



Appendix A

RF Test Data for BT (Conducted Measurement)

Product Name: Formuler Z mini

Test Model: Z mini

Environmental Conditions

Temperature:	23.1° C
Relative Humidity:	52.3%
ATM Pressure:	100.0 kPa
Test Engineer:	Taylor Hu
Supervised by:	Nick Peng





A.1 -20dB Bandwidth

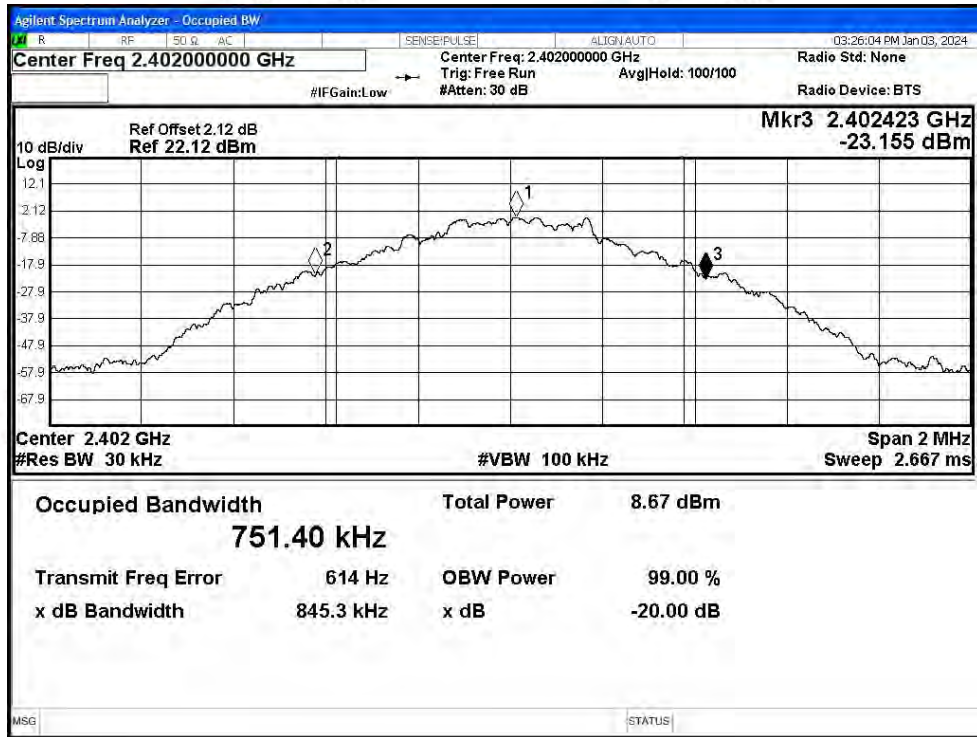
Condition	Mode	Frequency (MHz)	Antenna	-20 dB Bandwidth (MHz)	Limit -20 dB Bandwidth (MHz)	Verdict
NVNT	1-DH5	2402	Ant2	0.845	N/A	Pass
NVNT	1-DH5	2441	Ant2	0.855	N/A	Pass
NVNT	1-DH5	2480	Ant2	0.842	N/A	Pass
NVNT	2-DH5	2402	Ant2	1.276	N/A	Pass
NVNT	2-DH5	2441	Ant2	1.261	N/A	Pass
NVNT	2-DH5	2480	Ant2	1.276	N/A	Pass
NVNT	3-DH5	2402	Ant2	1.272	N/A	Pass
NVNT	3-DH5	2441	Ant2	1.3	N/A	Pass
NVNT	3-DH5	2480	Ant2	1.284	N/A	Pass





Test Graphs

-20dB Bandwidth NVNT 1-DH5 2402MHz Ant2



-20dB Bandwidth NVNT 1-DH5 2441MHz Ant2





-20dB Bandwidth NVNT 1-DH5 2480MHz Ant2

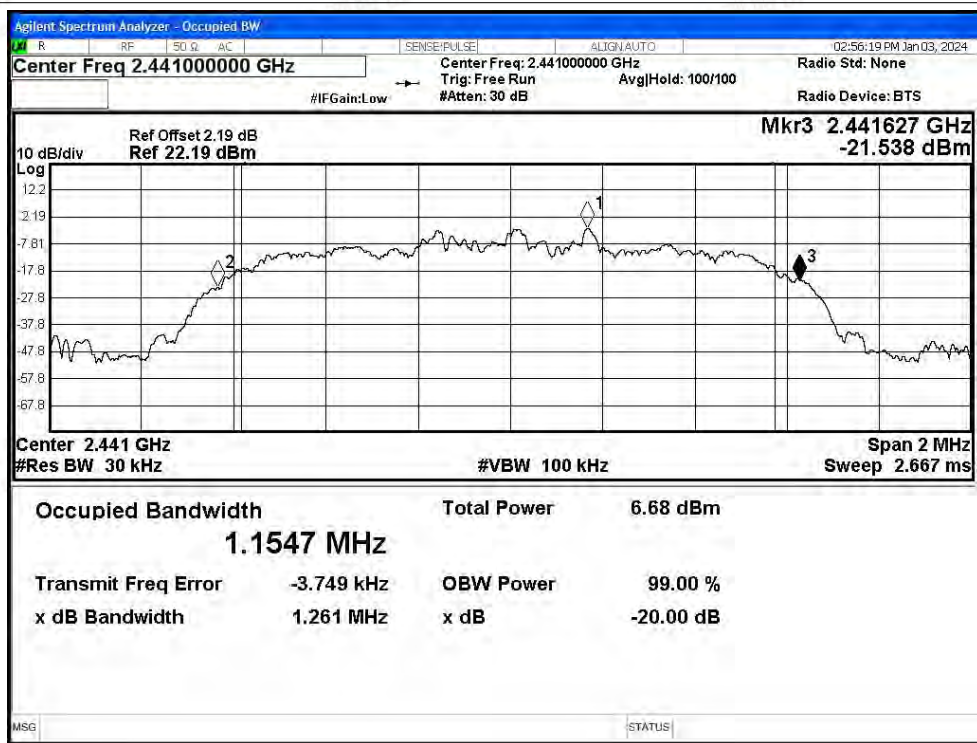


-20dB Bandwidth NVNT 2-DH5 2402MHz Ant2

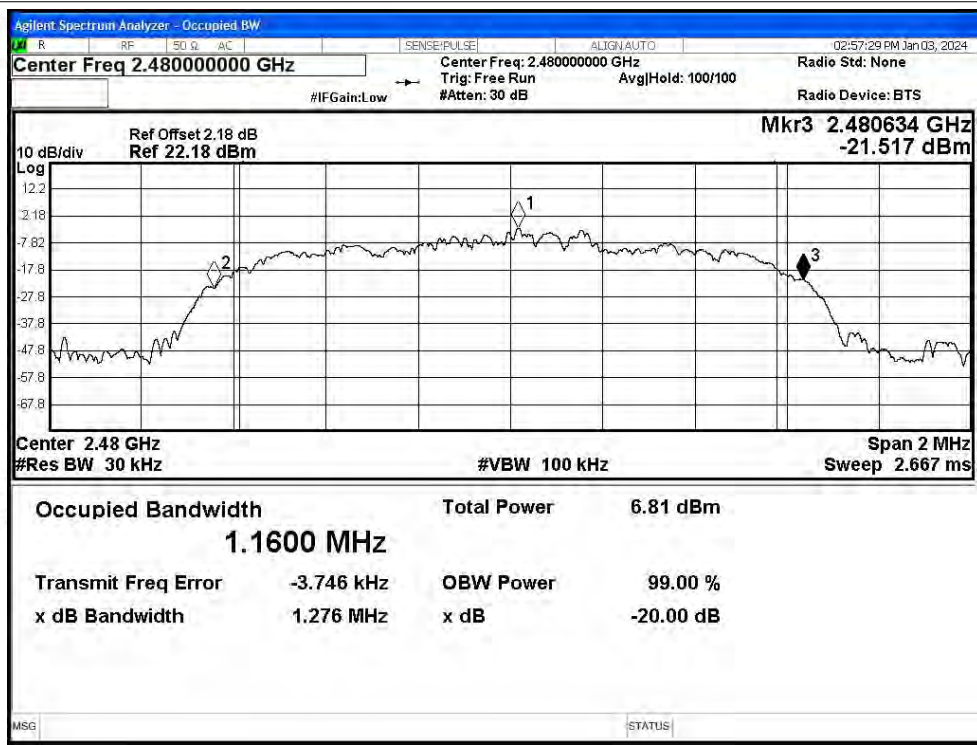




-20dB Bandwidth NVNT 2-DH5 2441MHz Ant2



-20dB Bandwidth NVNT 2-DH5 2480MHz Ant2

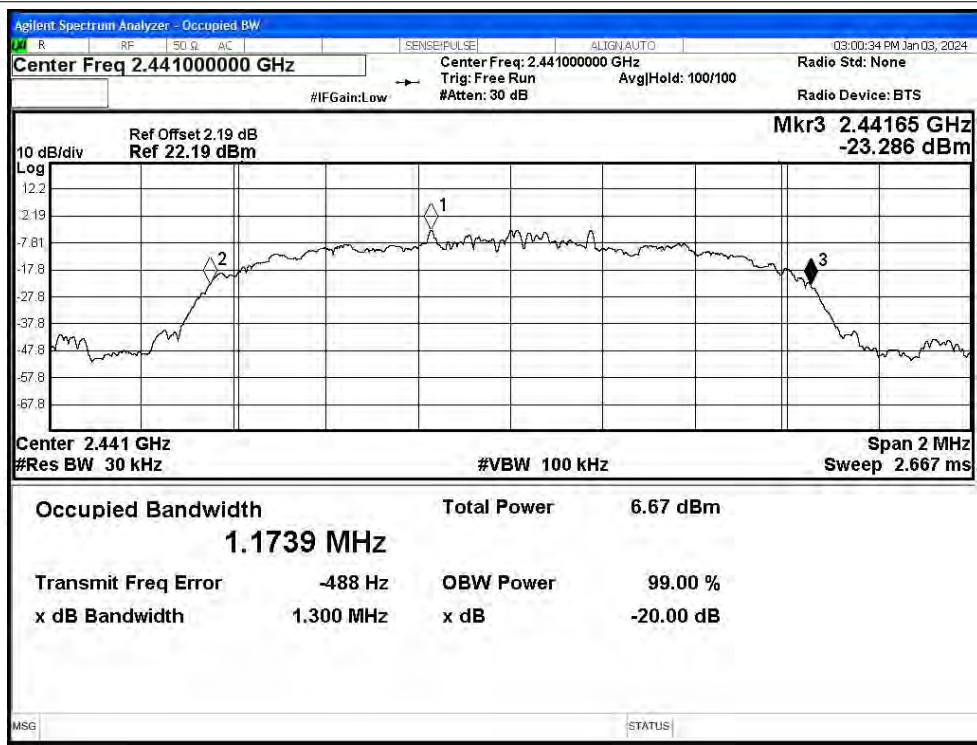




-20dB Bandwidth NVNT 3-DH5 2402MHz Ant2



-20dB Bandwidth NVNT 3-DH5 2441MHz Ant2





-20dB Bandwidth NVNT 3-DH5 2480MHz Ant2





A.2 Maximum Peak Conducted Output Power

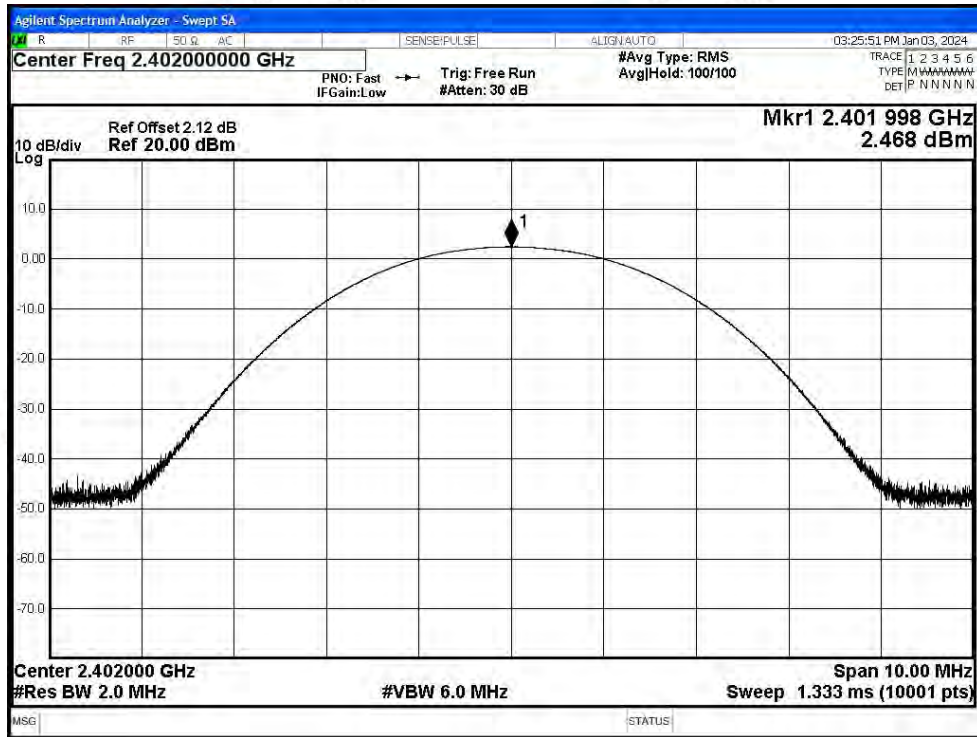
Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	1-DH5	2402	Ant2	2.47	21	Pass
NVNT	1-DH5	2441	Ant2	2.46	21	Pass
NVNT	1-DH5	2480	Ant2	2.54	21	Pass
NVNT	2-DH5	2402	Ant2	1.45	21	Pass
NVNT	2-DH5	2441	Ant2	1.64	21	Pass
NVNT	2-DH5	2480	Ant2	1.66	21	Pass
NVNT	3-DH5	2402	Ant2	1.71	21	Pass
NVNT	3-DH5	2441	Ant2	2.02	21	Pass
NVNT	3-DH5	2480	Ant2	2.05	21	Pass



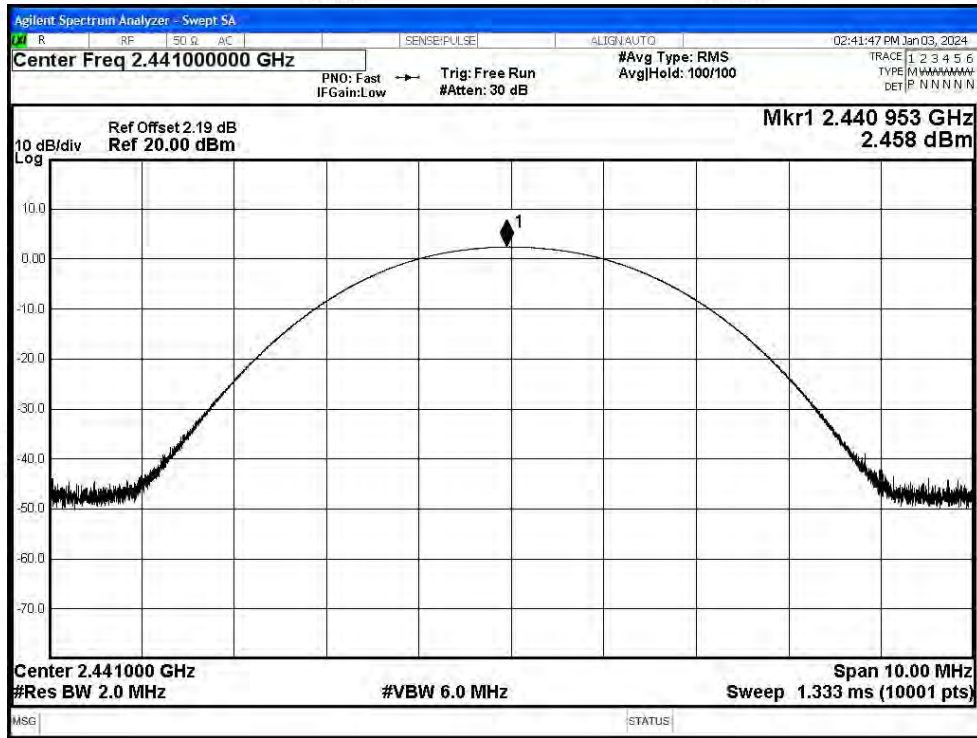


Test Graphs

Power NVNT 1-DH5 2402MHz Ant2

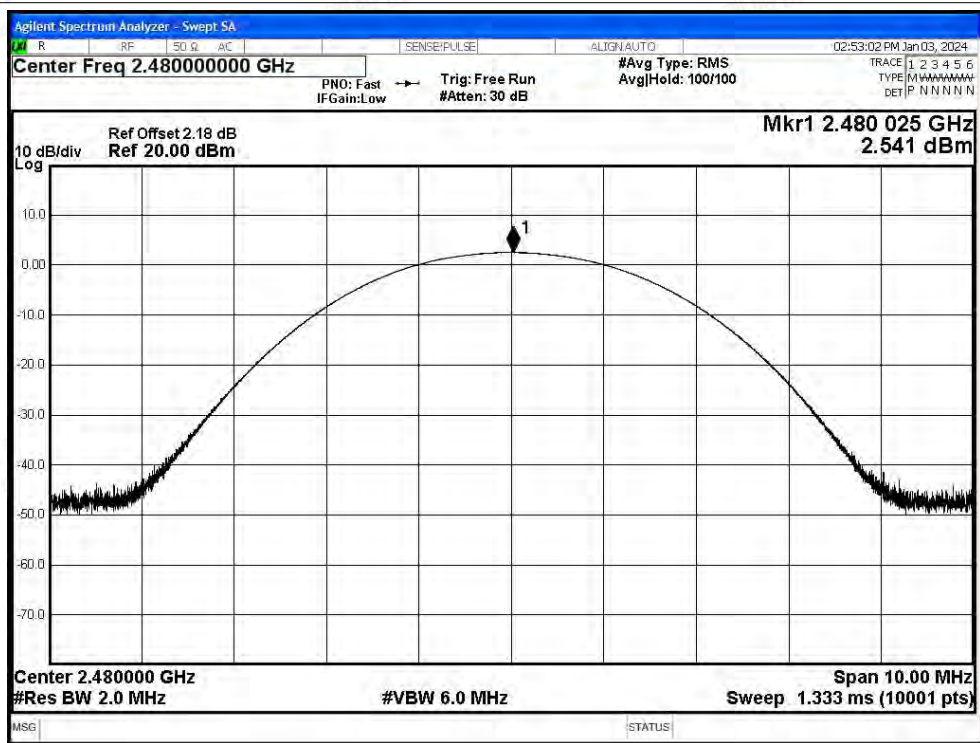


Power NVNT 1-DH5 2441MHz Ant2

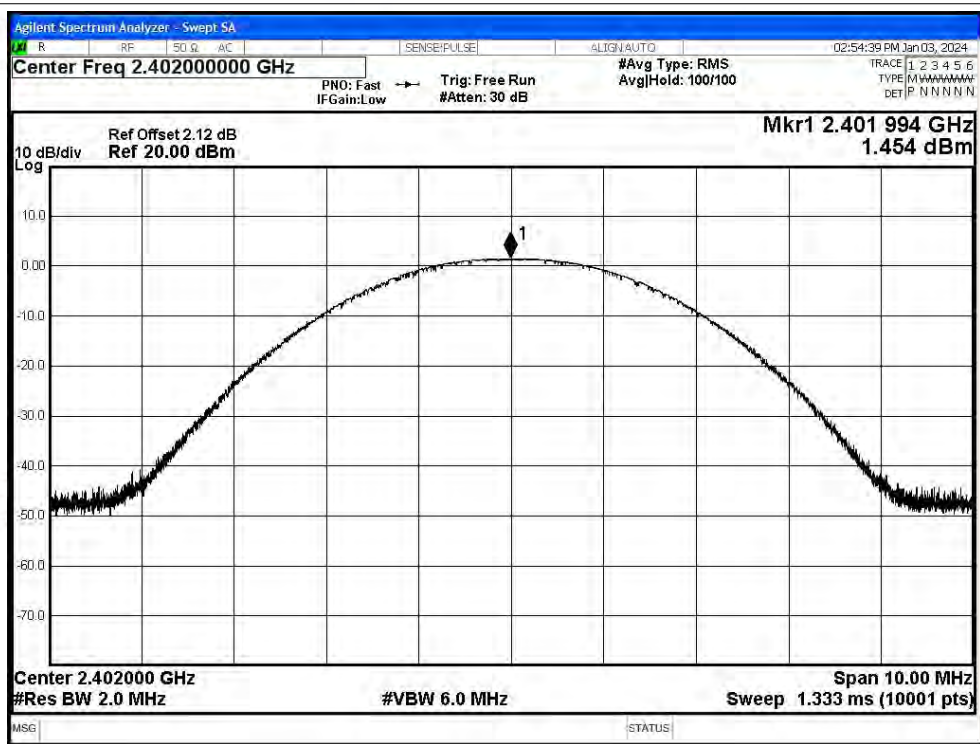




Power NVNT 1-DH5 2480MHz Ant2

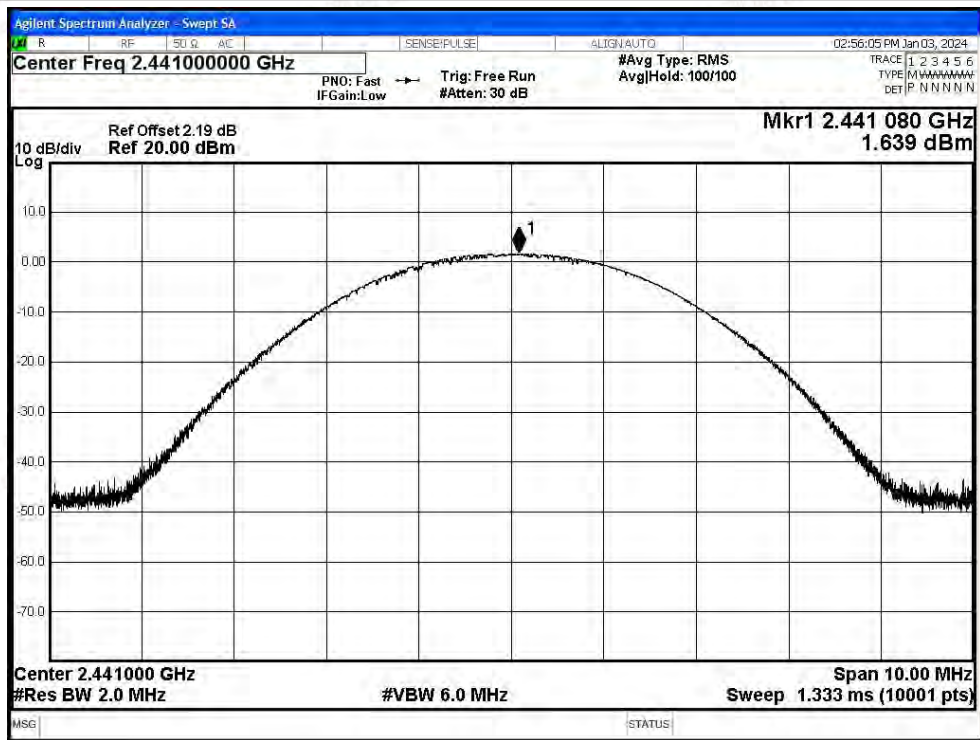


Power NVNT 2-DH5 2402MHz Ant2

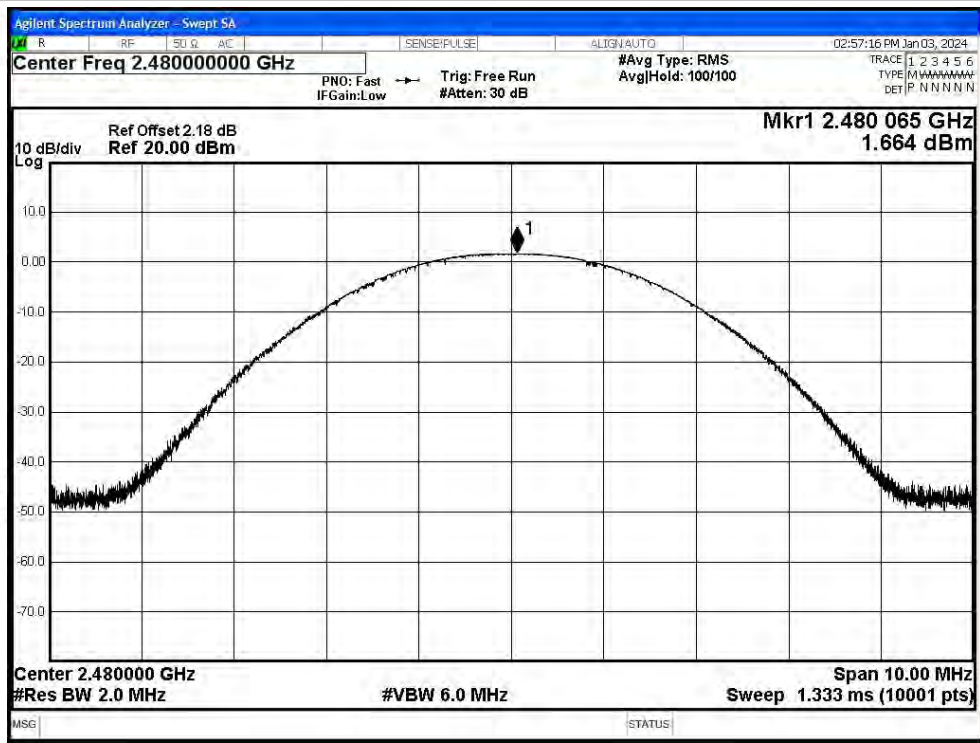




Power NVNT 2-DH5 2441MHz Ant2

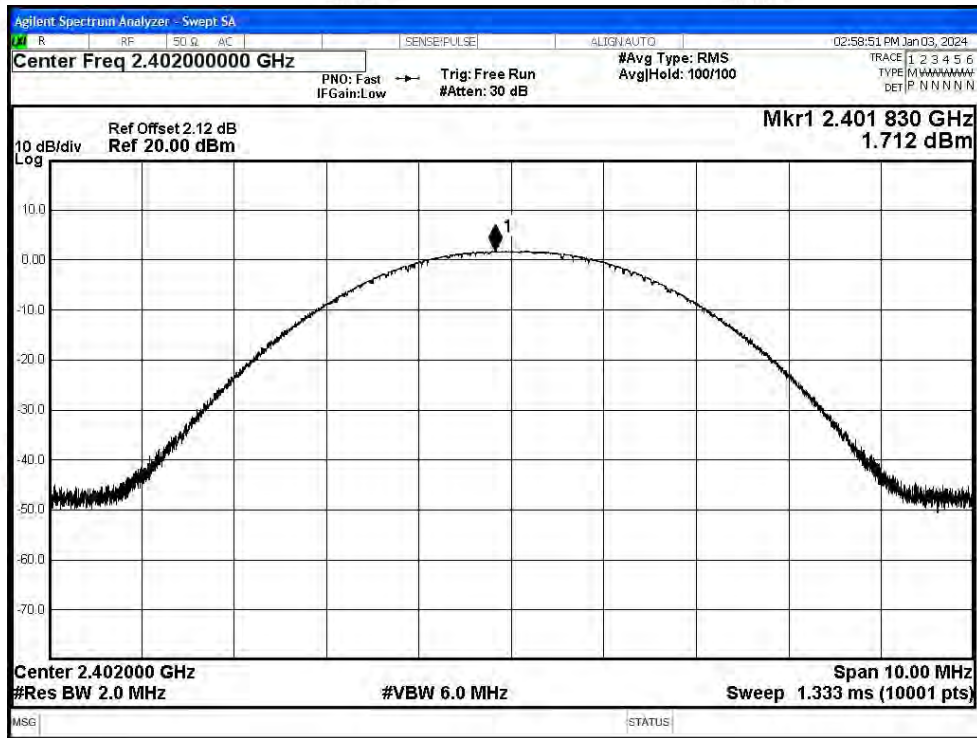


Power NVNT 2-DH5 2480MHz Ant2

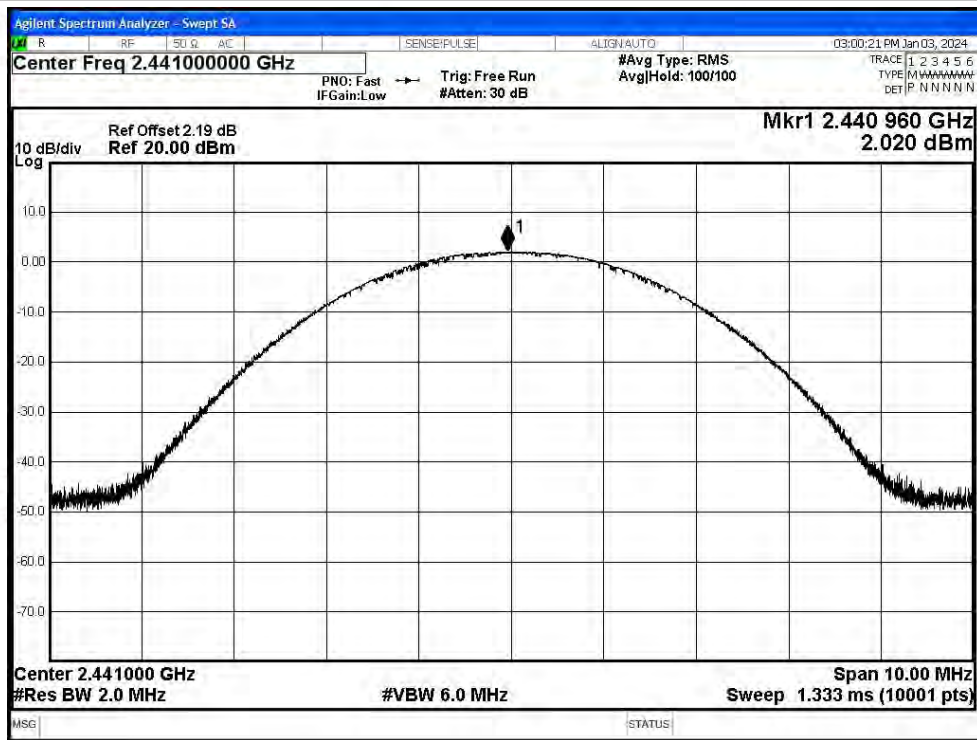


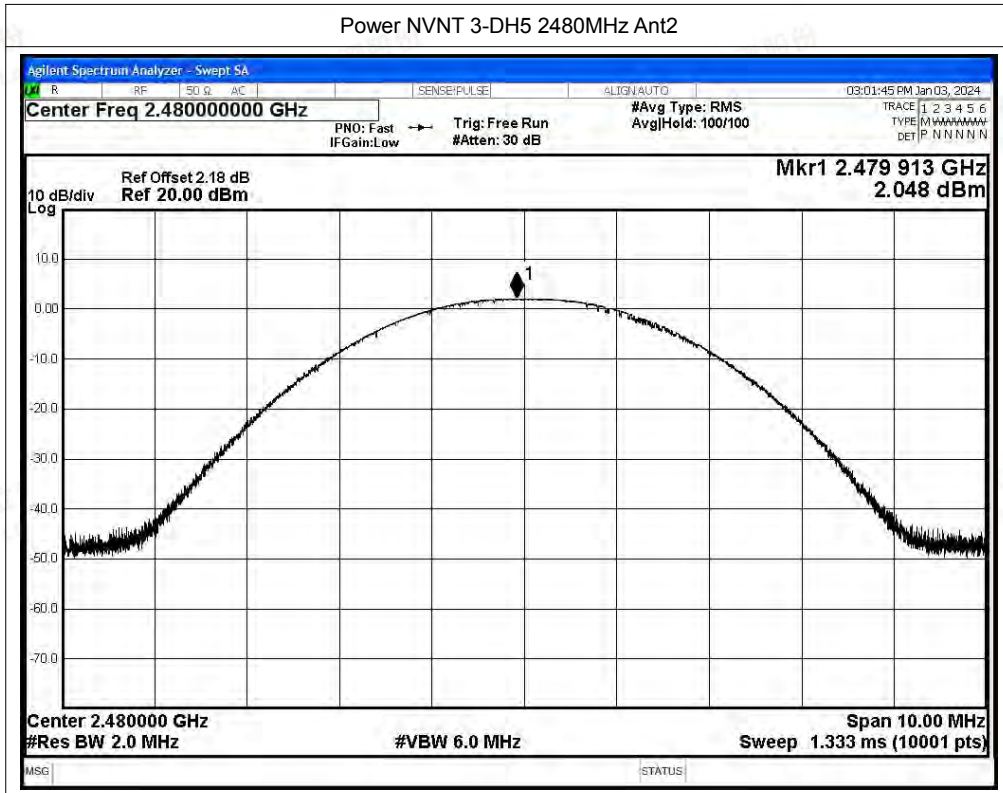


Power NVNT 3-DH5 2402MHz Ant2



Power NVNT 3-DH5 2441MHz Ant2







A.3 Carrier Frequencies Separation

Condition	Mode	Antenna	Hopping Freq1 (MHz)	Hopping Freq2 (MHz)	HFS (MHz)	Limit (MHz)	Verdict
NVNT	1-DH5	Ant2	2401.97	2403	1.03	0.570	Pass
NVNT	2-DH5	Ant2	2401.866	2403.03	1.164	0.851	Pass
NVNT	3-DH5	Ant2	2402.162	2403.158	0.996	0.867	Pass



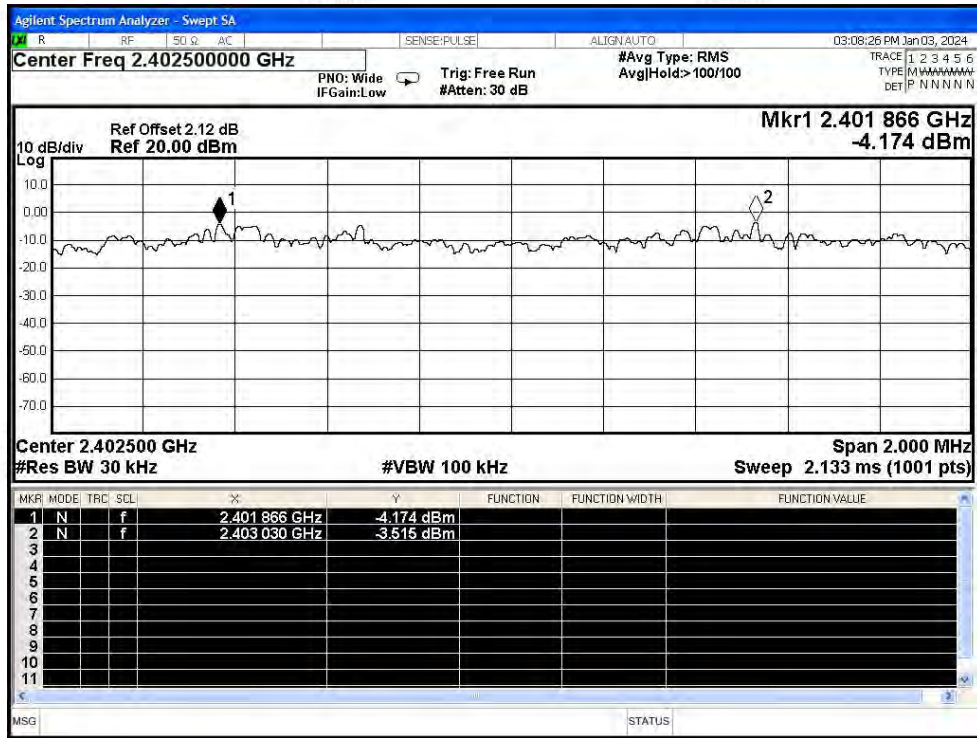


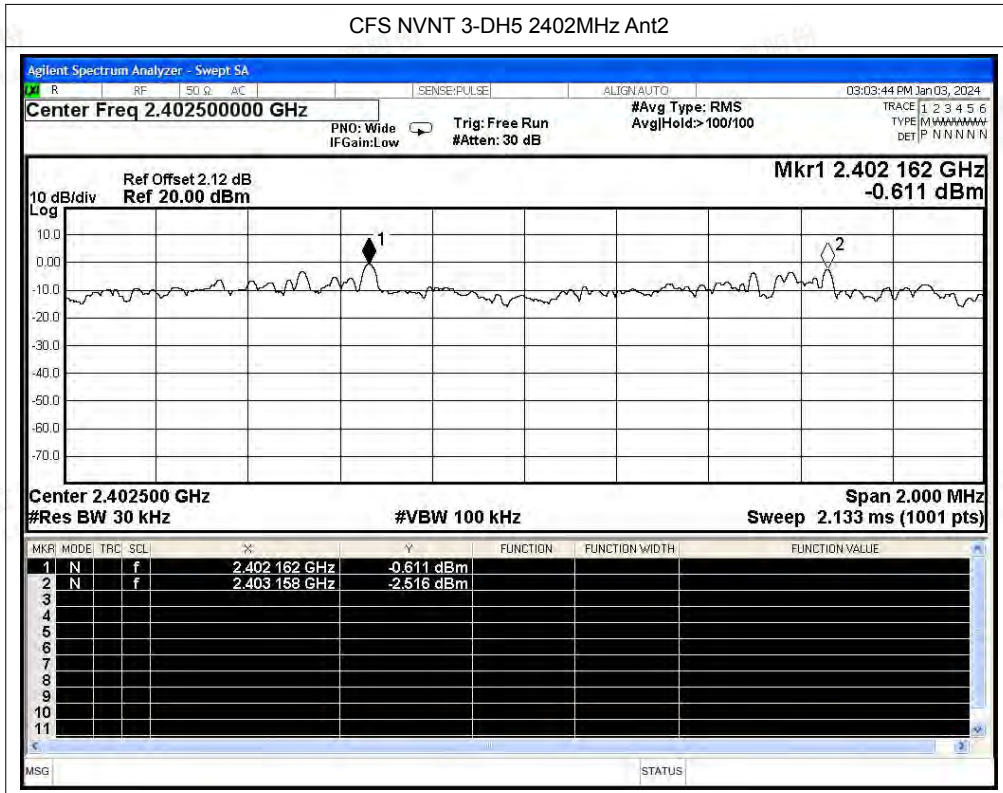
Test Graphs

CFS NVNT 1-DH5 2402MHz Ant2



CFS NVNT 2-DH5 2402MHz Ant2







A.4 Dwell Time

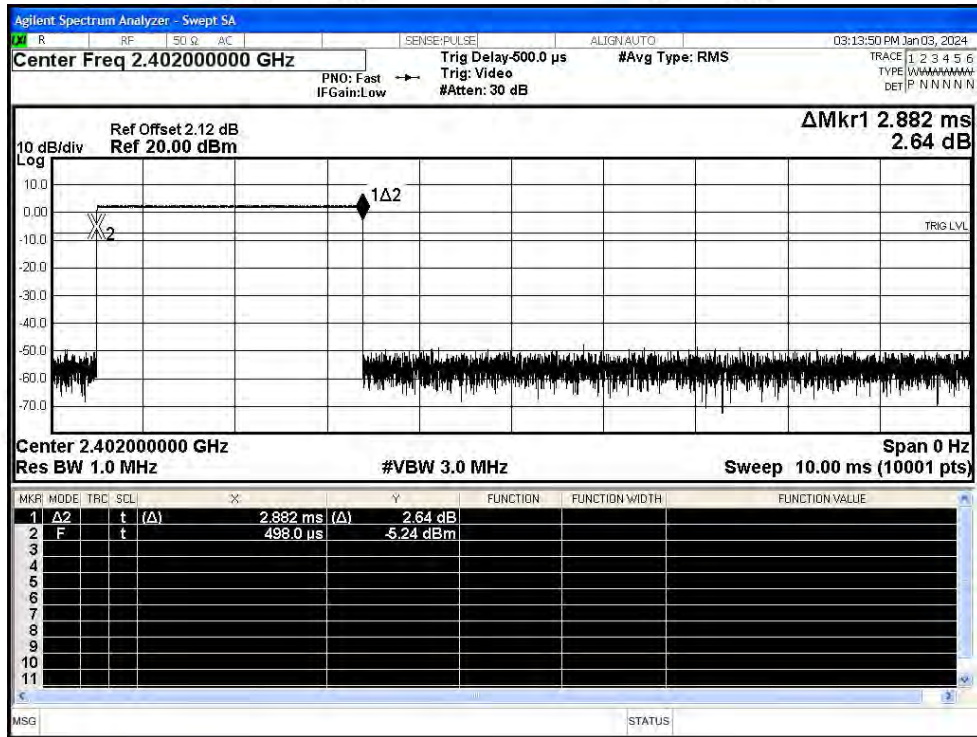
Condition	Mode	Frequency (MHz)	Antenna	Pulse Time (ms)	Total Dwell Time (ms)	Burst Count	Period Time (ms)	Limit (ms)	Verdict
NVNT	1-DH5	2402	Ant2	2.882	308.374	107	31600	400	Pass
NVNT	2-DH5	2402	Ant2	2.88	293.76	102	31600	400	Pass
NVNT	3-DH5	2402	Ant2	2.886	314.574	109	31600	400	Pass



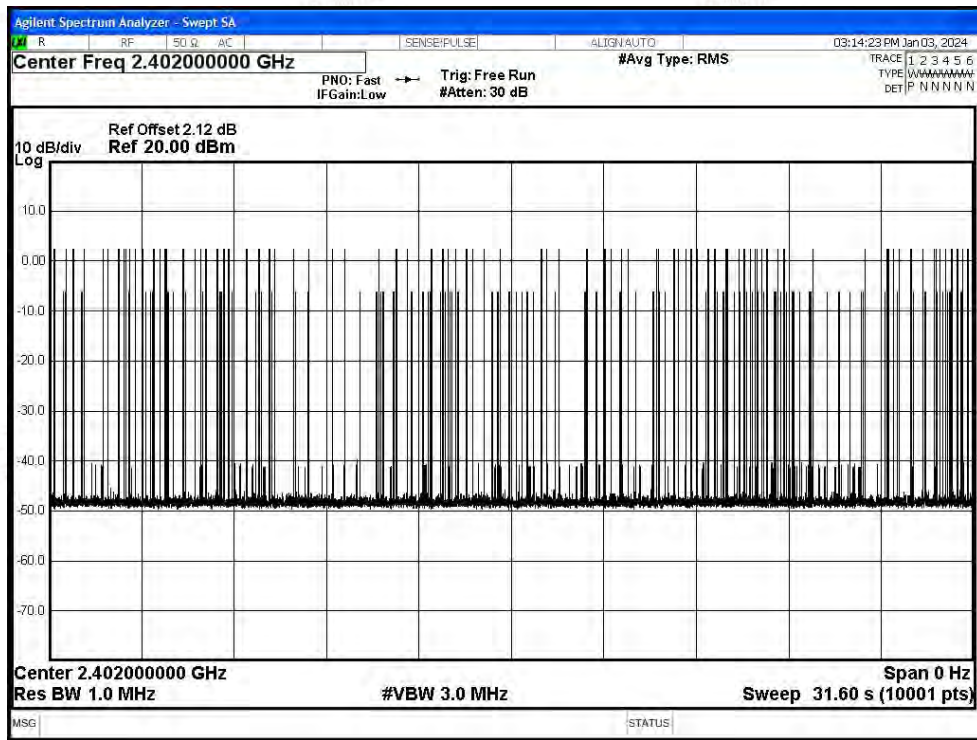


Test Graphs

Dwell NVNT 1-DH5 2402MHz Ant2 One Burst

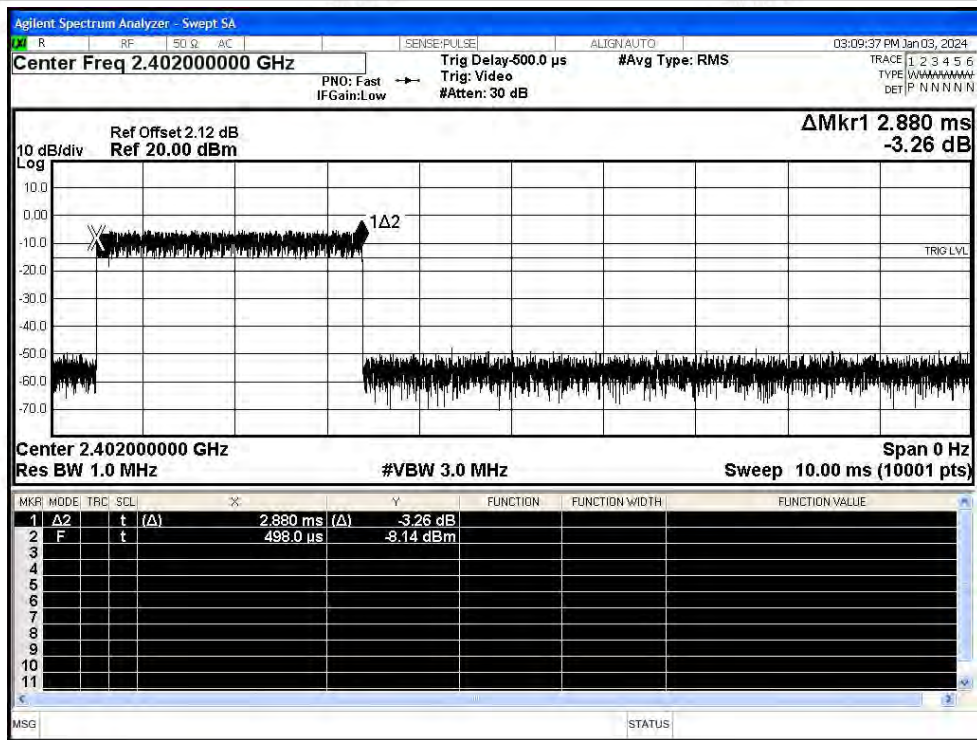


Dwell NVNT 1-DH5 2402MHz Ant2 Accumulated

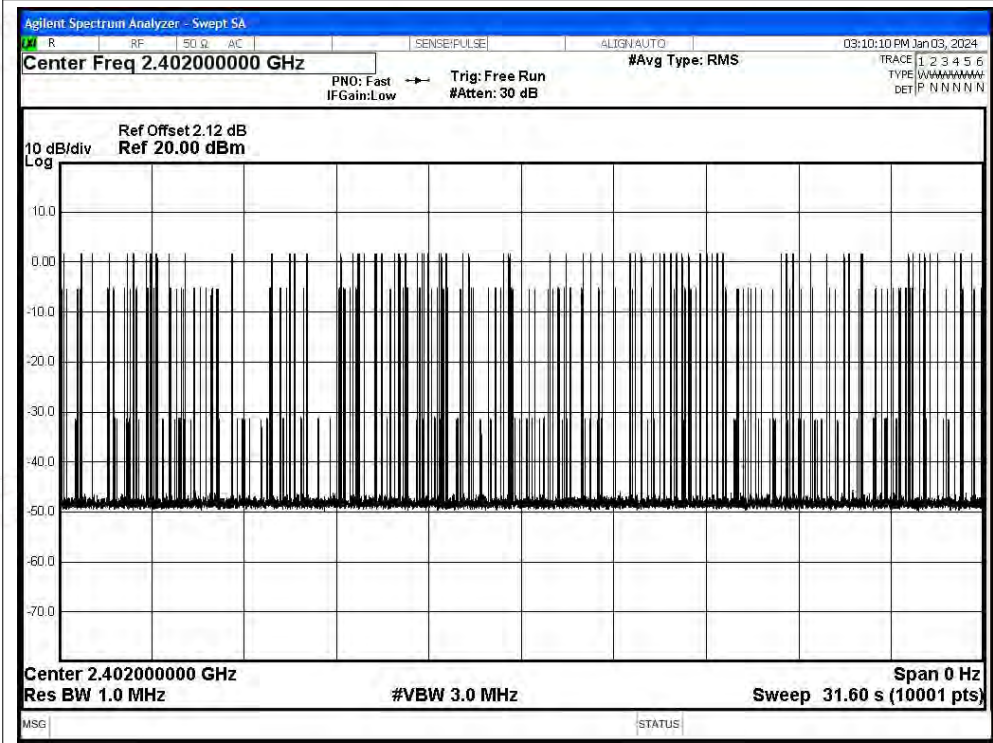




Dwell NVNT 2-DH5 2402MHz Ant2 One Burst

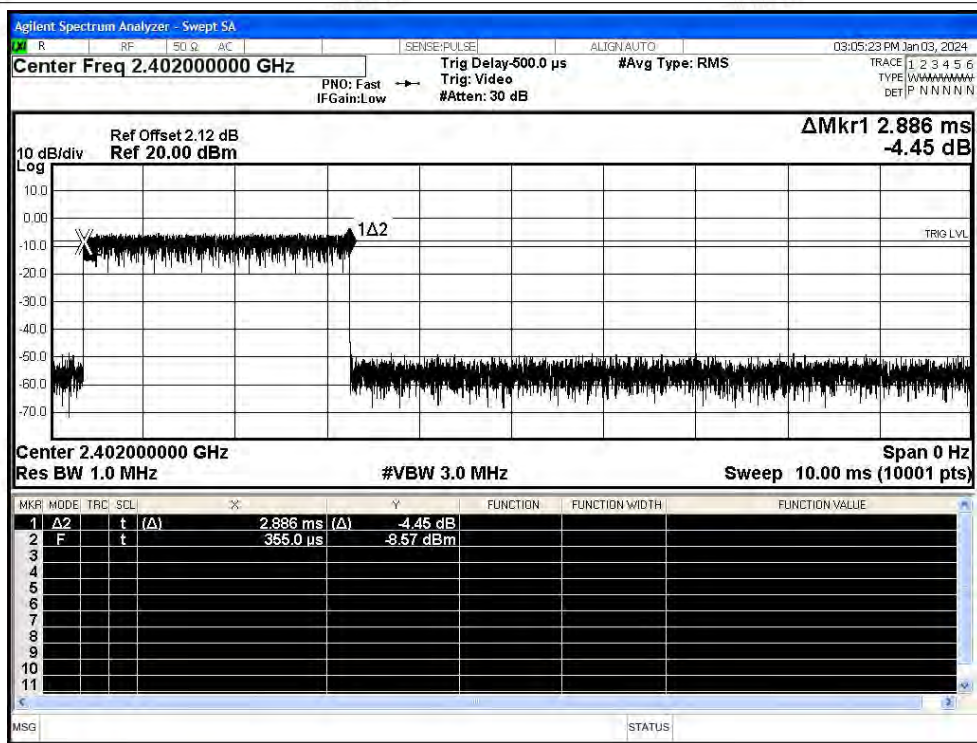


Dwell NVNT 2-DH5 2402MHz Ant2 Accumulated

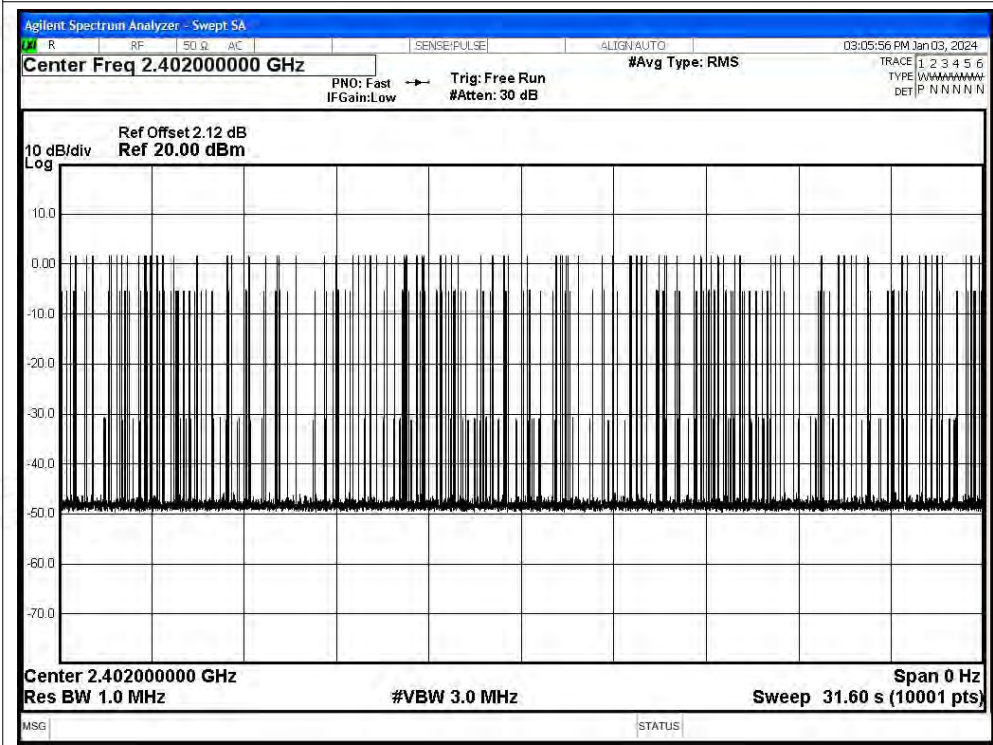




Dwell NVNT 3-DH5 2402MHz Ant2 One Burst



Dwell NVNT 3-DH5 2402MHz Ant2 Accumulated





A.5 Number of Hopping Channel

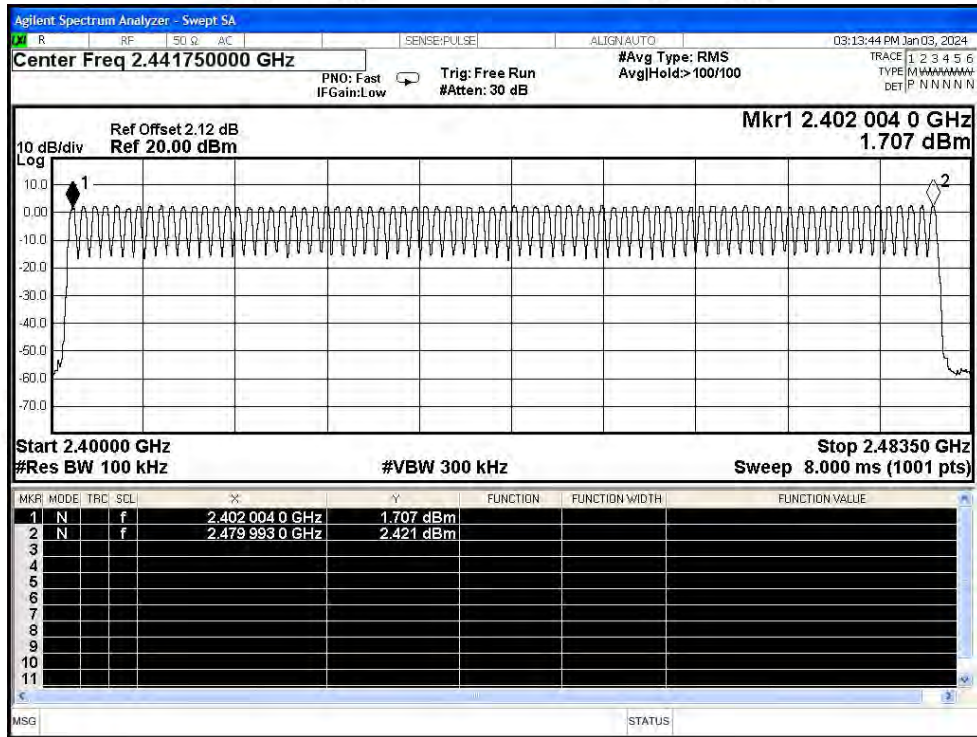
Condition	Mode	Antenna	Hopping Number	Limit	Verdict
NVNT	1-DH5	Ant2	79	15	Pass
NVNT	2-DH5	Ant2	79	15	Pass
NVNT	3-DH5	Ant2	79	15	Pass



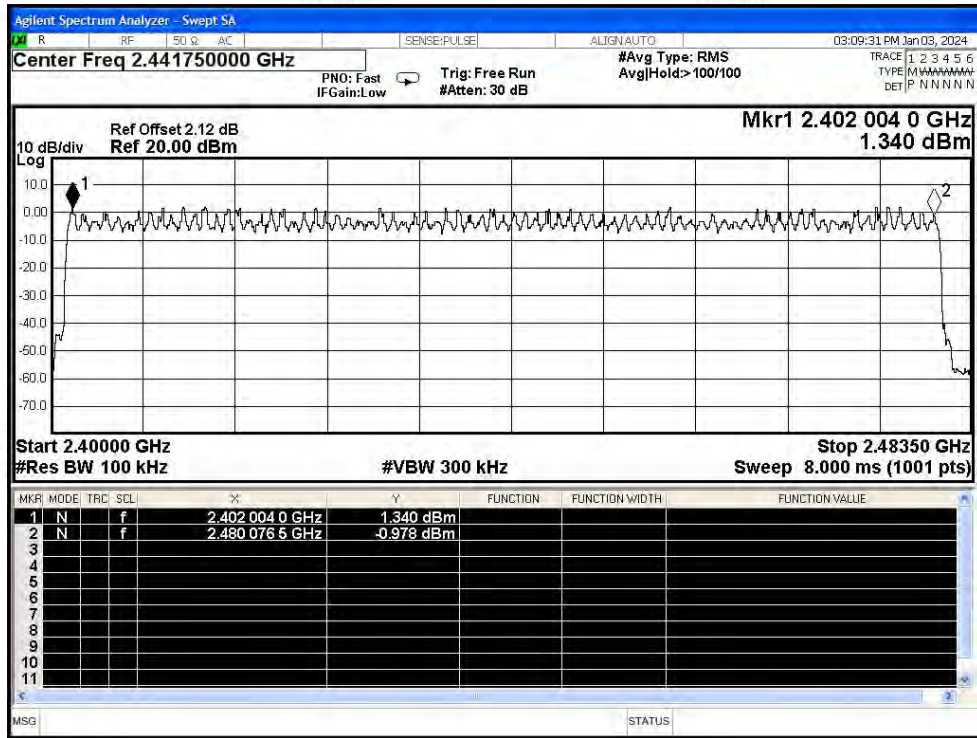


Test Graphs

Hopping No. NVNT 1-DH5 2402MHz Ant2

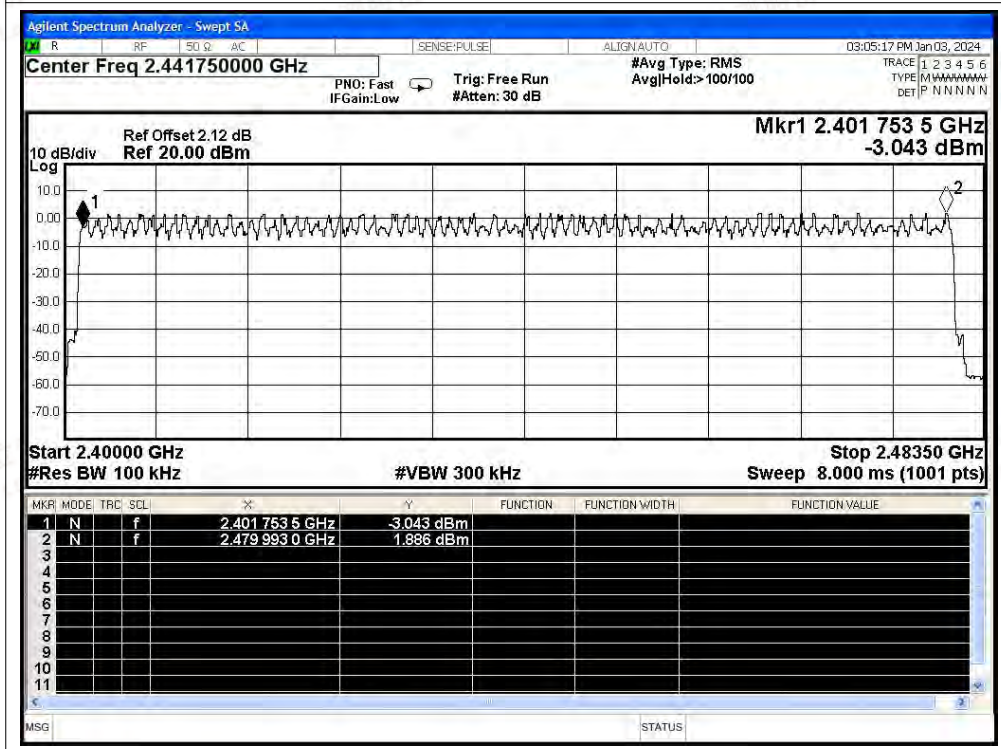


Hopping No. NVNT 2-DH5 2402MHz Ant2





Hopping No. NVNT 3-DH5 2402MHz Ant2





A.6 Band Edge

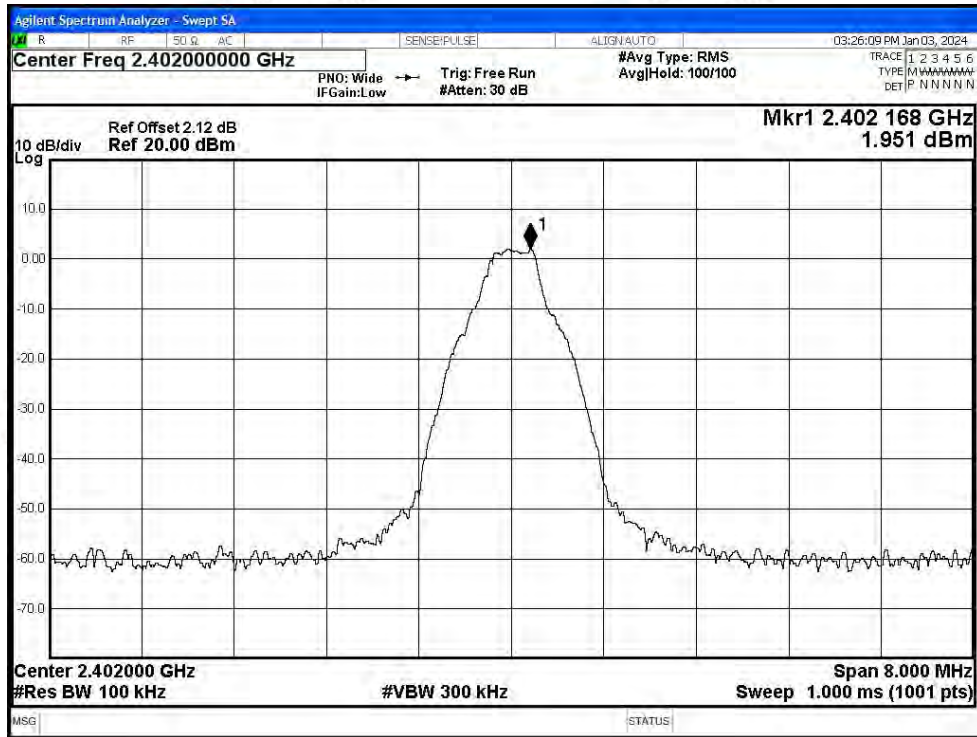
Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH5	2402	Ant2	No-Hopping	-59.25	-20	Pass
NVNT	1-DH5	2480	Ant2	No-Hopping	-58.84	-20	Pass
NVNT	2-DH5	2402	Ant2	No-Hopping	-57.84	-20	Pass
NVNT	2-DH5	2480	Ant2	No-Hopping	-57.7	-20	Pass
NVNT	3-DH5	2402	Ant2	No-Hopping	-57.78	-20	Pass
NVNT	3-DH5	2480	Ant2	No-Hopping	-58.07	-20	Pass



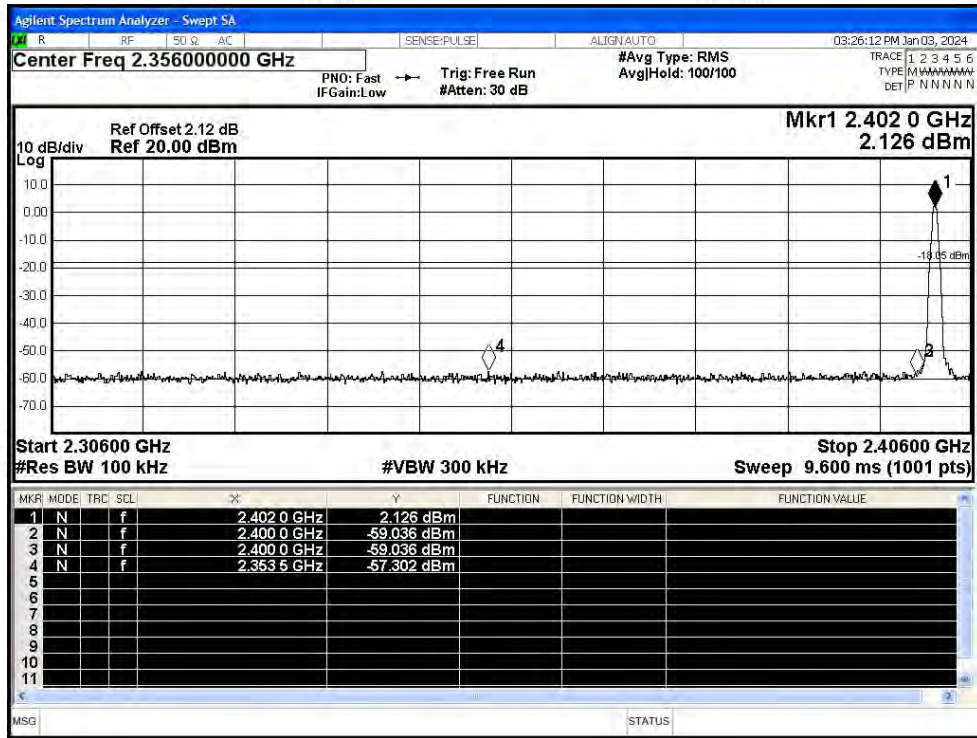


Test Graphs

Band Edge NVNT 1-DH5 2402MHz Ant2 No-Hopping Ref

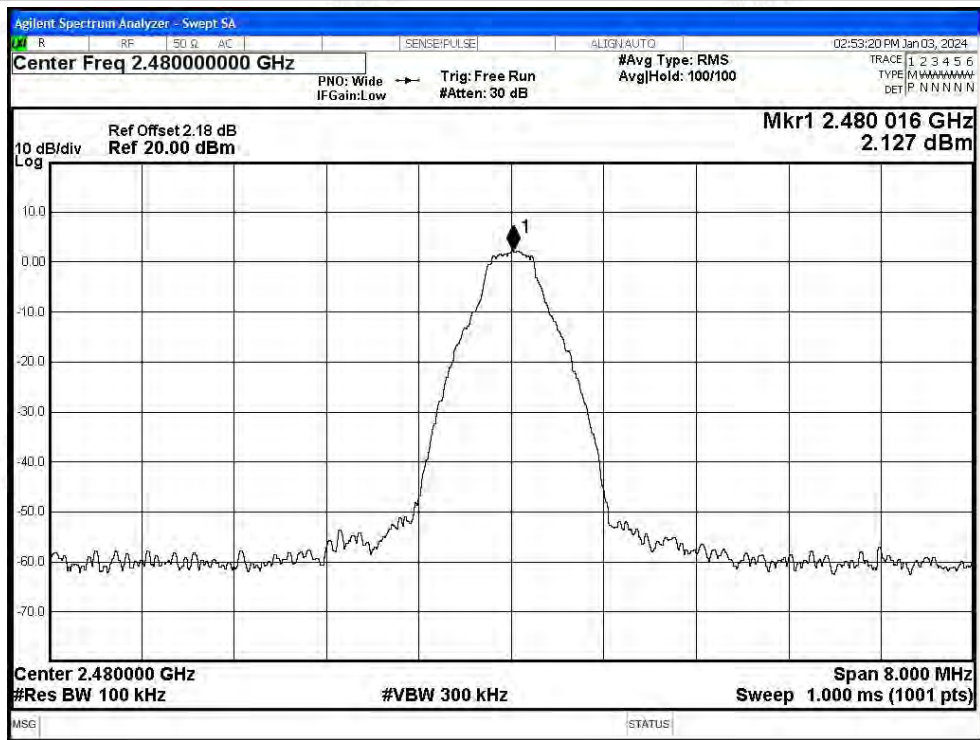


Band Edge NVNT 1-DH5 2402MHz Ant2 No-Hopping Emission

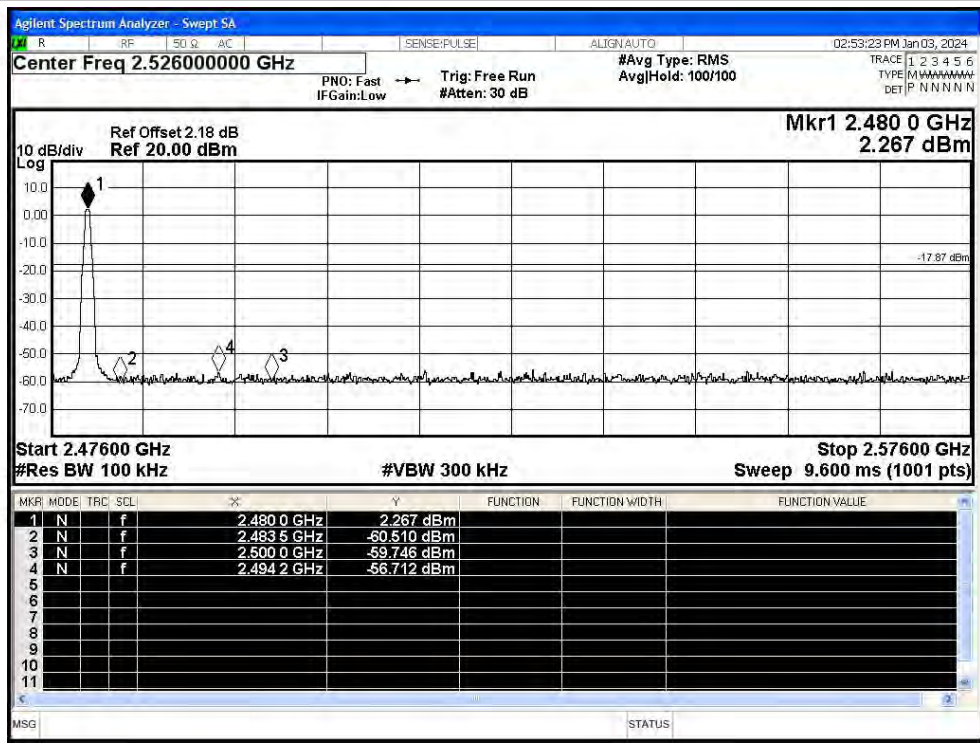




Band Edge NVNT 1-DH5 2480MHz Ant2 No-Hopping Ref

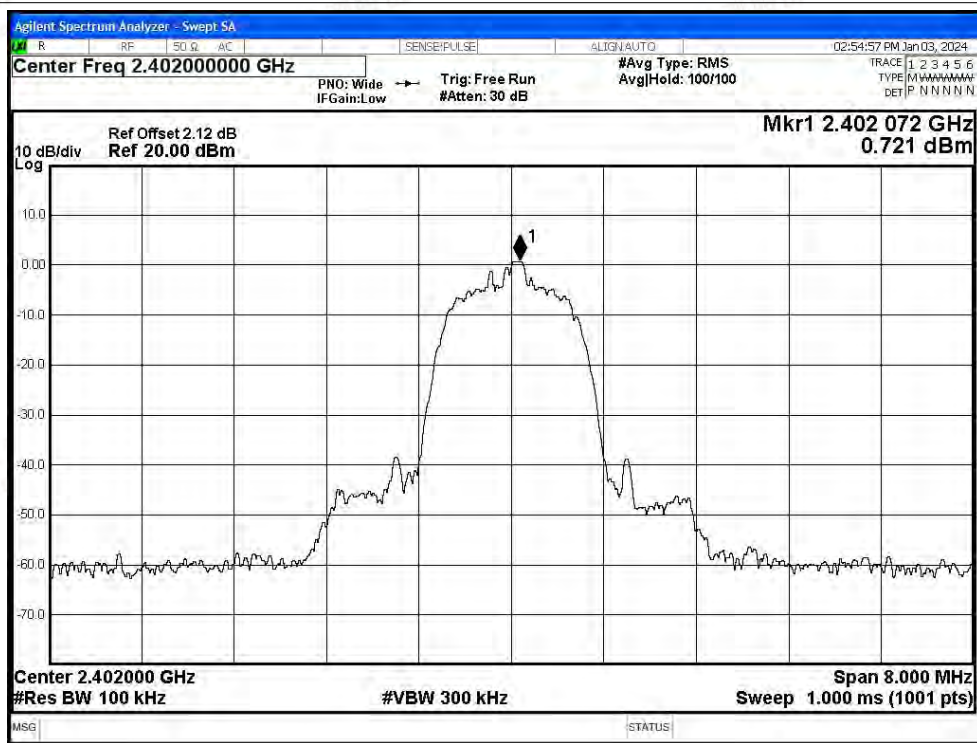


Band Edge NVNT 1-DH5 2480MHz Ant2 No-Hopping Emission

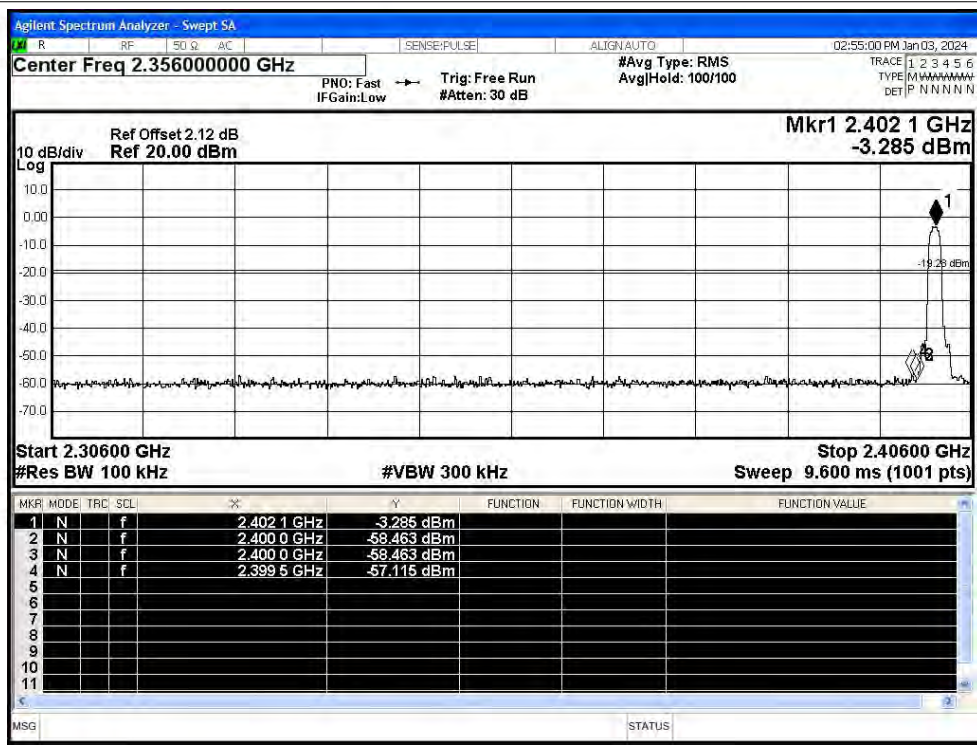




Band Edge NVNT 2-DH5 2402MHz Ant2 No-Hopping Ref

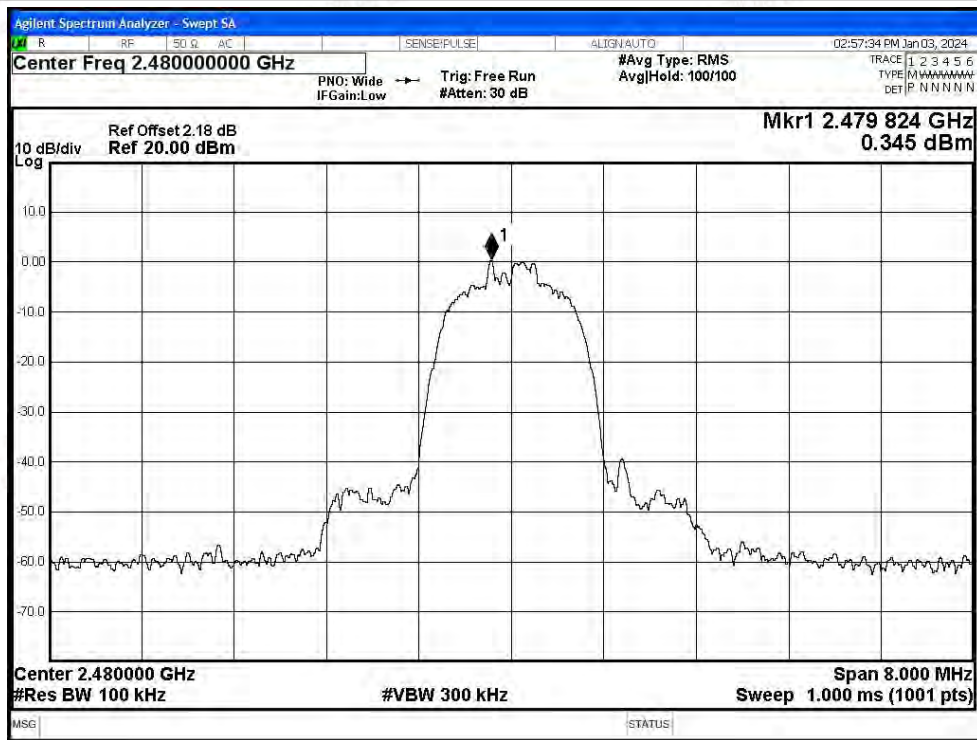


Band Edge NVNT 2-DH5 2402MHz Ant2 No-Hopping Emission

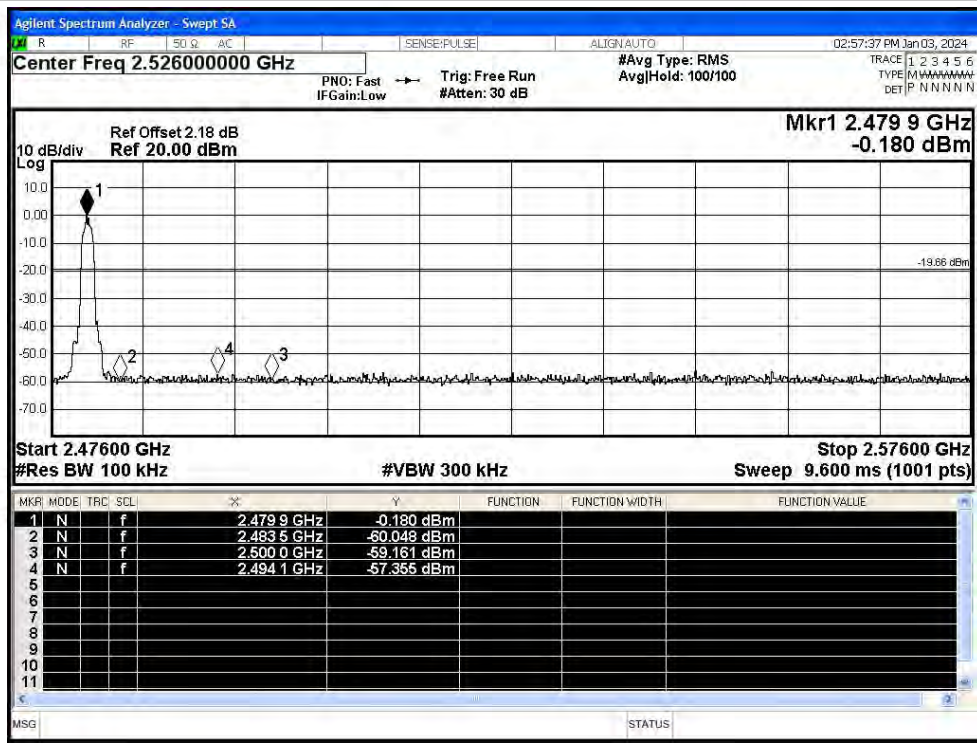




Band Edge NVNT 2-DH5 2480MHz Ant2 No-Hopping Ref

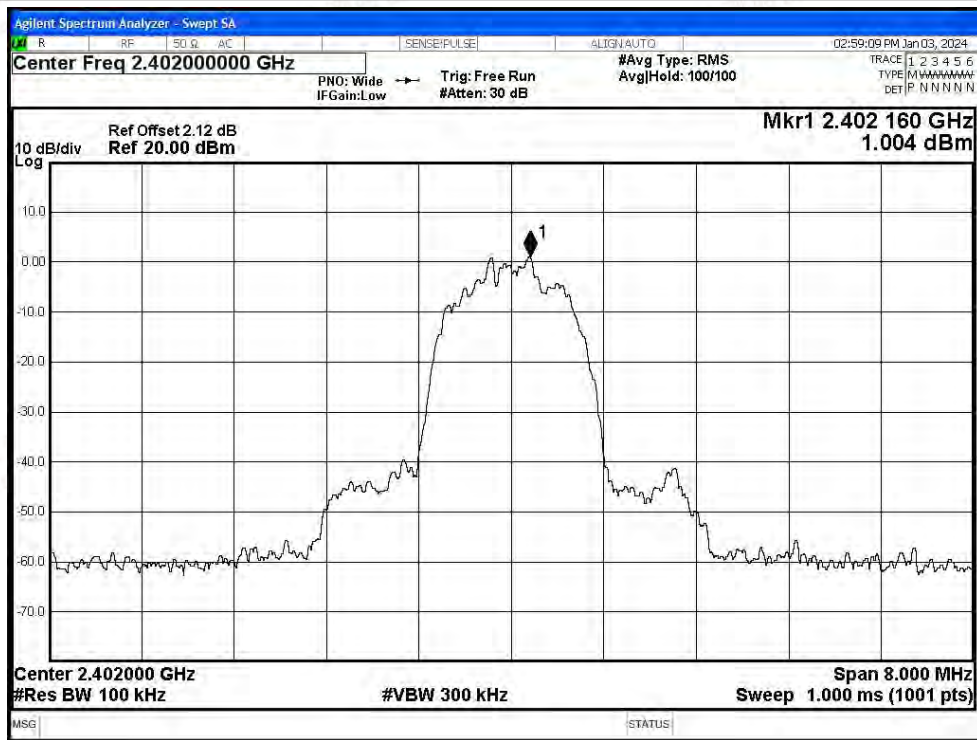


Band Edge NVNT 2-DH5 2480MHz Ant2 No-Hopping Emission

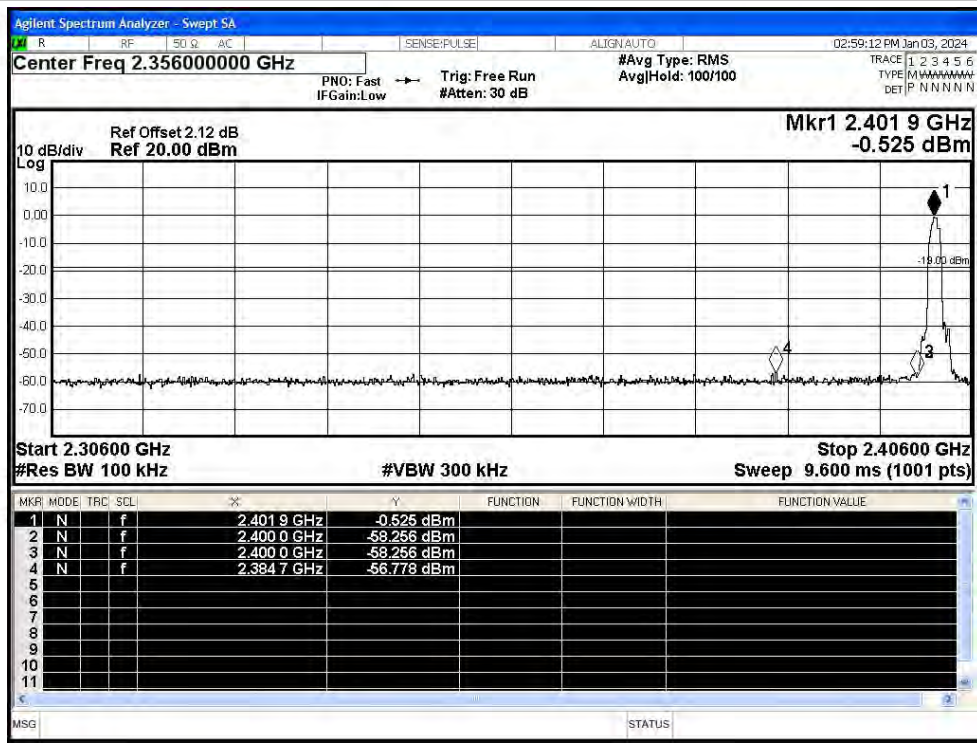




Band Edge NVNT 3-DH5 2402MHz Ant2 No-Hopping Ref

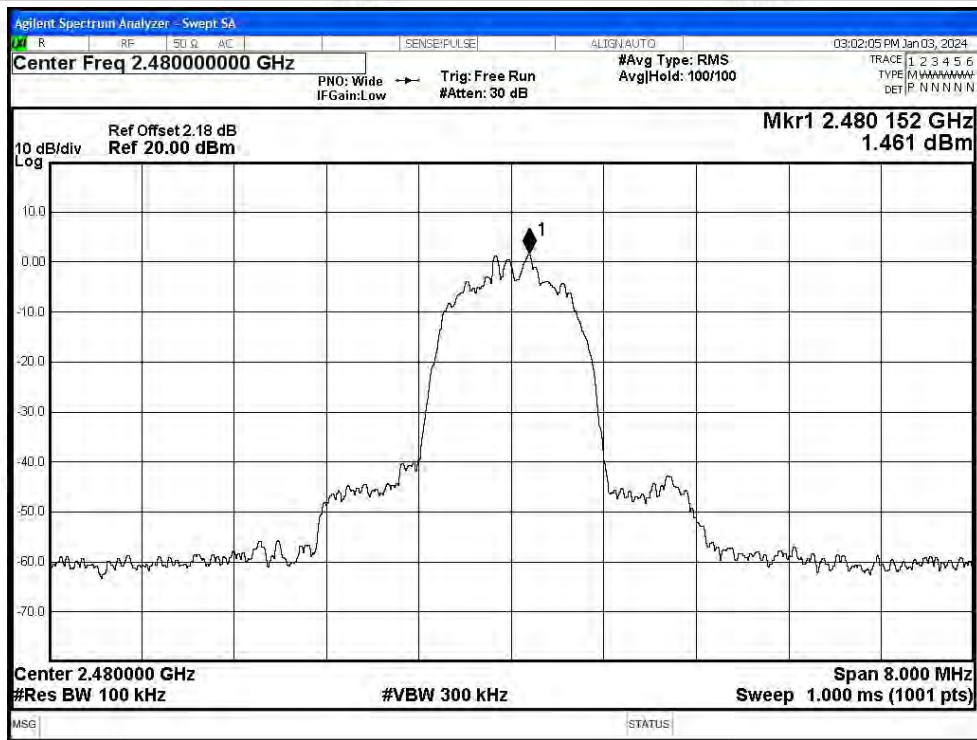


Band Edge NVNT 3-DH5 2402MHz Ant2 No-Hopping Emission

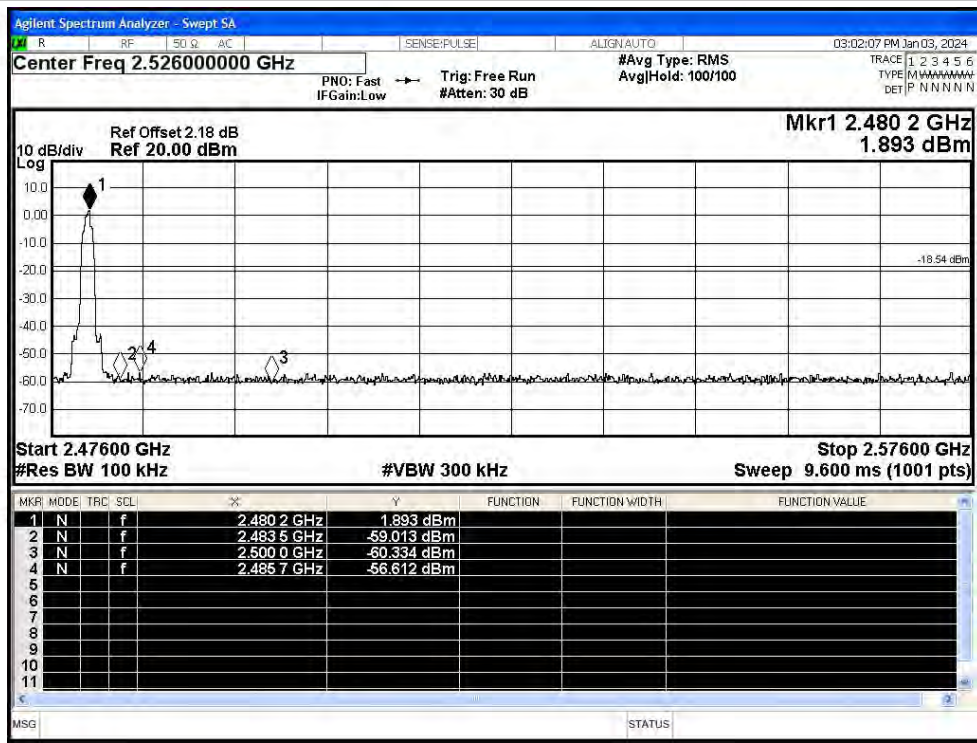




Band Edge NVNT 3-DH5 2480MHz Ant2 No-Hopping Ref



Band Edge NVNT 3-DH5 2480MHz Ant2 No-Hopping Emission





(Hopping)

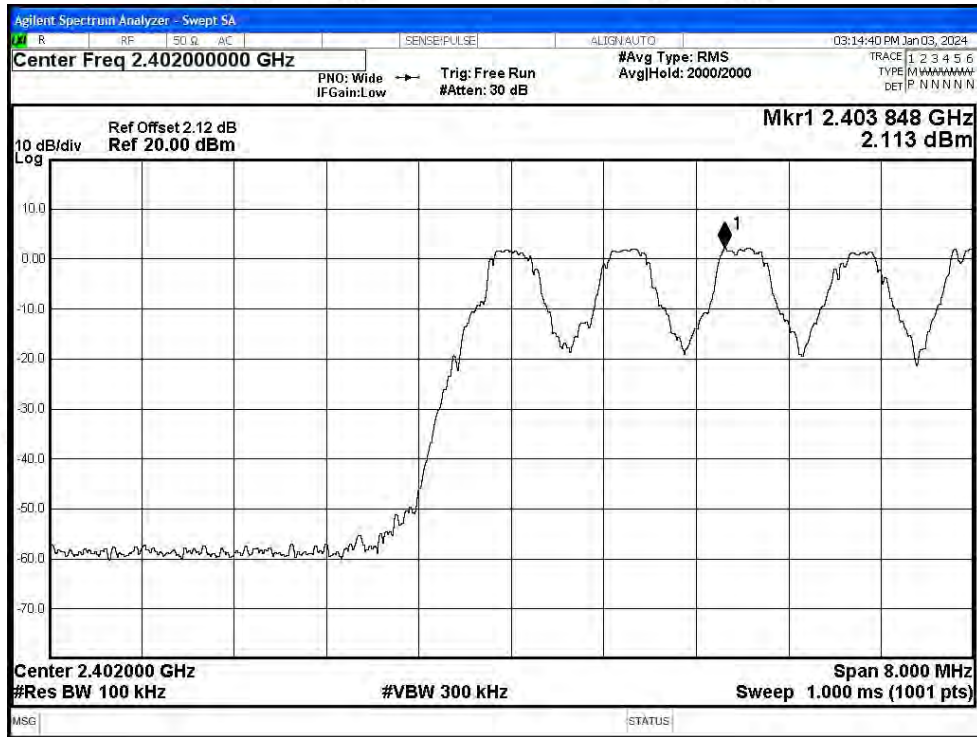
Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH5	2402	Ant2	Hopping	-58.14	-20	Pass
NVNT	1-DH5	2480	Ant2	Hopping	-58.41	-20	Pass
NVNT	2-DH5	2402	Ant2	Hopping	-58.01	-20	Pass
NVNT	2-DH5	2480	Ant2	Hopping	-57.15	-20	Pass
NVNT	3-DH5	2402	Ant2	Hopping	-57.17	-20	Pass
NVNT	3-DH5	2480	Ant2	Hopping	-53.64	-20	Pass



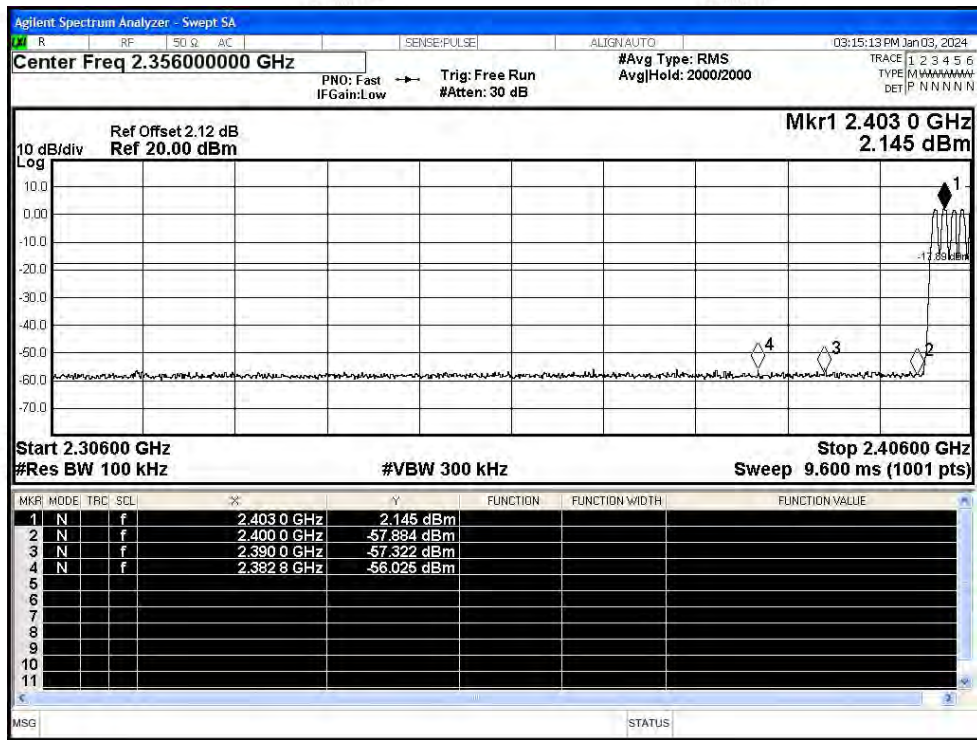


Test Graphs

Band Edge(Hopping) NVNT 1-DH5 2402MHz Ant2 Hopping Ref

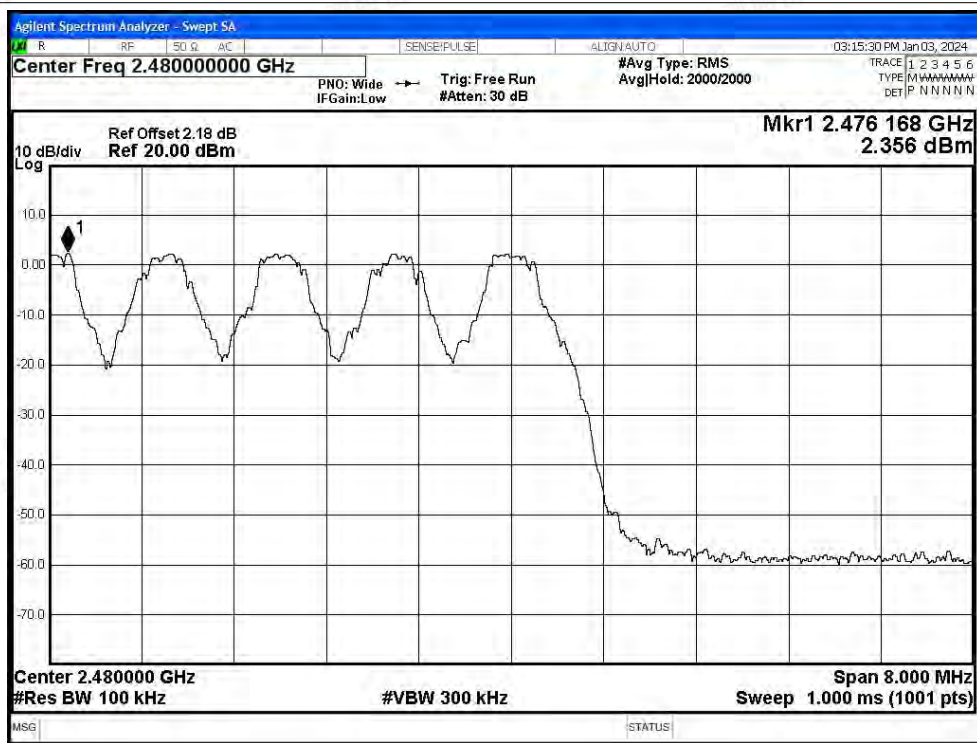


Band Edge(Hopping) NVNT 1-DH5 2402MHz Ant2 Hopping Emission

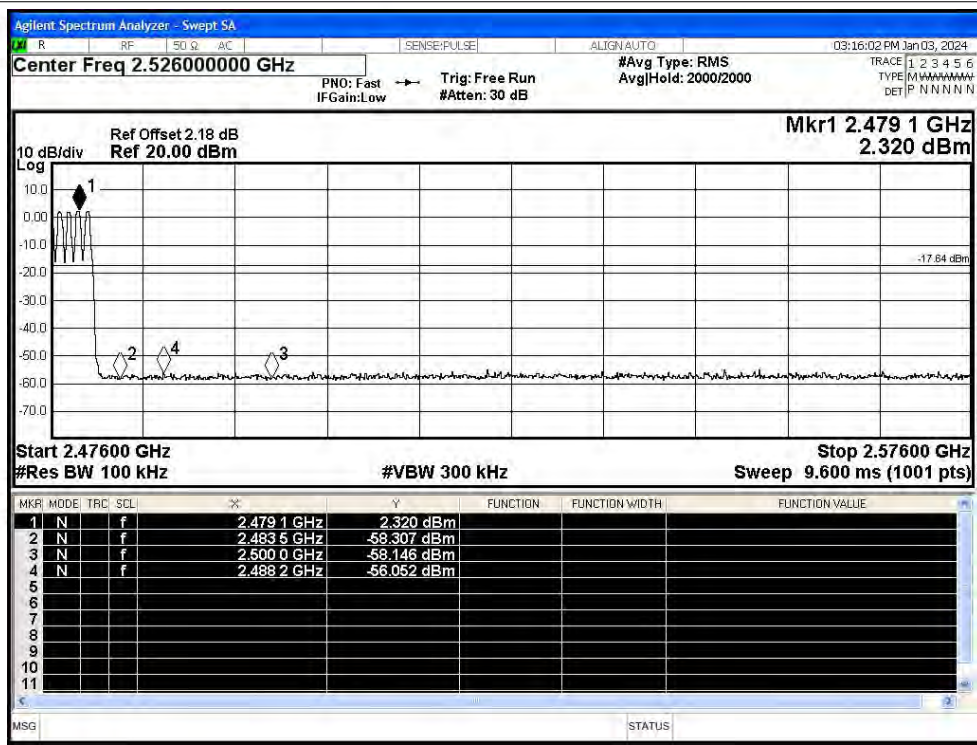




Band Edge(Hopping) NVNT 1-DH5 2480MHz Ant2 Hopping Ref



Band Edge(Hopping) NVNT 1-DH5 2480MHz Ant2 Hopping Emission

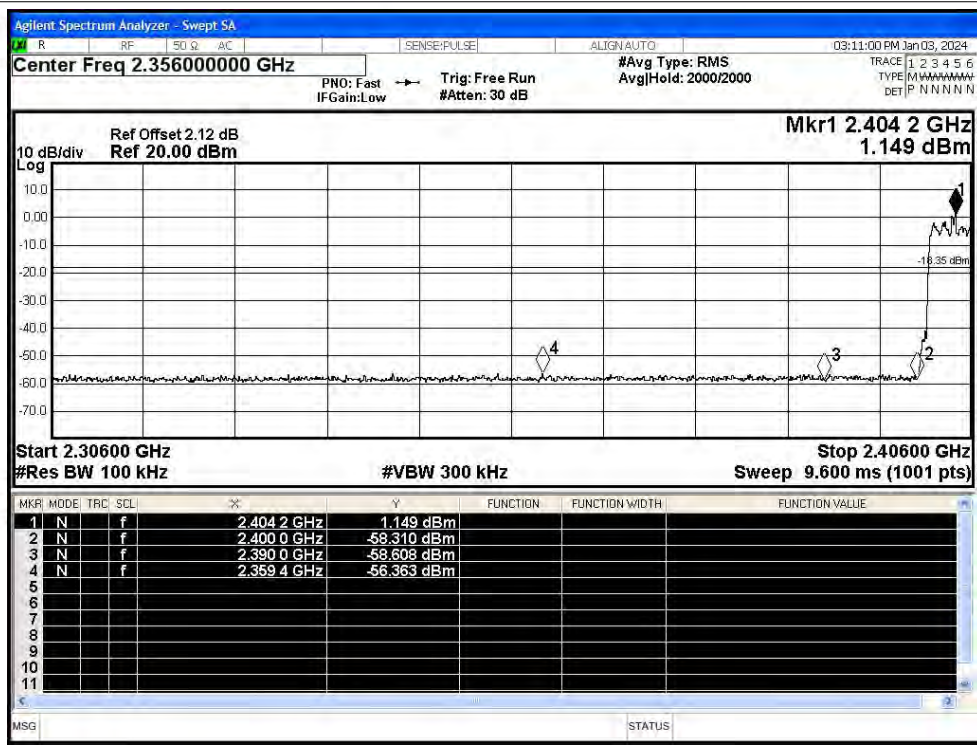




Band Edge(Hopping) NVNT 2-DH5 2402MHz Ant2 Hopping Ref



Band Edge(Hopping) NVNT 2-DH5 2402MHz Ant2 Hopping Emission

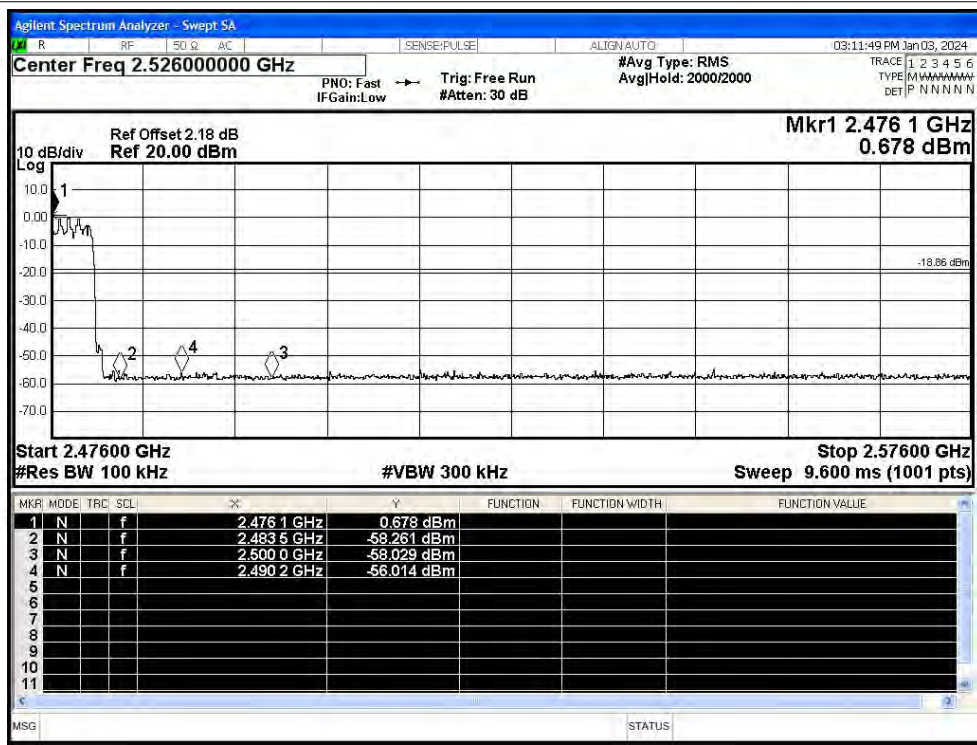




Band Edge(Hopping) NVNT 2-DH5 2480MHz Ant2 Hopping Ref



Band Edge(Hopping) NVNT 2-DH5 2480MHz Ant2 Hopping Emission

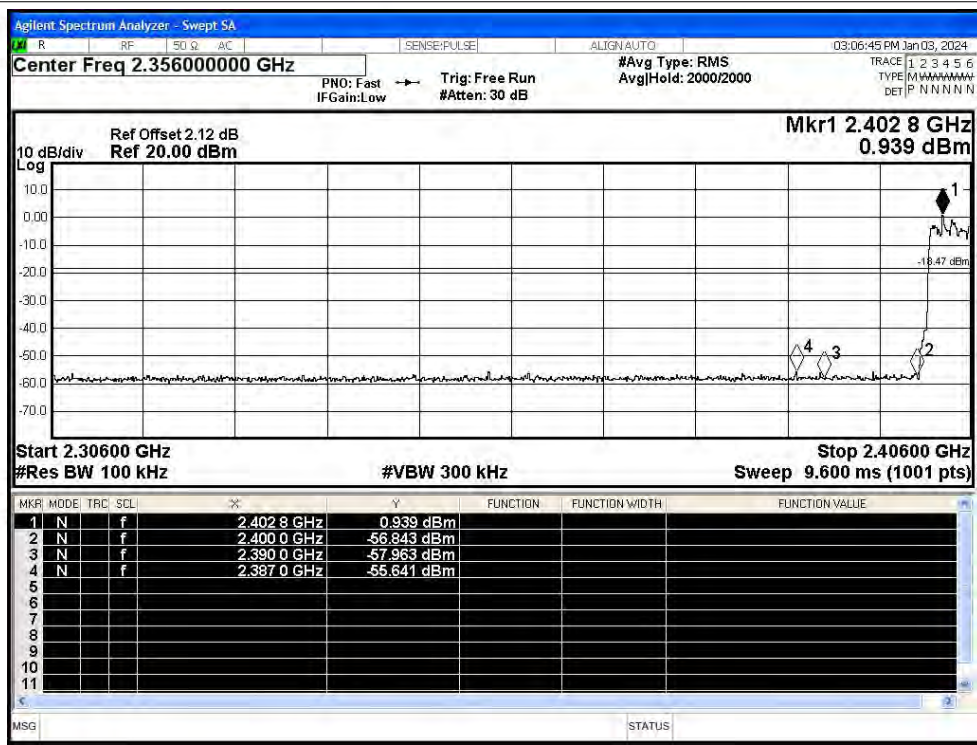




Band Edge(Hopping) NVNT 3-DH5 2402MHz Ant2 Hopping Ref

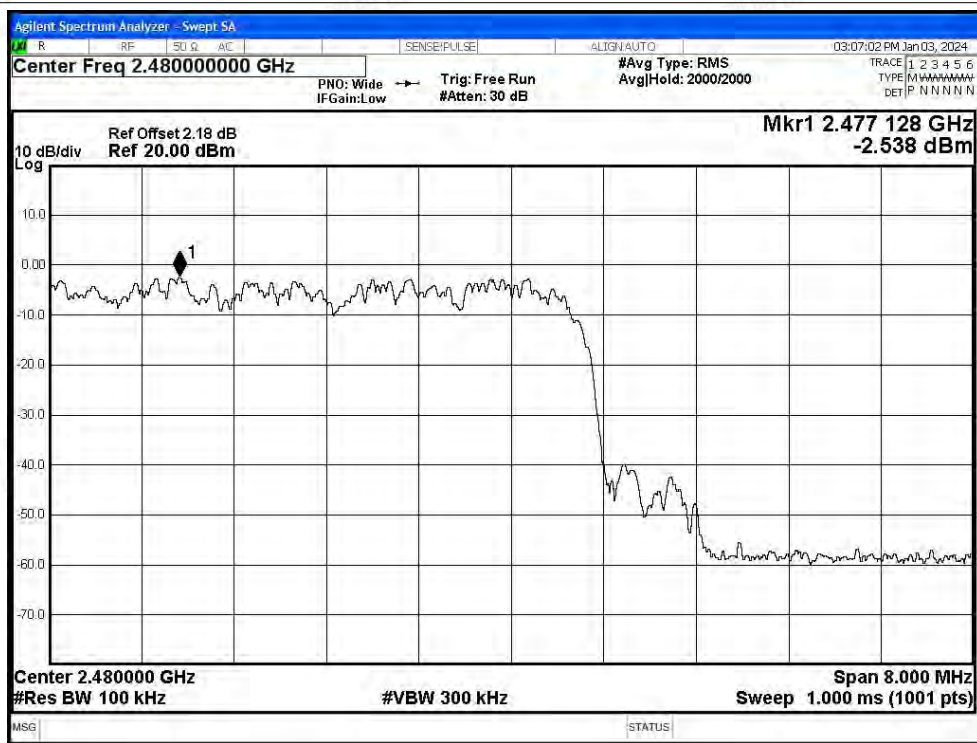


Band Edge(Hopping) NVNT 3-DH5 2402MHz Ant2 Hopping Emission

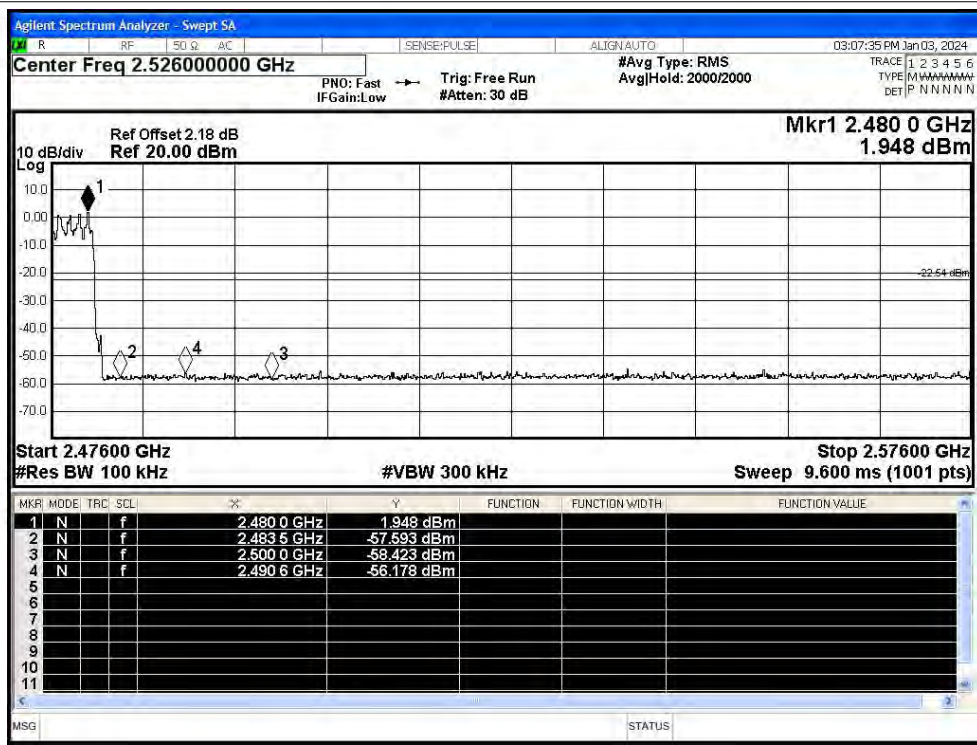




Band Edge(Hopping) NVNT 3-DH5 2480MHz Ant2 Hopping Ref



Band Edge(Hopping) NVNT 3-DH5 2480MHz Ant2 Hopping Emission





A.7 Conducted RF Spurious Emission

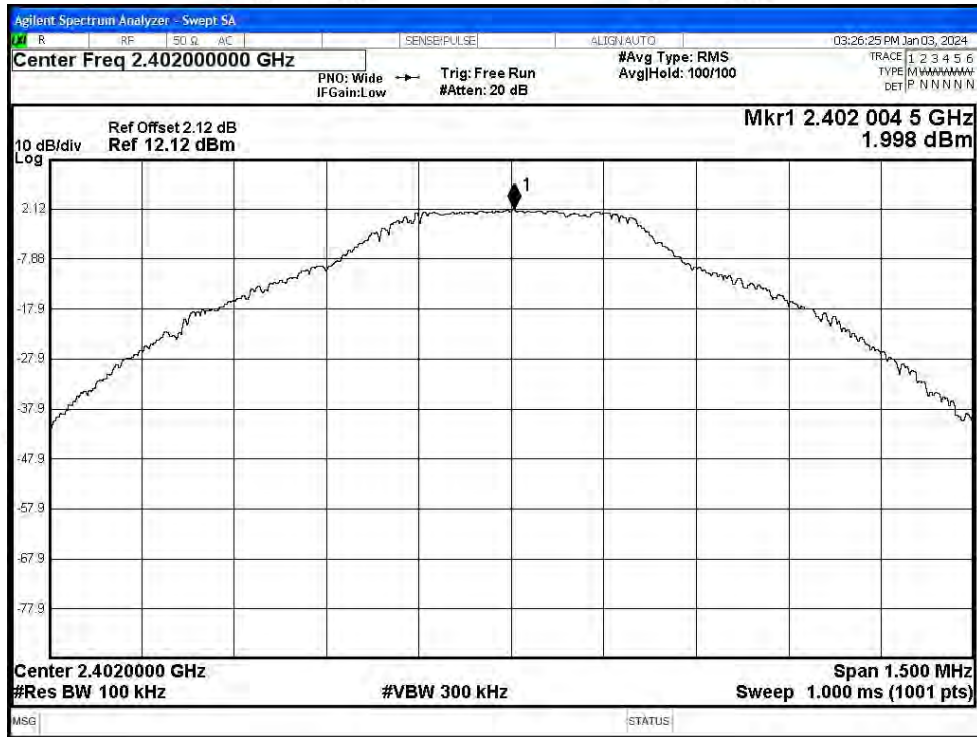
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH5	2402	Ant2	-57.36	-20	Pass
NVNT	1-DH5	2441	Ant2	-56.5	-20	Pass
NVNT	1-DH5	2480	Ant2	-57.16	-20	Pass
NVNT	2-DH5	2402	Ant2	-56.92	-20	Pass
NVNT	2-DH5	2441	Ant2	-56.54	-20	Pass
NVNT	2-DH5	2480	Ant2	-55.99	-20	Pass
NVNT	3-DH5	2402	Ant2	-56.16	-20	Pass
NVNT	3-DH5	2441	Ant2	-56.8	-20	Pass
NVNT	3-DH5	2480	Ant2	-56.07	-20	Pass



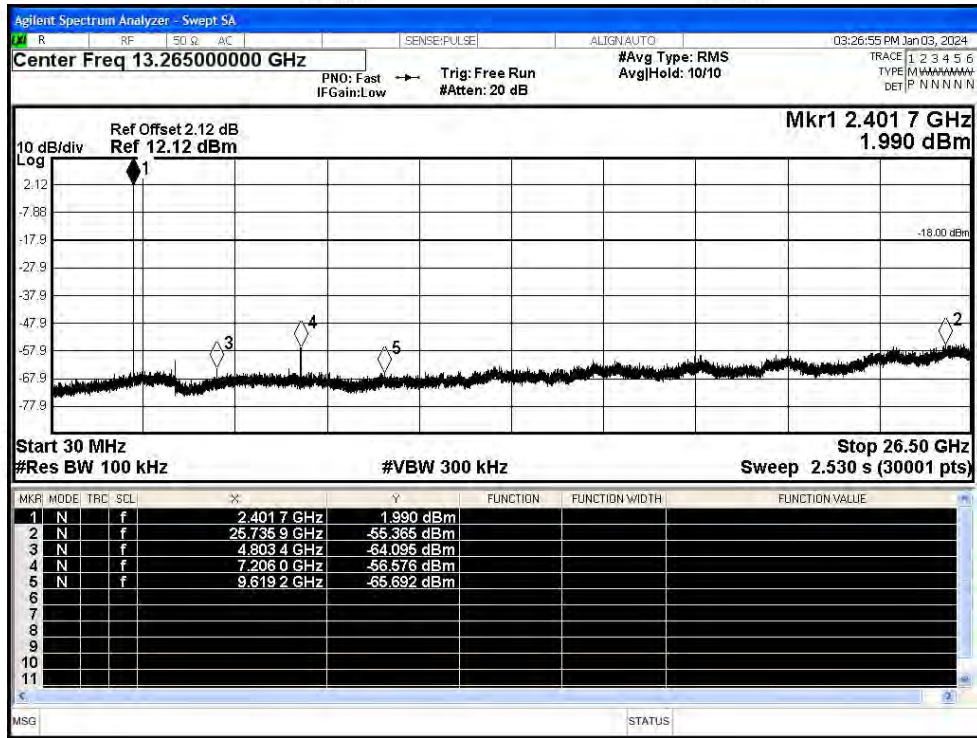


Test Graphs

Tx. Spurious NVNT 1-DH5 2402MHz Ant2 Ref



Tx. Spurious NVNT 1-DH5 2402MHz Ant2 Emission

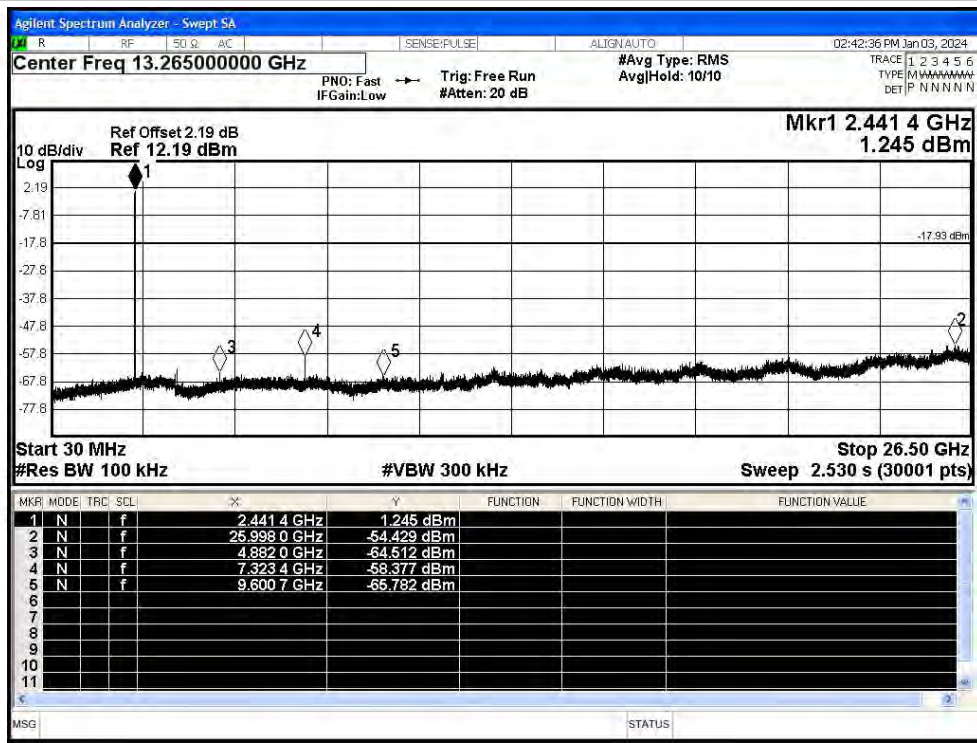




Tx. Spurious NVNT 1-DH5 2441MHz Ant2 Ref

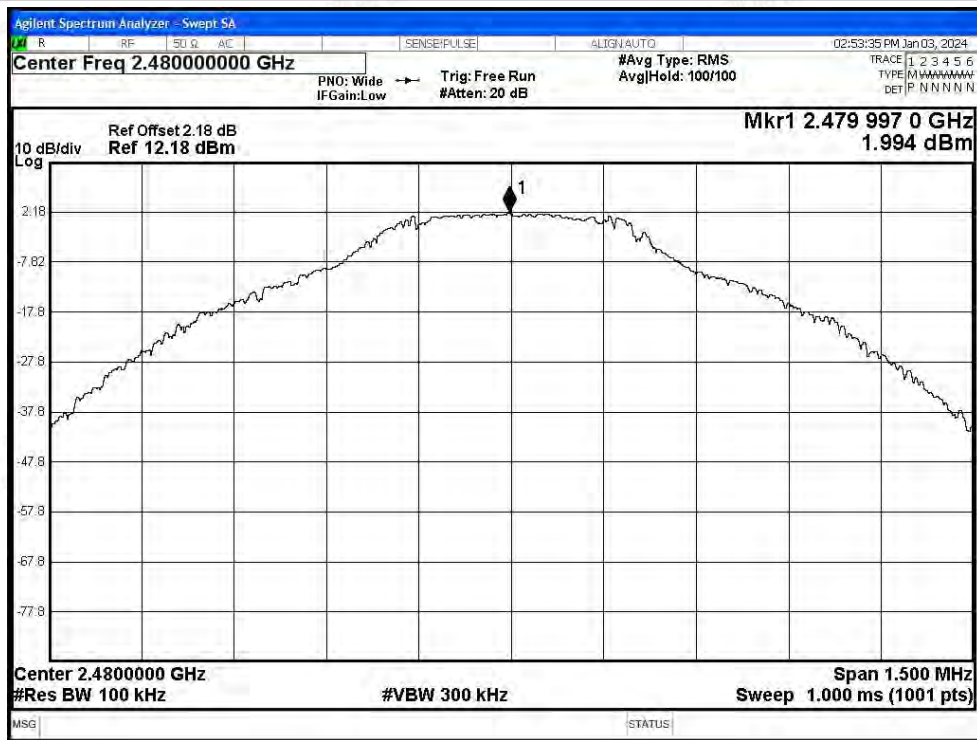


Tx. Spurious NVNT 1-DH5 2441MHz Ant2 Emission

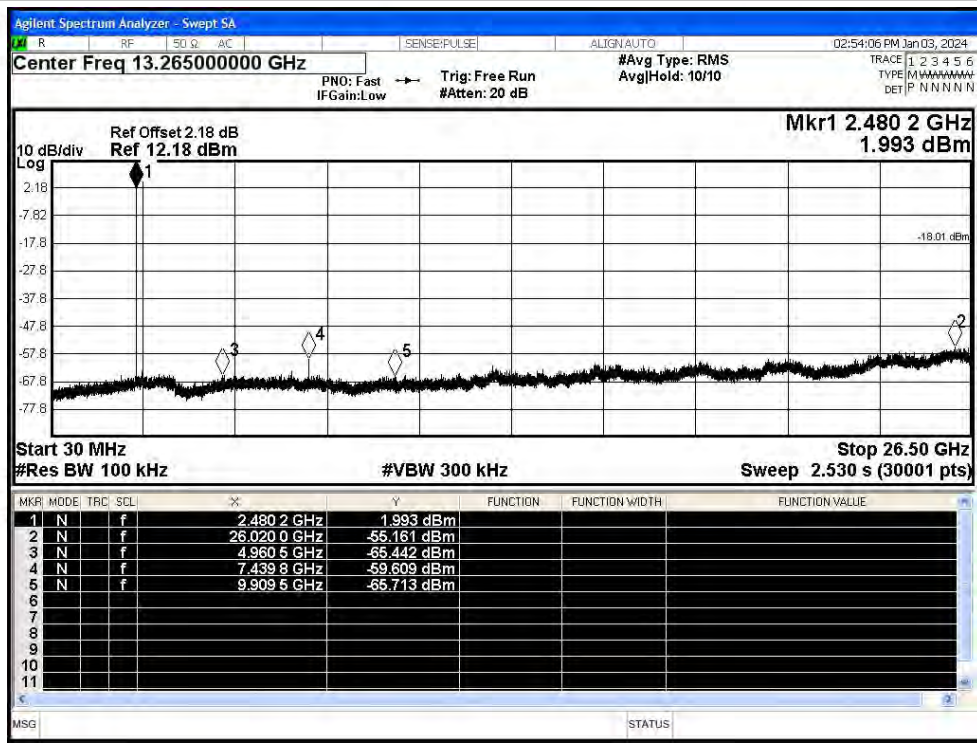




Tx. Spurious NVNT 1-DH5 2480MHz Ant2 Ref

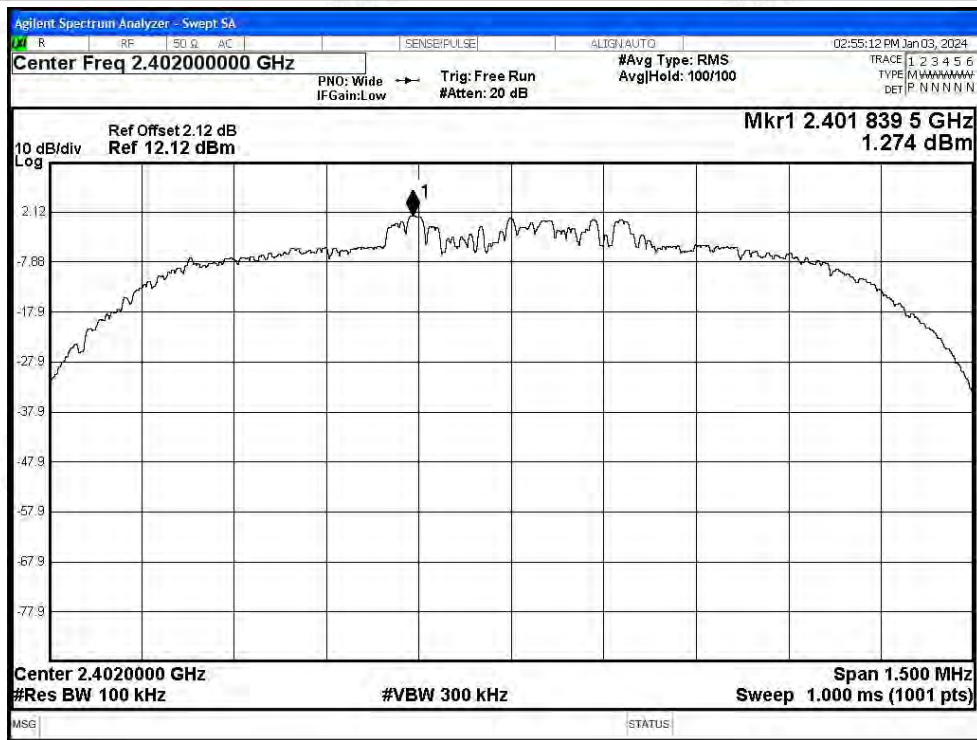


Tx. Spurious NVNT 1-DH5 2480MHz Ant2 Emission

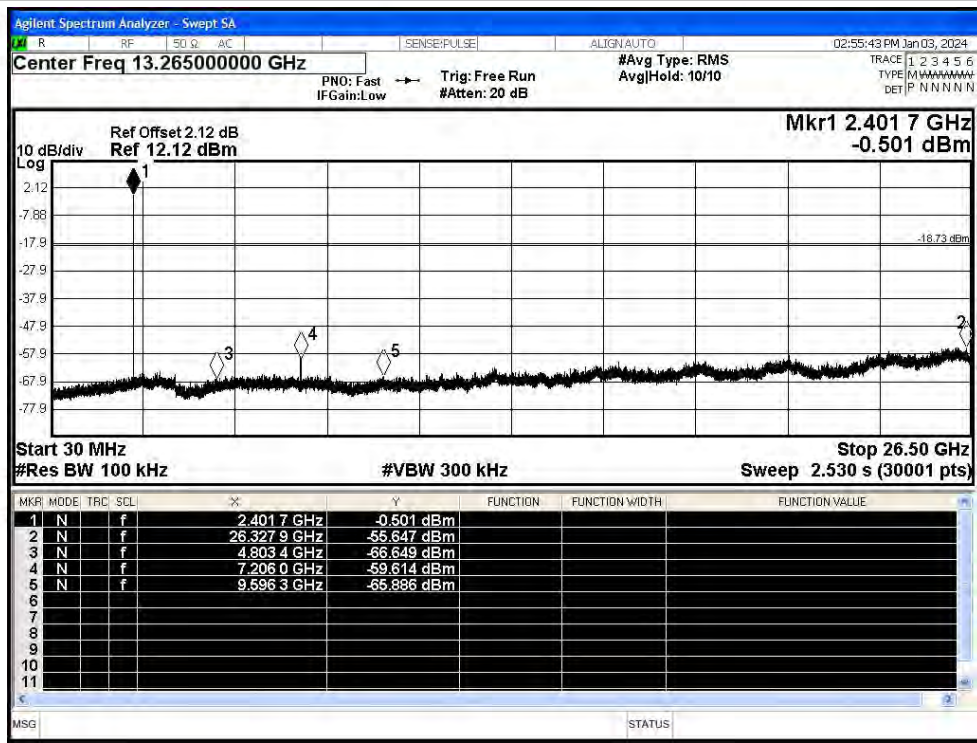




Tx. Spurious NVNT 2-DH5 2402MHz Ant2 Ref

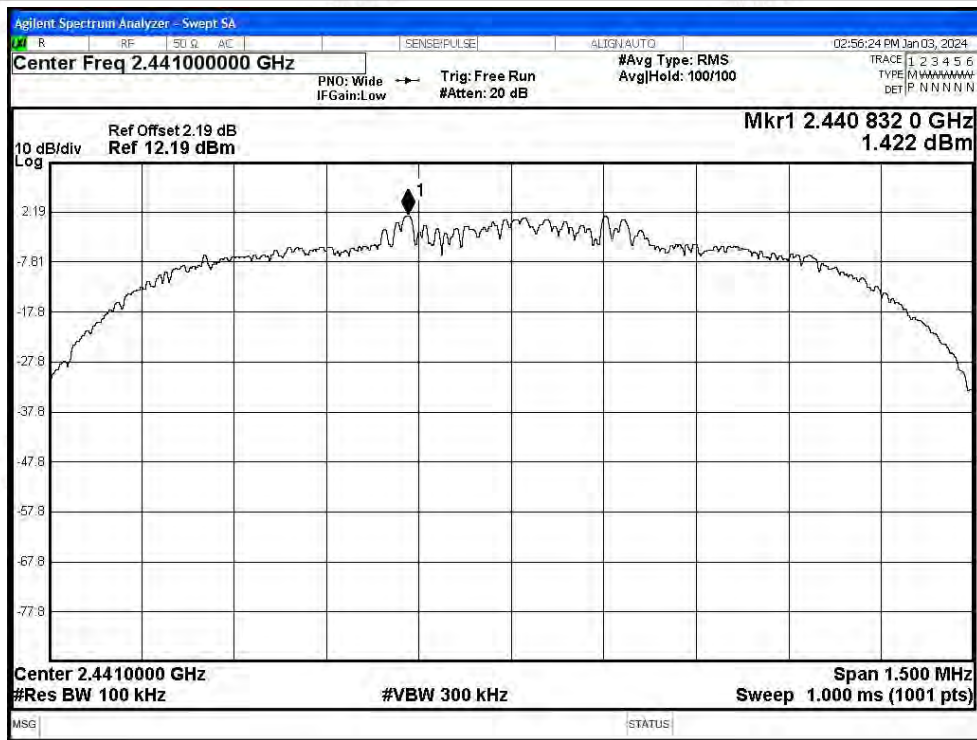


Tx. Spurious NVNT 2-DH5 2402MHz Ant2 Emission

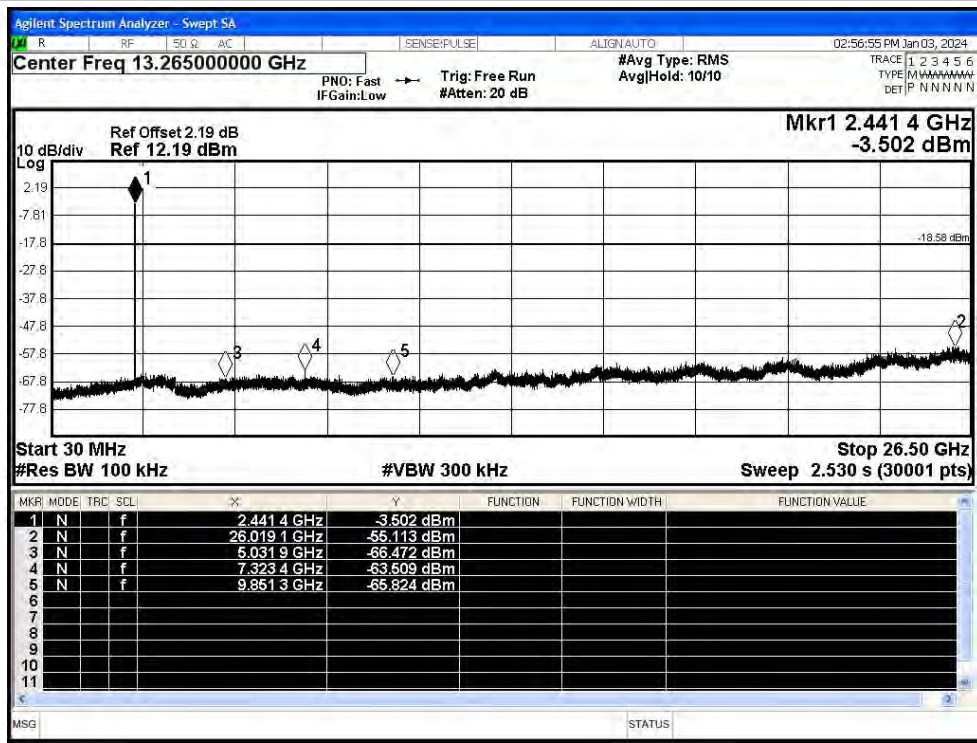




Tx. Spurious NVNT 2-DH5 2441MHz Ant2 Ref

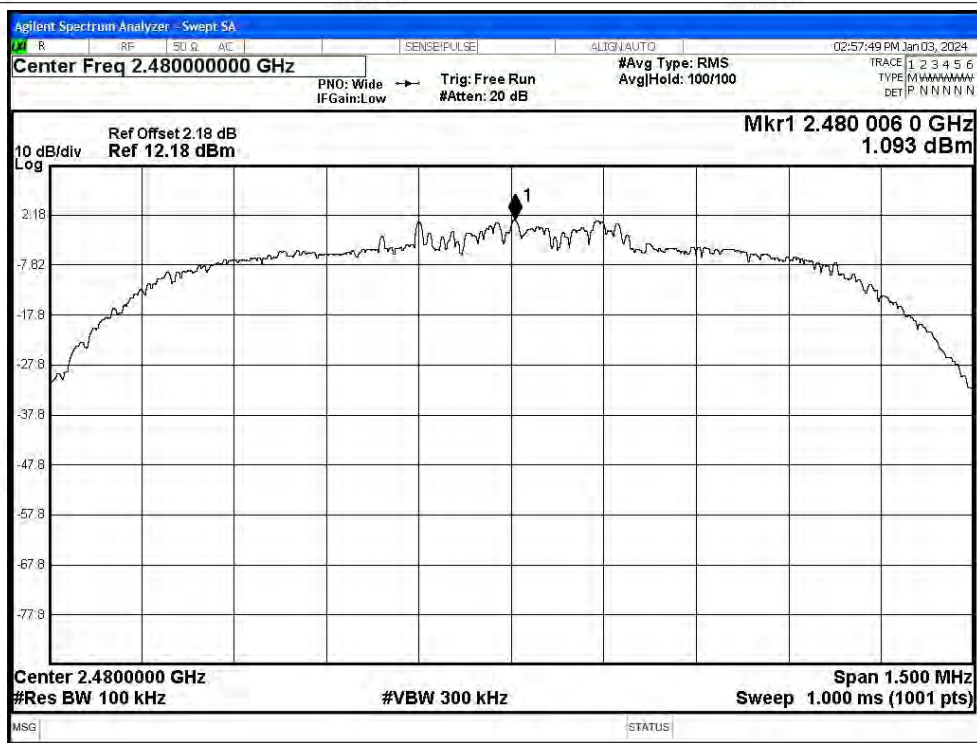


Tx. Spurious NVNT 2-DH5 2441MHz Ant2 Emission

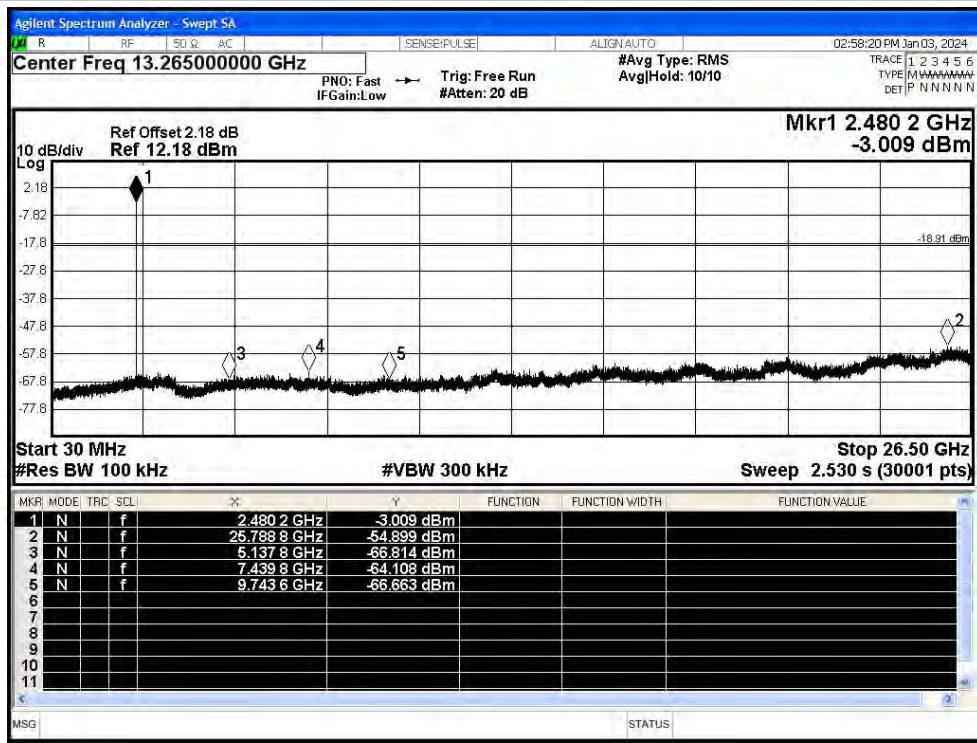




Tx. Spurious NVNT 2-DH5 2480MHz Ant2 Ref

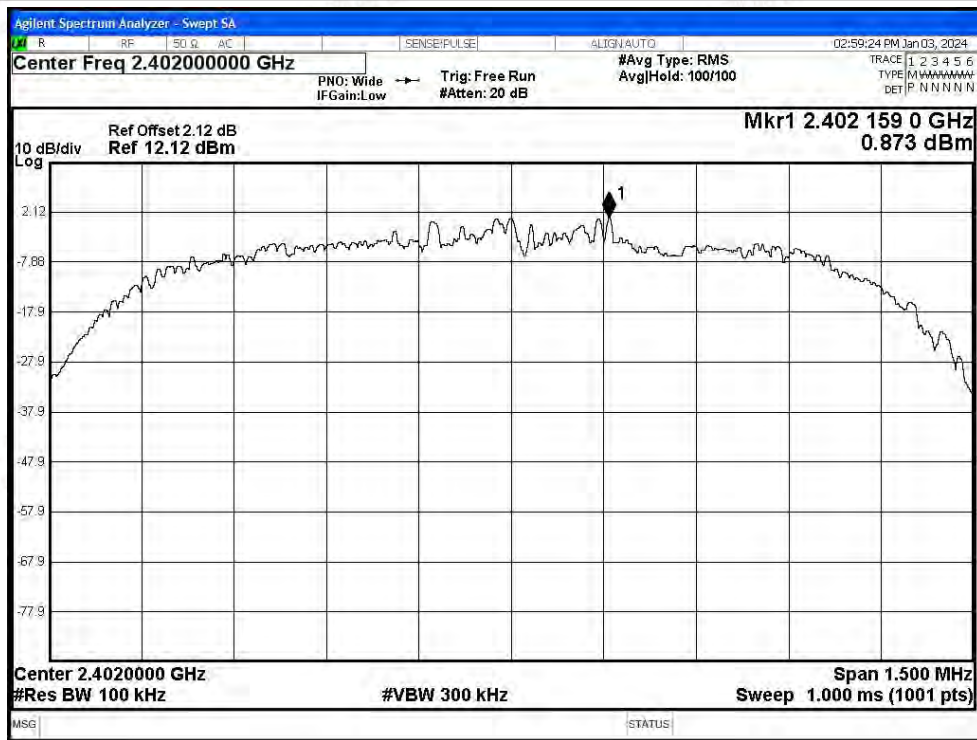


Tx. Spurious NVNT 2-DH5 2480MHz Ant2 Emission

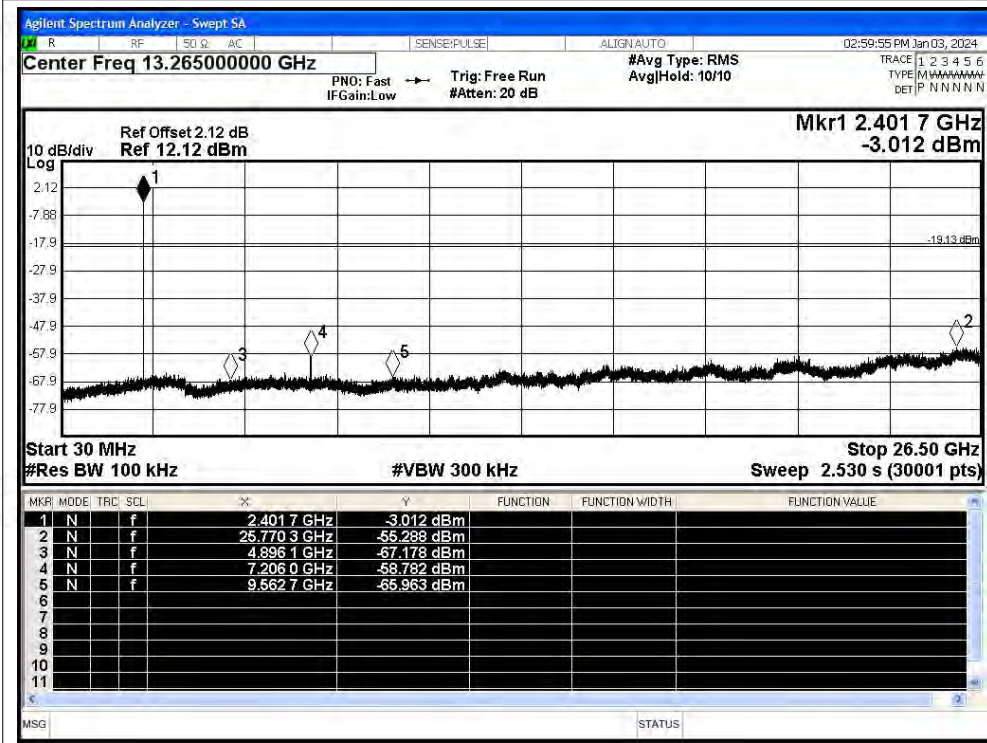




Tx. Spurious NVNT 3-DH5 2402MHz Ant2 Ref

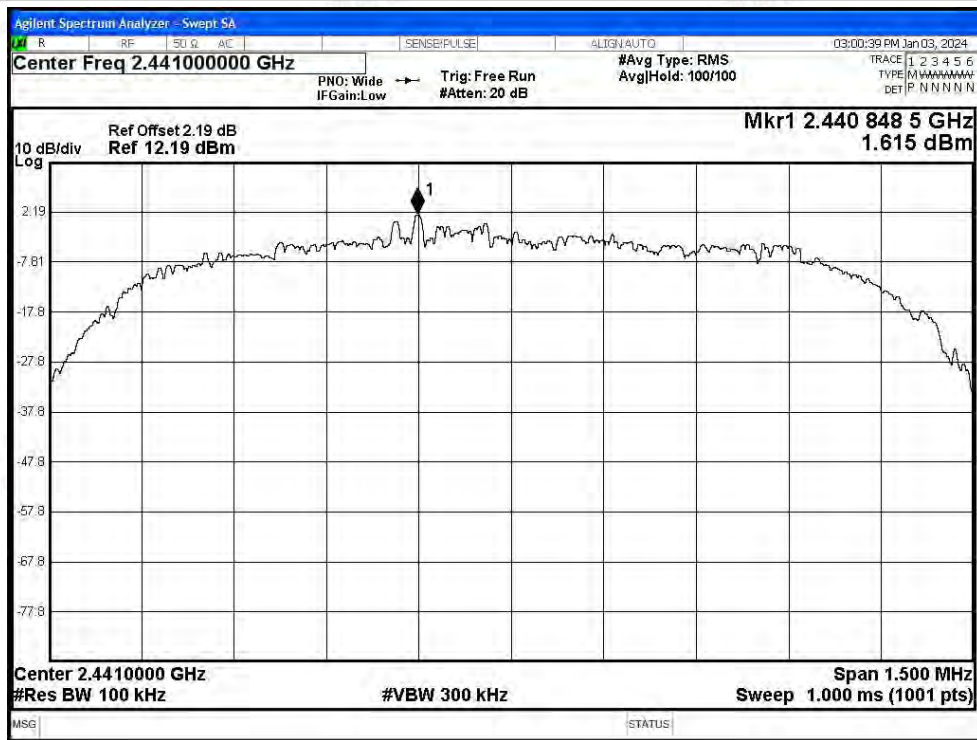


Tx. Spurious NVNT 3-DH5 2402MHz Ant2 Emission

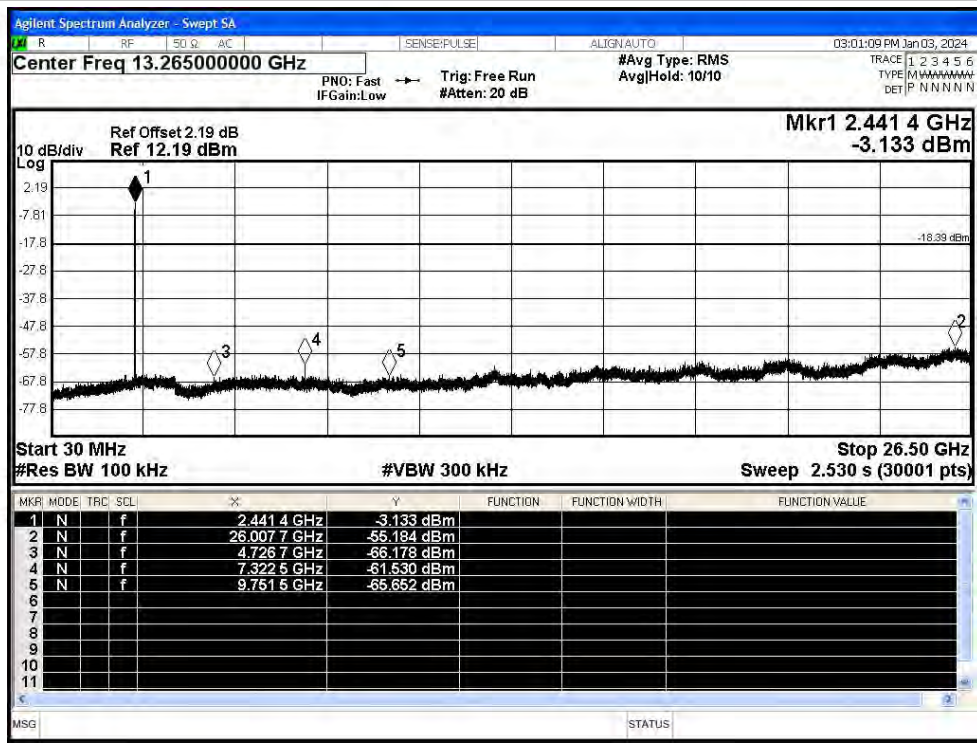




Tx. Spurious NVNT 3-DH5 2441MHz Ant2 Ref

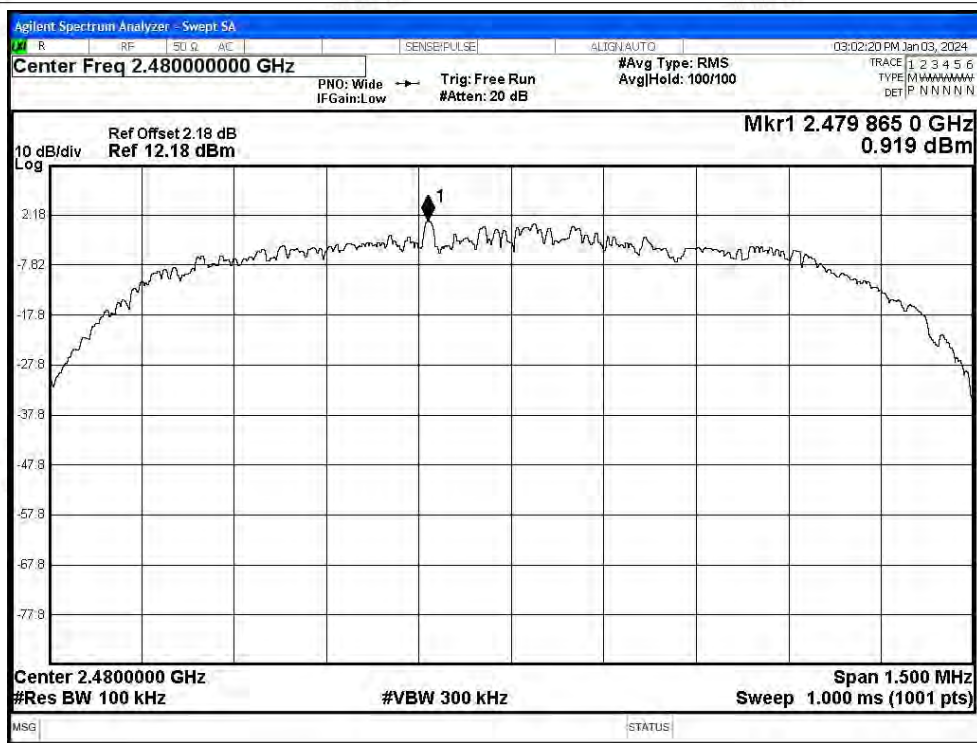


Tx. Spurious NVNT 3-DH5 2441MHz Ant2 Emission

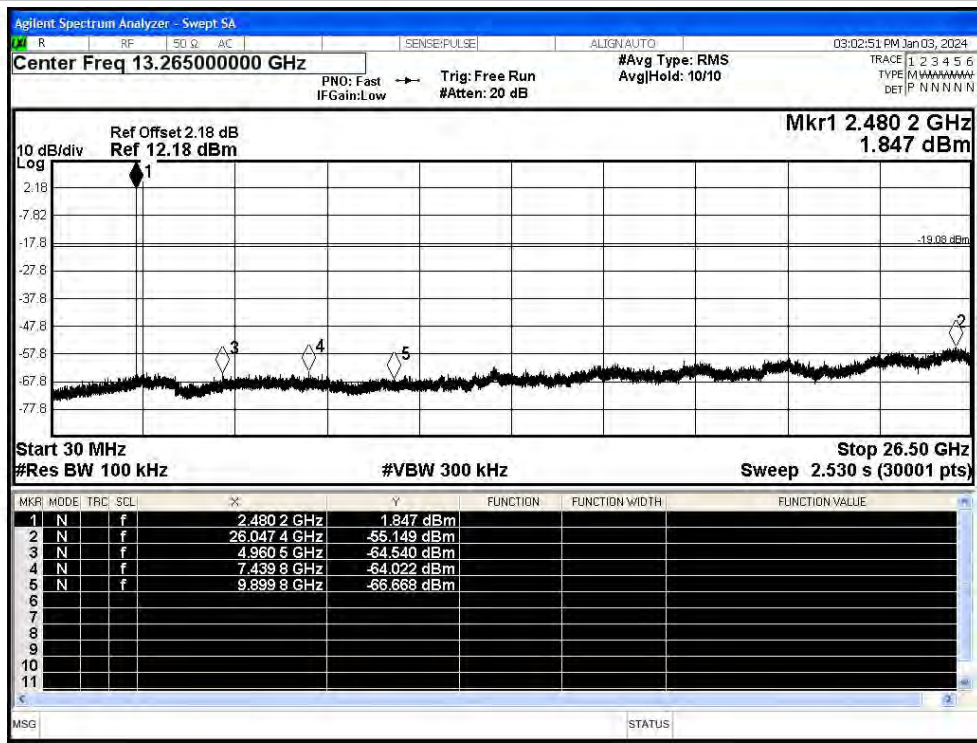




Tx. Spurious NVNT 3-DH5 2480MHz Ant2 Ref



Tx. Spurious NVNT 3-DH5 2480MHz Ant2 Emission





A.8 Duty Cycle

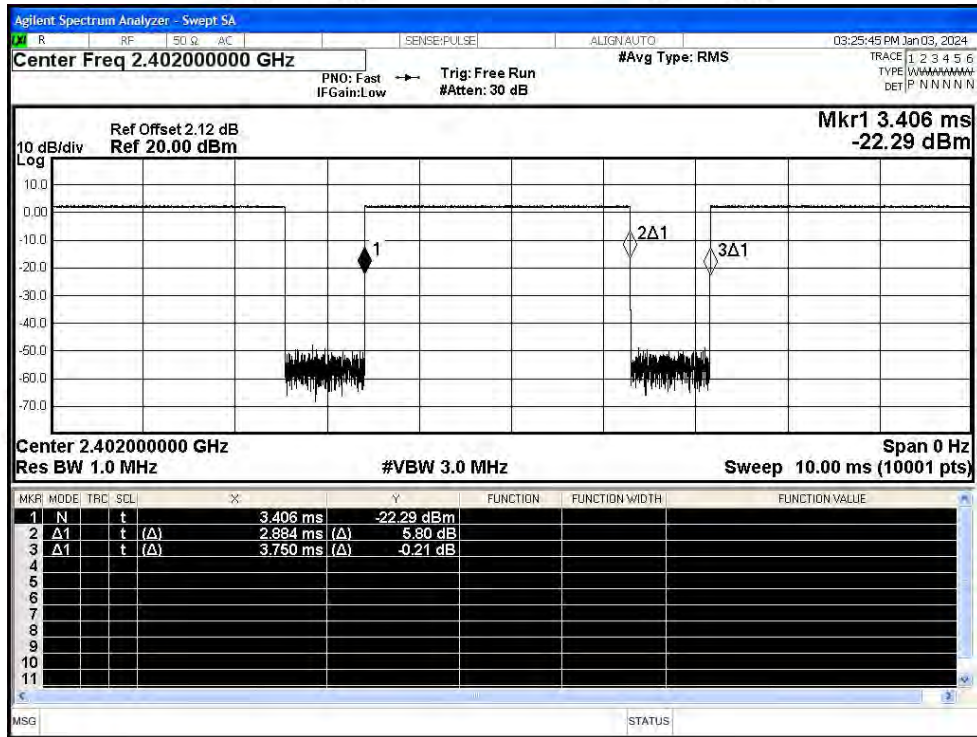
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	1-DH5	2402	Ant2	76.91	1.14	0.35
NVNT	1-DH5	2441	Ant2	76.88	1.14	0.35
NVNT	1-DH5	2480	Ant2	76.88	1.14	0.35
NVNT	2-DH5	2402	Ant2	76.99	1.14	0.35
NVNT	2-DH5	2441	Ant2	76.99	1.14	0.35
NVNT	2-DH5	2480	Ant2	76.96	1.14	0.35
NVNT	3-DH5	2402	Ant2	77.01	1.13	0.35
NVNT	3-DH5	2441	Ant2	77.04	1.13	0.35
NVNT	3-DH5	2480	Ant2	77.01	1.13	0.35



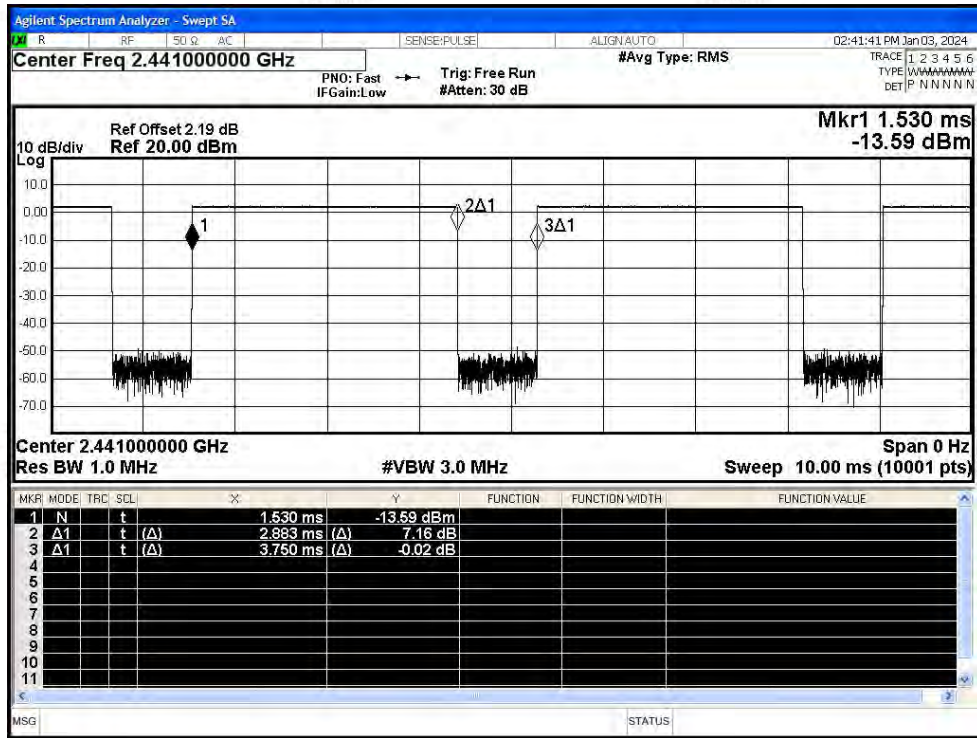


Test Graphs

Duty Cycle NVNT 1-DH5 2402MHz Ant2

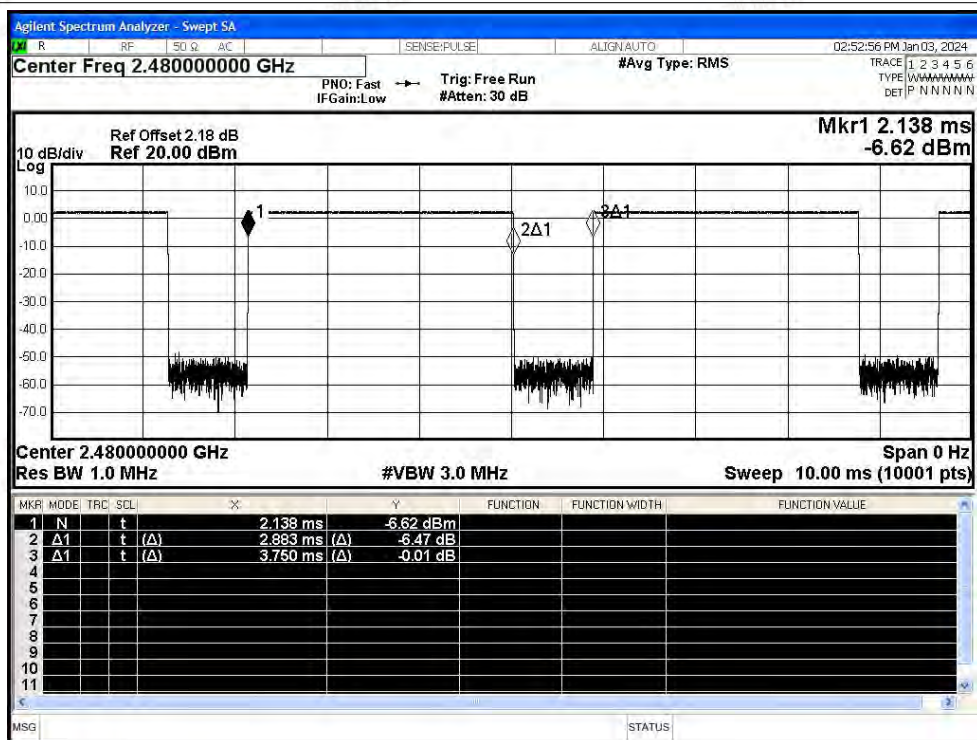


Duty Cycle NVNT 1-DH5 2441MHz Ant2

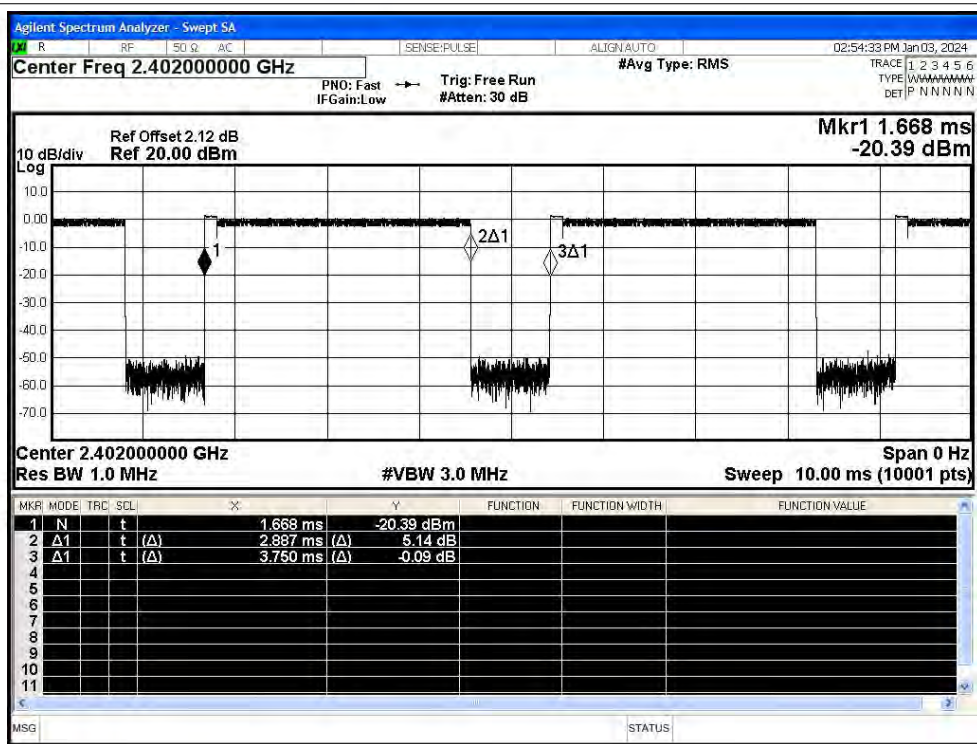




Duty Cycle NVNT 1-DH5 2480MHz Ant2

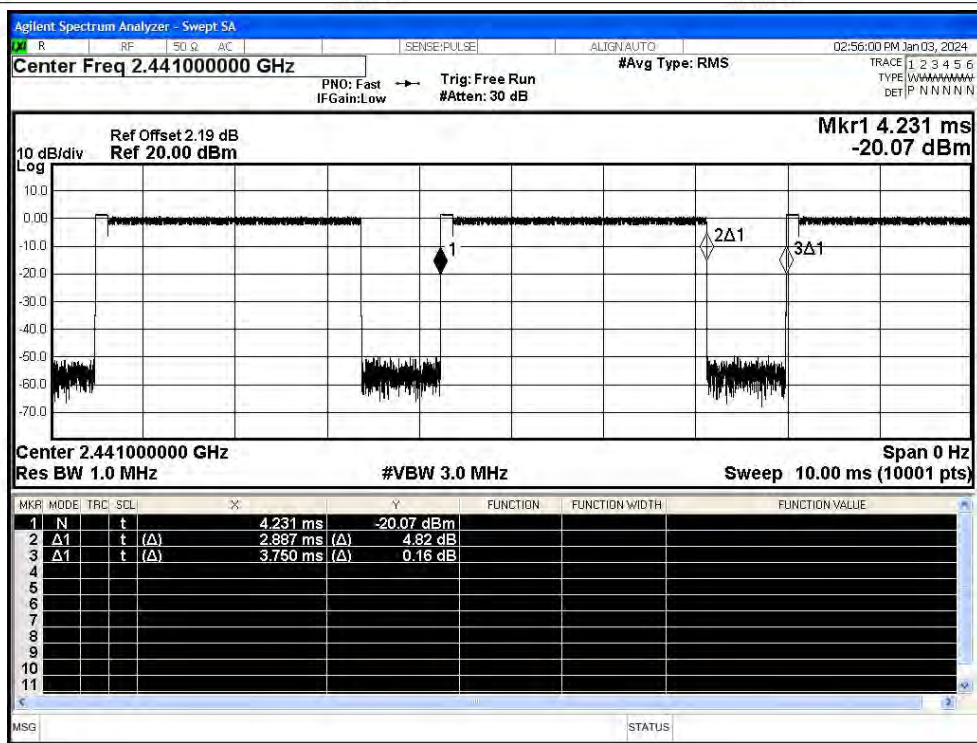


Duty Cycle NVNT 2-DH5 2402MHz Ant2

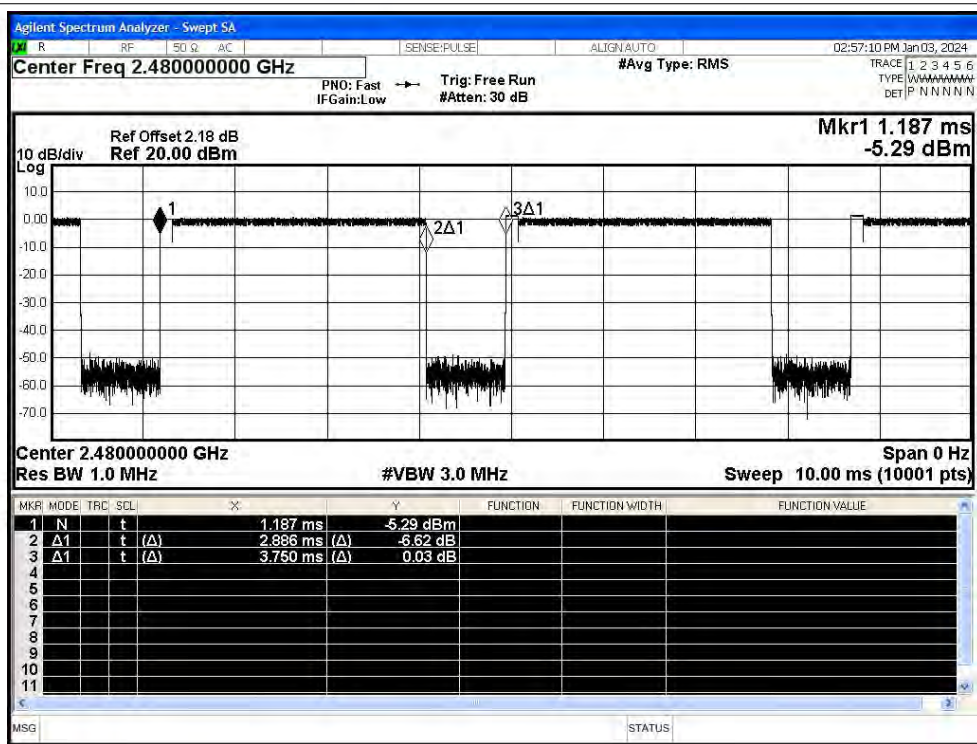




Duty Cycle NVNT 2-DH5 2441MHz Ant2

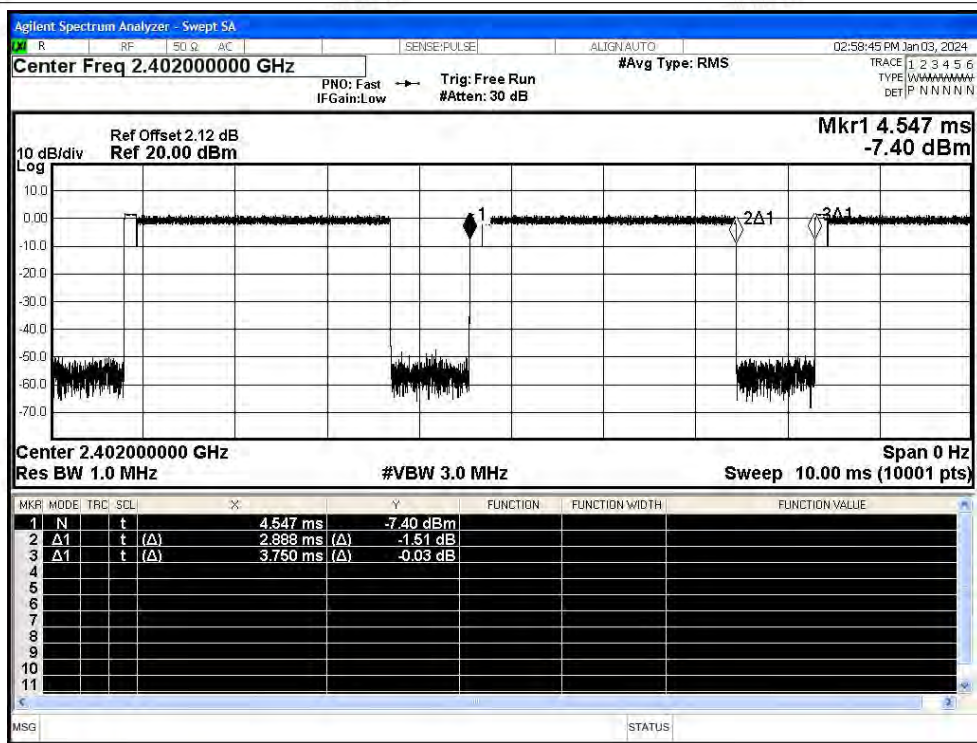


Duty Cycle NVNT 2-DH5 2480MHz Ant2

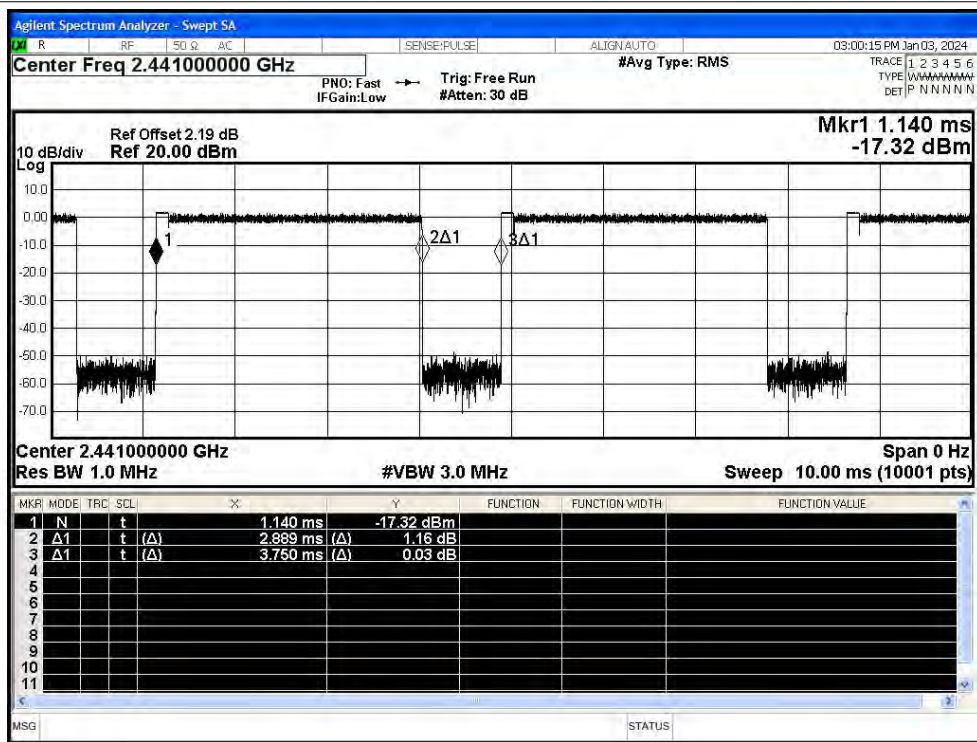


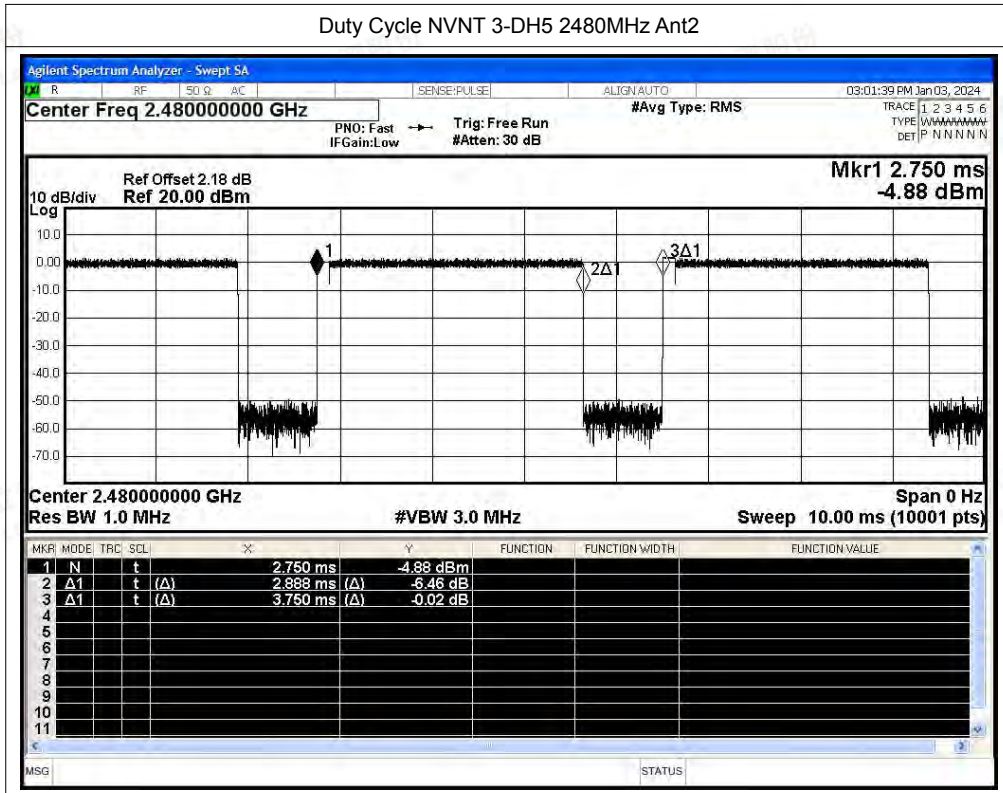


Duty Cycle NVNT 3-DH5 2402MHz Ant2



Duty Cycle NVNT 3-DH5 2441MHz Ant2







A.9 Restrict Band

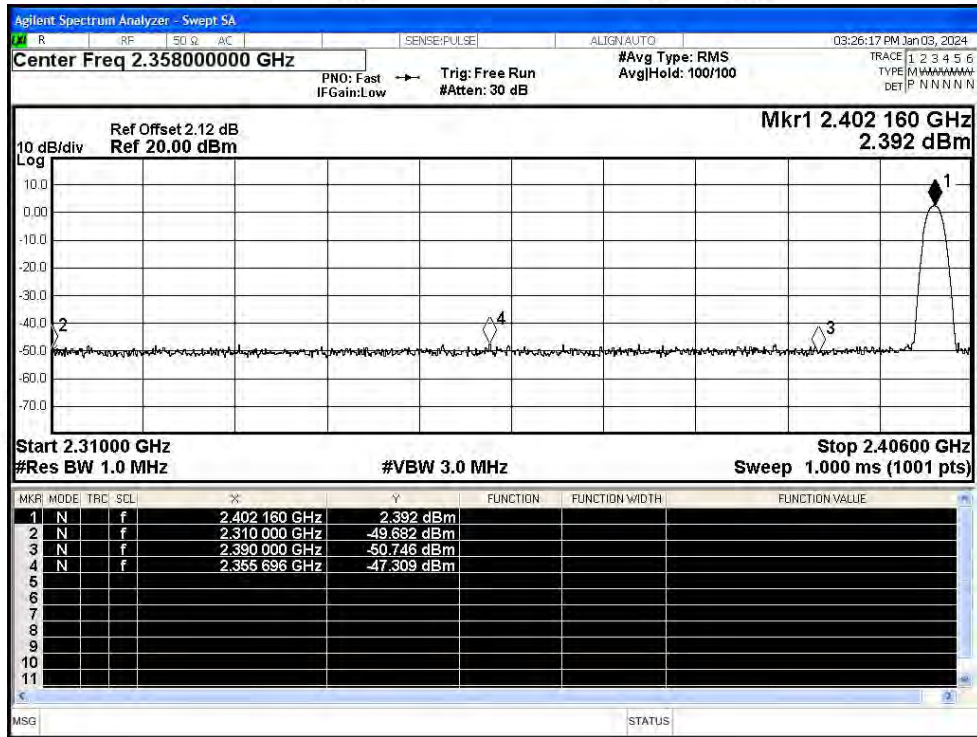
Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	Duty Factor (dB)	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
NVNT	1-DH5	2402	Ant2	No-Hopping	2310	-49.68	2.60	-	48.18	Peak	74	Pass
NVNT	1-DH5	2402	Ant2	No-Hopping	2310	-58.58	2.60	1.14	40.42	Average	54	Pass
NVNT	1-DH5	2402	Ant2	No-Hopping	2355.696	-47.31	2.60	-	50.55	Peak	74	Pass
NVNT	1-DH5	2402	Ant2	No-Hopping	2389.488	-57.53	2.60	1.14	41.47	Average	54	Pass
NVNT	1-DH5	2402	Ant2	No-Hopping	2390	-50.75	2.60	-	47.11	Peak	74	Pass
NVNT	1-DH5	2402	Ant2	No-Hopping	2390	-58.75	2.60	1.14	40.25	Average	54	Pass
NVNT	1-DH5	2480	Ant2	No-Hopping	2483.5	-50.13	2.60	-	47.73	Peak	74	Pass
NVNT	1-DH5	2480	Ant2	No-Hopping	2483.5	-57.98	2.60	1.14	41.02	Average	54	Pass
NVNT	1-DH5	2480	Ant2	No-Hopping	2488.96	-46.85	2.60	-	51.01	Peak	74	Pass
NVNT	1-DH5	2480	Ant2	No-Hopping	2483.584	-56.98	2.60	1.14	42.02	Average	54	Pass
NVNT	1-DH5	2480	Ant2	No-Hopping	2500	-49.64	2.60	-	48.22	Peak	74	Pass
NVNT	1-DH5	2480	Ant2	No-Hopping	2500	-57.57	2.60	1.14	41.43	Average	54	Pass
NVNT	2-DH5	2402	Ant2	No-Hopping	2310	-48.37	2.60	-	49.49	Peak	74	Pass
NVNT	2-DH5	2402	Ant2	No-Hopping	2310	-58.57	2.60	1.14	40.43	Average	54	Pass
NVNT	2-DH5	2402	Ant2	No-Hopping	2348.784	-47.3	2.60	-	50.56	Peak	74	Pass
NVNT	2-DH5	2402	Ant2	No-Hopping	2357.232	-57.51	2.60	1.14	41.49	Average	54	Pass
NVNT	2-DH5	2402	Ant2	No-Hopping	2390	-49.44	2.60	-	48.42	Peak	74	Pass
NVNT	2-DH5	2402	Ant2	No-Hopping	2390	-58.35	2.60	1.14	40.65	Average	54	Pass
NVNT	2-DH5	2480	Ant2	No-Hopping	2483.5	-50.52	2.60	-	47.34	Peak	74	Pass
NVNT	2-DH5	2480	Ant2	No-Hopping	2483.5	-57.82	2.60	1.14	41.18	Average	54	Pass
NVNT	2-DH5	2480	Ant2	No-Hopping	2489.2	-47.3	2.60	-	50.56	Peak	74	Pass
NVNT	2-DH5	2480	Ant2	No-Hopping	2483.92	-56.71	2.60	1.14	42.29	Average	54	Pass
NVNT	2-DH5	2480	Ant2	No-Hopping	2500	-48.49	2.60	-	49.37	Peak	74	Pass
NVNT	2-DH5	2480	Ant2	No-Hopping	2500	-57.69	2.60	1.14	41.31	Average	54	Pass
NVNT	3-DH5	2402	Ant2	No-Hopping	2310	-50.81	2.60	-	47.05	Peak	74	Pass
NVNT	3-DH5	2402	Ant2	No-Hopping	2310	-58.49	2.60	1.13	40.50	Average	54	Pass
NVNT	3-DH5	2402	Ant2	No-Hopping	2334.672	-47.78	2.60	-	50.08	Peak	74	Pass
NVNT	3-DH5	2402	Ant2	No-Hopping	2383.632	-57.27	2.60	1.13	41.72	Average	54	Pass
NVNT	3-DH5	2402	Ant2	No-Hopping	2390	-49.69	2.60	-	48.17	Peak	74	Pass
NVNT	3-DH5	2402	Ant2	No-Hopping	2390	-58.65	2.60	1.13	40.34	Average	54	Pass
NVNT	3-DH5	2480	Ant2	No-Hopping	2483.5	-49.06	2.60	-	48.80	Peak	74	Pass
NVNT	3-DH5	2480	Ant2	No-Hopping	2483.5	-57.55	2.60	1.13	41.44	Average	54	Pass
NVNT	3-DH5	2480	Ant2	No-Hopping	2499.832	-46.94	2.60	-	50.92	Peak	74	Pass
NVNT	3-DH5	2480	Ant2	No-Hopping	2487.52	-57.14	2.60	1.13	41.85	Average	54	Pass
NVNT	3-DH5	2480	Ant2	No-Hopping	2500	-49.45	2.60	-	48.41	Peak	74	Pass
NVNT	3-DH5	2480	Ant2	No-Hopping	2500	-57.81	2.60	1.13	41.18	Average	54	Pass



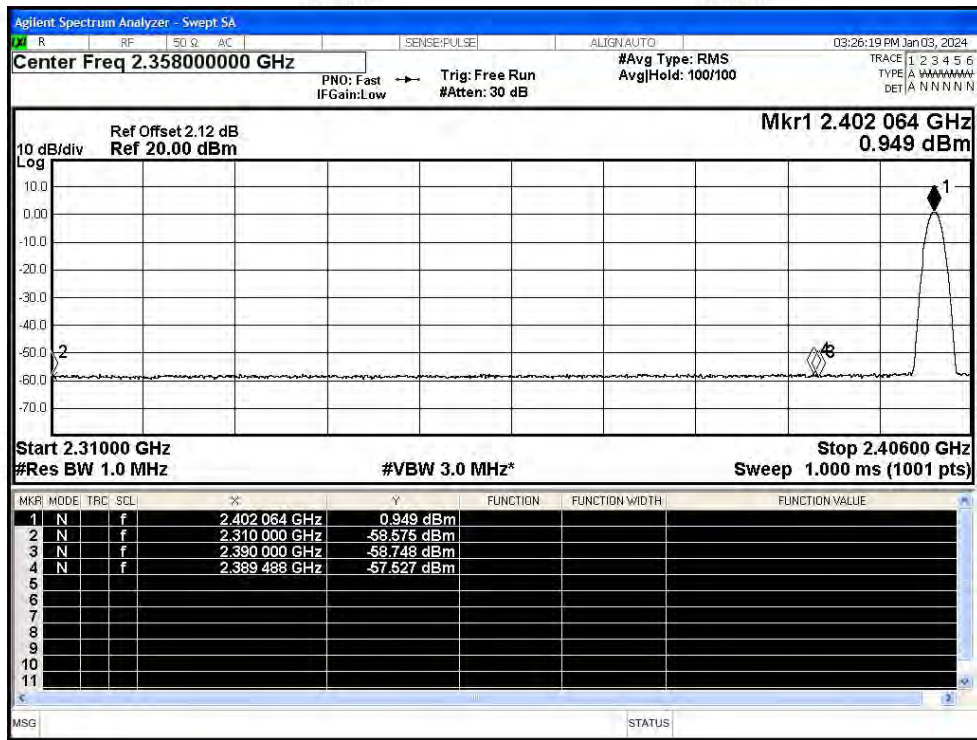


Test Graphs

Restrict Band NVNT 1-DH5 2402MHz Ant2 No-Hopping Peak

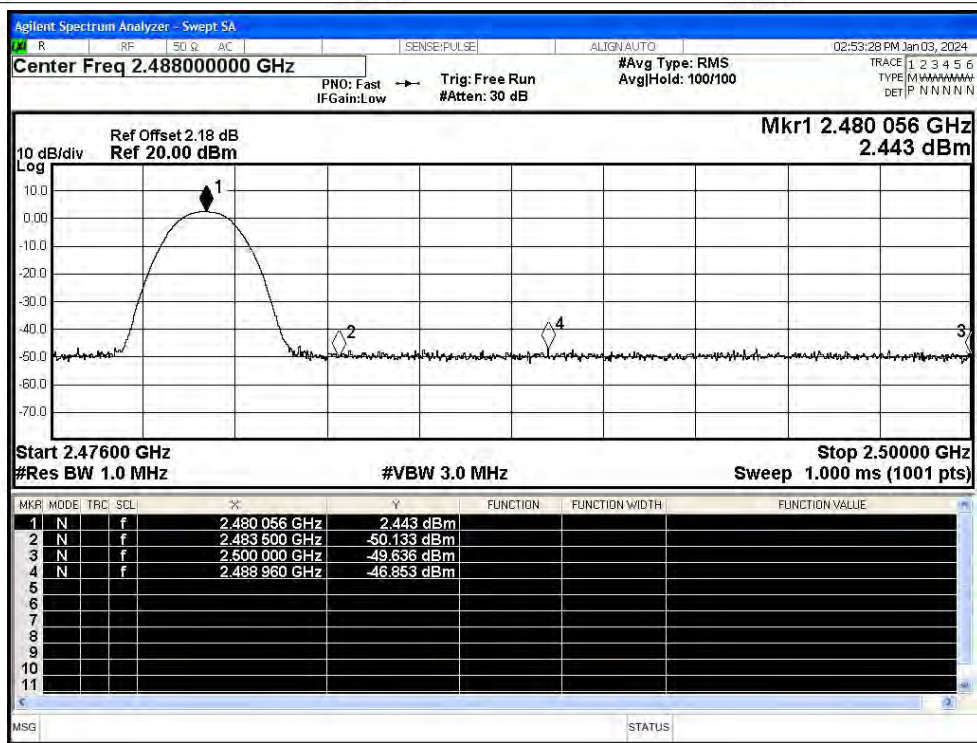


Restrict Band NVNT 1-DH5 2402MHz Ant2 No-Hopping Average

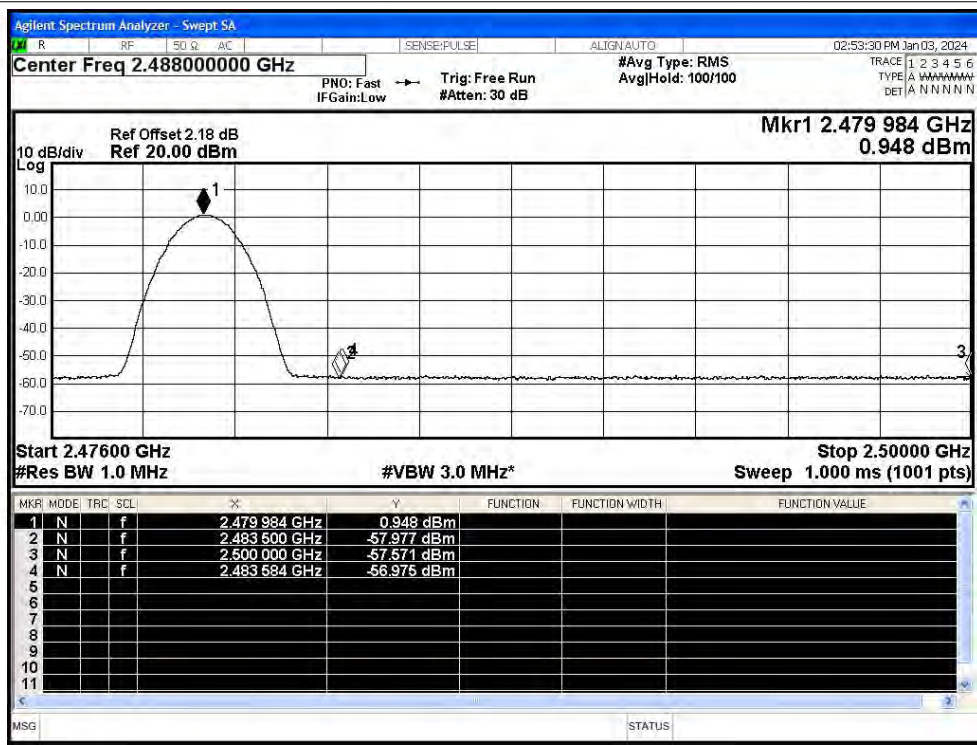




Restrict Band NVNT 1-DH5 2480MHz Ant2 No-Hopping Peak

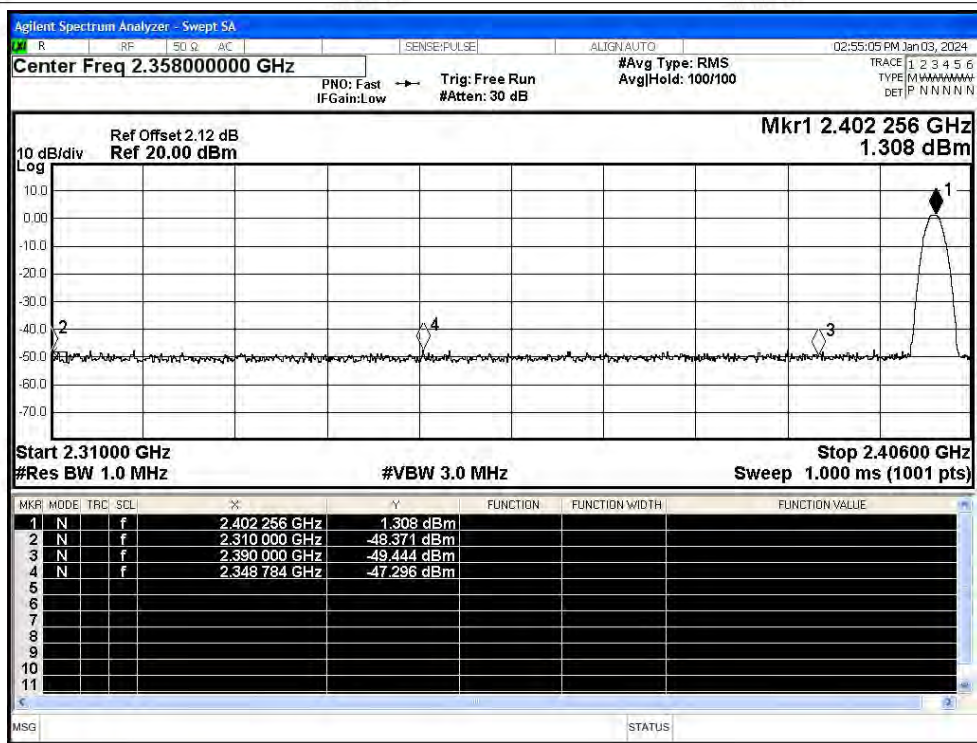


Restrict Band NVNT 1-DH5 2480MHz Ant2 No-Hopping Average

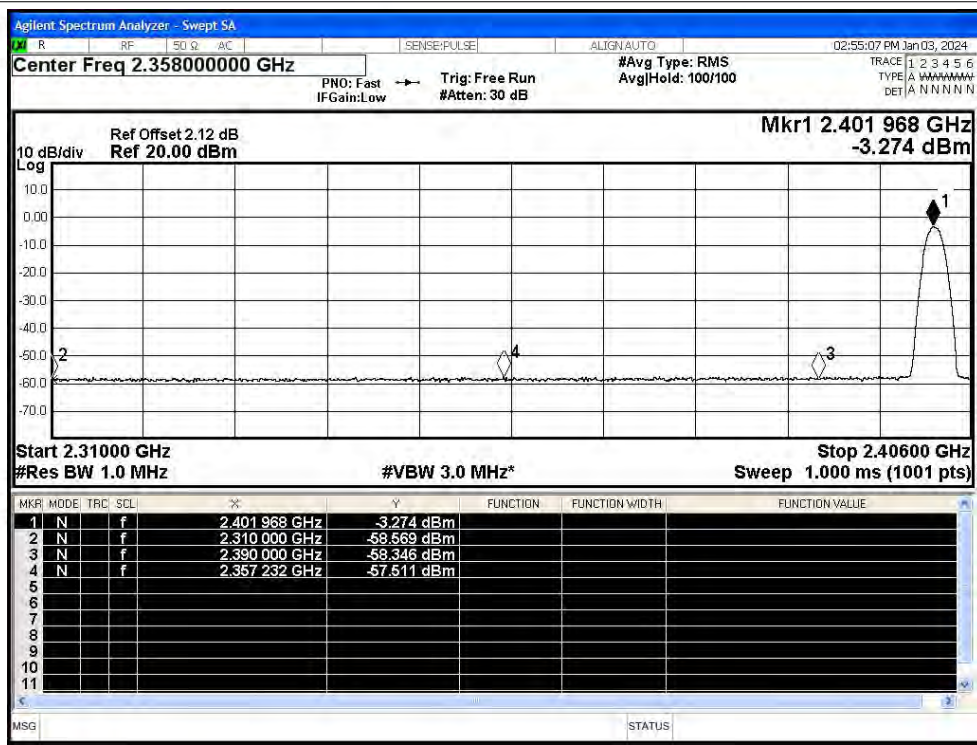




Restrict Band NVNT 2-DH5 2402MHz Ant2 No-Hopping Peak

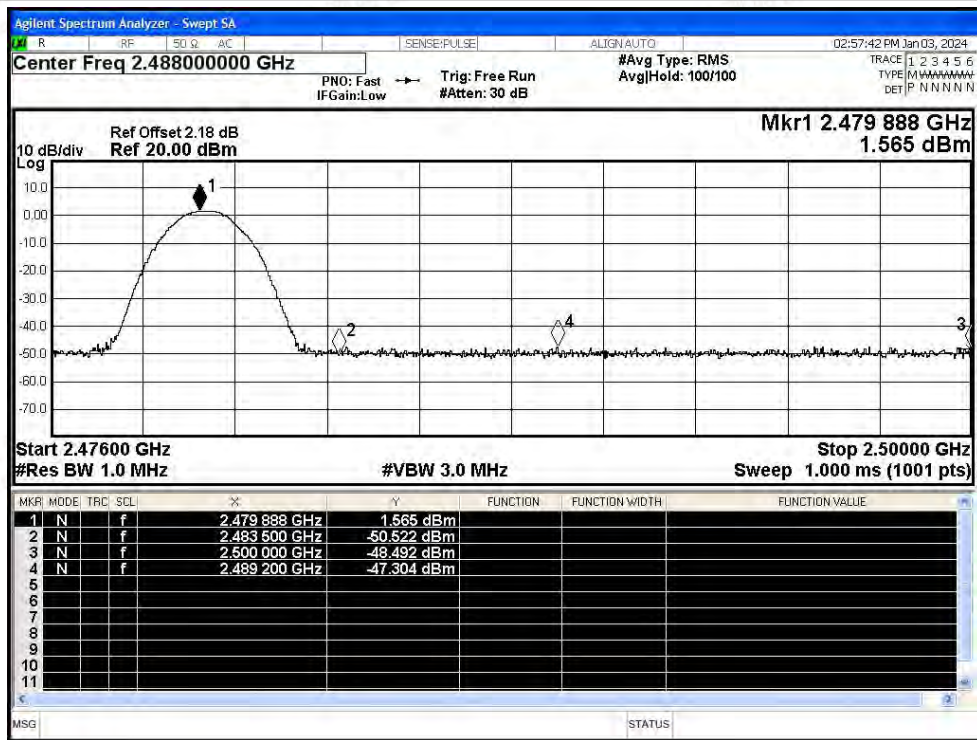


Restrict Band NVNT 2-DH5 2402MHz Ant2 No-Hopping Average

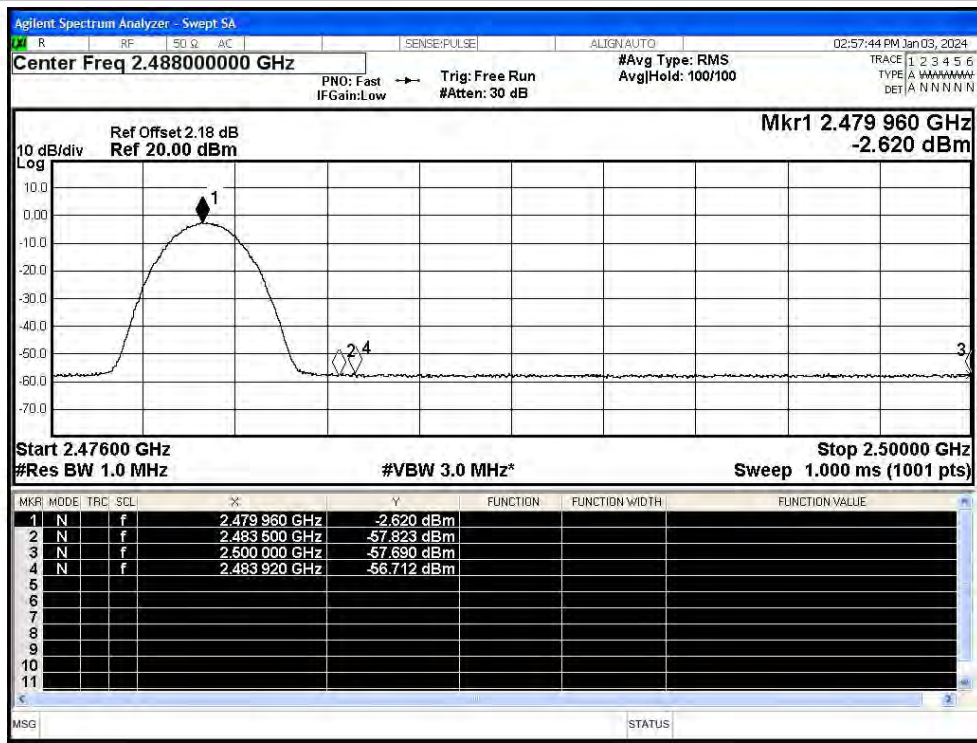




Restrict Band NVNT 2-DH5 2480MHz Ant2 No-Hopping Peak

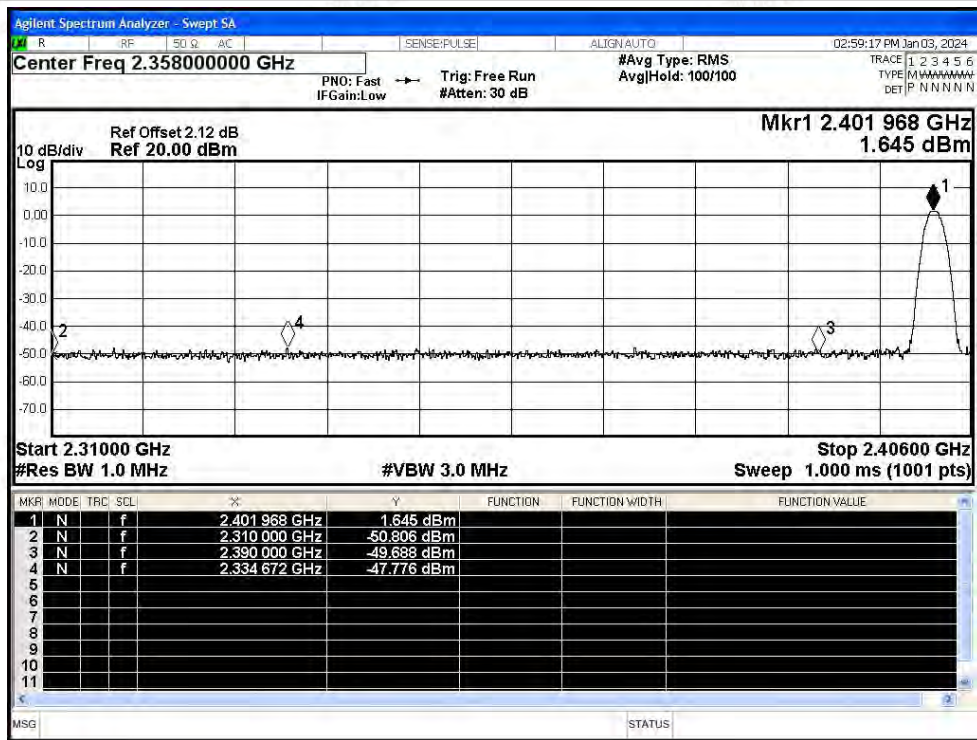


Restrict Band NVNT 2-DH5 2480MHz Ant2 No-Hopping Average

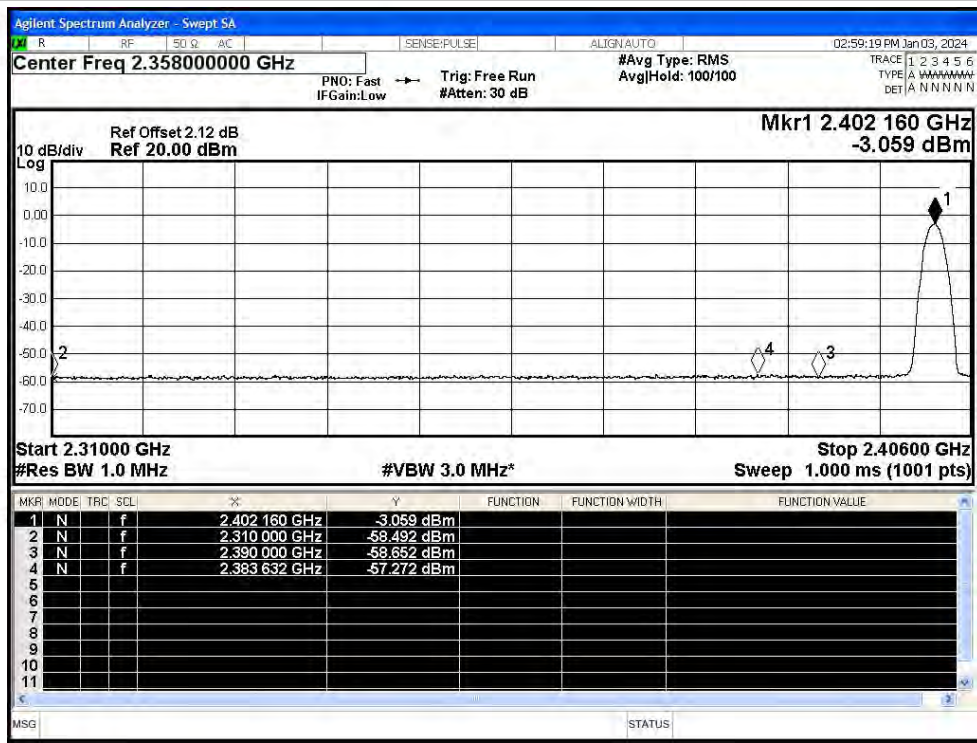




Restrict Band NVNT 3-DH5 2402MHz Ant2 No-Hopping Peak

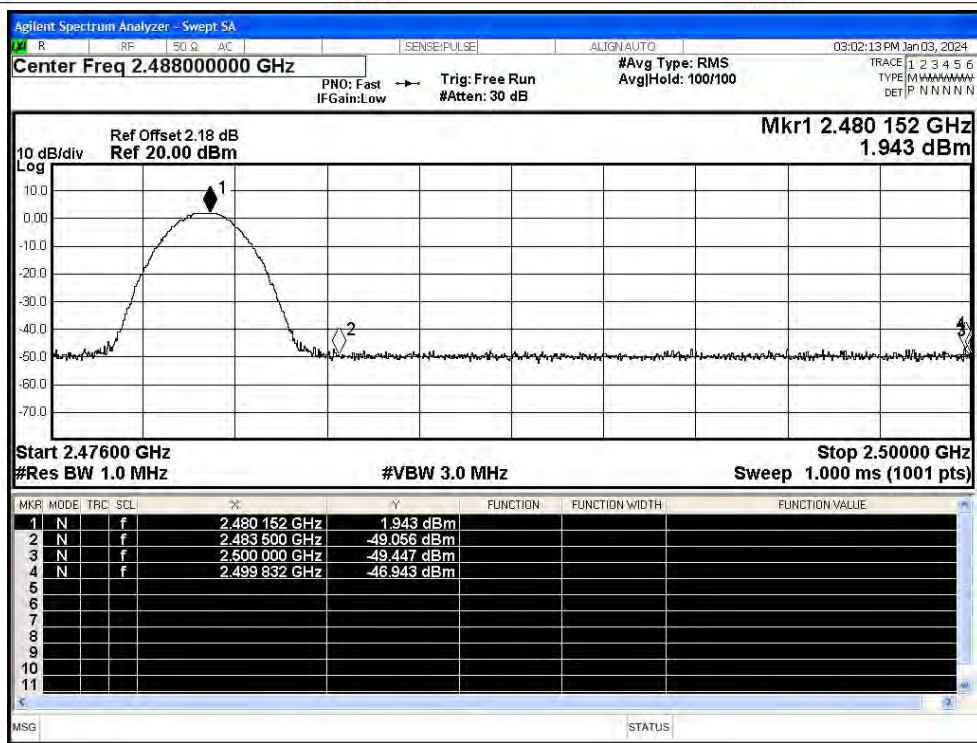


Restrict Band NVNT 3-DH5 2402MHz Ant2 No-Hopping Average





Restrict Band NVNT 3-DH5 2480MHz Ant2 No-Hopping Peak



Restrict Band NVNT 3-DH5 2480MHz Ant2 No-Hopping Average

