

5.6. Peak to Average Ratio

5.6.1. 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.

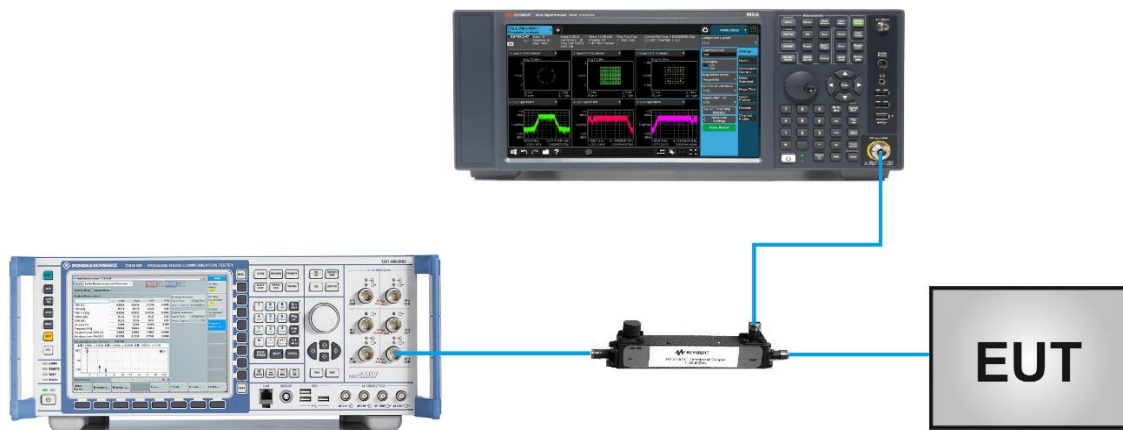
5.6.2. Test Procedure Used

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

5.6.3. Test Setting

1. Set the 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 PARR level associated with a probability of 0.1%

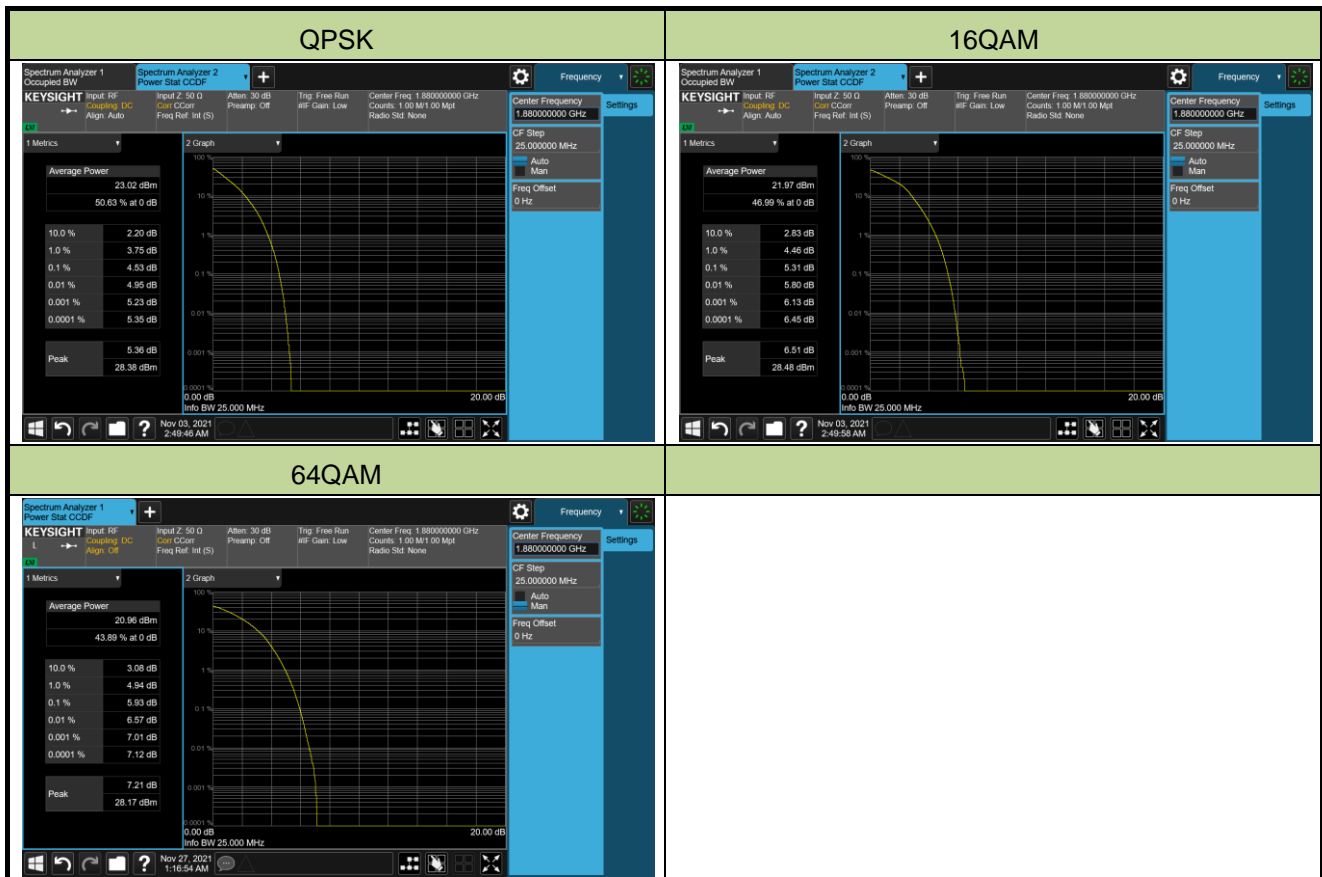
5.6.4. Test Setup



5.6.5. Test Result

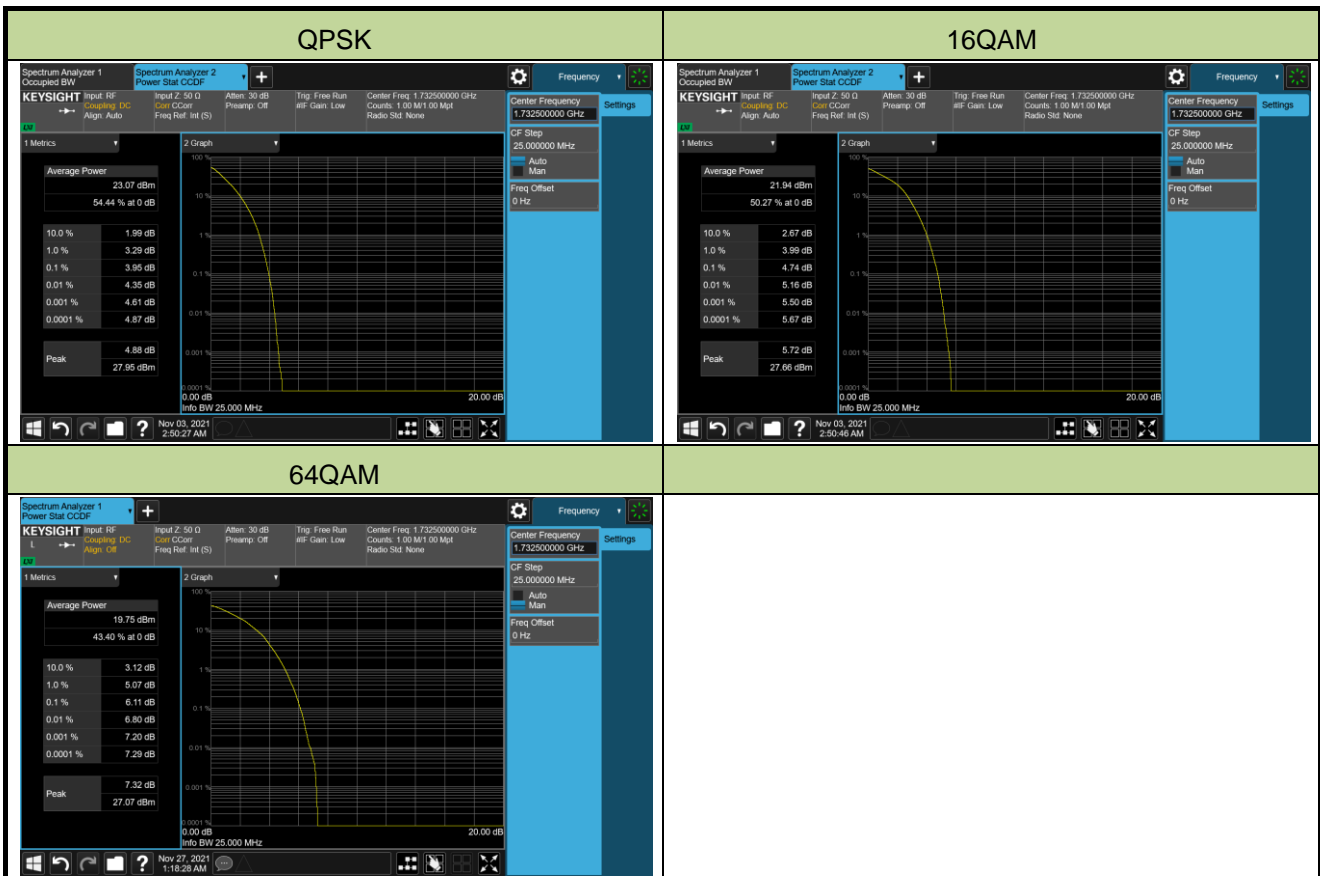
Test Site	WZ-SR6	Test Engineer	Caitlin Chen
Test Date	2021/11/03 ~ 2021/11/27	Test Band	LTE Band 2

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	Peak to Average Ratio (dB)	Limit (dB)
QPSK				
18900	1880.0	20	4.53	≤ 13.00
16QAM				
18900	1880.0	20	5.31	≤ 13.00
64QAM				
18900	1880.0	20	5.93	≤ 13.00



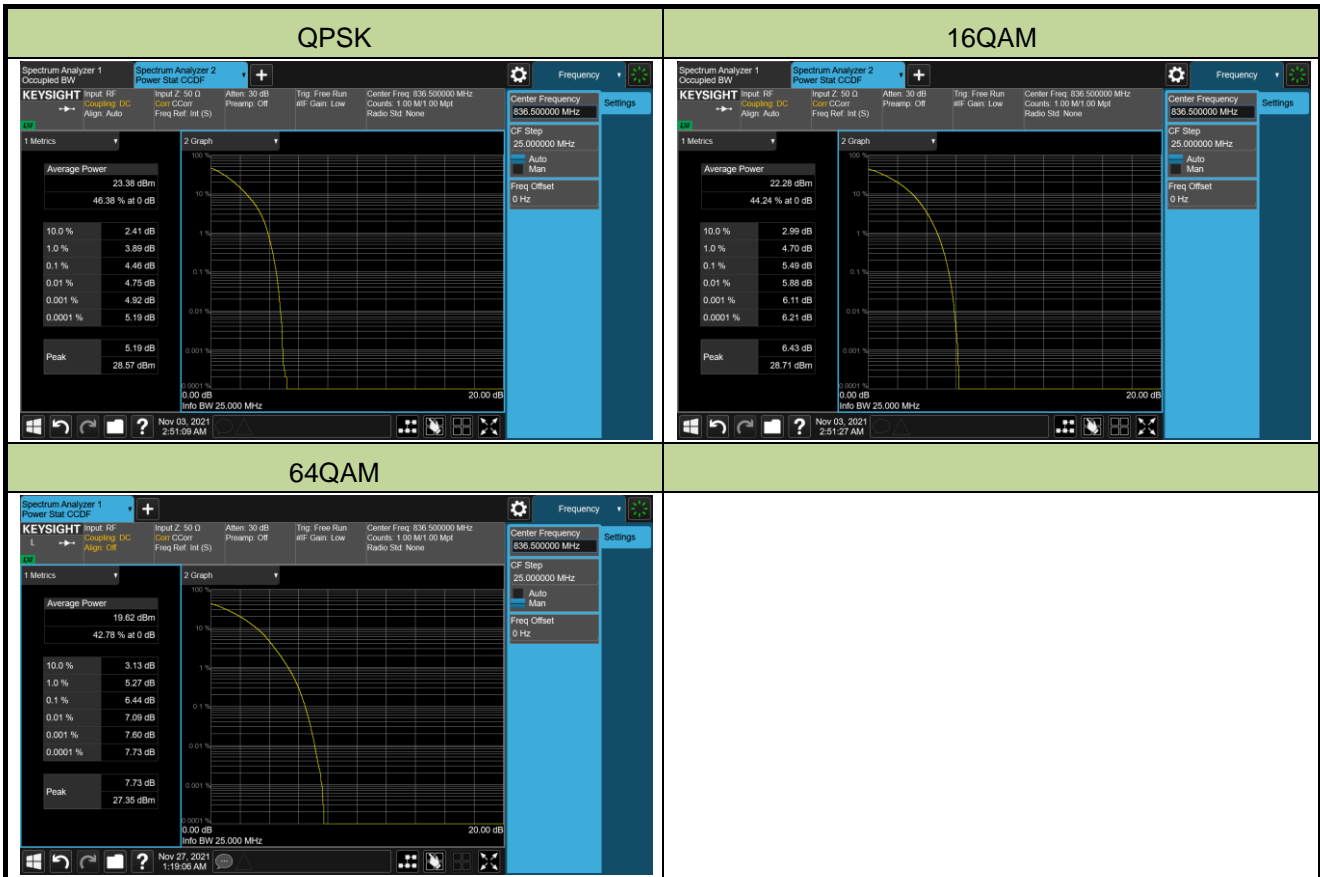
Test Site	WZ-SR6	Test Engineer	Caitlin Chen
Test Date	2021/11/03 ~ 2021/11/27	Test Band	LTE Band 4

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	Peak to Average Ratio (dB)	Limit (dB)
QPSK				
20175	1732.5	20	3.95	≤ 13.00
16QAM				
20175	1732.5	20	4.74	≤ 13.00
64QAM				
20175	1732.5	20	6.11	≤ 13.00



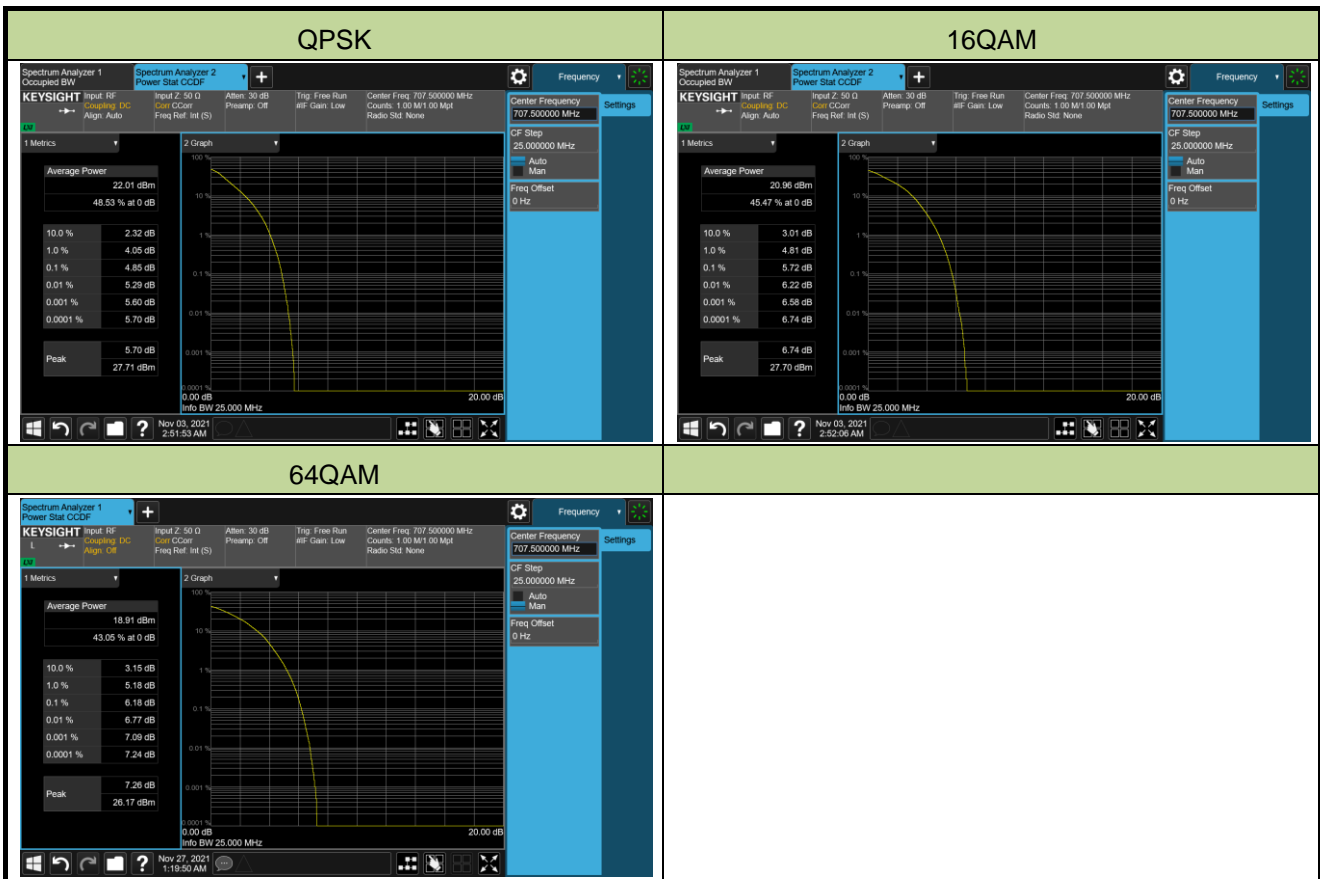
Test Site	WZ-SR6	Test Engineer	Caitlin Chen
Test Date	2021/11/03 ~ 2021/11/27	Test Band	LTE Band 5

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	Peak to Average Ratio (dB)	Limit (dB)
QPSK				
26915	836.5	10	4.46	≤ 13.00
16QAM				
26915	836.5	10	5.49	≤ 13.00
64QAM				
26915	836.5	10	6.44	≤ 13.00



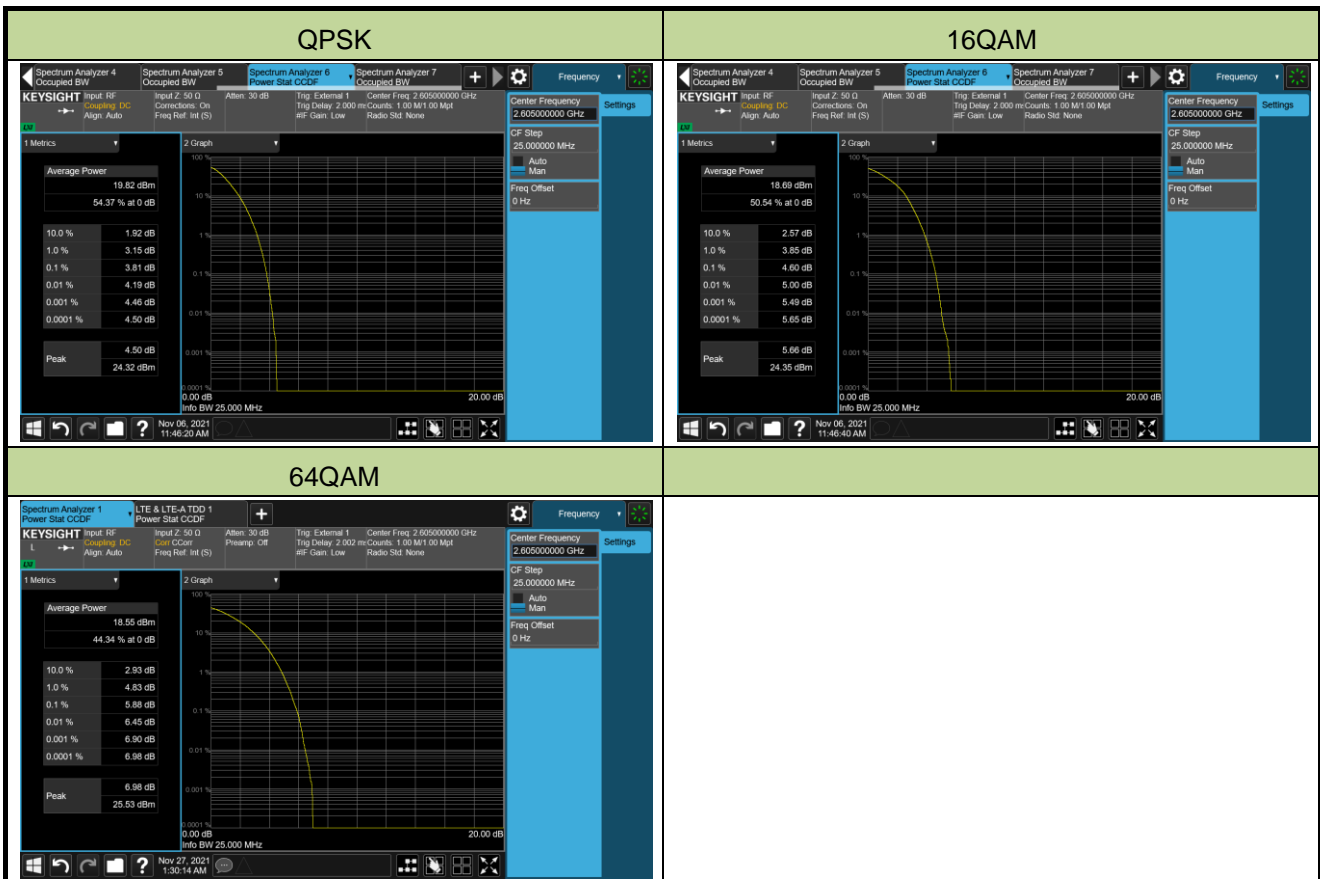
Test Site	WZ-SR6	Test Engineer	Caitlin Chen
Test Date	2021/11/03 ~ 2021/11/27	Test Band	LTE Band 12/17

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	Peak to Average Ratio (dB)	Limit (dB)
QPSK				
18900	707.5	10	4.85	≤ 13.00
16QAM				
18900	707.5	10	5.72	≤ 13.00
64QAM				
18900	707.5	10	6.18	≤ 13.00



Test Site	WZ-SR6	Test Engineer	Caitlin Chen
Test Date	2021/11/06 ~ 2021/11/27	Test Band	LTE Band 41

Channel No.	Frequency (MHz)	Channel Bandwidth (MHz)	Peak to Average Ratio (dB)	Limit (dB)
QPSK				
40740	2605.0	20	3.81	≤ 13.00
16QAM				
40740	2605.0	20	4.60	≤ 13.00
64QAM				
40740	2605.0	20	5.88	≤ 13.00



5.7. Conducted Spurious Emissions

5.7.1. 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 Band 41 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.

5.7.2. Test Procedure Used

ANSI C63.26-2015 - Section 5.7

5.7.3. Test Setting

1. Set the analyzer frequency to low, mid, high channel.
2. RBW = 1MHz
3. VBW $\geq 3 \cdot$ 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.

5.7.4. Test Setup



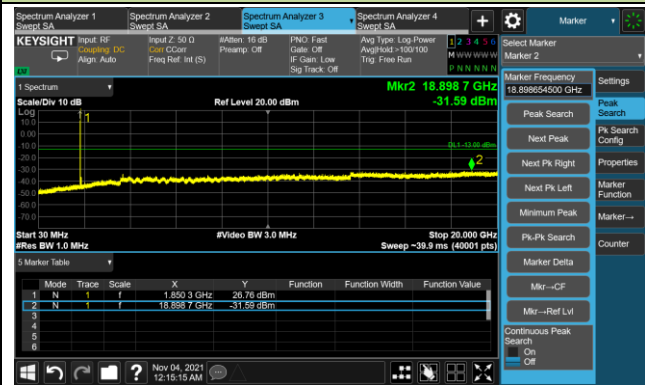
5.7.5. Test Result

Test Site	WZ-SR6	Test Engineer	Candy Luo
Test Date	2021/11/04	Test Band	LTE Band 2, 1RB, QPSK

Channel	Frequency (MHz)	Channel Bandwidth (MHz)	Frequency Range (MHz)	Max Spurious Emissions (dBm)	Limit (dBm)
18607	1850.7	1.4	30 ~ 20000	-31.59	≤ -13.00
18900	1880.0	1.4	30 ~ 20000	-31.87	≤ -13.00
19193	1909.3	1.4	30 ~ 20000	-31.51	≤ -13.00
18615	1851.5	3	30 ~ 20000	-32.02	≤ -13.00
18900	1880.0	3	30 ~ 20000	-31.18	≤ -13.00
19185	1908.5	3	30 ~ 20000	-31.73	≤ -13.00
18625	1852.5	5	30 ~ 20000	-31.40	≤ -13.00
18900	1880.0	5	30 ~ 20000	-31.57	≤ -13.00
19175	1907.5	5	30 ~ 20000	-31.27	≤ -13.00
18650	1855.0	10	30 ~ 20000	-31.98	≤ -13.00
18900	1880.0	10	30 ~ 20000	-31.18	≤ -13.00
19150	1905.0	10	30 ~ 20000	-31.51	≤ -13.00
18675	1857.5	15	30 ~ 20000	-31.12	≤ -13.00
18900	1880.0	15	30 ~ 20000	-30.81	≤ -13.00
19125	1902.5	15	30 ~ 20000	-31.67	≤ -13.00
18700	1860.0	20	30 ~ 20000	-31.88	≤ -13.00
18900	1880.0	20	30 ~ 20000	-32.16	≤ -13.00
19100	1900.0	20	30 ~ 20000	-32.18	≤ -13.00

1.4MHz Channel Bandwidth

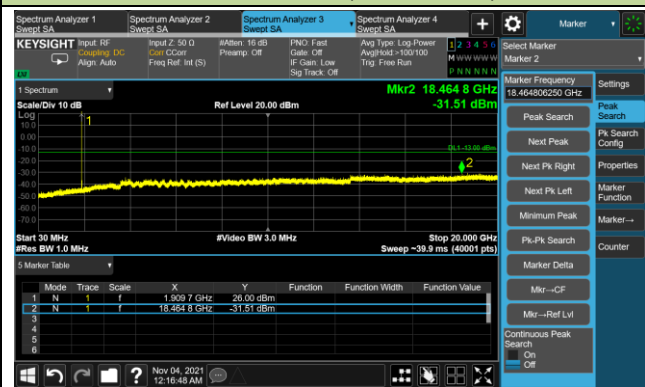
Channel 18607 (1850.7MHz)



Channel 18900 (1880.0MHz)

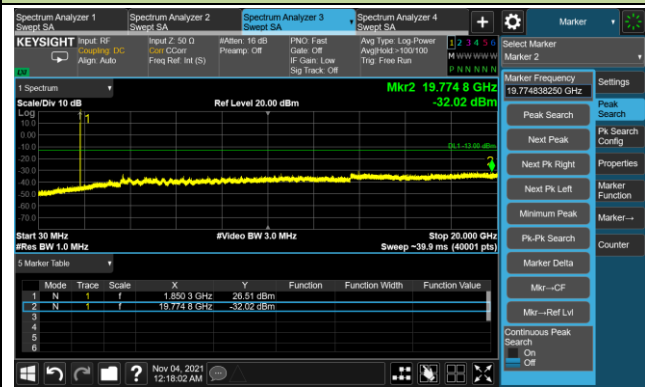


Channel 19193 (1909.3MHz)

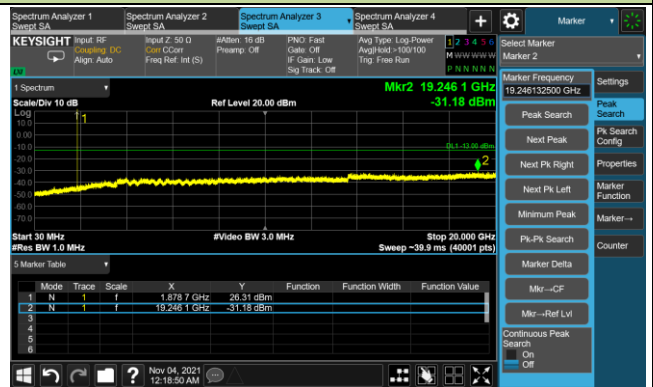


3MHz Channel Bandwidth

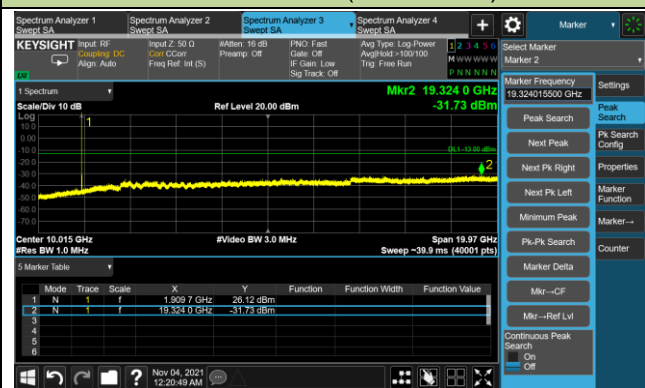
Channel 18615 (1851.5MHz)



Channel 18900 (1880.0MHz)

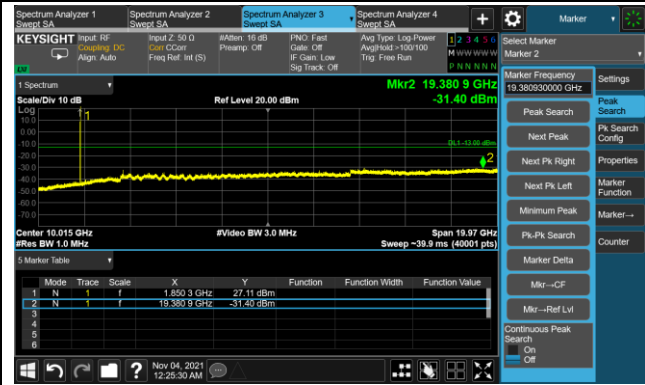


Channel 19185 (1908.5MHz)

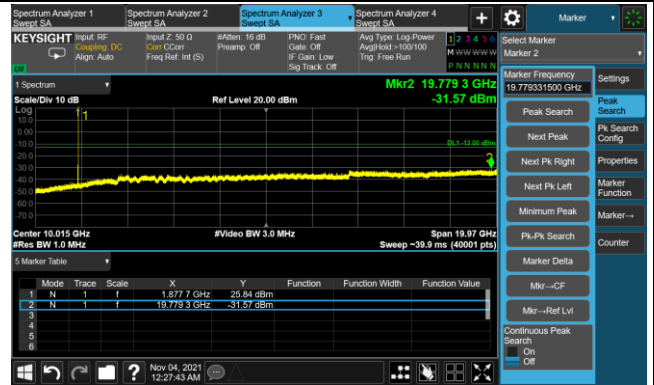


5MHz Channel Bandwidth

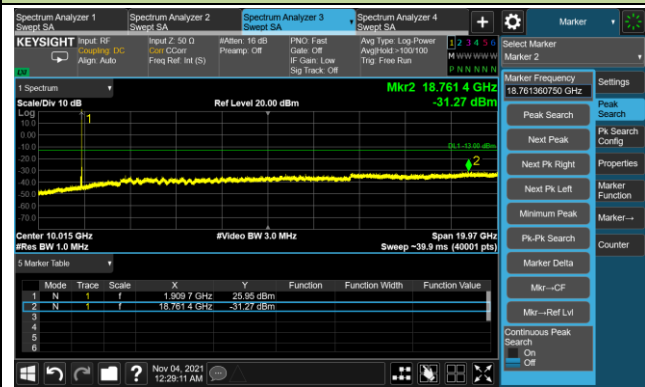
Channel 18625 (1852.5MHz)



Channel 18900 (1880.0MHz)

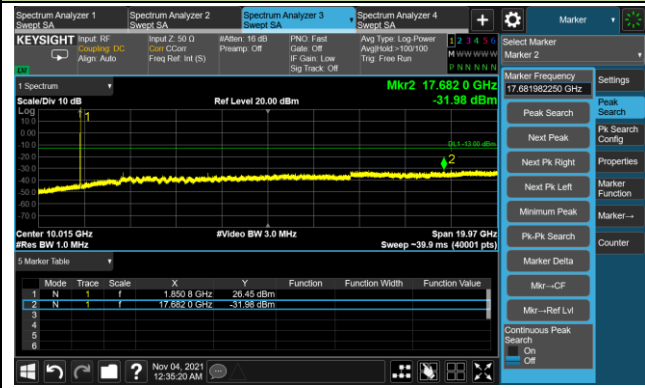


Channel 19175 (1907.5MHz)



10MHz Channel Bandwidth

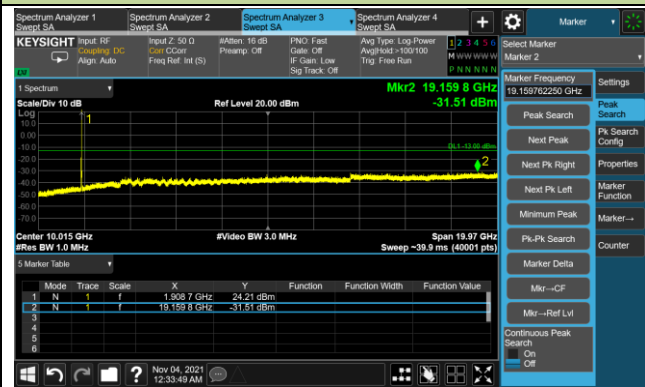
Channel 18650 (1855MHz)



Channel 18900 (1880.0MHz)

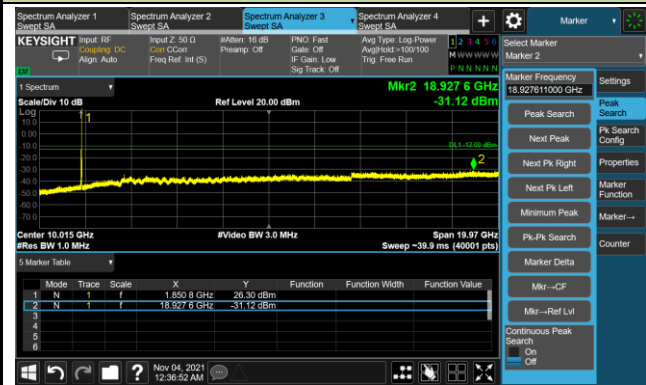


Channel 19150 (1905MHz)

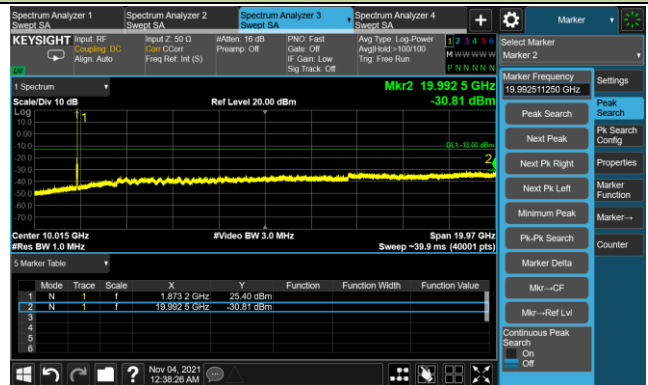


15MHz Channel Bandwidth

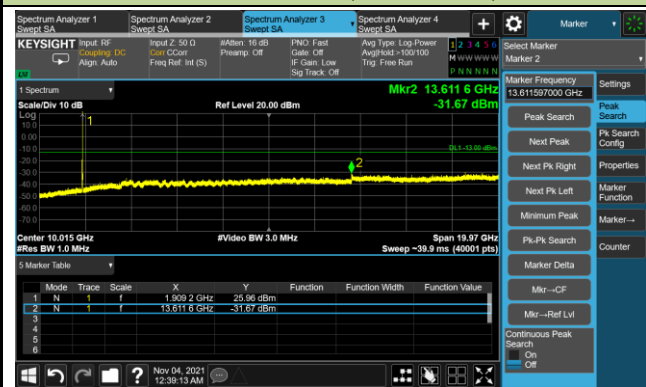
Channel 18675 (1857MHz)



Channel 18900 (1880.0MHz)

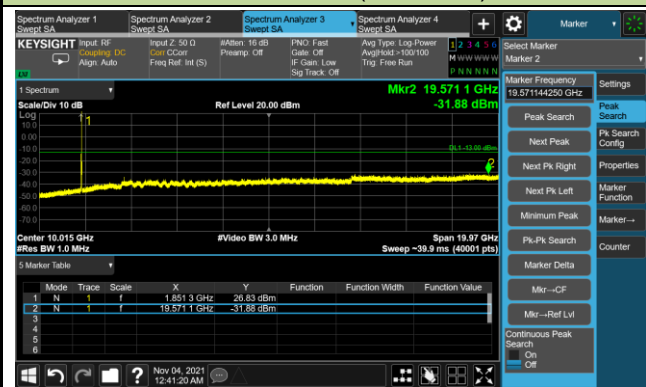


Channel 19125 (1902.5MHz)

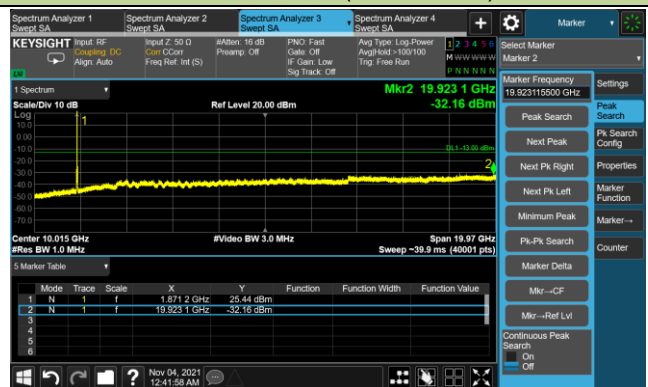


20MHz Channel Bandwidth

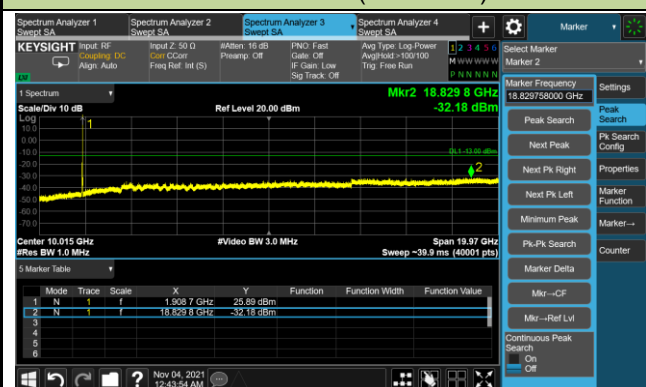
Channel 18700 (1860MHz)



Channel 18900 (1880.0MHz)



Channel 19100 (1900MHz)

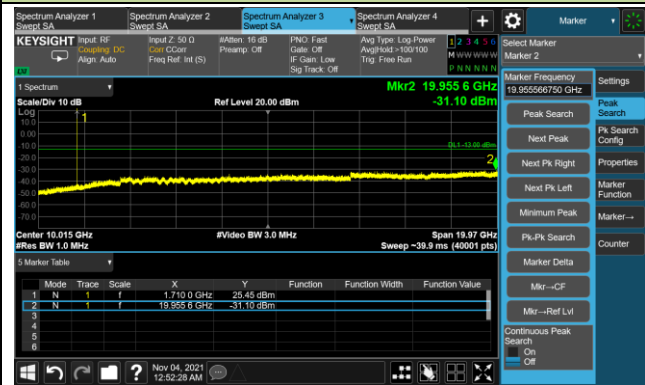


Test Site	WZ-SR6	Test Engineer	Caitlin Chen
Test Date	2021/11/04	Test Band	LTE Band 4, 1RB, QPSK

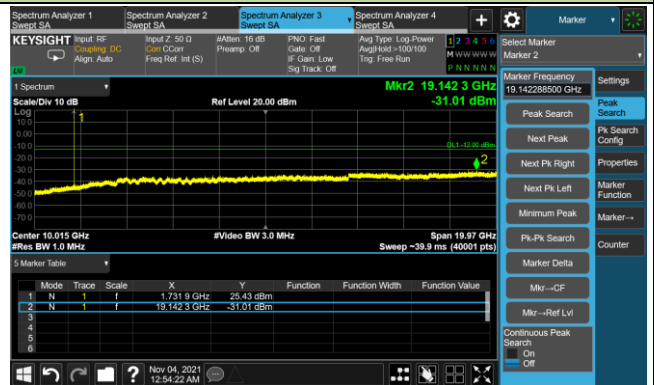
Channel	Frequency (MHz)	Channel Bandwidth (MHz)	Frequency Range (MHz)	Max Spurious Emissions (dBm)	Limit (dBm)
19957	1710.7	1.4	30 ~ 20000	-31.10	≤ -13.00
20175	1732.5	1.4	30 ~ 20000	-31.01	≤ -13.00
20393	1754.3	1.4	30 ~ 20000	-31.50	≤ -13.00
19965	1711.5	3	30 ~ 20000	-31.45	≤ -13.00
20175	1732.5	3	30 ~ 20000	-31.53	≤ -13.00
20385	1753.5	3	30 ~ 20000	-31.85	≤ -13.00
19975	1712.5	5	30 ~ 20000	-32.35	≤ -13.00
20175	1732.5	5	30 ~ 20000	-32.00	≤ -13.00
20375	1752.5	5	30 ~ 20000	-31.78	≤ -13.00
20000	1715.0	10	30 ~ 20000	-31.68	≤ -13.00
20175	1732.5	10	30 ~ 20000	-32.08	≤ -13.00
20350	1750.0	10	30 ~ 20000	-32.28	≤ -13.00
20025	1717.5	15	30 ~ 20000	-34.90	≤ -13.00
20175	1732.5	15	30 ~ 20000	-30.82	≤ -13.00
20325	1747.5	15	30 ~ 20000	-31.27	≤ -13.00
20050	1720.0	20	30 ~ 20000	-31.73	≤ -13.00
20175	1732.5	20	30 ~ 20000	-30.40	≤ -13.00
20300	1745.0	20	30 ~ 20000	-31.97	≤ -13.00

1.4MHz Channel Bandwidth

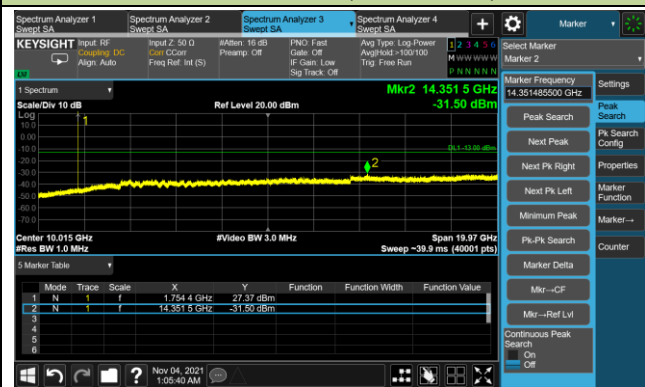
Channel 19957 (1710.7MHz)



Channel 20175 (1732.5MHz)

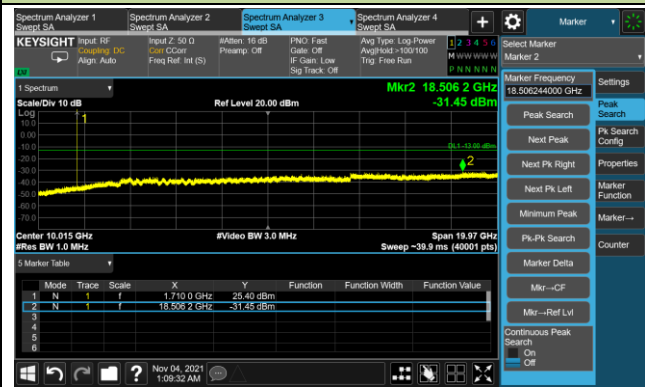


Channel 20393 (1754.3MHz)



3MHz Channel Bandwidth

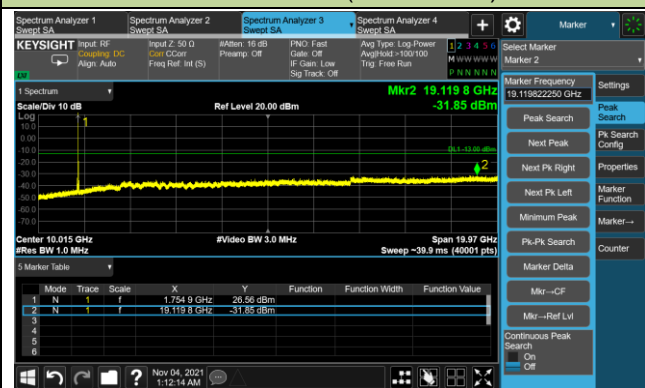
Channel 19965 (1711.5MHz)



Channel 20175 (1732.5MHz)

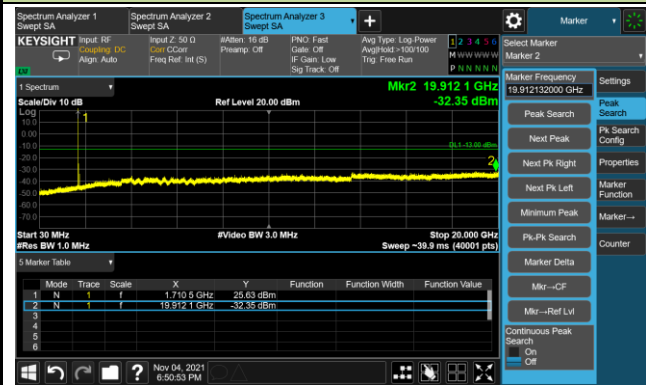


Channel 20385 (1753.5MHz)

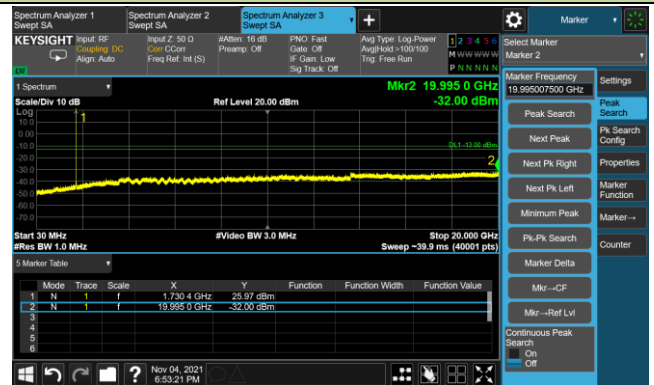


5MHz Channel Bandwidth

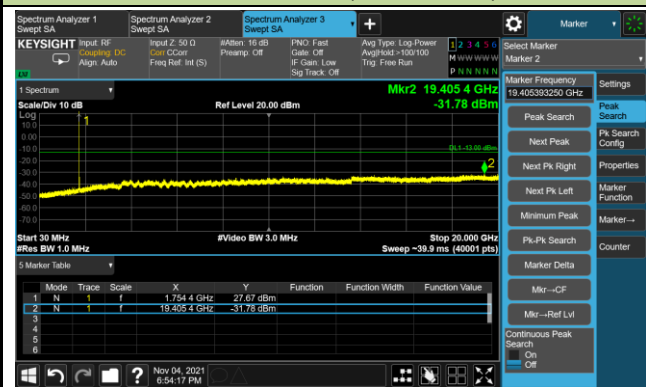
Channel 19975 (1712.5MHz)



Channel 20175 (1732.5MHz)

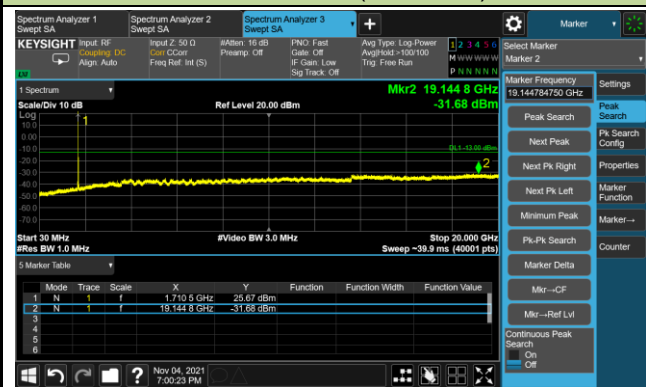


Channel 20375 (1752.5MHz)

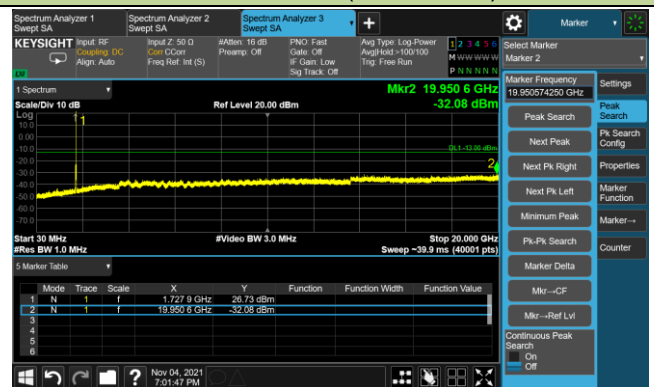


10MHz Channel Bandwidth

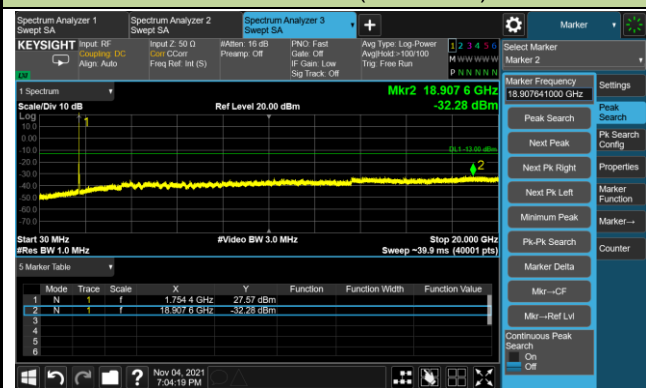
Channel 20000 (1715MHz)



Channel 19175 (1732.5MHz)

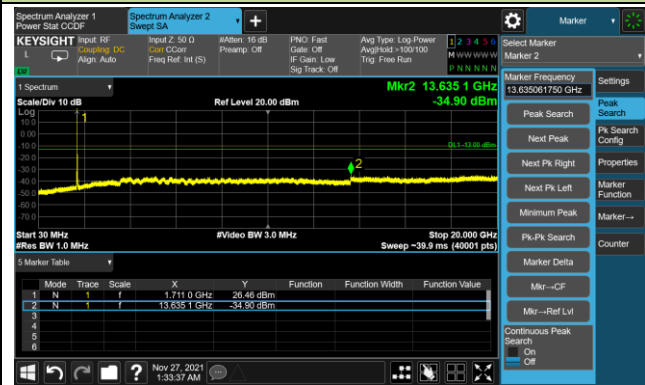


Channel 20350 (1750MHz)

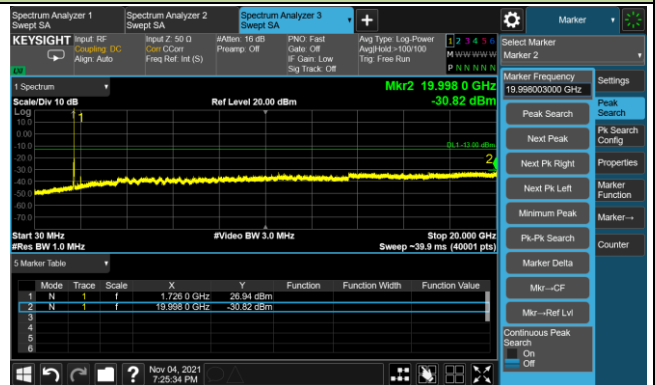


15MHz Channel Bandwidth

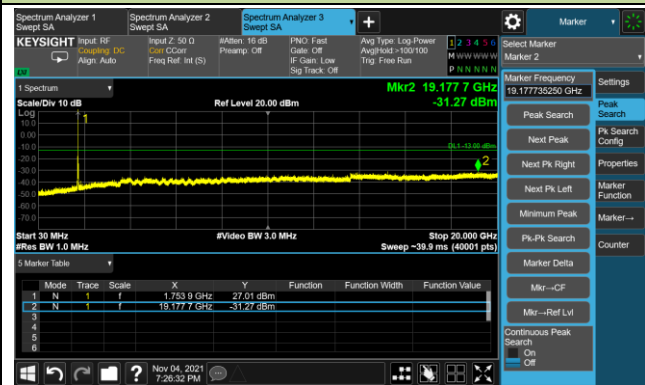
Channel 20025 (1717.5MHz)



Channel 20175 (1732.5MHz)

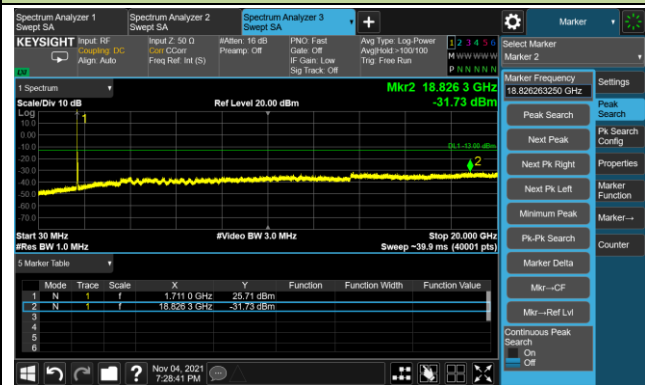


Channel 20325 (1747.5Hz)

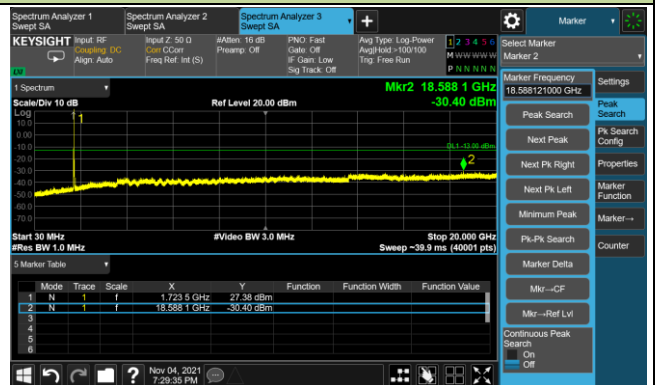


20MHz Channel Bandwidth

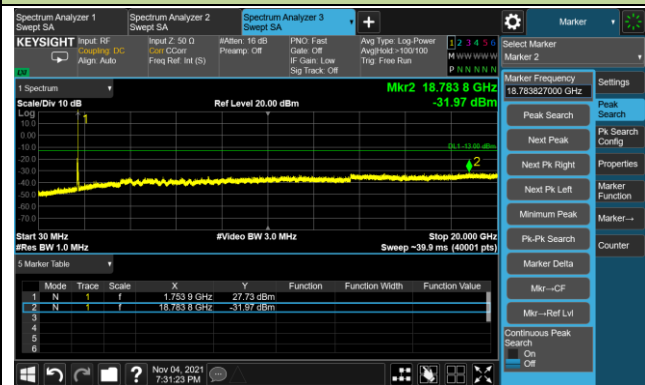
Channel 20050 (1720MHz)



Channel 20175 (1745MHz)



Channel 20300 (1745MHz)

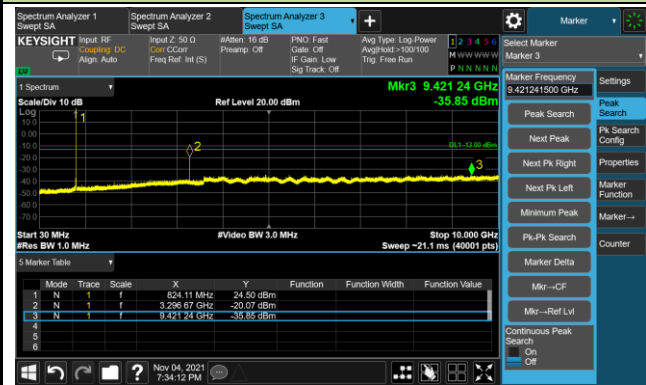


Test Site	WZ-SR6	Test Engineer	Caitlin Chen
Test Date	2021/11/04	Test Band	LTE Band 5, 1RB, QPSK

Channel	Frequency (MHz)	Channel Bandwidth (MHz)	Frequency Range (MHz)	Max Spurious Emissions (dBm)	Limit (dBm)
26797	824.7	1.4	30 ~ 10000	-35.85	≤ -13.00
26915	836.5	1.4	30 ~ 10000	-36.55	≤ -13.00
27033	848.3	1.4	30 ~ 10000	-37.09	≤ -13.00
26805	825.5	3	30 ~ 10000	-37.22	≤ -13.00
26915	836.5	3	30 ~ 10000	-35.70	≤ -13.00
27025	847.5	3	30 ~ 10000	-37.48	≤ -13.00
26815	826.5	5	30 ~ 10000	-38.25	≤ -13.00
26915	836.5	5	30 ~ 10000	-37.80	≤ -13.00
27015	846.5	5	30 ~ 10000	-37.55	≤ -13.00
26840	829.0	10	30 ~ 10000	-37.71	≤ -13.00
26915	836.5	10	30 ~ 10000	-37.37	≤ -13.00
26990	844.0	10	30 ~ 10000	-38.61	≤ -13.00

1.4MHz Channel Bandwidth

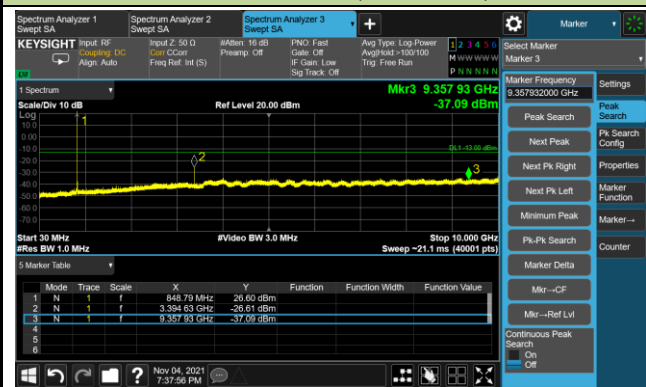
Channel 26697 (824.7MHz)



Channel 25865 (831.5MHz)

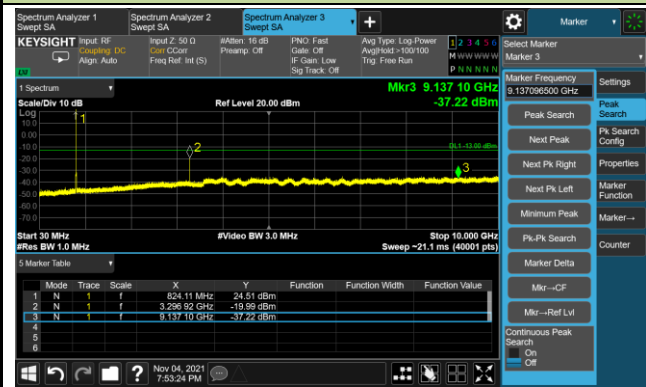


Channel 27033 (848.3MHz)

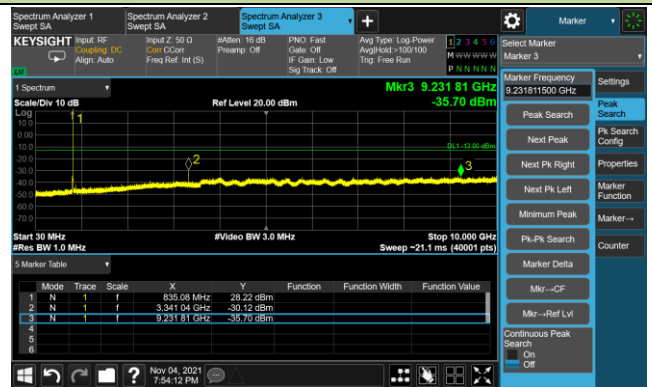


3MHz Channel Bandwidth

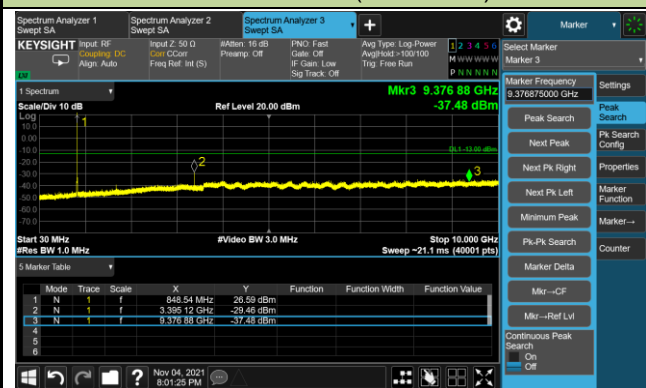
Channel 26705 (825.5MHz)



Channel 26865 (831.5MHz)

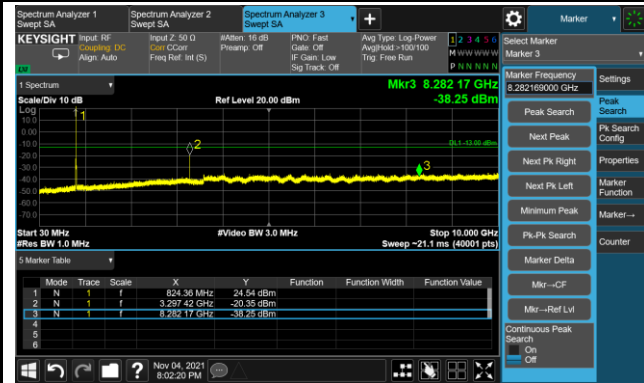


Channel 27025 (847.5MHz)

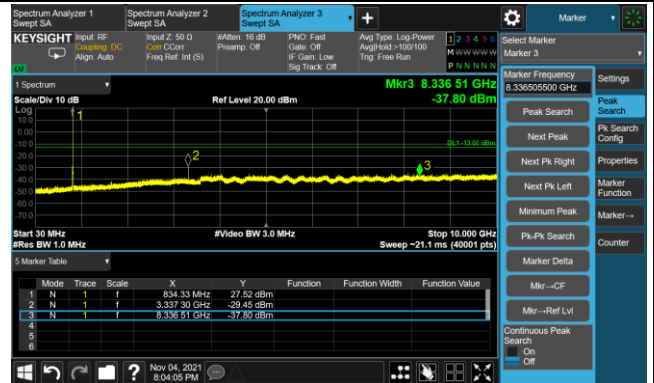


5MHz Channel Bandwidth

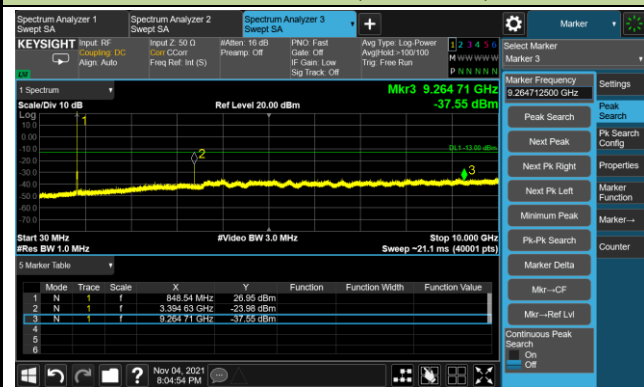
Channel 26715 (826.5MHz)



Channel 26865 (831.5MHz)

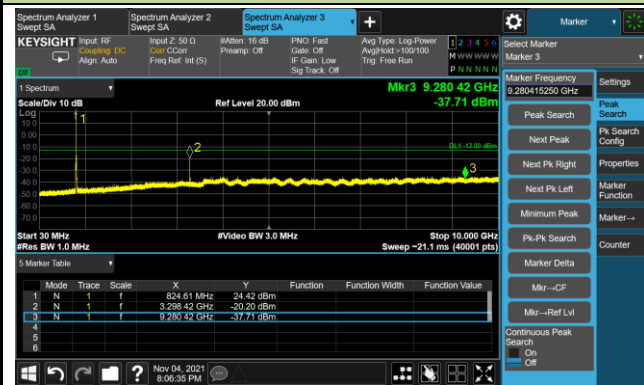


Channel 27015 (846.5MHz)



10MHz Channel Bandwidth

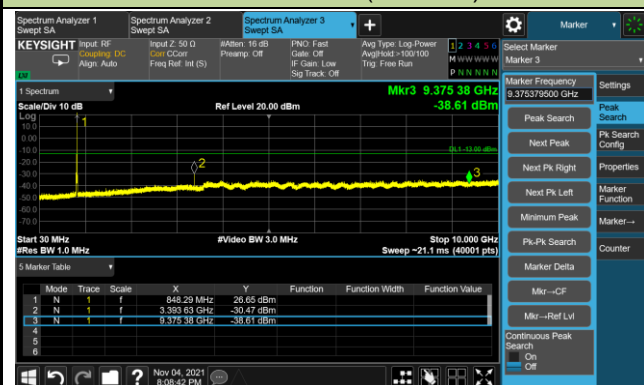
Channel 26740 (829MHz)



Channel 26865 (831.5MHz)



Channel 26990 (844MHz)



Test Site	WZ-SR6	Test Engineer	Caitlin Chen
Test Date	2021/11/04	Test Band	LTE Band 12/17, 1RB, QPSK

Channel	Frequency (MHz)	Channel Bandwidth (MHz)	Frequency Range (MHz)	Max Spurious Emissions (dBm)	Limit (dBm)
23017	699.7	1.4	30 ~ 10000	-34.54	≤ -13.00
23095	707.5	1.4	30 ~ 10000	-35.76	≤ -13.00
23173	715.3	1.4	30 ~ 10000	-33.45	≤ -13.00
23025	700.5	3	30 ~ 10000	-34.40	≤ -13.00
23095	707.5	3	30 ~ 10000	-34.67	≤ -13.00
23165	714.5	3	30 ~ 10000	-34.32	≤ -13.00
23035	701.5	5	30 ~ 10000	-36.74	≤ -13.00
23095	707.5	5	30 ~ 10000	-37.19	≤ -13.00
23155	713.5	5	30 ~ 10000	-32.98	≤ -13.00
23060	704.0	10	30 ~ 10000	-38.10	≤ -13.00
23095	707.5	10	30 ~ 10000	-33.17	≤ -13.00
23130	711.0	10	30 ~ 10000	-36.16	≤ -13.00