

FCC Appendix RF Test Data for BLE

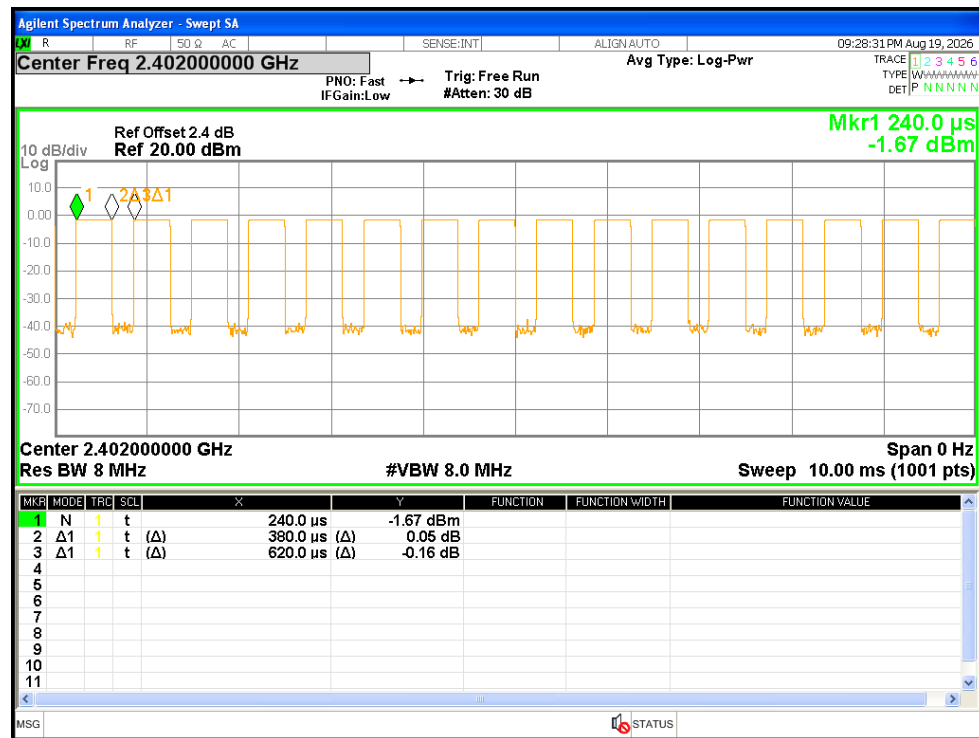
FCC ID : 2AUARTU7ABS
Company : THINKCAR TECH CO., LTD.
EUT : Automotive Diagnostic Tool
Model Number : TU7ABS
Report No. : CTA26080701801
Reviewed By : Eric Wang

Duty Cycle

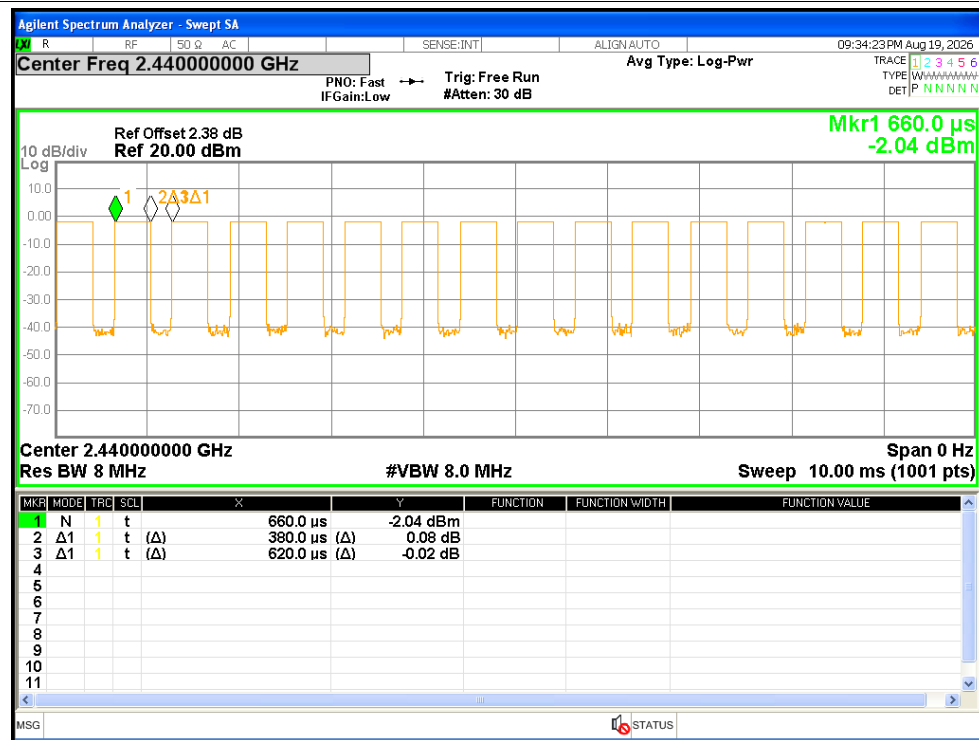
Mode	Frequency (MHz)	On Time (ms)	Period (ms)	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
BLE 1M	2402	0.38	0.62	61.29	2.13	2.63
BLE 1M	2440	0.38	0.62	61.29	2.13	2.63
BLE 1M	2480	0.39	0.63	61.9	2.08	2.56
BLE 2M	2402	0.198	0.625	31.68	4.99	5.05
BLE 2M	2440	0.199	0.625	31.84	4.97	5.03
BLE 2M	2480	0.199	0.625	31.84	4.97	5.03

Test Graphs

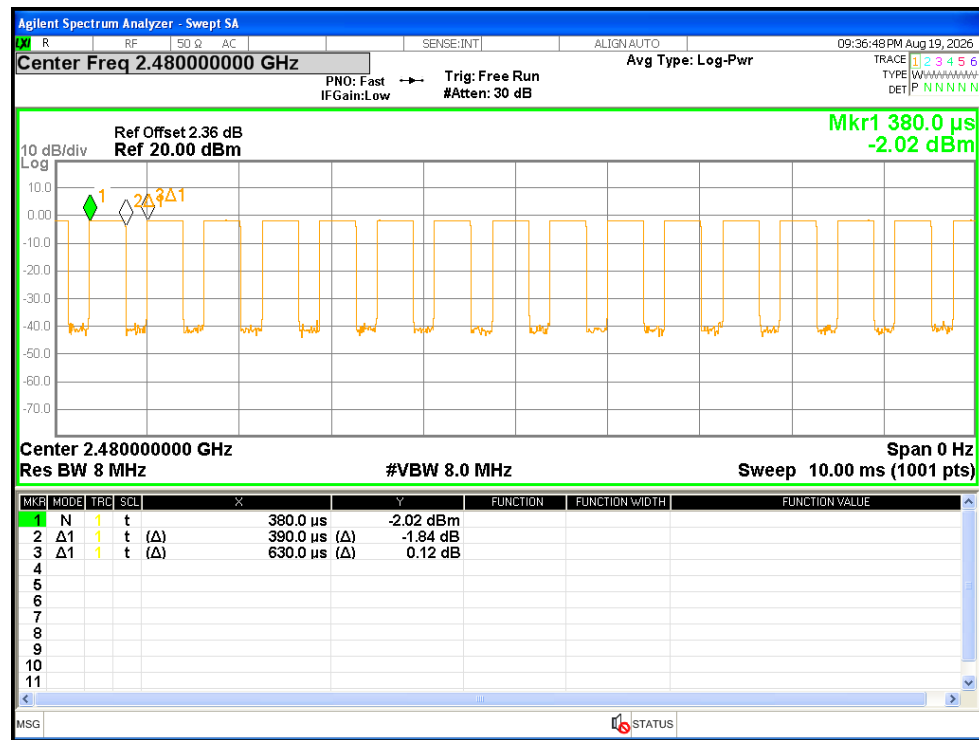
Duty Cycle NVNT BLE 1M 2402MHz



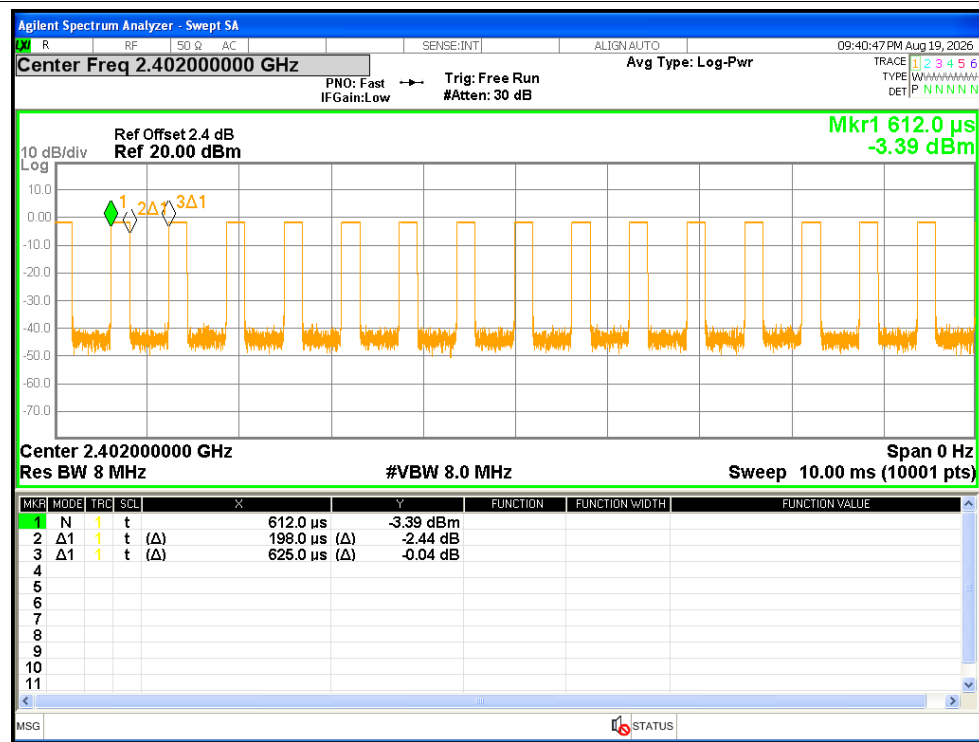
Duty Cycle NVNT BLE 1M 2440MHz



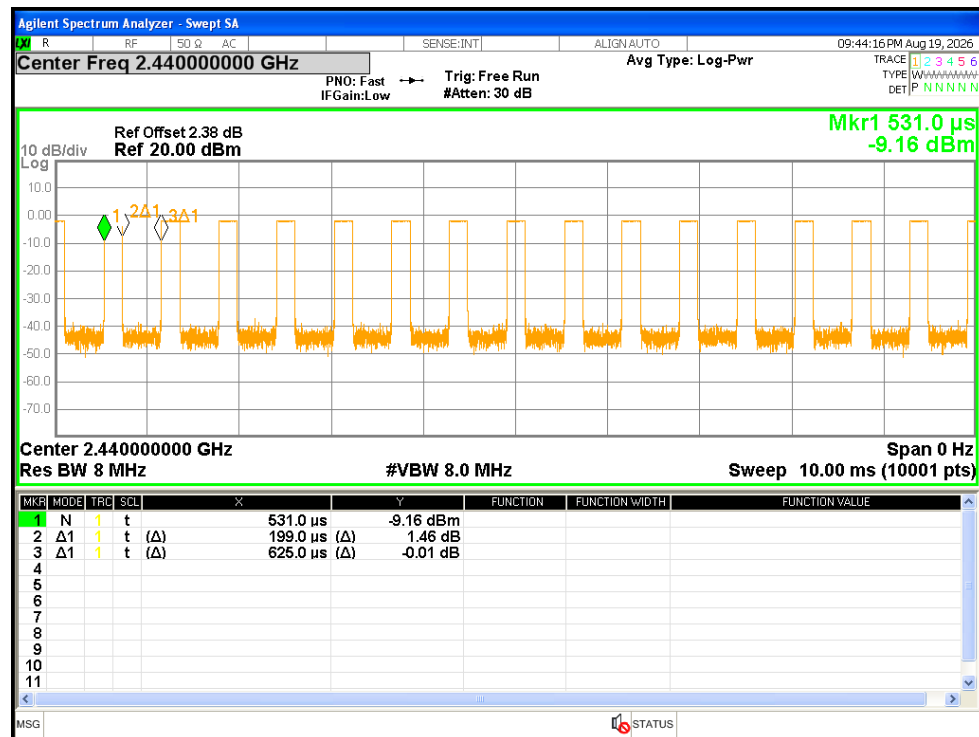
Duty Cycle NVNT BLE 1M 2480MHz



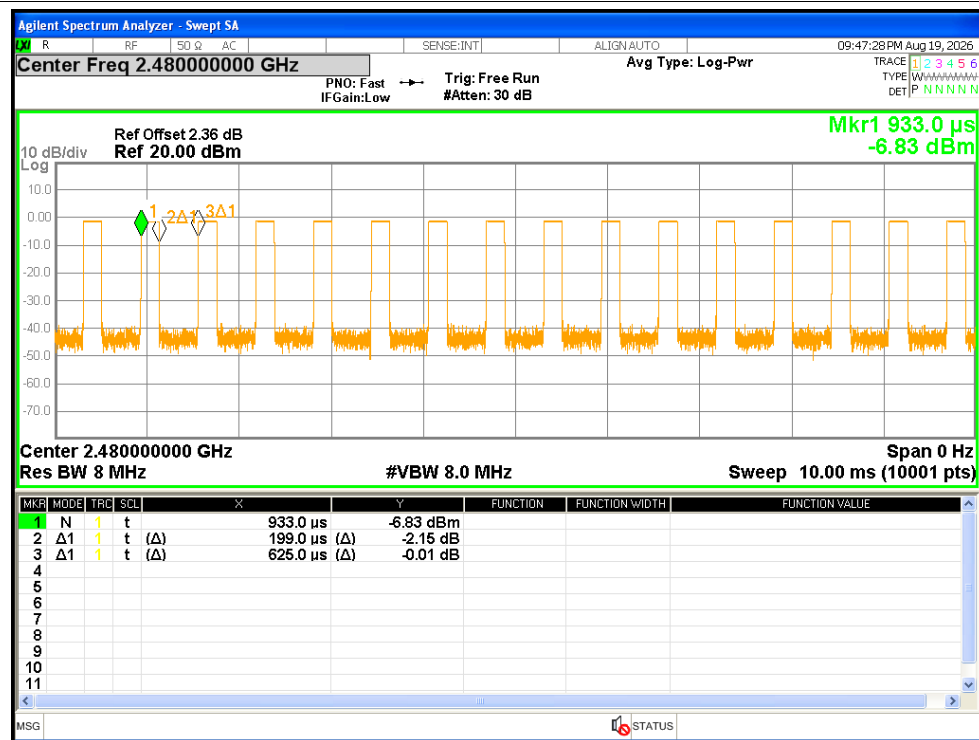
Duty Cycle NVNT BLE 2M 2402MHz



Duty Cycle NVNT BLE 2M 2440MHz



Duty Cycle NVNT BLE 2M 2480MHz



Maximum Peak Conducted Output Power

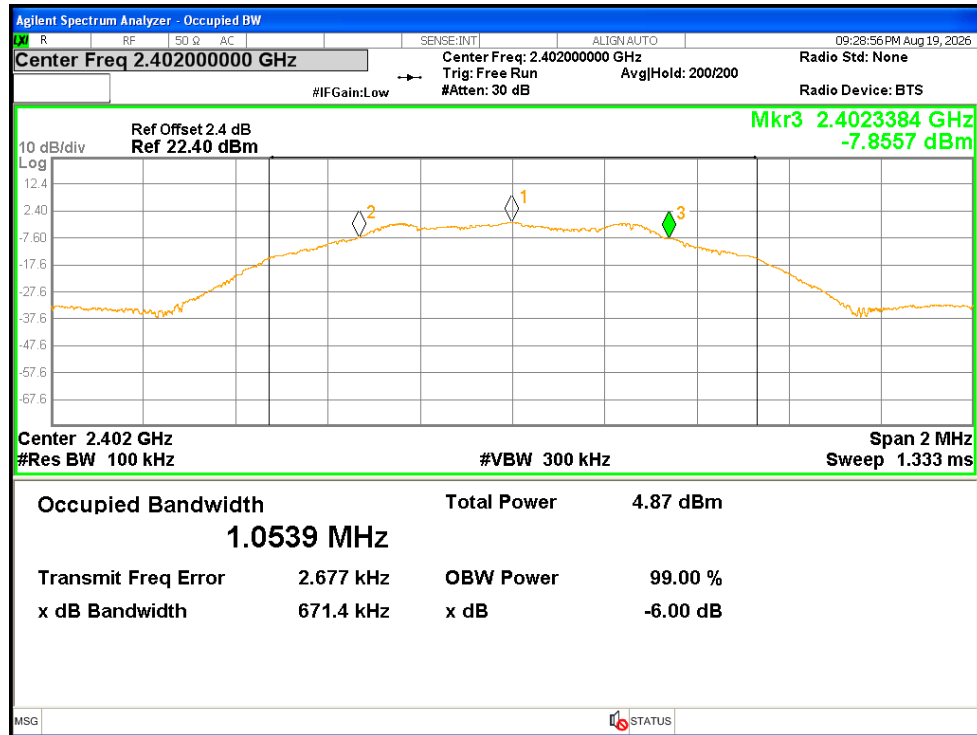
Mode	Frequency (MHz)	Conducted Power (dBm)	Limit (dBm)	Verdict
BLE 1M	2402	-1.62	<=30	Pass
BLE 1M	2440	-1.49	<=30	Pass
BLE 1M	2480	-1.83	<=30	Pass
BLE 2M	2402	-1.2	<=30	Pass
BLE 2M	2440	-1.55	<=30	Pass
BLE 2M	2480	-1.39	<=30	Pass

-6dB Bandwidth

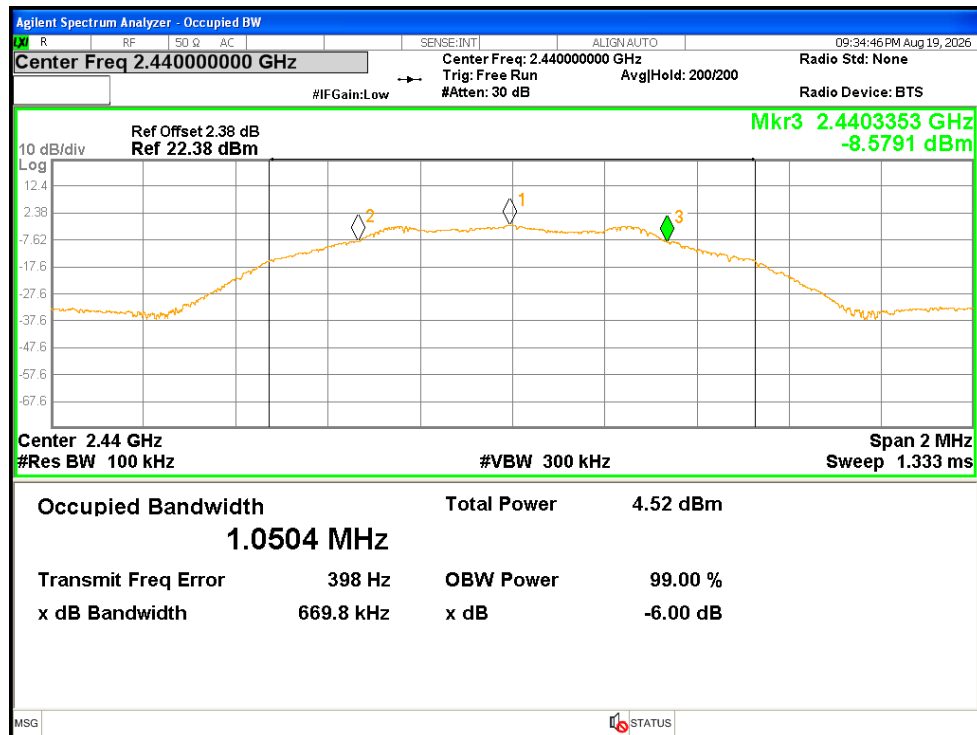
Mode	Frequency (MHz)	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
BLE 1M	2402	0.6714	≥ 0.5	Pass
BLE 1M	2440	0.6698	≥ 0.5	Pass
BLE 1M	2480	0.6821	≥ 0.5	Pass
BLE 2M	2402	1.106	≥ 0.5	Pass
BLE 2M	2440	1.144	≥ 0.5	Pass
BLE 2M	2480	1.159	≥ 0.5	Pass

Test Graphs

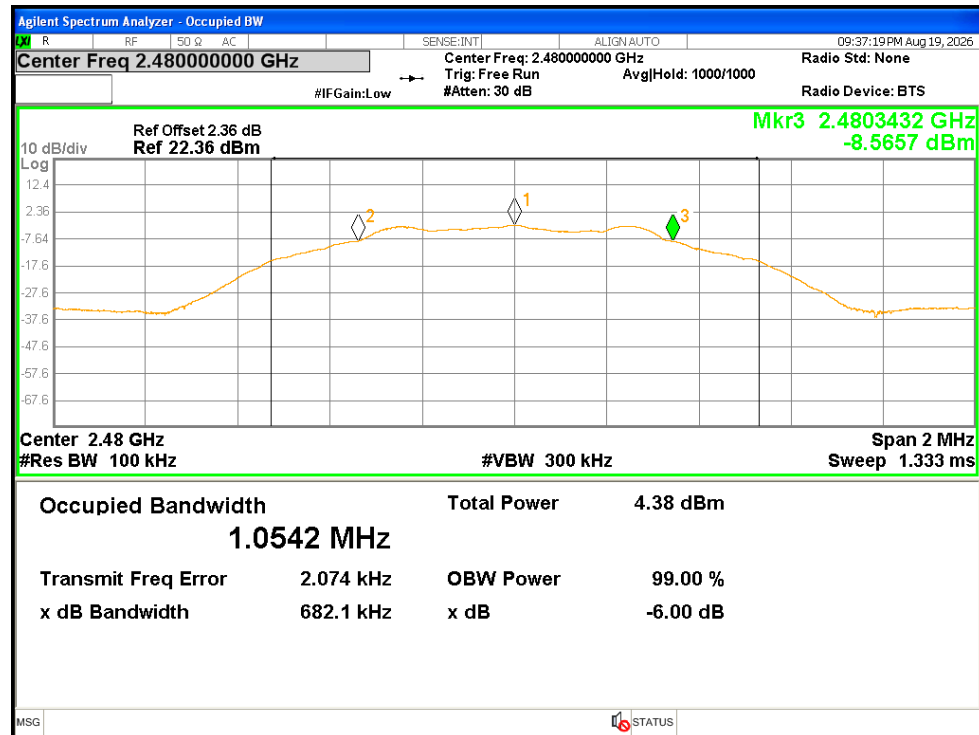
-6dB Bandwidth NVNT BLE 1M 2402MHz



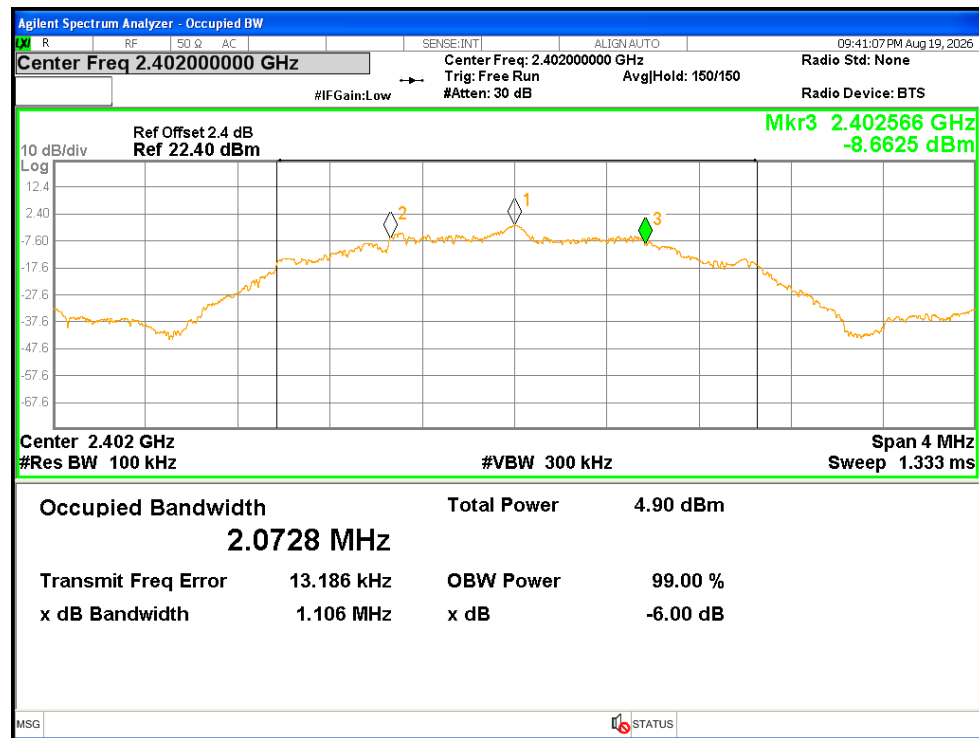
-6dB Bandwidth NVNT BLE 1M 2440MHz



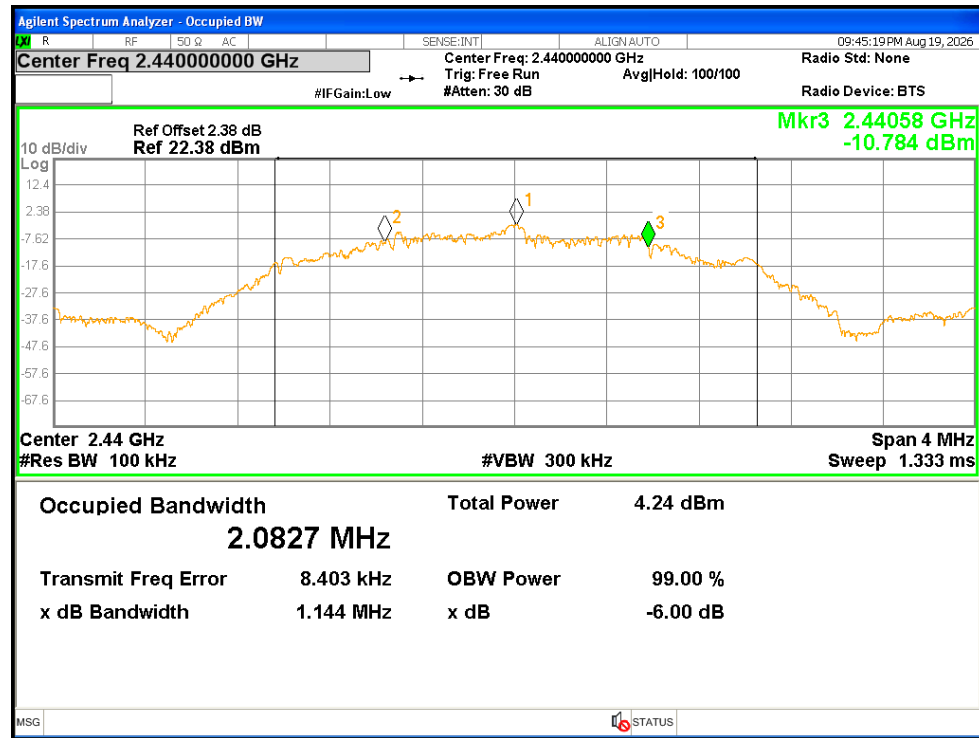
-6dB Bandwidth NVNT BLE 1M 2480MHz



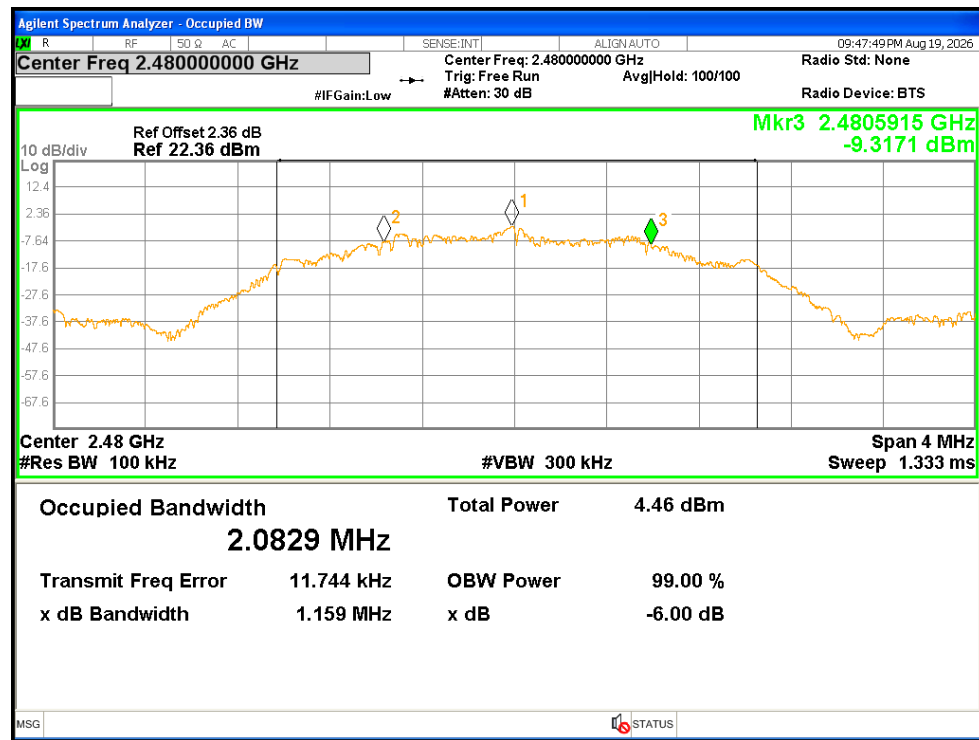
-6dB Bandwidth NVNT BLE 2M 2402MHz



-6dB Bandwidth NVNT BLE 2M 2440MHz



-6dB Bandwidth NVNT BLE 2M 2480MHz

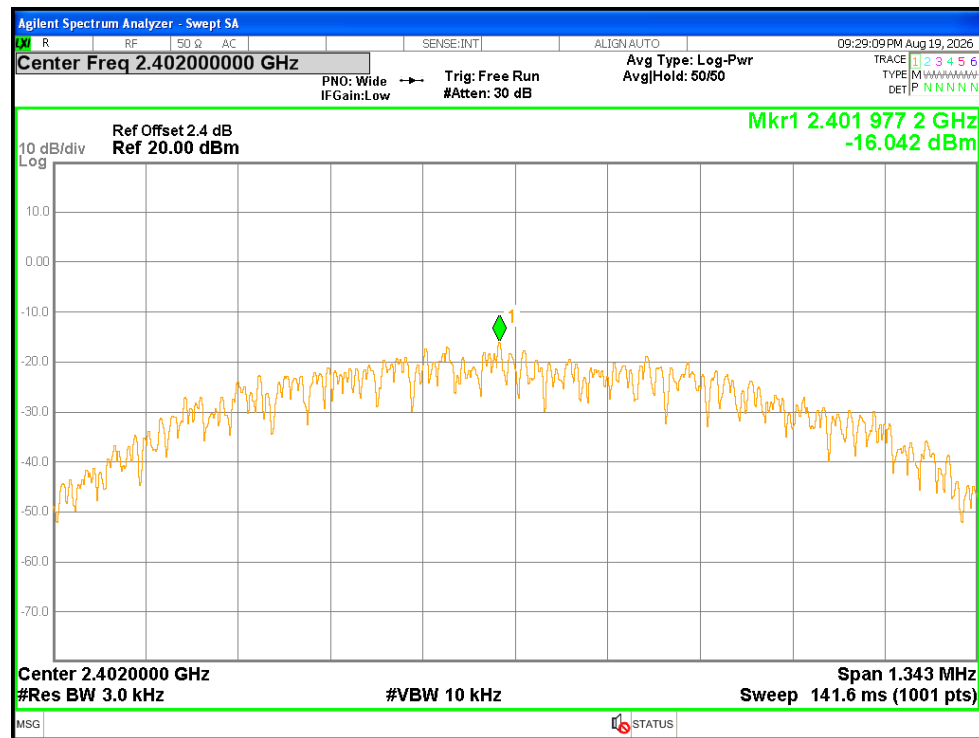


Maximum Power Spectral Density Level

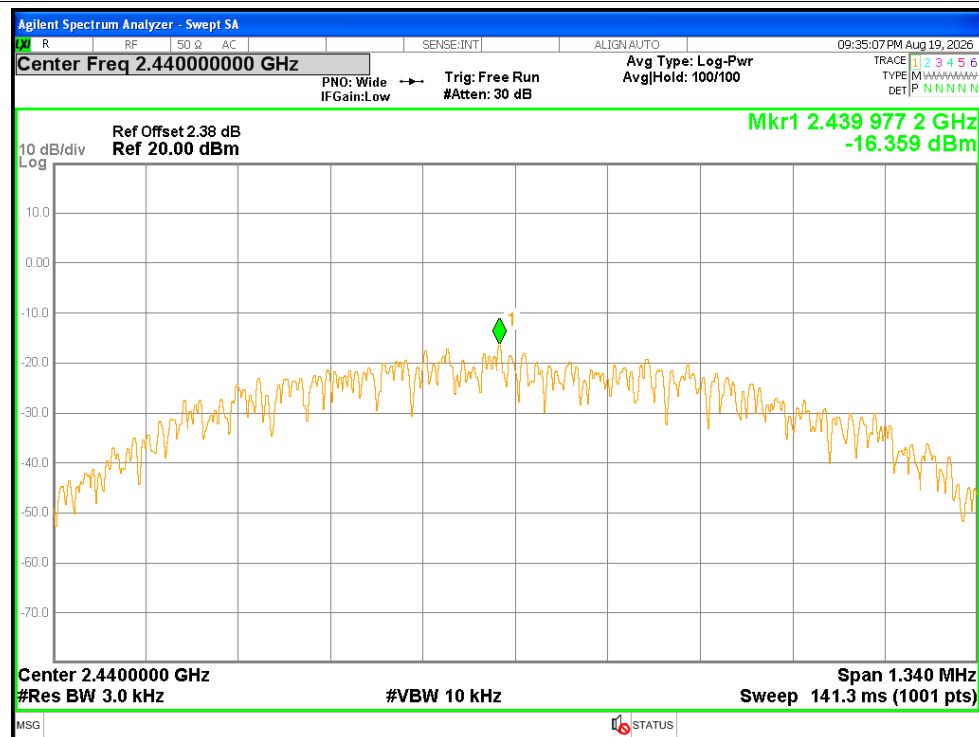
Mode	Frequency (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
BLE 1M	2402	-16.04	≤ 8	Pass
BLE 1M	2440	-16.36	≤ 8	Pass
BLE 1M	2480	-16.73	≤ 8	Pass
BLE 2M	2402	-18.62	≤ 8	Pass
BLE 2M	2440	-18.99	≤ 8	Pass
BLE 2M	2480	-18.83	≤ 8	Pass

Test Graphs

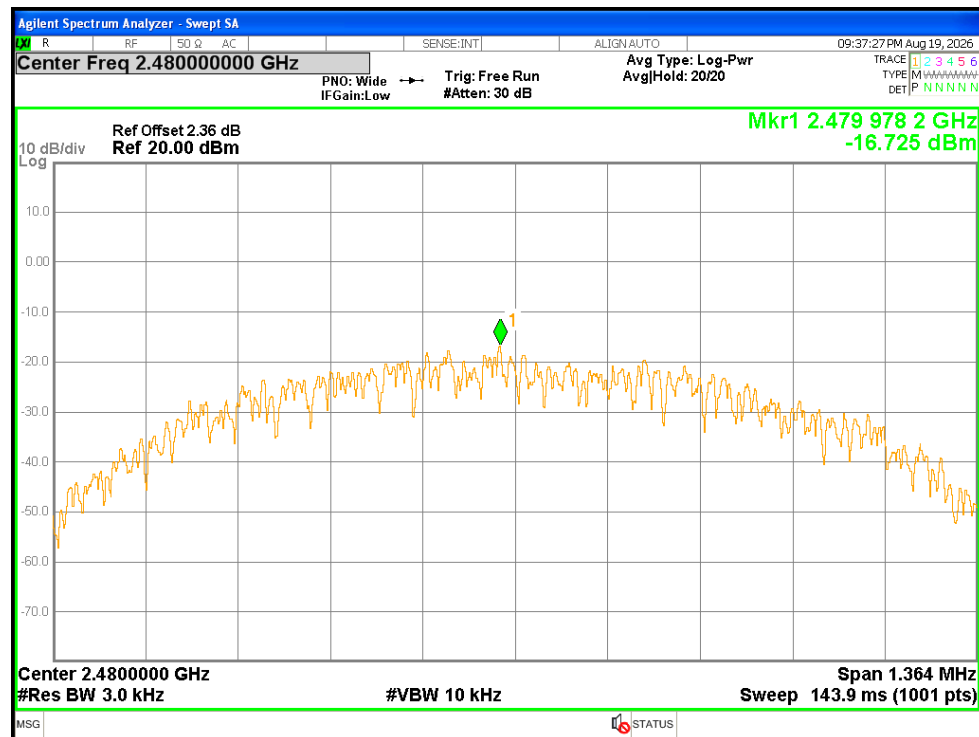
PSD NVNT BLE 1M 2402MHz



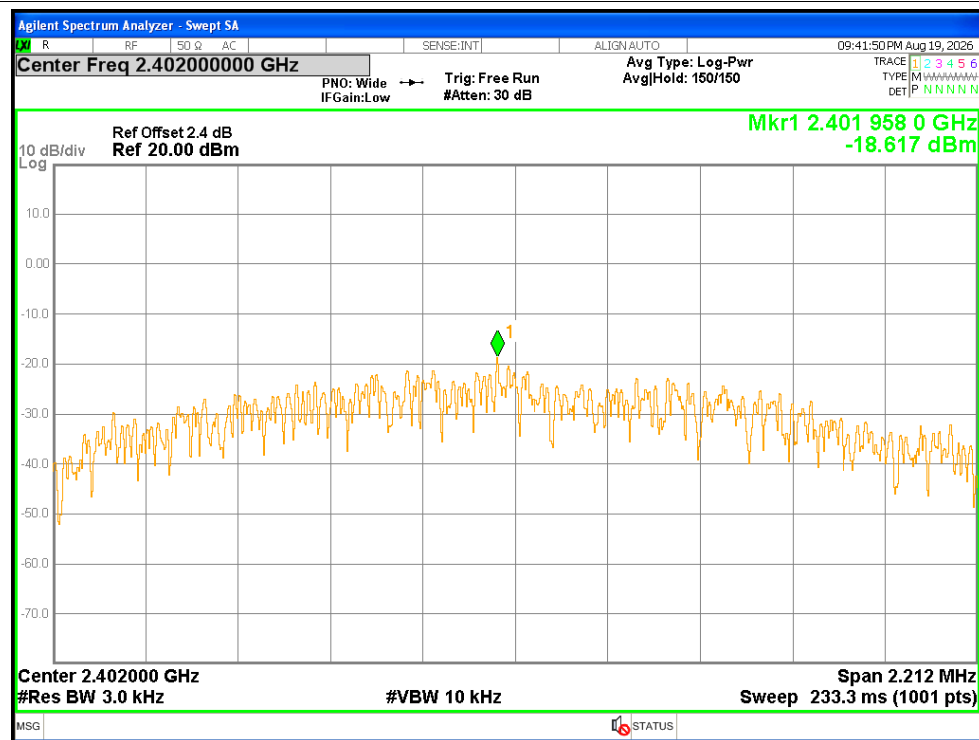
PSD NVNT BLE 1M 2440MHz



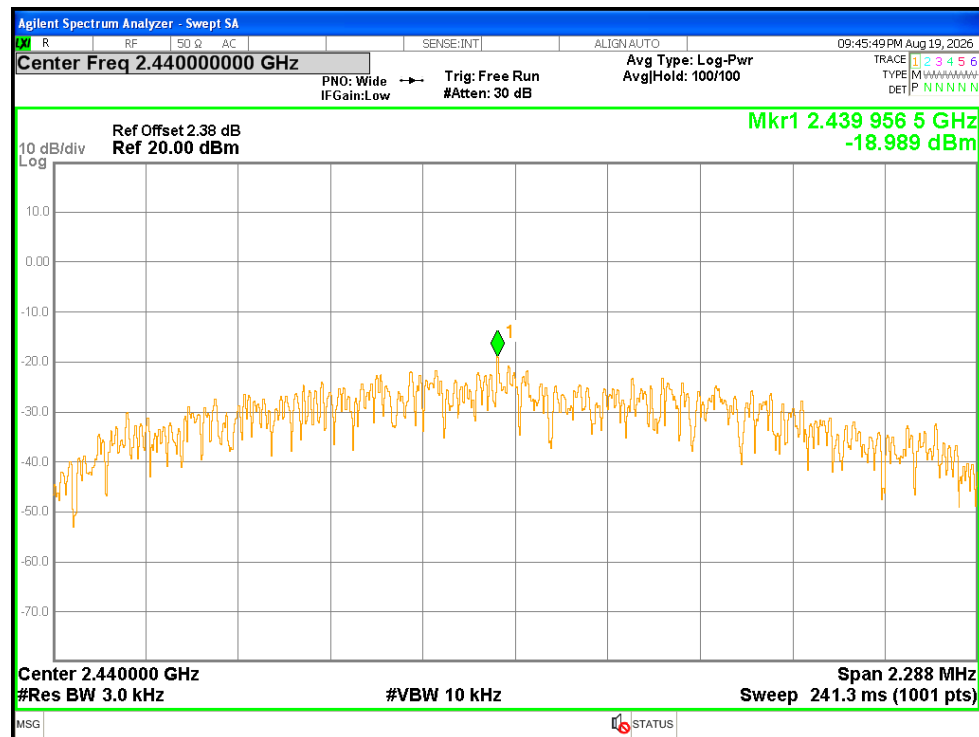
PSD NVNT BLE 1M 2480MHz



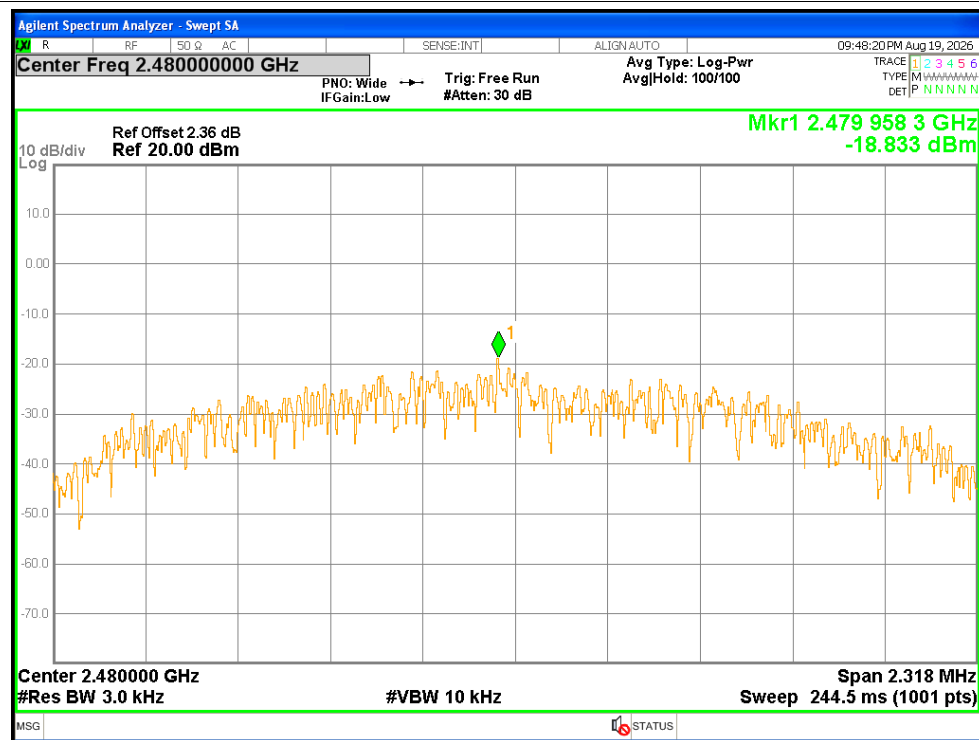
PSD NVNT BLE 2M 2402MHz



PSD NVNT BLE 2M 2440MHz



PSD NVNT BLE 2M 2480MHz

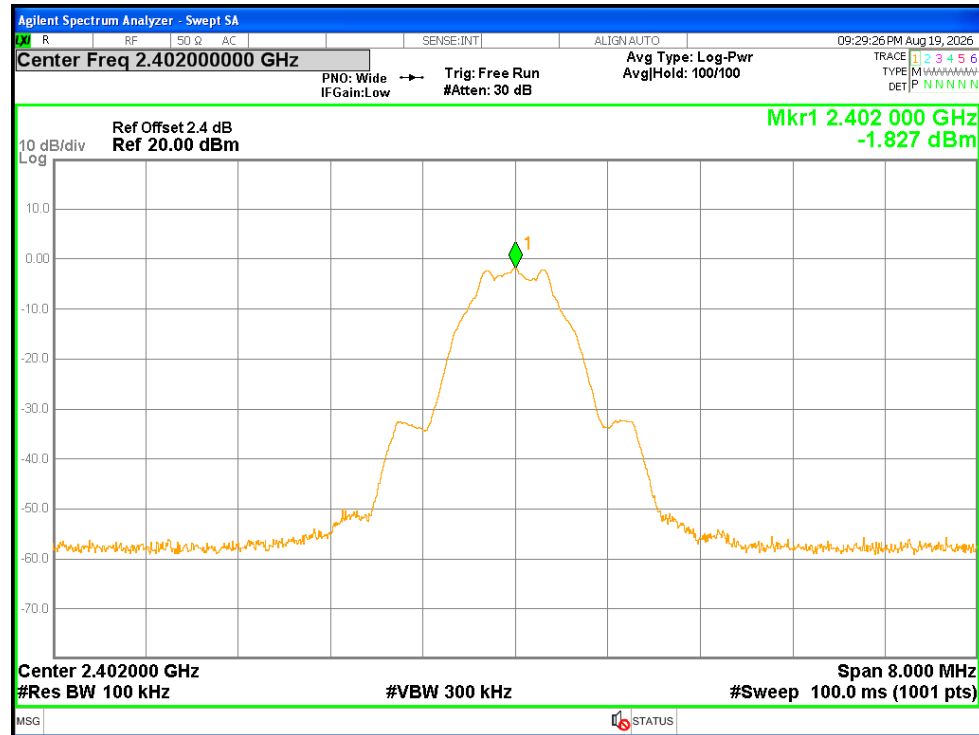


Band Edge

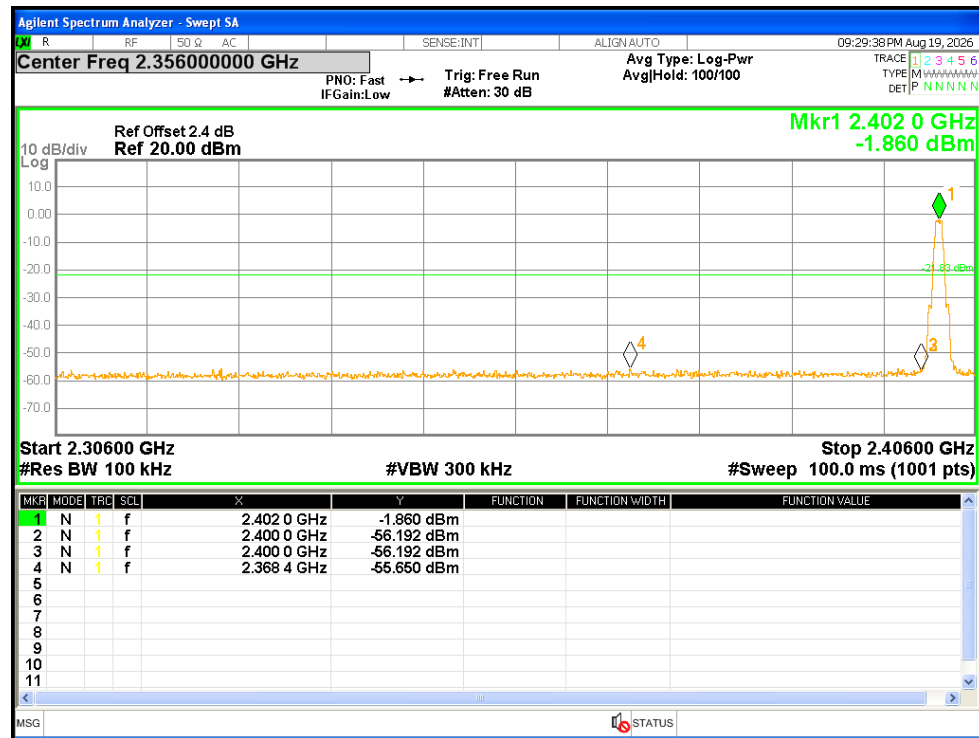
Mode	Frequency (MHz)	Max Value (dBc)	Limit (dBc)	Verdict
BLE 1M	2402	-53.81	<=-20	Pass
BLE 1M	2480	-54	<=-20	Pass
BLE 2M	2402	-33.64	<=-20	Pass
BLE 2M	2480	-53.64	<=-20	Pass

Test Graphs

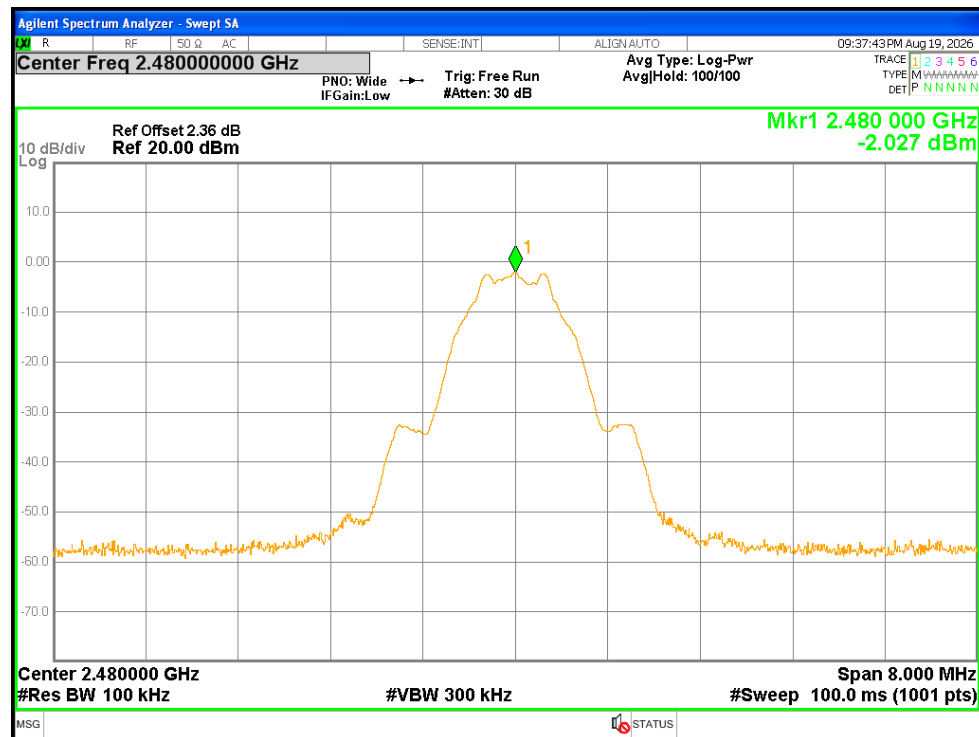
Band Edge NVNT BLE 1M 2402MHz Ref



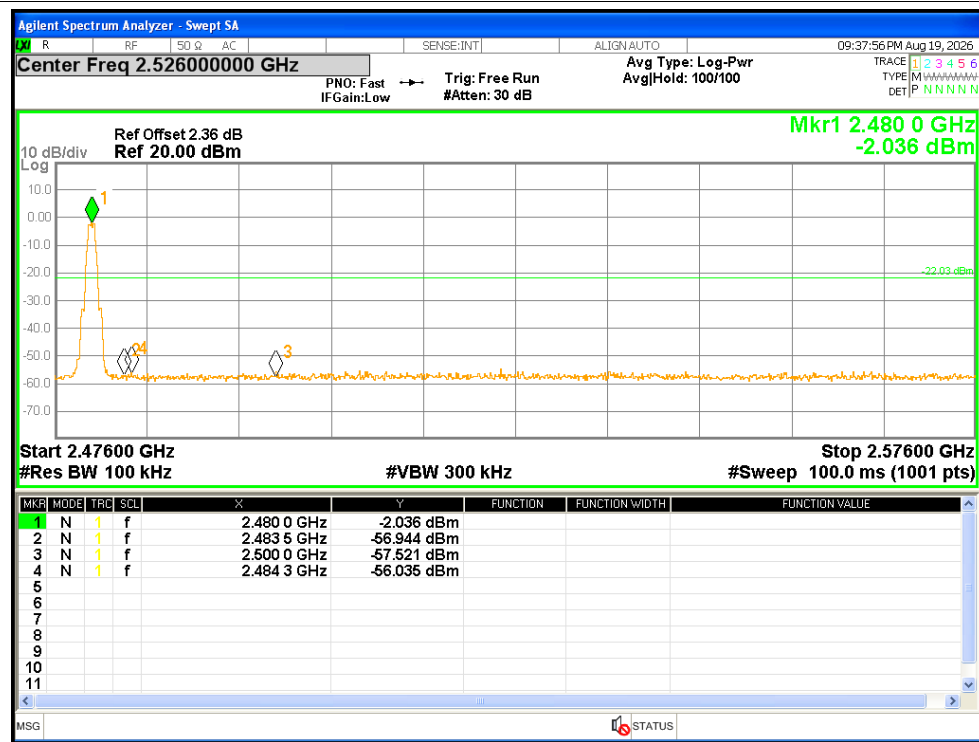
Band Edge NVNT BLE 1M 2402MHz Emission



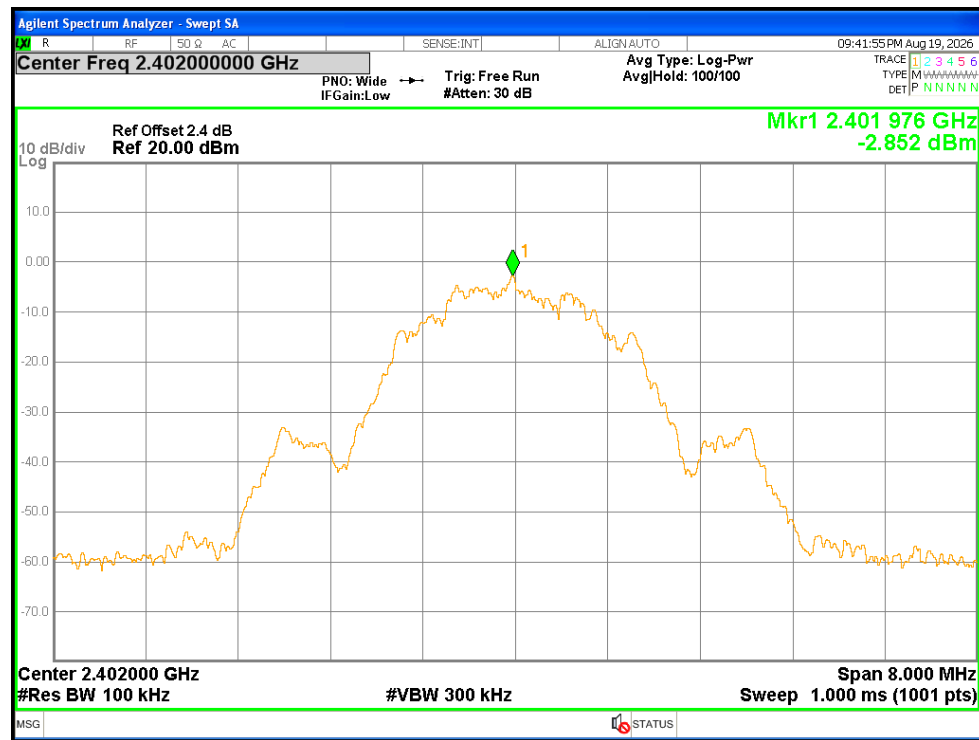
Band Edge NVNT BLE 1M 2480MHz Ref



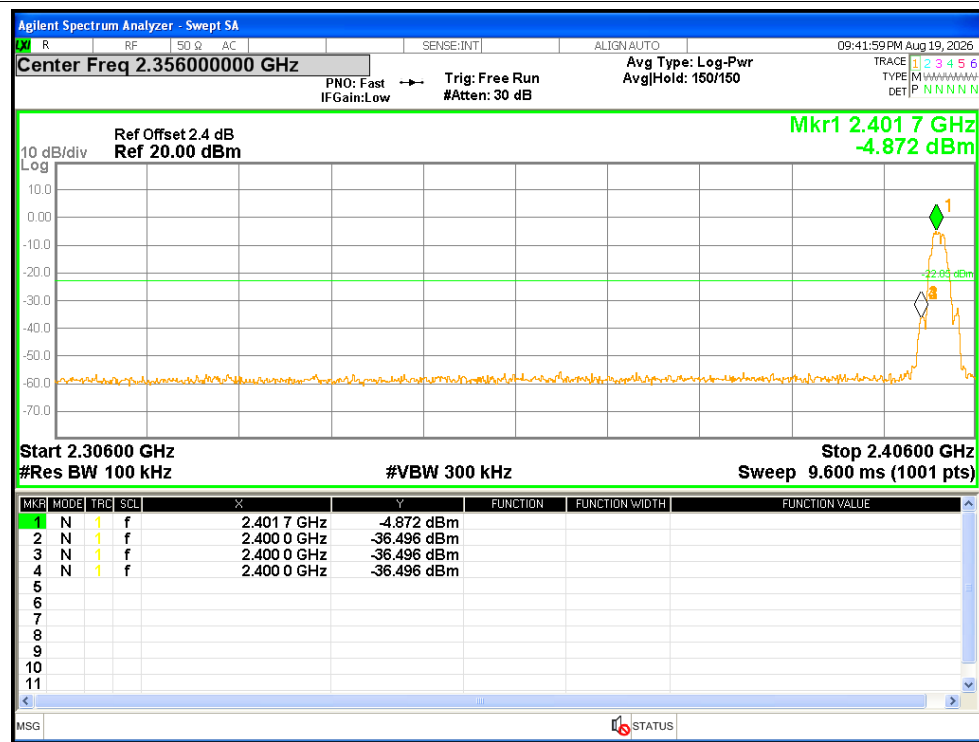
Band Edge NVNT BLE 1M 2480MHz Emission



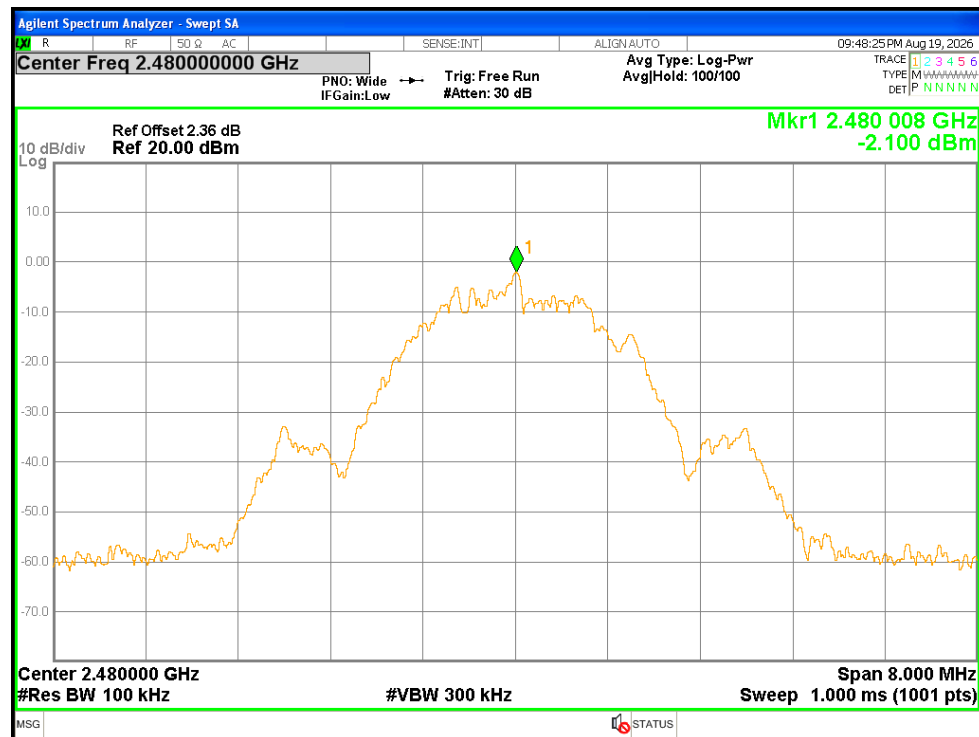
Band Edge NVNT BLE 2M 2402MHz Ref



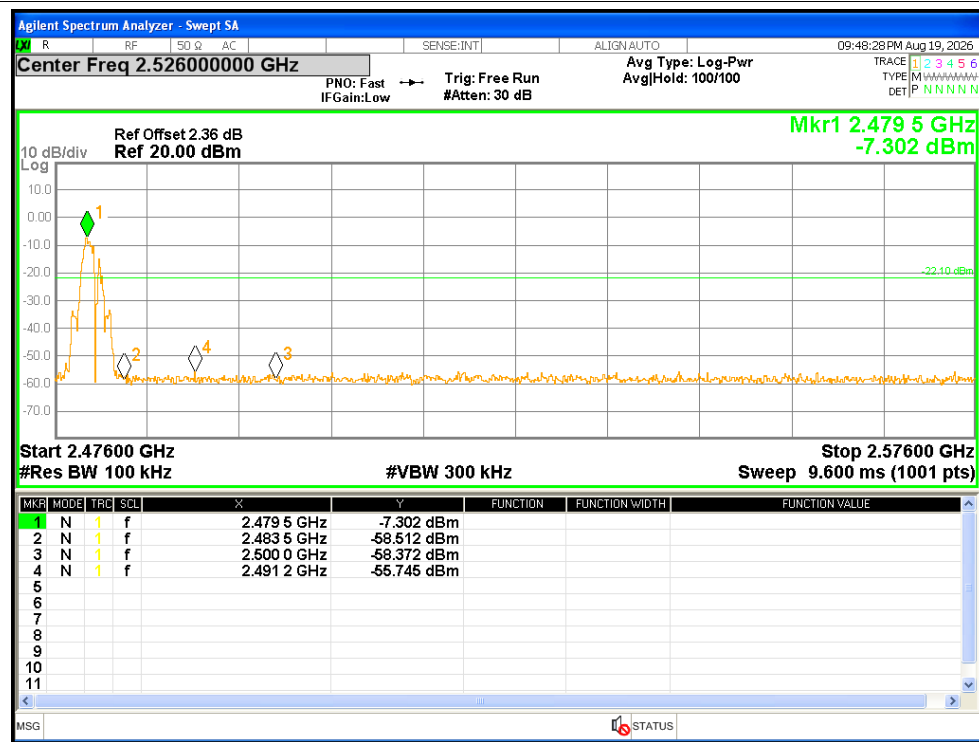
Band Edge NVNT BLE 2M 2402MHz Emission



Band Edge NVNT BLE 2M 2480MHz Ref



Band Edge NVNT BLE 2M 2480MHz Emission

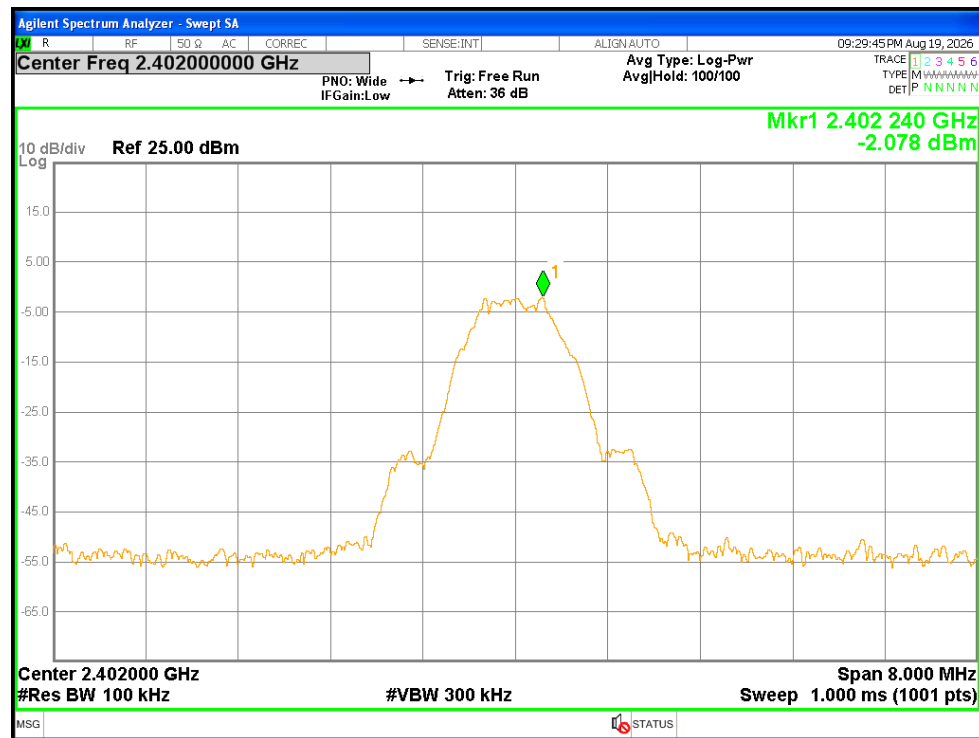


Conducted RF Spurious Emission

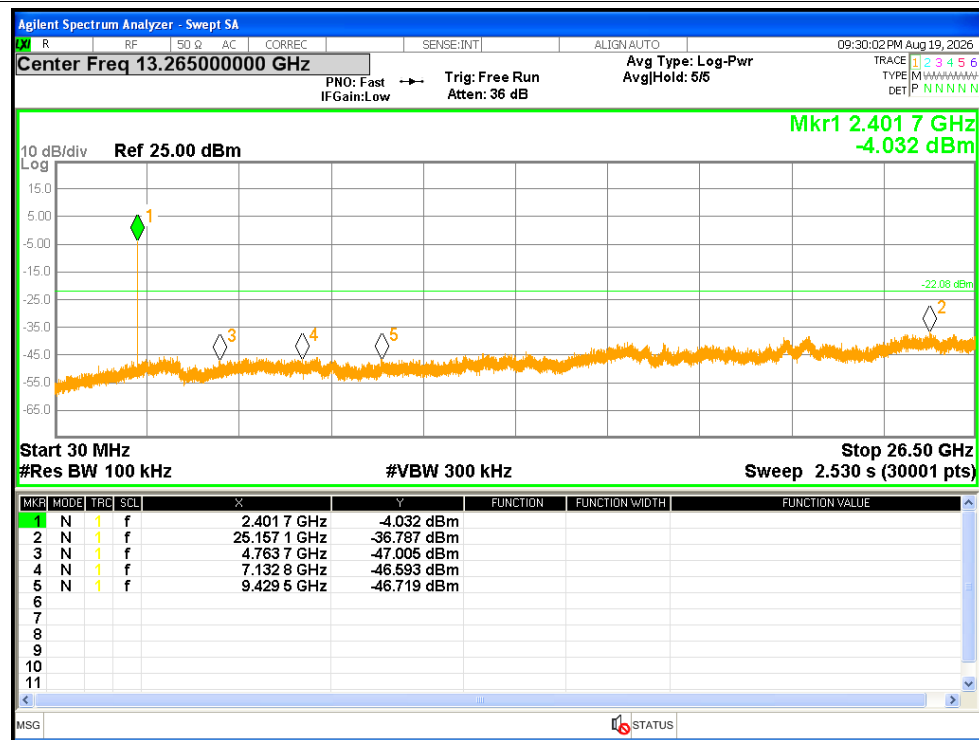
Mode	Frequency (MHz)	Max Value (dBc)	Limit (dBc)	Verdict
BLE 1M	2402	-34.7	<=-20	Pass
BLE 1M	2440	-41.12	<=-20	Pass
BLE 1M	2480	-41.45	<=-20	Pass
BLE 2M	2402	-50.72	<=-20	Pass
BLE 2M	2440	-50.32	<=-20	Pass
BLE 2M	2480	-47.76	<=-20	Pass

Test Graphs

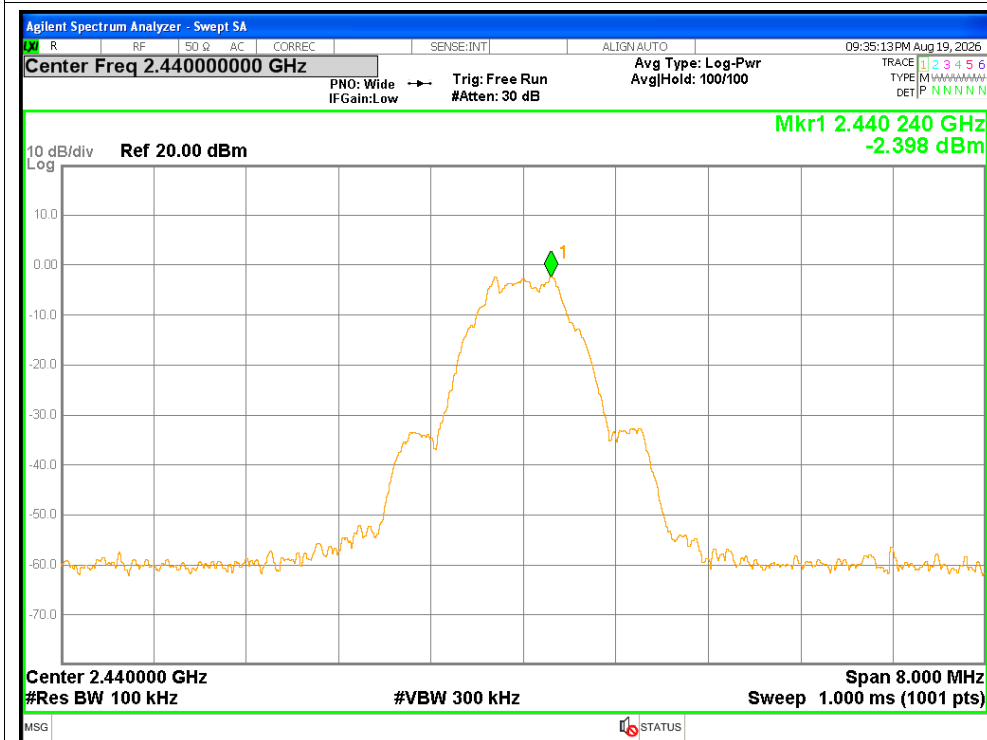
Tx. Spurious NVNT BLE 1M 2402MHz Ref



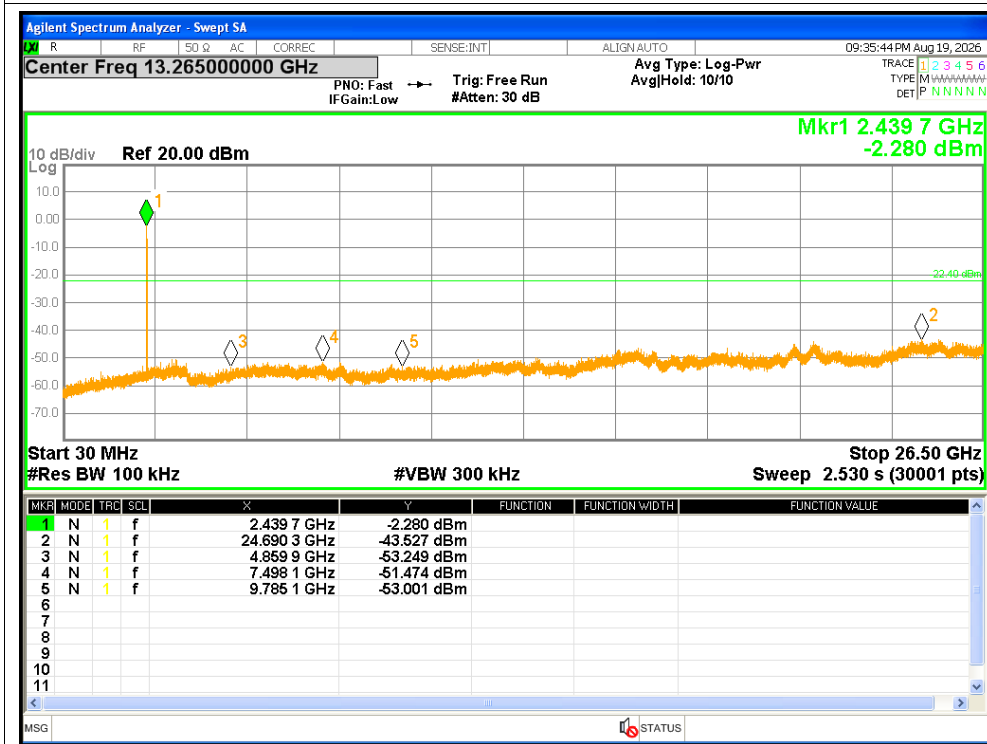
Tx. Spurious NVNT BLE 1M 2402MHz Emission



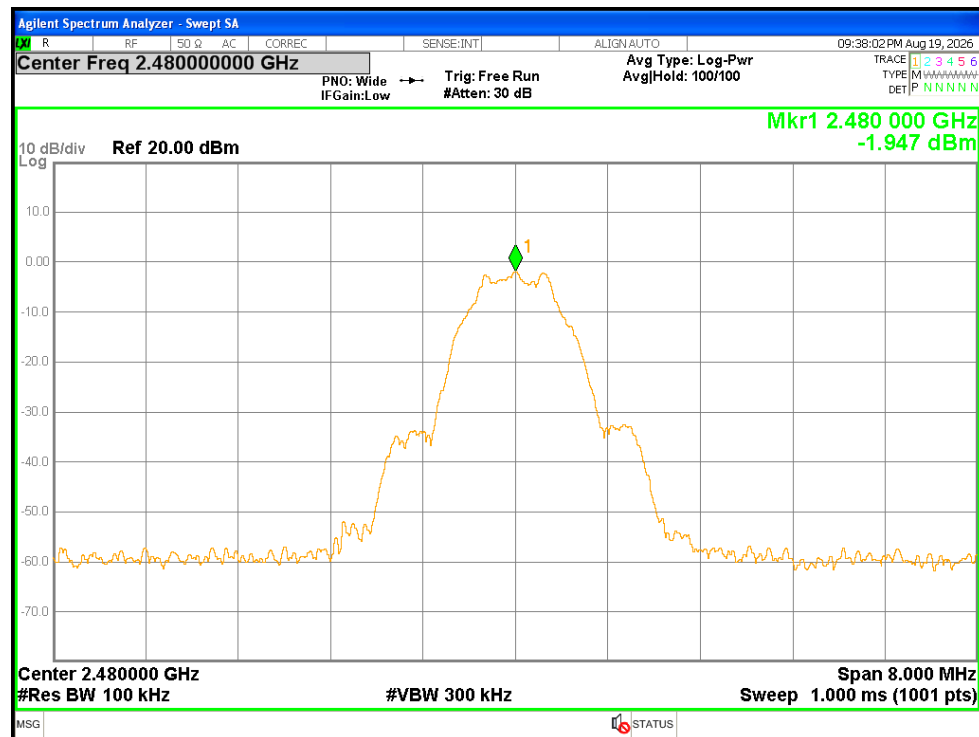
Tx. Spurious NVNT BLE 1M 2440MHz Ref



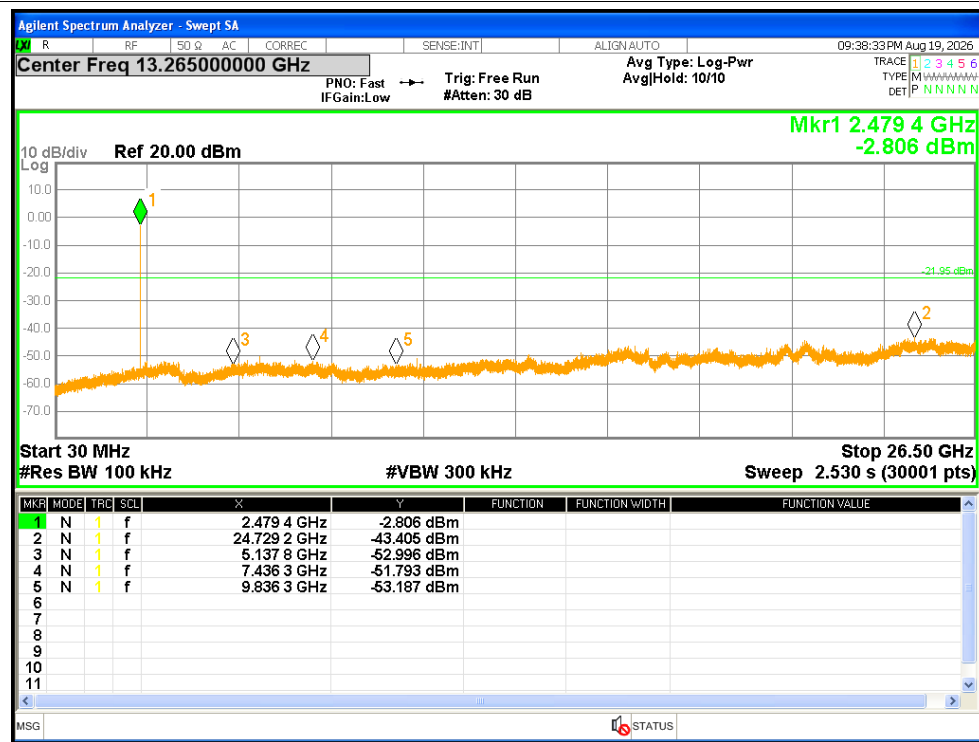
Tx. Spurious NVNT BLE 1M 2440MHz Emission



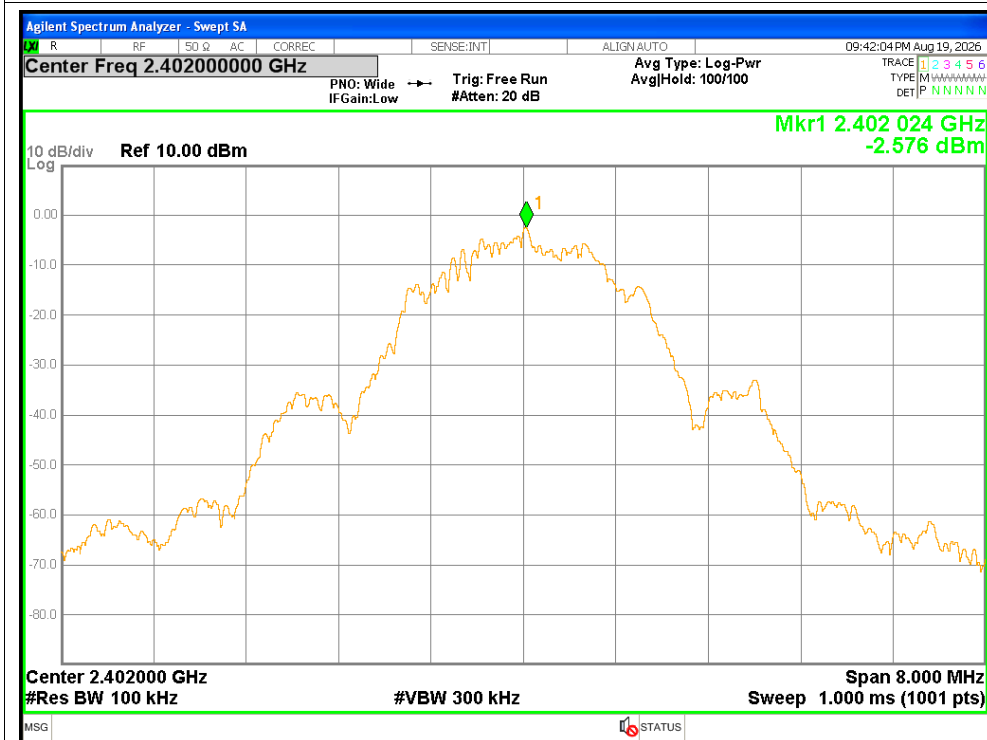
Tx. Spurious NVNT BLE 1M 2480MHz Ref



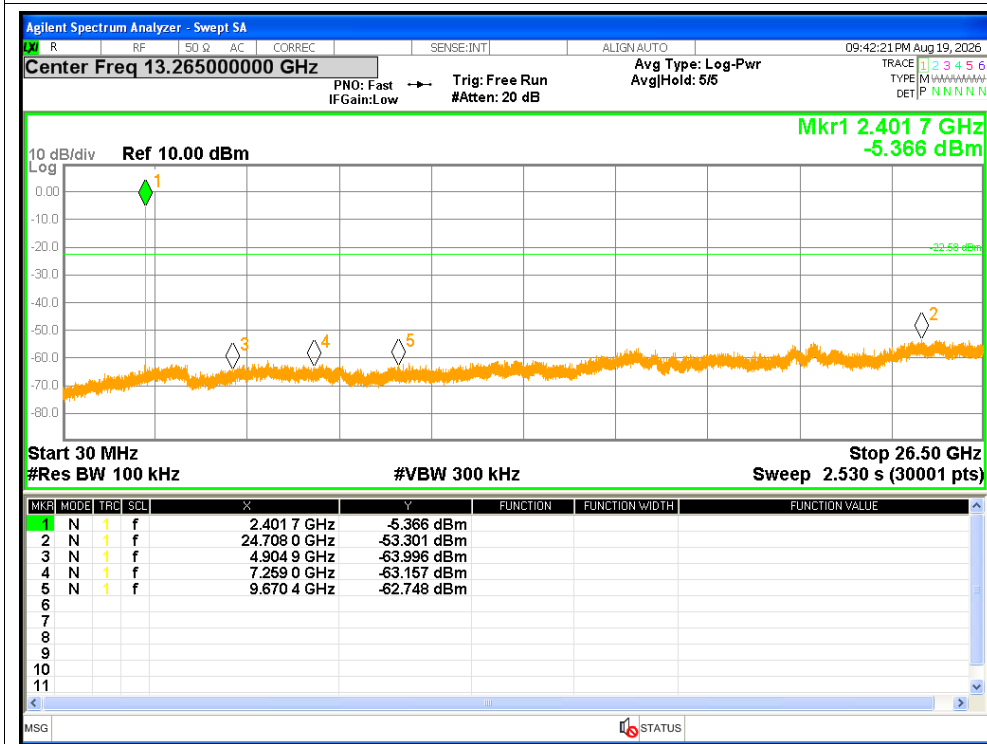
Tx. Spurious NVNT BLE 1M 2480MHz Emission



Tx. Spurious NVNT BLE 2M 2402MHz Ref



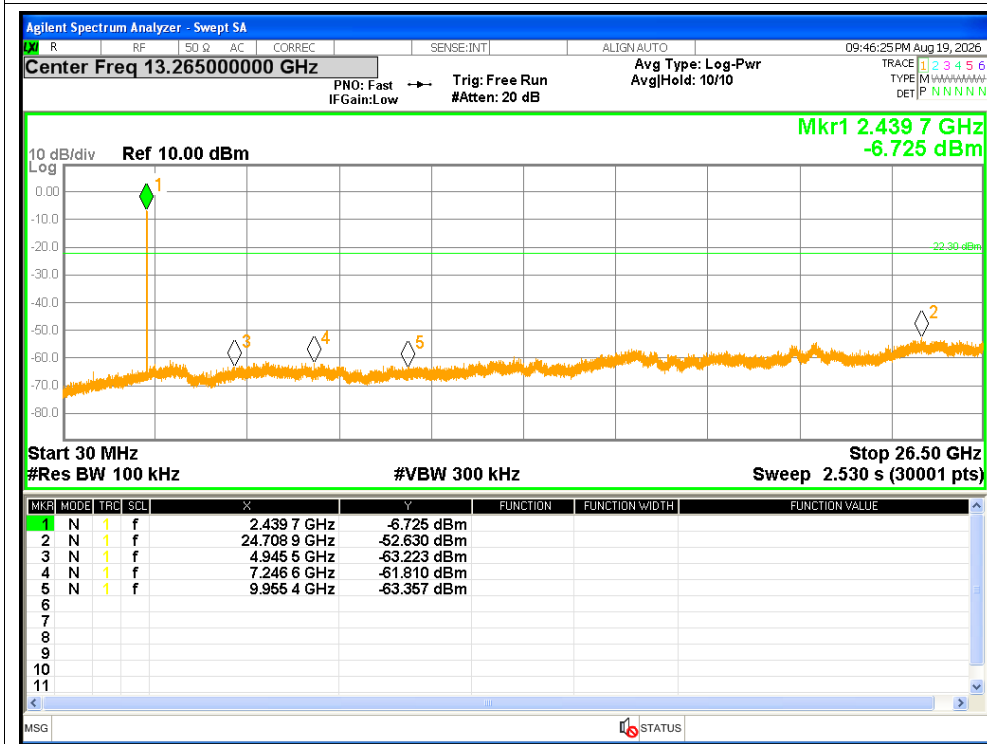
Tx. Spurious NVNT BLE 2M 2402MHz Emission



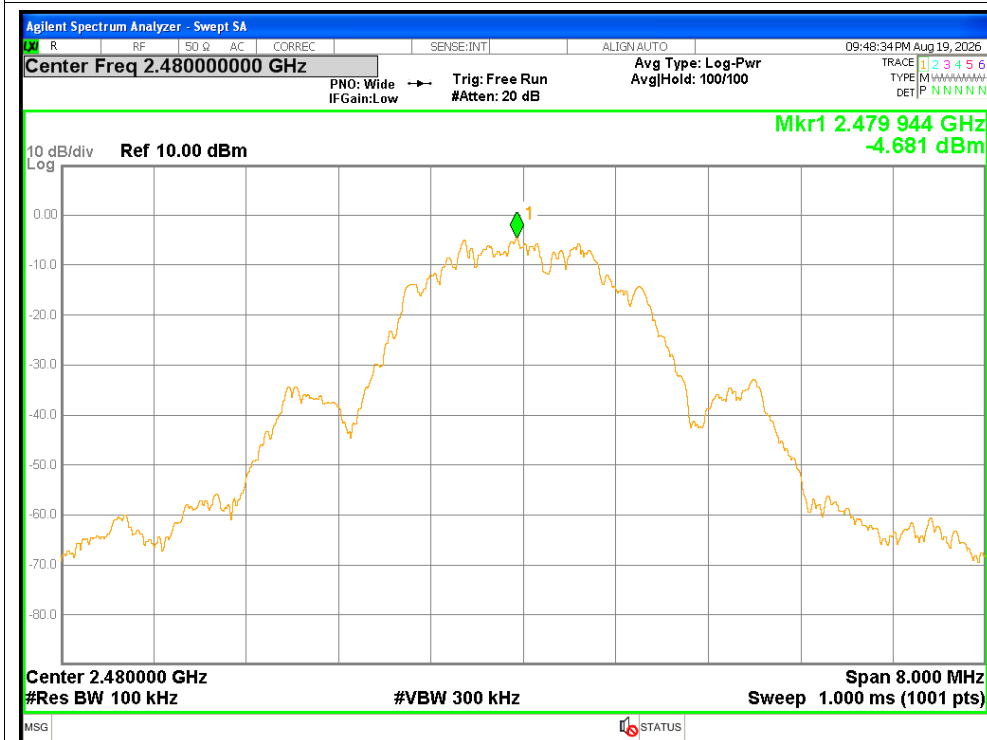
Tx. Spurious NVNT BLE 2M 2440MHz Ref



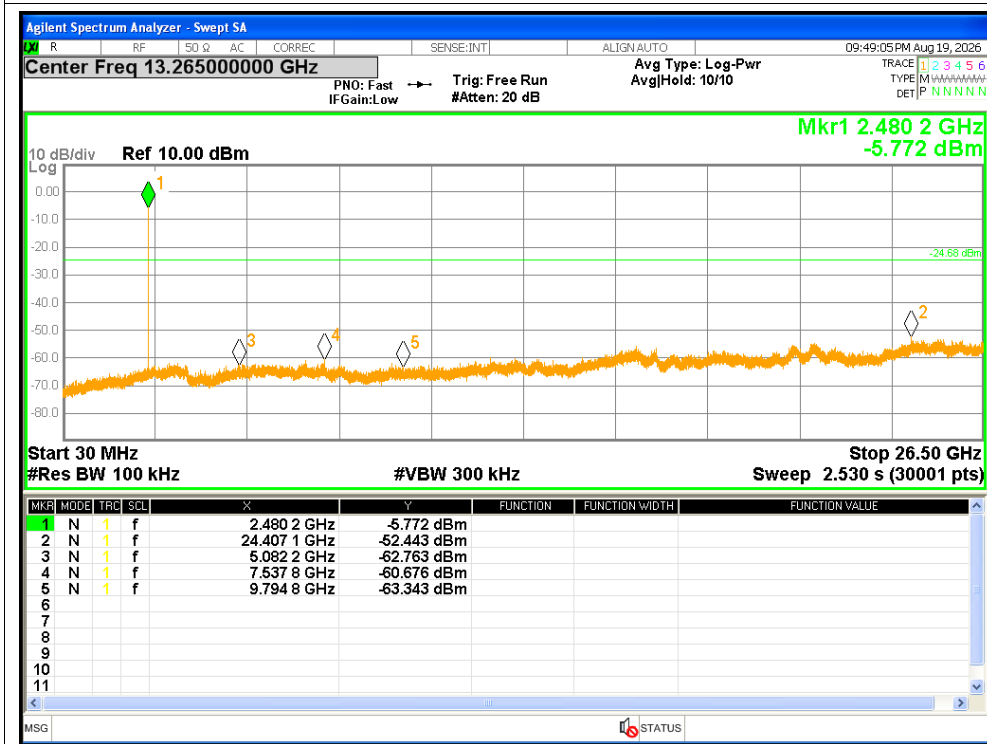
Tx. Spurious NVNT BLE 2M 2440MHz Emission



Tx. Spurious NVNT BLE 2M 2480MHz Ref



Tx. Spurious NVNT BLE 2M 2480MHz Emission

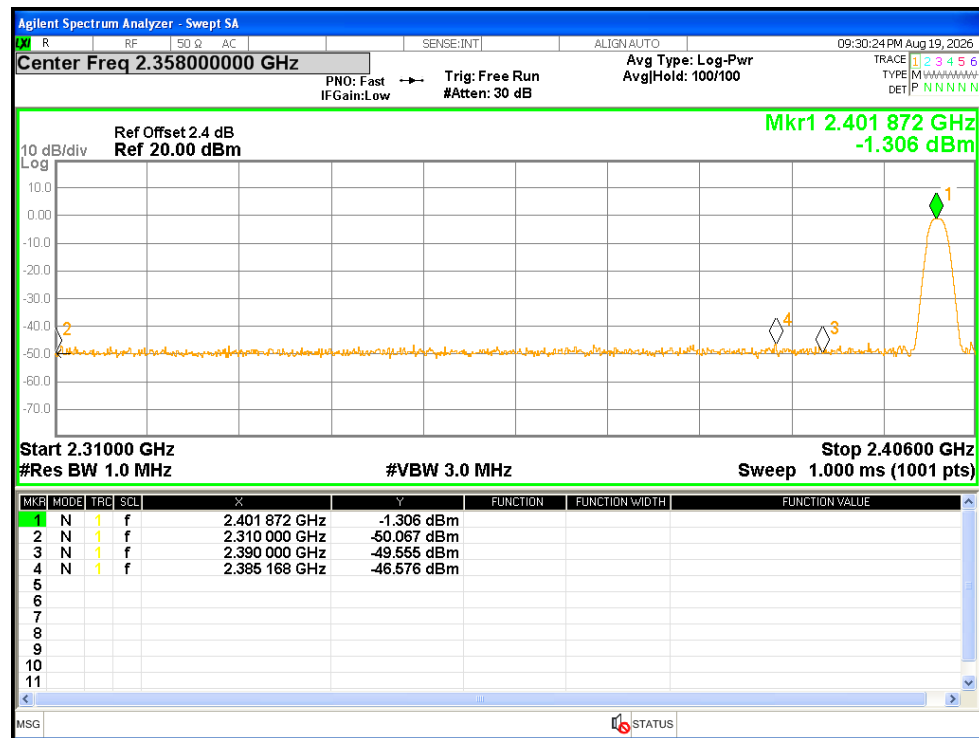


Restrict Band

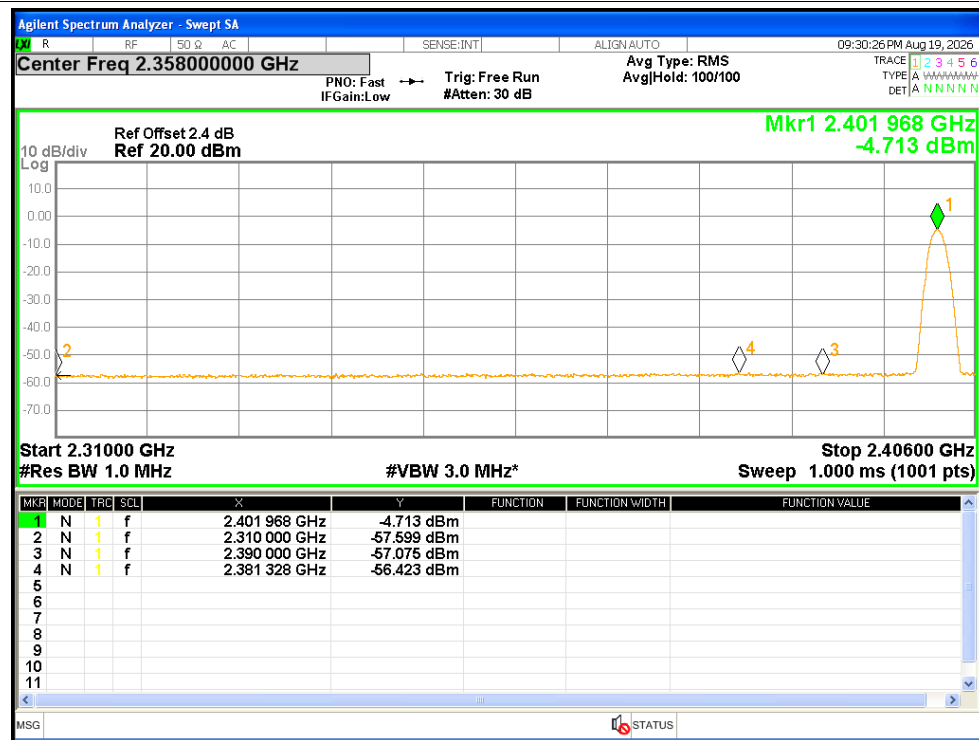
Mode	Frequency (MHz)	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	Duty Factor (dB)	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
BLE 1M	2402	2310	-50.06	2.06	0	47.26	Peak	<=74	Pass
BLE 1M	2402	2310	-57.59	2.06	2.13	41.86	Average	<=54	Pass
BLE 1M	2402	2385.168	-46.57	2.06	0	50.75	Peak	<=74	Pass
BLE 1M	2402	2381.328	-56.42	2.06	2.13	43.03	Average	<=54	Pass
BLE 1M	2402	2390	-49.73	2.06	0	47.59	Peak	<=74	Pass
BLE 1M	2402	2390	-56.64	2.06	2.13	42.81	Average	<=54	Pass
BLE 1M	2480	2483.5	-48.64	2.06	0	48.68	Peak	<=74	Pass
BLE 1M	2480	2483.5	-56.95	2.06	2.08	42.45	Average	<=54	Pass
BLE 1M	2480	2495.968	-45.69	2.06	0	51.63	Peak	<=74	Pass
BLE 1M	2480	2487.688	-56.33	2.06	2.08	43.07	Average	<=54	Pass
BLE 1M	2480	2500	-47.76	2.06	0	49.56	Peak	<=74	Pass
BLE 1M	2480	2500	-57.37	2.06	2.08	42.03	Average	<=54	Pass
BLE 2M	2402	2310	-50.43	2.06	0	46.89	Peak	<=74	Pass
BLE 2M	2402	2310	-58.06	2.06	4.99	44.25	Average	<=54	Pass
BLE 2M	2402	2385.456	-46.59	2.06	0	50.73	Peak	<=74	Pass
BLE 2M	2402	2374.224	-56.42	2.06	4.99	45.89	Average	<=54	Pass
BLE 2M	2402	2390	-50.18	2.06	0	47.14	Peak	<=74	Pass
BLE 2M	2402	2390	-57.47	2.06	4.99	44.84	Average	<=54	Pass
BLE 2M	2480	2483.5	-47.43	2.06	0	49.89	Peak	<=74	Pass
BLE 2M	2480	2483.5	-56.36	2.06	4.97	45.93	Average	<=54	Pass
BLE 2M	2480	2496.352	-45.31	2.06	0	52.01	Peak	<=74	Pass
BLE 2M	2480	2497.888	-56.06	2.06	4.97	46.23	Average	<=54	Pass
BLE 2M	2480	2500	-48.1	2.06	0	49.22	Peak	<=74	Pass
BLE 2M	2480	2500	-57.12	2.06	4.97	45.17	Average	<=54	Pass

Test Graphs

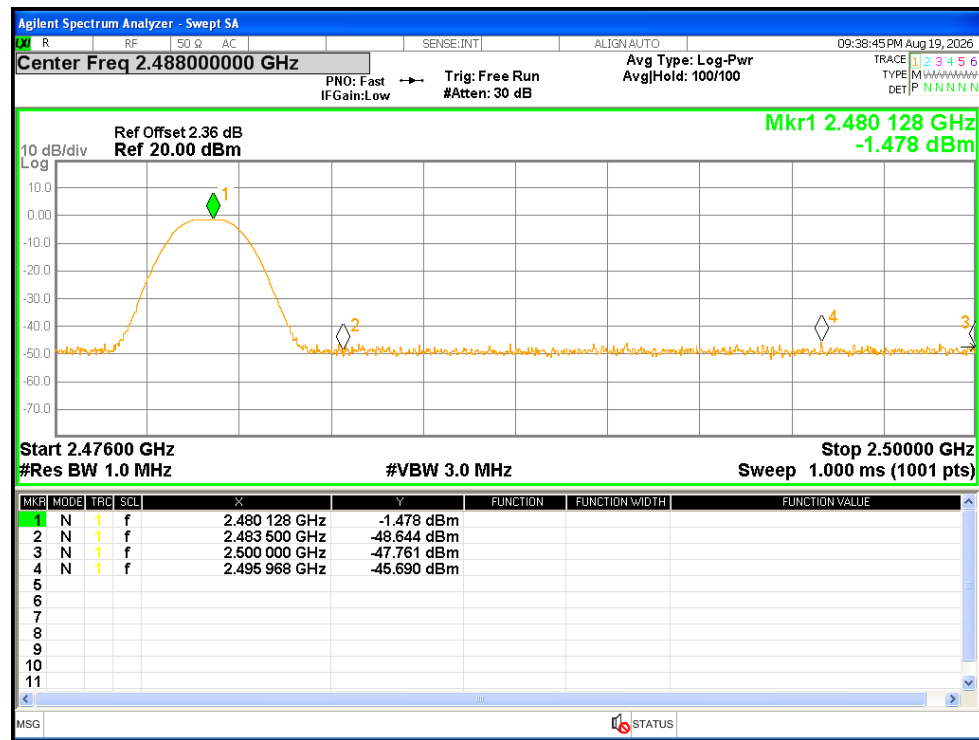
Restrict Band NVNT BLE 1M 2402MHz Peak



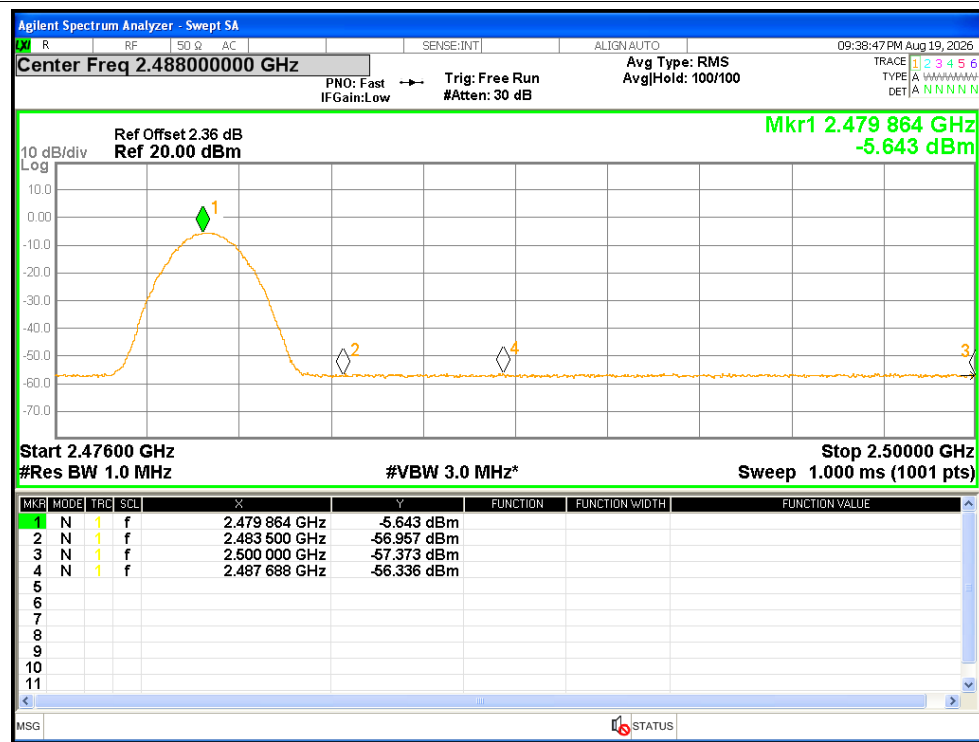
Restrict Band NVNT BLE 1M 2402MHz Average



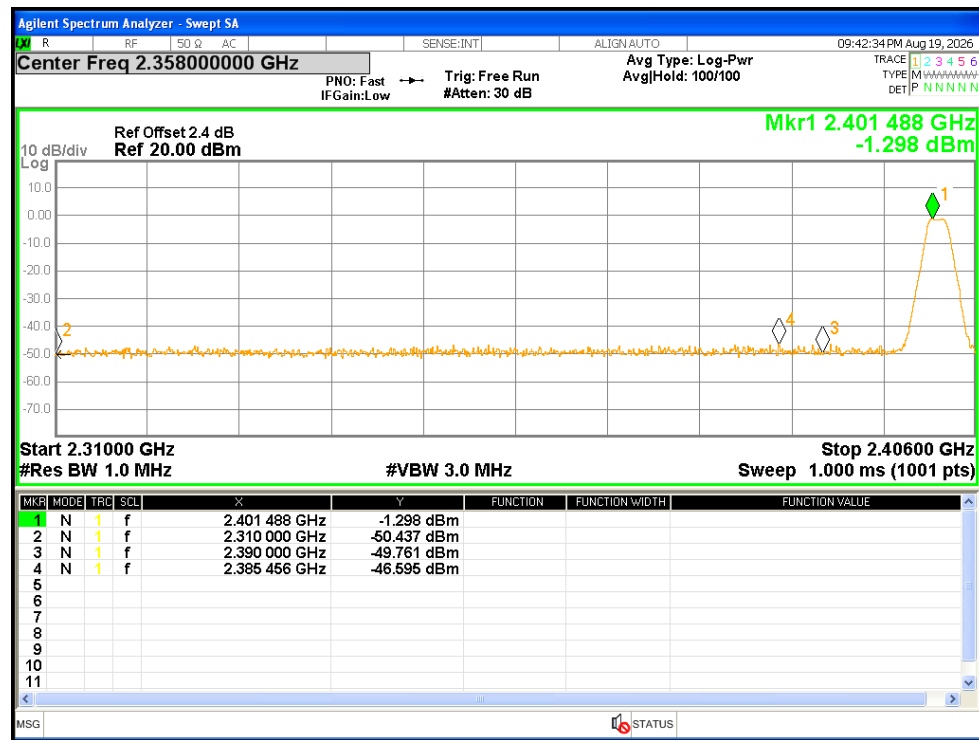
Restrict Band NVNT BLE 1M 2480MHz Peak



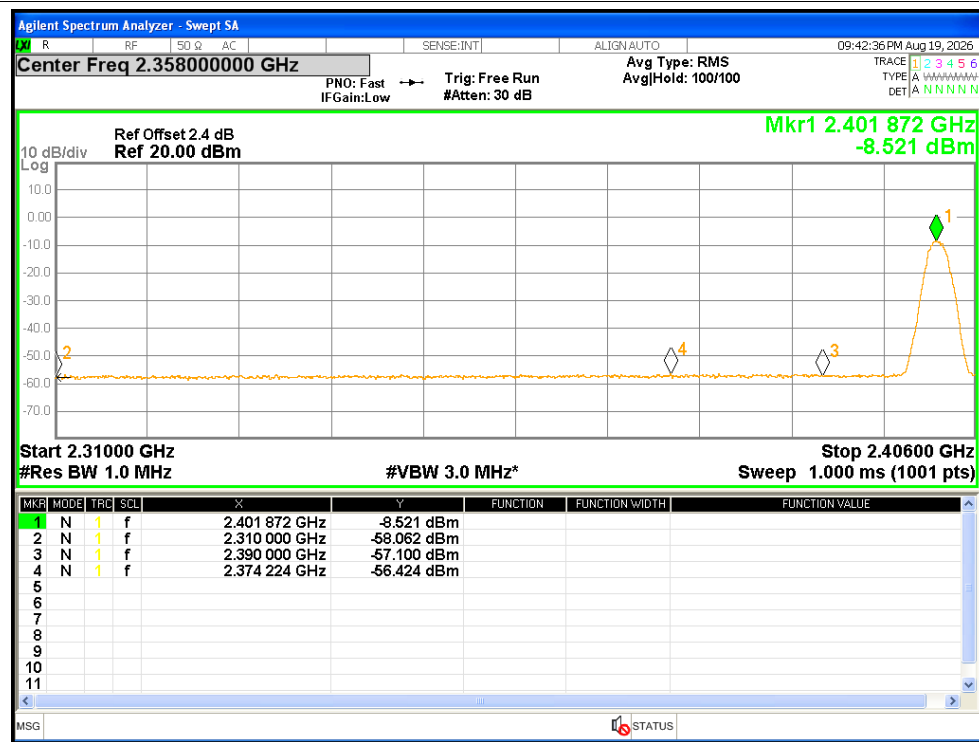
Restrict Band NVNT BLE 1M 2480MHz Average



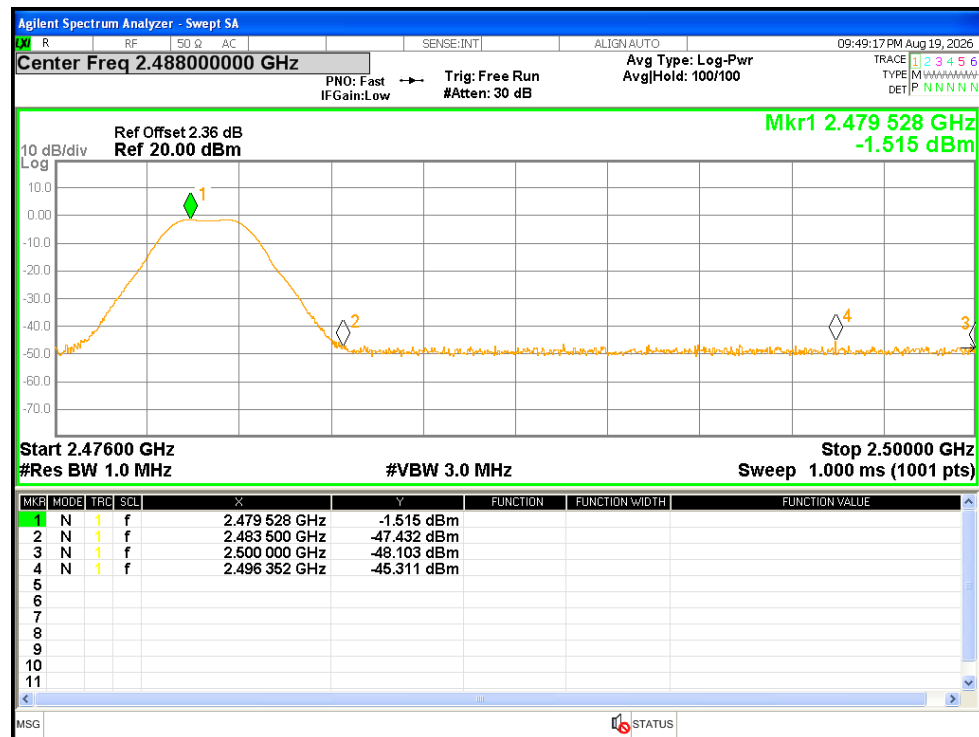
Restrict Band NVNT BLE 2M 2402MHz Peak



Restrict Band NVNT BLE 2M 2402MHz Average



Restrict Band NVNT BLE 2M 2480MHz Peak



Restrict Band NVNT BLE 2M 2480MHz Average

