



Appendix A

RF Test Data for BLE (Conducted Measurement)

Product Name: Tag

Test Model: TSZPJ-D009

Environmental Conditions

Temperature:	23.9° C
Relative Humidity:	52.0%
ATM Pressure:	100.0 kPa
Test Engineer:	Jay Luo
Supervised by:	Nick Peng



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A.1 -6dB Bandwidth

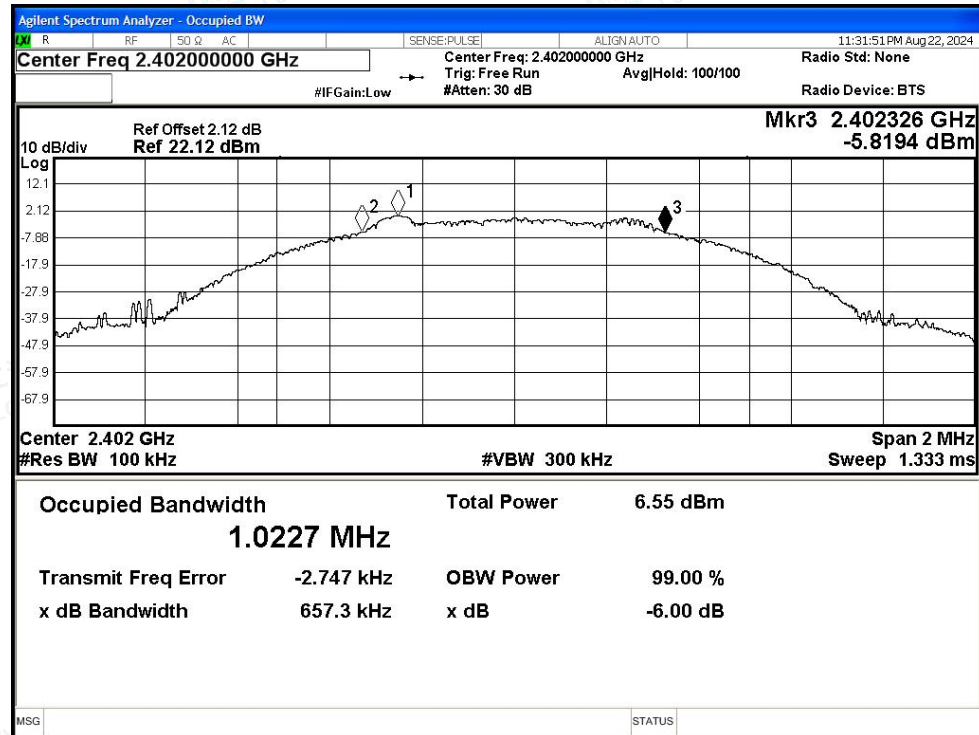
Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	BLE 1M	2402	Ant1	0.657	≥ 0.5	Pass
NVNT	BLE 1M	2440	Ant1	0.649	≥ 0.5	Pass
NVNT	BLE 1M	2480	Ant1	0.654	≥ 0.5	Pass



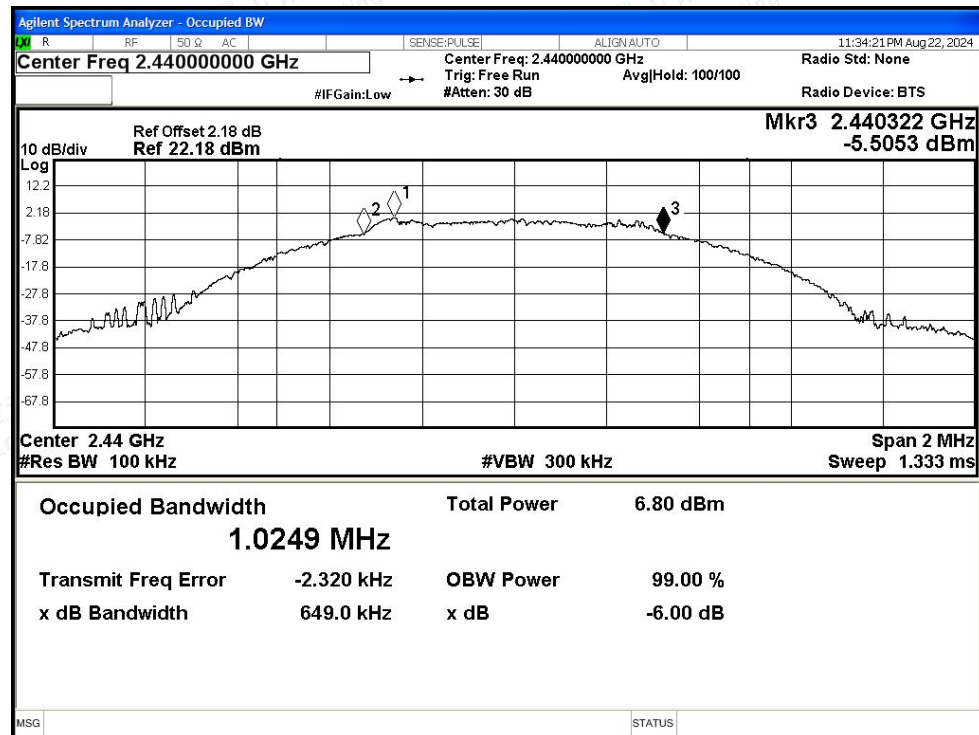


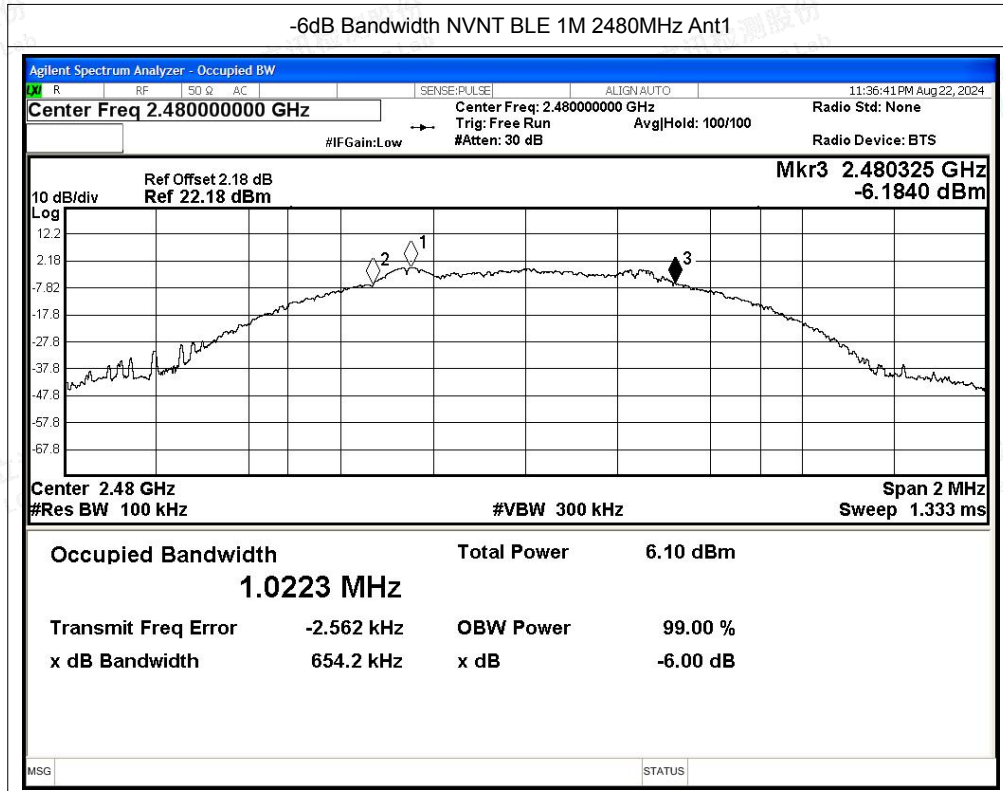
Test Graphs

-6dB Bandwidth NVNT BLE 1M 2402MHz Ant1



-6dB Bandwidth NVNT BLE 1M 2440MHz Ant1







A.2 Maximum Peak Conducted Output Power

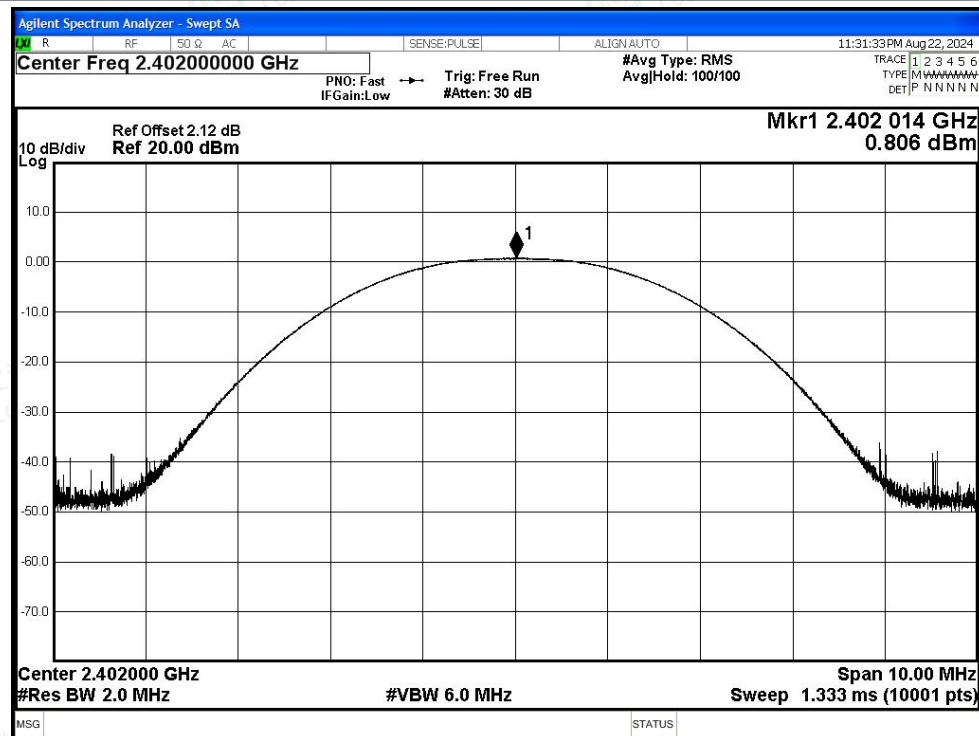
Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	BLE 1M	2402	Ant1	0.81	30	Pass
NVNT	BLE 1M	2440	Ant1	1.1	30	Pass
NVNT	BLE 1M	2480	Ant1	0.33	30	Pass



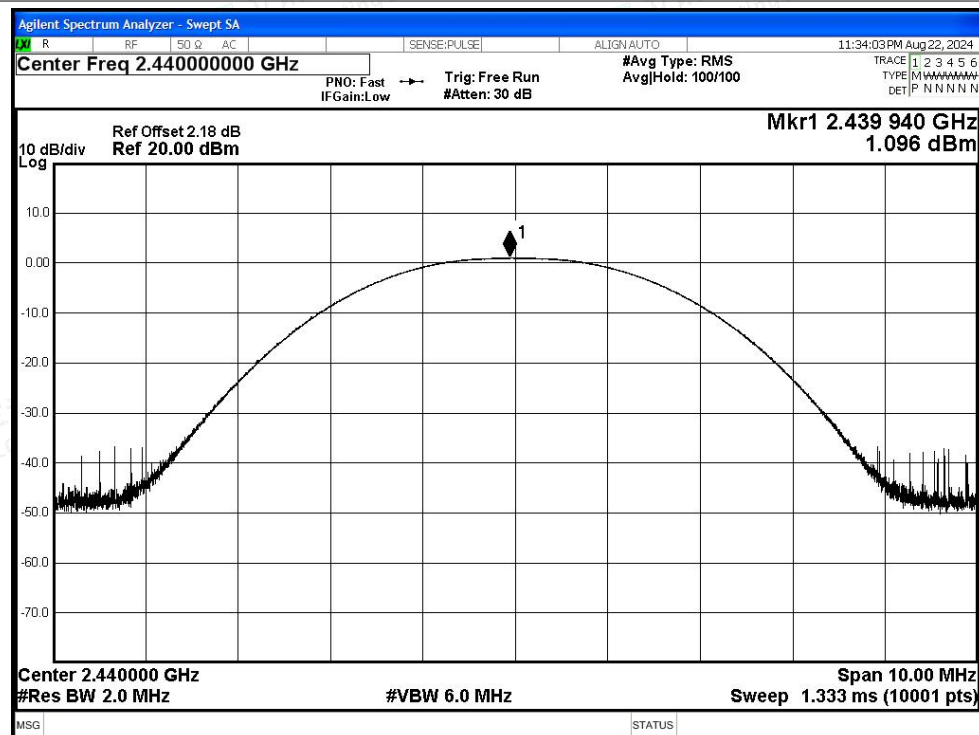


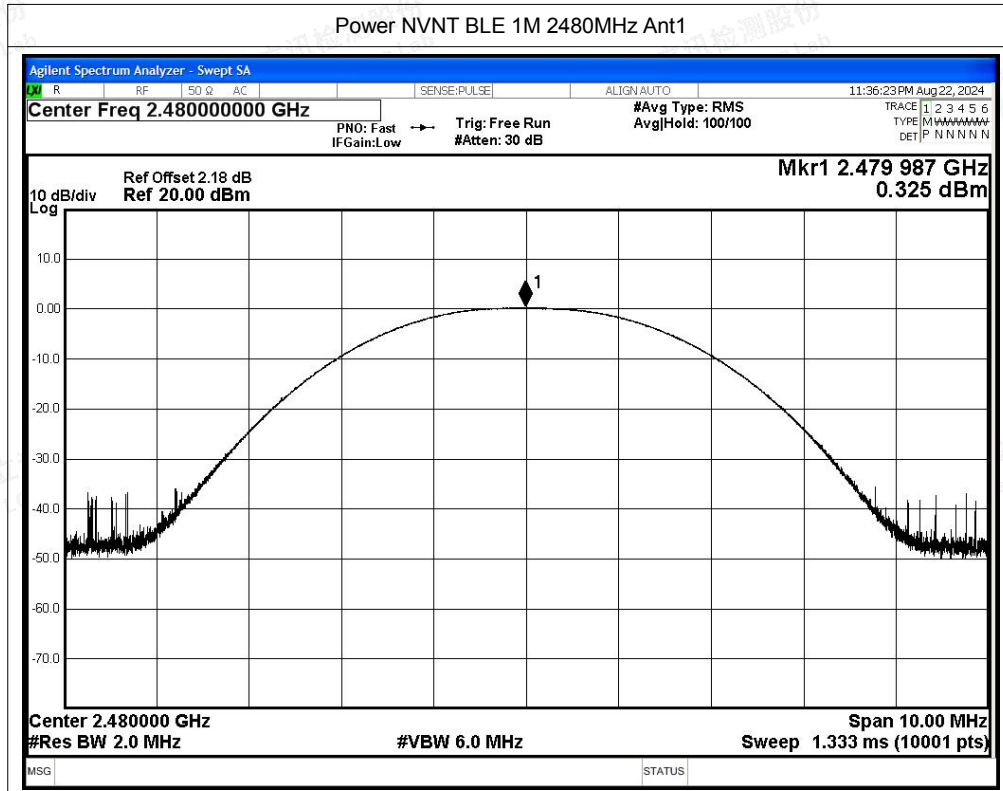
Test Graphs

Power NVNT BLE 1M 2402MHz Ant1



Power NVNT BLE 1M 2440MHz Ant1







A.3 Maximum Power Spectral Density Level

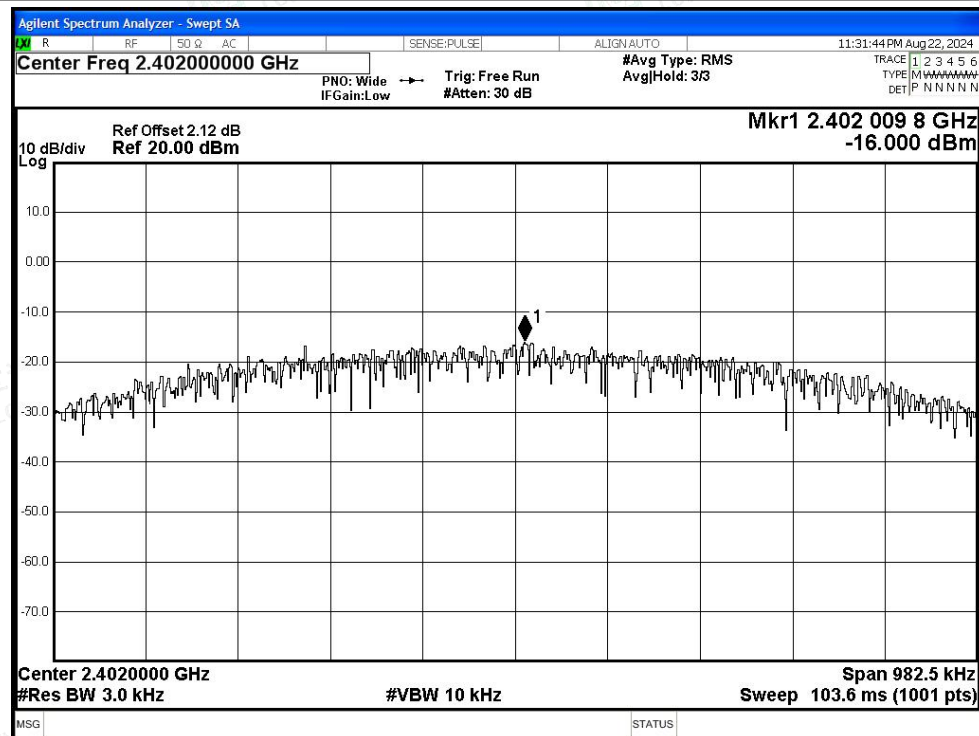
Condition	Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	BLE 1M	2402	Ant1	-16	8	Pass
NVNT	BLE 1M	2440	Ant1	-16.08	8	Pass
NVNT	BLE 1M	2480	Ant1	-16.66	8	Pass



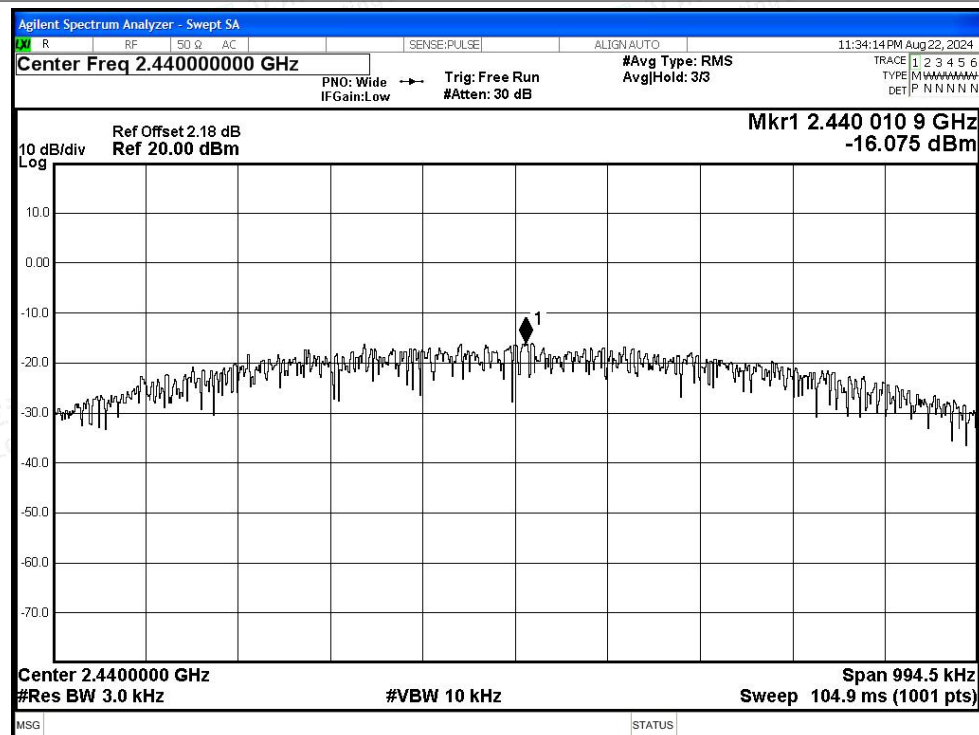


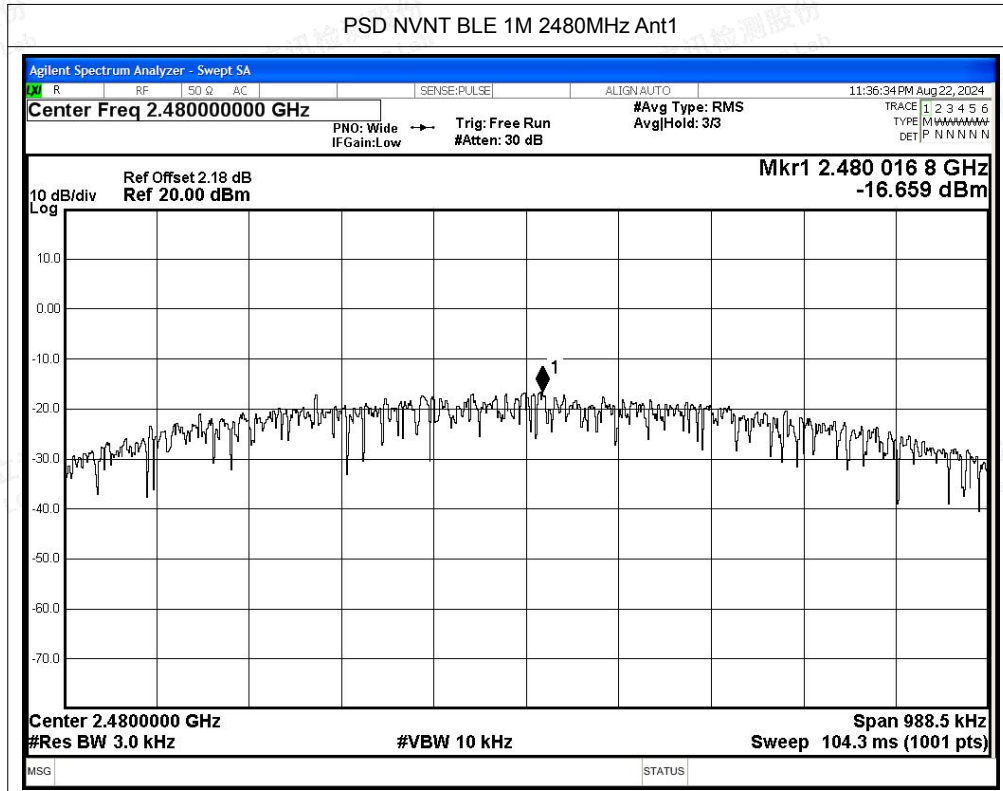
Test Graphs

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	Ant1	-56.68	-20	Pass
NVNT	BLE 1M	2480	Ant1	-56.23	-20	Pass

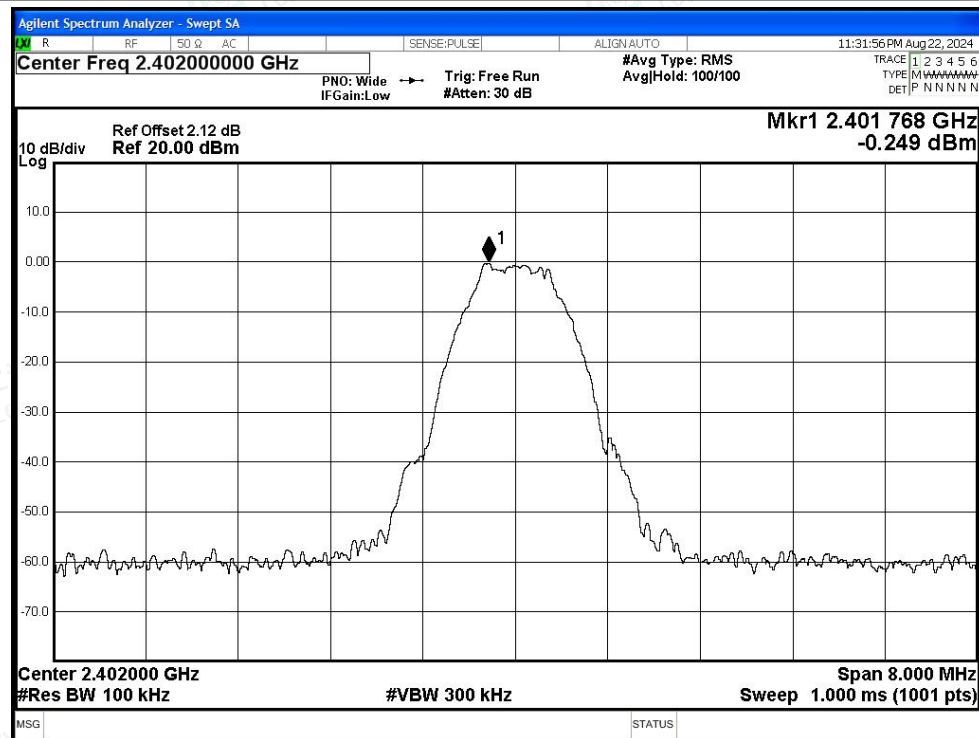


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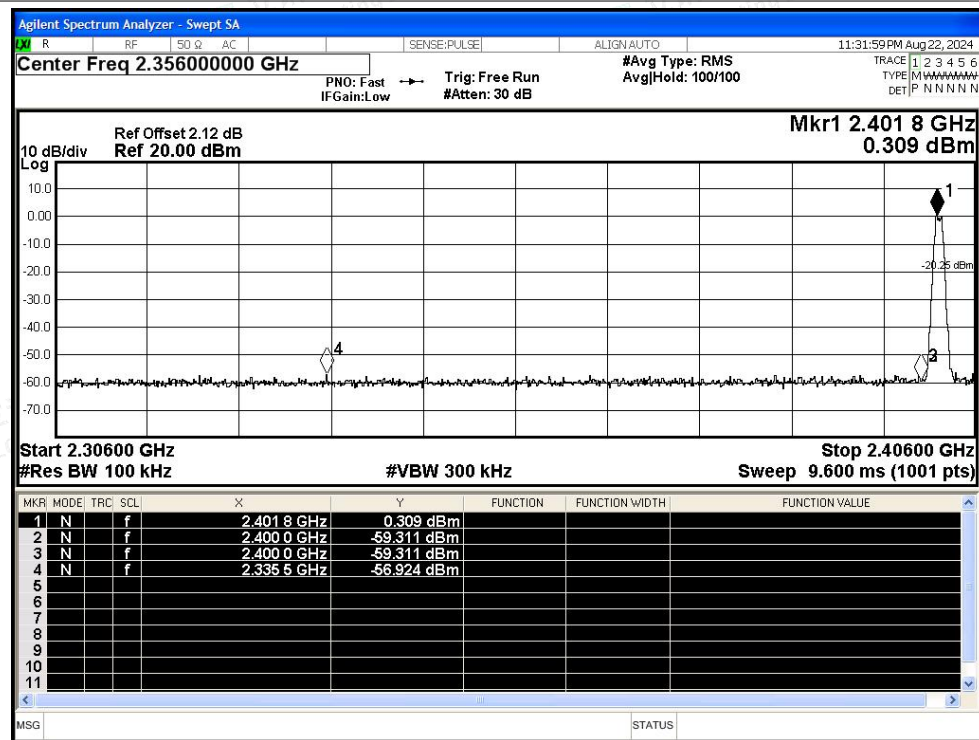


Test Graphs

Band Edge NVNT BLE 1M 2402MHz Ant1 Ref

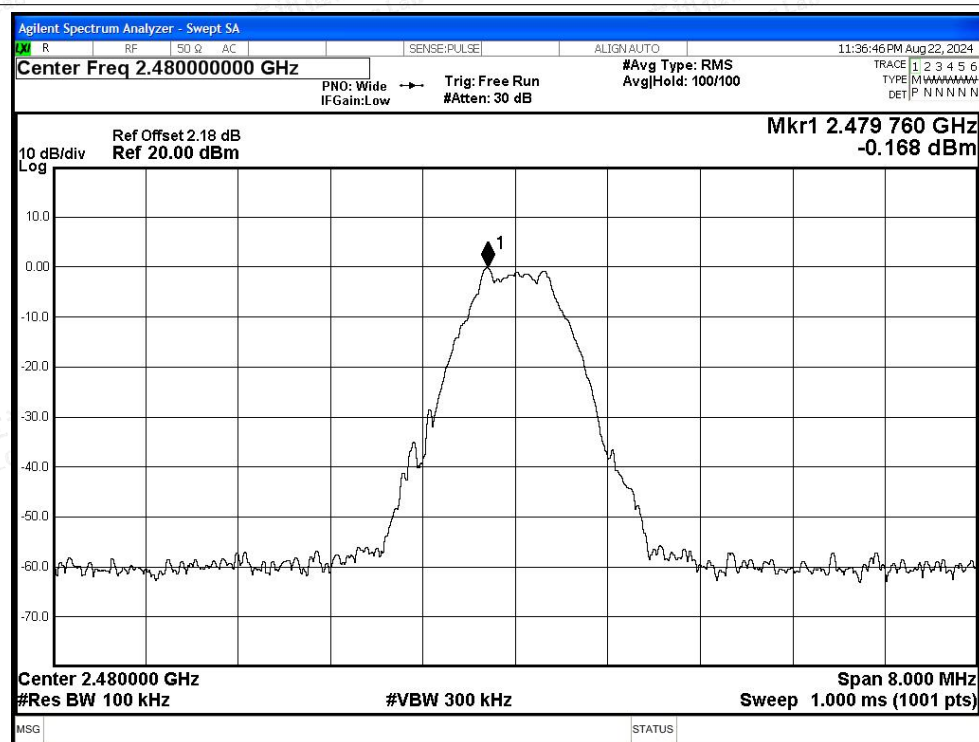


Band Edge NVNT BLE 1M 2402MHz Ant1 Emission

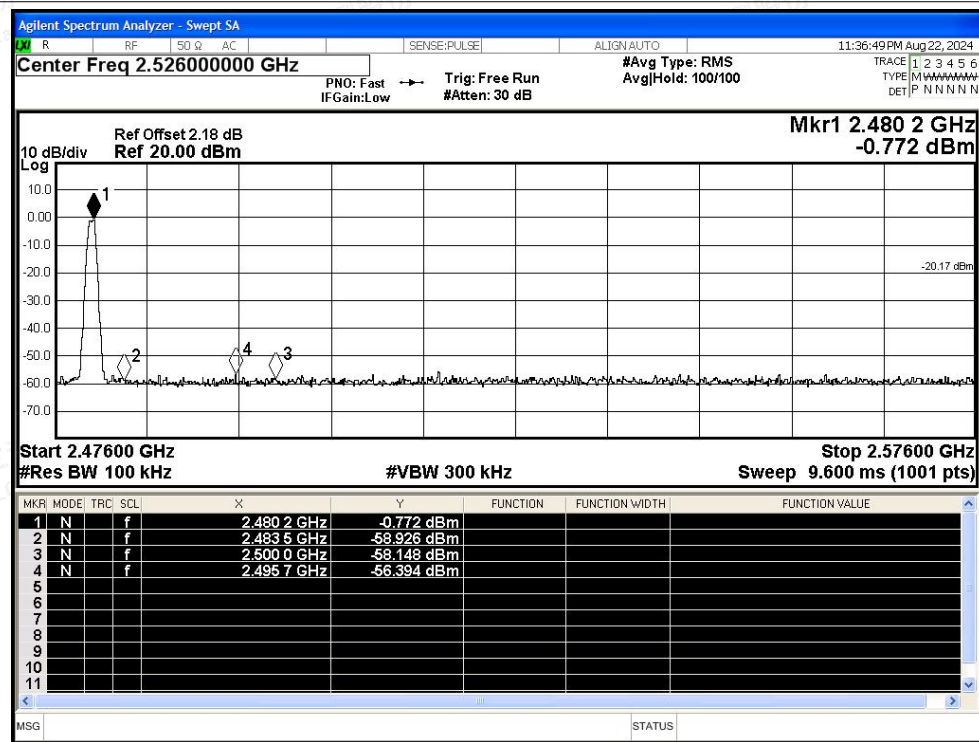




Band Edge NVNT BLE 1M 2480MHz Ant1 Ref



Band Edge NVNT BLE 1M 2480MHz Ant1 Emission



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A.5 Conducted RF Spurious Emission

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	Ant1	-55.87	-20	Pass
NVNT	BLE 1M	2440	Ant1	-55.5	-20	Pass
NVNT	BLE 1M	2480	Ant1	-54.92	-20	Pass

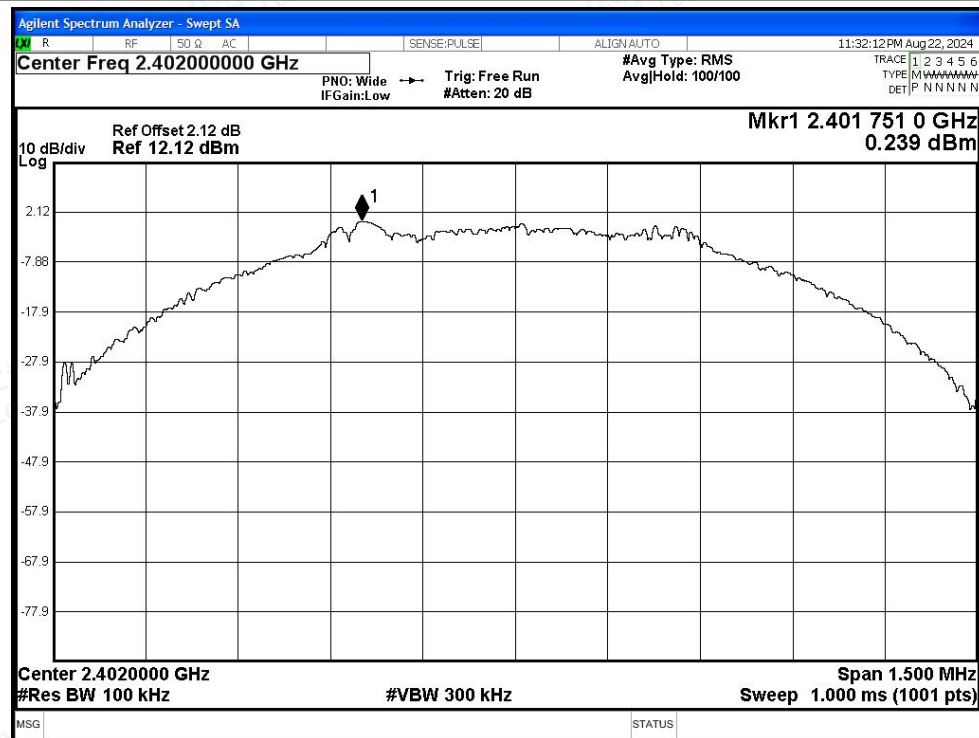


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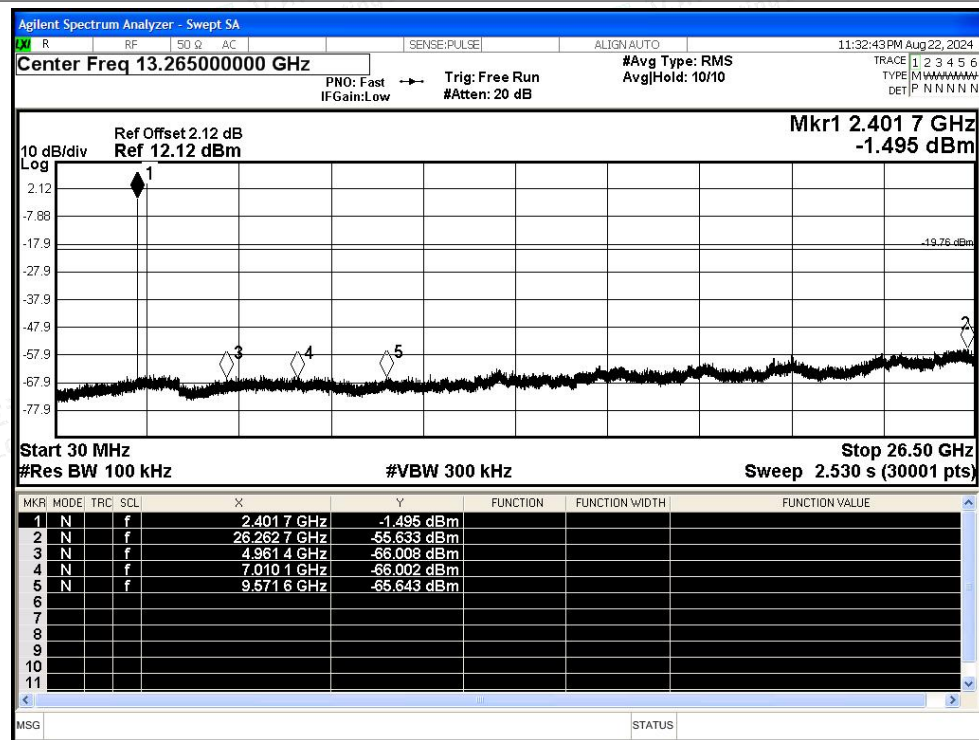


Test Graphs

Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Ref

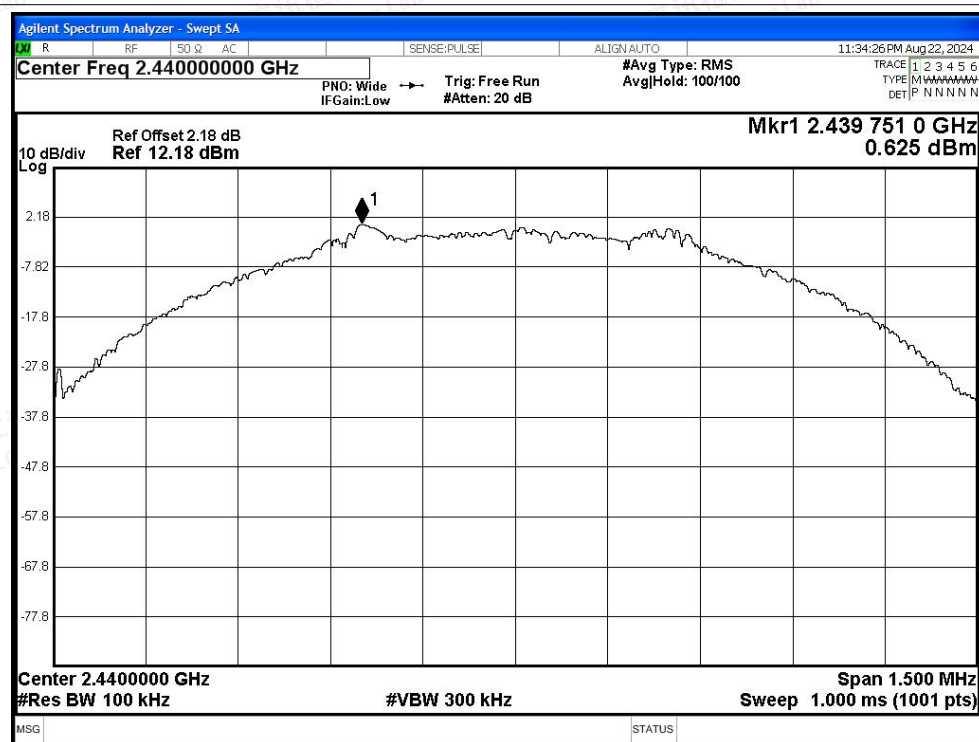


Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Emission

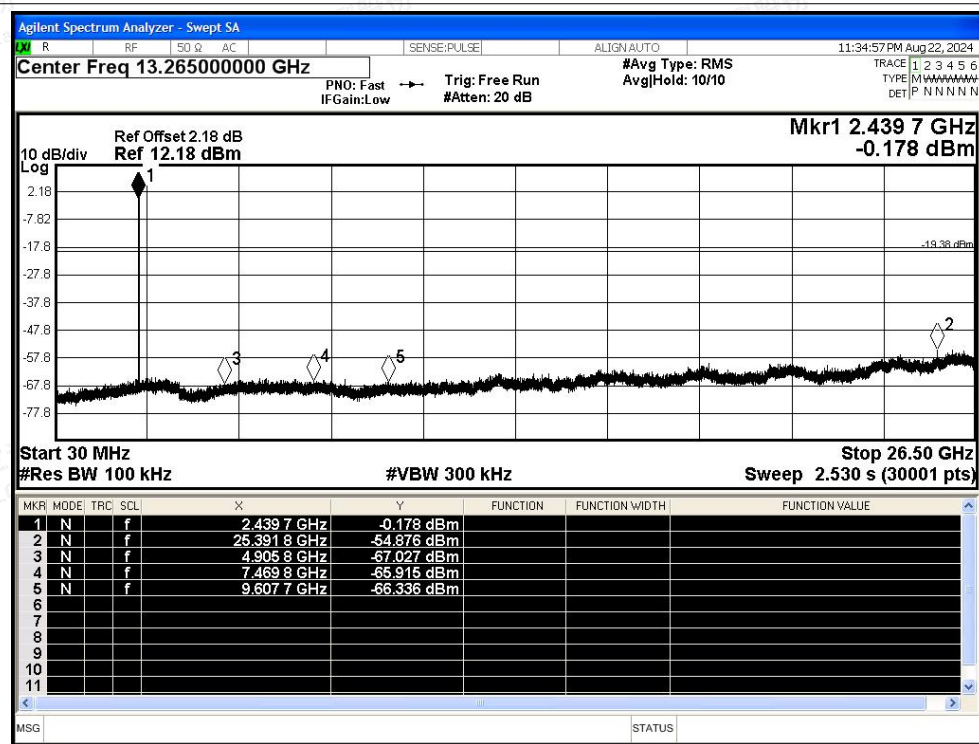




Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Ref

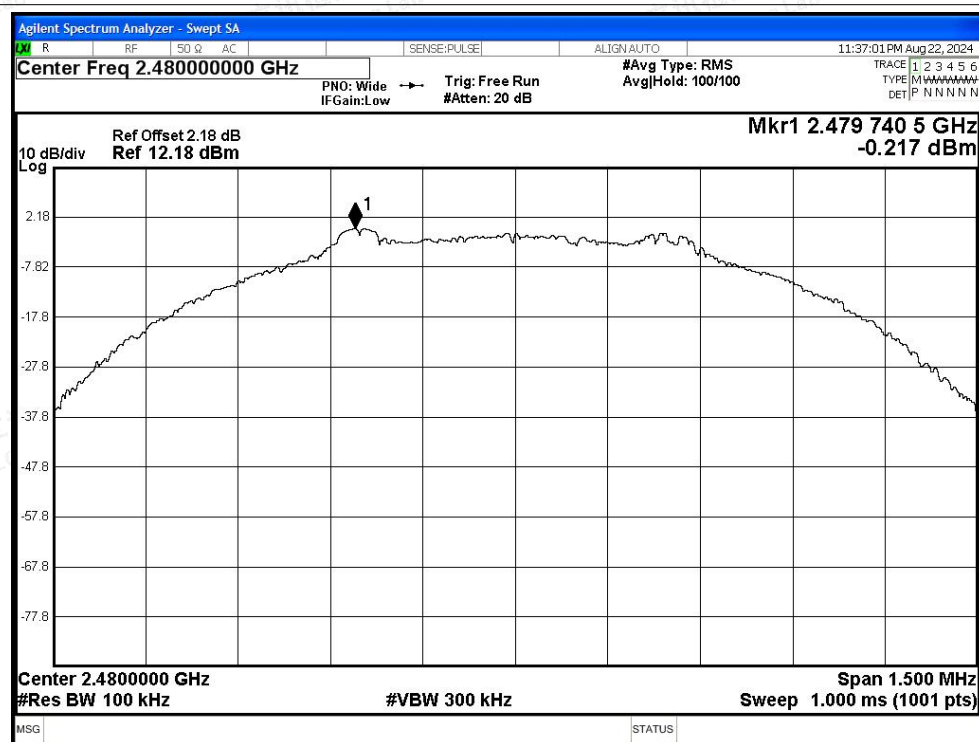


Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Emission

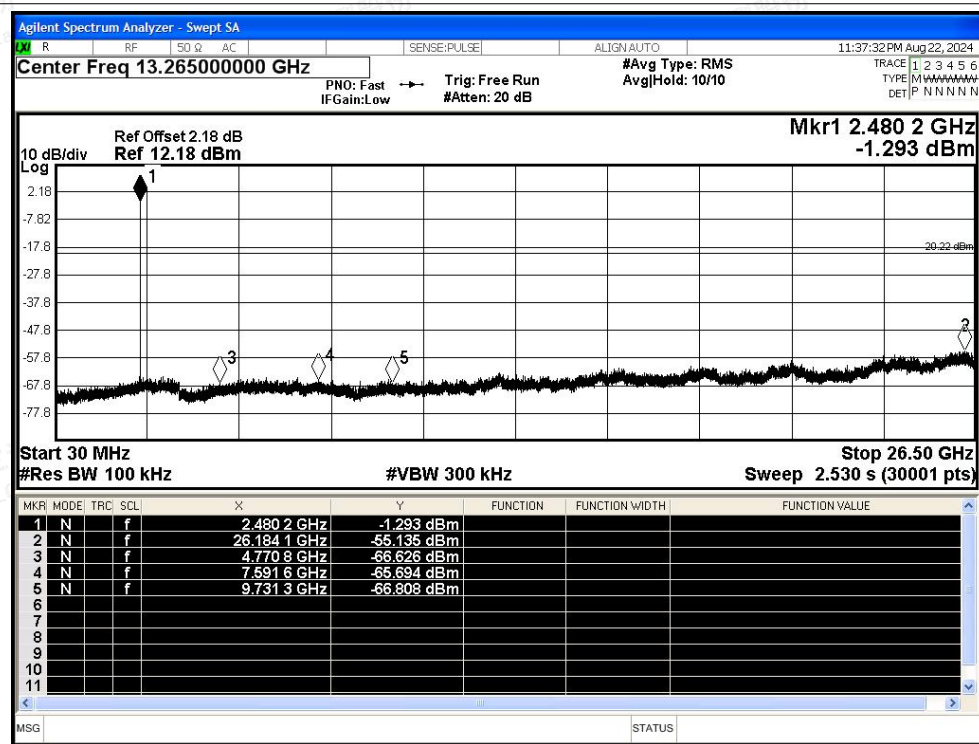




Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Ref



Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Emission





A.6 Duty Cycle

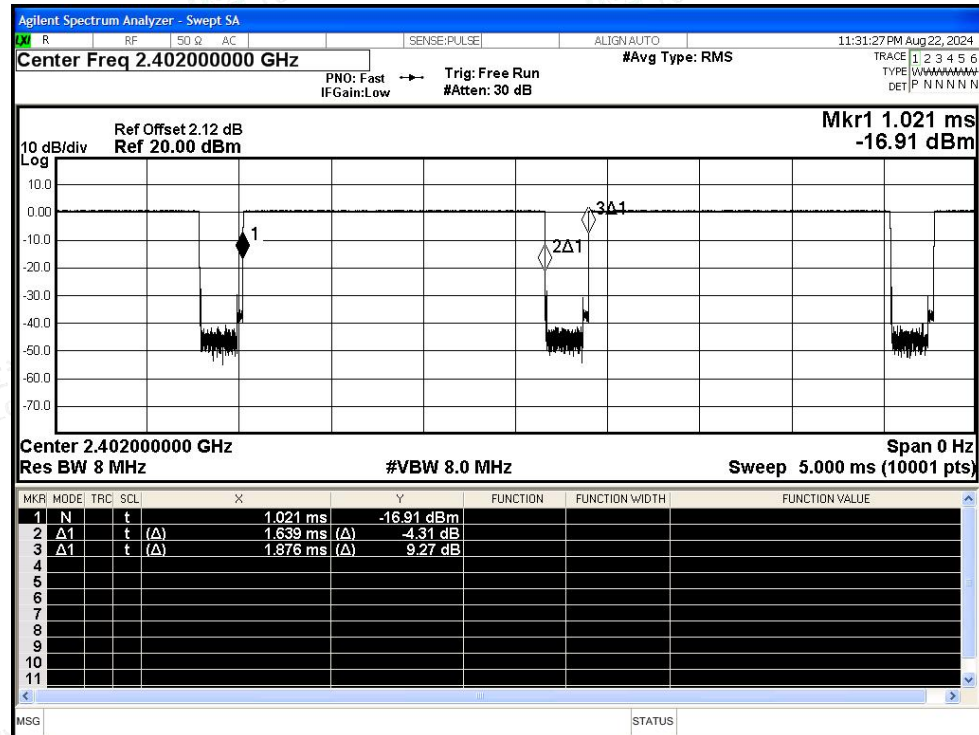
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	BLE 1M	2402	Ant1	87.39	0.59	0.61
NVNT	BLE 1M	2440	Ant1	87.41	0.58	0.61
NVNT	BLE 1M	2480	Ant1	87.39	0.59	0.61



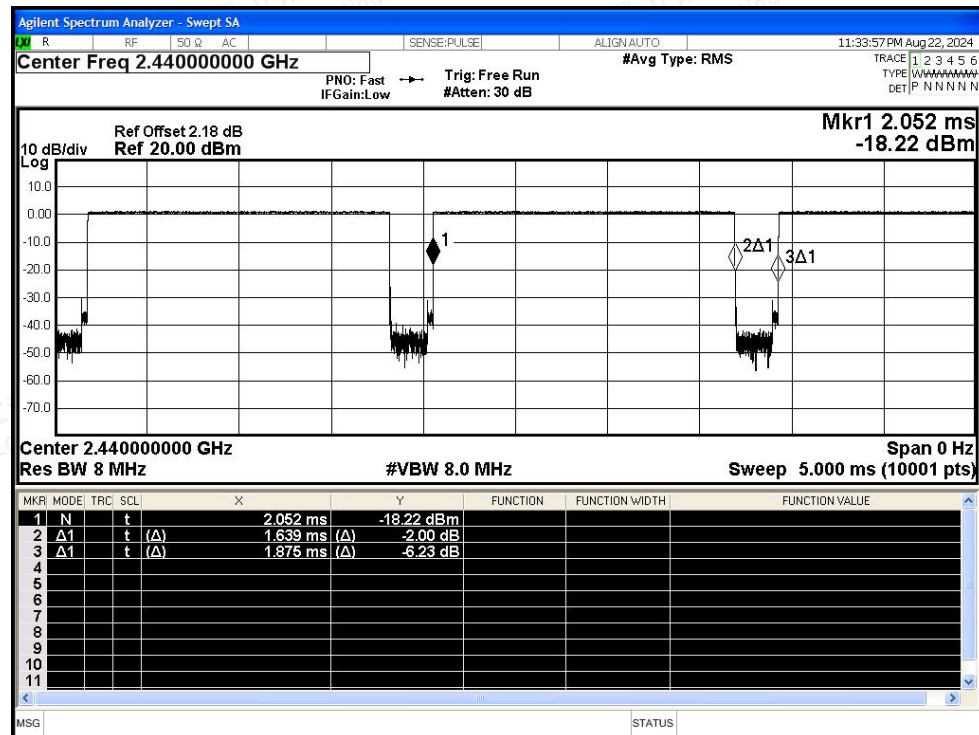


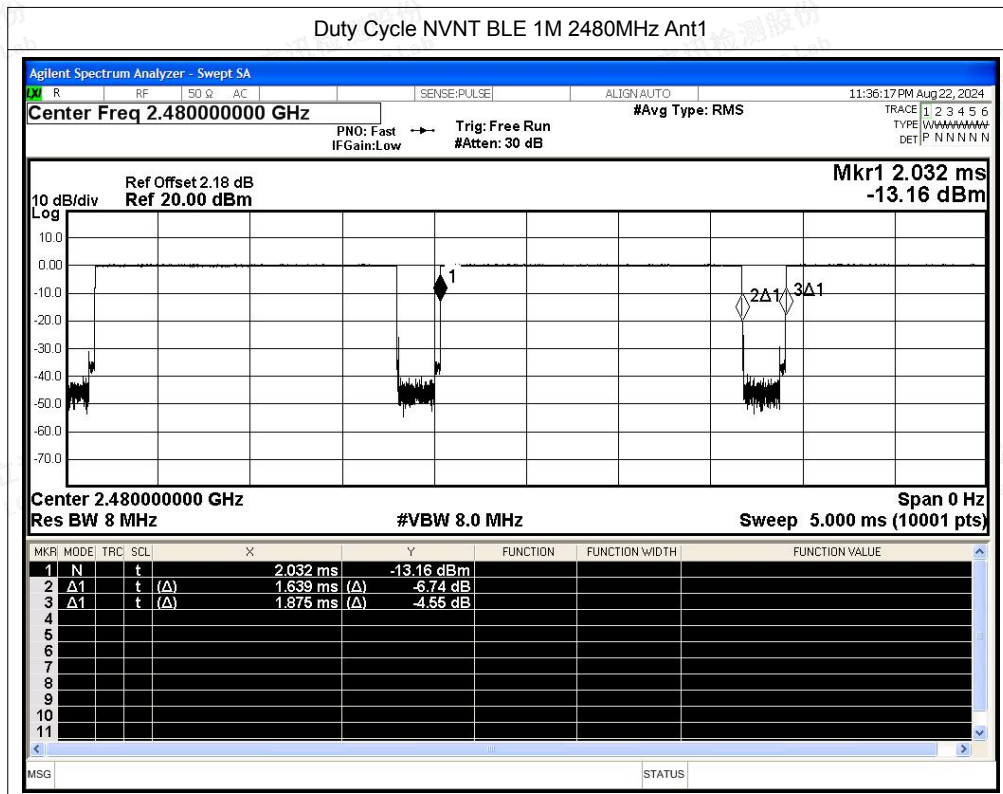
Test Graphs

Duty Cycle NVNT BLE 1M 2402MHz Ant1



Duty Cycle NVNT BLE 1M 2440MHz Ant1







A.7 Restrict Band

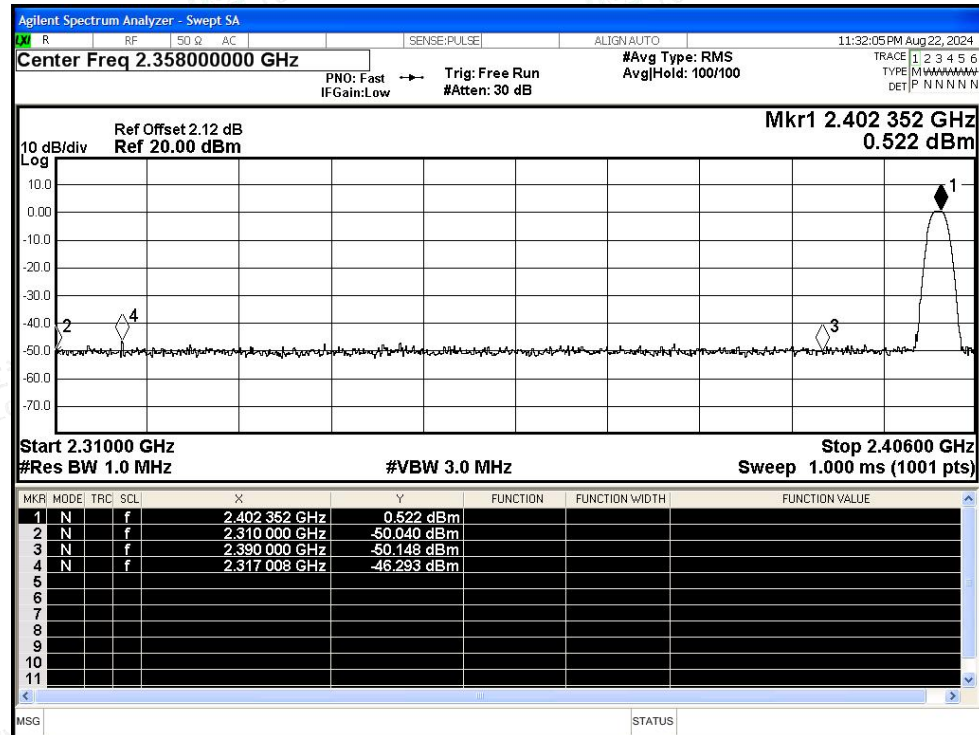
Condition	Mode	Frequency (MHz)	Antenna	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	Duty Factor (dB)	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
NVNT	BLE 1M	2402	Ant1	2310	-50.04	2.0	-	47.22	Peak	74	Pass
NVNT	BLE 1M	2402	Ant1	2310	-58.65	2.0	0.59	39.20	Average	54	Pass
NVNT	BLE 1M	2402	Ant1	2317.008	-46.29	2.0	-	50.97	Peak	74	Pass
NVNT	BLE 1M	2402	Ant1	2364.24	-57.33	2.0	0.59	40.52	Average	54	Pass
NVNT	BLE 1M	2402	Ant1	2390	-50.15	2.0	-	47.11	Peak	74	Pass
NVNT	BLE 1M	2402	Ant1	2390	-58.04	2.0	0.59	39.81	Average	54	Pass
NVNT	BLE 1M	2480	Ant1	2483.5	-50.05	2.0	-	47.21	Peak	74	Pass
NVNT	BLE 1M	2480	Ant1	2483.5	-57.54	2.0	0.59	40.31	Average	54	Pass
NVNT	BLE 1M	2480	Ant1	2484.4	-43.38	2.0	-	53.88	Peak	74	Pass
NVNT	BLE 1M	2480	Ant1	2492.848	-57.03	2.0	0.59	40.82	Average	54	Pass
NVNT	BLE 1M	2480	Ant1	2500	-49.67	2.0	-	47.59	Peak	74	Pass
NVNT	BLE 1M	2480	Ant1	2500	-58.13	2.0	0.59	39.72	Average	54	Pass



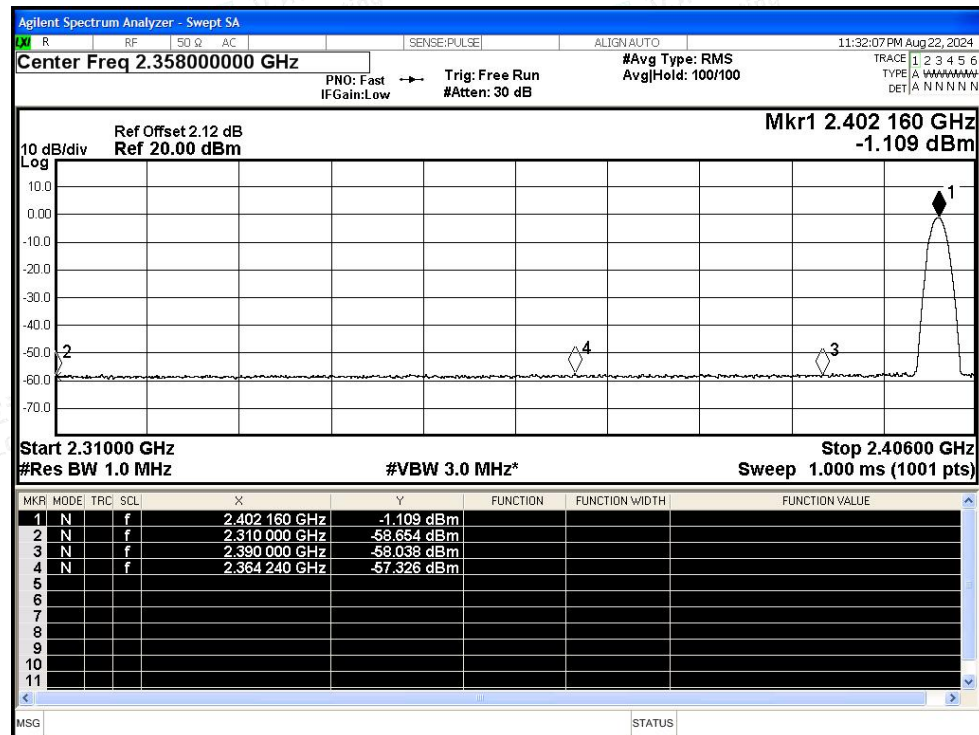


Test Graphs

Restrict Band NVNT BLE 1M 2402MHz Ant1 Peak

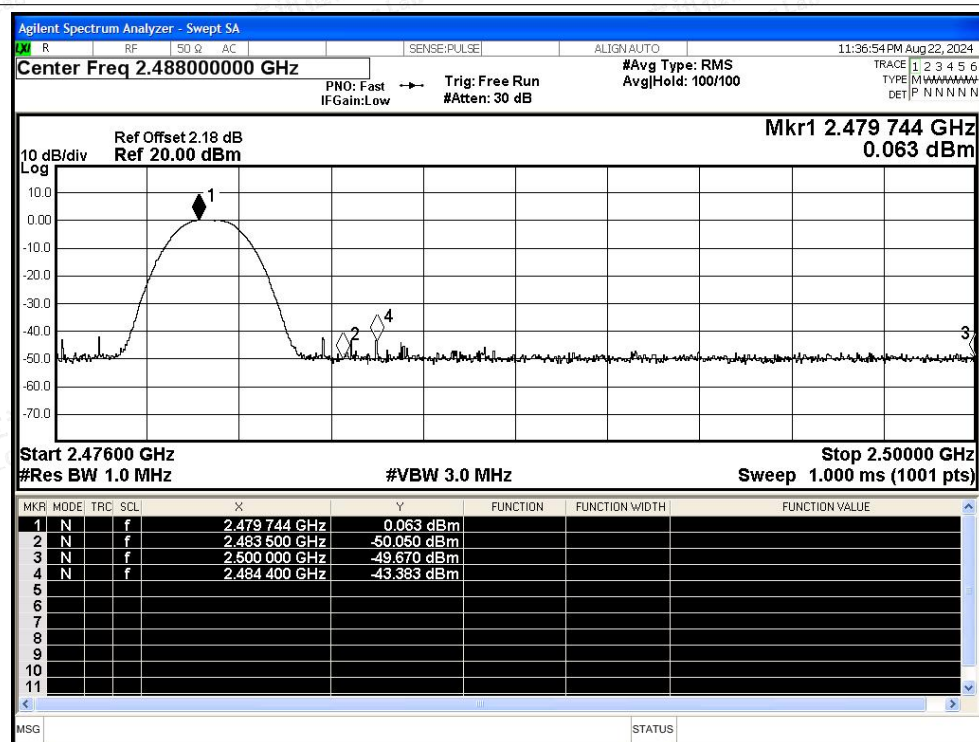


Restrict Band NVNT BLE 1M 2402MHz Ant1 Average





Restrict Band NVNT BLE 1M 2480MHz Ant1 Peak



Restrict Band NVNT BLE 1M 2480MHz Ant1 Average

