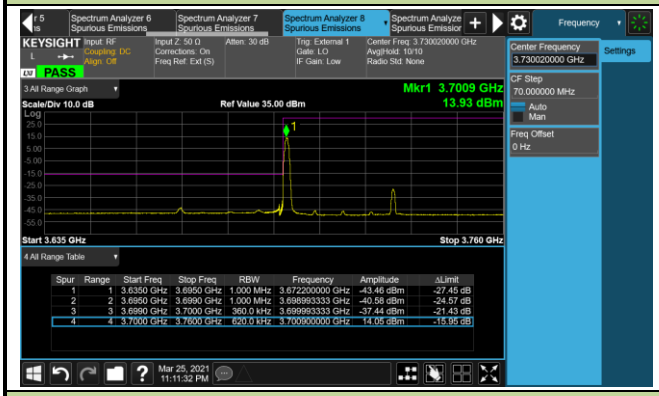
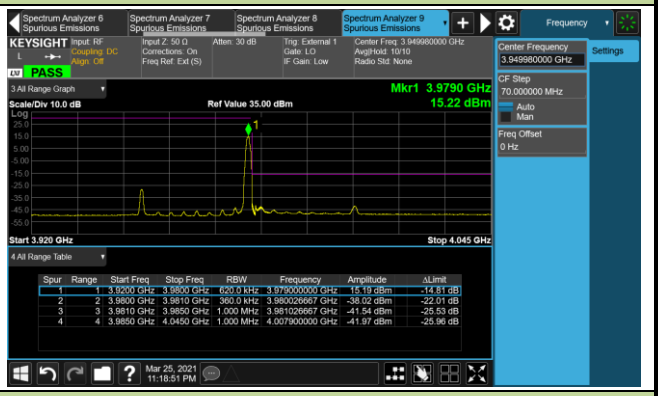
60MHz Channel Bandwidth - 1RB

Lower Band Edge

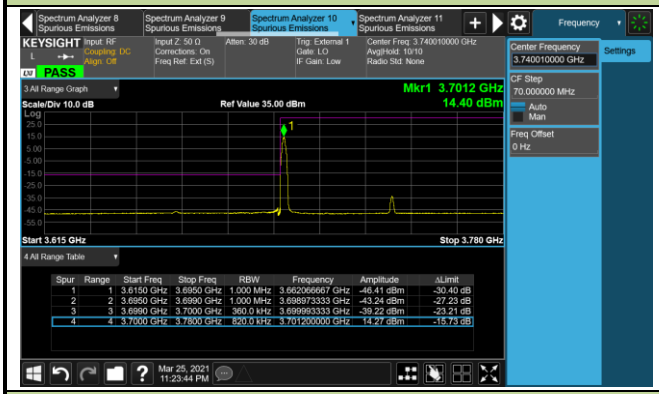


Upper Band Edge

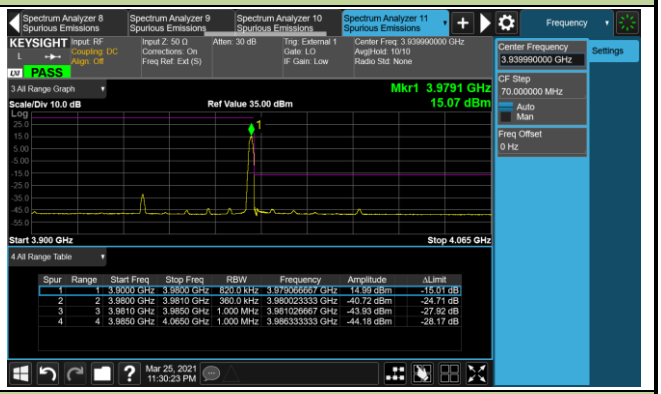


80MHz Channel Bandwidth - 1RB

Lower Band Edge

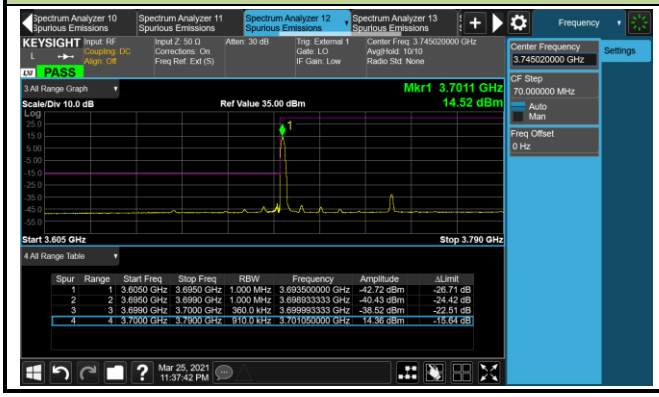


Upper Band Edge

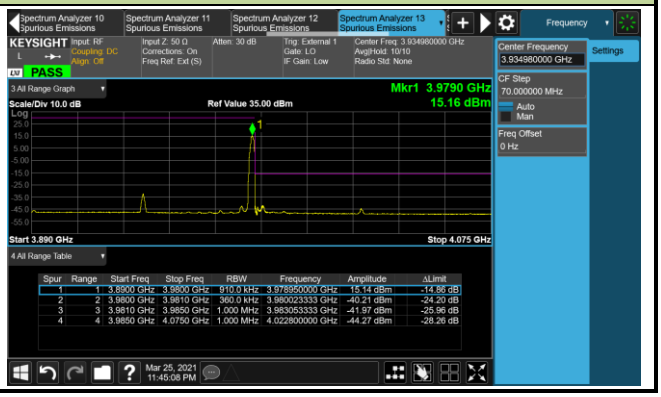


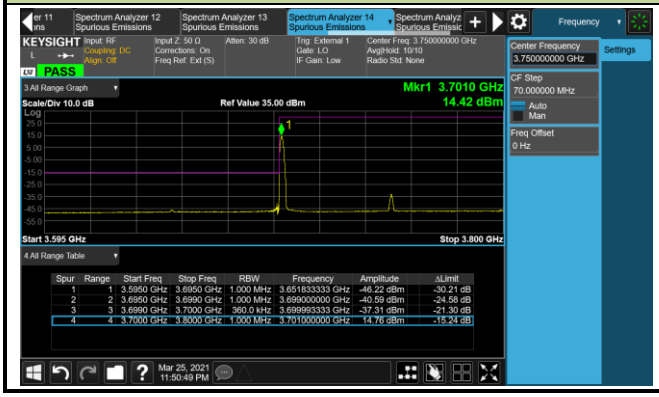
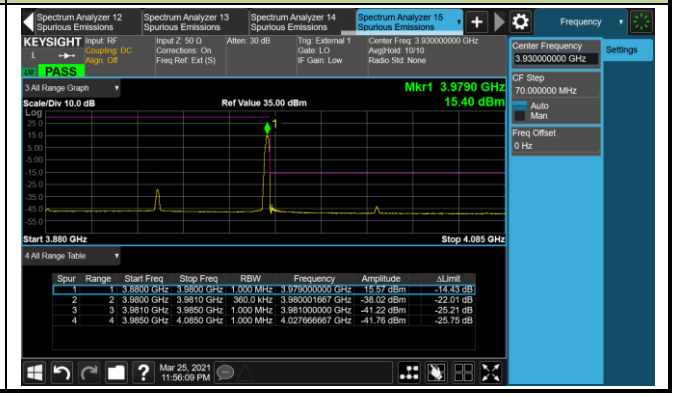
90MHz Channel Bandwidth - 1RB

Lower Band Edge



Upper Band Edge



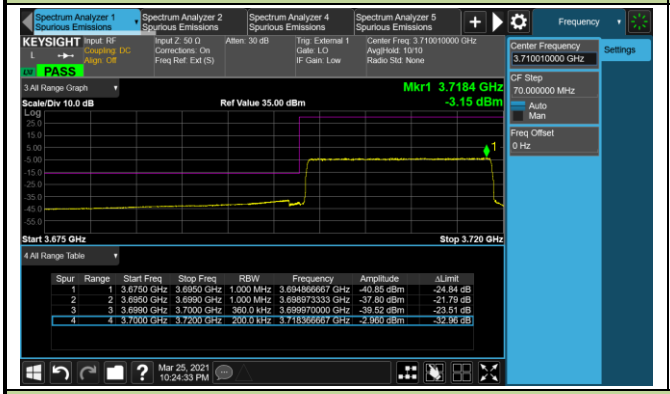
100MHz Channel Bandwidth - 1RB	
Lower Band Edge	Upper Band Edge
	

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	ΔLimit
1	1	3.5950 GHz	3.6950 GHz	1.000 MHz	3.651833333 GHz	-46.22 dBm	-30.21 dB
2	2	3.6950 GHz	3.6990 GHz	1.000 MHz	3.699000000 GHz	-40.59 dBm	-24.56 dB
3	3	3.6990 GHz	3.7000 GHz	360.0 kHz	3.699993333 GHz	-37.31 dBm	-21.30 dB
4	4	3.7000 GHz	3.8000 GHz	1.000 MHz	3.701000000 GHz	14.76 dBm	-15.24 dB

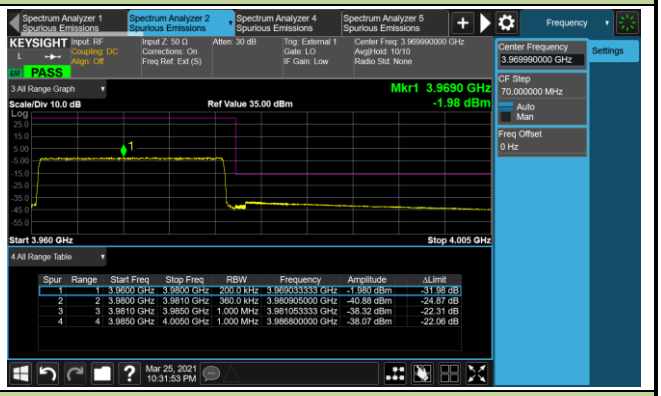
Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	ΔLimit
1	1	3.8800 GHz	3.9800 GHz	1.000 MHz	3.979000000 GHz	-15.57 dBm	-14.43 dB
2	2	3.9800 GHz	3.9810 GHz	360.0 kHz	3.980001667 GHz	-38.02 dBm	-22.01 dB
3	3	3.9810 GHz	3.9850 GHz	1.000 MHz	3.981000000 GHz	-41.22 dBm	-25.21 dB
4	4	3.9850 GHz	4.0850 GHz	1.000 MHz	4.027666667 GHz	-41.76 dBm	-25.75 dB

20MHz Channel Bandwidth - Full RB

Lower Band Edge

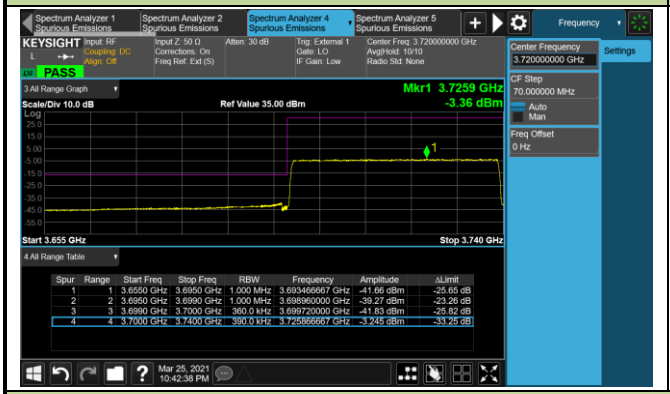


Upper Band Edge

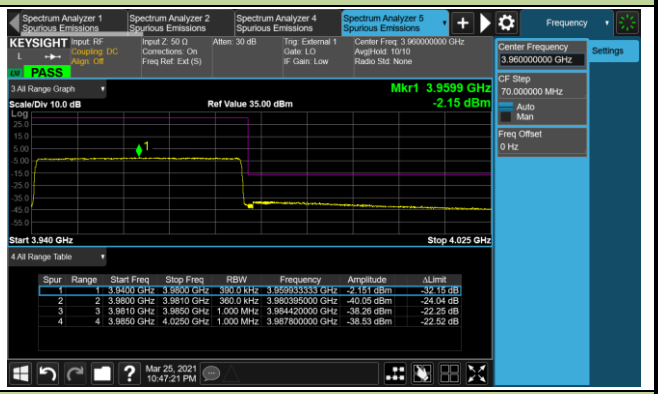


40MHz Channel Bandwidth - Full RB

Lower Band Edge

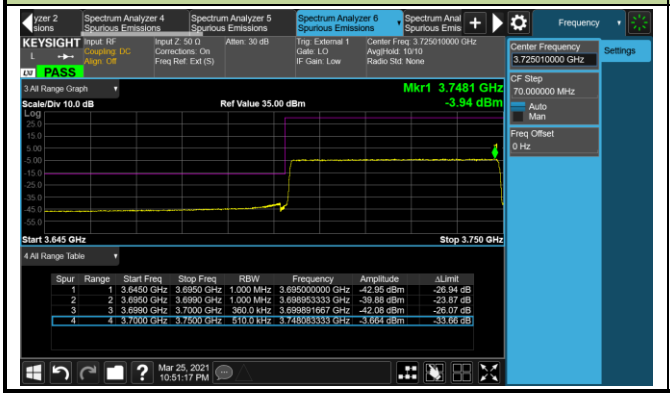


Upper Band Edge

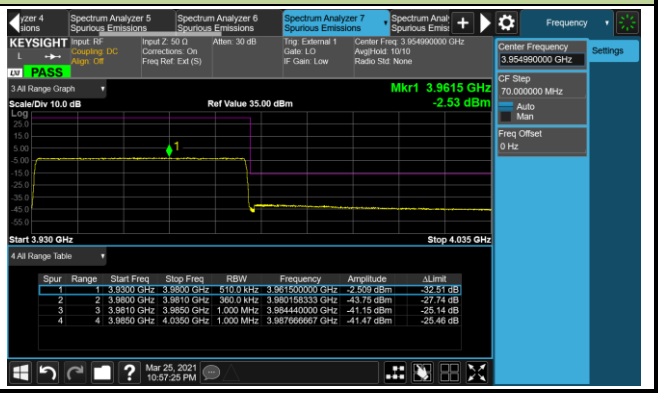


50MHz Channel Bandwidth - Full RB

Lower Band Edge

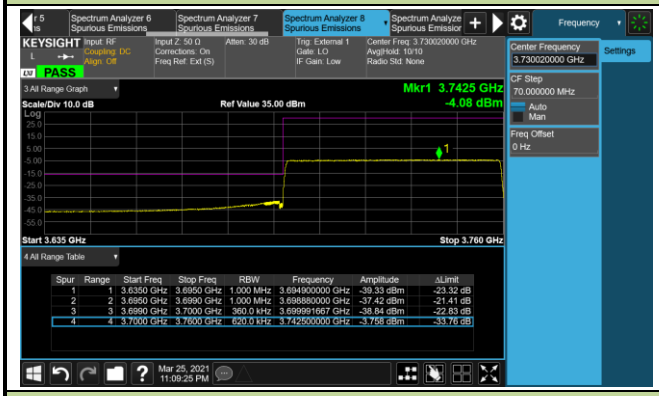


Upper Band Edge

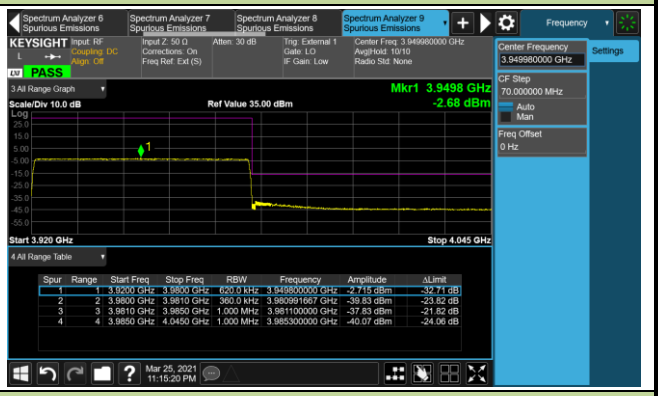


60MHz Channel Bandwidth - Full RB

Lower Band Edge

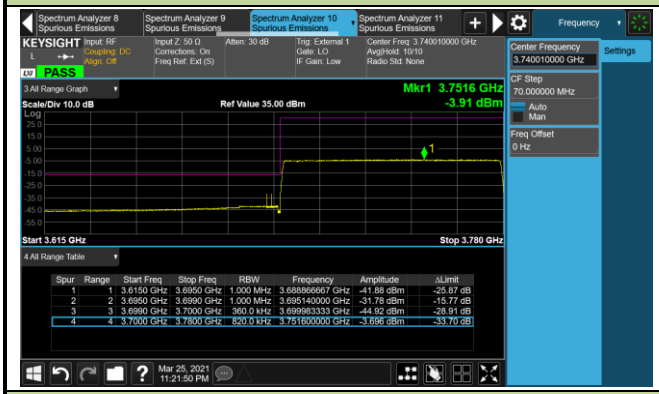


Upper Band Edge

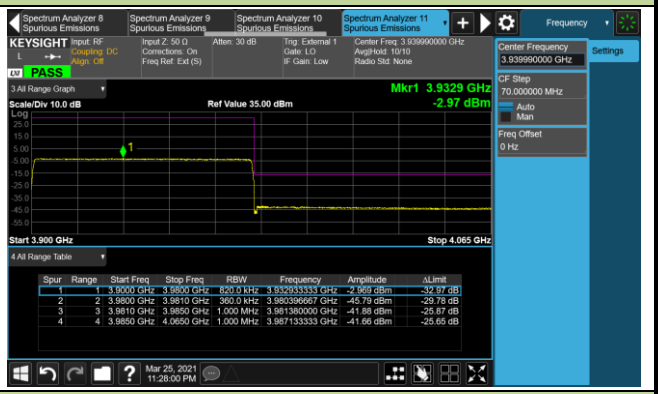


80MHz Channel Bandwidth - Full RB

Lower Band Edge

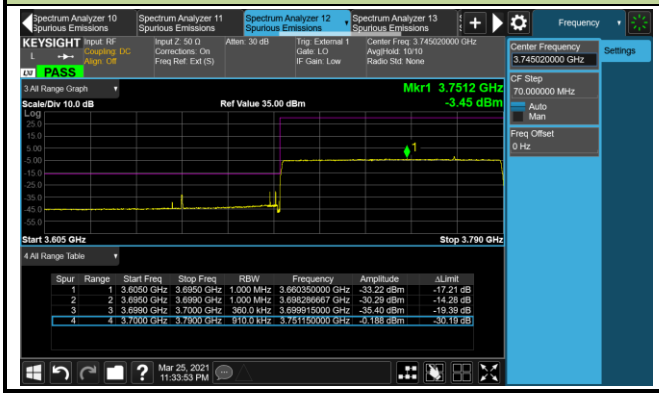


Upper Band Edge

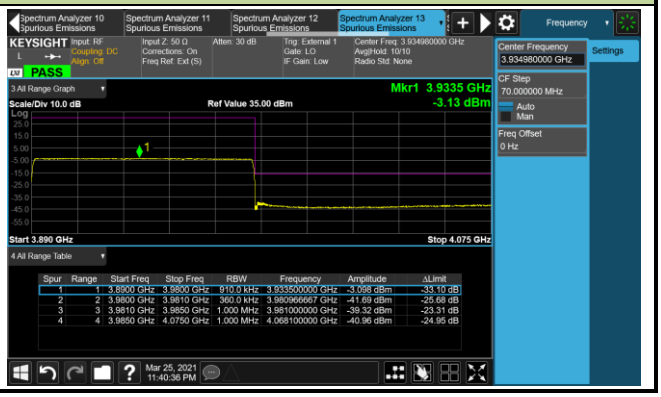


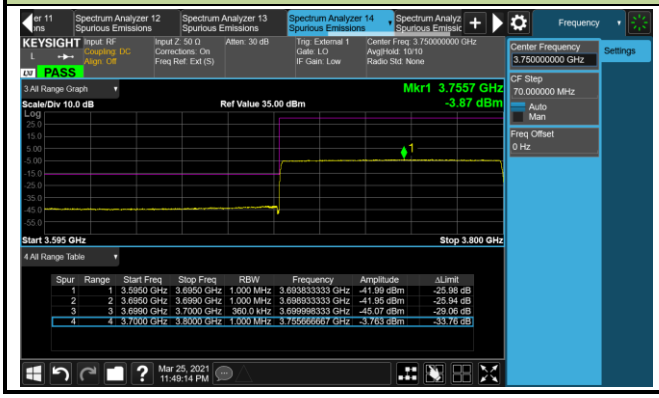
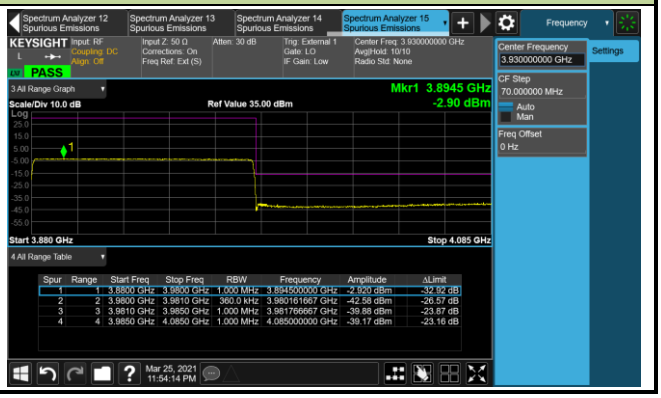
90MHz Channel Bandwidth - Full RB

Lower Band Edge



Upper Band Edge

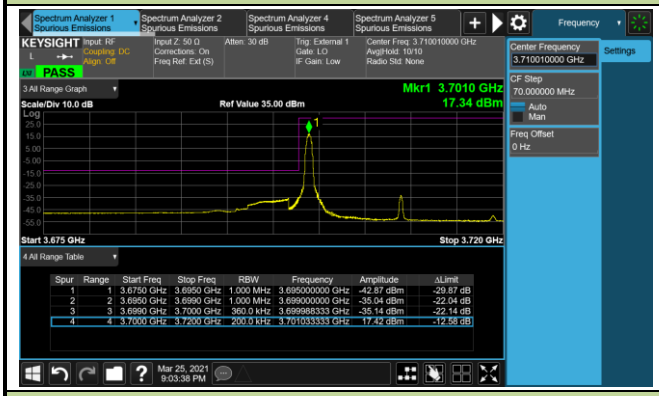


100MHz Channel Bandwidth - Full RB	
Lower Band Edge	Upper Band Edge
	

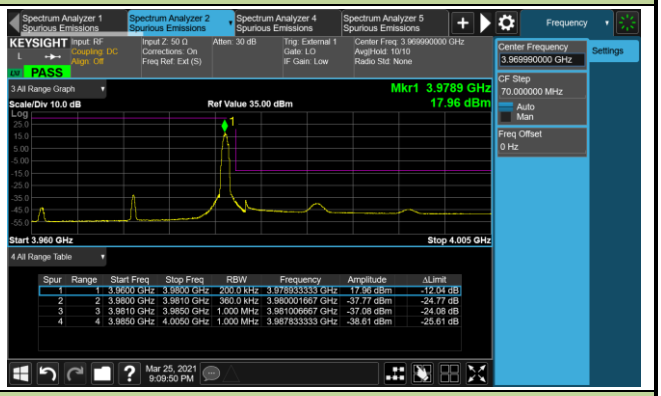
Product	5G Sub-6 GHz M.2 Module	Test Site	SIP-SR5
Test Engineer	Edgar Ma	Test Date	2021/03/25
Test Band	n77_EN-DC		

20MHz Channel Bandwidth - 1RB

Lower Band Edge

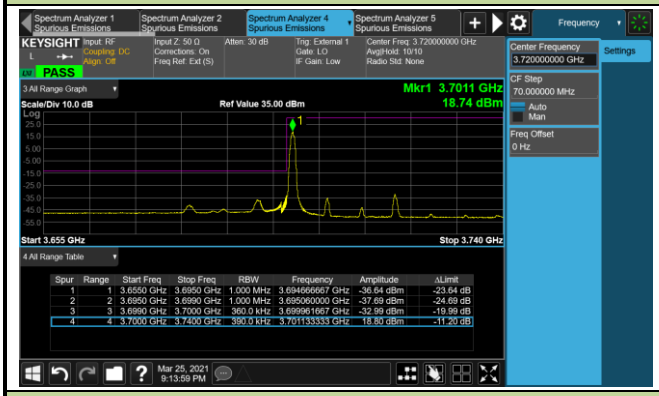


Upper Band Edge

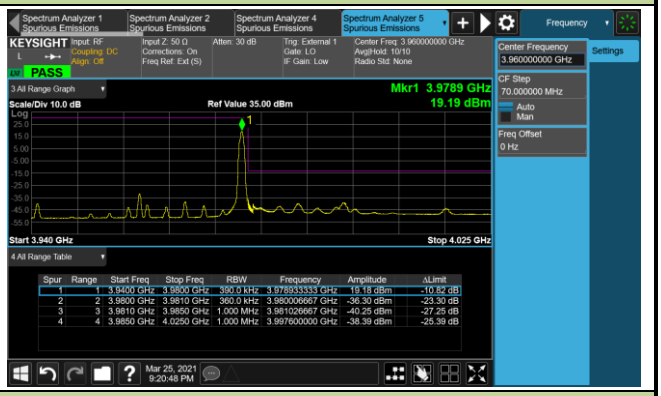


40MHz Channel Bandwidth - 1RB

Lower Band Edge

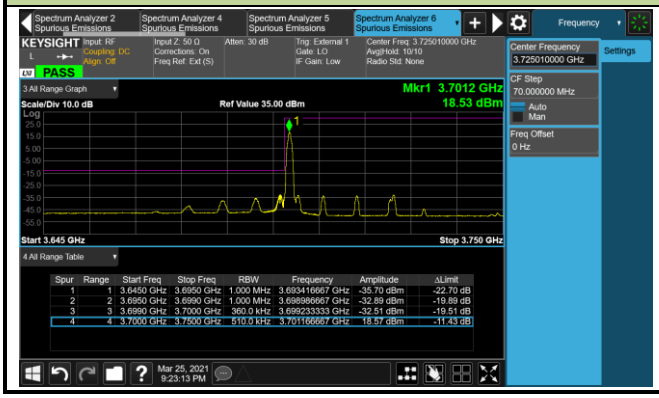


Upper Band Edge

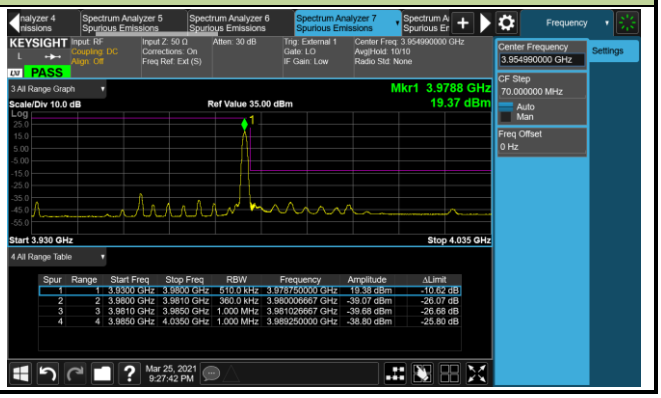


50MHz Channel Bandwidth - 1RB

Lower Band Edge

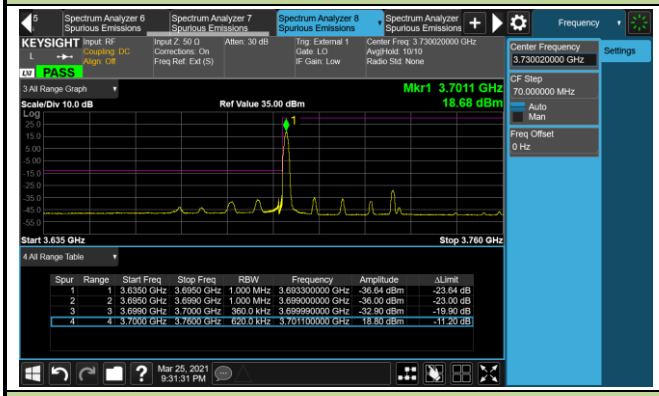


Upper Band Edge

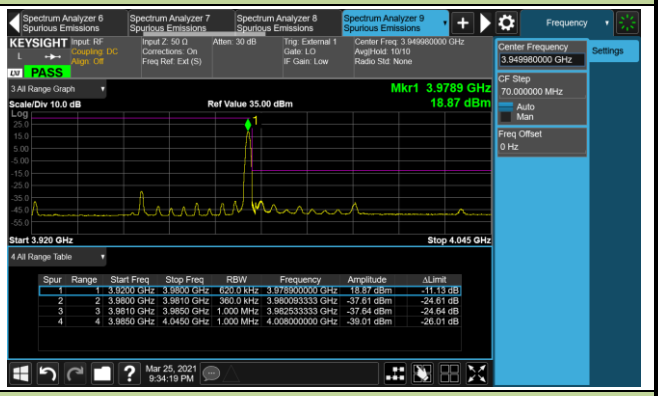


60MHz Channel Bandwidth - 1RB

Lower Band Edge

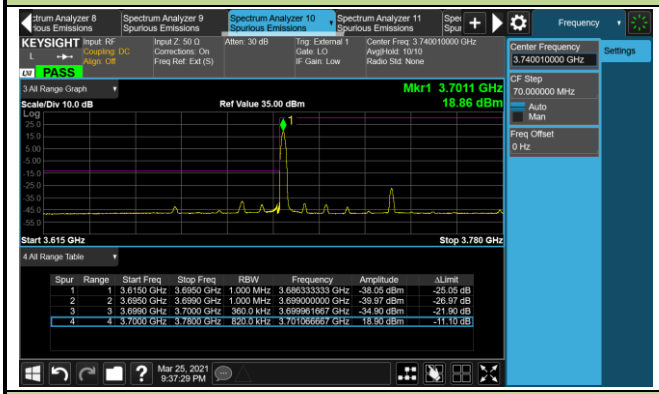


Upper Band Edge

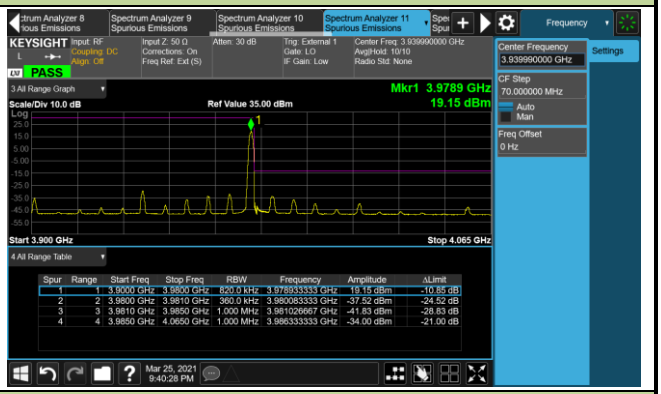


80MHz Channel Bandwidth - 1RB

Lower Band Edge

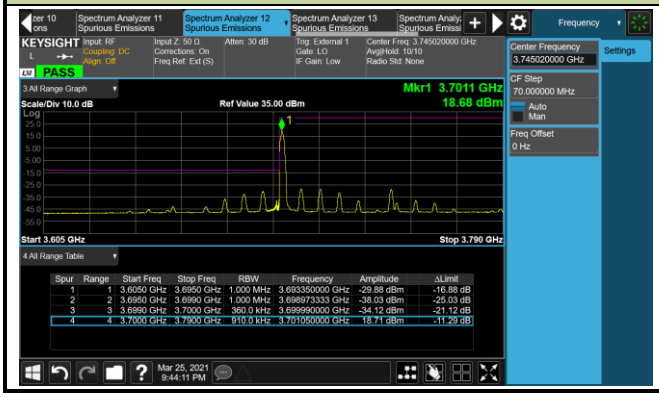


Upper Band Edge

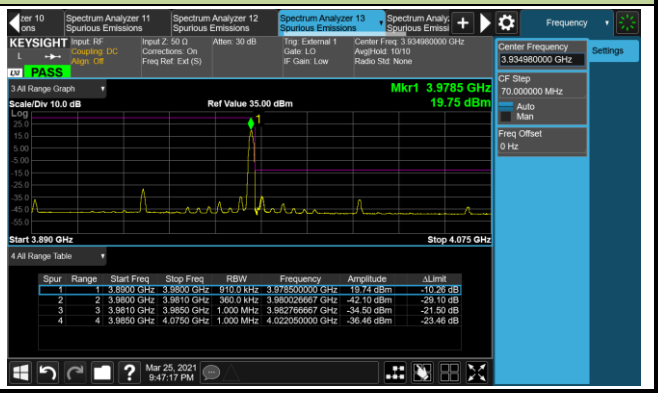


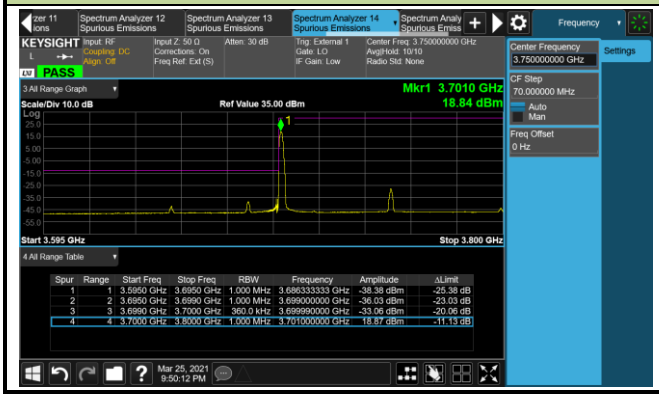
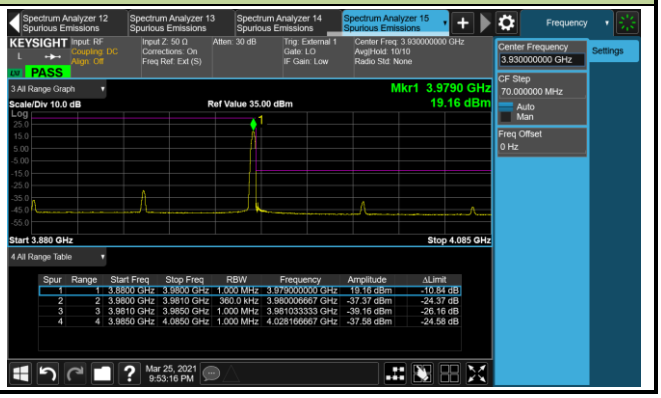
90MHz Channel Bandwidth - 1RB

Lower Band Edge



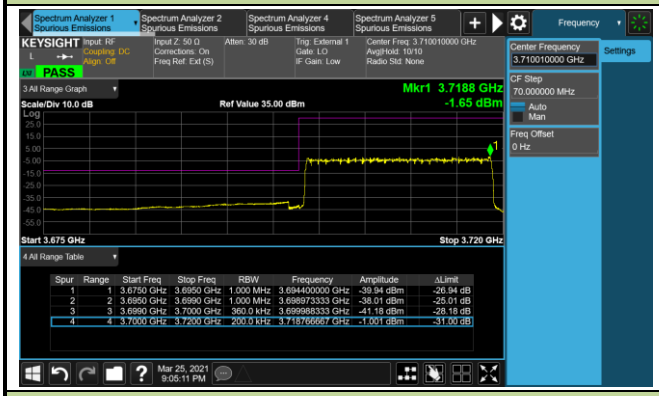
Upper Band Edge



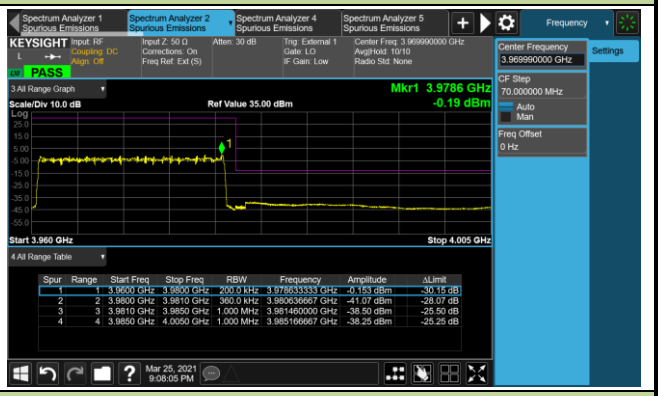
100MHz Channel Bandwidth - 1RB	
Lower Band Edge	Upper Band Edge
	

20MHz Channel Bandwidth - Full RB

Lower Band Edge

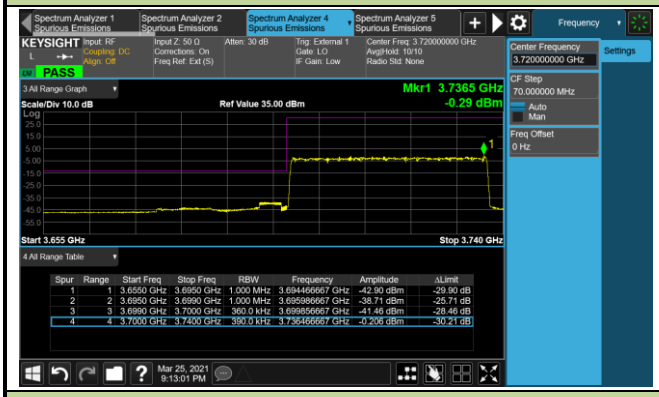


Upper Band Edge

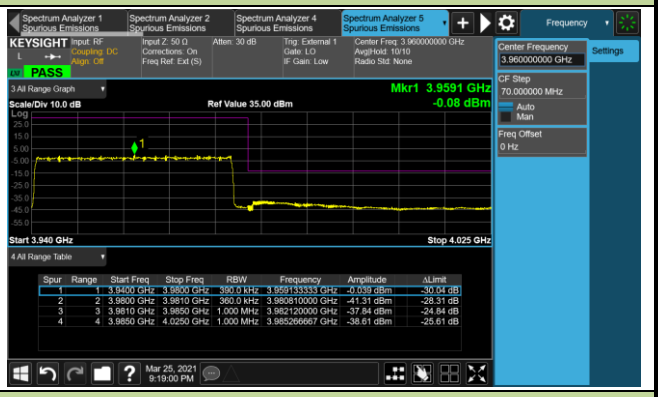


40MHz Channel Bandwidth - Full RB

Lower Band Edge

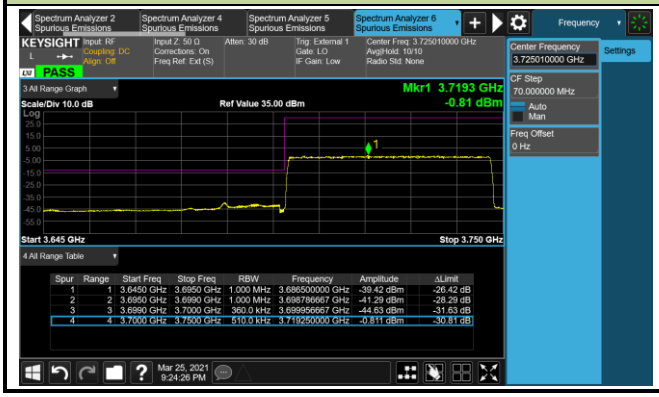


Upper Band Edge

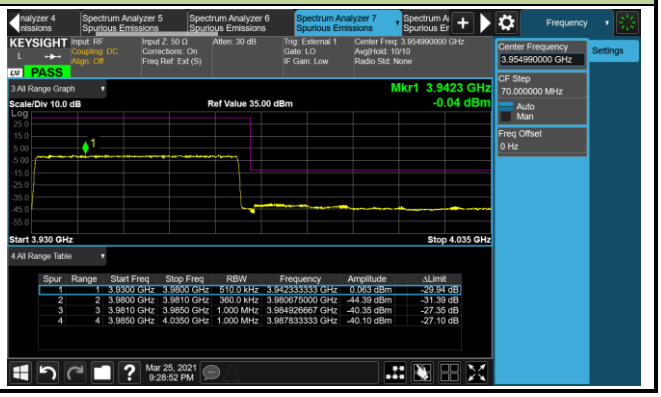


50MHz Channel Bandwidth - Full RB

Lower Band Edge

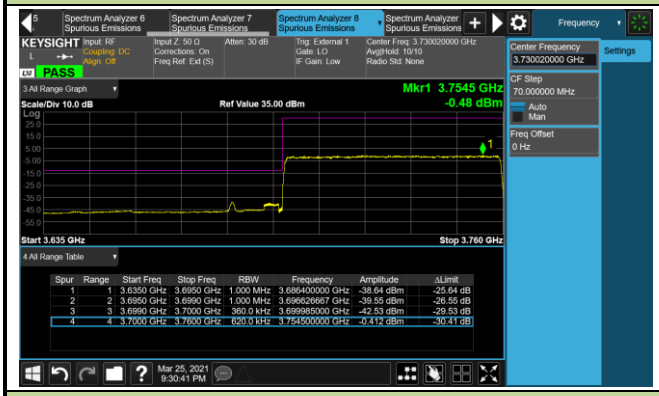


Upper Band Edge

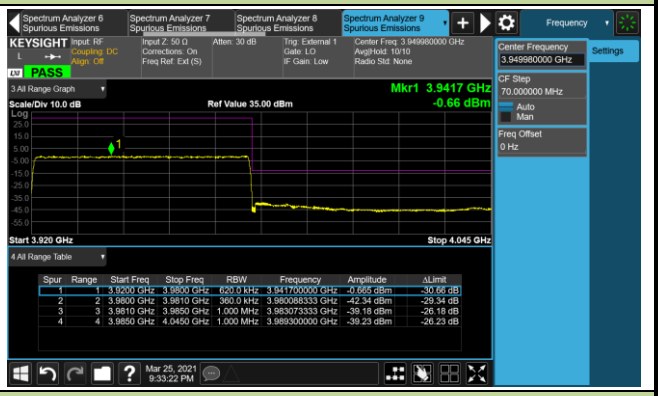


60MHz Channel Bandwidth - Full RB

Lower Band Edge

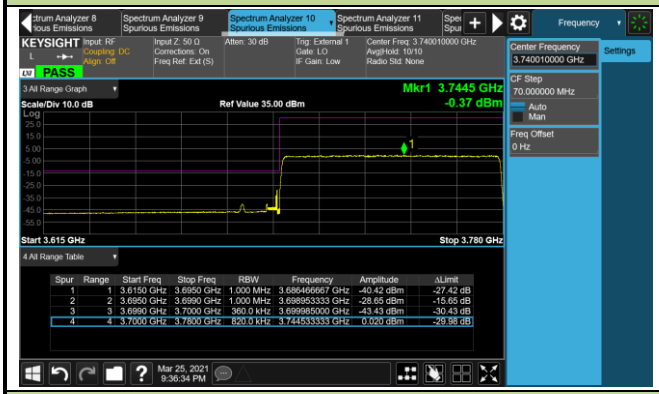


Upper Band Edge

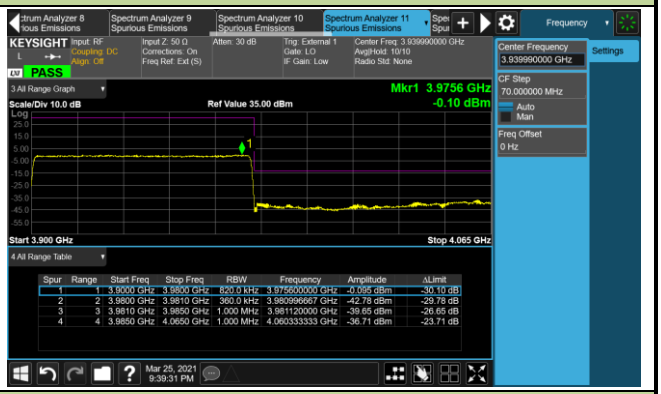


80MHz Channel Bandwidth - Full RB

Lower Band Edge

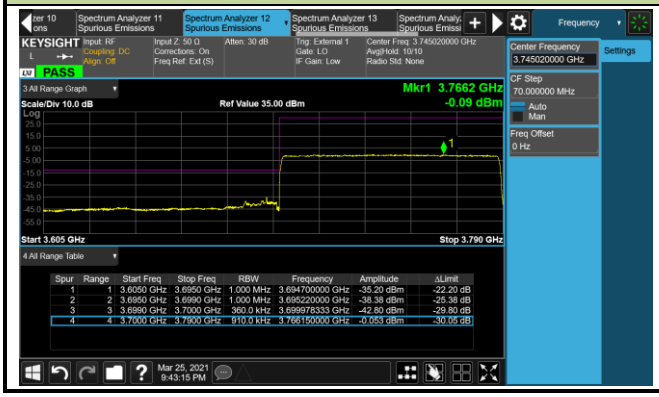


Upper Band Edge

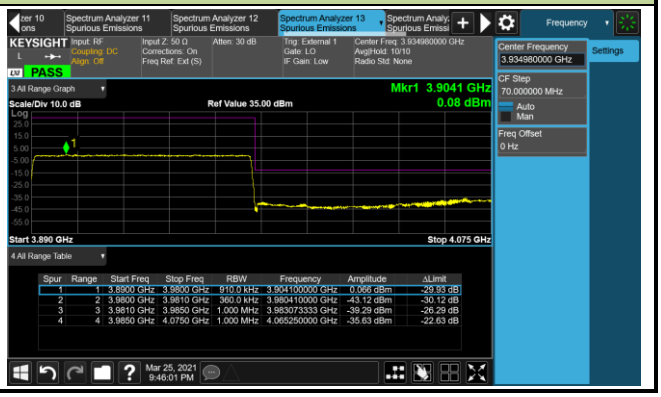


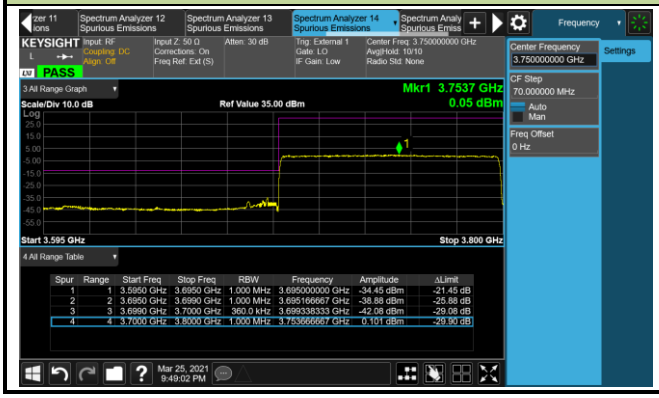
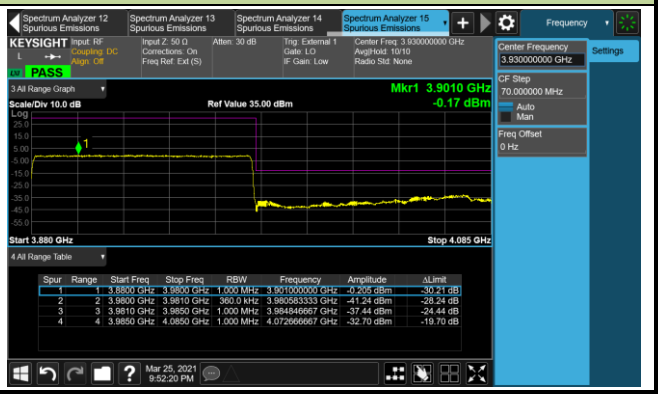
90MHz Channel Bandwidth - Full RB

Lower Band Edge



Upper Band Edge



100MHz Channel Bandwidth - Full RB	
Lower Band Edge	Upper Band Edge
	

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	ΔLimit
1	1	3.5950 GHz	3.6950 GHz	1.000 MHz	3.695000000 GHz	-34.45 dBm	-21.45 dB
2	2	3.6950 GHz	3.6990 GHz	1.000 MHz	3.695166667 GHz	-38.88 dBm	-25.88 dB
3	3	3.6990 GHz	3.7000 GHz	360.0 kHz	3.699338333 GHz	-42.08 dBm	-29.08 dB
4	4	3.7000 GHz	3.8000 GHz	1.000 MHz	3.753666667 GHz	0.101 dBm	-29.90 dB

Spur	Range	Start Freq	Stop Freq	RBW	Frequency	Amplitude	ΔLimit
1	1	3.8800 GHz	3.9800 GHz	1.000 MHz	3.901000000 GHz	-0.205 dBm	-30.21 dB
2	2	3.9800 GHz	3.9810 GHz	360.0 kHz	3.980583333 GHz	-41.24 dBm	-28.24 dB
3	3	3.9810 GHz	3.9850 GHz	1.000 MHz	3.984846667 GHz	-37.44 dBm	-24.44 dB
4	4	3.9850 GHz	4.0850 GHz	1.000 MHz	4.072666667 GHz	-32.70 dBm	-19.70 dB

4.6. Peak to Average Ratio Measurement

4.6.1.Test Limit

A peak to average ratio measurement is performed at the conducted port of the EUT. The spectrum analyzers Complementary Cumulative Distribution Function (CCDF) measurement profile is used to determine the largest deviation between the average and the peak power of the EUT in a given bandwidth. The CCDF curve shows how much time the peak waveform spends at or above a given average power level. The percent of time the signal spends at or above the level defines the probability for that particular power level.

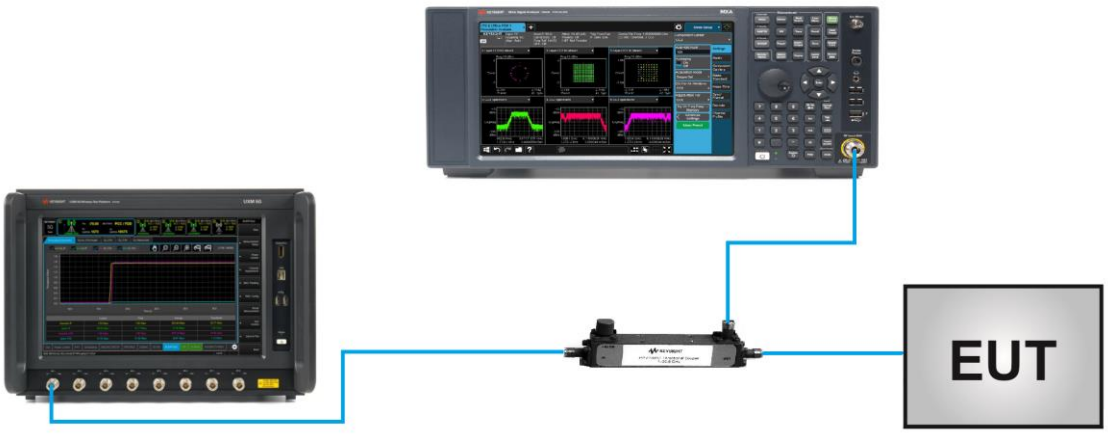
4.6.2.Test Procedure

ANSI C63.26-2015 - Section 5.2.3.4 (CCDF).

4.6.3.Test Setting

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

4.6.4.Test Setup

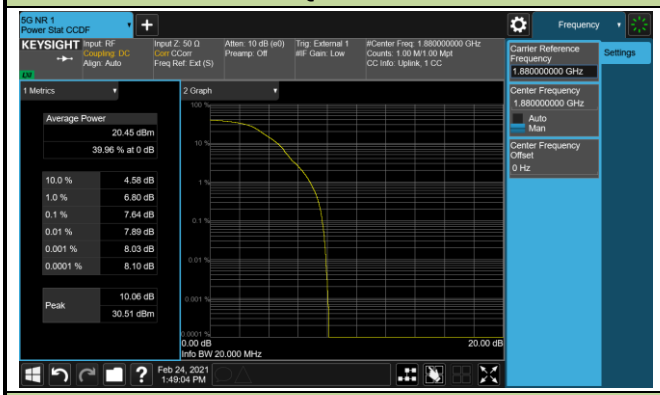


4.6.5.Test Result

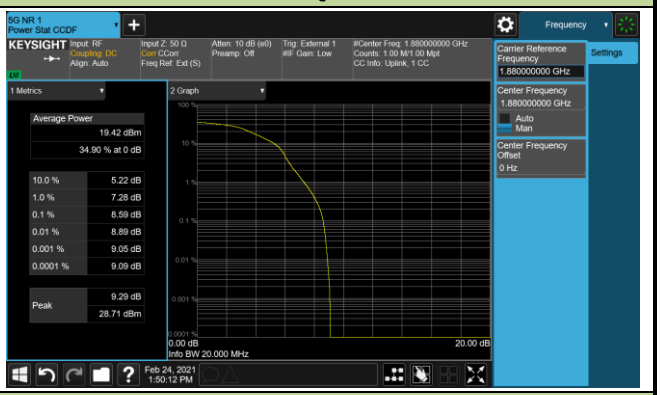
Product	5G Sub-6 GHz M.2 Module	Test Site	SIP-SR5
Test Engineer	Gordon Qi	Test Date	2021/02/24
Test Band	n2/25_SA		

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	Peak to Average Ratio (dB)	Limit (dB)	Result
QPSK					
376500	1882.5	20	7.64	≤ 13.00	Pass
16QAM					
376500	1882.5	20	8.59	≤ 13.00	Pass
64QAM					
376500	1882.5	20	9.33	≤ 13.00	Pass
256QAM					
376500	1882.5	20	8.97	≤ 13.00	Pass

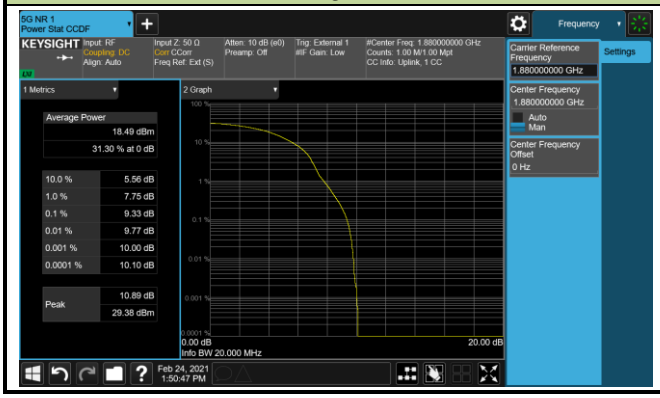
QPSK



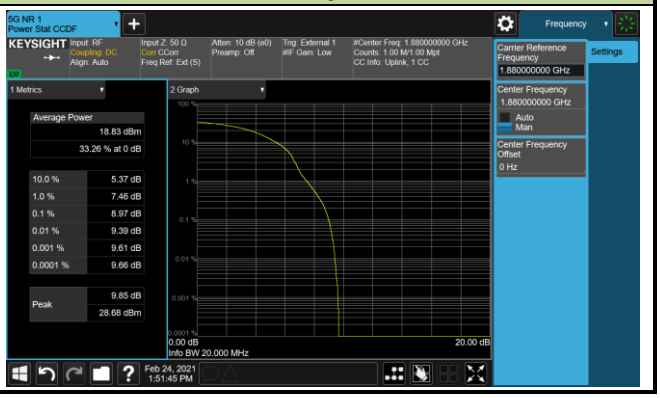
16QAM



64QAM



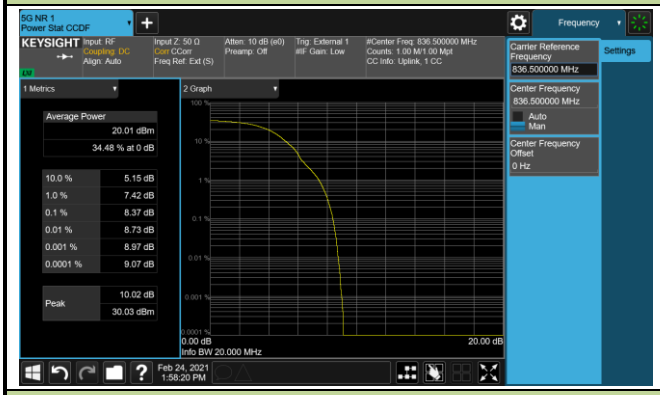
256QAM



Product	5G Sub-6 GHz M.2 Module	Test Site	SIP-SR5
Test Engineer	Gordon Qi	Test Date	2021/02/24
Test Band	n5_SA		

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	Peak to Average Ratio (dB)	Limit (dB)	Result
QPSK					
167300	836.5	20	8.37	≤ 13.00	Pass
16QAM					
167300	836.5	20	8.86	≤ 13.00	Pass
64QAM					
167300	836.5	20	8.81	≤ 13.00	Pass
256QAM					
167300	836.5	20	8.57	≤ 13.00	Pass

QPSK



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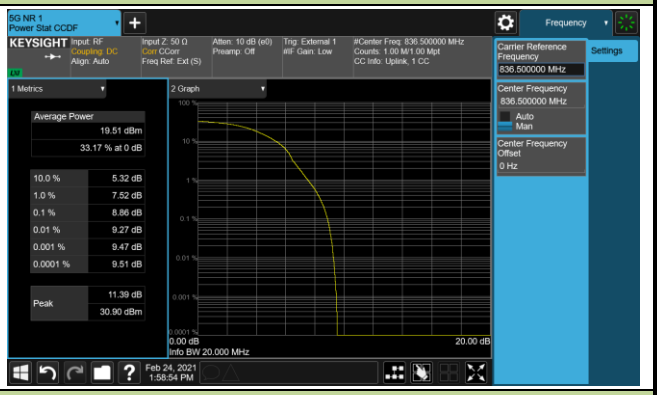
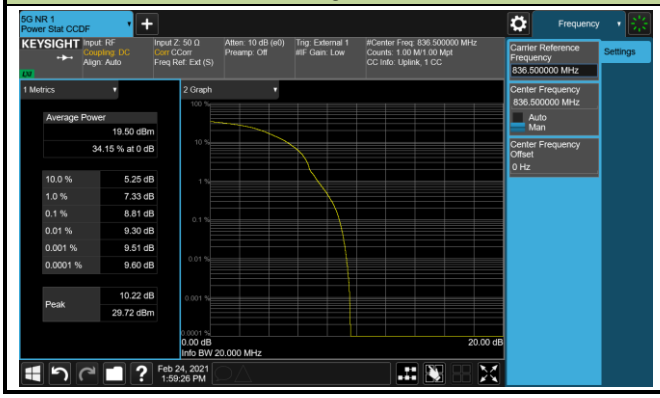


64QAM

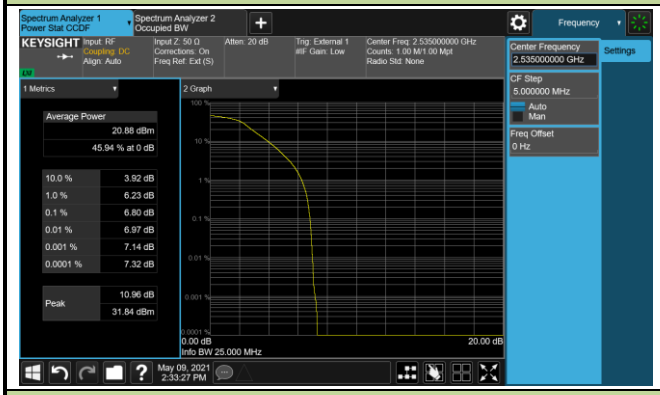


256QAM

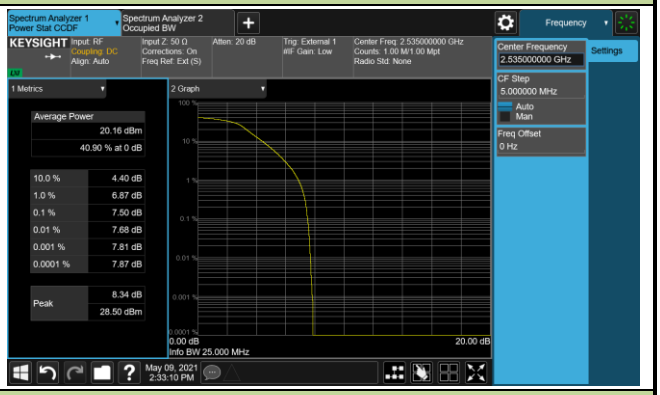
Product	5G Sub-6 GHz M.2 Module	Test Site	SIP-SR5
Test Engineer	Candy Luo	Test Date	2021/05/09
Test Band	n7_SA		

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	Peak to Average Ratio (dB)	Limit (dB)	Result
QPSK					
507000	2535.0	20	6.80	≤ 13.00	Pass
16QAM					
507000	2535.0	20	7.50	≤ 13.00	Pass
64QAM					
507000	2535.0	20	8.38	≤ 13.00	Pass
256QAM					
507000	2535.0	20	8.38	≤ 13.00	Pass

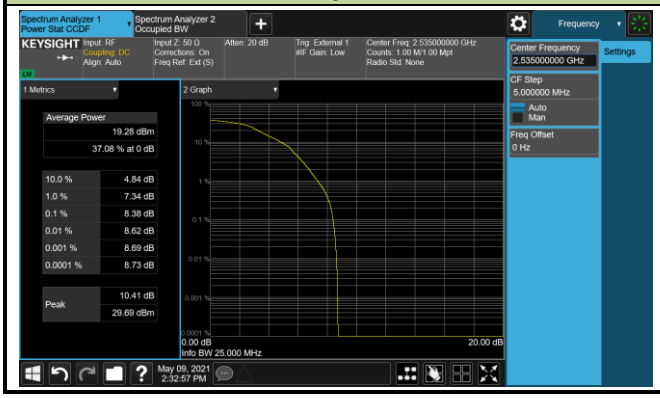
QPSK



16QAM



64QAM

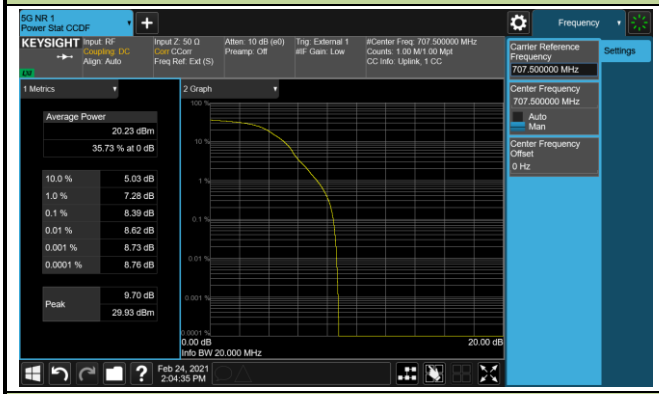


256QAM

Product	5G Sub-6 GHz M.2 Module	Test Site	SIP-SR5
Test Engineer	Gordon Qi	Test Date	2021/02/24
Test Band	n12_SA		

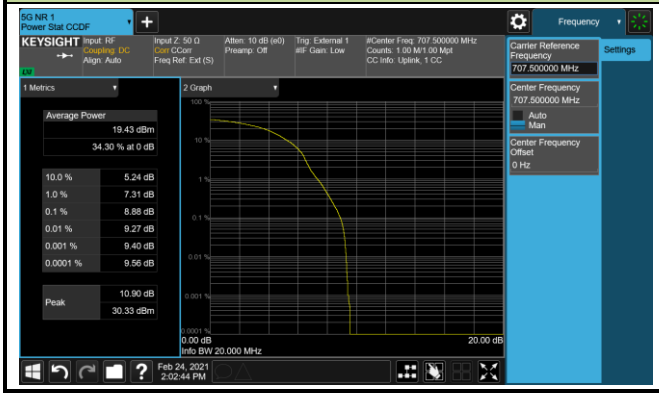
Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	Peak to Average Ratio (dB)	Limit (dB)	Result
QPSK					
141500	707.5	15	8.39	≤ 13.00	Pass
16QAM					
141500	707.5	15	8.95	≤ 13.00	Pass
64QAM					
141500	707.5	15	8.88	≤ 13.00	Pass
256QAM					
141500	707.5	15	9.22	≤ 13.00	Pass

QPSK



16QAM

64QAM

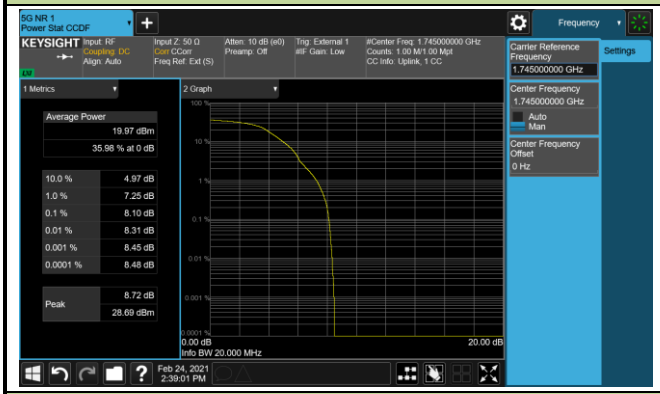


256QAM

Product	5G Sub-6 GHz M.2 Module	Test Site	SIP-SR5
Test Engineer	Gordon Qi	Test Date	2021/02/24
Test Band	n66_SA		

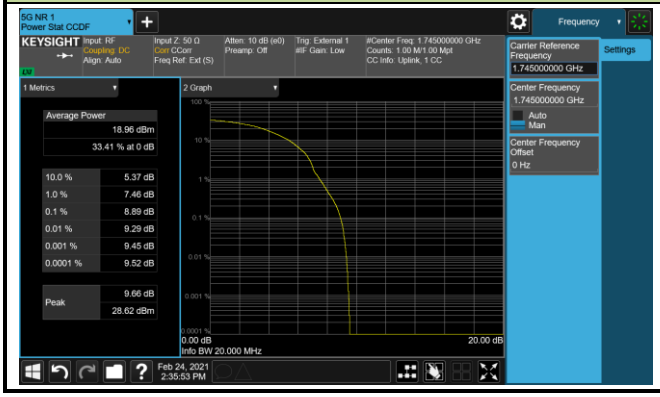
Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	Peak to Average Ratio (dB)	Limit (dB)	Result
QPSK					
349000	1745.0	40	8.10	≤ 13.00	Pass
16QAM					
349000	1745.0	40	8.65	≤ 13.00	Pass
64QAM					
349000	1745.0	40	8.89	≤ 13.00	Pass
256QAM					
349000	1745.0	40	9.06	≤ 13.00	Pass

QPSK



16QAM

64QAM

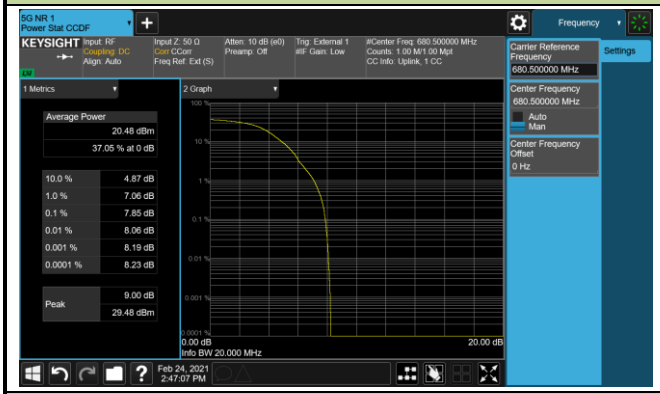


256QAM

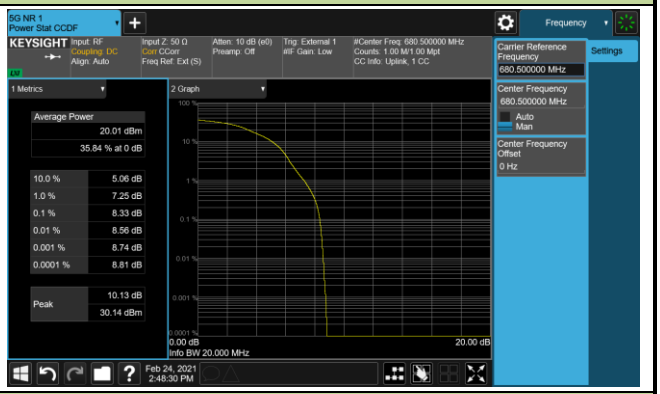
Product	5G Sub-6 GHz M.2 Module	Test Site	SIP-SR5
Test Engineer	Gordon Qi	Test Date	2021/02/24
Test Band	n71_SA		

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	Peak to Average Ratio (dB)	Limit (dB)	Result
QPSK					
136100	680.5	20	7.85	≤ 13.00	Pass
16QAM					
136100	680.5	20	8.33	≤ 13.00	Pass
64QAM					
136100	680.5	20	8.76	≤ 13.00	Pass
256QAM					
136100	680.5	20	8.69	≤ 13.00	Pass

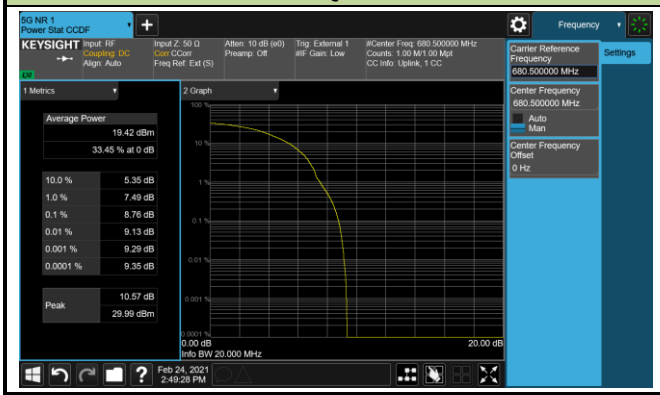
QPSK



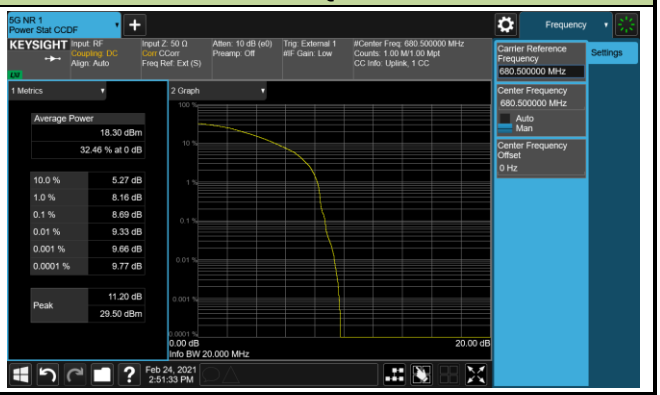
16QAM



64QAM



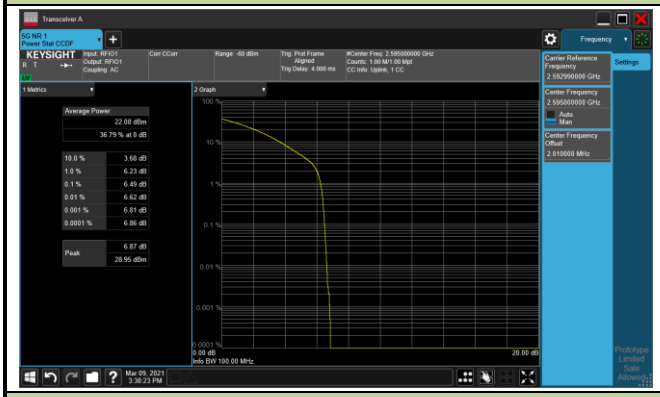
256QAM



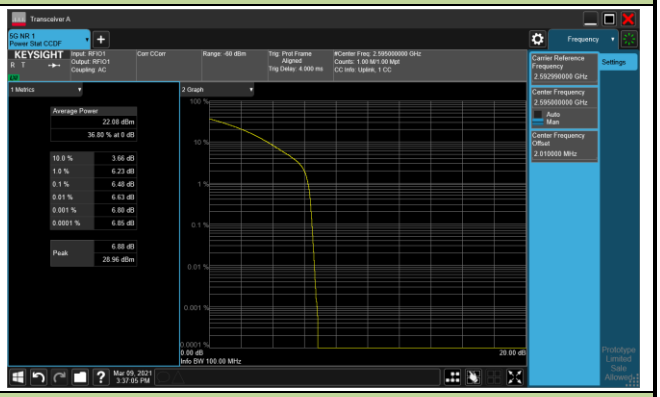
Product	5G Sub-6 GHz M.2 Module	Test Site	SIP-SR5
Test Engineer	Gordon Qi	Test Date	2021/02/24
Test Band	n41_SA_HPUE		

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	Peak to Average Ratio (dB)	Limit (dB)	Result
QPSK					
518598	2592.99	100	6.49	≤ 13.00	Pass
16QAM					
518598	2592.99	100	6.48	≤ 13.00	Pass
64QAM					
518598	2592.99	100	7.34	≤ 13.00	Pass
256QAM					
518598	2592.99	100	7.37	≤ 13.00	Pass

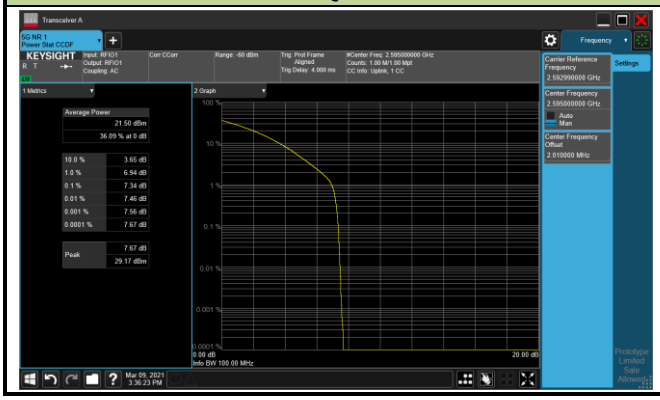
QPSK



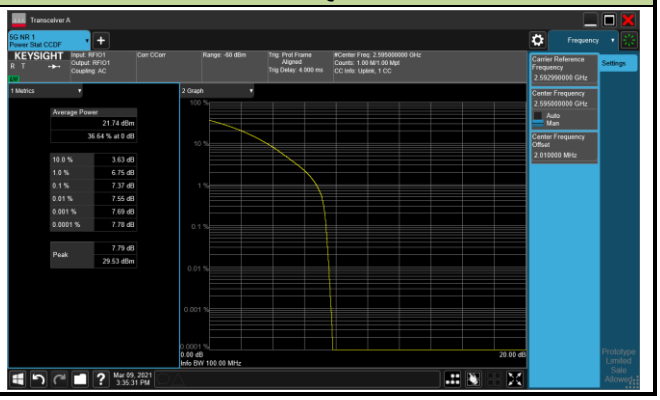
16QAM



64QAM



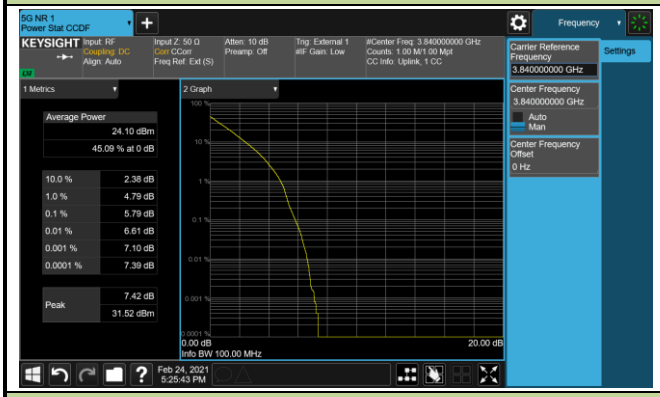
256QAM



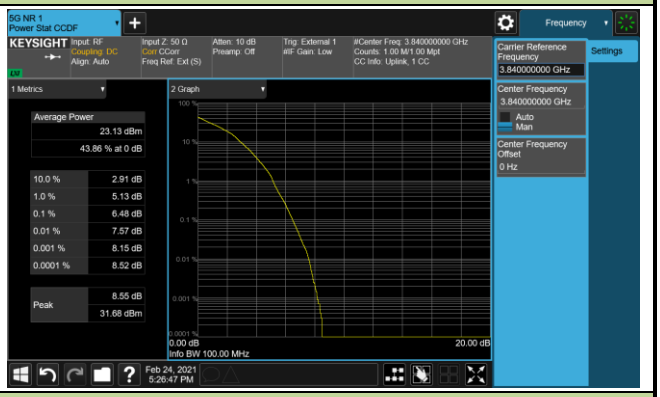
Product	5G Sub-6 GHz M.2 Module	Test Site	SIP-SR5
Test Engineer	Gordon Qi	Test Date	2021/02/24
Test Band	n77_SA_HPUE		

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	Peak to Average Ratio (dB)	Limit (dB)	Result
QPSK					
656000	3840.00	100	5.79	≤ 13.00	Pass
16QAM					
656000	3840.00	100	6.48	≤ 13.00	Pass
64QAM					
656000	3840.00	100	6.60	≤ 13.00	Pass
256QAM					
656000	3840.00	100	6.58	≤ 13.00	Pass

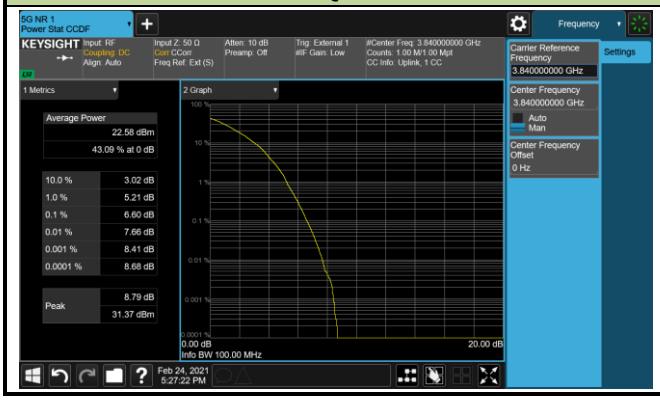
QPSK



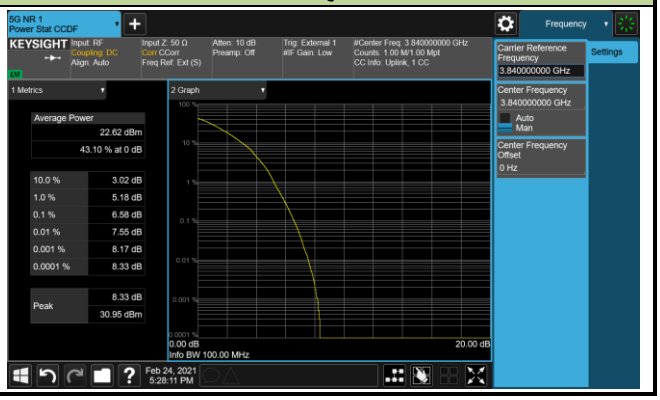
16QAM



64QAM



256QAM



4.7. Conducted Spurious Emission Measurement

4.7.1.Test Limit

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst-case configuration. All modes of operation were investigated and the worst-case configuration results are reported in this section.

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB.

For n7, n41 the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 55 + 10 log(P) dB.

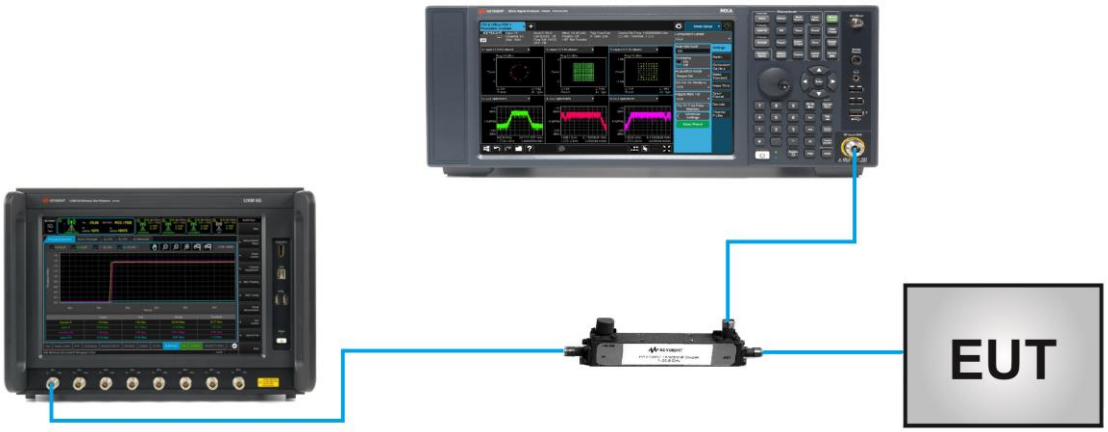
4.7.2.Test Procedure

ANSI C63.26-2015 - Section 5.7

4.7.3.Test Setting

1. Set the analyzer frequency to low, mid, high channel.
2. RBW = 1MHz
3. VBW ≥ 3*RBW
4. Sweep time = auto
5. Detector = power averaging (rms)
6. Set sweep trigger to “free run.”
7. User gate triggered such that the analyzer only sweeps when the device is transmitting at full power.
8. Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. To accurately determine the average power over the on and off time of the transmitter, it can be necessary to increase the number of traces to be averaged above 100, or if using a manually configured sweep time, increase the sweep time.

4.7.4.Test Setup



4.7.5.Test Result

Product	5G Sub-6 GHz M.2 Module	Test Site	SIP-SR5
Test Engineer	Gordon Qi	Test Date	2021/02/23
Test Band	n2/25_SA		

Channel	Frequency (MHz)	Channel Bandwidth (MHz)	Frequency Range (MHz)	Max Spurious Emissions (dBm)	Limit (dBm)	Result
370500	1852.5	5	30 ~ 20000	-34.51	≤ -13.00	Pass
376500	1882.5	5	30 ~ 20000	-33.97	≤ -13.00	Pass
382500	1912.5	5	30 ~ 20000	-35.17	≤ -13.00	Pass
371000	1855.0	10	30 ~ 20000	-36.13	≤ -13.00	Pass
376500	1882.5	10	30 ~ 20000	-34.85	≤ -13.00	Pass
382000	1910.0	10	30 ~ 20000	-35.86	≤ -13.00	Pass
371500	1857.5	15	30 ~ 20000	-32.31	≤ -13.00	Pass
376500	1882.5	15	30 ~ 20000	-33.80	≤ -13.00	Pass
381500	1907.5	15	30 ~ 20000	-33.84	≤ -13.00	Pass
372000	1860.0	20	30 ~ 20000	-34.90	≤ -13.00	Pass
376500	1882.5	20	30 ~ 20000	-33.52	≤ -13.00	Pass
381000	1905.0	20	30 ~ 20000	-33.50	≤ -13.00	Pass