Appendix A

RF Test Data for BT (Conducted Measurement)

Product Name: Bluetooth module

Test Model: BLE-Bike

Environmental Conditions

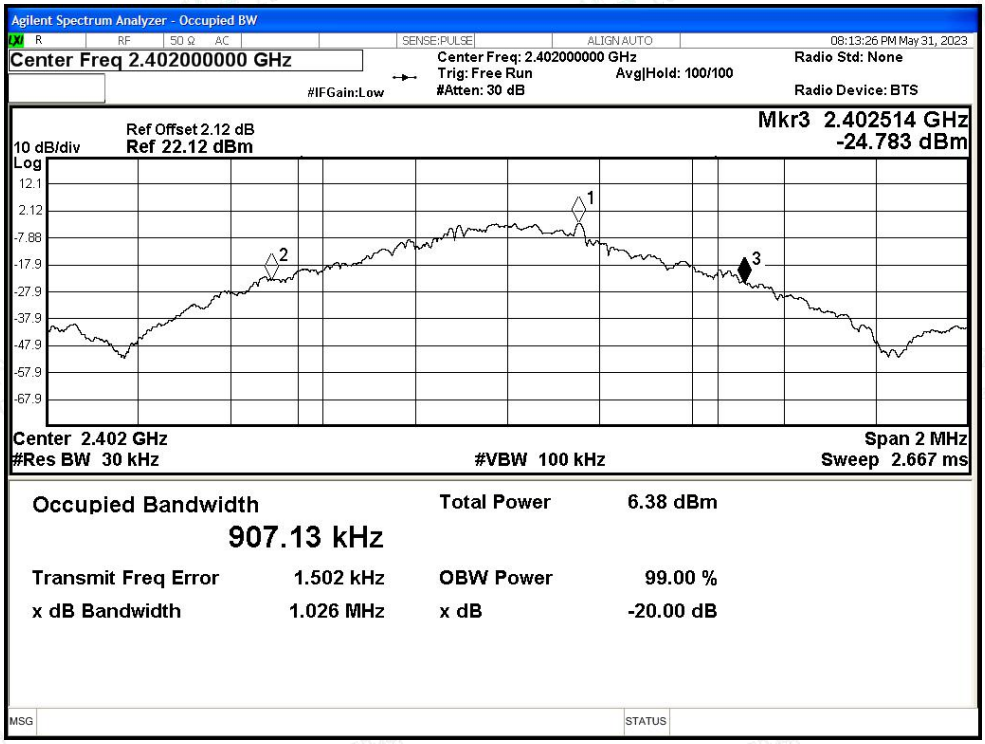
Temperature:	23.8° C
Relative Humidity:	52.1%
ATM Pressure:	100.0 kPa
Test Engineer:	Mening Su
Supervised by:	Ling Zhu

A.1 -20dB Bandwidth

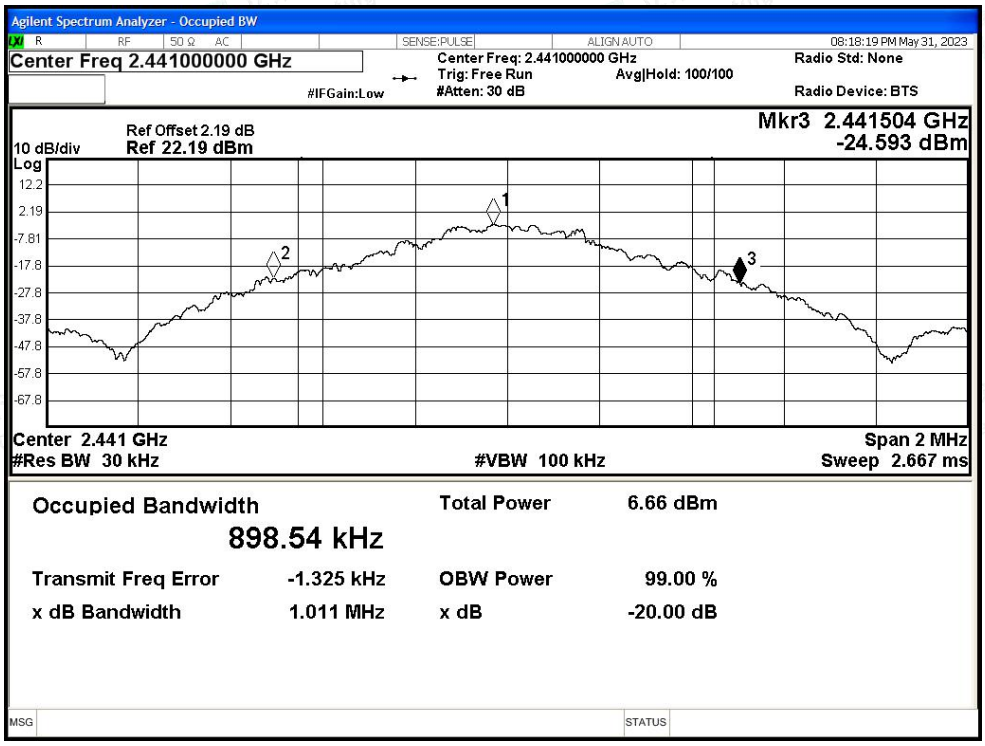
Condition	Mode	Frequency (MHz)	Antenna	-20 dB Bandwidth (MHz)	Limit -20 dB Bandwidth (MHz)	Verdict
NVNT	1-DH5	2402	Ant1	1.026	N/A	Pass
NVNT	1-DH5	2441	Ant1	1.011	N/A	Pass
NVNT	1-DH5	2480	Ant1	1.016	N/A	Pass

Test Graphs

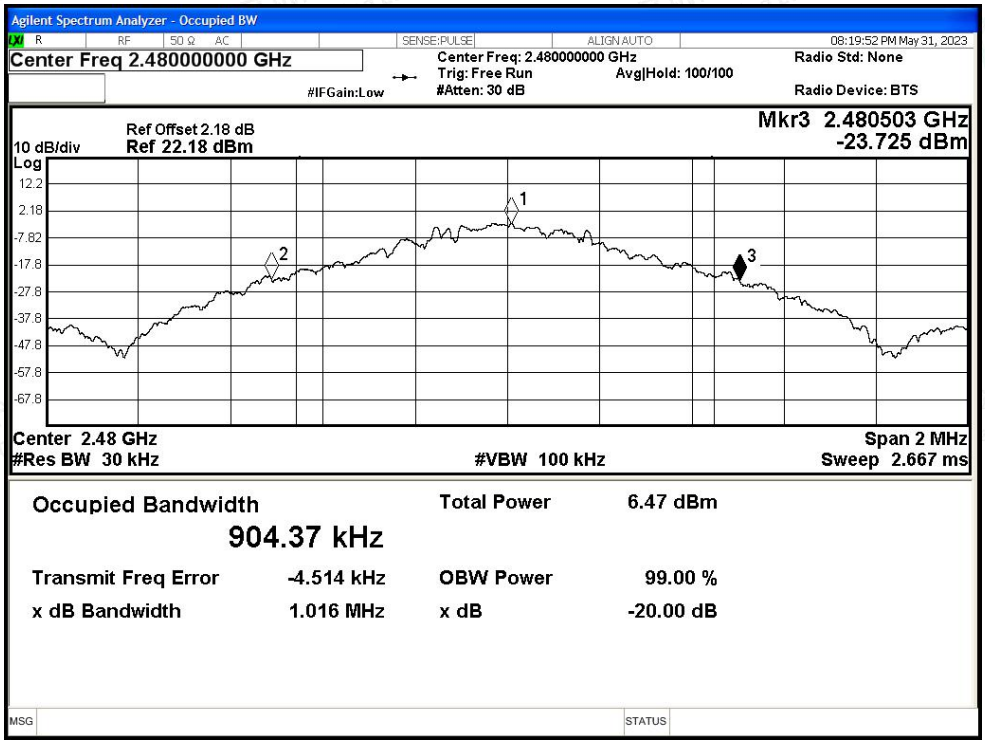
-20dB Bandwidth NVNT 1-DH5 2402MHz Ant1



-20dB Bandwidth NVNT 1-DH5 2441MHz Ant1



-20dB Bandwidth NVNT 1-DH5 2480MHz Ant1

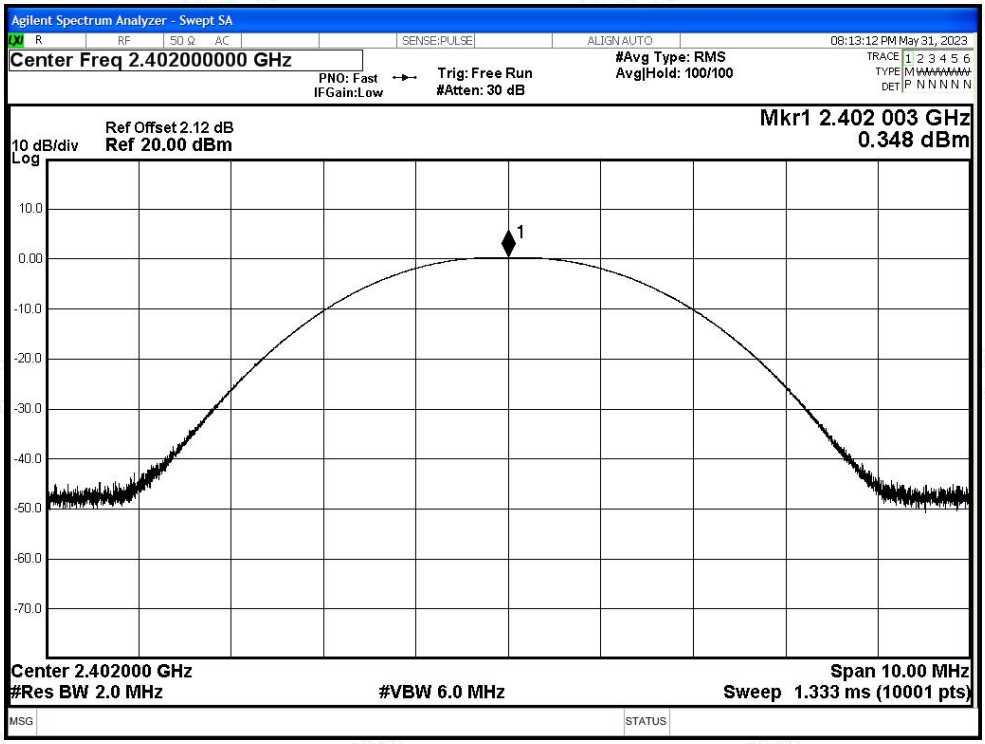


A.2 Maximum Conducted Output Power

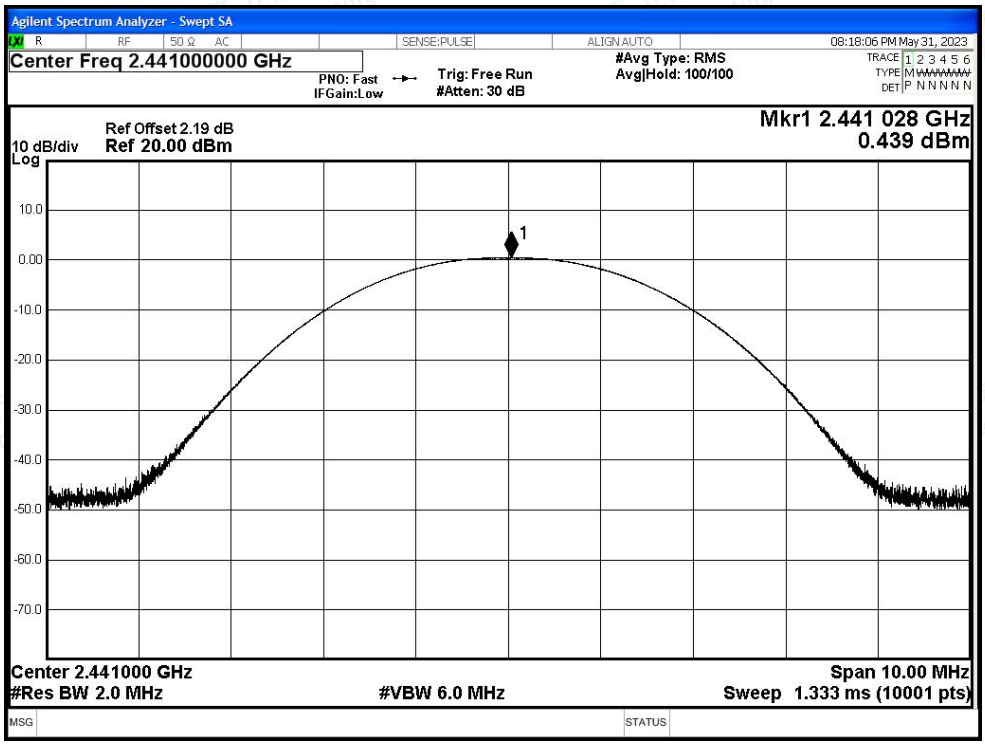
Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	1-DH5	2402	Ant1	0.35	21	Pass
NVNT	1-DH5	2441	Ant1	0.44	21	Pass
NVNT	1-DH5	2480	Ant1	0.5	21	Pass

Test Graphs

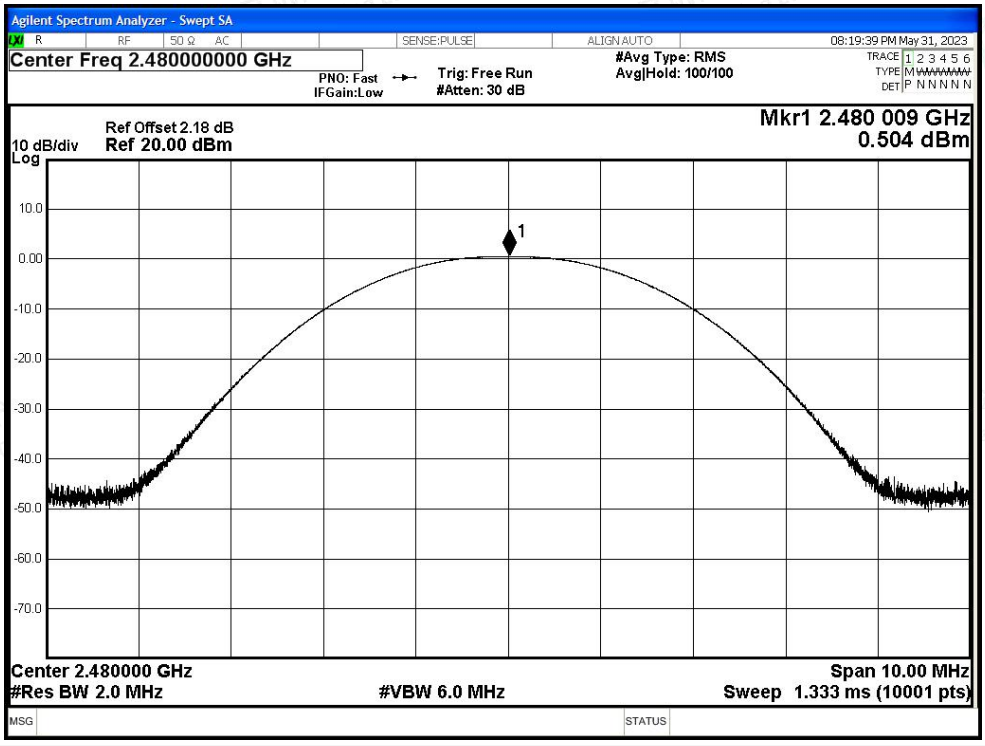
Power NVNT 1-DH5 2402MHz Ant1



Power NVNT 1-DH5 2441MHz Ant1



Power NVNT 1-DH5 2480MHz Ant1

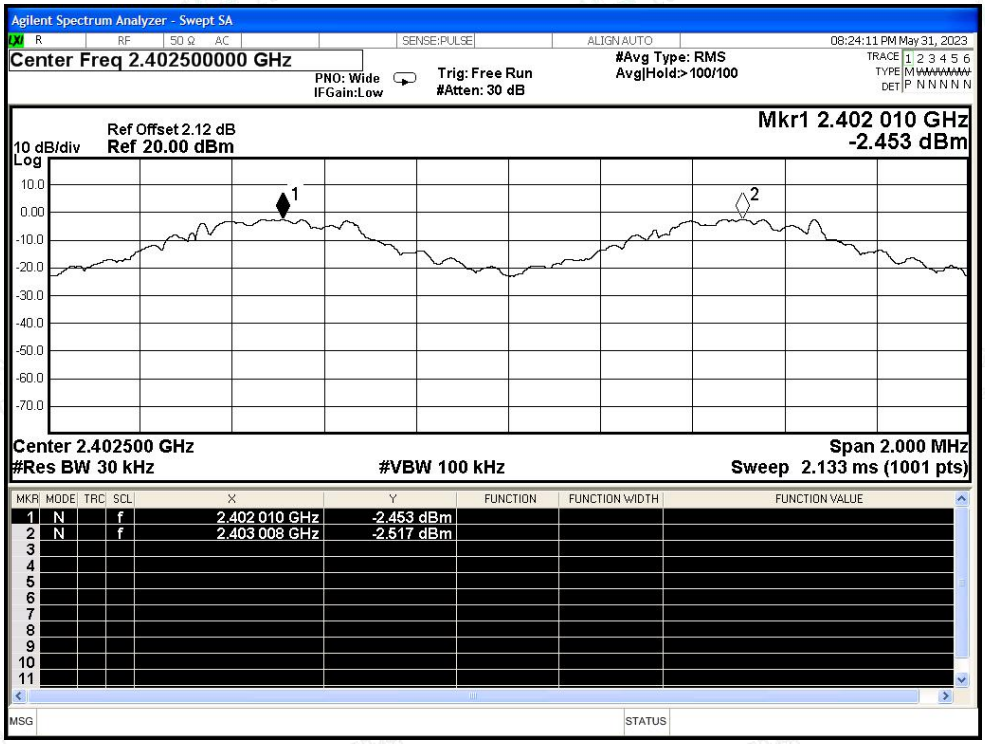


A.3 Carrier Frequencies Separation

Condition	Mode	Antenna	Hopping Freq1 (MHz)	Hopping Freq2 (MHz)	HFS (MHz)	Limit (MHz)	Verdict
NVNT	1-DH5	Ant1	2402.01	2403.008	0.998	0.684	Pass

Test Graphs

CFS NVNT 1-DH5 2402MHz Ant1

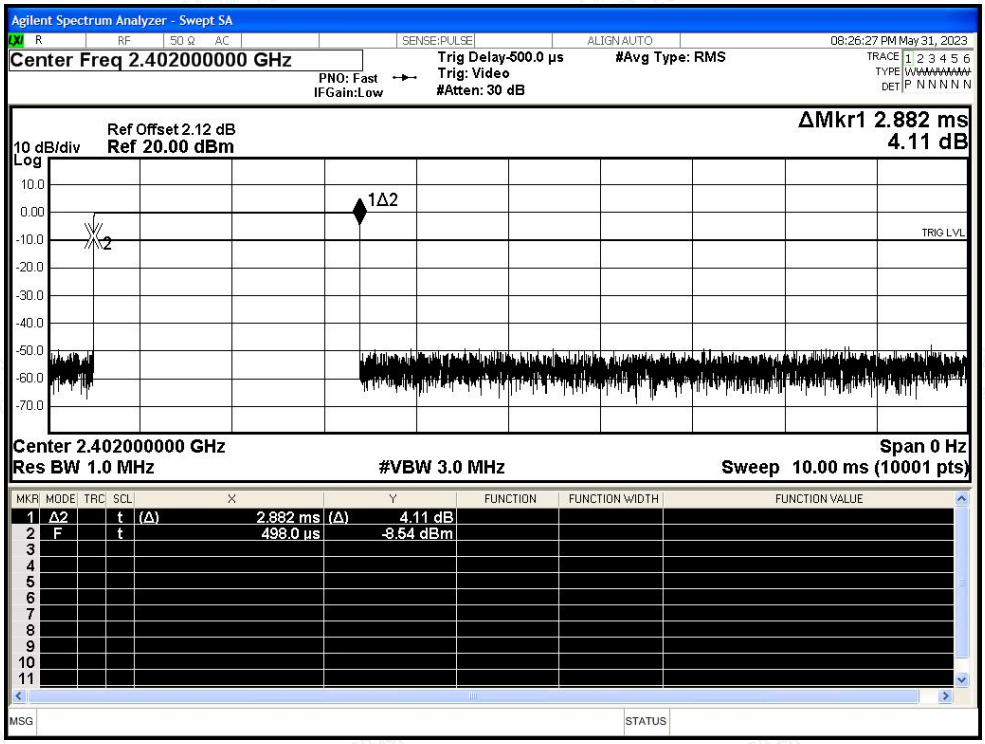


A.4 Dwell Time

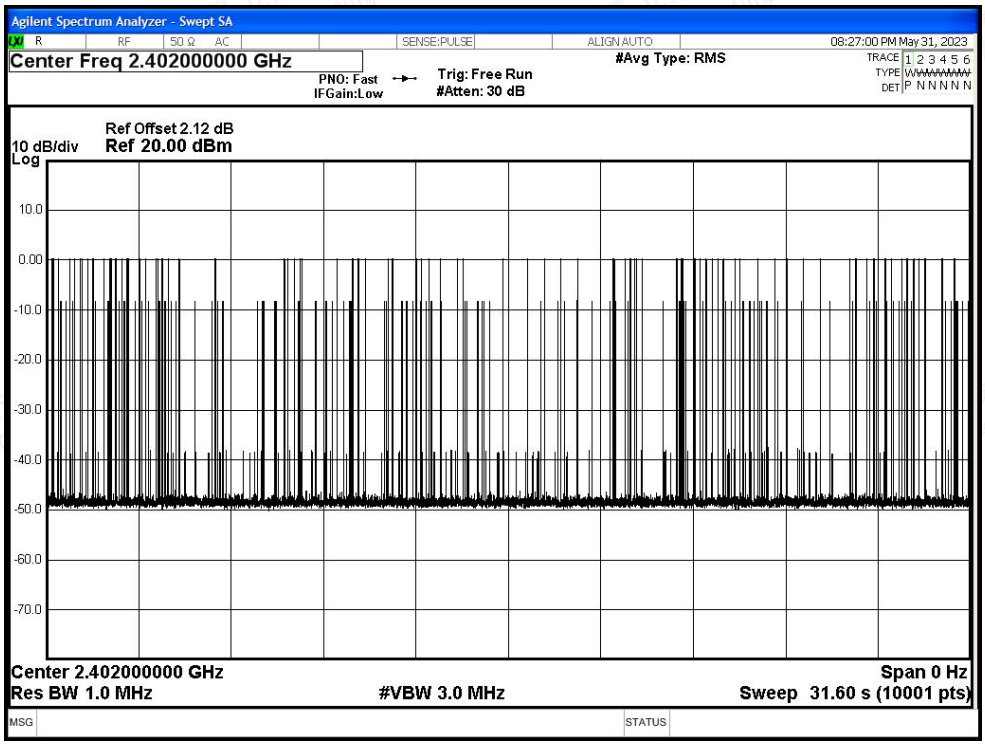
Condition	Mode	Frequency (MHz)	Antenna	Pulse Time (ms)	Total Dwell Time (ms)	Burst Count	Period Time (ms)	Limit (ms)	Verdict
NVNT	1-DH5	2402	Ant1	2.882	273.79	95	31600	400	Pass

Test Graphs

Dwell NVNT 1-DH5 2402MHz Ant1 One Burst



Dwell NVNT 1-DH5 2402MHz Ant1 Accumulated

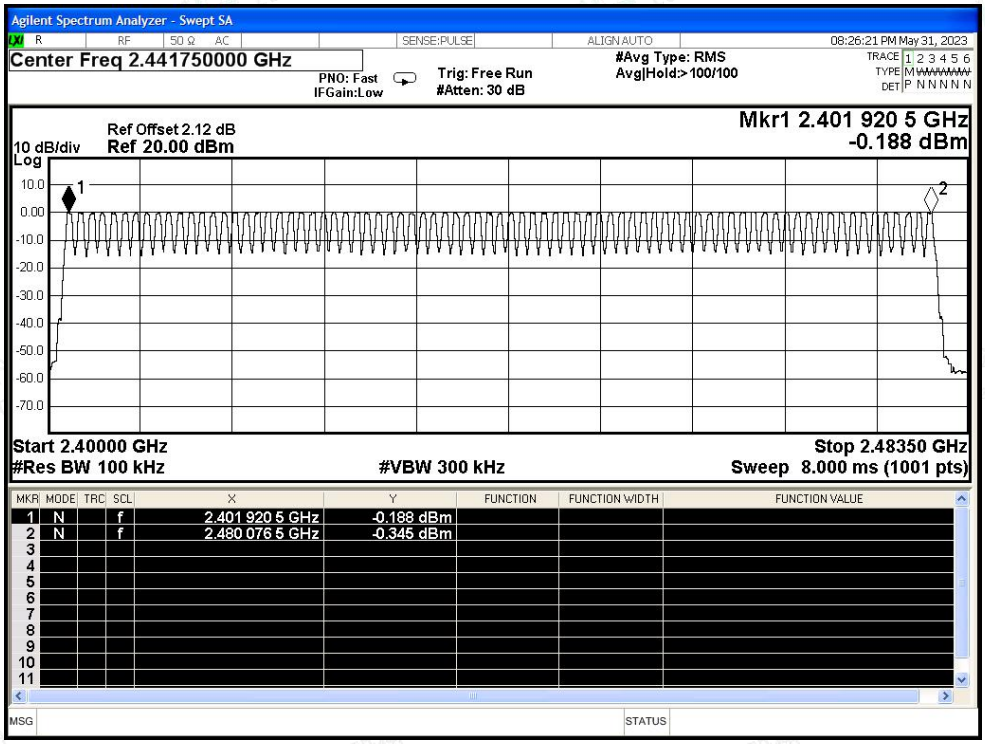


A.5 Number of Hopping Channel

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

Test Graphs

Hopping No. NVNT 1-DH5 2402MHz Ant1

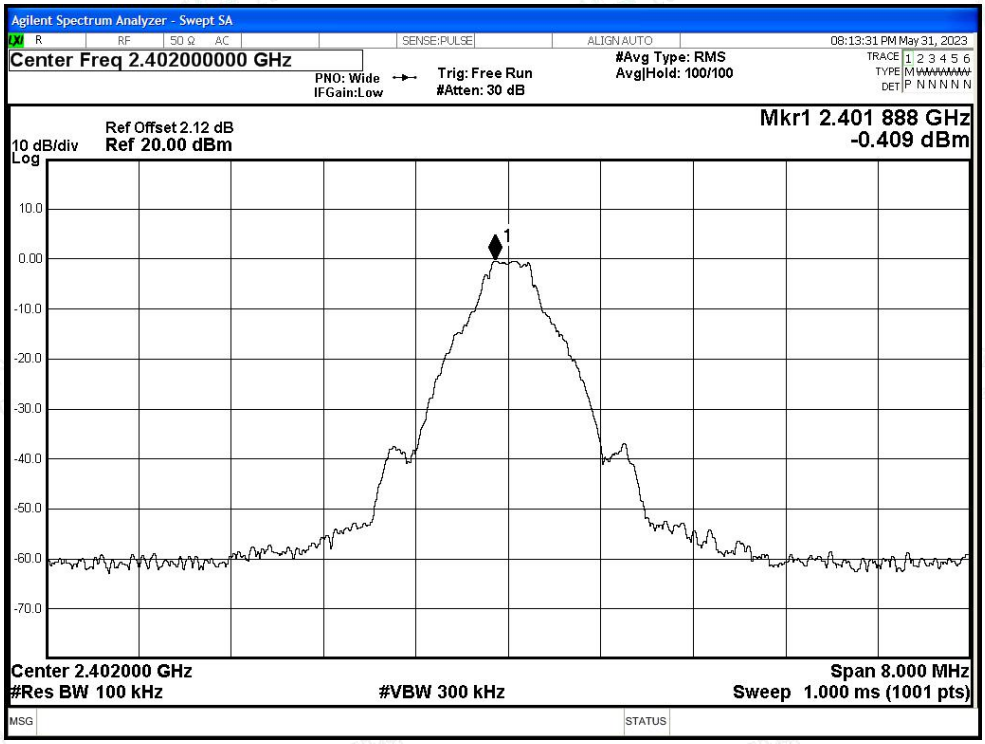


A.6 Band Edge

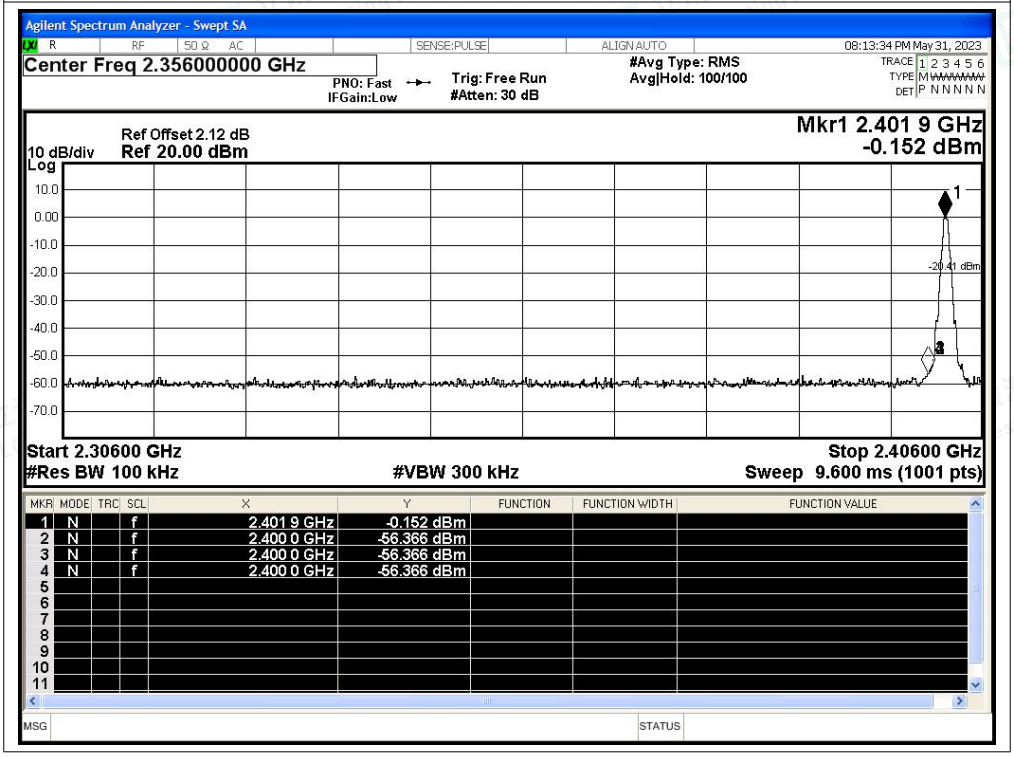
Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH5	2402	Ant1	No-Hopping	-55.96	-20	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	-58.03	-20	Pass

Test Graphs

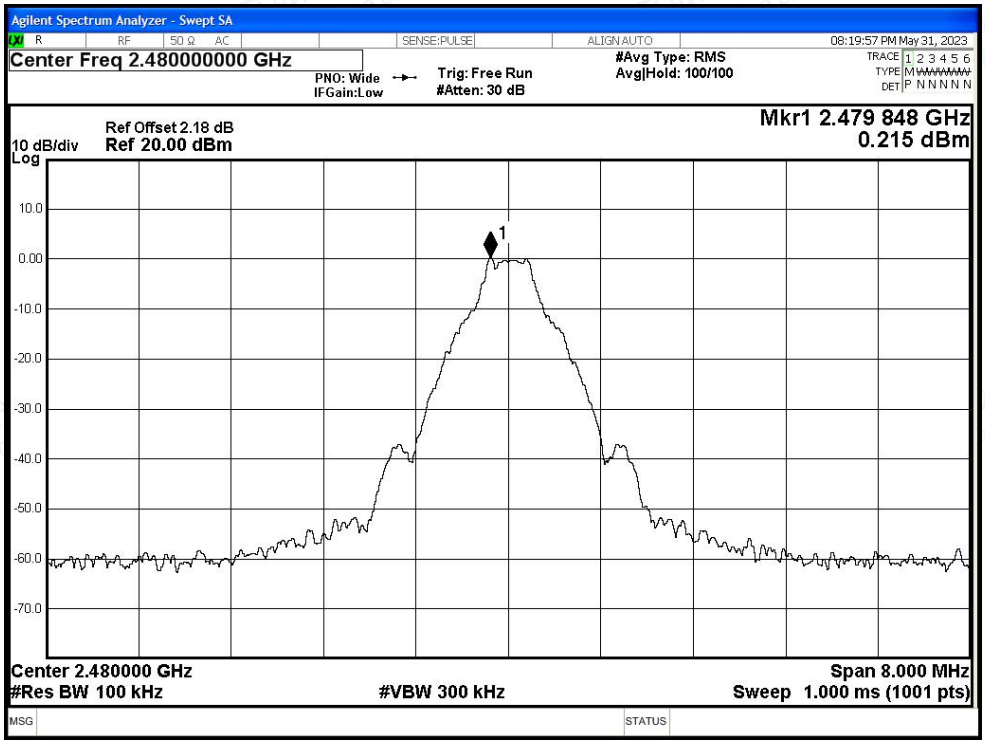
Band Edge NVNT 1-DH5 2402MHz Ant1 No-Hopping Ref



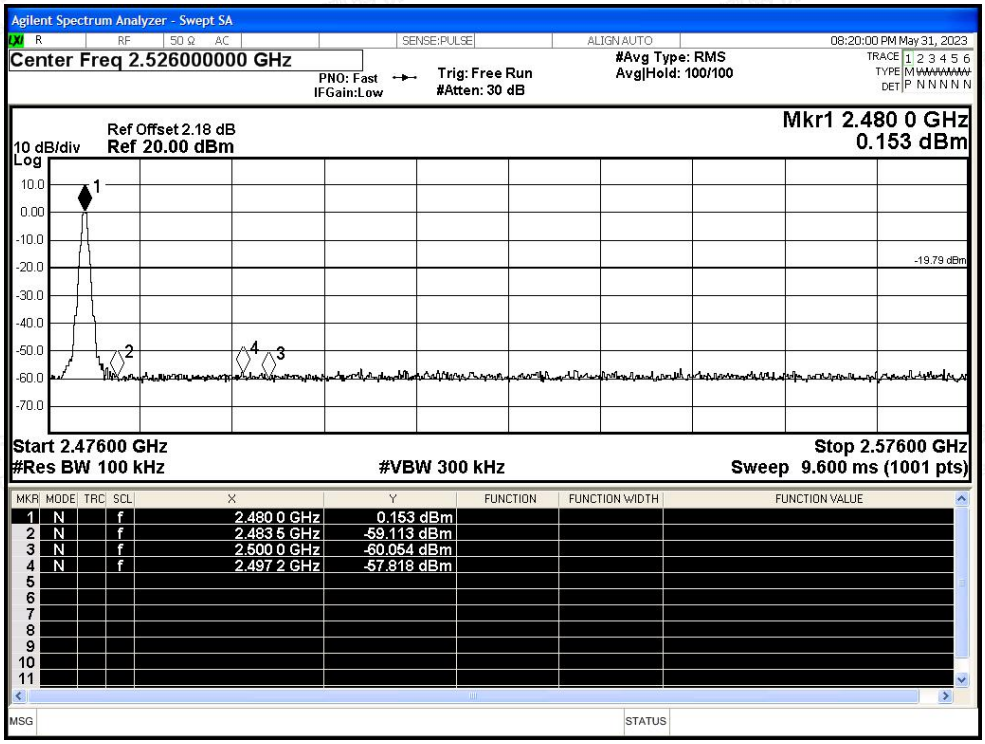
Band Edge NVNT 1-DH5 2402MHz Ant1 No-Hopping Emission



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



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

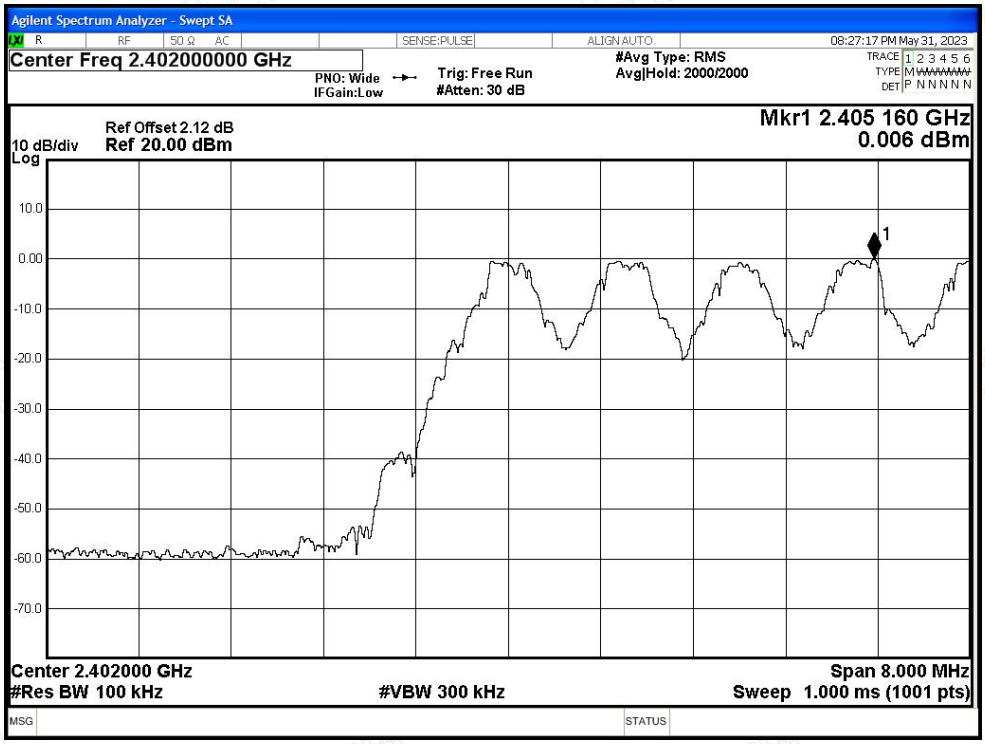


(Hopping)

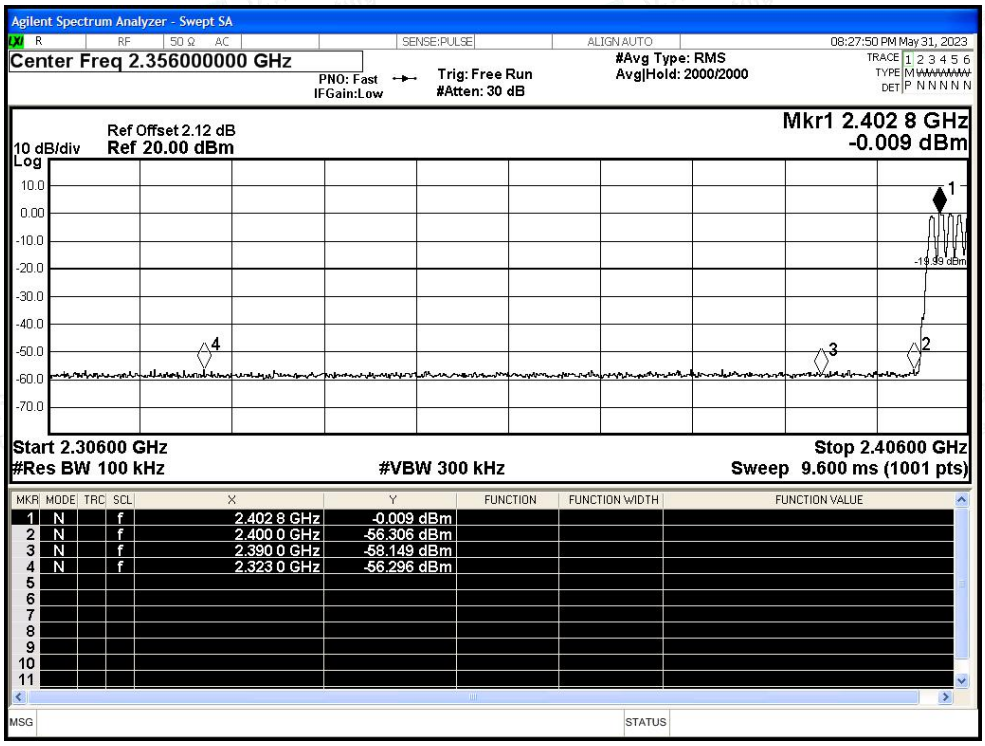
Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH5	2402	Ant1	Hopping	-56.3	-20	Pass
NVNT	1-DH5	2480	Ant1	Hopping	-55.9	-20	Pass

Test Graphs

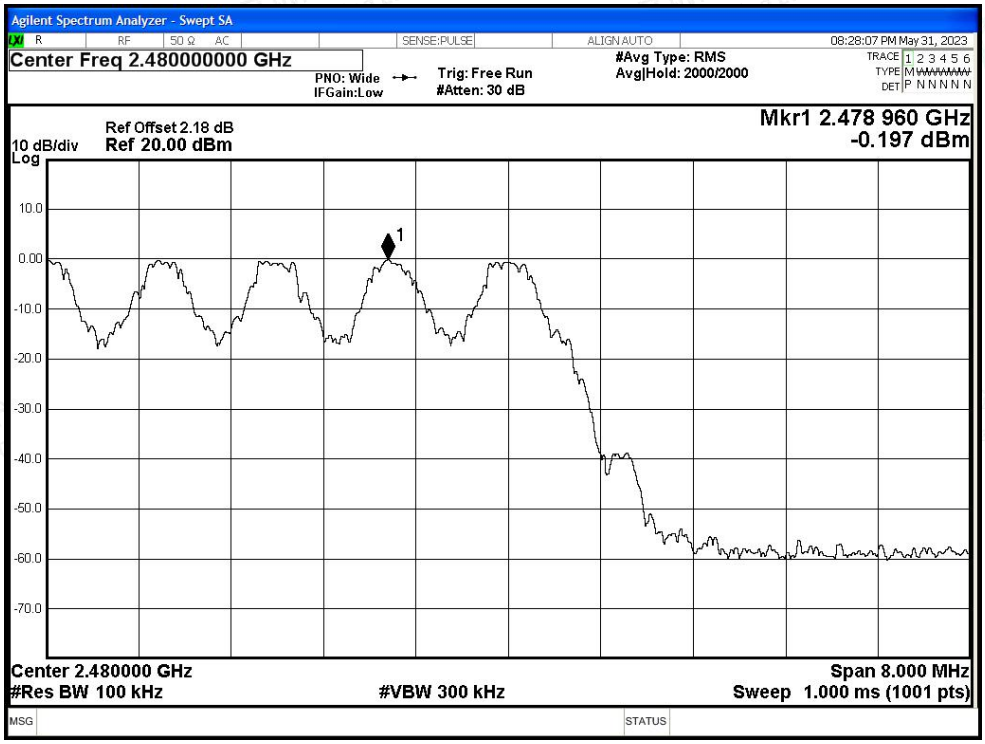
Band Edge(Hopping) NVNT 1-DH5 2402MHz Ant1 Hopping Ref



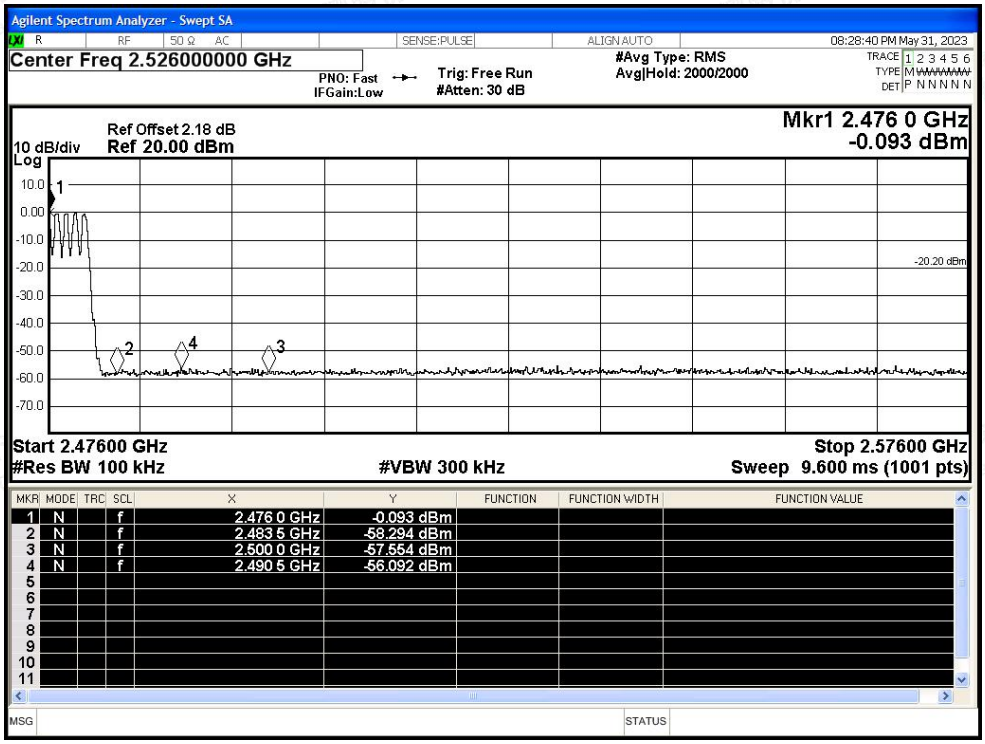
Band Edge(Hopping) NVNT 1-DH5 2402MHz Ant1 Hopping Emission



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



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

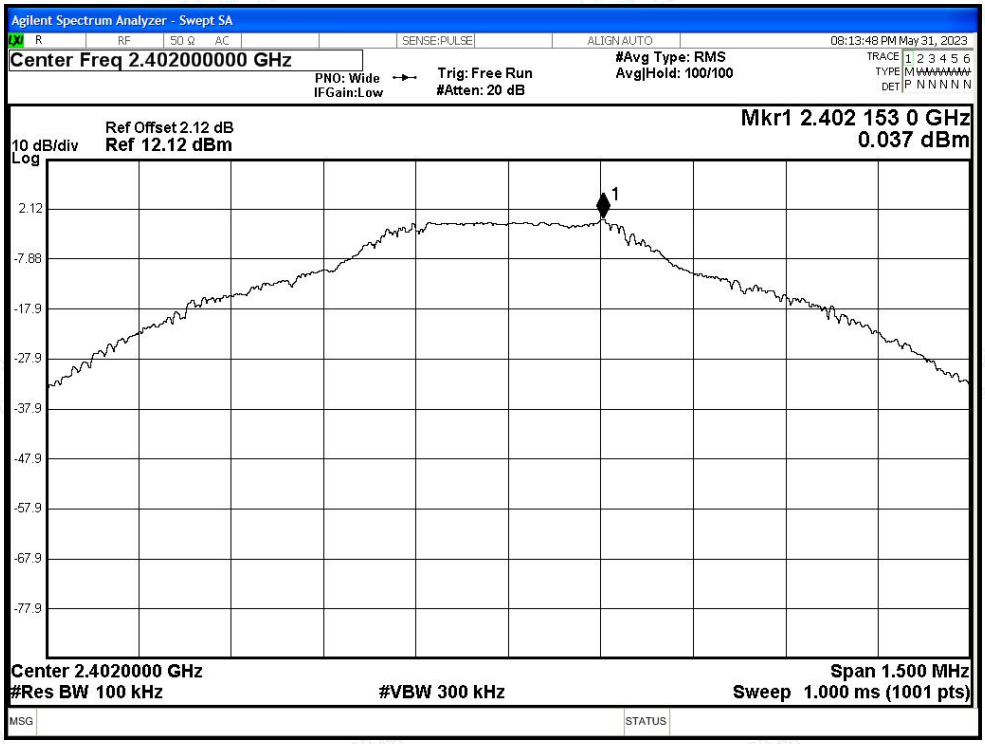


A.7 Conducted RF Spurious Emission

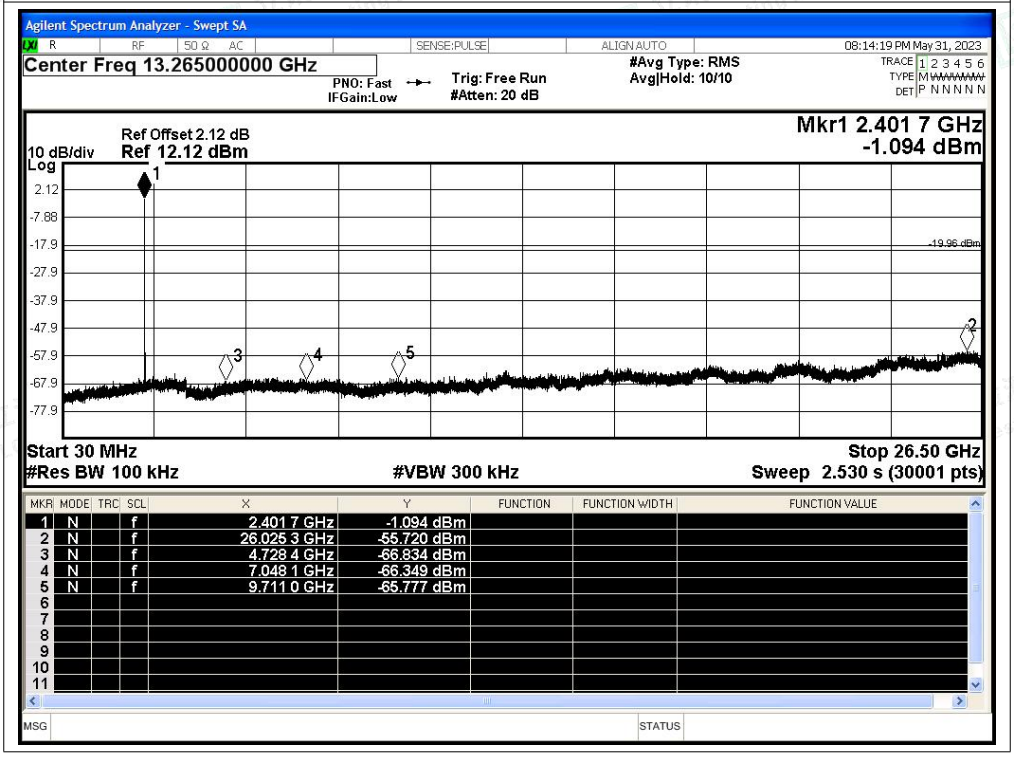
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH5	2402	Ant1	-55.76	-20	Pass
NVNT	1-DH5	2441	Ant1	-55.36	-20	Pass
NVNT	1-DH5	2480	Ant1	-55.98	-20	Pass

Test Graphs

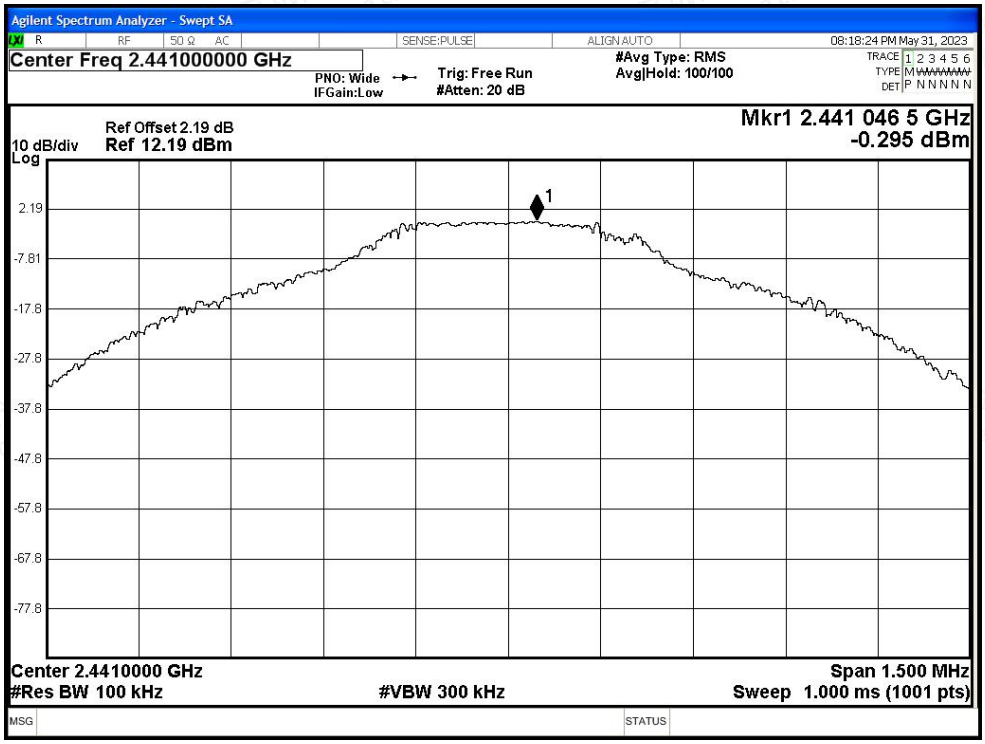
Tx. Spurious NVNT 1-DH5 2402MHz Ant1 Ref



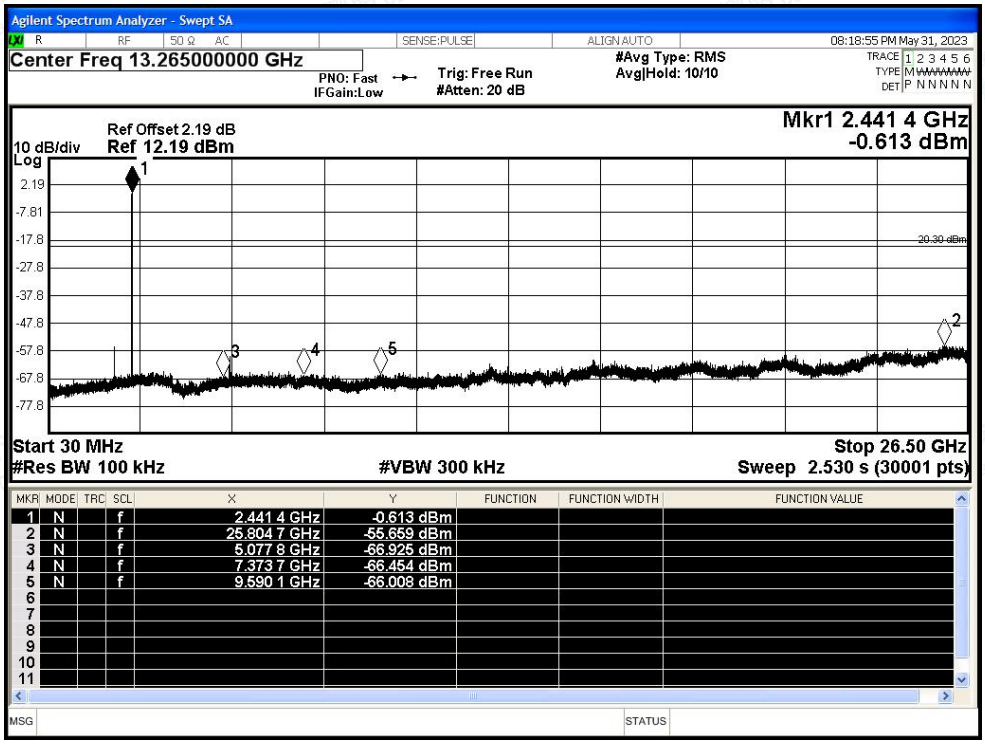
Tx. Spurious NVNT 1-DH5 2402MHz Ant1 Emission



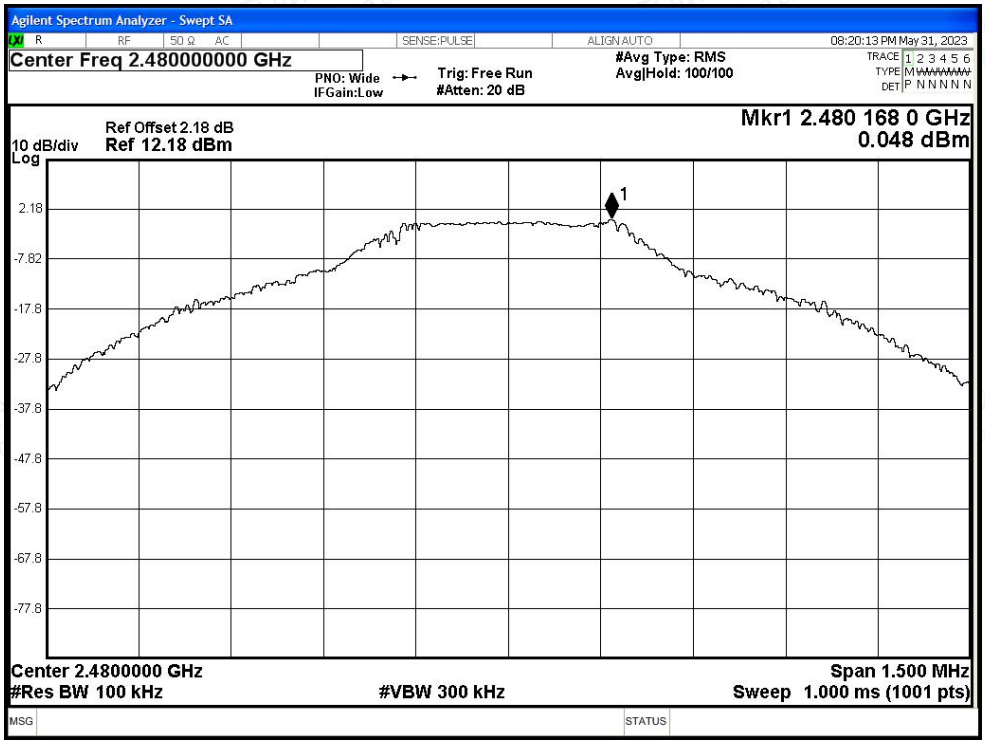
Tx. Spurious NVNT 1-DH5 2441MHz Ant1 Ref



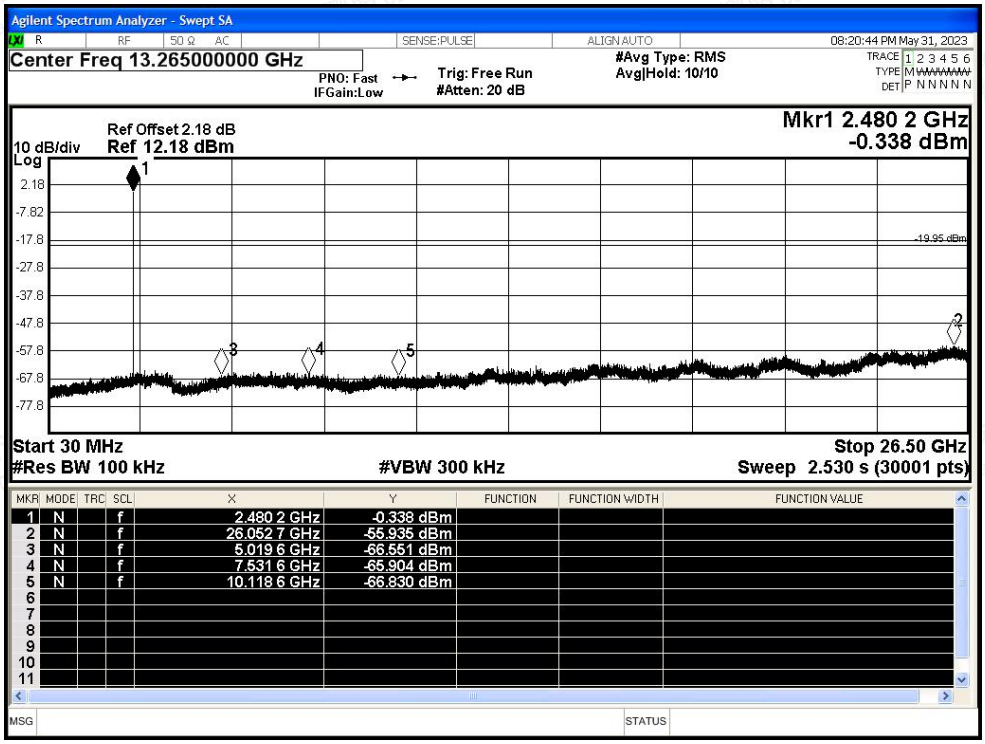
Tx. Spurious NVNT 1-DH5 2441MHz Ant1 Emission



Tx. Spurious NVNT 1-DH5 2480MHz Ant1 Ref



Tx. Spurious NVNT 1-DH5 2480MHz Ant1 Emission



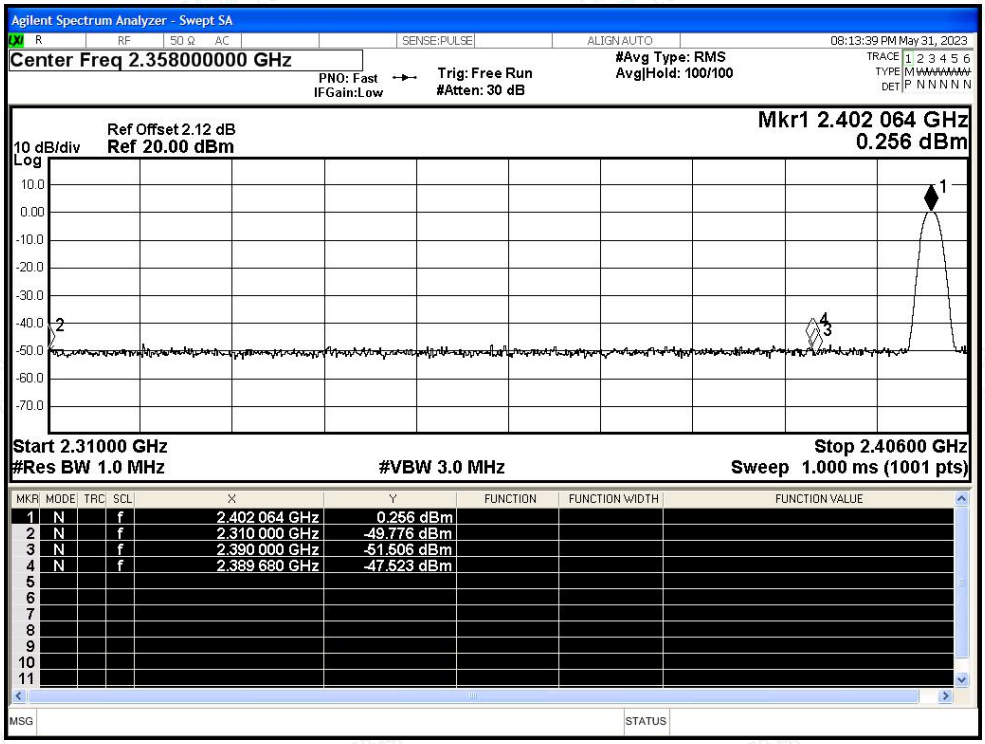
MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N		f	2.480 2 GHz	-0.338 dBm			
2	N		f	26.052 7 GHz	-55.935 dBm			
3	N		f	5.019 6 GHz	-66.551 dBm			
4	N		f	7.531 6 GHz	-65.904 dBm			
5	N		f	10.118 6 GHz	-66.830 dBm			
6								
7								
8								
9								
10								
11								

A.8 Restrict Band

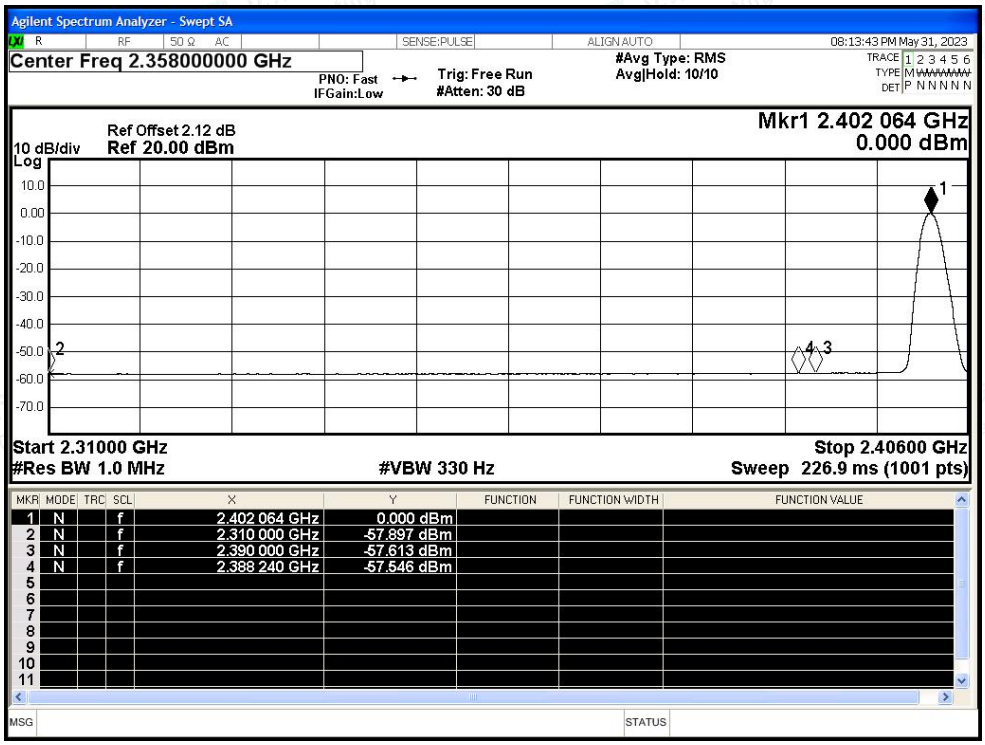
Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
NVNT	1-DH5	2402	Ant1	No-Hopping	2310	-49.78	3.85	49.33	Peak	74	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2310	-57.9	3.85	41.21	Average	54	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2389.68	-47.52	3.85	51.59	Peak	74	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2388.24	-57.55	3.85	41.56	Average	54	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2390	-51.51	3.85	47.60	Peak	74	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2390	-57.61	3.85	41.50	Average	54	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2483.5	-50.46	3.85	48.65	Peak	74	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2483.5	-55.74	3.85	43.37	Average	54	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2490.256	-46.66	3.85	52.45	Peak	74	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2483.512	-55.74	3.85	43.37	Average	54	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2500	-50.68	3.85	48.43	Peak	74	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2500	-57.34	3.85	41.77	Average	54	Pass

Test Graphs

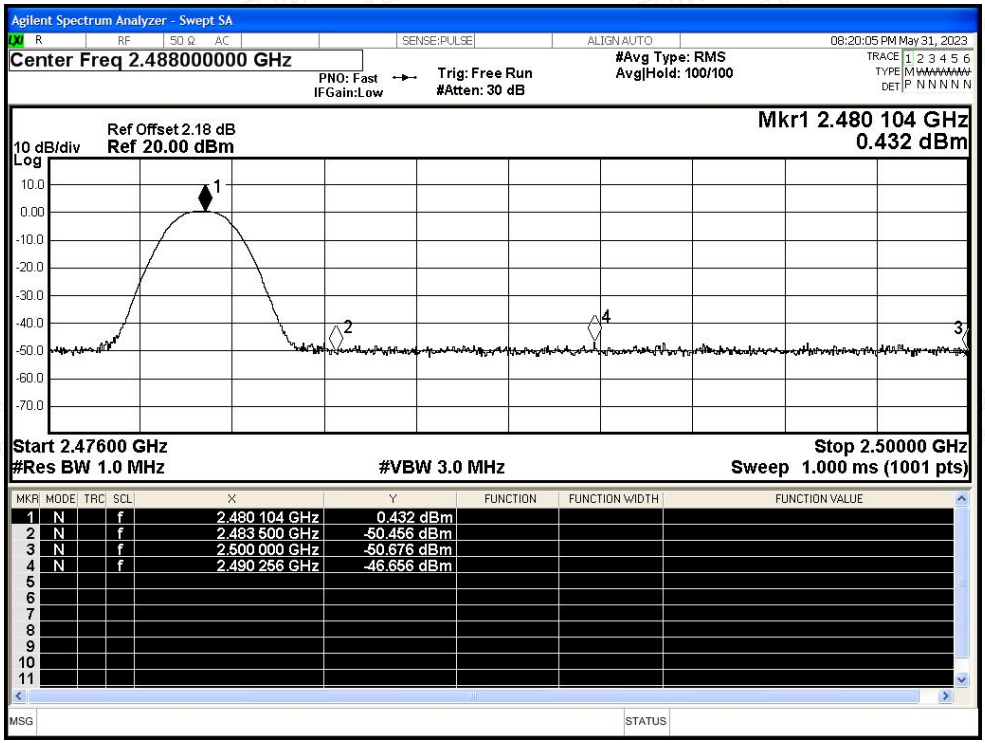
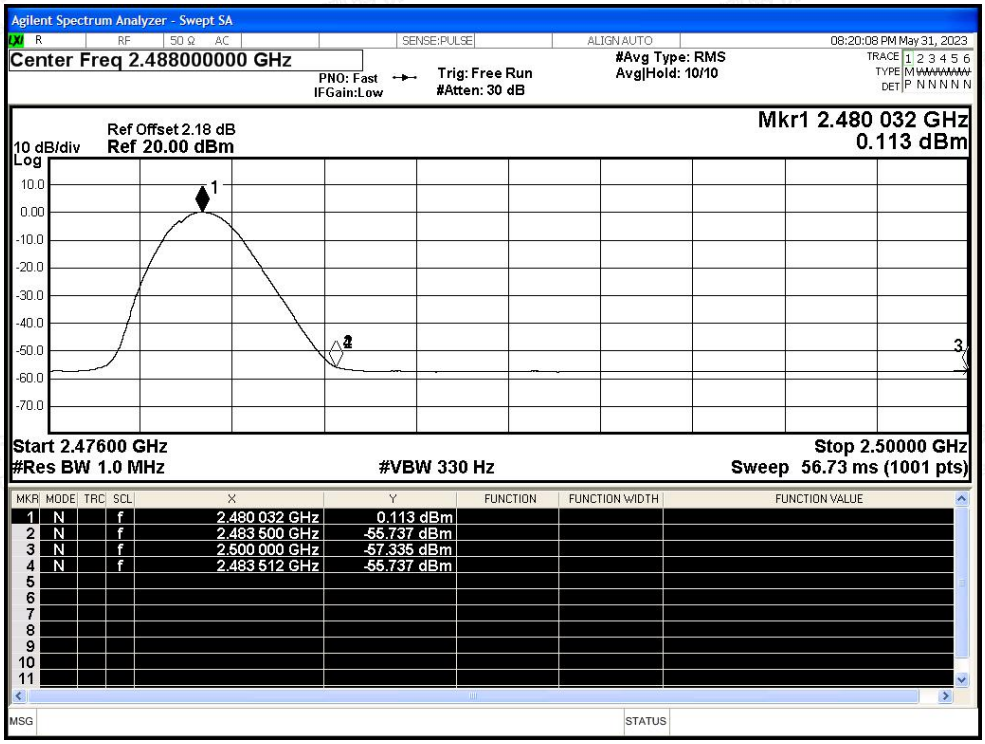
Restrict Band NVNT 1-DH5 2402MHz Ant1 No-Hopping Peak



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