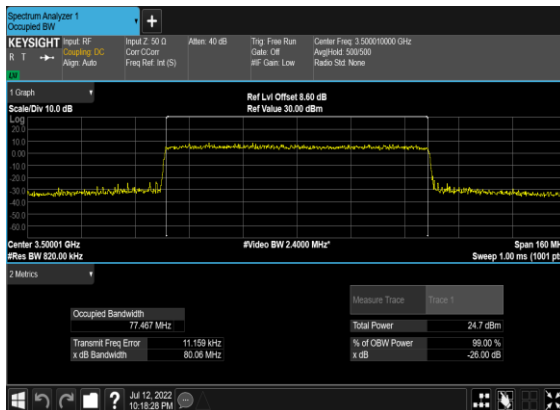
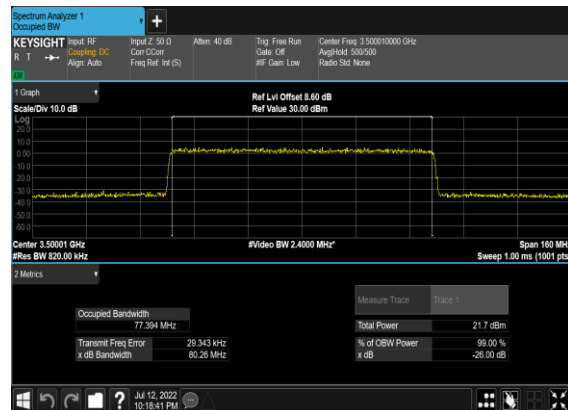


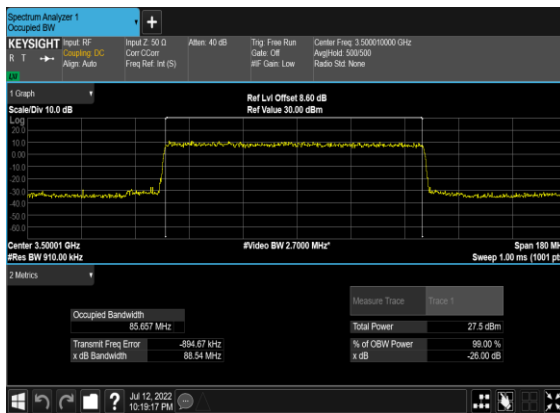
N78(80M)\_CP-OFDM\_64  
QAM\_Outer\_Full\_Mid\_CH



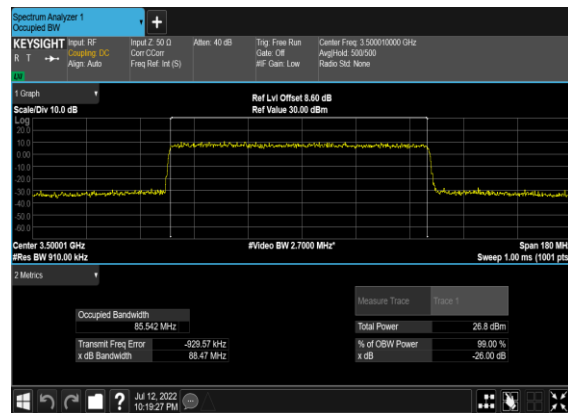
N78(80M)\_CP-OFDM\_256  
QAM\_Outer\_Full\_Mid\_CH



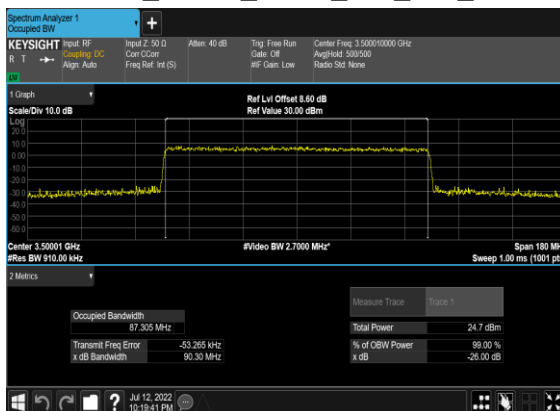
N78(90M)\_DFT-s-OFDM\_PI\_2-  
BPSK\_Outer\_Full\_Mid\_CH



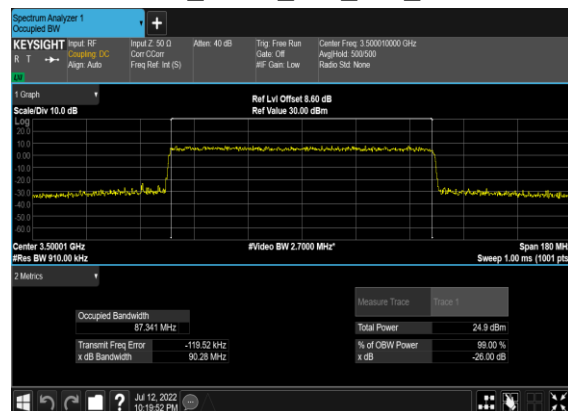
N78(90M)\_DFT-s-  
OFDM\_QPSK\_Outer\_Full\_Mid\_CH



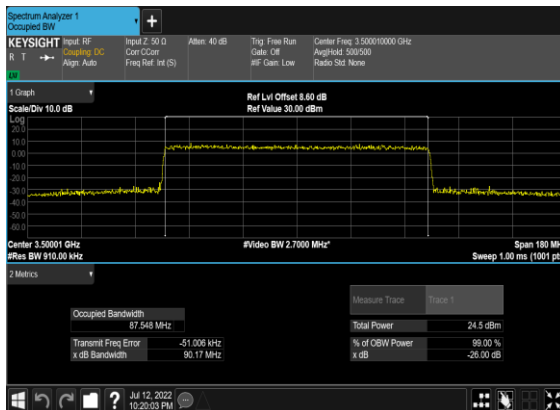
N78(90M)\_CP-  
OFDM\_QPSK\_Outer\_Full\_Mid\_CH



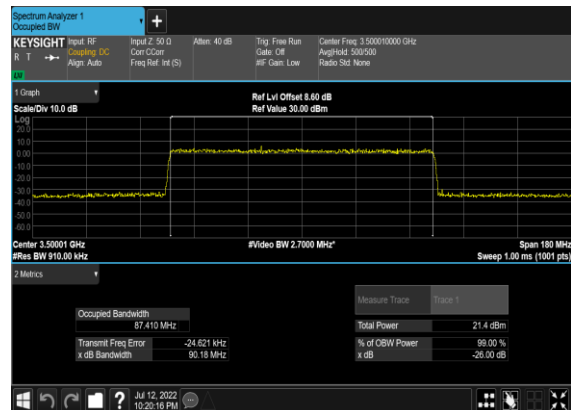
N78(90M)\_CP-OFDM\_16  
QAM\_Outer\_Full\_Mid\_CH



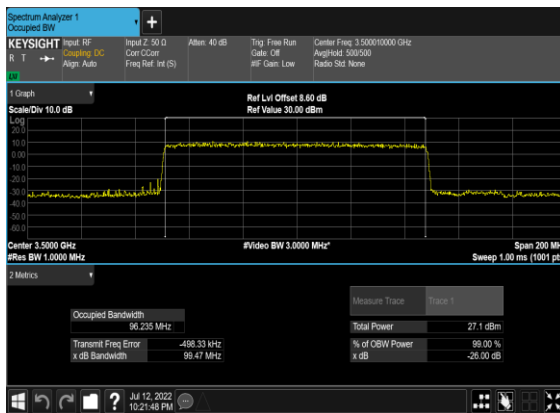
N78(90M)\_CP-OFDM\_64  
QAM\_Outter\_Full\_Mid\_CH



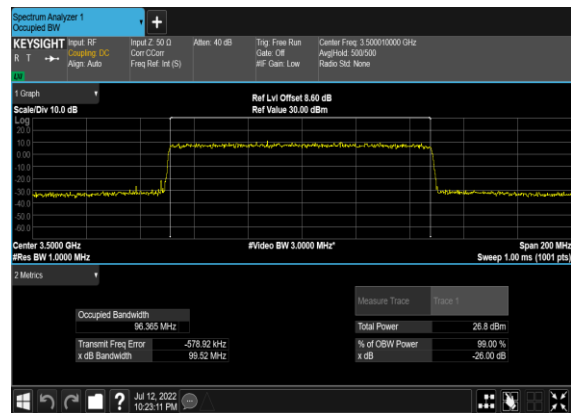
N78(90M)\_CP-OFDM\_256  
QAM\_Outter\_Full\_Mid\_CH



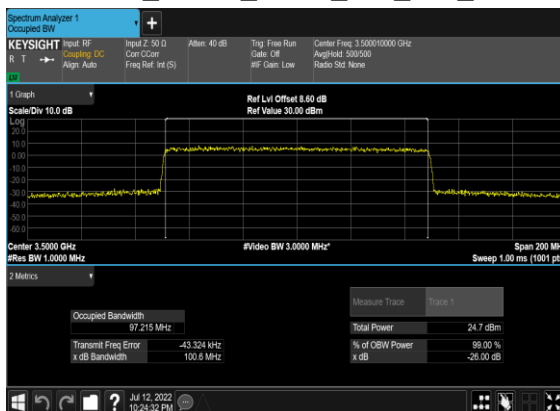
N78(100M)\_DFT-s-OFDM\_PI\_2-  
BPSK\_Outter\_Full\_Mid\_CH



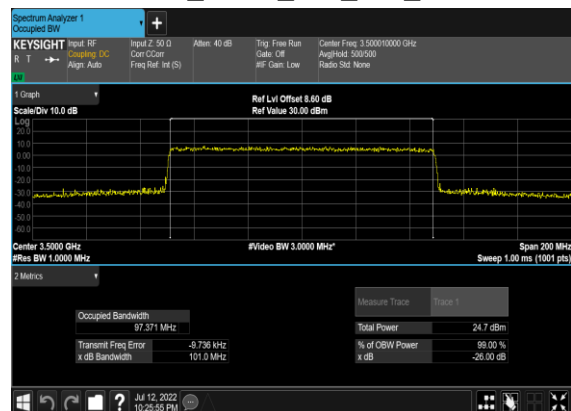
N78(100M)\_DFT-s-  
OFDM\_QPSK\_Outter\_Full\_Mid\_CH



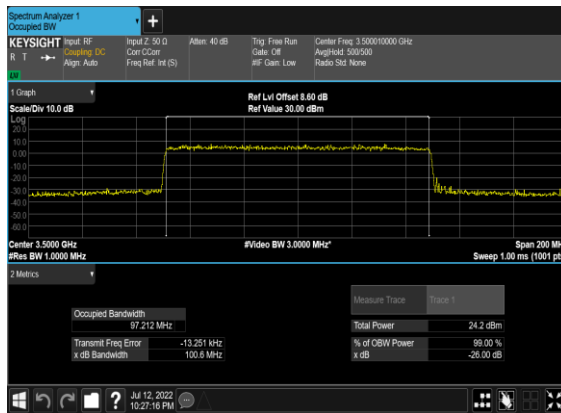
N78(100M)\_CP-  
OFDM\_QPSK\_Outter\_Full\_Mid\_CH



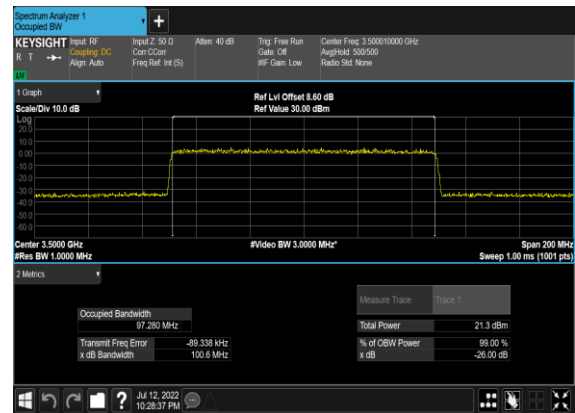
N78(100M)\_CP-OFDM\_16  
QAM\_Outter\_Full\_Mid\_CH



## N78(100M)\_CP-OFDM\_64 QAM\_Outer\_Full\_Mid\_CH



## N78(100M)\_CP-OFDM\_256 QAM\_Outer\_Full\_Mid\_CH



## Conducted Spurious Emissions

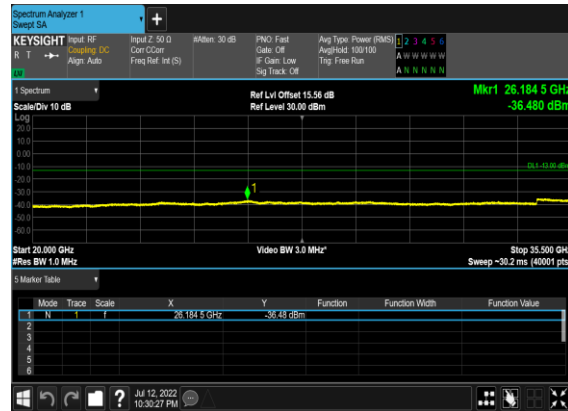
NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	Result	Verdict
78	30	10	630334	3455.01	DFT-s-OFDM BPSK	1@0	see graph	---
78	30	10	630334	3455.01	DFT-s-OFDM BPSK	1@0	see graph	PASS
78	30	10	630334	3455.01	DFT-s-OFDM BPSK	1@0	see graph	PASS
78	30	10	630334	3455.01	DFT-s-OFDM QPSK	1@0	see graph	---
78	30	10	630334	3455.01	DFT-s-OFDM QPSK	1@0	see graph	PASS
78	30	10	630334	3455.01	DFT-s-OFDM QPSK	1@0	see graph	PASS
78	30	10	633334	3500.01	DFT-s-OFDM BPSK	1@0	see graph	---
78	30	10	633334	3500.01	DFT-s-OFDM BPSK	1@0	see graph	PASS
78	30	10	633334	3500.01	DFT-s-OFDM BPSK	1@0	see graph	PASS
78	30	10	633334	3500.01	DFT-s-OFDM QPSK	1@0	see graph	---
78	30	10	633334	3500.01	DFT-s-OFDM QPSK	1@0	see graph	PASS
78	30	10	633334	3500.01	DFT-s-OFDM QPSK	1@0	see graph	PASS
78	30	10	636332	3544.98	DFT-s-OFDM BPSK	1@0	see graph	---
78	30	10	636332	3544.98	DFT-s-OFDM BPSK	1@0	see graph	PASS
78	30	10	636332	3544.98	DFT-s-OFDM BPSK	1@0	see graph	PASS
78	30	10	636332	3544.98	DFT-s-OFDM QPSK	1@0	see graph	---
78	30	10	636332	3544.98	DFT-s-OFDM QPSK	1@0	see graph	PASS
78	30	10	636332	3544.98	DFT-s-OFDM QPSK	1@0	see graph	PASS
78	30	50	631668	3475.02	DFT-s-OFDM BPSK	1@0	see graph	---
78	30	50	631668	3475.02	DFT-s-OFDM BPSK	1@0	see graph	PASS
78	30	50	631668	3475.02	DFT-s-OFDM BPSK	1@0	see graph	PASS
78	30	50	631668	3475.02	DFT-s-OFDM QPSK	1@0	see graph	---

78	30	50	631668	3475.02	DFT-s-OFDM QPSK	1@0	see graph	PASS
78	30	50	631668	3475.02	DFT-s-OFDM QPSK	1@0	see graph	PASS
78	30	50	633334	3500.01	DFT-s-OFDM BPSK	1@0	see graph	---
78	30	50	633334	3500.01	DFT-s-OFDM BPSK	1@0	see graph	PASS
78	30	50	633334	3500.01	DFT-s-OFDM BPSK	1@0	see graph	PASS
78	30	50	633334	3500.01	DFT-s-OFDM QPSK	1@0	see graph	---
78	30	50	633334	3500.01	DFT-s-OFDM QPSK	1@0	see graph	PASS
78	30	50	633334	3500.01	DFT-s-OFDM QPSK	1@0	see graph	PASS
78	30	50	635000	3525.0	DFT-s-OFDM BPSK	1@0	see graph	---
78	30	50	635000	3525.0	DFT-s-OFDM BPSK	1@0	see graph	PASS
78	30	50	635000	3525.0	DFT-s-OFDM BPSK	1@0	see graph	PASS
78	30	50	635000	3525.0	DFT-s-OFDM QPSK	1@0	see graph	---
78	30	50	635000	3525.0	DFT-s-OFDM QPSK	1@0	see graph	PASS
78	30	50	635000	3525.0	DFT-s-OFDM QPSK	1@0	see graph	PASS
78	30	100	633334	3500.01	DFT-s-OFDM BPSK	1@0	see graph	---
78	30	100	633334	3500.01	DFT-s-OFDM BPSK	1@0	see graph	PASS
78	30	100	633334	3500.01	DFT-s-OFDM BPSK	1@0	see graph	PASS
78	30	100	633334	3500.01	DFT-s-OFDM QPSK	1@0	see graph	---
78	30	100	633334	3500.01	DFT-s-OFDM QPSK	1@0	see graph	PASS
78	30	100	633334	3500.01	DFT-s-OFDM QPSK	1@0	see graph	PASS

N78(10M)\_DFT-s-  
OFDM\_BPSK\_Edge\_1RB\_Left\_Low\_CH



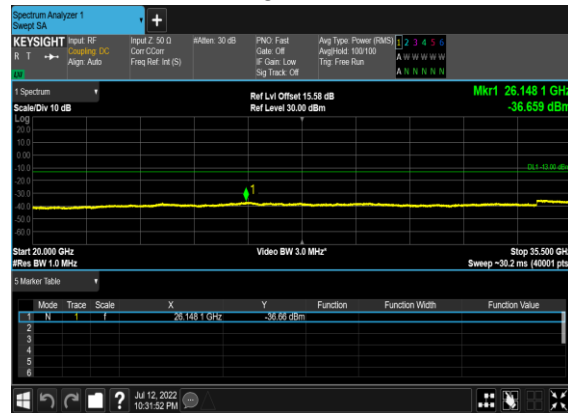
N78(10M)\_DFT-s-  
OFDM\_BPSK\_Edge\_1RB\_Left\_Low\_CH



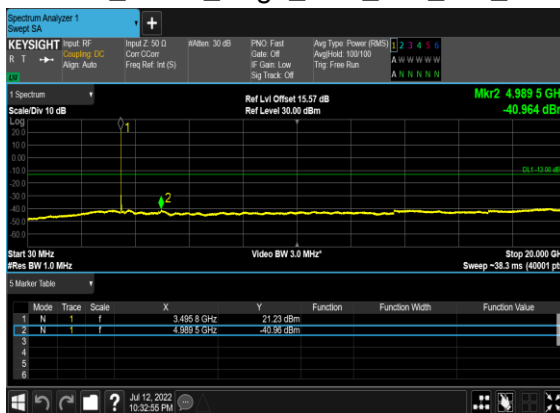
N78(10M)\_DFT-s-  
OFDM\_QPSK\_Edge\_1RB\_Left\_Low\_CH



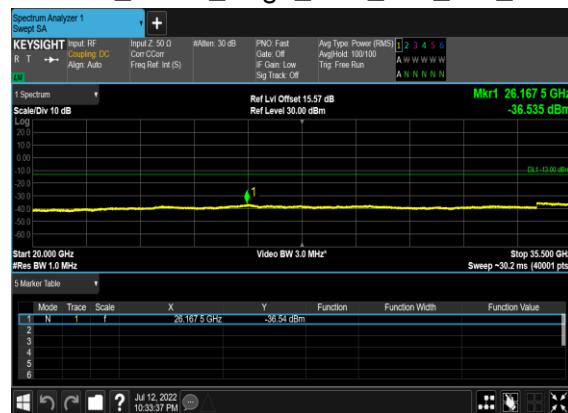
N78(10M)\_DFT-s-  
OFDM\_QPSK\_Edge\_1RB\_Left\_Low\_CH



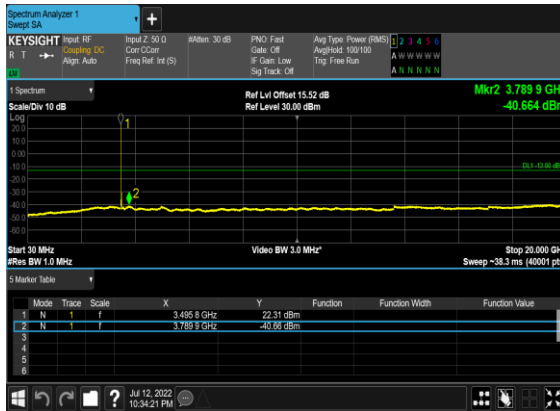
N78(10M)\_DFT-s-  
OFDM\_BPSK\_Edge\_1RB\_Left\_Mid\_CH



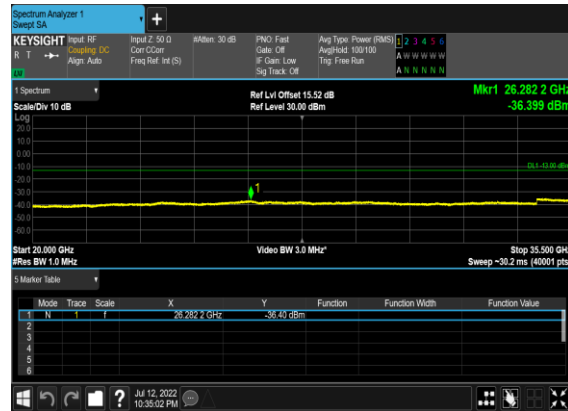
N78(10M)\_DFT-s-  
OFDM\_BPSK\_Edge\_1RB\_Left\_Mid\_CH



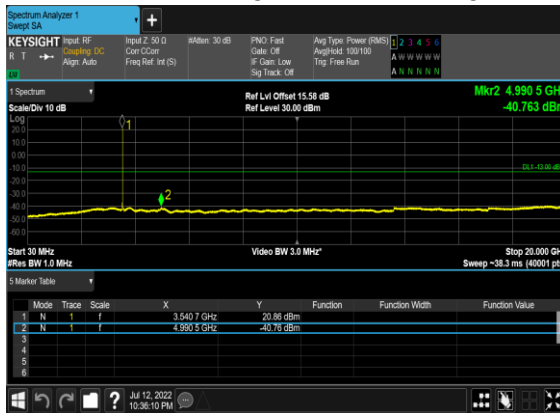
### N78(10M)\_DFT-s-OFDM\_QPSK\_Edge\_1RB\_Left\_Mid\_CH



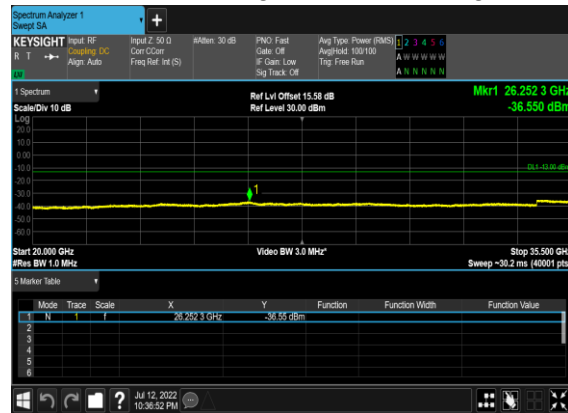
### N78(10M)\_DFT-s-OFDM\_QPSK\_Edge\_1RB\_Left\_Mid\_CH



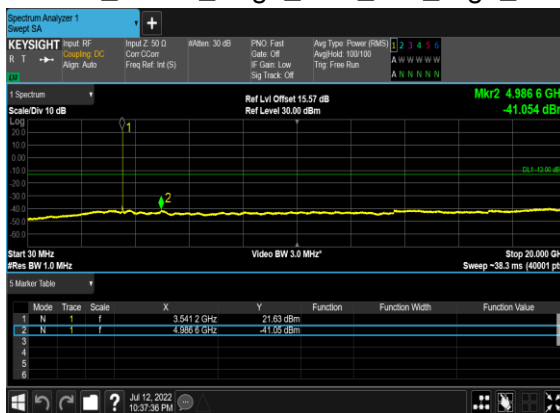
### N78(10M)\_DFT-s-OFDM\_BPSK\_Edge\_1RB\_Left\_High\_CH



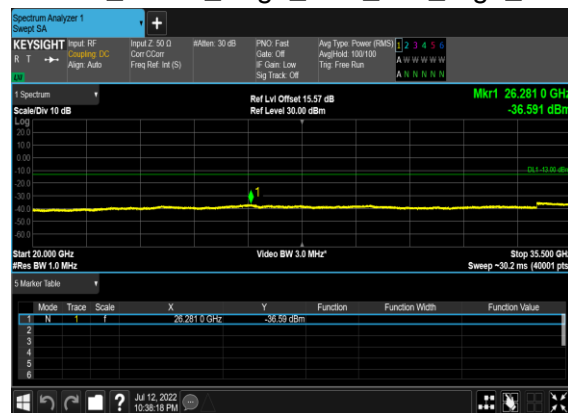
### N78(10M)\_DFT-s-OFDM\_BPSK\_Edge\_1RB\_Left\_High\_CH



### N78(10M)\_DFT-s-OFDM\_QPSK\_Edge\_1RB\_Left\_High\_CH



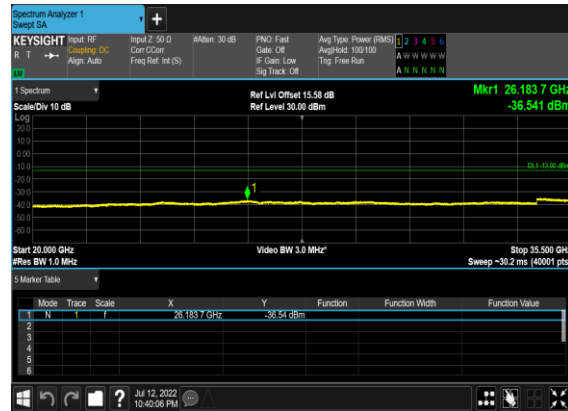
### N78(10M)\_DFT-s-OFDM\_QPSK\_Edge\_1RB\_Left\_High\_CH



N78(50M)\_DFT-s-  
OFDM\_BPSK\_Edge\_1RB\_Left\_Low\_CH



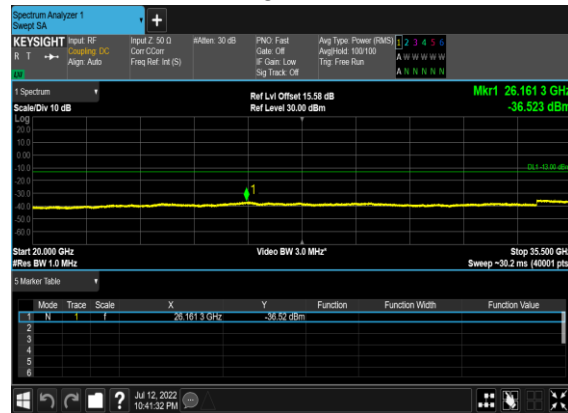
N78(50M)\_DFT-s-  
OFDM\_BPSK\_Edge\_1RB\_Left\_Low\_CH



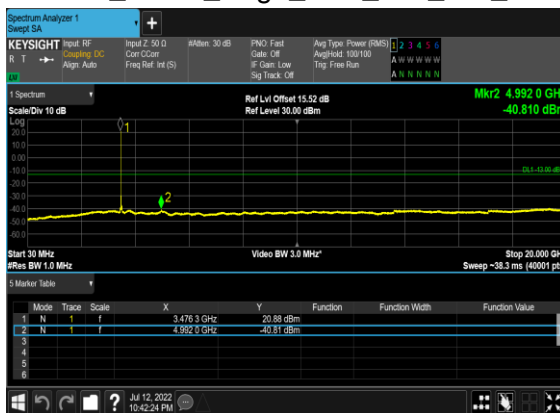
N78(50M)\_DFT-s-  
OFDM\_QPSK\_Edge\_1RB\_Left\_Low\_CH



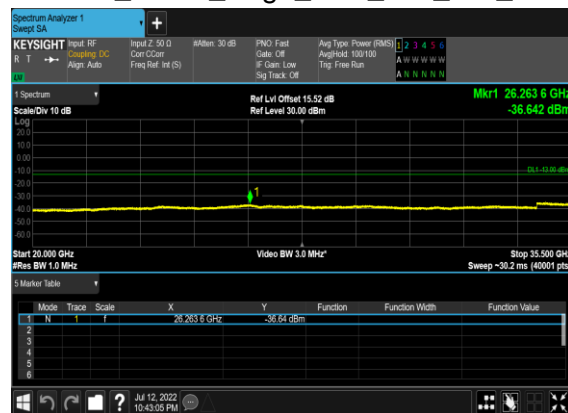
N78(50M)\_DFT-s-  
OFDM\_QPSK\_Edge\_1RB\_Left\_Low\_CH



N78(50M)\_DFT-s-  
OFDM\_BPSK\_Edge\_1RB\_Left\_Mid\_CH



N78(50M)\_DFT-s-  
OFDM\_BPSK\_Edge\_1RB\_Left\_Mid\_CH

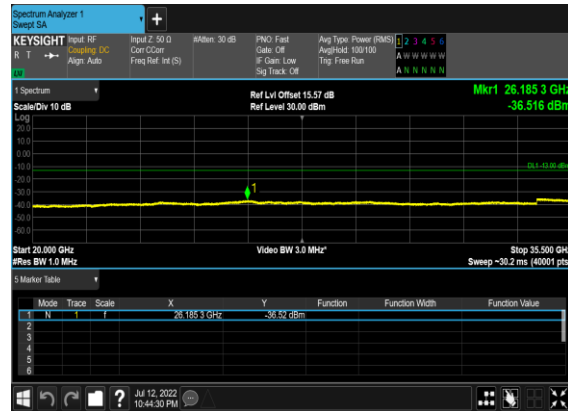




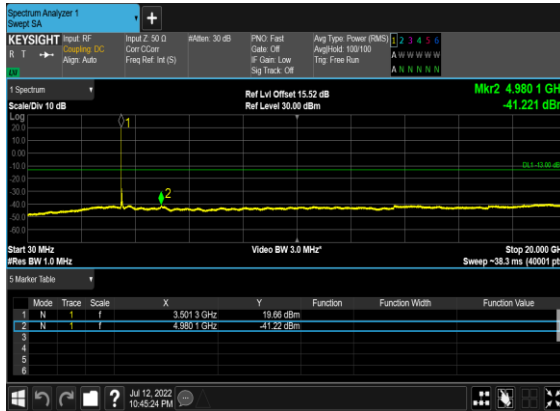
# N78(50M)\_DFT-s- OFDM\_QPSK\_Edge\_1RB\_Left\_Mid\_CH



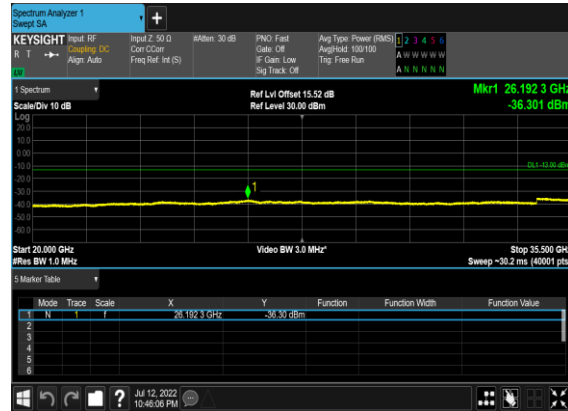
# N78(50M)\_DFT-s- OFDM\_QPSK\_Edge\_1RB\_Left\_Mid\_CH



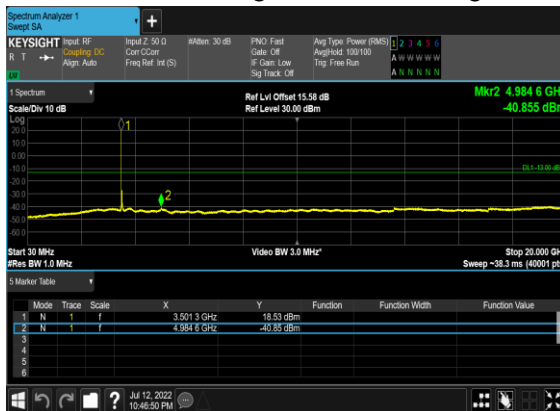
# N78(50M)\_DFT-s- OFDM\_BPSK\_Edge\_1RB\_Left\_High\_CH



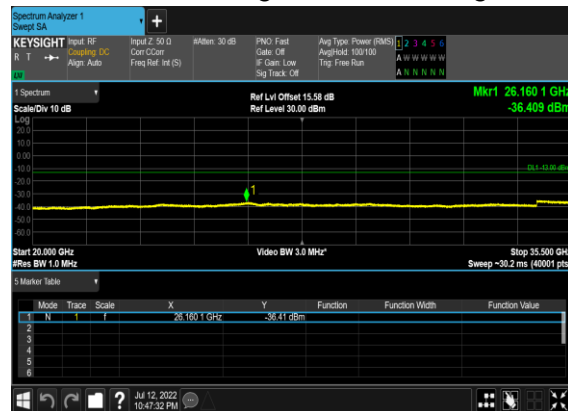
# N78(50M)\_DFT-s- OFDM\_BPSK\_Edge\_1RB\_Left\_High\_CH



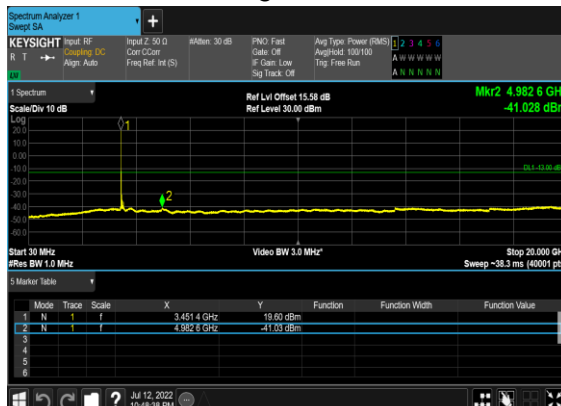
# N78(50M)\_DFT-s- OFDM\_QPSK\_Edge\_1RB\_Left\_High\_CH



# N78(50M)\_DFT-s- OFDM\_QPSK\_Edge\_1RB\_Left\_High\_CH



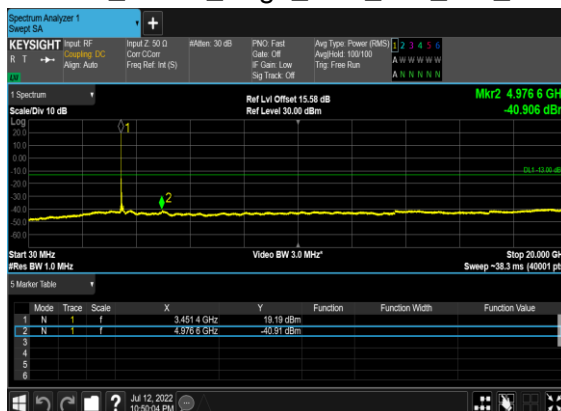
# N78(100M)\_DFT-s- OFDM\_BPSK\_Edge\_1RB\_Left\_Mid\_CH



# N78(100M)\_DFT-s- OFDM\_BPSK\_Edge\_1RB\_Left\_Mid\_CH



# N78(100M)\_DFT-s- OFDM\_QPSK\_Edge\_1RB\_Left\_Mid\_CH



# N78(100M)\_DFT-s- OFDM\_QPSK\_Edge\_1RB\_Left\_Mid\_CH



## Conducted Band Edge

NR Band	SCS (kHz)	Bandwidth (MHz)	Arfcn	Freq (MHz)	Modulation	RB	Result	Verdict
78	30	10	630334	3455.01	DFT-s-OFDM BPSK	1@0	see graph	PASS
78	30	10	630334	3455.01	DFT-s-OFDM QPSK	1@0	see graph	PASS
78	30	10	630334	3455.01	DFT-s-OFDM BPSK	24@0	see graph	PASS
78	30	10	630334	3455.01	DFT-s-OFDM QPSK	24@0	see graph	PASS
78	30	10	636332	3544.98	DFT-s-OFDM BPSK	1@23	see graph	PASS
78	30	10	636332	3544.98	DFT-s-OFDM QPSK	1@23	see graph	PASS
78	30	10	636332	3544.98	DFT-s-OFDM BPSK	24@0	see graph	PASS
78	30	10	636332	3544.98	DFT-s-OFDM QPSK	24@0	see graph	PASS
78	30	50	631668	3475.02	DFT-s-OFDM BPSK	1@0	see graph	PASS
78	30	50	631668	3475.02	DFT-s-OFDM QPSK	1@0	see graph	PASS
78	30	50	631668	3475.02	DFT-s-OFDM BPSK	128@0	see graph	PASS
78	30	50	631668	3475.02	DFT-s-OFDM QPSK	128@0	see graph	PASS
78	30	50	635000	3525.0	DFT-s-OFDM BPSK	1@132	see graph	PASS
78	30	50	635000	3525.0	DFT-s-OFDM QPSK	1@132	see graph	PASS
78	30	50	635000	3525.0	DFT-s-OFDM BPSK	128@0	see graph	PASS
78	30	50	635000	3525.0	DFT-s-OFDM QPSK	128@0	see graph	PASS
78	30	100	633334	3500.01	DFT-s-OFDM BPSK	1@0	see graph	PASS
78	30	100	633334	3500.01	DFT-s-OFDM QPSK	1@0	see graph	PASS
78	30	100	633334	3500.01	DFT-s-OFDM BPSK	1@272	see graph	PASS
78	30	100	633334	3500.01	DFT-s-OFDM QPSK	1@272	see graph	PASS
78	30	100	633334	3500.01	DFT-s-OFDM BPSK	270@0	see graph	PASS
78	30	100	633334	3500.01	DFT-s-OFDM QPSK	270@0	see graph	PASS

The screenshot shows a Spectrum Analyzer interface. At the top, there are tabs for "Emissions 1", "Night", "RF", "Caching DC", and "Align Auto". The main display area shows a frequency plot with a peak at 400 MHz. The plot is labeled "400 MHz" and "Stop 3.550 GHz". Below the plot, there is a table of signal parameters.

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	QLimit
1	1	3.45001 GHz	3.45501 GHz	1.000 MHz	3.452500000 GHz	-26.50 dBm	-24.50 dB
2	2	3.44500 GHz	3.44900 GHz	510.0 kHz	3.446873333 GHz	-26.32 dBm	-13.32 dB
3	3	3.44800 GHz	3.45000 GHz	100.0 kHz	3.449678333 GHz	-23.75 dBm	-10.75 dB
4	4	3.45000 GHz	3.45500 GHz	100.0 kHz	3.450683333 GHz	-16.01 dBm	-13.39 dB

At the bottom of the screen, there is a status bar showing the date and time: "Jul 12, 2022 10:51:48 PM".

**KEYSIGHT** Input: RF Coupling: DC Span: Auto Ref Level Offset: 15.00 dB Ref Value: 30.00 dBm

**3.450 GHz** **Scale Div: 10.0 dB**

**Start: 3.450 GHz** **Stop: 3.550 GHz**

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Limit
1	3	3.4500 GHz	3.4550 GHz	1000 MHz	3.449300000 GHz	-33.16 dBm	-20.16 dBm
2	2	3.4450 GHz	3.4490 GHz	510.0 MHz	3.448826667 GHz	-22.29 dBm	-9.289 dBm
3	3	3.4490 GHz	3.4500 GHz	100.0 MHz	3.449853333 GHz	-23.02 dBm	-10.02 dBm
4	4	3.4500 GHz	3.5500 GHz	100.0 MHz	3.450833333 GHz	15.36 dBm	-14.62 dBm

**KEYSIGHT** Spectrum Analyzer 1  
Spurious Emissions

Input: RF    Coupling: DC    Att: 30 dB    Trig: Free Run    Center Freq: 22.05000000 GHz  
 R T    Auto    Cor: C-Cor    Gate: Off    F. Gain: Low    Aref: 100 dB    Ratio Std: None  
**PASS**

3 All Range Graph    Ref Lvl Offset: 15.59 dBm  
 Scale Div: 10.0 dB    Ref Value: 20.00 dBm

Start 3.400 GHz    Stop 3.550 GHz

4 All Range Table    Measure Trace    Trace Type    Trace Average (Active)

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	Offset
1	1	3.4000 GHz	3.4450 GHz	1000 MHz	3.442425000 GHz	-31.05 dBm	-16.10 dB
2	2	3.4450 GHz	3.4490 GHz	510.0 MHz	3.448473333 GHz	-29.80 dBm	-16.60 dB
3	3	3.4490 GHz	3.4500 GHz	100.0 MHz	3.449891667 GHz	-30.82 dBm	-17.82 dB
4	4	3.4500 GHz	3.5500 GHz	100.0 MHz	3.452333333 GHz	-3.14 dBm	-28.09 dB

**KEYSIGHT** Input: RF Output: DC Att: 30 dB Trig: Free Run Gate: Off F: Gain: Low Center Freq: 22.00000000 GHz Aref: 100.0 dB Ratio Std: None

**Log** **PASS**

4 All Range Graph

Scale Div 10.0 dB

Ref Lvl Offset: 15.57 dBm  
Ref Value: 30.00 dBm

Start 3.400 GHz Stop 3.500 GHz

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	ΔLimit
1	1	3.42000 GHz	3.42500 GHz	1000 MHz	3.444792000 GHz	-26.95 dBm	-16.95 dB
2	2	3.44500 GHz	3.44800 GHz	510.0 MHz	3.448696667 GHz	-26.55 dBm	-13.55 dB
3	3	3.44800 GHz	3.45000 GHz	100.0 MHz	3.449785000 GHz	-34.61 dBm	-21.61 dB
4	4	3.45000 GHz	3.50000 GHz	100.0 MHz	3.451900000 GHz	-2.992 dBm	-27.41 dB

**Spectrum Analyzer 1**  
Source: Emulation

**KEYSIGHT** Input RF  
H T  $\rightarrow$  Coupling DC  
Align: Auto

**PASS**

3 dB Range Graph  
Scale/Div 10.0 dB

Ref Lvl Offset 15.53 dB  
Ref Value 30.00 dBm

Start 3.450 GHz  
Stop 3.600 GHz

4 All Range Table

		Measure Trace					Trace Type		Trace Average (Active)	
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	$\Delta$ Unit			
1	3.4500 GHz	3.4500 GHz	100.0 MHz	3.451966667 GHz	-15.84 dBm	-14.18 dB				
2	3.5500 GHz	3.5510 GHz	100.0 MHz	3.550100000 GHz	-18.84 dBm	-5.838 dB				
3	3.5510 GHz	3.5550 GHz	510.0 kHz	3.552600000 GHz	-16.42 dBm	-3.419 dB				
4	3.5550 GHz	3.6000 GHz	1.000 MHz	3.563400000 GHz	-26.17 dBm	-13.17 dB				

Jul 12, 2022  
10:54:38 PM

Spectrum Analyzer 1  
Spurious Emissions

KEYSIGHT Input RF  
R T  $\rightarrow$   $\leftarrow$   $\rightarrow$   $\leftarrow$   
Align: Auto  
**dB PASS**

Input2: 2.50 D  
Corr CCoar  
Freq Ref: Int (S)

Atten: 30 dB

Trig: Free Run  
Gate: Off  
IF Gain: Low

Center Freq: 22.000000000 GHz  
Avg/Hz: 100/100  
Radio Std: None

3.4k Range Graph  
Scale/Div: 10.0 dB  
Ref Lvl Offset: 15.58 dB  
Ref Value: 30.00 dBm

Start 3.450 GHz  
Stop 3.600 GHz

4.0k Range Table

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	dBSm
1	3.5500 GHz	3.5500 GHz	100.0 MHz	3.550000000 GHz	10.00 dBm	-15.15 dB	
2	3.5500 GHz	3.5510 GHz	100.0 MHz	3.550133333 GHz	-23.37 dBm	-10.57 dB	
3	3.5510 GHz	3.5550 GHz	510.0 kHz	3.551083333 GHz	-22.19 dBm	-8.190 dB	
4	3.5550 GHz	3.6000 GHz	1.000 MHz	3.557475000 GHz	-41.49 dBm	-28.49 dB	

Measure Trace  
Trace Type  
Trace Average (Active)

Jul 12, 2002 10:55:06 PM

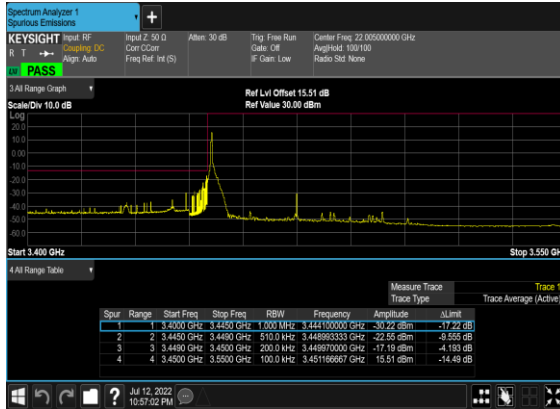
N78(10M)\_DFT-s-  
OFDM\_BPSK\_Outer\_Full\_High\_CH



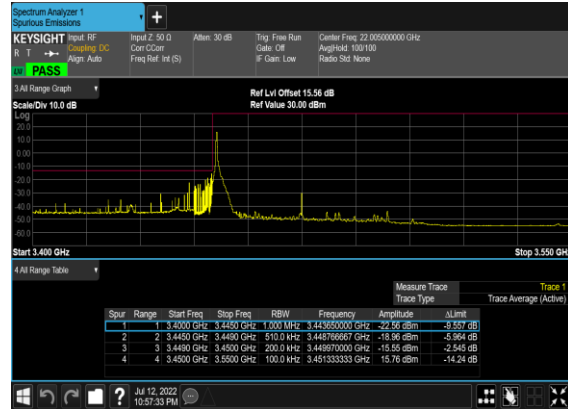
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OFDM\_QPSK\_Outer\_Full\_High\_CH



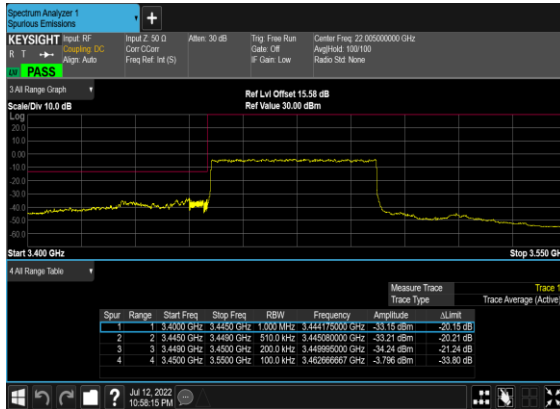
N78(50M)\_DFT-s-  
OFDM\_BPSK\_Edge\_1RB\_Left\_Low\_CH



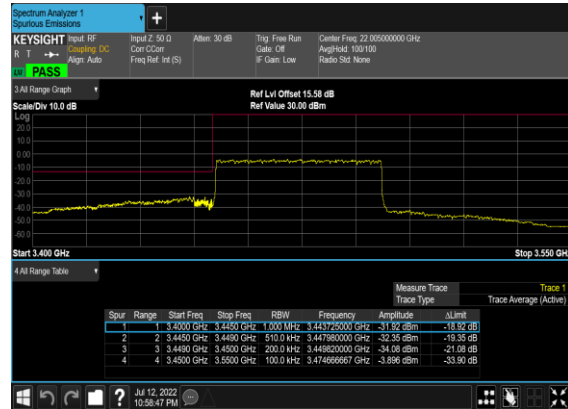
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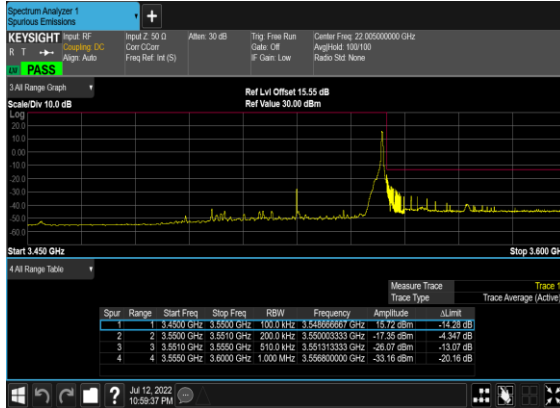
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OFDM\_BPSK\_Outer\_Full\_Low\_CH



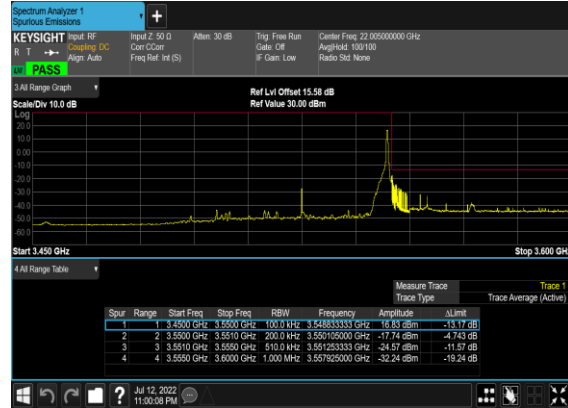
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OFDM\_QPSK\_Outer\_Full\_Low\_CH



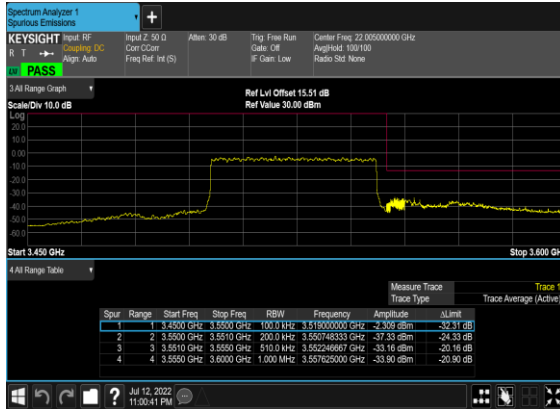
### N78(50M)\_DFT-s-OFDM\_BPSK\_Edge\_1RB\_Right\_High\_CH



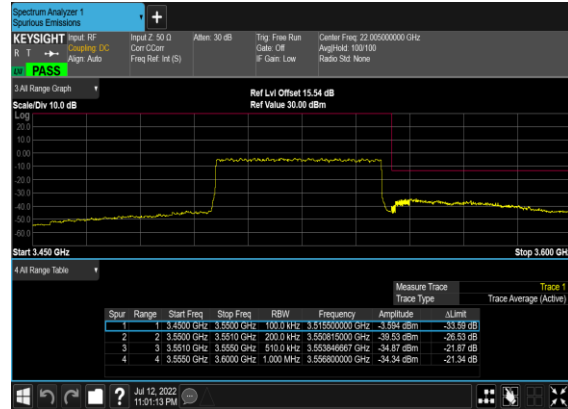
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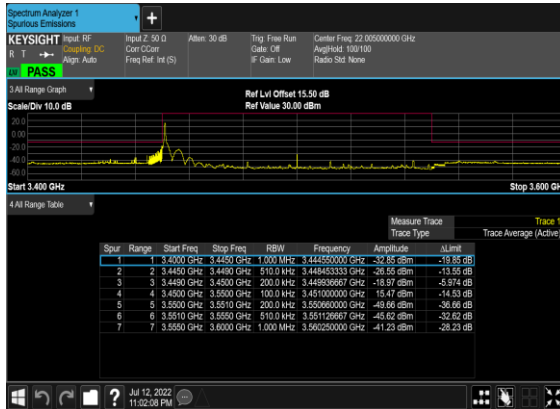
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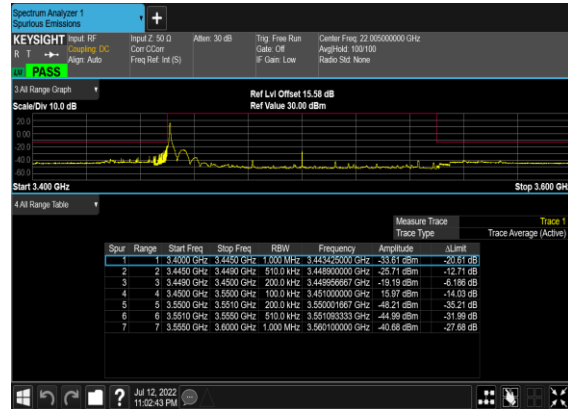
### N78(50M)\_DFT-s-OFDM\_QPSK\_Outer\_Full\_High\_CH



### N78(100M)\_DFT-s-OFDM\_BPSK\_Edge\_1RB\_Left\_Mid\_CH



### N78(100M)\_DFT-s-OFDM\_QPSK\_Edge\_1RB\_Left\_Mid\_CH



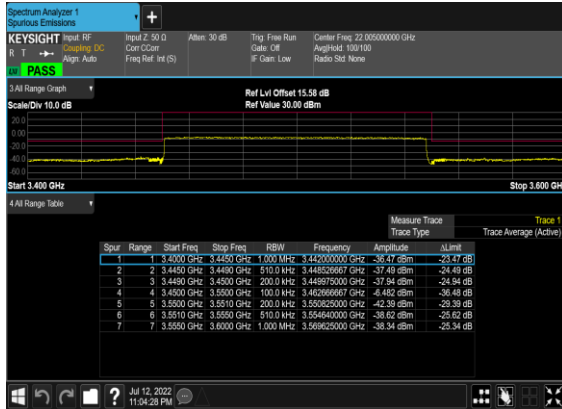
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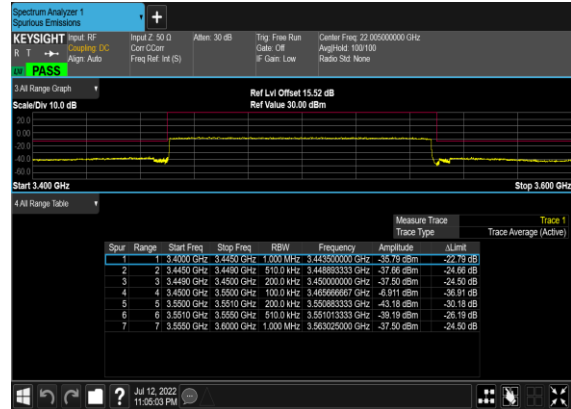
## N78(100M)\_DFT-s-OFDM\_QPSK\_Edge\_1RB\_Right\_Mid\_CH



## N78(100M)\_DFT-s-OFDM\_BPSK\_Outer\_Full\_Mid\_CH



## N78(100M)\_DFT-s-OFDM\_QPSK\_Outer\_Full\_Mid\_CH



## Appendix B. Test Results of Radiated Test

### Radiated Spurious Emission

<b>Test Engineer :</b>	Kuang Jia and Wenbo Xiao	<b>Temperature :</b>	22~25°C
		<b>Relative Humidity :</b>	48~52%

Note: Pre-scanned harmonic for testing, we choose the worst antenna mode to test.

SA n78 / 100MHz / QPSK / ANT13									
Channel	Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)
Middle	7000.20	-59.40	-13	-46.40	-64.52	-62.70	8.30	11.60	H
	10050.30	-56.97	-13	-43.97	-66.94	-58.49	10.48	12.00	H
	13550.30	-54.99	-13	-41.99	-67.33	-56.69	11.80	13.50	H
	7000.20	-59.24	-13	-46.24	-64.54	-62.54	8.30	11.60	V
	10050.30	-58.35	-13	-45.35	-66.9	-59.87	10.48	12.00	V
	13550.30	-55.72	-13	-42.72	-67.14	-57.42	11.80	13.50	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.

EN-DC 41A_n78A / 20MHz + 100MHz / QPSK / ANT31+ANT13									
Channel	Frequency ( MHz )	EIRP ( dBm )	Limit ( dBm )	Over Limit ( dB )	SPA Reading (dBm)	S.G. Power ( dBm )	TX Cable loss ( dB )	TX Antenna Gain (dBi)	Polarization (H/V)
n78 Middle	7000.20	-57.55	-13	-44.55	-79.83	-60.85	8.30	11.60	H
	10050.30	-53.02	-13	-40.02	-79.98	-54.54	10.48	12.00	H
	13550.30	-49.56	-13	-36.56	-81.01	-51.26	11.80	13.50	H
	7000.20	-57.14	-13	-44.14	-79.6	-60.44	8.30	11.60	V
	10050.30	-54.35	-13	-41.35	-79.89	-55.87	10.48	12.00	V
	13550.30	-50.47	-13	-37.47	-81.00	-52.17	11.80	13.50	V
B41 Middle	5168.18	-60.97	-25	-35.97	-80.62	-66.53	7.14	12.70	H
	7752.27	-55.93	-25	-30.93	-79.22	-59.23	8.30	11.60	H
	10336.36	-53.00	-25	-28.00	-79.91	-54.52	10.48	12.00	H
	5168.18	-60.98	-25	-35.98	-80.31	-66.54	7.14	12.70	V
	7752.27	-55.28	-25	-30.28	-79.21	-58.58	8.30	11.60	V
	10336.36	-54.06	-25	-29.06	-79.97	-55.58	10.48	12.00	V

Remark: Spurious emissions within 30-1000MHz were found more than 20dB below limit line.