

RF Test Data for Bluetooth LE (Conducted Measurements)

General Description of EUT	
Product Name:	WiFi & BT combo module
Test Model:	EWN-5330SNN1AC
Sample ID:	HC-C-202509-0218-02-01
Environmental Conditions	
Temperature:	24.6℃
Relative Humidity:	52.3%
Test Voltage:	DC 12V
Test Engineer:	Lily zhang
Note: For a more detailed features description, please refer to the report TBR-C-202509-0218-3 The report only show the worst case data.	

Contents

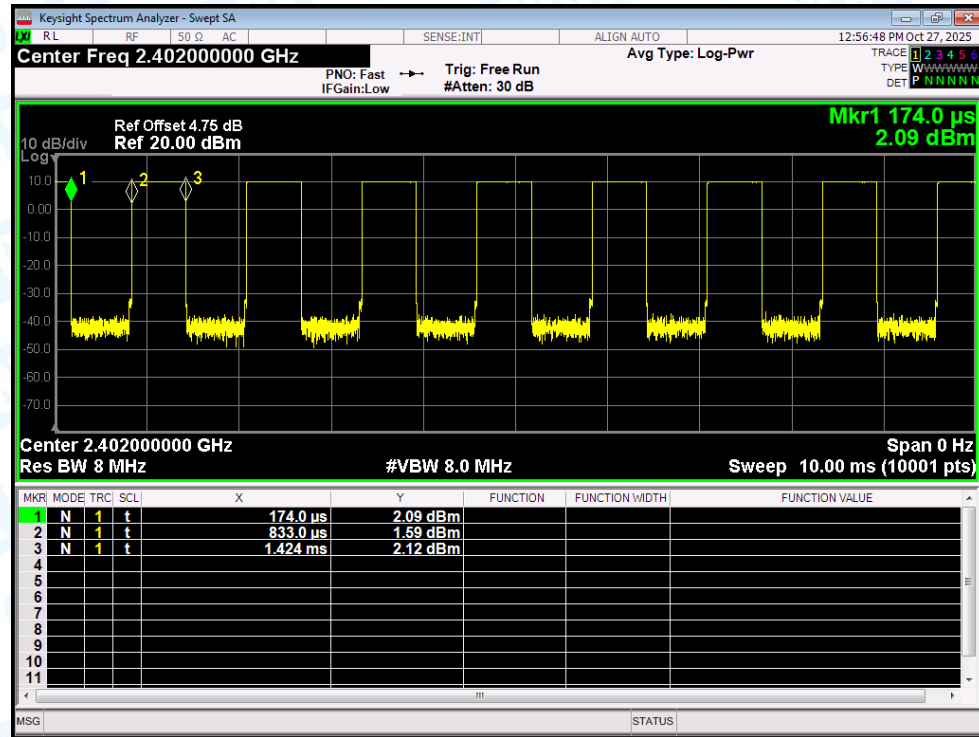
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1. Duty Cycle

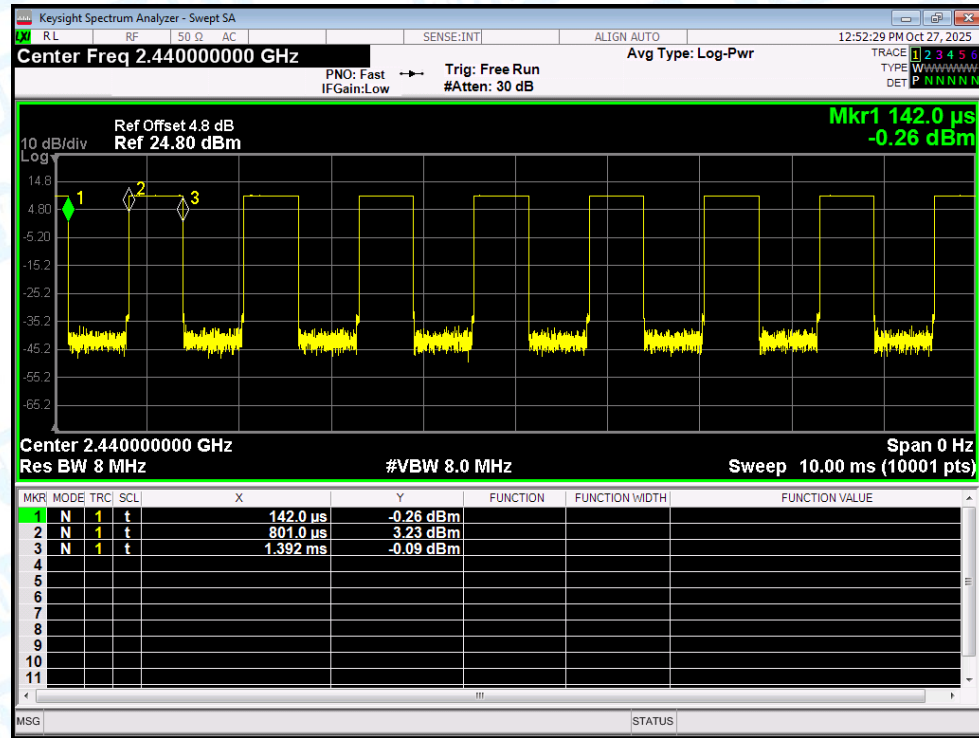
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	BLE 1Mbps	2402	Ant1	47.28	3.25	1.69
NVNT	BLE 1Mbps	2440	Ant1	47.28	3.25	1.69
NVNT	BLE 1Mbps	2480	Ant1	47.28	3.25	1.69
NVNT	BLE 2Mbps	2402	Ant1	48.48	3.14	3.3
NVNT	BLE 2Mbps	2440	Ant1	48.48	3.14	3.3
NVNT	BLE 2Mbps	2480	Ant1	48.48	3.14	3.3

Test Graphs

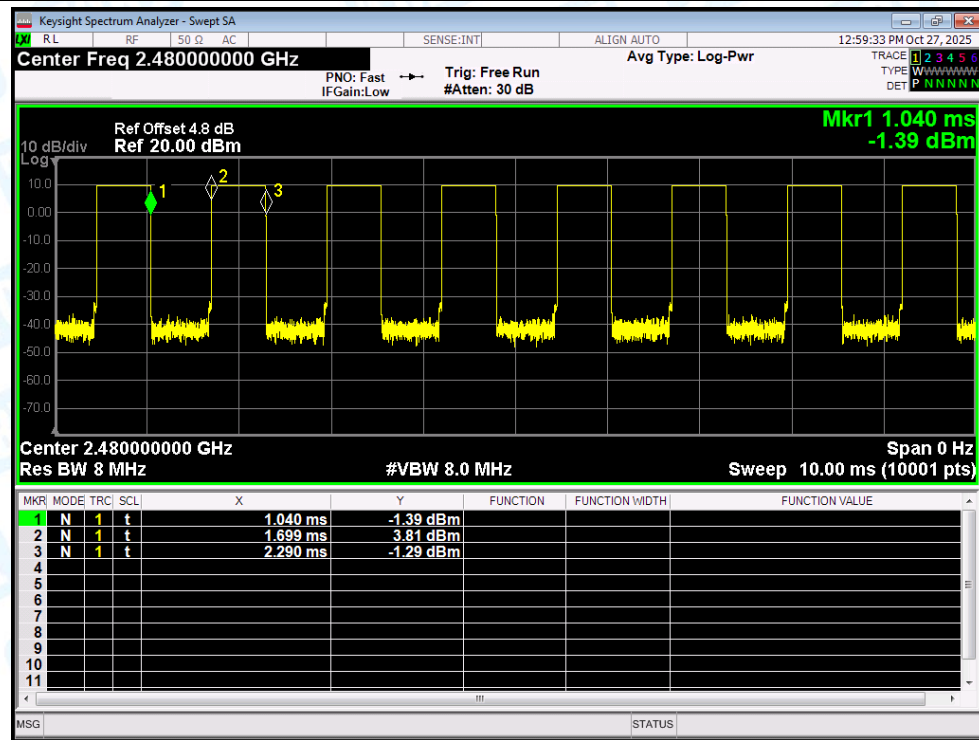
Duty Cycle NVNT BLE 1Mbps 2402MHz Ant1



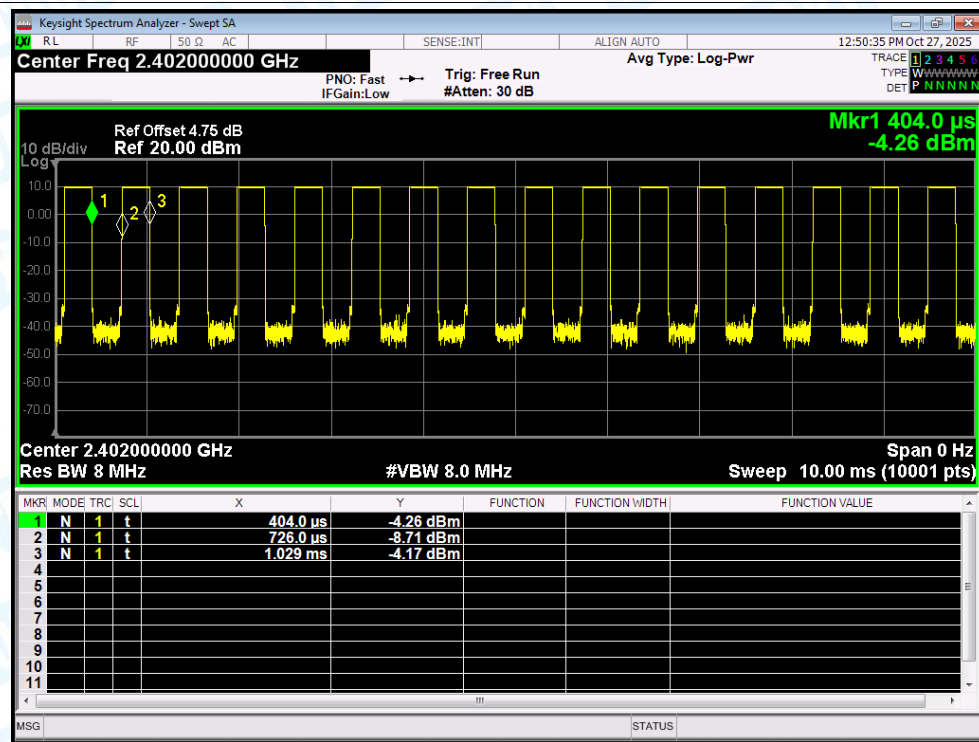
Duty Cycle NVNT BLE 1Mbps 2440MHz Ant1



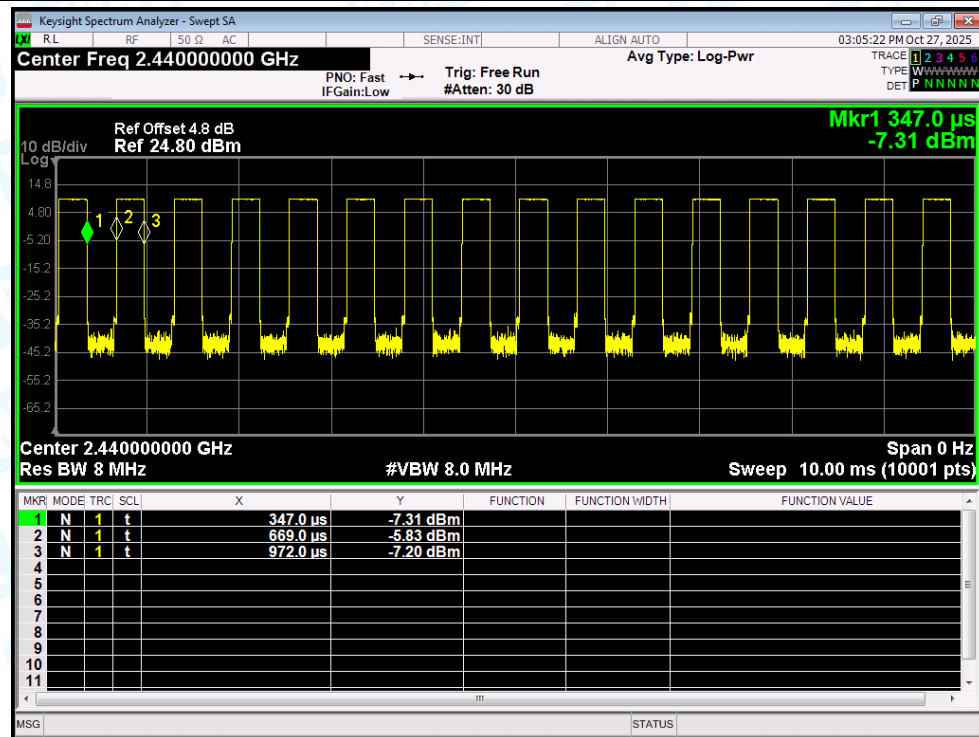
Duty Cycle NVNT BLE 1Mbps 2480MHz Ant1



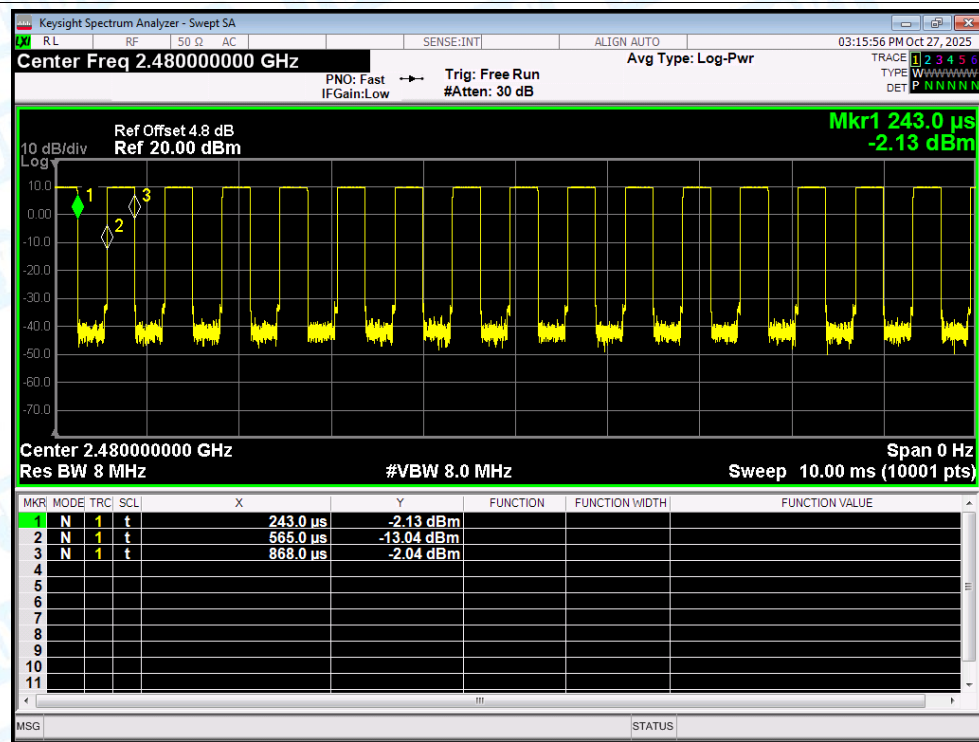
Duty Cycle NVNT BLE 2Mbps 2402MHz Ant1



Duty Cycle NVNT BLE 2Mbps 2440MHz Ant1



Duty Cycle NVNT BLE 2Mbps 2480MHz Ant1

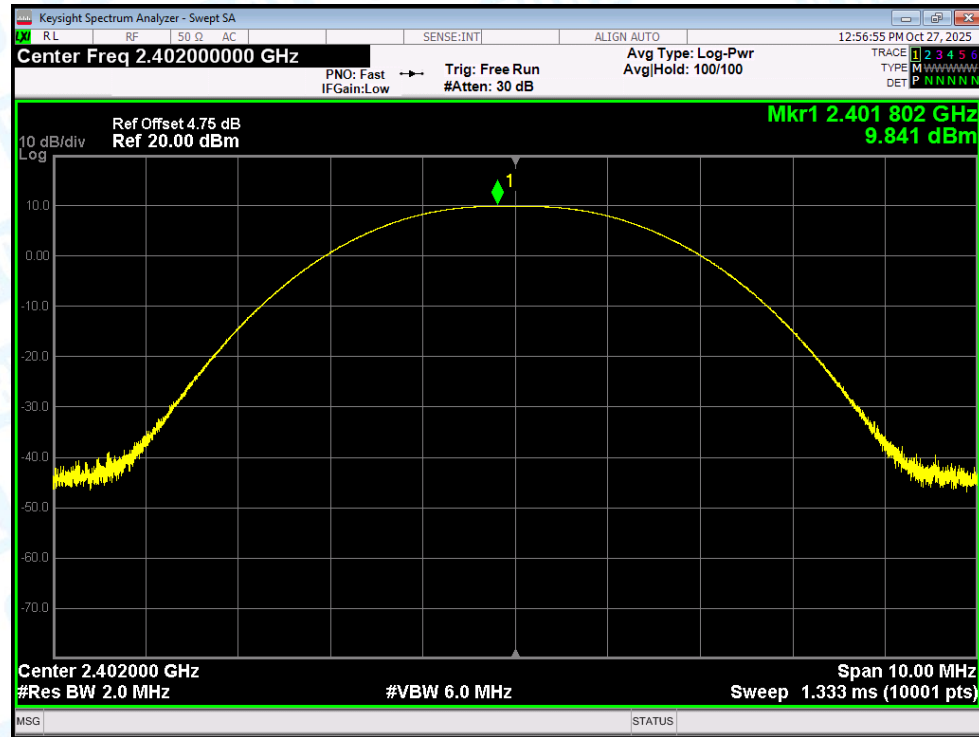


2. Maximum Conducted Output Power

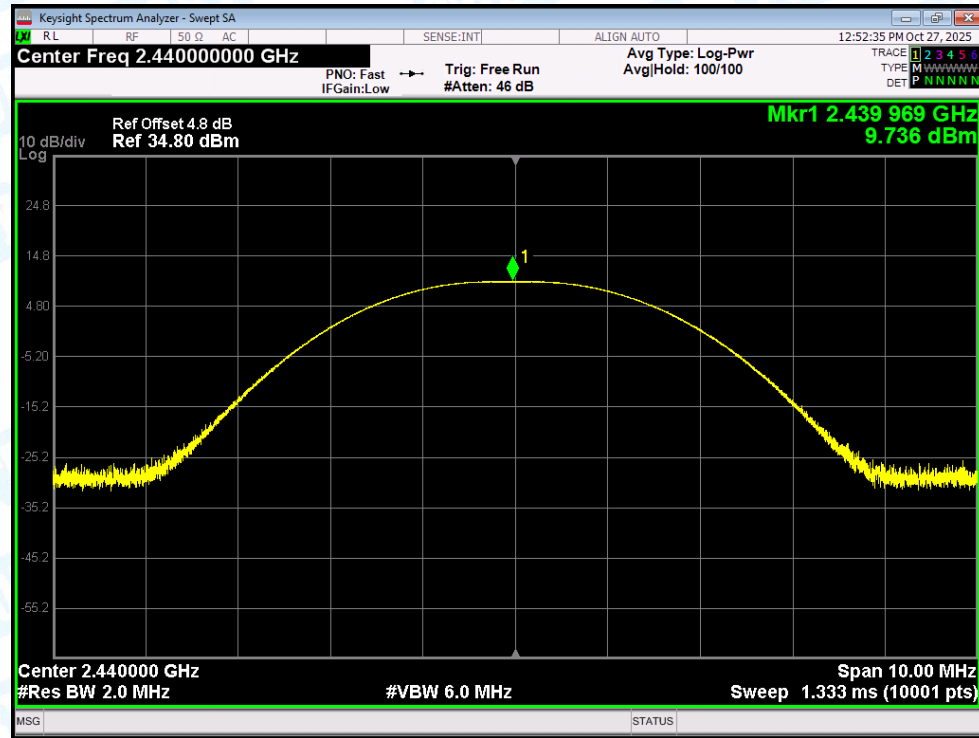
Condition	Mode	Frequency (MHz)	Antenna	Total Power (dBm)	Limit (dBm)	Verdict
NVNT	BLE 1Mbps	2402	Ant1	9.841	30	Pass
NVNT	BLE 1Mbps	2440	Ant1	9.736	30	Pass
NVNT	BLE 1Mbps	2480	Ant1	9.586	30	Pass
NVNT	BLE 2Mbps	2402	Ant1	9.782	30	Pass
NVNT	BLE 2Mbps	2440	Ant1	9.644	30	Pass
NVNT	BLE 2Mbps	2480	Ant1	9.523	30	Pass

Test Graphs

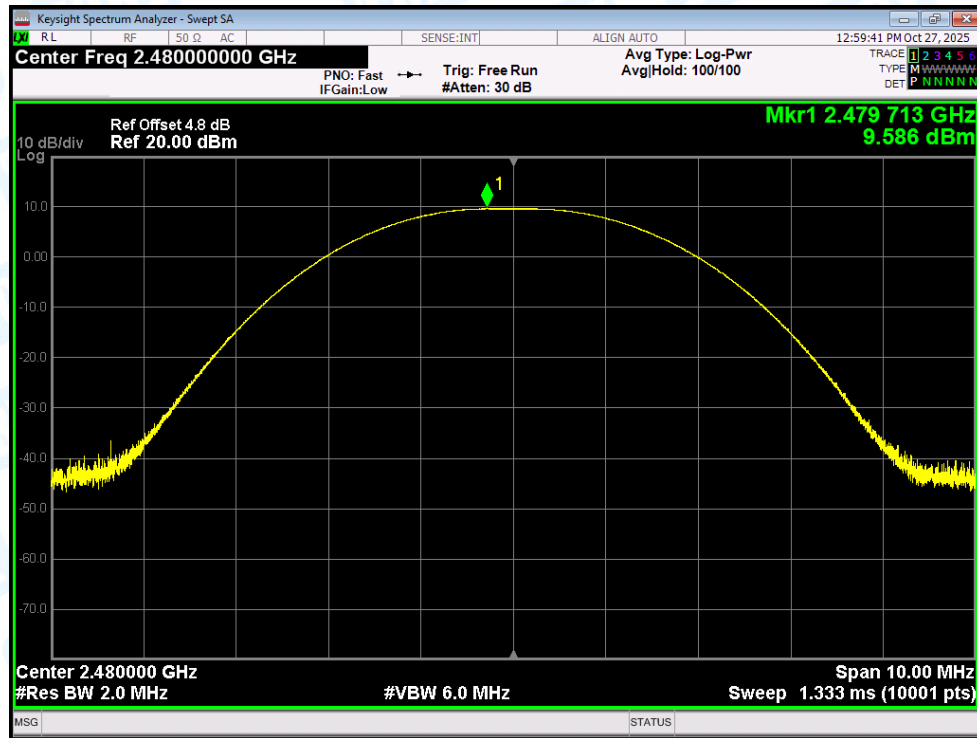
Power NVNT BLE 1Mbps 2402MHz Ant1



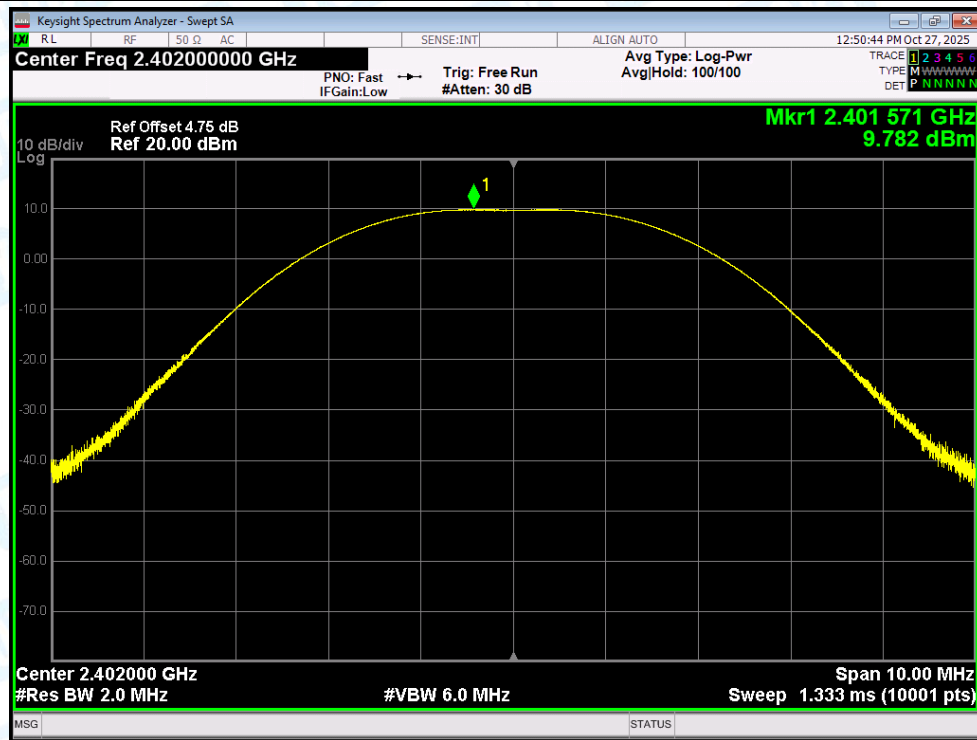
Power NVNT BLE 1Mbps 2440MHz Ant1



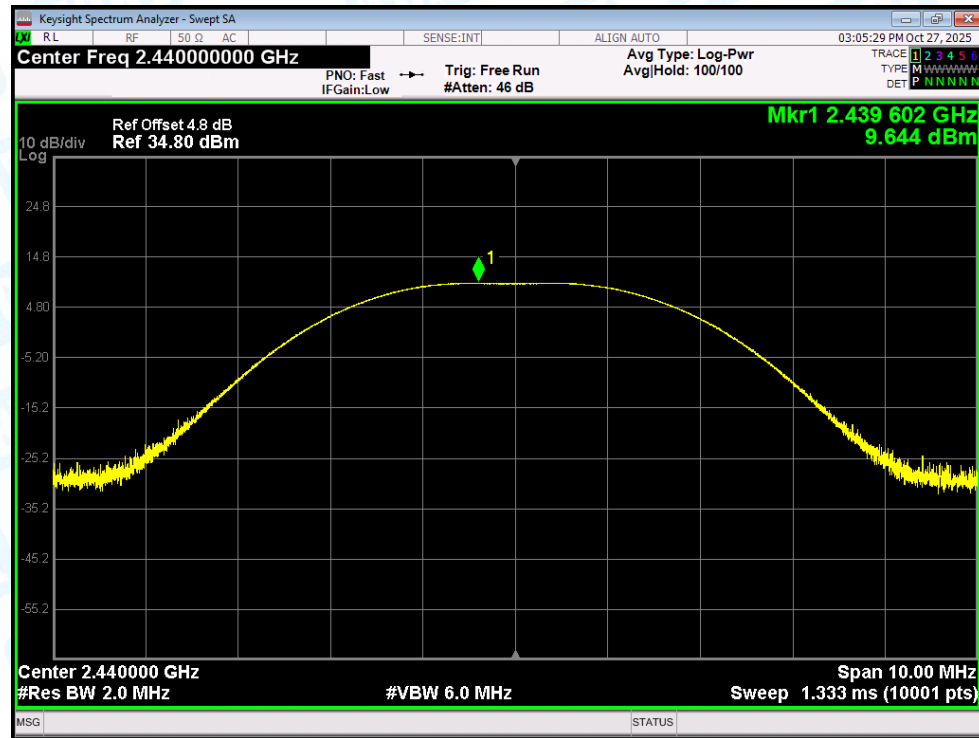
Power NVNT BLE 1Mbps 2480MHz Ant1



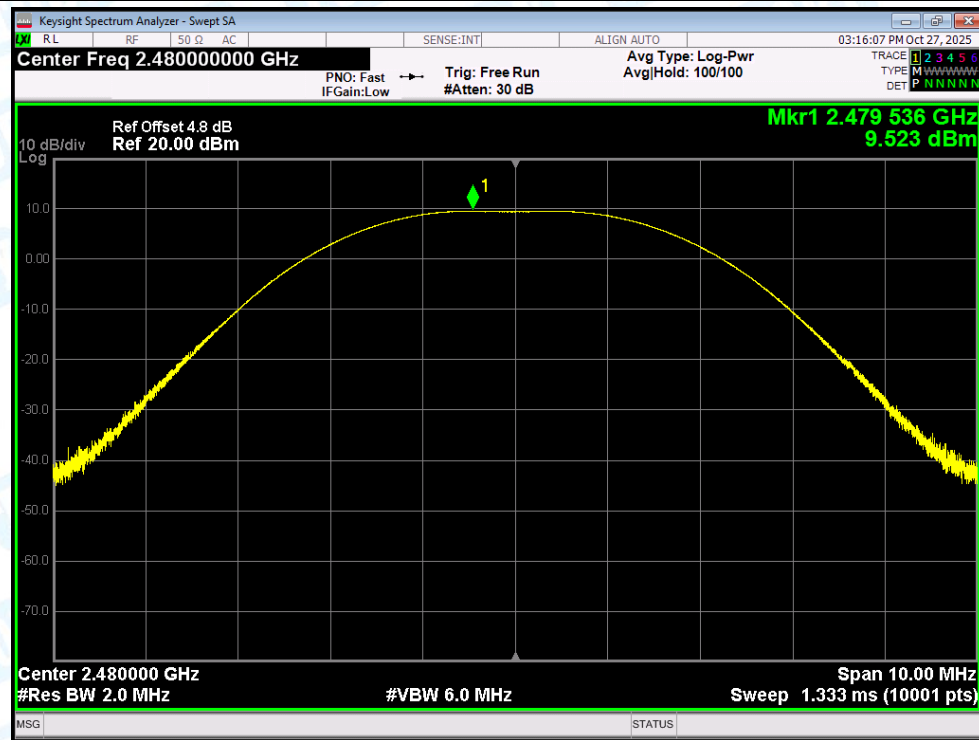
Power NVNT BLE 2Mbps 2402MHz Ant1



Power NVNT BLE 2Mbps 2440MHz Ant1



Power NVNT BLE 2Mbps 2480MHz Ant1

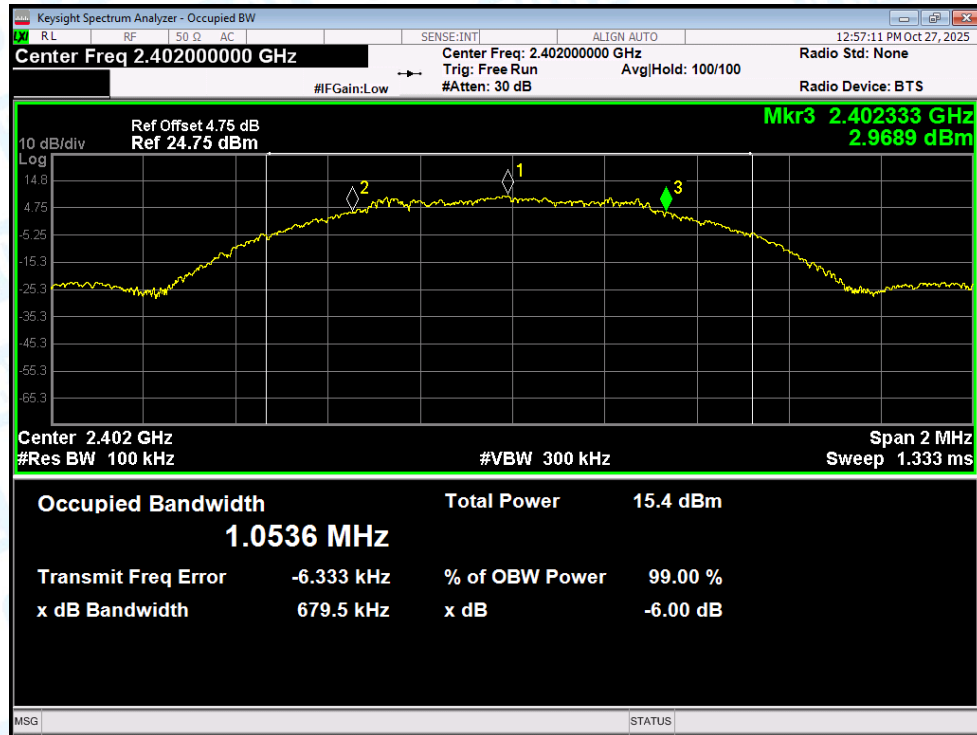


3. -6dB Bandwidth

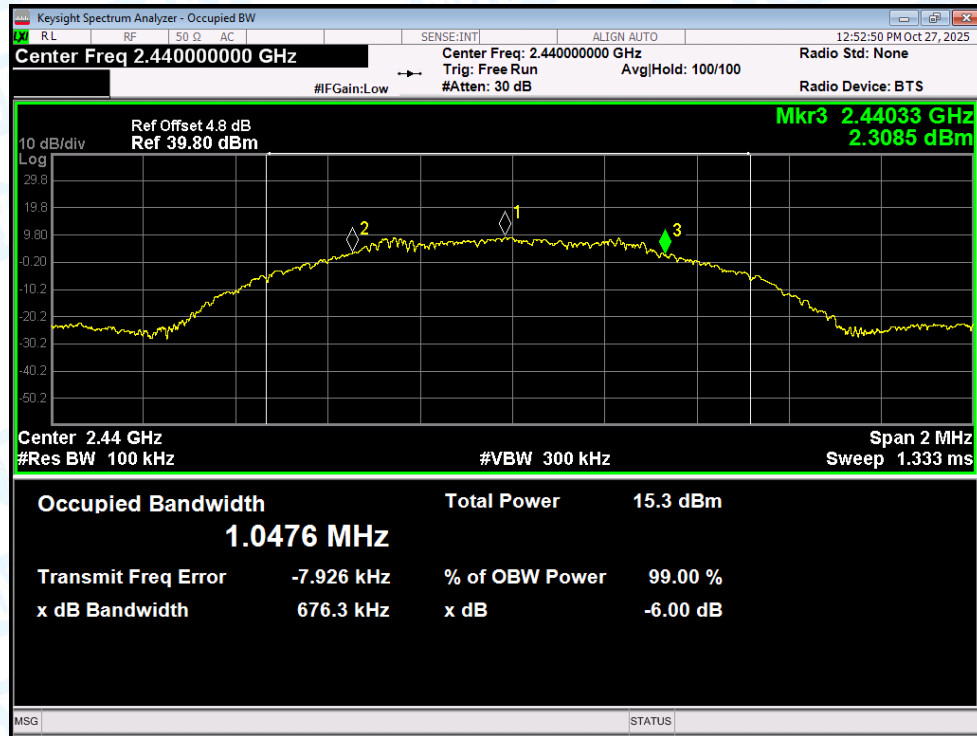
Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	BLE 1Mbps	2402	Ant1	0.68	0.5	Pass
NVNT	BLE 1Mbps	2440	Ant1	0.68	0.5	Pass
NVNT	BLE 1Mbps	2480	Ant1	0.68	0.5	Pass
NVNT	BLE 2Mbps	2402	Ant1	1.12	0.5	Pass
NVNT	BLE 2Mbps	2440	Ant1	1.09	0.5	Pass
NVNT	BLE 2Mbps	2480	Ant1	1.09	0.5	Pass

Test Graphs

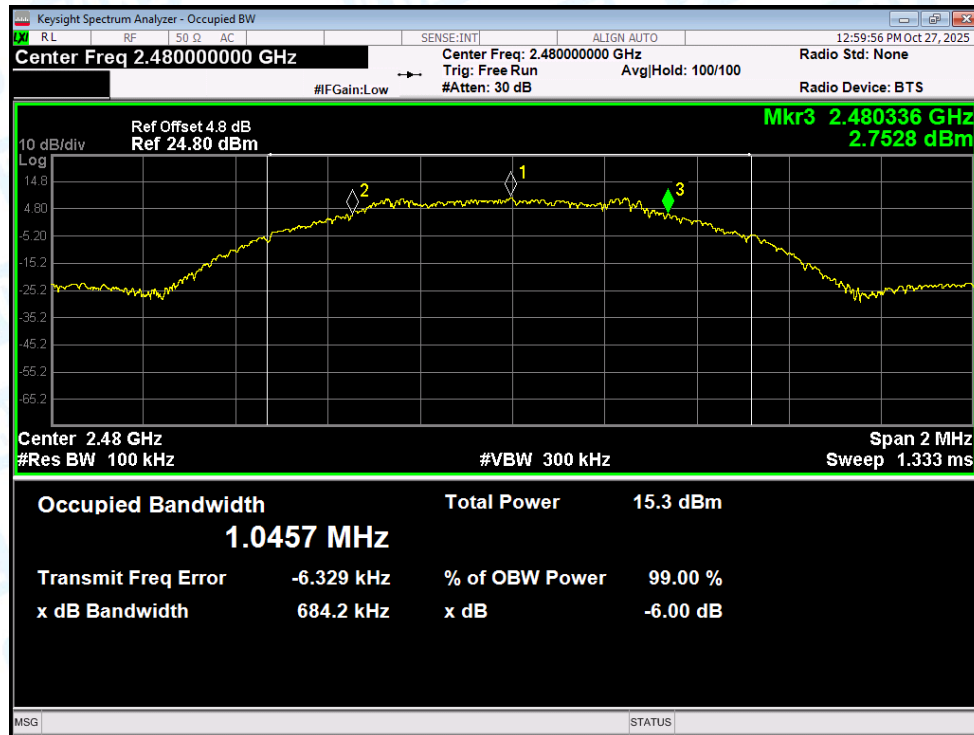
-6dB Bandwidth NVNT BLE 1Mbps 2402MHz Ant1



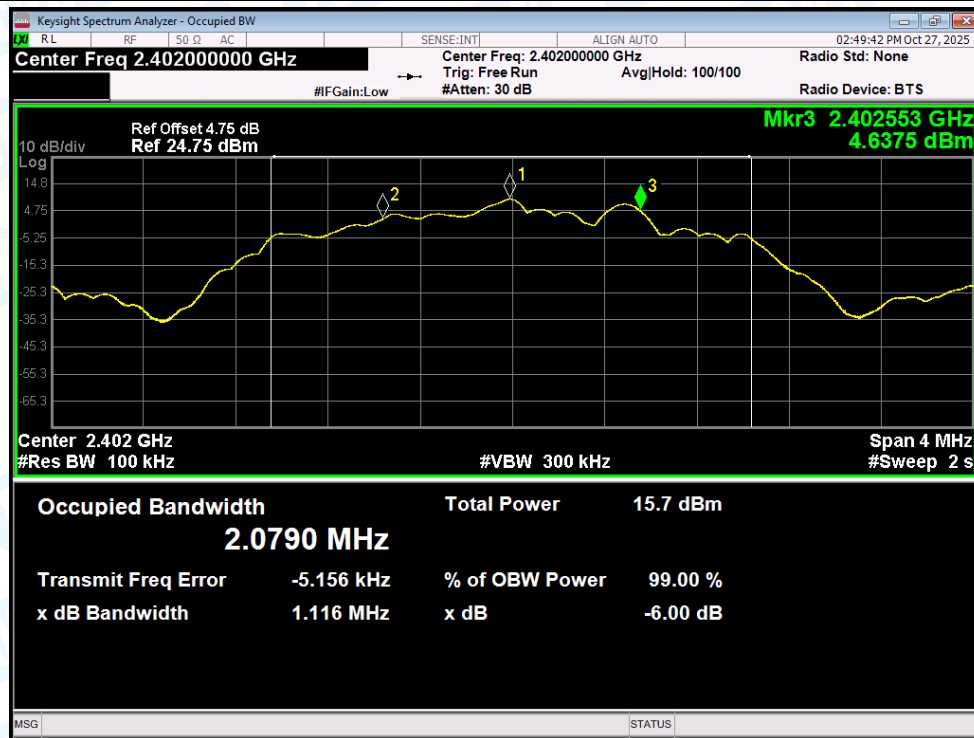
-6dB Bandwidth NVNT BLE 1Mbps 2440MHz Ant1

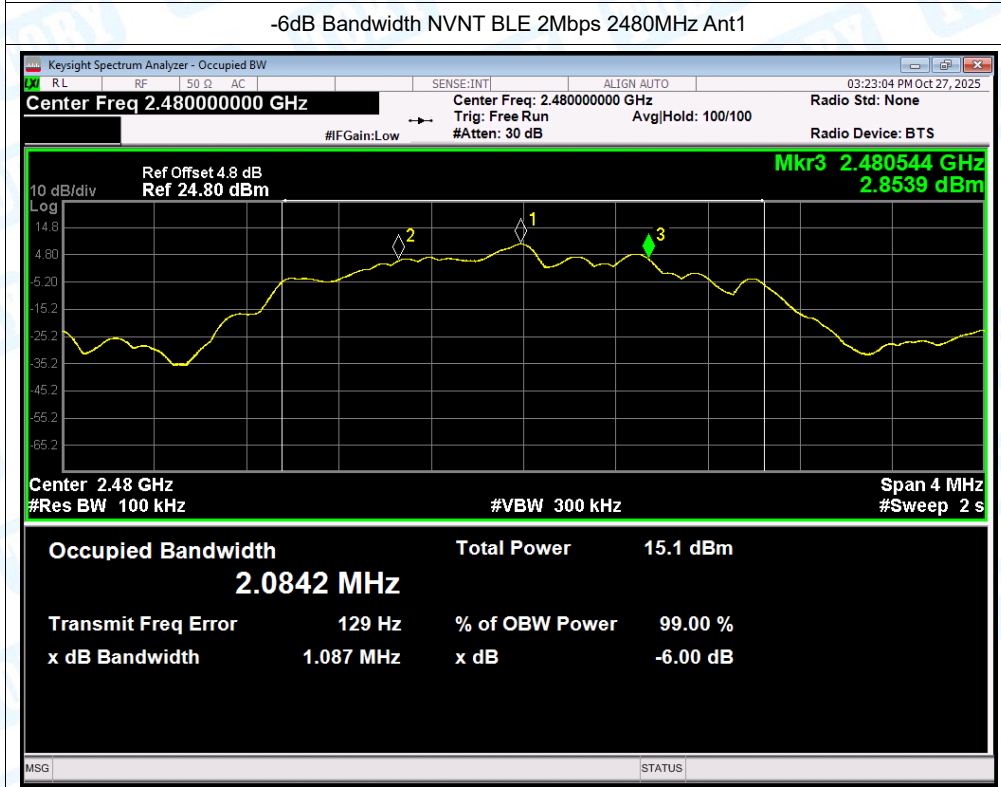
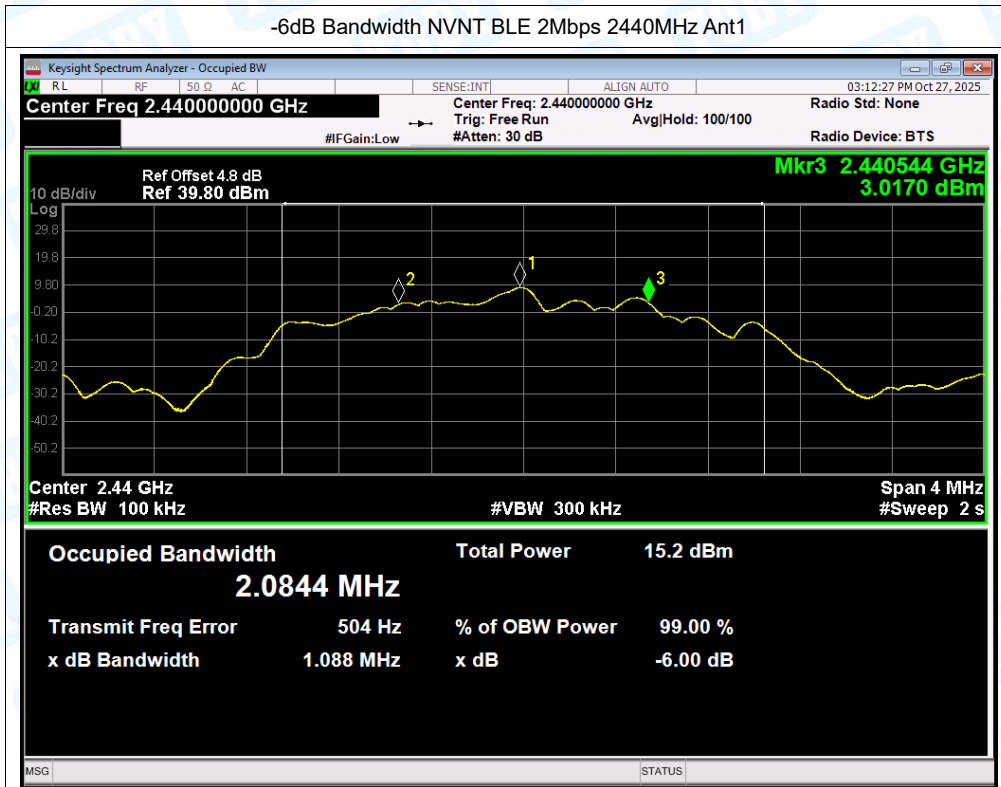


-6dB Bandwidth NVNT BLE 1Mbps 2480MHz Ant1



-6dB Bandwidth NVNT BLE 2Mbps 2402MHz Ant1



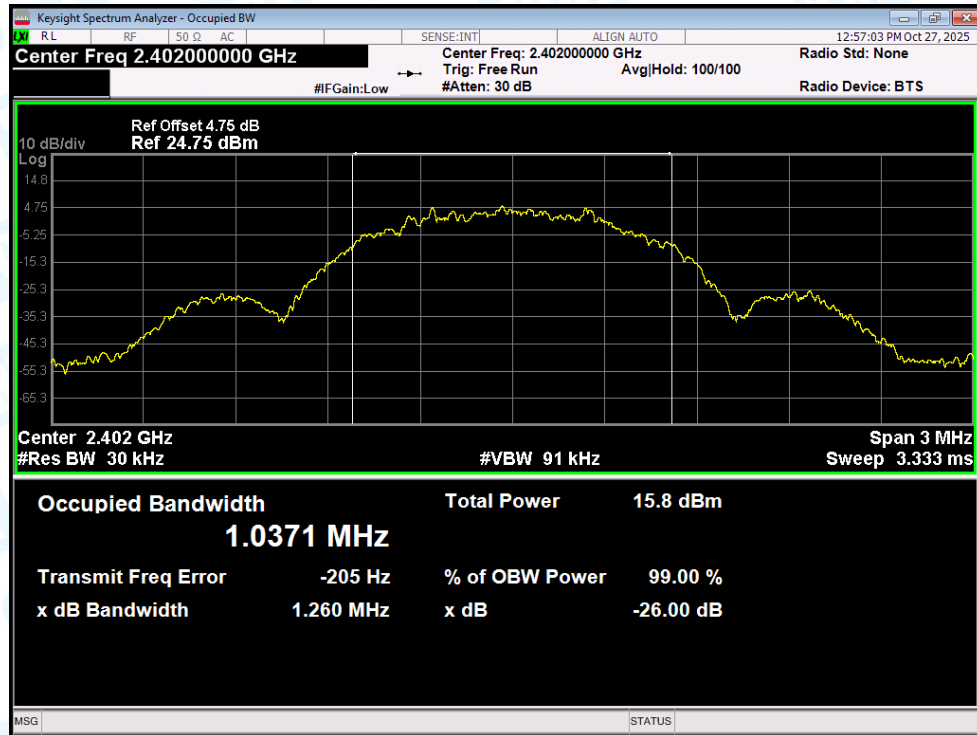


4. Occupied Channel Bandwidth

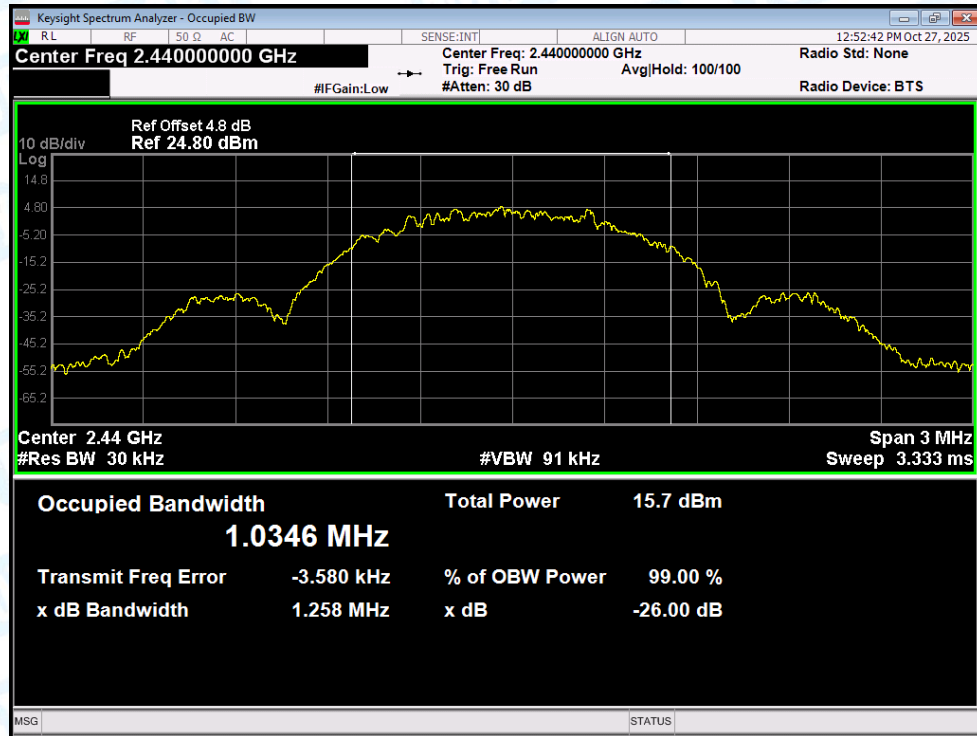
Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	BLE 1Mbps	2402	Ant1	1.037
NVNT	BLE 1Mbps	2440	Ant1	1.035
NVNT	BLE 1Mbps	2480	Ant1	1.039
NVNT	BLE 2Mbps	2402	Ant1	2.05
NVNT	BLE 2Mbps	2440	Ant1	2.041
NVNT	BLE 2Mbps	2480	Ant1	2.04

Test Graphs

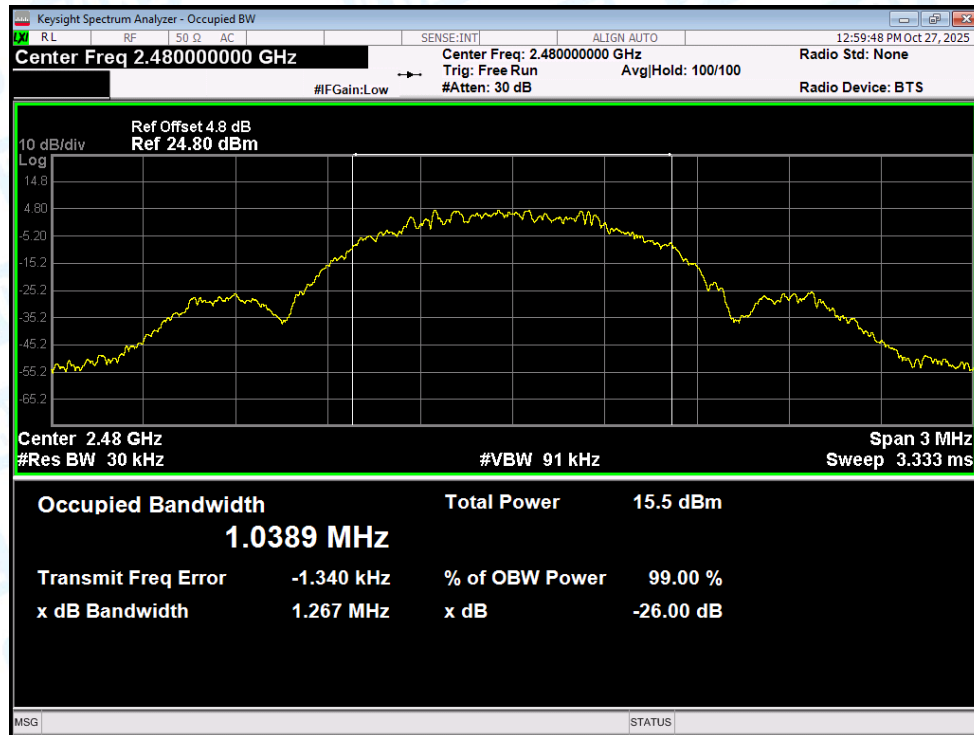
OBW NVNT BLE 1Mbps 2402MHz Ant1



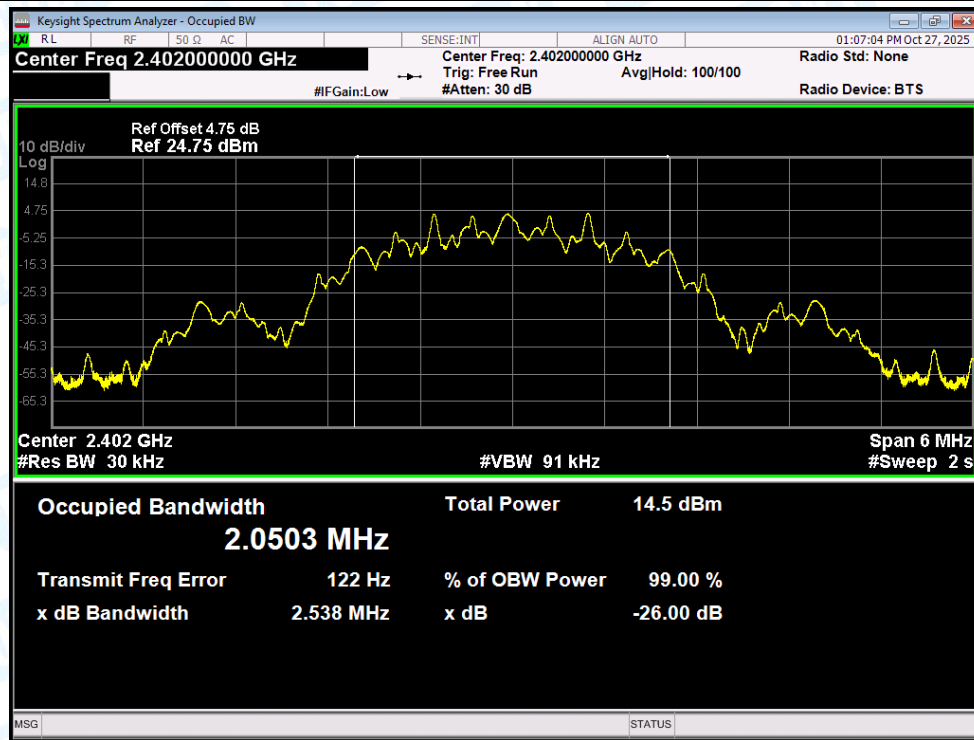
OBW NVNT BLE 1Mbps 2440MHz Ant1



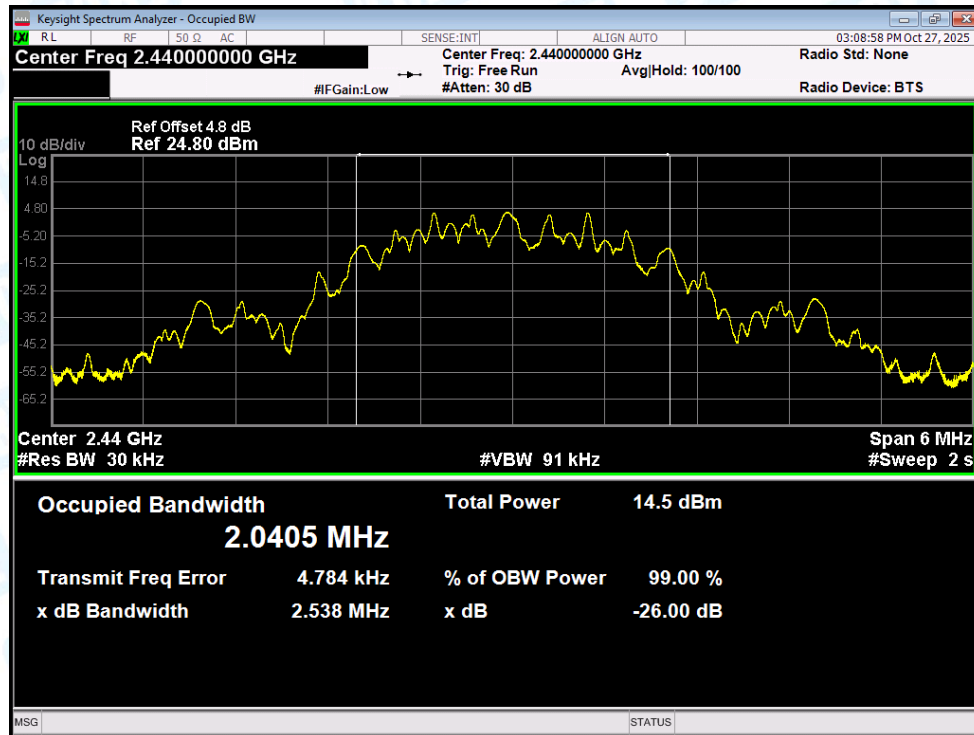
OBW NVNT BLE 1Mbps 2480MHz Ant1



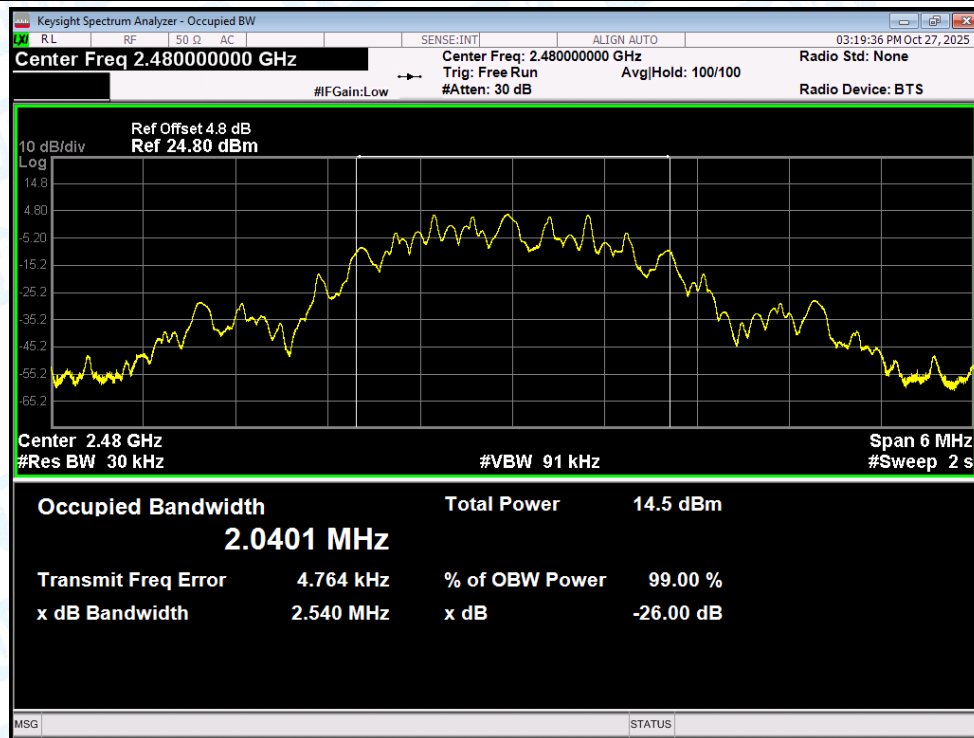
OBW NVNT BLE 2Mbps 2402MHz Ant1



OBW NVNT BLE 2Mbps 2440MHz Ant1



OBW NVNT BLE 2Mbps 2480MHz Ant1

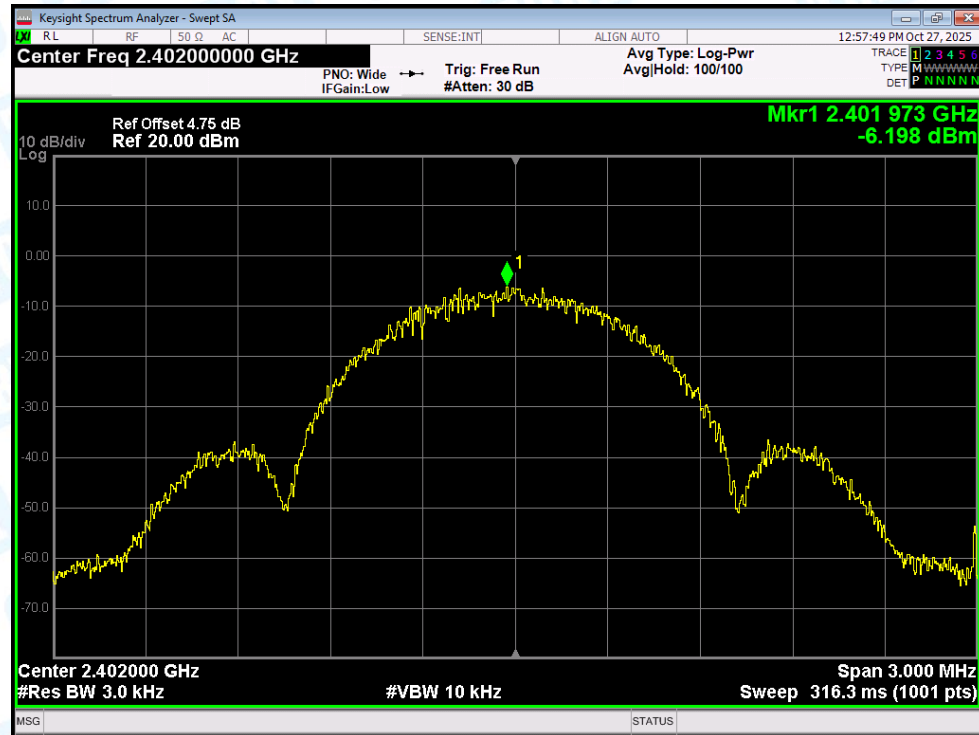


5. Maximum Power Spectral Density Level

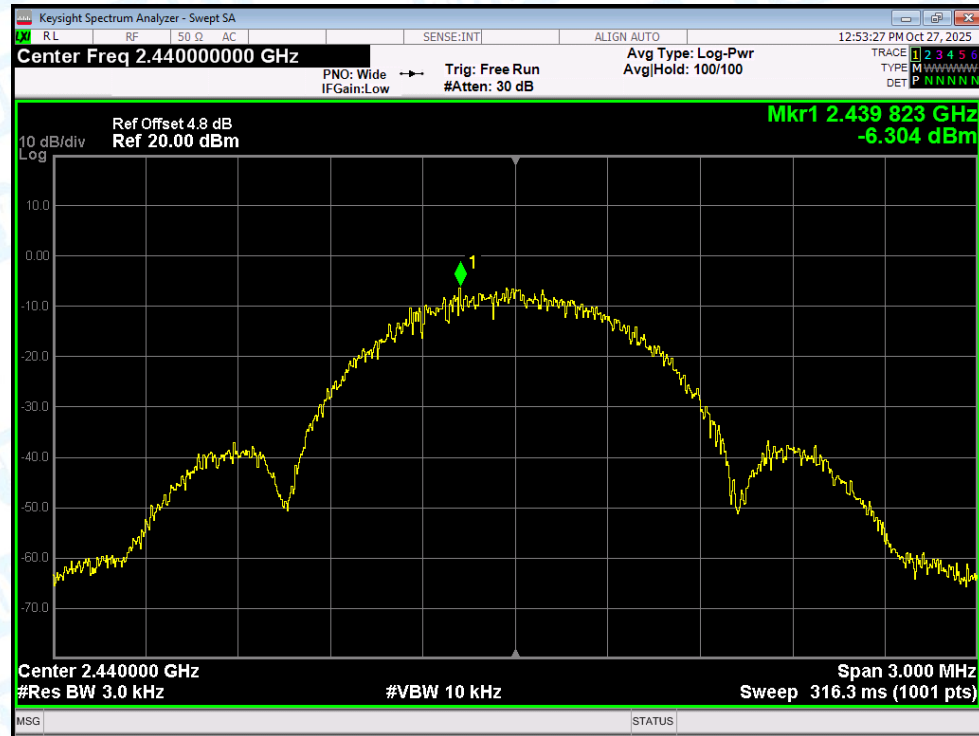
Condition	Mode	Frequency (MHz)	Antenna	Max PSD (dBm/3KHz)	Limit (dBm/3KHz)	Verdict
NVNT	BLE 1Mbps	2402	Ant1	-6.198	8	Pass
NVNT	BLE 1Mbps	2440	Ant1	-6.304	8	Pass
NVNT	BLE 1Mbps	2480	Ant1	-6.323	8	Pass
NVNT	BLE 2Mbps	2402	Ant1	-7.723	8	Pass
NVNT	BLE 2Mbps	2440	Ant1	-8.19	8	Pass
NVNT	BLE 2Mbps	2480	Ant1	-8.242	8	Pass

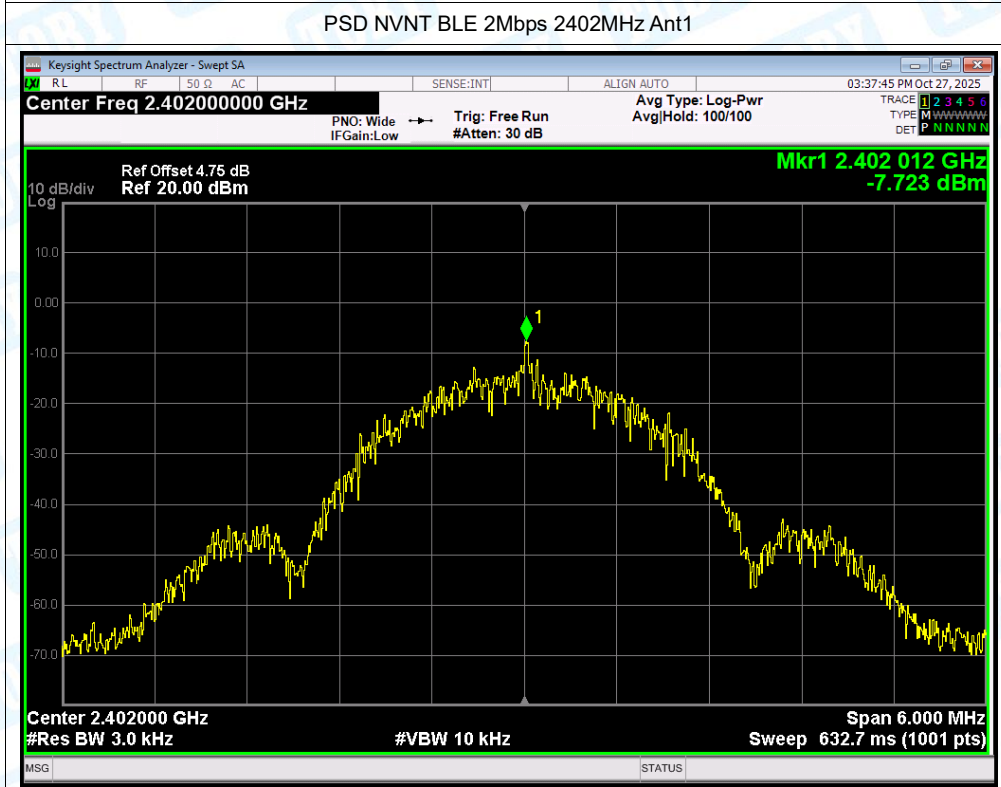
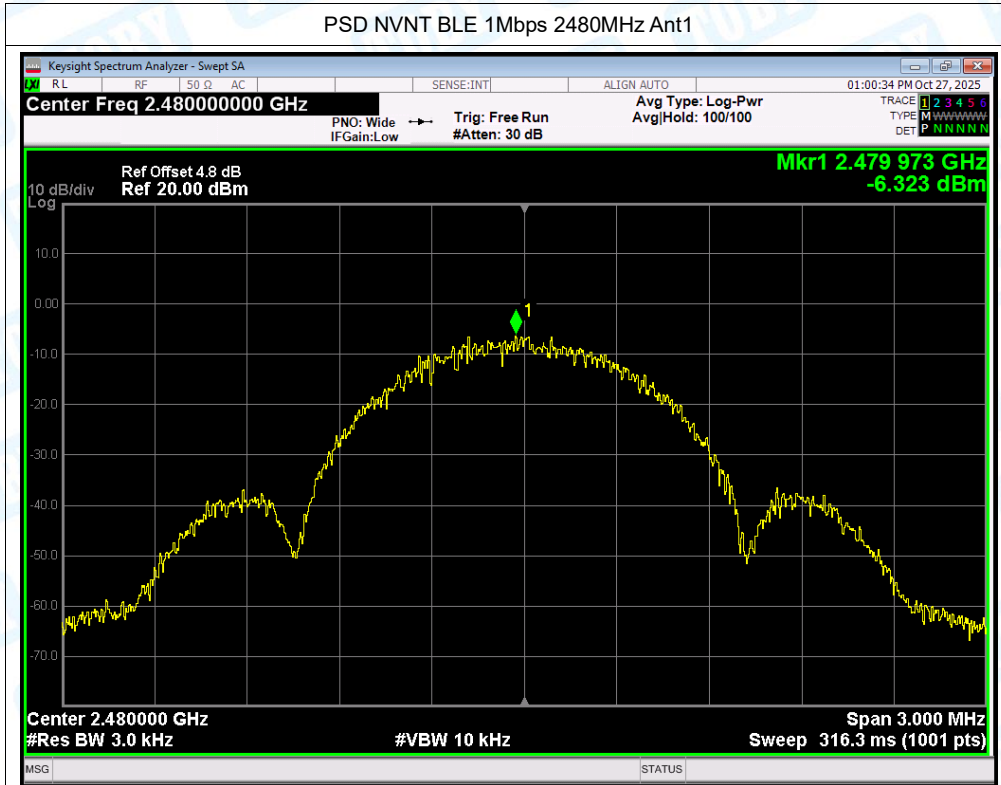
Test Graphs

PSD NVNT BLE 1Mbps 2402MHz Ant1

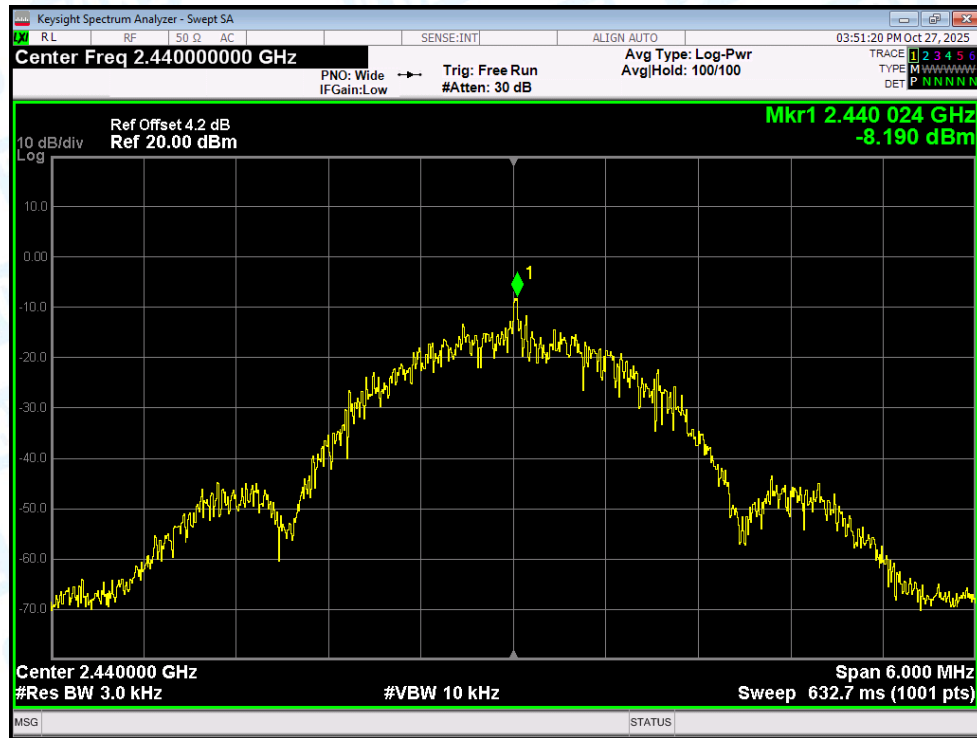


PSD NVNT BLE 1Mbps 2440MHz Ant1

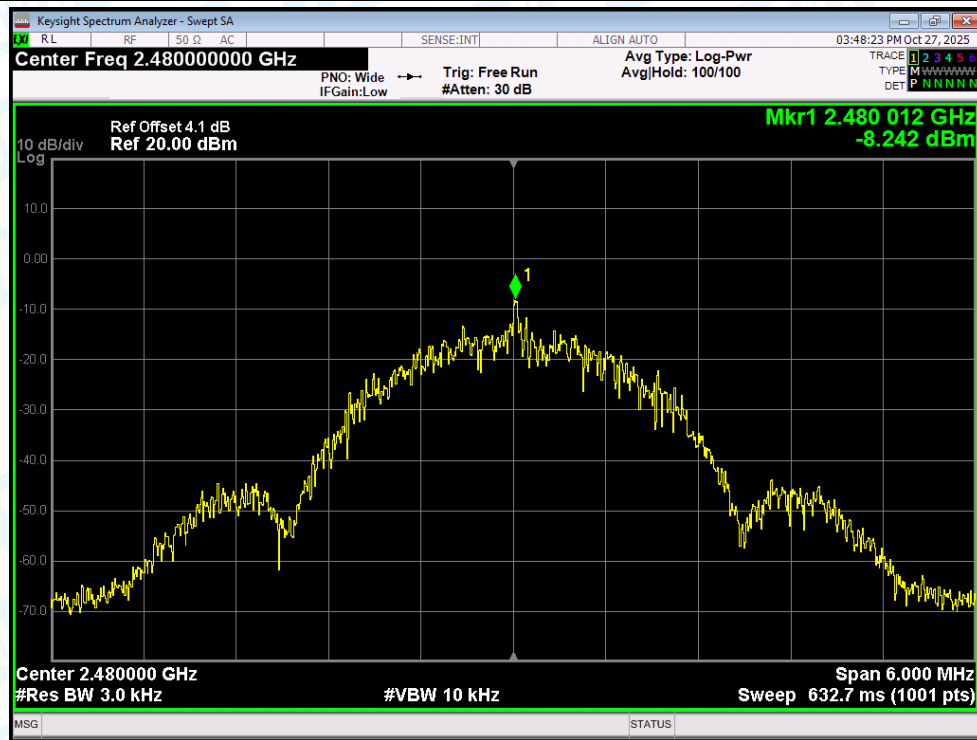




PSD NVNT BLE 2Mbps 2440MHz Ant1



PSD NVNT BLE 2Mbps 2480MHz Ant1

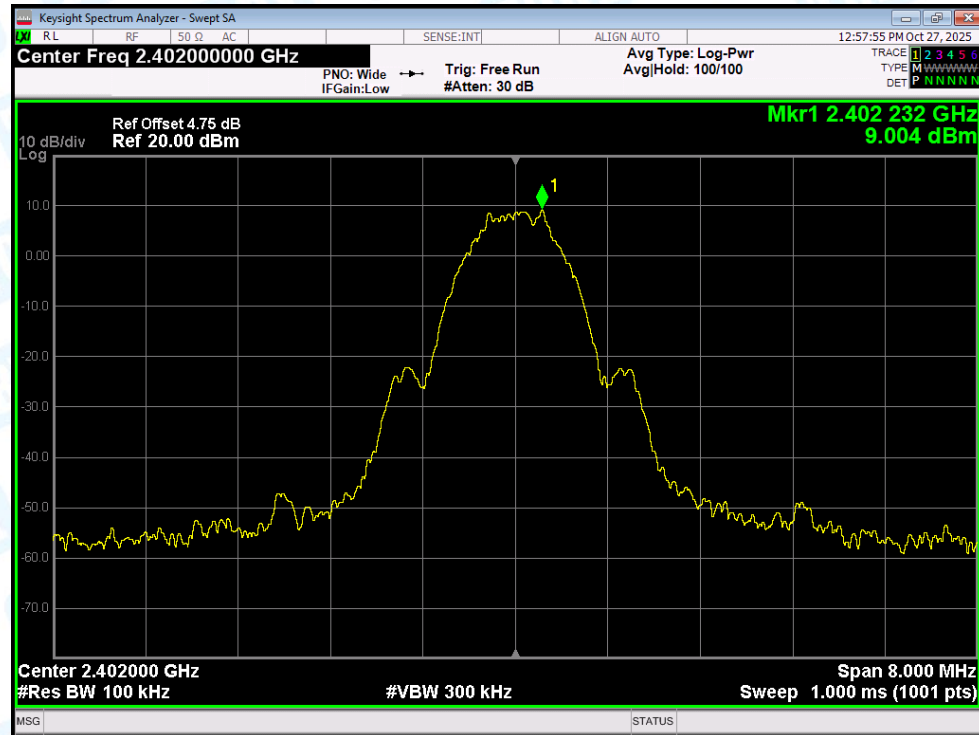


6. Band Edge

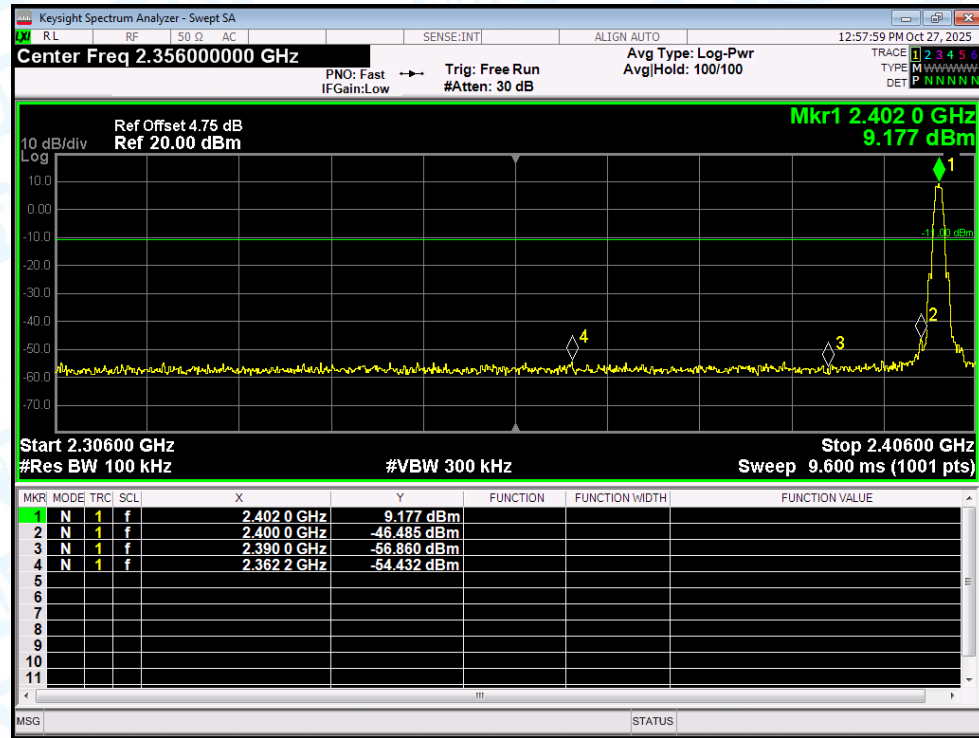
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1Mbps	2402	Ant1	-63.43	-20	Pass
NVNT	BLE 1Mbps	2480	Ant1	-59.87	-20	Pass
NVNT	BLE 2Mbps	2402	Ant1	-62.08	-20	Pass
NVNT	BLE 2Mbps	2480	Ant1	-61.09	-20	Pass

Test Graphs

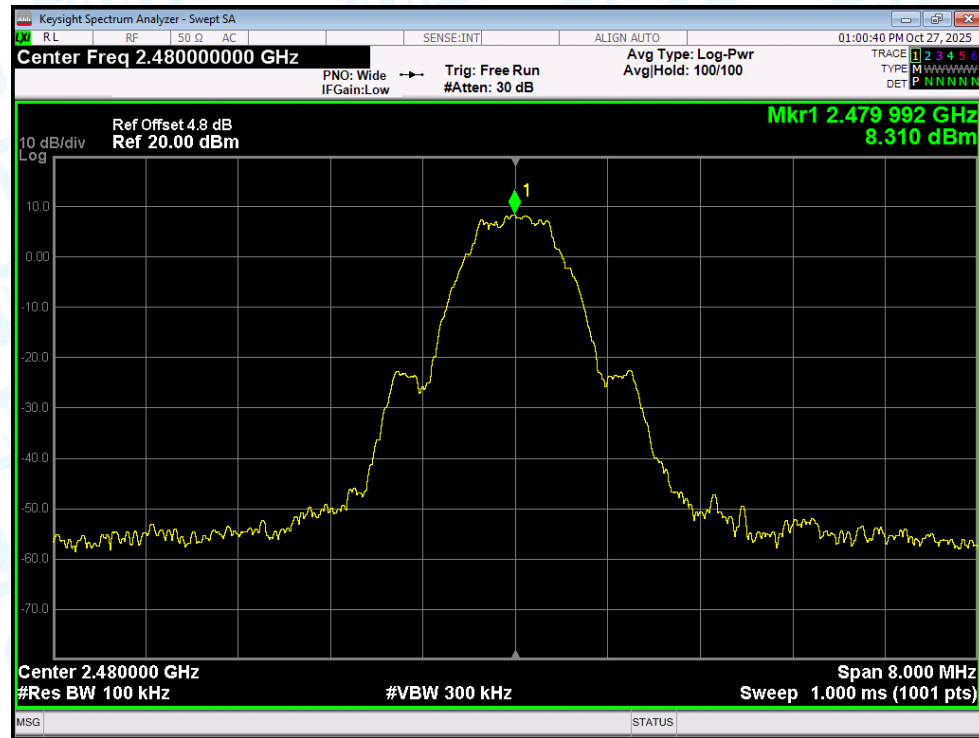
Band Edge NVNT BLE 1Mbps 2402MHz Ant1 Ref



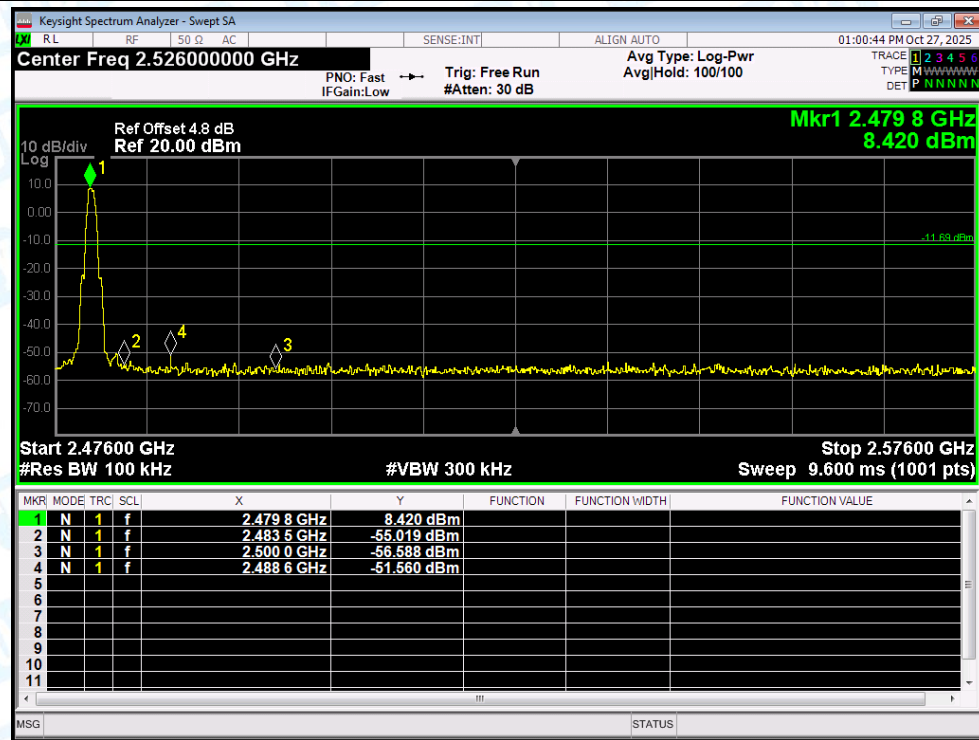
Band Edge NVNT BLE 1Mbps 2402MHz Ant1 Emission



Band Edge NVNT BLE 1Mbps 2480MHz Ant1 Ref



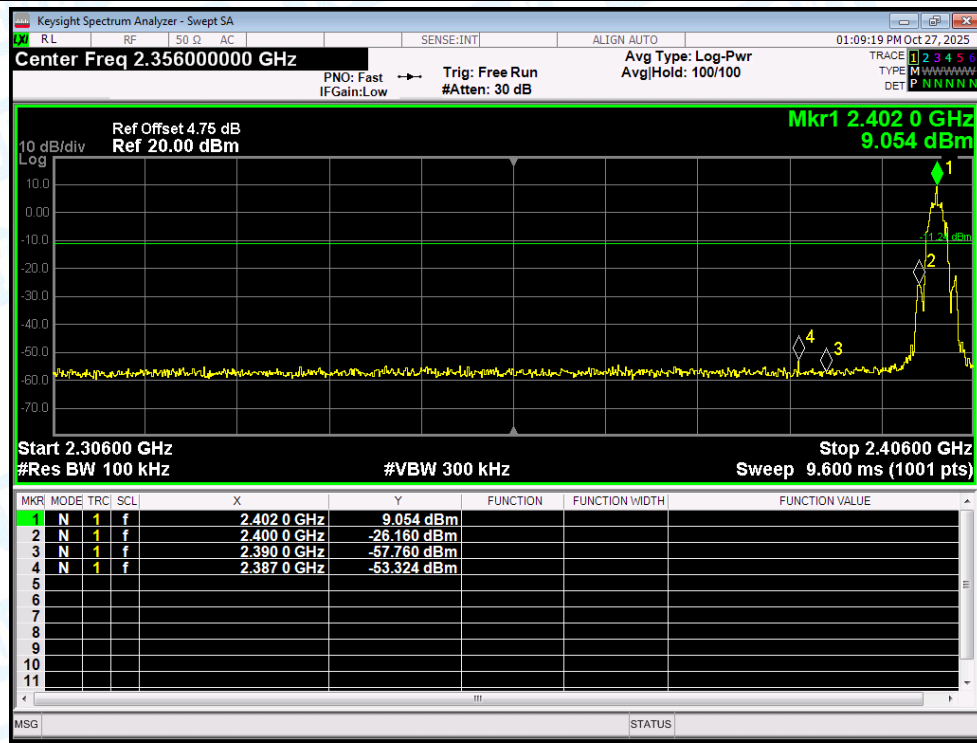
Band Edge NVNT BLE 1Mbps 2480MHz Ant1 Emission



Band Edge NVNT BLE 2Mbps 2402MHz Ant1 Ref



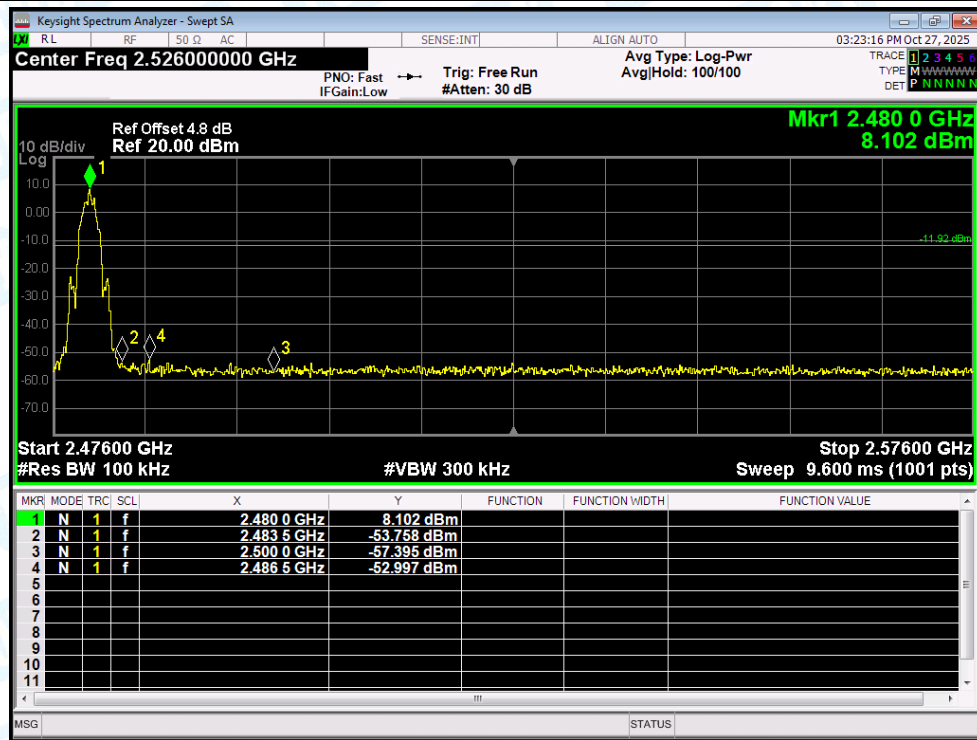
Band Edge NVNT BLE 2Mbps 2402MHz Ant1 Emission



Band Edge NVNT BLE 2Mbps 2480MHz Ant1 Ref



Band Edge NVNT BLE 2Mbps 2480MHz Ant1 Emission

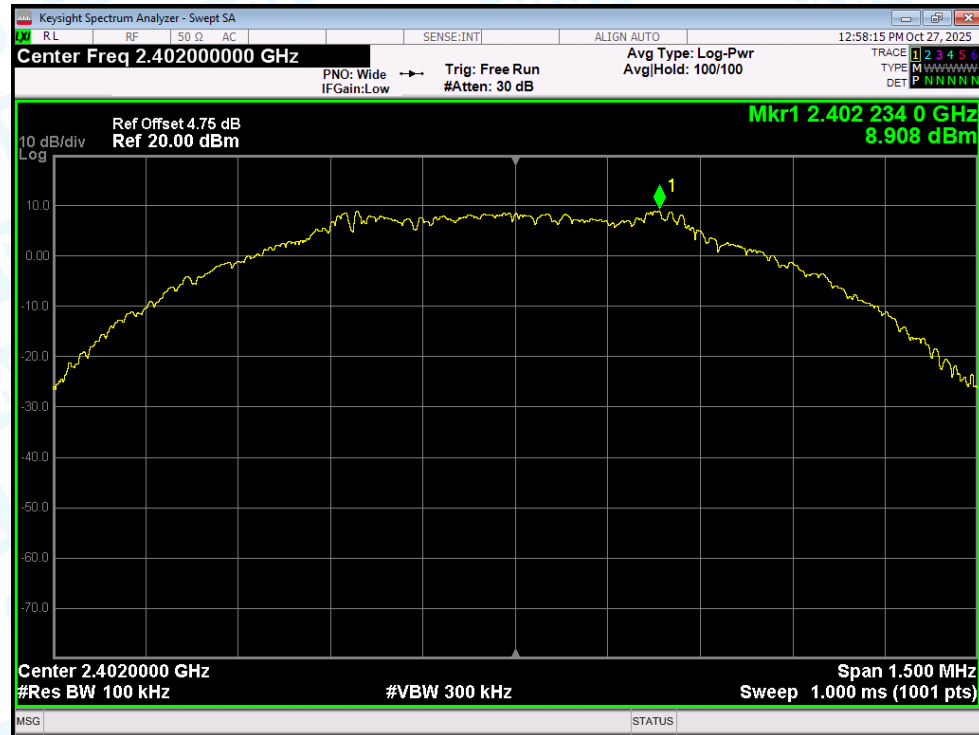


7. Conducted RF Spurious Emission

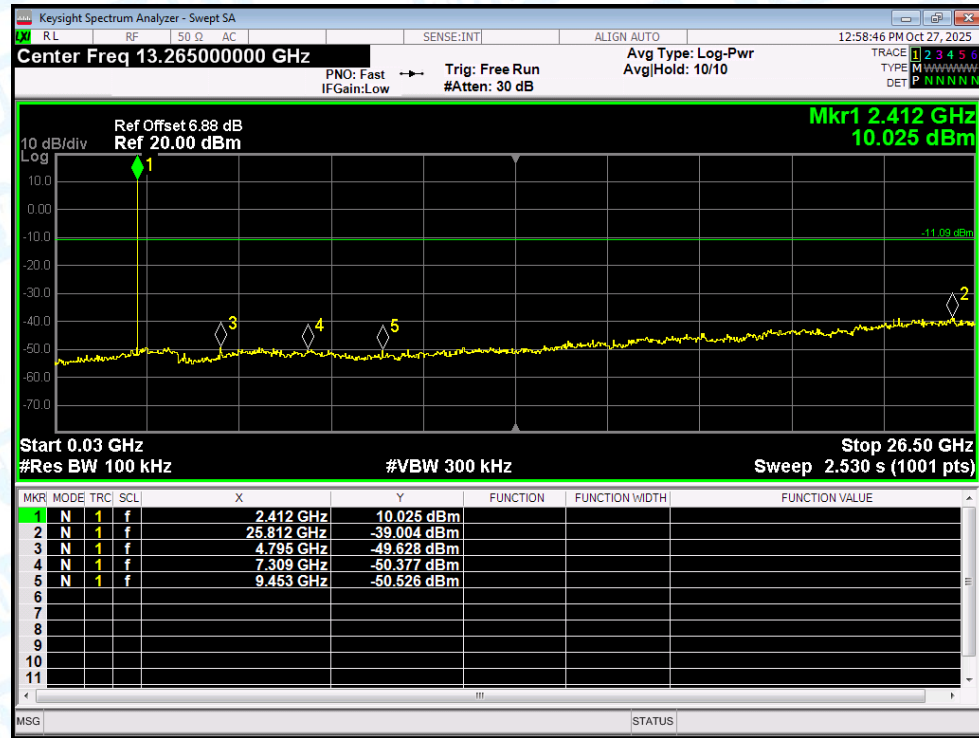
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1Mbps	2402	Ant1	-47.91	-20	Pass
NVNT	BLE 1Mbps	2440	Ant1	-42.39	-20	Pass
NVNT	BLE 1Mbps	2480	Ant1	-47.49	-20	Pass
NVNT	BLE 2Mbps	2402	Ant1	-47.21	-20	Pass
NVNT	BLE 2Mbps	2440	Ant1	-47.64	-20	Pass
NVNT	BLE 2Mbps	2480	Ant1	-48.25	-20	Pass

Test Graphs

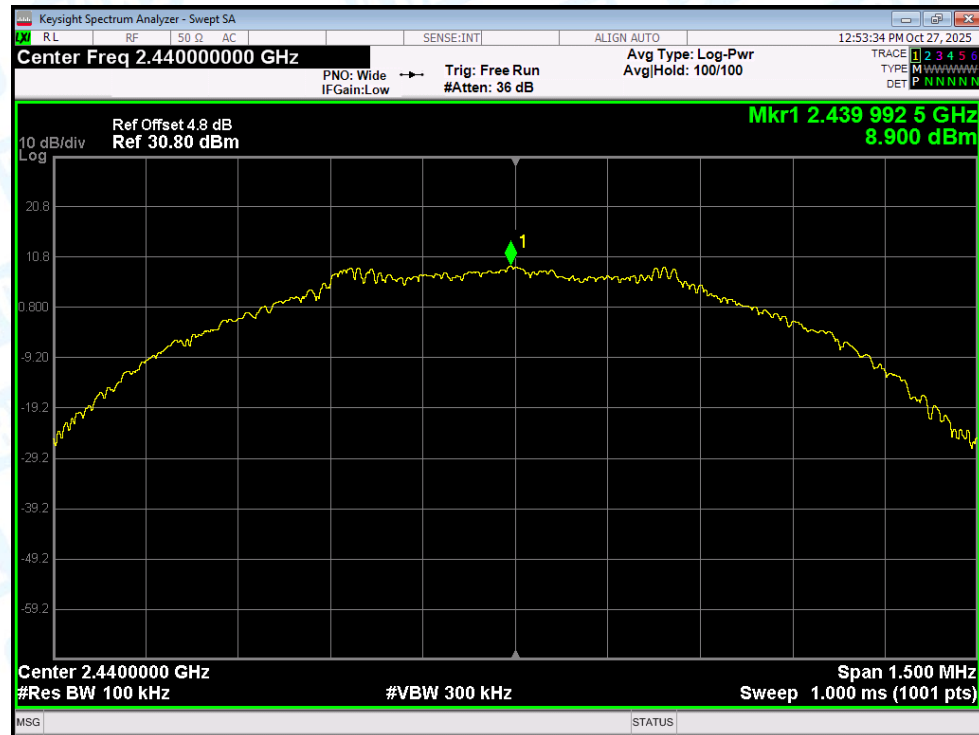
Tx. Spurious NVNT BLE 1Mbps 2402MHz Ant1 Ref



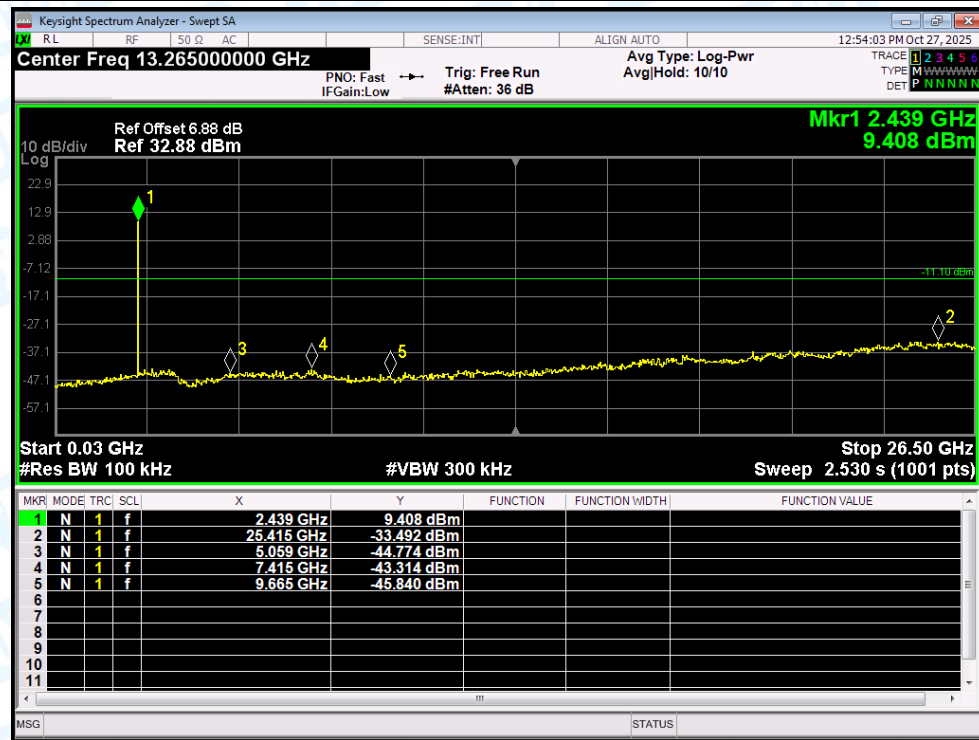
Tx. Spurious NVNT BLE 1Mbps 2402MHz Ant1 Emission



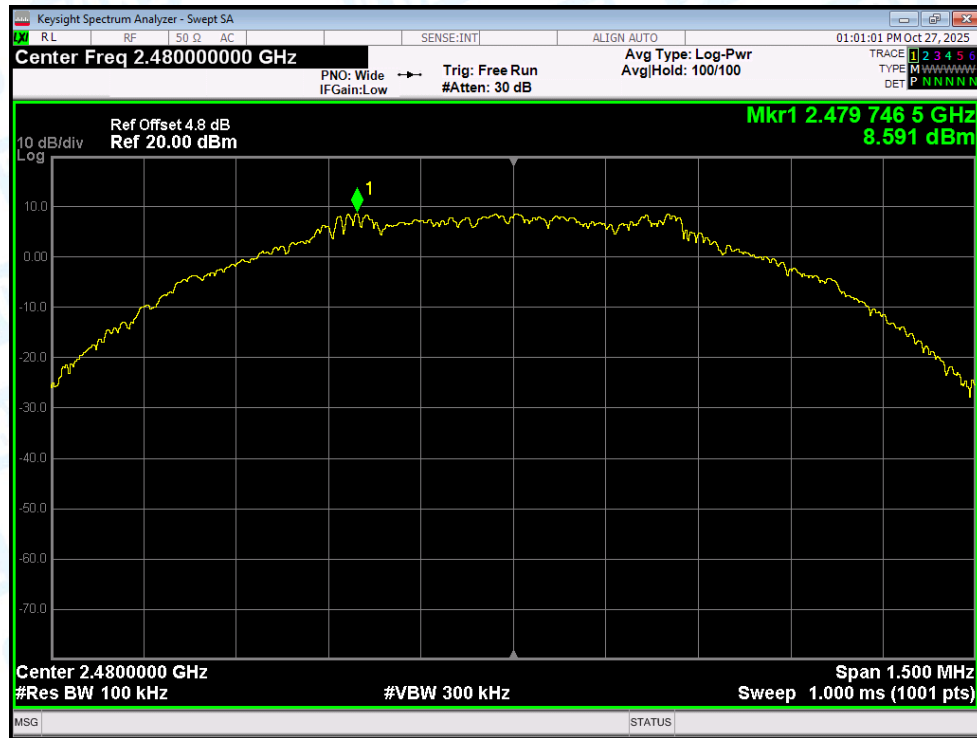
Tx. Spurious NVNT BLE 1Mbps 2440MHz Ant1 Ref



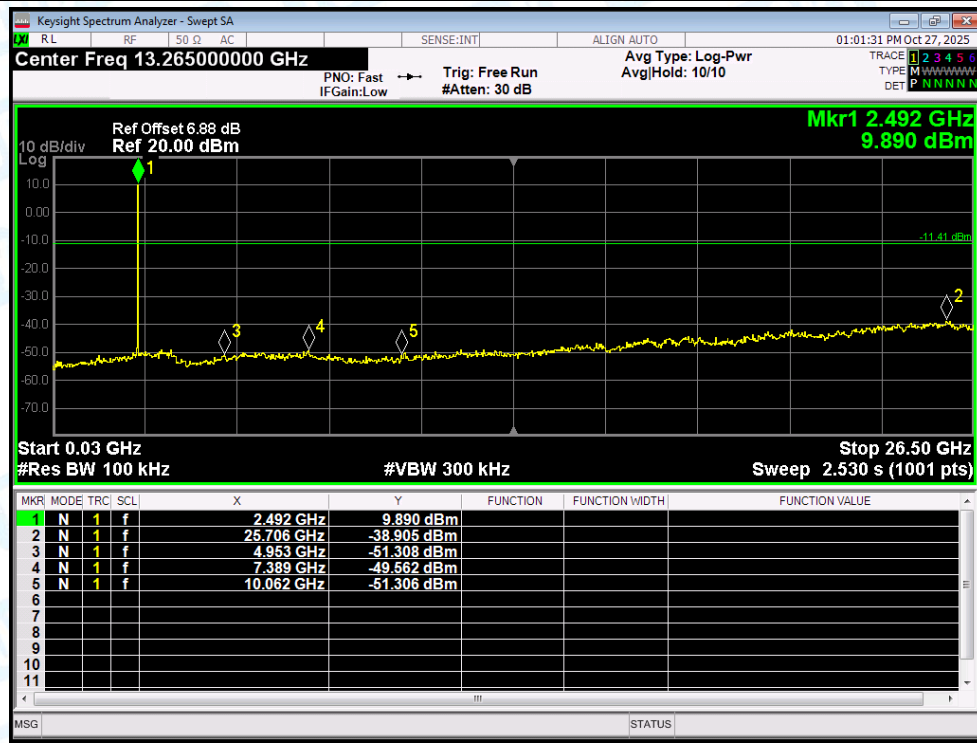
Tx. Spurious NVNT BLE 1Mbps 2440MHz Ant1 Emission



Tx. Spurious NVNT BLE 1Mbps 2480MHz Ant1 Ref



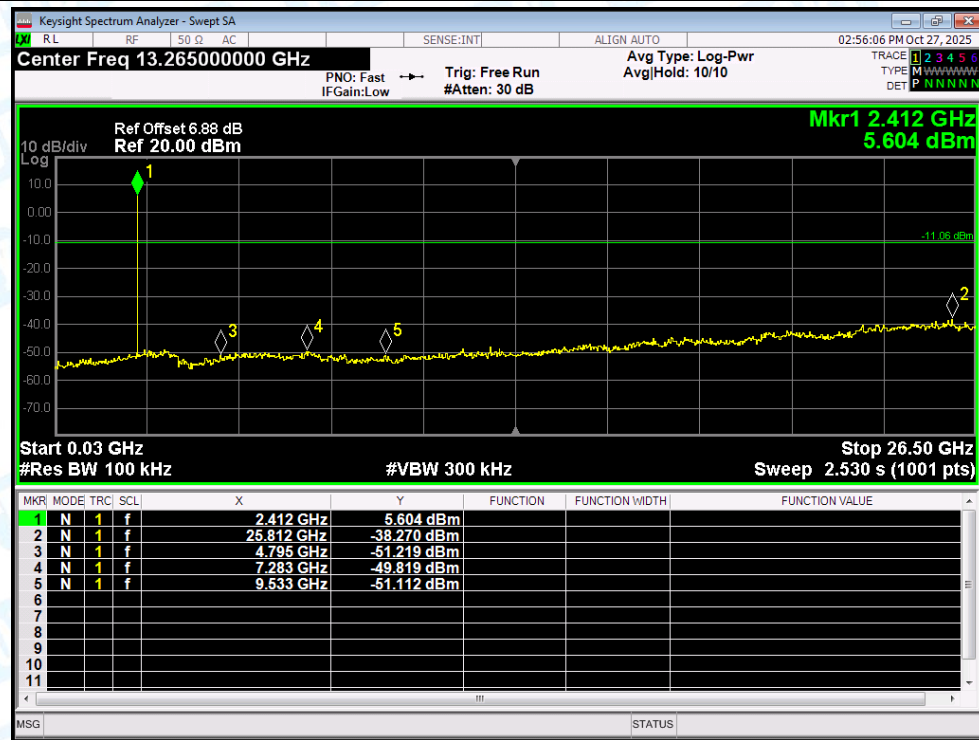
Tx. Spurious NVNT BLE 1Mbps 2480MHz Ant1 Emission



Tx. Spurious NVNT BLE 2Mbps 2402MHz Ant1 Ref



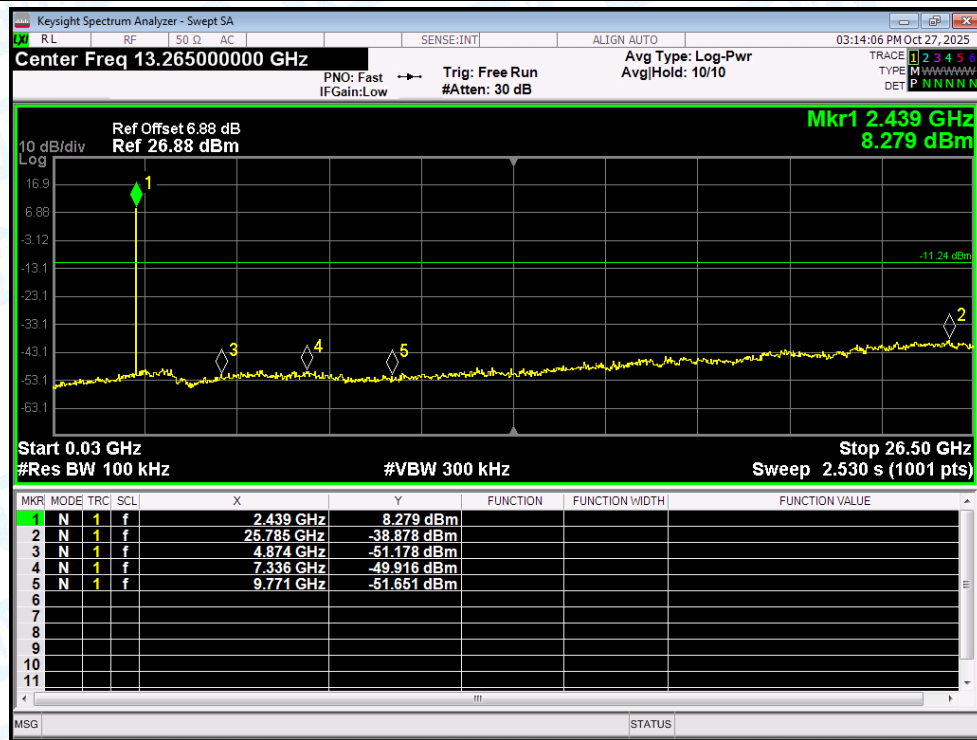
Tx. Spurious NVNT BLE 2Mbps 2402MHz Ant1 Emission



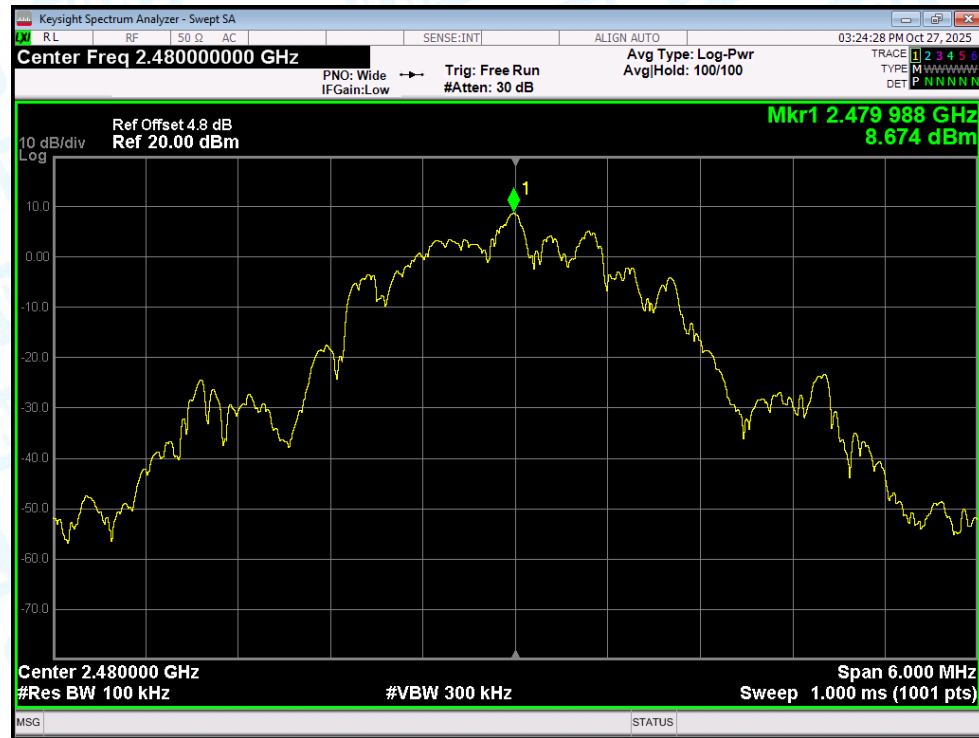
Tx. Spurious NVNT BLE 2Mbps 2440MHz Ant1 Ref



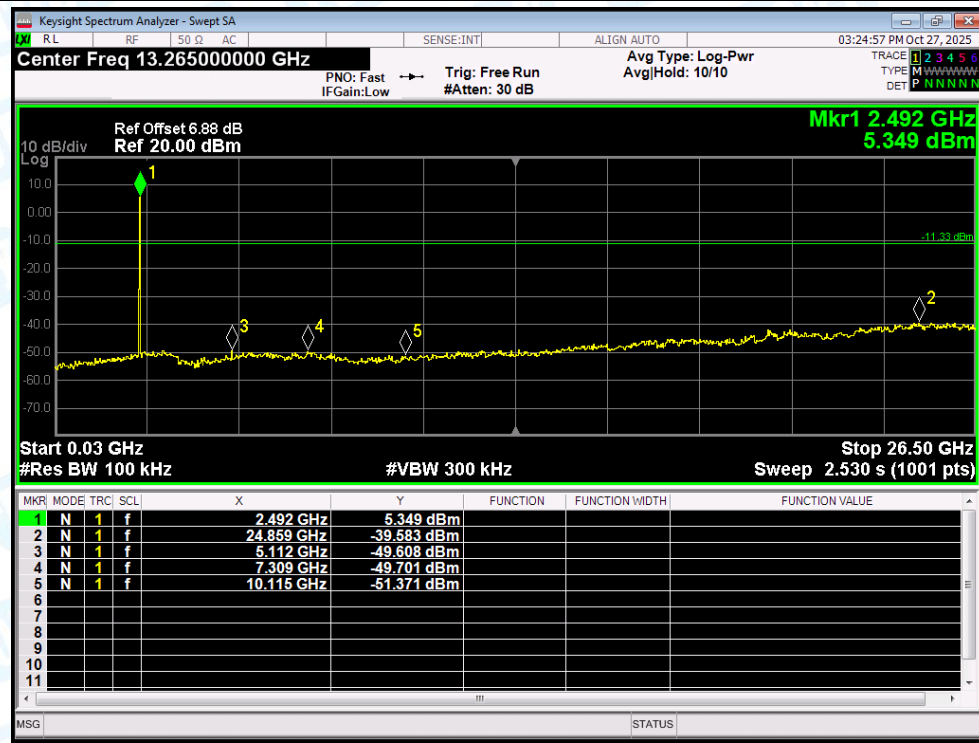
Tx. Spurious NVNT BLE 2Mbps 2440MHz Ant1 Emission



Tx. Spurious NVNT BLE 2Mbps 2480MHz Ant1 Ref



Tx. Spurious NVNT BLE 2Mbps 2480MHz Ant1 Emission

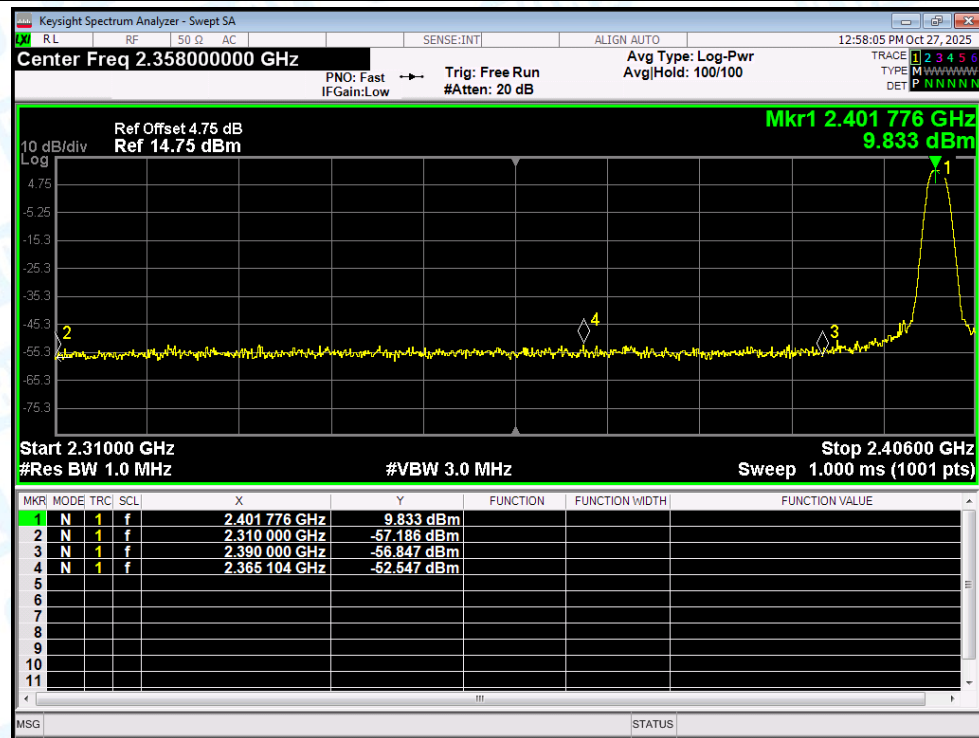


8. Restrict Band

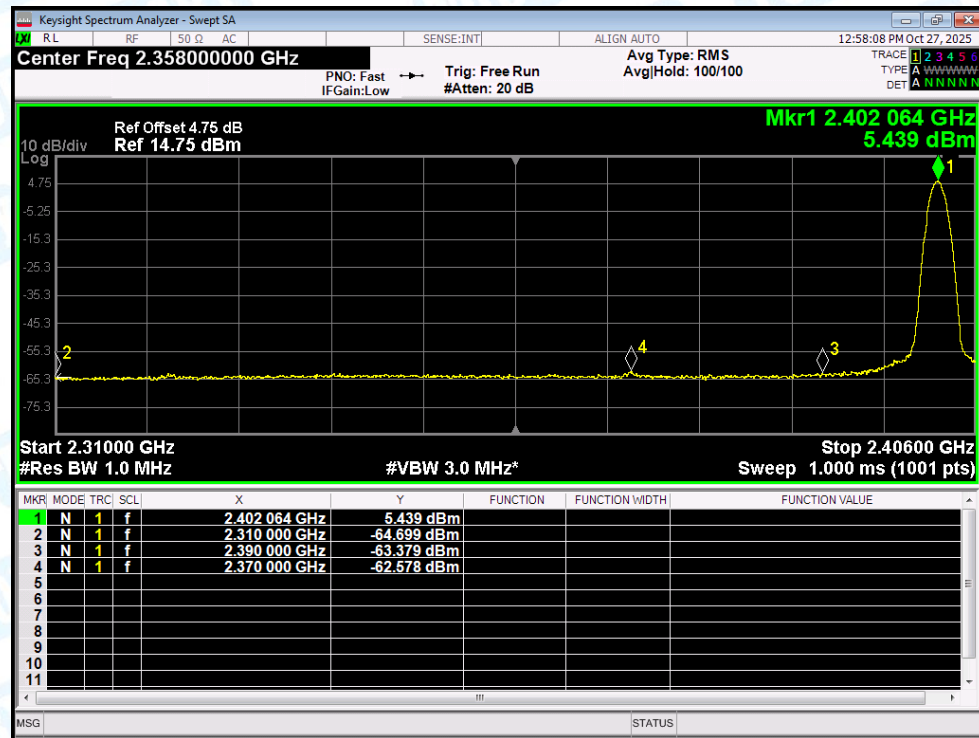
Condition	Mode	Frequency (MHz)	Antenna	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	Duty Factor (dB)	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
NVNT	BLE 1Mbps	2402	Ant1	2310	-57.19	3.56	-	41.63	Peak	74	Pass
NVNT	BLE 1Mbps	2402	Ant1	2310	-64.7	3.56	3.25	37.37	Average	54	Pass
NVNT	BLE 1Mbps	2402	Ant1	2365.104	-52.55	3.56	-	46.27	Peak	74	Pass
NVNT	BLE 1Mbps	2402	Ant1	2370	-62.58	3.56	3.25	39.49	Average	54	Pass
NVNT	BLE 1Mbps	2402	Ant1	2390	-56.85	3.56	-	41.97	Peak	74	Pass
NVNT	BLE 1Mbps	2402	Ant1	2390	-63.38	3.56	3.25	38.69	Average	54	Pass
NVNT	BLE 1Mbps	2480	Ant1	2483.5	-48.8	3.56	-	50.02	Peak	74	Pass
NVNT	BLE 1Mbps	2480	Ant1	2483.5	-57.73	3.56	3.25	44.34	Average	54	Pass
NVNT	BLE 1Mbps	2480	Ant1	2483.56	-44.92	3.56	-	53.9	Peak	74	Pass
NVNT	BLE 1Mbps	2480	Ant1	2483.848	-57.23	3.56	3.25	44.84	Average	54	Pass
NVNT	BLE 1Mbps	2480	Ant1	2500	-56.74	3.56	-	42.08	Peak	74	Pass
NVNT	BLE 1Mbps	2480	Ant1	2500	-64.32	3.56	3.25	37.75	Average	54	Pass
NVNT	BLE 2Mbps	2402	Ant1	2310	-49.21	3.56	-	49.61	Peak	74	Pass
NVNT	BLE 2Mbps	2402	Ant1	2310	-60.04	3.56	3.14	41.92	Average	54	Pass
NVNT	BLE 2Mbps	2402	Ant1	2349.168	-47.74	3.56	-	51.08	Peak	74	Pass
NVNT	BLE 2Mbps	2402	Ant1	2383.92	-58.66	3.56	3.14	43.3	Average	54	Pass
NVNT	BLE 2Mbps	2402	Ant1	2390	-51.79	3.56	-	47.03	Peak	74	Pass
NVNT	BLE 2Mbps	2402	Ant1	2390	-59.15	3.56	3.14	42.81	Average	54	Pass
NVNT	BLE 2Mbps	2480	Ant1	2483.5	-43.43	3.56	-	55.39	Peak	74	Pass
NVNT	BLE 2Mbps	2480	Ant1	2483.5	-53.61	3.56	3.14	48.35	Average	54	Pass
NVNT	BLE 2Mbps	2480	Ant1	2483.68	-43.11	3.56	-	55.71	Peak	74	Pass
NVNT	BLE 2Mbps	2480	Ant1	2483.512	-53.61	3.56	3.14	48.35	Average	54	Pass
NVNT	BLE 2Mbps	2480	Ant1	2500	-50.52	3.56	-	48.3	Peak	74	Pass
NVNT	BLE 2Mbps	2480	Ant1	2500	-58.85	3.56	3.14	43.11	Average	54	Pass

Test Graphs

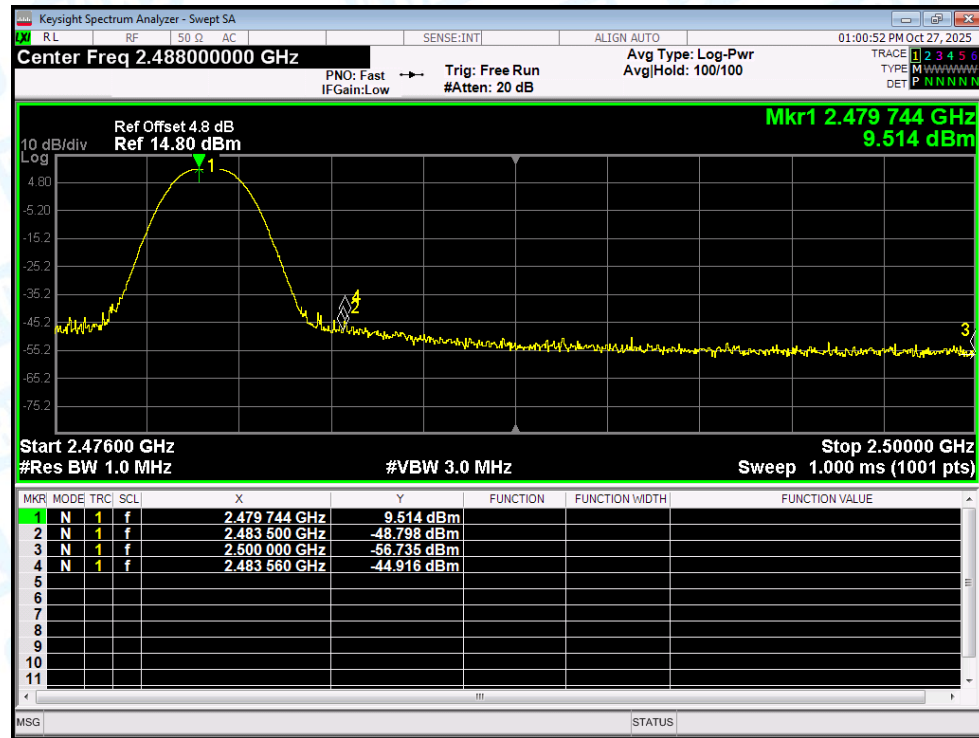
Restrict Band NVNT BLE 1Mbps 2402MHz Ant1 Peak



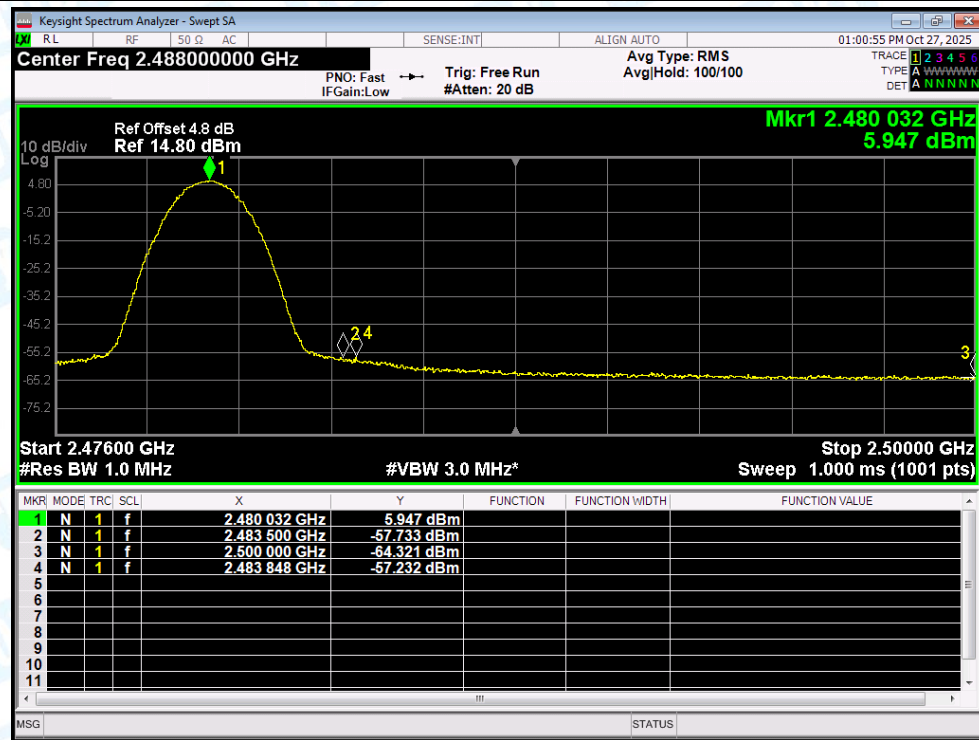
Restrict Band NVNT BLE 1Mbps 2402MHz Ant1 Average



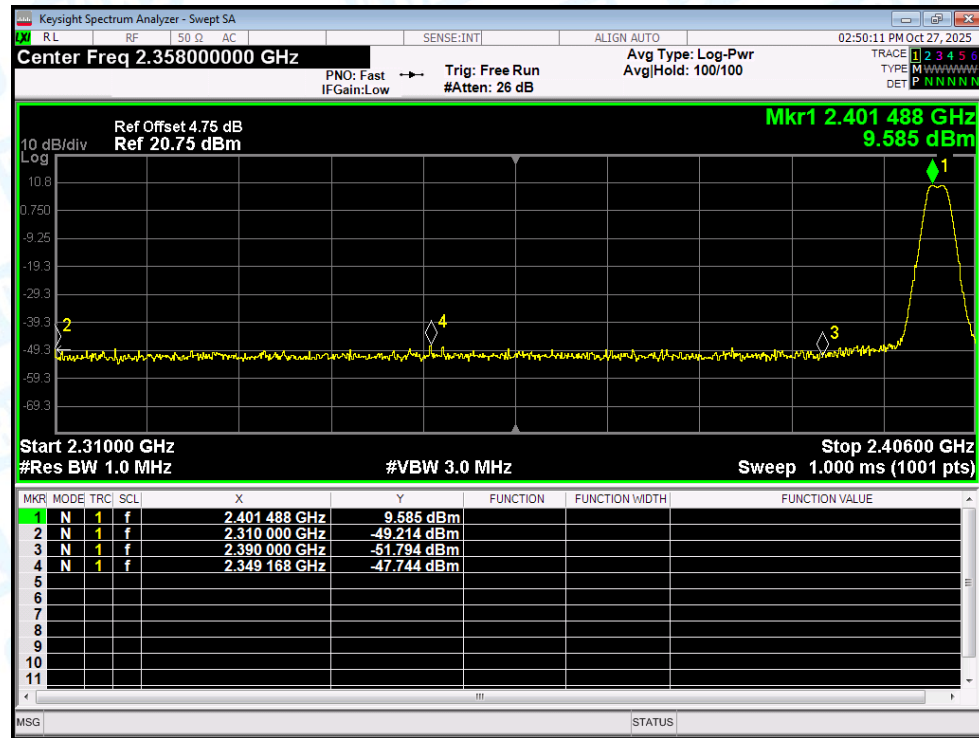
Restrict Band NVNT BLE 1Mbps 2480MHz Ant1 Peak



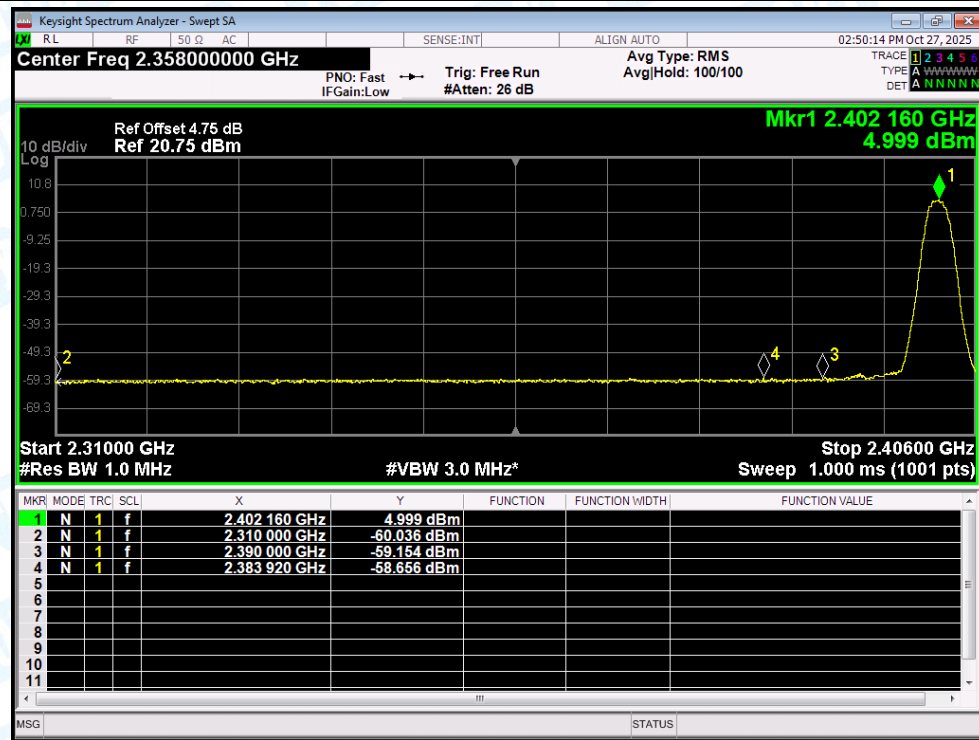
Restrict Band NVNT BLE 1Mbps 2480MHz Ant1 Average



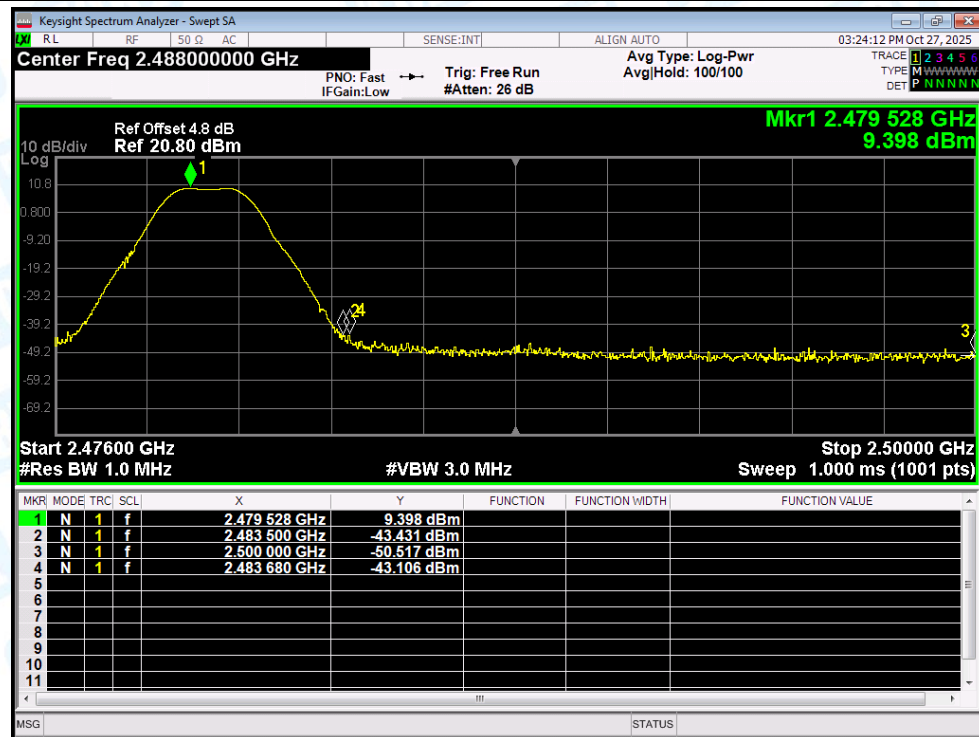
Restrict Band NVNT BLE 2Mbps 2402MHz Ant1 Peak



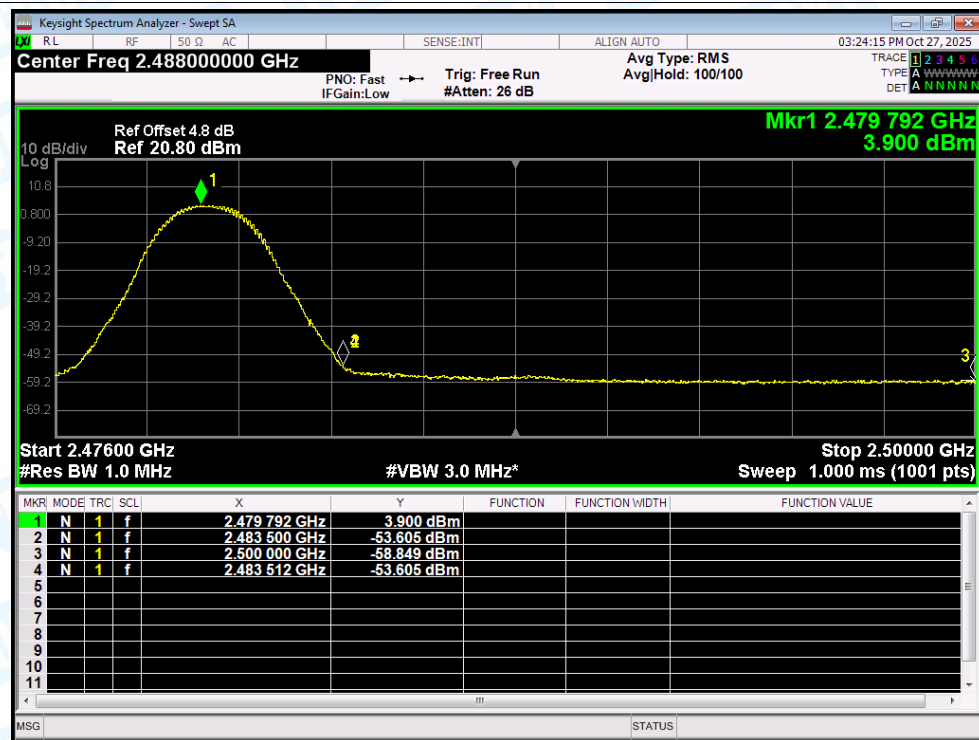
Restrict Band NVNT BLE 2Mbps 2402MHz Ant1 Average



Restrict Band NVNT BLE 2Mbps 2480MHz Ant1 Peak



Restrict Band NVNT BLE 2Mbps 2480MHz Ant1 Average



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