

# RF Test Data for Bluetooth LE (Conducted Measurements)

General Description of EUT	
<b>Product Name:</b>	Sensor Hub
<b>Test Model:</b>	HRI-3621
<b>Sample ID:</b>	HC-C-202404-0276-01-02-2#
Environmental Conditions	
<b>Temperature:</b>	23.8°C
<b>Relative Humidity:</b>	48%
<b>Test Voltage:</b>	DC 3.7V
<b>Test Engineer:</b>	Mike Yan
Note: For a more detailed features description, please refer to the report TBR-C-202404-0276-2 The report only show the worst case data.	



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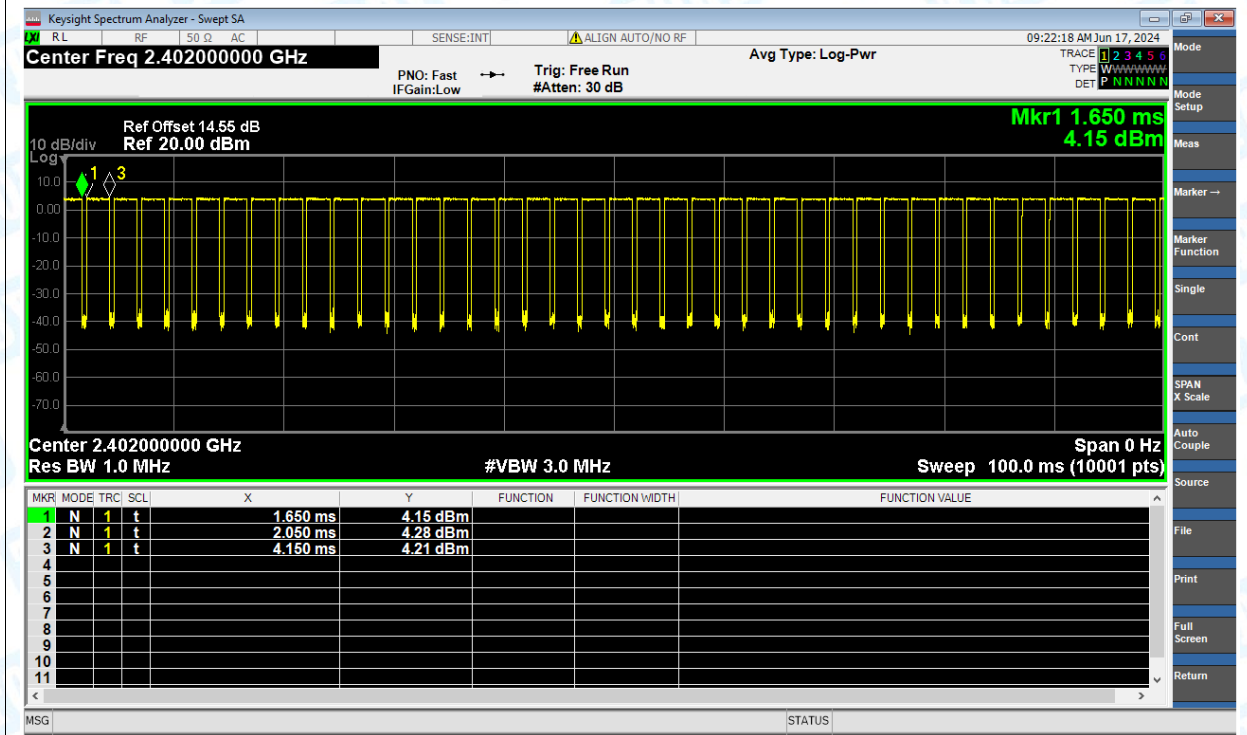


## 1. Duty Cycle

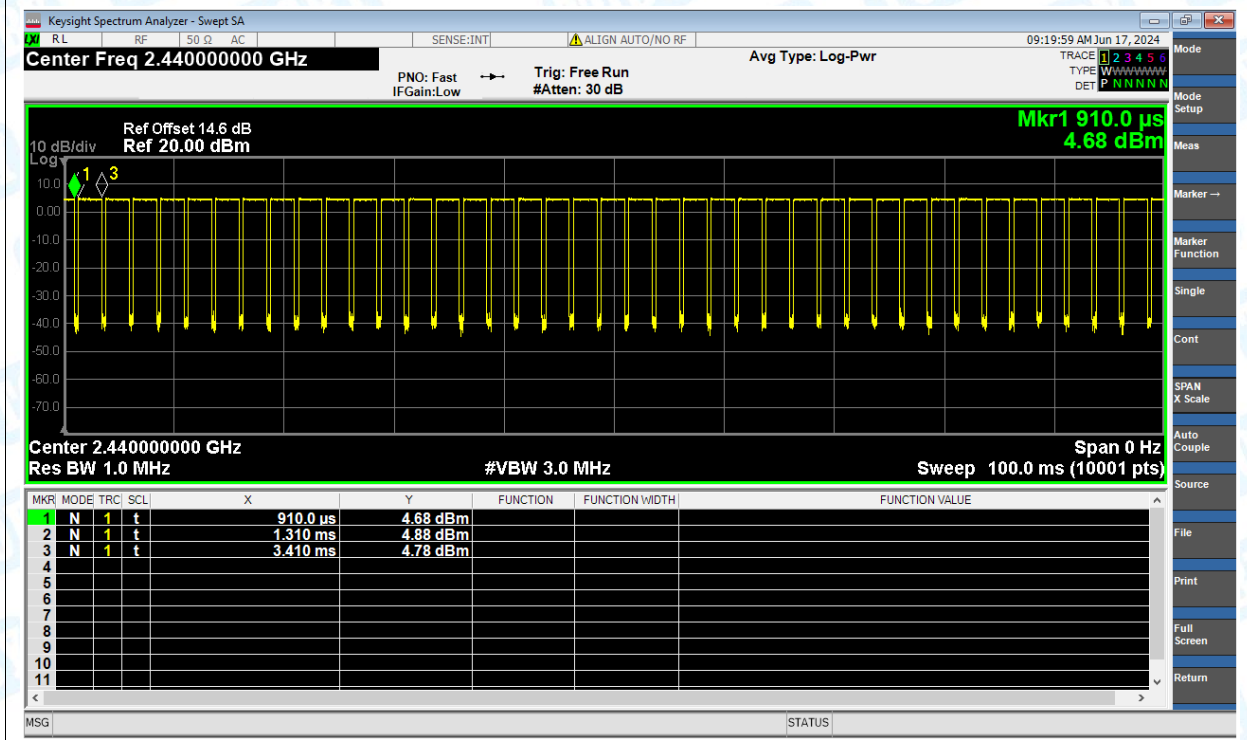
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	BLE 1Mbps	2402	Ant1	84	0.76	0.48
NVNT	BLE 1Mbps	2440	Ant1	84	0.76	0.48
NVNT	BLE 1Mbps	2480	Ant1	84	0.76	0.48
NVNT	BLE 2Mbps	2402	Ant1	56.68	2.47	0.94
NVNT	BLE 2Mbps	2440	Ant1	56.91	2.45	0.93
NVNT	BLE 2Mbps	2480	Ant1	56.38	2.49	0.94

Test Graphs

Duty Cycle NVNT BLE 1Mbps 2402MHz Ant1

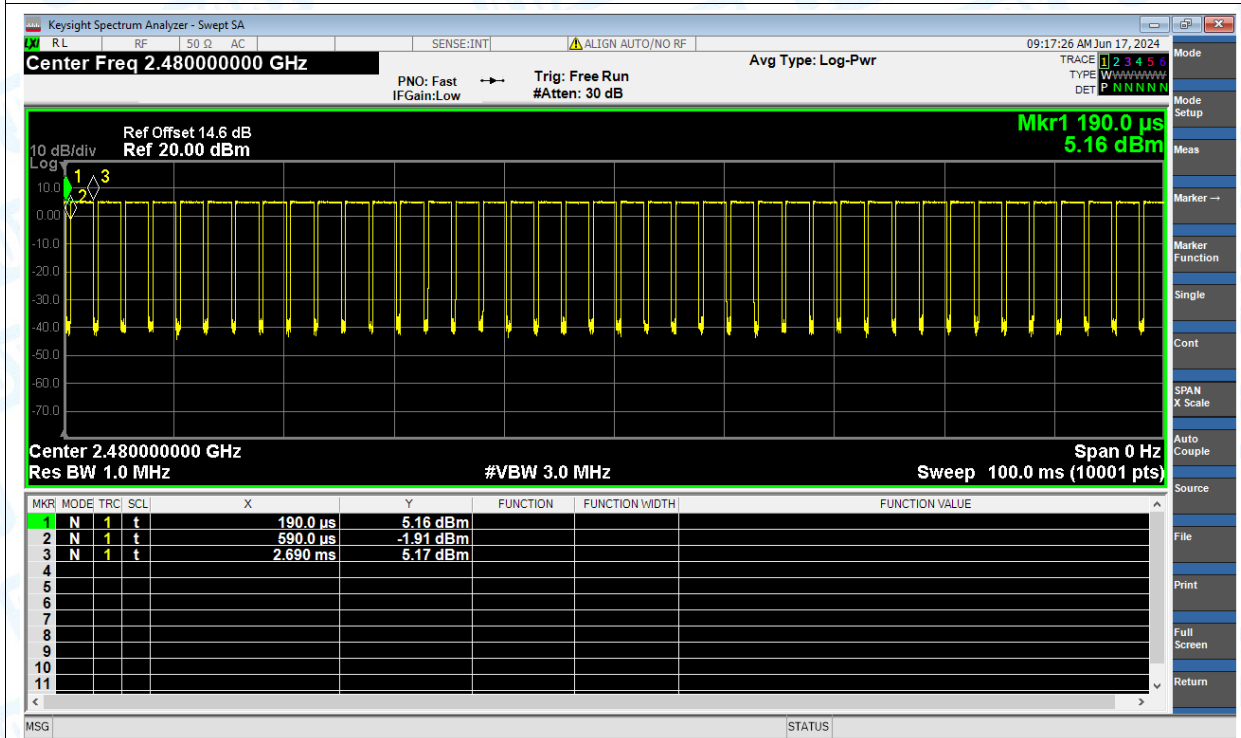


Duty Cycle NVNT BLE 1Mbps 2440MHz Ant1

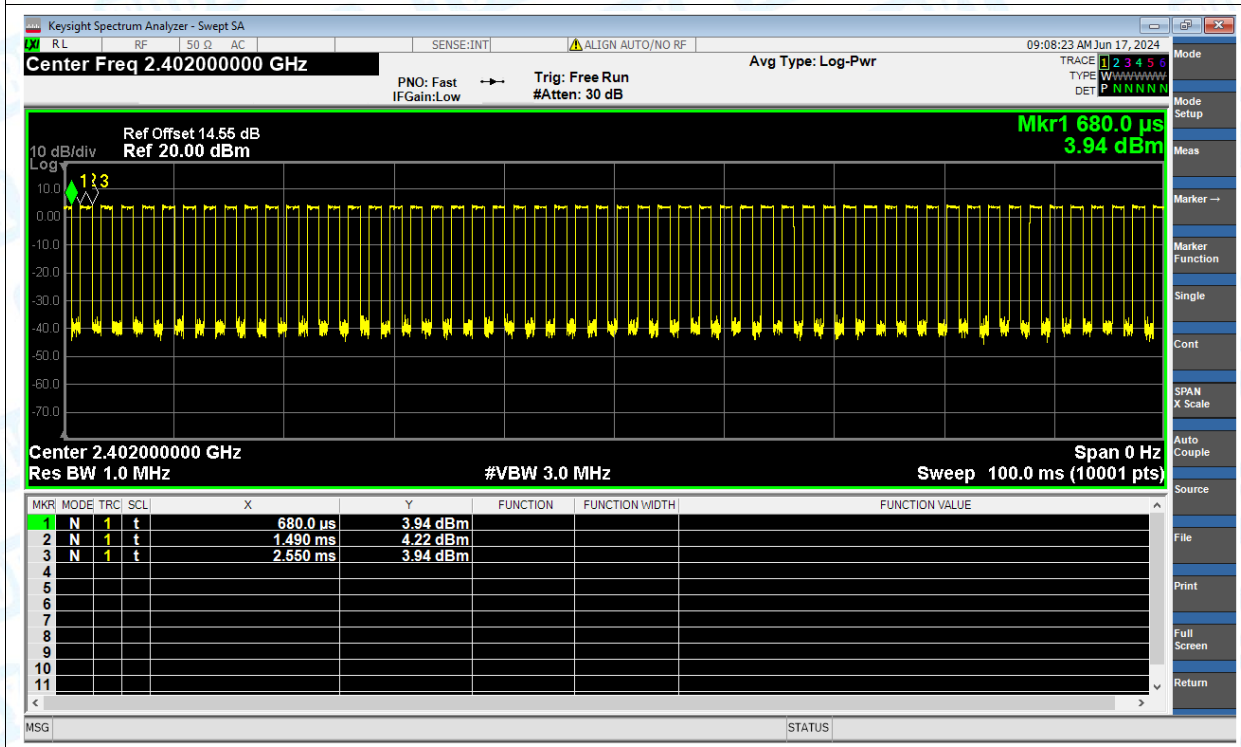




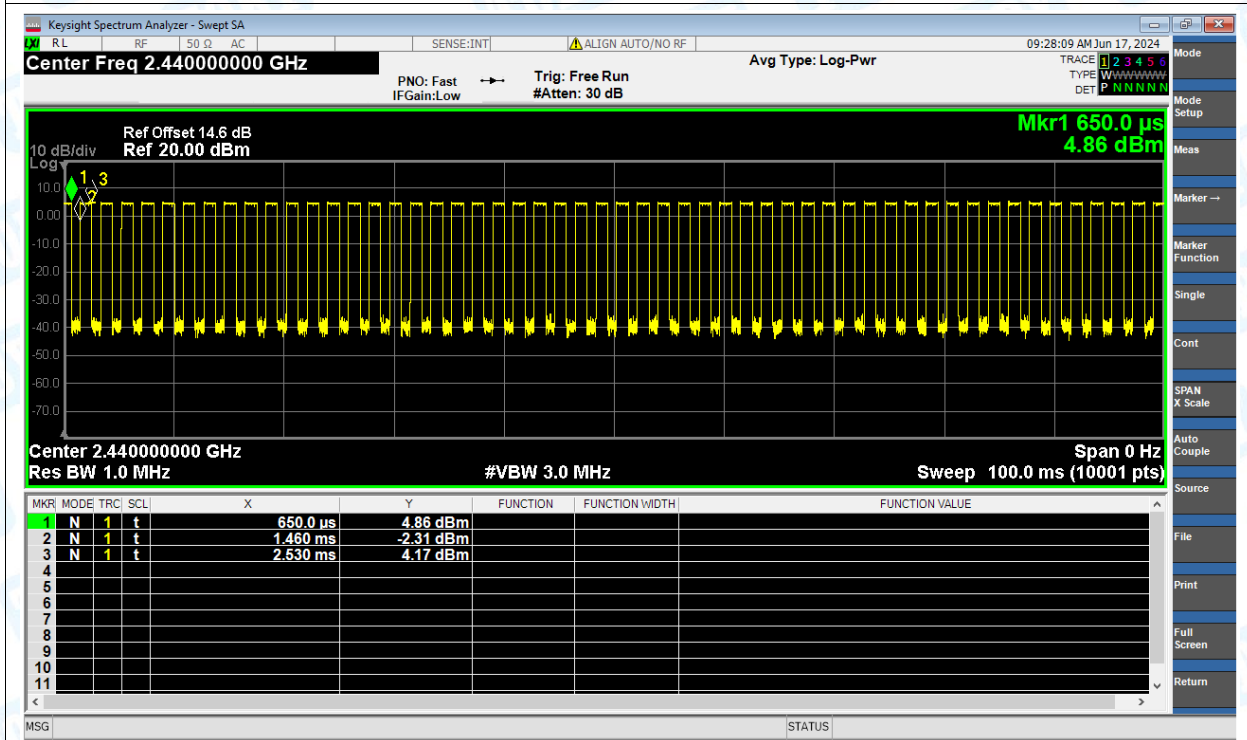
Duty Cycle NVNT BLE 1Mbps 2480MHz Ant1



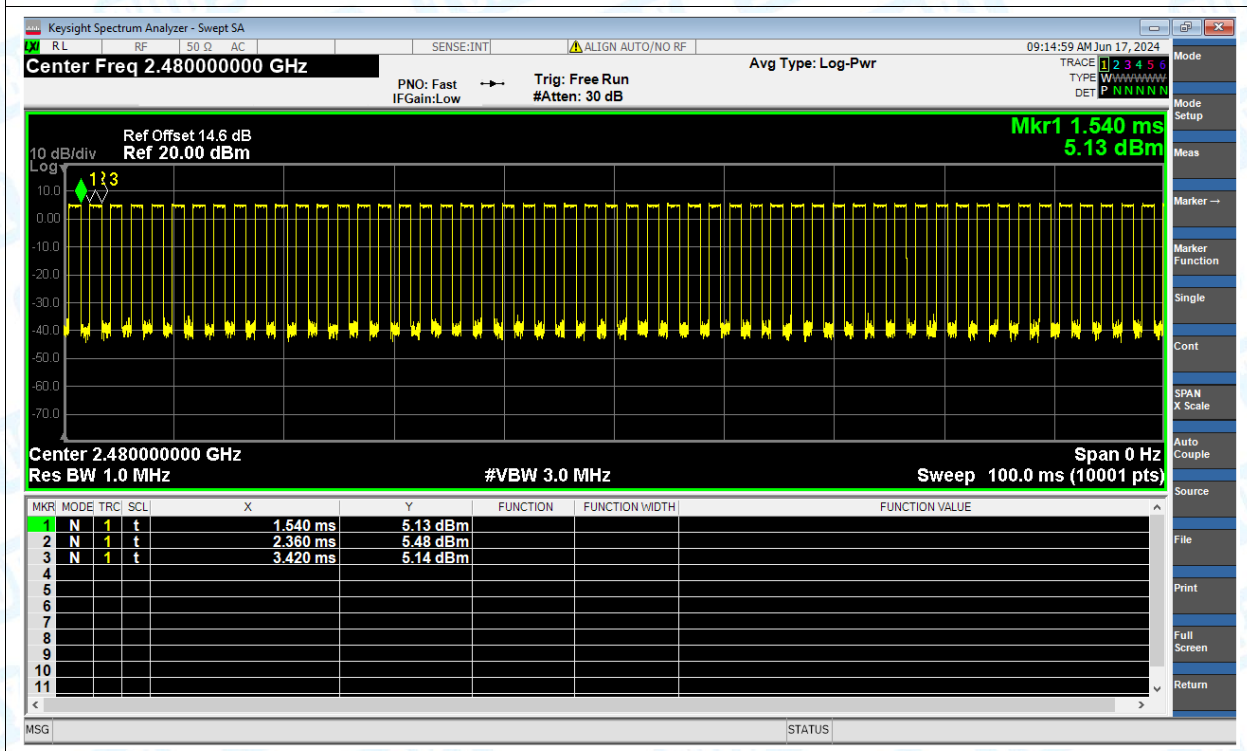
Duty Cycle NVNT BLE 2Mbps 2402MHz Ant1



Duty Cycle NVNT BLE 2Mbps 2440MHz Ant1



Duty Cycle NVNT BLE 2Mbps 2480MHz Ant1



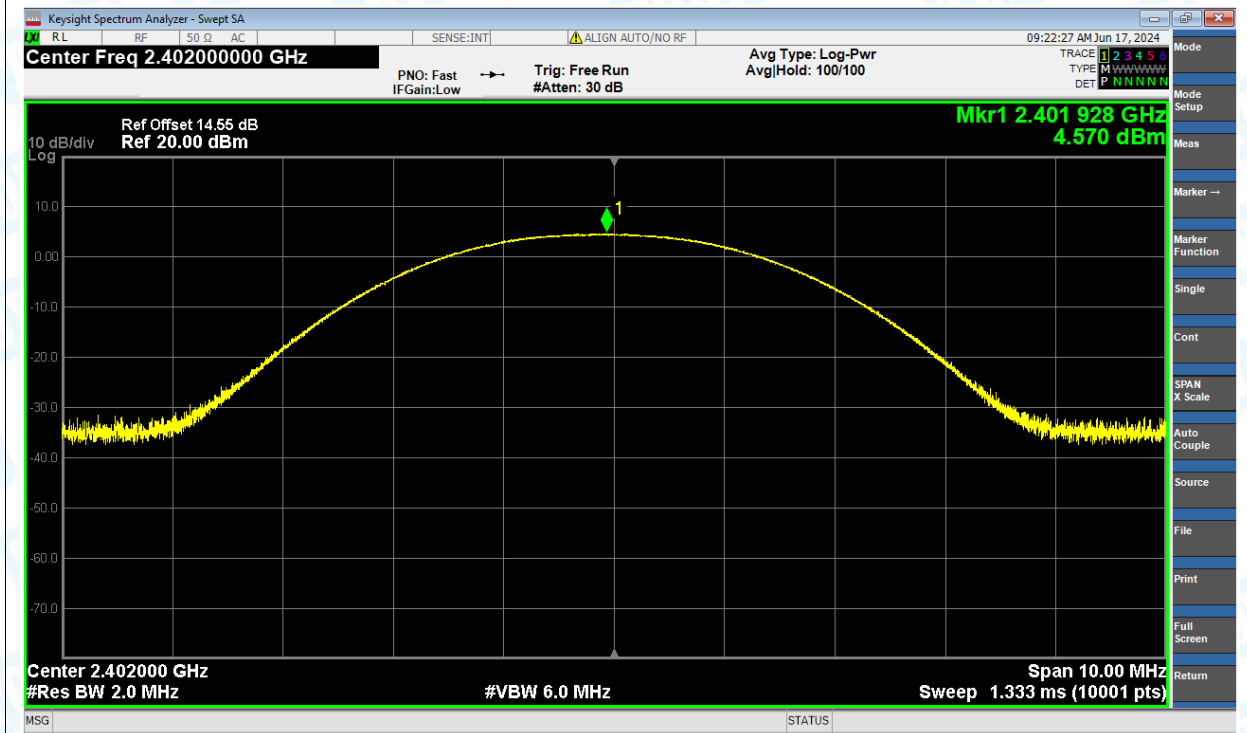


## 2. Maximum Conducted Output Power

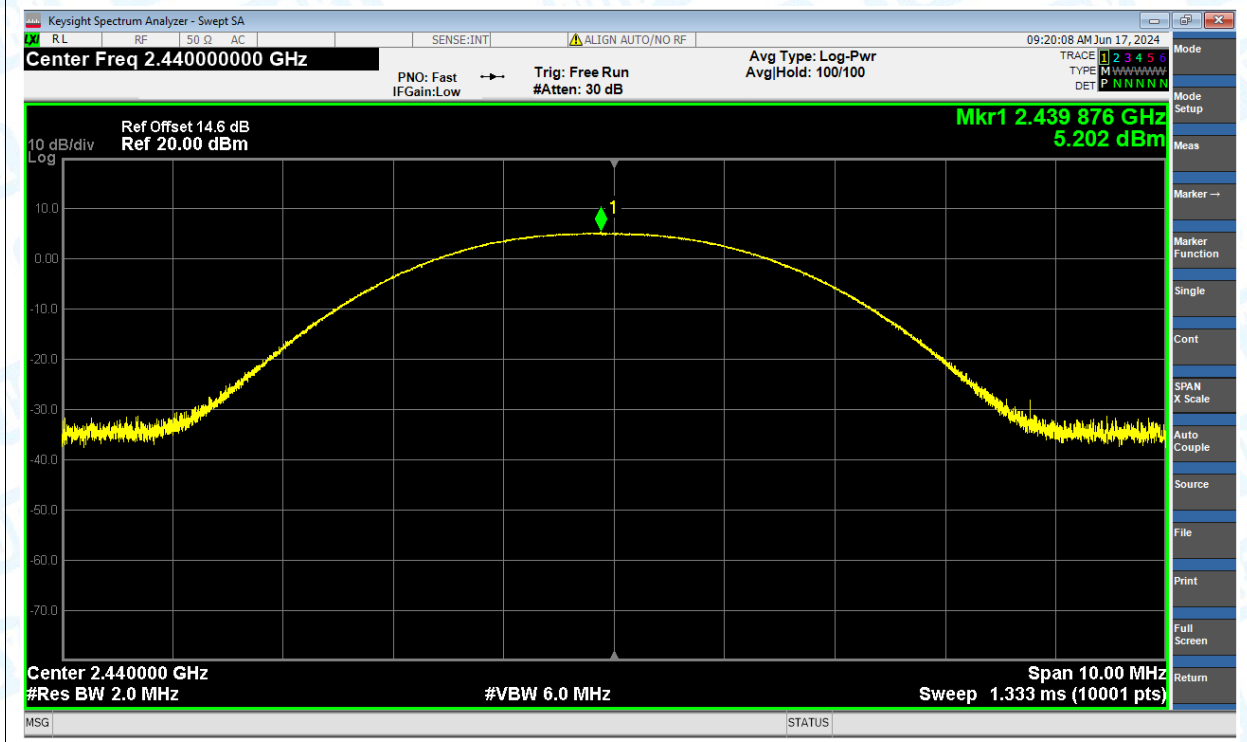
Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	BLE 1Mbps	2402	Ant1	4.570	30	Pass
NVNT	BLE 1Mbps	2440	Ant1	5.202	30	Pass
NVNT	BLE 1Mbps	2480	Ant1	5.456	30	Pass
NVNT	BLE 2Mbps	2402	Ant1	4.469	30	Pass
NVNT	BLE 2Mbps	2440	Ant1	5.248	30	Pass
NVNT	BLE 2Mbps	2480	Ant1	5.678	30	Pass

Test Graphs

Power NVNT BLE 1Mbps 2402MHz Ant1



Power NVNT BLE 1Mbps 2440MHz Ant1

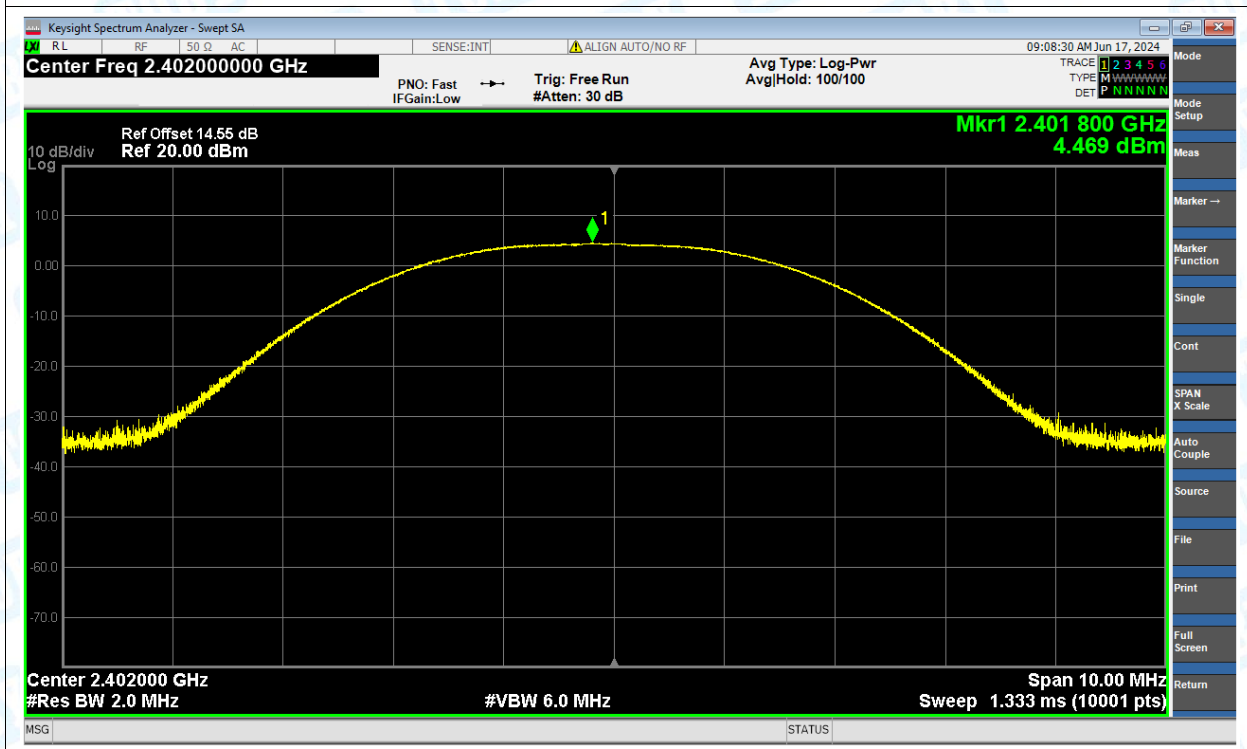




Power NVNT BLE 1Mbps 2480MHz Ant1



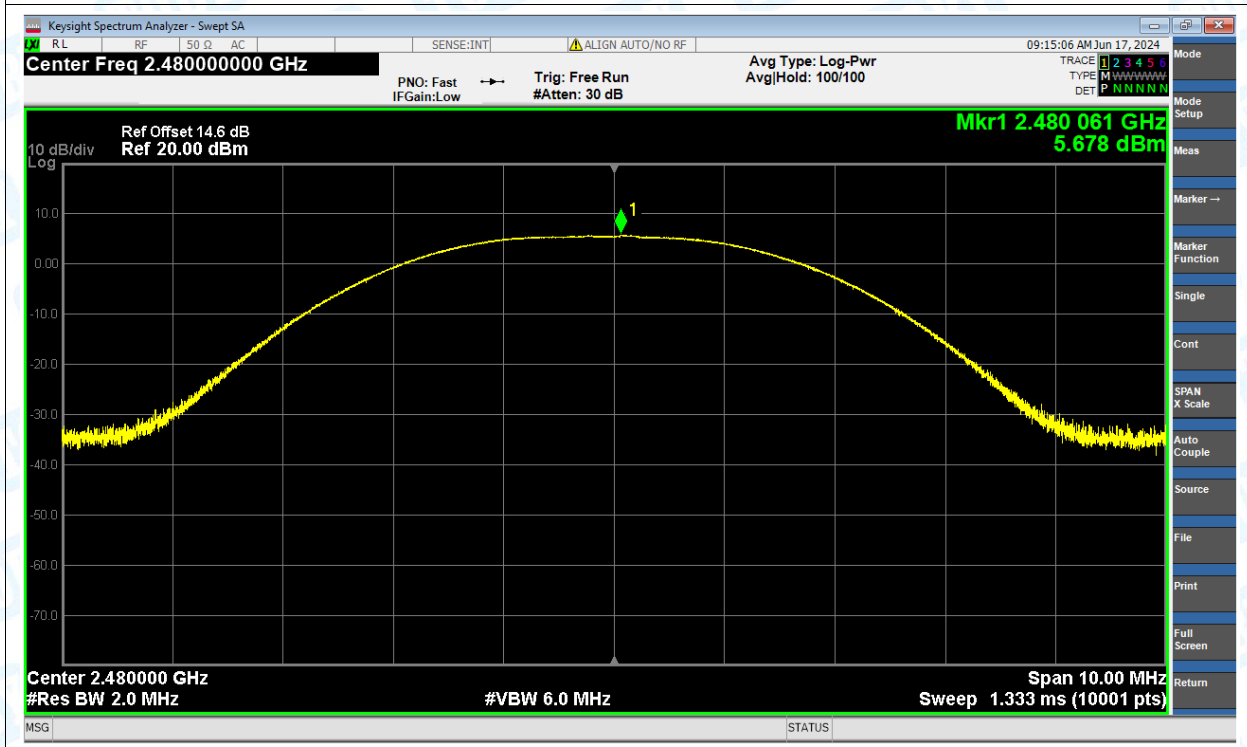
Power NVNT BLE 2Mbps 2402MHz Ant1



Power NVNT BLE 2Mbps 2440MHz Ant1



Power NVNT BLE 2Mbps 2480MHz Ant1



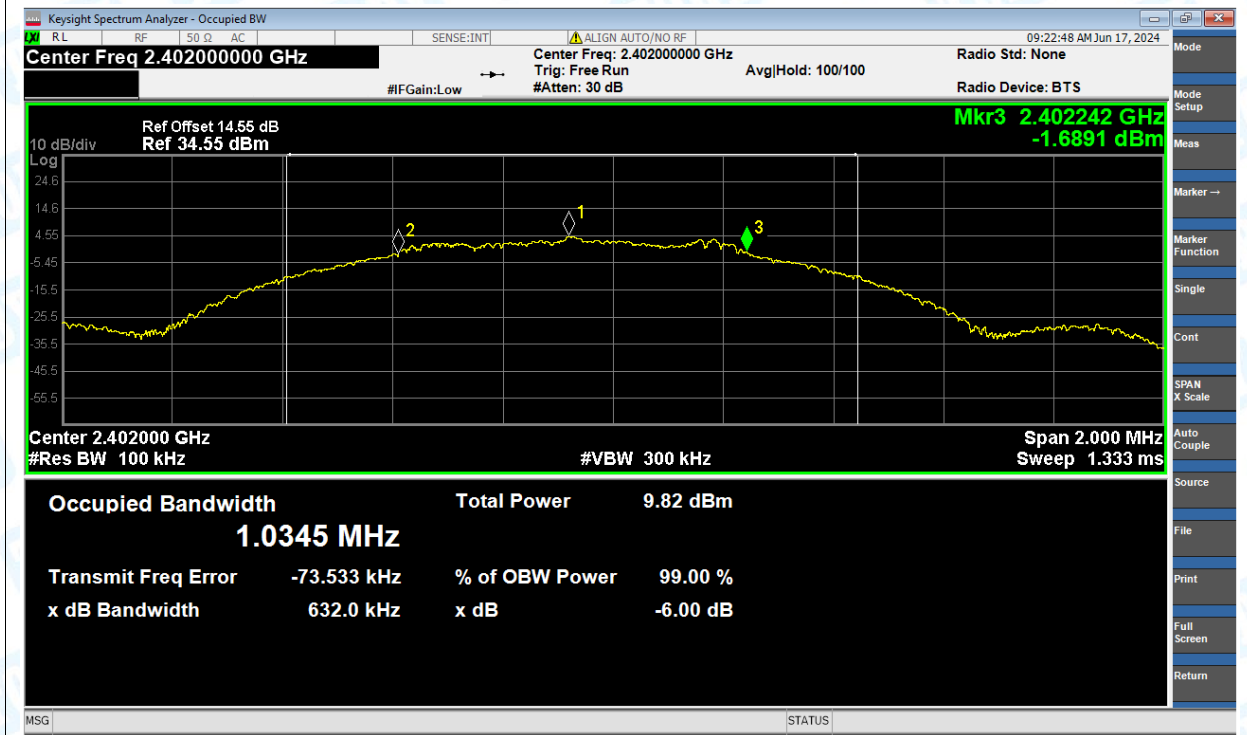


### 3. -6dB Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	BLE 1Mbps	2402	Ant1	0.63	0.5	Pass
NVNT	BLE 1Mbps	2440	Ant1	0.64	0.5	Pass
NVNT	BLE 1Mbps	2480	Ant1	0.63	0.5	Pass
NVNT	BLE 2Mbps	2402	Ant1	1.09	0.5	Pass
NVNT	BLE 2Mbps	2440	Ant1	1.09	0.5	Pass
NVNT	BLE 2Mbps	2480	Ant1	1.06	0.5	Pass

Test Graphs

-6dB Bandwidth NVNT BLE 1Mbps 2402MHz Ant1

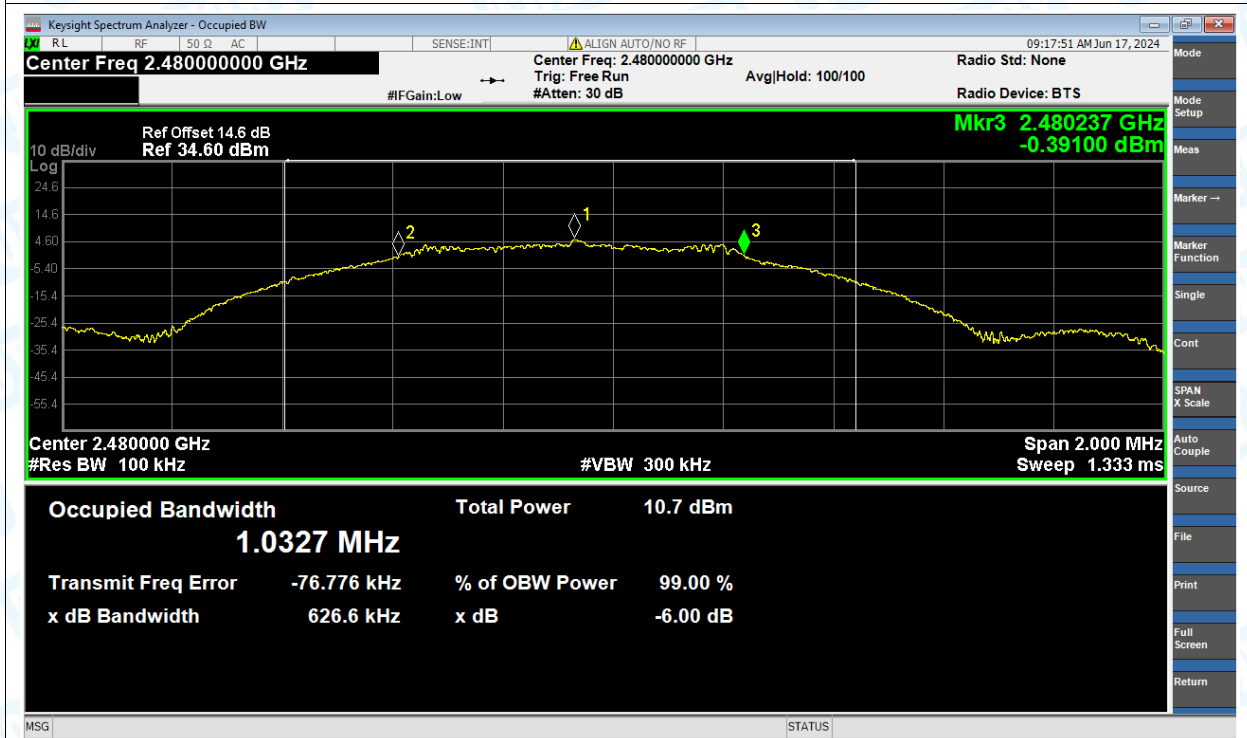


-6dB Bandwidth NVNT BLE 1Mbps 2440MHz Ant1

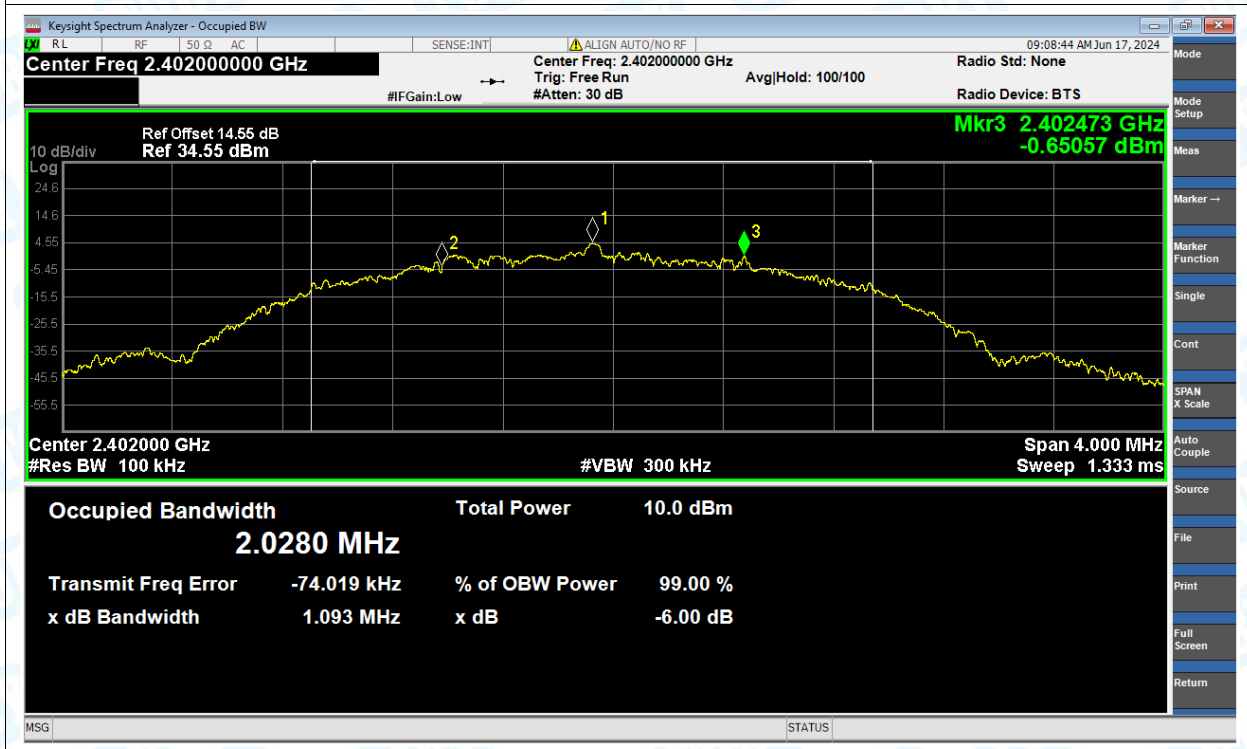




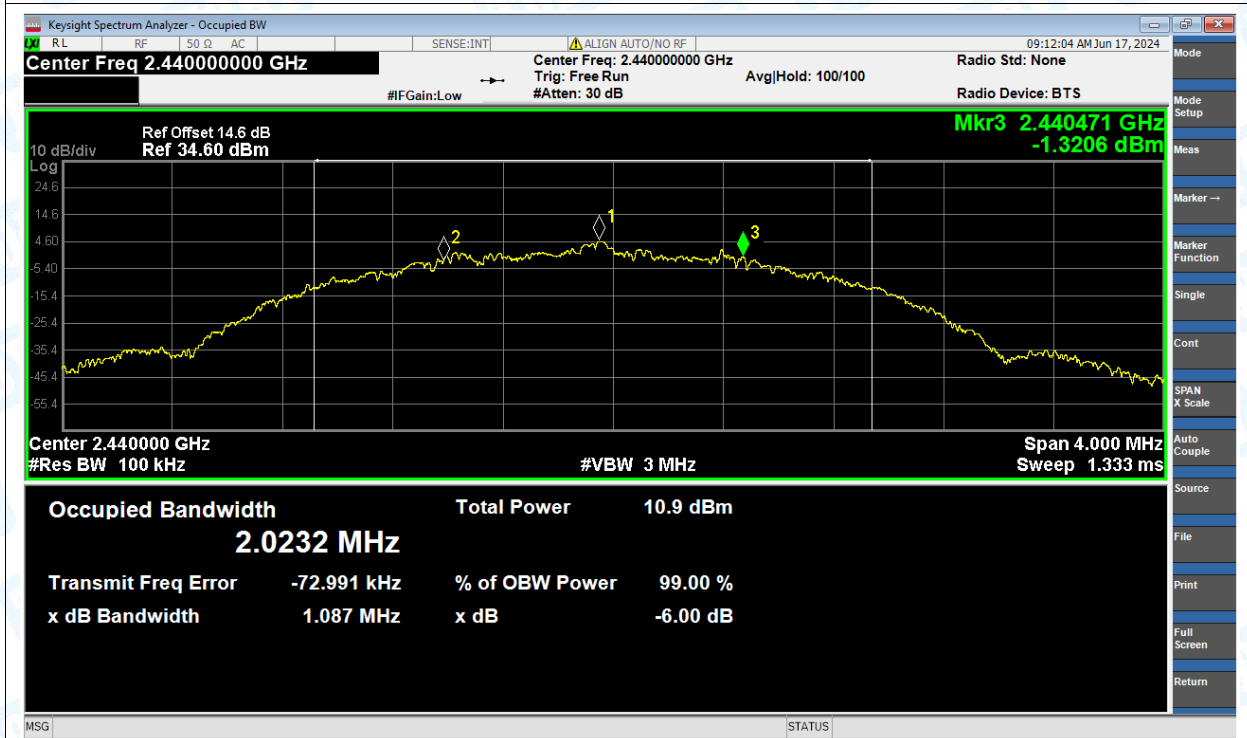
-6dB Bandwidth NVNT BLE 1Mbps 2480MHz Ant1



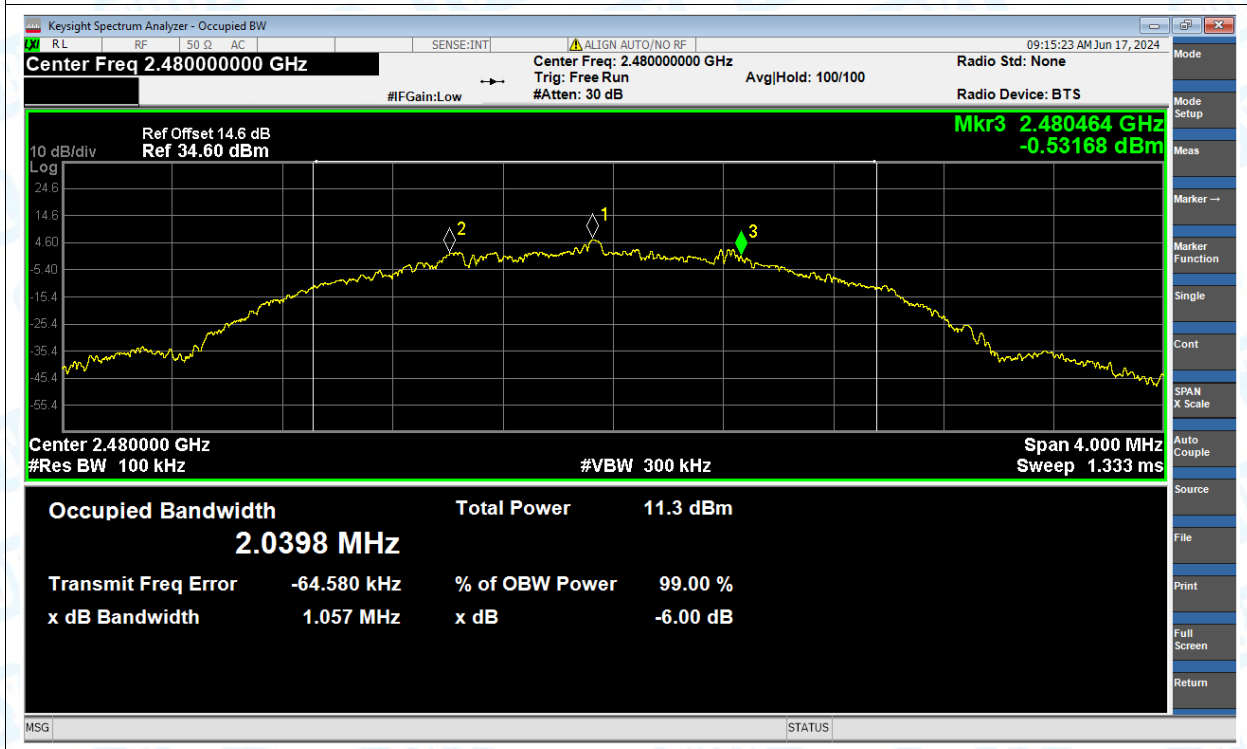
-6dB Bandwidth NVNT BLE 2Mbps 2402MHz Ant1



-6dB Bandwidth NVNT BLE 2Mbps 2440MHz Ant1



-6dB Bandwidth NVNT BLE 2Mbps 2480MHz Ant1



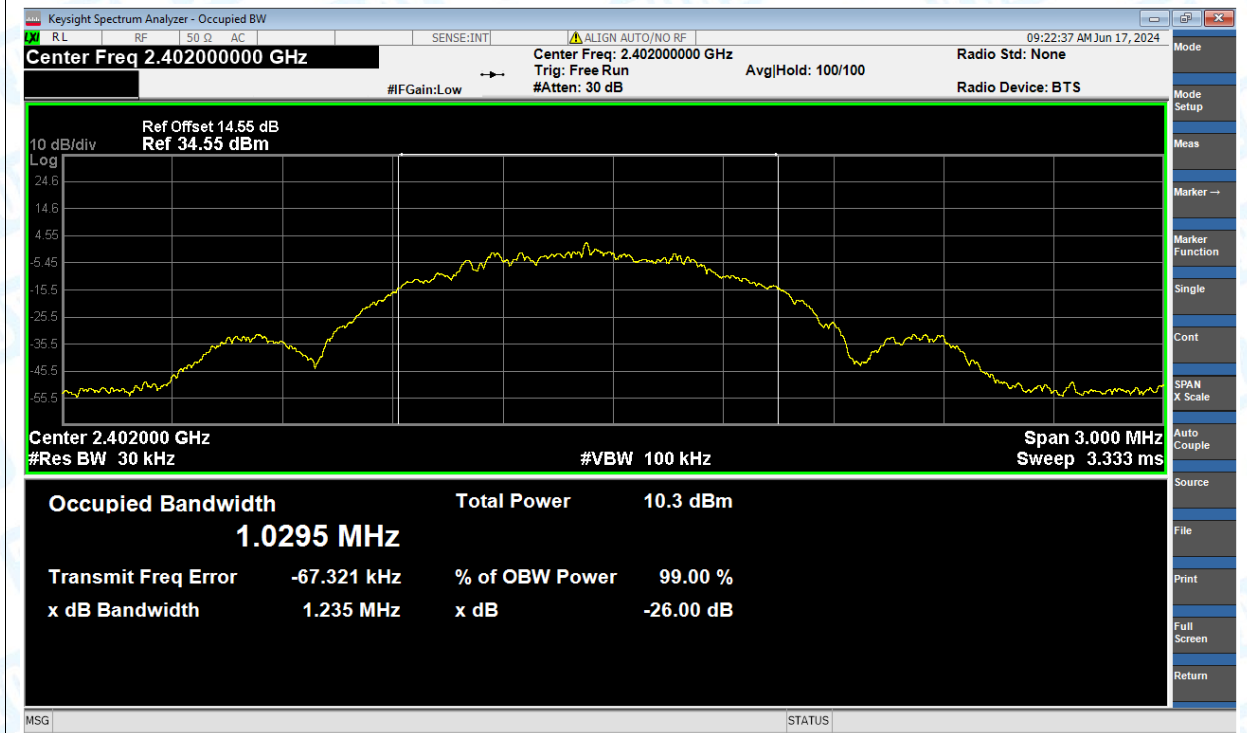


## 4. Occupied Channel Bandwidth

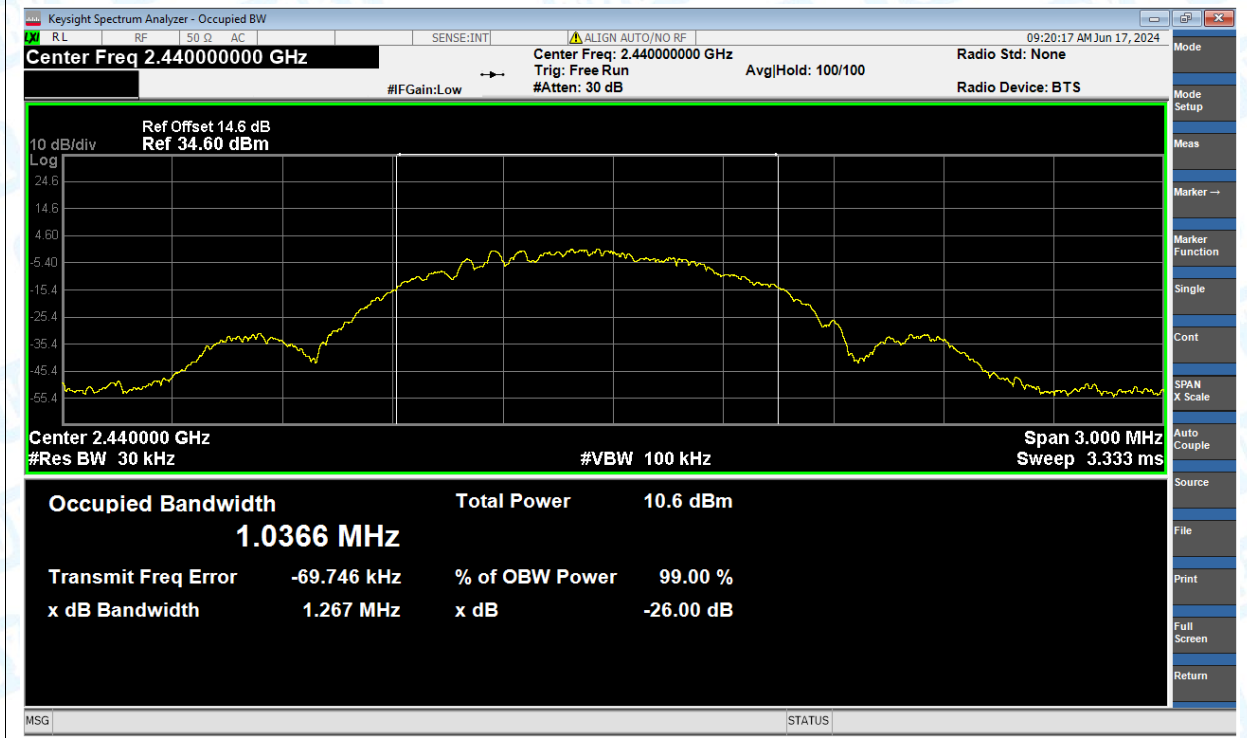
Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	BLE 1Mbps	2402	Ant1	1.029
NVNT	BLE 1Mbps	2440	Ant1	1.037
NVNT	BLE 1Mbps	2480	Ant1	1.034
NVNT	BLE 2Mbps	2402	Ant1	2.021
NVNT	BLE 2Mbps	2440	Ant1	2.035
NVNT	BLE 2Mbps	2480	Ant1	2.032

Test Graphs

OBW NVNT BLE 1Mbps 2402MHz Ant1

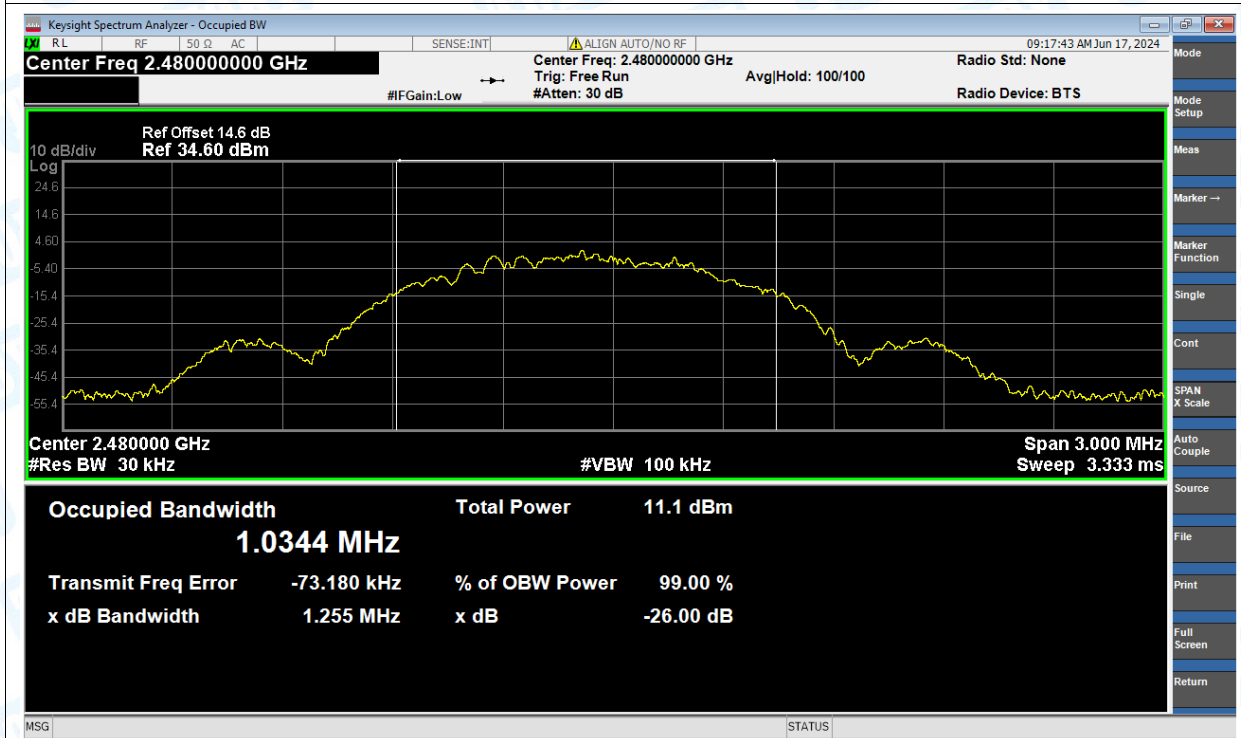


OBW NVNT BLE 1Mbps 2440MHz Ant1

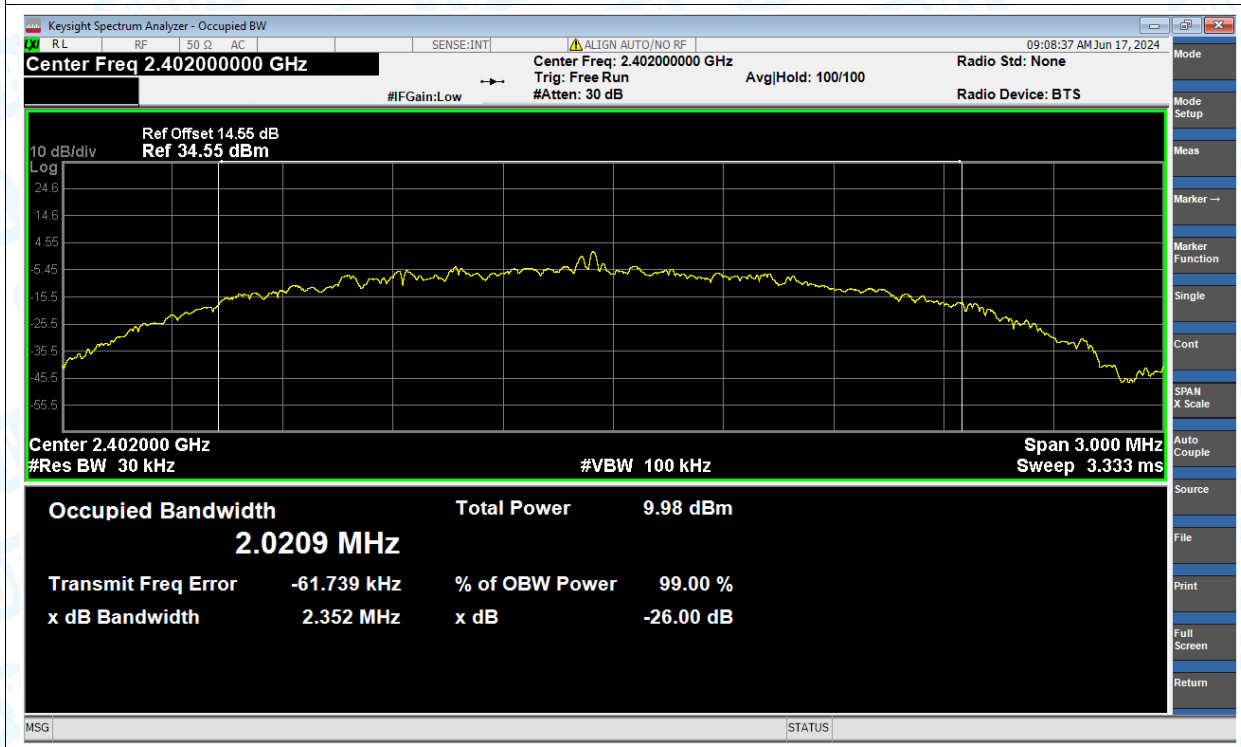




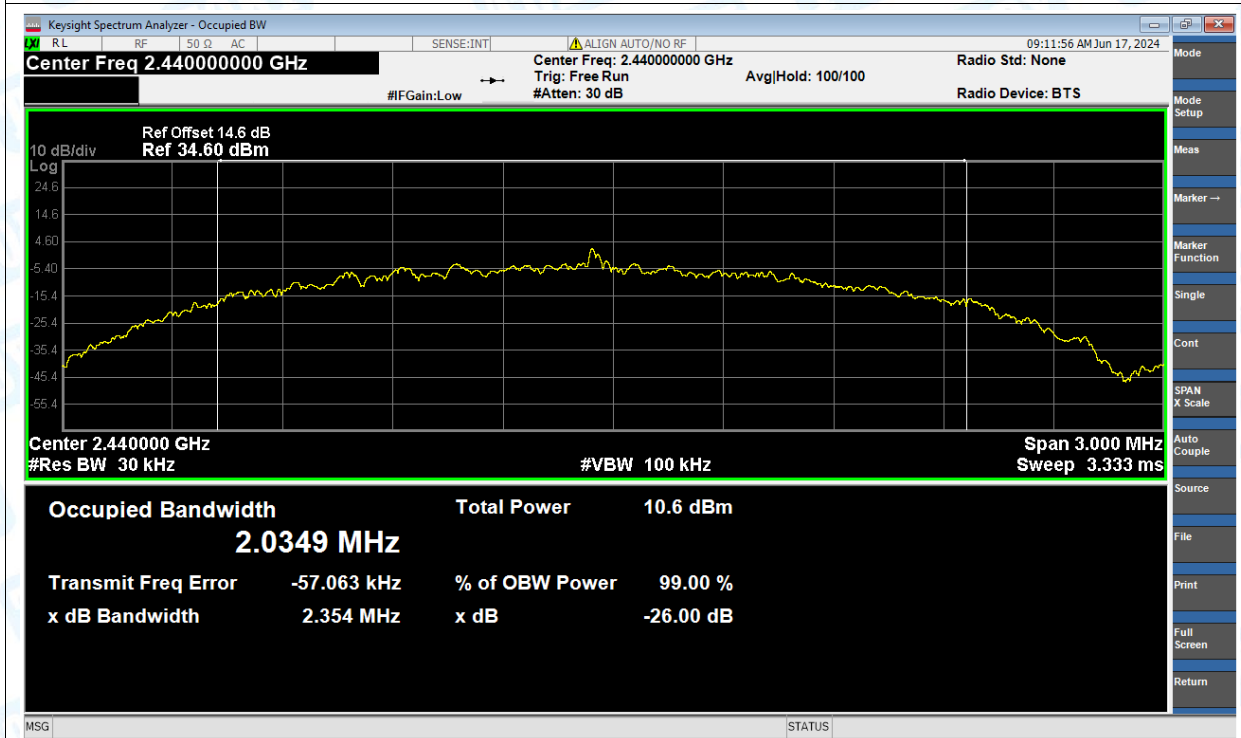
OBW NVNT BLE 1Mbps 2480MHz Ant1



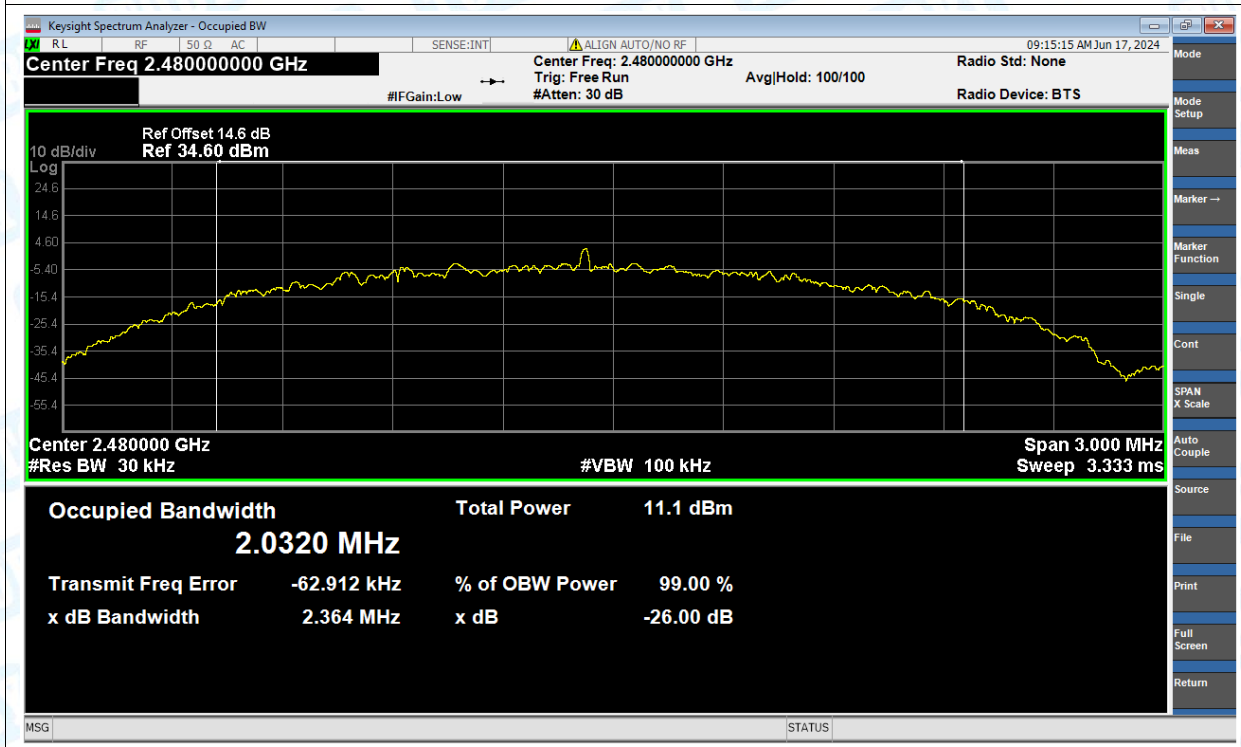
OBW NVNT BLE 2Mbps 2402MHz Ant1



OBW NVNT BLE 2Mbps 2440MHz Ant1



OBW NVNT BLE 2Mbps 2480MHz Ant1





## 5. Maximum Power Spectral Density Level

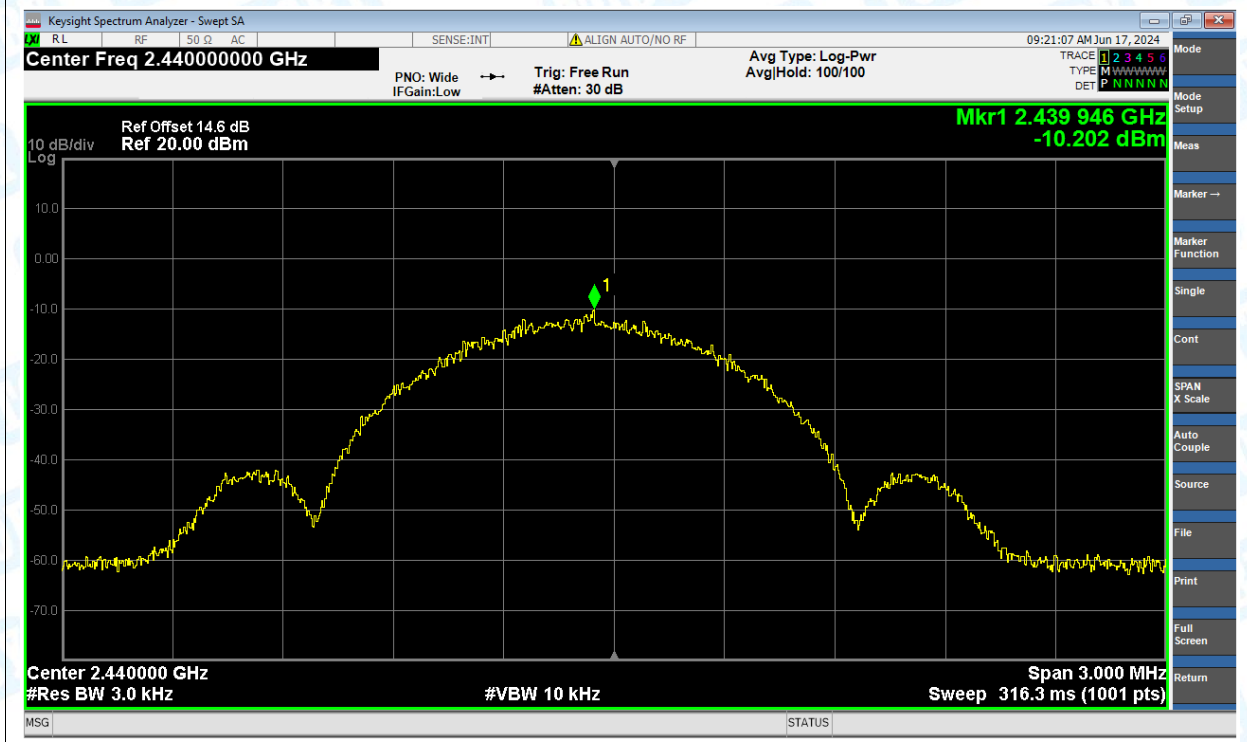
Condition	Mode	Frequency (MHz)	Antenna	Max PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	BLE 1Mbps	2402	Ant1	-10.873	8	Pass
NVNT	BLE 1Mbps	2440	Ant1	-10.202	8	Pass
NVNT	BLE 1Mbps	2480	Ant1	-9.825	8	Pass
NVNT	BLE 2Mbps	2402	Ant1	-13.395	8	Pass
NVNT	BLE 2Mbps	2440	Ant1	-11.960	8	Pass
NVNT	BLE 2Mbps	2480	Ant1	-11.648	8	Pass

Test Graphs

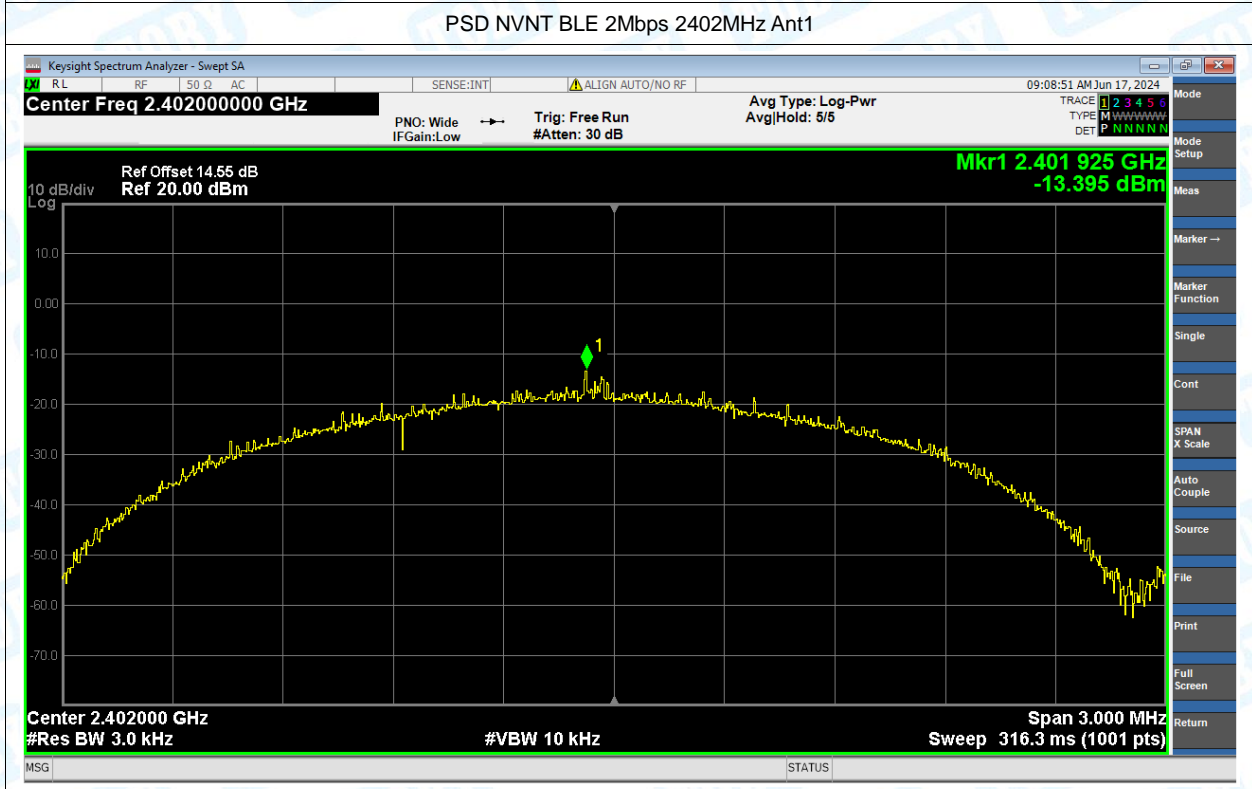
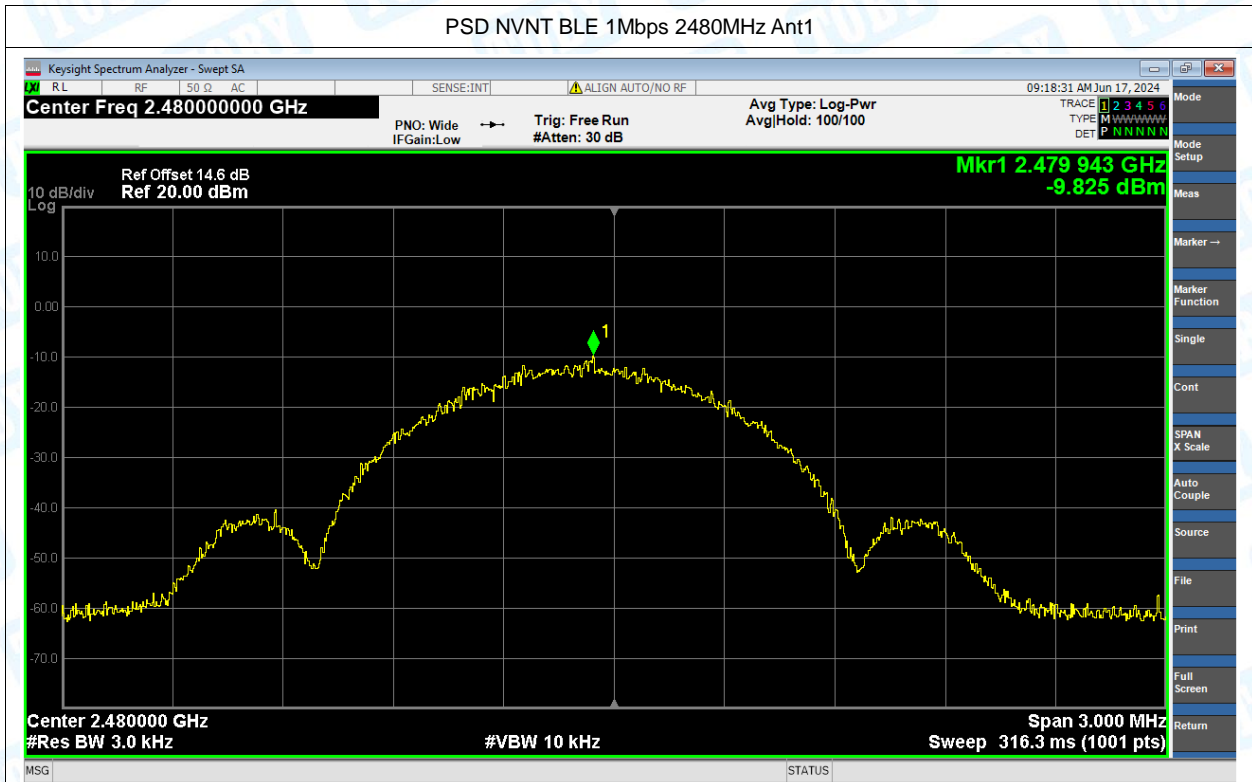
PSD NVNT BLE 1Mbps 2402MHz Ant1

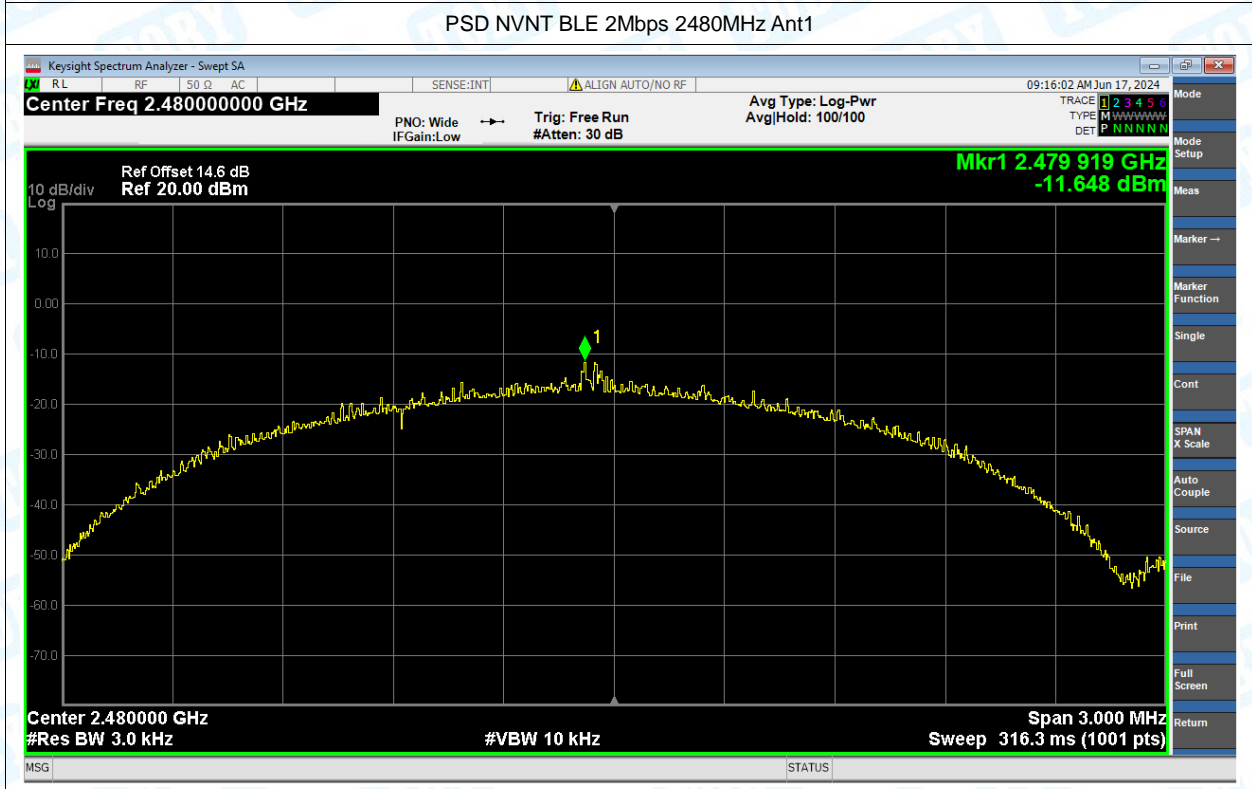
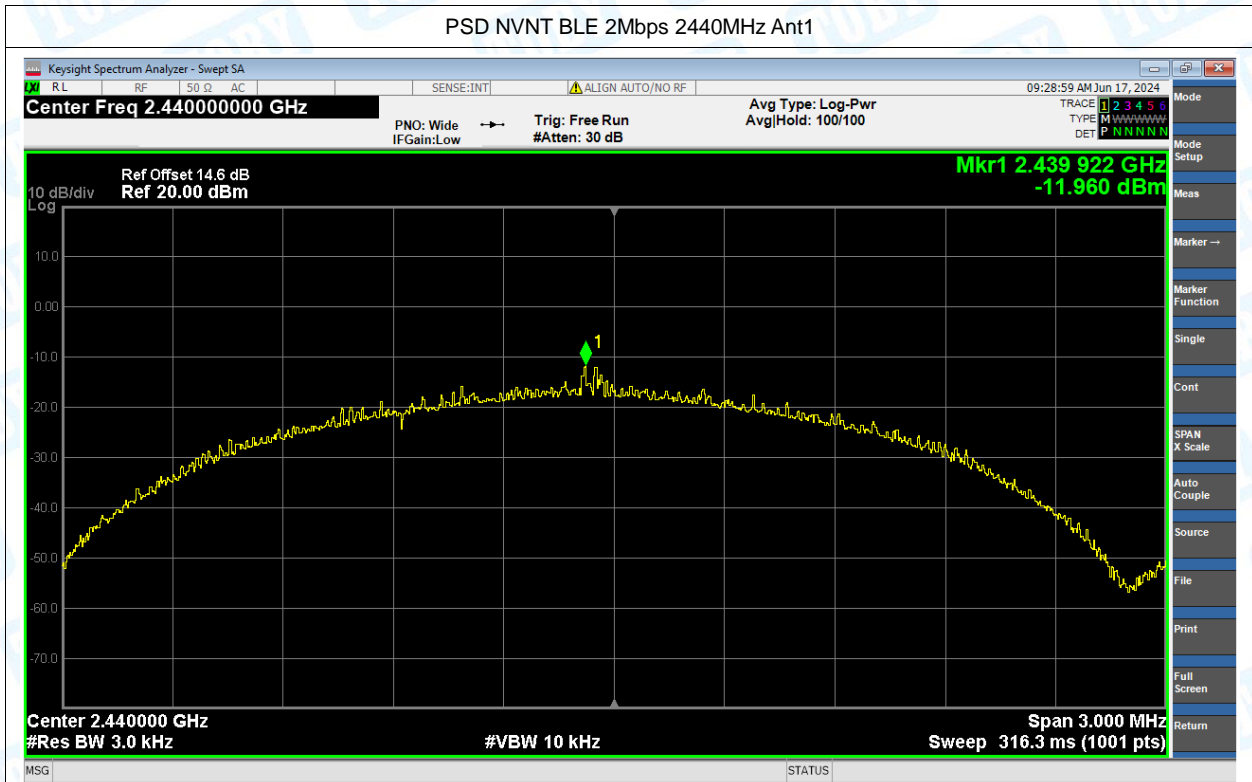


PSD NVNT BLE 1Mbps 2440MHz Ant1









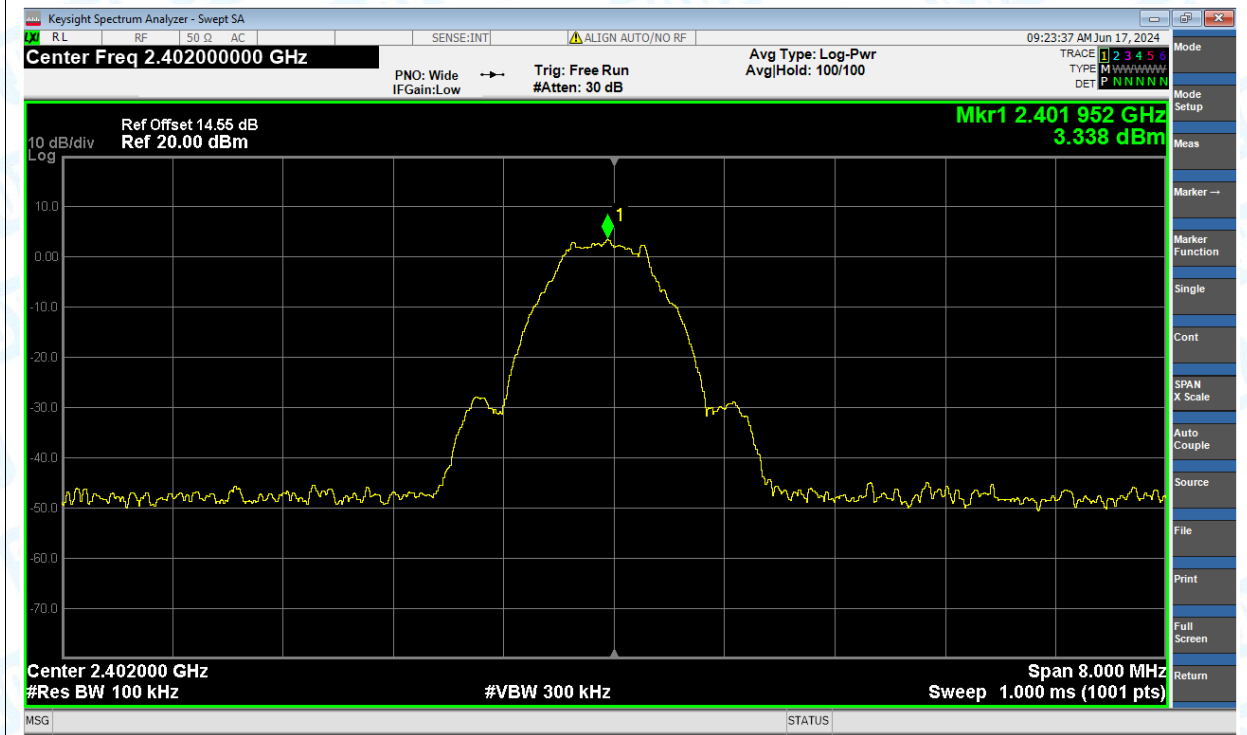


## 6. Band Edge

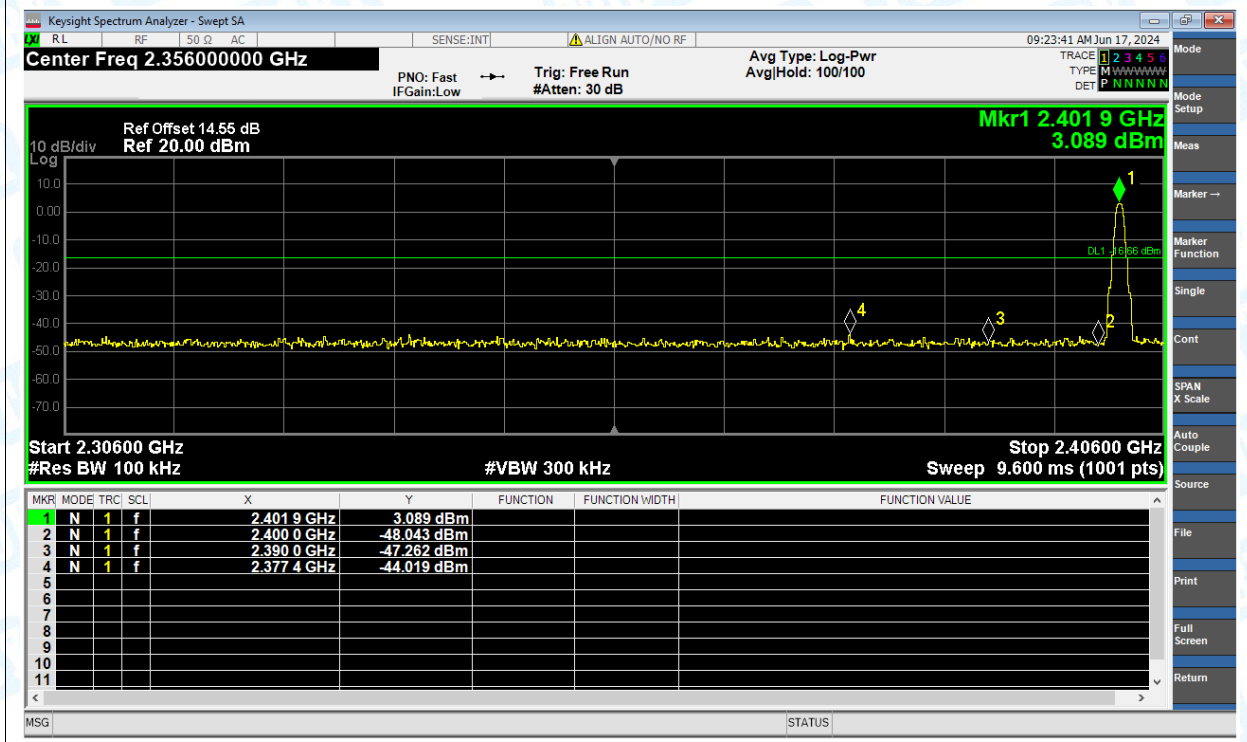
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1Mbps	2402	Ant1	-47.36	-20	Pass
NVNT	BLE 1Mbps	2480	Ant1	-48.54	-20	Pass
NVNT	BLE 2Mbps	2402	Ant1	-45.76	-20	Pass
NVNT	BLE 2Mbps	2480	Ant1	-49.72	-20	Pass

Test Graphs

Band Edge NVNT BLE 1Mbps 2402MHz Ant1 Ref

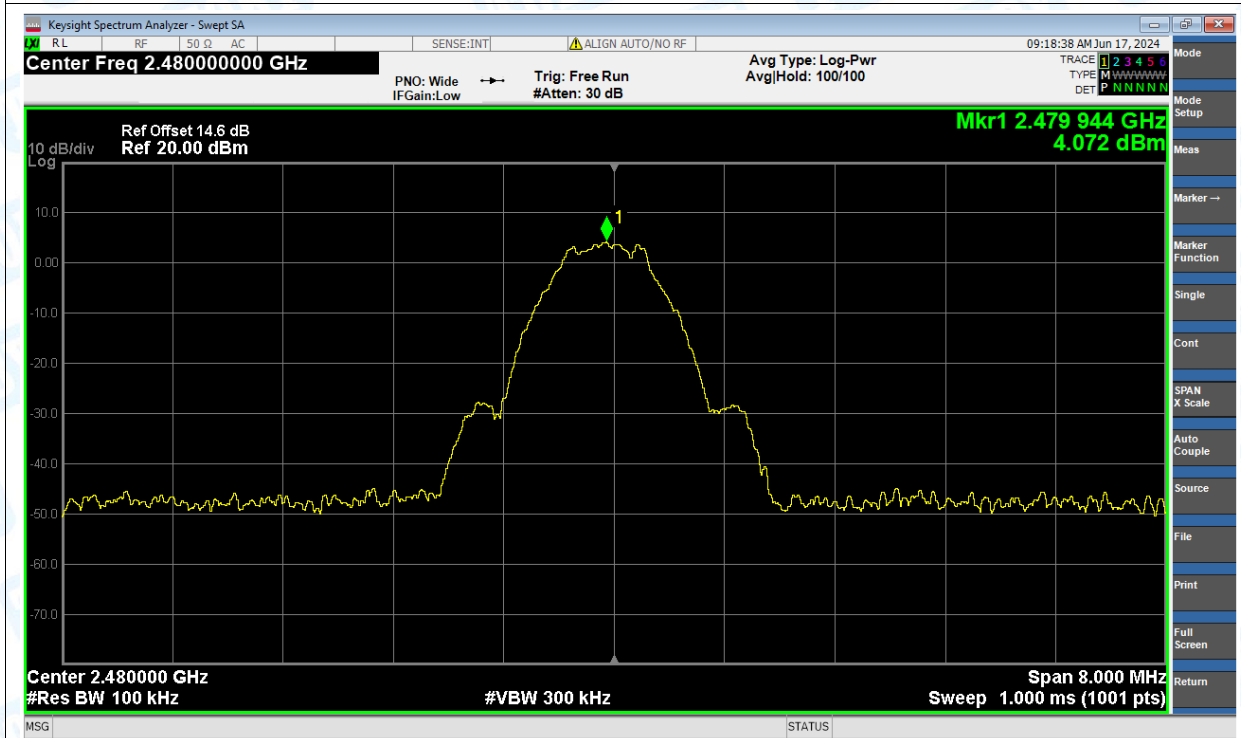


Band Edge NVNT BLE 1Mbps 2402MHz Ant1 Emission

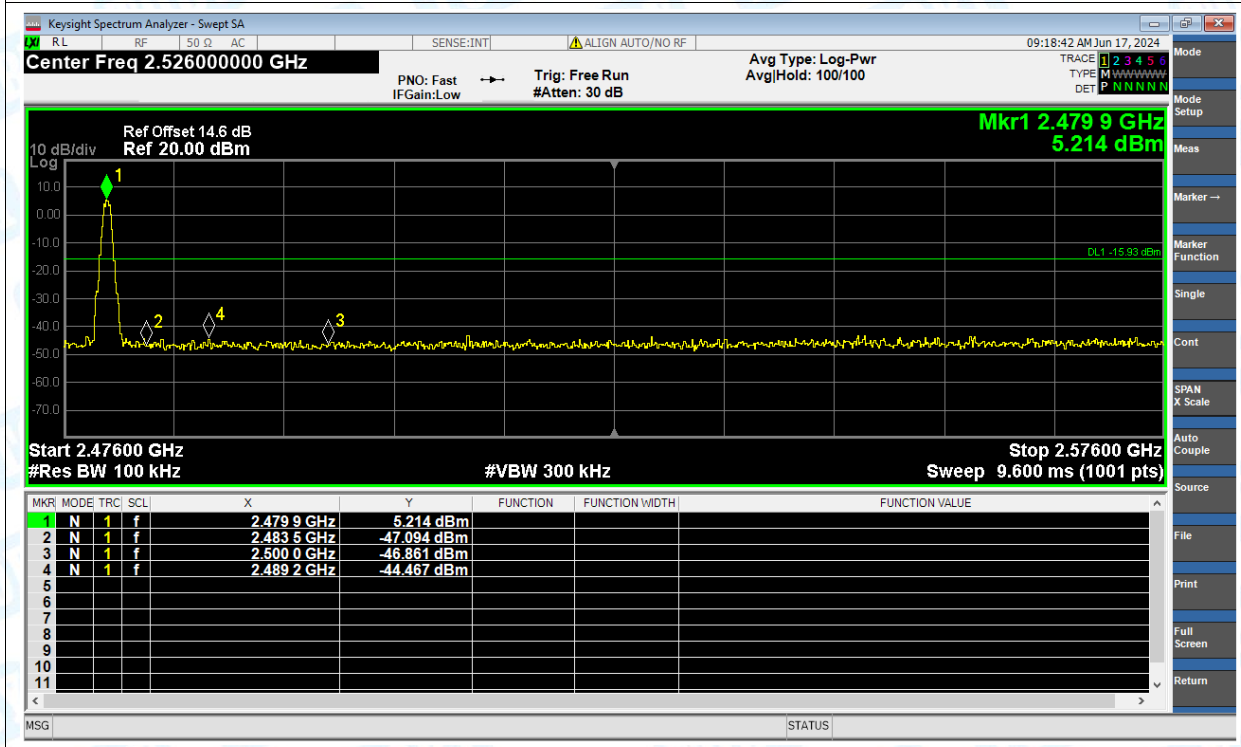




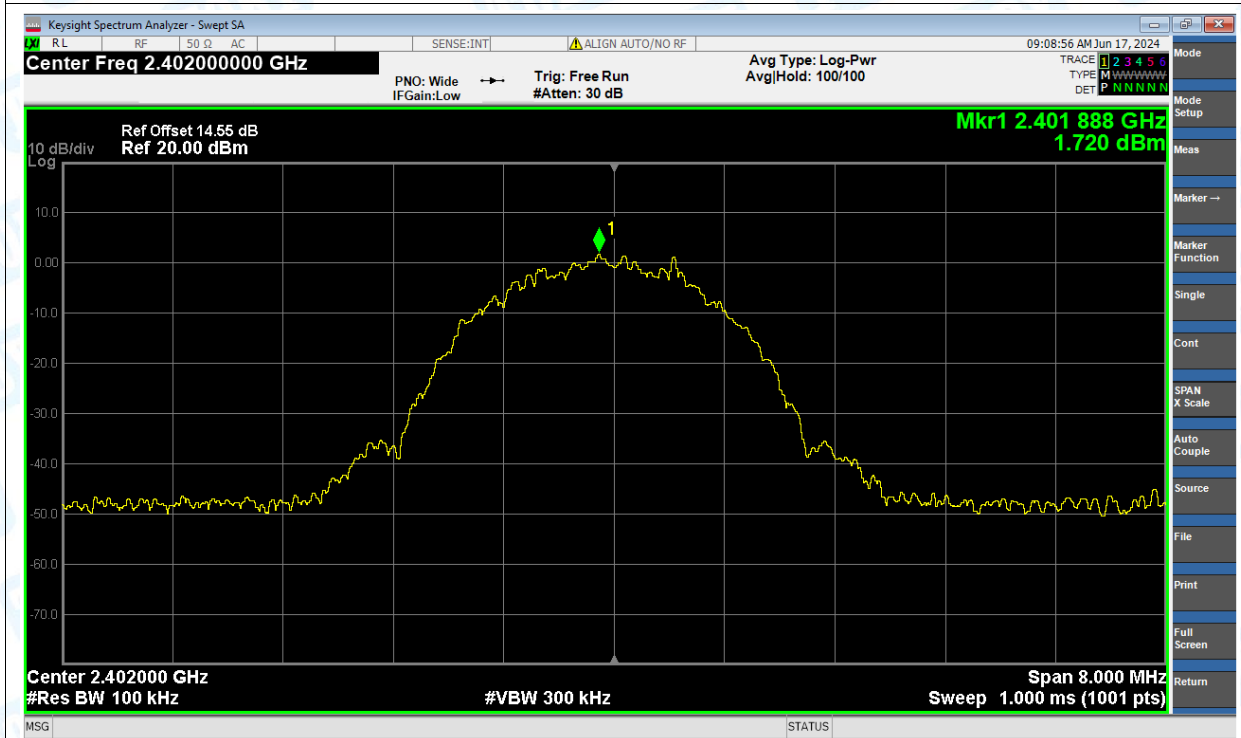
Band Edge NVNT BLE 1Mbps 2480MHz Ant1 Ref



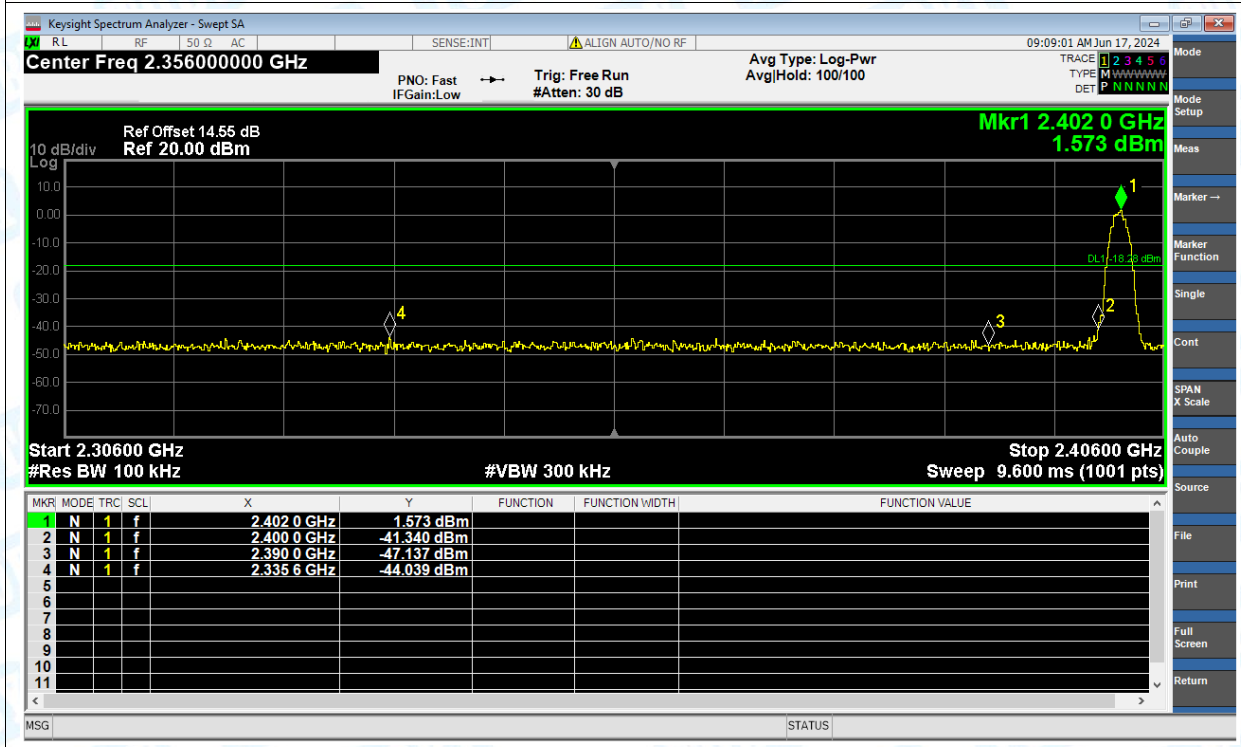
Band Edge NVNT BLE 1Mbps 2480MHz Ant1 Emission



Band Edge NVNT BLE 2Mbps 2402MHz Ant1 Ref

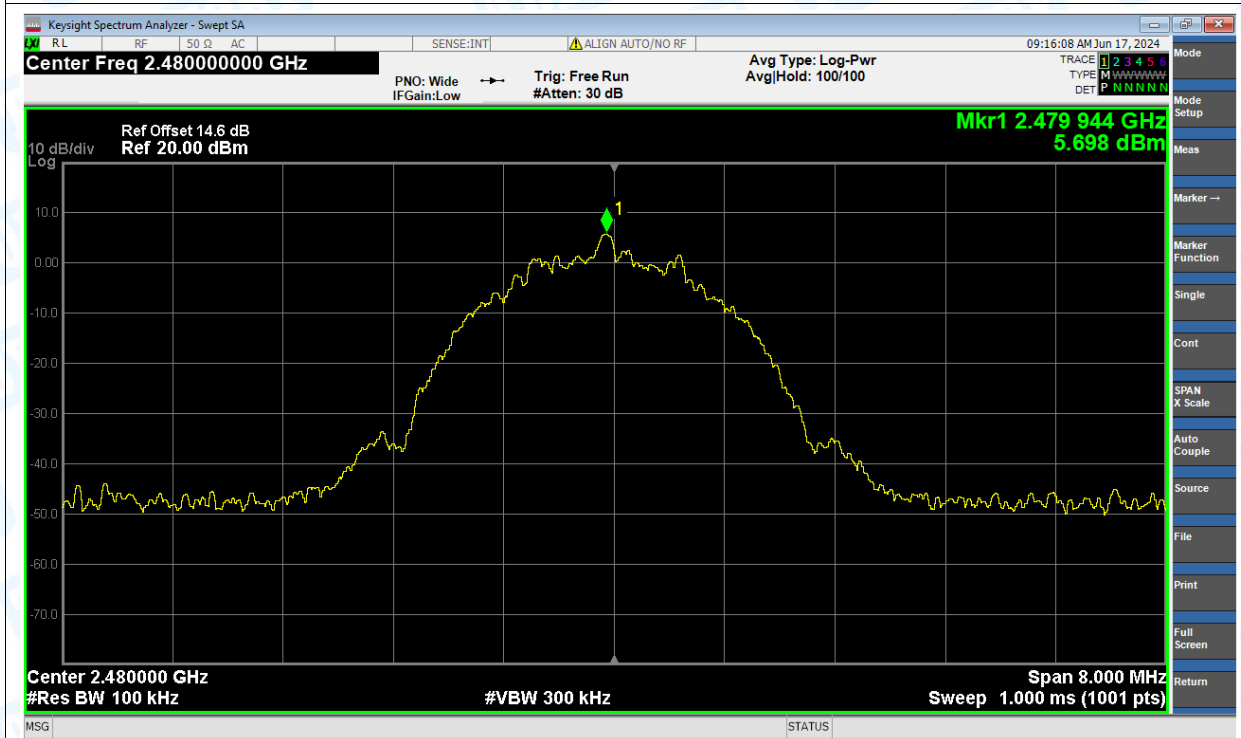


Band Edge NVNT BLE 2Mbps 2402MHz Ant1 Emission

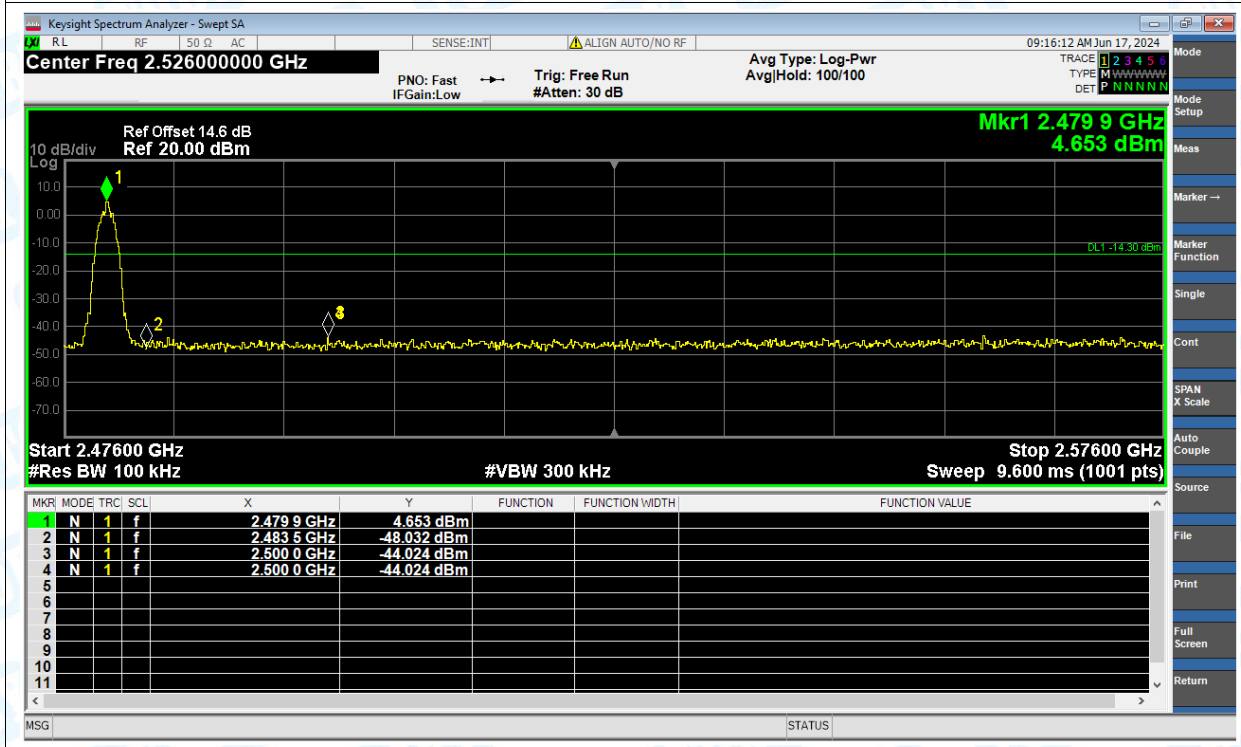




Band Edge NVNT BLE 2Mbps 2480MHz Ant1 Ref



Band Edge NVNT BLE 2Mbps 2480MHz Ant1 Emission



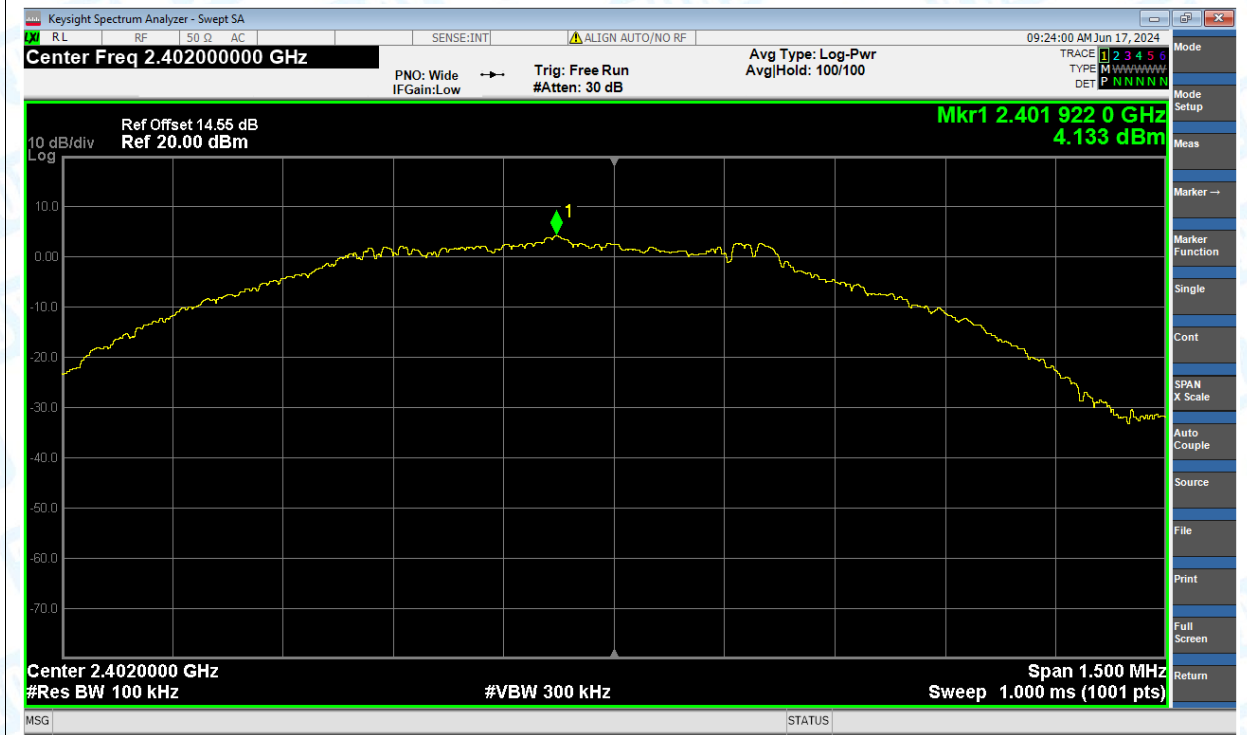
## 7. Conducted RF Spurious Emission

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1Mbps	2402	Ant1	-33.93	-20	Pass
NVNT	BLE 1Mbps	2440	Ant1	-34.38	-20	Pass
NVNT	BLE 1Mbps	2480	Ant1	-36.35	-20	Pass
NVNT	BLE 2Mbps	2402	Ant1	-33.86	-20	Pass
NVNT	BLE 2Mbps	2440	Ant1	-33.68	-20	Pass
NVNT	BLE 2Mbps	2480	Ant1	-35.70	-20	Pass

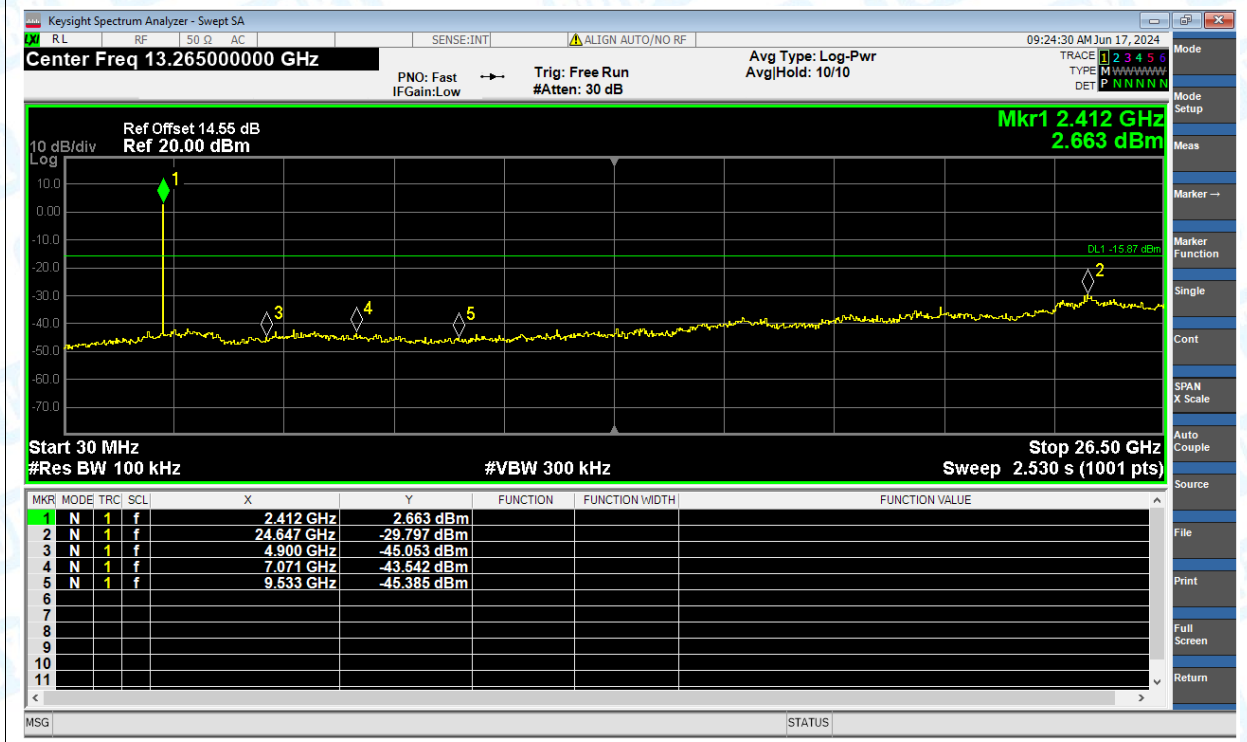


Test Graphs

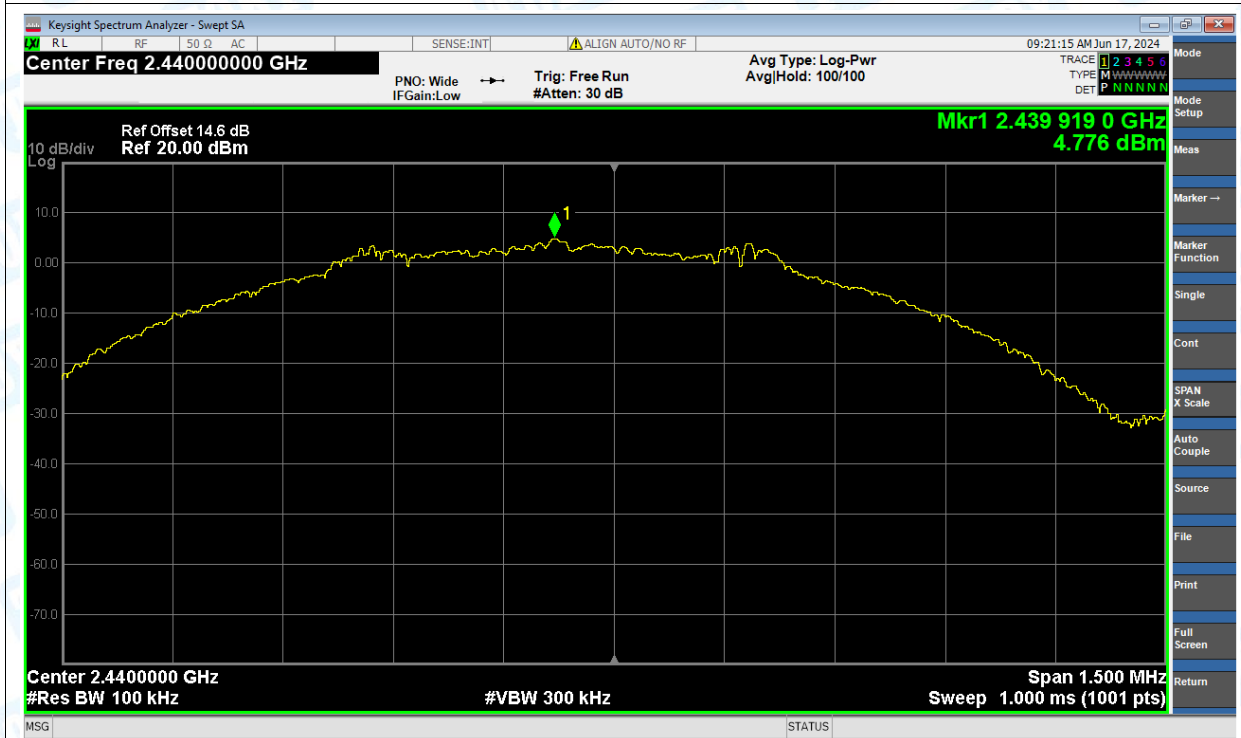
Tx. Spurious NVNT BLE 1Mbps 2402MHz Ant1 Ref



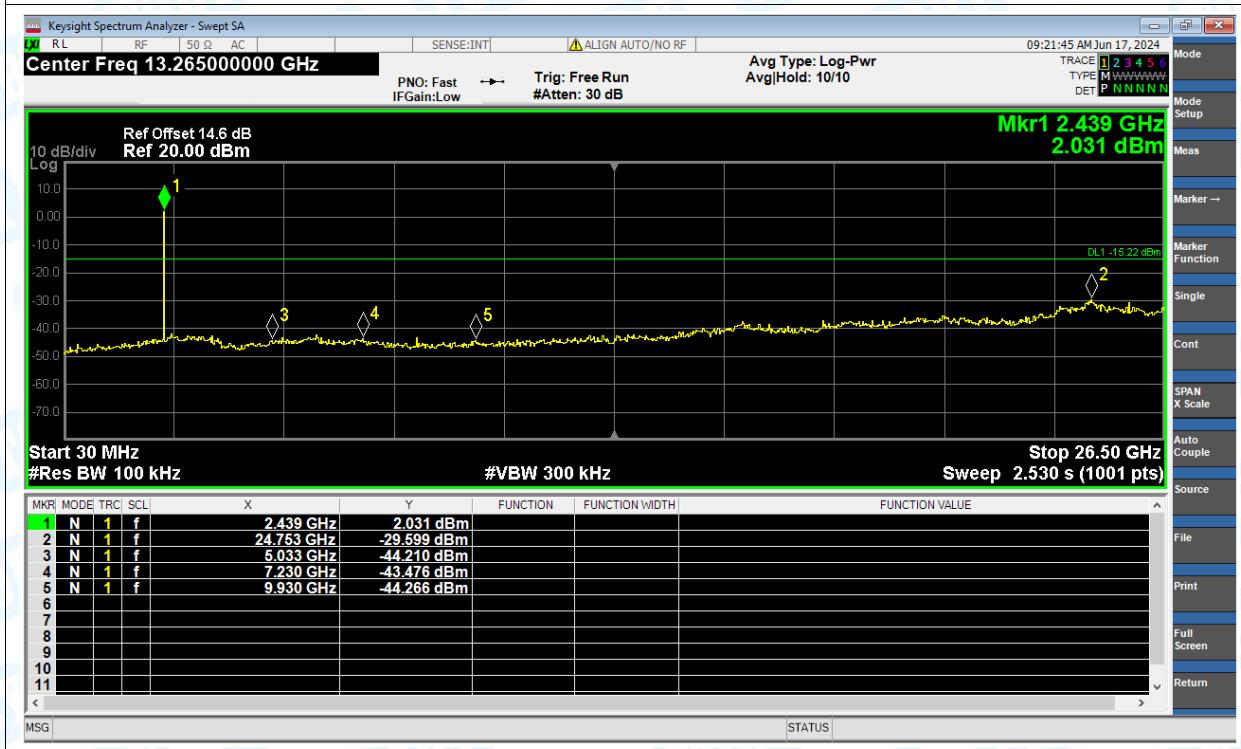
Tx. Spurious NVNT BLE 1Mbps 2402MHz Ant1 Emission



Tx. Spurious NVNT BLE 1Mbps 2440MHz Ant1 Ref

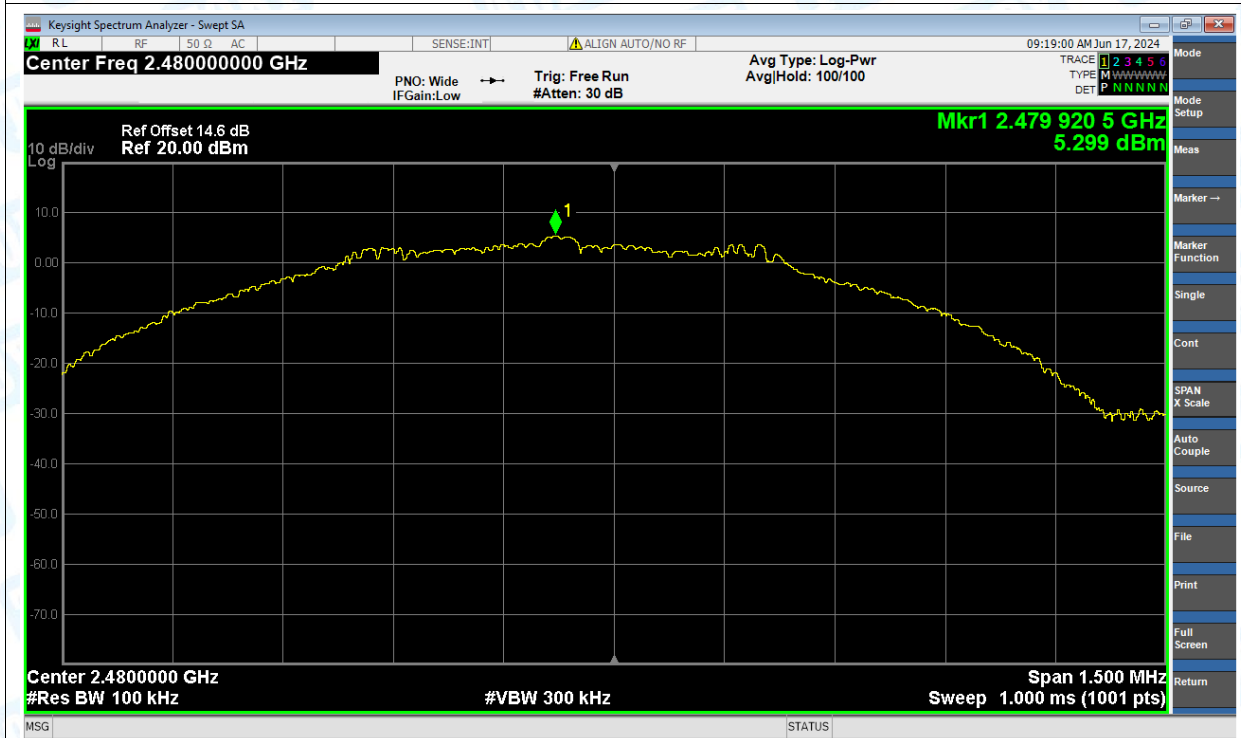


Tx. Spurious NVNT BLE 1Mbps 2440MHz Ant1 Emission

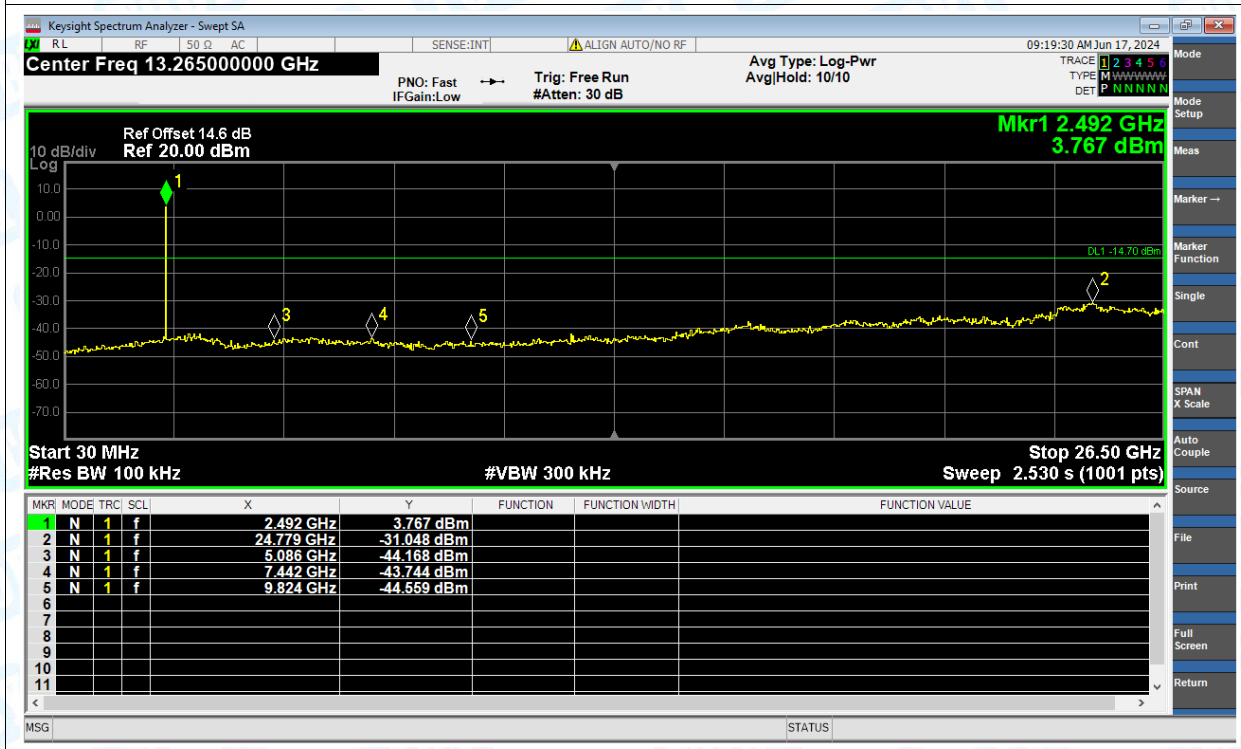




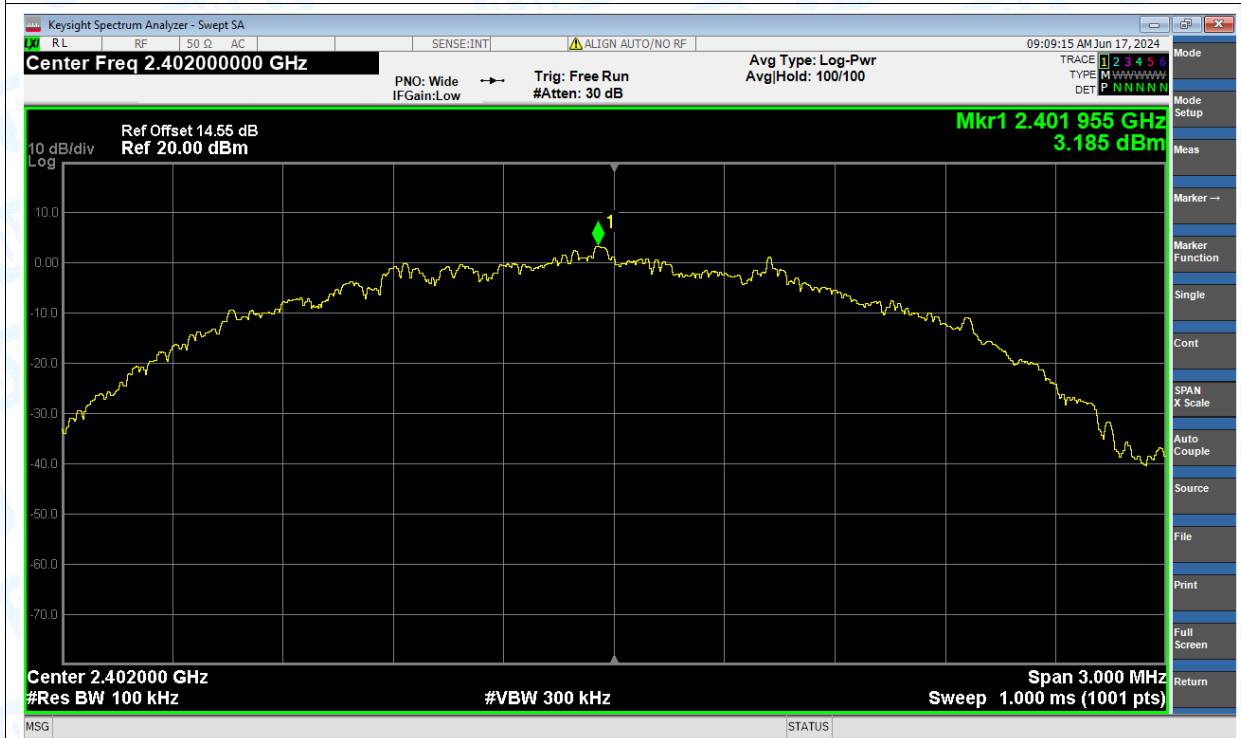
Tx. Spurious NVNT BLE 1Mbps 2480MHz Ant1 Ref



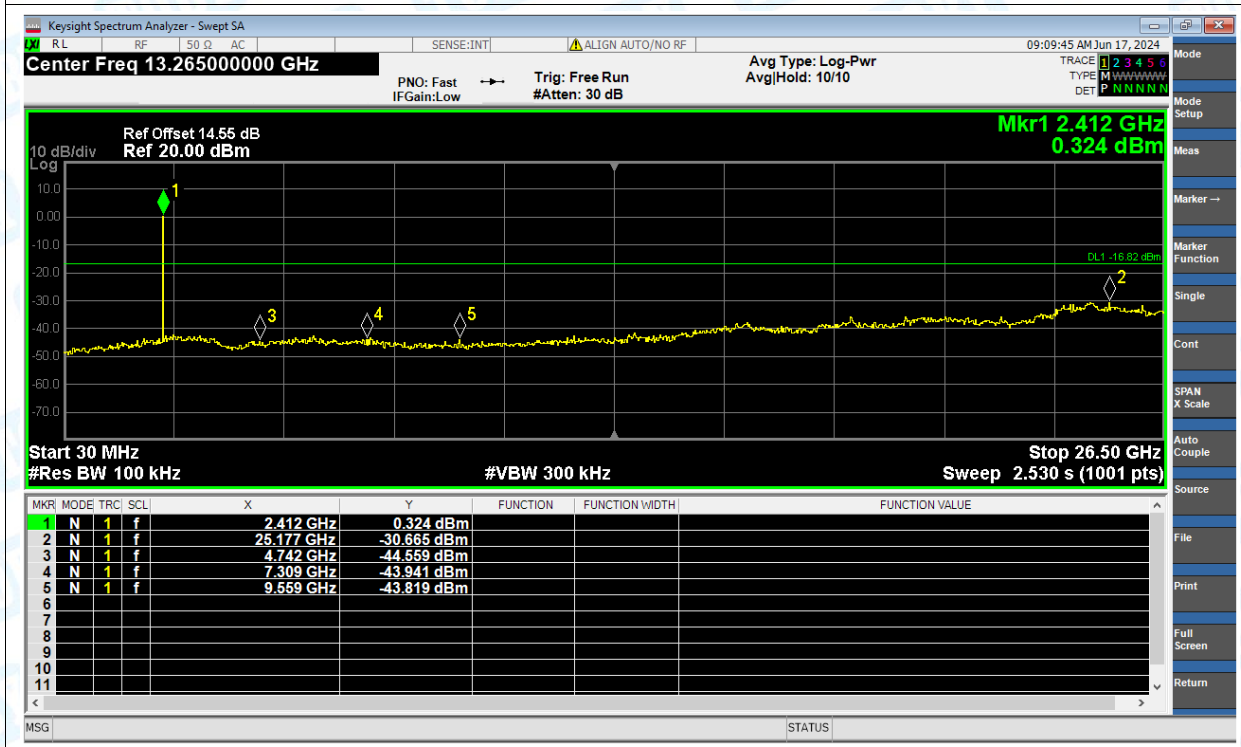
Tx. Spurious NVNT BLE 1Mbps 2480MHz Ant1 Emission



Tx. Spurious NVNT BLE 2Mbps 2402MHz Ant1 Ref

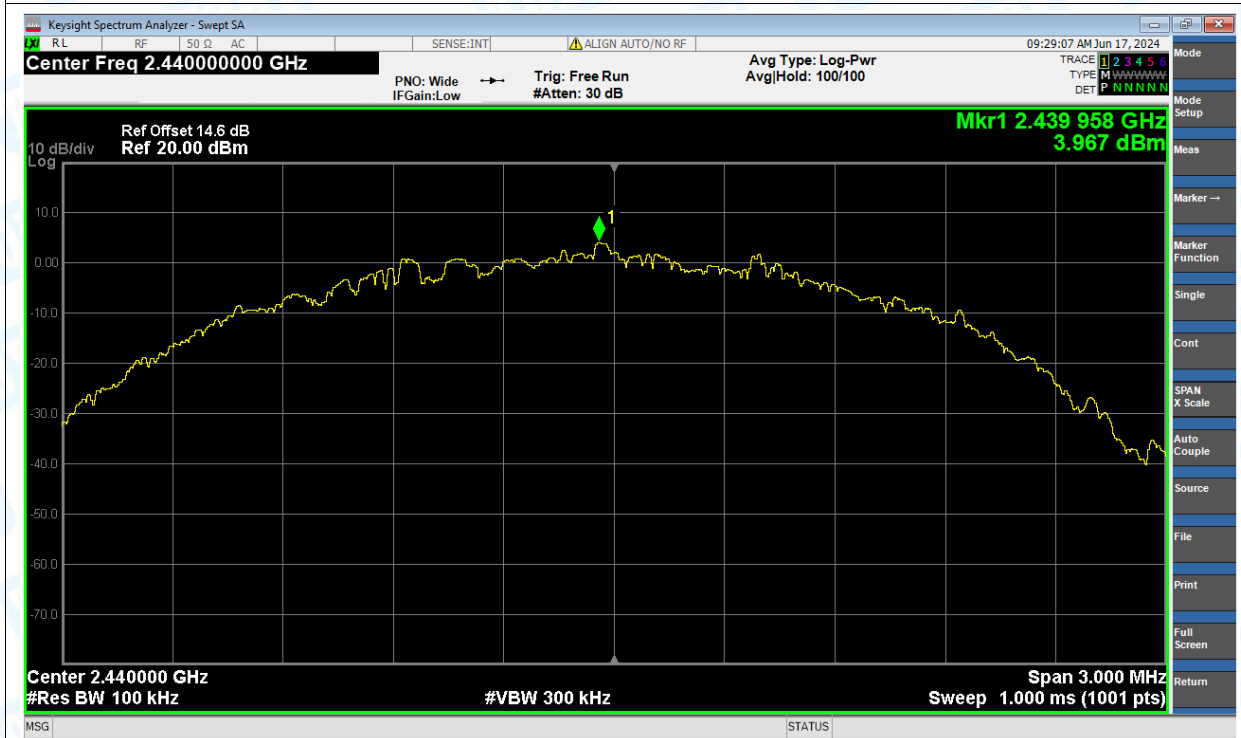


Tx. Spurious NVNT BLE 2Mbps 2402MHz Ant1 Emission

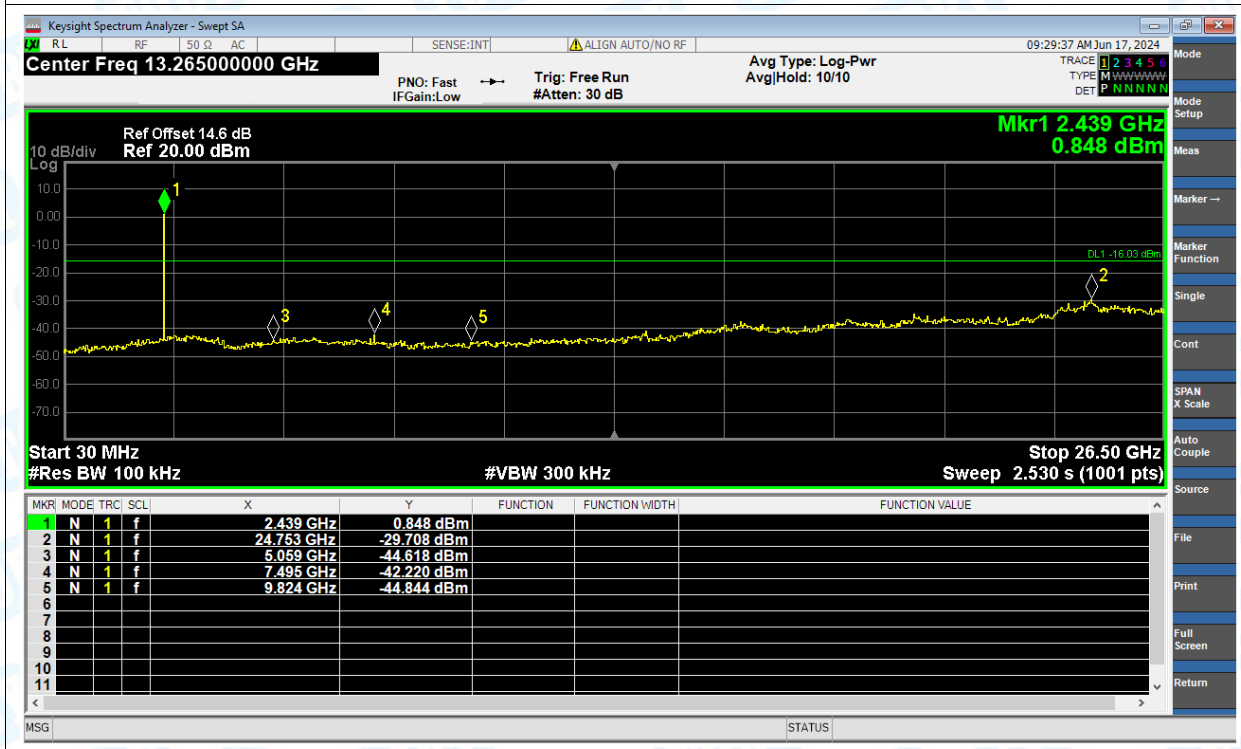




Tx. Spurious NVNT BLE 2Mbps 2440MHz Ant1 Ref



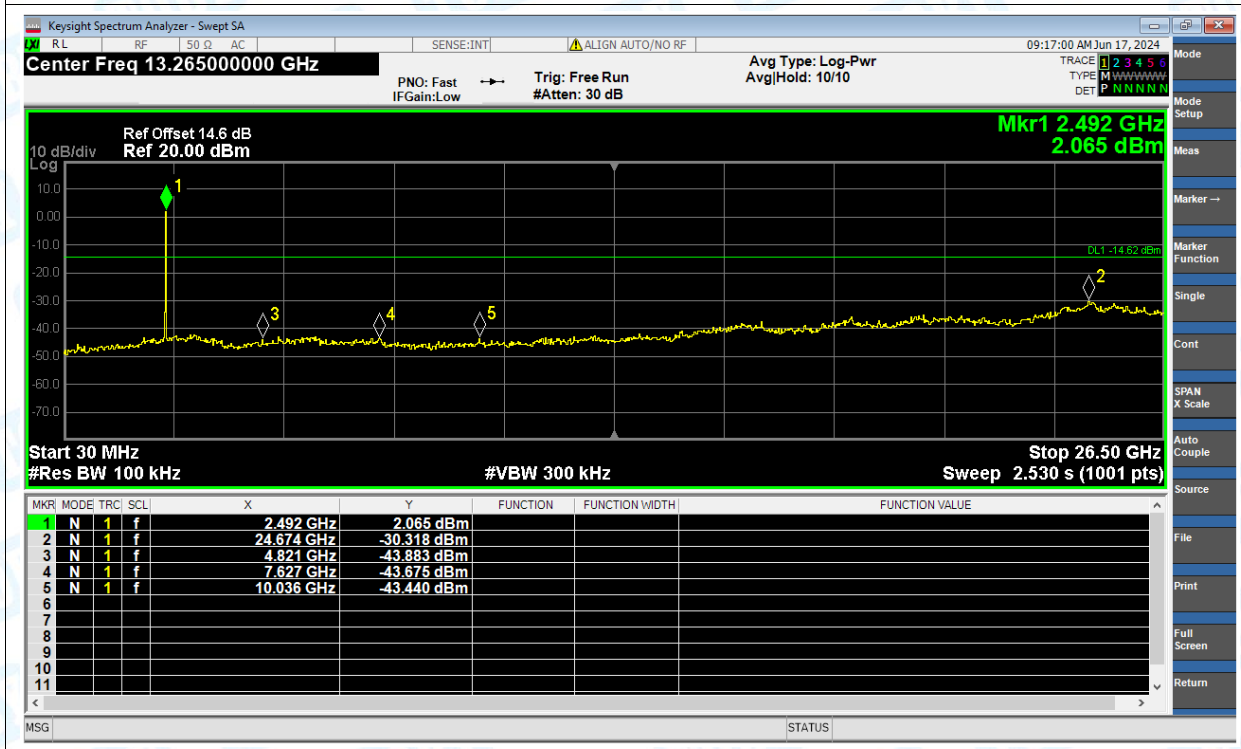
Tx. Spurious NVNT BLE 2Mbps 2440MHz Ant1 Emission



Tx. Spurious NVNT BLE 2Mbps 2480MHz Ant1 Ref



Tx. Spurious NVNT BLE 2Mbps 2480MHz Ant1 Emission



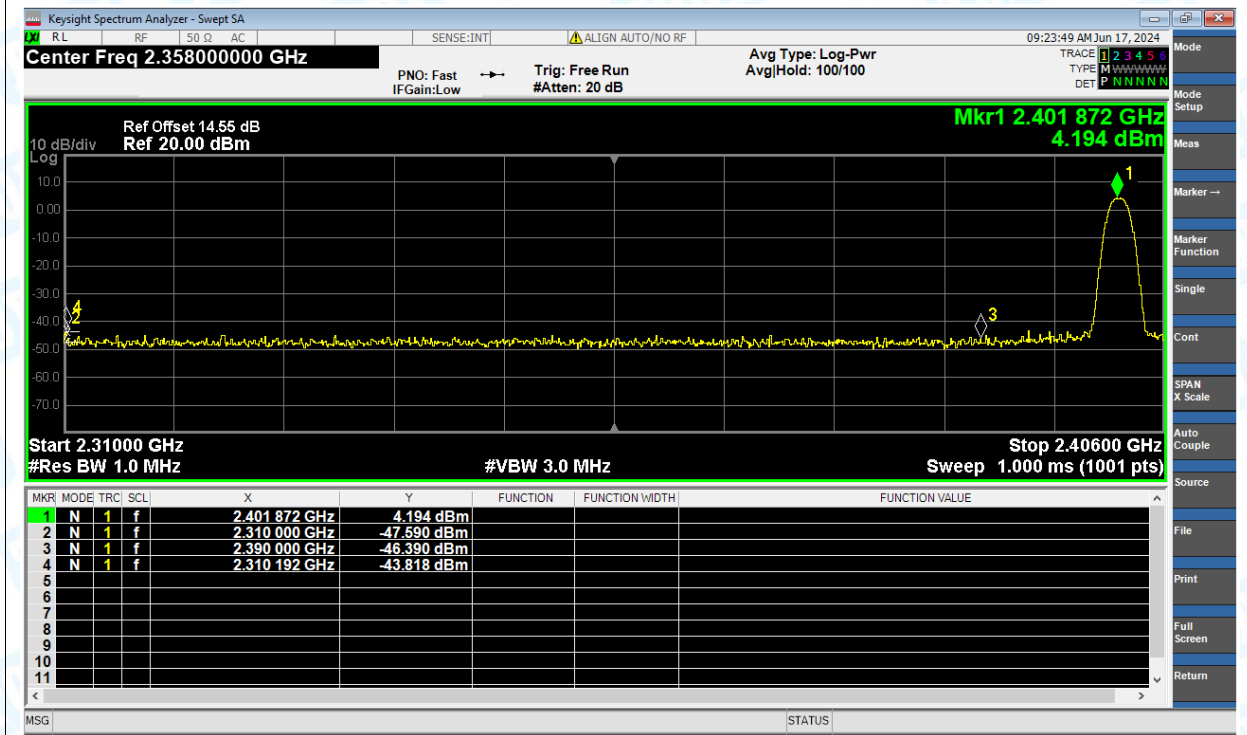


## 8. Restrict Band

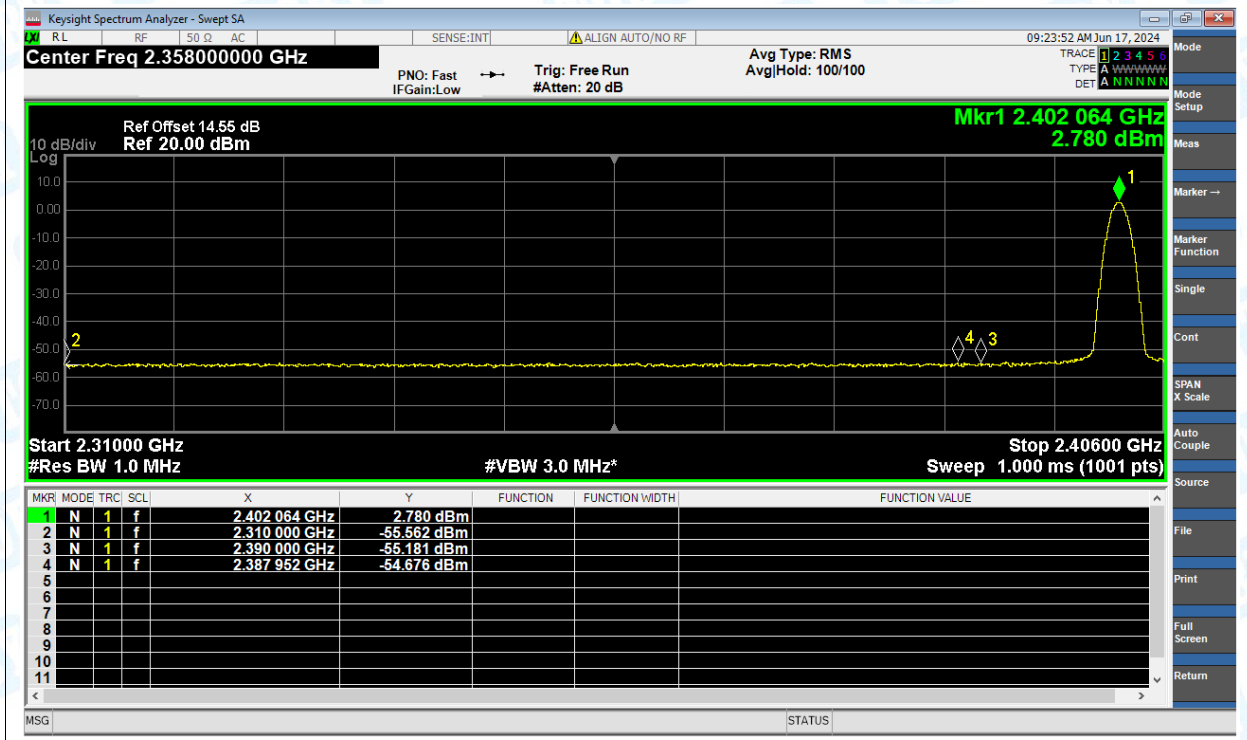
Condition	Mode	Frequency (MHz)	Antenna	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	Duty Factor (dB)	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
NVNT	BLE 1Mbps	2402	Ant1	2310	-47.59	2	-	49.67	Peak	74	Pass
NVNT	BLE 1Mbps	2402	Ant1	2310	-55.56	2	0.76	42.46	Average	54	Pass
NVNT	BLE 1Mbps	2402	Ant1	2310.192	-43.82	2	-	53.44	Peak	74	Pass
NVNT	BLE 1Mbps	2402	Ant1	2387.952	-54.68	2	0.76	43.34	Average	54	Pass
NVNT	BLE 1Mbps	2402	Ant1	2390	-46.39	2	-	50.87	Peak	74	Pass
NVNT	BLE 1Mbps	2402	Ant1	2390	-55.18	2	0.76	42.84	Average	54	Pass
NVNT	BLE 1Mbps	2480	Ant1	2483.5	-46.04	2	-	51.22	Peak	74	Pass
NVNT	BLE 1Mbps	2480	Ant1	2483.5	-53.26	2	0.76	44.76	Average	54	Pass
NVNT	BLE 1Mbps	2480	Ant1	2485	-43.39	2	-	53.87	Peak	74	Pass
NVNT	BLE 1Mbps	2480	Ant1	2483.536	-52.63	2	0.76	45.39	Average	54	Pass
NVNT	BLE 1Mbps	2480	Ant1	2500	-46.77	2	-	50.49	Peak	74	Pass
NVNT	BLE 1Mbps	2480	Ant1	2500	-55.13	2	0.76	42.89	Average	54	Pass
NVNT	BLE 2Mbps	2402	Ant1	2310	-47.92	2	-	49.34	Peak	74	Pass
NVNT	BLE 2Mbps	2402	Ant1	2310	-55.69	2	2.47	44.04	Average	54	Pass
NVNT	BLE 2Mbps	2402	Ant1	2363.376	-44.07	2	-	53.19	Peak	74	Pass
NVNT	BLE 2Mbps	2402	Ant1	2382.48	-54.62	2	2.47	45.11	Average	54	Pass
NVNT	BLE 2Mbps	2402	Ant1	2390	-47.79	2	-	49.47	Peak	74	Pass
NVNT	BLE 2Mbps	2402	Ant1	2390	-55.26	2	2.47	44.47	Average	54	Pass
NVNT	BLE 2Mbps	2480	Ant1	2483.5	-46.57	2	-	50.69	Peak	74	Pass
NVNT	BLE 2Mbps	2480	Ant1	2483.5	-53.22	2	2.49	46.53	Average	54	Pass
NVNT	BLE 2Mbps	2480	Ant1	2485.792	-43.66	2	-	53.6	Peak	74	Pass
NVNT	BLE 2Mbps	2480	Ant1	2483.512	-53.22	2	2.49	46.53	Average	54	Pass
NVNT	BLE 2Mbps	2480	Ant1	2500	-46.04	2	-	51.22	Peak	74	Pass
NVNT	BLE 2Mbps	2480	Ant1	2500	-55.25	2	2.49	44.5	Average	54	Pass

Test Graphs

Restrict Band NVNT BLE 1Mbps 2402MHz Ant1 Peak

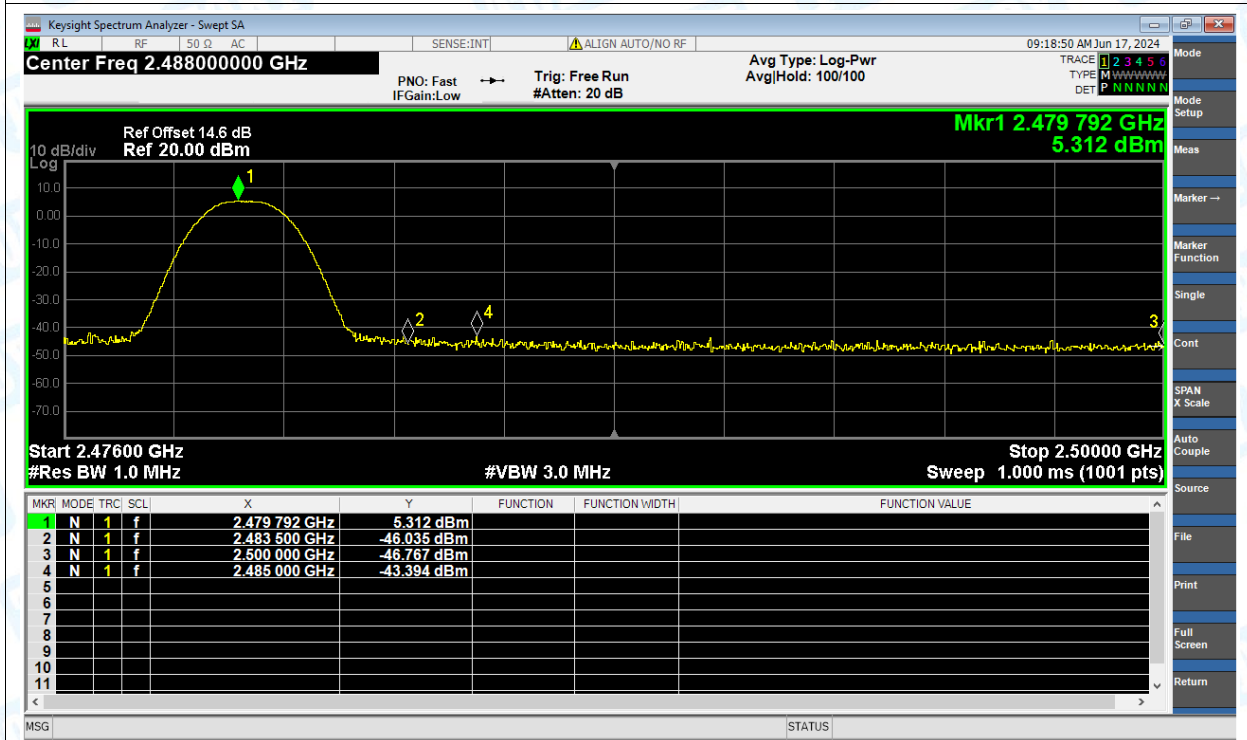


Restrict Band NVNT BLE 1Mbps 2402MHz Ant1 Average

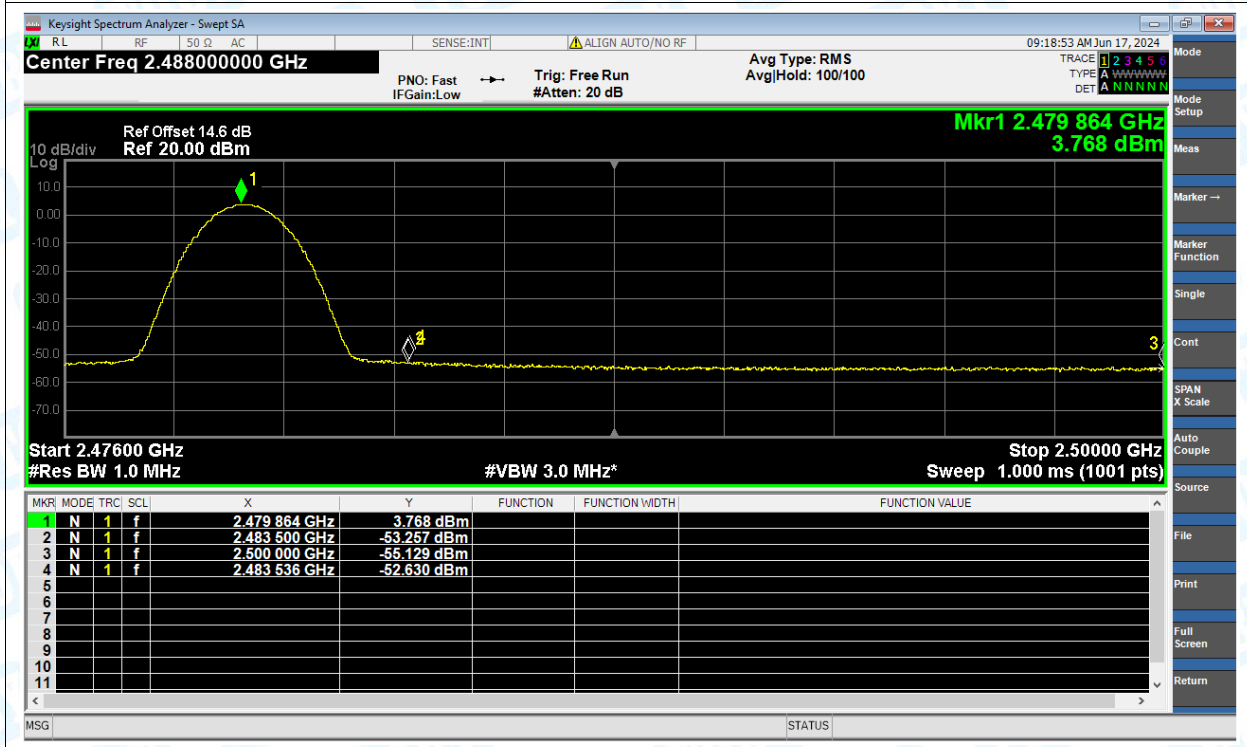




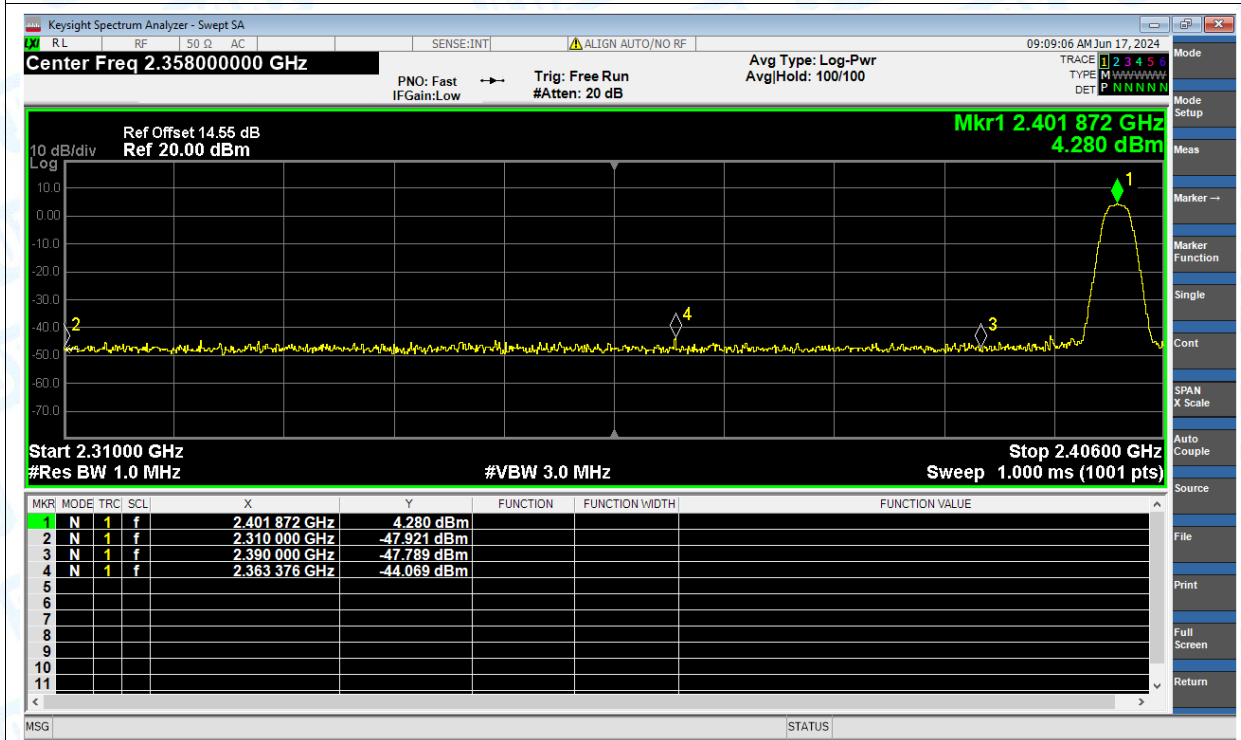
Restrict Band NVNT BLE 1Mbps 2480MHz Ant1 Peak



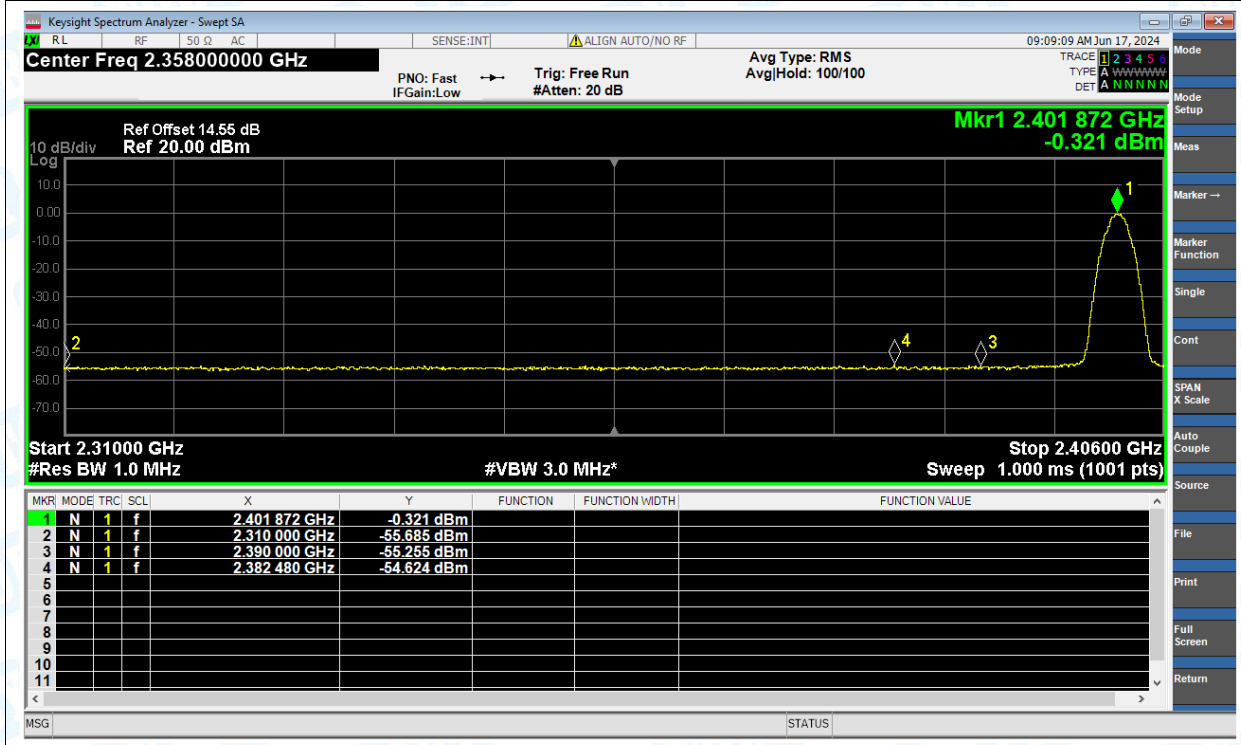
Restrict Band NVNT BLE 1Mbps 2480MHz Ant1 Average



Restrict Band NVNT BLE 2Mbps 2402MHz Ant1 Peak

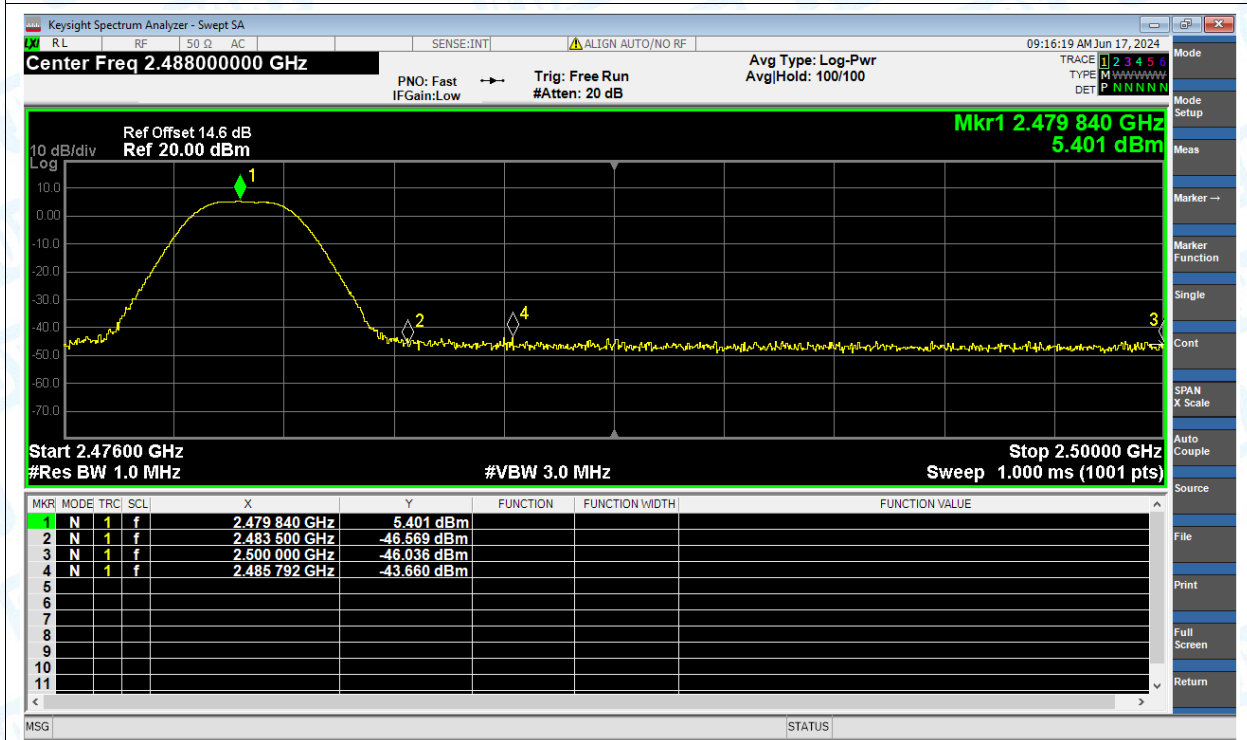


Restrict Band NVNT BLE 2Mbps 2402MHz Ant1 Average

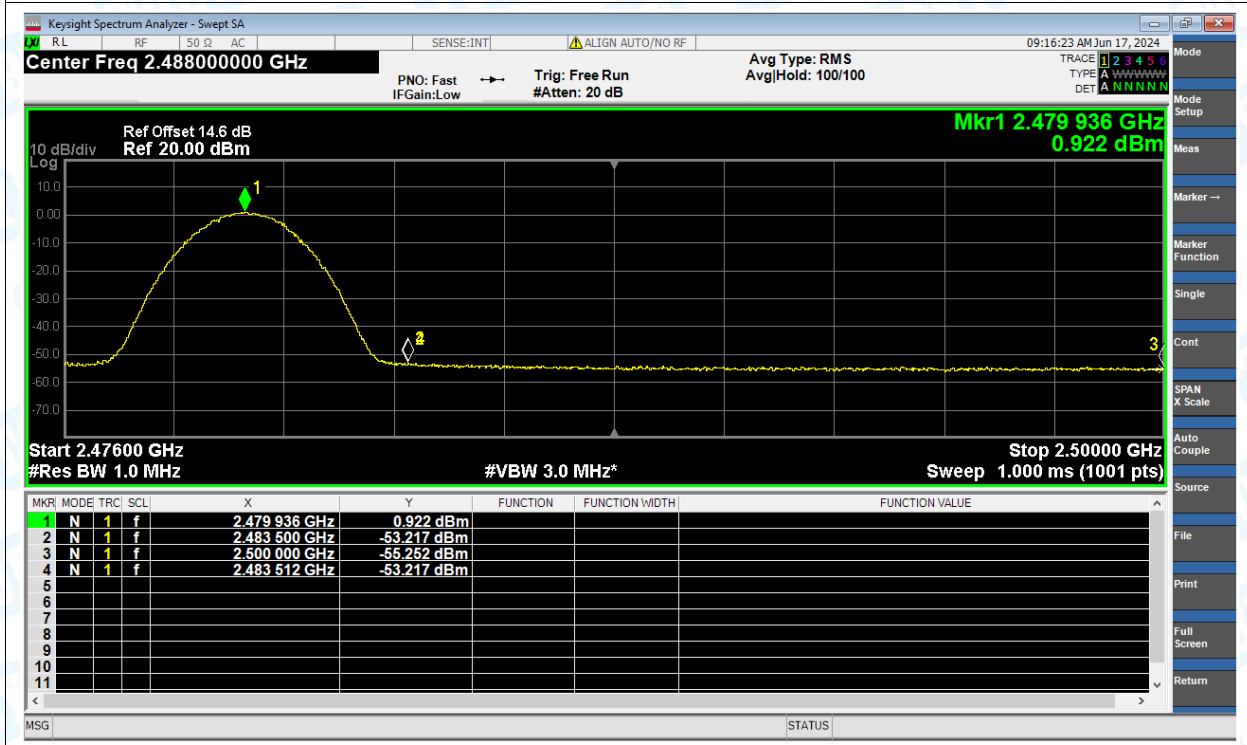




Restrict Band NVNT BLE 2Mbps 2480MHz Ant1 Peak



Restrict Band NVNT BLE 2Mbps 2480MHz Ant1 Average



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