Appendix

BLE Test Data

for BTEK240313007AE

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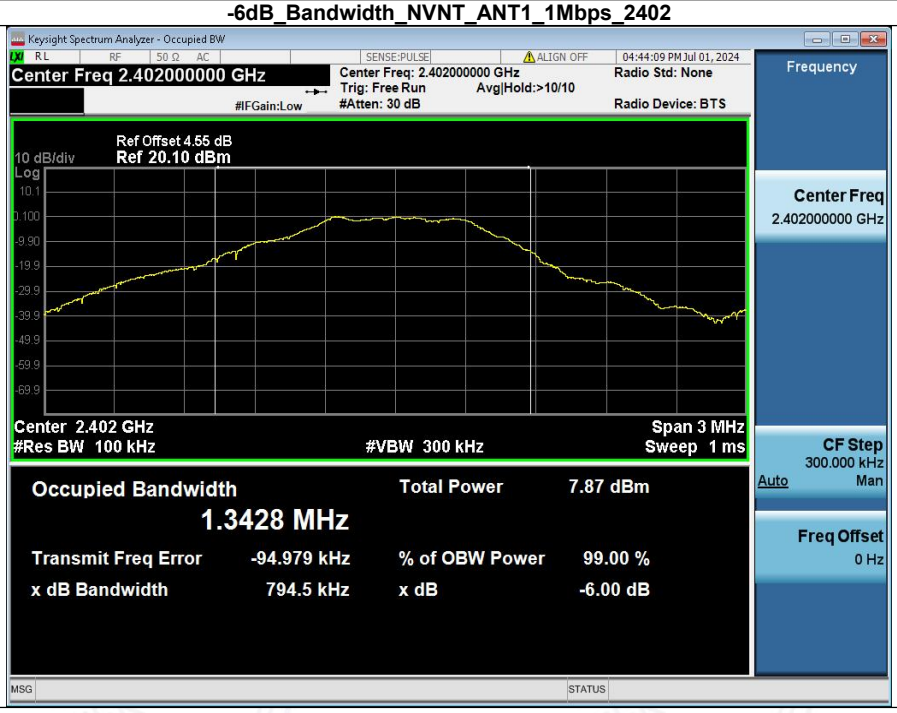
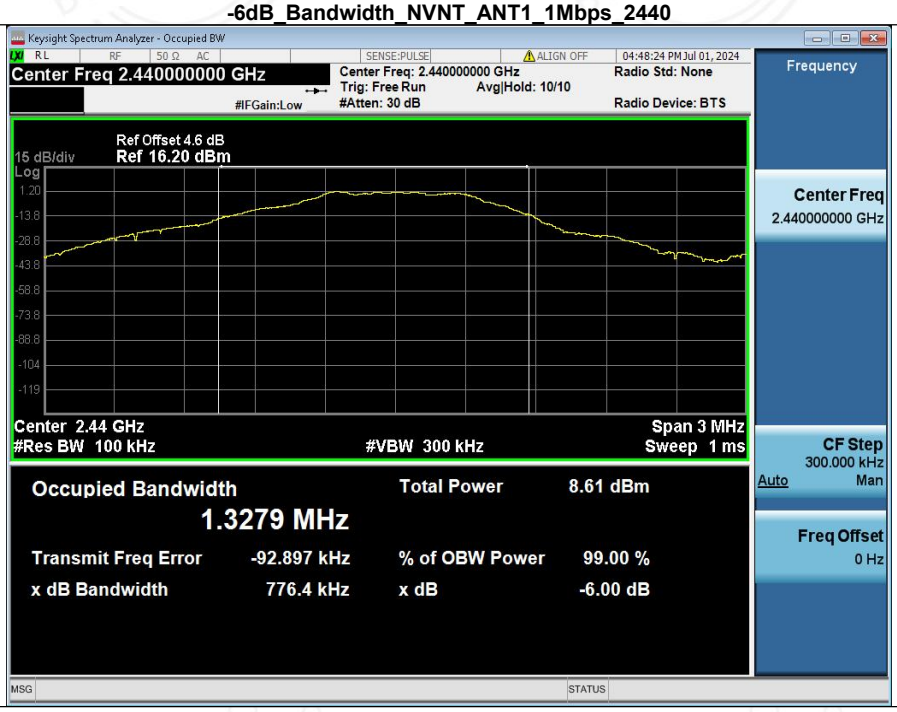
1. -6dB Bandwidth

Condition	Antenna	Rate	Frequency (MHz)	-6dB BW(kHz)	limit(kHz)	Result
NVNT	ANT1	1Mbps	2402.00	794.52	500	Pass
NVNT	ANT1	1Mbps	2440.00	776.36	500	Pass
NVNT	ANT1	1Mbps	2480.00	783.42	500	Pass

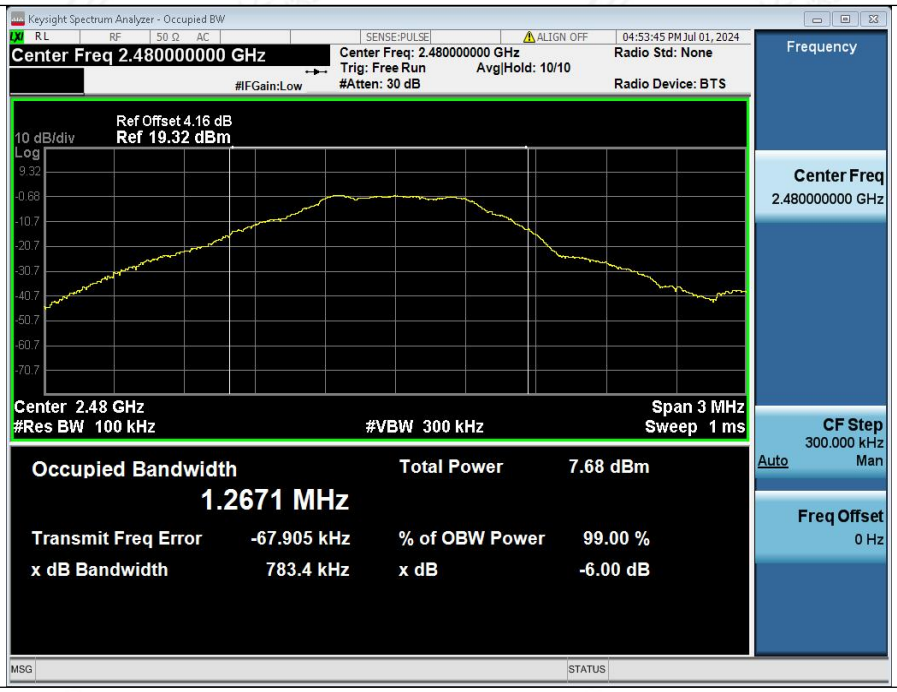
-6dB_Bandwidth_NVNT_ANT1_1Mbps_2402



-6dB_Bandwidth_NVNT_ANT1_1Mbps_2440



-6dB_Bandwidth_NVNT_ANT1_1Mbps_2480


Keysight Spectrum Analyzer - Occupied BW
RL
RF
50 Ω AC
SENSE:PULSE
ALIGN OFF
04:53:45 PM Jul 01, 2024
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold: 10/10
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
#IFGain:Low
Frequency
Ref Offset 4.16 dB
10 dB/div
Ref 19.32 dBm
Log
9.32
-0.68
-10.7
-20.7
-30.7
-40.7
-50.7
-60.7
-70.7
Center Freq
2.480000000 GHz
Center 2.48 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 3 MHz
Sweep 1 ms
CF Step
300.000 kHz
Auto
Man
Occupied Bandwidth
1.2671 MHz
Total Power 7.68 dBm
Transmit Freq Error -67.905 kHz
% of OBW Power 99.00 %
x dB Bandwidth 783.4 kHz
x dB -6.00 dB
Freq Offset
0 Hz
MSG
STATUS

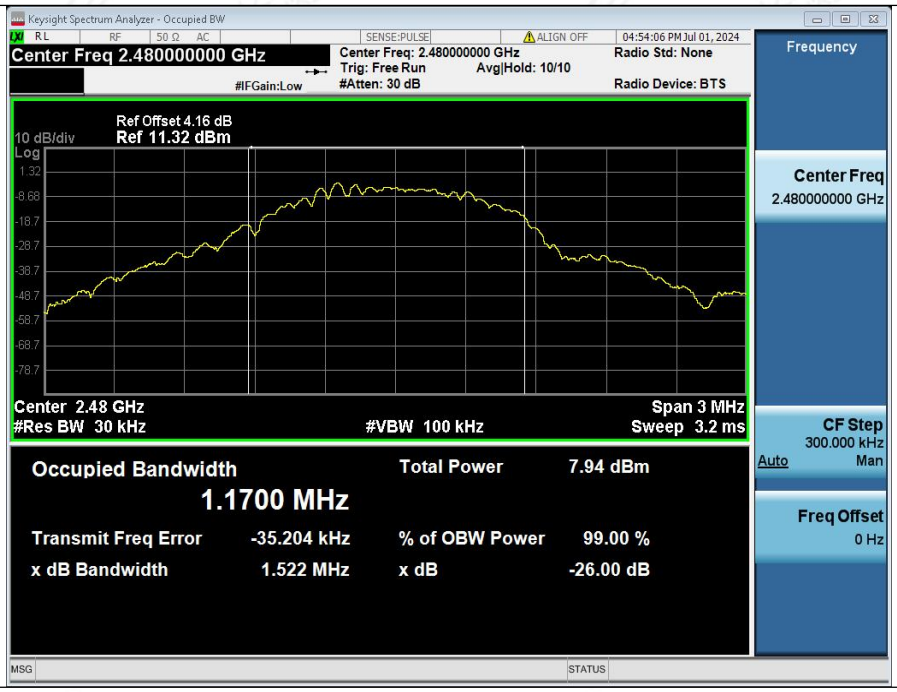
2. 99% Occupied Bandwidth

Condition	Antenna	Rate	Frequency (MHz)	99%%BW(MHz)
NVNT	ANT1	1Mbps	2402.00	1.193
NVNT	ANT1	1Mbps	2440.00	1.185
NVNT	ANT1	1Mbps	2480.00	1.170

99%_Occupied_Bandwidth_NVNT_ANT1_1Mbps_2402

99%_Occupied_Bandwidth_NVNT_ANT1_1Mbps_2440

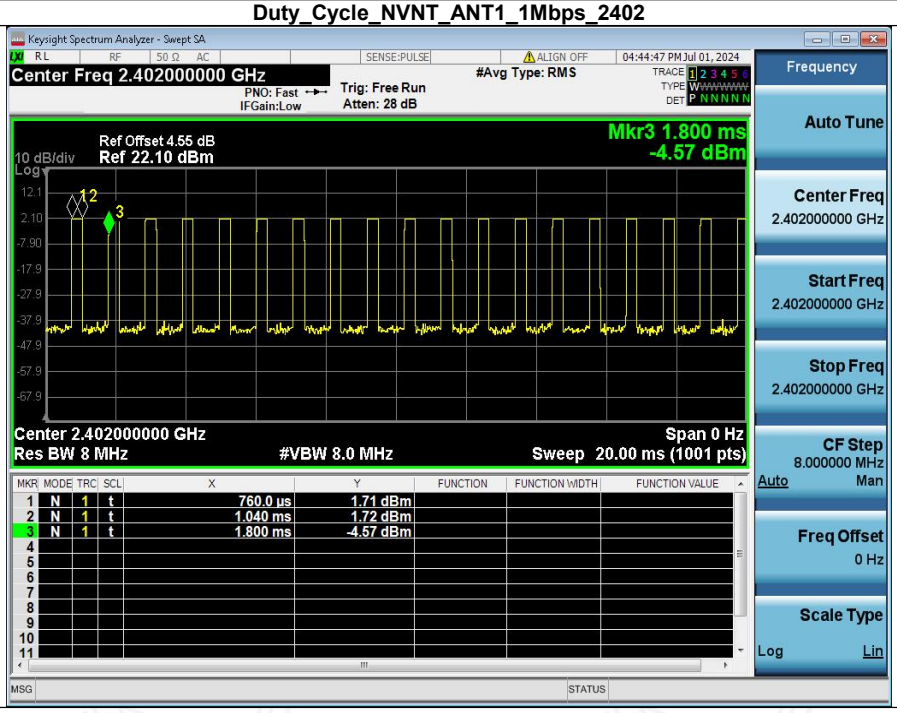
99%_Occupied_Bandwidth_NVNT_ANT1_1Mbps_2480


Keysight Spectrum Analyzer - Occupied BW
RL
RF
50 Ω AC
SENSE:PULSE
ALIGN OFF
04:54:06 PM Jul 01, 2024
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold: 10/10
#Atten: 30 dB
Radio Std: None
Radio Device: BTS
#IFGain:Low
Frequency
Ref Offset 4.16 dB
10 dB/div
Ref 11.32 dBm
Log
1.32
-8.68
-18.7
-28.7
-38.7
-48.7
-58.7
-68.7
-78.7
Center 2.48 GHz
#Res BW 30 kHz
#VBW 100 kHz
Span 3 MHz
Sweep 3.2 ms
Center Freq
2.480000000 GHz
CF Step
300.000 kHz
Auto
Man
Occupied Bandwidth
1.1700 MHz
Total Power 7.94 dBm
Transmit Freq Error -35.204 kHz
% of OBW Power 99.00 %
x dB Bandwidth 1.522 MHz
x dB -26.00 dB
Freq Offset
0 Hz
MSG
STATUS

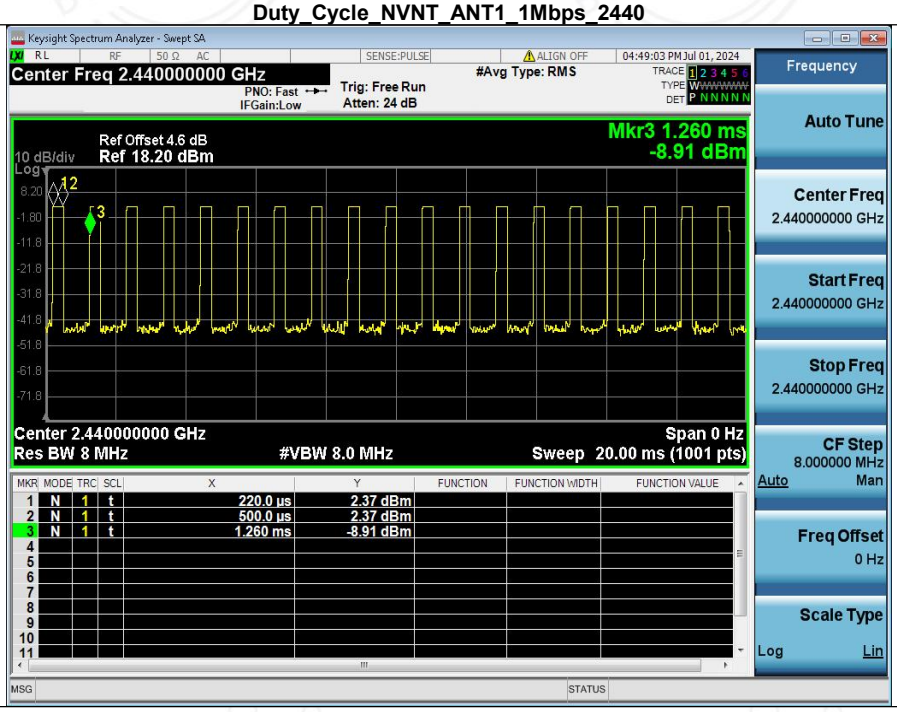
3. Duty Cycle

Condition	Antenna	Rate	Frequency (MHz)	Dutycycle(%)	Duty_factor
NVNT	ANT1	1Mbps	2402.00	26.92	5.70
NVNT	ANT1	1Mbps	2440.00	26.92	5.70
NVNT	ANT1	1Mbps	2480.00	26.92	5.70

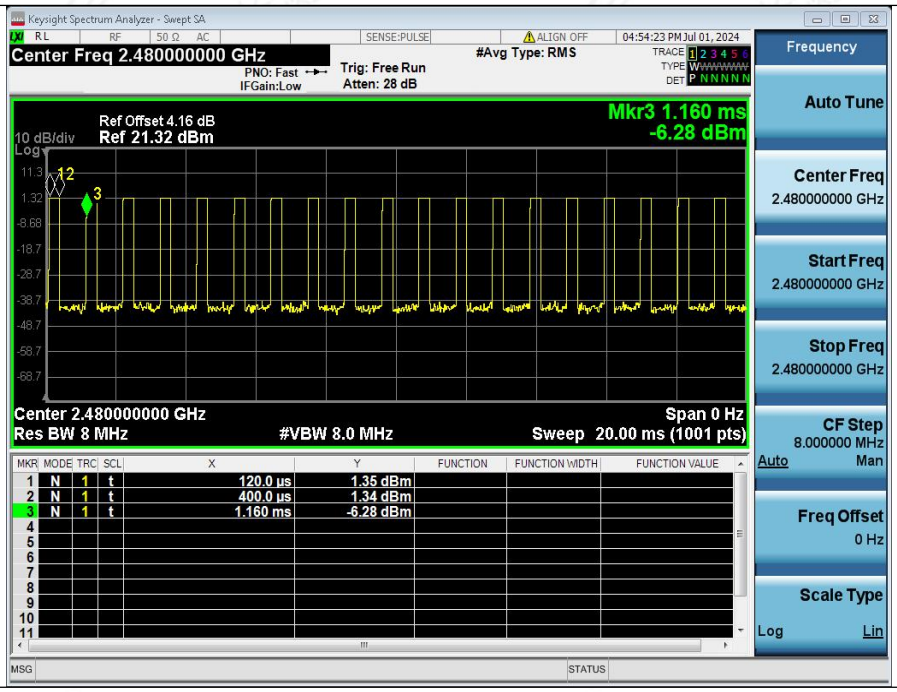
Duty_Cycle_NVNT_ANT1_1Mbps_2402



Duty_Cycle_NVNT_ANT1_1Mbps_2440



Duty_Cycle_NVNT_ANT1_1Mbps_2480

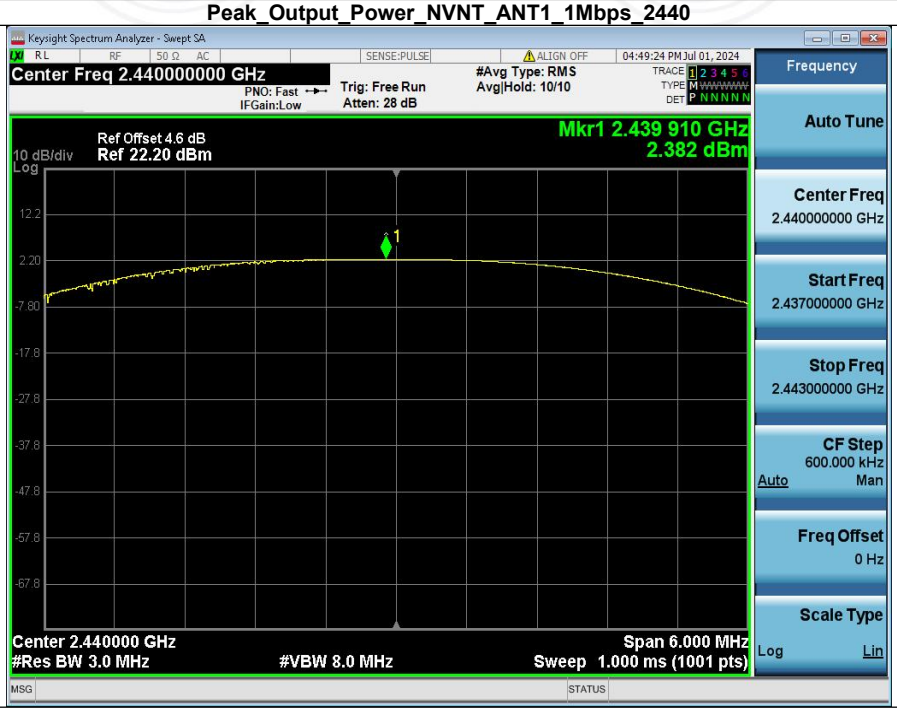

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 28 dB
#Avg Type: RMS
04:54:23 PM Jul 01, 2024
Ref Offset 4.16 dB
10 dB/div
Ref 21.32 dBm
Mkr3 1.160 ms
-6.28 dBm
Center 2.480000000 GHz
Span 0 Hz
Res BW 8 MHz
#VBW 8.0 MHz
Sweep 20.00 ms (1001 pts)
1 N 1 t 120.0 µs 1.35 dBm
2 N 1 t 400.0 µs 1.34 dBm
3 N 1 t 1.160 ms -6.28 dBm
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.480000000 GHz
Stop Freq
2.480000000 GHz
CF Step
8.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

4. Peak Output Power

Condition	Antenna	Rate	Frequency (MHz)	Max. Conducted Power(dBm)	Max. Conducted Power(mW)	Limit(mW)	Result
NVNT	ANT1	1Mbps	2402.00	1.72	1.49	1000	Pass
NVNT	ANT1	1Mbps	2440.00	2.38	1.73	1000	Pass
NVNT	ANT1	1Mbps	2480.00	1.37	1.37	1000	Pass

Peak_Output_Power_NVNT_ANT1_1Mbps_2402

Peak_Output_Power_NVNT_ANT1_1Mbps_2440



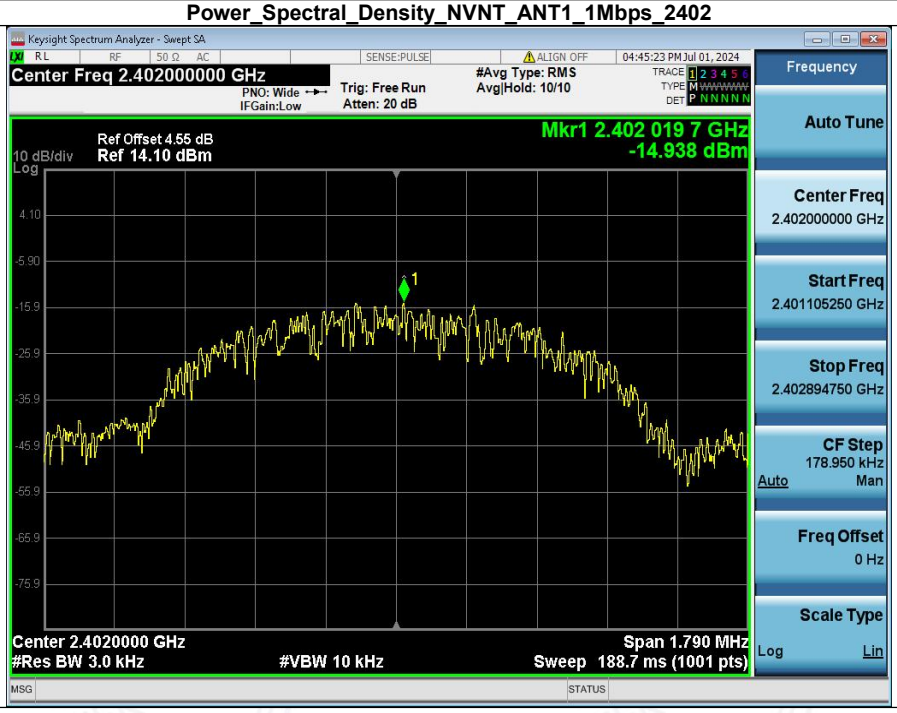
Peak_Output_Power_NVNT_ANT1_1Mbps_2480

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 28 dB
#Avg Type: RMS
Avg|Hold: 10/10
04:54:44 PM Jul 01, 2024
Ref Offset 4.16 dB
10 dB/div
Ref 21.32 dBm
Log
Mkr1 2.479 562 GHz
1.374 dBm
Center 2.480000 GHz
#Res BW 3.0 MHz
#VBW 8.0 MHz
Span 6.000 MHz
Sweep 1.000 ms (1001 pts)
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.477000000 GHz
Stop Freq
2.483000000 GHz
CF Step
600.000 kHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

5. Power Spectral Density

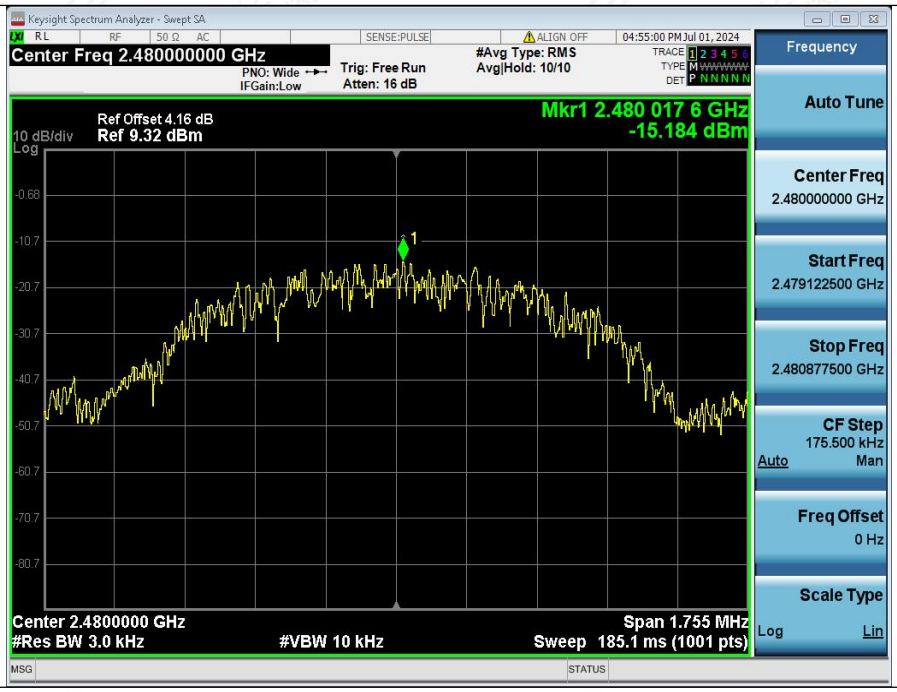
Condition	Antenna	Rate	Frequency (MHz)	Power Spectral Density(dBm)	Limit(dBm/3kHz)	Result
NVNT	ANT1	1Mbps	2402.00	-14.94	8	Pass
NVNT	ANT1	1Mbps	2440.00	-14.46	8	Pass
NVNT	ANT1	1Mbps	2480.00	-15.18	8	Pass

Power_Spectral_Density_NVNT_ANT1_1Mbps_2402



Power_Spectral_Density_NVNT_ANT1_1Mbps_2440

Power_Spectral_Density_NVNT_ANT1_1Mbps_2480

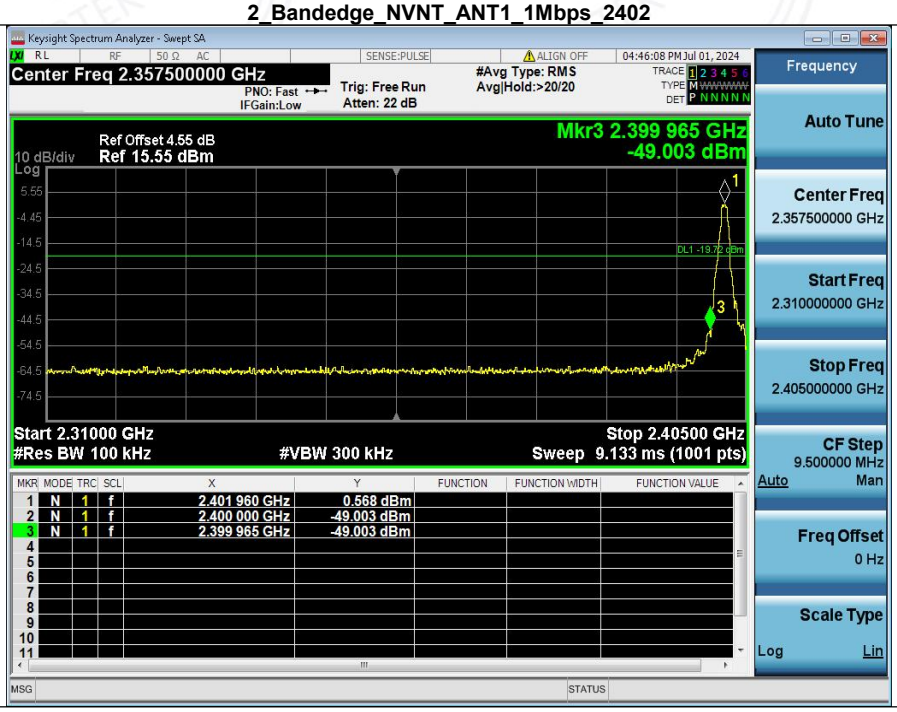

Keysight Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 16 dB
#Avg Type: RMS
Avg|Hold: 10/10
04:55:00 PM Jul 01, 2024
Ref Offset 4.16 dB
10 dB/div
Ref 9.32 dBm
Log
Mkr1 2.480 017 6 GHz
-15.184 dBm
Center 2.4800000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 1.755 MHz
Sweep 185.1 ms (1001 pts)
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.479122500 GHz
Stop Freq
2.480877500 GHz
CF Step
175.500 kHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

6. Bandedge

Condition	Antenna	Rate	TX_Frequency (MHz)	Max. Mark Frequency (MHz)	Spurious level(dBm)	limit(dBm)	Result
NVNT	ANT1	1Mbps	2402.00	2399.965	-49.003	-19.719	Pass
NVNT	ANT1	1Mbps	2480.00	2483.600	-54.643	-20.015	Pass

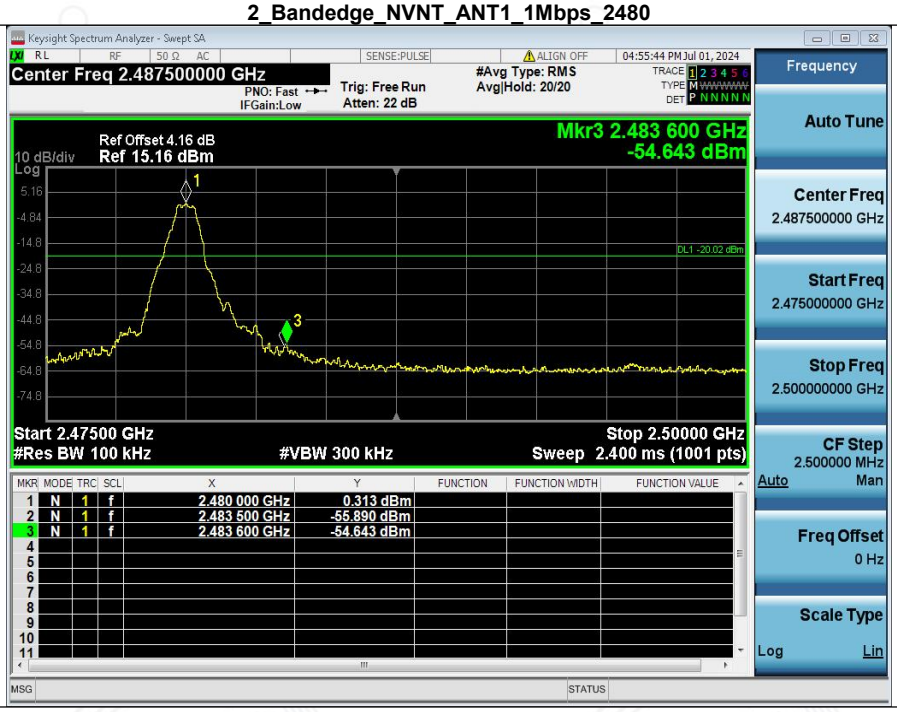
1_Reference_Level_NVNT_ANT1_1Mbps_2402

2_Bandedge_NVNT_ANT1_1Mbps_2402



1_Reference_Level_NVNT_ANT1_1Mbps_2480

2_Bandedge_NVNT_ANT1_1Mbps_2480

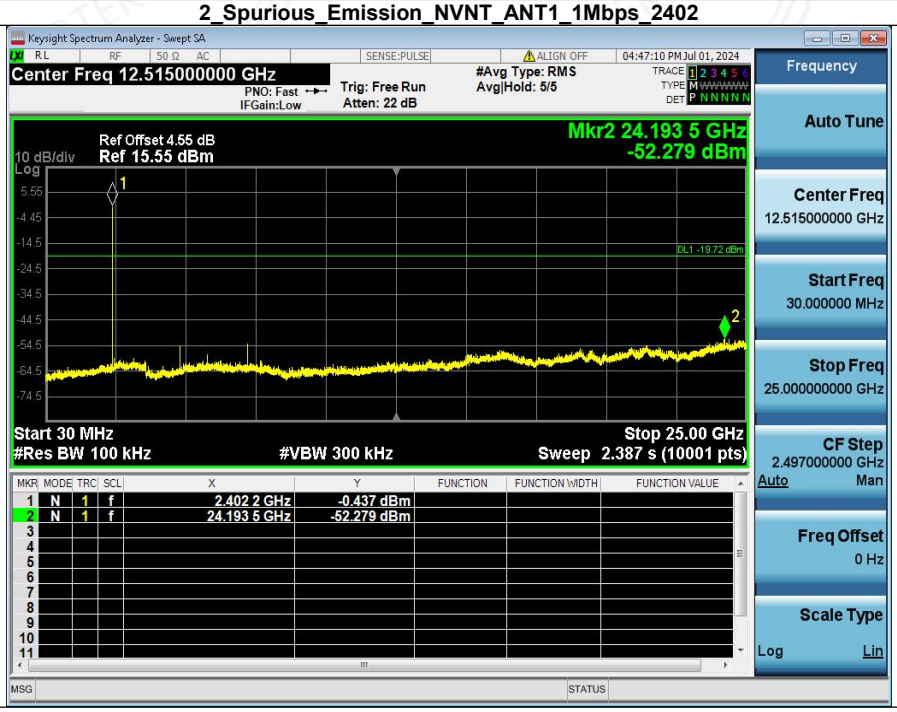


7. Spurious Emission

Condition	Antenna	Rate	TX_Frequency(MHz)	Spurious MAX.Value(dBm)	Limit	Result
NVNT	ANT1	1Mbps	2402.00	-52.279	-19.719	Pass
NVNT	ANT1	1Mbps	2440.00	-52.398	-19.159	Pass
NVNT	ANT1	1Mbps	2480.00	-52.031	-20.015	Pass

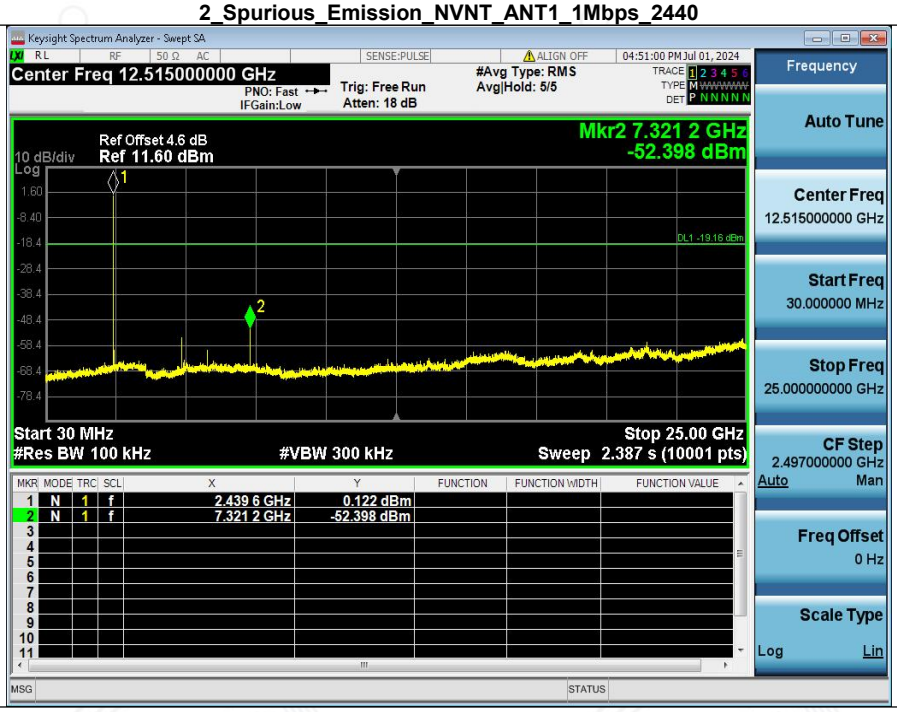
1_Reference_Level_NVNT_ANT1_1Mbps_2402

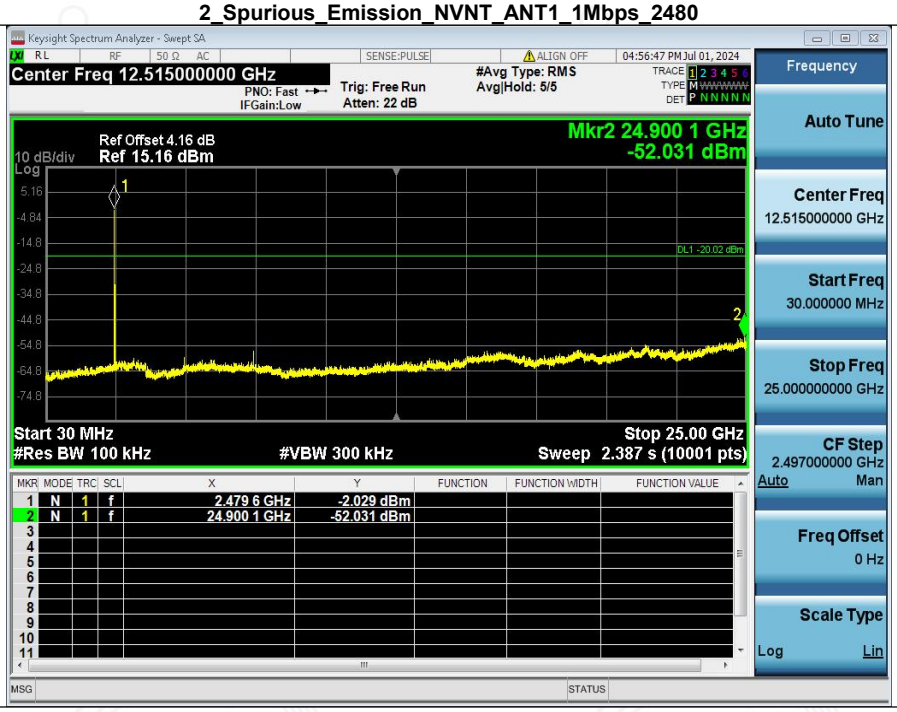
2_Spurious_Emission_NVNT_ANT1_1Mbps_2402



1_Reference_Level_NVNT_ANT1_1Mbps_2440

2_Spurious_Emission_NVNT_ANT1_1Mbps_2440



1_Reference_Level_NVNT_ANT1_1Mbps_2480

2_Spurious_Emission_NVNT_ANT1_1Mbps_2480