

RF Test Data for Bluetooth LE (Conducted Measurements)

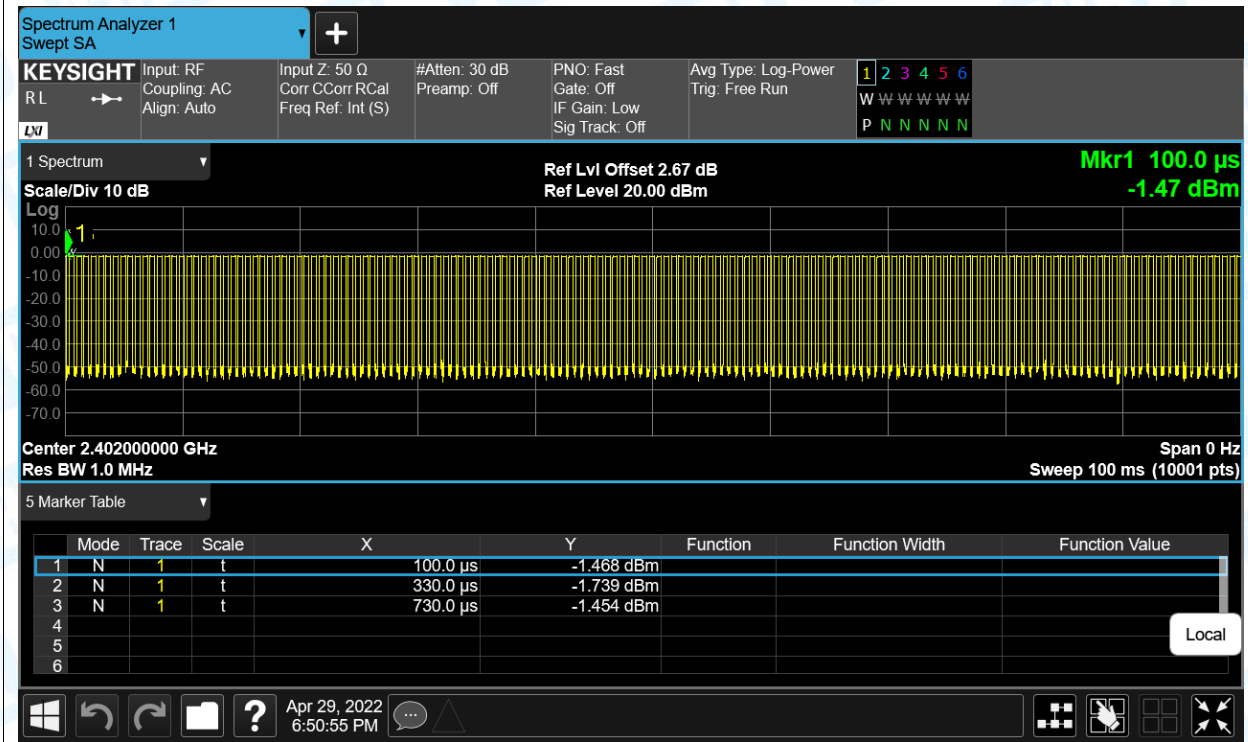
General Description of EUT	
Product Name:	NRF52180 BLE Tag, BLE module
Test Model:	NRF52810-X5
Sample ID:	202203-0343-1-2-2#
Environmental Conditions	
Temperature:	24°C
Relative Humidity:	50%
Test Voltage:	DC3V
Test Engineer:	Huangjianping
Note: For a more detailed features description, please refer to the report TBR-C-202203-0343-2.	

Duty Cycle

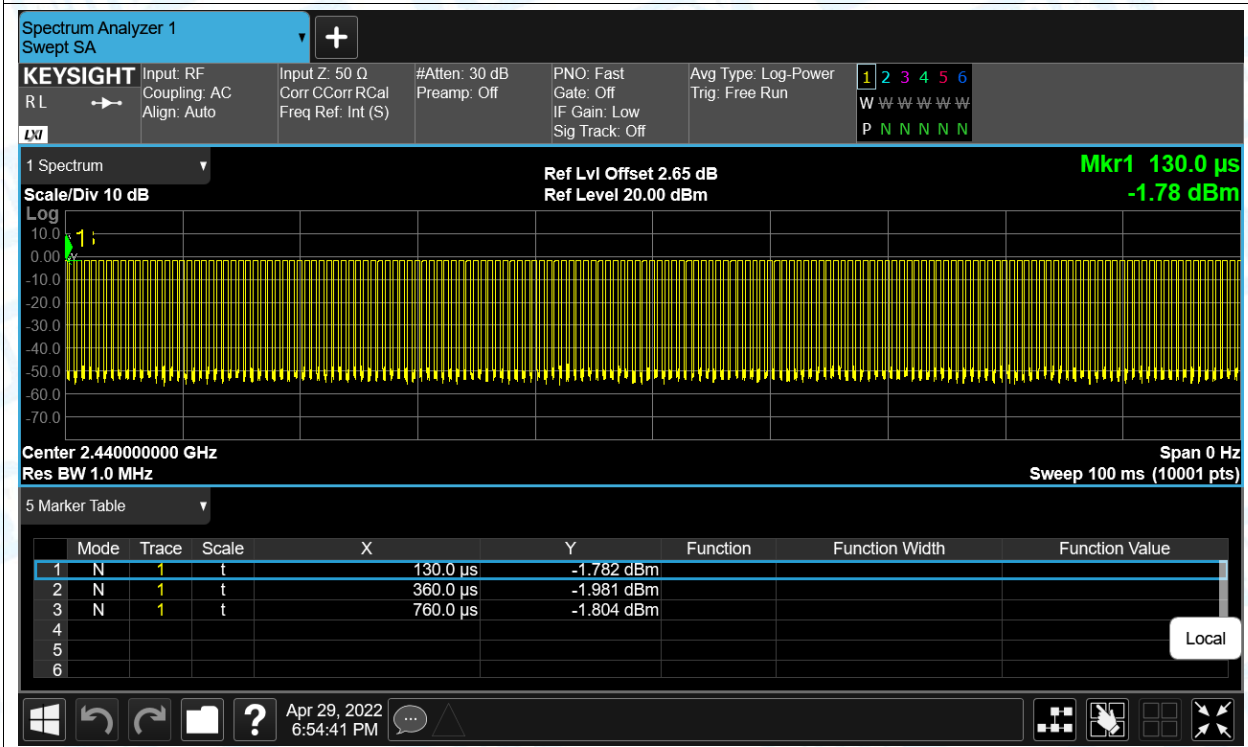
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	BLE 1Mbps	2402	Ant1	64.8	1.88	2.5
NVNT	BLE 1Mbps	2440	Ant1	64.8	1.88	2.5
NVNT	BLE 1Mbps	2480	Ant1	64.79	1.88	2.5
NVNT	BLE 2Mbps	2402	Ant1	35.21	4.53	4.76
NVNT	BLE 2Mbps	2440	Ant1	34.57	4.61	4.76
NVNT	BLE 2Mbps	2480	Ant1	35.2	4.54	4.76

Test Graphs

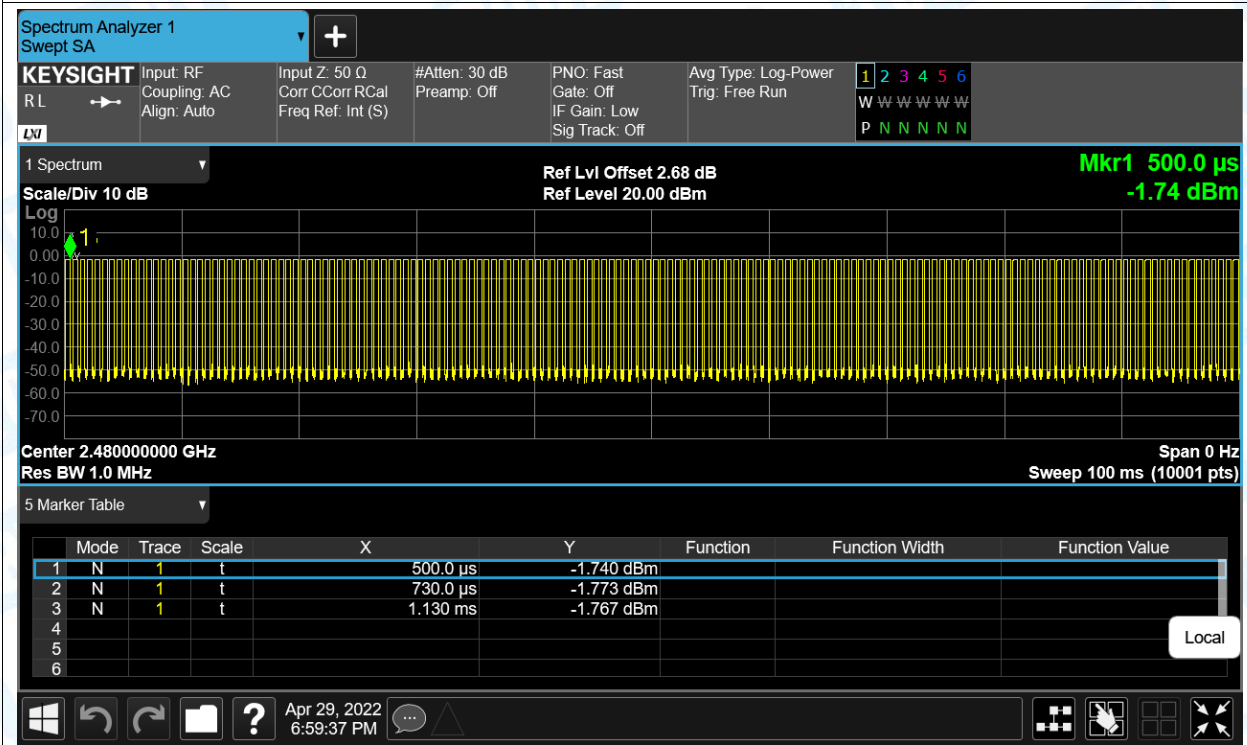
Duty Cycle NVNT BLE 1Mbps 2402MHz Ant1



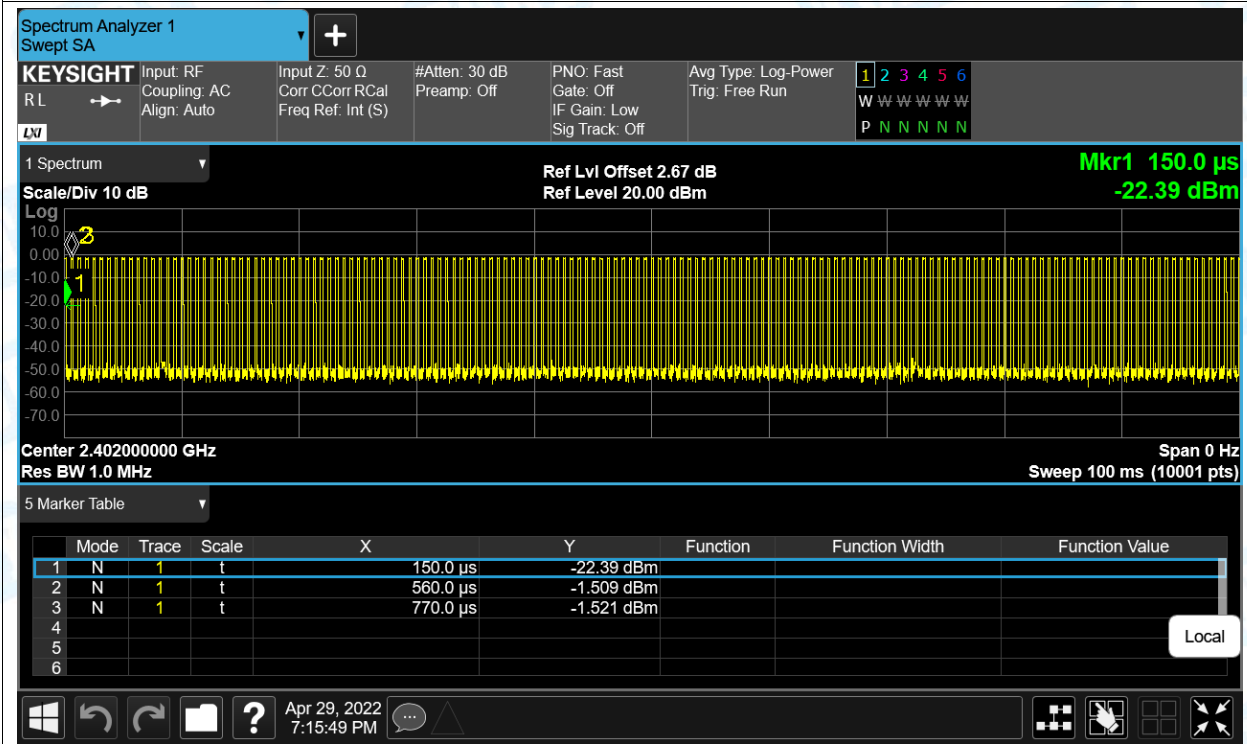
Duty Cycle NVNT BLE 1Mbps 2440MHz Ant1



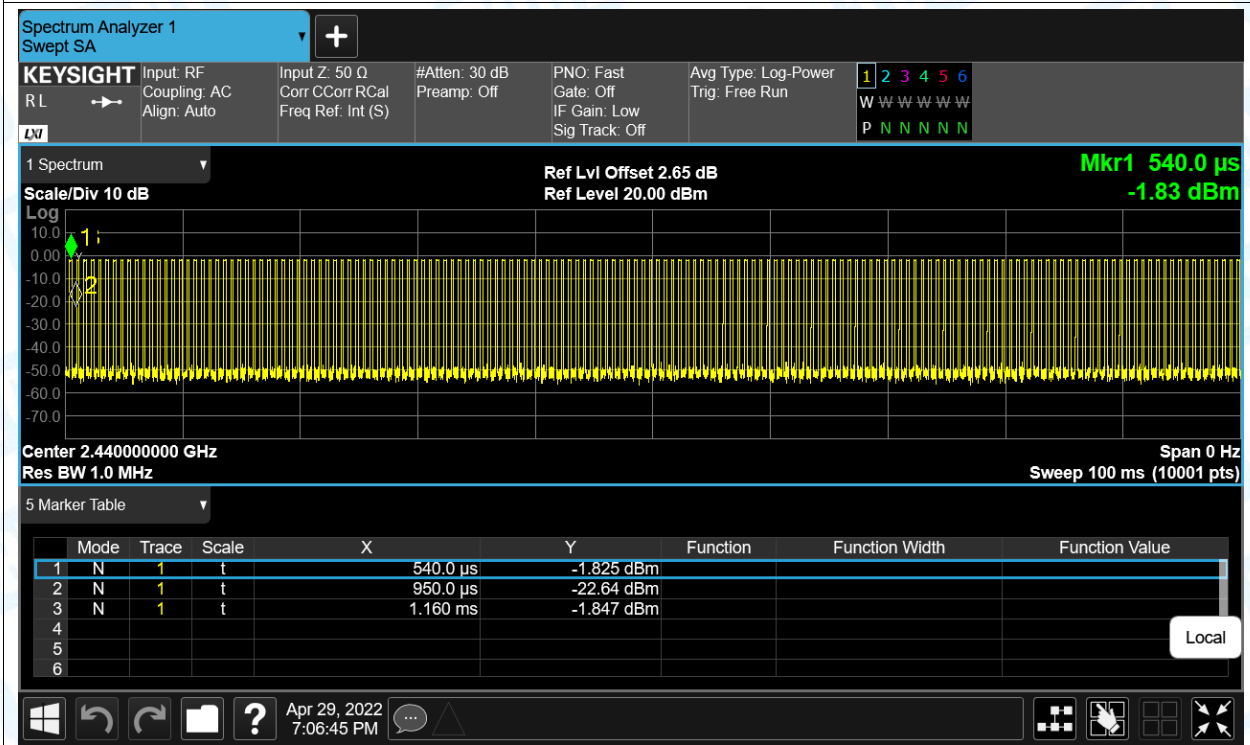
Duty Cycle NVNT BLE 1Mbps 2480MHz Ant1



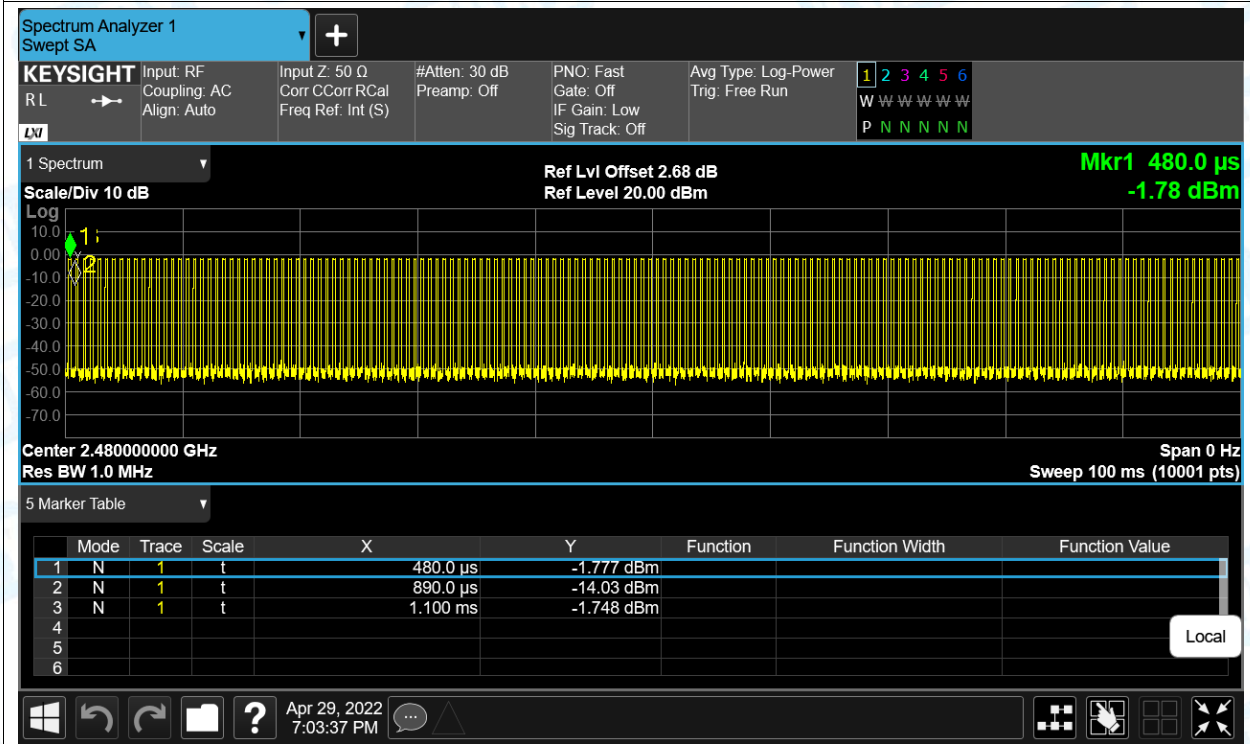
Duty Cycle NVNT BLE 2Mbps 2402MHz Ant1



Duty Cycle NVNT BLE 2Mbps 2440MHz Ant1



Duty Cycle NVNT BLE 2Mbps 2480MHz Ant1

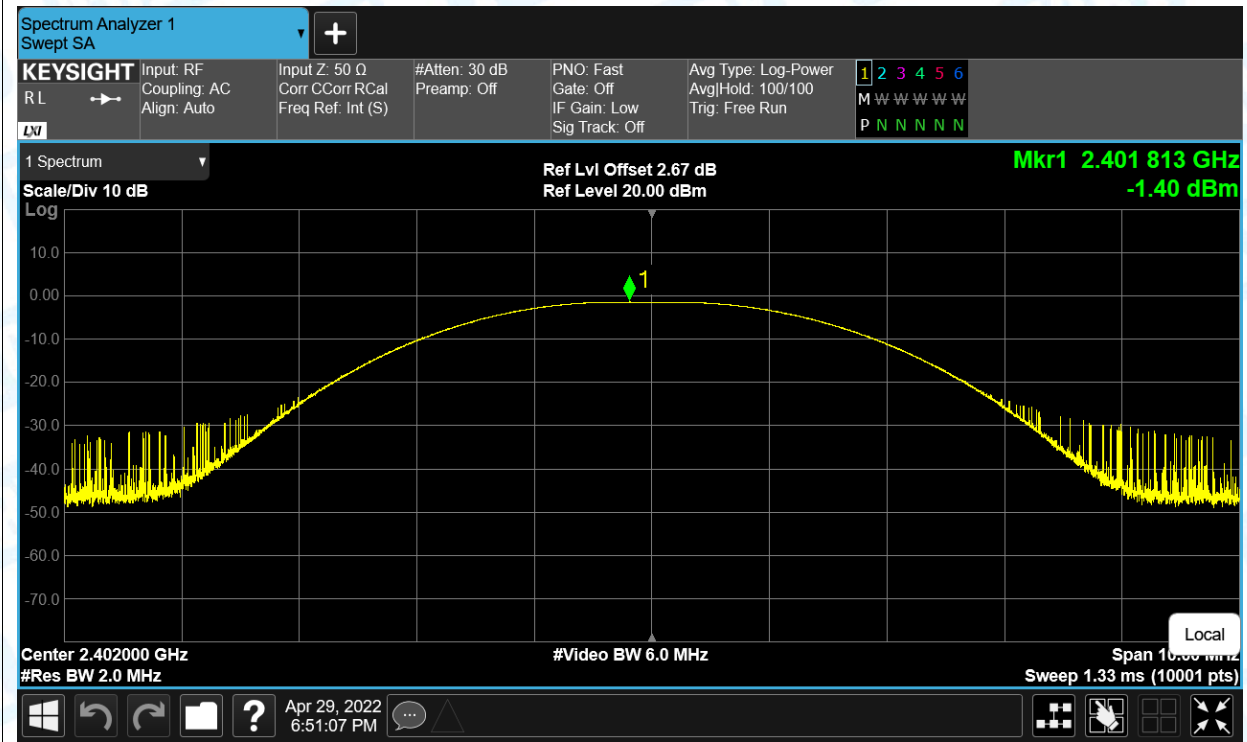


Maximum Conducted Output Power

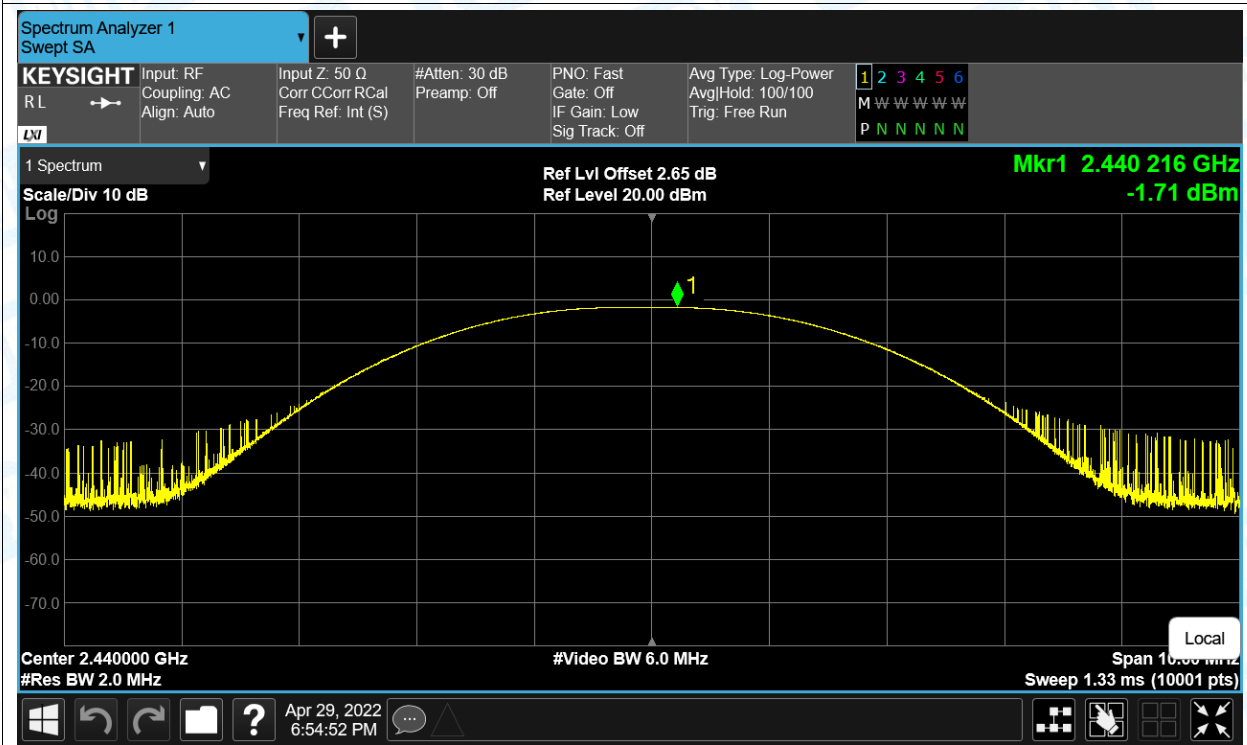
Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	BLE 1Mbps	2402	Ant1	-1.40	30	Pass
NVNT	BLE 1Mbps	2440	Ant1	-1.71	30	Pass
NVNT	BLE 1Mbps	2480	Ant1	-1.65	30	Pass
NVNT	BLE 2Mbps	2402	Ant1	-1.41	30	Pass
NVNT	BLE 2Mbps	2440	Ant1	-1.72	30	Pass
NVNT	BLE 2Mbps	2480	Ant1	-1.65	30	Pass

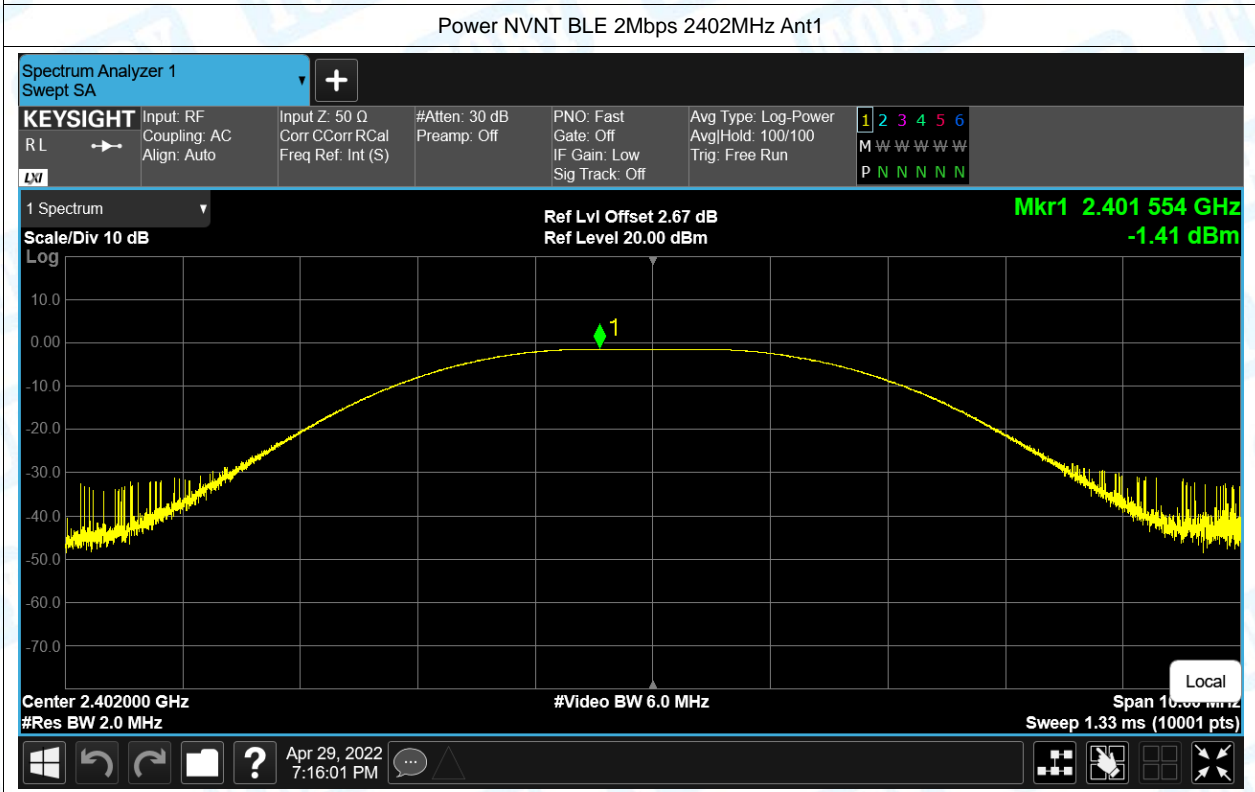
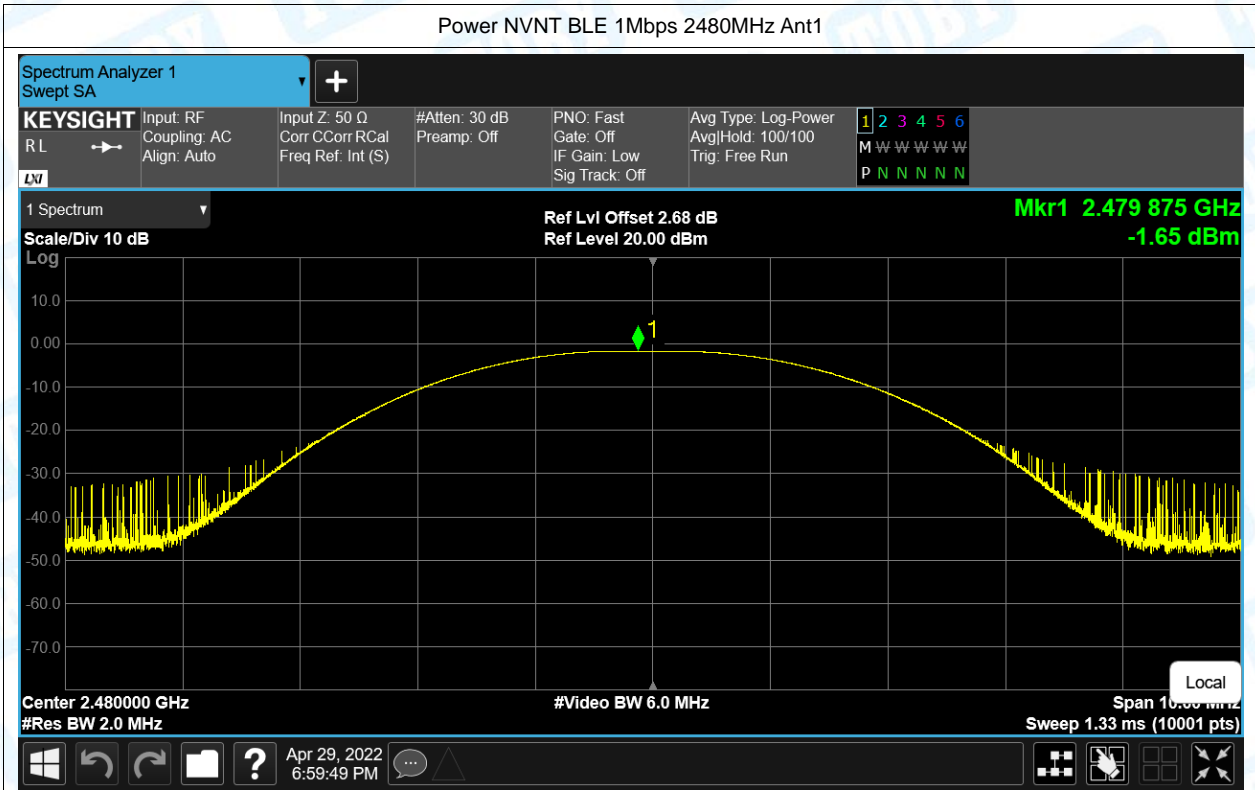
Test Graphs

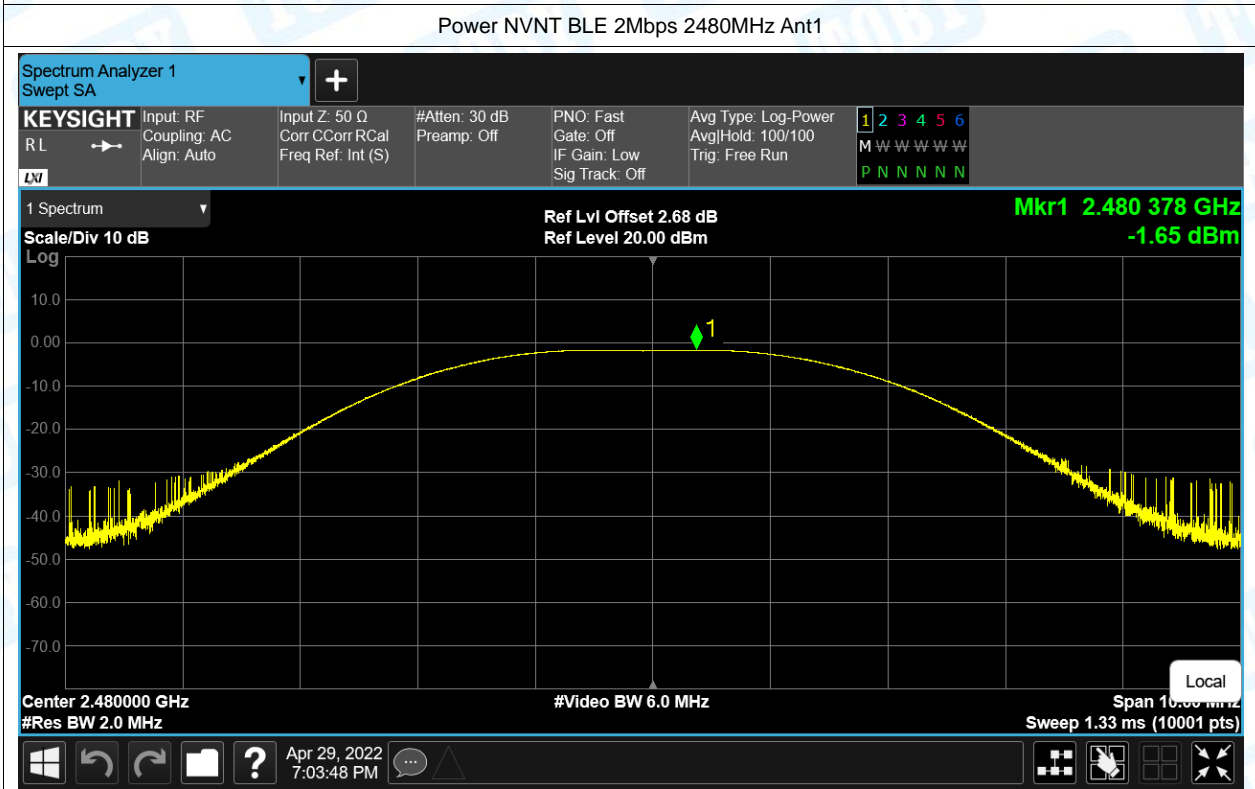
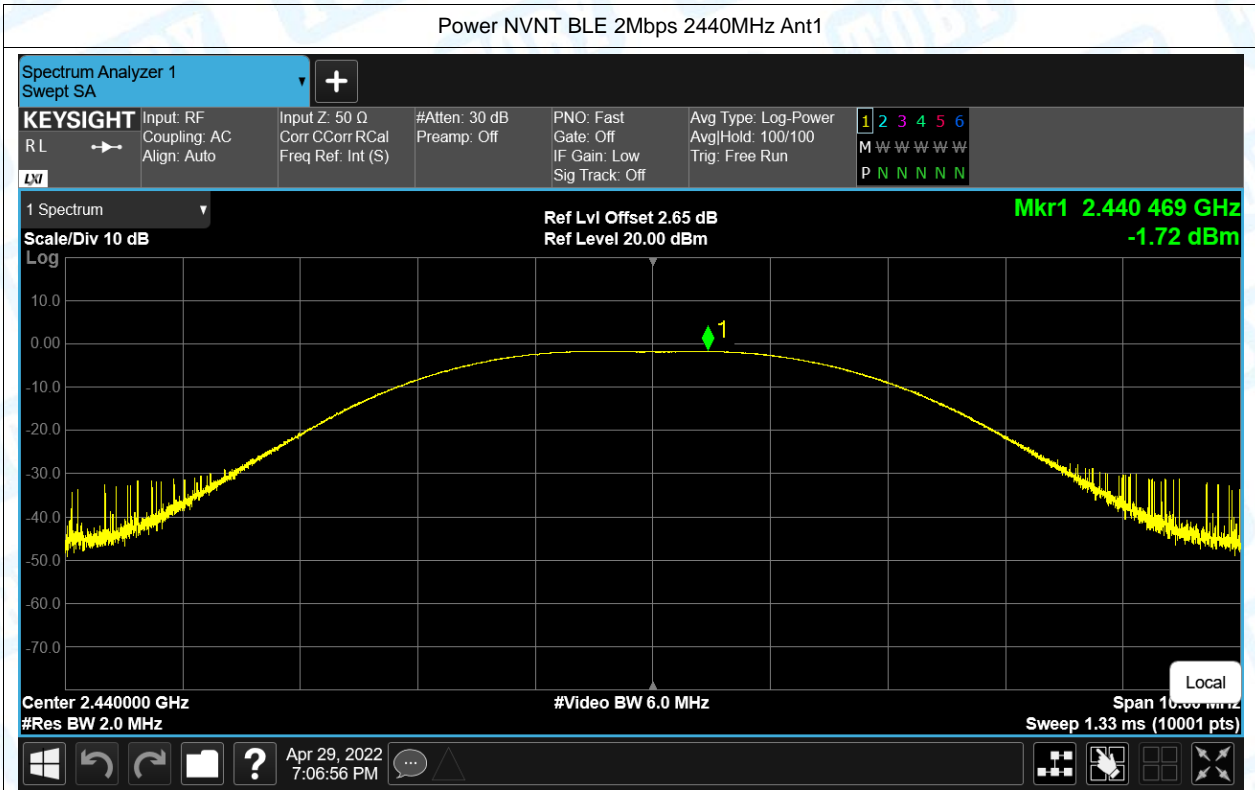
Power NVNT BLE 1Mbps 2402MHz Ant1



Power NVNT BLE 1Mbps 2440MHz Ant1





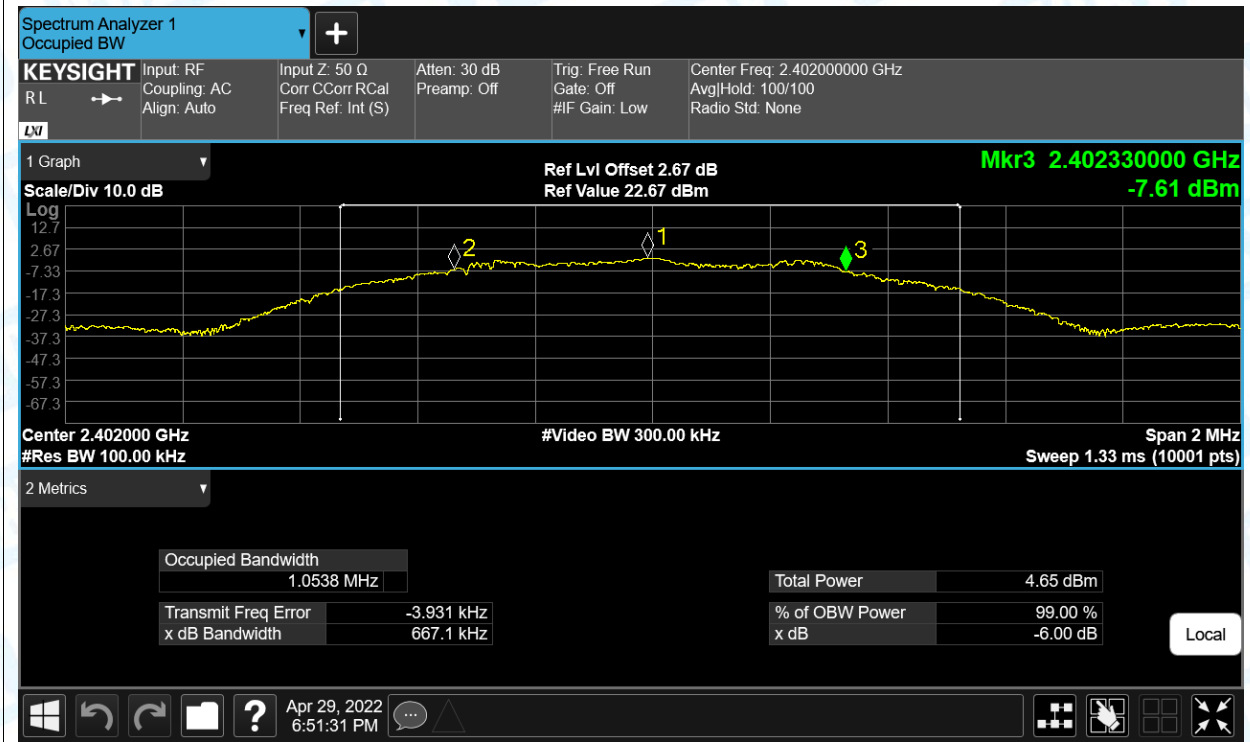


-6dB Bandwidth

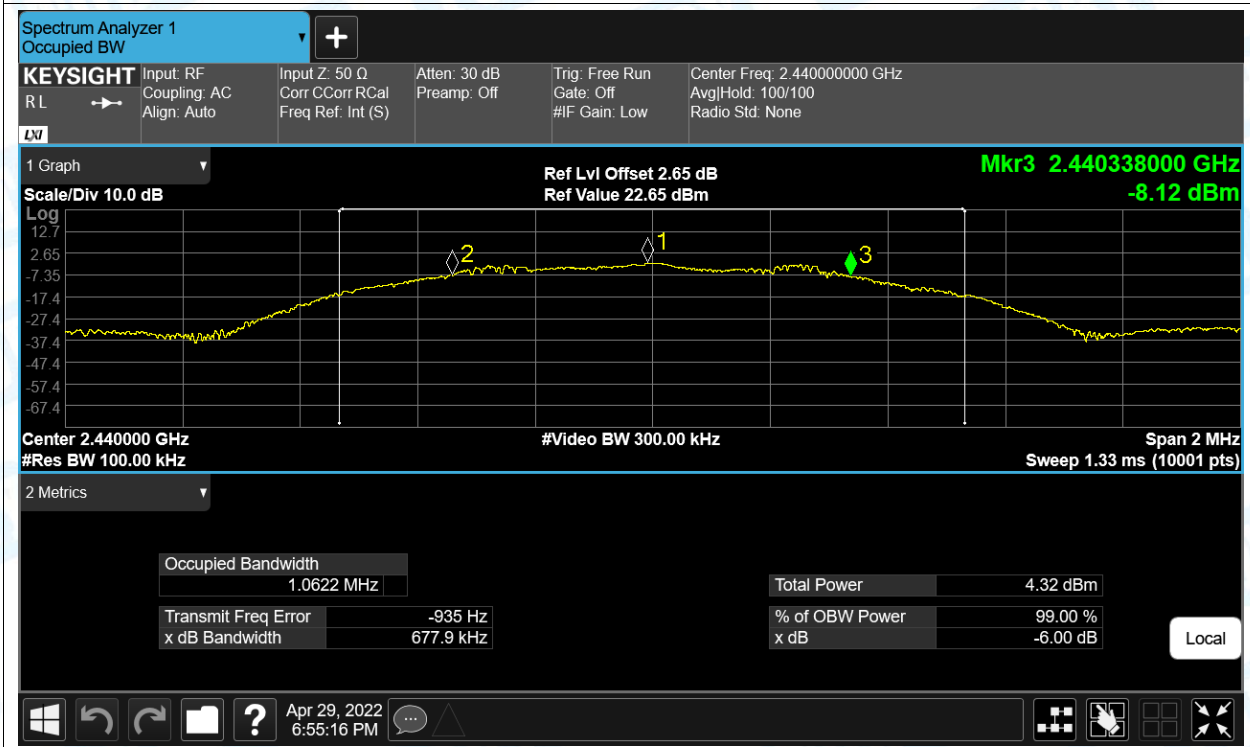
Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	BLE 1Mbps	2402	Ant1	0.67	0.5	Pass
NVNT	BLE 1Mbps	2440	Ant1	0.68	0.5	Pass
NVNT	BLE 1Mbps	2480	Ant1	0.68	0.5	Pass
NVNT	BLE 2Mbps	2402	Ant1	1.12	0.5	Pass
NVNT	BLE 2Mbps	2440	Ant1	1.18	0.5	Pass
NVNT	BLE 2Mbps	2480	Ant1	1.12	0.5	Pass

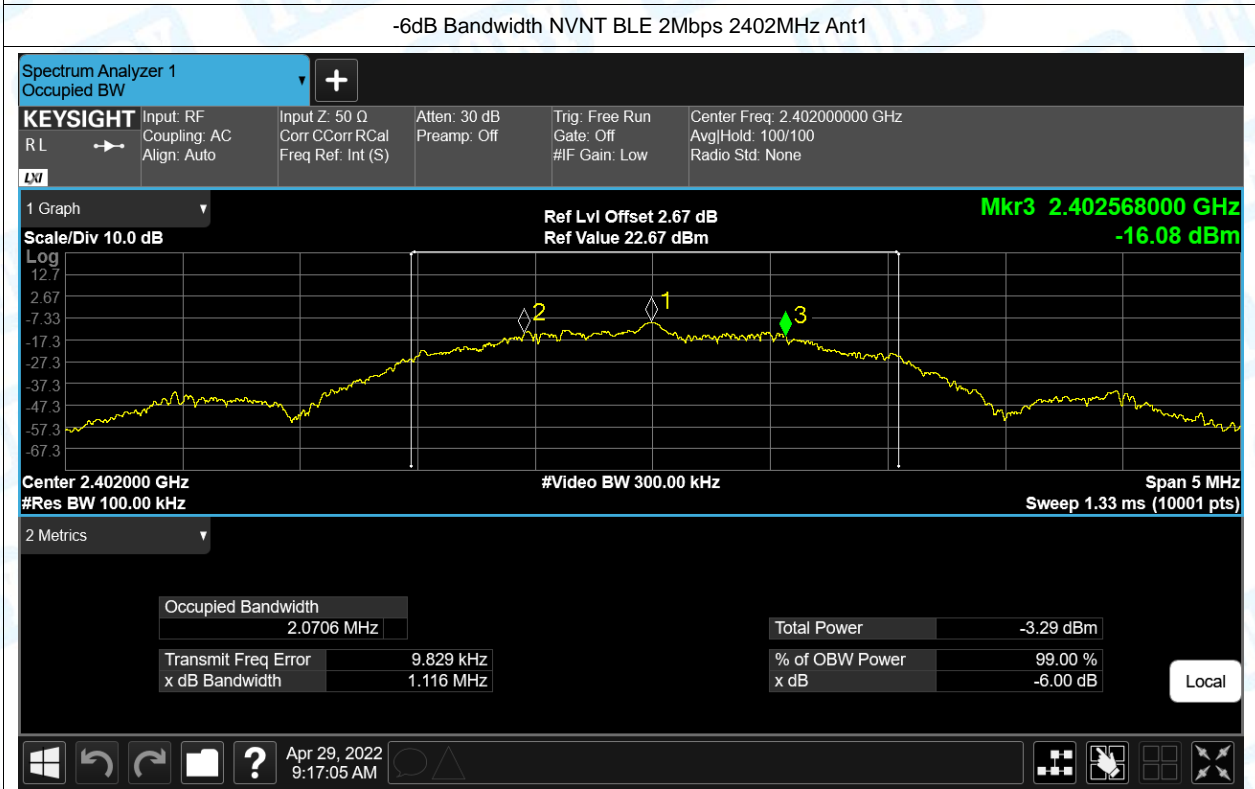
Test Graphs

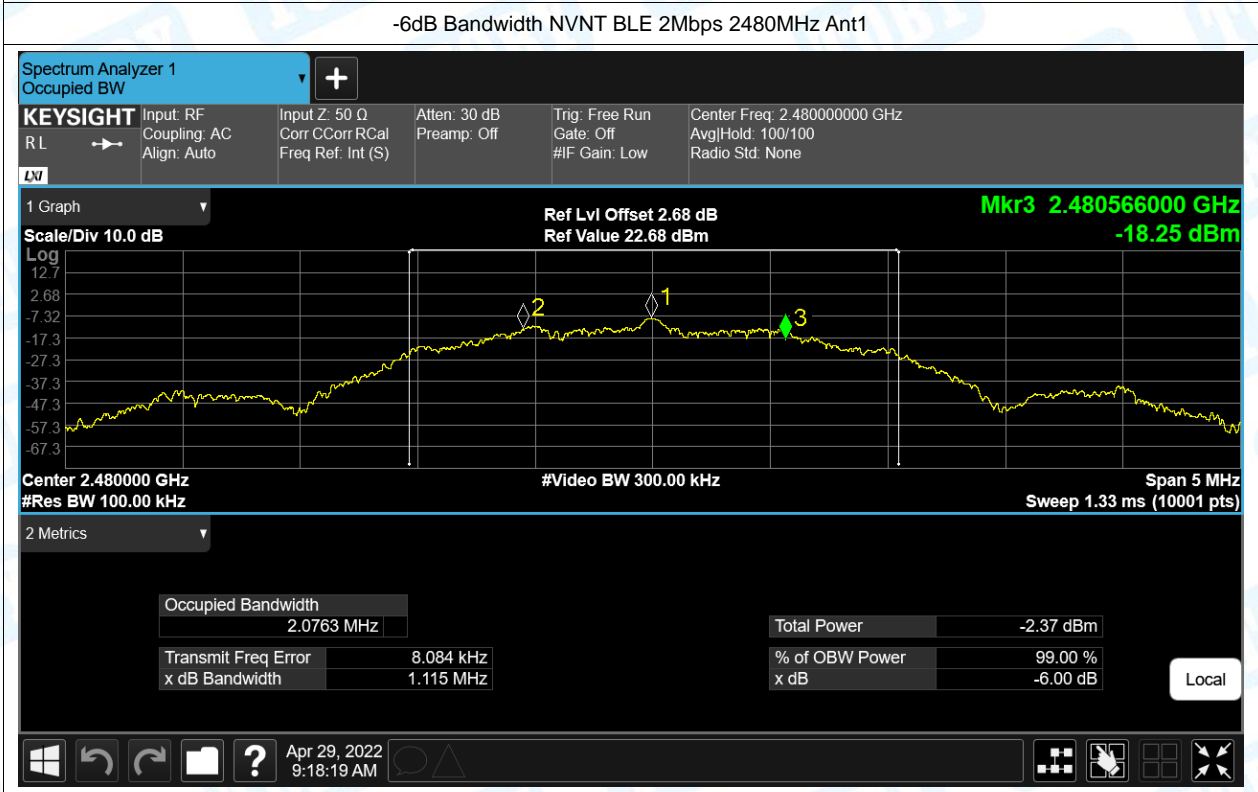
-6dB Bandwidth NVNT BLE 1Mbps 2402MHz Ant1



-6dB Bandwidth NVNT BLE 1Mbps 2440MHz Ant1





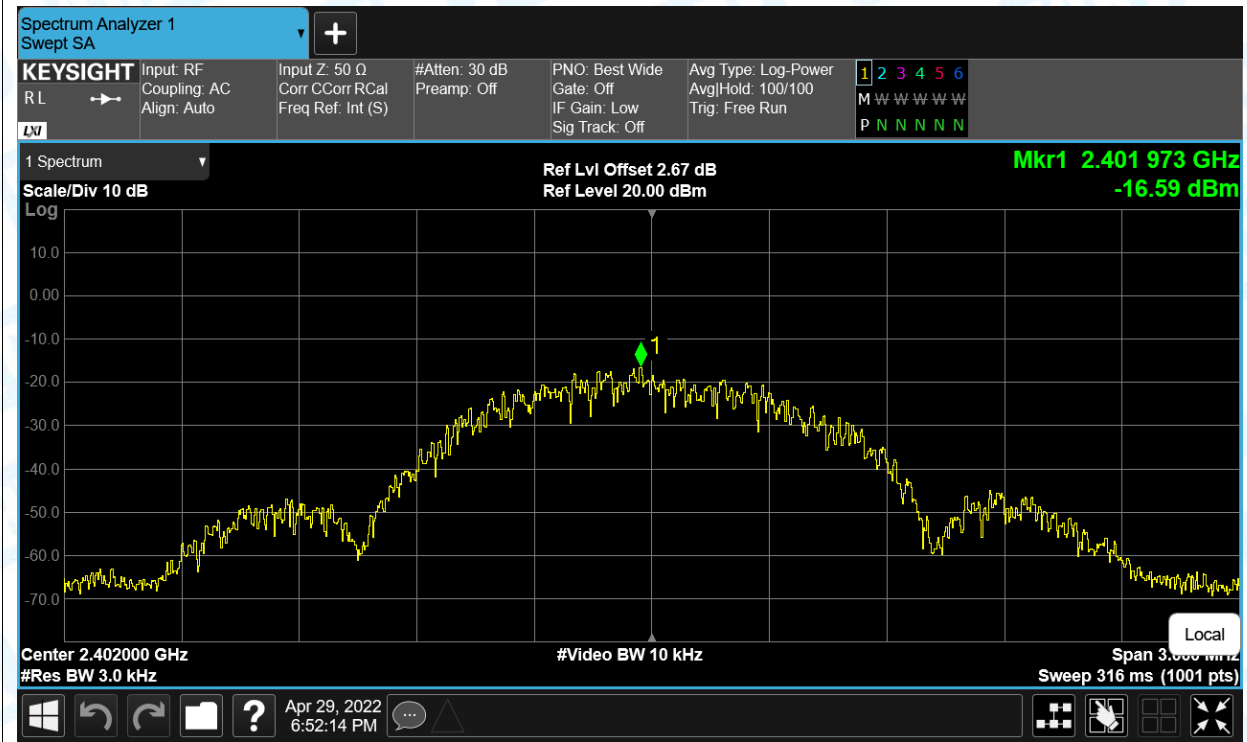


Maximum Power Spectral Density Level

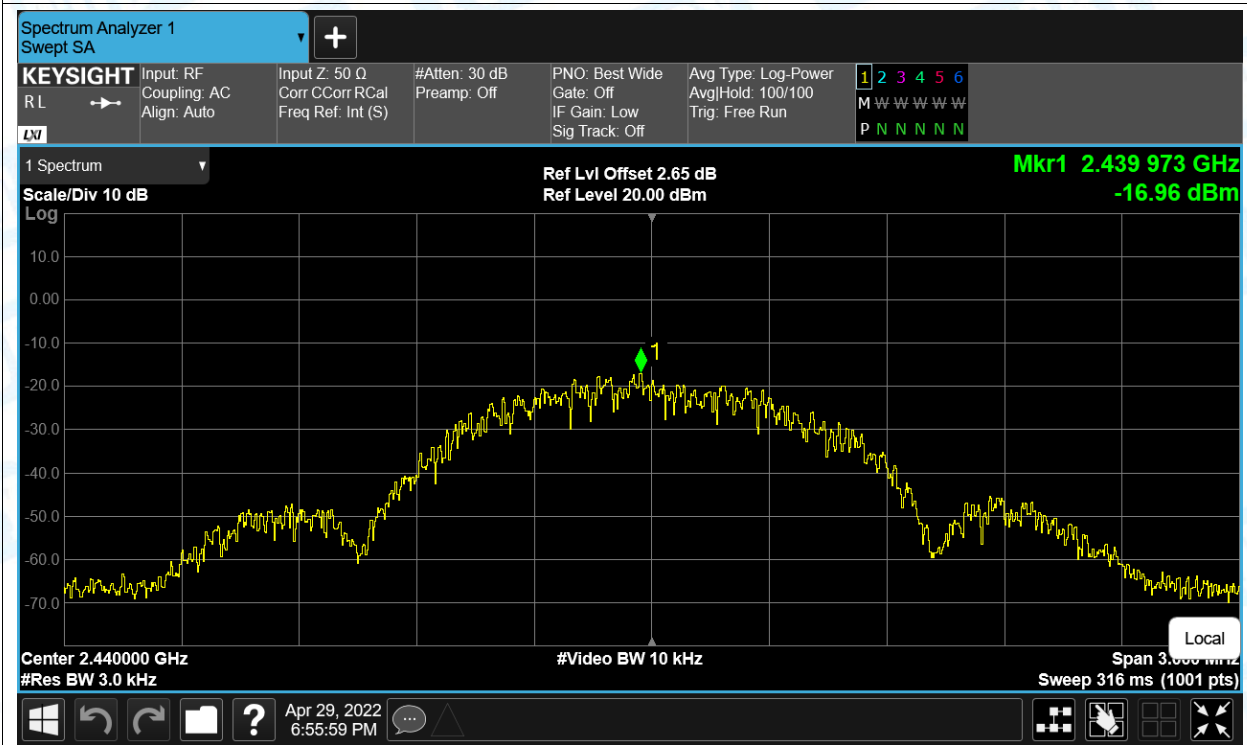
Condition	Mode	Frequency (MHz)	Antenna	Max PSD (dBm)/3KHz	Limit (dBm)/3KHz	Verdict
NVNT	BLE 1Mbps	2402	Ant1	-16.59	8	Pass
NVNT	BLE 1Mbps	2440	Ant1	-16.96	8	Pass
NVNT	BLE 1Mbps	2480	Ant1	-16.89	8	Pass
NVNT	BLE 2Mbps	2402	Ant1	-19.20	8	Pass
NVNT	BLE 2Mbps	2440	Ant1	-19.52	8	Pass
NVNT	BLE 2Mbps	2480	Ant1	-19.41	8	Pass

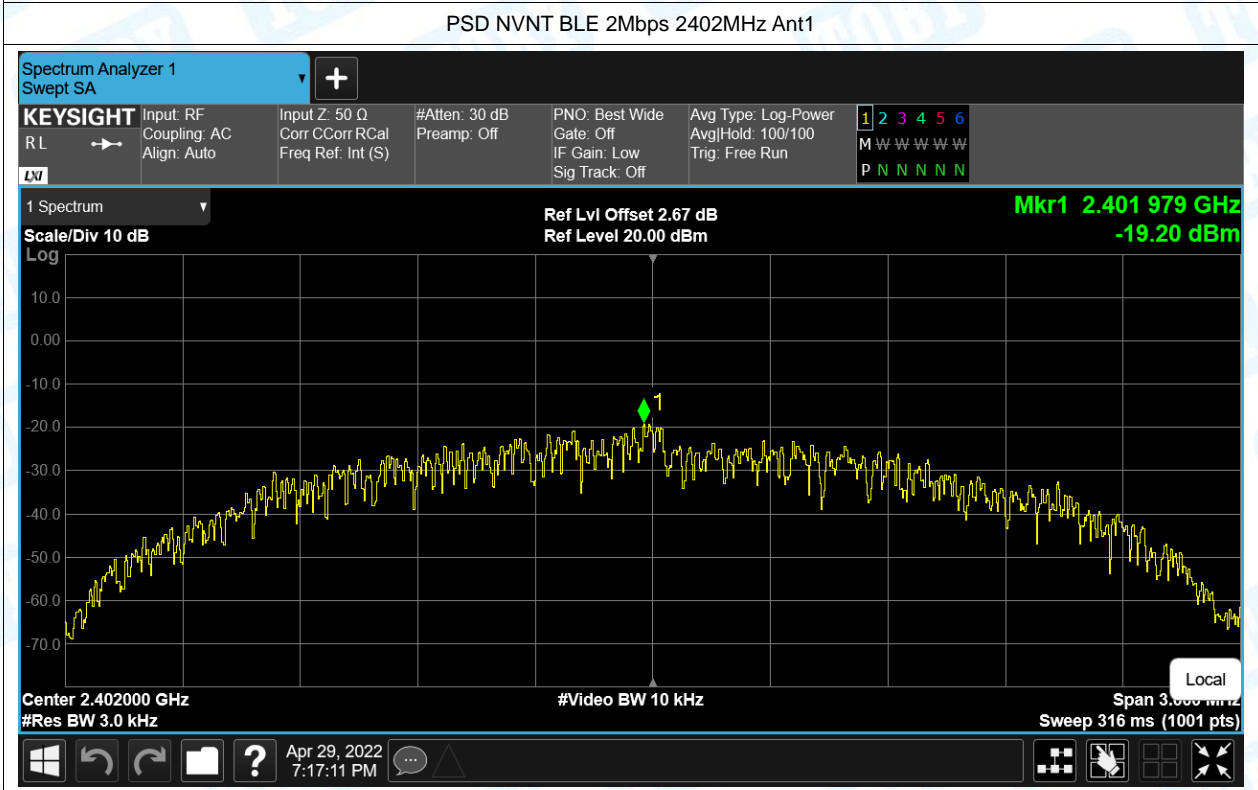
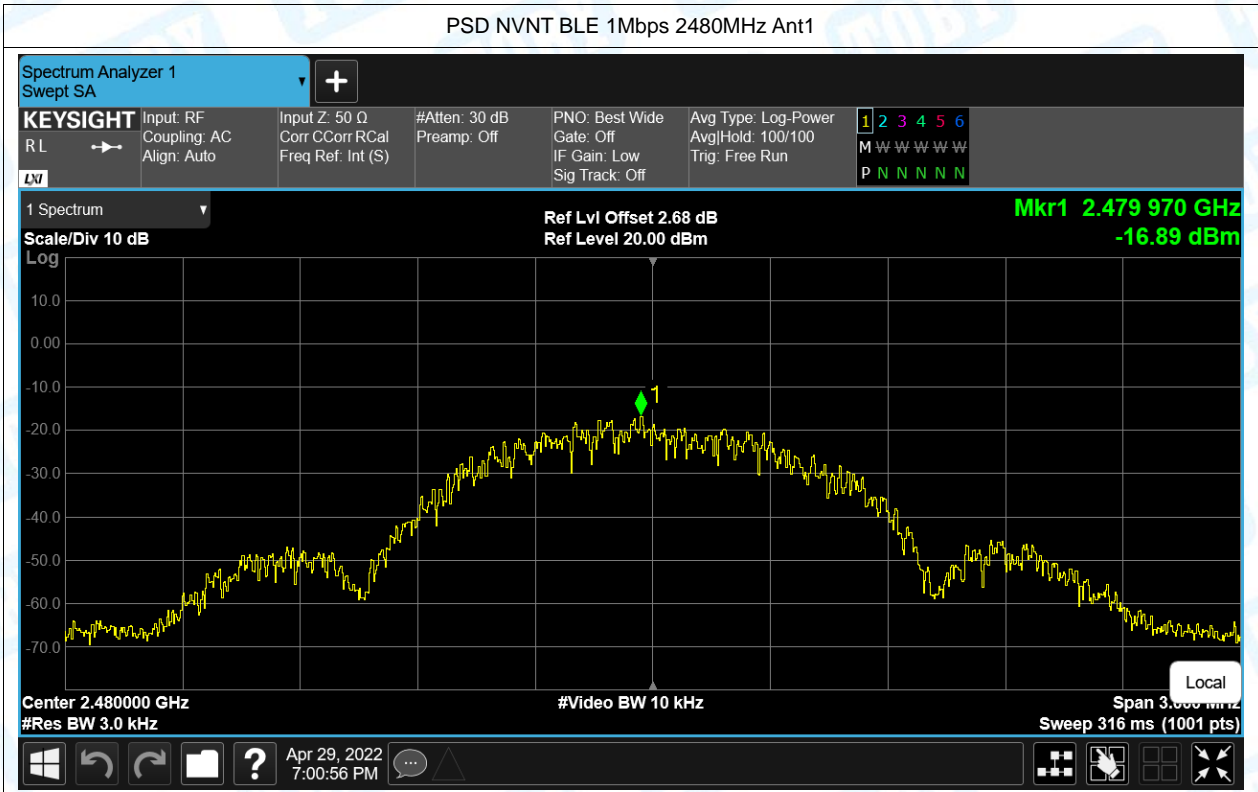
Test Graphs

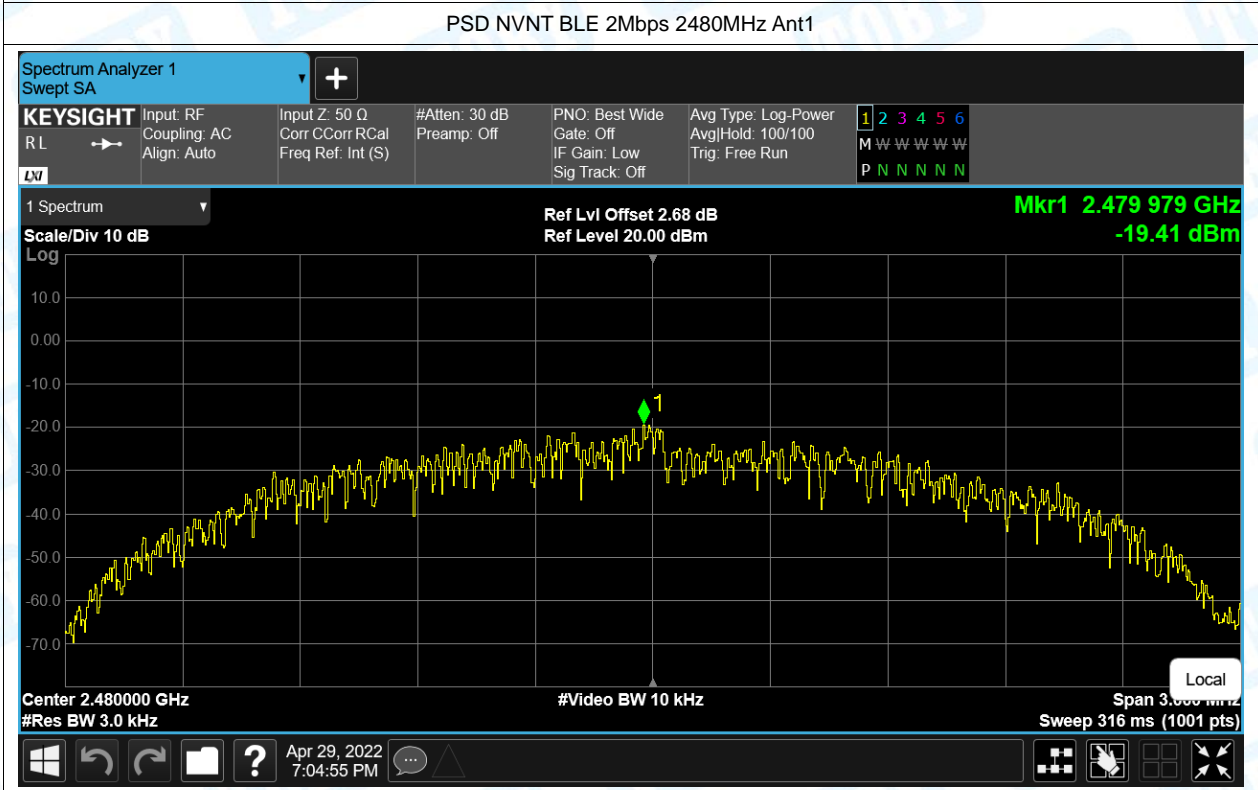
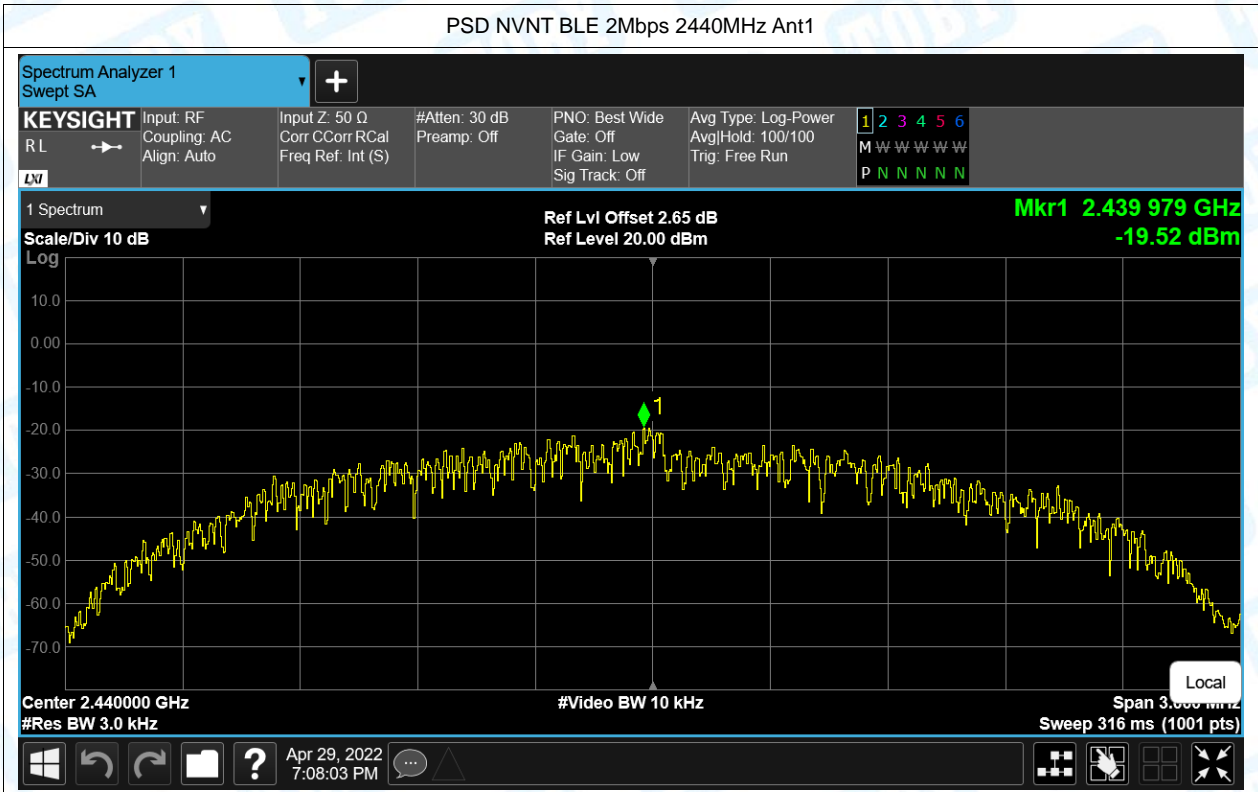
PSD NVNT BLE 1Mbps 2402MHz Ant1



PSD NVNT BLE 1Mbps 2440MHz Ant1





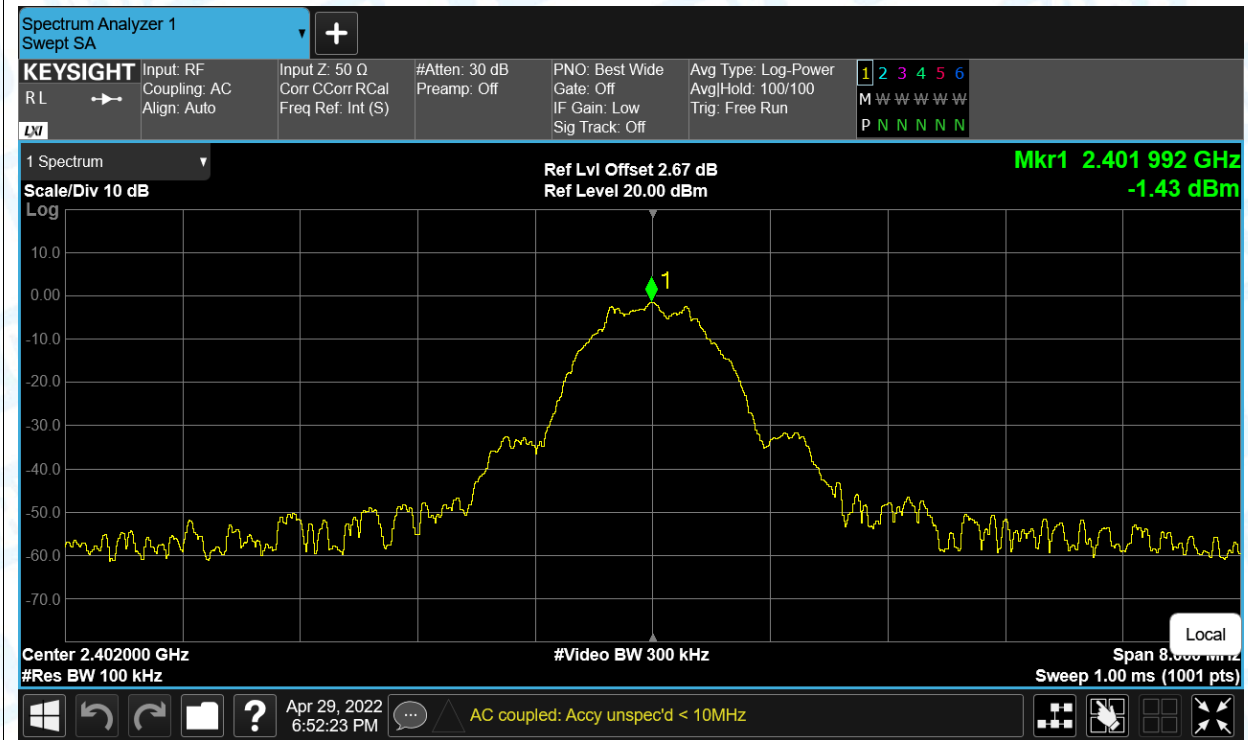


Band Edge

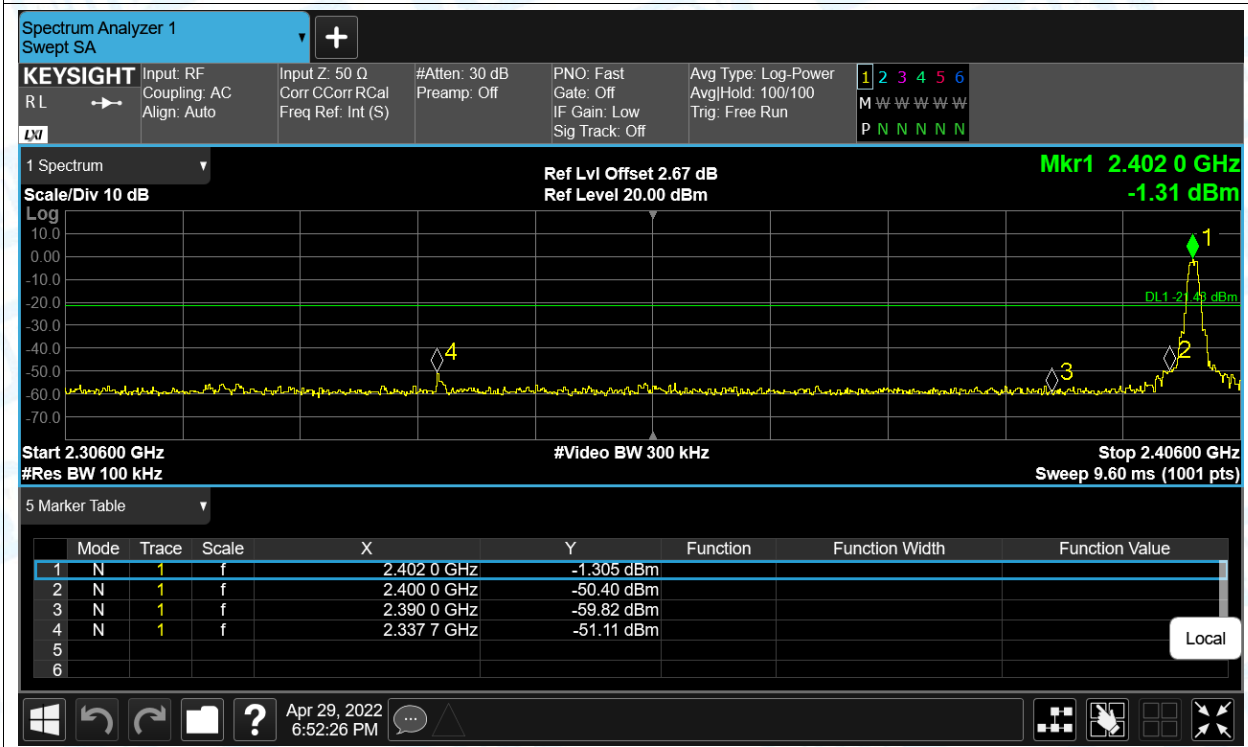
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1Mbps	2402	Ant1	-49.68	-20	Pass
NVNT	BLE 1Mbps	2480	Ant1	-51.84	-20	Pass
NVNT	BLE 2Mbps	2402	Ant1	-52.46	-20	Pass
NVNT	BLE 2Mbps	2480	Ant1	-51.26	-20	Pass

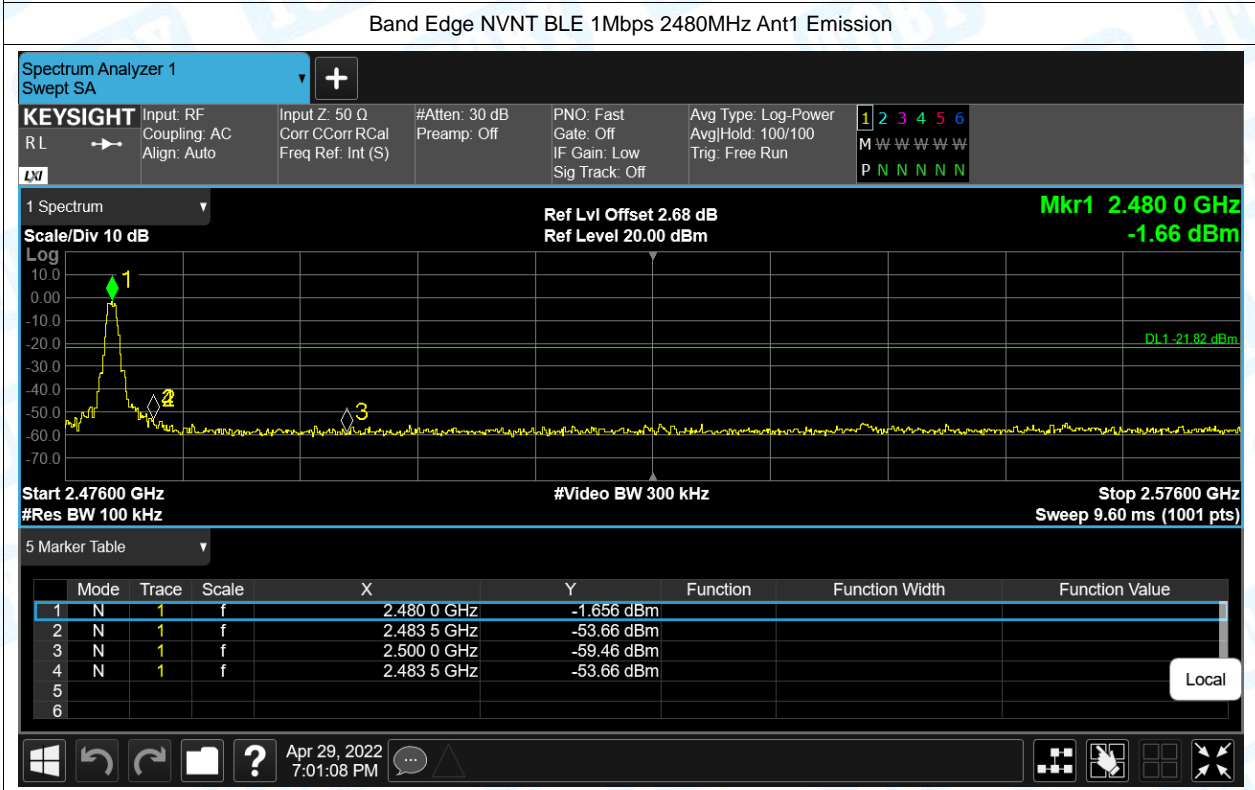
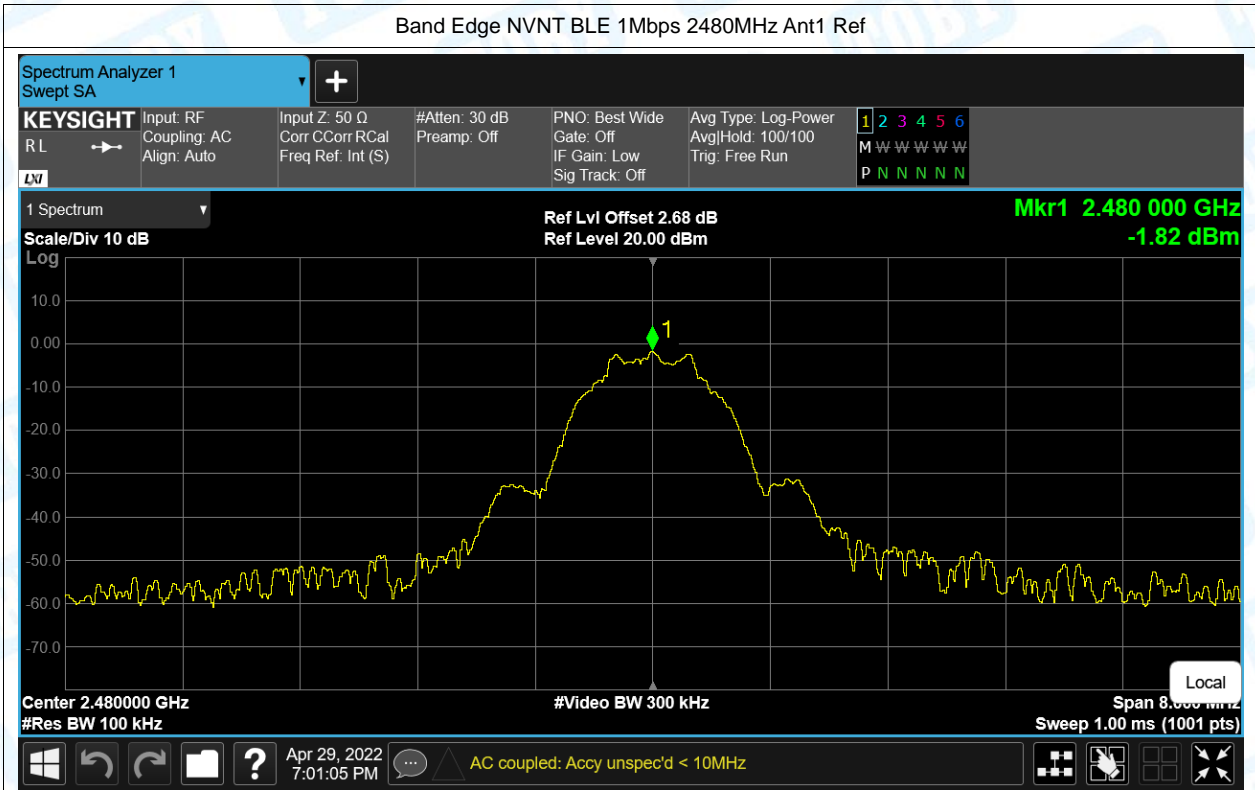
Test Graphs

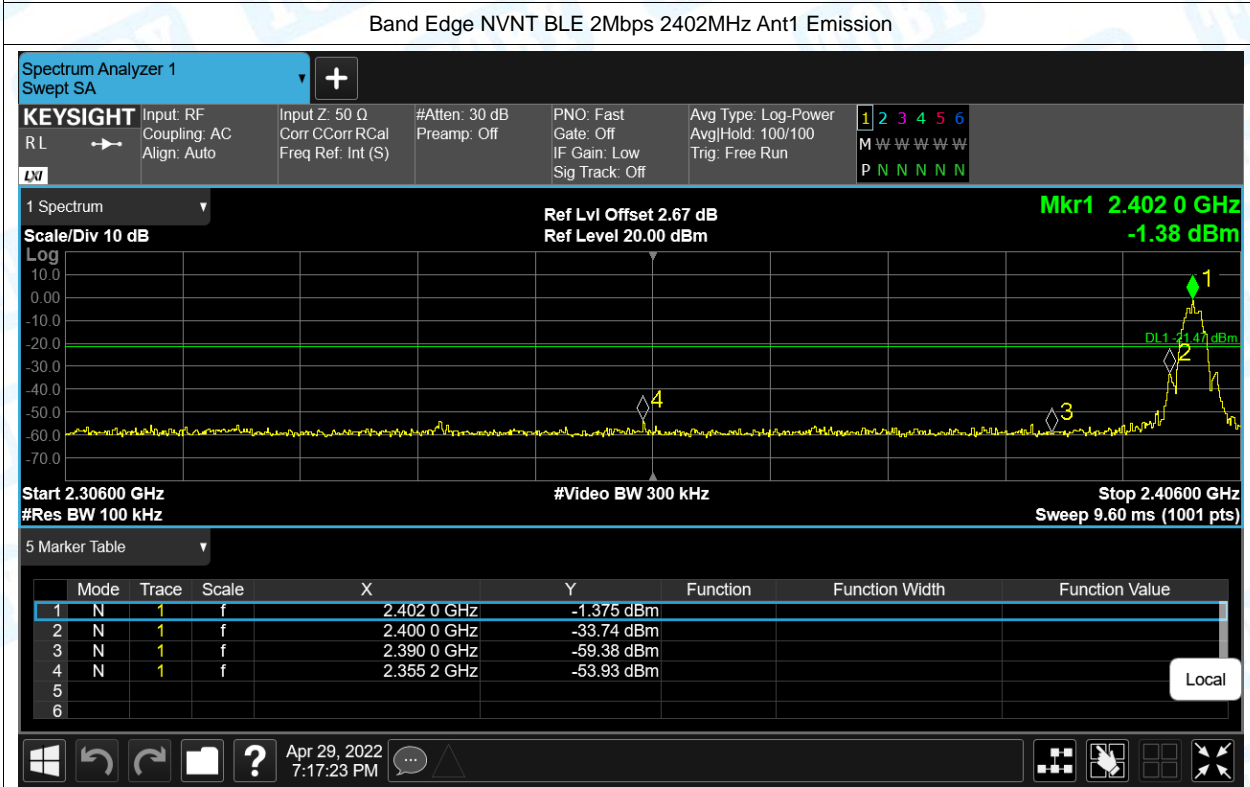
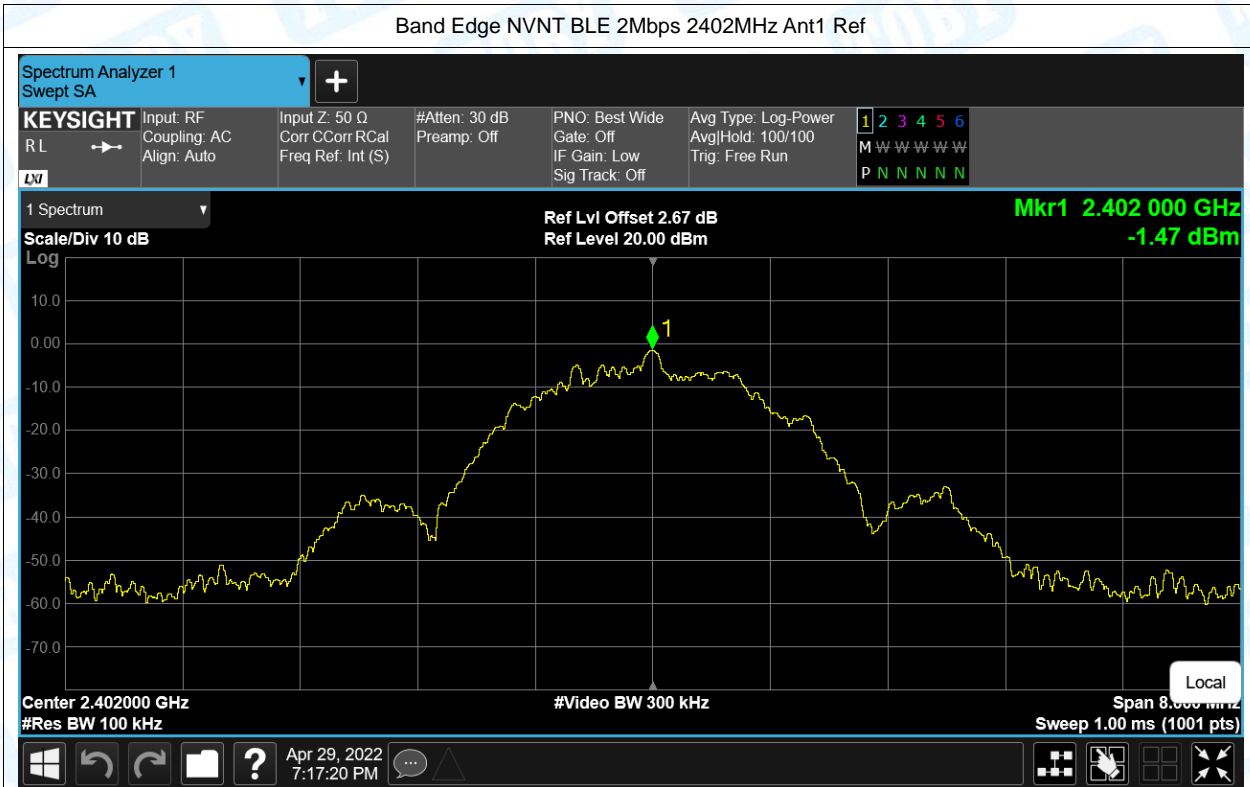
Band Edge NVNT BLE 1Mbps 2402MHz Ant1 Ref

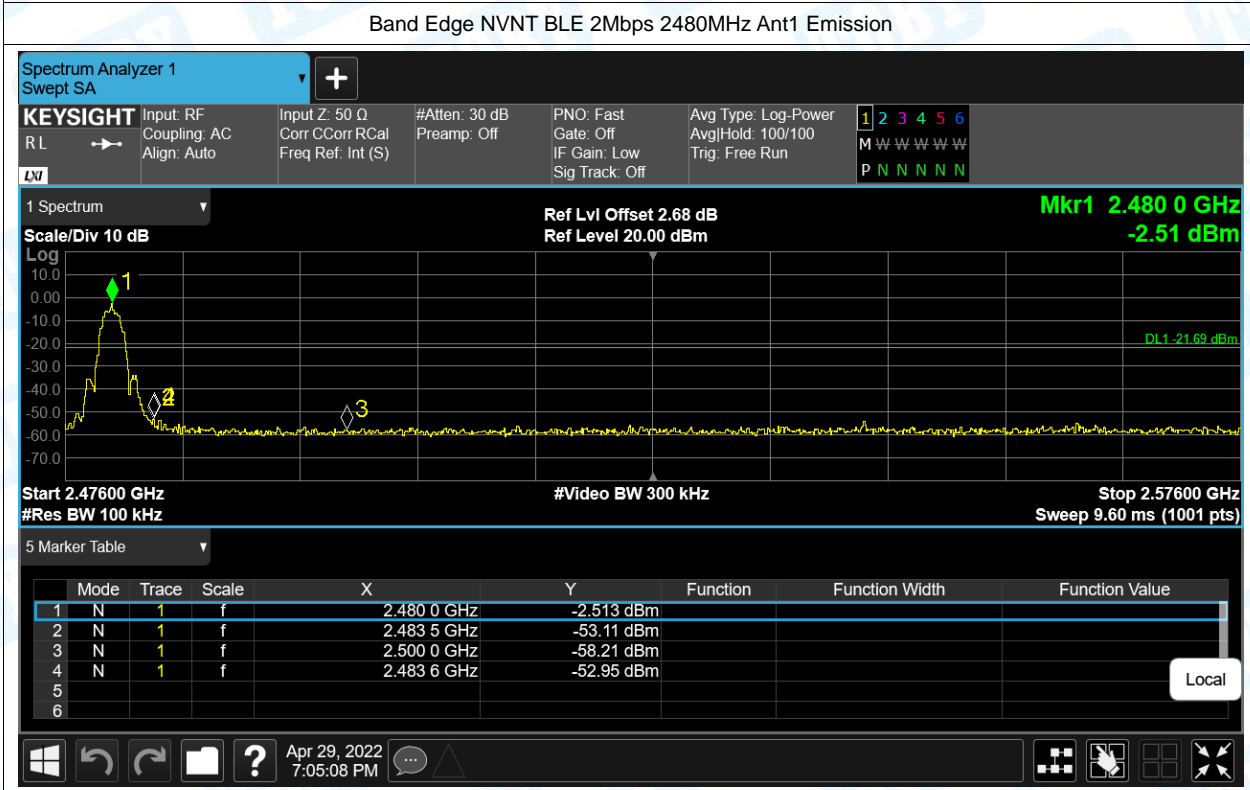
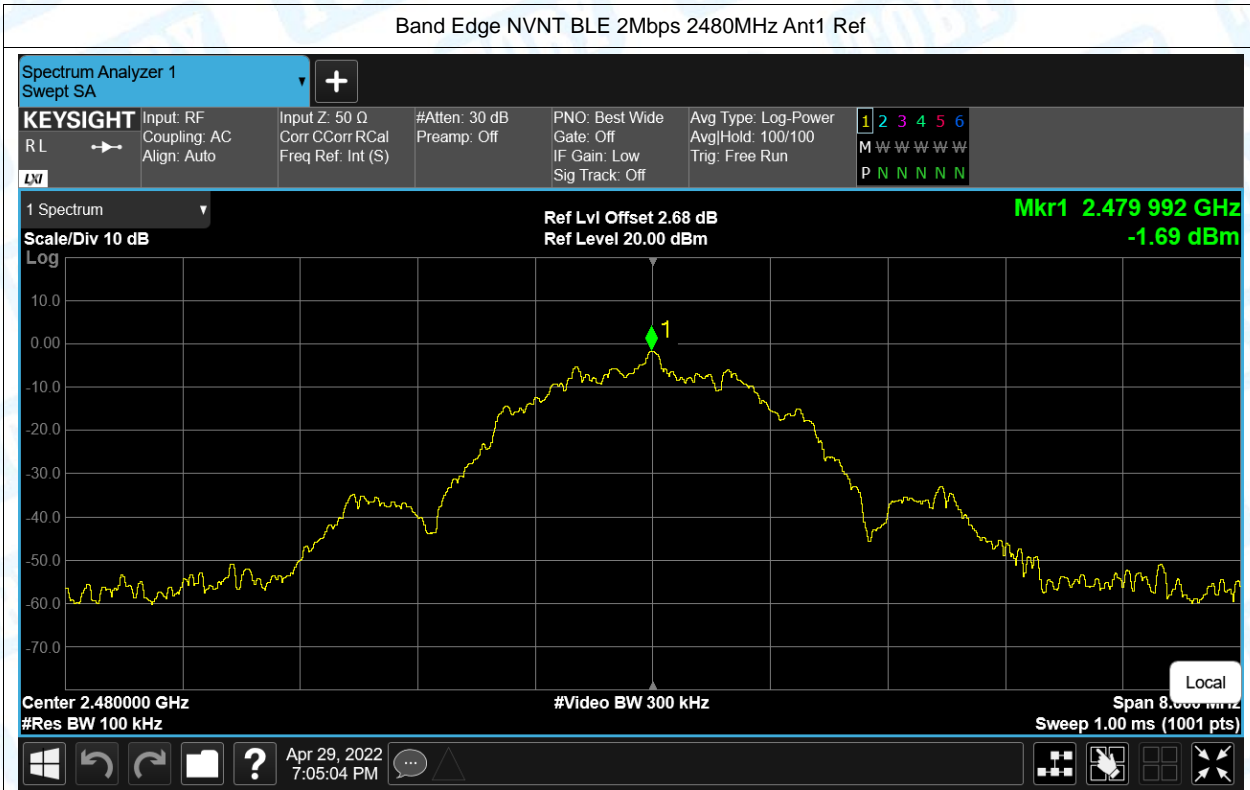


Band Edge NVNT BLE 1Mbps 2402MHz Ant1 Emission







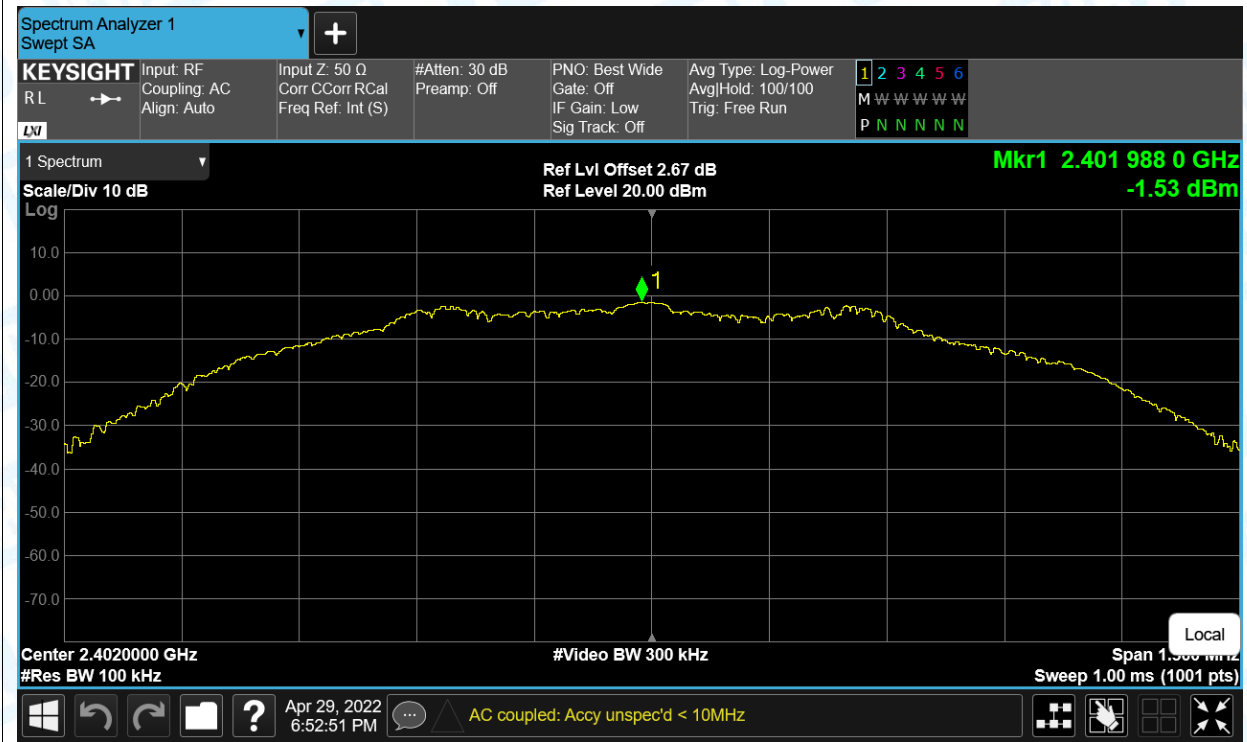


Conducted RF Spurious Emission

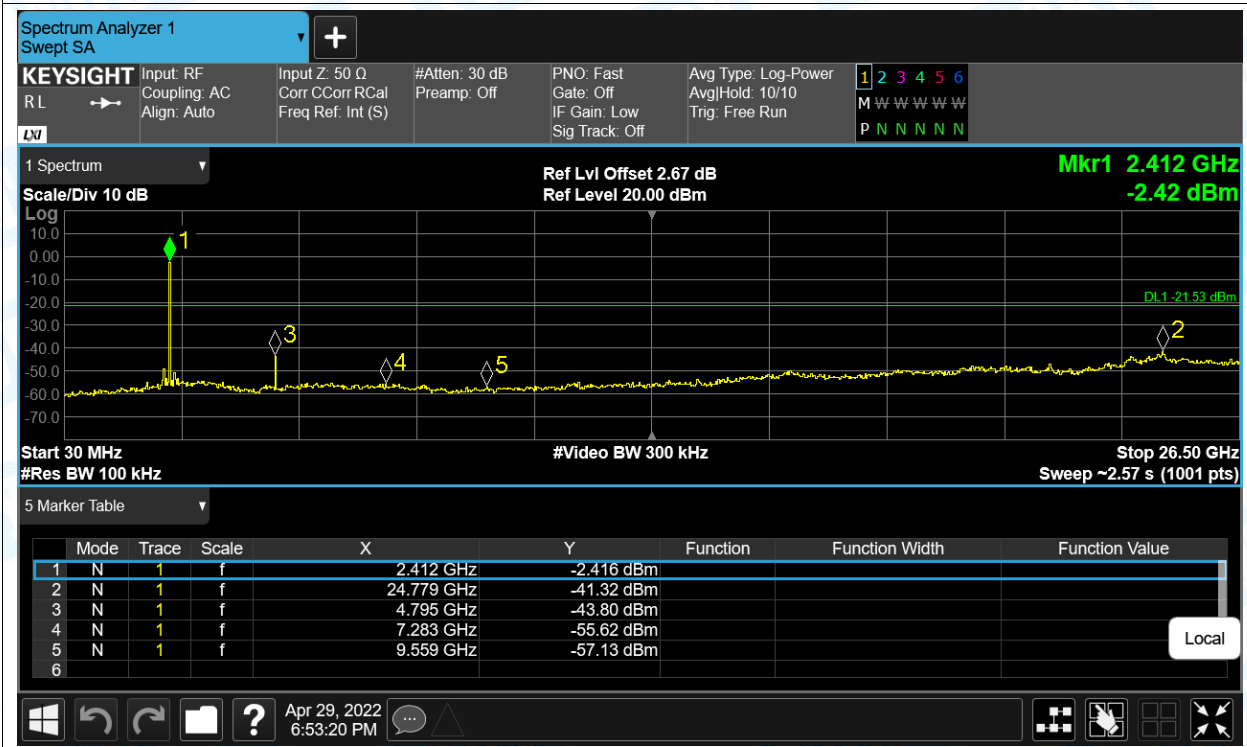
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1Mbps	2402	Ant1	-39.79	-20	Pass
NVNT	BLE 1Mbps	2440	Ant1	-39.48	-20	Pass
NVNT	BLE 1Mbps	2480	Ant1	-39.67	-20	Pass
NVNT	BLE 2Mbps	2402	Ant1	-40.24	-20	Pass
NVNT	BLE 2Mbps	2440	Ant1	-40.07	-20	Pass
NVNT	BLE 2Mbps	2480	Ant1	-40.48	-20	Pass

Test Graphs

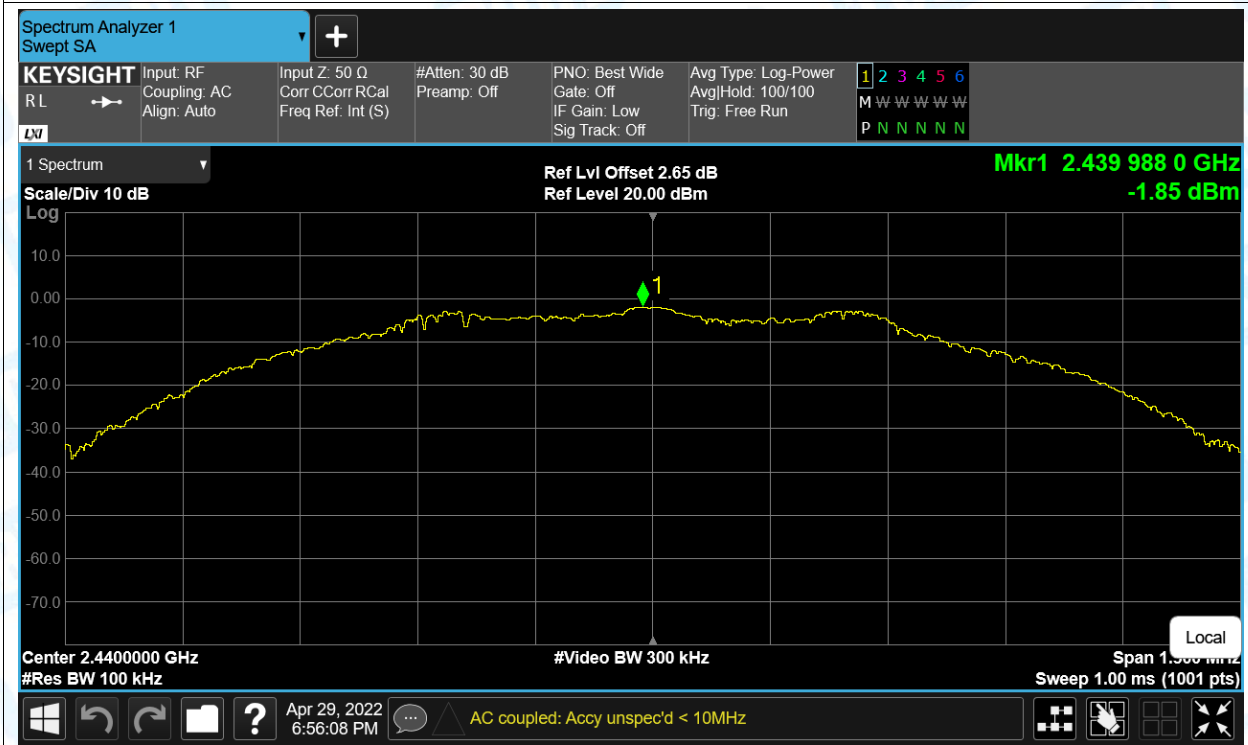
Tx. Spurious NVNT BLE 1Mbps 2402MHz Ant1 Ref



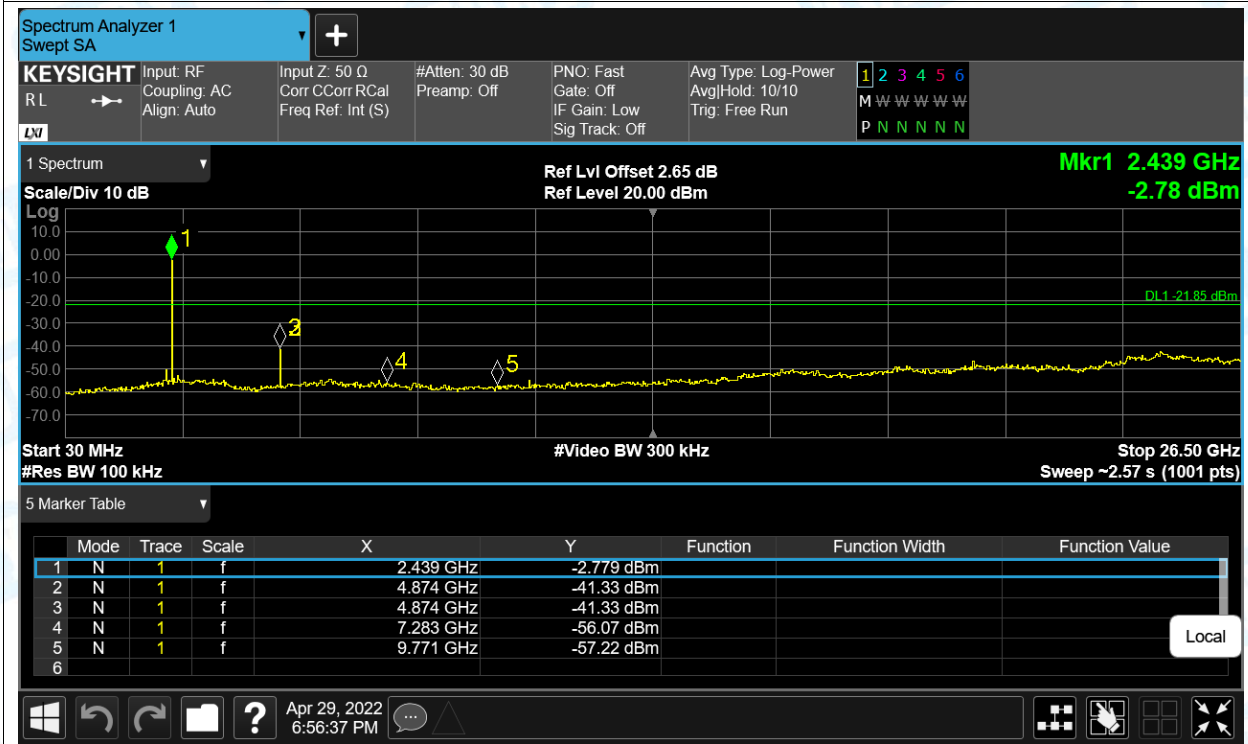
Tx. Spurious NVNT BLE 1Mbps 2402MHz Ant1 Emission



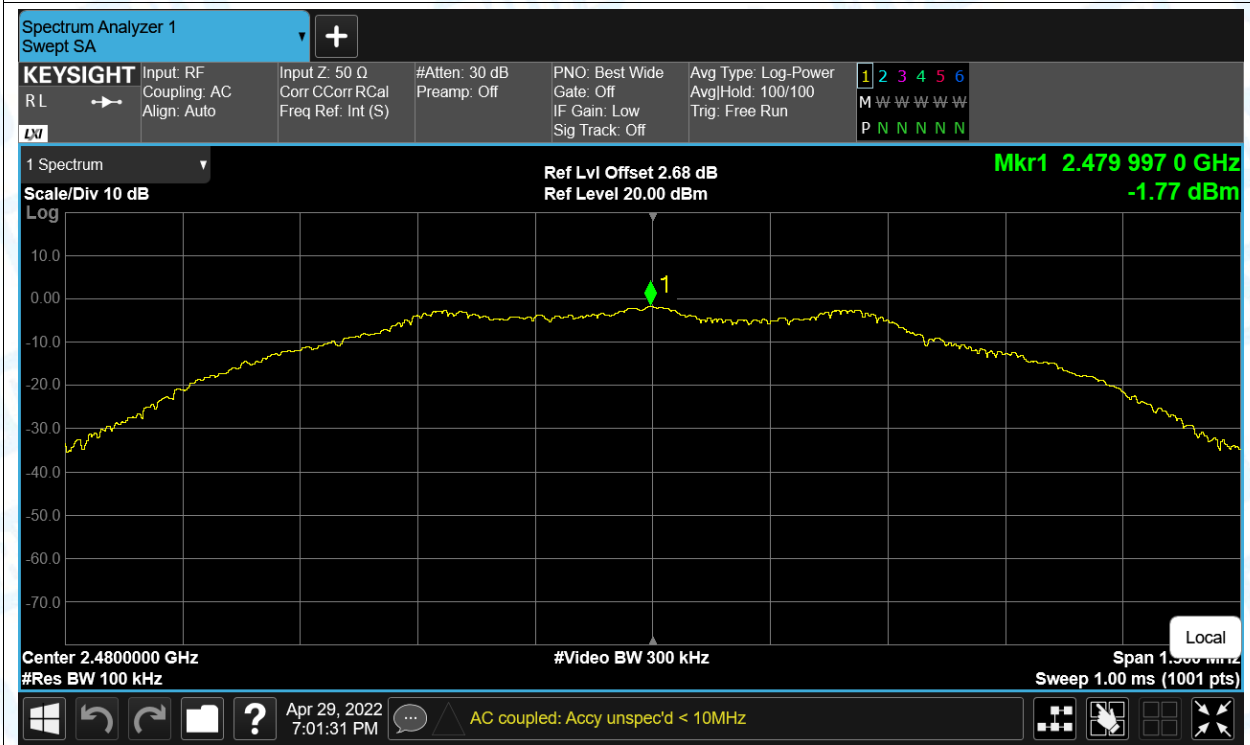
Tx. Spurious NVNT BLE 1Mbps 2440MHz Ant1 Ref



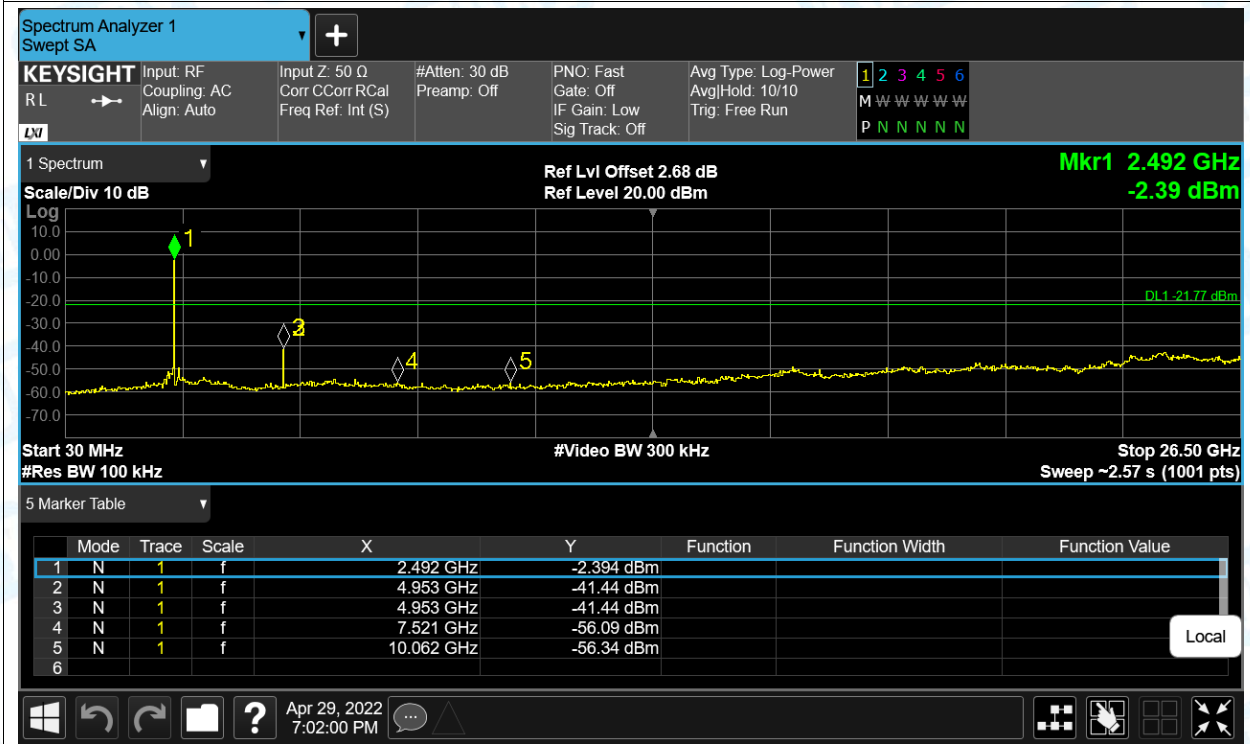
Tx. Spurious NVNT BLE 1Mbps 2440MHz Ant1 Emission



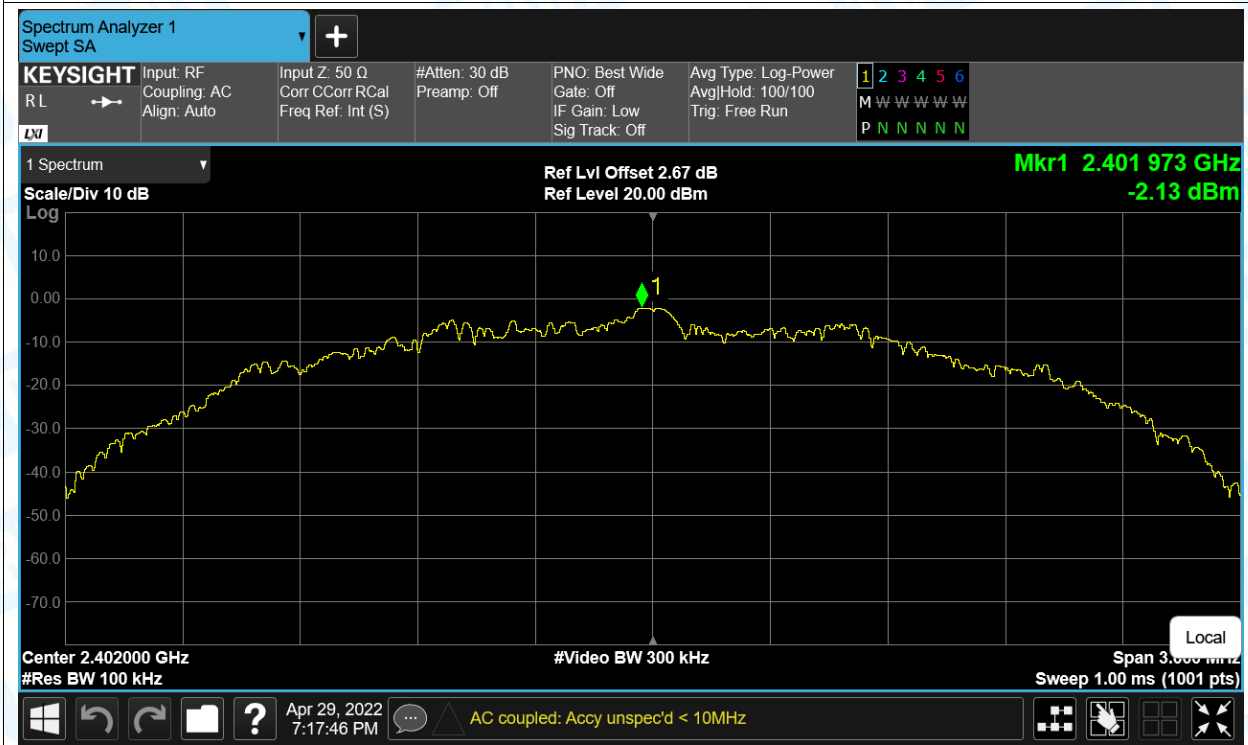
Tx. Spurious NVNT BLE 1Mbps 2480MHz Ant1 Ref



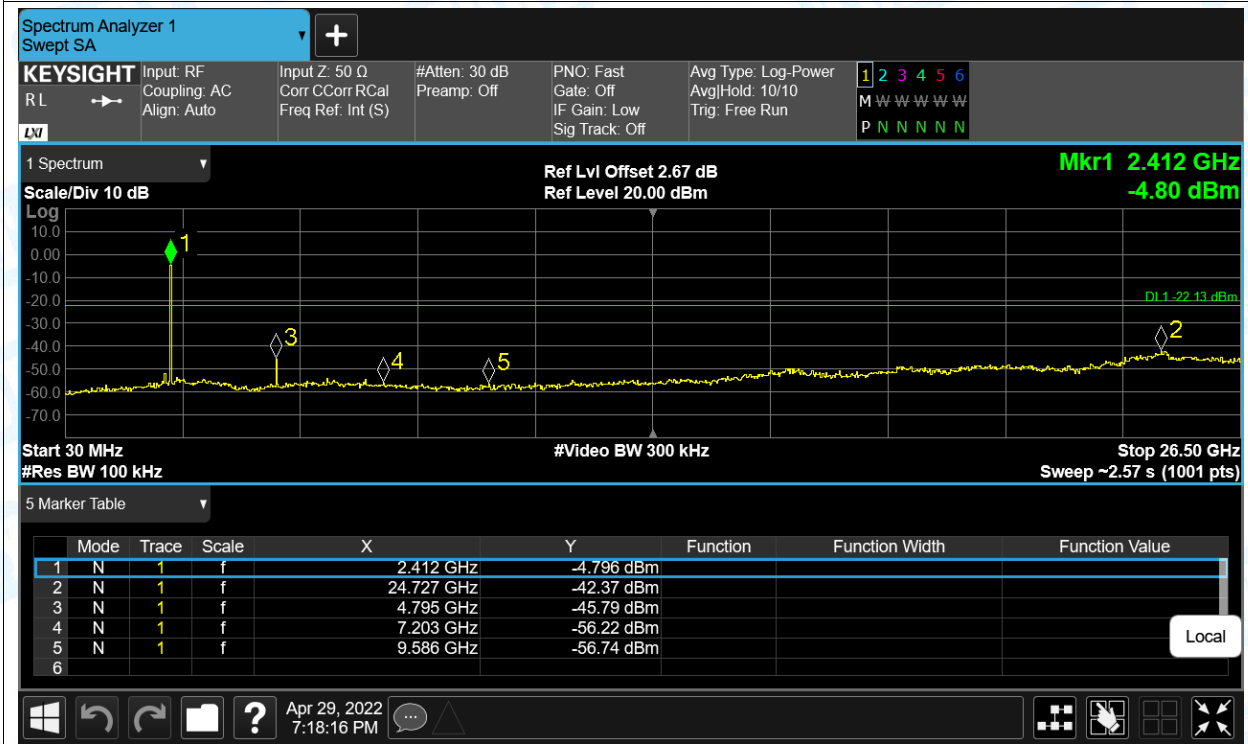
Tx. Spurious NVNT BLE 1Mbps 2480MHz Ant1 Emission



Tx. Spurious NVNT BLE 2Mbps 2402MHz Ant1 Ref



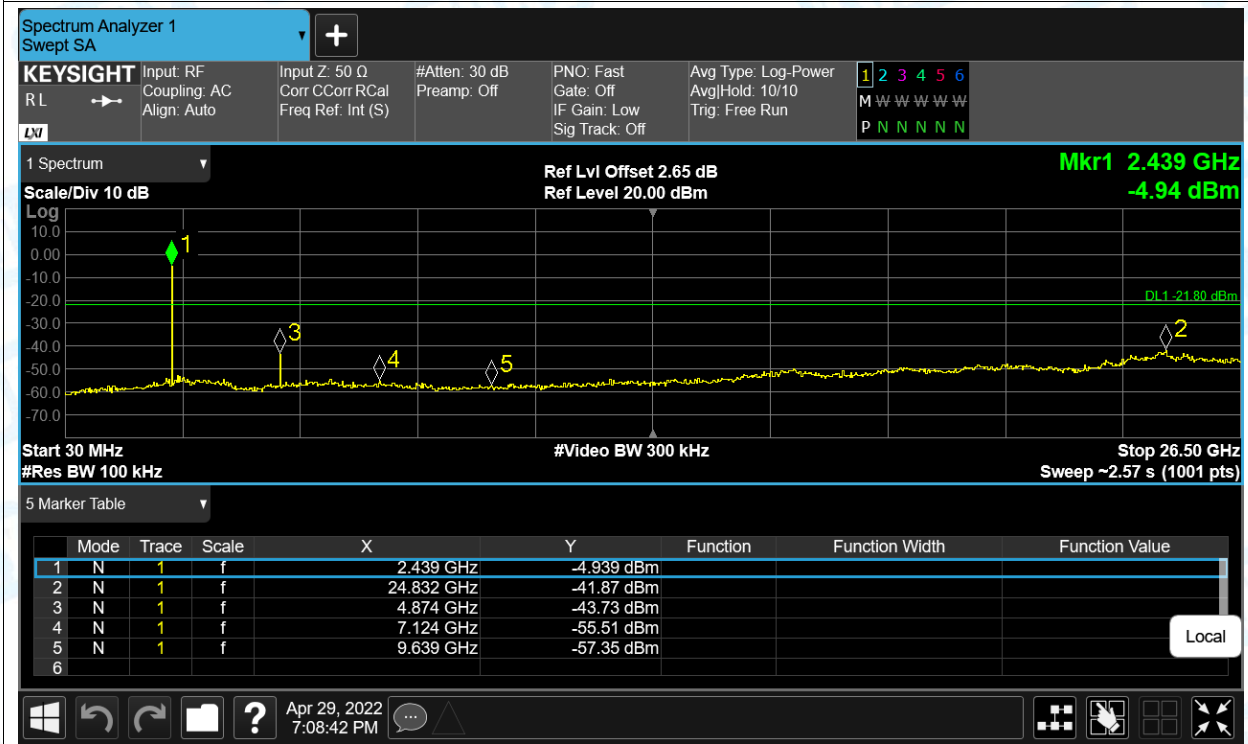
Tx. Spurious NVNT BLE 2Mbps 2402MHz Ant1 Emission



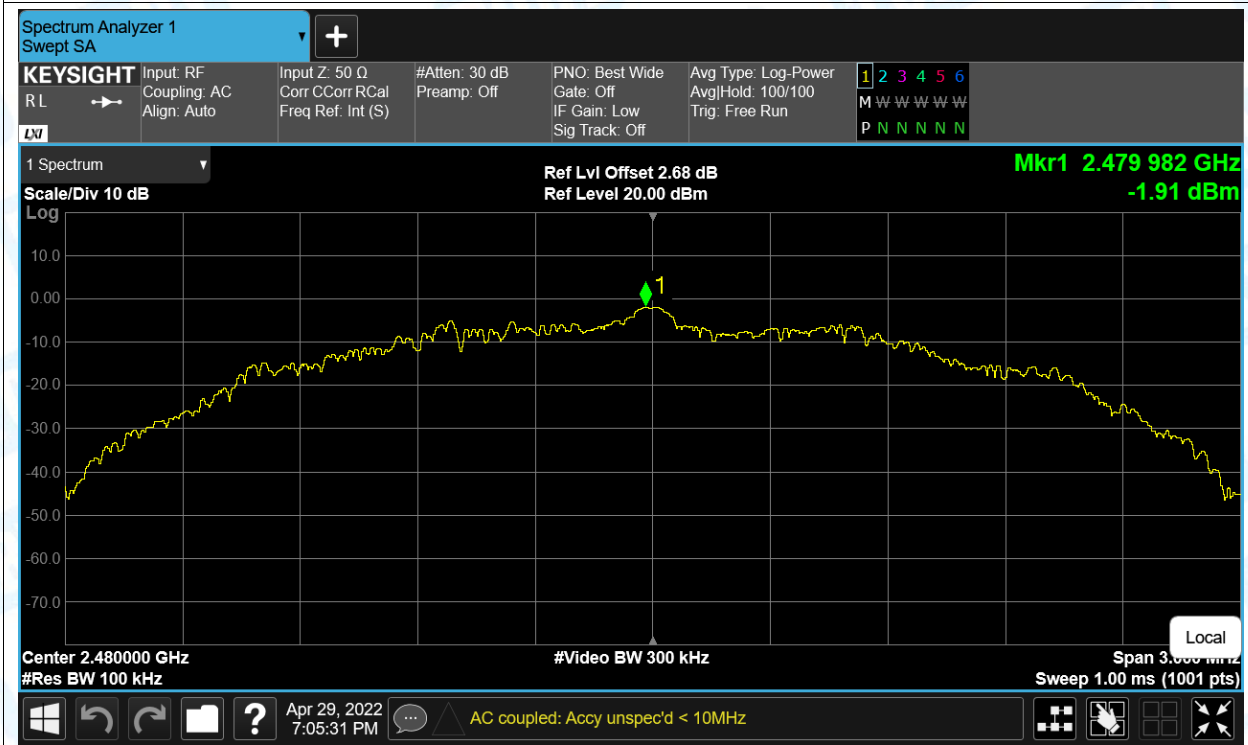
Tx. Spurious NVNT BLE 2Mbps 2440MHz Ant1 Ref



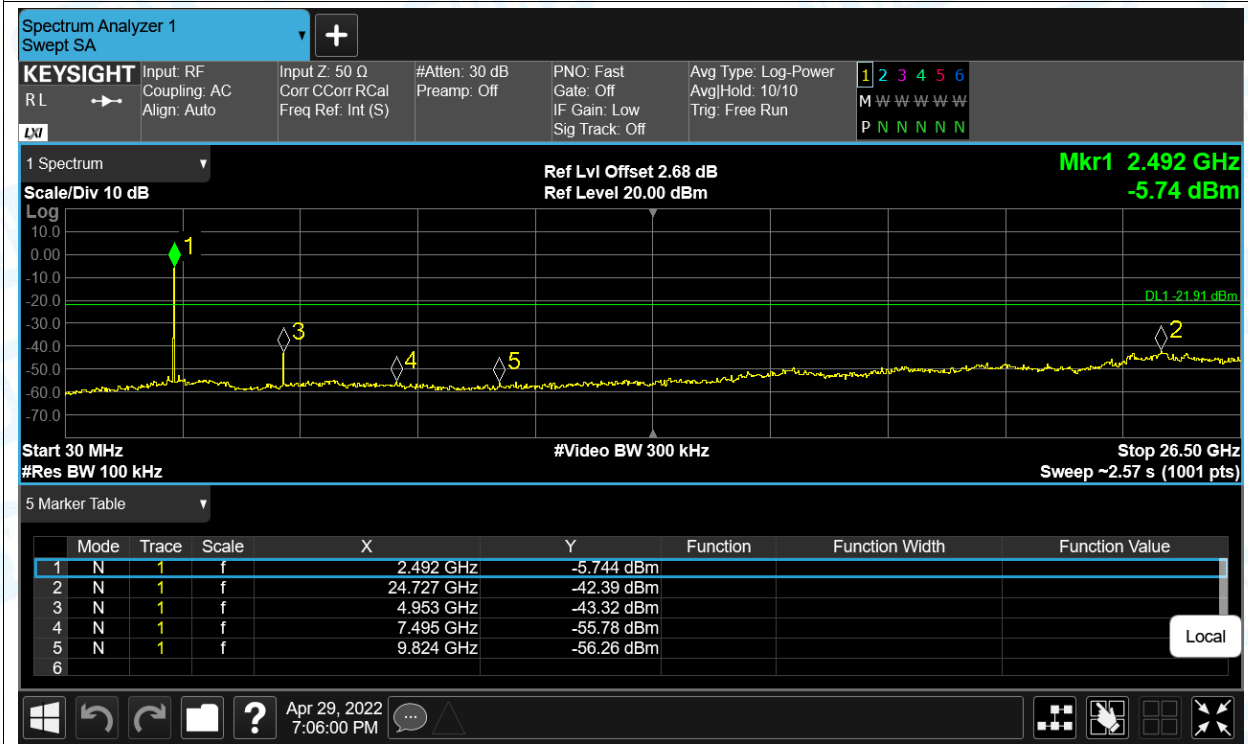
Tx. Spurious NVNT BLE 2Mbps 2440MHz Ant1 Emission



Tx. Spurious NVNT BLE 2Mbps 2480MHz Ant1 Ref



Tx. Spurious NVNT BLE 2Mbps 2480MHz Ant1 Emission



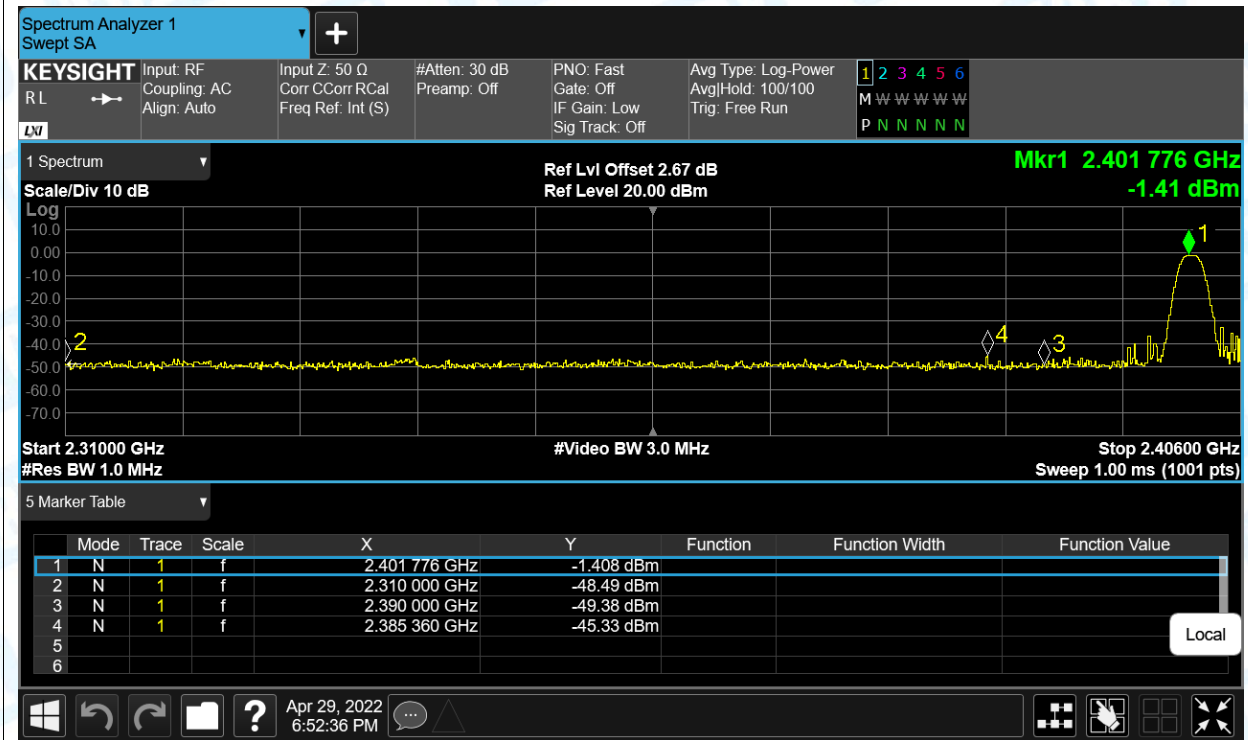
Restrict Band

Condition	Mode	Frequency (MHz)	Antenna	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
NVNT	BLE 1Mbps	2402	Ant1	2310	-48.49	2	48.77	Peak	74	Pass
NVNT	BLE 1Mbps	2402	Ant1	2310	-57.81	2	39.45	Average	54	Pass
NVNT	BLE 1Mbps	2402	Ant1	2385.36	-45.33	2	51.93	Peak	74	Pass
NVNT	BLE 1Mbps	2402	Ant1	2337.936	-54.43	2	42.83	Average	54	Pass
NVNT	BLE 1Mbps	2402	Ant1	2390	-48.72	2	48.54	Peak	74	Pass
NVNT	BLE 1Mbps	2402	Ant1	2390	-58.45	2	38.81	Average	54	Pass
NVNT	BLE 1Mbps	2480	Ant1	2483.5	-47.9	2	49.36	Peak	74	Pass
NVNT	BLE 1Mbps	2480	Ant1	2483.5	-57.43	2	39.83	Average	54	Pass
NVNT	BLE 1Mbps	2480	Ant1	2483.608	-35.86	2	61.4	Peak	74	Pass
NVNT	BLE 1Mbps	2480	Ant1	2484.352	-57.28	2	39.98	Average	54	Pass
NVNT	BLE 1Mbps	2480	Ant1	2500	-50.16	2	47.1	Peak	74	Pass
NVNT	BLE 1Mbps	2480	Ant1	2500	-58.04	2	39.22	Average	54	Pass
NVNT	BLE 2Mbps	2402	Ant1	2310	-50.18	2	47.08	Peak	74	Pass
NVNT	BLE 2Mbps	2402	Ant1	2310	-57.47	2	39.79	Average	54	Pass
NVNT	BLE 2Mbps	2402	Ant1	2347.824	-46.57	2	50.69	Peak	74	Pass
NVNT	BLE 2Mbps	2402	Ant1	2337.744	-54.76	2	42.5	Average	54	Pass
NVNT	BLE 2Mbps	2402	Ant1	2390	-47.63	2	49.63	Peak	74	Pass
NVNT	BLE 2Mbps	2402	Ant1	2390	-57.44	2	39.82	Average	54	Pass
NVNT	BLE 2Mbps	2480	Ant1	2483.5	-47	2	50.26	Peak	74	Pass
NVNT	BLE 2Mbps	2480	Ant1	2483.5	-53.98	2	43.28	Average	54	Pass
NVNT	BLE 2Mbps	2480	Ant1	2483.584	-35.85	2	61.41	Peak	74	Pass
NVNT	BLE 2Mbps	2480	Ant1	2483.512	-53.98	2	43.28	Average	54	Pass

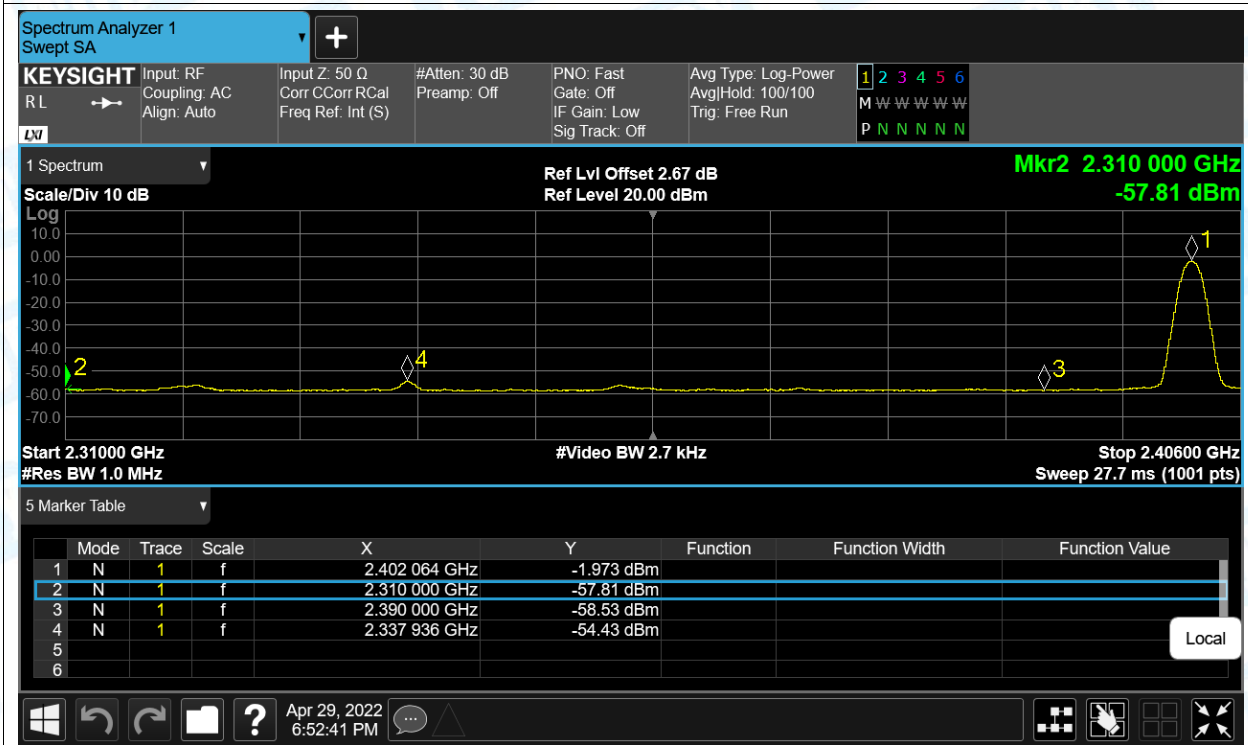
NVNT	BLE 2Mbps	2480	Ant1	2500	-49.66	2	47.6	Peak	74	Pass
NVNT	BLE 2Mbps	2480	Ant1	2500	-58.07	2	39.19	Average	54	Pass

Test Graphs

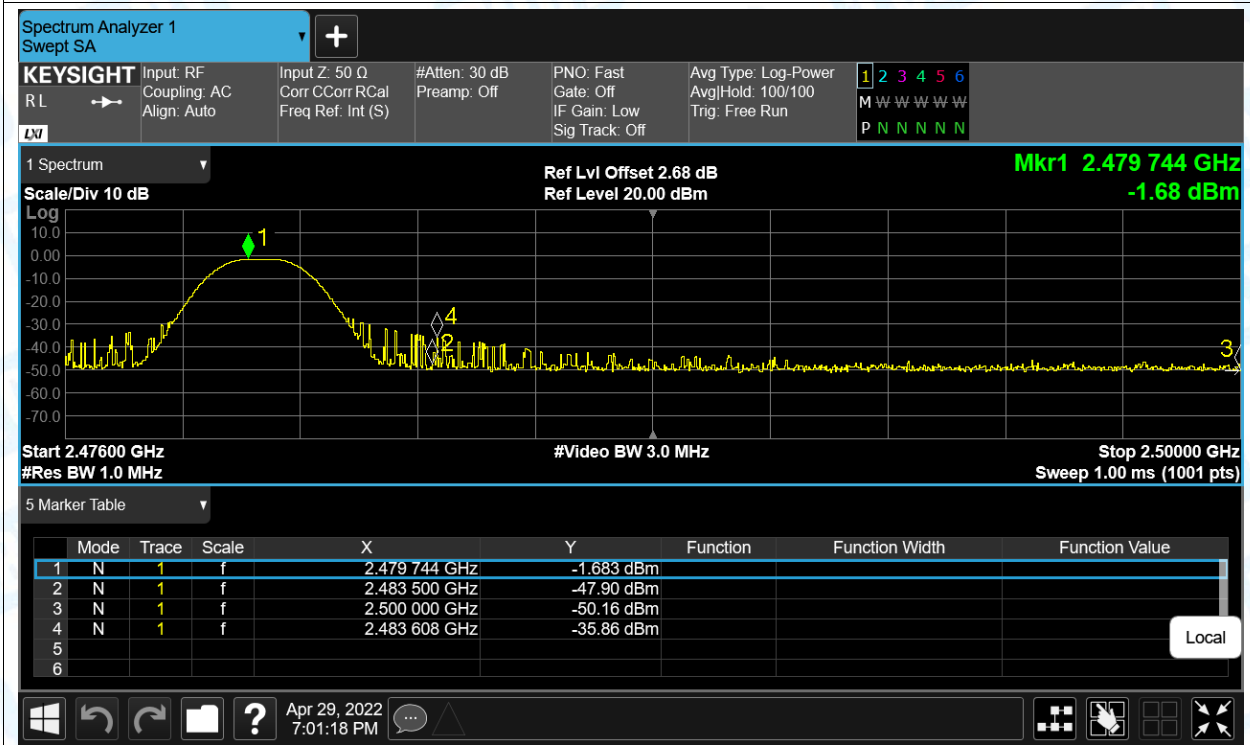
Restrict Band NVNT BLE 1Mbps 2402MHz Ant1 Peak



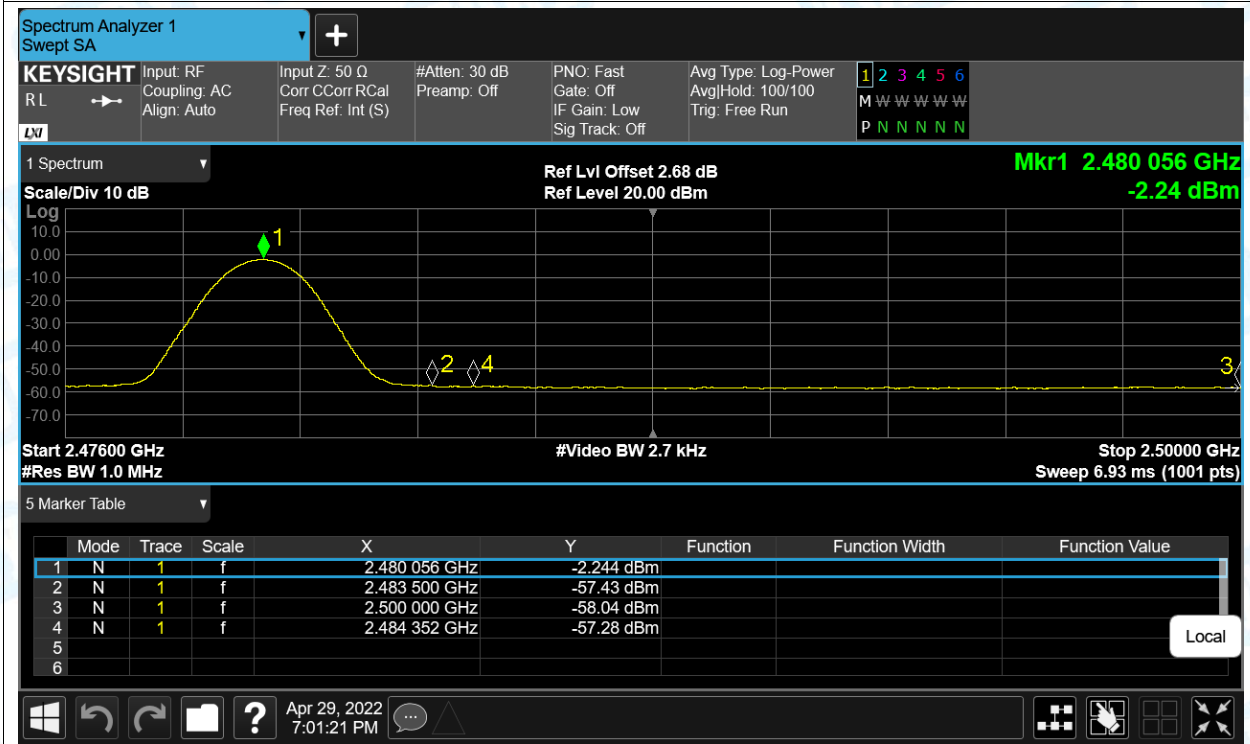
Restrict Band NVNT BLE 1Mbps 2402MHz Ant1 Average



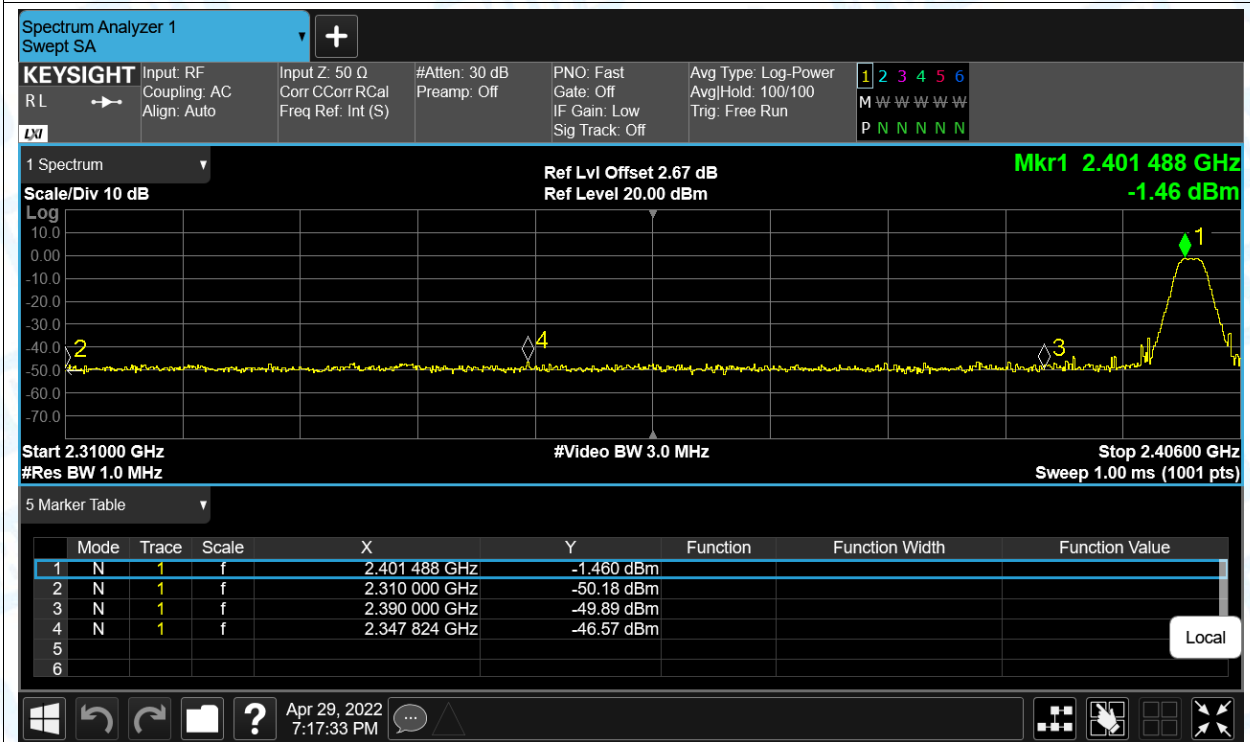
Restrict Band NVNT BLE 1Mbps 2480MHz Ant1 Peak



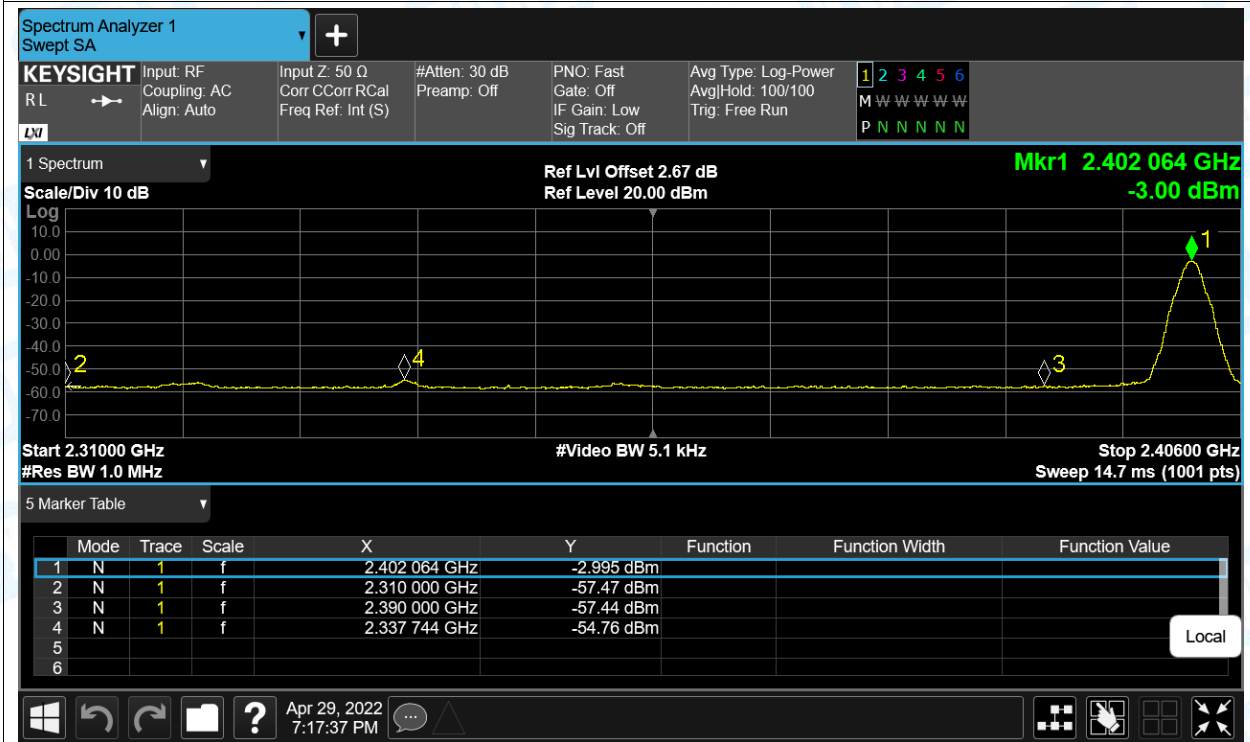
Restrict Band NVNT BLE 1Mbps 2480MHz Ant1 Average



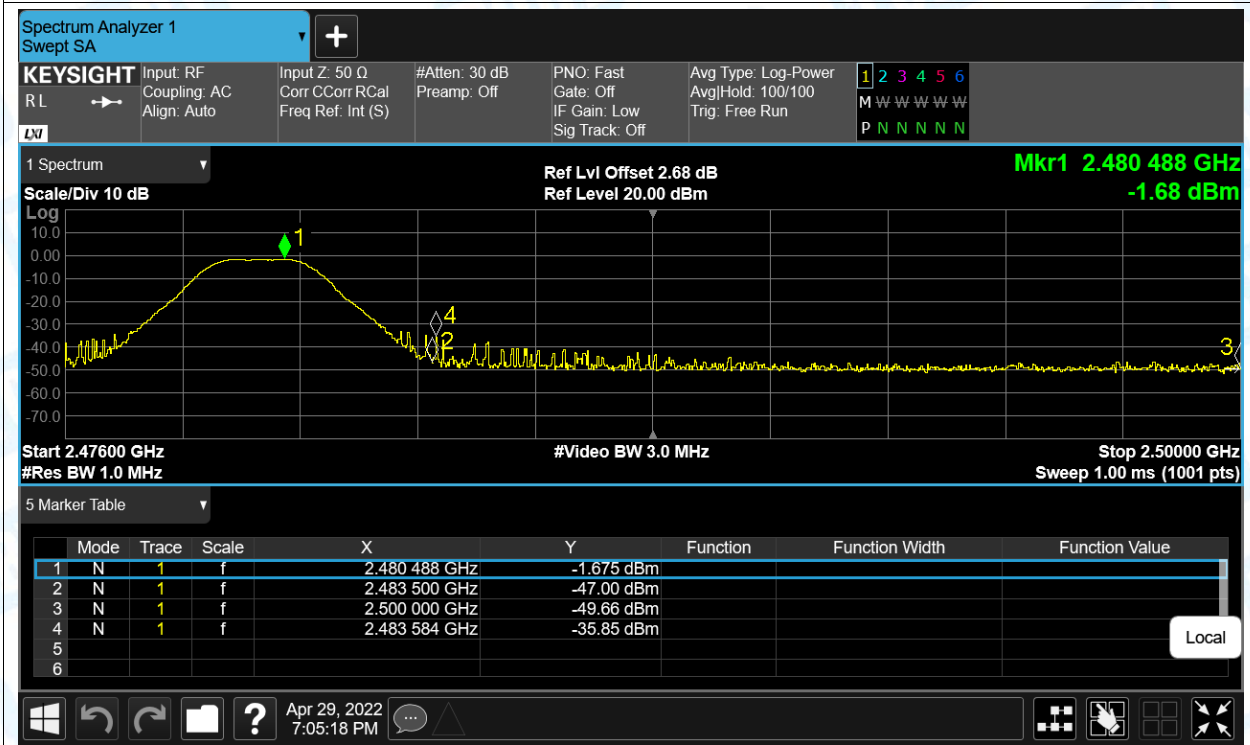
Restrict Band NVNT BLE 2Mbps 2402MHz Ant1 Peak



Restrict Band NVNT BLE 2Mbps 2402MHz Ant1 Average



Restrict Band NVNT BLE 2Mbps 2480MHz Ant1 Peak



Restrict Band NVNT BLE 2Mbps 2480MHz Ant1 Average

