Appendix A

RF Test Data for BT (Conducted Measurement)

Product Name: Bluetooth Speaker

Test Model: Kasa

Environmental Conditions

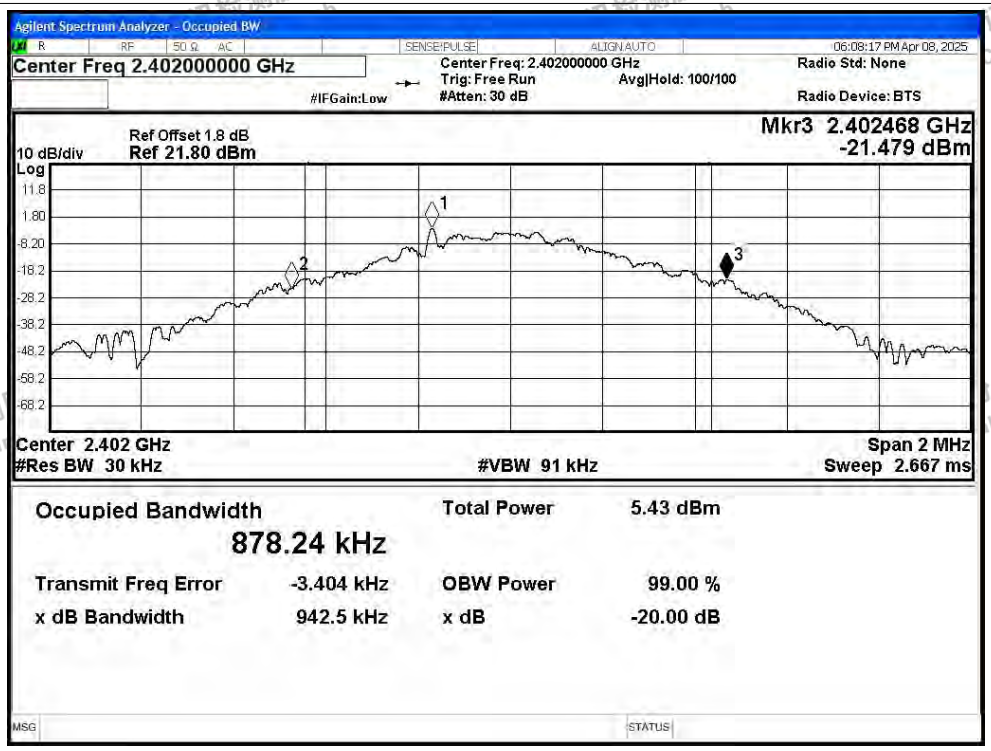
Temperature:	23.8°C
Relative Humidity:	52.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Jerry Chu
Supervised by:	Nick Peng

A.1 -20dB Bandwidth

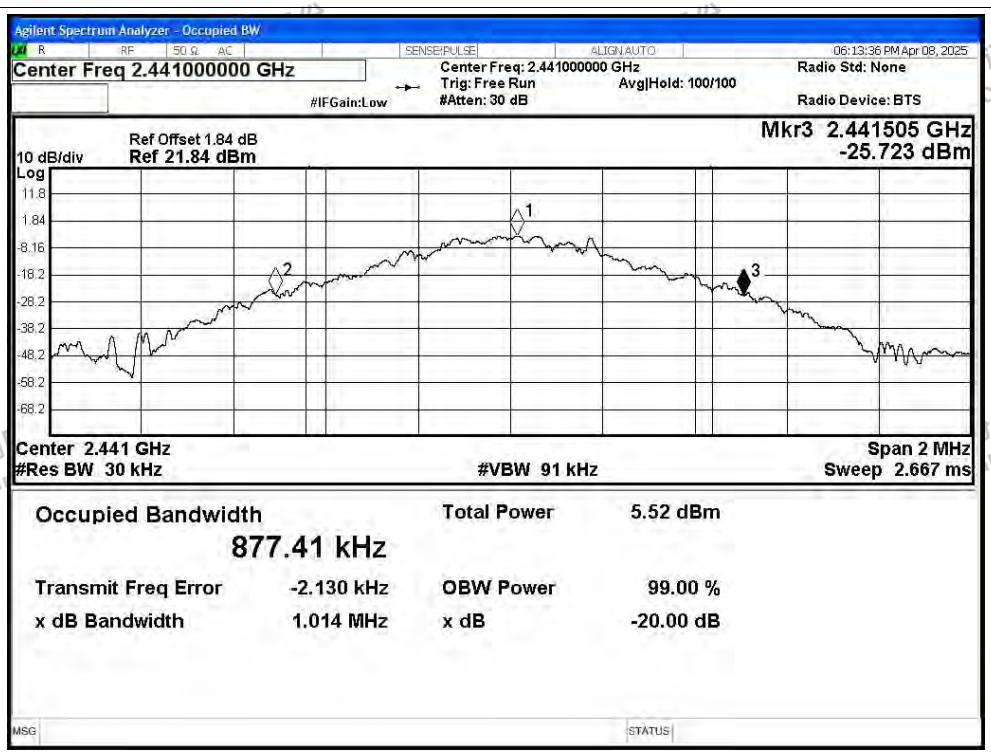
Condition	Mode	Frequency (MHz)	Antenna	-20 dB Bandwidth (MHz)	Limit -20 dB Bandwidth (MHz)	Verdict
NVNT	1-DH5	2402	Ant1	0.942	N/A	Pass
NVNT	1-DH5	2441	Ant1	1.014	N/A	Pass
NVNT	1-DH5	2480	Ant1	0.948	N/A	Pass
NVNT	2-DH5	2402	Ant1	1.288	N/A	Pass
NVNT	2-DH5	2441	Ant1	1.286	N/A	Pass
NVNT	2-DH5	2480	Ant1	1.283	N/A	Pass
NVNT	3-DH5	2402	Ant1	1.298	N/A	Pass
NVNT	3-DH5	2441	Ant1	1.309	N/A	Pass
NVNT	3-DH5	2480	Ant1	1.288	N/A	Pass

Test Graphs

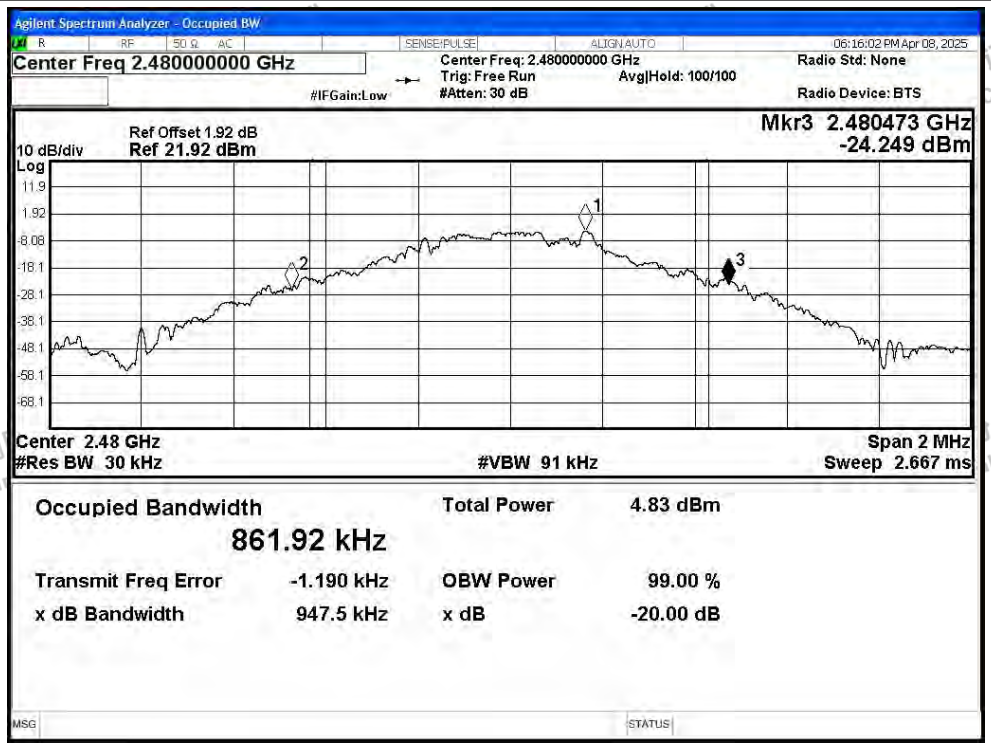
-20dB Bandwidth NVNT 1-DH5 2402MHz Ant1



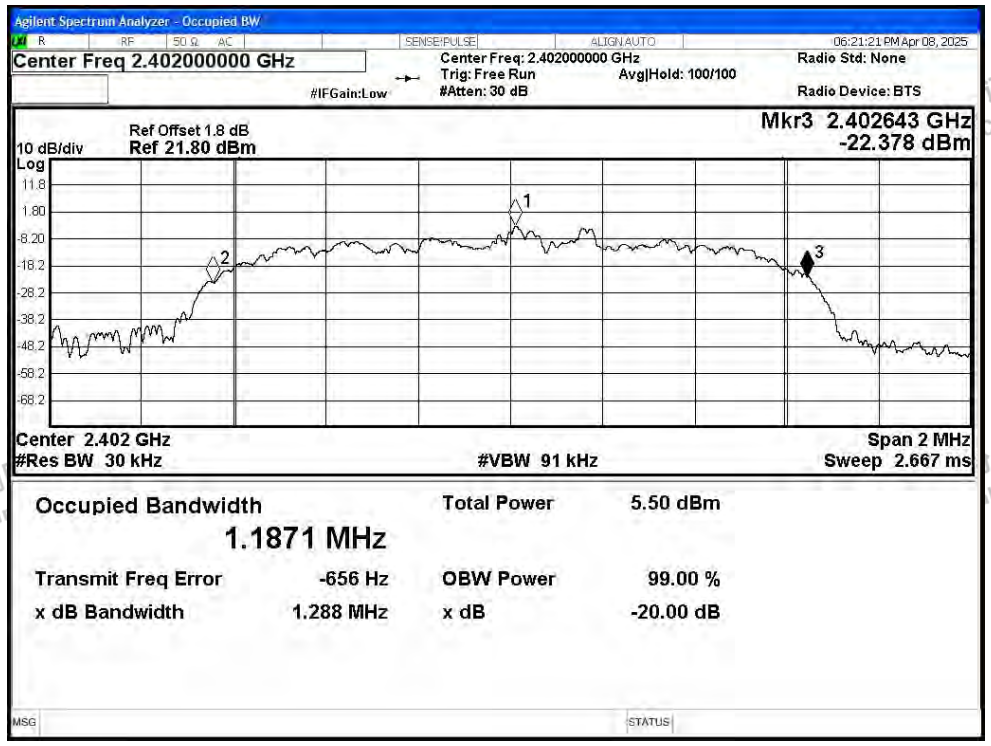
-20dB Bandwidth NVNT 1-DH5 2441MHz Ant1



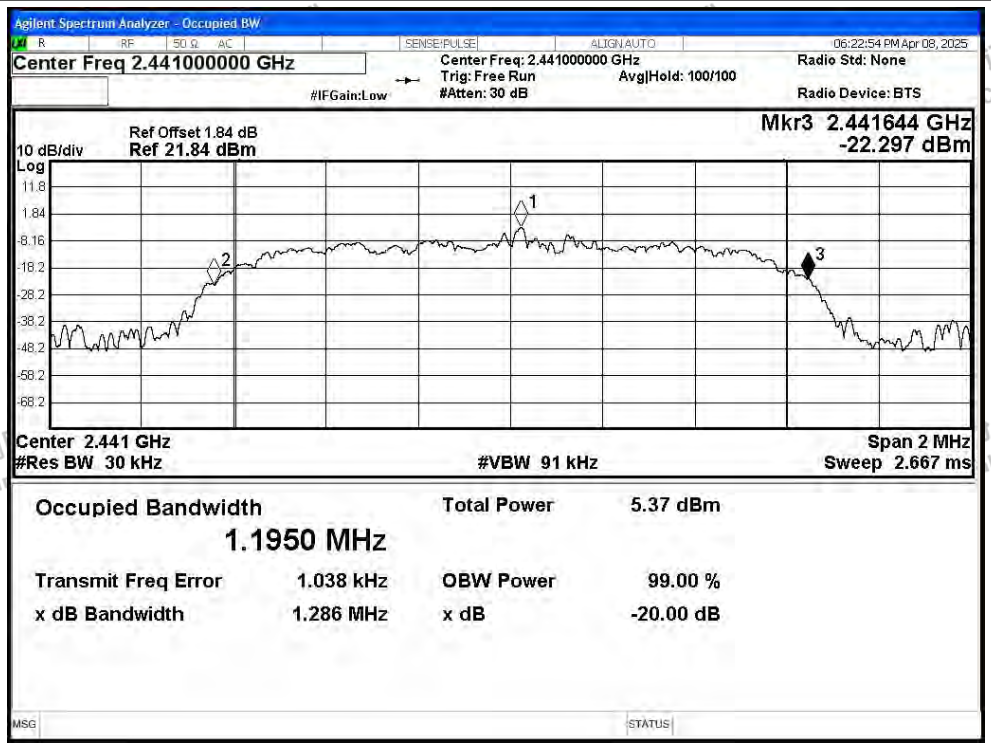
-20dB Bandwidth NVNT 1-DH5 2480MHz Ant1



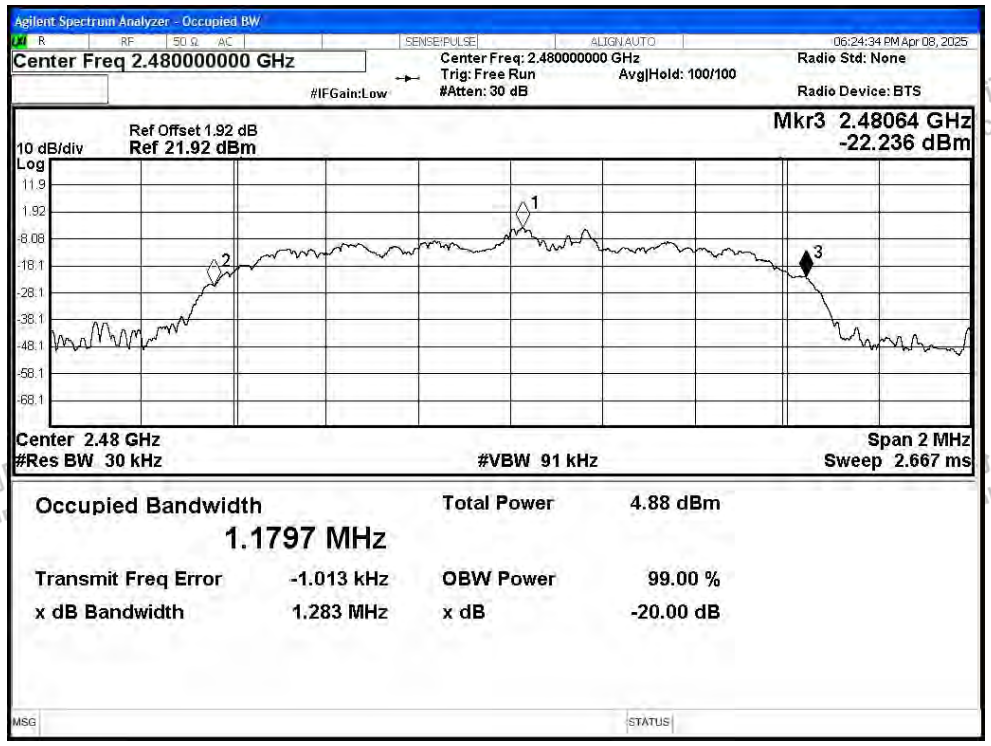
-20dB Bandwidth NVNT 2-DH5 2402MHz Ant1



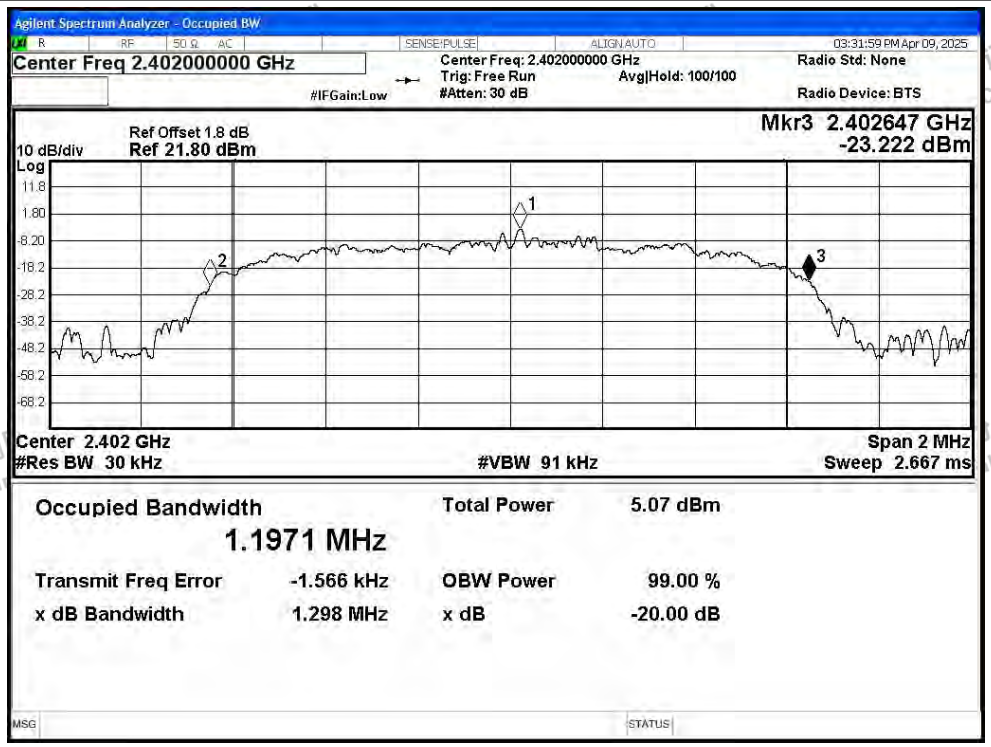
-20dB Bandwidth NVNT 2-DH5 2441MHz Ant1



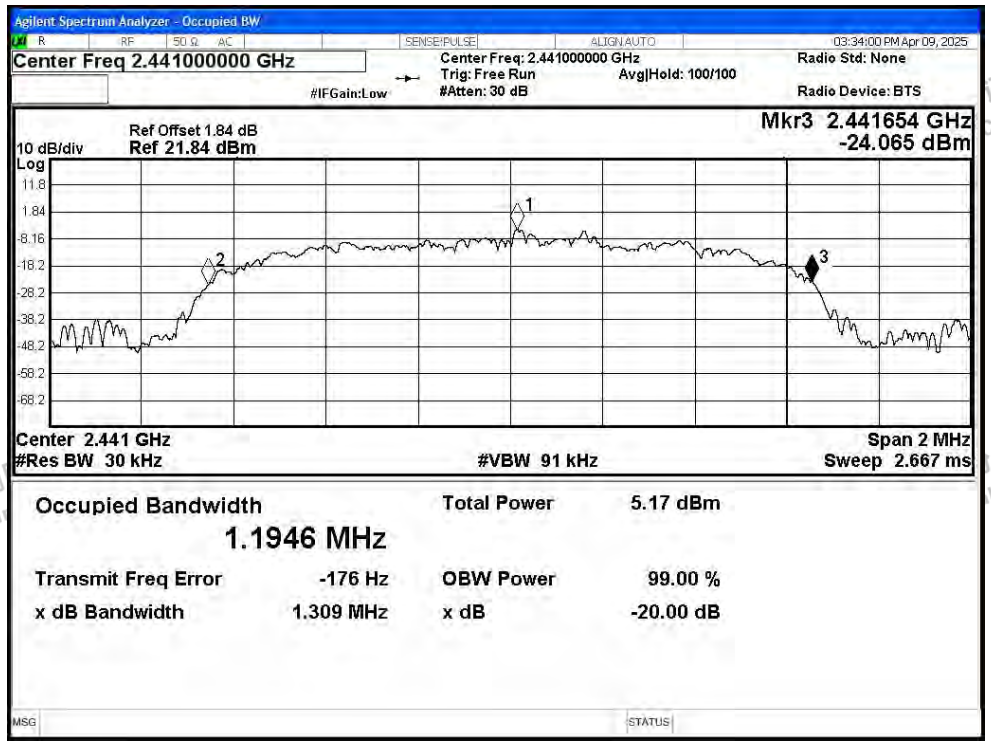
-20dB Bandwidth NVNT 2-DH5 2480MHz Ant1



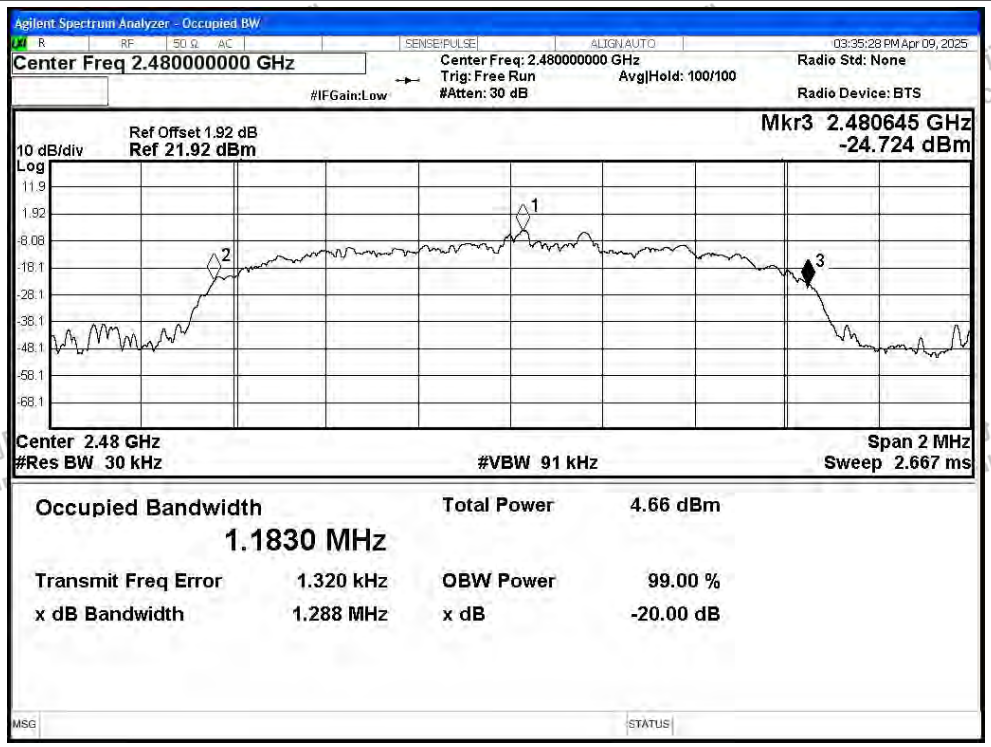
-20dB Bandwidth NVNT 3-DH5 2402MHz Ant1



-20dB Bandwidth NVNT 3-DH5 2441MHz Ant1



-20dB Bandwidth NVNT 3-DH5 2480MHz Ant1

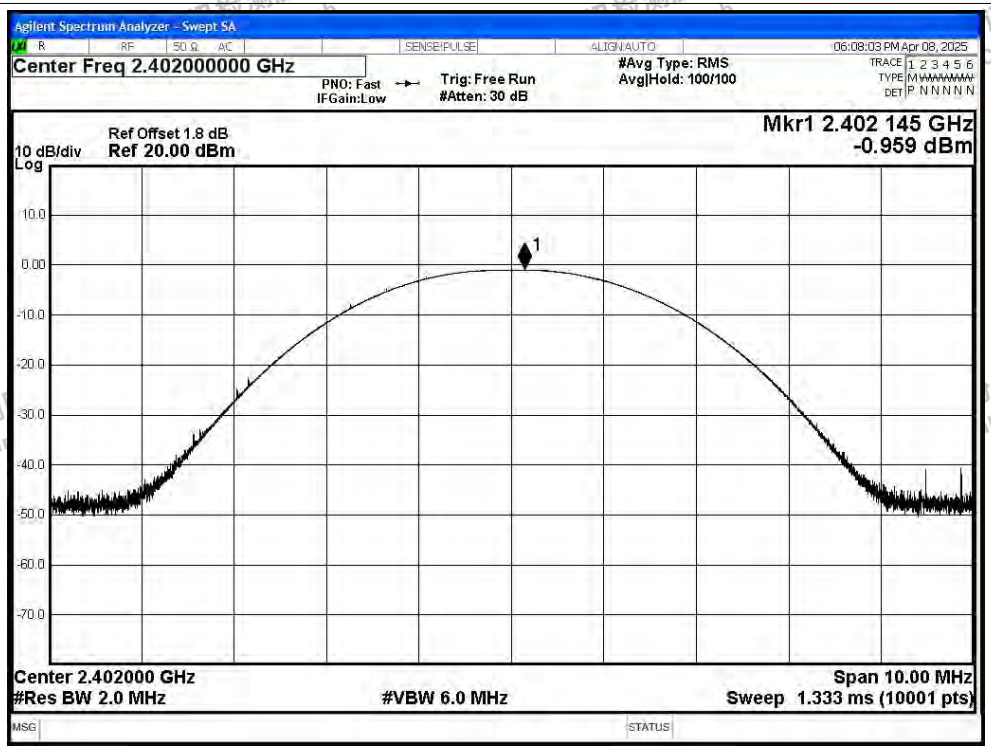


A.2 Maximum Peak Conducted Output Power

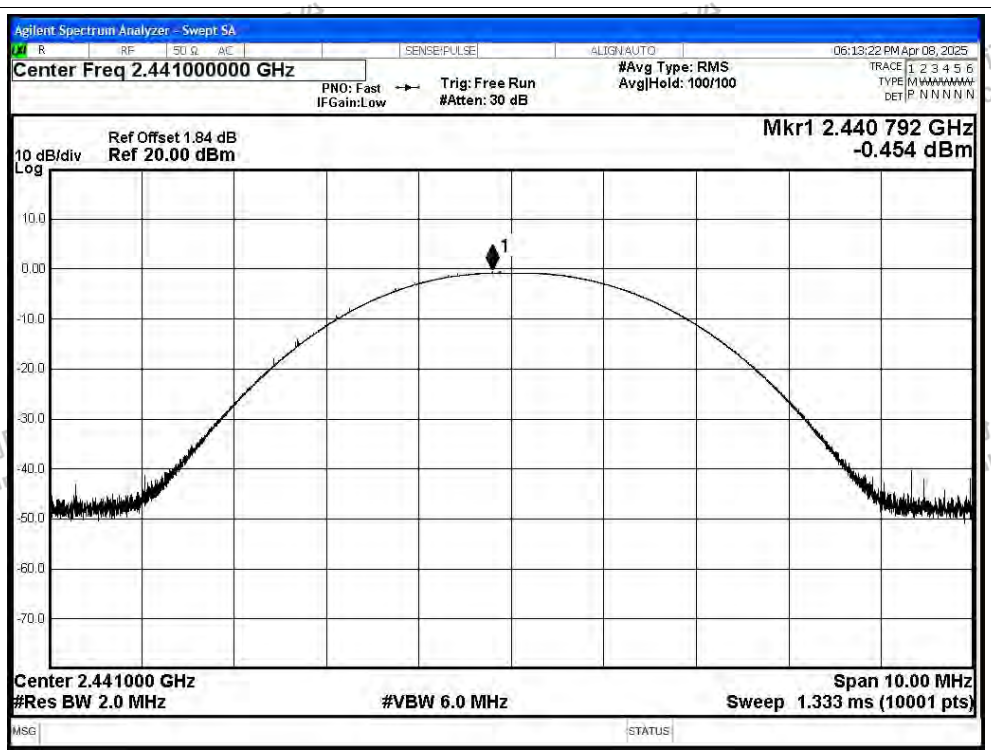
Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	1-DH5	2402	Ant1	-0.96	21	Pass
NVNT	1-DH5	2441	Ant1	-0.45	21	Pass
NVNT	1-DH5	2480	Ant1	-1.55	21	Pass
NVNT	2-DH5	2402	Ant1	1.14	21	Pass
NVNT	2-DH5	2441	Ant1	1.34	21	Pass
NVNT	2-DH5	2480	Ant1	0.24	21	Pass
NVNT	3-DH5	2402	Ant1	1.22	21	Pass
NVNT	3-DH5	2441	Ant1	1.45	21	Pass
NVNT	3-DH5	2480	Ant1	0.43	21	Pass

Test Graphs

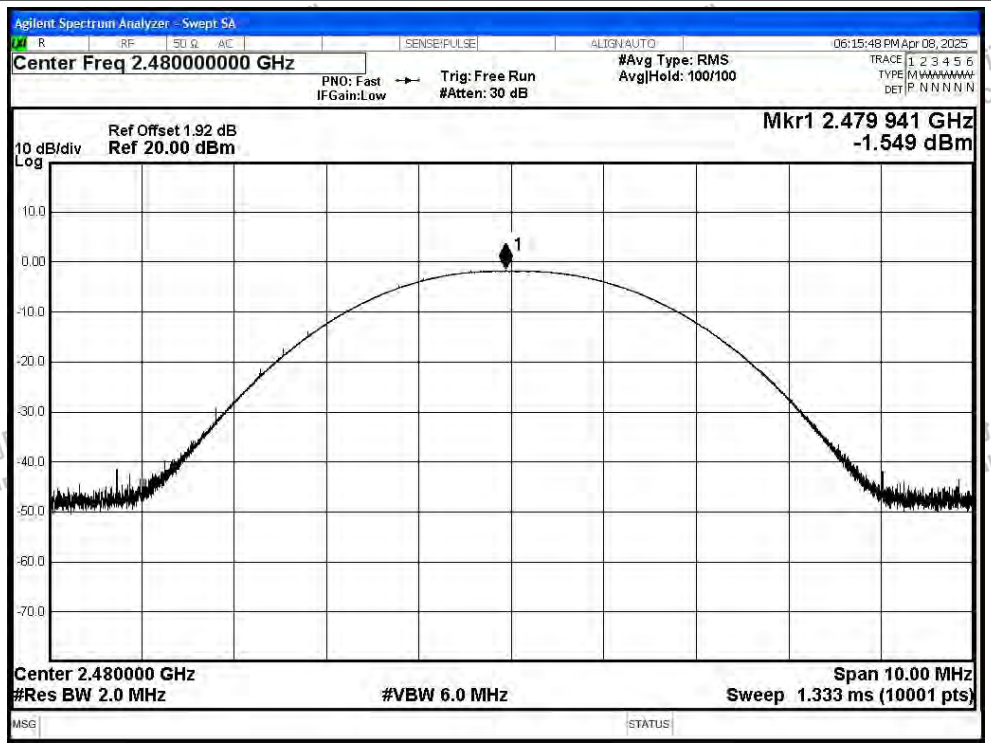
Power NVNT 1-DH5 2402MHz Ant1



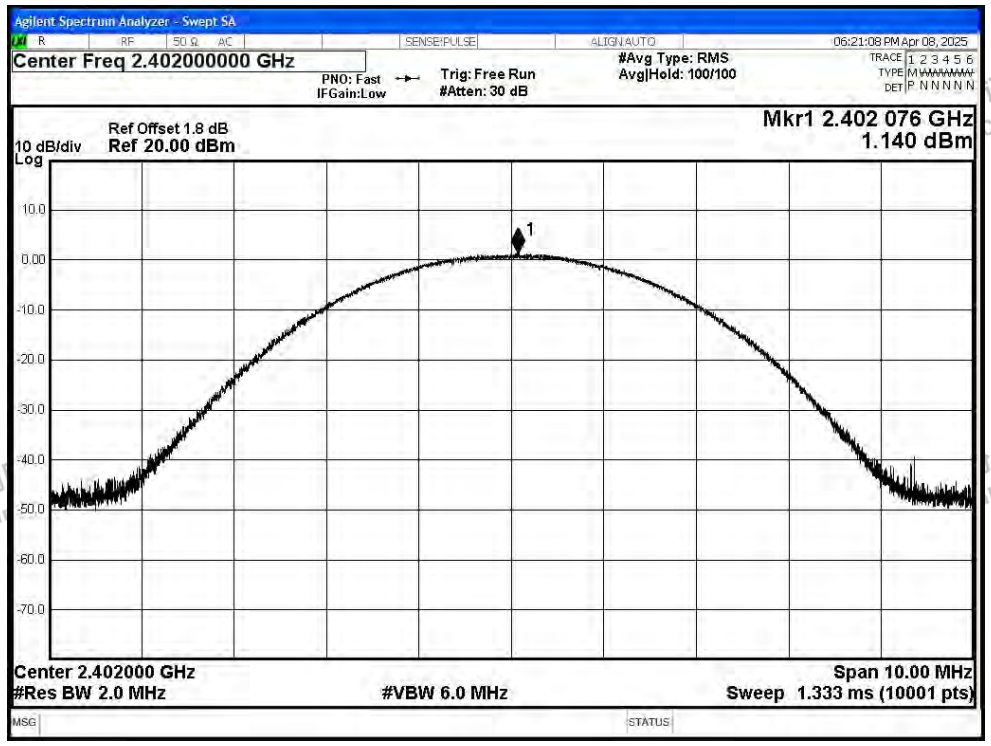
Power NVNT 1-DH5 2441MHz Ant1



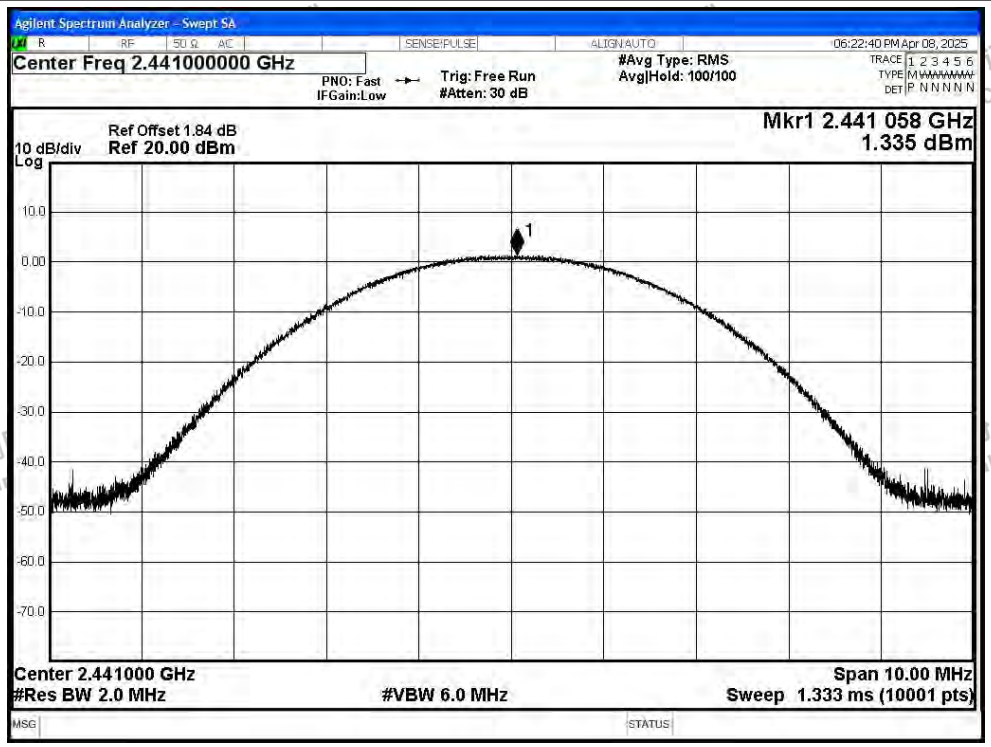
Power NVNT 1-DH5 2480MHz Ant1



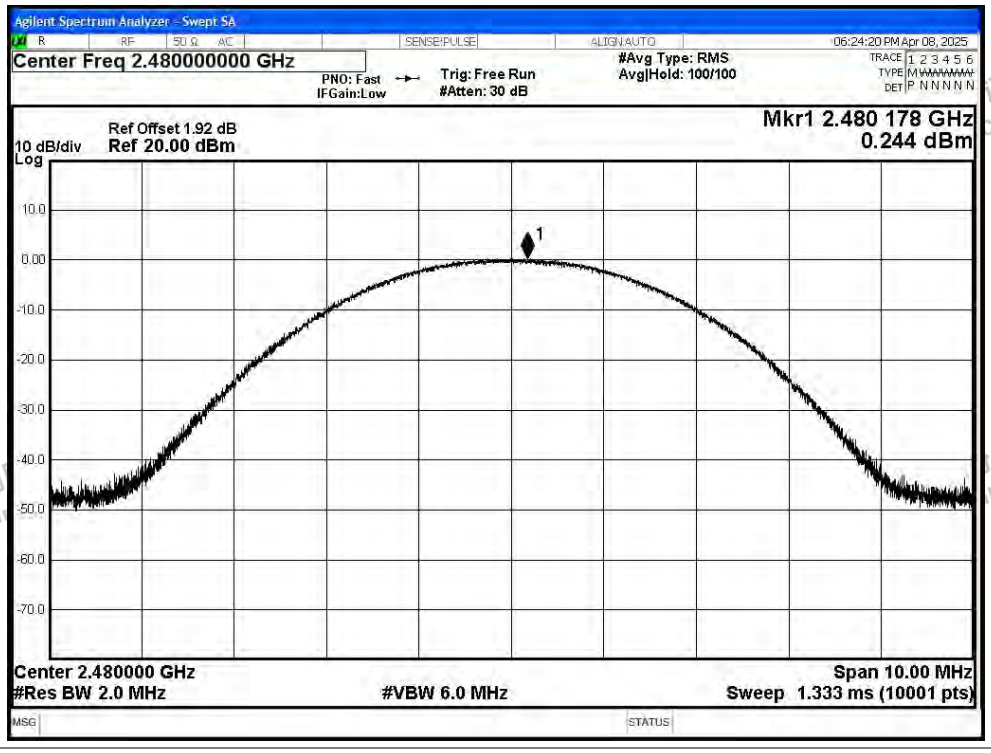
Power NVNT 2-DH5 2402MHz Ant1



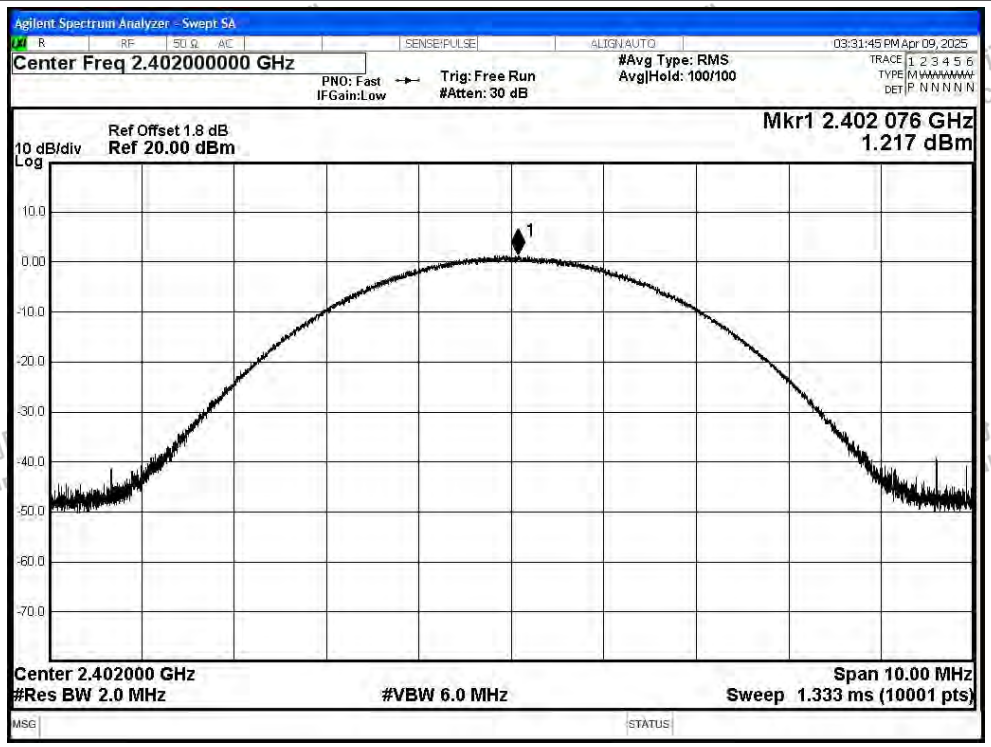
Power NVNT 2-DH5 2441MHz Ant1



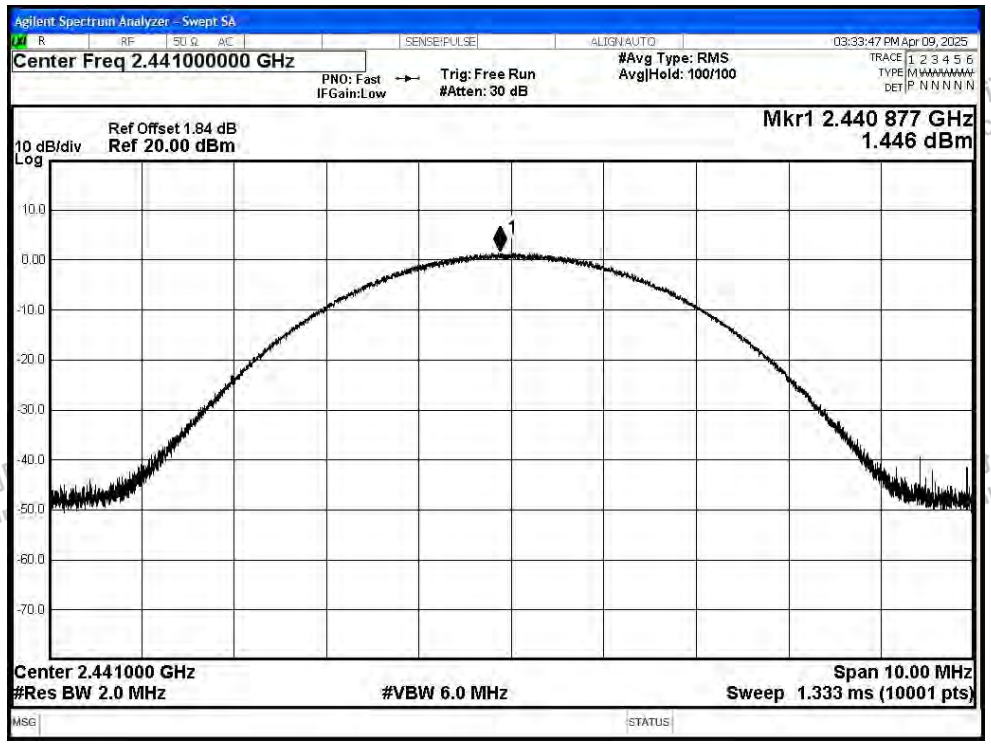
Power NVNT 2-DH5 2480MHz Ant1



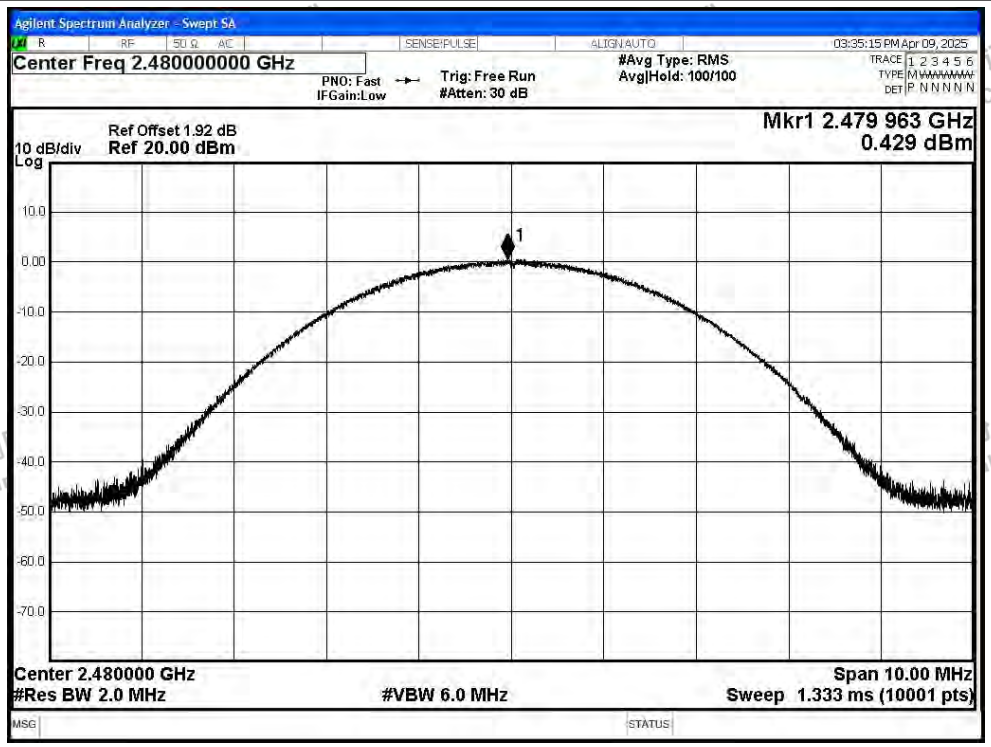
Power NVNT 3-DH5 2402MHz Ant1



Power NVNT 3-DH5 2441MHz Ant1



Power NVNT 3-DH5 2480MHz Ant1

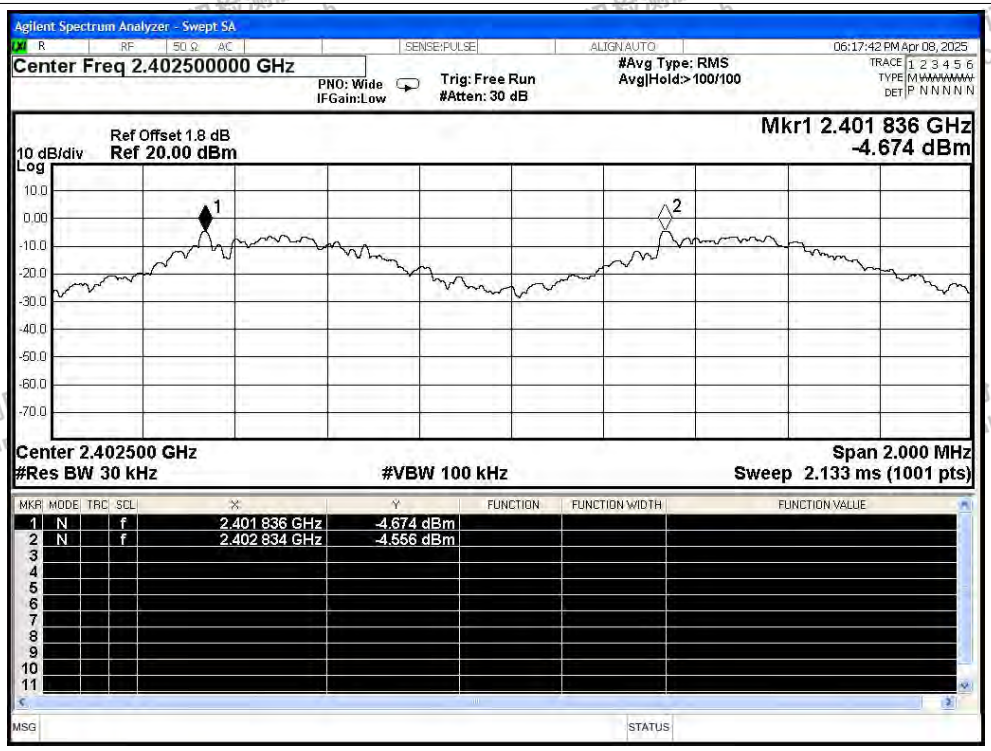


A.3 Carrier Frequencies Separation

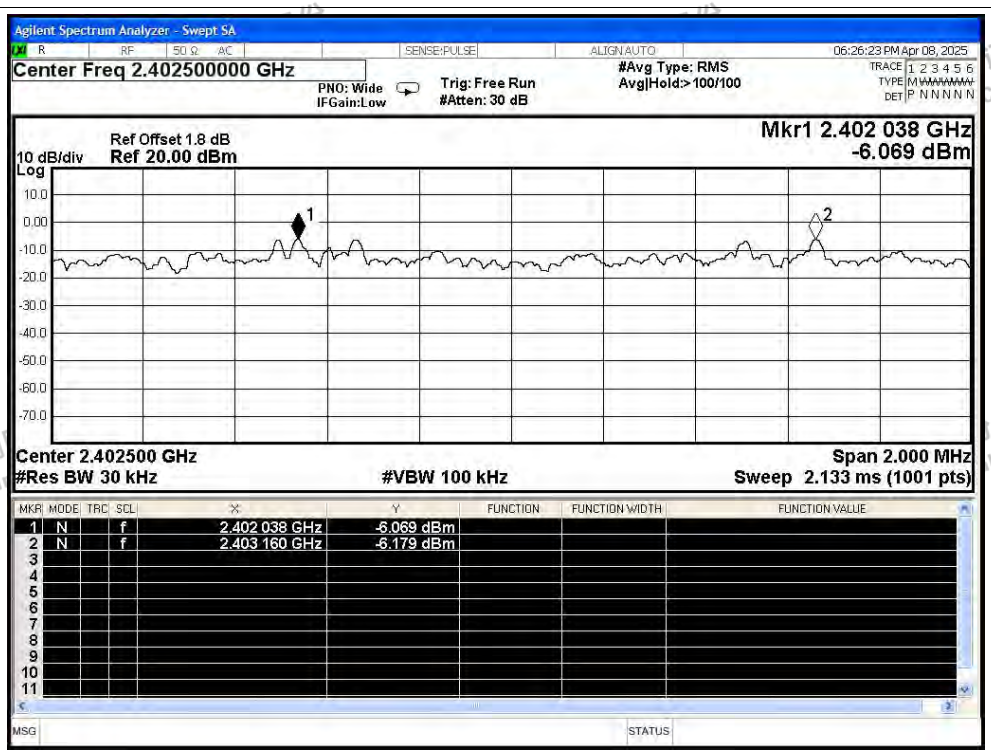
Condition	Mode	Antenna	Hopping Freq1 (MHz)	Hopping Freq2 (MHz)	HFS (MHz)	Limit (MHz)	Verdict
NVNT	1-DH5	Ant1	2401.836	2402.834	0.998	0.676	Pass
NVNT	2-DH5	Ant1	2402.038	2403.16	1.122	0.859	Pass
NVNT	3-DH5	Ant1	2402.03	2403.03	1	0.873	Pass

Test Graphs

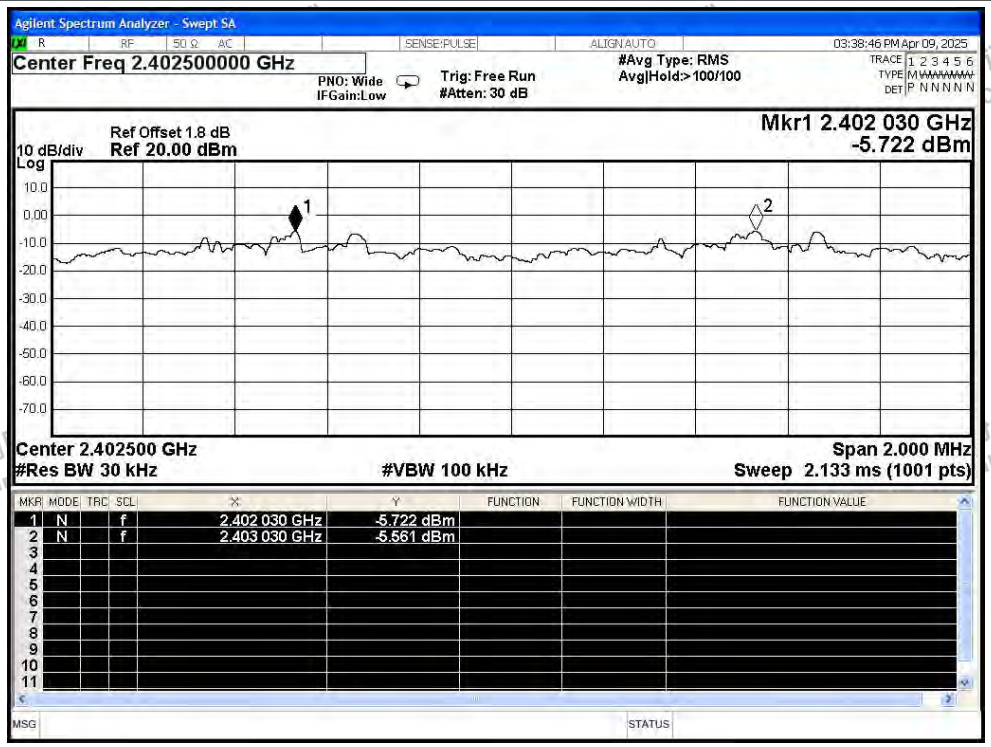
CFS NVNT 1-DH5 2402MHz Ant1



CFS NVNT 2-DH5 2402MHz Ant1



CFS NVNT 3-DH5 2402MHz Ant1

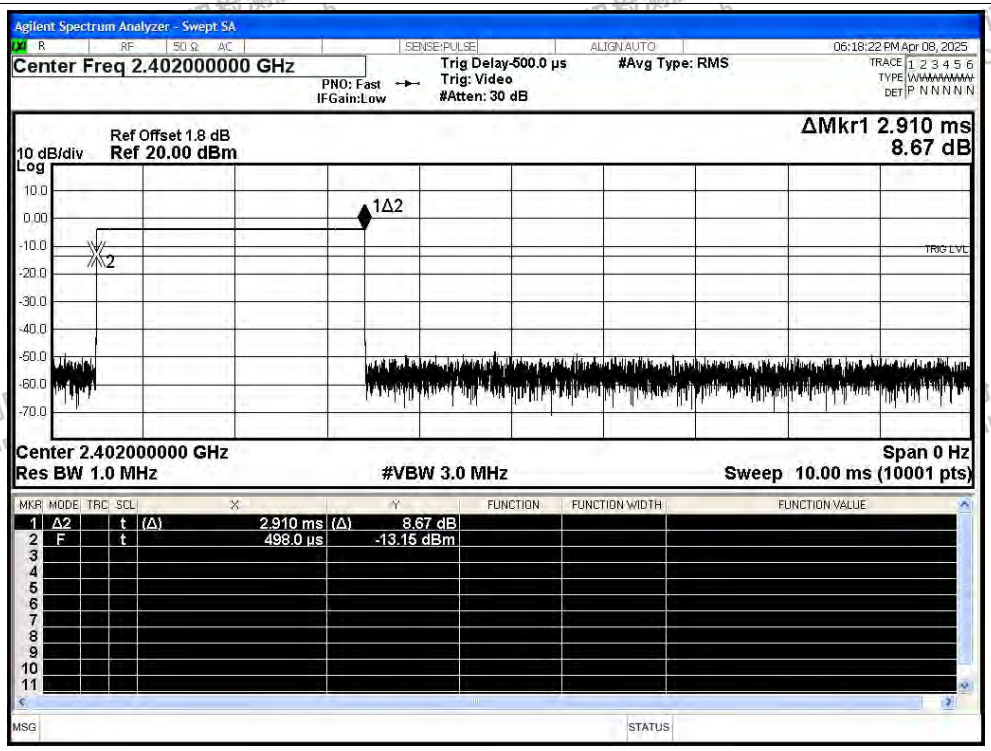


A.4 Dwell Time

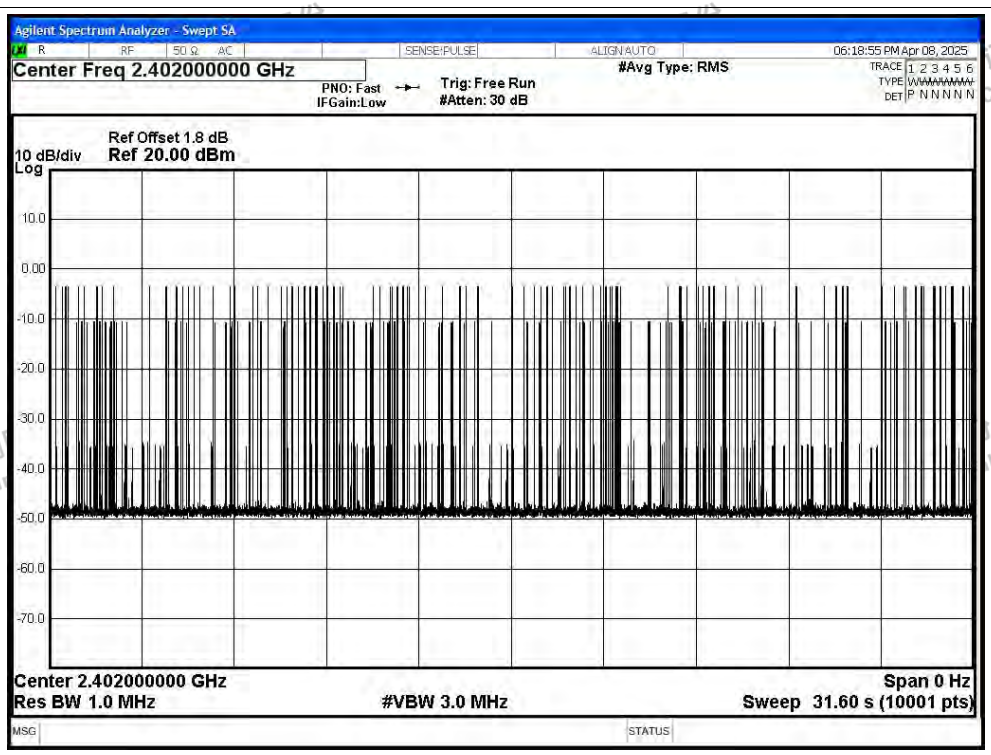
Condition	Mode	Frequency (MHz)	Antenna	Pulse Time (ms)	Total Dwell Time (ms)	Burst Count	Period Time (ms)	Limit (ms)	Verdict
NVNT	1-DH5	2402	Ant1	2.91	325.92	112	31600	400	Pass
NVNT	2-DH5	2402	Ant1	2.898	307.188	106	31600	400	Pass
NVNT	3-DH5	2402	Ant1	2.897	269.421	93	31600	400	Pass

Test Graphs

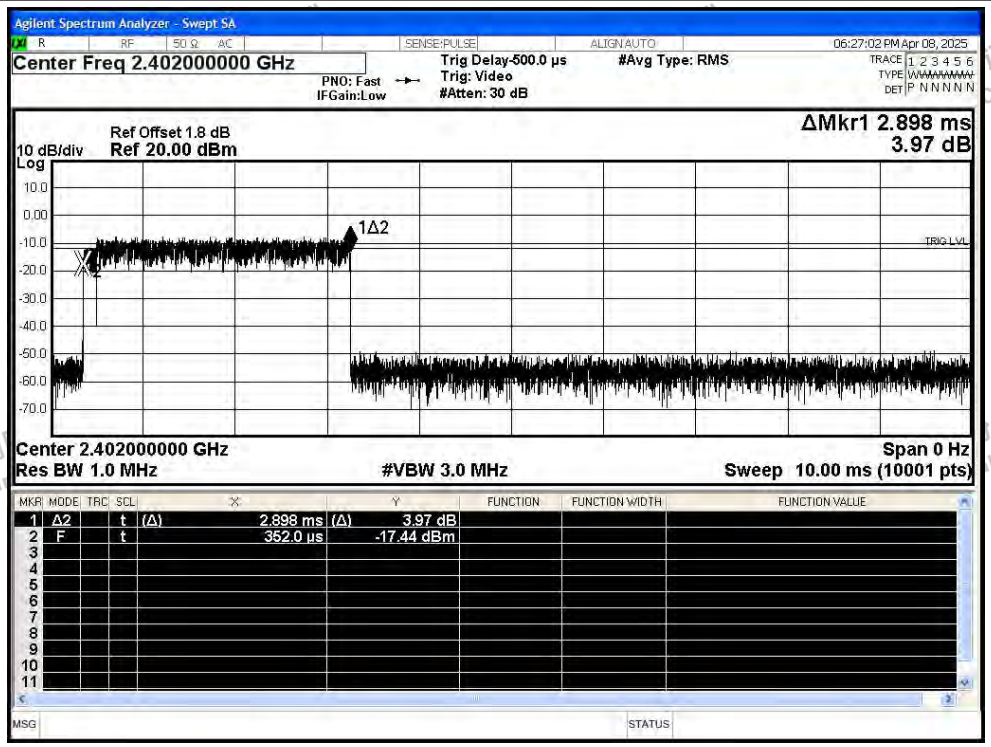
Dwell NVNT 1-DH5 2402MHz Ant1 One Burst



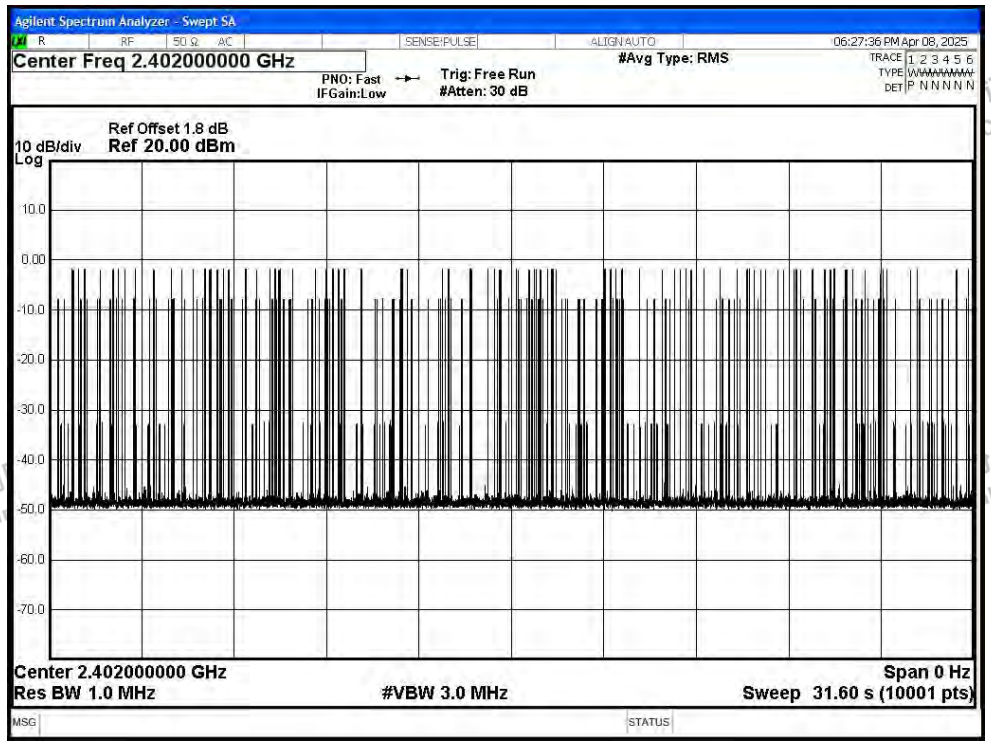
Dwell NVNT 1-DH5 2402MHz Ant1 Accumulated



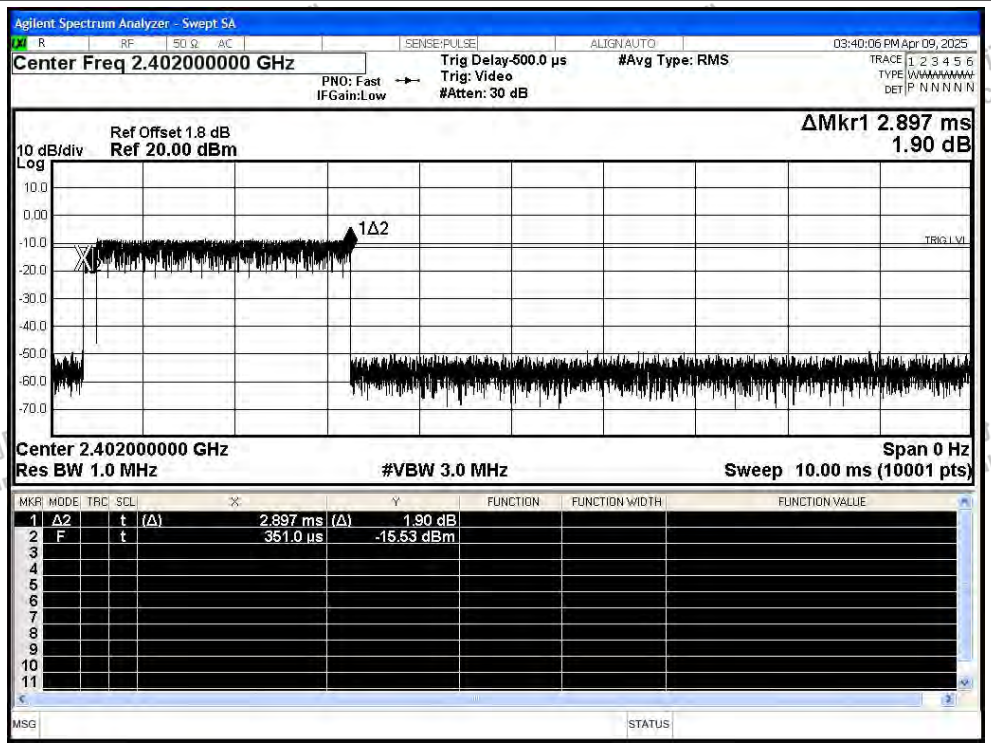
Dwell NVNT 2-DH5 2402MHz Ant1 One Burst



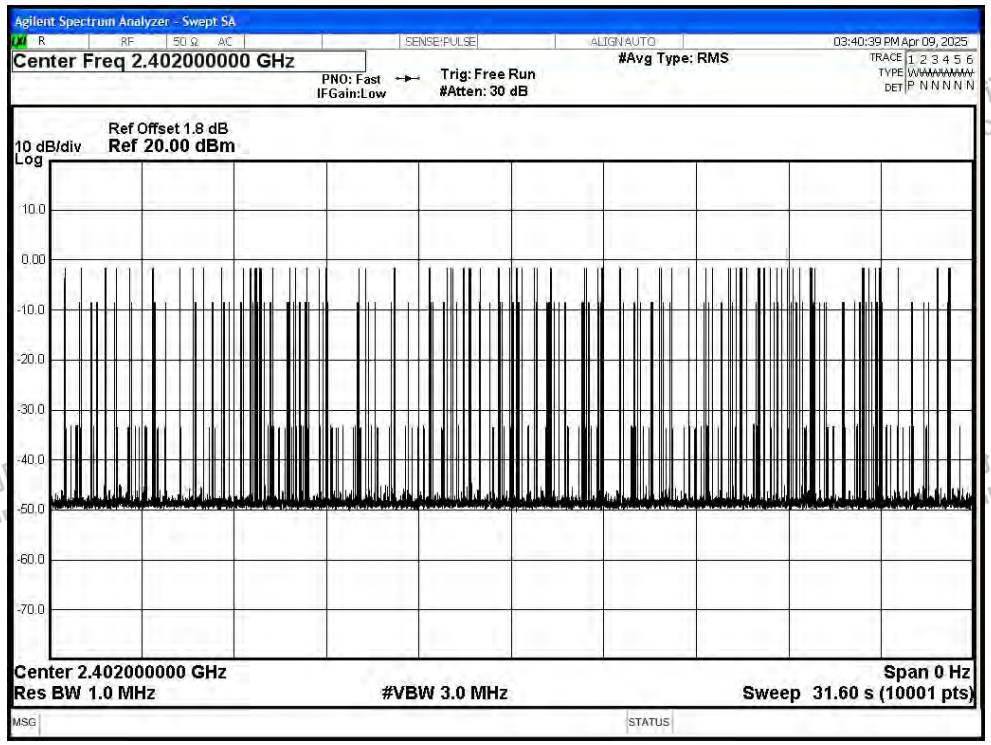
Dwell NVNT 2-DH5 2402MHz Ant1 Accumulated



Dwell NVNT 3-DH5 2402MHz Ant1 One Burst



Dwell NVNT 3-DH5 2402MHz Ant1 Accumulated

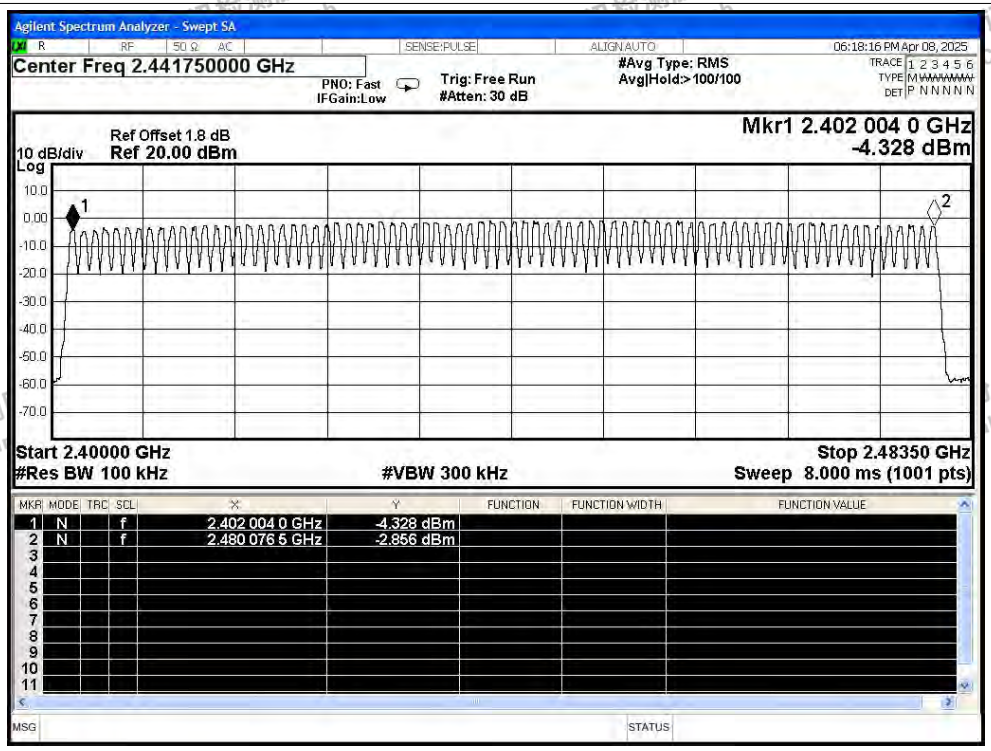


A.5 Number of Hopping Channel

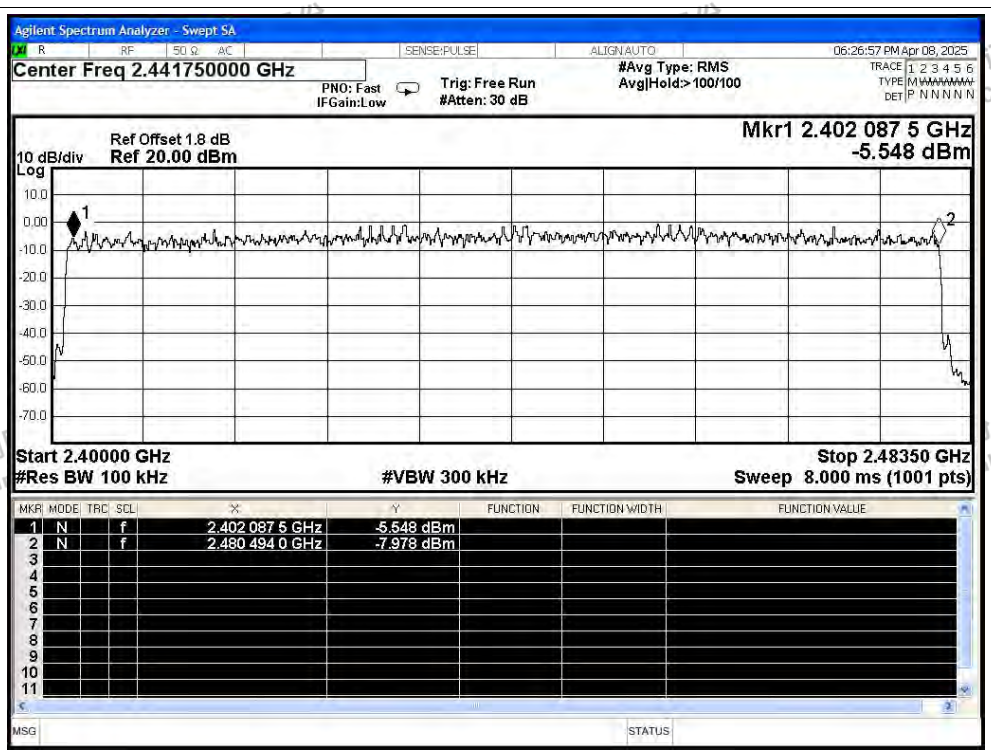
Condition	Mode	Antenna	Hopping Number	Limit	Verdict
NVNT	1-DH5	Ant1	79	15	Pass
NVNT	2-DH5	Ant1	79	15	Pass
NVNT	3-DH5	Ant1	79	15	Pass

Test Graphs

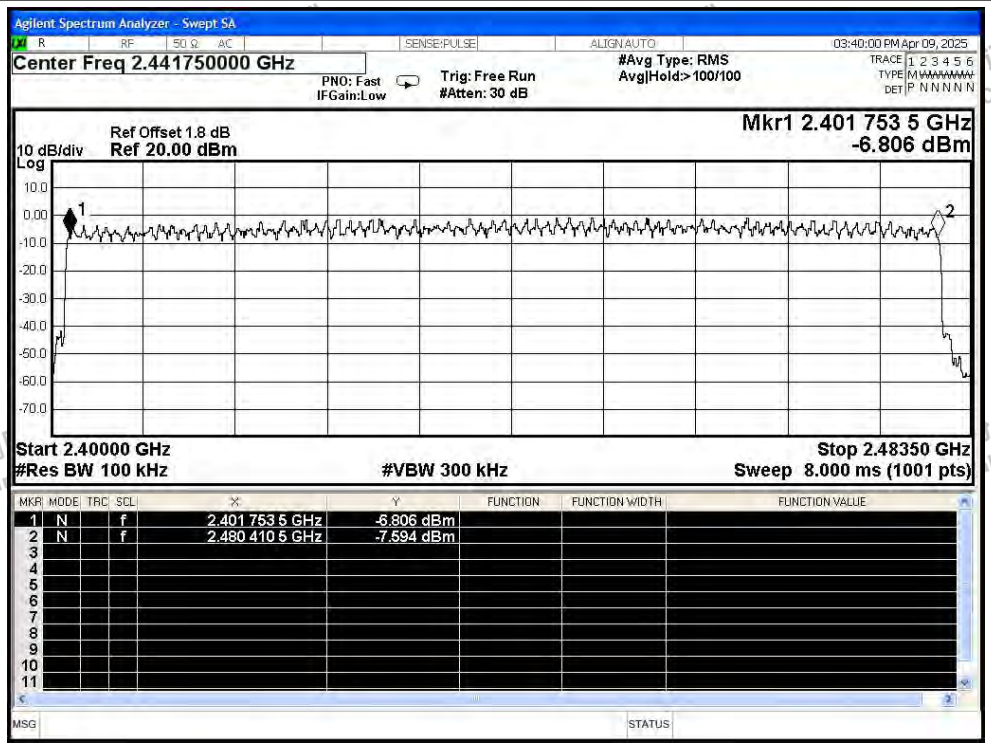
Hopping No. NVNT 1-DH5 2402MHz Ant1



Hopping No. NVNT 2-DH5 2402MHz Ant1



Hopping No. NVNT 3-DH5 2402MHz Ant1

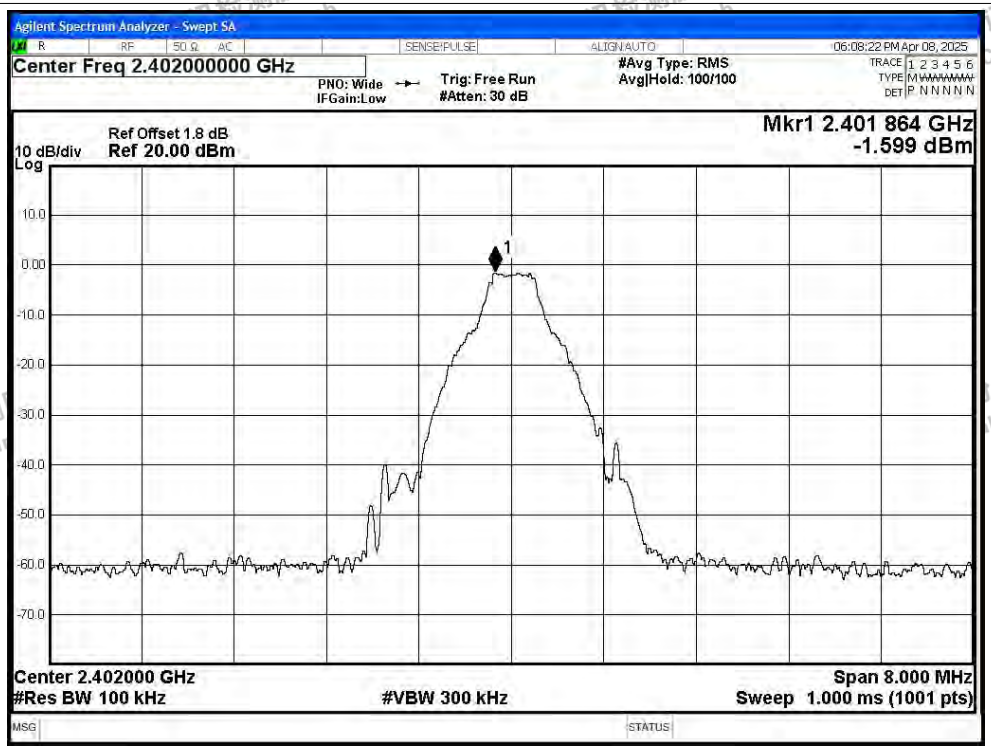


A.6 Band Edge

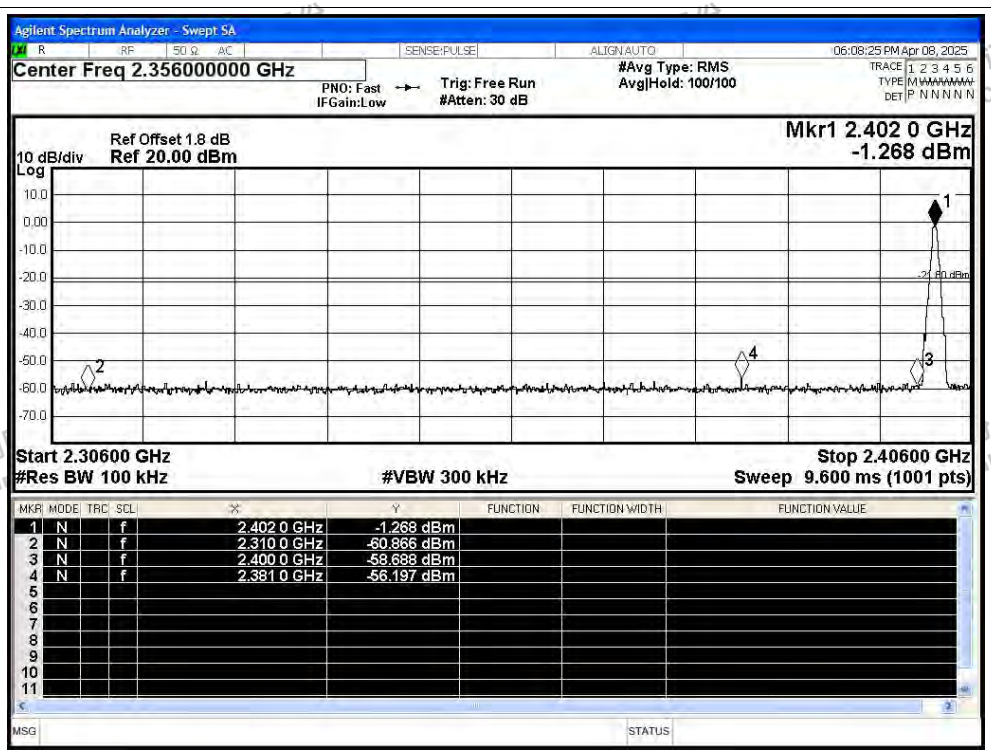
Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH5	2402	Ant1	No-Hopping	-54.6	-20	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	-54.71	-20	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	-51.62	-20	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	-54.36	-20	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	-51.17	-20	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	-54.31	-20	Pass

Test Graphs

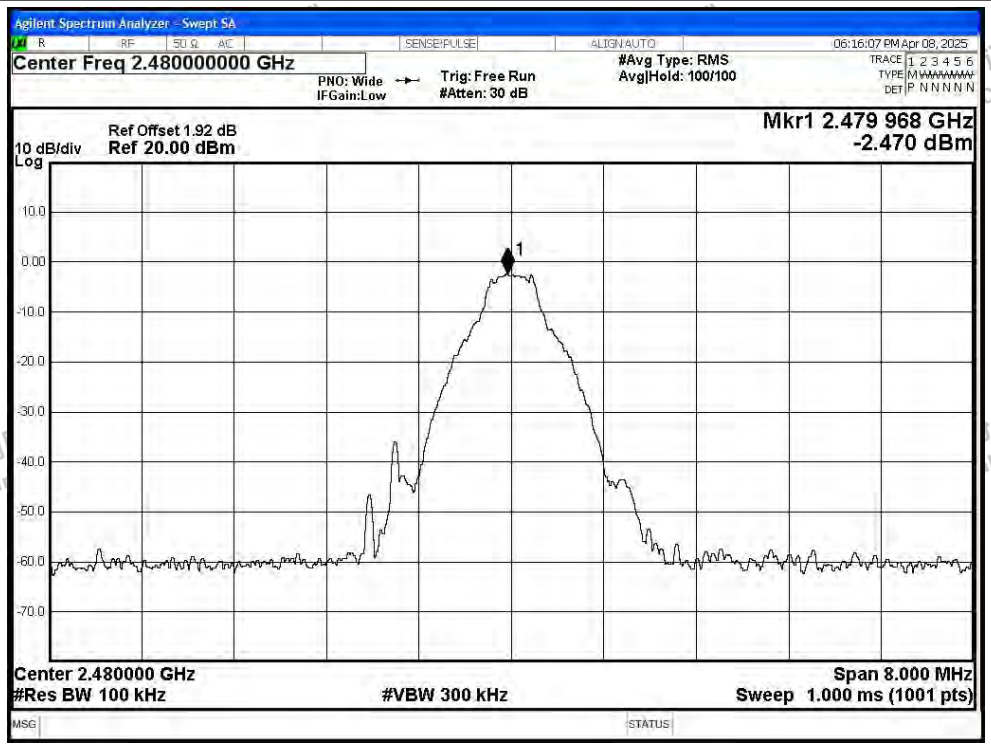
Band Edge NVNT 1-DH5 2402MHz Ant1 No-Hopping Ref



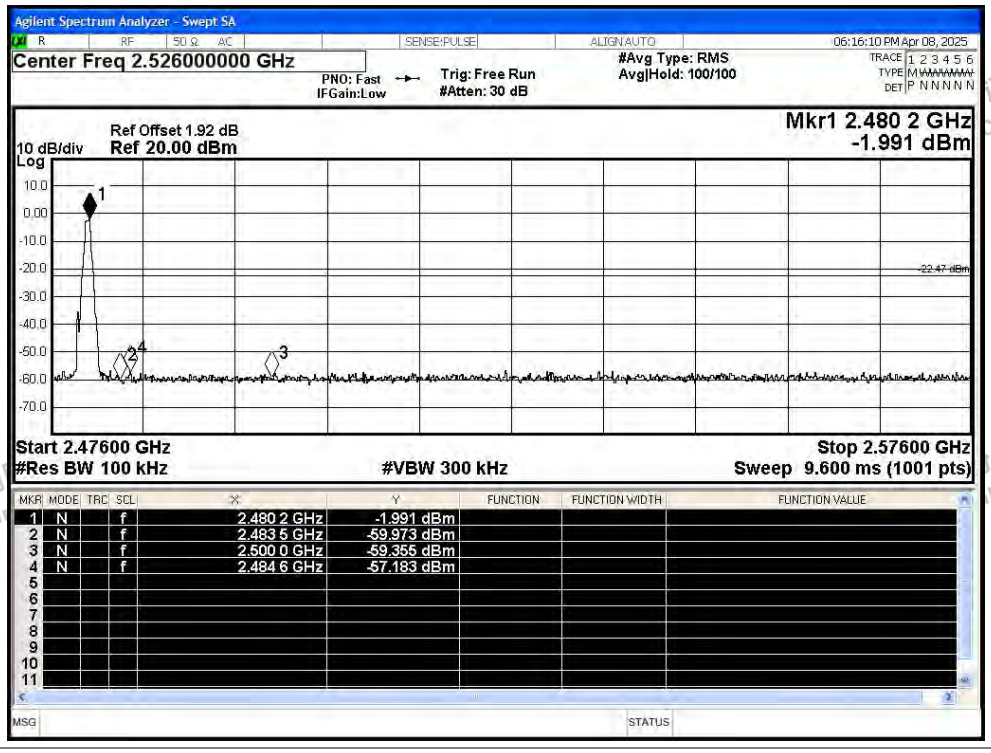
Band Edge NVNT 1-DH5 2402MHz Ant1 No-Hopping Emission



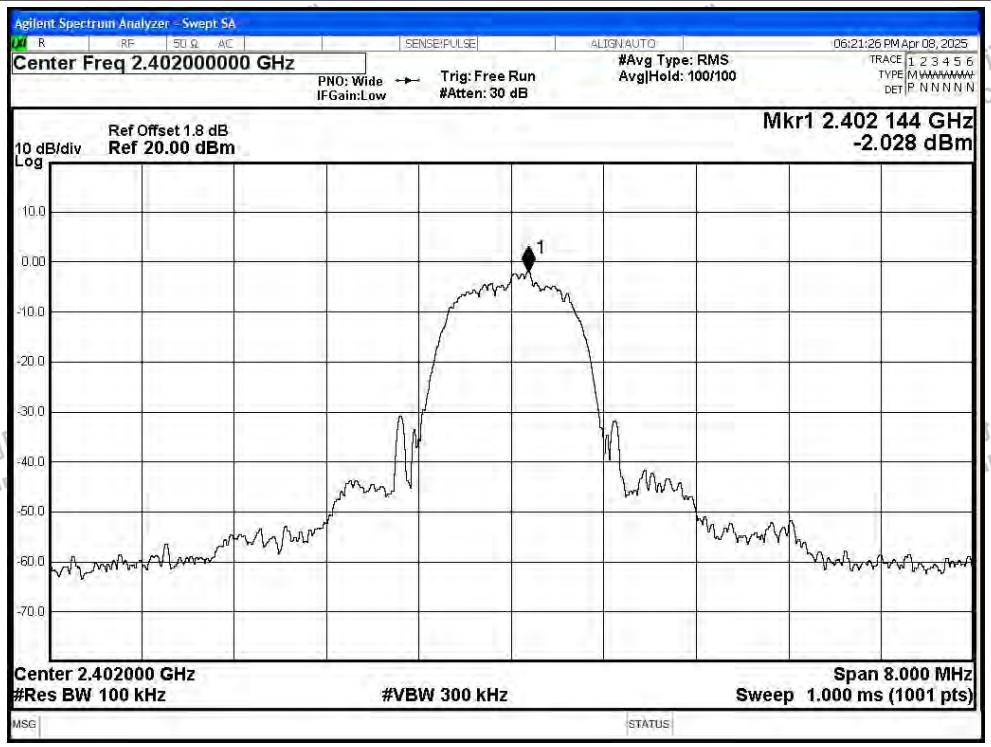
Band Edge NVNT 1-DH5 2480MHz Ant1 No-Hopping Ref



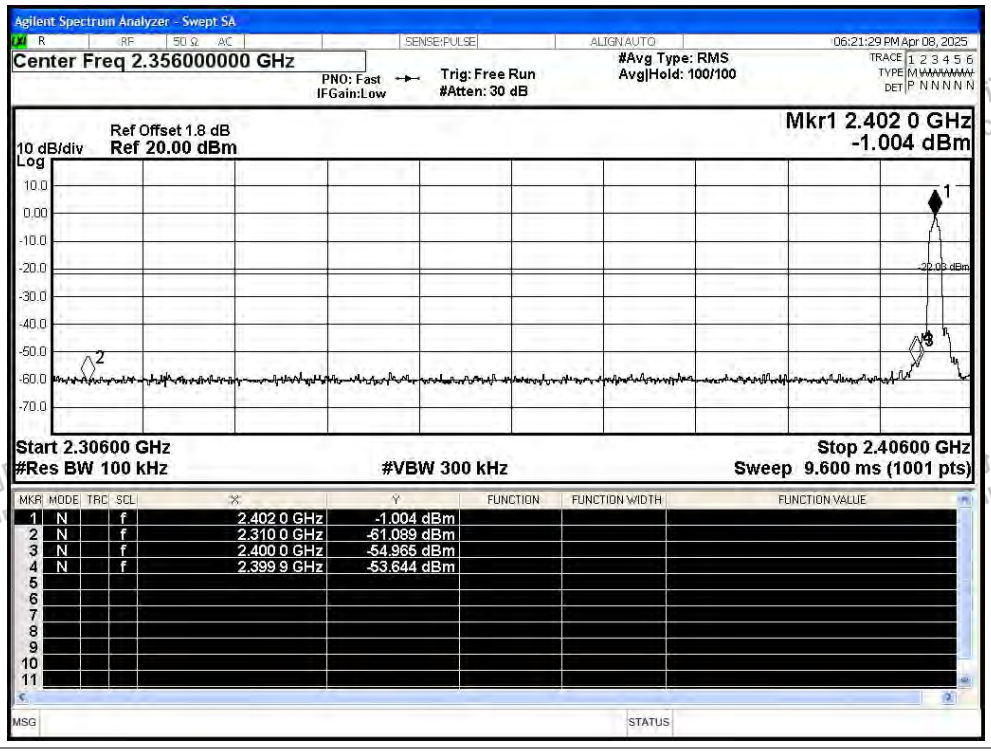
Band Edge NVNT 1-DH5 2480MHz Ant1 No-Hopping Emission



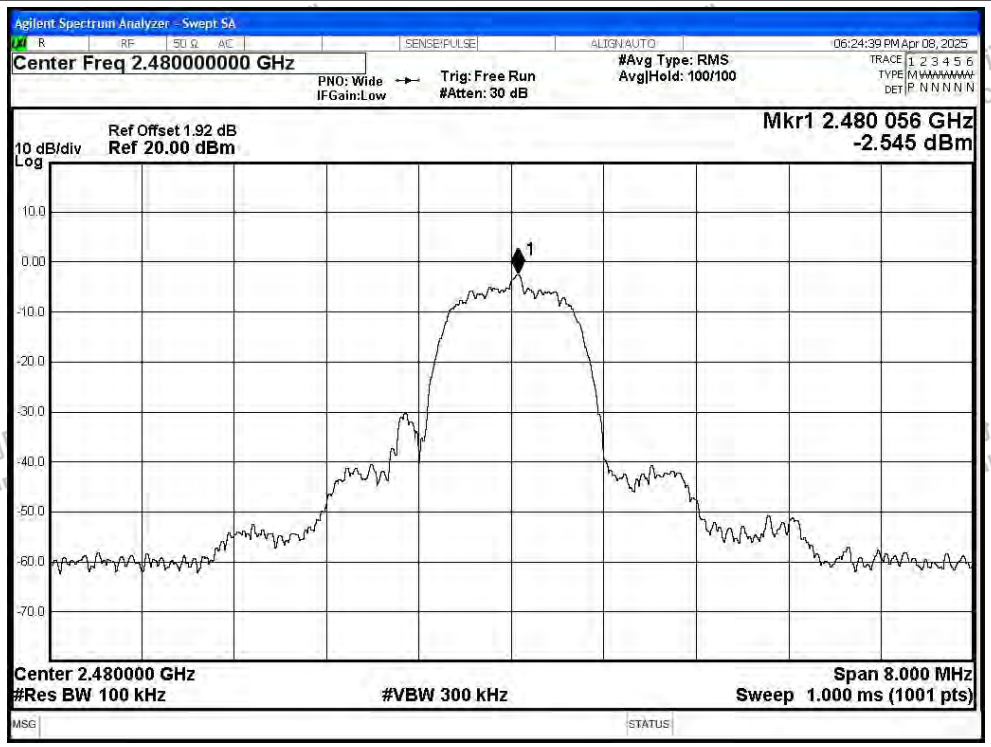
Band Edge NVNT 2-DH5 2402MHz Ant1 No-Hopping Ref



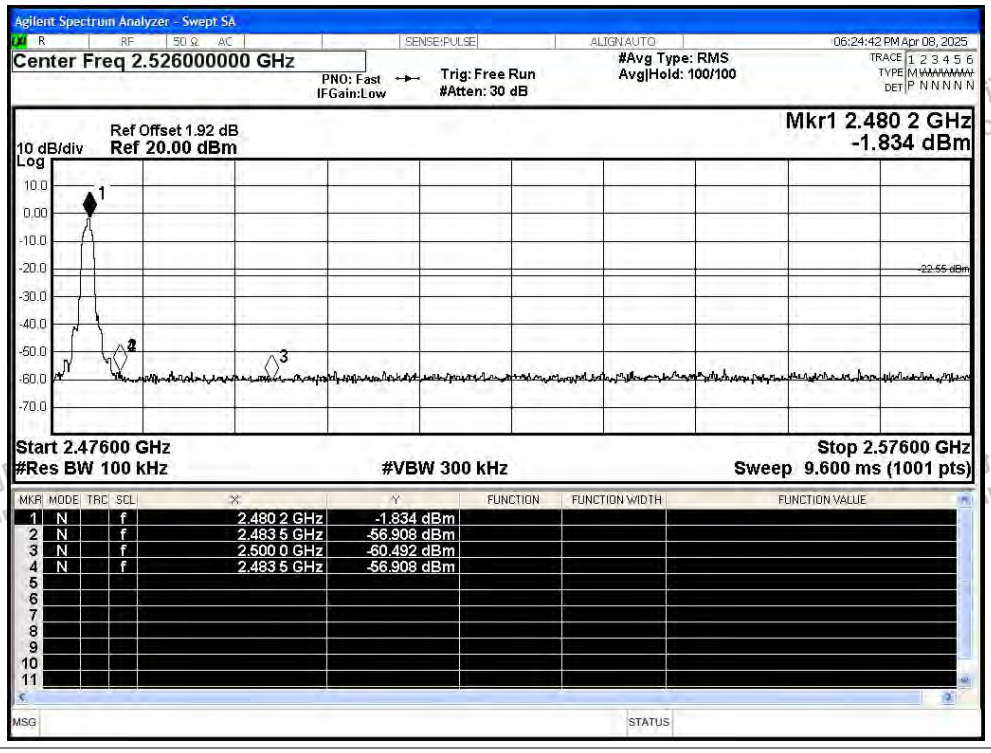
Band Edge NVNT 2-DH5 2402MHz Ant1 No-Hopping Emission



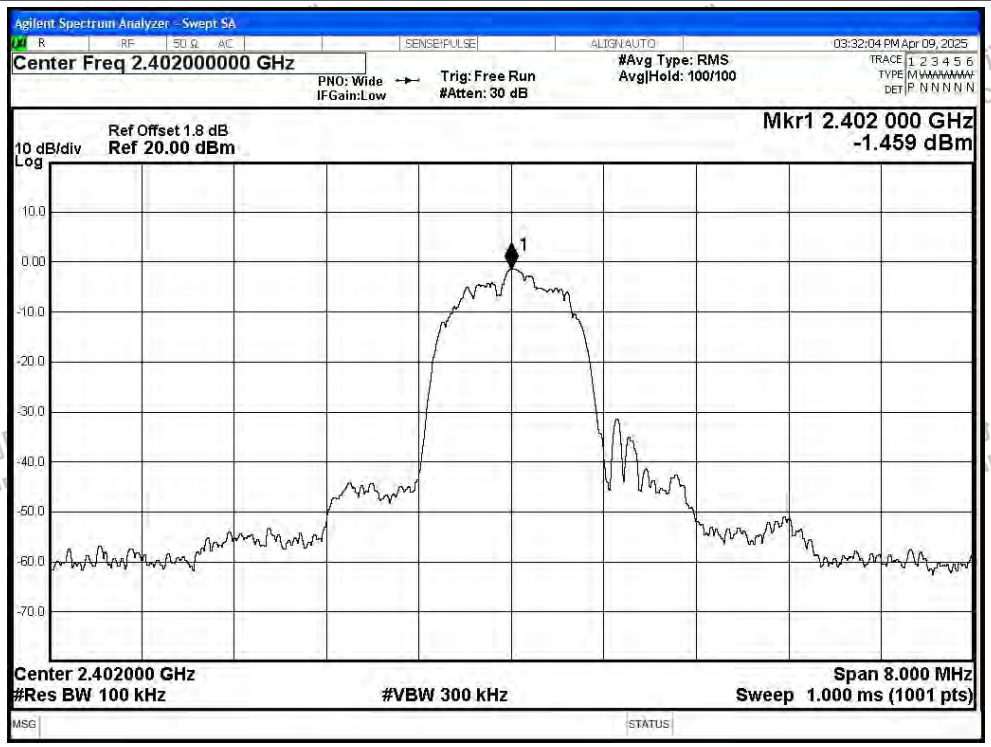
Band Edge NVNT 2-DH5 2480MHz Ant1 No-Hopping Ref



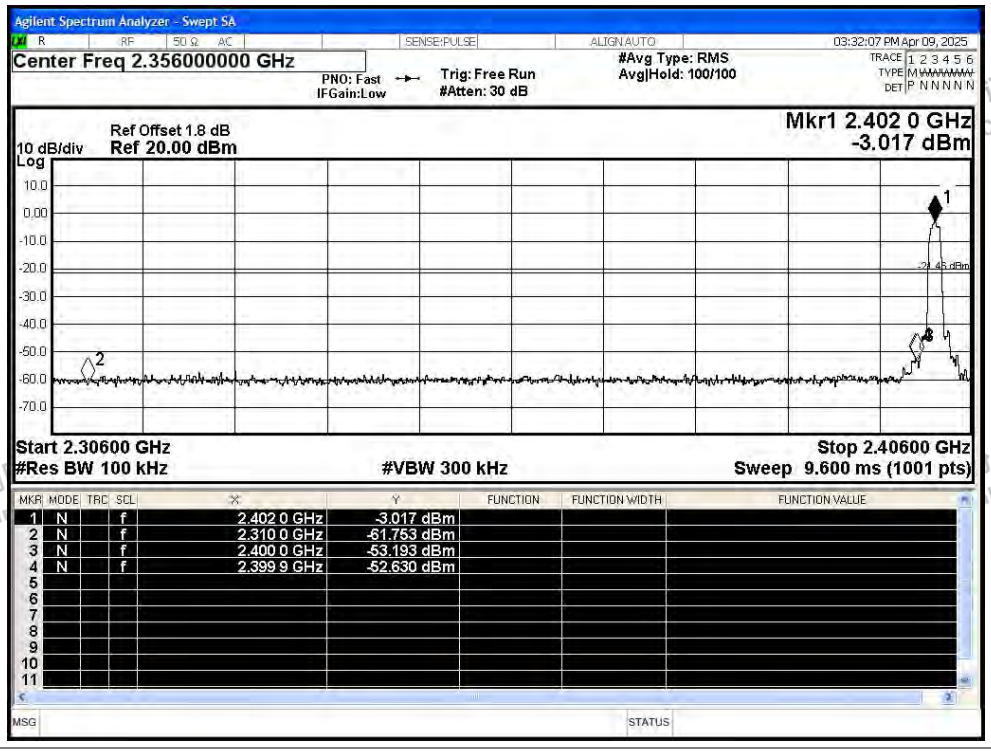
Band Edge NVNT 2-DH5 2480MHz Ant1 No-Hopping Emission



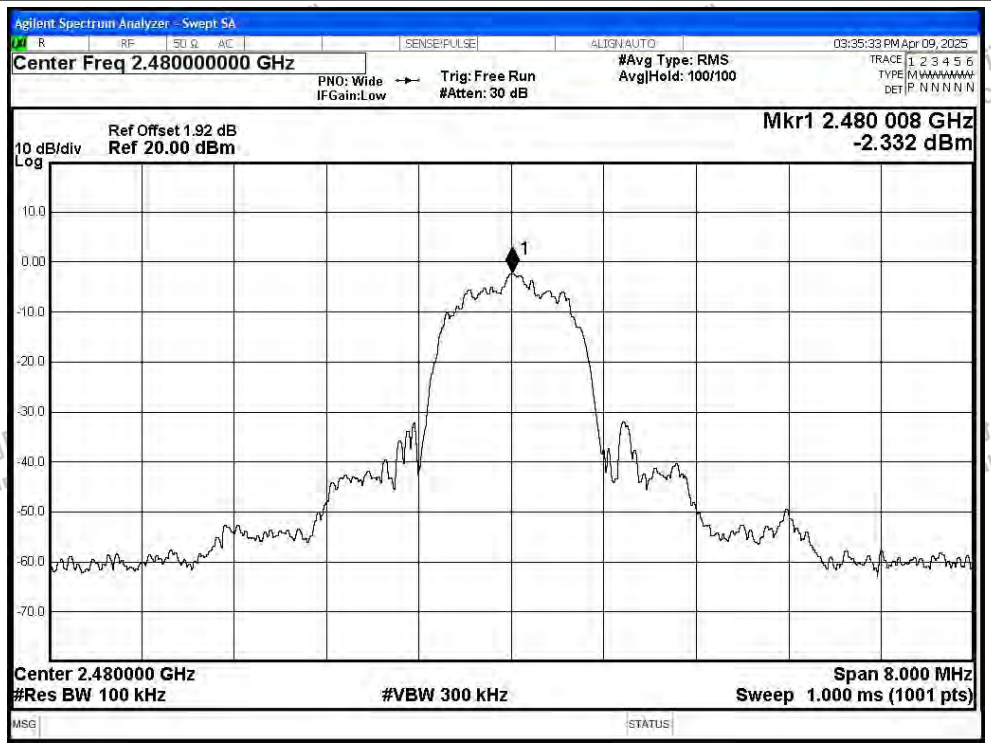
Band Edge NVNT 3-DH5 2402MHz Ant1 No-Hopping Ref



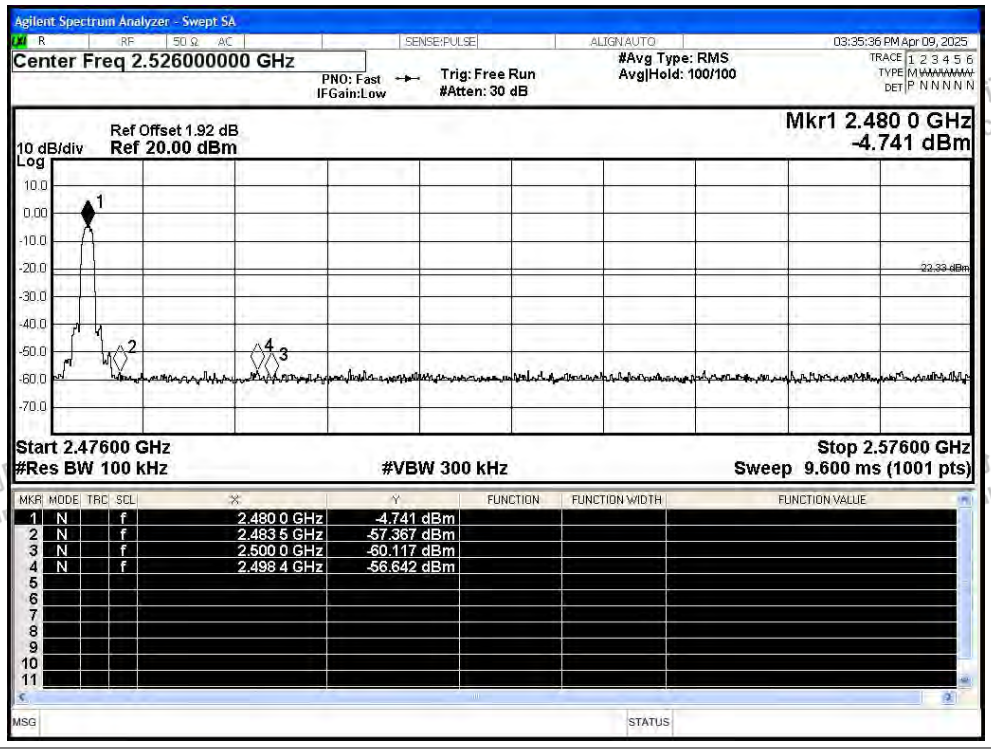
Band Edge NVNT 3-DH5 2402MHz Ant1 No-Hopping Emission



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



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

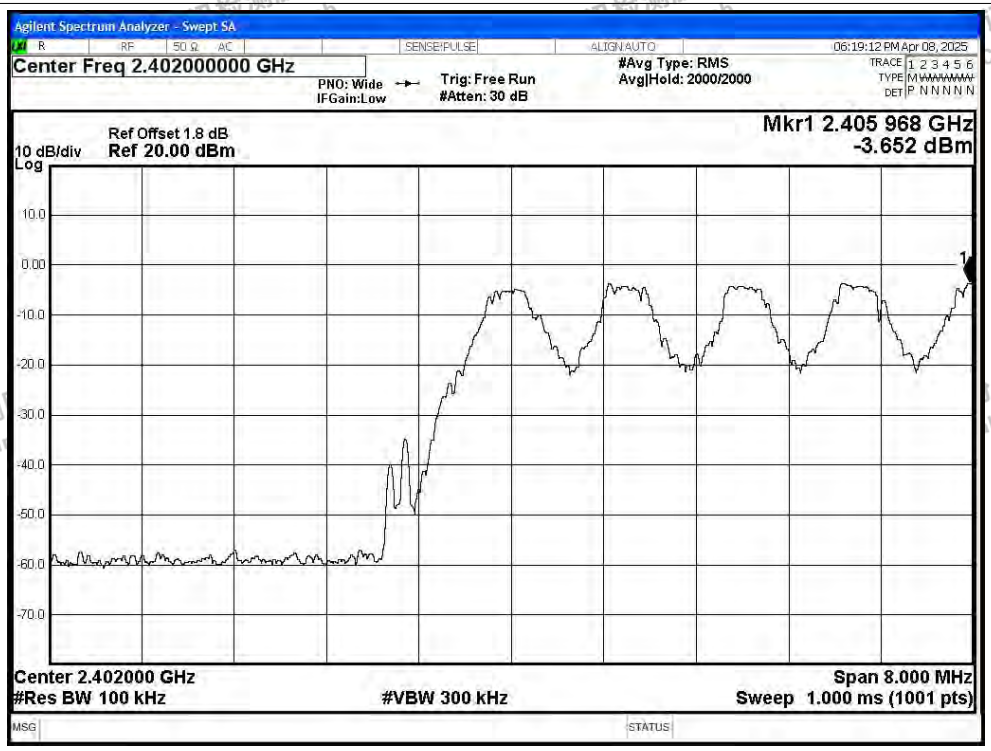


(Hopping)

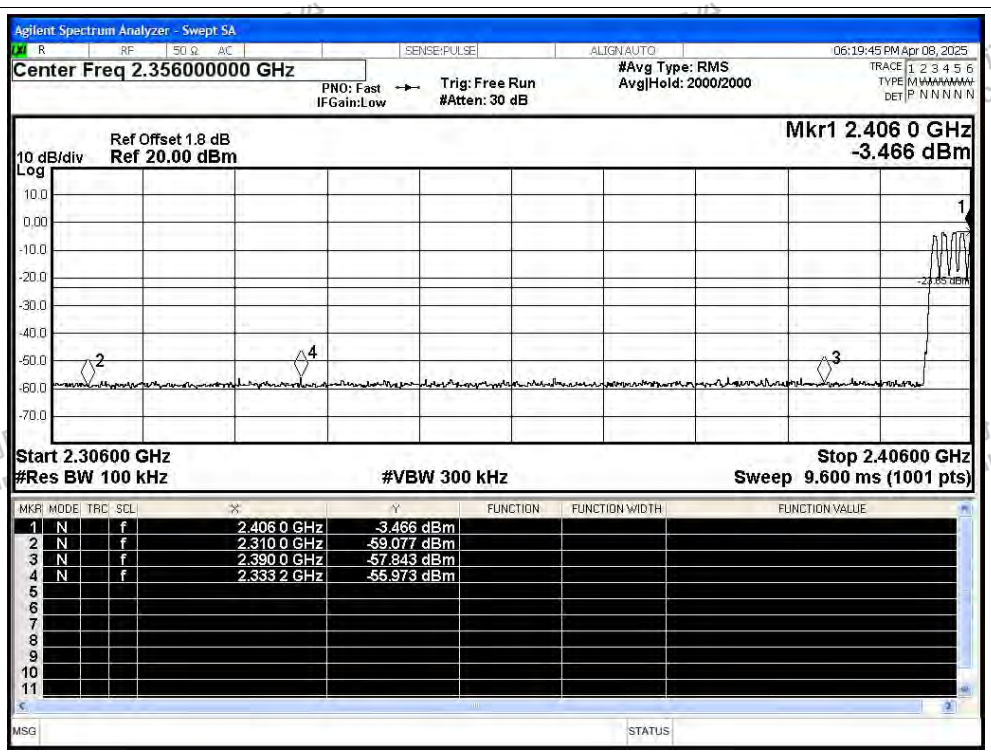
Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH5	2402	Ant1	Hopping	-52.32	-20	Pass
NVNT	1-DH5	2480	Ant1	Hopping	-53.79	-20	Pass
NVNT	2-DH5	2402	Ant1	Hopping	-51.21	-20	Pass
NVNT	2-DH5	2480	Ant1	Hopping	-53.95	-20	Pass
NVNT	3-DH5	2402	Ant1	Hopping	-52.17	-20	Pass
NVNT	3-DH5	2480	Ant1	Hopping	-54.33	-20	Pass

Test Graphs

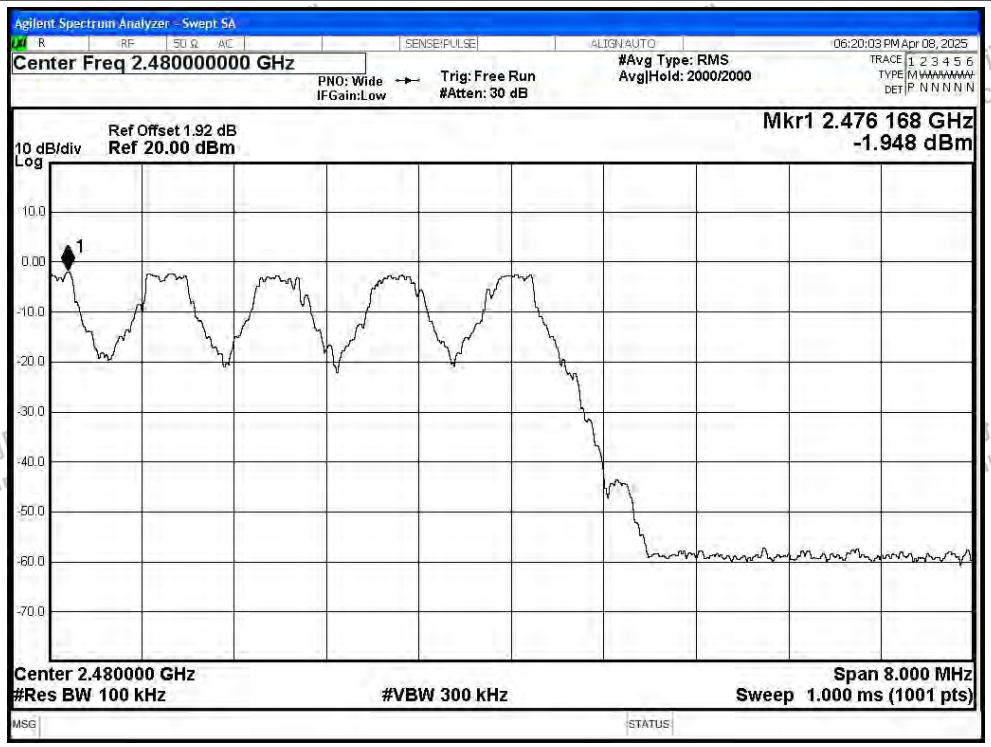
Band Edge(Hopping) NVNT 1-DH5 2402MHz Ant1 Hopping Ref



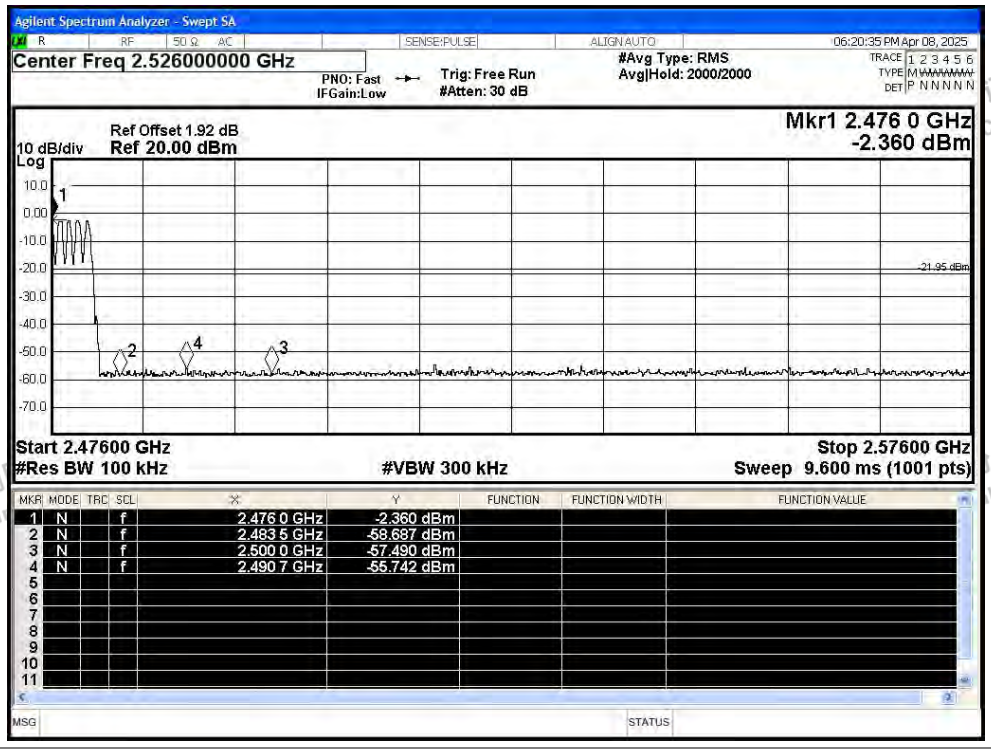
Band Edge(Hopping) NVNT 1-DH5 2402MHz Ant1 Hopping Emission



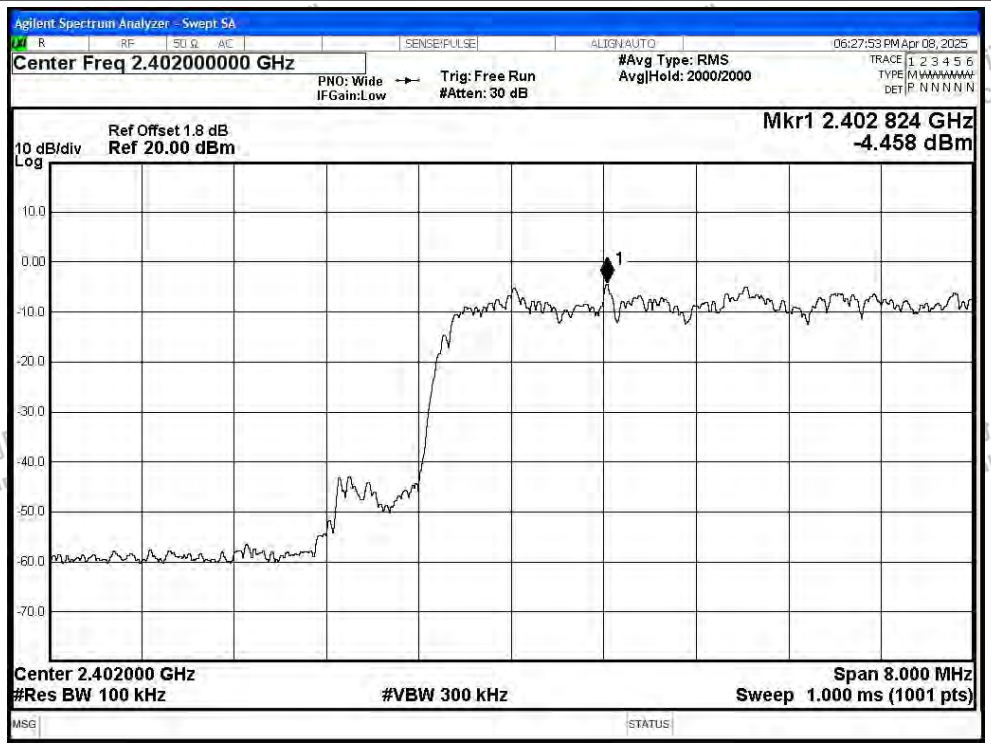
Band Edge(Hopping) NVNT 1-DH5 2480MHz Ant1 Hopping Ref



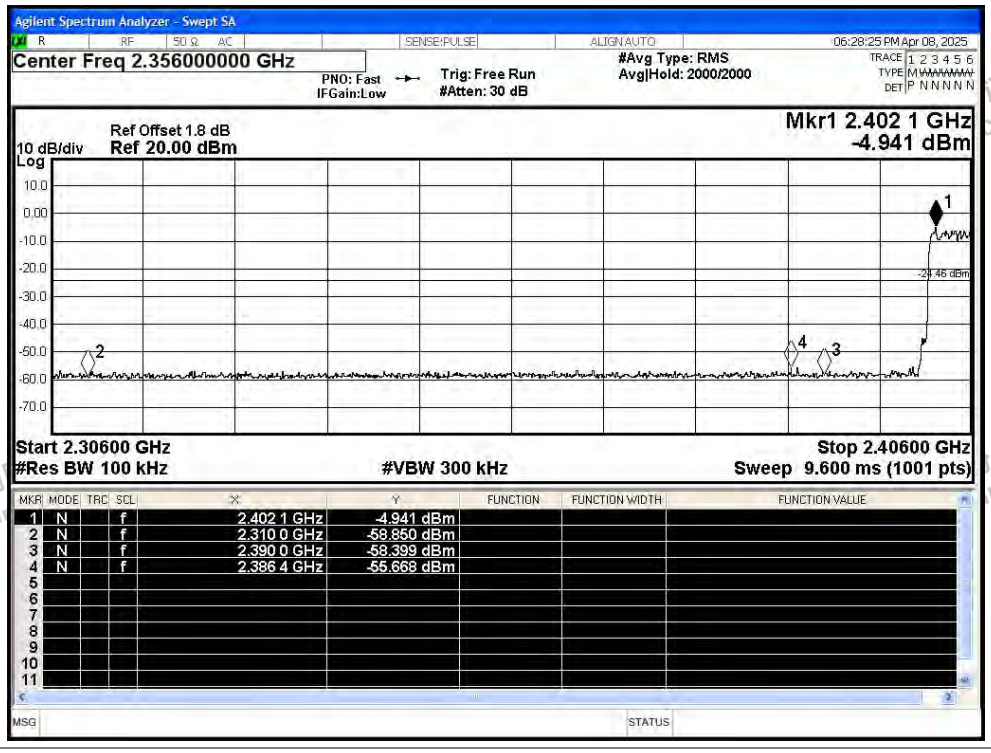
Band Edge(Hopping) NVNT 1-DH5 2480MHz Ant1 Hopping Emission



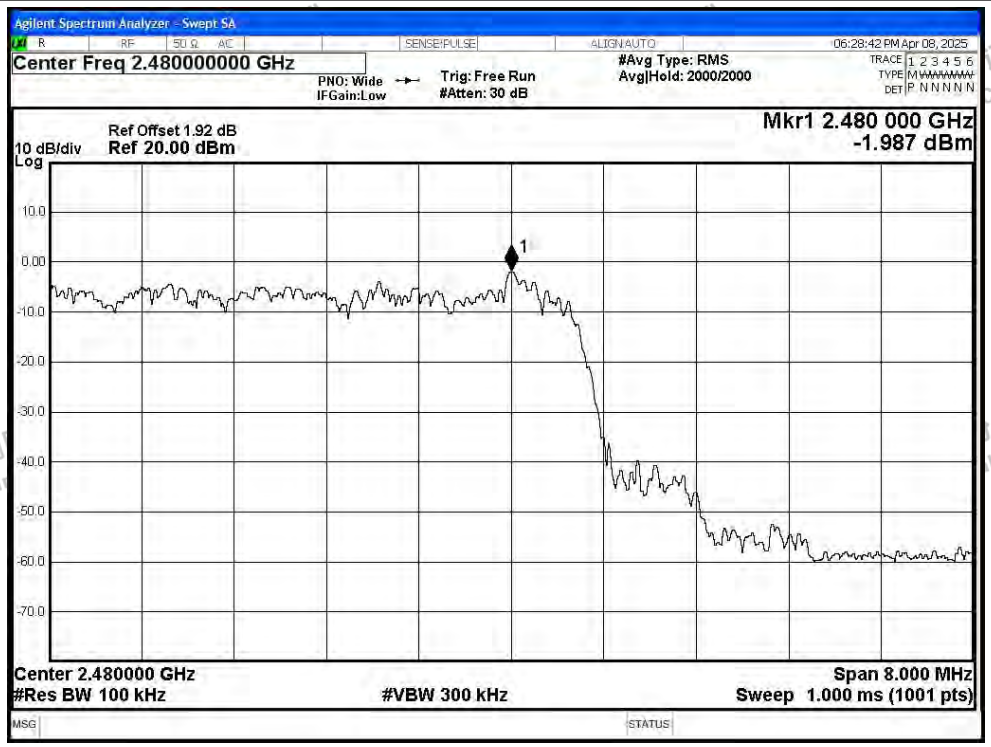
Band Edge(Hopping) NVNT 2-DH5 2402MHz Ant1 Hopping Ref



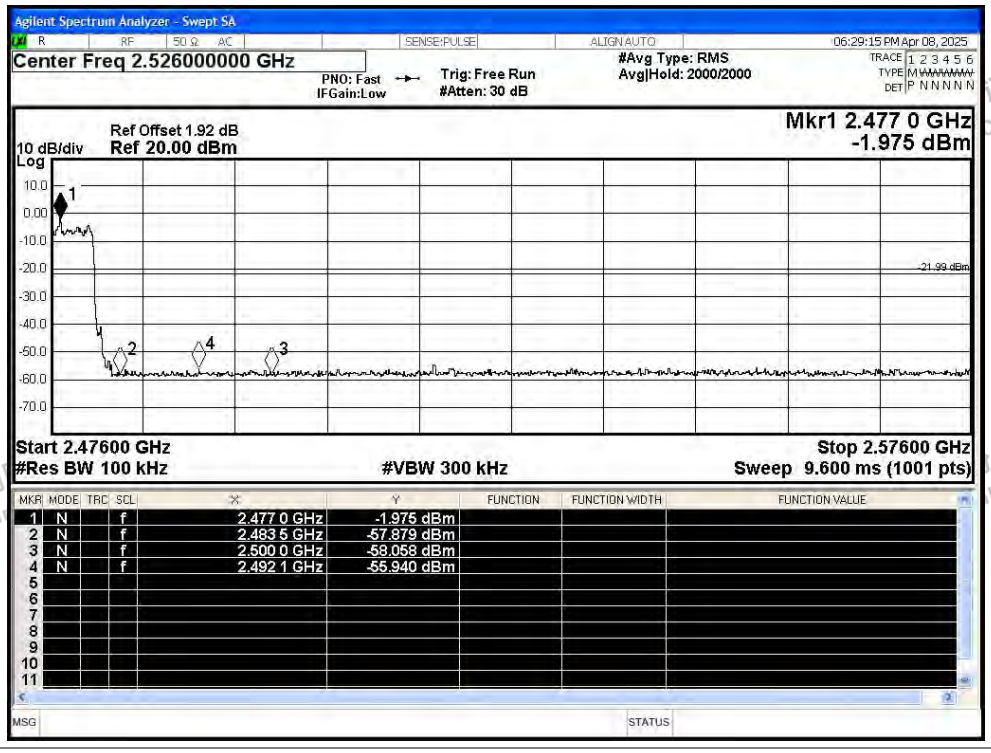
Band Edge(Hopping) NVNT 2-DH5 2402MHz Ant1 Hopping Emission



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

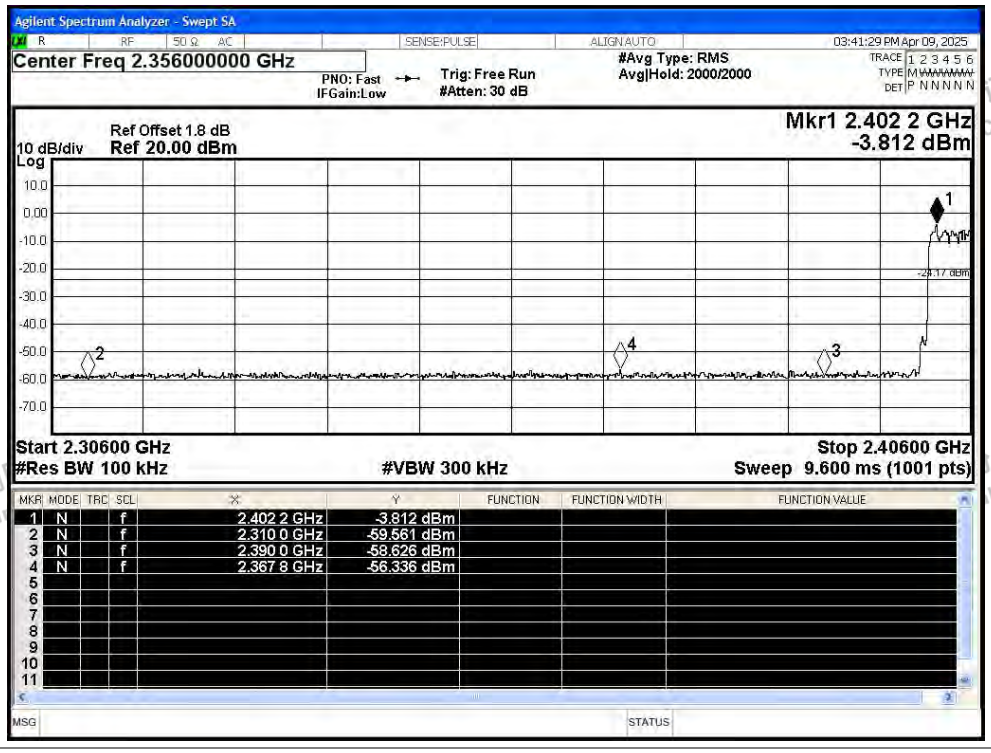


Band Edge(Hopping) NVNT 2-DH5 2480MHz Ant1 Hopping Emission

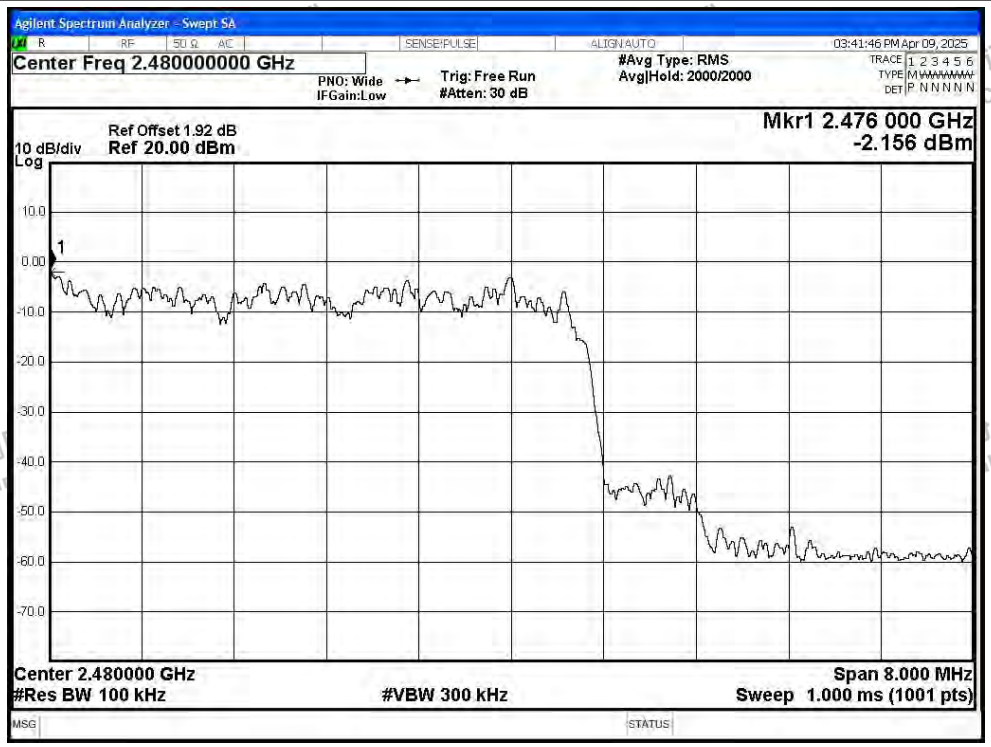


Band Edge(Hopping) NVNT 3-DH5 2402MHz Ant1 Hopping Ref

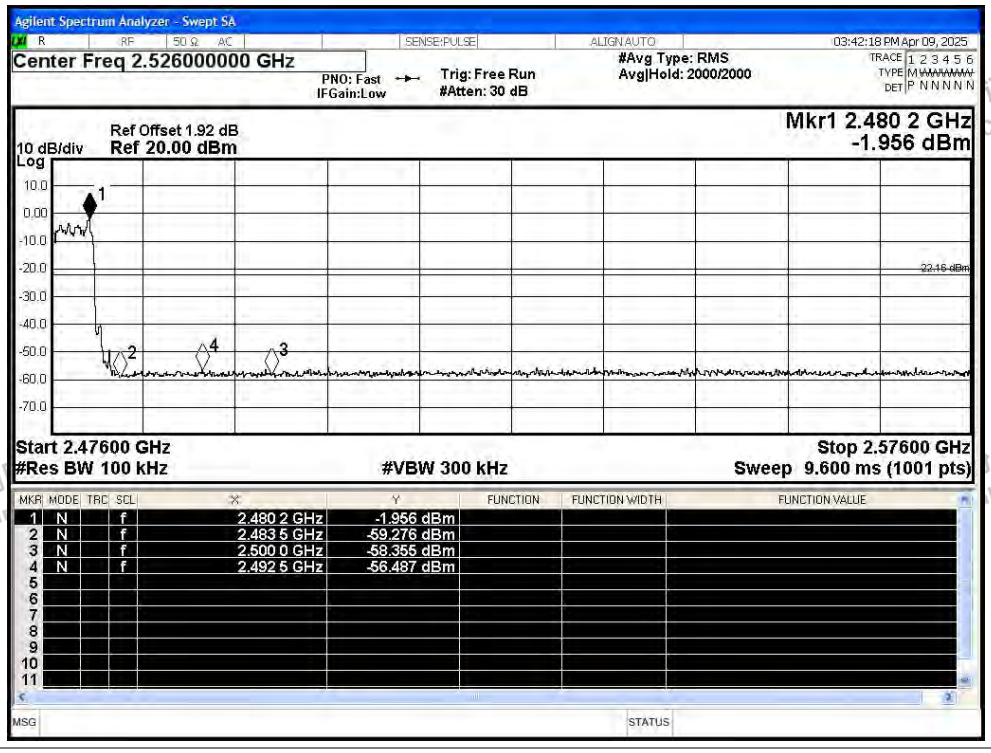
Band Edge(Hopping) NVNT 3-DH5 2402MHz Ant1 Hopping Emission



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



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



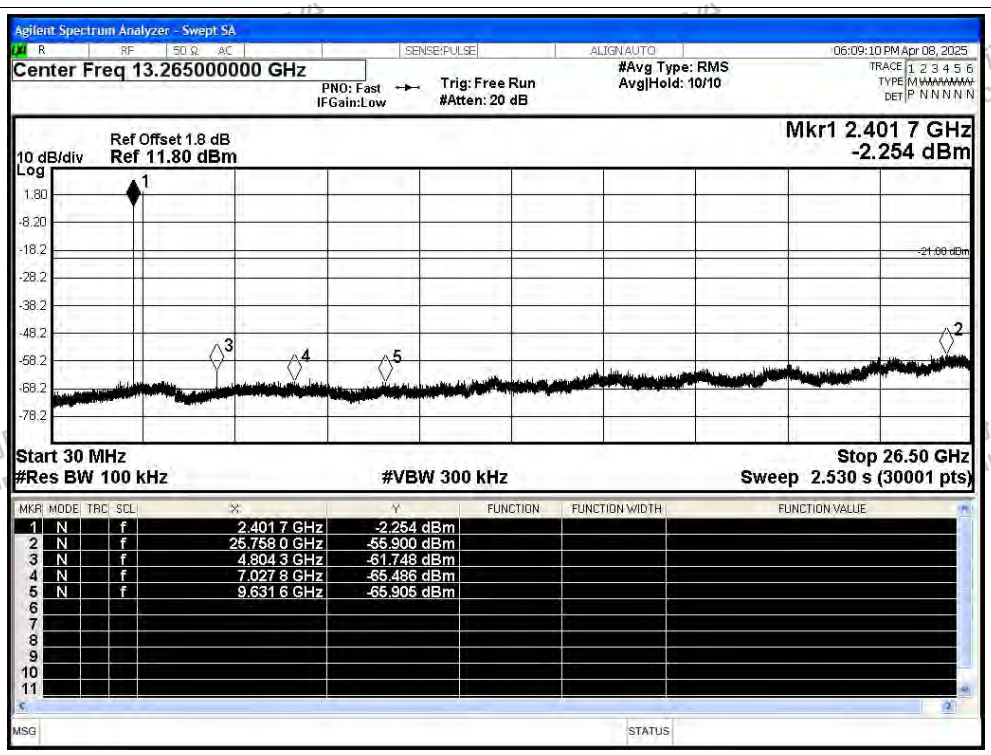
A.7 Conducted RF Spurious Emission

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH5	2402	Ant1	-54.82	-20	Pass
NVNT	1-DH5	2441	Ant1	-54.3	-20	Pass
NVNT	1-DH5	2480	Ant1	-53.62	-20	Pass
NVNT	2-DH5	2402	Ant1	-53.62	-20	Pass
NVNT	2-DH5	2441	Ant1	-53.76	-20	Pass
NVNT	2-DH5	2480	Ant1	-52.43	-20	Pass
NVNT	3-DH5	2402	Ant1	-53.81	-20	Pass
NVNT	3-DH5	2441	Ant1	-53.91	-20	Pass
NVNT	3-DH5	2480	Ant1	-52.47	-20	Pass

Test Graphs

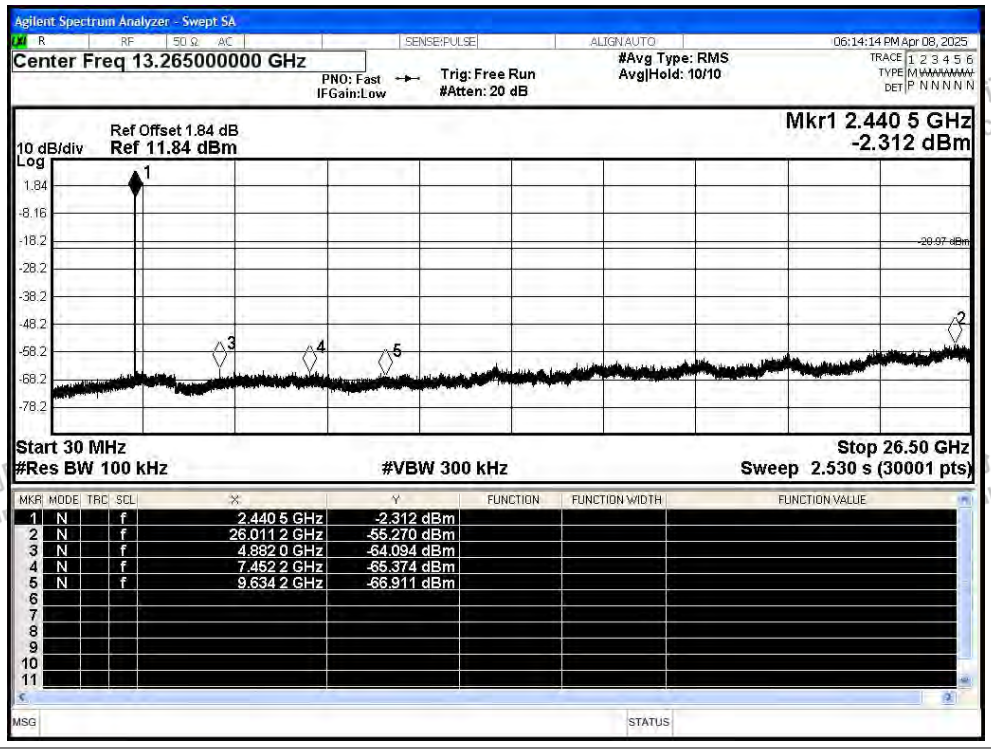
Tx. Spurious NVNT 1-DH5 2402MHz Ant1 Ref

Tx. Spurious NVNT 1-DH5 2402MHz Ant1 Emission

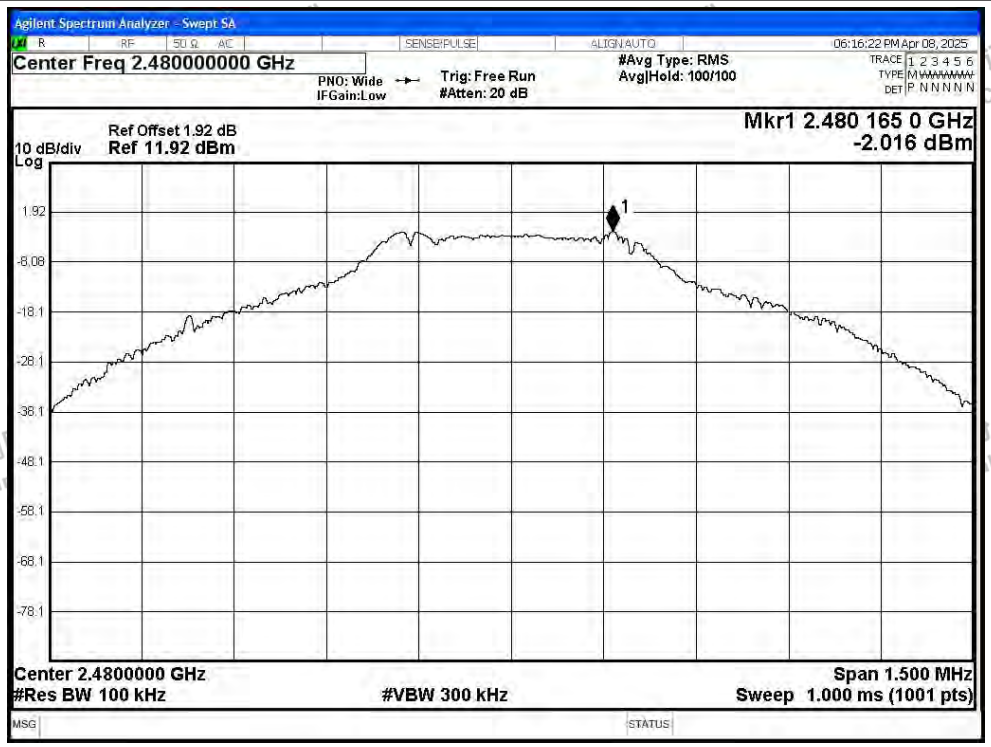


Tx. Spurious NVNT 1-DH5 2441MHz Ant1 Ref

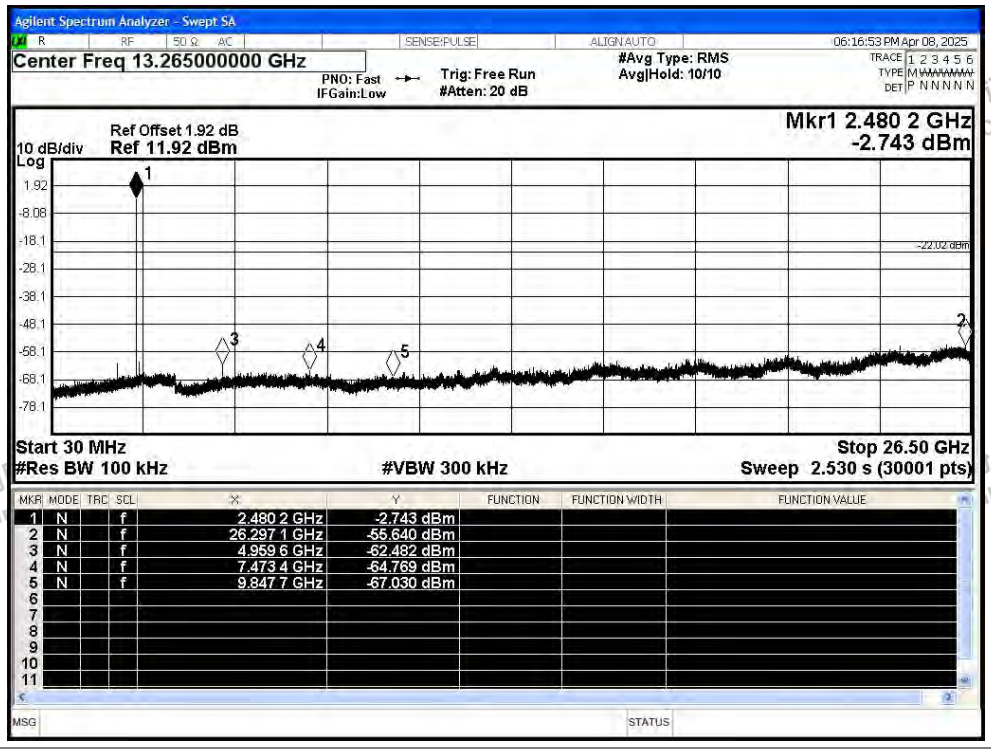
Tx. Spurious NVNT 1-DH5 2441MHz Ant1 Emission



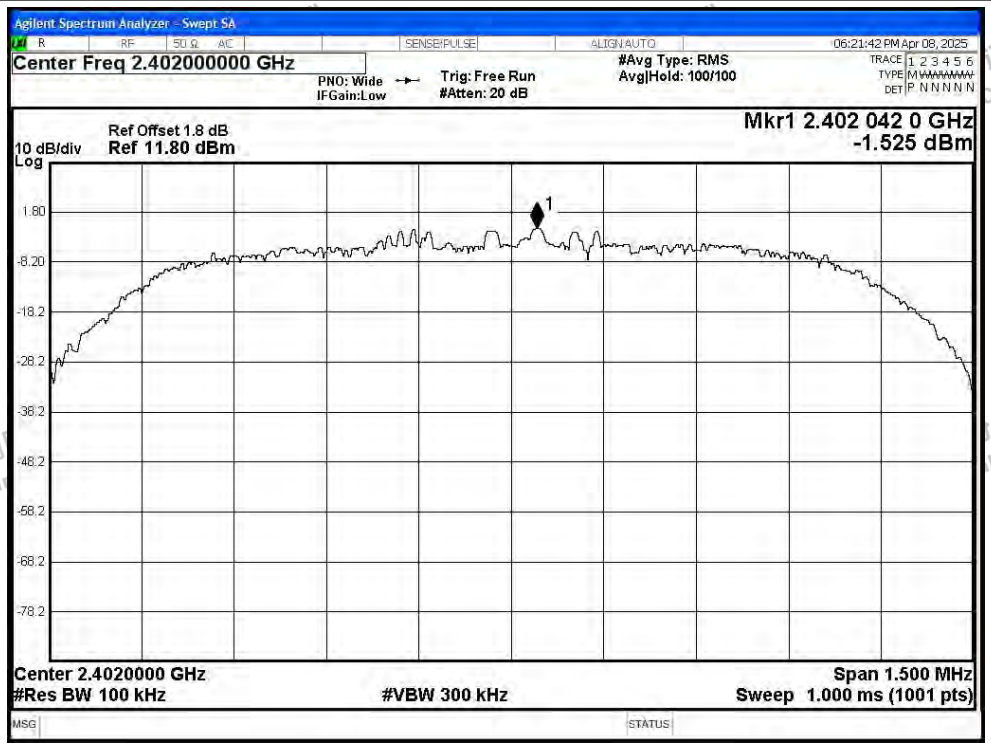
Tx. Spurious NVNT 1-DH5 2480MHz Ant1 Ref



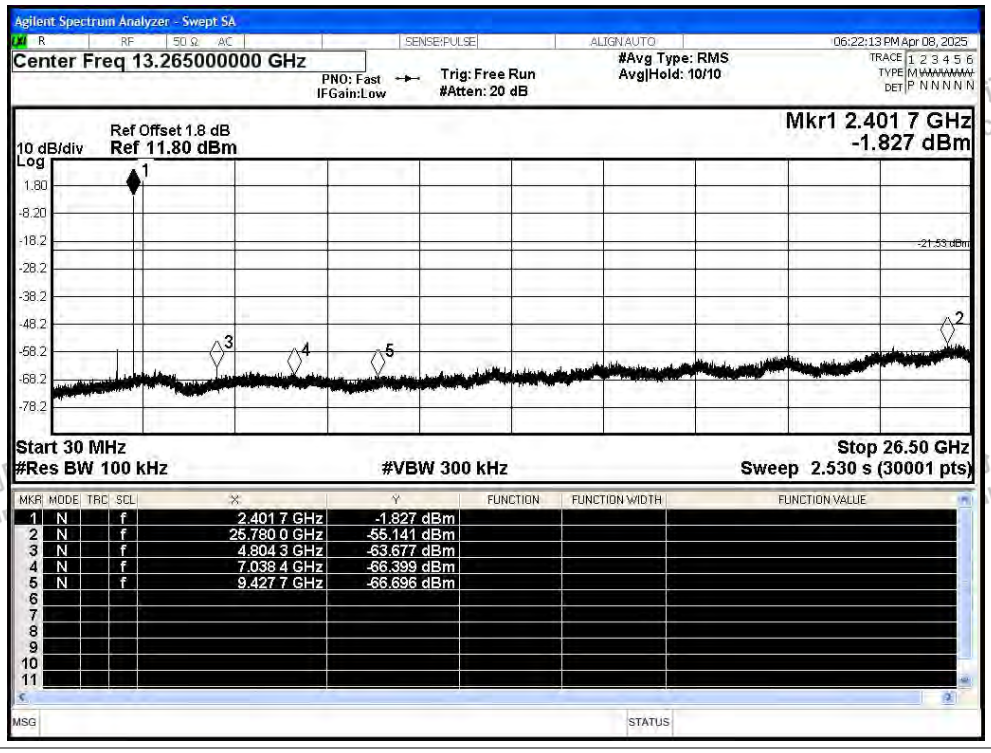
Tx. Spurious NVNT 1-DH5 2480MHz Ant1 Emission



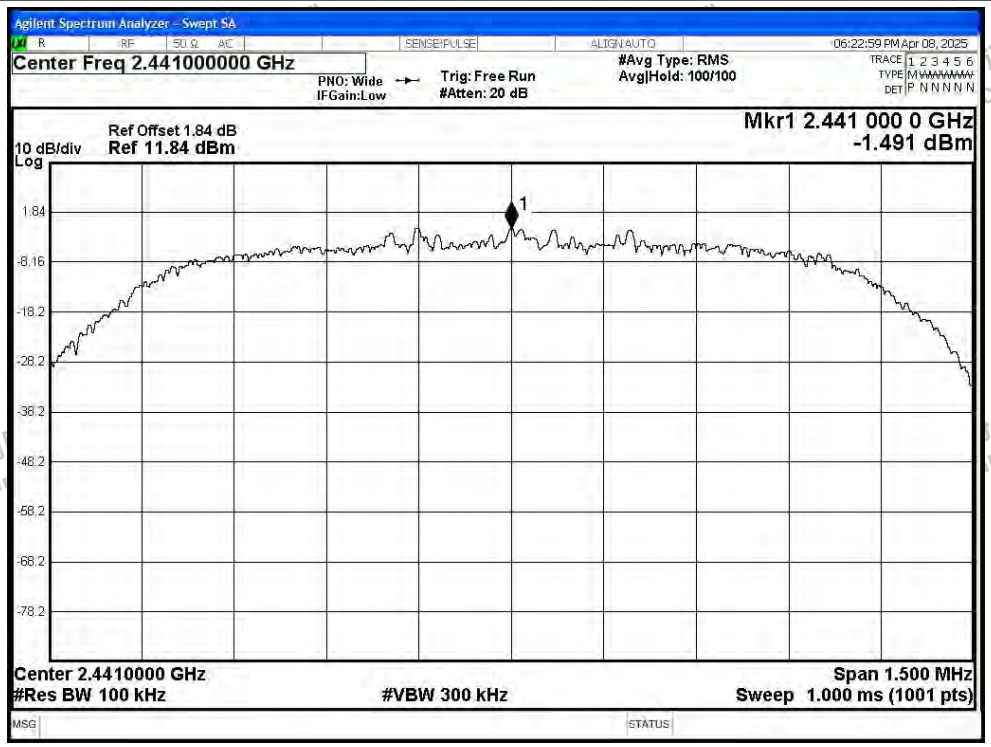
Tx. Spurious NVNT 2-DH5 2402MHz Ant1 Ref



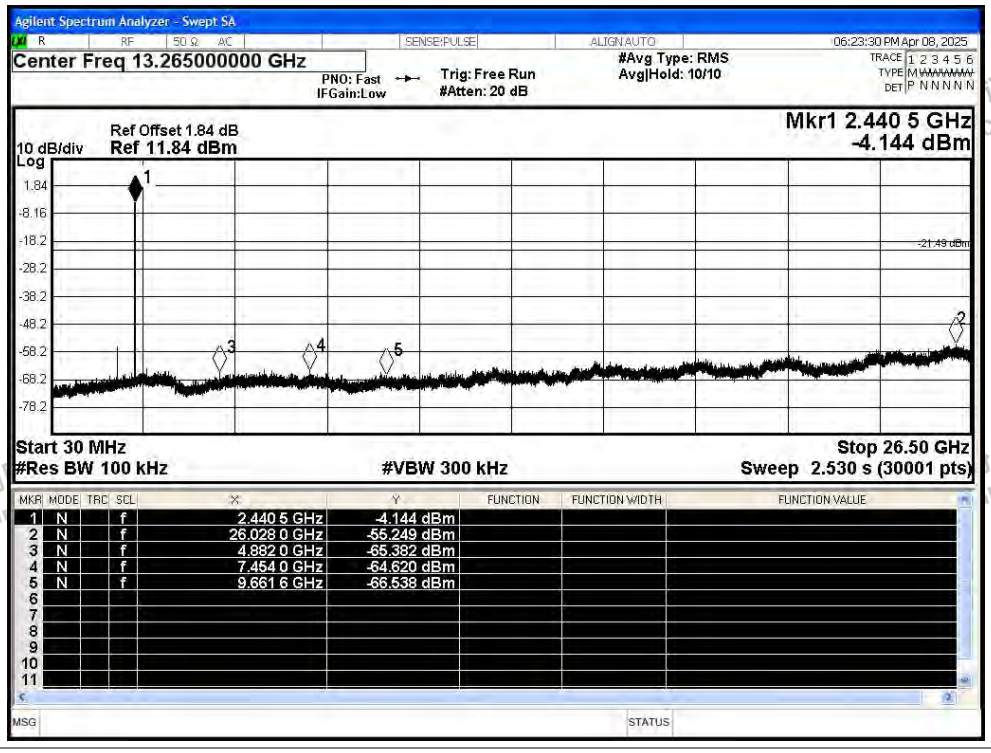
Tx. Spurious NVNT 2-DH5 2402MHz Ant1 Emission



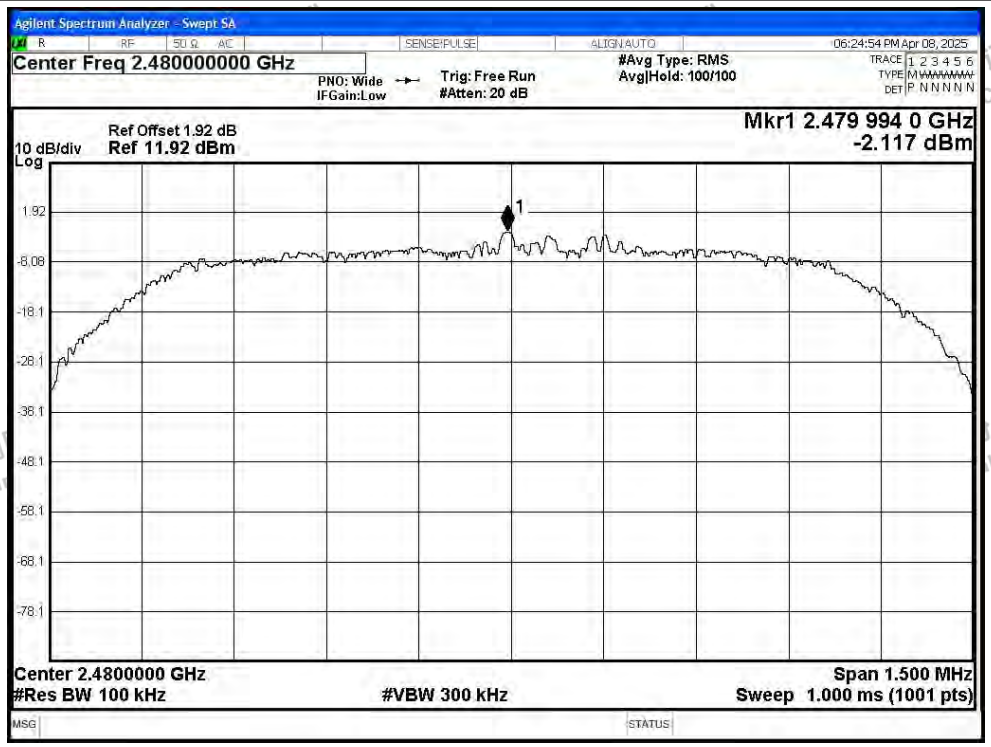
Tx. Spurious NVNT 2-DH5 2441MHz Ant1 Ref



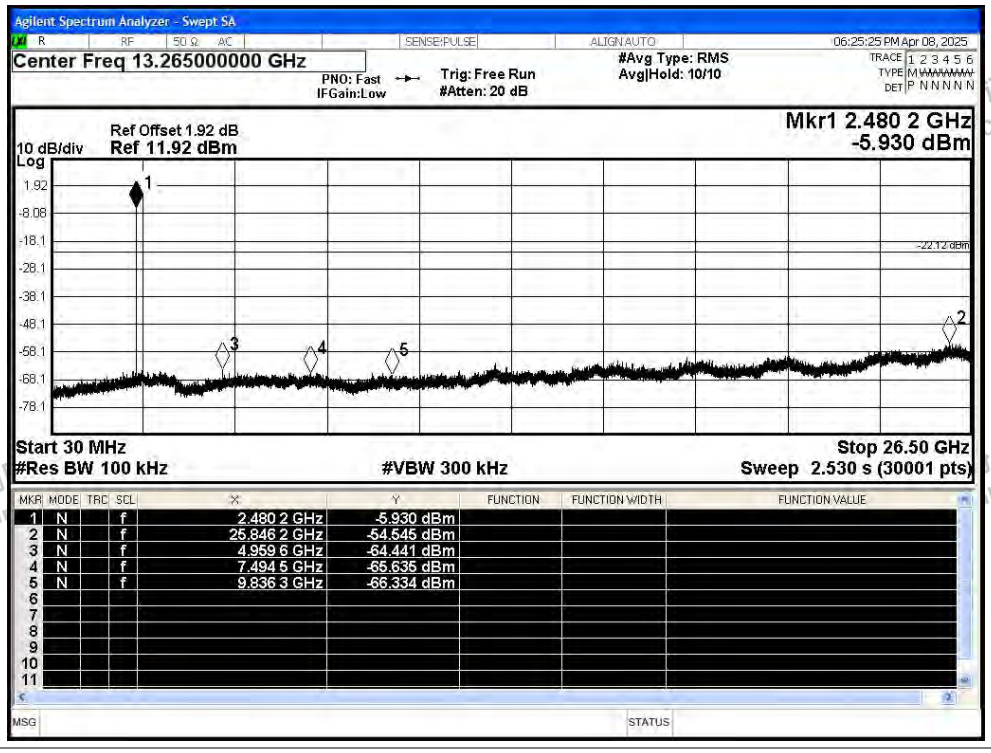
Tx. Spurious NVNT 2-DH5 2441MHz Ant1 Emission



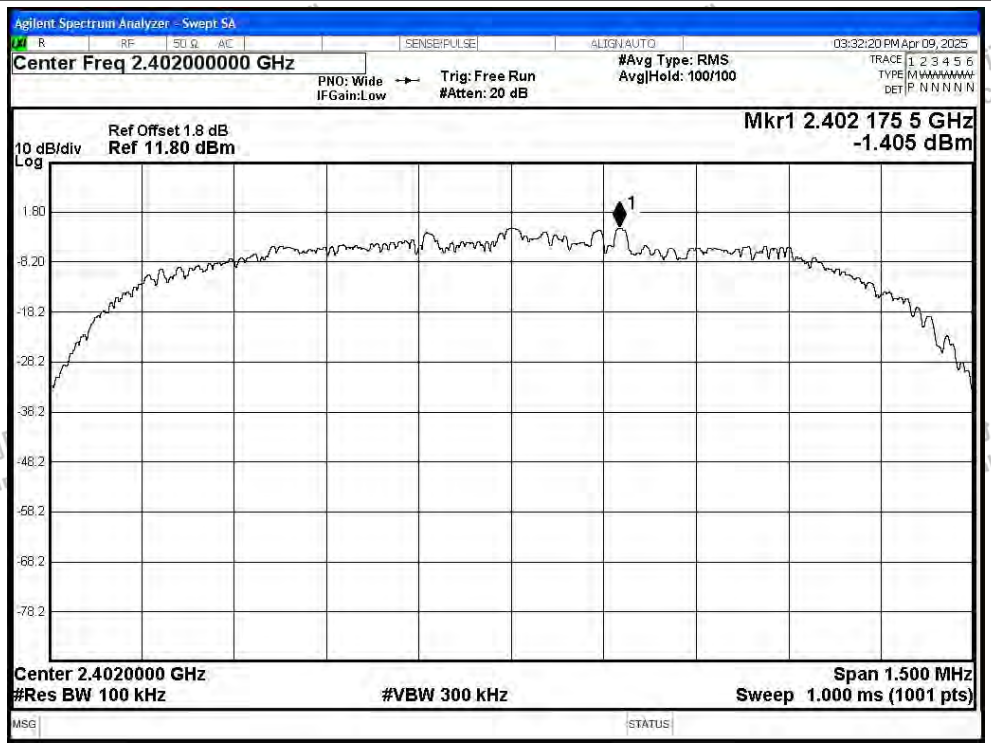
Tx. Spurious NVNT 2-DH5 2480MHz Ant1 Ref



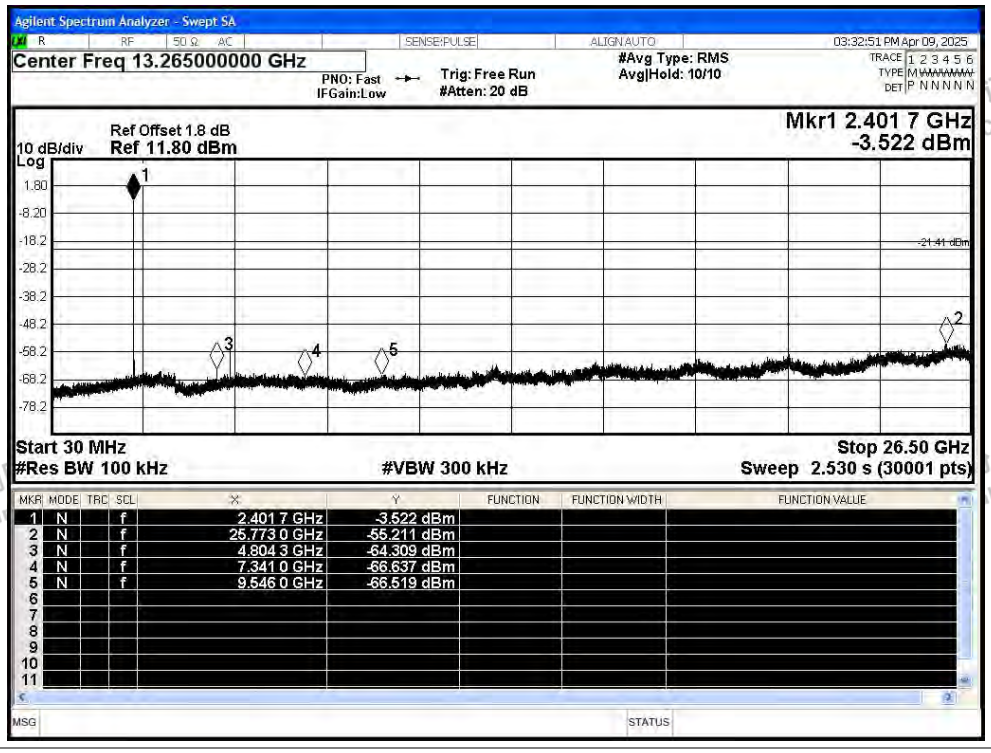
Tx. Spurious NVNT 2-DH5 2480MHz Ant1 Emission



Tx. Spurious NVNT 3-DH5 2402MHz Ant1 Ref

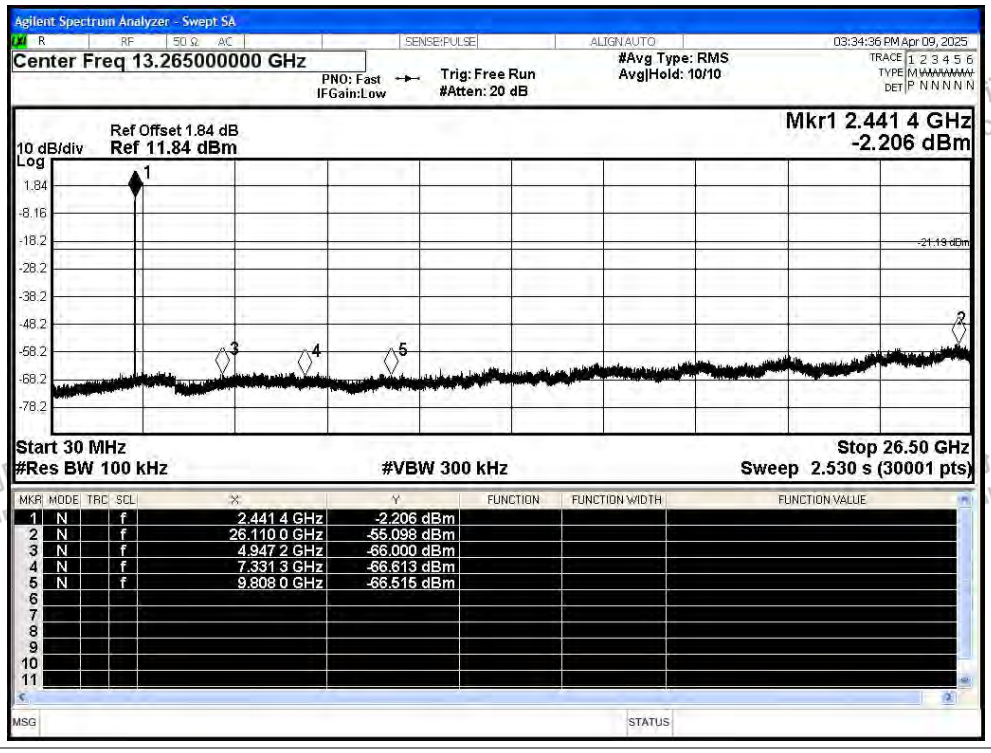


Tx. Spurious NVNT 3-DH5 2402MHz Ant1 Emission

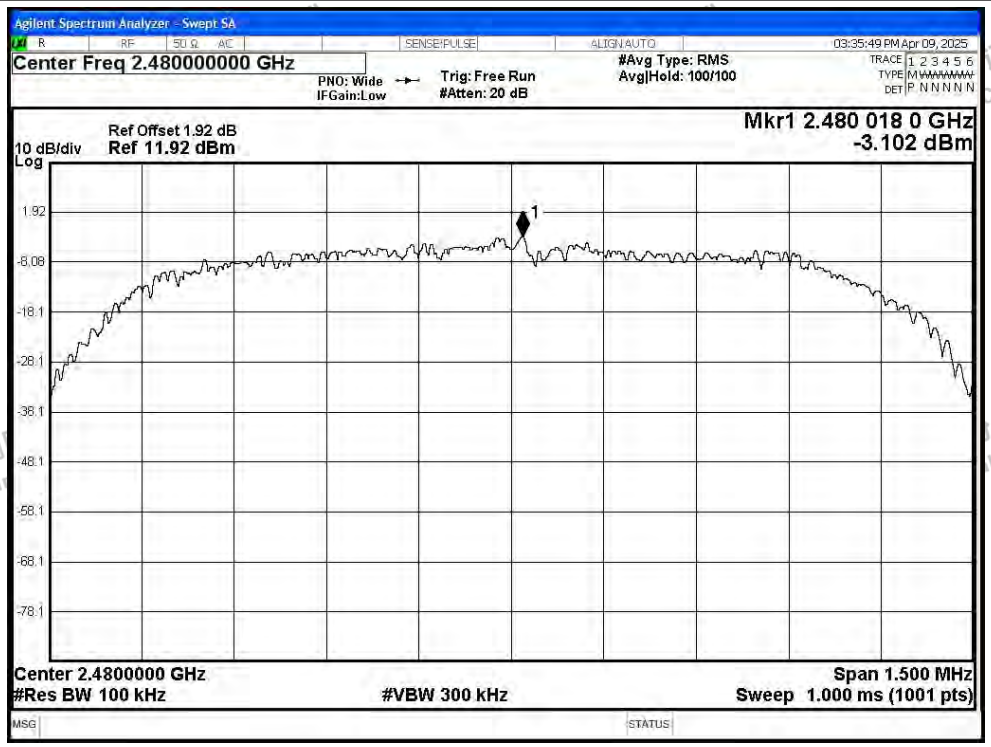


Tx. Spurious NVNT 3-DH5 2441MHz Ant1 Ref

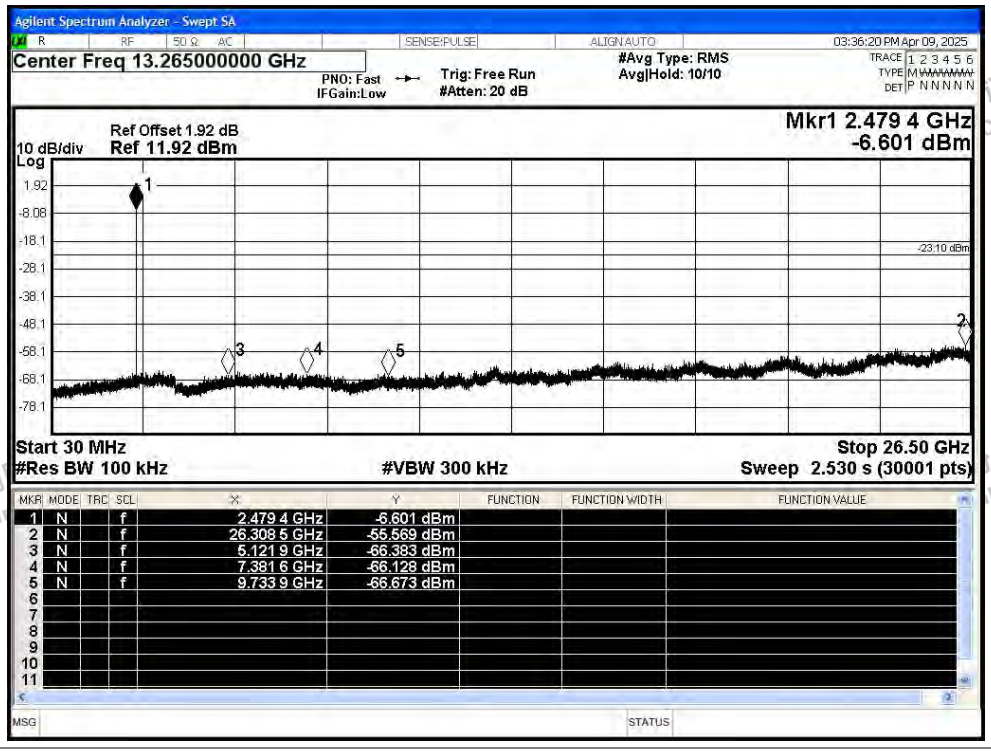
Tx. Spurious NVNT 3-DH5 2441MHz Ant1 Emission



Tx. Spurious NVNT 3-DH5 2480MHz Ant1 Ref



Tx. Spurious NVNT 3-DH5 2480MHz Ant1 Emission

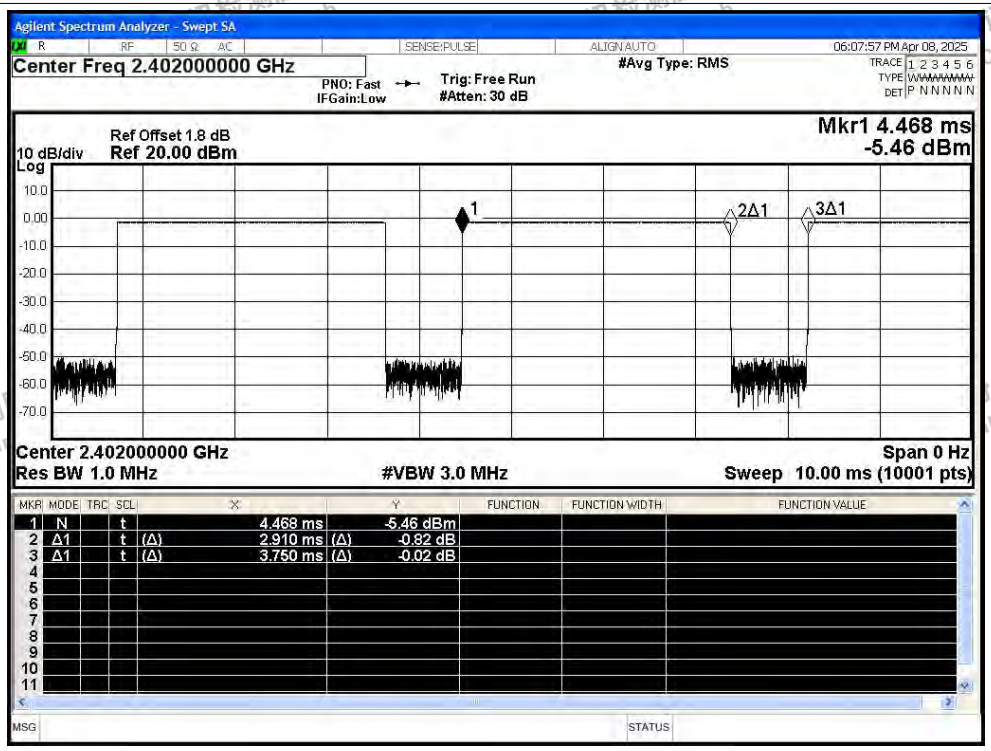


A.8 Duty Cycle

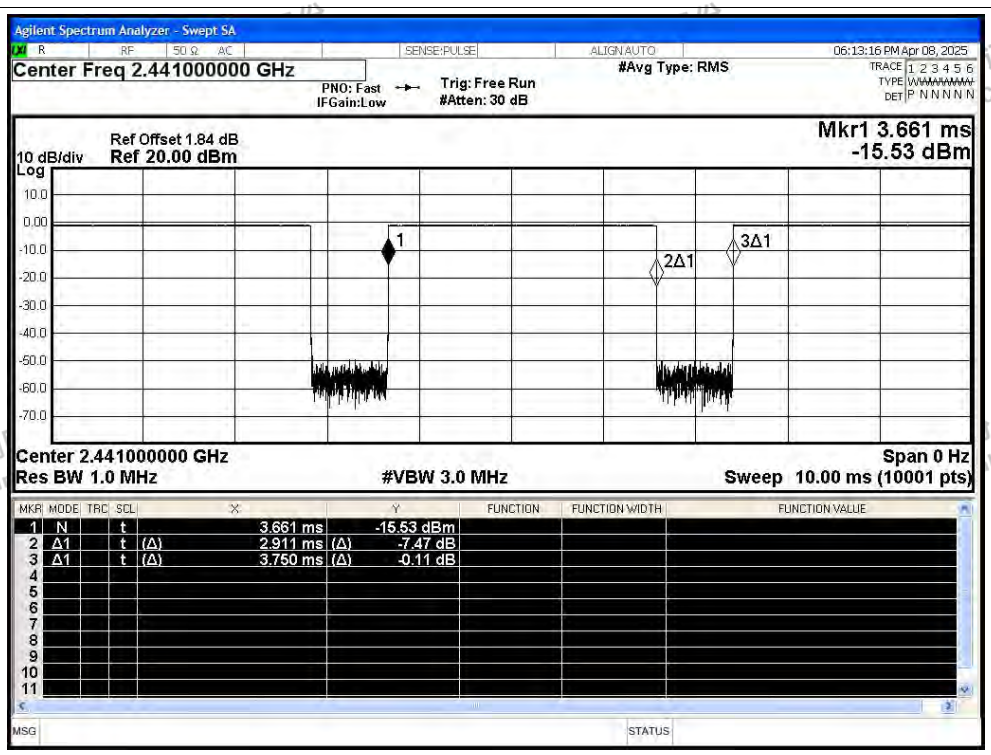
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	1-DH5	2402	Ant1	77.6	1.1	0.34
NVNT	1-DH5	2441	Ant1	77.63	1.1	0.34
NVNT	1-DH5	2480	Ant1	77.63	1.1	0.34
NVNT	2-DH5	2402	Ant1	77.28	1.12	0.35
NVNT	2-DH5	2441	Ant1	77.28	1.12	0.35
NVNT	2-DH5	2480	Ant1	77.28	1.12	0.35
NVNT	3-DH5	2402	Ant1	77.28	1.12	0.35
NVNT	3-DH5	2441	Ant1	77.28	1.12	0.35
NVNT	3-DH5	2480	Ant1	77.28	1.12	0.35

Test Graphs

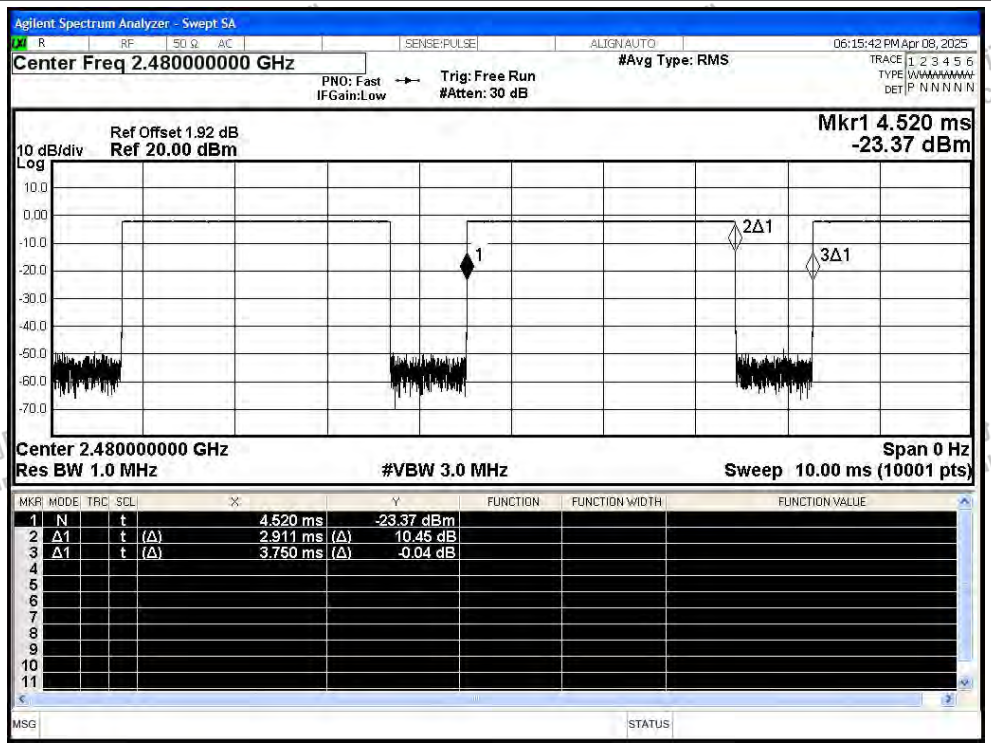
Duty Cycle NVNT 1-DH5 2402MHz Ant1



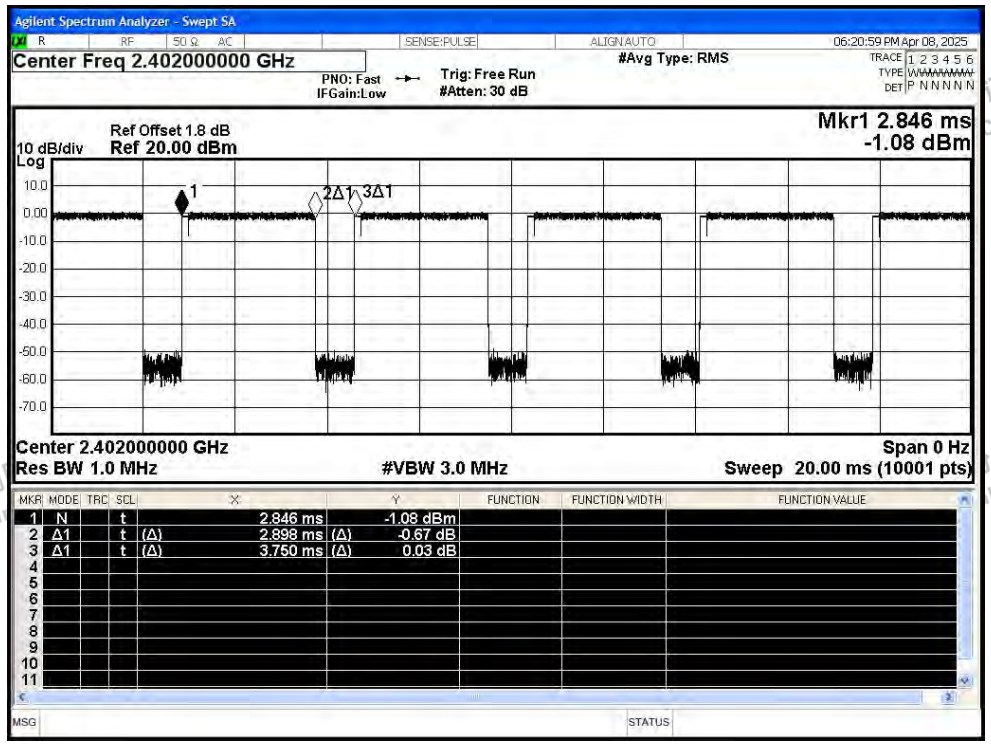
Duty Cycle NVNT 1-DH5 2441MHz Ant1



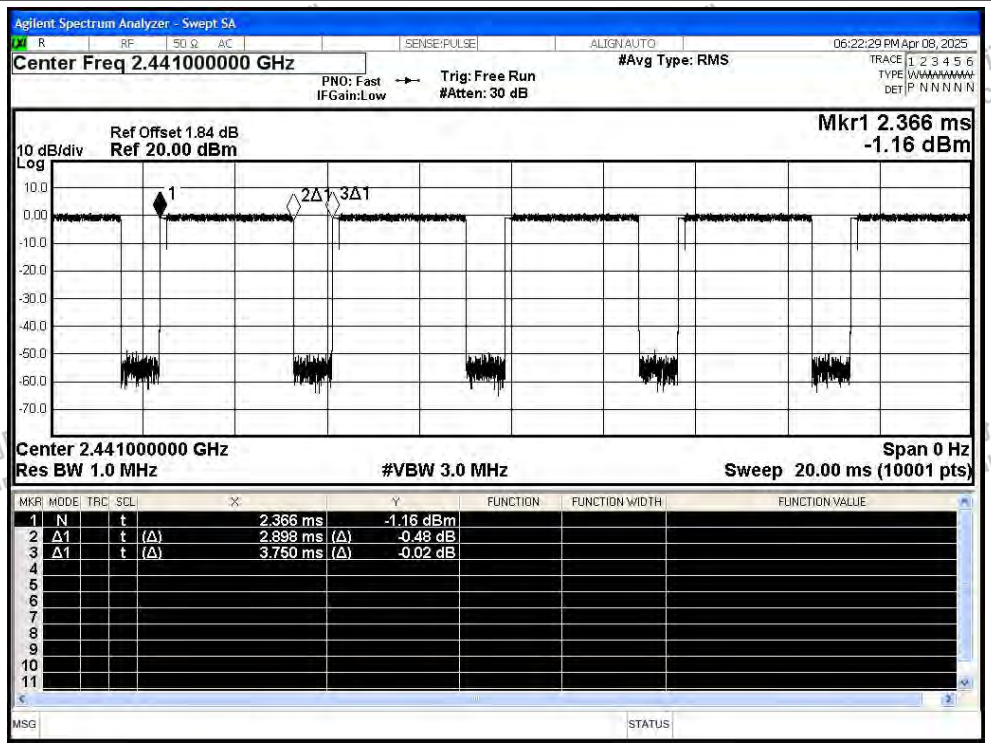
Duty Cycle NVNT 1-DH5 2480MHz Ant1



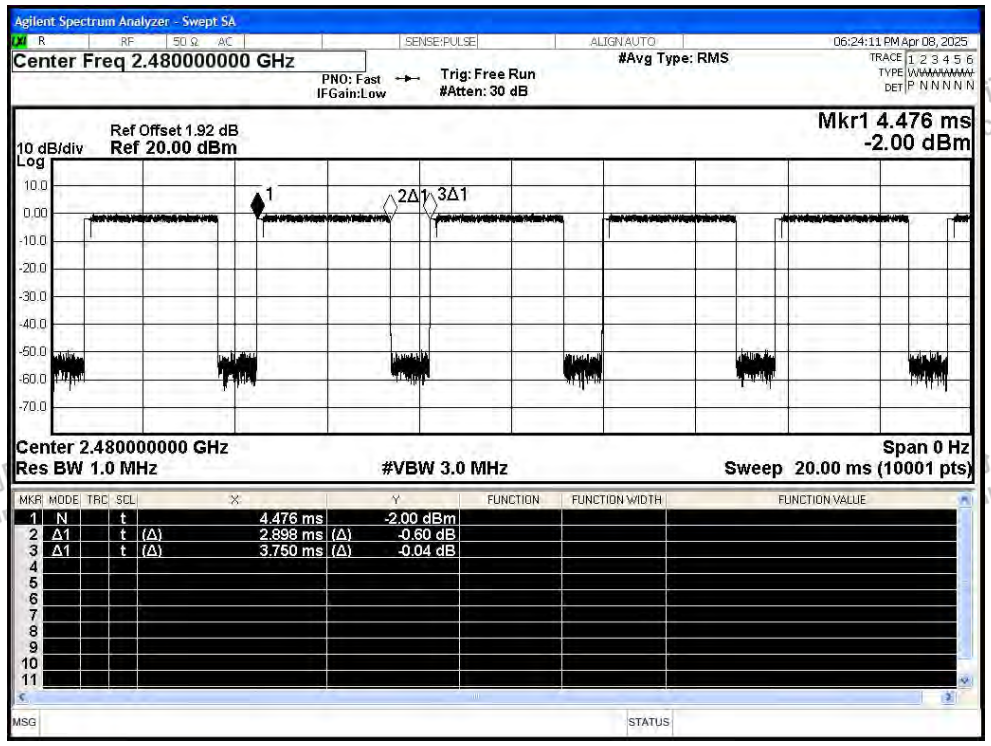
Duty Cycle NVNT 2-DH5 2402MHz Ant1



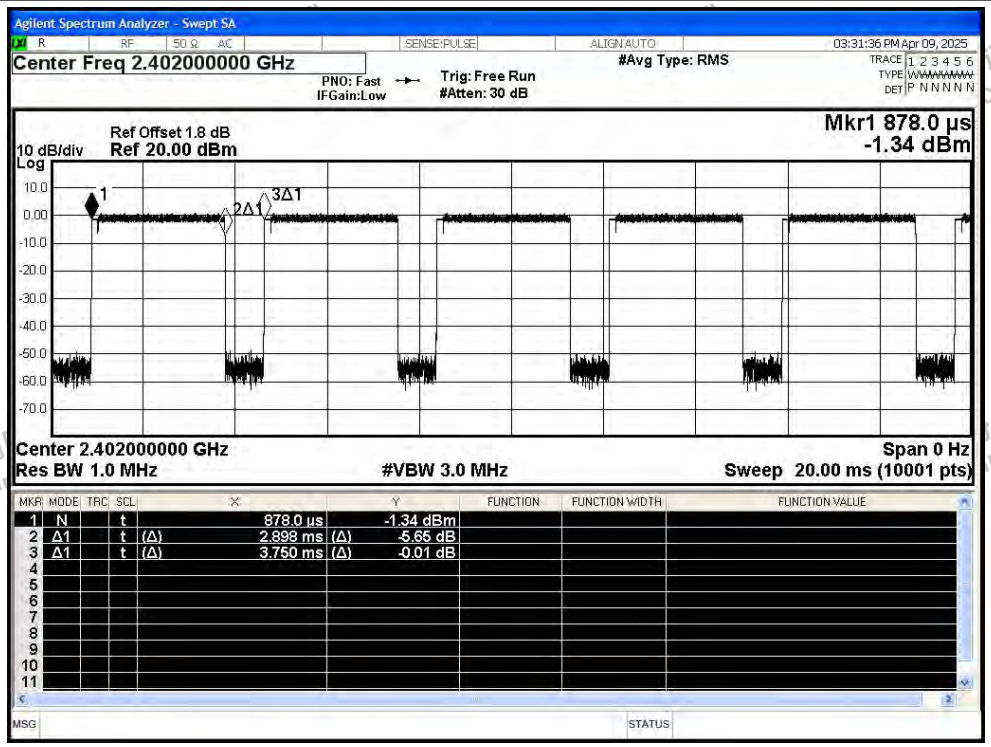
Duty Cycle NVNT 2-DH5 2441MHz Ant1



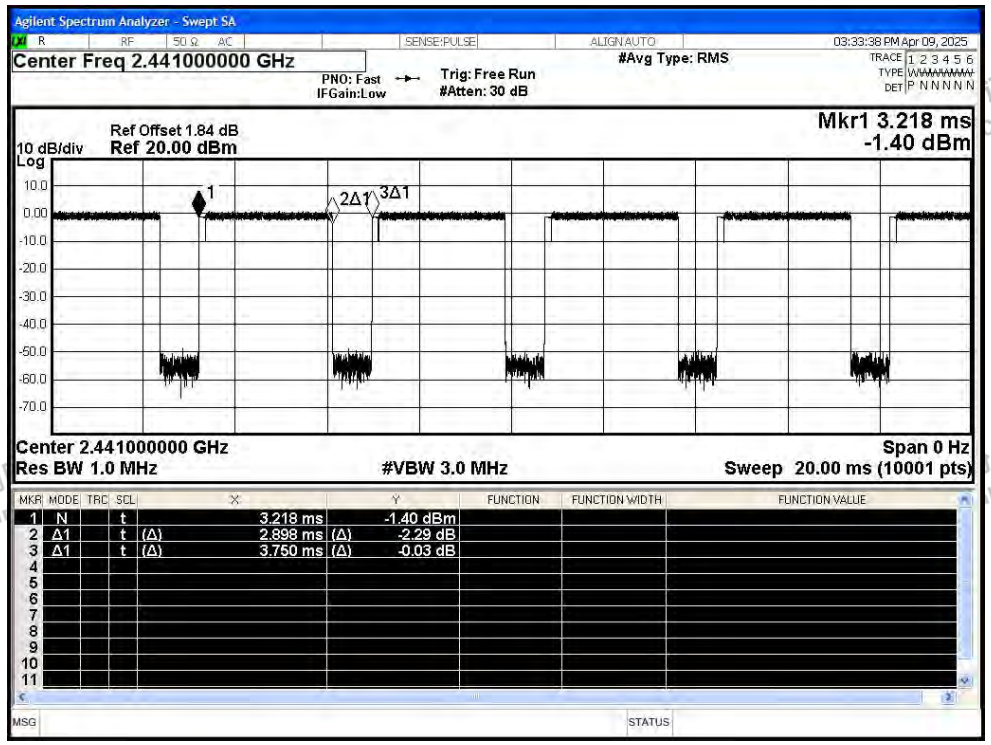
Duty Cycle NVNT 2-DH5 2480MHz Ant1



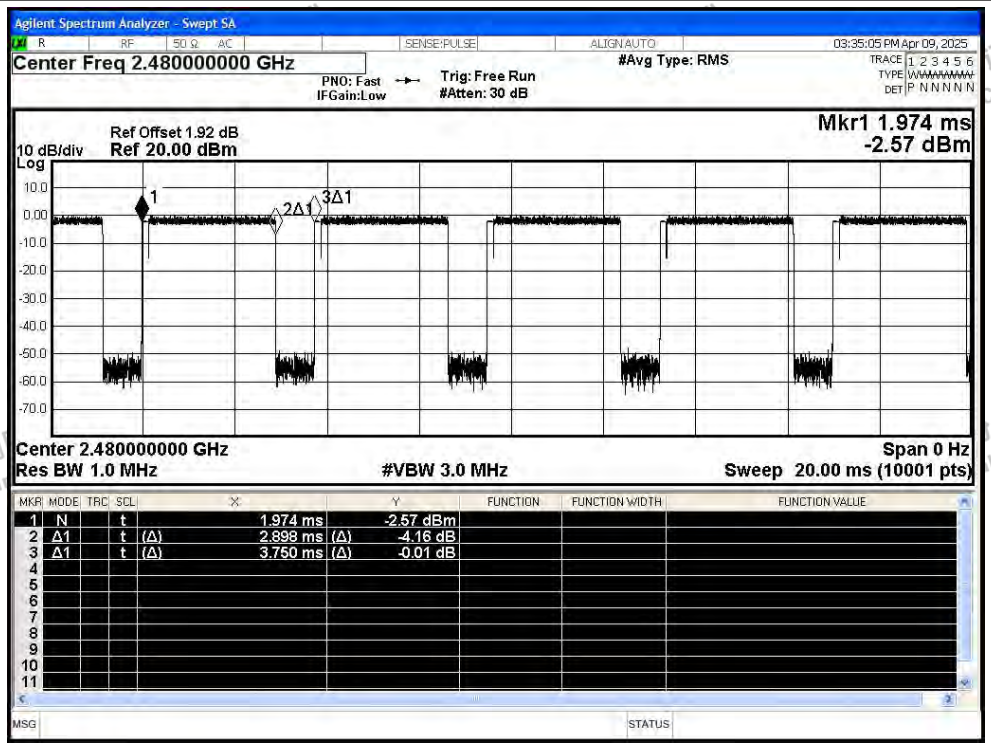
Duty Cycle NVNT 3-DH5 2402MHz Ant1



Duty Cycle NVNT 3-DH5 2441MHz Ant1



Duty Cycle NVNT 3-DH5 2480MHz Ant1

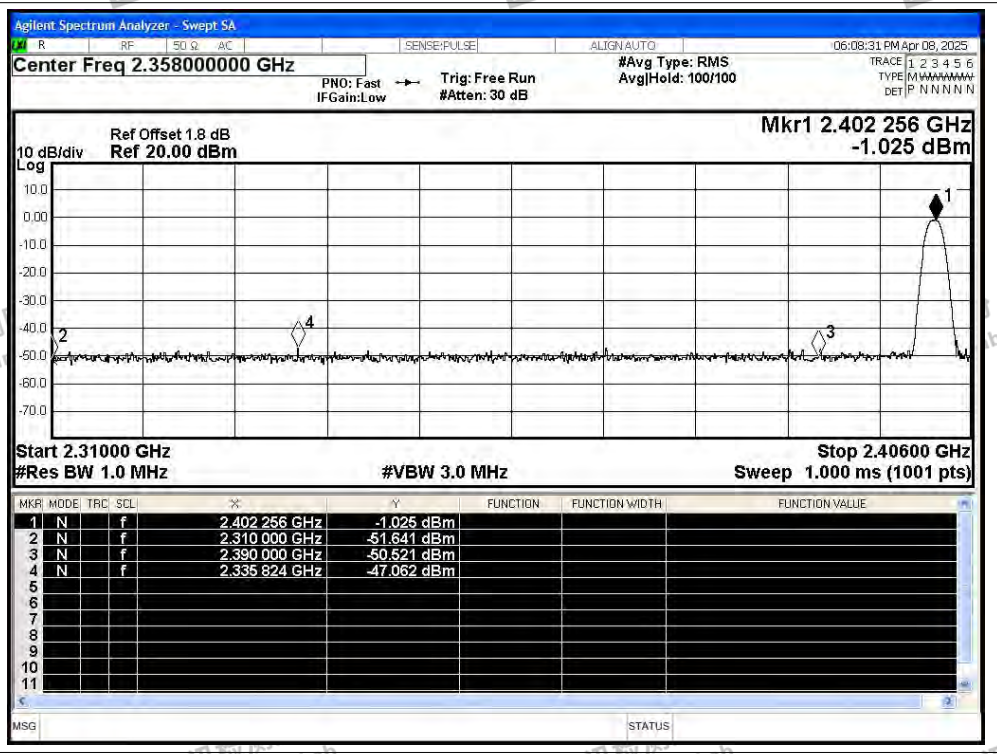


A.9 Restrict Band

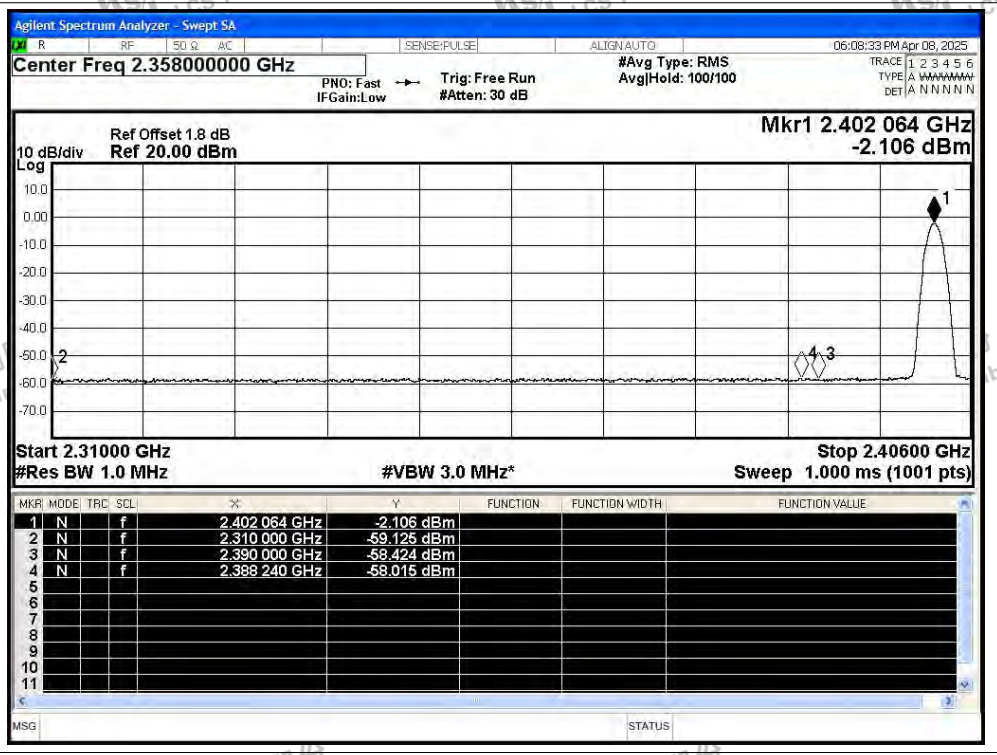
Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	Duty Factor (dB)	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
NVNT	1-DH5	2402	Ant1	No-Hopping	2310	-51.64	2	-	45.62	Peak	74	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2310	-59.13	2	1.1	39.23	Average	54	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2335.824	-47.06	2	-	50.2	Peak	74	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2388.24	-58.02	2	1.1	40.34	Average	54	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2390	-50.52	2	-	46.74	Peak	74	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2390	-58.42	2	1.1	39.94	Average	54	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2483.5	-48.53	2	-	48.73	Peak	74	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2483.5	-58.07	2	1.1	40.29	Average	54	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2494.984	-47.13	2	-	50.13	Peak	74	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2497.192	-57.19	2	1.1	41.17	Average	54	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2500	-49.97	2	-	47.29	Peak	74	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2500	-58.08	2	1.1	40.28	Average	54	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2310	-49.07	2	-	48.19	Peak	74	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2310	-59.53	2	1.12	38.85	Average	54	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2385.936	-47.32	2	-	49.94	Peak	74	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2386.224	-57.73	2	1.12	40.65	Average	54	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2390	-49.14	2	-	48.12	Peak	74	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2390	-58.75	2	1.12	39.63	Average	54	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2483.5	-49.74	2	-	47.52	Peak	74	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2483.5	-57.01	2	1.12	41.37	Average	54	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2498.512	-47.34	2	-	49.92	Peak	74	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2483.512	-57.01	2	1.12	41.37	Average	54	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2500	-50.49	2	-	46.77	Peak	74	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2500	-57.99	2	1.12	40.39	Average	54	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2310	-52.23	2	-	45.03	Peak	74	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2310	-58.52	2	1.12	39.86	Average	54	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2343.696	-47.32	2	-	49.94	Peak	74	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2378.16	-57.89	2	1.12	40.49	Average	54	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2390	-50.56	2	-	46.7	Peak	74	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2390	-58.46	2	1.12	39.92	Average	54	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2483.5	-49.85	2	-	47.41	Peak	74	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2483.5	-57.47	2	1.12	40.91	Average	54	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2493.352	-47.05	2	-	50.21	Peak	74	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2486.584	-57.27	2	1.12	41.11	Average	54	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2500	-49.28	2	-	47.98	Peak	74	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2500	-58.69	2	1.12	39.69	Average	54	Pass

Test Graphs

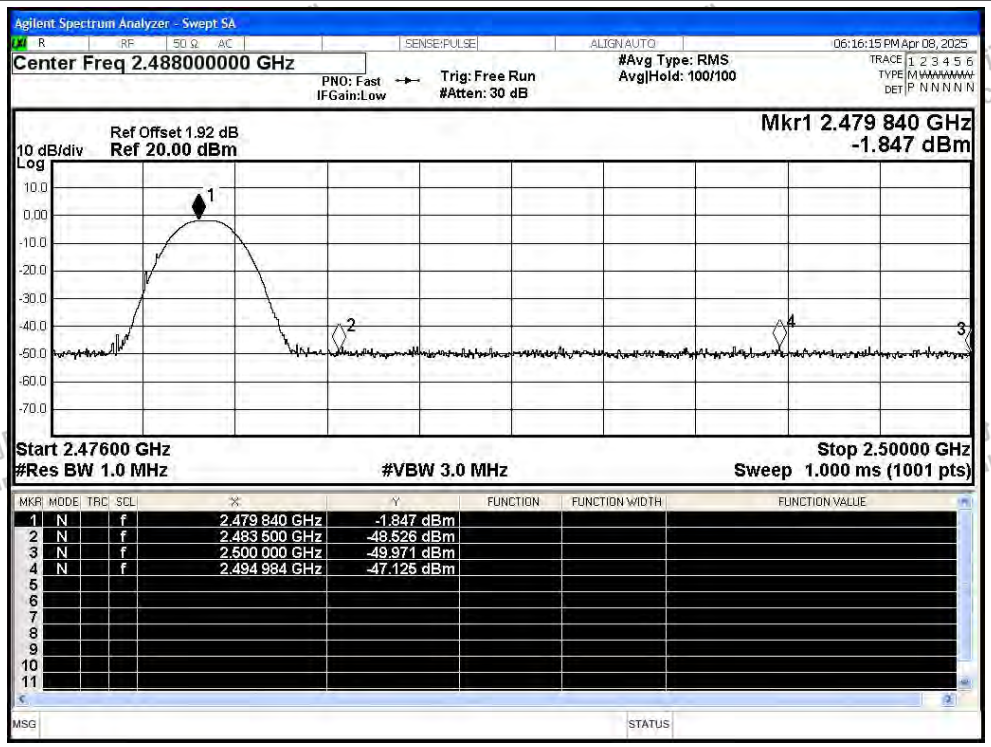
Restrict Band NVNT 1-DH5 2402MHz Ant1 No-Hopping Peak



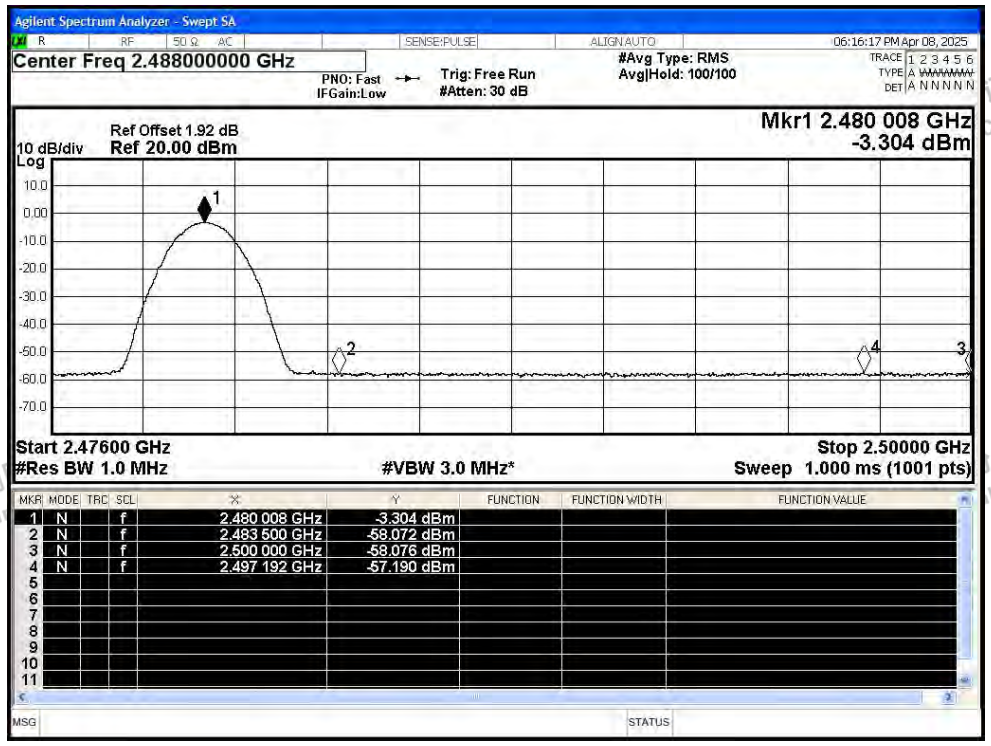
Restrict Band NVNT 1-DH5 2402MHz Ant1 No-Hopping Average



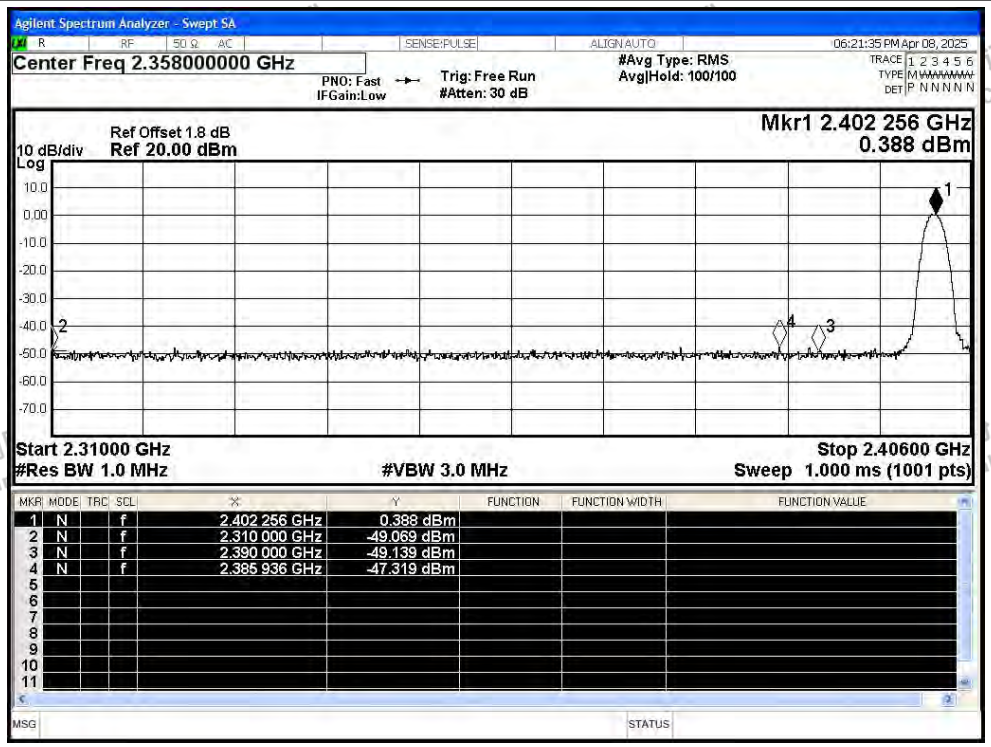
Restrict Band NVNT 1-DH5 2480MHz Ant1 No-Hopping Peak



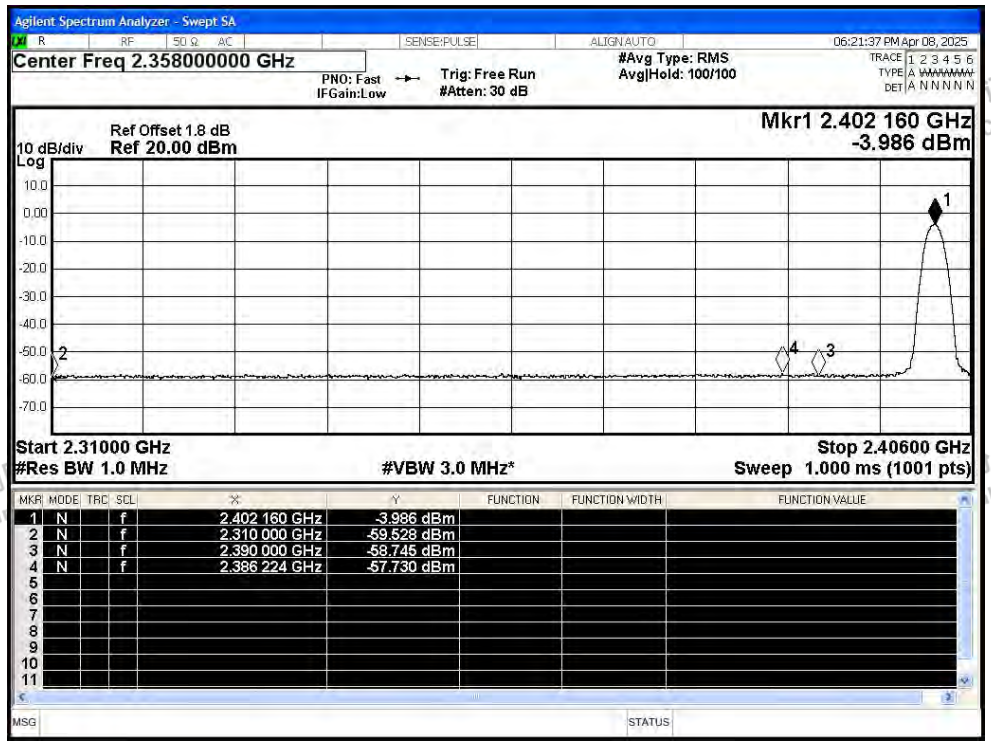
Restrict Band NVNT 1-DH5 2480MHz Ant1 No-Hopping Average



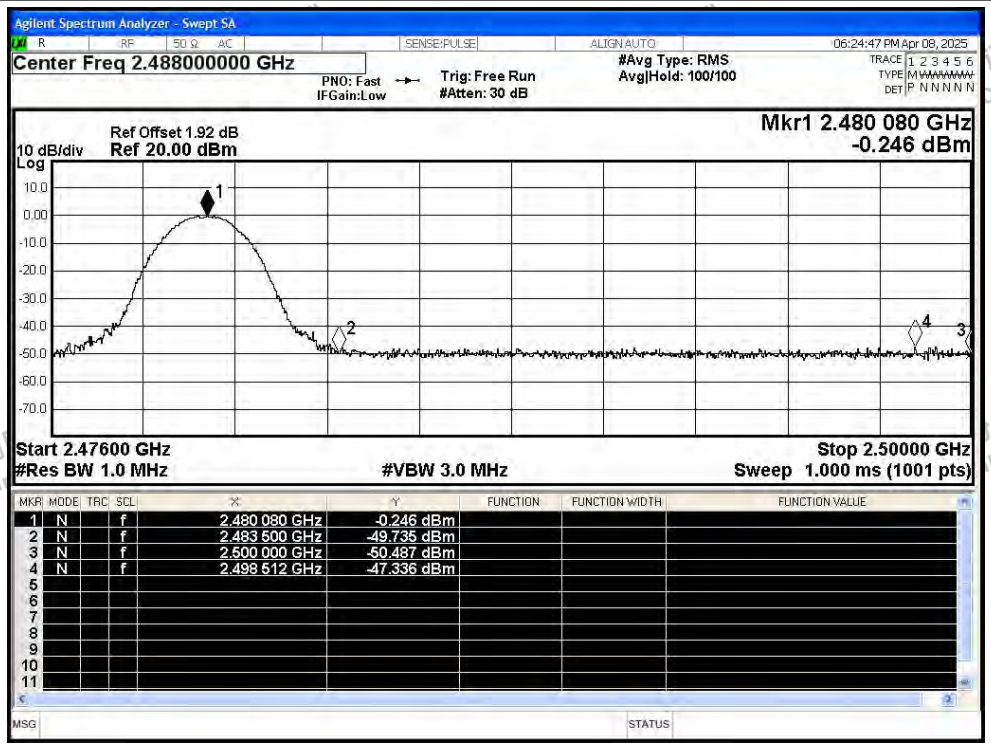
Restrict Band NVNT 2-DH5 2402MHz Ant1 No-Hopping Peak



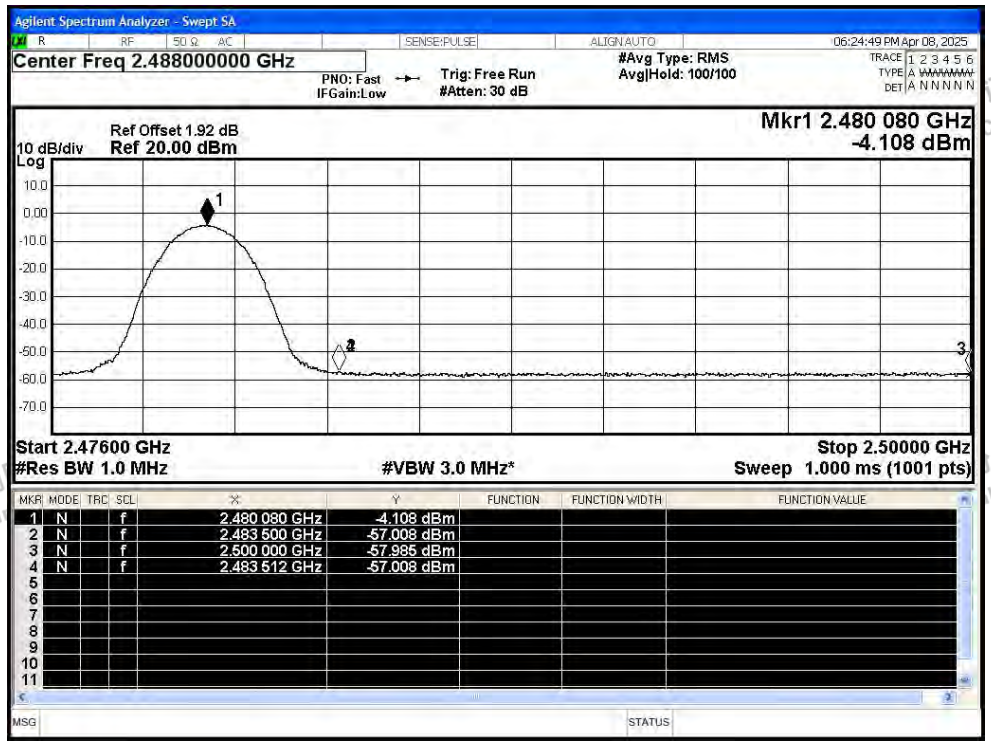
Restrict Band NVNT 2-DH5 2402MHz Ant1 No-Hopping Average



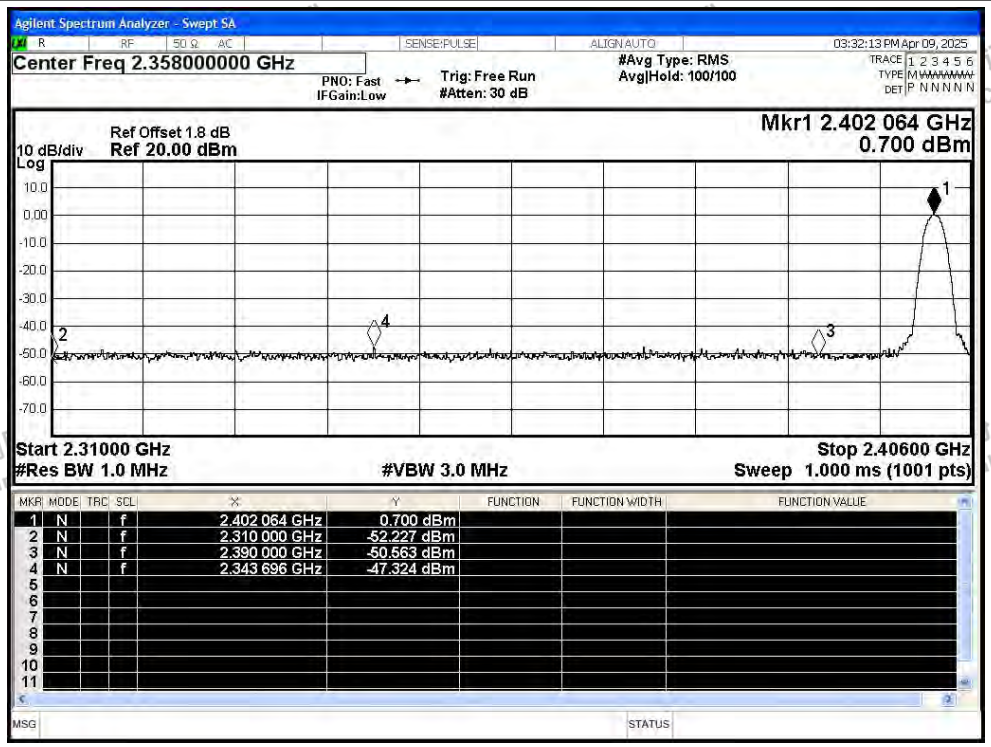
Restrict Band NVNT 2-DH5 2480MHz Ant1 No-Hopping Peak



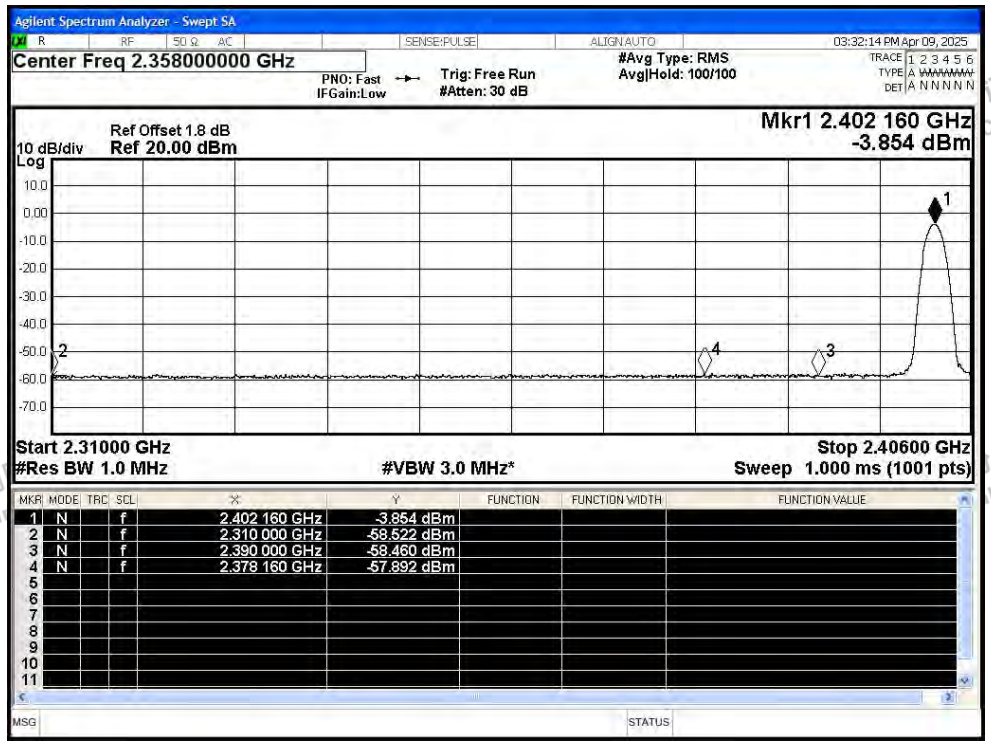
Restrict Band NVNT 2-DH5 2480MHz Ant1 No-Hopping Average



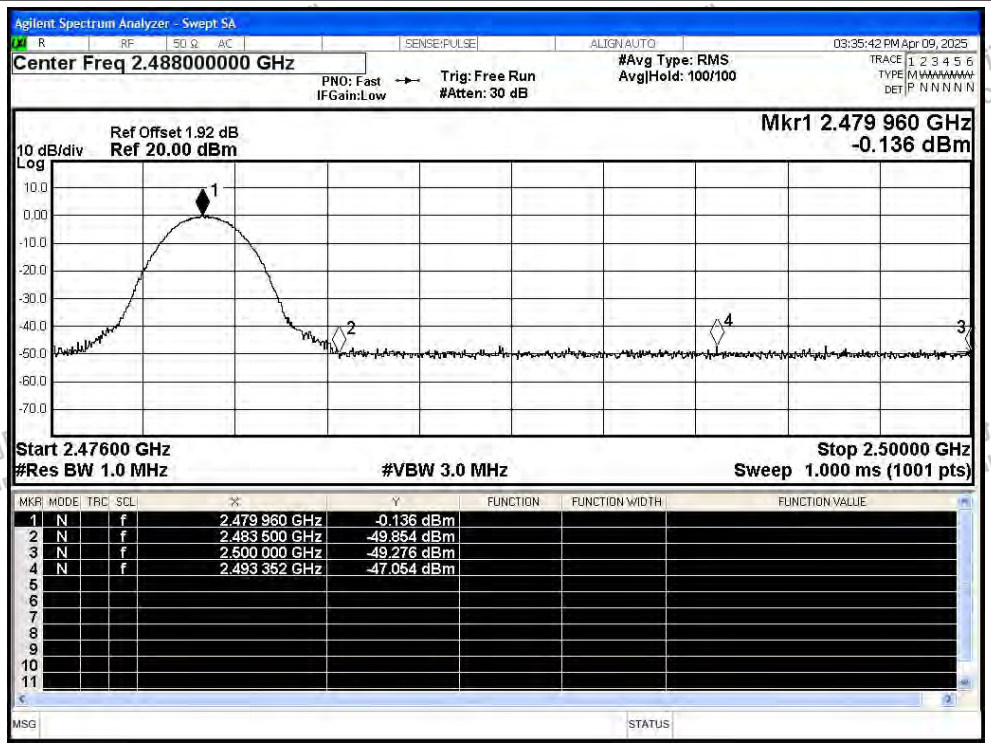
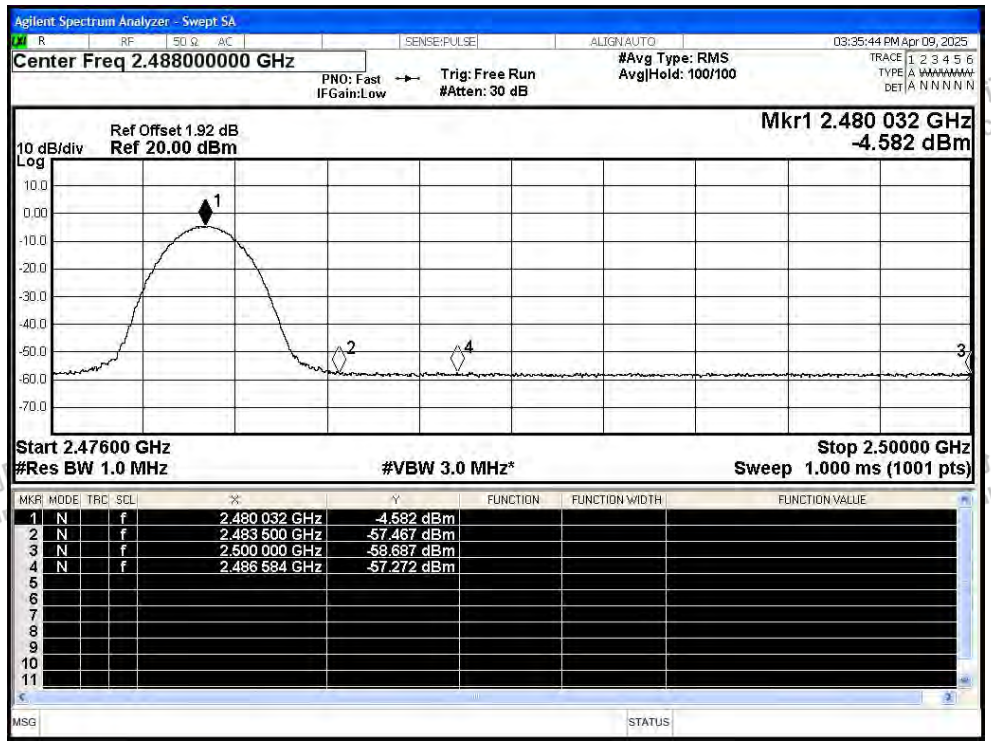
Restrict Band NVNT 3-DH5 2402MHz Ant1 No-Hopping Peak



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