RF Test Data for Bluetooth LE (Conducted Measurements)

General Description of EUT	
Product Name:	Smart Irrigation Timmer
Test Model:	SWT60-US-WIFI
Sample ID:	HC-C-202406-0290-01-02
Environmental Conditions	
Temperature:	22.0℃-25℃
Relative Humidity:	43%-55%
Test Voltage:	DC 6V
Test Engineer:	Zkn Zhou
Note: For a more detailed features description, please refer to the report TBR-C-202406-0290-55 The report only show the worst case data.	

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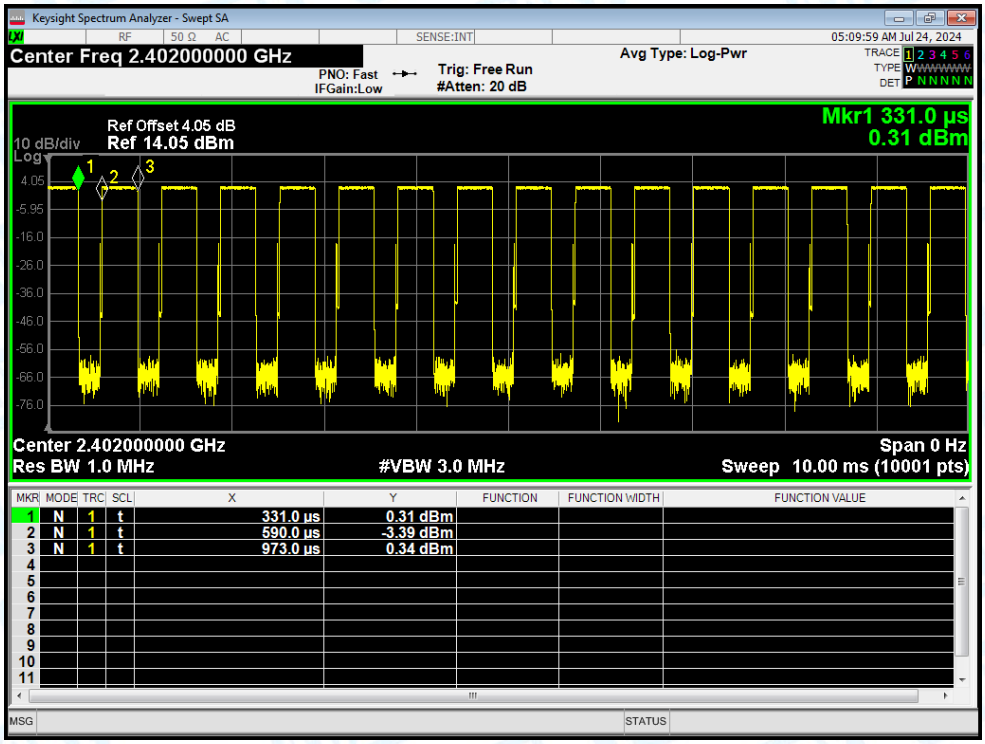
1.Duty Cycle

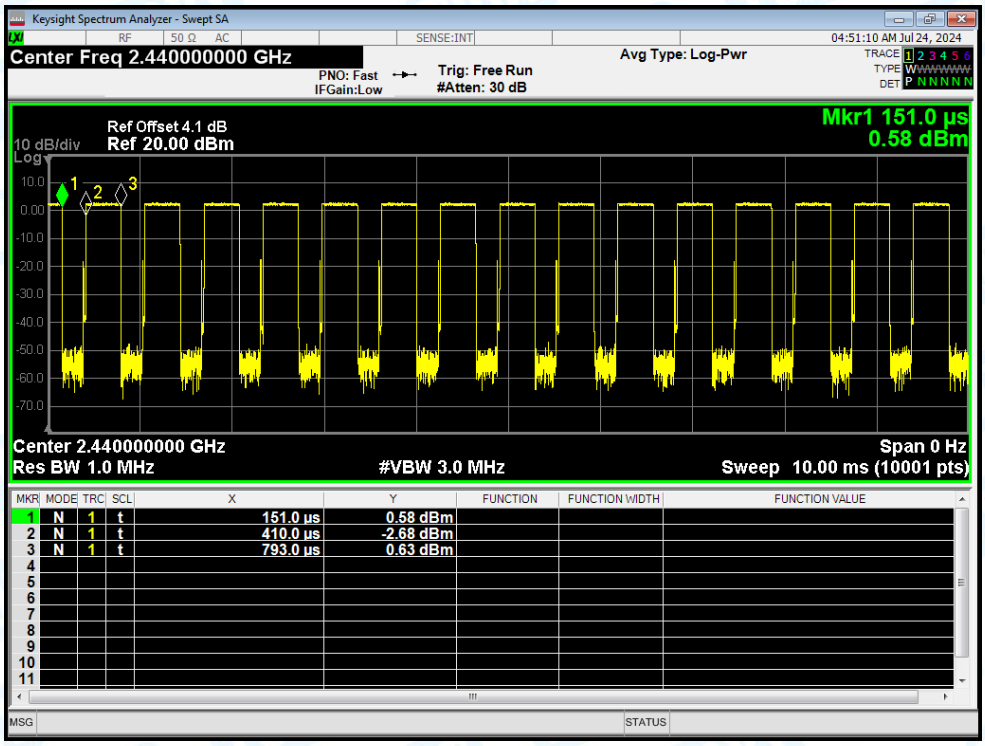
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	BLE 1Mbps	2402	Ant1	59.66	2.24	2.61
NVNT	BLE 1Mbps	2440	Ant1	59.66	2.24	2.61
NVNT	BLE 1Mbps	2480	Ant1	59.66	2.24	2.61
NVNT	BLE 2Mbps	2402	Ant1	30.53	5.15	5.1
NVNT	BLE 2Mbps	2440	Ant1	30.53	5.15	5.1
NVNT	BLE 2Mbps	2480	Ant1	30.53	5.15	5.1

Test Graphs

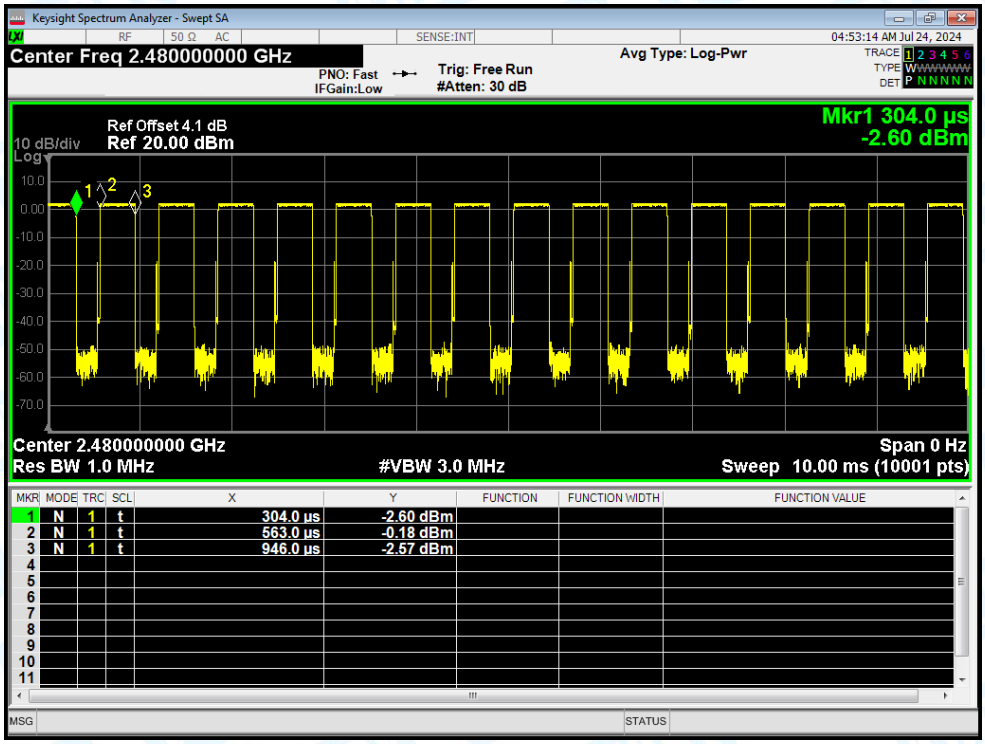
Duty Cycle NVNT BLE 1Mbps 2402MHz Ant1



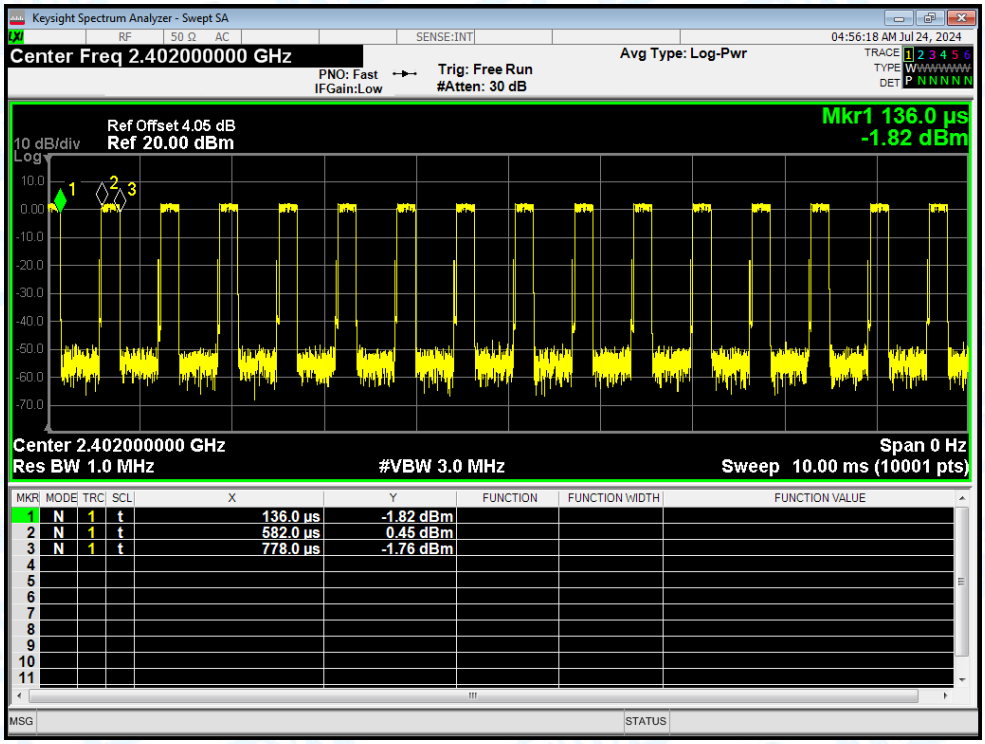
Duty Cycle NVNT BLE 1Mbps 2440MHz Ant1



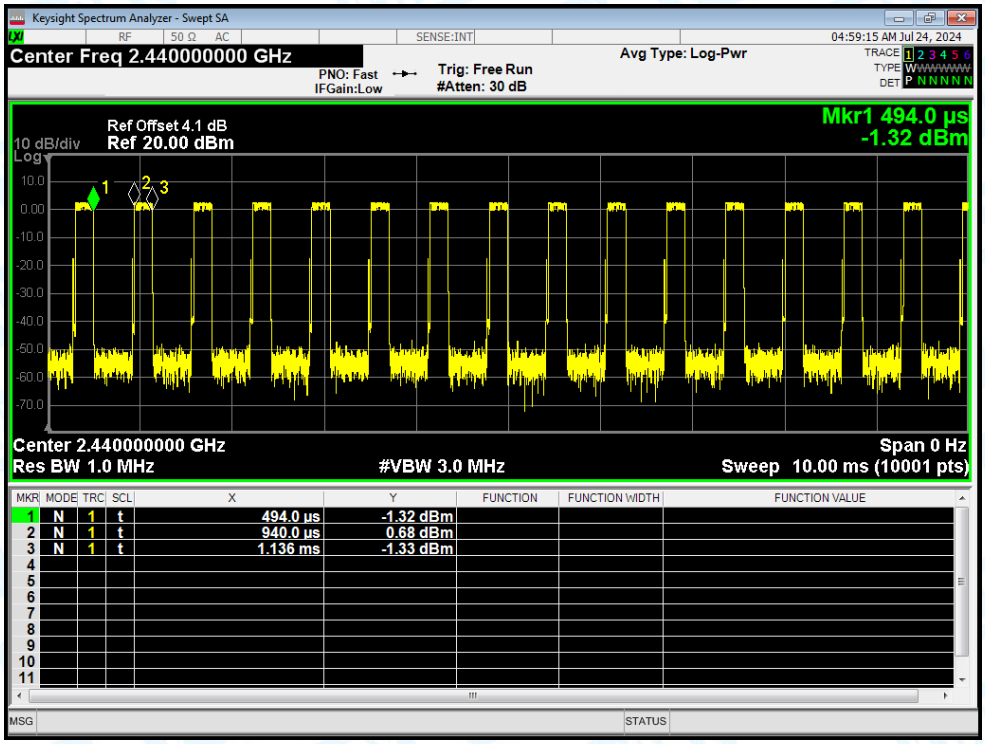
Duty Cycle NVNT BLE 1Mbps 2480MHz Ant1



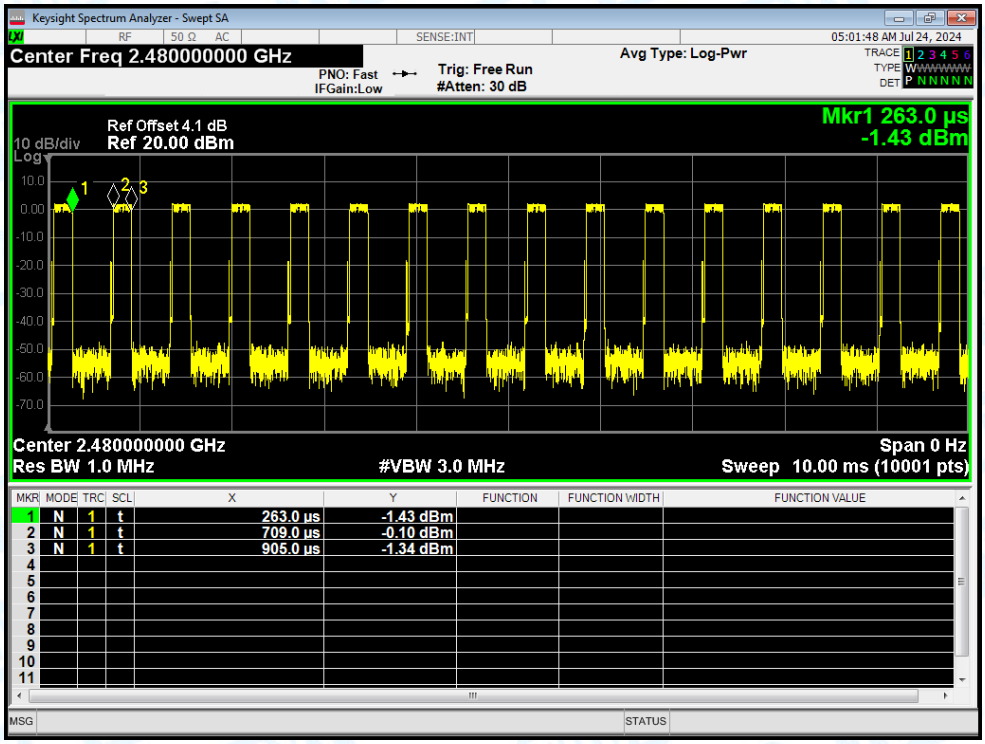
Duty Cycle NVNT BLE 2Mbps 2402MHz Ant1



Duty Cycle NVNT BLE 2Mbps 2440MHz Ant1



Duty Cycle NVNT BLE 2Mbps 2480MHz Ant1

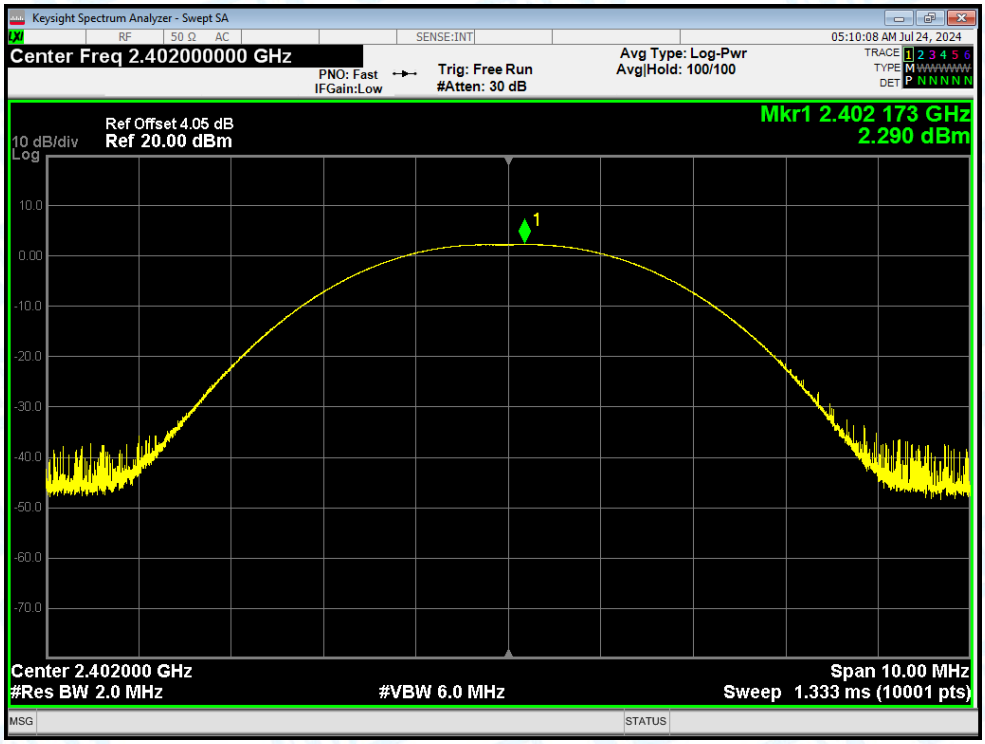


2.Maximum Conducted Output Power

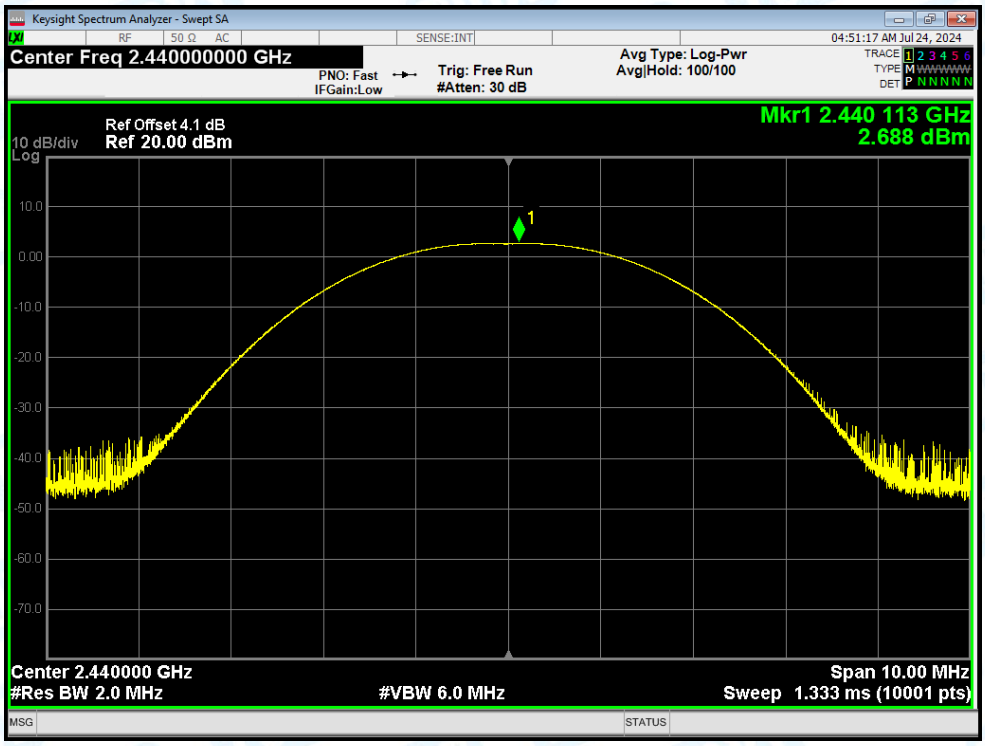
Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	BLE 1Mbps	2402	Ant1	2.29	30	Pass
NVNT	BLE 1Mbps	2440	Ant1	2.688	30	Pass
NVNT	BLE 1Mbps	2480	Ant1	2.188	30	Pass
NVNT	BLE 2Mbps	2402	Ant1	2.295	30	Pass
NVNT	BLE 2Mbps	2440	Ant1	2.702	30	Pass
NVNT	BLE 2Mbps	2480	Ant1	2.271	30	Pass

Test Graphs

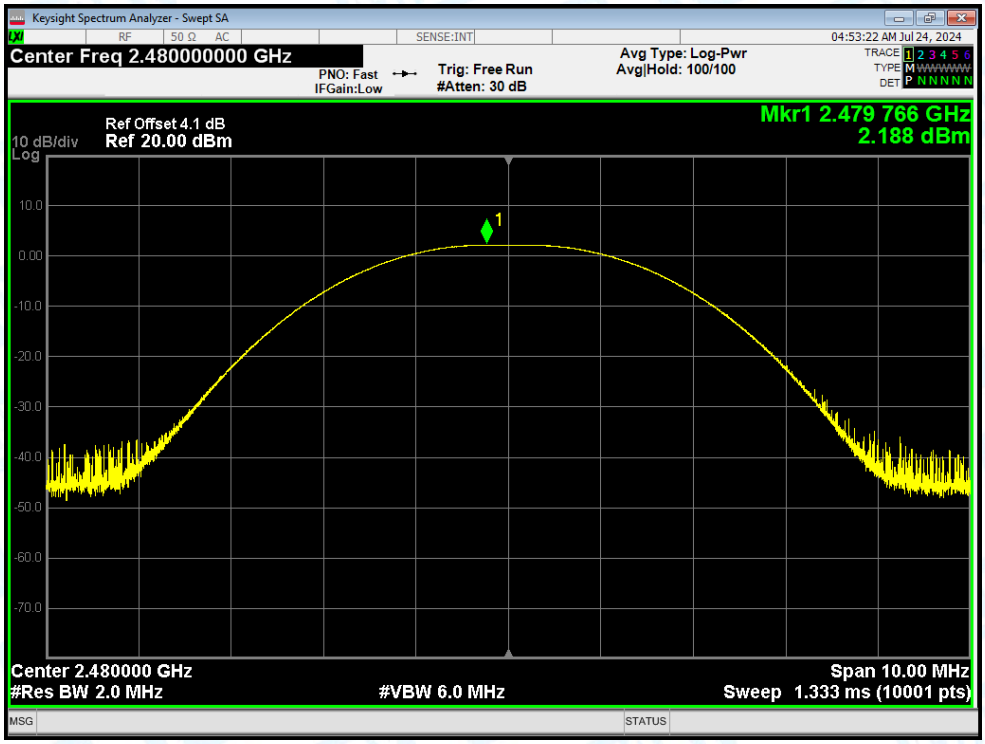
Power NVNT BLE 1Mbps 2402MHz Ant1



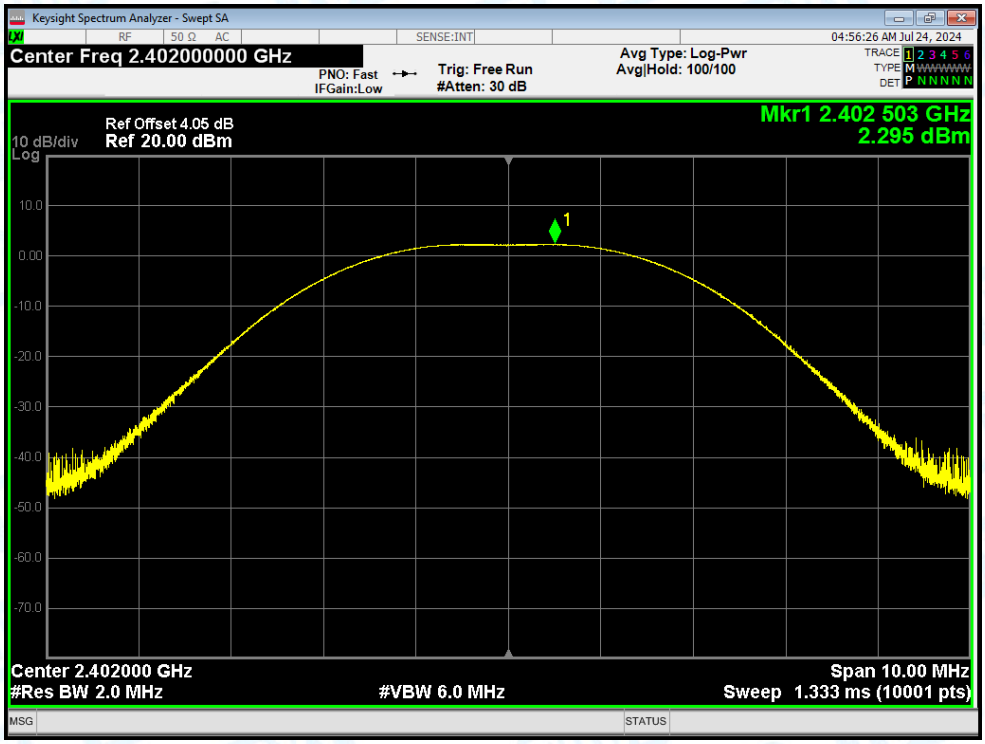
Power NVNT BLE 1Mbps 2440MHz Ant1



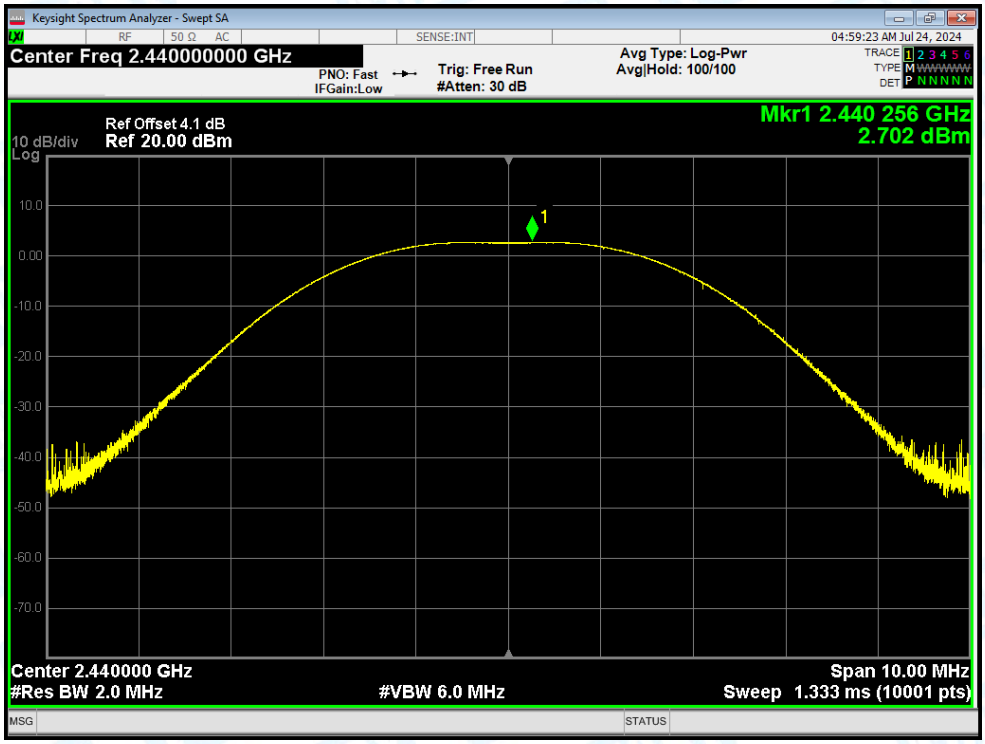
Power NVNT BLE 1Mbps 2480MHz Ant1



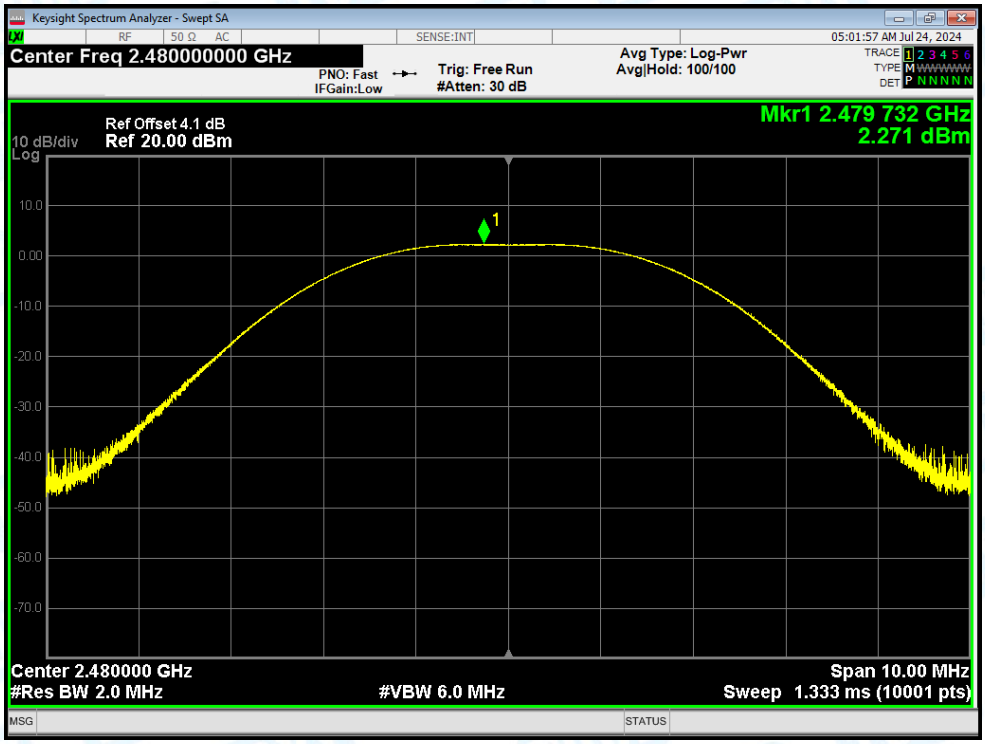
Power NVNT BLE 2Mbps 2402MHz Ant1



Power NVNT BLE 2Mbps 2440MHz Ant1



Power NVNT BLE 2Mbps 2480MHz Ant1

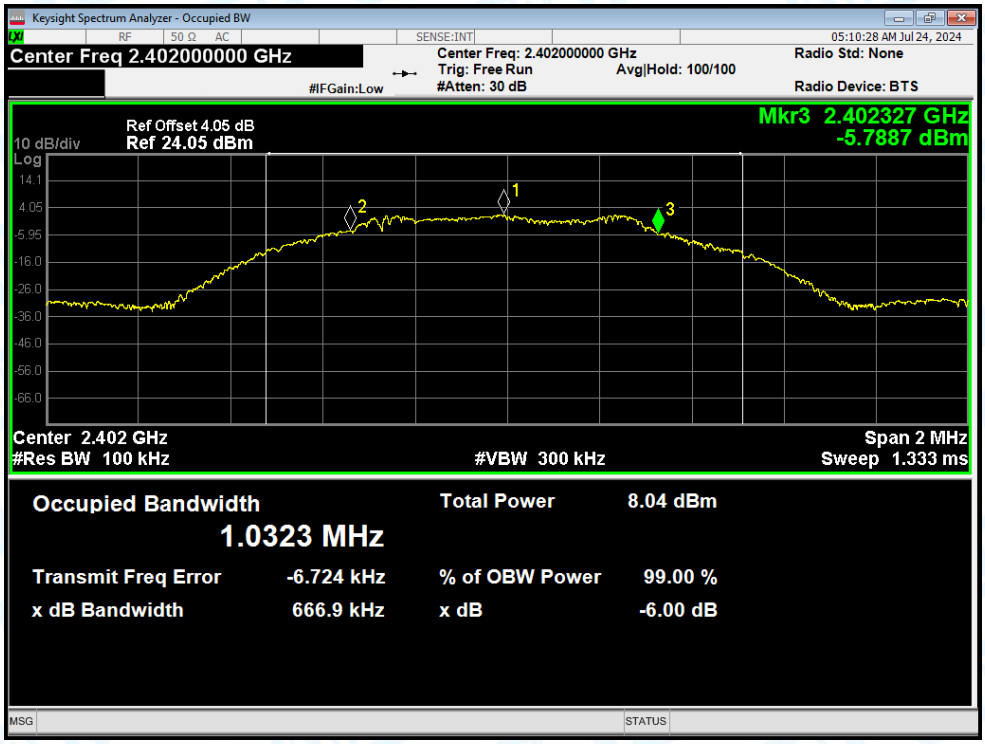


3.-6dB Bandwidth

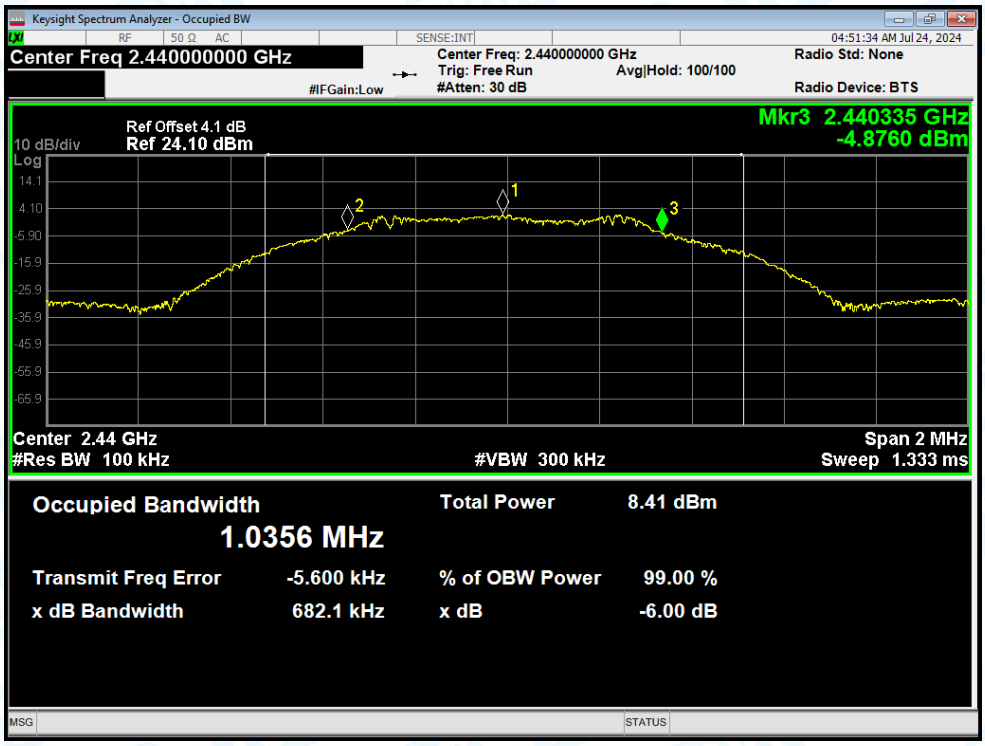
Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	BLE 1Mbps	2402	Ant1	0.67	0.5	Pass
NVNT	BLE 1Mbps	2440	Ant1	0.68	0.5	Pass
NVNT	BLE 1Mbps	2480	Ant1	0.68	0.5	Pass
NVNT	BLE 2Mbps	2402	Ant1	1.17	0.5	Pass
NVNT	BLE 2Mbps	2440	Ant1	1.25	0.5	Pass
NVNT	BLE 2Mbps	2480	Ant1	1.22	0.5	Pass

Test Graphs

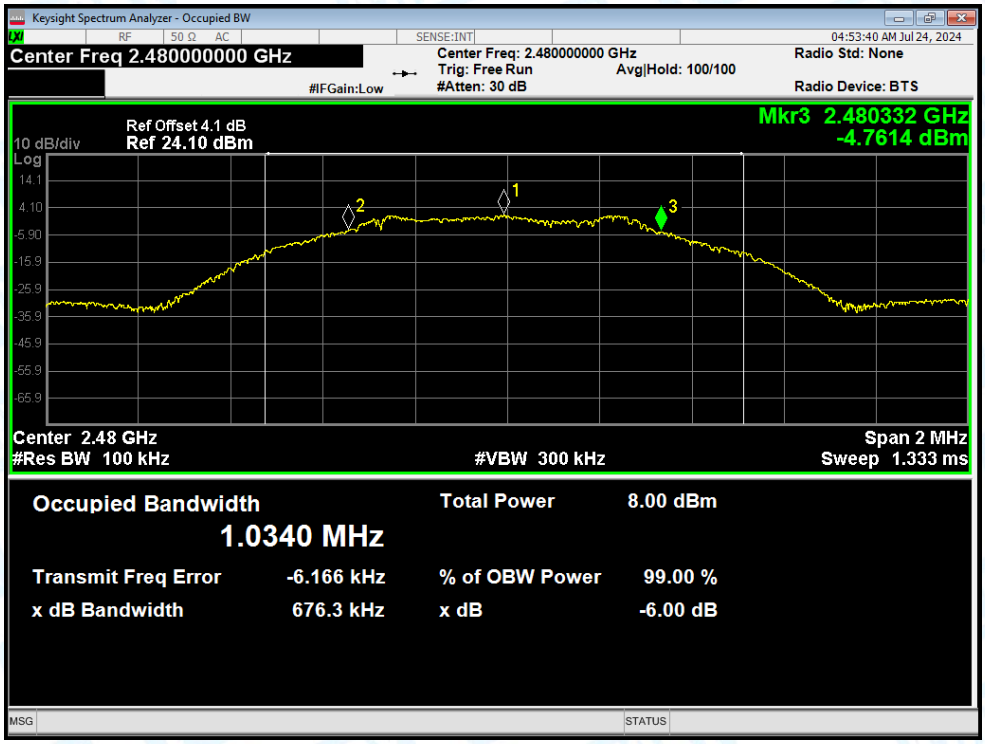
-6dB Bandwidth NVNT BLE 1Mbps 2402MHz Ant1



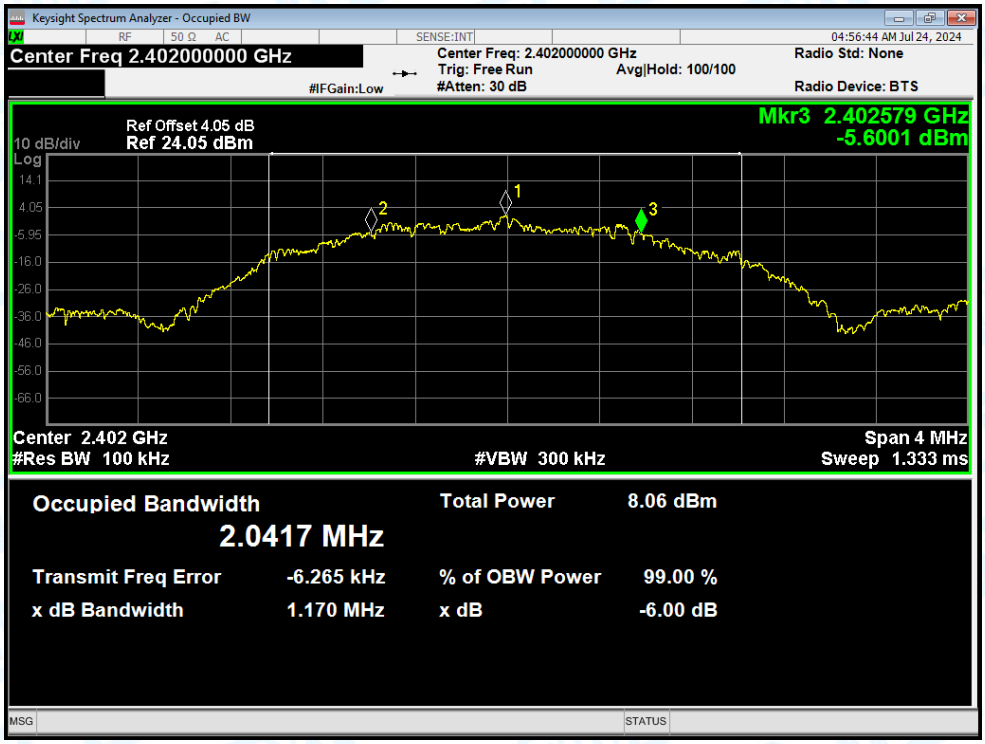
-6dB Bandwidth NVNT BLE 1Mbps 2440MHz Ant1



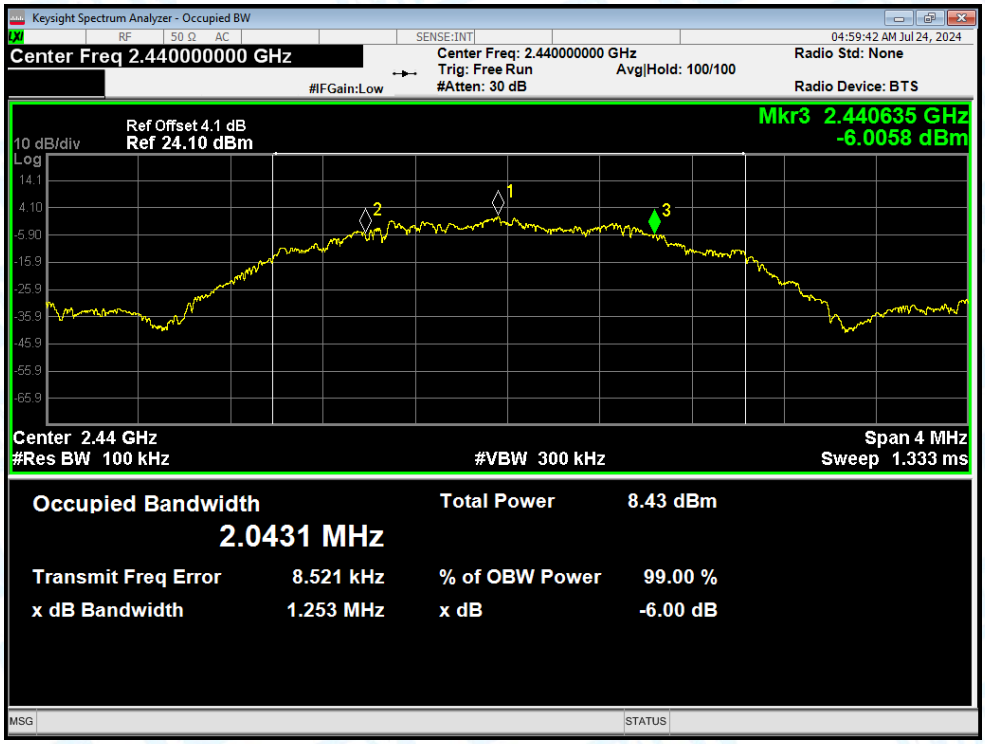
-6dB Bandwidth NVNT BLE 1Mbps 2480MHz Ant1



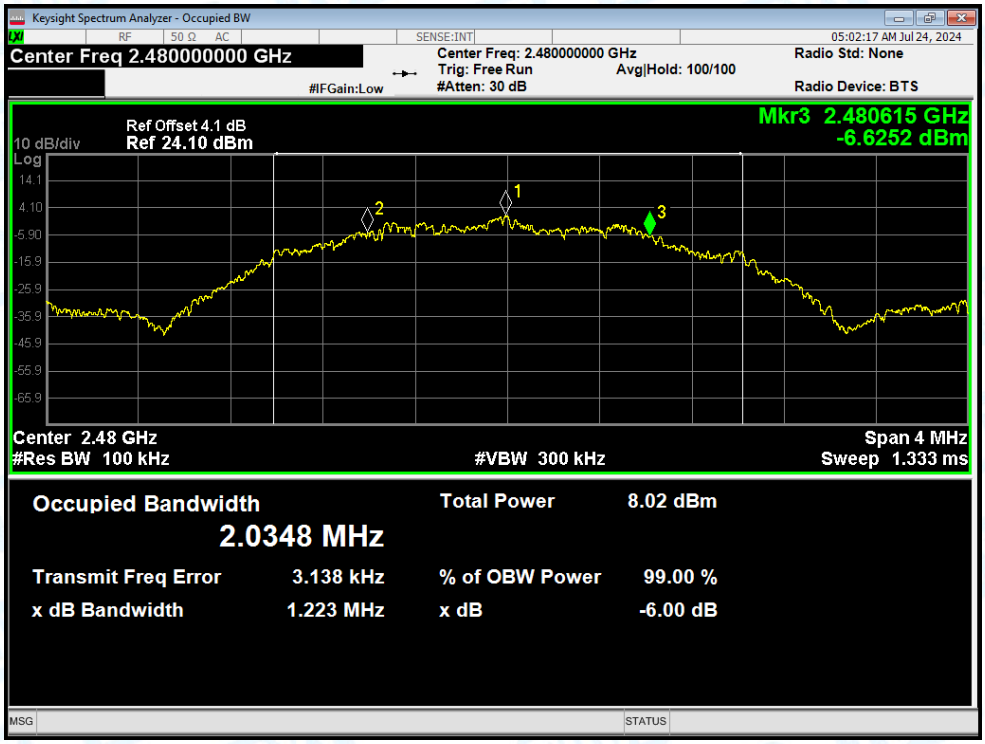
-6dB Bandwidth NVNT BLE 2Mbps 2402MHz Ant1



-6dB Bandwidth NVNT BLE 2Mbps 2440MHz Ant1



-6dB Bandwidth NVNT BLE 2Mbps 2480MHz Ant1

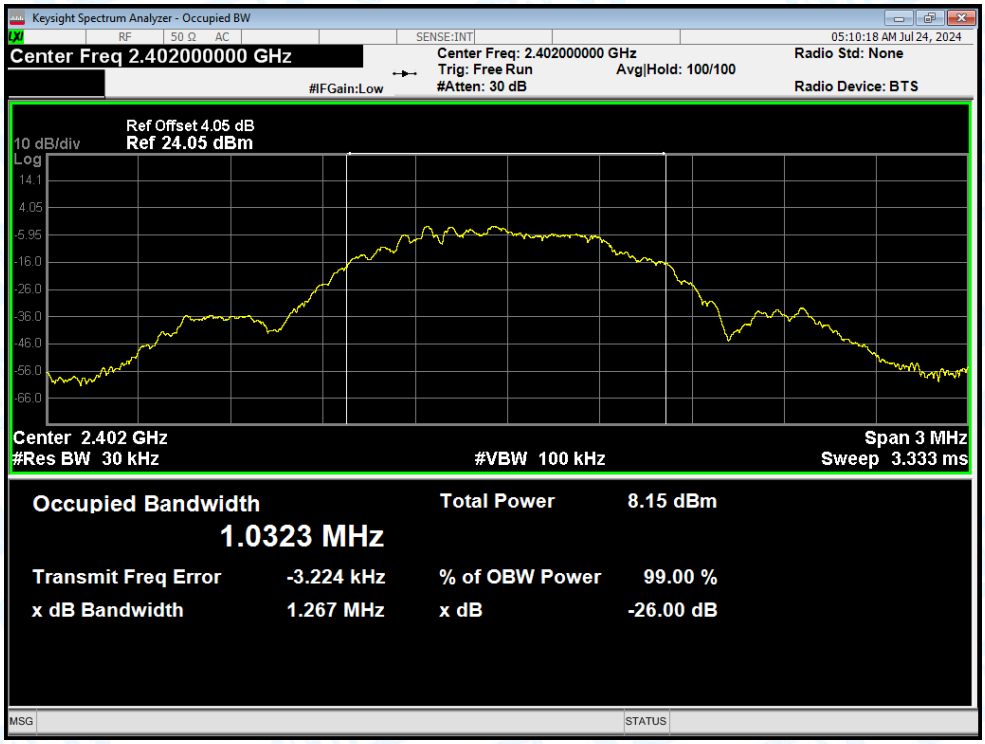


4.Occupied Channel Bandwidth

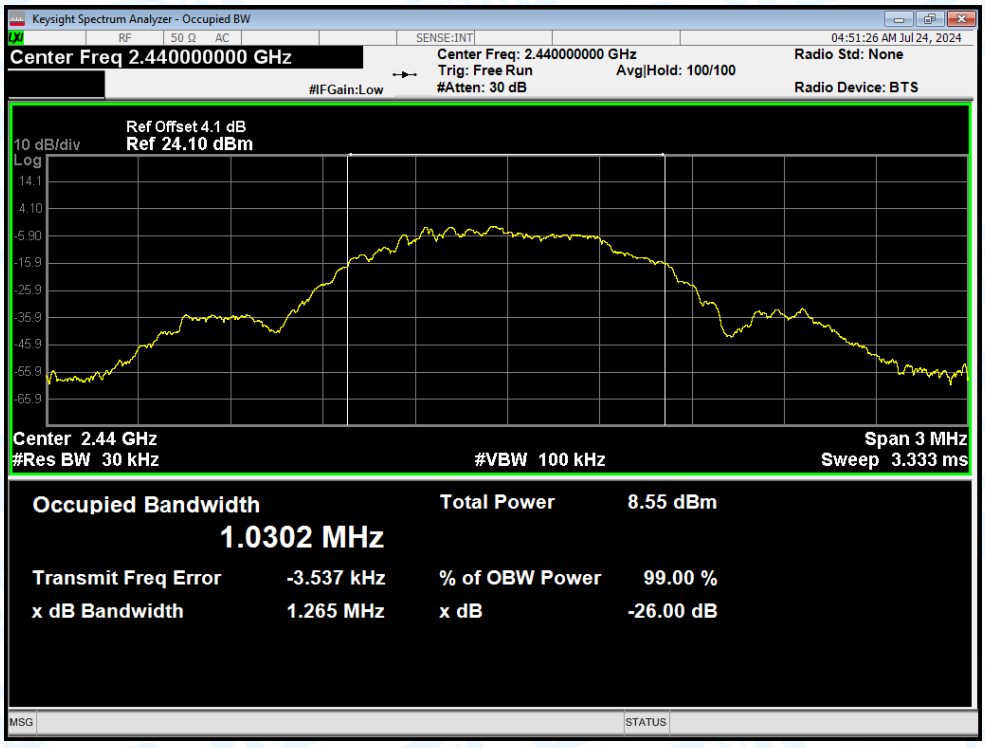
Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	BLE 1Mbps	2402	Ant1	1.032
NVNT	BLE 1Mbps	2440	Ant1	1.03
NVNT	BLE 1Mbps	2480	Ant1	1.031
NVNT	BLE 2Mbps	2402	Ant1	2.052
NVNT	BLE 2Mbps	2440	Ant1	2.047
NVNT	BLE 2Mbps	2480	Ant1	2.047

Test Graphs

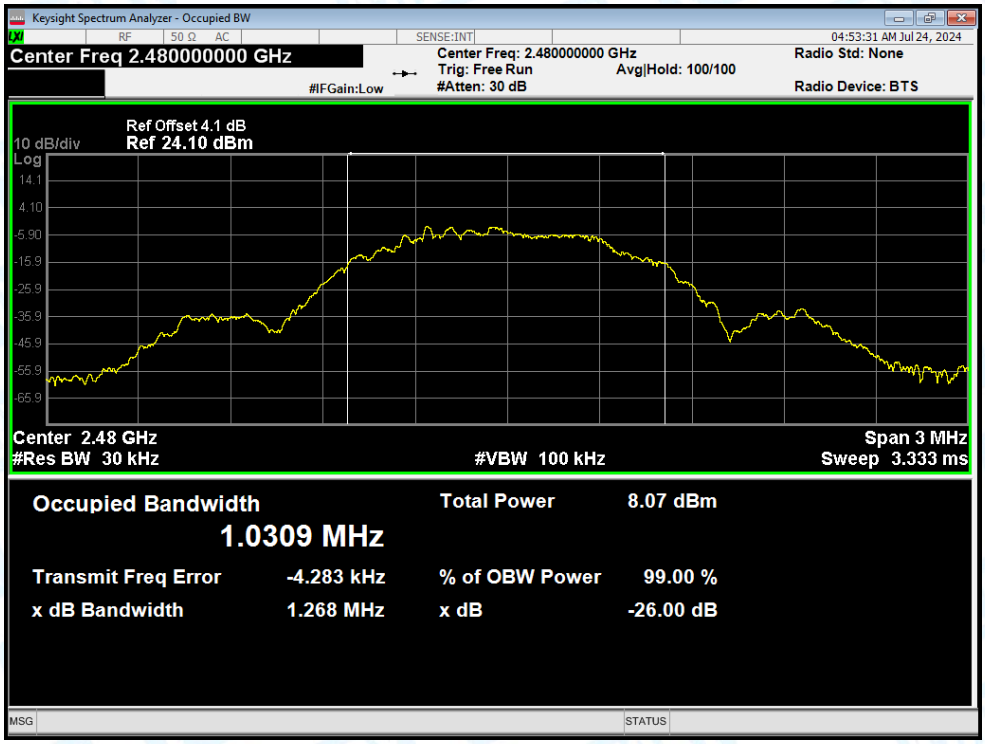
OBW NVNT BLE 1Mbps 2402MHz Ant1



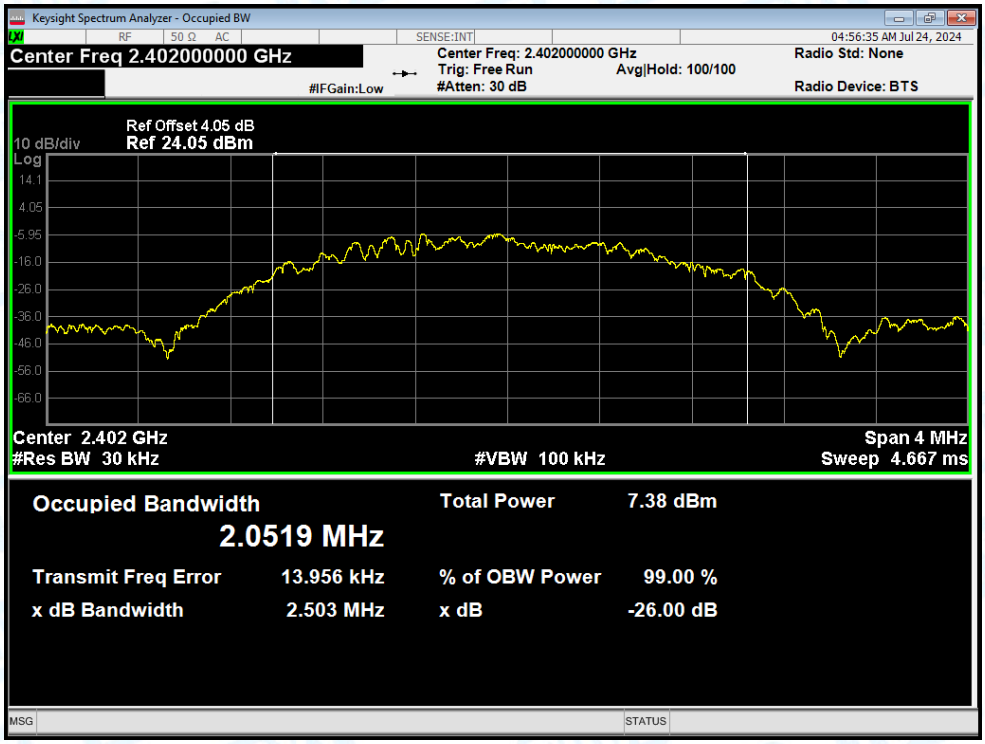
OBW NVNT BLE 1Mbps 2440MHz Ant1



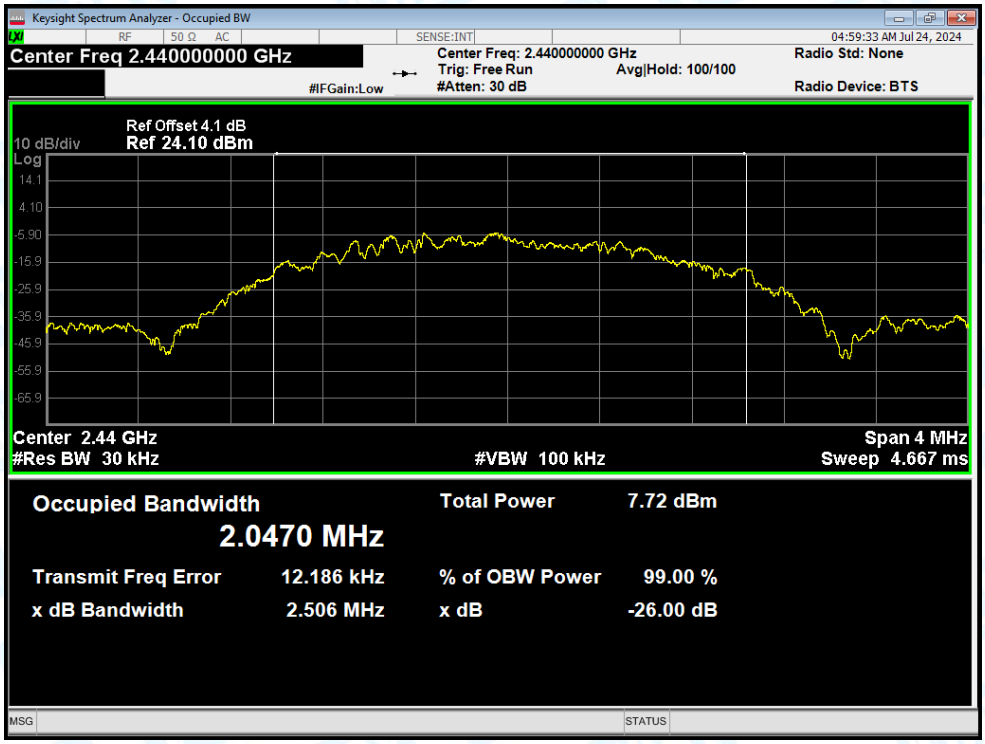
OBW NVNT BLE 1Mbps 2480MHz Ant1



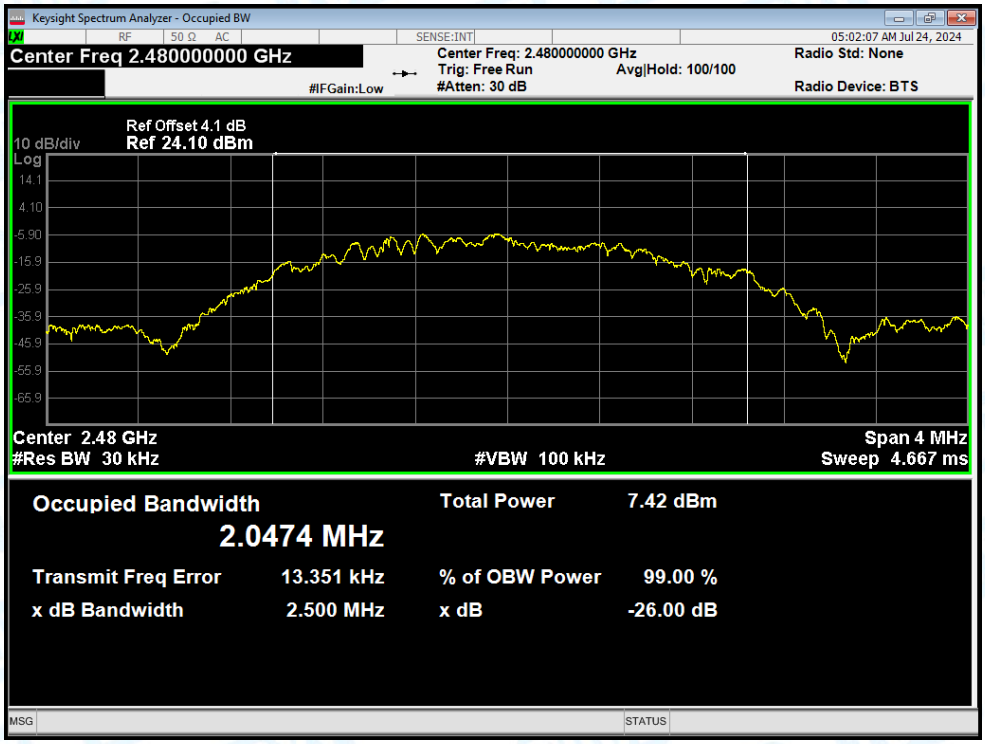
OBW NVNT BLE 2Mbps 2402MHz Ant1



OBW NVNT BLE 2Mbps 2440MHz Ant1



OBW NVNT BLE 2Mbps 2480MHz Ant1

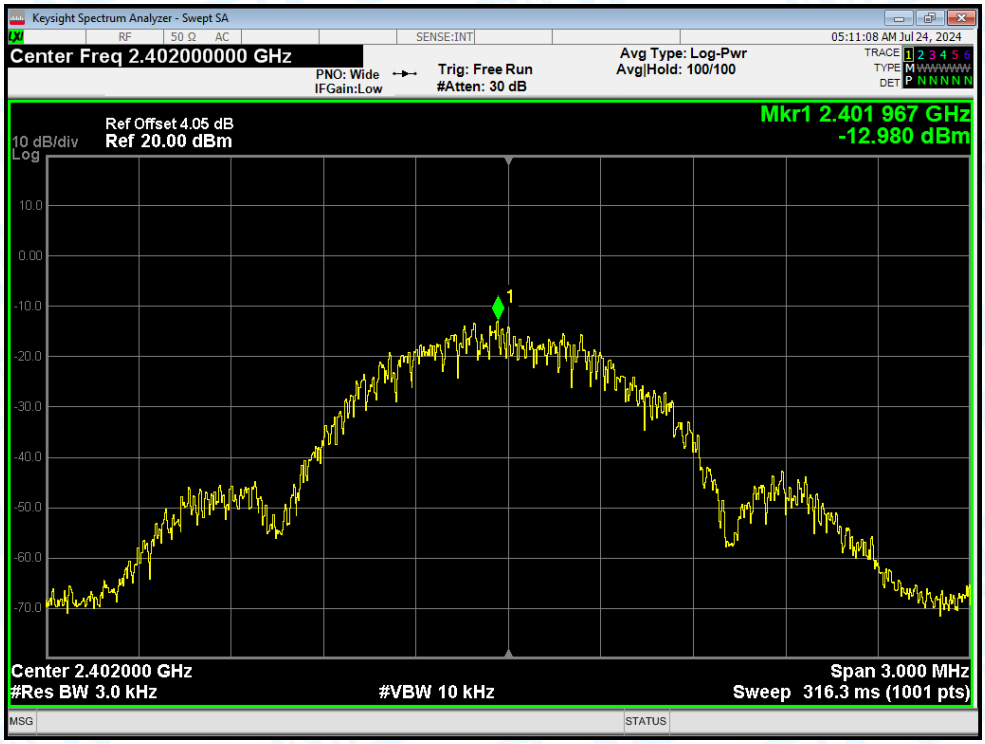


5.Maximum Power Spectral Density Level

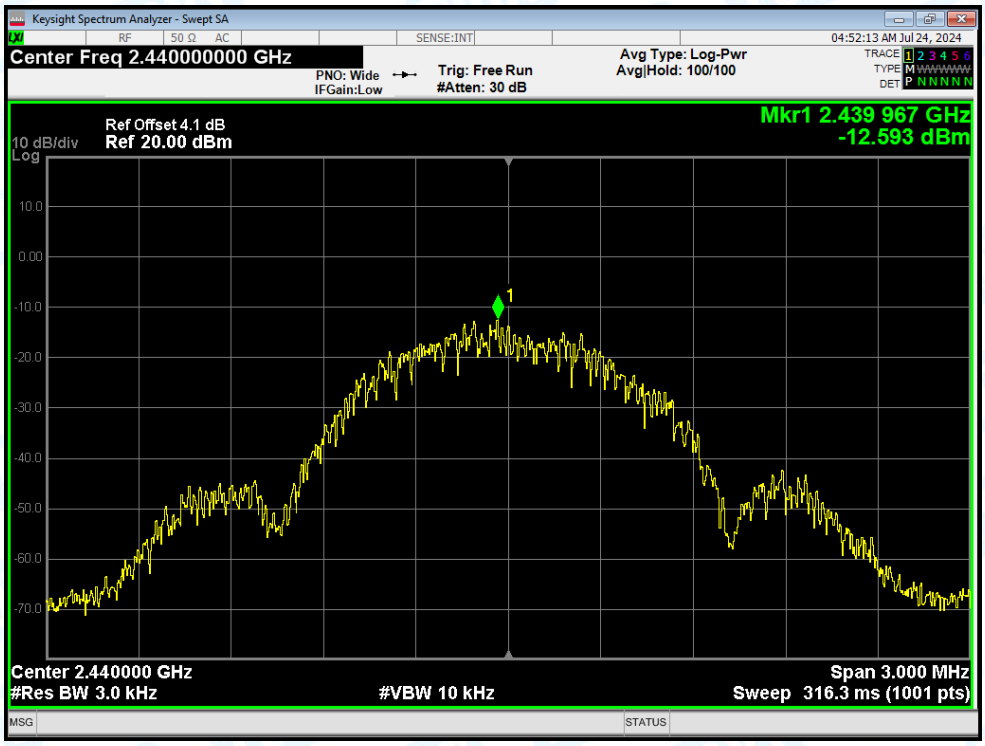
Condition	Mode	Frequency (MHz)	Antenna	Max PSD (dBm)	Limit (dBm)	Verdict
NVNT	BLE 1Mbps	2402	Ant1	-12.98	8	Pass
NVNT	BLE 1Mbps	2440	Ant1	-12.593	8	Pass
NVNT	BLE 1Mbps	2480	Ant1	-13.05	8	Pass
NVNT	BLE 2Mbps	2402	Ant1	-15.313	8	Pass
NVNT	BLE 2Mbps	2440	Ant1	-14.851	8	Pass
NVNT	BLE 2Mbps	2480	Ant1	-15.294	8	Pass

Test Graphs

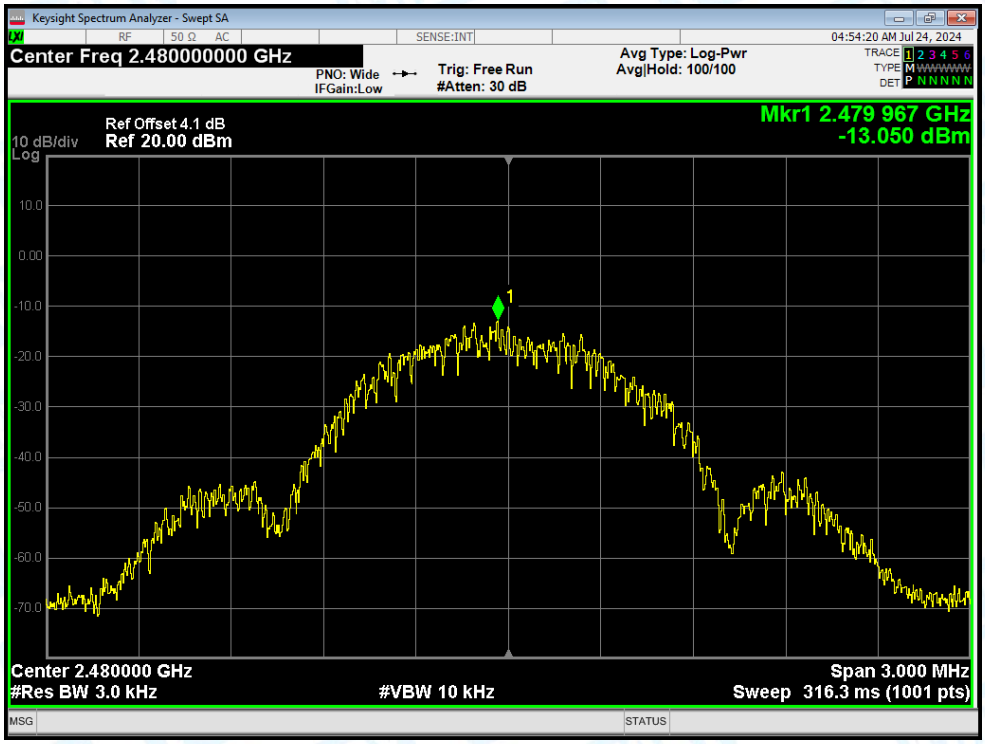
PSD NVNT BLE 1Mbps 2402MHz Ant1



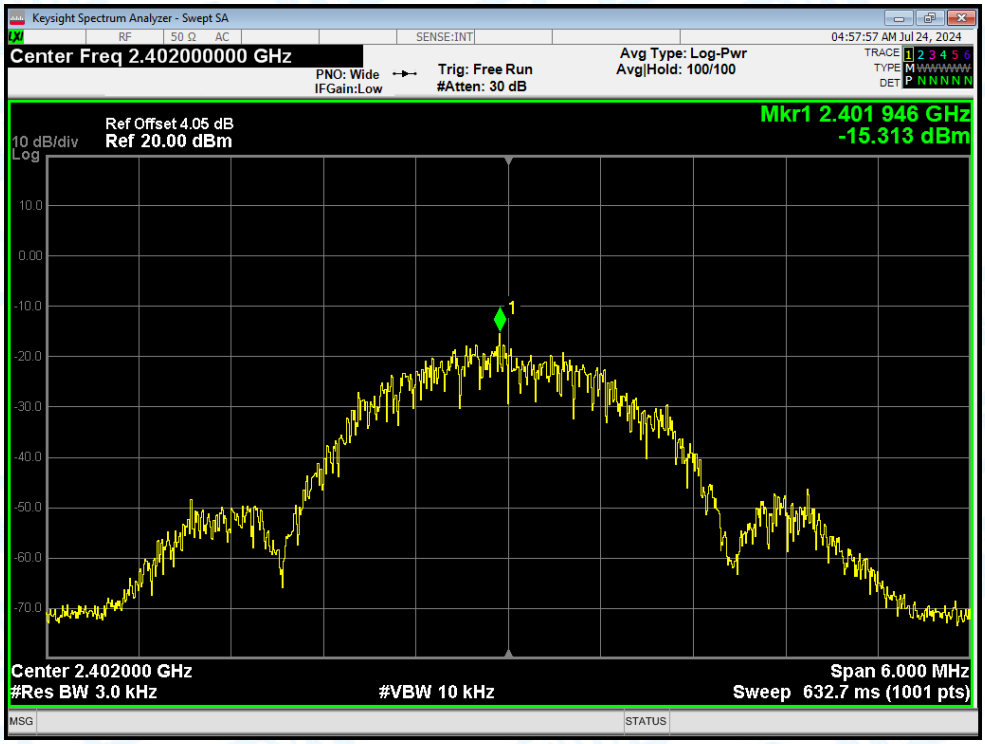
PSD NVNT BLE 1Mbps 2440MHz Ant1



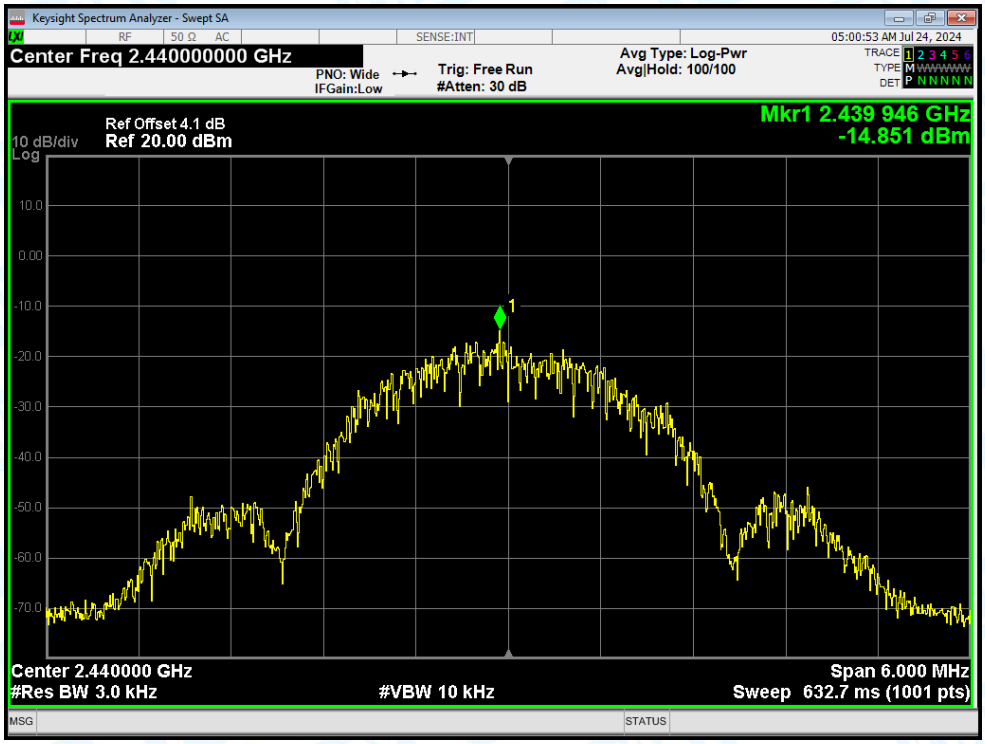
PSD NVNT BLE 1Mbps 2480MHz Ant1



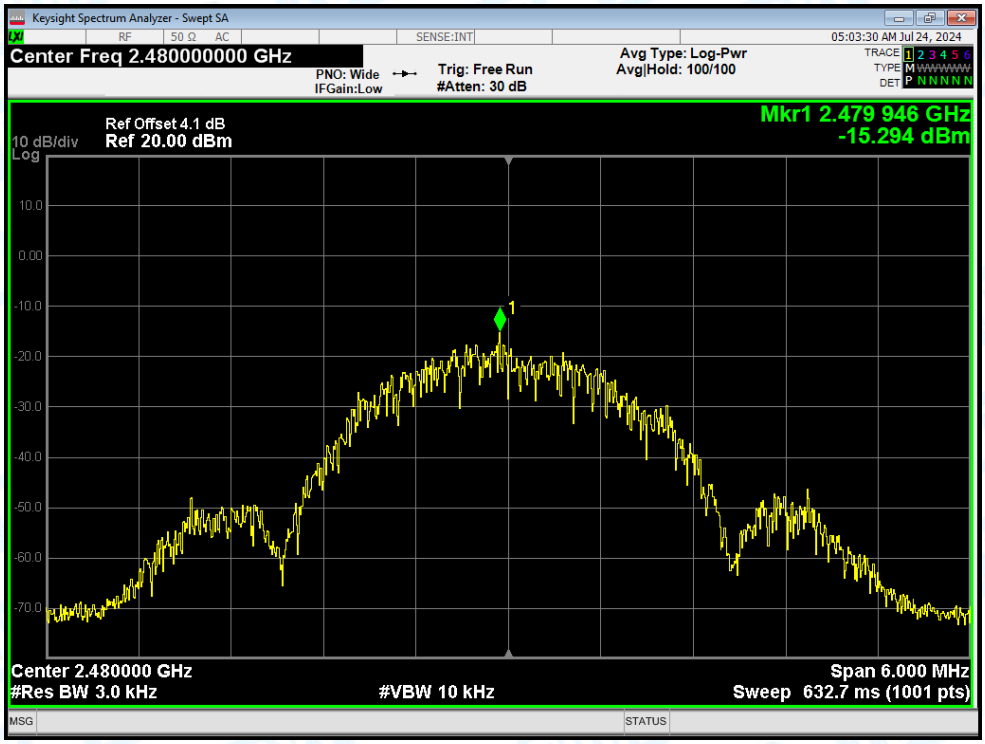
PSD NVNT BLE 2Mbps 2402MHz Ant1



PSD NVNT BLE 2Mbps 2440MHz Ant1



PSD NVNT BLE 2Mbps 2480MHz Ant1

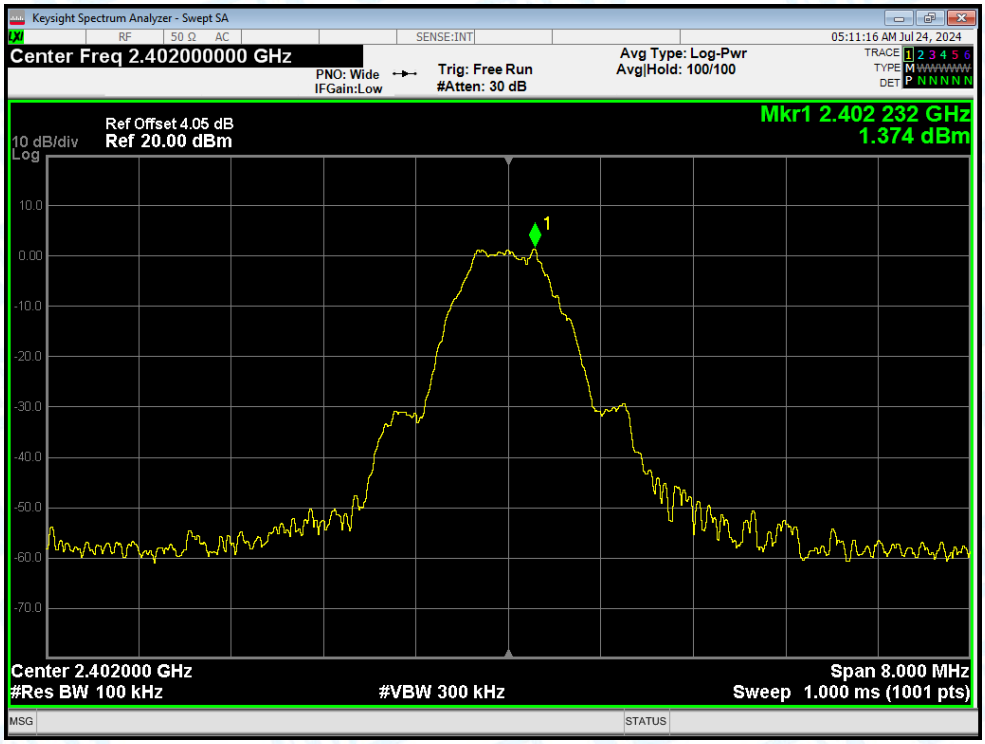


6.Band Edge

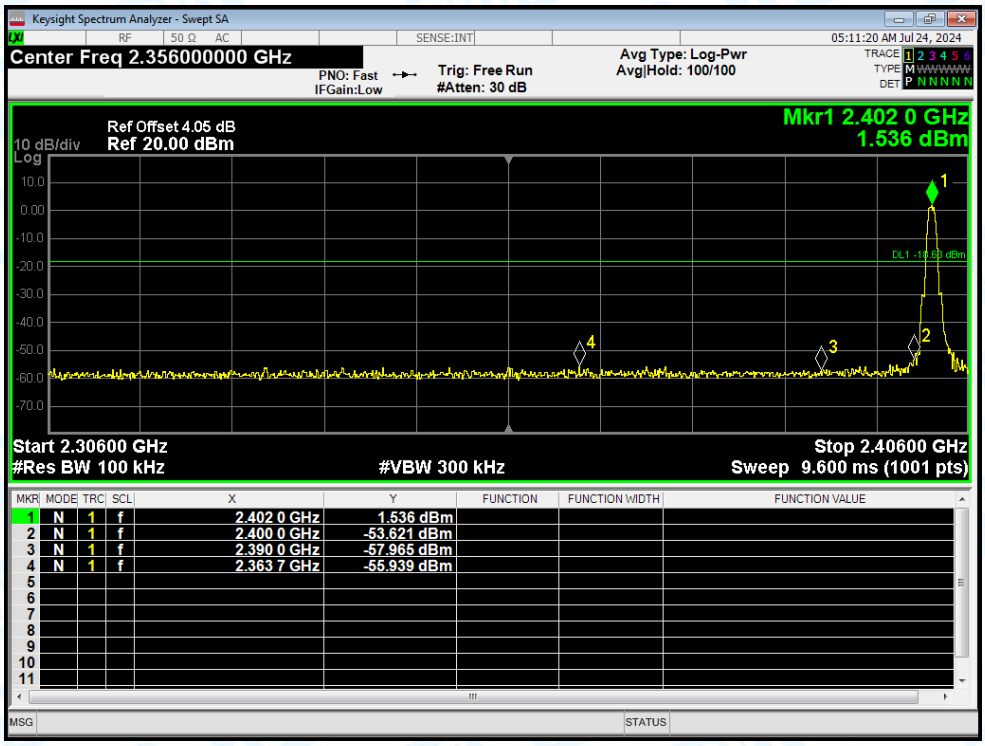
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1Mbps	2402	Ant1	-57.31	-20	Pass
NVNT	BLE 1Mbps	2480	Ant1	-55.3	-20	Pass
NVNT	BLE 2Mbps	2402	Ant1	-56.32	-20	Pass
NVNT	BLE 2Mbps	2480	Ant1	-55.91	-20	Pass

Test Graphs

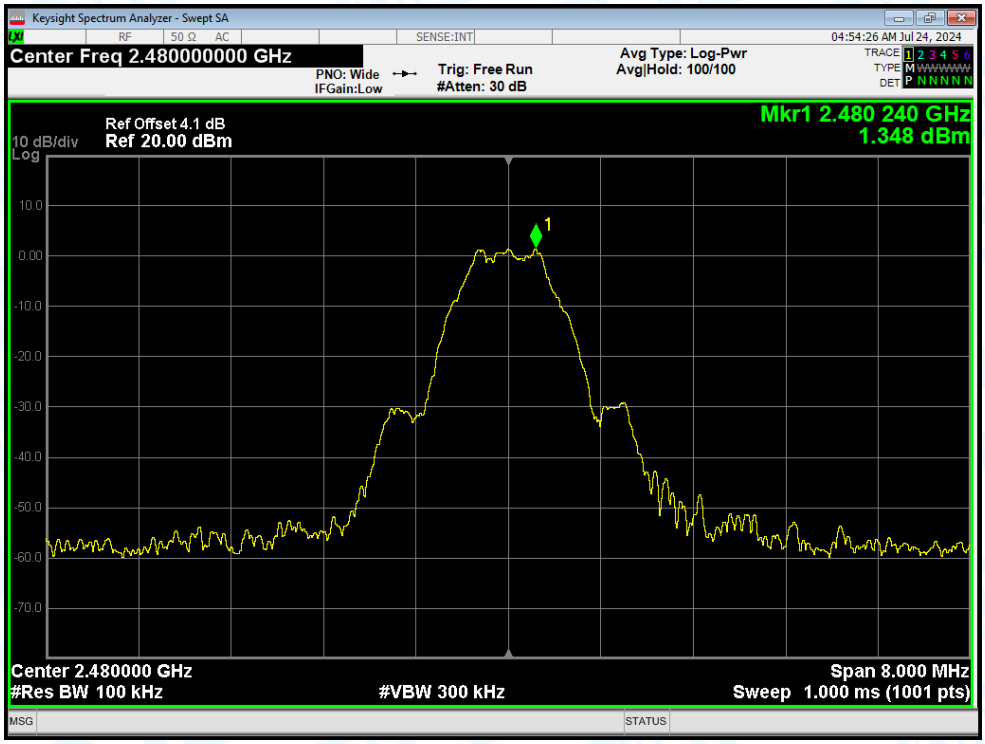
Band Edge NVNT BLE 1Mbps 2402MHz Ant1 Ref



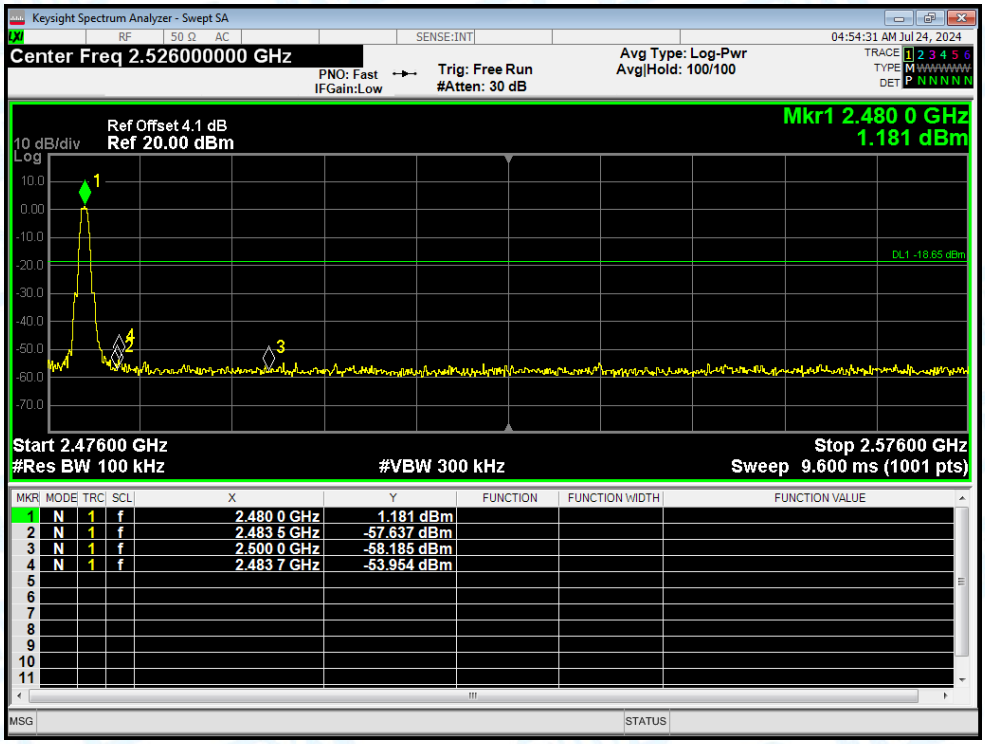
Band Edge NVNT BLE 1Mbps 2402MHz Ant1 Emission



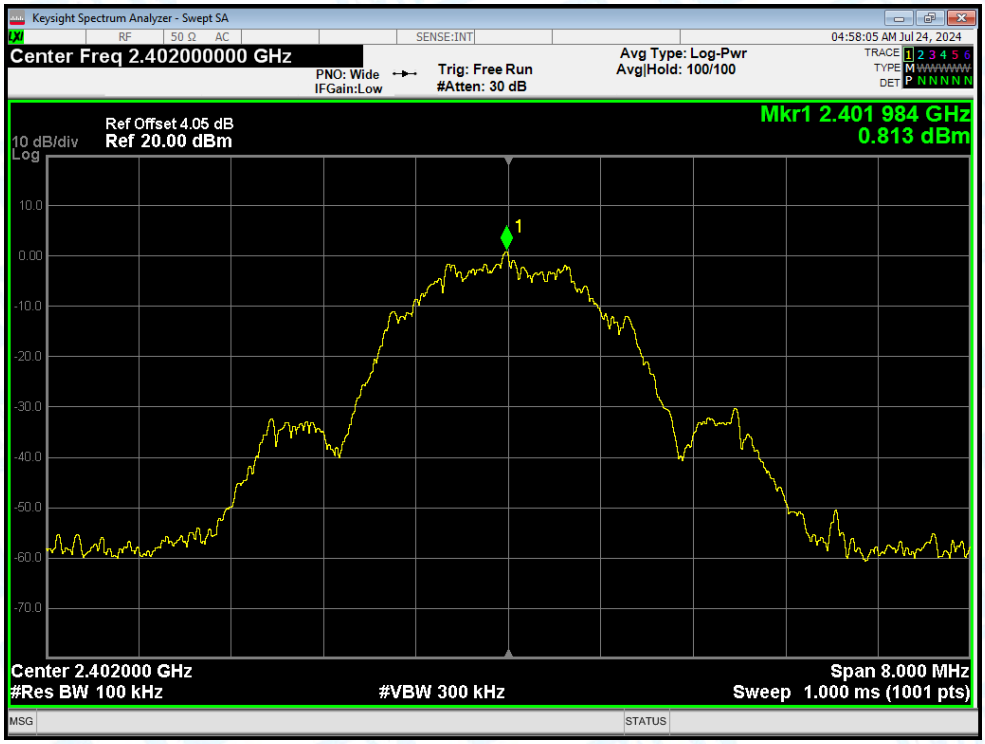
Band Edge NVNT BLE 1Mbps 2480MHz Ant1 Ref



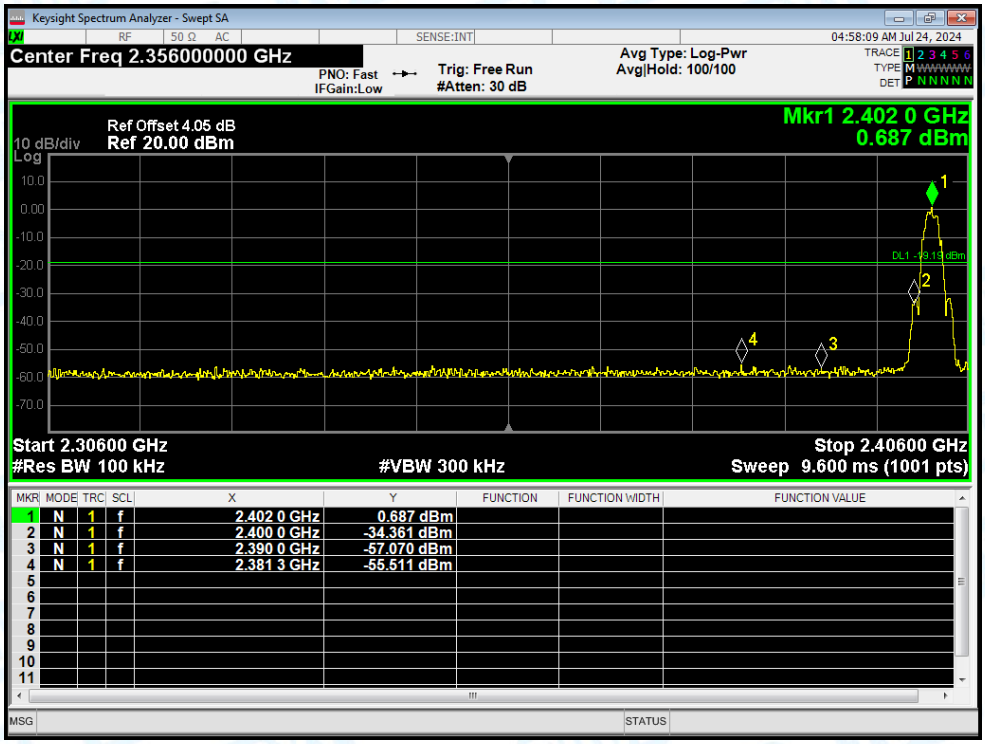
Band Edge NVNT BLE 1Mbps 2480MHz Ant1 Emission



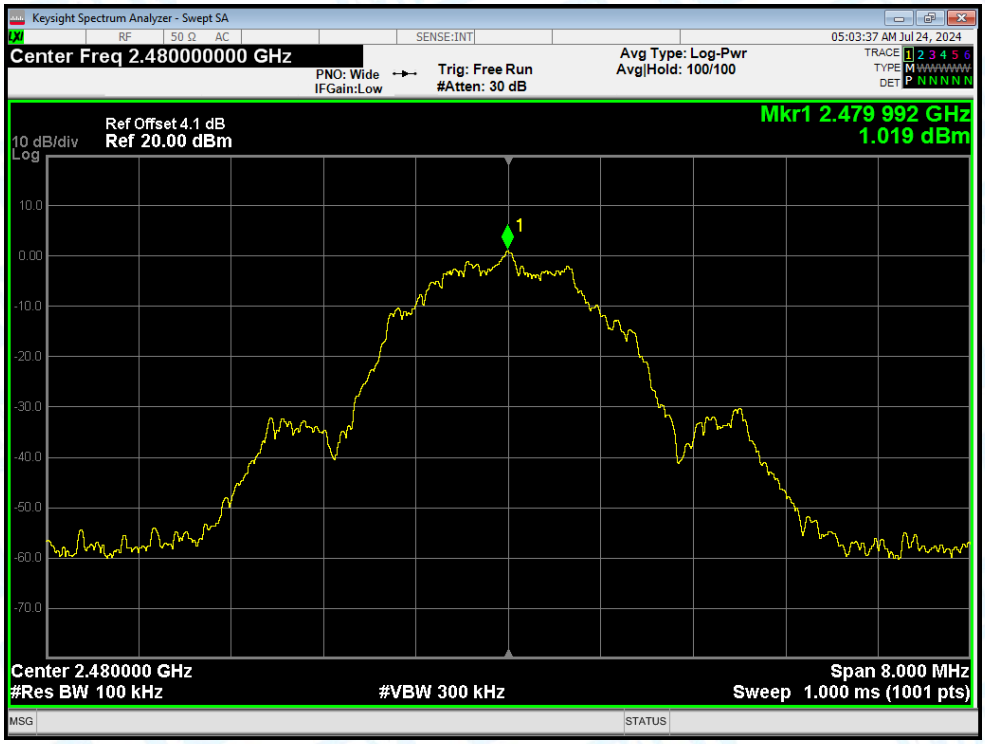
Band Edge NVNT BLE 2Mbps 2402MHz Ant1 Ref



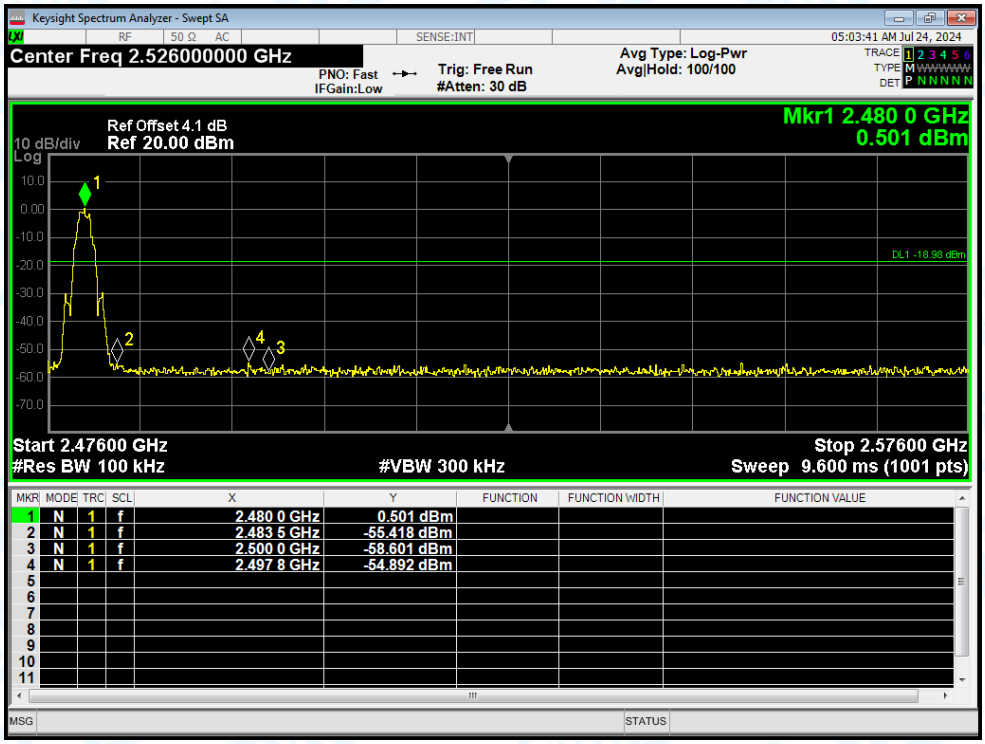
Band Edge NVNT BLE 2Mbps 2402MHz Ant1 Emission



Band Edge NVNT BLE 2Mbps 2480MHz Ant1 Ref



Band Edge NVNT BLE 2Mbps 2480MHz Ant1 Emission

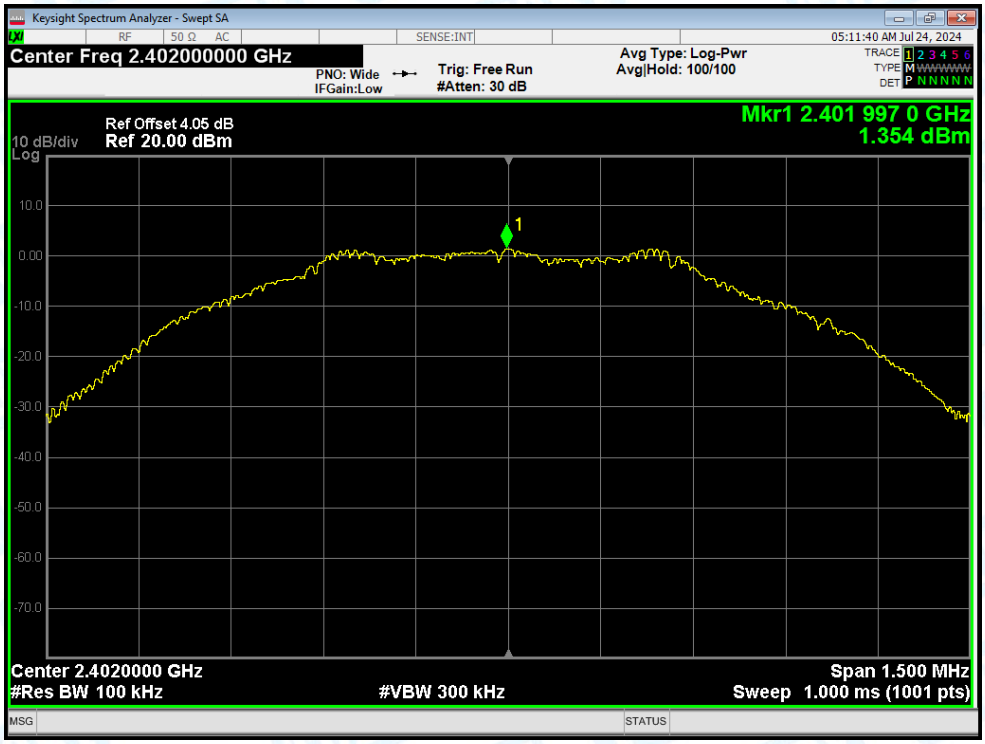


7.Conducted RF Spurious Emission

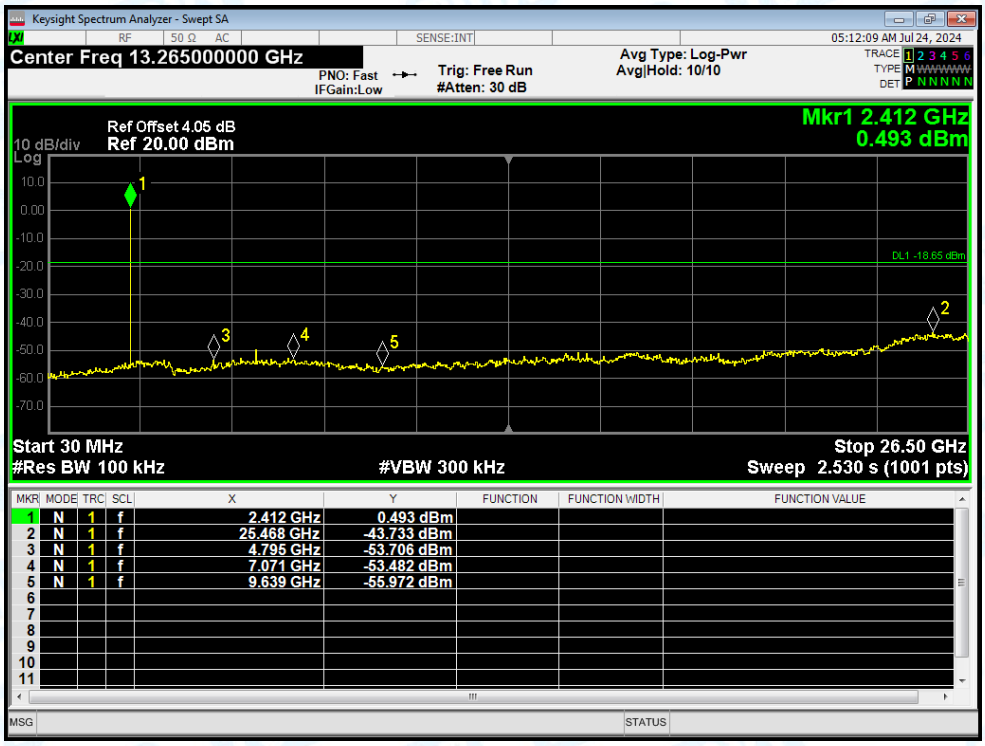
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1Mbps	2402	Ant1	-45.08	-20	Pass
NVNT	BLE 1Mbps	2440	Ant1	-45.53	-20	Pass
NVNT	BLE 1Mbps	2480	Ant1	-44.92	-20	Pass
NVNT	BLE 2Mbps	2402	Ant1	-44.47	-20	Pass
NVNT	BLE 2Mbps	2440	Ant1	-44.6	-20	Pass
NVNT	BLE 2Mbps	2480	Ant1	-44.92	-20	Pass

Test Graphs

Tx. Spurious NVNT BLE 1Mbps 2402MHz Ant1 Ref

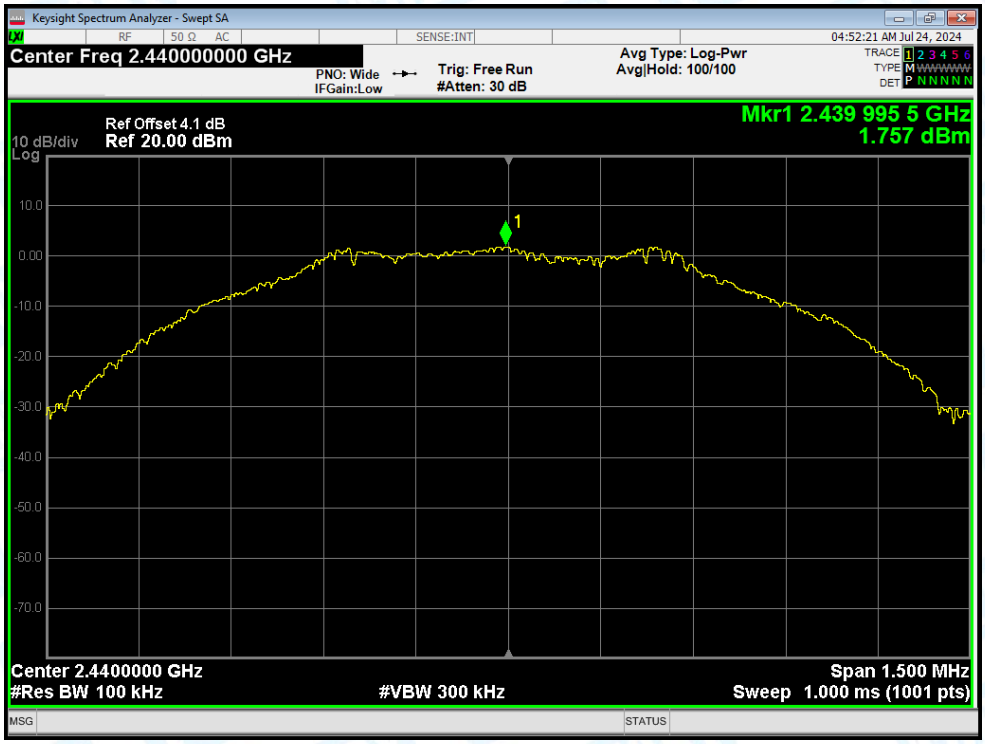


Tx. Spurious NVNT BLE 1Mbps 2402MHz Ant1 Emission

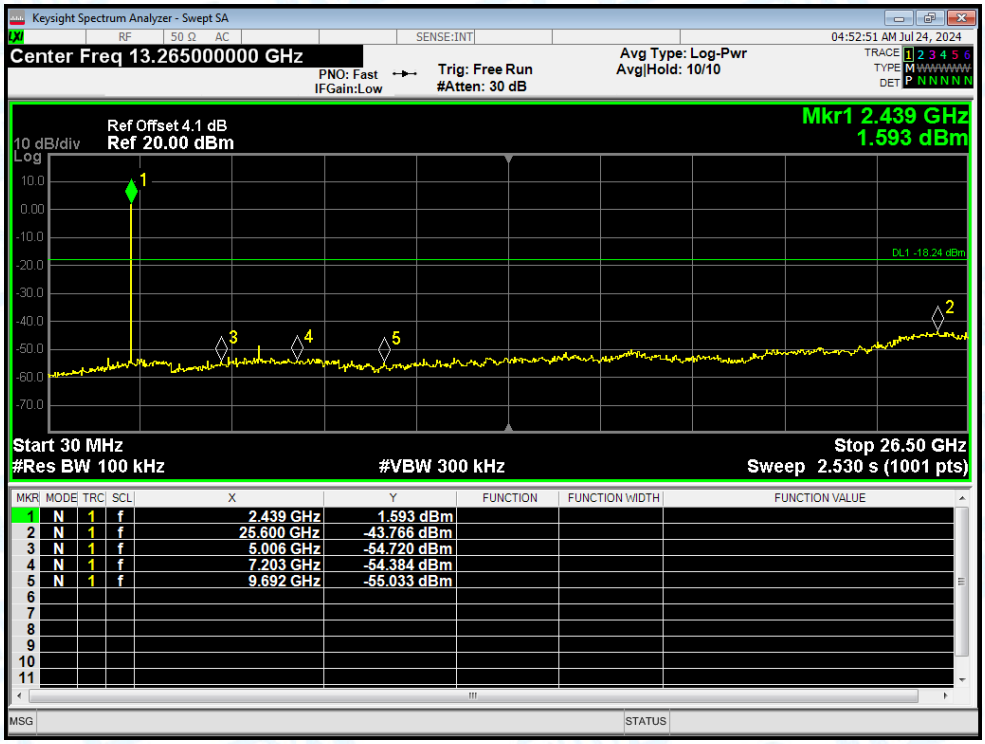


MKR	MODE	TRC	SCL	X	Y	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE
1	N	1	f	2.412 GHz	0.493 dBm			
2	N	1	f	25.468 GHz	-43.733 dBm			
3	N	1	f	4.795 GHz	-53.706 dBm			
4	N	1	f	7.071 GHz	-53.482 dBm			
5	N	1	f	9.639 GHz	-55.972 dBm			
6								
7								
8								
9								
10								
11								

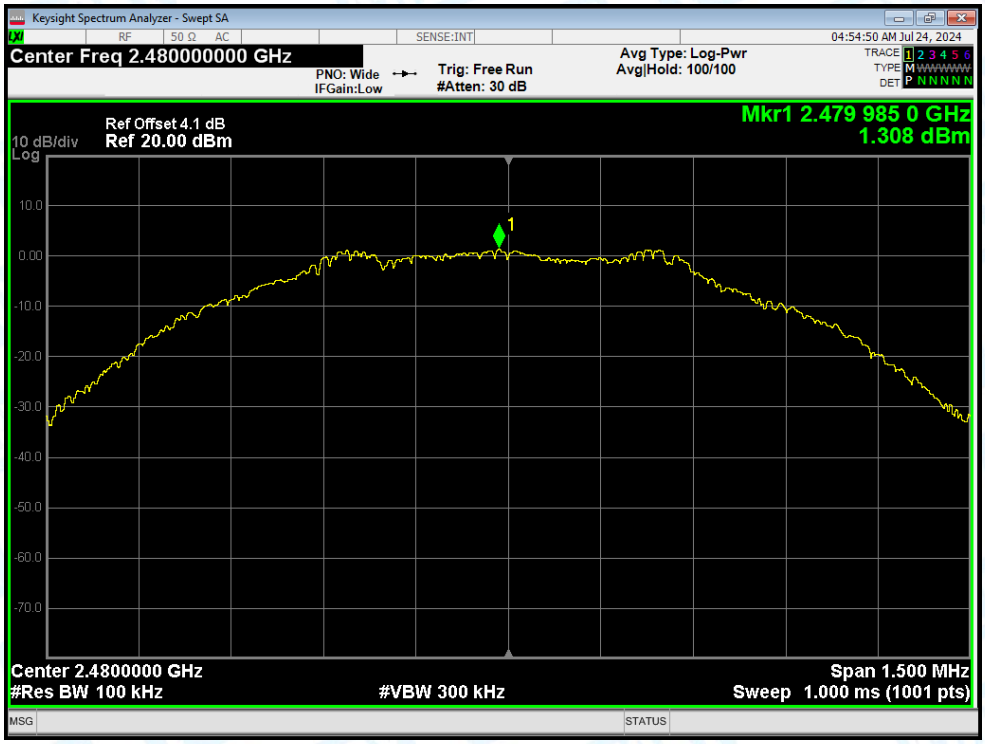
Tx. Spurious NVNT BLE 1Mbps 2440MHz Ant1 Ref



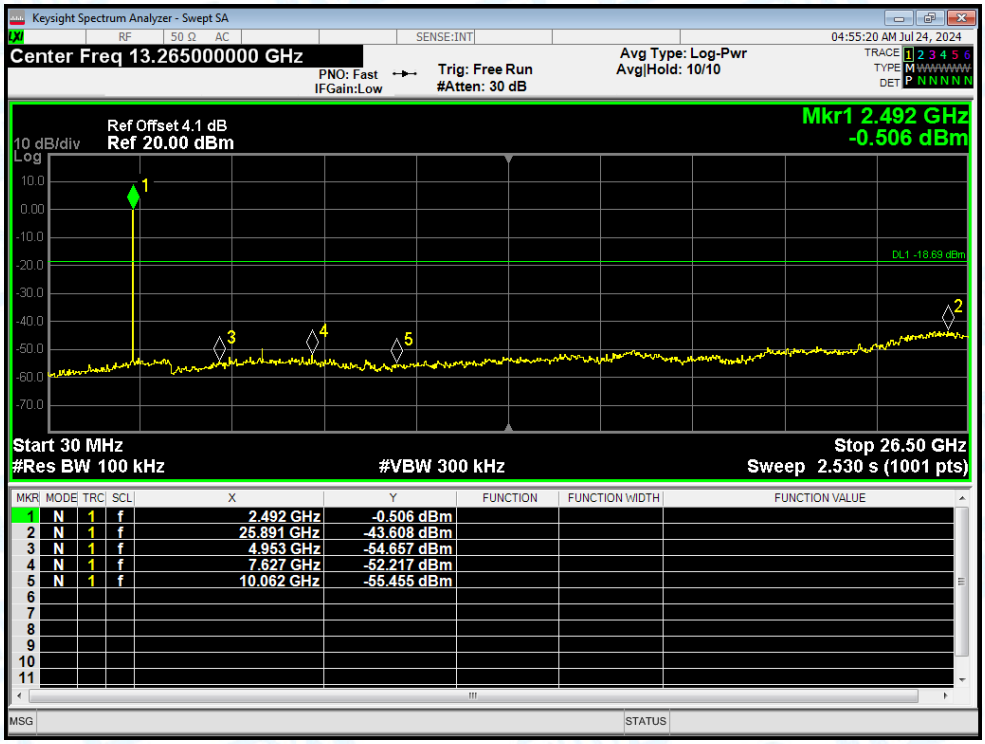
Tx. Spurious NVNT BLE 1Mbps 2440MHz Ant1 Emission



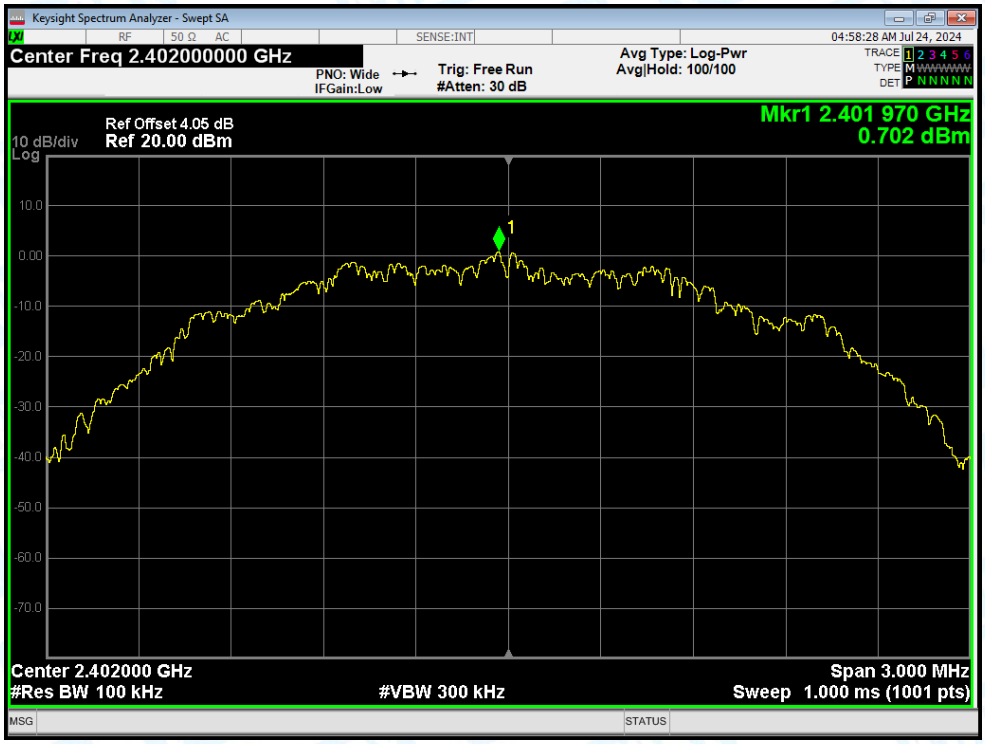
Tx. Spurious NVNT BLE 1Mbps 2480MHz Ant1 Ref



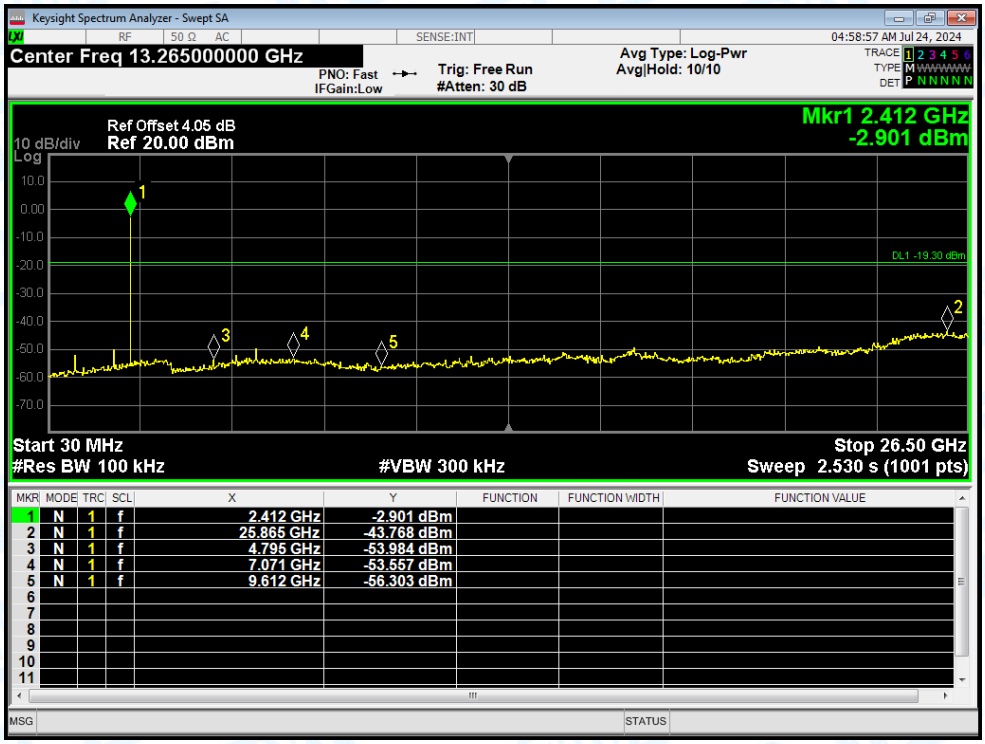
Tx. Spurious NVNT BLE 1Mbps 2480MHz Ant1 Emission



Tx. Spurious NVNT BLE 2Mbps 2402MHz Ant1 Ref



Tx. Spurious NVNT BLE 2Mbps 2402MHz Ant1 Emission



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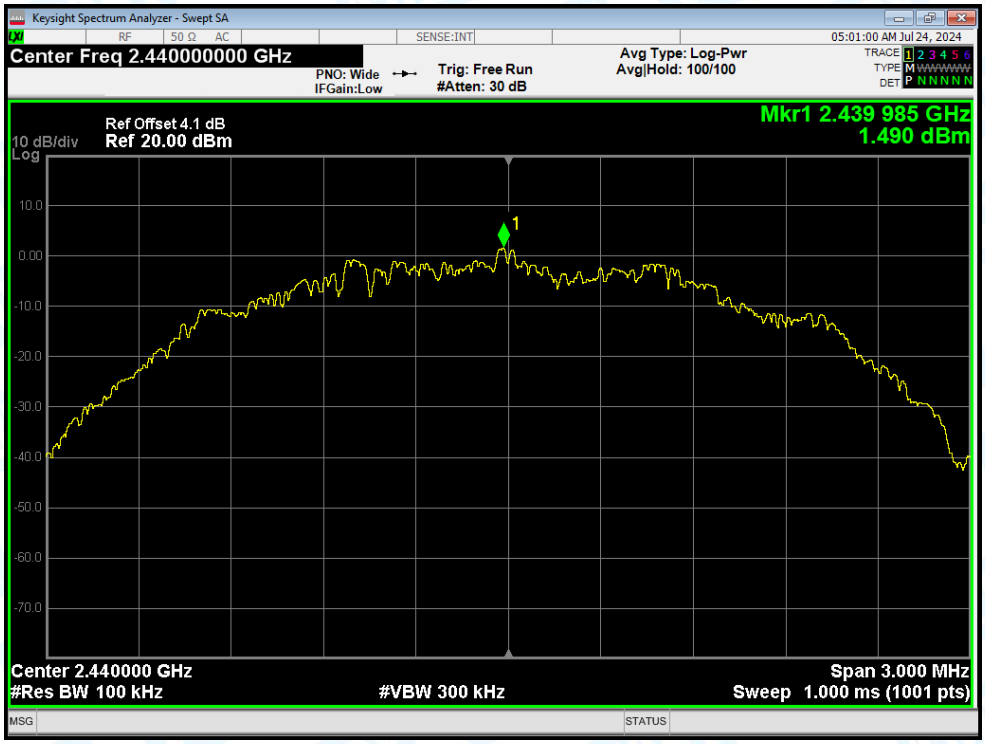
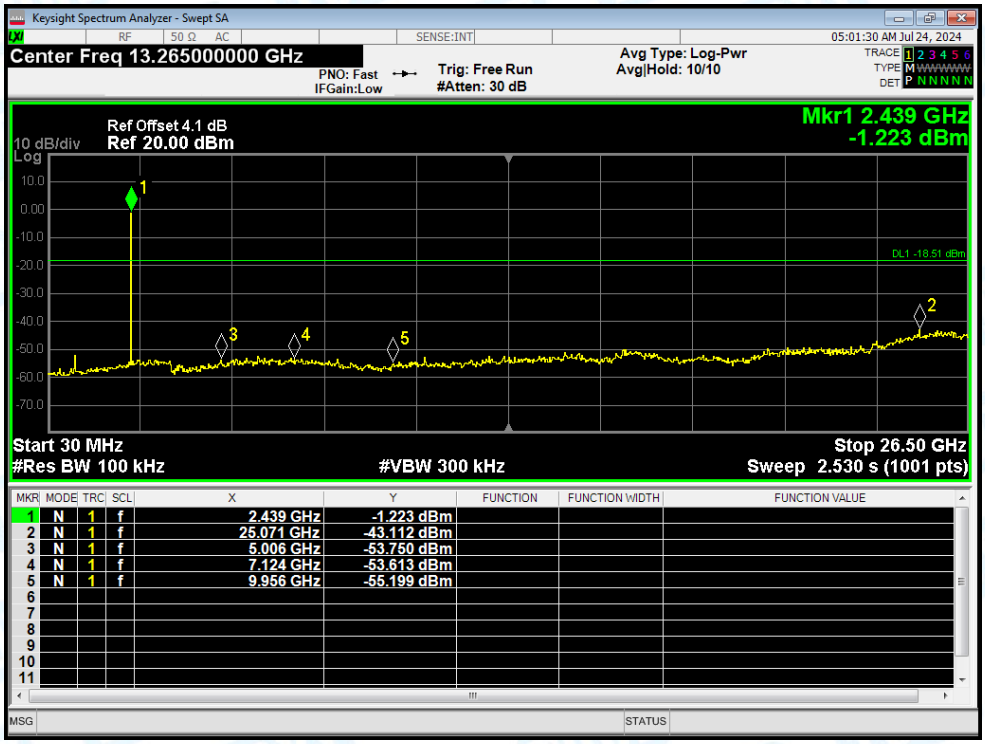
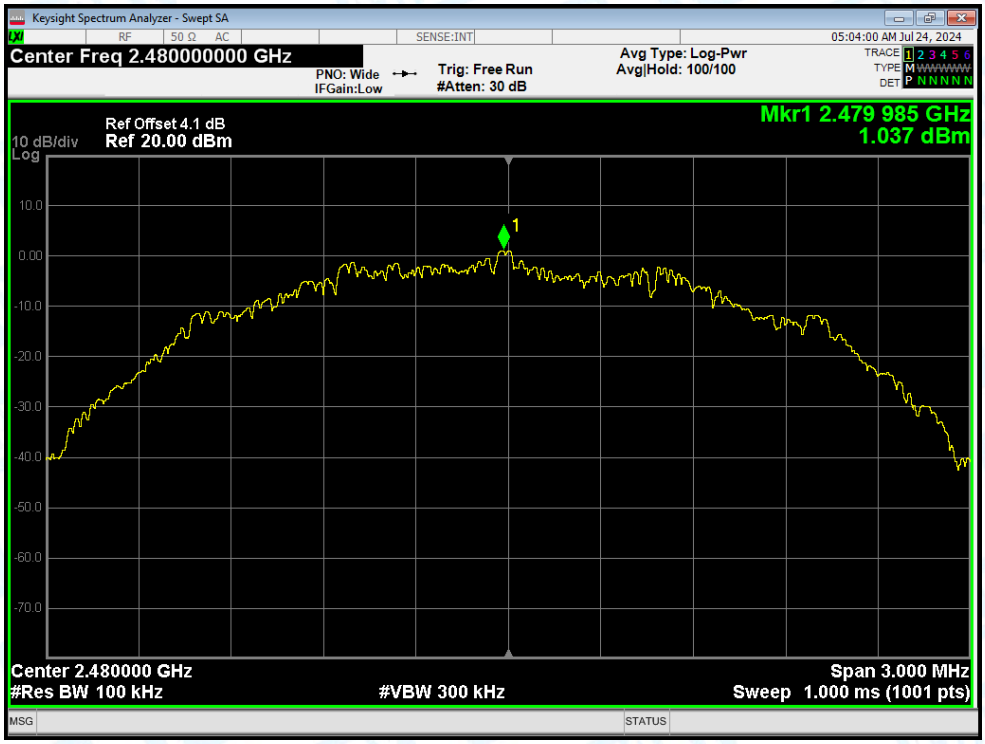


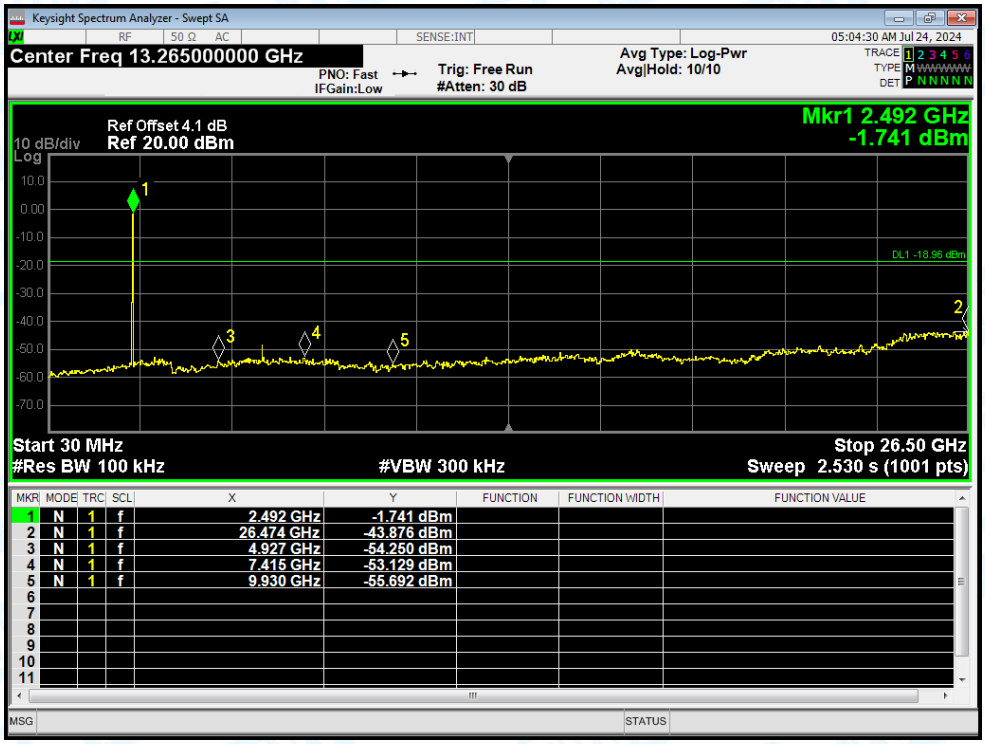
Tx. Spurious NVNT BLE 2Mbps 2440MHz Ant1 Emission



Tx. Spurious NVNT BLE 2Mbps 2480MHz Ant1 Ref



Tx. Spurious NVNT BLE 2Mbps 2480MHz Ant1 Emission



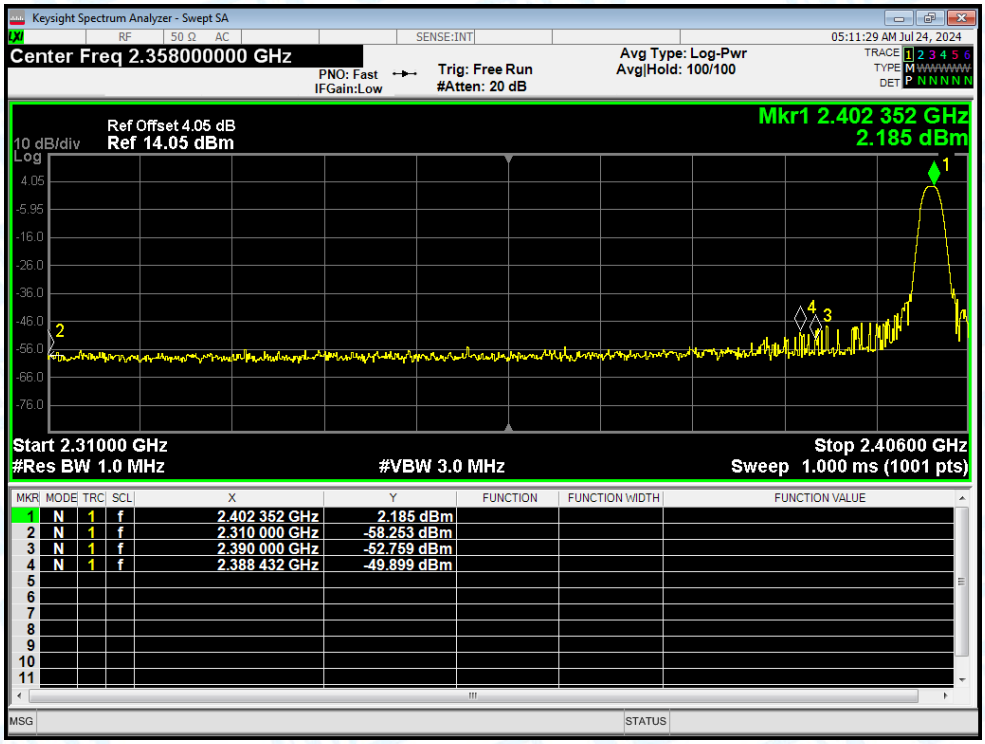
8.Restrict Band

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	-58.25	3	-	40.01	Peak	74	Pass
NVNT	BLE 1Mbps	2402	Ant1	2310	-66.75	3	2.24	33.75	Average	54	Pass
NVNT	BLE 1Mbps	2402	Ant1	2388.432	-49.9	3	-	48.36	Peak	74	Pass
NVNT	BLE 1Mbps	2402	Ant1	2380.848	-63.83	3	2.24	36.67	Average	54	Pass
NVNT	BLE 1Mbps	2402	Ant1	2390	-52.76	3	-	45.5	Peak	74	Pass
NVNT	BLE 1Mbps	2402	Ant1	2390	-65.4	3	2.24	35.1	Average	54	Pass
NVNT	BLE 1Mbps	2480	Ant1	2483.5	-45.77	3	-	52.49	Peak	74	Pass
NVNT	BLE 1Mbps	2480	Ant1	2483.5	-60.75	3	2.24	39.75	Average	54	Pass
NVNT	BLE 1Mbps	2480	Ant1	2483.584	-42.82	3	-	55.44	Peak	74	Pass
NVNT	BLE 1Mbps	2480	Ant1	2483.8	-58.78	3	2.24	41.72	Average	54	Pass
NVNT	BLE 1Mbps	2480	Ant1	2500	-56.01	3	-	42.25	Peak	74	Pass
NVNT	BLE 1Mbps	2480	Ant1	2500	-65.68	3	2.24	34.82	Average	54	Pass
NVNT	BLE 2Mbps	2402	Ant1	2310	-60.22	3	-	38.04	Peak	74	Pass
NVNT	BLE 2Mbps	2402	Ant1	2310	-66.66	3	5.15	36.75	Average	54	Pass
NVNT	BLE 2Mbps	2402	Ant1	2387.76	-50.27	3	-	47.99	Peak	74	Pass
NVNT	BLE 2Mbps	2402	Ant1	2387.088	-65.49	3	5.15	37.92	Average	54	Pass
NVNT	BLE 2Mbps	2402	Ant1	2390	-58.12	3	-	40.14	Peak	74	Pass
NVNT	BLE 2Mbps	2402	Ant1	2390	-66.36	3	5.15	37.05	Average	54	Pass
NVNT	BLE 2Mbps	2480	Ant1	2483.5	-50.17	3	-	48.09	Peak	74	Pass
NVNT	BLE 2Mbps	2480	Ant1	2483.5	-59.62	3	5.15	43.79	Average	54	Pass
NVNT	BLE	2480	Ant1	2483.68	-42.7	3	-	55.56	Peak	74	Pass

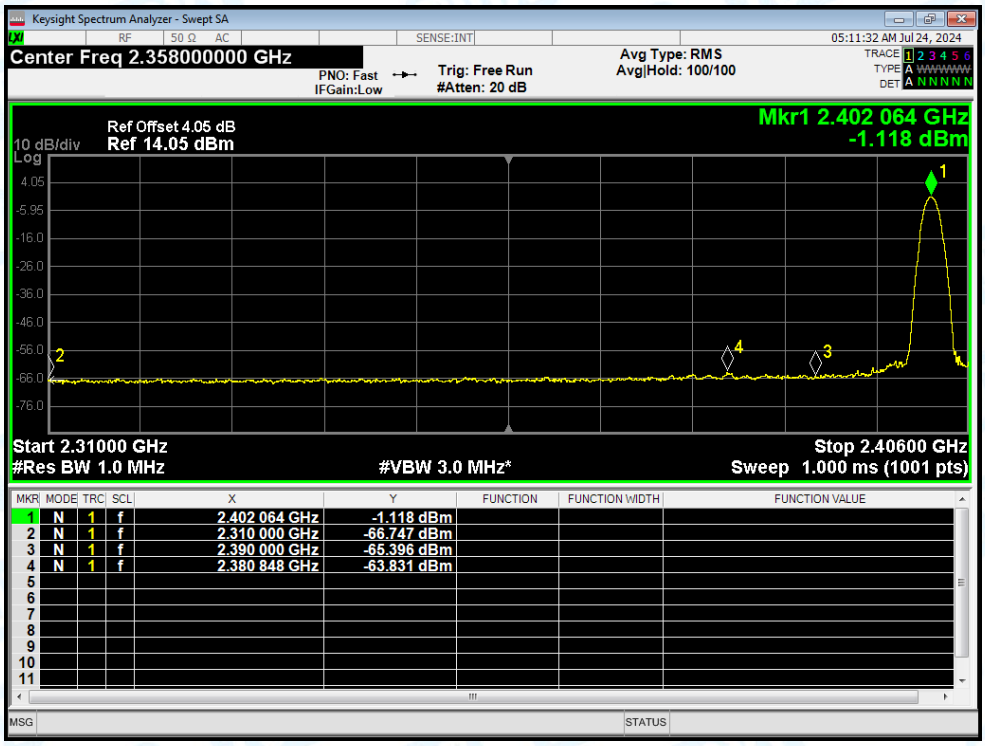
	2Mbps										
NVNT	BLE 2Mbps	2480	Ant1	2483.56	-59.4	3	5.15	44.01	Average	54	Pass
NVNT	BLE 2Mbps	2480	Ant1	2500	-57.89	3	-	40.37	Peak	74	Pass
NVNT	BLE 2Mbps	2480	Ant1	2500	-66.12	3	5.15	37.29	Average	54	Pass

Test Graphs

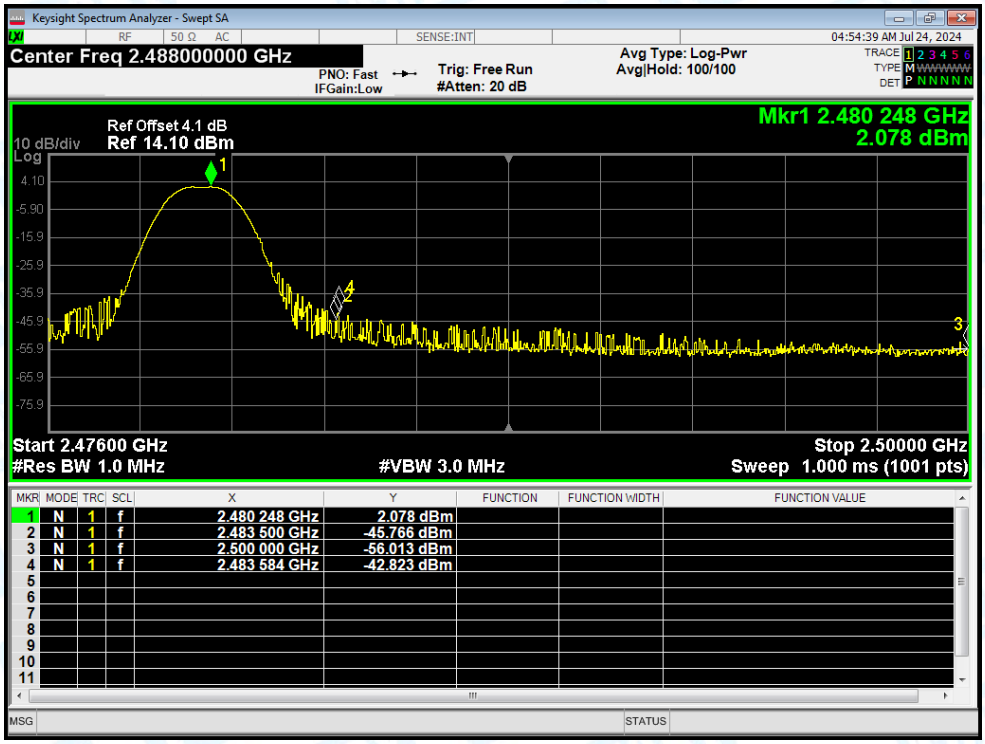
Restrict Band NVNT BLE 1Mbps 2402MHz Ant1 Peak



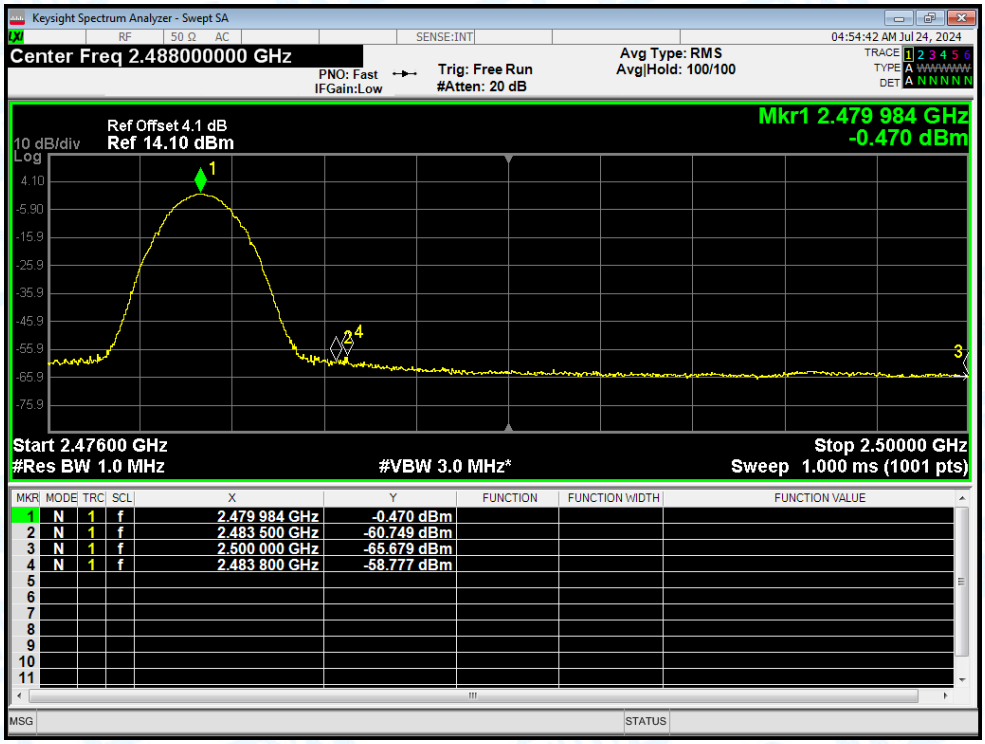
Restrict Band NVNT BLE 1Mbps 2402MHz Ant1 Average



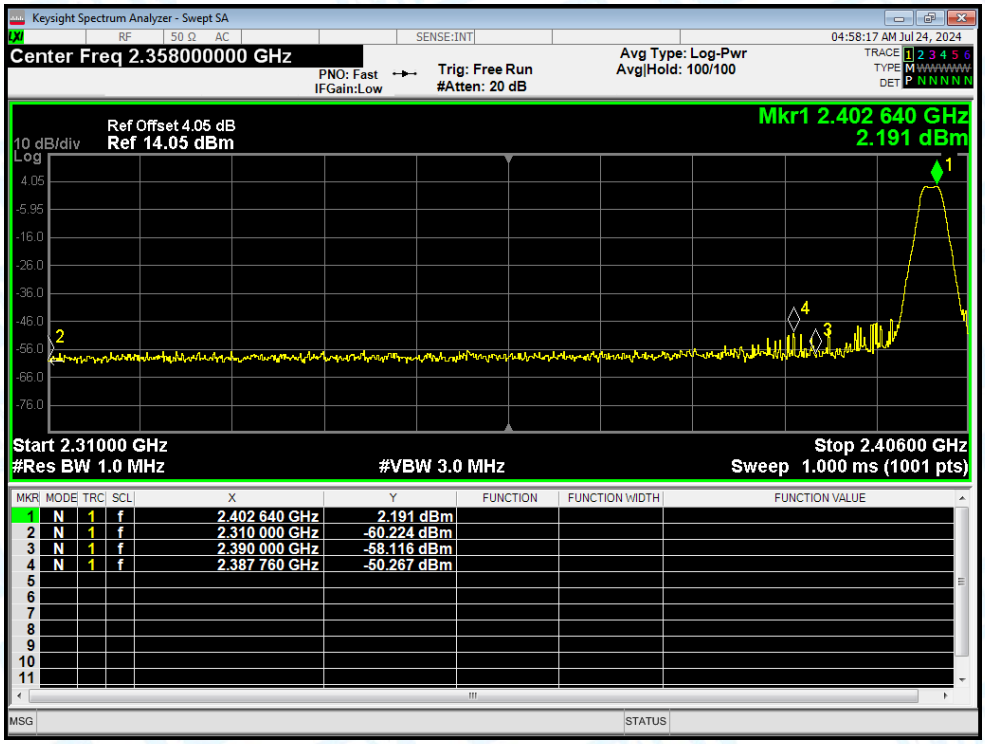
Restrict Band NVNT BLE 1Mbps 2480MHz Ant1 Peak



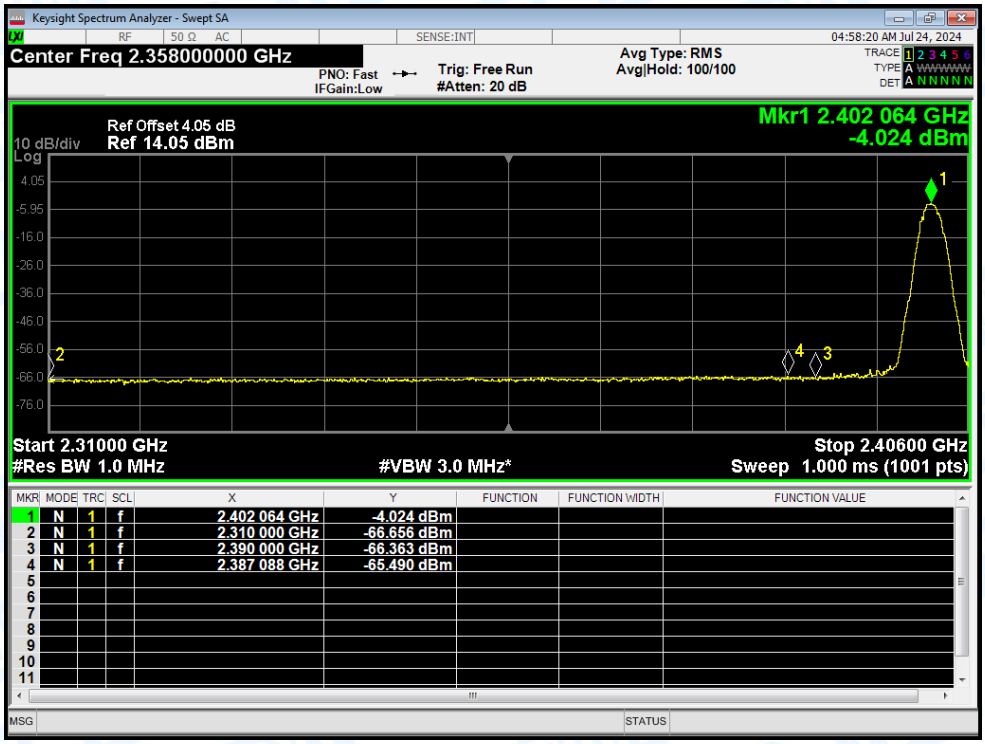
Restrict Band NVNT BLE 1Mbps 2480MHz Ant1 Average



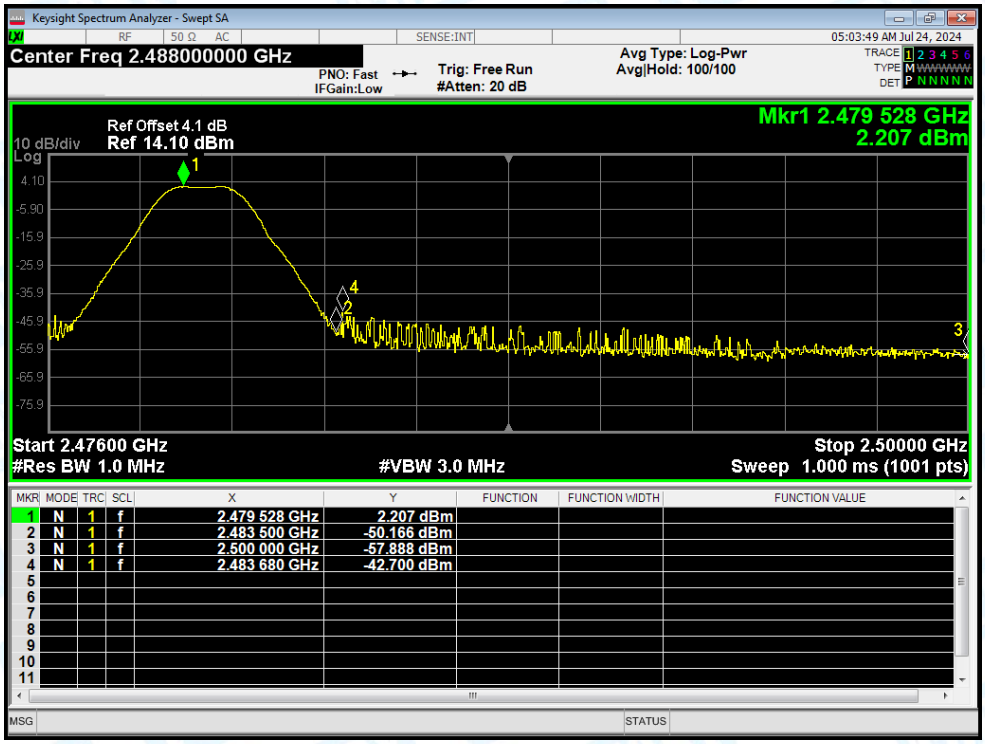
Restrict Band NVNT BLE 2Mbps 2402MHz Ant1 Peak



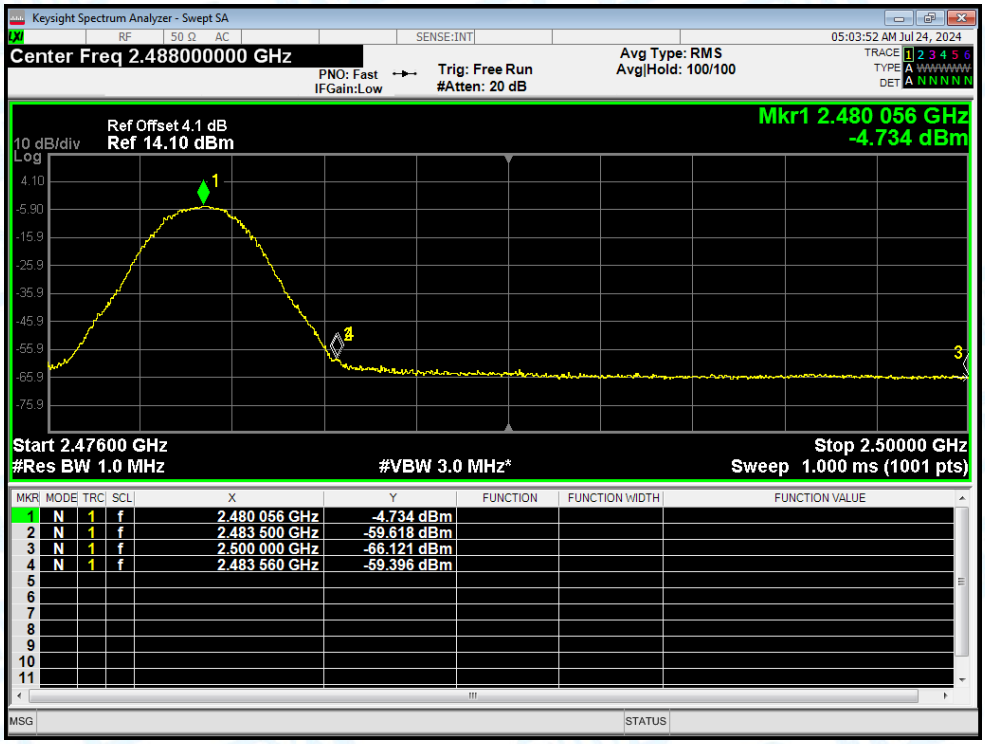
Restrict Band NVNT BLE 2Mbps 2402MHz Ant1 Average



Restrict Band NVNT BLE 2Mbps 2480MHz Ant1 Peak



Restrict Band NVNT BLE 2Mbps 2480MHz Ant1 Average



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