

N41-20M-OBW-M-DFT-s-OFDM-Pi2 BPSK

Spectrum Analyzer 1 Occupied BW

KEYSIGHT Input RF Input Z: 50 Ω Atten: 36 dB Trig: Free Run Center Freq: 2.592990000 GHz  
 RL Coupling: DC Corr: CCorr Preamp: Off Gate: Off Avg/Hold: 1000/1000  
 Align: Off Freq Ref: Int (S) #F Gain: Low Radio Std: None

1 Graph Scale/Div 10.0 dB Ref Lvl Offset 5.50 dB Mkr1 2.588310000 GHz  
 Ref Value 30.00 dBm 16.21 dBm

Center 2.59299 GHz #Res BW 300.00 kHz #Video BW 1.0000 MHz Span 60 MHz  
 #Sweep 10.0 ms (1001 pts)

2 Metrics

Measure Trace		Trace 1	
Occupied Bandwidth	17.876 MHz	Total Power	31.5 dBm
Transmit Freq Error	-215.62 kHz	% of OBW Power	99.00 %
x dB Bandwidth	19.32 MHz	x dB	-26.00 dB

May 24, 2024 9:56:30 AM

N41-20M-OBW-M-DFT-s-OFDM-QPSK

Spectrum Analyzer 1 Occupied BW

KEYSIGHT Input RF Input Z: 50 Ω Atten: 36 dB Trig: Free Run Center Freq: 2.592990000 GHz  
 RL Coupling: DC Corr: CCorr Preamp: Off Gate: Off Avg/Hold: 1000/1000  
 Align: Off Freq Ref: Int (S) #F Gain: Low Radio Std: None

1 Graph Scale/Div 10.0 dB Ref Lvl Offset 5.50 dB Mkr1 2.586150000 GHz  
 Ref Value 30.00 dBm 16.10 dBm

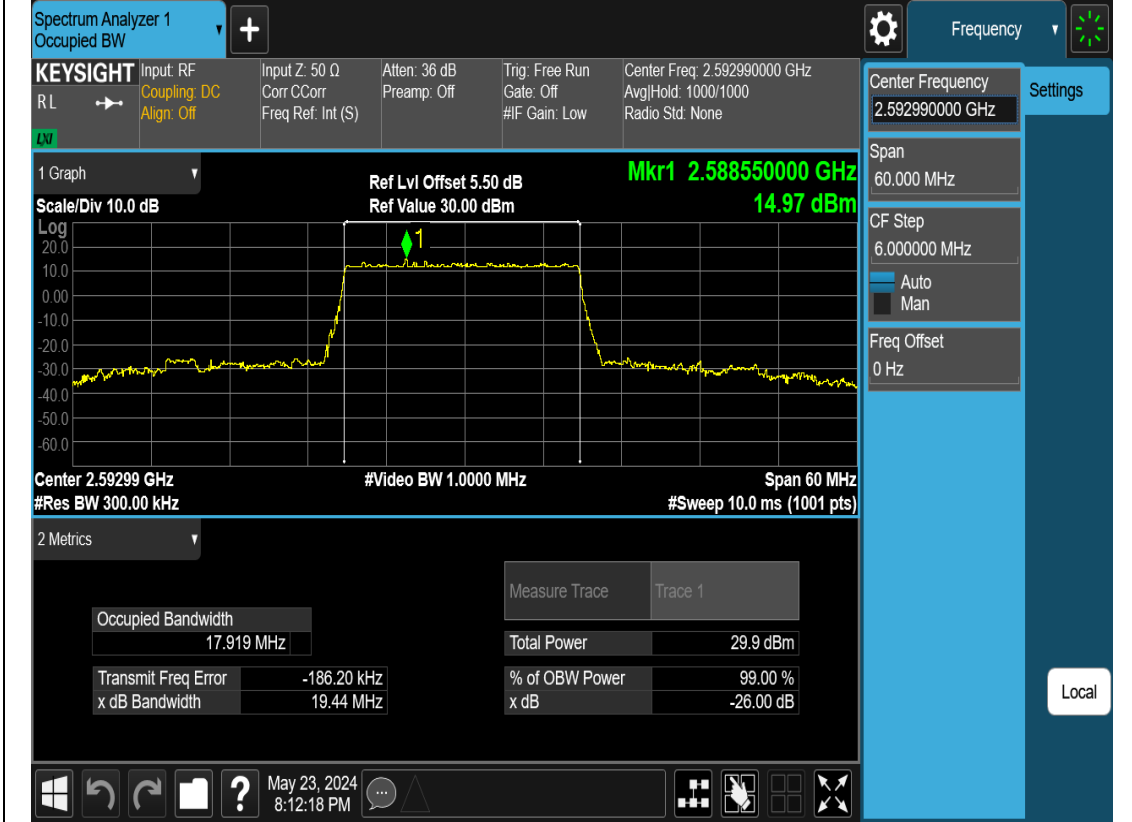
Center 2.59299 GHz #Res BW 300.00 kHz #Video BW 1.0000 MHz Span 60 MHz  
 #Sweep 10.0 ms (1001 pts)

2 Metrics

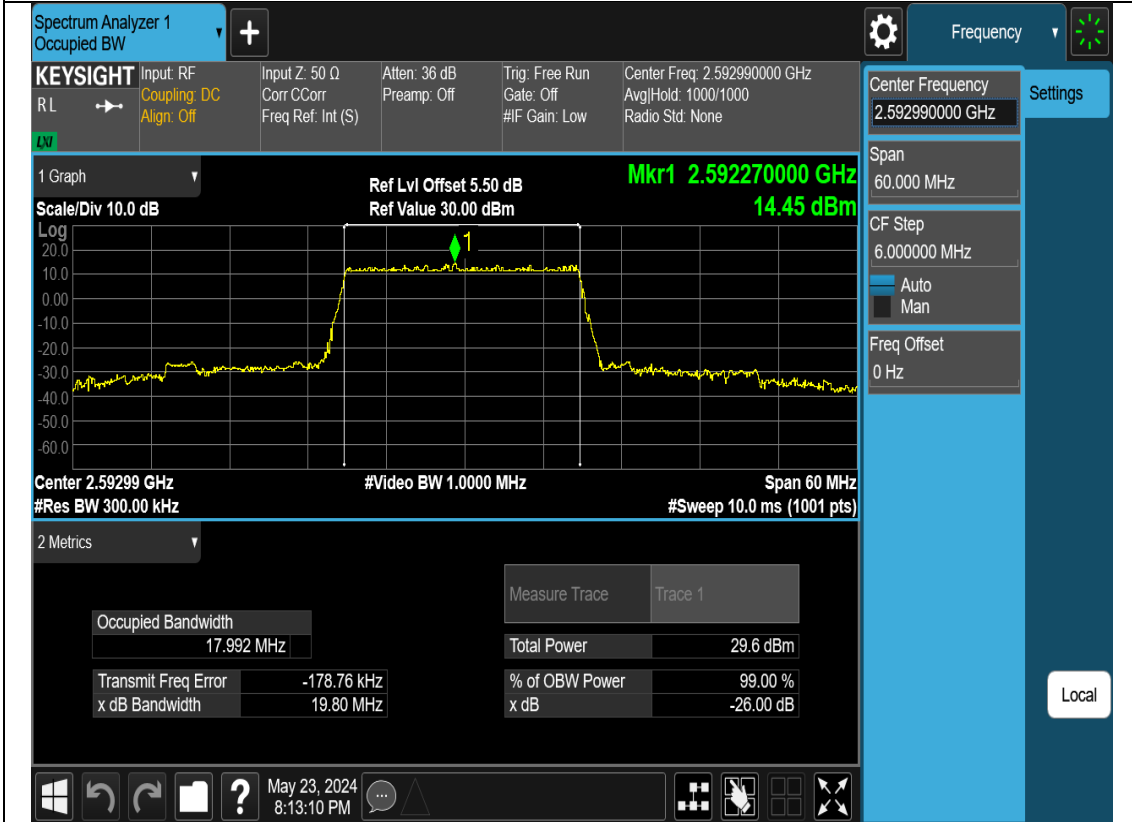
Measure Trace		Trace 1	
Occupied Bandwidth	17.917 MHz	Total Power	31.0 dBm
Transmit Freq Error	-209.42 kHz	% of OBW Power	99.00 %
x dB Bandwidth	19.51 MHz	x dB	-26.00 dB

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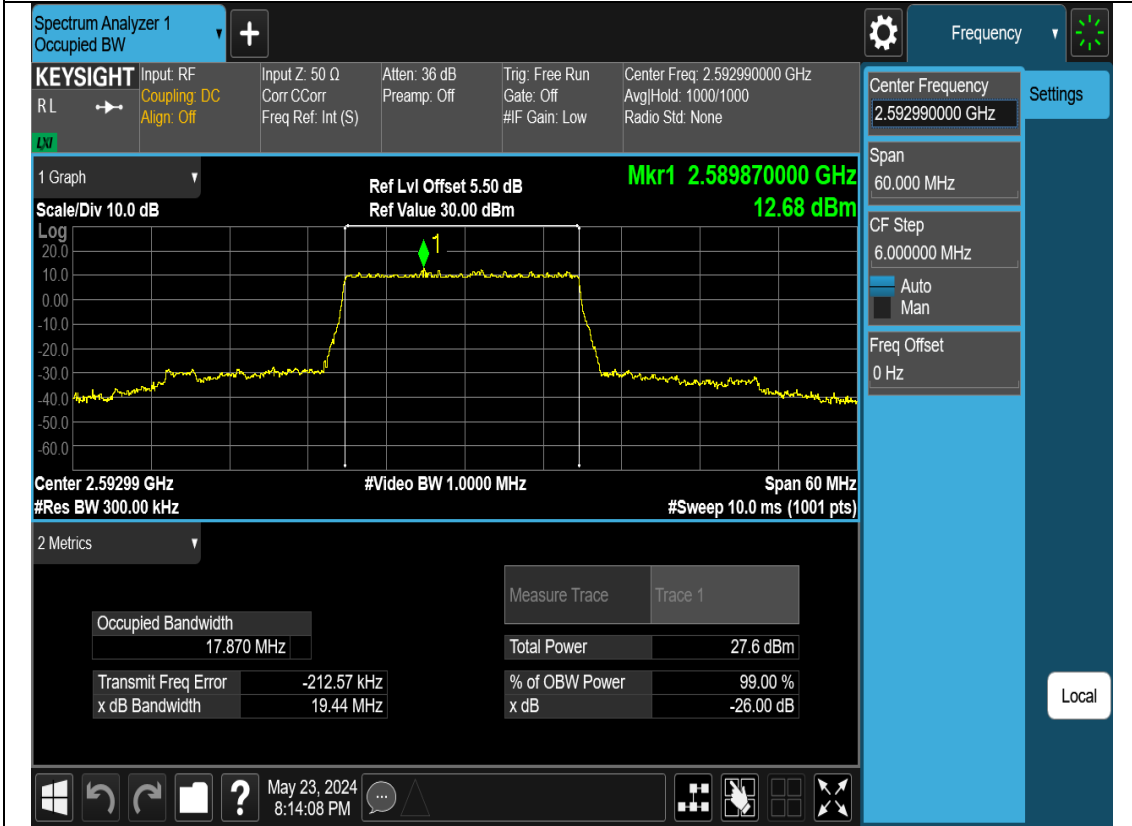
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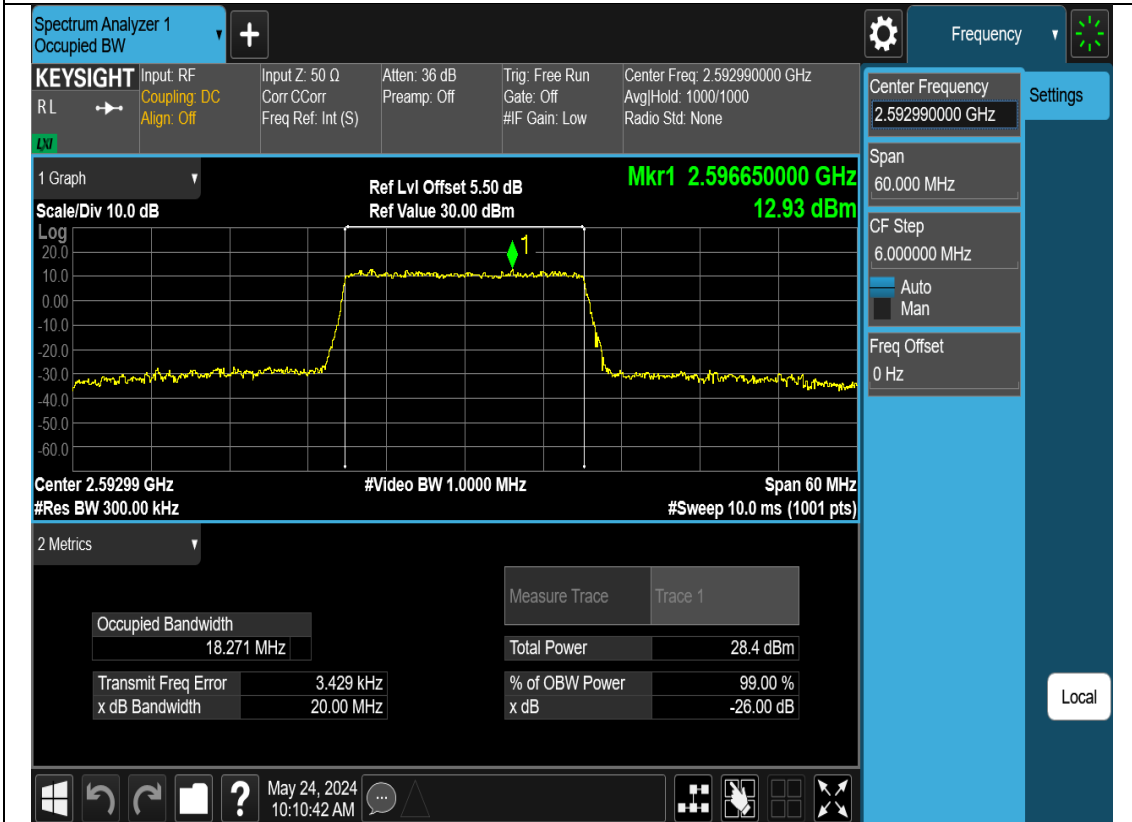
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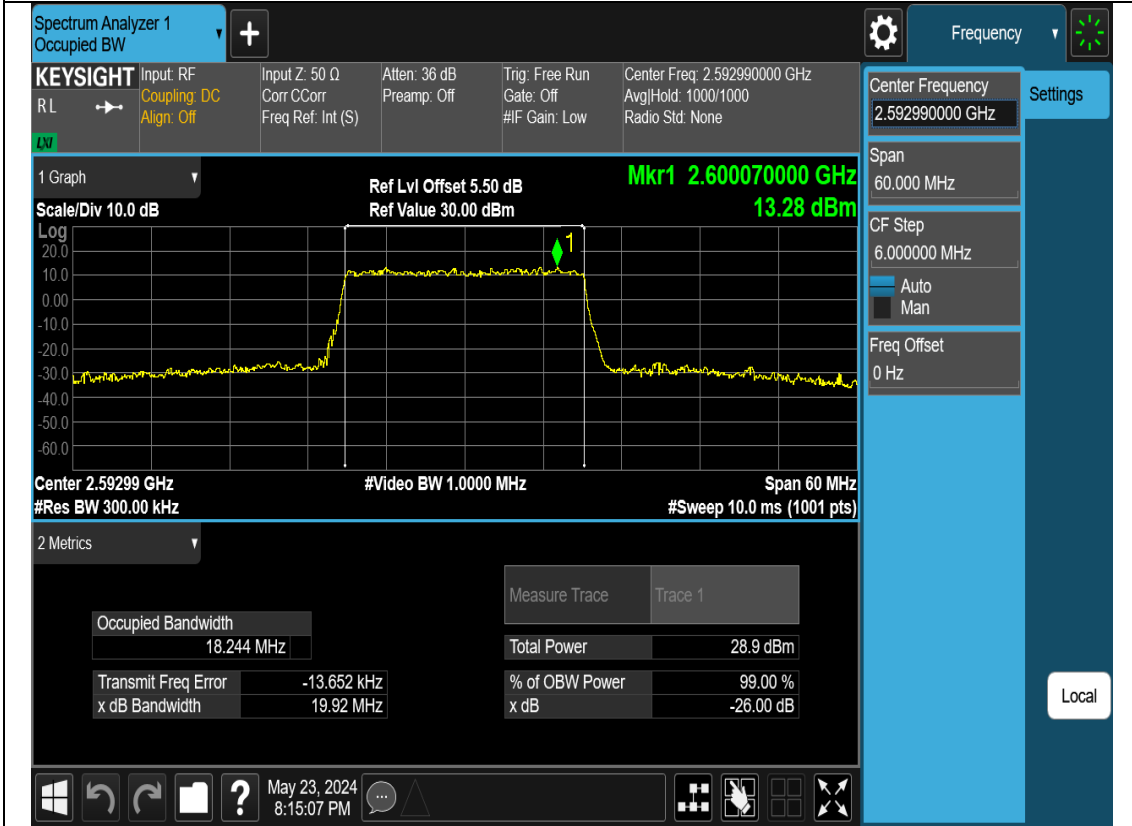
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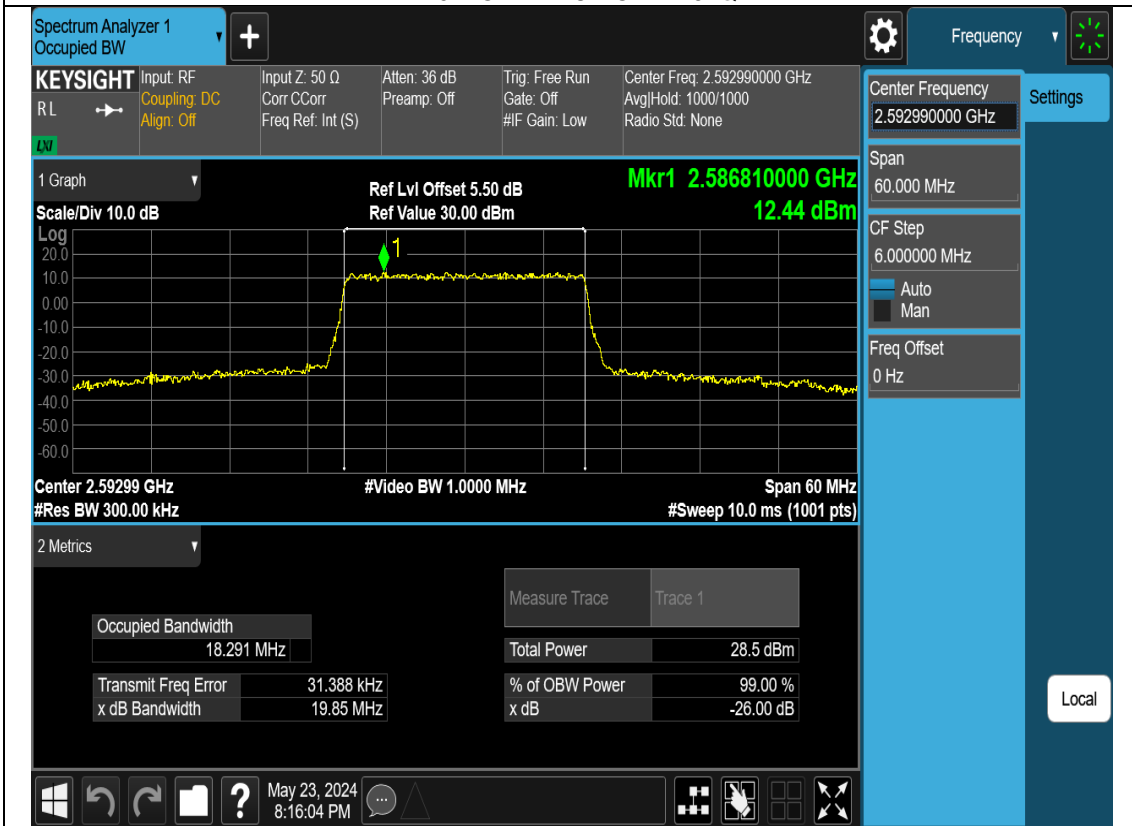
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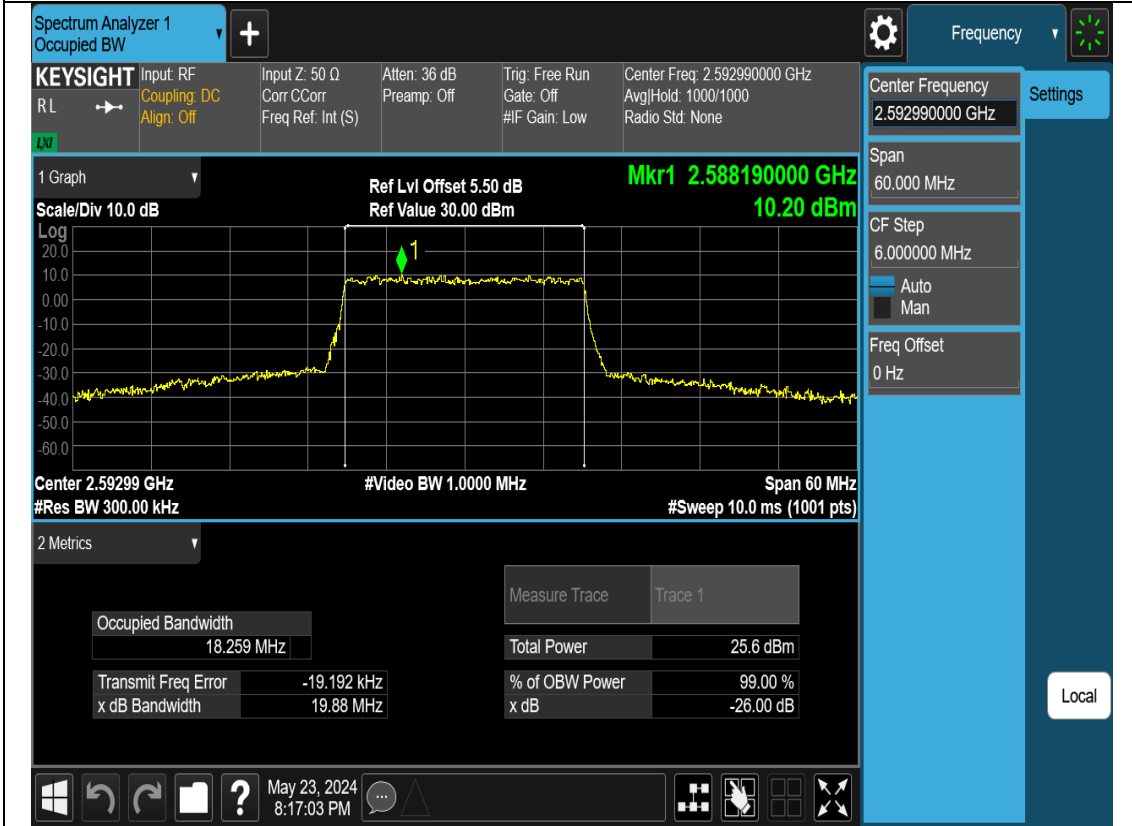
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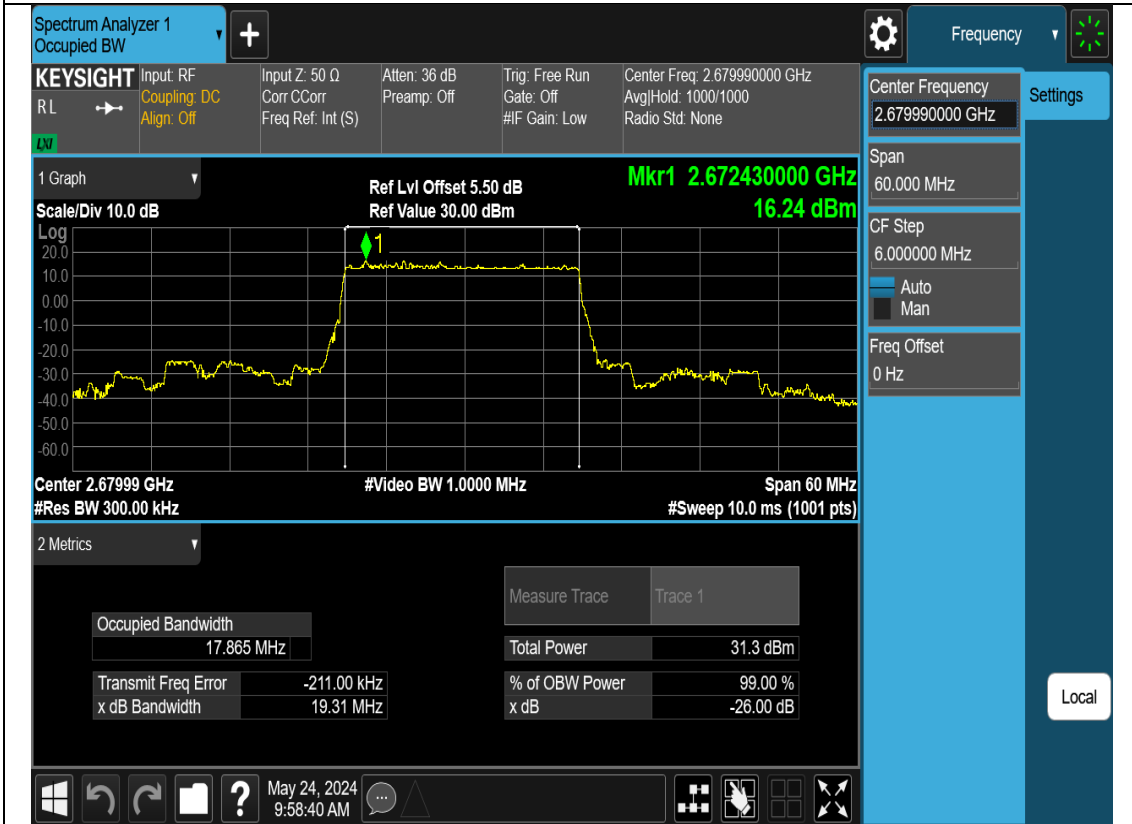
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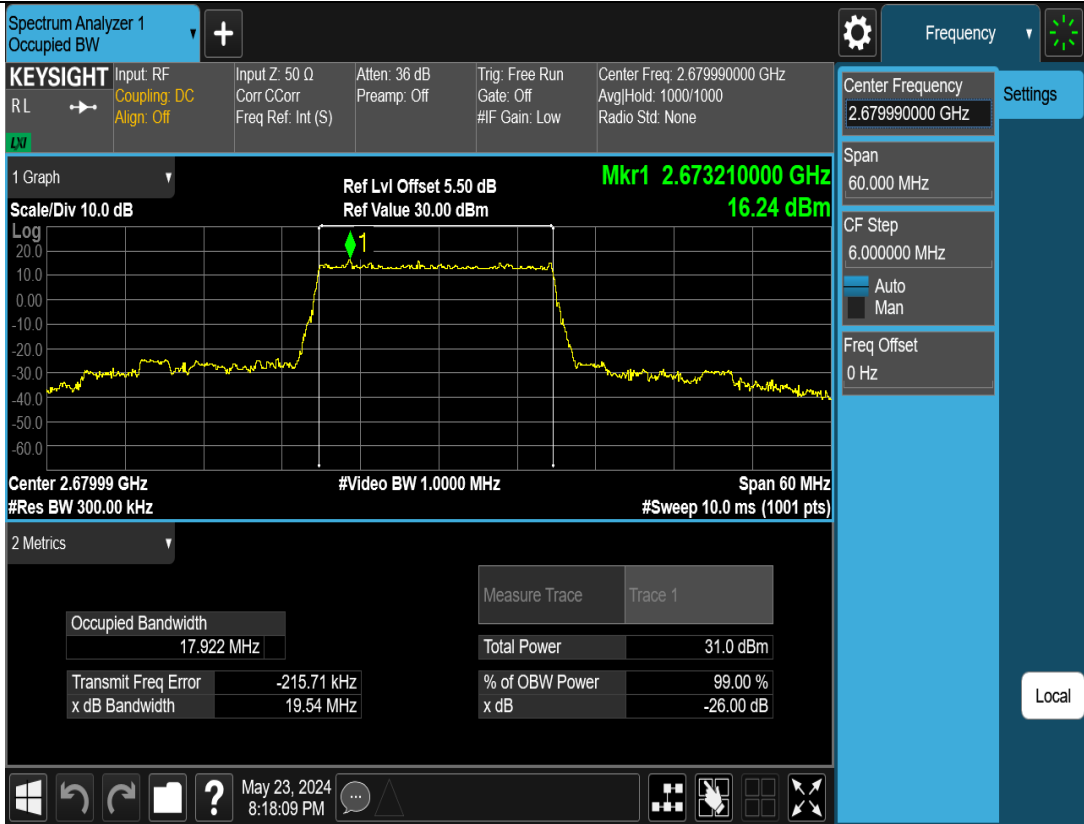
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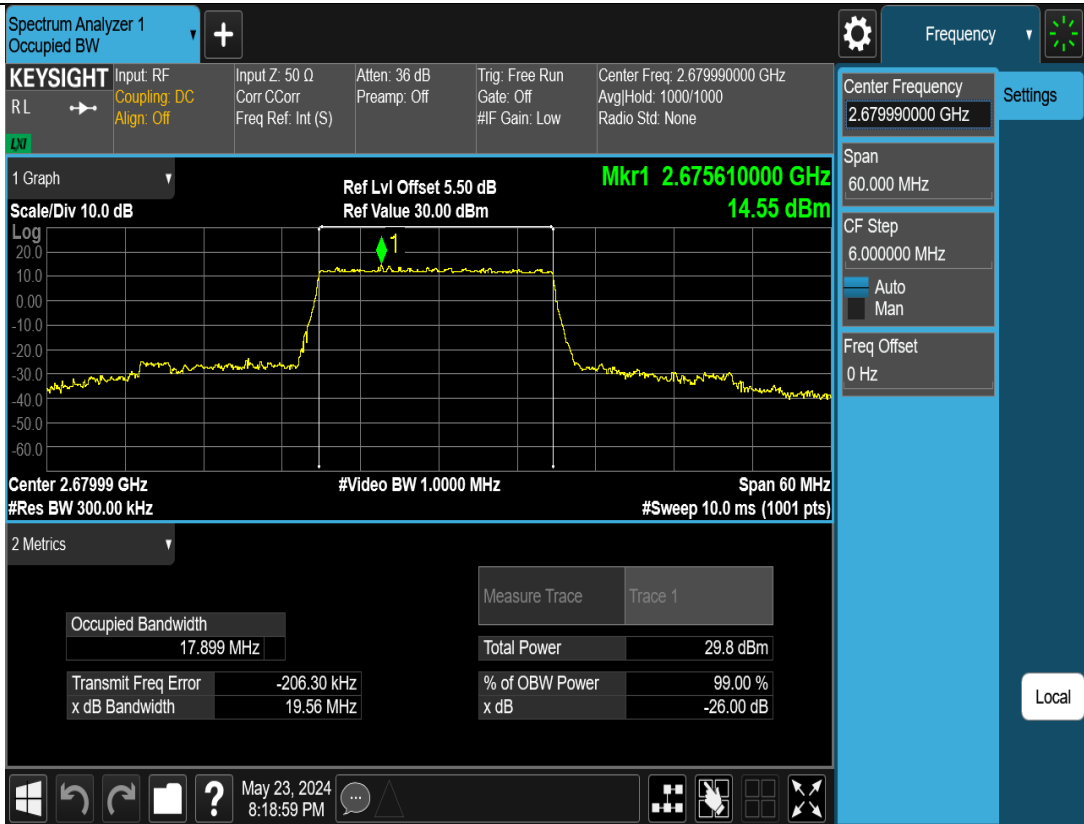
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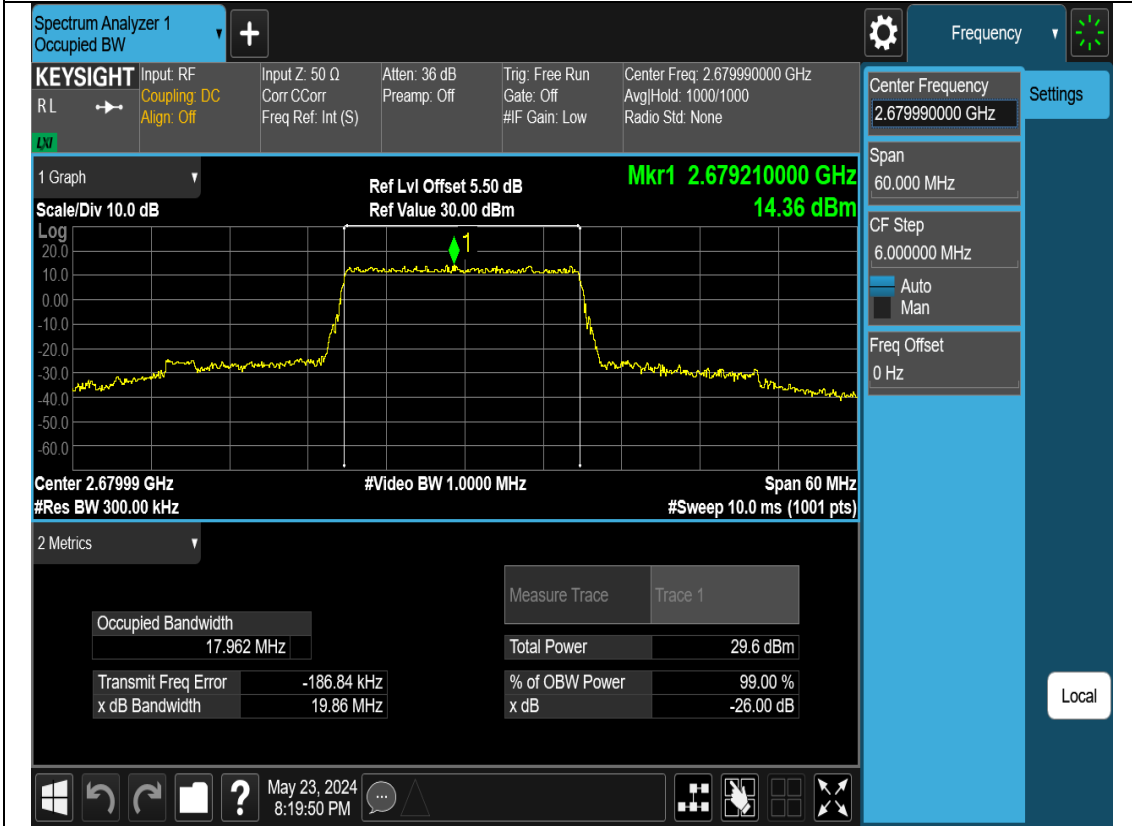
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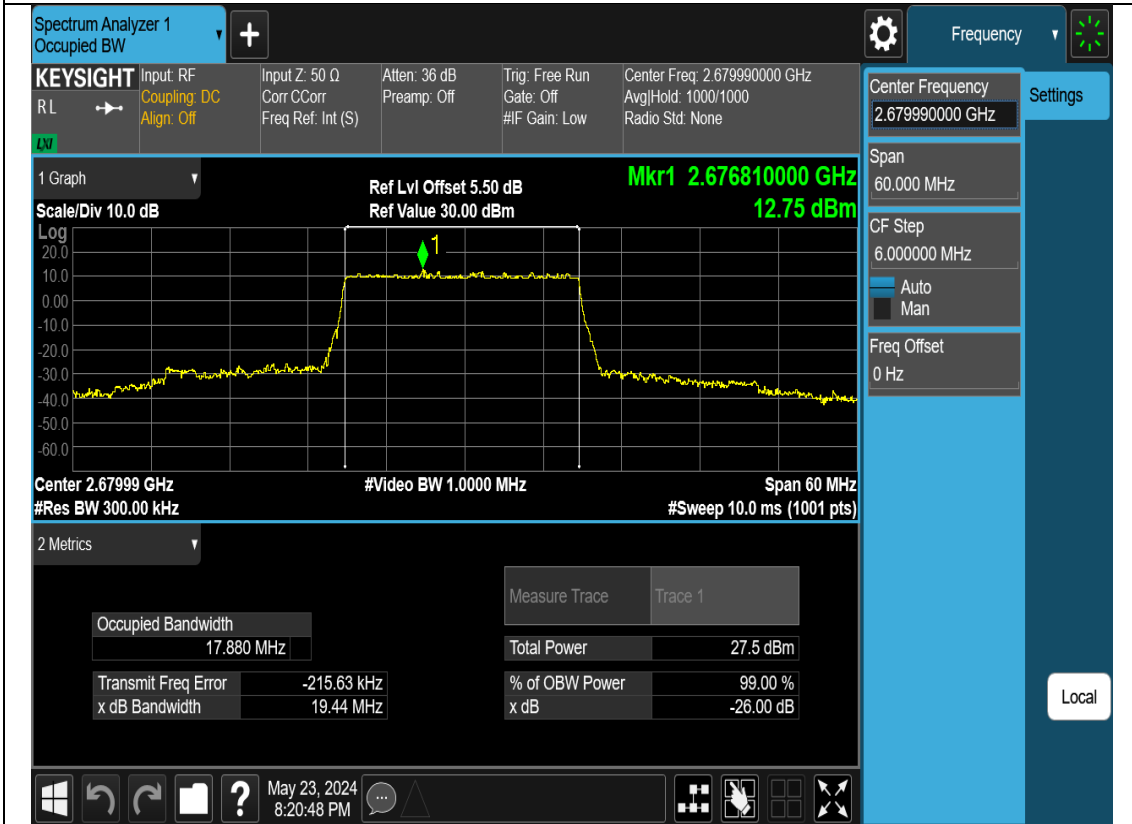
N41-20M-OBW-H-DFT-s-OFDM-16QAM



N41-20M-OBW-H-DFT-s-OFDM-64QAM



N41-20M-OBW-H-DFT-s-OFDM-256QAM



N41-20M-OBW-H-CP-OFDM-QPSK

Spectrum Analyzer 1 Occupied BW

KEYSIGHT Input RF Input Z: 50 Ω Atten: 36 dB Trig: Free Run Center Freq: 2.679990000 GHz  
 RL Coupling: DC Corr: CCorr Preamp: Off Gate: Off Avg/Hold: 1000/1000  
 Align: Off Freq Ref: Int (S) #F Gain: Low Radio Std: None

1 Graph Scale/Div 10.0 dB Ref Lvl Offset 5.50 dB Mkr1 2.672850000 GHz  
 Ref Value 30.00 dBm 13.20 dBm

Center 2.67999 GHz #Res BW 300.00 kHz #Video BW 1.0000 MHz Span 60 MHz #Sweep 10.0 ms (1001 pts)

2 Metrics

Measure Trace		Trace 1	
Occupied Bandwidth	18.191 MHz	Total Power	28.4 dBm
Transmit Freq Error	-32.058 kHz	% of OBW Power	99.00 %
x dB Bandwidth	19.81 MHz	x dB	-26.00 dB

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N41-20M-OBW-H-CP-OFDM-16QAM

Spectrum Analyzer 1 Occupied BW

KEYSIGHT Input RF Input Z: 50 Ω Atten: 36 dB Trig: Free Run Center Freq: 2.679990000 GHz  
 RL Coupling: DC Corr: CCorr Preamp: Off Gate: Off Avg/Hold: 1000/1000  
 Align: Off Freq Ref: Int (S) #F Gain: Low Radio Std: None

1 Graph Scale/Div 10.0 dB Ref Lvl Offset 5.50 dB Mkr1 2.674410000 GHz  
 Ref Value 30.00 dBm 13.25 dBm

Center 2.67999 GHz #Res BW 300.00 kHz #Video BW 1.0000 MHz Span 60 MHz #Sweep 10.0 ms (1001 pts)

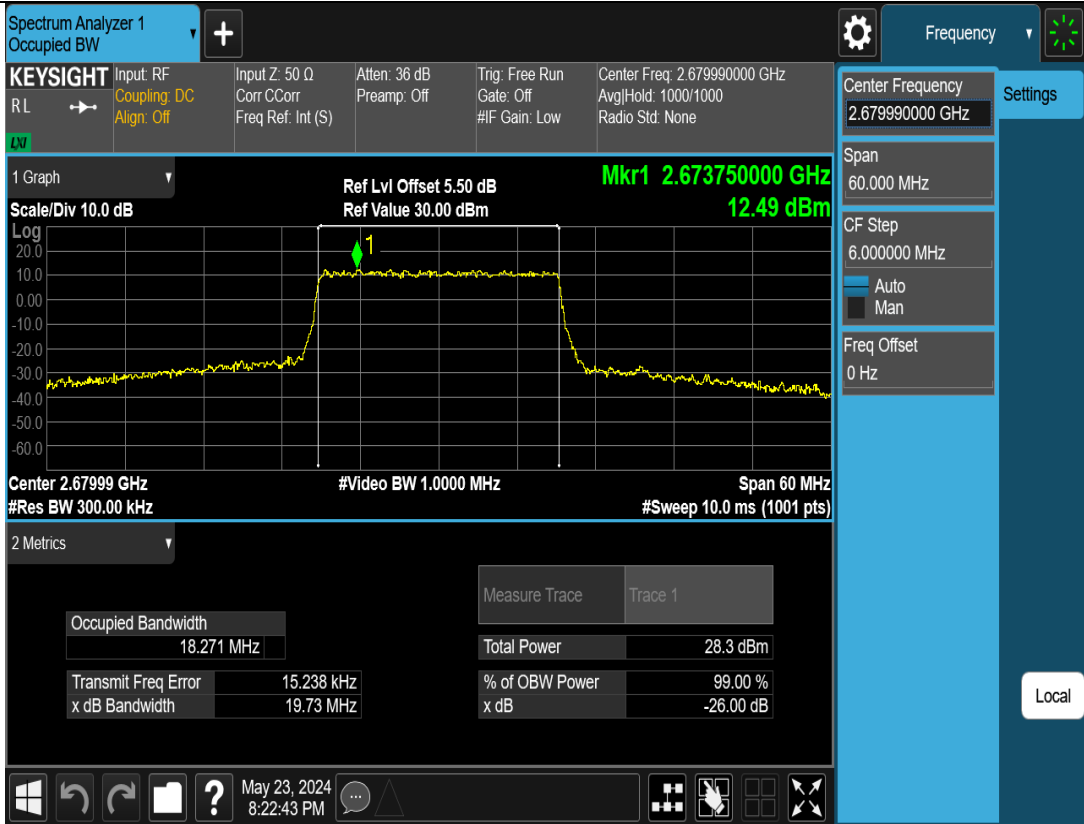
2 Metrics

Measure Trace		Trace 1	
Occupied Bandwidth	18.204 MHz	Total Power	28.8 dBm
Transmit Freq Error	-19.797 kHz	% of OBW Power	99.00 %
x dB Bandwidth	19.85 MHz	x dB	-26.00 dB

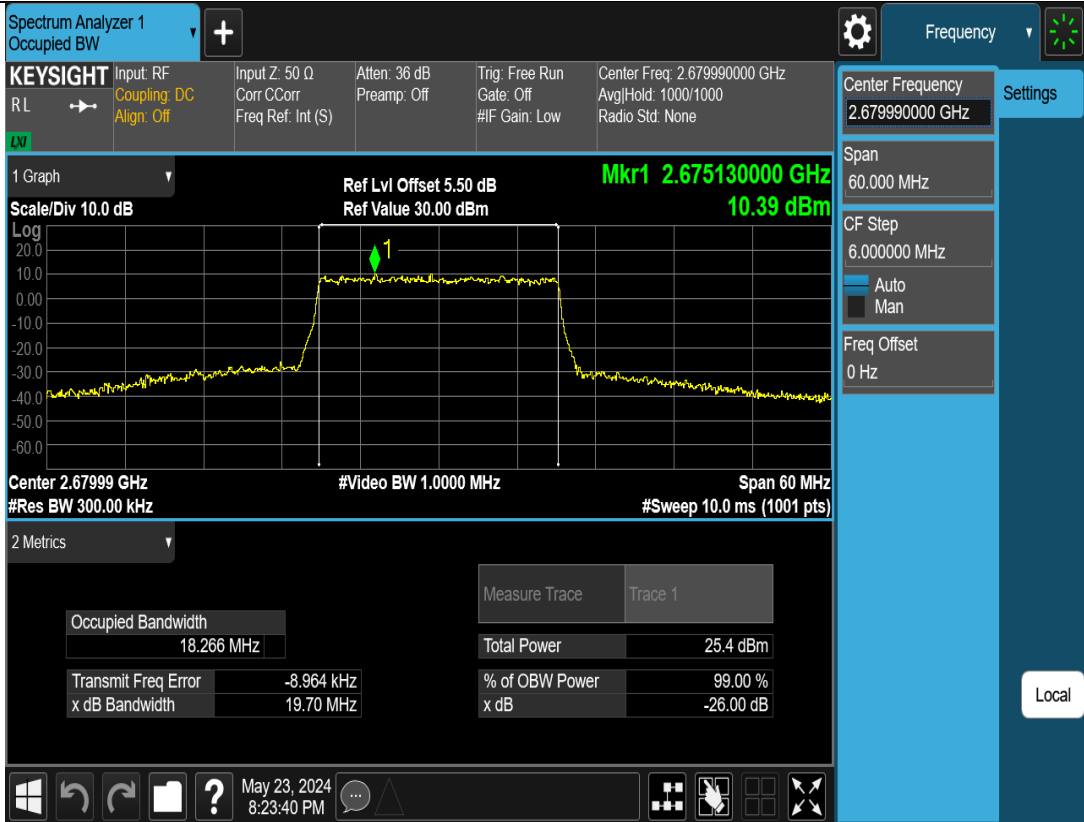
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N41-20M-OBW-H-CP-OFDM-64QAM



N41-20M-OBW-H-CP-OFDM-256QAM



# Peak-Average Ratio

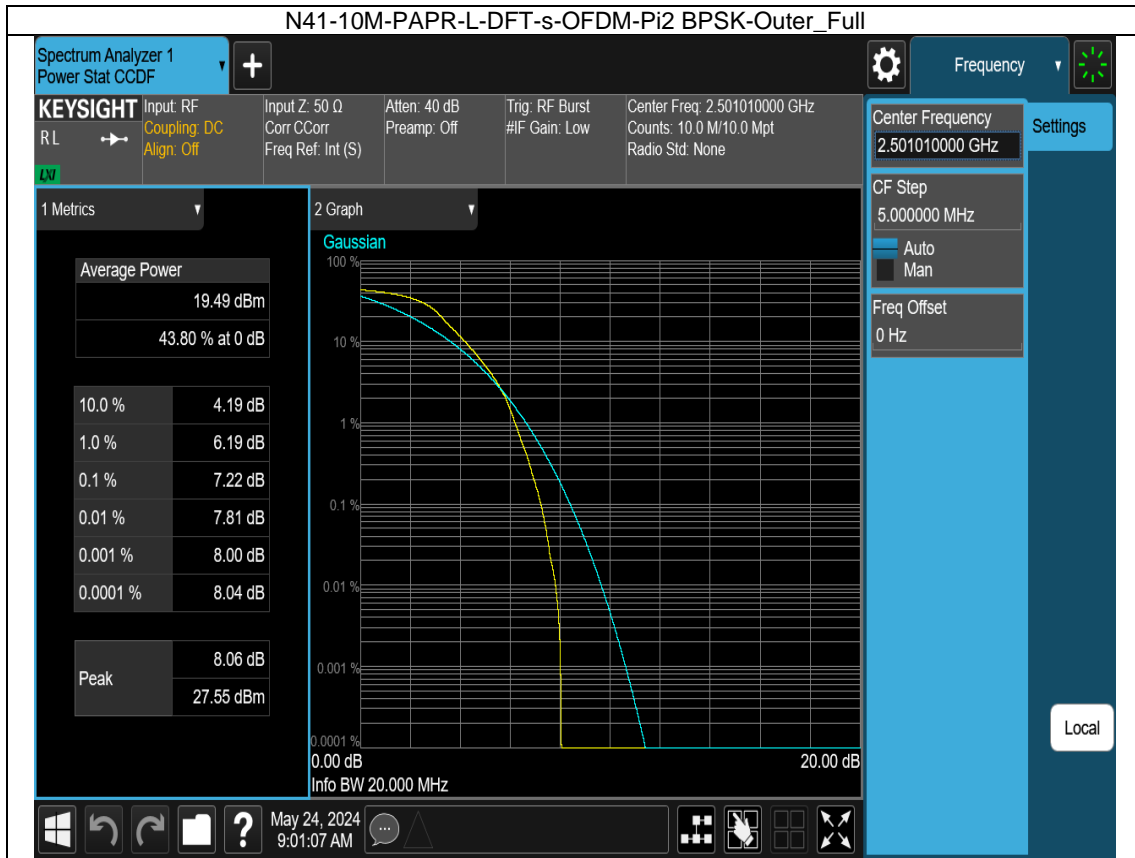
## Test Result

5G NR n41 SCS=30kHz 10MHz					
Modulation	CH	RB Allocation	Peak-Average Ratio (dB)	Limit	Verdict
DFT-s-OFDM PI/2 BPSK	Low CH	Outer_Full	7.22	<=13	Pass
DFT-s-OFDM QPSK		Outer_Full	8.19	<=13	Pass
DFT-s-OFDM 16QAM		Outer_Full	9.09	<=13	Pass
DFT-s-OFDM 64QAM		Outer_Full	9.53	<=13	Pass
DFT-s-OFDM 256QAM		Outer_Full	9.43	<=13	Pass
CP-OFDM QPSK		Outer_Full	10.04	<=13	Pass
CP-OFDM 16QAM		Outer_Full	10.18	<=13	Pass
CP-OFDM 64QAM		Outer_Full	10.65	<=13	Pass
CP-OFDM 256QAM		Outer_Full	11.34	<=13	Pass
DFT-s-OFDM PI/2 BPSK		Middle CH	Outer_Full	7.05	<=13
DFT-s-OFDM QPSK	Outer_Full		9.84	<=13	Pass
DFT-s-OFDM 16QAM	Outer_Full		8.97	<=13	Pass
DFT-s-OFDM 64QAM	Outer_Full		9.37	<=13	Pass
DFT-s-OFDM 256QAM	Outer_Full		9.34	<=13	Pass
CP-OFDM QPSK	Outer_Full		9.76	<=13	Pass
CP-OFDM 16QAM	Outer_Full		9.92	<=13	Pass
CP-OFDM 64QAM	Outer_Full		10.36	<=13	Pass
CP-OFDM 256QAM	Outer_Full		11.35	<=13	Pass
DFT-s-OFDM PI/2 BPSK	High CH		Outer_Full	7.04	<=13
DFT-s-OFDM QPSK		Outer_Full	10.18	<=13	Pass
DFT-s-OFDM 16QAM		Outer_Full	9.06	<=13	Pass
DFT-s-OFDM 64QAM		Outer_Full	9.60	<=13	Pass
DFT-s-OFDM 256QAM		Outer_Full	9.43	<=13	Pass
CP-OFDM QPSK		Outer_Full	10.13	<=13	Pass
CP-OFDM 16QAM		Outer_Full	10.35	<=13	Pass
CP-OFDM 64QAM		Outer_Full	10.80	<=13	Pass
CP-OFDM 256QAM		Outer_Full	11.39	<=13	Pass

5G NR n41 SCS=30kHz 15MHz					
Modulation	CH	RB Allocation	Peak-Average Ratio (dB)	Limit	Verdict
DFT-s-OFDM PI/2 BPSK	Low CH	Outer_Full	6.87	<=13	Pass
DFT-s-OFDM QPSK		Outer_Full	8.20	<=13	Pass
DFT-s-OFDM 16QAM		Outer_Full	9.11	<=13	Pass
DFT-s-OFDM 64QAM		Outer_Full	9.28	<=13	Pass
DFT-s-OFDM 256QAM		Outer_Full	9.28	<=13	Pass
CP-OFDM QPSK		Outer_Full	10.21	<=13	Pass
CP-OFDM 16QAM		Outer_Full	10.36	<=13	Pass
CP-OFDM 64QAM		Outer_Full	10.73	<=13	Pass
CP-OFDM 256QAM		Outer_Full	11.34	<=13	Pass
DFT-s-OFDM PI/2 BPSK	Middle CH	Outer_Full	7.08	<=13	Pass
DFT-s-OFDM QPSK		Outer_Full	8.31	<=13	Pass
DFT-s-OFDM 16QAM		Outer_Full	9.12	<=13	Pass
DFT-s-OFDM 64QAM		Outer_Full	9.27	<=13	Pass
DFT-s-OFDM 256QAM		Outer_Full	9.21	<=13	Pass
CP-OFDM QPSK		Outer_Full	9.87	<=13	Pass
CP-OFDM 16QAM		Outer_Full	10.07	<=13	Pass
CP-OFDM 64QAM		Outer_Full	10.46	<=13	Pass
CP-OFDM 256QAM		Outer_Full	11.19	<=13	Pass
DFT-s-OFDM PI/2 BPSK	High CH	Outer_Full	6.93	<=13	Pass
DFT-s-OFDM QPSK		Outer_Full	10.52	<=13	Pass
DFT-s-OFDM 16QAM		Outer_Full	10.48	<=13	Pass
DFT-s-OFDM 64QAM		Outer_Full	9.35	<=13	Pass
DFT-s-OFDM 256QAM		Outer_Full	9.28	<=13	Pass
CP-OFDM QPSK		Outer_Full	10.36	<=13	Pass
CP-OFDM 16QAM		Outer_Full	10.59	<=13	Pass
CP-OFDM 64QAM		Outer_Full	10.23	<=13	Pass
CP-OFDM 256QAM		Outer_Full	11.21	<=13	Pass

5G NR n41 SCS=30kHz 20MHz					
Modulation	CH	RB Allocation	Peak-Average Ratio (dB)	Limit	Verdict
DFT-s-OFDM PI/2 BPSK	Low CH	Outer_Full	7.10	<=13	Pass
DFT-s-OFDM QPSK		Outer_Full	8.18	<=13	Pass
DFT-s-OFDM 16QAM		Outer_Full	9.00	<=13	Pass
DFT-s-OFDM 64QAM		Outer_Full	9.14	<=13	Pass
DFT-s-OFDM 256QAM		Outer_Full	9.39	<=13	Pass
CP-OFDM QPSK		Outer_Full	10.04	<=13	Pass
CP-OFDM 16QAM		Outer_Full	10.37	<=13	Pass
CP-OFDM 64QAM		Outer_Full	10.79	<=13	Pass
CP-OFDM 256QAM		Outer_Full	11.14	<=13	Pass
DFT-s-OFDM PI/2 BPSK		Middle CH	Outer_Full	6.96	<=13
DFT-s-OFDM QPSK	Outer_Full		8.25	<=13	Pass
DFT-s-OFDM 16QAM	Outer_Full		9.00	<=13	Pass
DFT-s-OFDM 64QAM	Outer_Full		9.18	<=13	Pass
DFT-s-OFDM 256QAM	Outer_Full		9.33	<=13	Pass
CP-OFDM QPSK	Outer_Full		10.22	<=13	Pass
CP-OFDM 16QAM	Outer_Full		10.05	<=13	Pass
CP-OFDM 64QAM	Outer_Full		10.47	<=13	Pass
CP-OFDM 256QAM	Outer_Full		10.96	<=13	Pass
DFT-s-OFDM PI/2 BPSK	High CH		Outer_Full	7.14	<=13
DFT-s-OFDM QPSK		Outer_Full	8.29	<=13	Pass
DFT-s-OFDM 16QAM		Outer_Full	9.07	<=13	Pass
DFT-s-OFDM 64QAM		Outer_Full	9.37	<=13	Pass
DFT-s-OFDM 256QAM		Outer_Full	9.38	<=13	Pass
CP-OFDM QPSK		Outer_Full	10.11	<=13	Pass
CP-OFDM 16QAM		Outer_Full	10.39	<=13	Pass
CP-OFDM 64QAM		Outer_Full	10.84	<=13	Pass
CP-OFDM 256QAM		Outer_Full	11.09	<=13	Pass

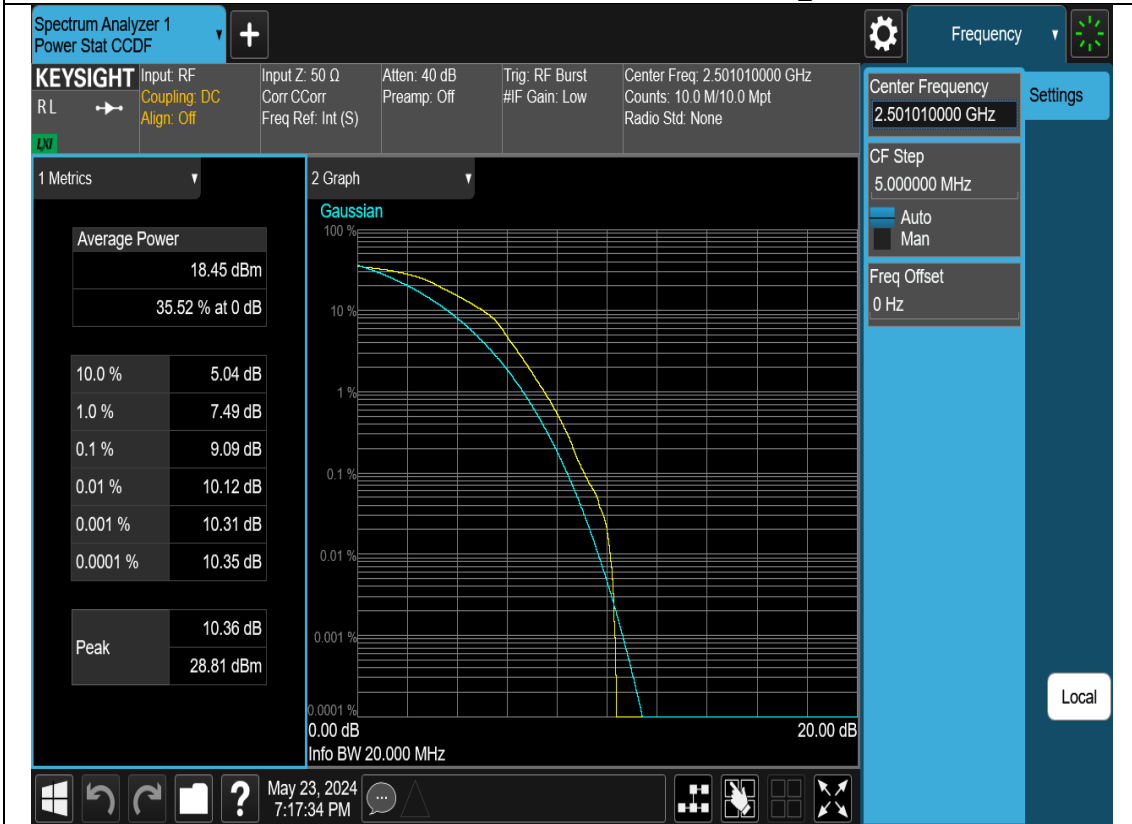
# Test Graph



N41-10M-PAPR-L-DFT-s-OFDM-QPSK-Outer\_Full



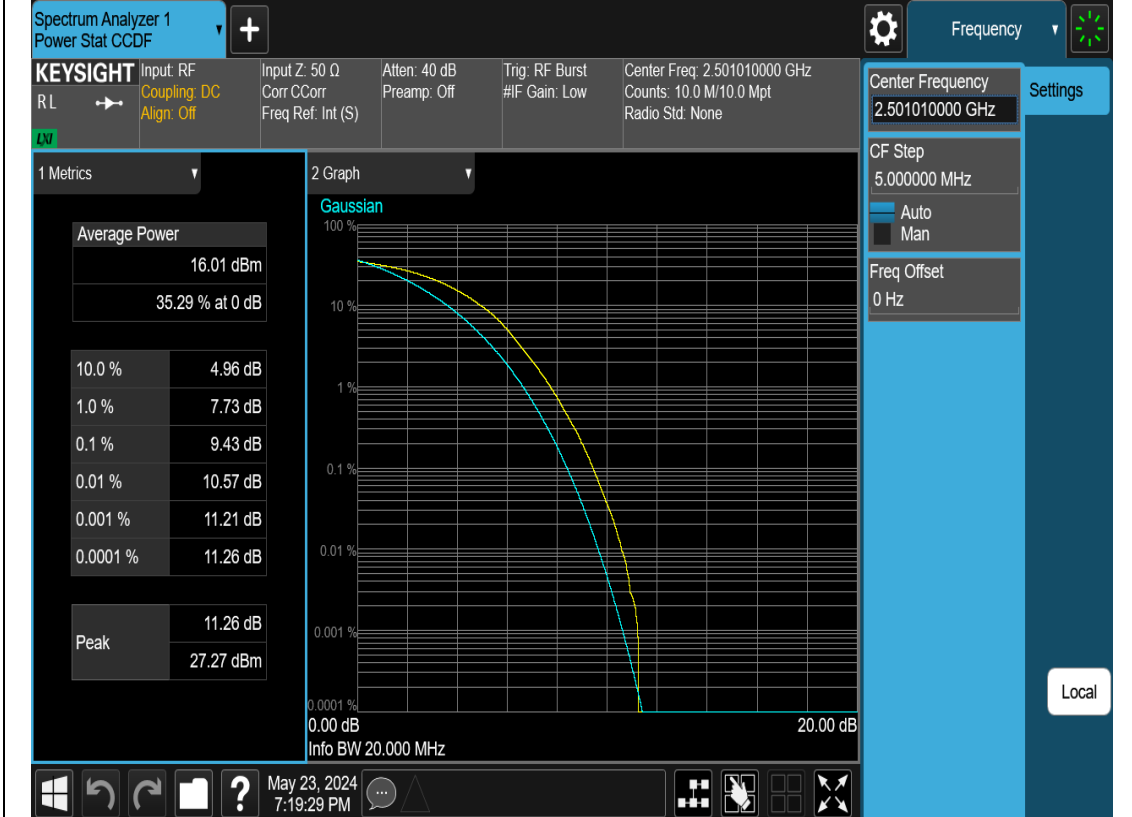
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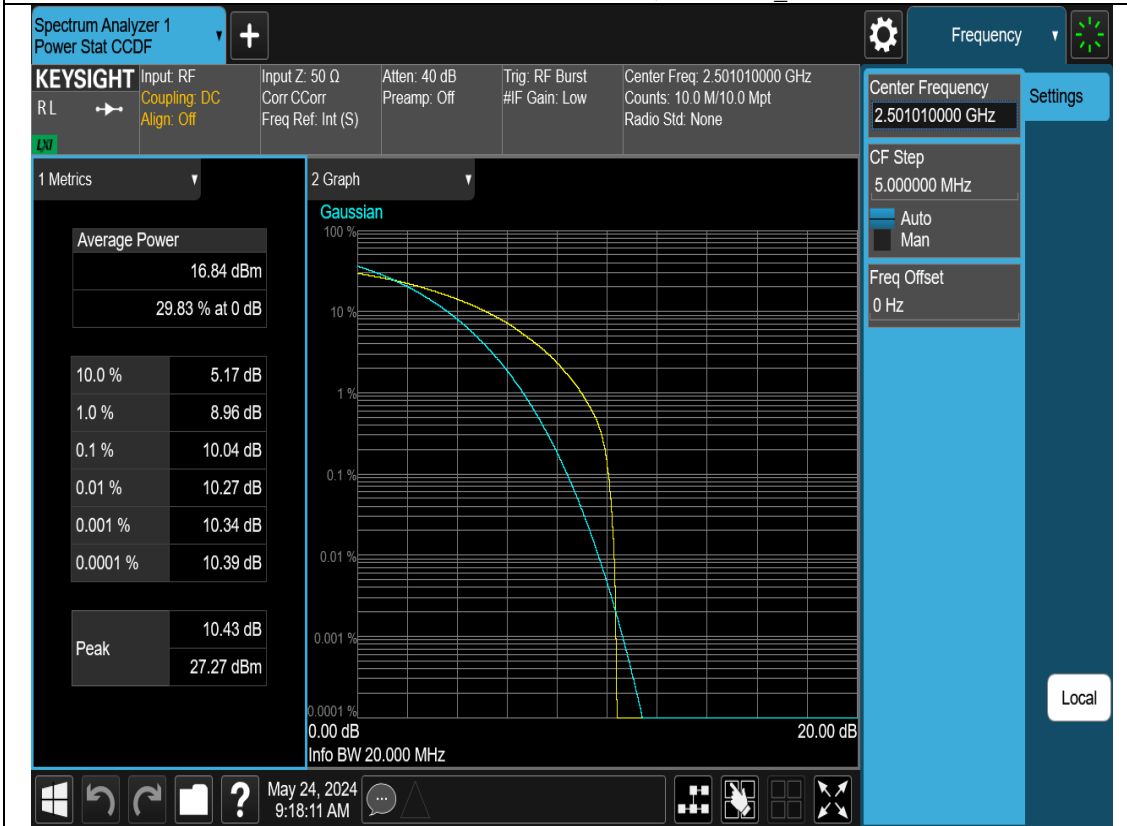
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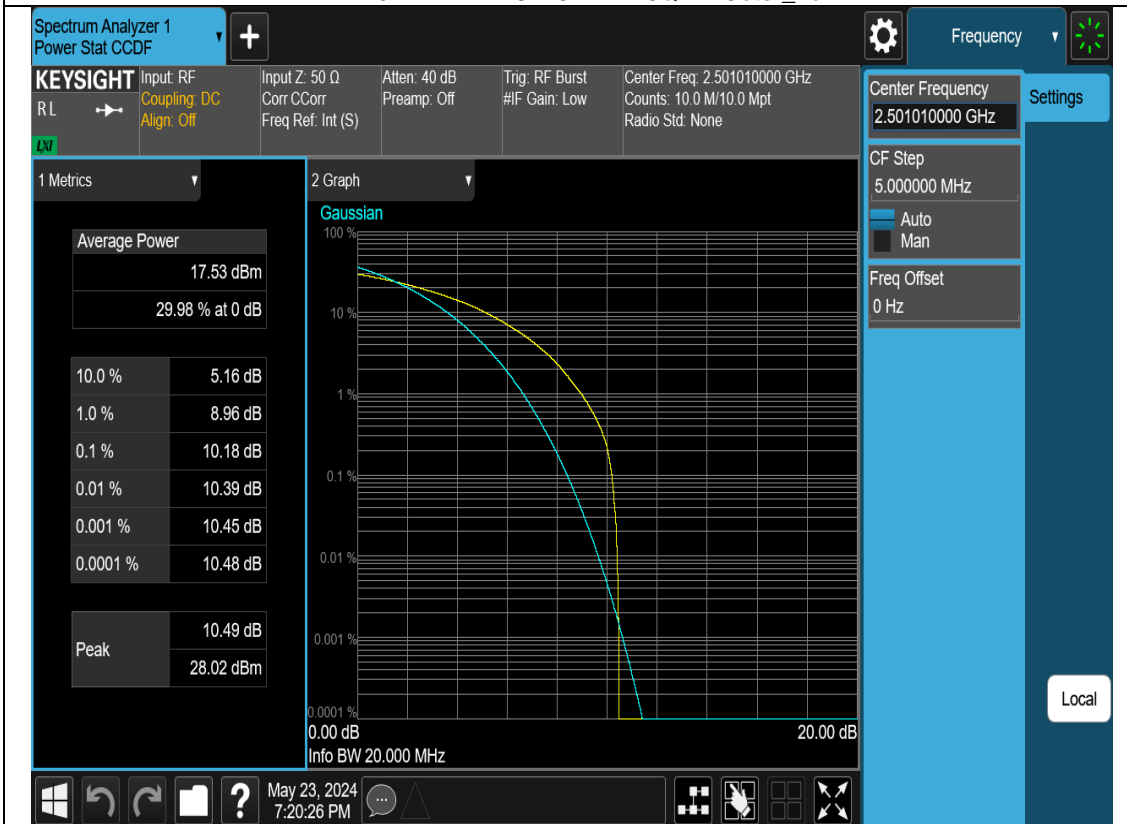
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N41-10M-PAPR-L-CP-OFDM-QPSK-Outer\_Full

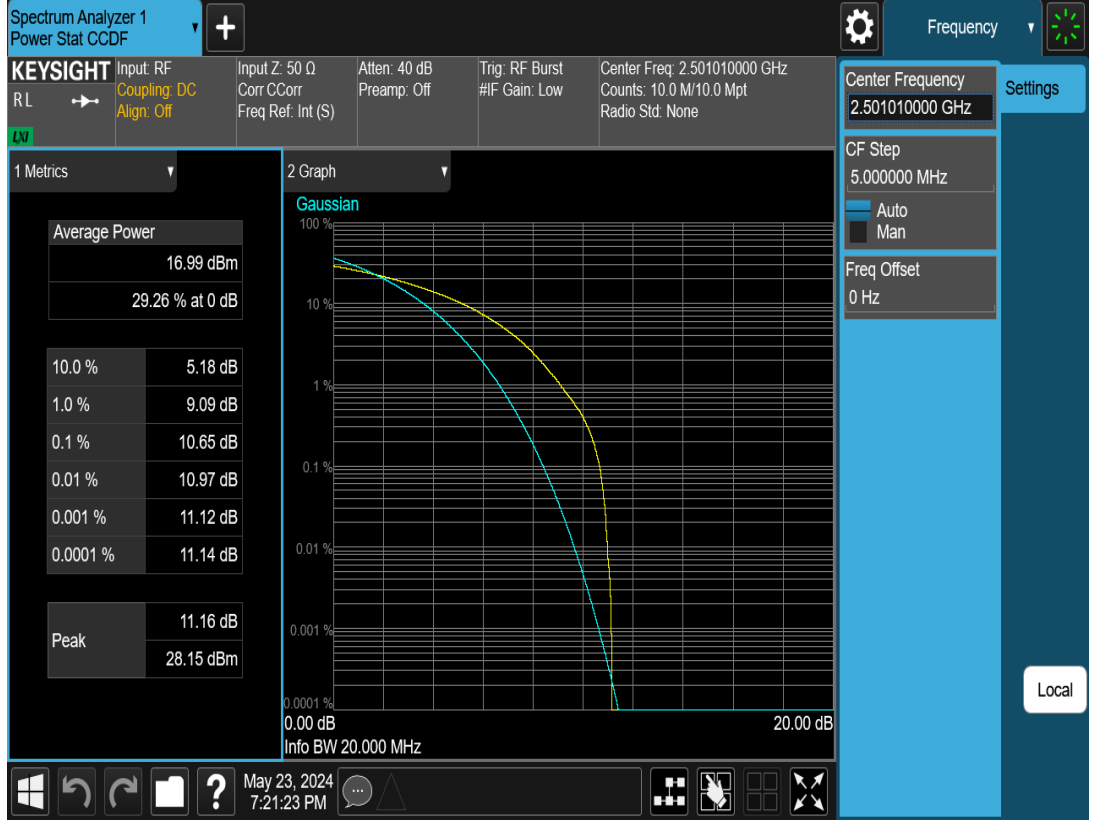


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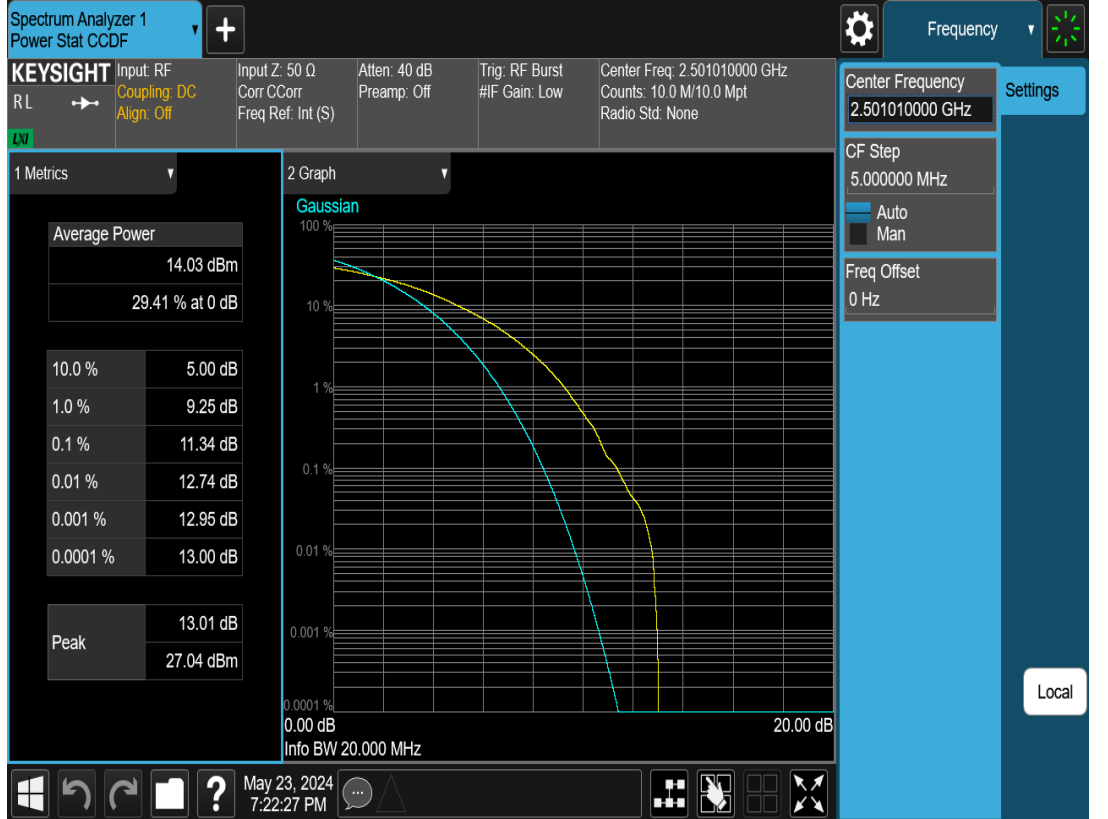




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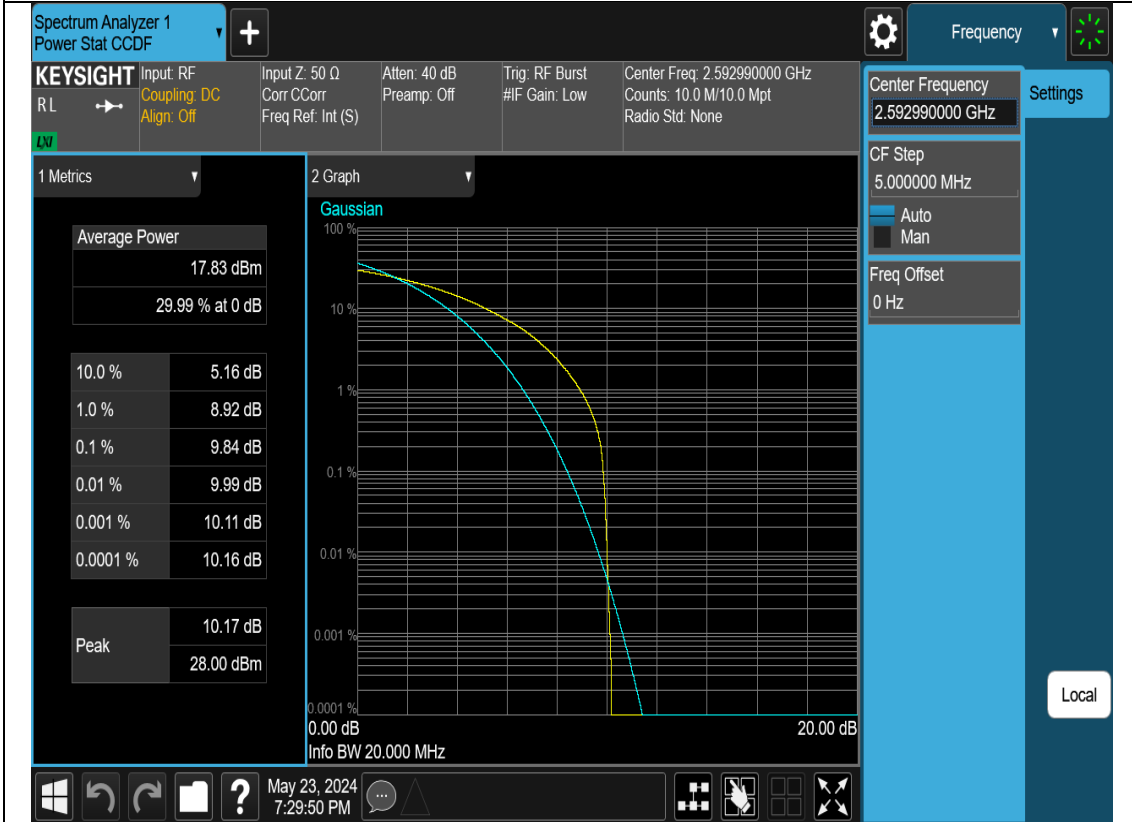
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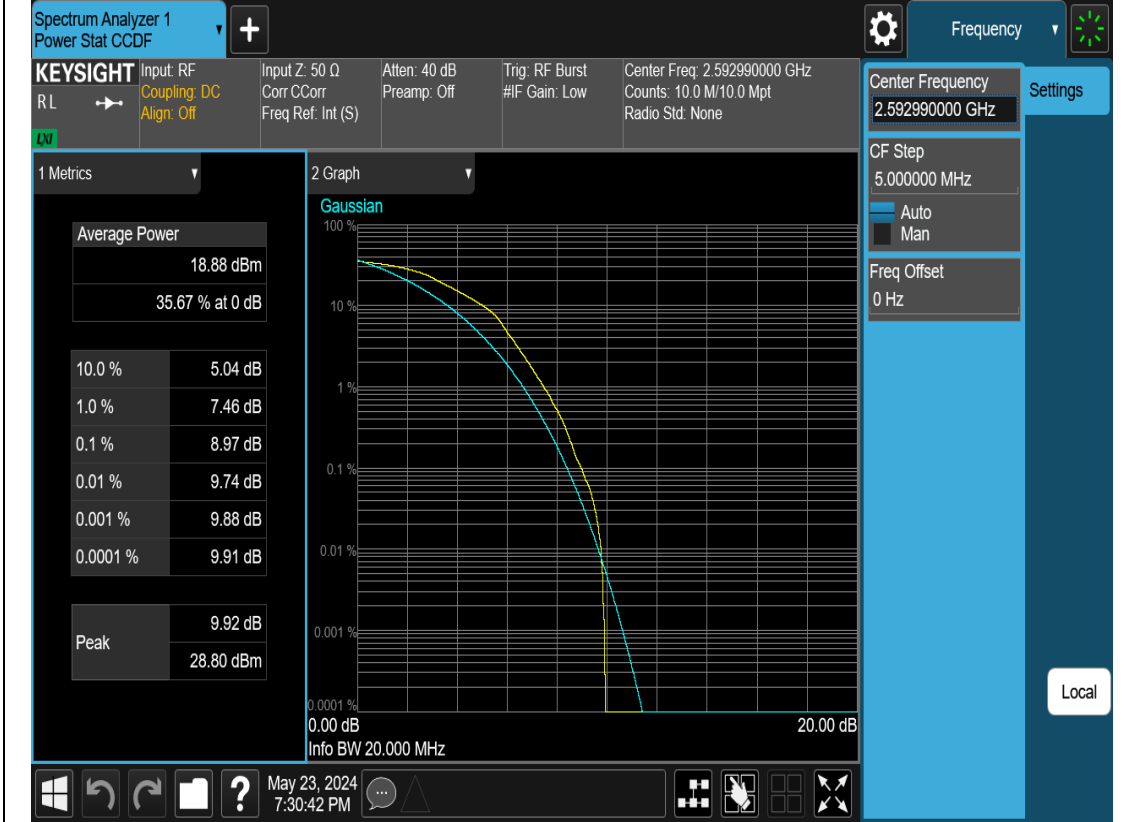
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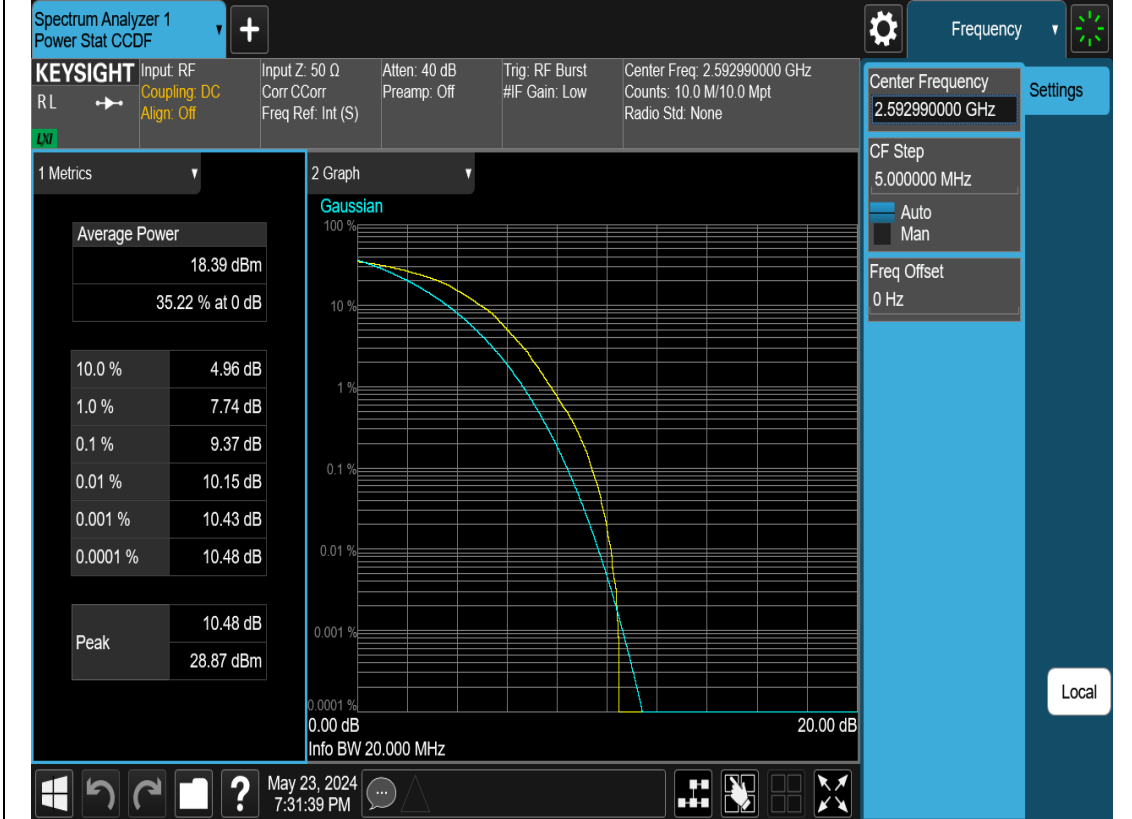
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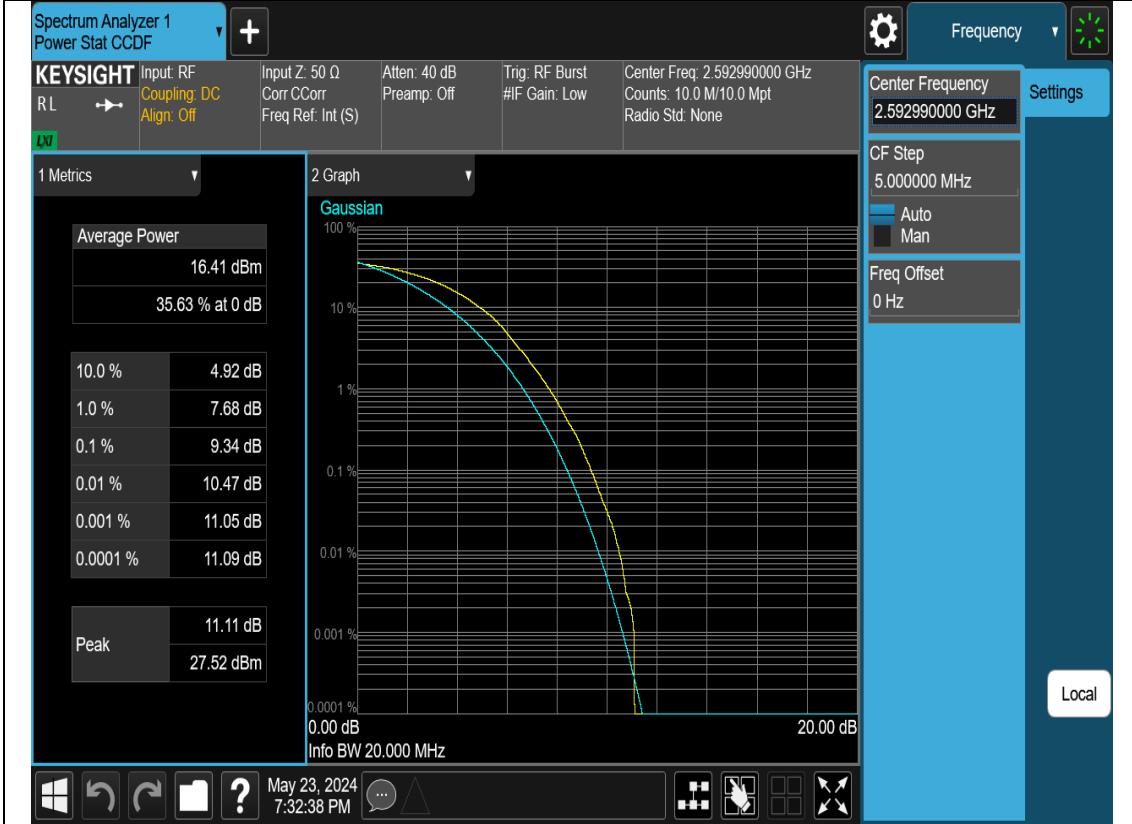
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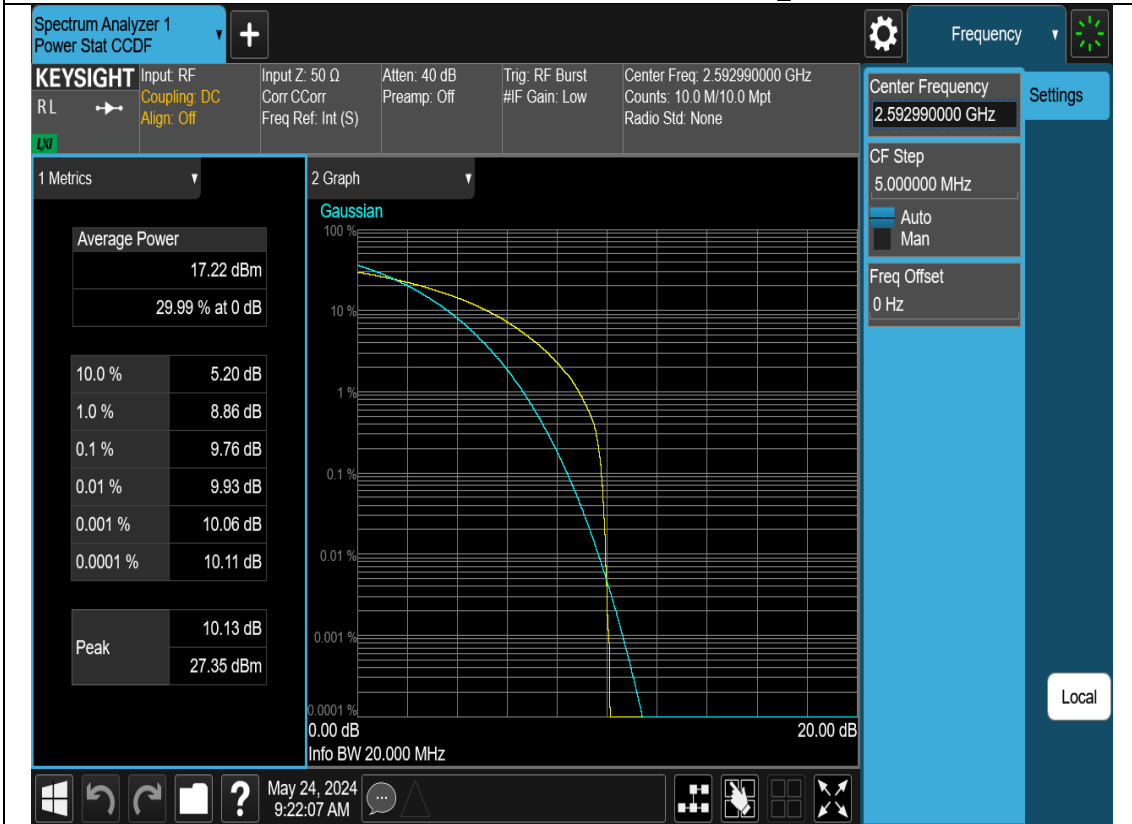
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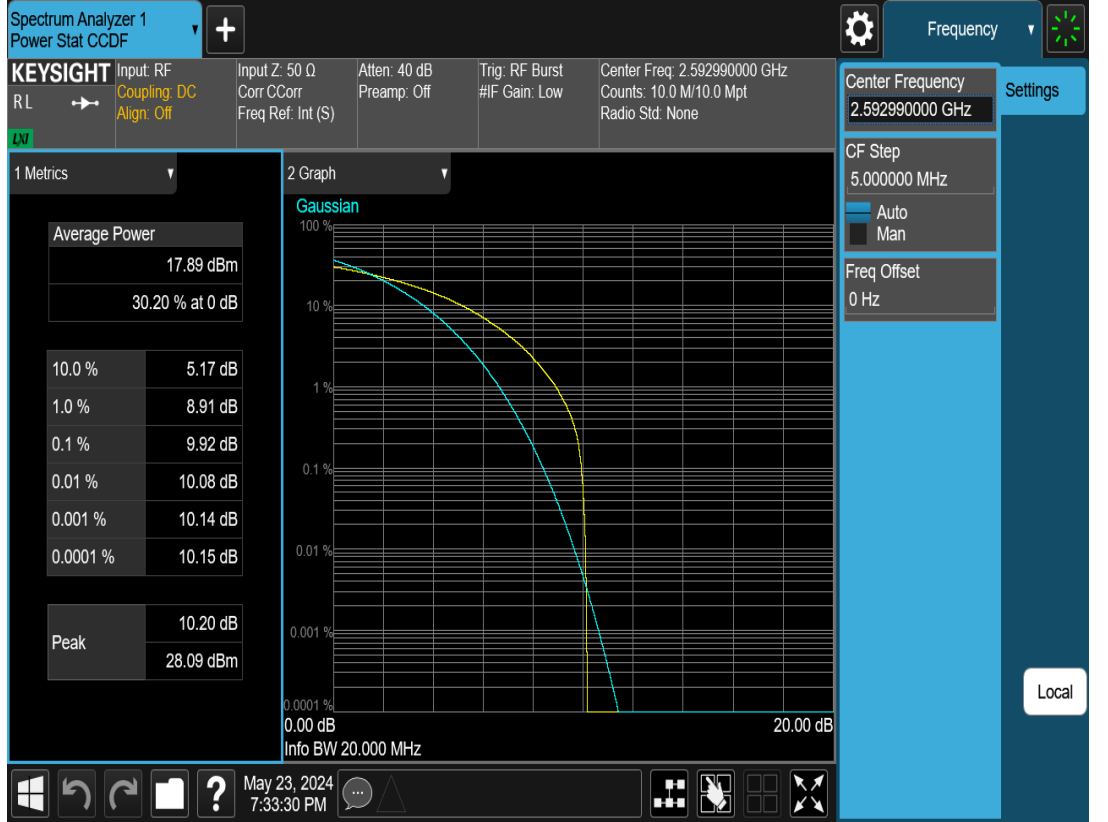
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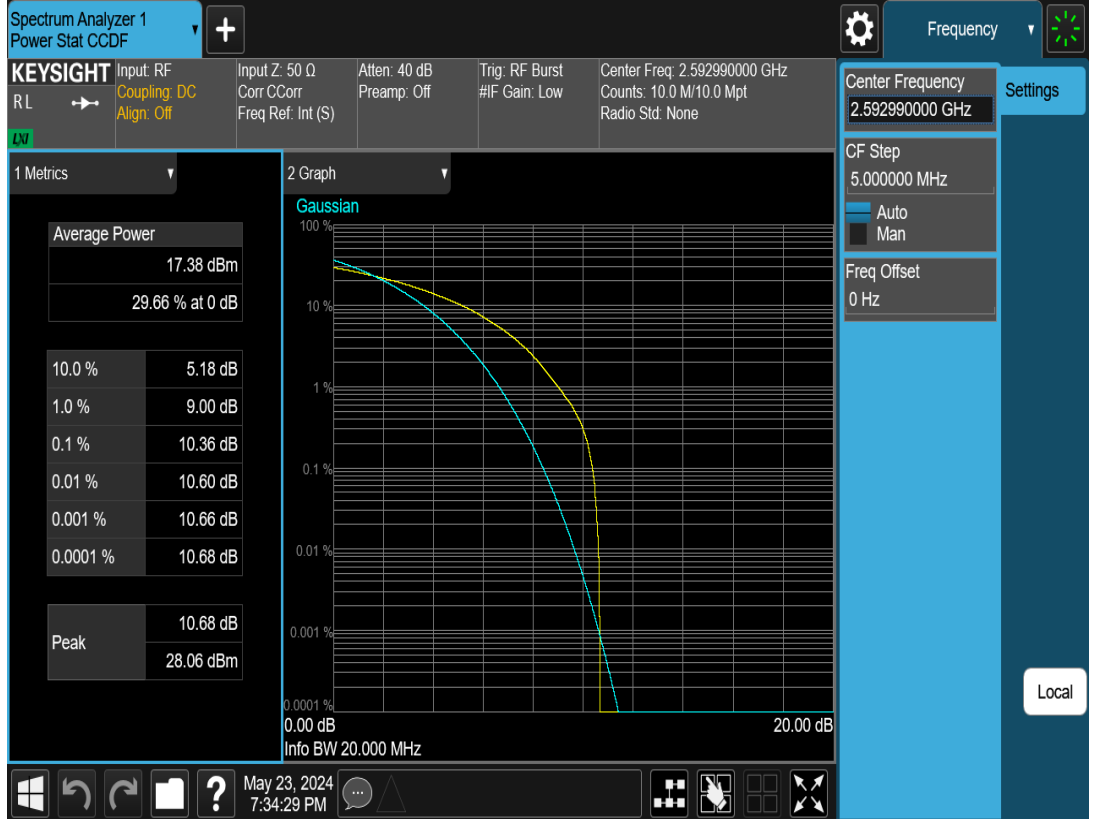
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N41-10M-PAPR-M-CP-OFDM-16QAM-Outer\_Full



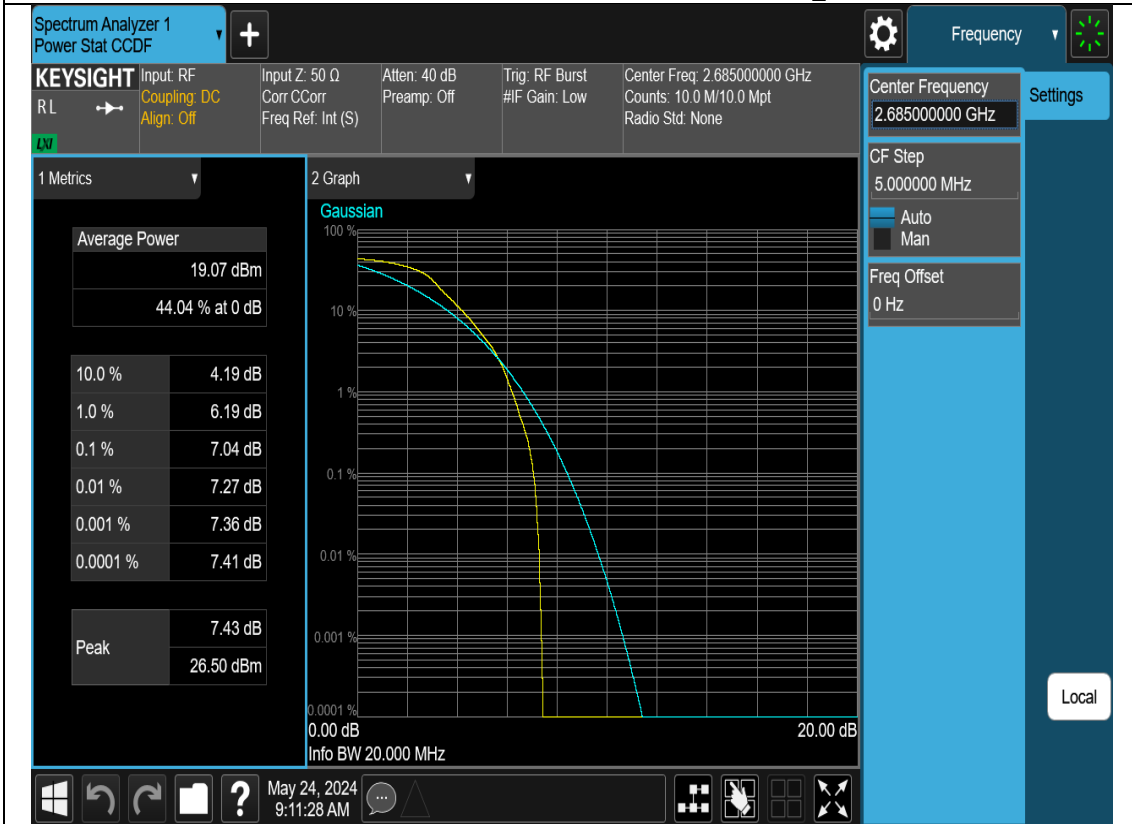
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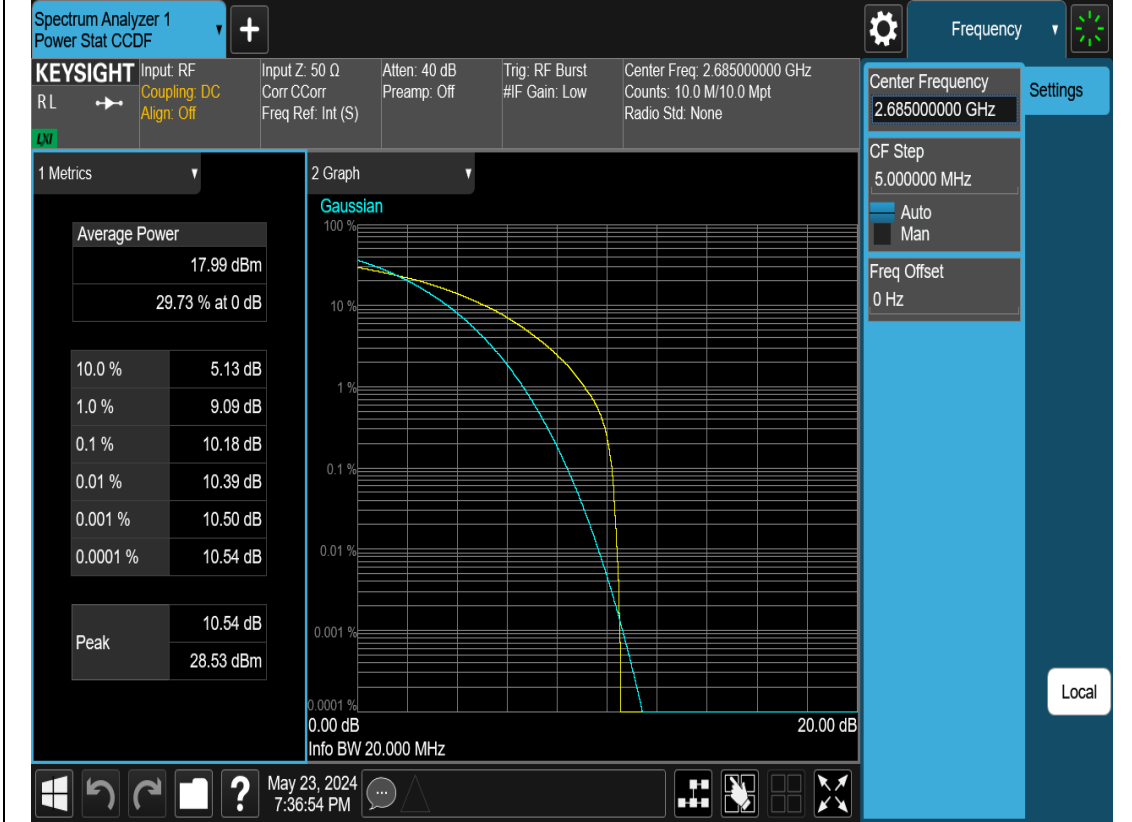
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N41-10M-PAPR-H-DFT-s-OFDM-Pi2 BPSK-Outer\_Full



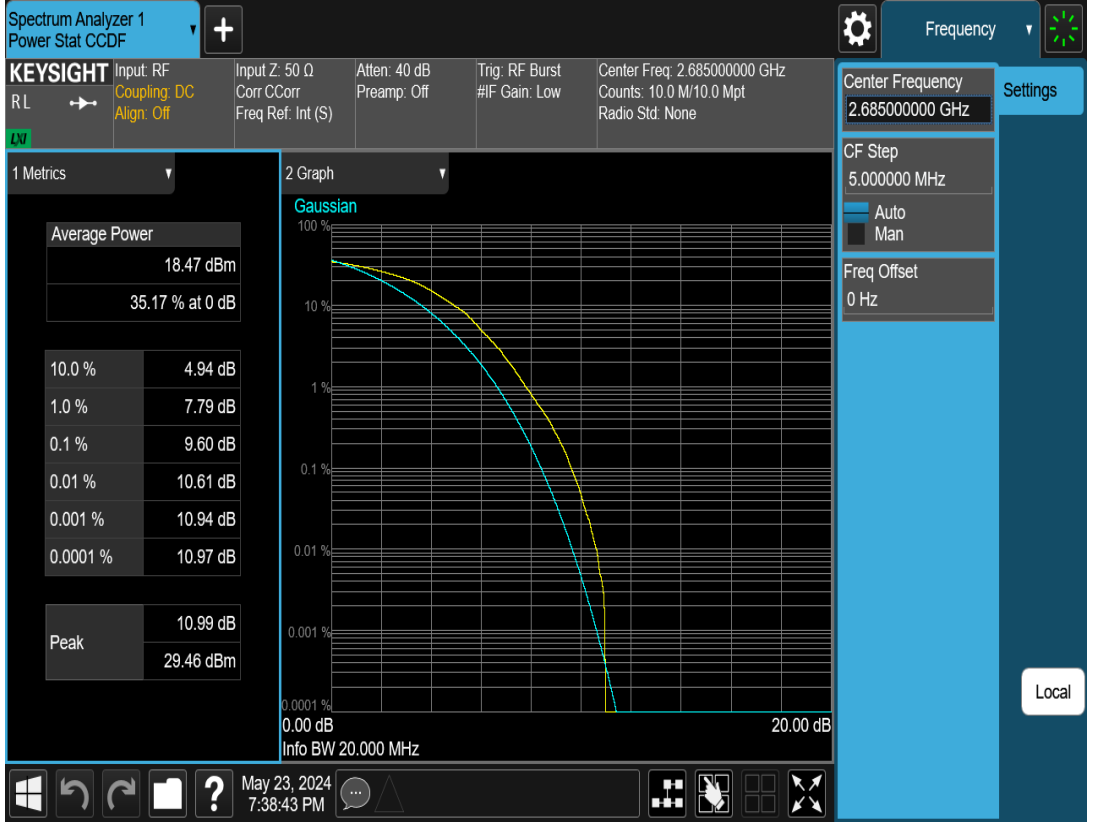
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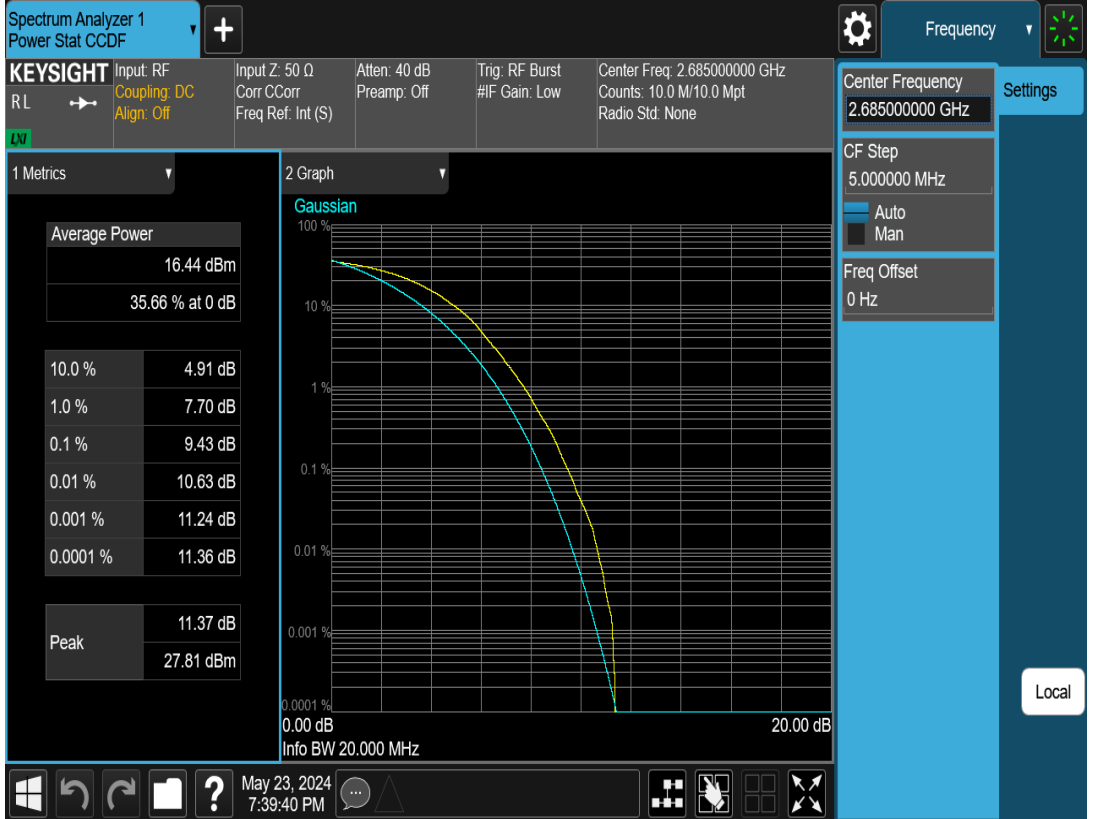
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N41-10M-PAPR-H-DFT-s-OFDM-64QAM-Outer\_Full



N41-10M-PAPR-H-DFT-s-OFDM-256QAM-Outer\_Full

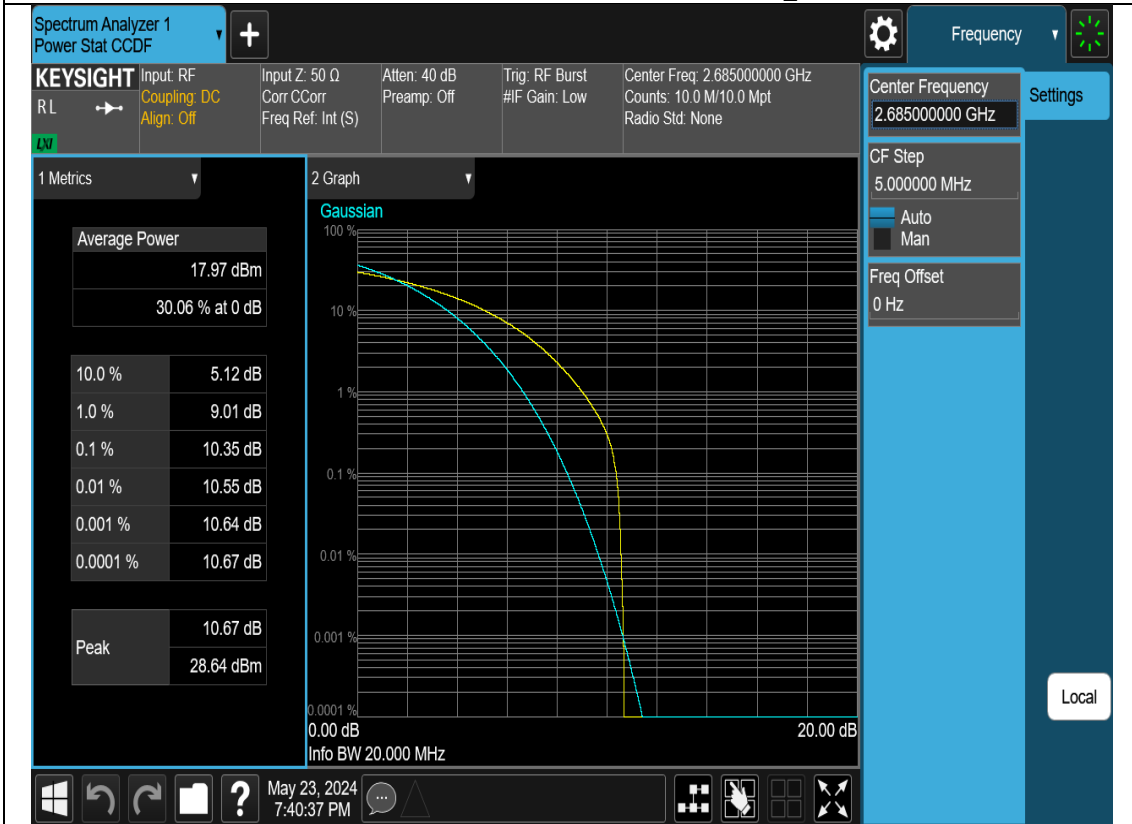




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N41-10M-PAPR-H-CP-OFDM-16QAM-Outer\_Full



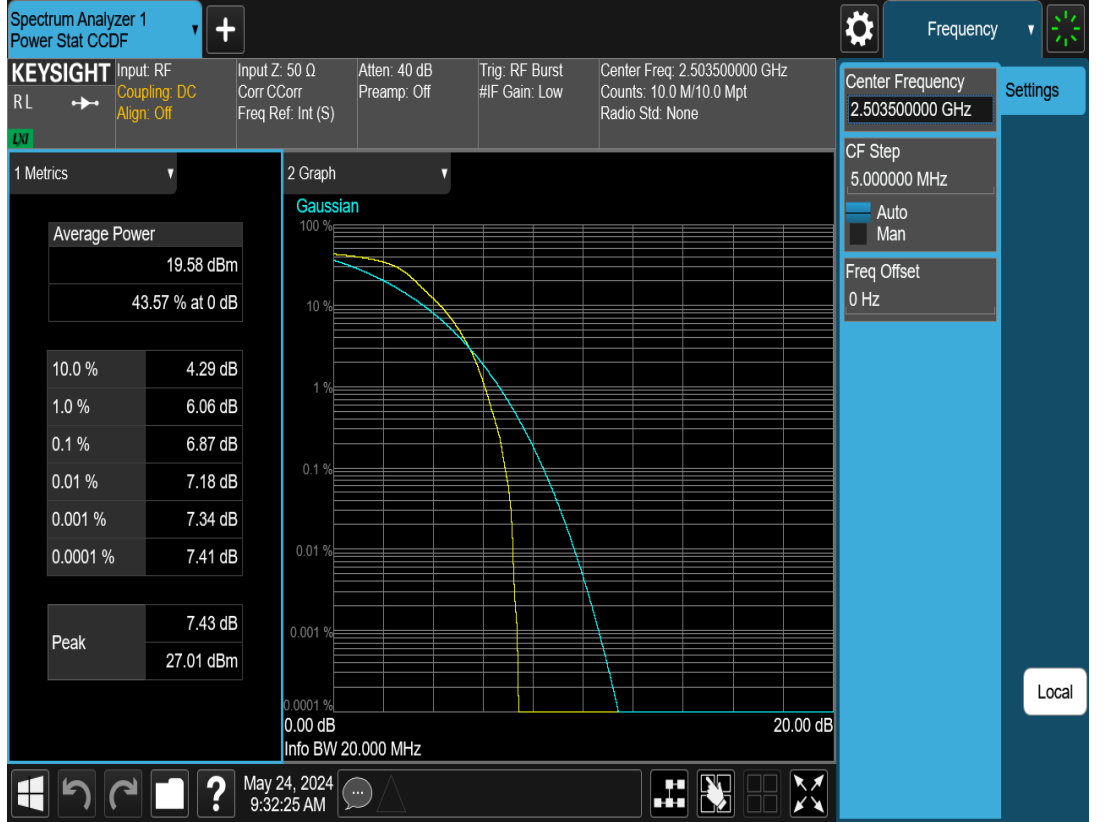
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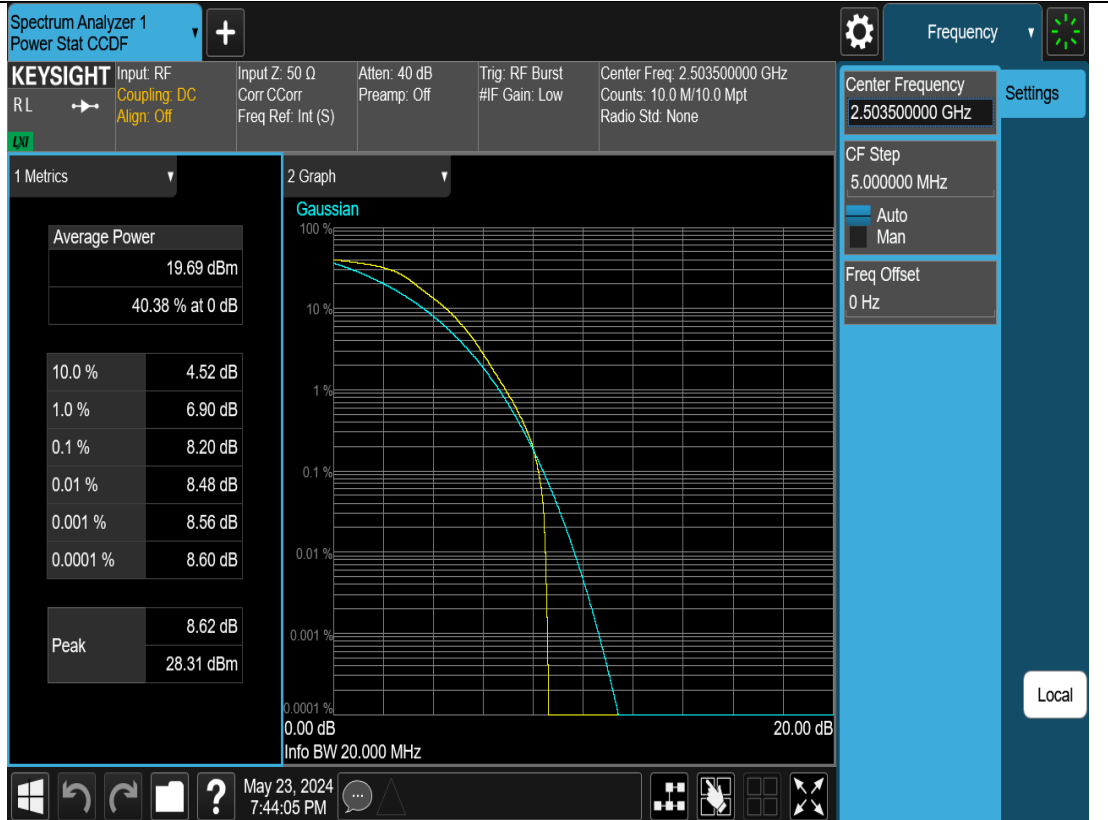
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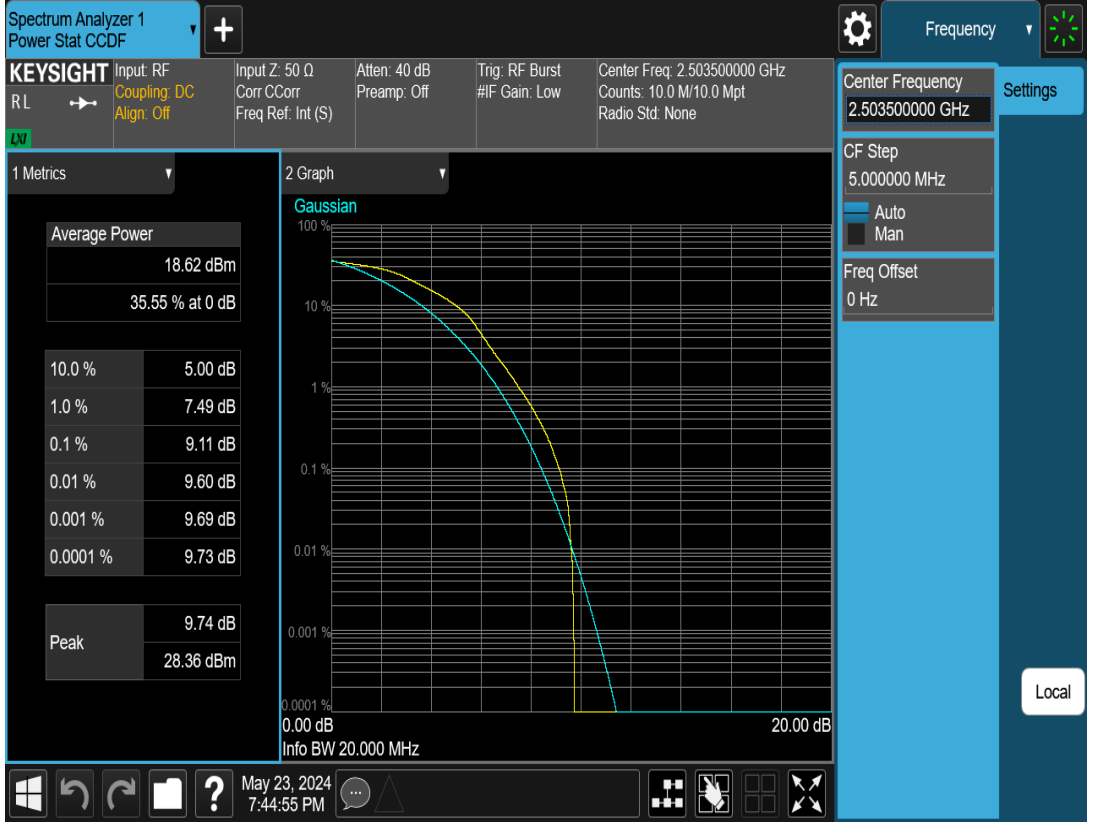
N41-15M-PAPR-L-DFT-s-OFDM-Pi2 BPSK-Outer\_Full



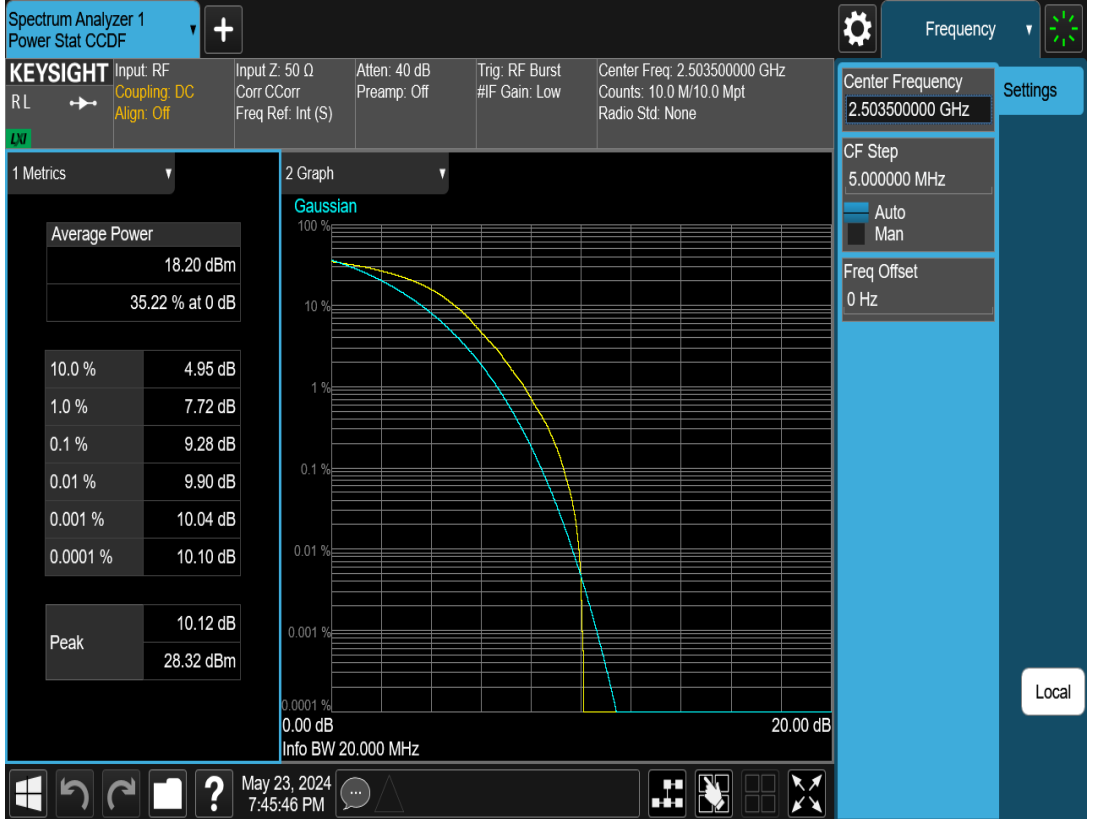
N41-15M-PAPR-L-DFT-s-OFDM-QPSK-Outer\_Full



N41-15M-PAPR-L-DFT-s-OFDM-16QAM-Outer\_Full



N41-15M-PAPR-L-DFT-s-OFDM-64QAM-Outer\_Full



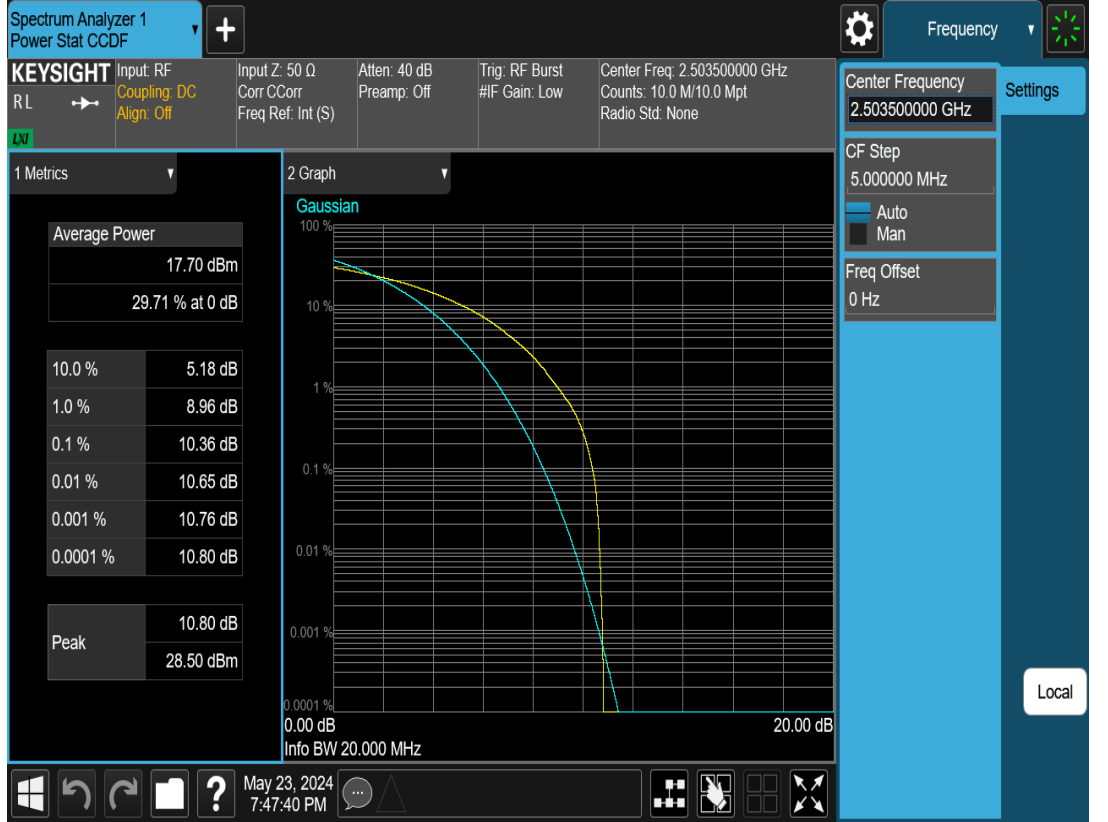
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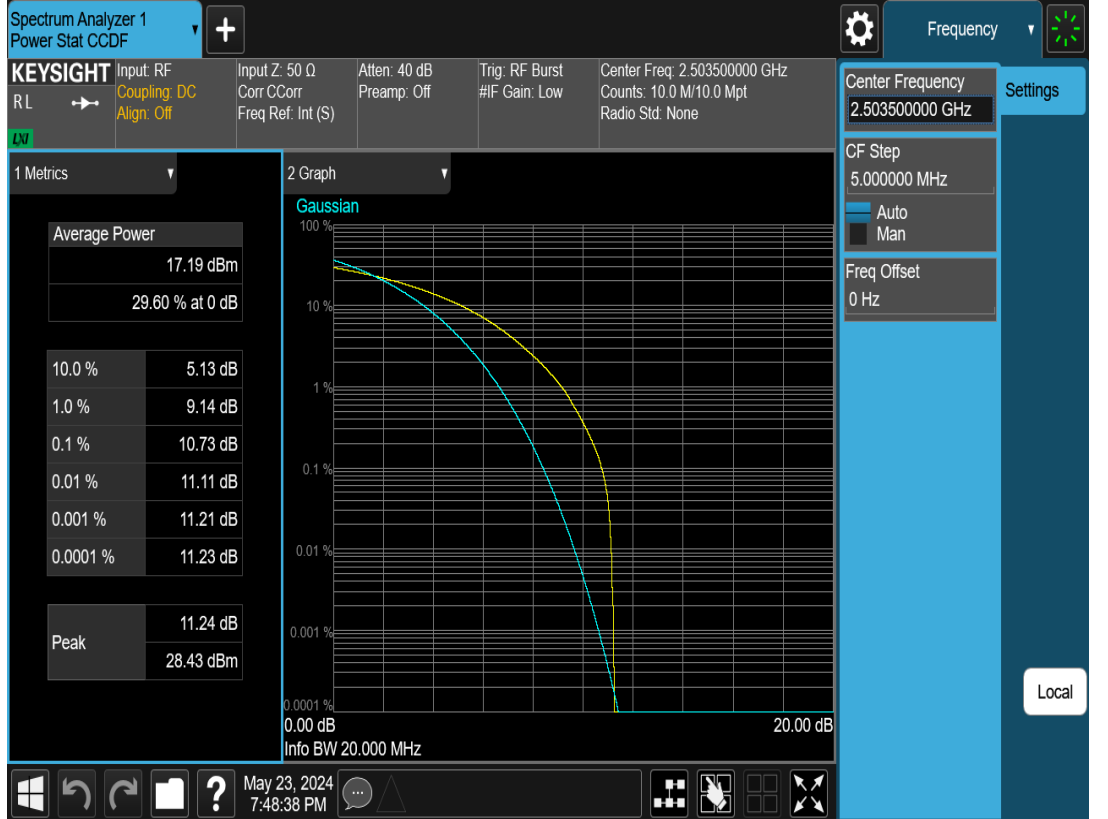
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N41-15M-PAPR-L-CP-OFDM-16QAM-Outer\_Full



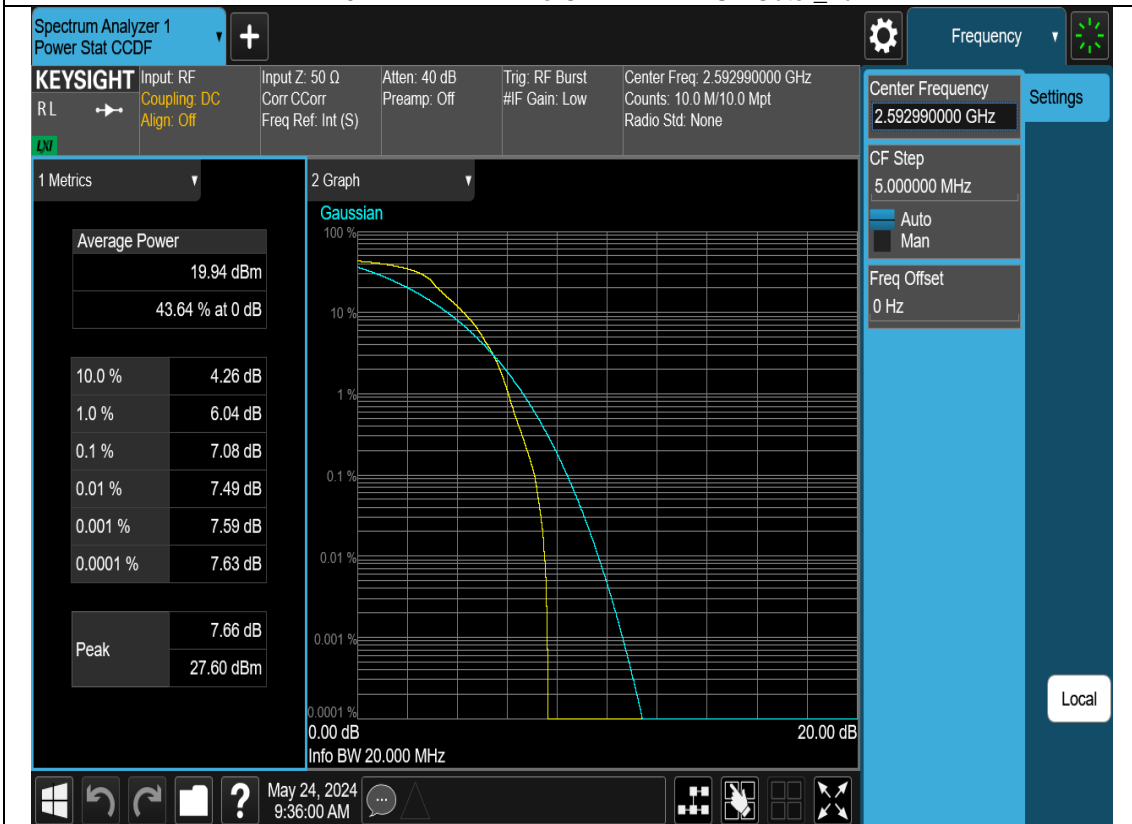
N41-15M-PAPR-L-CP-OFDM-64QAM-Outer\_Full



N41-15M-PAPR-L-CP-OFDM-256QAM-Outer\_Full



N41-15M-PAPR-M-DFT-s-OFDM-Pi2 BPSK-Outer\_Full



N41-15M-PAPR-M-DFT-s-OFDM-QPSK-Outer\_Full

Spectrum Analyzer 1  
Power Stat CCDF

KEYSIGHT Input RF  
RL Coupling: DC  
Align: Off

Input Z: 50 Ω  
Corr: CCorr  
Freq Ref: Int (S)

Atten: 40 dB  
Preamp: Off

Trig: RF Burst  
#IF Gain: Low

Center Freq: 2.592990000 GHz  
Counts: 10.0 M/10.0 Mpt  
Radio Std: None

Center Frequency: 2.592990000 GHz

CF Step: 5.000000 MHz

Freq Offset: 0 Hz

1 Metrics

Average Power

19.98 dBm

40.40 % at 0 dB

10.0 %	4.51 dB
1.0 %	6.94 dB
0.1 %	8.31 dB
0.01 %	8.90 dB
0.001 %	9.01 dB
0.0001 %	9.04 dB

Peak

9.04 dB

29.02 dBm

2 Graph

Gaussian

0.0001 %

0.001 %

0.01 %

0.1 %

1 %

10 %

100 %

0.00 dB

20.00 dB

Info BW 20.000 MHz

May 23, 2024  
7:50:34 PM

Local

N41-15M-PAPR-M-DFT-s-OFDM-16QAM-Outer\_Full

Spectrum Analyzer 1  
Power Stat CCDF

KEYSIGHT Input RF  
RL Coupling: DC  
Align: Off

Input Z: 50 Ω  
Corr: CCorr  
Freq Ref: Int (S)

Atten: 40 dB  
Preamp: Off

Trig: RF Burst  
#IF Gain: Low

Center Freq: 2.592990000 GHz  
Counts: 10.0 M/10.0 Mpt  
Radio Std: None

Center Frequency: 2.592990000 GHz

CF Step: 5.000000 MHz

Freq Offset: 0 Hz

1 Metrics

Average Power

18.91 dBm

35.63 % at 0 dB

10.0 %	4.99 dB
1.0 %	7.52 dB
0.1 %	9.12 dB
0.01 %	9.86 dB
0.001 %	10.11 dB
0.0001 %	10.13 dB

Peak

10.14 dB

29.05 dBm

2 Graph

Gaussian

0.0001 %

0.001 %

0.01 %

0.1 %

1 %

10 %

100 %

0.00 dB

20.00 dB

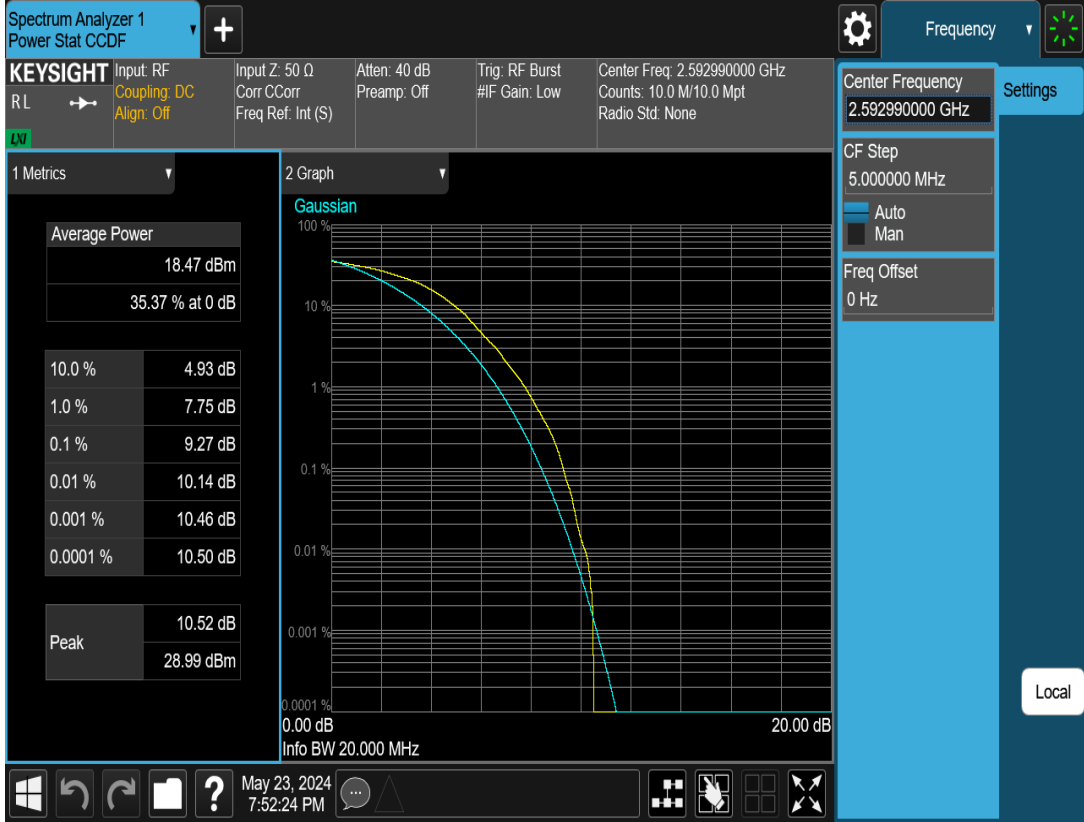
Info BW 20.000 MHz

May 23, 2024  
7:51:27 PM

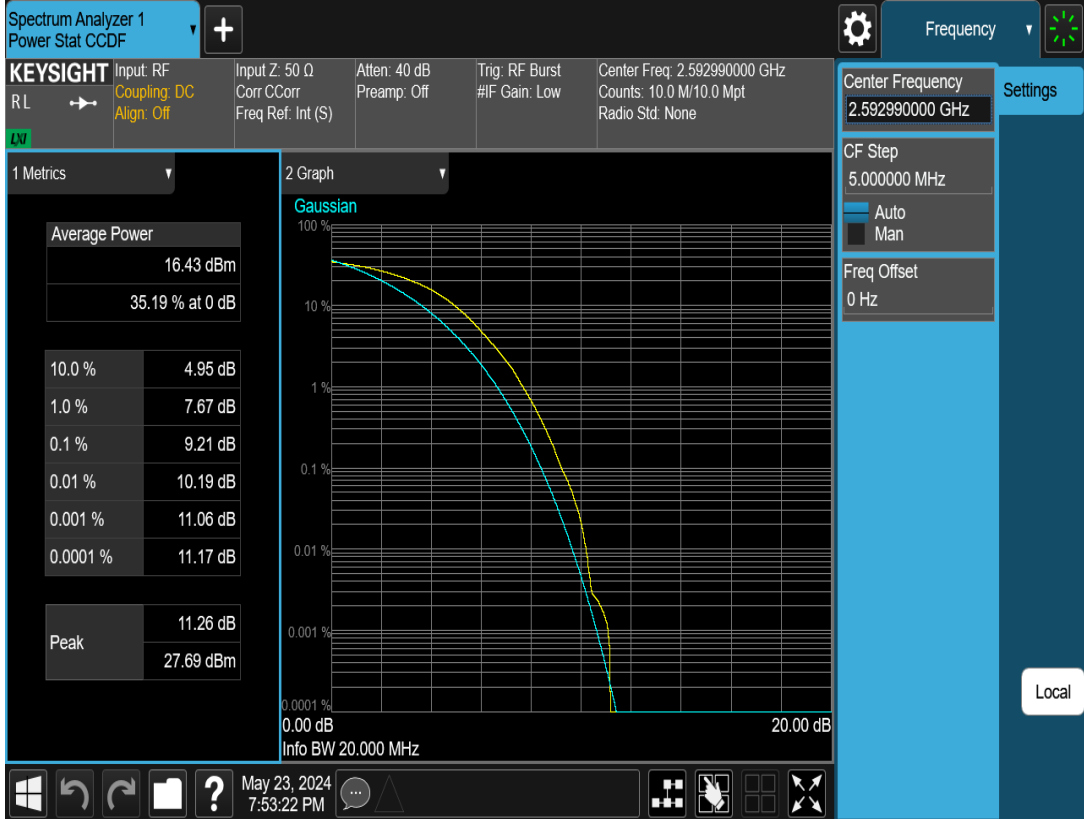
Local



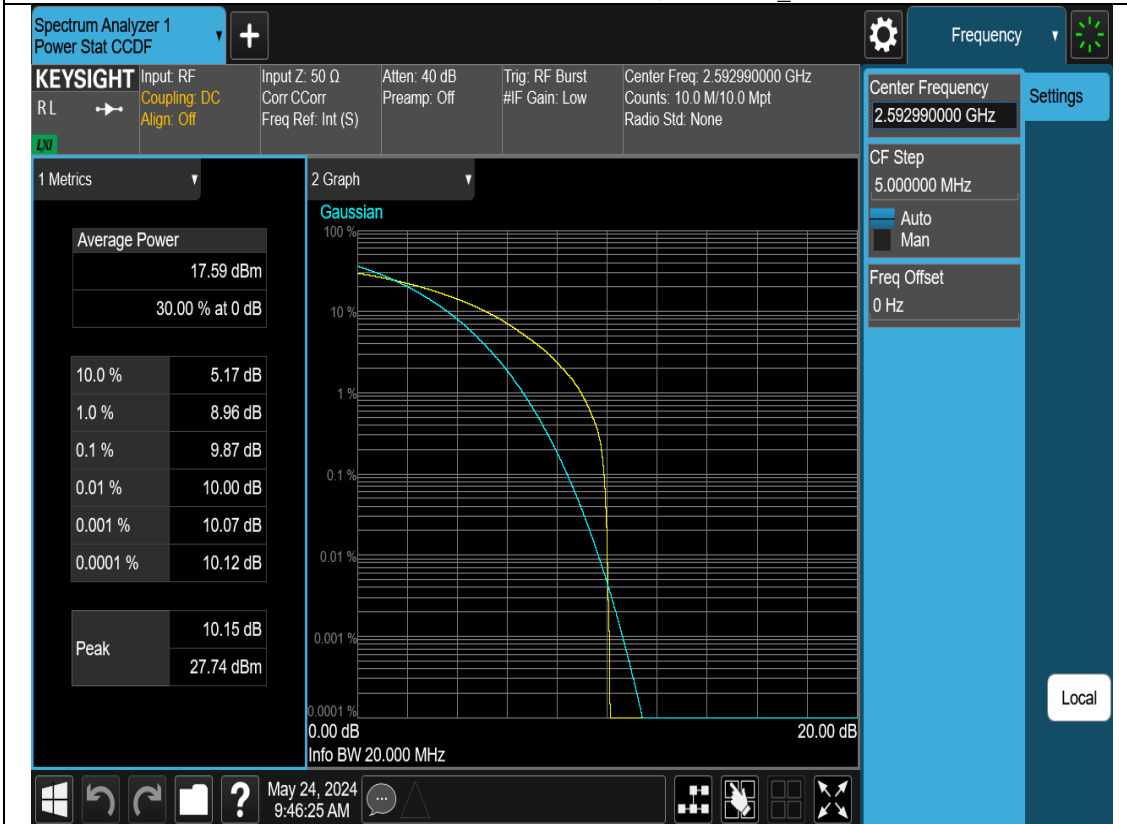
N41-15M-PAPR-M-DFT-s-OFDM-64QAM-Outer\_Full



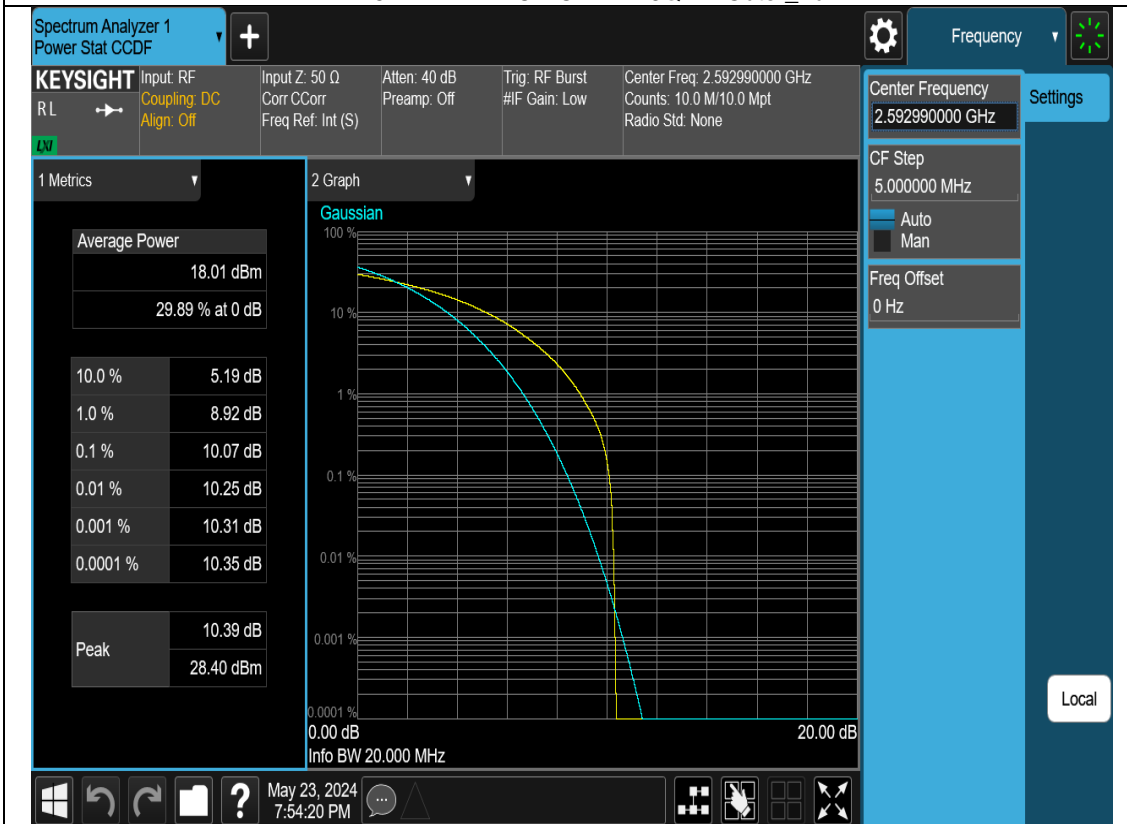
N41-15M-PAPR-M-DFT-s-OFDM-256QAM-Outer\_Full



N41-15M-PAPR-M-CP-OFDM-QPSK-Outer\_Full



N41-15M-PAPR-M-CP-OFDM-16QAM-Outer\_Full



N41-15M-PAPR-M-CP-OFDM-64QAM-Outer\_Full



N41-15M-PAPR-M-CP-OFDM-256QAM-Outer\_Full

