

RF Test Data for Bluetooth (Conducted Measurements)

General Description of EUT	
Product Name:	TRUE WIRELESS EARBUDS
Test Model:	S3
Sample ID:	HC-C-202405-0068-01-01
Environmental Conditions	
Temperature:	24℃
Relative Humidity:	46%
Test Voltage:	DC 3.7V
Test Engineer:	Mike Yan
Note: For a more detailed features description, please refer to the report TBR-C-202405-0068-4 The report only show the worst case data.	

Contents

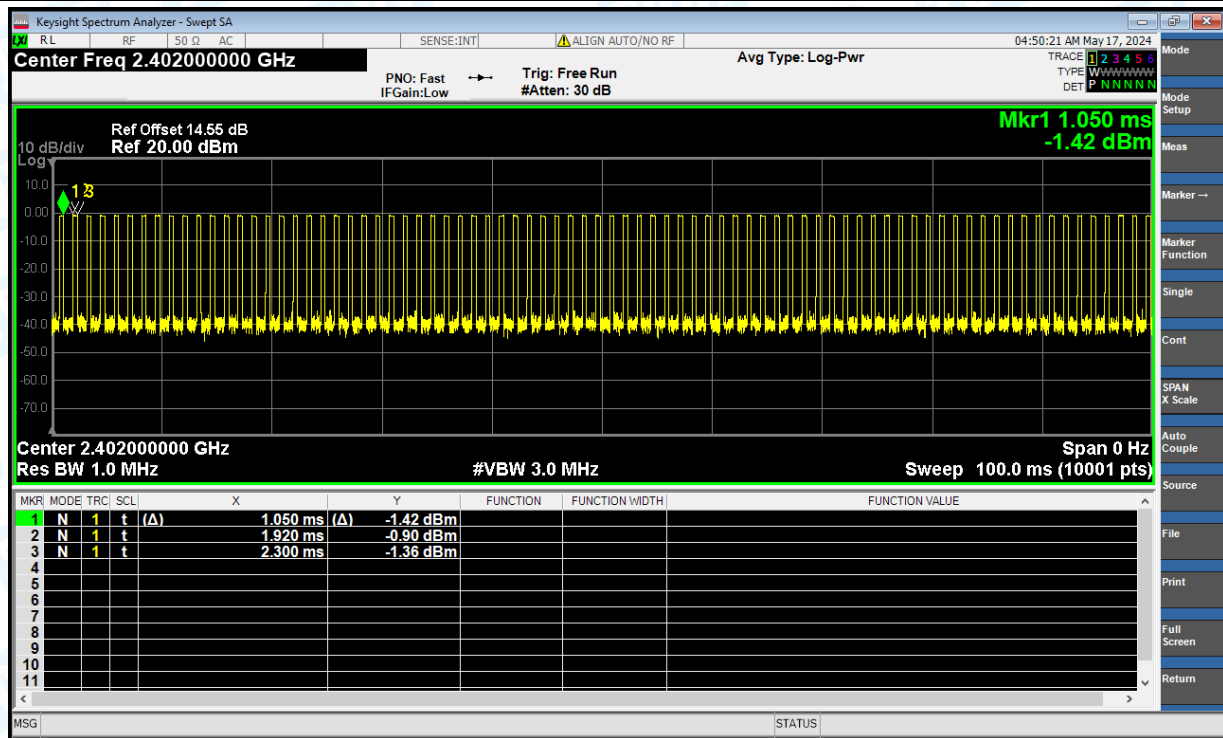
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1. Duty Cycle

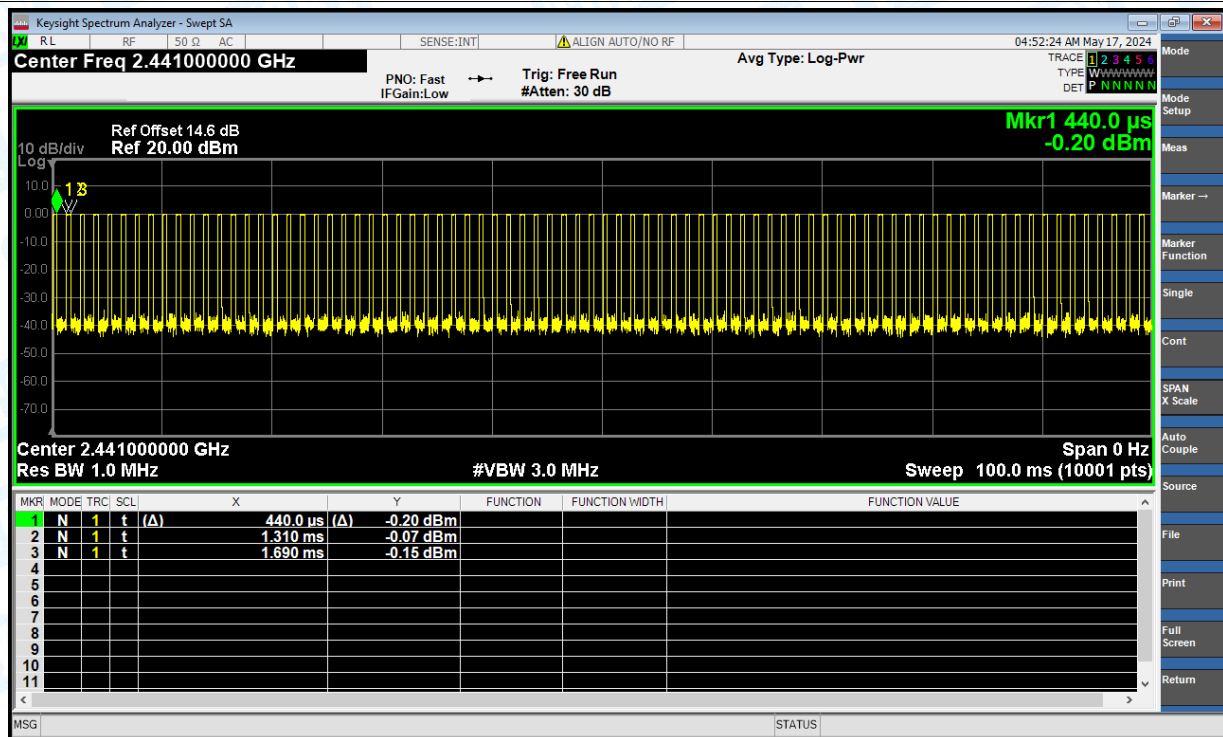
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	1-DH1	2402	Ant1	30.4	5.17	2.63
NVNT	1-DH1	2441	Ant1	30.4	5.17	2.63
NVNT	1-DH1	2480	Ant1	30.4	5.17	2.63
NVNT	2-DH1	2402	Ant1	32	4.95	2.5
NVNT	2-DH1	2441	Ant1	31.2	5.06	2.56
NVNT	2-DH1	2480	Ant1	31.2	5.06	2.56

Test Graphs

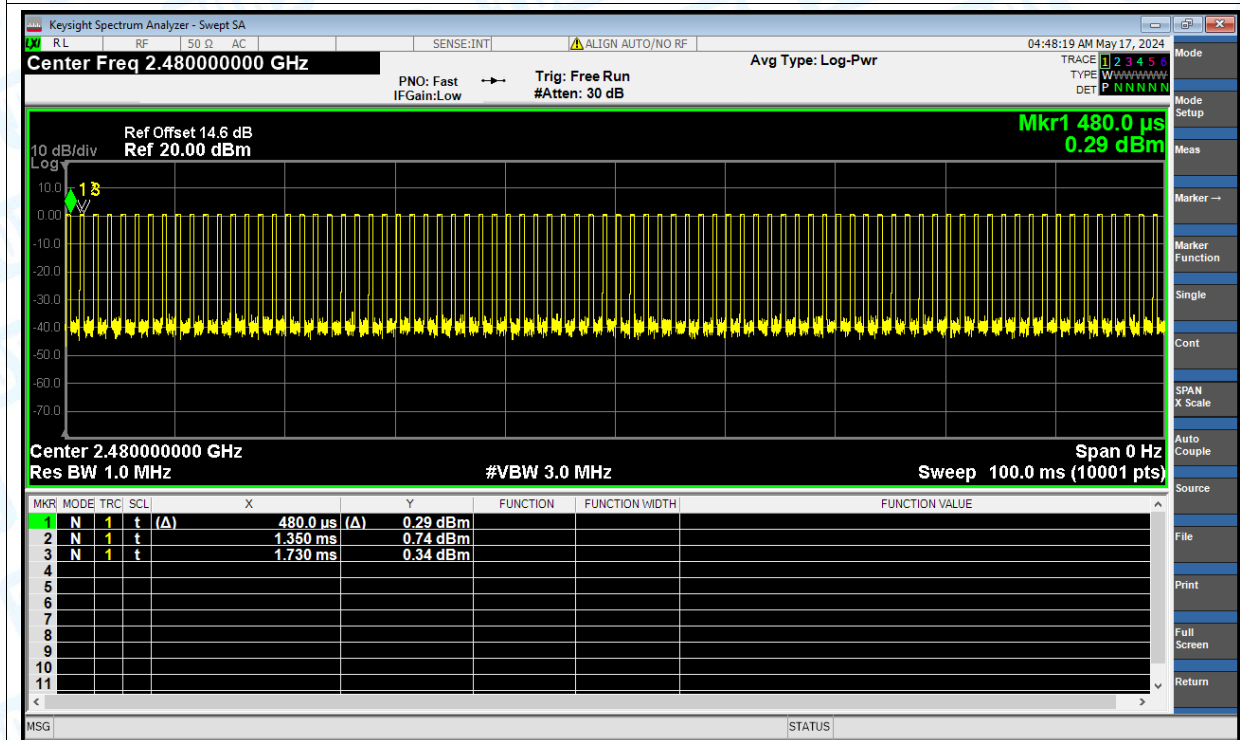
Duty Cycle NVNT 1-DH1 2402MHz Ant1



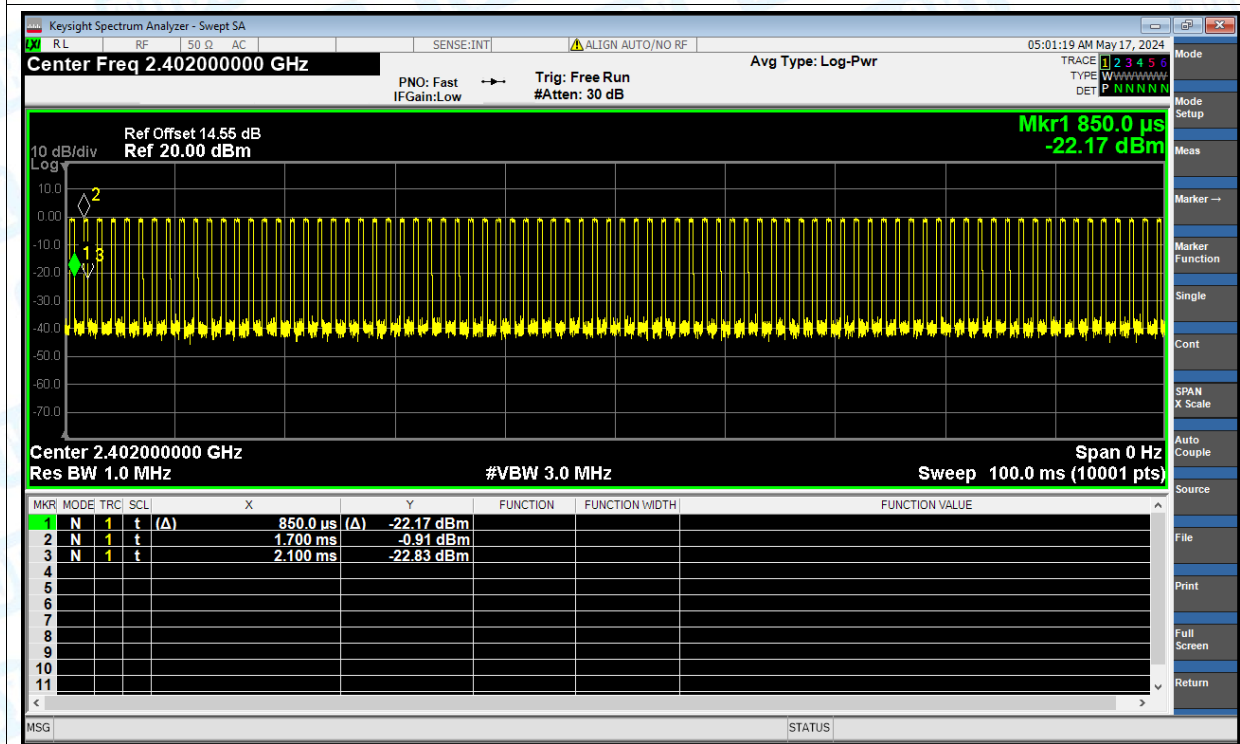
Duty Cycle NVNT 1-DH1 2441MHz Ant1



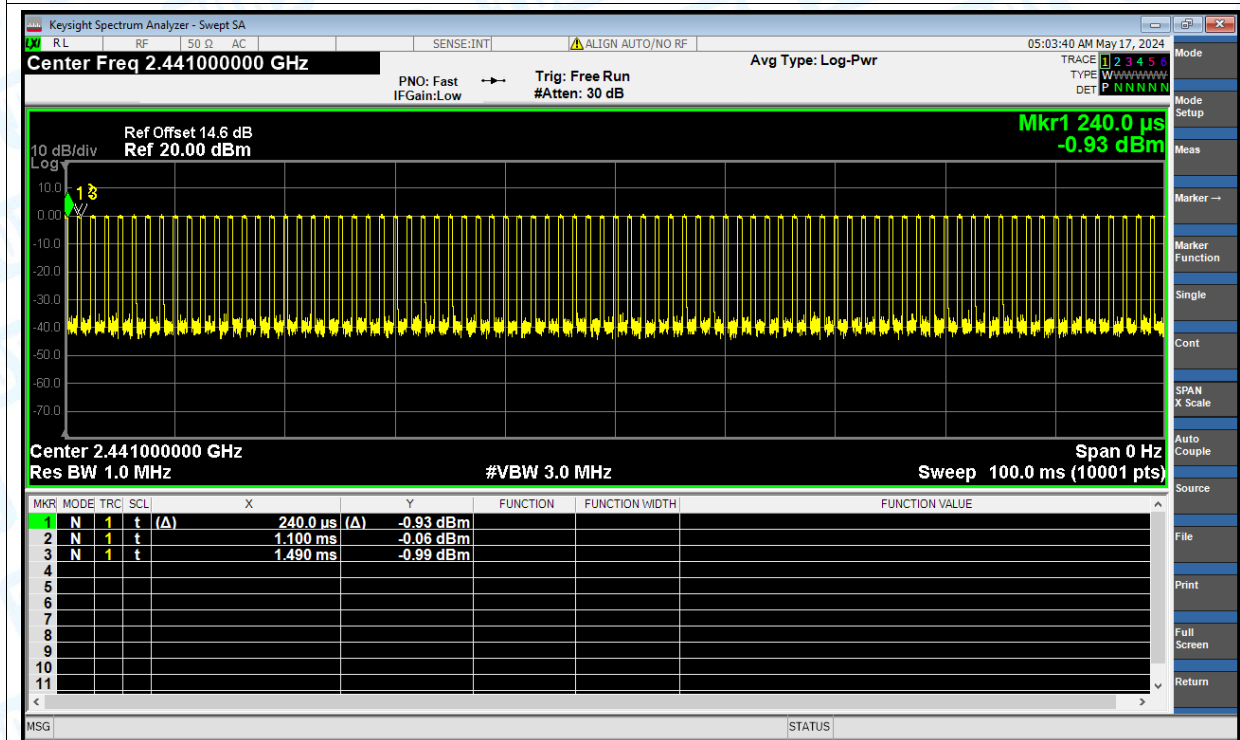
Duty Cycle NVNT 1-DH1 2480MHz Ant1



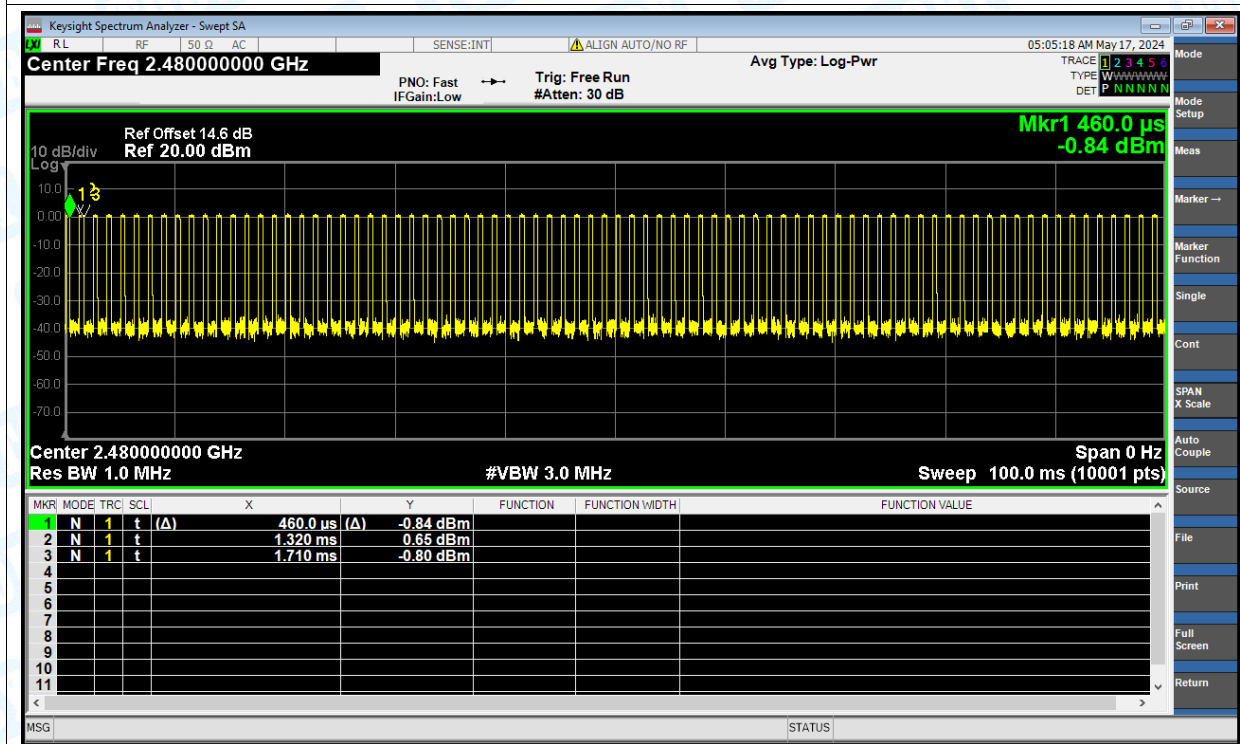
Duty Cycle NVNT 2-DH1 2402MHz Ant1



Duty Cycle NVNT 2-DH1 2441MHz Ant1



Duty Cycle NVNT 2-DH1 2480MHz Ant1

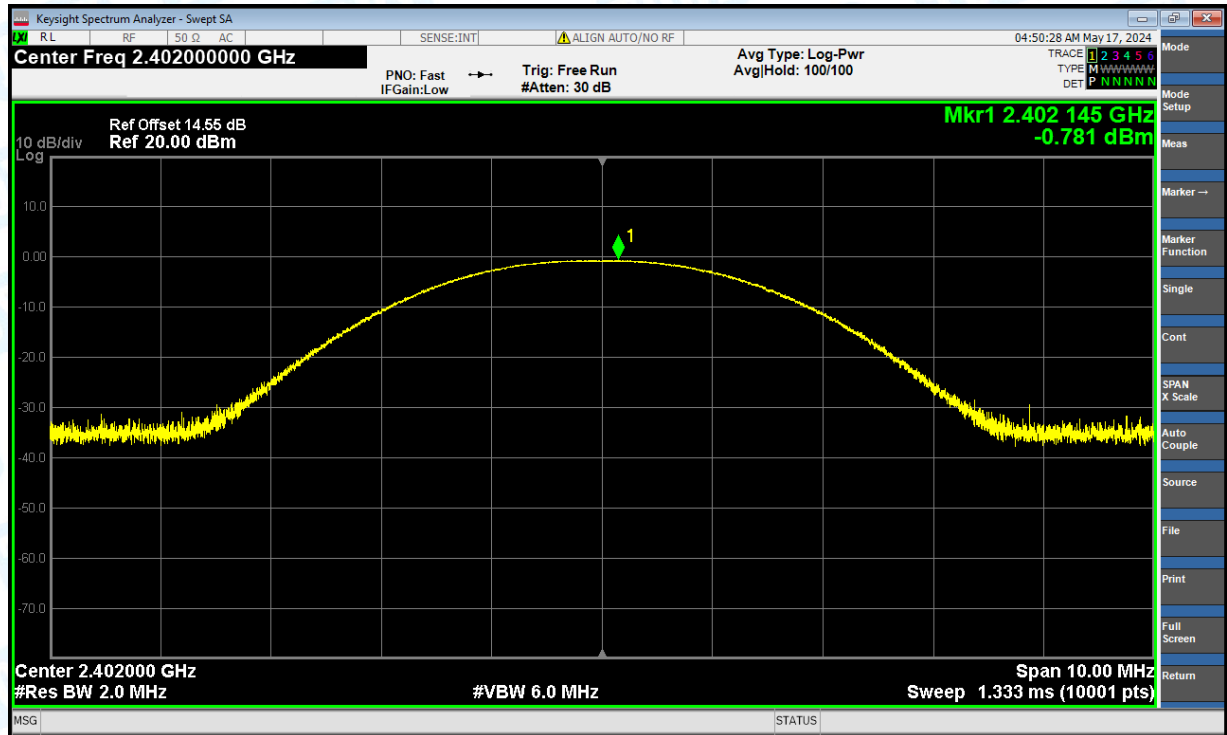


2. Maximum Conducted Output Power

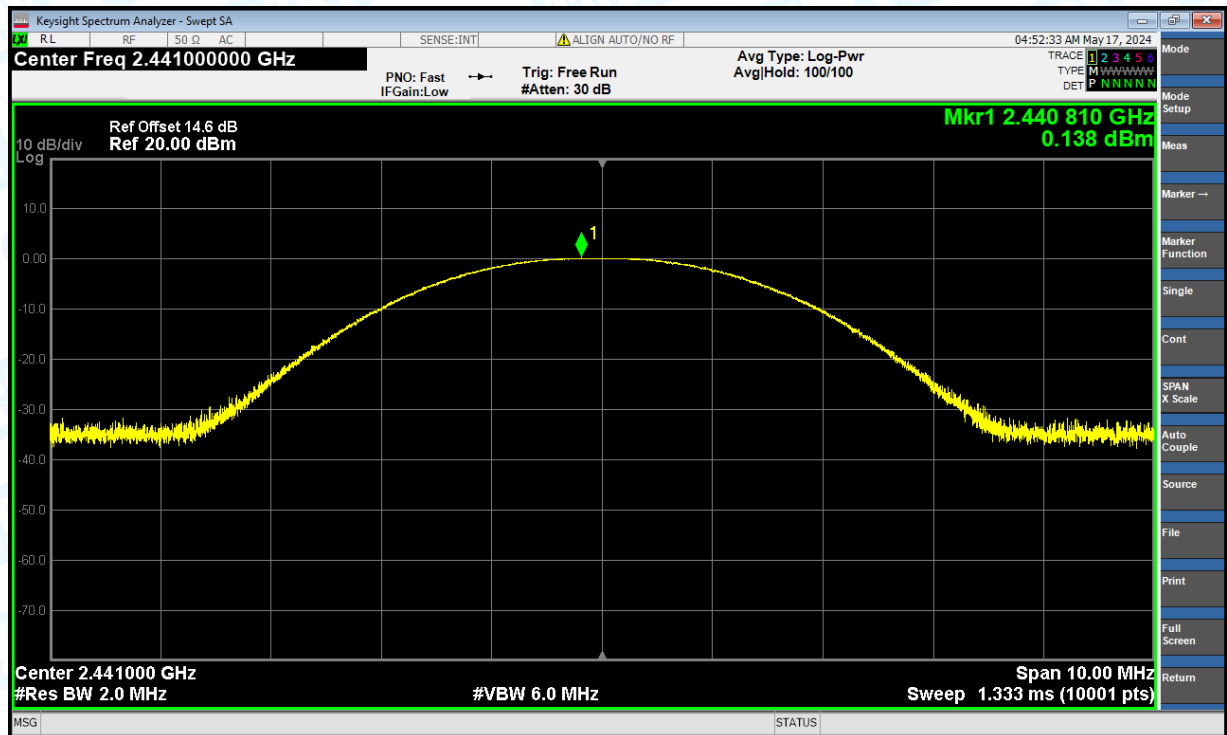
Condition	Mode	Frequency (MHz)	Antenna	Total Power (dBm)	Limit (dBm)	Verdict
NVNT	1-DH1	2402	Ant1	-0.781	21	Pass
NVNT	1-DH1	2441	Ant1	0.138	21	Pass
NVNT	1-DH1	2480	Ant1	0.827	21	Pass
NVNT	1-DH3	2441	Ant1	0.016	21	Pass
NVNT	1-DH5	2441	Ant1	-0.04	21	Pass
NVNT	2-DH1	2402	Ant1	0.111	21	Pass
NVNT	2-DH1	2441	Ant1	0.86	21	Pass
NVNT	2-DH1	2480	Ant1	1.593	21	Pass
NVNT	2-DH3	2441	Ant1	-0.016	21	Pass
NVNT	2-DH5	2441	Ant1	0.763	21	Pass

Test Graphs

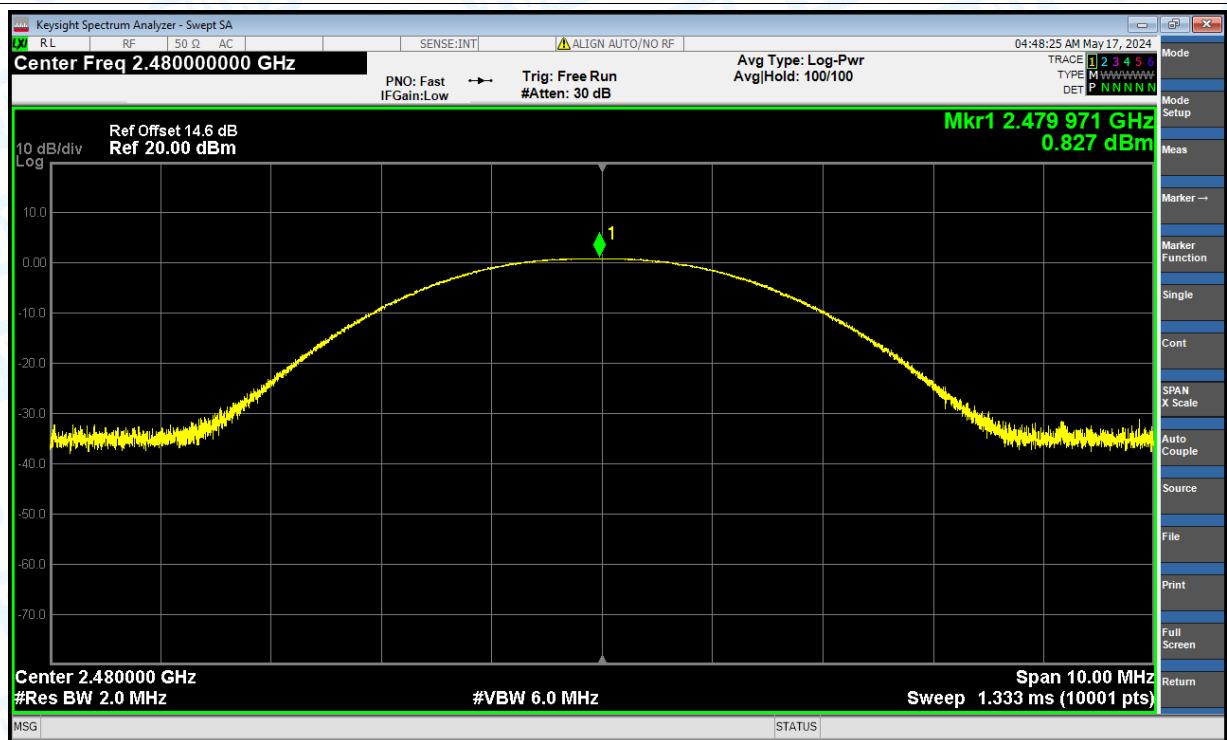
Power NVNT 1-DH1 2402MHz Ant1



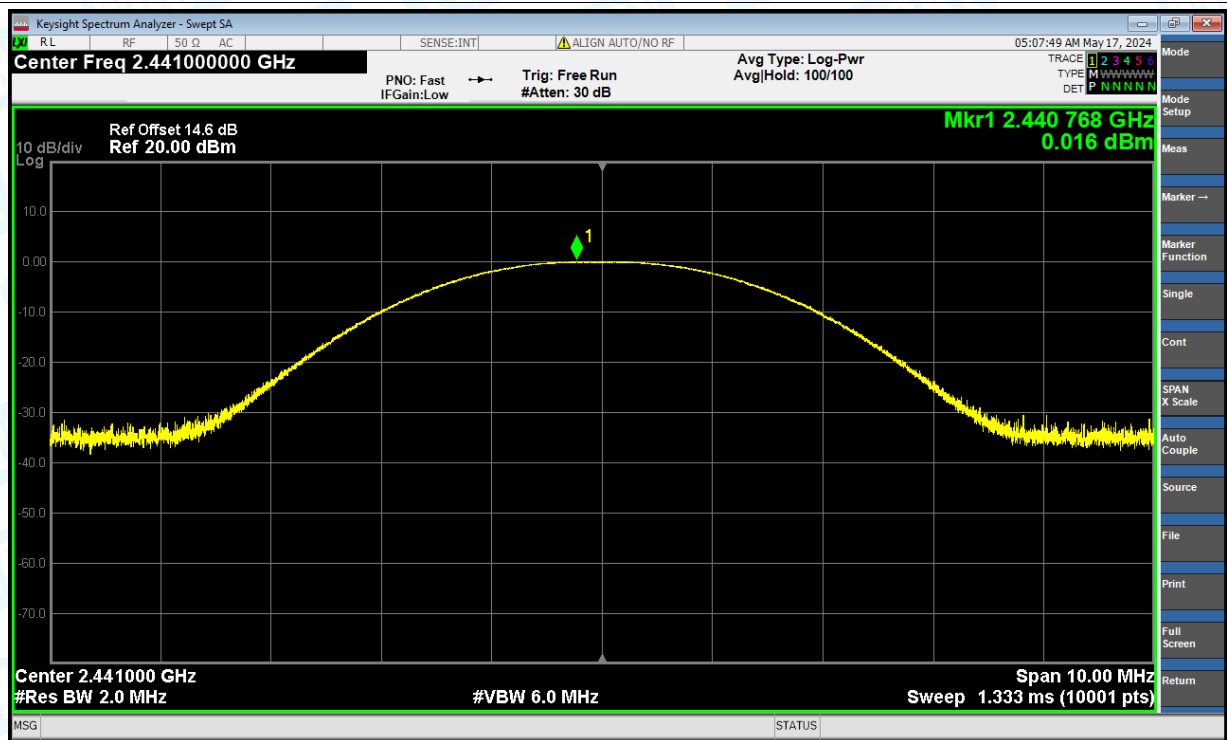
Power NVNT 1-DH1 2441MHz Ant1



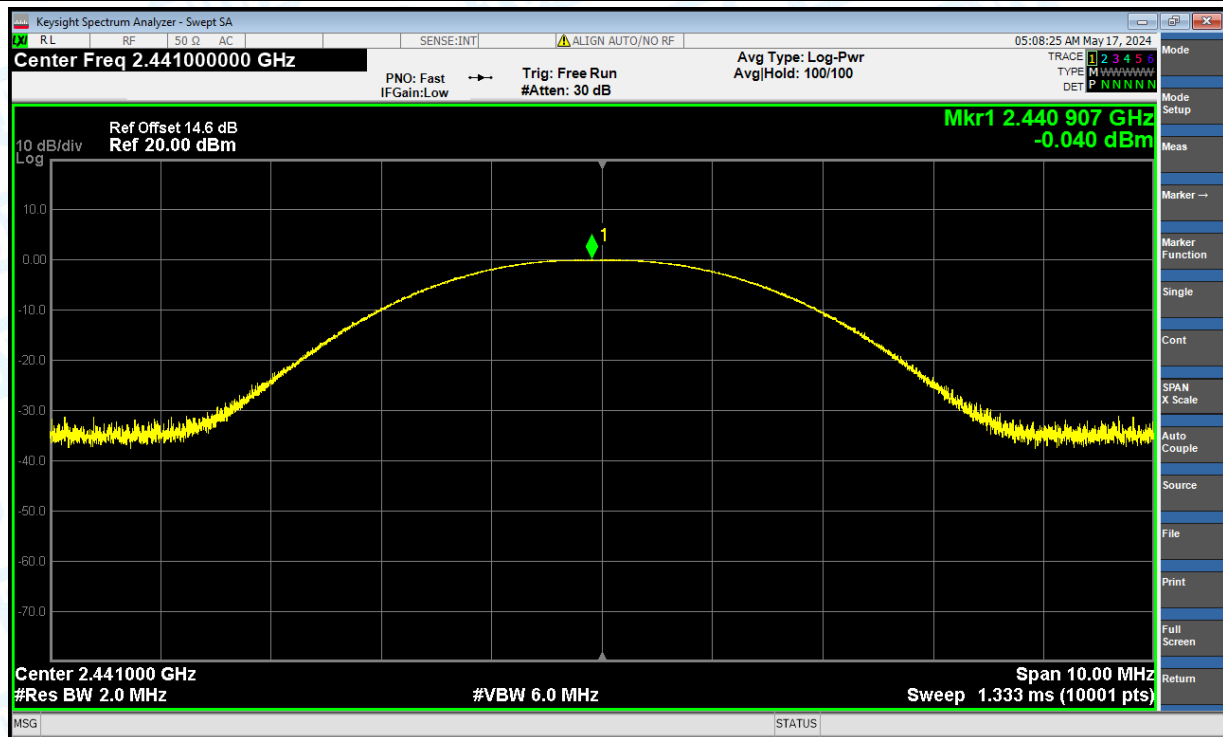
Power NVNT 1-DH1 2480MHz Ant1



Power NVNT 1-DH3 2441MHz Ant1



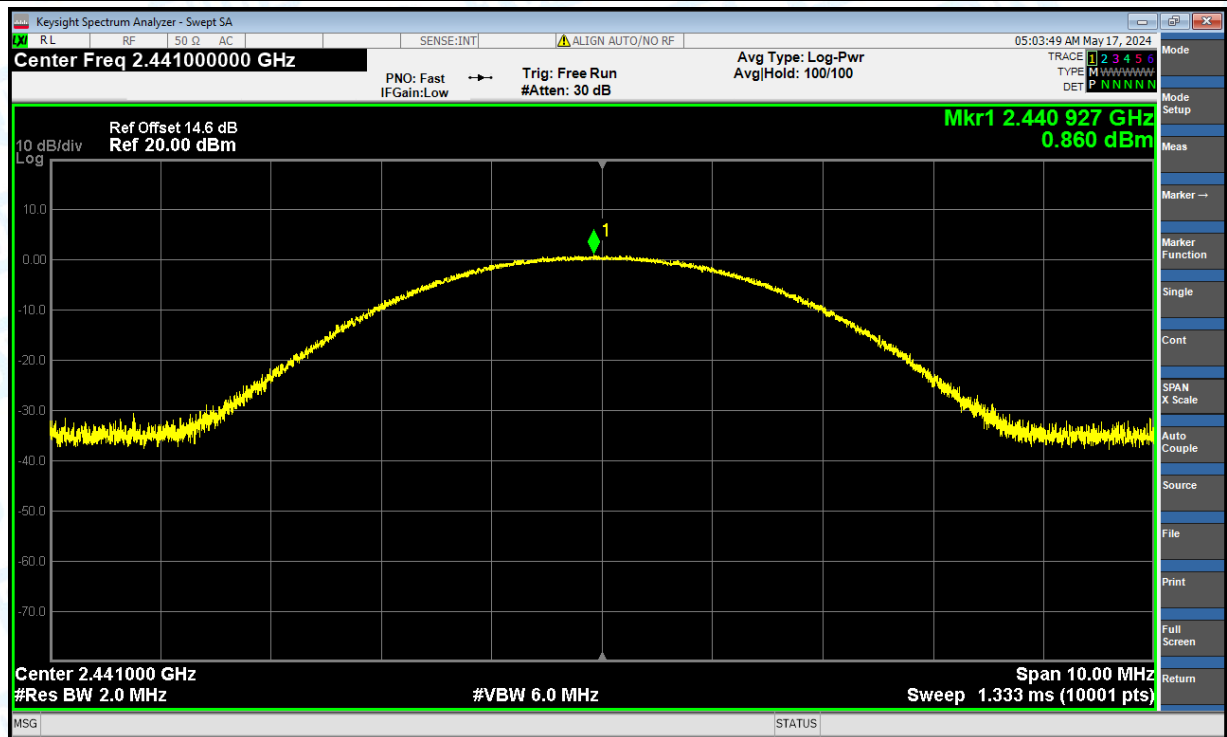
Power NVNT 1-DH5 2441MHz Ant1



Power NVNT 2-DH1 2402MHz Ant1



Power NVNT 2-DH1 2441MHz Ant1



Power NVNT 2-DH1 2480MHz Ant1



Power NVNT 2-DH3 2441MHz Ant1



Power NVNT 2-DH5 2441MHz Ant1

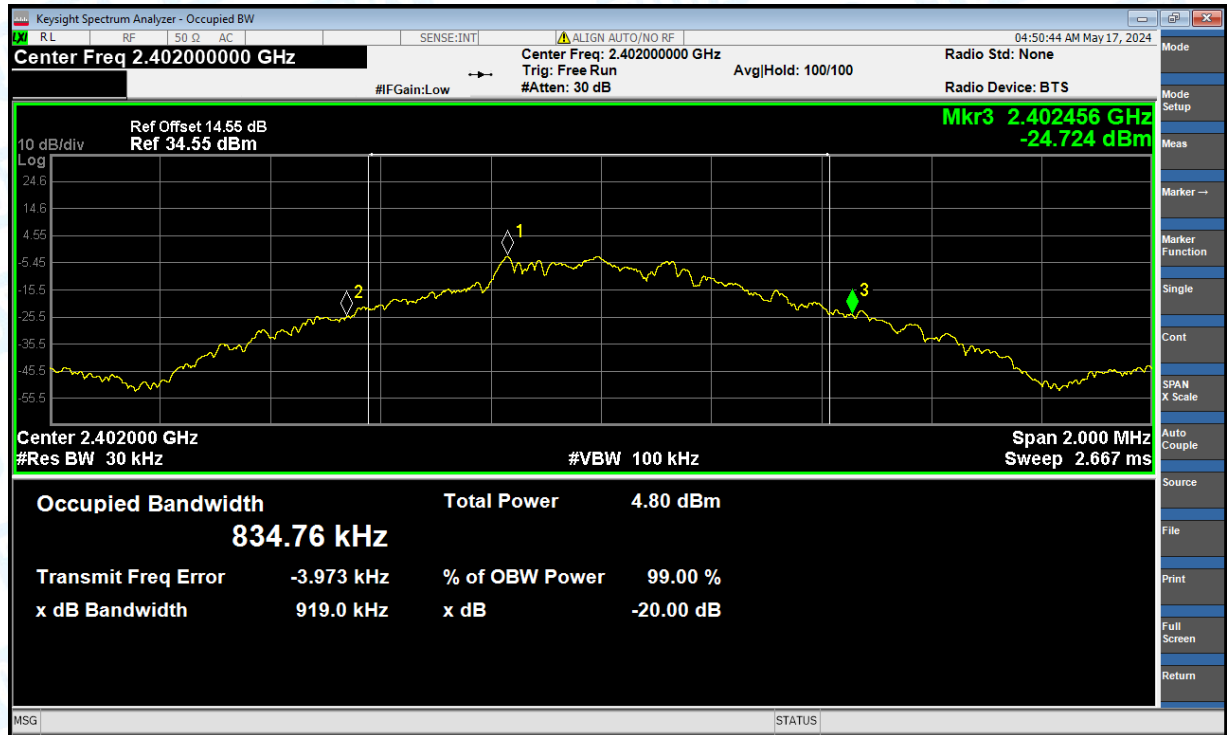


3. -20dB Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	-20 dB Bandwidth (MHz)	Limit -20 dB Bandwidth (MHz)	Verdict
NVNT	1-DH1	2402	Ant1	0.92	0	Pass
NVNT	1-DH1	2441	Ant1	0.87	0	Pass
NVNT	1-DH1	2480	Ant1	0.85	0	Pass
NVNT	2-DH1	2402	Ant1	1.23	0	Pass
NVNT	2-DH1	2441	Ant1	1.24	0	Pass
NVNT	2-DH1	2480	Ant1	1.23	0	Pass

Test Graphs

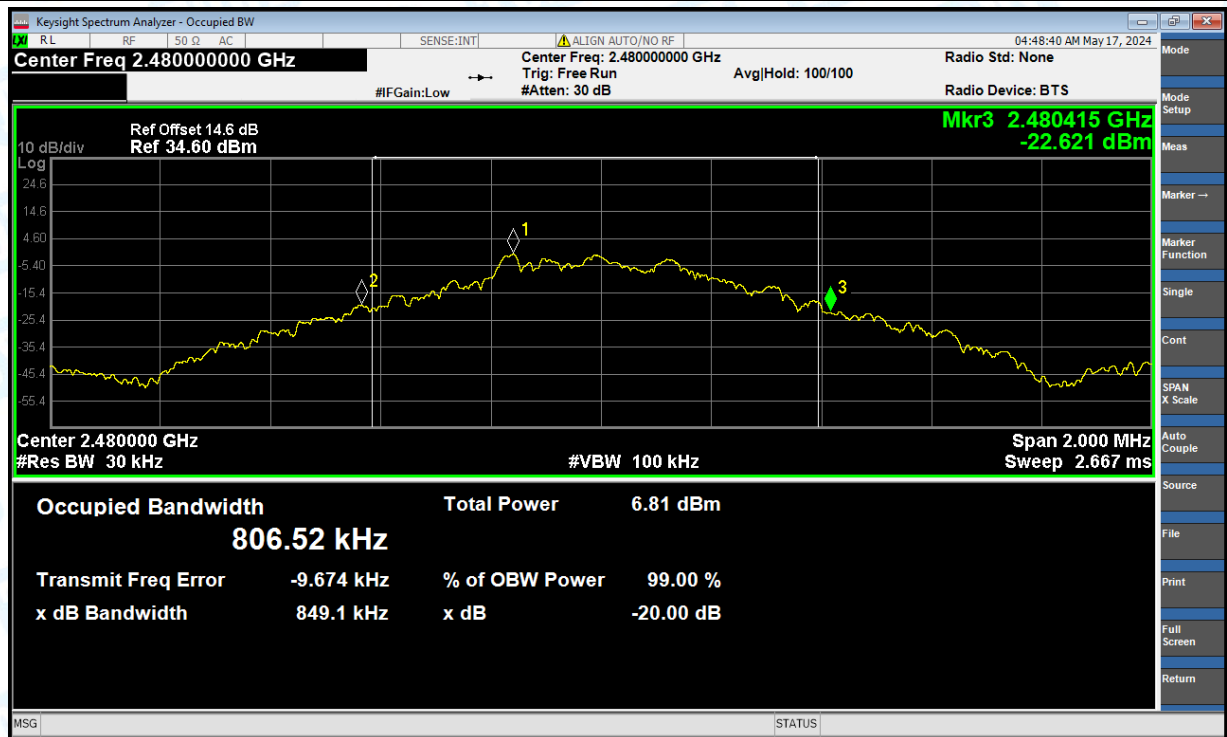
-20dB Bandwidth NVNT 1-DH1 2402MHz Ant1



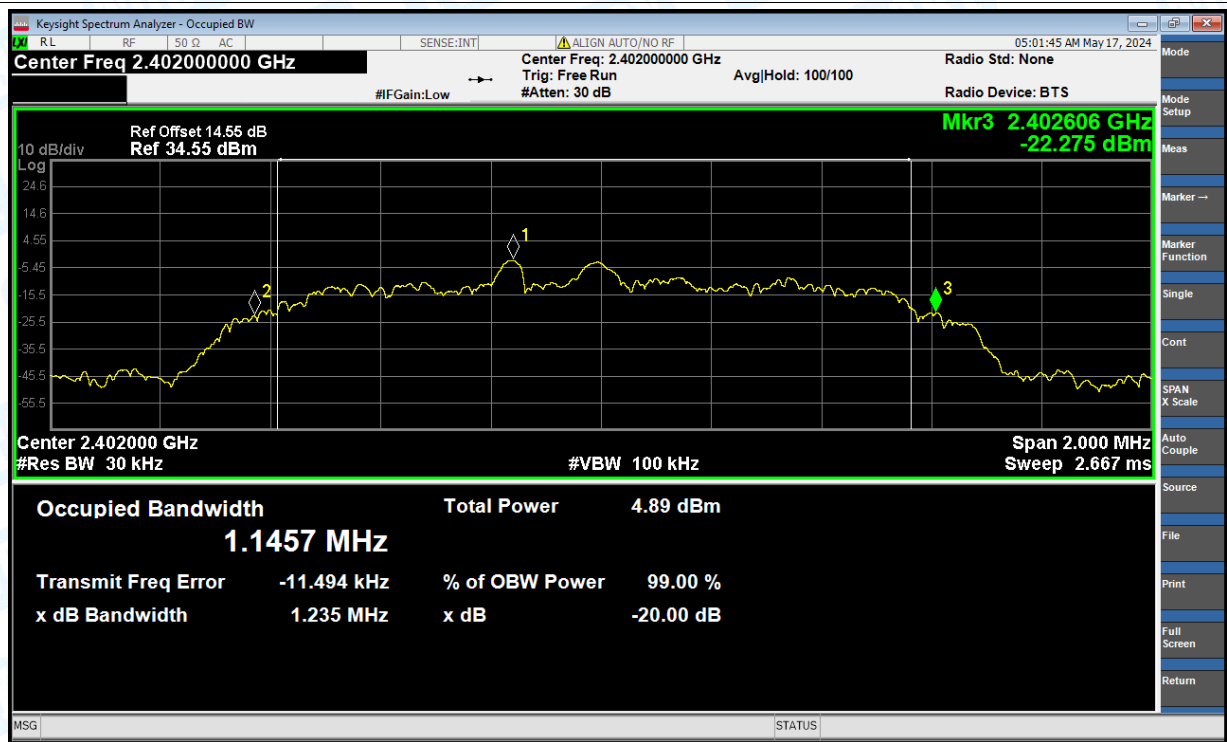
-20dB Bandwidth NVNT 1-DH1 2441MHz Ant1



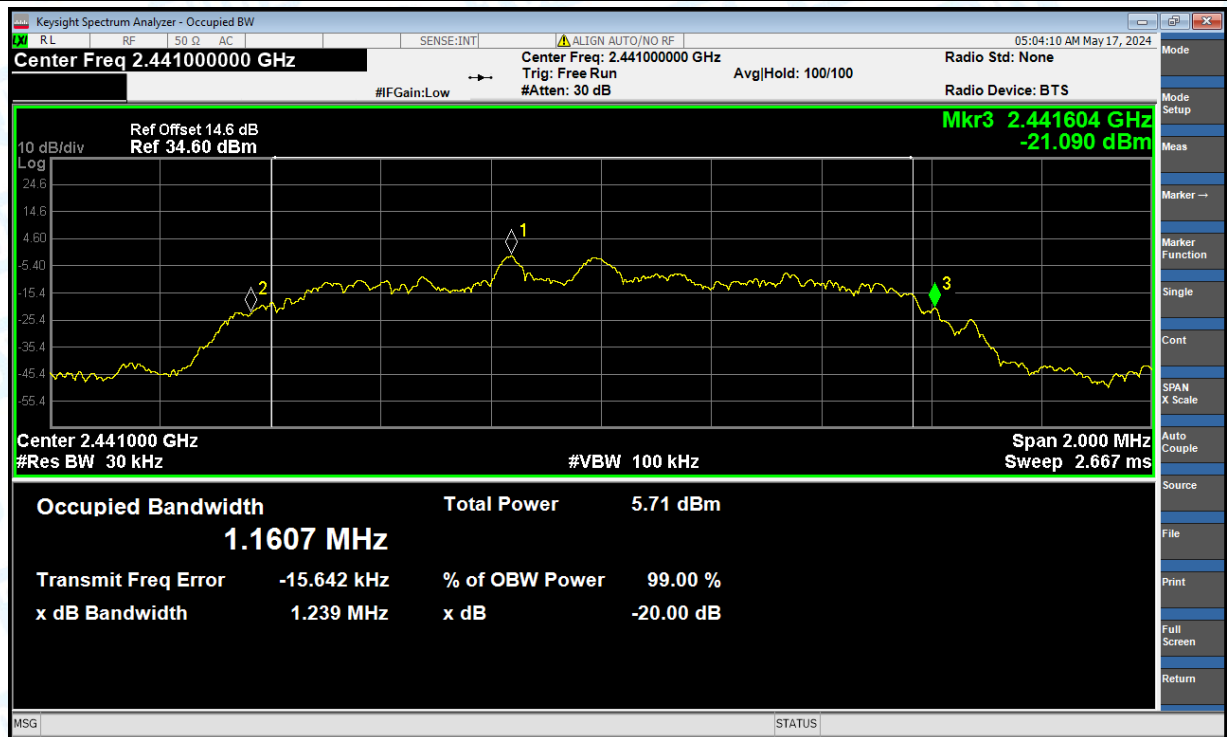
-20dB Bandwidth NVNT 1-DH1 2480MHz Ant1



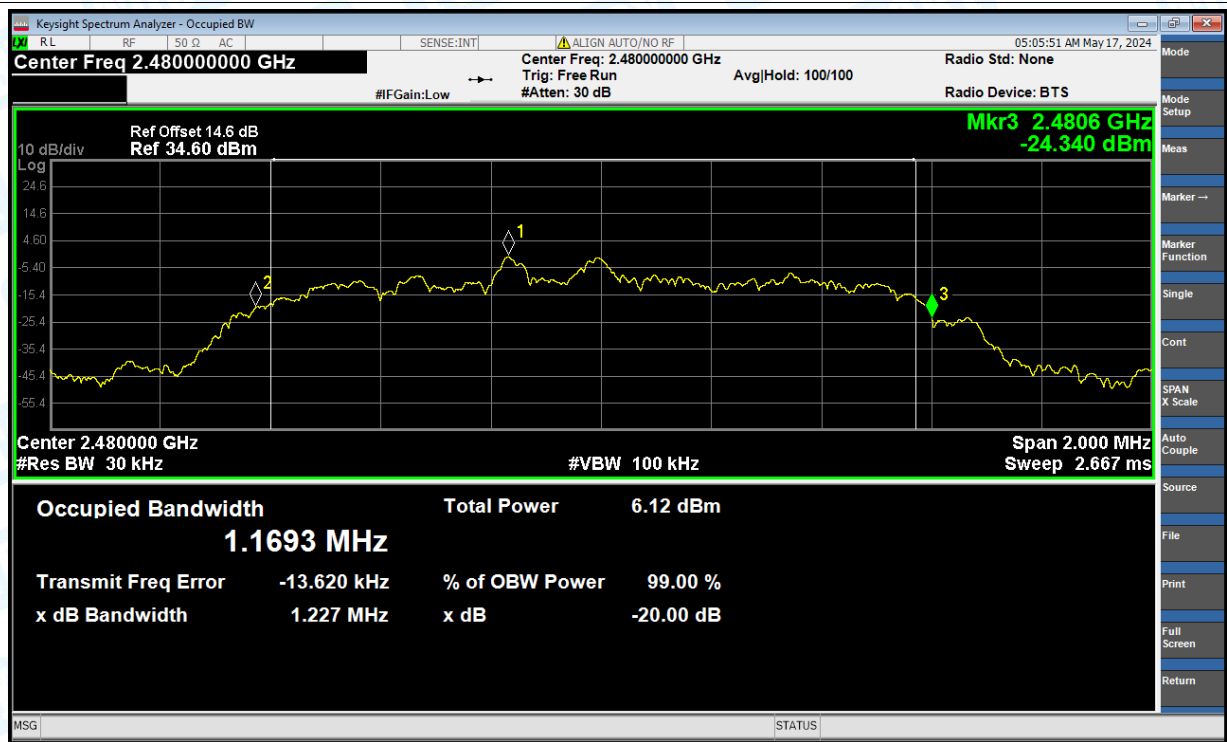
-20dB Bandwidth NVNT 2-DH1 2402MHz Ant1



-20dB Bandwidth NVNT 2-DH1 2441MHz Ant1



-20dB Bandwidth NVNT 2-DH1 2480MHz Ant1

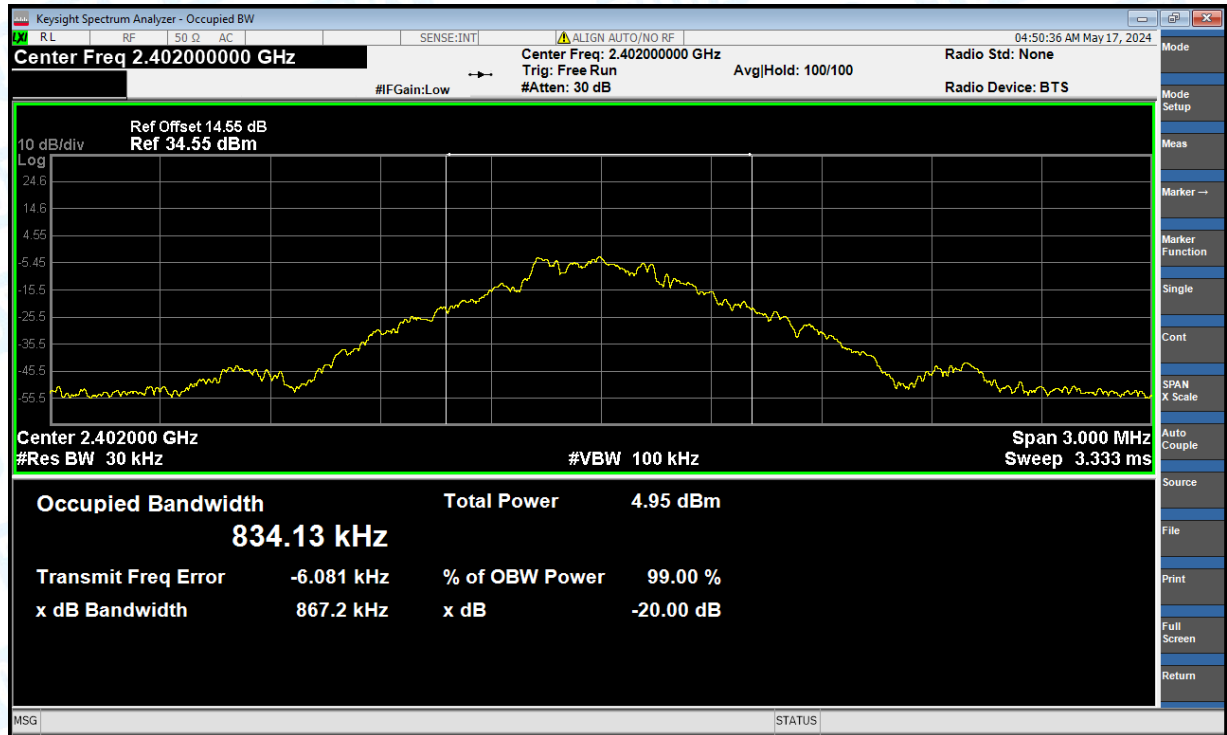


4. Occupied Channel Bandwidth

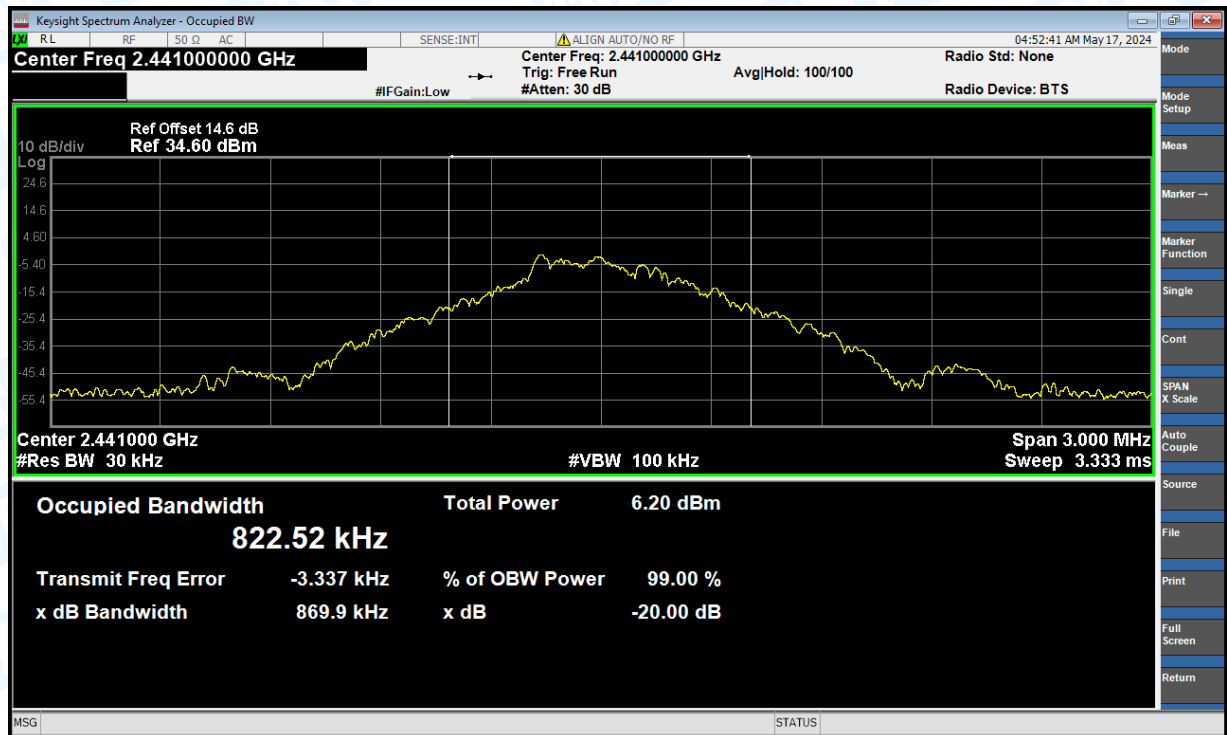
Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	1-DH1	2402	Ant1	0.834
NVNT	1-DH1	2441	Ant1	0.823
NVNT	1-DH1	2480	Ant1	0.814
NVNT	2-DH1	2402	Ant1	1.156
NVNT	2-DH1	2441	Ant1	1.163
NVNT	2-DH1	2480	Ant1	1.167

Test Graphs

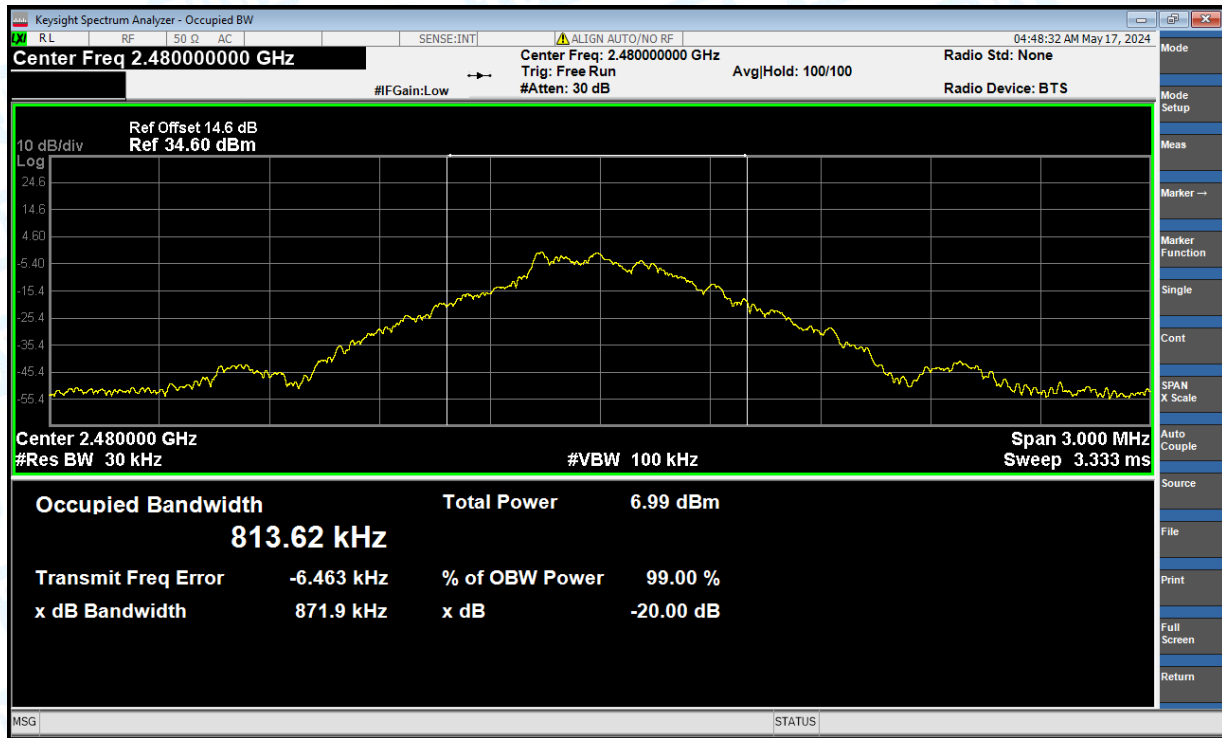
OBW NVNT 1-DH1 2402MHz Ant1



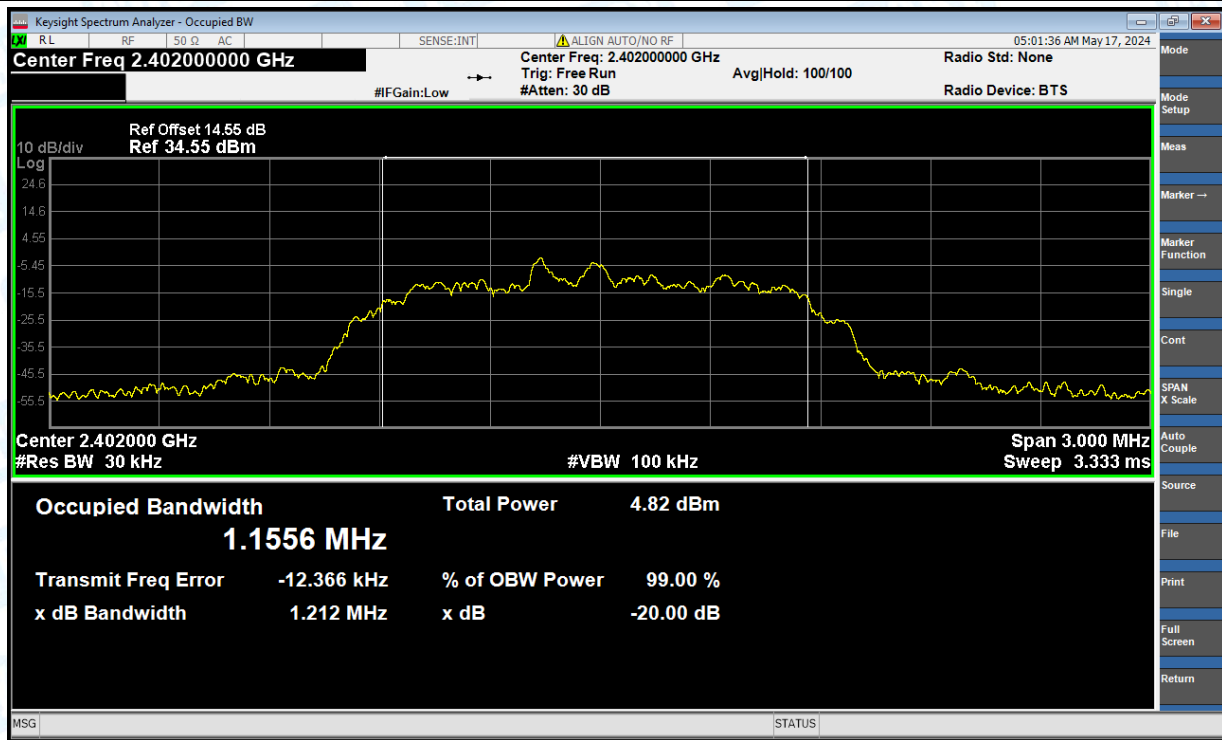
OBW NVNT 1-DH1 2441MHz Ant1



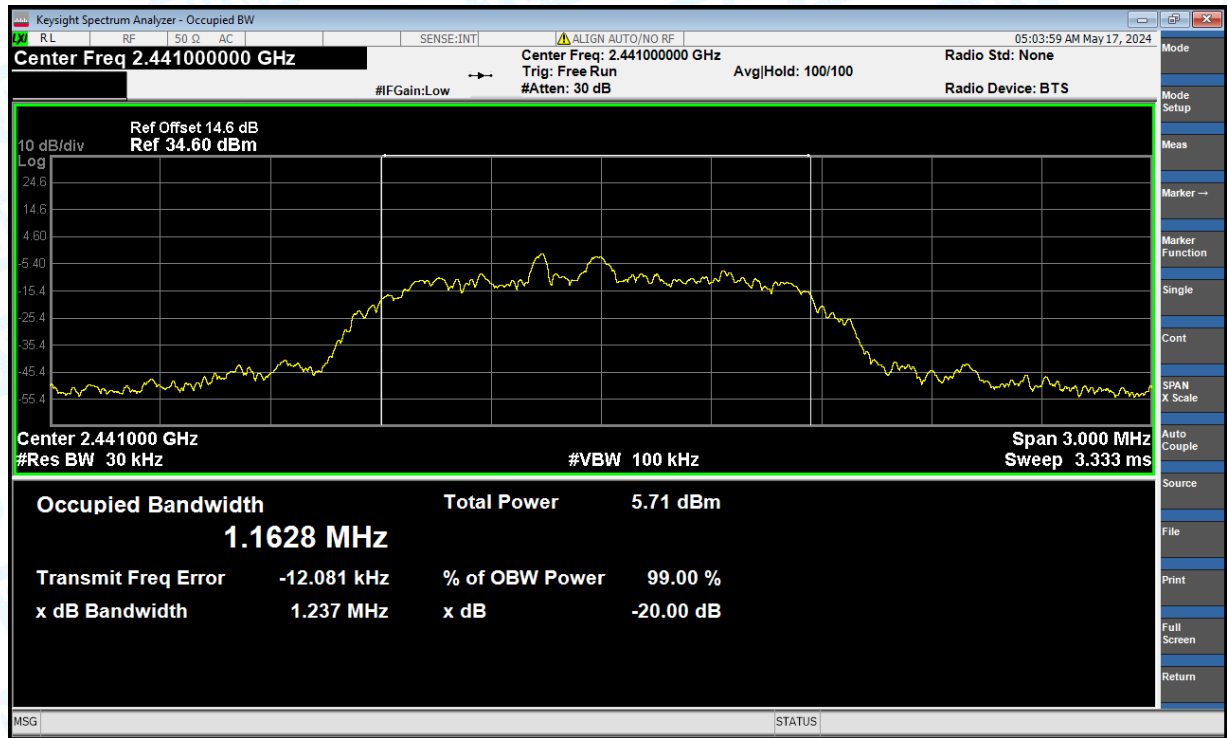
OBW NVNT 1-DH1 2480MHz Ant1



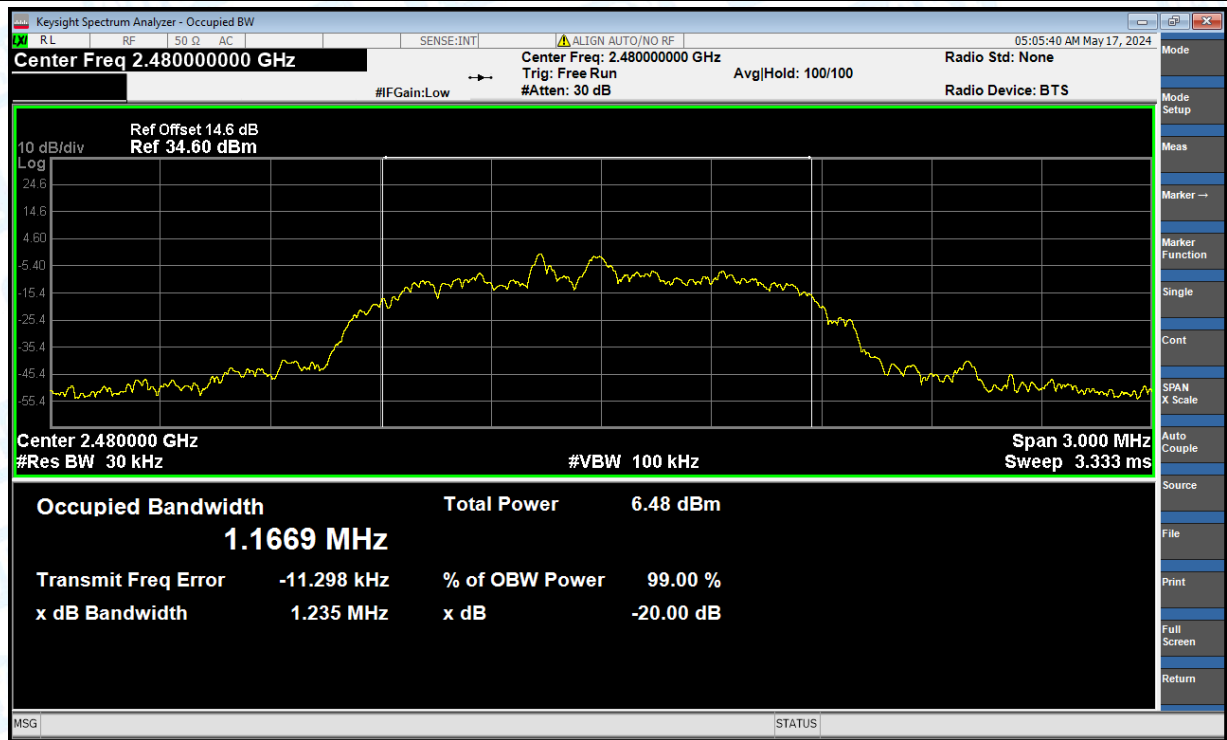
OBW NVNT 2-DH1 2402MHz Ant1



OBW NVNT 2-DH1 2441MHz Ant1



OBW NVNT 2-DH1 2480MHz Ant1

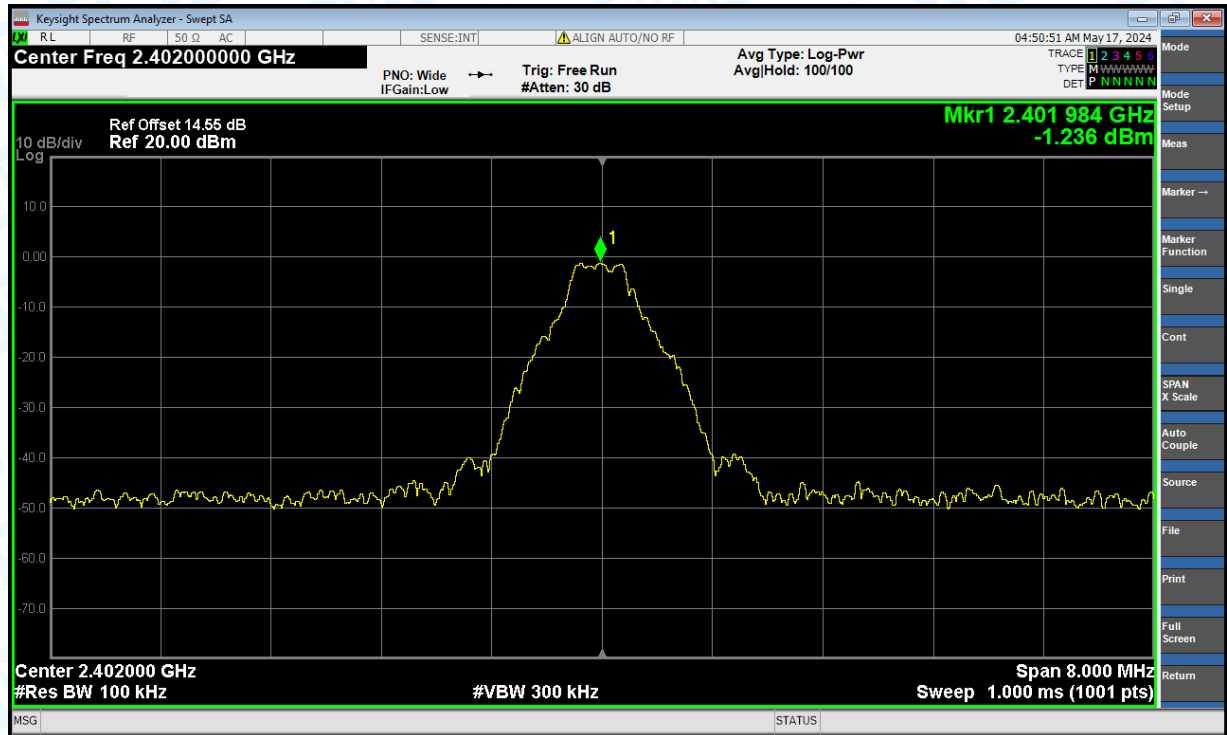


5. Band Edge

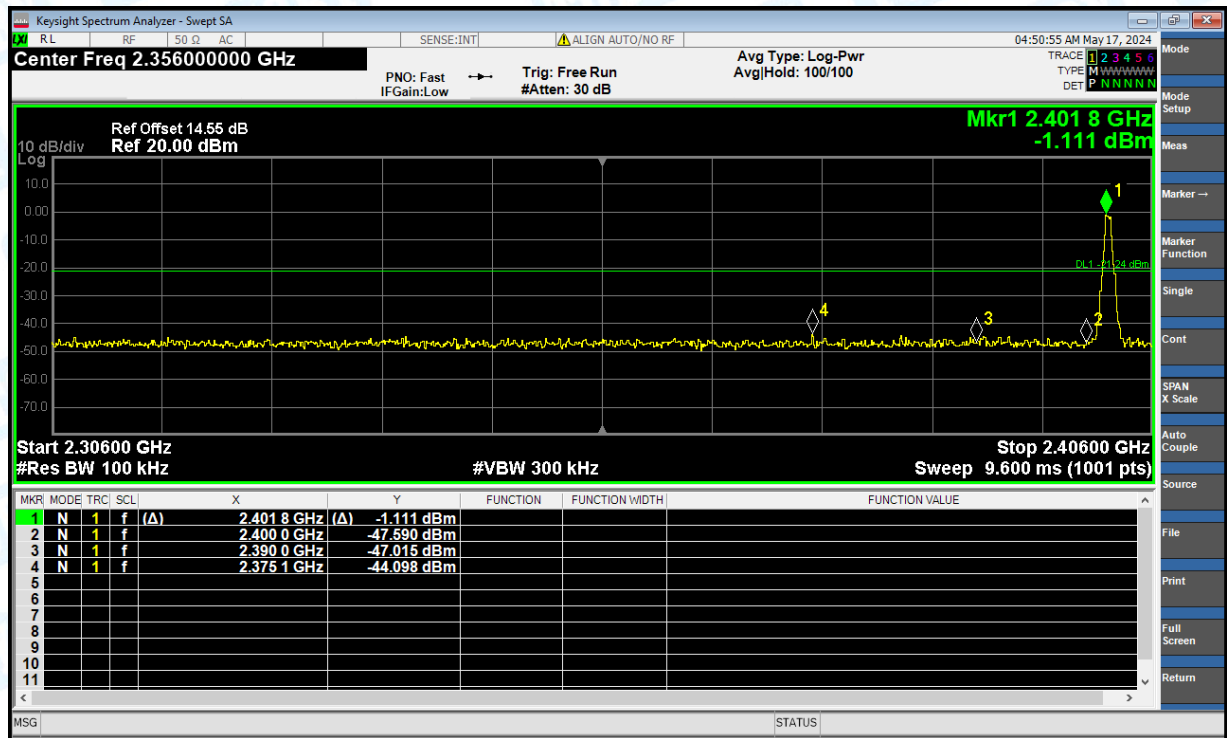
Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH1	2402	Ant1	No-Hopping	-42.86	-20	Pass
NVNT	1-DH1	2480	Ant1	No-Hopping	-44.59	-20	Pass
NVNT	2-DH1	2402	Ant1	No-Hopping	-41.28	-20	Pass
NVNT	2-DH1	2480	Ant1	No-Hopping	-44.86	-20	Pass

Test Graphs

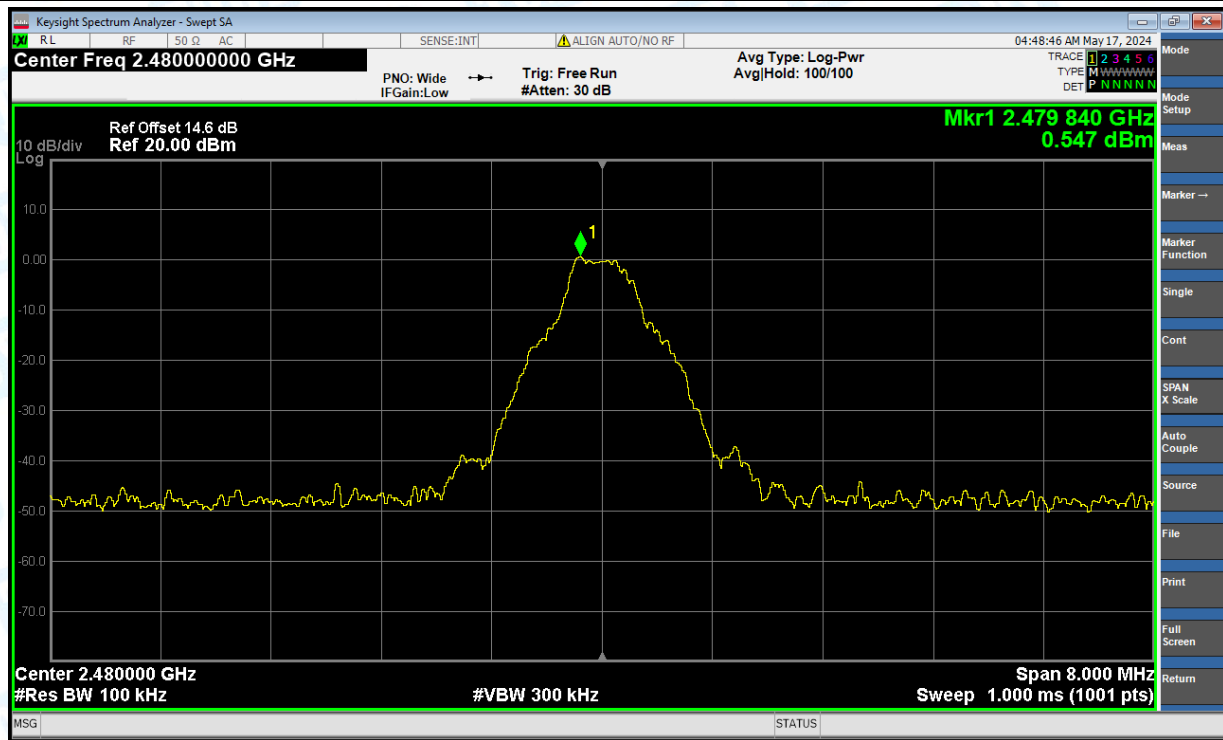
Band Edge NVNT 1-DH1 2402MHz Ant1 No-Hopping Ref



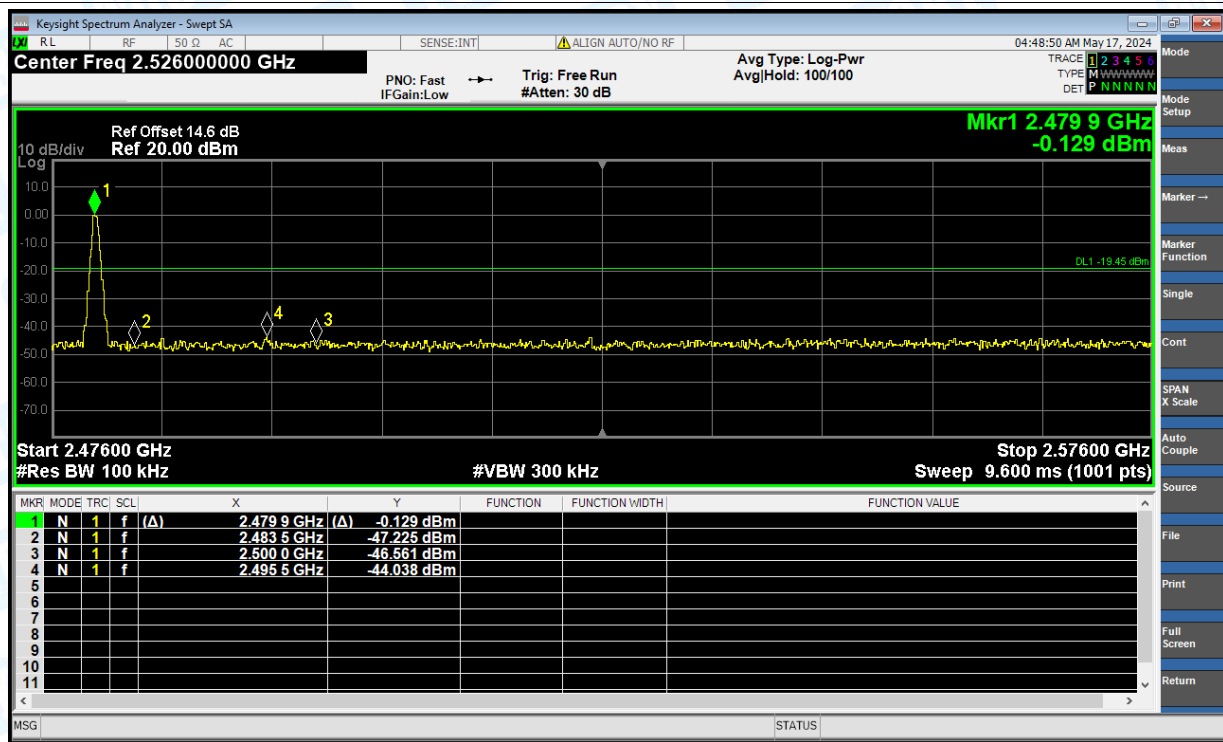
Band Edge NVNT 1-DH1 2402MHz Ant1 No-Hopping Emission



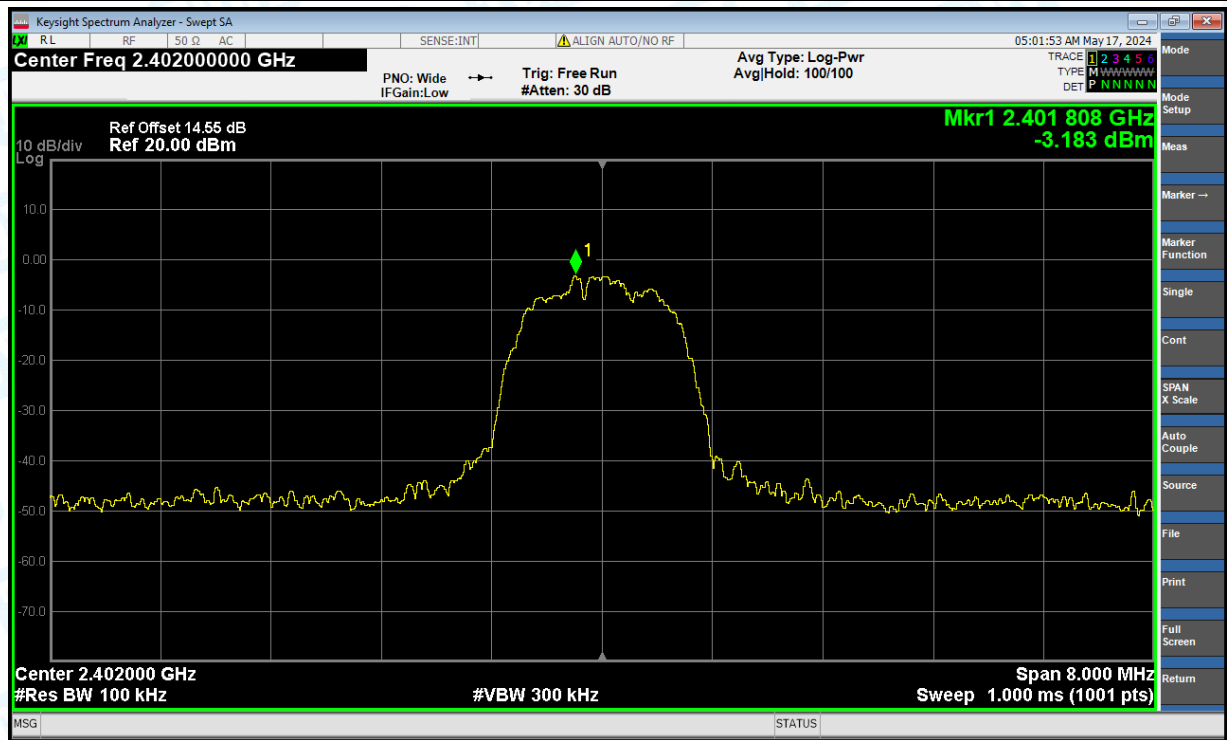
Band Edge NVNT 1-DH1 2480MHz Ant1 No-Hopping Ref



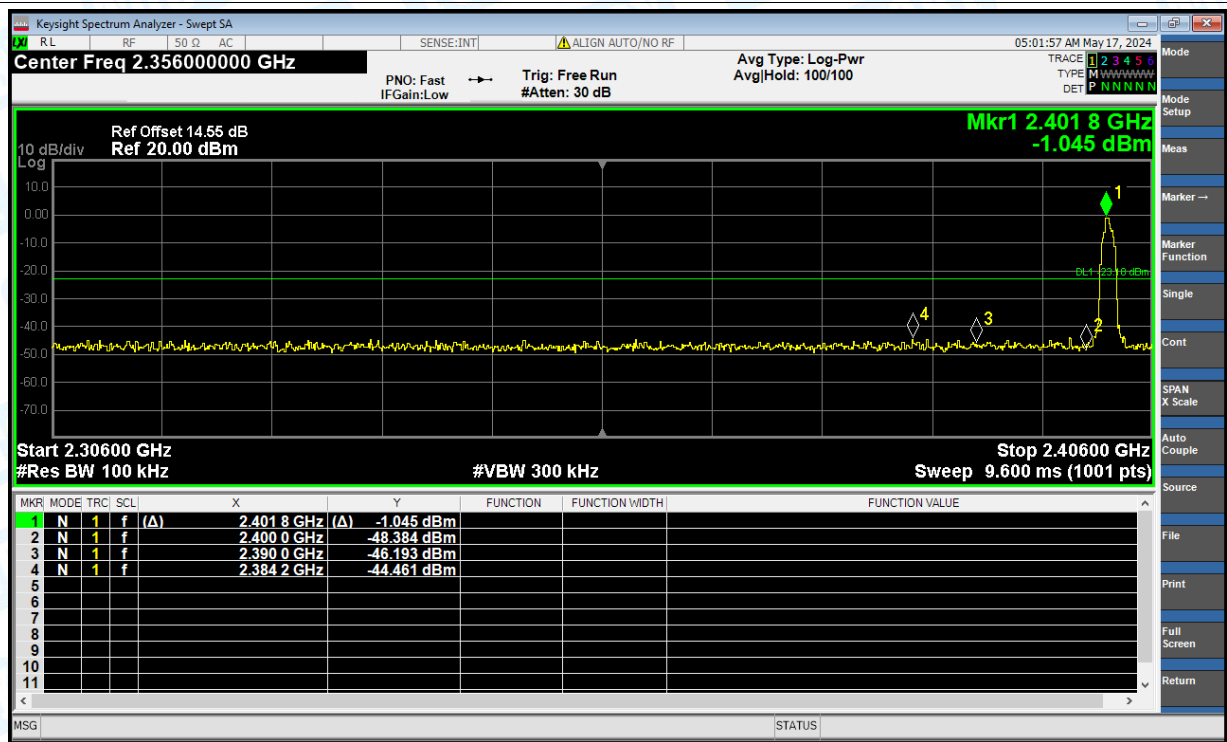
Band Edge NVNT 1-DH1 2480MHz Ant1 No-Hopping Emission



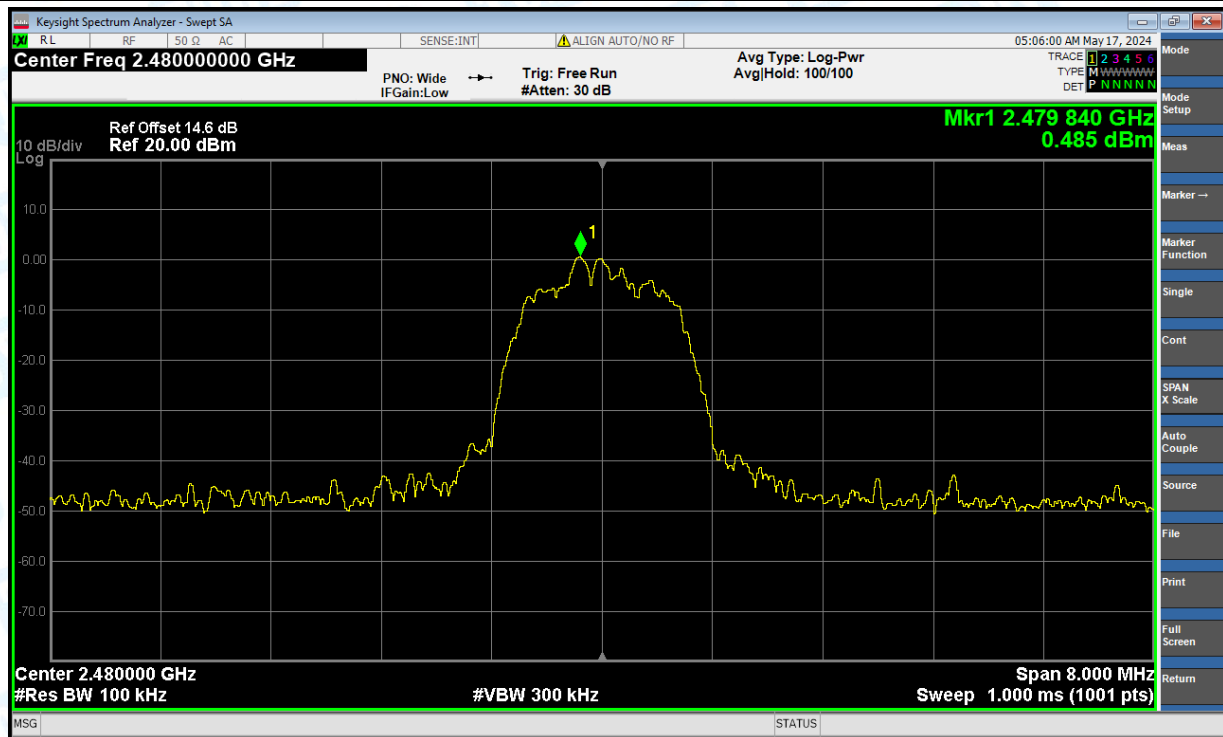
Band Edge NVNT 2-DH1 2402MHz Ant1 No-Hopping Ref



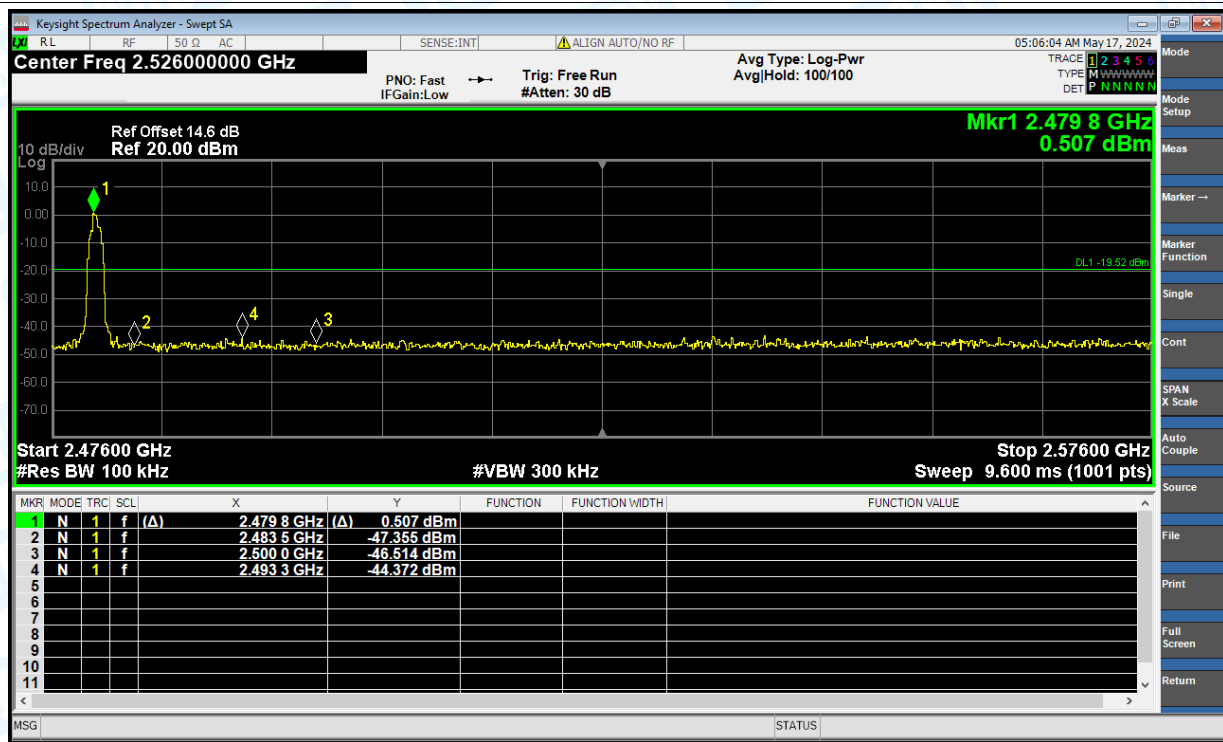
Band Edge NVNT 2-DH1 2402MHz Ant1 No-Hopping Emission



Band Edge NVNT 2-DH1 2480MHz Ant1 No-Hopping Ref



Band Edge NVNT 2-DH1 2480MHz Ant1 No-Hopping Emission

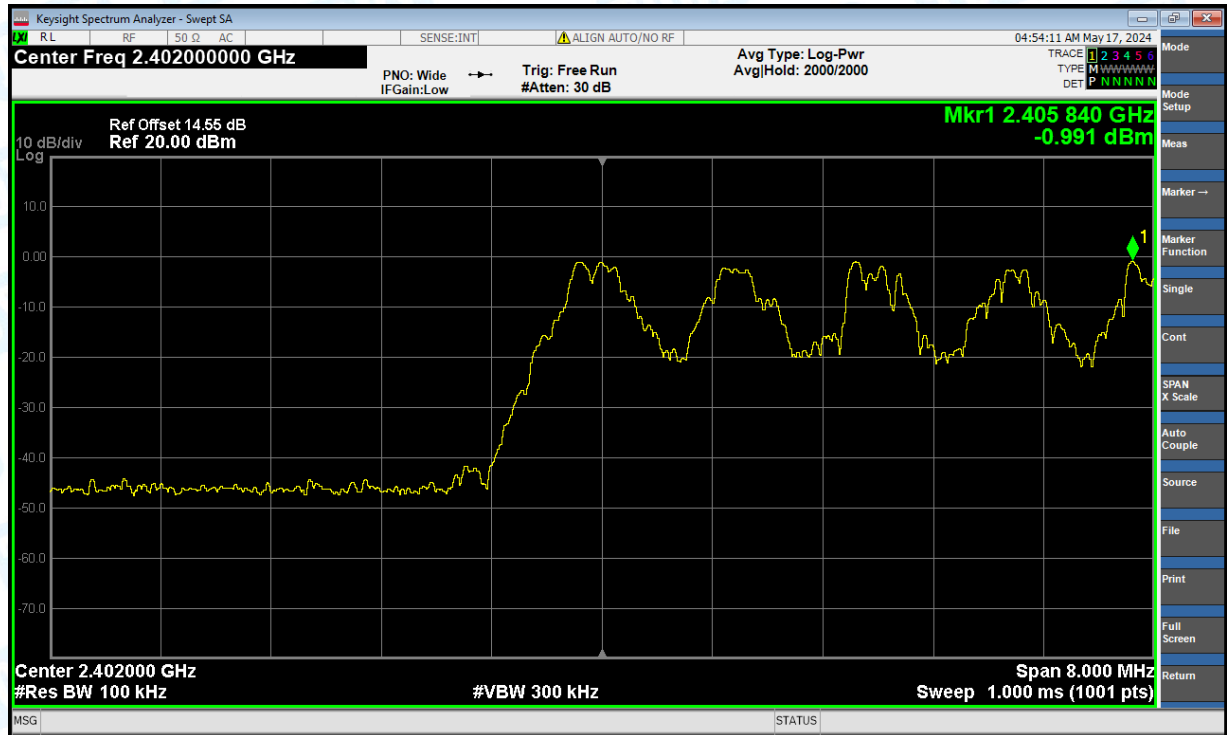


6. Band Edge(Hopping)

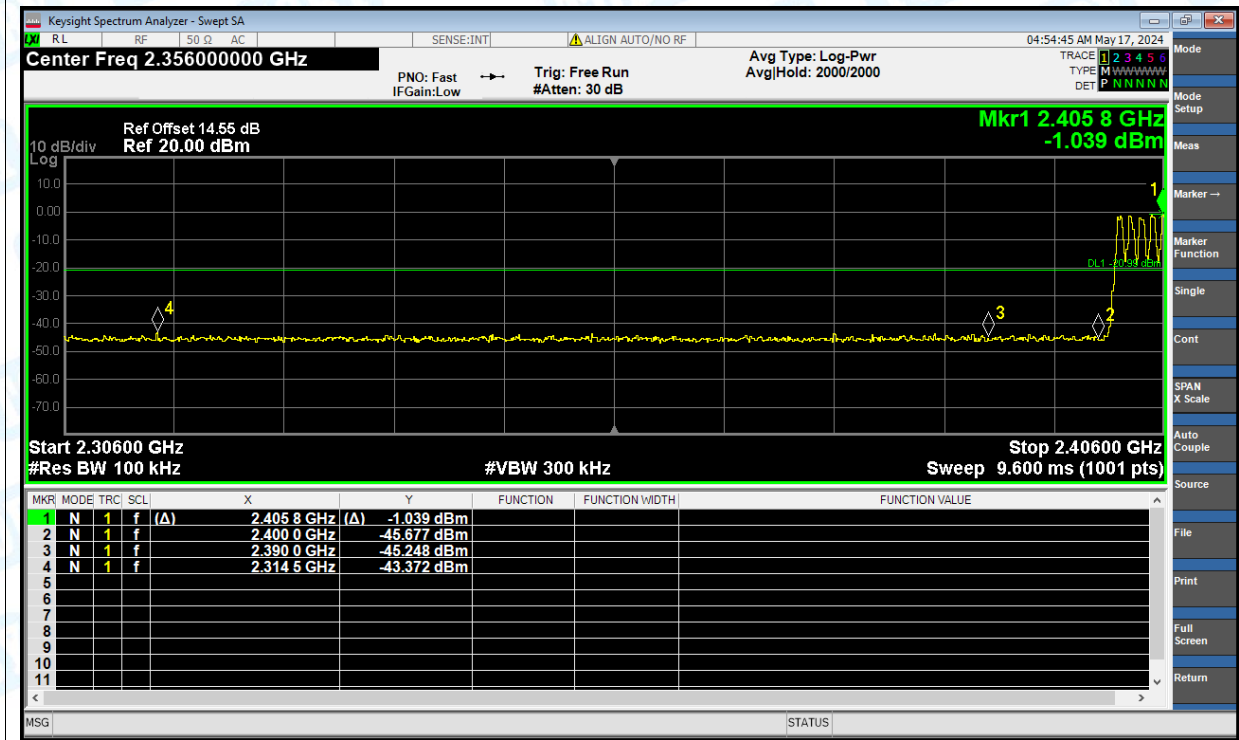
Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH1	2402	Ant1	Hopping	-42.38	-20	Pass
NVNT	1-DH1	2480	Ant1	Hopping	-43.44	-20	Pass
NVNT	2-DH1	2402	Ant1	Hopping	-41.73	-20	Pass
NVNT	2-DH1	2480	Ant1	Hopping	-43.19	-20	Pass

Test Graphs

Band Edge(Hopping) NVNT 1-DH1 2402MHz Ant1 Hopping Ref



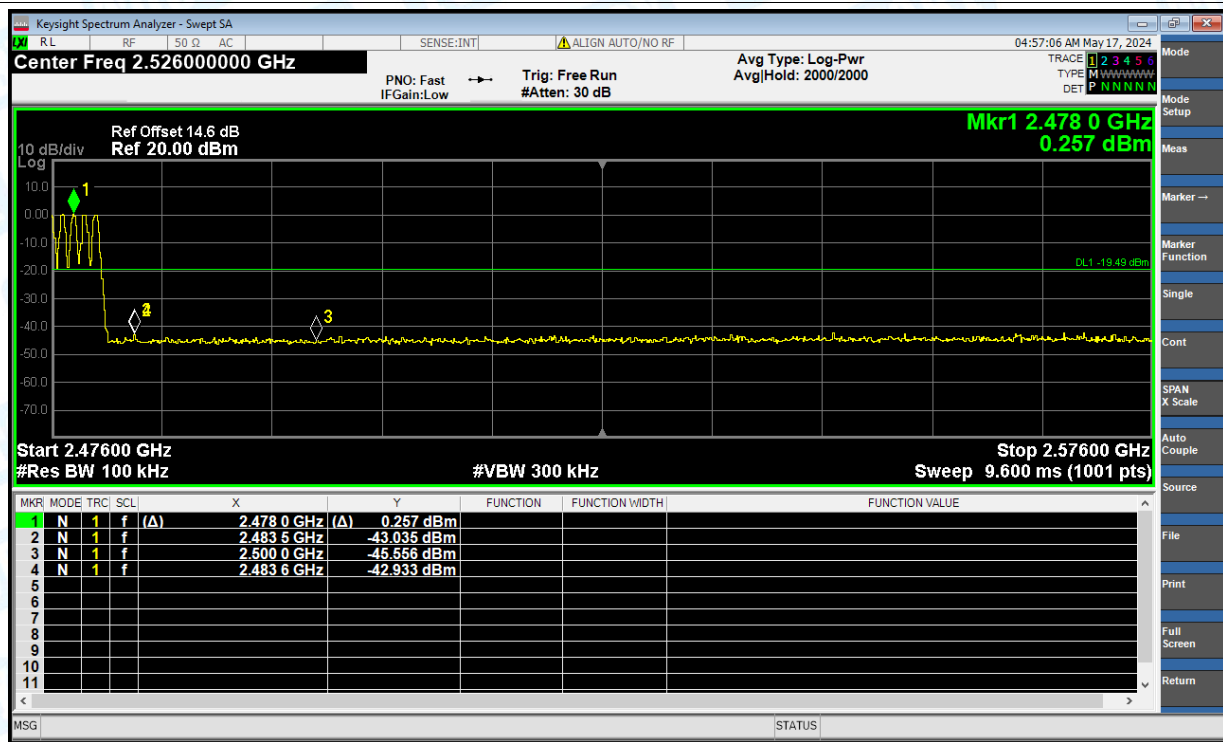
Band Edge(Hopping) NVNT 1-DH1 2402MHz Ant1 Hopping Emission



Band Edge(Hopping) NVNT 1-DH1 2480MHz Ant1 Hopping Ref



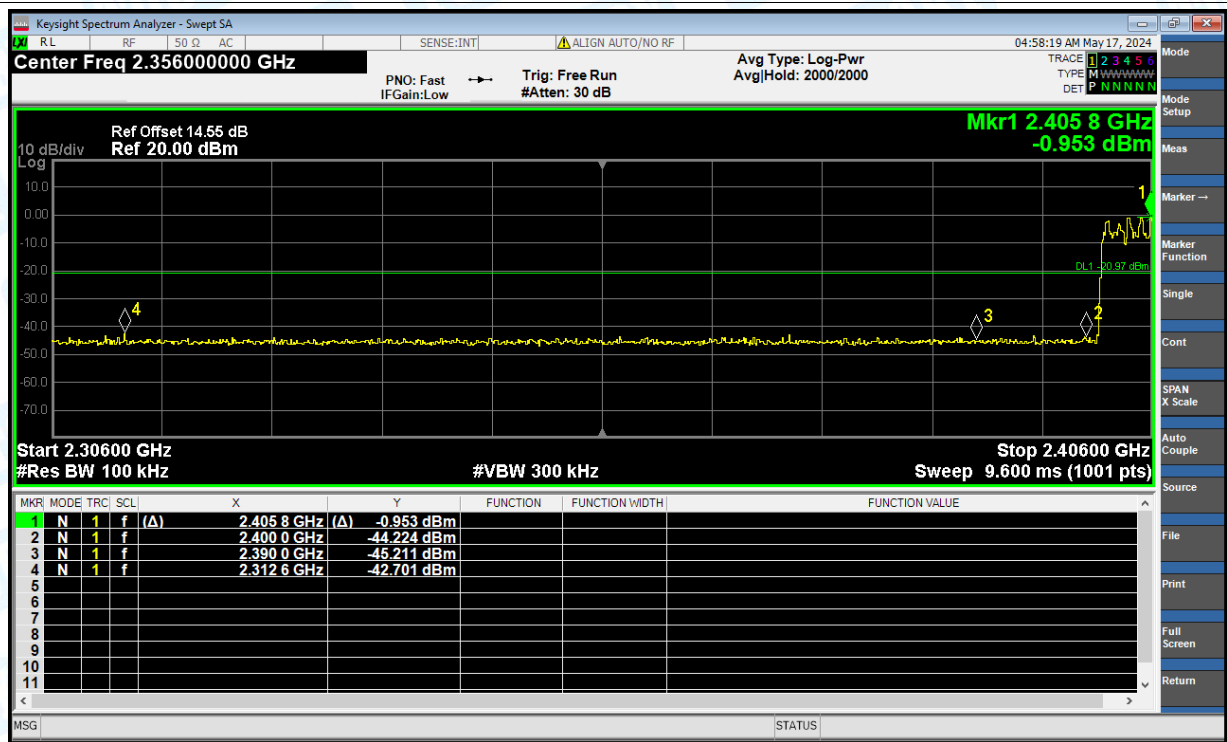
Band Edge(Hopping) NVNT 1-DH1 2480MHz Ant1 Hopping Emission



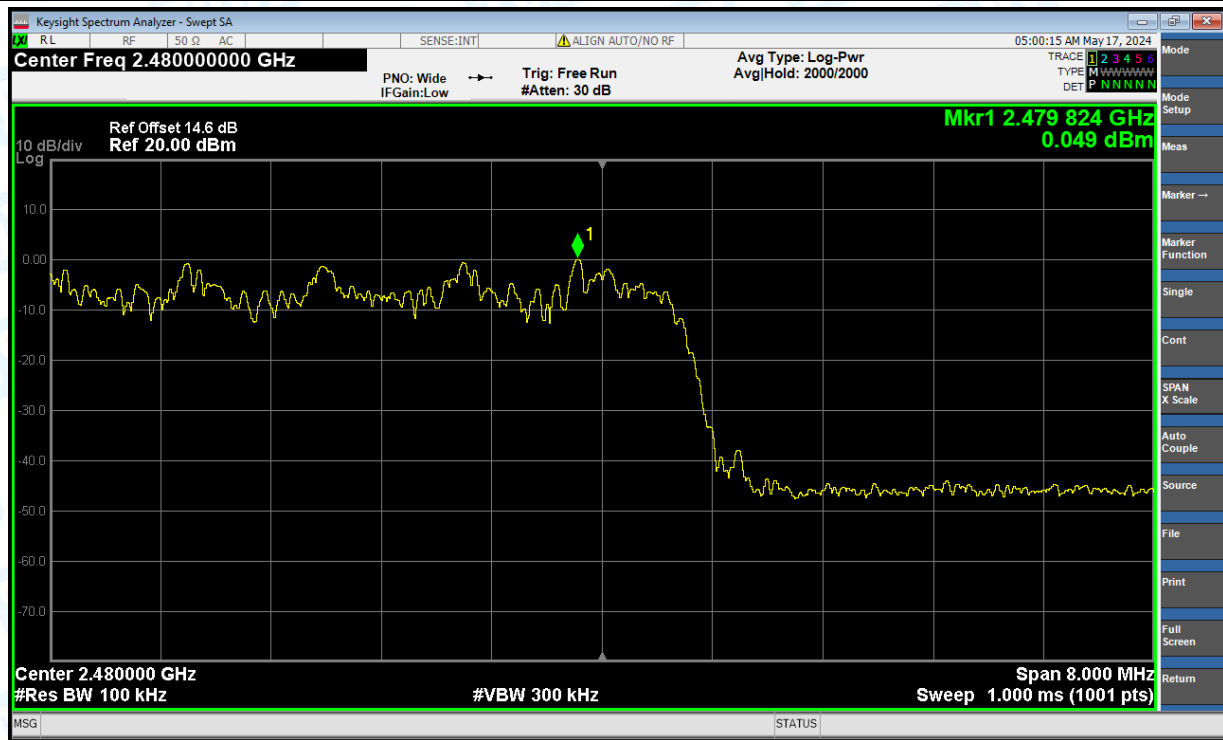
Band Edge(Hopping) NVNT 2-DH1 2402MHz Ant1 Hopping Ref



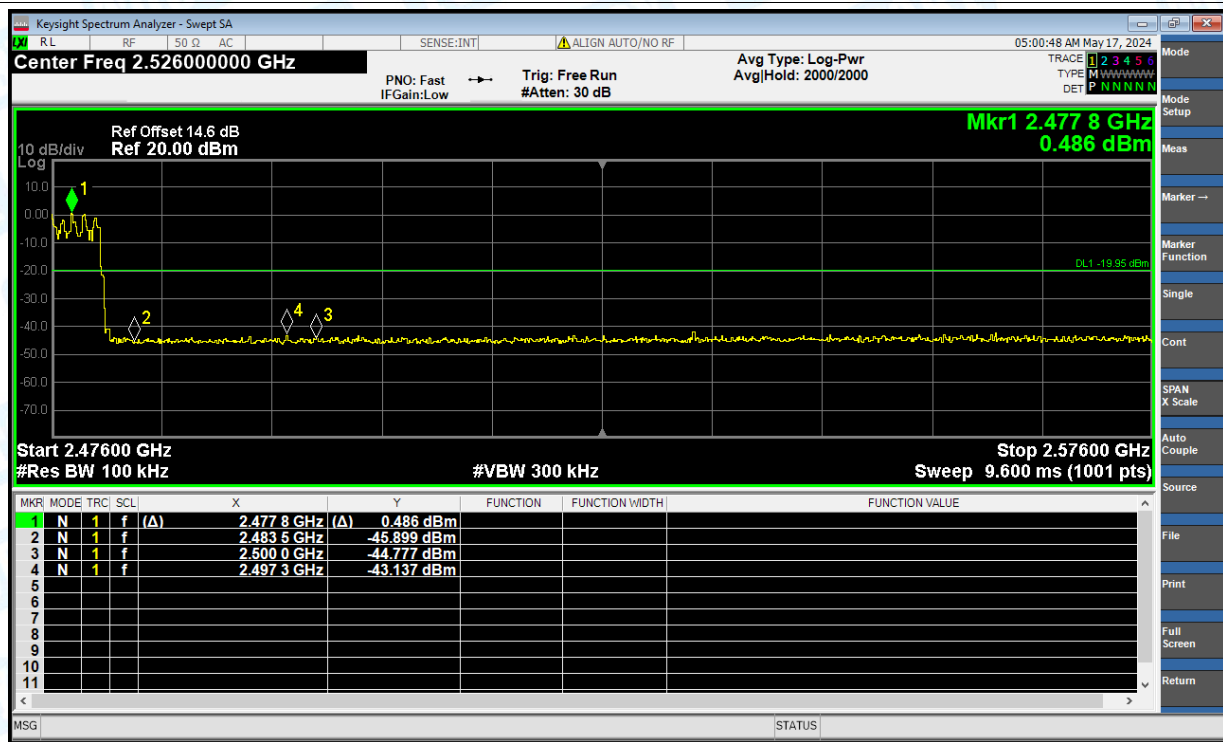
Band Edge(Hopping) NVNT 2-DH1 2402MHz Ant1 Hopping Emission



Band Edge(Hopping) NVNT 2-DH1 2480MHz Ant1 Hopping Ref



Band Edge(Hopping) NVNT 2-DH1 2480MHz Ant1 Hopping Emission

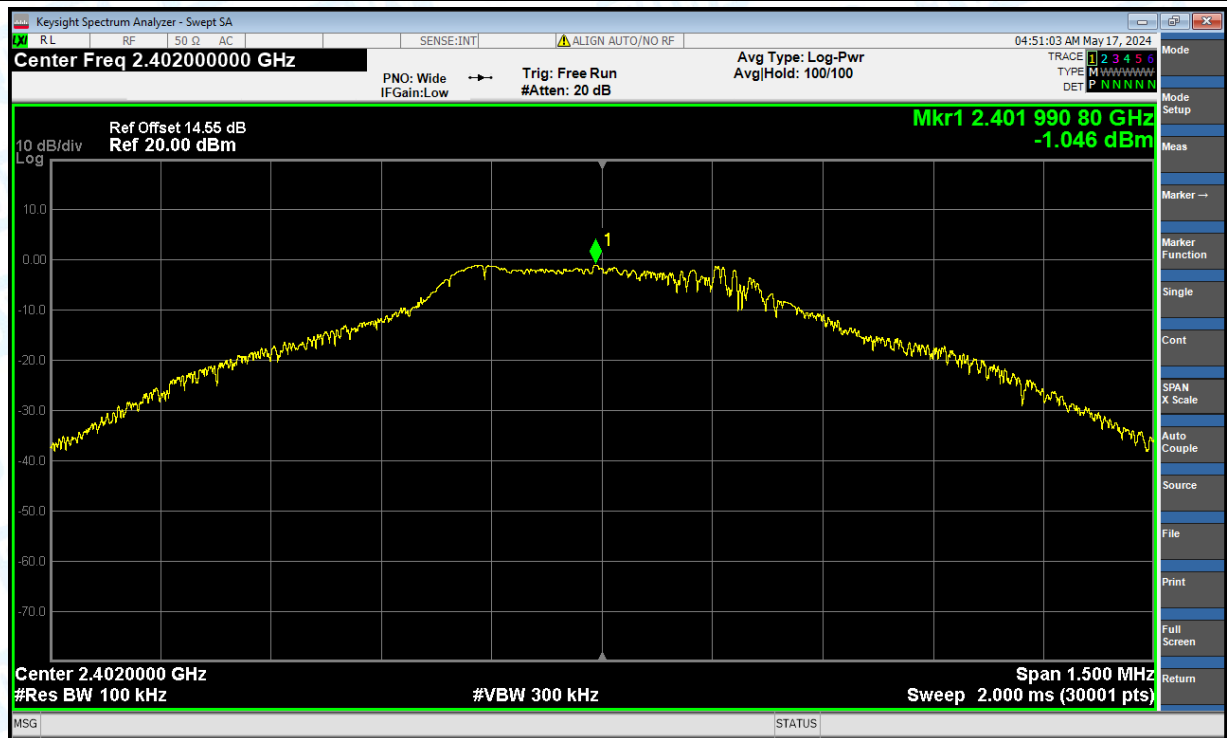


7.Conducted RF Spurious Emission

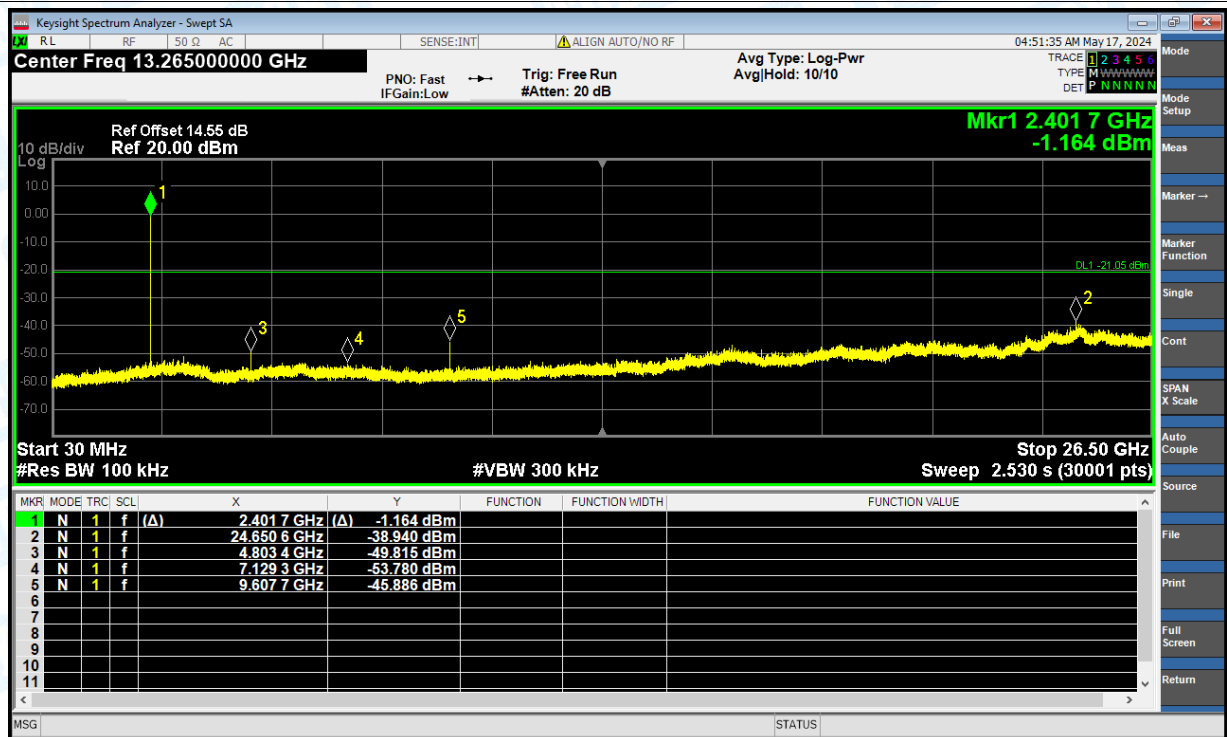
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	1-DH1	2402	Ant1	-37.89	-20	Pass
NVNT	1-DH1	2441	Ant1	-39.56	-20	Pass
NVNT	1-DH1	2480	Ant1	-39.98	-20	Pass
NVNT	2-DH1	2402	Ant1	-38.04	-20	Pass
NVNT	2-DH1	2441	Ant1	-39.89	-20	Pass
NVNT	2-DH1	2480	Ant1	-39.85	-20	Pass

Test Graphs

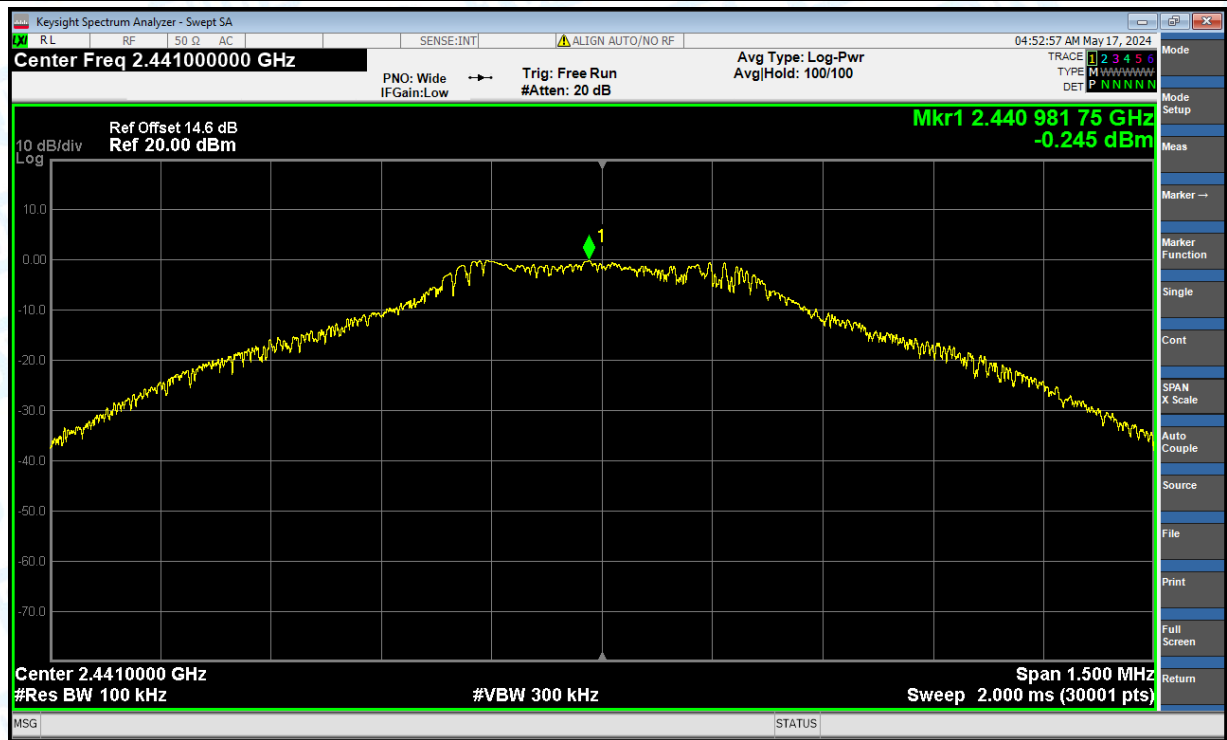
Tx. Spurious NVNT 1-DH1 2402MHz Ant1 Ref



Tx. Spurious NVNT 1-DH1 2402MHz Ant1 Emission



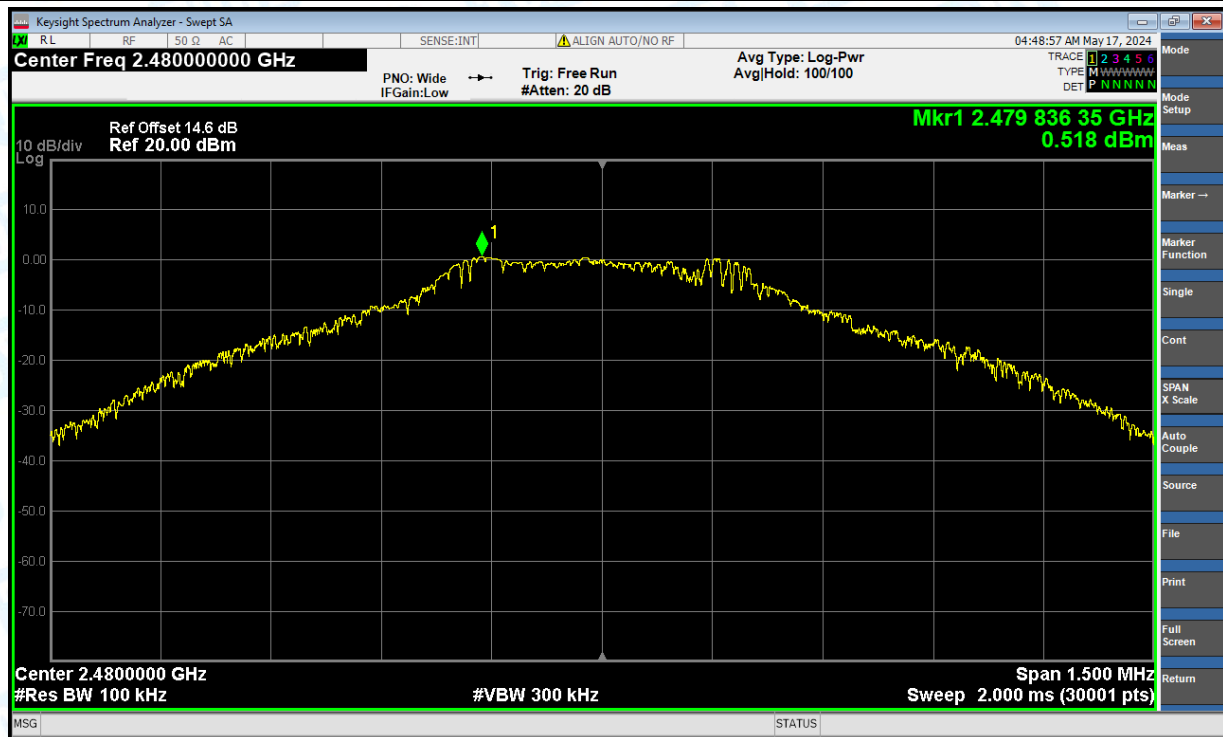
Tx. Spurious NVNT 1-DH1 2441MHz Ant1 Ref



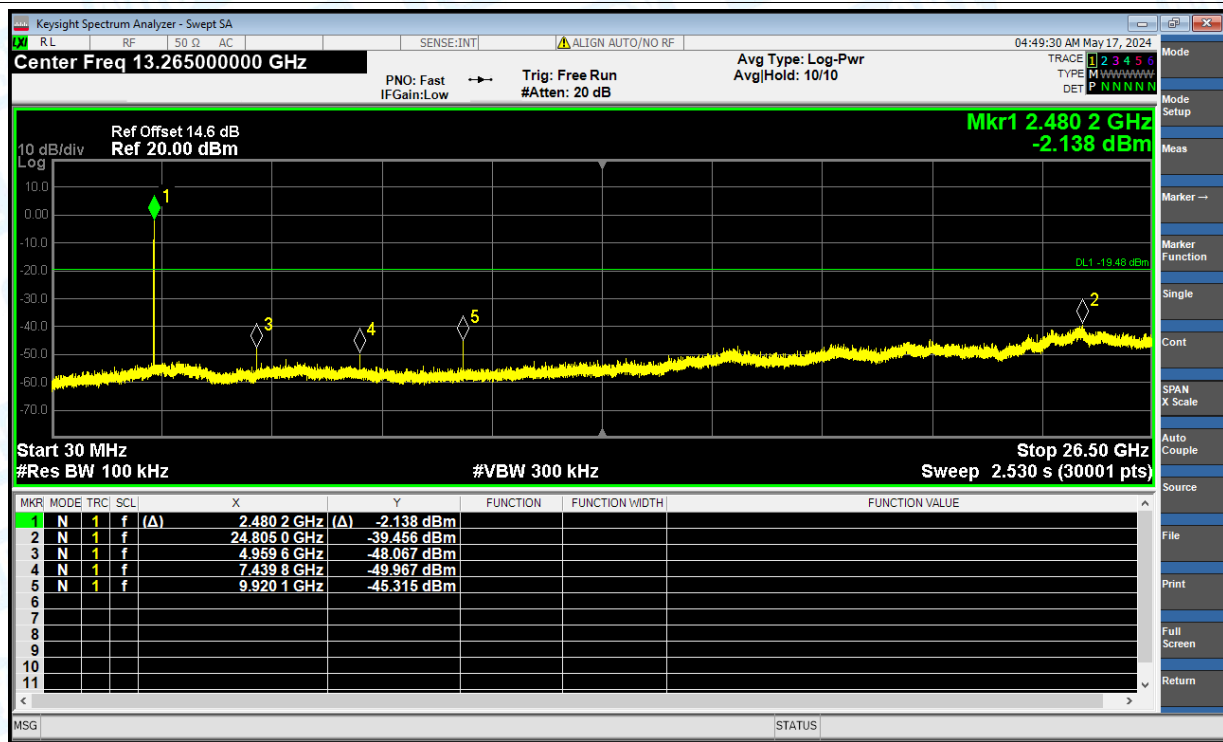
Tx. Spurious NVNT 1-DH1 2441MHz Ant1 Emission



Tx. Spurious NVNT 1-DH1 2480MHz Ant1 Ref



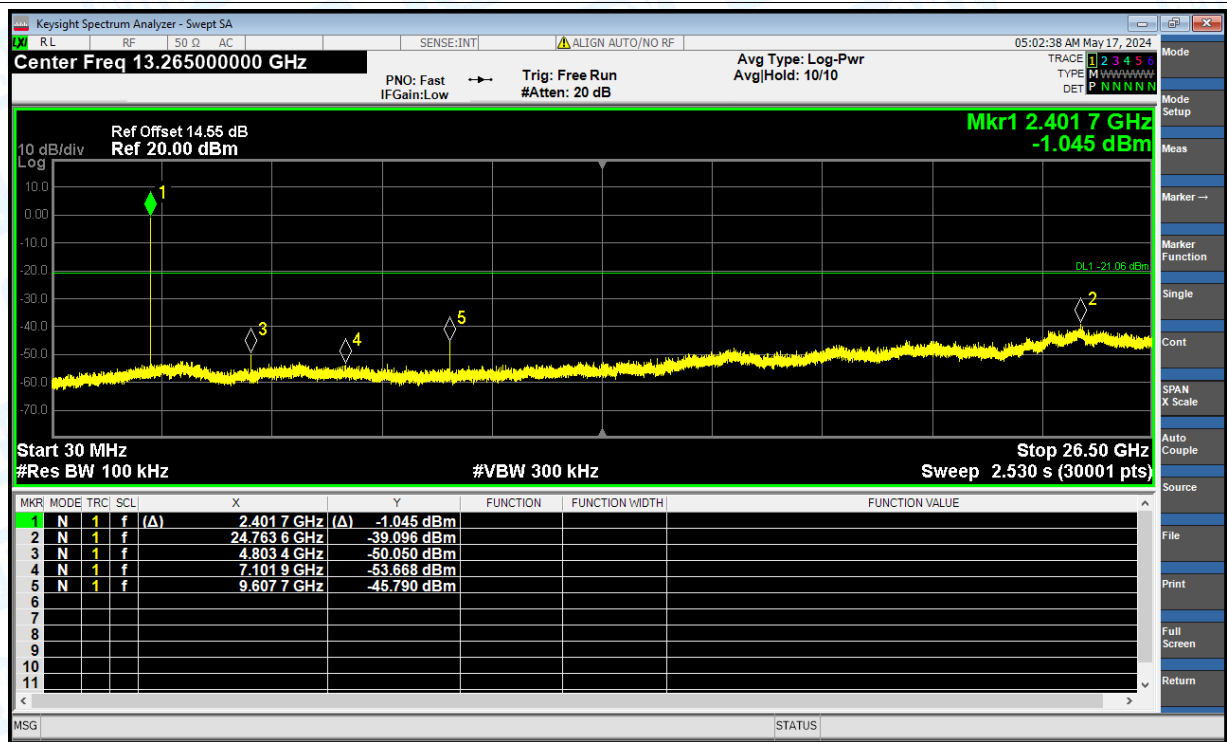
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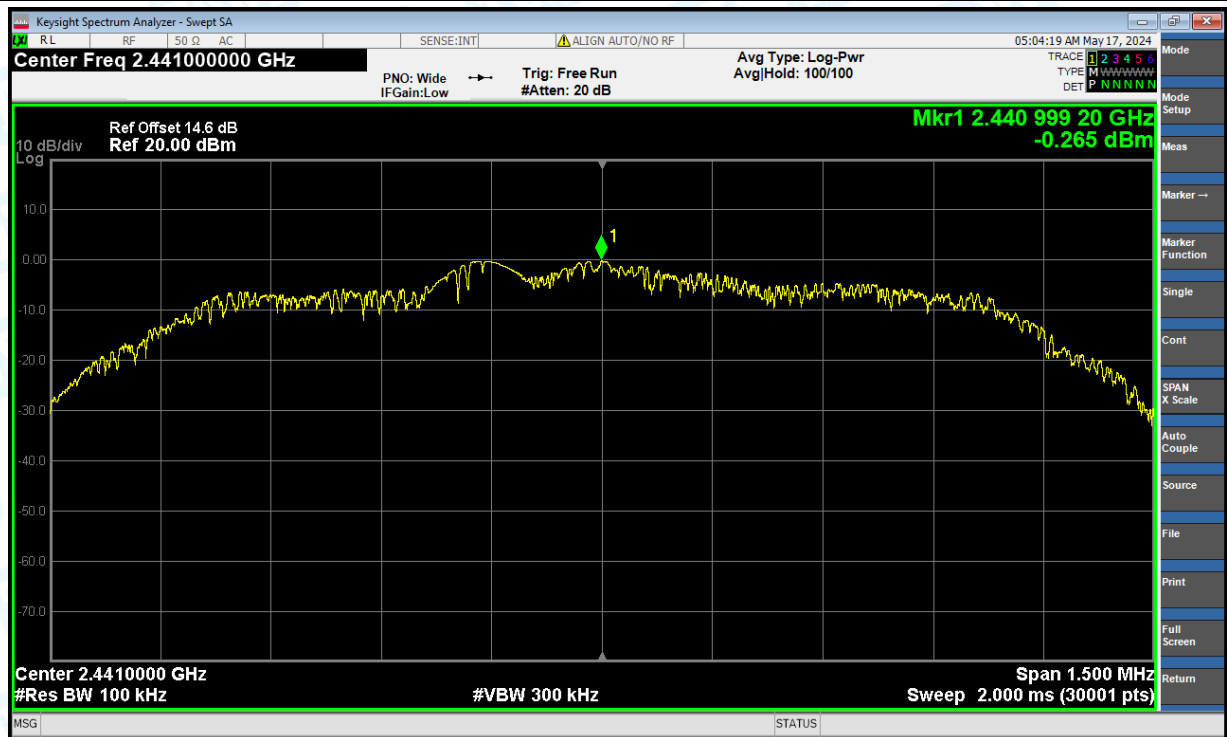
Tx. Spurious NVNT 2-DH1 2402MHz Ant1 Ref



Tx. Spurious NVNT 2-DH1 2402MHz Ant1 Emission



Tx. Spurious NVNT 2-DH1 2441MHz Ant1 Ref



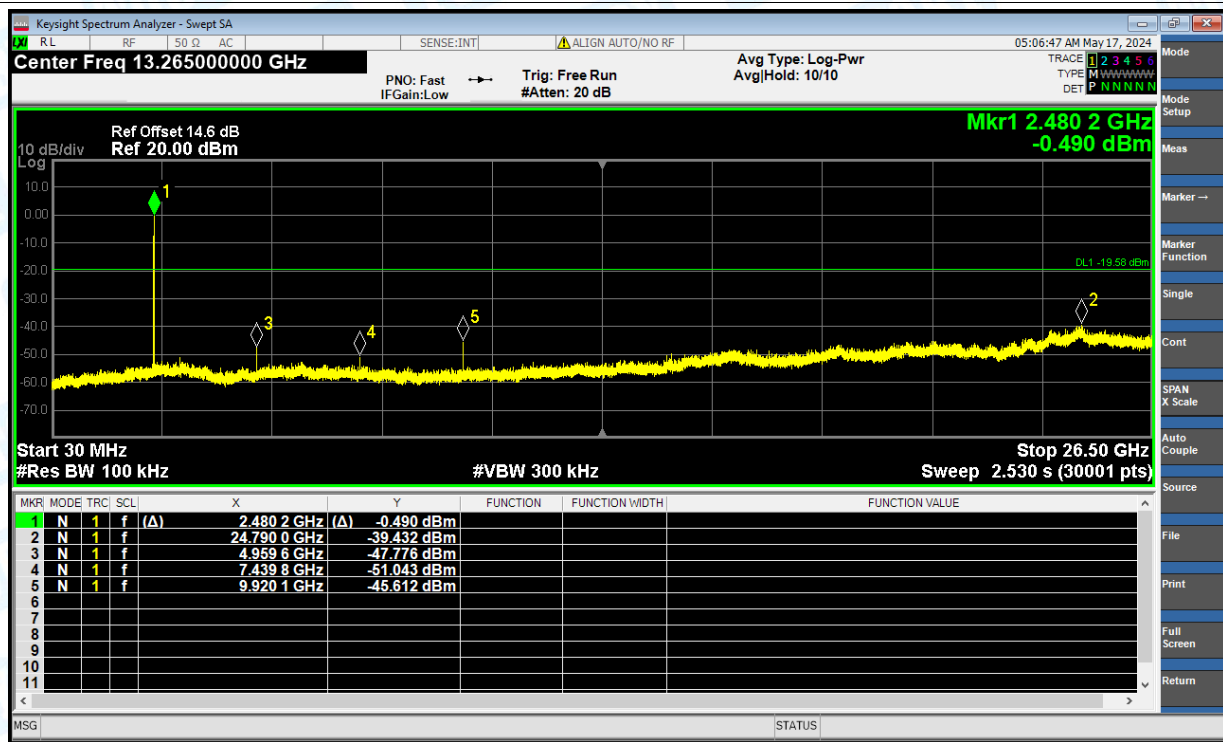
Tx. Spurious NVNT 2-DH1 2441MHz Ant1 Emission



Tx. Spurious NVNT 2-DH1 2480MHz Ant1 Ref



Tx. Spurious NVNT 2-DH1 2480MHz Ant1 Emission

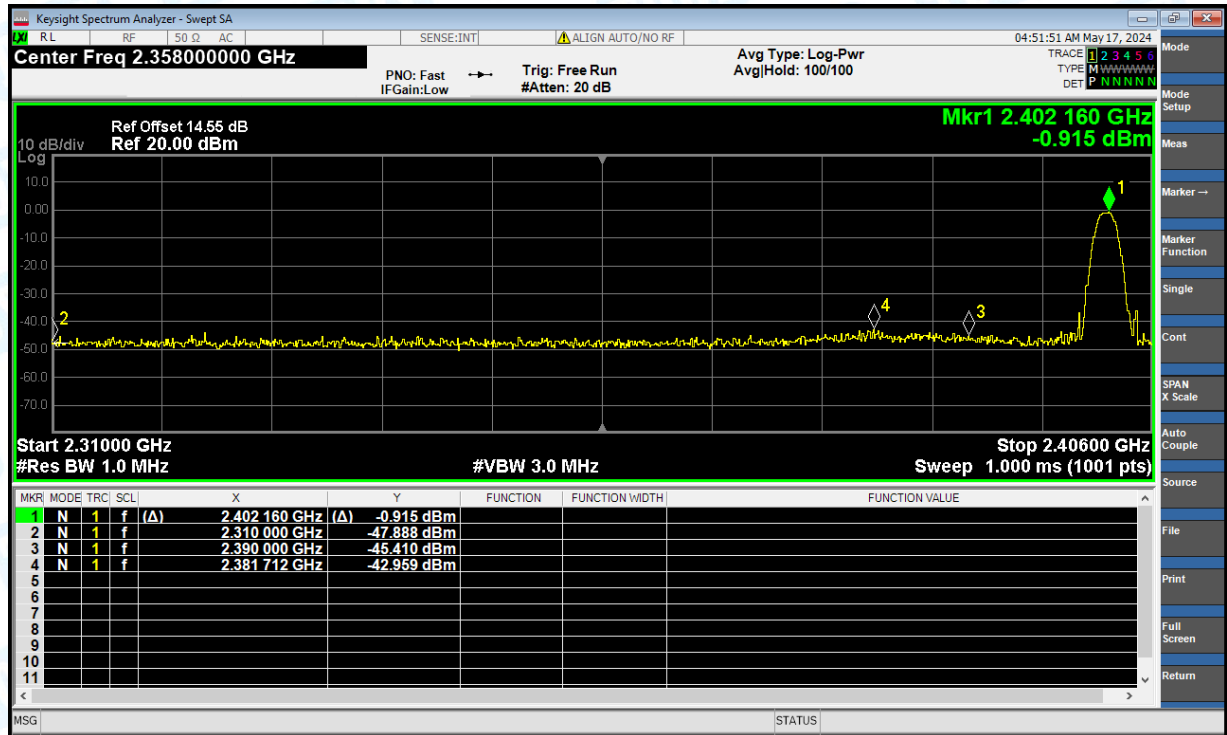


8. Restrict Band

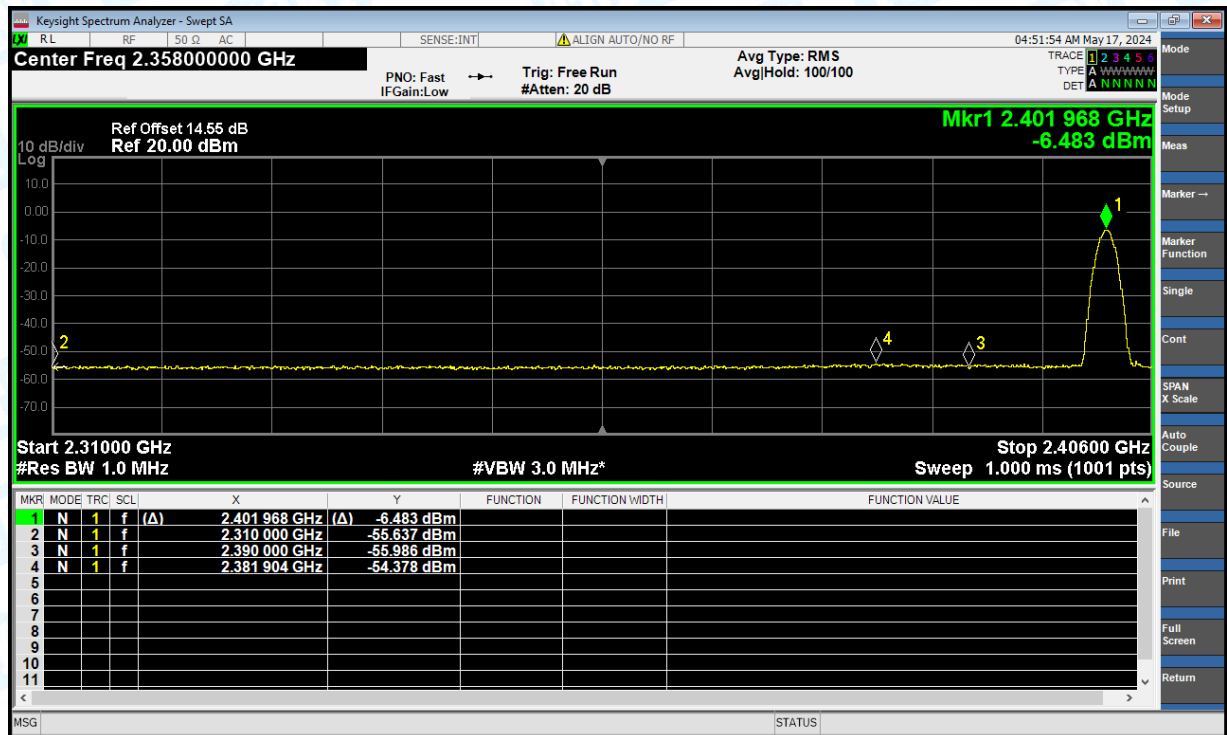
Condition	Mode	Frequency (MHz)	Antenna	Hopping Mode	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	Duty Factor (dB)	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
NVNT	1-DH1	2402	Ant1	No-Hopping	2310	-47.89	2.7	-	50.07	Peak	74	Pass
NVNT	1-DH1	2402	Ant1	No-Hopping	2310	-55.64	2.7	5.17	47.49	Average	54	Pass
NVNT	1-DH1	2402	Ant1	No-Hopping	2381.712	-42.96	2.7	-	55	Peak	74	Pass
NVNT	1-DH1	2402	Ant1	No-Hopping	2381.904	-54.38	2.7	5.17	48.75	Average	54	Pass
NVNT	1-DH1	2402	Ant1	No-Hopping	2390	-45.41	2.7	-	52.55	Peak	74	Pass
NVNT	1-DH1	2402	Ant1	No-Hopping	2390	-55.99	2.7	5.17	47.14	Average	54	Pass
NVNT	1-DH1	2480	Ant1	No-Hopping	2483.5	-46.45	2.7	-	51.51	Peak	74	Pass
NVNT	1-DH1	2480	Ant1	No-Hopping	2483.5	-55.29	2.7	5.17	47.84	Average	54	Pass
NVNT	1-DH1	2480	Ant1	No-Hopping	2486.368	-41.97	2.7	-	55.99	Peak	74	Pass
NVNT	1-DH1	2480	Ant1	No-Hopping	2495.2	-53.3	2.7	5.17	49.83	Average	54	Pass
NVNT	1-DH1	2480	Ant1	No-Hopping	2500	-46.22	2.7	-	51.74	Peak	74	Pass
NVNT	1-DH1	2480	Ant1	No-Hopping	2500	-54.15	2.7	5.17	48.98	Average	54	Pass
NVNT	2-DH1	2402	Ant1	No-Hopping	2310	-48.26	2.7	-	49.7	Peak	74	Pass
NVNT	2-DH1	2402	Ant1	No-Hopping	2310	-55.58	2.7	4.95	47.33	Average	54	Pass
NVNT	2-DH1	2402	Ant1	No-Hopping	2383.824	-43.38	2.7	-	54.58	Peak	74	Pass
NVNT	2-DH1	2402	Ant1	No-Hopping	2387.088	-53.93	2.7	4.95	48.98	Average	54	Pass
NVNT	2-DH1	2402	Ant1	No-Hopping	2390	-45.32	2.7	-	52.64	Peak	74	Pass
NVNT	2-DH1	2402	Ant1	No-Hopping	2390	-54.57	2.7	4.95	48.34	Average	54	Pass
NVNT	2-DH1	2480	Ant1	No-Hopping	2483.5	-45.27	2.7	-	52.69	Peak	74	Pass
NVNT	2-DH1	2480	Ant1	No-Hopping	2483.5	-55.73	2.7	5.06	47.29	Average	54	Pass
NVNT	2-DH1	2480	Ant1	No-Hopping	2498.56	-41.79	2.7	-	56.17	Peak	74	Pass
NVNT	2-DH1	2480	Ant1	No-Hopping	2495.296	-53.73	2.7	5.06	49.29	Average	54	Pass
NVNT	2-DH1	2480	Ant1	No-Hopping	2500	-44.94	2.7	-	53.02	Peak	74	Pass
NVNT	2-DH1	2480	Ant1	No-Hopping	2500	-54.7	2.7	5.06	48.32	Average	54	Pass

Test Graphs

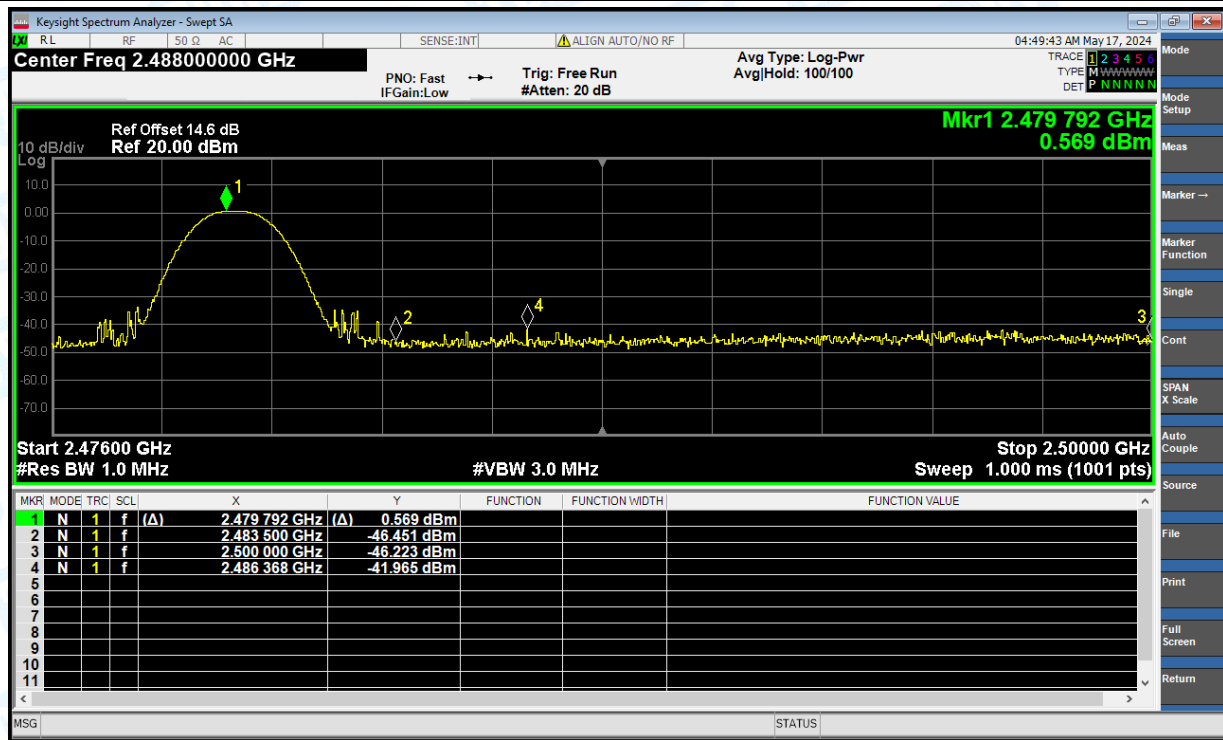
Restrict Band NVNT 1-DH1 2402MHz Ant1 No-Hopping Peak



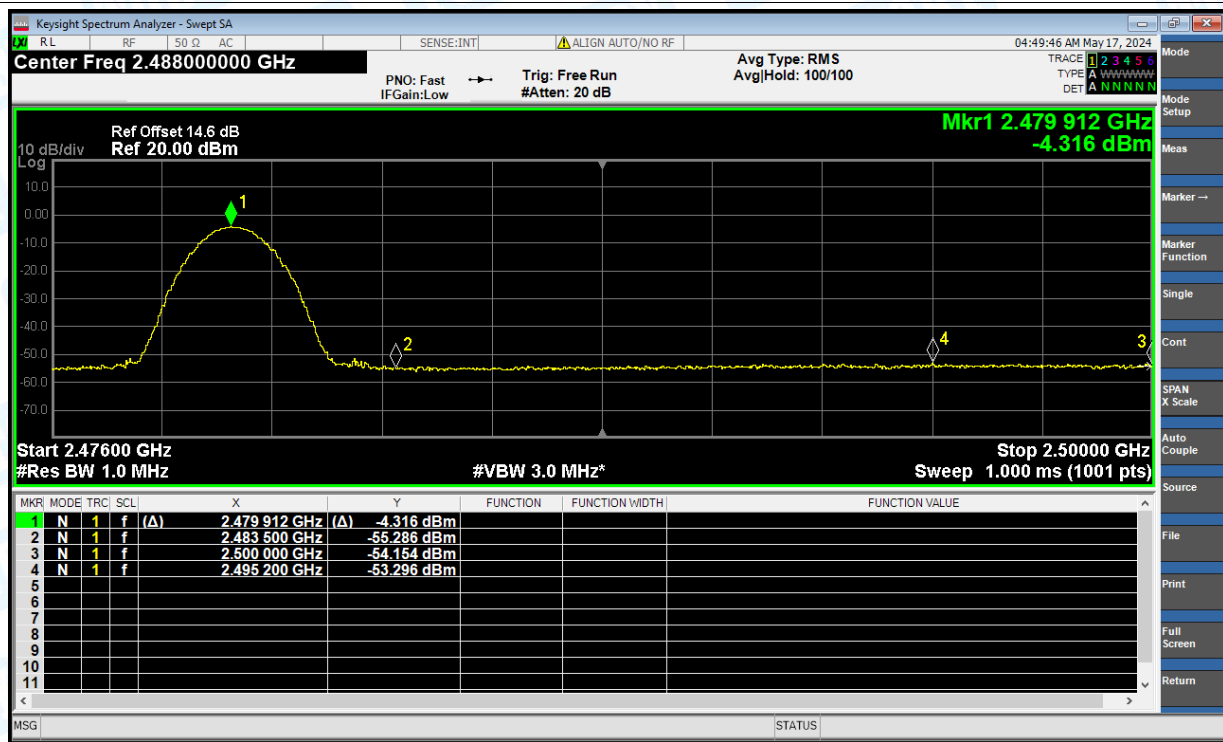
Restrict Band NVNT 1-DH1 2402MHz Ant1 No-Hopping Average



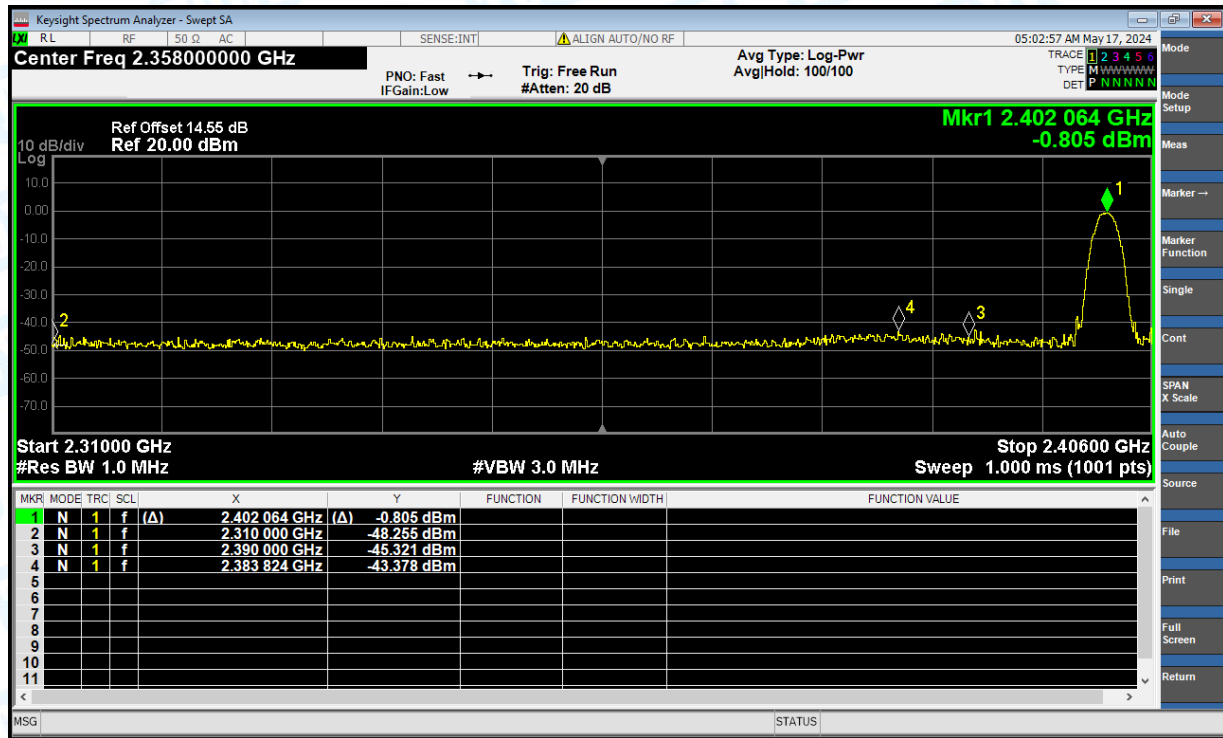
Restrict Band NVNT 1-DH1 2480MHz Ant1 No-Hopping Peak



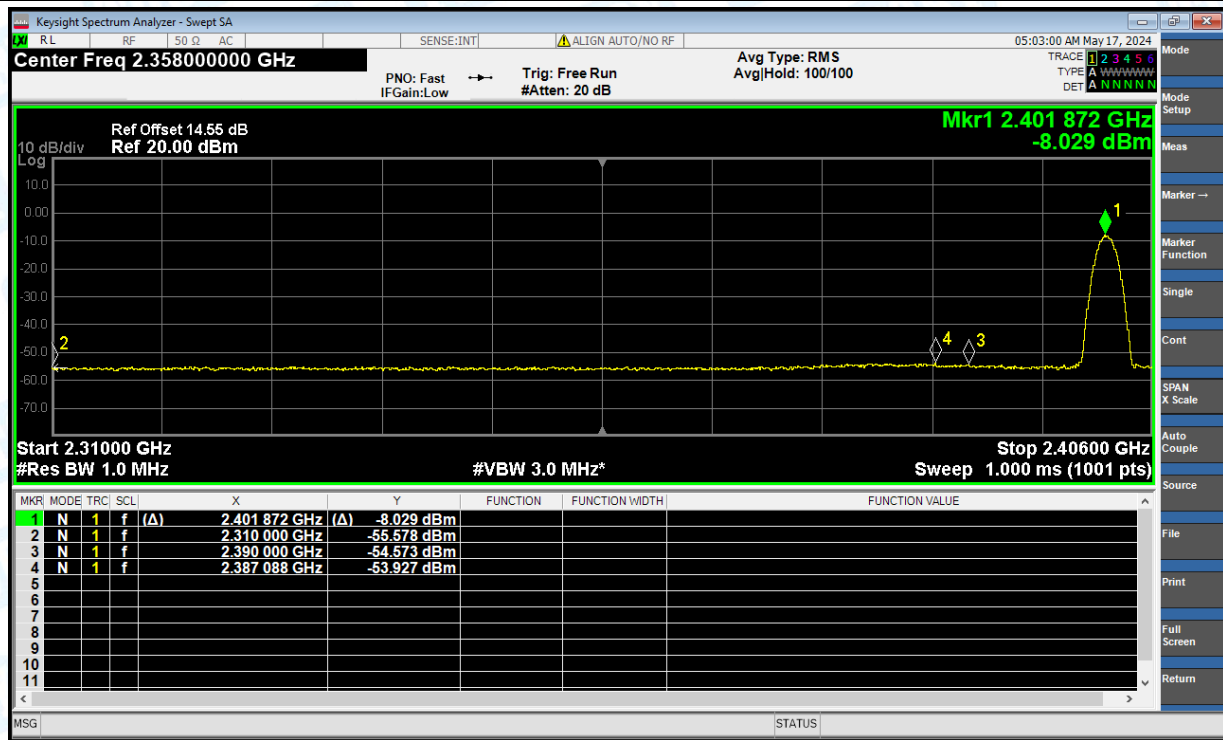
Restrict Band NVNT 1-DH1 2480MHz Ant1 No-Hopping Average



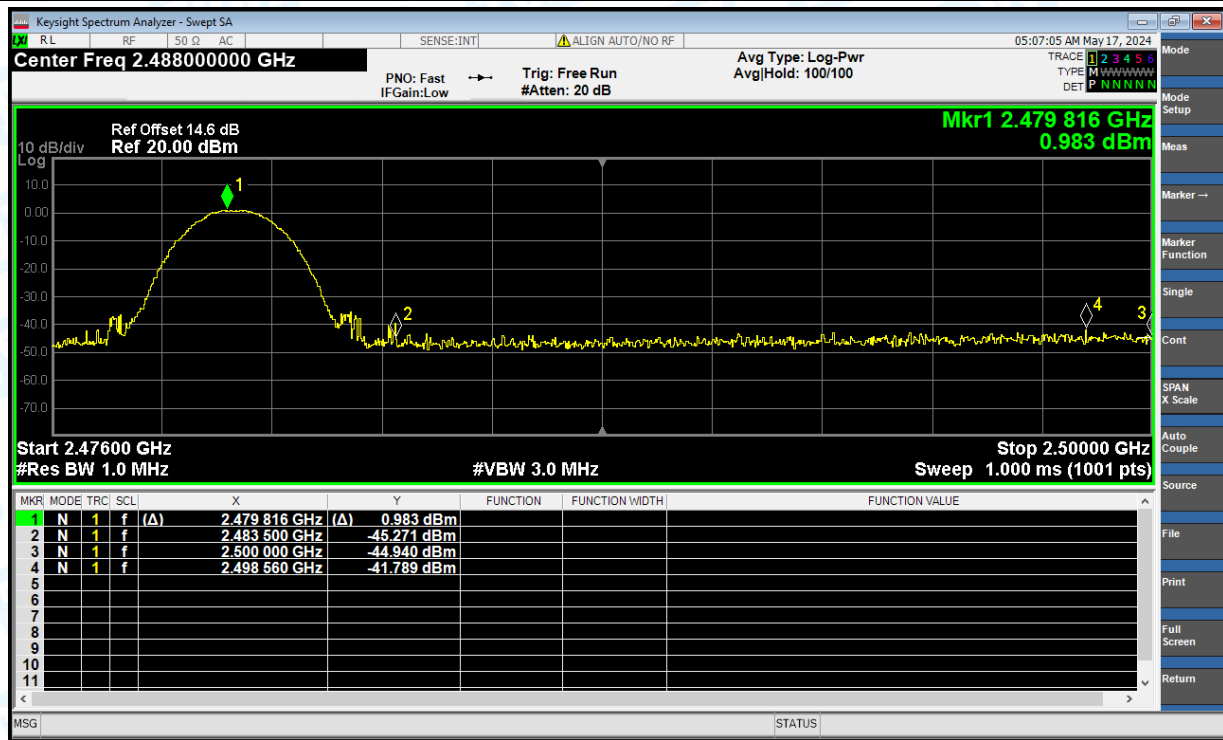
Restrict Band NVNT 2-DH1 2402MHz Ant1 No-Hopping Peak



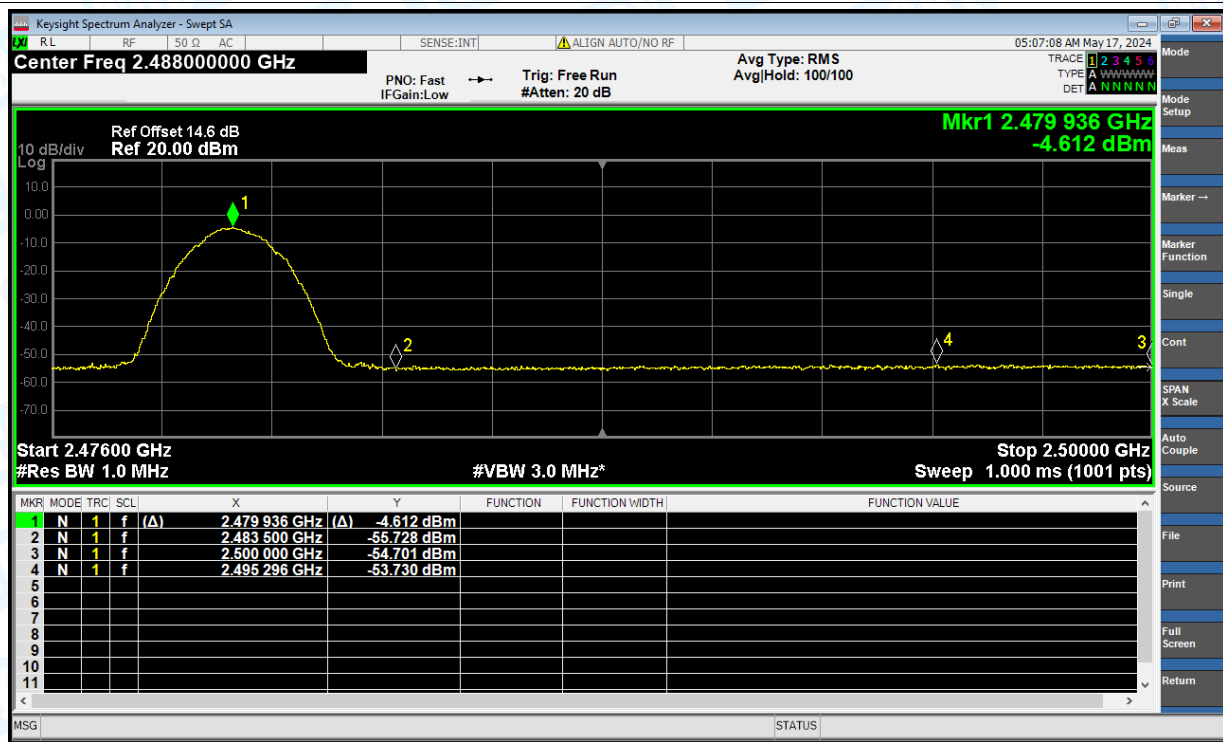
Restrict Band NVNT 2-DH1 2402MHz Ant1 No-Hopping Average



Restrict Band NVNT 2-DH1 2480MHz Ant1 No-Hopping Peak



Restrict Band NVNT 2-DH1 2480MHz Ant1 No-Hopping Average

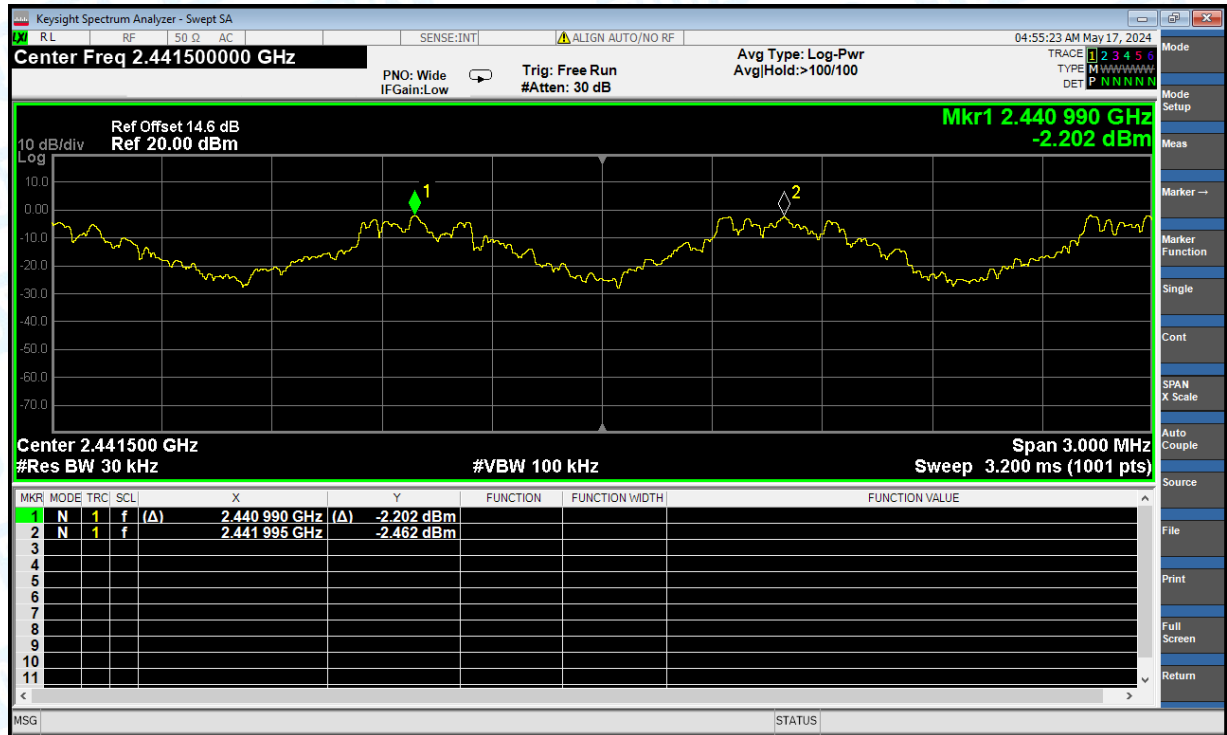


9. Carrier Frequencies Separation

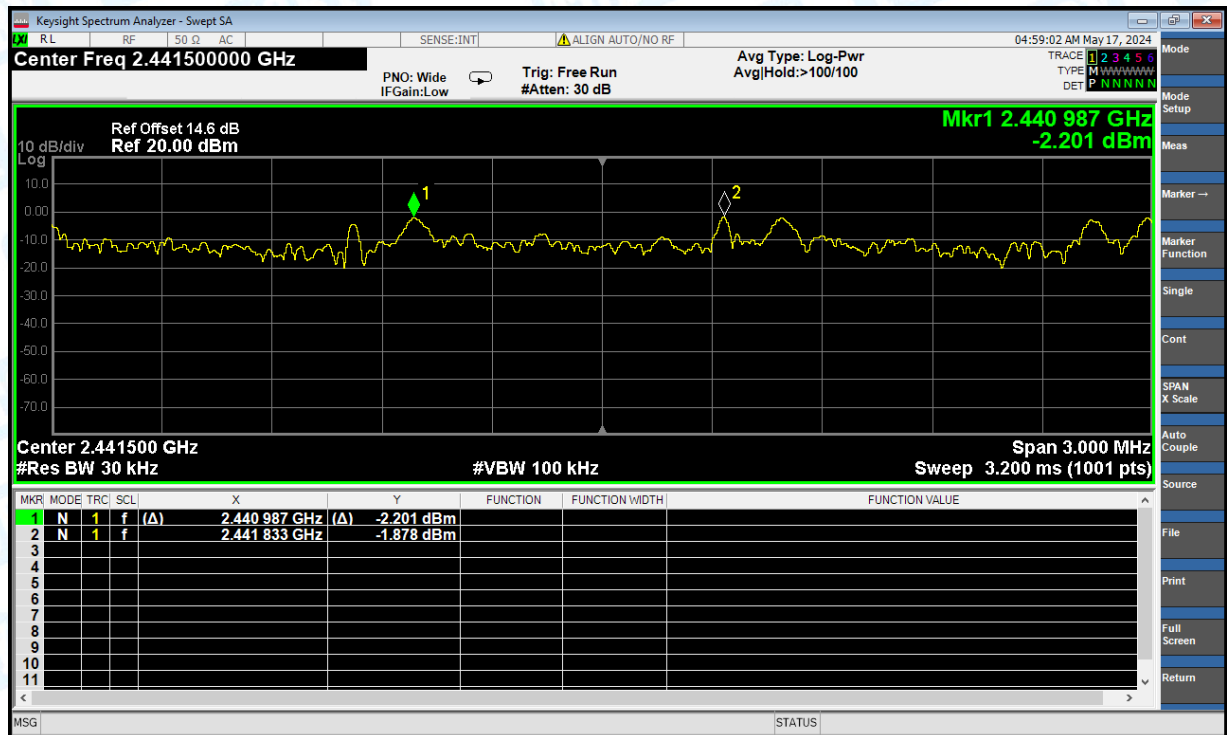
Condition	Mode	Antenna	Hopping Freq1 (MHz)	Hopping Freq2 (MHz)	HFS (MHz)	Limit (MHz)	Verdict
NVNT	1-DH1	Ant1	2440.99	2441.995	1.005	0.58	Pass
NVNT	2-DH1	Ant1	2440.987	2441.833	0.846	0.025	Pass

Test Graphs

CFS NVNT 1-DH1 2441MHz Ant1



CFS NVNT 2-DH1 2441MHz Ant1

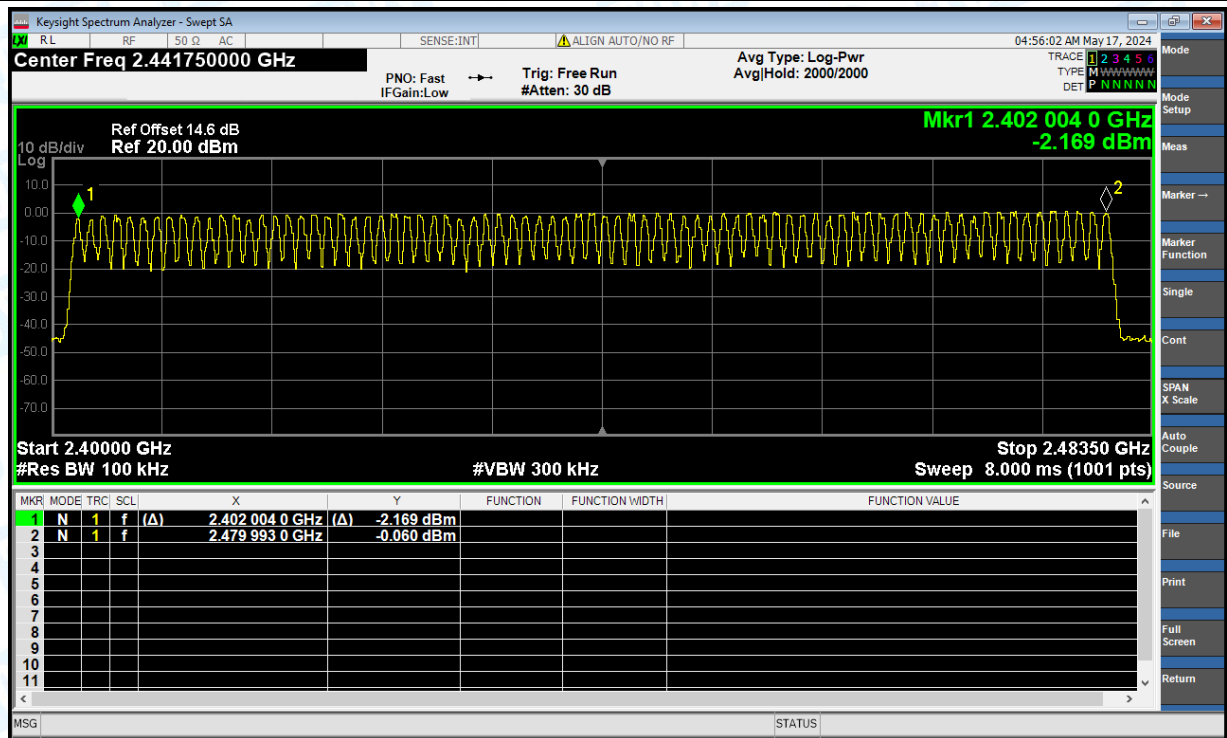


10. Number of Hopping Channel

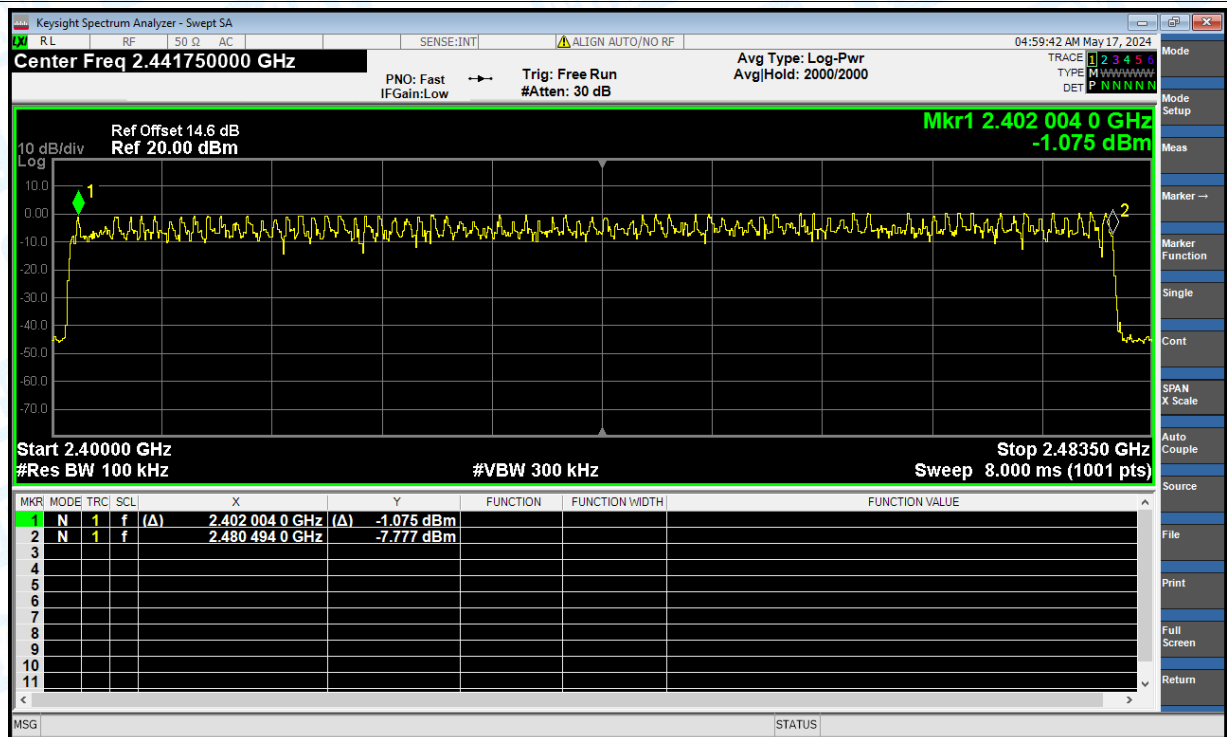
Condition	Mode	Antenna	Hopping Number	Limit	Verdict
NVNT	1-DH1	Ant1	79	15	Pass
NVNT	2-DH1	Ant1	79	15	Pass

Test Graphs

Hopping No. NVNT 1-DH1 2441MHz Ant1



Hopping No. NVNT 2-DH1 2441MHz Ant1

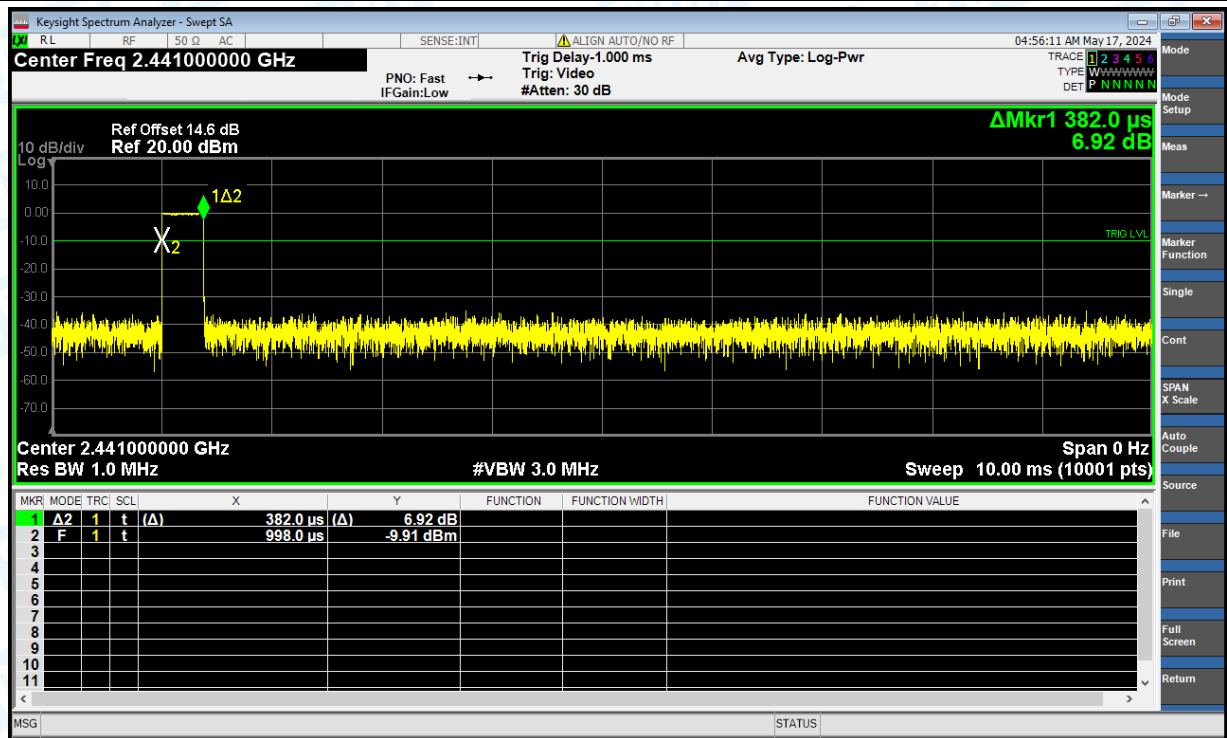


11. Dwell Time

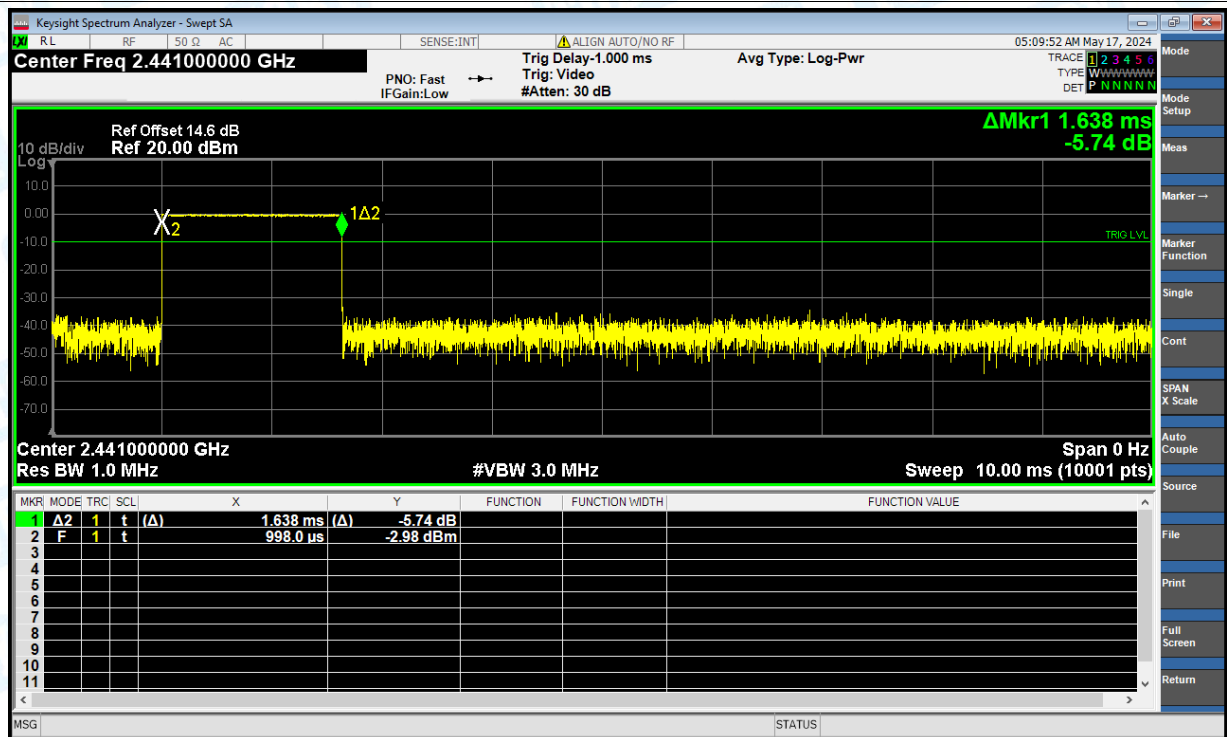
Condition	Mode	Frequency (MHz)	Antenna	Pulse Time (ms)	Total Dwell Time (ms)	Period Time (ms)	Limit (ms)	Verdict
NVNT	1-DH1	2441	Ant1	0.382	122.24	31600	400	Pass
NVNT	1-DH3	2441	Ant1	1.638	262.08	31600	400	Pass
NVNT	1-DH5	2441	Ant1	2.886	307.84	31600	400	Pass
NVNT	2-DH1	2441	Ant1	0.391	125.12	31600	400	Pass
NVNT	2-DH3	2441	Ant1	1.643	262.88	31600	400	Pass
NVNT	2-DH5	2441	Ant1	2.891	308.373	31600	400	Pass

Test Graphs

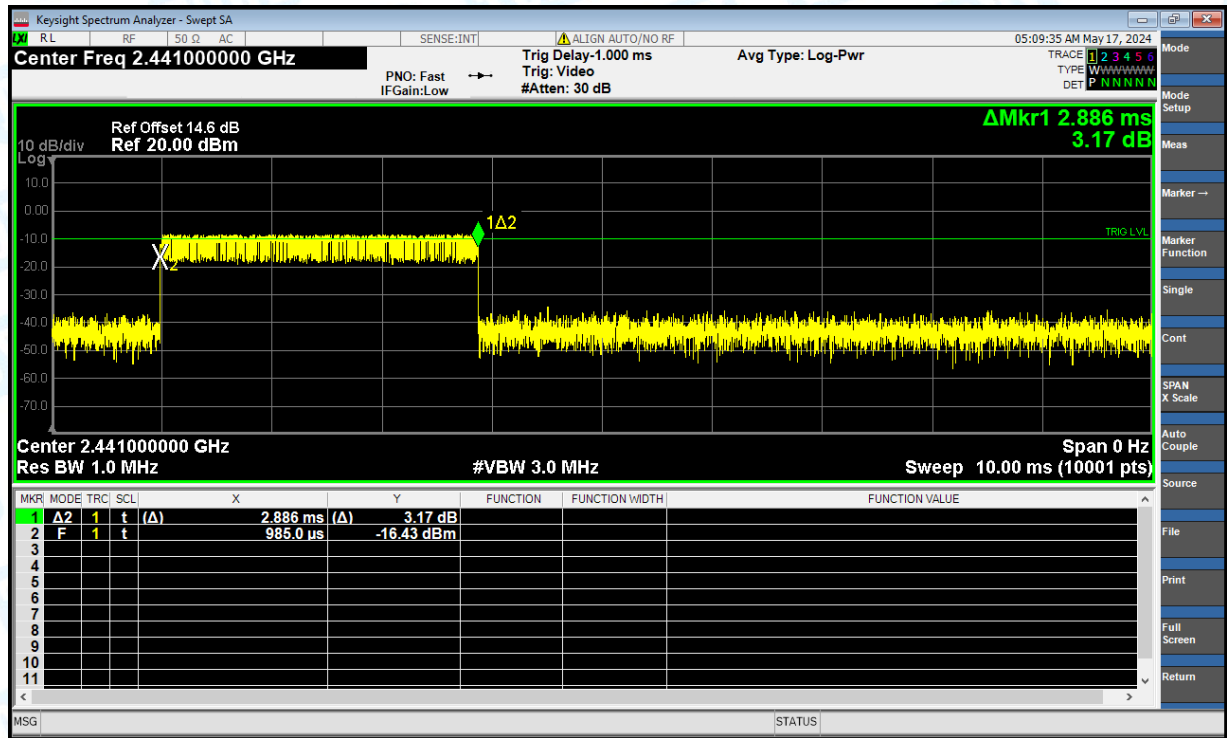
Dwell NVNT 1-DH1 2441MHz Ant1



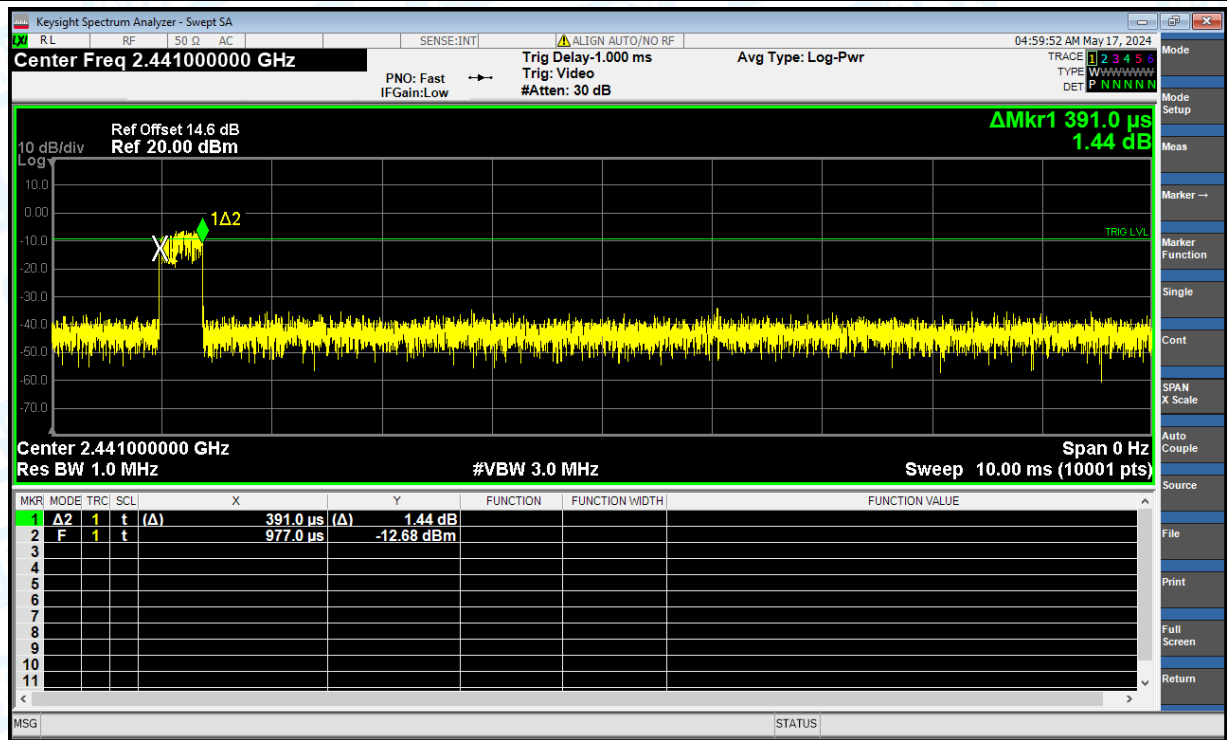
Dwell NVNT 1-DH3 2441MHz Ant1



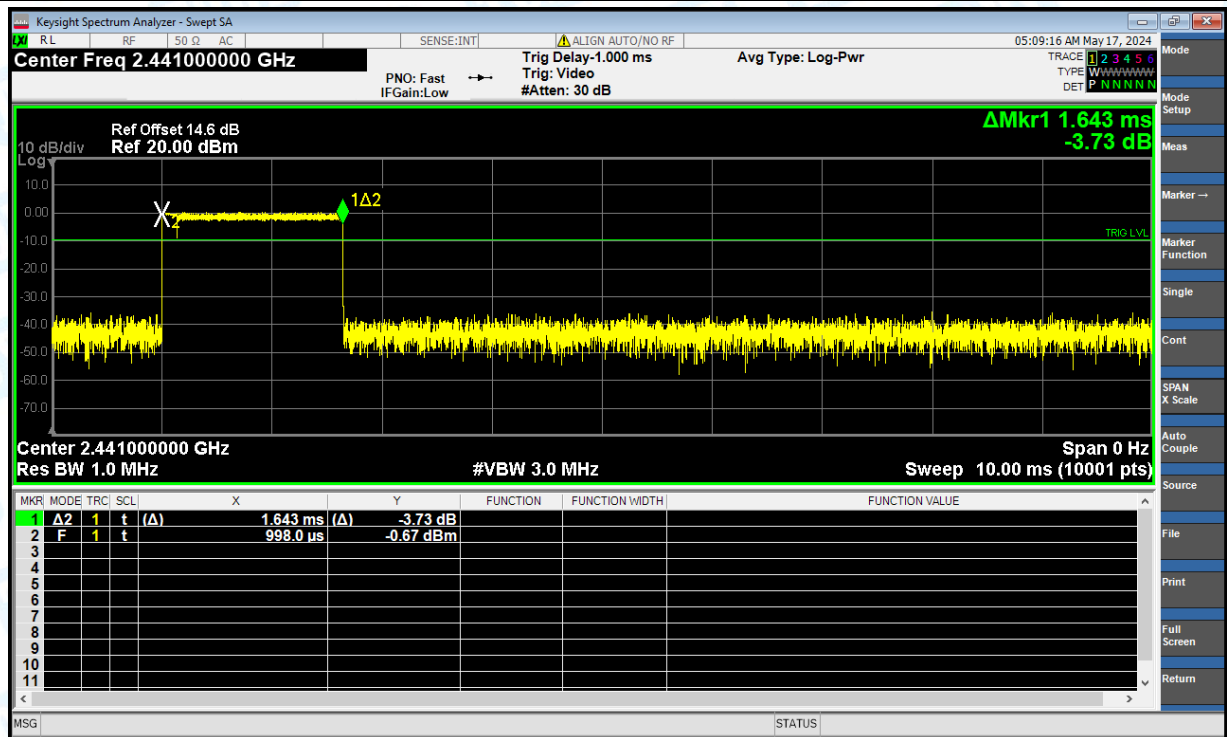
Dwell NVNT 1-DH5 2441MHz Ant1



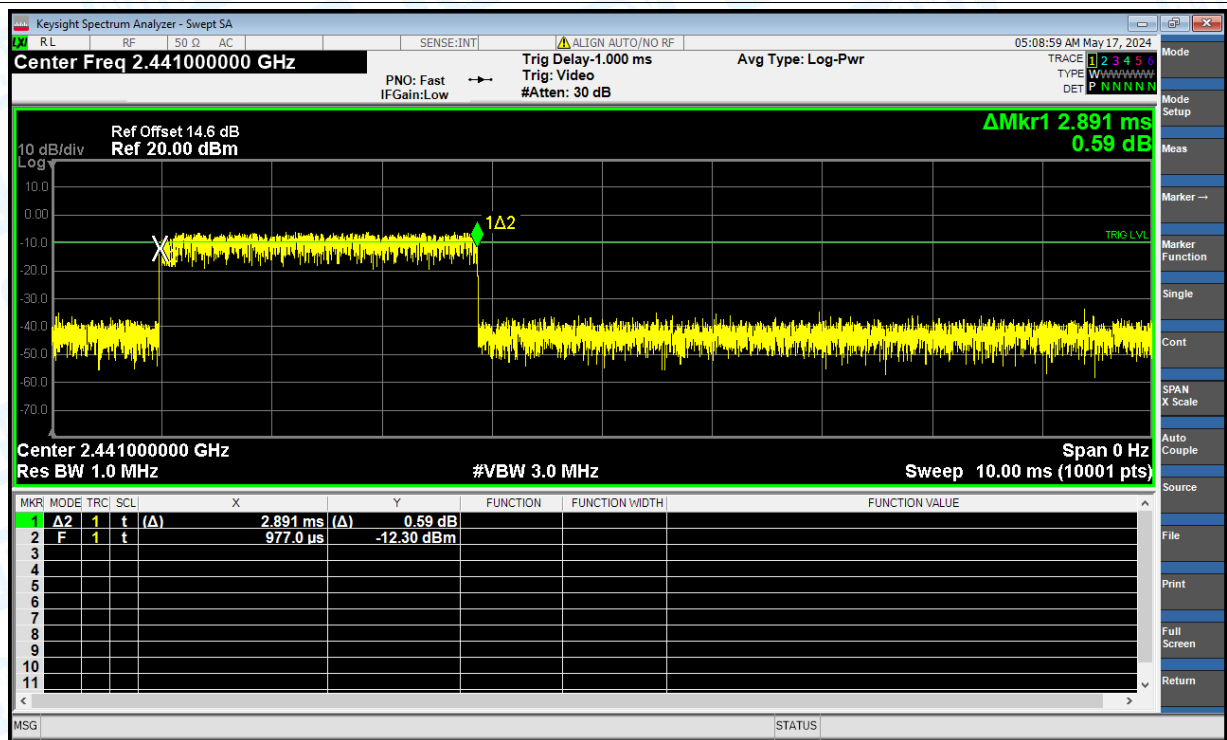
Dwell NVNT 2-DH1 2441MHz Ant1



Dwell NVNT 2-DH3 2441MHz Ant1



Dwell NVNT 2-DH5 2441MHz Ant1



-----END OF THE REPORT-----