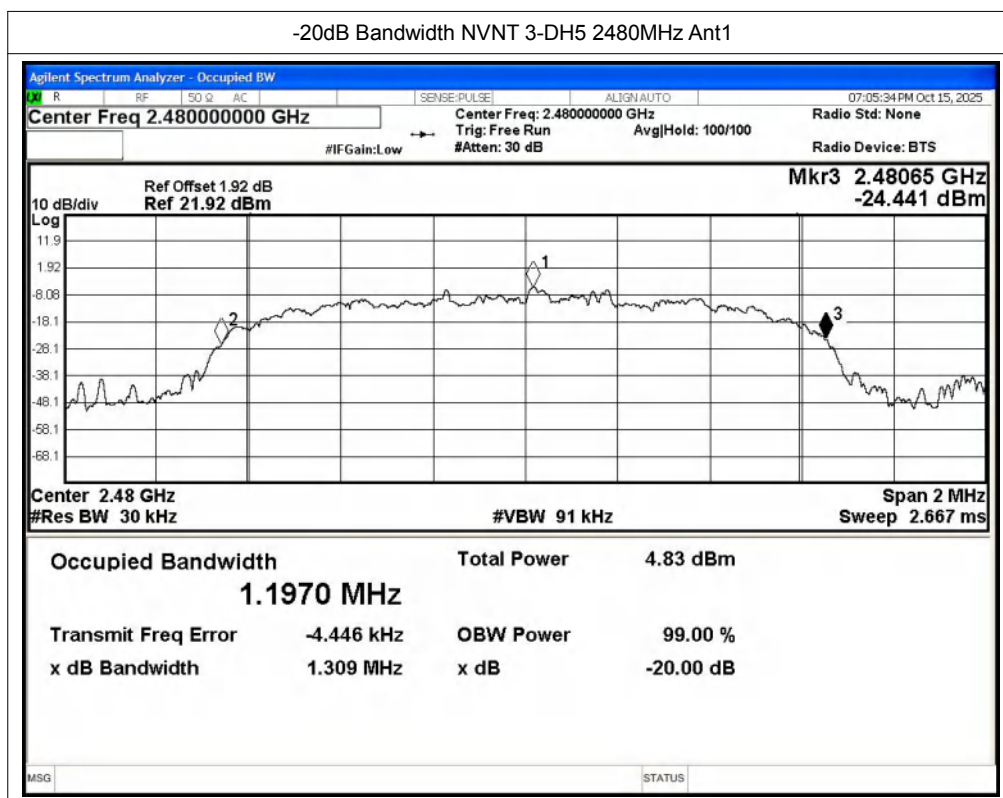


-20dB Bandwidth NVNT 3-DH5 2402MHz Ant1



-20dB Bandwidth NVNT 3-DH5 2441MHz Ant1



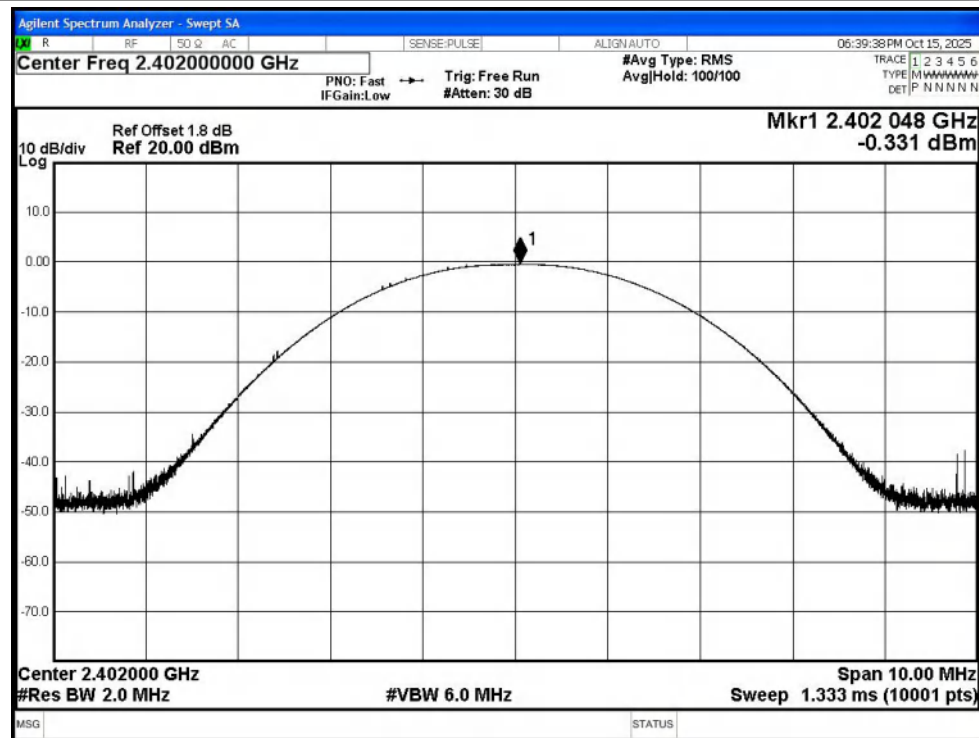


A.2 Maximum Peak Conducted Output Power

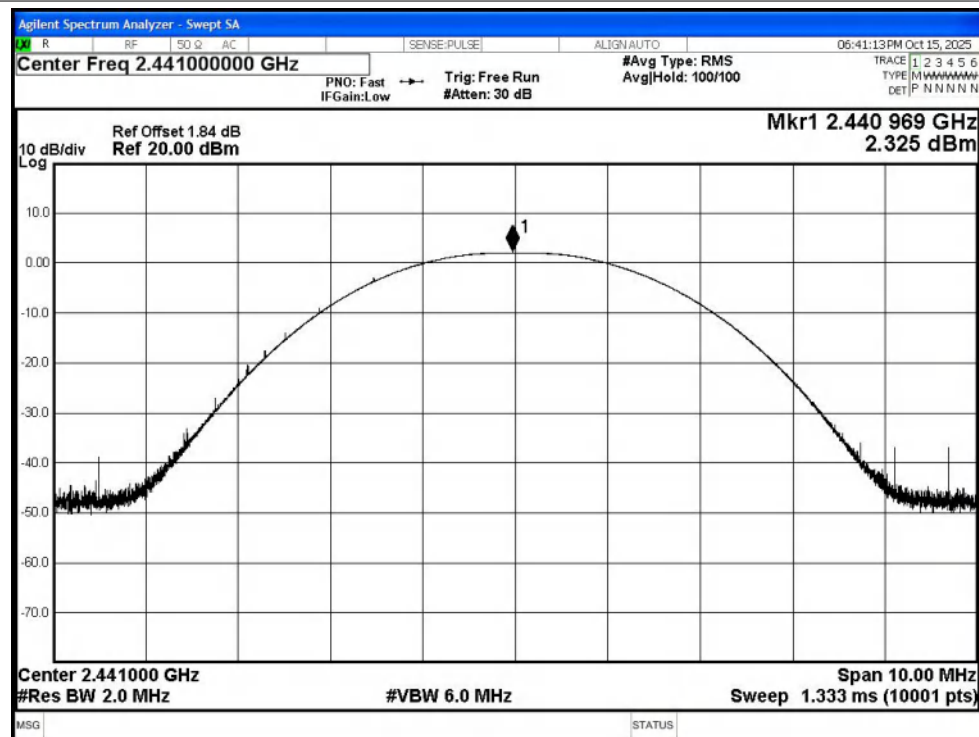
Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	1-DH5	2402	Ant1	-0.33	21	Pass
NVNT	1-DH5	2441	Ant1	2.33	21	Pass
NVNT	1-DH5	2480	Ant1	1.25	21	Pass
NVNT	2-DH5	2402	Ant1	1.59	21	Pass
NVNT	2-DH5	2441	Ant1	4.01	21	Pass
NVNT	2-DH5	2480	Ant1	2.89	21	Pass
NVNT	3-DH5	2402	Ant1	1.94	21	Pass
NVNT	3-DH5	2441	Ant1	1.97	21	Pass
NVNT	3-DH5	2480	Ant1	0.98	21	Pass

Test Graphs

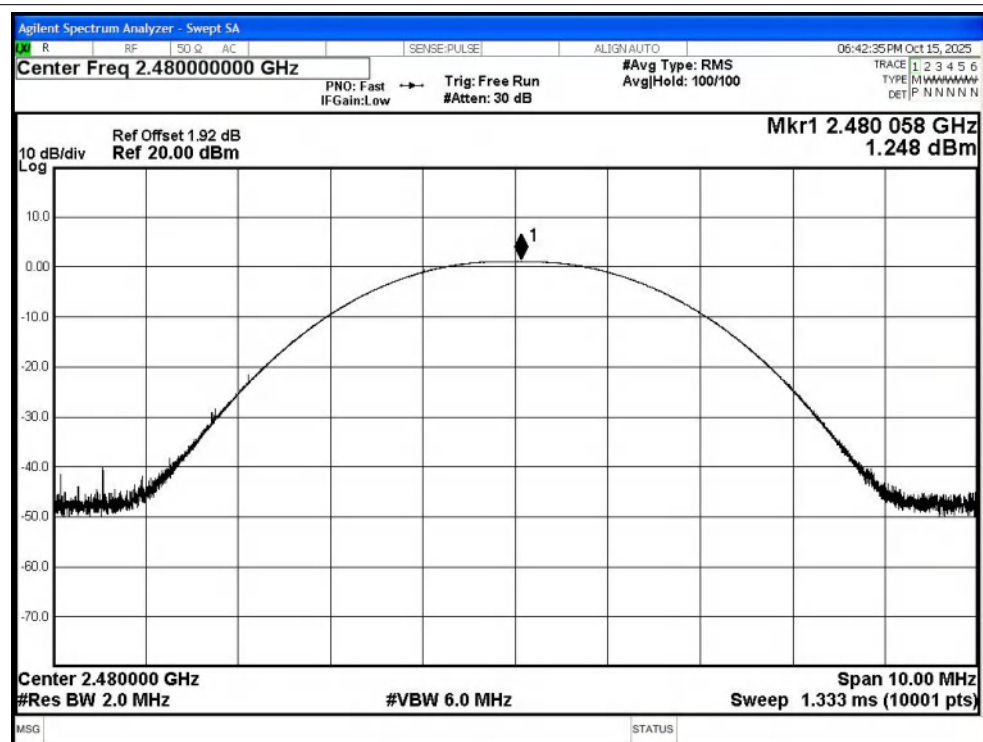
Power NVNT 1-DH5 2402MHz Ant1



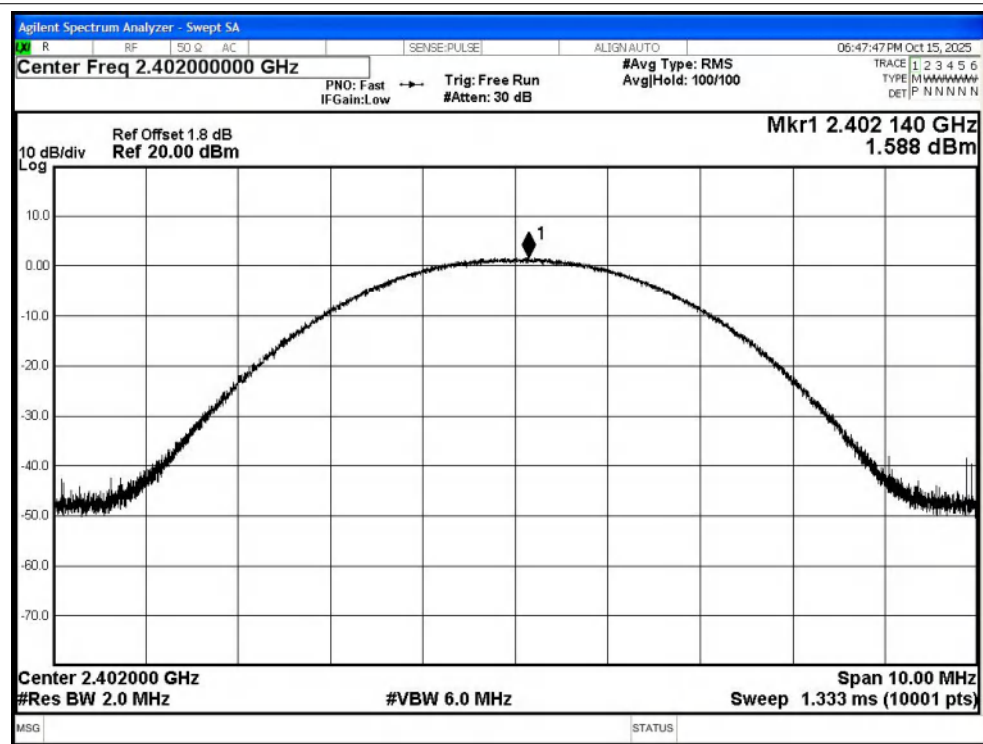
Power NVNT 1-DH5 2441MHz Ant1



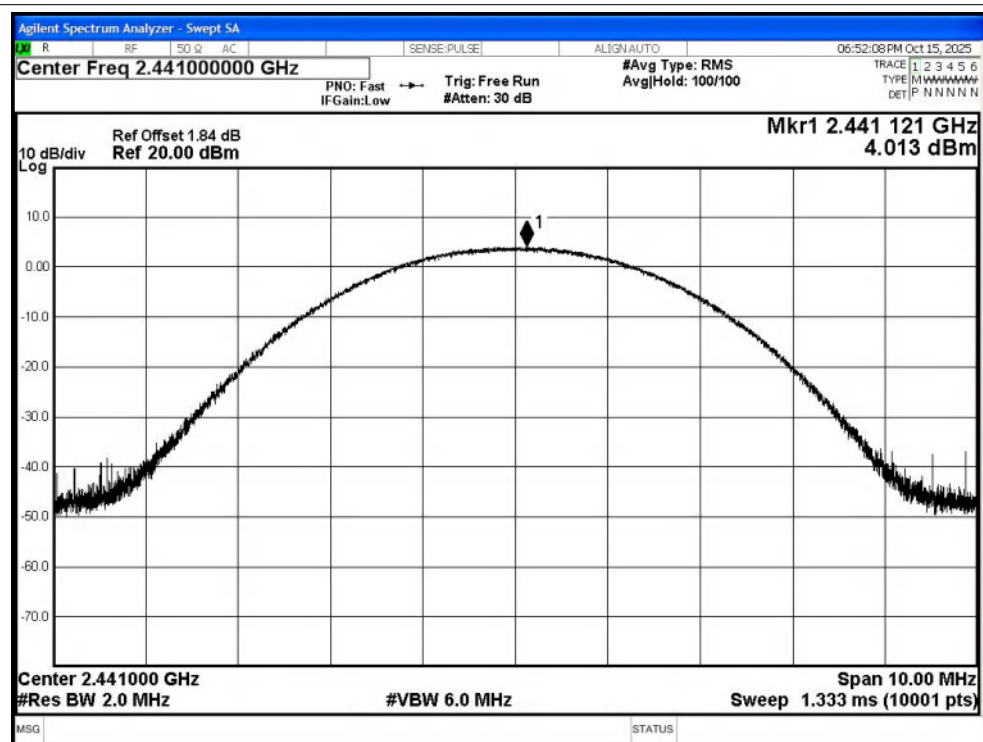
Power NVNT 1-DH5 2480MHz Ant1



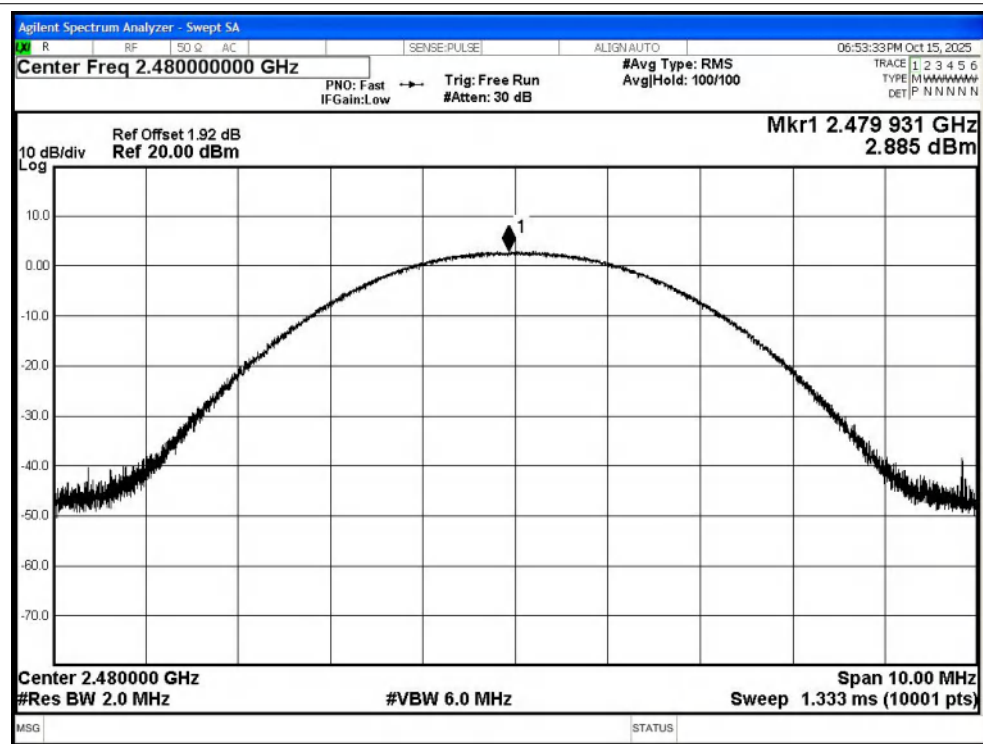
Power NVNT 2-DH5 2402MHz Ant1



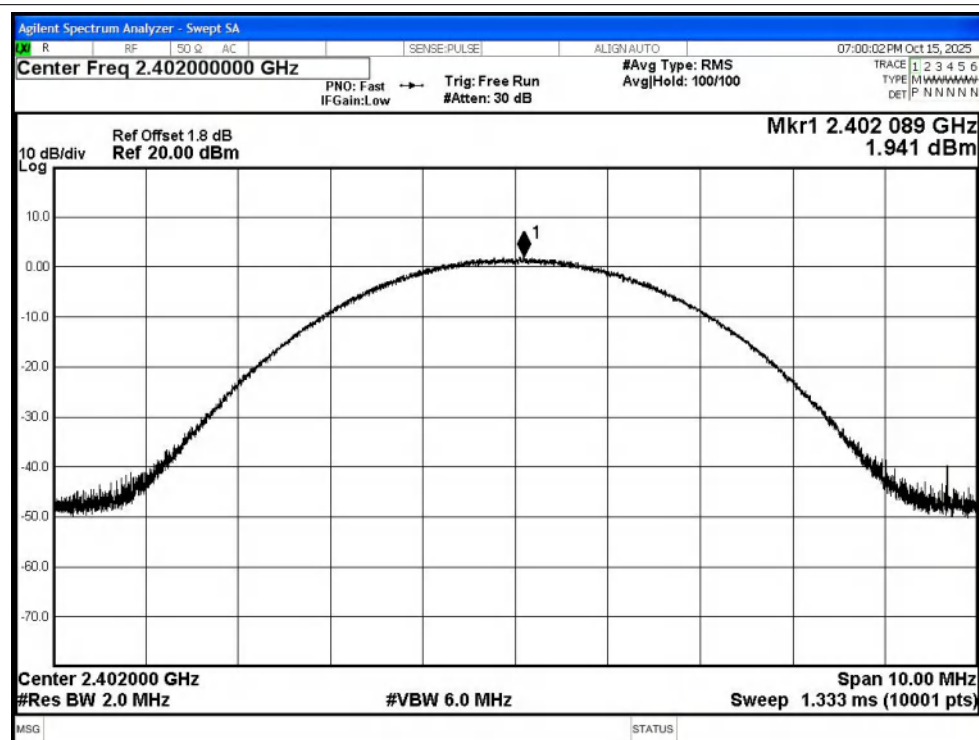
Power NVNT 2-DH5 2441MHz Ant1



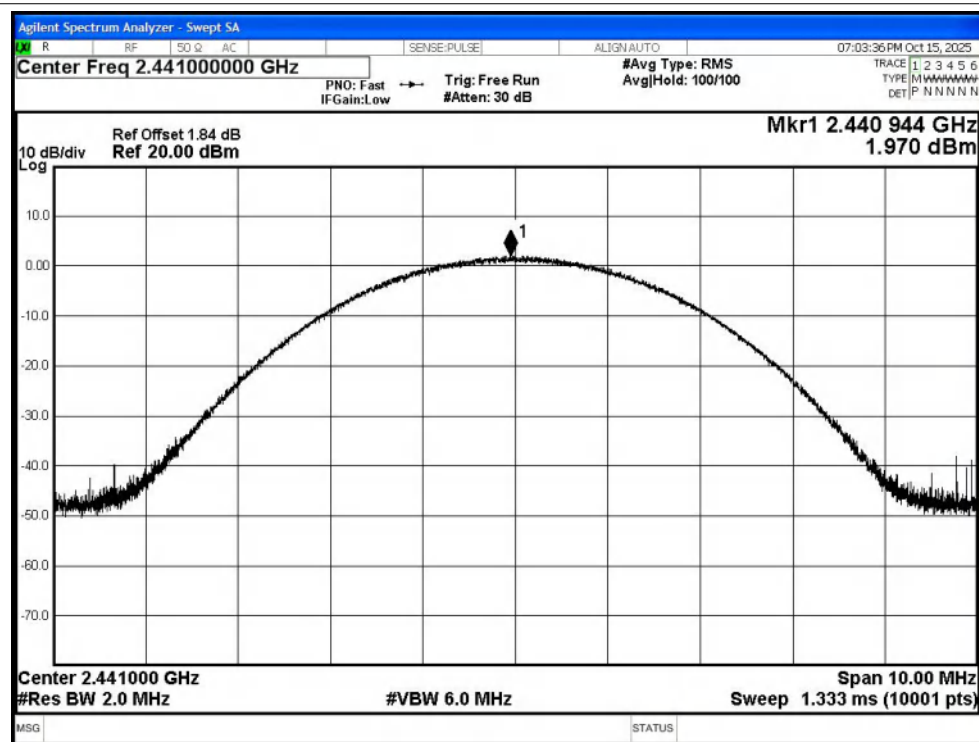
Power NVNT 2-DH5 2480MHz Ant1

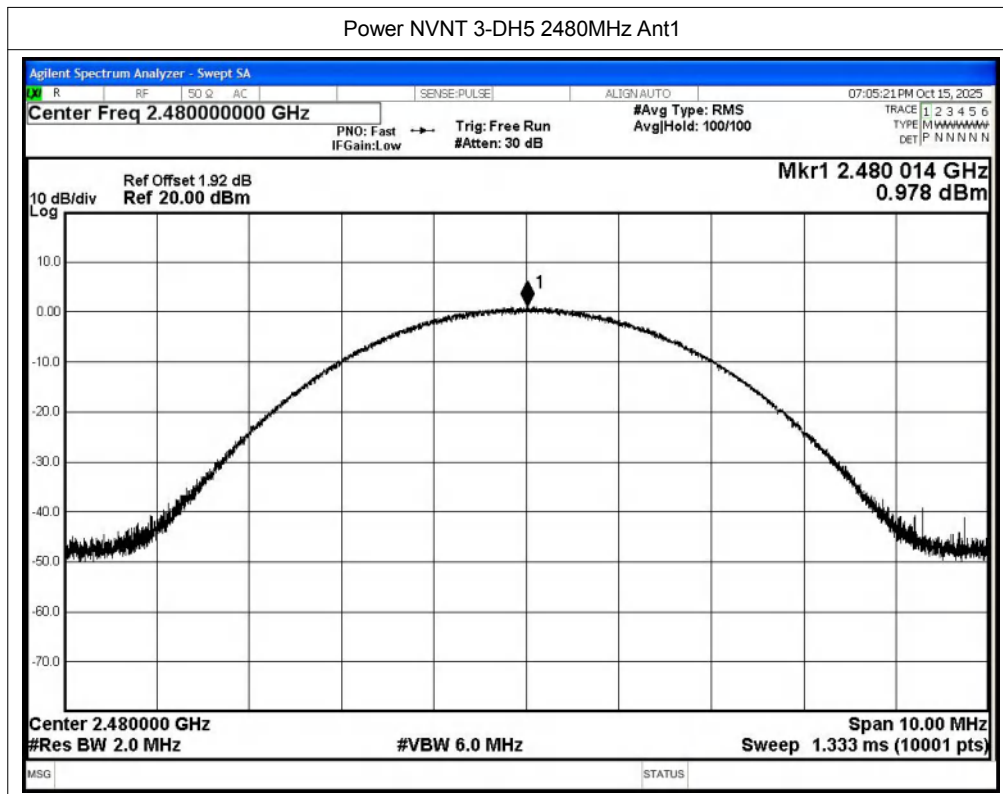


Power NVNT 3-DH5 2402MHz Ant1



Power NVNT 3-DH5 2441MHz Ant1



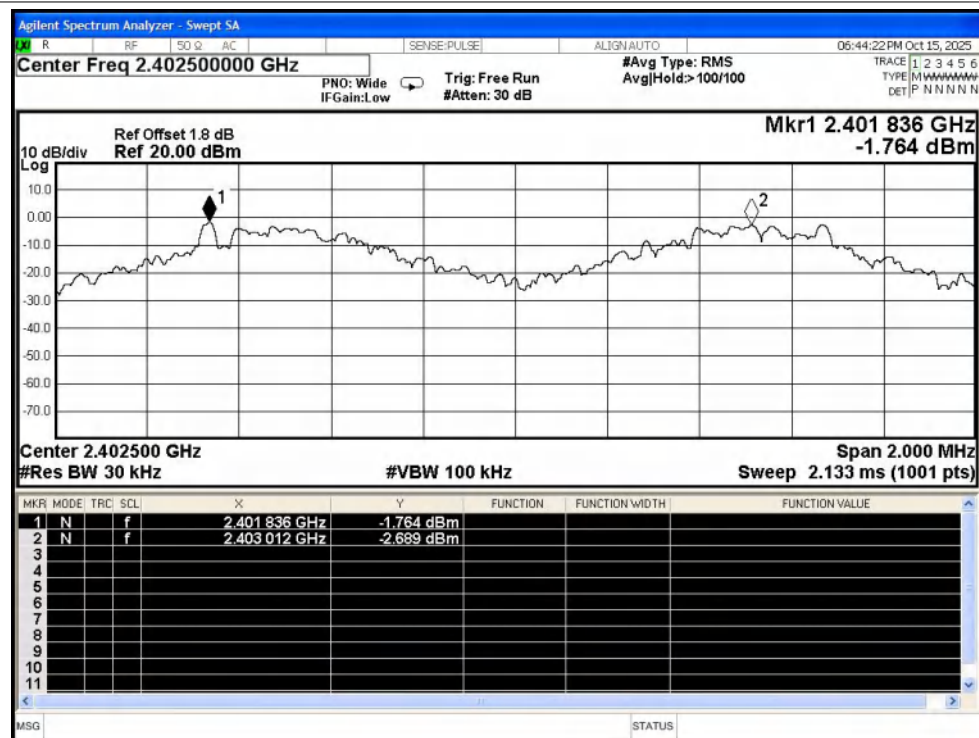


A.3 Carrier Frequencies Separation

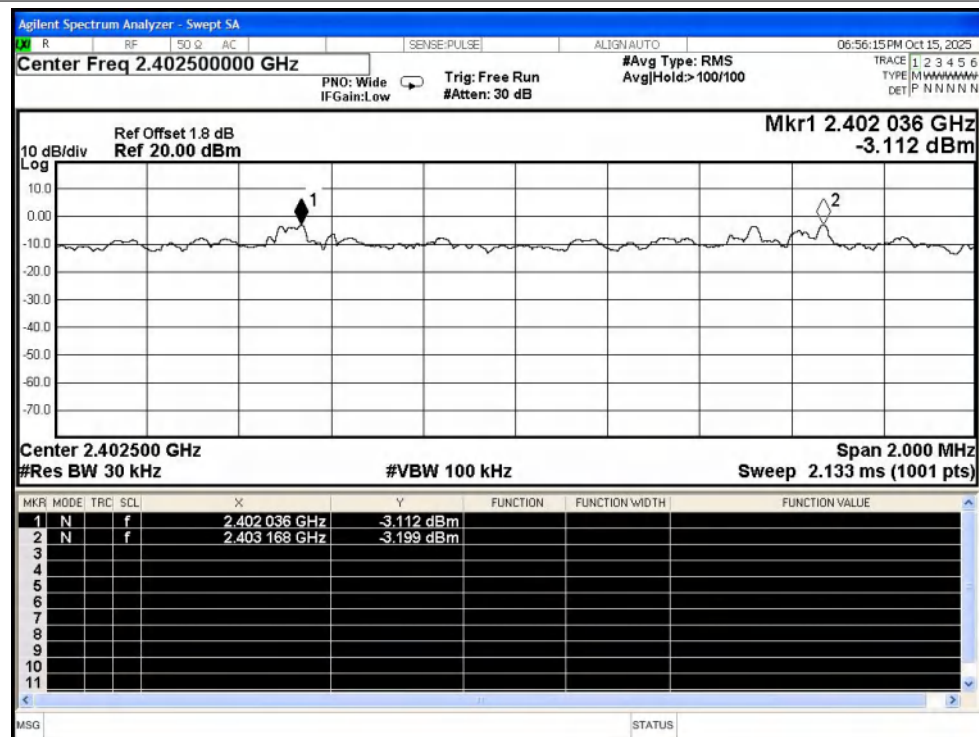
Condition	Mode	Antenna	Hopping Freq1 (MHz)	Hopping Freq2 (MHz)	HFS (MHz)	Limit (MHz)	Verdict
NVNT	1-DH5	Ant1	2401.836	2403.012	1.176	0.682	Pass
NVNT	2-DH5	Ant1	2402.036	2403.168	1.132	0.861	Pass
NVNT	3-DH5	Ant1	2402.16	2403.146	0.986	0.873	Pass

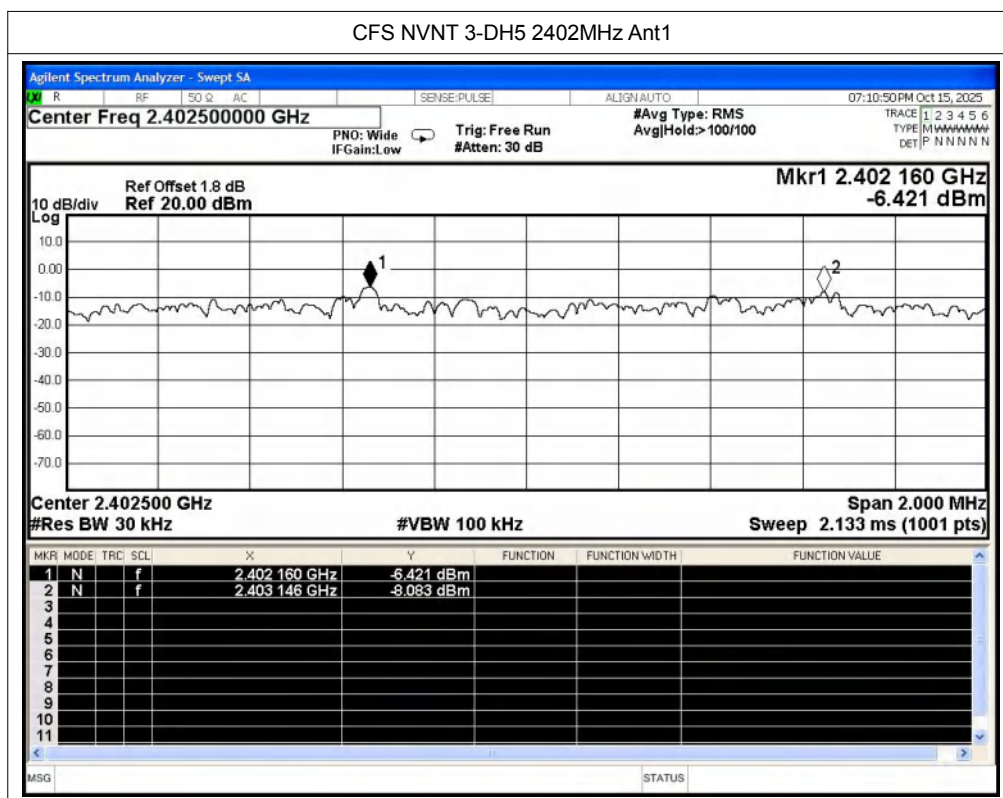
Test Graphs

CFS NVNT 1-DH5 2402MHz Ant1



CFS NVNT 2-DH5 2402MHz Ant1



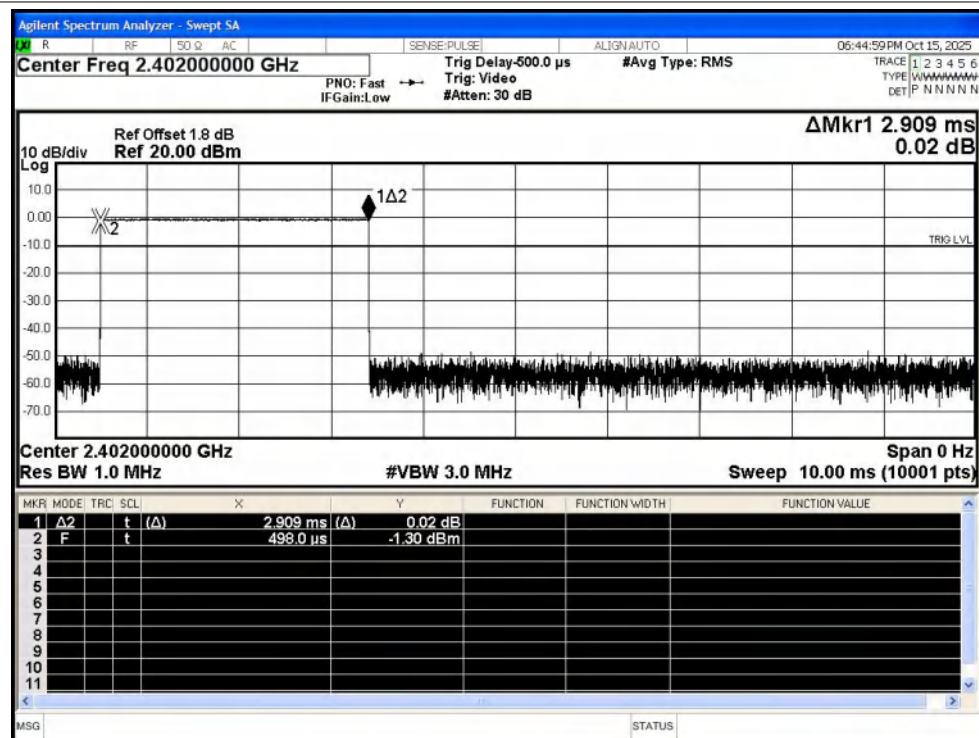


A.4 Dwell Time

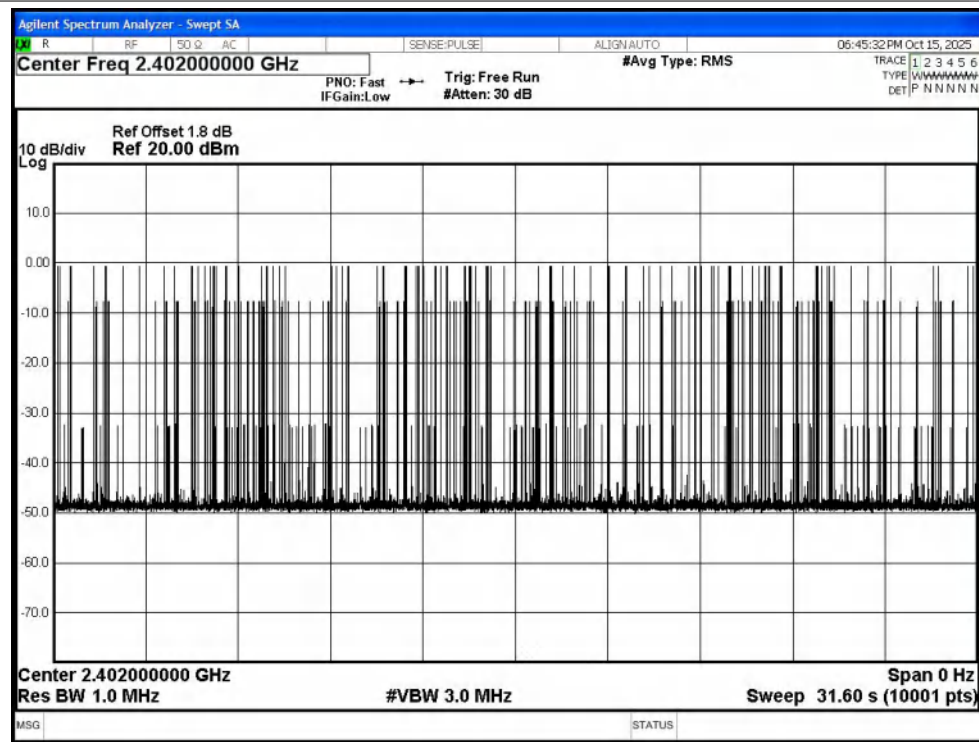
Condition	Mode	Frequency (MHz)	Antenna	Pulse Time (ms)	Total Dwell Time (ms)	Burst Count	Period Time (ms)	Limit (ms)	Verdict
NVNT	1-DH5	2402	Ant1	2.909	276.355	95	31600	400	Pass
NVNT	2-DH5	2402	Ant1	2.899	321.789	111	31600	400	Pass
NVNT	3-DH5	2402	Ant1	2.897	286.803	99	31600	400	Pass

Test Graphs

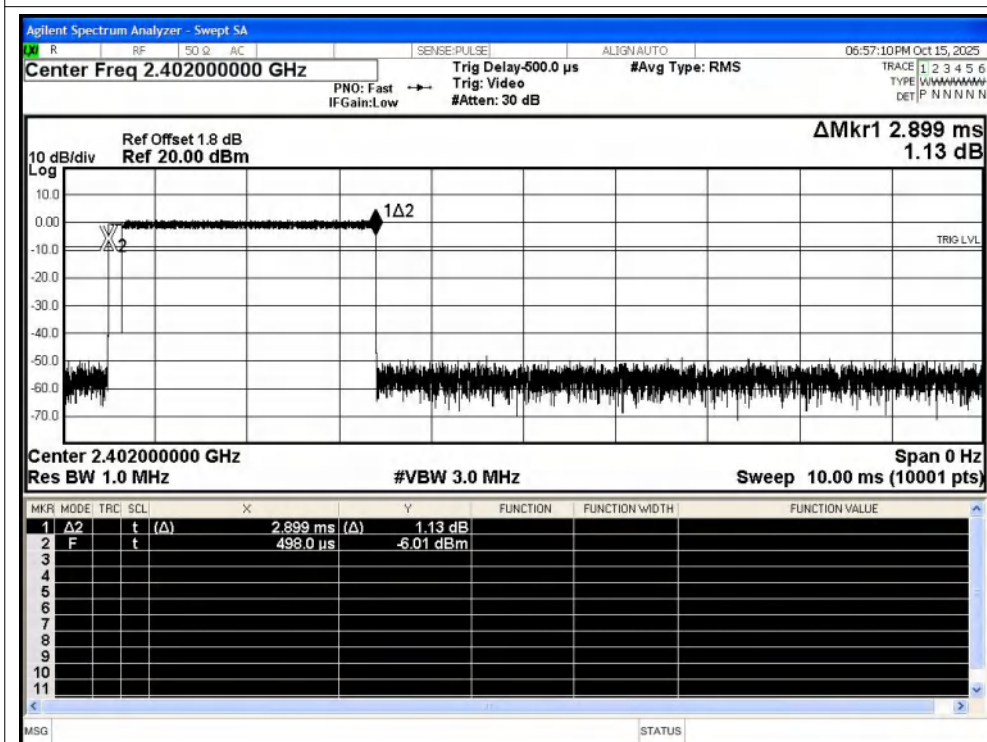
Dwell NVNT 1-DH5 2402MHz Ant1 One Burst



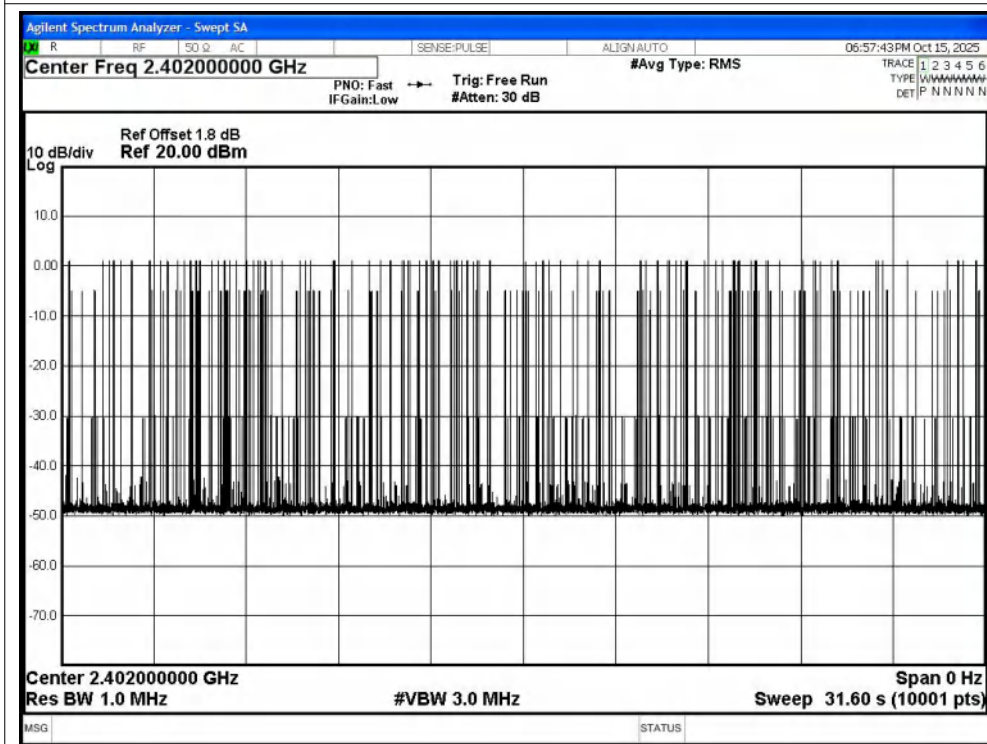
Dwell NVNT 1-DH5 2402MHz Ant1 Accumulated



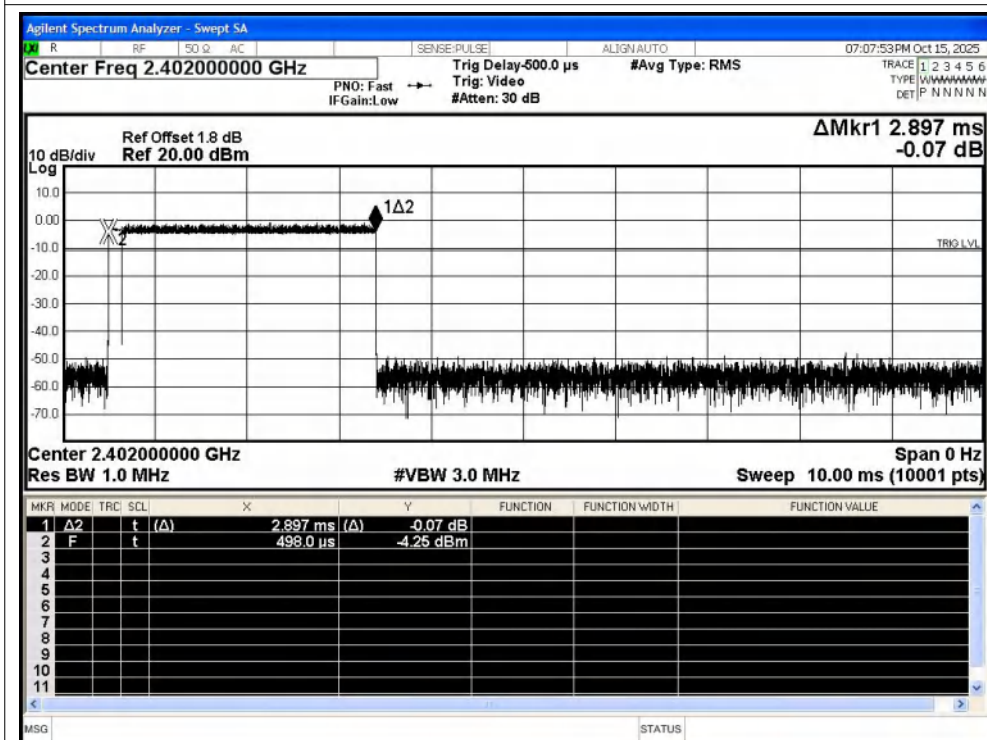
Dwell NVNT 2-DH5 2402MHz Ant1 One Burst



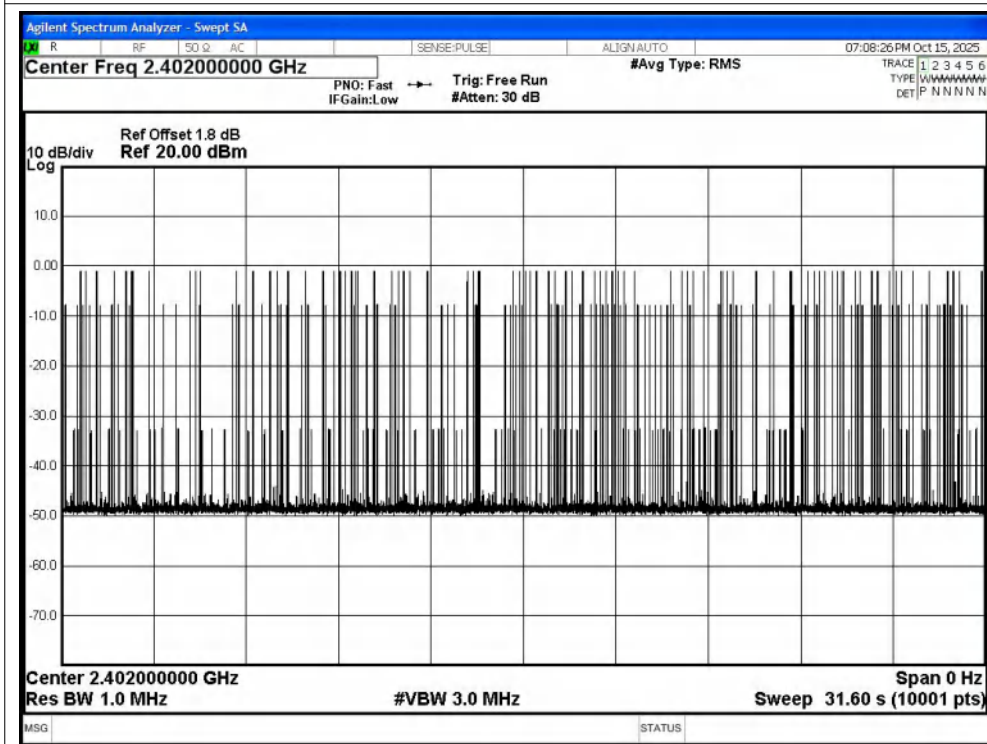
Dwell NVNT 2-DH5 2402MHz Ant1 Accumulated



Dwell NVNT 3-DH5 2402MHz Ant1 One Burst



Dwell NVNT 3-DH5 2402MHz Ant1 Accumulated

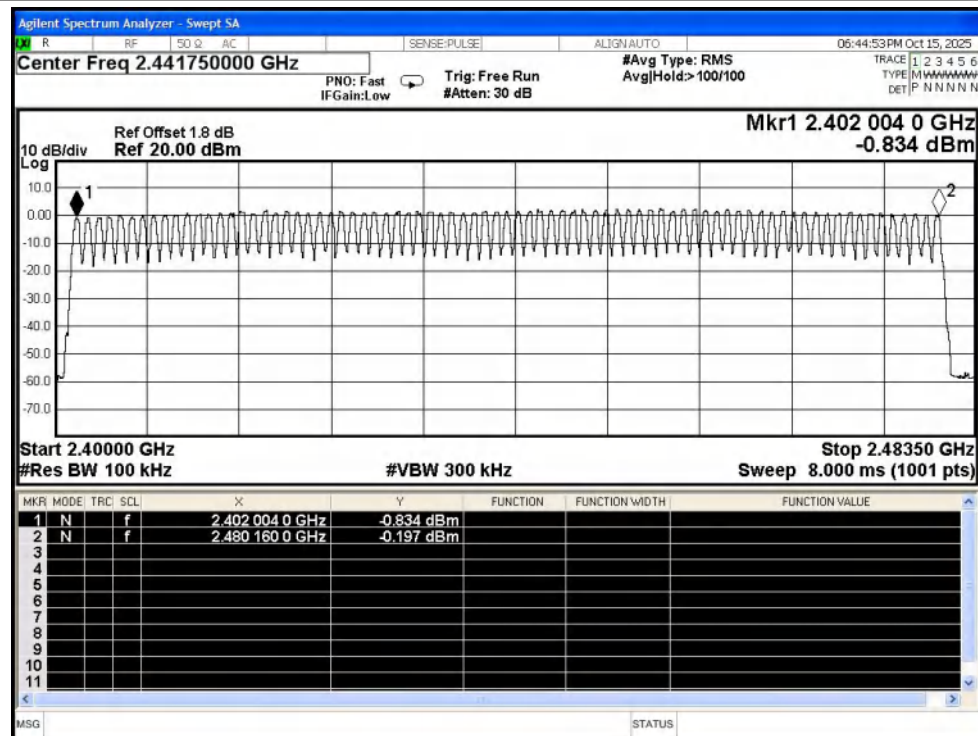


A.5 Number of Hopping Channel

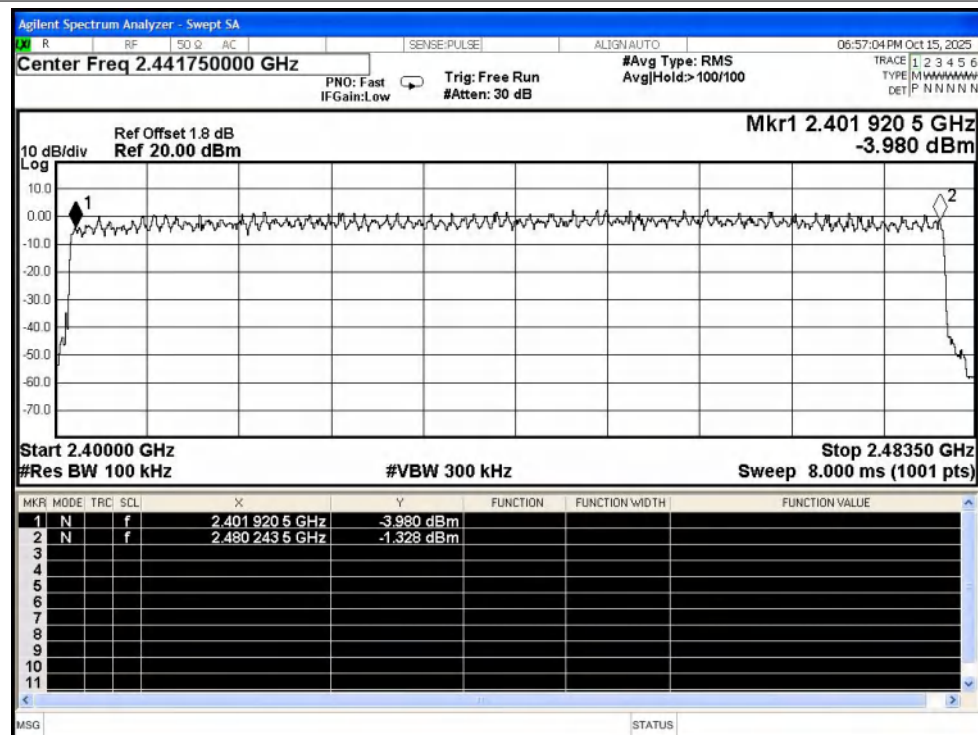
Condition	Mode	Antenna	Hopping Number	Limit	Verdict
NVNT	1-DH5	Ant1	79	15	Pass
NVNT	2-DH5	Ant1	79	15	Pass
NVNT	3-DH5	Ant1	79	15	Pass

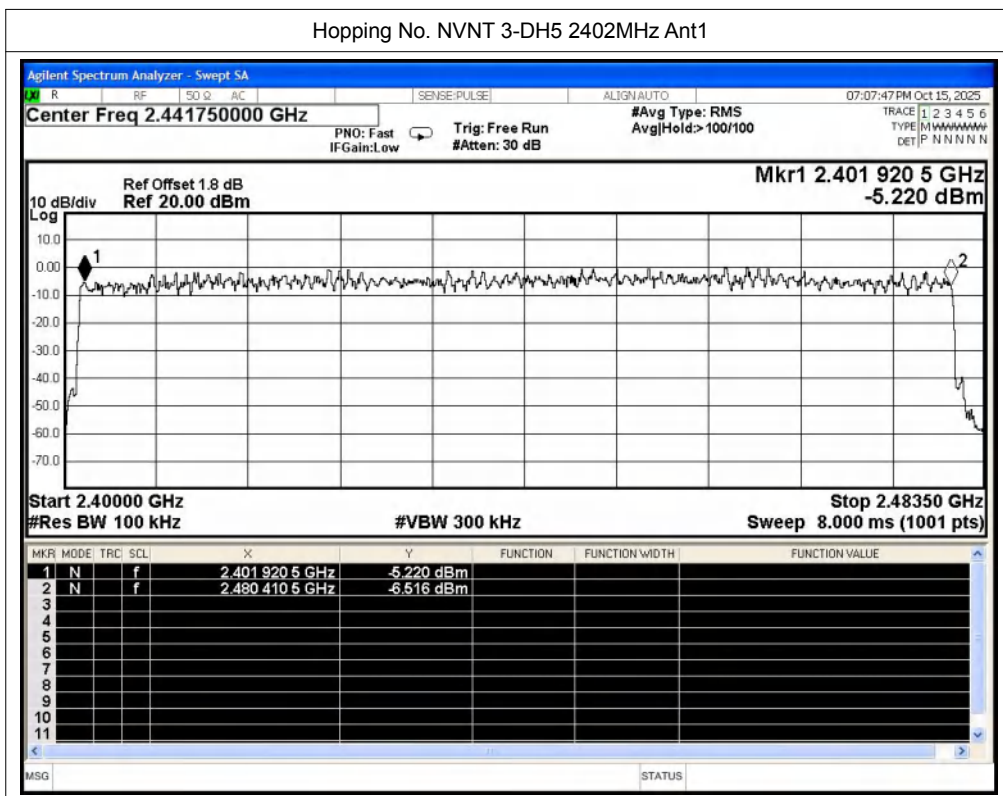
Test Graphs

Hopping No. NVNT 1-DH5 2402MHz Ant1



Hopping No. NVNT 2-DH5 2402MHz Ant1



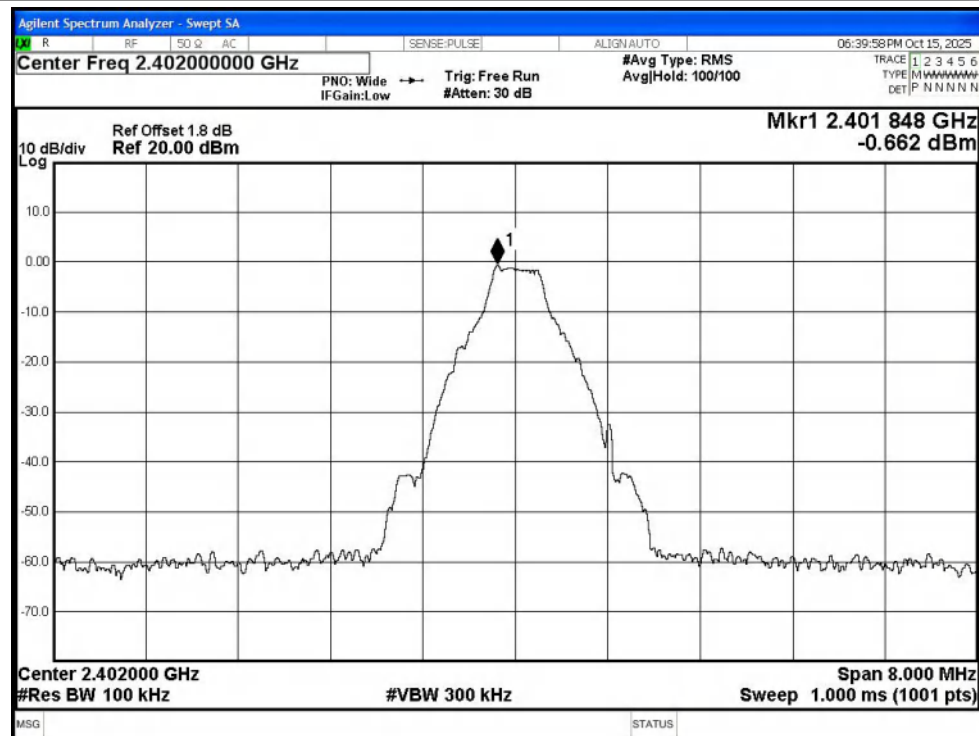


A.6 Band Edge

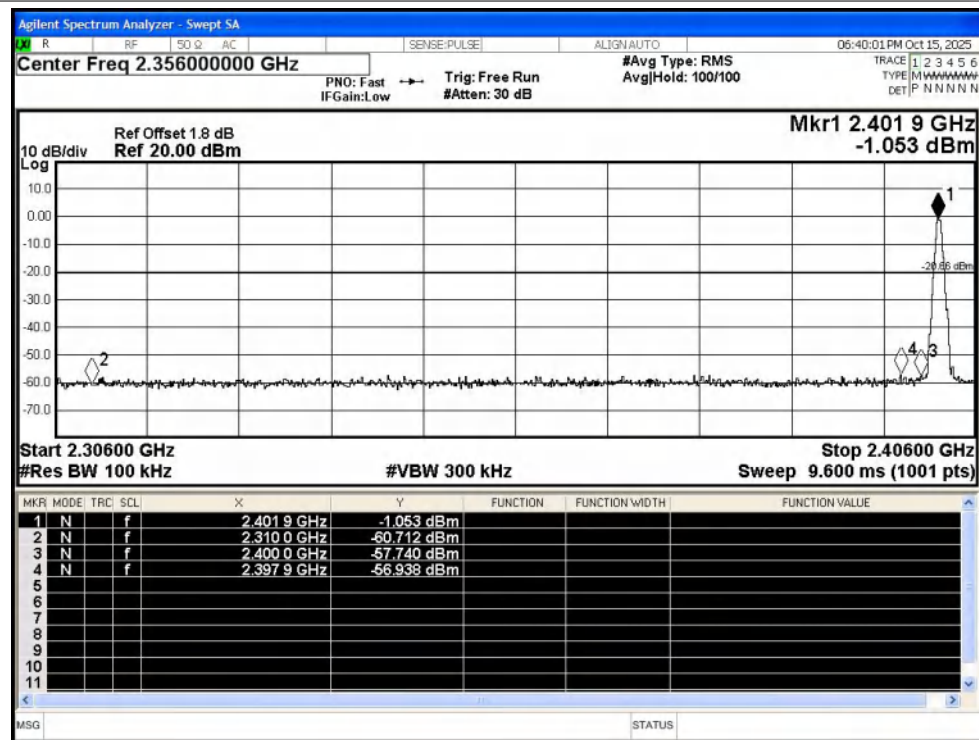
Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH5	2402	Ant1	No-Hopping	-56.28	-20	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	-58.45	-20	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	-50.82	-20	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	-57.79	-20	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	-48.72	-20	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	-55.23	-20	Pass

Test Graphs

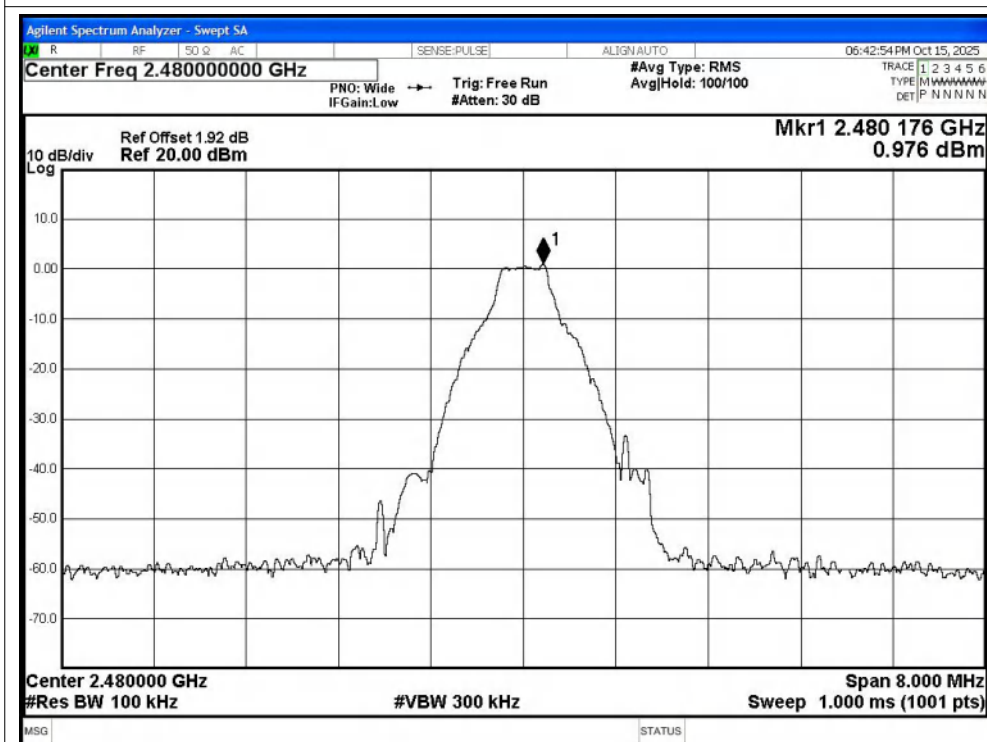
Band Edge NVNT 1-DH5 2402MHz Ant1 No-Hopping Ref



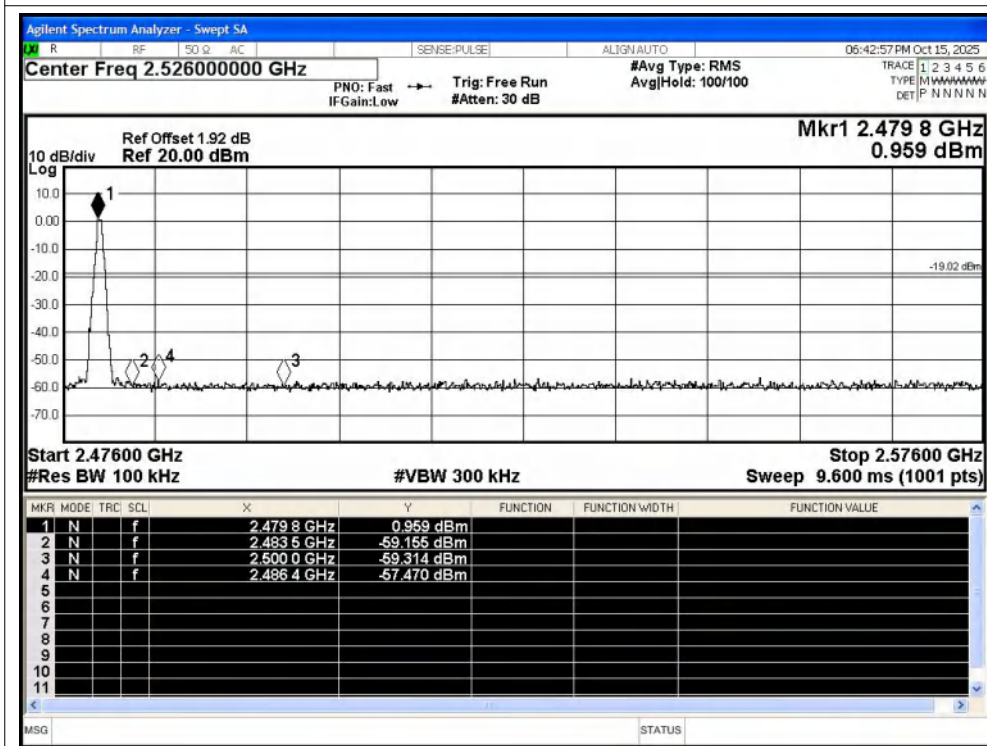
Band Edge NVNT 1-DH5 2402MHz Ant1 No-Hopping Emission



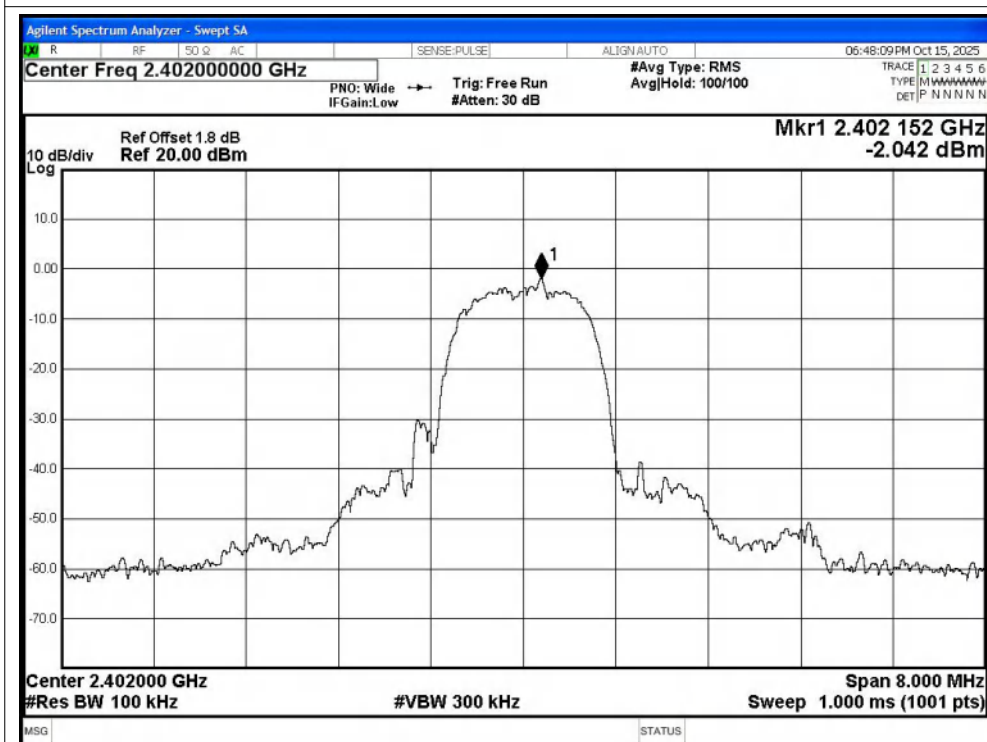
Band Edge NVNT 1-DH5 2480MHz Ant1 No-Hopping Ref



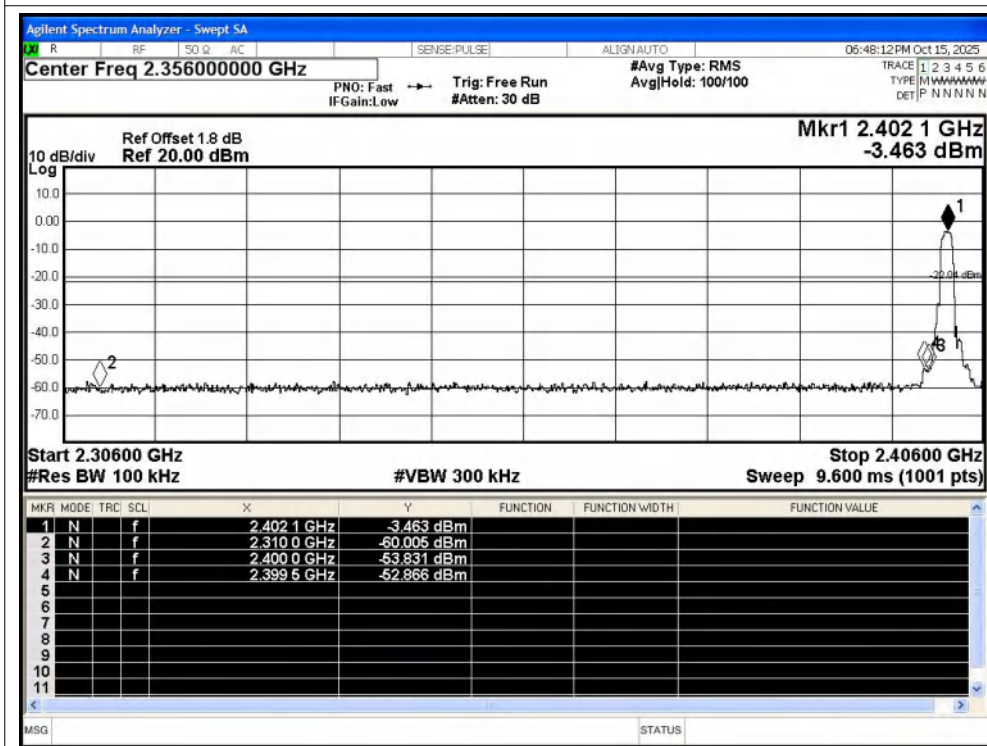
Band Edge NVNT 1-DH5 2480MHz Ant1 No-Hopping Emission



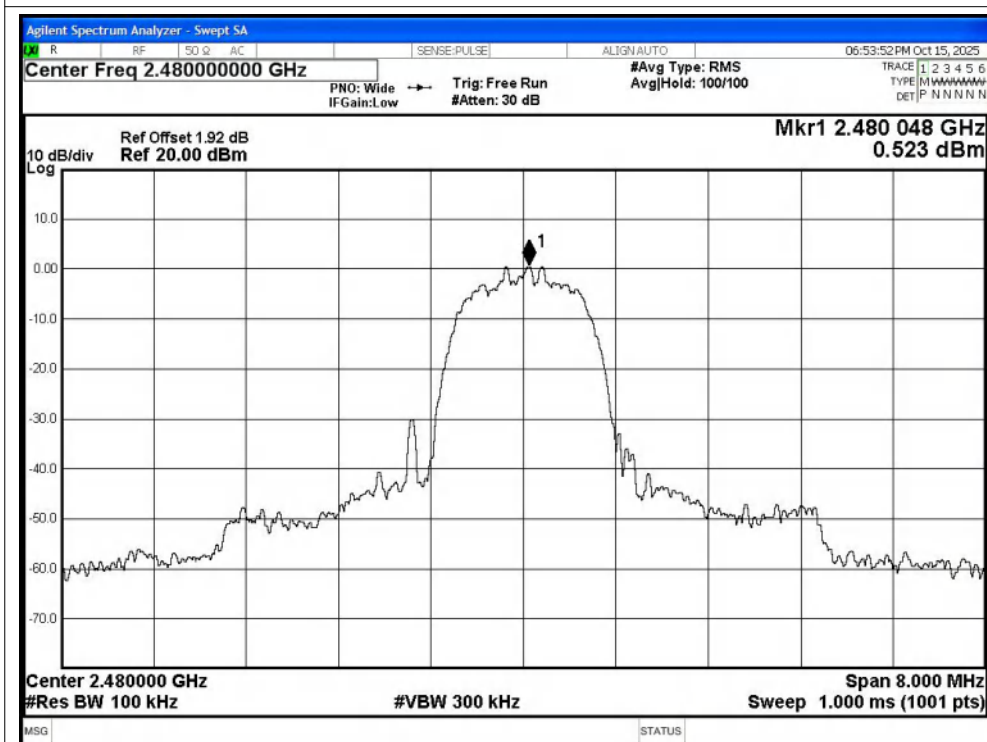
Band Edge NVNT 2-DH5 2402MHz Ant1 No-Hopping Ref



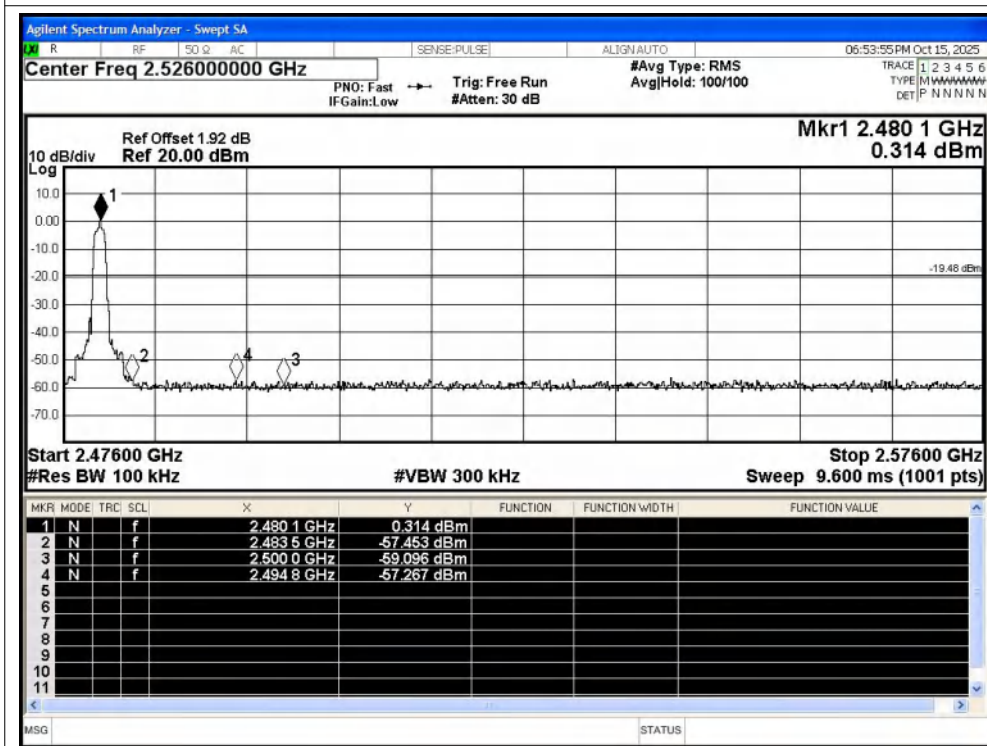
Band Edge NVNT 2-DH5 2402MHz Ant1 No-Hopping Emission



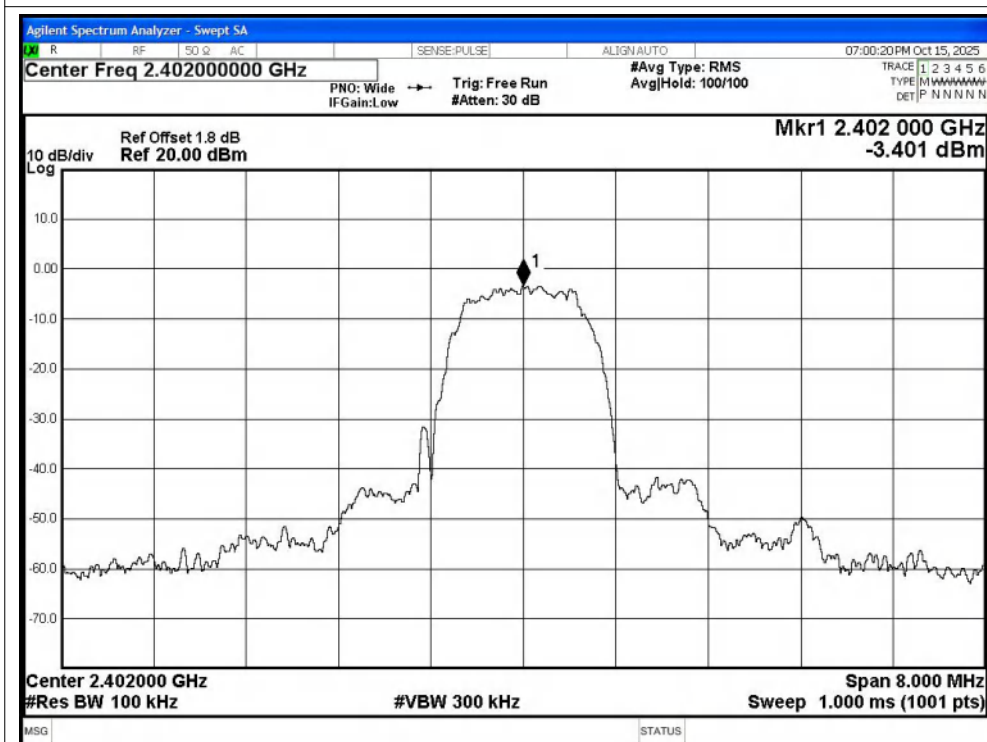
Band Edge NVNT 2-DH5 2480MHz Ant1 No-Hopping Ref



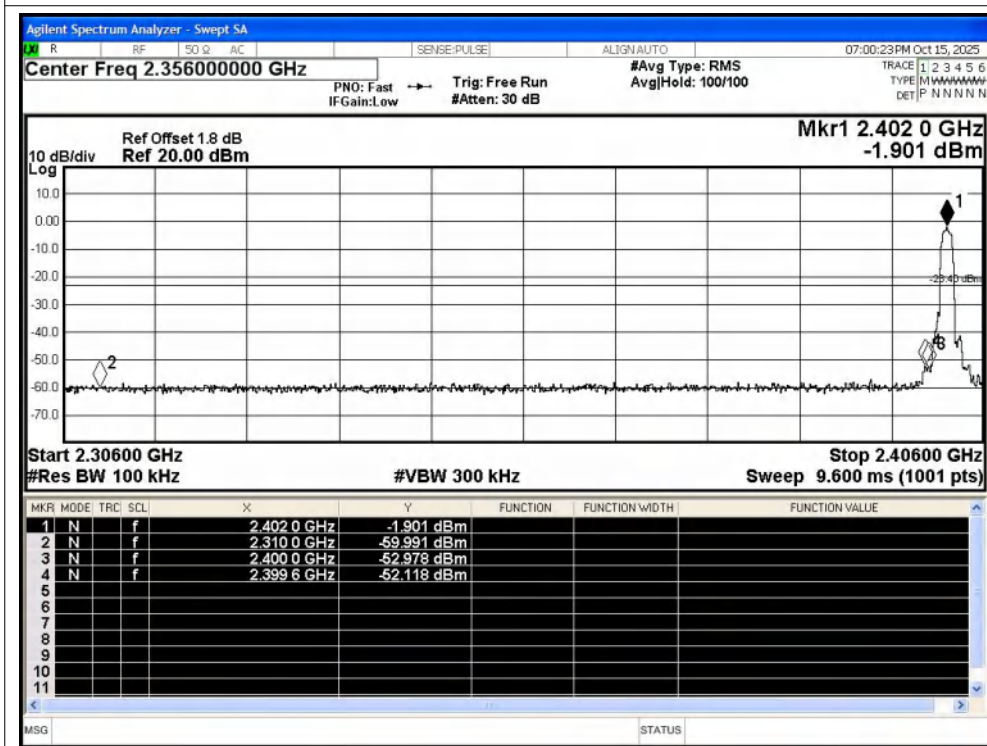
Band Edge NVNT 2-DH5 2480MHz Ant1 No-Hopping Emission



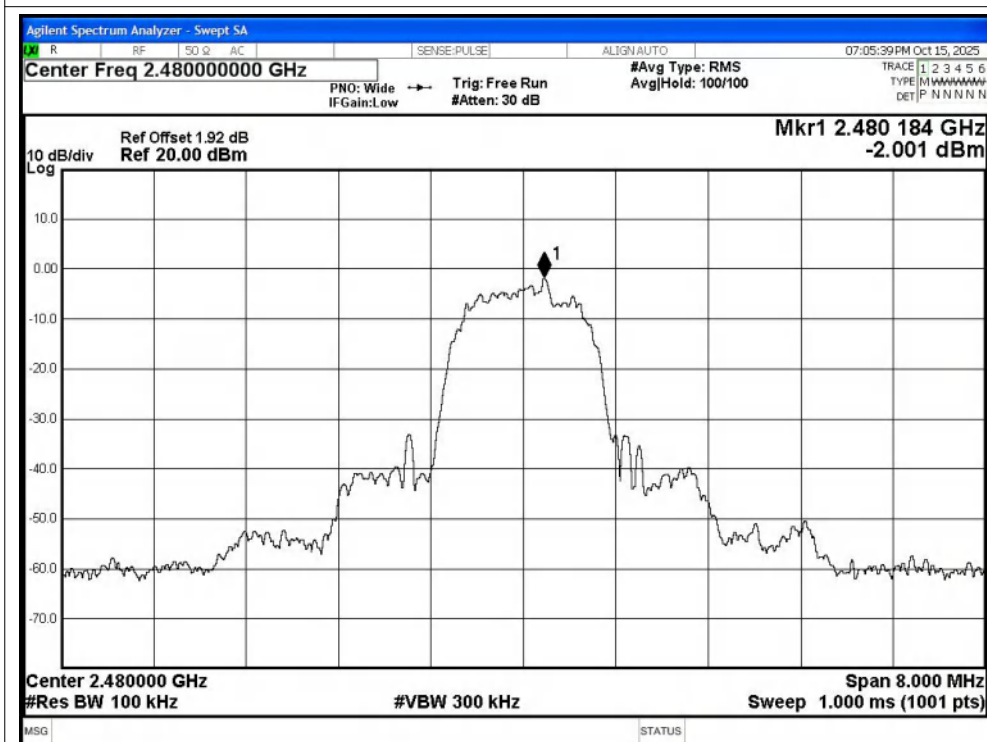
Band Edge NVNT 3-DH5 2402MHz Ant1 No-Hopping Ref



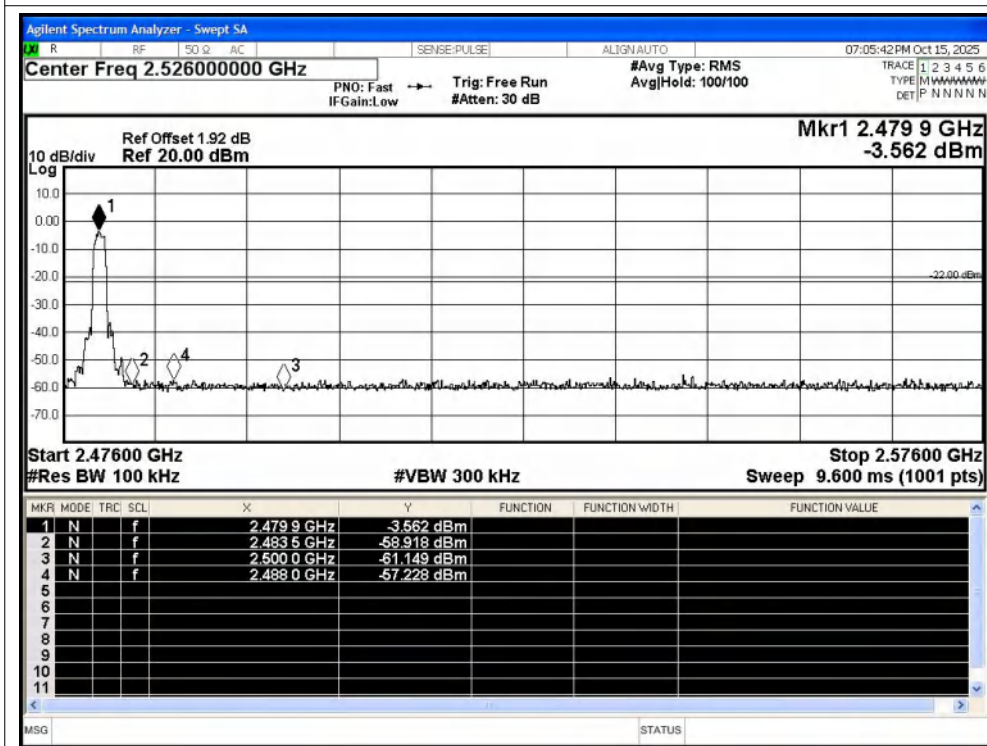
Band Edge NVNT 3-DH5 2402MHz Ant1 No-Hopping Emission



Band Edge NVNT 3-DH5 2480MHz Ant1 No-Hopping Ref



Band Edge NVNT 3-DH5 2480MHz Ant1 No-Hopping Emission

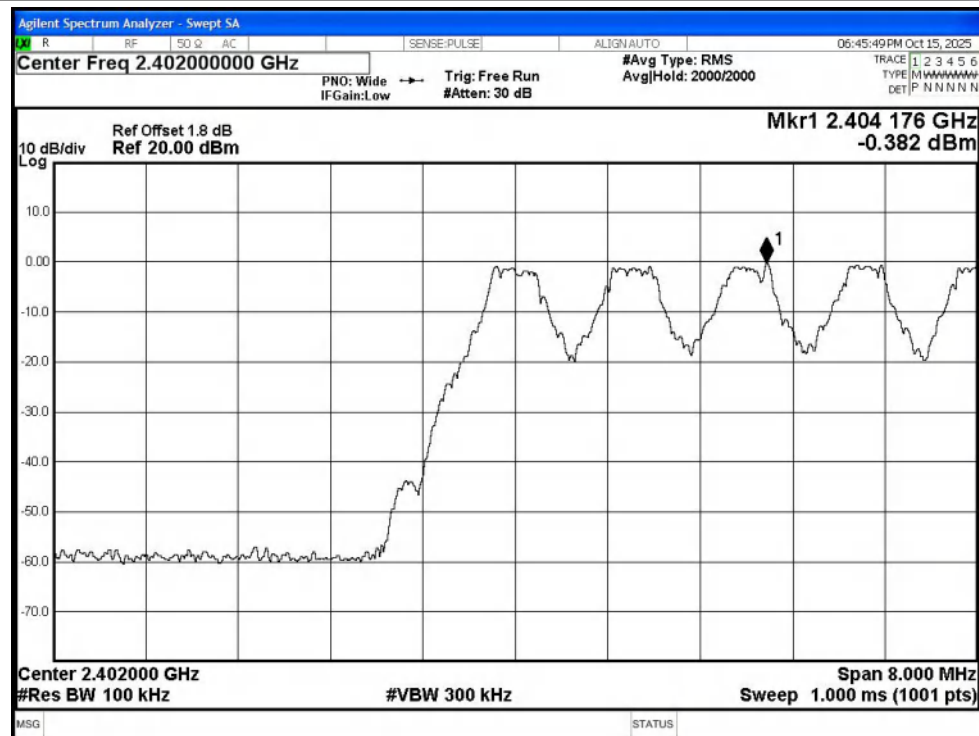


(Hopping)

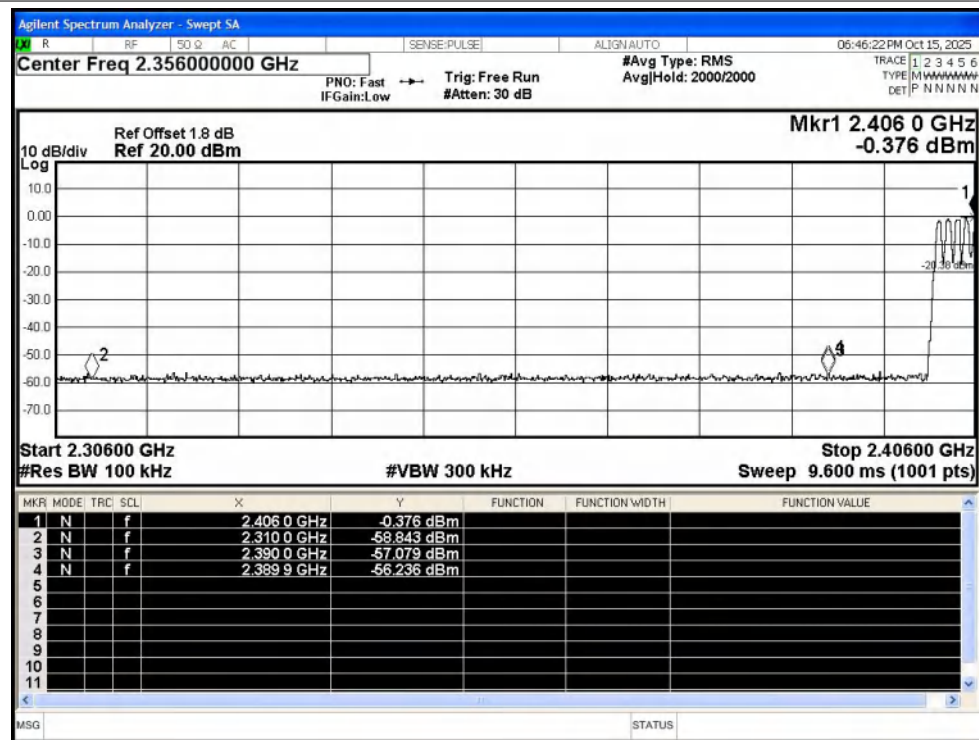
Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH5	2402	Ant1	Hopping	-55.85	-20	Pass
NVNT	1-DH5	2480	Ant1	Hopping	-57.55	-20	Pass
NVNT	2-DH5	2402	Ant1	Hopping	-55.21	-20	Pass
NVNT	2-DH5	2480	Ant1	Hopping	-56.21	-20	Pass
NVNT	3-DH5	2402	Ant1	Hopping	-52.03	-20	Pass
NVNT	3-DH5	2480	Ant1	Hopping	-53.73	-20	Pass

Test Graphs

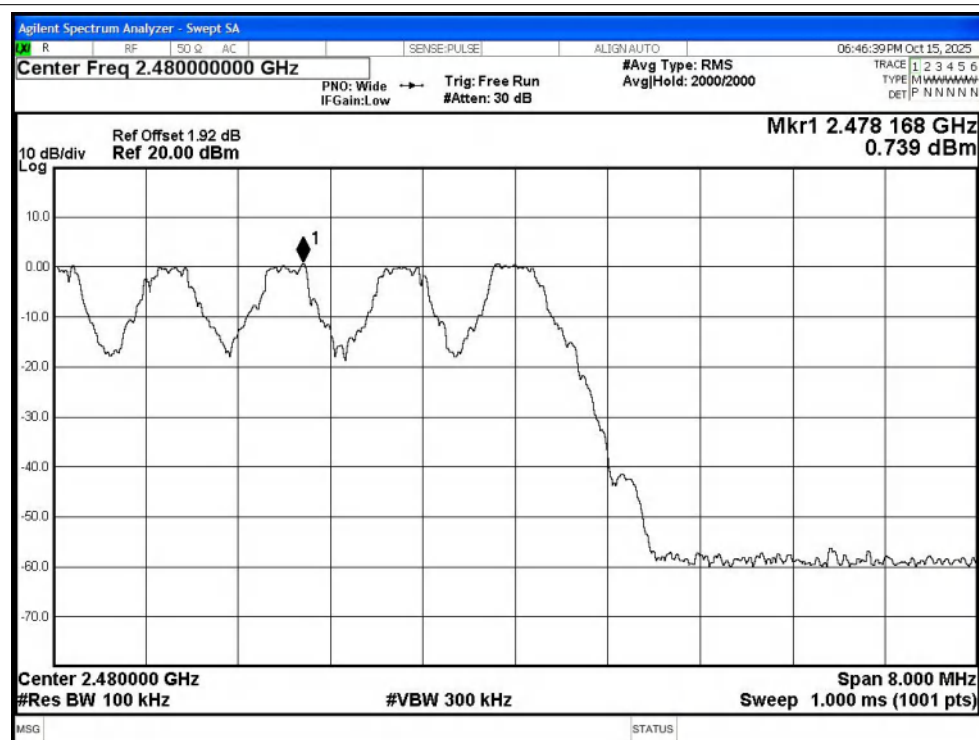
Band Edge(Hopping) NVNT 1-DH5 2402MHz Ant1 Hopping Ref



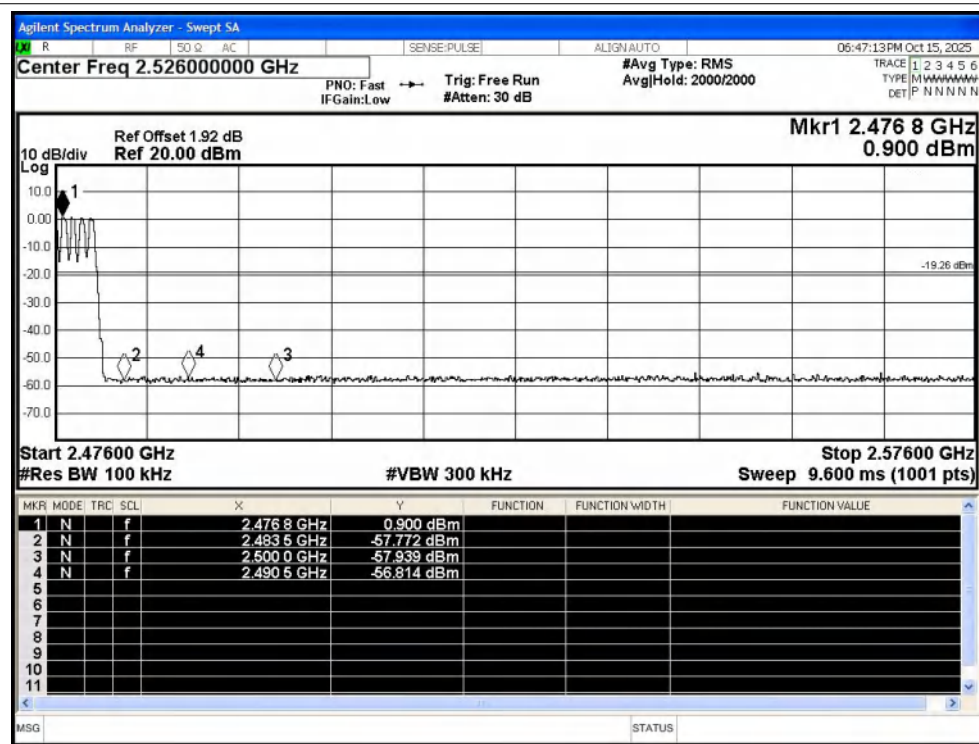
Band Edge(Hopping) NVNT 1-DH5 2402MHz Ant1 Hopping Emission



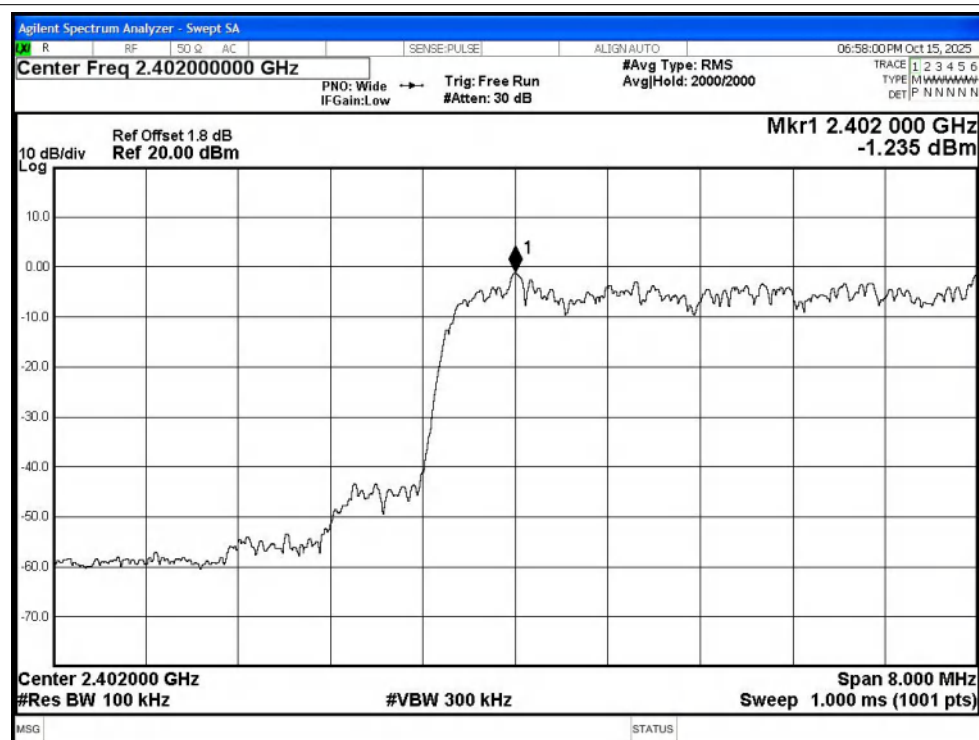
Band Edge(Hopping) NVNT 1-DH5 2480MHz Ant1 Hopping Ref



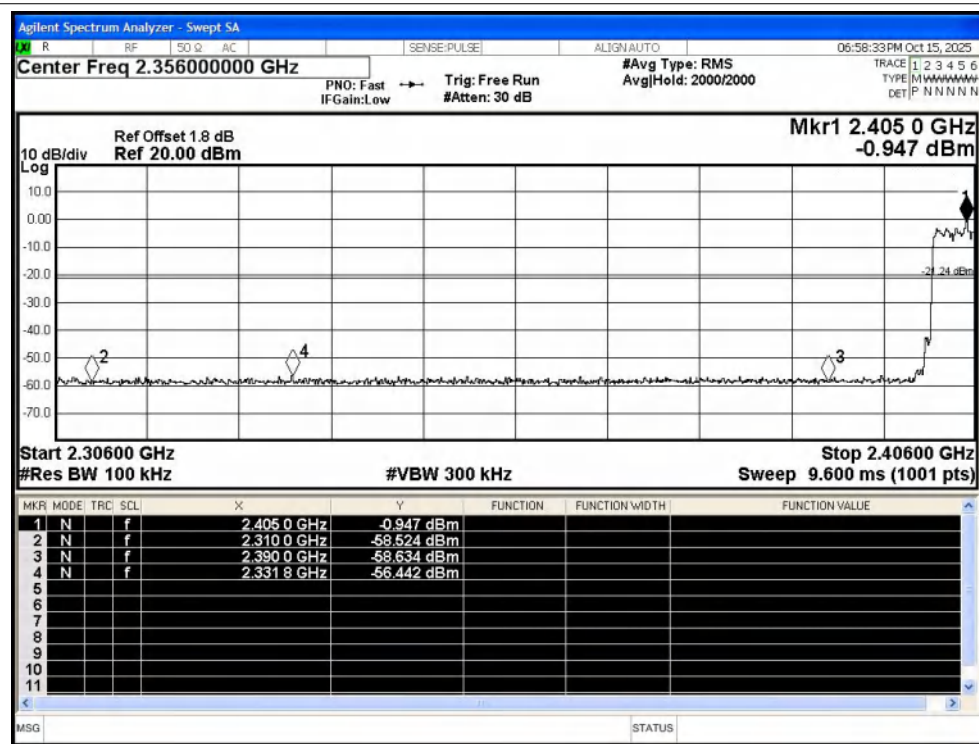
Band Edge(Hopping) NVNT 1-DH5 2480MHz Ant1 Hopping Emission



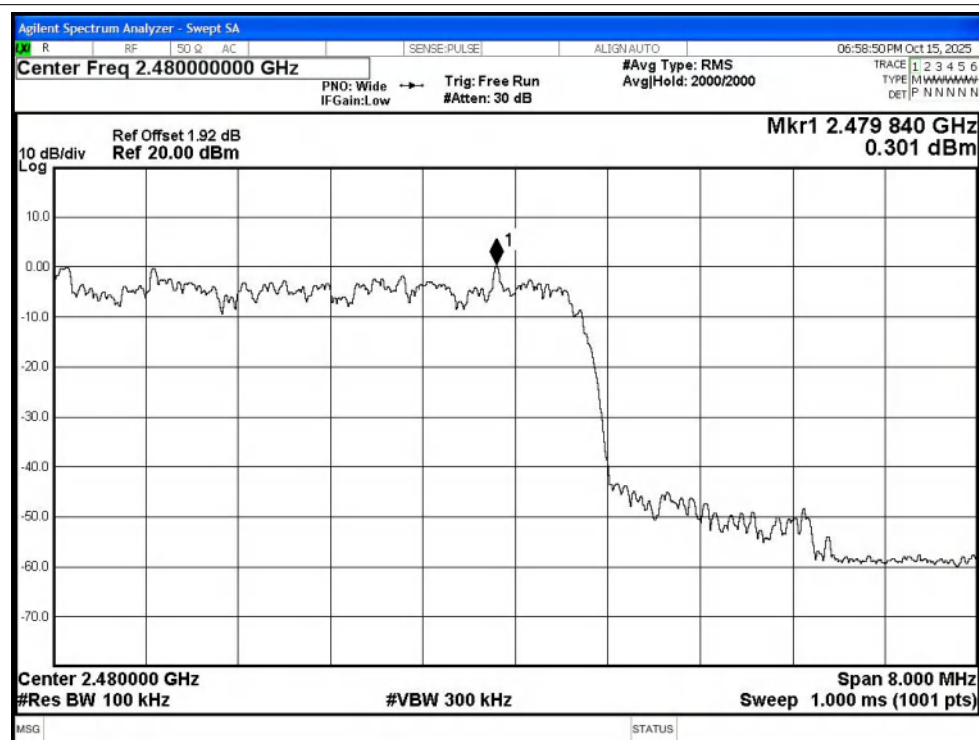
Band Edge(Hopping) NVNT 2-DH5 2402MHz Ant1 Hopping Ref



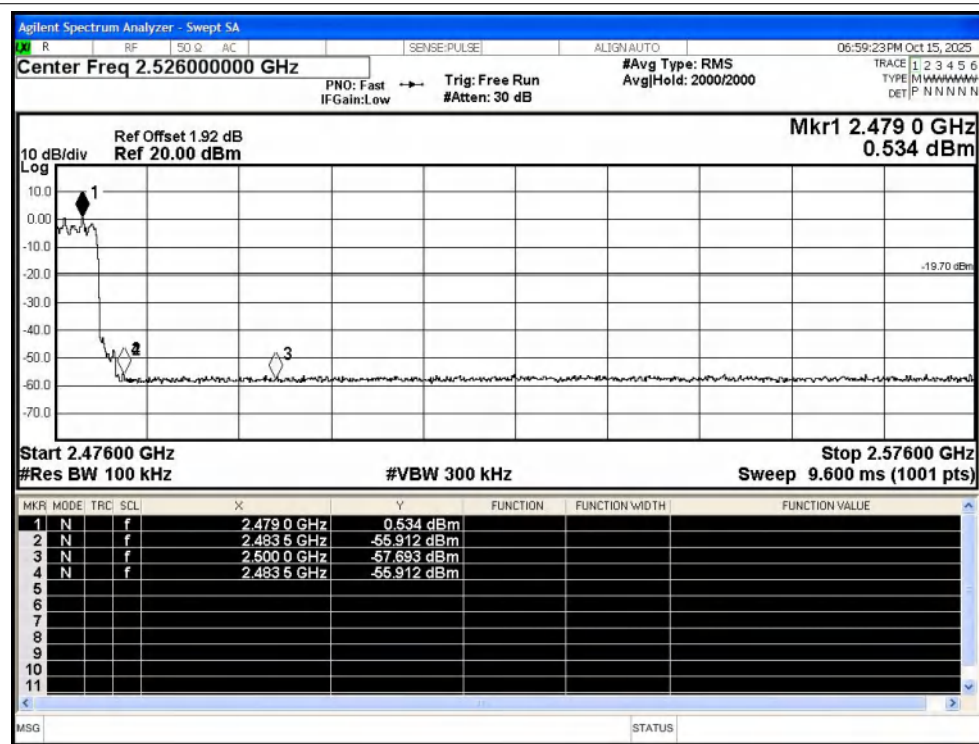
Band Edge(Hopping) NVNT 2-DH5 2402MHz Ant1 Hopping Emission



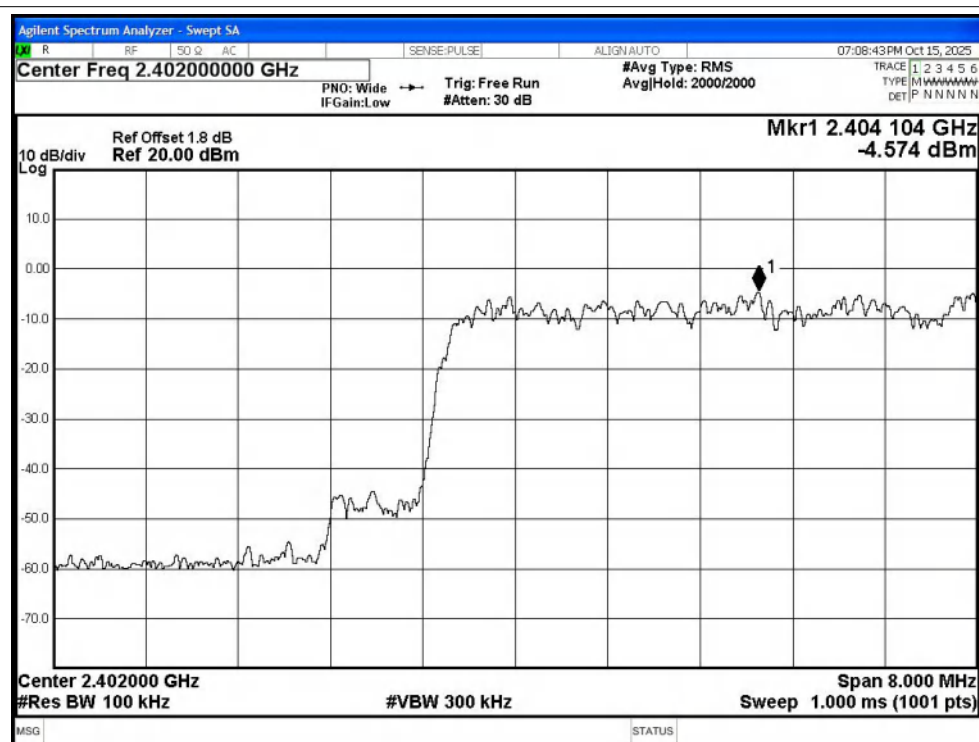
Band Edge(Hopping) NVNT 2-DH5 2480MHz Ant1 Hopping Ref



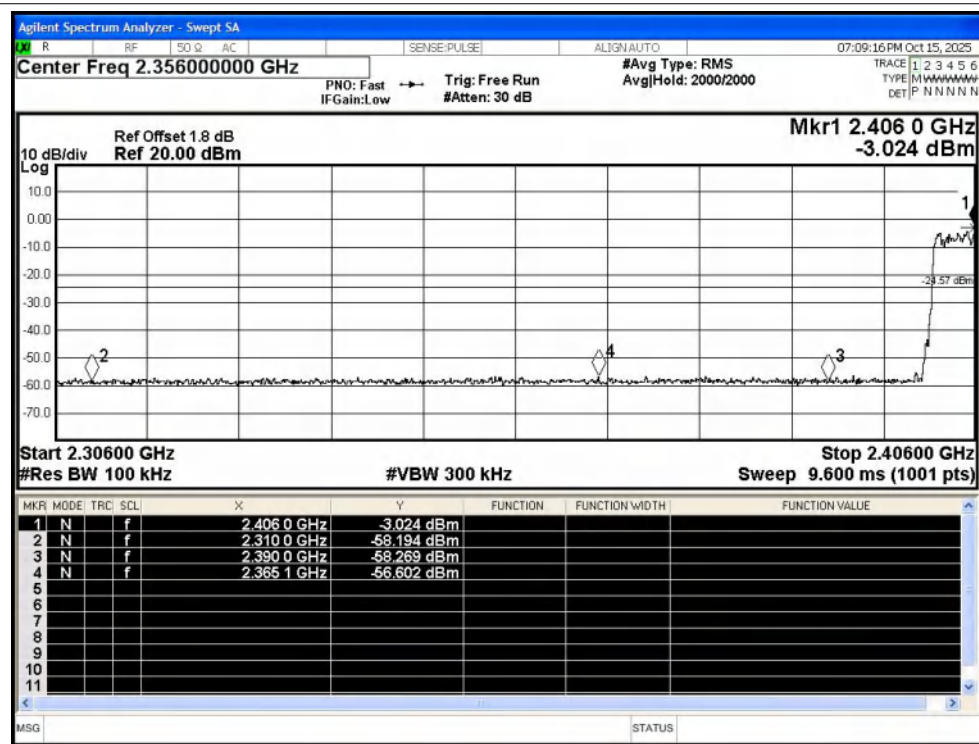
Band Edge(Hopping) NVNT 2-DH5 2480MHz Ant1 Hopping Emission



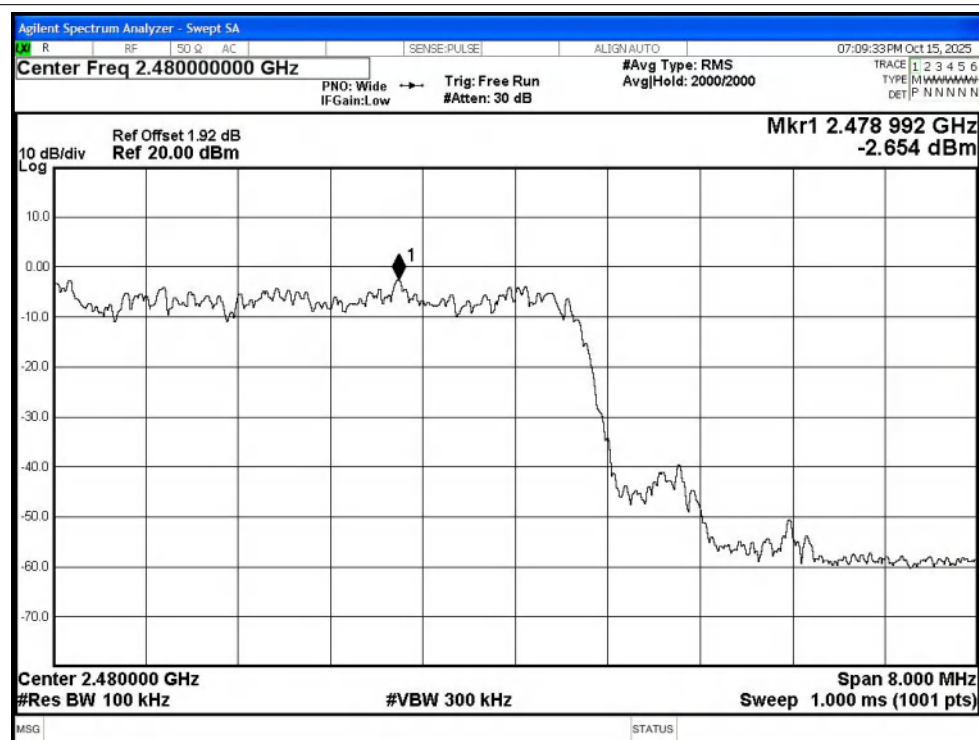
Band Edge(Hopping) NVNT 3-DH5 2402MHz Ant1 Hopping Ref



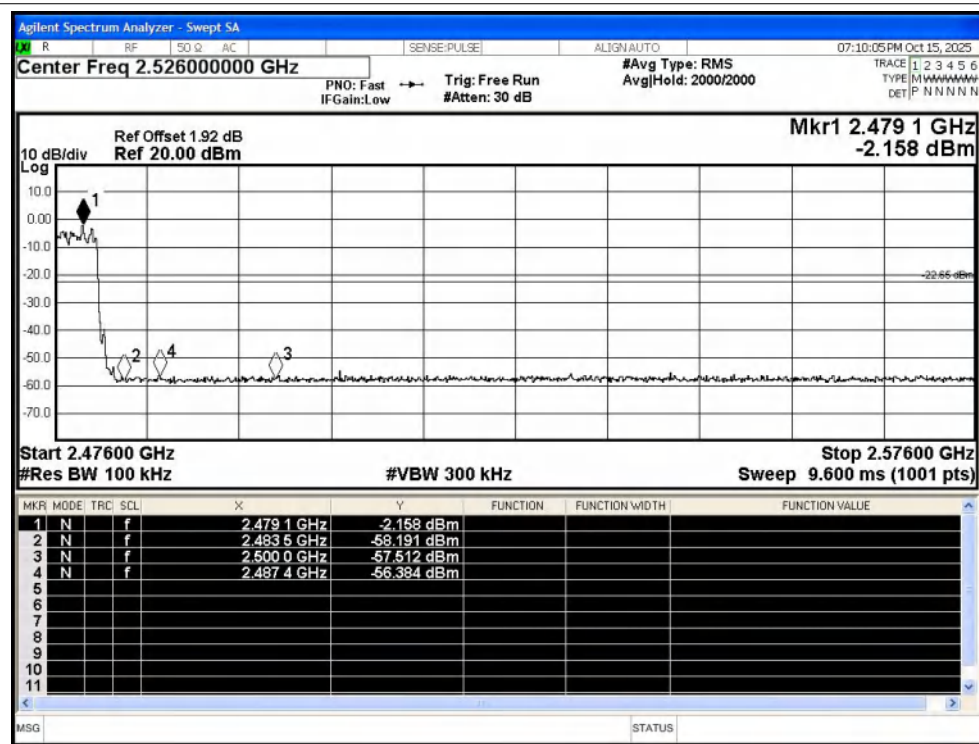
Band Edge(Hopping) NVNT 3-DH5 2402MHz Ant1 Hopping Emission



Band Edge(Hopping) NVNT 3-DH5 2480MHz Ant1 Hopping Ref



Band Edge(Hopping) NVNT 3-DH5 2480MHz Ant1 Hopping Emission

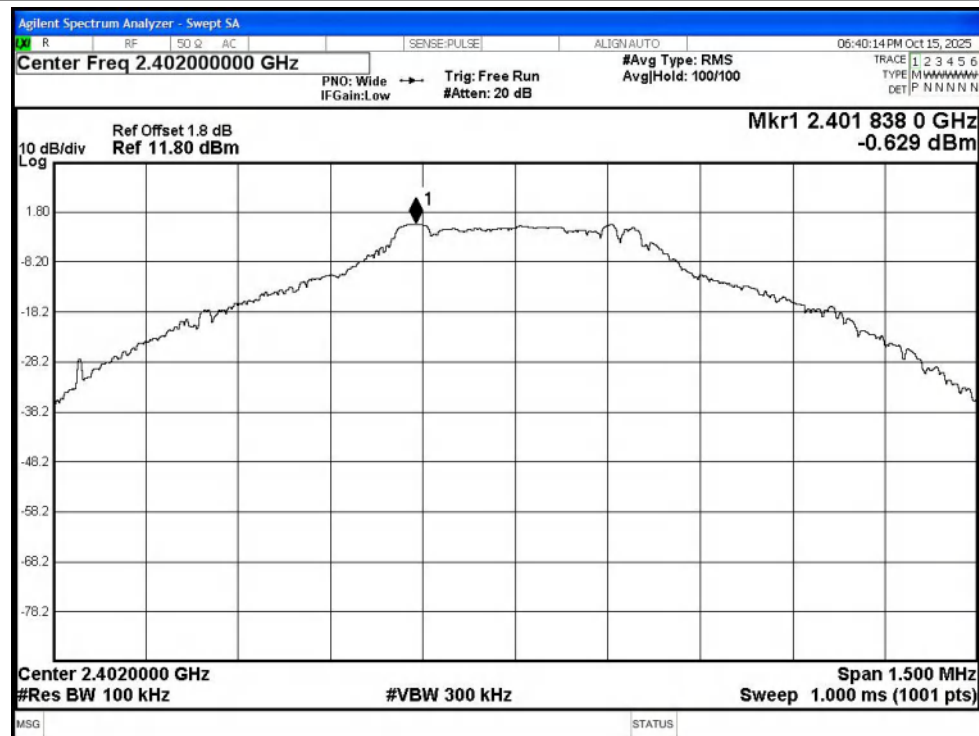


A.7 Conducted RF Spurious Emission

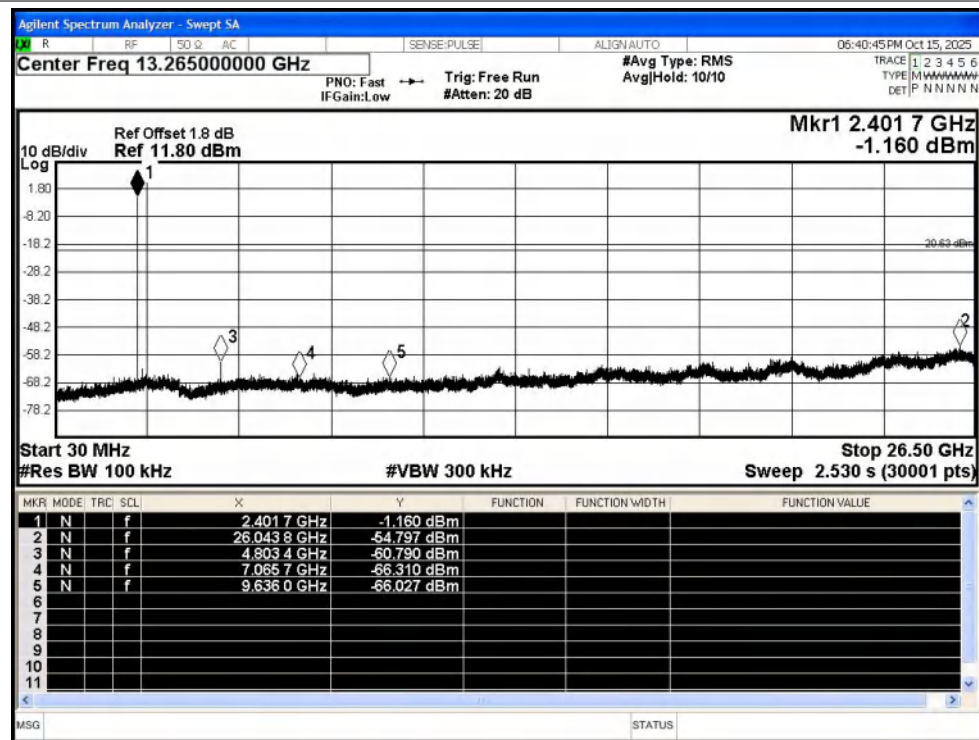
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH5	2402	Ant1	-54.17	-20	Pass
NVNT	1-DH5	2441	Ant1	-55.39	-20	Pass
NVNT	1-DH5	2480	Ant1	-56.04	-20	Pass
NVNT	2-DH5	2402	Ant1	-54.6	-20	Pass
NVNT	2-DH5	2441	Ant1	-55.9	-20	Pass
NVNT	2-DH5	2480	Ant1	-55.52	-20	Pass
NVNT	3-DH5	2402	Ant1	-55.36	-20	Pass
NVNT	3-DH5	2441	Ant1	-54.37	-20	Pass
NVNT	3-DH5	2480	Ant1	-50.57	-20	Pass

Test Graphs

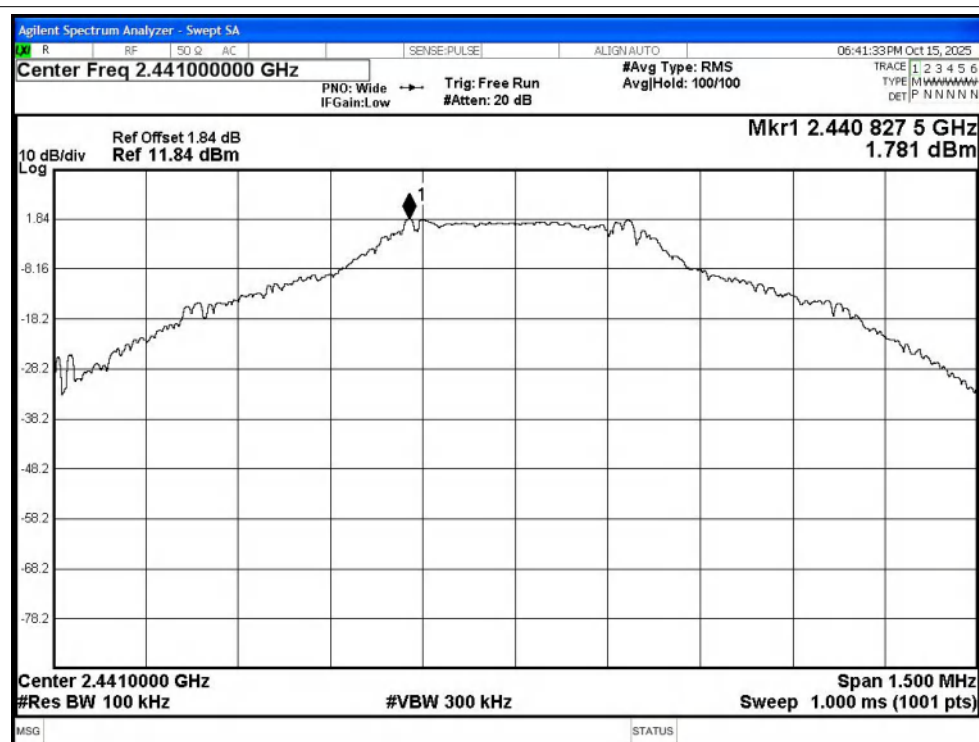
Tx. Spurious NVNT 1-DH5 2402MHz Ant1 Ref



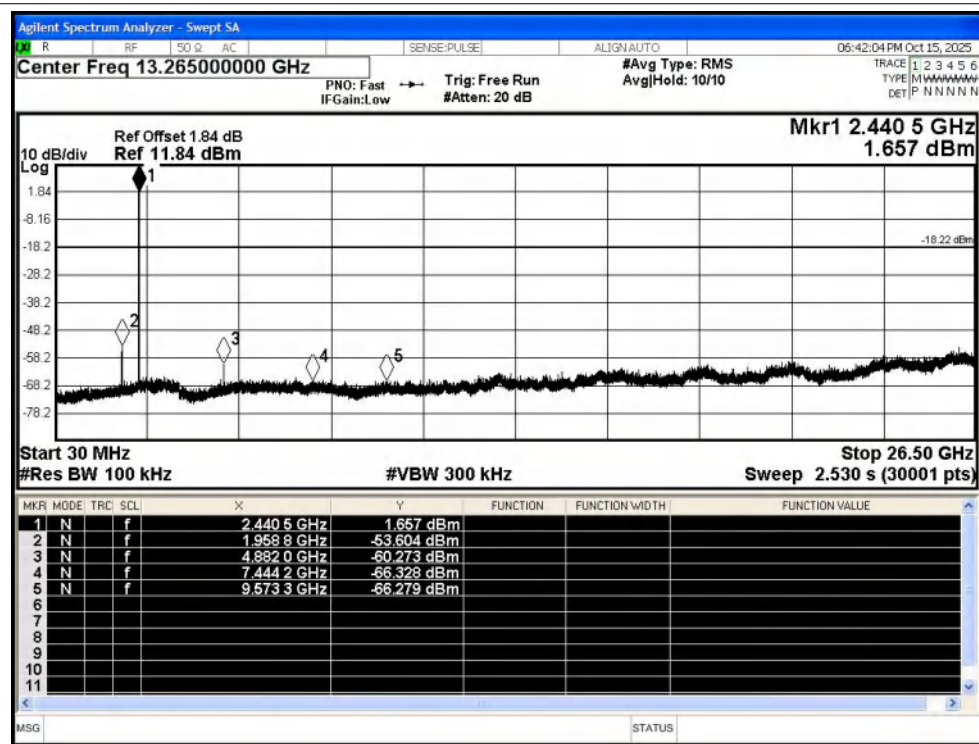
Tx. Spurious NVNT 1-DH5 2402MHz Ant1 Emission



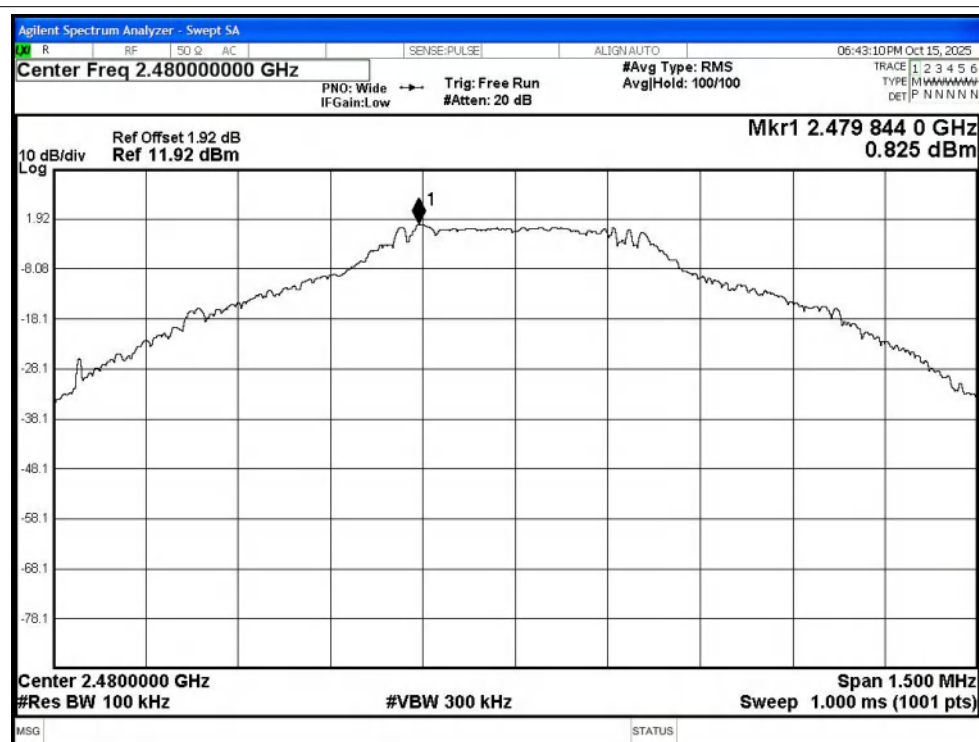
Tx. Spurious NVNT 1-DH5 2441MHz Ant1 Ref



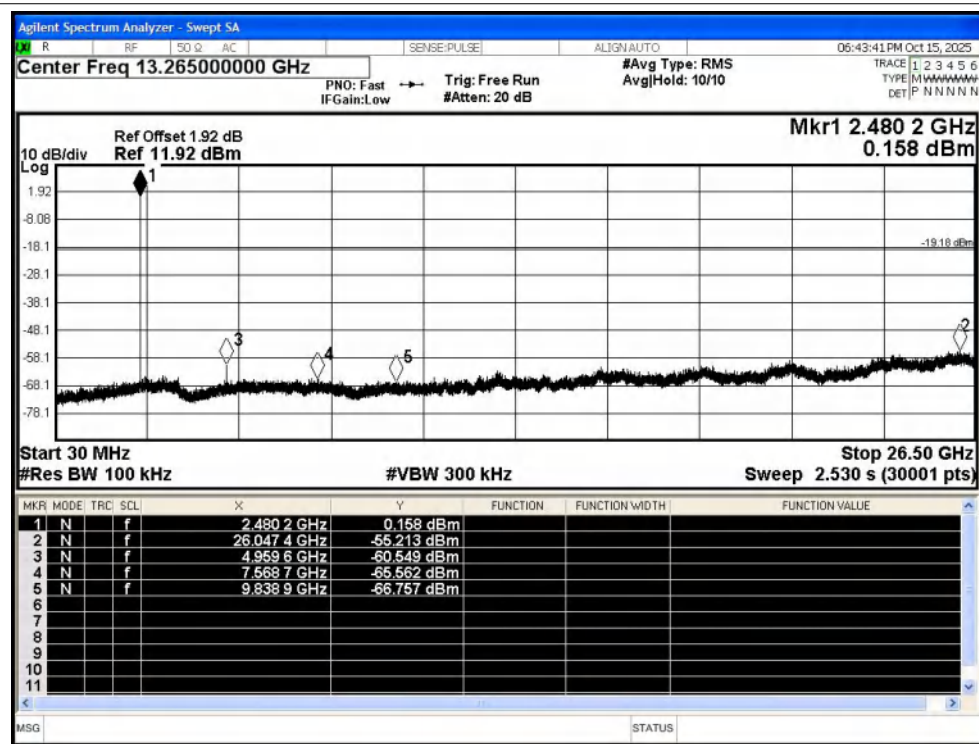
Tx. Spurious NVNT 1-DH5 2441MHz Ant1 Emission



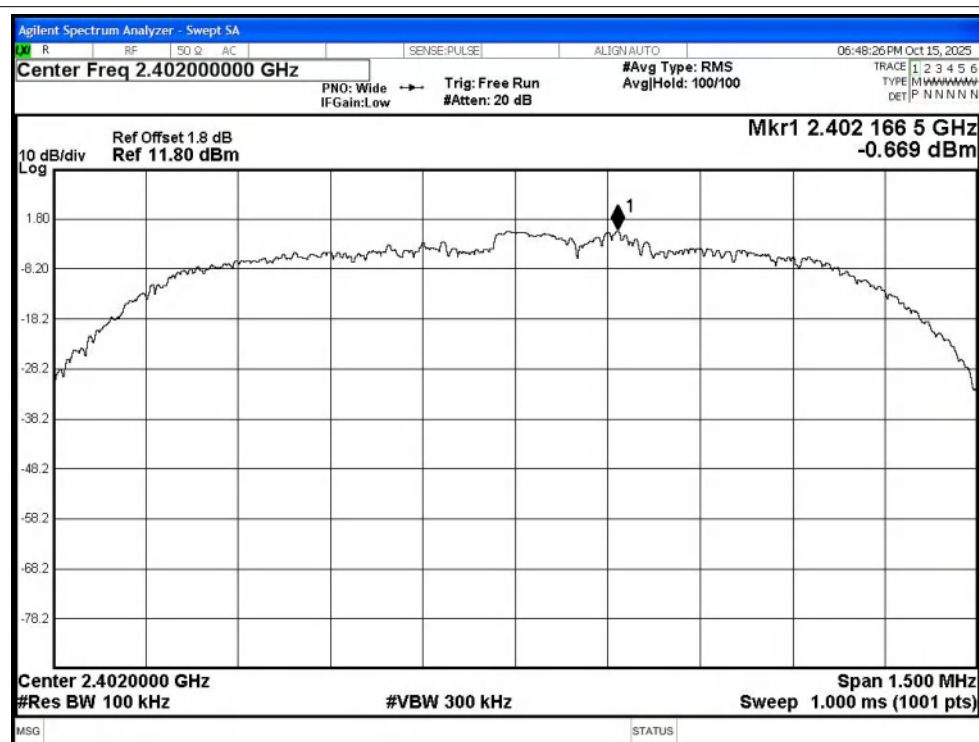
Tx. Spurious NVNT 1-DH5 2480MHz Ant1 Ref



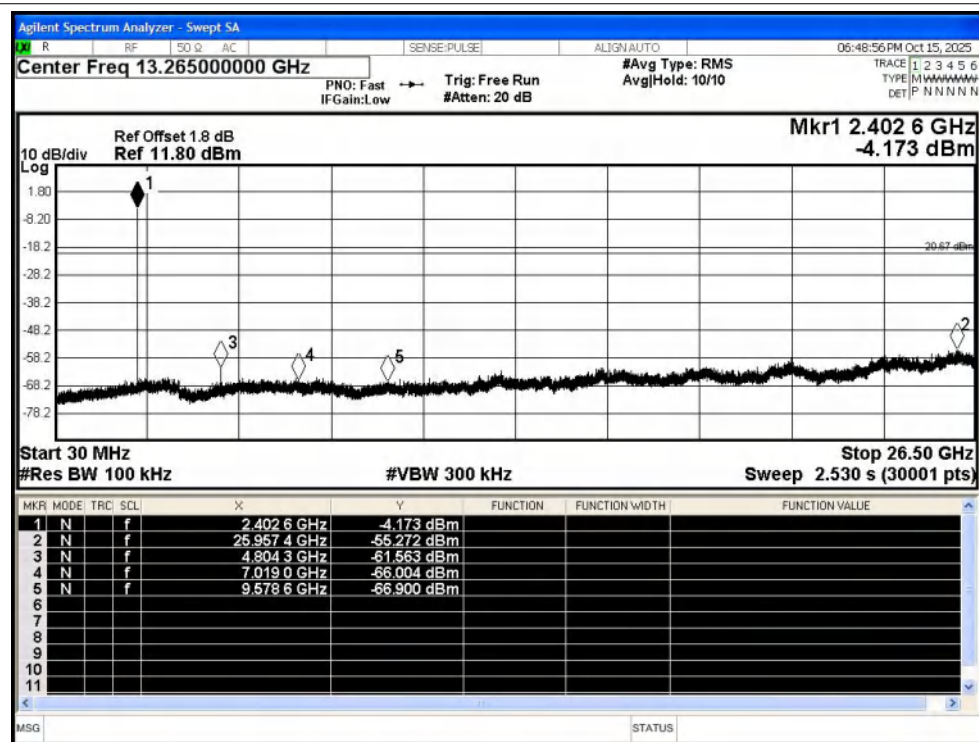
Tx. Spurious NVNT 1-DH5 2480MHz Ant1 Emission



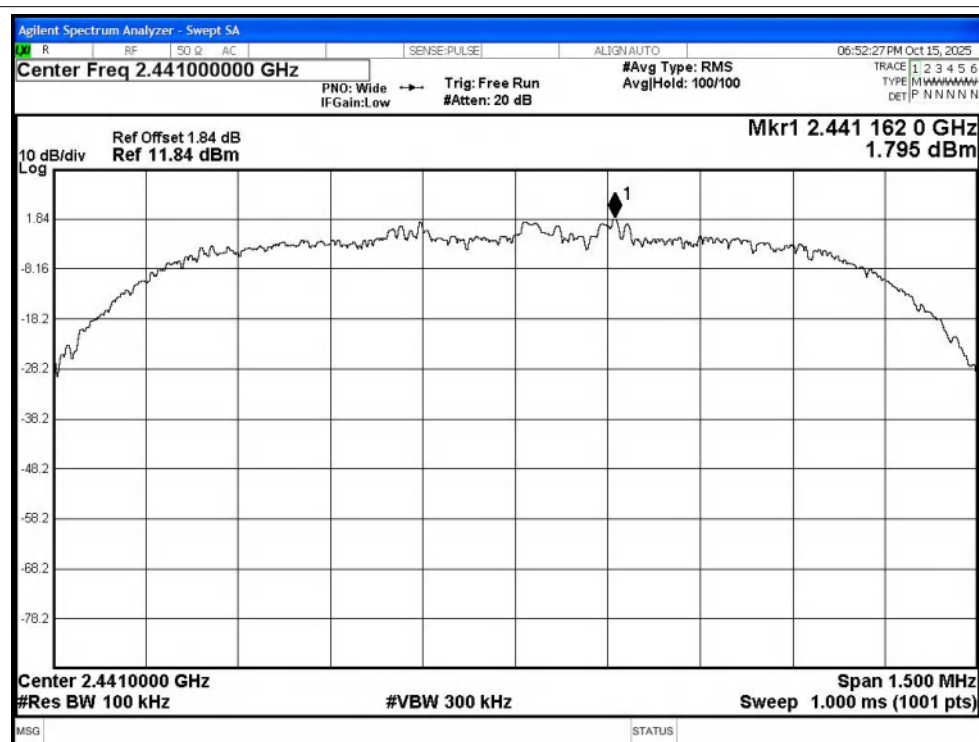
Tx. Spurious NVNT 2-DH5 2402MHz Ant1 Ref



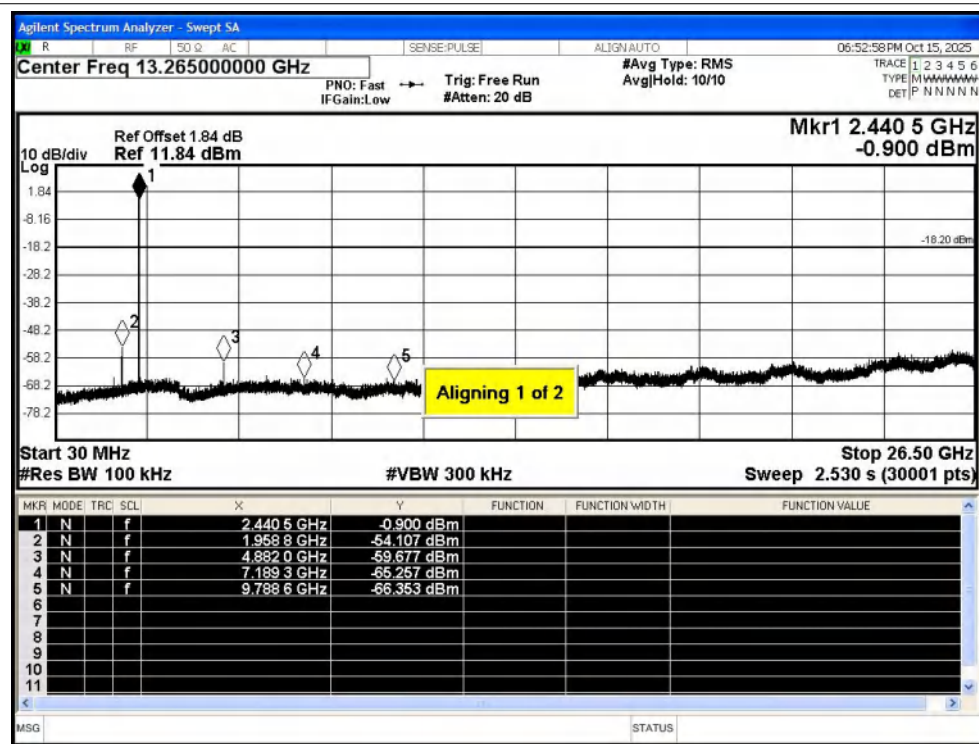
Tx. Spurious NVNT 2-DH5 2402MHz Ant1 Emission



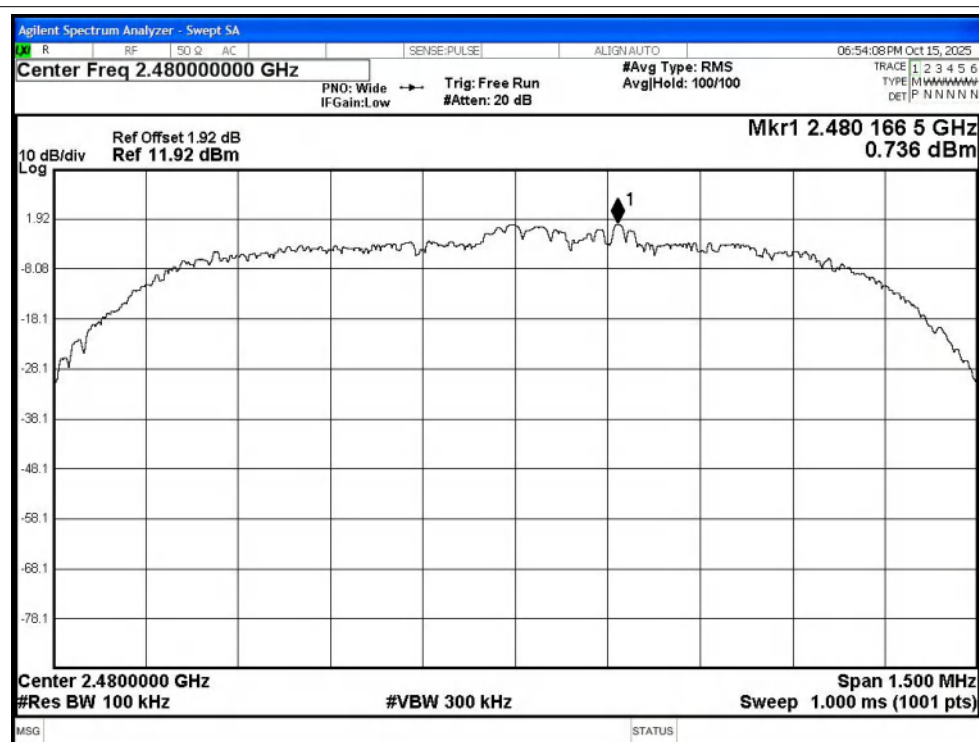
Tx. Spurious NVNT 2-DH5 2441MHz Ant1 Ref



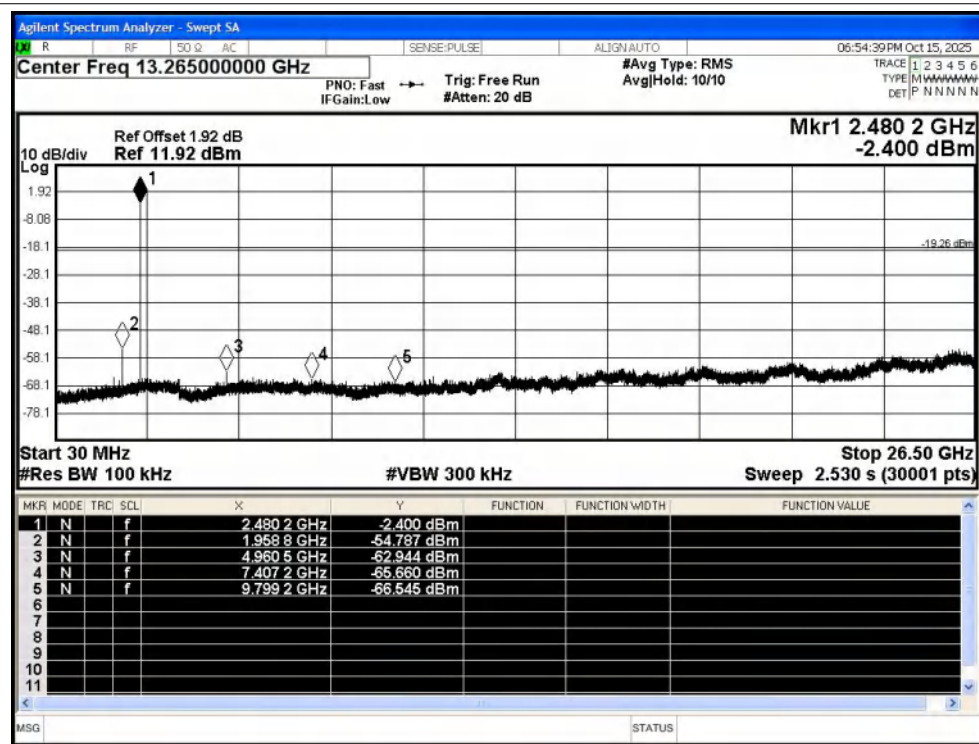
Tx. Spurious NVNT 2-DH5 2441MHz Ant1 Emission



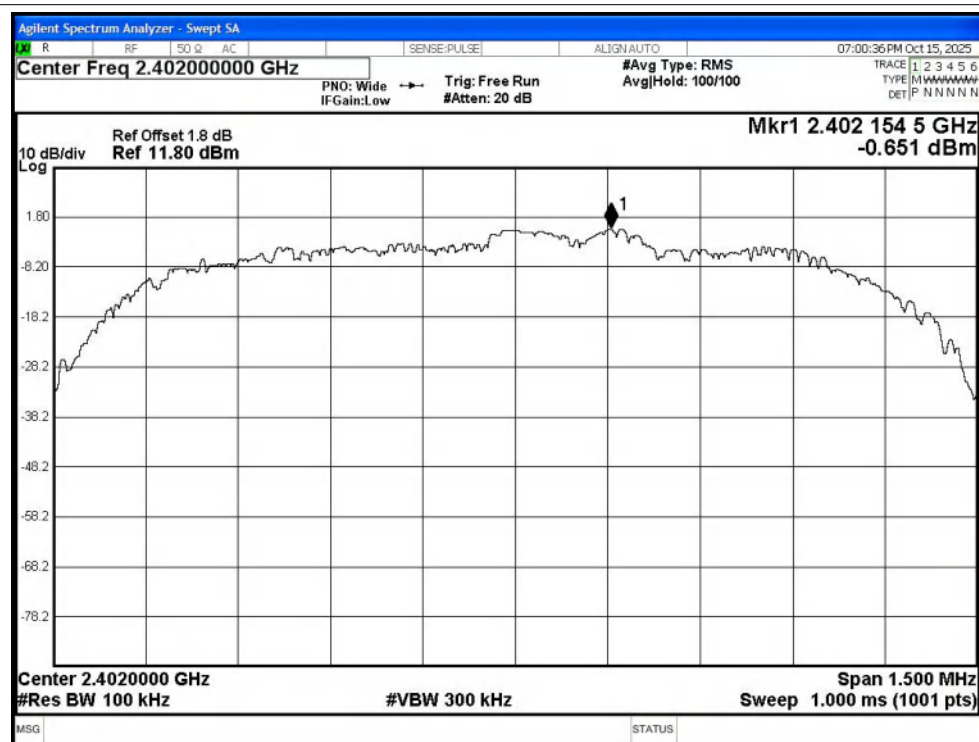
Tx. Spurious NVNT 2-DH5 2480MHz Ant1 Ref



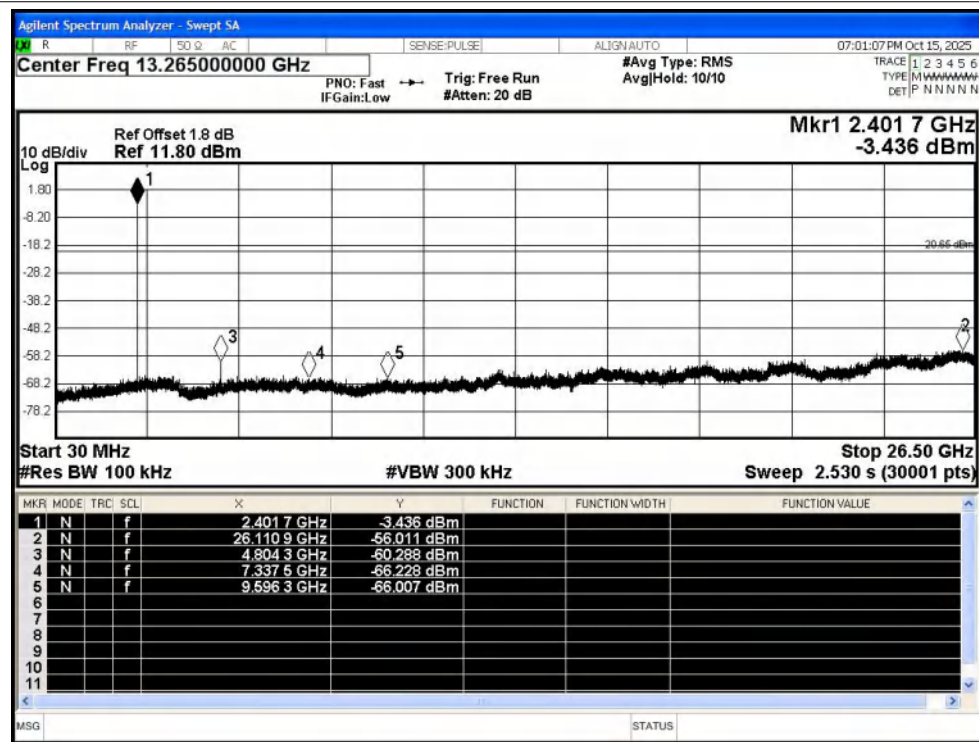
Tx. Spurious NVNT 2-DH5 2480MHz Ant1 Emission



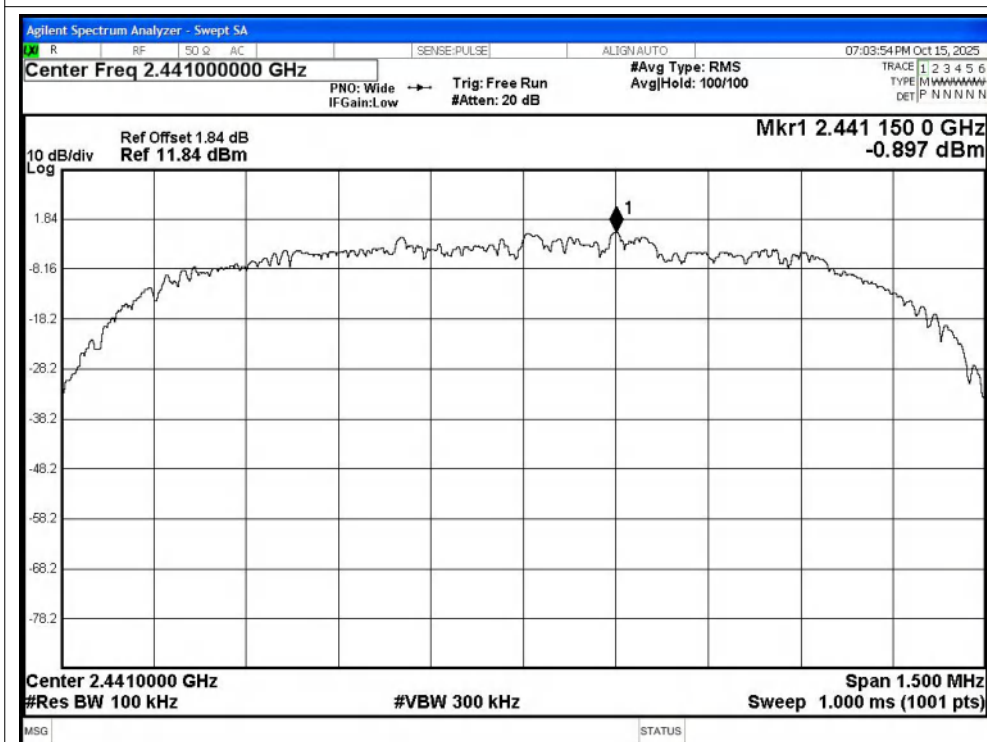
Tx. Spurious NVNT 3-DH5 2402MHz Ant1 Ref



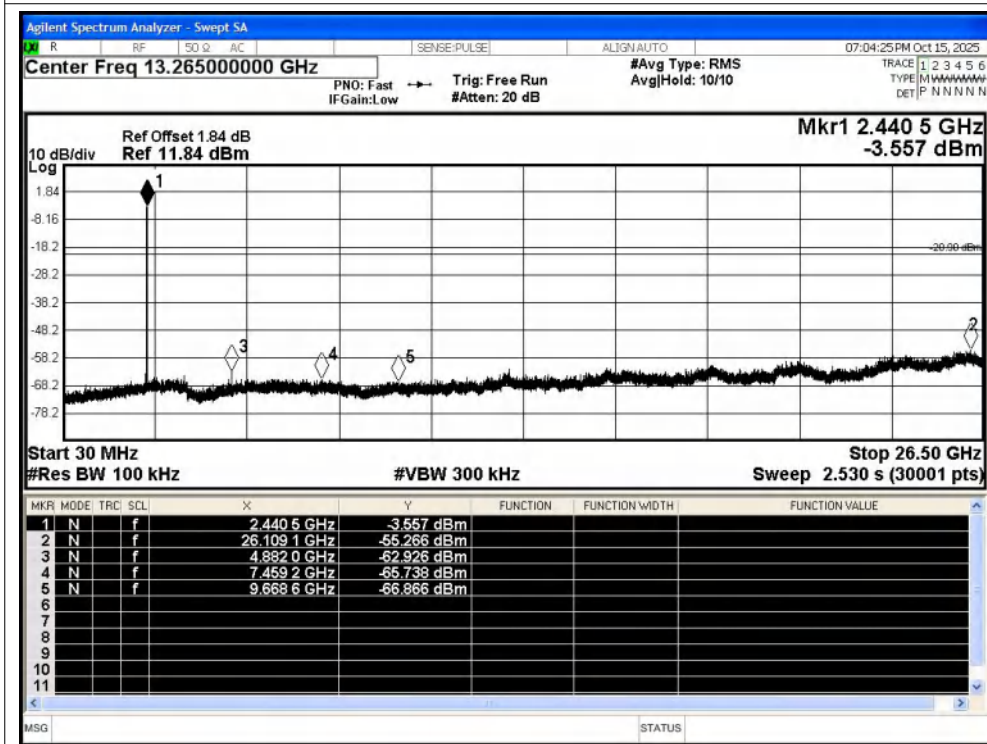
Tx. Spurious NVNT 3-DH5 2402MHz Ant1 Emission



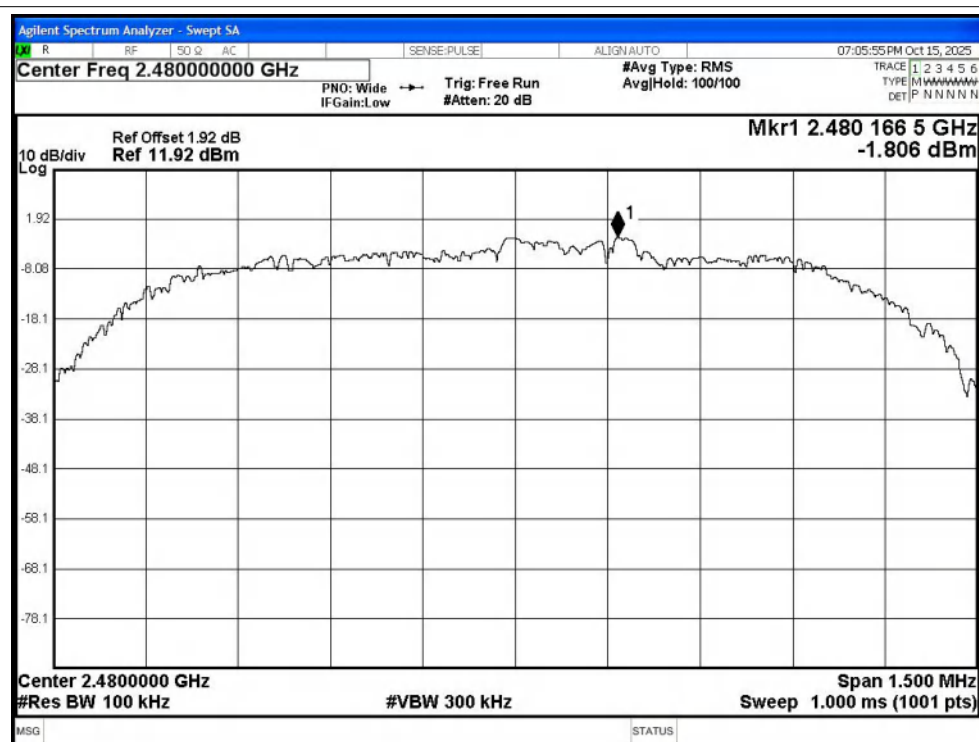
Tx. Spurious NVNT 3-DH5 2441MHz Ant1 Ref



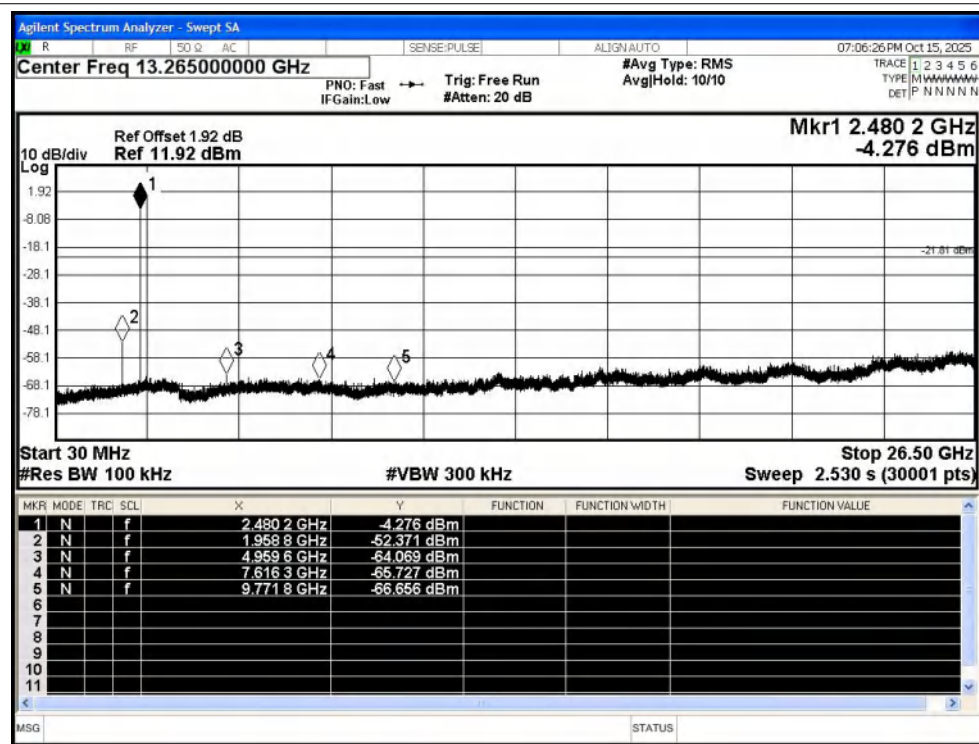
Tx. Spurious NVNT 3-DH5 2441MHz Ant1 Emission



Tx. Spurious NVNT 3-DH5 2480MHz Ant1 Ref



Tx. Spurious NVNT 3-DH5 2480MHz Ant1 Emission

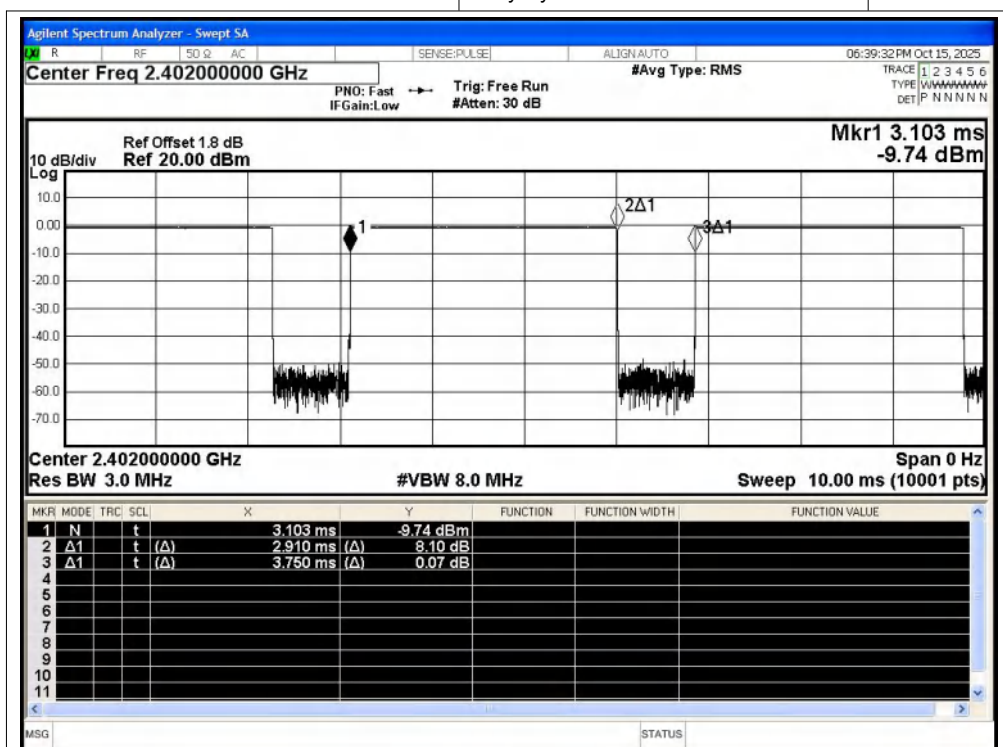


A.8 Duty Cycle

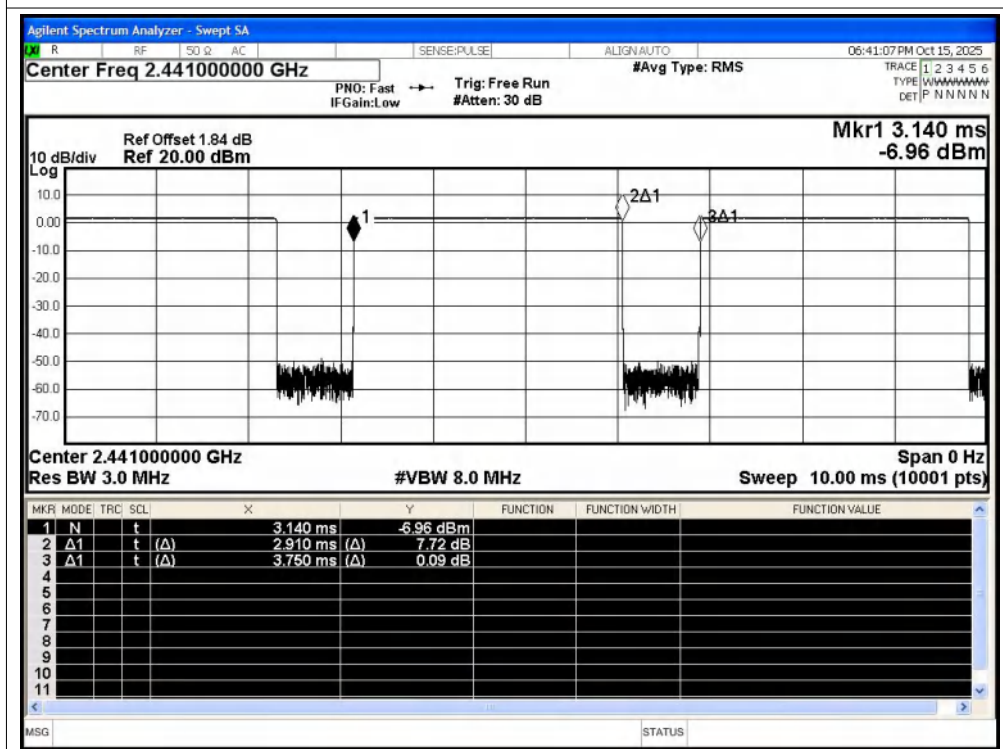
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	1-DH5	2402	Ant1	77.6	1.1	0.34
NVNT	1-DH5	2441	Ant1	77.6	1.1	0.34
NVNT	1-DH5	2480	Ant1	77.6	1.1	0.34
NVNT	2-DH5	2402	Ant1	77.28	1.12	0.35
NVNT	2-DH5	2441	Ant1	77.33	1.12	0.34
NVNT	2-DH5	2480	Ant1	77.28	1.12	0.35
NVNT	3-DH5	2402	Ant1	77.33	1.12	0.34
NVNT	3-DH5	2441	Ant1	77.28	1.12	0.35
NVNT	3-DH5	2480	Ant1	77.28	1.12	0.35

Test Graphs

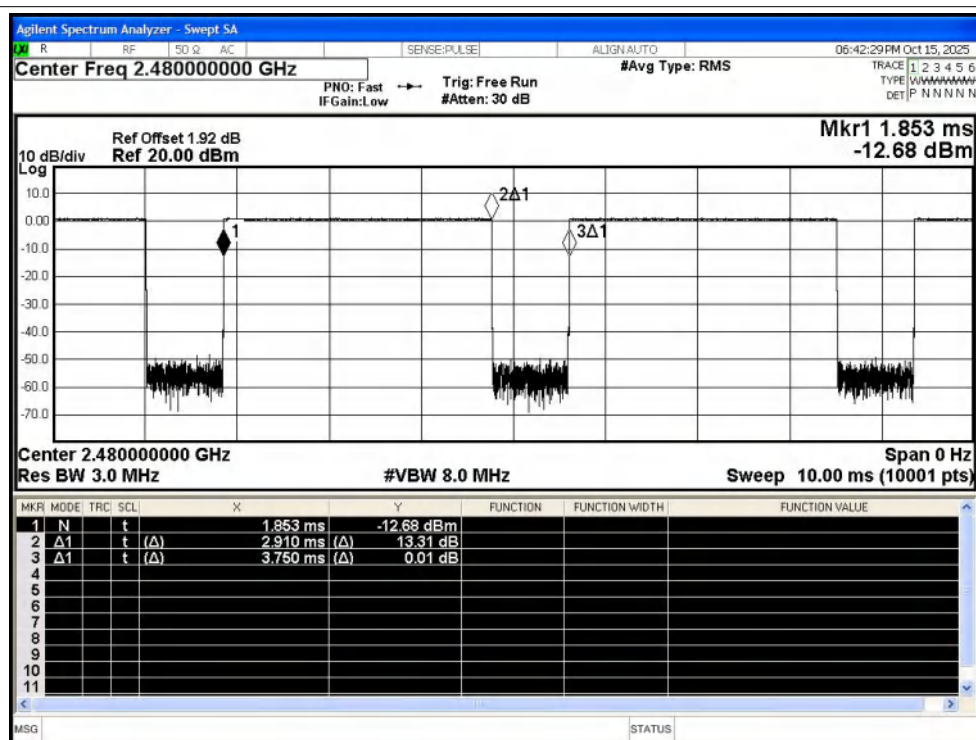
Duty Cycle NVNT 1-DH5 2402MHz Ant1



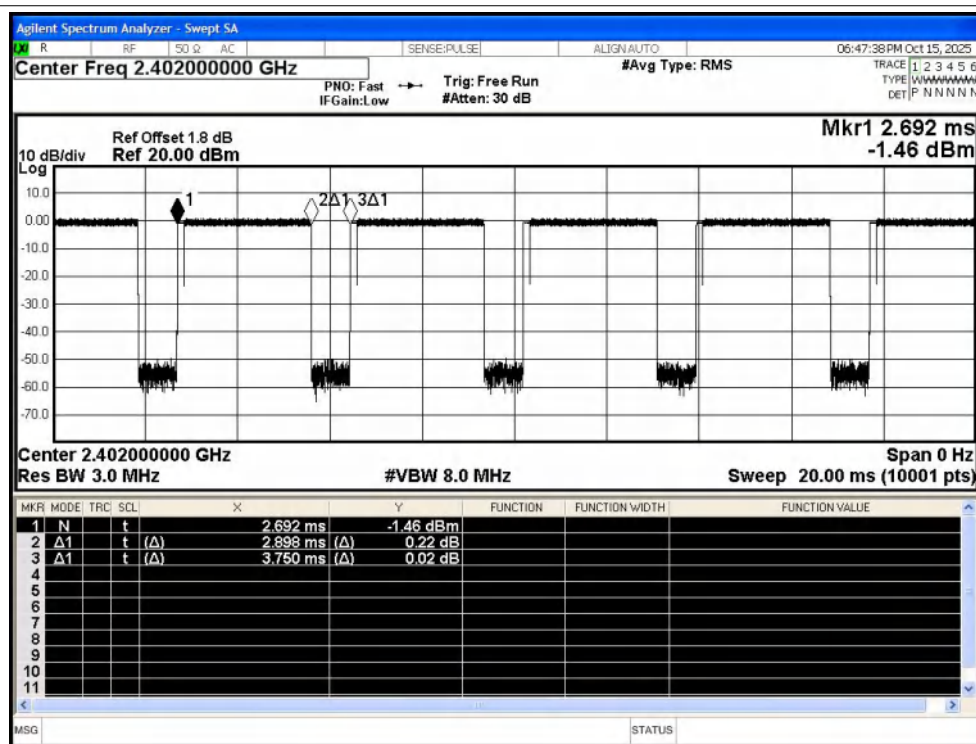
Duty Cycle NVNT 1-DH5 2441MHz Ant1



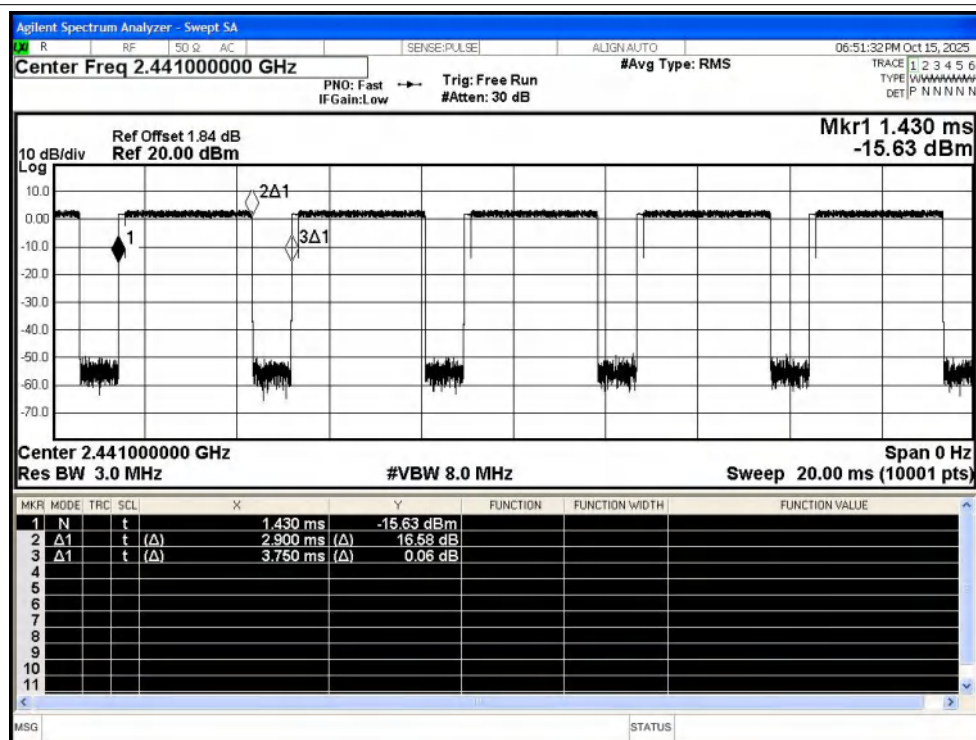
Duty Cycle NVNT 1-DH5 2480MHz Ant1



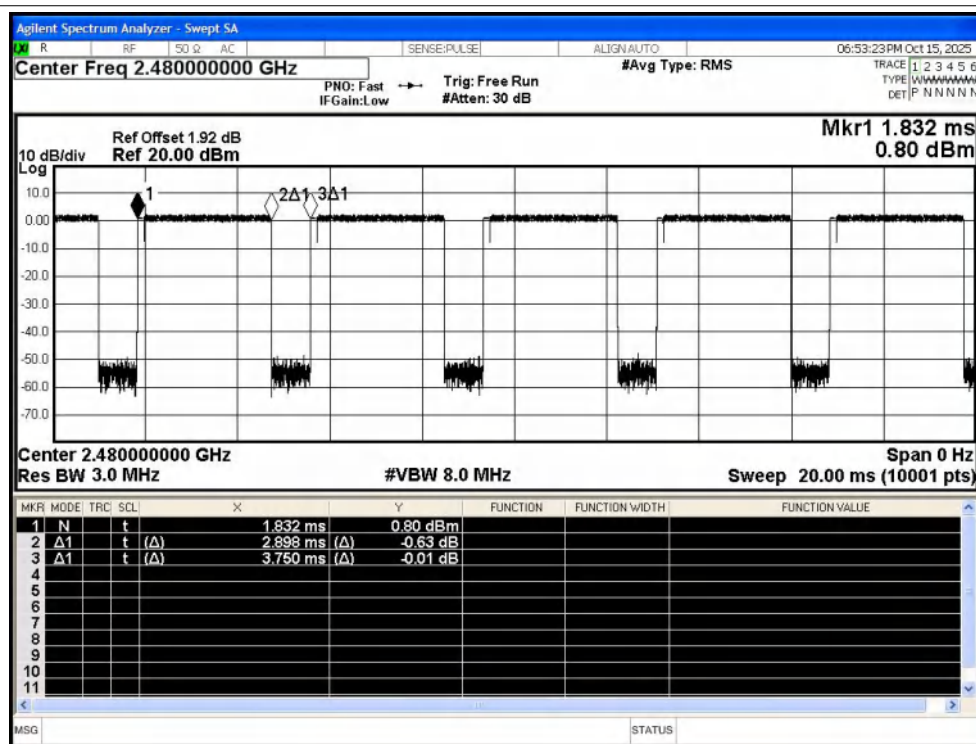
Duty Cycle NVNT 2-DH5 2402MHz Ant1



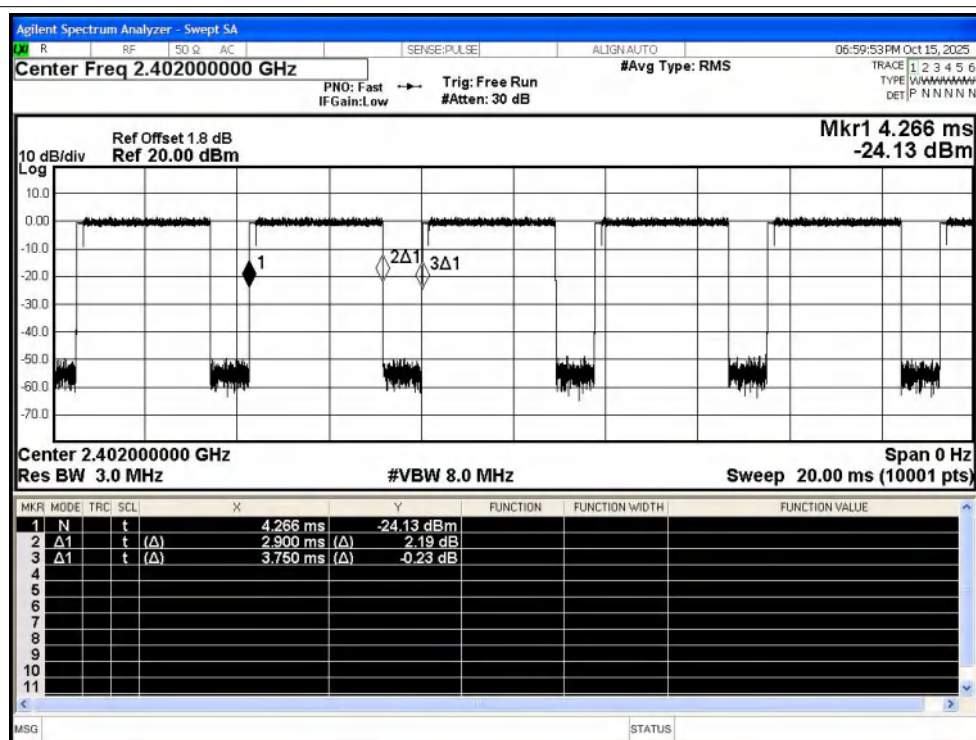
Duty Cycle NVNT 2-DH5 2441MHz Ant1



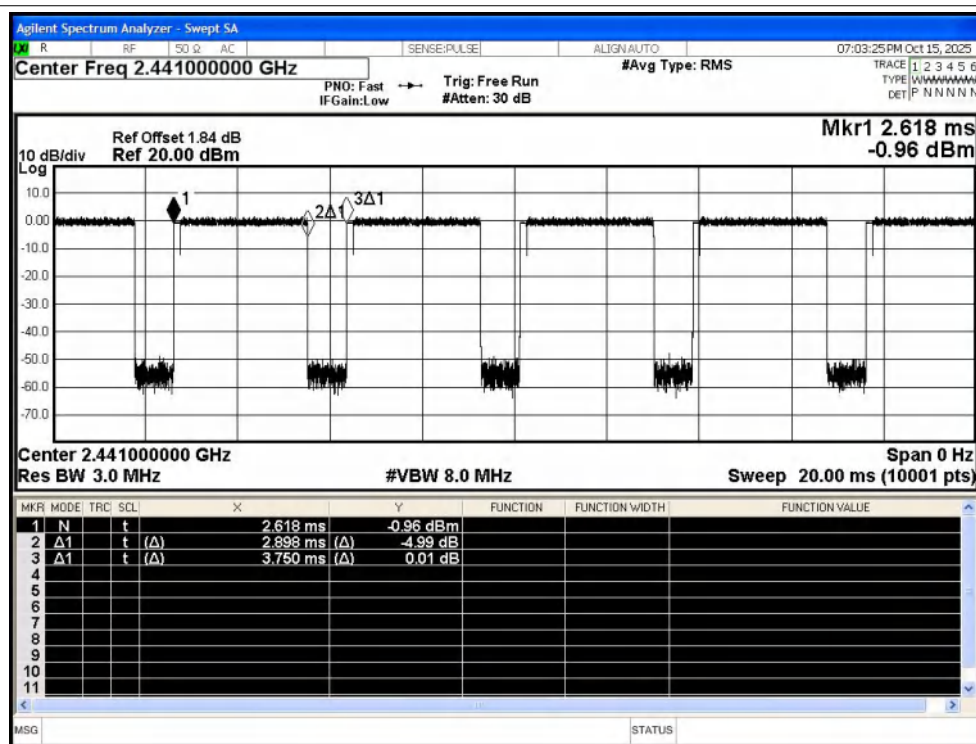
Duty Cycle NVNT 2-DH5 2480MHz Ant1

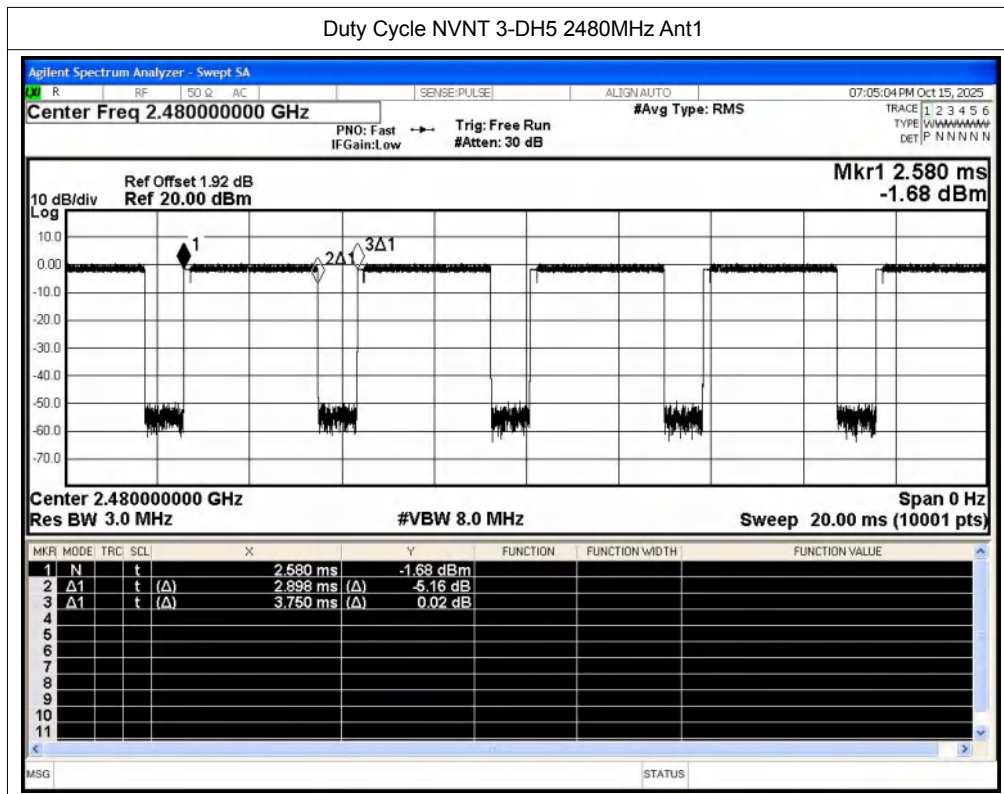


Duty Cycle NVNT 3-DH5 2402MHz Ant1



Duty Cycle NVNT 3-DH5 2441MHz Ant1



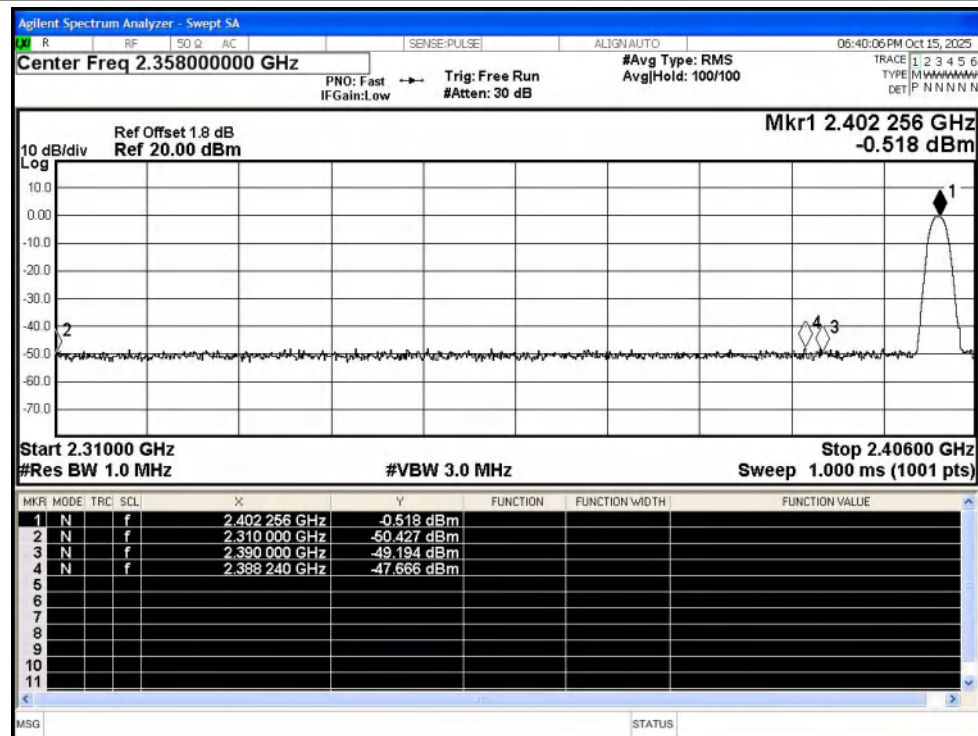


A.9 Restrict Band

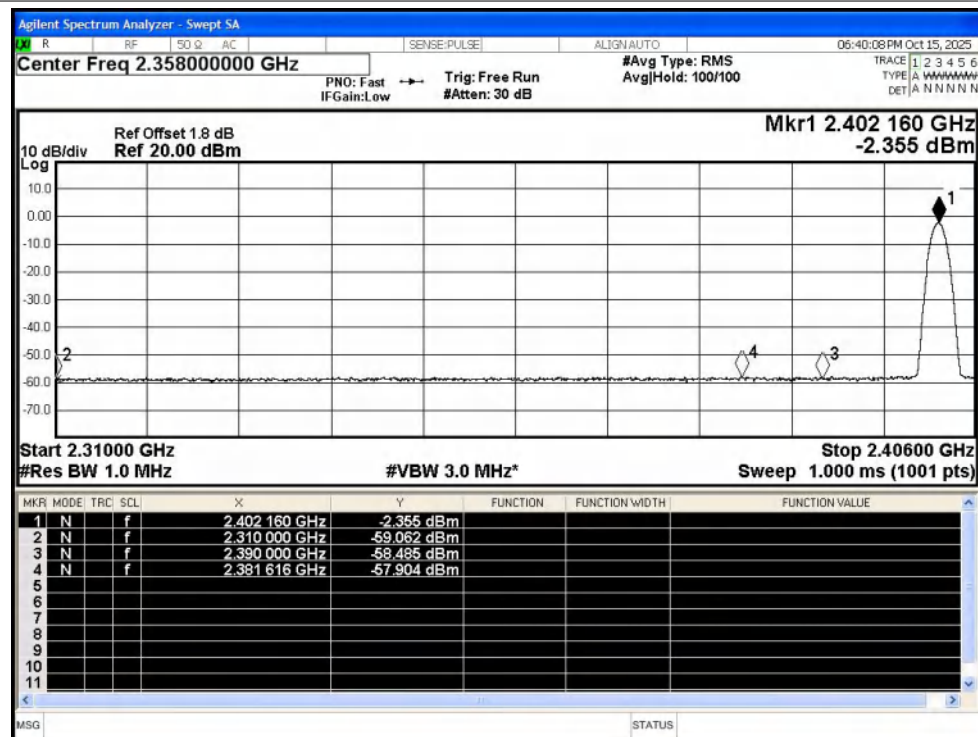
Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	Duty Factor (dB)	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
NVNT	1-DH5	2402	Ant1	No-Hopping	2310	-50.43	3.32	-	48.15	Peak	74	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2310	-59.06	3.32	1.1	40.62	Average	54	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2388.24	-47.67	3.32	-	50.91	Peak	74	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2381.616	-57.9	3.32	1.1	41.78	Average	54	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2390	-49.19	3.32	-	49.39	Peak	74	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2390	-58.49	3.32	1.1	41.19	Average	54	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2483.5	-49.21	3.32	-	49.37	Peak	74	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2483.5	-57.8	3.32	1.1	41.88	Average	54	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2484.712	-44.69	3.32	-	53.89	Peak	74	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2483.92	-57	3.32	1.1	42.68	Average	54	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2500	-49.78	3.32	-	48.80	Peak	74	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2500	-58.62	3.32	1.1	41.06	Average	54	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2310	-48.95	3.32	-	49.63	Peak	74	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2310	-58.98	3.32	1.12	40.72	Average	54	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2389.2	-47.66	3.32	-	50.92	Peak	74	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2374.032	-57.87	3.32	1.12	41.83	Average	54	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2390	-48.81	3.32	-	49.77	Peak	74	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2390	-58.42	3.32	1.12	41.28	Average	54	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2483.5	-46.52	3.32	-	52.06	Peak	74	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2483.5	-56.66	3.32	1.12	43.04	Average	54	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2484.016	-44.7	3.32	-	53.88	Peak	74	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2483.56	-56.14	3.32	1.12	43.56	Average	54	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2500	-49.35	3.32	-	49.23	Peak	74	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2500	-58.02	3.32	1.12	41.68	Average	54	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2310	-50.5	3.32	-	48.08	Peak	74	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2310	-59.18	3.32	1.12	40.52	Average	54	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2310.288	-47.33	3.32	-	51.25	Peak	74	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2389.008	-57.66	3.32	1.12	42.04	Average	54	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2390	-50.42	3.32	-	48.16	Peak	74	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2390	-58.64	3.32	1.12	41.06	Average	54	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2483.5	-49.25	3.32	-	49.33	Peak	74	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2483.5	-58.36	3.32	1.12	41.34	Average	54	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2485.072	-46.07	3.32	-	52.51	Peak	74	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2483.656	-57.14	3.32	1.12	42.56	Average	54	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2500	-50.2	3.32	-	48.38	Peak	74	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2500	-58.36	3.32	1.12	41.34	Average	54	Pass

Test Graphs

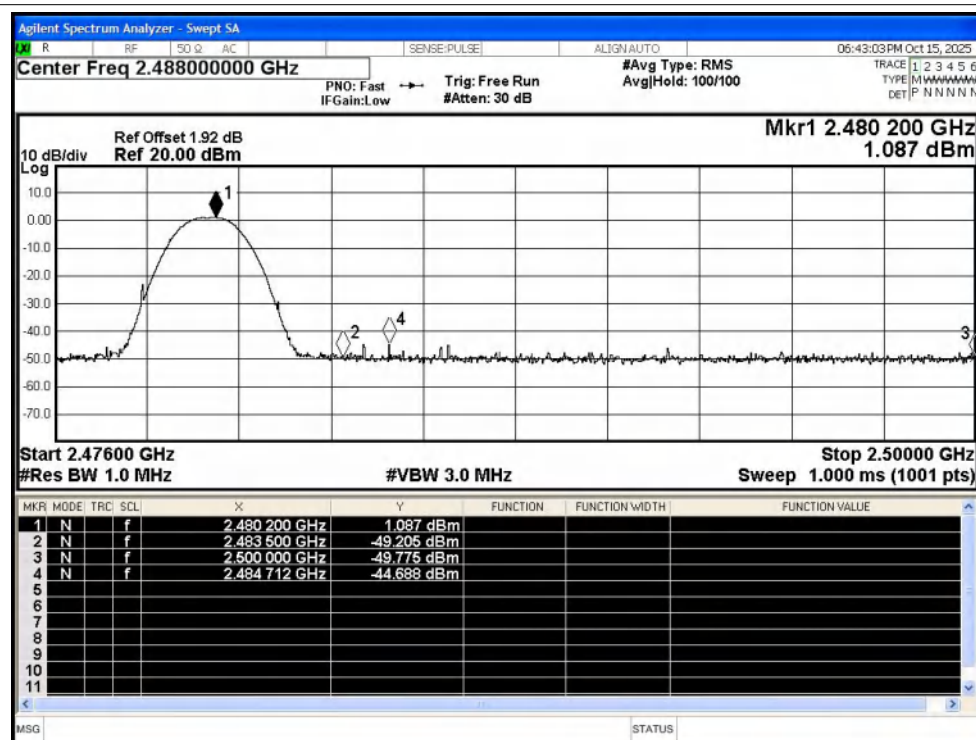
Restrict Band NVNT 1-DH5 2402MHz Ant1 No-Hopping Peak



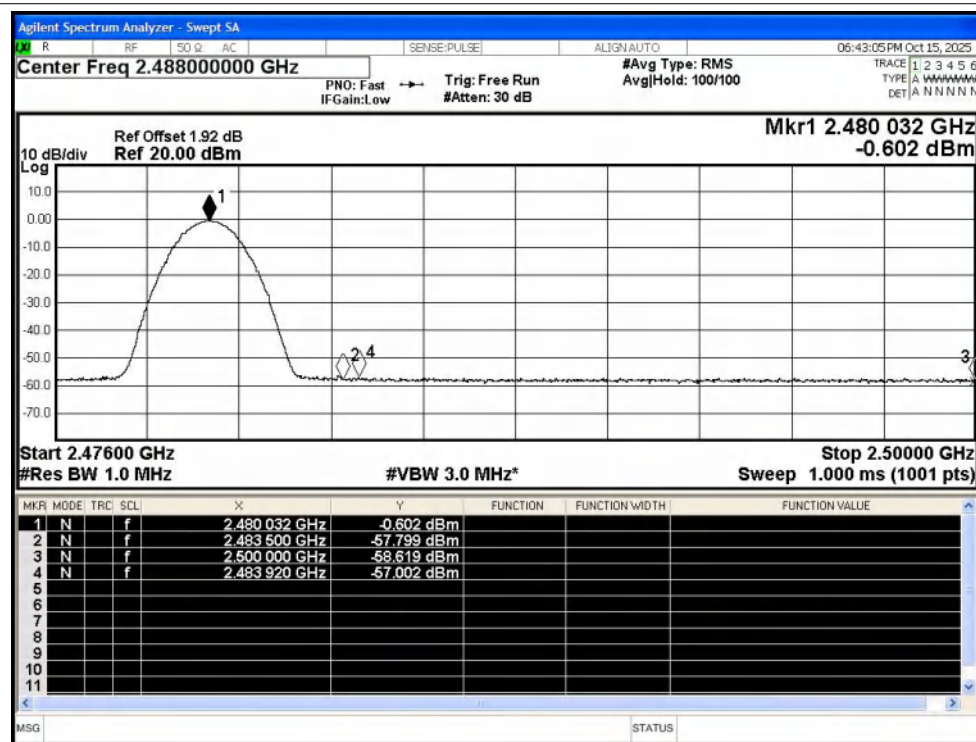
Restrict Band NVNT 1-DH5 2402MHz Ant1 No-Hopping Average



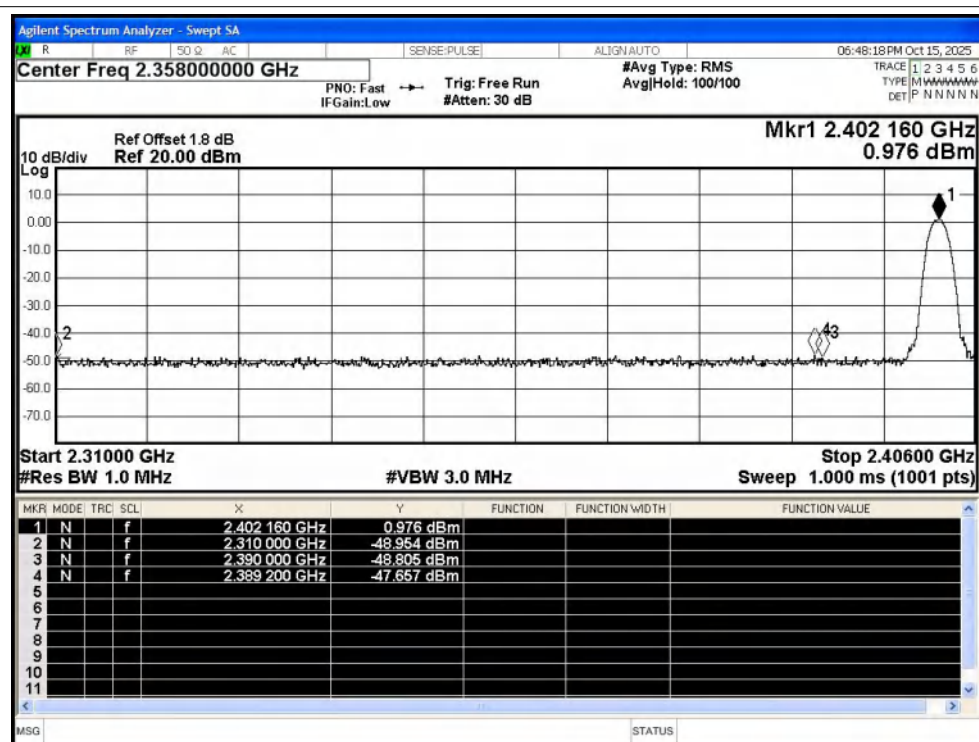
Restrict Band NVNT 1-DH5 2480MHz Ant1 No-Hopping Peak



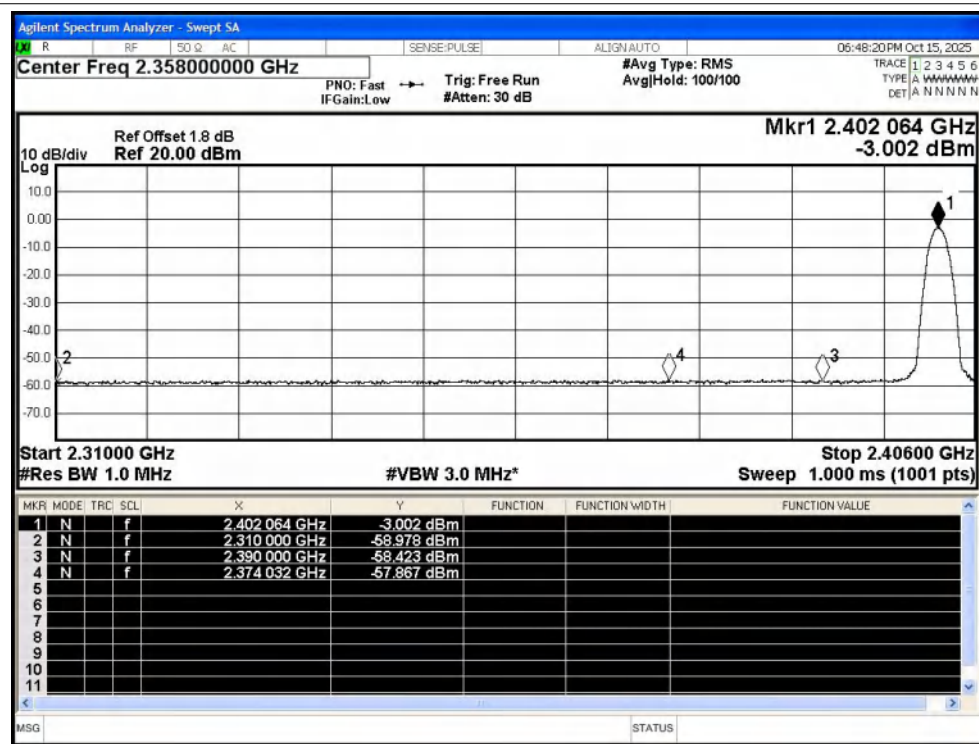
Restrict Band NVNT 1-DH5 2480MHz Ant1 No-Hopping Average



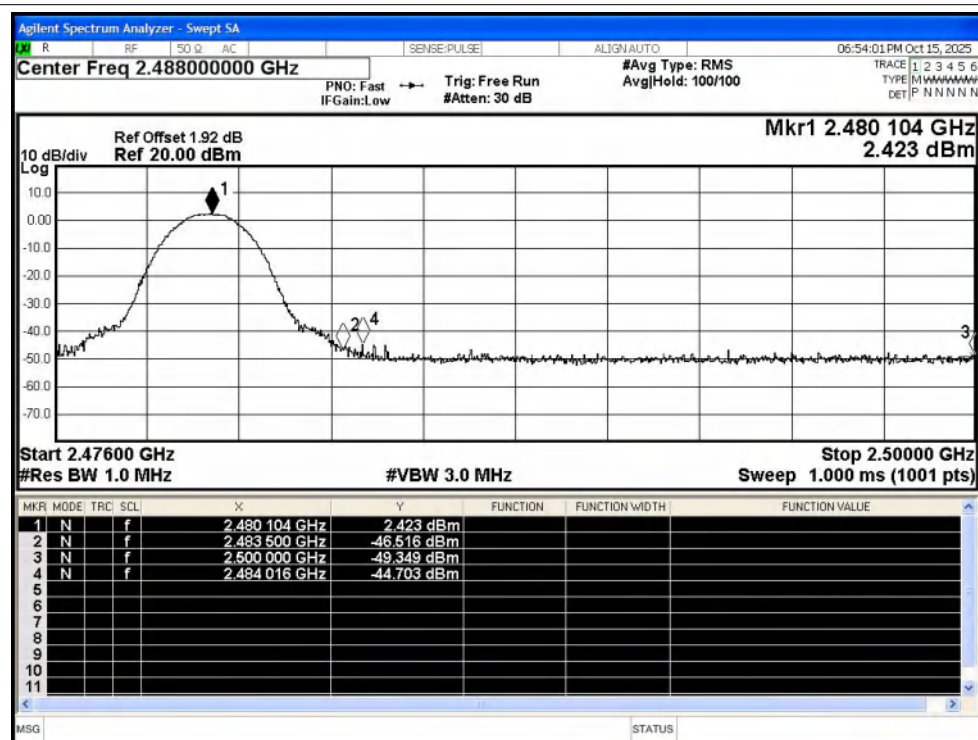
Restrict Band NVNT 2-DH5 2402MHz Ant1 No-Hopping Peak



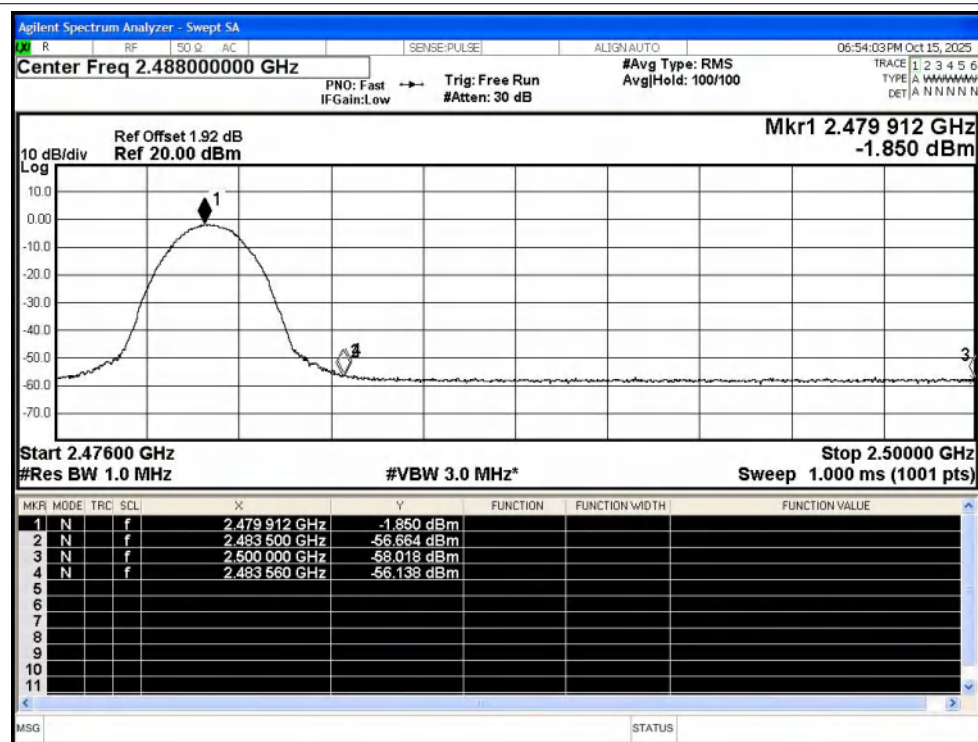
Restrict Band NVNT 2-DH5 2402MHz Ant1 No-Hopping Average



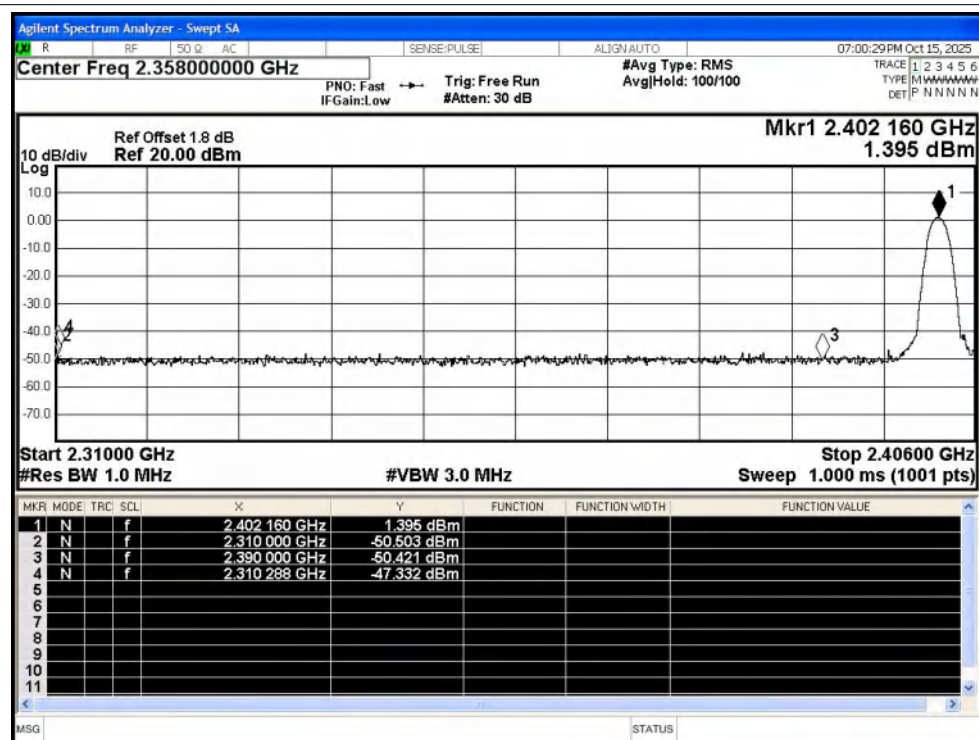
Restrict Band NVNT 2-DH5 2480MHz Ant1 No-Hopping Peak



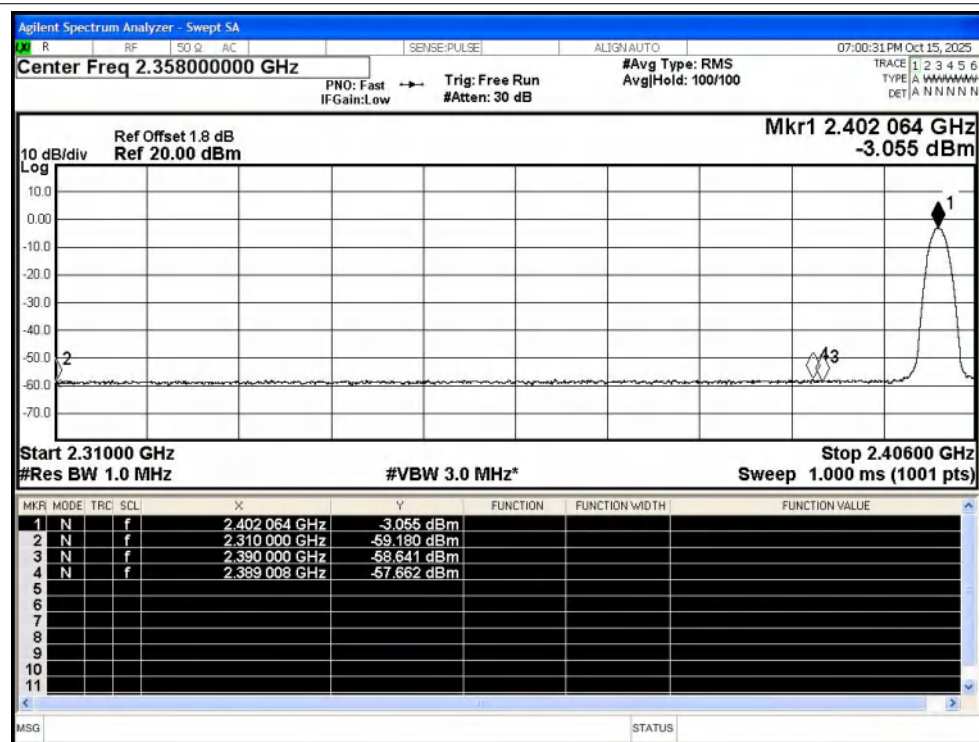
Restrict Band NVNT 2-DH5 2480MHz Ant1 No-Hopping Average



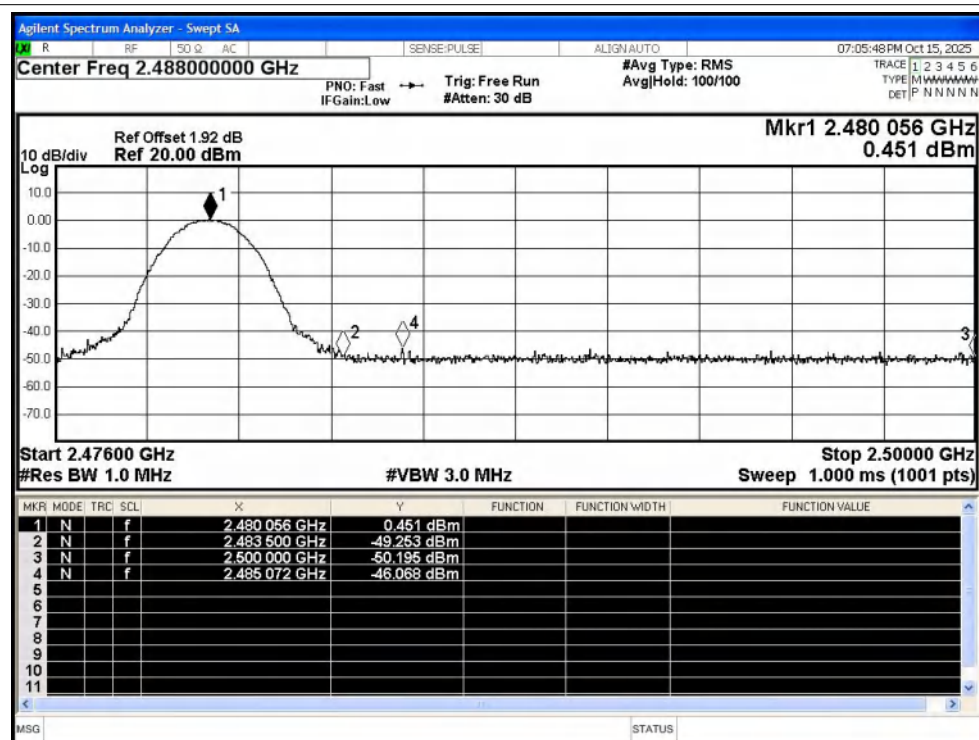
Restrict Band NVNT 3-DH5 2402MHz Ant1 No-Hopping Peak



Restrict Band NVNT 3-DH5 2402MHz Ant1 No-Hopping Average



Restrict Band NVNT 3-DH5 2480MHz Ant1 No-Hopping Peak



Restrict Band NVNT 3-DH5 2480MHz Ant1 No-Hopping Average

