



Appendix A

RF Test Data for BT (Conducted Measurement)

Product Name: True Wireless Earbuds

Test Model: TREBLAB X8

Environmental Conditions

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





A.1 -20dB Bandwidth

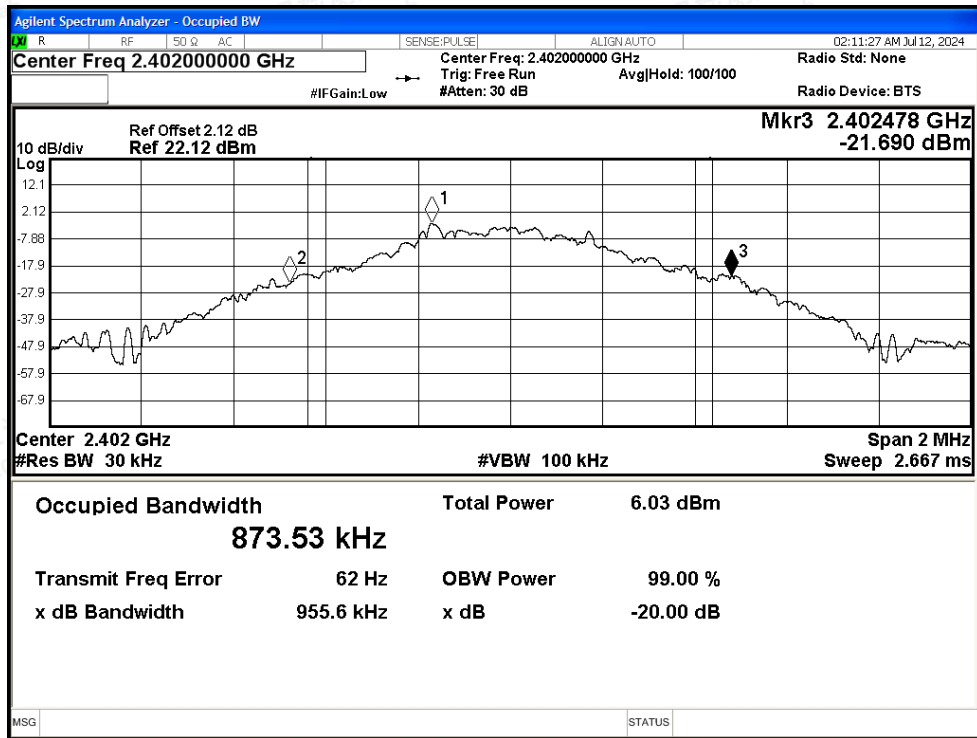
Condition	Mode	Frequency (MHz)	Antenna	-20 dB Bandwidth (MHz)	Limit -20 dB Bandwidth (MHz)	Verdict
NVNT	1-DH5	2402	Ant	0.956	N/A	Pass
NVNT	1-DH5	2441	Ant	1.02	N/A	Pass
NVNT	1-DH5	2480	Ant	0.954	N/A	Pass
NVNT	2-DH5	2402	Ant	1.287	N/A	Pass
NVNT	2-DH5	2441	Ant	1.302	N/A	Pass
NVNT	2-DH5	2480	Ant	1.288	N/A	Pass
NVNT	3-DH5	2402	Ant	1.302	N/A	Pass
NVNT	3-DH5	2441	Ant	1.309	N/A	Pass
NVNT	3-DH5	2480	Ant	1.29	N/A	Pass





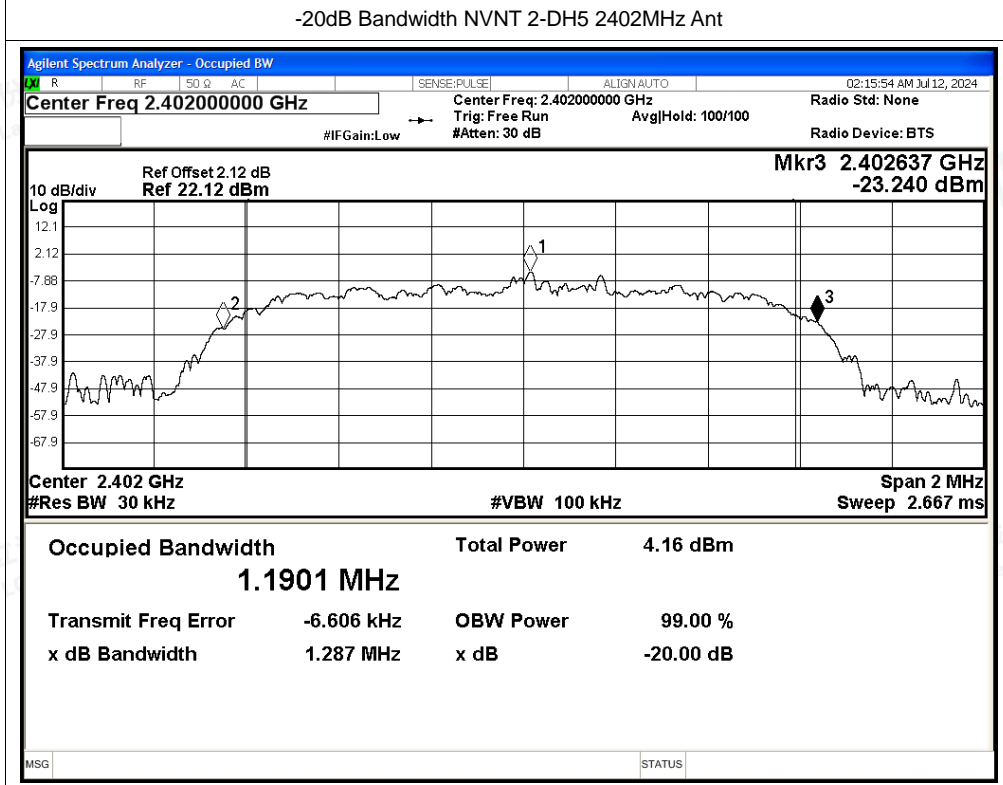
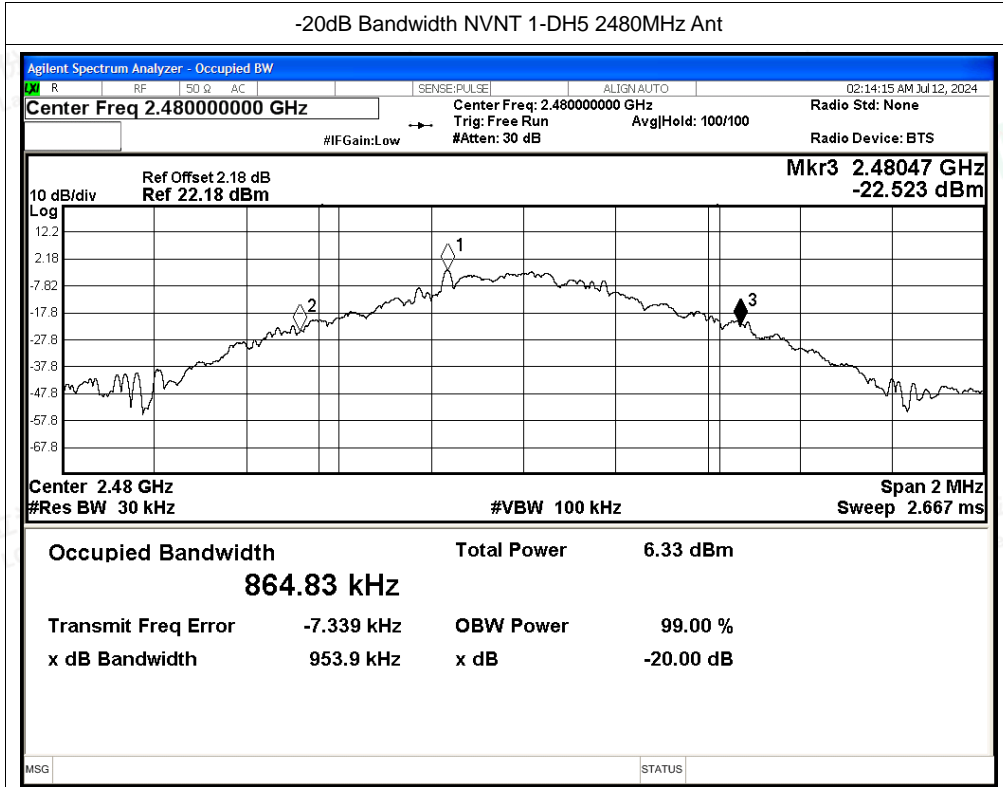
Test Graphs

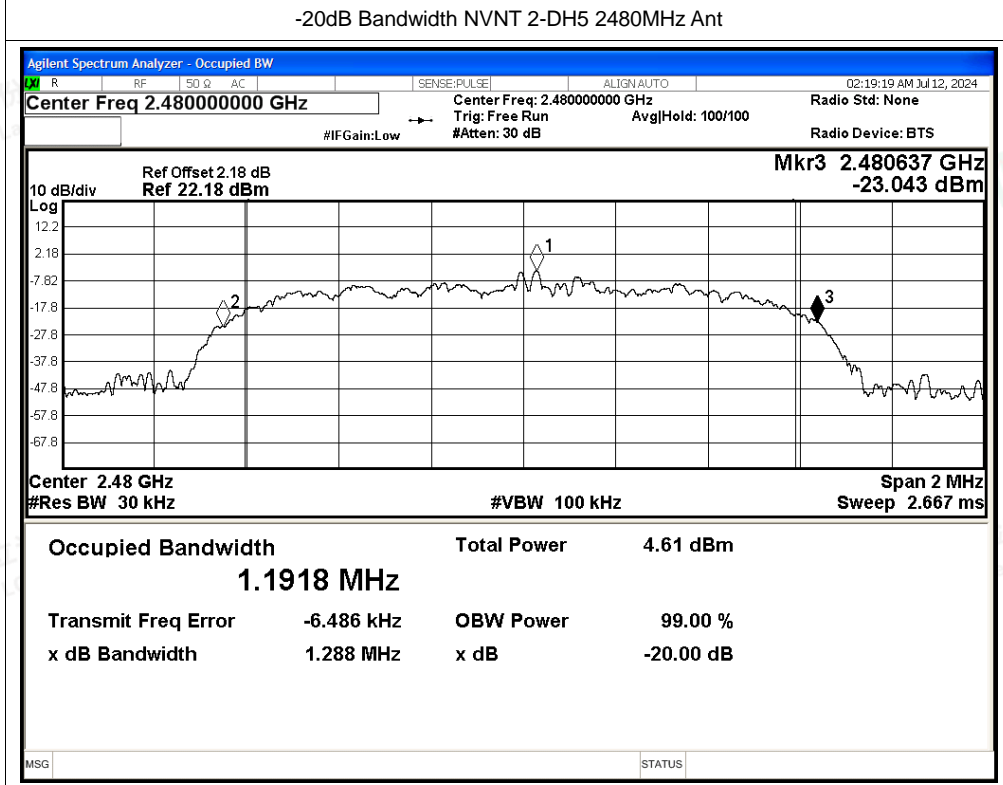
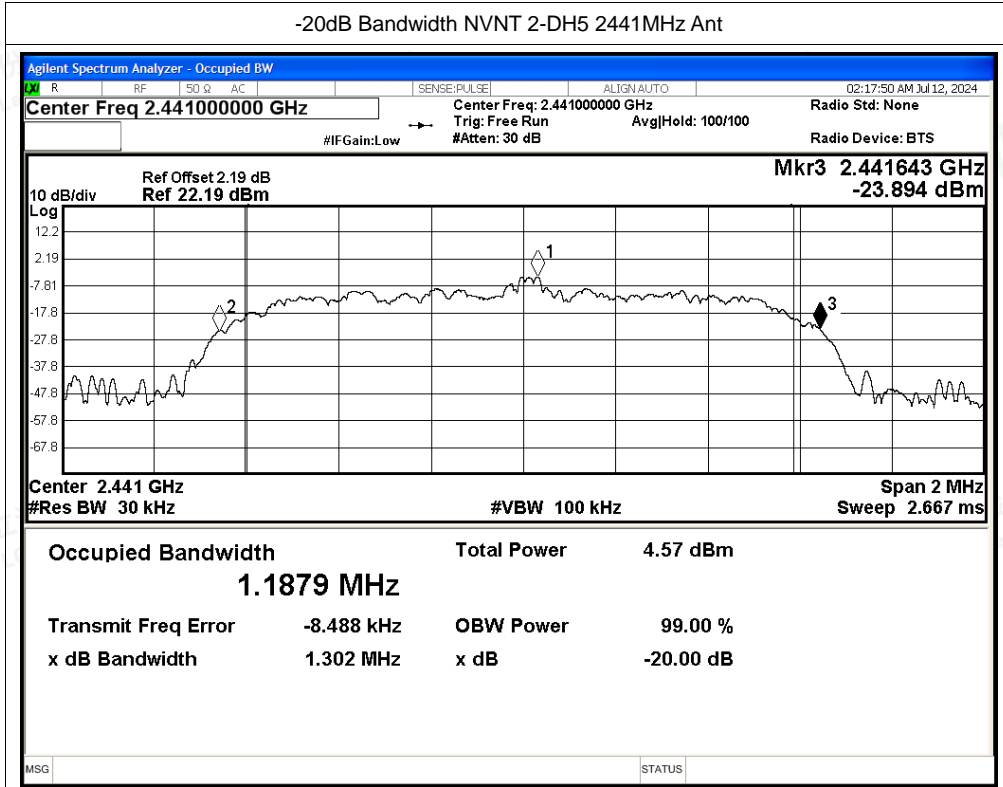
-20dB Bandwidth NVNT 1-DH5 2402MHz Ant

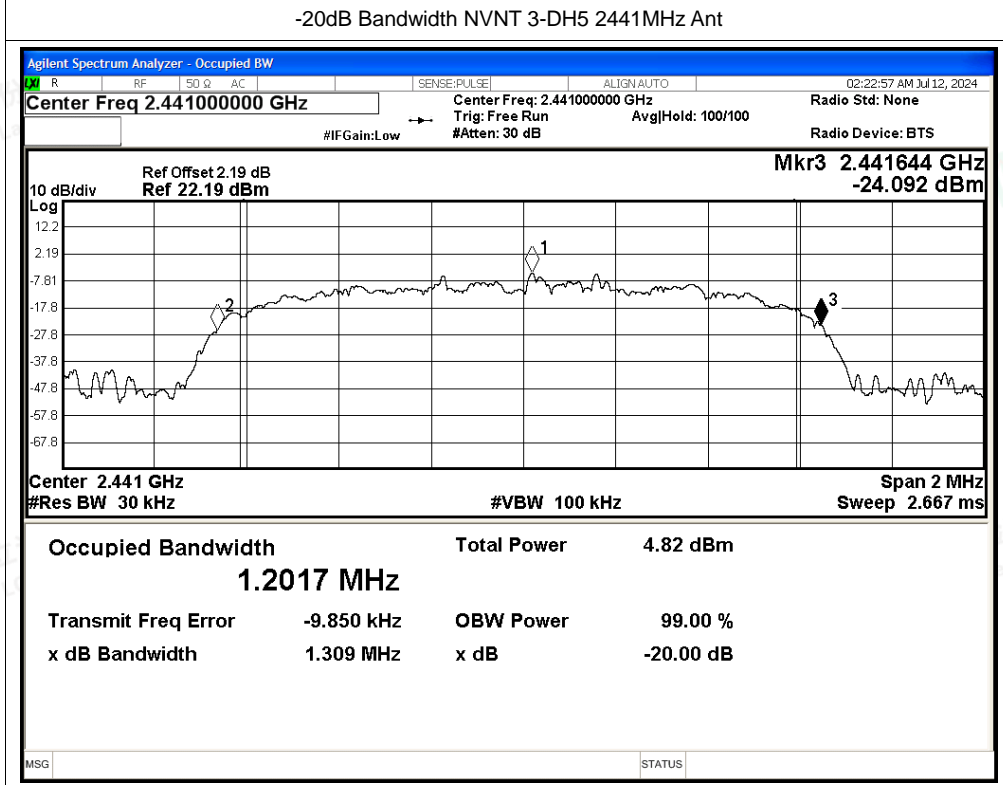
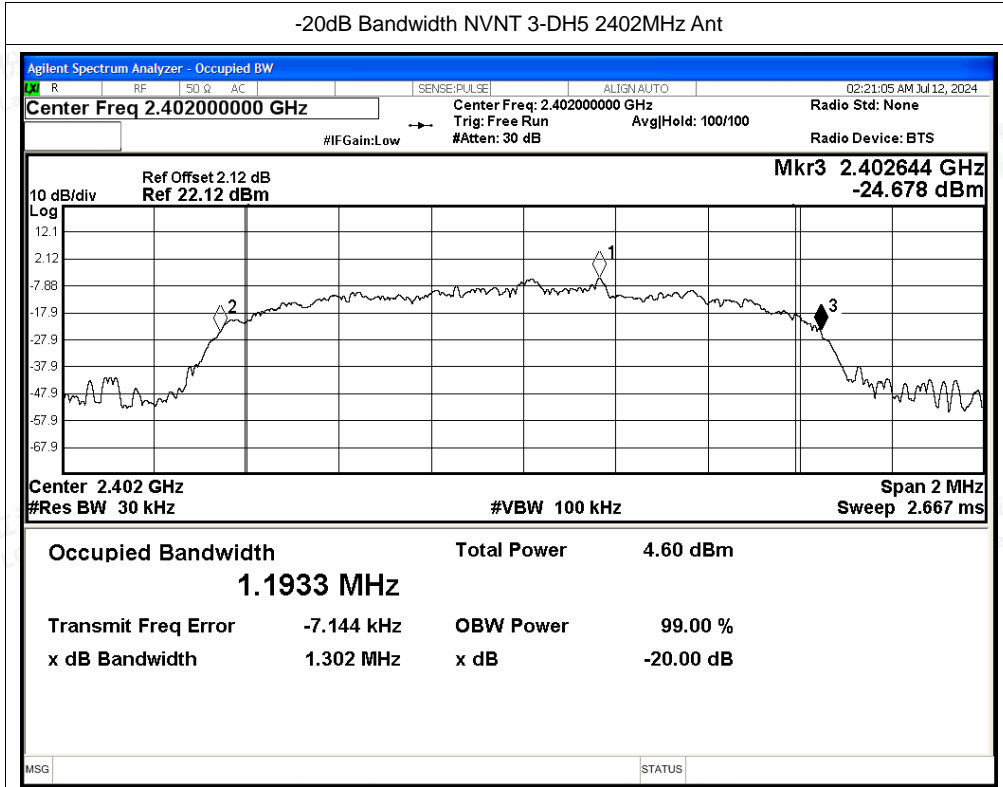


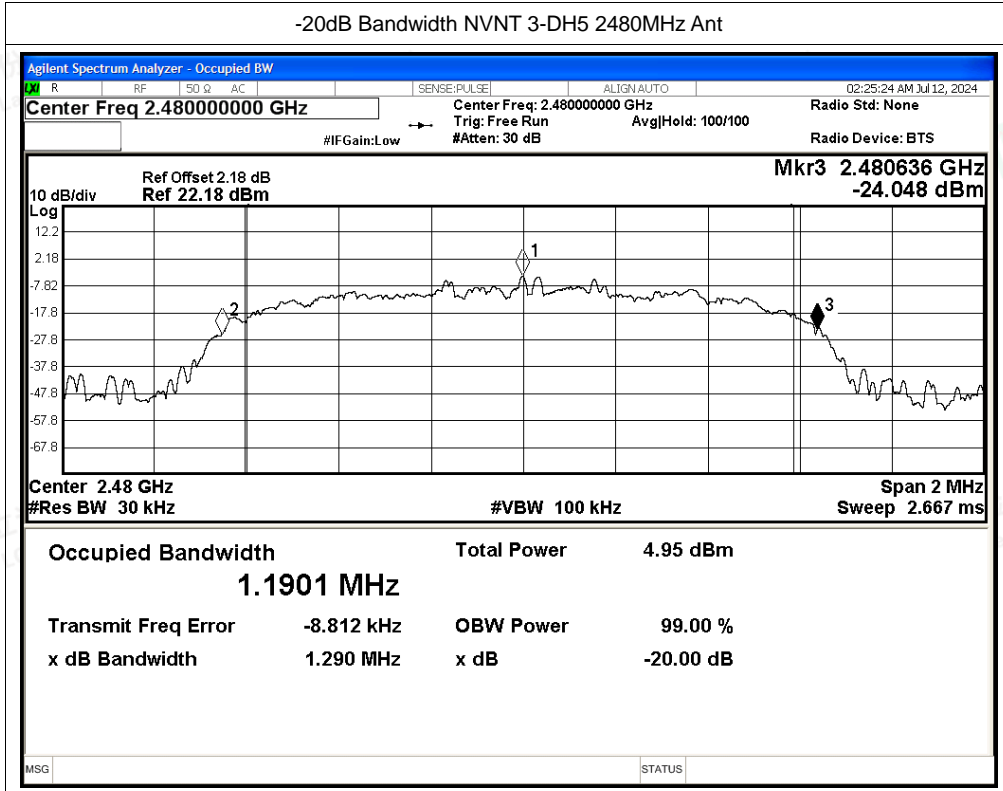
-20dB Bandwidth NVNT 1-DH5 2441MHz Ant













A.2 Maximum Peak Conducted Output Power

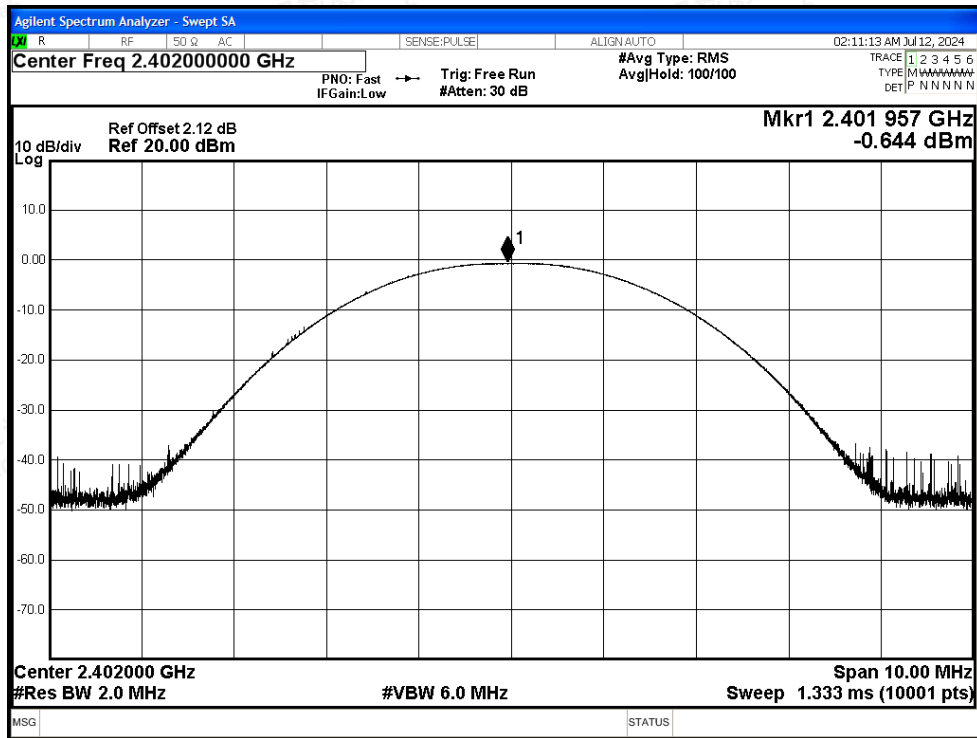
Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	1-DH5	2402	Ant	-0.64	21	Pass
NVNT	1-DH5	2441	Ant	-0.4	21	Pass
NVNT	1-DH5	2480	Ant	-0.19	21	Pass
NVNT	2-DH5	2402	Ant	-0.12	21	Pass
NVNT	2-DH5	2441	Ant	0.46	21	Pass
NVNT	2-DH5	2480	Ant	0.48	21	Pass
NVNT	3-DH5	2402	Ant	0.37	21	Pass
NVNT	3-DH5	2441	Ant	0.9	21	Pass
NVNT	3-DH5	2480	Ant	0.88	21	Pass



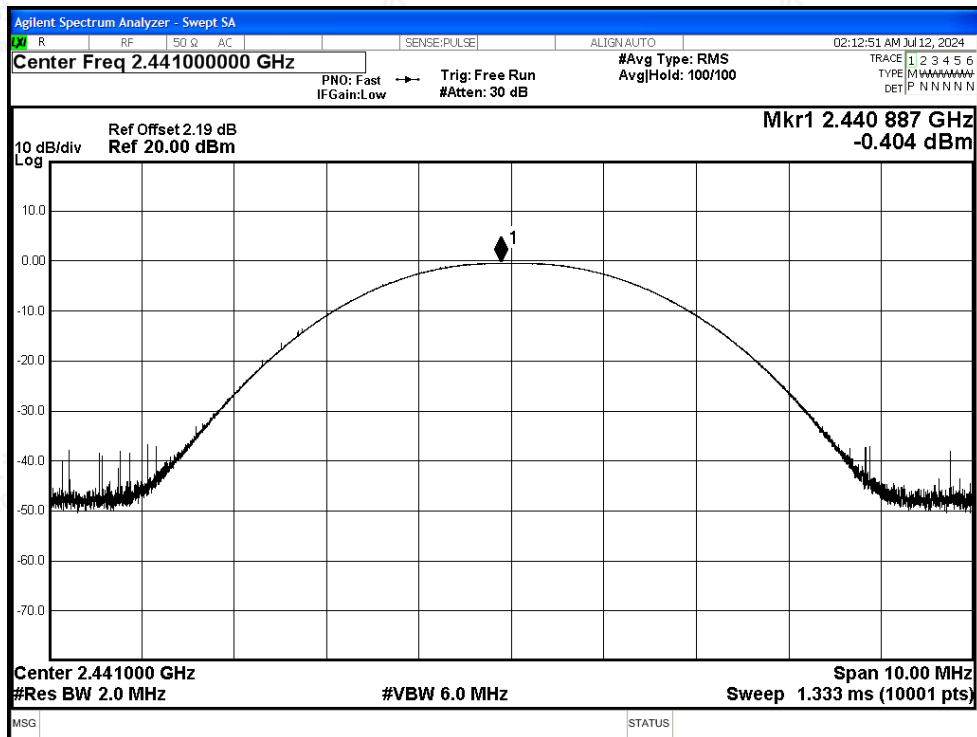


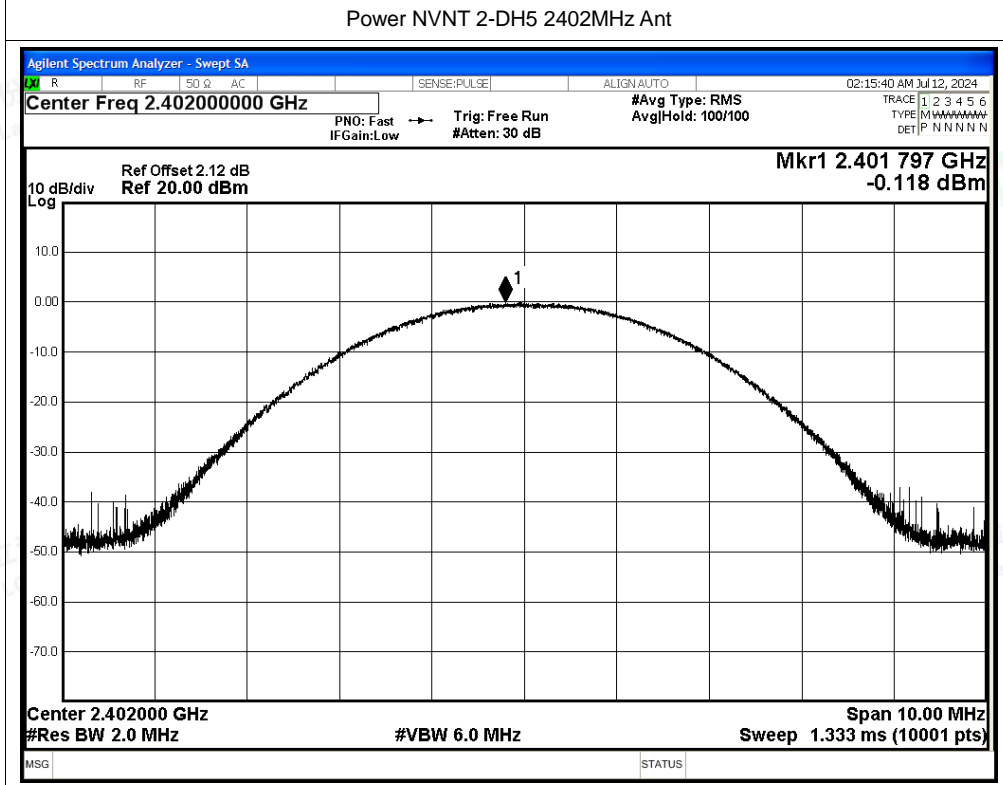
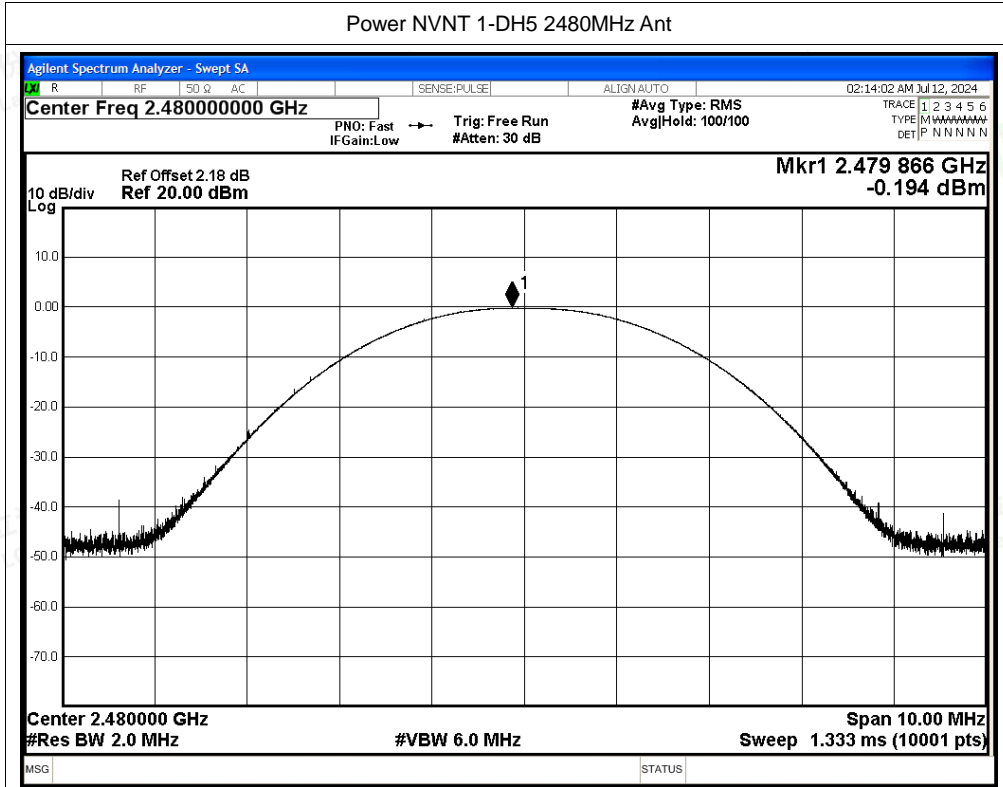
Test Graphs

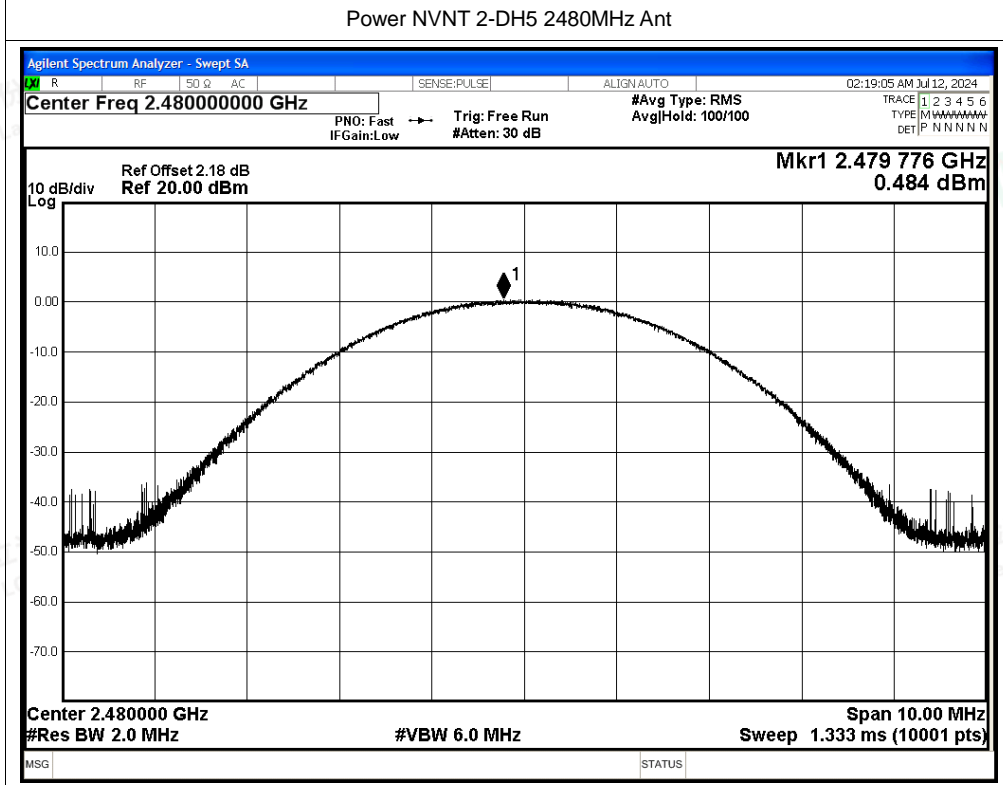
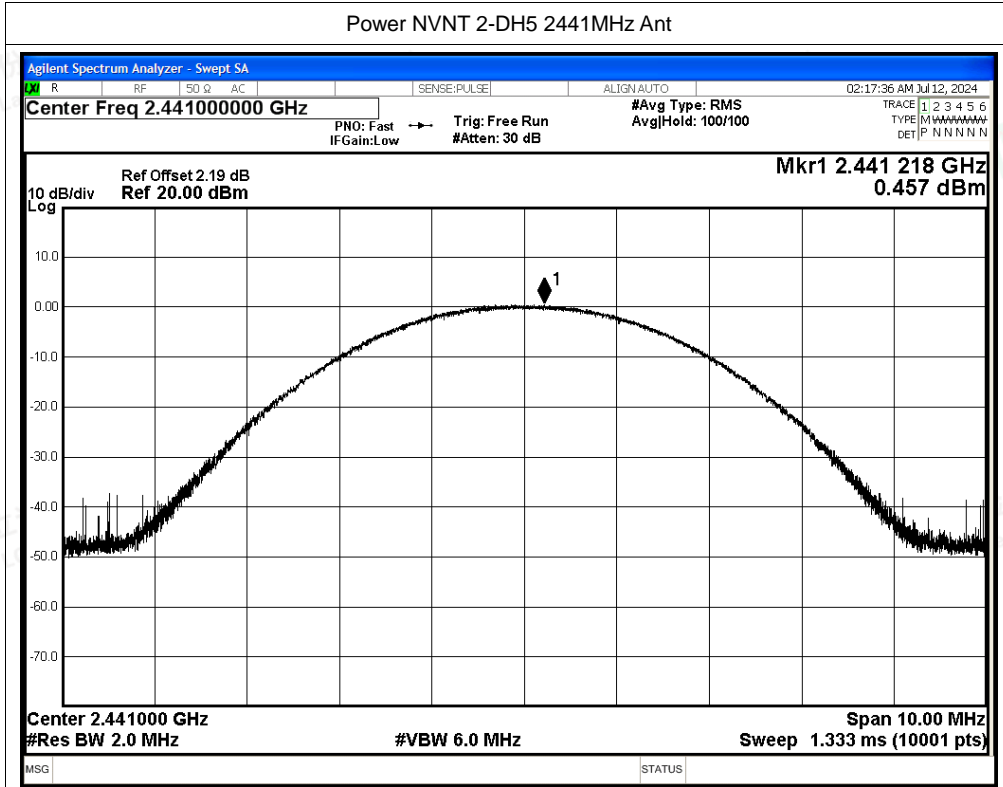
Power NVNT 1-DH5 2402MHz Ant

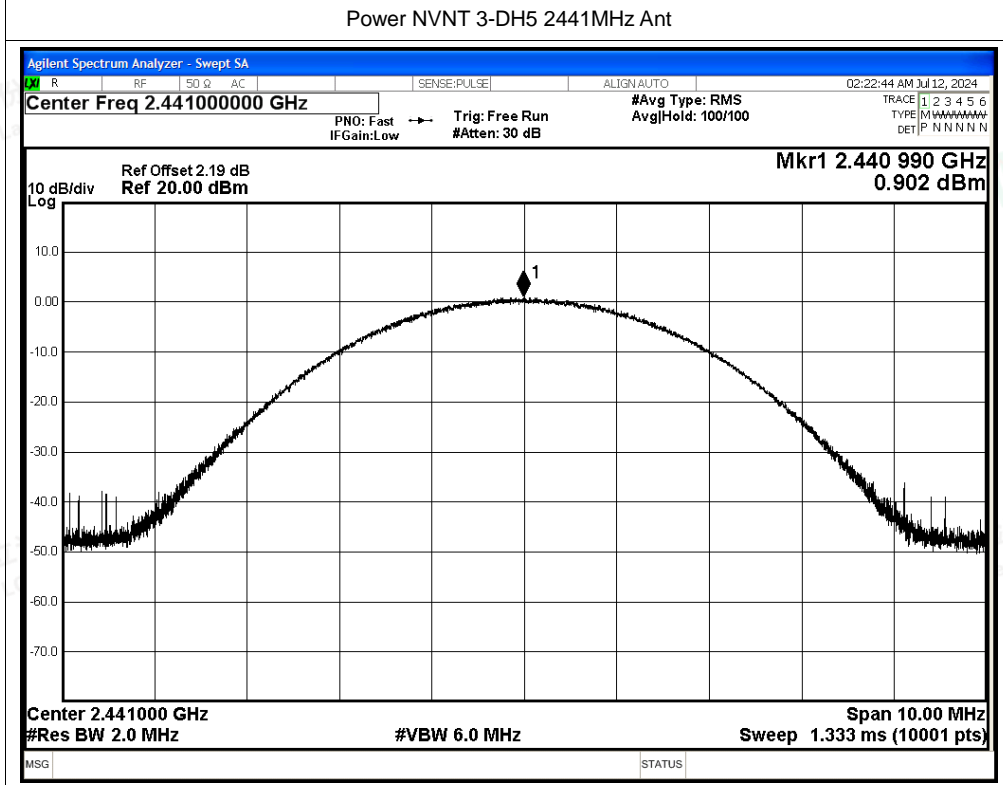
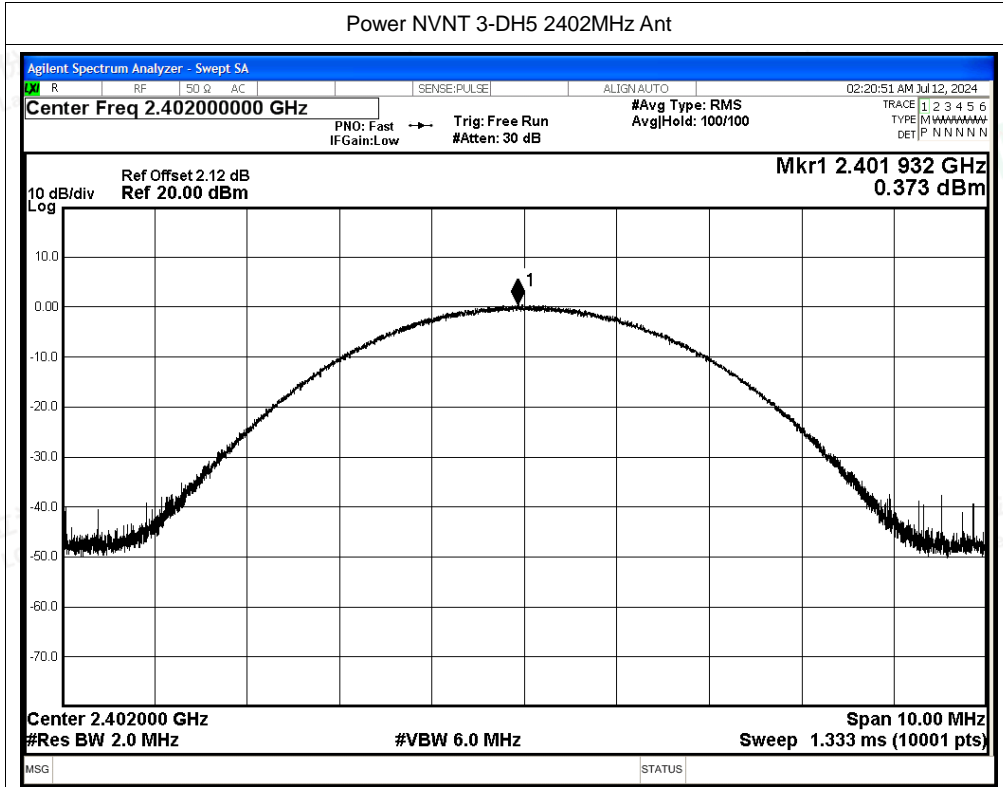


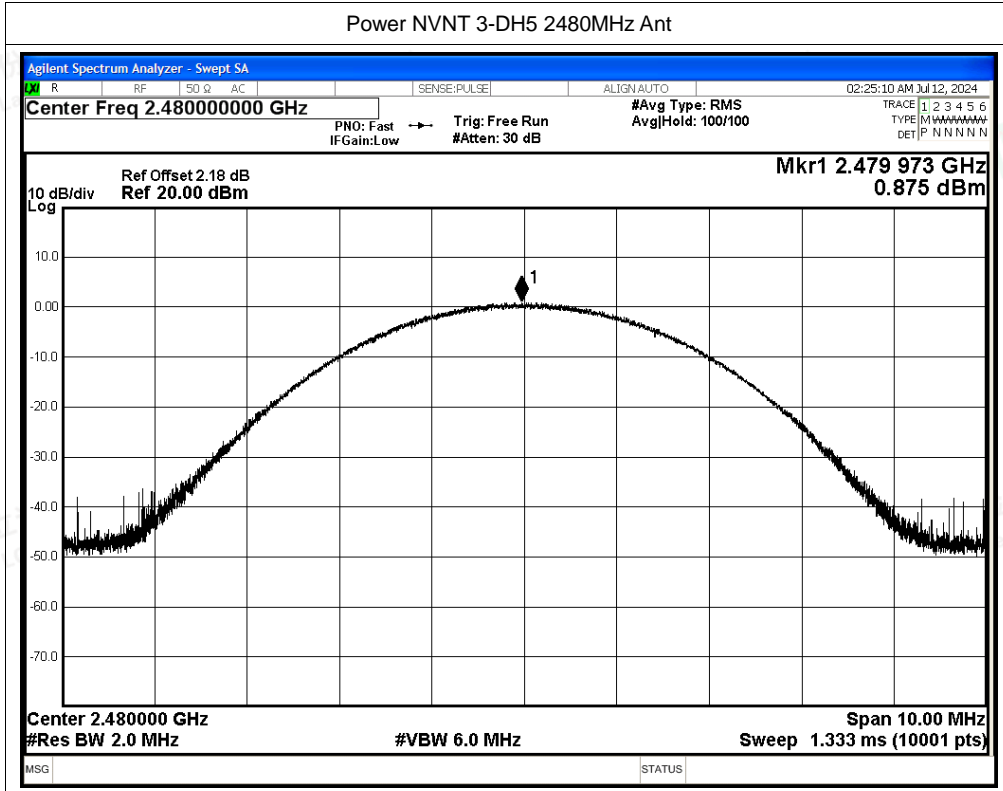
Power NVNT 1-DH5 2441MHz Ant













A.3 Carrier Frequencies Separation

Condition	Mode	Antenna	Hopping Freq1 (MHz)	Hopping Freq2 (MHz)	HFS (MHz)	Limit (MHz)	Verdict
NVNT	1-DH5	Ant	2401.828	2402.986	1.158	0.680	Pass
NVNT	2-DH5	Ant	2402.012	2403.17	1.158	0.868	Pass
NVNT	3-DH5	Ant	2402.154	2403.154	1	0.873	Pass



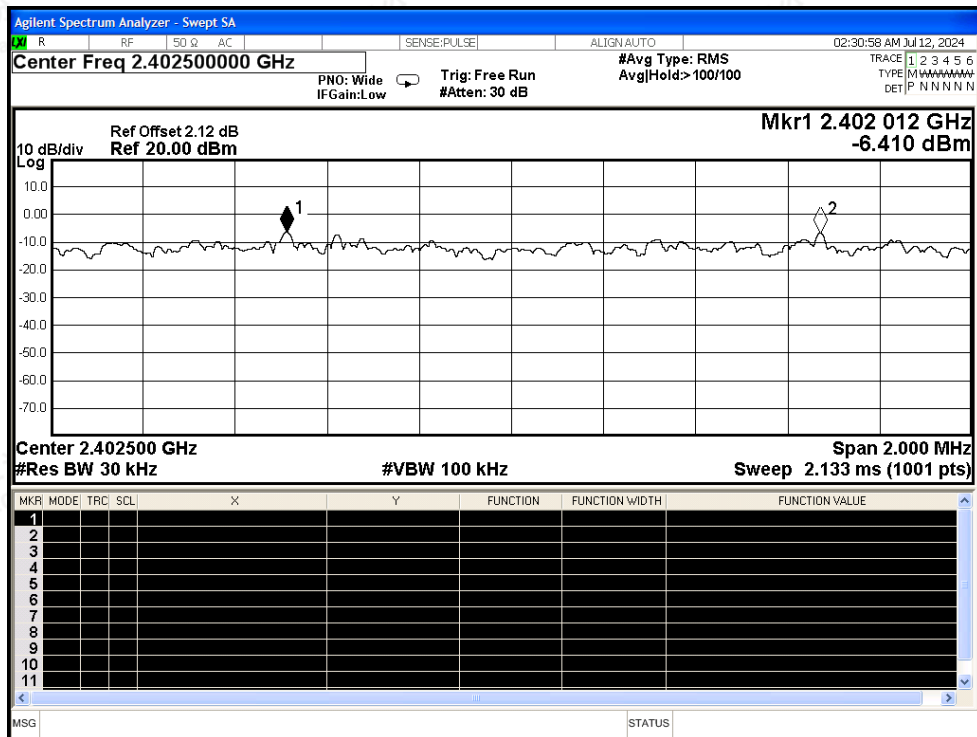


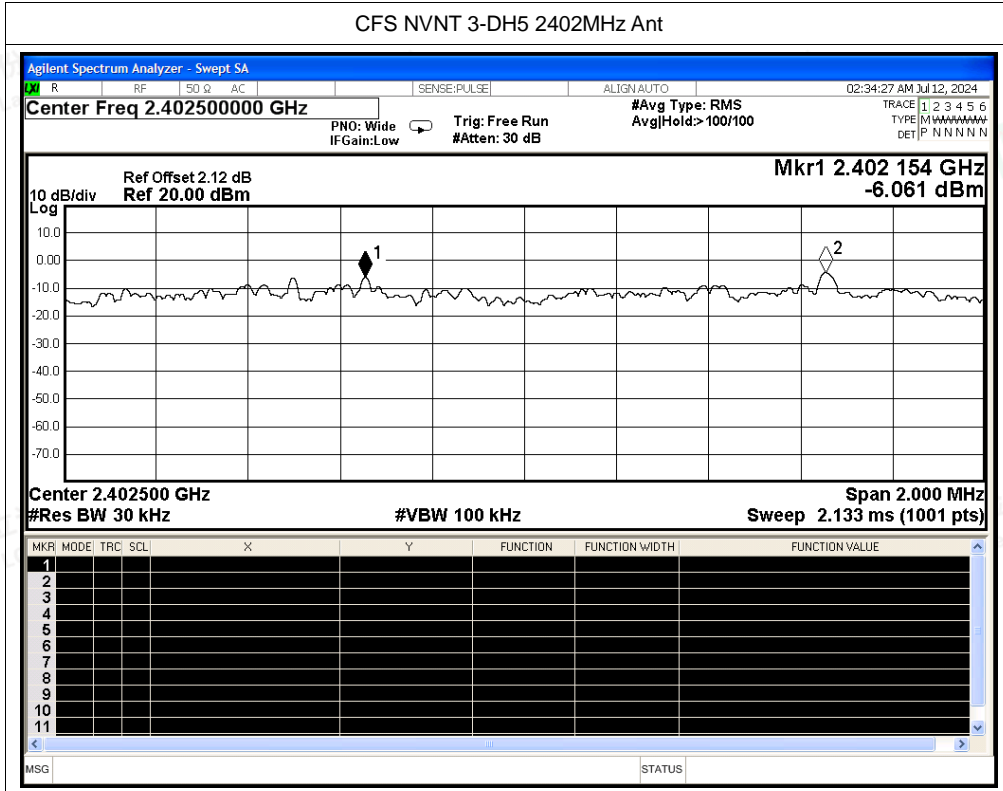
Test Graphs

CFS NVNT 1-DH5 2402MHz Ant



CFS NVNT 2-DH5 2402MHz Ant







A.4 Dwell Time

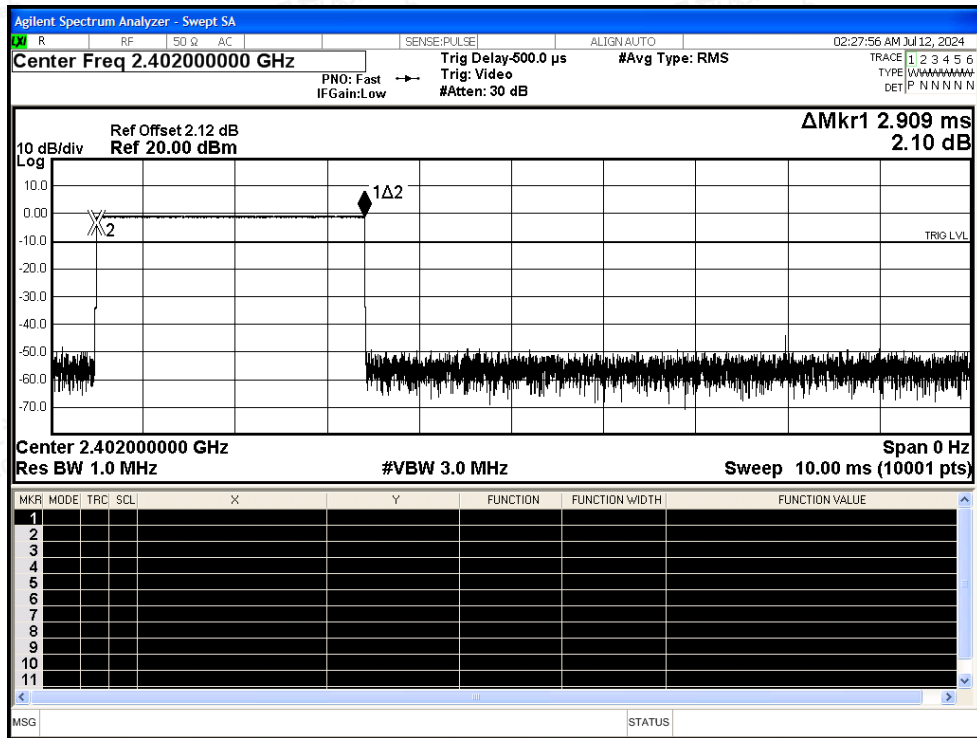
Condition	Mode	Frequency (MHz)	Antenna	Pulse Time (ms)	Total Dwell Time (ms)	Burst Count	Period Time (ms)	Limit (ms)	Verdict
NVNT	1-DH5	2402	Ant	2.909	319.99	110	31600	400	Pass
NVNT	2-DH5	2402	Ant	2.898	315.882	109	31600	400	Pass
NVNT	3-DH5	2402	Ant	2.897	304.185	105	31600	400	Pass



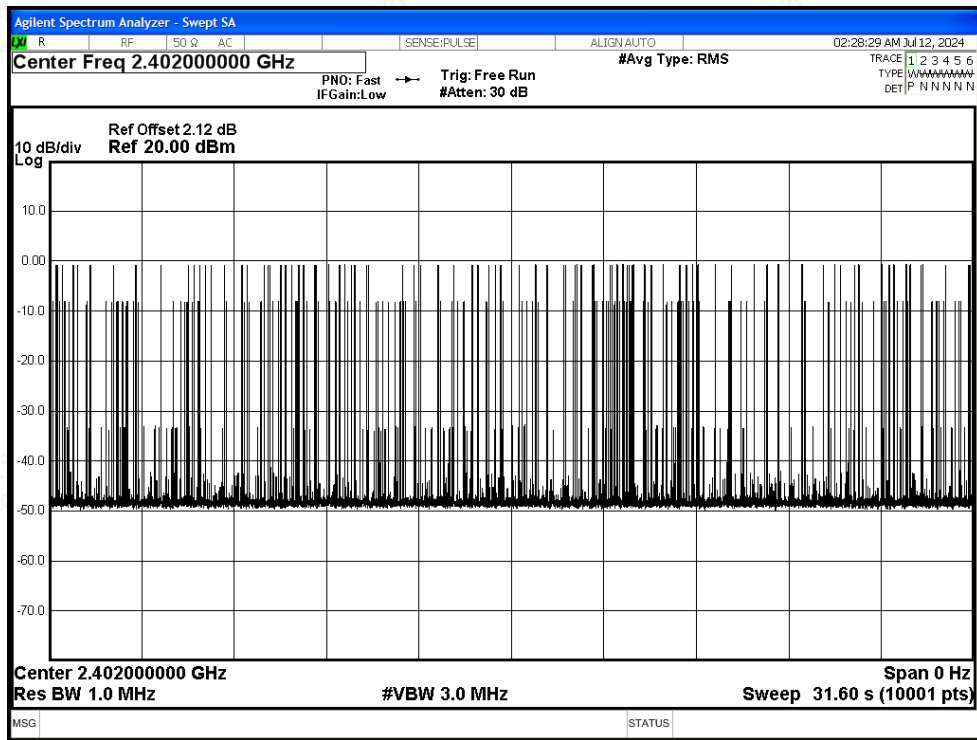


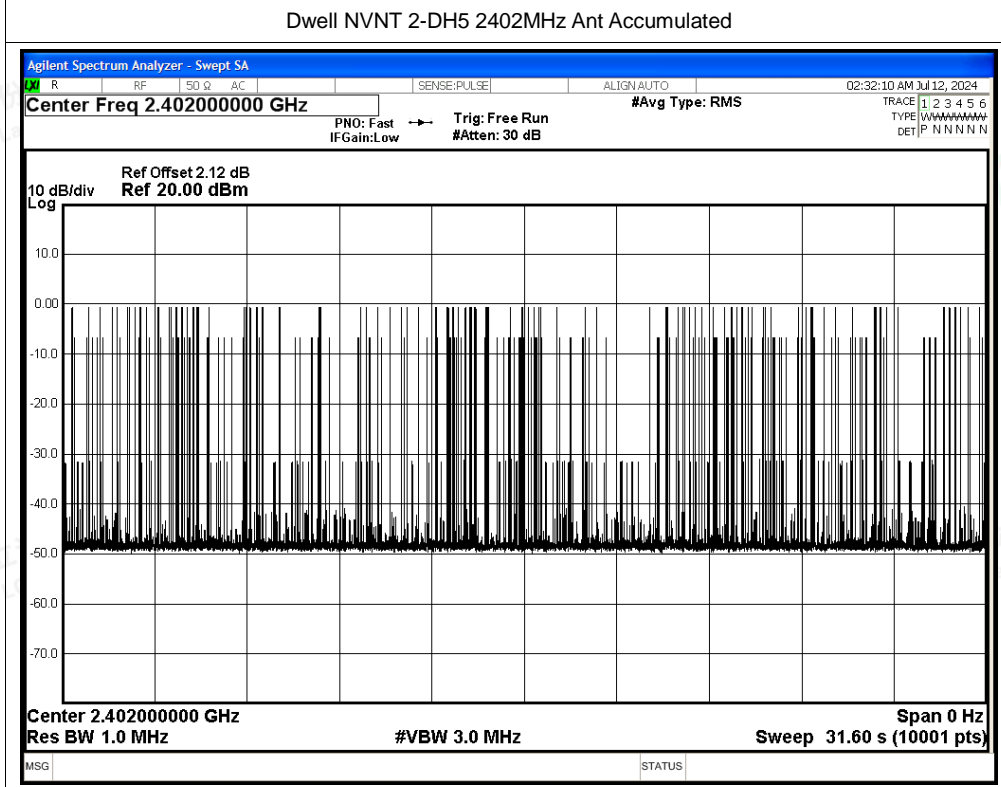
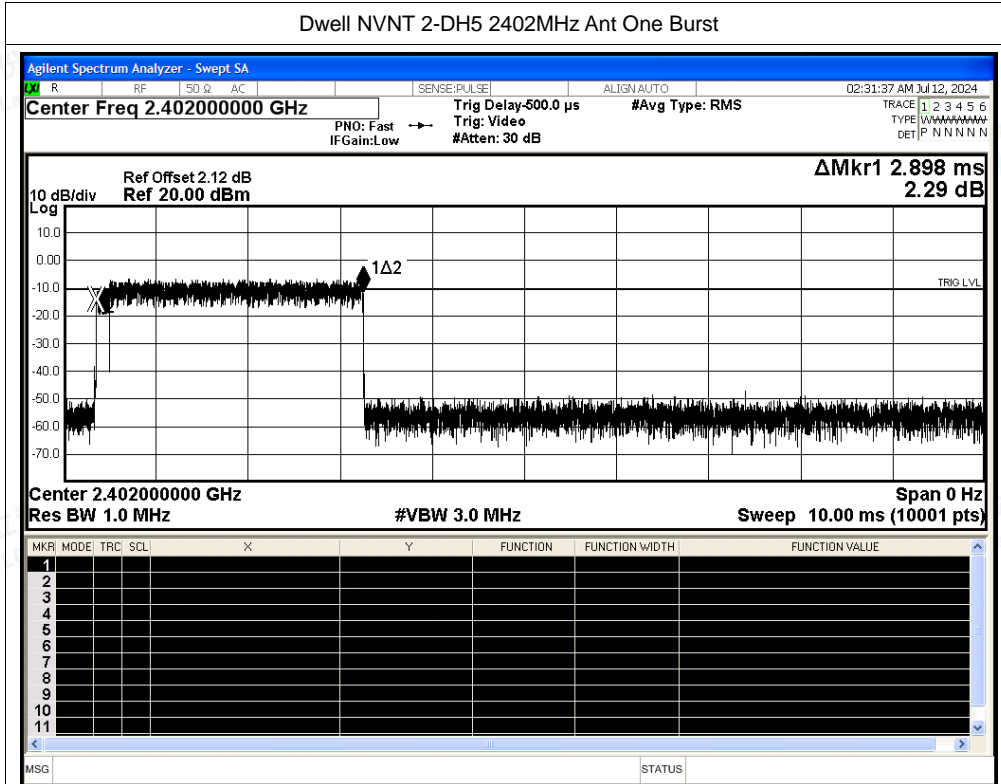
Test Graphs

Dwell NVNT 1-DH5 2402MHz Ant One Burst



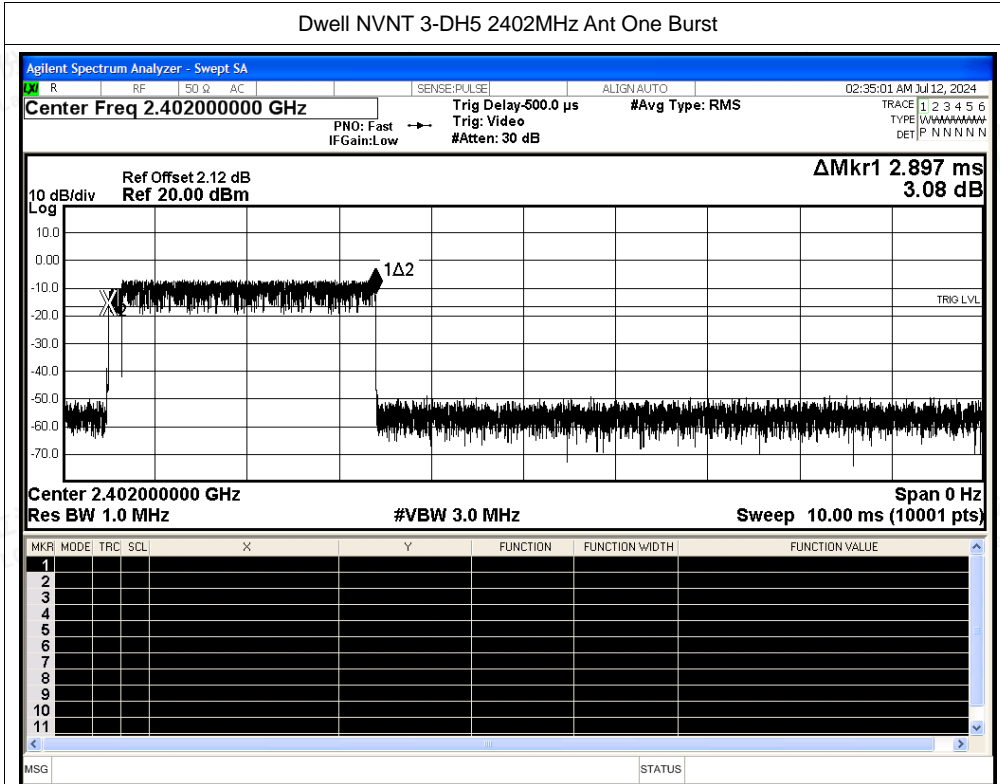
Dwell NVNT 1-DH5 2402MHz Ant Accumulated



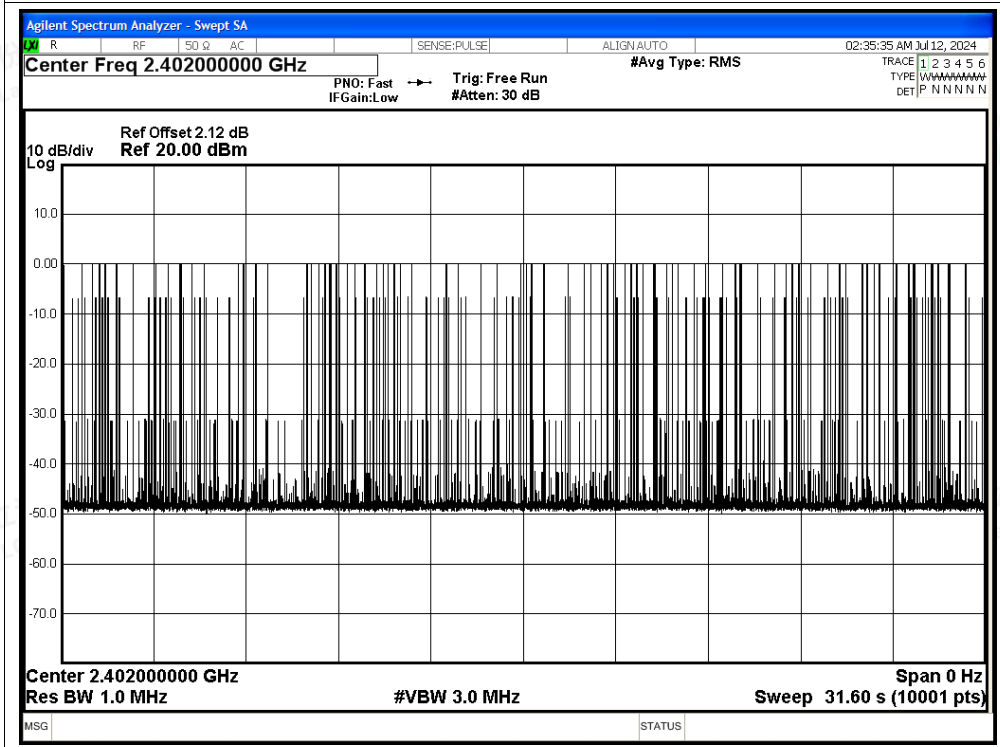




Dwell NVNT 3-DH5 2402MHz Ant One Burst



Dwell NVNT 3-DH5 2402MHz Ant Accumulated





A.5 Number of Hopping Channel

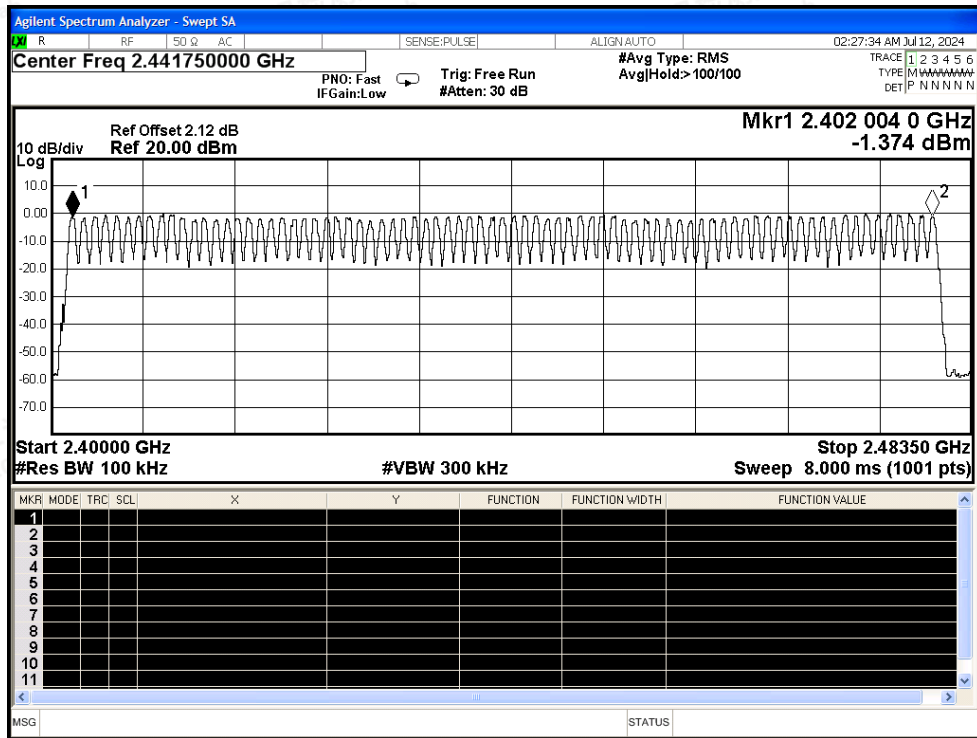
Condition	Mode	Antenna	Hopping Number	Limit	Verdict
NVNT	1-DH5	Ant	79	15	Pass
NVNT	2-DH5	Ant	79	15	Pass
NVNT	3-DH5	Ant	79	15	Pass



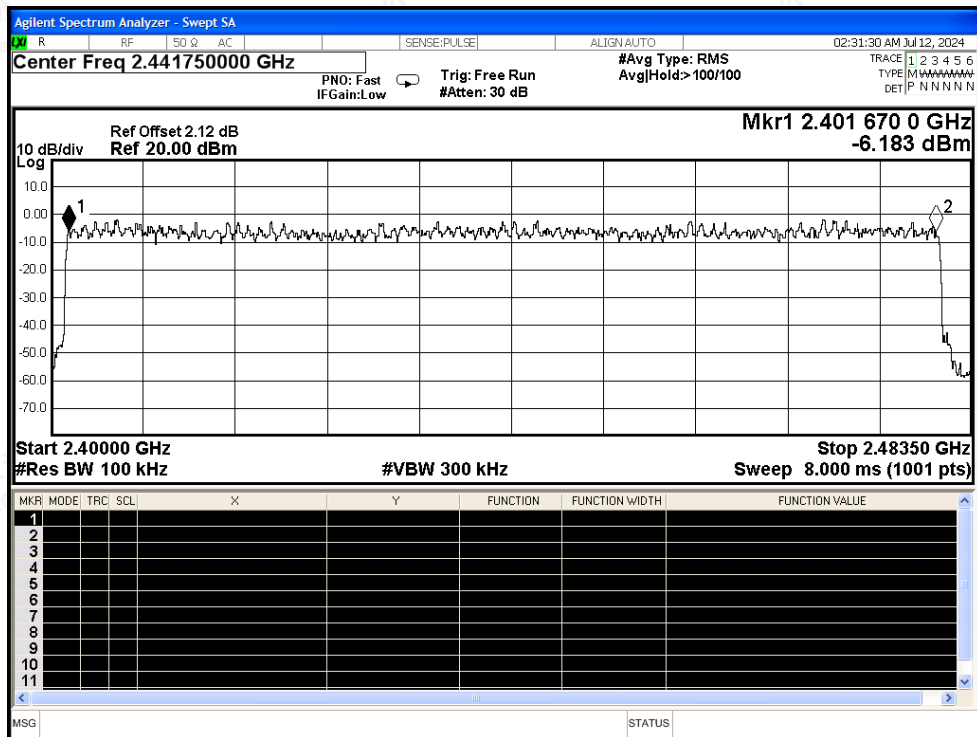


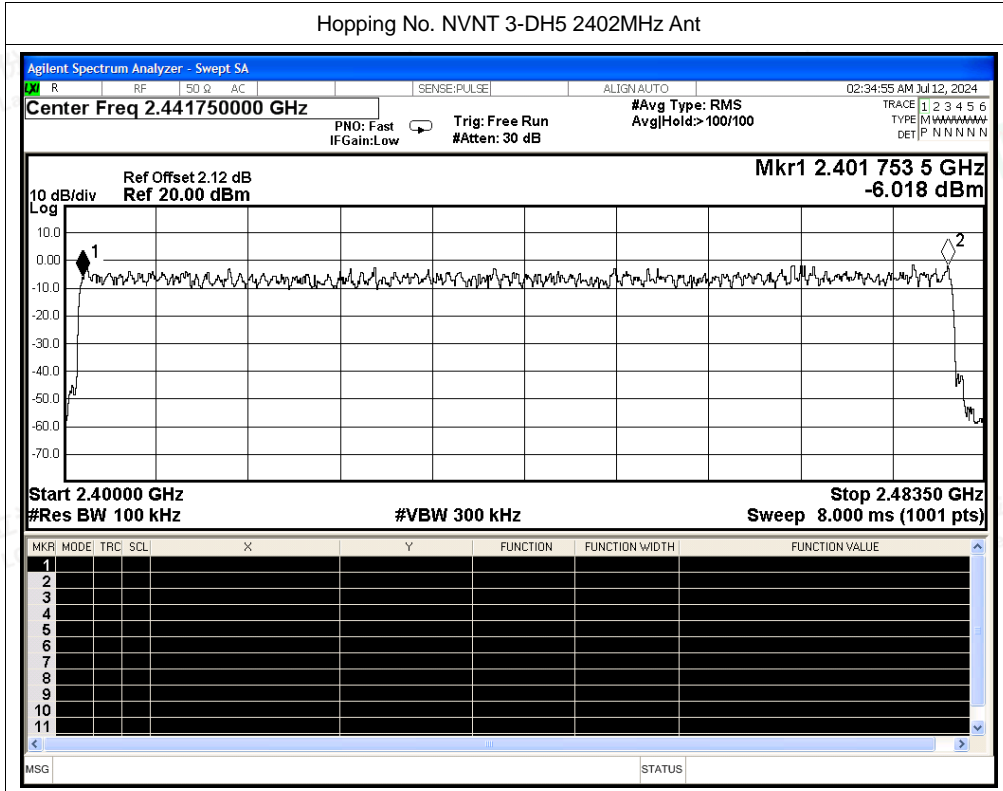
Test Graphs

Hopping No. NVNT 1-DH5 2402MHz Ant



Hopping No. NVNT 2-DH5 2402MHz Ant







A.6 Band Edge

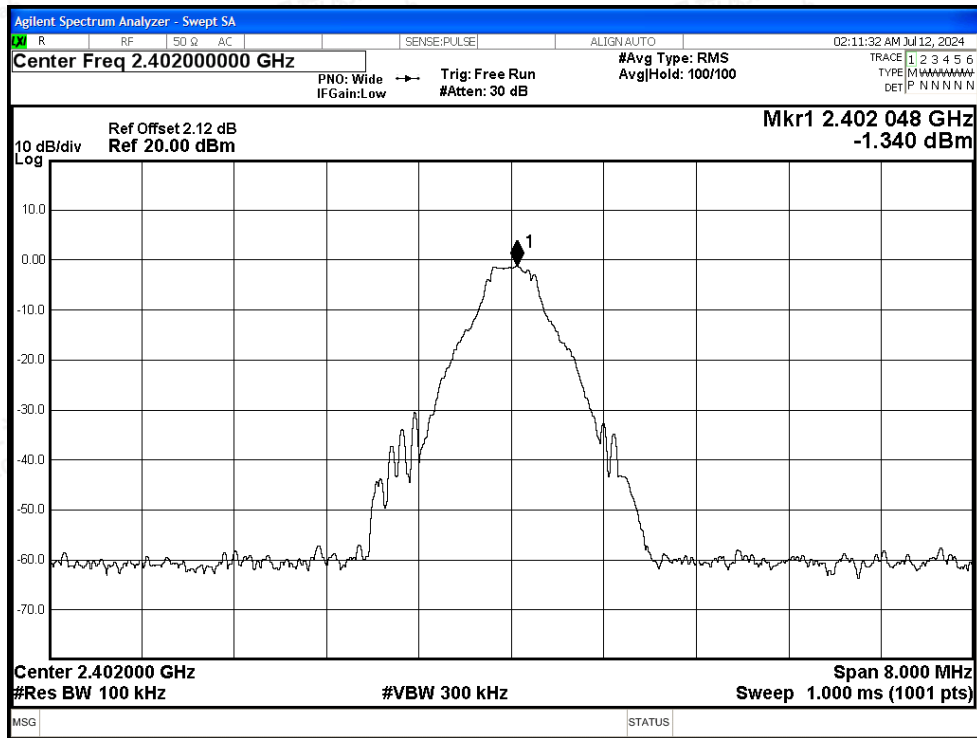
Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH5	2402	Ant	No-Hopping	-55.67	-20	Pass
NVNT	1-DH5	2480	Ant	No-Hopping	-56.82	-20	Pass
NVNT	2-DH5	2402	Ant	No-Hopping	-53.47	-20	Pass
NVNT	2-DH5	2480	Ant	No-Hopping	-53.08	-20	Pass
NVNT	3-DH5	2402	Ant	No-Hopping	-49.13	-20	Pass
NVNT	3-DH5	2480	Ant	No-Hopping	-54.12	-20	Pass



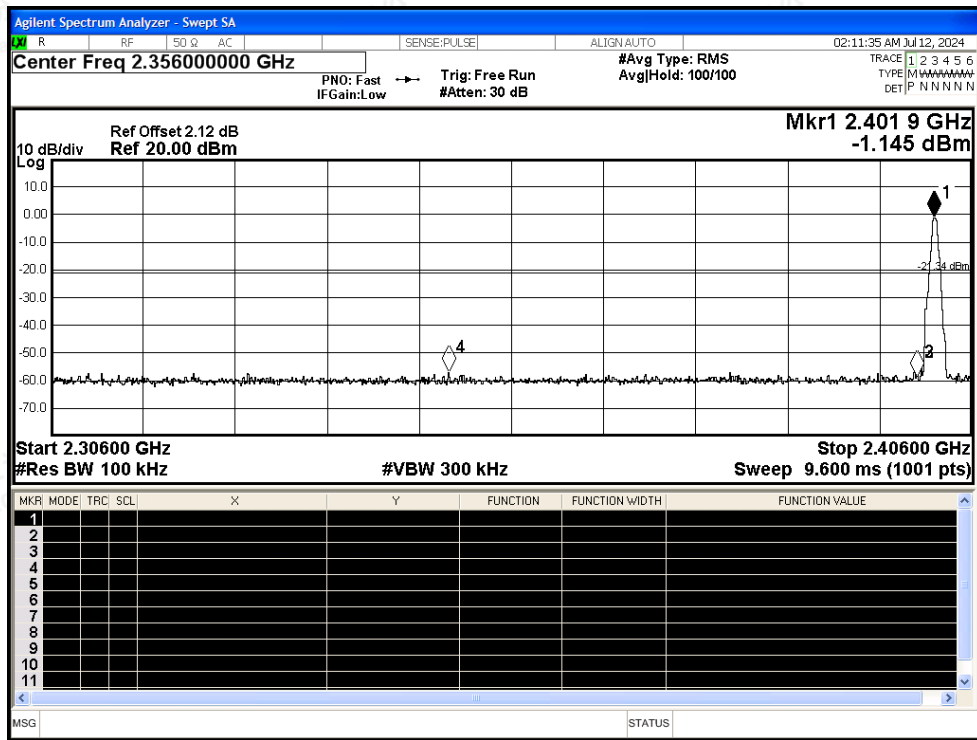


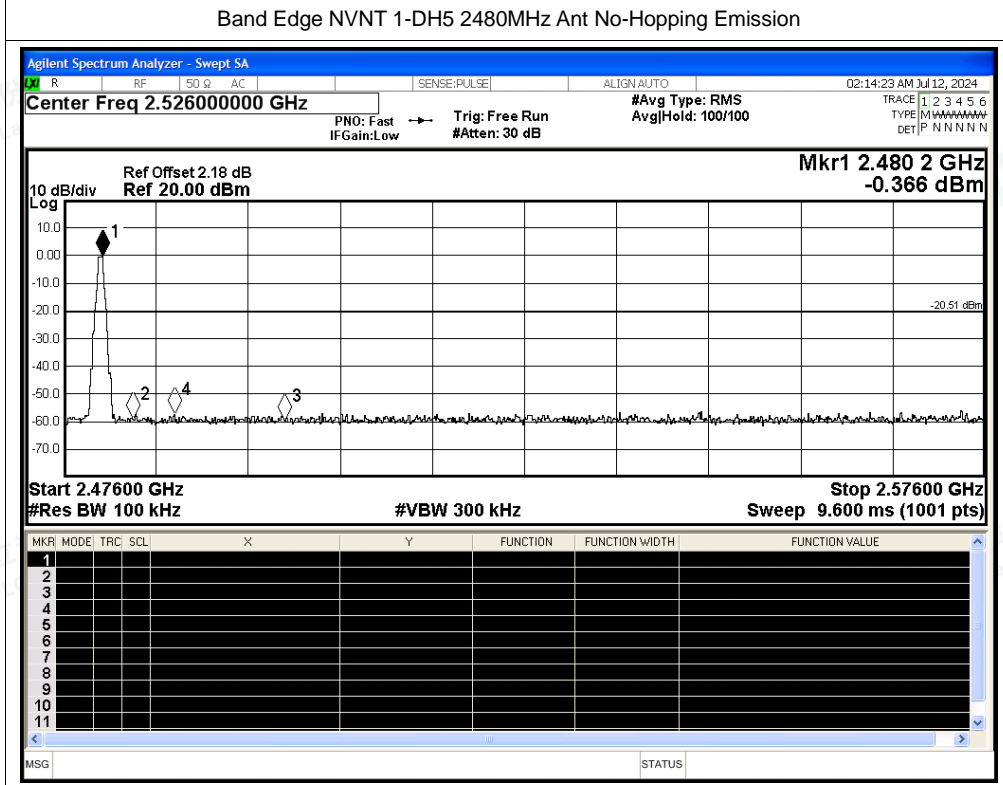
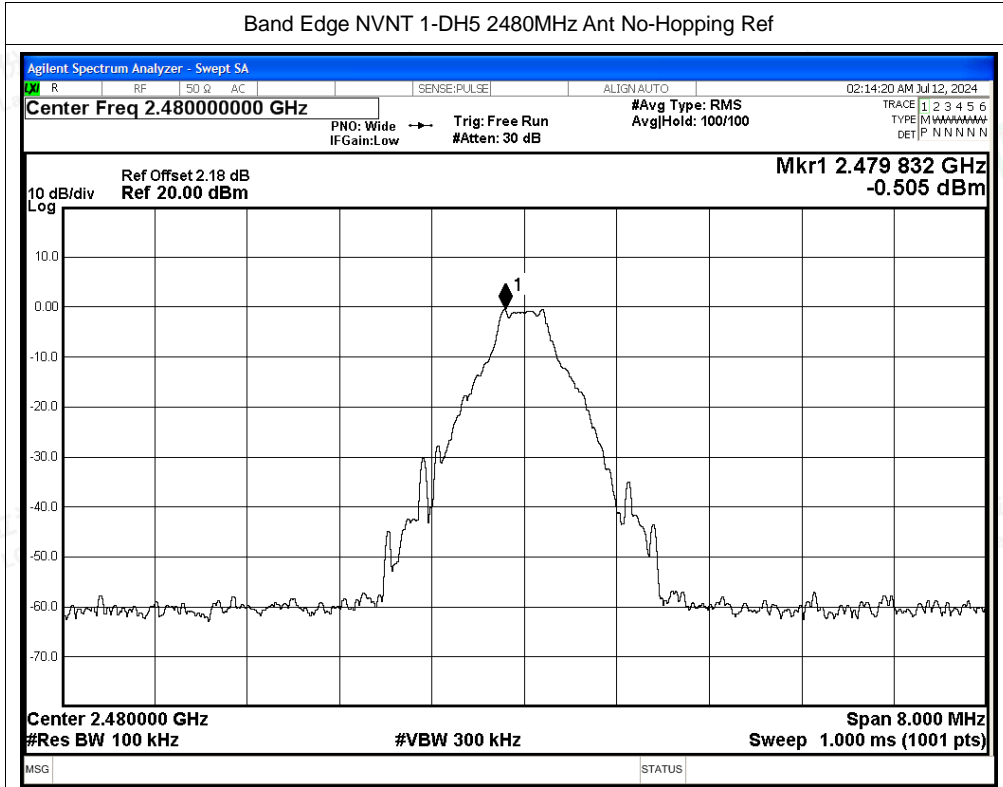
Test Graphs

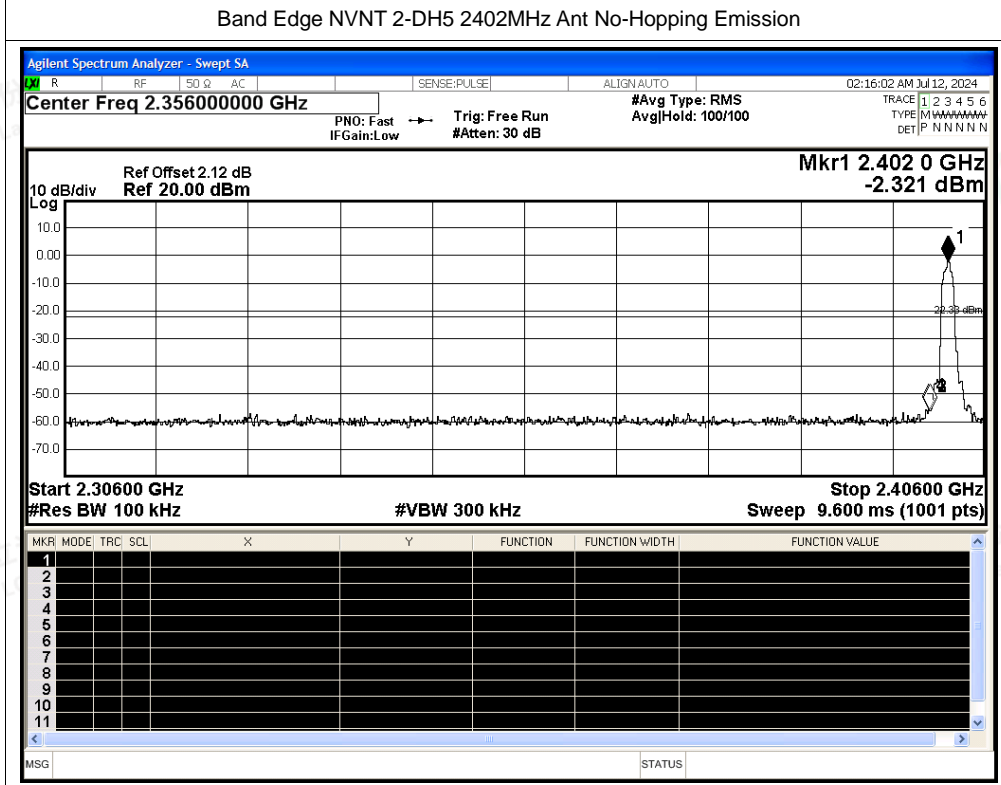
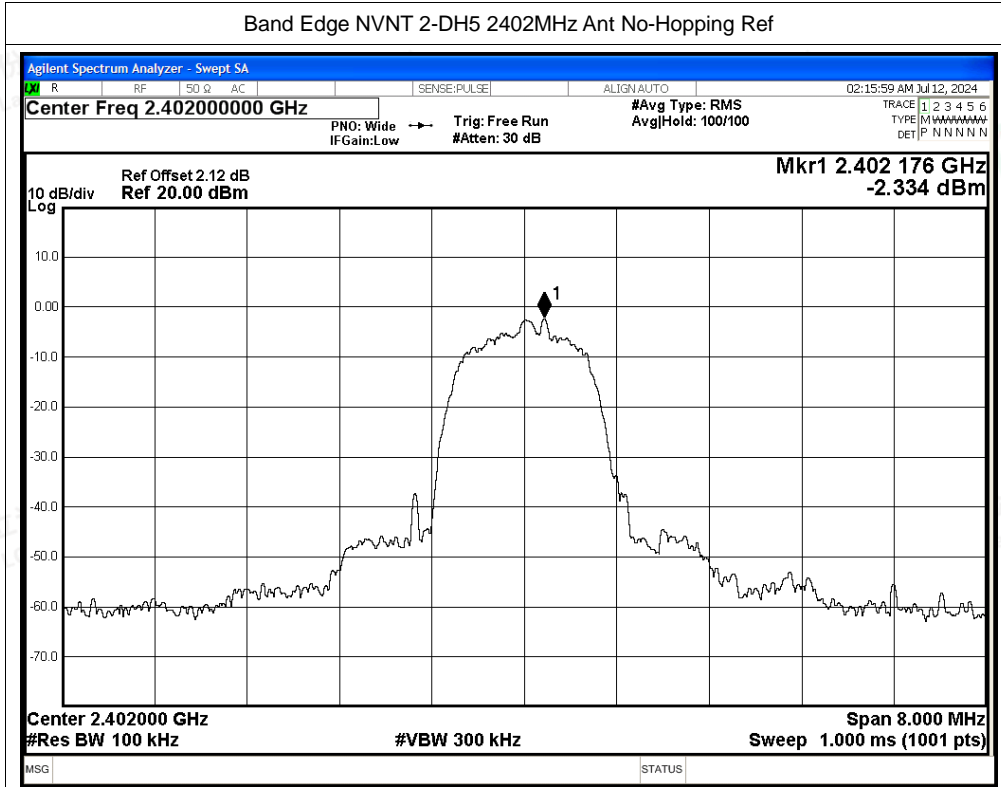
Band Edge NVNT 1-DH5 2402MHz Ant No-Hopping Ref

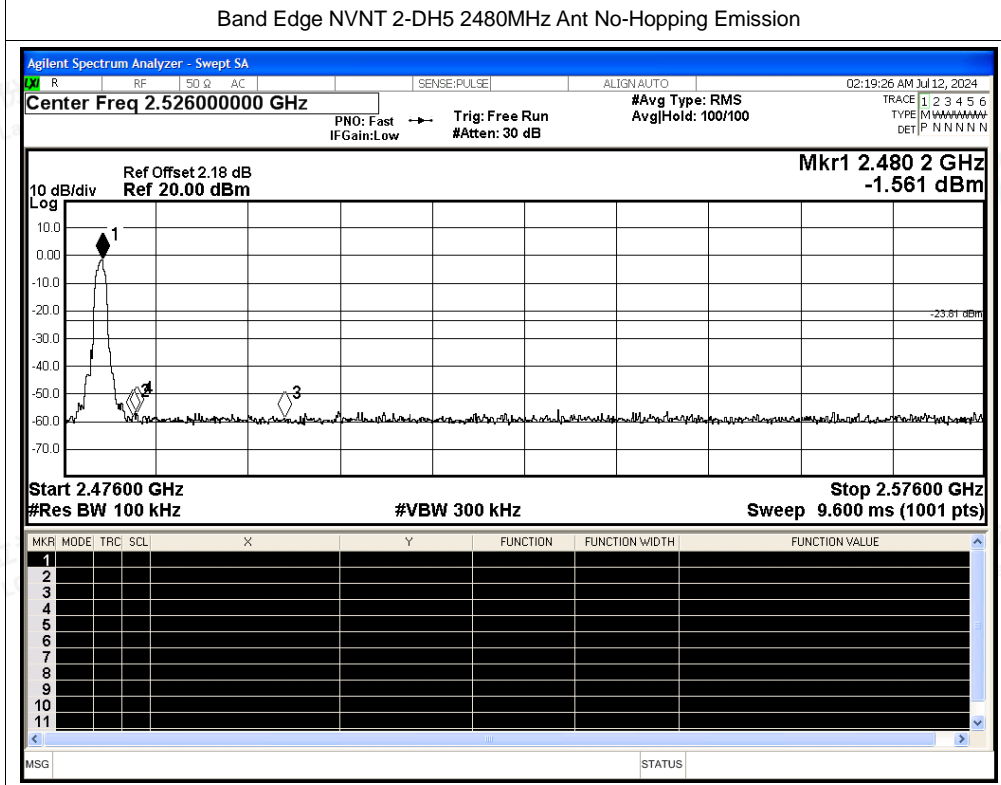
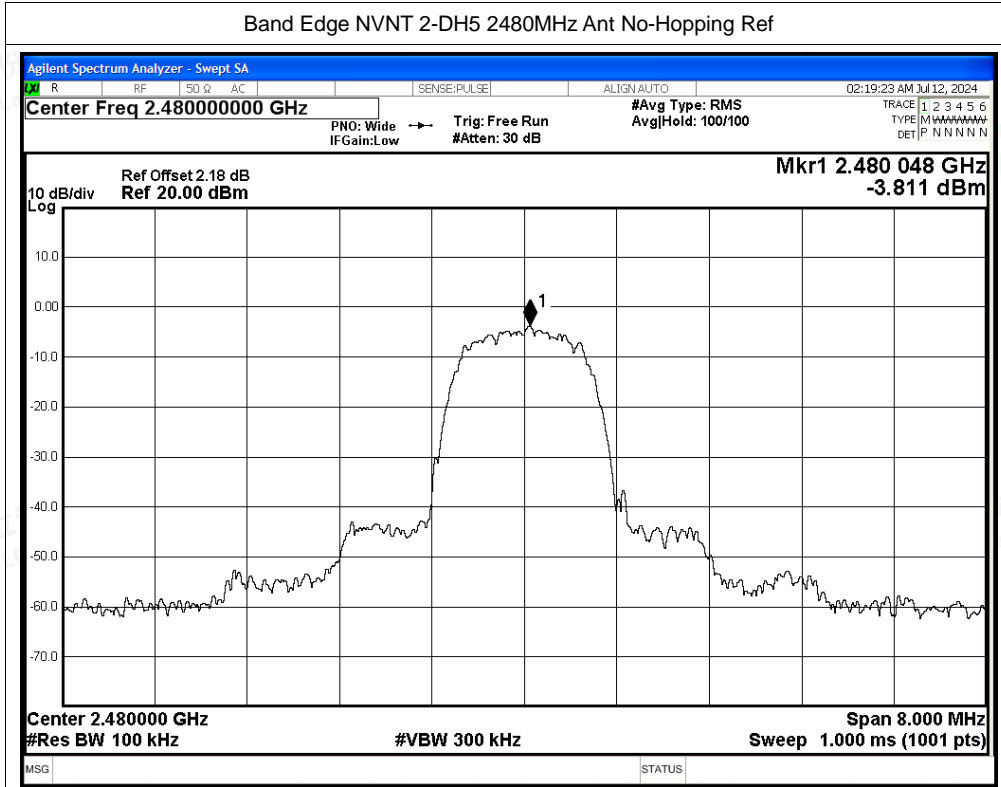


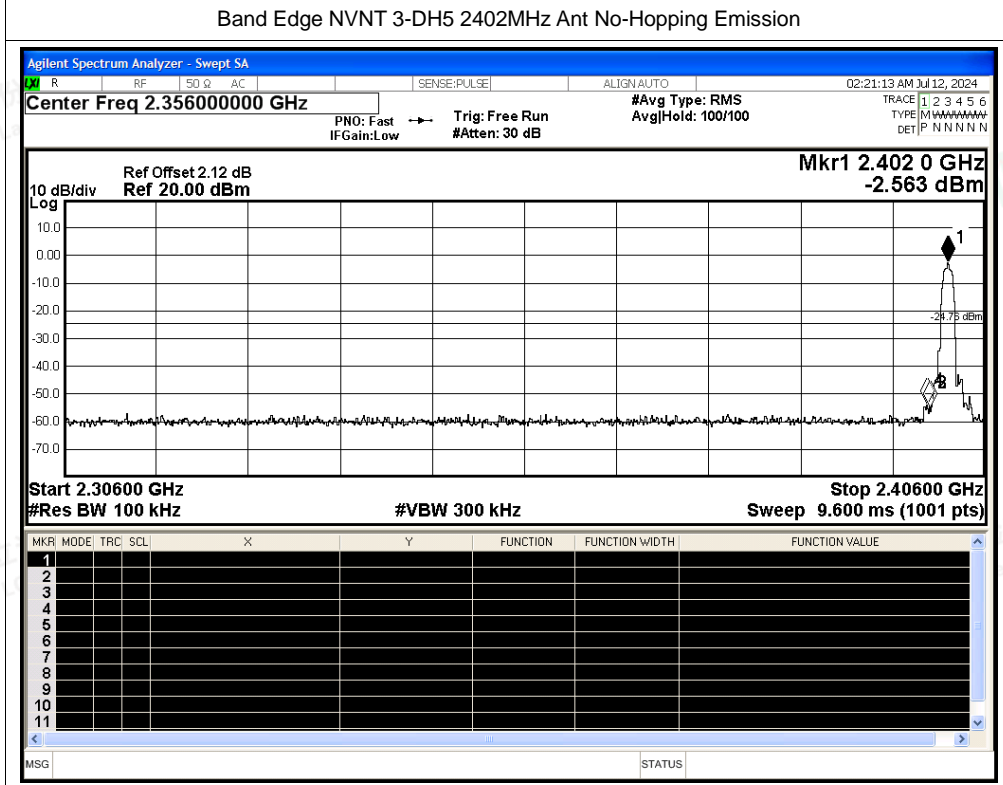
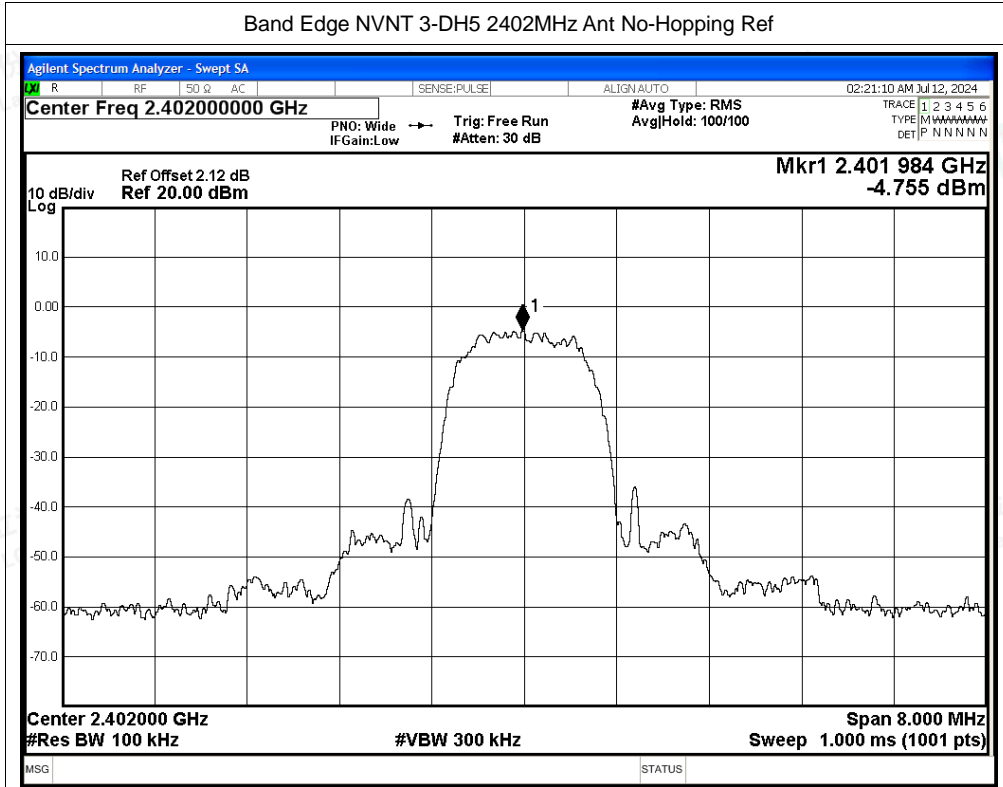
Band Edge NVNT 1-DH5 2402MHz Ant No-Hopping Emission

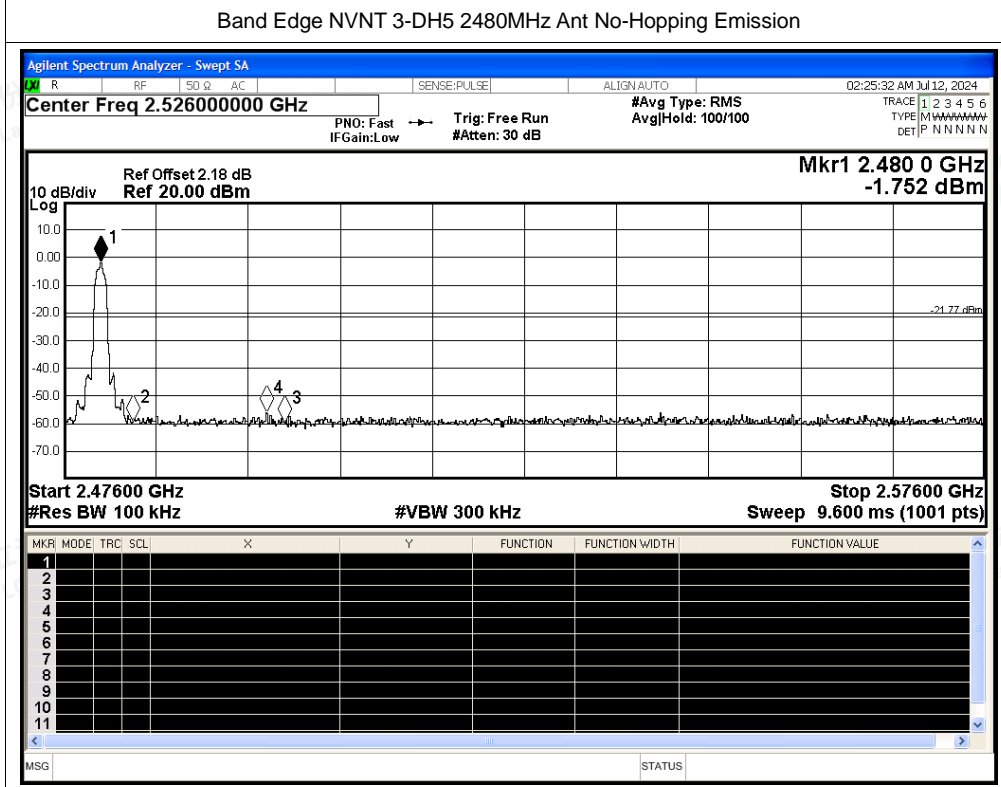
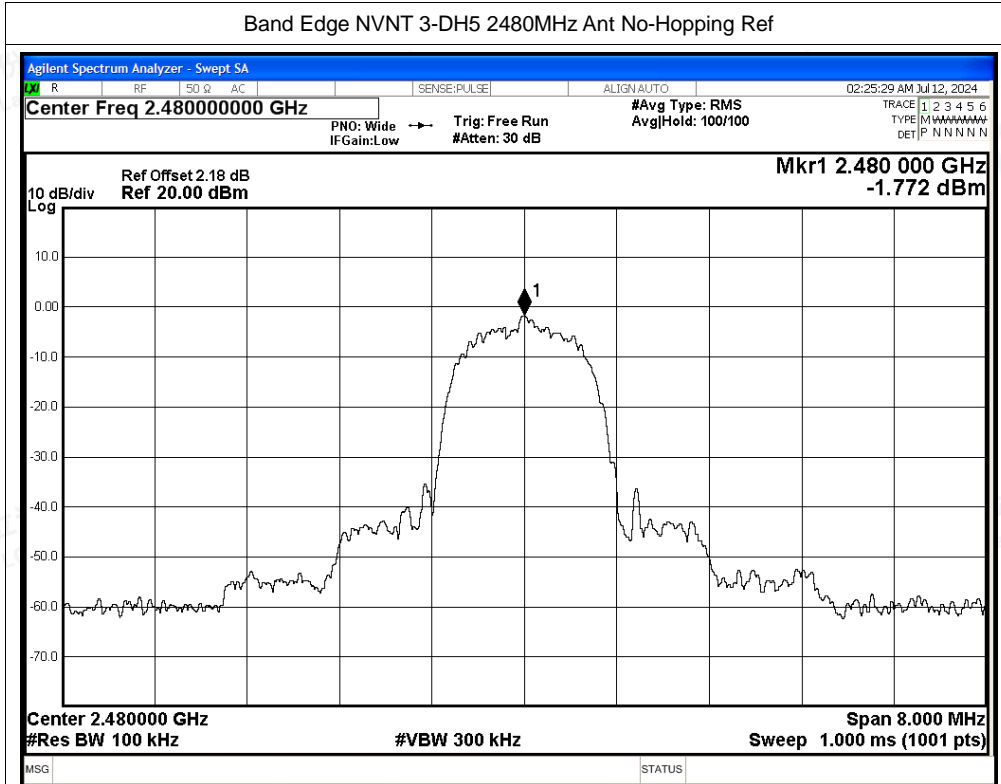














(Hopping)

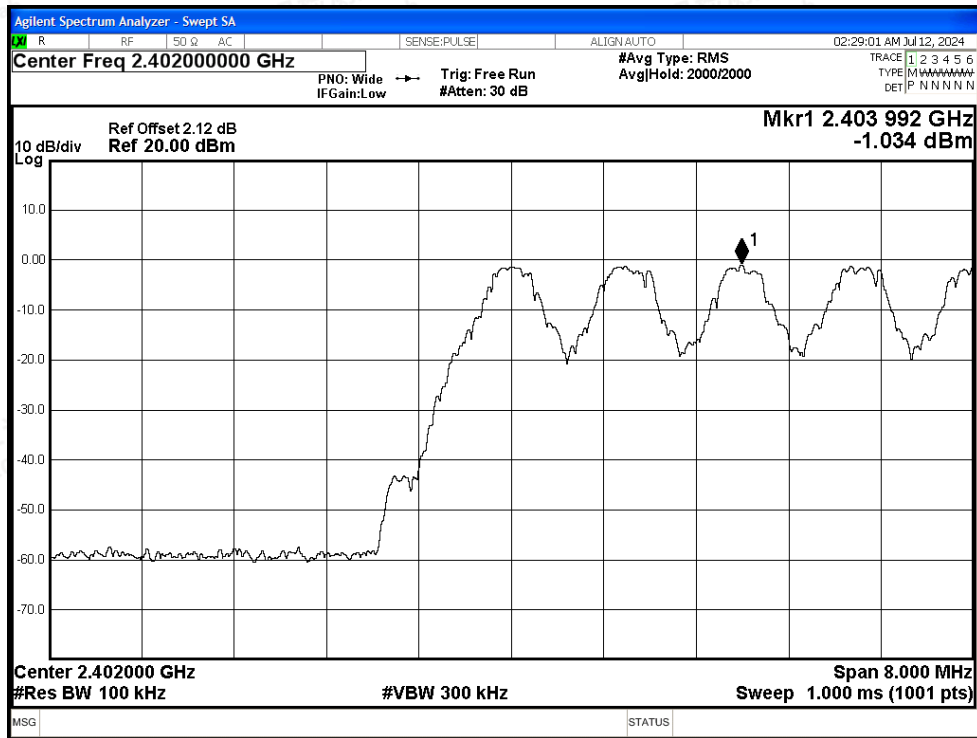
Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH5	2402	Ant	Hopping	-54.96	-20	Pass
NVNT	1-DH5	2480	Ant	Hopping	-55.1	-20	Pass
NVNT	2-DH5	2402	Ant	Hopping	-54.08	-20	Pass
NVNT	2-DH5	2480	Ant	Hopping	-44.8	-20	Pass
NVNT	3-DH5	2402	Ant	Hopping	-54.79	-20	Pass
NVNT	3-DH5	2480	Ant	Hopping	-49	-20	Pass



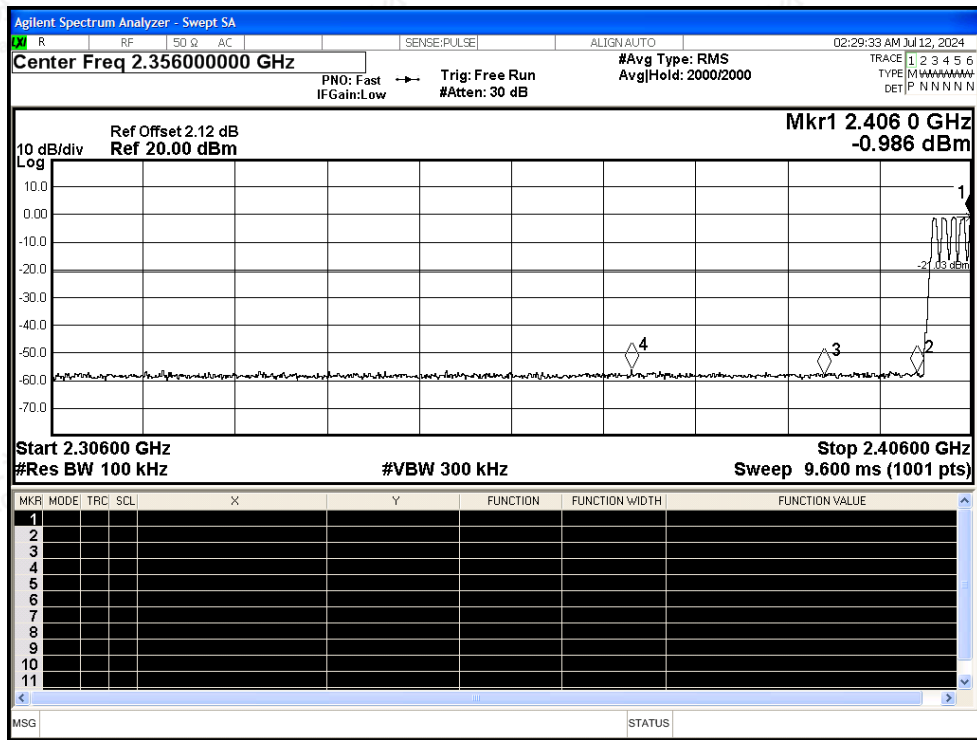


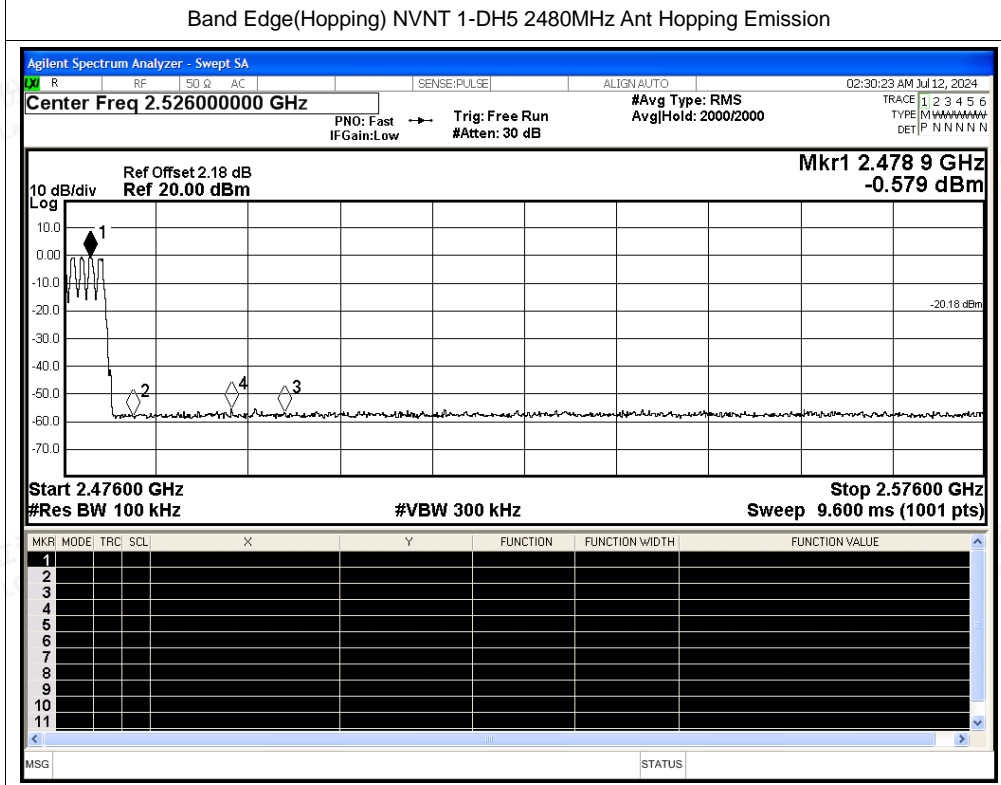
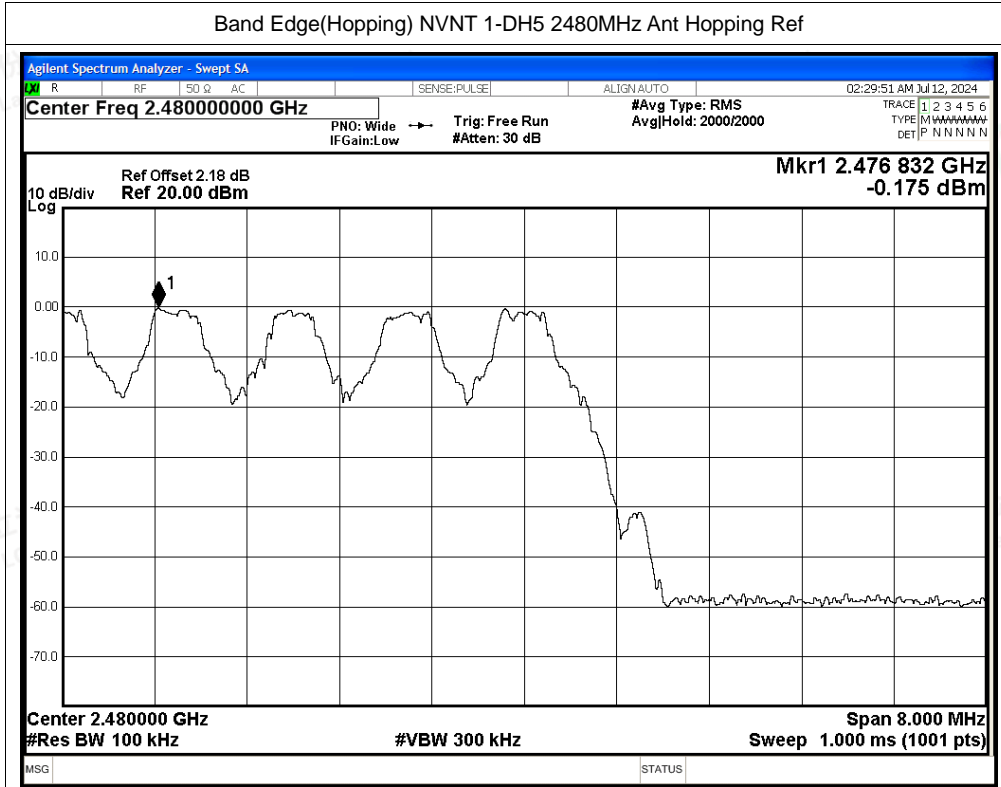
Test Graphs

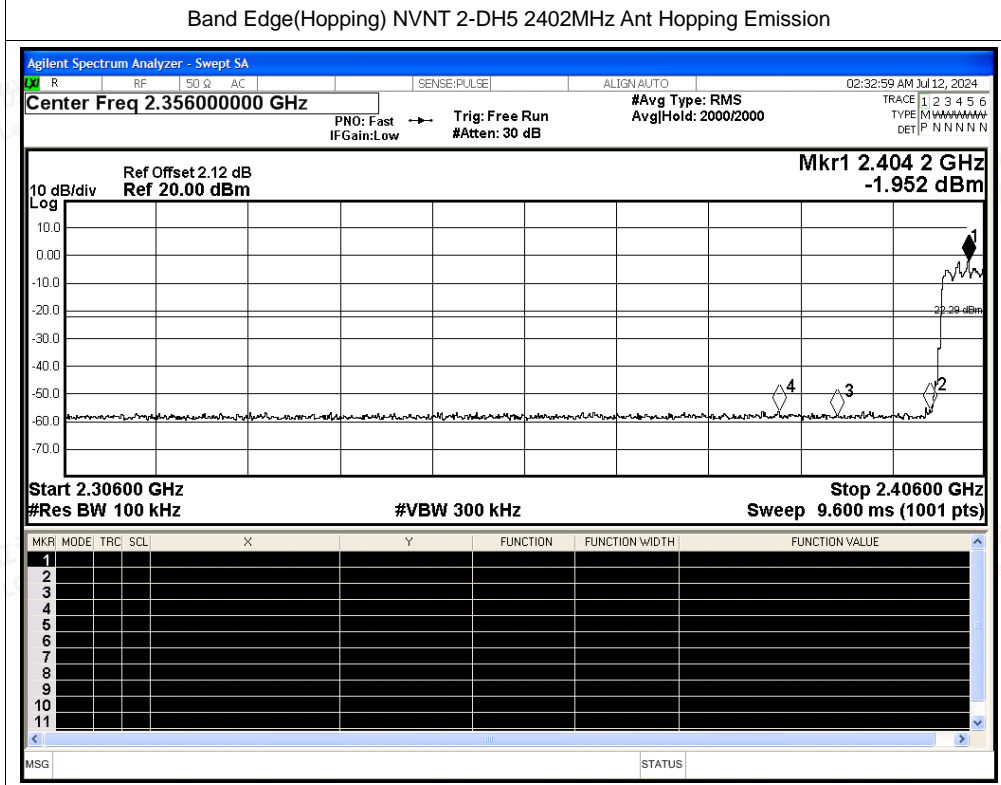
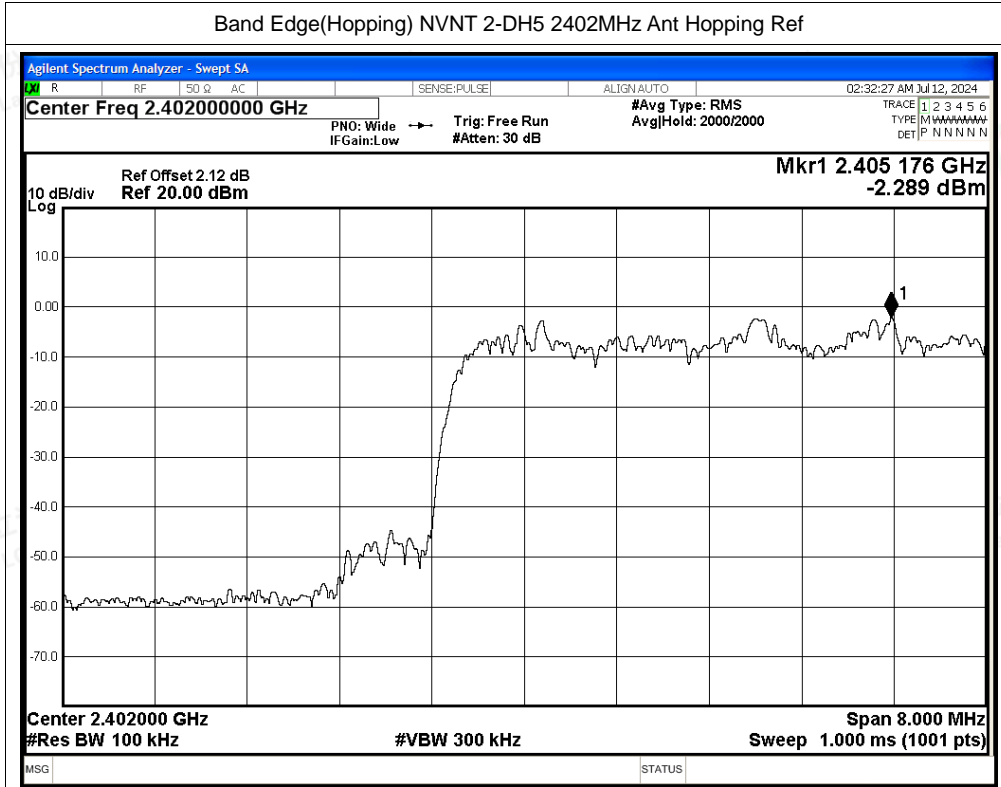
Band Edge(Hopping) NVNT 1-DH5 2402MHz Ant Hopping Ref

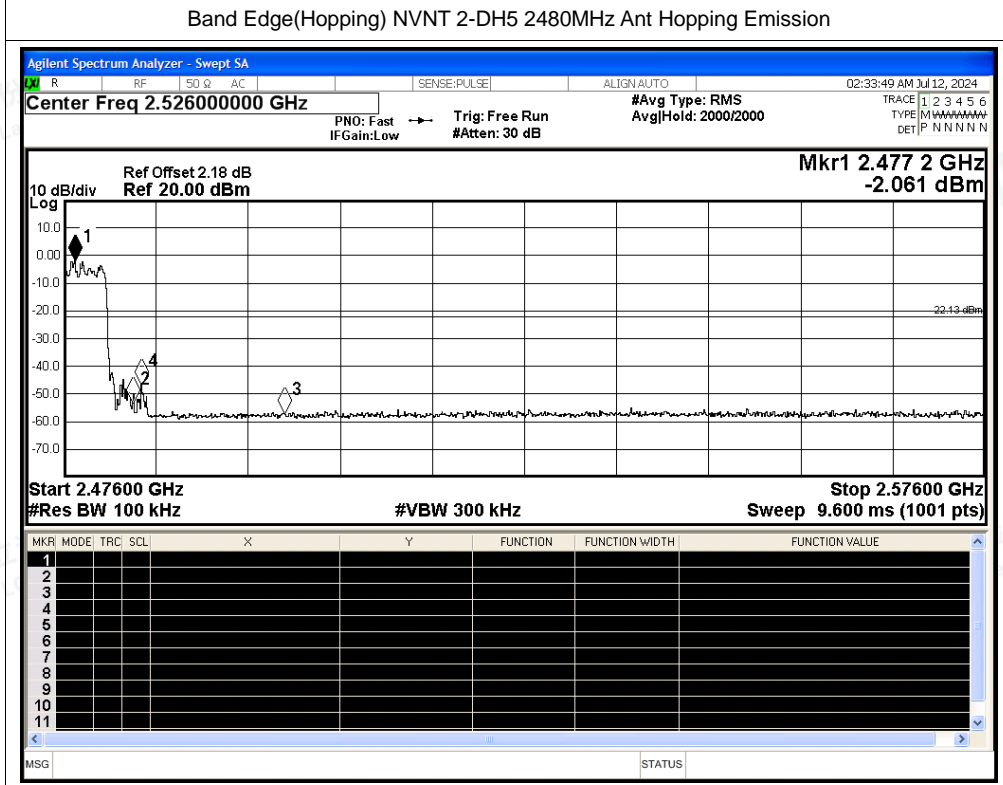
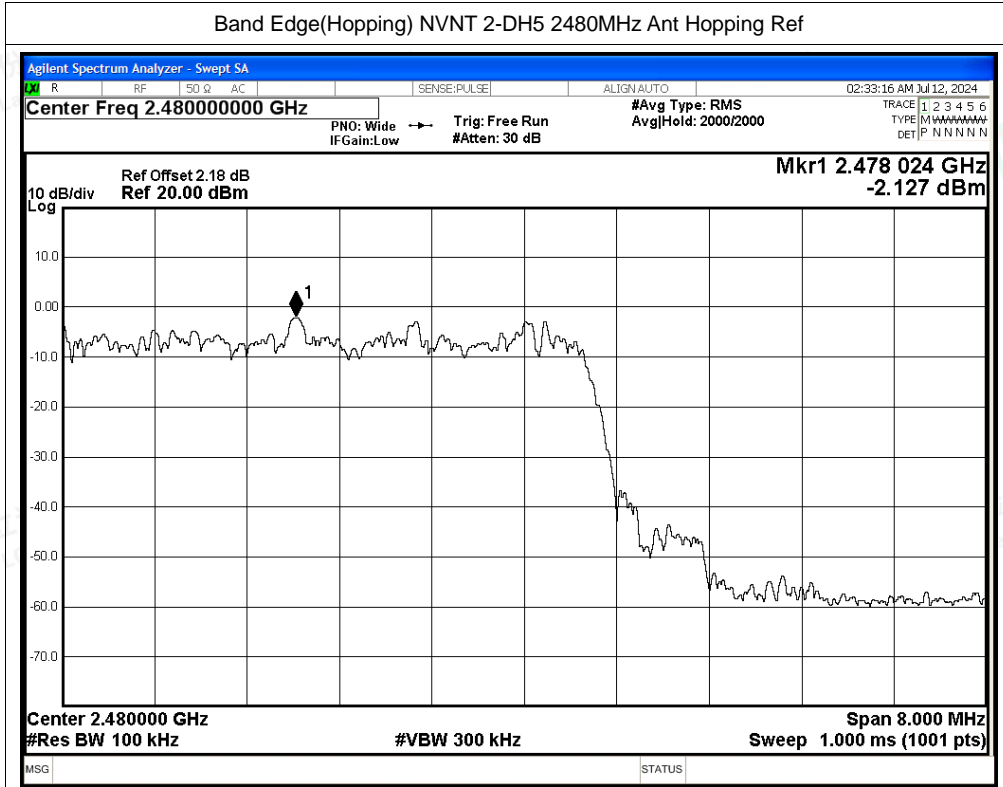


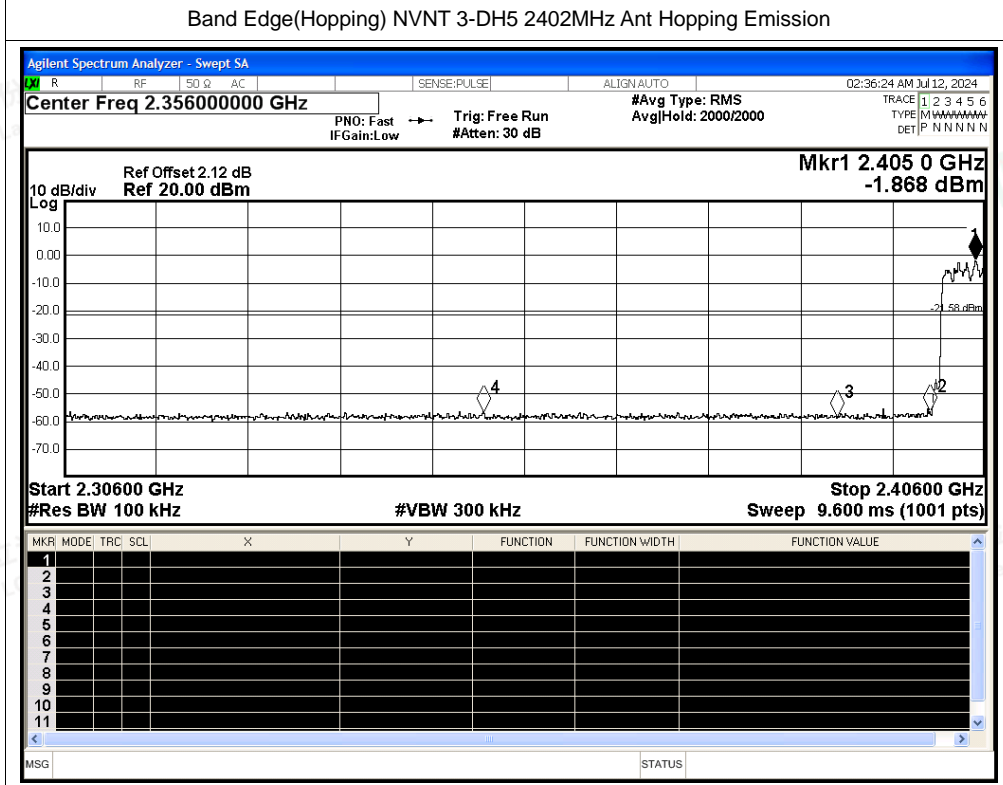
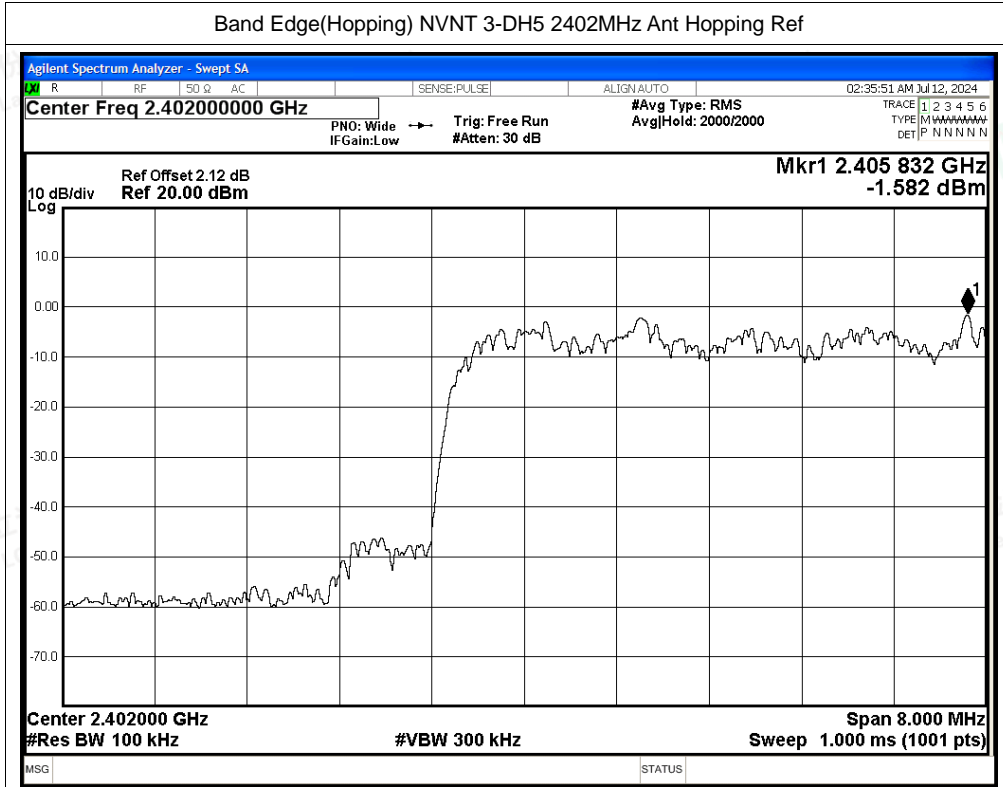
Band Edge(Hopping) NVNT 1-DH5 2402MHz Ant Hopping Emission

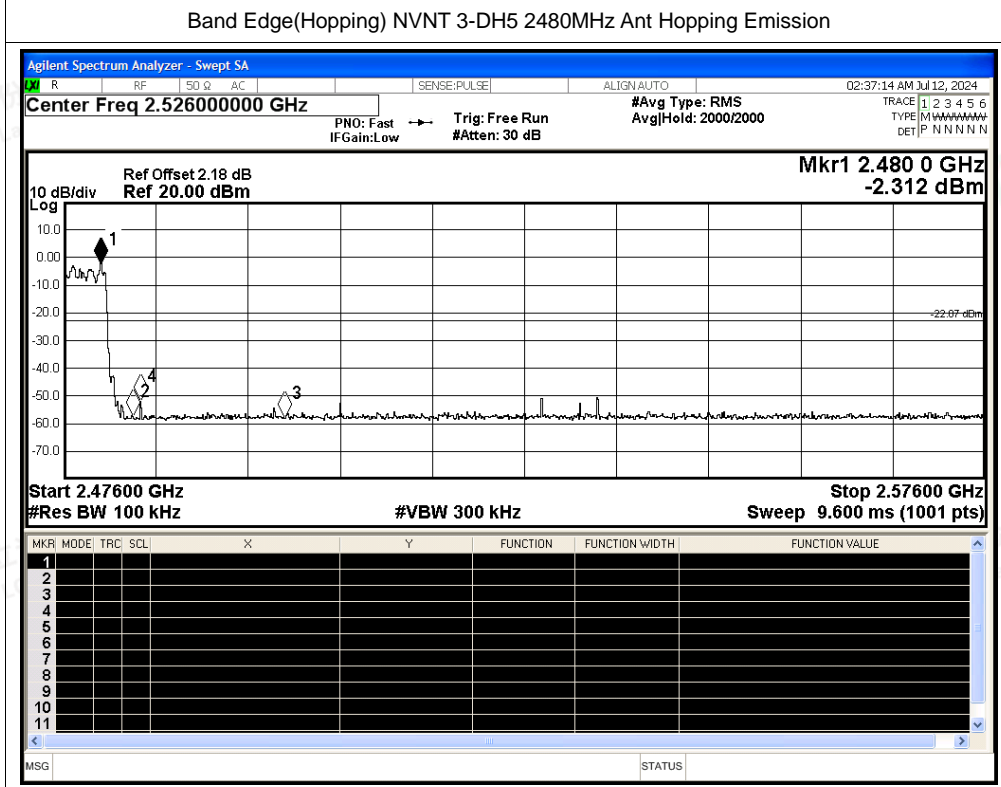
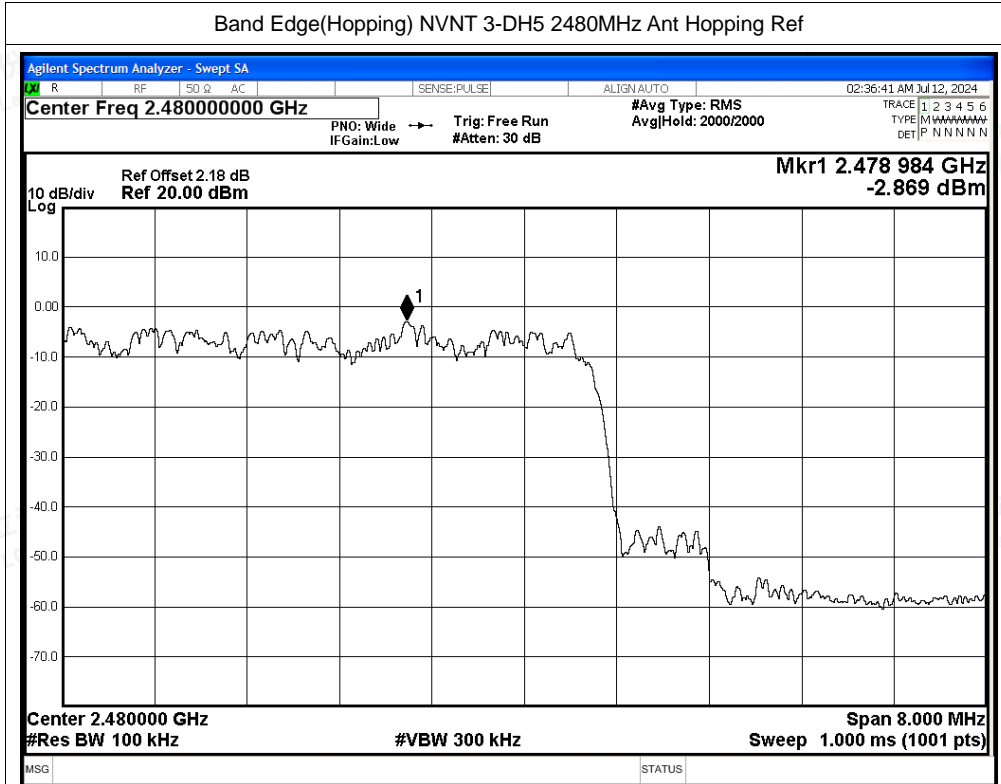














A.7 Conducted RF Spurious Emission

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH5	2402	Ant	-54.45	-20	Pass
NVNT	1-DH5	2441	Ant	-54.57	-20	Pass
NVNT	1-DH5	2480	Ant	-54.67	-20	Pass
NVNT	2-DH5	2402	Ant	-52.9	-20	Pass
NVNT	2-DH5	2441	Ant	-44.48	-20	Pass
NVNT	2-DH5	2480	Ant	-42.5	-20	Pass
NVNT	3-DH5	2402	Ant	-52.73	-20	Pass
NVNT	3-DH5	2441	Ant	-53.07	-20	Pass
NVNT	3-DH5	2480	Ant	-51.57	-20	Pass



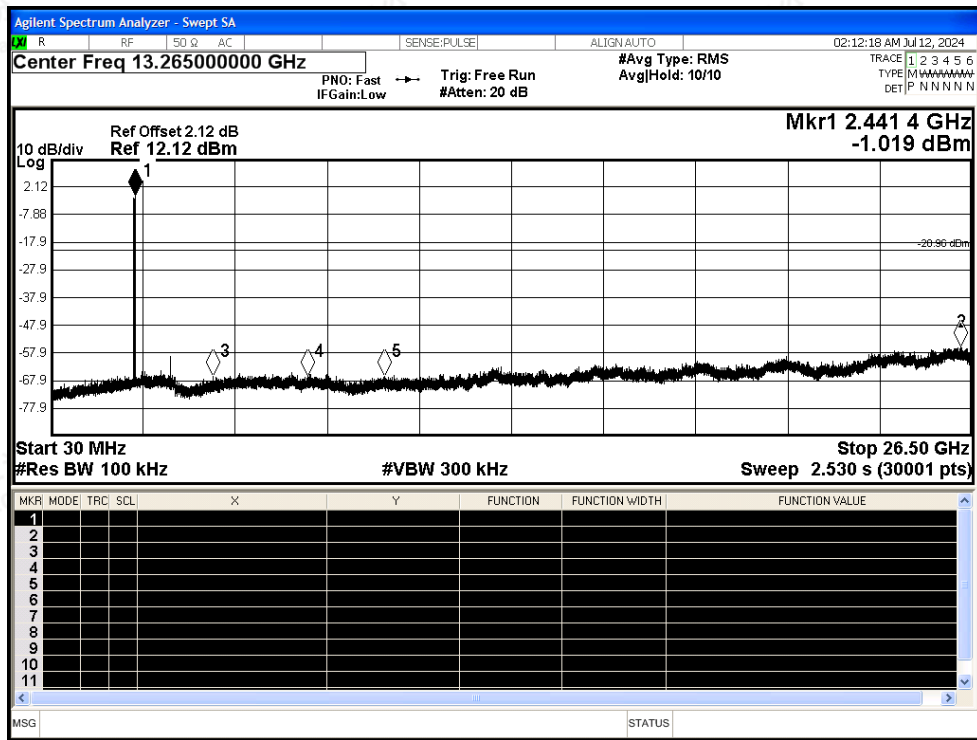


Test Graphs

Tx. Spurious NVNT 1-DH5 2402MHz Ant Ref

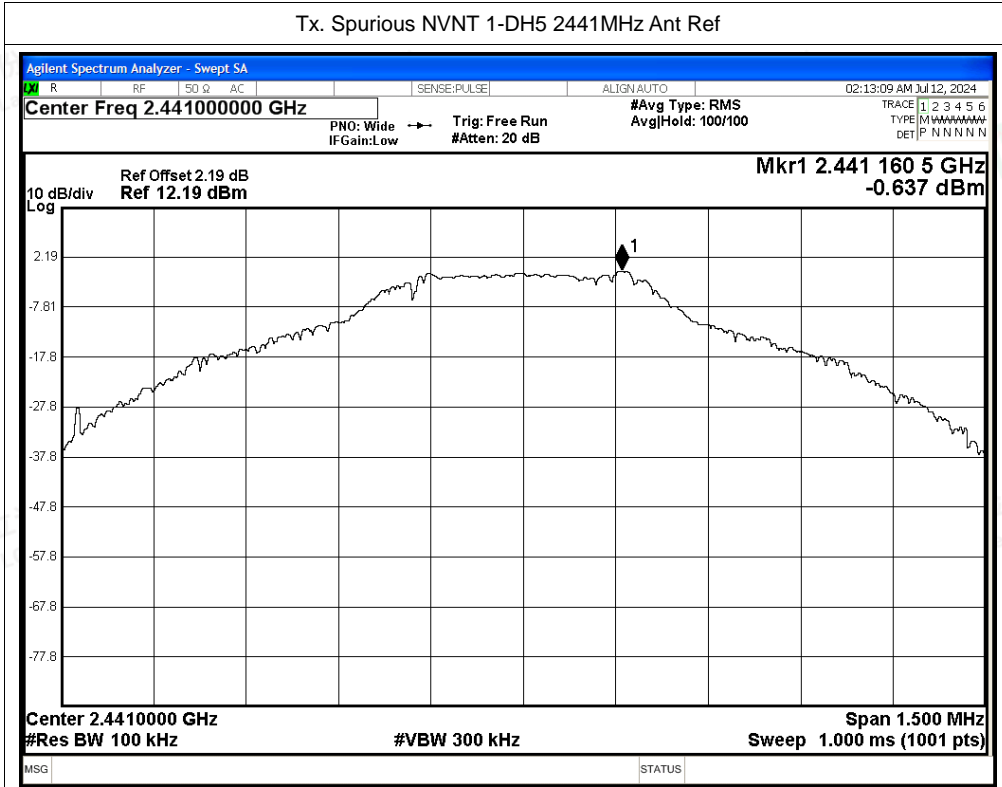


Tx. Spurious NVNT 1-DH5 2402MHz Ant Emission

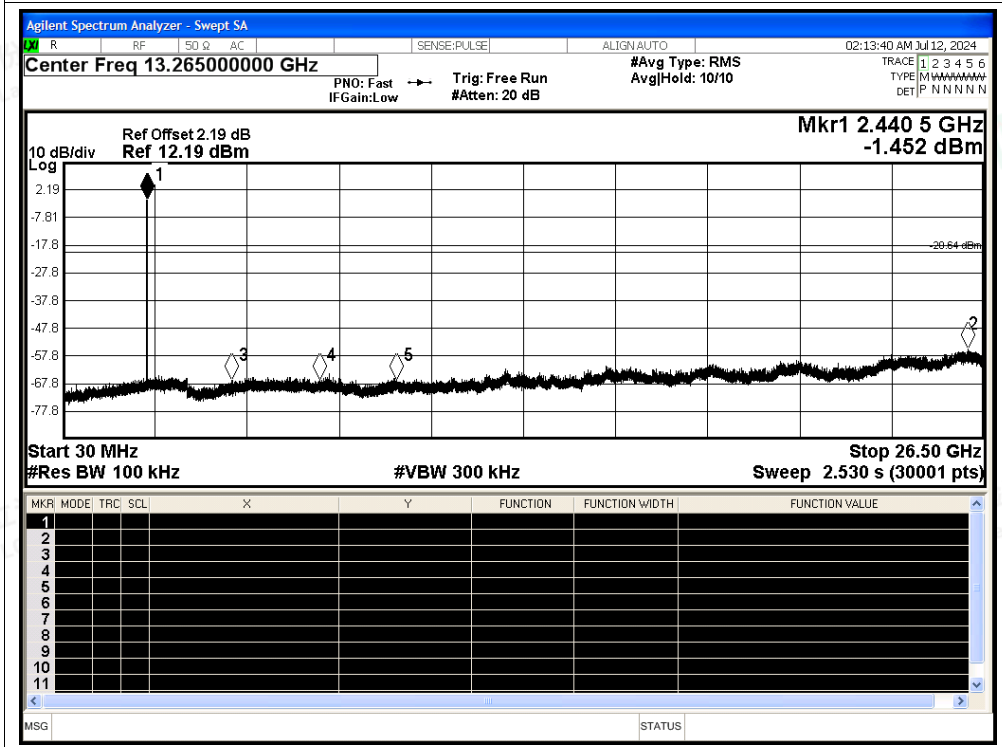




Tx. Spurious NVNT 1-DH5 2441MHz Ant Ref

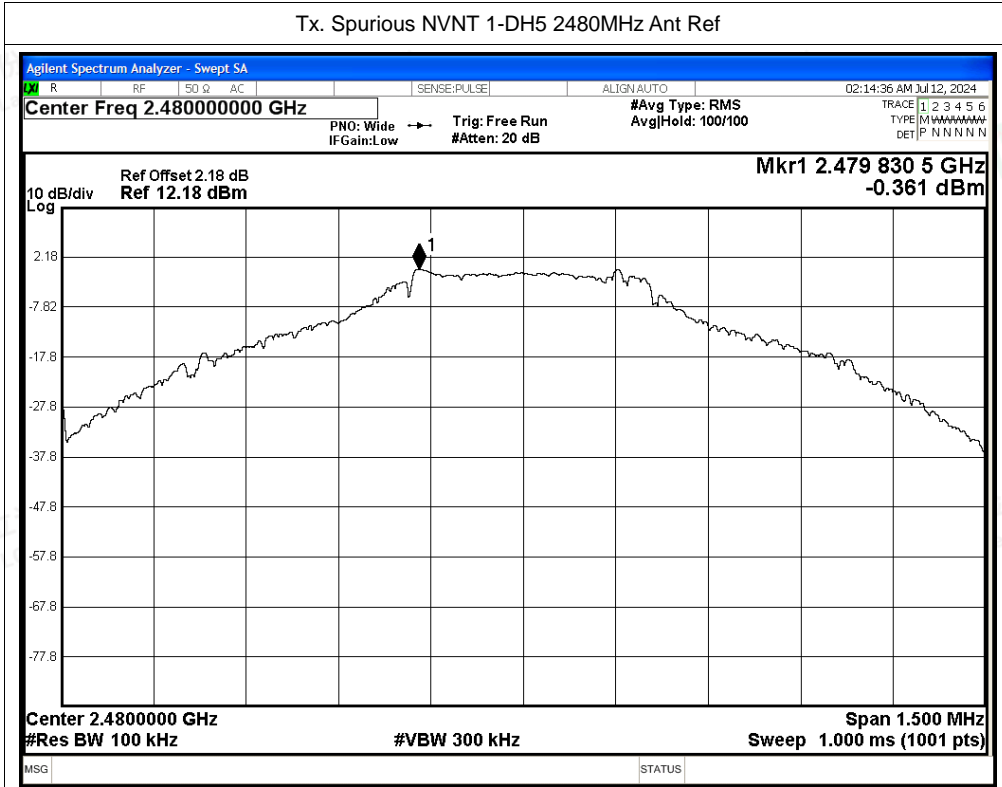


Tx. Spurious NVNT 1-DH5 2441MHz Ant Emission

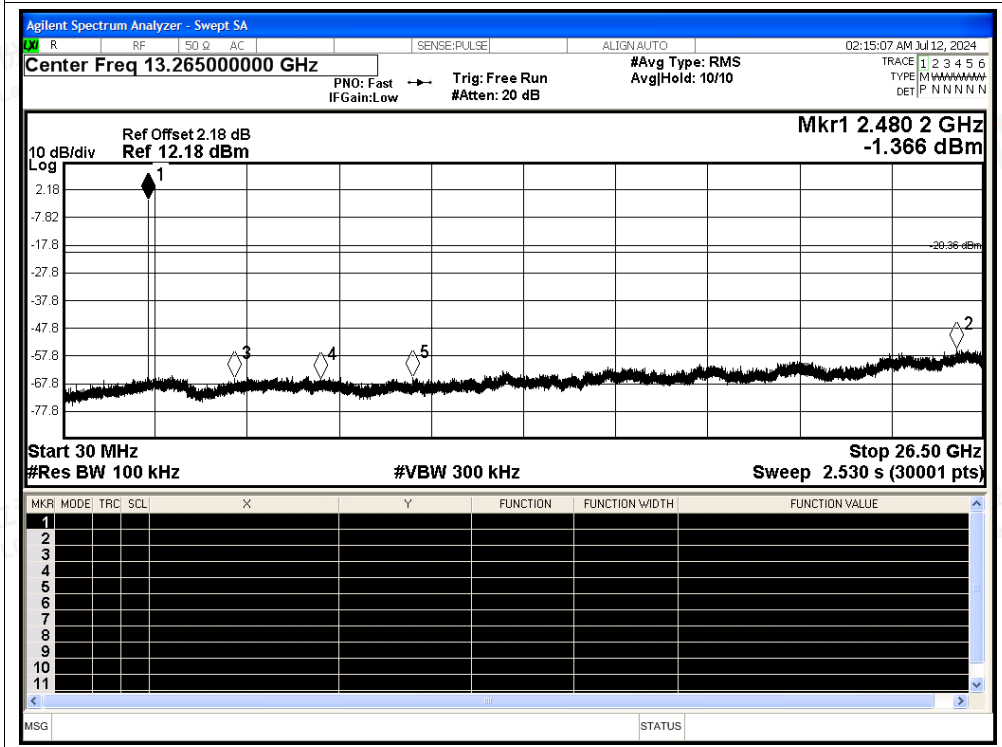




Tx. Spurious NVNT 1-DH5 2480MHz Ant Ref

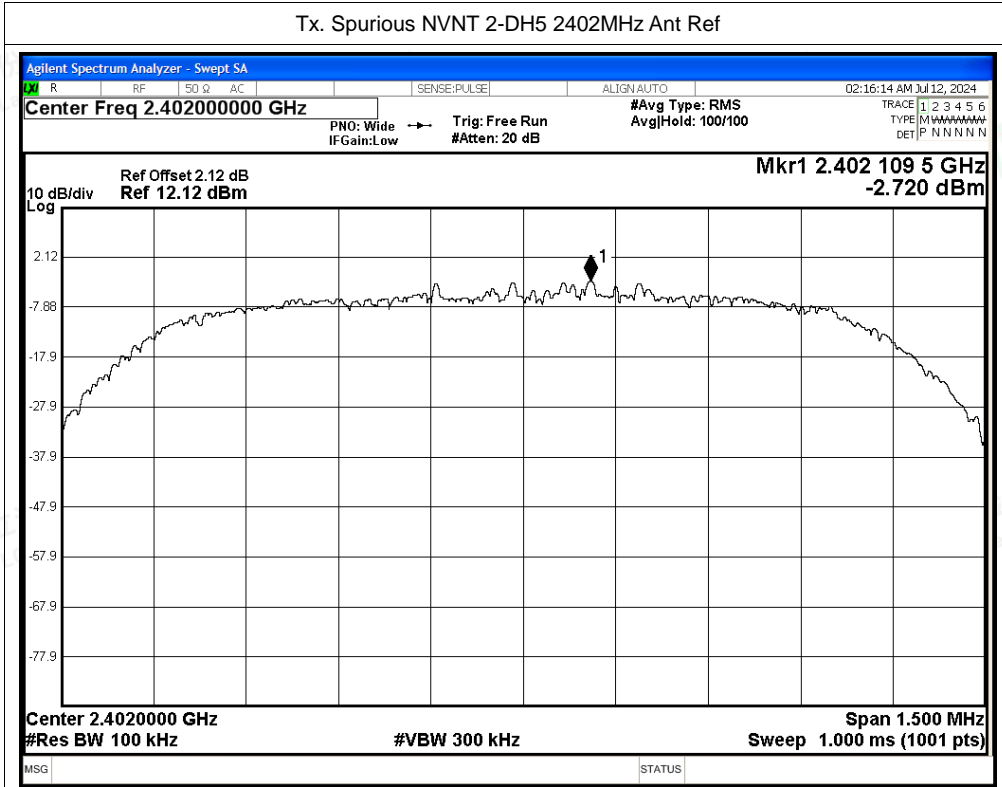


Tx. Spurious NVNT 1-DH5 2480MHz Ant Emission

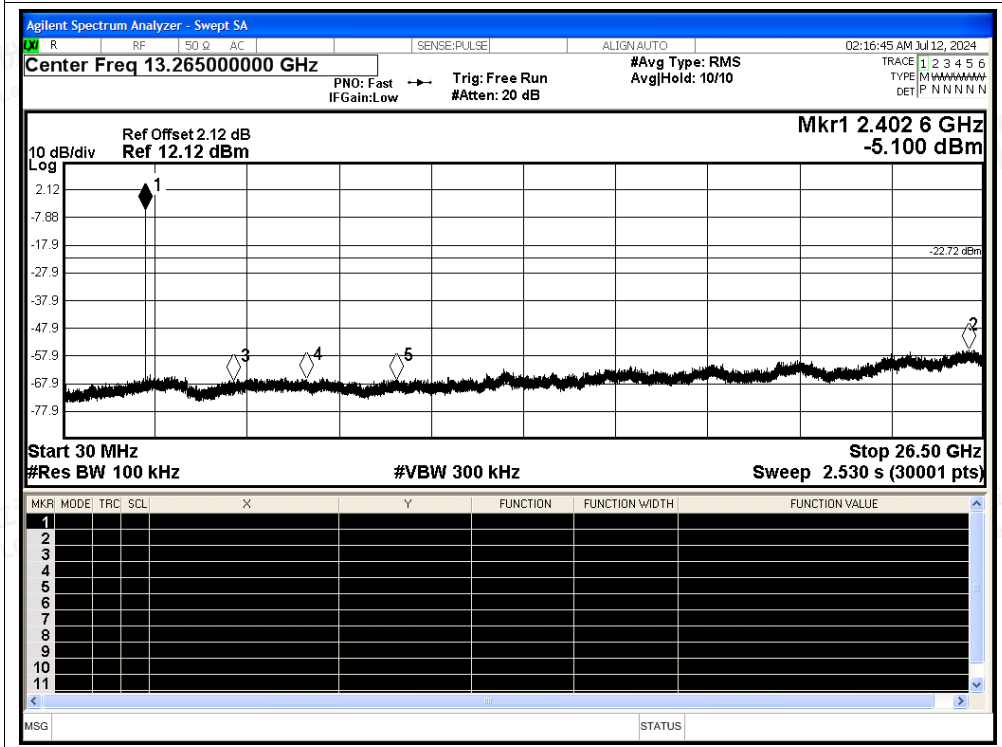




Tx. Spurious NVNT 2-DH5 2402MHz Ant Ref

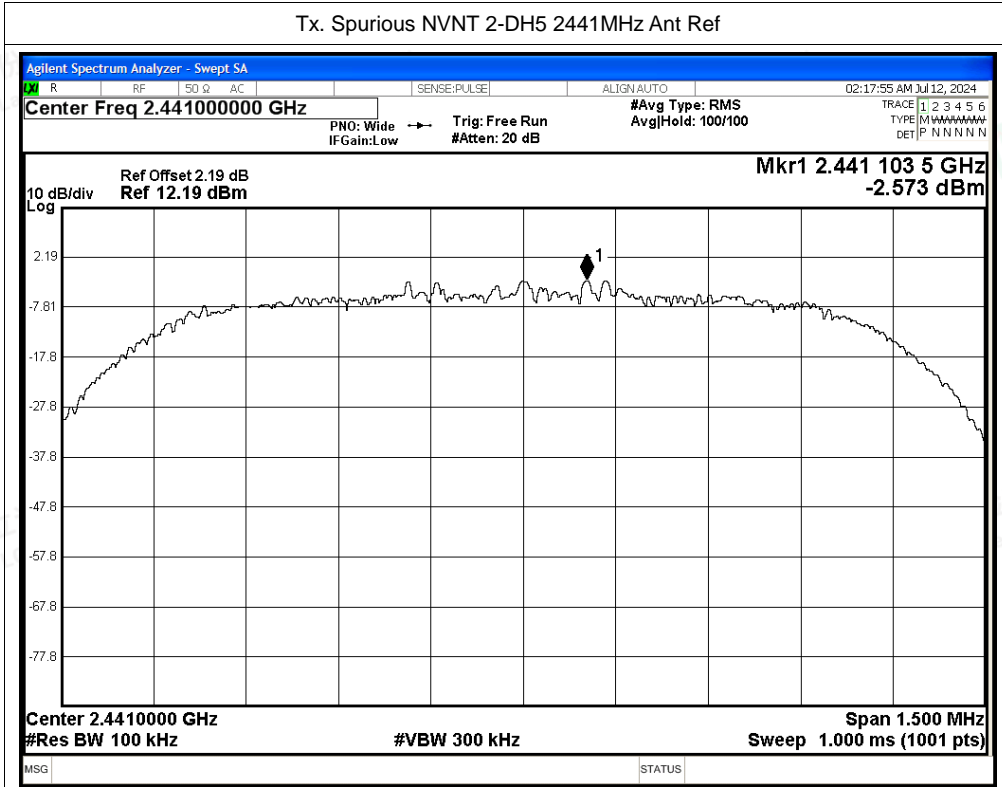


Tx. Spurious NVNT 2-DH5 2402MHz Ant Emission

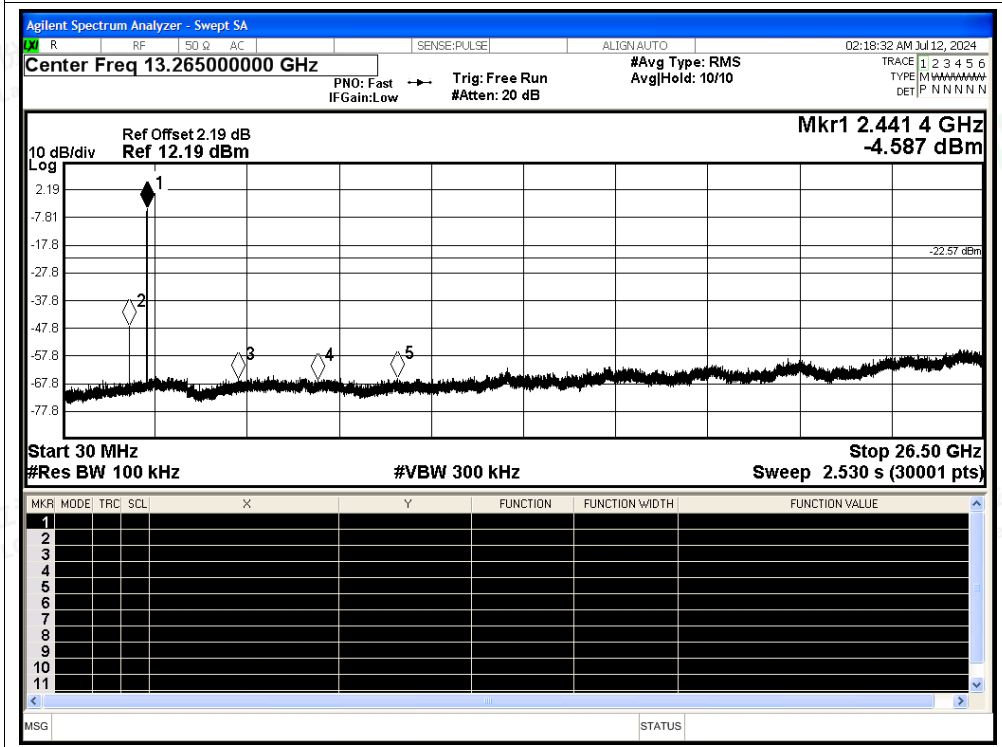




Tx. Spurious NVNT 2-DH5 2441MHz Ant Ref

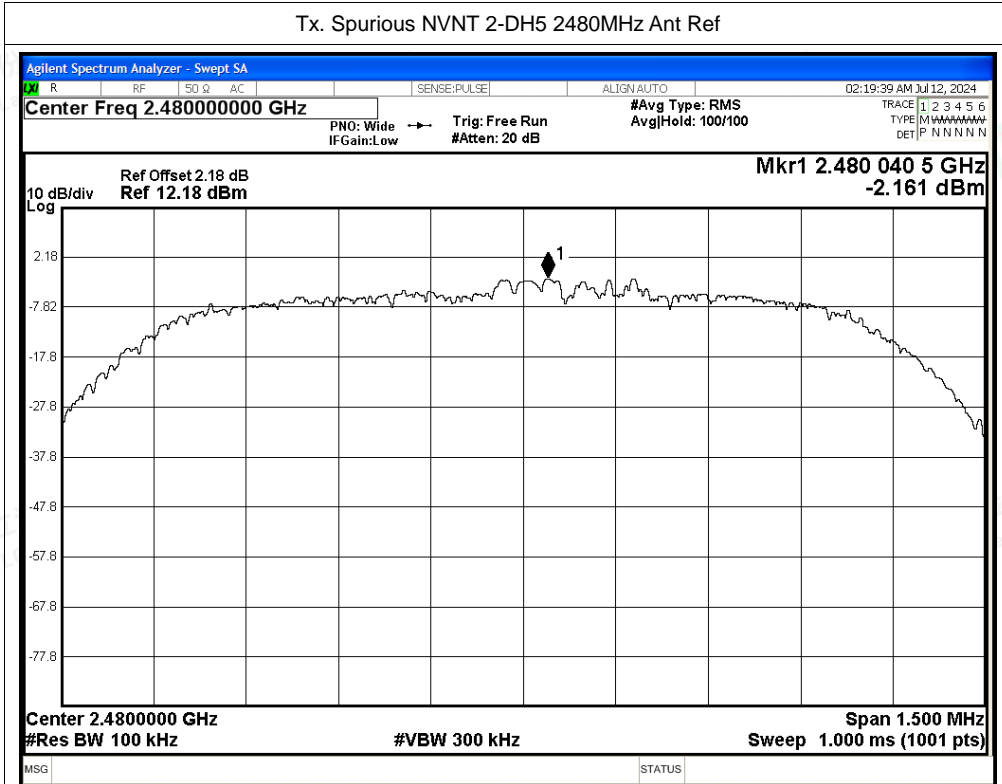


Tx. Spurious NVNT 2-DH5 2441MHz Ant Emission

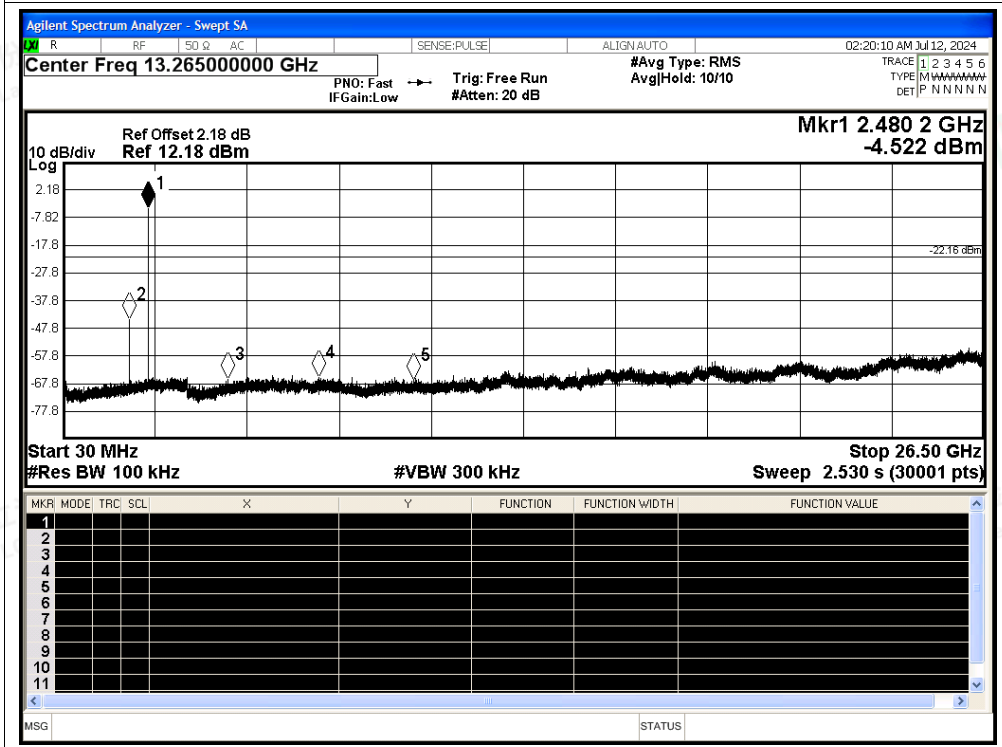




Tx. Spurious NVNT 2-DH5 2480MHz Ant Ref

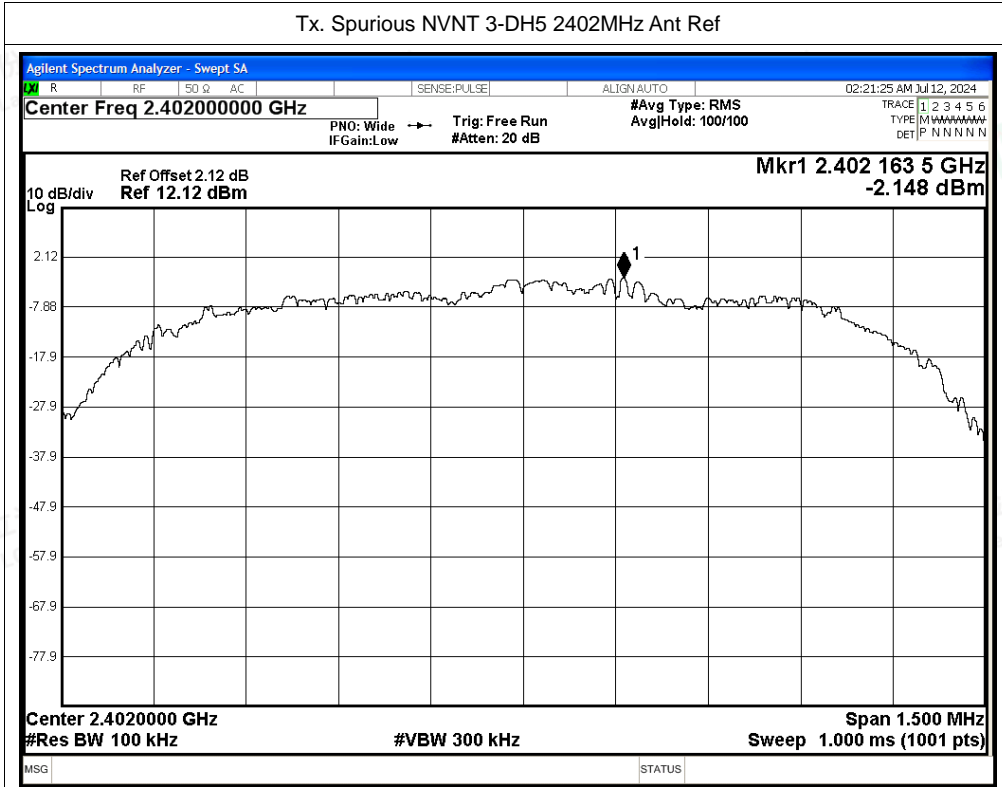


Tx. Spurious NVNT 2-DH5 2480MHz Ant Emission

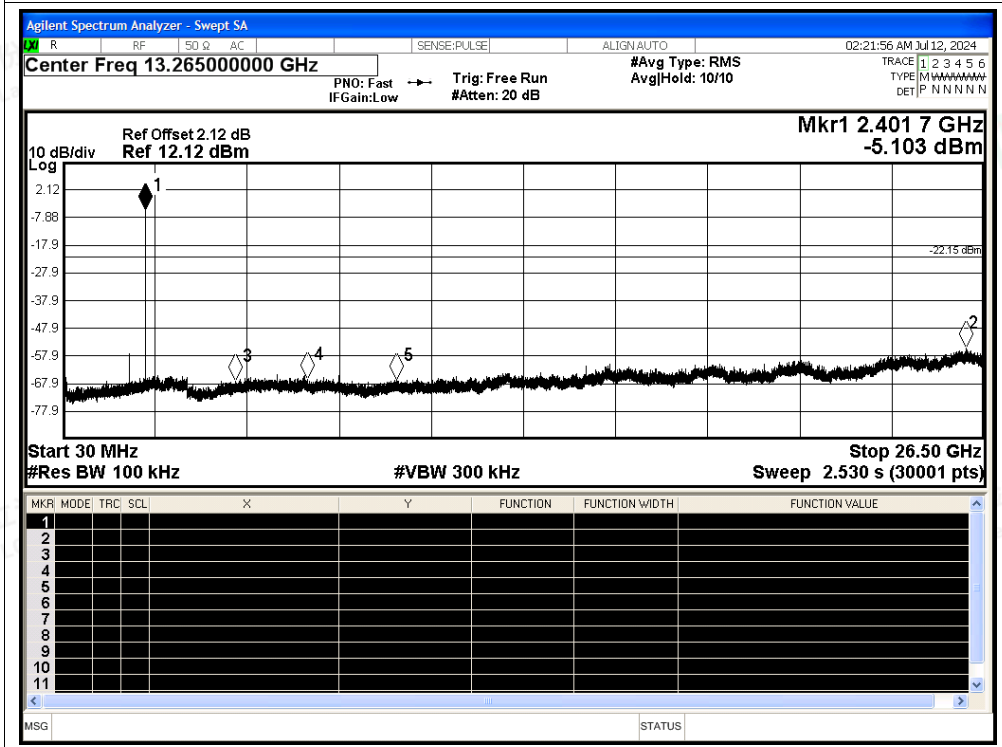




Tx. Spurious NVNT 3-DH5 2402MHz Ant Ref

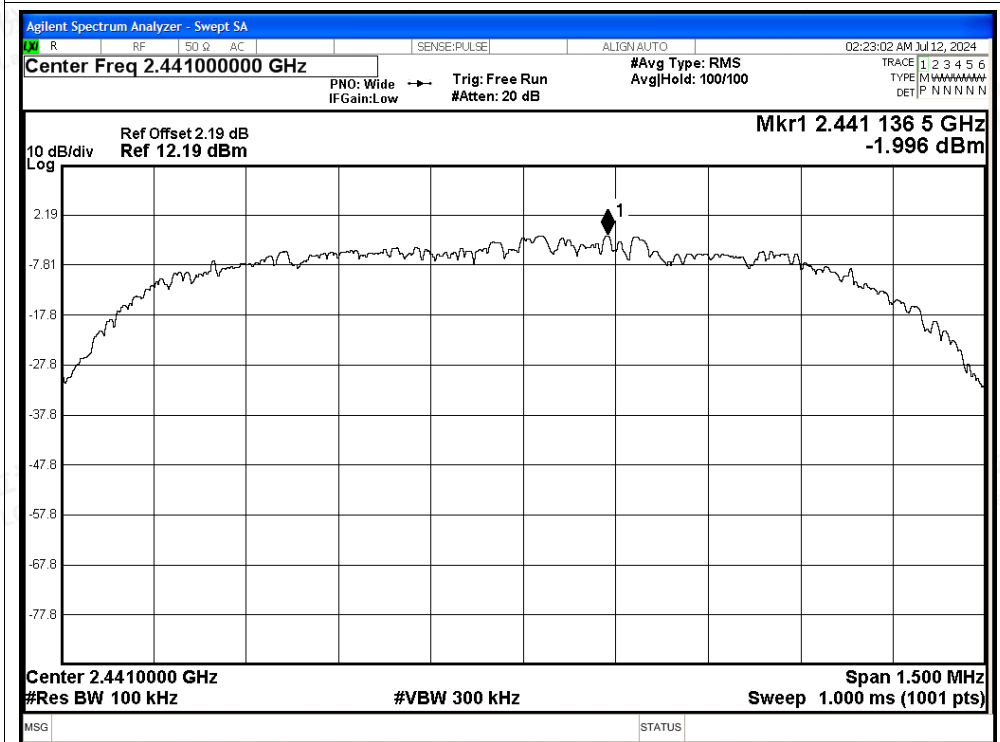


Tx. Spurious NVNT 3-DH5 2402MHz Ant Emission

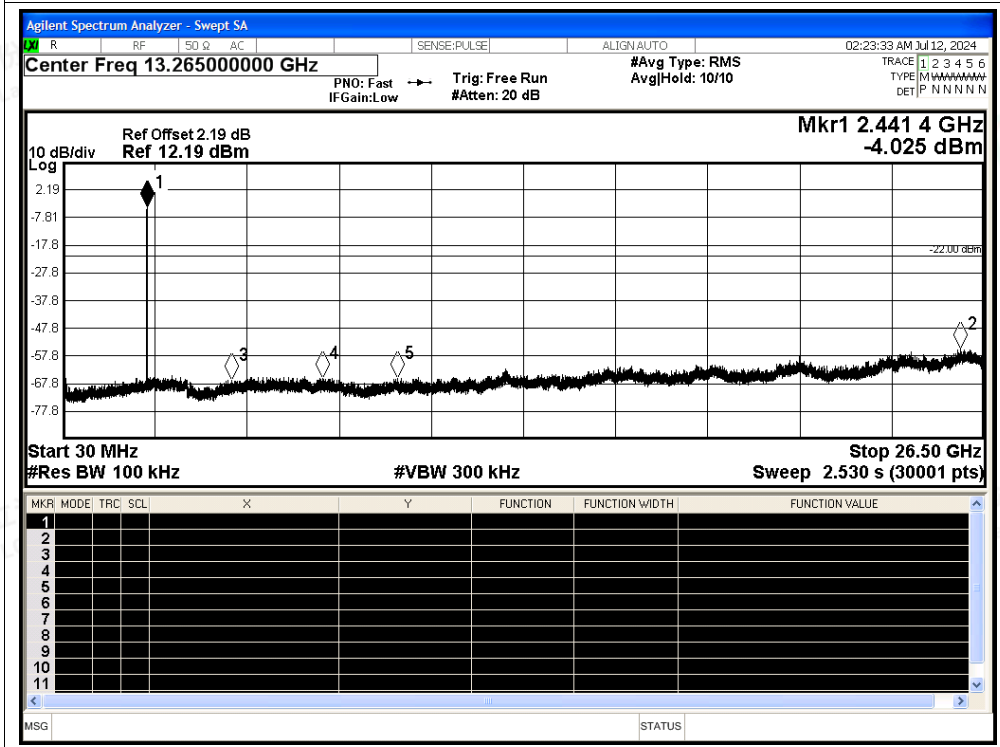




Tx. Spurious NVNT 3-DH5 2441MHz Ant Ref

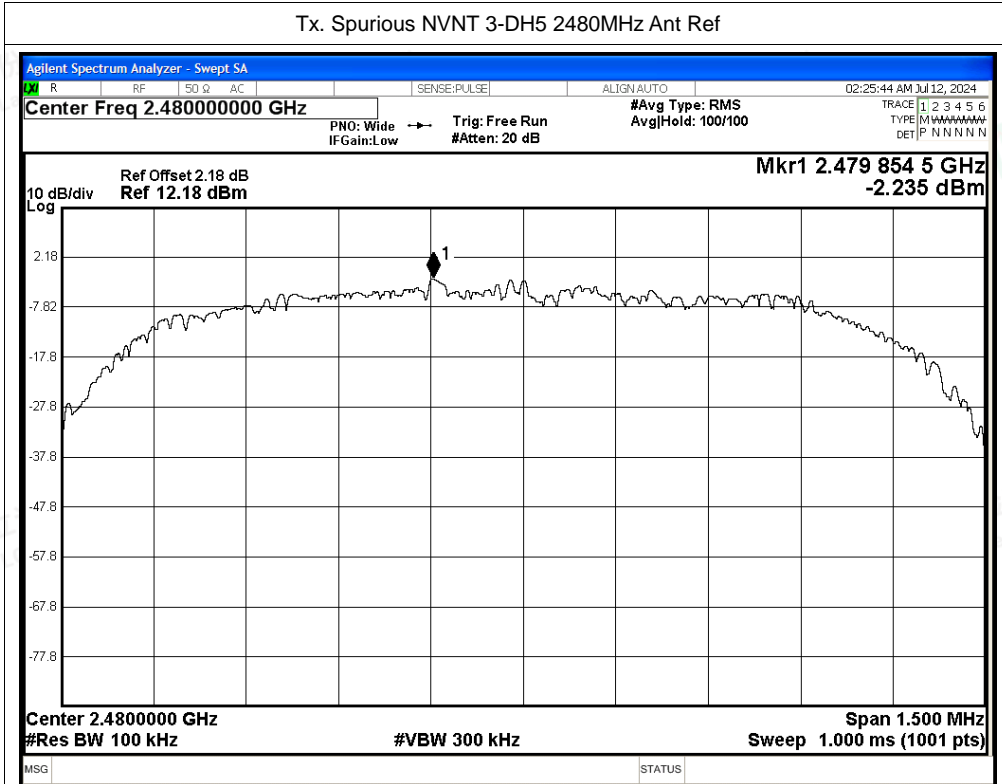


Tx. Spurious NVNT 3-DH5 2441MHz Ant Emission

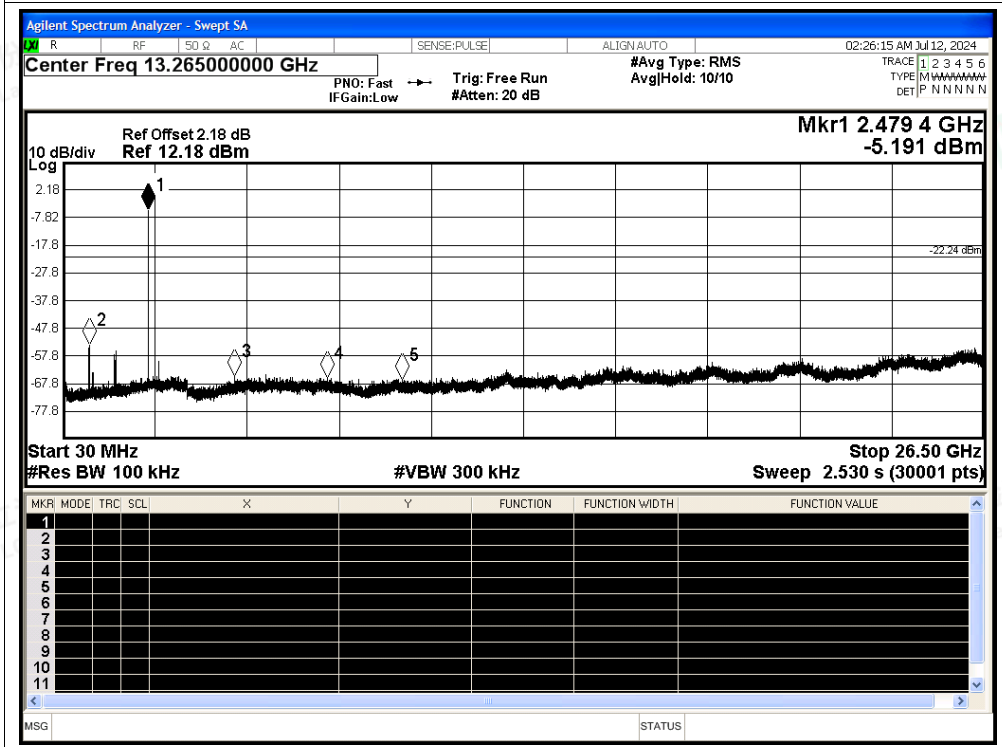




Tx. Spurious NVNT 3-DH5 2480MHz Ant Ref



Tx. Spurious NVNT 3-DH5 2480MHz Ant Emission





A.8 Duty Cycle

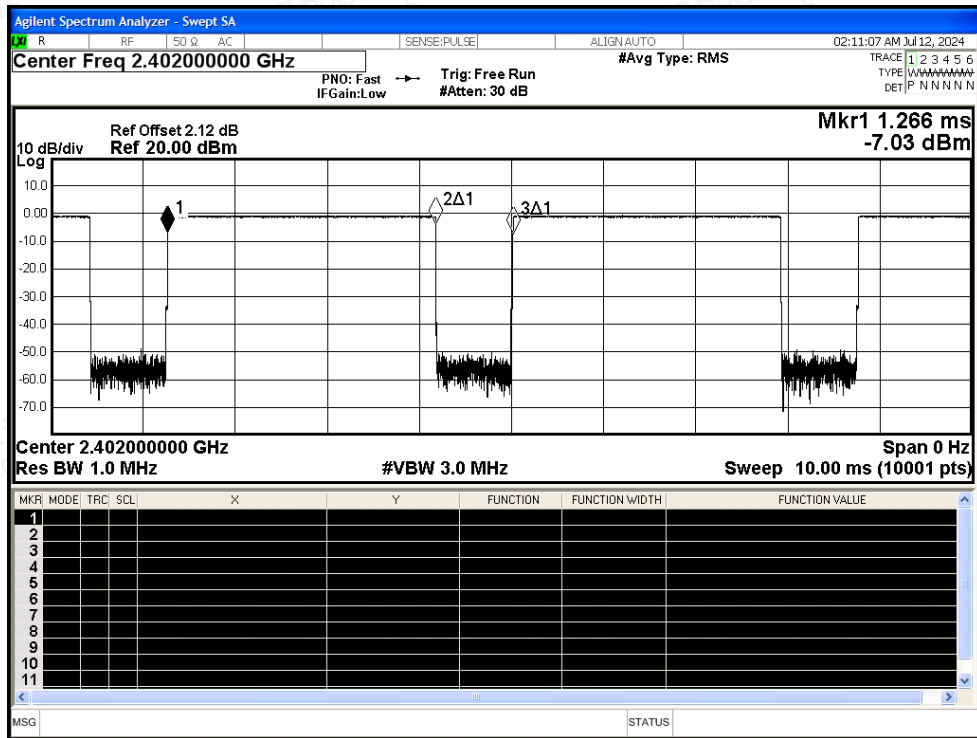
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	1-DH5	2402	Ant	77.6	1.1	0.34
NVNT	1-DH5	2441	Ant	77.63	1.1	0.34
NVNT	1-DH5	2480	Ant	77.6	1.1	0.34
NVNT	2-DH5	2402	Ant	76.41	1.17	0.36
NVNT	2-DH5	2441	Ant	76.43	1.17	0.36
NVNT	2-DH5	2480	Ant	76.43	1.17	0.36
NVNT	3-DH5	2402	Ant	76.38	1.17	0.36
NVNT	3-DH5	2441	Ant	76.38	1.17	0.36
NVNT	3-DH5	2480	Ant	76.38	1.17	0.36



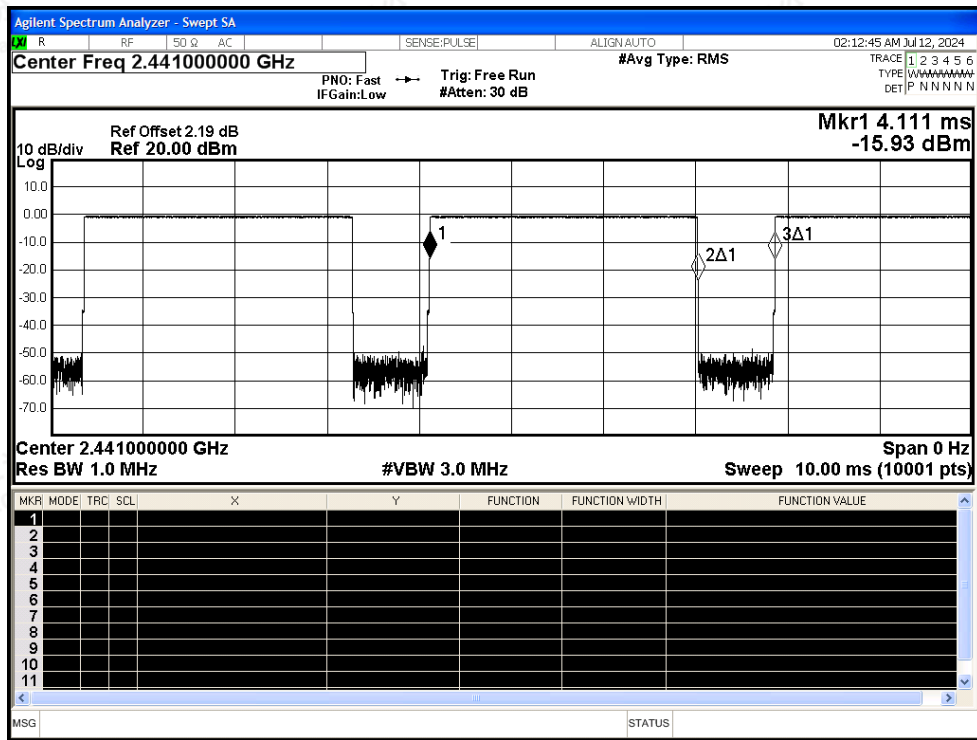


Test Graphs

Duty Cycle NVNT 1-DH5 2402MHz Ant

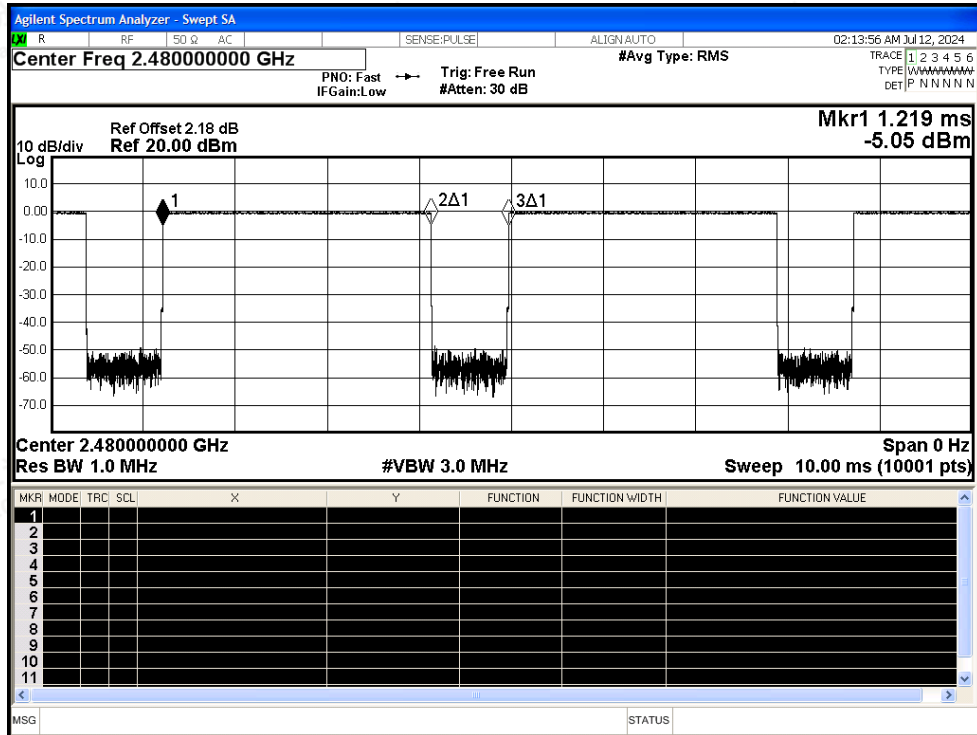


Duty Cycle NVNT 1-DH5 2441MHz Ant

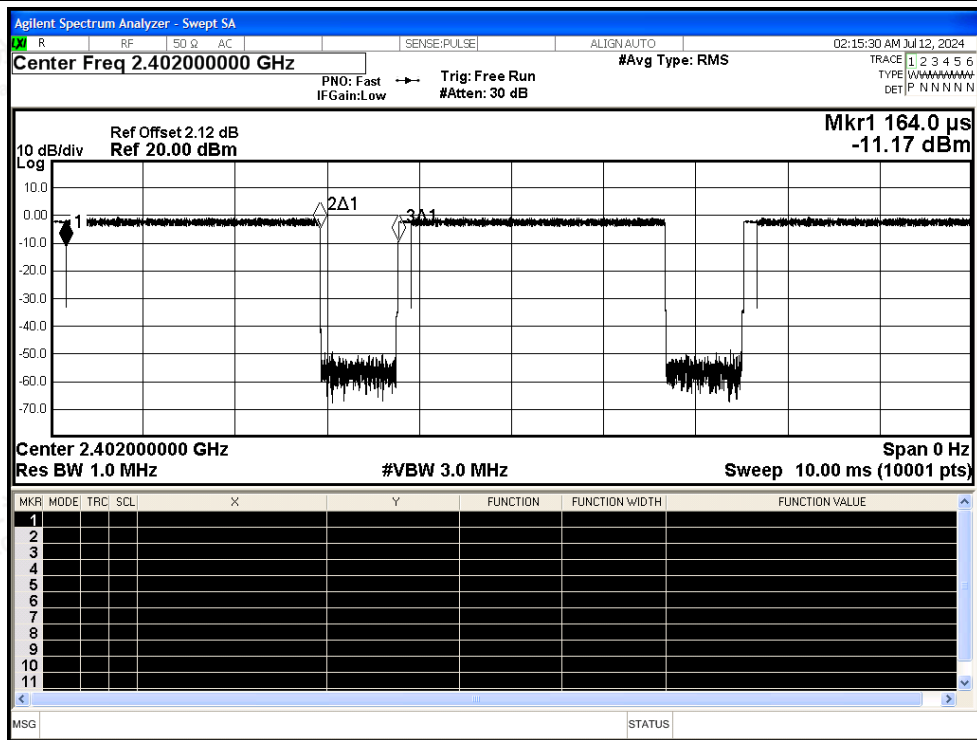




Duty Cycle NVNT 1-DH5 2480MHz Ant

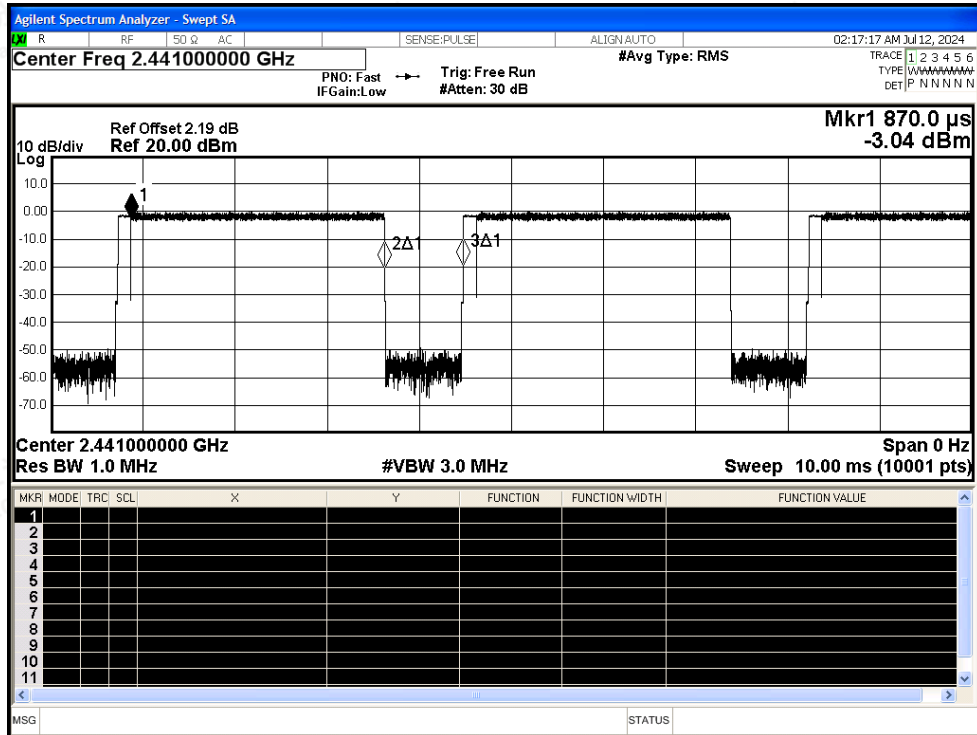


Duty Cycle NVNT 2-DH5 2402MHz Ant

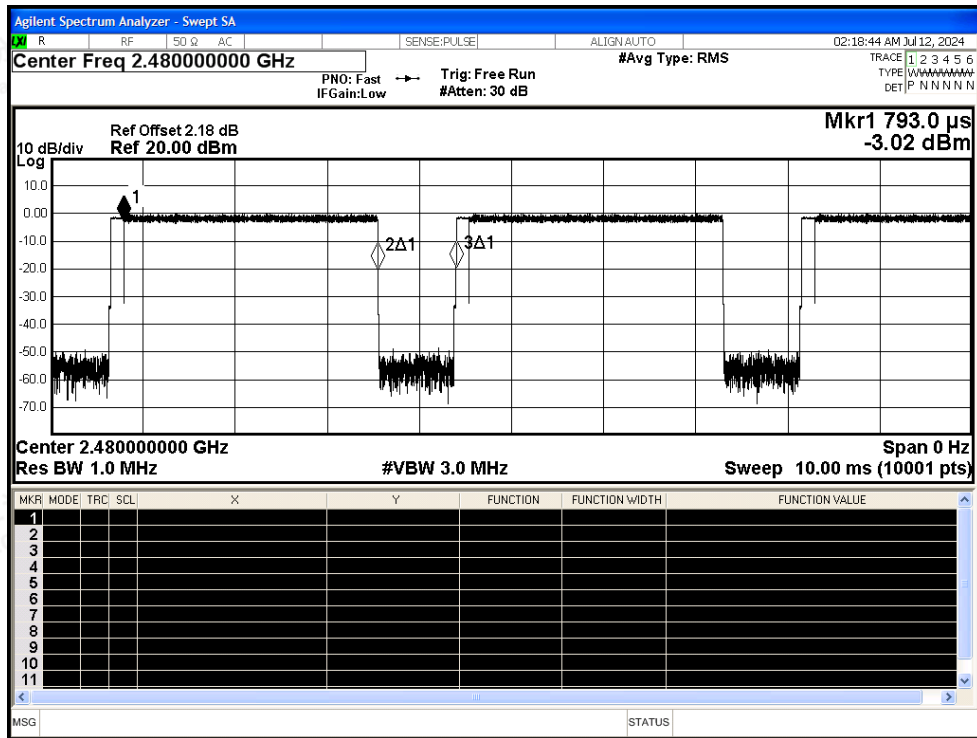




Duty Cycle NVNT 2-DH5 2441MHz Ant

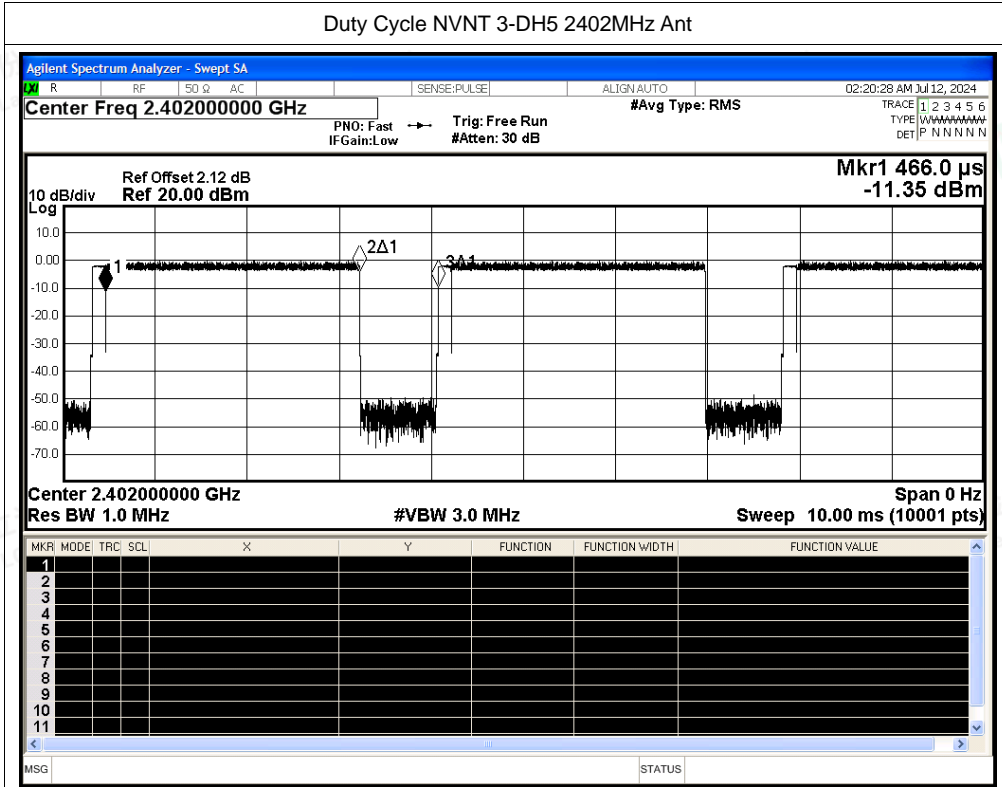


Duty Cycle NVNT 2-DH5 2480MHz Ant

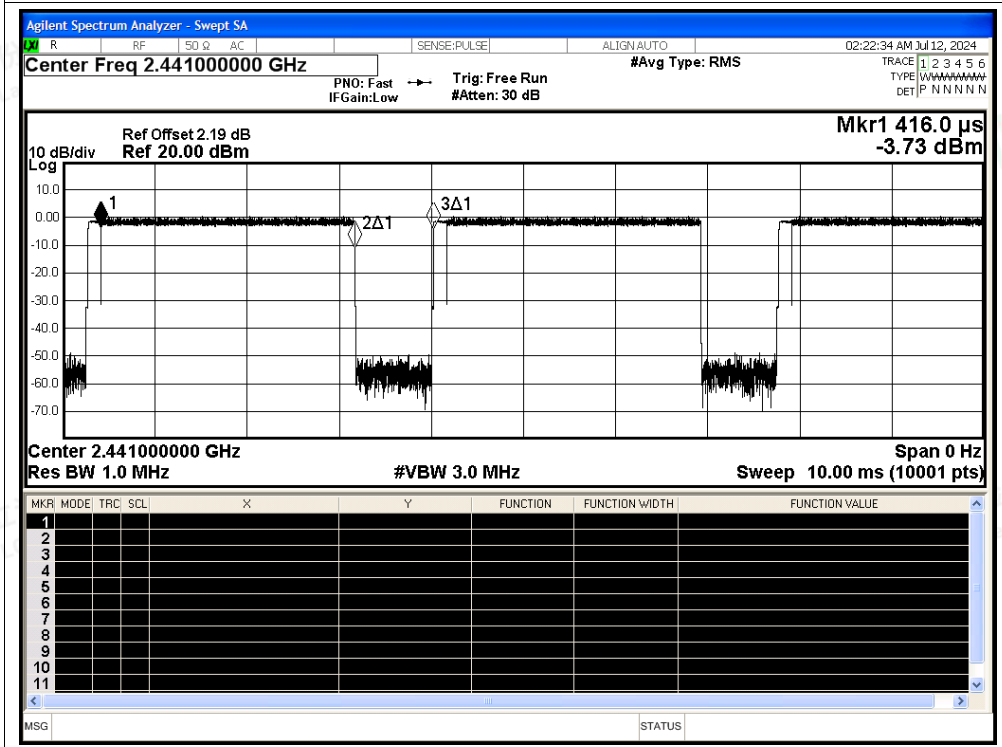


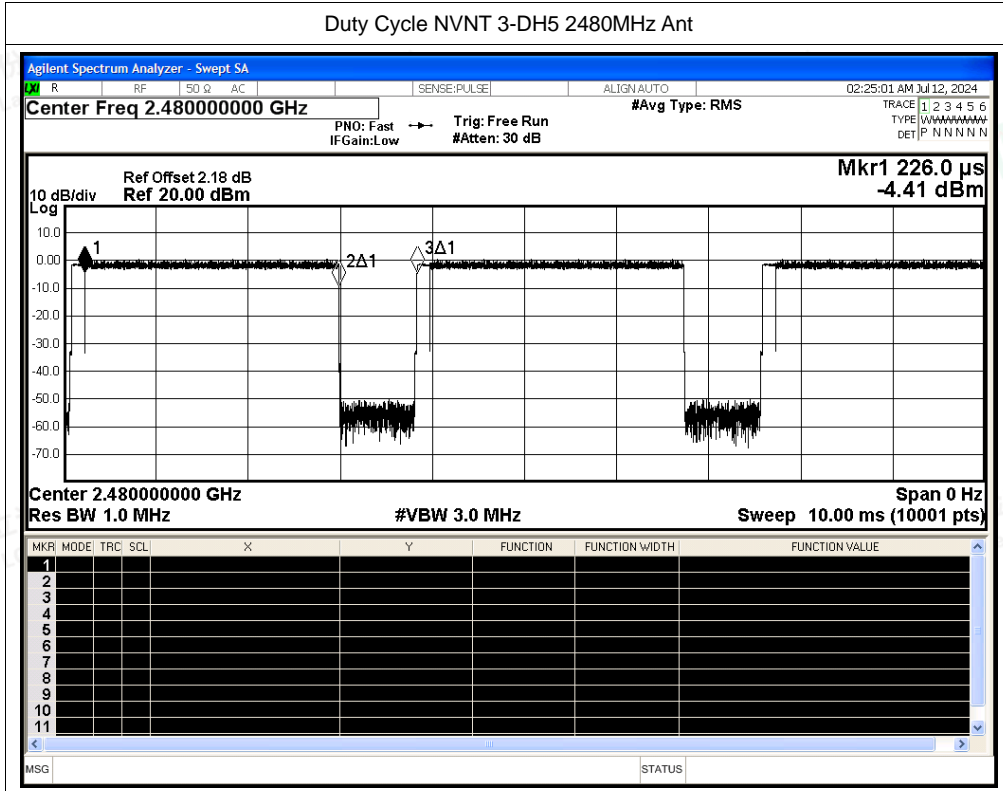


Duty Cycle NVNT 3-DH5 2402MHz Ant



Duty Cycle NVNT 3-DH5 2441MHz Ant







A.9 Restrict Band

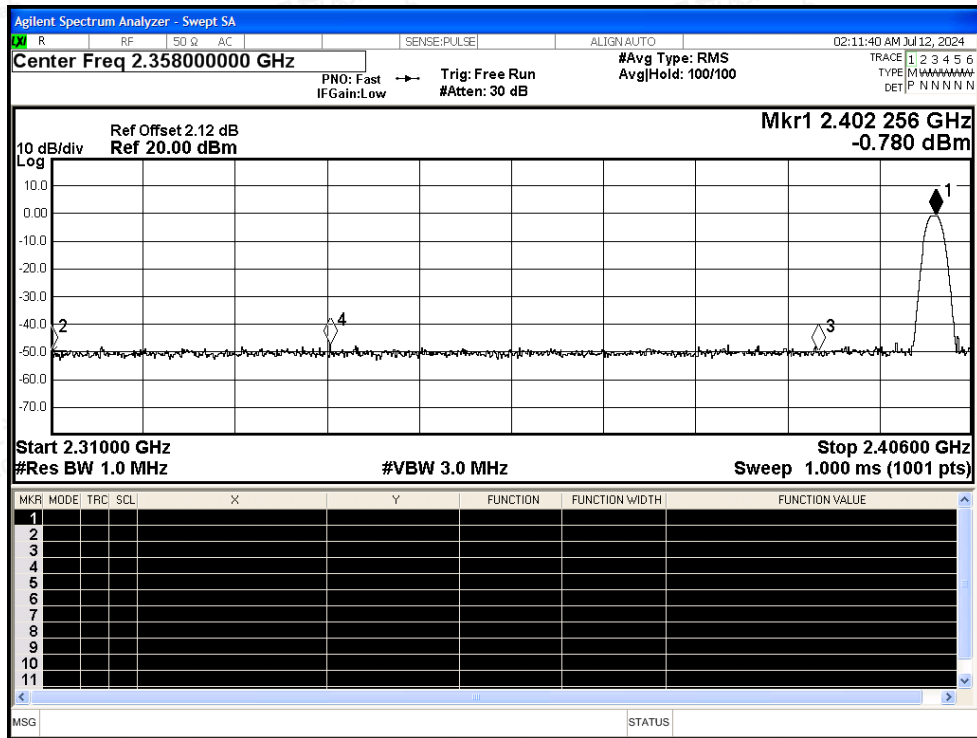
Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	Duty Factor (dB)	E (dBUV/m)	Detector	Limit (dBUV/m)	Verdict
NVNT	1-DH5	2402	Ant	No-Hopping	2310	-49.86	2.7	-	48.10	Peak	74	Pass
NVNT	1-DH5	2402	Ant	No-Hopping	2310	-58.38	2.7	1.1	40.68	Average	54	Pass
NVNT	1-DH5	2402	Ant	No-Hopping	2339.088	-47.19	2.7	-	50.77	Peak	74	Pass
NVNT	1-DH5	2402	Ant	No-Hopping	2377.488	-57.65	2.7	1.1	41.41	Average	54	Pass
NVNT	1-DH5	2402	Ant	No-Hopping	2390	-49.7	2.7	-	48.26	Peak	74	Pass
NVNT	1-DH5	2402	Ant	No-Hopping	2390	-58.15	2.7	1.1	40.91	Average	54	Pass
NVNT	1-DH5	2480	Ant	No-Hopping	2483.5	-49.55	2.7	-	48.41	Peak	74	Pass
NVNT	1-DH5	2480	Ant	No-Hopping	2483.5	-57.87	2.7	1.1	41.19	Average	54	Pass
NVNT	1-DH5	2480	Ant	No-Hopping	2483.608	-43.13	2.7	-	54.83	Peak	74	Pass
NVNT	1-DH5	2480	Ant	No-Hopping	2499.136	-56.89	2.7	1.1	42.17	Average	54	Pass
NVNT	1-DH5	2480	Ant	No-Hopping	2500	-50.8	2.7	-	47.16	Peak	74	Pass
NVNT	1-DH5	2480	Ant	No-Hopping	2500	-58.19	2.7	1.1	40.87	Average	54	Pass
NVNT	2-DH5	2402	Ant	No-Hopping	2310	-50.76	2.7	-	47.20	Peak	74	Pass
NVNT	2-DH5	2402	Ant	No-Hopping	2310	-58	2.7	1.17	41.13	Average	54	Pass
NVNT	2-DH5	2402	Ant	No-Hopping	2354.544	-46.66	2.7	-	51.30	Peak	74	Pass
NVNT	2-DH5	2402	Ant	No-Hopping	2340.912	-57.75	2.7	1.17	41.38	Average	54	Pass
NVNT	2-DH5	2402	Ant	No-Hopping	2390	-49.55	2.7	-	48.41	Peak	74	Pass
NVNT	2-DH5	2402	Ant	No-Hopping	2390	-58.62	2.7	1.17	40.51	Average	54	Pass
NVNT	2-DH5	2480	Ant	No-Hopping	2483.5	-49.58	2.7	-	48.38	Peak	74	Pass
NVNT	2-DH5	2480	Ant	No-Hopping	2483.5	-57.38	2.7	1.17	41.75	Average	54	Pass
NVNT	2-DH5	2480	Ant	No-Hopping	2485.216	-43.83	2.7	-	54.13	Peak	74	Pass
NVNT	2-DH5	2480	Ant	No-Hopping	2484.52	-56.97	2.7	1.17	42.16	Average	54	Pass
NVNT	2-DH5	2480	Ant	No-Hopping	2500	-49.09	2.7	-	48.87	Peak	74	Pass
NVNT	2-DH5	2480	Ant	No-Hopping	2500	-58.36	2.7	1.17	40.77	Average	54	Pass
NVNT	3-DH5	2402	Ant	No-Hopping	2310	-51.08	2.7	-	46.88	Peak	74	Pass
NVNT	3-DH5	2402	Ant	No-Hopping	2310	-58.93	2.7	1.17	40.20	Average	54	Pass
NVNT	3-DH5	2402	Ant	No-Hopping	2376.336	-47.27	2.7	-	50.69	Peak	74	Pass
NVNT	3-DH5	2402	Ant	No-Hopping	2382.48	-57.66	2.7	1.17	41.47	Average	54	Pass
NVNT	3-DH5	2402	Ant	No-Hopping	2390	-50.52	2.7	-	47.44	Peak	74	Pass
NVNT	3-DH5	2402	Ant	No-Hopping	2390	-58.58	2.7	1.17	40.55	Average	54	Pass
NVNT	3-DH5	2480	Ant	No-Hopping	2483.5	-49.36	2.7	-	48.60	Peak	74	Pass
NVNT	3-DH5	2480	Ant	No-Hopping	2483.5	-57.42	2.7	1.17	41.71	Average	54	Pass
NVNT	3-DH5	2480	Ant	No-Hopping	2484.64	-44.32	2.7	-	53.64	Peak	74	Pass
NVNT	3-DH5	2480	Ant	No-Hopping	2483.56	-57.11	2.7	1.17	42.02	Average	54	Pass
NVNT	3-DH5	2480	Ant	No-Hopping	2500	-48.93	2.7	-	49.03	Peak	74	Pass
NVNT	3-DH5	2480	Ant	No-Hopping	2500	-58.39	2.7	1.17	40.74	Average	54	Pass



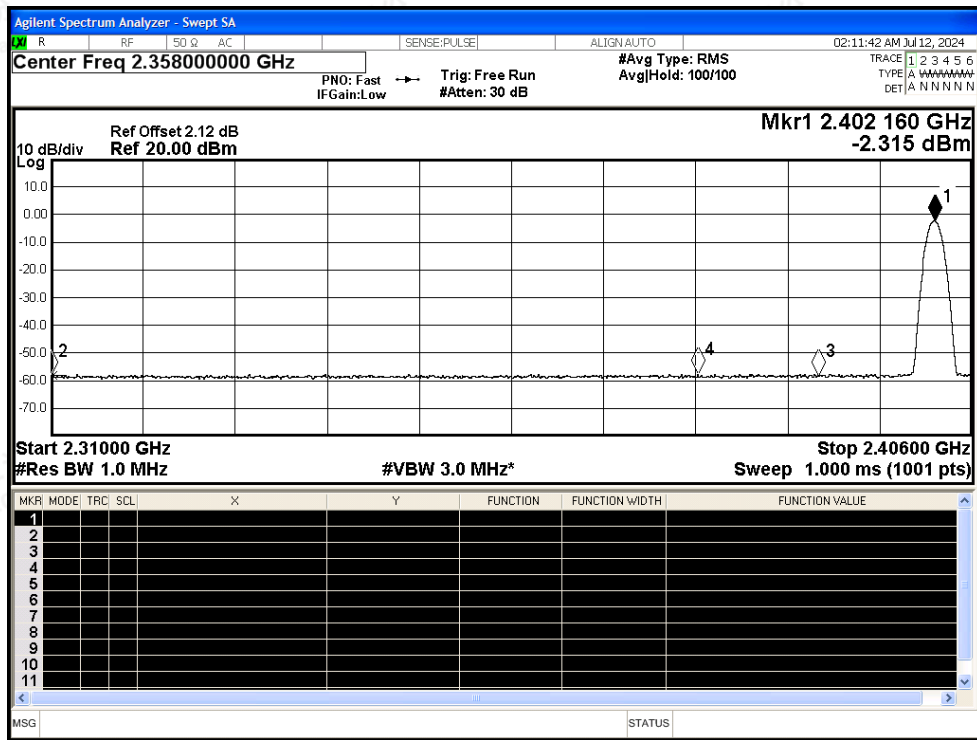


Test Graphs

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

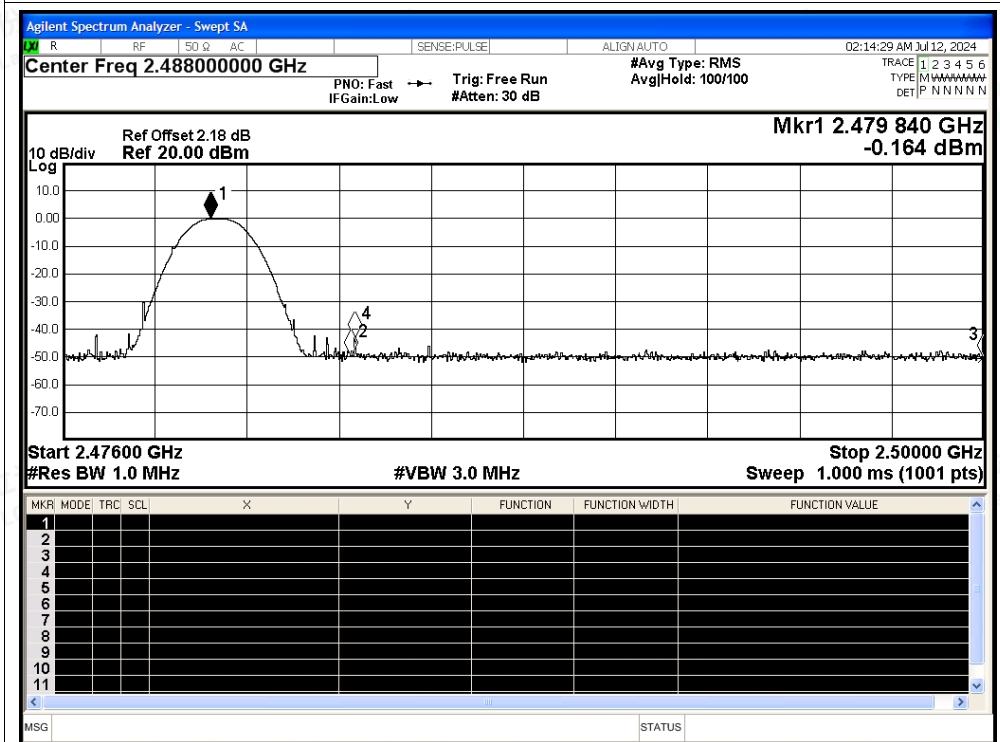


Restrict Band NVNT 1-DH5 2402MHz Ant No-Hopping Average

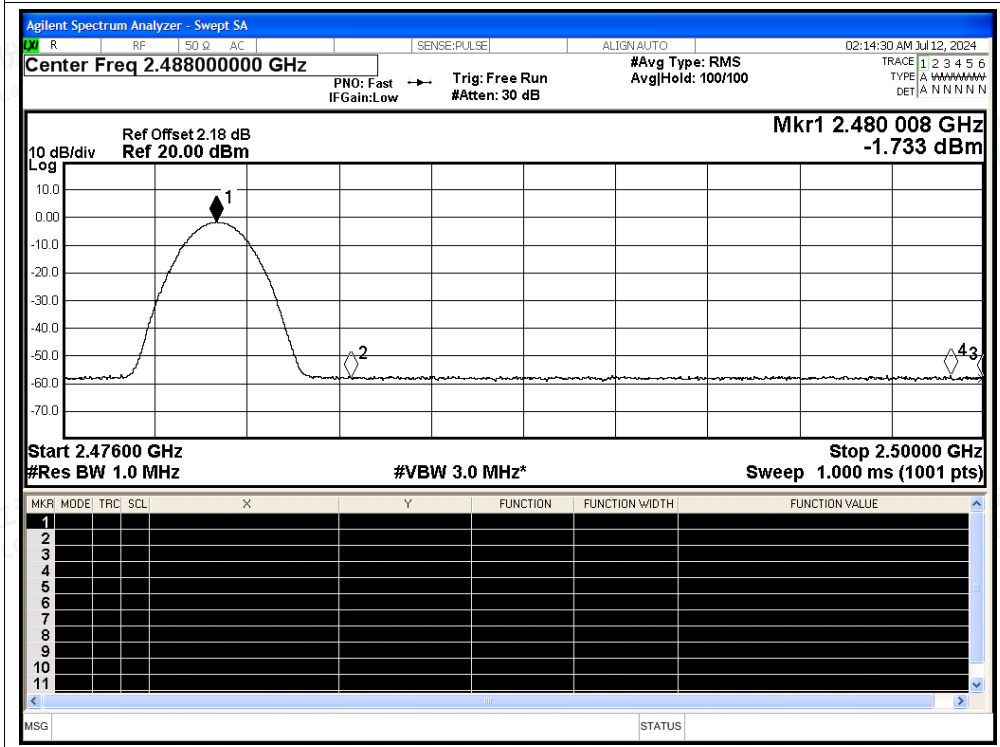




Restrict Band NVNT 1-DH5 2480MHz Ant No-Hopping Peak

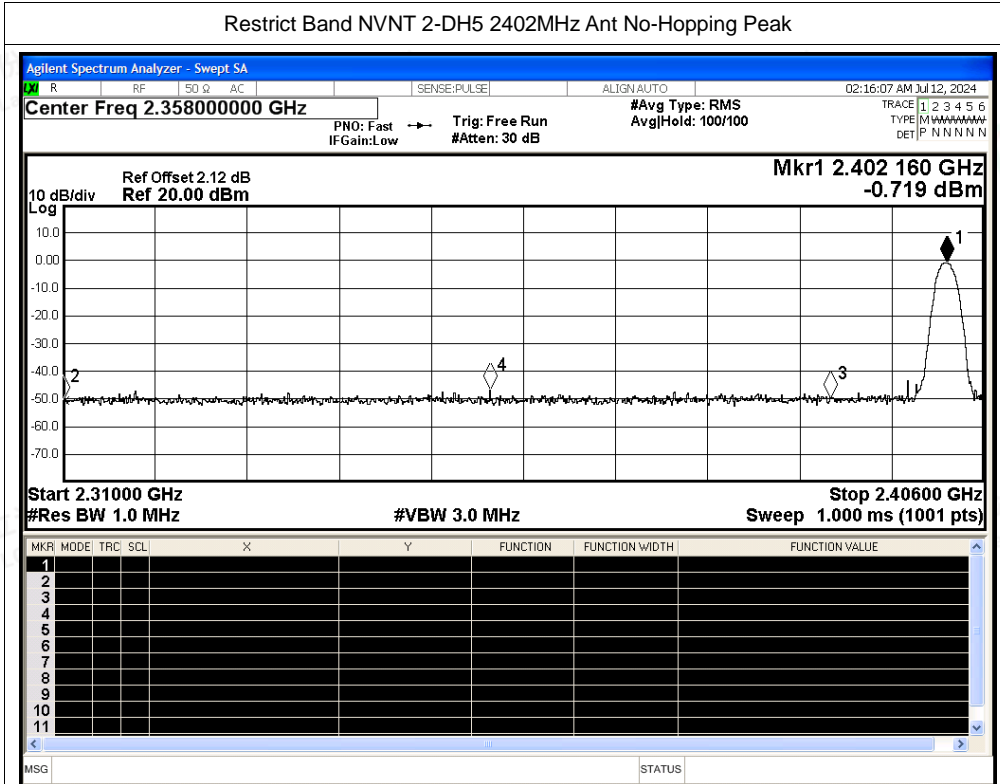


Restrict Band NVNT 1-DH5 2480MHz Ant No-Hopping Average

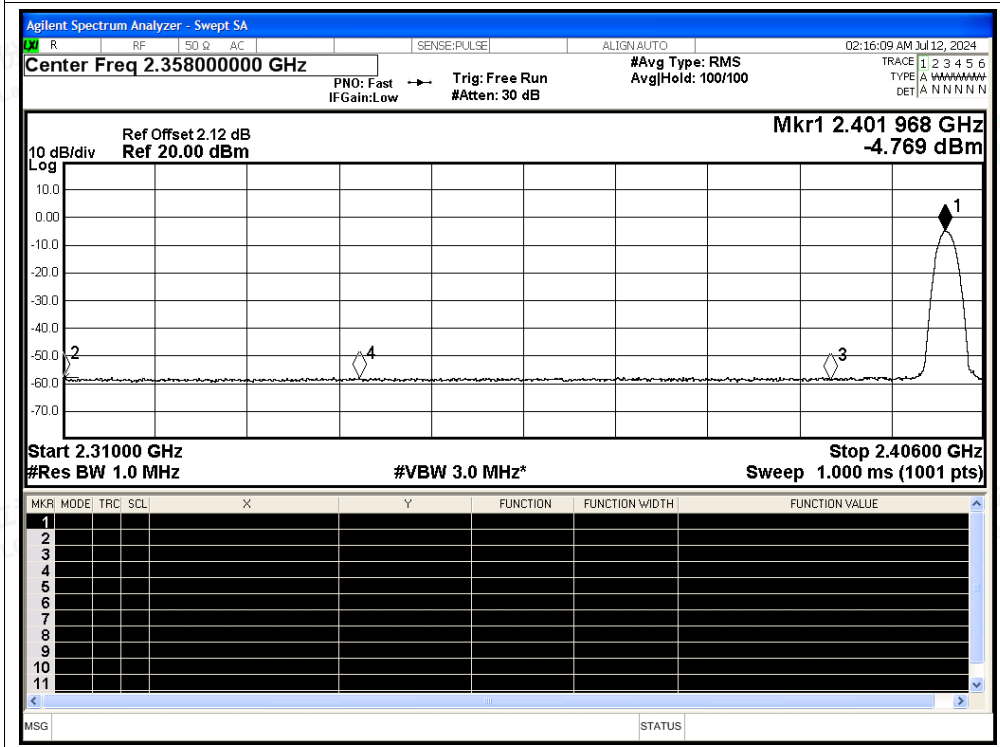




Restrict Band NVNT 2-DH5 2402MHz Ant No-Hopping Peak

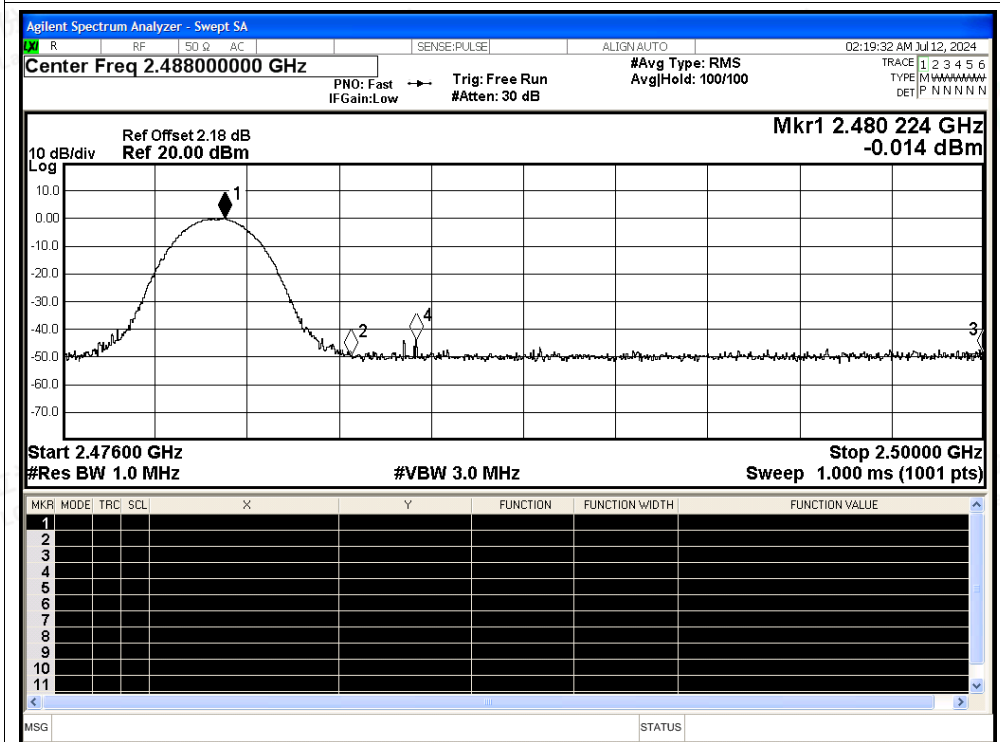


Restrict Band NVNT 2-DH5 2402MHz Ant No-Hopping Average

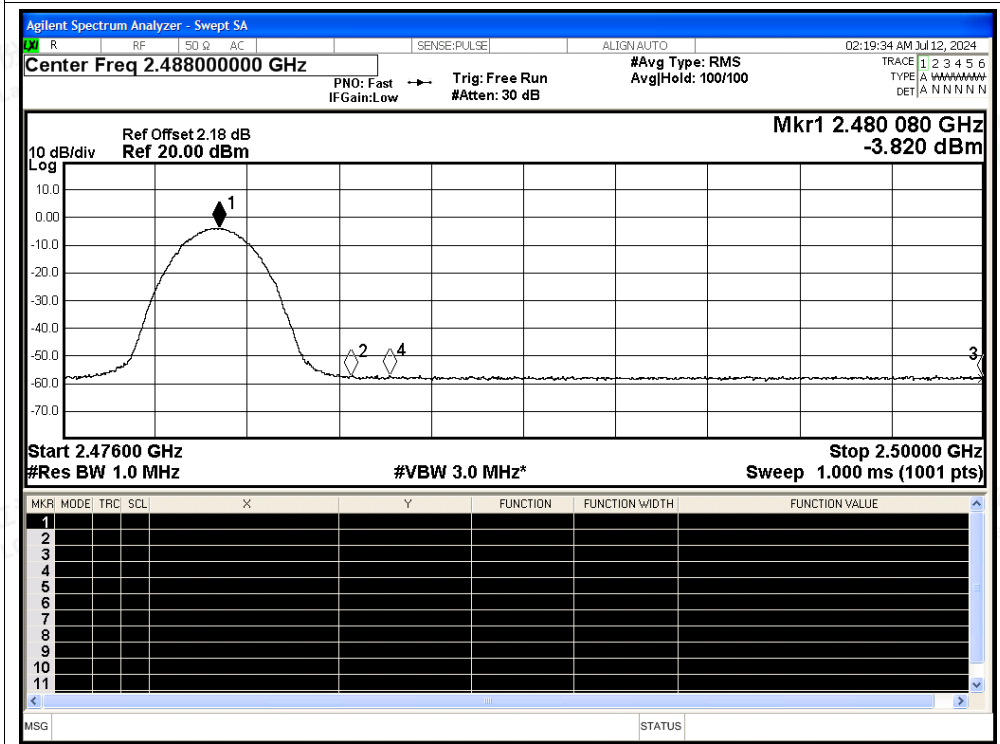




Restrict Band NVNT 2-DH5 2480MHz Ant No-Hopping Peak

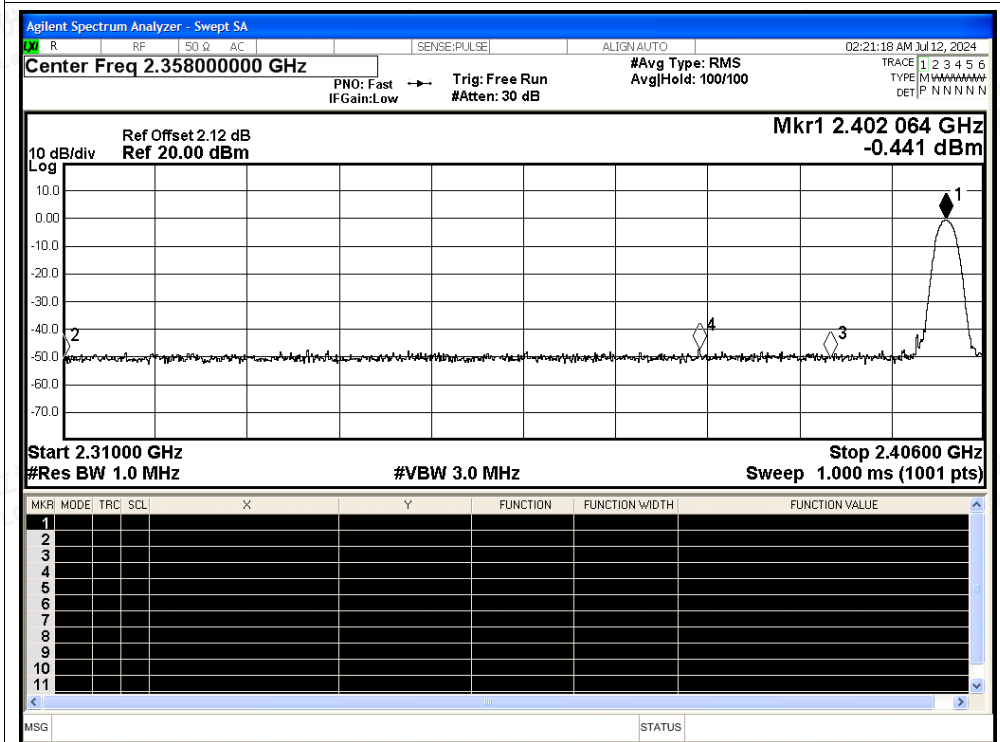


Restrict Band NVNT 2-DH5 2480MHz Ant No-Hopping Average

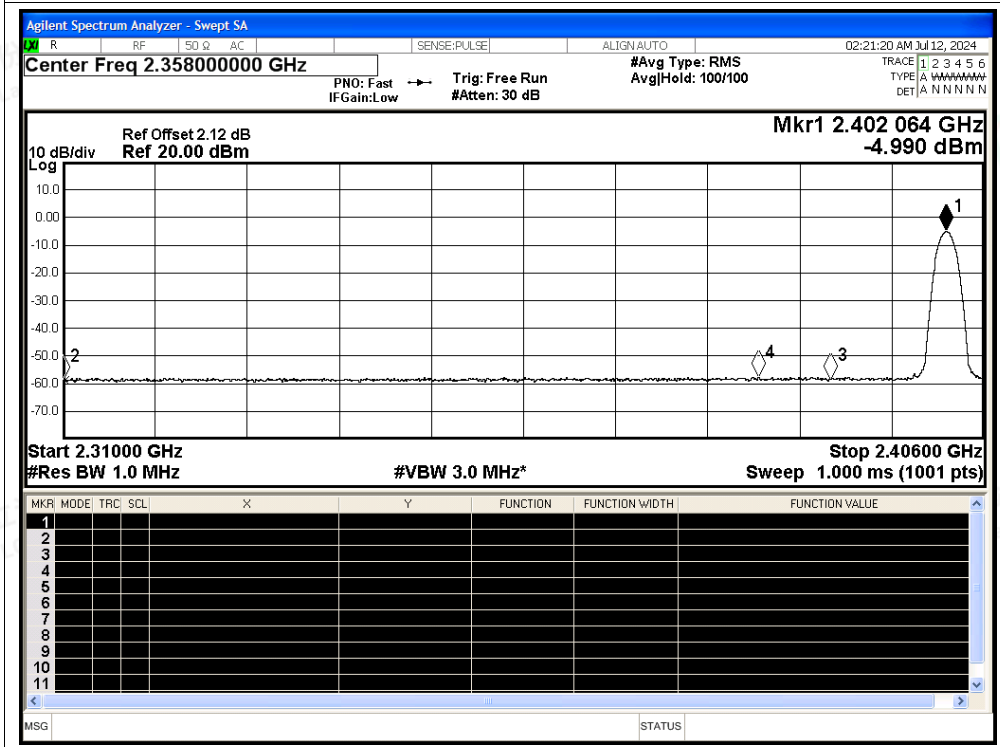




Restrict Band NVNT 3-DH5 2402MHz Ant No-Hopping Peak

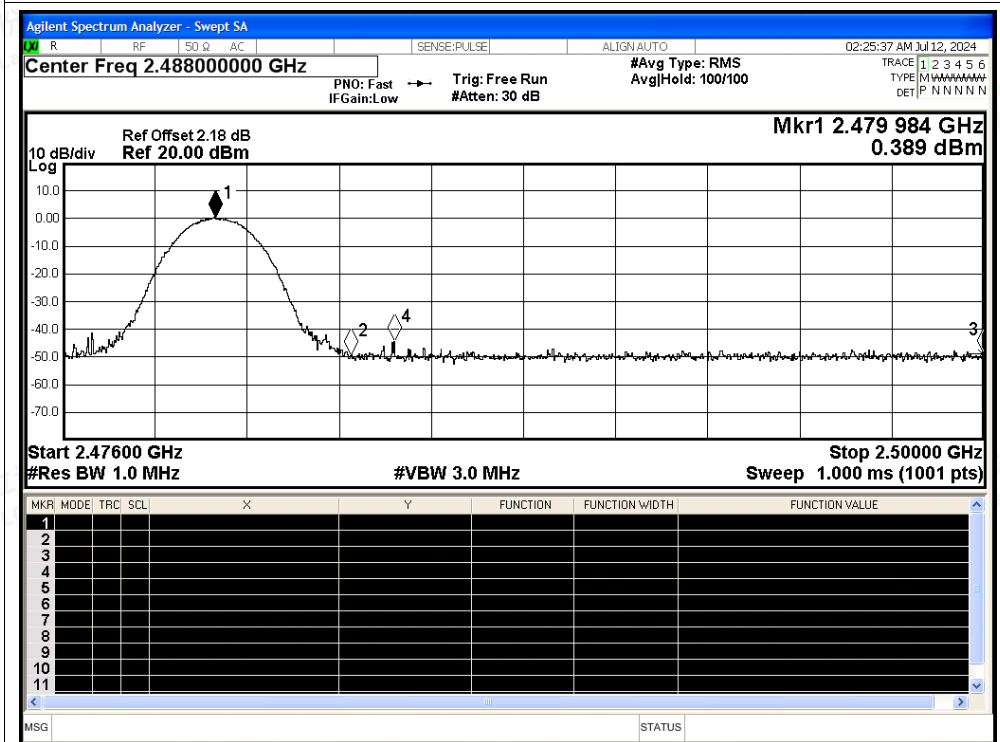


Restrict Band NVNT 3-DH5 2402MHz Ant No-Hopping Average





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



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

