

Ant. TX 2



Ant. TX 3



10MHz
Ant. TX 0



Ant. TX 1



Ant. TX 2



Ant. TX 3



15MHz
Ant. TX 0



Ant. TX 1



Ant. TX 2



Ant. TX 3



20MHz
Ant. TX 0



Ant. TX 1



Ant. TX 2



Ant. TX 3



Band n70
Single Carrier

5MHz
Ant. TX 0



Ant. TX 1



Ant. TX 2



Ant. TX 3



10MHz
Ant. TX 0



Ant. TX 1



Ant. TX 2



Ant. TX 3



15MHz Ant. TX 0



Ant. TX 1



Ant. TX 2



Ant. TX 3



20MHz
Ant. TX 0



Ant. TX 1



Ant. TX 2



Ant. TX 3

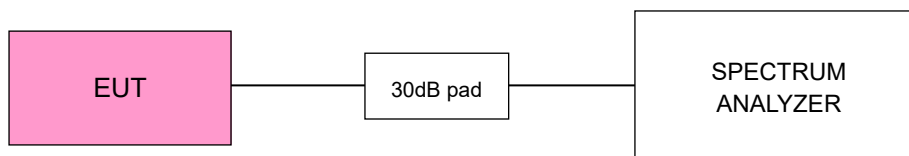


4.6 Peak to Average Ratio

4.6.1 Limits of Peak to Average Ratio Measurement

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB

4.6.2 Test Setup



4.6.3 Test Procedures

1. Set resolution/measurement bandwidth $\geq$ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

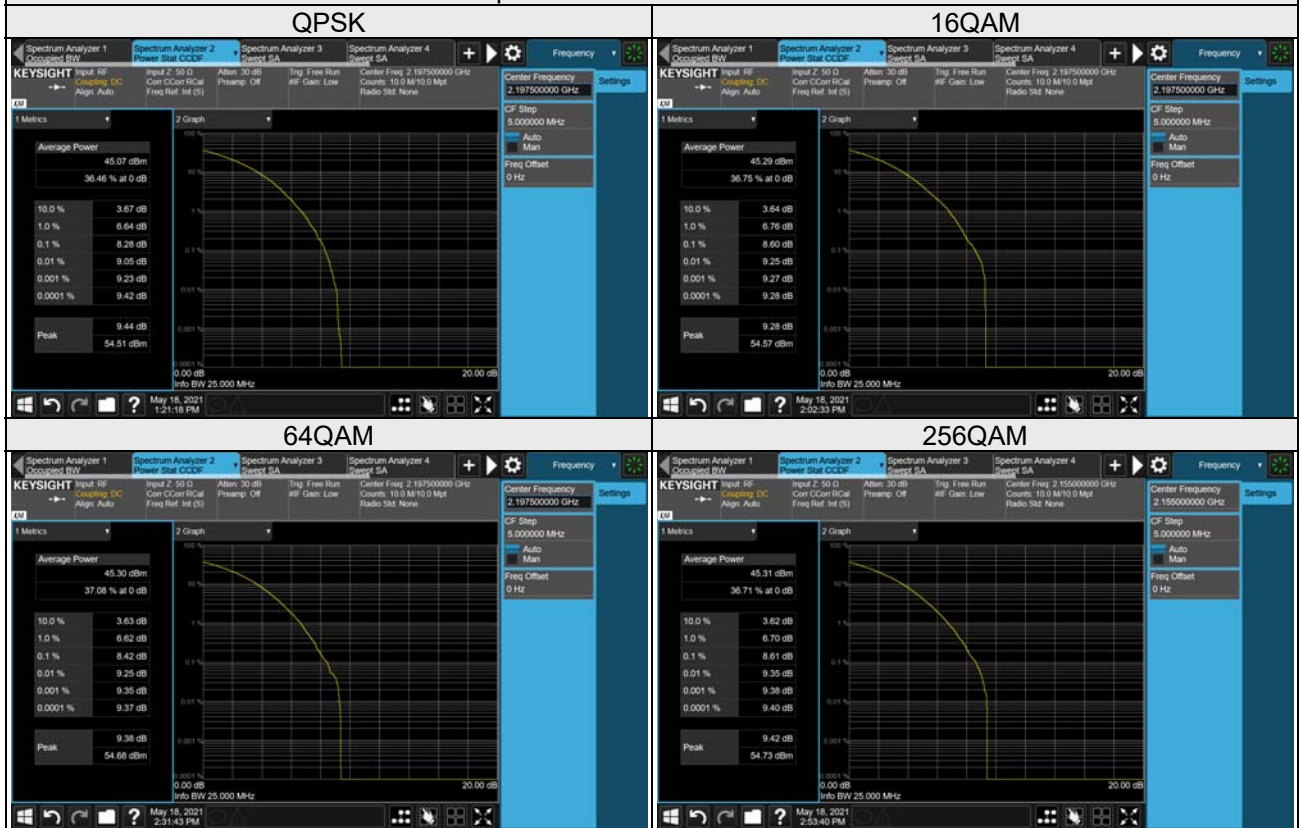
4.6.4 Test Results

Band n66 Single Carrier

5MHz

Channel Number	Freq. (MHz)	Peak-to-Average Power Ratio (dB)															
		Ant. TX0				Ant. TX1				Ant. TX2				Ant. TX3			
		QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
422500	2112.5	8.25	8.58	8.28	8.57	8.26	8.55	8.28	8.55	8.26	8.58	8.30	8.59	8.28	8.58	8.25	8.57
431000	2155	8.25	8.53	8.39	8.61	8.25	8.52	8.36	8.60	8.23	8.53	8.41	8.57	8.24	8.55	8.32	8.58
439500	2197.5	8.28	8.60	8.42	8.56	8.26	8.57	8.37	8.55	8.25	8.59	8.33	8.55	8.26	8.57	8.35	8.56

Spectrum Plot of Worst Value



10MHz

Channel Number	Freq. (MHz)	Peak-to-Average Power Ratio (dB)															
		Ant. TX0				Ant. TX1				Ant. TX2				Ant. TX3			
		QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
423000	2115	7.51	7.52	7.46	7.52	7.51	7.50	7.47	7.52	7.52	7.48	7.46	7.52	7.52	7.50	7.46	7.50
431000	2155	7.52	7.51	7.47	8.15	7.53	7.50	7.48	8.14	7.55	7.51	7.51	7.96	7.56	7.49	7.46	7.95
439000	2195	7.50	7.47	7.47	7.85	7.50	7.48	7.47	7.78	7.48	7.46	7.48	7.78	7.50	7.48	7.49	7.78

Spectrum Plot of Worst Value

QPSK



16QAM



64QAM



256QAM



15MHz

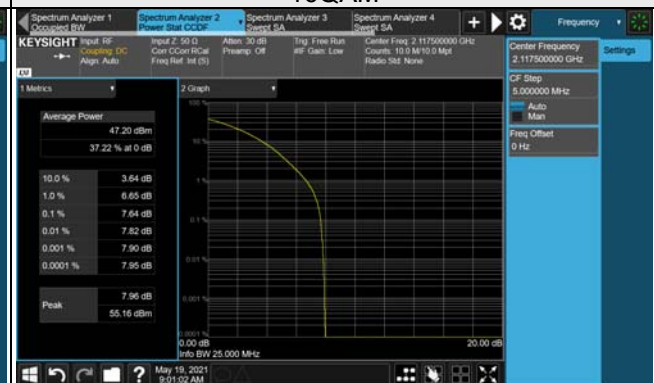
Channel Number	Freq. (MHz)	Peak-to-Average Power Ratio (dB)															
		Ant. TX0				Ant. TX1				Ant. TX2				Ant. TX3			
		QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
423500	2117.5	7.69	7.63	7.56	7.59	7.73	7.64	7.56	7.57	7.70	7.62	7.57	7.58	7.69	7.64	7.56	7.58
431000	2155	7.67	7.63	7.63	7.66	7.68	7.63	7.64	7.63	7.67	7.62	7.64	7.60	7.68	7.61	7.63	7.61
438500	2192.5	7.66	7.58	7.61	7.60	7.65	7.57	7.59	7.58	7.64	7.59	7.63	7.58	7.64	7.58	7.61	7.58

Spectrum Plot of Worst Value

QPSK



16QAM



64QAM



256QAM



20MHz

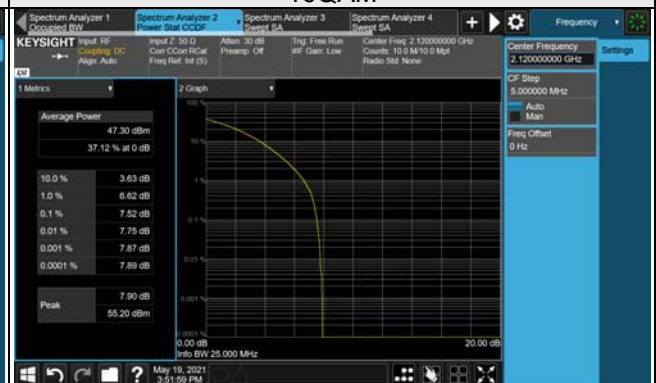
Channel Number	Freq. (MHz)	Peak-to-Average Power Ratio (dB)															
		Ant. TX0				Ant. TX1				Ant. TX2				Ant. TX3			
		QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
424000	2120	7.57	7.52	7.53	7.53	7.55	7.50	7.53	7.52	7.57	7.52	7.54	7.53	7.55	7.50	7.53	7.52
431000	2155	7.53	7.49	7.95	7.51	7.55	7.50	7.54	7.50	7.55	7.48	7.87	7.50	7.55	7.50	7.54	7.50
438000	2190	7.58	7.47	7.55	7.51	7.55	7.50	7.50	7.50	7.57	7.48	7.50	7.50	7.55	7.50	7.50	7.50

Spectrum Plot of Worst Value

QPSK



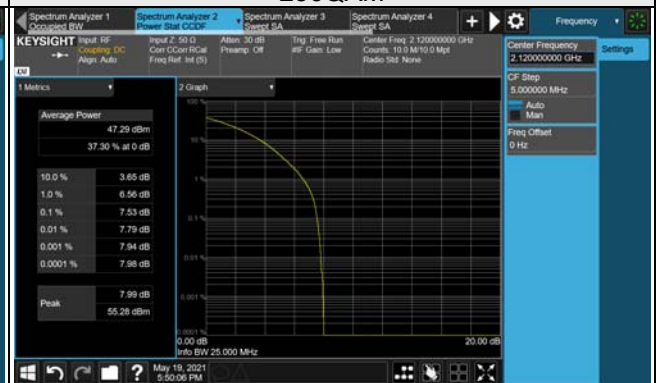
16QAM



64QAM



256QAM

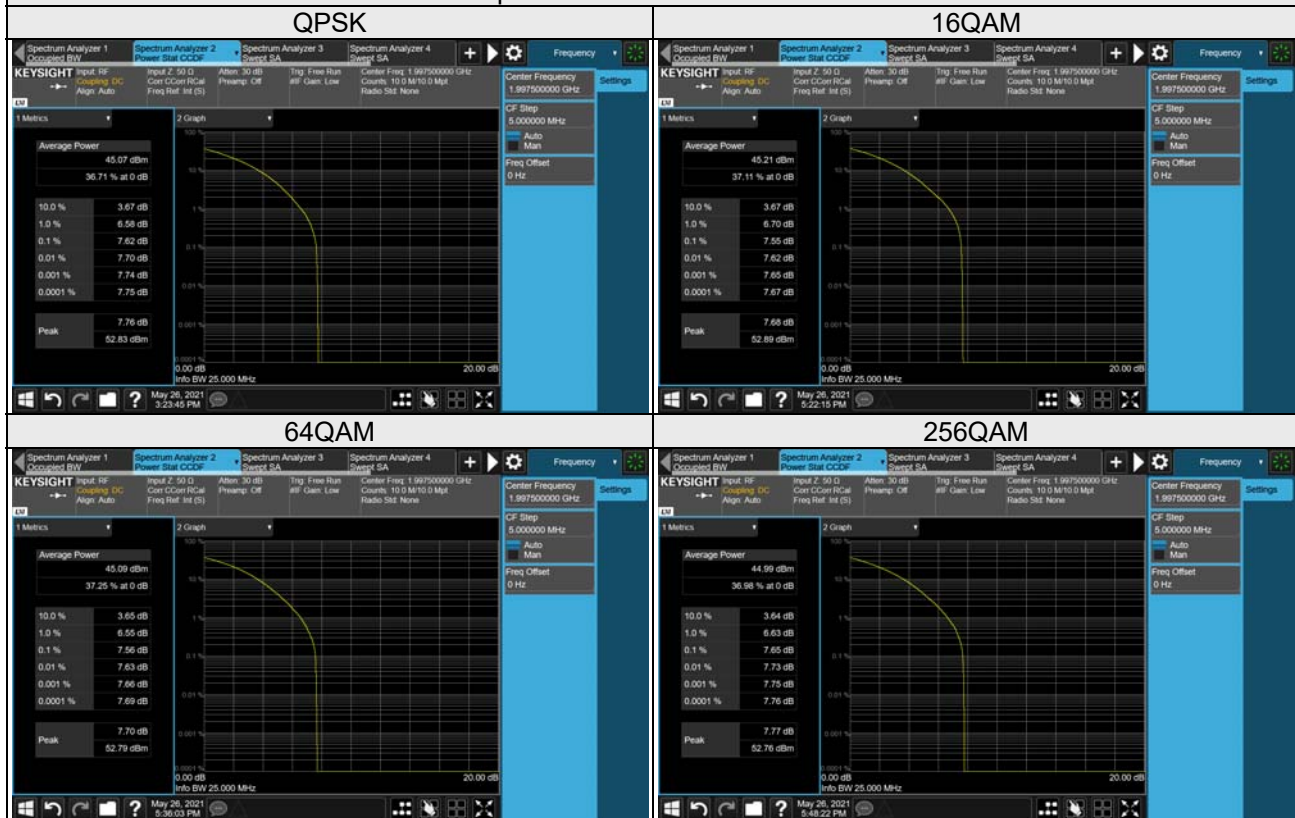


Band n70 Single Carrier

5MHz

Channel Number	Freq. (MHz)	Peak-to-Average Power Ratio (dB)															
		Ant. TX0				Ant. TX1				Ant. TX2				Ant. TX3			
		QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
399500	1997.5	7.61	7.54	7.56	7.64	7.62	7.55	7.56	7.65	7.62	7.54	7.55	7.65	7.62	7.54	7.56	7.64
401500	2007.5	7.60	7.52	7.54	7.64	7.60	7.52	7.54	7.62	7.59	7.51	7.53	7.62	7.59	7.51	7.53	7.62
403500	2017.5	7.60	7.54	7.56	7.63	7.60	7.53	7.55	7.63	7.61	7.54	7.56	7.64	7.61	7.54	7.55	7.63

Spectrum Plot of Worst Value



10MHz

Channel Number	Freq. (MHz)	Peak-to-Average Power Ratio (dB)															
		Ant. TX0				Ant. TX1				Ant. TX2				Ant. TX3			
		QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
400000	2000	7.57	7.54	7.50	7.59	7.58	7.54	7.50	7.59	7.58	7.53	7.51	7.61	7.58	7.55	7.51	7.59
401500	2007.5	7.56	7.52	7.52	7.58	7.56	7.52	7.52	7.58	7.56	7.52	7.50	7.58	7.56	7.52	7.51	7.57
403000	2015	7.56	7.53	7.52	7.61	7.56	7.53	7.53	7.60	7.56	7.53	7.52	7.59	7.56	7.53	7.51	7.58

Spectrum Plot of Worst Value

QPSK



16QAM



64QAM



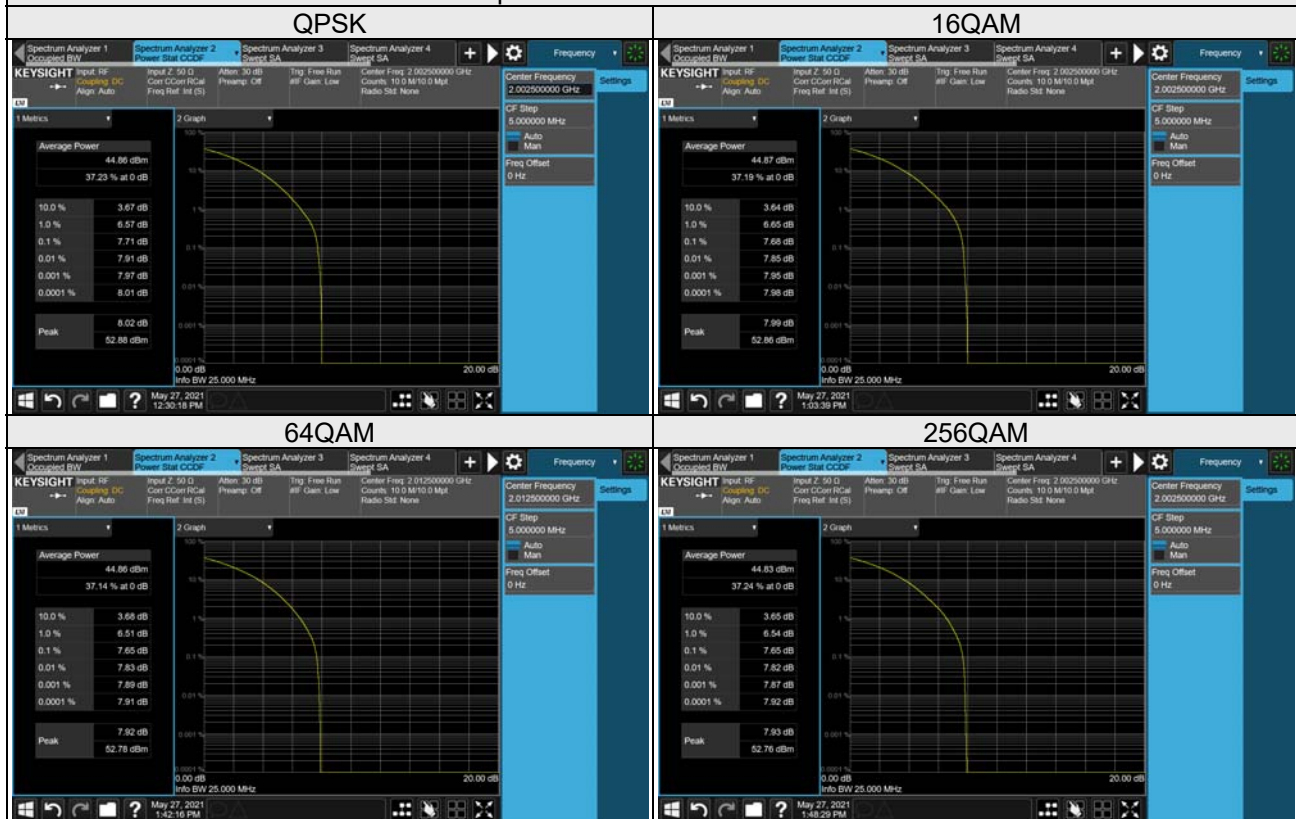
256QAM



15MHz

Channel Number	Freq. (MHz)	Peak-to-Average Power Ratio (dB)															
		Ant. TX0				Ant. TX1				Ant. TX2				Ant. TX3			
		QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
400500	2002.5	7.71	7.67	7.61	7.61	7.70	7.65	7.60	7.65	7.70	7.67	7.58	7.59	7.70	7.68	7.58	7.59
401500	2007.5	7.70	7.65	7.64	7.64	7.70	7.65	7.63	7.65	7.70	7.65	7.60	7.64	7.70	7.64	7.60	7.63
402500	2012.5	7.68	7.66	7.64	7.63	7.67	7.64	7.64	7.62	7.69	7.64	7.63	7.63	7.68	7.63	7.65	7.62

Spectrum Plot of Worst Value



20MHz

Channel Number	Freq. (MHz)	Peak-to-Average Power Ratio (dB)															
		Ant. TX0				Ant. TX1				Ant. TX2				Ant. TX3			
		QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM	QPSK	16QAM	64QAM	256QAM
401000	2005	7.52	7.52	7.55	7.56	7.53	7.52	7.52	7.53	7.53	7.52	7.53	7.54	7.52	7.52	7.52	7.54
401500	2007.5	7.55	7.50	7.53	7.54	7.56	7.49	7.53	7.54	7.56	7.49	7.53	7.54	7.56	7.51	7.52	7.53
402000	2010	7.57	7.53	7.53	7.51	7.58	7.53	7.53	7.51	7.59	7.53	7.54	7.51	7.56	7.54	7.54	7.55

Spectrum Plot of Worst Value

QPSK



16QAM



64QAM



256QAM



4.7 Conducted Spurious Emissions

4.7.1 Limits of Conducted Spurious Emissions Measurement

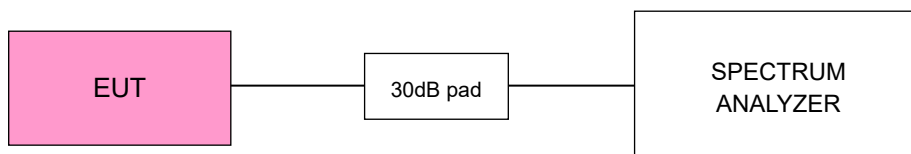
In the FCC 27.53(h)(1), On any frequency outside a licensee's frequency block, The power of any emission shall be attenuated below the transmitter power (P) by at least $43 + 10 \log (P)$ dB.

Note:

This device can be implement MIMO function, so the limit of spurious emissions needs to be reduced by $10\log(\text{Numbers}_{\text{Ant}})$ according to FCC KDB 662911 D01 guidance.

{4TX: The limit is adjusted to $-13\text{dBm} - 10*\log(4) = -19.01\text{dBm}$.}

4.7.2 Test Setup



4.7.3 Test Procedure

- All measurements were done at 3 channels: low, middle and high operational frequency range.
- When the spectrum scanned from 9kHz to 26GHz or 30GHz, it shall be connected to the 30dB pad attenuated the carried frequency.
- S.A. setting: RBW=1MHz, VBW=3MHz, Detector=RMS (Power average)

4.7.4 Test Results

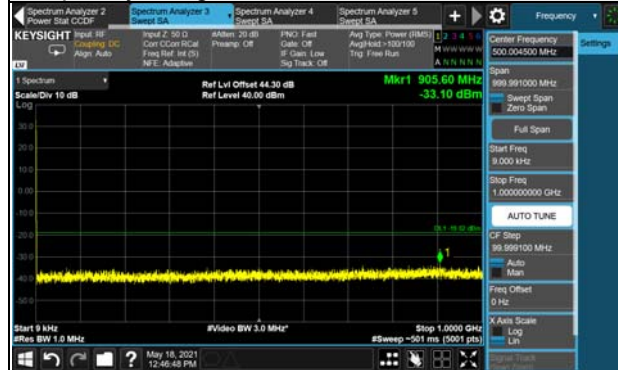
Band n66
Single Carrier

5MHz-Ant. TX 0

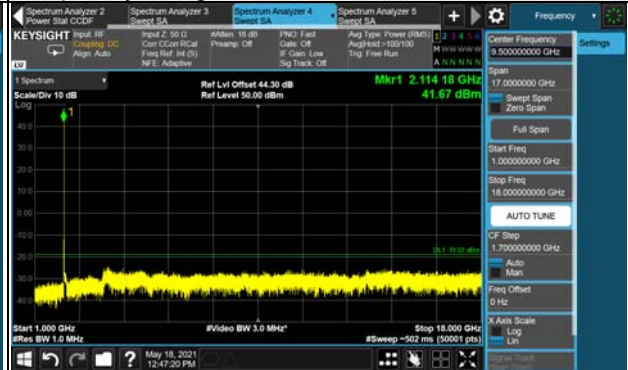
QPSK

Ch 422500 (2112.5MHz)

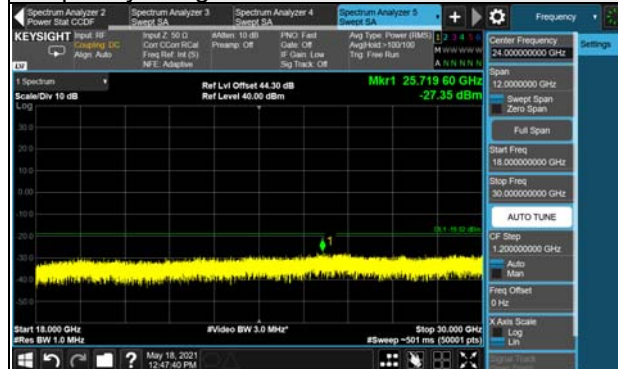
Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



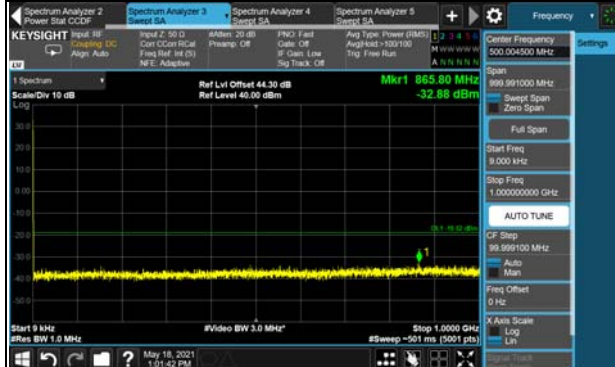
Frequency Range : 18GHz~30GHz



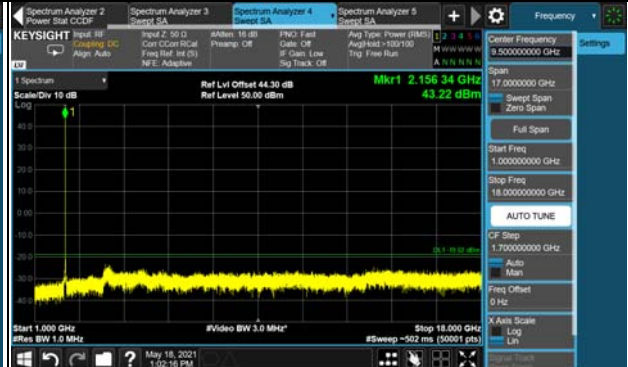
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

Ch 431000 (2155.0MHz)

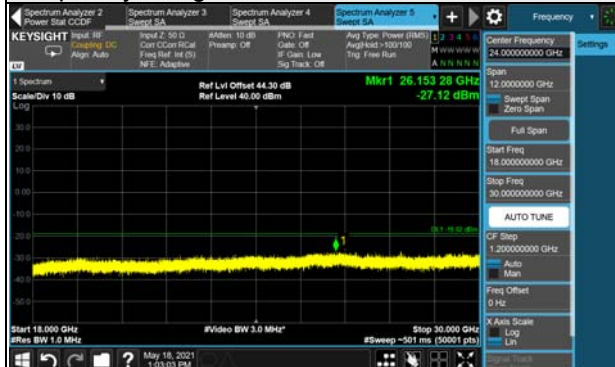
Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



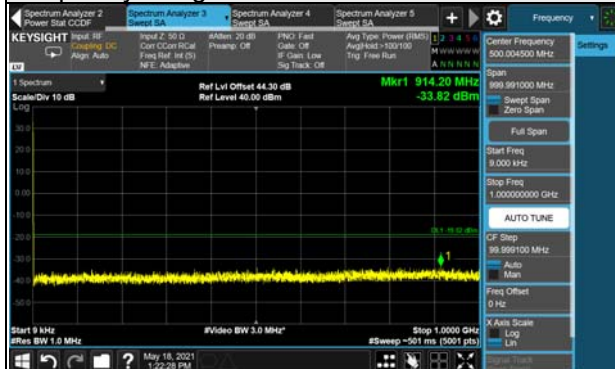
Frequency Range : 18GHz~30GHz



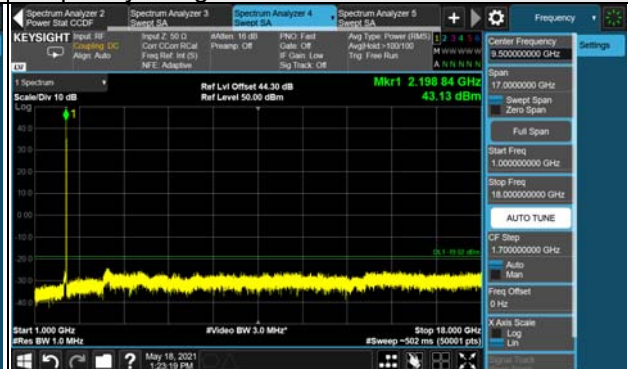
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

Ch 439500 (2197.5MHz)

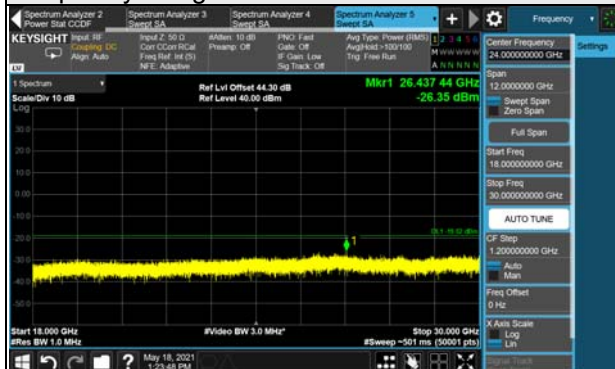
Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



Frequency Range : 18GHz~30GHz



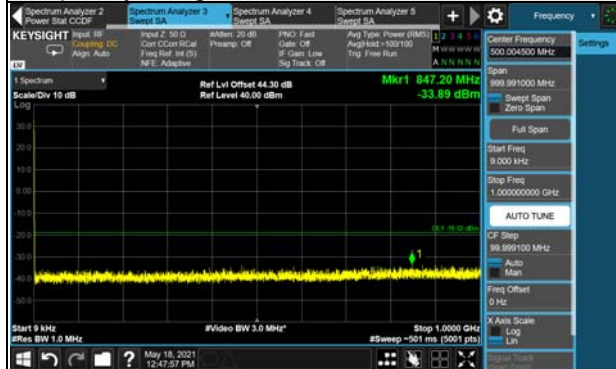
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

5MHz-Ant. TX 1

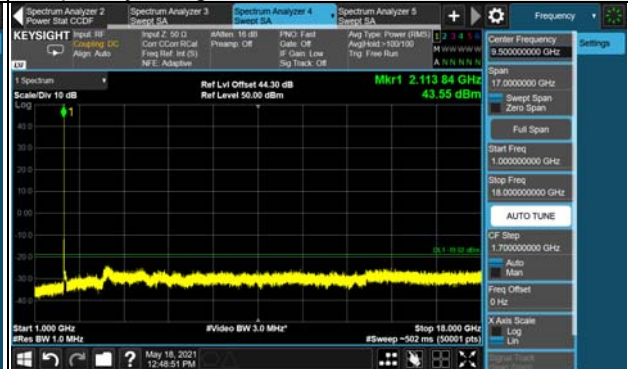
QPSK

Ch 422500 (2112.5MHz)

Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



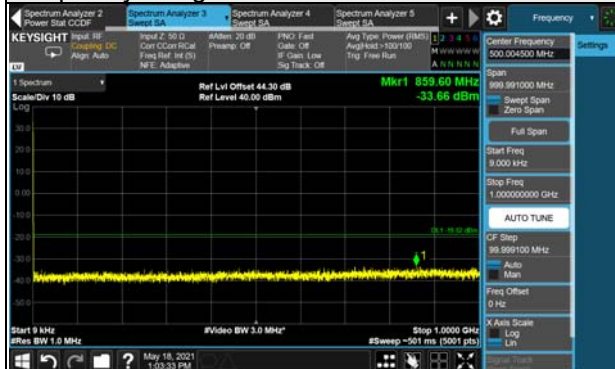
Frequency Range : 18GHz~30GHz



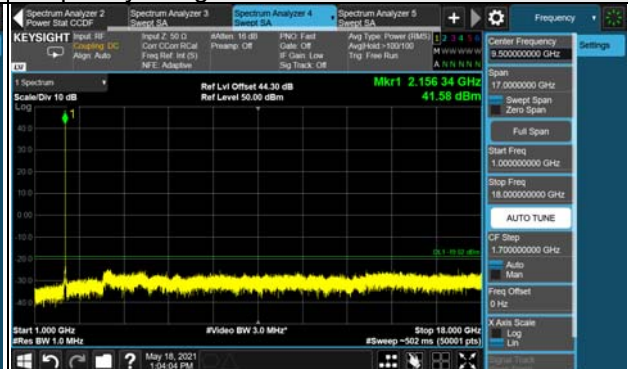
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

Ch 431000 (2155.0MHz)

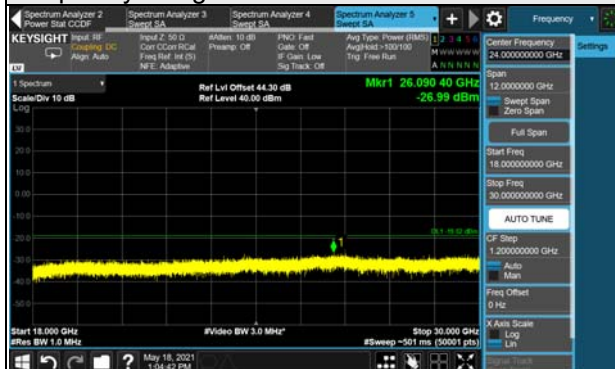
Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



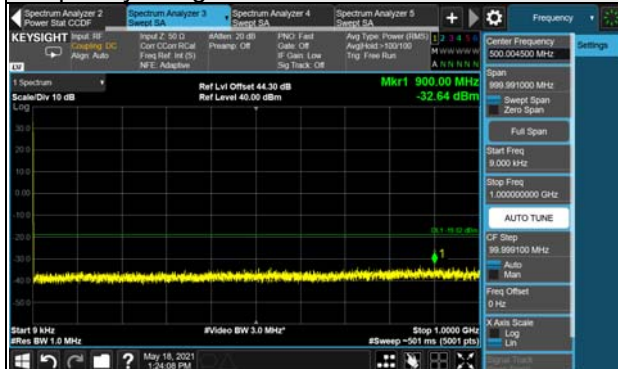
Frequency Range : 18GHz~30GHz



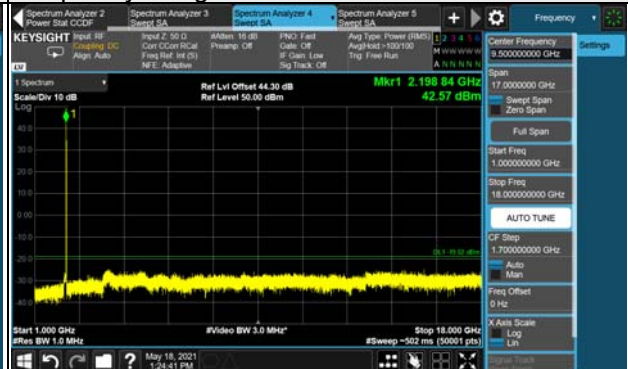
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

Ch 439500 (2197.5MHz)

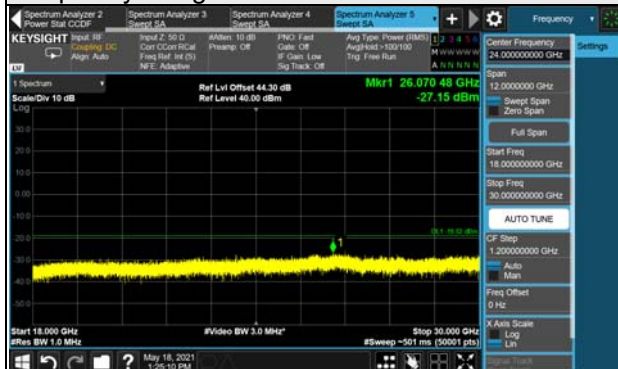
Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



Frequency Range : 18GHz~30GHz



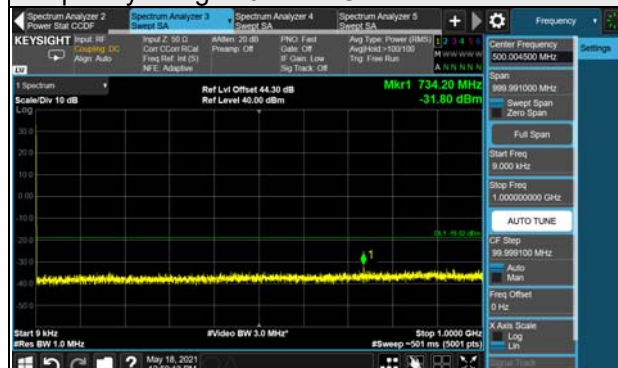
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

5MHz-Ant. TX 2

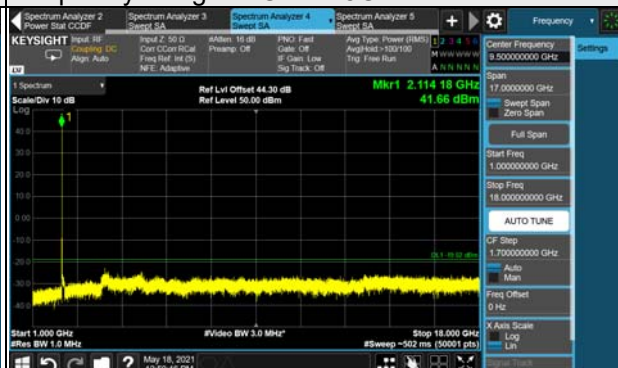
QPSK

Ch 422500 (2112.5MHz)

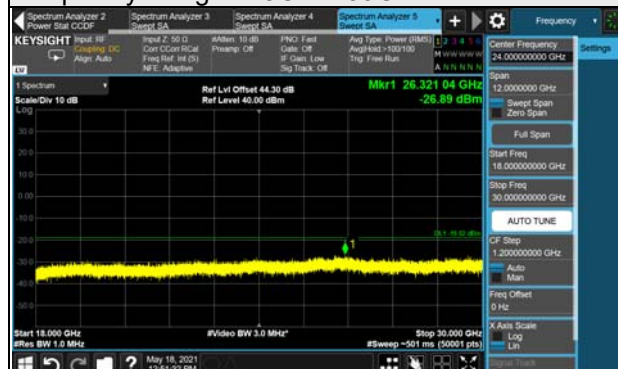
Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



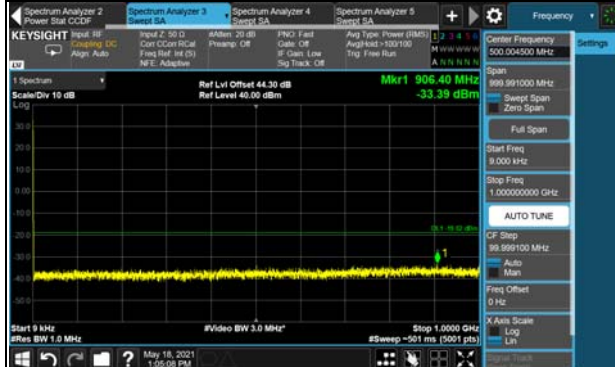
Frequency Range : 18GHz~30GHz



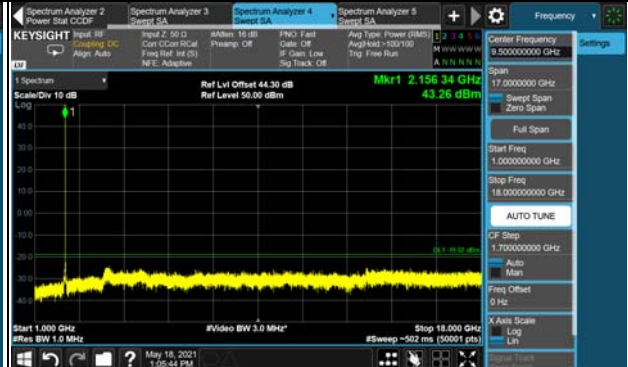
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

Ch 431000 (2155.0MHz)

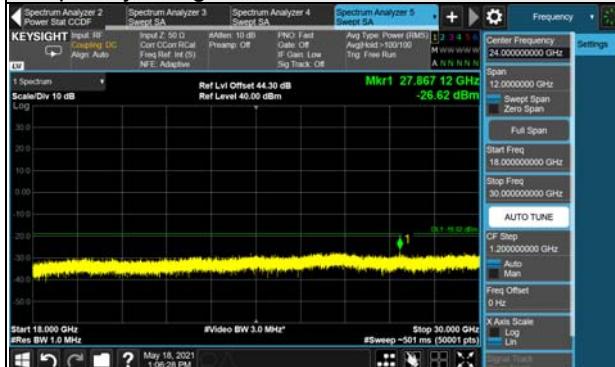
Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



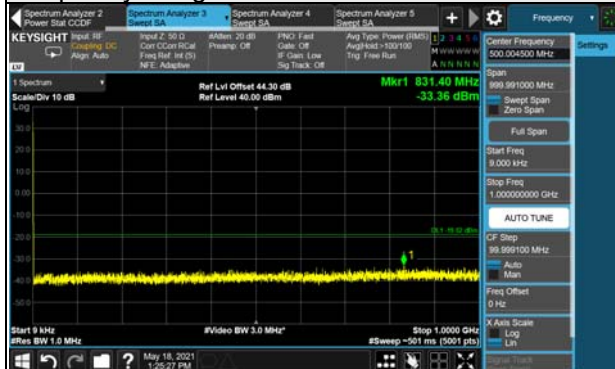
Frequency Range : 18GHz~30GHz



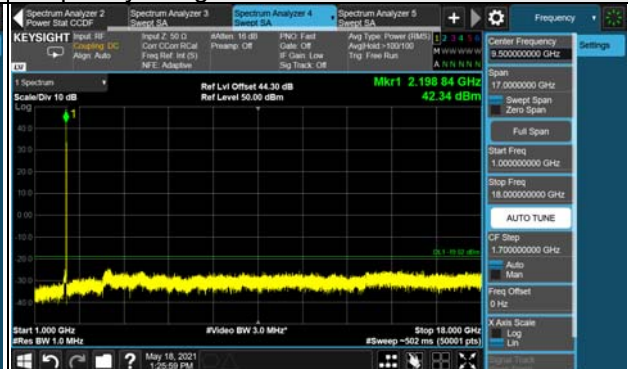
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

Ch 439500 (2197.5MHz)

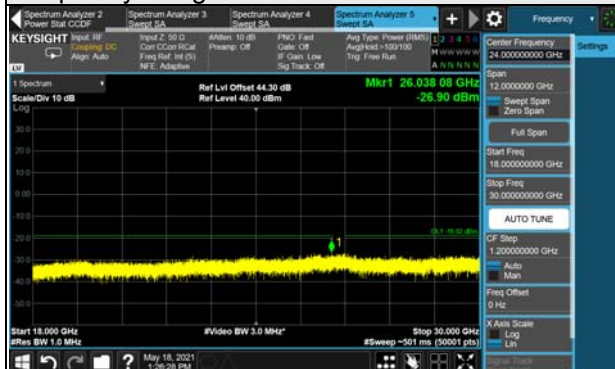
Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



Frequency Range : 18GHz~30GHz



Note: The signal at 9 kHz is IF signal from spectrum analyzer.

5MHz-Ant. TX 3

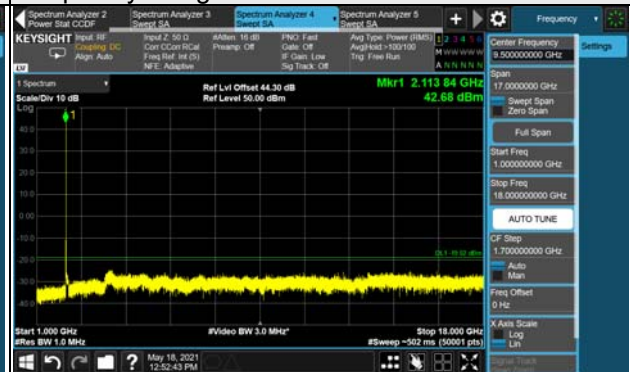
QPSK

Ch 422500 (2112.5MHz)

Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



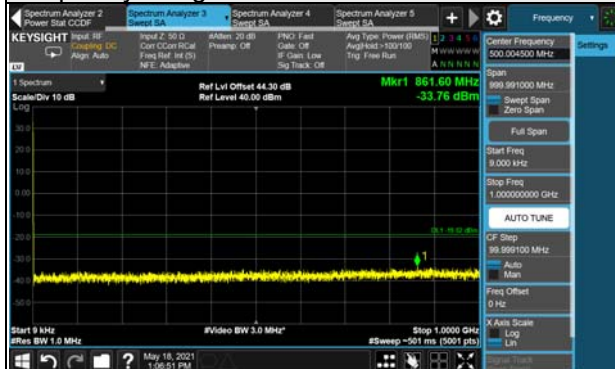
Frequency Range : 18GHz~30GHz



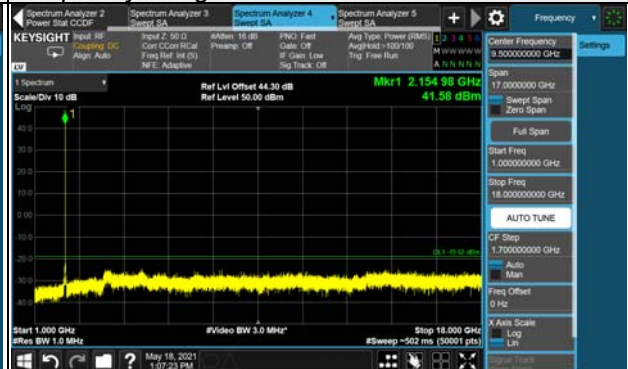
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

Ch 431000 (2155.0MHz)

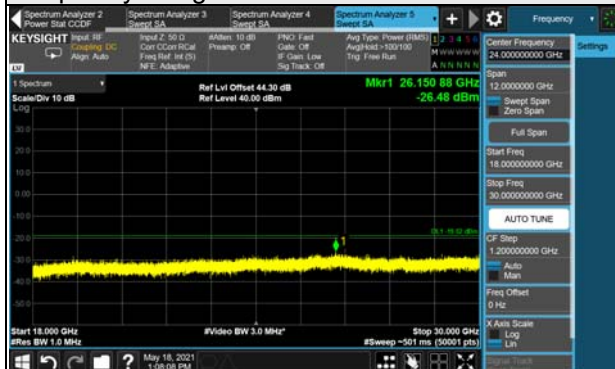
Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



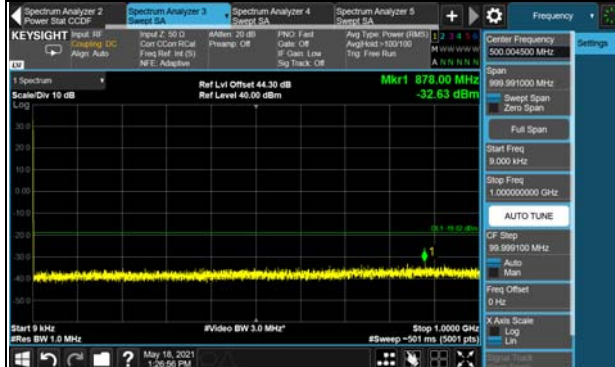
Frequency Range : 18GHz~30GHz



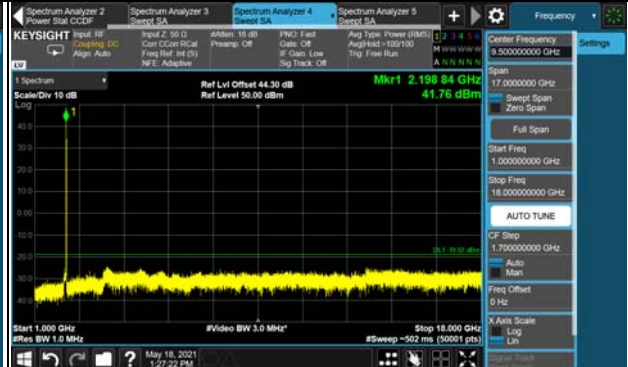
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

Ch 439500 (2197.5MHz)

Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



Frequency Range : 18GHz~30GHz



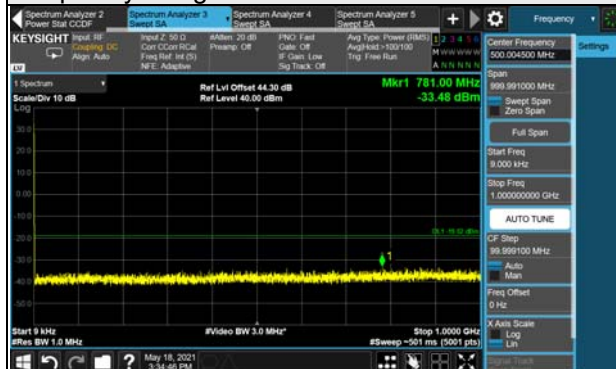
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

10MHz-Ant. TX 0

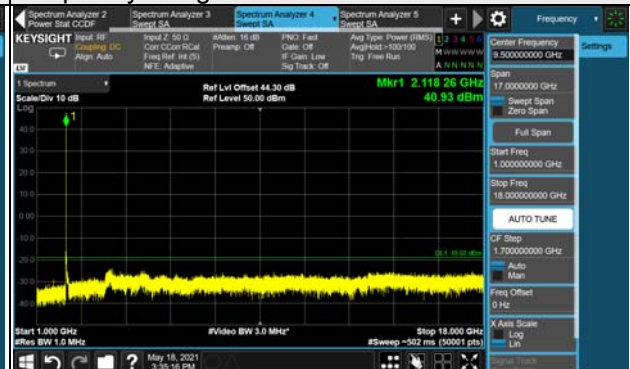
QPSK

Ch 423000 (2115.0MHz)

Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



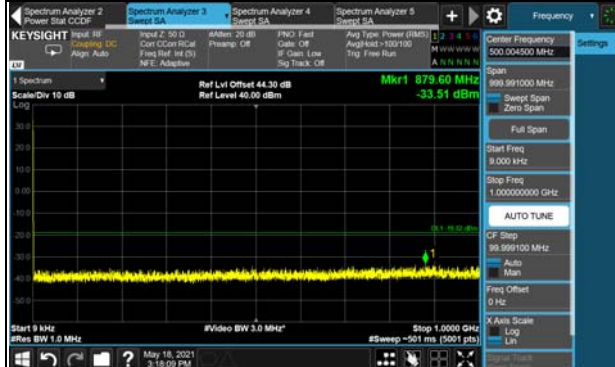
Frequency Range : 18GHz~30GHz



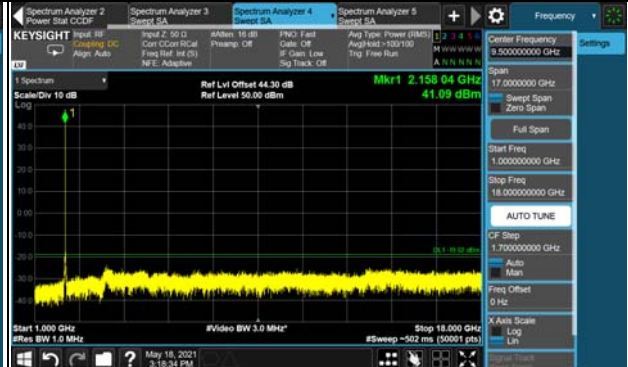
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

Ch 431000 (2155.0MHz)

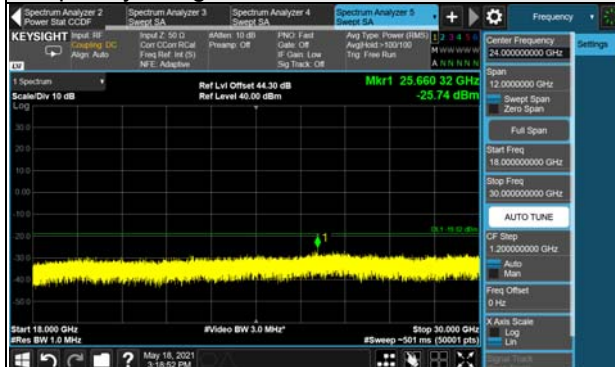
Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



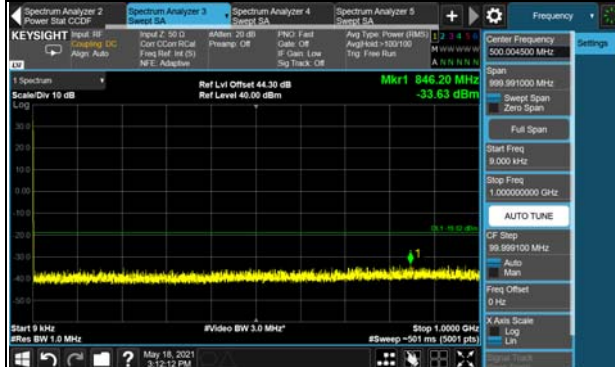
Frequency Range : 18GHz~30GHz



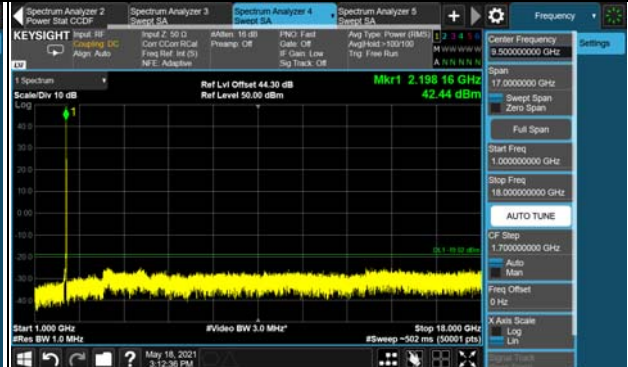
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

Ch 439000 (2195.0MHz)

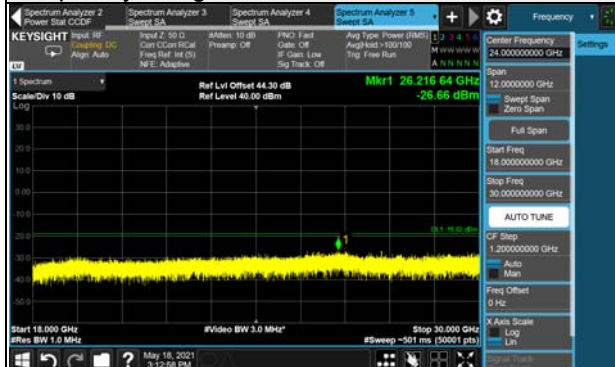
Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



Frequency Range : 18GHz~30GHz



Note: The signal at 9 kHz is IF signal from spectrum analyzer.

10MHz-Ant. TX 1

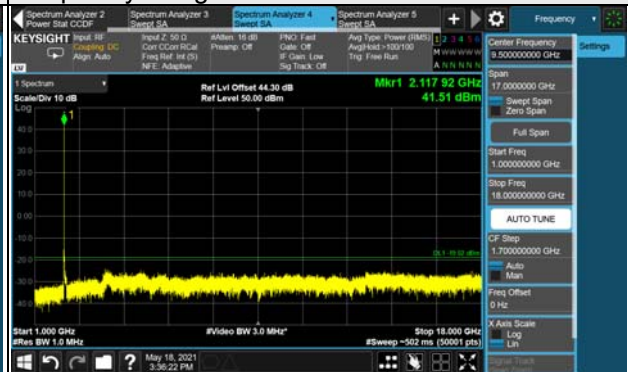
QPSK

Ch 423000 (2115.0MHz)

Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



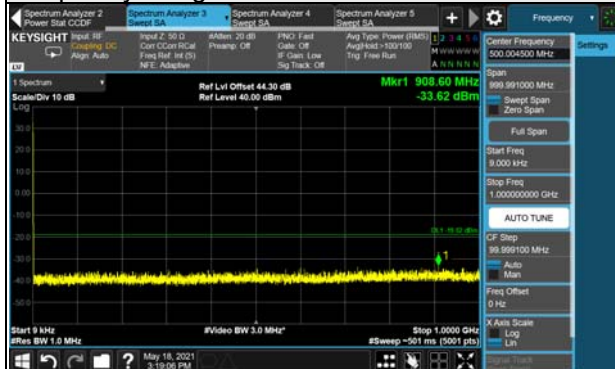
Frequency Range : 18GHz~30GHz



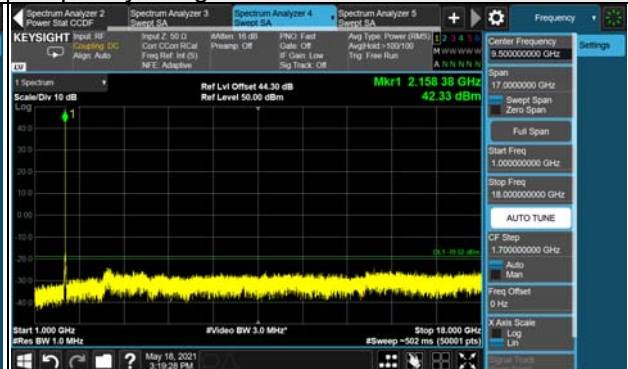
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

Ch 431000 (2155.0MHz)

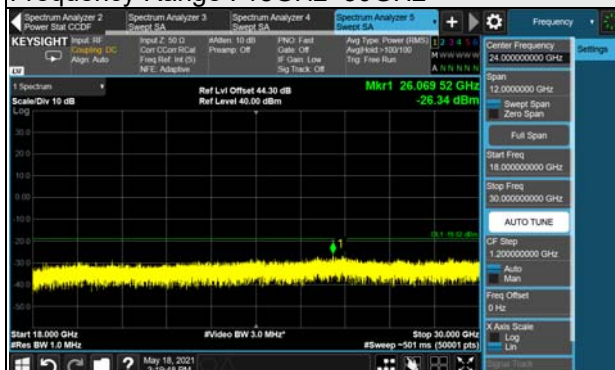
Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



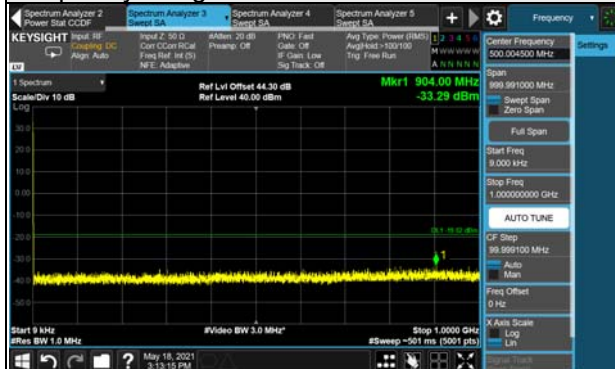
Frequency Range : 18GHz~30GHz



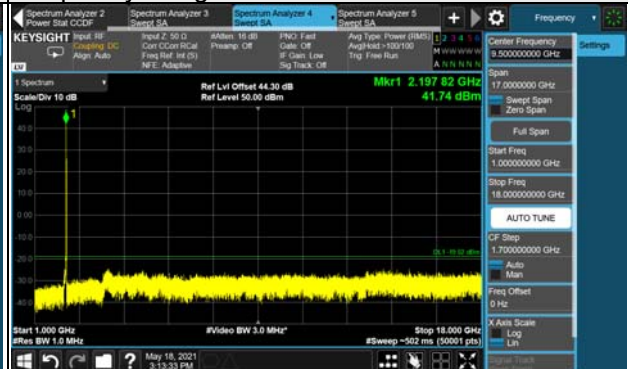
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

Ch 439000 (2195.0MHz)

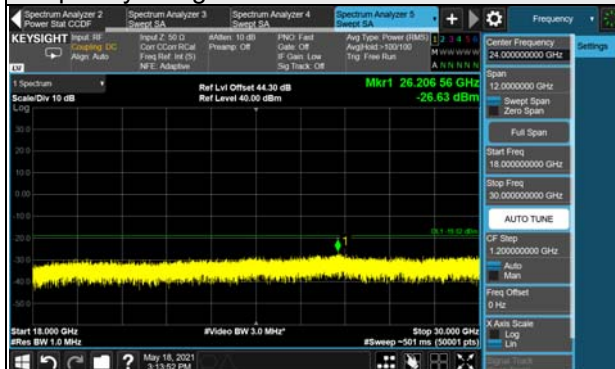
Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



Frequency Range : 18GHz~30GHz



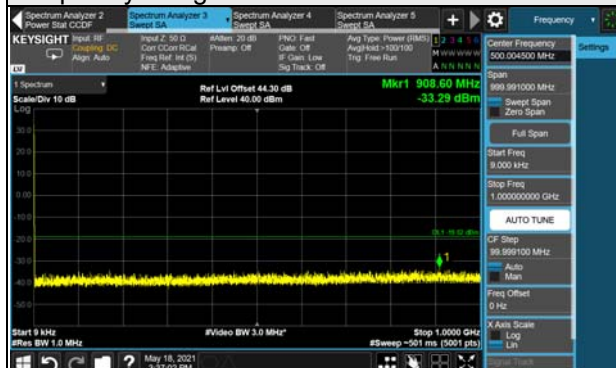
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

10MHz-Ant. TX 2

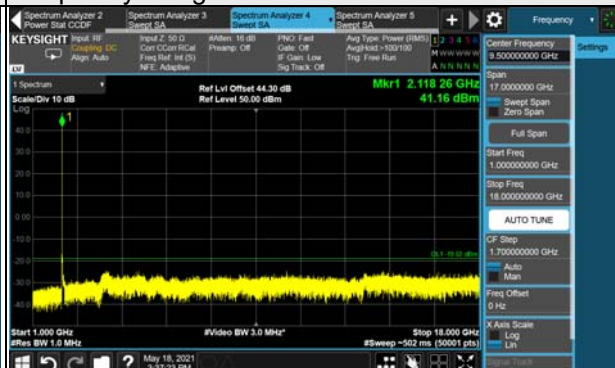
QPSK

Ch 423000 (2115.0MHz)

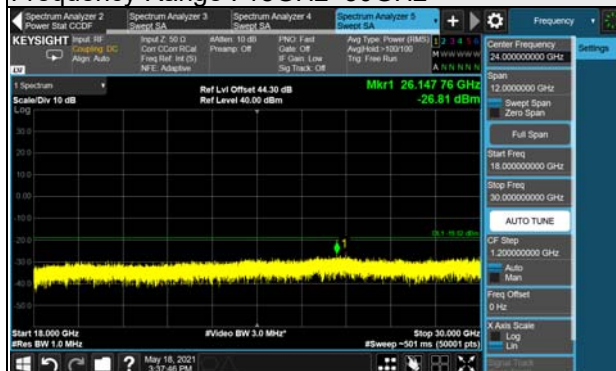
Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



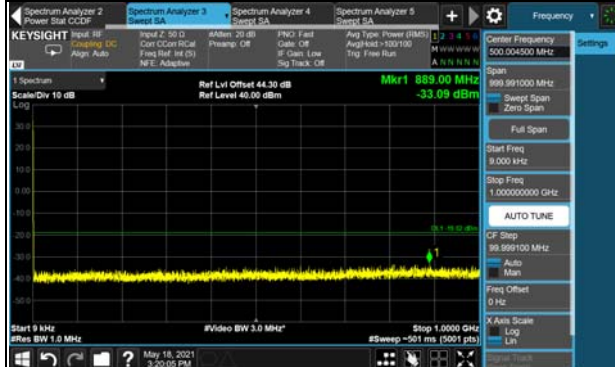
Frequency Range : 18GHz~30GHz



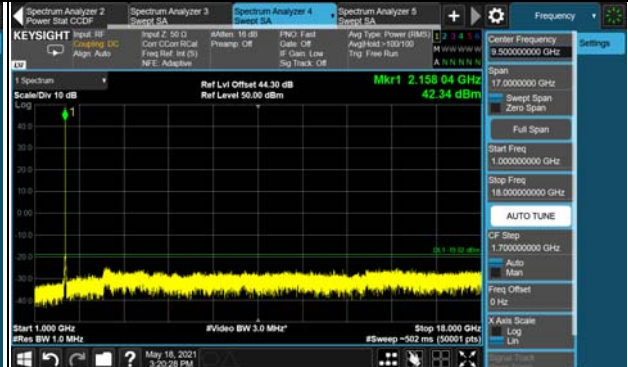
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

Ch 431000 (2155.0MHz)

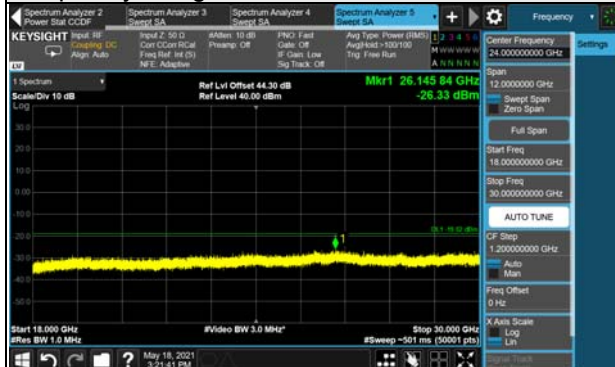
Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



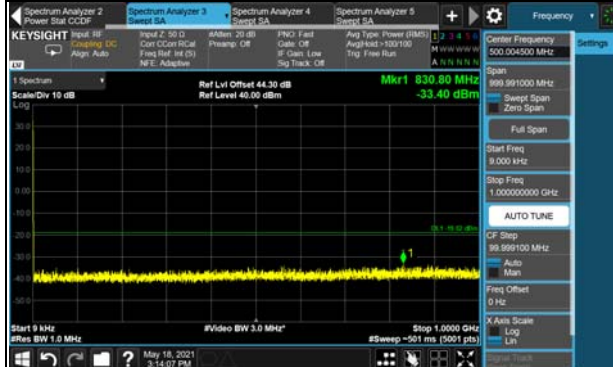
Frequency Range : 18GHz~30GHz



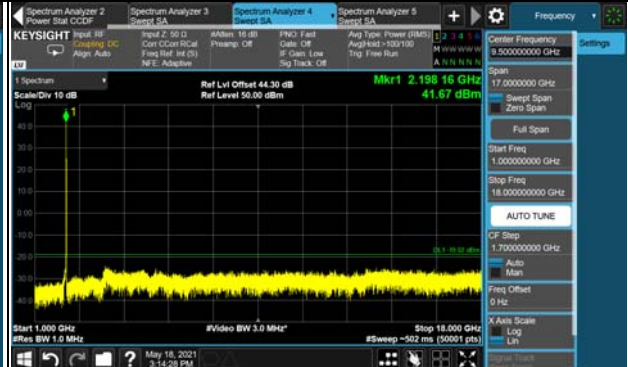
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

Ch 439000 (2195.0MHz)

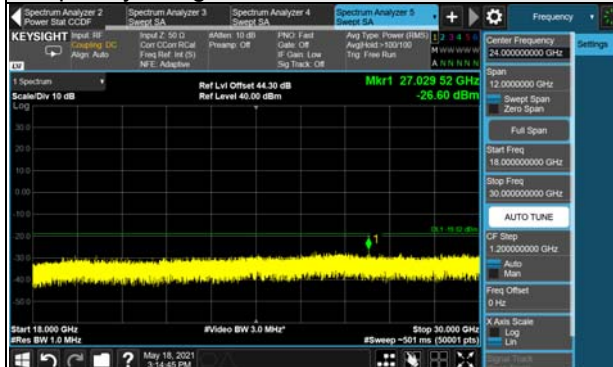
Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



Frequency Range : 18GHz~30GHz



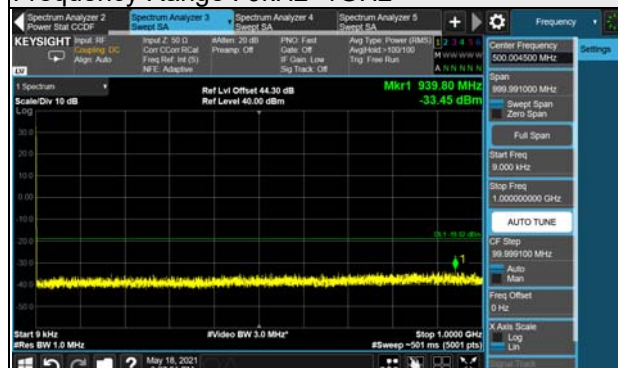
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

10MHz-Ant. TX 3

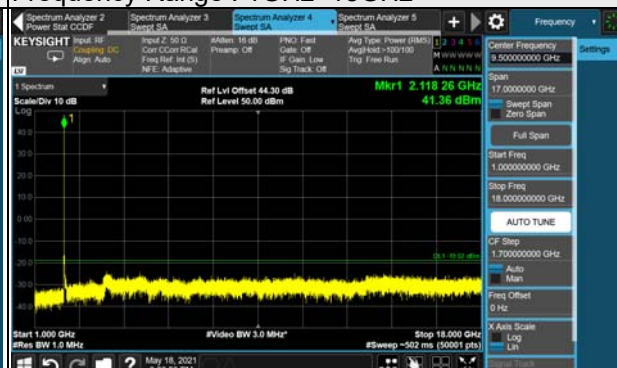
QPSK

Ch 423000 (2115.0MHz)

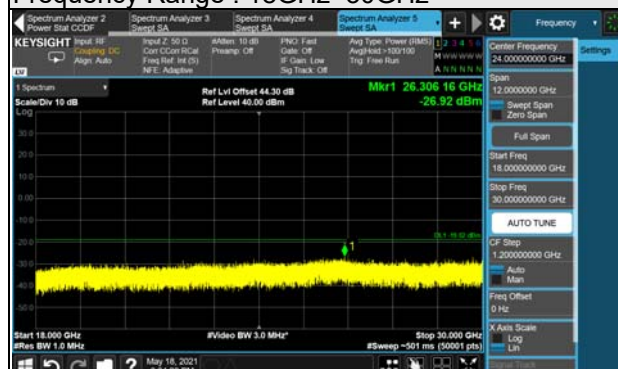
Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



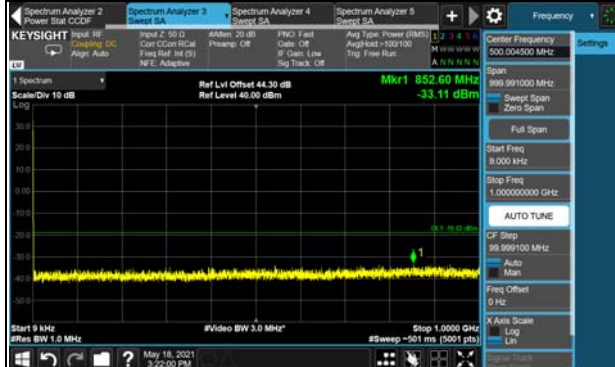
Frequency Range : 18GHz~30GHz



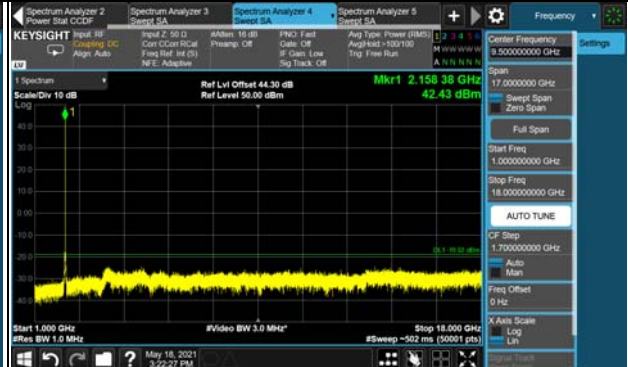
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

Ch 431000 (2155.0MHz)

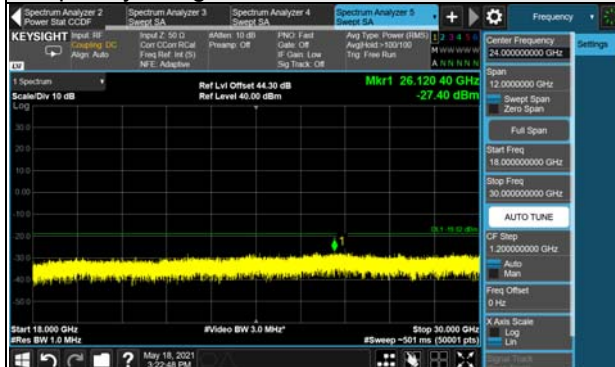
Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



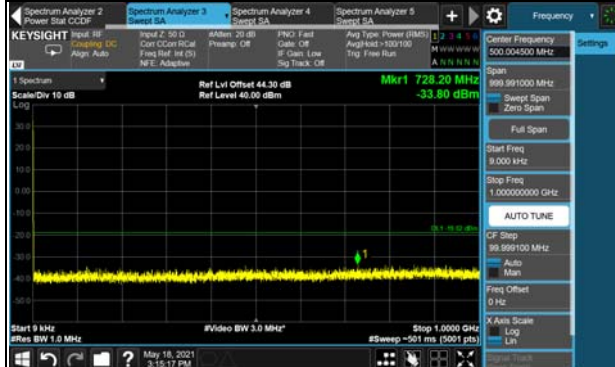
Frequency Range : 18GHz~30GHz



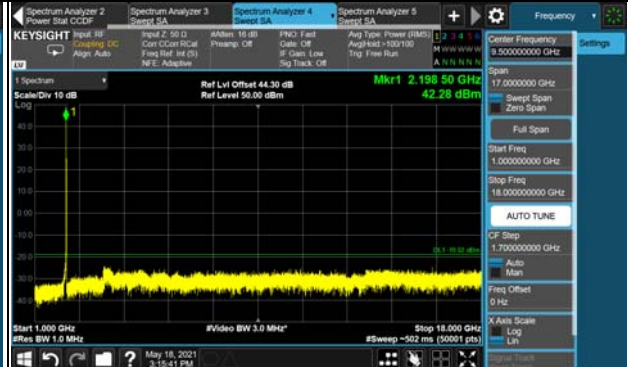
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

Ch 439000 (2195.0MHz)

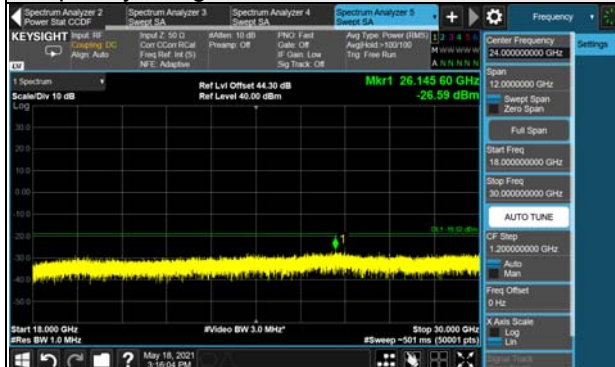
Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



Frequency Range : 18GHz~30GHz



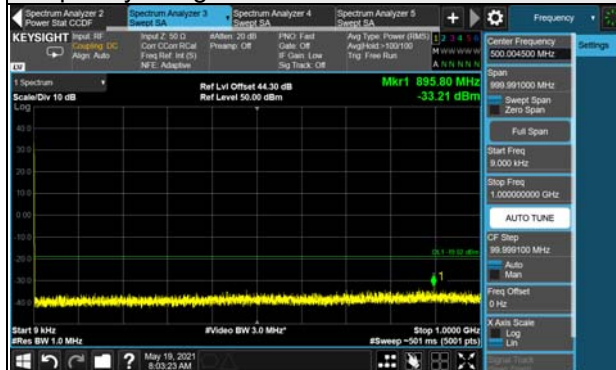
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

15MHz-Ant. TX 0

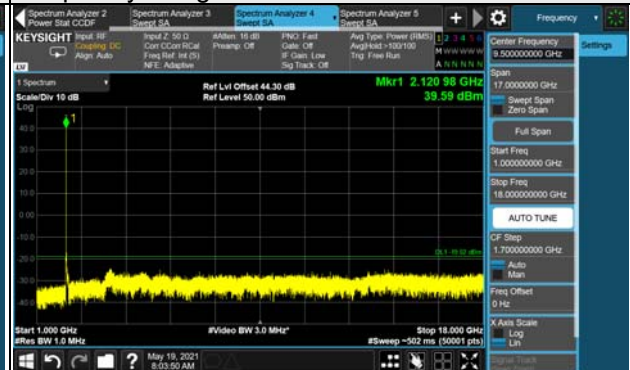
QPSK

Ch 423500 (2117.5MHz)

Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



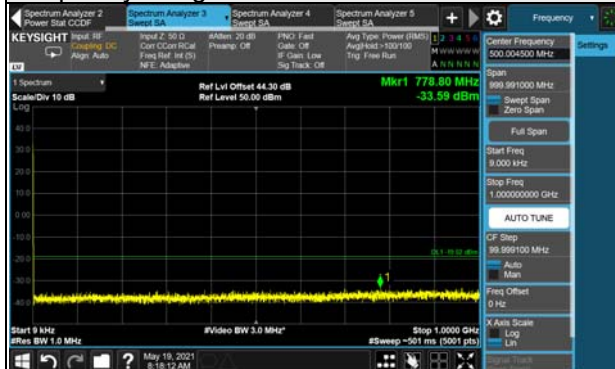
Frequency Range : 18GHz~30GHz



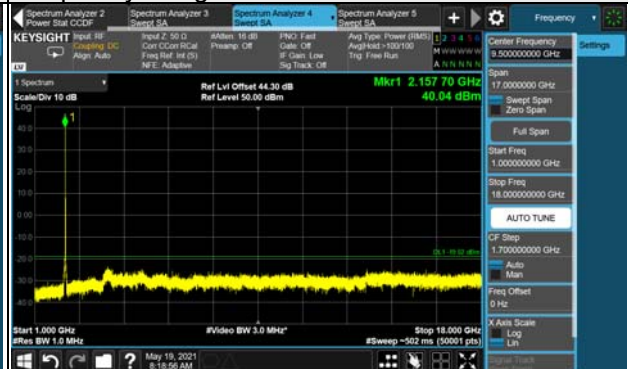
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

Ch 431000 (2155.0MHz)

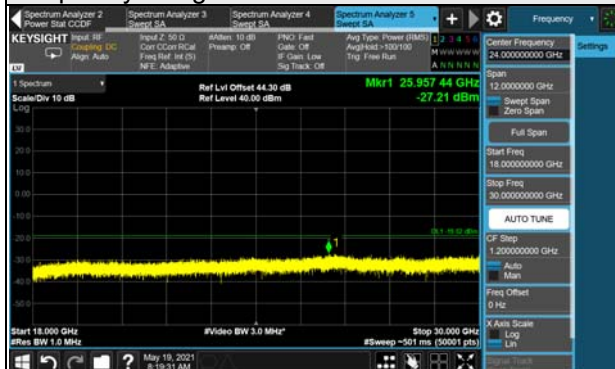
Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



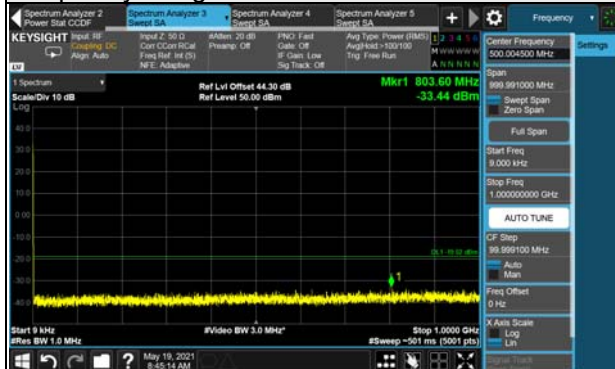
Frequency Range : 18GHz~30GHz



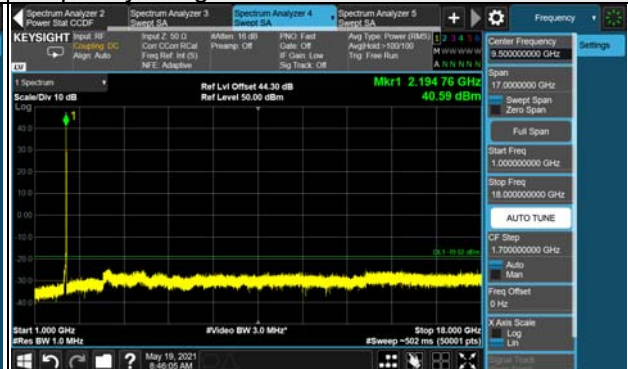
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

Ch 438500 (2192.5MHz)

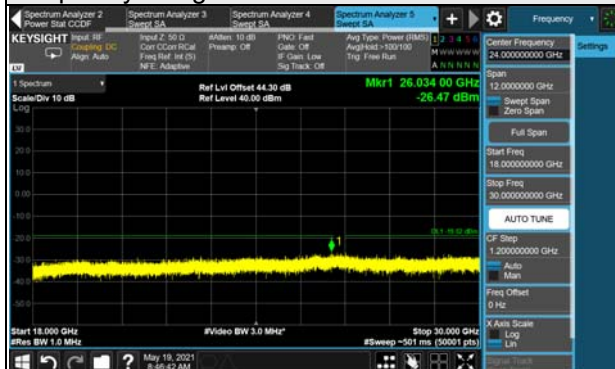
Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



Frequency Range : 18GHz~30GHz



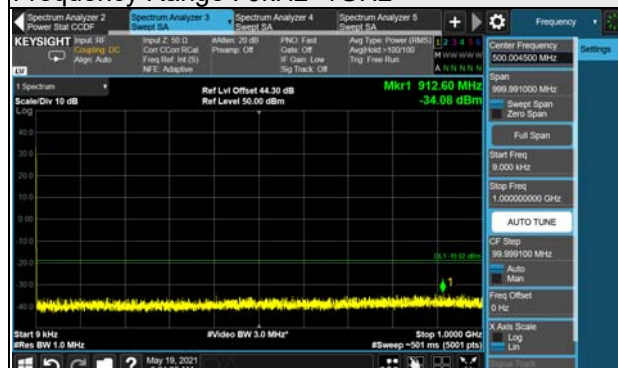
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

15MHz-Ant. TX 1

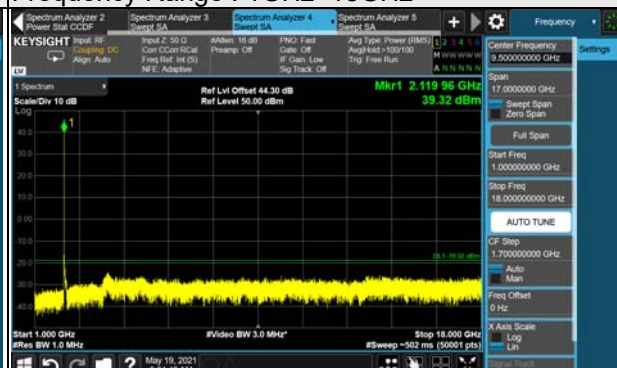
QPSK

Ch 423500 (2117.5MHz)

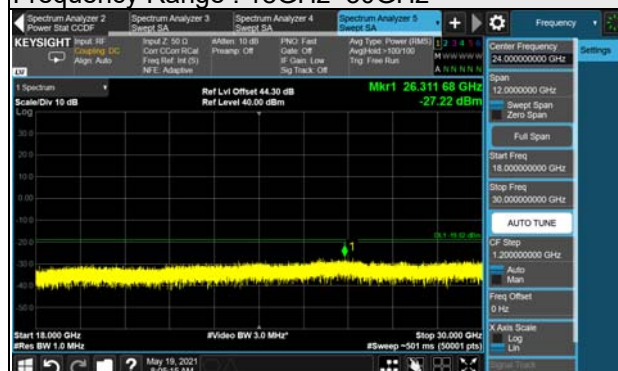
Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



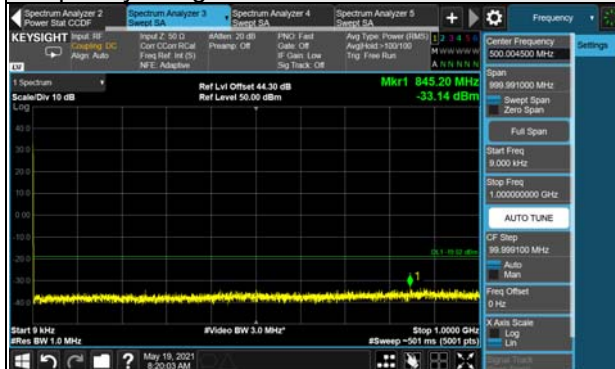
Frequency Range : 18GHz~30GHz



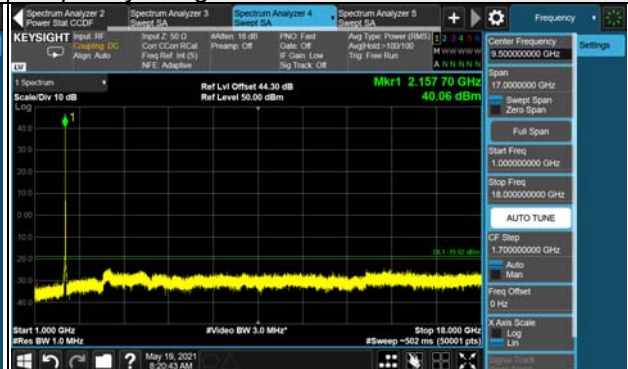
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

Ch 431000 (2155.0MHz)

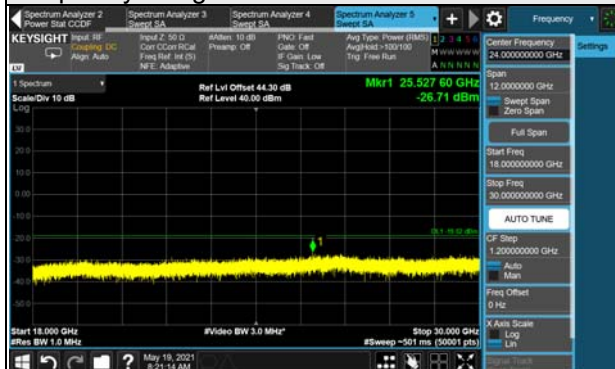
Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



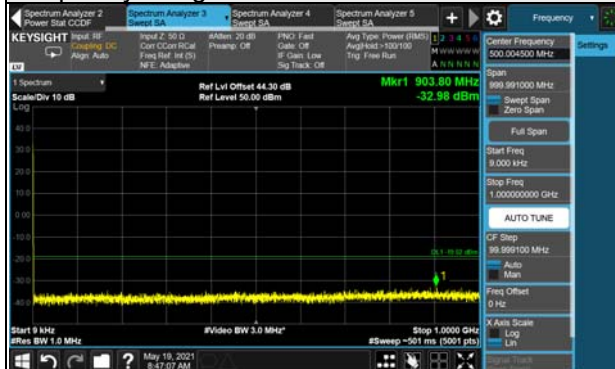
Frequency Range : 18GHz~30GHz



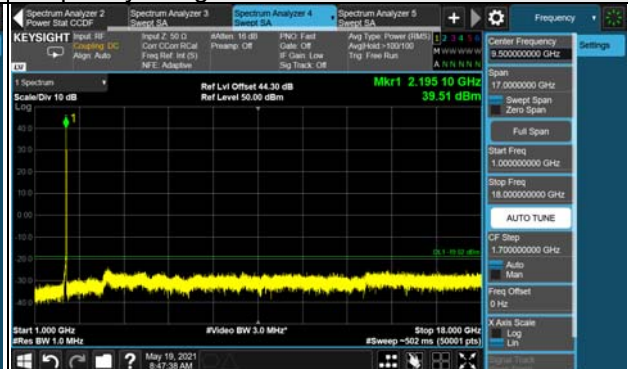
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

Ch 438500 (2192.5MHz)

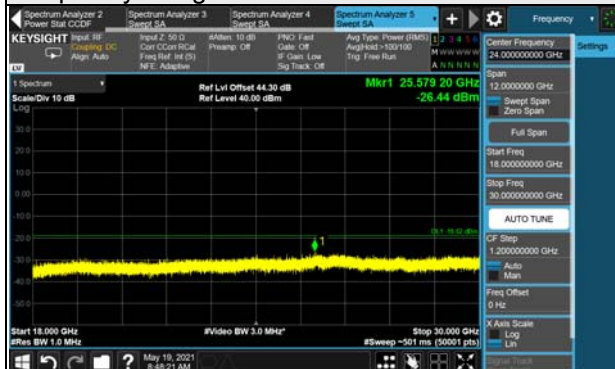
Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



Frequency Range : 18GHz~30GHz



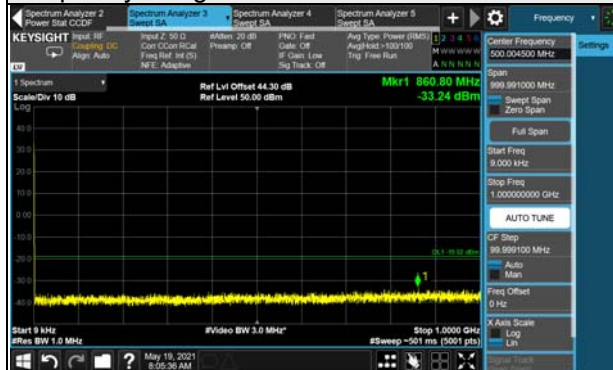
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

15MHz-Ant. TX 2

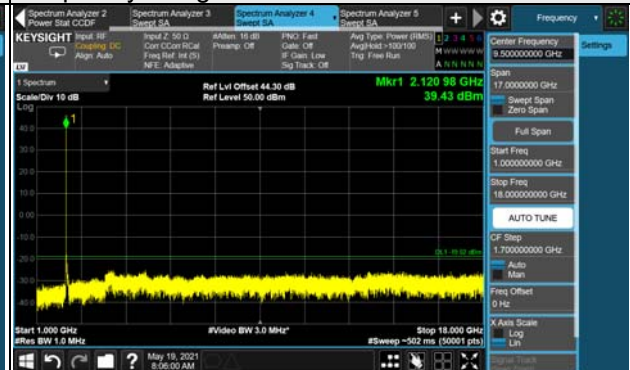
QPSK

Ch 423500 (2117.5MHz)

Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



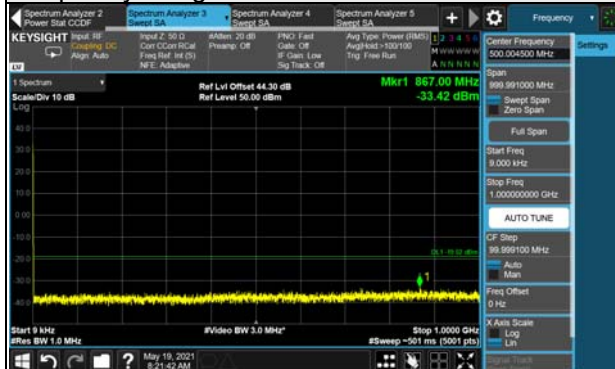
Frequency Range : 18GHz~30GHz



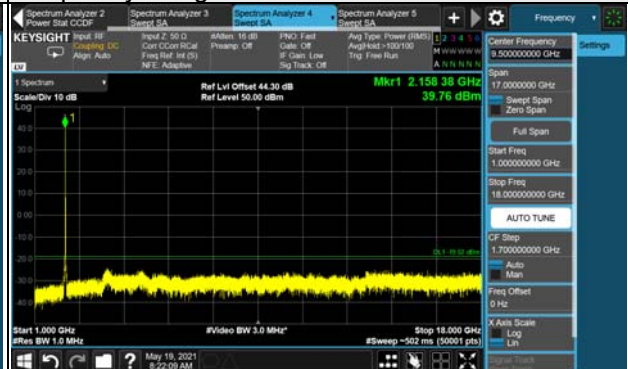
Note: The signal at 9 kHz is IF signal from spectrum analyzer.

Ch 431000 (2155.0MHz)

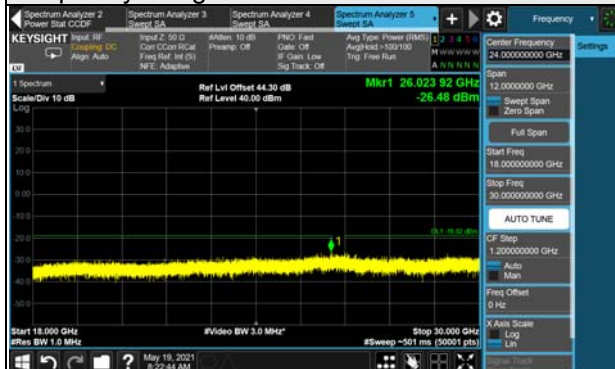
Frequency Range : 9kHz~1GHz



Frequency Range : 1GHz~18GHz



Frequency Range : 18GHz~30GHz



Note: The signal at 9 kHz is IF signal from spectrum analyzer.