Appendix B

RF Test Data for BT LE (Conducted Measurement)

Product Name: Touch all in one

Test Model: 1561E-IDT-C02F-ECM10

Environmental Conditions

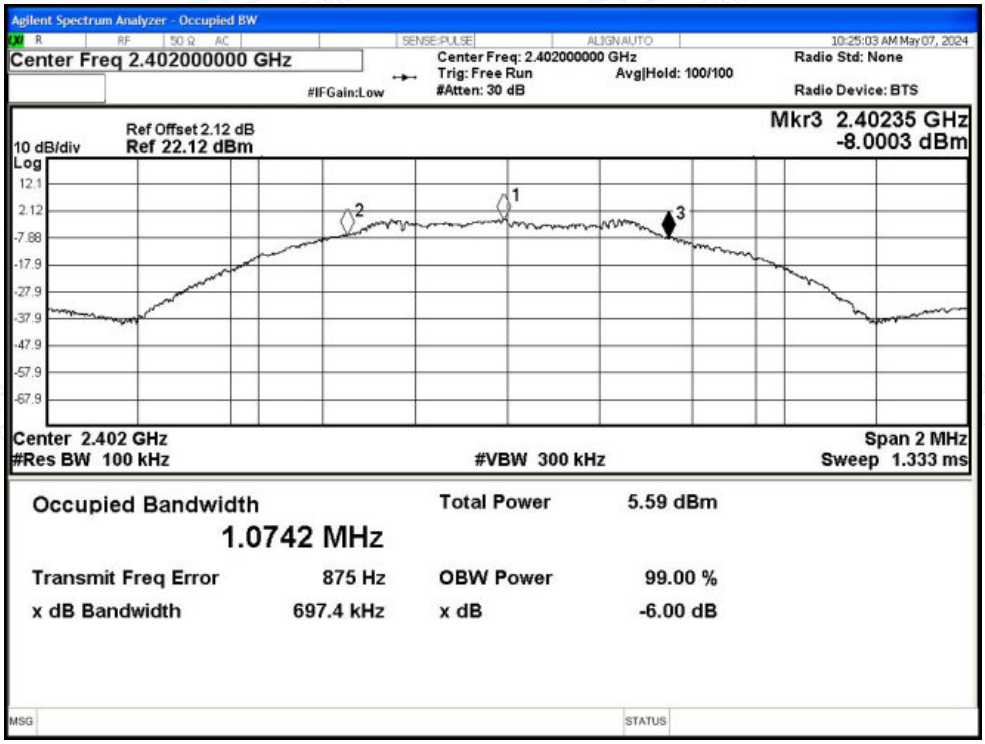
Temperature:	23.8 ° C
Relative Humidity:	52.3%
ATM Pressure:	100.0 kPa
Test Engineer:	Eason Zhou
Supervised by:	Nick Peng

B.1 -6dB Bandwidth

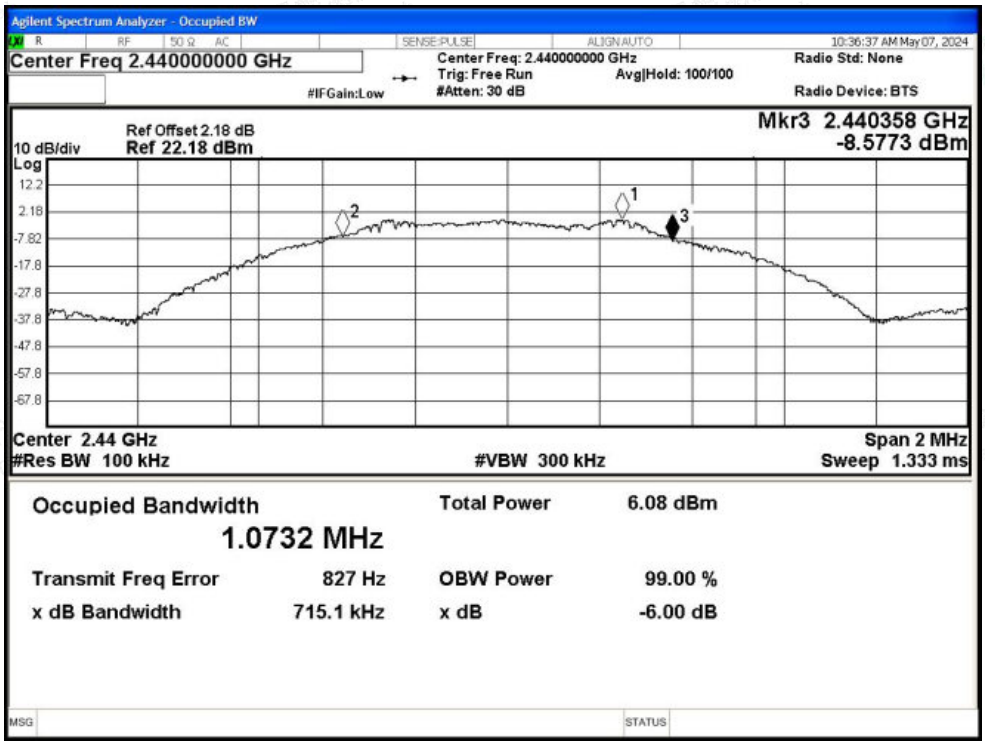
Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	BLE 1M	2402	Ant1	0.697	>=0.5	Pass
NVNT	BLE 1M	2440	Ant1	0.715	>=0.5	Pass
NVNT	BLE 1M	2480	Ant1	0.709	>=0.5	Pass
NVNT	BLE 2M	2402	Ant1	1.168	>=0.5	Pass
NVNT	BLE 2M	2440	Ant1	1.143	>=0.5	Pass
NVNT	BLE 2M	2480	Ant1	1.107	>=0.5	Pass

Test Graphs

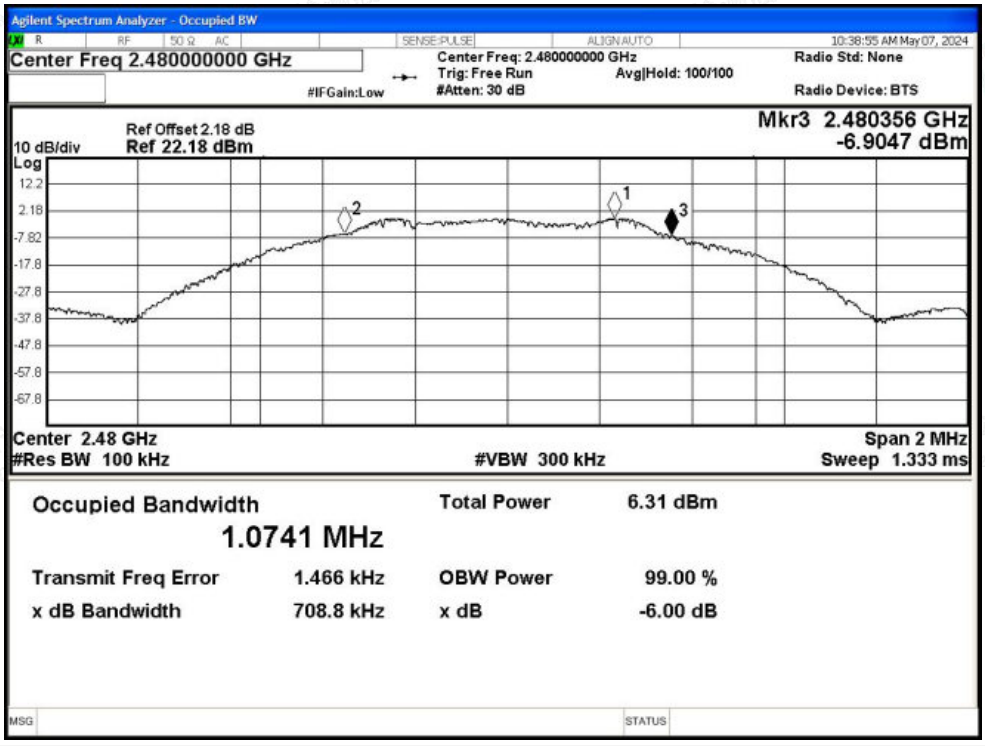
-6dB Bandwidth NVNT BLE 1M 2402MHz Ant1



-6dB Bandwidth NVNT BLE 1M 2440MHz Ant1

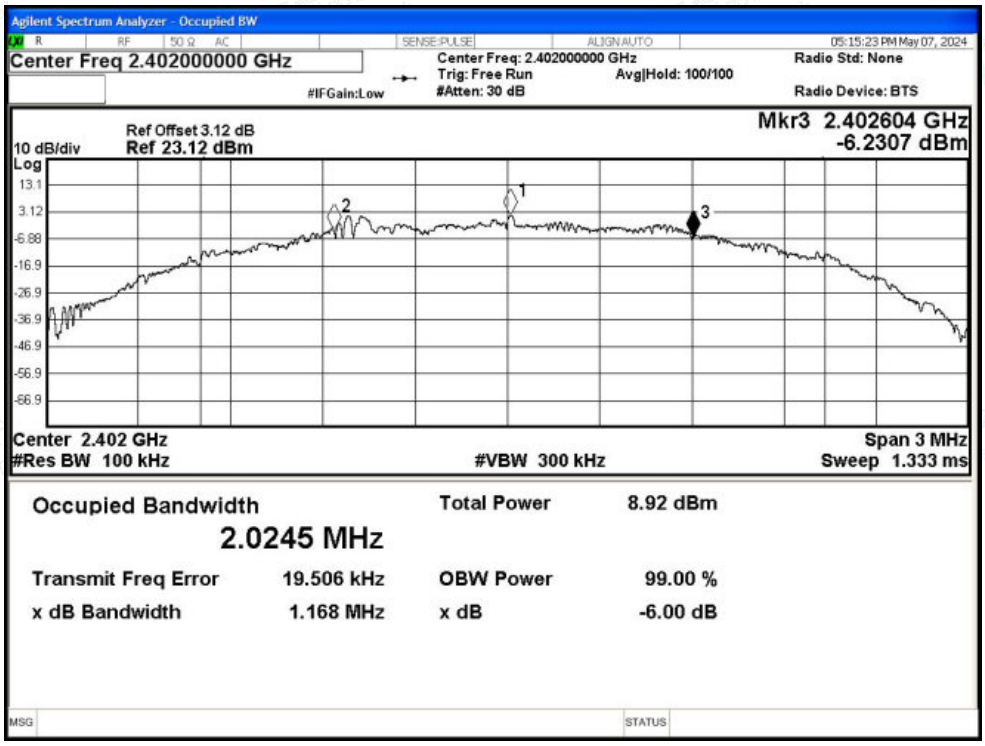


-6dB Bandwidth NVNT BLE 1M 2480MHz Ant1

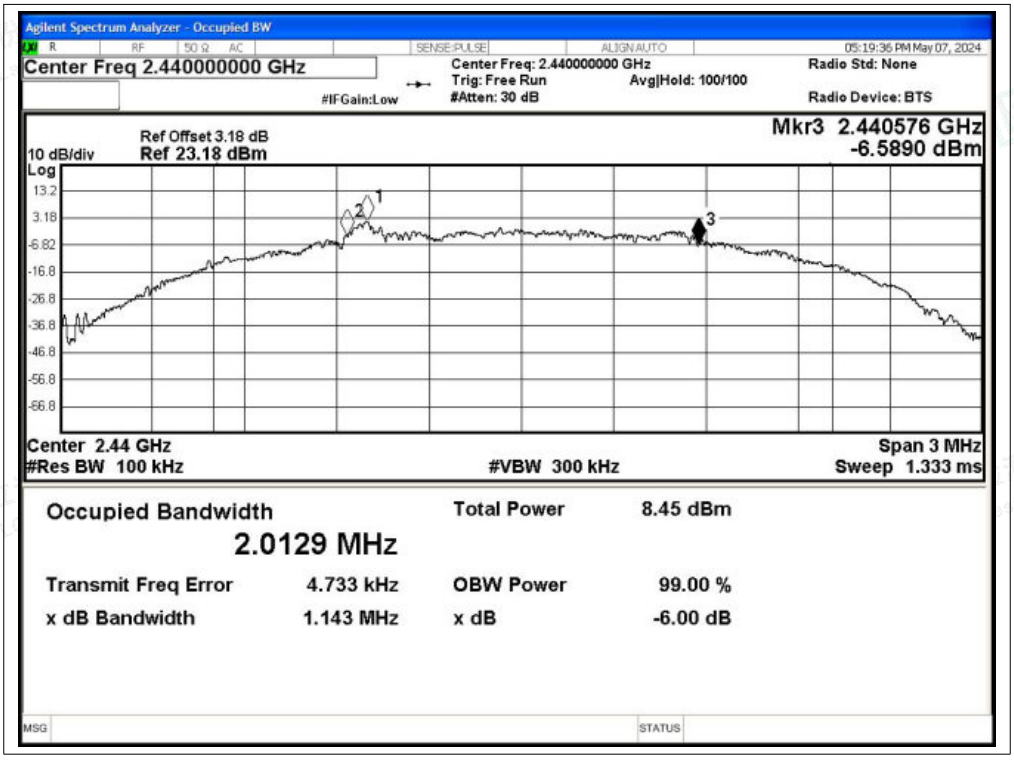


Test Graphs

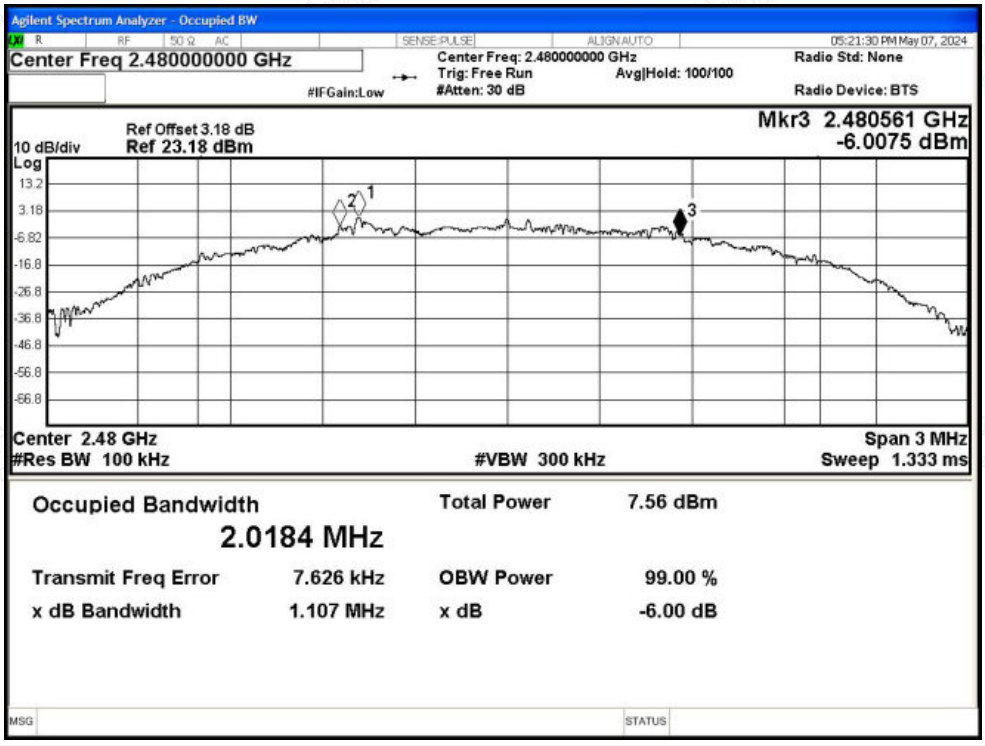
-6dB Bandwidth NVNT BLE 2M 2402MHz Ant1



-6dB Bandwidth NVNT BLE 2M 2440MHz Ant1


Agilent Spectrum Analyzer - Occupied BW
Center Freq 2.440000000 GHz
Center Freq: 2.440000000 GHz
Trig: Free Run
#Atten: 30 dB
Avg|Hold: 100/100
#IFGain:Low
Radio Std: None
Radio Device: BTS
05:19:36 PM May 07, 2024
Ref Offset 3.18 dB
10 dB/div
Ref 23.18 dBm
Log
Mkr3 2.440576 GHz
-6.5890 dBm
Center 2.44 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3 MHz
Sweep 1.333 ms
Occupied Bandwidth
2.0129 MHz
Total Power 8.45 dBm
Transmit Freq Error 4.733 kHz
OBW Power 99.00 %
x dB Bandwidth 1.143 MHz
x dB -6.00 dB
MSG
STATUS

-6dB Bandwidth NVNT BLE 2M 2480MHz Ant1

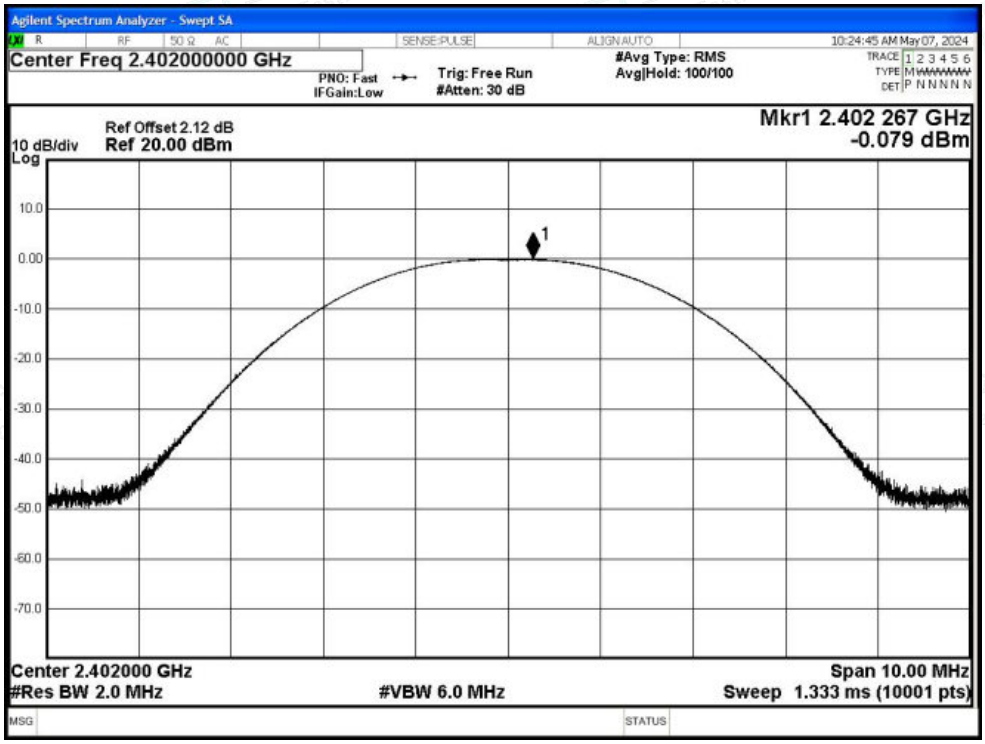


B.2 Maximum Conducted Output Power

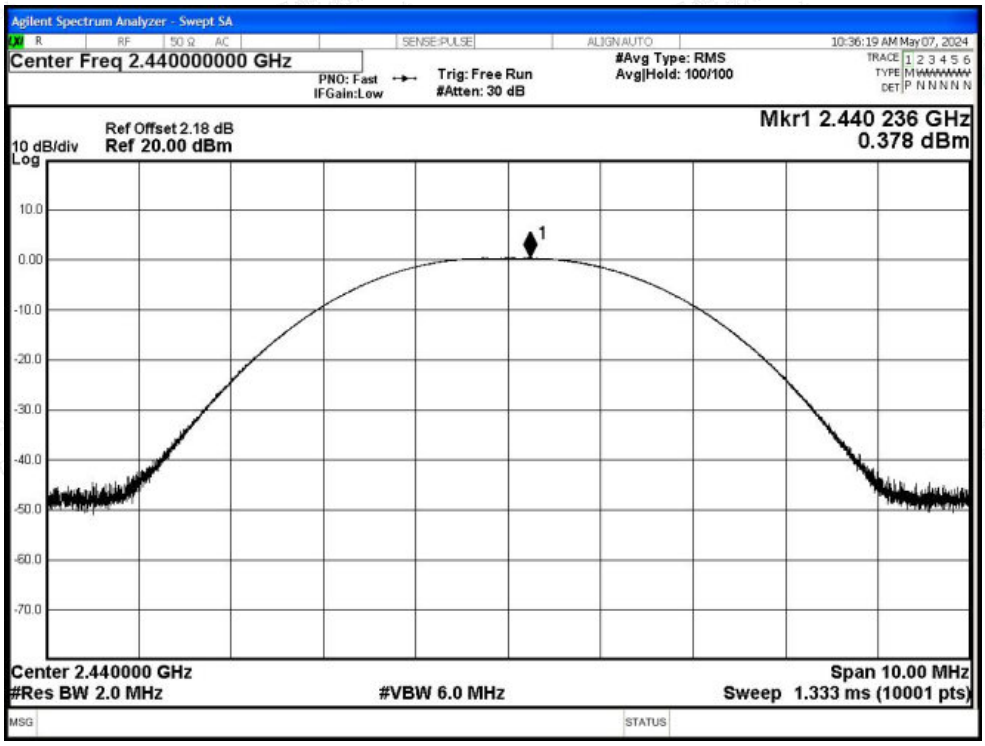
Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Limit (dBm)	Verdict
NVNT	BLE 1M	2402	Ant1	-0.08	30	Pass
NVNT	BLE 1M	2440	Ant1	0.38	30	Pass
NVNT	BLE 1M	2480	Ant1	0.58	30	Pass
NVNT	BLE 2M	2402	Ant1	-0.53	30	Pass
NVNT	BLE 2M	2440	Ant1	-0.46	30	Pass
NVNT	BLE 2M	2480	Ant1	-1.29	30	Pass

Test Graphs

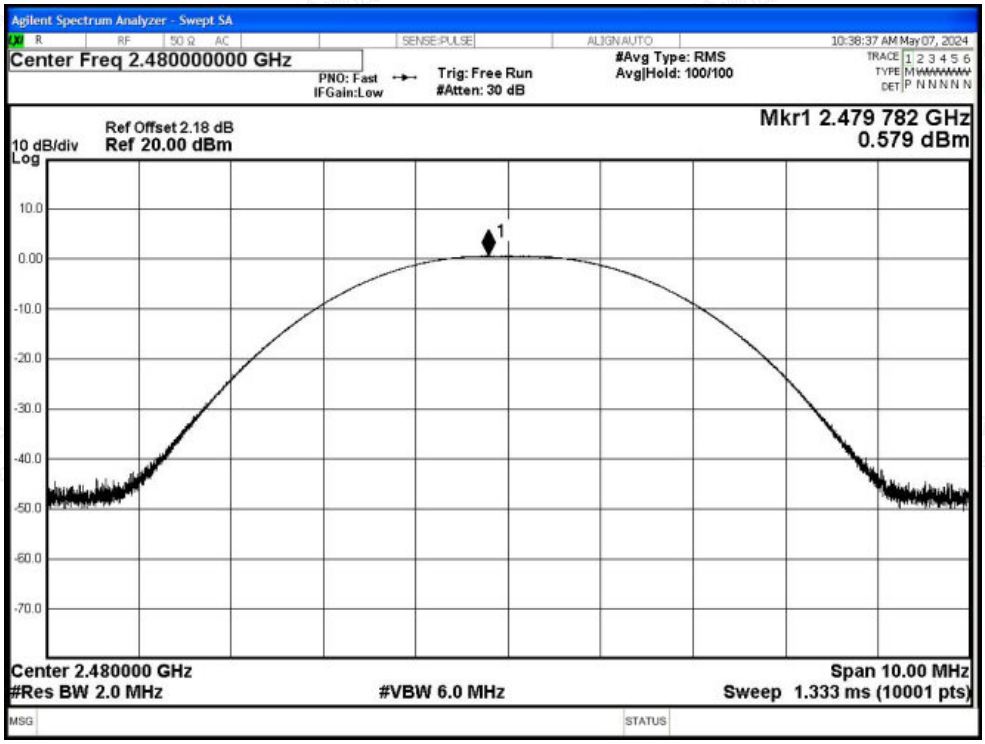
Power NVNT BLE 1M 2402MHz Ant1



Power NVNT BLE 1M 2440MHz Ant1

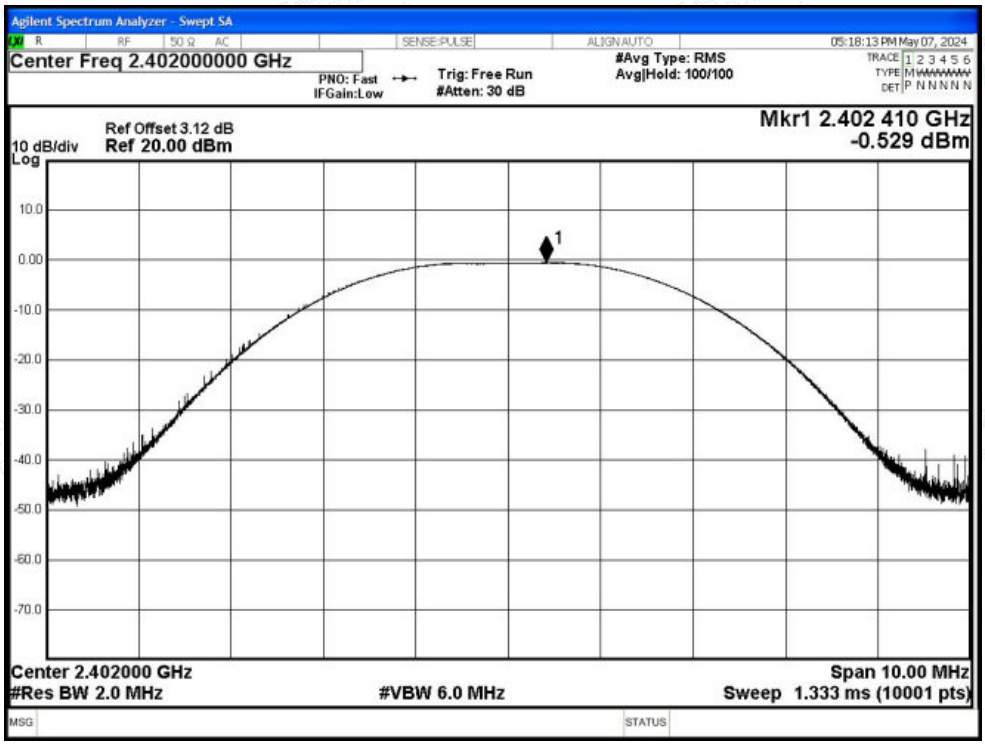


Power NVNT BLE 1M 2480MHz Ant1

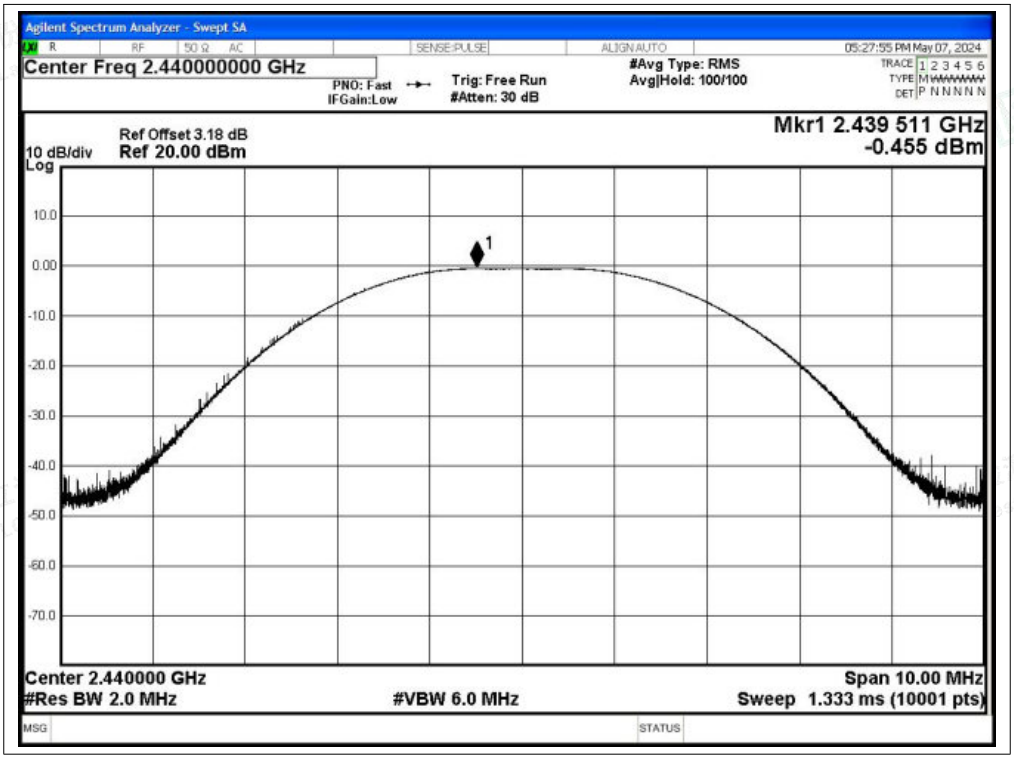


Test Graphs

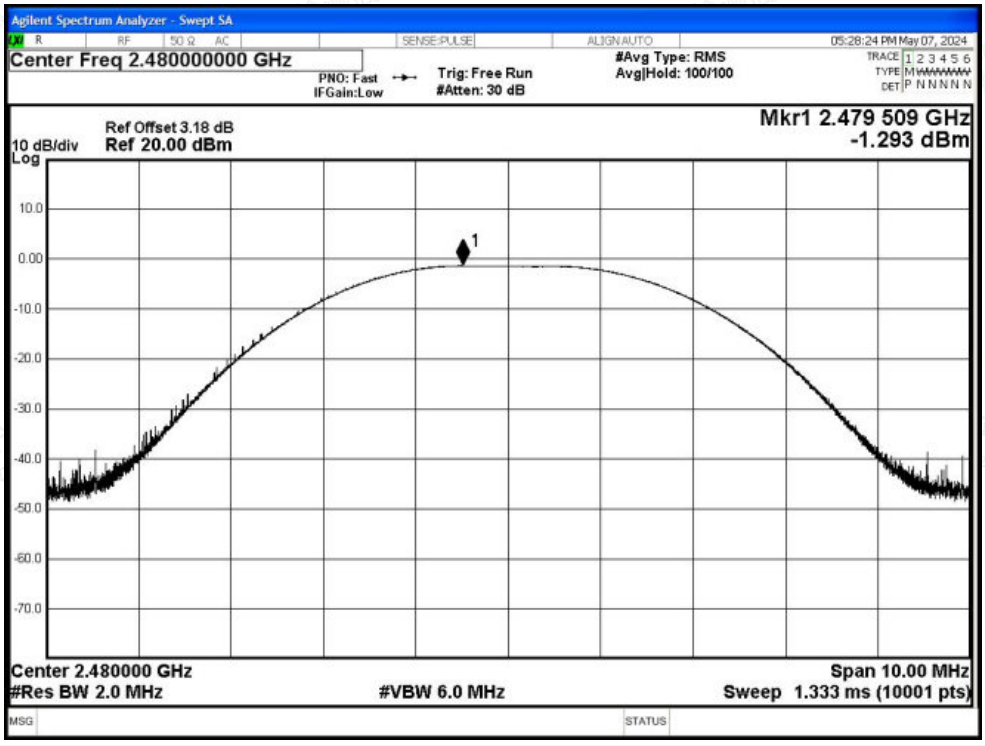
Power NVNT BLE 2M 2402MHz Ant1



Power NVNT BLE 2M 2440MHz Ant1


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.440000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 100/100
05:27:55 PM May 07, 2024
Ref Offset 3.18 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.439 511 GHz
-0.455 dBm
Center 2.440000 GHz
#Res BW 2.0 MHz
#VBW 6.0 MHz
Span 10.00 MHz
Sweep 1.333 ms (10001 pts)

Power NVNT BLE 2M 2480MHz Ant1

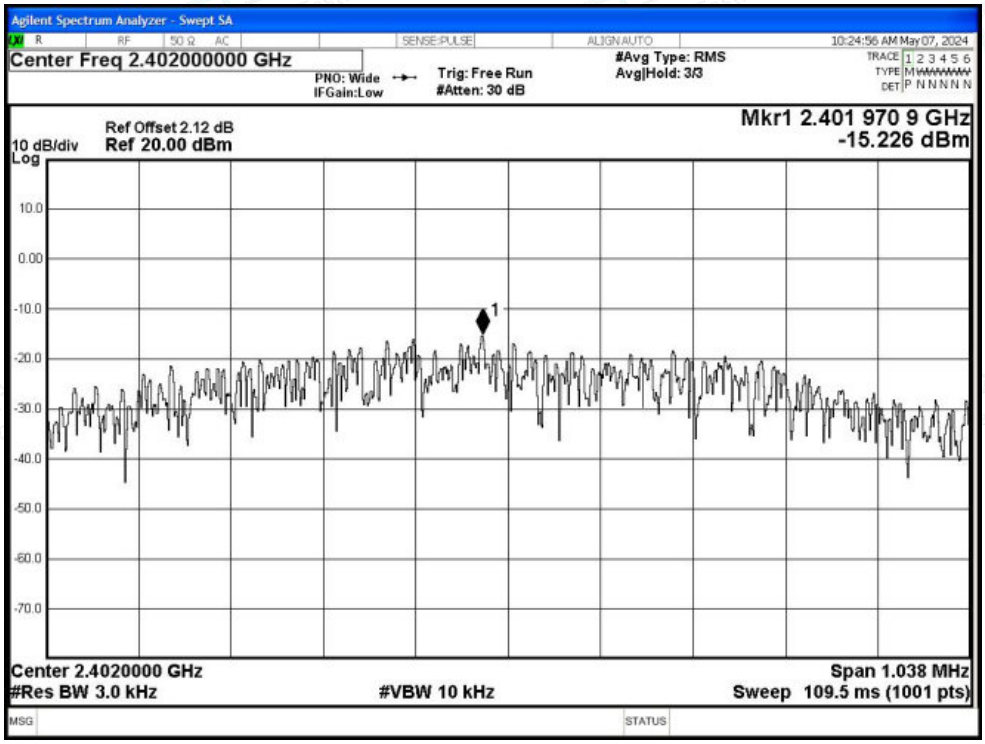


B.3 Maximum Power Spectral Density Level

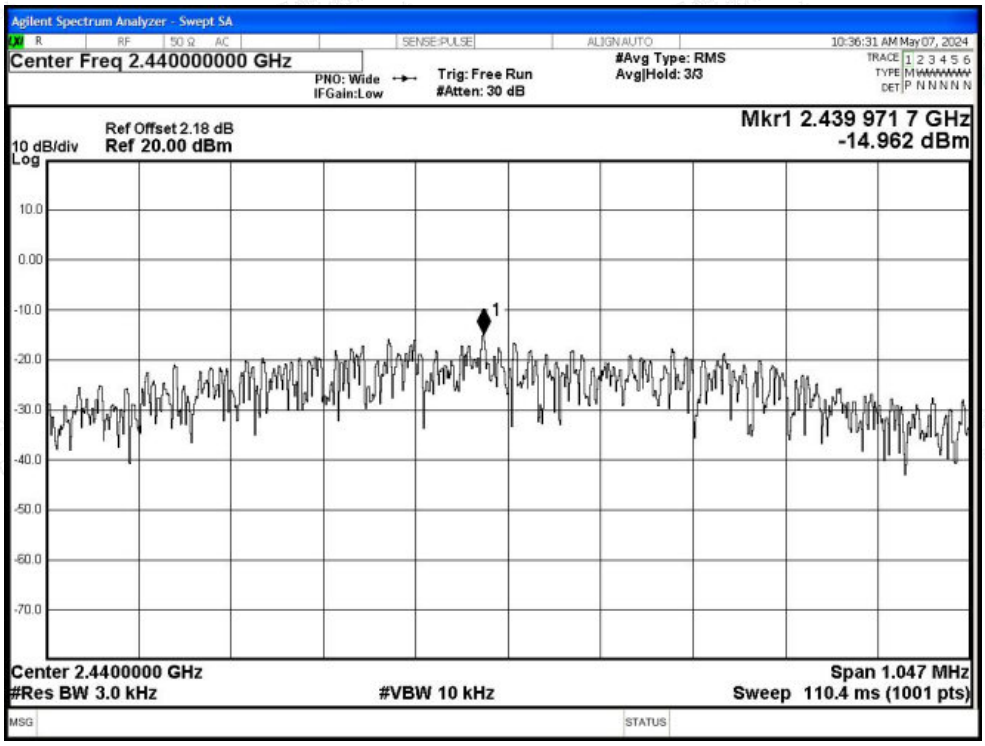
Condition	Mode	Frequency (MHz)	Antenna	Conducted PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	BLE 1M	2402	Ant1	-15.23	8	Pass
NVNT	BLE 1M	2440	Ant1	-14.96	8	Pass
NVNT	BLE 1M	2480	Ant1	-14.65	8	Pass
NVNT	BLE 2M	2402	Ant1	-20.23	8	Pass
NVNT	BLE 2M	2440	Ant1	-19.98	8	Pass
NVNT	BLE 2M	2480	Ant1	-21.23	8	Pass

Test Graphs

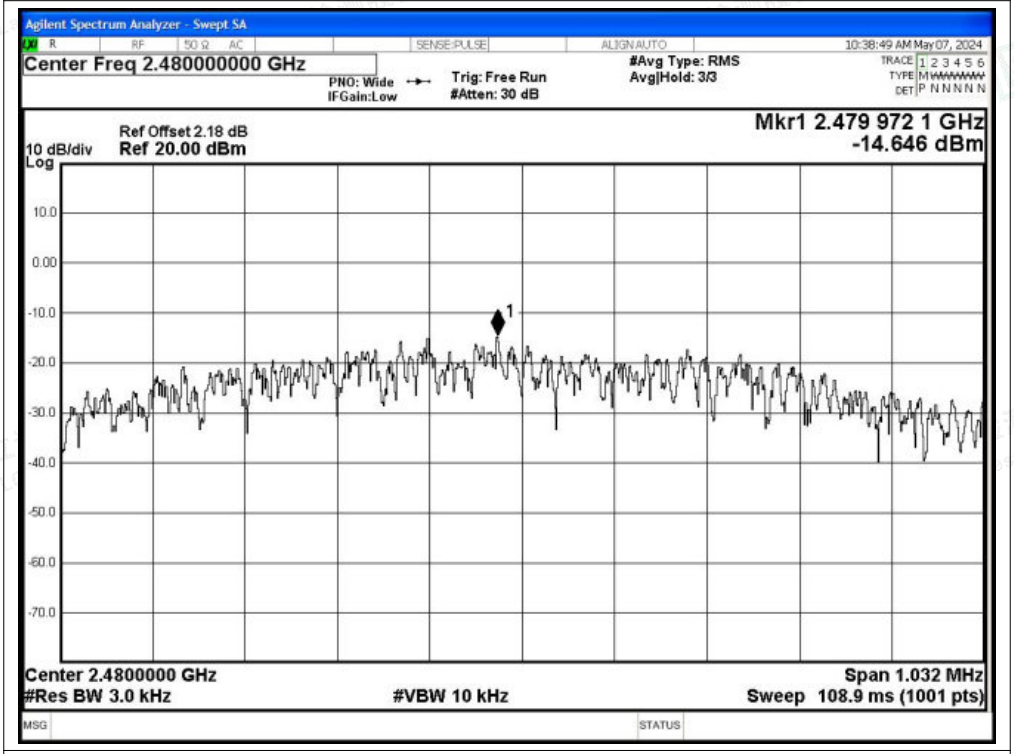
PSD NVNT BLE 1M 2402MHz Ant1



PSD NVNT BLE 1M 2440MHz Ant1

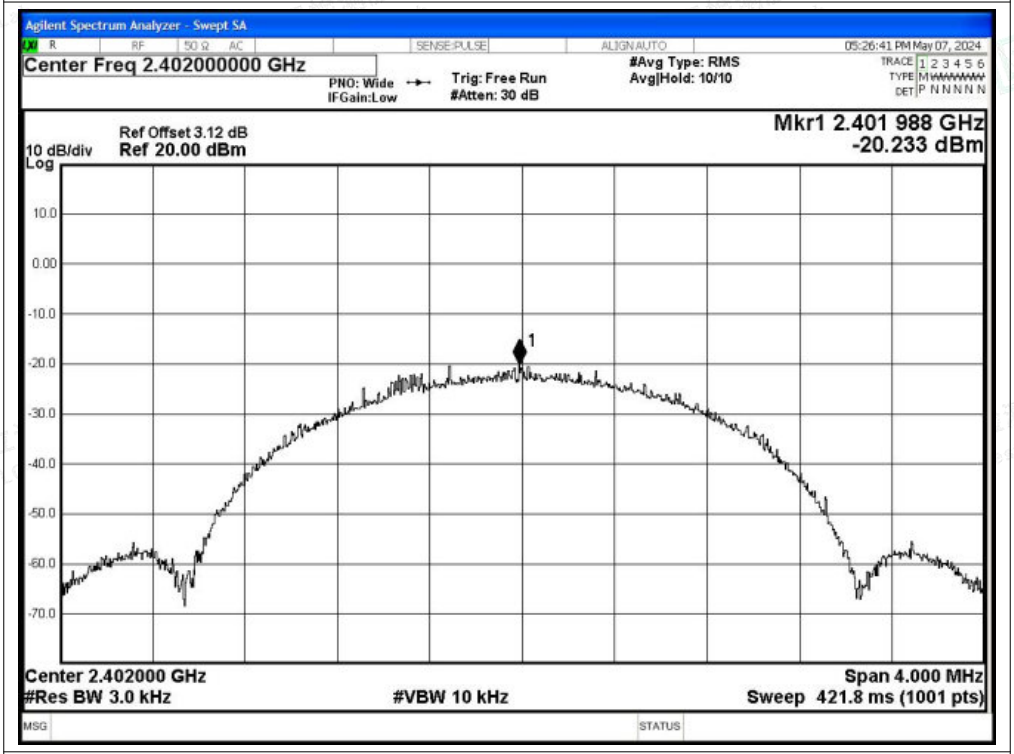


PSD NVNT BLE 1M 2480MHz Ant1

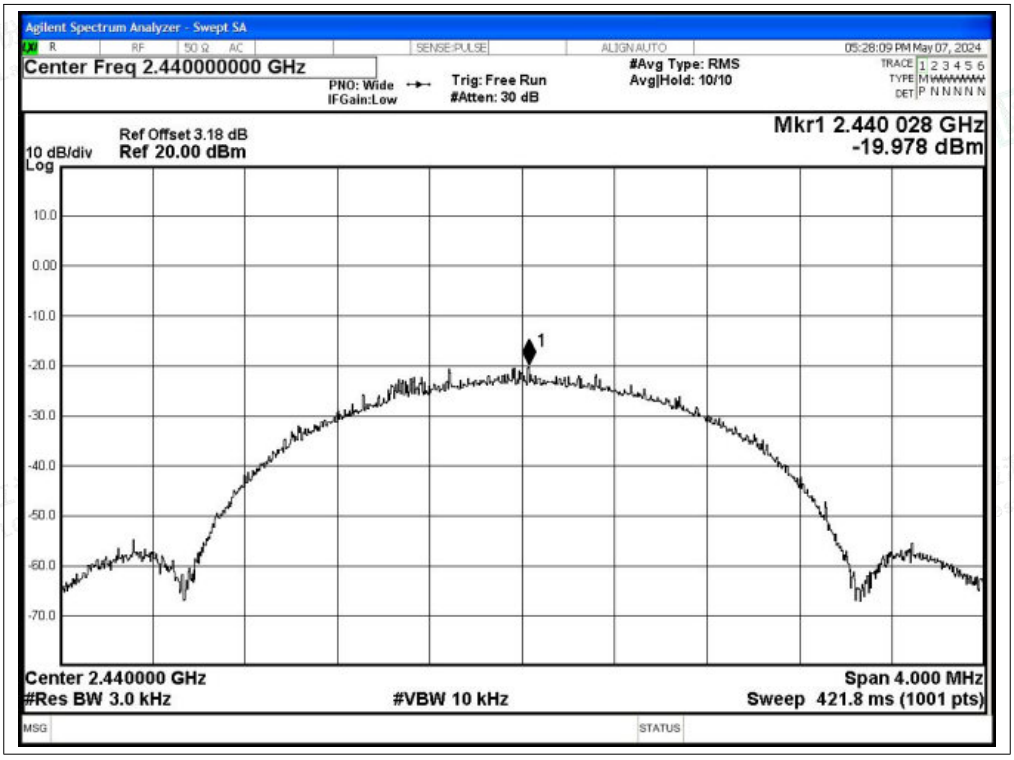


Test Graphs

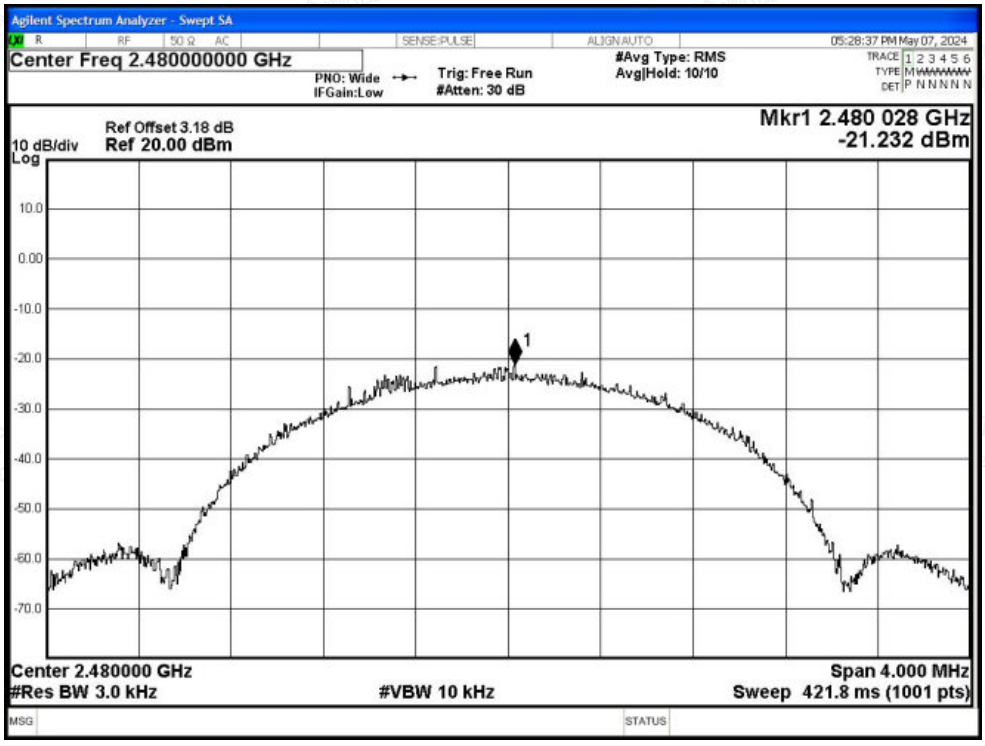
PSD NVNT BLE 2M 2402MHz Ant1



PSD NVNT BLE 2M 2440MHz Ant1


Agilent Spectrum Analyzer - Swept SA
05:28:09 PM May 07, 2024
Center Freq 2.440000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 10/10
Ref Offset 3.18 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.440 028 GHz
-19.978 dBm
Center 2.440000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 4.000 MHz
Sweep 421.8 ms (1001 pts)

PSD NVNT BLE 2M 2480MHz Ant1

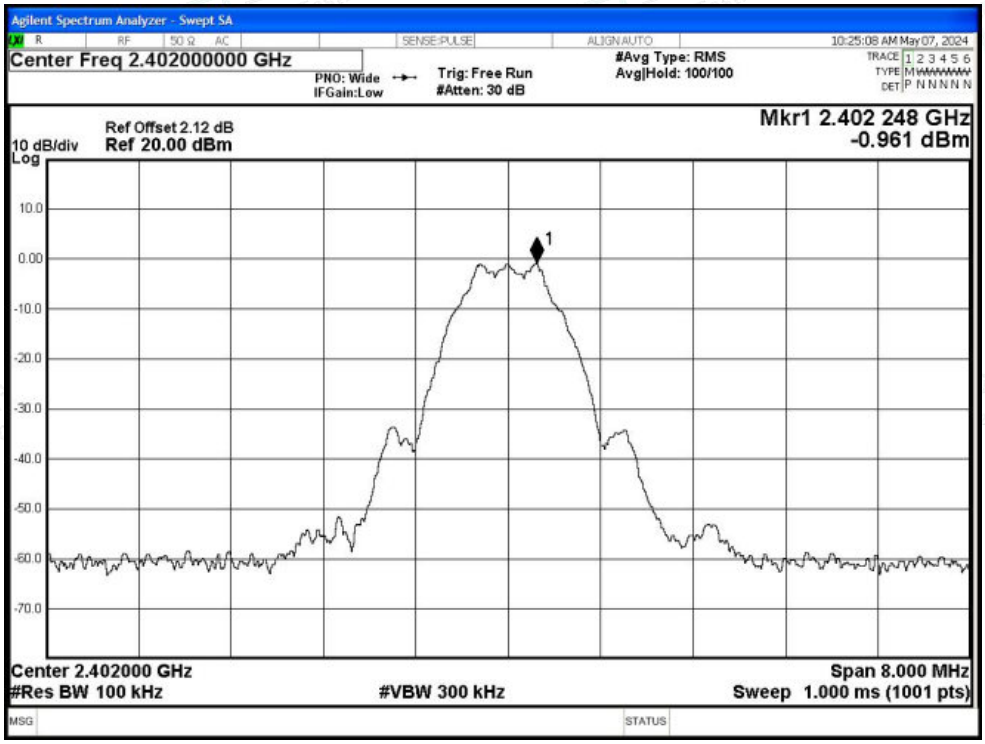


B.4 Band Edge

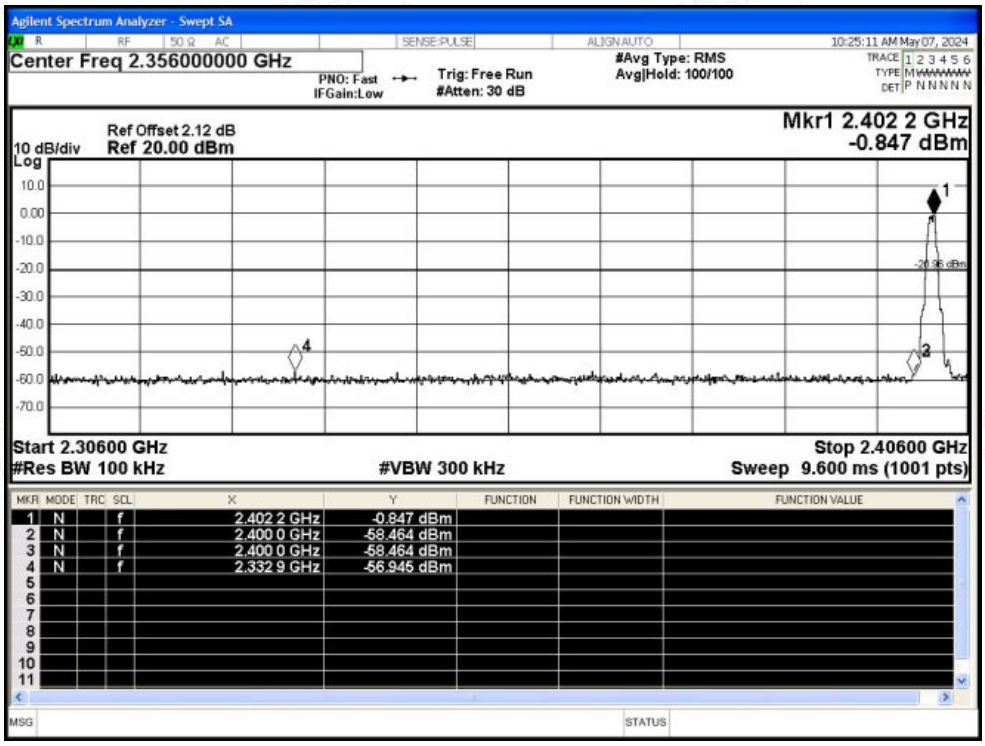
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	Ant1	-55.98	-20	Pass
NVNT	BLE 1M	2480	Ant1	-56.65	-20	Pass
NVNT	BLE 2M	2402	Ant1	-44.08	-20	Pass
NVNT	BLE 2M	2480	Ant1	-55.52	-20	Pass

Test Graphs

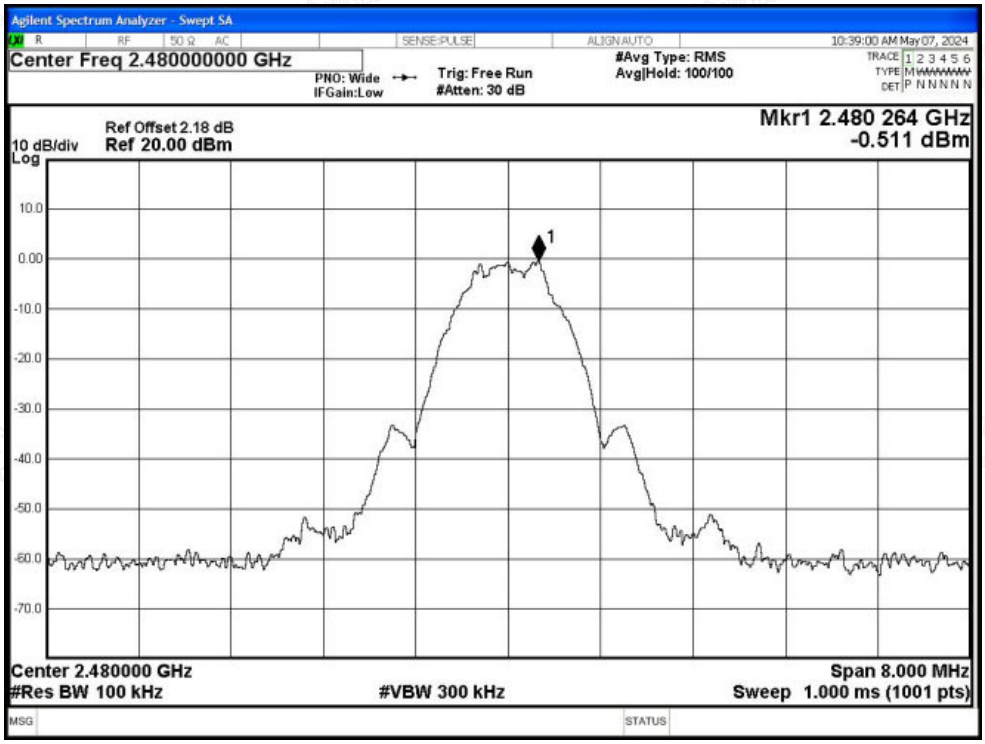
Band Edge NVNT BLE 1M 2402MHz Ant1 Ref



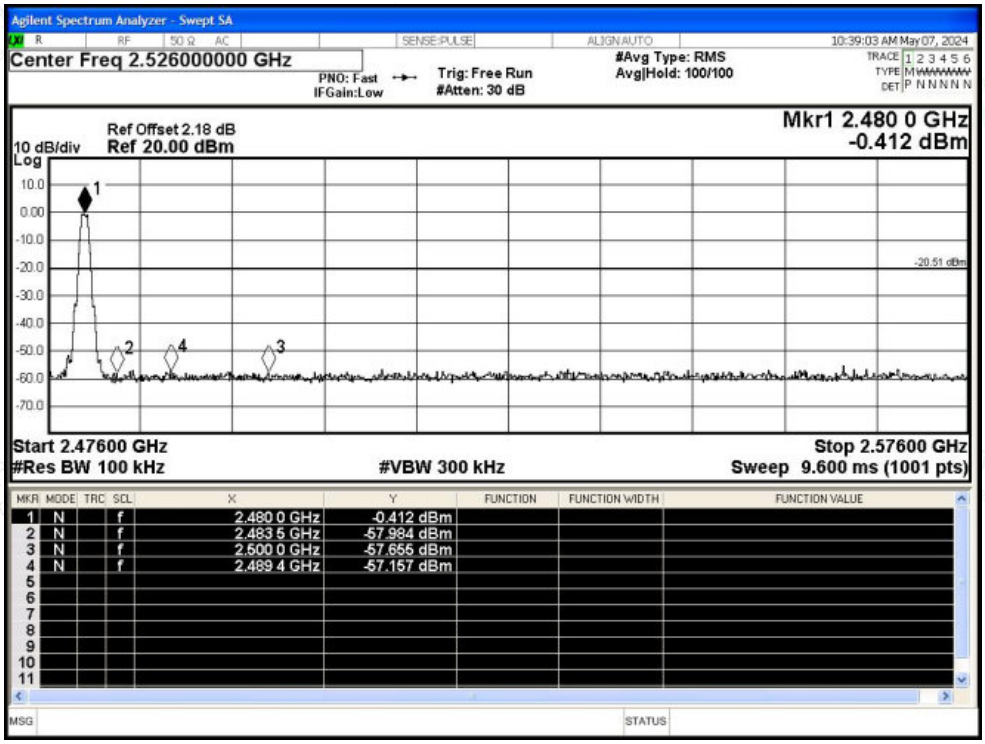
Band Edge NVNT BLE 1M 2402MHz Ant1 Emission



Band Edge NVNT BLE 1M 2480MHz Ant1 Ref

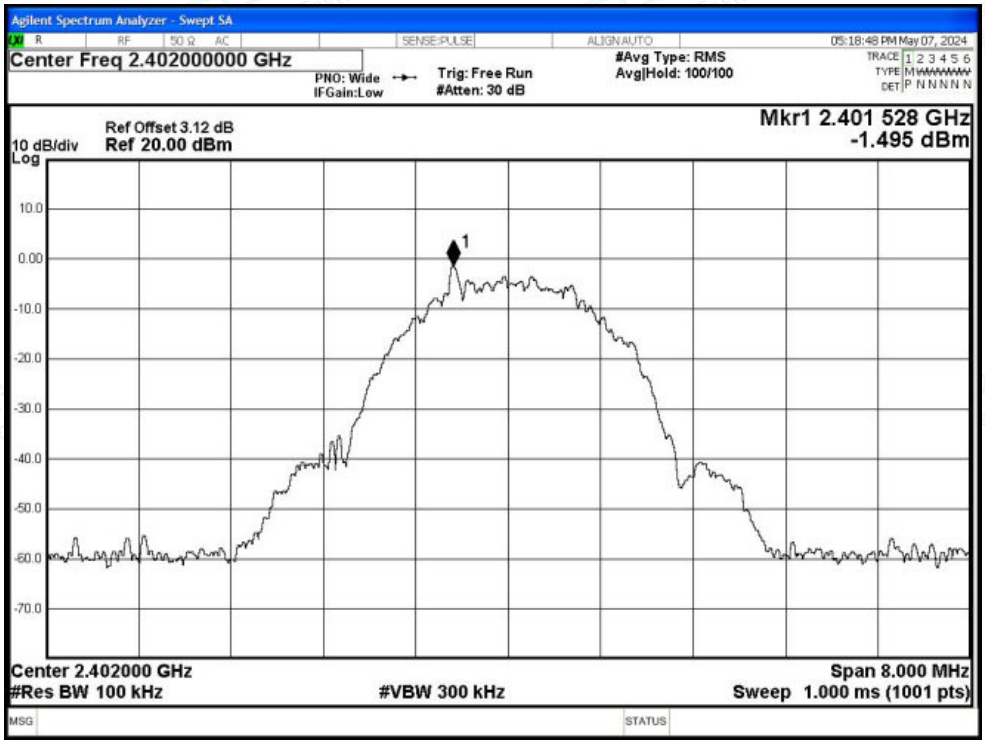


Band Edge NVNT BLE 1M 2480MHz Ant1 Emission

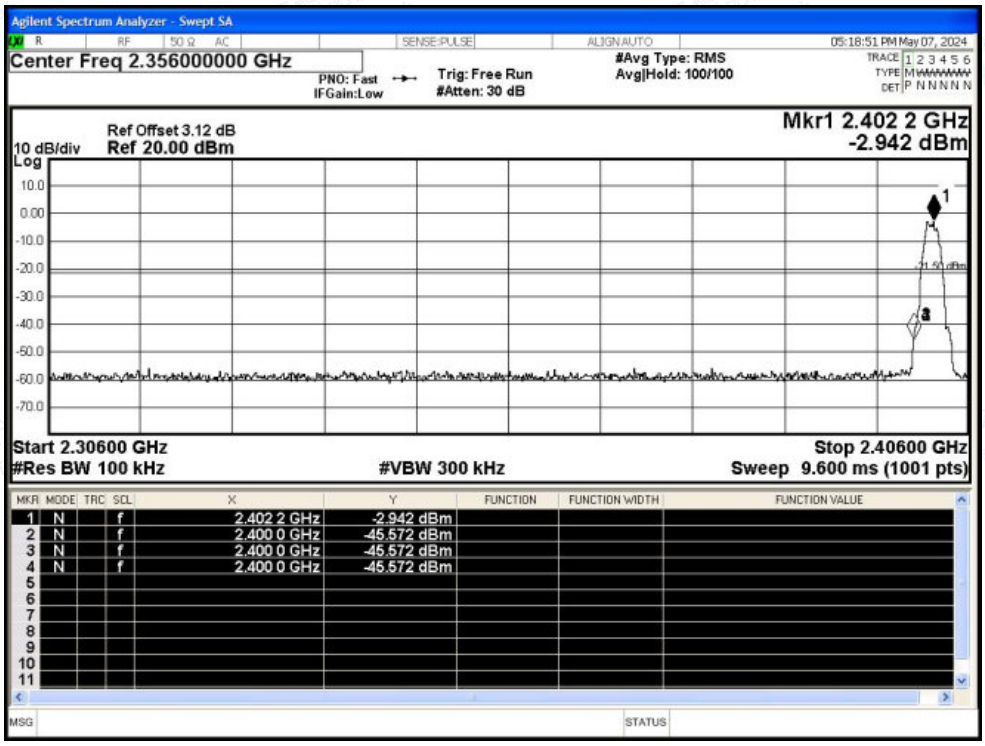


Test Graphs

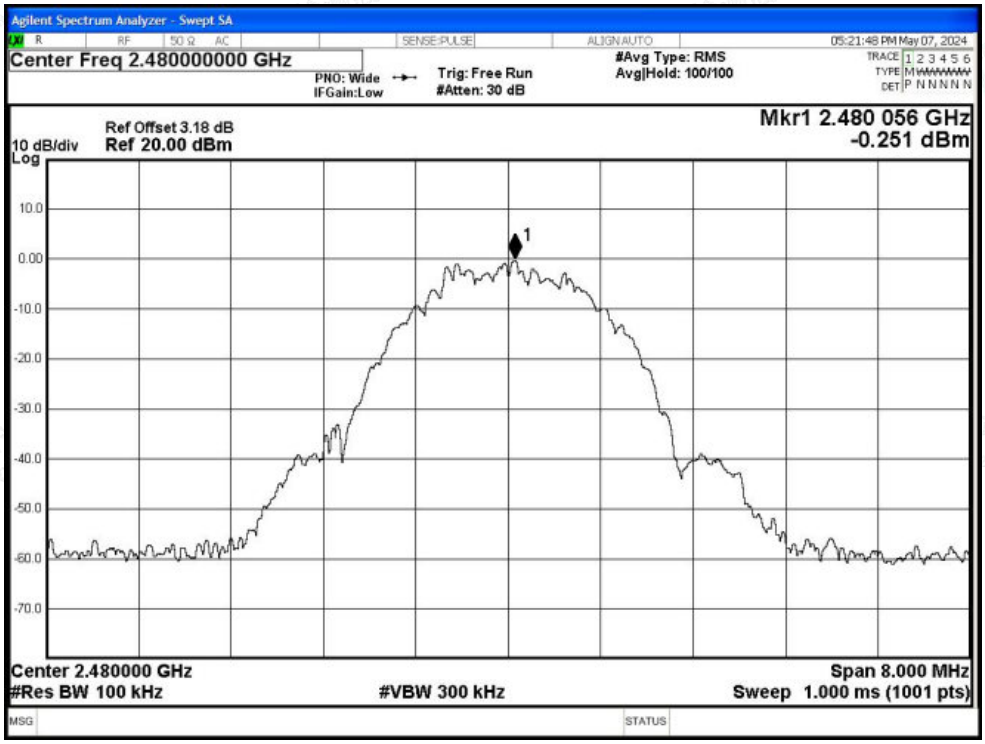
Band Edge NVNT BLE 2M 2402MHz Ant1 Ref



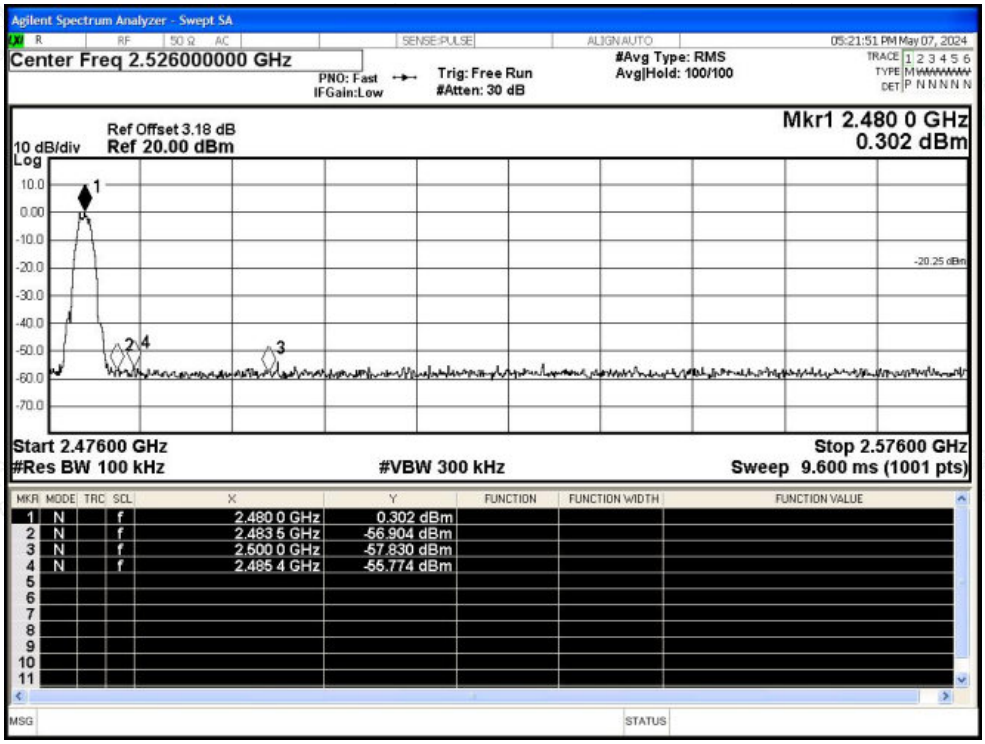
Band Edge NVNT BLE 2M 2402MHz Ant1 Emission



Band Edge NVNT BLE 2M 2480MHz Ant1 Ref



Band Edge NVNT BLE 2M 2480MHz Ant1 Emission

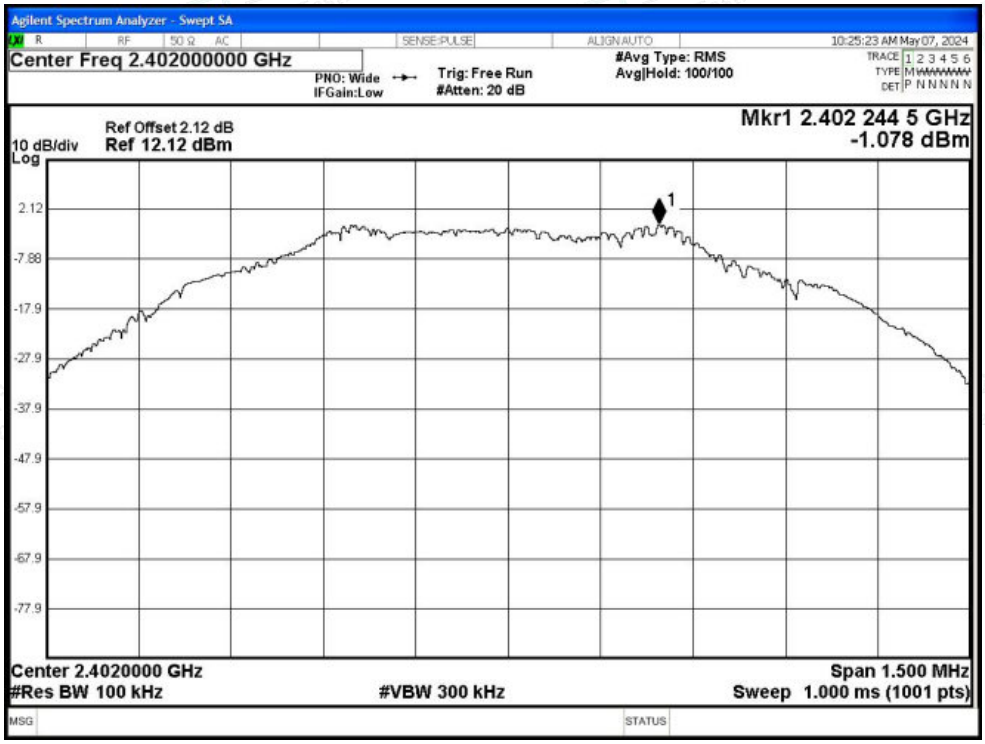


B.5 Conducted RF Spurious Emission

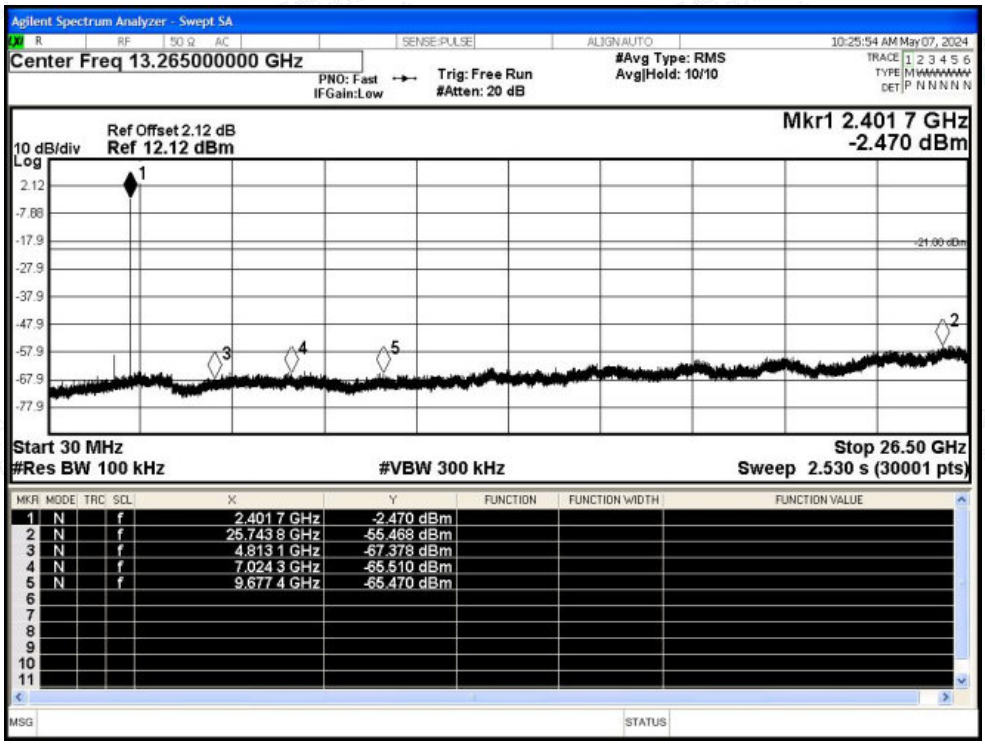
Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	BLE 1M	2402	Ant1	-54.39	-20	Pass
NVNT	BLE 1M	2440	Ant1	-54.72	-20	Pass
NVNT	BLE 1M	2480	Ant1	-54.6	-20	Pass
NVNT	BLE 2M	2402	Ant1	-53.18	-20	Pass
NVNT	BLE 2M	2440	Ant1	-55.1	-20	Pass
NVNT	BLE 2M	2480	Ant1	-49.67	-20	Pass

Test Graphs

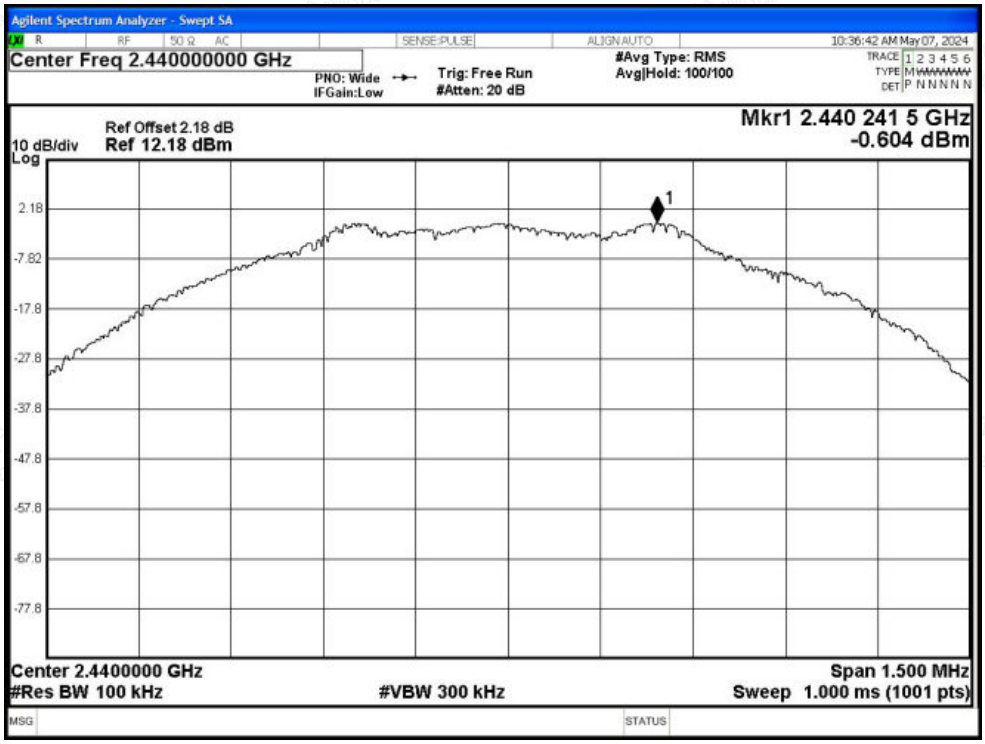
Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Ref



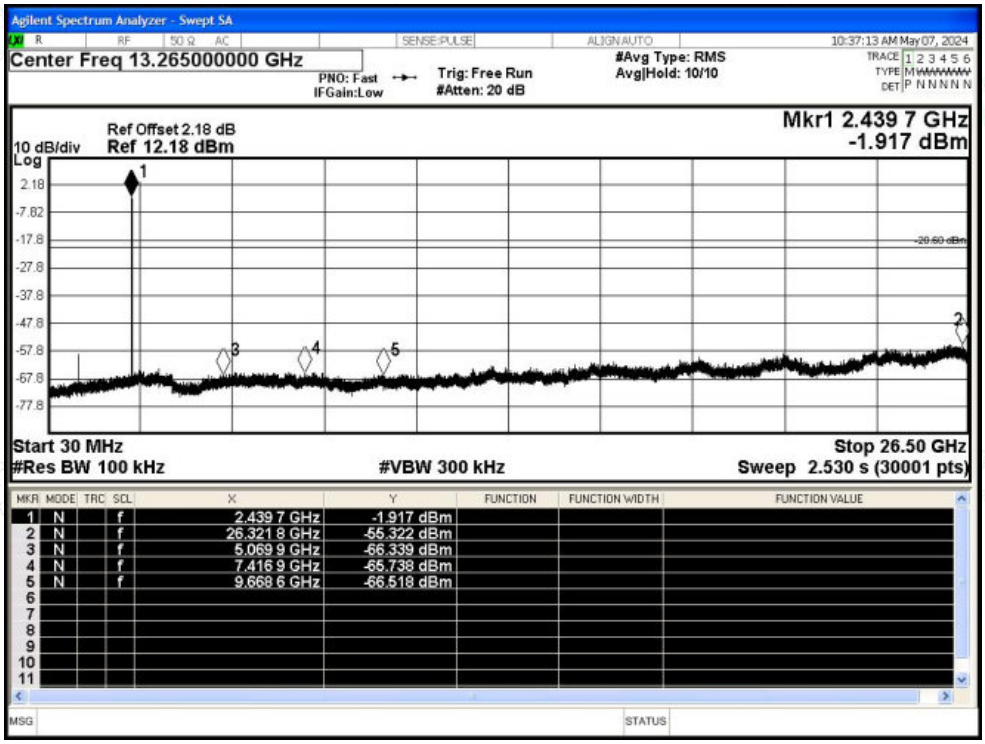
Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Emission



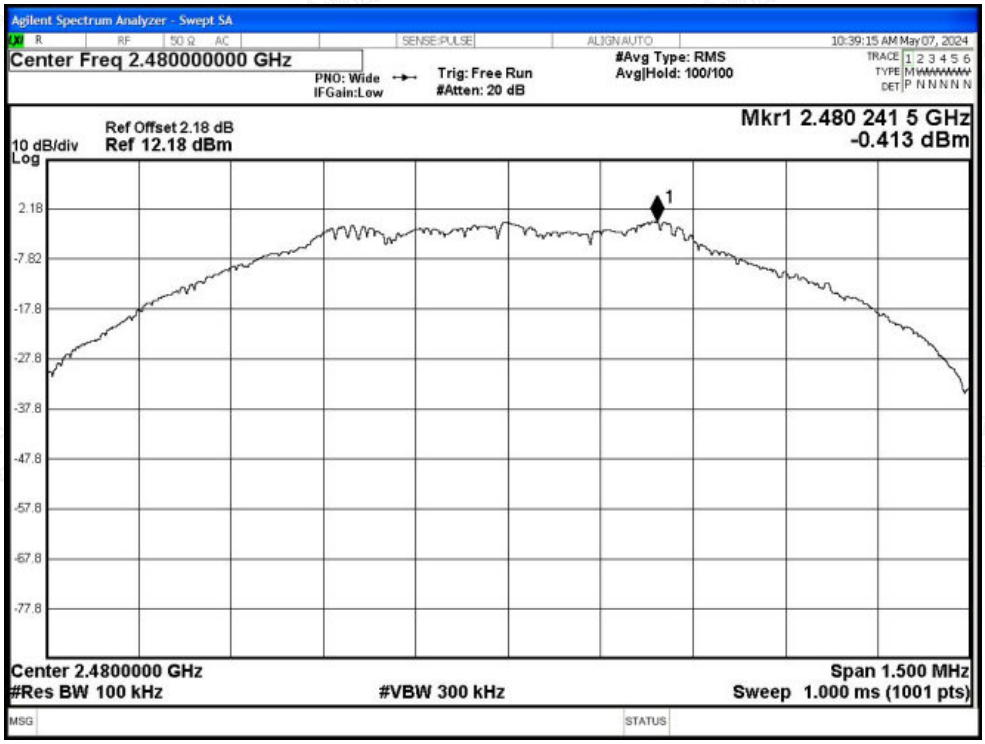
Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Ref



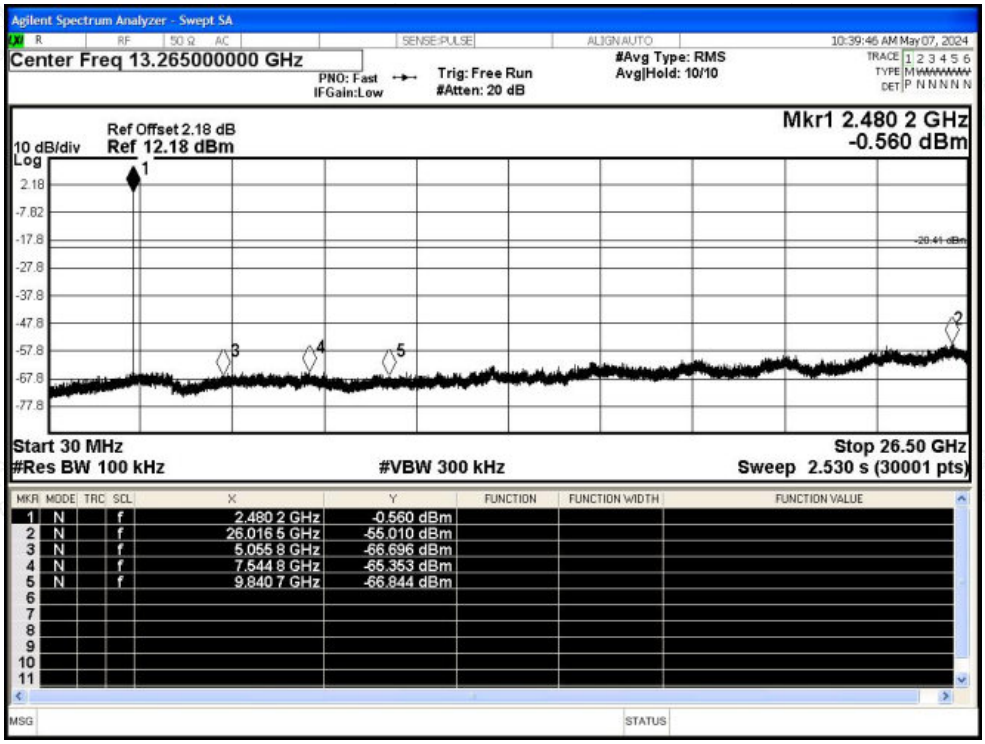
Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Emission



Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Ref

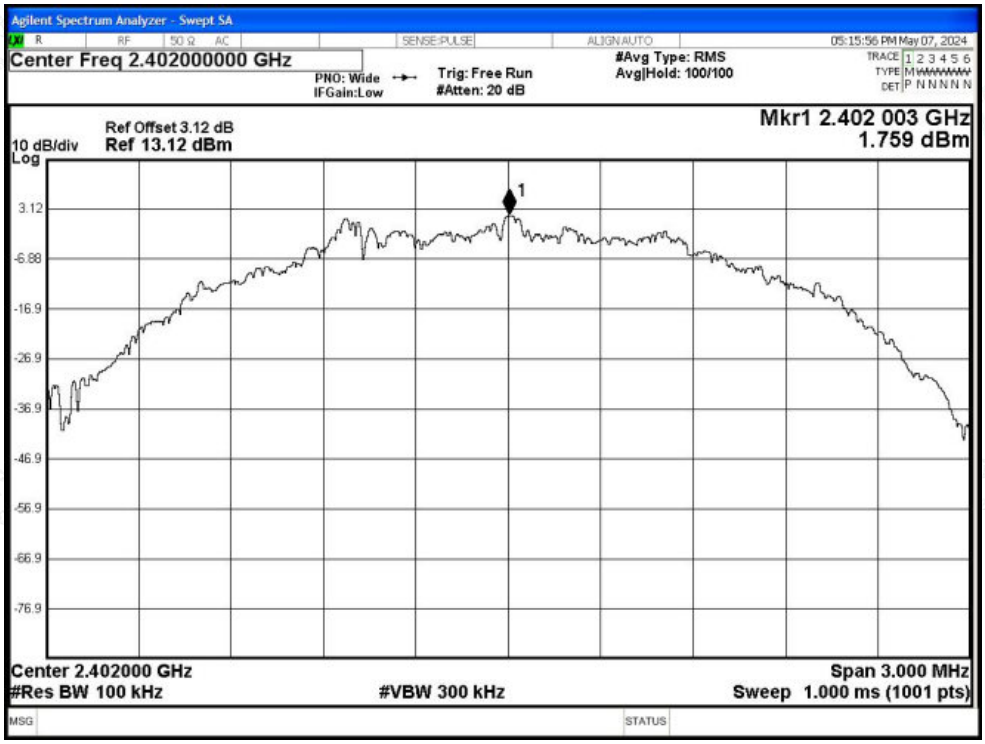


Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Emission

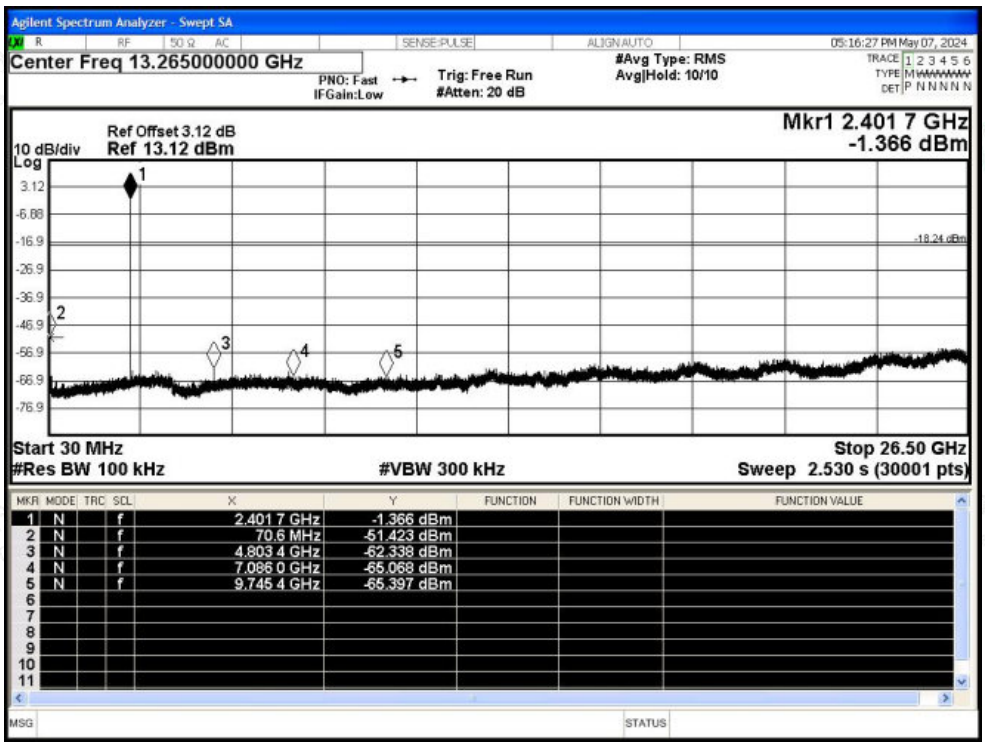


Test Graphs

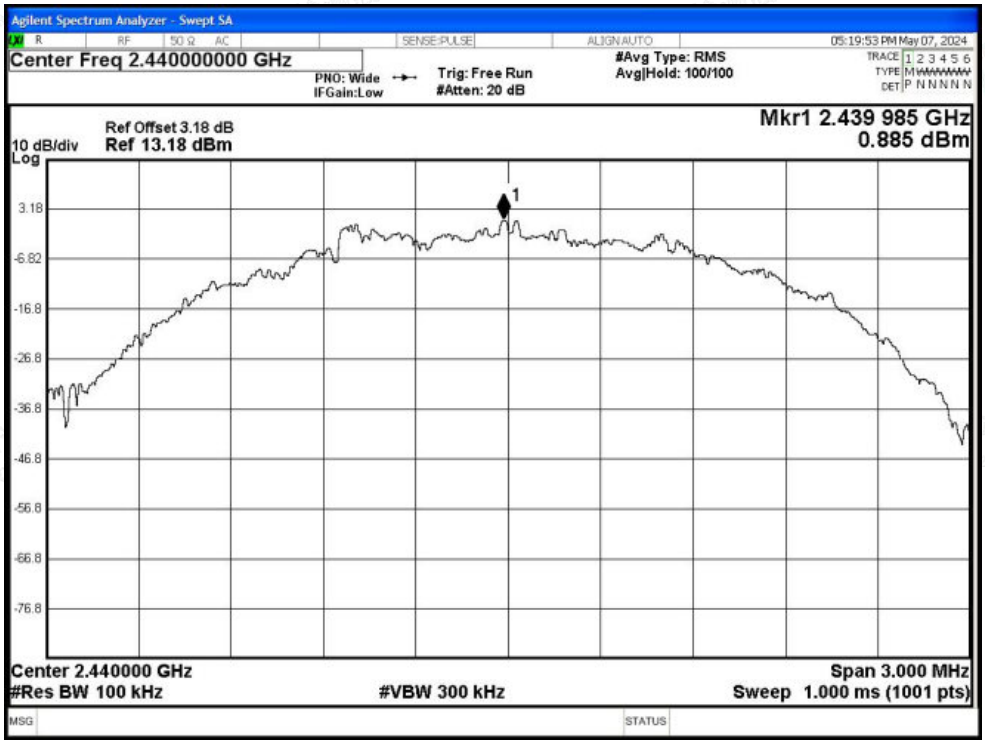
Tx. Spurious NVNT BLE 2M 2402MHz Ant1 Ref



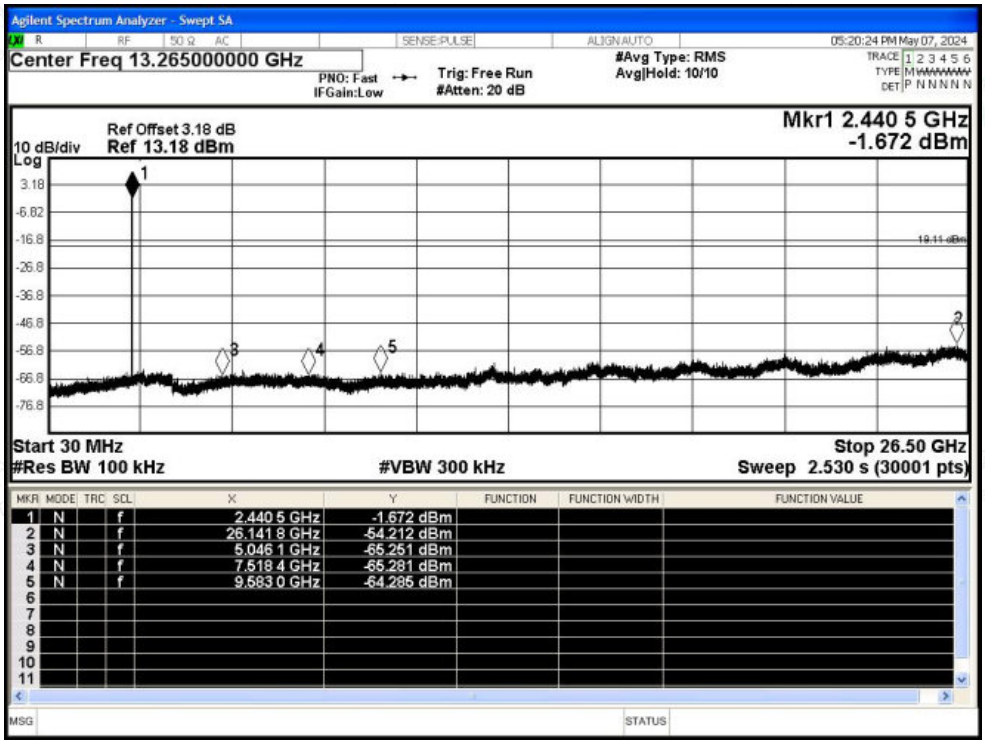
Tx. Spurious NVNT BLE 2M 2402MHz Ant1 Emission



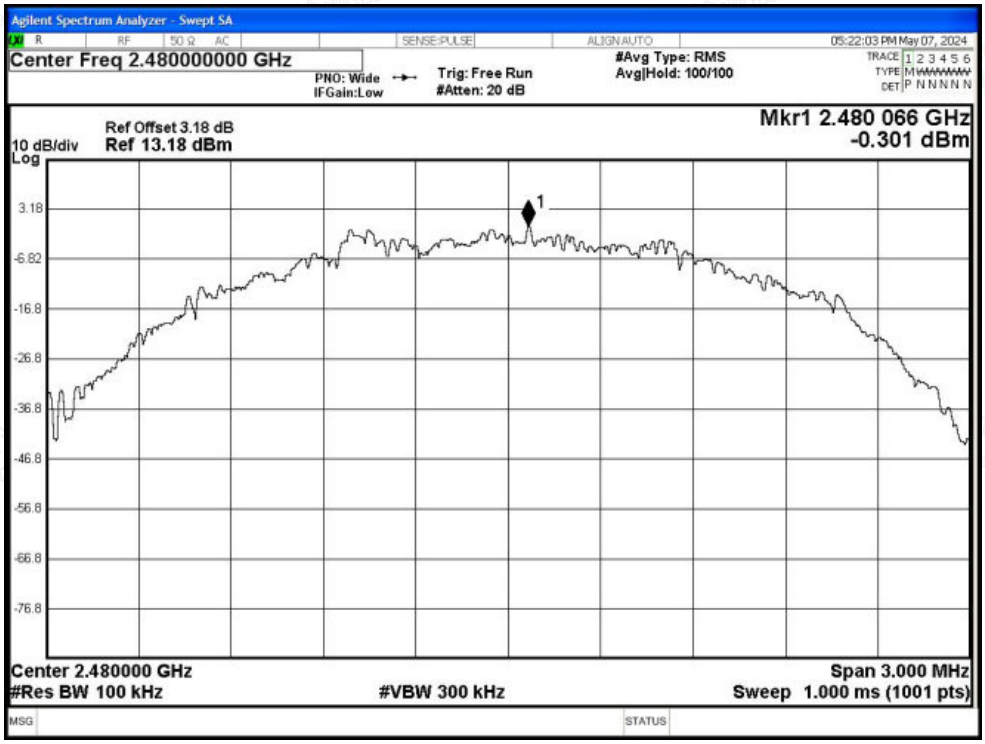
Tx. Spurious NVNT BLE 2M 2440MHz Ant1 Ref



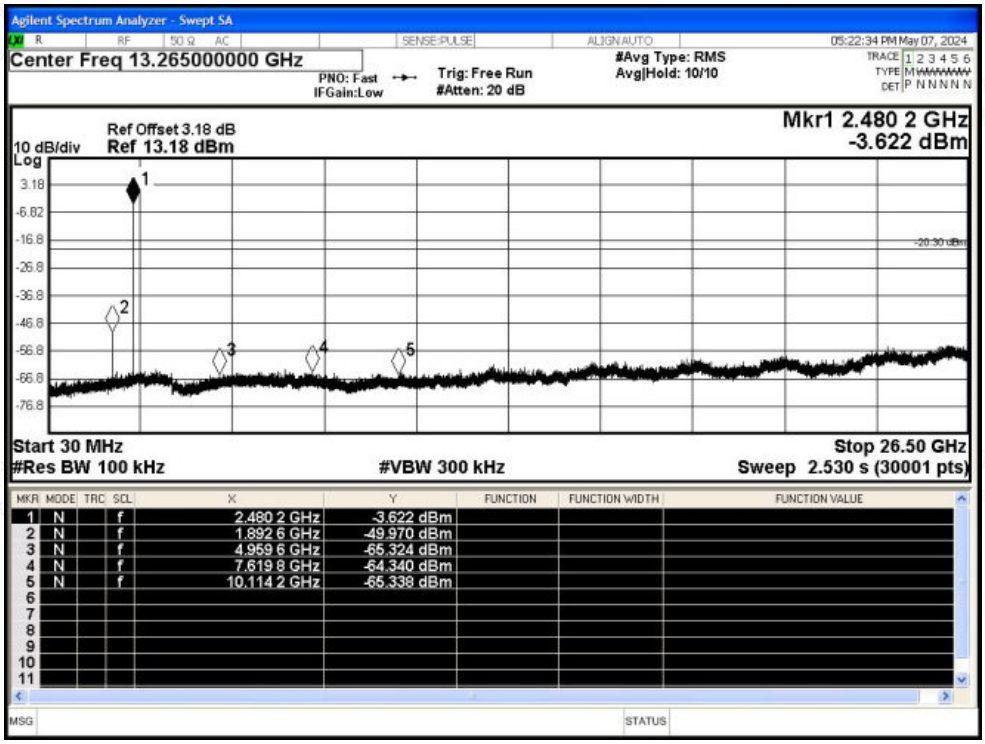
Tx. Spurious NVNT BLE 2M 2440MHz Ant1 Emission



Tx. Spurious NVNT BLE 2M 2480MHz Ant1 Ref



Tx. Spurious NVNT BLE 2M 2480MHz Ant1 Emission

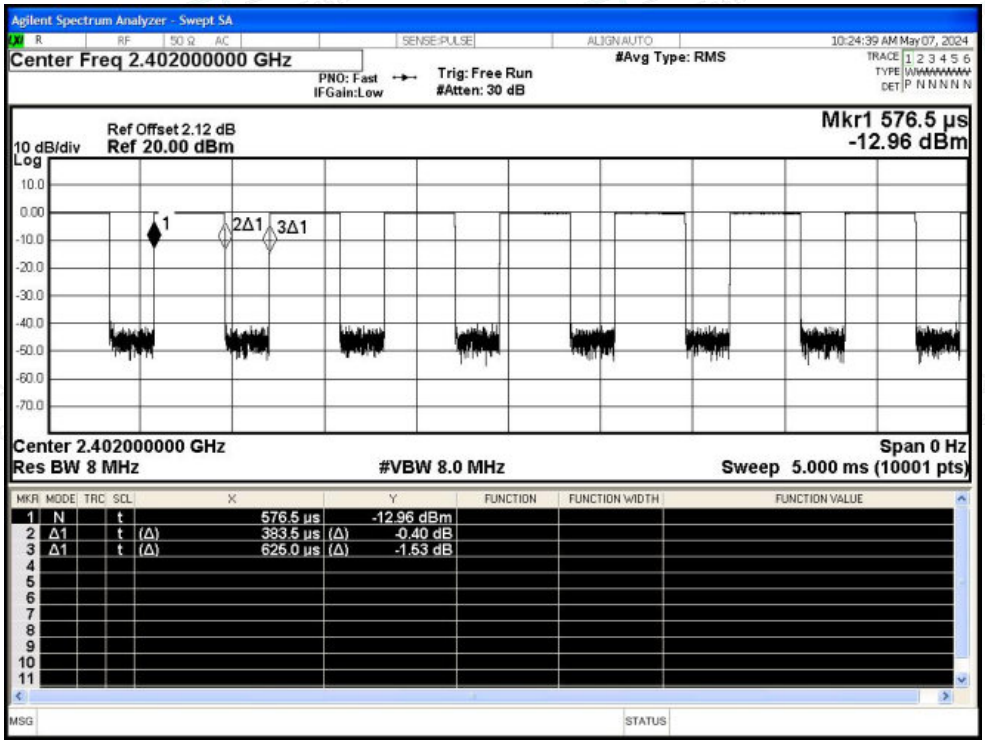


B.6 Duty Cycle

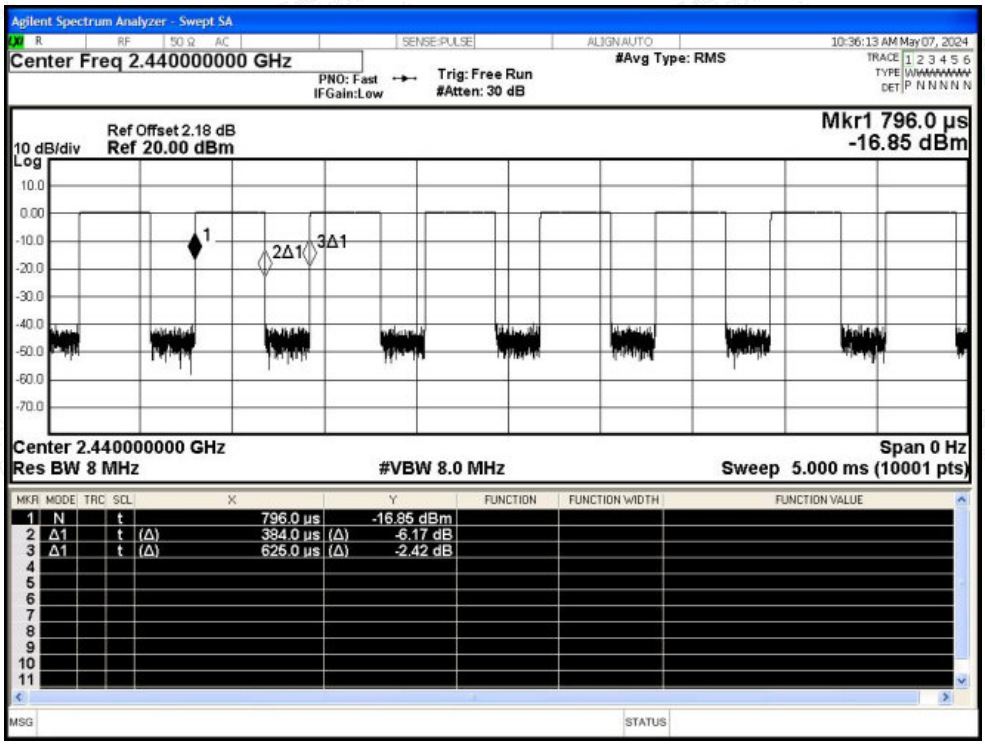
Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)	1/T (kHz)
NVNT	BLE 1M	2402	Ant1	61.36	2.12	2.61
NVNT	BLE 1M	2440	Ant1	61.44	2.12	2.6
NVNT	BLE 1M	2480	Ant1	61.39	2.12	2.6
NVNT	BLE 2M	2402	Ant1	65.92	1.81	1.21
NVNT	BLE 2M	2440	Ant1	65.92	1.81	1.21
NVNT	BLE 2M	2480	Ant1	65.96	1.81	1.21

Test Graphs

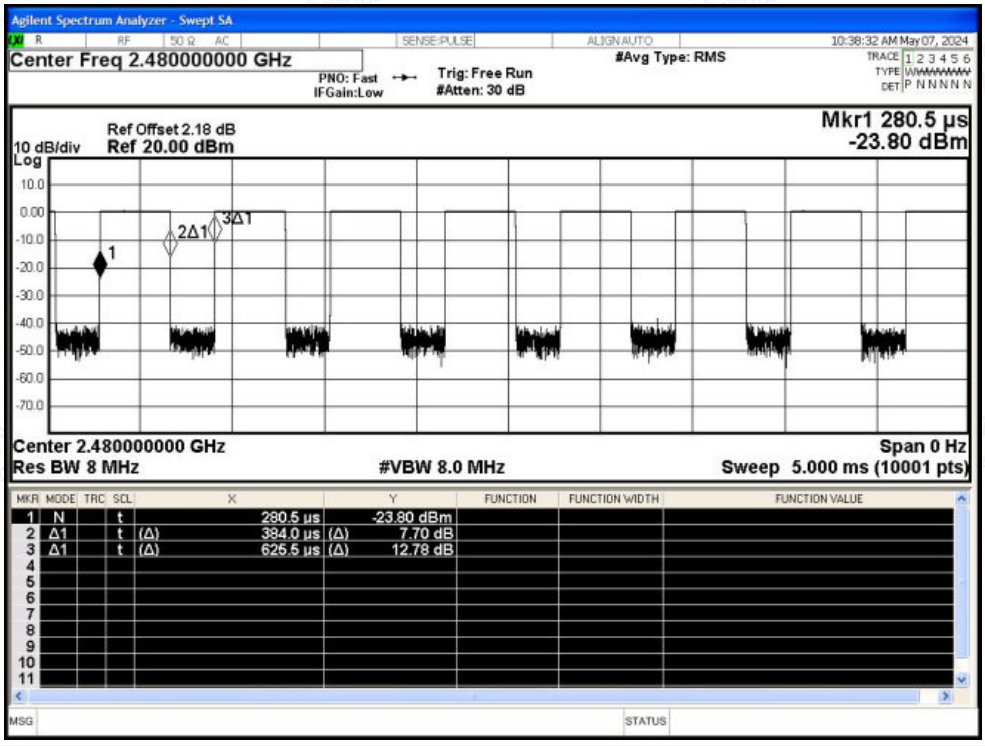
Duty Cycle NVNT BLE 1M 2402MHz Ant1



Duty Cycle NVNT BLE 1M 2440MHz Ant1

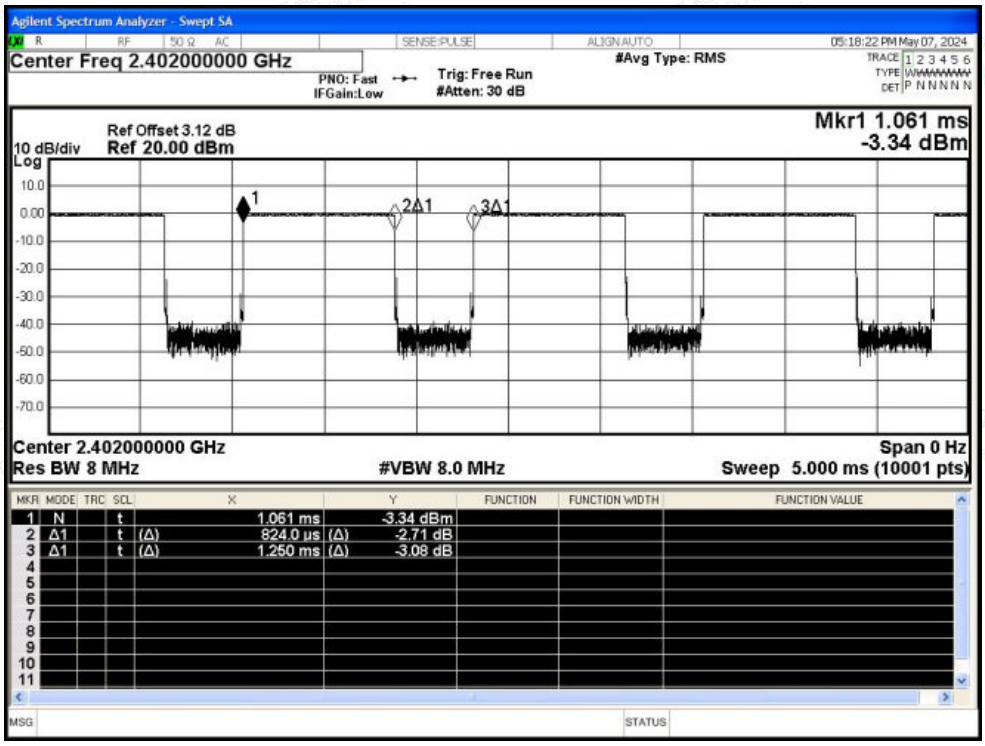


Duty Cycle NVNT BLE 1M 2480MHz Ant1

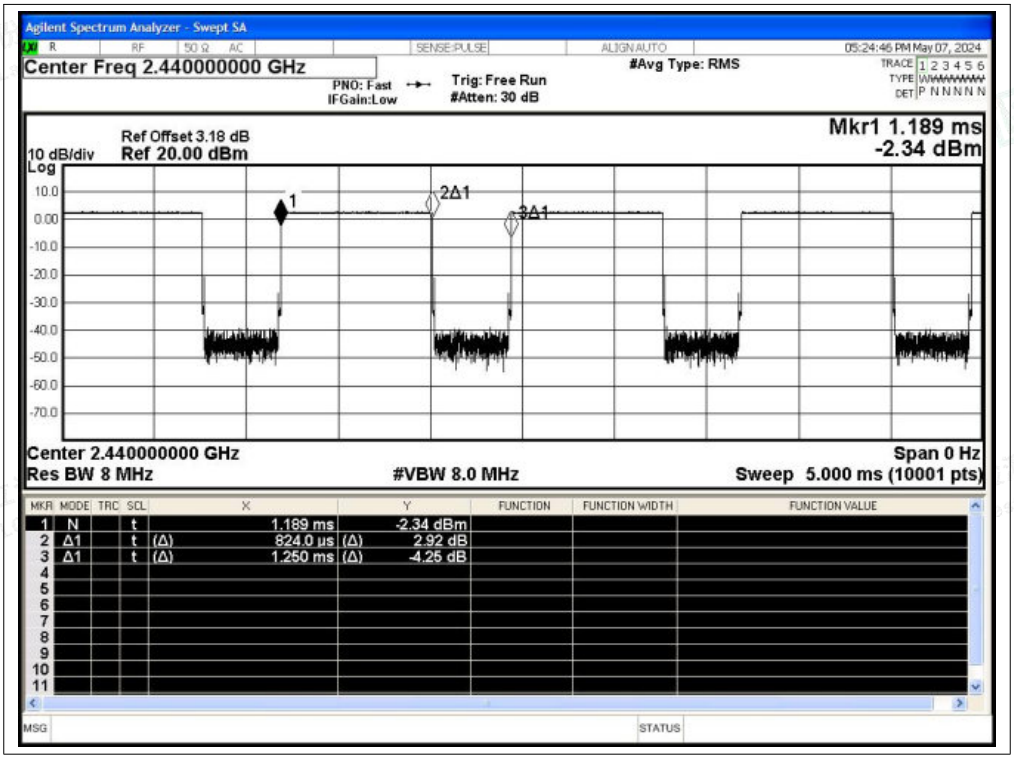


Test Graphs

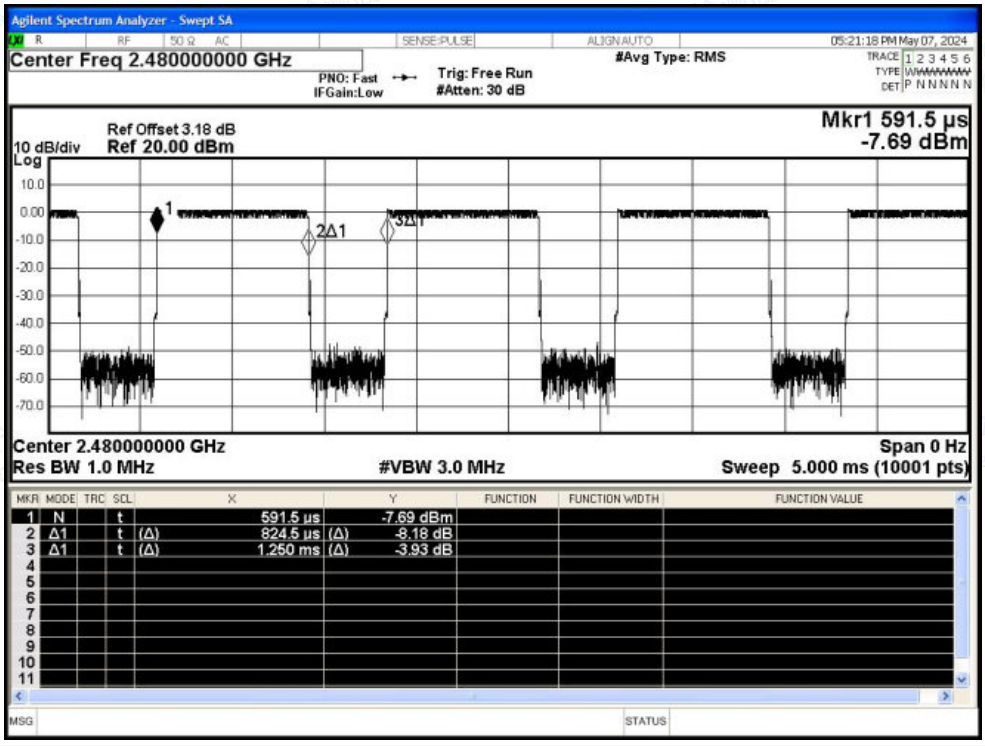
Duty Cycle NVNT BLE 2M 2402MHz Ant1



Duty Cycle NVNT BLE 2M 2440MHz Ant1


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.440000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
05:24:46 PM May 07, 2024
Ref Offset 3.18 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 1.189 ms
-2.34 dBm
Center 2.440000000 GHz
Res BW 8 MHz
#VBW 8.0 MHz
Span 0 Hz
Sweep 5.000 ms (10001 pts)
1 N t 1.189 ms -2.34 dBm
2 Δ1 t (Δ) 824.0 µs (Δ) 2.92 dB
3 Δ1 t (Δ) 1.250 ms (Δ) -4.25 dB

Duty Cycle NVNT BLE 2M 2480MHz Ant1

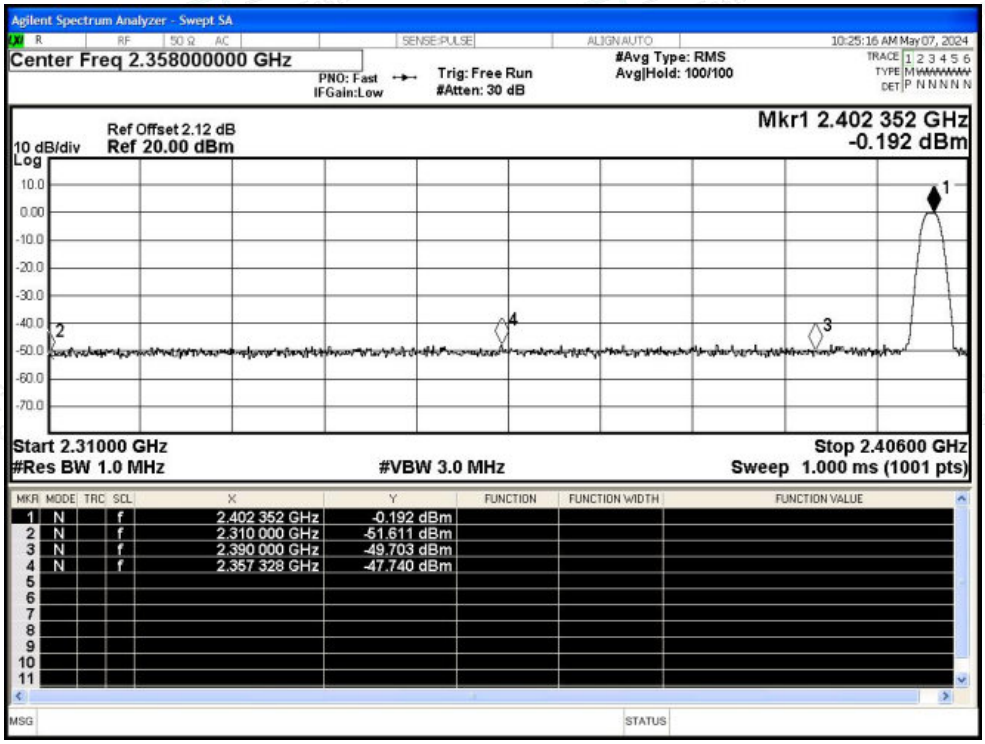


B.7 Restrict Band

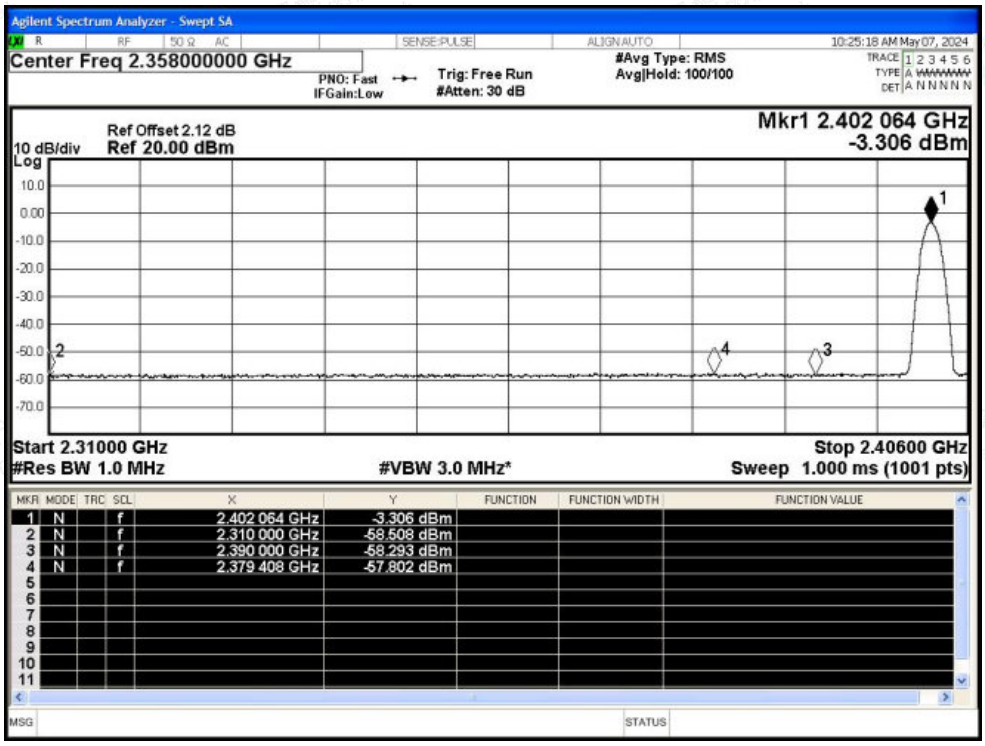
Condition	Mode	Frequency (MHz)	Antenna	Spur Freq (MHz)	Power (dBm)	Gain (dBi)	Duty Factor (dB)	E (dBuV/m)	Detector	Limit (dBuV/m)	Verdict
NVNT	BLE 1M	2402	Ant1	2310	-51.61	3.14	-	46.79	Peak	74	Pass
NVNT	BLE 1M	2402	Ant1	2310	-58.51	3.14	2.12	42.01	Average	54	Pass
NVNT	BLE 1M	2402	Ant1	2357.328	-47.74	3.14	-	50.66	Peak	74	Pass
NVNT	BLE 1M	2402	Ant1	2379.408	-57.8	3.14	2.12	42.72	Average	54	Pass
NVNT	BLE 1M	2402	Ant1	2390	-49.7	3.14	-	48.70	Peak	74	Pass
NVNT	BLE 1M	2402	Ant1	2390	-58.29	3.14	2.12	42.23	Average	54	Pass
NVNT	BLE 1M	2480	Ant1	2483.5	-48.39	3.14	-	50.01	Peak	74	Pass
NVNT	BLE 1M	2480	Ant1	2483.5	-57.82	3.14	2.12	42.70	Average	54	Pass
NVNT	BLE 1M	2480	Ant1	2496.28	-47.33	3.14	-	51.07	Peak	74	Pass
NVNT	BLE 1M	2480	Ant1	2494.216	-57.14	3.14	2.12	43.38	Average	54	Pass
NVNT	BLE 1M	2480	Ant1	2500	-48.95	3.14	-	49.45	Peak	74	Pass
NVNT	BLE 1M	2480	Ant1	2500	-58.69	3.14	2.12	41.83	Average	54	Pass
NVNT	BLE 2M	2402	Ant1	2310	-48.5	3.14	-	49.90	Peak	74	Pass
NVNT	BLE 2M	2402	Ant1	2310	-57.5	3.14	1.81	42.71	Average	54	Pass
NVNT	BLE 2M	2402	Ant1	2357.904	-46.13	3.14	-	52.27	Peak	74	Pass
NVNT	BLE 2M	2402	Ant1	2329.968	-56.54	3.14	1.81	43.67	Average	54	Pass
NVNT	BLE 2M	2402	Ant1	2390	-48.29	3.14	-	50.11	Peak	74	Pass
NVNT	BLE 2M	2402	Ant1	2390	-57.51	3.14	1.81	42.70	Average	54	Pass
NVNT	BLE 2M	2480	Ant1	2483.5	-47.6	3.14	-	50.80	Peak	74	Pass
NVNT	BLE 2M	2480	Ant1	2483.5	-57.09	3.14	1.81	43.12	Average	54	Pass
NVNT	BLE 2M	2480	Ant1	2485.024	-41.11	3.14	-	57.29	Peak	74	Pass
NVNT	BLE 2M	2480	Ant1	2484.544	-55.96	3.14	1.81	44.25	Average	54	Pass
NVNT	BLE 2M	2480	Ant1	2500	-49.02	3.14	-	49.38	Peak	74	Pass
NVNT	BLE 2M	2480	Ant1	2500	-57.3	3.14	1.81	42.91	Average	54	Pass

Test Graphs

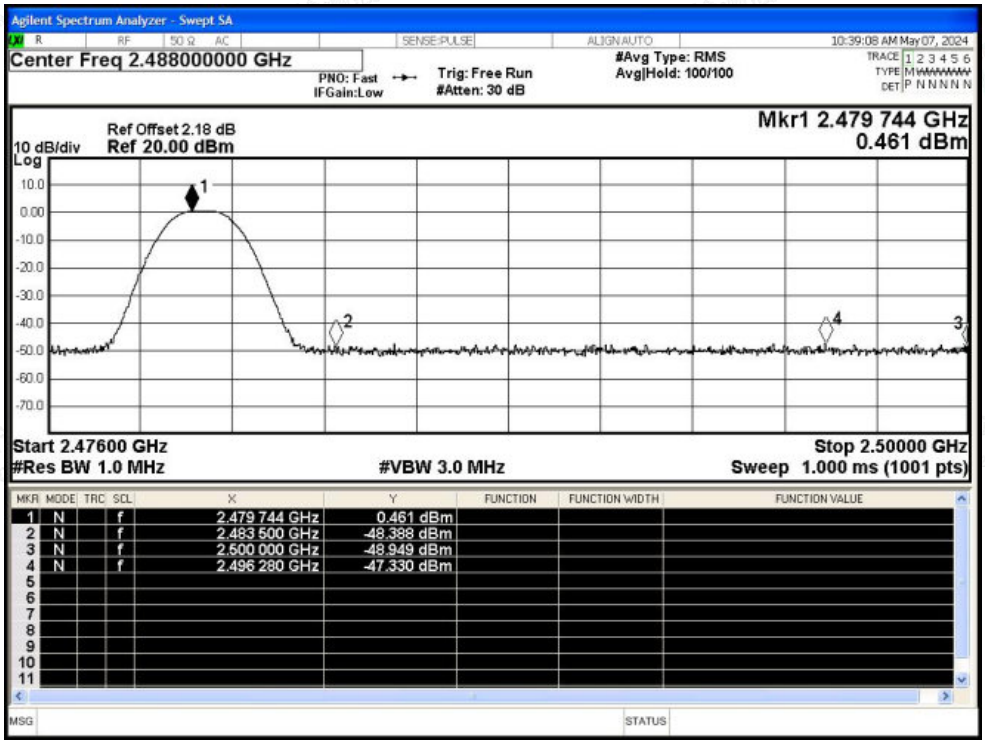
Restrict Band NVNT BLE 1M 2402MHz Ant1 Peak



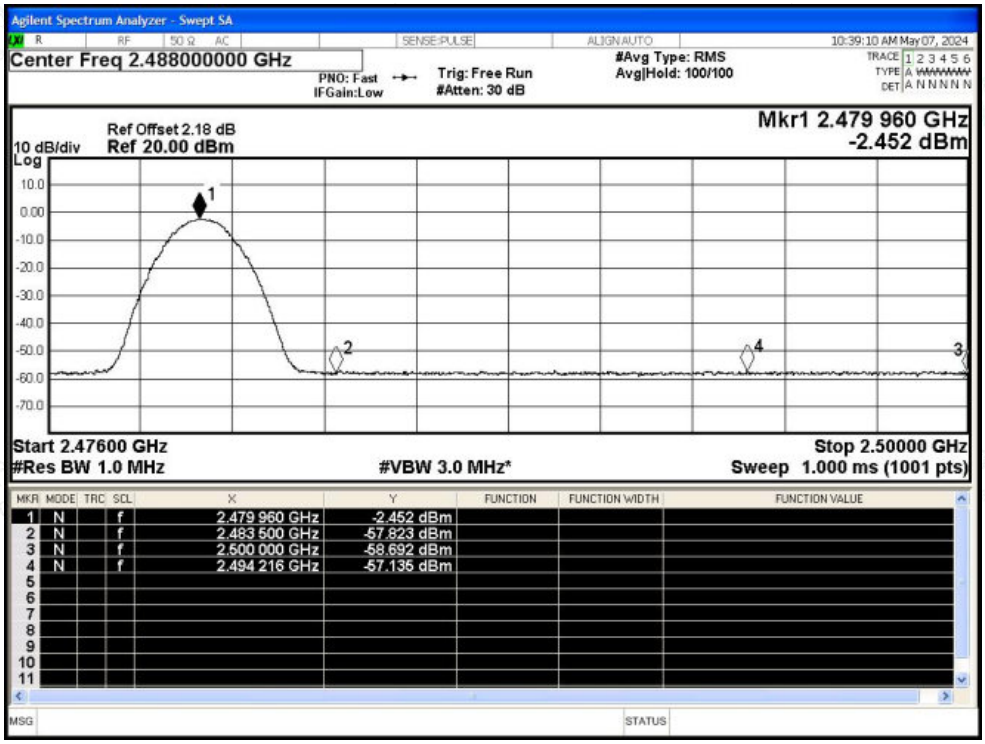
Restrict Band NVNT BLE 1M 2402MHz Ant1 Average



Restrict Band NVNT BLE 1M 2480MHz Ant1 Peak

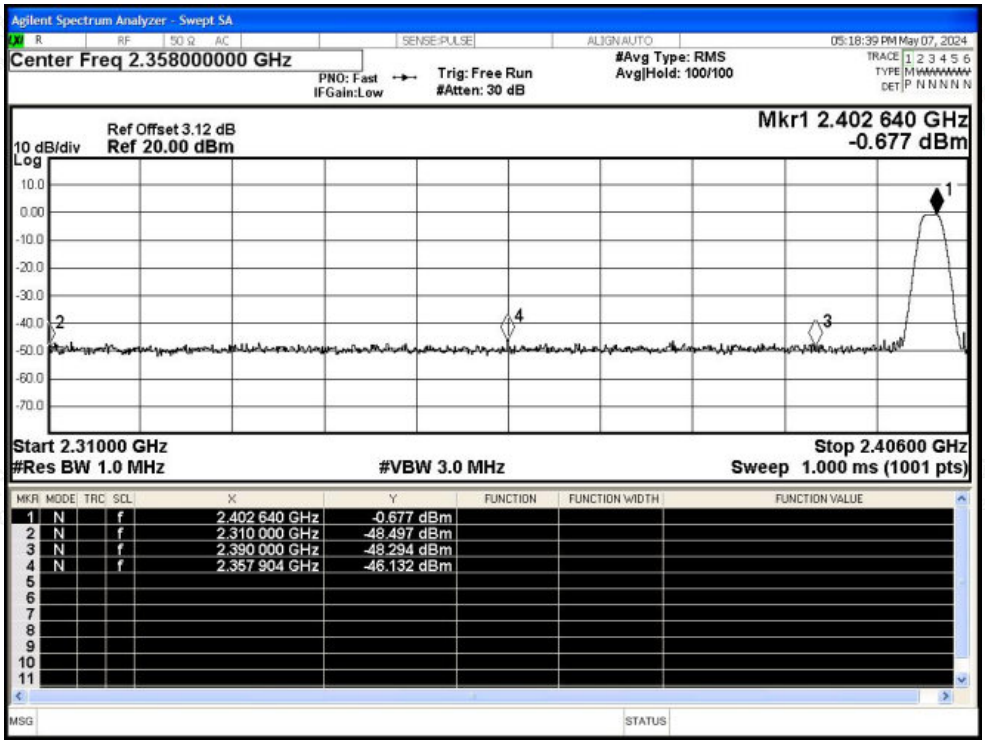


Restrict Band NVNT BLE 1M 2480MHz Ant1 Average

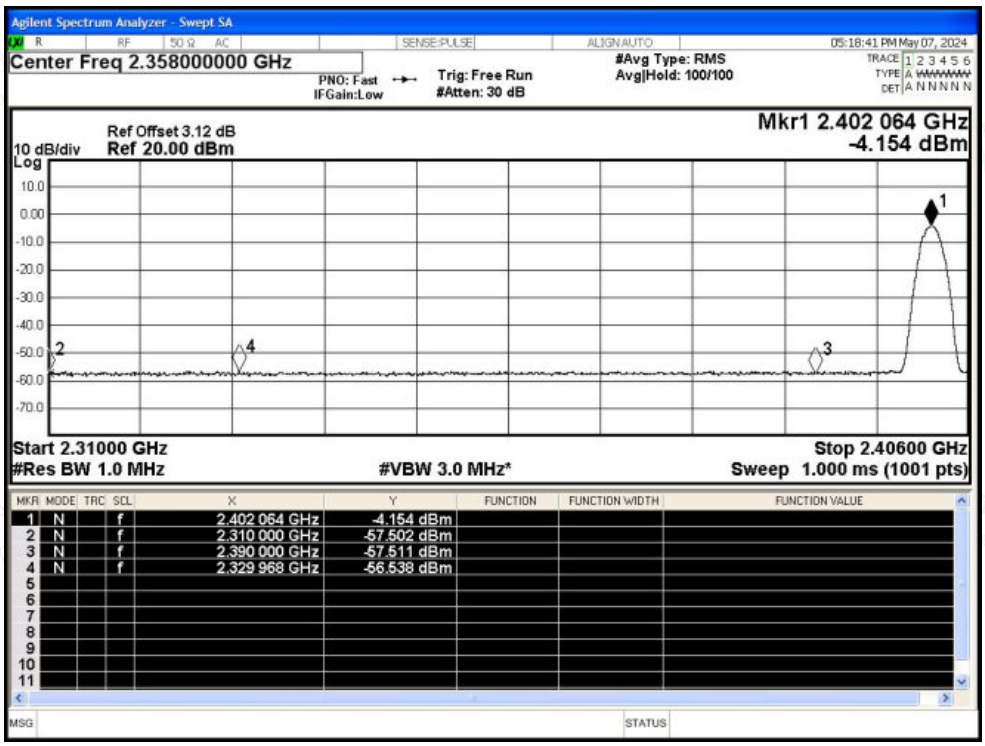


Test Graphs

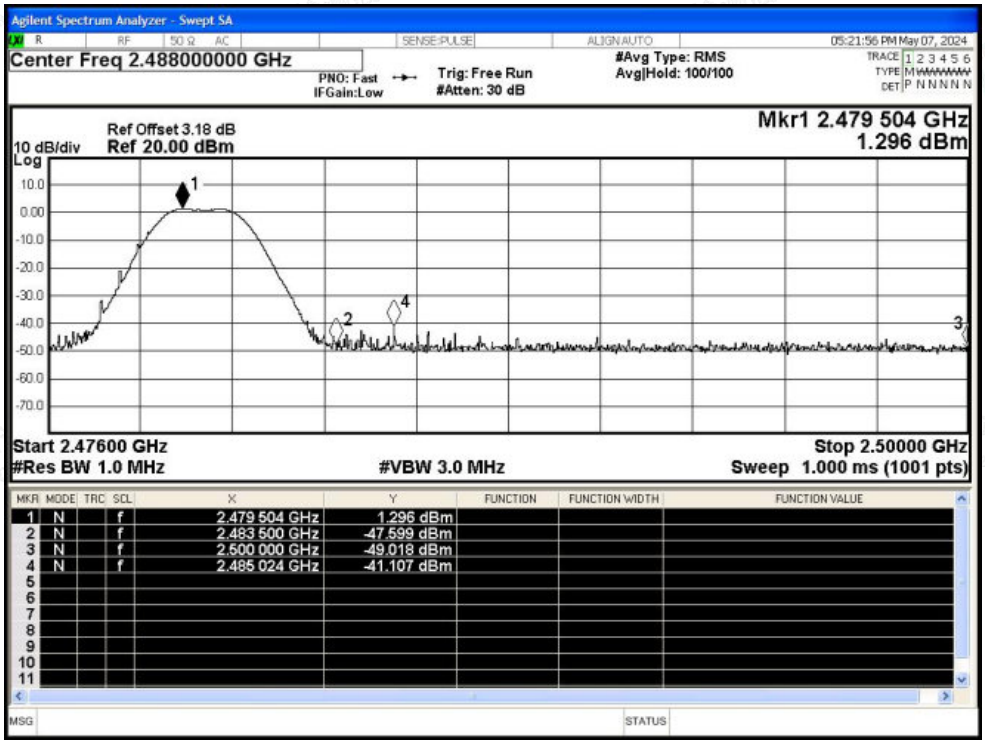
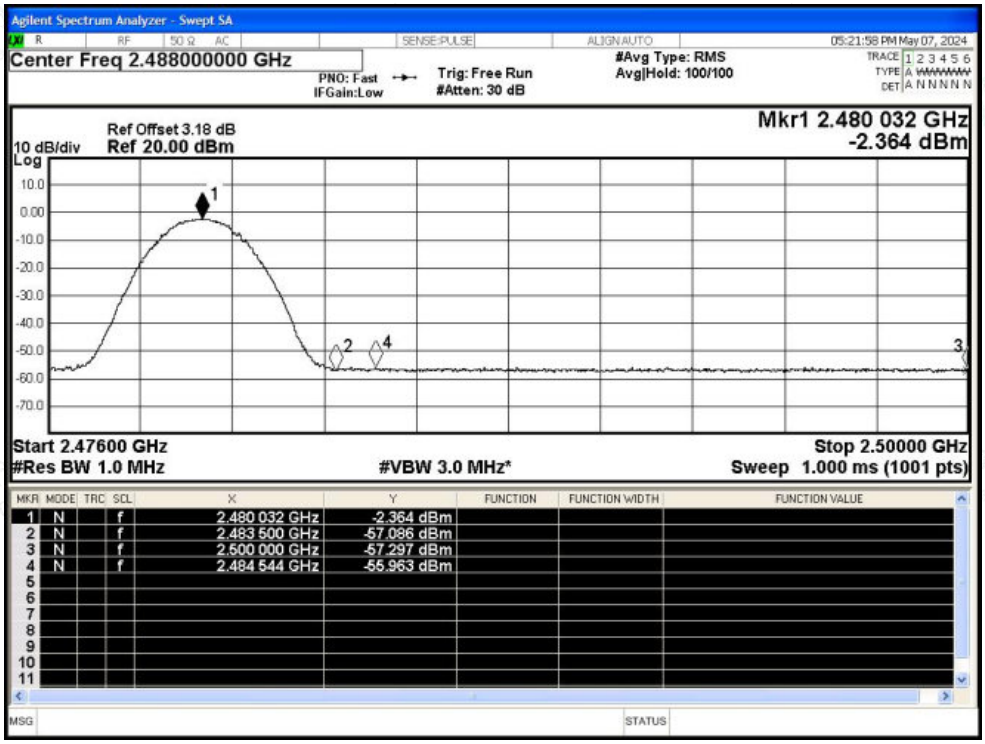
Restrict Band NVNT BLE 2M 2402MHz Ant1 Peak



Restrict Band NVNT BLE 2M 2402MHz Ant1 Average



Restrict Band NVNT BLE 2M 2480MHz Ant1 Peak



Restrict Band NVNT BLE 2M 2480MHz Ant1 Average