

RF Test Data for Bluetooth LE (Conducted Measurements)

General Description of EUT	
Product Name:	SMART LOCK
Test Model:	K8
Sample ID:	HC-C-202312-0210-01-02#
Environmental Conditions	
Temperature:	25°C
Relative Humidity:	55%
Test Voltage:	DC 3.8V
Test Engineer:	Zhouzhen
Note: For a more detailed features description, please refer to the report TBR-C-202312-0210-2 The report only show the worst case data.	

Contents

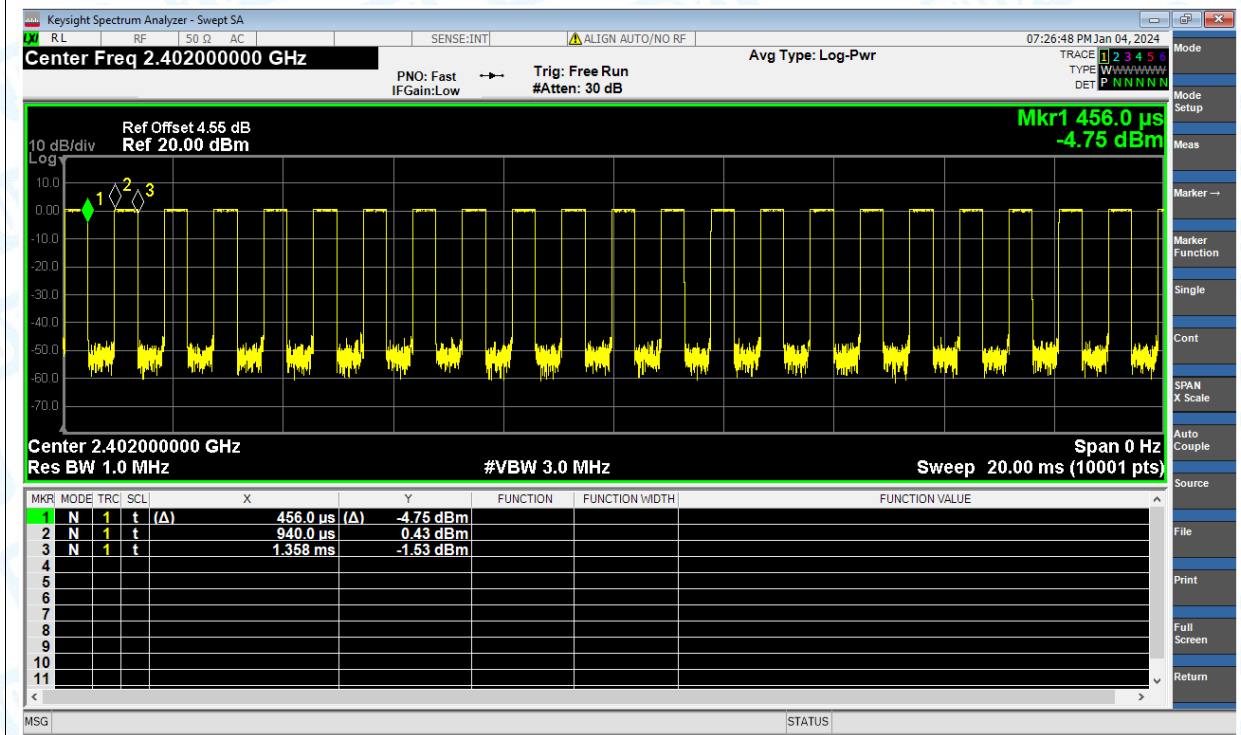
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1. Duty Cycle

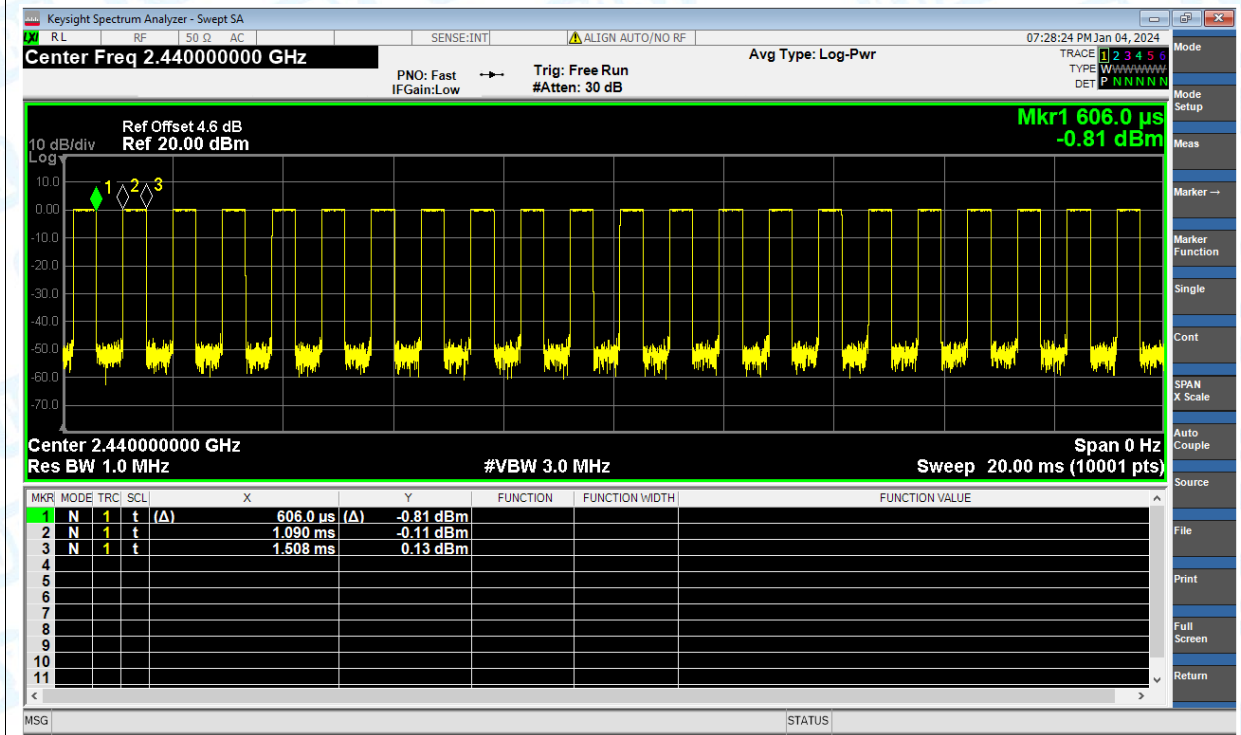
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	BLE 1Mbps	2402	Ant1	46.34	3.34	2.39
NVNT	BLE 1Mbps	2440	Ant1	46.34	3.34	2.39
NVNT	BLE 1Mbps	2480	Ant1	46.45	3.33	2.39
NVNT	BLE 2Mbps	2402	Ant1	23.28	6.33	4.76
NVNT	BLE 2Mbps	2440	Ant1	23.28	6.33	4.76
NVNT	BLE 2Mbps	2480	Ant1	23.28	6.33	4.76

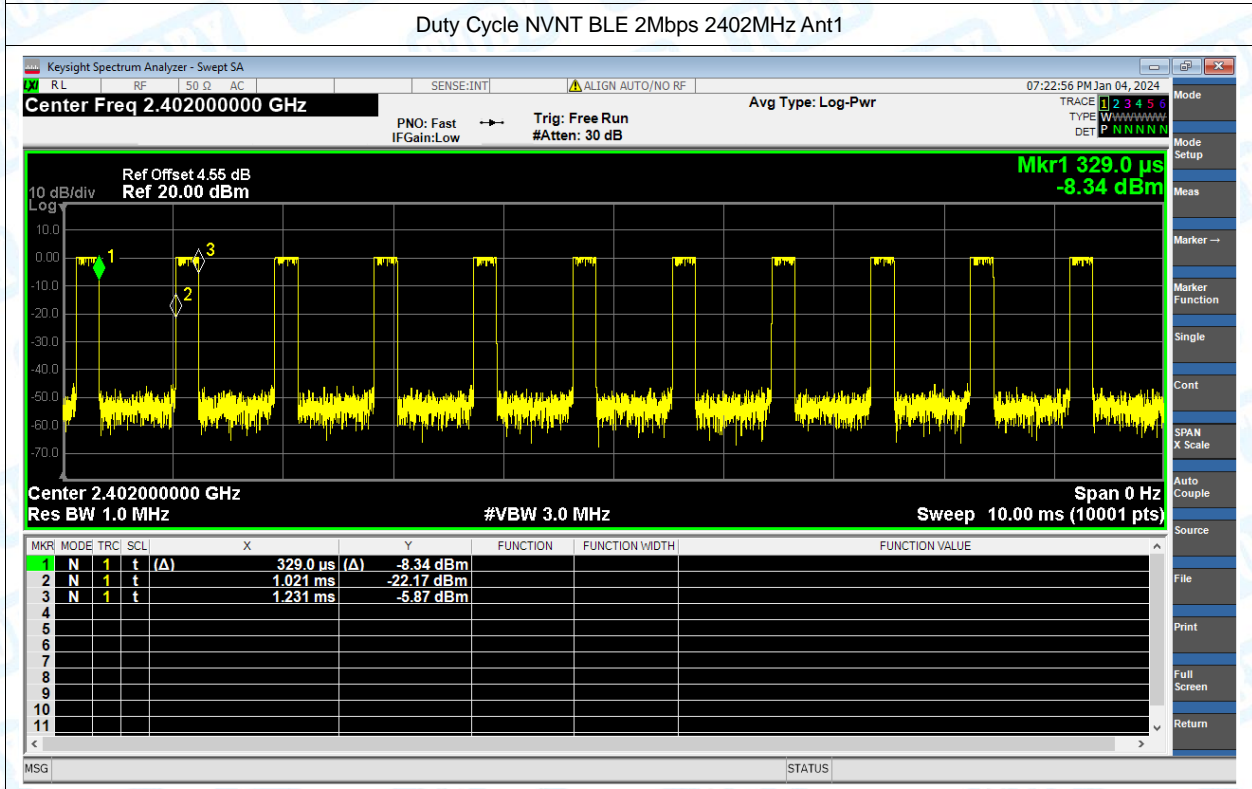
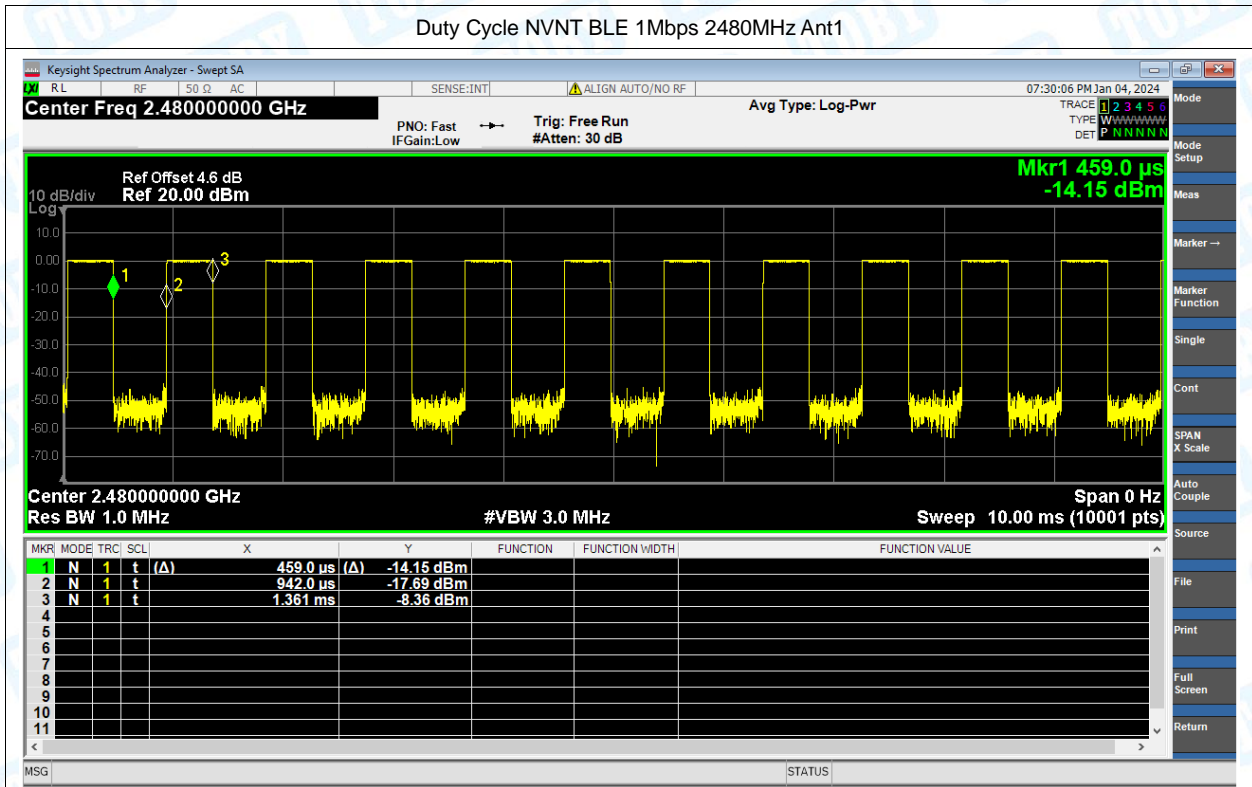
Test Graphs

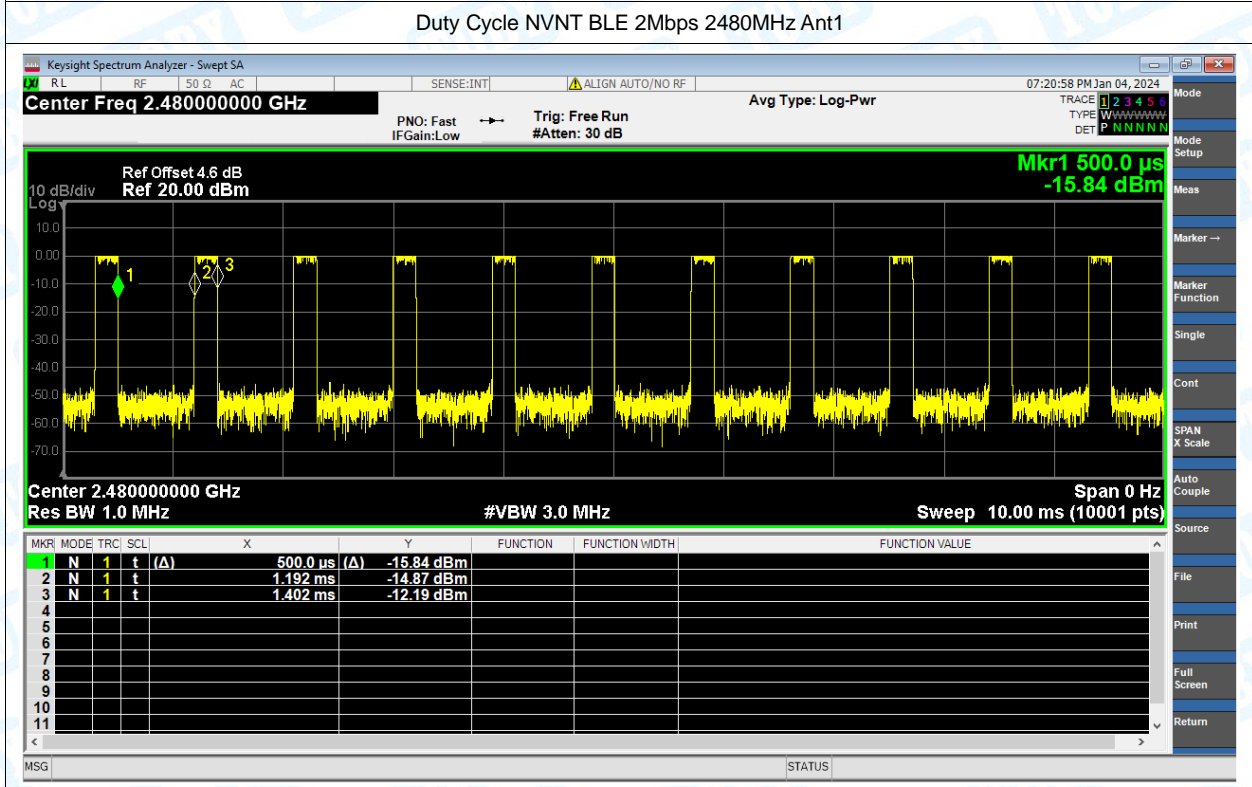
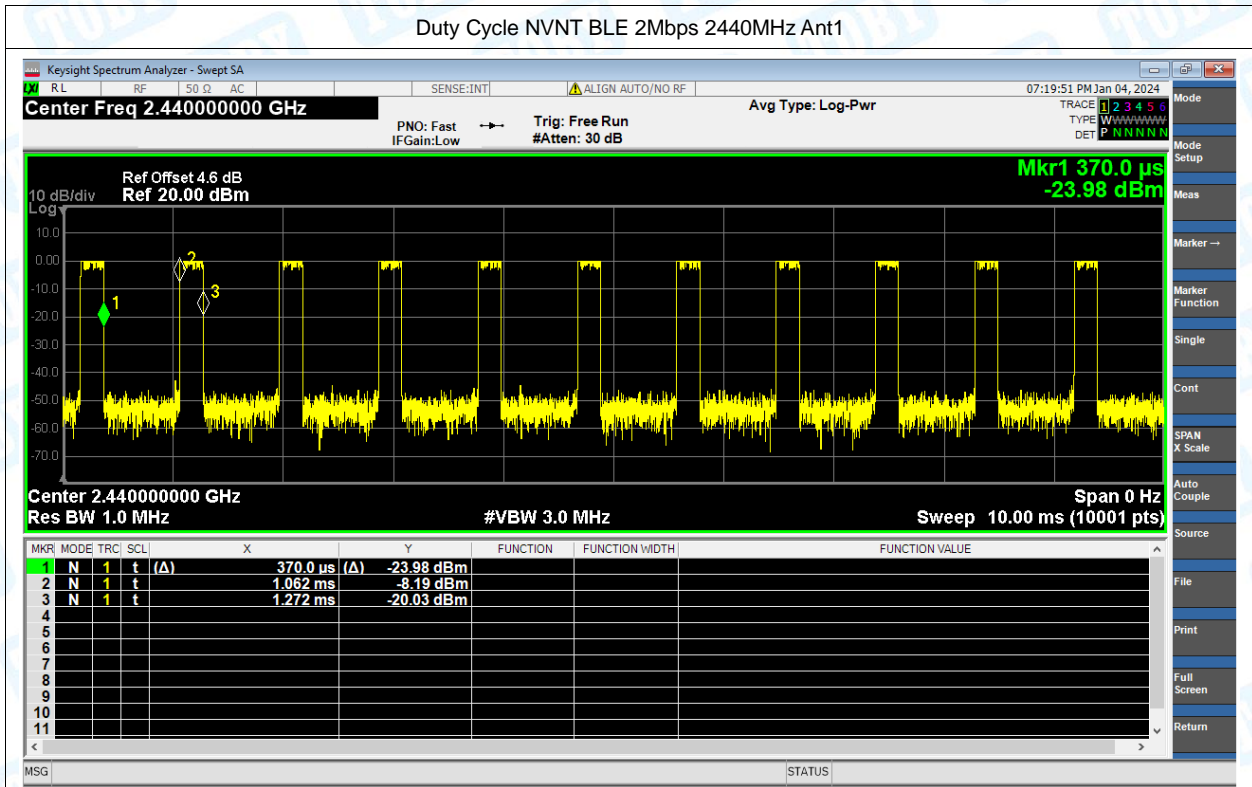
Duty Cycle NVNT BLE 1Mbps 2402MHz Ant1



Duty Cycle NVNT BLE 1Mbps 2440MHz Ant1





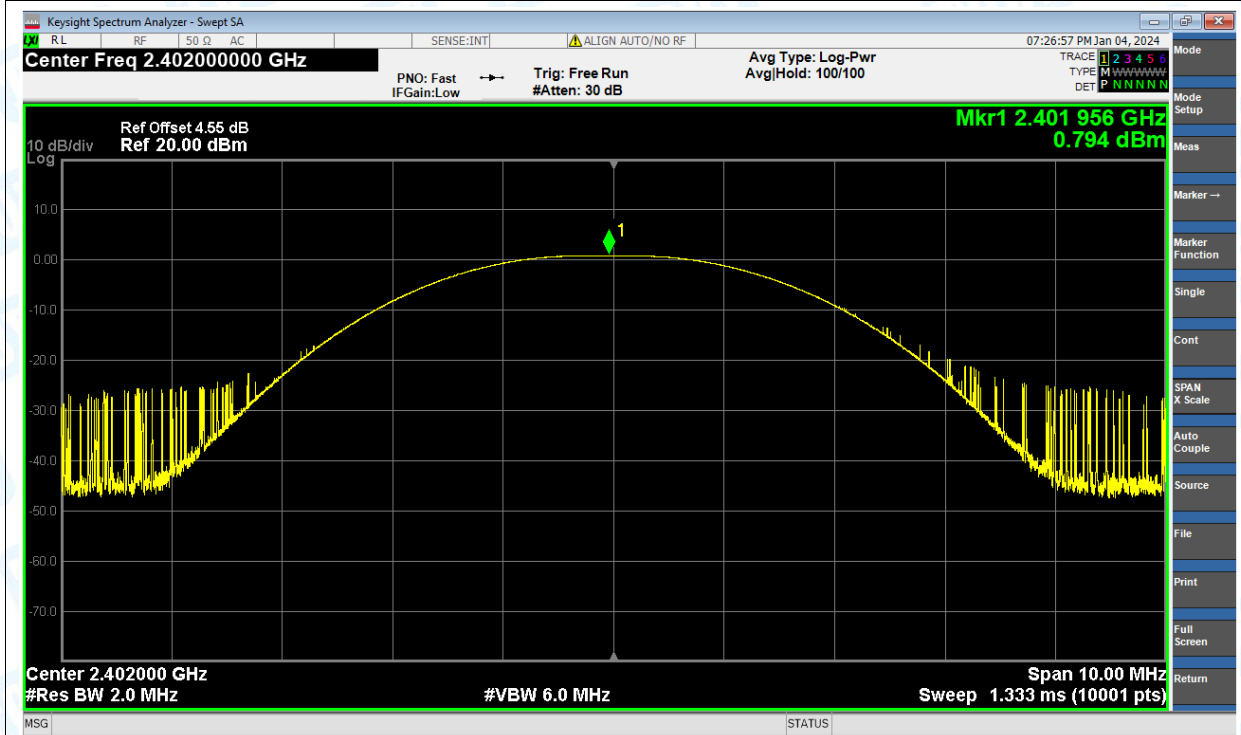


2.Maximum Conducted Output Power

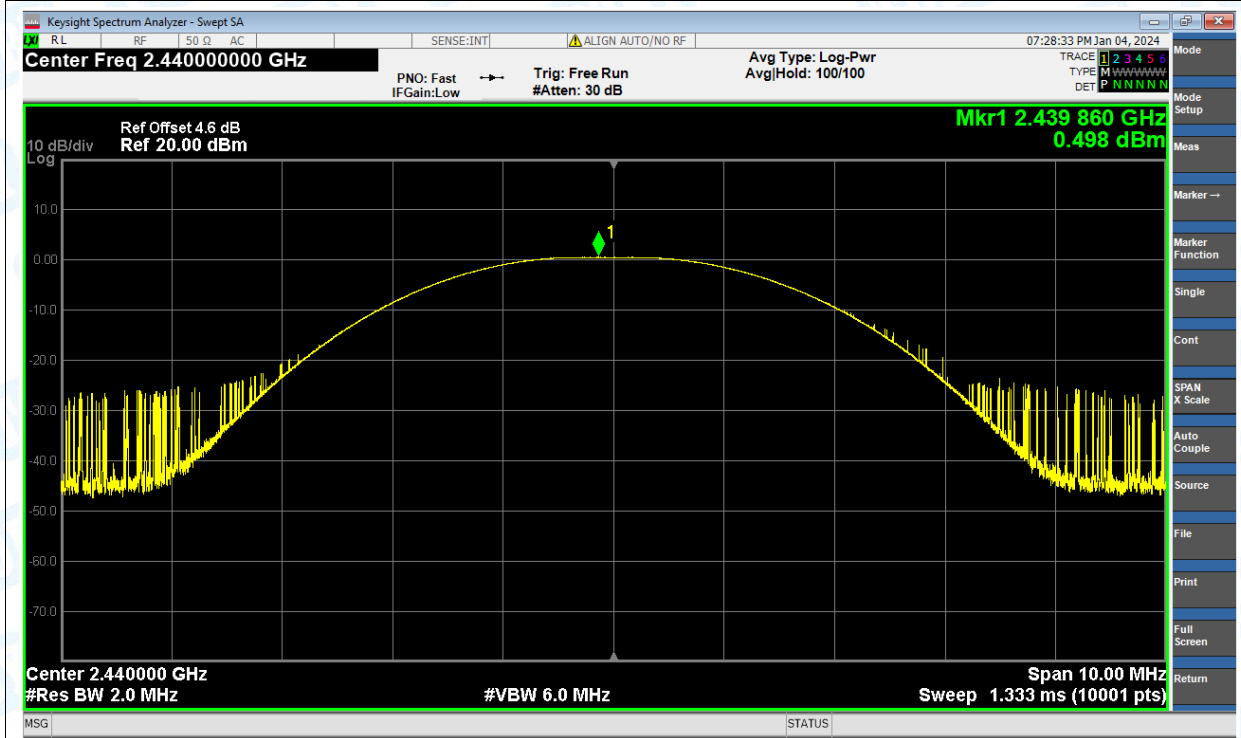
Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	BLE 1Mbps	2402	Ant1	0.794	30	Pass
NVNT	BLE 1Mbps	2440	Ant1	0.498	30	Pass
NVNT	BLE 1Mbps	2480	Ant1	0.501	30	Pass
NVNT	BLE 2Mbps	2402	Ant1	0.766	30	Pass
NVNT	BLE 2Mbps	2440	Ant1	0.41	30	Pass
NVNT	BLE 2Mbps	2480	Ant1	0.445	30	Pass

Test Graphs

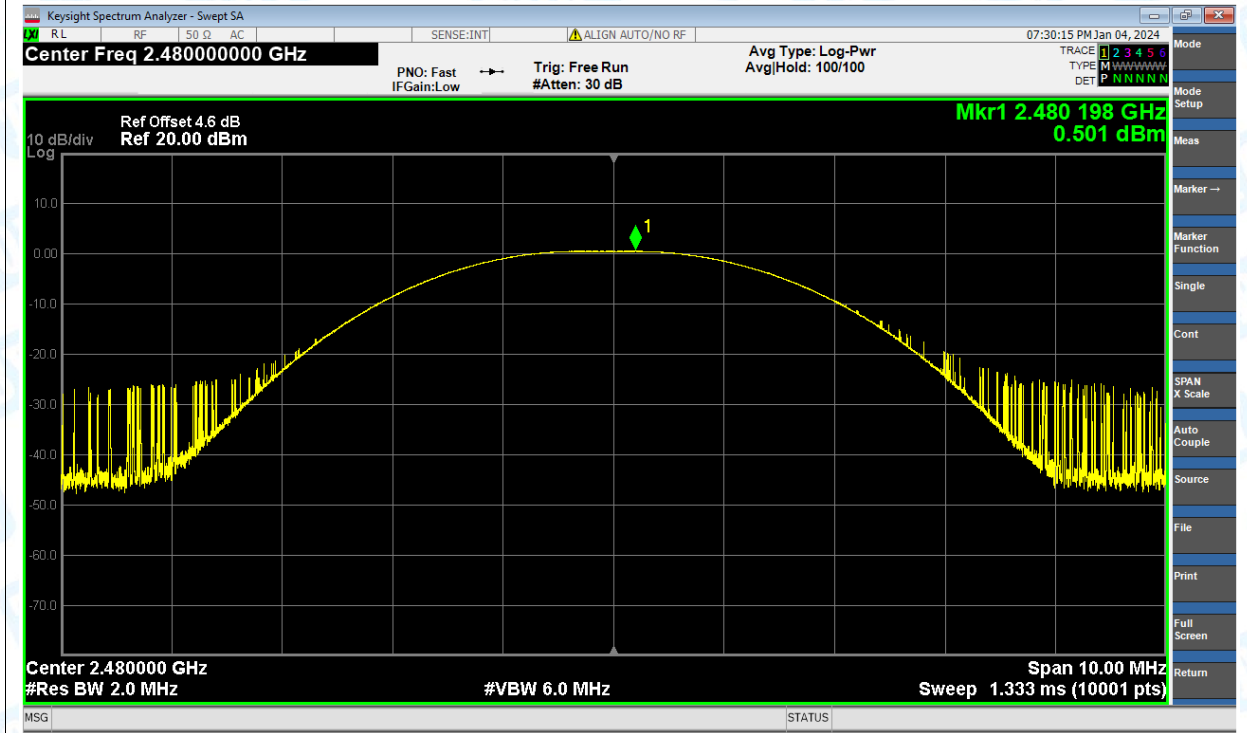
Power NVNT BLE 1Mbps 2402MHz Ant1



Power NVNT BLE 1Mbps 2440MHz Ant1



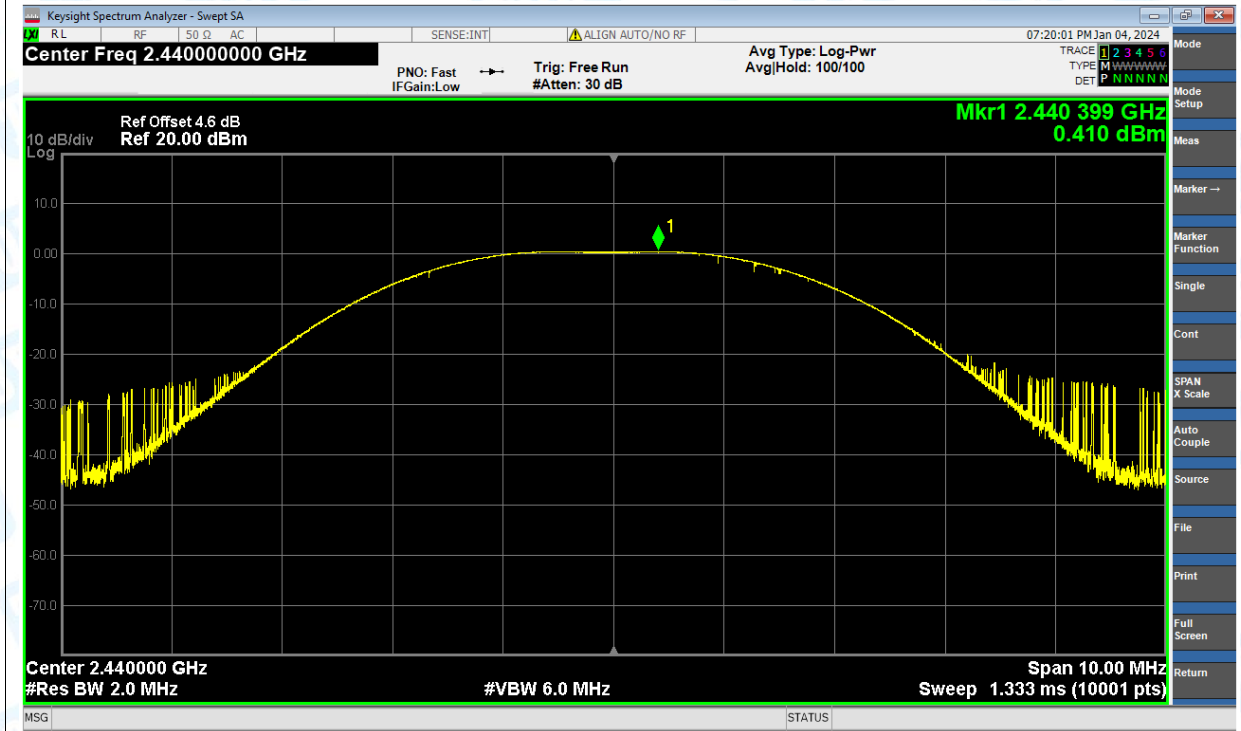
Power NVNT BLE 1Mbps 2480MHz Ant1



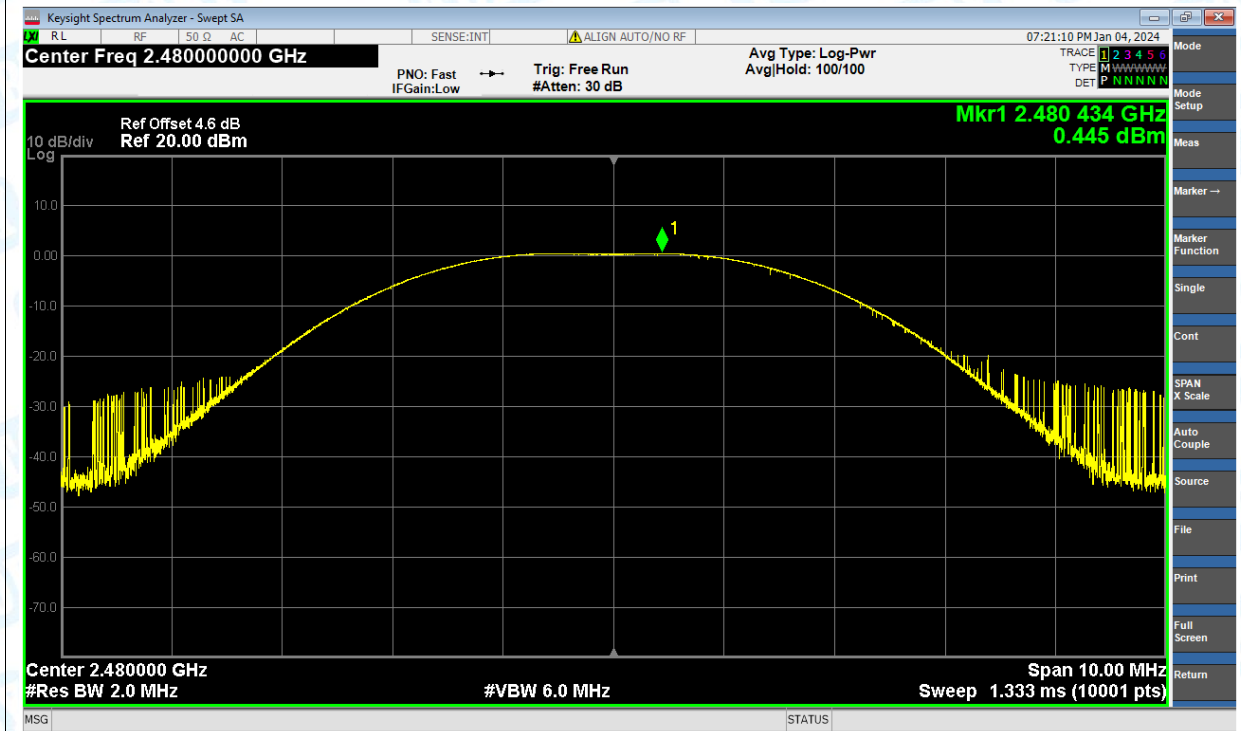
Power NVNT BLE 2Mbps 2402MHz Ant1



Power NVNT BLE 2Mbps 2440MHz Ant1



Power NVNT BLE 2Mbps 2480MHz Ant1

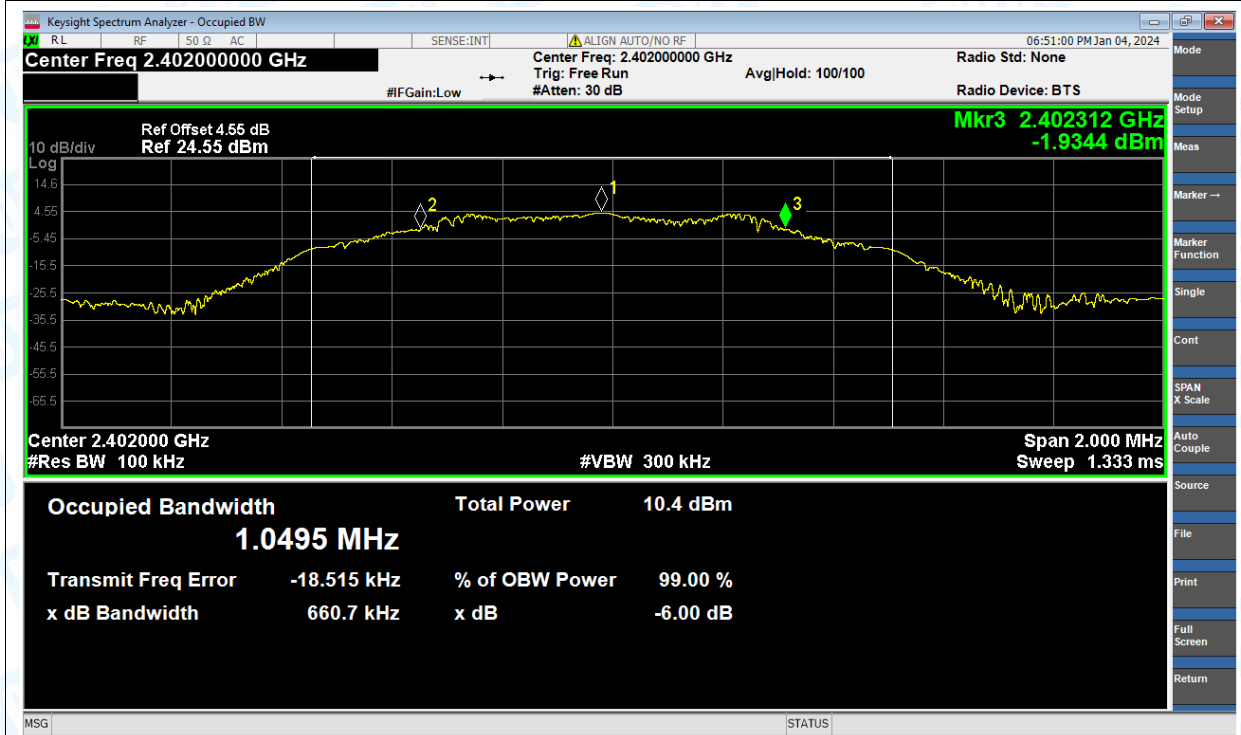


3.-6dB Bandwidth

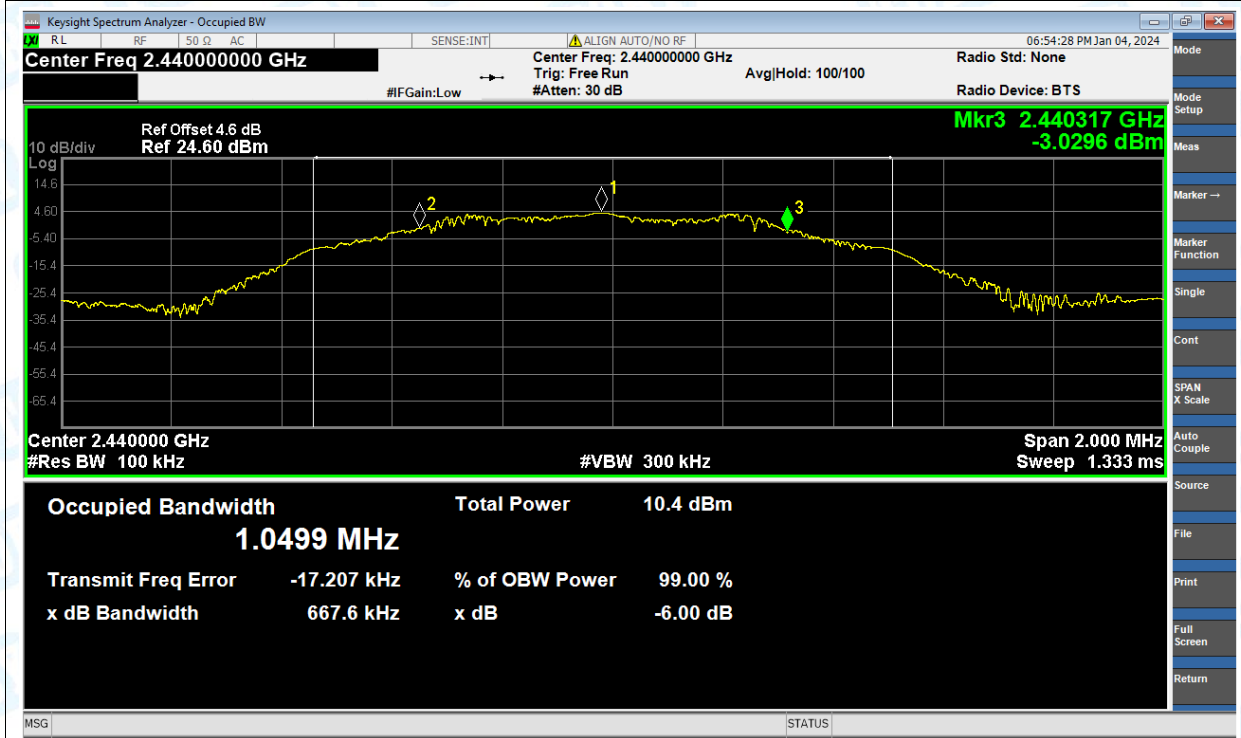
Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	BLE 1Mbps	2402	Ant1	0.66	0.5	Pass
NVNT	BLE 1Mbps	2440	Ant1	0.67	0.5	Pass
NVNT	BLE 1Mbps	2480	Ant1	0.67	0.5	Pass
NVNT	BLE 2Mbps	2402	Ant1	1.09	0.5	Pass
NVNT	BLE 2Mbps	2440	Ant1	1.03	0.5	Pass
NVNT	BLE 2Mbps	2480	Ant1	1.14	0.5	Pass

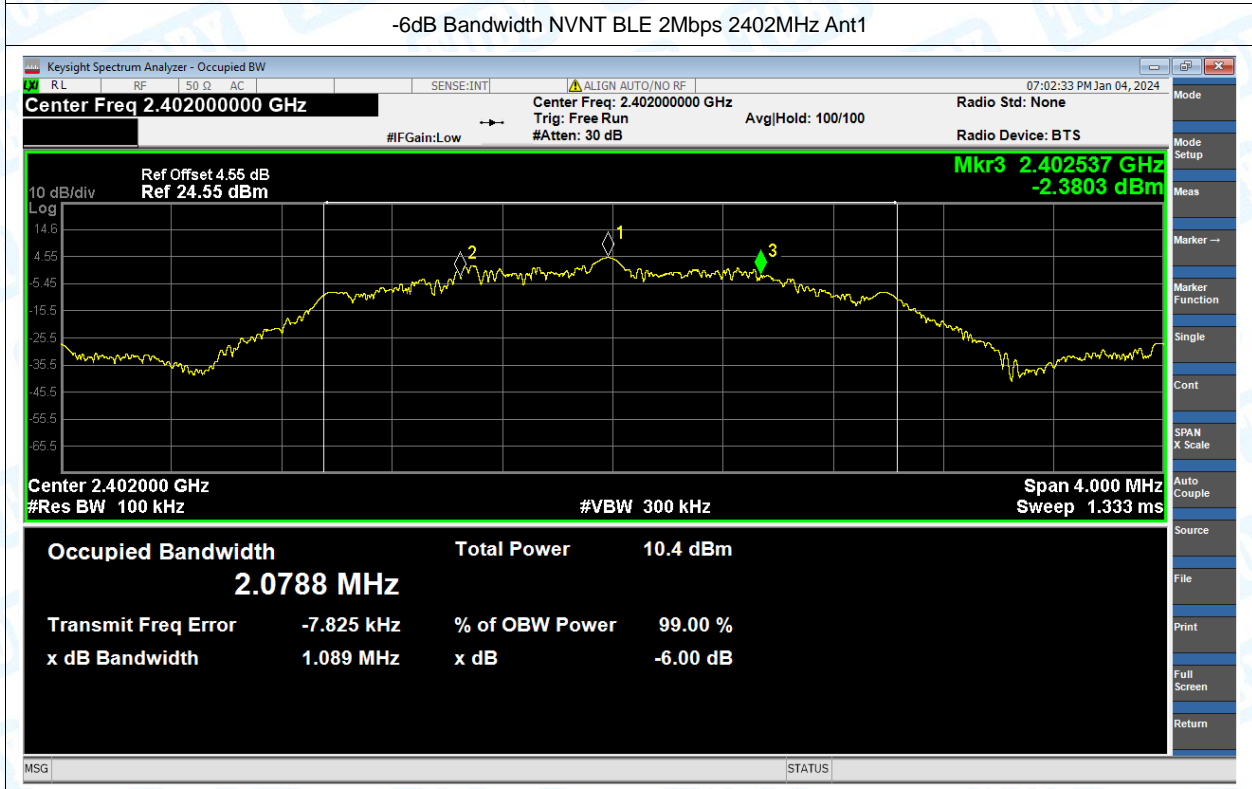
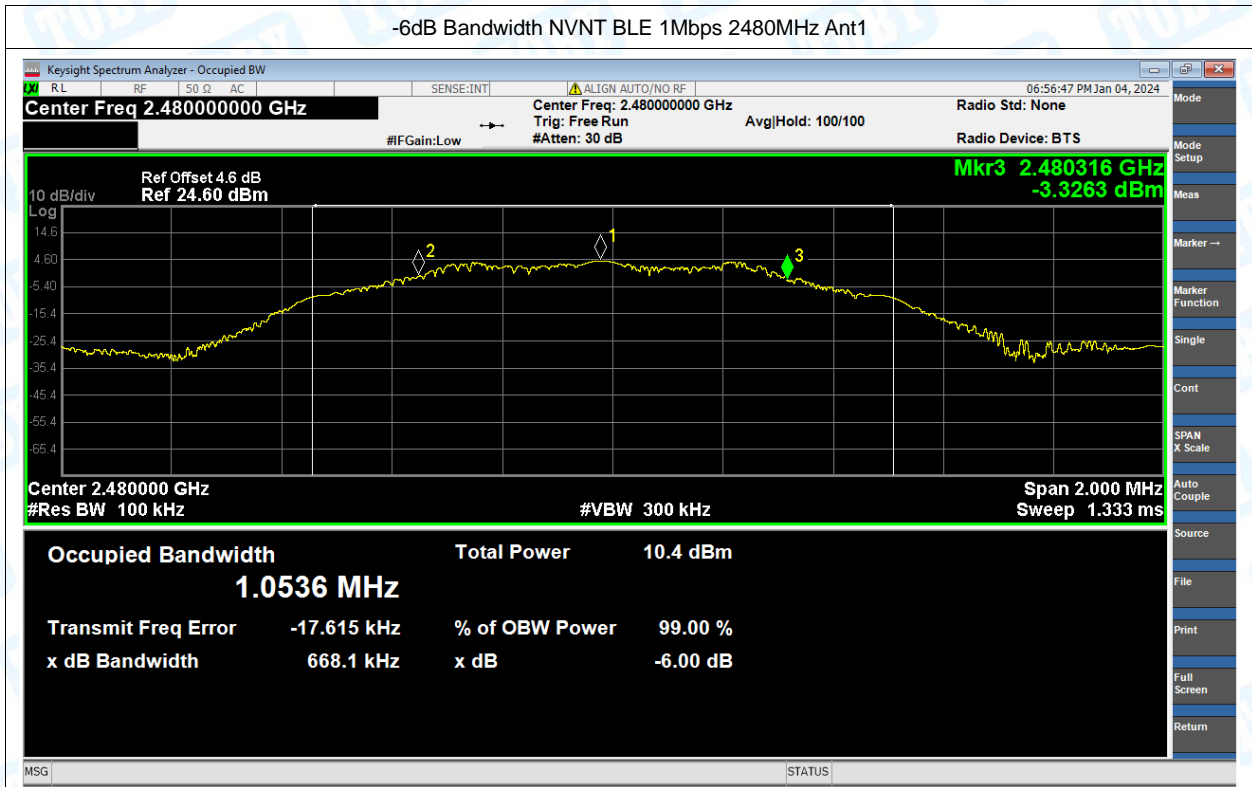
Test Graphs

-6dB Bandwidth NVNT BLE 1Mbps 2402MHz Ant1

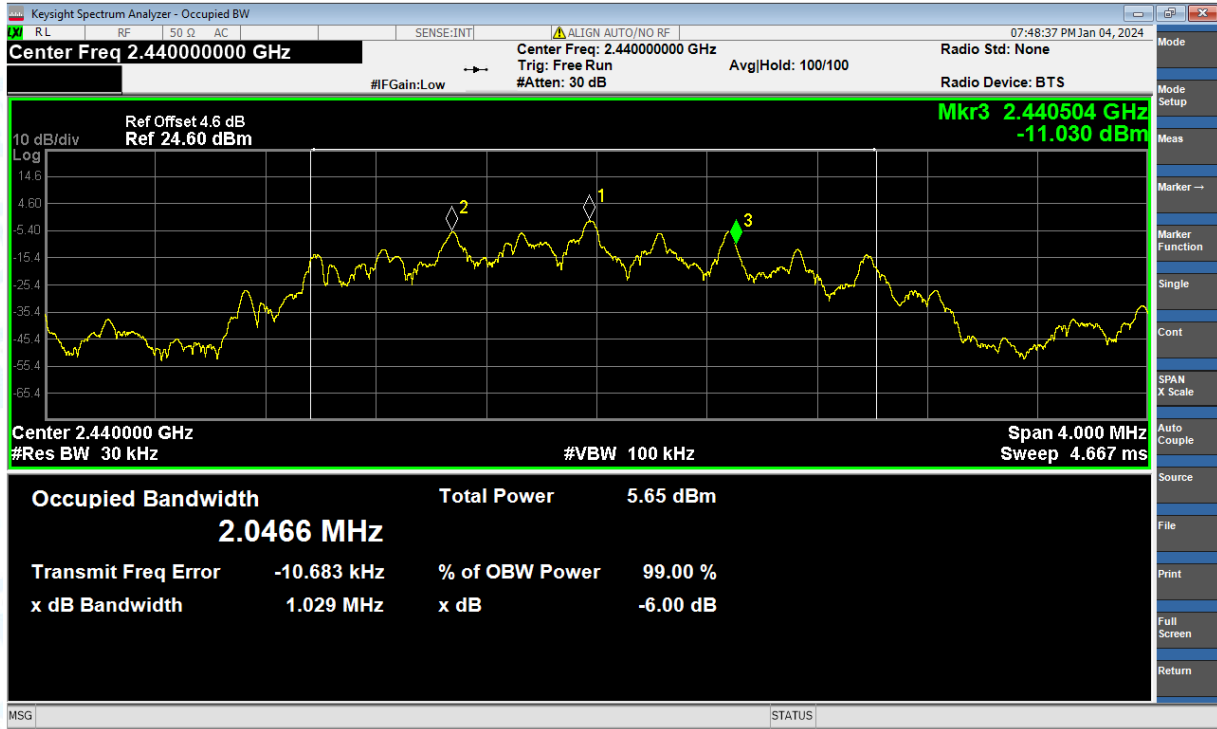


-6dB Bandwidth NVNT BLE 1Mbps 2440MHz Ant1

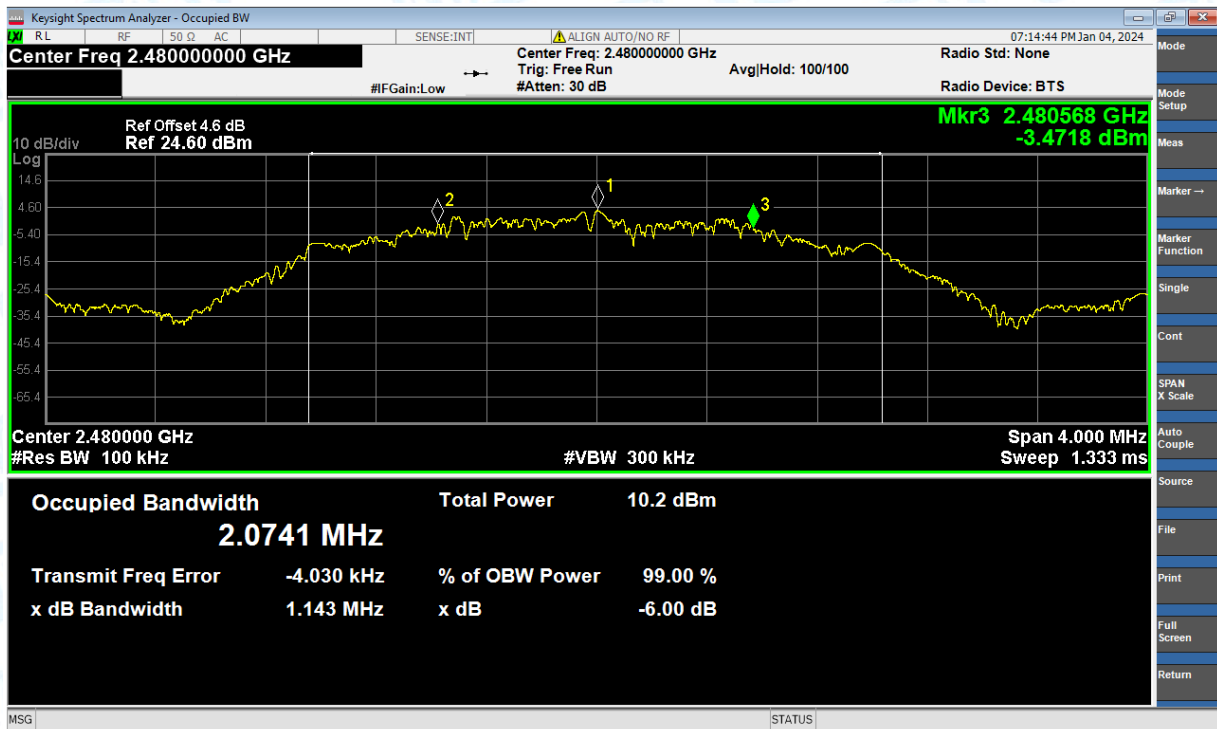




-6dB Bandwidth NVNT BLE 2Mbps 2440MHz Ant1



-6dB Bandwidth NVNT BLE 2Mbps 2480MHz Ant1

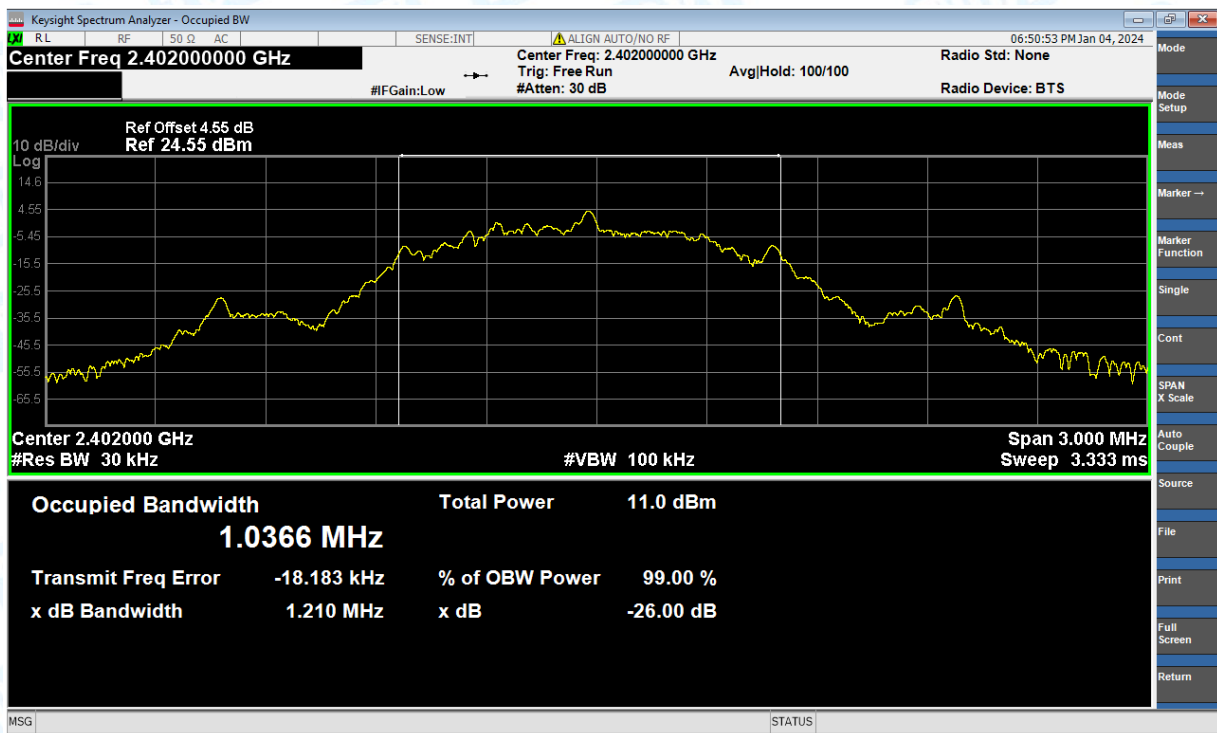


4.Occupied Channel Bandwidth

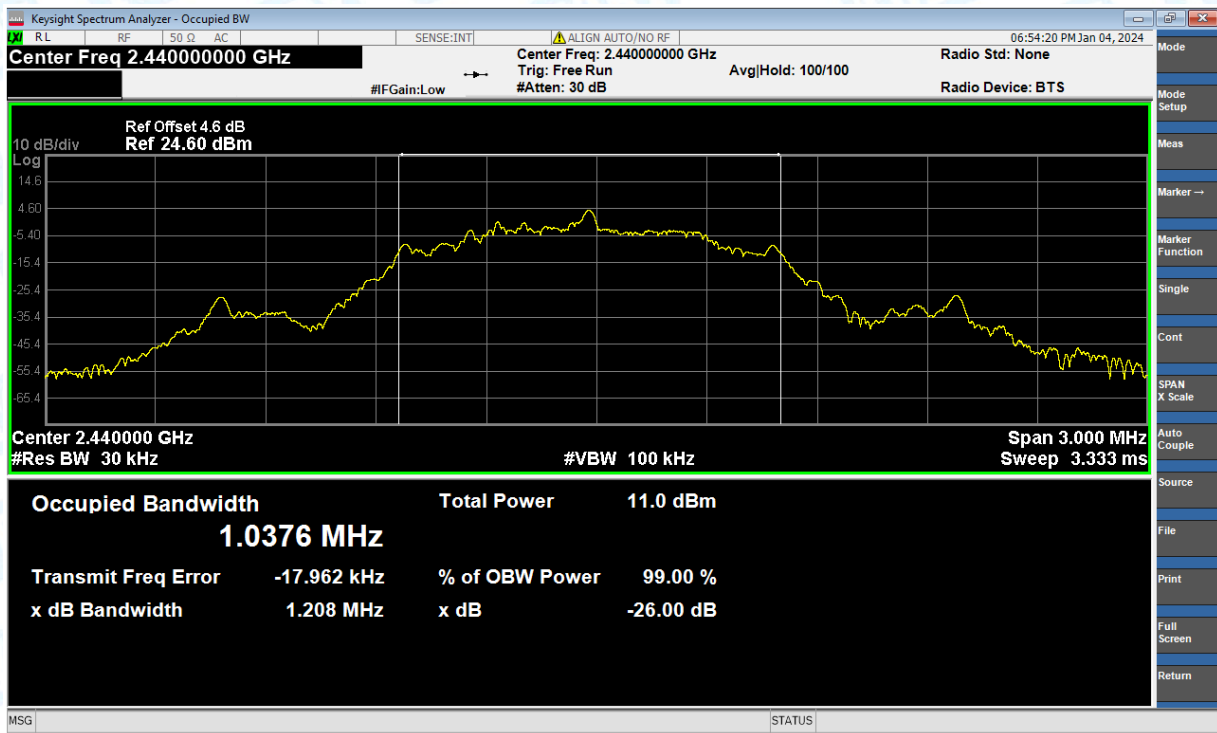
Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	BLE 1Mbps	2402	Ant1	1.037
NVNT	BLE 1Mbps	2440	Ant1	1.038
NVNT	BLE 1Mbps	2480	Ant1	1.036
NVNT	BLE 2Mbps	2402	Ant1	2.066
NVNT	BLE 2Mbps	2440	Ant1	2.054
NVNT	BLE 2Mbps	2480	Ant1	2.06

Test Graphs

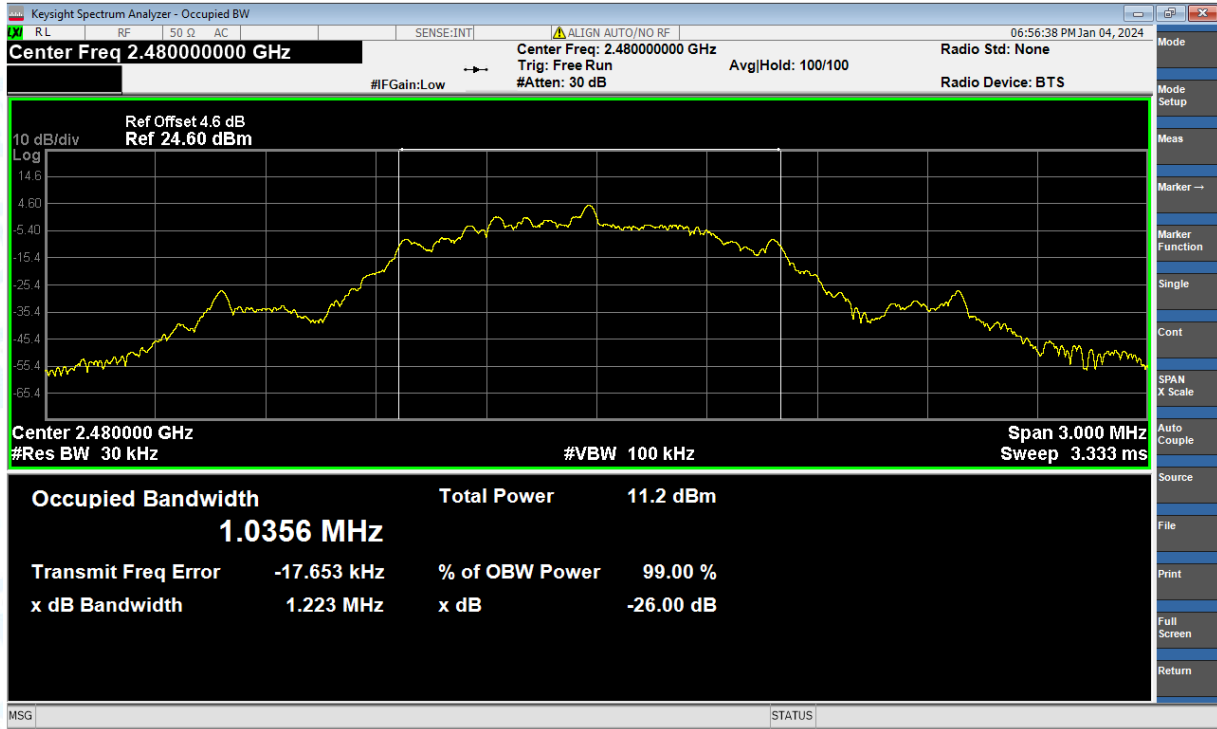
OBW NVNT BLE 1Mbps 2402MHz Ant1



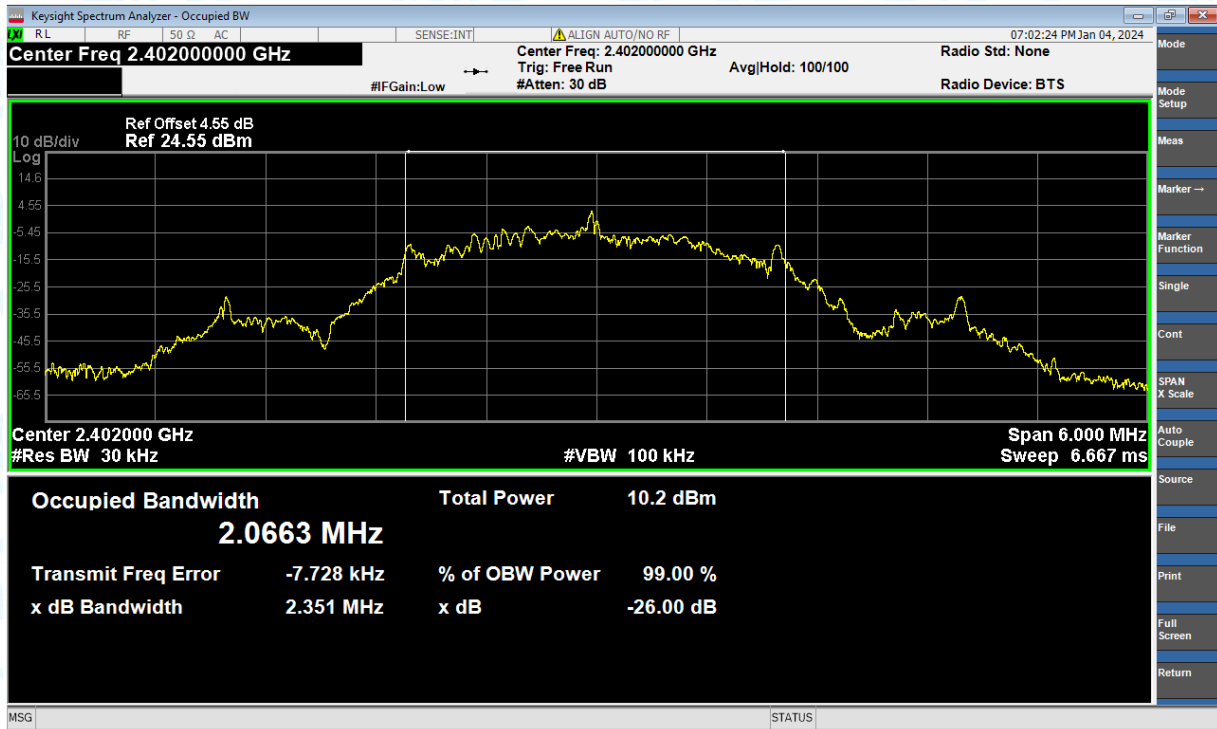
OBW NVNT BLE 1Mbps 2440MHz Ant1



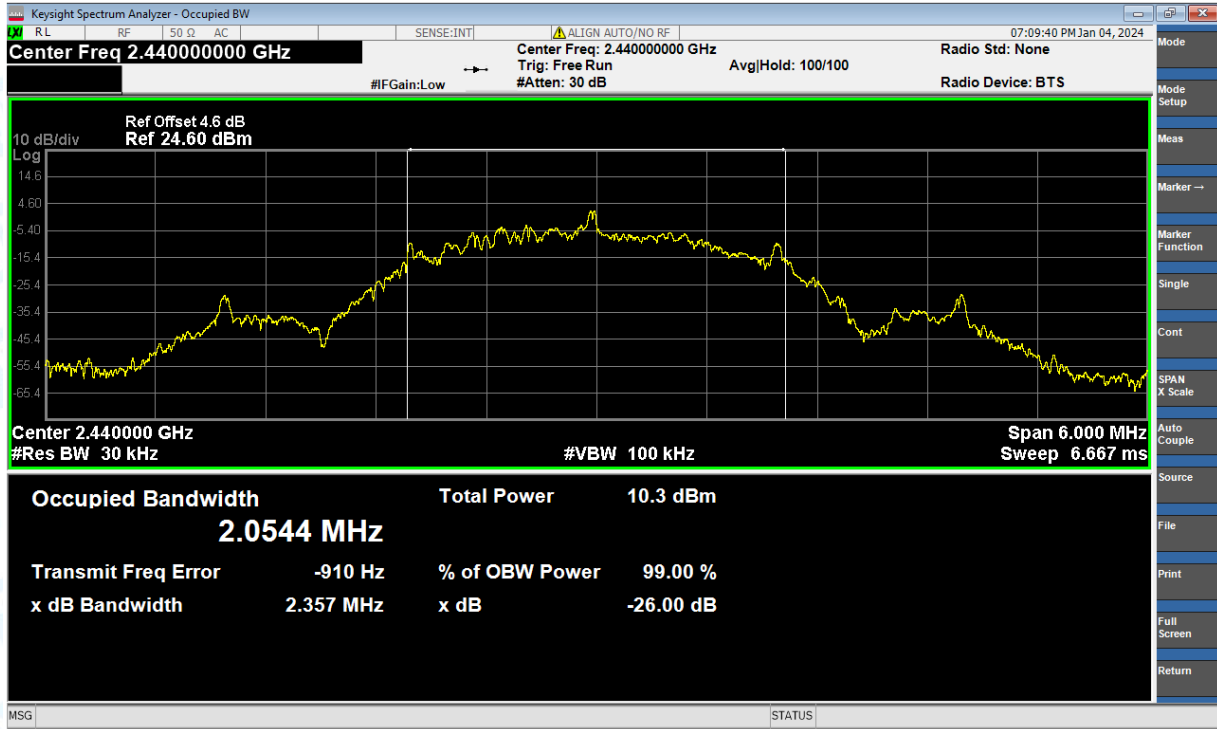
OBW NVNT BLE 1Mbps 2480MHz Ant1



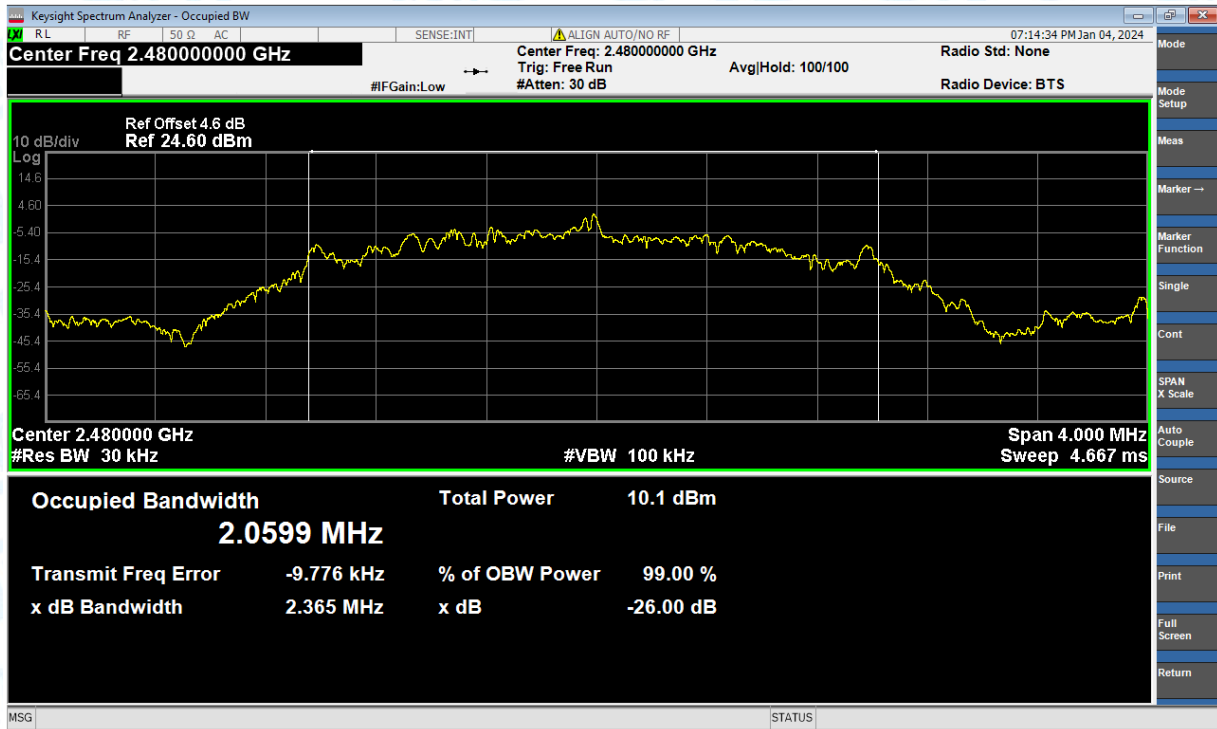
OBW NVNT BLE 2Mbps 2402MHz Ant1



OBW NVNT BLE 2Mbps 2440MHz Ant1



OBW NVNT BLE 2Mbps 2480MHz Ant1

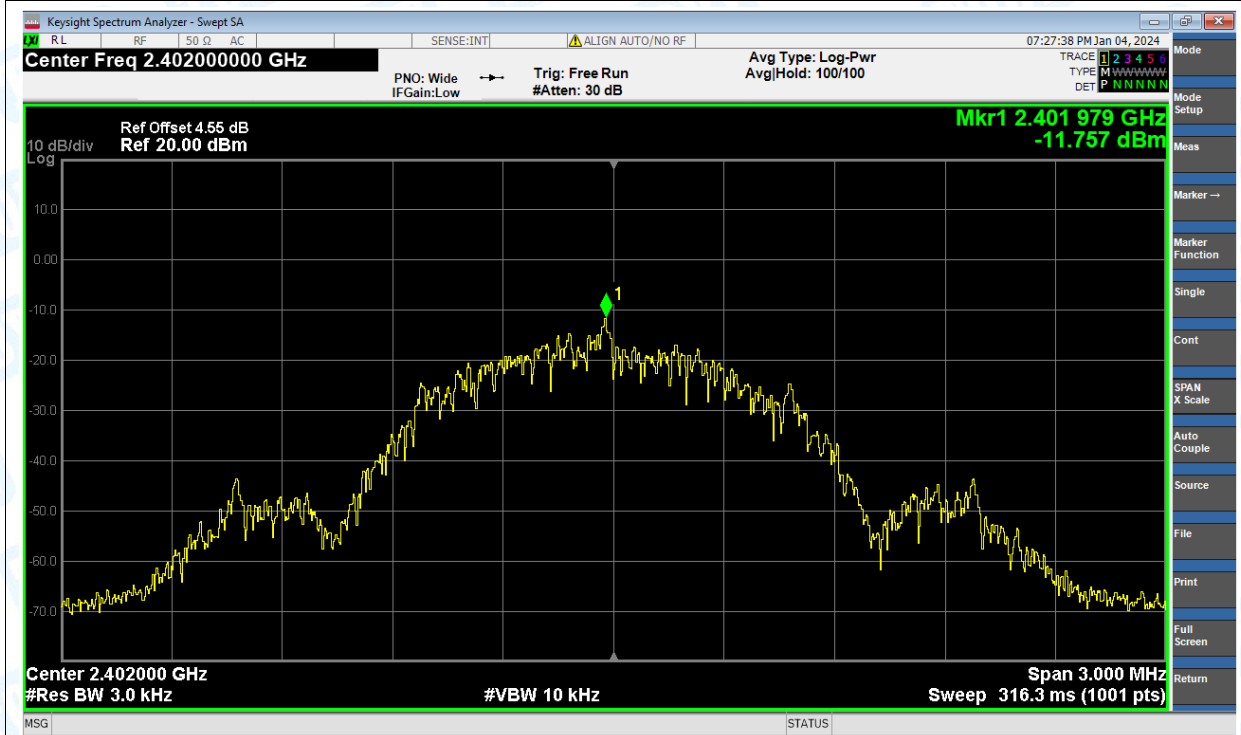


5. Maximum Power Spectral Density Level

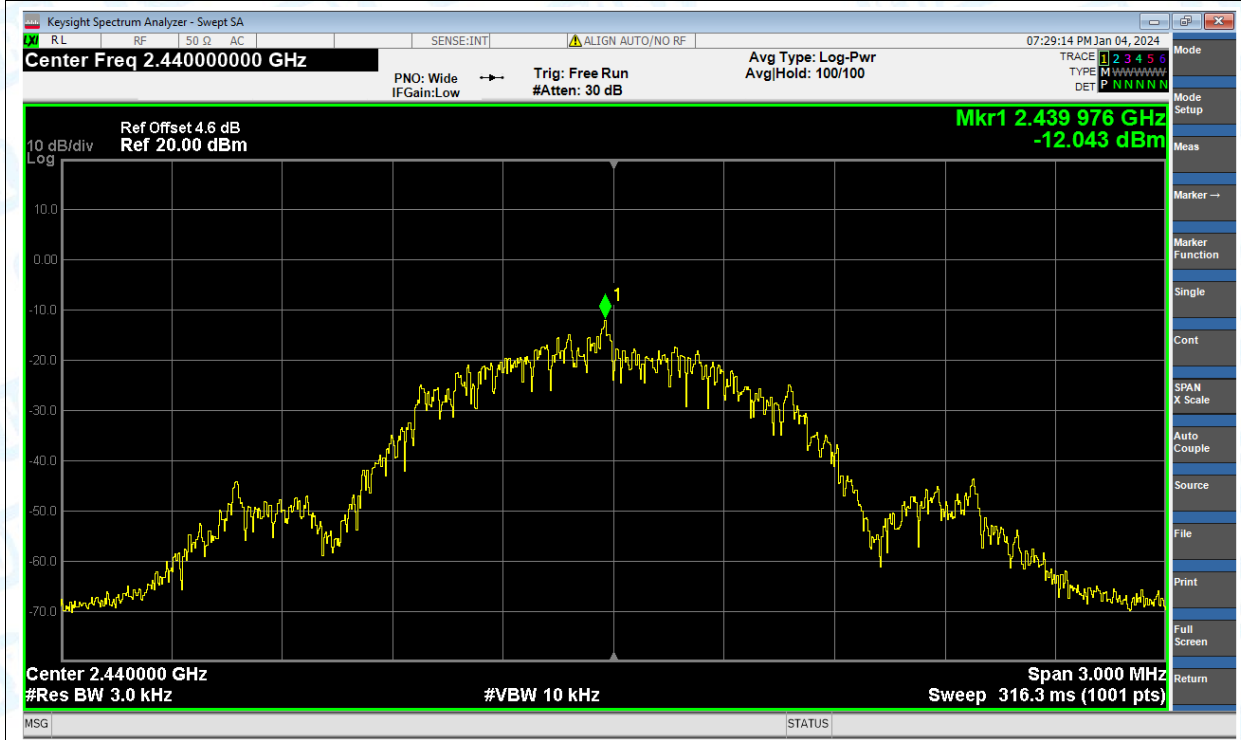
Condition	Mode	Frequency (MHz)	Antenna	Max PSD (dBm)	Limit (dBm)	Verdict
NVNT	BLE 1Mbps	2402	Ant1	-11.757	8	Pass
NVNT	BLE 1Mbps	2440	Ant1	-12.043	8	Pass
NVNT	BLE 1Mbps	2480	Ant1	-12.09	8	Pass
NVNT	BLE 2Mbps	2402	Ant1	-16.108	8	Pass
NVNT	BLE 2Mbps	2440	Ant1	-16.603	8	Pass
NVNT	BLE 2Mbps	2480	Ant1	-16.513	8	Pass

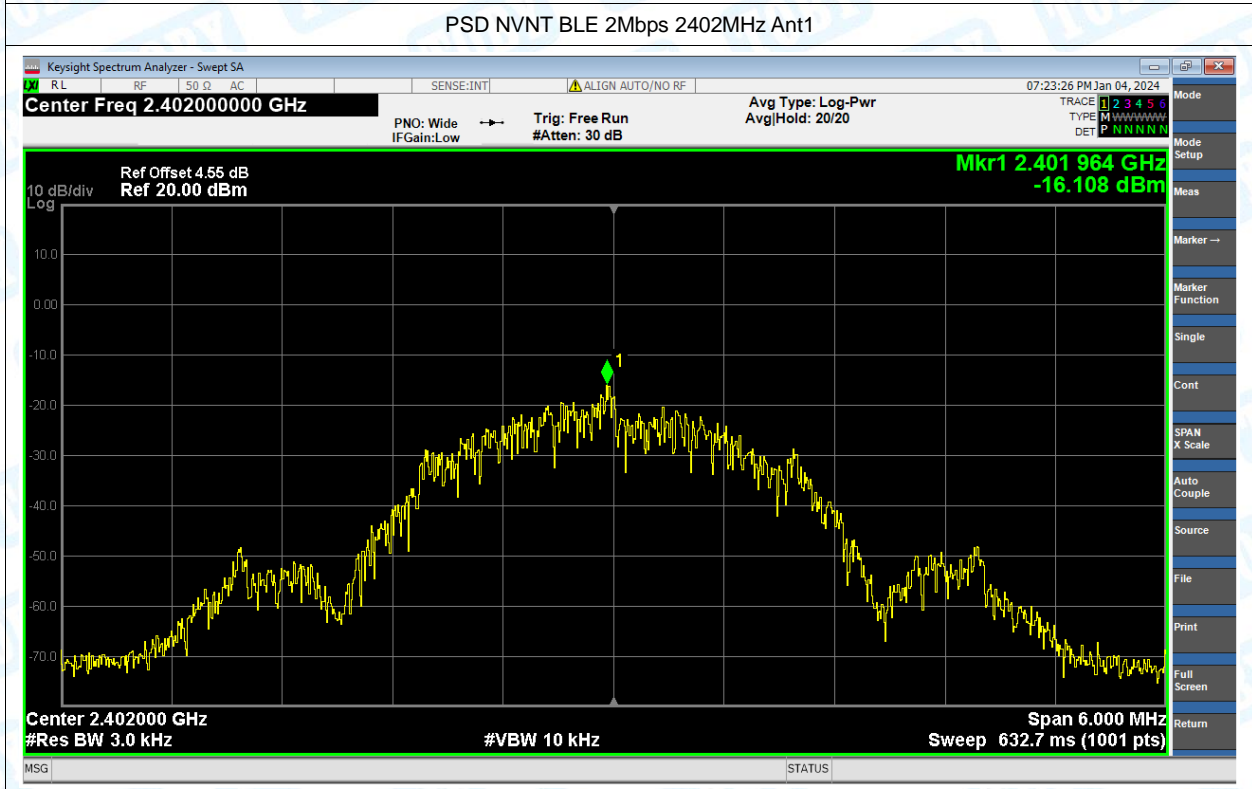
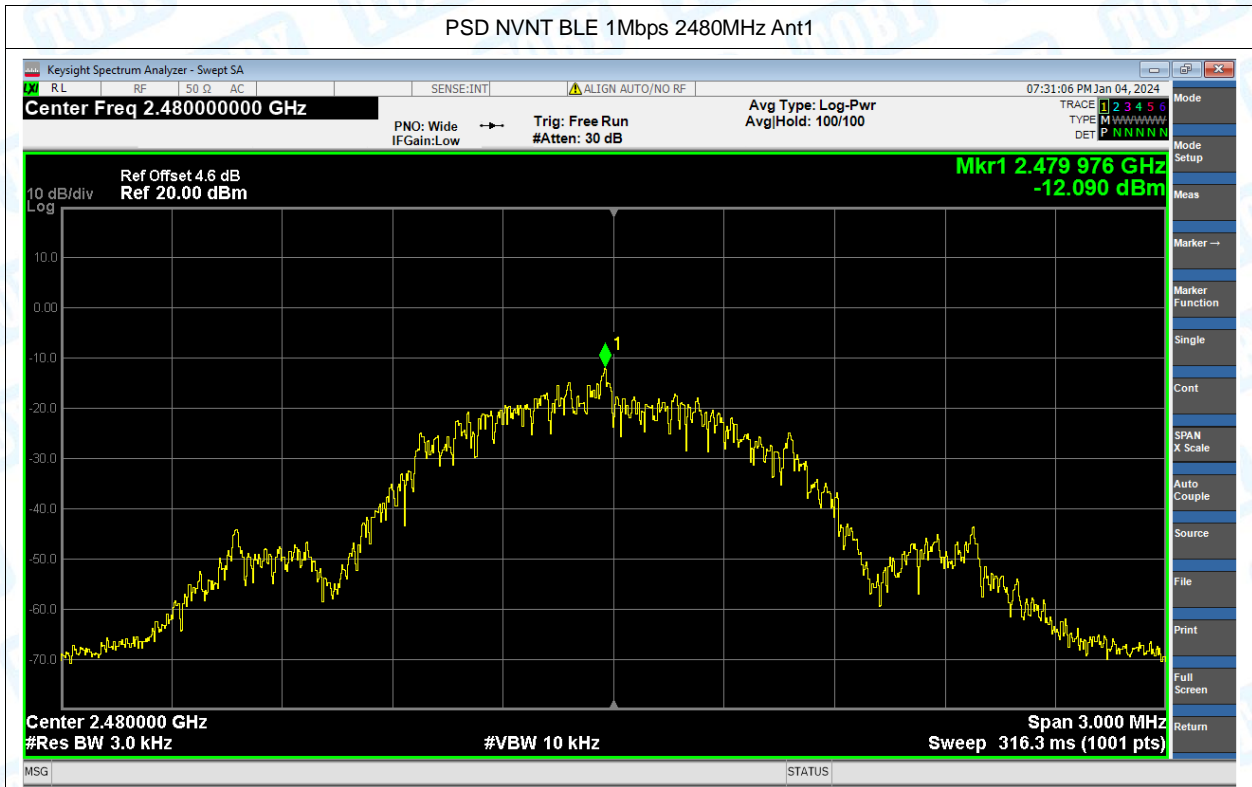
Test Graphs

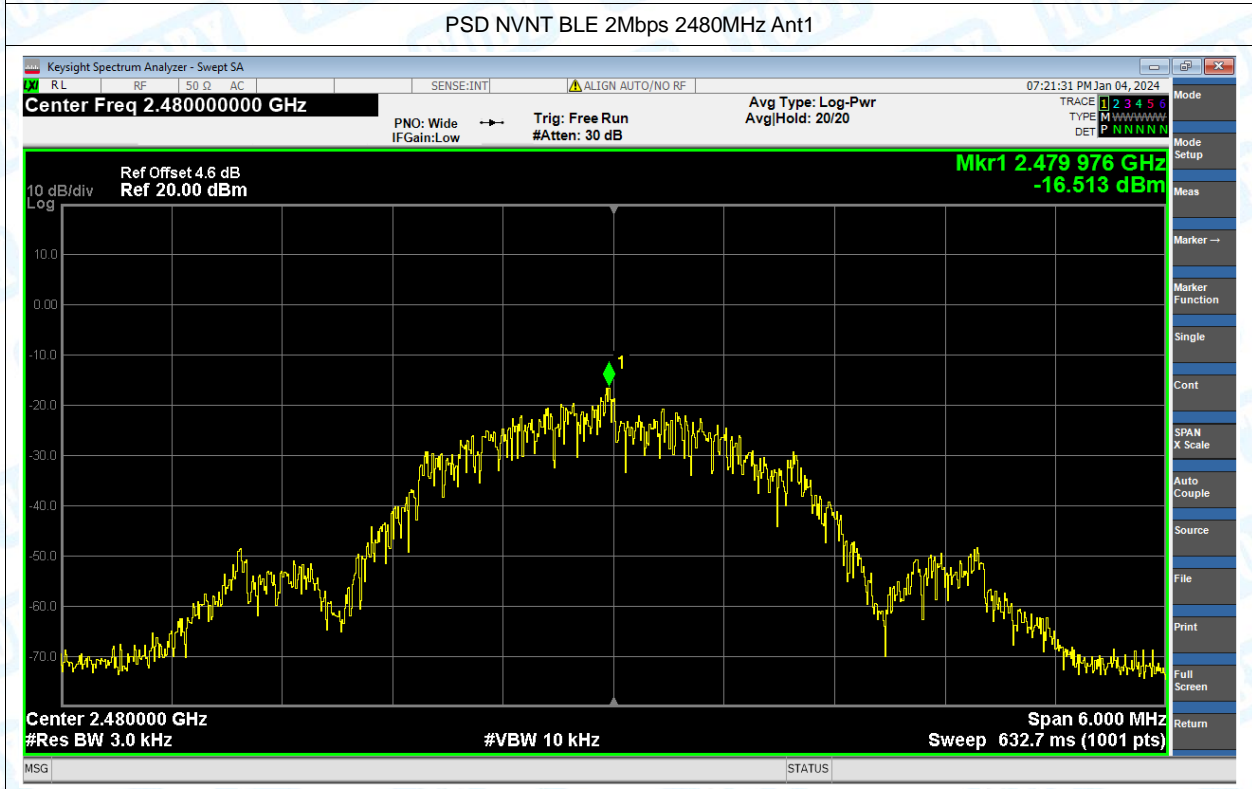
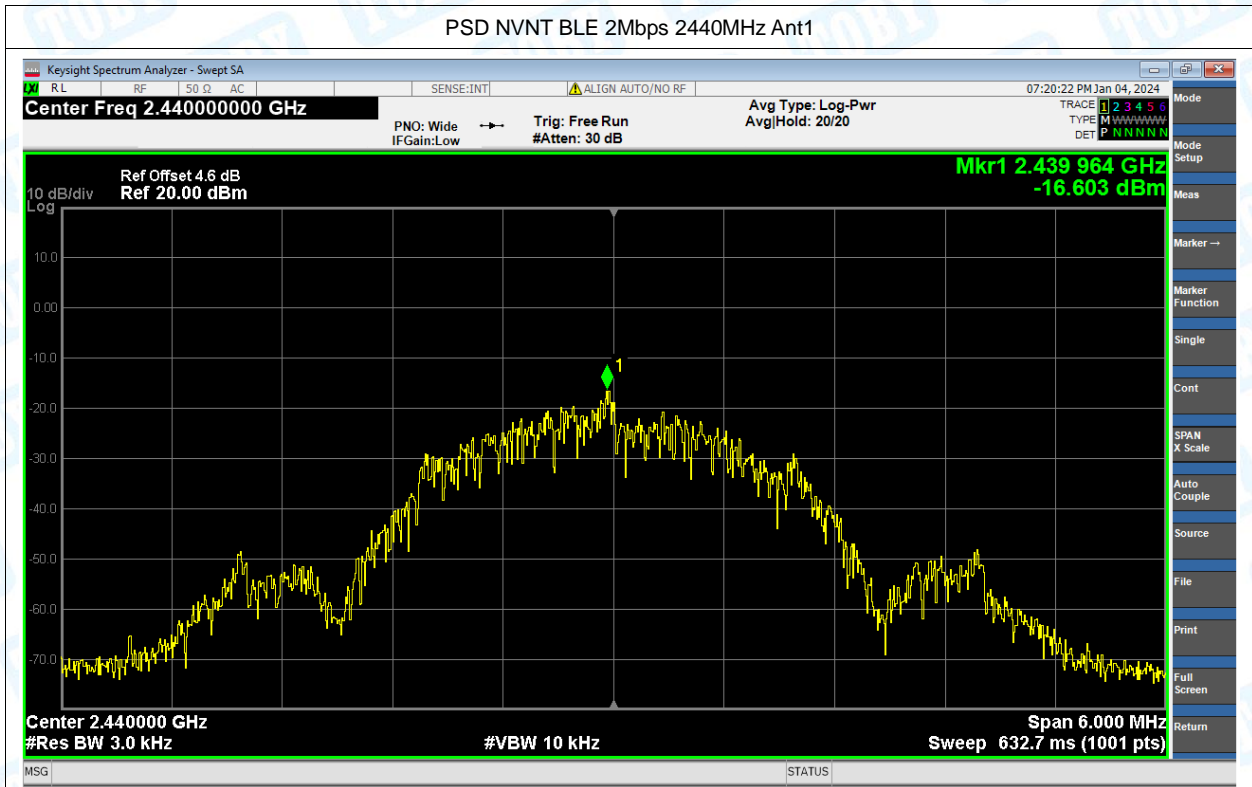
PSD NVNT BLE 1Mbps 2402MHz Ant1



PSD NVNT BLE 1Mbps 2440MHz Ant1





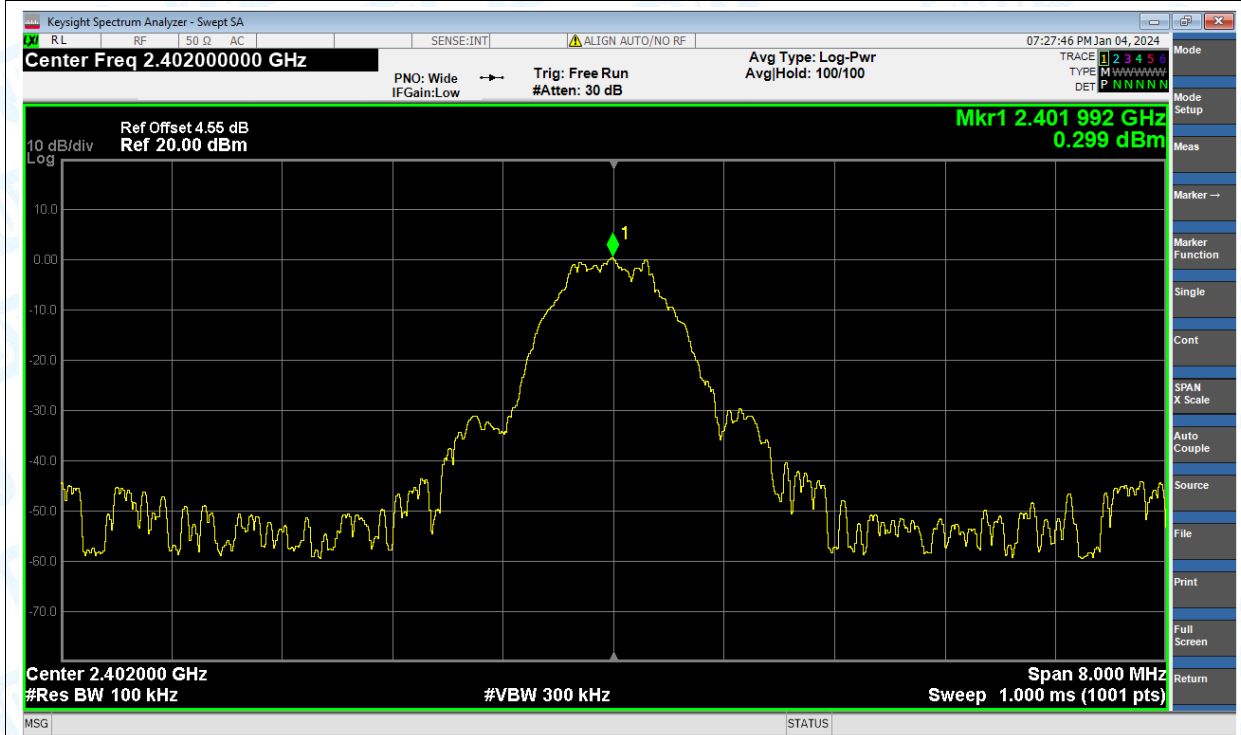


6.Band Edge

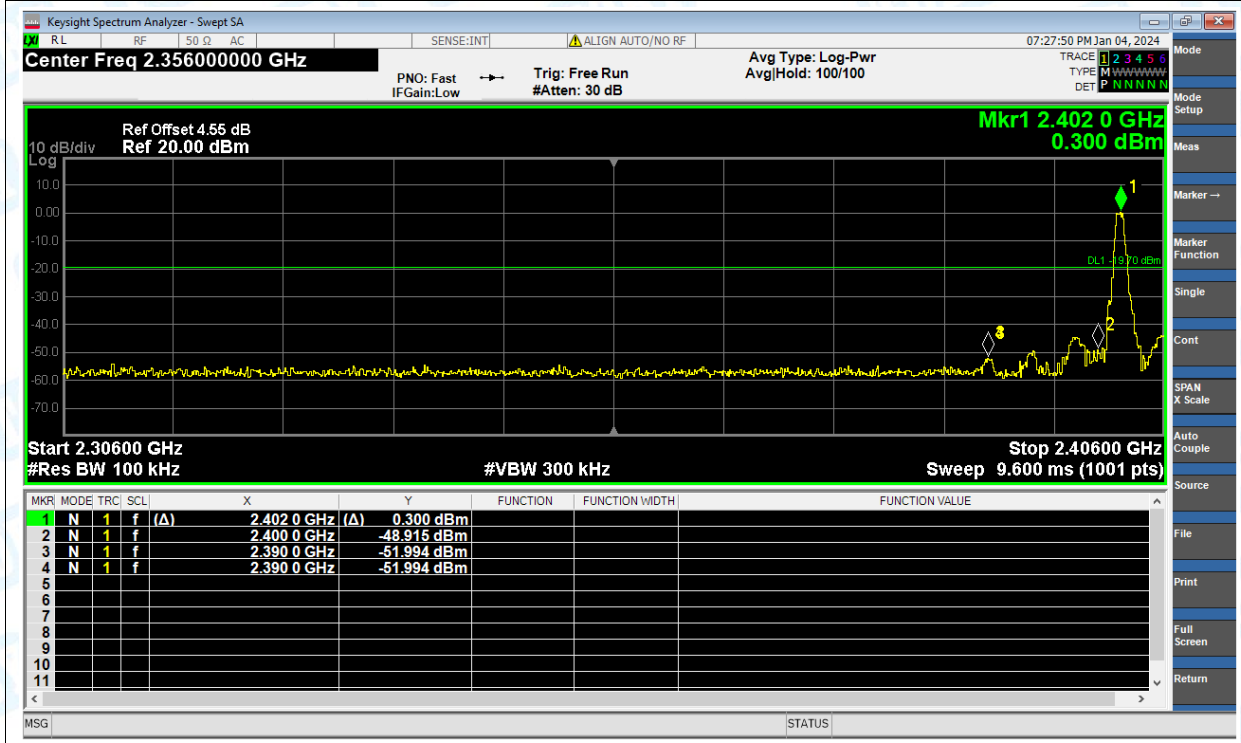
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1Mbps	2402	Ant1	-52.29	-20	Pass
NVNT	BLE 1Mbps	2480	Ant1	-44.28	-20	Pass
NVNT	BLE 2Mbps	2402	Ant1	-52.88	-20	Pass
NVNT	BLE 2Mbps	2480	Ant1	-44.18	-20	Pass

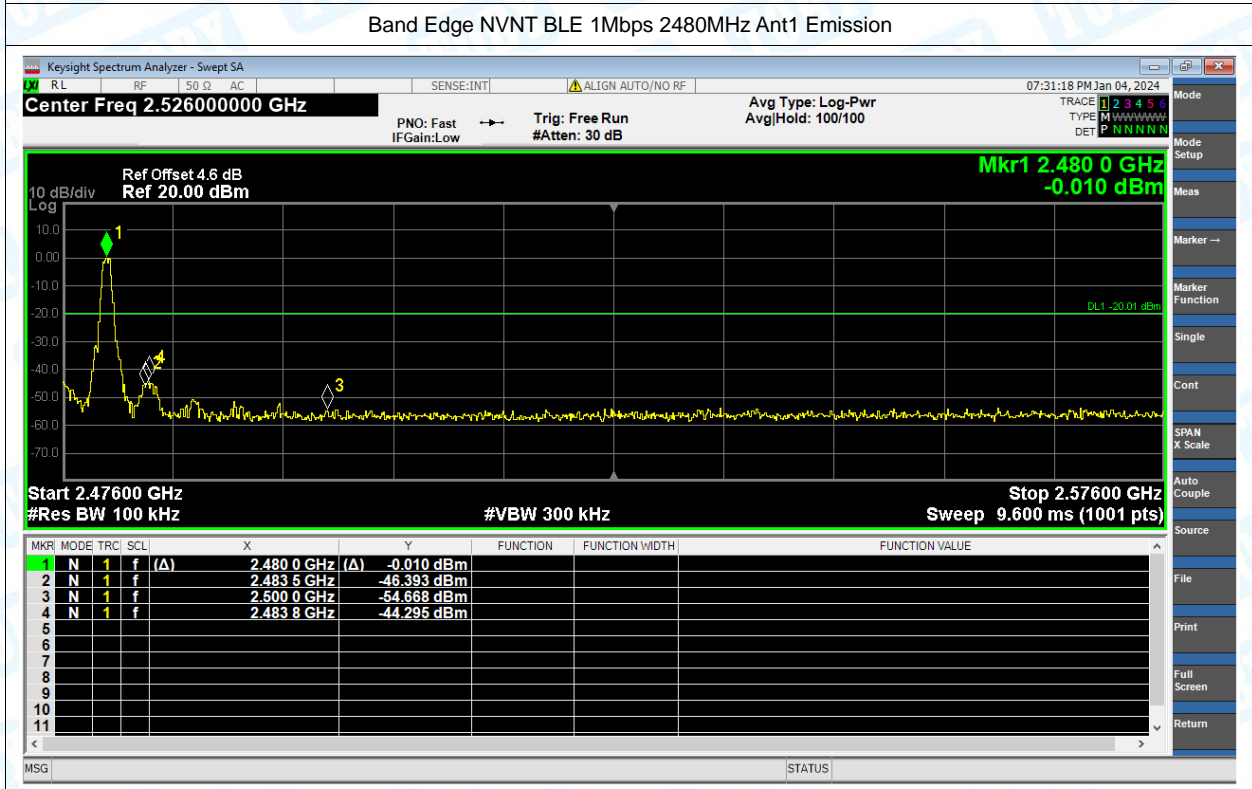
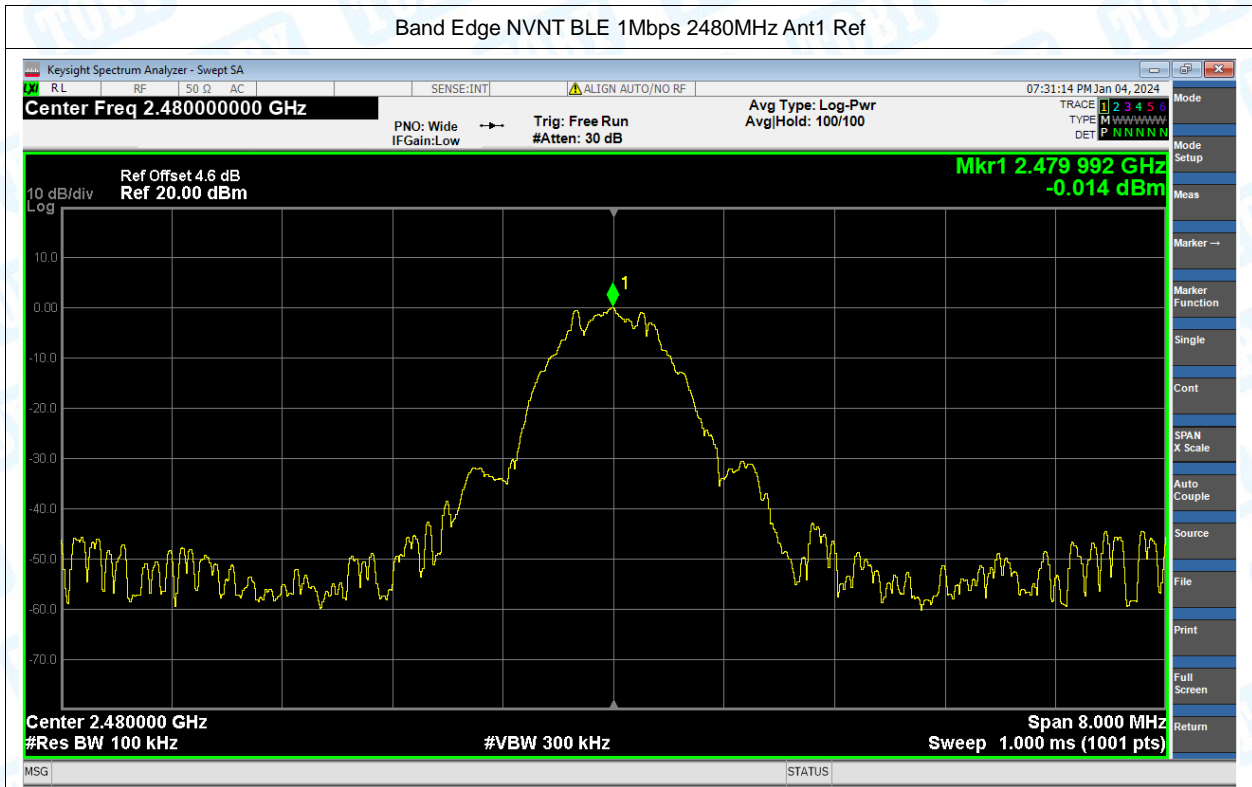
Test Graphs

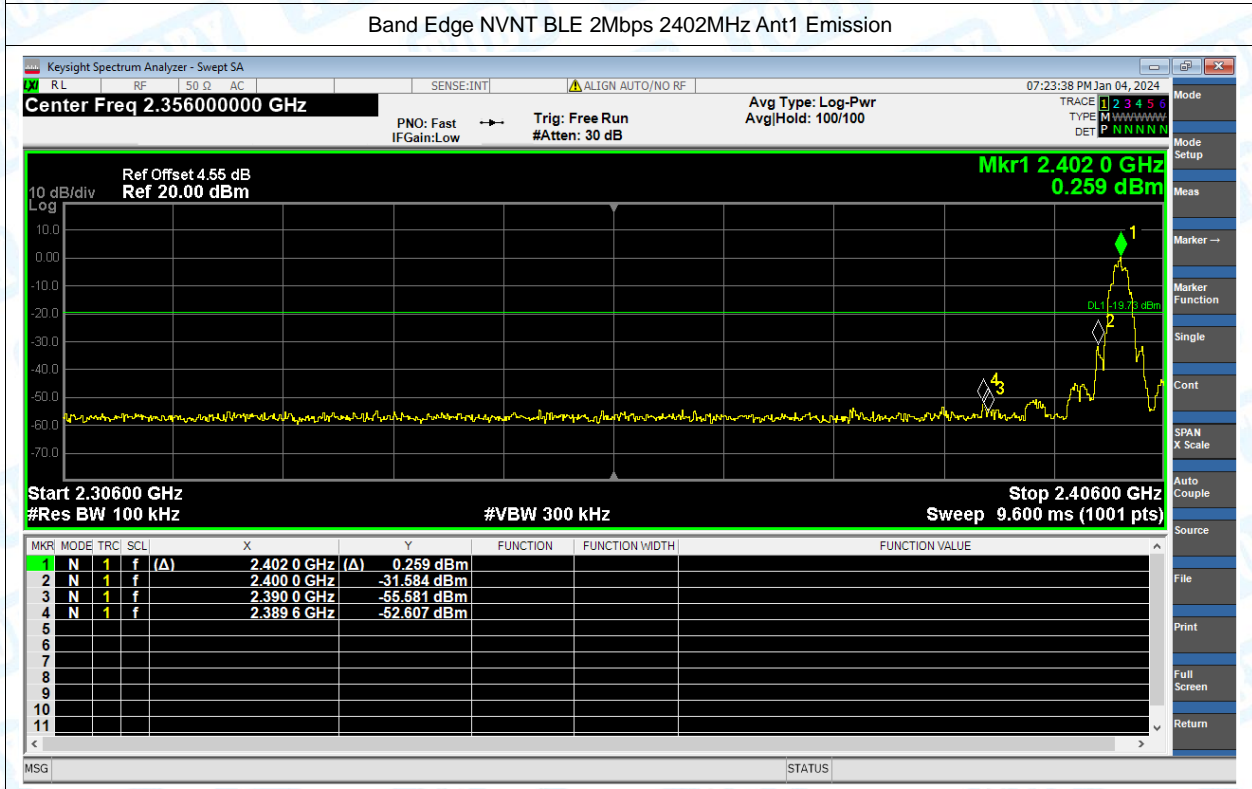
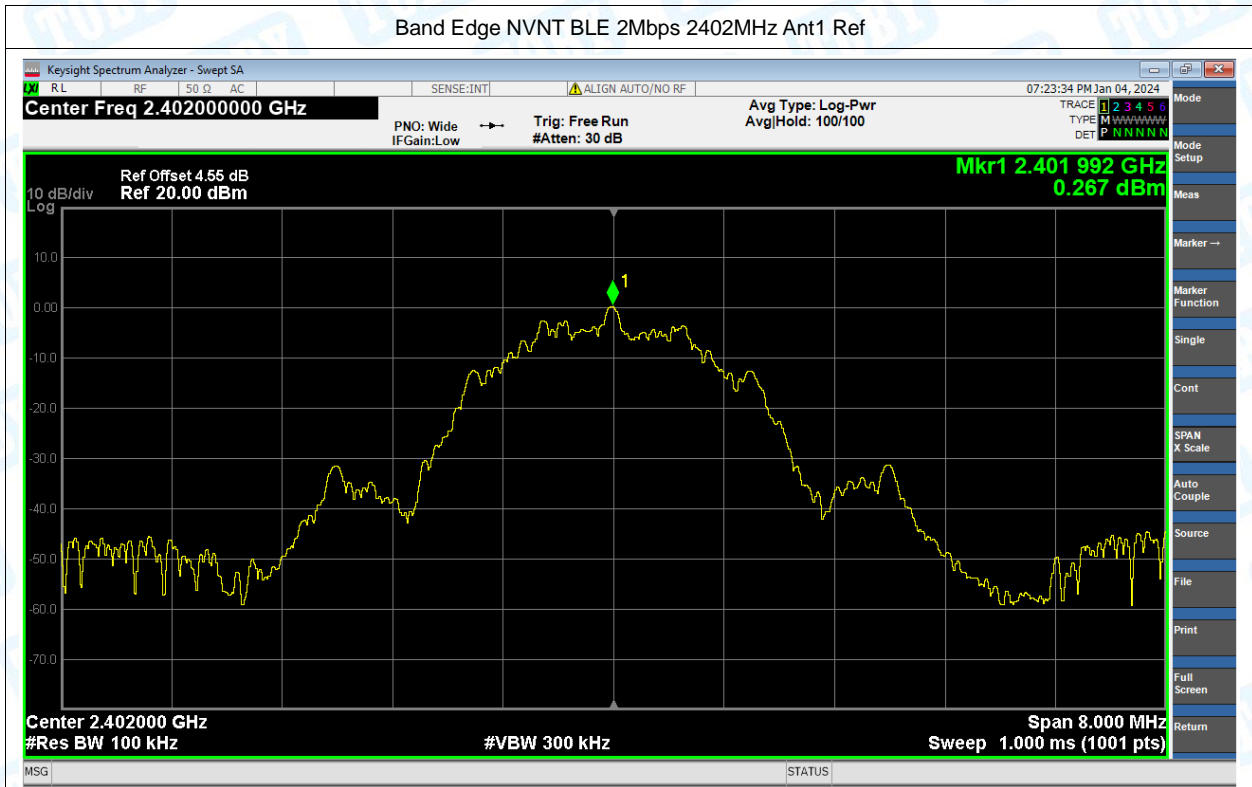
Band Edge NVNT BLE 1Mbps 2402MHz Ant1 Ref

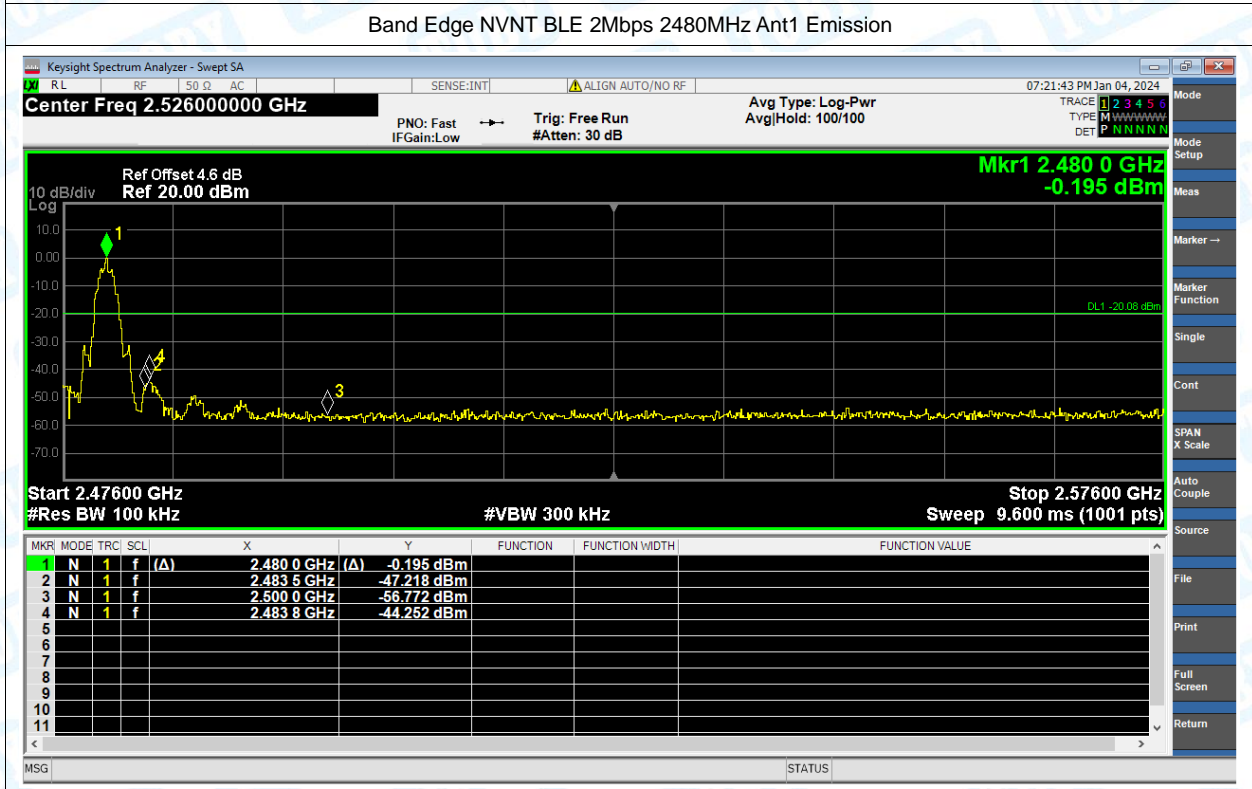


Band Edge NVNT BLE 1Mbps 2402MHz Ant1 Emission







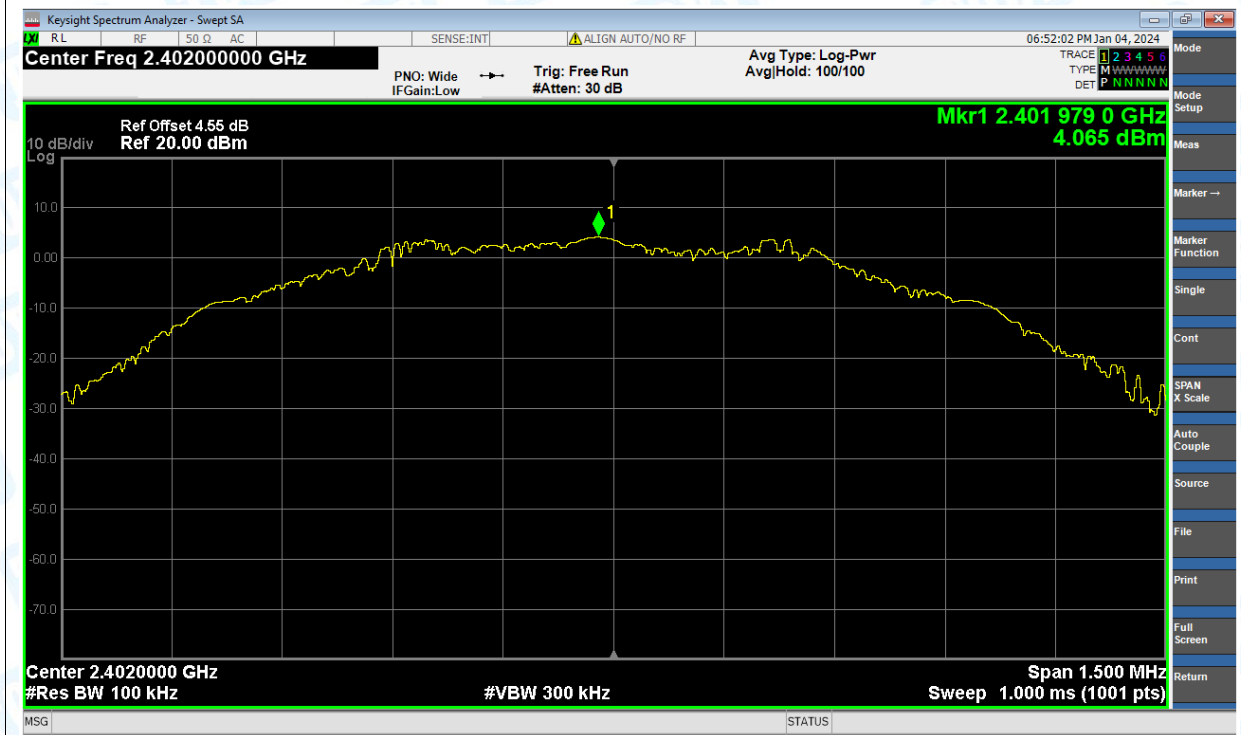


7. Conducted RF Spurious Emission

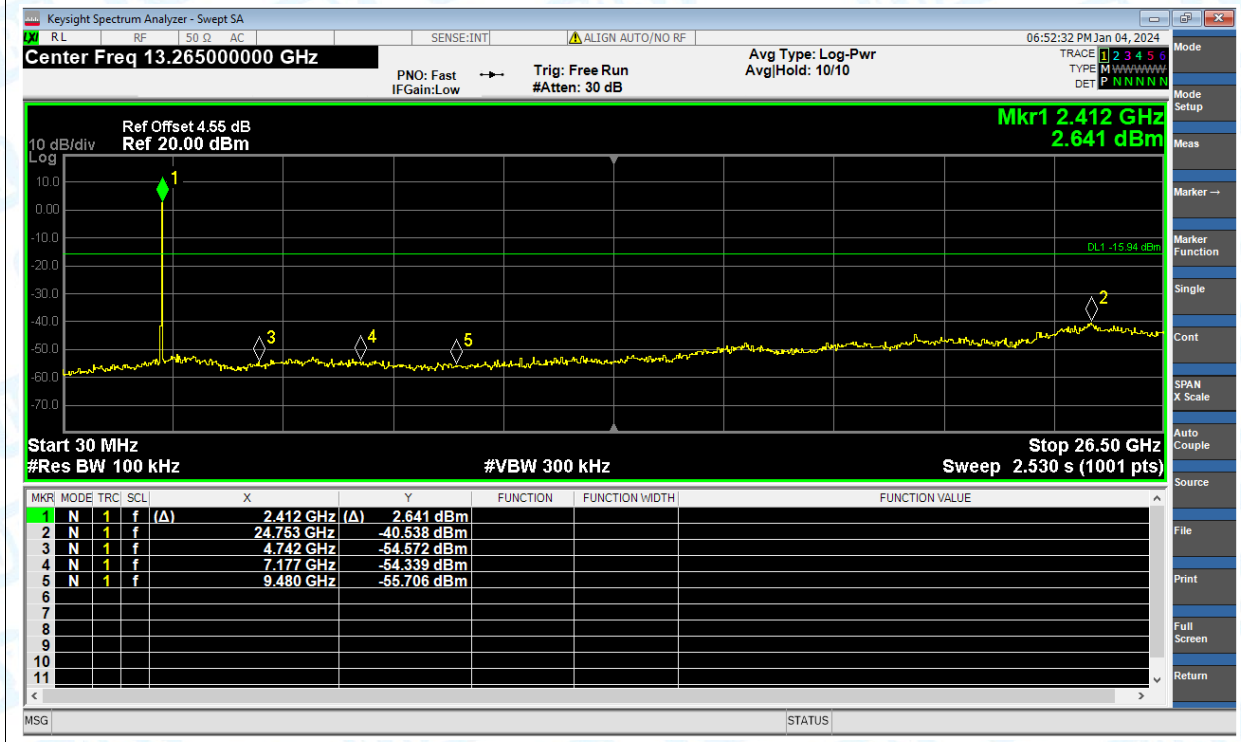
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1Mbps	2402	Ant1	-44.61	-20	Pass
NVNT	BLE 1Mbps	2440	Ant1	-43.87	-20	Pass
NVNT	BLE 1Mbps	2480	Ant1	-44.29	-20	Pass
NVNT	BLE 2Mbps	2402	Ant1	-40.28	-20	Pass
NVNT	BLE 2Mbps	2440	Ant1	-44	-20	Pass
NVNT	BLE 2Mbps	2480	Ant1	-40.49	-20	Pass

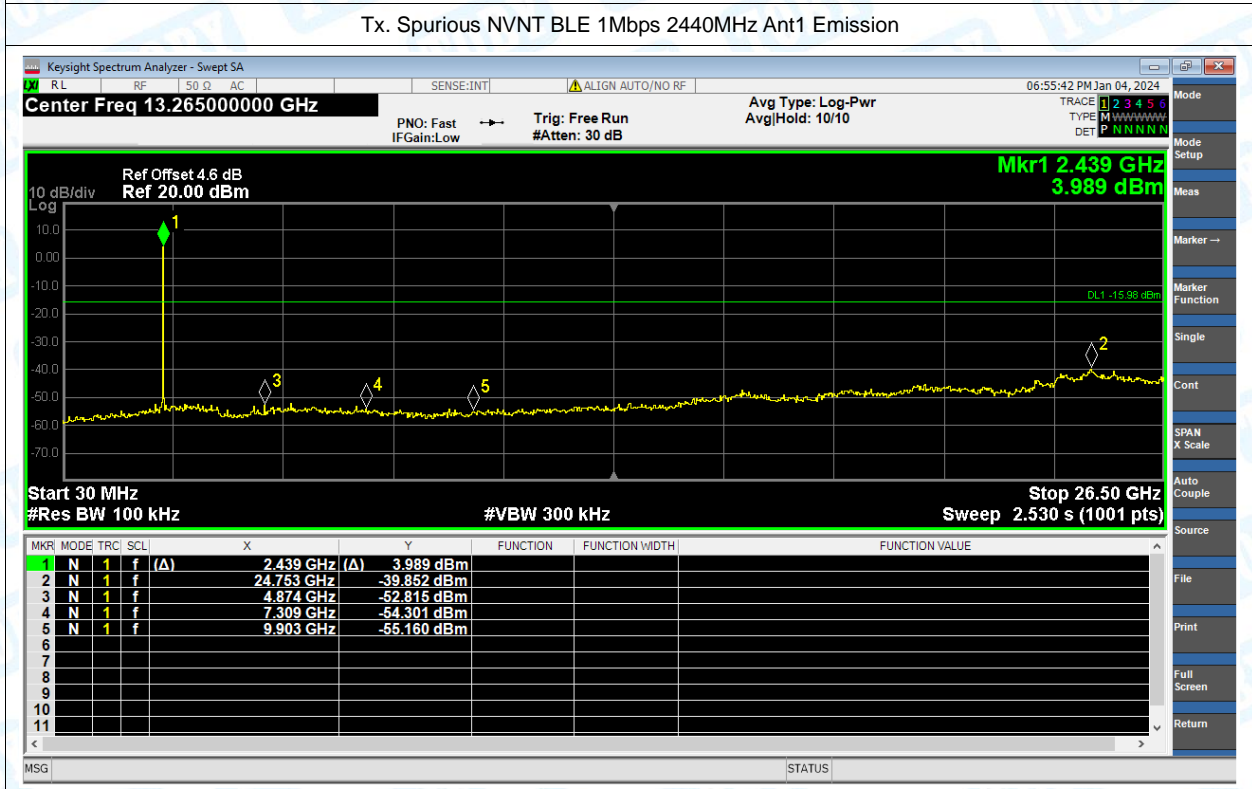
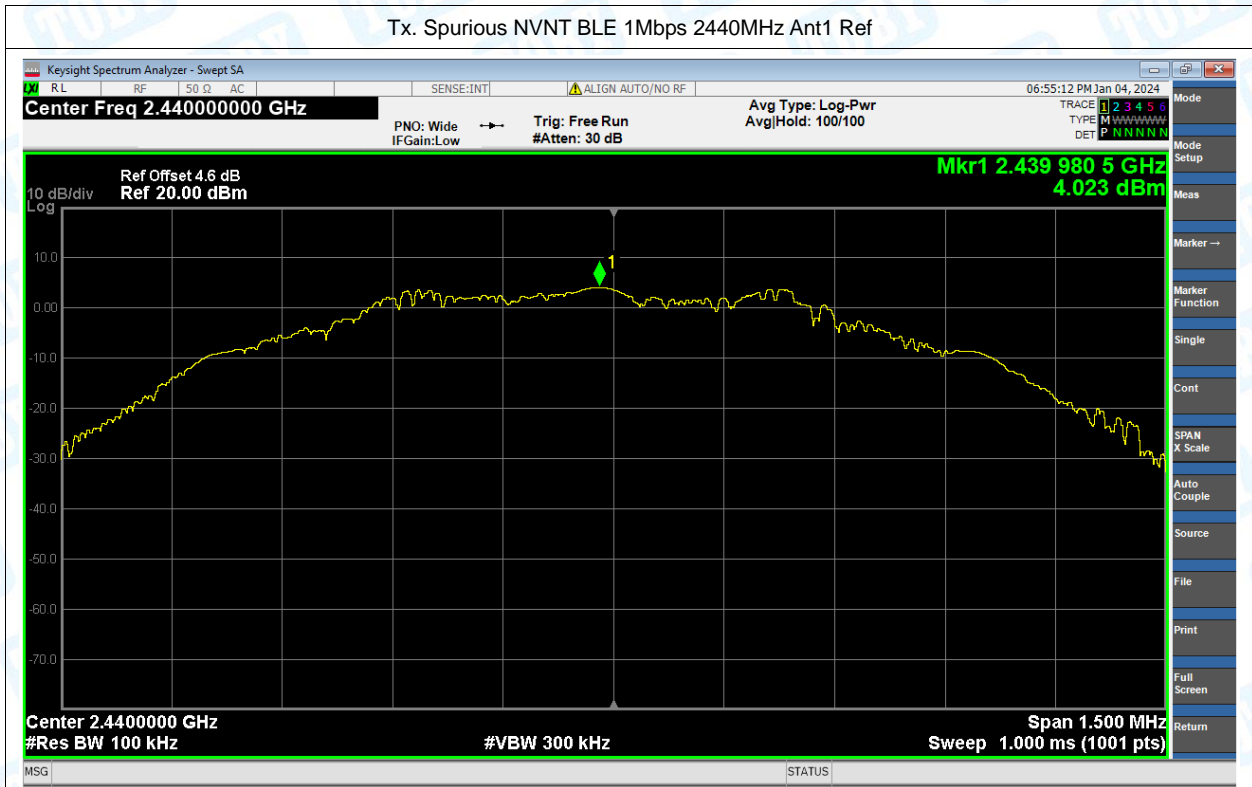
Test Graphs

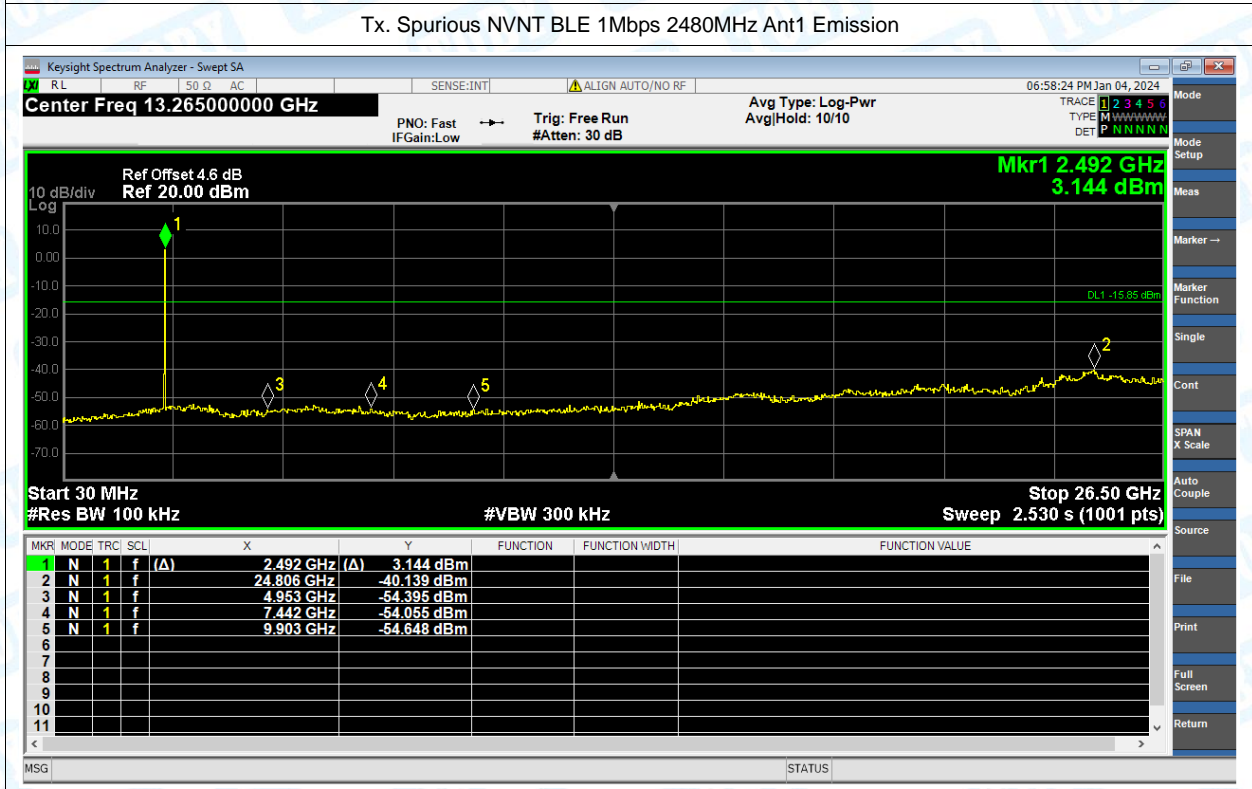
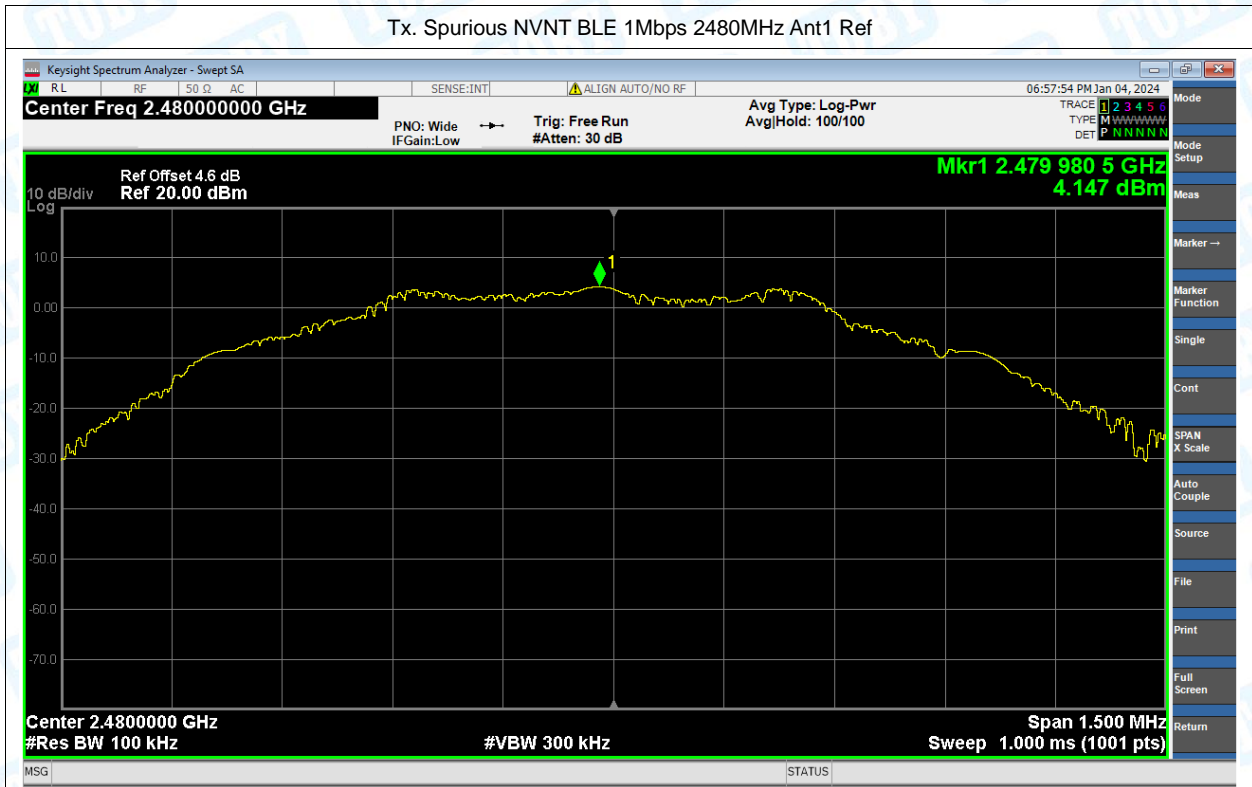
Tx. Spurious NVNT BLE 1Mbps 2402MHz Ant1 Ref

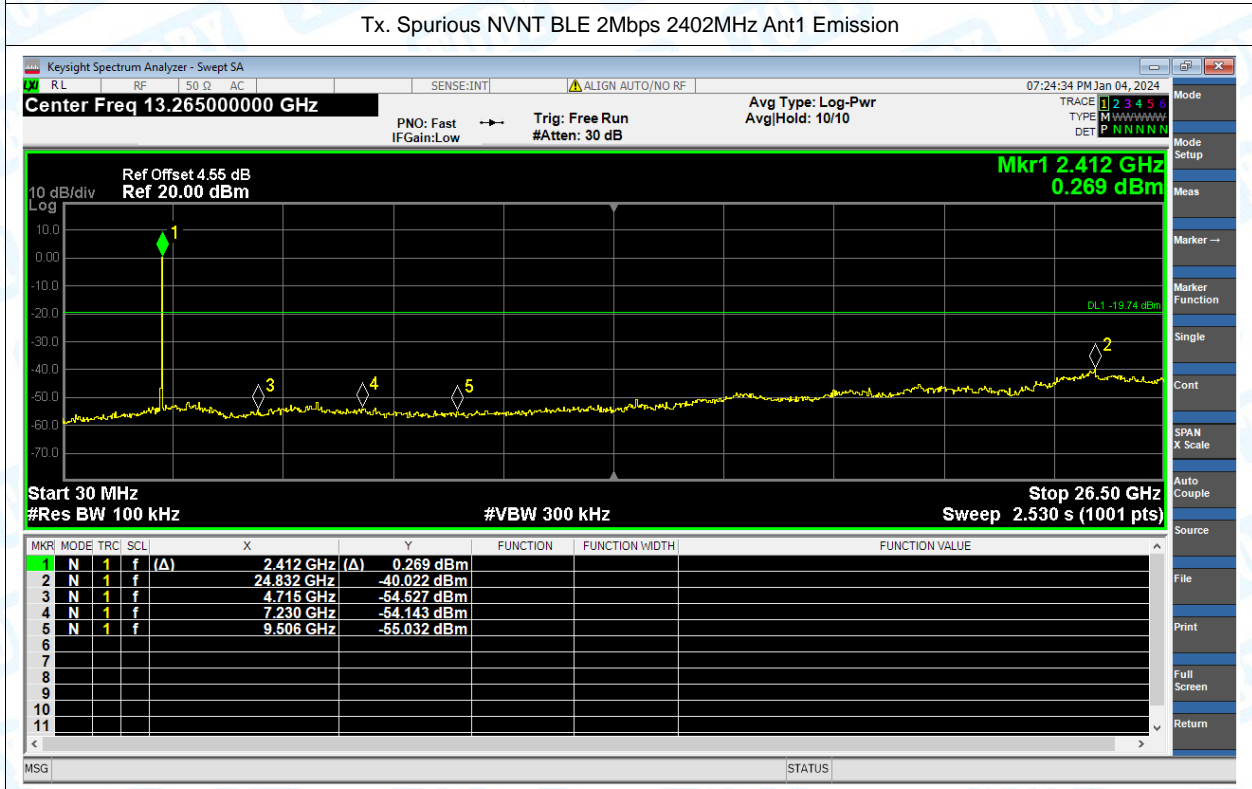
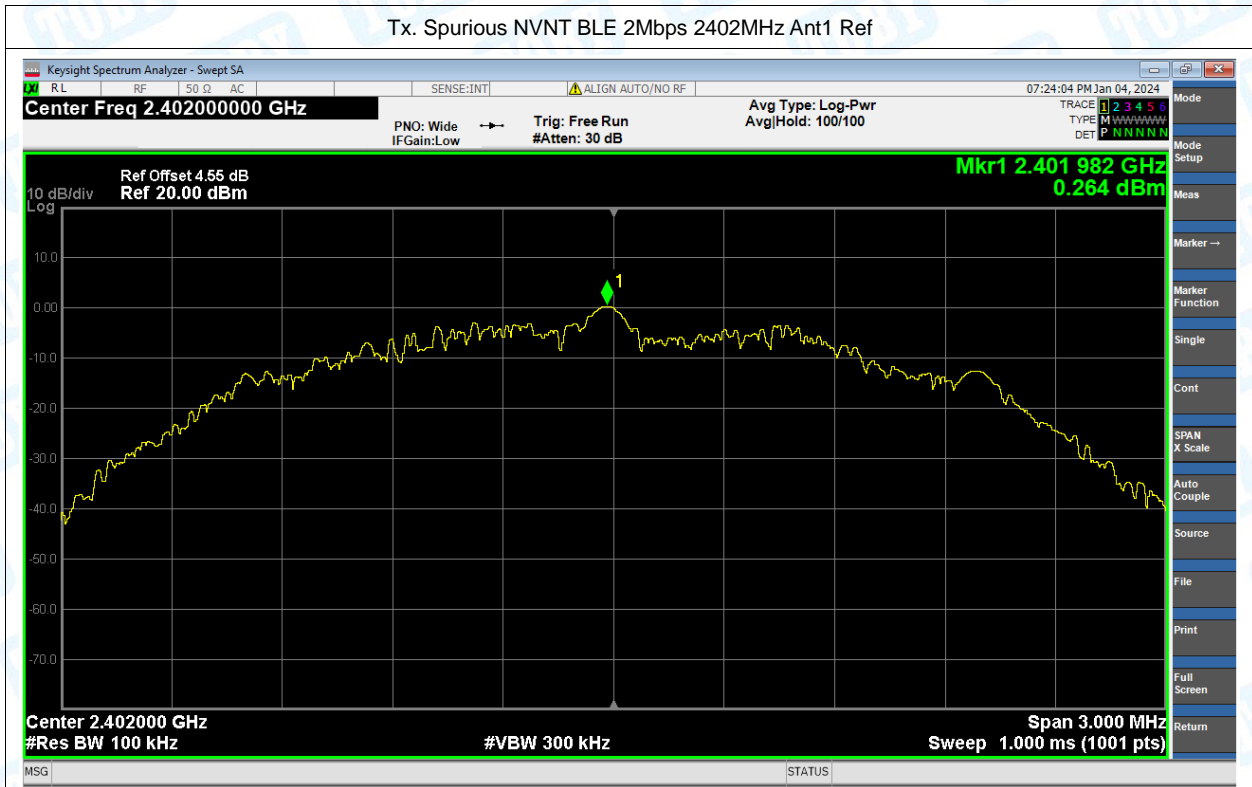


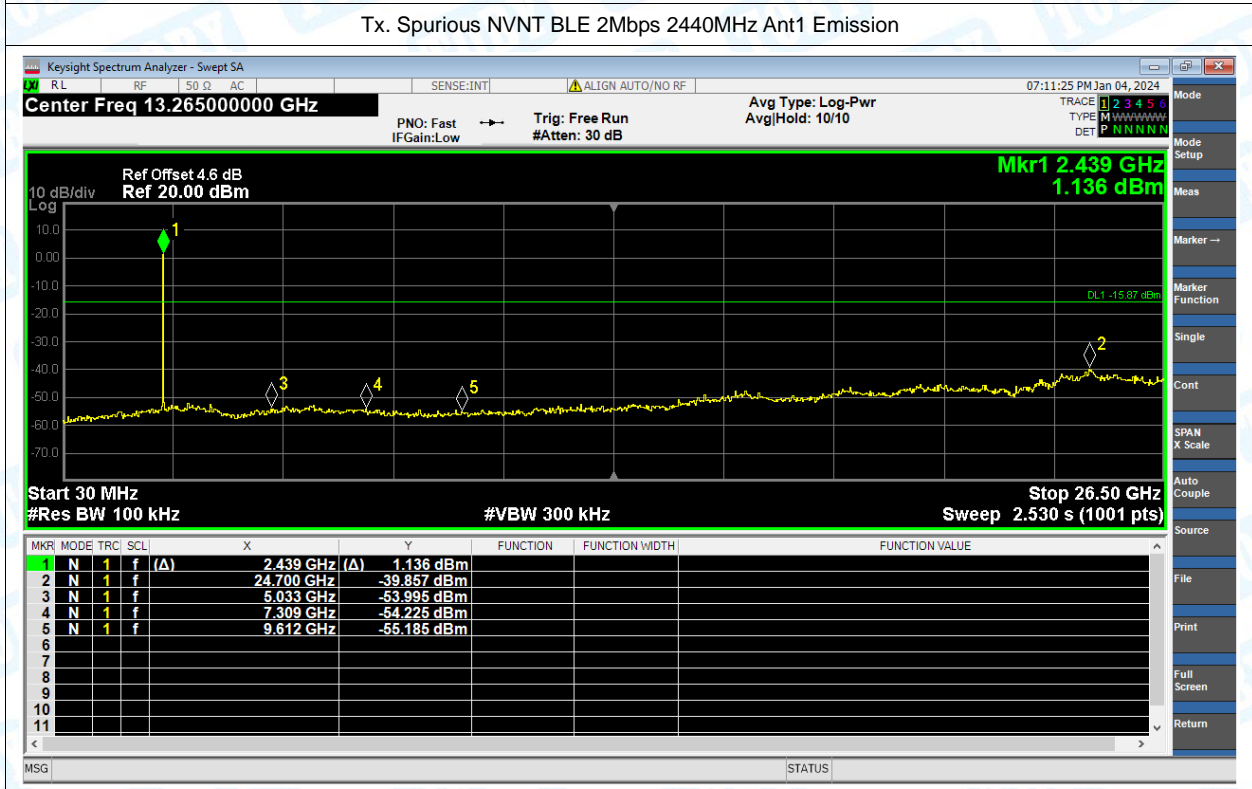
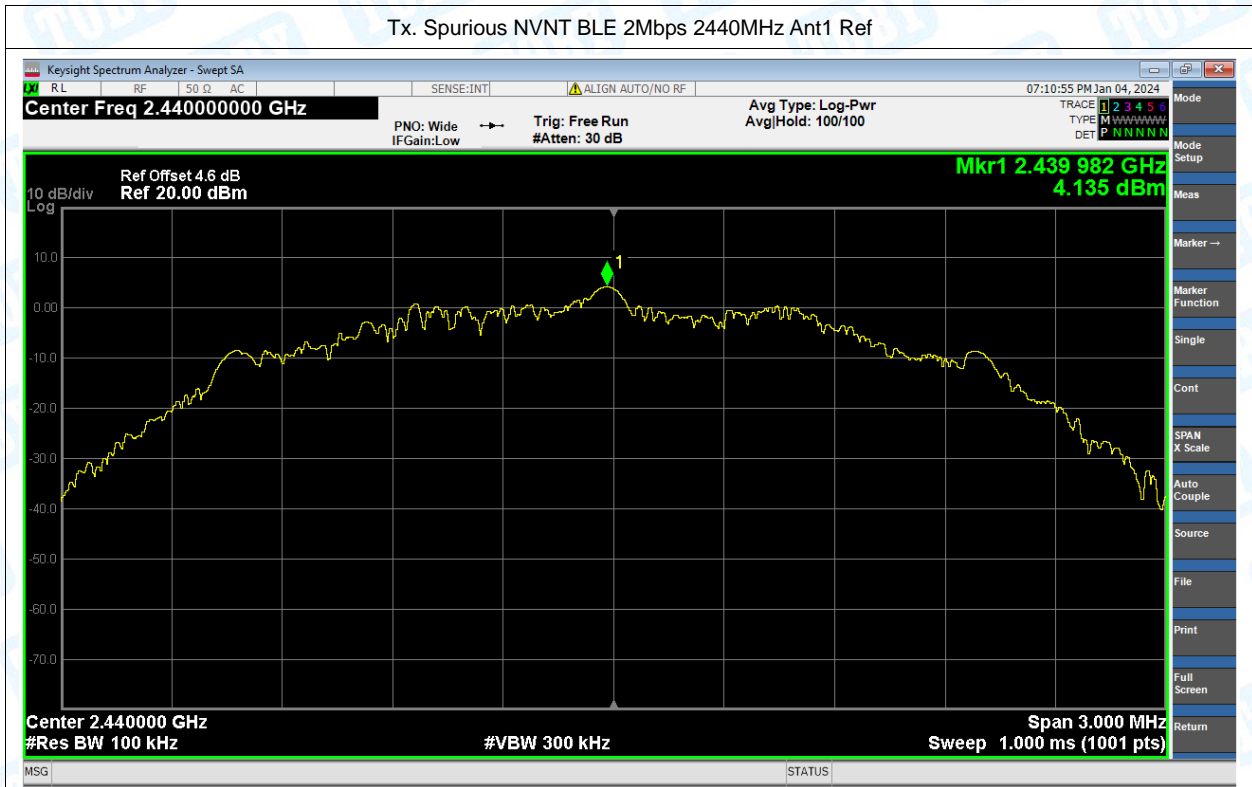
Tx. Spurious NVNT BLE 1Mbps 2402MHz Ant1 Emission

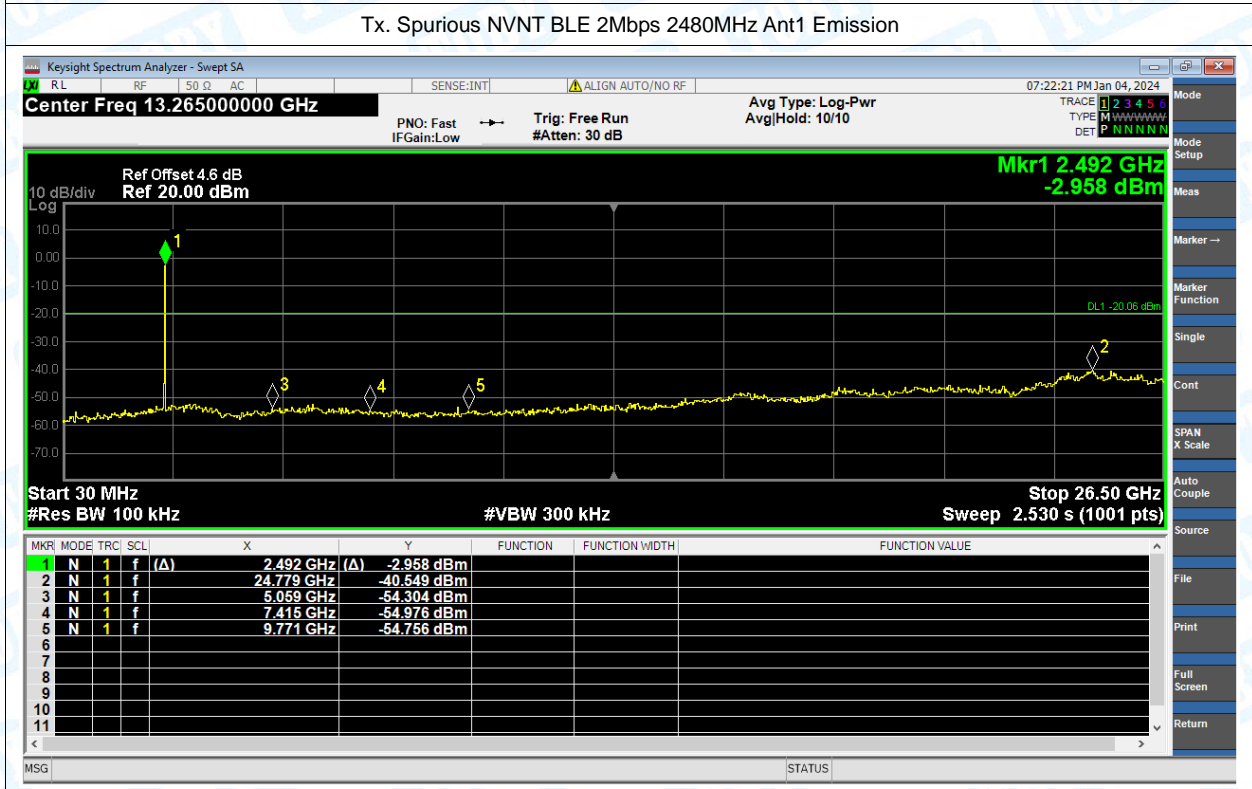
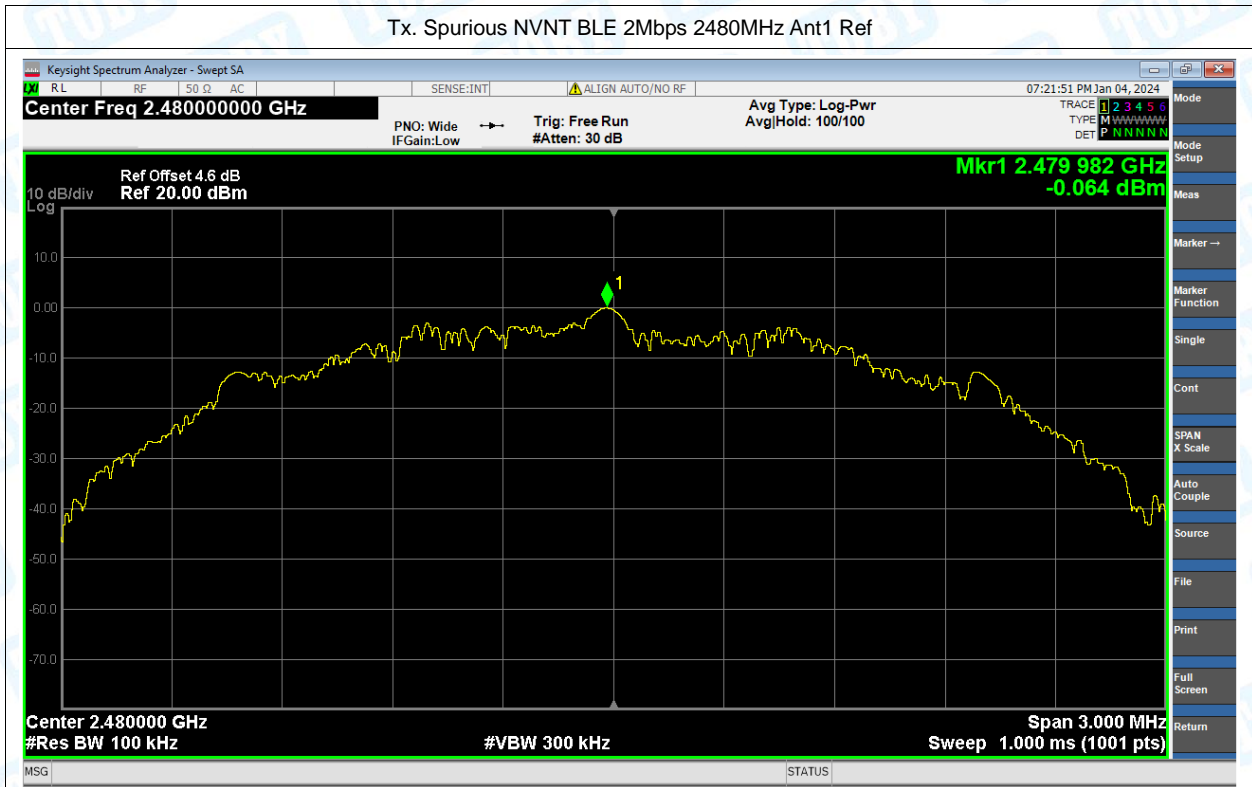












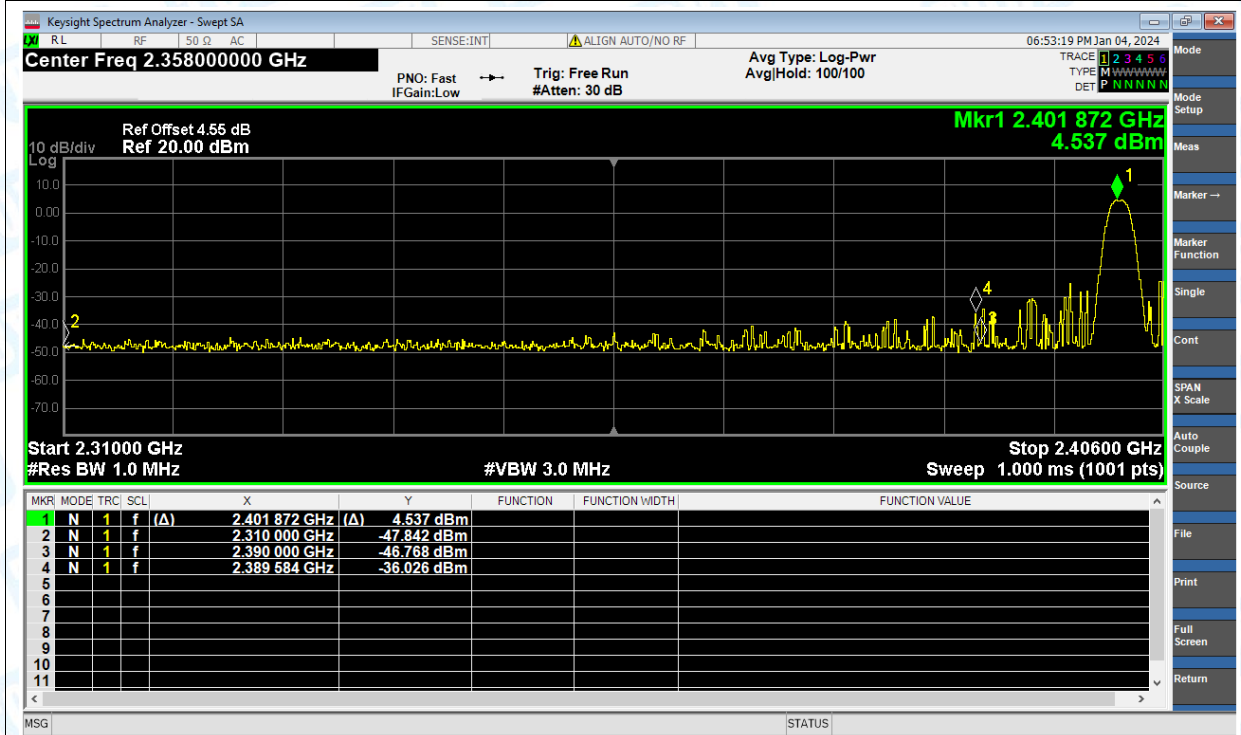
8.Restrict Band

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	-47.84	2.5	-	49.92	Peak	74	Pass
NVNT	BLE 1Mbps	2402	Ant1	2310	-56.12	2.5	3.34	44.98	Average	54	Pass
NVNT	BLE 1Mbps	2402	Ant1	2389.584	-36.03	2.5	-	61.73	Peak	74	Pass
NVNT	BLE 1Mbps	2402	Ant1	2389.872	-50.21	2.5	3.34	50.89	Average	54	Pass
NVNT	BLE 1Mbps	2402	Ant1	2390	-46.77	2.5	-	50.99	Peak	74	Pass
NVNT	BLE 1Mbps	2402	Ant1	2390	-53.83	2.5	3.34	47.27	Average	54	Pass
NVNT	BLE 1Mbps	2480	Ant1	2483.5	-56.19	2.5	-	41.57	Peak	74	Pass
NVNT	BLE 1Mbps	2480	Ant1	2483.5	-64.59	2.5	3.33	36.5	Average	54	Pass
NVNT	BLE 1Mbps	2480	Ant1	2484.04	-30.36	2.5	-	67.4	Peak	74	Pass
NVNT	BLE 1Mbps	2480	Ant1	2483.584	-50.76	2.5	3.33	50.33	Average	54	Pass
NVNT	BLE 1Mbps	2480	Ant1	2500	-57.72	2.5	-	40.04	Peak	74	Pass
NVNT	BLE 1Mbps	2480	Ant1	2500	-63.29	2.5	3.33	37.8	Average	54	Pass
NVNT	BLE 2Mbps	2402	Ant1	2310	-59.28	2.5	-	38.48	Peak	74	Pass
NVNT	BLE 2Mbps	2402	Ant1	2310	-65.4	2.5	6.33	38.69	Average	54	Pass
NVNT	BLE 2Mbps	2402	Ant1	2389.776	-35.19	2.5	-	62.57	Peak	74	Pass
NVNT	BLE 2Mbps	2402	Ant1	2389.872	-55.31	2.5	6.33	48.78	Average	54	Pass
NVNT	BLE 2Mbps	2402	Ant1	2390	-48.38	2.5	-	49.38	Peak	74	Pass
NVNT	BLE 2Mbps	2402	Ant1	2390	-61.51	2.5	6.33	42.58	Average	54	Pass
NVNT	BLE 2Mbps	2480	Ant1	2483.5	-56.91	2.5	-	40.85	Peak	74	Pass
NVNT	BLE 2Mbps	2480	Ant1	2483.5	-64.73	2.5	6.33	39.36	Average	54	Pass
NVNT	BLE 2Mbps	2480	Ant1	2483.584	-34.24	2.5	-	63.52	Peak	74	Pass

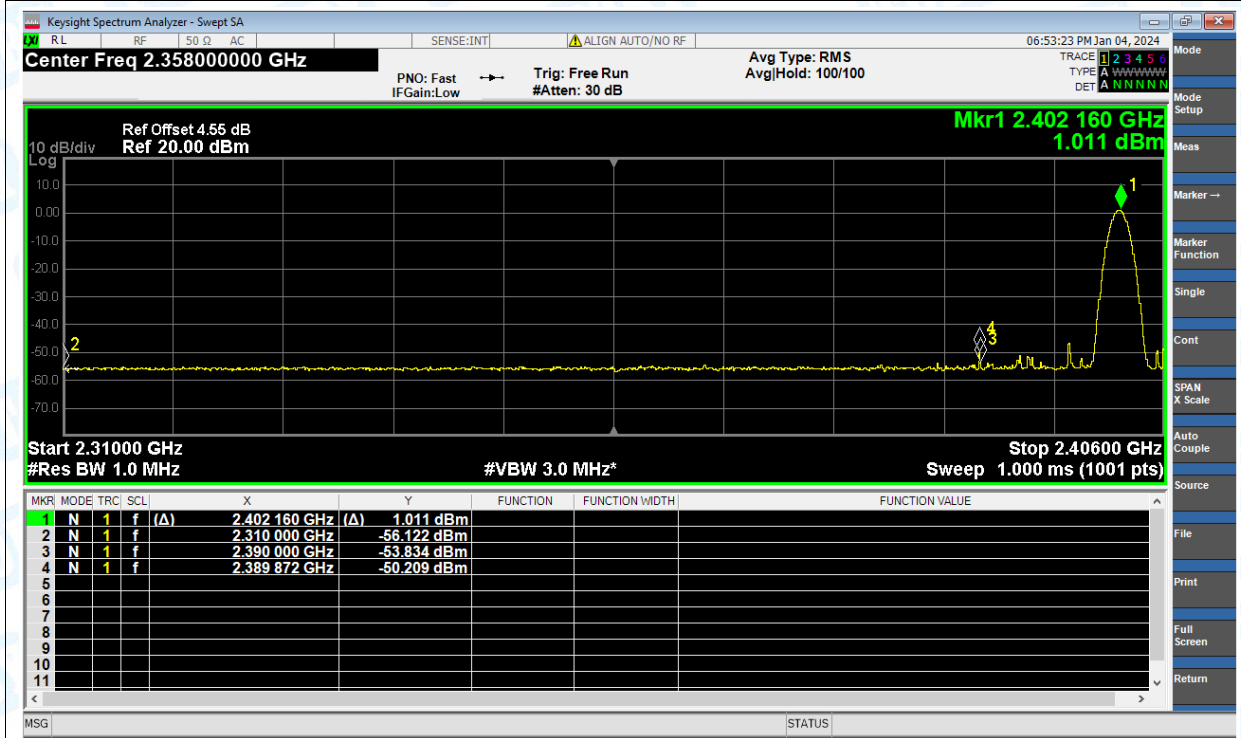
NVNT	BLE 2Mbps	2480	Ant1	2483.56	-52.15	2.5	6.33	51.94	Average	54	Pass
NVNT	BLE 2Mbps	2480	Ant1	2500	-56.86	2.5	-	40.9	Peak	74	Pass
NVNT	BLE 2Mbps	2480	Ant1	2500	-65.05	2.5	6.33	39.04	Average	54	Pass

Test Graphs

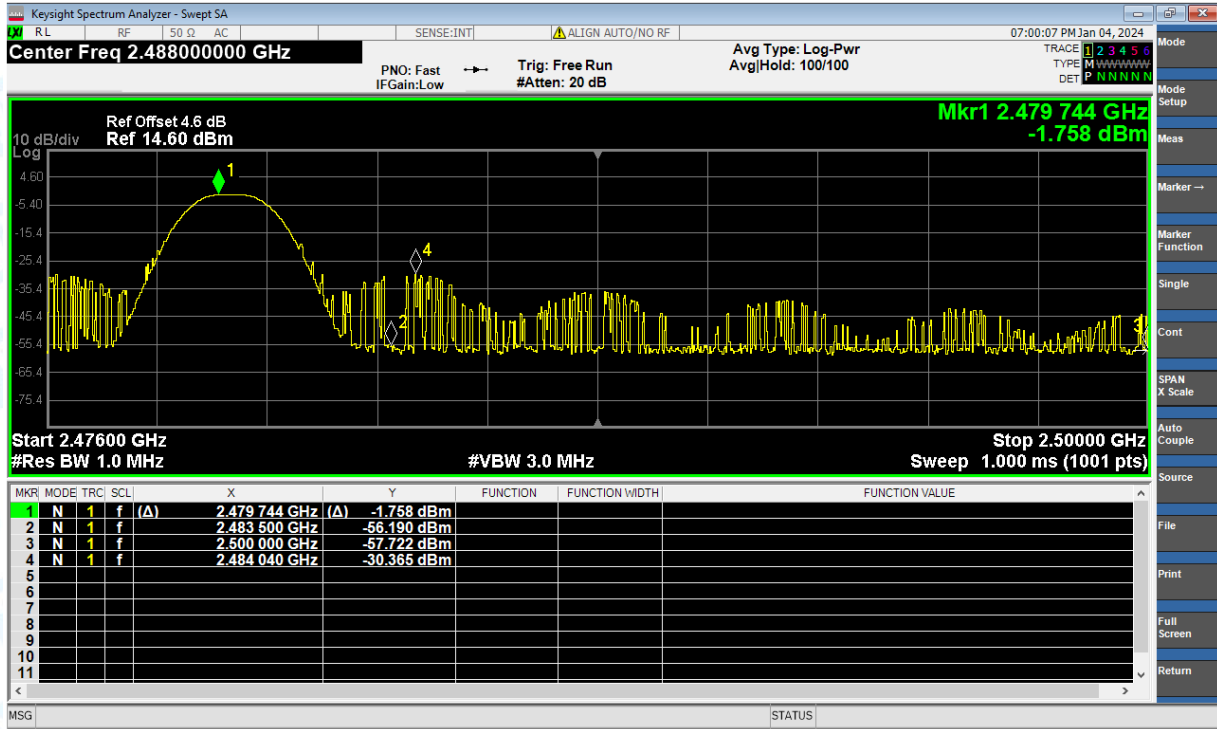
Restrict Band NVNT BLE 1Mbps 2402MHz Ant1 Peak



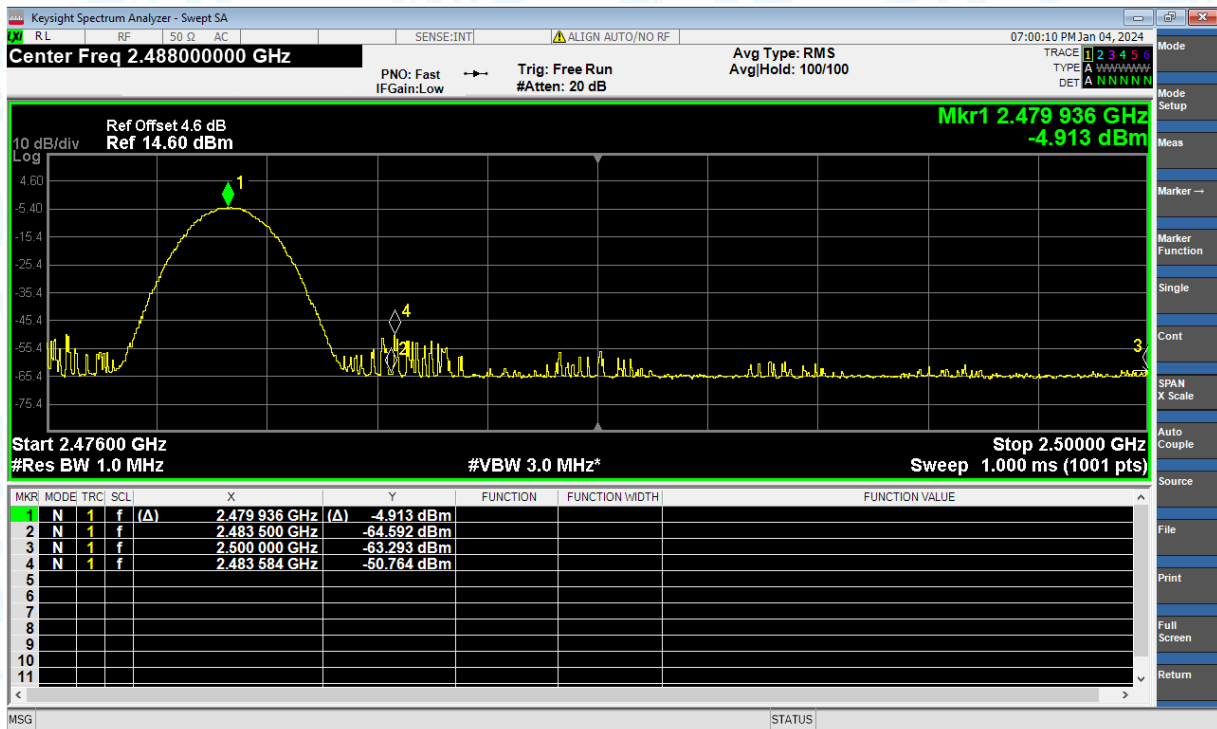
Restrict Band NVNT BLE 1Mbps 2402MHz Ant1 Average



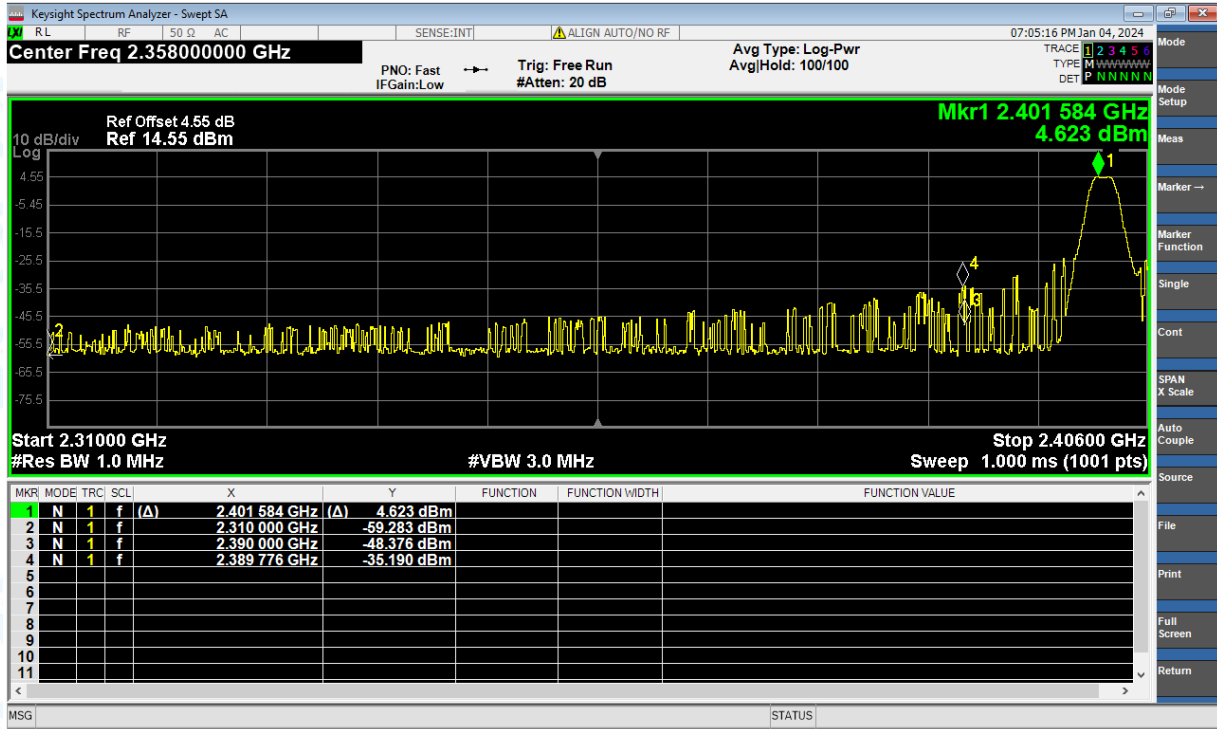
Restrict Band NVNT BLE 1Mbps 2480MHz Ant1 Peak



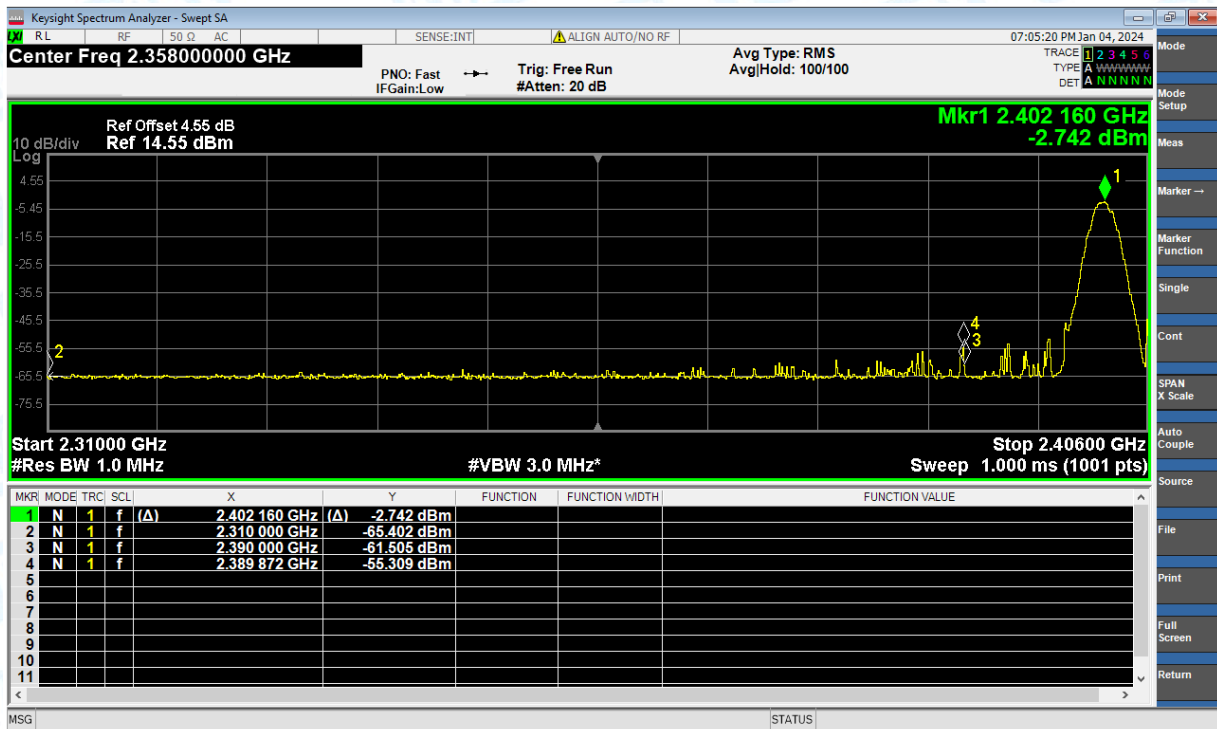
Restrict Band NVNT BLE 1Mbps 2480MHz Ant1 Average



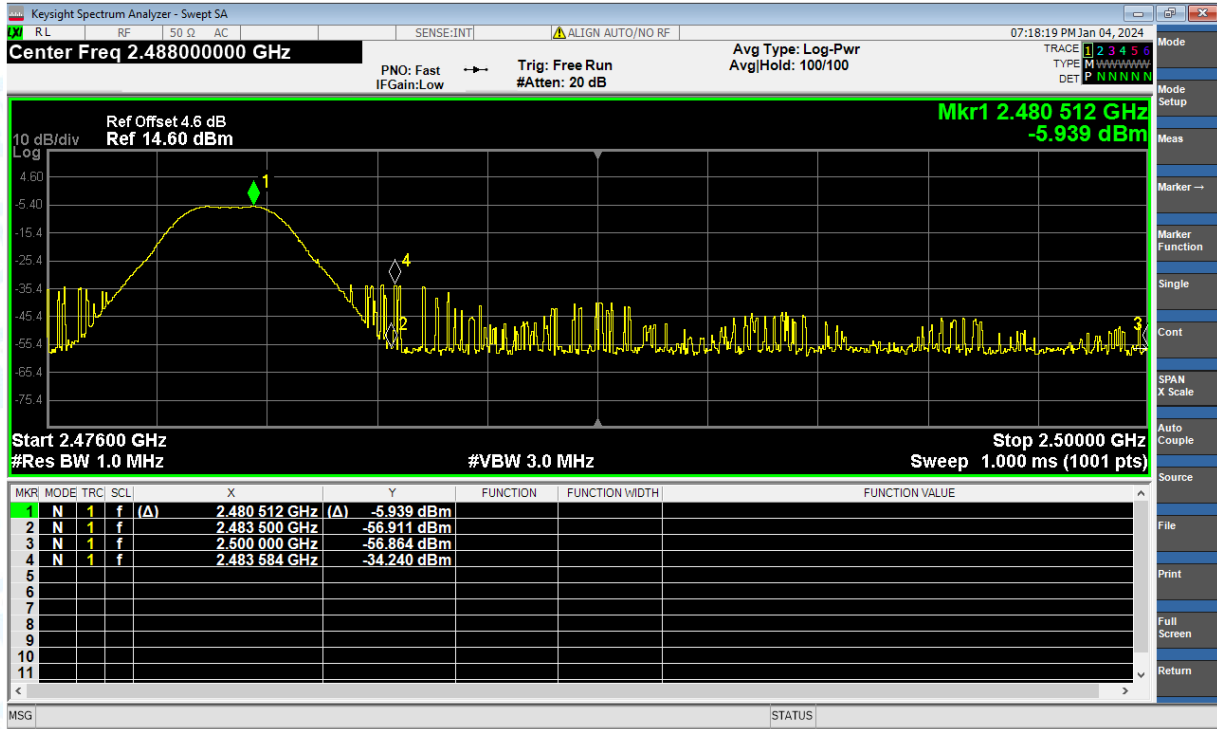
Restrict Band NVNT BLE 2Mbps 2402MHz Ant1 Peak



Restrict Band NVNT BLE 2Mbps 2402MHz Ant1 Average



Restrict Band NVNT BLE 2Mbps 2480MHz Ant1 Peak



Restrict Band NVNT BLE 2Mbps 2480MHz Ant1 Average

