



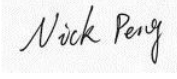

Appendix A

RF Test Data for BT (Conducted Measurement)

Product Name: Smart switch

Test Model: Shelly Plus 2PM

Environmental Conditions

Temperature:	23.8 °C
Relative Humidity:	52.2%
ATM Pressure:	100.0 kPa
Test Engineer:	 Nick Peng
Supervised by:	 Li Huan





A.1 -20dB Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	-20 dB Bandwidth (MHz)	Limit -20 dB Bandwidth (MHz)	Verdict
NVNT	1-DH5	2402	Ant1	0.916	N/A	Pass
NVNT	1-DH5	2441	Ant1	0.926	N/A	Pass
NVNT	1-DH5	2480	Ant1	0.933	N/A	Pass
NVNT	2-DH5	2402	Ant1	1.319	N/A	Pass
NVNT	2-DH5	2441	Ant1	1.319	N/A	Pass
NVNT	2-DH5	2480	Ant1	1.315	N/A	Pass
NVNT	3-DH5	2402	Ant1	1.316	N/A	Pass
NVNT	3-DH5	2441	Ant1	1.303	N/A	Pass
NVNT	3-DH5	2480	Ant1	1.303	N/A	Pass





Test Graphs

-20dB Bandwidth NVNT 1-DH5 2402MHz Ant1



-20dB Bandwidth NVNT 1-DH5 2441MHz Ant1

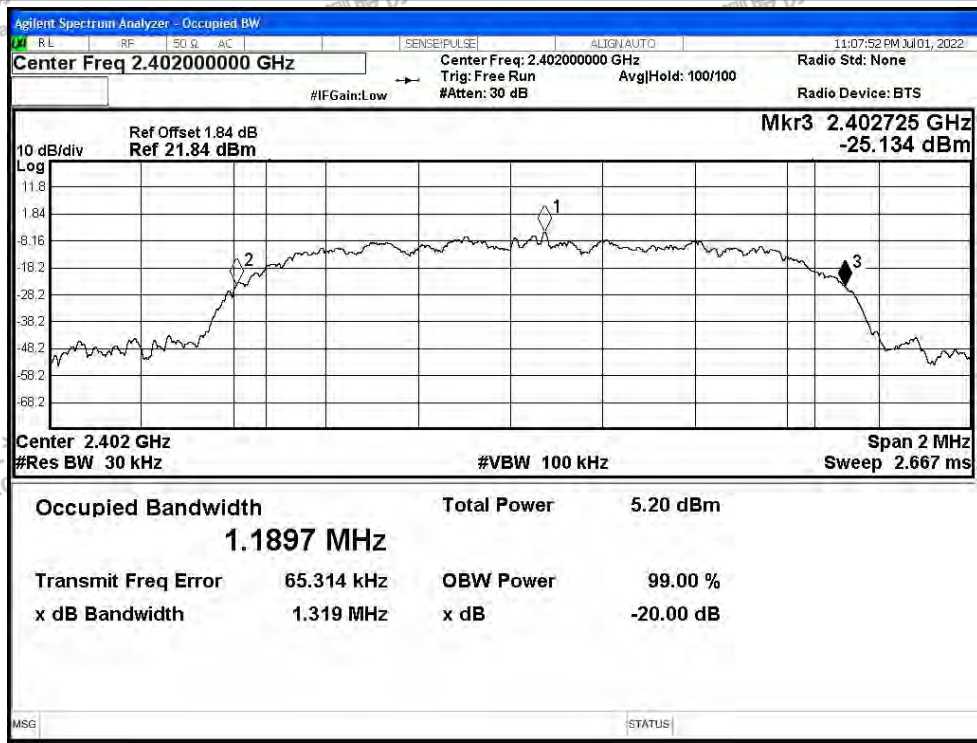




-20dB Bandwidth NVNT 1-DH5 2480MHz Ant1

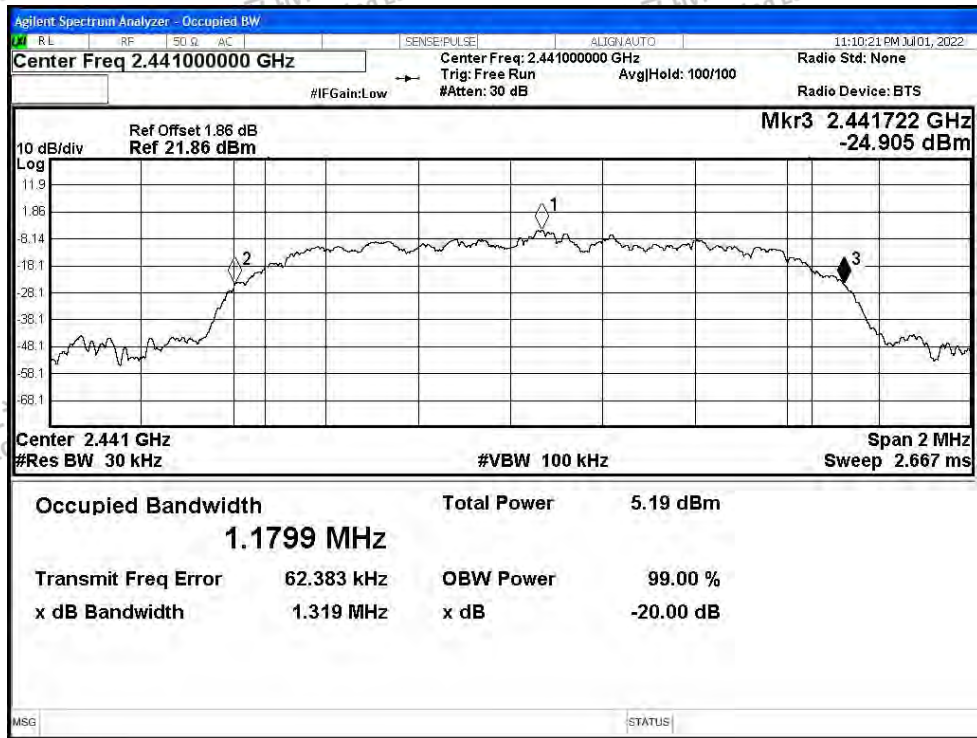


-20dB Bandwidth NVNT 2-DH5 2402MHz Ant1

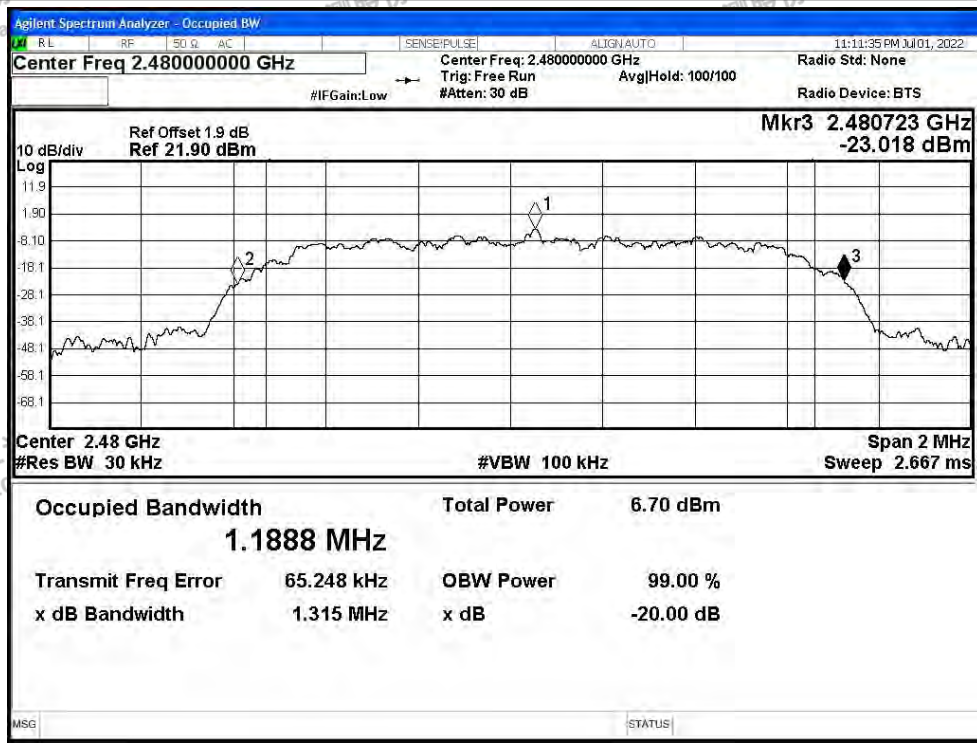




-20dB Bandwidth NVNT 2-DH5 2441MHz Ant1

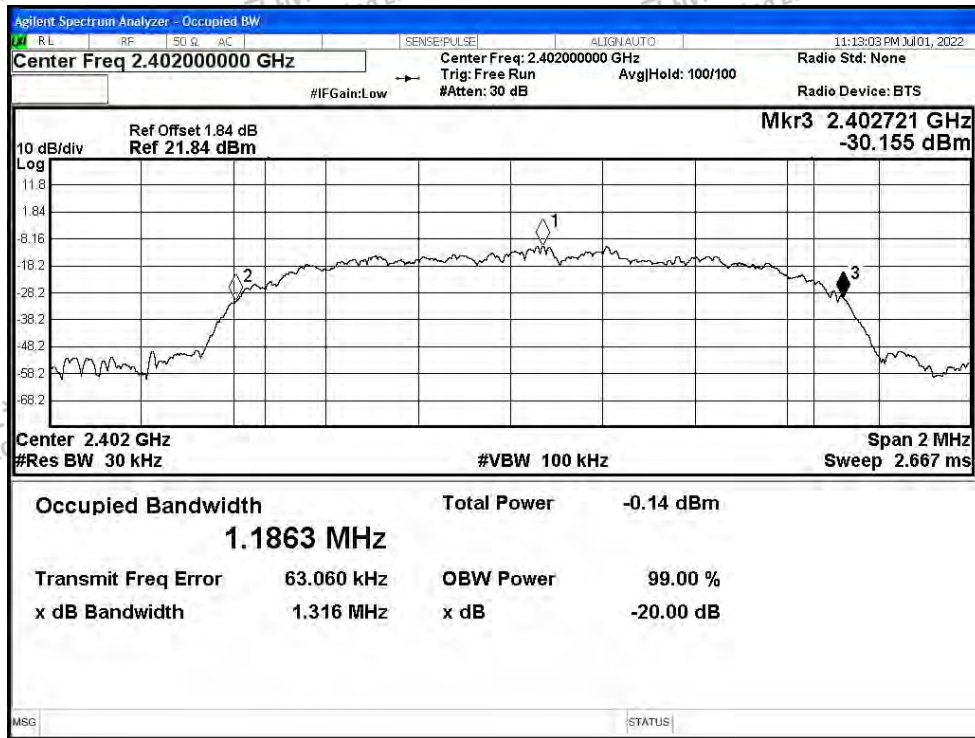


-20dB Bandwidth NVNT 2-DH5 2480MHz Ant1

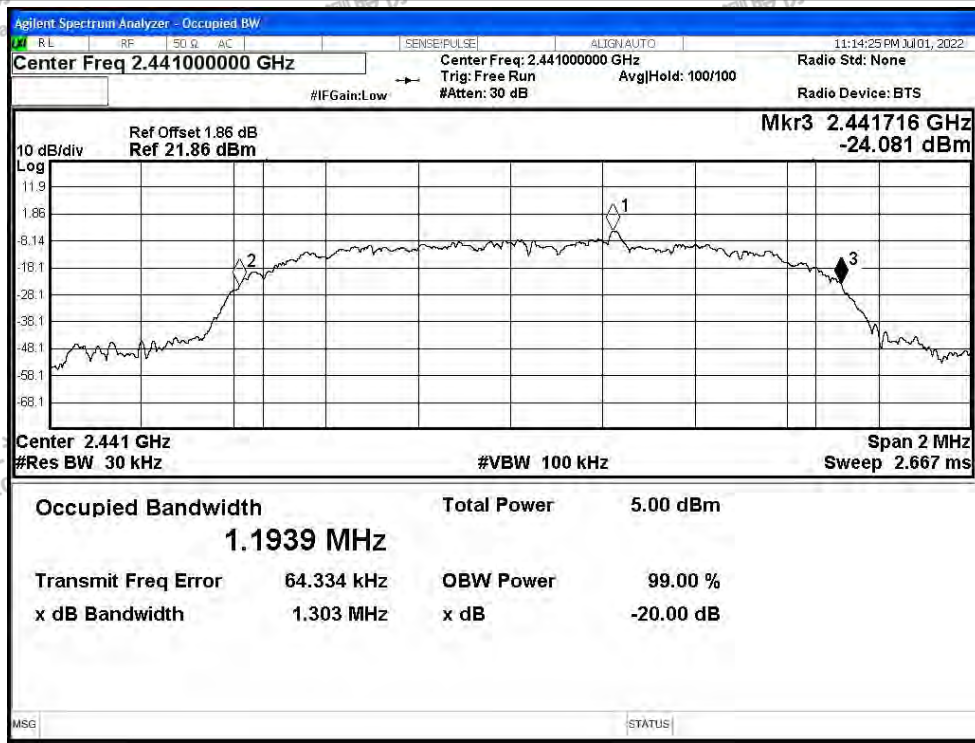




-20dB Bandwidth NVNT 3-DH5 2402MHz Ant1

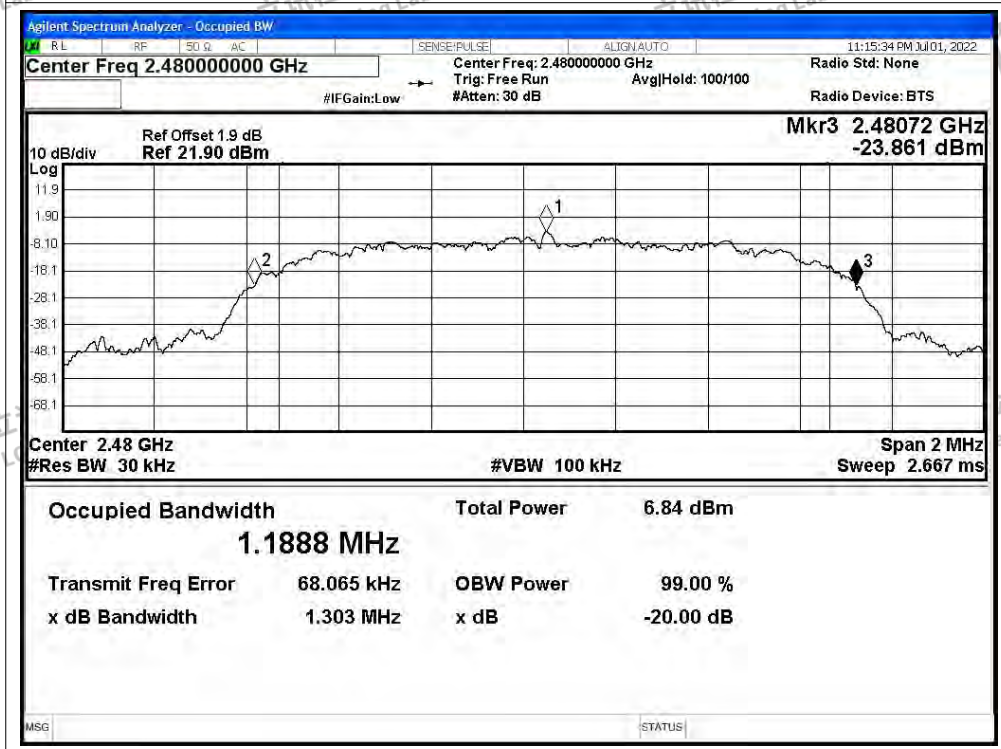


-20dB Bandwidth NVNT 3-DH5 2441MHz Ant1





-20dB Bandwidth NVNT 3-DH5 2480MHz Ant1





A.2 Maximum Peak Conducted Output Power

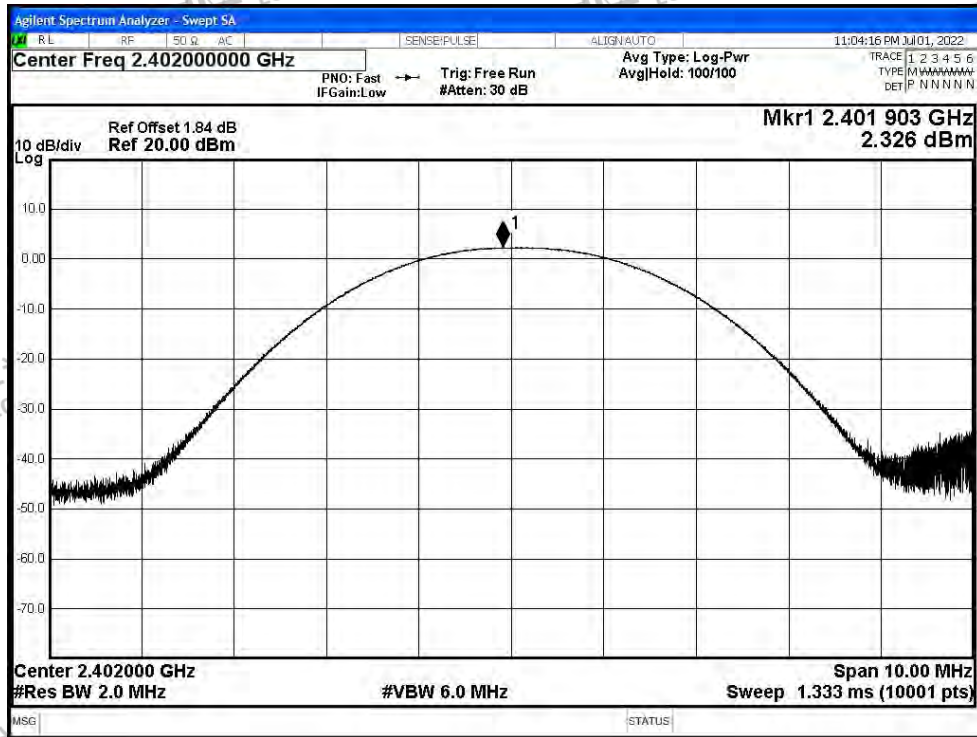
Condition	Mode	Frequency (MHz)	Antenna	Total Power (dBm)	Limit (dBm)	Verdict
NVNT	1-DH5	2402	Ant1	2.33	21	Pass
NVNT	1-DH5	2441	Ant1	1.52	21	Pass
NVNT	1-DH5	2480	Ant1	0.72	21	Pass
NVNT	2-DH5	2402	Ant1	1.5	21	Pass
NVNT	2-DH5	2441	Ant1	1.13	21	Pass
NVNT	2-DH5	2480	Ant1	3.05	21	Pass
NVNT	3-DH5	2402	Ant1	1.9	21	Pass
NVNT	3-DH5	2441	Ant1	1.76	21	Pass
NVNT	3-DH5	2480	Ant1	3.62	21	Pass



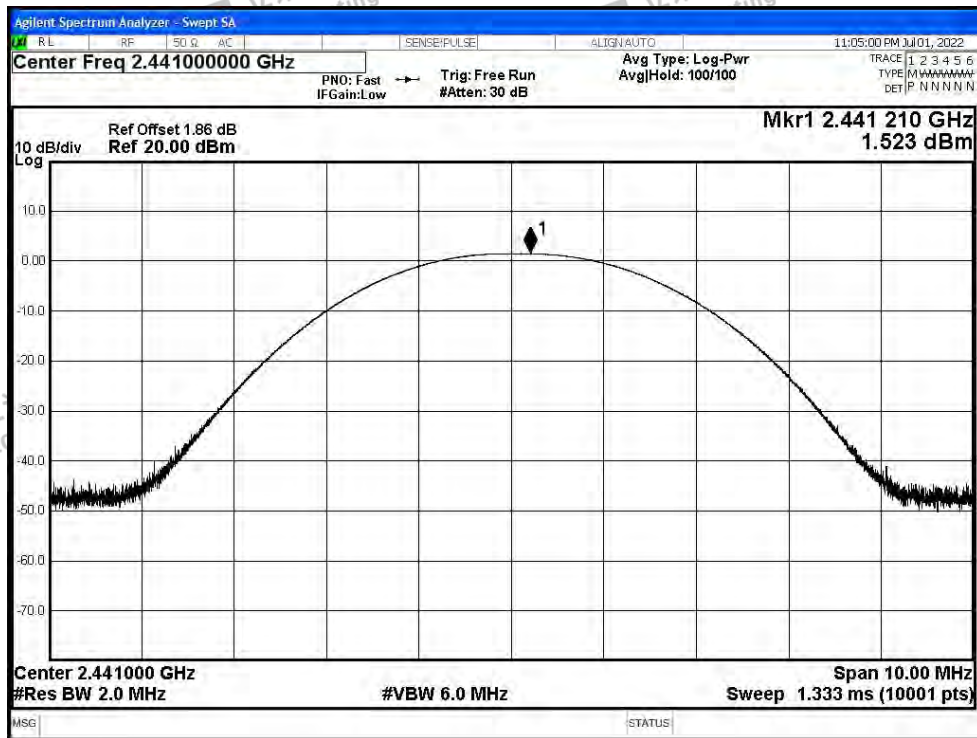


Test Graphs

Power NVNT 1-DH5 2402MHz Ant1

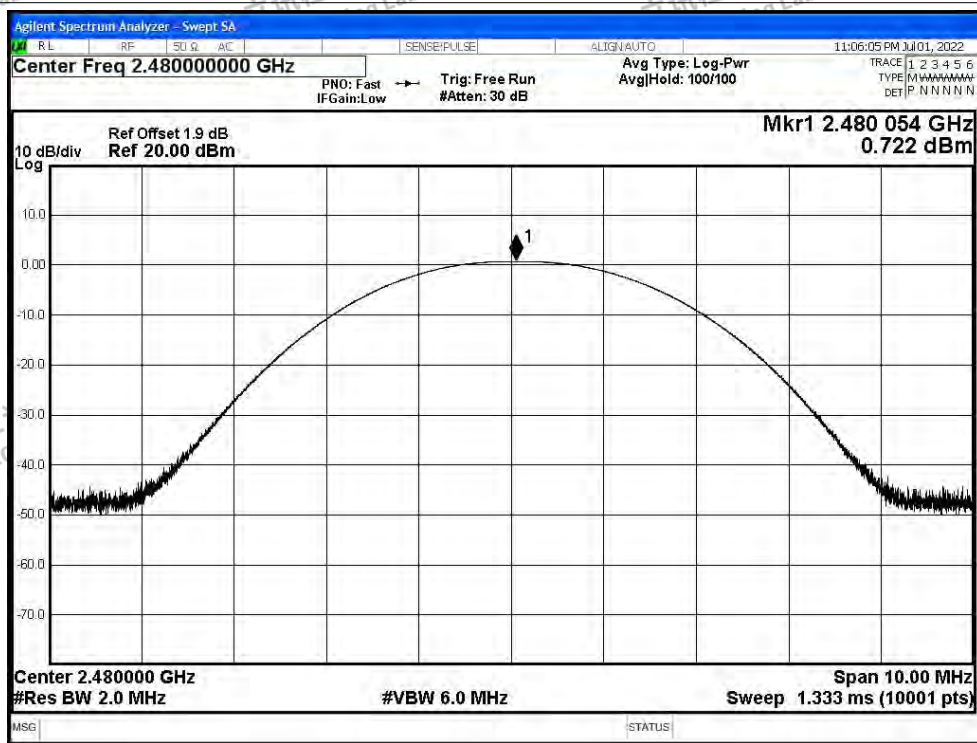


Power NVNT 1-DH5 2441MHz Ant1

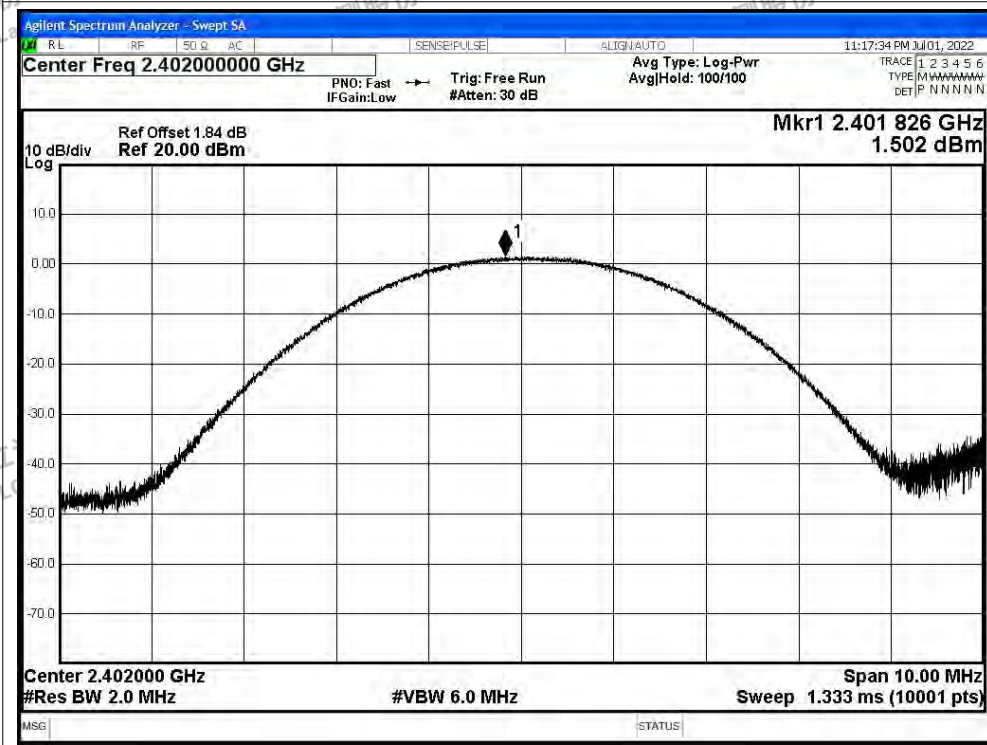




Power NVNT 1-DH5 2480MHz Ant1

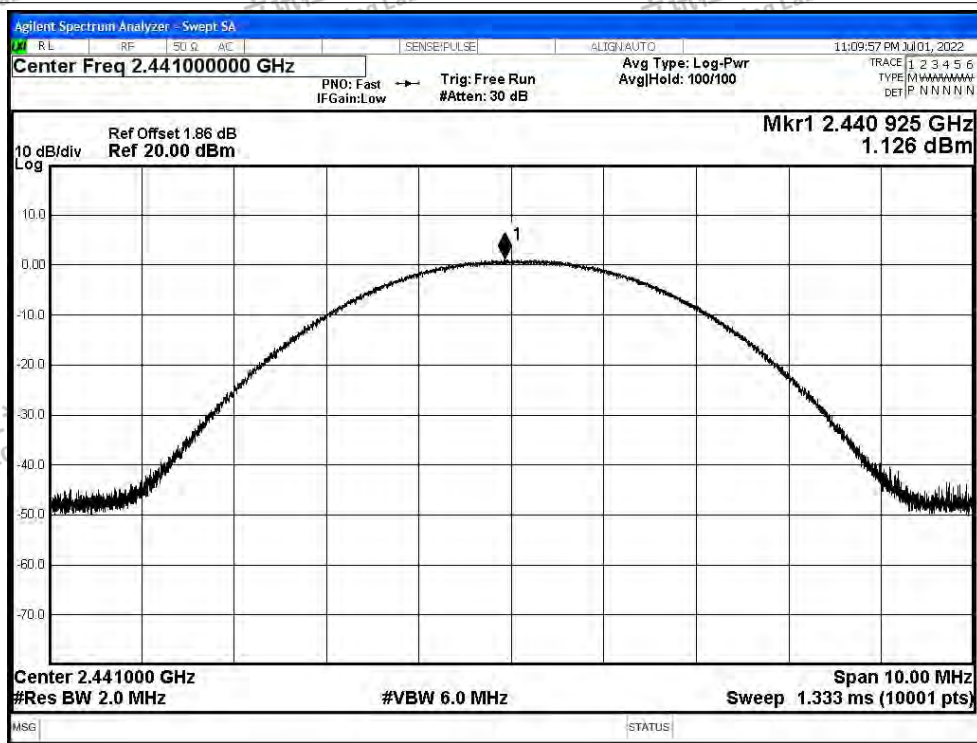


Power NVNT 2-DH5 2402MHz Ant1

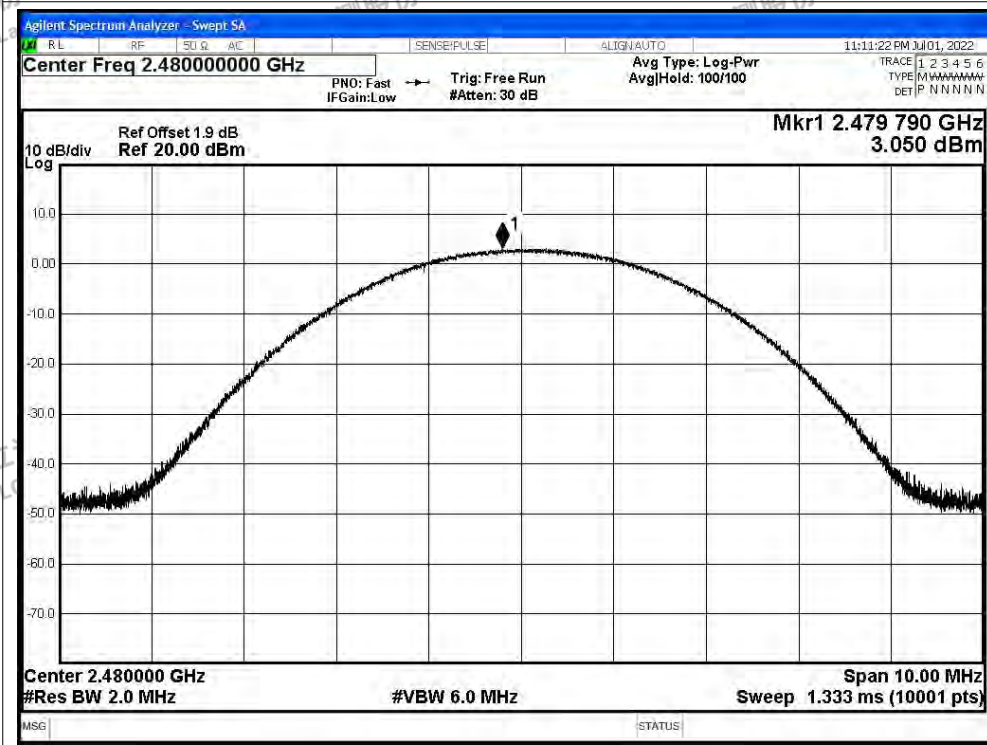




Power NVNT 2-DH5 2441MHz Ant1

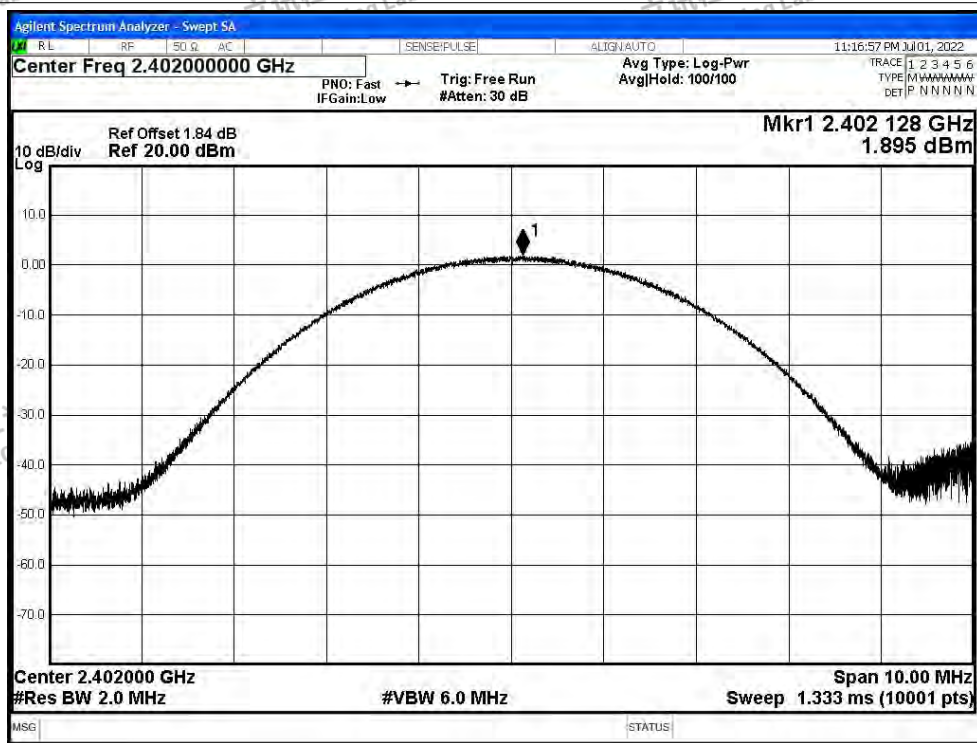


Power NVNT 2-DH5 2480MHz Ant1

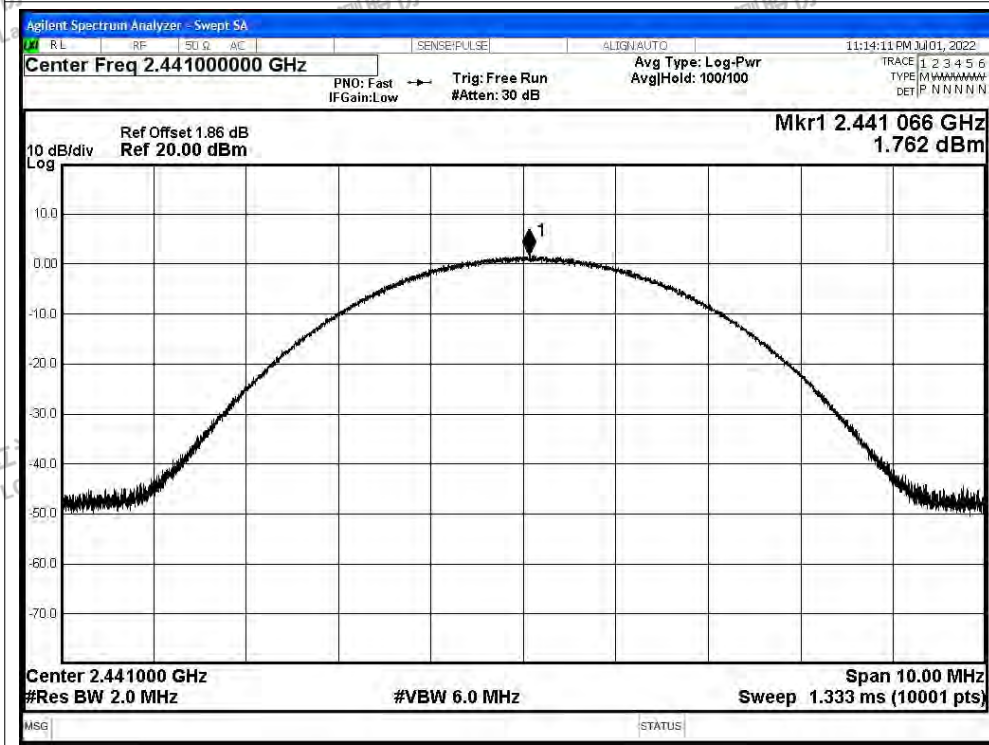


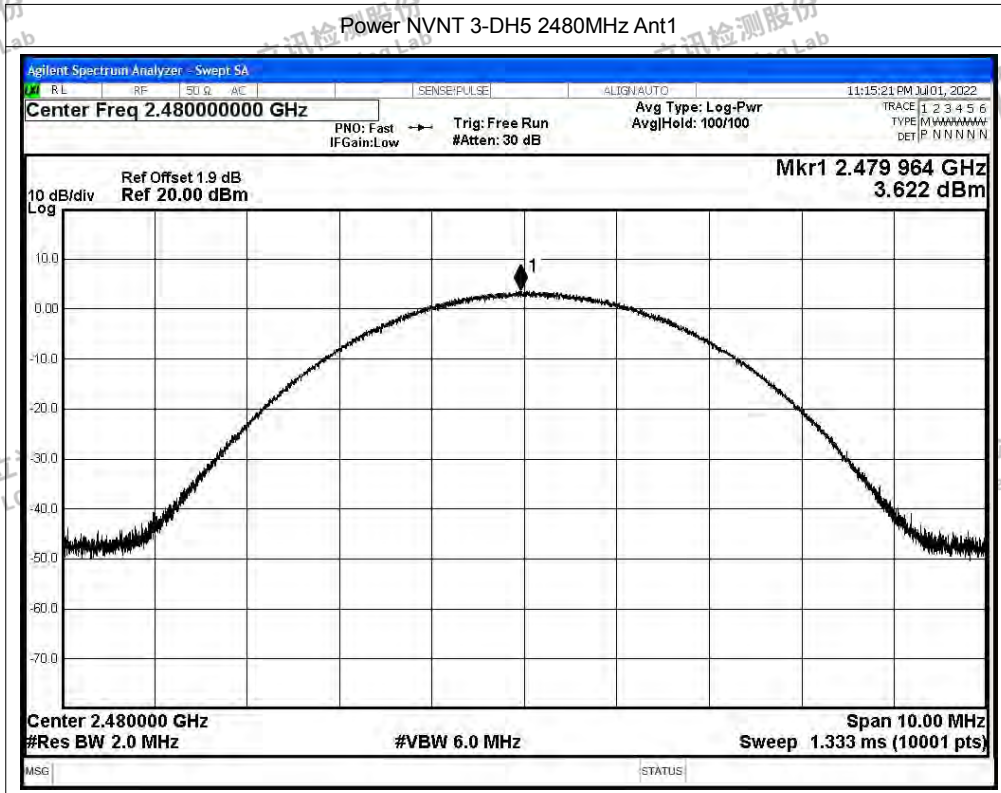


Power NVNT 3-DH5 2402MHz Ant1



Power NVNT 3-DH5 2441MHz Ant1







A.3 Carrier Frequencies Separation

Condition	Mode	Antenna	Hopping Freq1 (MHz)	Hopping Freq2 (MHz)	HFS (MHz)	Limit (MHz)	Verdict
NVNT	1-DH5	Ant1	2402.05	2403.058	1.008	0.611	Pass
NVNT	2-DH5	Ant1	2402.202	2403.132	0.93	0.879	Pass
NVNT	3-DH5	Ant1	2402.224	2403.222	0.998	0.877	Pass

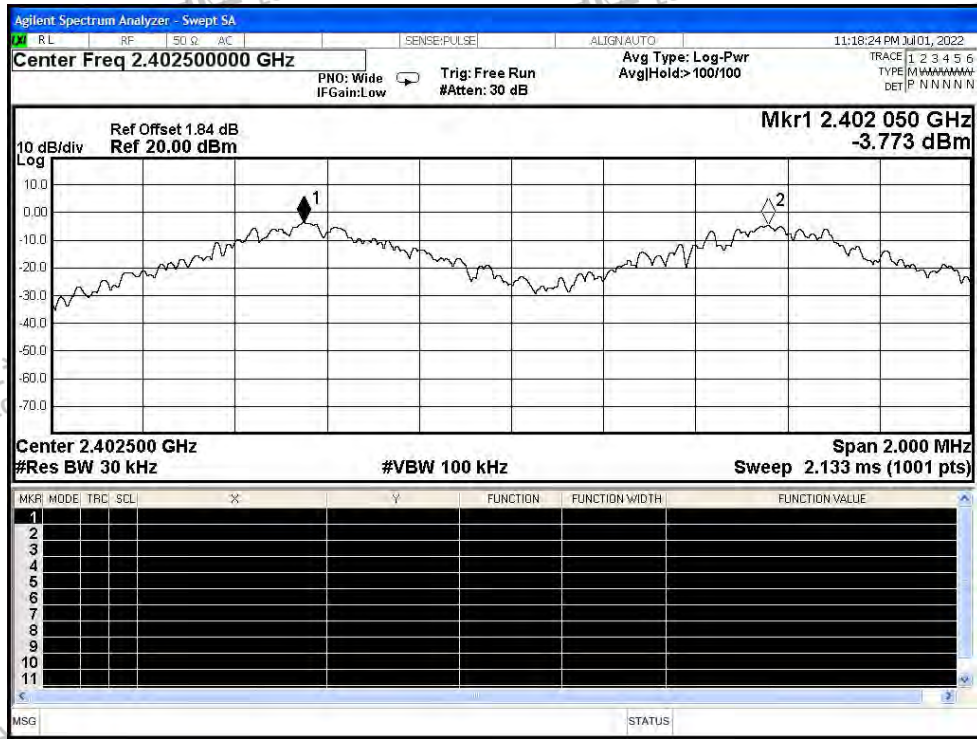


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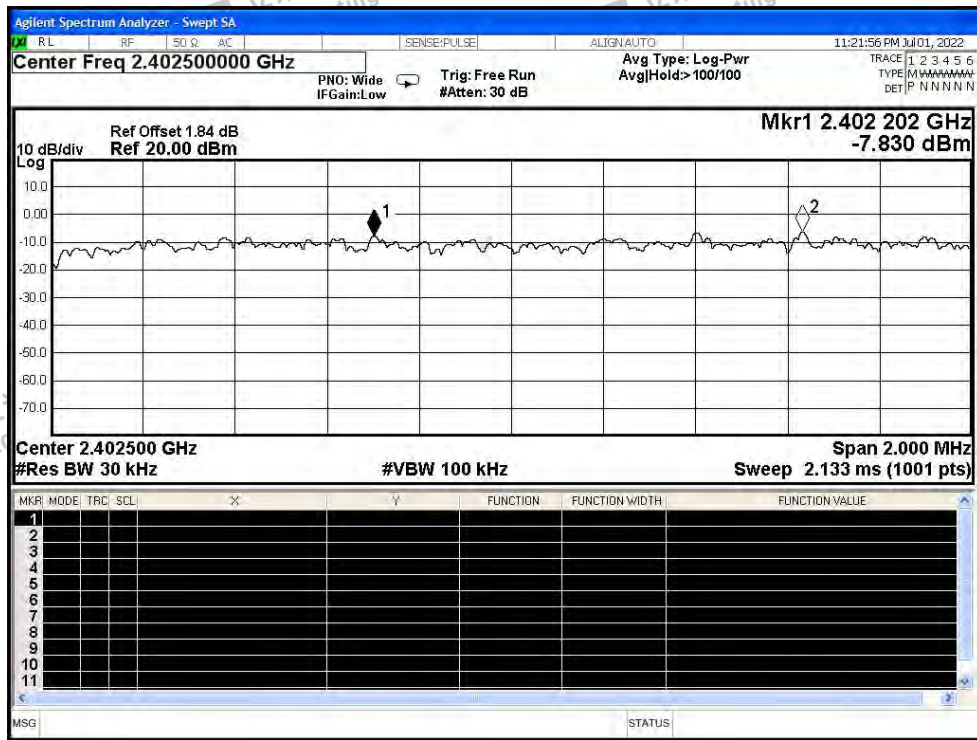


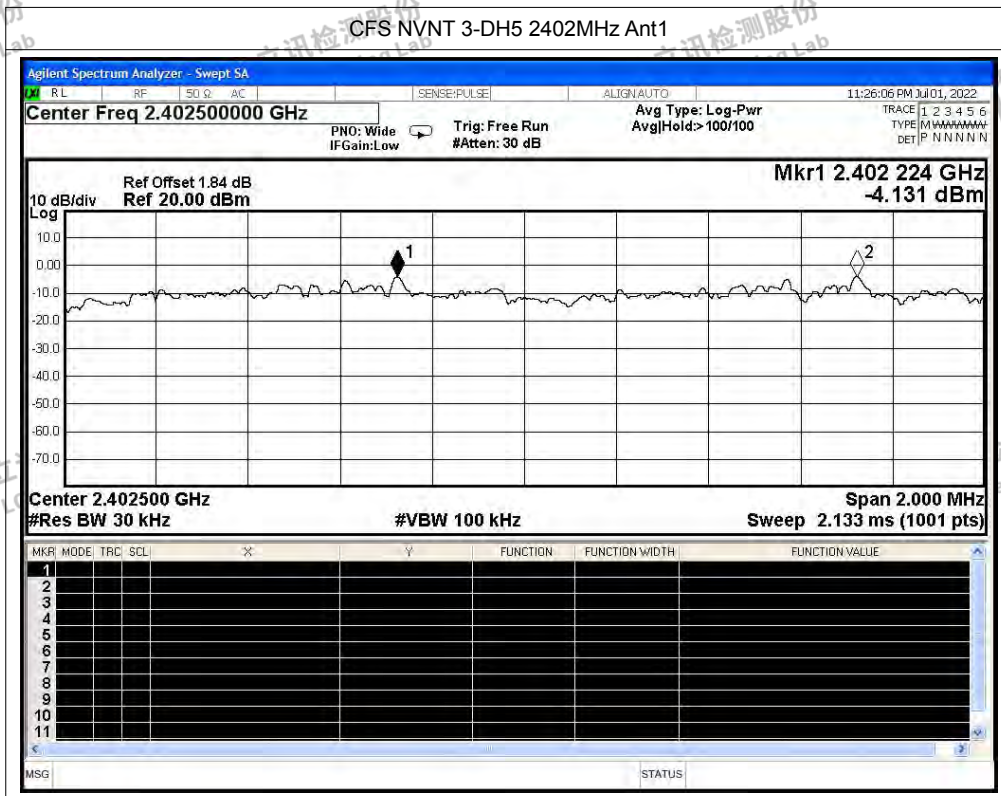
Test Graphs

CFS NVNT 1-DH5 2402MHz Ant1



CFS NVNT 2-DH5 2402MHz Ant1







A.4 Dwell Time

Condition	Mode	Frequency (MHz)	Antenna	Pulse Time (ms)	Total Dwell Time (ms)	Burst Count	Period Time (ms)	Limit (ms)	Verdict
NVNT	1-DH5	2402	Ant1	2.881	302.505	105	31600	400	Pass
NVNT	2-DH5	2402	Ant1	2.888	335.008	116	31600	400	Pass
NVNT	3-DH5	2402	Ant1	2.89	315.01	109	31600	400	Pass

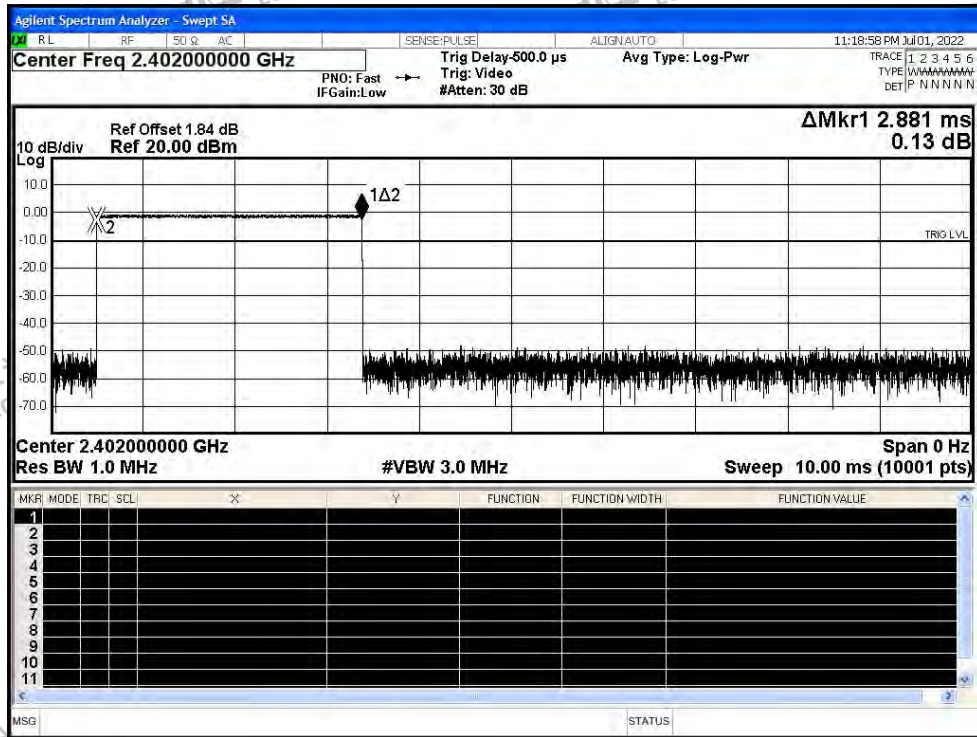


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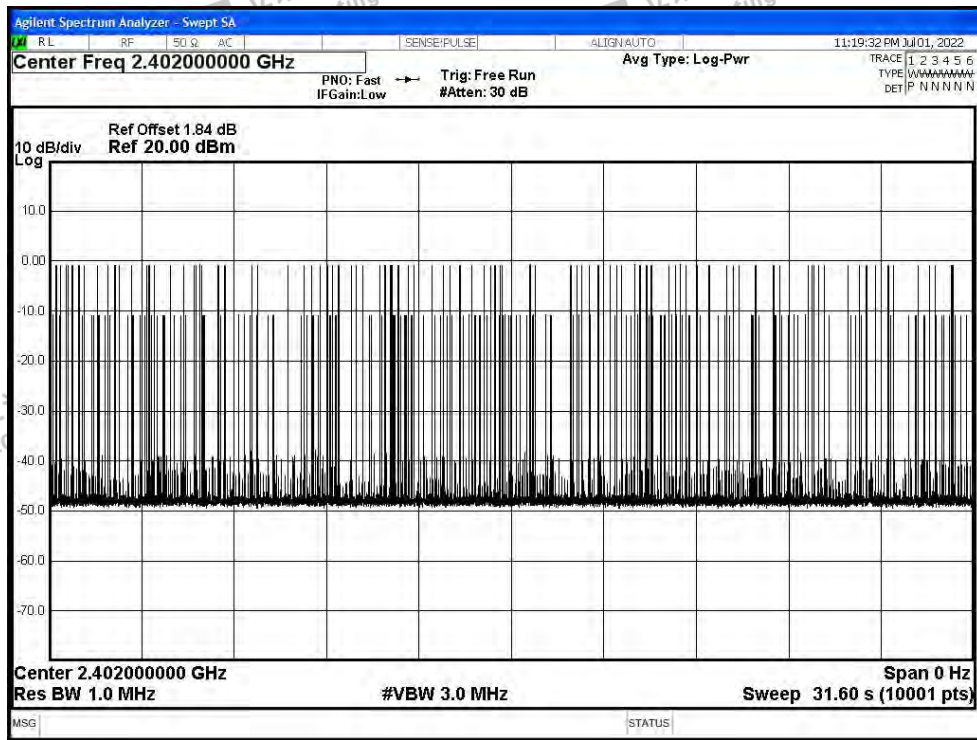


Test Graphs

Dwell-NVNT 1-DH5 2402MHz Ant1 One Burst

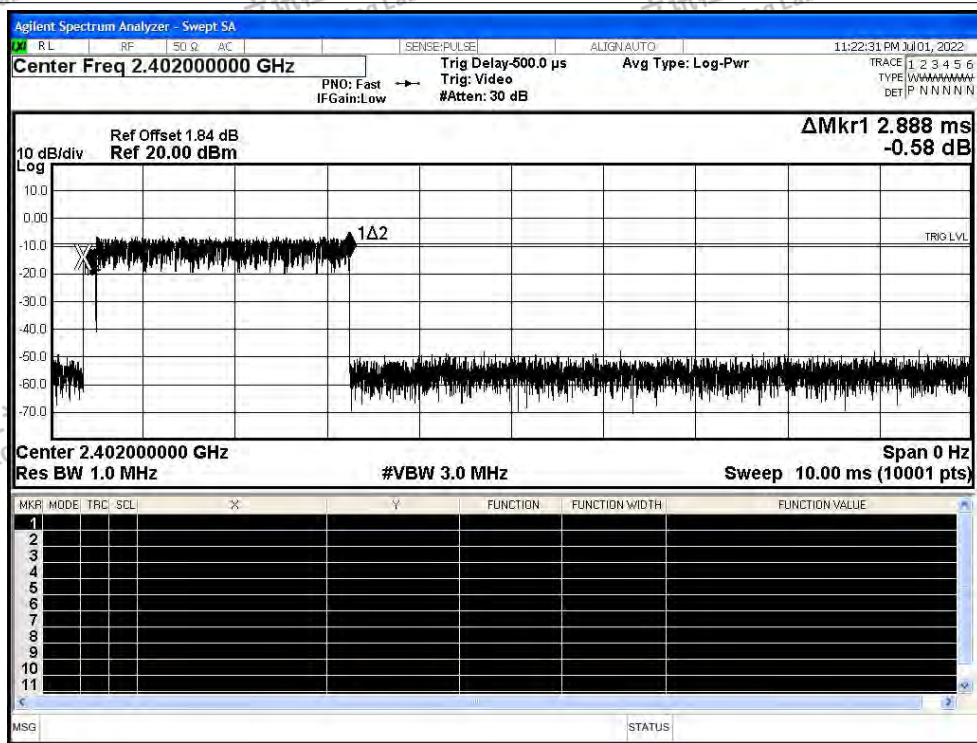


Dwell-NVNT 1-DH5 2402MHz Ant1 Accumulated

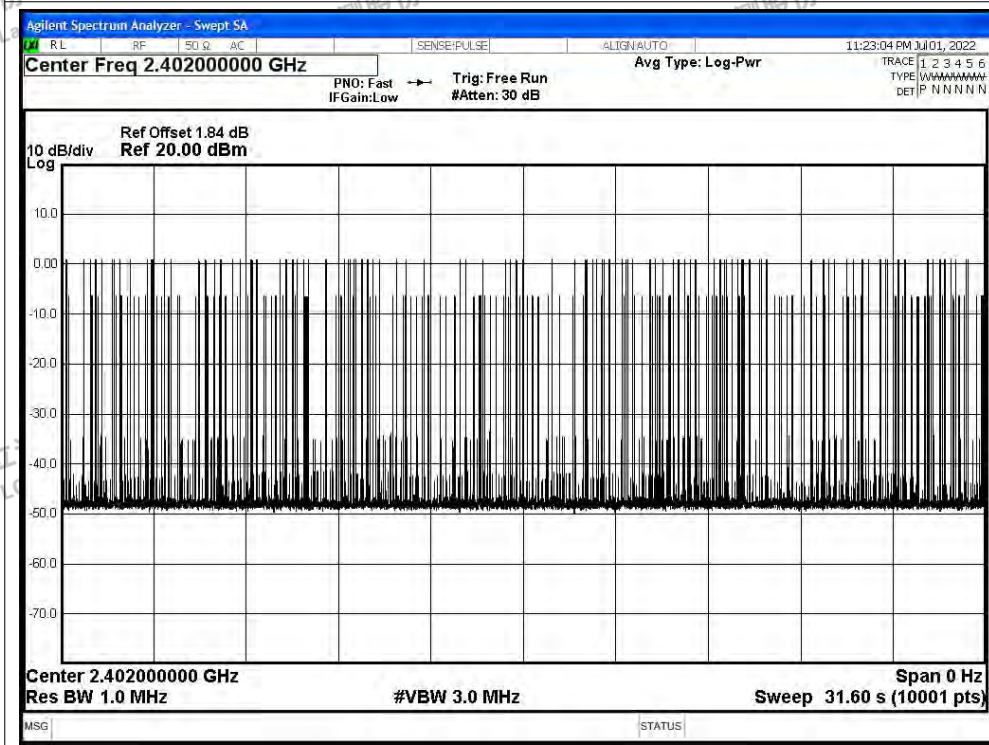




Dwell NVNT 2-DH5 2402MHz Ant1 One Burst

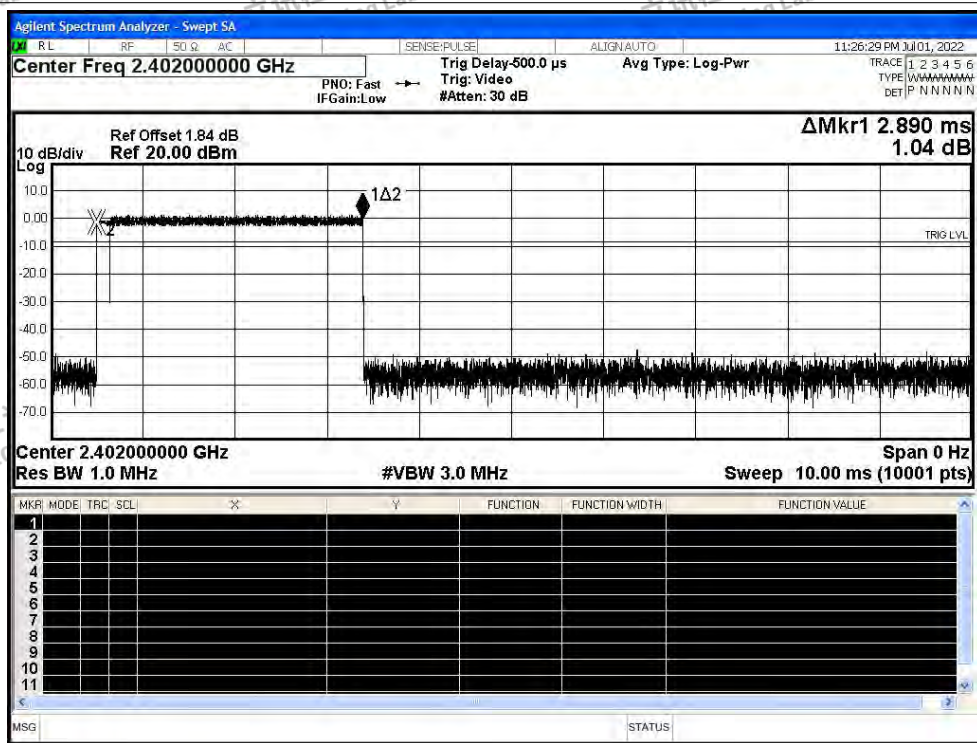


Dwell NVNT 2-DH5 2402MHz Ant1 Accumulated

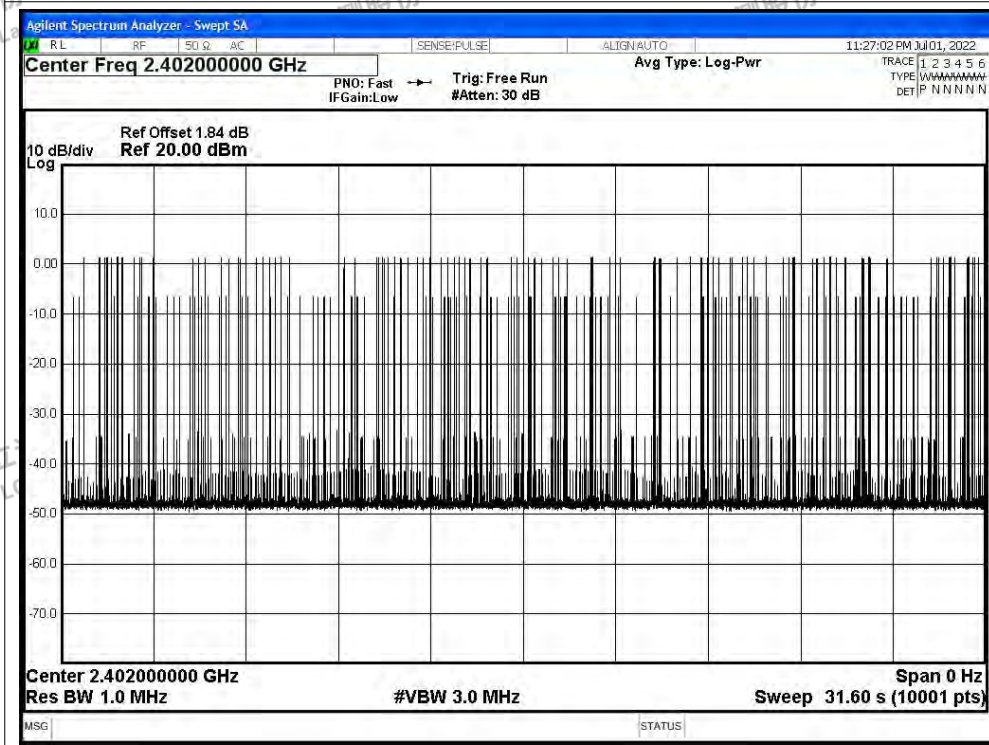




Dwell NVNT 3-DH5 2402MHz Ant1 One Burst



Dwell NVNT 3-DH5 2402MHz Ant1 Accumulated





A.5 Number of Hopping Channel

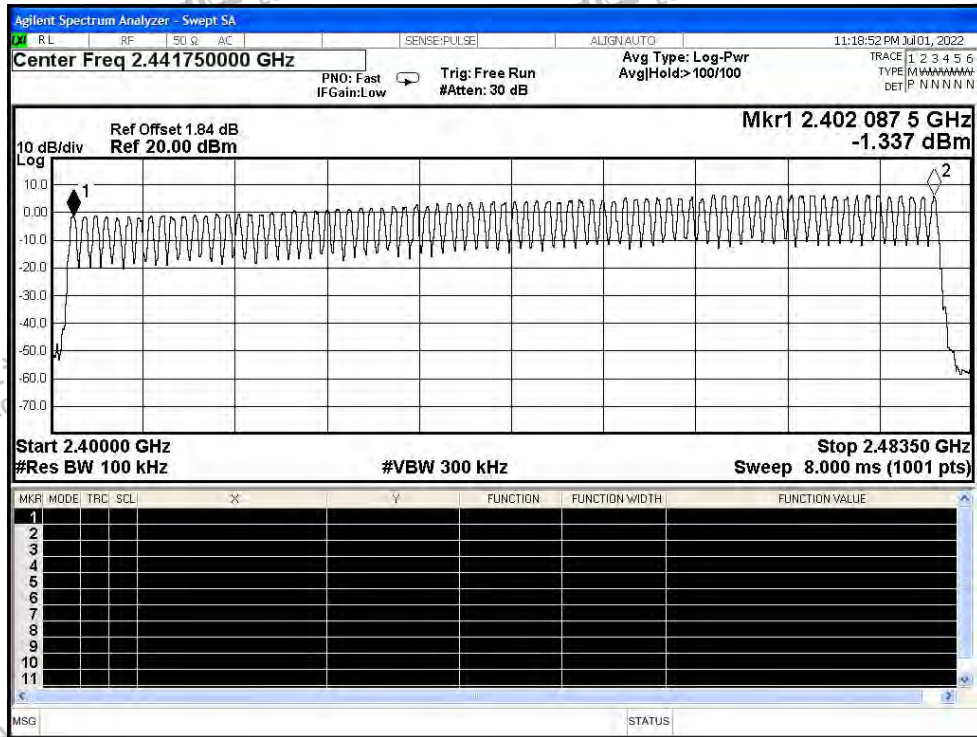
Condition	Mode	Antenna	Hopping Number	Limit	Verdict
NVNT	1-DH5	Ant1	79	15	Pass
NVNT	2-DH5	Ant1	79	15	Pass
NVNT	3-DH5	Ant1	79	15	Pass



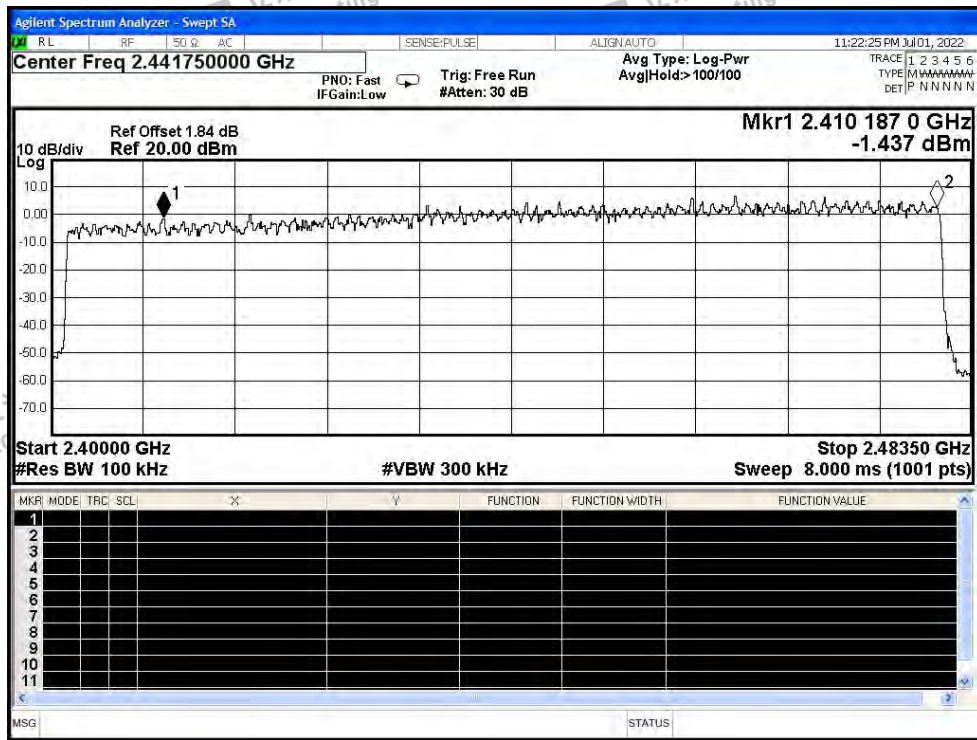


Test Graphs

Hopping No. NVNT 1-DH5 2402MHz Ant1

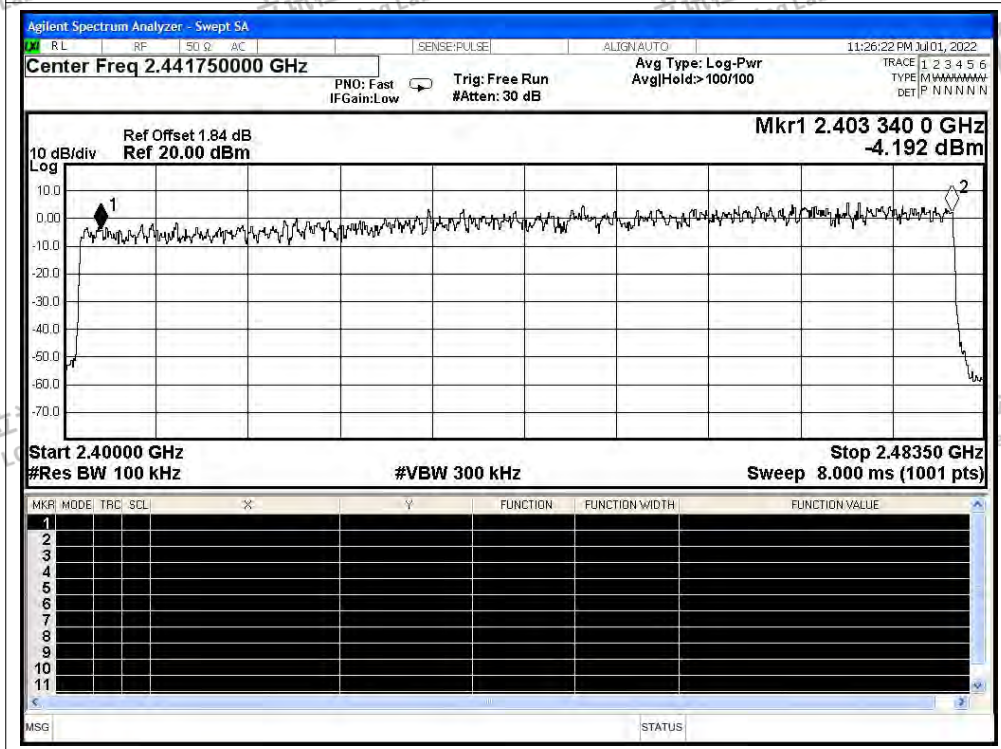


Hopping No. NVNT 2-DH5 2402MHz Ant1





Hopping No. NVNT 3-DH5 2402MHz Ant1



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A.6 Band Edge

Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH5	2402	Ant1	No-Hopping	-51.81	-20	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	-64.68	-20	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	-51.89	-20	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	-55.02	-20	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	-49.15	-20	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	-57.88	-20	Pass



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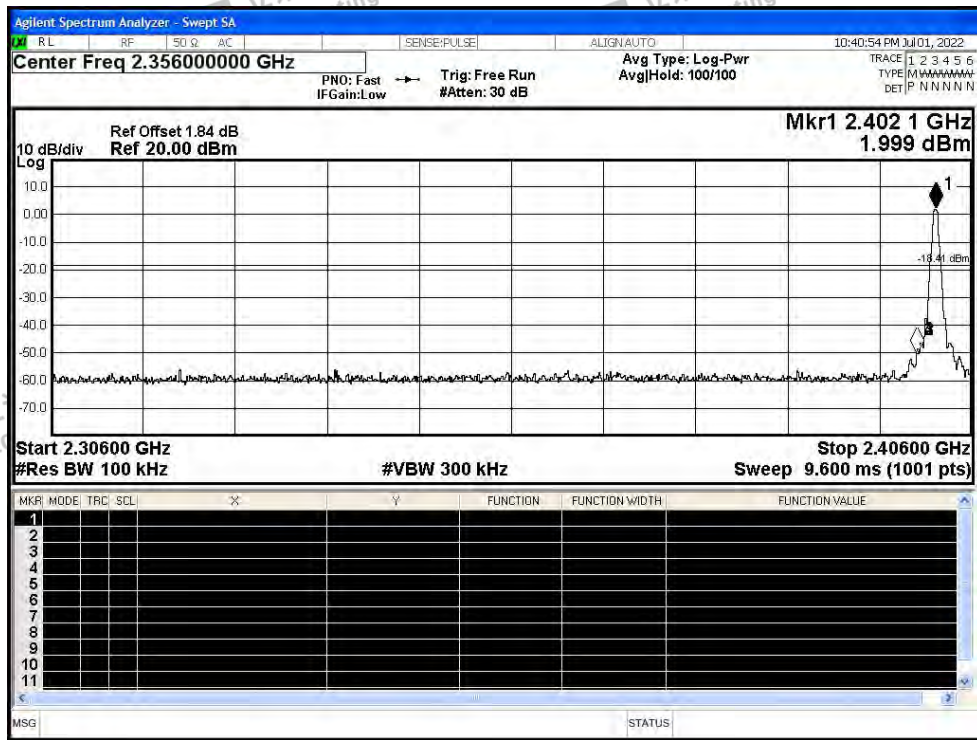


Test Graphs

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



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

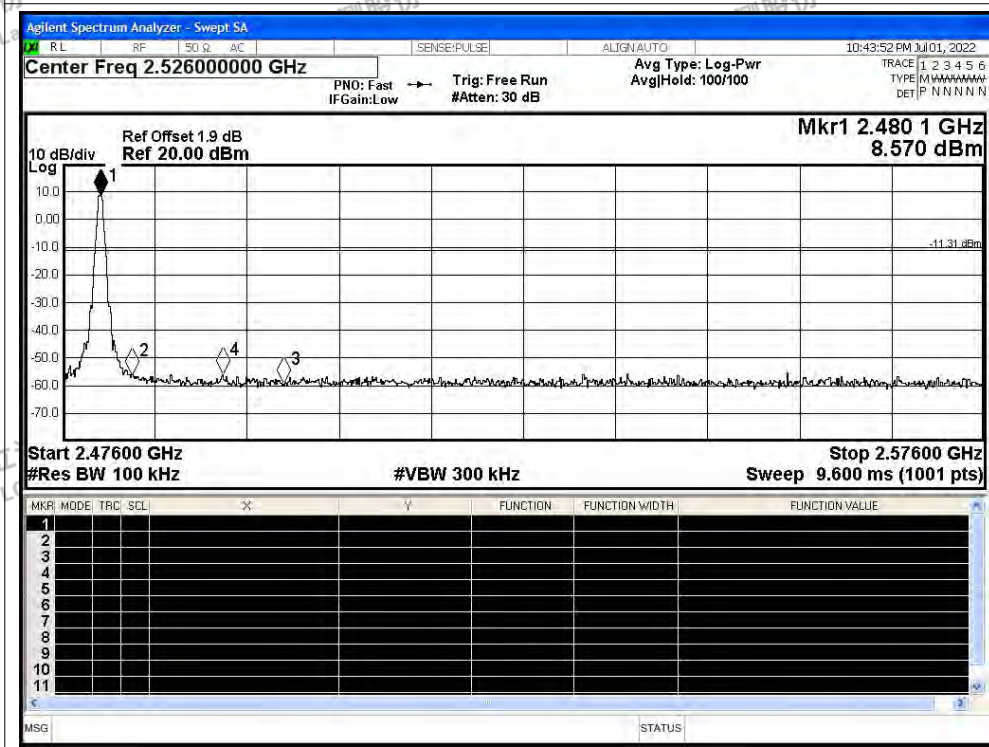




Band Edge NVNT 1-DH5 2480MHz Ant1 No-Hopping Ref

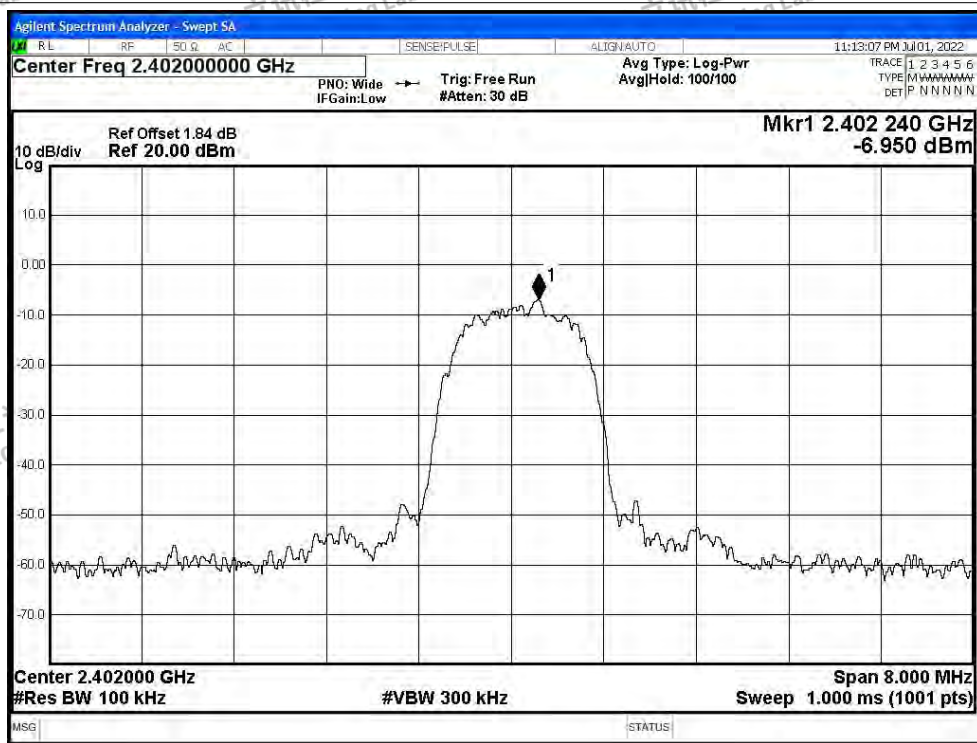


Band Edge NVNT 1-DH5 2480MHz Ant1 No-Hopping Emission

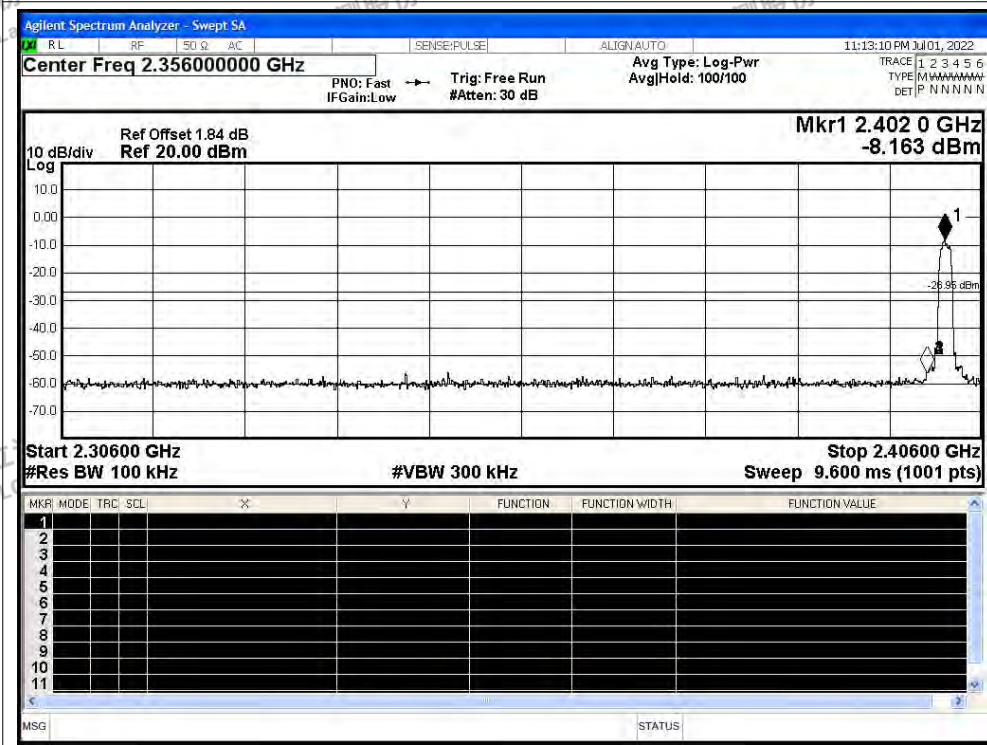




Band Edge NVNT 3-DH5 2402MHz Ant1 No-Hopping Ref

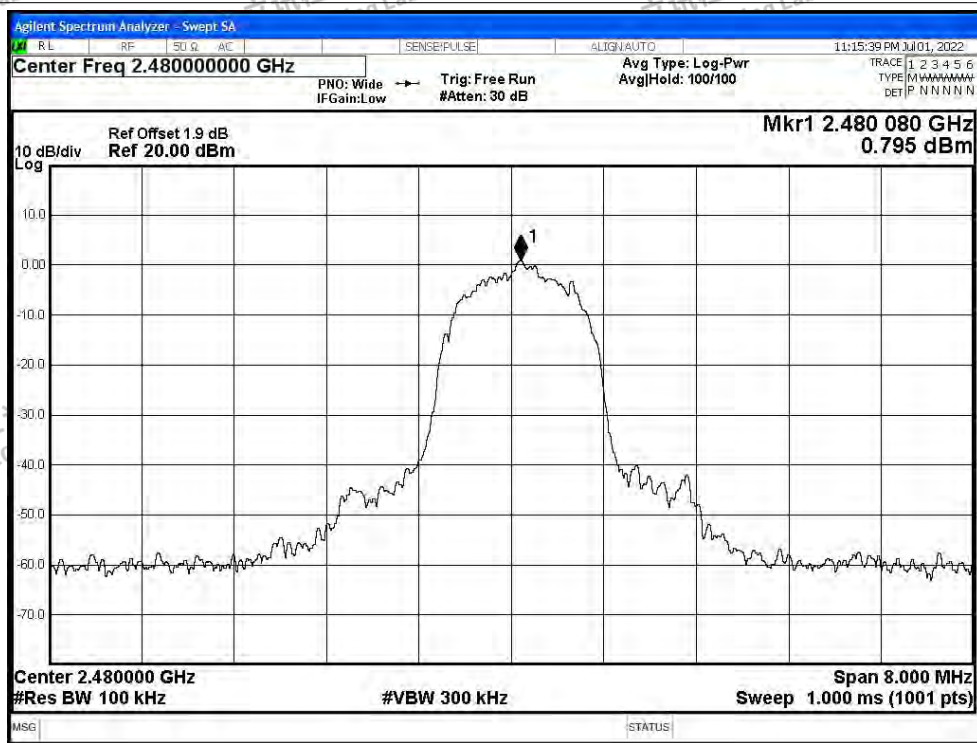


Band Edge NVNT 3-DH5 2402MHz Ant1 No-Hopping Emission

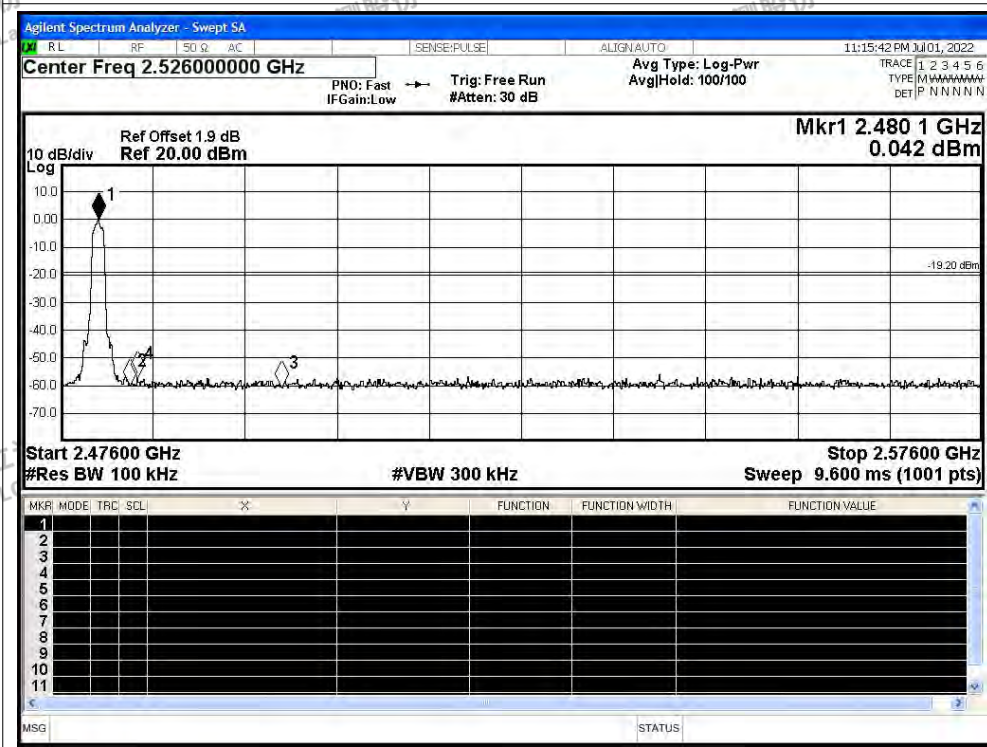




Band Edge NVNT 3-DH5 2480MHz Ant1 No-Hopping Ref



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





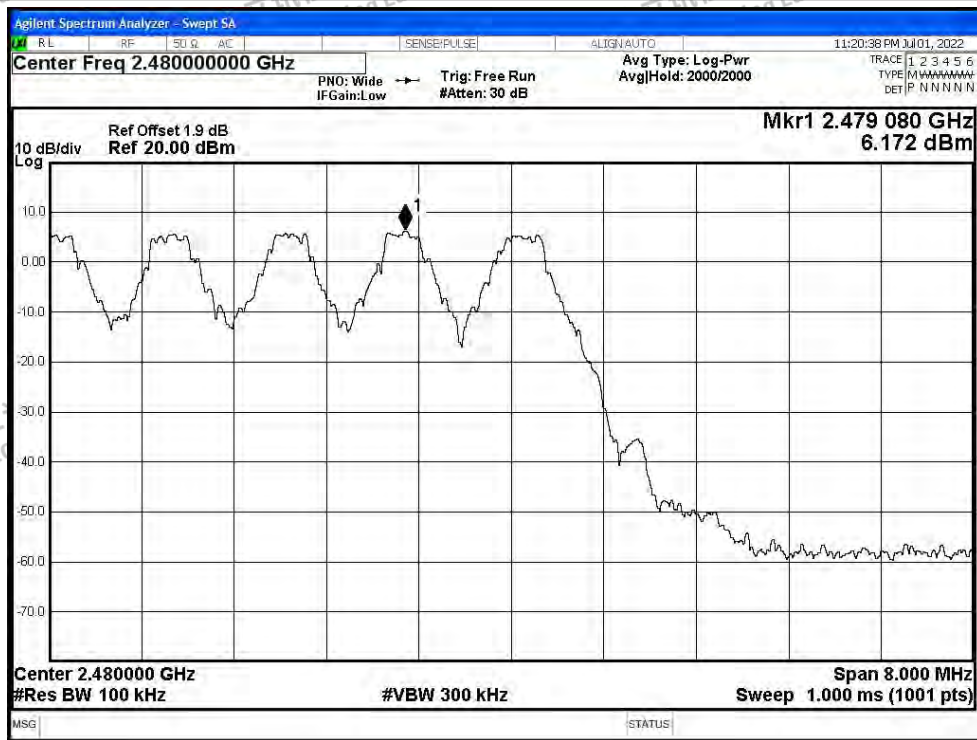
(Hopping)

Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH5	2402	Ant1	Hopping	-54.14	-20	Pass
NVNT	1-DH5	2480	Ant1	Hopping	-61.38	-20	Pass
NVNT	2-DH5	2402	Ant1	Hopping	-54.43	-20	Pass
NVNT	2-DH5	2480	Ant1	Hopping	-62.4	-20	Pass
NVNT	3-DH5	2402	Ant1	Hopping	-55.19	-20	Pass
NVNT	3-DH5	2480	Ant1	Hopping	-61.36	-20	Pass

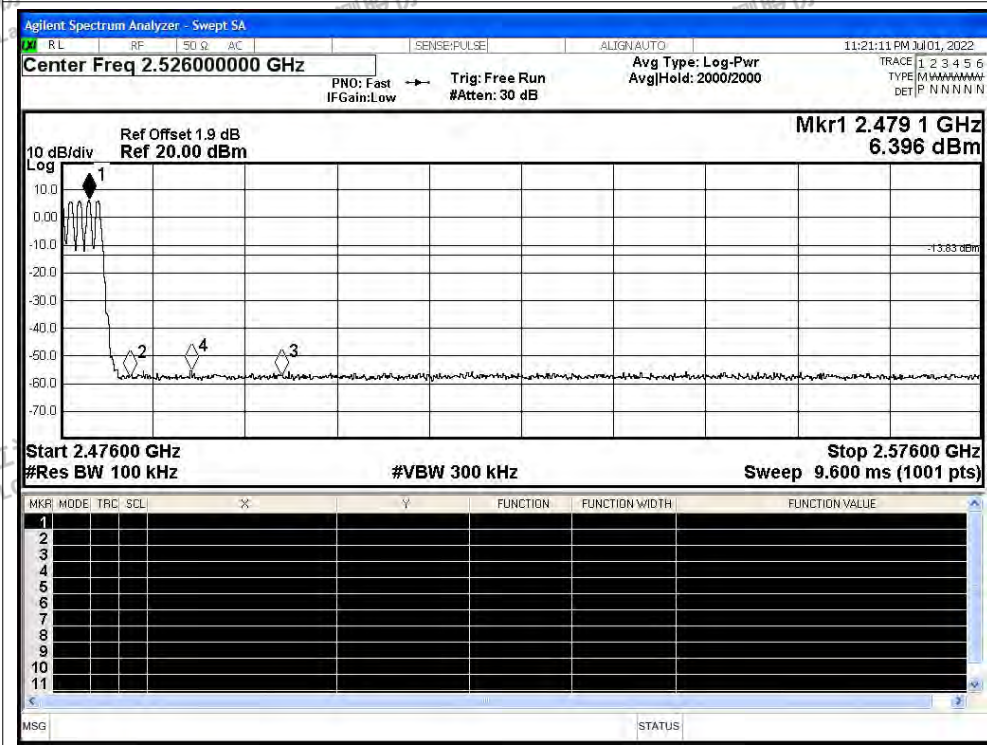




Band Edge(Hopping) NVNT 1-DH5 2480MHz Ant1 Hopping Ref

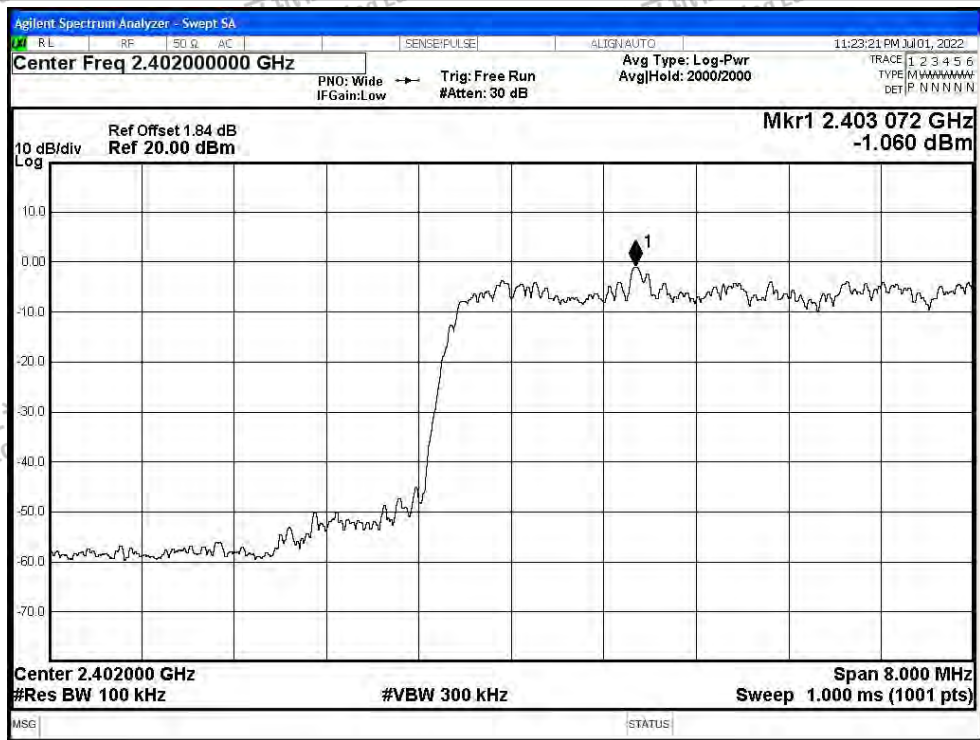


Band Edge(Hopping) NVNT 1-DH5 2480MHz Ant1 Hopping Emission

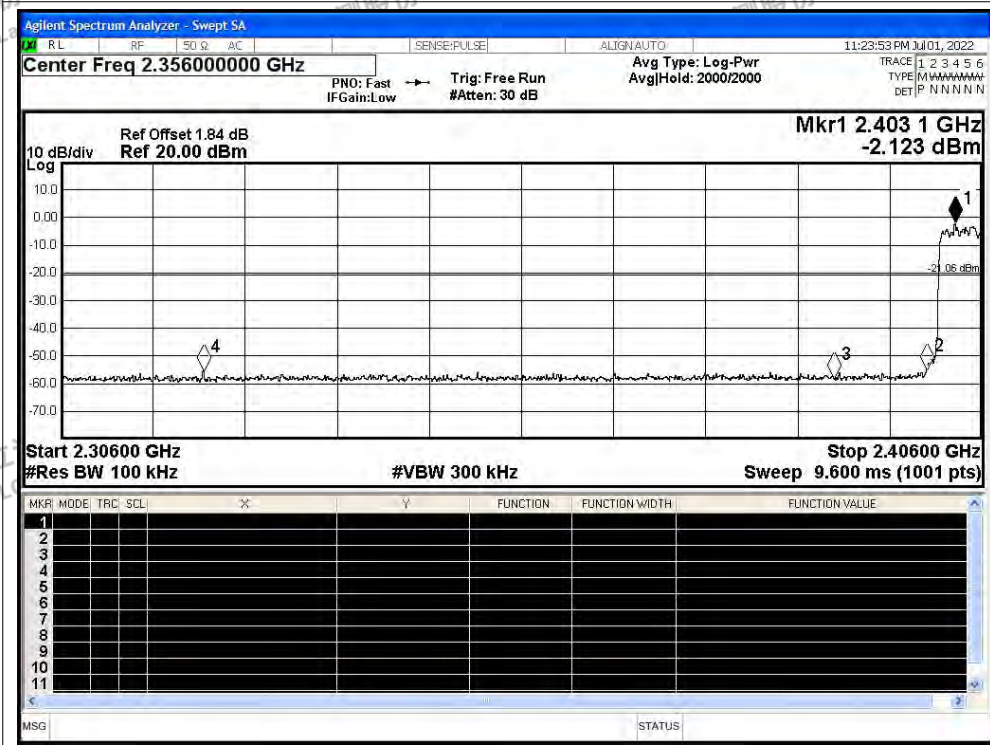




Band Edge(Hopping) NVNT 2-DH5 2402MHz Ant1 Hopping Ref

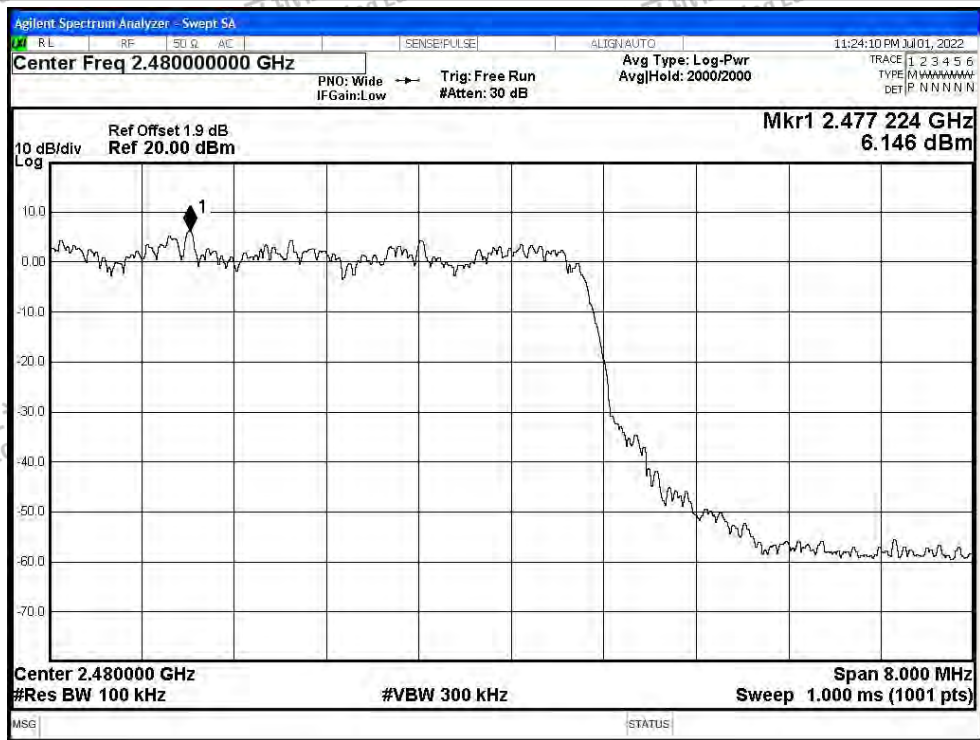


Band Edge(Hopping) NVNT 2-DH5 2402MHz Ant1 Hopping Emission

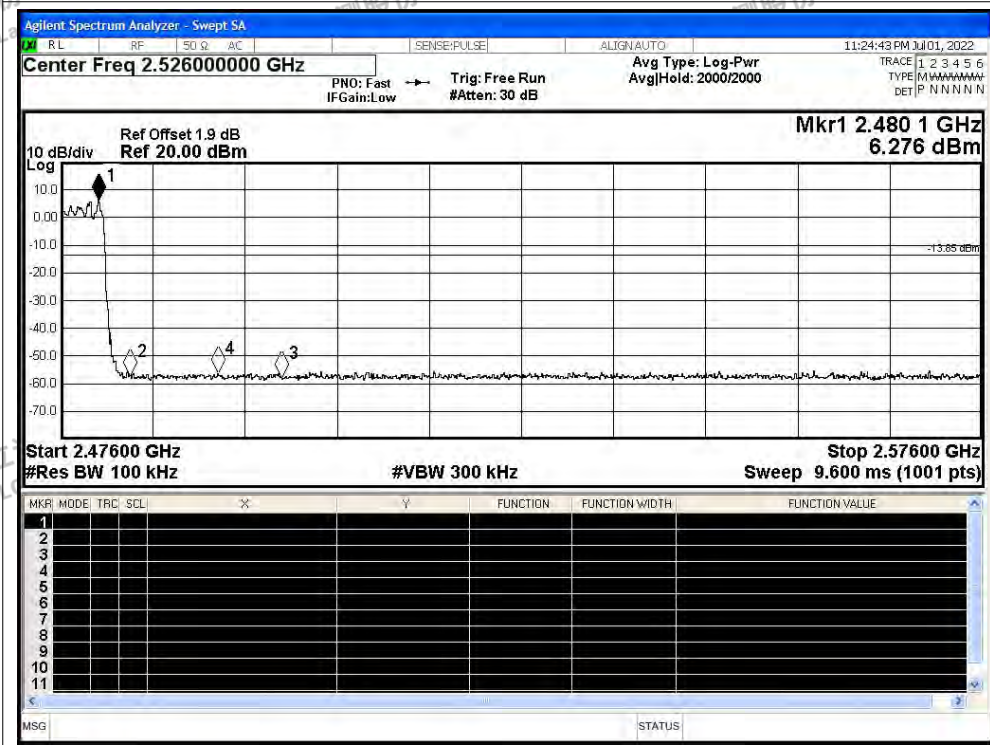




Band Edge(Hopping) NVNT 2-DH5 2480MHz Ant1 Hopping Ref



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

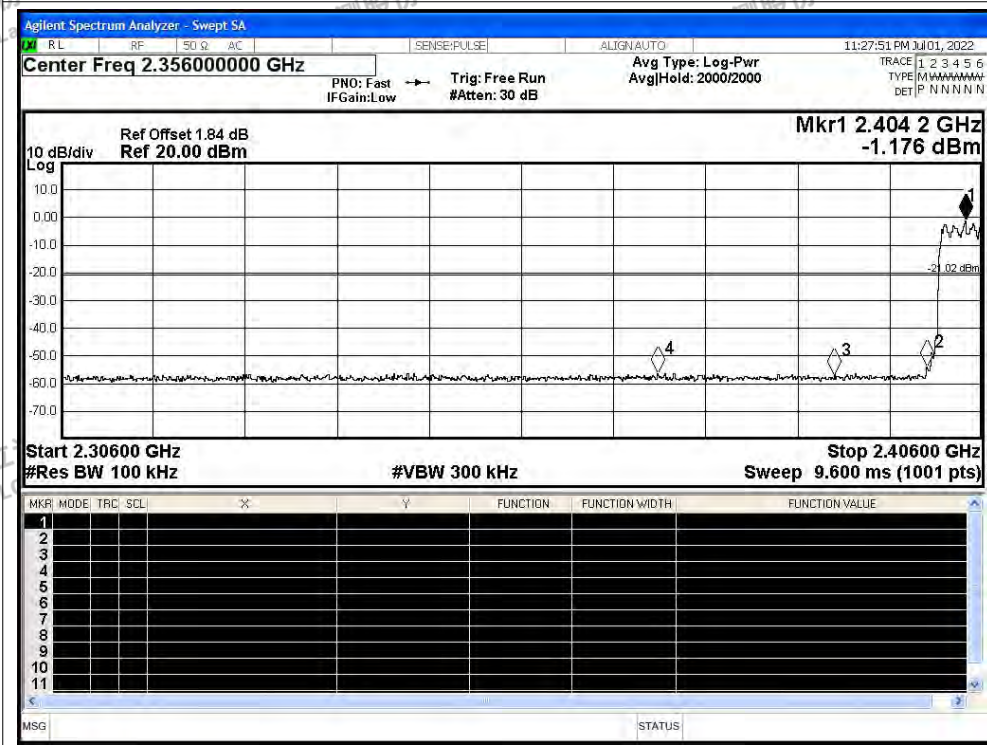




Band Edge(Hopping) NVNT 3-DH5 2402MHz Ant1 Hopping Ref

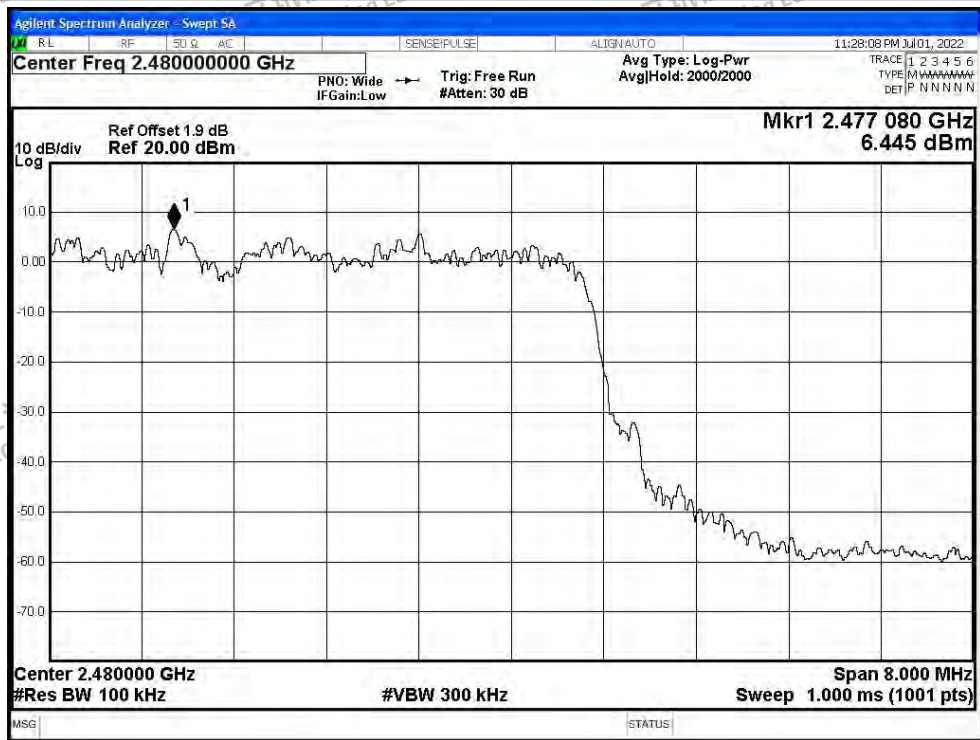


Band Edge(Hopping) NVNT 3-DH5 2402MHz Ant1 Hopping Emission

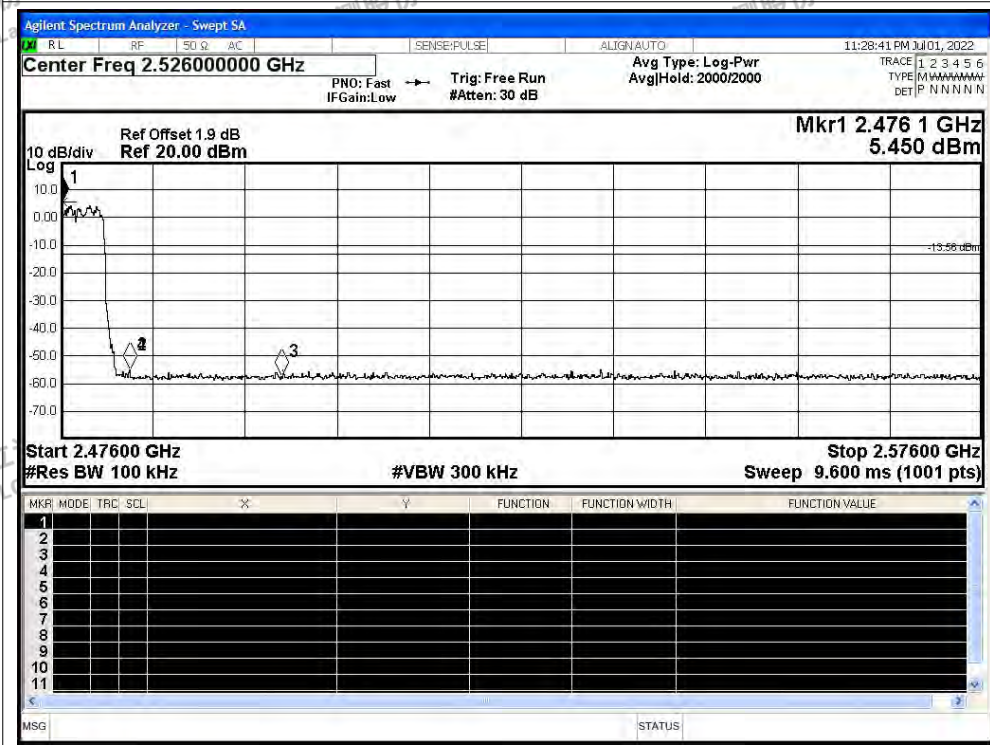




Band Edge(Hopping) NVNT 3-DH5 2480MHz Ant1 Hopping Ref



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	-43.77	-20	Pass
NVNT	1-DH5	2441	Ant1	-53.02	-20	Pass
NVNT	1-DH5	2480	Ant1	-53.03	-20	Pass
NVNT	2-DH5	2402	Ant1	-41.42	-20	Pass
NVNT	2-DH5	2441	Ant1	-44.23	-20	Pass
NVNT	2-DH5	2480	Ant1	-52.28	-20	Pass
NVNT	3-DH5	2402	Ant1	-39.01	-20	Pass
NVNT	3-DH5	2441	Ant1	-46.39	-20	Pass
NVNT	3-DH5	2480	Ant1	-47.98	-20	Pass



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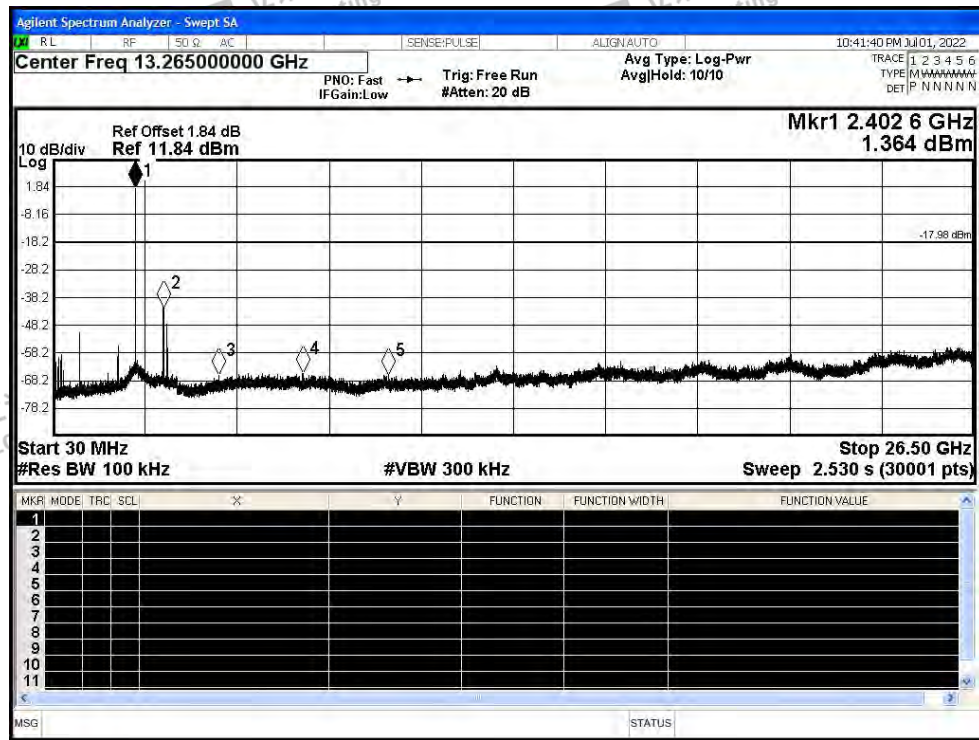


Test Graphs

Tx. Spurious NVNT 1-DH5 2402MHz Ant1 Ref

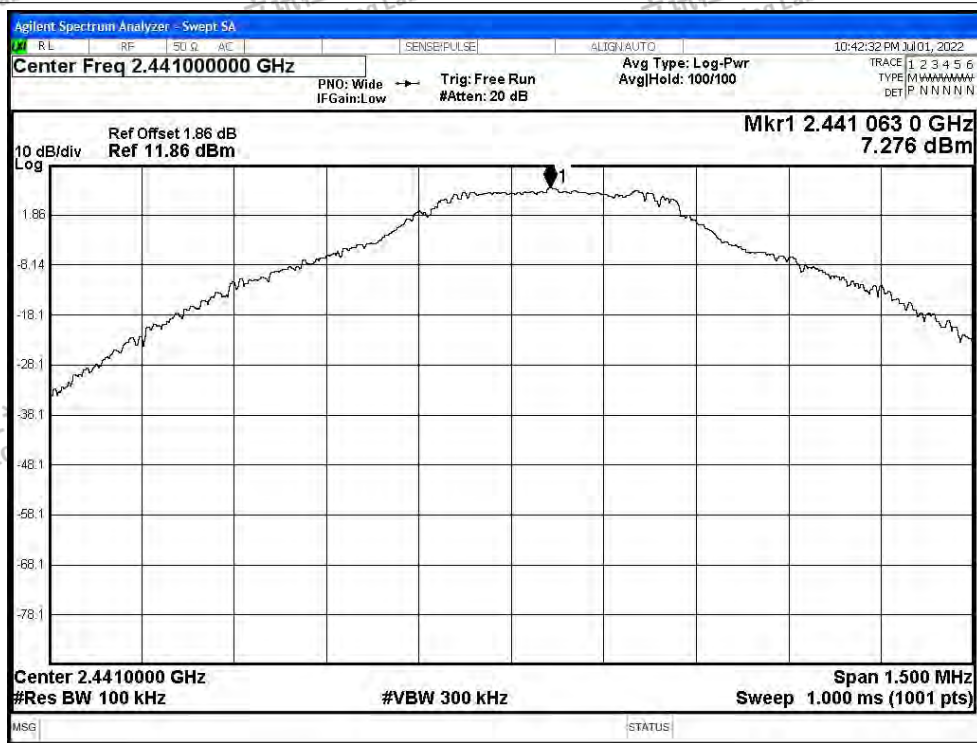


Tx. Spurious NVNT 1-DH5 2402MHz Ant1 Emission

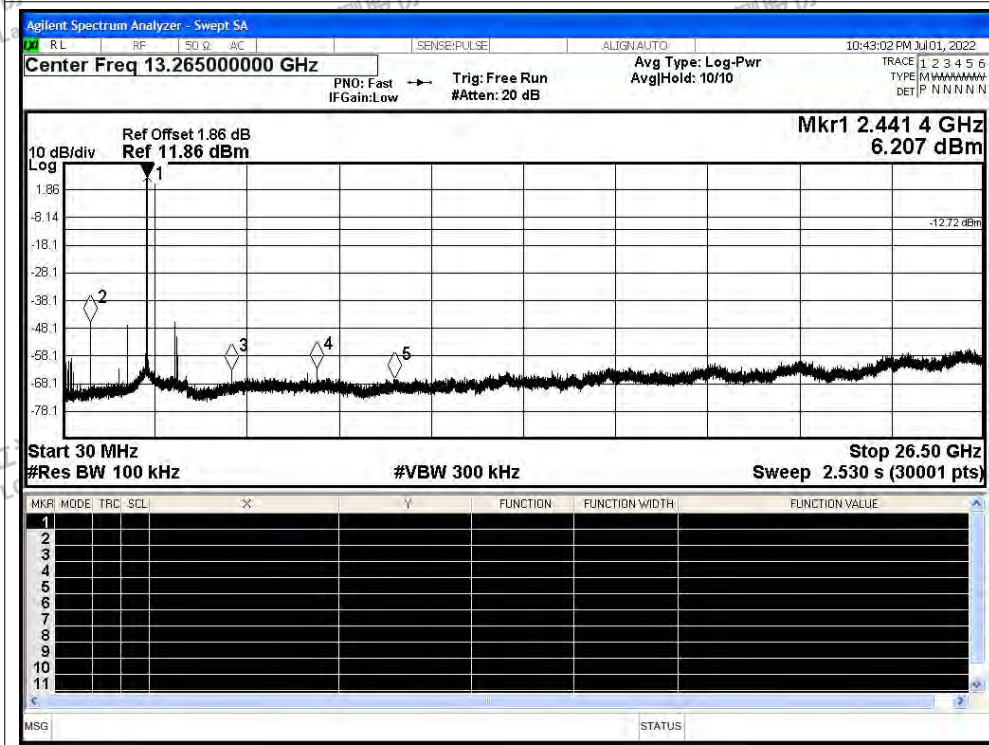




Tx. Spurious NVNT 1-DH5 2441MHz Ant1 Ref

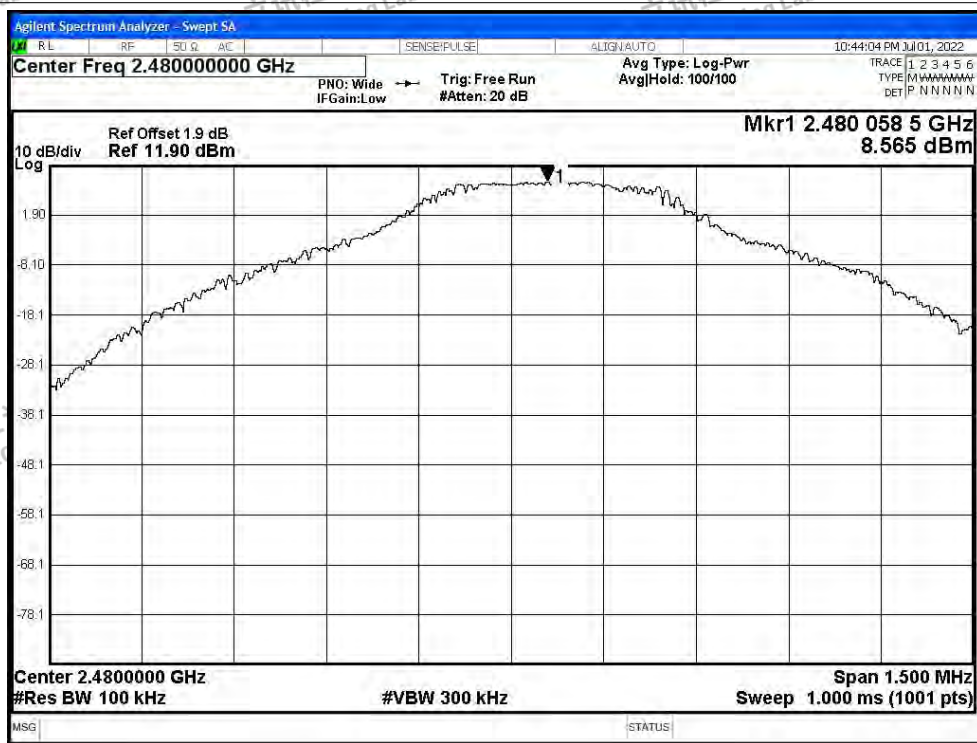


Tx. Spurious NVNT 1-DH5 2441MHz Ant1 Emission

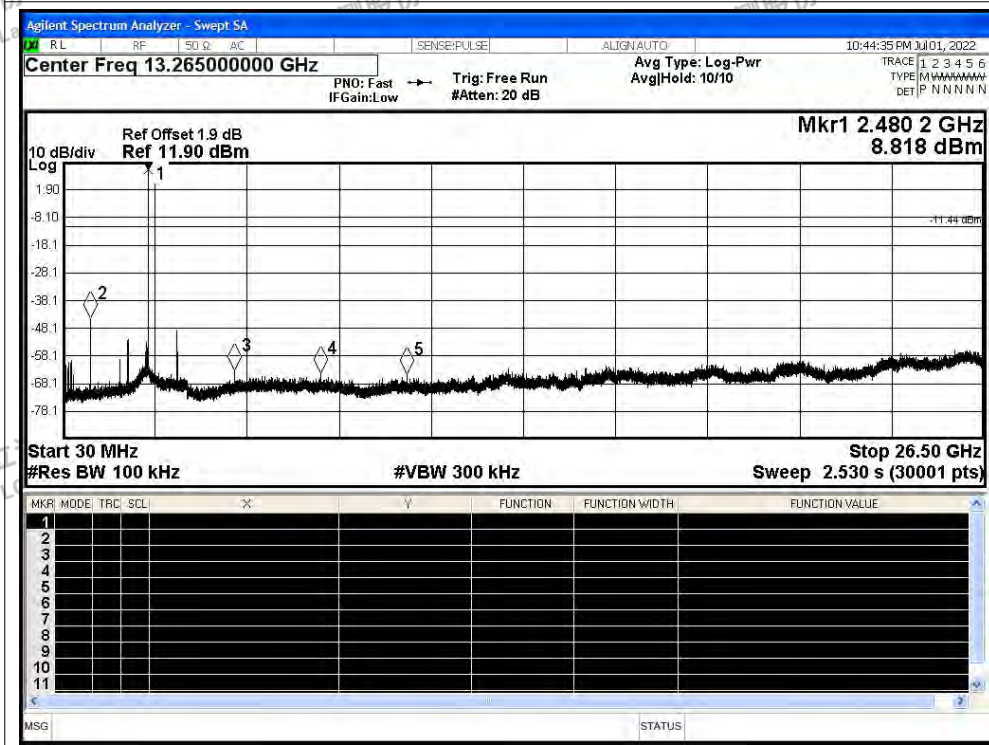




Tx. Spurious NVNT 1-DH5 2480MHz Ant1 Ref

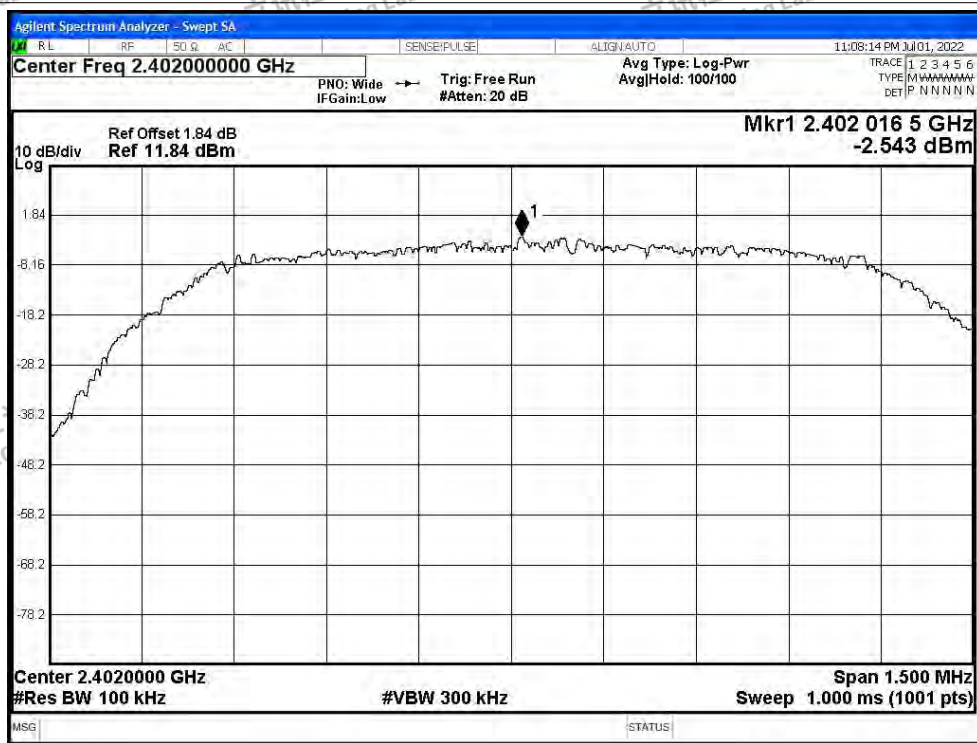


Tx. Spurious NVNT 1-DH5 2480MHz Ant1 Emission

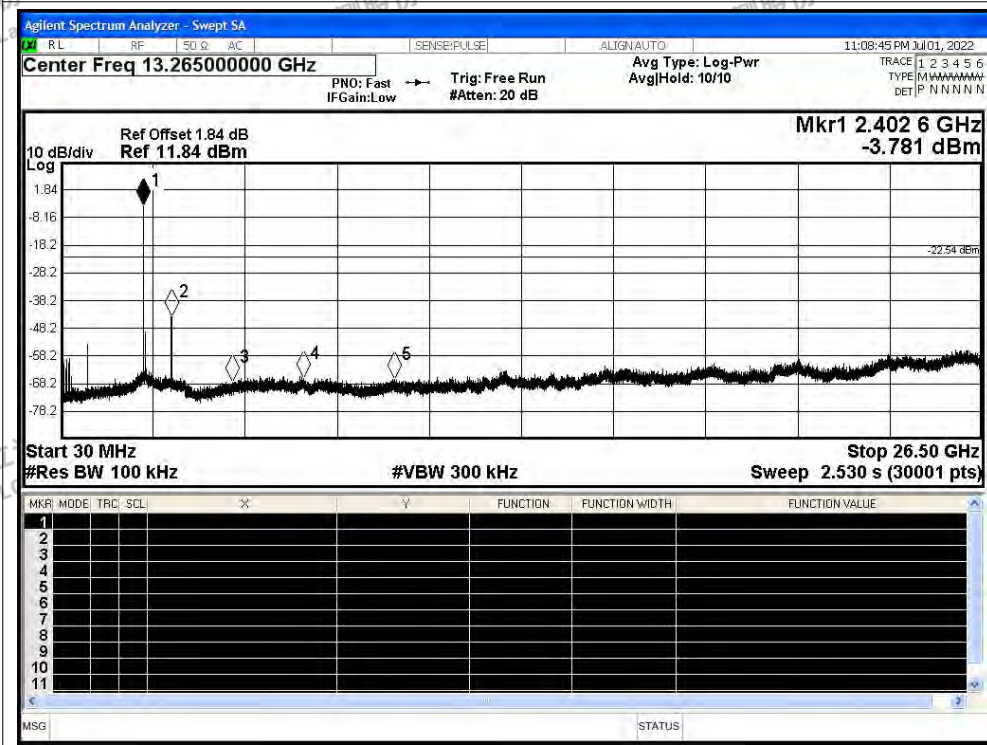




Tx. Spurious NVNT 2-DH5 2402MHz Ant1 Ref

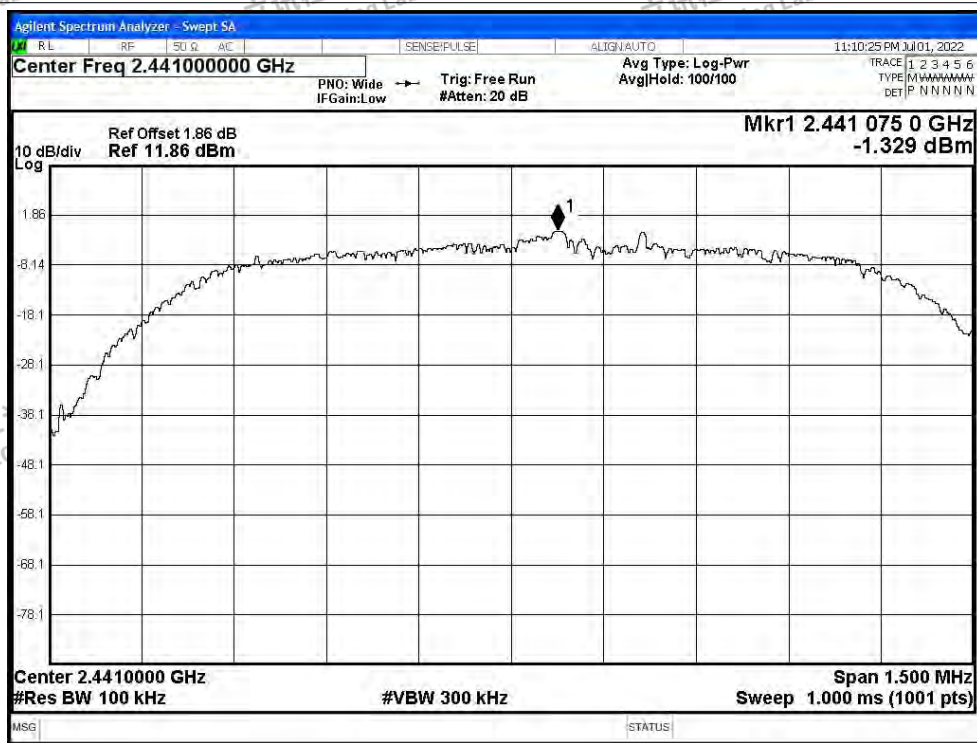


Tx. Spurious NVNT 2-DH5 2402MHz Ant1 Emission

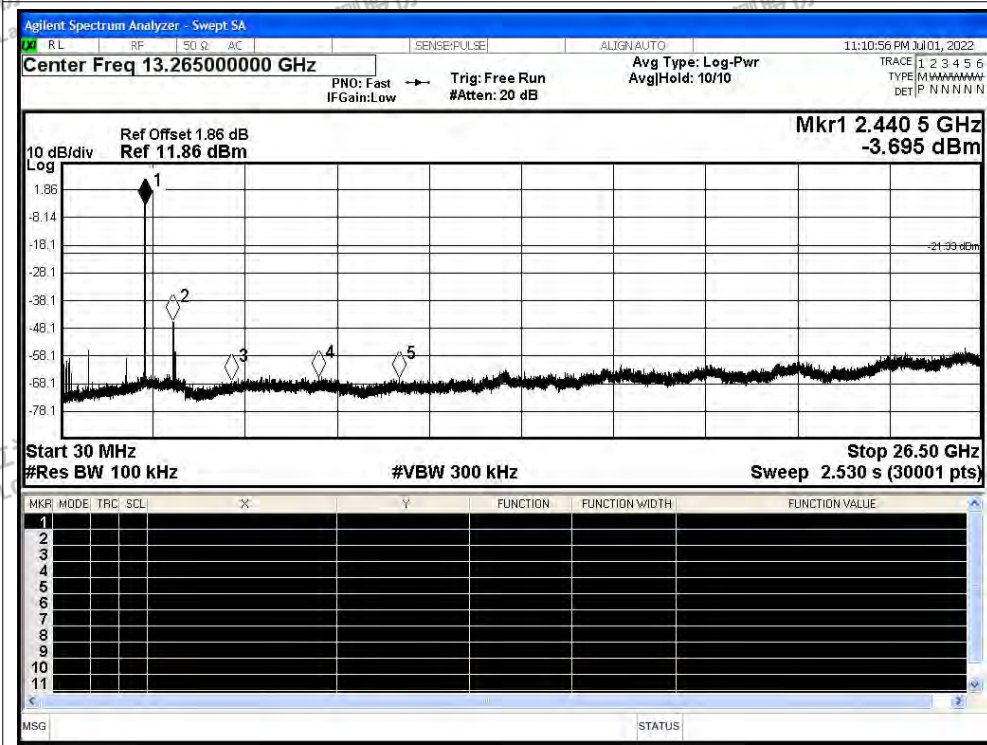




Tx. Spurious NVNT 2-DH5 2441MHz Ant1 Ref

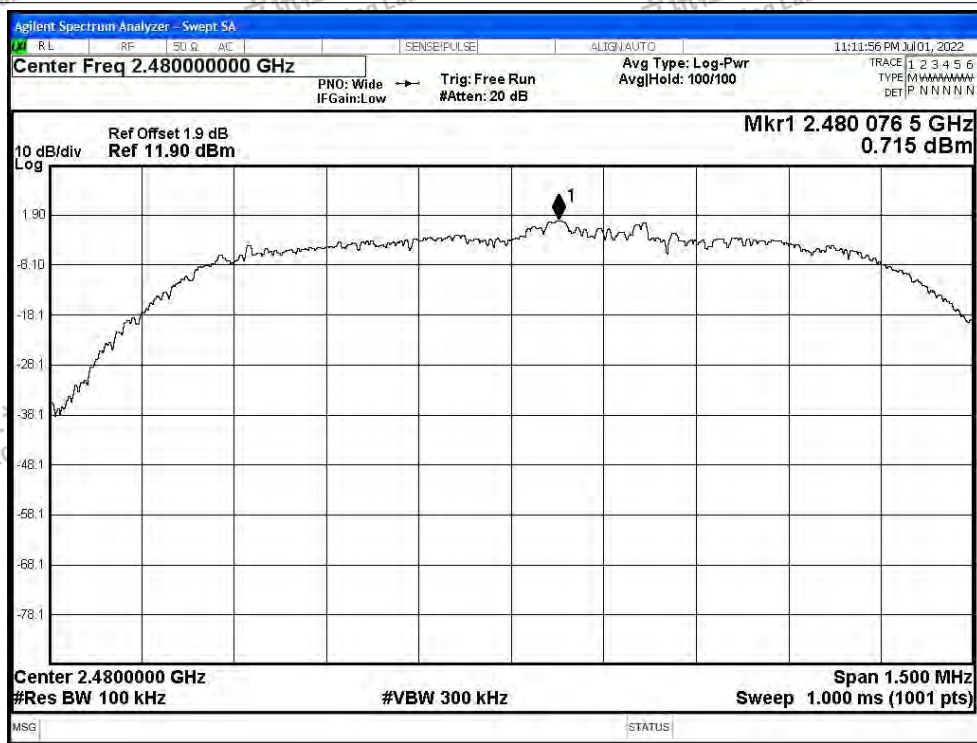


Tx. Spurious NVNT 2-DH5 2441MHz Ant1 Emission

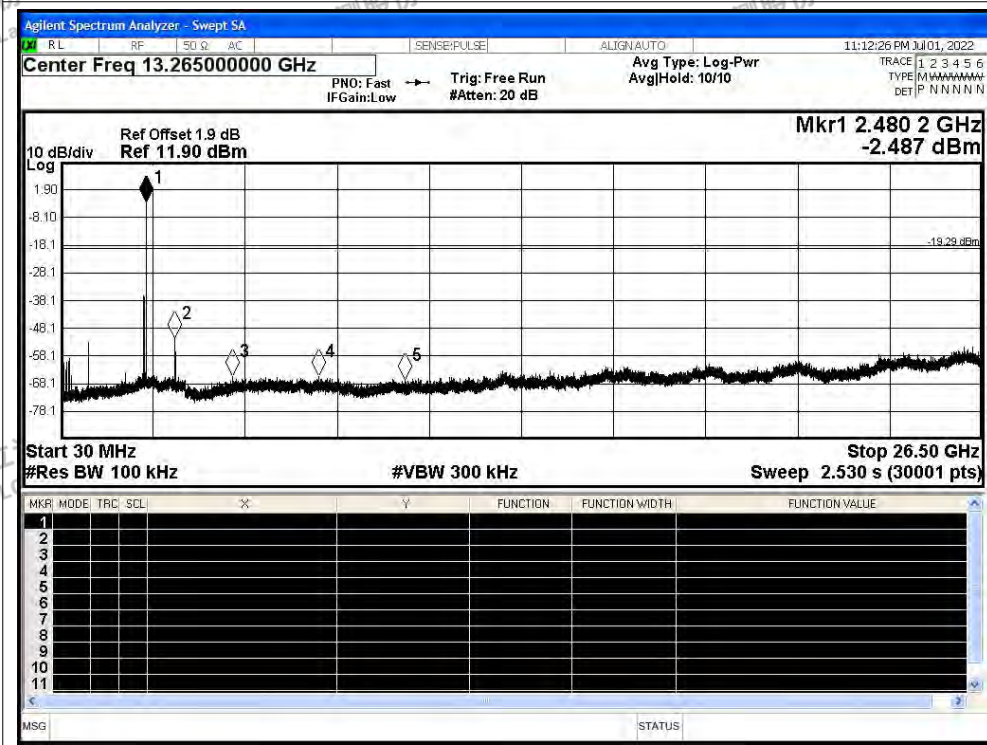




Tx. Spurious NVNT 2-DH5 2480MHz Ant1 Ref

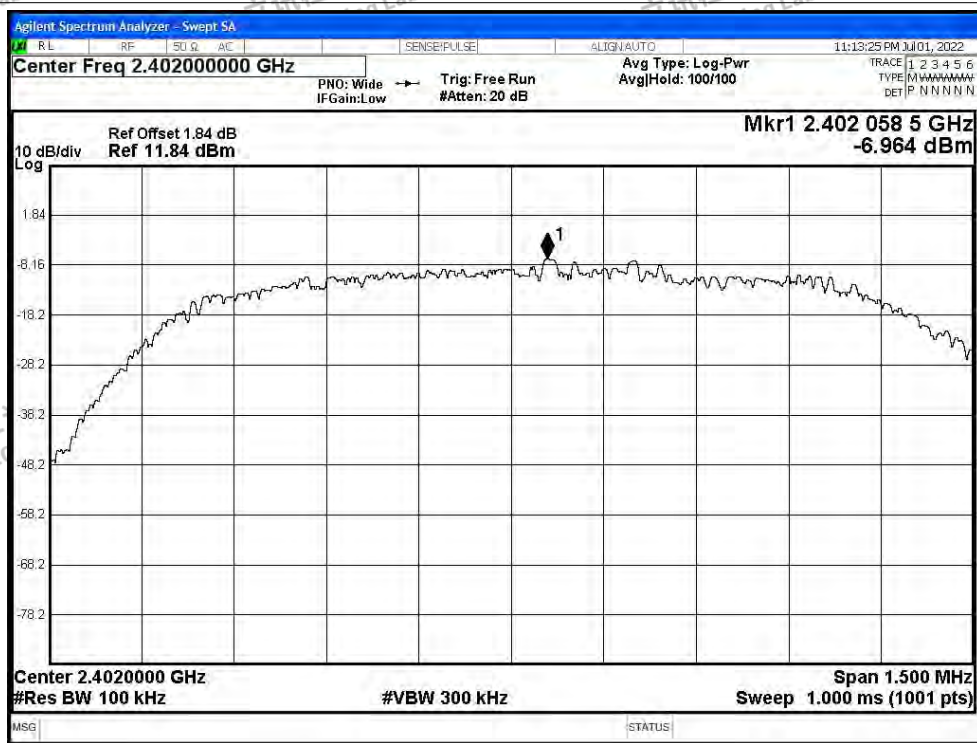


Tx. Spurious NVNT 2-DH5 2480MHz Ant1 Emission

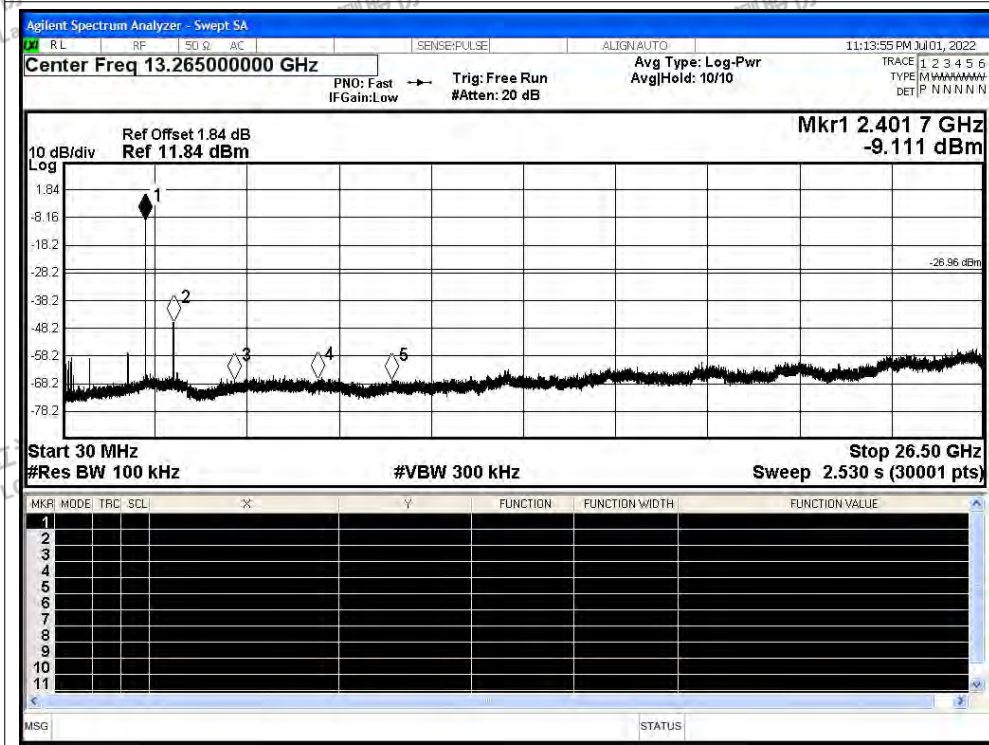




Tx. Spurious NVNT 3-DH5 2402MHz Ant1 Ref

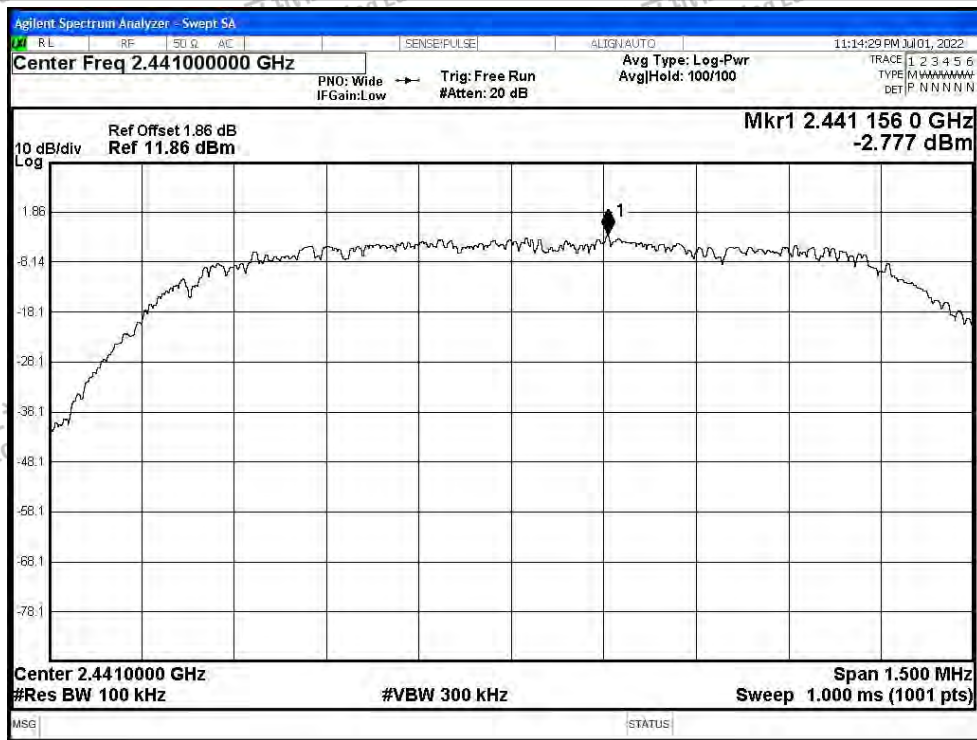


Tx. Spurious NVNT 3-DH5 2402MHz Ant1 Emission

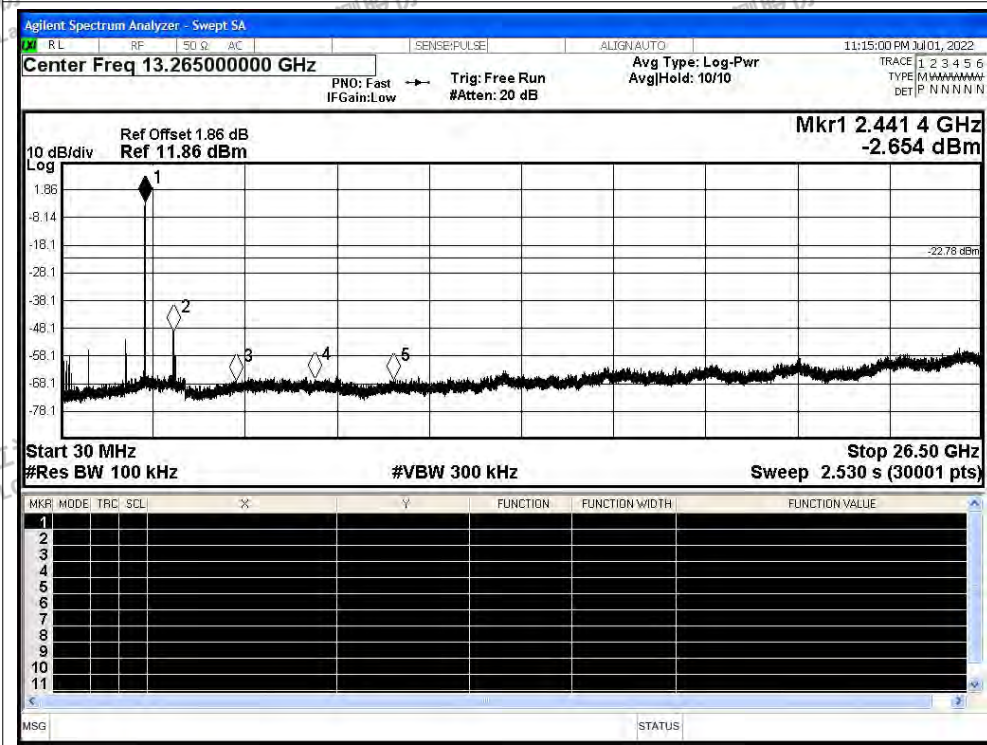




Tx. Spurious NVNT 3-DH5 2441MHz Ant1 Ref

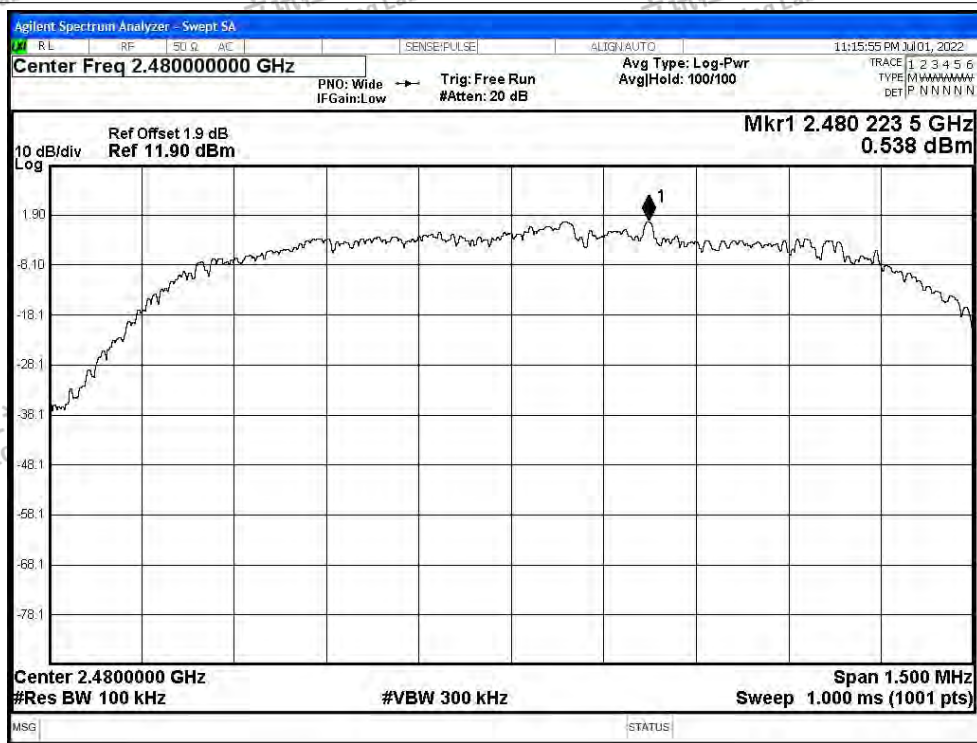


Tx. Spurious NVNT 3-DH5 2441MHz Ant1 Emission

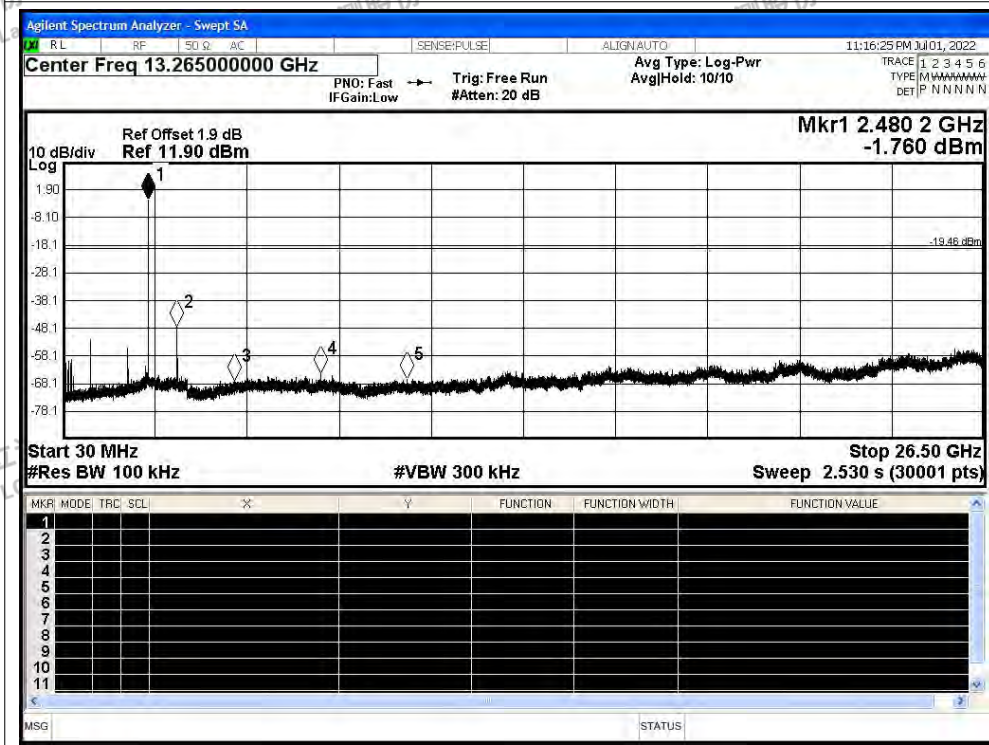




Tx. Spurious NVNT 3-DH5 2480MHz Ant1 Ref



Tx. Spurious NVNT 3-DH5 2480MHz Ant1 Emission





A.8 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	-50.24	2	47.02	Peak	74	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2310	-59.79	2	37.47	Average	54	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2355.696	-46.54	2	50.72	Peak	74	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2362.128	-58.63	2	38.63	Average	54	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2390	-49.34	2	47.92	Peak	74	Pass
NVNT	1-DH5	2402	Ant1	No-Hopping	2390	-59.27	2	37.99	Average	54	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2483.5	-45.74	2	51.52	Peak	74	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2483.5	-56.33	2	40.93	Average	54	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2483.584	-45.08	2	52.18	Peak	74	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2483.512	-56.33	2	40.93	Average	54	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2500	-47.6	2	49.66	Peak	74	Pass
NVNT	1-DH5	2480	Ant1	No-Hopping	2500	-59.09	2	38.17	Average	54	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2310	-50.87	2	46.39	Peak	74	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2310	-60.34	2	36.92	Average	54	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2338.704	-45.64	2	51.62	Peak	74	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2382.768	-59.59	2	37.67	Average	54	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2390	-48.49	2	48.77	Peak	74	Pass
NVNT	2-DH5	2402	Ant1	No-Hopping	2390	-59.78	2	37.48	Average	54	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2483.5	-49.69	2	47.57	Peak	74	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2483.5	-59.23	2	38.03	Average	54	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2485.048	-47.55	2	49.71	Peak	74	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2483.512	-59.23	2	38.03	Average	54	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2500	-50.35	2	46.91	Peak	74	Pass
NVNT	2-DH5	2480	Ant1	No-Hopping	2500	-59.91	2	37.35	Average	54	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2310	-50.2	2	47.06	Peak	74	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2310	-60.39	2	36.87	Average	54	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2341.296	-47.69	2	49.57	Peak	74	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2387.664	-60.05	2	37.21	Average	54	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2390	-50.92	2	46.34	Peak	74	Pass
NVNT	3-DH5	2402	Ant1	No-Hopping	2390	-60.17	2	37.09	Average	54	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2483.5	-48.85	2	48.41	Peak	74	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2483.5	-59.46	2	37.8	Average	54	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2489.368	-47.48	2	49.78	Peak	74	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2483.512	-59.46	2	37.8	Average	54	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2500	-50.51	2	46.75	Peak	74	Pass
NVNT	3-DH5	2480	Ant1	No-Hopping	2500	-59.83	2	37.43	Average	54	Pass

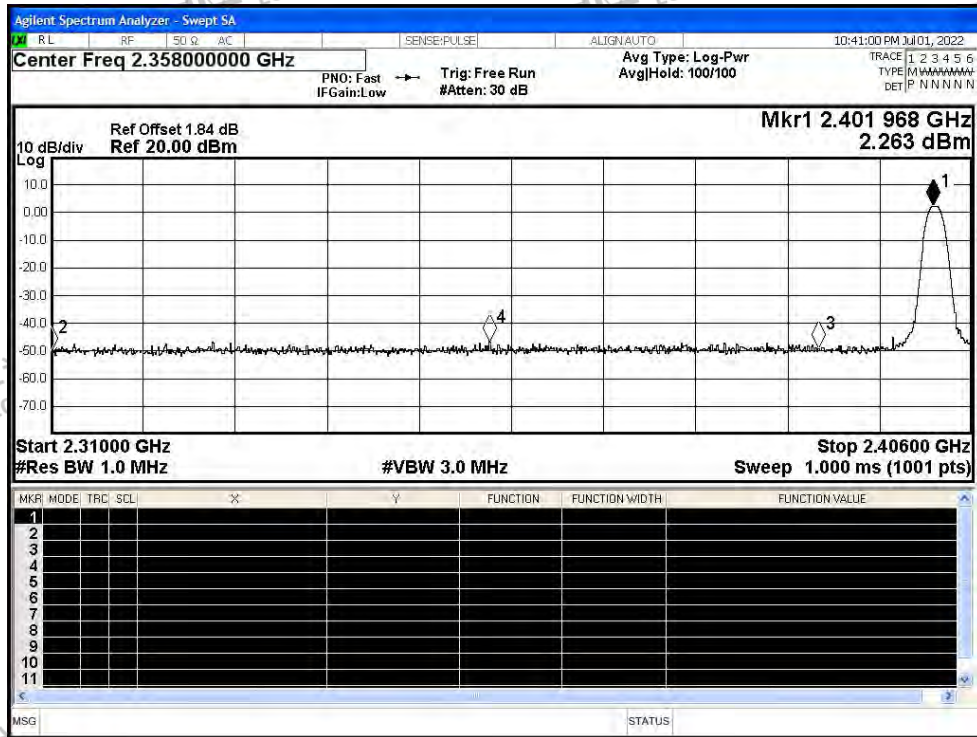


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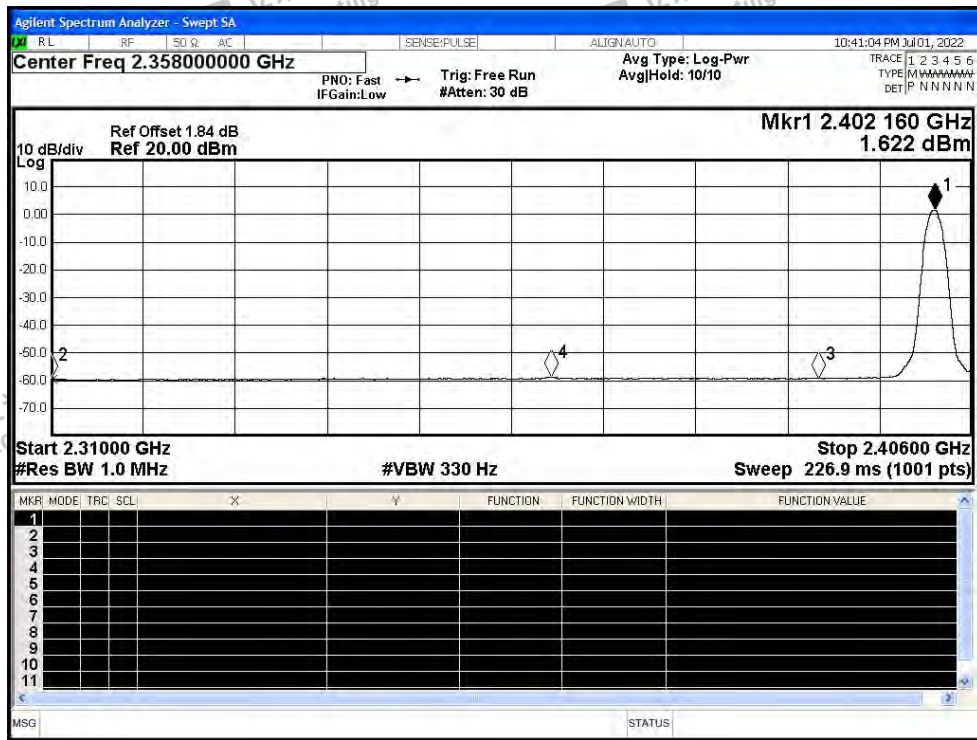


Test Graphs

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

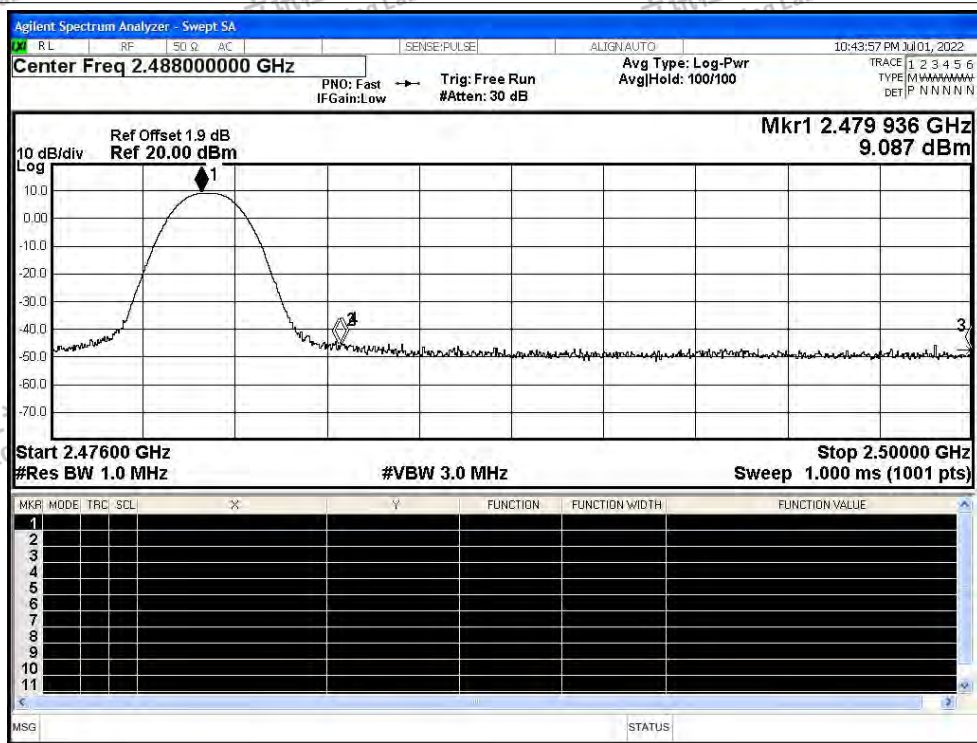


Restrict Band NVNT 1-DH5 2402MHz Ant1 No-Hopping Average

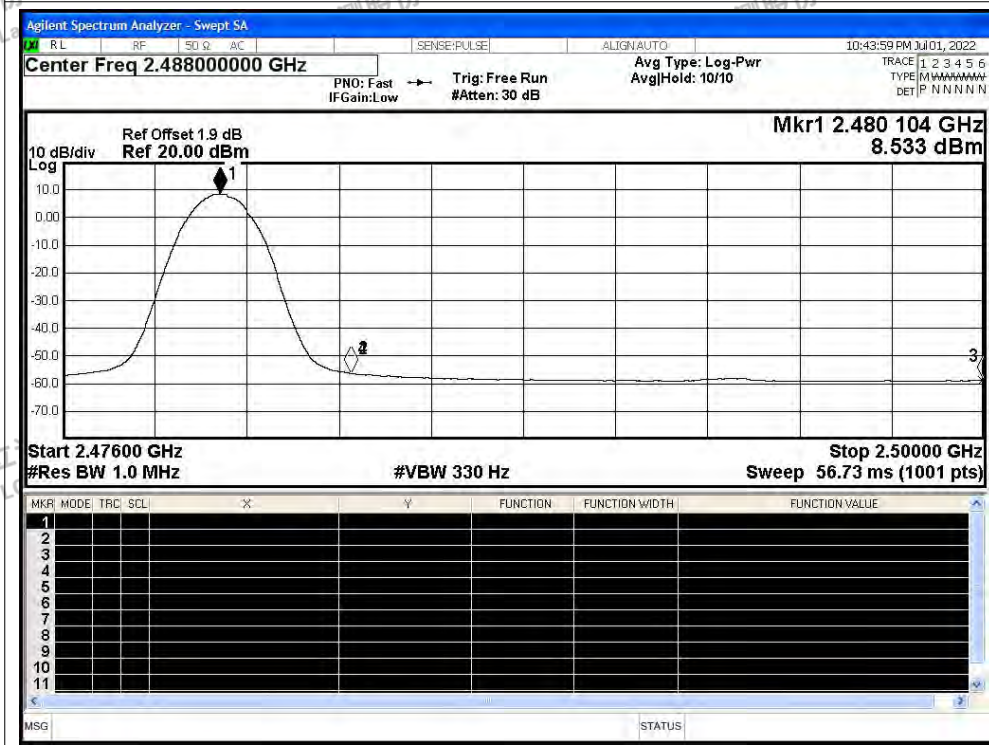




Restrict Band NVNT 1-DH5 2480MHz Ant1 No-Hopping Peak

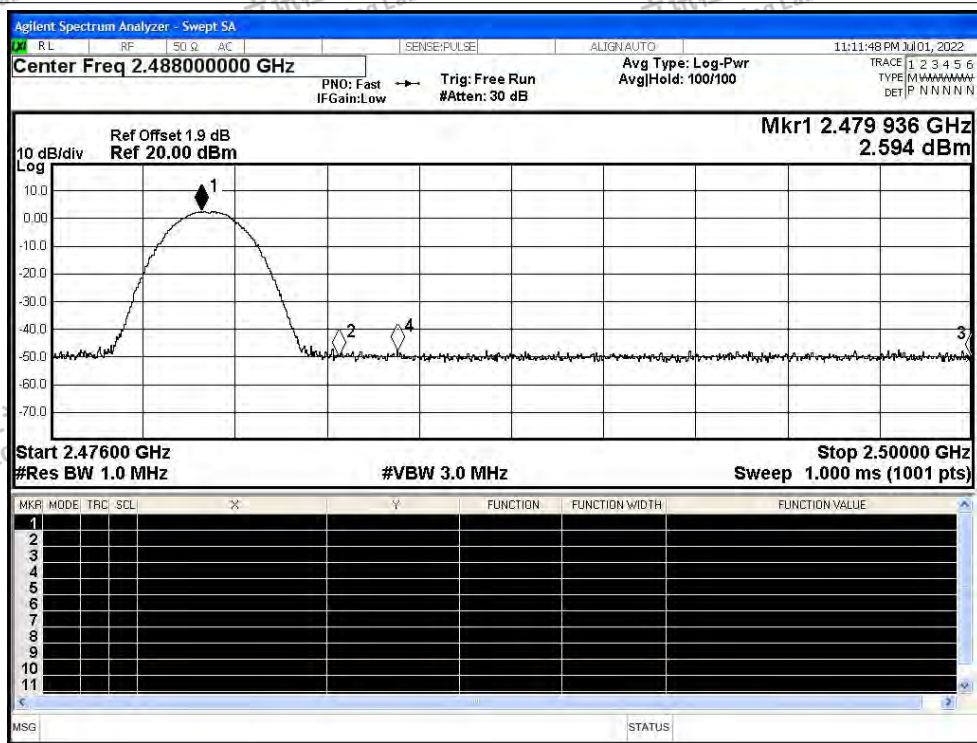


Restrict Band NVNT 1-DH5 2480MHz Ant1 No-Hopping Average

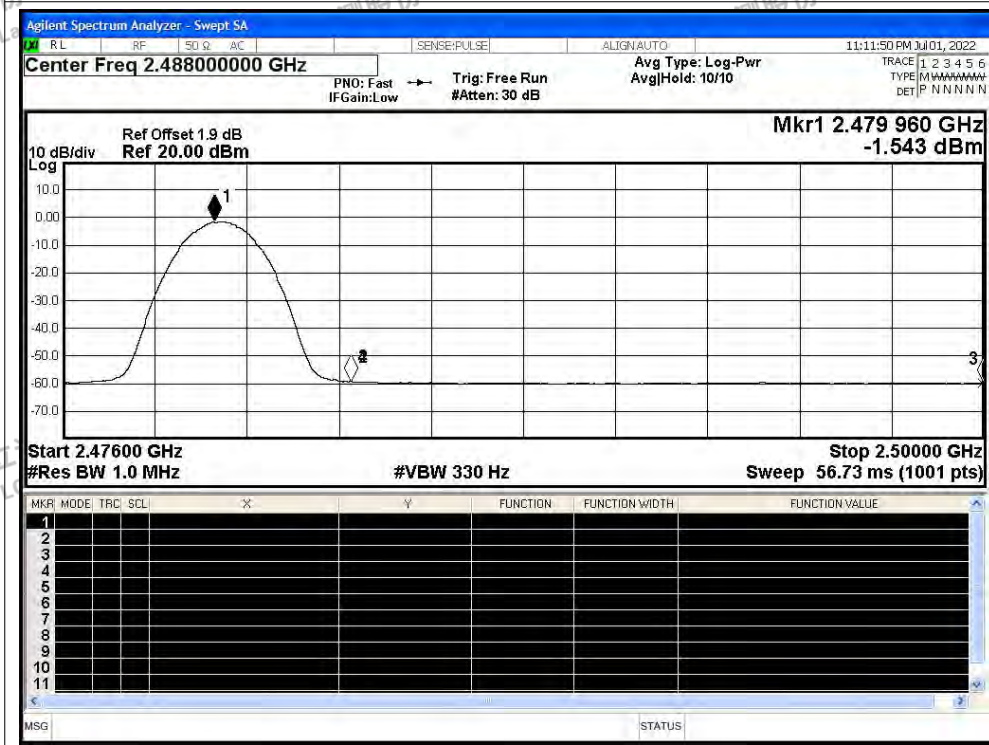




Restrict Band NVNT 2-DH5 2480MHz Ant1 No-Hopping Peak

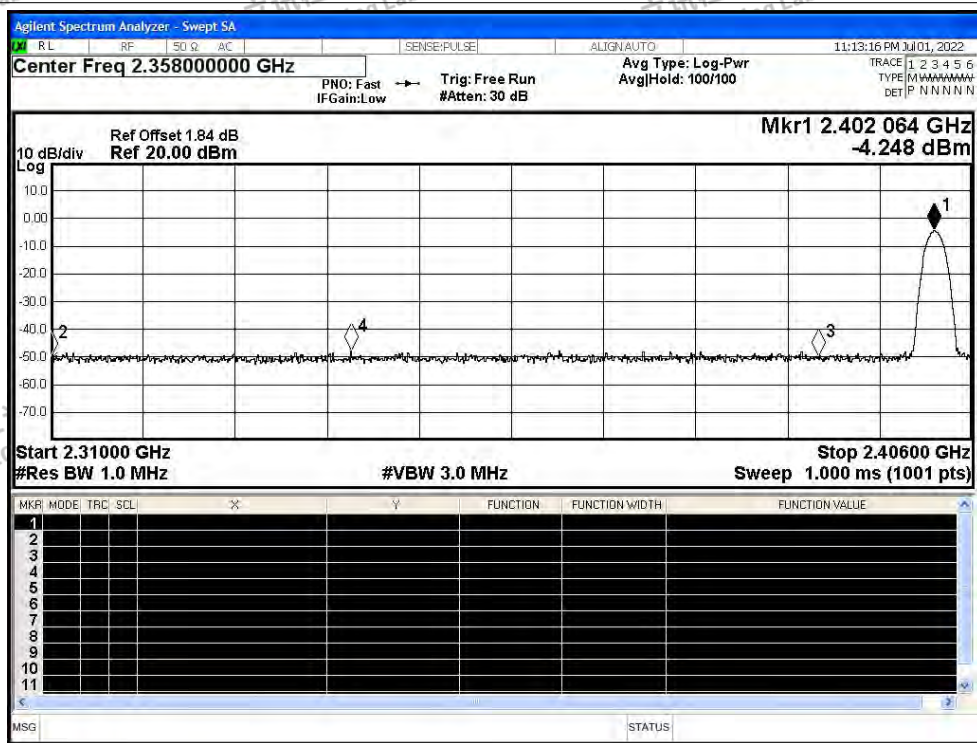


Restrict Band NVNT 2-DH5 2480MHz Ant1 No-Hopping Average

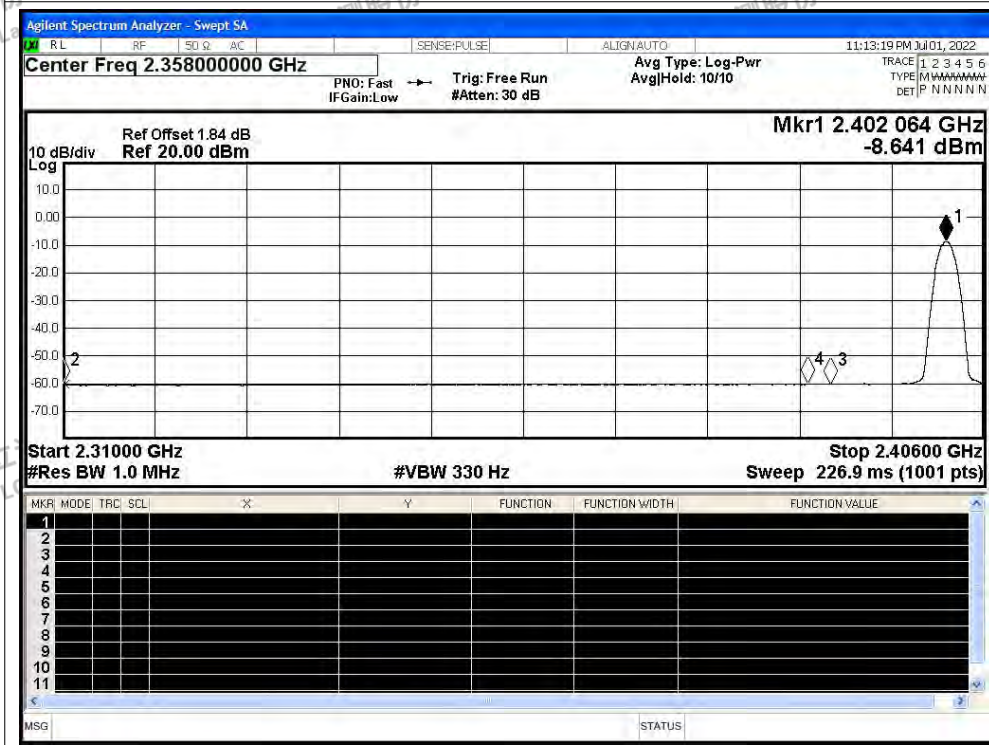




Restrict Band NVNT 3-DH5 2402MHz Ant1 No-Hopping Peak

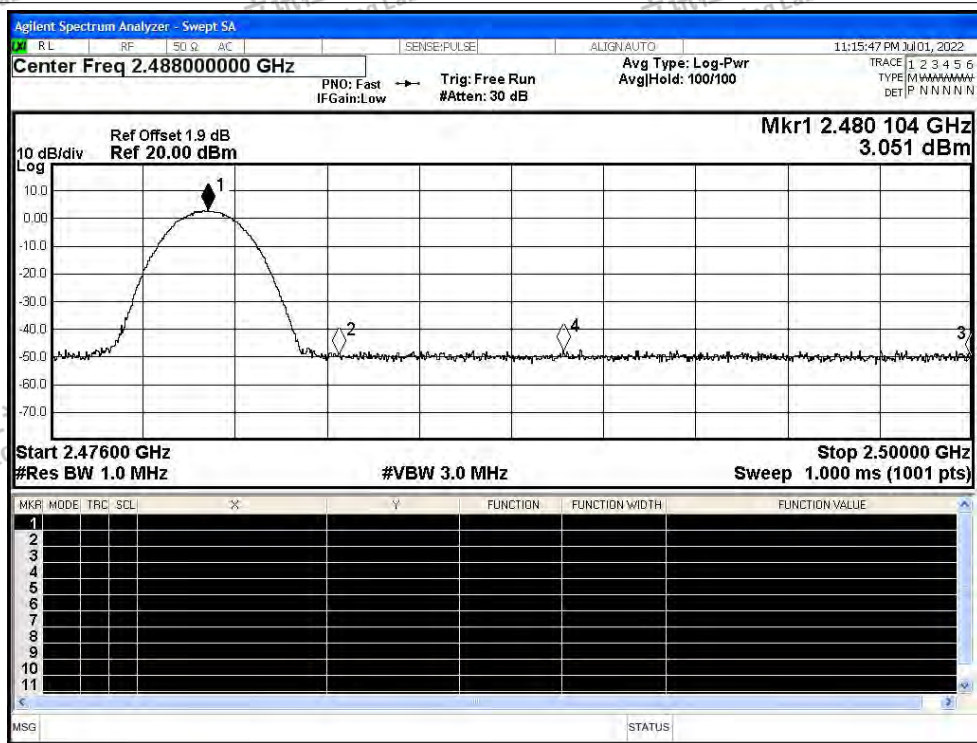


Restrict Band NVNT 3-DH5 2402MHz Ant1 No-Hopping Average





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



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

