

99% & 26dB Bandwidth

Test Result

5G NR N48 SCS=30kHz 10MHz						
Modulation	CH	RB Allocation	99% Bandwidth (MHz)	26dB Bandwidth (MHz)	Limit (MHz)	Verdict
DFT-s-OFDM PI/2 BPSK	Low	Outer_Full	8.65	9.97	/	Pass
CP-OFDM QPSK		Outer_Full	8.65	10.23	/	Pass
DFT-s-OFDM PI/2 BPSK	Middle	Outer_Full	8.66	10.22	/	Pass
CP-OFDM QPSK		Outer_Full	8.65	10.01	/	Pass
DFT-s-OFDM PI/2 BPSK	High	Outer_Full	8.64	10.05	/	Pass
CP-OFDM QPSK		Outer_Full	8.68	10.17	/	Pass

5G NR N48 SCS=30kHz 15MHz						
Modulation	CH	RB Allocation	99% Bandwidth (MHz)	26dB Bandwidth (MHz)	Limit (MHz)	Verdict
DFT-s-OFDM PI/2 BPSK	Low	Outer_Full	13.74	15.69	/	Pass
CP-OFDM QPSK		Outer_Full	12.98	14.7	/	Pass
DFT-s-OFDM PI/2 BPSK	Middle	Outer_Full	13.71	15.34	/	Pass
CP-OFDM QPSK		Outer_Full	12.99	14.5	/	Pass
DFT-s-OFDM PI/2 BPSK	High	Outer_Full	13.72	15.44	/	Pass
CP-OFDM QPSK		Outer_Full	8.63	10.1	/	Pass

5G NR N48 SCS=30kHz 20MHz						
Modulation	CH	RB Allocation	99% Bandwidth (MHz)	26dB Bandwidth (MHz)	Limit (MHz)	Verdict
DFT-s-OFDM PI/2 BPSK	Low	Outer_Full	18.33	20.32	/	Pass
CP-OFDM QPSK		Outer_Full	17.95	19.66	/	Pass
DFT-s-OFDM PI/2 BPSK	Middle	Outer_Full	17.91	19.57	/	Pass
CP-OFDM QPSK		Outer_Full	18.3	20.07	/	Pass
DFT-s-OFDM PI/2 BPSK	High	Outer_Full	18.3	20.21	/	Pass
CP-OFDM QPSK		Outer_Full	12.98	14.55	/	Pass

Test Graph



N48-10M-OBW-L-CP-OFDM-QPSK



N48-10M-OBW-M-CP-OFDM-QPSK



N48-10M-OBW-L-DFT-s-OFDM-Pi2 BPSK



N48-10M-OBW-H-DFT-s-OFDM-Pi2 BPSK



N48-10M-OBW-H-CP-OFDM-QPSK



N48-15M-OBW-L-CP-OFDM-QPSK



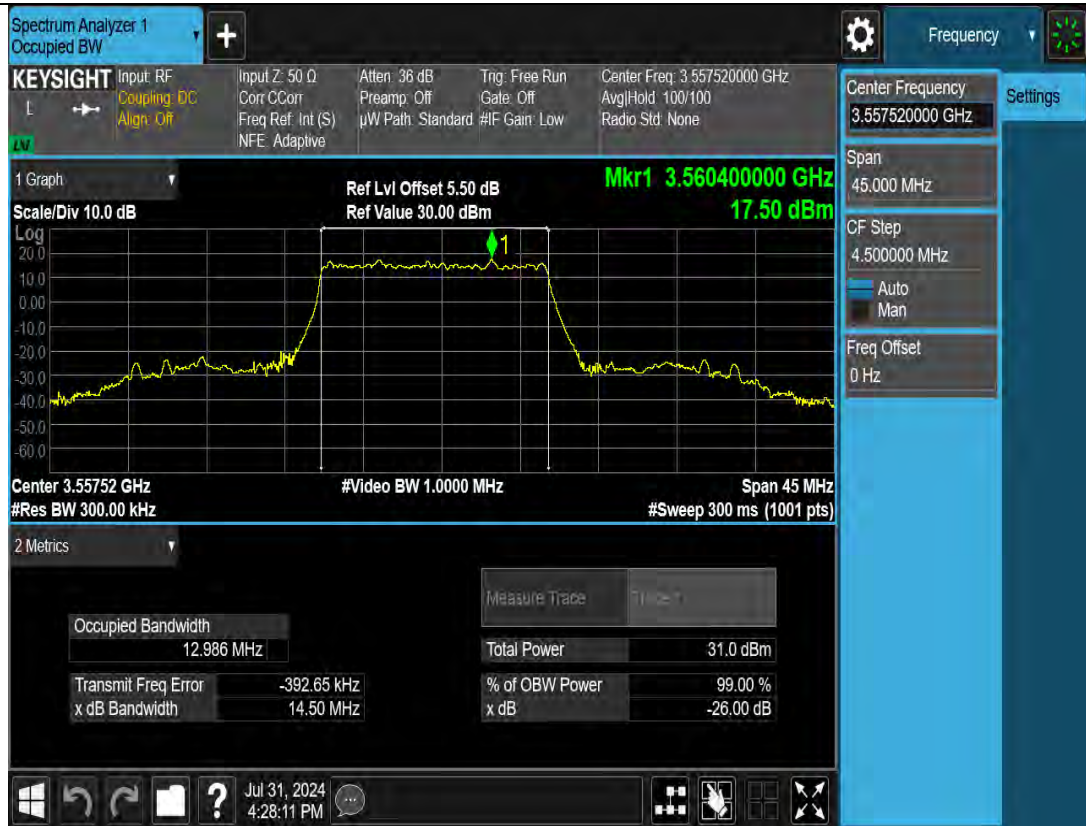
N48-15M-OBW-H-DFT-s-OFDM-Pi2 BPSK



N48-15M-OBW-M-CP-OFDM-QPSK



N48-15M-OBW-L-DFT-s-OFDM-Pi2 BPSK



N48-15M-OBW-H-CP-OFDM-QPSK



N48-10M-OBW-M-DFT-s-OFDM-Pi2 BPSK



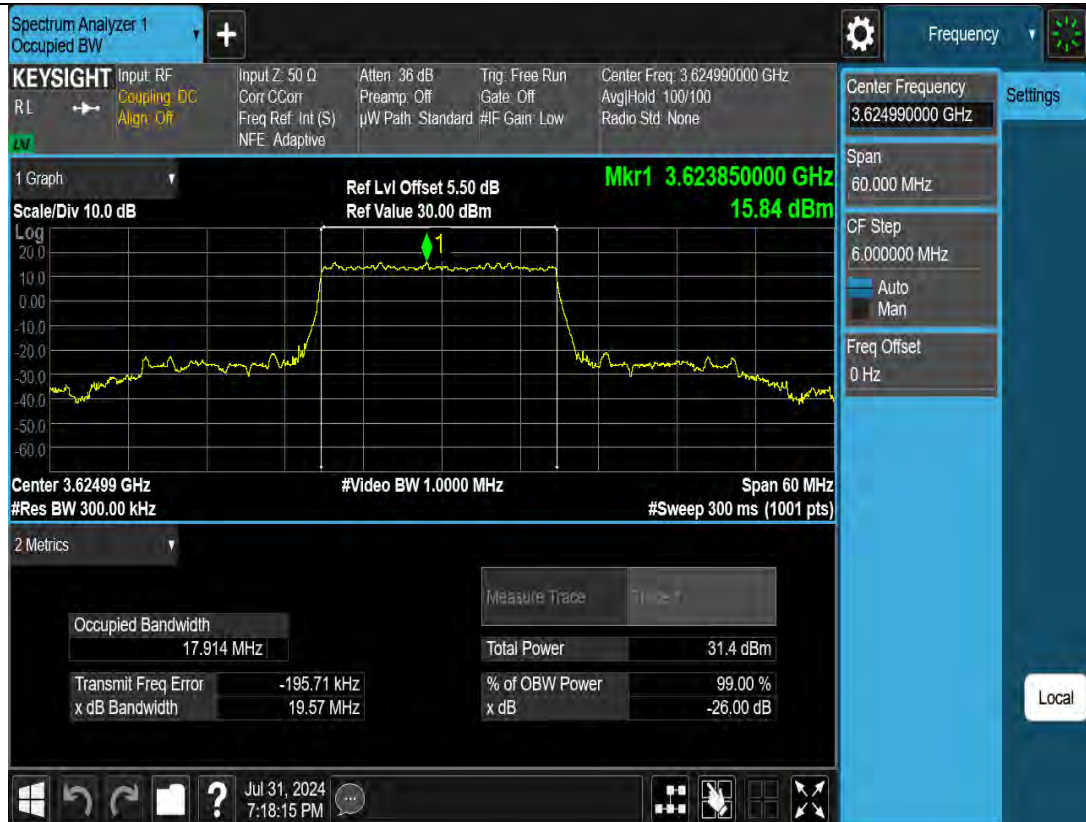
N48-20M-OBW-L-CP-OFDM-QPSK



N48-20M-OBW-H-DFT-s-OFDM-Pi2 BPSK



N48-20M-OBW-M-DFT-s-OFDM-Pi2 BPSK



N48-20M-OBW-M-CP-OFDM-QPSK



N48-20M-OBW-H-CP-OFDM-QPSK



N48-15M-OBW-M-DFT-s-OFDM-Pi2 BPSK



Peak-Average Ratio

Test Result

5G NR N48 SCS=30kHz 10MHz					
Modulation	CH	RB Allocation	Peak-Average Ratio (dB)	Limit	Verdict
DFT-s-OFDM PI/2 BPSK	Low	Outer_Full	4.66	<=13	Pass
CP-OFDM QPSK		Outer_Full	7.05	<=13	Pass
DFT-s-OFDM PI/2 BPSK	Middle	Outer_Full	7.07	<=13	Pass
CP-OFDM QPSK		Outer_Full	4.72	<=13	Pass
DFT-s-OFDM PI/2 BPSK	High	Outer_Full	4.62	<=13	Pass
CP-OFDM QPSK		Outer_Full	7.06	<=13	Pass

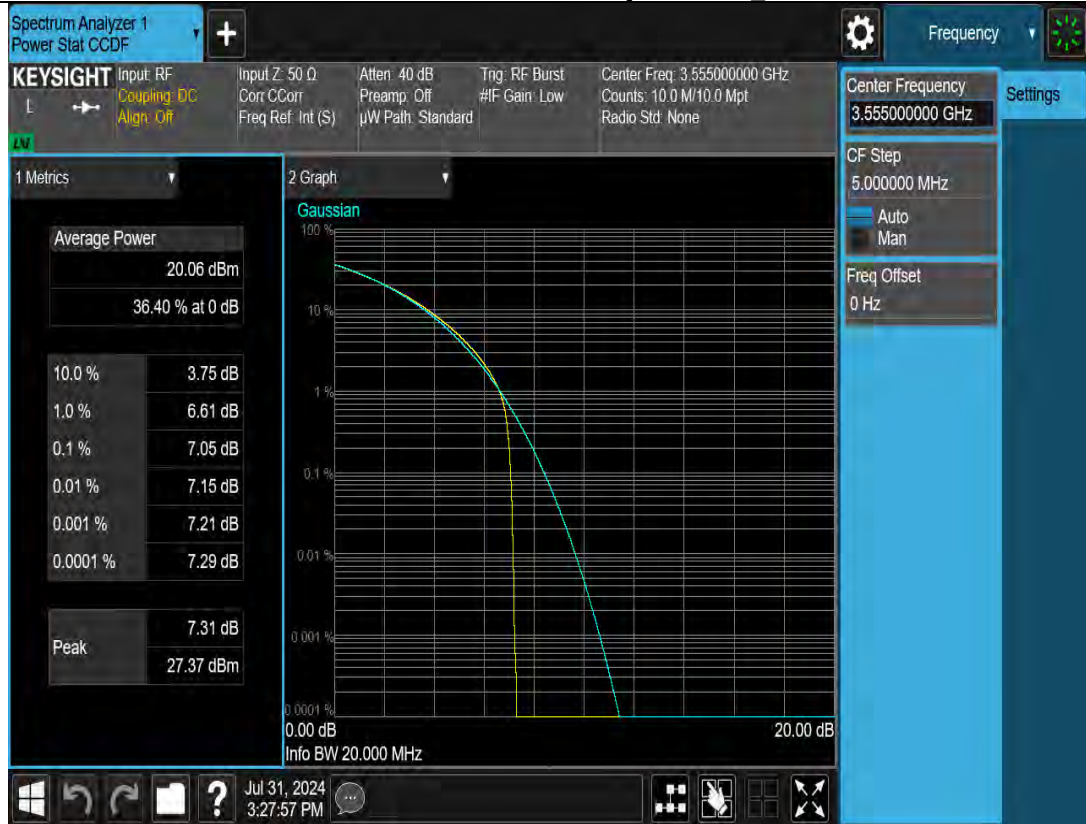
5G NR N48 SCS=30kHz 15MHz					
Modulation	CH	RB Allocation	Peak-Average Ratio (dB)	Limit	Verdict
DFT-s-OFDM PI/2 BPSK	Low	Outer_Full	7.39	<=13	Pass
CP-OFDM QPSK		Outer_Full	4.52	<=13	Pass
DFT-s-OFDM PI/2 BPSK	Middle	Outer_Full	7.49	<=13	Pass
CP-OFDM QPSK		Outer_Full	4.52	<=13	Pass
DFT-s-OFDM PI/2 BPSK	High	Outer_Full	7.49	<=13	Pass
CP-OFDM QPSK		Outer_Full	4.69	<=13	Pass

5G NR N48 SCS=30kHz 20MHz					
Modulation	CH	RB Allocation	Peak-Average Ratio (dB)	Limit	Verdict
DFT-s-OFDM PI/2 BPSK	Low	Outer_Full	6.96	<=13	Pass
CP-OFDM QPSK		Outer_Full	4.49	<=13	Pass
DFT-s-OFDM PI/2 BPSK	Middle	Outer_Full	4.5	<=13	Pass
CP-OFDM QPSK		Outer_Full	6.95	<=13	Pass
DFT-s-OFDM PI/2 BPSK	High	Outer_Full	7.33	<=13	Pass
CP-OFDM QPSK		Outer_Full	4.53	<=13	Pass

Test Graph

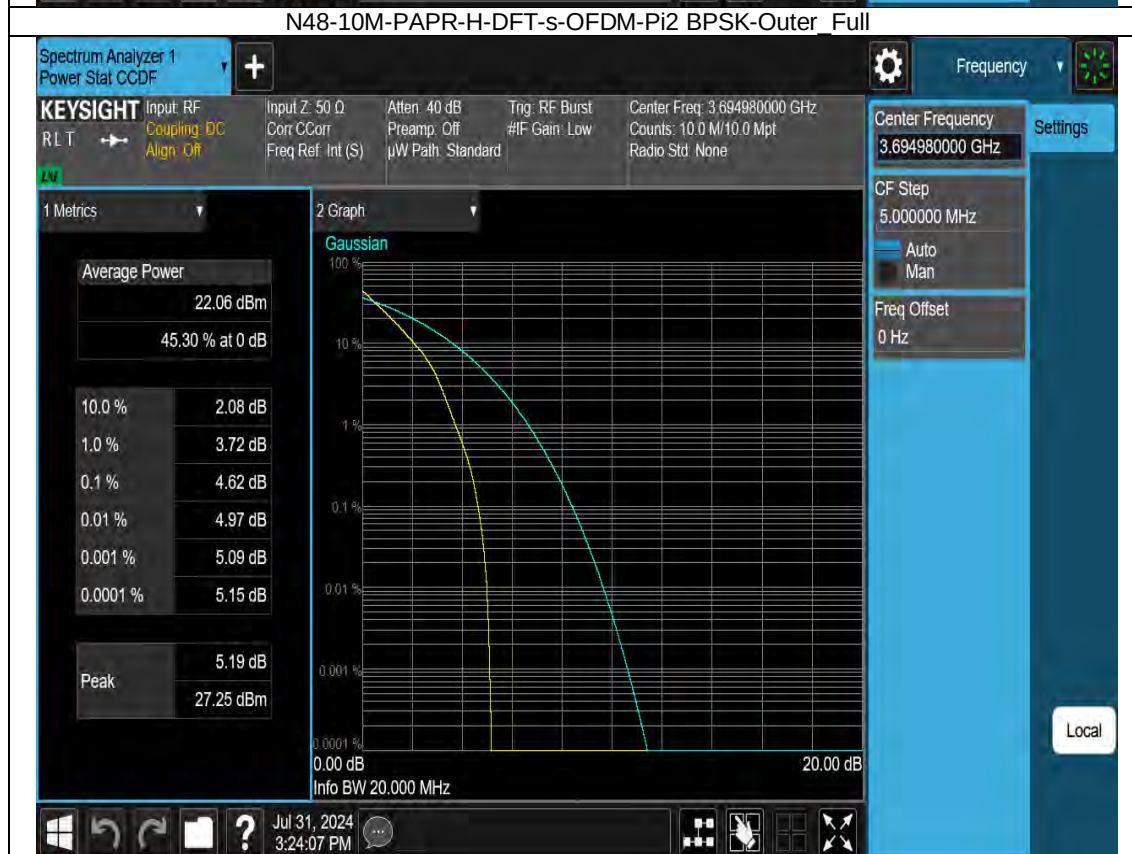
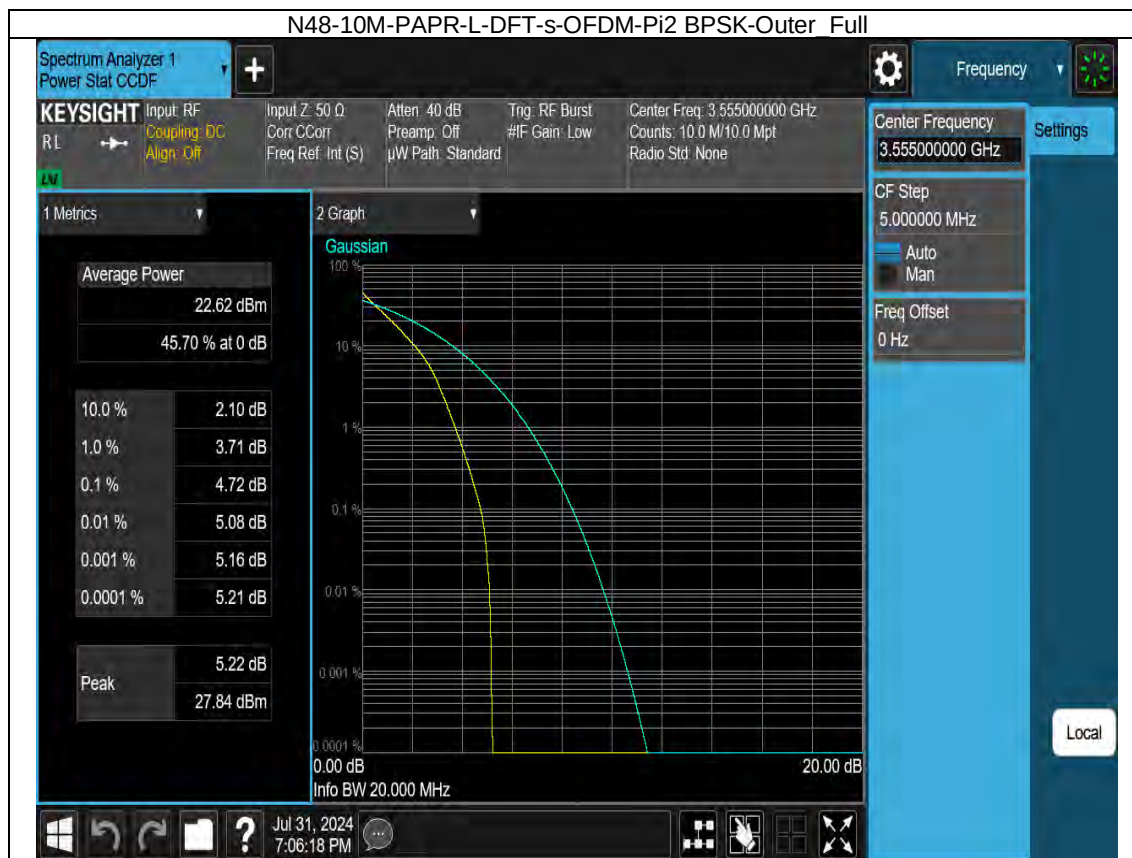


N48-10M-PAPR-L-CP-OFDM-QPSK-Outer Full

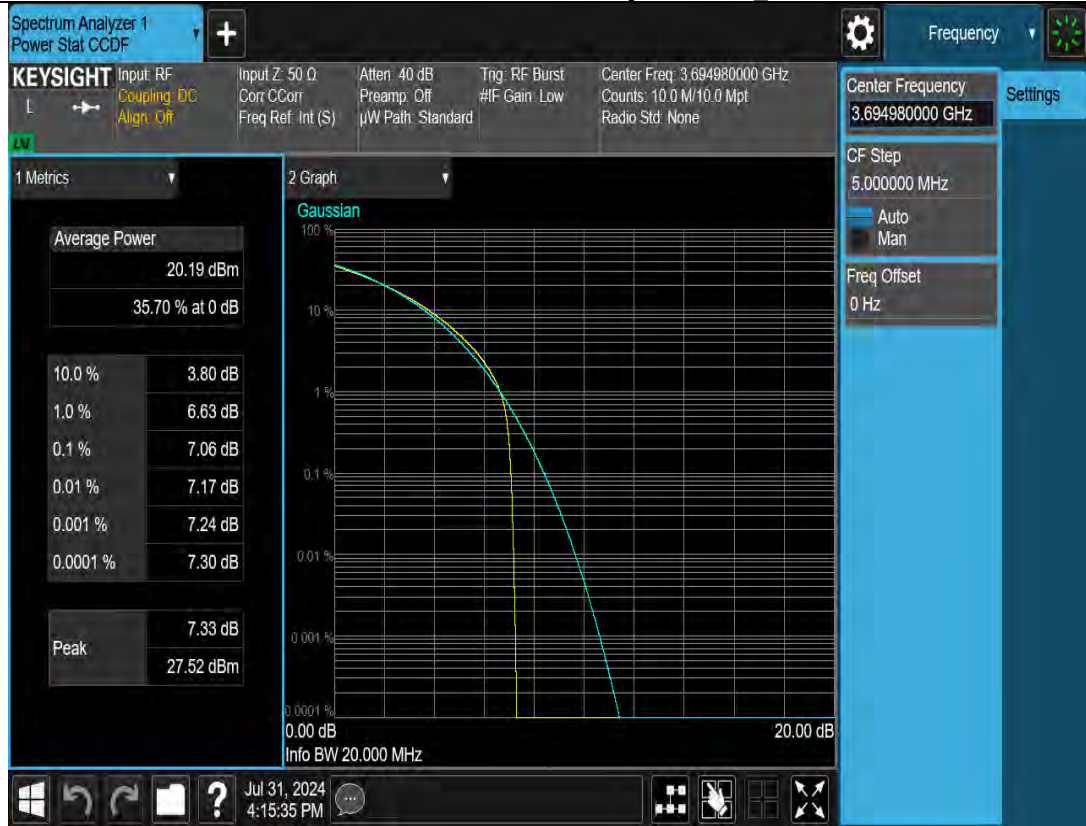


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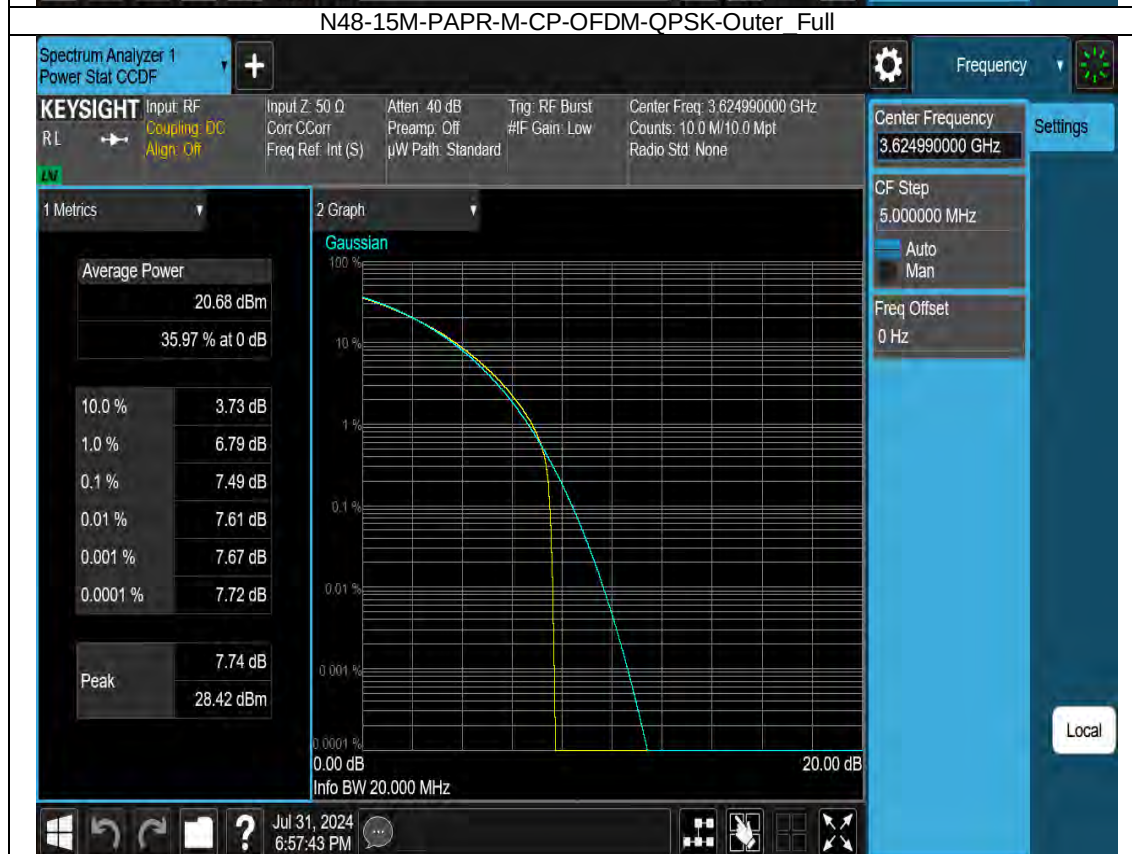
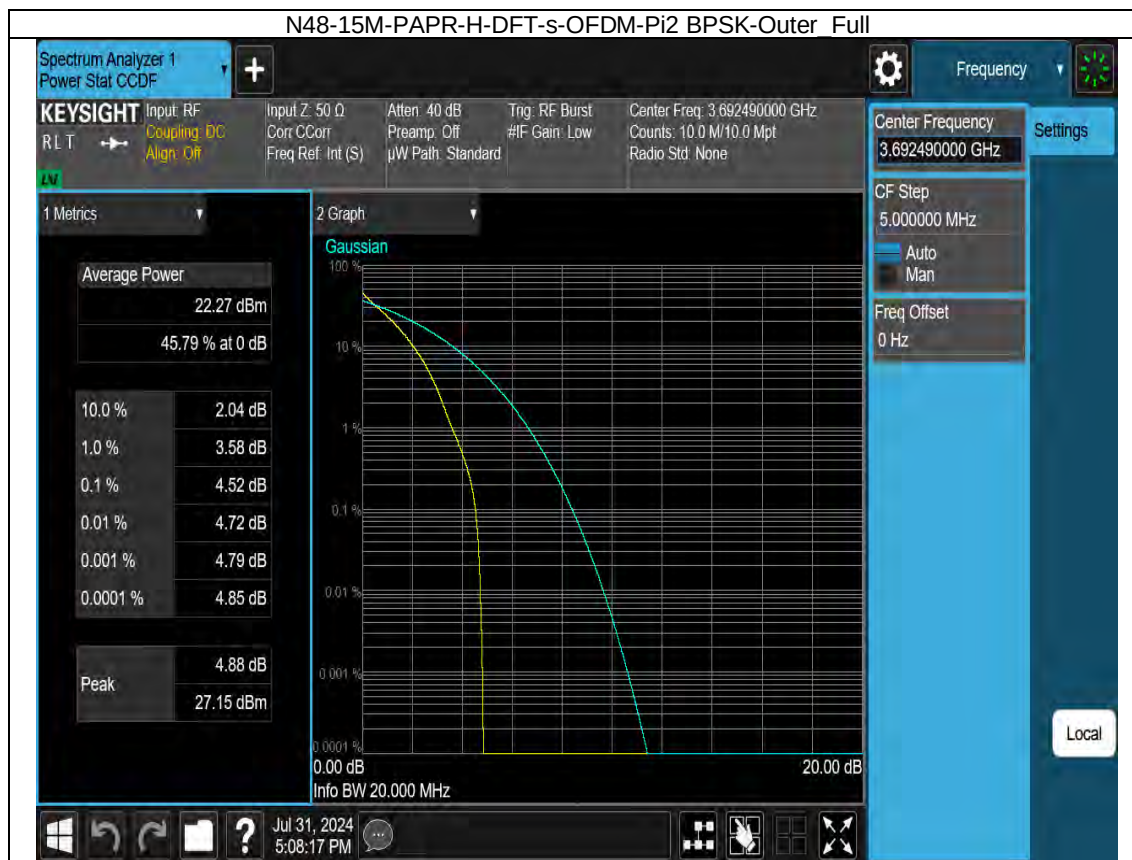


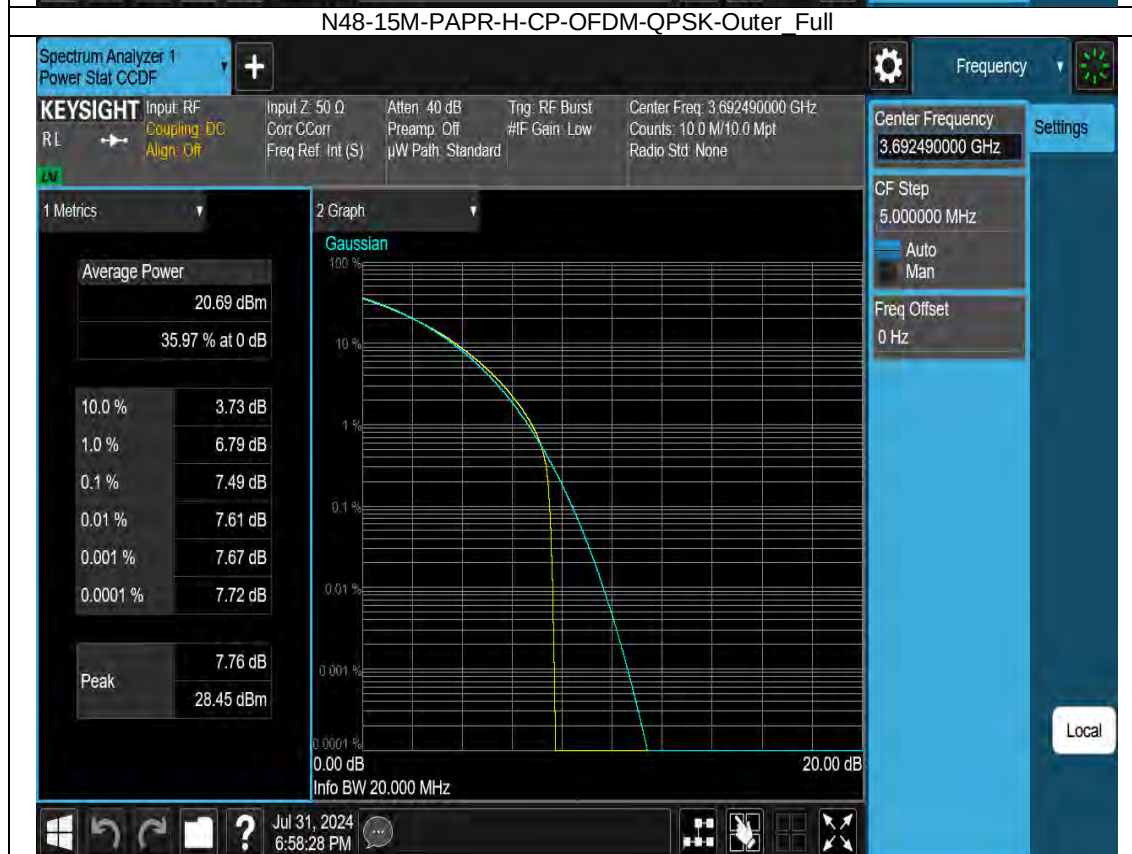
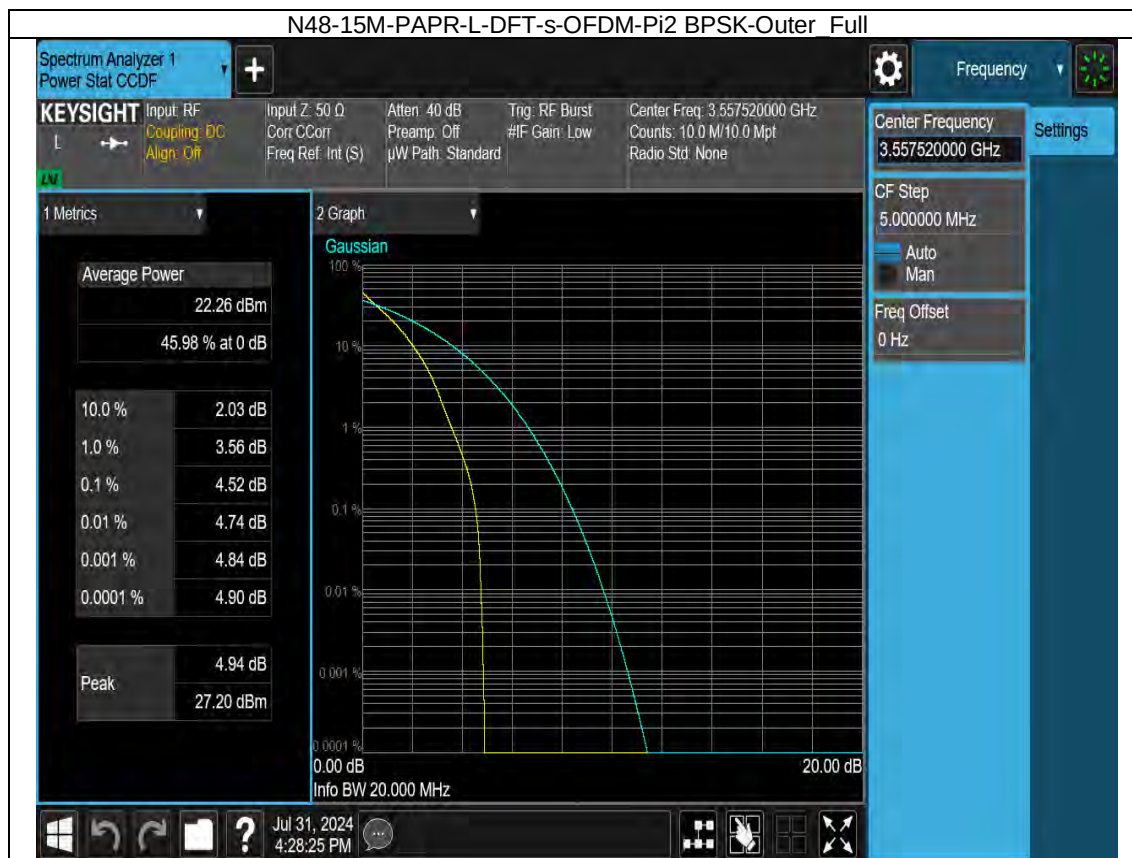
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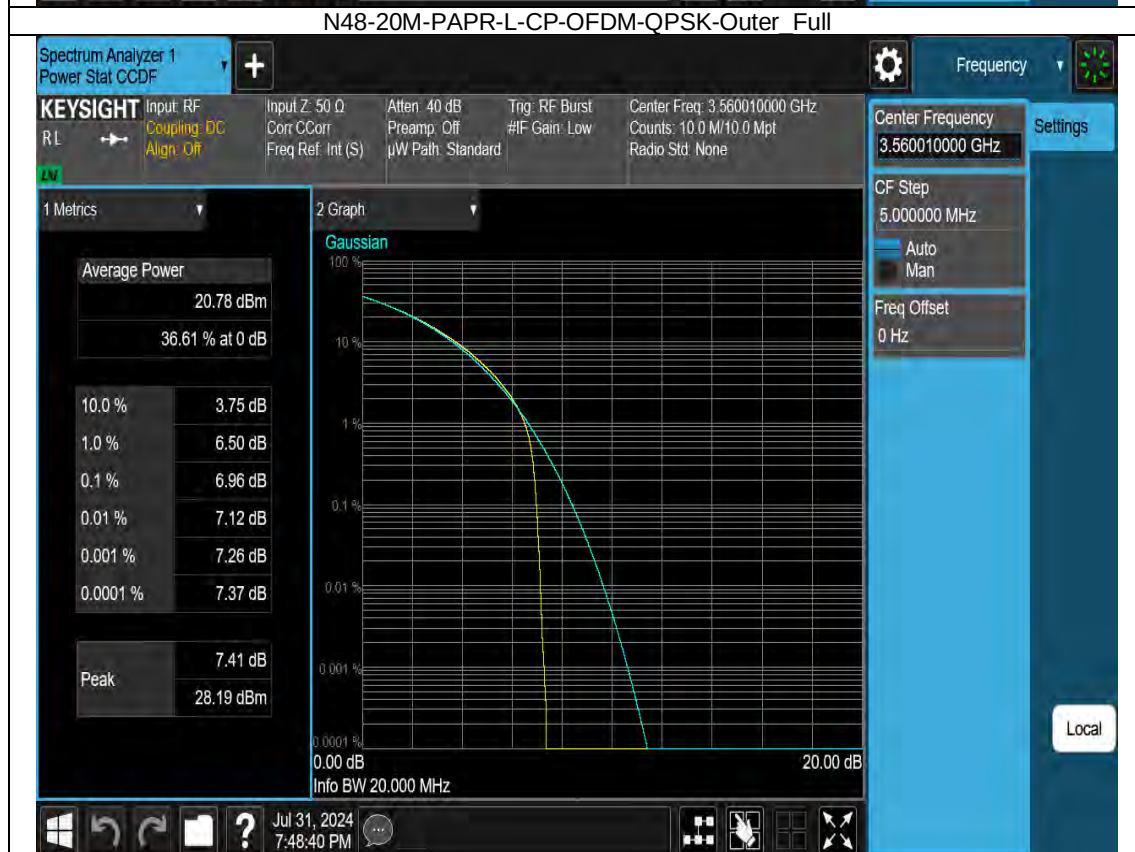


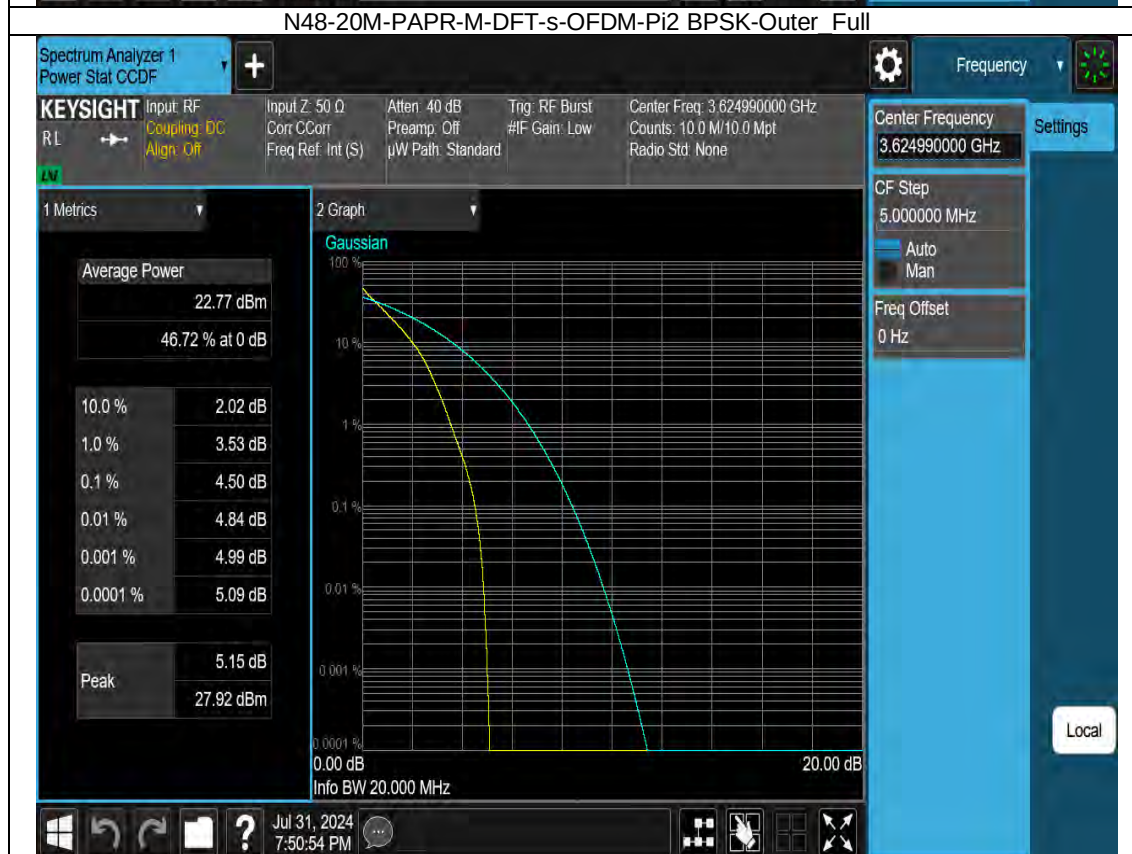
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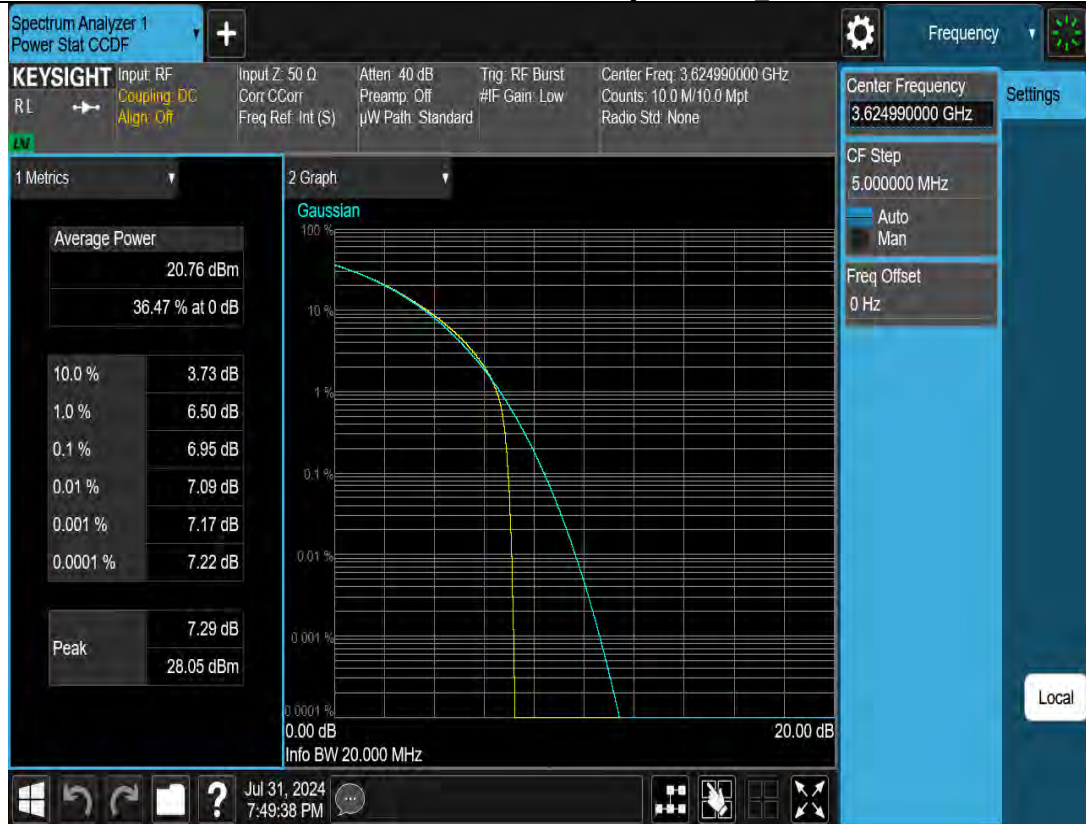








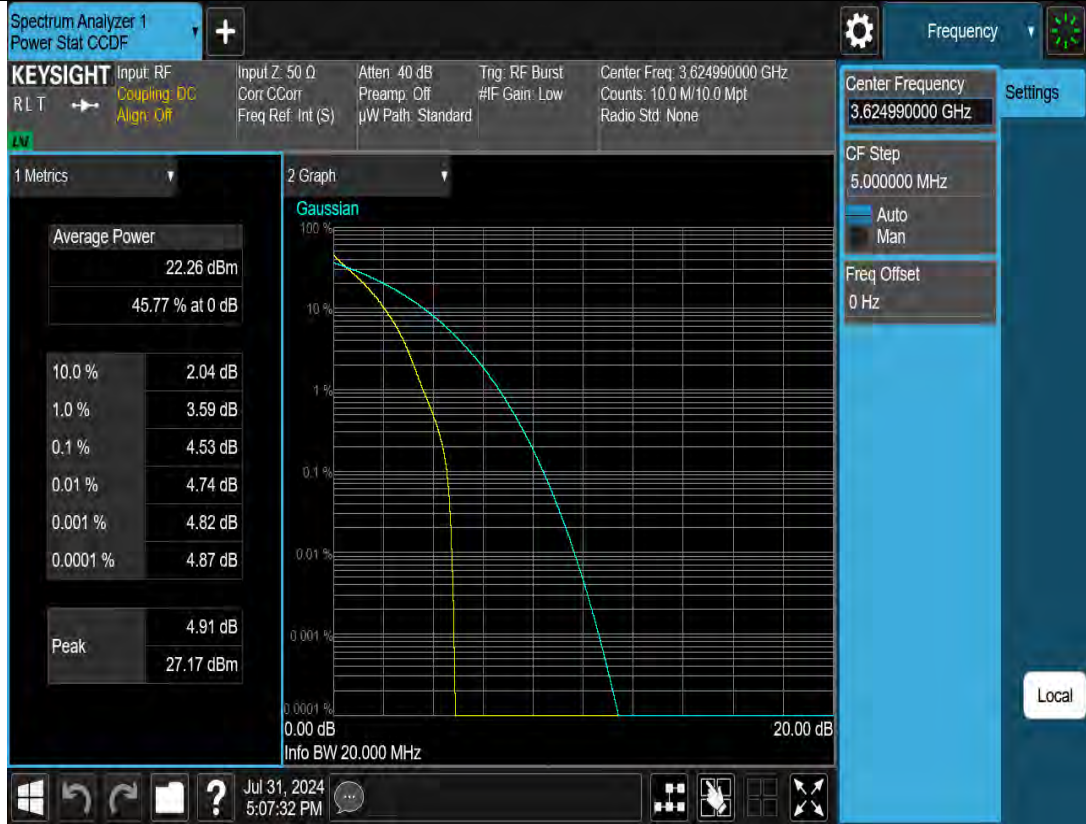
N48-20M-PAPR-M-CP-OFDM-QPSK-Outer Full



N48-20M-PAPR-H-CP-OFDM-QPSK-Outer Full



N48-15M-PAPR-M-DFT-s-OFDM-Pi2 BPSK-Outer Full



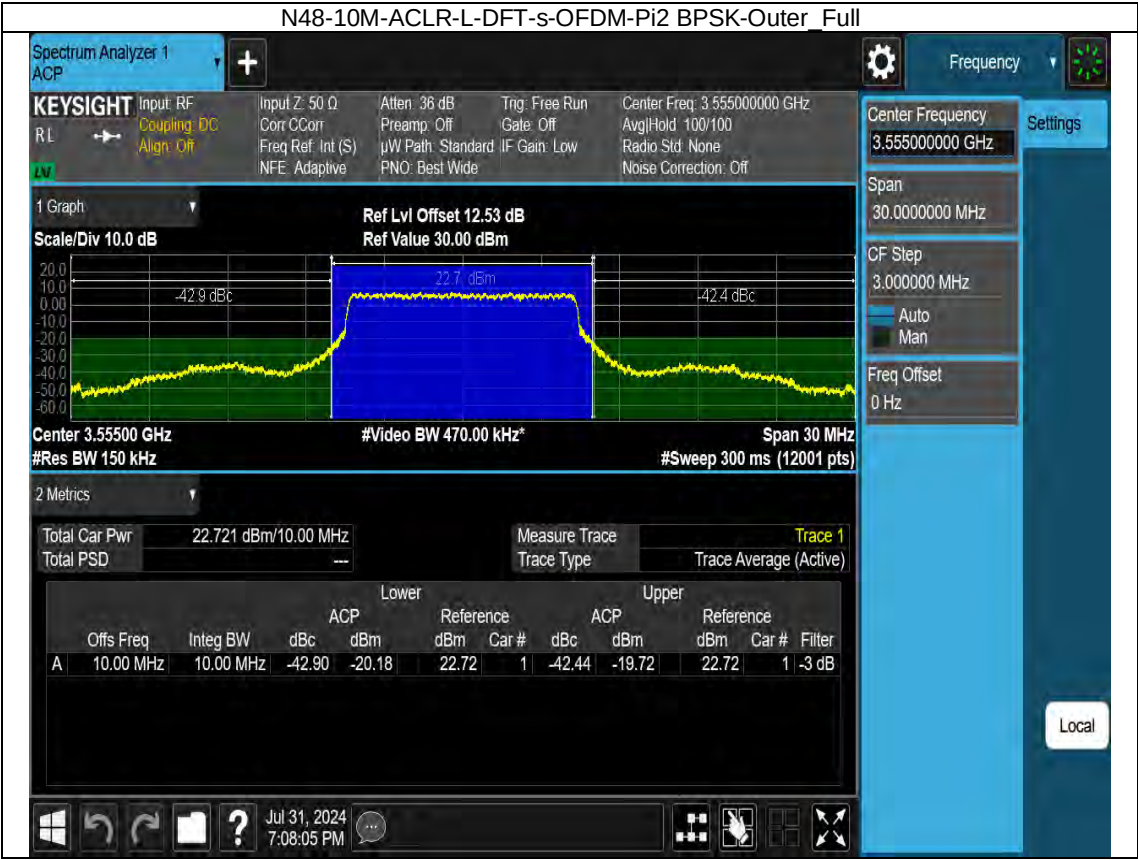
Adjacent Channel Power

5G NR N48 SCS=30kHz 10MHz						
Modulation	CH	RB Allocation	Channel Spacing (MHz)		Limit (dBc)	Verdict
			-10	+10		
DFT-s-OFDM PI/2 BPSK	Low	Outer_Full	42.9	42.44	≥30	Pass
		1RB0	41.34	62.38	≥30	Pass
		1RB_Max	64.95	41.24	≥30	Pass
	Middle	Outer_Full	40.44	40.84	≥30	Pass
		1RB0	40.7	63.38	≥30	Pass
		1RB_Max	63.67	41.38	≥30	Pass
	Middle	Outer_Full	42.71	42.27	≥30	Pass
		1RB0	41.89	59.71	≥30	Pass
		1RB_Max	59.84	42.58	≥30	Pass
CP-OFDM QPSK	Low	Outer_Full	40.08	40.93	≥30	Pass
		1RB0	39.6	57.88	≥30	Pass
		1RB_Max	57.96	41.01	≥30	Pass
	Middle	Outer_Full	43.44	43.16	≥30	Pass
		1RB0	41.29	57.93	≥30	Pass
		1RB_Max	58.24	41.5	≥30	Pass
	Middle	Outer_Full	40.73	41.19	≥30	Pass
		1RB0	40.34	56.05	≥30	Pass
		1RB_Max	56.19	41.64	≥30	Pass

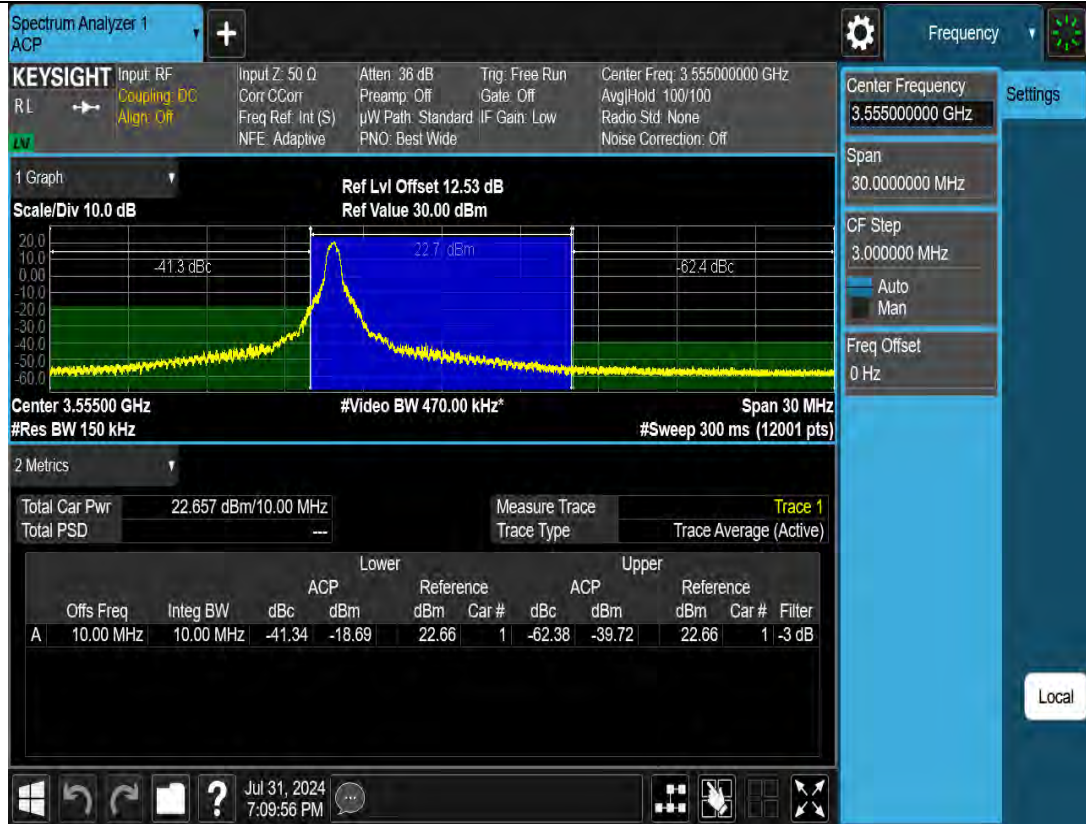
5G NR N48 SCS=30kHz 15MHz						
Modulation	CH	RB Allocation	Channel Spacing (MHz)		Limit (dBc)	Verdict
			-15	+15		
DFT-s-OFDM PI/2 BPSK	Low	Outer_Full	42.98	45.25	≥30	Pass
		1RB0	38.07	64.33	≥30	Pass
		1RB_Max	64.56	38.01	≥30	Pass
	Middle	Outer_Full	40.57	40.93	≥30	Pass
		1RB0	36.35	62.63	≥30	Pass
		1RB_Max	61.24	38.68	≥30	Pass
	Middle	Outer_Full	42.52	44.91	≥30	Pass
		1RB0	37.96	59.01	≥30	Pass
		1RB_Max	59.29	39.16	≥30	Pass
CP-OFDM QPSK	Low	Outer_Full	40.18	40.36	≥30	Pass
		1RB0	37.1	56.16	≥30	Pass
		1RB_Max	56.41	38.03	≥30	Pass
	Middle	Outer_Full	43.35	45.83	≥30	Pass
		1RB0	37.83	56.97	≥30	Pass
		1RB_Max	57.76	38.96	≥30	Pass
	Middle	Outer_Full	40.23	40.35	≥30	Pass
		1RB0	36.39	54.25	≥30	Pass
		1RB_Max	54.6	37.91	≥30	Pass

5G NR N48 SCS=30kHz 20MHz						
Modulation	CH	RB Allocation	Channel Spacing (MHz)		Limit (dBc)	Verdict
			-20	+20		
DFT-s-OFDM PI/2 BPSK	Low	Outer_Full	43.17	44.2	≥ 30	Pass
		1RB0	41.1	61.49	≥ 30	Pass
		1RB_Max	62.51	41.74	≥ 30	Pass
	Middle	Outer_Full	39.78	40.01	≥ 30	Pass
		1RB0	41.78	59.26	≥ 30	Pass
		1RB_Max	59.8	42.29	≥ 30	Pass
	Middle	Outer_Full	42.92	43.49	≥ 30	Pass
		1RB0	42.82	56.28	≥ 30	Pass
		1RB_Max	56.71	42.35	≥ 30	Pass
CP-OFDM QPSK	Low	Outer_Full	39.93	40.2	≥ 30	Pass
		1RB0	40.81	54.41	≥ 30	Pass
		1RB_Max	54.76	40.93	≥ 30	Pass
	Middle	Outer_Full	43.37	44.26	≥ 30	Pass
		1RB0	42.27	54.57	≥ 30	Pass
		1RB_Max	55.76	42.41	≥ 30	Pass
	Middle	Outer_Full	40.12	40.58	≥ 30	Pass
		1RB0	40.78	53.21	≥ 30	Pass
		1RB_Max	53.93	41.4	≥ 30	Pass

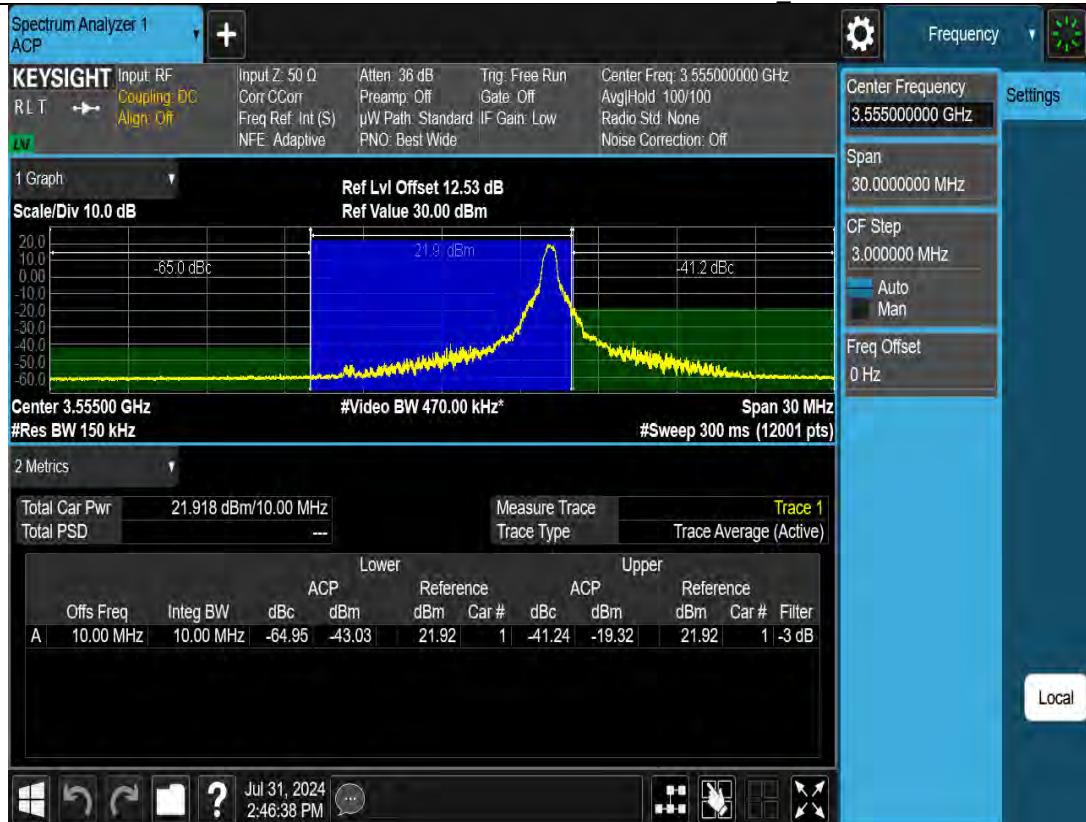
Test graph



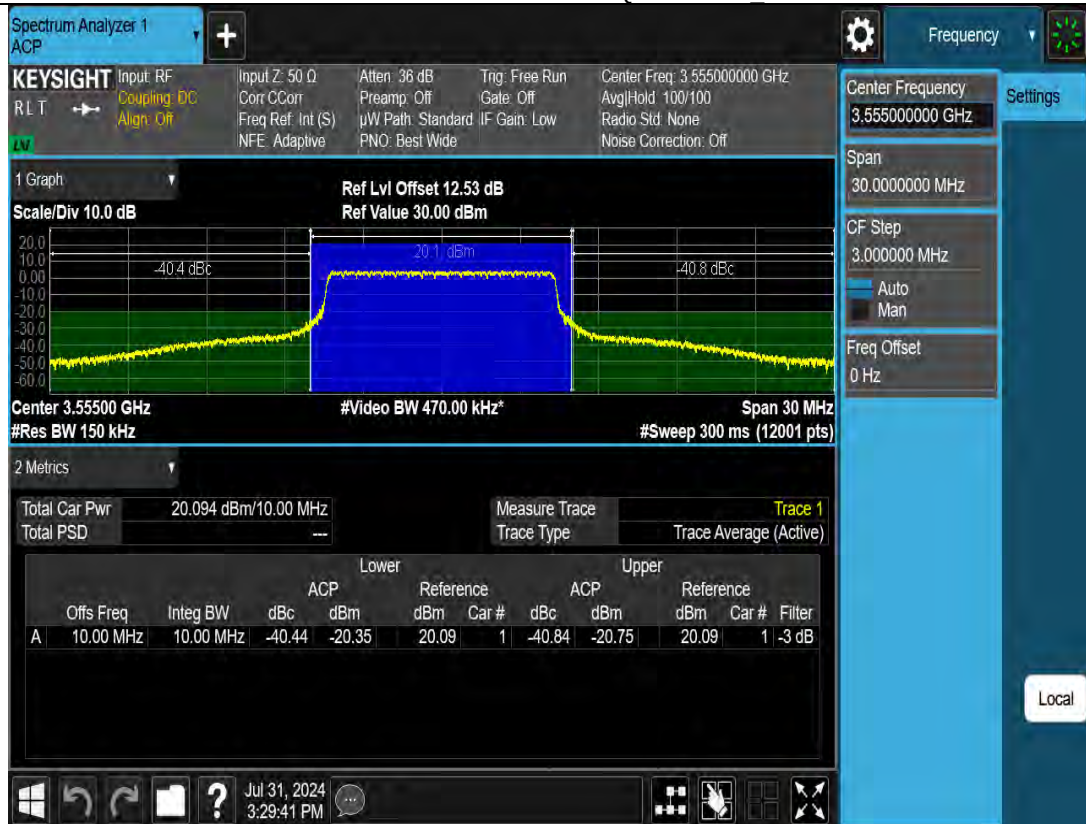
N48-10M-ACLR-L-DFT-s-OFDM-Pi2 BPSK-1RB0



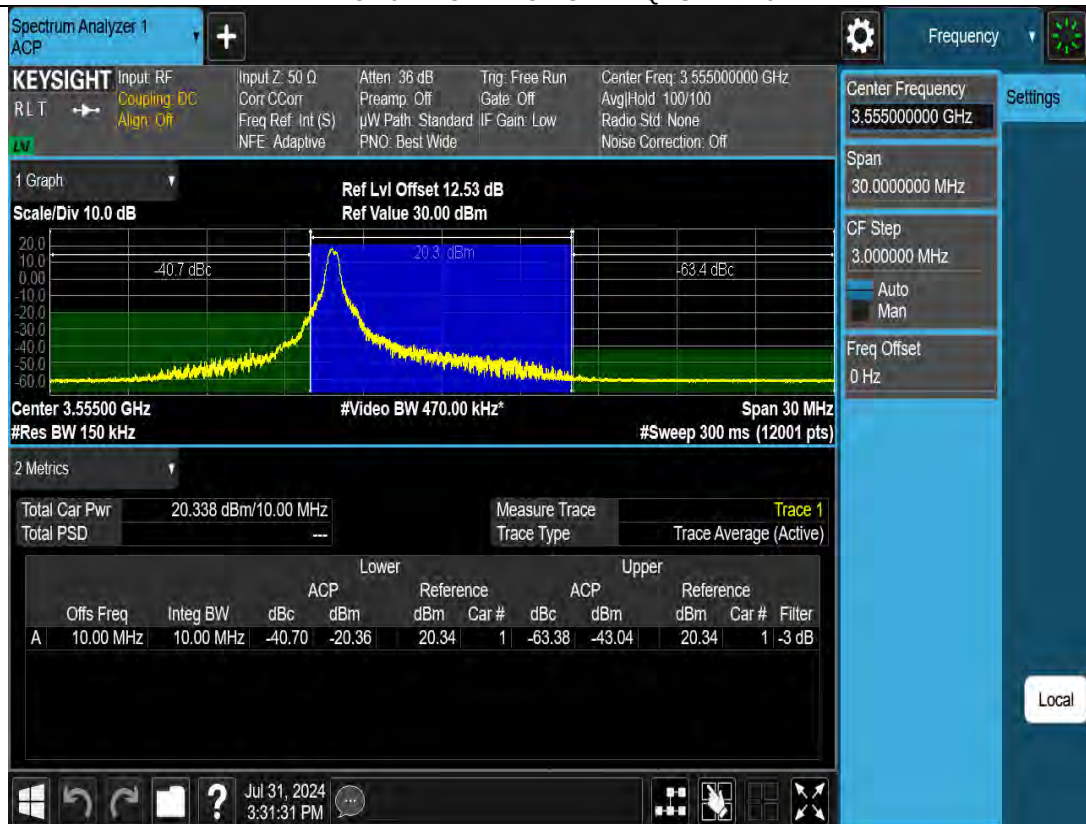
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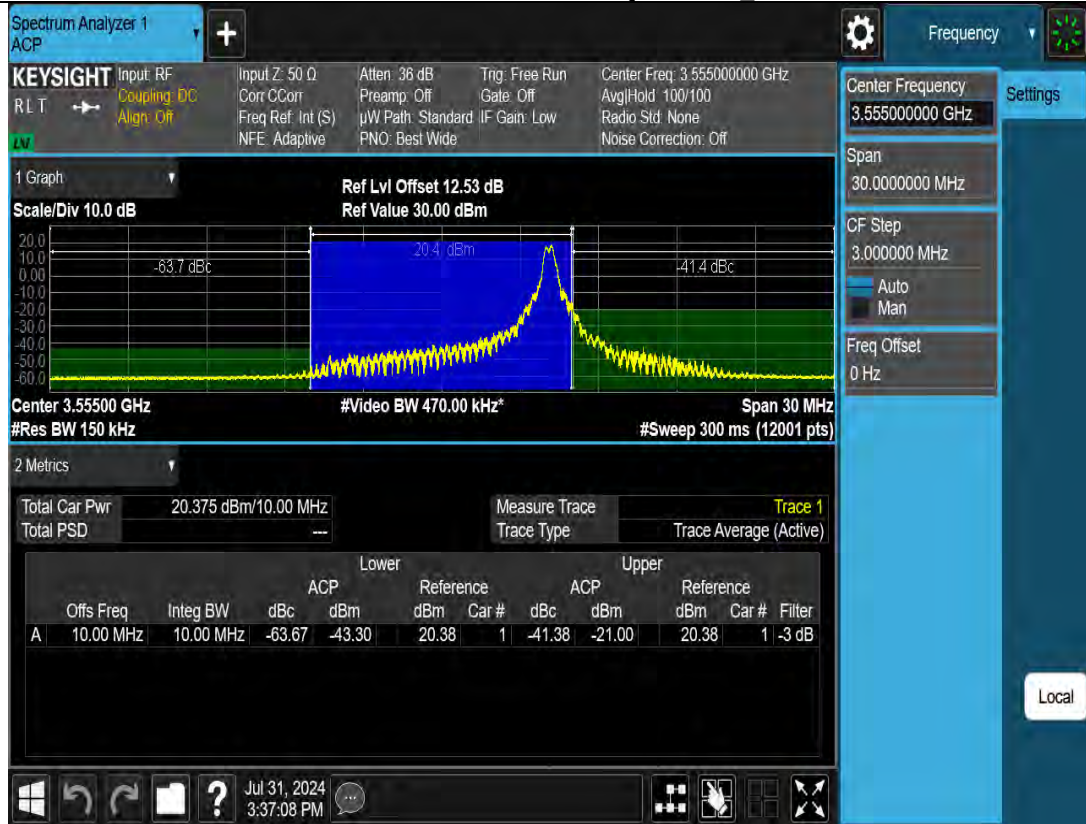
N48-10M-ACLR-L-CP-OFDM-QPSK-Outer Full



N48-10M-ACLR-L-CP-OFDM-QPSK-1RB0



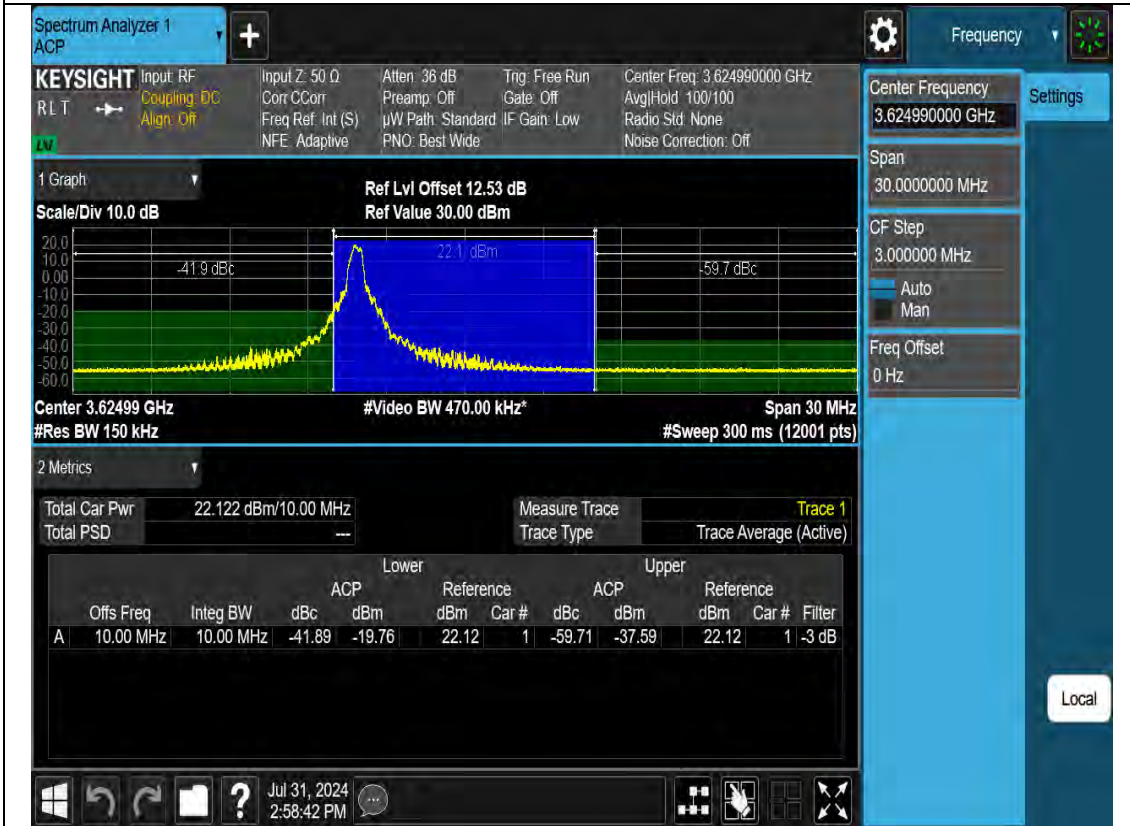
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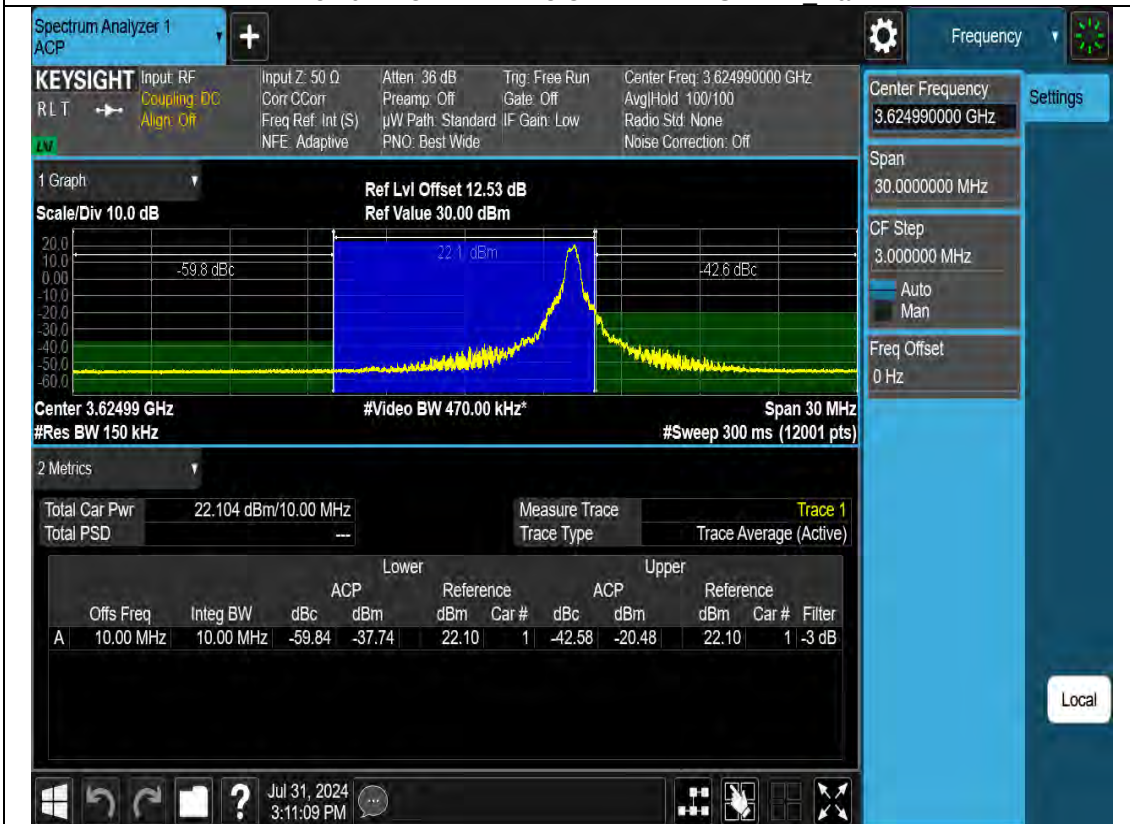
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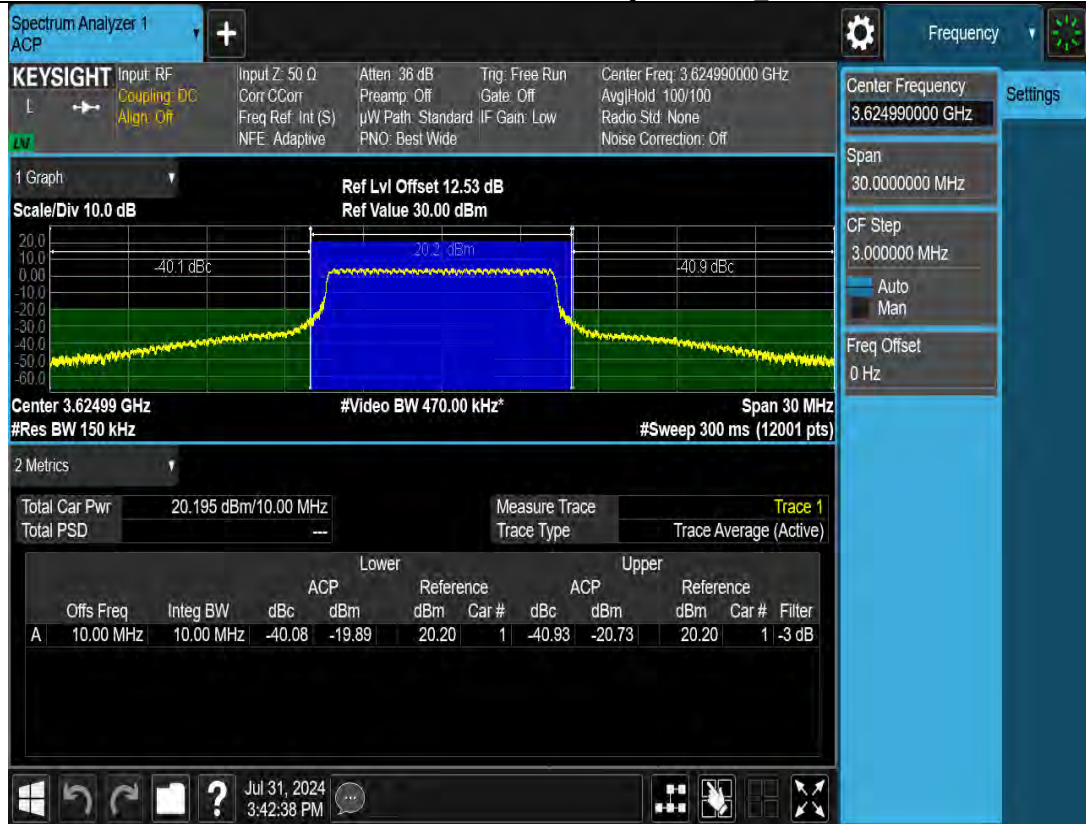
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N48-10M-ACLR-M-DFT-s-OFDM-Pi2 BPSK-1RB Max



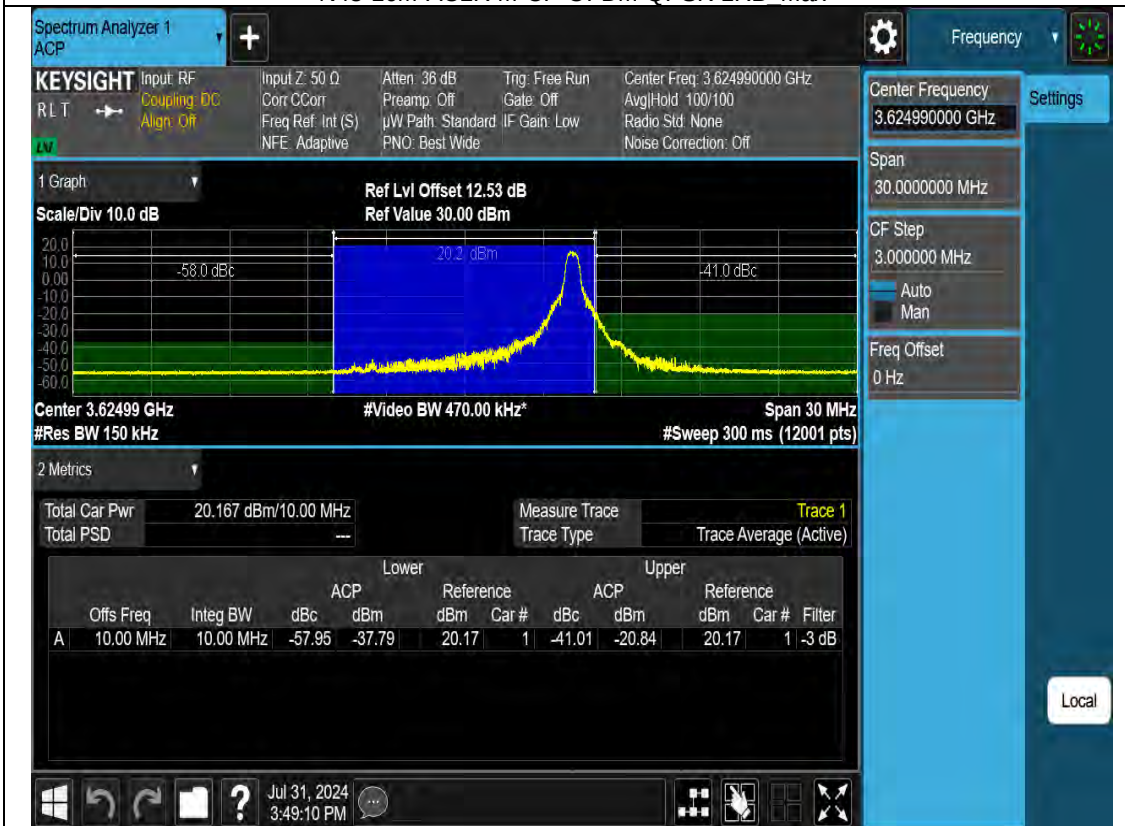
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N48-10M-ACLR-M-CP-OFDM-QPSK-1RB0



N48-10M-ACLR-M-CP-OFDM-QPSK-1RB Max



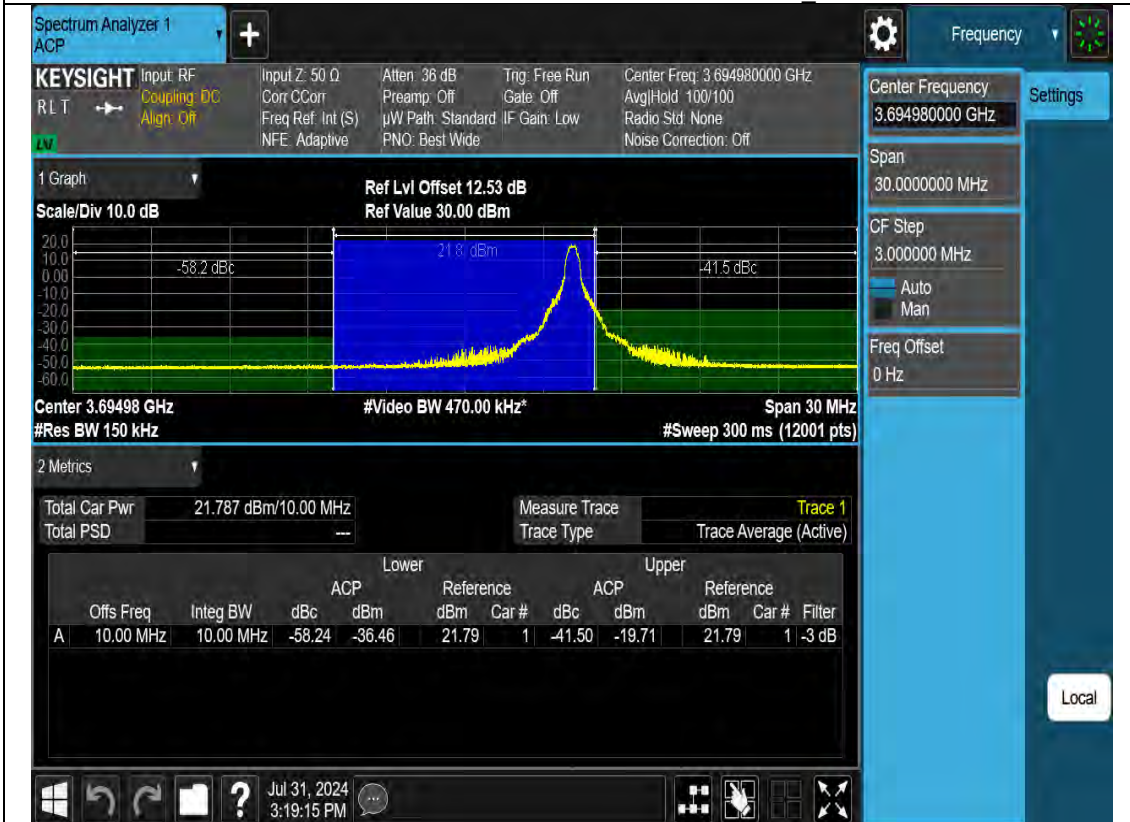
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N48-10M-ACLR-H-DFT-s-OFDM-Pi2 BPSK-1RB Max



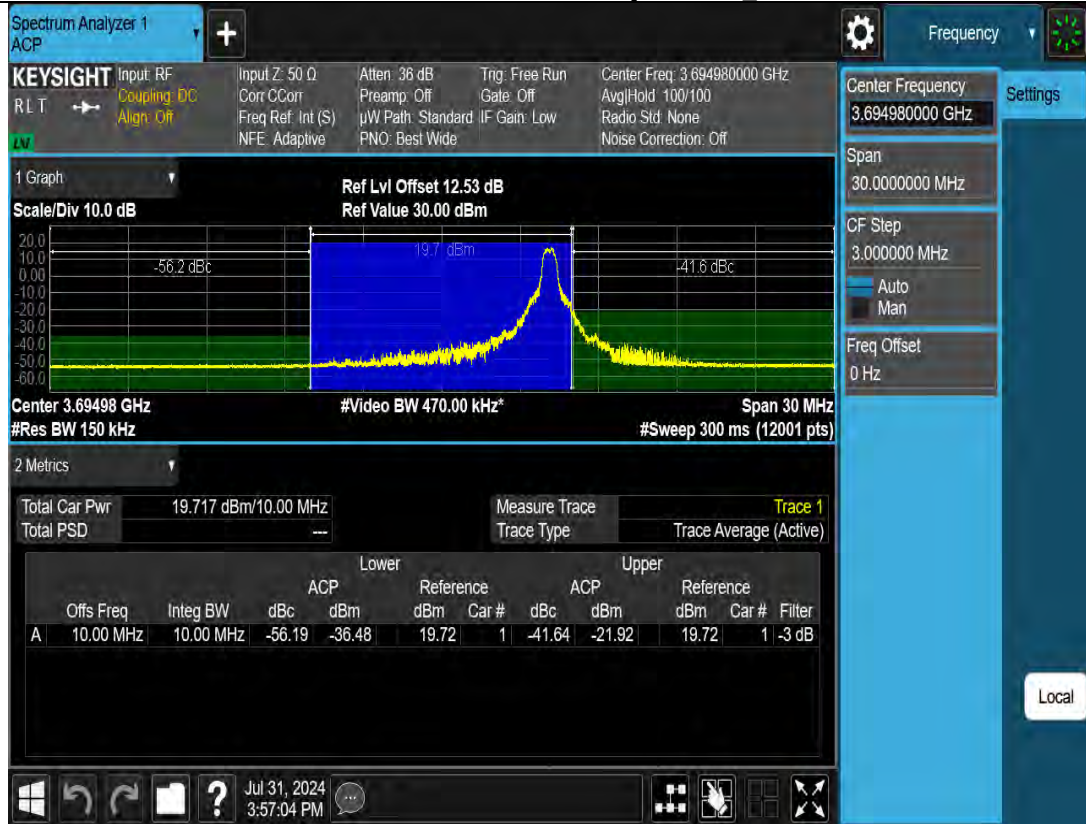
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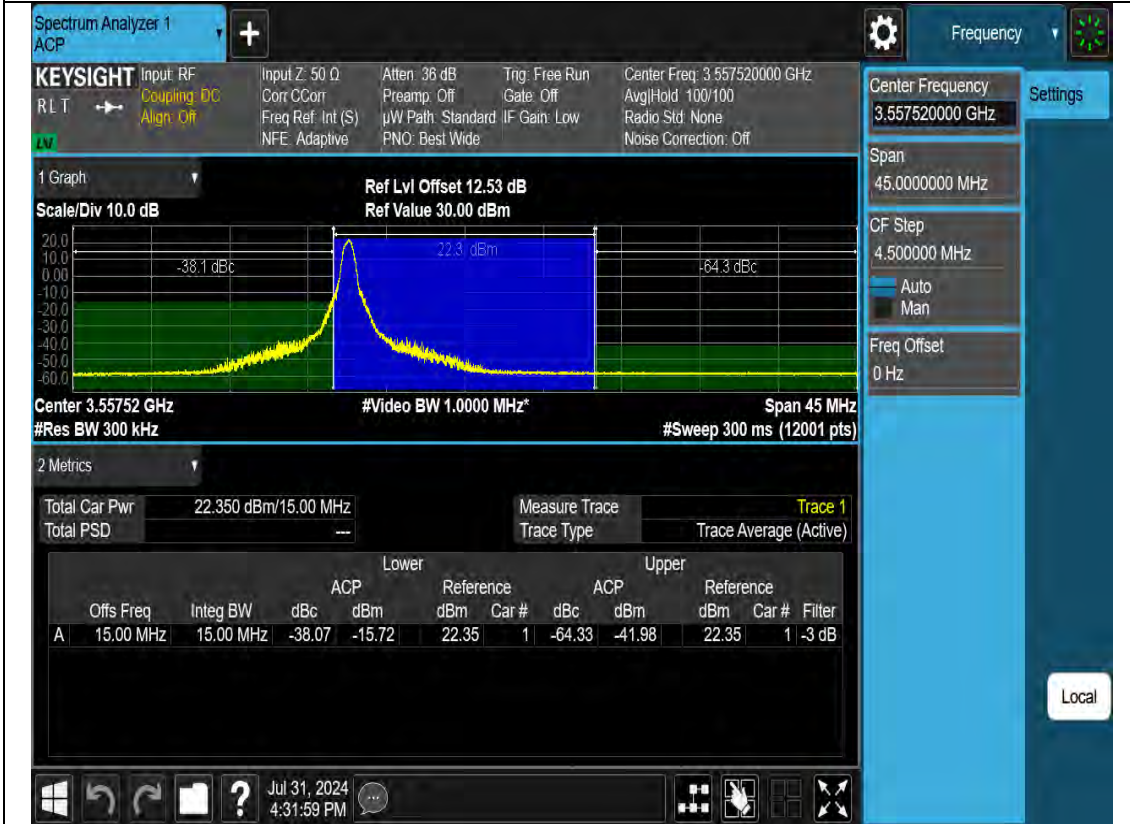
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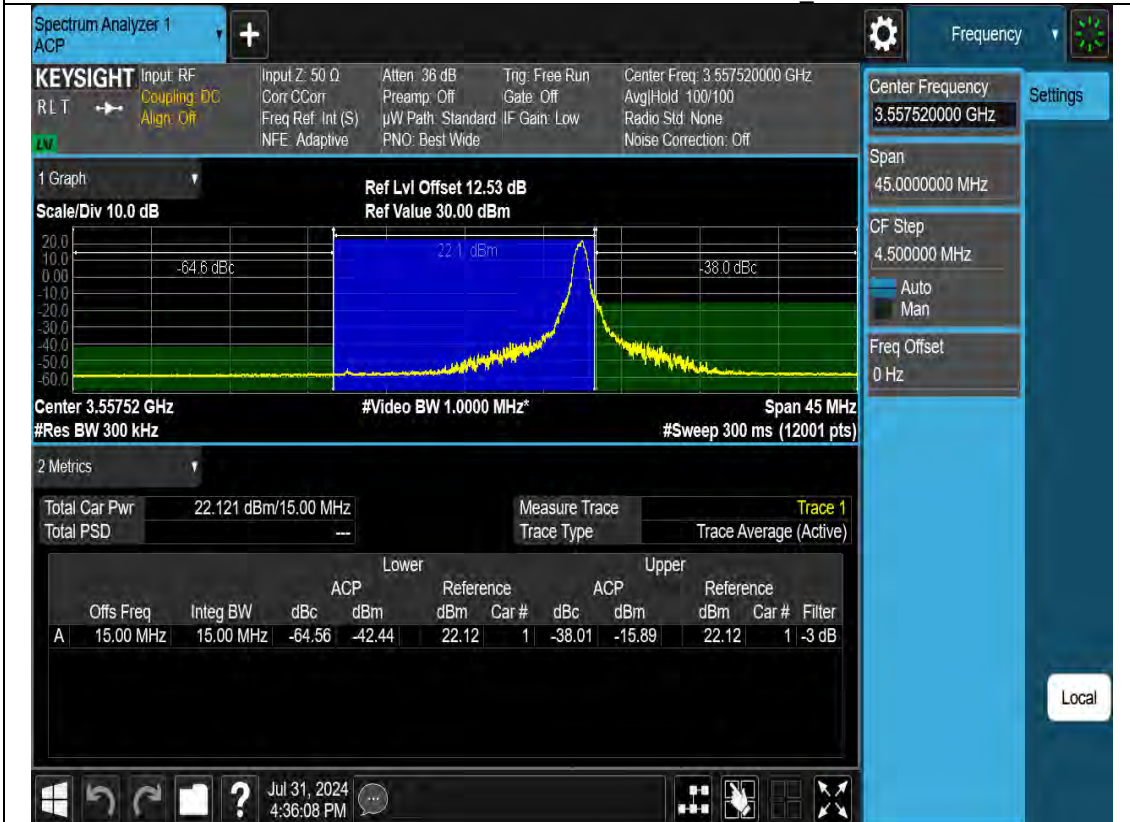
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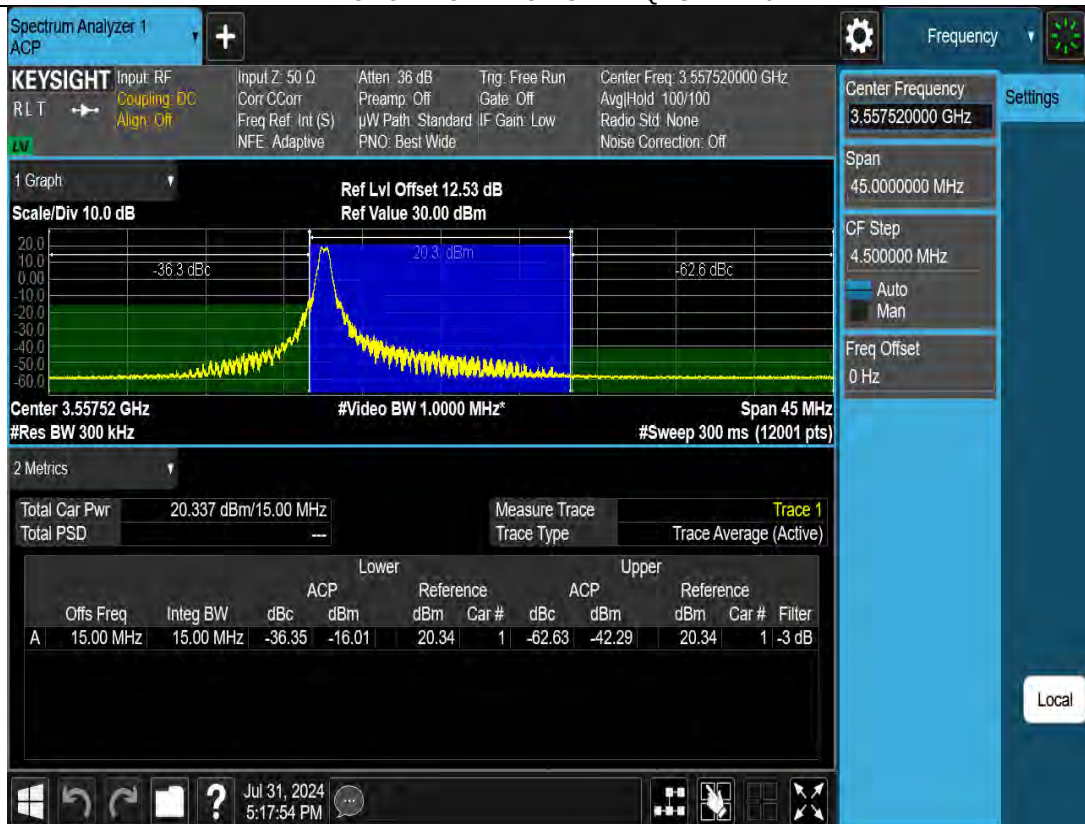
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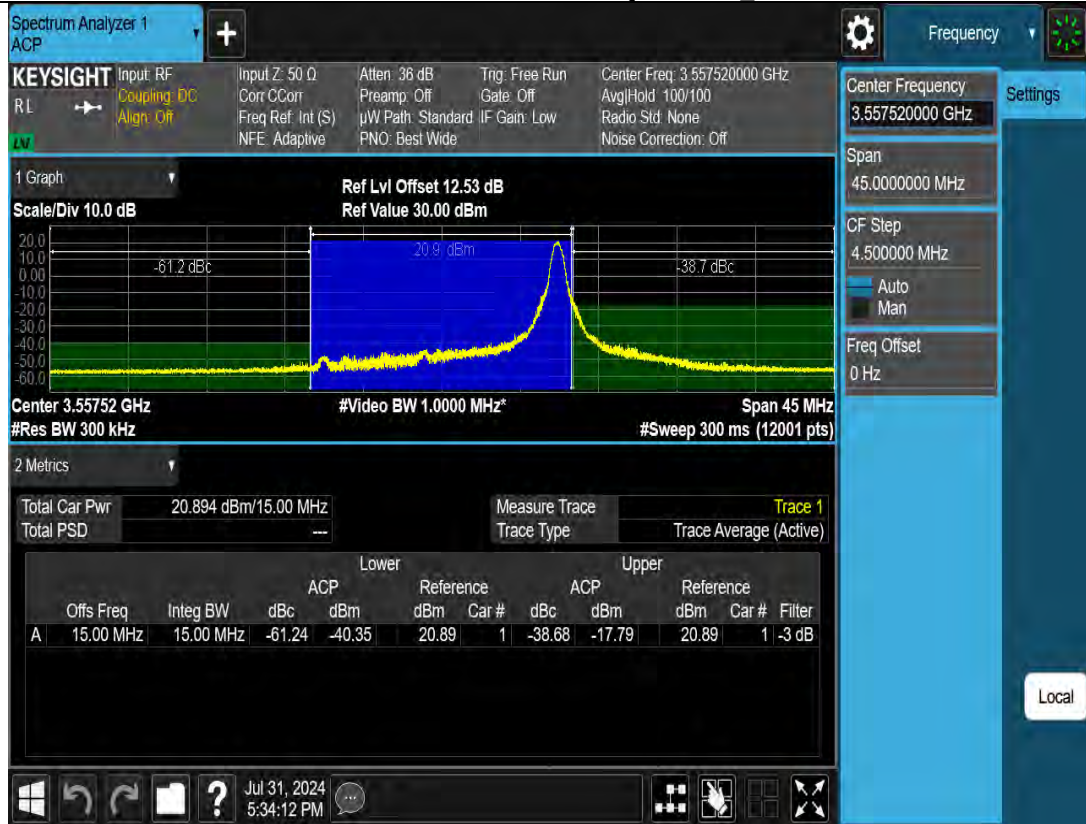
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N48-15M-ACLR-L-CP-OFDM-QPSK-1RB0



N48-15M-ACLR-L-CP-OFDM-QPSK-1RB Max



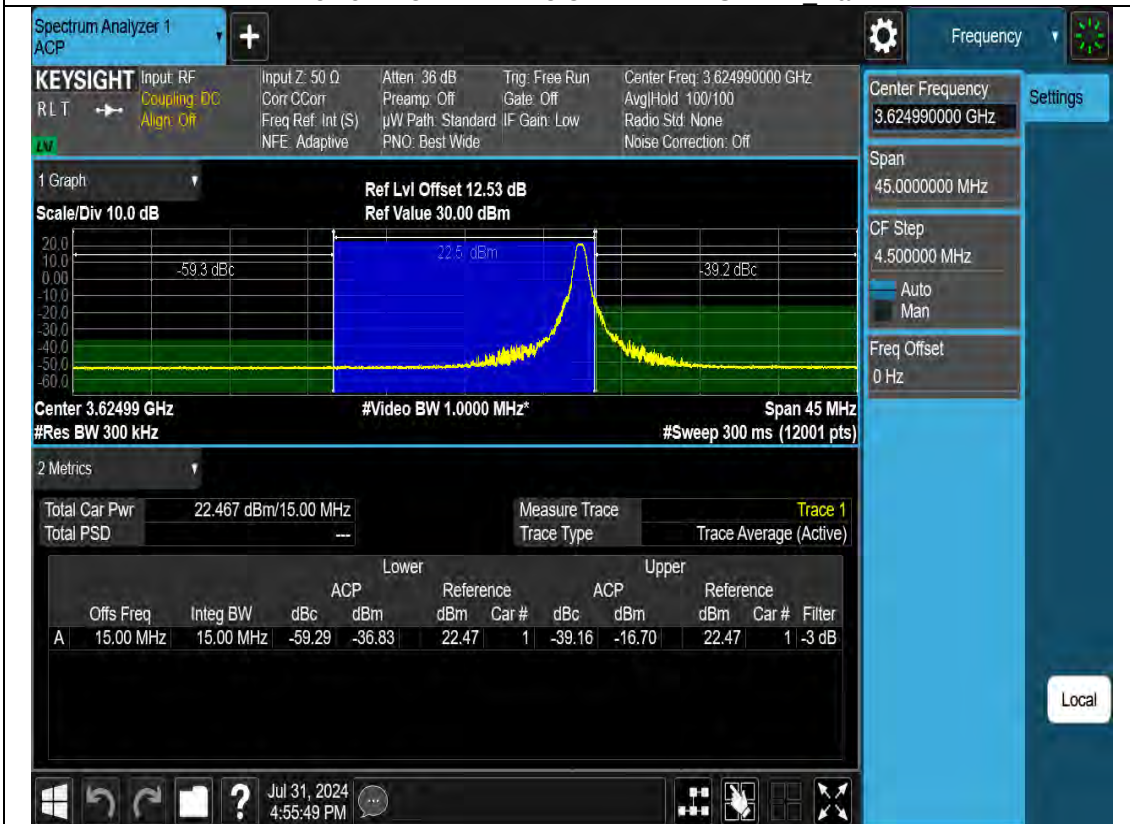
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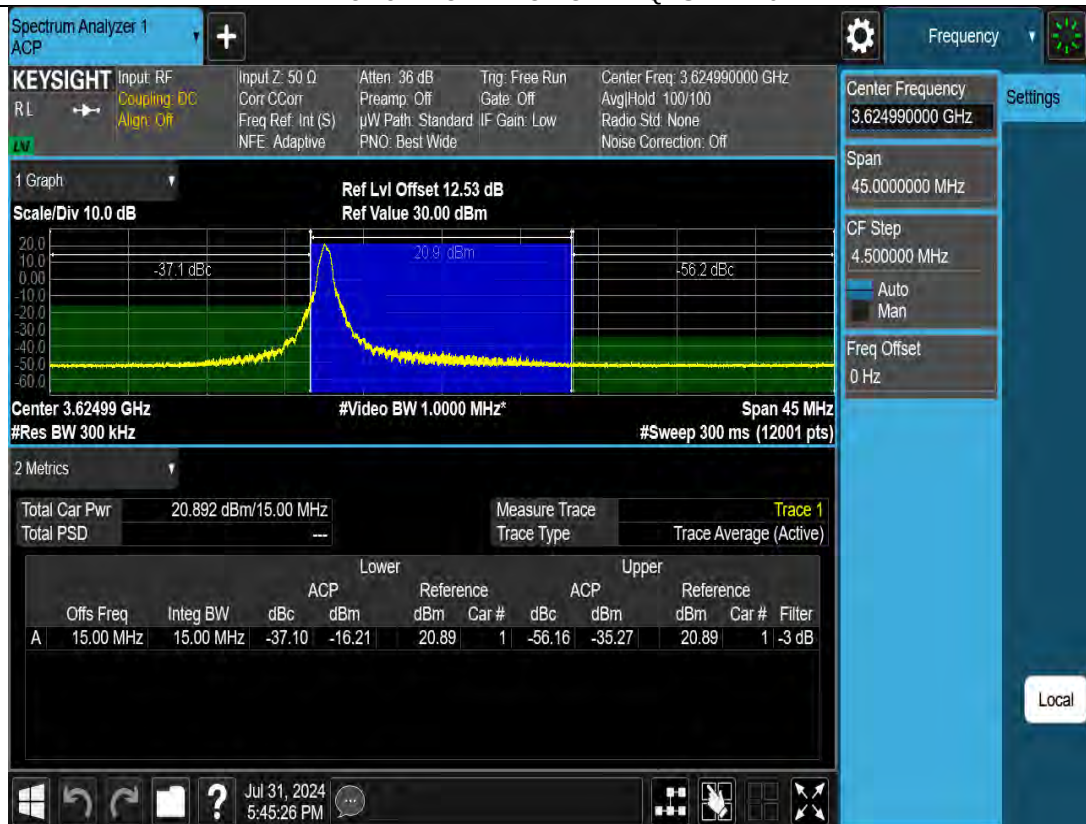
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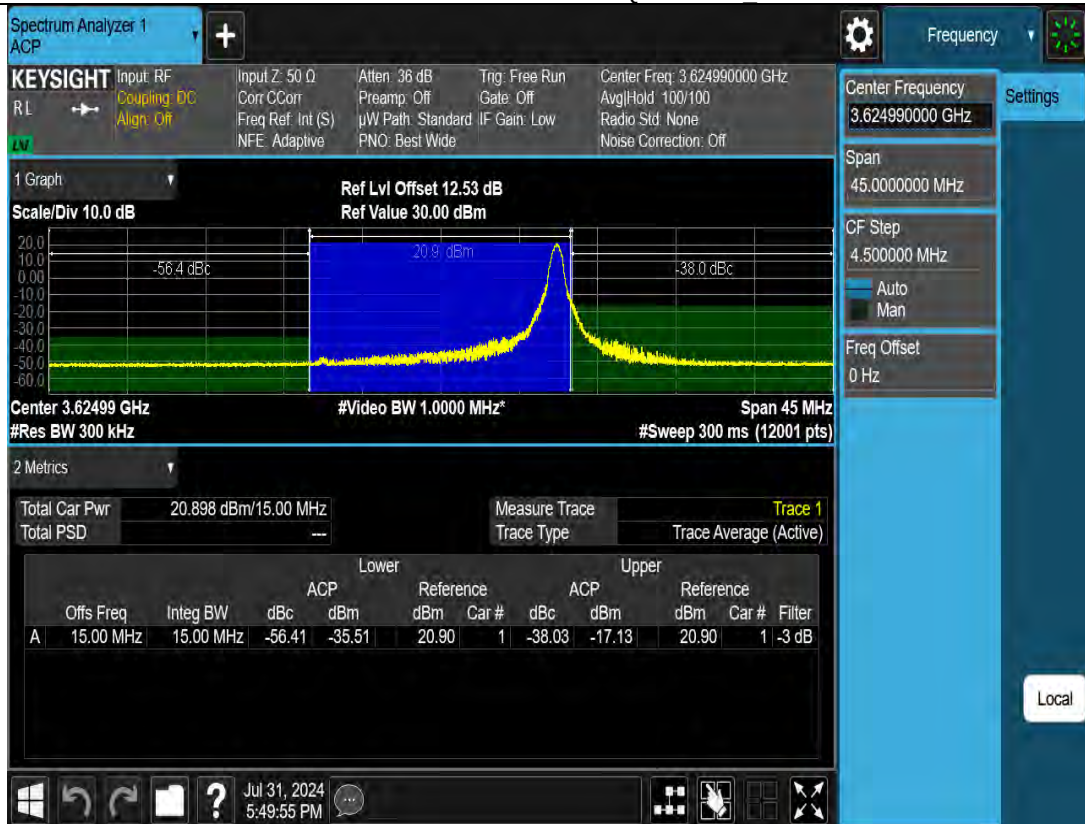
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N48-15M-ACLR-M-CP-OFDM-QPSK-1RB0



N48-15M-ACLR-M-CP-OFDM-QPSK-1RB Max



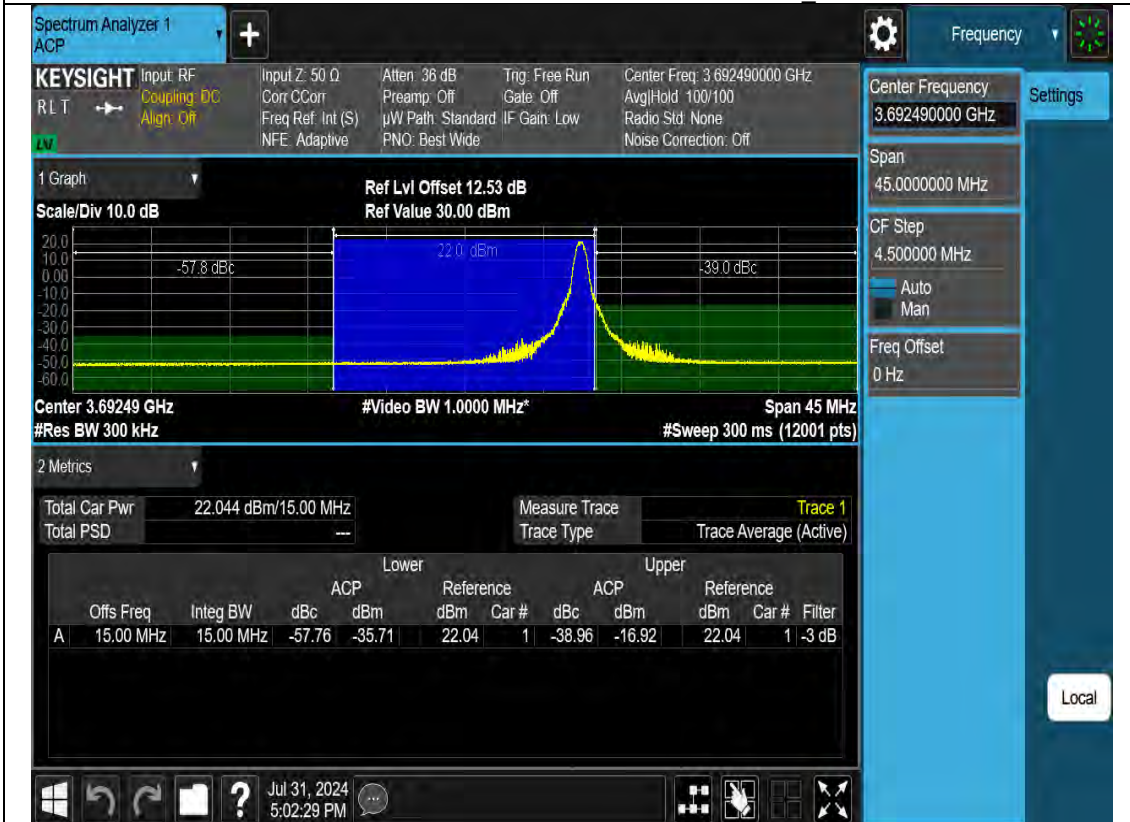
N48-15M-ACLR-H-DFT-s-OFDM-Pi2 BPSK-Outer Full



N48-15M-ACLR-H-DFT-s-OFDM-Pi2 BPSK-1RB0



N48-15M-ACLR-H-DFT-s-OFDM-Pi2 BPSK-1RB Max



N48-15M-ACLR-H-CP-OFDM-QPSK-Outer Full



N48-15M-ACLR-H-CP-OFDM-QPSK-1RB0



Keysight Spectrum Analyzer 1 ACP

Input RF
 R/L ☒ Coupling: DC Align: Off

Input Z: 50 Ω
 Corr: C Corr
 Freq Ref: Int (S)
 NFE: Adaptive

Atten: 36 dB
 Preamp: Off
 μ W Path: Standard
 PNO: Best Wide

Trig: Free Run
 Gate: Off
 IF Gain: Low

Center Freq: 3.692490000 GHz
 Avg/Hold: 100/100
 Radio Std: None
 Noise Correction: Off

Frequency
 Center Frequency: 3.692490000 MHz
 Span: 45.0000000 MHz
 CF Step: 4.5000000 MHz
 Auto Man
 Freq Offset: 0 Hz

1 Graph
 Scale/Div: 10.0 dB
 Ref Lvl Offset: 12.53 dB
 Ref Value: 30.00 dBm

Center 3.69249 GHz
#Res BW 300 kHz
#Video BW 1.0000 MHz*
Span 45 MHz
#Sweep 300 ms (12001 pts)

2 Metrics

Total Car Pwr: 20.388 dBm/15.00 MHz
Total PSD: ---

Measure Trace: Trace 1
Trace Type: Trace Average (Active)

Lower				Upper			
Offs Freq	Integ BW	dBc	dBm	Reference	ACP	Reference	ACP
				dBm	Car #	dBc	dBm
A	15.00 MHz	15.00 MHz	-54.60	-34.21	20.39	1	-37.91
							-17.52
							20.39
							1
							-3 dB

Local

Spectrum Analyzer 1 ACP

KEYSIGHT Input: RF Coupling: DC Align: Off

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

Atten: 36 dB Preamp: Off μW Path: Standard PNO: Best Wide

Trig: Free Run Gate: Off IF Gain: Low

Center Freq: 3.560010000 GHz Avg/Hold: 100/100 Radio Std: None Noise Correction: Off

Center Frequency: 3.560010000 MHz

Span: 60.0000000 MHz

CF Step: 6.0000000 MHz

Auto Man

Freq Offset: 0 Hz

1 Graph

Scale/Div 10.0 dB

Ref Lvl Offset 12.53 dB

Ref Value 30.00 dBm

22.5 dBm

-43.2 dBc

-44.2 dBc

Center 3.56001 GHz

#Video BW 1.0000 MHz

Span 60 MHz

#Res BW 300 kHz

#Sweep 300 ms (12001 pts)

2 Metrics

Total Car Pwr: 22.462 dBm/20.00 MHz

Total PSD: ---

Measure Trace: Trace 1

Trace Type: Trace Average (Active)

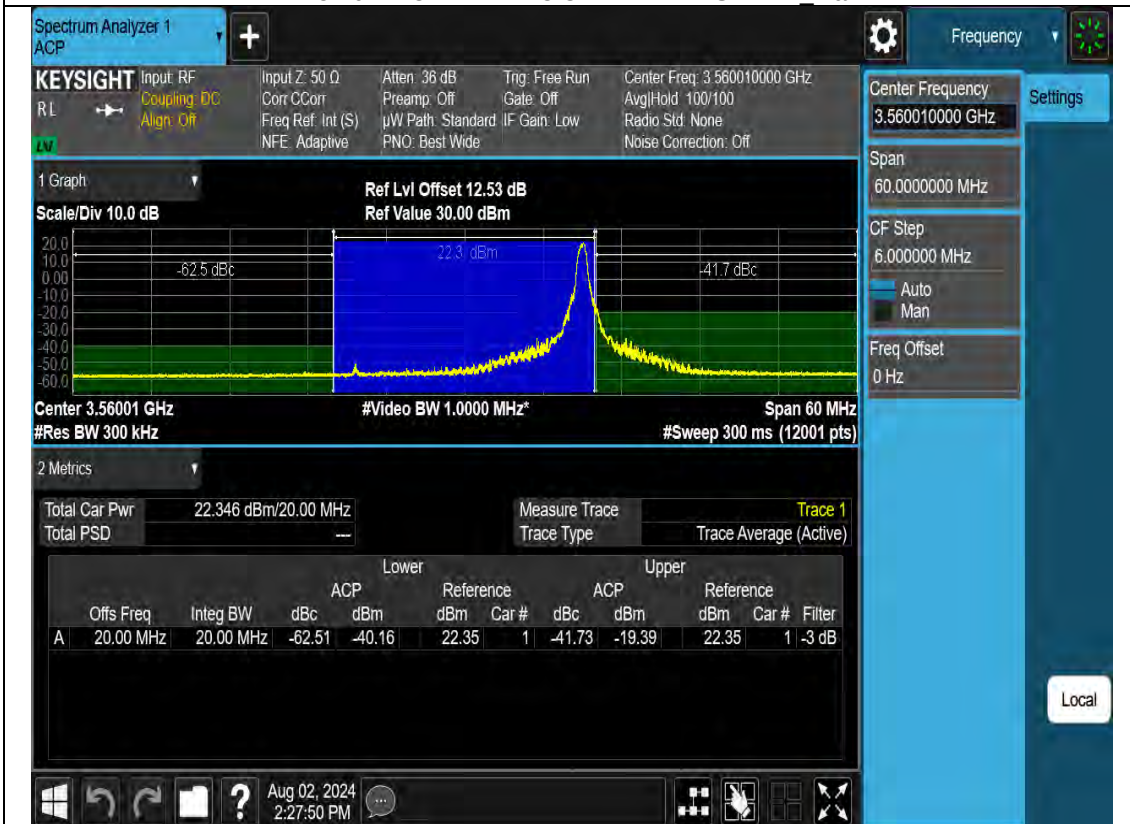
Lower						Upper					
Offs	Freq	Integ	ACP	Reference		Offs	Freq	Integ	ACP	Reference	
		BW	dBc	dBm	Car #			BW	dBc	dBm	Car #
A	20.00 MHz	20.00 MHz	-43.17	-20.71	22.46	1	-44.20	-21.74	22.46	22.46	1
											-3 dB

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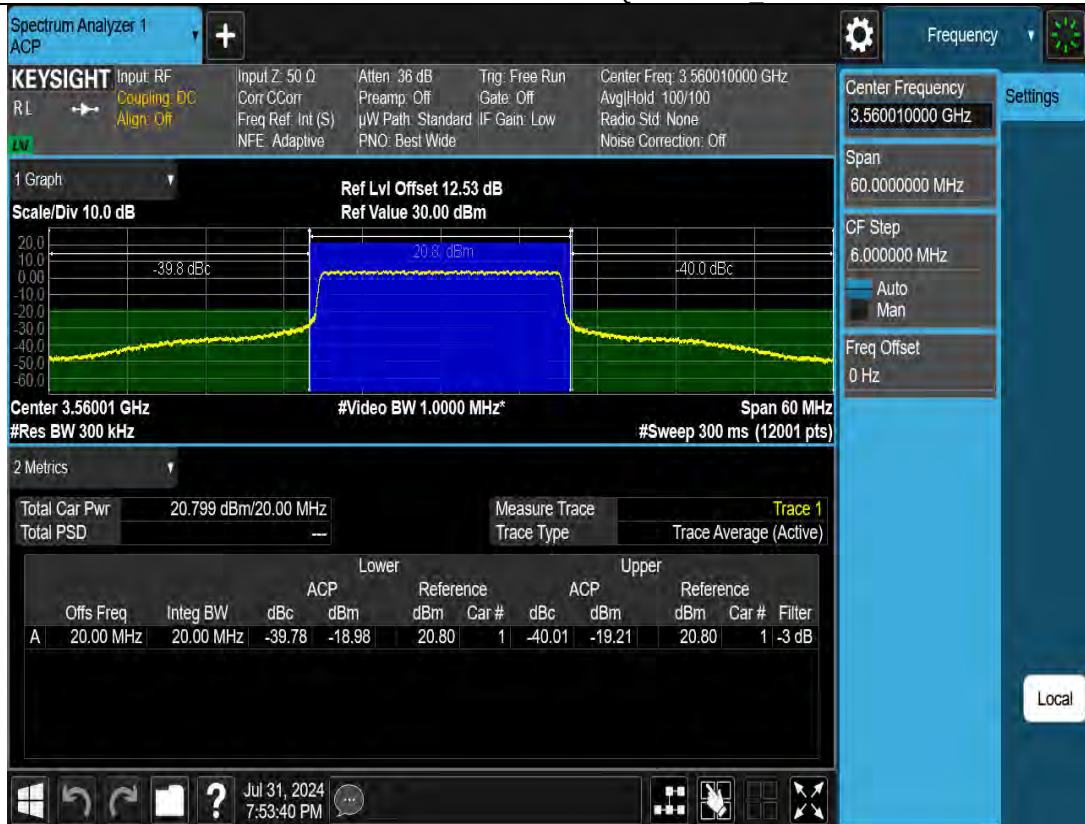
N48-20M-ACLR-L-DFT-s-OFDM-Pi2 BPSK-1RB0



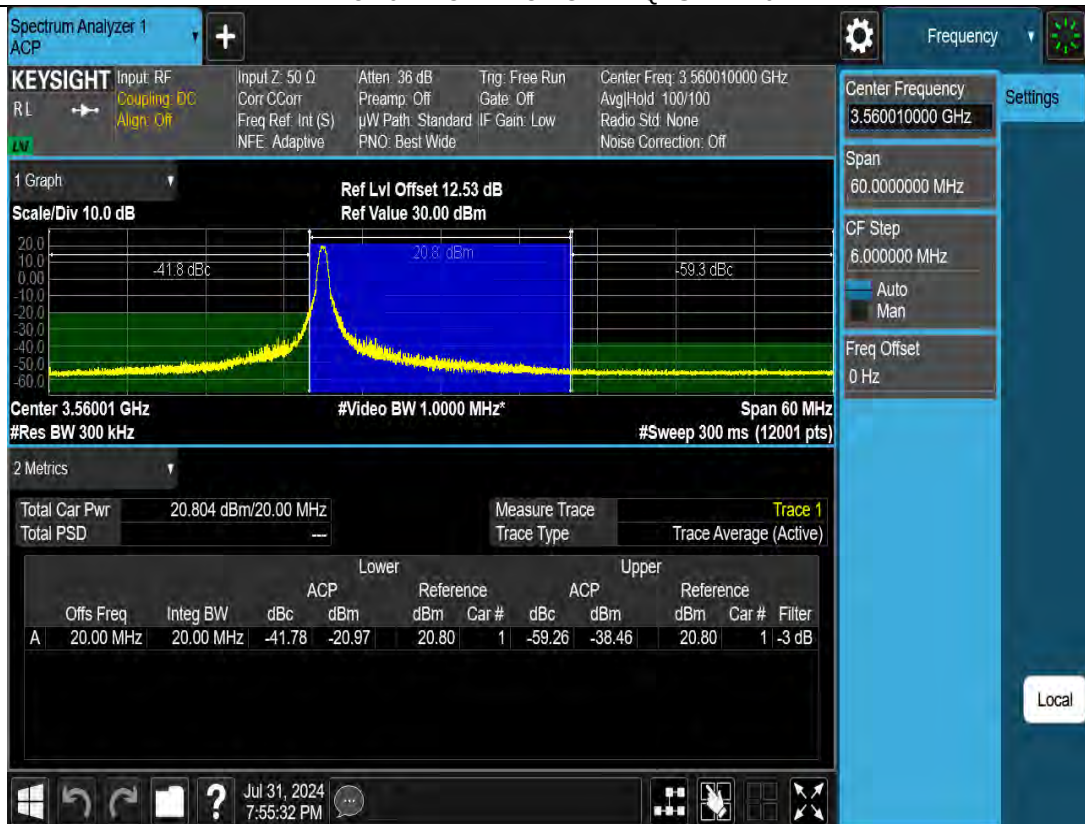
N48-20M-ACLR-L-DFT-s-OFDM-Pi2 BPSK-1RB Max



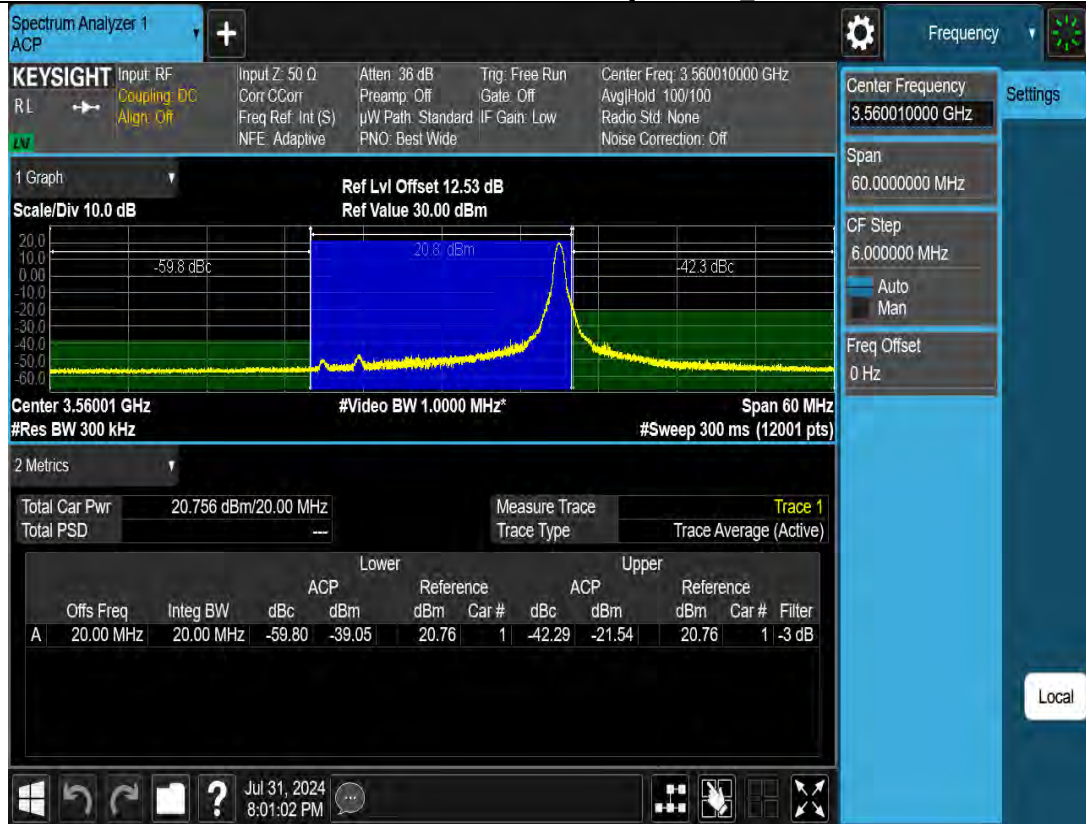
N48-20M-ACLR-L-CP-OFDM-QPSK-Outer Full



N48-20M-ACLR-L-CP-OFDM-QPSK-1RB0



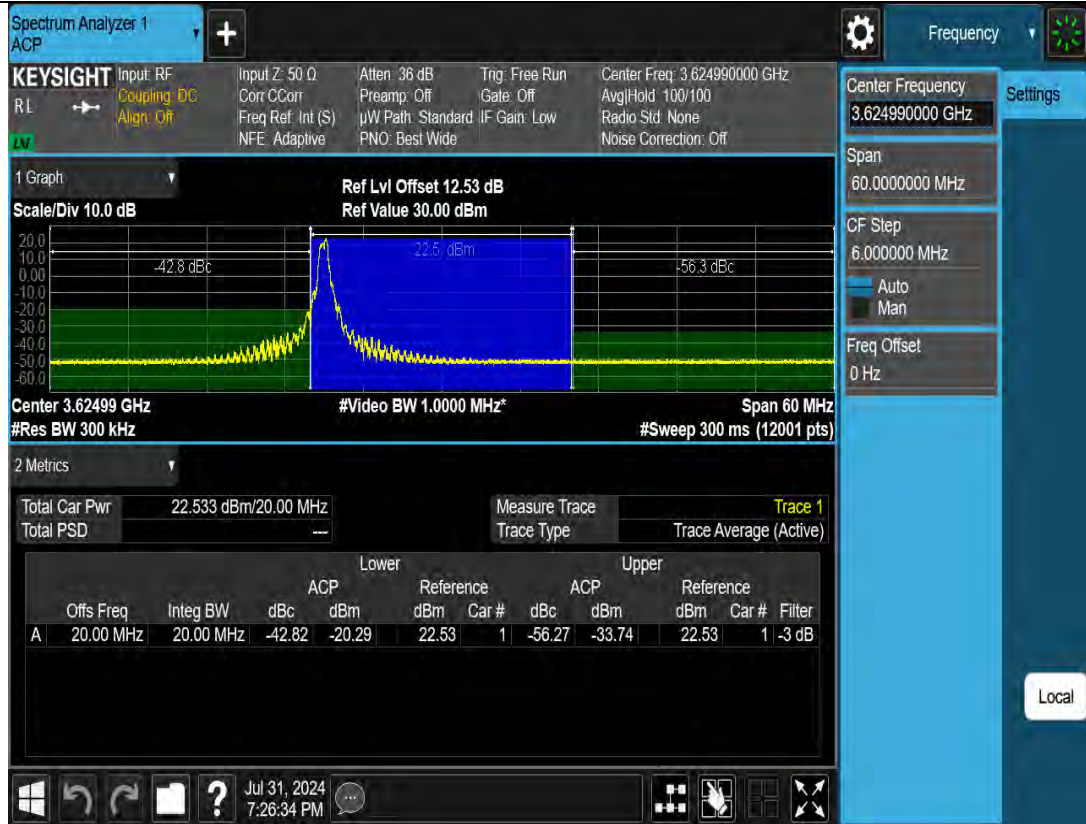
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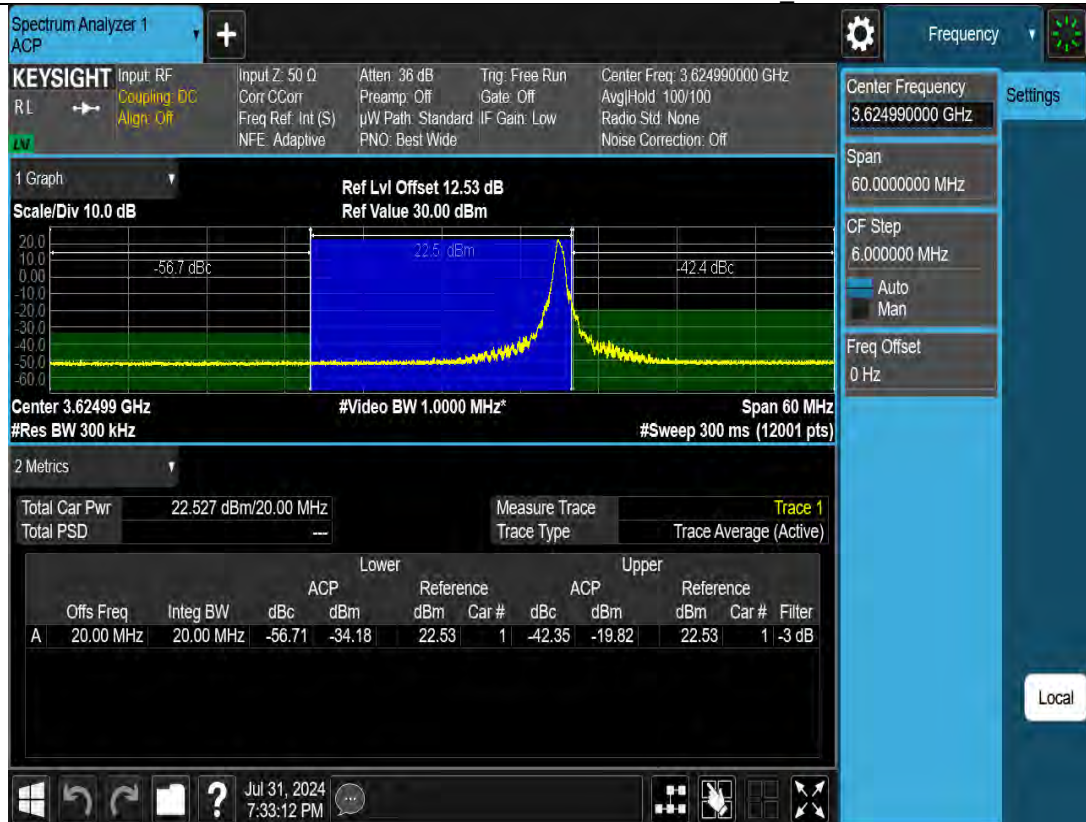
N48-20M-ACLR-M-DFT-s-OFDM-Pi2 BPSK-Outer Full



N48-20M-ACLR-M-DFT-s-OFDM-Pi2 BPSK-1RB0



N48-20M-ACLR-M-DFT-s-OFDM-Pi2 BPSK-1RB Max



Keysight Spectrum Analyzer 1 ACP

Input: RF
Coupling: DC
Align: Off

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

Atten: 36 dB
Preamp: Off
μW Path: Standard
PNO: Best Wide

Trig: Free Run
Gate: Off
IF Gain: Low
Noise Correction: Off

Center Freq: 3.624990000 GHz
Avg/Hold: 100/100
Radio Std: None

Center Frequency: 3.624990000 GHz

Span: 60.0000000 MHz

CF Step: 6.000000 MHz

Auto
Man

Freq Offset: 0 Hz

1 Graph

Scale/Div 10.0 dB

Ref Lvl Offset 12.53 dB
Ref Value 30.00 dBm

20.8 dBm
-39.9 dBc
-40.2 dBc

Center 3.62499 GHz
#Res BW 300 kHz

#Video BW 1.0000 MHz*
Span 60 MHz
#Sweep 300 ms (12001 pts)

2 Metrics

Total Car Pwr: 20.807 dBm/20.00 MHz
Total PSD: ---

Measure Trace: Trace 1
Trace Type: Trace Average (Active)

		Lower				Upper				
		ACP		Reference		ACP		Reference		
Offs Freq	Integ BW	dBc	dBm	dBm	Car #	dBc	dBm	dBm	Car #	Filter
A	20.00 MHz	20.00 MHz	-39.93	-19.13	20.81	1	-40.20	-19.40	20.81	1 -3 dB

Local

Keysight Spectrum Analyzer 1
KEYSIGHT Input: RF
 R.L. ☒ Coupling: DC
 Align: Off

Input Z: 50 Ω
 Corr: CCarr
 Freq Ref: Int (S)
 NFE: Adaptive

Atten: 36 dB
 Preamp: Off
 μW Path: Standard
 PNO: Best Wide

Trig: Free Run
 Gate: Off
 IF Gain: Low
 Noise Correction: Off

Center Freq: 3.624990000 GHz
 Avg/Hold: 100/100
 Radio Std: None

Center Frequency
 3.624990000 GHz

Span
 60.000000 MHz

CF Step
 6.000000 MHz

☒ Auto
☐ Man

Freq Offset
 0 Hz

1 Graph
 Scale/Div 10.0 dB
 Ref Lvl Offset 12.53 dB
 Ref Value 30.00 dBm

20.0
 10.0
 0.00
 -10.0
 -20.0
 -30.0
 -40.0
 -50.0
 -60.0

-40.8 dBc
 20.8 dBm
 -54.4 dBc

Center 3.62499 GHz
#Res BW 300 kHz
#Video BW 1.0000 MHz*
Span 60 MHz
#Sweep 300 ms (12001 pts)

2 Metrics

Total Car Pwr 20.755 dBm/20.00 MHz
 Total PSD ---

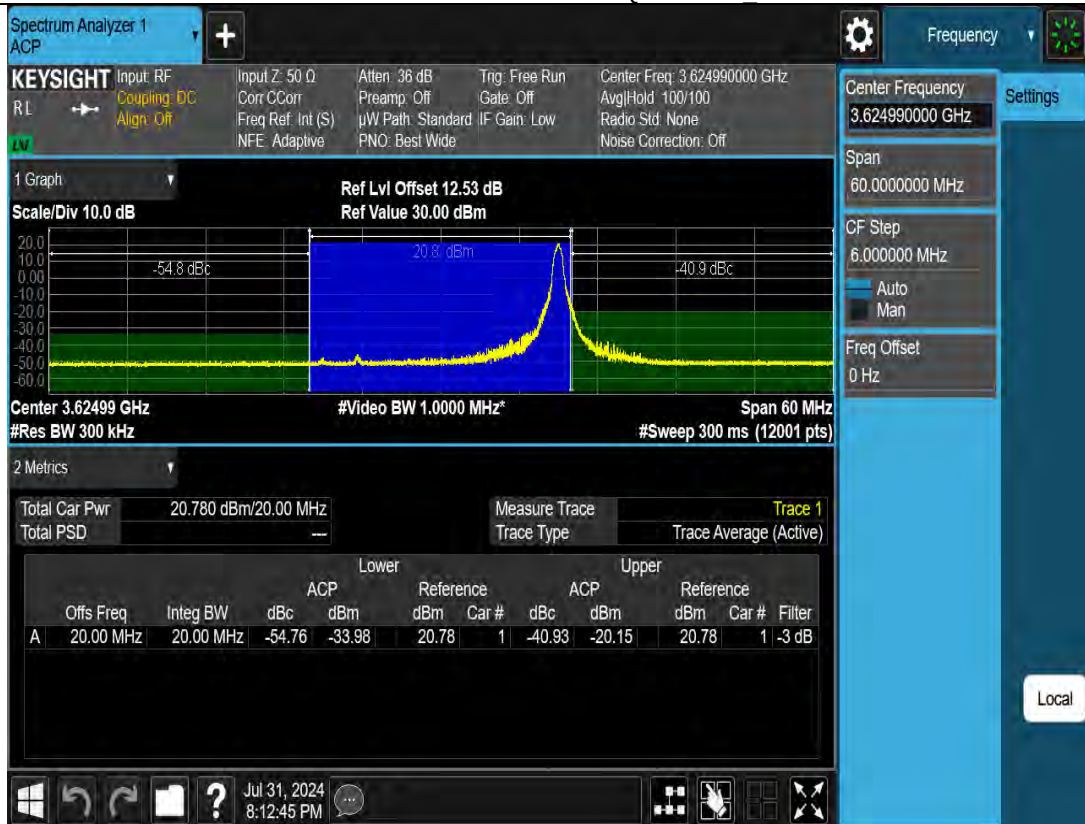
Measure Trace
 Trace Type Trace Average (Active)

Trace 1

Lower				Upper							
Offs Freq	Integ BW	dBc	dBm	Reference	ACP	Reference	ACP				
				dBm	Car #	dBm	Car #				
A	20.00 MHz	20.00 MHz	-40.81	-20.06	20.76	1	-54.41	-33.65	20.76	1	-3 dB

Local

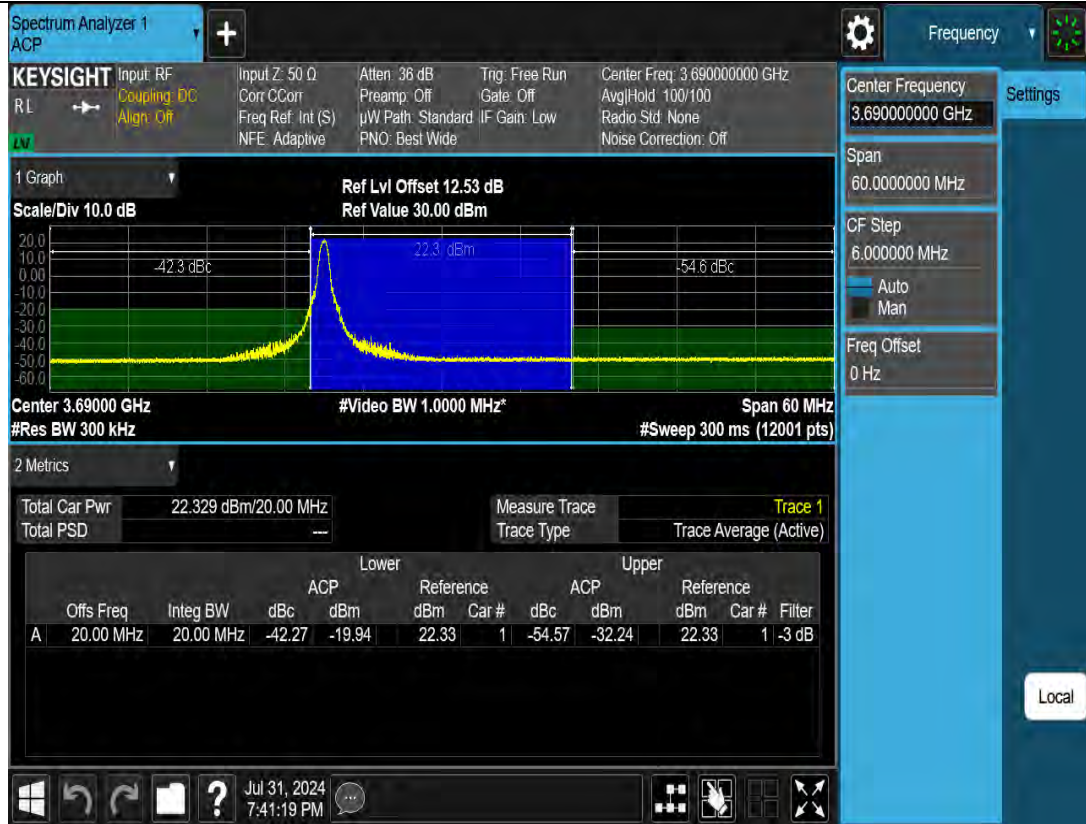
N48-20M-ACLR-M-CP-OFDM-QPSK-1RB Max



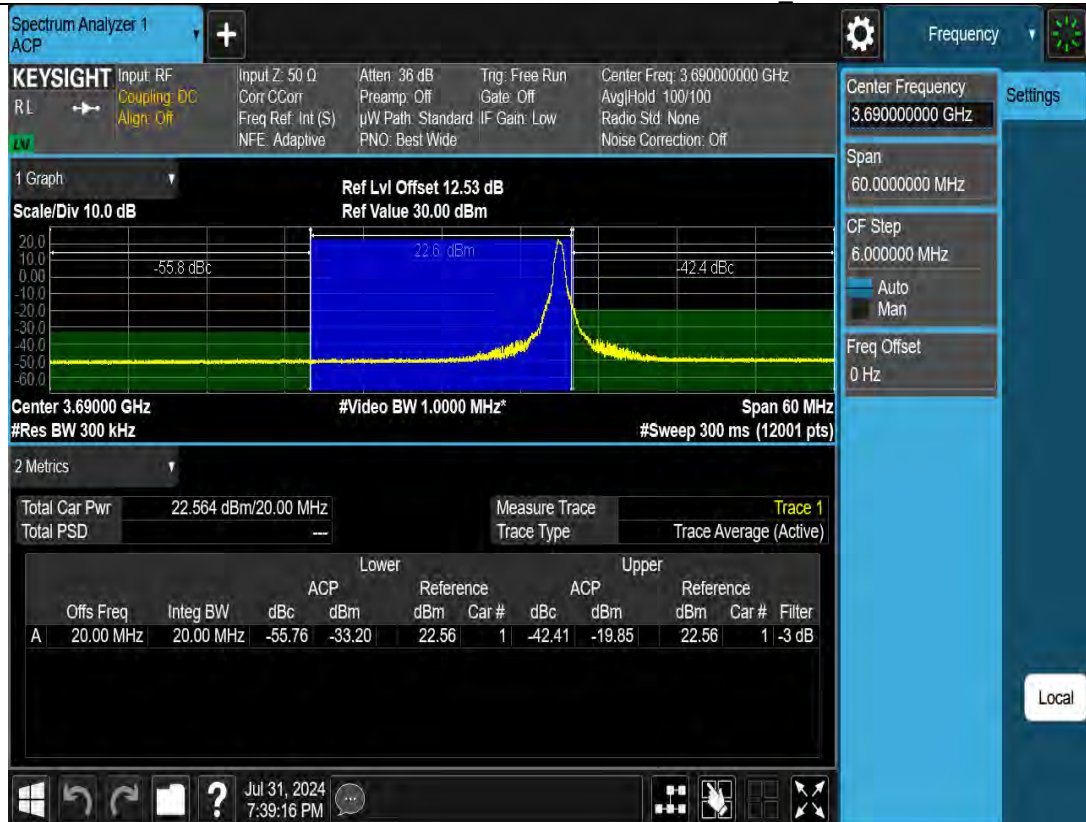
N48-20M-ACLR-H-DFT-s-OFDM-Pi2 BPSK-Outer Full



N48-20M-ACLR-H-DFT-s-OFDM-Pi2 BPSK-1RB0



N48-20M-ACLR-H-DFT-s-OFDM-Pi2 BPSK-1RB Max



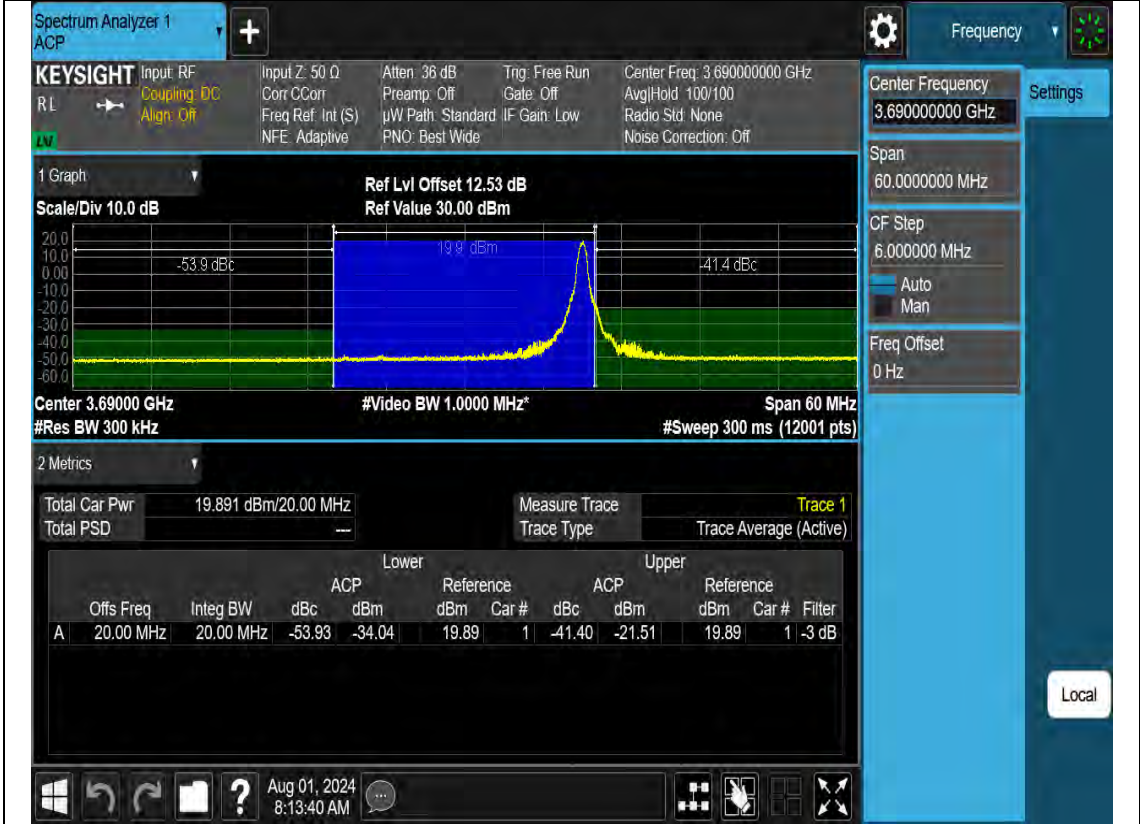
N48-20M-ACLR-H-CP-OFDM-QPSK-Outer Full



N48-20M-ACLR-H-CP-OFDM-QPSK-1RB0

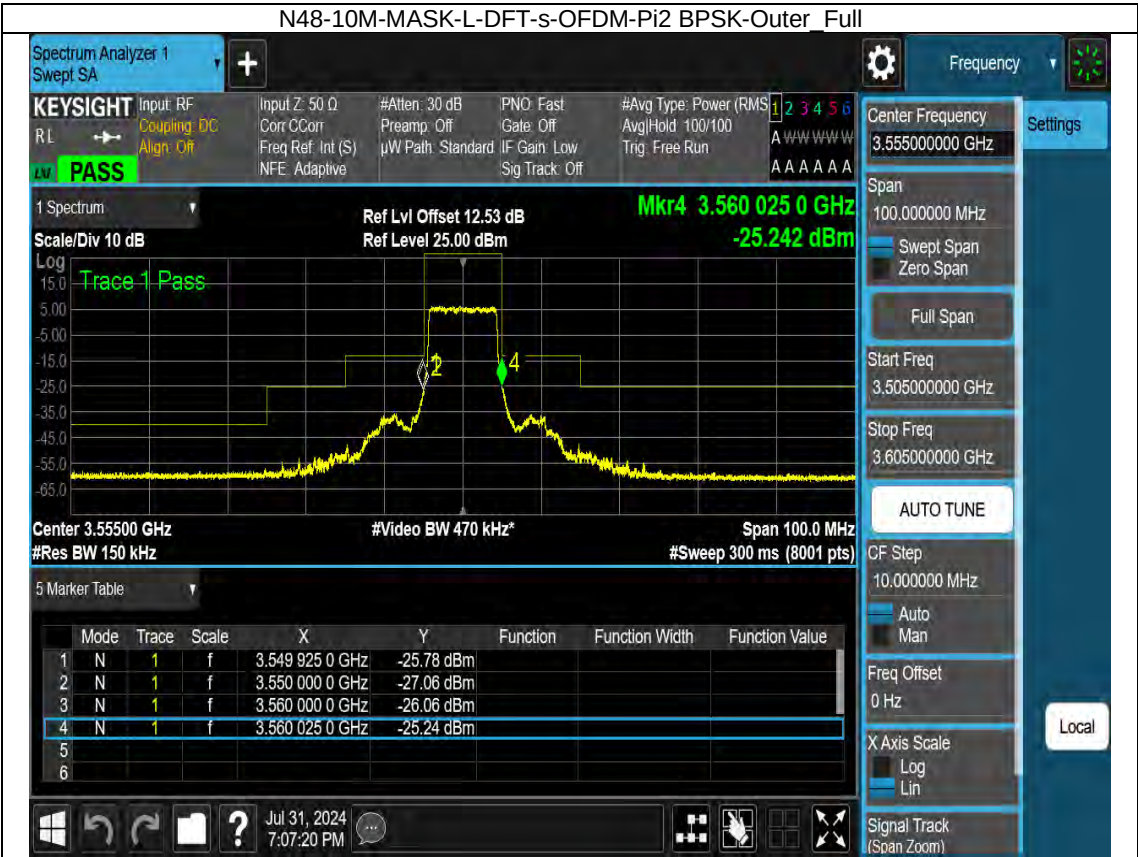


N48-20M-ACLR-H-CP-OFDM-QPSK-1RB Max

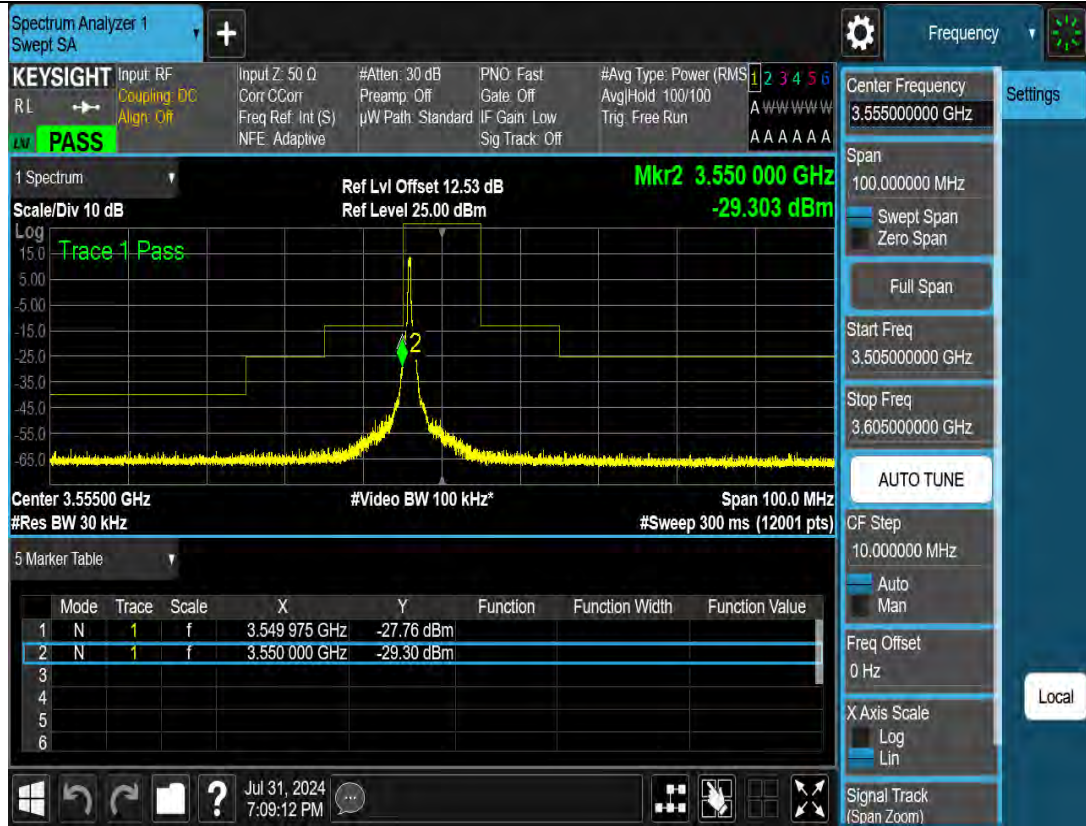


Emission mask

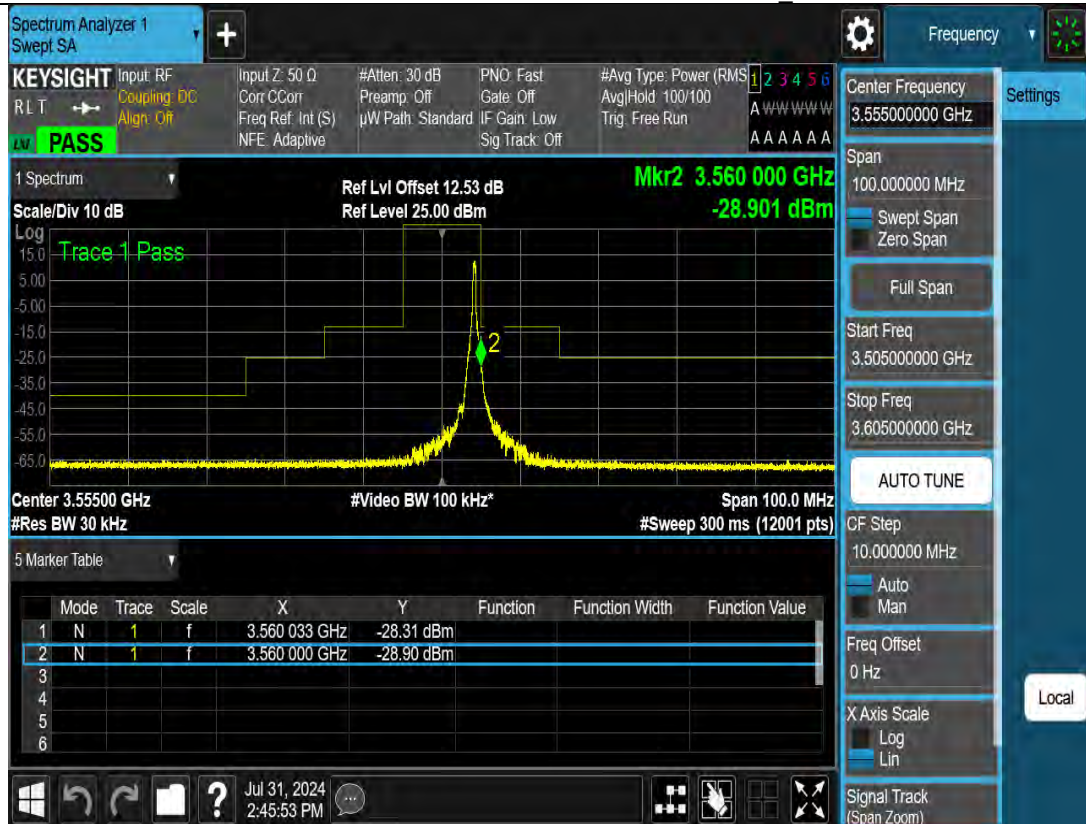
test graph



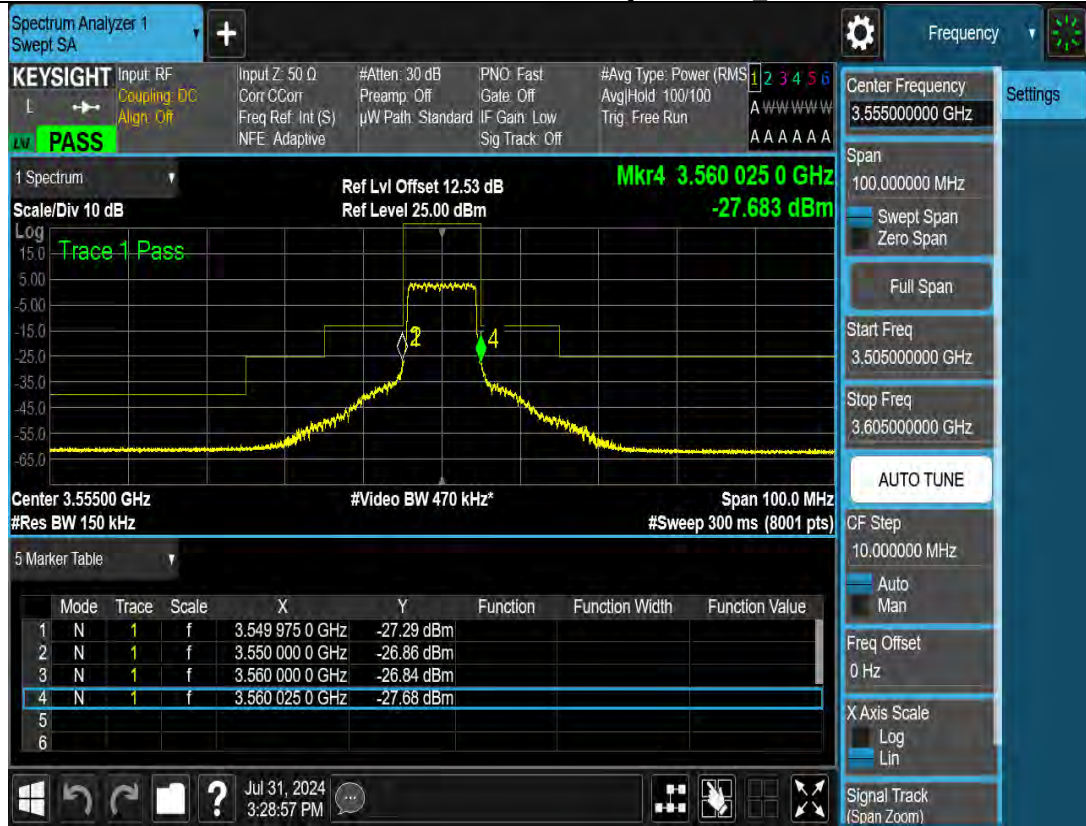
N48-10M-MASK-L-DFT-s-OFDM-Pi2 BPSK-1RB0



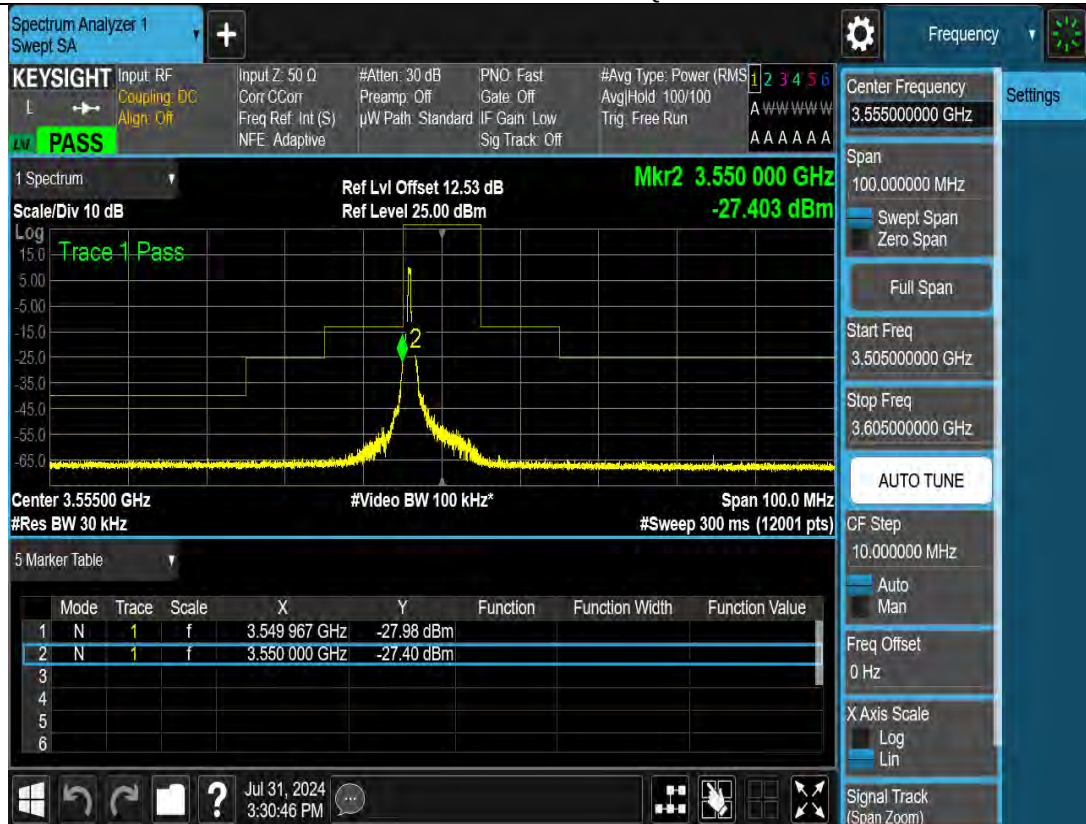
N48-10M-MASK-L-DFT-s-OFDM-Pi2 BPSK-1RB Max



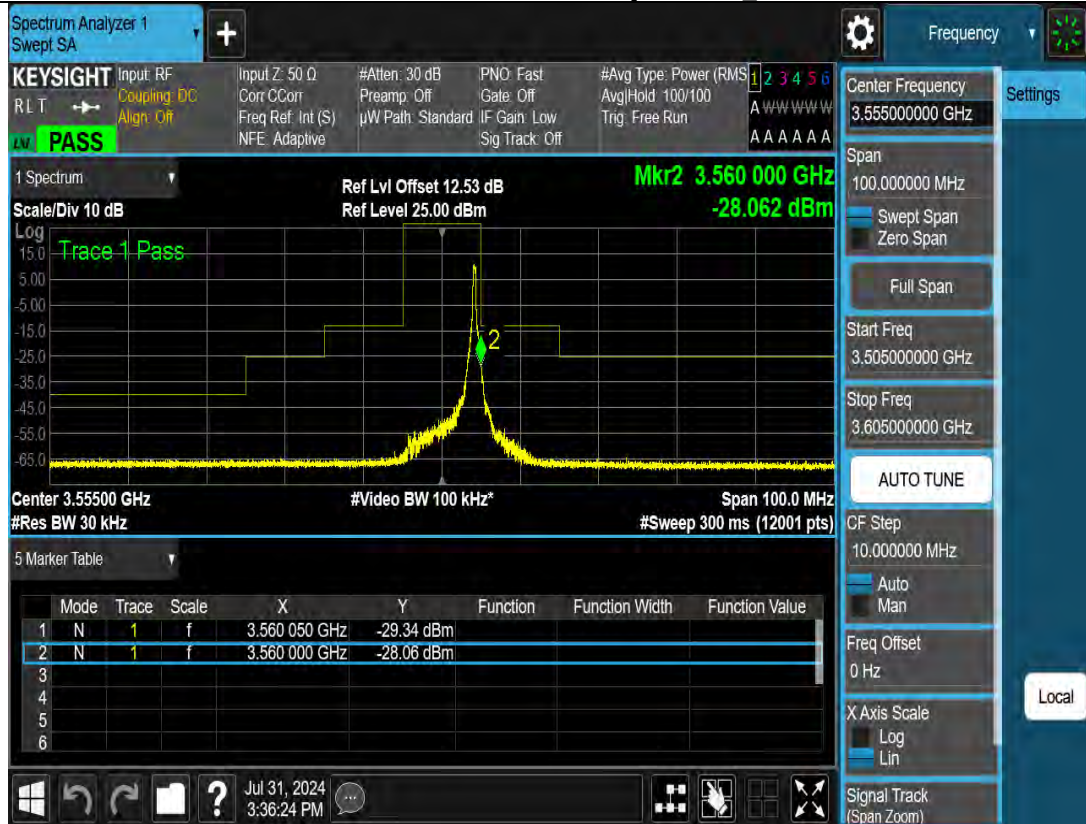
N48-10M-MASK-L-CP-OFDM-QPSK-Outer Full



N48-10M-MASK-L-CP-OFDM-QPSK-1RB0



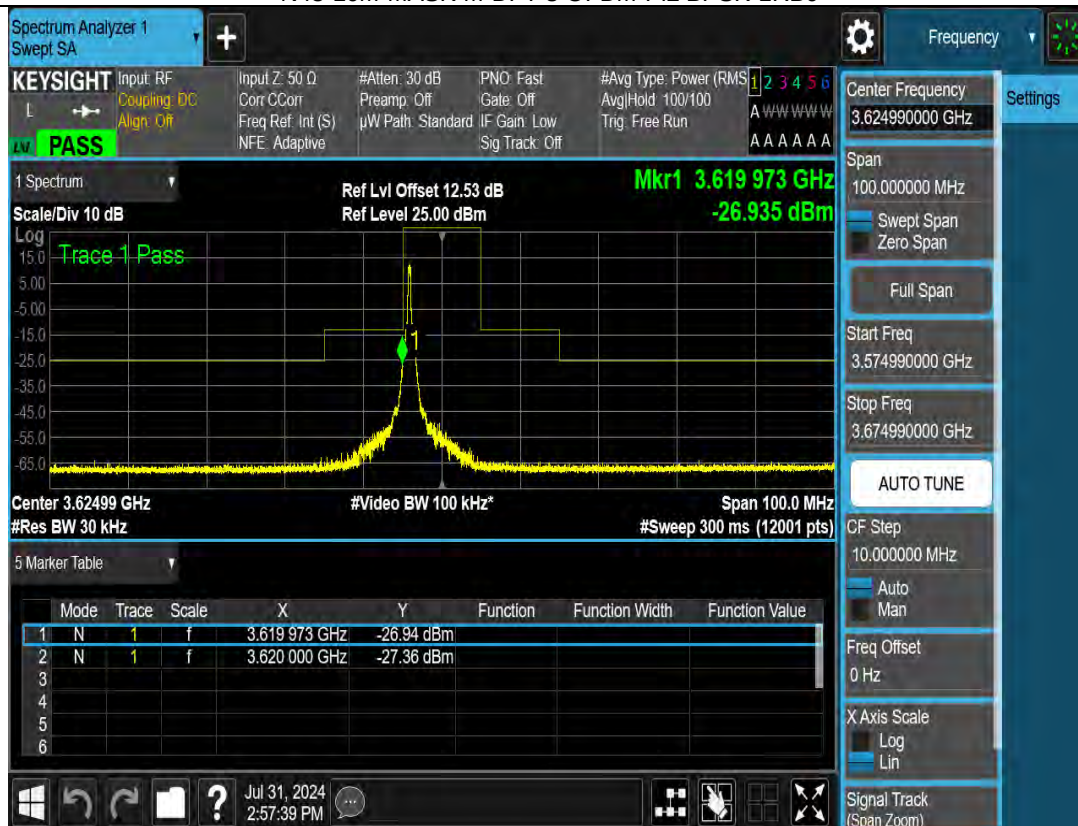
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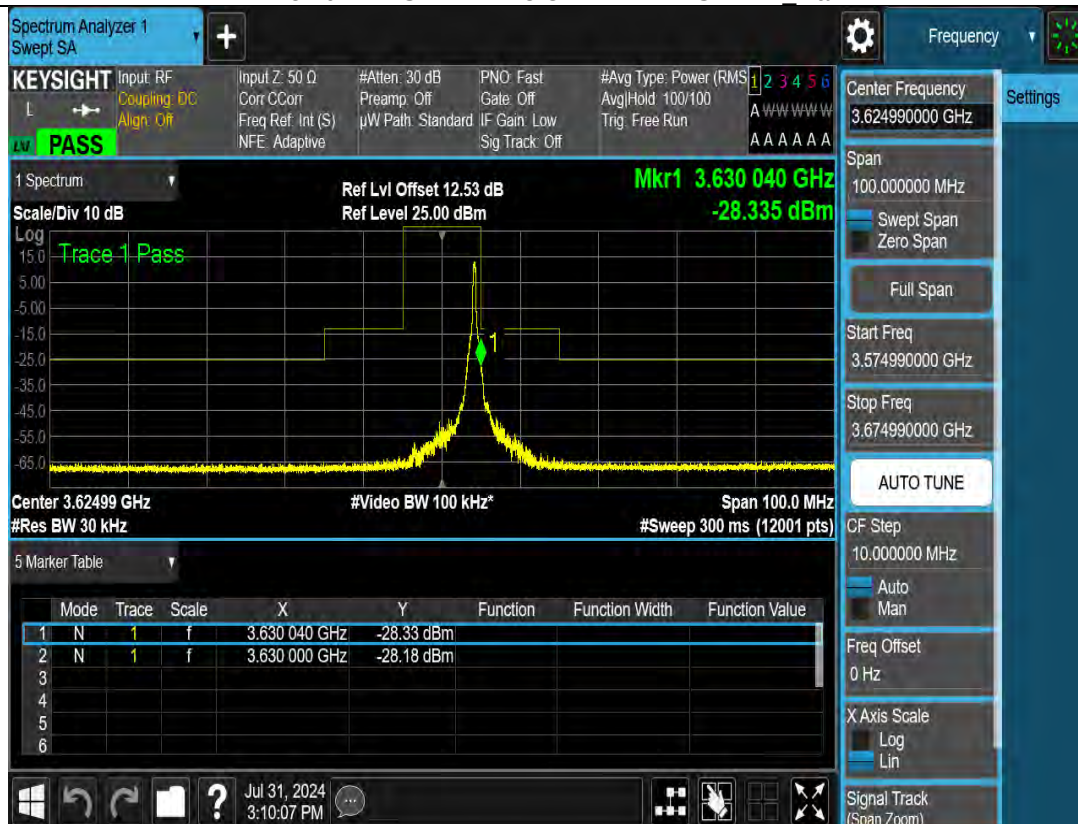
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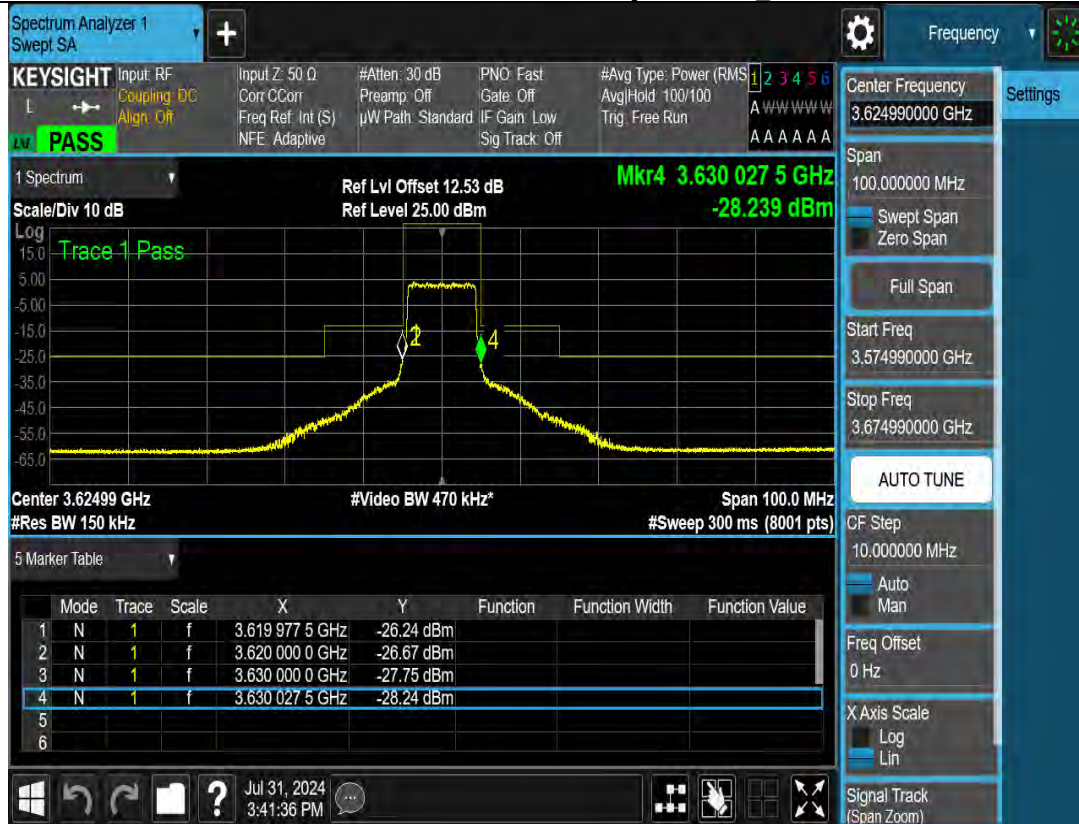
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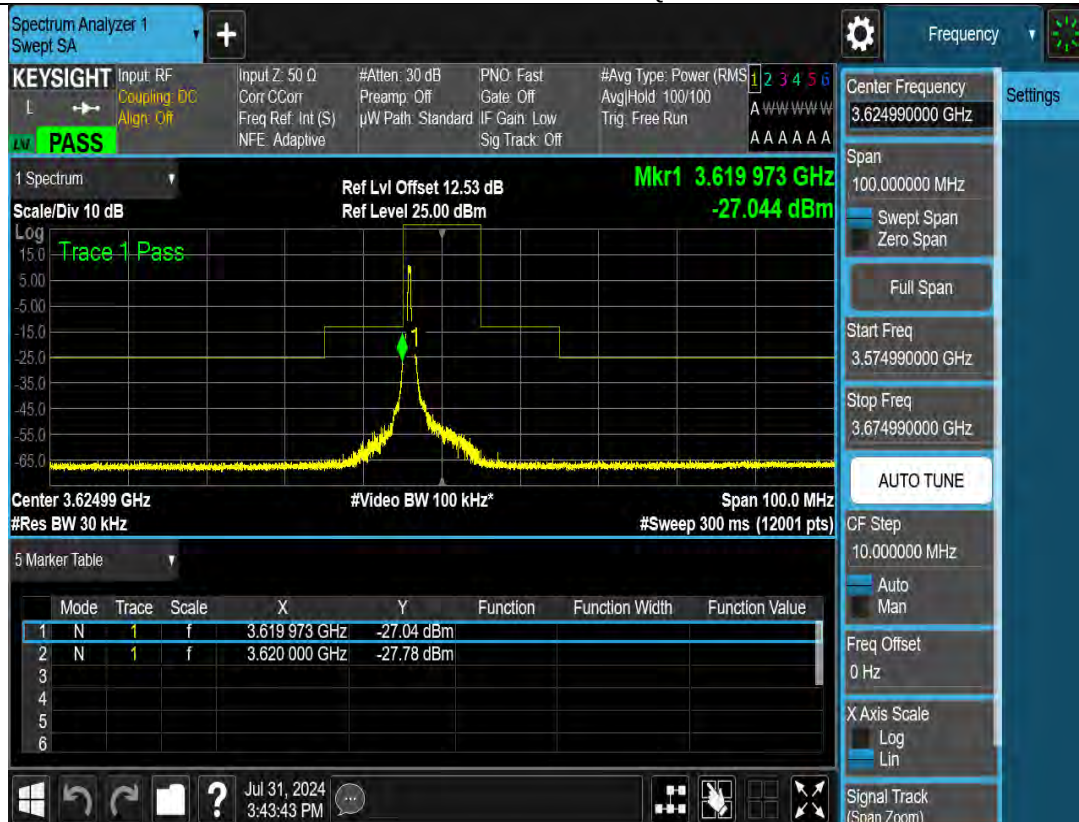
N48-10M-MASK-M-DFT-s-OFDM-Pi2 BPSK-1RB Max



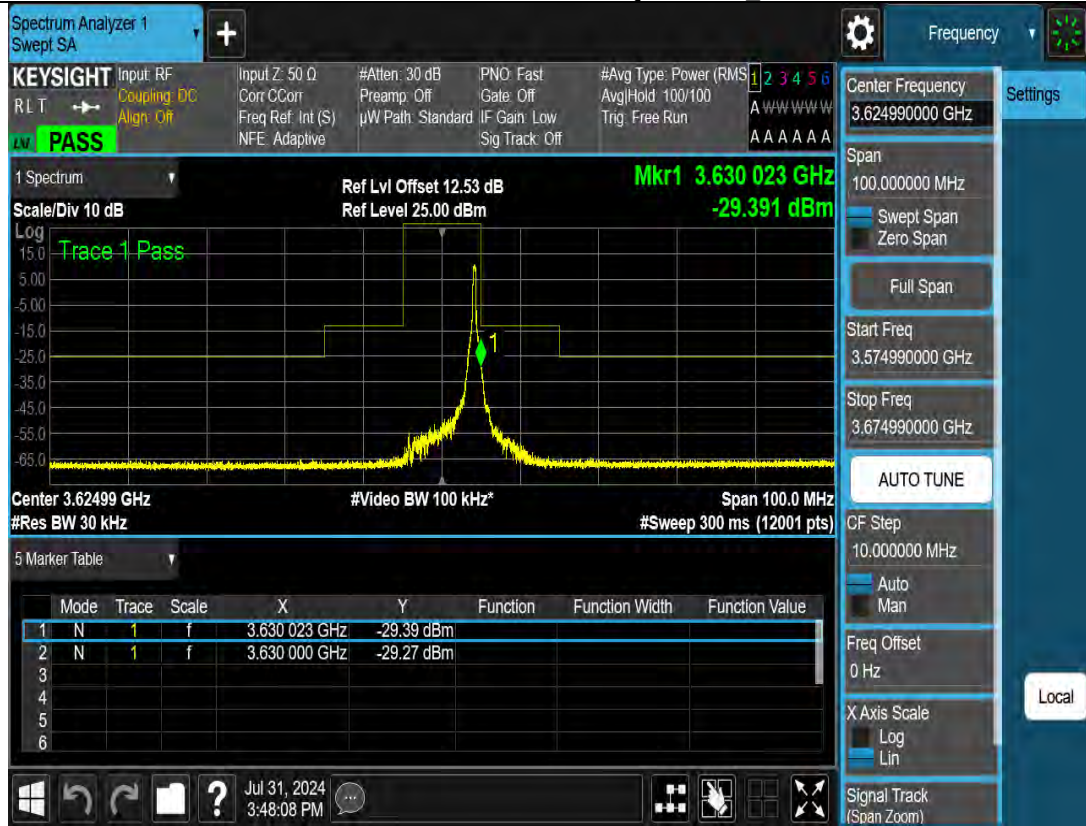
N48-10M-MASK-M-CP-OFDM-QPSK-Outer Full



N48-10M-MASK-M-CP-OFDM-QPSK-1RB0



N48-10M-MASK-M-CP-OFDM-QPSK-1RB Max



N48-10M-MASK-H-DFT-s-OFDM-Pi2 BPSK-Outer Full

