



Appendix A

RF Test Data for BT LE (Conducted Measurement)

Product Name: Permanent Outdoor lights Pro

Test Model: S108F

Note: Ant 0 CBU Module Ant 1 ESP Module

Environmental Conditions

Temperature:	23.8° C
Relative Humidity:	52.3%
ATM Pressure:	100.0 kPa
Test Engineer:	Jerry Chu
Supervised by:	Nick Peng





A.1 -6dB Bandwidth

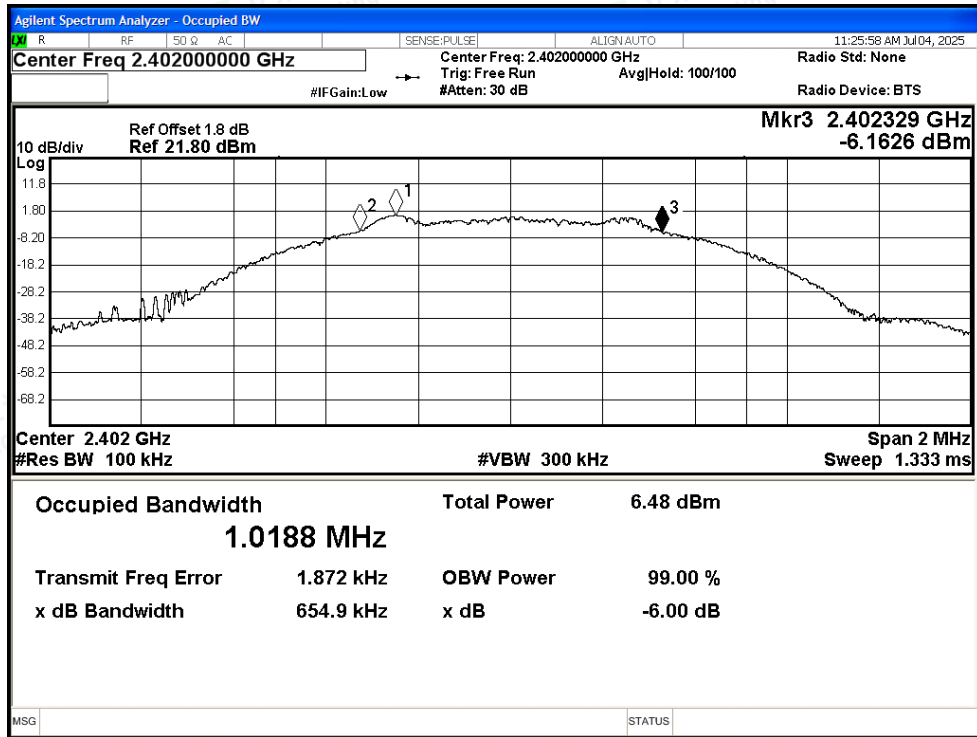
Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	BLE 1M	2402	Ant0	0.655	≥ 0.5	Pass
NVNT	BLE 1M	2440	Ant0	0.659	≥ 0.5	Pass
NVNT	BLE 1M	2480	Ant0	0.658	≥ 0.5	Pass
NVNT	BLE 1M	2402	Ant1	0.677	≥ 0.5	Pass
NVNT	BLE 1M	2440	Ant1	0.653	≥ 0.5	Pass
NVNT	BLE 1M	2480	Ant1	0.665	≥ 0.5	Pass



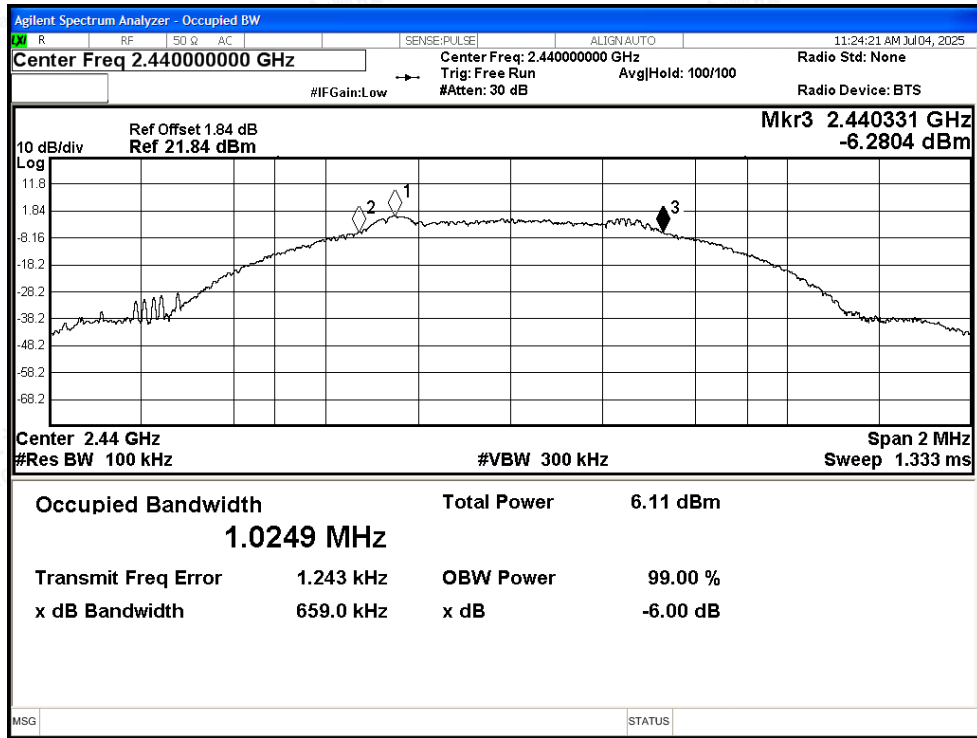


Test Graphs

-6dB Bandwidth NVNT BLE 1M 2402MHz Ant0



-6dB Bandwidth NVNT BLE 1M 2440MHz Ant0

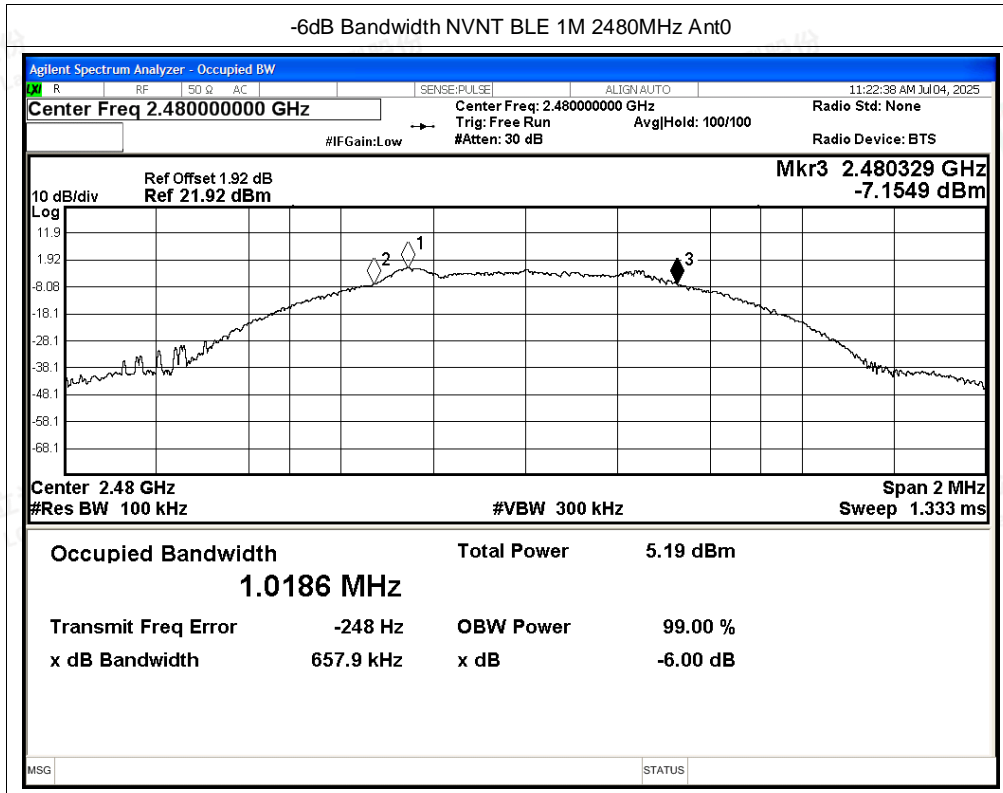


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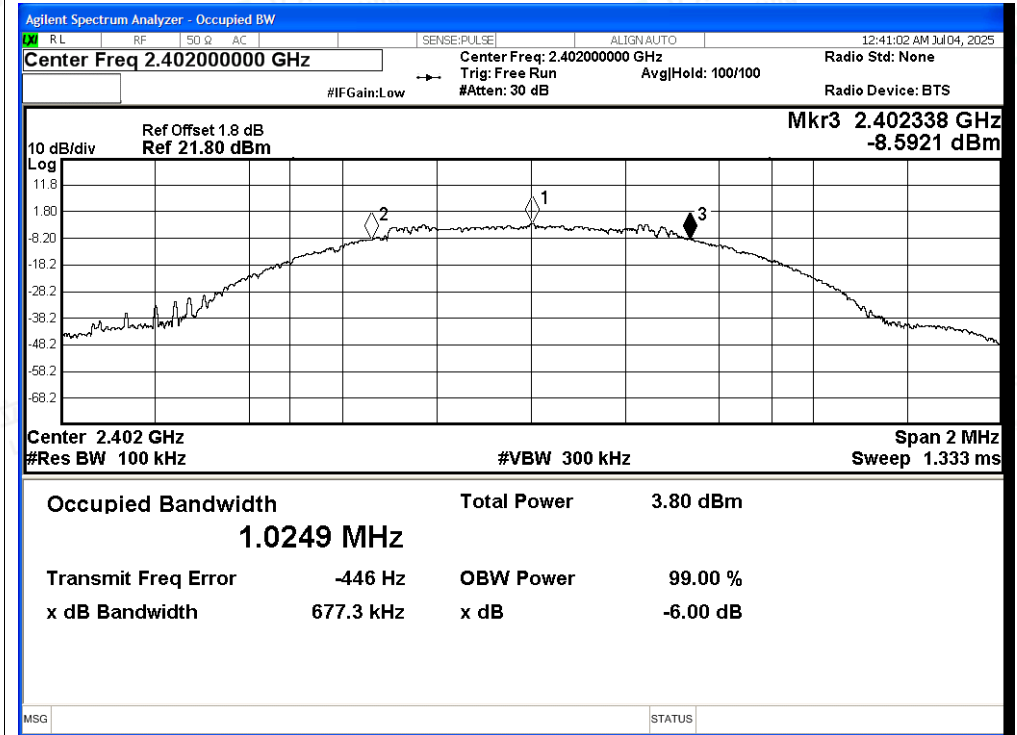
Scan code to check authenticity



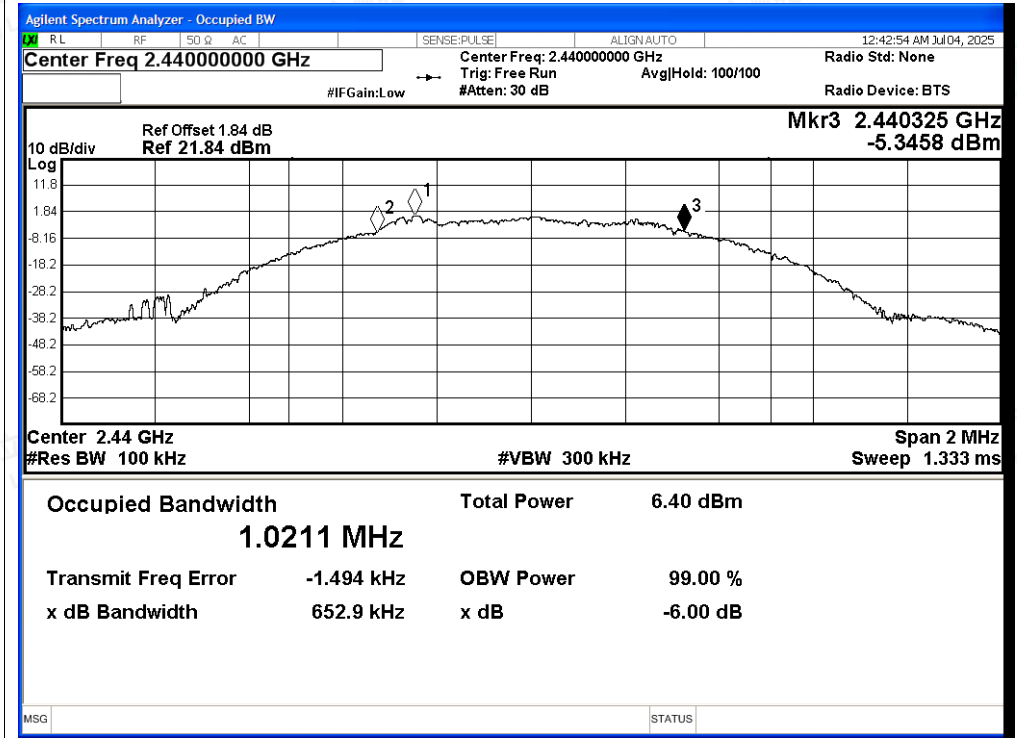


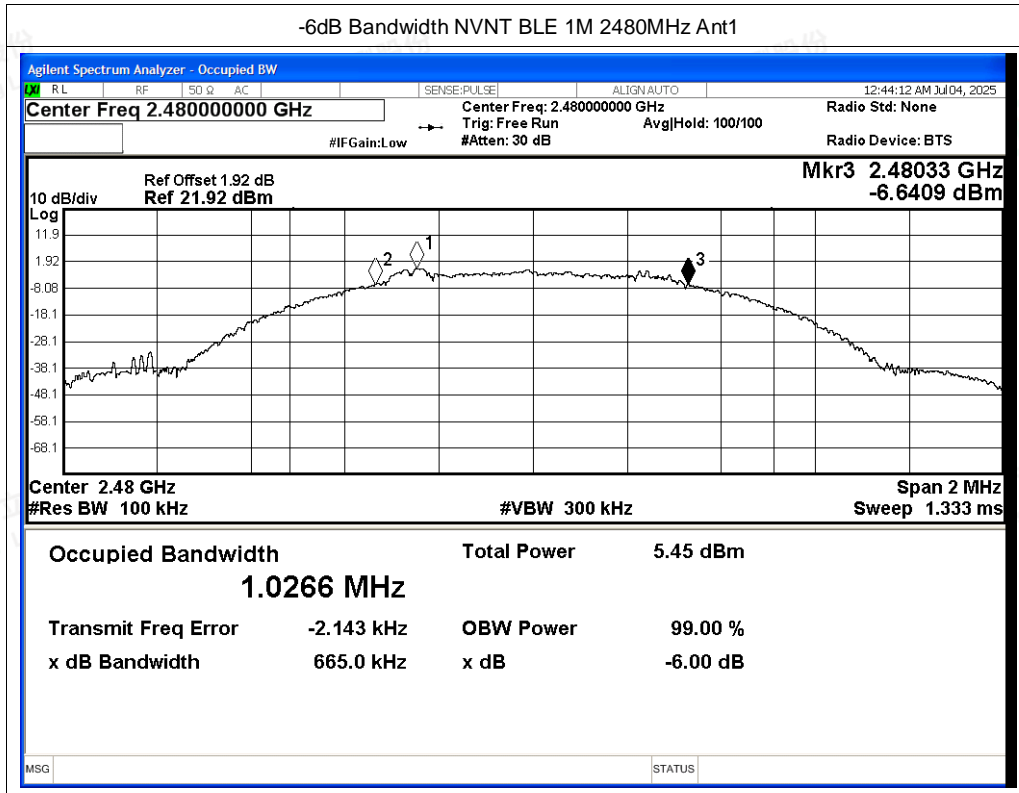
Test Graphs

-6dB Bandwidth NVNT BLE 1M 2402MHz Ant1



-6dB Bandwidth NVNT BLE 1M 2440MHz Ant1







A.2 Maximum Peak Conducted Output Power

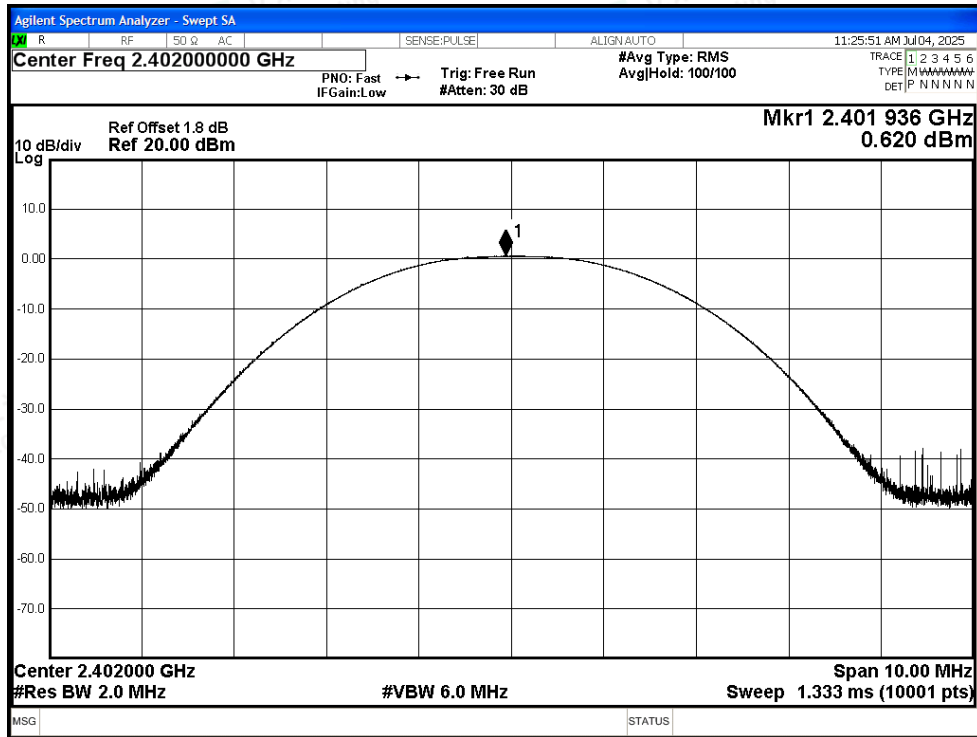
Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	BLE 1M	2402	Ant0	0.62	30	Pass
NVNT	BLE 1M	2440	Ant0	0.31	30	Pass
NVNT	BLE 1M	2480	Ant0	-0.69	30	Pass
NVNT	BLE 1M	2402	Ant1	-1.79	30	Pass
NVNT	BLE 1M	2440	Ant1	0.77	30	Pass
NVNT	BLE 1M	2480	Ant1	-0.16	30	Pass



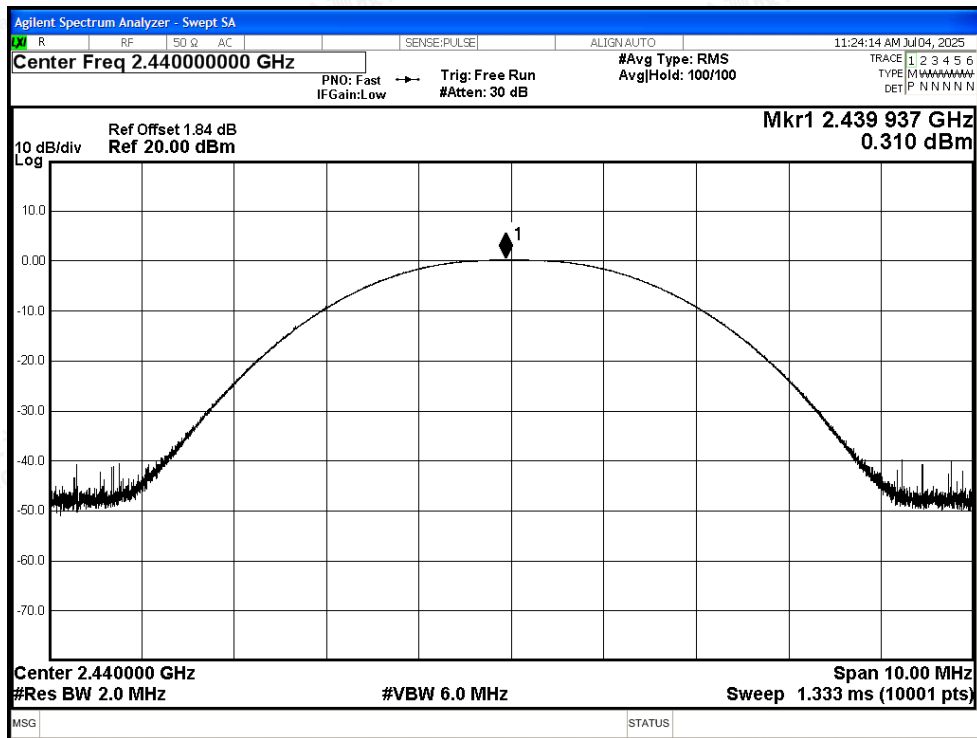


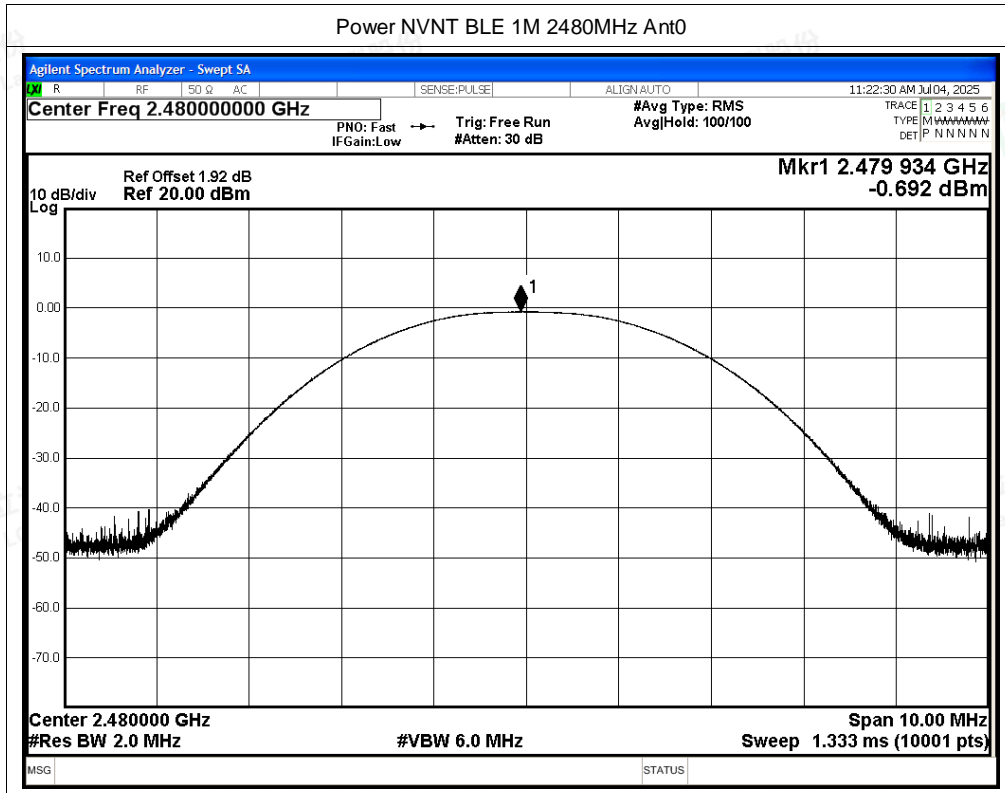
Test Graphs

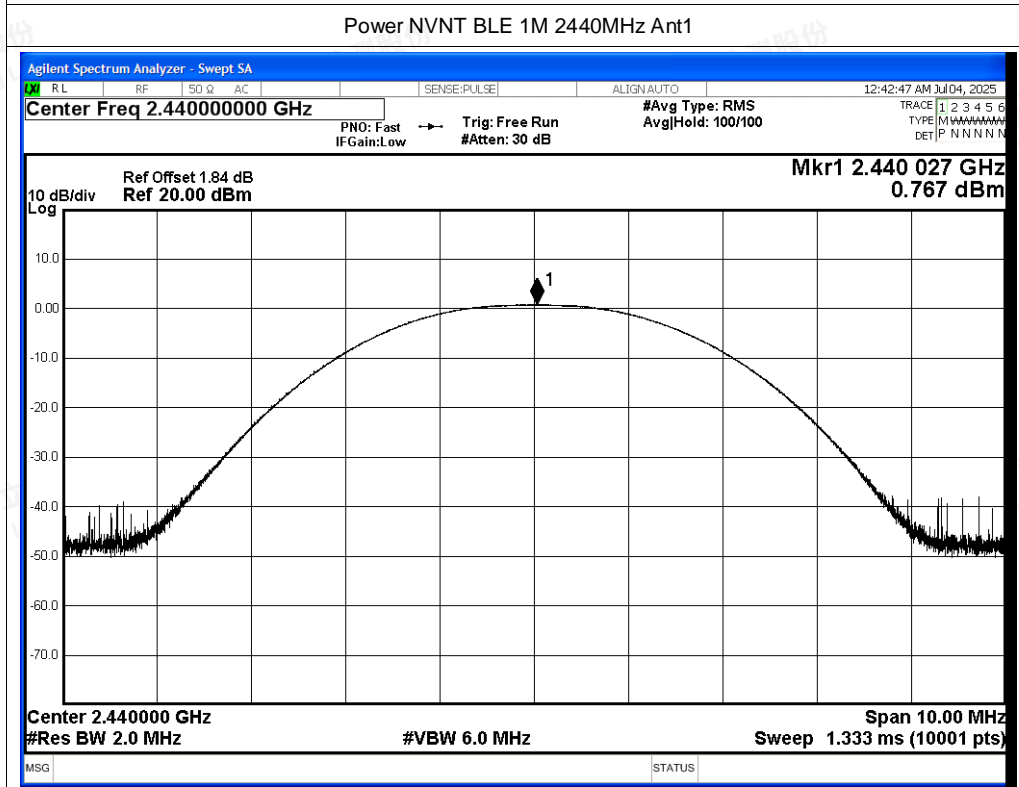
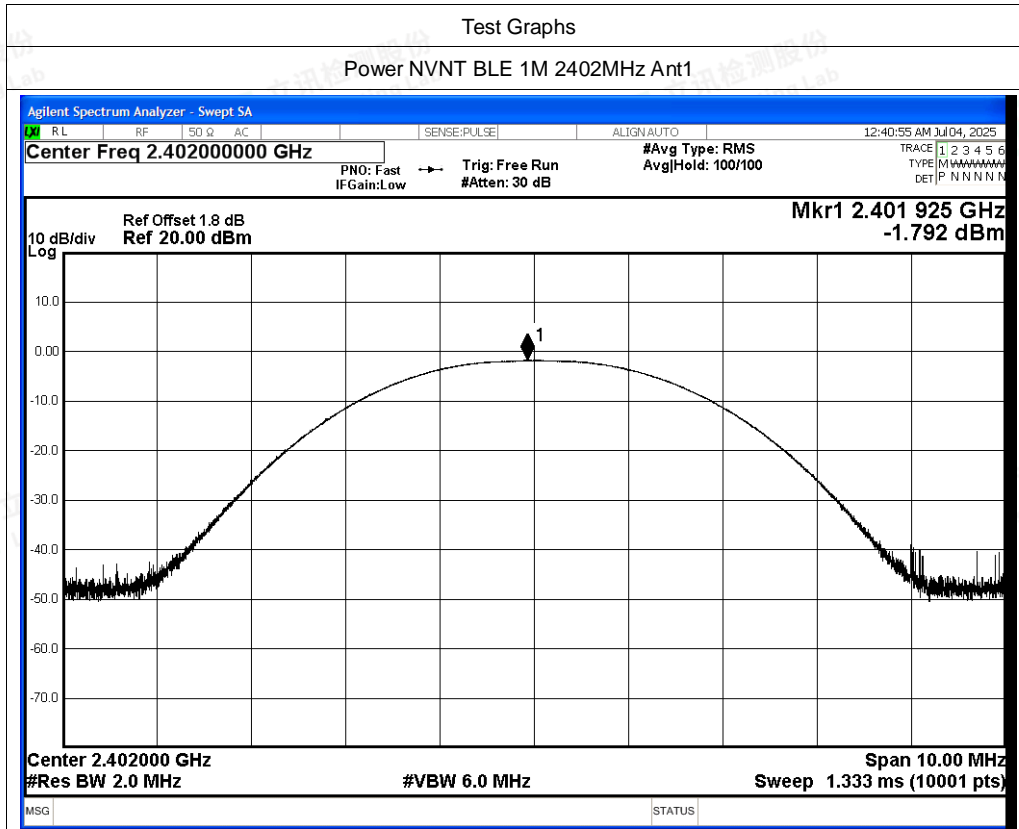
Power NVNT BLE 1M 2402MHz Ant0

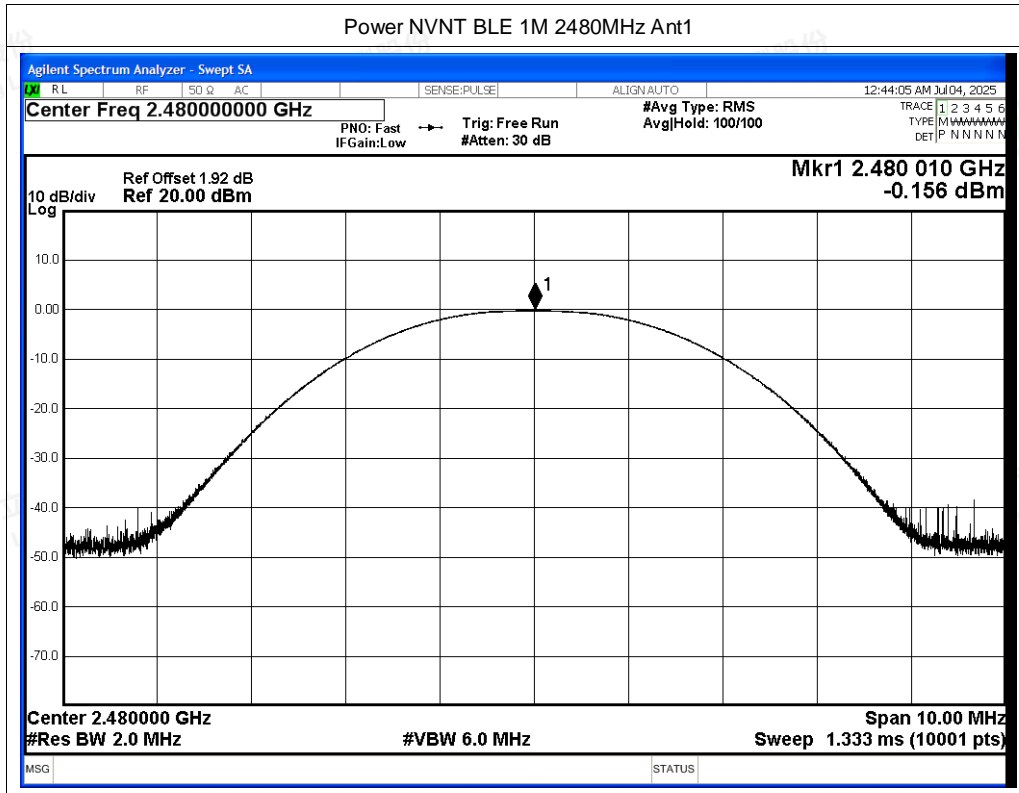


Power NVNT BLE 1M 2440MHz Ant0







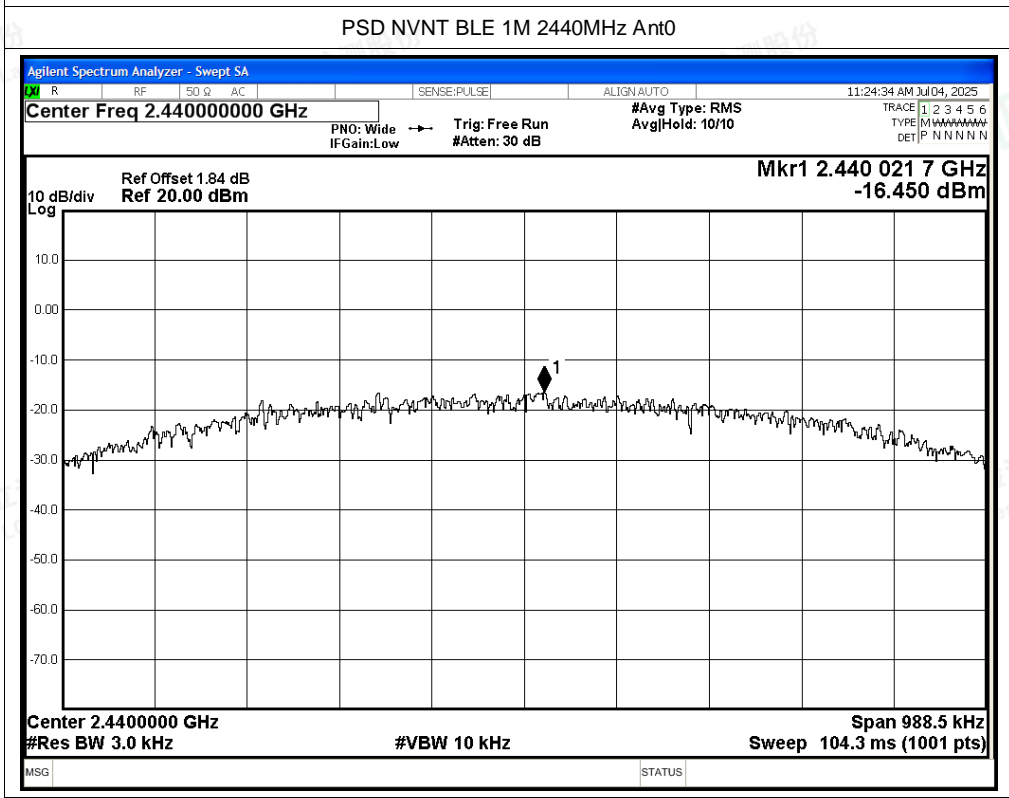
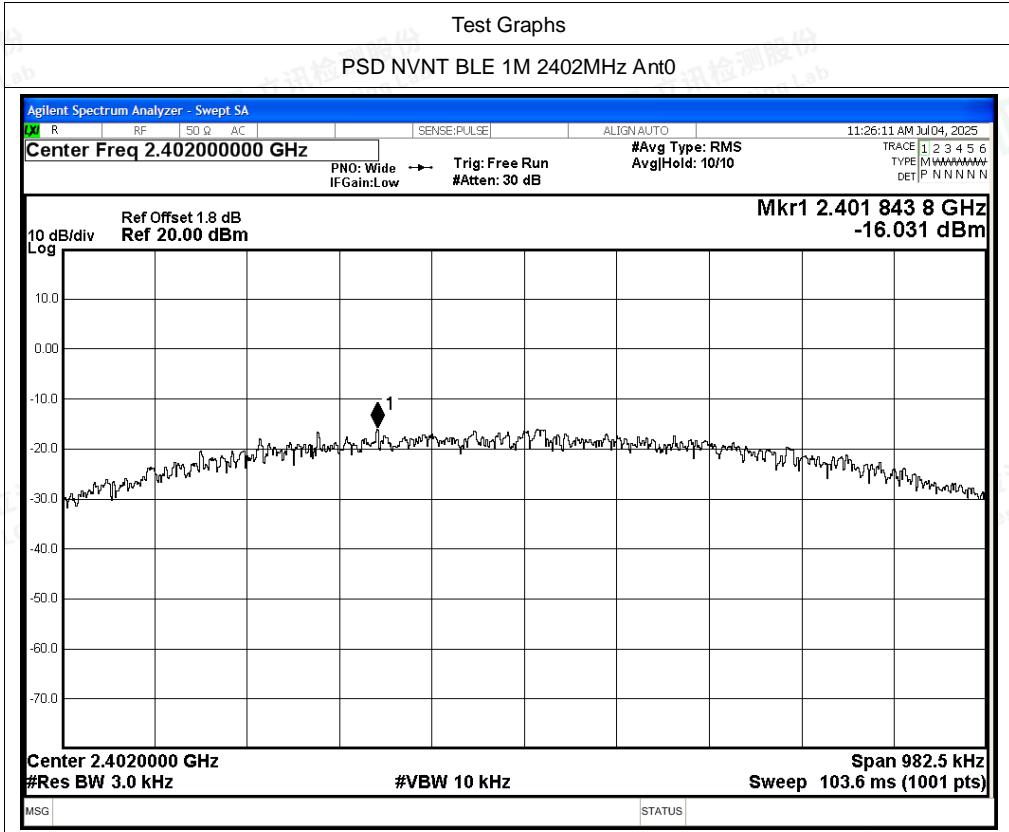


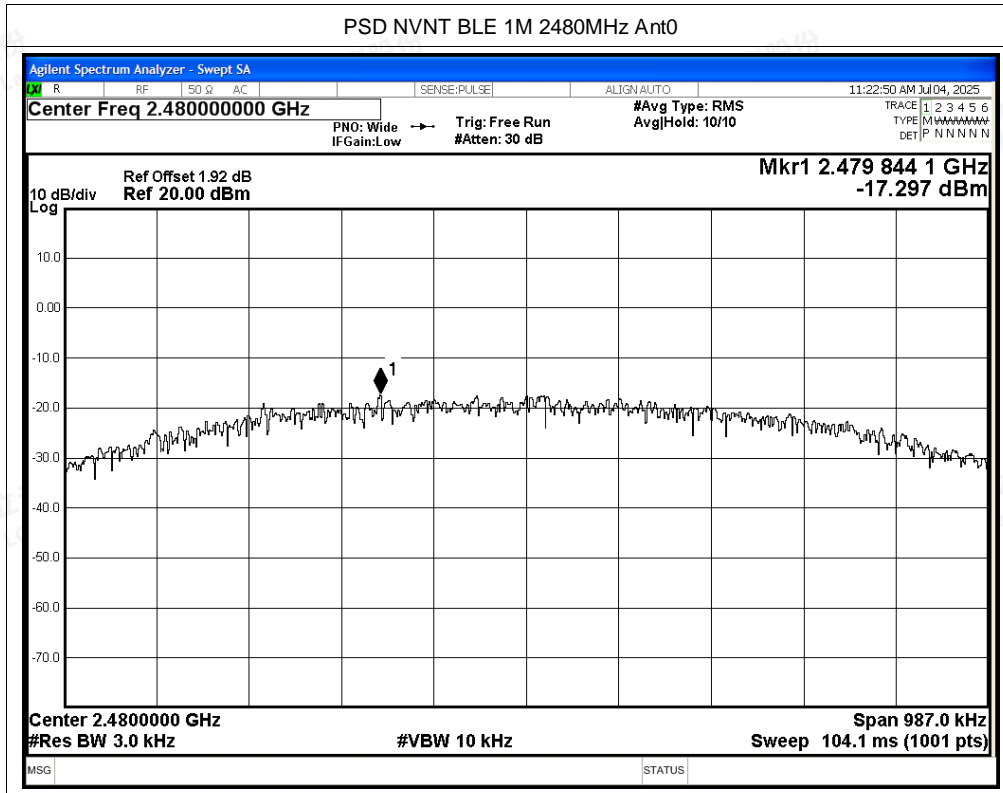


A.3 Maximum Power Spectral Density Level

Condition	Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	BLE 1M	2402	Ant0	-16.03	8	Pass
NVNT	BLE 1M	2440	Ant0	-16.45	8	Pass
NVNT	BLE 1M	2480	Ant0	-17.3	8	Pass
NVNT	BLE 1M	2402	Ant1	-18.06	8	Pass
NVNT	BLE 1M	2440	Ant1	-15.71	8	Pass
NVNT	BLE 1M	2480	Ant1	-16.47	8	Pass



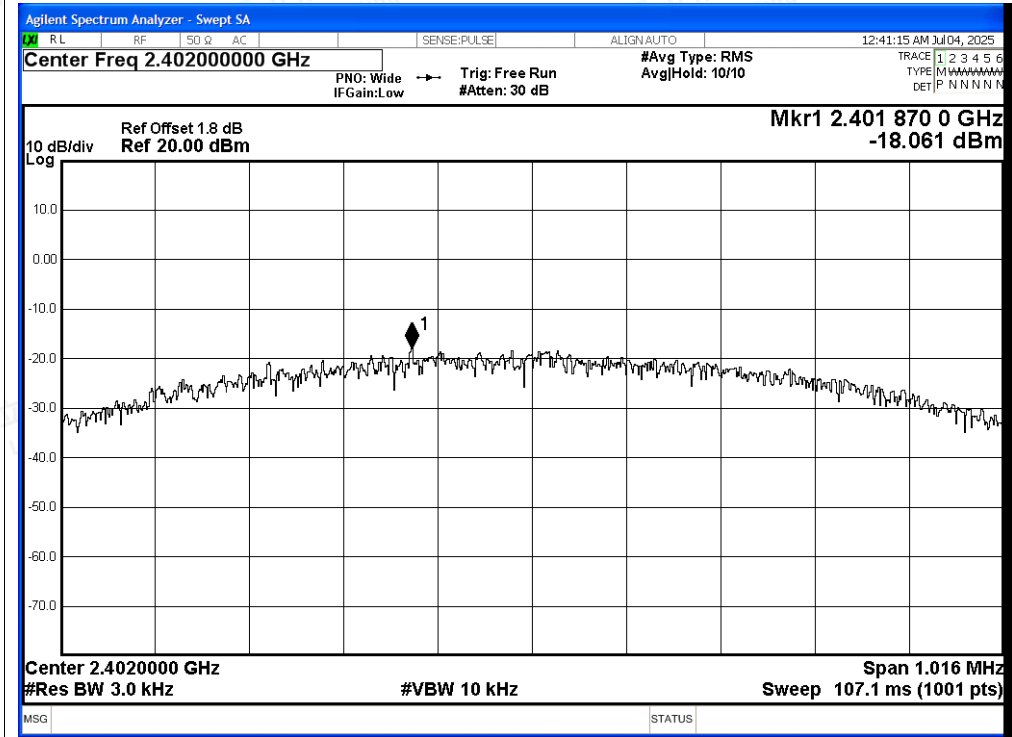




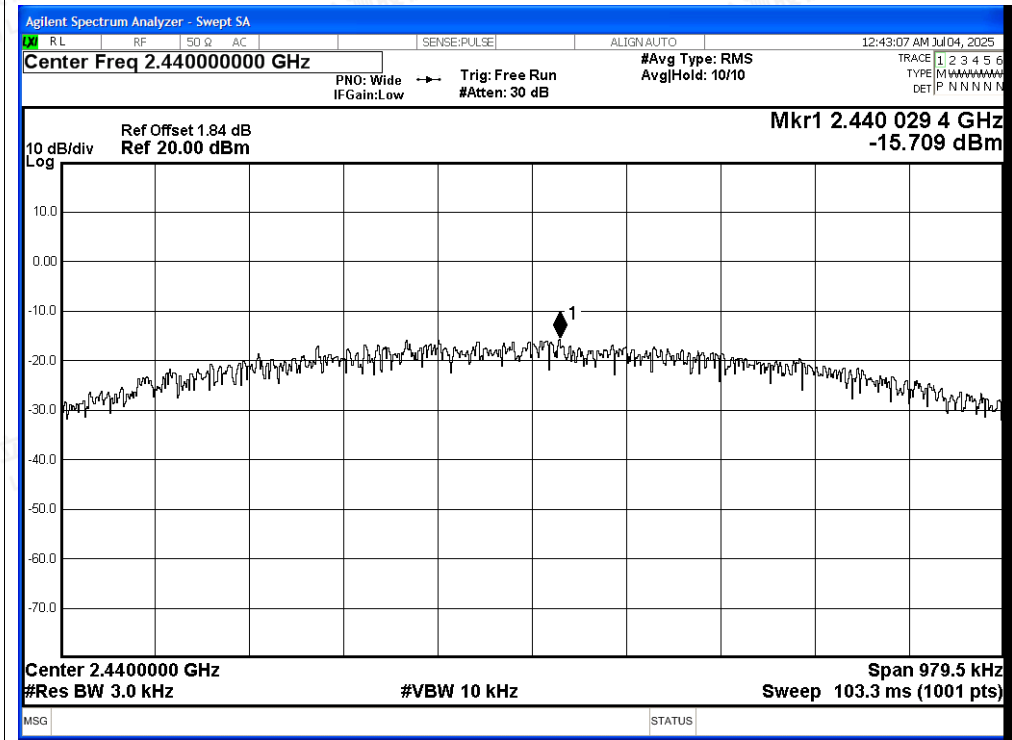


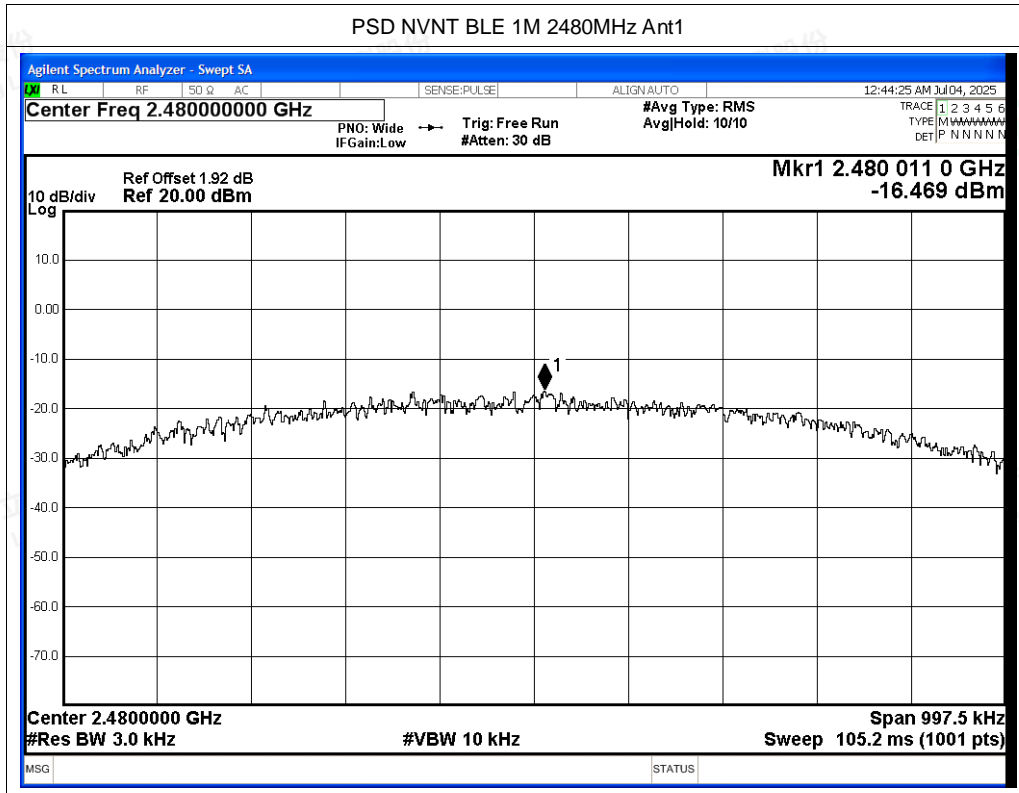
Test Graphs

PSD NVNT BLE 1M 2402MHz Ant1



PSD NVNT BLE 1M 2440MHz Ant1







A. 4 Band Edge

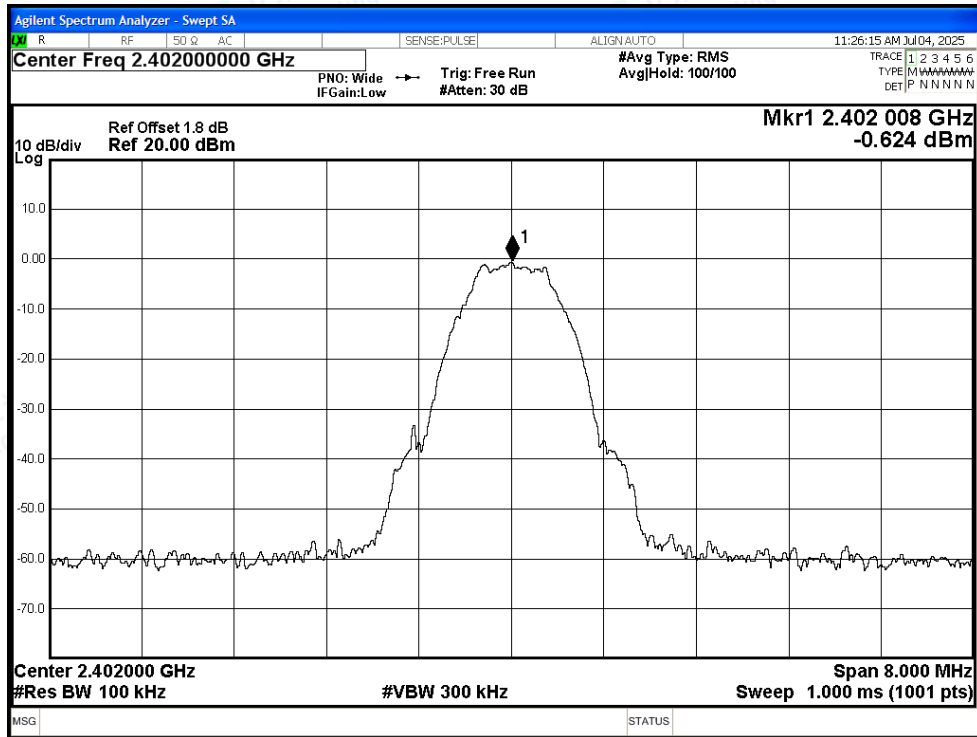
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	Ant0	-56.02	-20	Pass
NVNT	BLE 1M	2480	Ant0	-55.82	-20	Pass
NVNT	BLE 1M	2402	Ant1	-54.71	-20	Pass
NVNT	BLE 1M	2480	Ant1	-56.13	-20	Pass



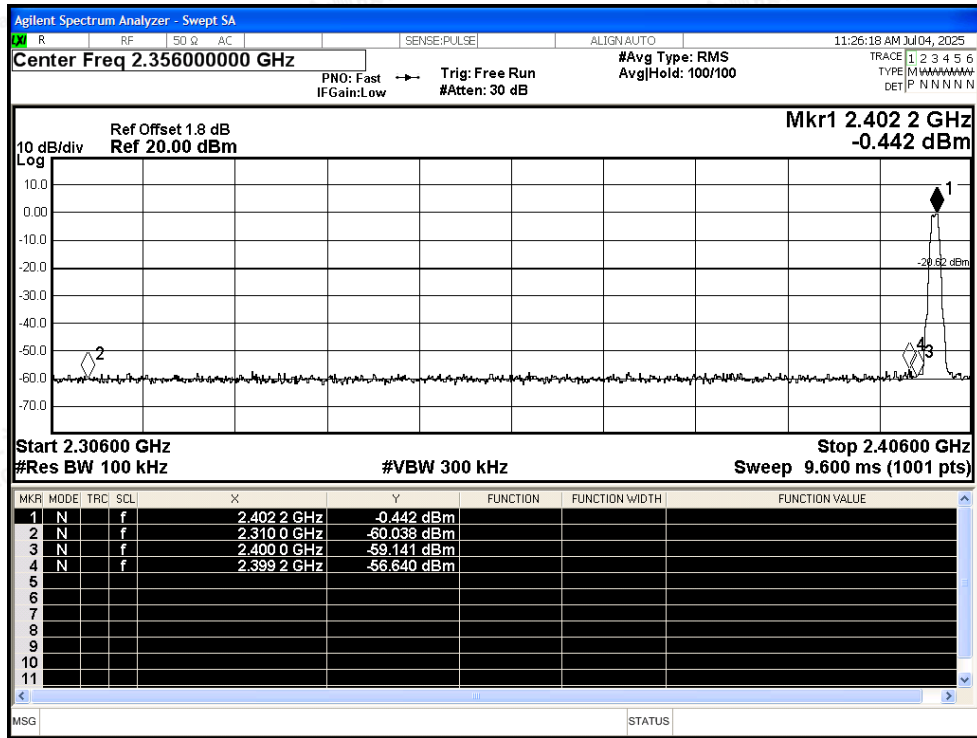


Test Graphs

Band Edge NVNT BLE 1M 2402MHz Ant0 Ref



Band Edge NVNT BLE 1M 2402MHz Ant0 Emission

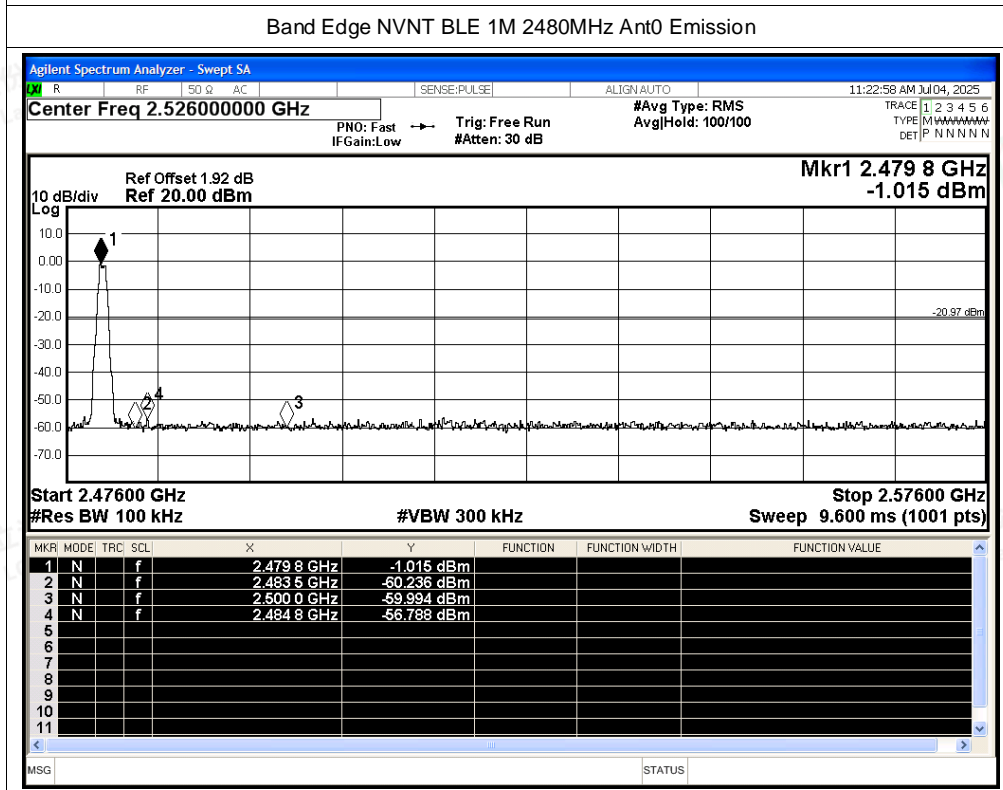
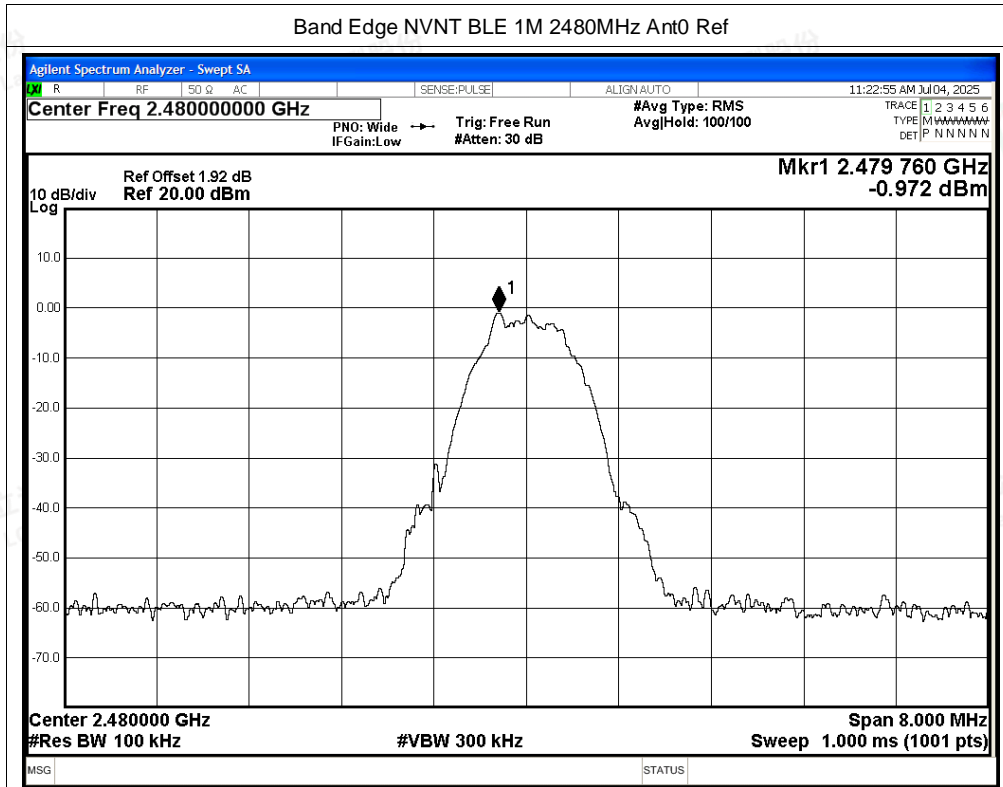


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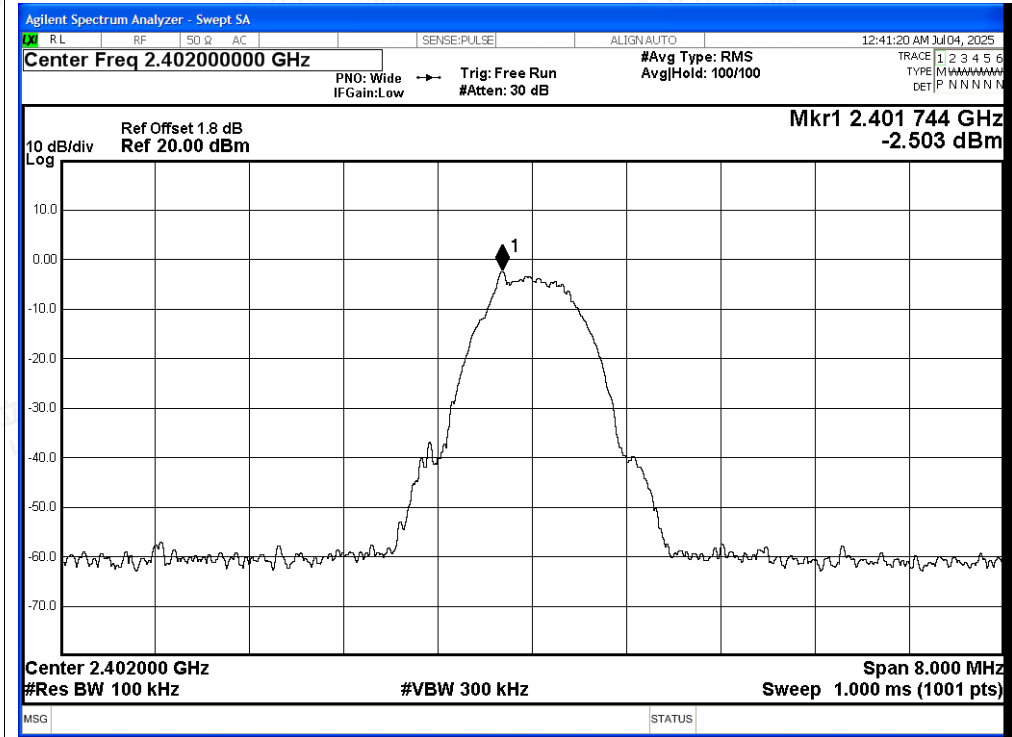
Scan code to check authenticity



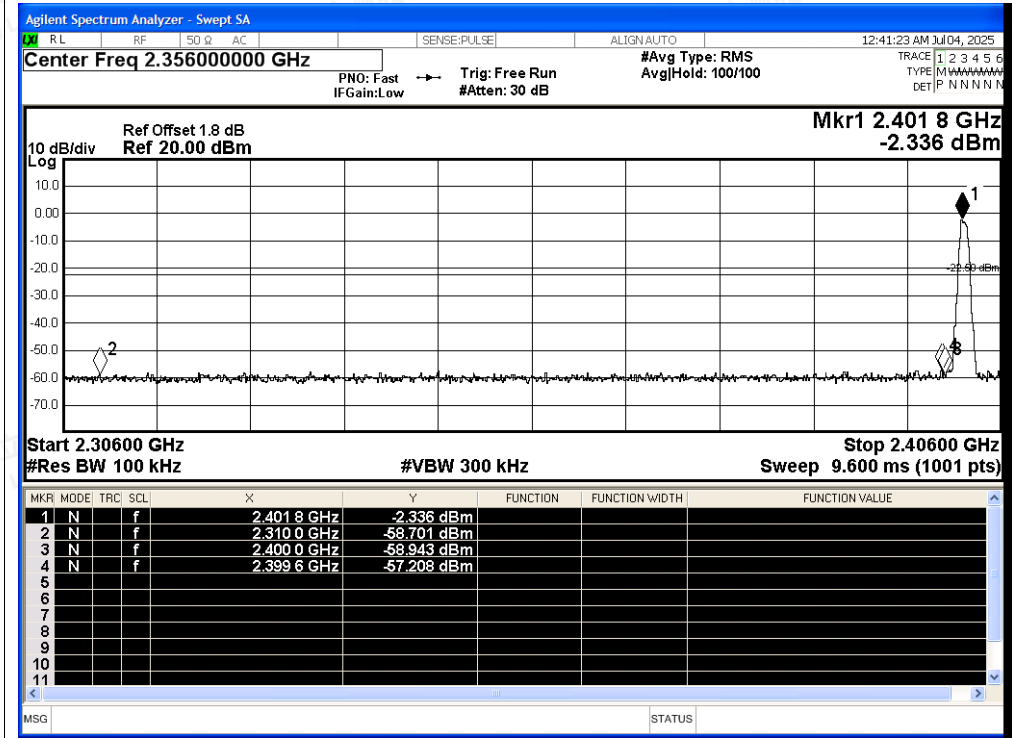


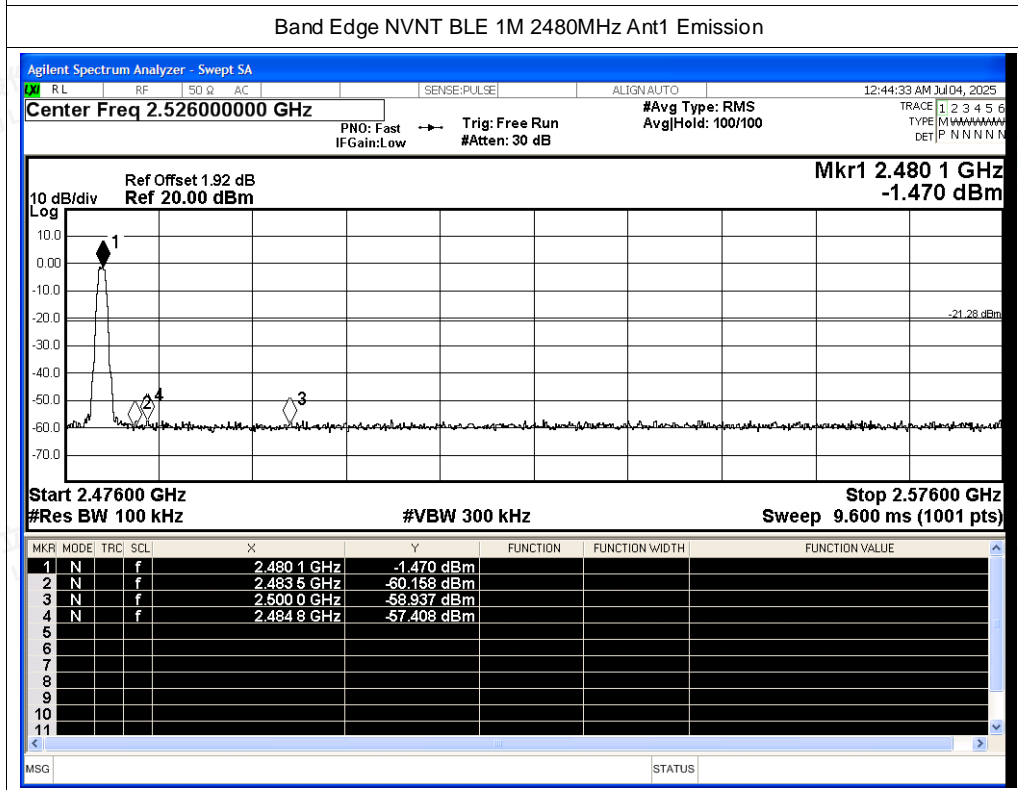
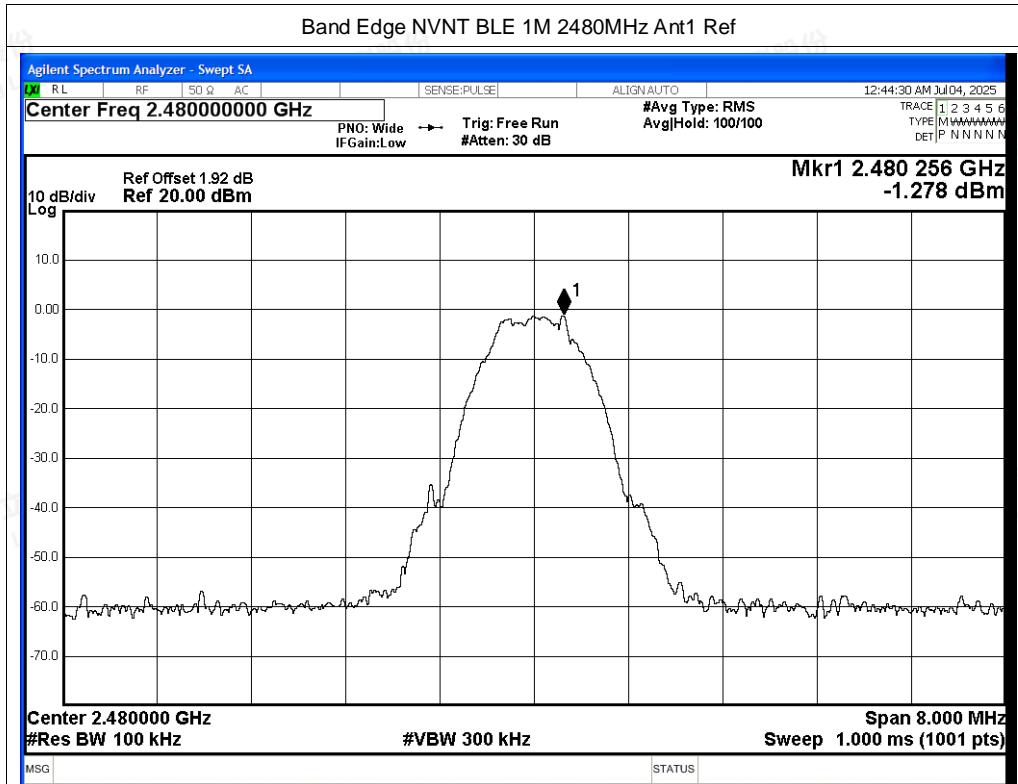
Test Graphs

Band Edge NVNT BLE 1M 2402MHz Ant1 Ref



Band Edge NVNT BLE 1M 2402MHz Ant1 Emission







A.5 Conducted RF Spurious Emission

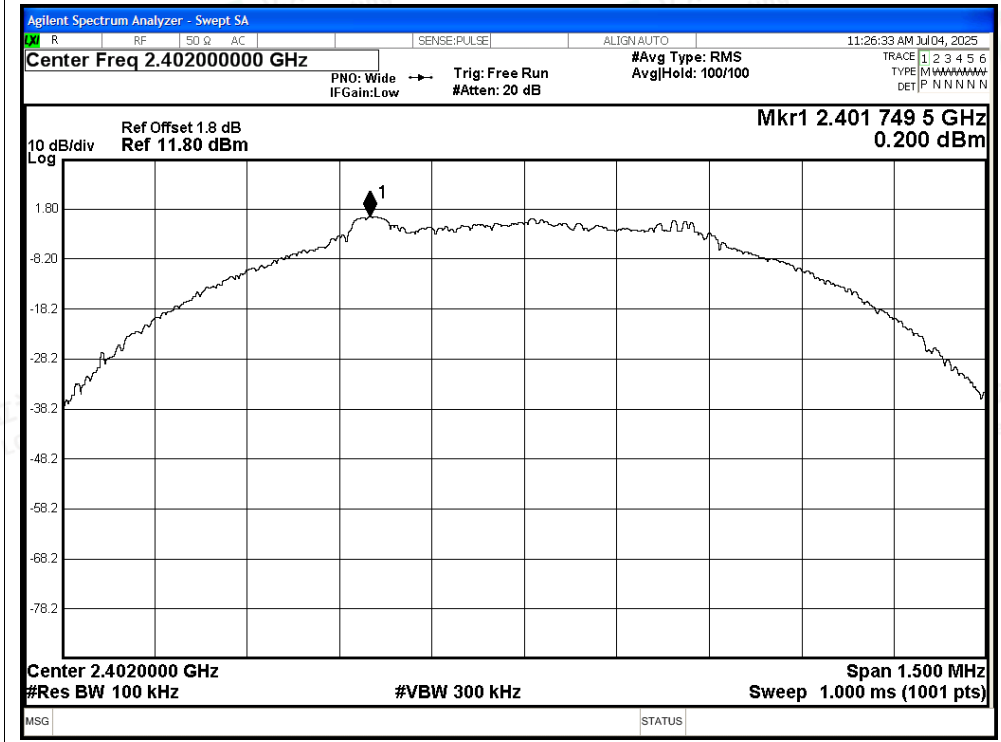
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	Ant0	-55.57	-20	Pass
NVNT	BLE 1M	2440	Ant0	-55.74	-20	Pass
NVNT	BLE 1M	2480	Ant0	-53.6	-20	Pass
NVNT	BLE 1M	2402	Ant1	-53.14	-20	Pass
NVNT	BLE 1M	2440	Ant1	-54.76	-20	Pass
NVNT	BLE 1M	2480	Ant1	-54.19	-20	Pass



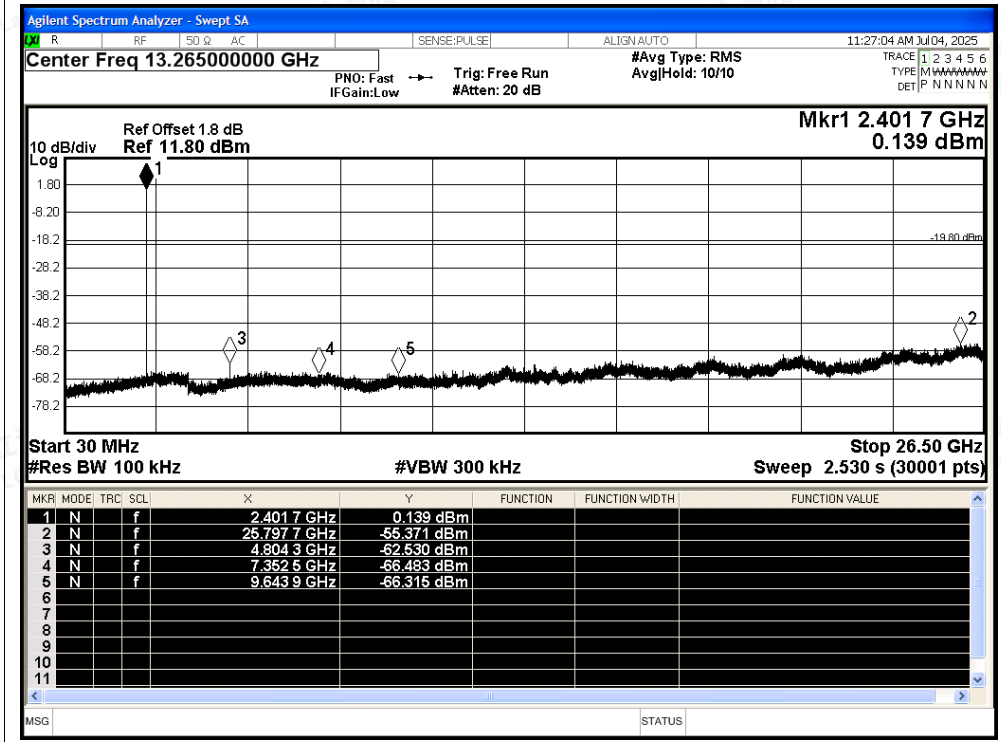


Test Graphs

Tx. Spurious NVNT BLE 1M 2402MHz Ant0 Ref

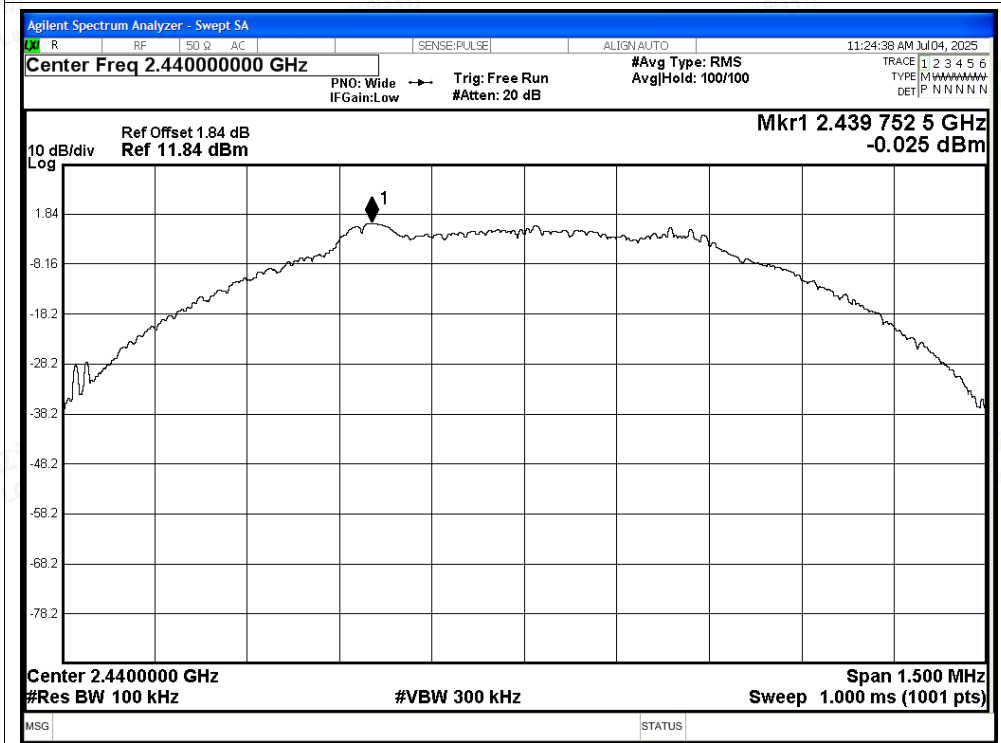


Tx. Spurious NVNT BLE 1M 2402MHz Ant0 Emission

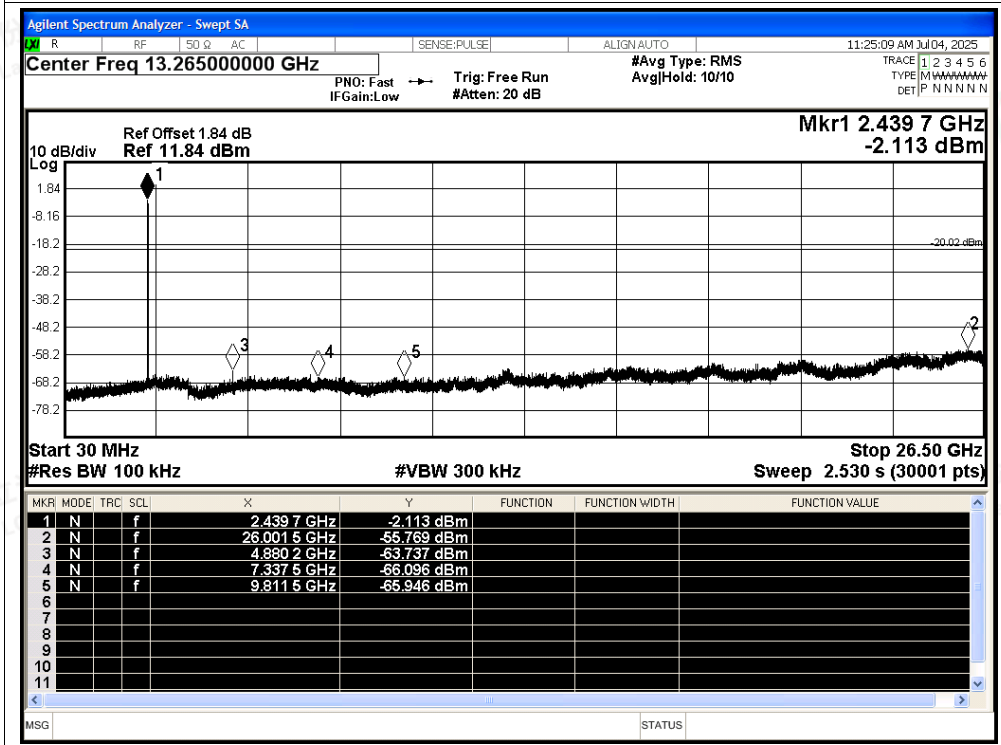




Tx. Spurious NVNT BLE 1M 2440MHz Ant0 Ref

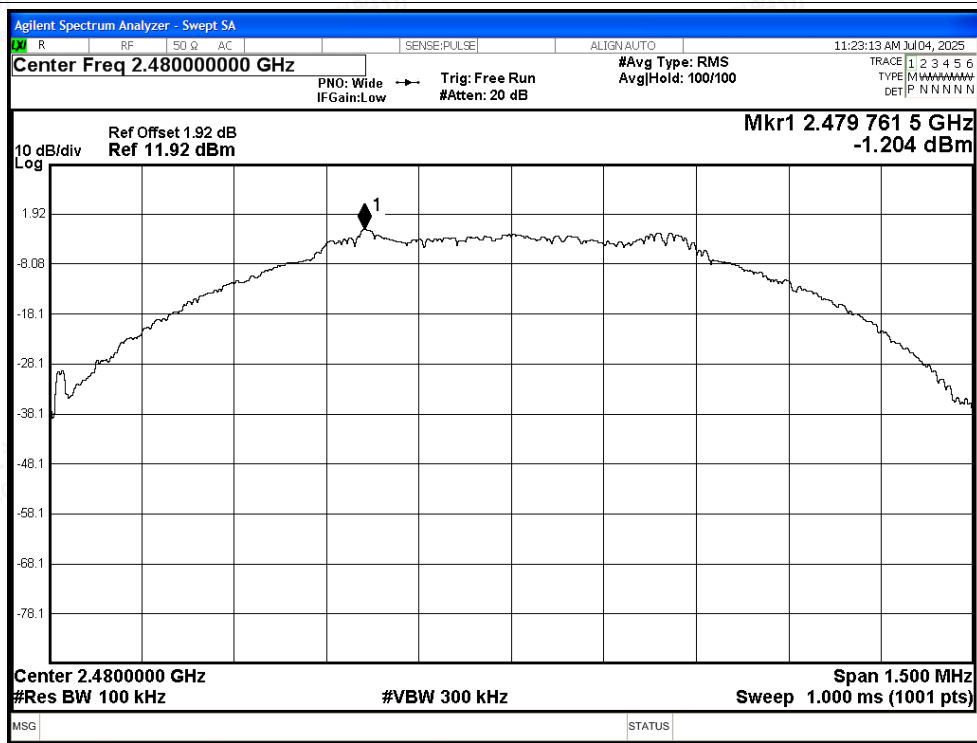


Tx. Spurious NVNT BLE 1M 2440MHz Ant0 Emission

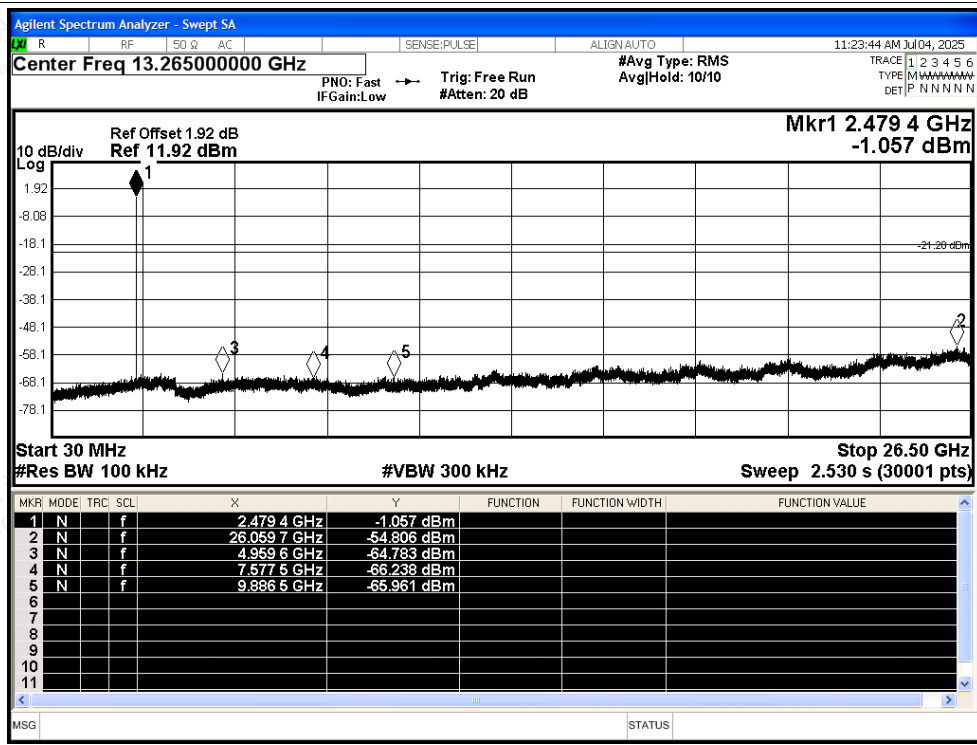




Tx. Spurious NVNT BLE 1M 2480MHz Ant0 Ref



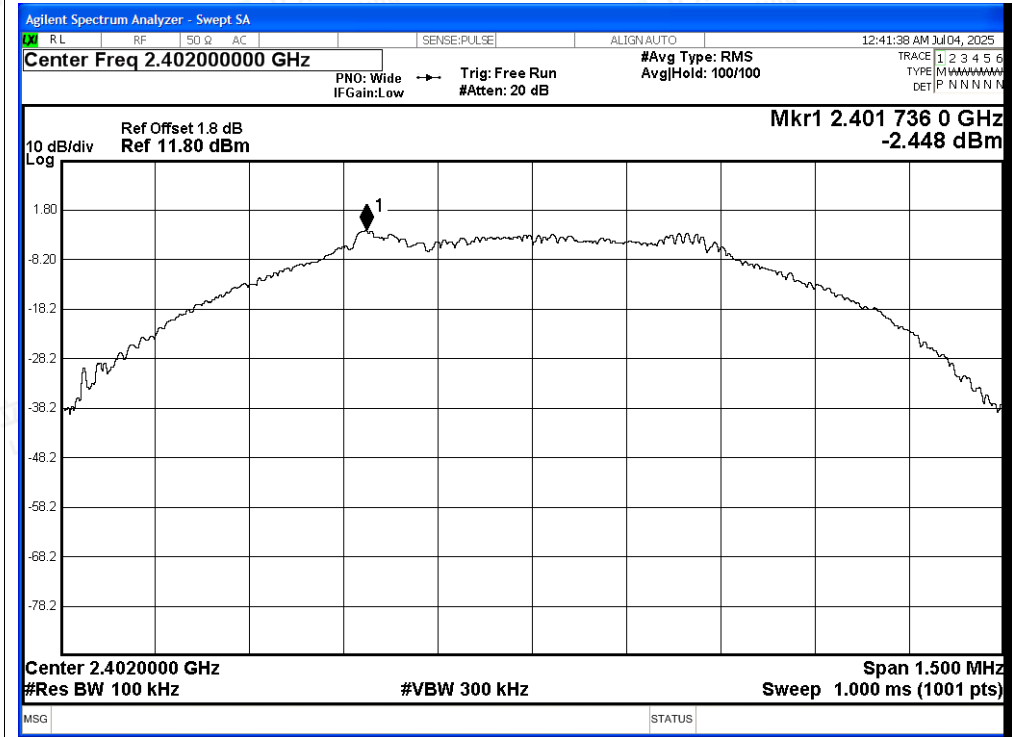
Tx. Spurious NVNT BLE 1M 2480MHz Ant0 Emission



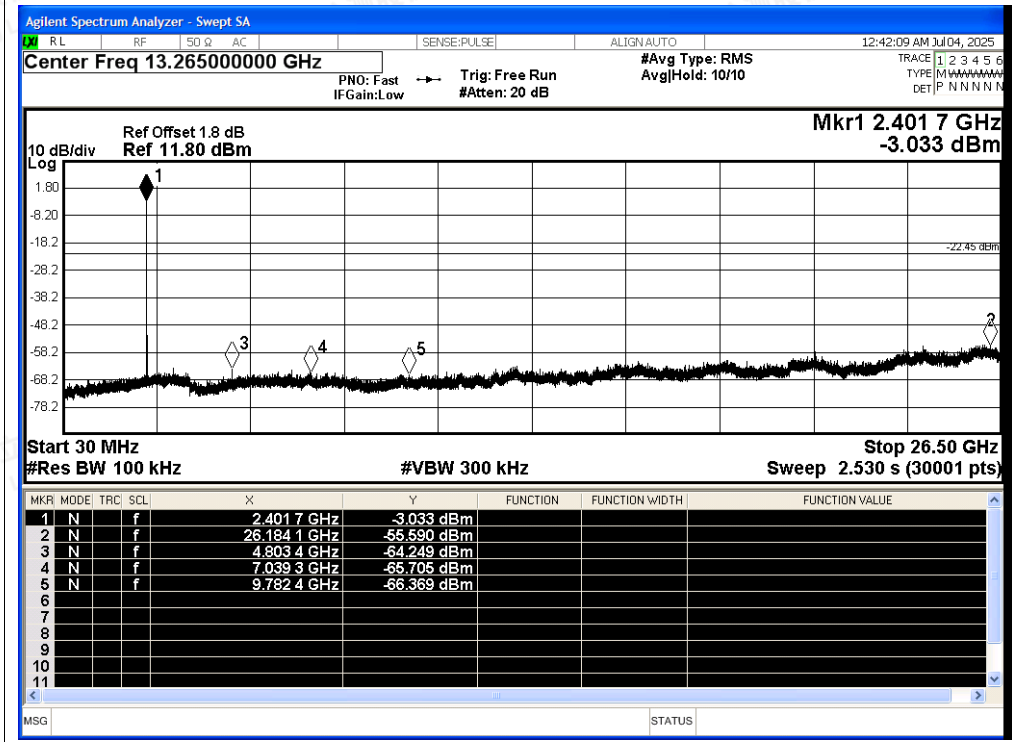


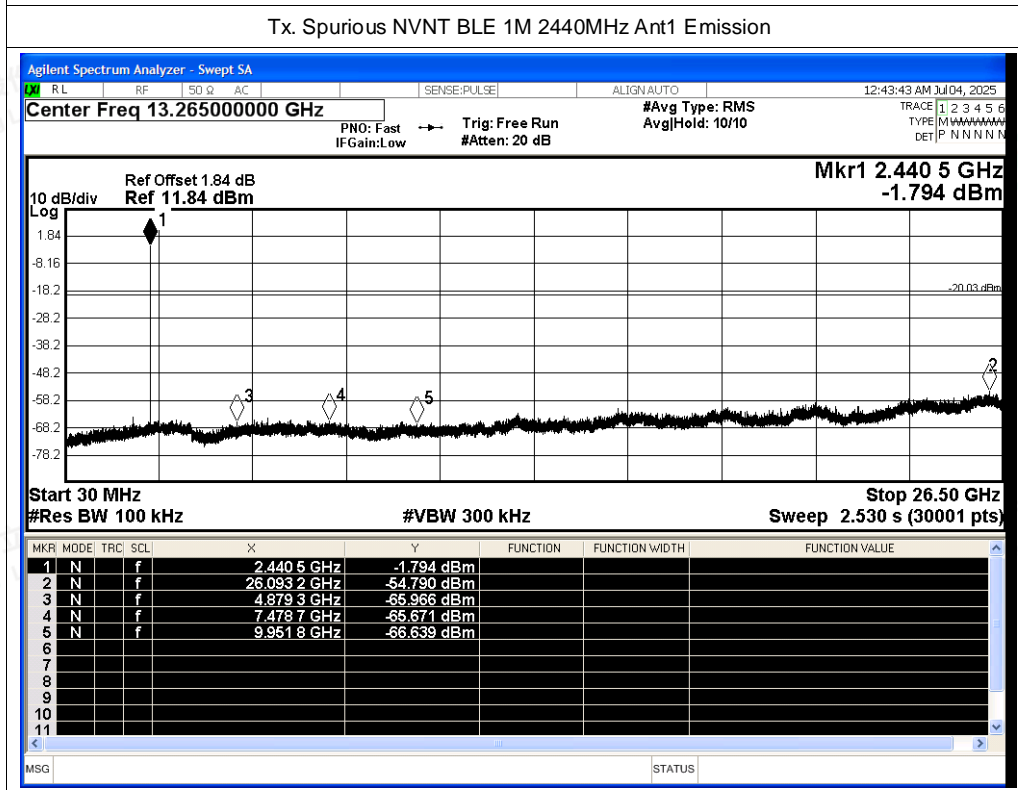
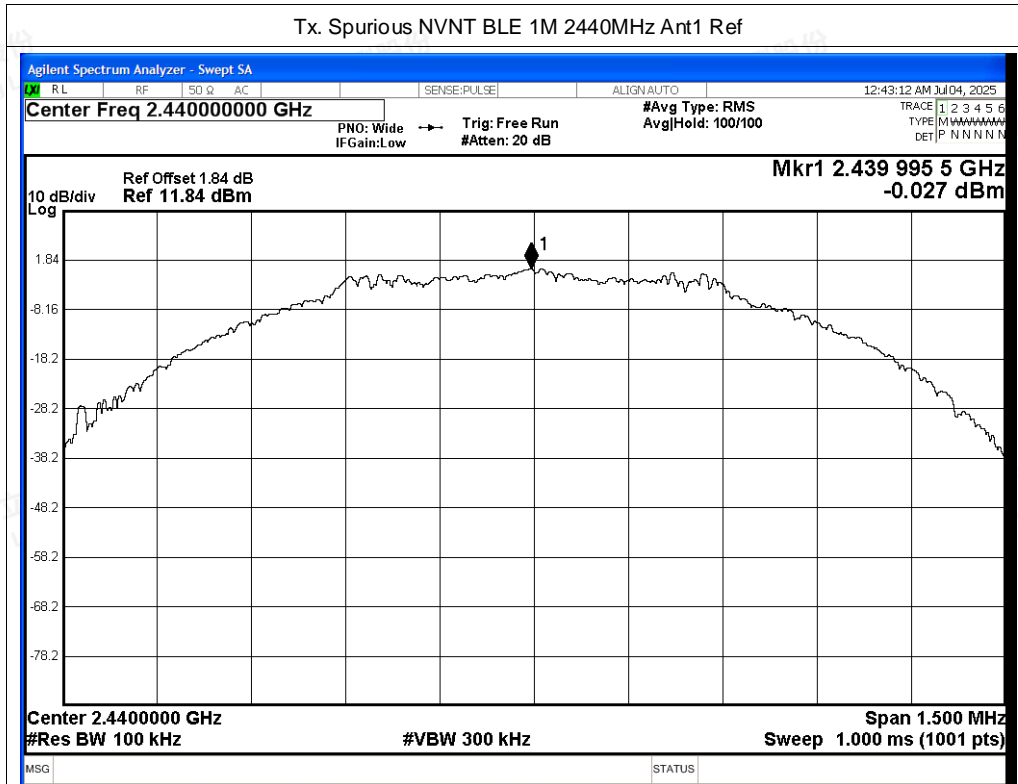
Test Graphs

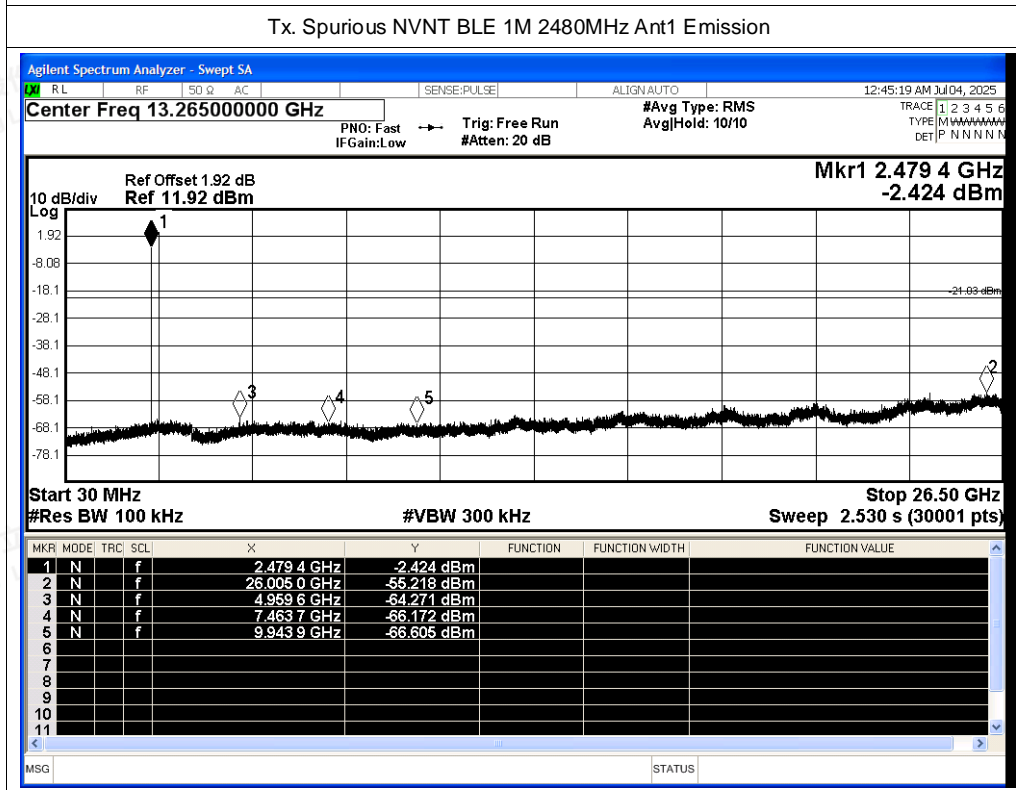
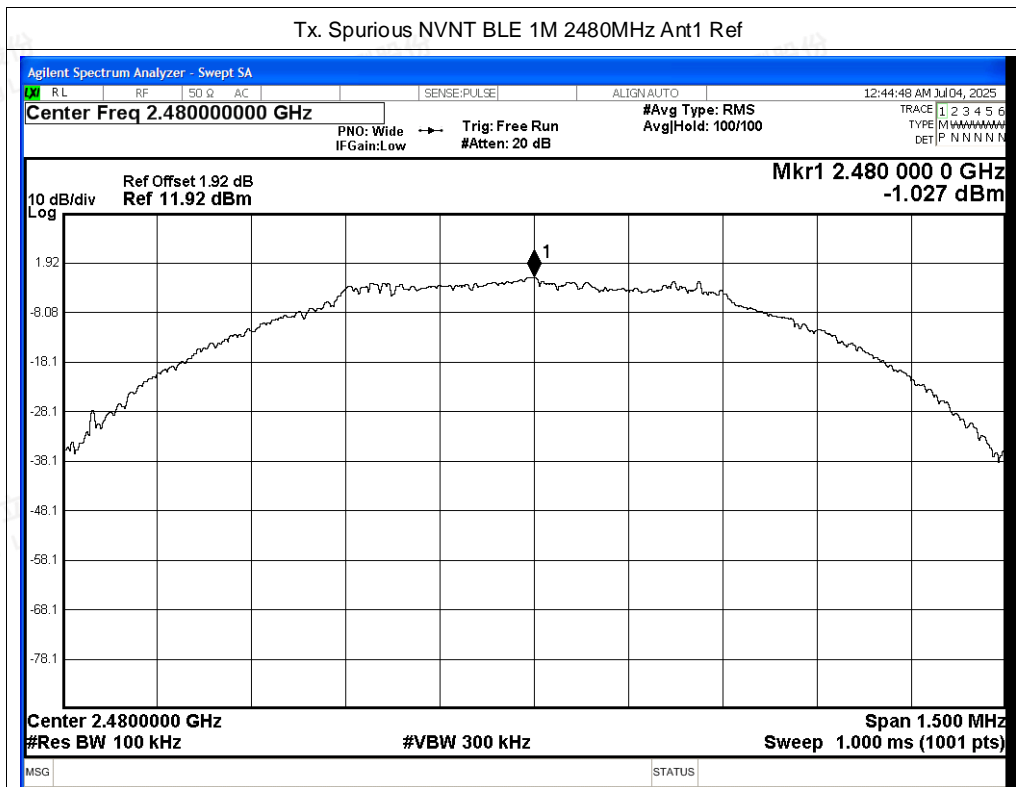
Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Ref



Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Emission









A.6 Duty Cycle

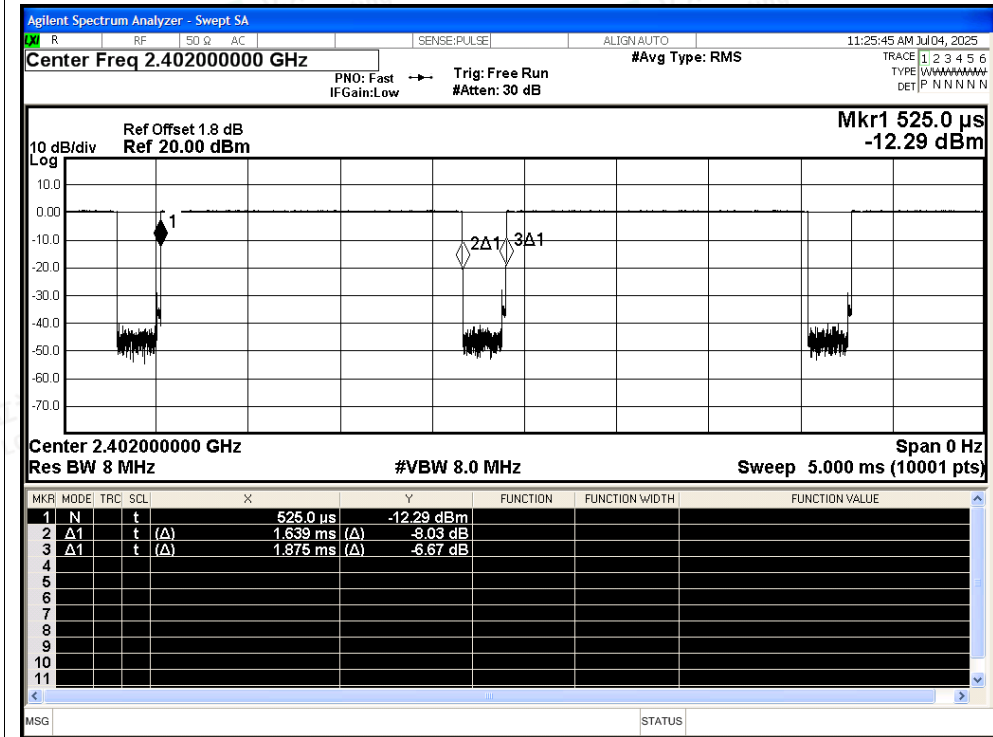
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	BLE 1M	2402	Ant0	87.39	0.59	0.61
NVNT	BLE 1M	2440	Ant0	87.39	0.59	0.61
NVNT	BLE 1M	2480	Ant0	87.39	0.59	0.61
NVNT	BLE 1M	2402	Ant1	72.03	1.42	0.74
NVNT	BLE 1M	2440	Ant1	72.03	1.42	0.74
NVNT	BLE 1M	2480	Ant1	72.03	1.42	0.74



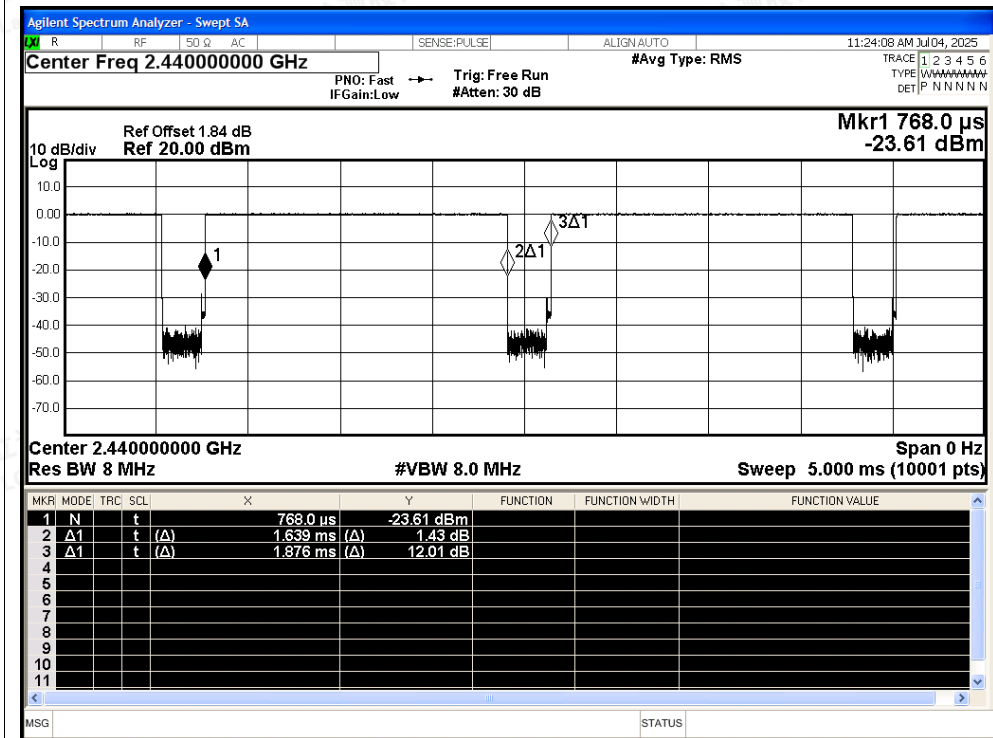


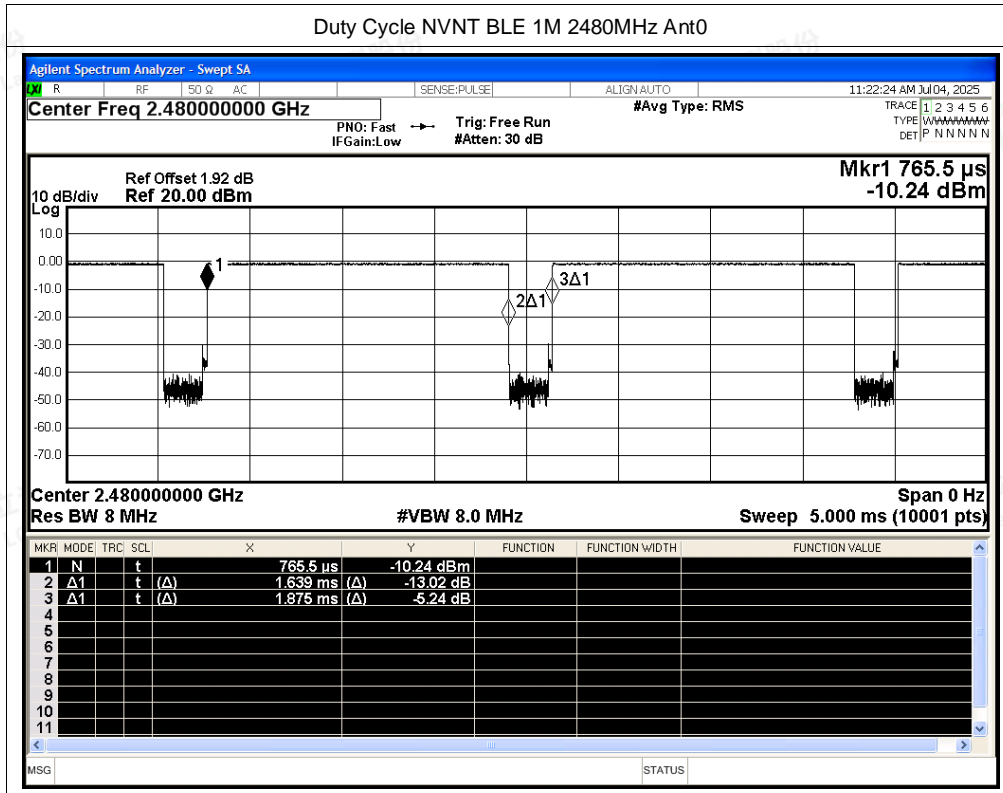
Test Graphs

Duty Cycle NVNT BLE 1M 2402MHz Ant0



Duty Cycle NVNT BLE 1M 2440MHz Ant0

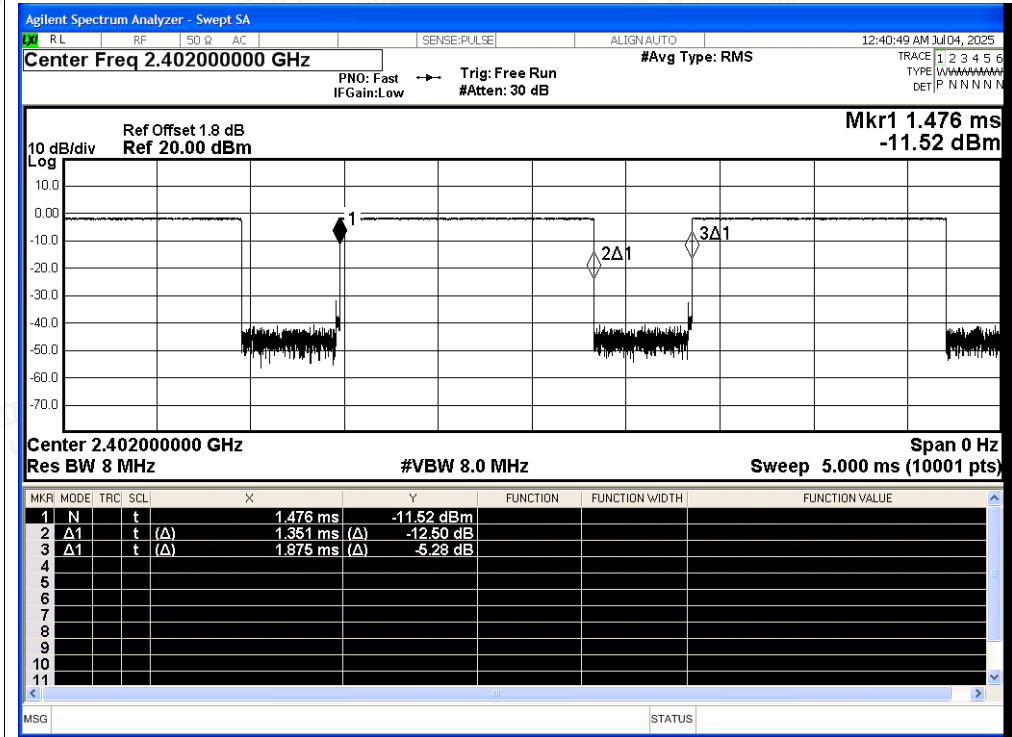




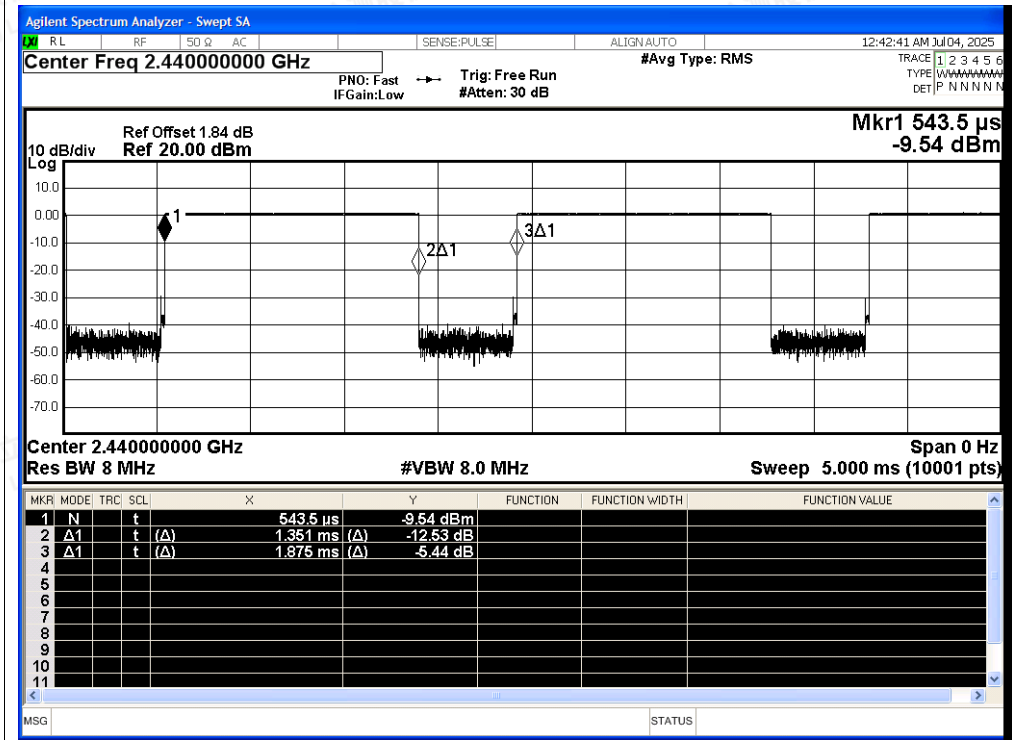


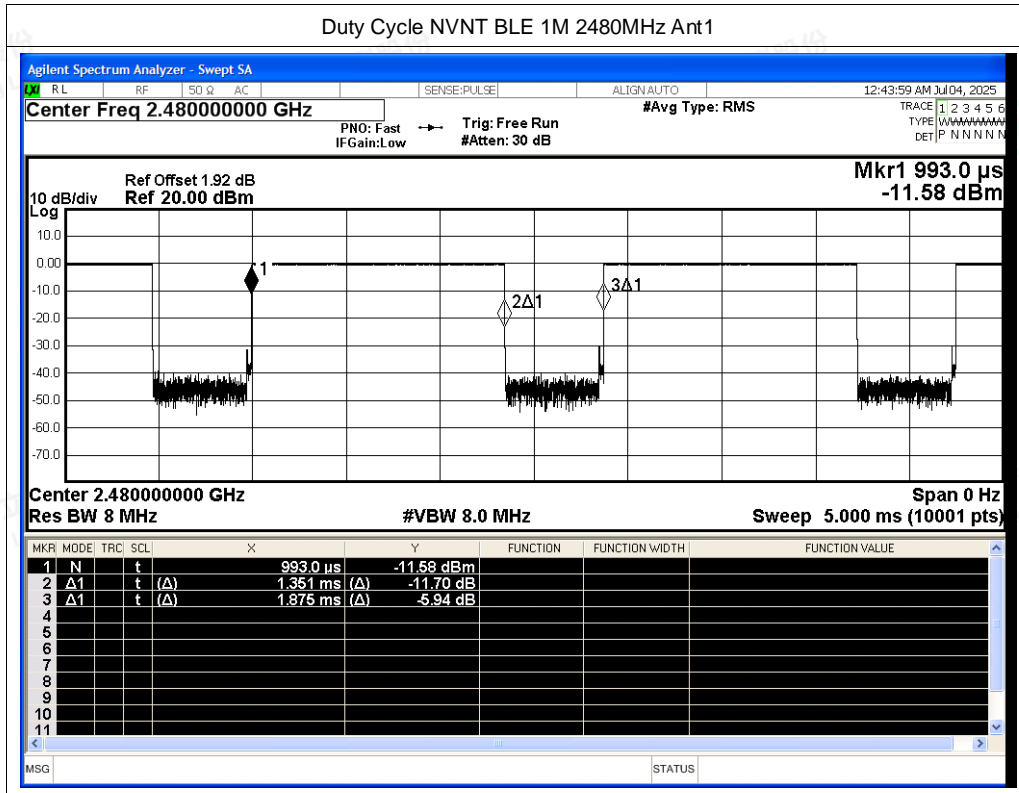
Test Graphs

Duty Cycle NVNT BLE 1M 2402MHz Ant 1



Duty Cycle NVNT BLE 1M 2440MHz Ant 1



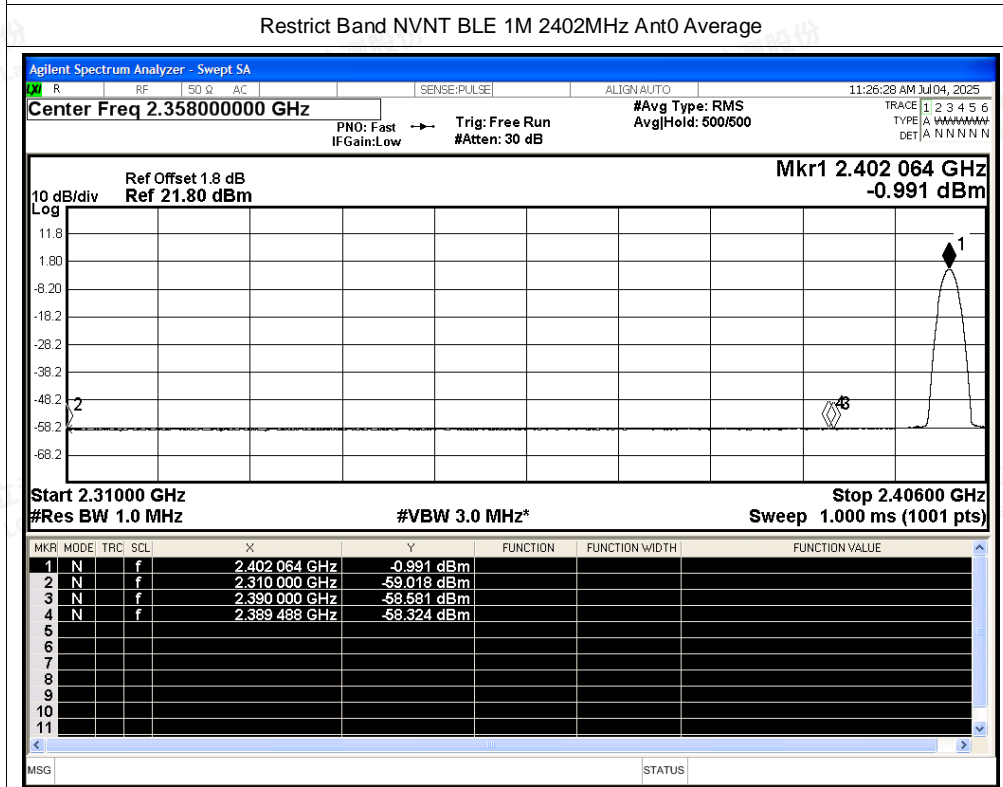
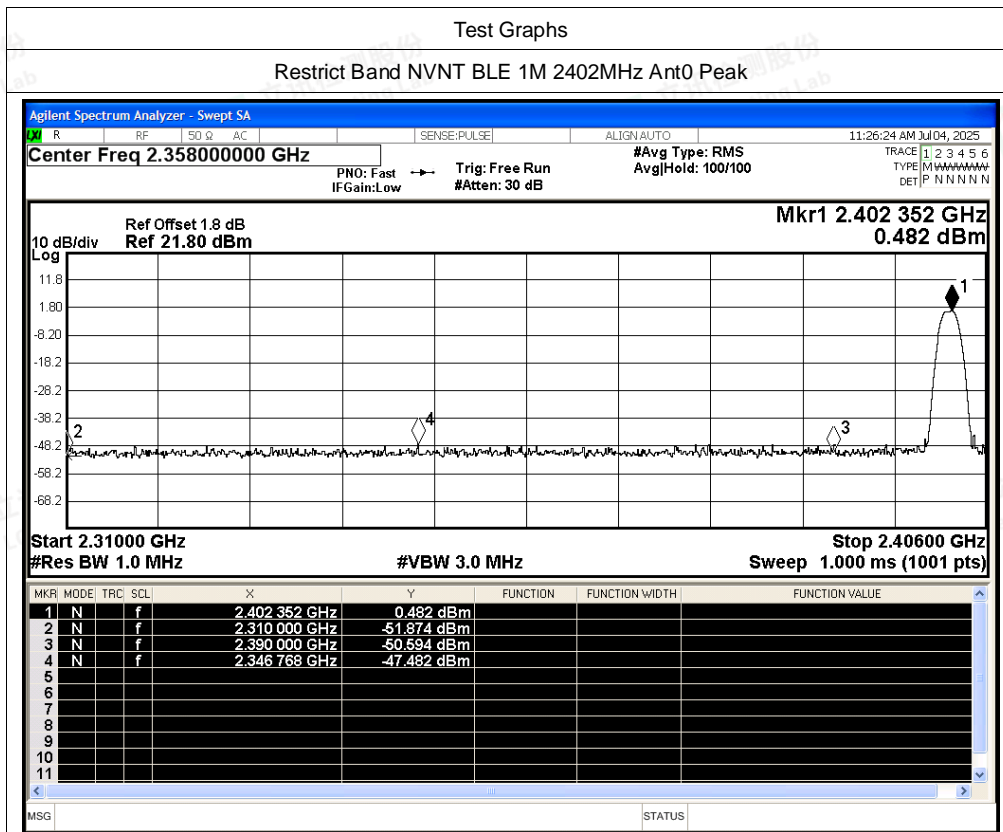




A.7 Restrict Band

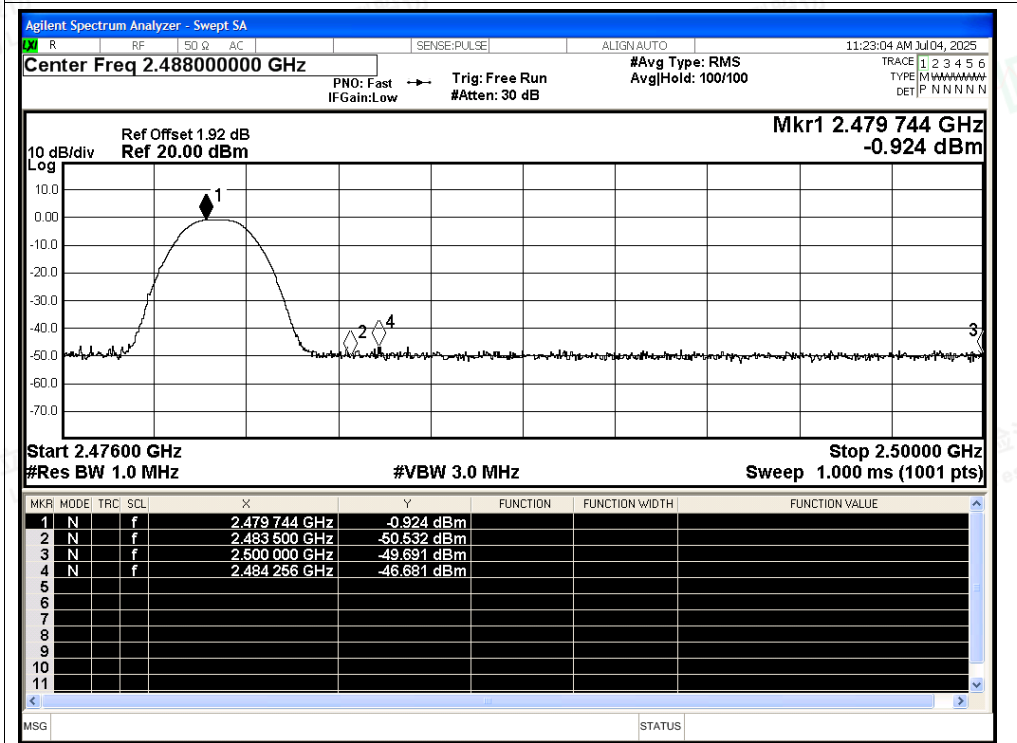
Condition	Mode	Frequency (MHz)	Antenna	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	Duty Factor (dB)	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
NVNT	BLE 1M	2402	Ant0	2310	-51.87	2.2	-	45.59	Peak	74	Pass
NVNT	BLE 1M	2402	Ant0	2310	-59.02	2.2	0.59	39.03	Average	54	Pass
NVNT	BLE 1M	2402	Ant0	2346.768	-47.48	2.2	-	49.98	Peak	74	Pass
NVNT	BLE 1M	2402	Ant0	2389.488	-58.32	2.2	0.59	39.73	Average	54	Pass
NVNT	BLE 1M	2402	Ant0	2390	-50.59	2.2	-	46.87	Peak	74	Pass
NVNT	BLE 1M	2402	Ant0	2390	-58.58	2.2	0.59	39.47	Average	54	Pass
NVNT	BLE 1M	2480	Ant0	2483.5	-50.53	2.2	-	46.93	Peak	74	Pass
NVNT	BLE 1M	2480	Ant0	2483.5	-57.7	2.2	0.59	40.35	Average	54	Pass
NVNT	BLE 1M	2480	Ant0	2484.256	-46.68	2.2	-	50.78	Peak	74	Pass
NVNT	BLE 1M	2480	Ant0	2484.784	-57.69	2.2	0.59	40.36	Average	54	Pass
NVNT	BLE 1M	2480	Ant0	2500	-49.69	2.2	-	47.77	Peak	74	Pass
NVNT	BLE 1M	2480	Ant0	2500	-58.23	2.2	0.59	39.82	Average	54	Pass
NVNT	BLE 1M	2402	Ant1	2310	-49.1	2.2	-	48.36	Peak	74	Pass
NVNT	BLE 1M	2402	Ant1	2310	-59	2.2	1.42	39.88	Average	54	Pass
NVNT	BLE 1M	2402	Ant1	2359.056	-47.88	2.2	-	49.58	Peak	74	Pass
NVNT	BLE 1M	2402	Ant1	2376.528	-58.31	2.2	1.42	40.57	Average	54	Pass
NVNT	BLE 1M	2402	Ant1	2390	-50.66	2.2	-	46.80	Peak	74	Pass
NVNT	BLE 1M	2402	Ant1	2390	-58.49	2.2	1.42	40.39	Average	54	Pass
NVNT	BLE 1M	2480	Ant1	2483.5	-50.05	2.2	-	47.41	Peak	74	Pass
NVNT	BLE 1M	2480	Ant1	2483.5	-57.83	2.2	1.42	41.05	Average	54	Pass
NVNT	BLE 1M	2480	Ant1	2486.056	-45.17	2.2	-	52.29	Peak	74	Pass
NVNT	BLE 1M	2480	Ant1	2483.704	-57.71	2.2	1.42	41.17	Average	54	Pass
NVNT	BLE 1M	2480	Ant1	2500	-50.71	2.2	-	46.75	Peak	74	Pass
NVNT	BLE 1M	2480	Ant1	2500	-58.1	2.2	1.42	48.36	Average	54	Pass



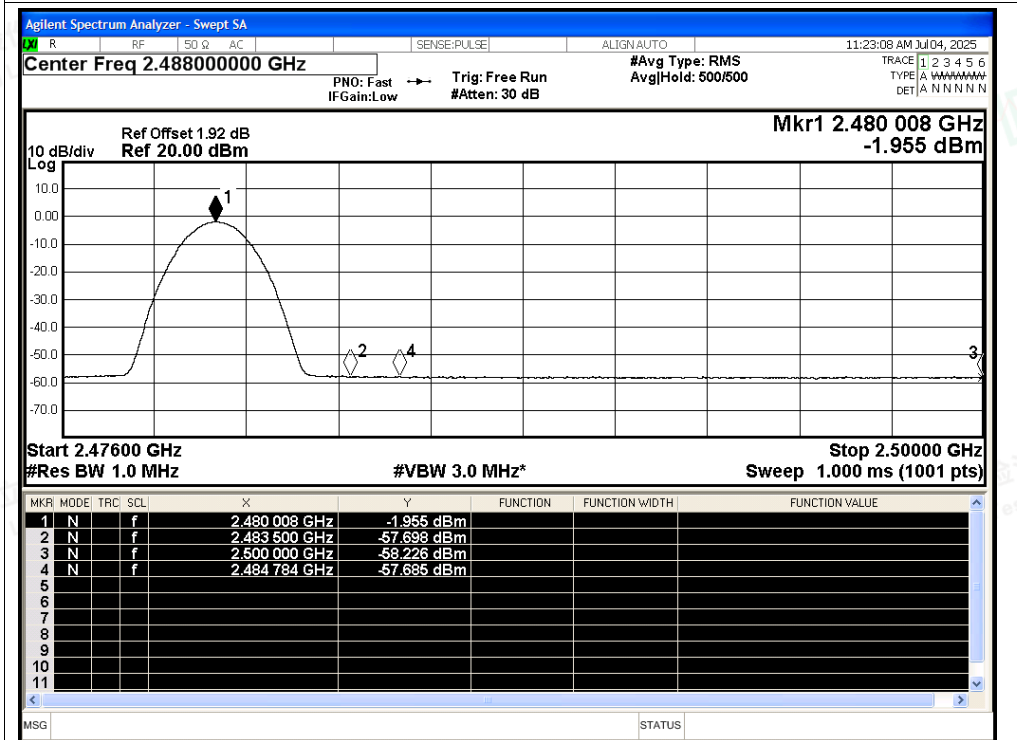




Restrict Band NVNT BLE 1M 2480MHz Ant0 Peak



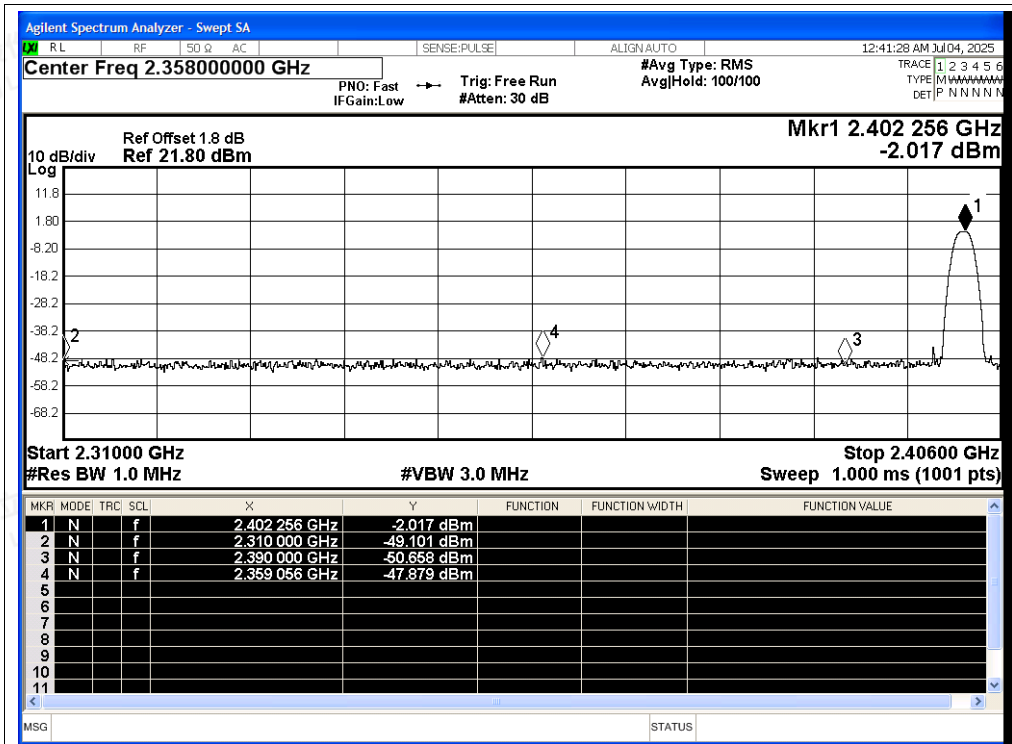
Restrict Band NVNT BLE 1M 2480MHz Ant0 Average



Test Graphs

Restrict Band NVNT BLE 1M 2402MHz Ant1 Peak





Restrict Band NVNT BLE 1M 2402MHz Ant1 Average

