Appendix

Test Data

for BTEK241111036A01E03

Start date	2024/12/3	Finish date	2024/12/4
Temperature	22.0℃	Humidity	53%
RF specifications	2.4G_WIFI	Test Engineer	Zora

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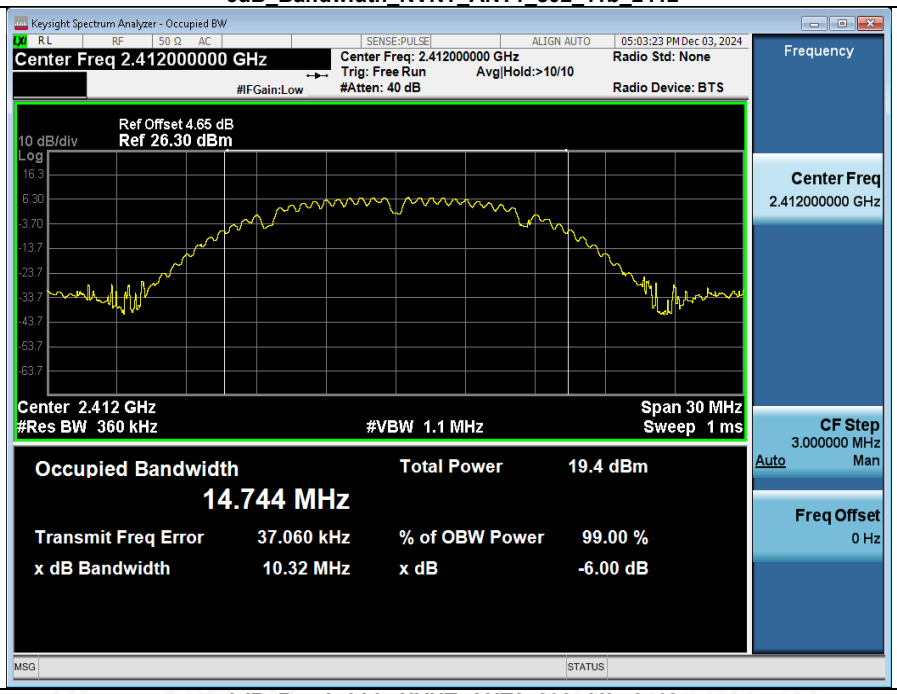
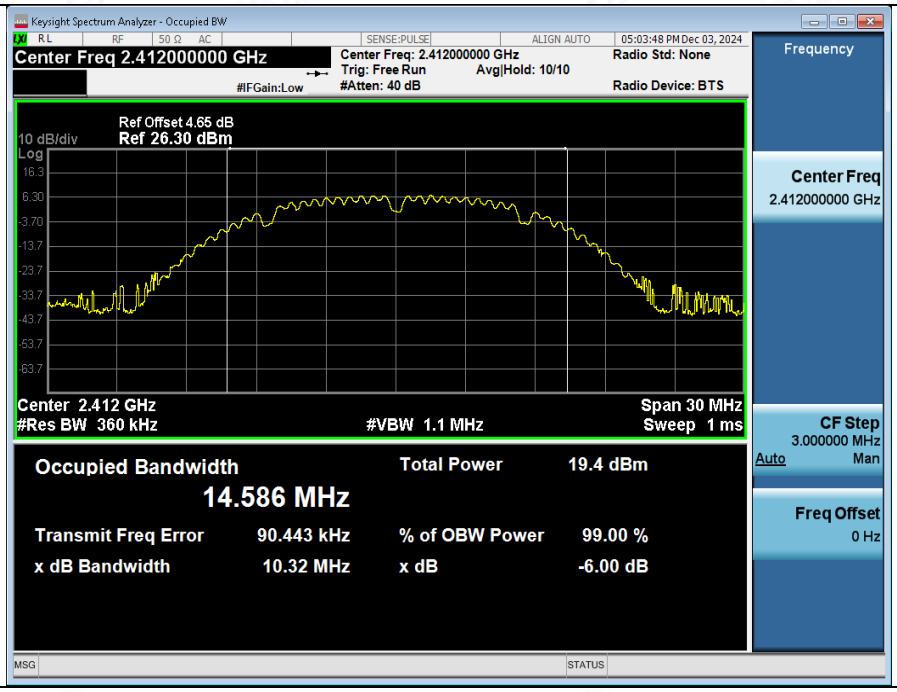
1. -6dB Bandwidth

Condition	Antenna	Modulation	Frequency (MHz)	-6dB BW(MHz)	limit(kHz)	Result
NVNT	ANT1	802.11b	2412.00	10.32	500	Pass
NVNT	ANT2	802.11b	2412.00	10.32	500	Pass
NVNT	ANT1	802.11b	2437.00	10.35	500	Pass
NVNT	ANT2	802.11b	2437.00	10.35	500	Pass
NVNT	ANT1	802.11b	2462.00	10.35	500	Pass
NVNT	ANT2	802.11b	2462.00	10.35	500	Pass
NVNT	ANT1	802.11g	2412.00	16.29	500	Pass
NVNT	ANT2	802.11g	2412.00	16.30	500	Pass
NVNT	ANT1	802.11g	2437.00	16.31	500	Pass
NVNT	ANT2	802.11g	2437.00	16.37	500	Pass
NVNT	ANT1	802.11g	2462.00	16.39	500	Pass
NVNT	ANT2	802.11g	2462.00	16.22	500	Pass
NVNT	ANT1	802.11n(HT20)	2412.00	17.31	500	Pass
NVNT	ANT2	802.11n(HT20)	2412.00	17.34	500	Pass
NVNT	ANT1	802.11n(HT20)	2437.00	17.35	500	Pass
NVNT	ANT2	802.11n(HT20)	2437.00	17.48	500	Pass
NVNT	ANT1	802.11n(HT20)	2462.00	17.46	500	Pass
NVNT	ANT2	802.11n(HT20)	2462.00	17.49	500	Pass
NVNT	ANT1	802.11n(HT40)	2422.00	36.01	500	Pass
NVNT	ANT2	802.11n(HT40)	2422.00	36.17	500	Pass
NVNT	ANT1	802.11n(HT40)	2437.00	36.15	500	Pass
NVNT	ANT2	802.11n(HT40)	2437.00	36.33	500	Pass
NVNT	ANT1	802.11n(HT40)	2452.00	36.18	500	Pass
NVNT	ANT2	802.11n(HT40)	2452.00	36.12	500	Pass

-6dB_Bandwidth_NVNT_ANT1_802_11b_2412



-6dB_Bandwidth_NVNT_ANT2_802_11b_2412



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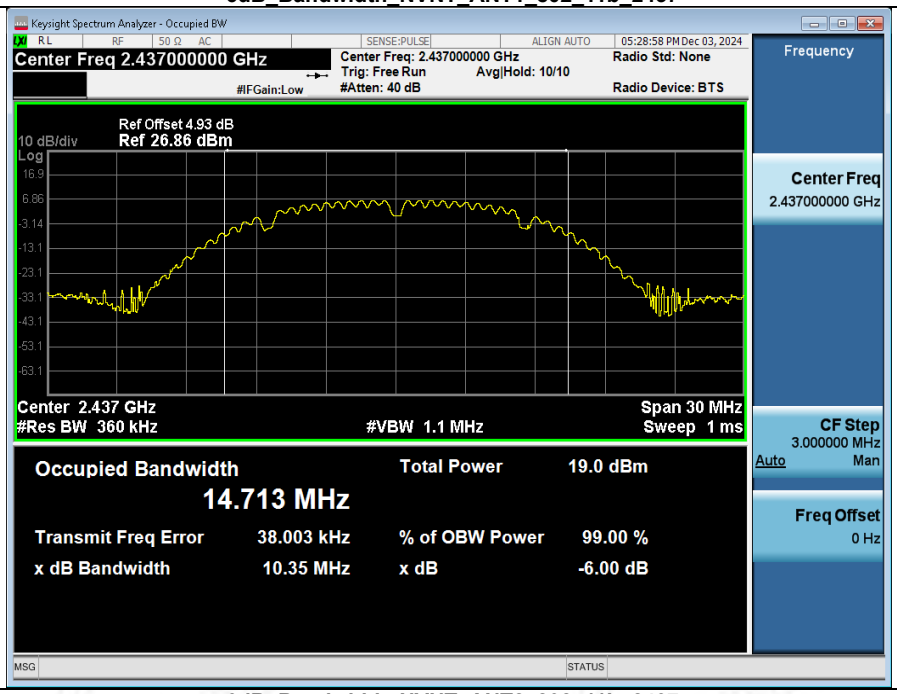

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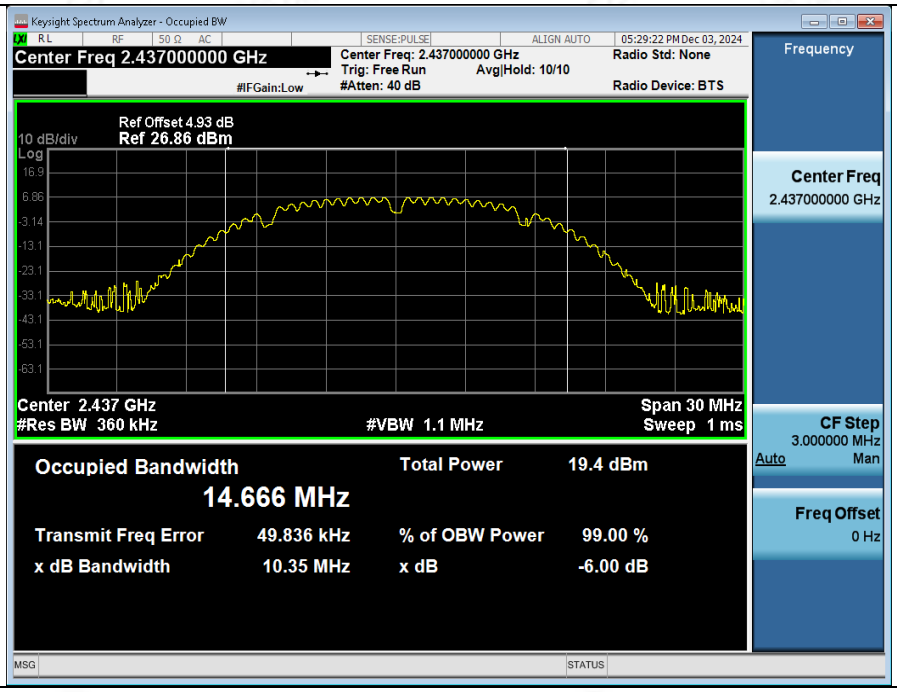

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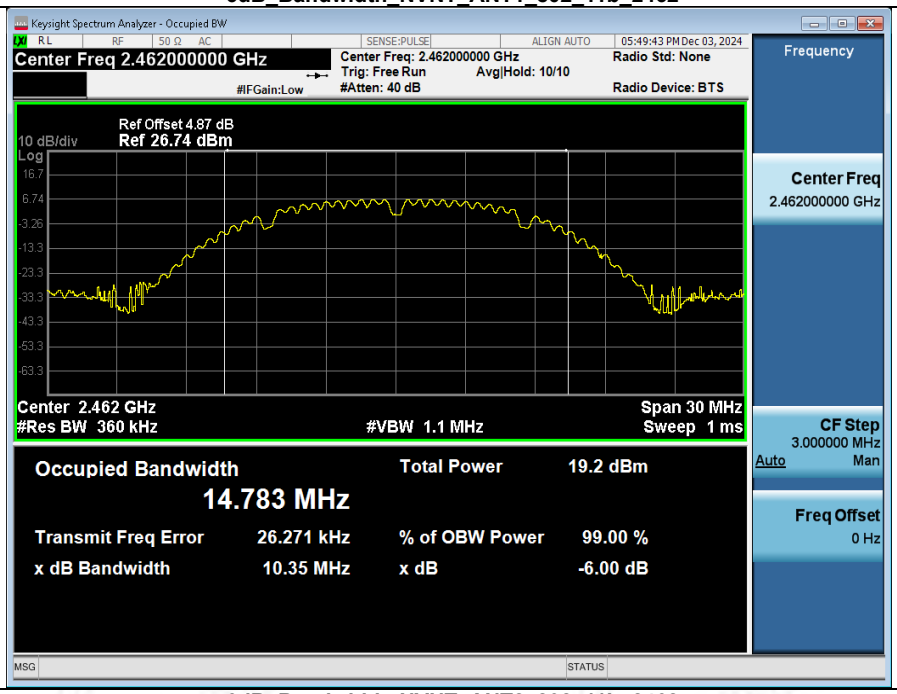

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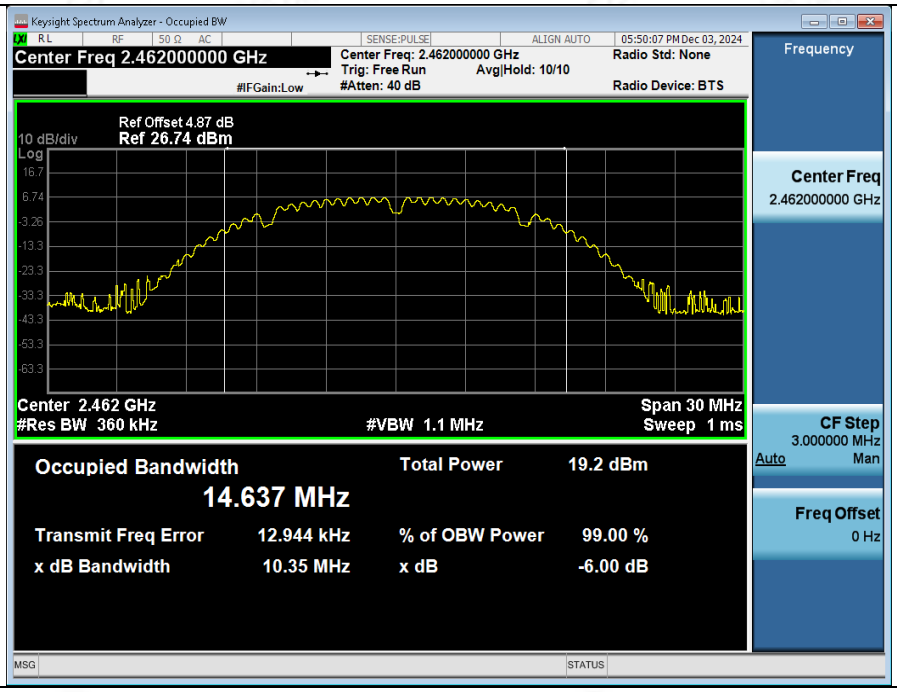

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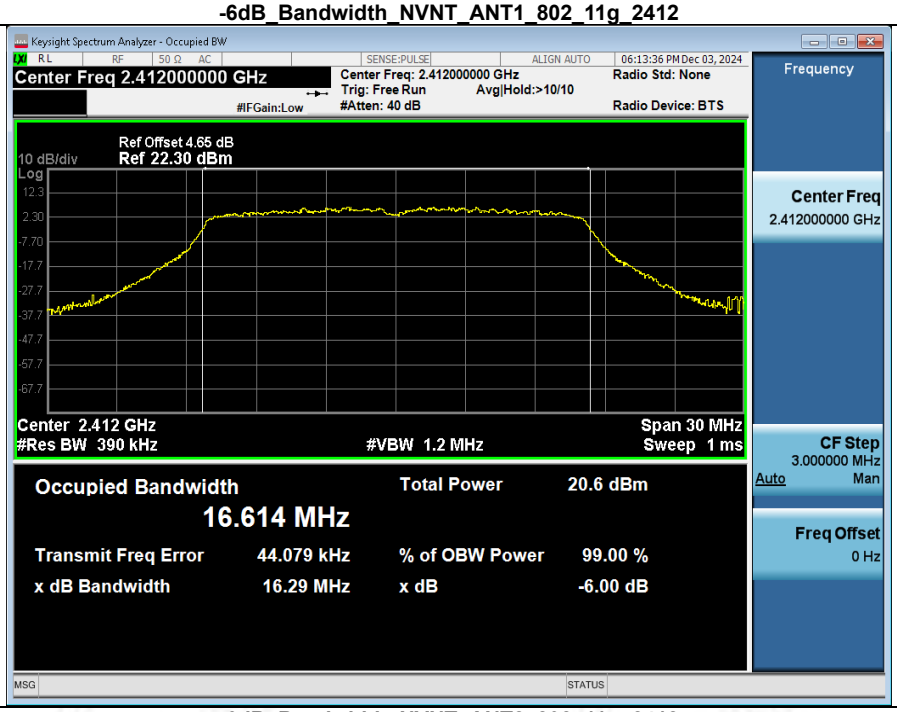

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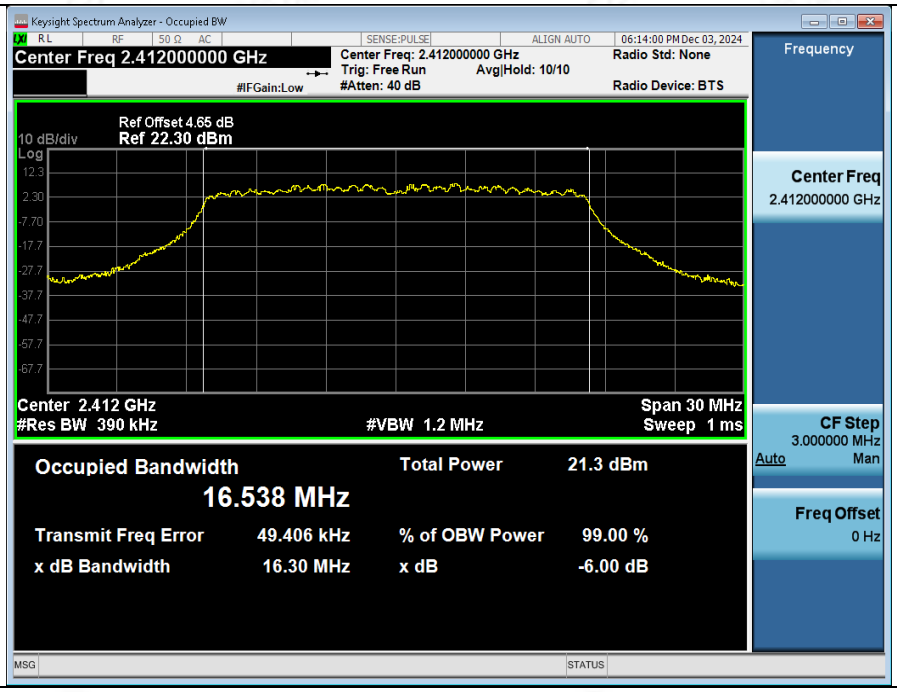

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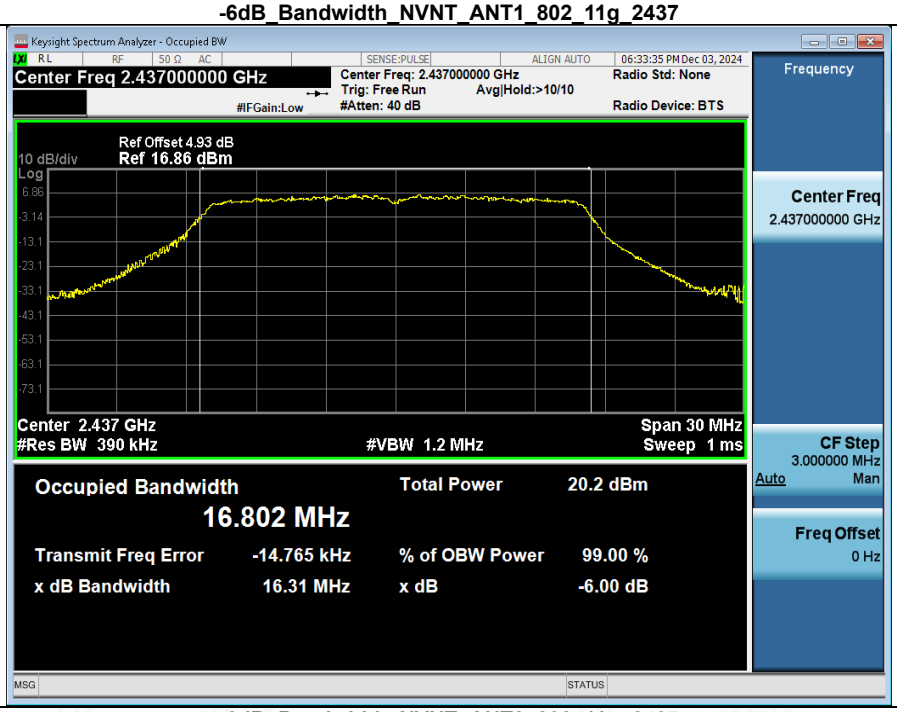

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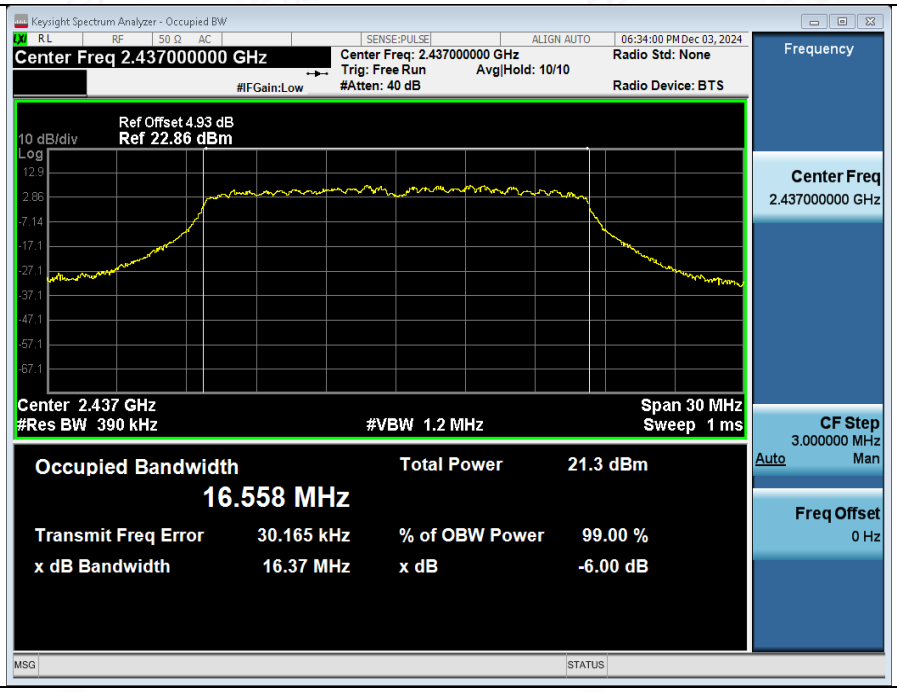

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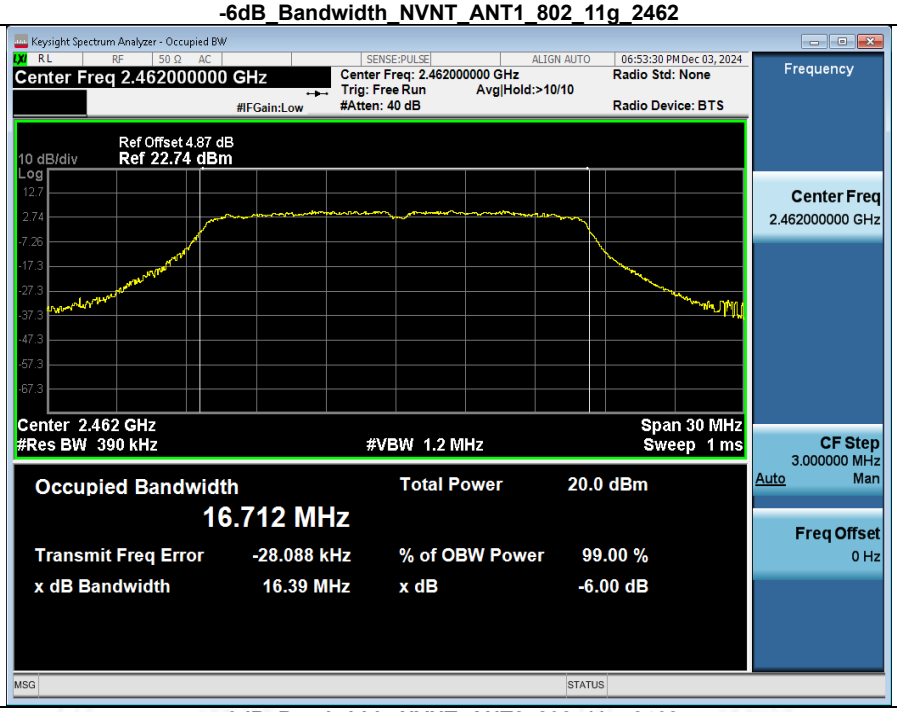

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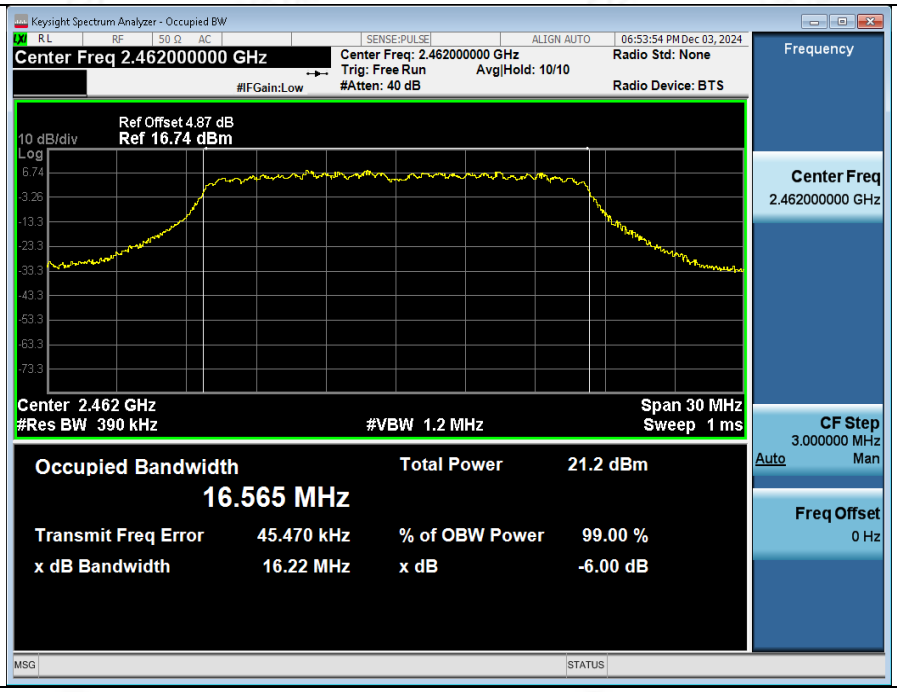
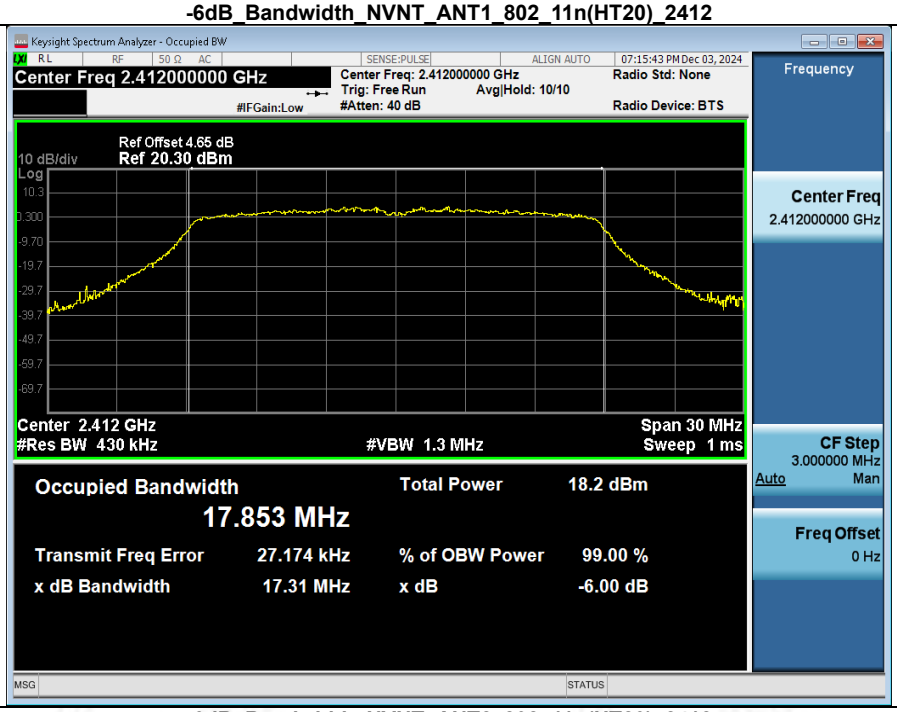


-6dB_Bandwidth_NVNT_ANT1_802_11n(HT20)_2412



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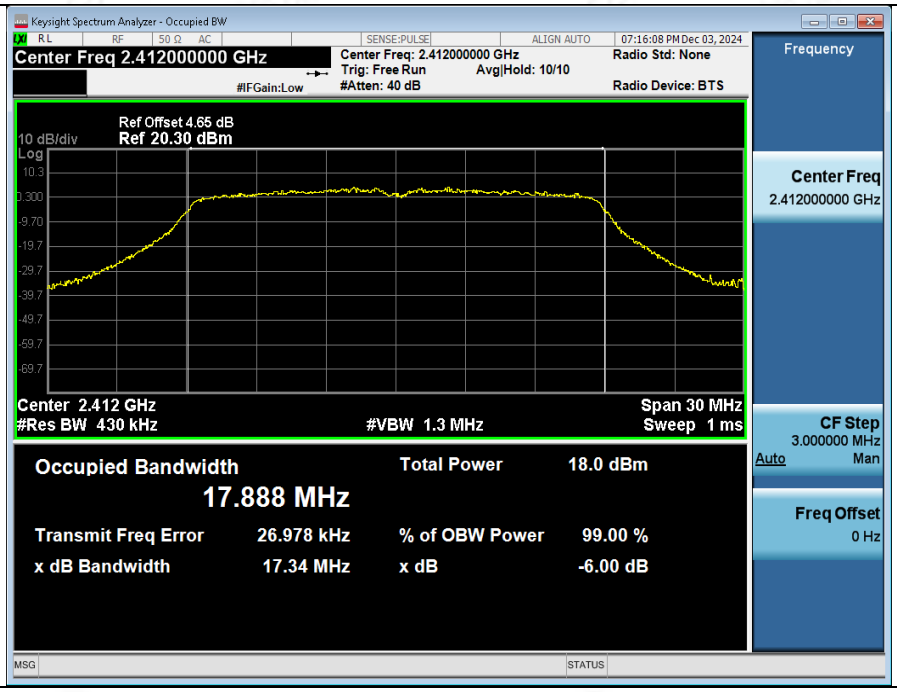

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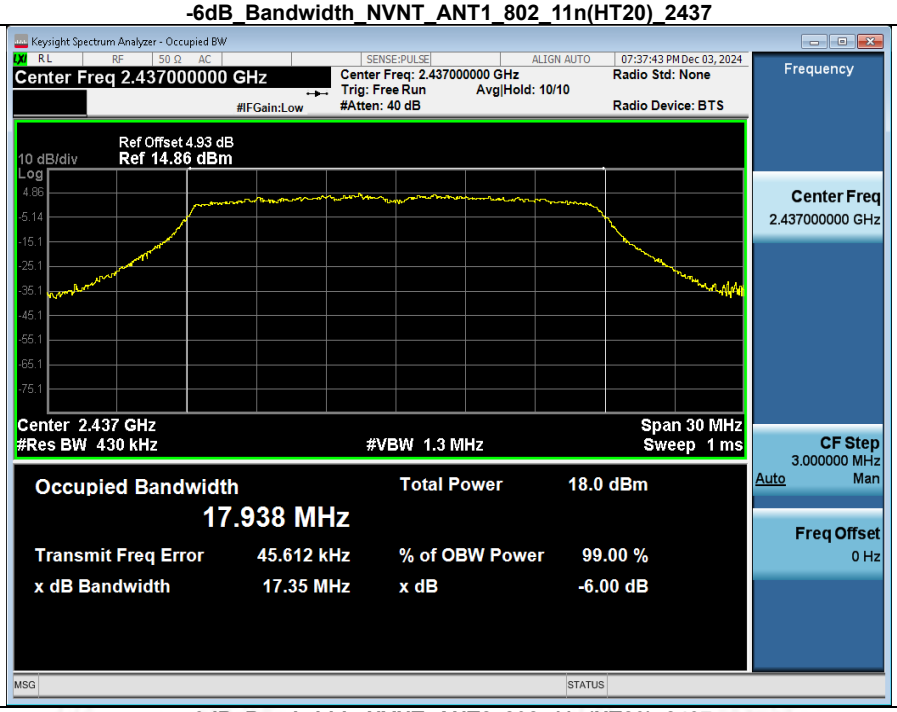

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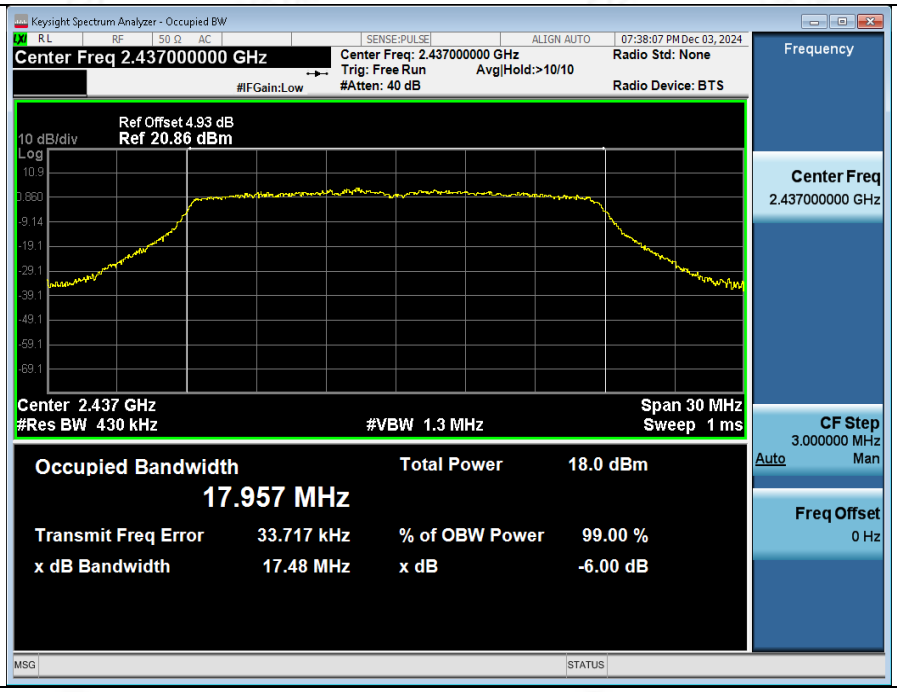

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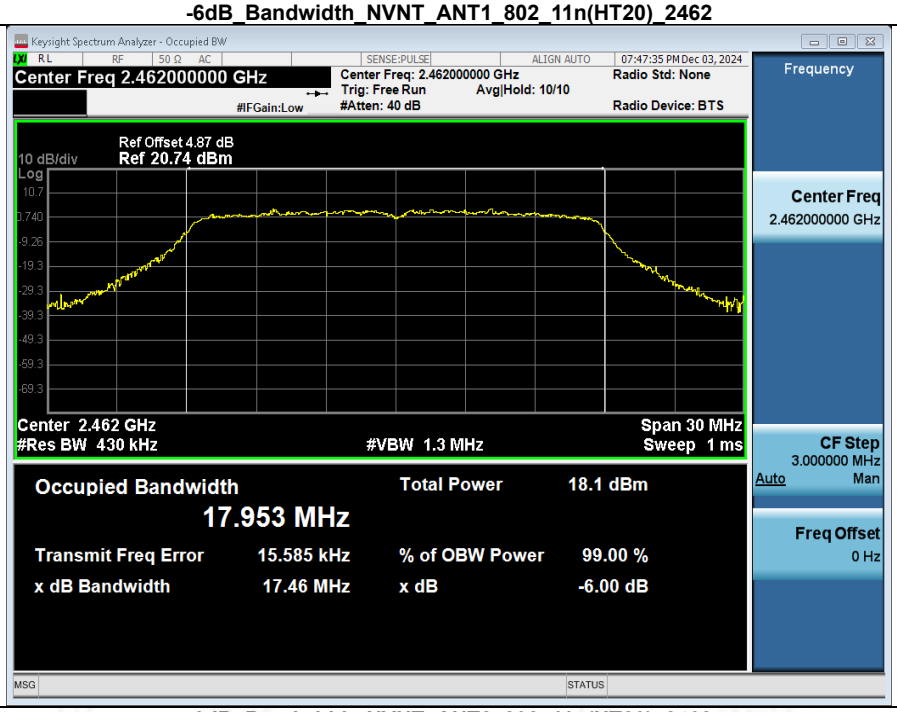

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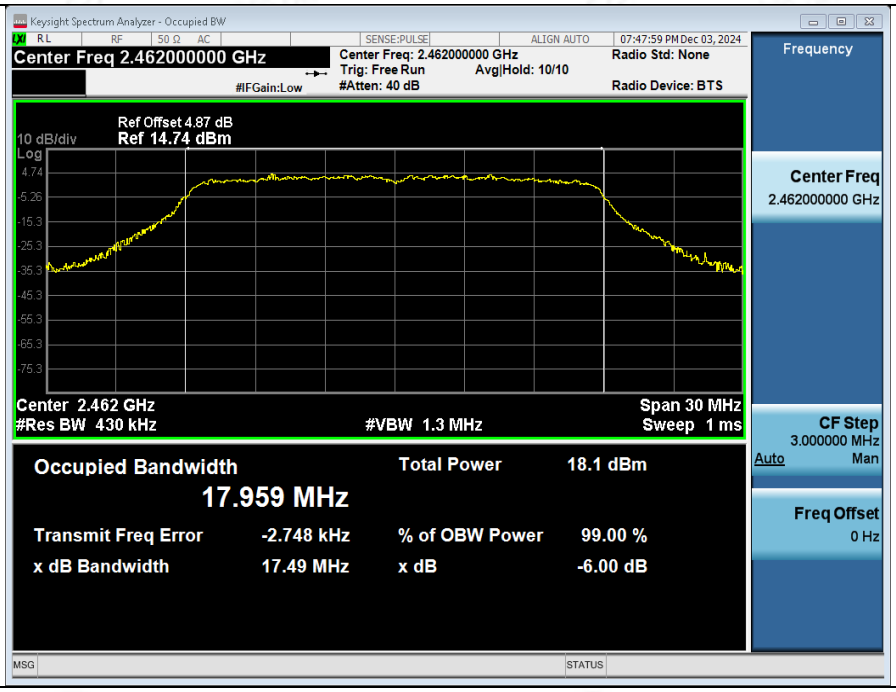

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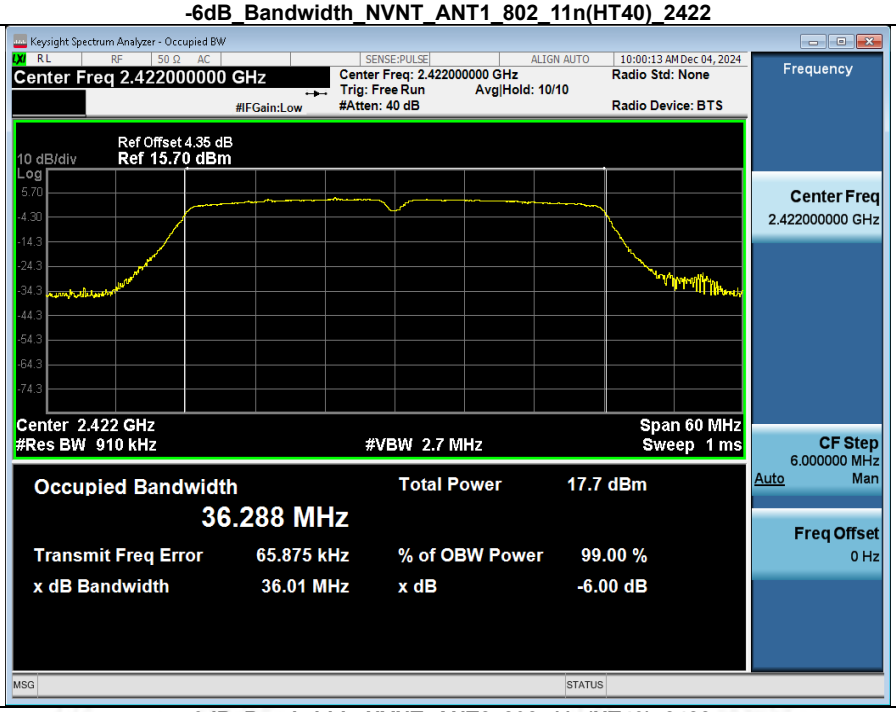

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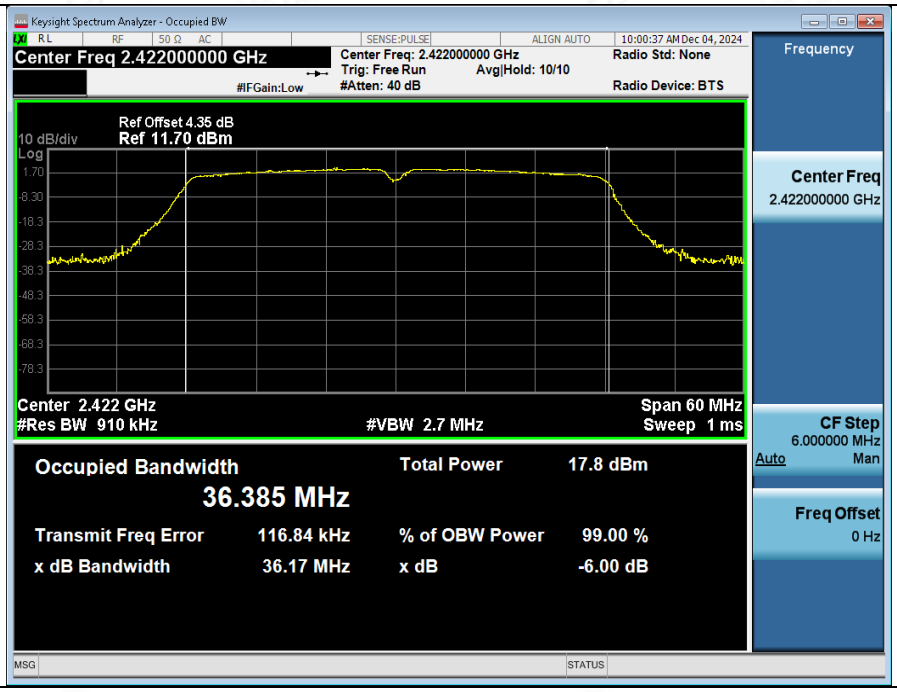

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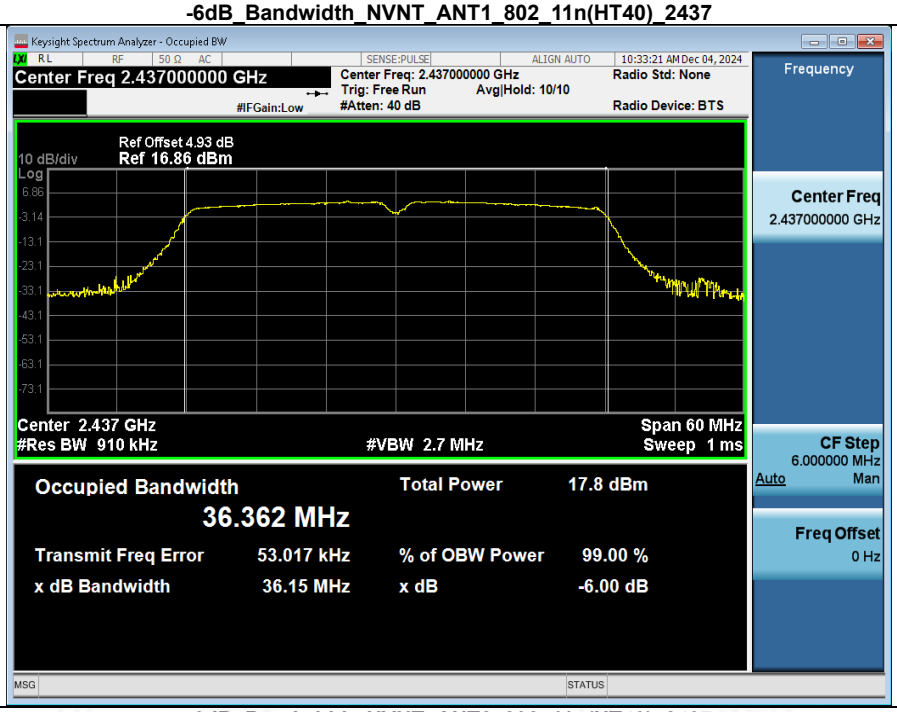

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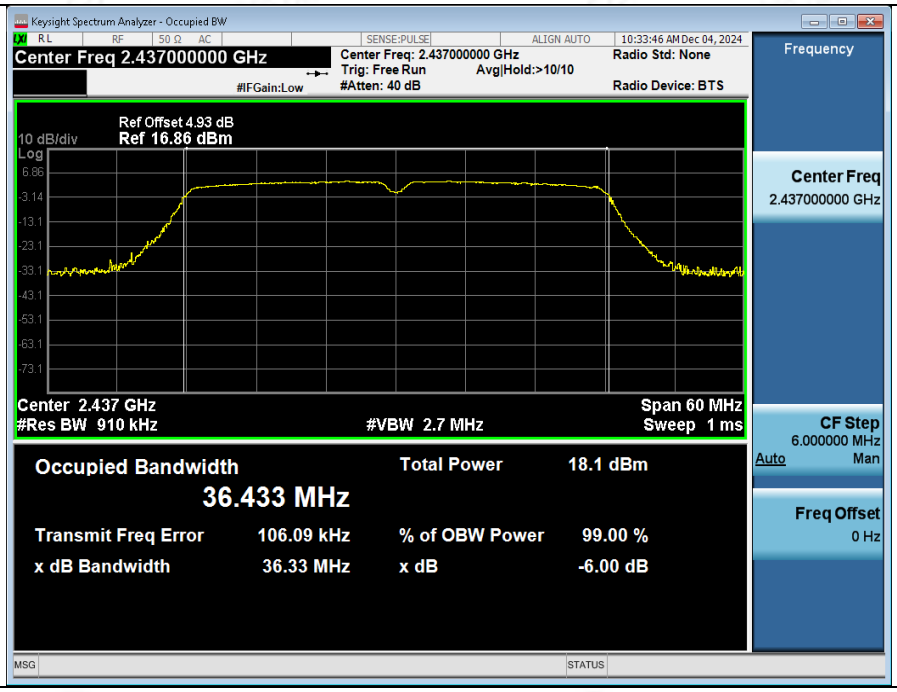

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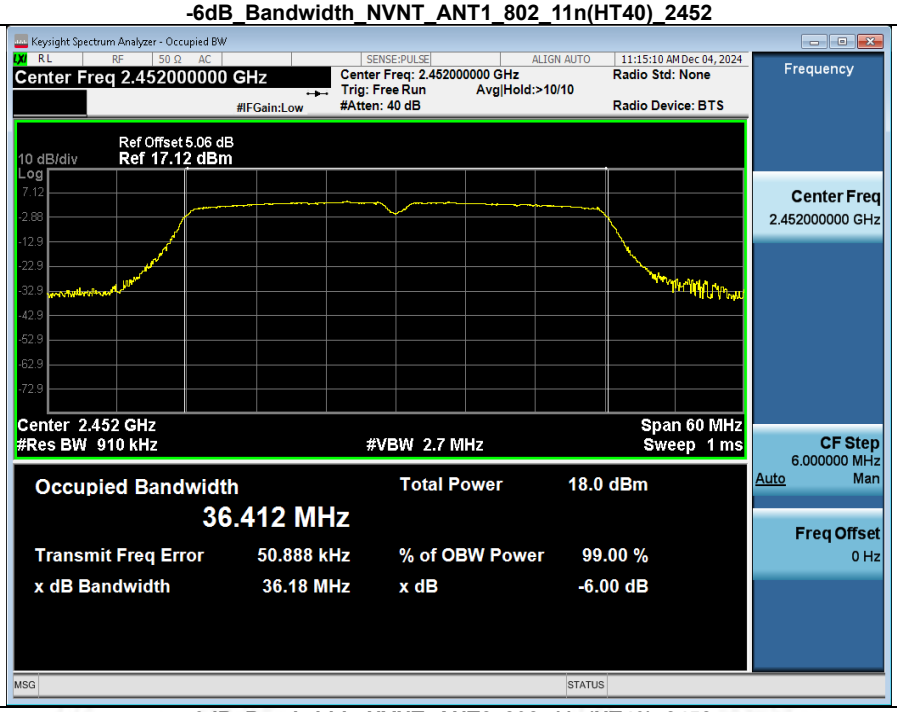
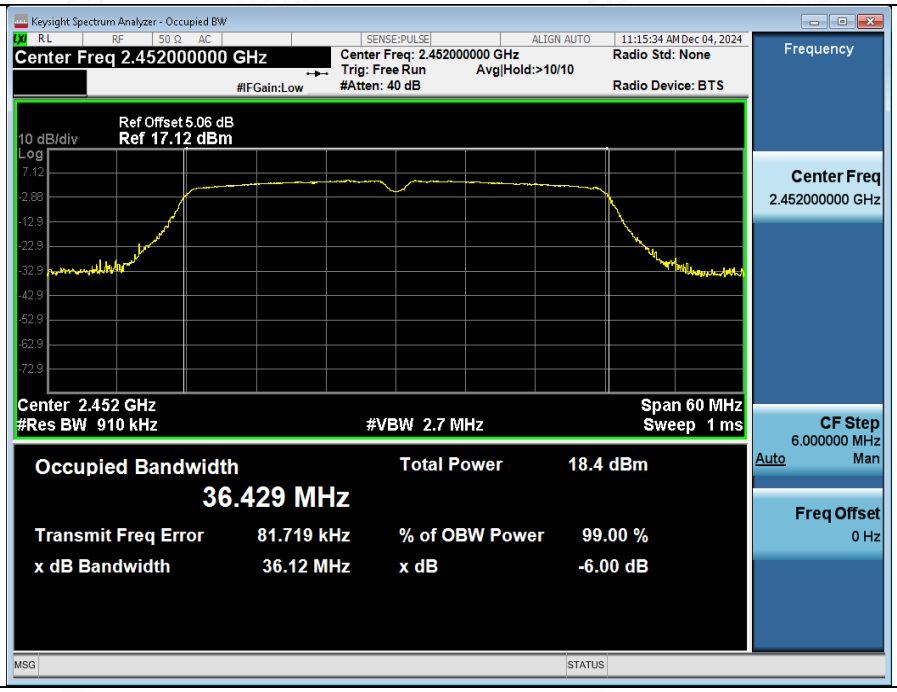


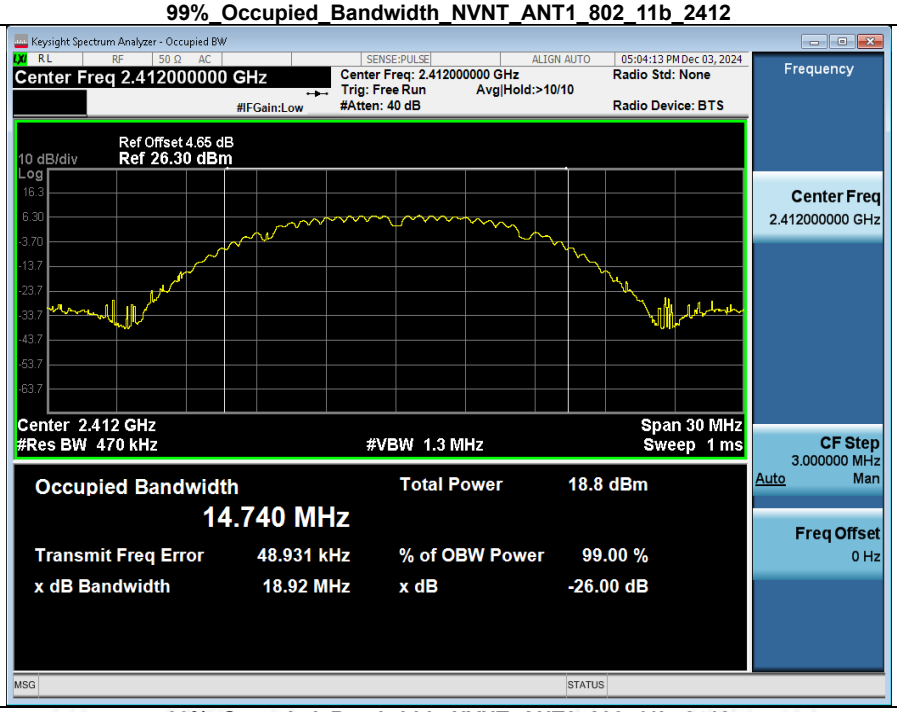
-6dB_Bandwidth_NVNT_ANT2_802_11n(HT40)_2452


Keysight Spectrum Analyzer - Occupied BW
Center Freq 2.452000000 GHz
Center Freq: 2.452000000 GHz
Trig: Free Run
Avg|Hold:>10/10
#Atten: 40 dB
Radio Std: None
Radio Device: BTS
11:15:34 AM Dec 04, 2024
Frequency
Ref Offset 5.06 dB
10 dB/div
Ref 17.12 dBm
Center Freq
2.452000000 GHz
Center 2.452 GHz
#Res BW 910 kHz
#VBW 2.7 MHz
Span 60 MHz
Sweep 1 ms
CF Step
6.000000 MHz
Auto
Man
Occupied Bandwidth
36.429 MHz
Total Power
18.4 dBm
Transmit Freq Error
81.719 kHz
% of OBW Power
99.00 %
x dB Bandwidth
36.12 MHz
x dB
-6.00 dB
Freq Offset
0 Hz
MSG
STATUS

2. 99% Occupied Bandwidth

Condition	Antenna	Modulation	Frequency (MHz)	99%%BW(MHz)
NVNT	ANT1	802.11b	2412.00	14.740
NVNT	ANT2	802.11b	2412.00	14.613
NVNT	ANT1	802.11b	2437.00	14.725
NVNT	ANT2	802.11b	2437.00	14.686
NVNT	ANT1	802.11b	2462.00	14.792
NVNT	ANT2	802.11b	2462.00	14.628
NVNT	ANT1	802.11g	2412.00	16.759
NVNT	ANT2	802.11g	2412.00	16.617
NVNT	ANT1	802.11g	2437.00	16.985
NVNT	ANT2	802.11g	2437.00	16.667
NVNT	ANT1	802.11g	2462.00	16.865
NVNT	ANT2	802.11g	2462.00	16.676
NVNT	ANT1	802.11n(HT20)	2412.00	17.942
NVNT	ANT2	802.11n(HT20)	2412.00	18.051
NVNT	ANT1	802.11n(HT20)	2437.00	18.099
NVNT	ANT2	802.11n(HT20)	2437.00	18.131
NVNT	ANT1	802.11n(HT20)	2462.00	18.120
NVNT	ANT2	802.11n(HT20)	2462.00	18.137
NVNT	ANT1	802.11n(HT40)	2422.00	36.282
NVNT	ANT2	802.11n(HT40)	2422.00	36.373
NVNT	ANT1	802.11n(HT40)	2437.00	36.401
NVNT	ANT2	802.11n(HT40)	2437.00	36.483
NVNT	ANT1	802.11n(HT40)	2452.00	36.406
NVNT	ANT2	802.11n(HT40)	2452.00	36.435

99%_Occupied_Bandwidth_NVNT_ANT1_802_11b_2412



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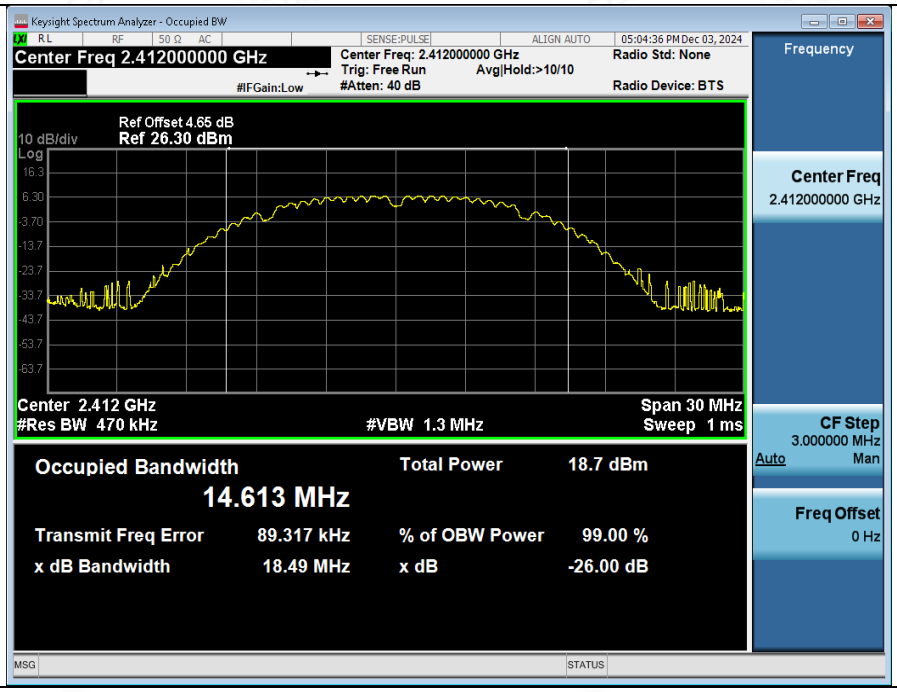

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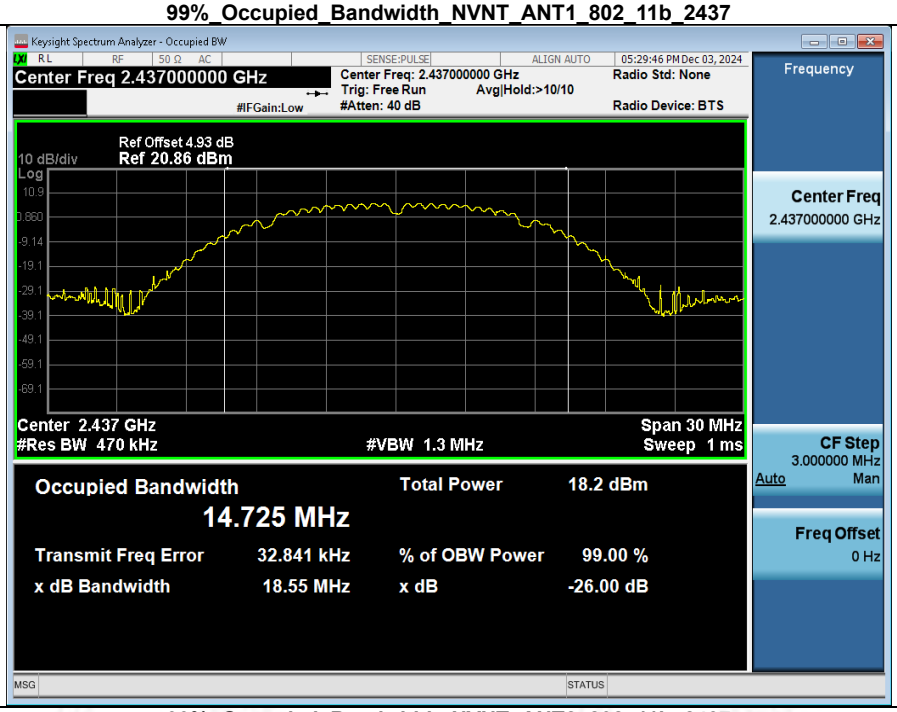

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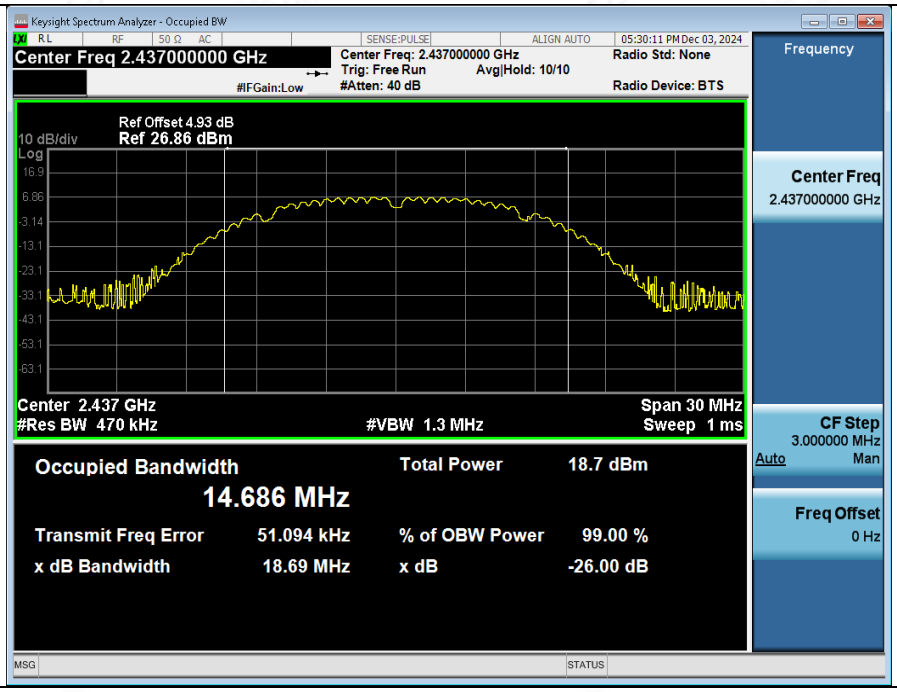

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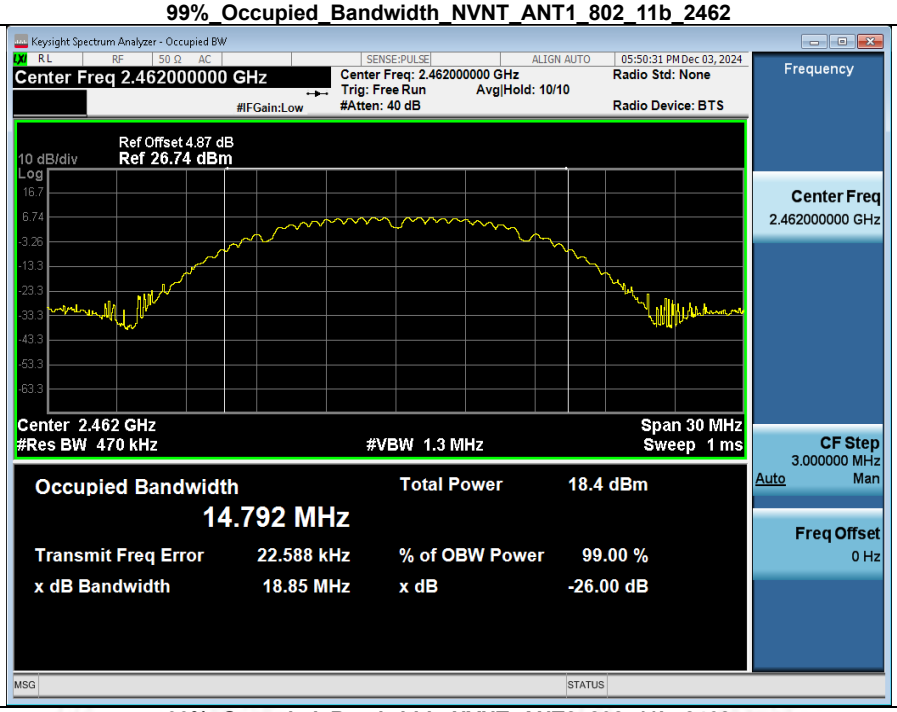

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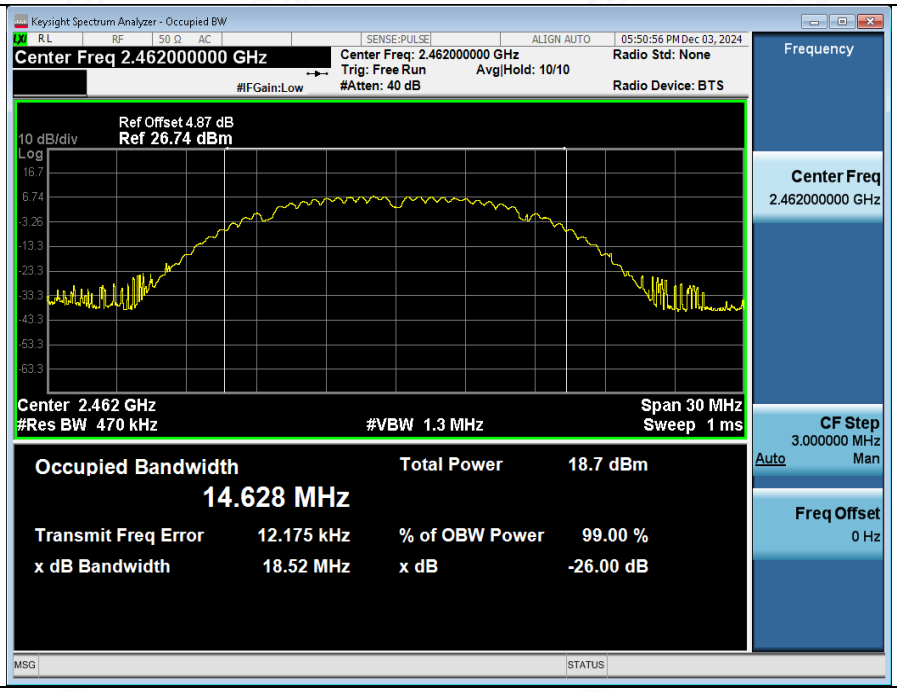

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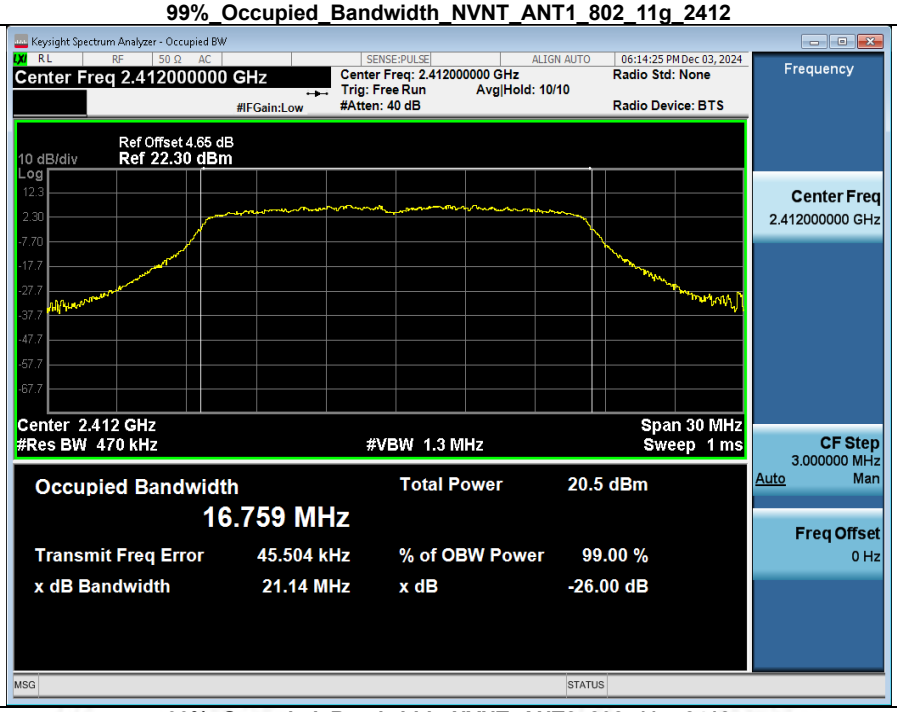

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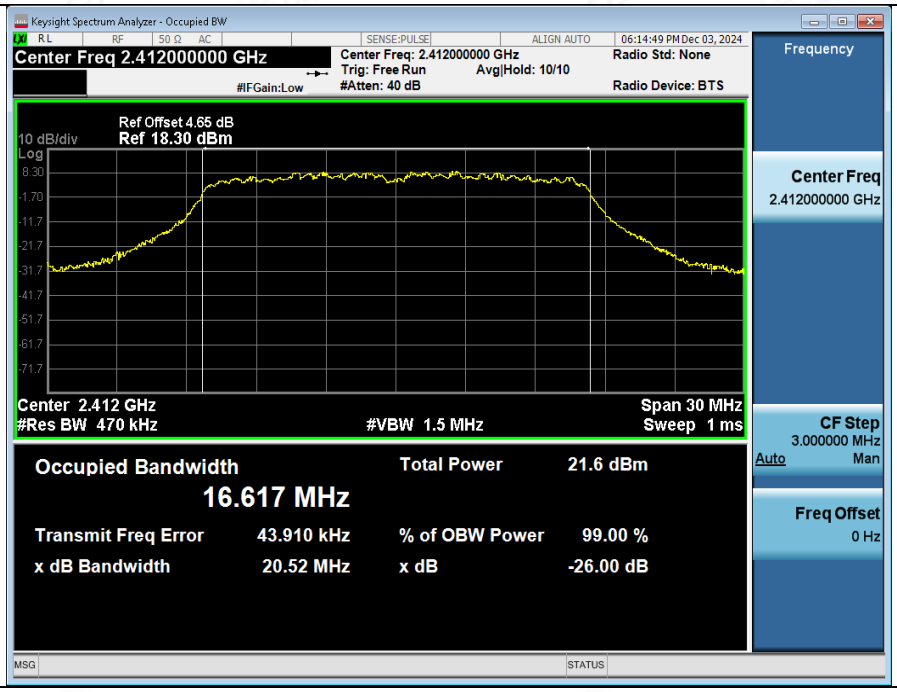

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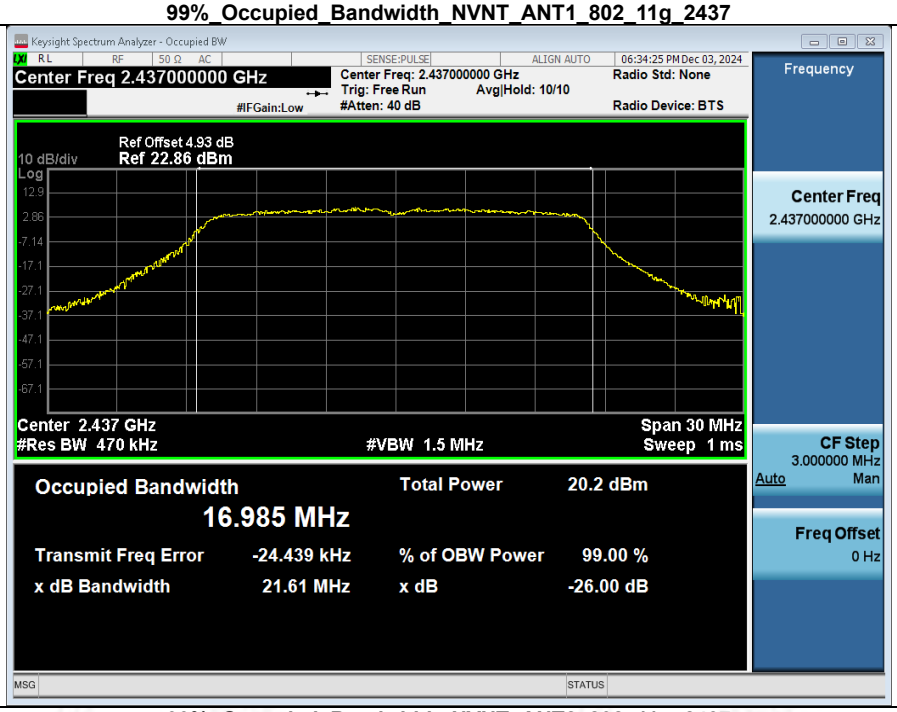

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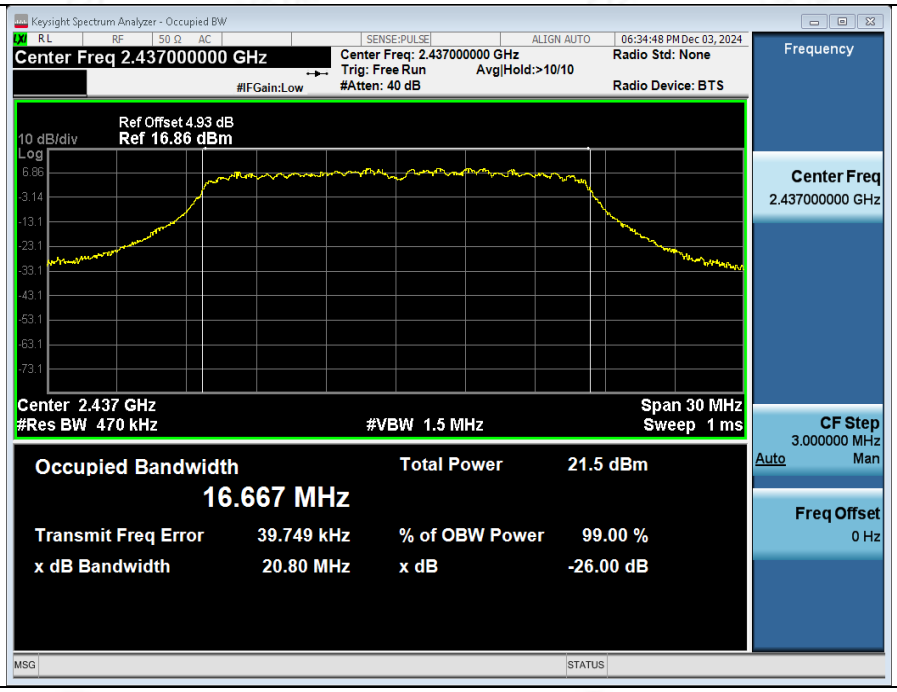

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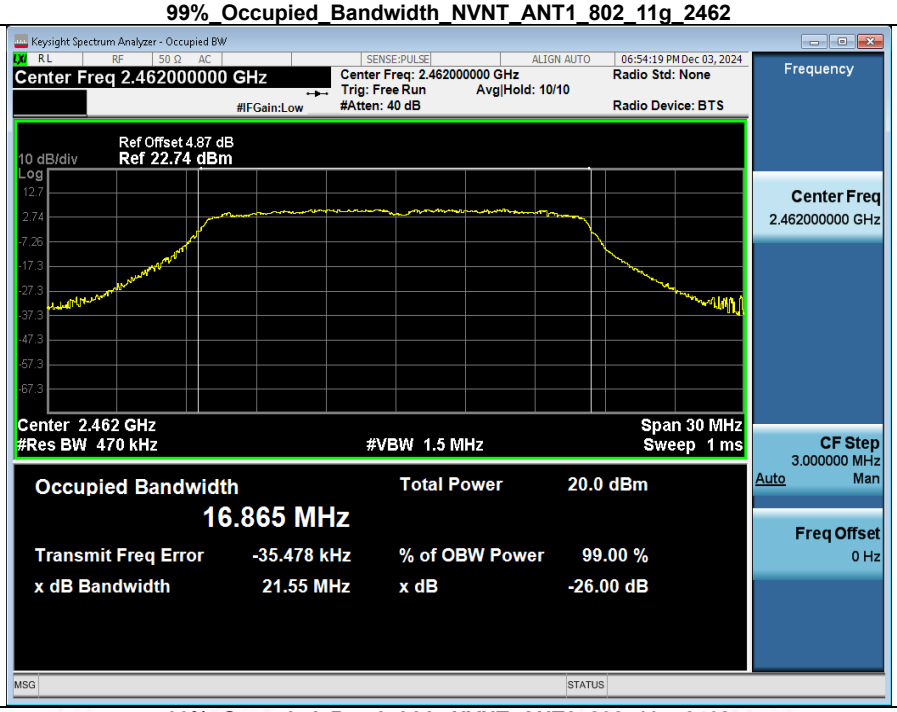

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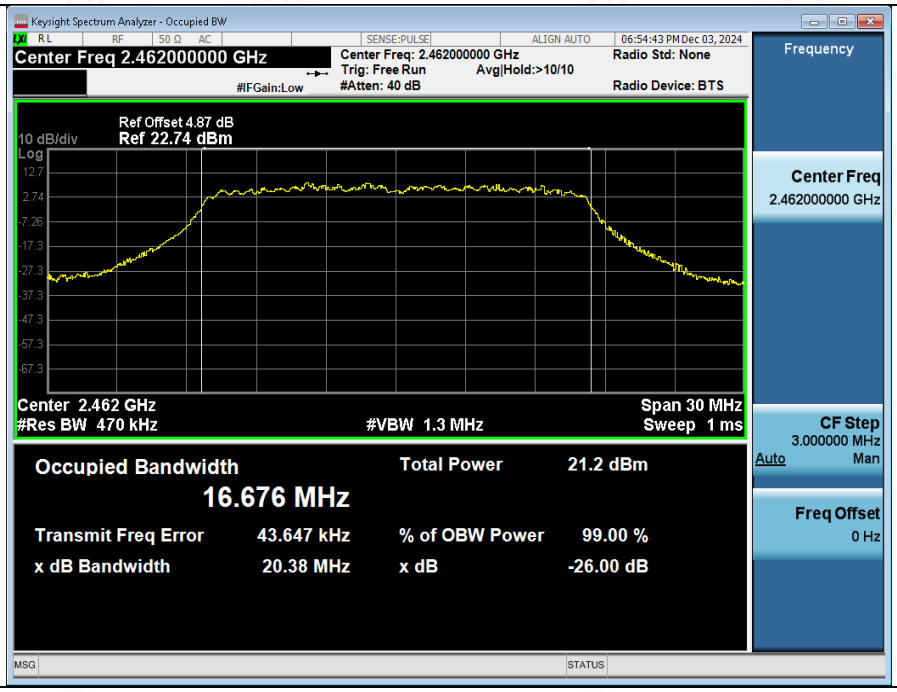

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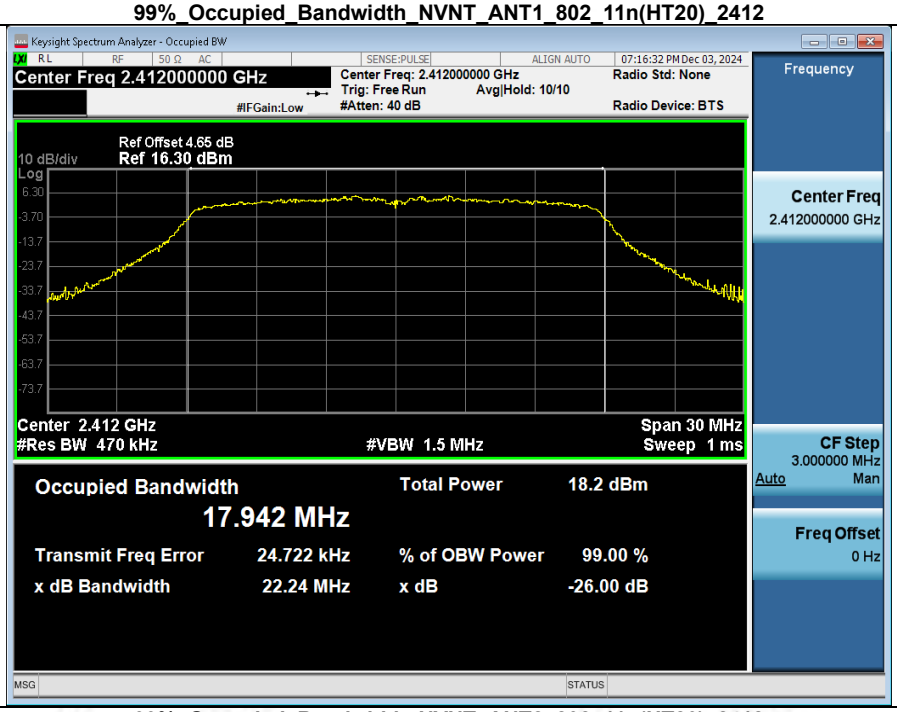

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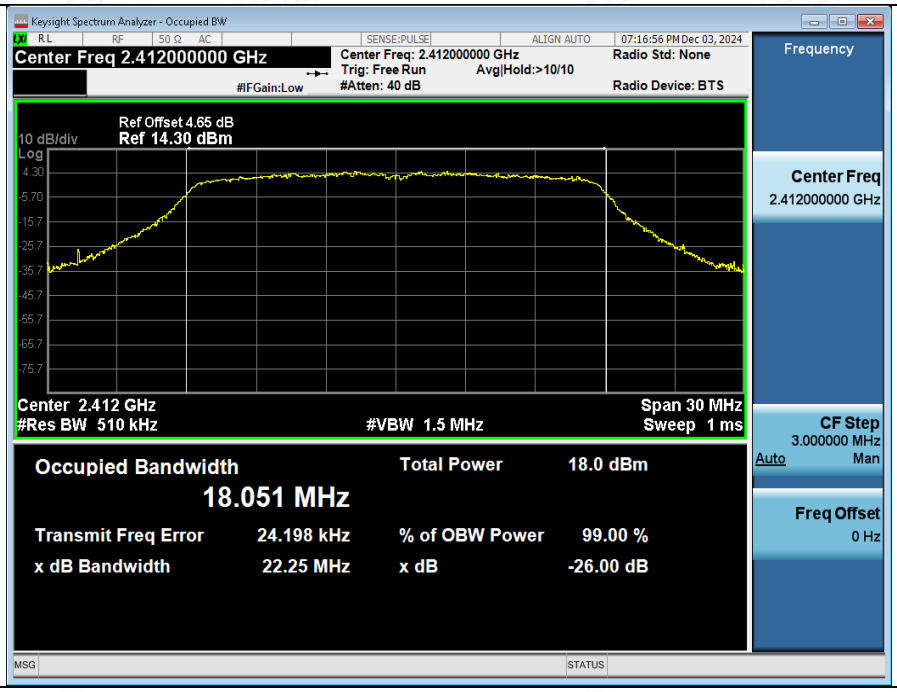

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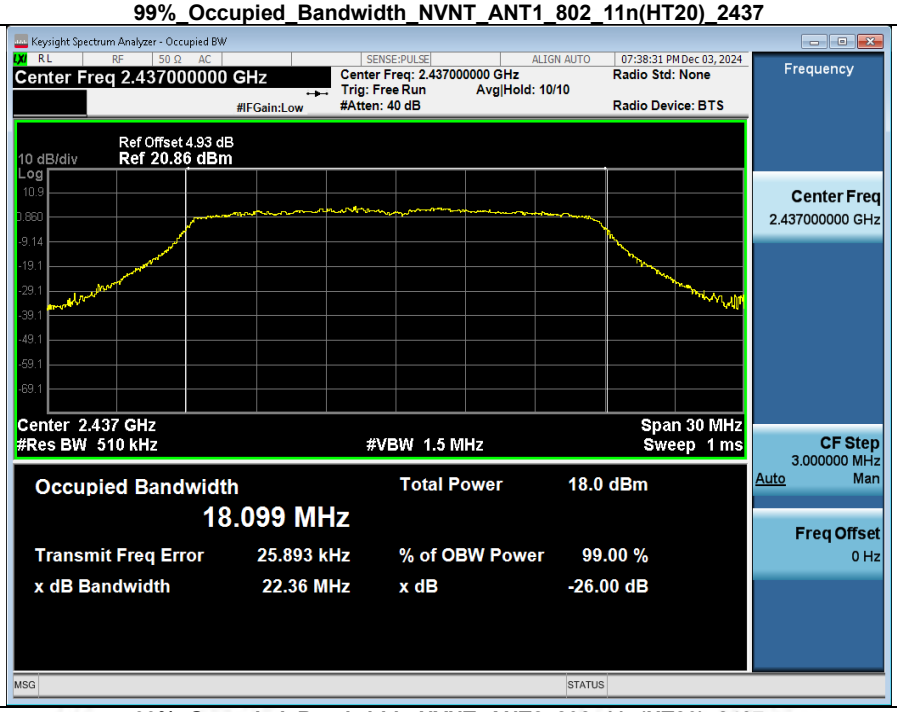
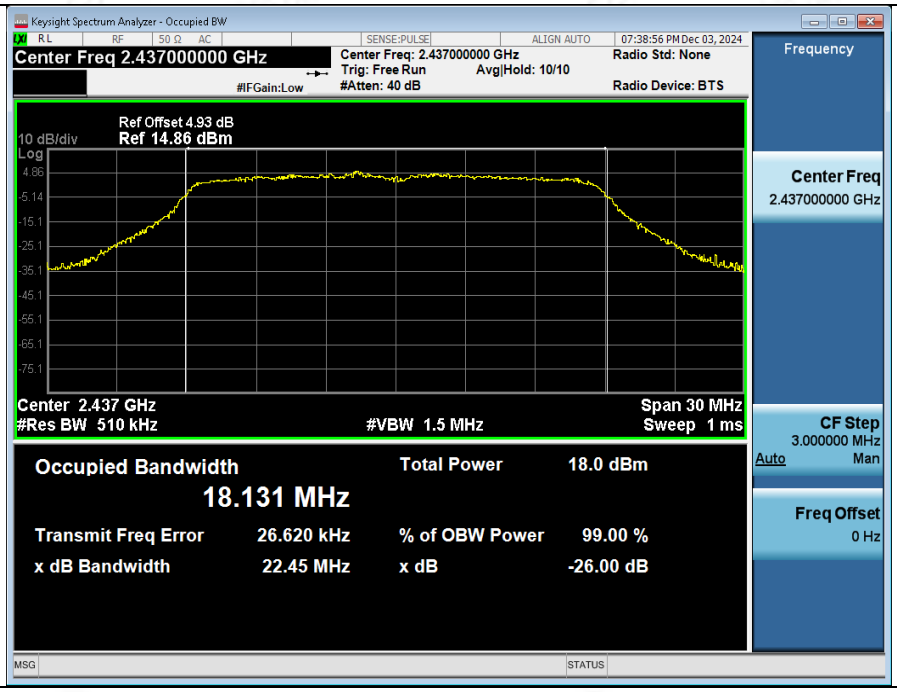
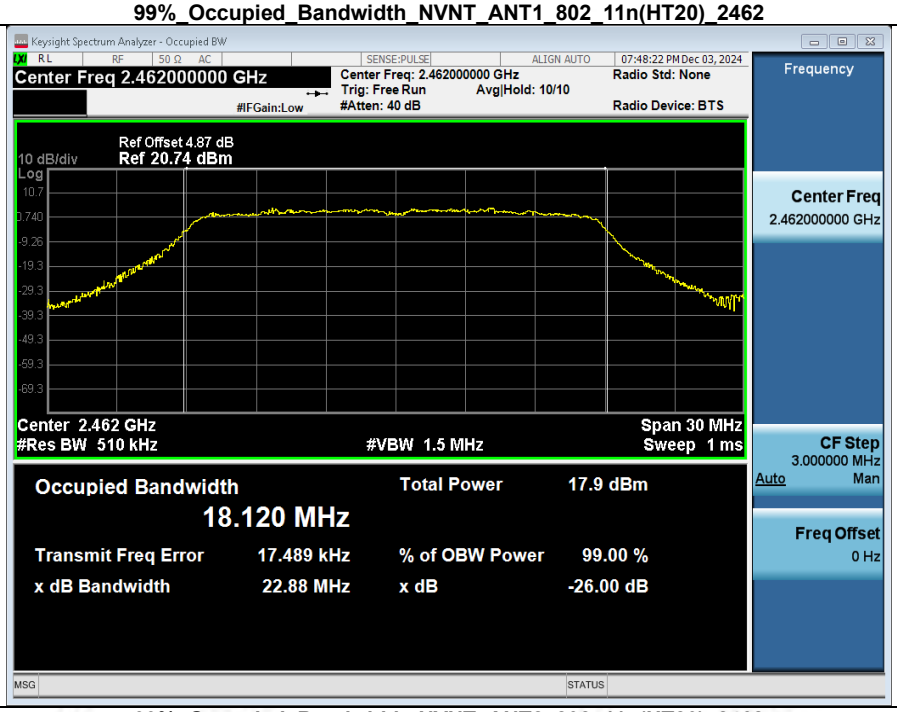


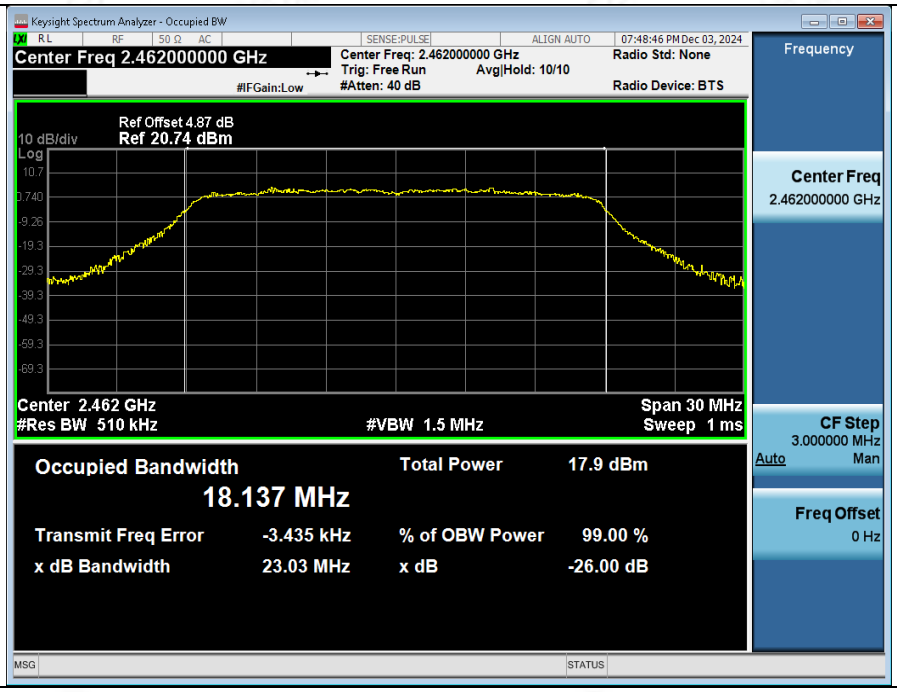
99%_Occupied_Bandwidth_NVNT_ANT2_802_11n(HT20)_2437



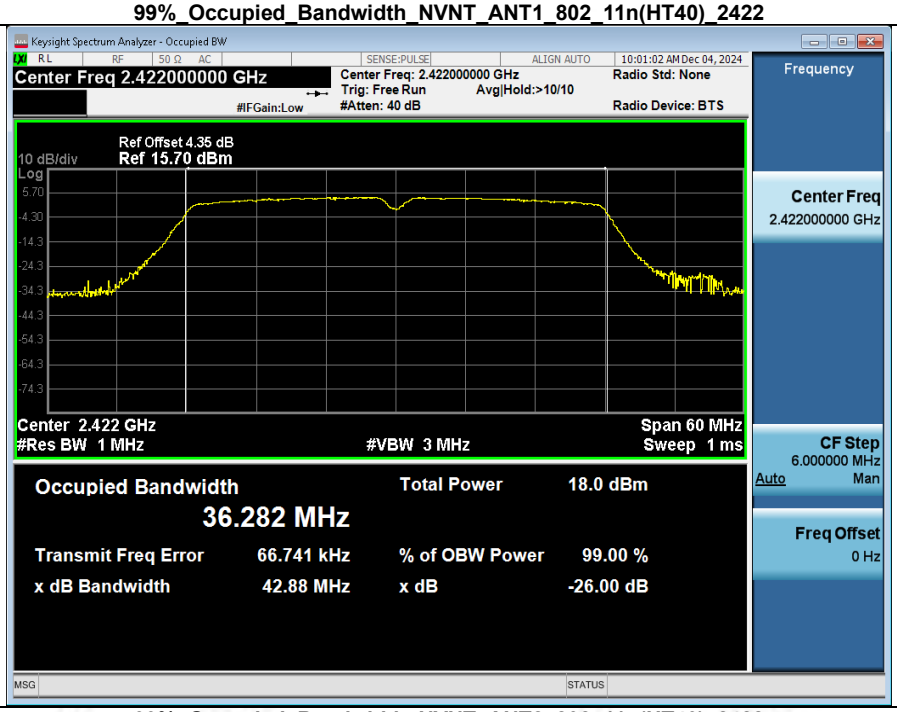
99%_Occupied_Bandwidth_NVNT_ANT1_802_11n(HT20)_2462



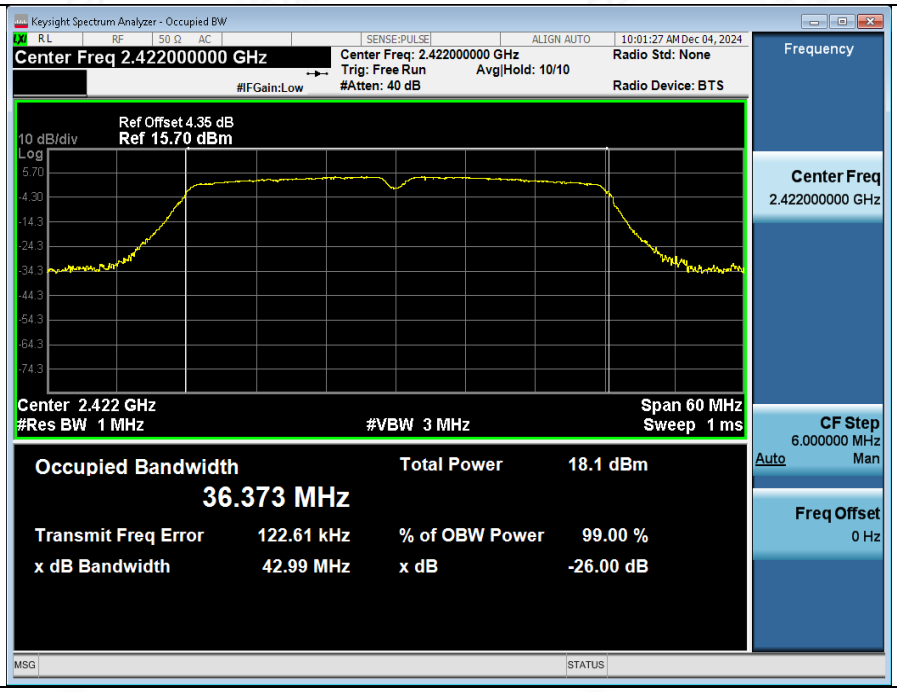
99%_Occupied_Bandwidth_NVNT_ANT2_802_11n(HT20)_2462



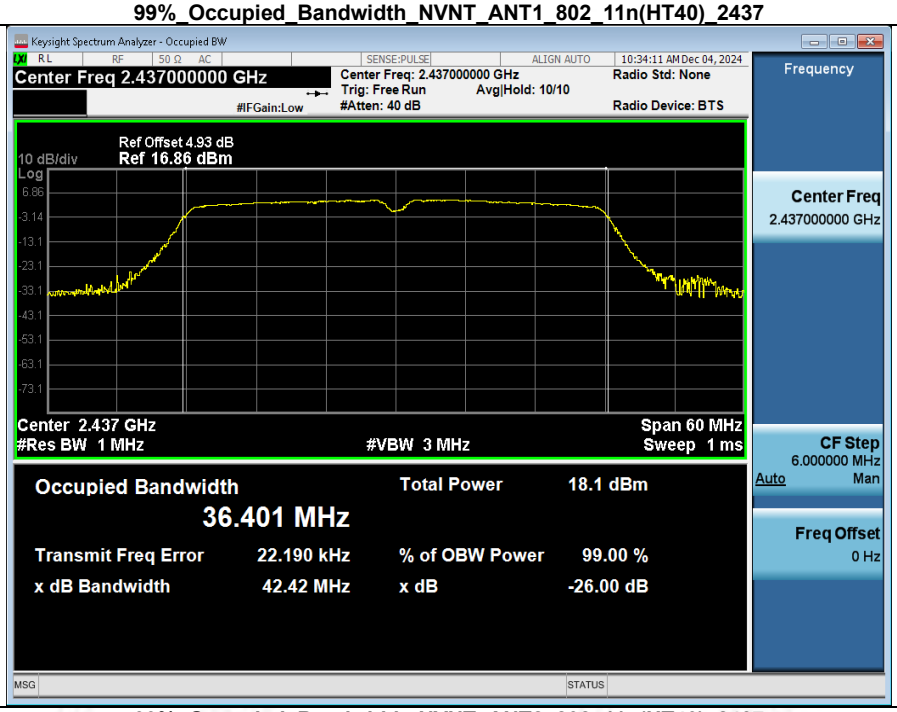
99%_Occupied_Bandwidth_NVNT_ANT1_802_11n(HT40)_2422



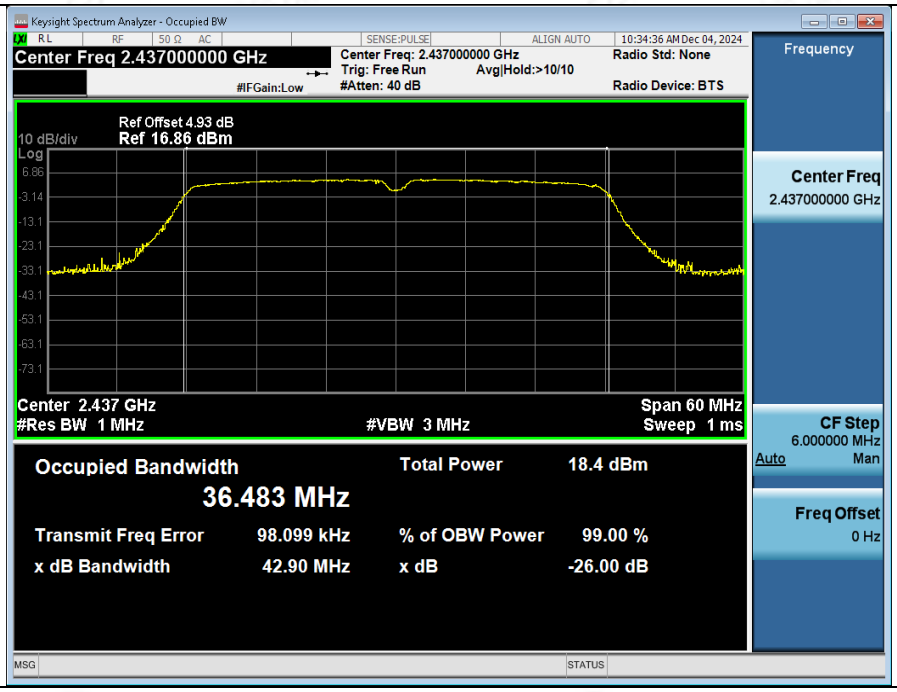
99%_Occupied_Bandwidth_NVNT_ANT2_802_11n(HT40)_2422



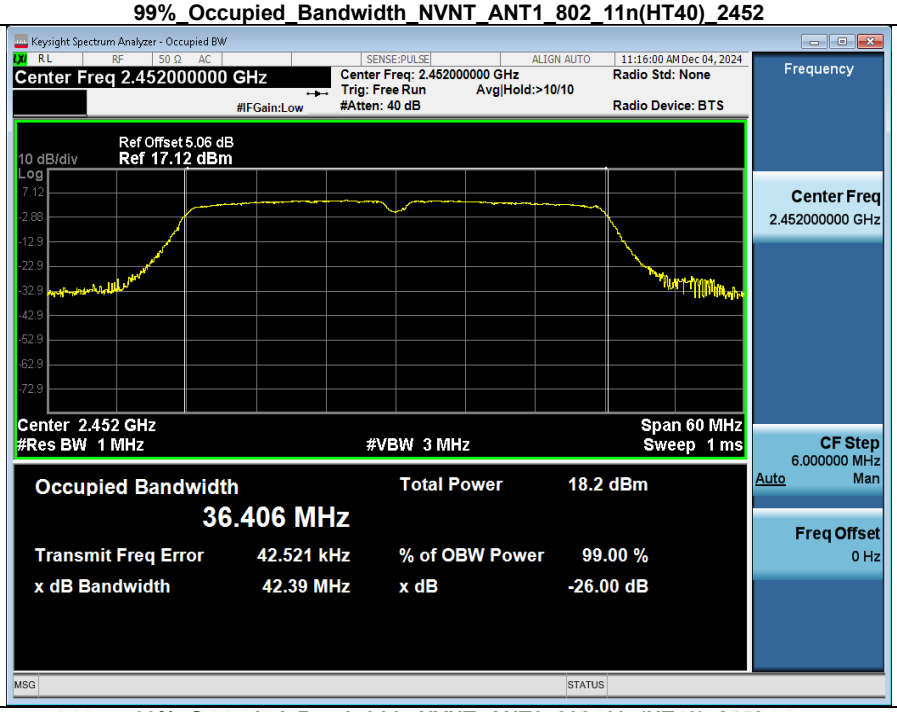
99%_Occupied_Bandwidth_NVNT_ANT1_802_11n(HT40)_2437



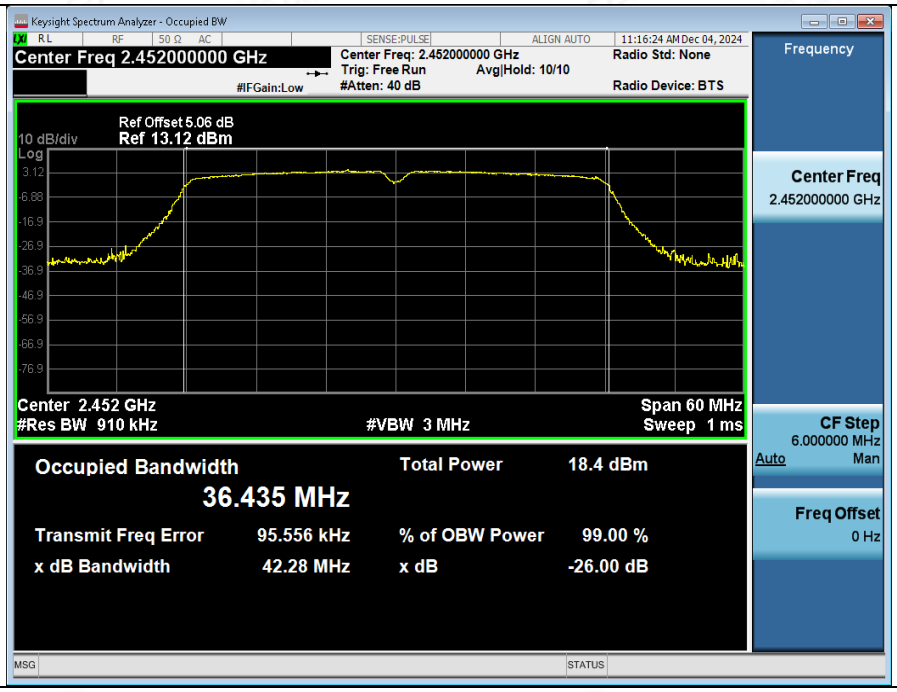
99%_Occupied_Bandwidth_NVNT_ANT2_802_11n(HT40)_2437



99%_Occupied_Bandwidth_NVNT_ANT1_802_11n(HT40)_2452



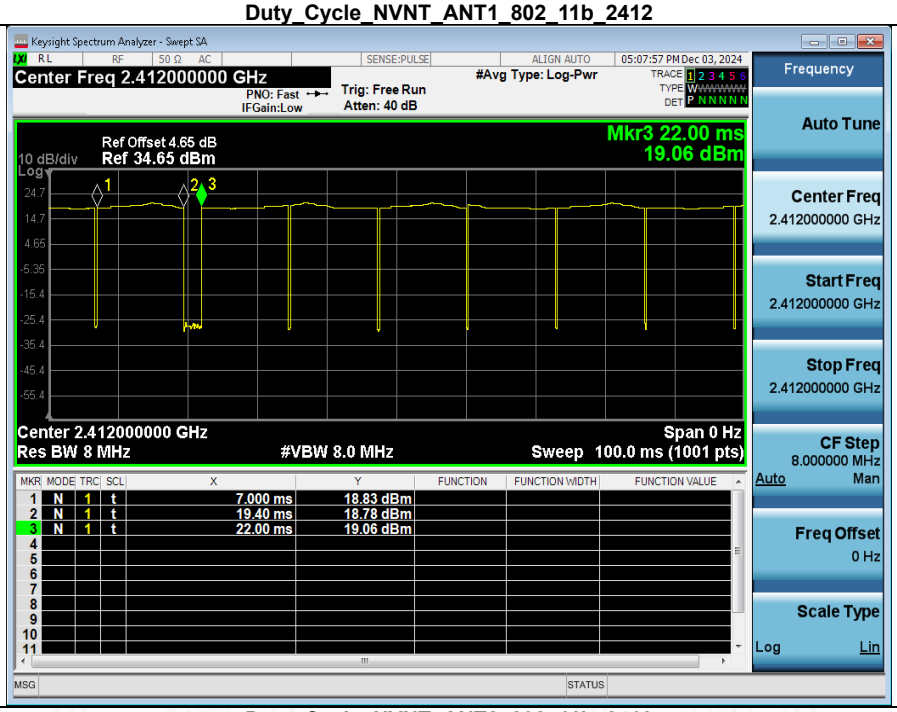
99%_Occupied_Bandwidth_NVNT_ANT2_802_11n(HT40)_2452


Keysight Spectrum Analyzer - Occupied BW
Center Freq 2.452000000 GHz
Center Freq: 2.452000000 GHz
Trig: Free Run
Avg|Hold: 10/10
#Atten: 40 dB
Radio Std: None
Radio Device: BTS
11:16:24 AM Dec 04, 2024
Frequency
Ref Offset 5.06 dB
10 dB/div
Ref 13.12 dBm
Center Freq
2.452000000 GHz
Center 2.452 GHz
#Res BW 910 kHz
#VBW 3 MHz
Span 60 MHz
Sweep 1 ms
CF Step
6.000000 MHz
Auto
Man
Occupied Bandwidth
36.435 MHz
Total Power 18.4 dBm
Transmit Freq Error 95.556 kHz
% of OBW Power 99.00 %
x dB Bandwidth 42.28 MHz
x dB -26.00 dB
Freq Offset
0 Hz
MSG
STATUS

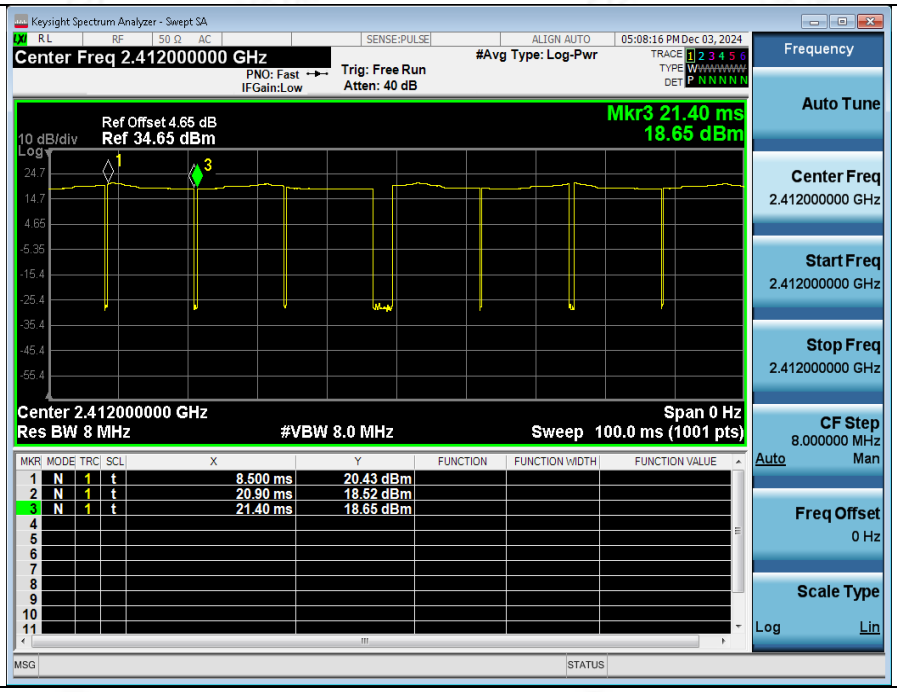
3. Duty Cycle

Condition	Antenna	Modulation	Frequency (MHz)	Duty cycle(%)	Duty factor(dB)
NVNT	ANT1	802.11b	2412.00	83.33	0.79
NVNT	ANT2	802.11b	2412.00	96.90	0.14
NVNT	ANT1	802.11b	2437.00	97.66	0.10
NVNT	ANT2	802.11b	2437.00	97.66	0.10
NVNT	ANT1	802.11b	2462.00	96.90	0.14
NVNT	ANT2	802.11b	2462.00	97.66	0.10
NVNT	ANT1	802.11g	2412.00	91.30	0.40
NVNT	ANT2	802.11g	2412.00	94.55	0.24
NVNT	ANT1	802.11g	2437.00	96.33	0.16
NVNT	ANT2	802.11g	2437.00	92.86	0.32
NVNT	ANT1	802.11g	2462.00	95.41	0.20
NVNT	ANT2	802.11g	2462.00	93.69	0.28
NVNT	ANT1	802.11n(HT20)	2412.00	92.38	0.34
NVNT	ANT2	802.11n(HT20)	2412.00	92.38	0.34
NVNT	ANT1	802.11n(HT20)	2437.00	90.65	0.43
NVNT	ANT2	802.11n(HT20)	2437.00	91.51	0.39
NVNT	ANT1	802.11n(HT20)	2462.00	95.10	0.22
NVNT	ANT2	802.11n(HT20)	2462.00	89.81	0.47
NVNT	ANT1	802.11n(HT40)	2422.00	84.48	0.73
NVNT	ANT2	802.11n(HT40)	2422.00	92.31	0.35
NVNT	ANT1	802.11n(HT40)	2437.00	85.71	0.67
NVNT	ANT2	802.11n(HT40)	2437.00	92.31	0.35
NVNT	ANT1	802.11n(HT40)	2452.00	88.89	0.51
NVNT	ANT2	802.11n(HT40)	2452.00	85.71	0.67

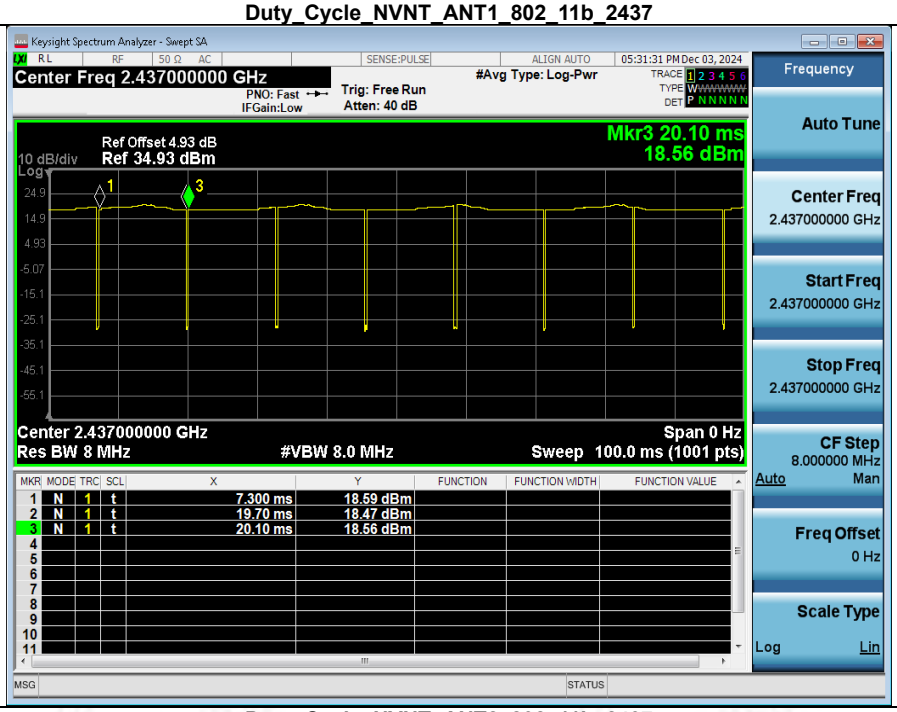
Duty_Cycle_NVNT_ANT1_802_11b_2412



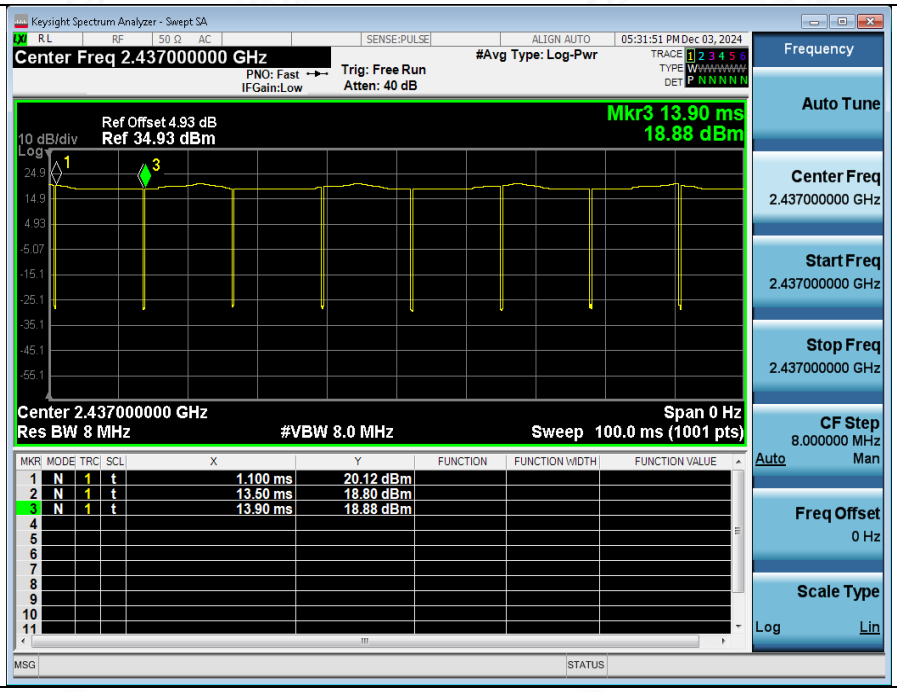
Duty_Cycle_NVNT_ANT2_802_11b_2412



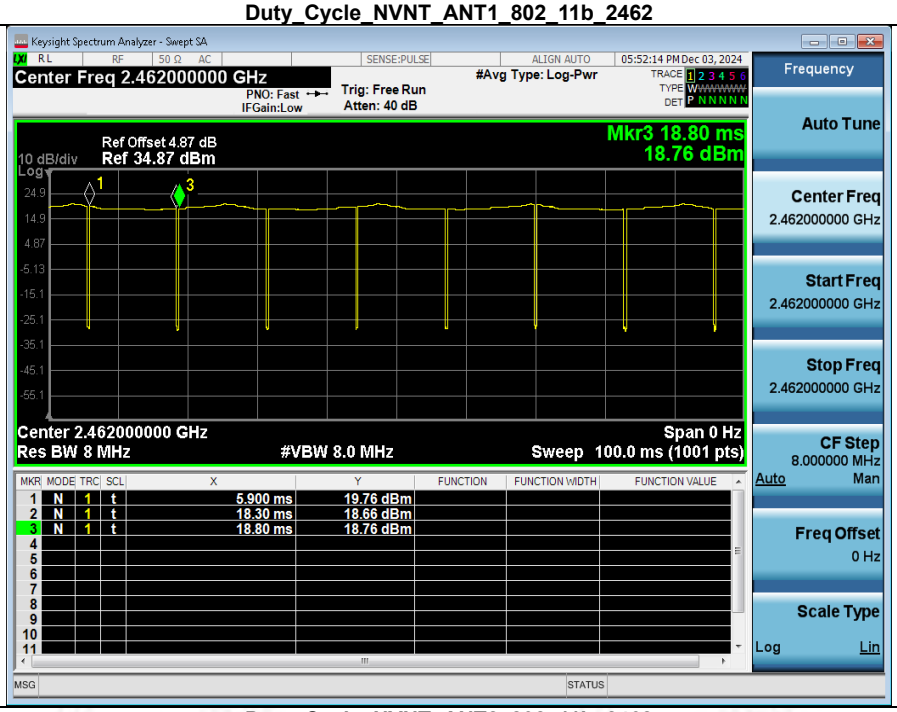
Duty_Cycle_NVNT_ANT1_802_11b_2437



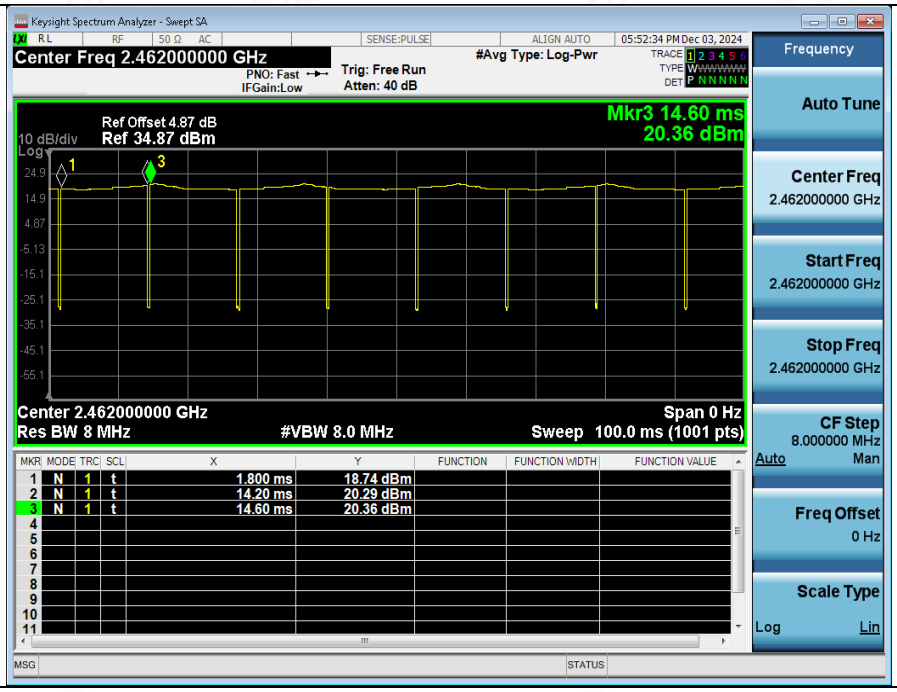
Duty_Cycle_NVNT_ANT2_802_11b_2437



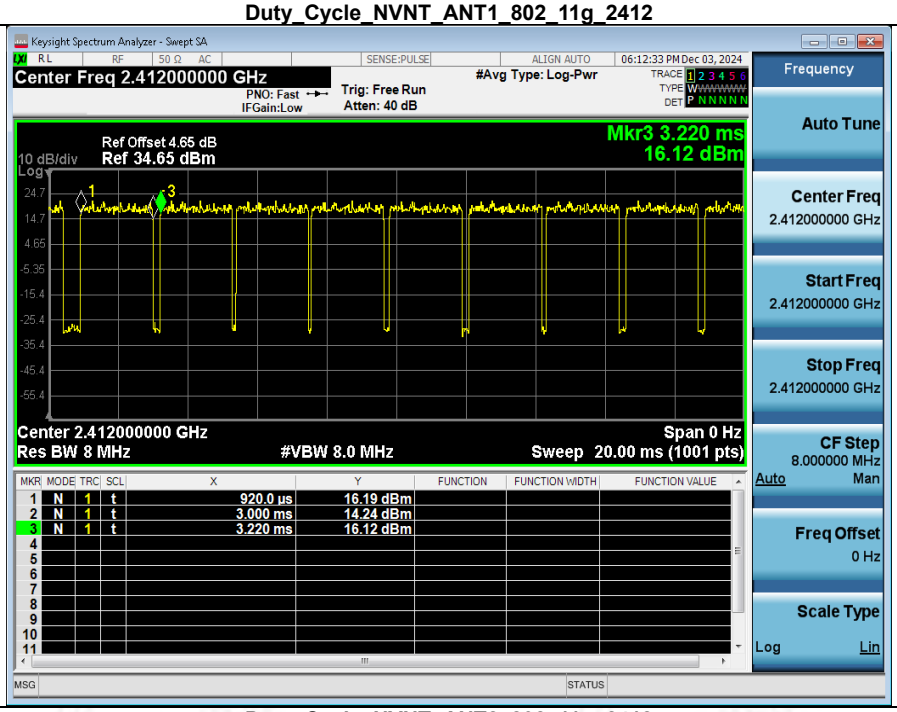
Duty_Cycle_NVNT_ANT1_802_11b_2462



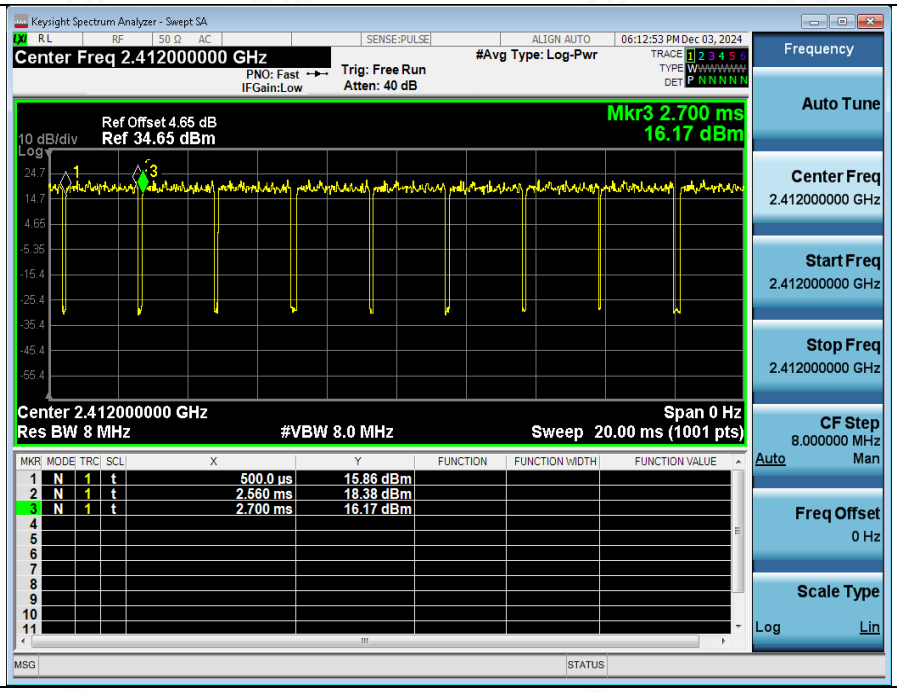
Duty_Cycle_NVNT_ANT2_802_11b_2462



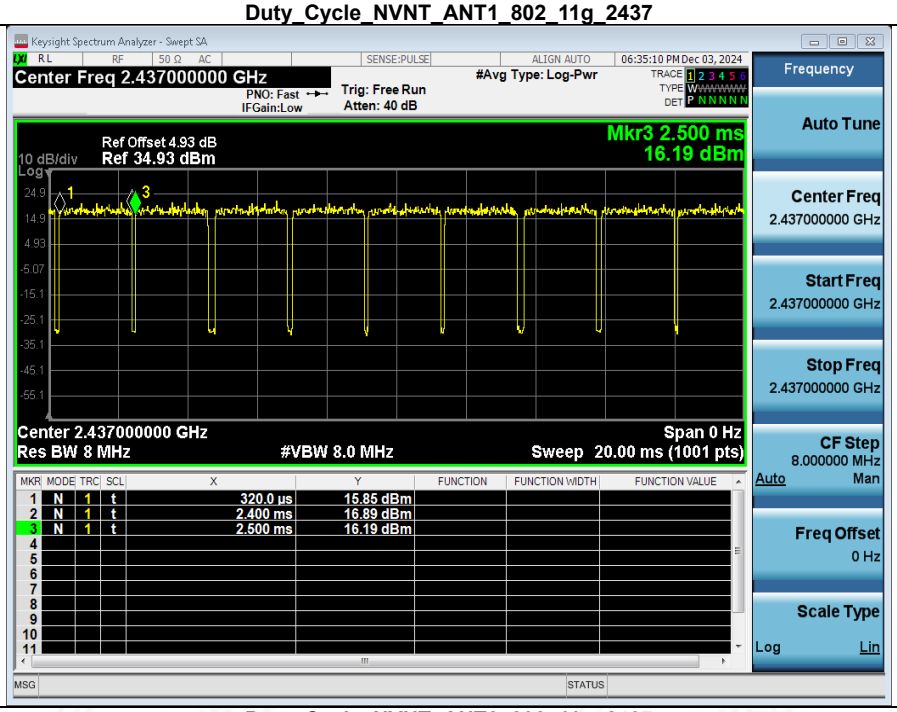
Duty_Cycle_NVNT_ANT1_802_11g_2412



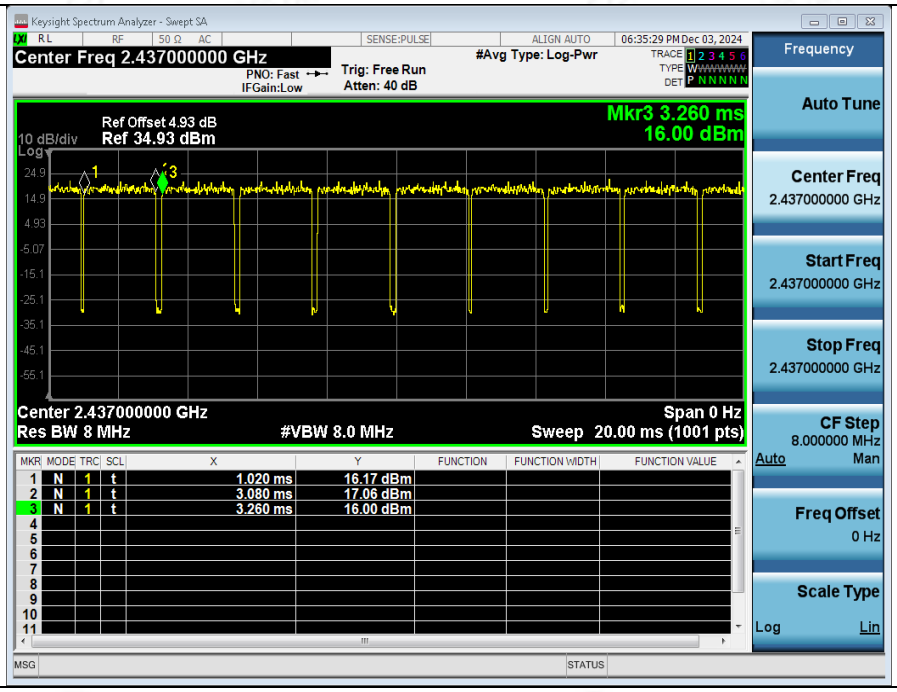
Duty_Cycle_NVNT_ANT2_802_11g_2412



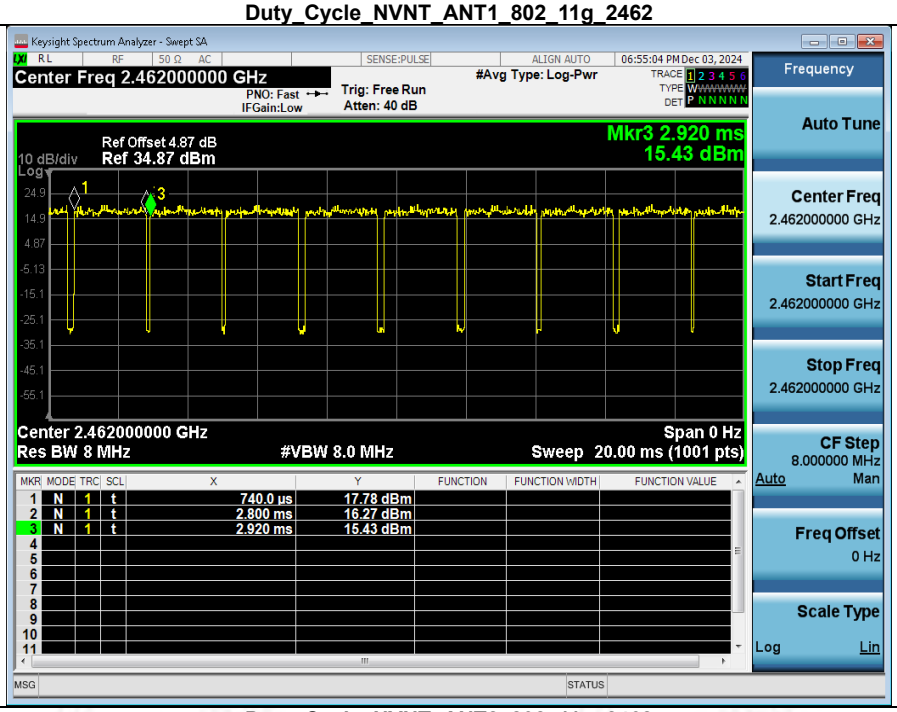
Duty_Cycle_NVNT_ANT1_802_11g_2437



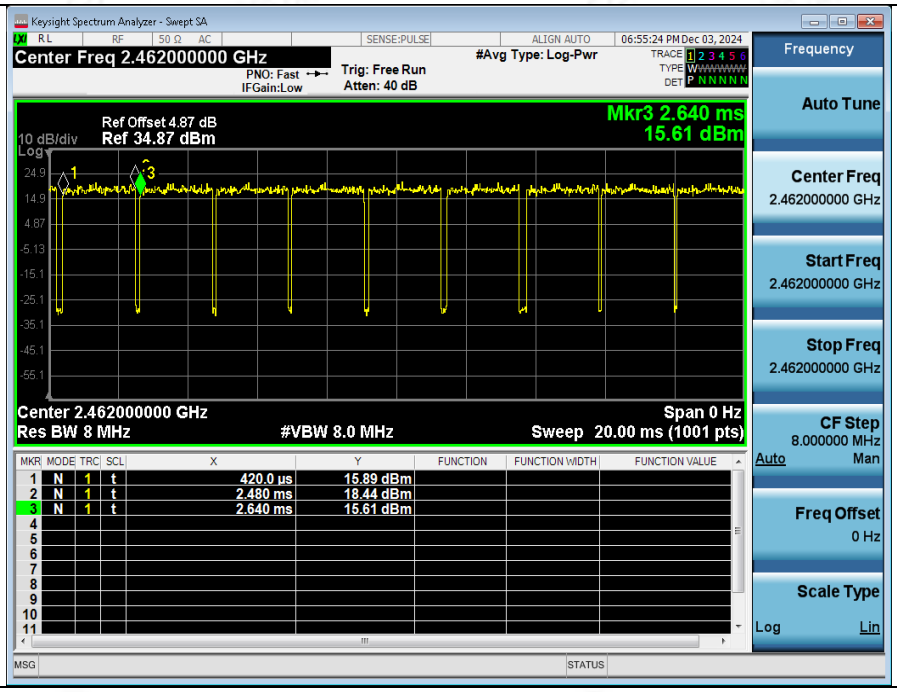
Duty_Cycle_NVNT_ANT2_802_11g_2437



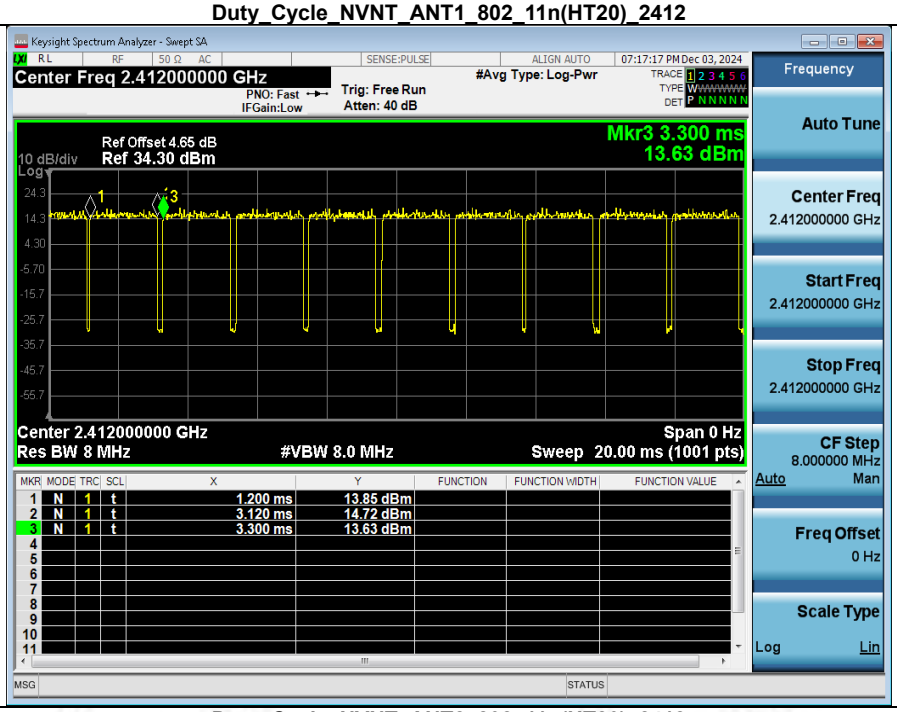
Duty_Cycle_NVNT_ANT1_802_11g_2462



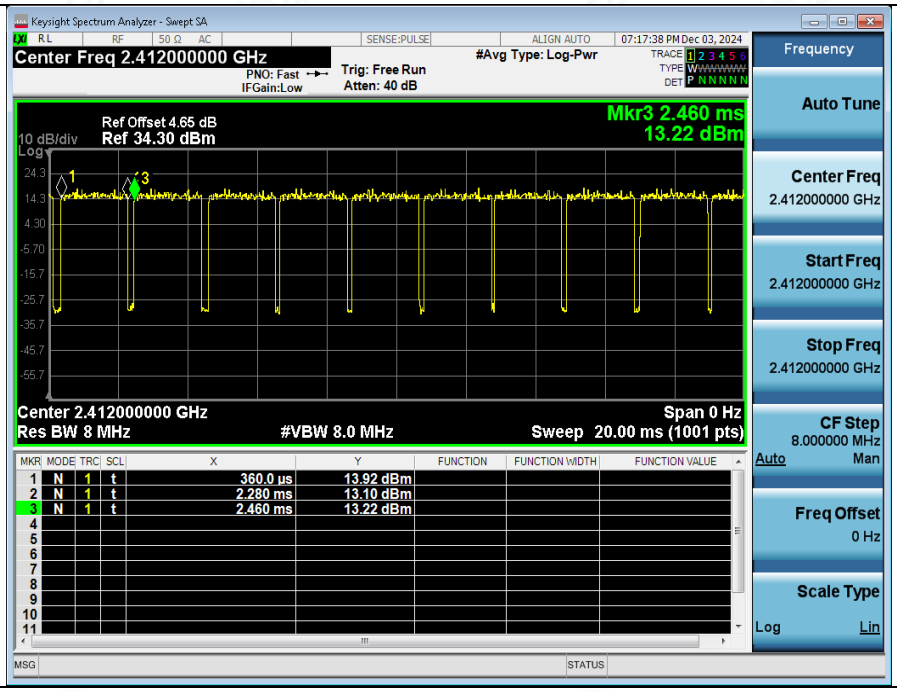
Duty_Cycle_NVNT_ANT2_802_11g_2462



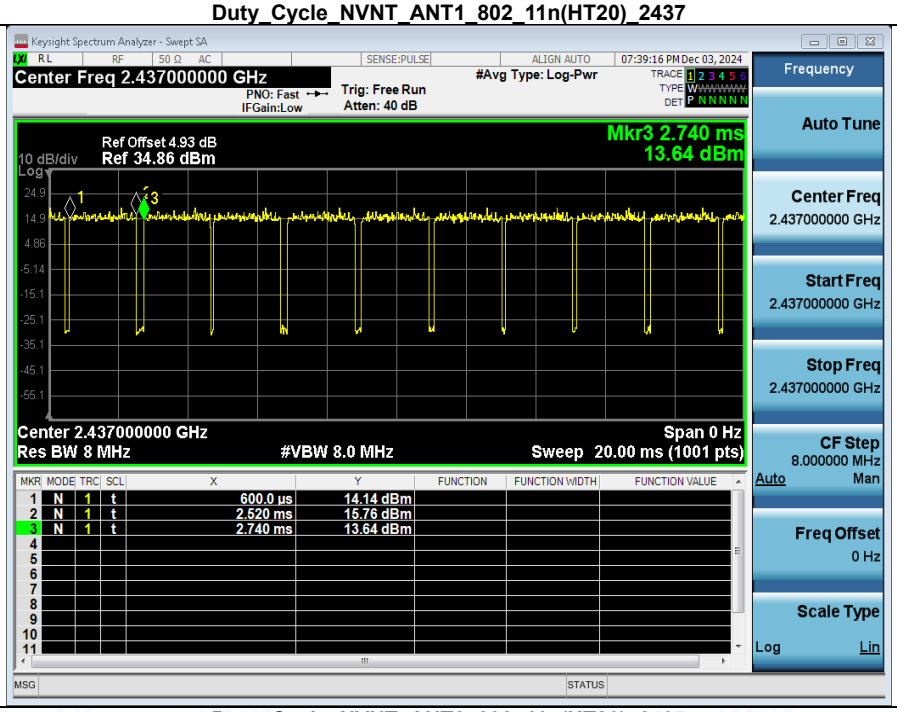
Duty_Cycle_NVNT_ANT1_802_11n(HT20)_2412



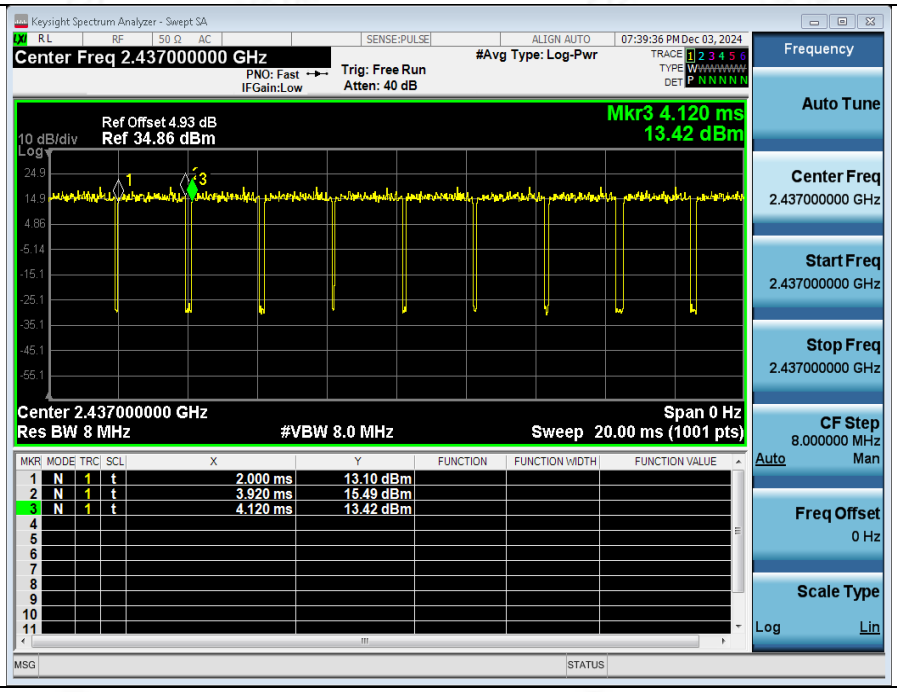
Duty_Cycle_NVNT_ANT2_802_11n(HT20)_2412



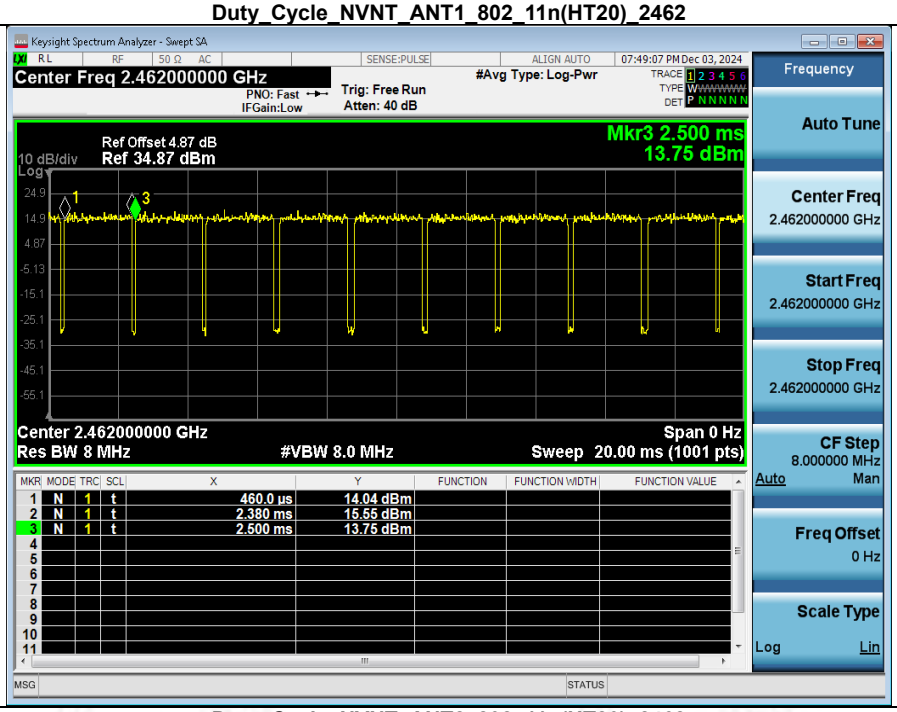
Duty_Cycle_NVNT_ANT1_802_11n(HT20)_2437



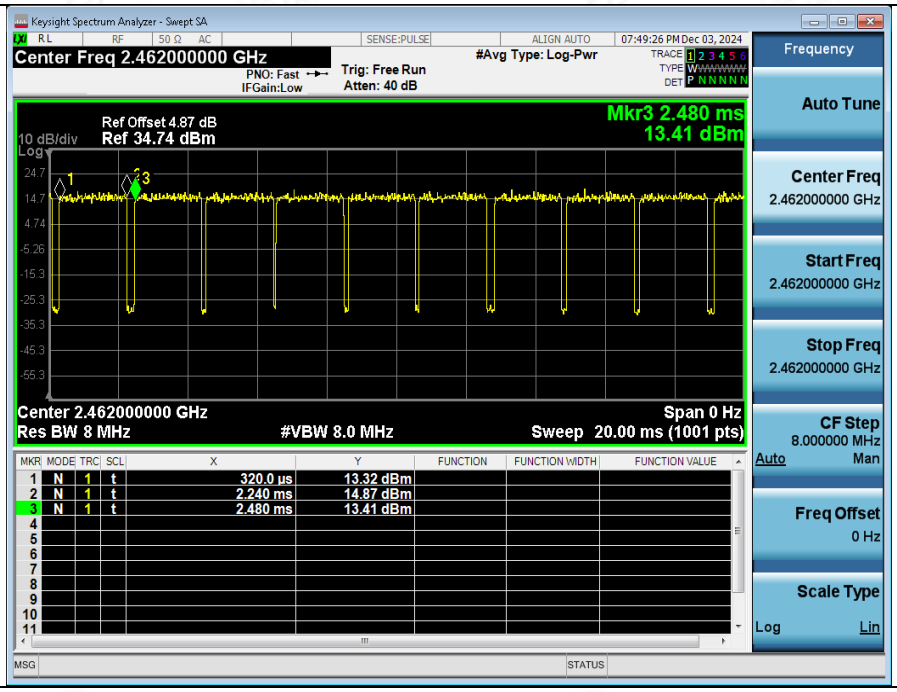
Duty_Cycle_NVNT_ANT2_802_11n(HT20)_2437



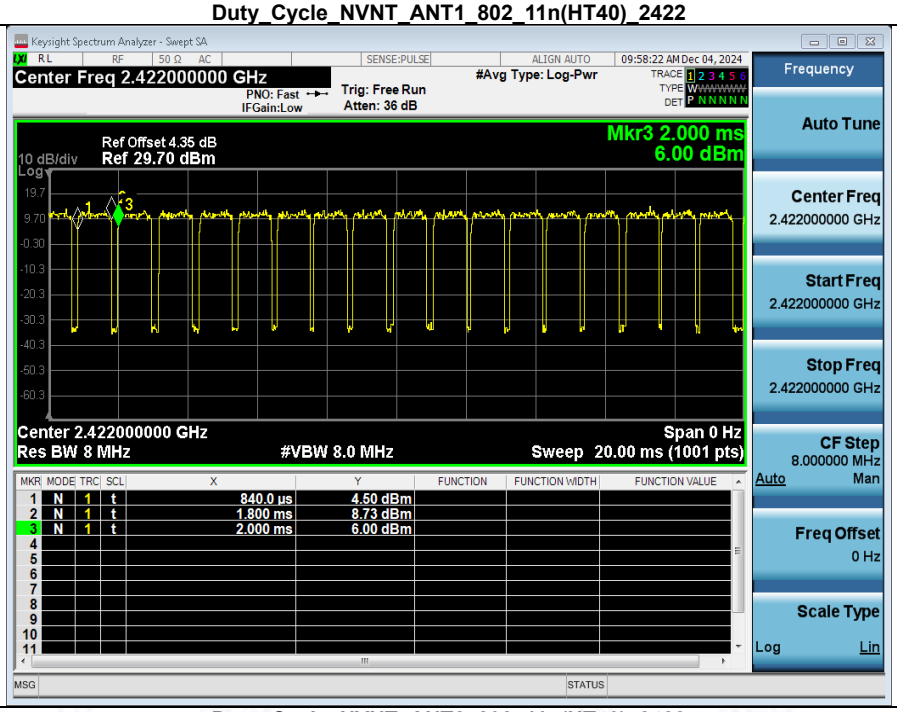
Duty_Cycle_NVNT_ANT1_802_11n(HT20)_2462



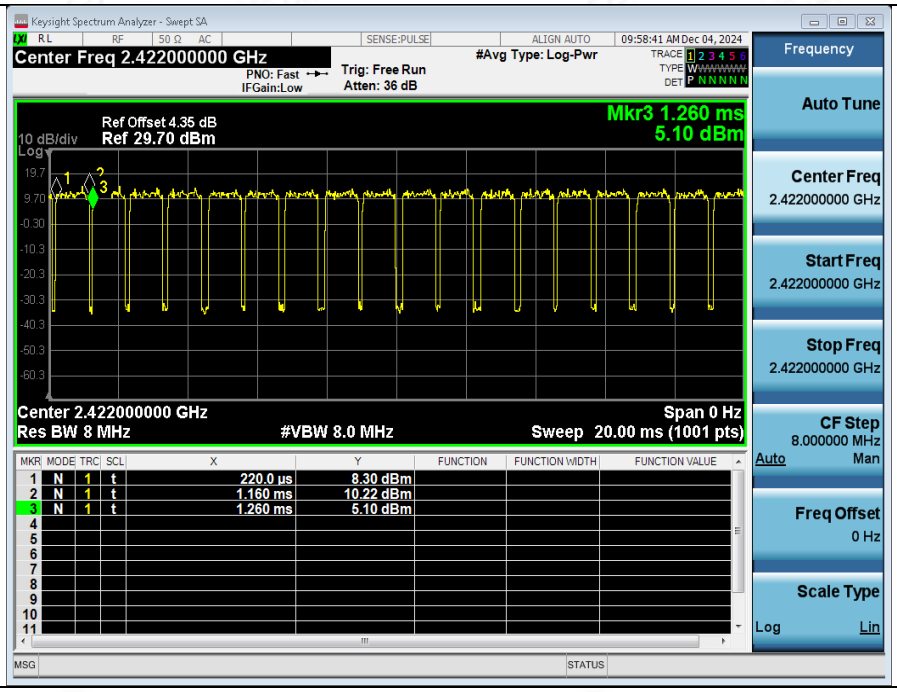
Duty_Cycle_NVNT_ANT2_802_11n(HT20)_2462



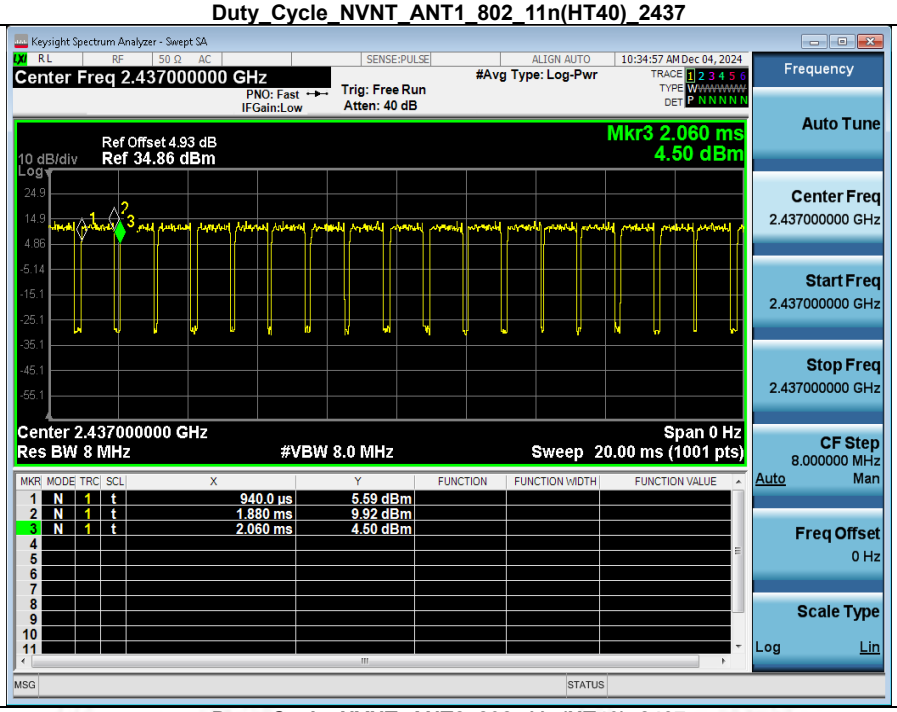
Duty_Cycle_NVNT_ANT1_802_11n(HT40)_2422



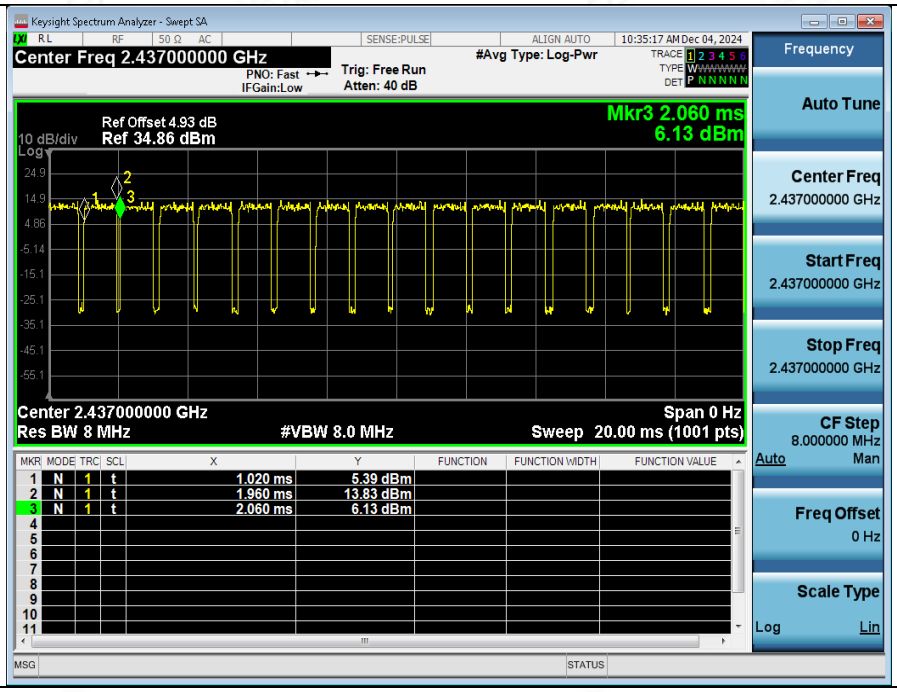
Duty_Cycle_NVNT_ANT2_802_11n(HT40)_2422



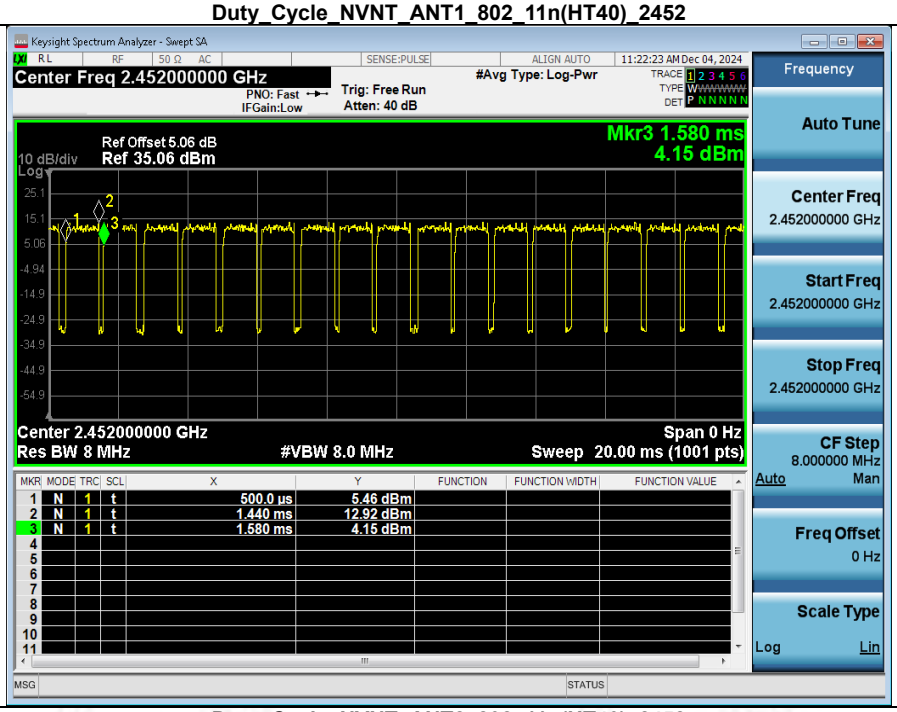
Duty_Cycle_NVNT_ANT1_802_11n(HT40)_2437



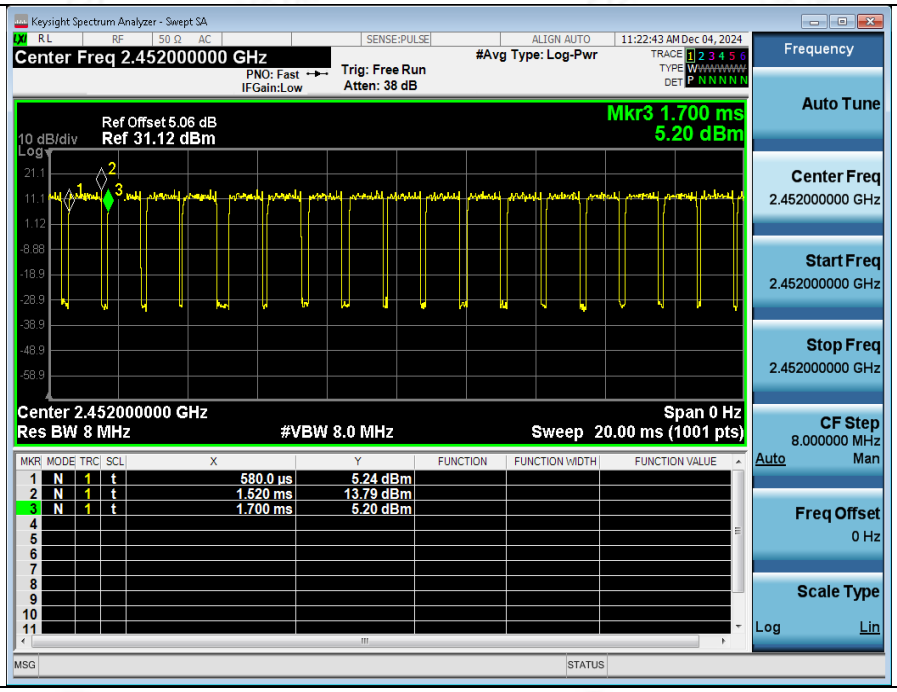
Duty_Cycle_NVNT_ANT2_802_11n(HT40)_2437



Duty_Cycle_NVNT_ANT1_802_11n(HT40)_2452



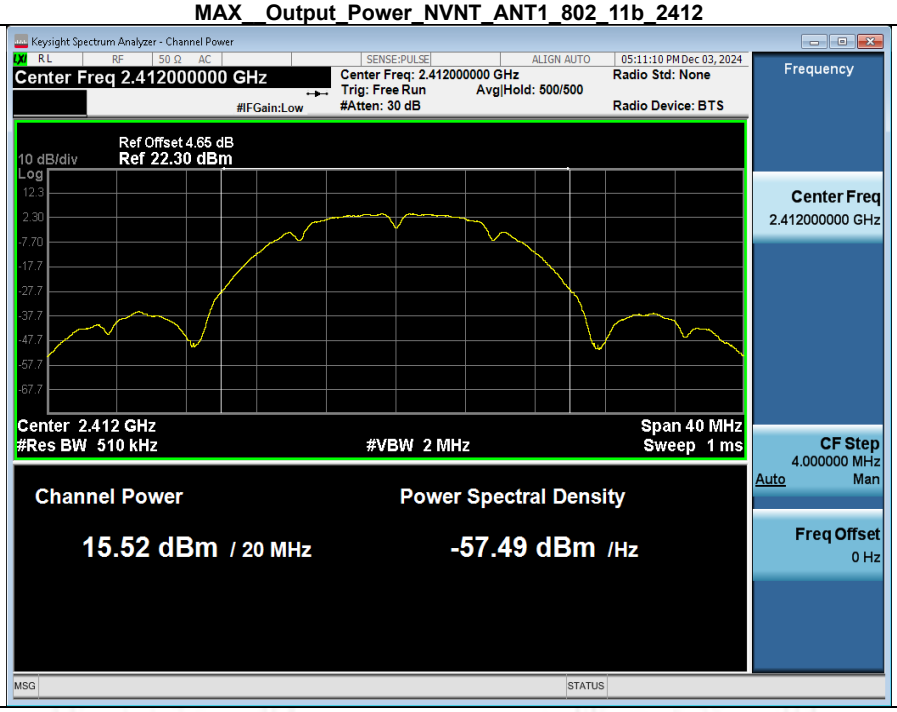
Duty_Cycle_NVNT_ANT2_802_11n(HT40)_2452


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.452000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 38 dB
#Avg Type: Log-Pwr
11:22:43 AM Dec 04, 2024
Ref Offset 5.06 dB
10 dB/div
Ref 31.12 dBm
Mkr3 1.700 ms
5.20 dBm
Center 2.452000000 GHz
Res BW 8 MHz
#VBW 8.0 MHz
Span 0 Hz
Sweep 20.00 ms (1001 pts)
1 N 1 t 580.0 µs 5.24 dBm
2 N 1 t 1.520 ms 13.79 dBm
3 N 1 t 1.700 ms 5.20 dBm
Frequency
Auto Tune
Center Freq
2.452000000 GHz
Start Freq
2.452000000 GHz
Stop Freq
2.452000000 GHz
CF Step
8.000000 MHz
Auto
Man
Freq Offset
0 Hz
Scale Type
Log
Lin

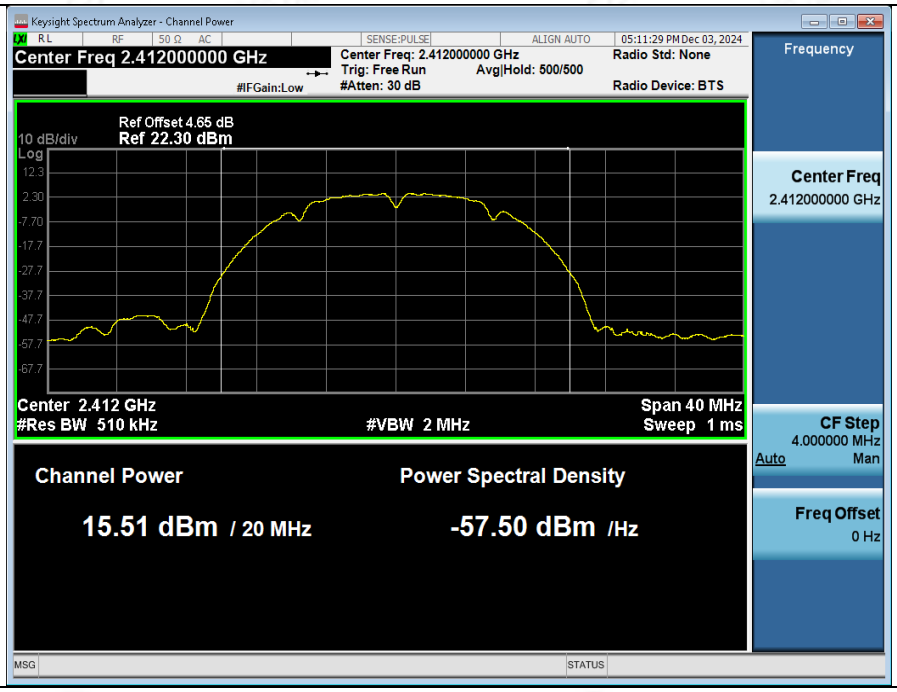
4. MAX. Output Power

Condition	Antenna	Modulation	Frequency (MHz)	Detector	Conducted Power(dBm)	Duty factor(dB)	Total Power(dBm)	limit(dBm)	Result
NVNT	ANT1	802.11b	2412.00	RMS	15.52	0.79	16.31	30	Pass
NVNT	ANT2	802.11b	2412.00	RMS	15.51	0.14	15.65	30	Pass
NVNT	ANT1	802.11b	2437.00	RMS	15.40	0.10	15.50	30	Pass
NVNT	ANT2	802.11b	2437.00	RMS	15.82	0.10	15.92	30	Pass
NVNT	ANT1	802.11b	2462.00	RMS	15.62	0.14	15.76	30	Pass
NVNT	ANT2	802.11b	2462.00	RMS	15.65	0.10	15.75	30	Pass
NVNT	ANT1	802.11g	2412.00	RMS	13.21	0.40	13.61	30	Pass
NVNT	ANT2	802.11g	2412.00	RMS	13.46	0.24	13.70	30	Pass
NVNT	ANT1	802.11g	2437.00	RMS	12.98	0.16	13.14	30	Pass
NVNT	ANT2	802.11g	2437.00	RMS	13.48	0.32	13.80	30	Pass
NVNT	ANT1	802.11g	2462.00	RMS	12.75	0.20	12.95	30	Pass
NVNT	ANT2	802.11g	2462.00	RMS	13.37	0.28	13.65	30	Pass
NVNT	ANT1	802.11n(HT20)	2412.00	RMS	10.71	0.34	11.05	30	Pass
NVNT	ANT2	802.11n(HT20)	2412.00	RMS	10.50	0.34	10.84	30	Pass
NVNT	ANT1	802.11n(HT20)	2437.00	RMS	9.76	0.43	10.19	30	Pass
NVNT	ANT2	802.11n(HT20)	2437.00	RMS	9.74	0.39	10.13	30	Pass
NVNT	ANT1	802.11n(HT20)	2462.00	RMS	10.50	0.22	10.72	30	Pass
NVNT	ANT2	802.11n(HT20)	2462.00	RMS	10.67	0.47	11.14	30	Pass
NVNT	ANT1	802.11n(HT40)	2422.00	RMS	9.35	0.73	10.08	30	Pass
NVNT	ANT2	802.11n(HT40)	2422.00	RMS	9.34	0.35	9.69	30	Pass
NVNT	ANT1	802.11n(HT40)	2437.00	RMS	9.40	0.67	10.07	30	Pass
NVNT	ANT2	802.11n(HT40)	2437.00	RMS	9.76	0.35	10.11	30	Pass
NVNT	ANT1	802.11n(HT40)	2452.00	RMS	9.38	0.51	9.89	30	Pass
NVNT	ANT2	802.11n(HT40)	2452.00	RMS	9.80	0.67	10.47	30	Pass

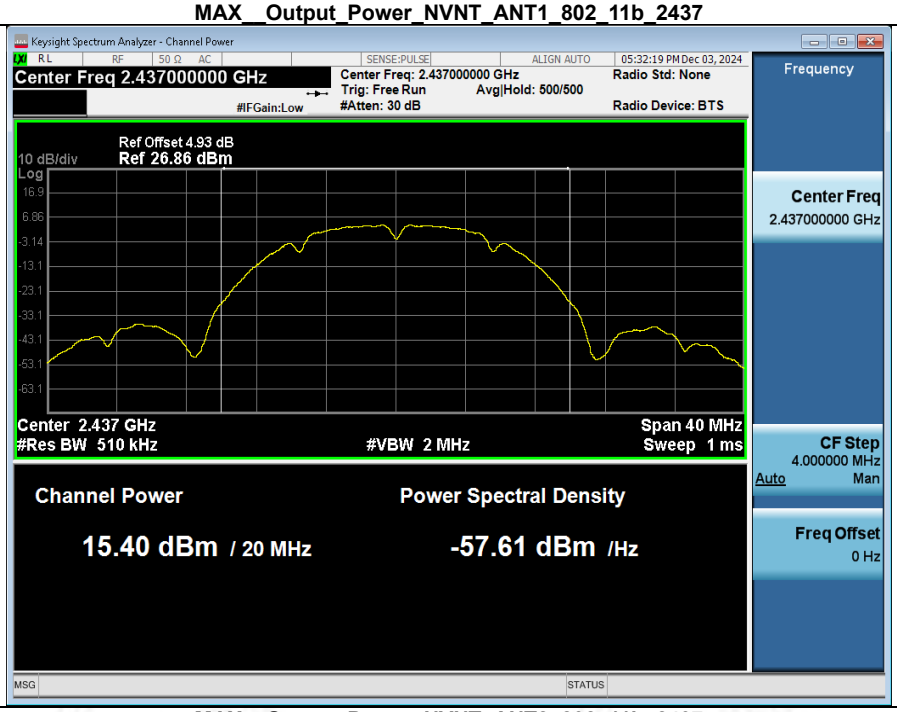
MAX__Output_Power_NVNT_ANT1_802_11b_2412



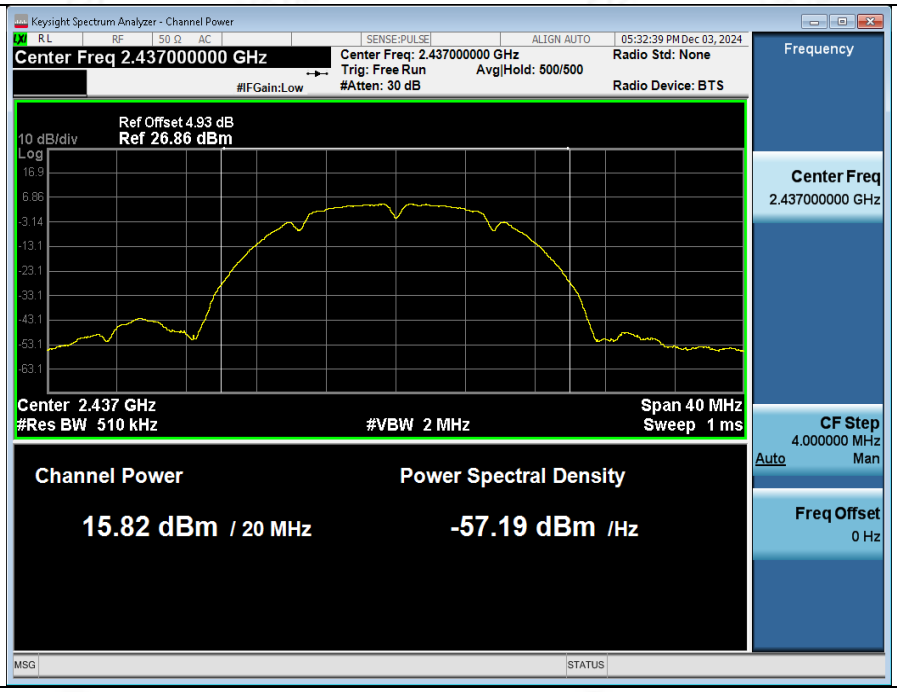
MAX__Output_Power_NVNT_ANT2_802_11b_2412



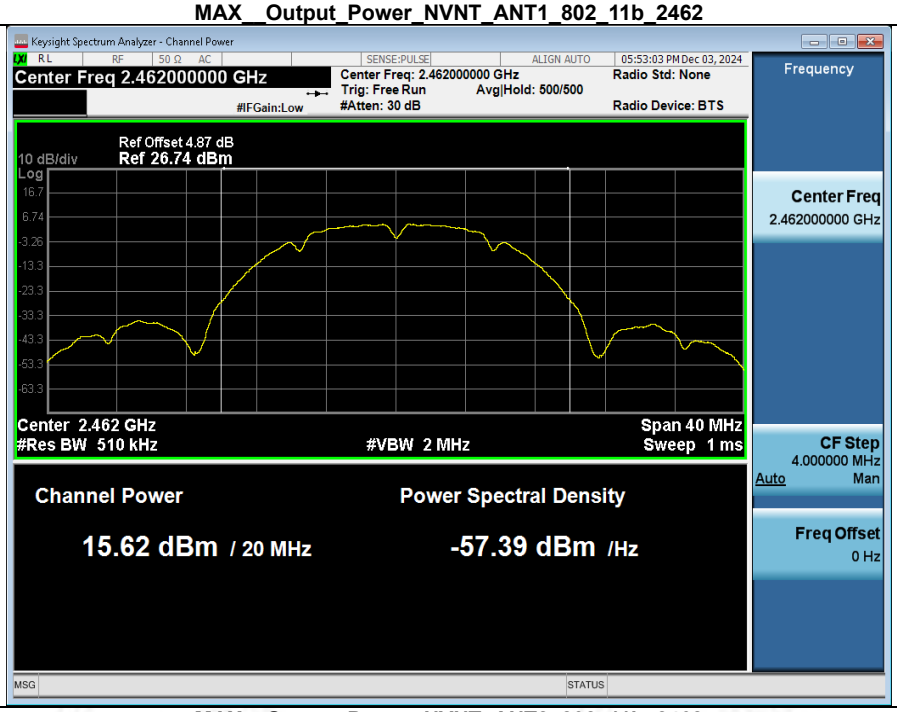
MAX__Output_Power_NVNT_ANT1_802_11b_2437



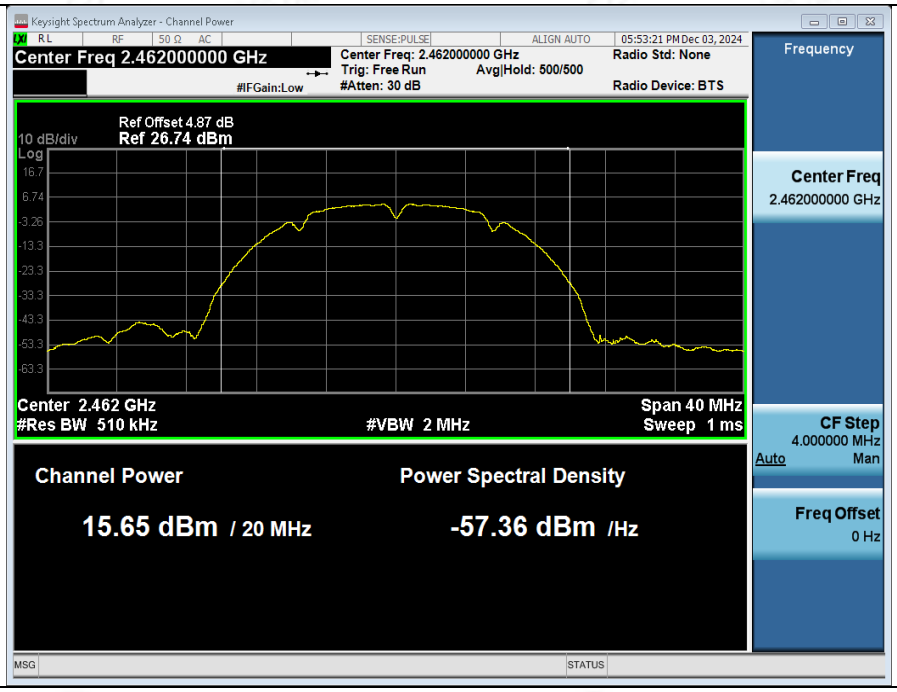
MAX__Output_Power_NVNT_ANT2_802_11b_2437



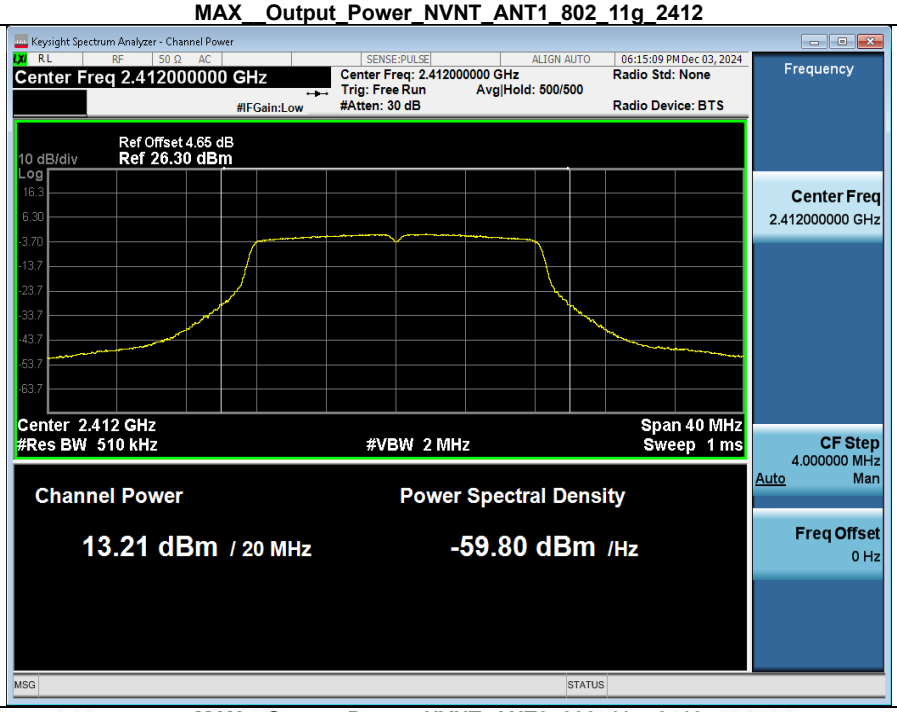
MAX__Output_Power_NVNT_ANT1_802_11b_2462



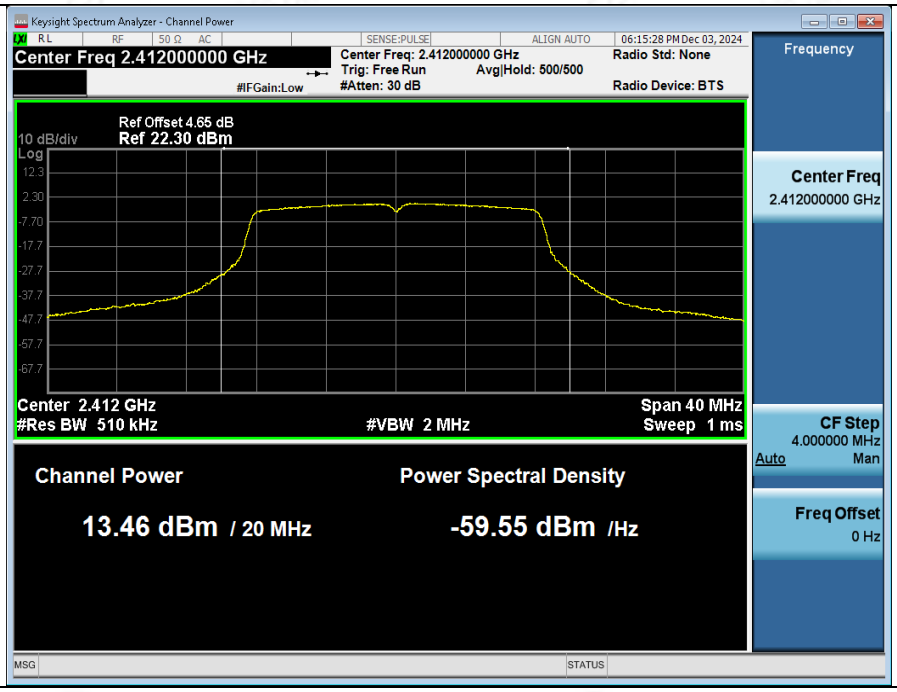
MAX__Output_Power_NVNT_ANT2_802_11b_2462



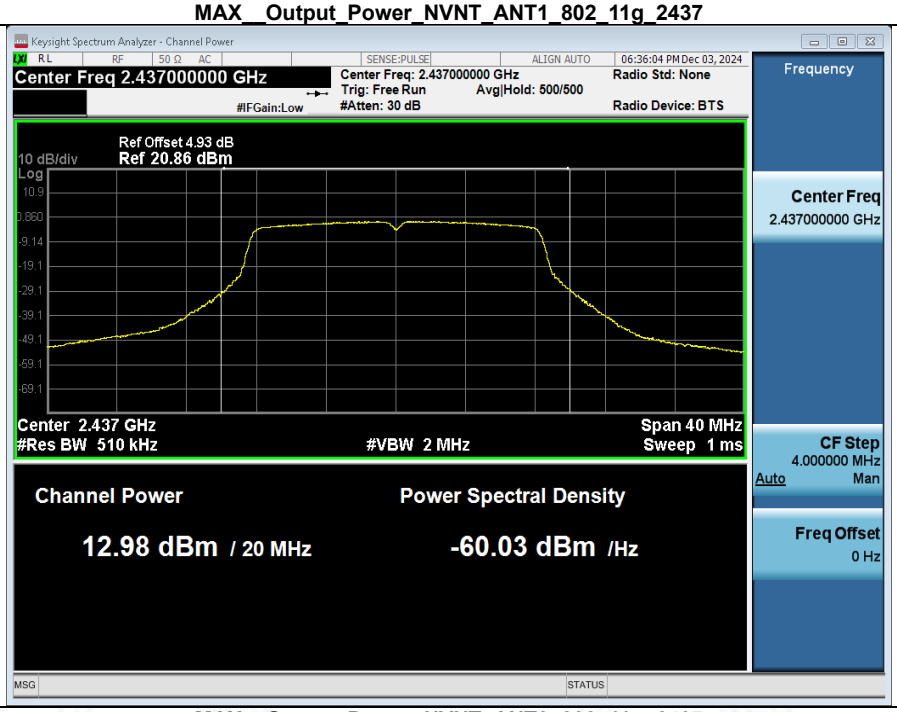
MAX__Output_Power_NVNT_ANT1_802_11g_2412



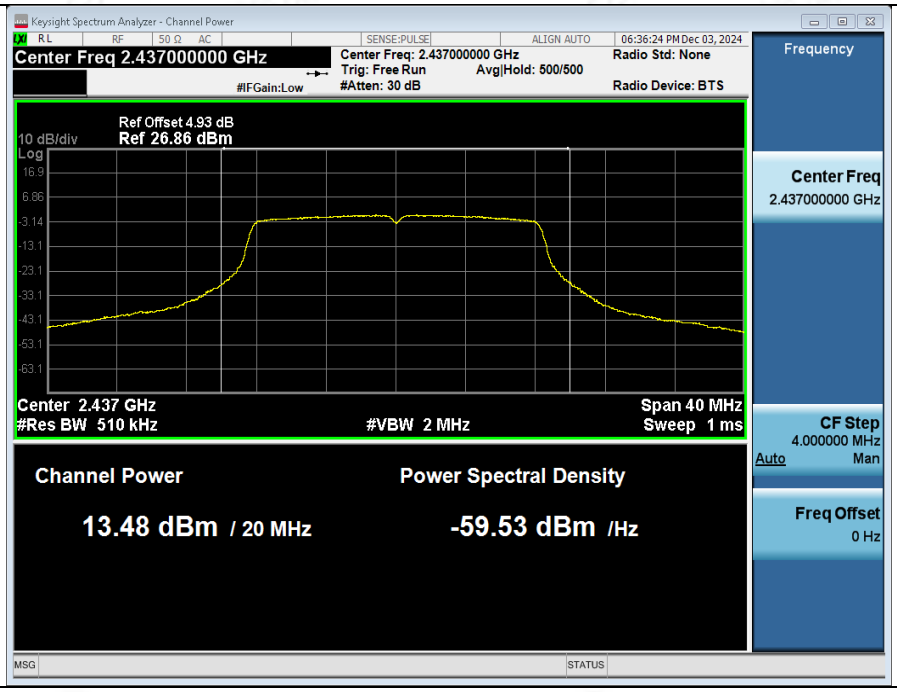
MAX__Output_Power_NVNT_ANT2_802_11g_2412



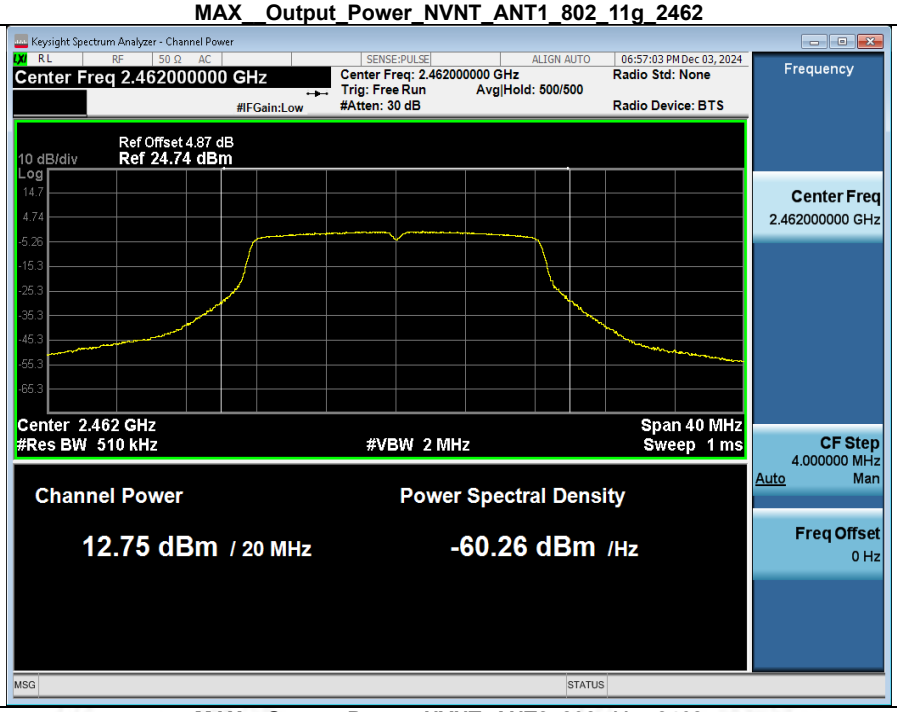
MAX__Output_Power_NVNT_ANT1_802_11g_2437



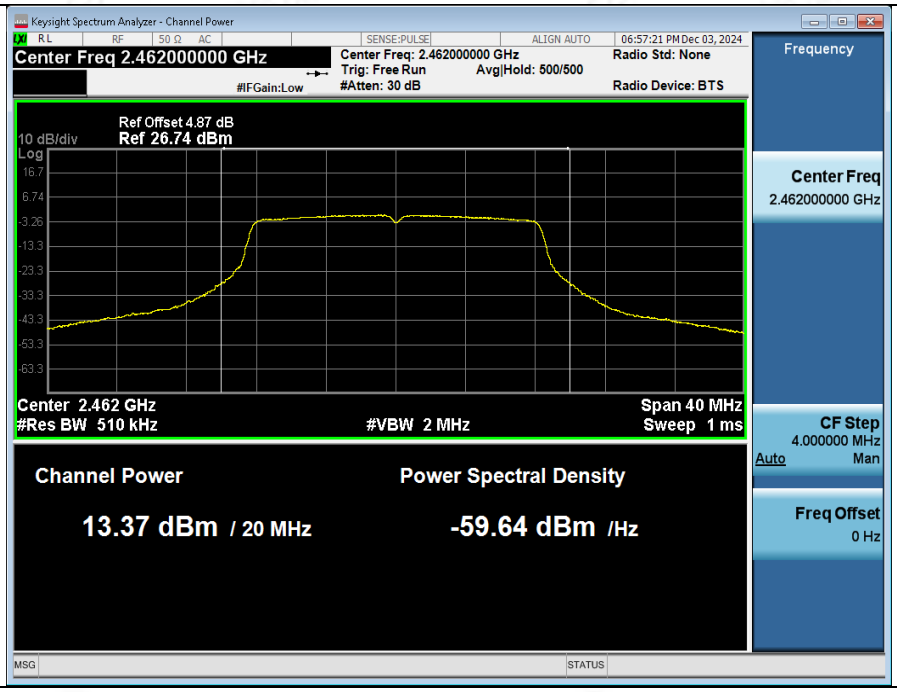
MAX__Output_Power_NVNT_ANT2_802_11g_2437



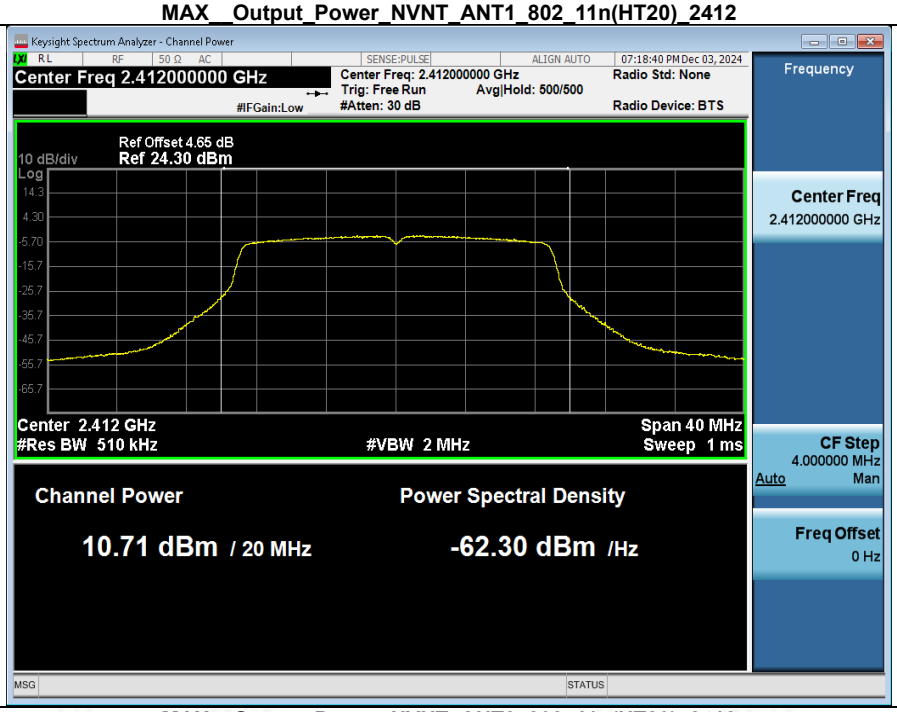
MAX__Output_Power_NVNT_ANT1_802_11g_2462



MAX__Output_Power_NVNT_ANT2_802_11g_2462



MAX__Output_Power_NVNT_ANT1_802_11n(HT20)_2412



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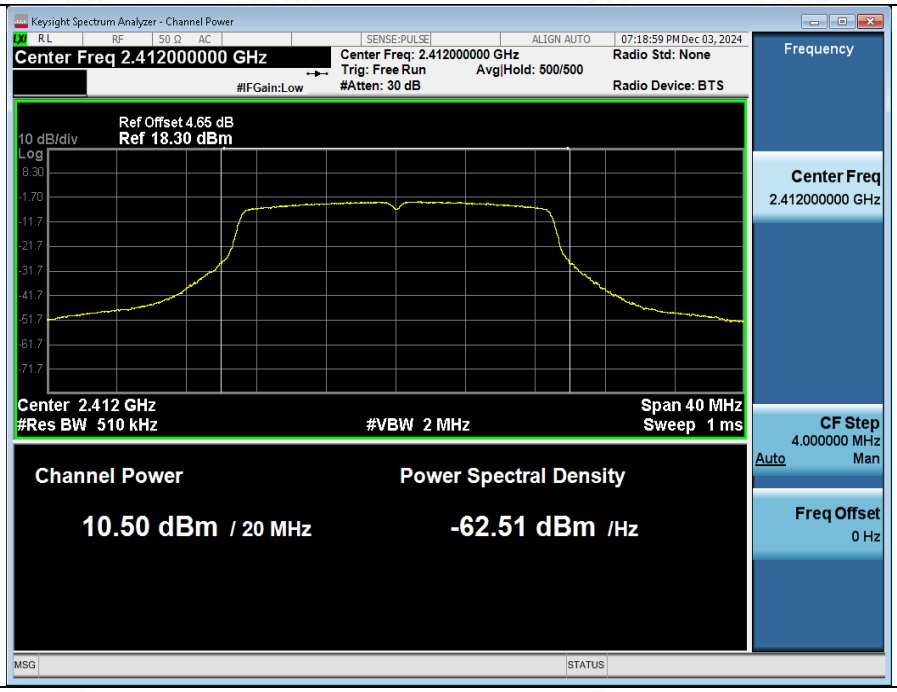
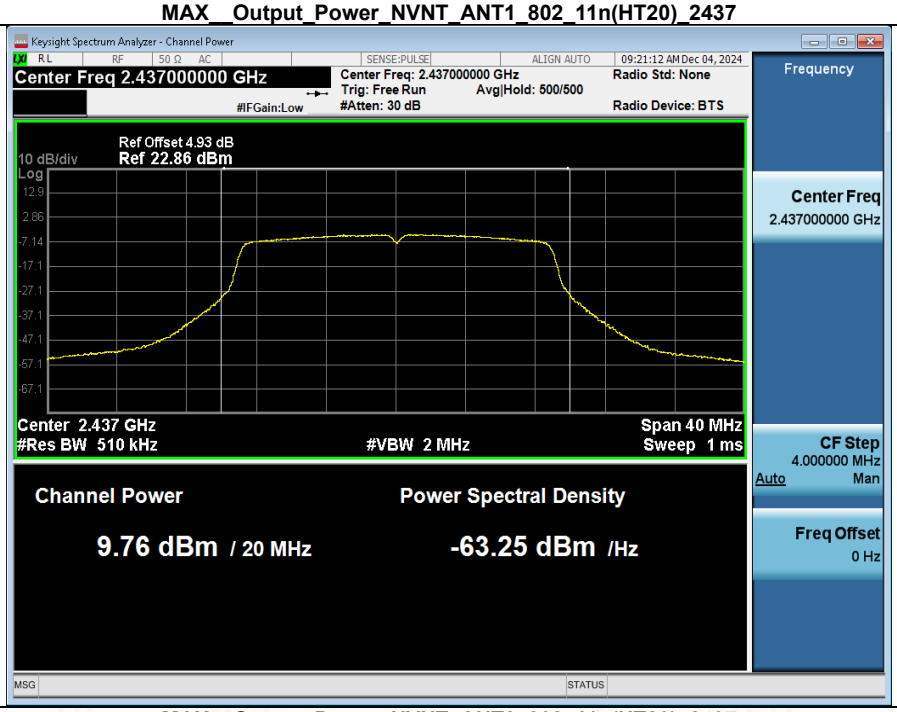
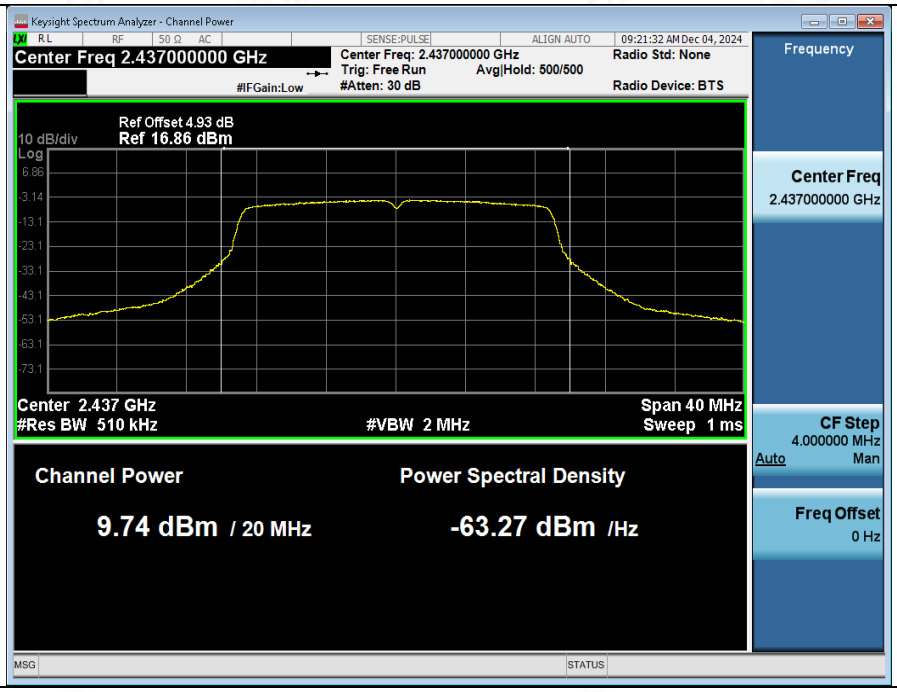


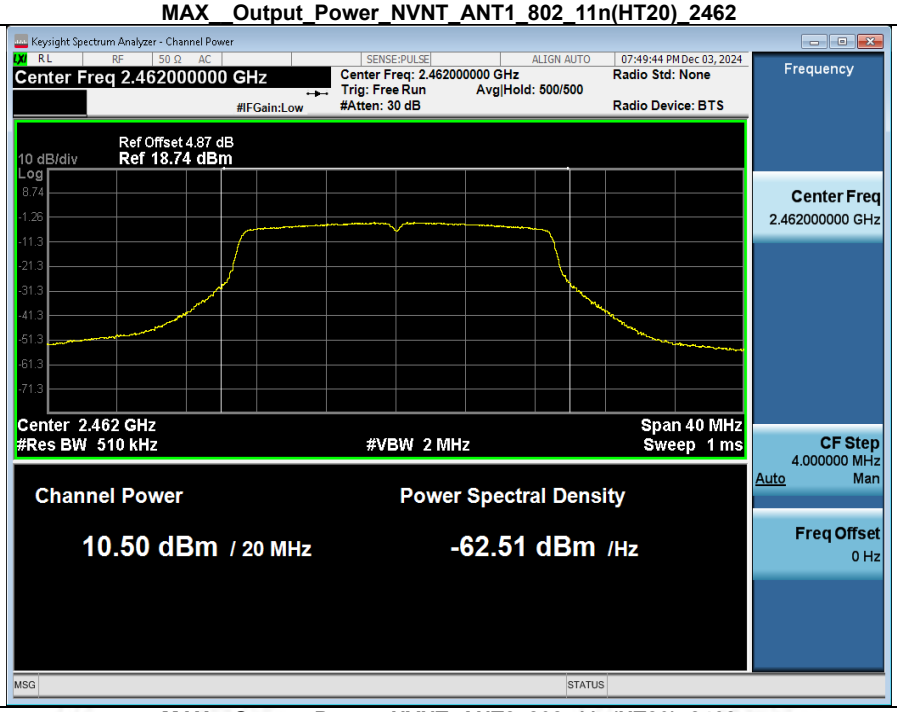
MAX__Output_Power_NVNT_ANT1_802_11n(HT20)_2437



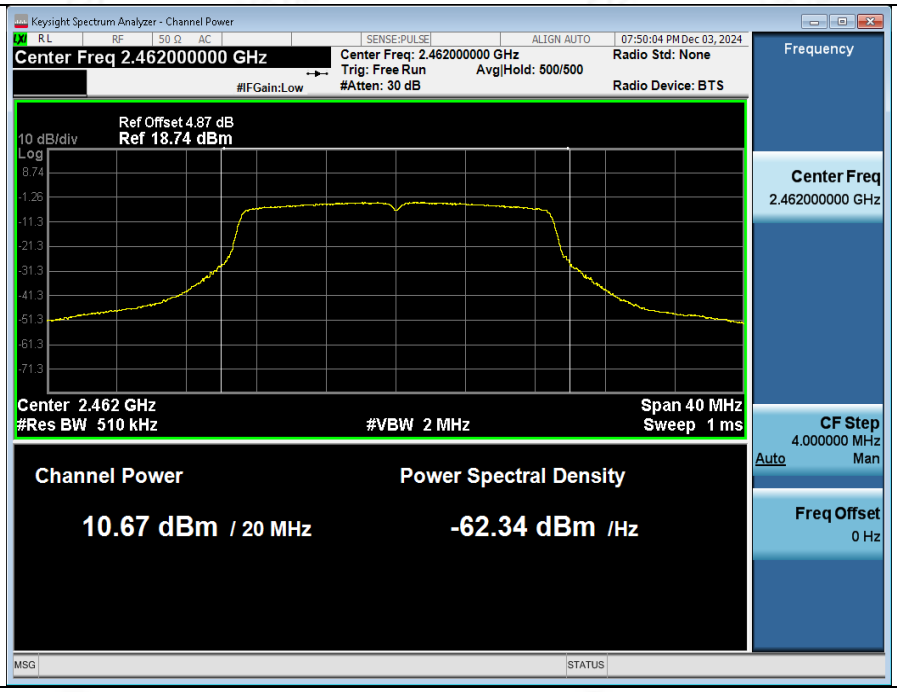
MAX__Output_Power_NVNT_ANT2_802_11n(HT20)_2437



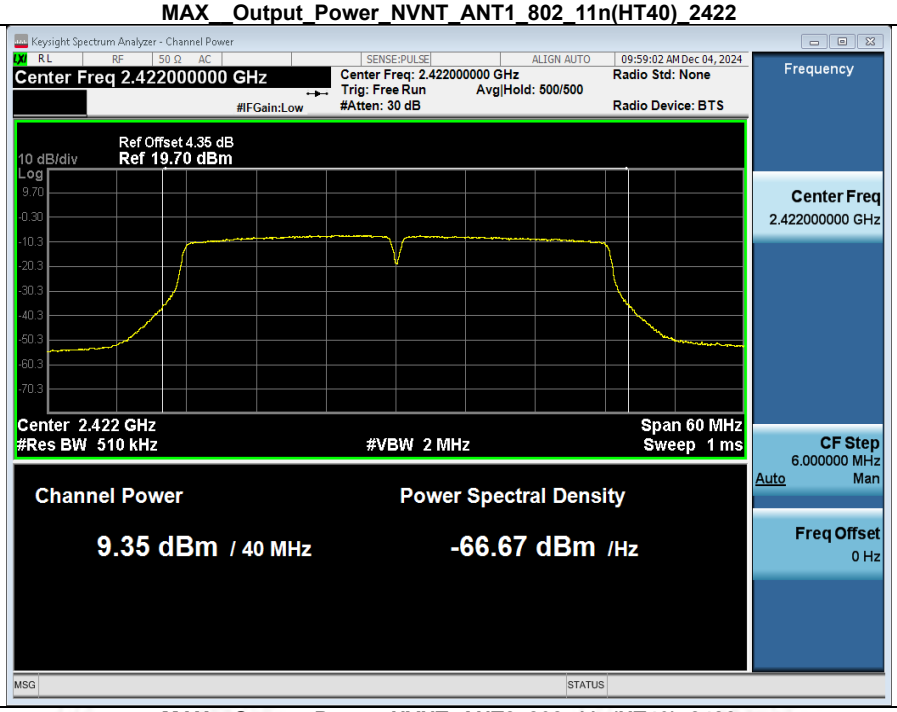
MAX__Output_Power_NVNT_ANT1_802_11n(HT20)_2462



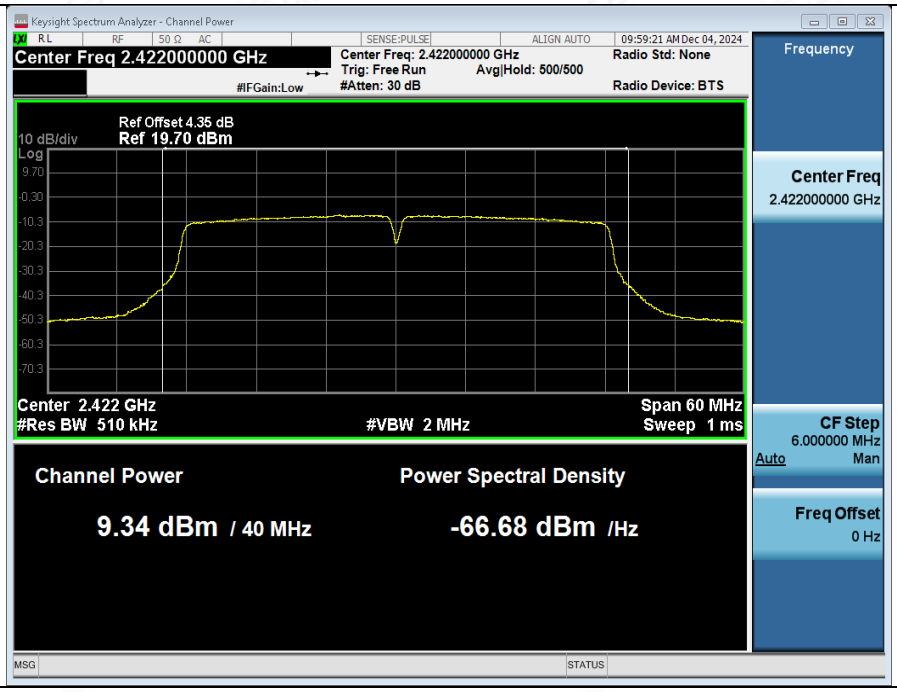
MAX__Output_Power_NVNT_ANT2_802_11n(HT20)_2462



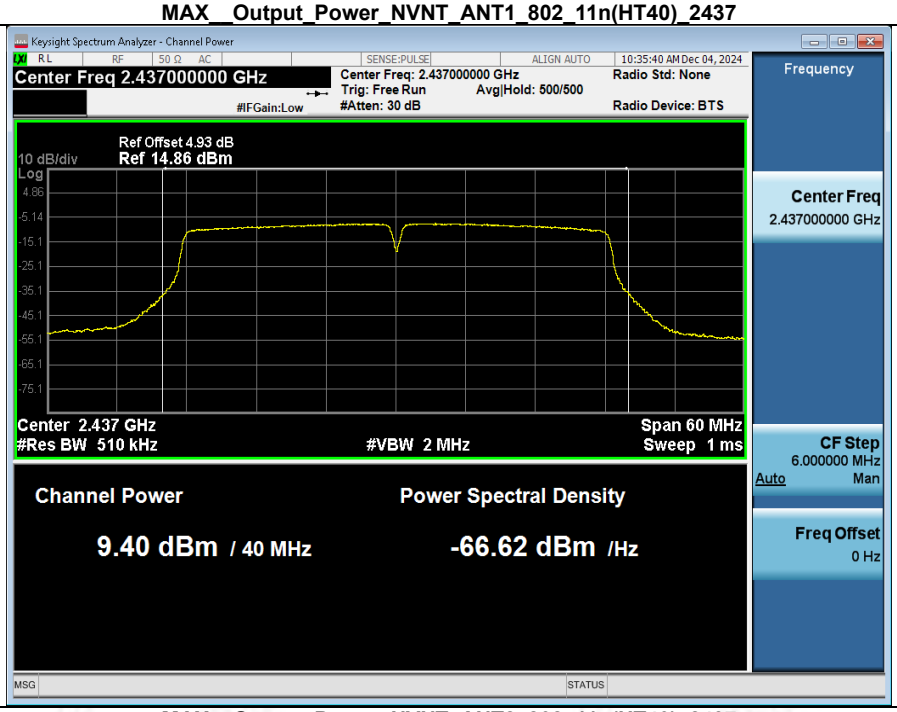
MAX__Output_Power_NVNT_ANT1_802_11n(HT40)_2422



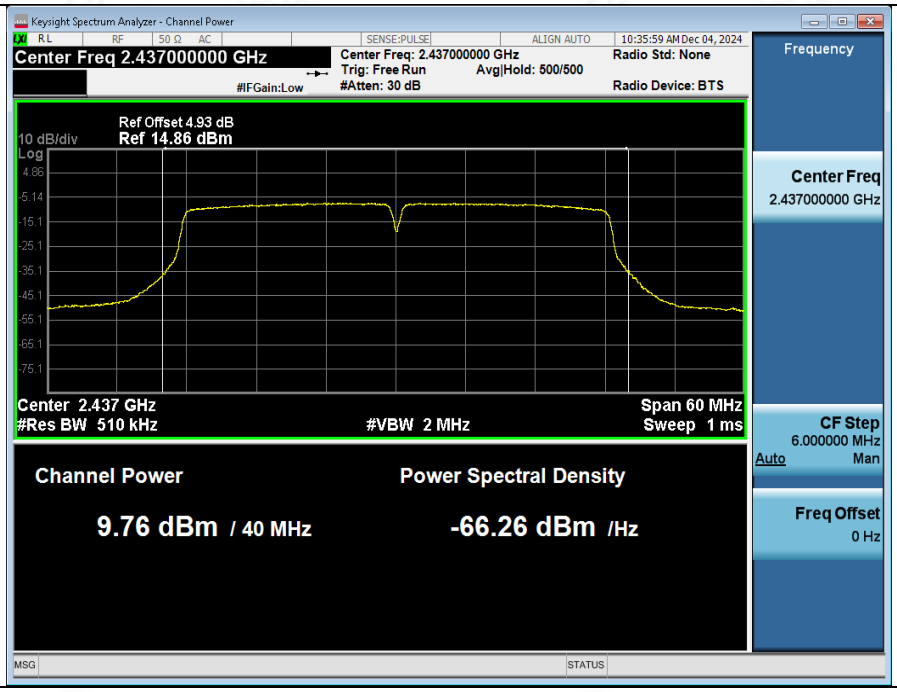
MAX__Output_Power_NVNT_ANT2_802_11n(HT40)_2422



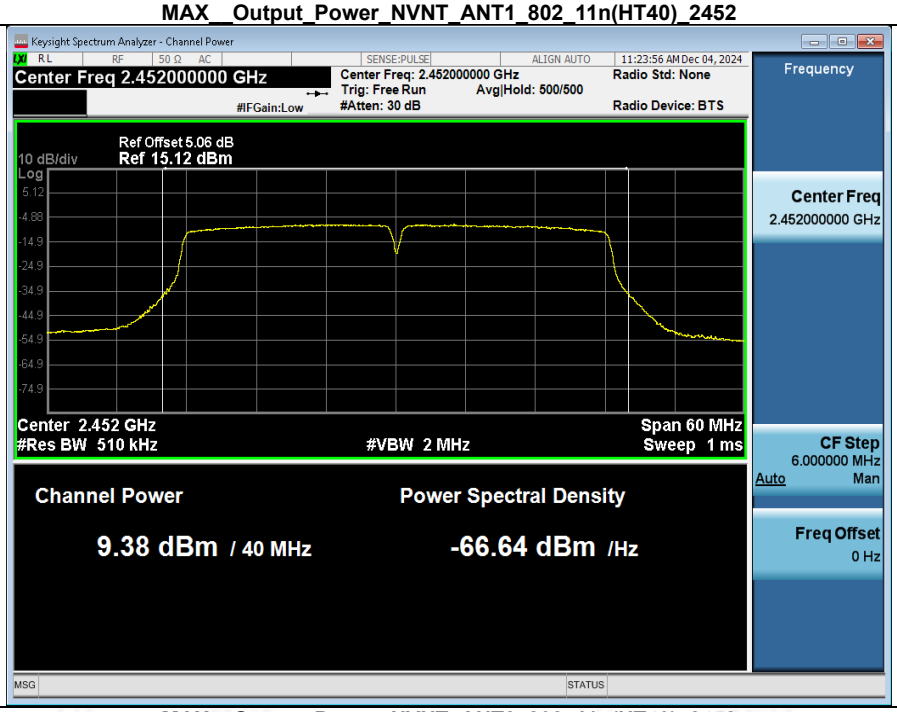
MAX__Output_Power_NVNT_ANT1_802_11n(HT40)_2437



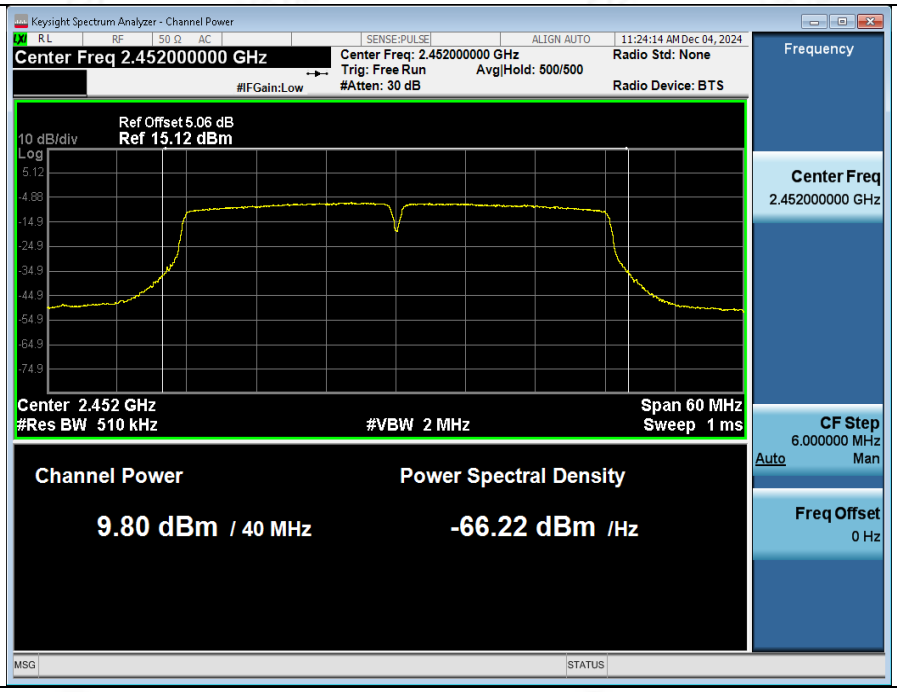
MAX__Output_Power_NVNT_ANT2_802_11n(HT40)_2437



MAX__Output_Power_NVNT_ANT1_802_11n(HT40)_2452



MAX__Output_Power_NVNT_ANT2_802_11n(HT40)_2452



Condition	Antenna	Mode	Frequency(MHz)	MIMO_Conducted_Power(dBm)	Limit(dBm)	Result
NVNT	MIMO_TX	802.11n(HT20)	2412.00	13.96	30	Pass
NVNT	MIMO_TX	802.11n(HT20)	2437.00	13.17	30	Pass
NVNT	MIMO_TX	802.11n(HT20)	2462.00	13.95	30	Pass
NVNT	MIMO_TX	802.11n(HT40)	2422.00	12.90	30	Pass
NVNT	MIMO_TX	802.11n(HT40)	2437.00	13.10	30	Pass
NVNT	MIMO_TX	802.11n(HT40)	2452.00	13.20	30	Pass

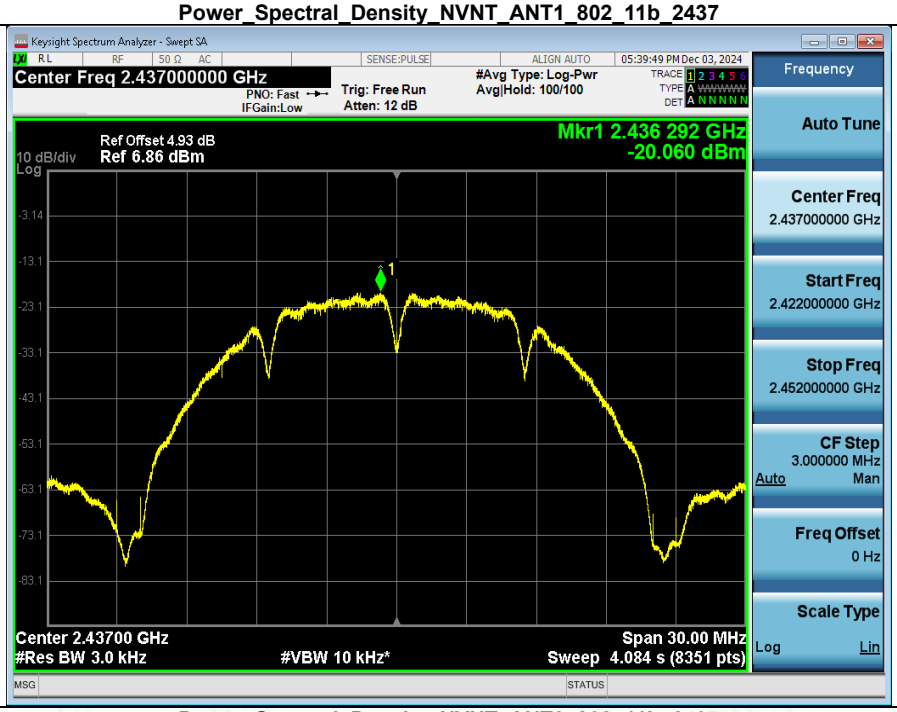
5. Power Spectral Density

Condition	Antenna	Modulation	Frequency (MHz)	SA_PSD(dBm/3kHz)	Duty factor(dB)	RB factor(dB)	PSD(dBm/3kHz)	limit(dBm/3kHz)	Result
NVNT	ANT1	802.11b	2412.00	-20.25	0.79	0.00	-19.46	8	Pass
NVNT	ANT2	802.11b	2412.00	-20.35	0.14	0.00	-20.21	8	Pass
NVNT	ANT1	802.11b	2437.00	-20.06	0.10	0.00	-19.96	8	Pass
NVNT	ANT2	802.11b	2437.00	-19.81	0.10	0.00	-19.71	8	Pass
NVNT	ANT1	802.11b	2462.00	-20.05	0.14	0.00	-19.91	8	Pass
NVNT	ANT2	802.11b	2462.00	-19.91	0.10	0.00	-19.81	8	Pass
NVNT	ANT1	802.11g	2412.00	-21.32	0.40	0.00	-20.92	8	Pass
NVNT	ANT2	802.11g	2412.00	-21.65	0.24	0.00	-21.41	8	Pass
NVNT	ANT1	802.11g	2437.00	-20.99	0.16	0.00	-20.83	8	Pass
NVNT	ANT2	802.11g	2437.00	-19.80	0.32	0.00	-19.48	8	Pass
NVNT	ANT1	802.11g	2462.00	-21.51	0.20	0.00	-21.31	8	Pass
NVNT	ANT2	802.11g	2462.00	-20.46	0.28	0.00	-20.18	8	Pass
NVNT	ANT1	802.11n(HT20)	2412.00	-23.34	0.34	0.00	-23.00	8	Pass
NVNT	ANT2	802.11n(HT20)	2412.00	-24.38	0.34	0.00	-24.04	8	Pass
NVNT	ANT1	802.11n(HT20)	2437.00	-24.46	0.43	0.00	-24.04	8	Pass
NVNT	ANT2	802.11n(HT20)	2437.00	-24.67	0.39	0.00	-24.28	8	Pass
NVNT	ANT1	802.11n(HT20)	2462.00	-24.01	0.22	0.00	-23.79	8	Pass
NVNT	ANT2	802.11n(HT20)	2462.00	-23.57	0.47	0.00	-23.10	8	Pass
NVNT	ANT1	802.11n(HT40)	2422.00	-27.43	0.73	0.00	-26.70	8	Pass
NVNT	ANT2	802.11n(HT40)	2422.00	-27.64	0.35	0.00	-27.29	8	Pass
NVNT	ANT1	802.11n(HT40)	2437.00	-27.68	0.67	0.00	-27.01	8	Pass
NVNT	ANT2	802.11n(HT40)	2437.00	-27.32	0.35	0.00	-26.97	8	Pass
NVNT	ANT1	802.11n(HT40)	2452.00	-26.19	0.51	0.00	-25.68	8	Pass
NVNT	ANT2	802.11n(HT40)	2452.00	-25.13	0.67	0.00	-24.46	8	Pass

Power_Spectral_Density_NVNT_ANT1_802_11b_2412

Power_Spectral_Density_NVNT_ANT2_802_11b_2412

Power_Spectral_Density_NVNT_ANT1_802_11b_2437



Power_Spectral_Density_NVNT_ANT2_802_11b_2437