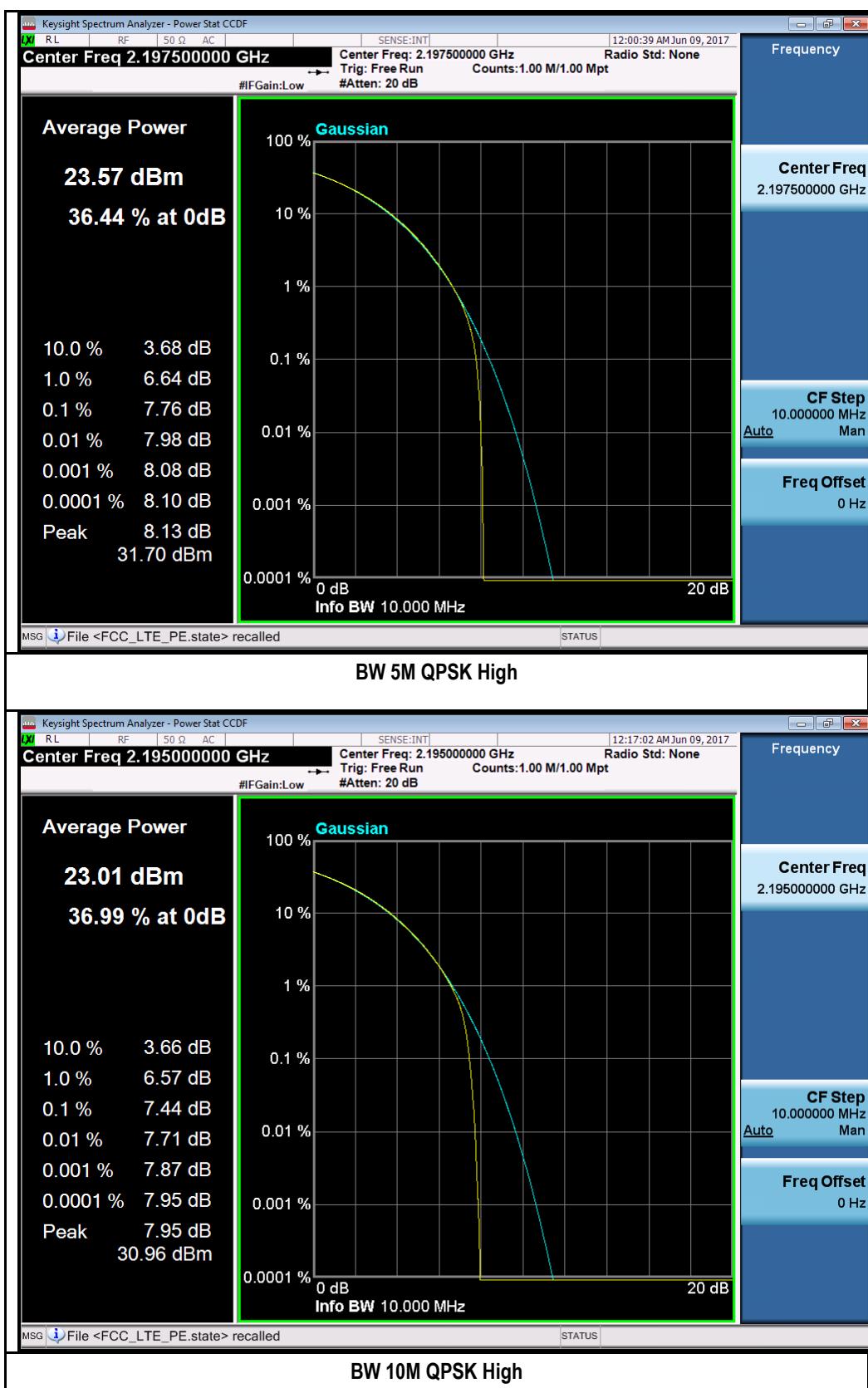
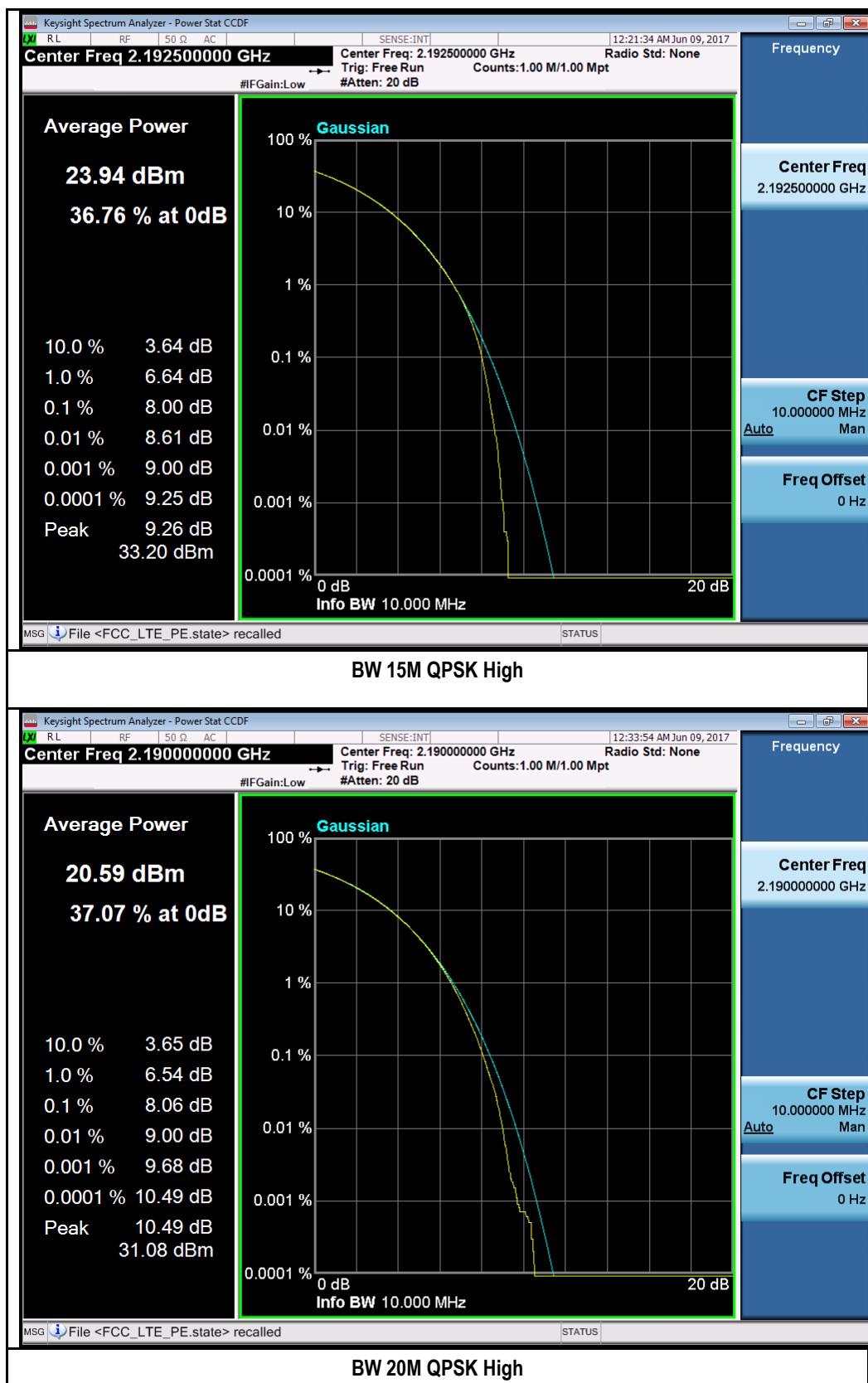


Test Plots for LTE band 66:



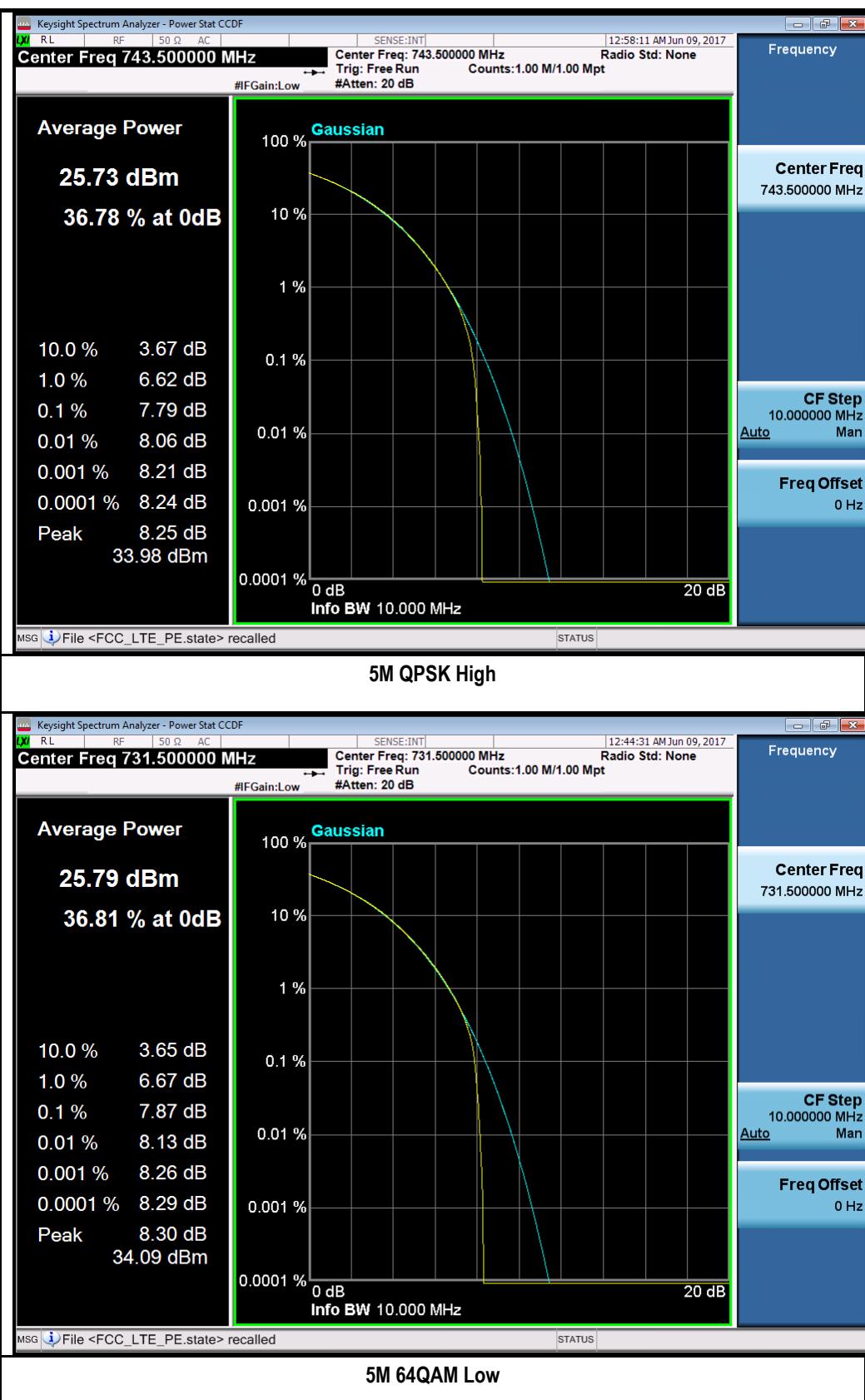




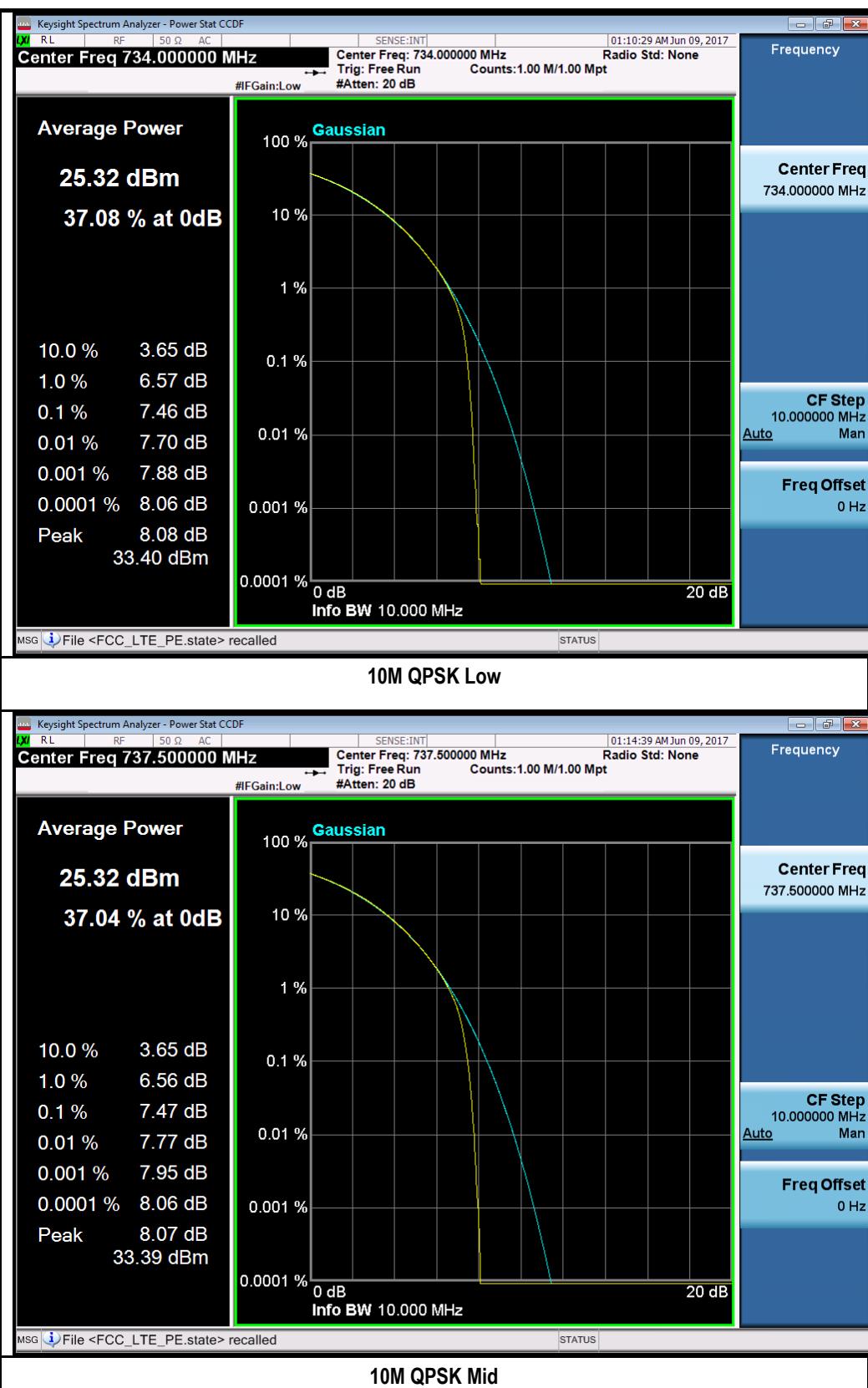


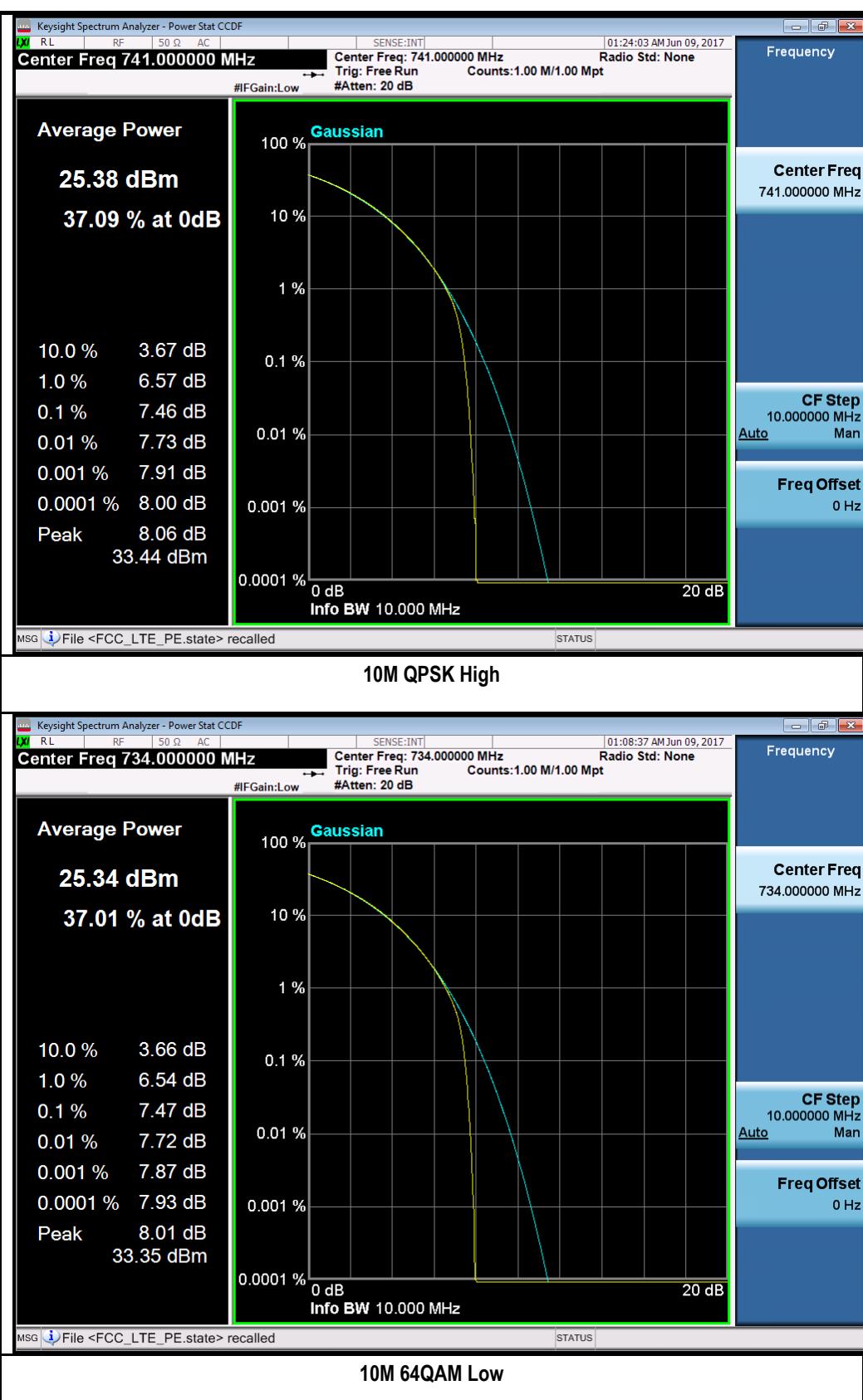
Test Plots for LTE band 12:

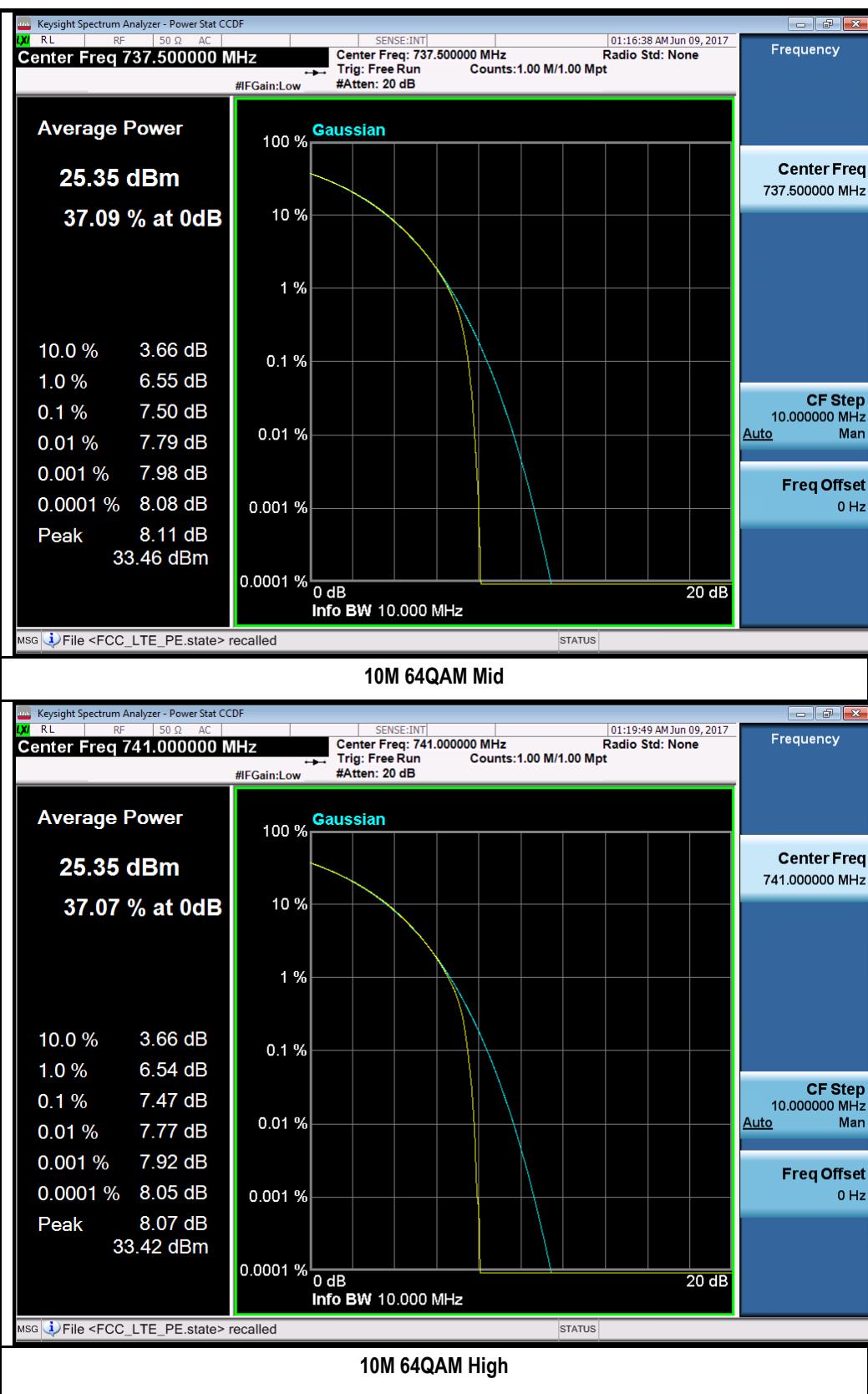






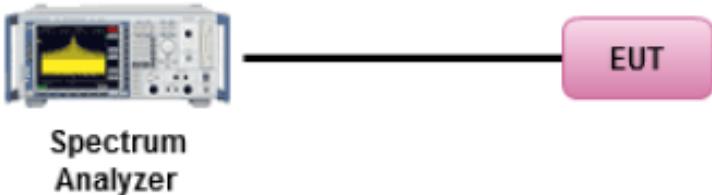






10.3 Occupied Bandwidth

Requirement(s):

Spec	Requirement	Applicable
47 CFR §2.1049	The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured under the following conditions of § 2.1049 (a) through (i)	<input checked="" type="checkbox"/>
Test Setup	 <p>Spectrum Analyzer</p>	
Procedure	<p><u>99% Occupied bandwidth measurement procedure</u></p> <ul style="list-style-type: none"> - Allow the trace to stabilize. - Use the spectrum analyzer built-in measurement function to determine the 26 dB bandwidth 99% OBW. <ul style="list-style-type: none"> o Set RBW = 1% -5% of Emission Bandwidth o Set VBW = approximately 3 x RBW o Detector = Peak o Trace mode = max hold o Sweep = auto couple - Capture the plot. <p>Repeat above steps for different test channel and other modulation type.</p>	
Test Date	01/13/2017 – 06/09/2017	Environmental condition Temperature 23°C Relative Humidity 48% Atmospheric Pressure 1008mbar
Remark	NONE	
Result	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail

Test Data Yes N/A

Test Plot Yes (See below) N/A

Test was done by Chen Ge at RF Test Site.

Test Data

Bandwidth measurement result for LTE band 4:

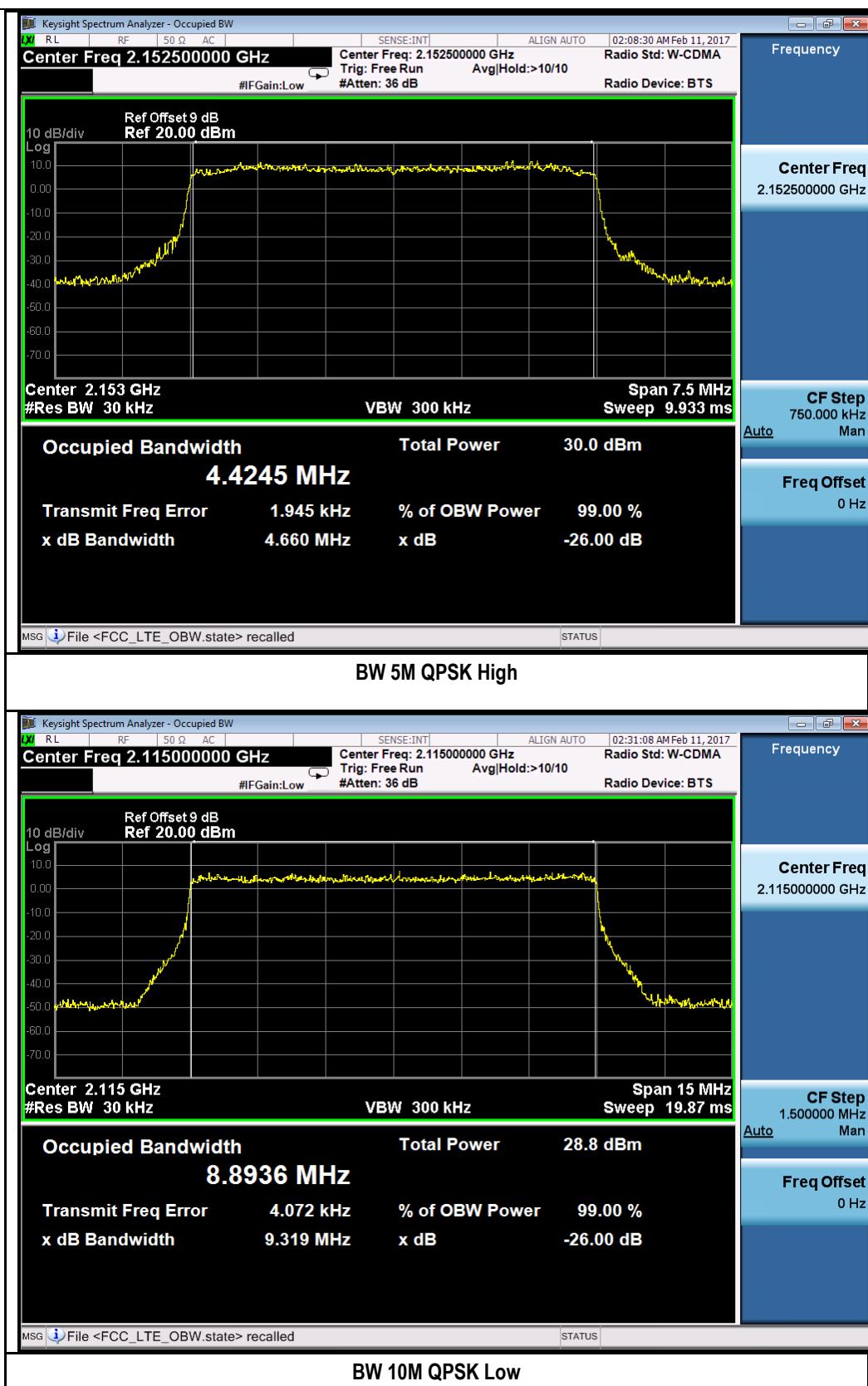
Type	Channel	Channel Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
5MHz BW, QPSK	Low	2112.5	4.42	4.64
	Mid	2132.5	4.41	4.64
	High	2152.5	4.42	4.66
5MHz BW, 64QAM	Low	2112.5	4.43	4.68
	Mid	2132.5	4.43	4.66
	High	2152.5	4.42	4.64
10MHz BW, QPSK	Low	2115.0	8.89	9.31
	Mid	2132.5	8.90	9.34
	High	2150.0	8.90	9.35
10MHz BW, 64QAM	Low	2115.0	8.90	9.33
	Mid	2132.5	8.91	9.36
	High	2150.0	8.91	9.39
15MHz BW, QPSK	Low	2117.5	13.27	13.85
	Mid	2132.5	13.27	13.78
	High	2147.5	13.28	13.78
15MHz BW, 64QAM	Low	2117.5	13.29	13.78
	Mid	2132.5	13.28	13.81
	High	2147.5	13.29	13.82
20MHz BW, QPSK	Low	2120.0	17.80	18.44
	Mid	2132.5	17.84	18.49
	High	2145.0	17.84	18.56
20MHz BW, 64QAM	Low	2120.0	17.81	18.47
	Mid	2132.5	17.82	18.49
	High	2145.0	17.82	18.51

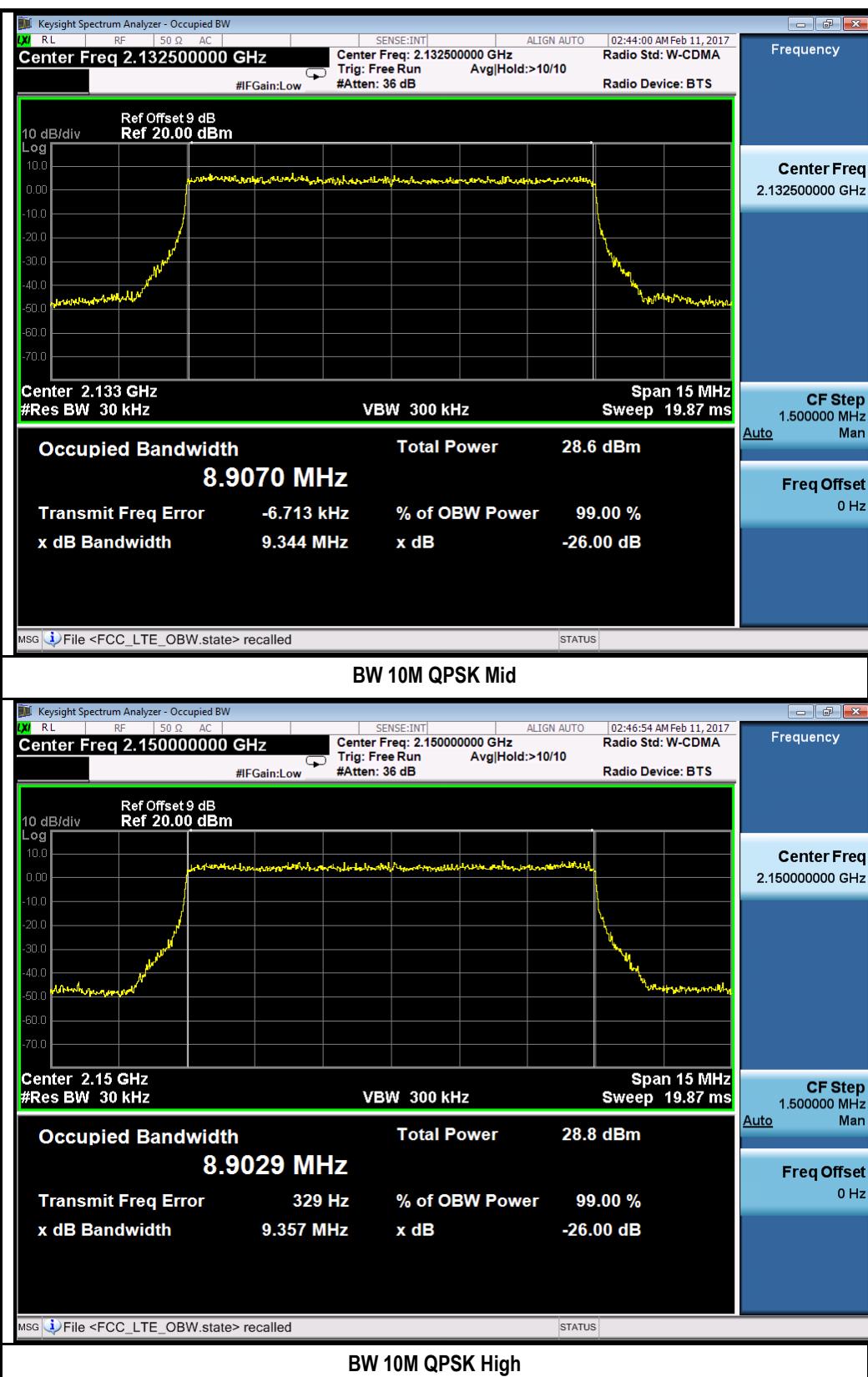
99% Bandwidth measurement result for LTE band 66:

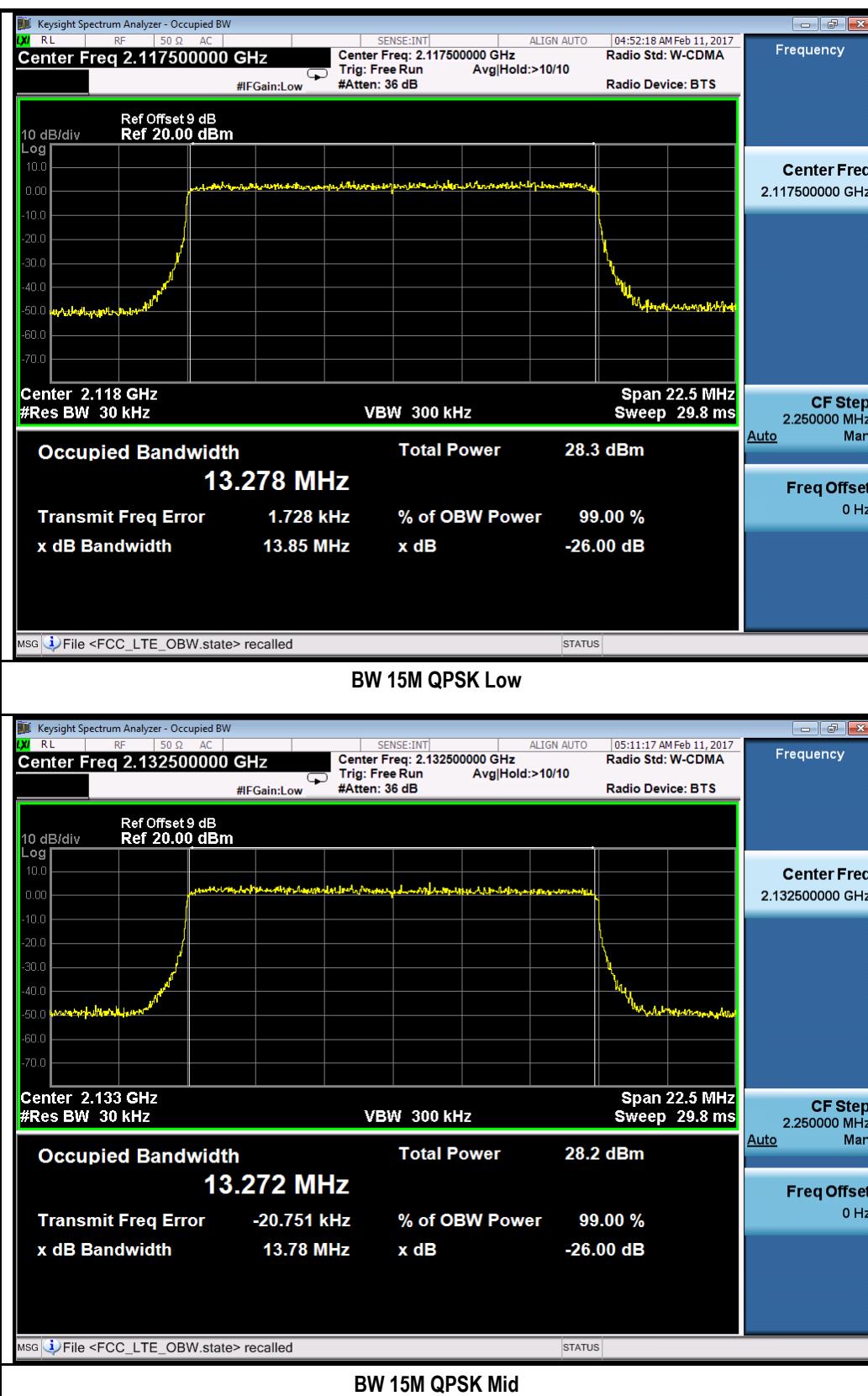
Type	Channel	Channel Frequency (MHz)	99% Occupied Bandwidth (MHz)	26 dB Occupied Bandwidth (MHz)
5MHz BW, QPSK	High	2197.5	4.42	4.65
5MHz BW, 64QAM	High	2197.5	4.43	4.70
10MHz BW, QPSK	High	2195	8.90	9.30
10MHz BW, 64QAM	High	2195	8.90	9.31
15MHz BW, QPSK	High	2192.5	13.29	13.79
15MHz BW, 64QAM	High	2192.5	13.29	13.76
20MHz BW, QPSK	High	2190	17.82	18.51
20MHz BW, 64QAM	High	2190	17.83	18.41

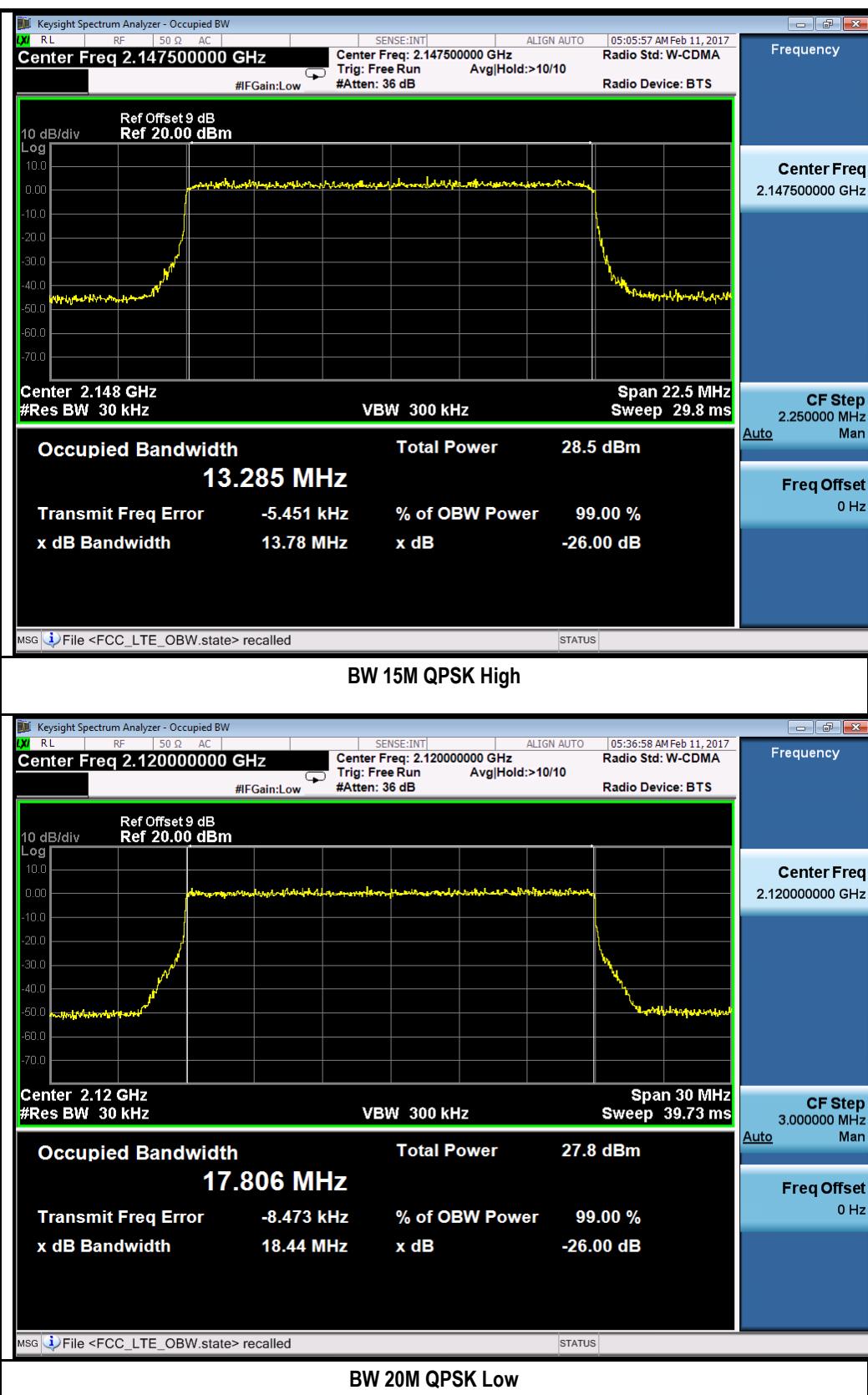
Test Plot for band 4:

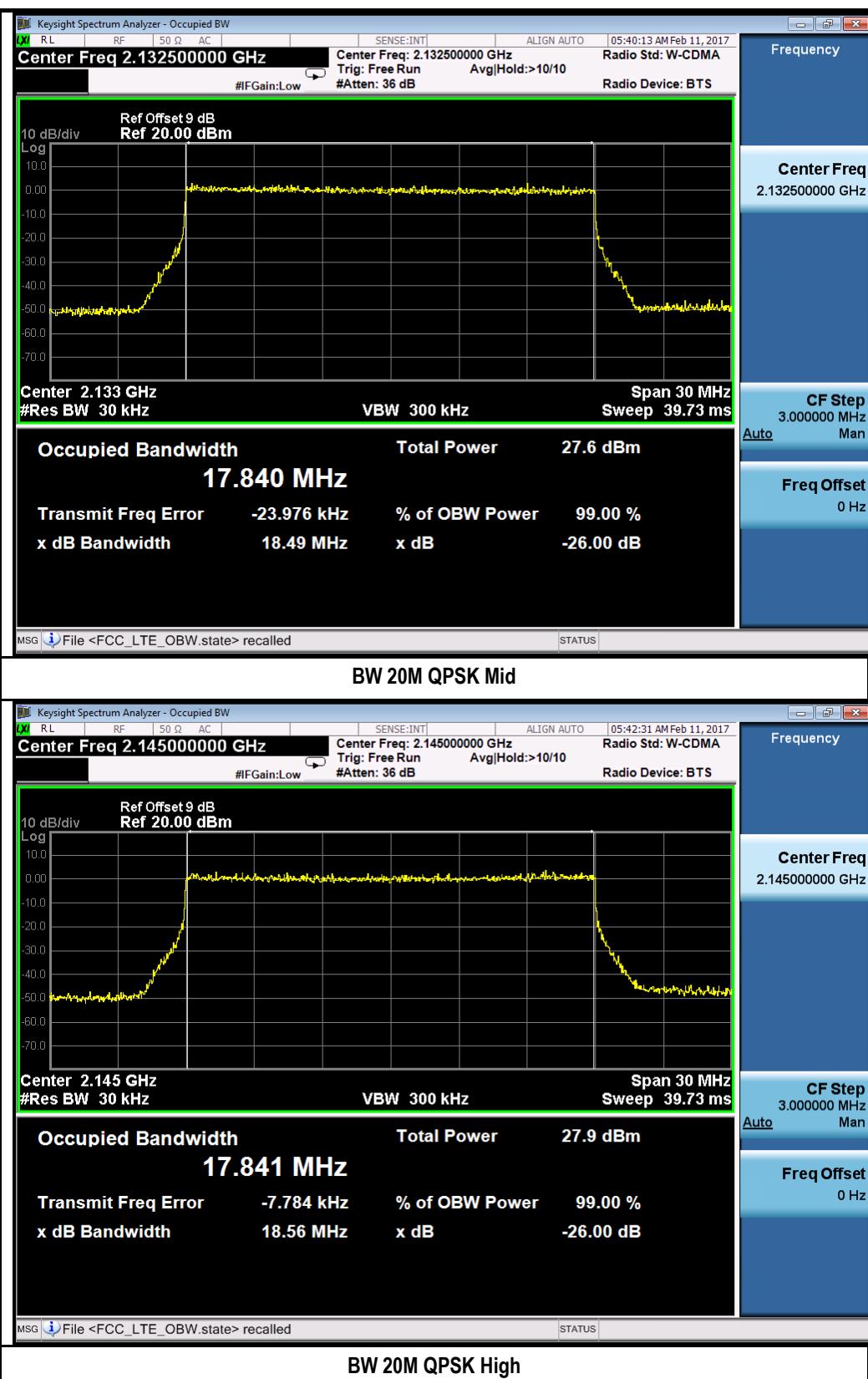


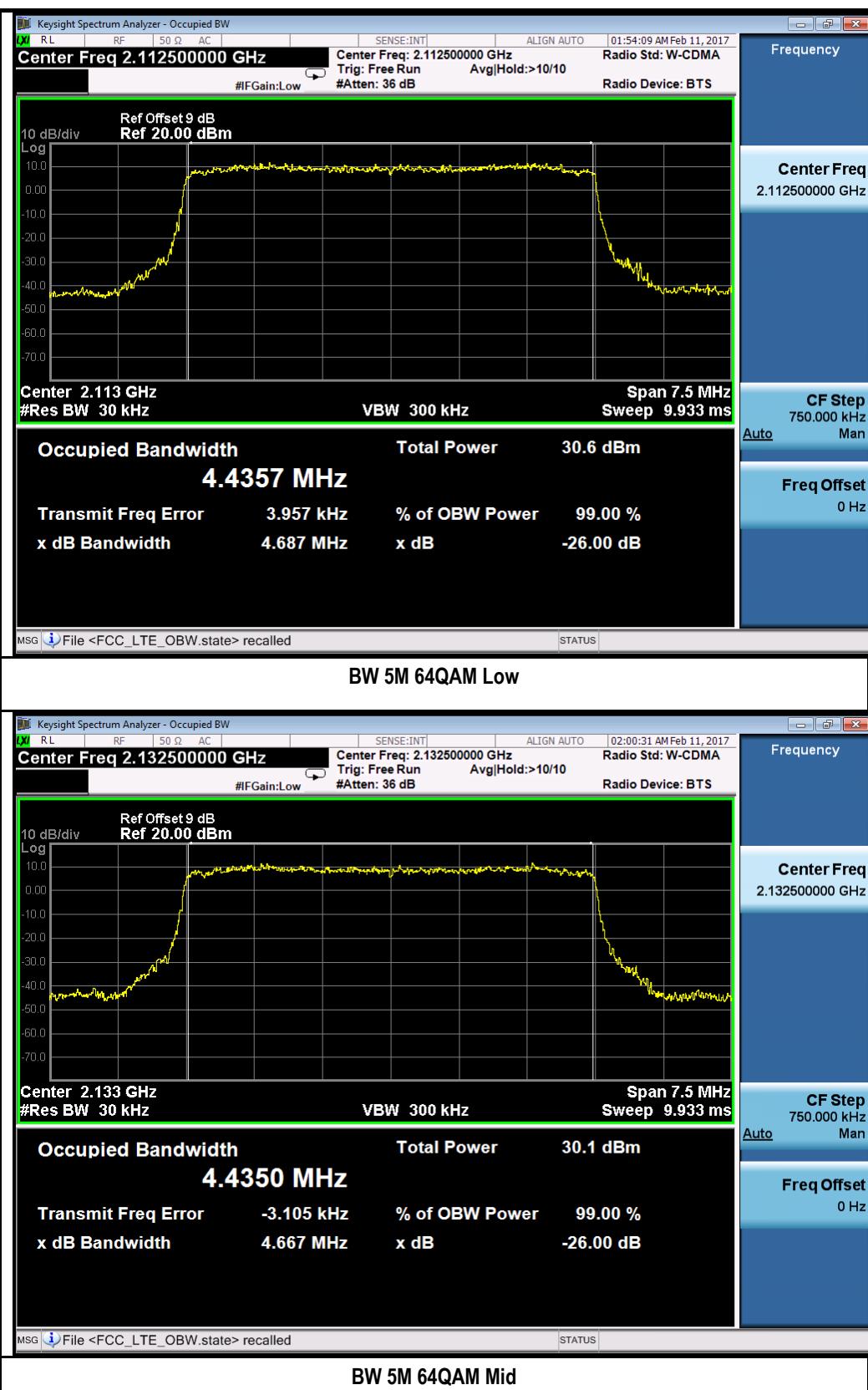


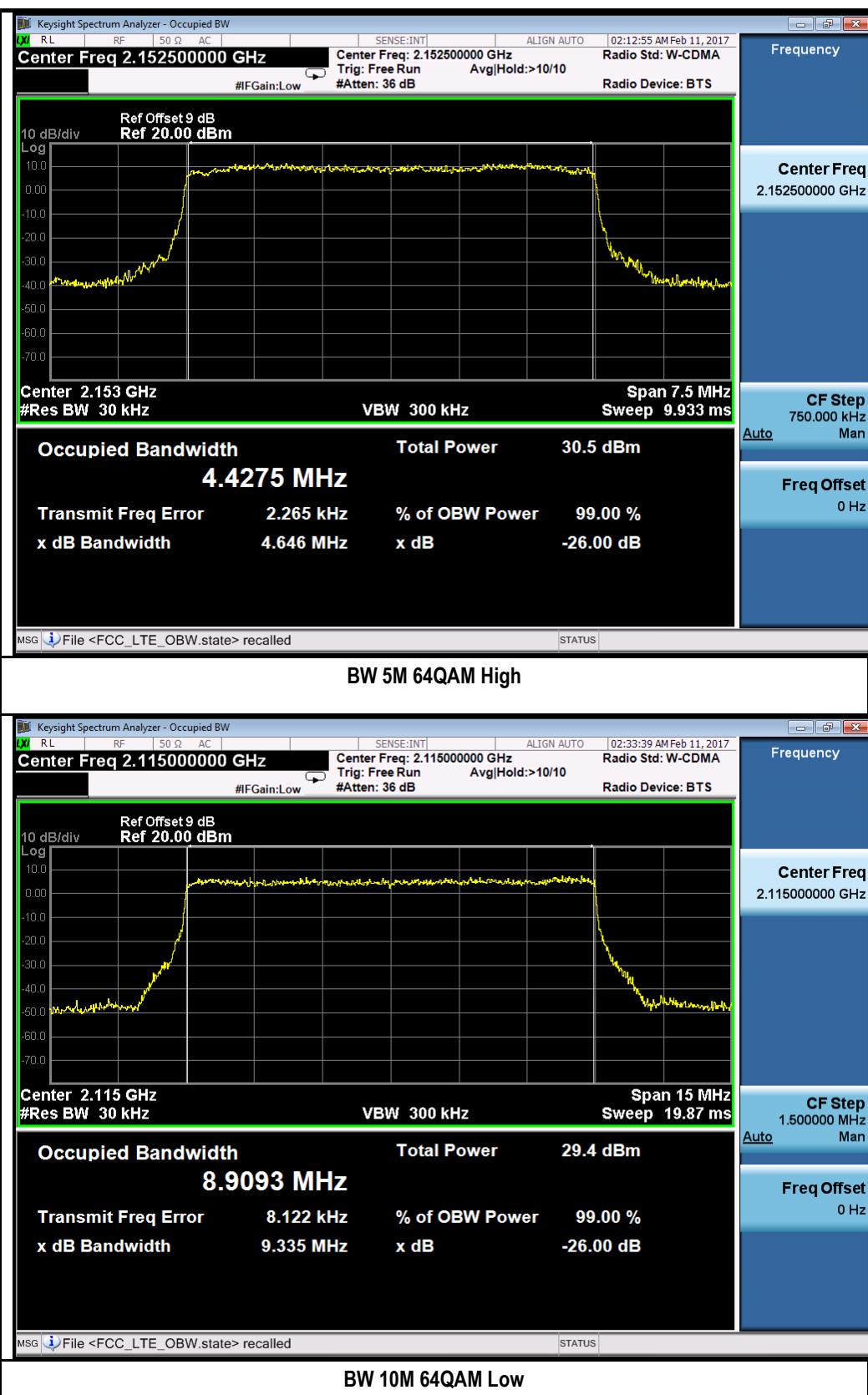


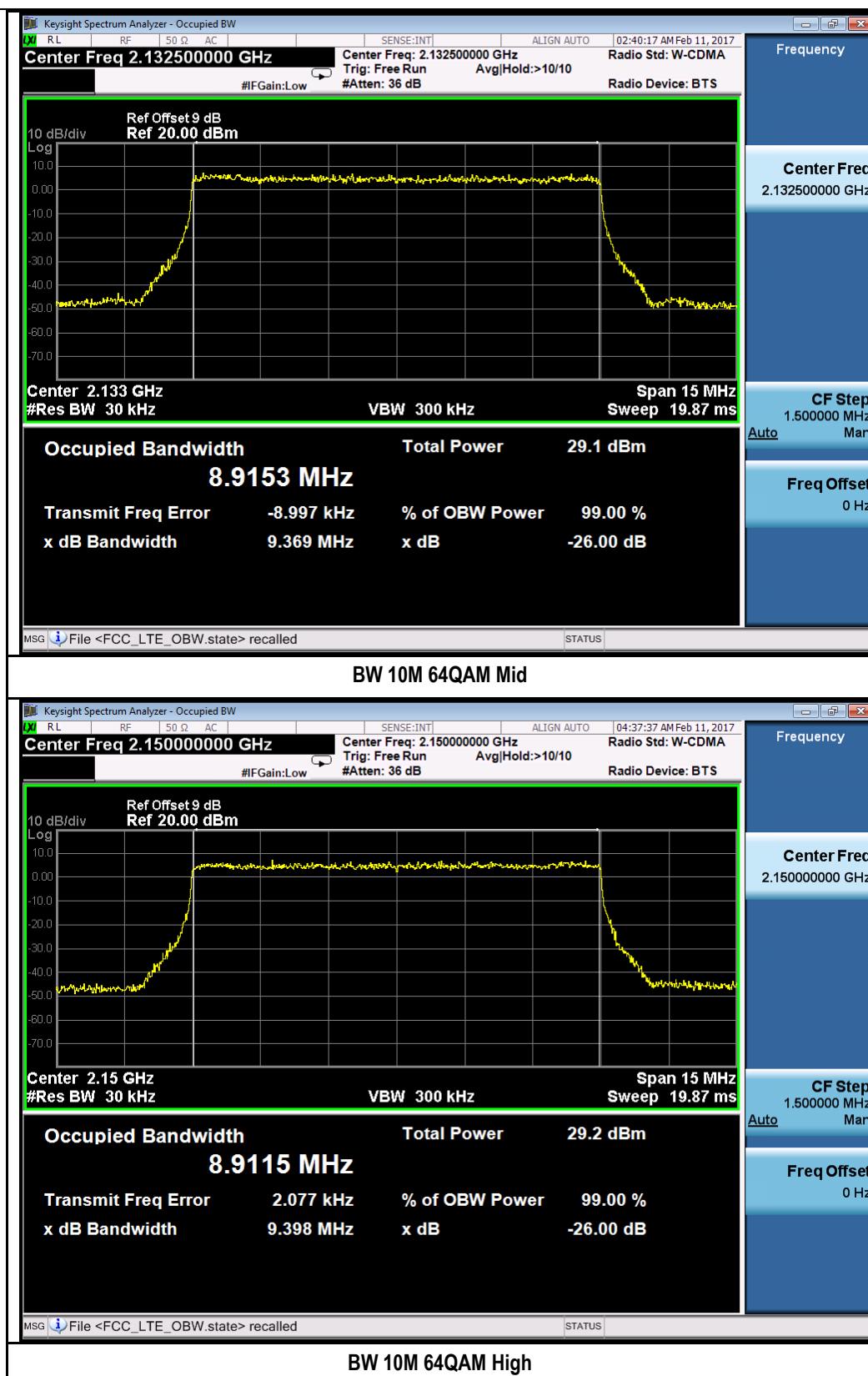


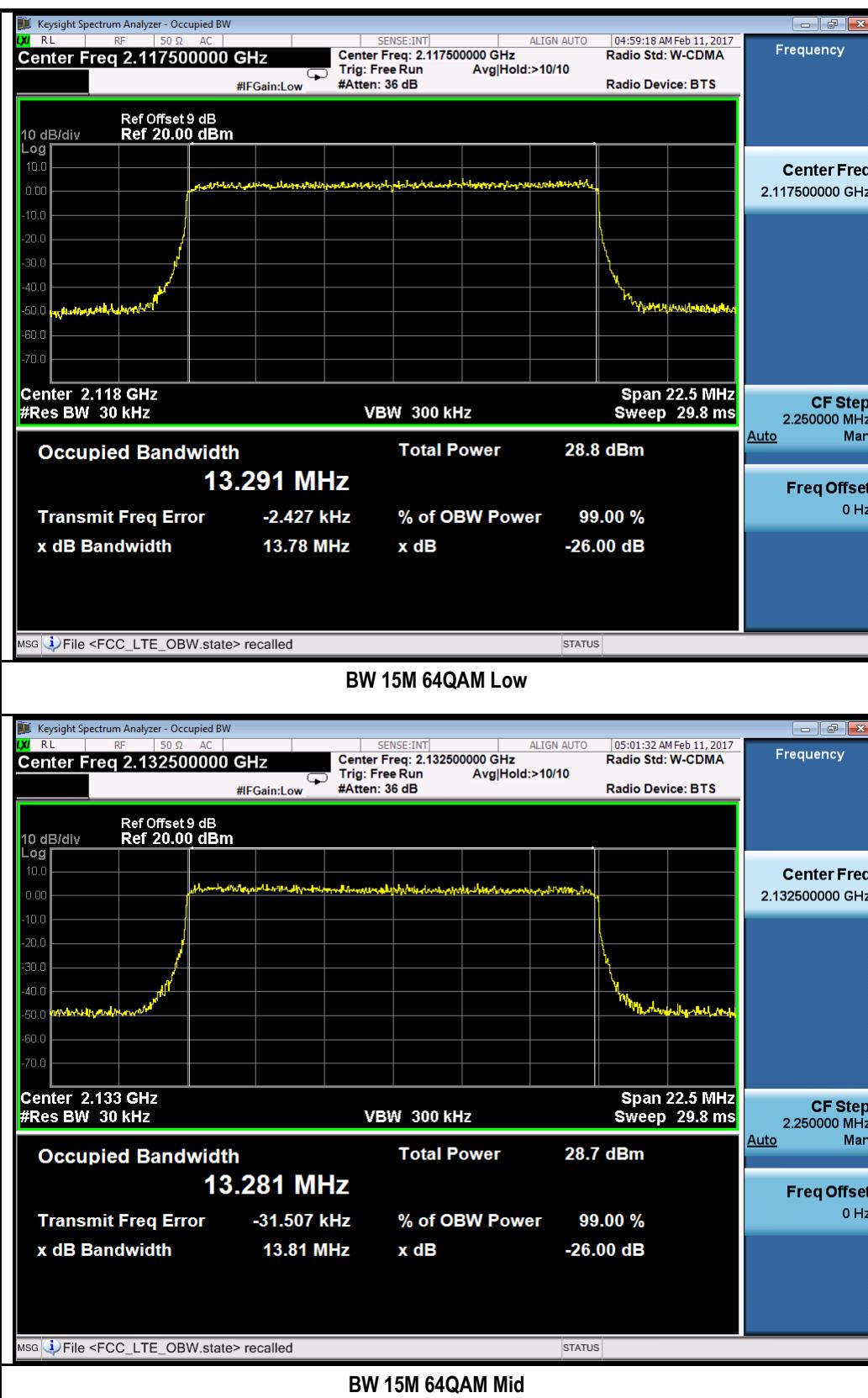


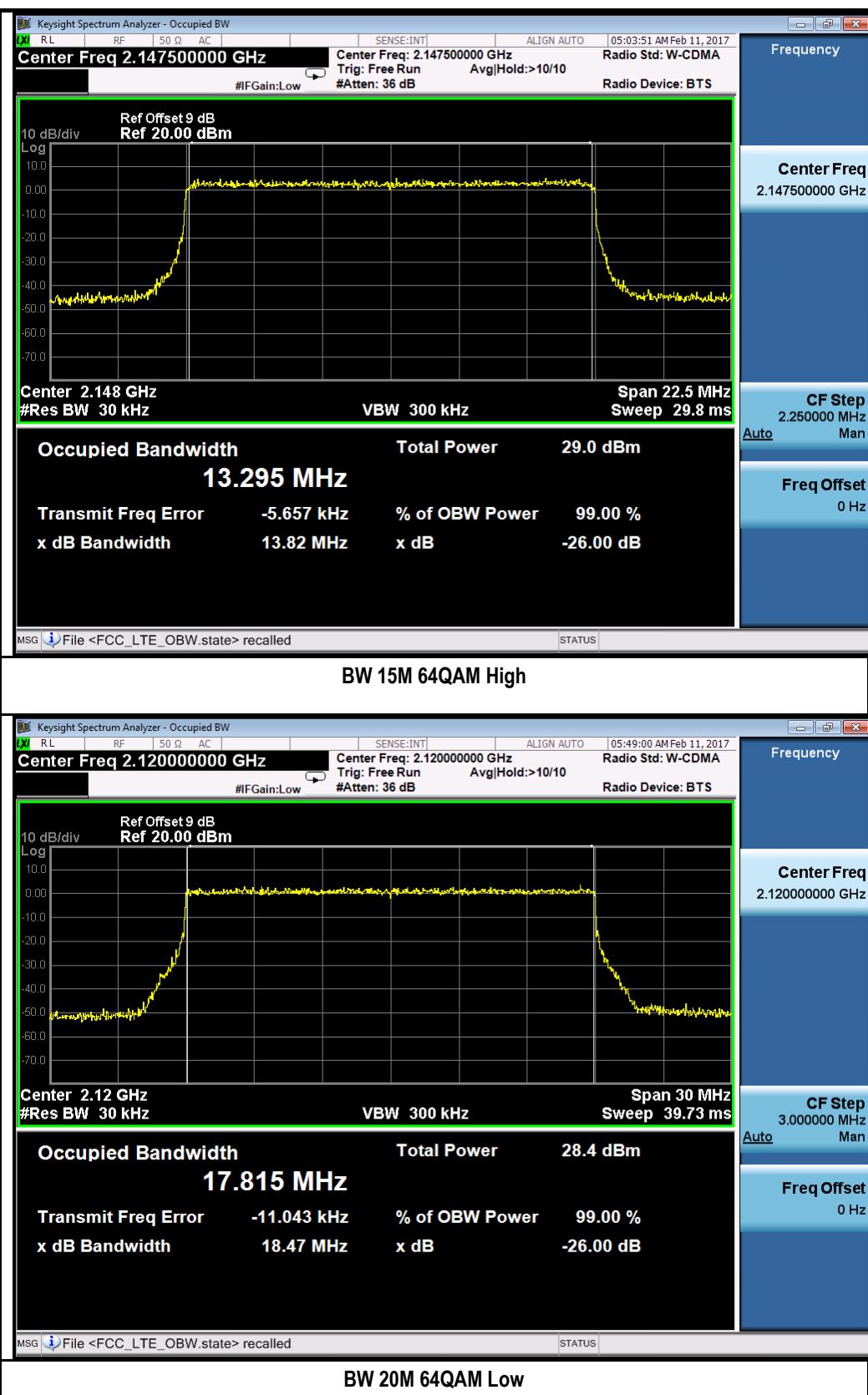


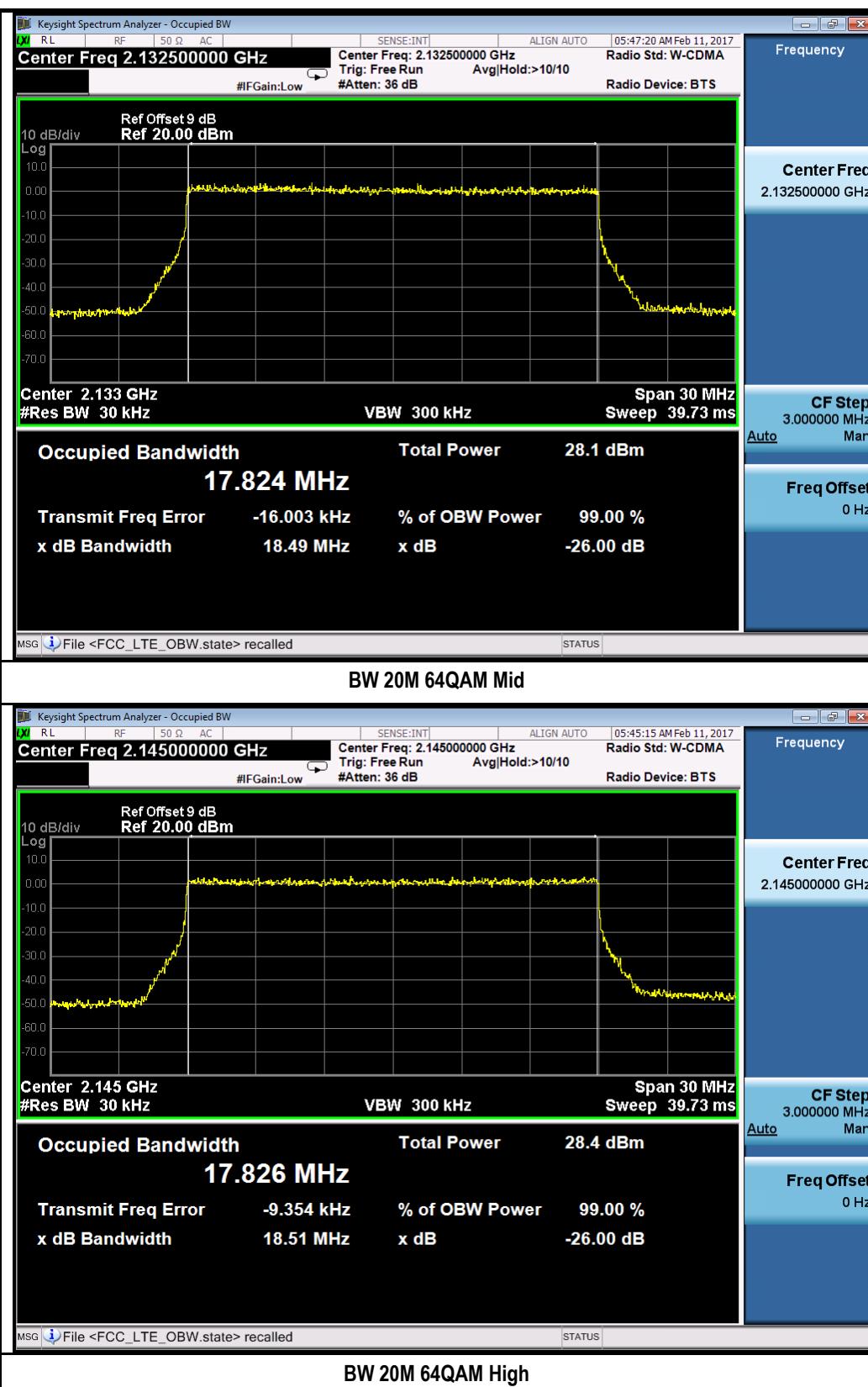




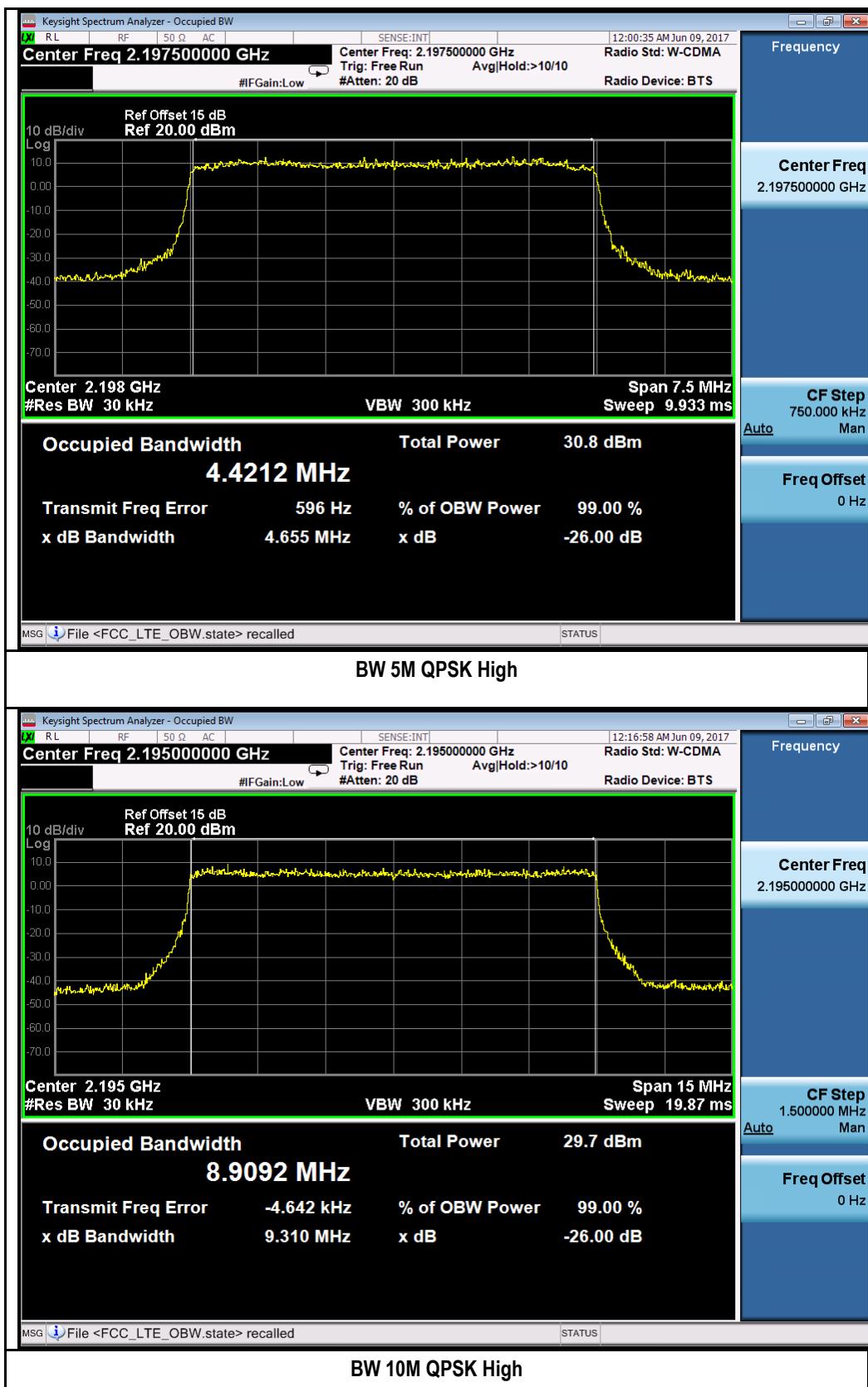


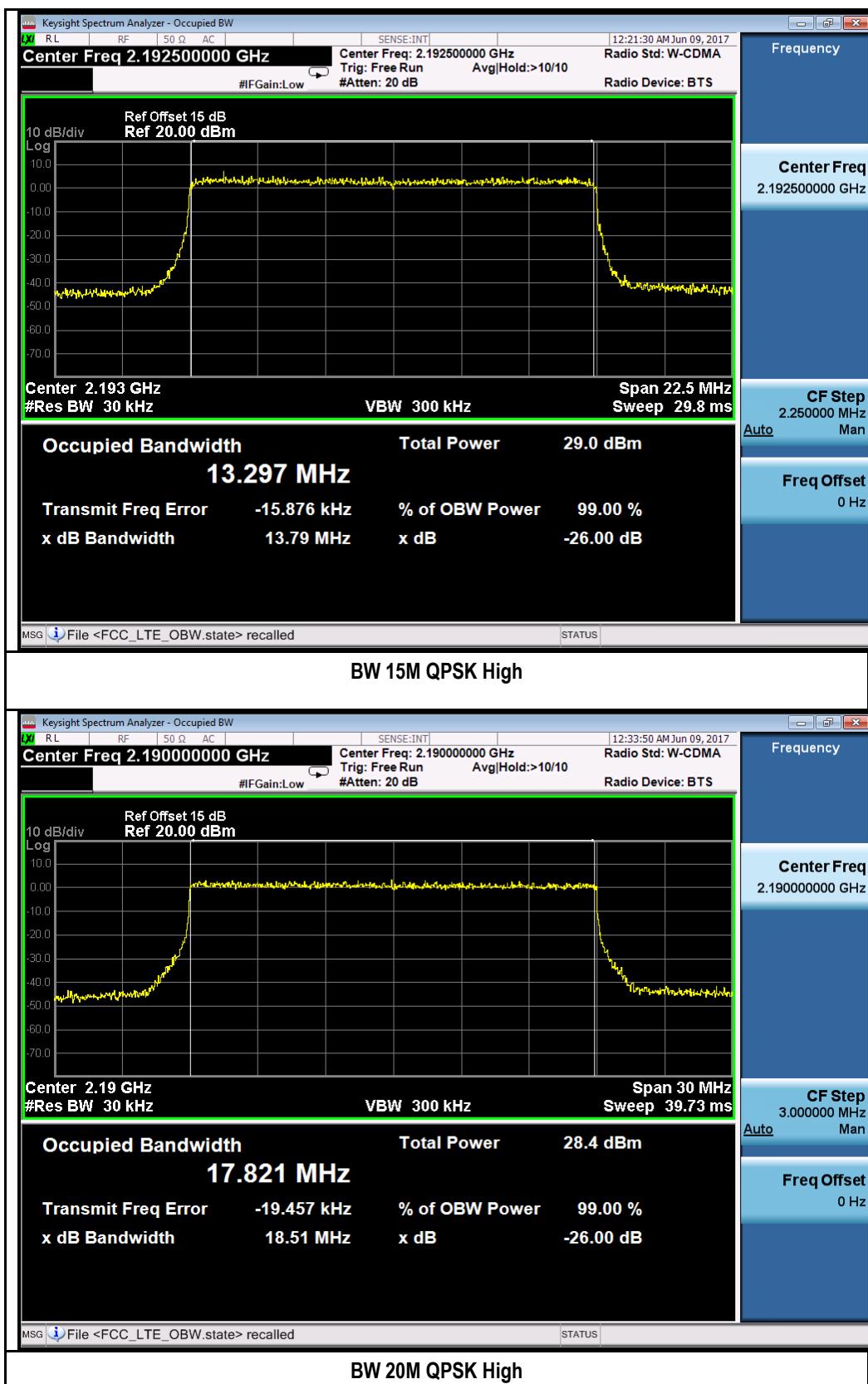


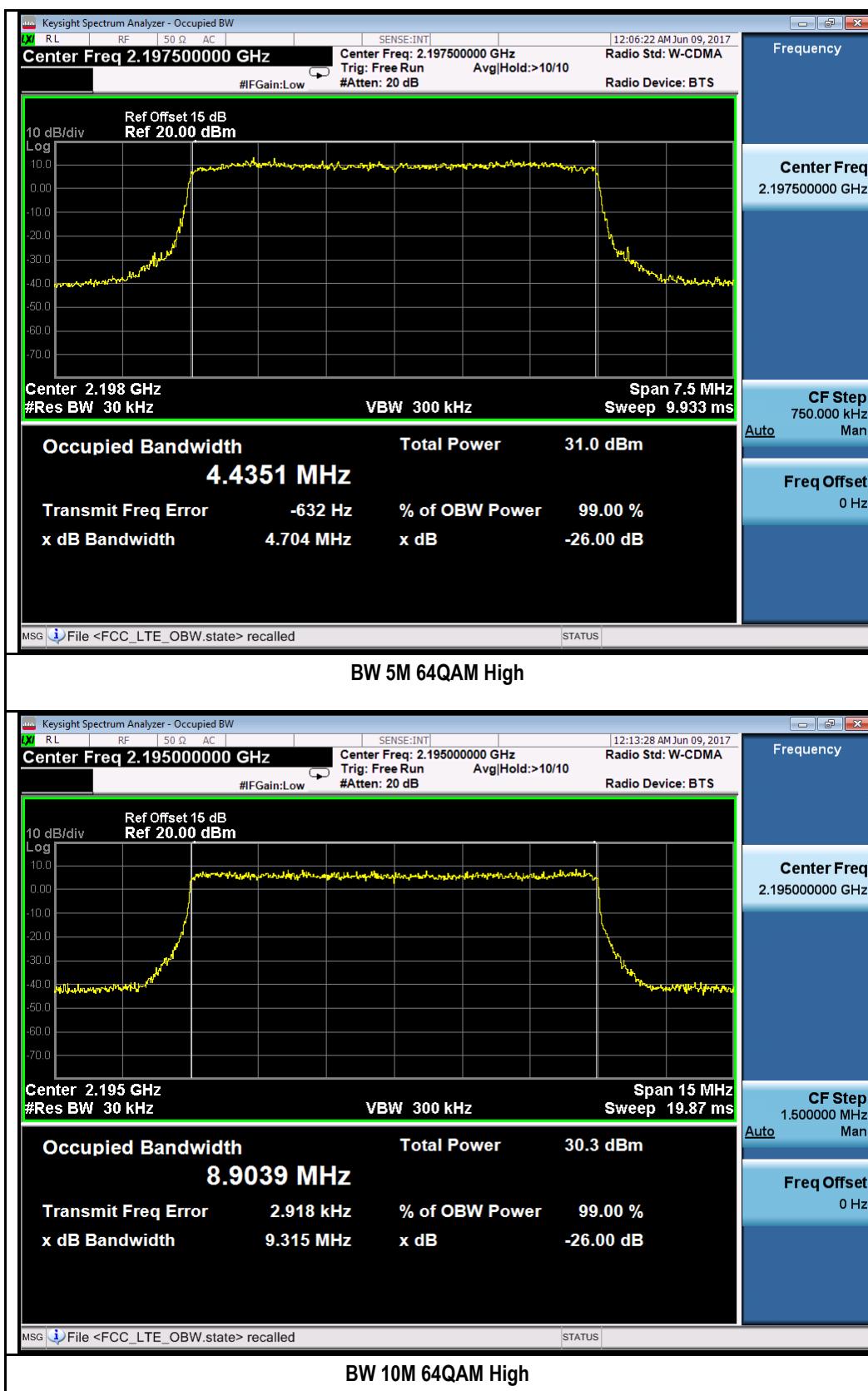


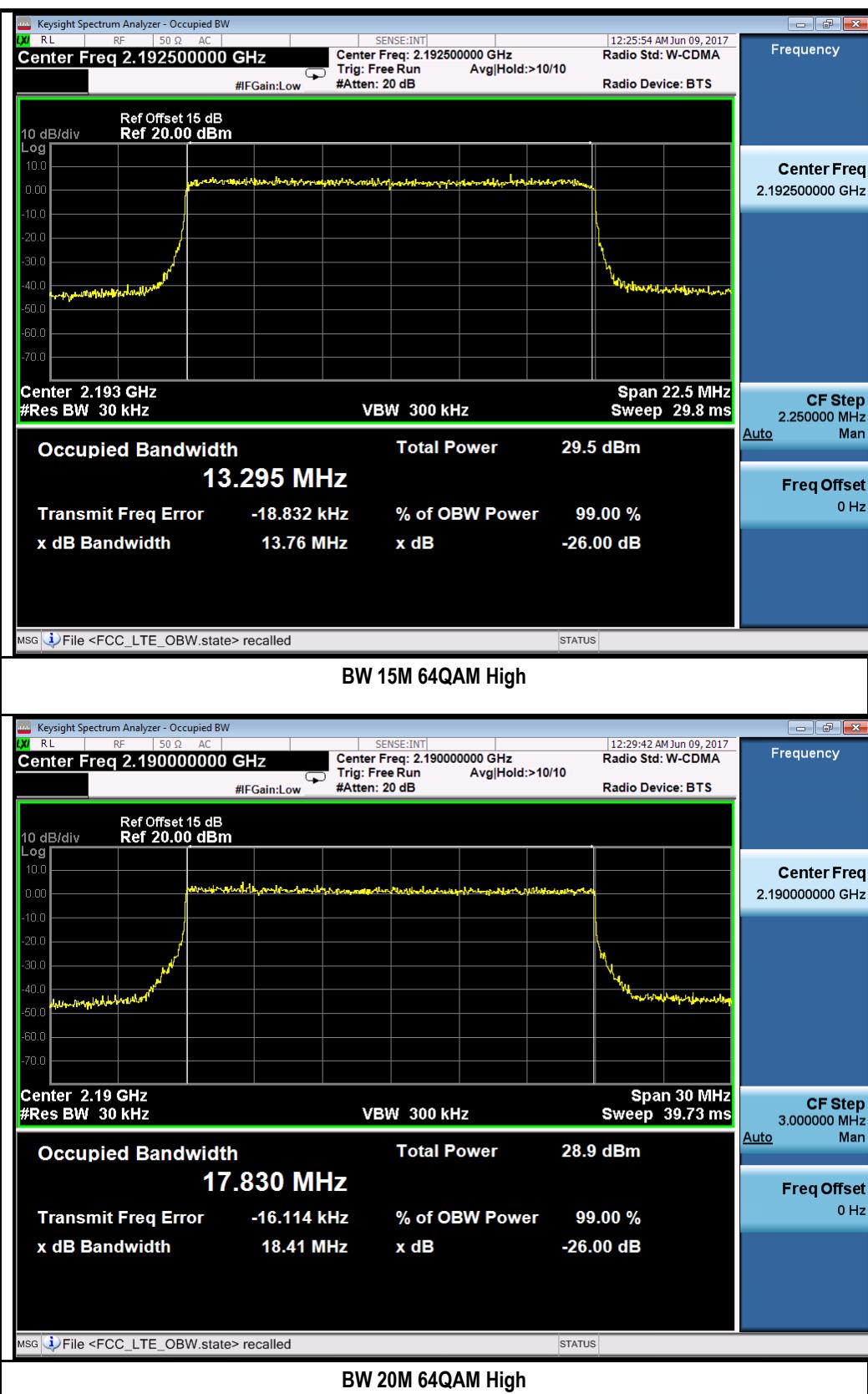


Test Plots for LTE band 66:

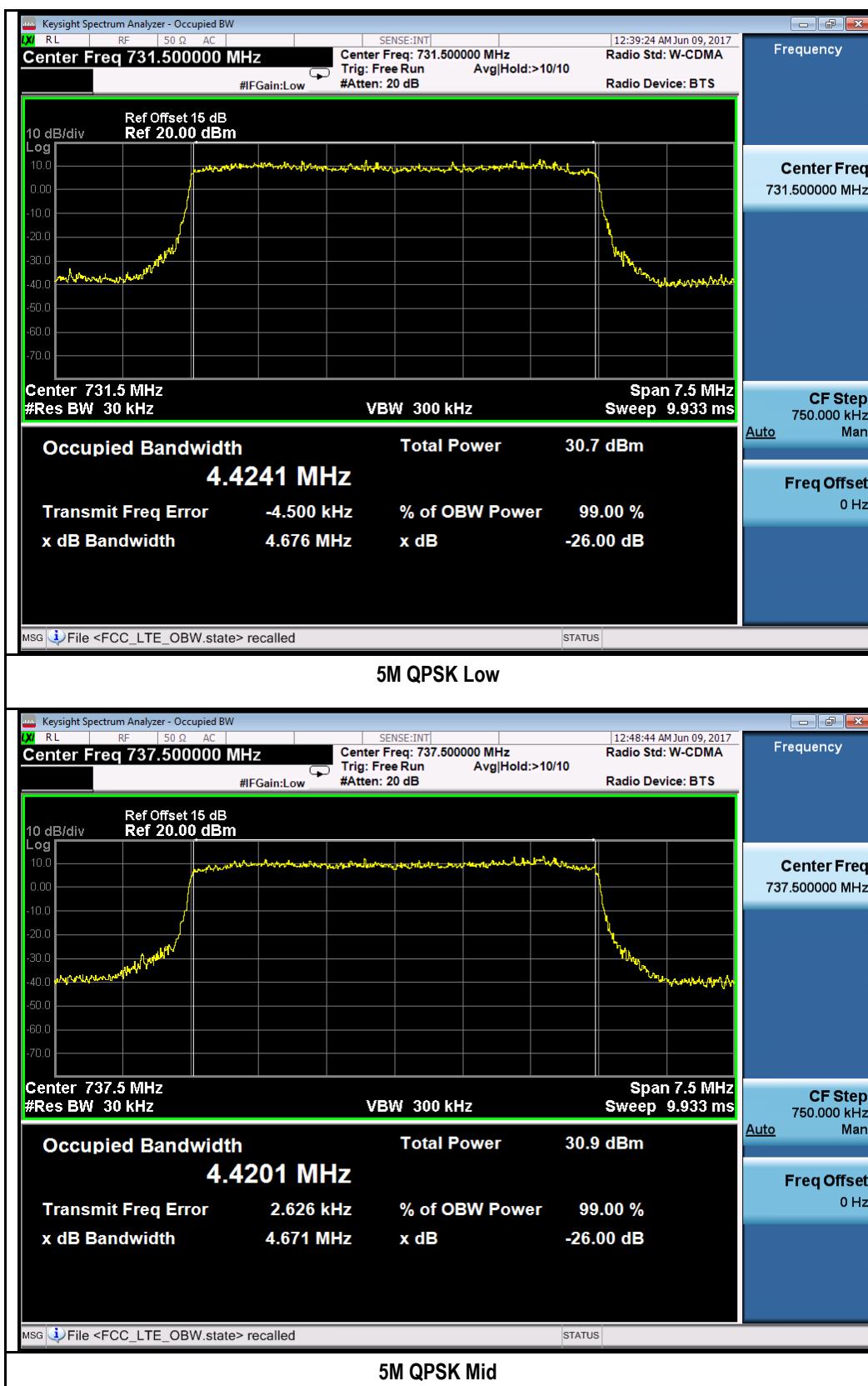


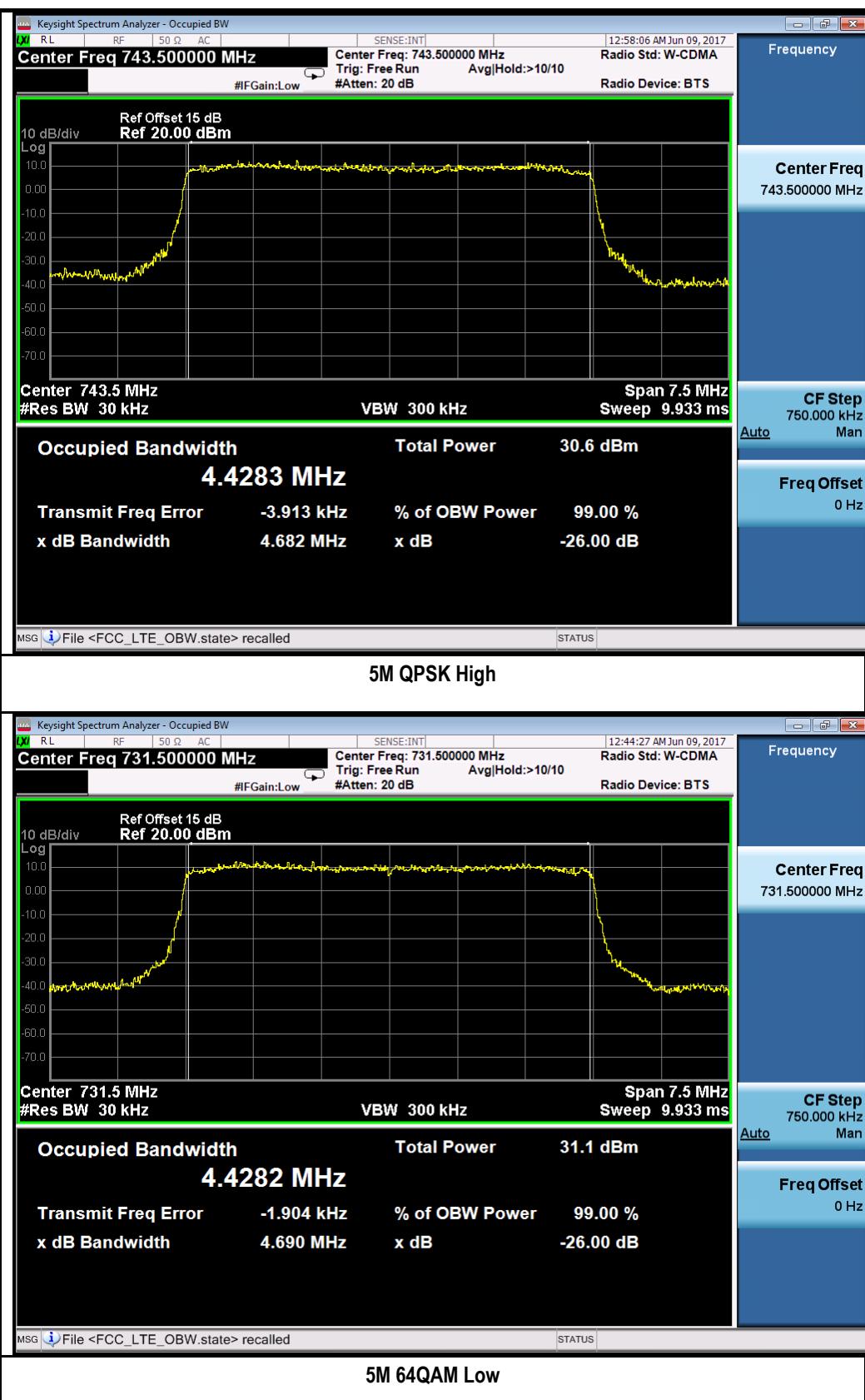


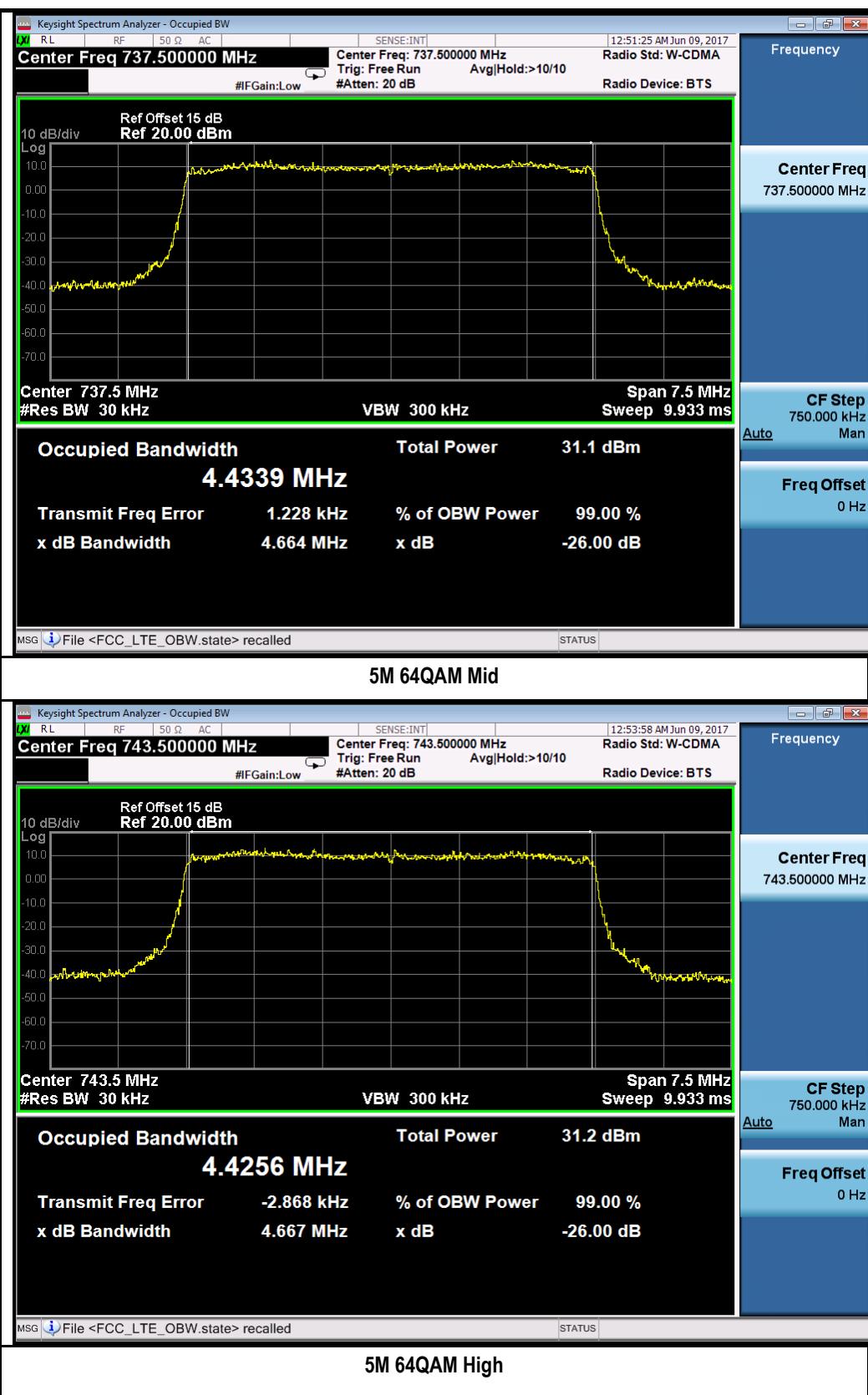


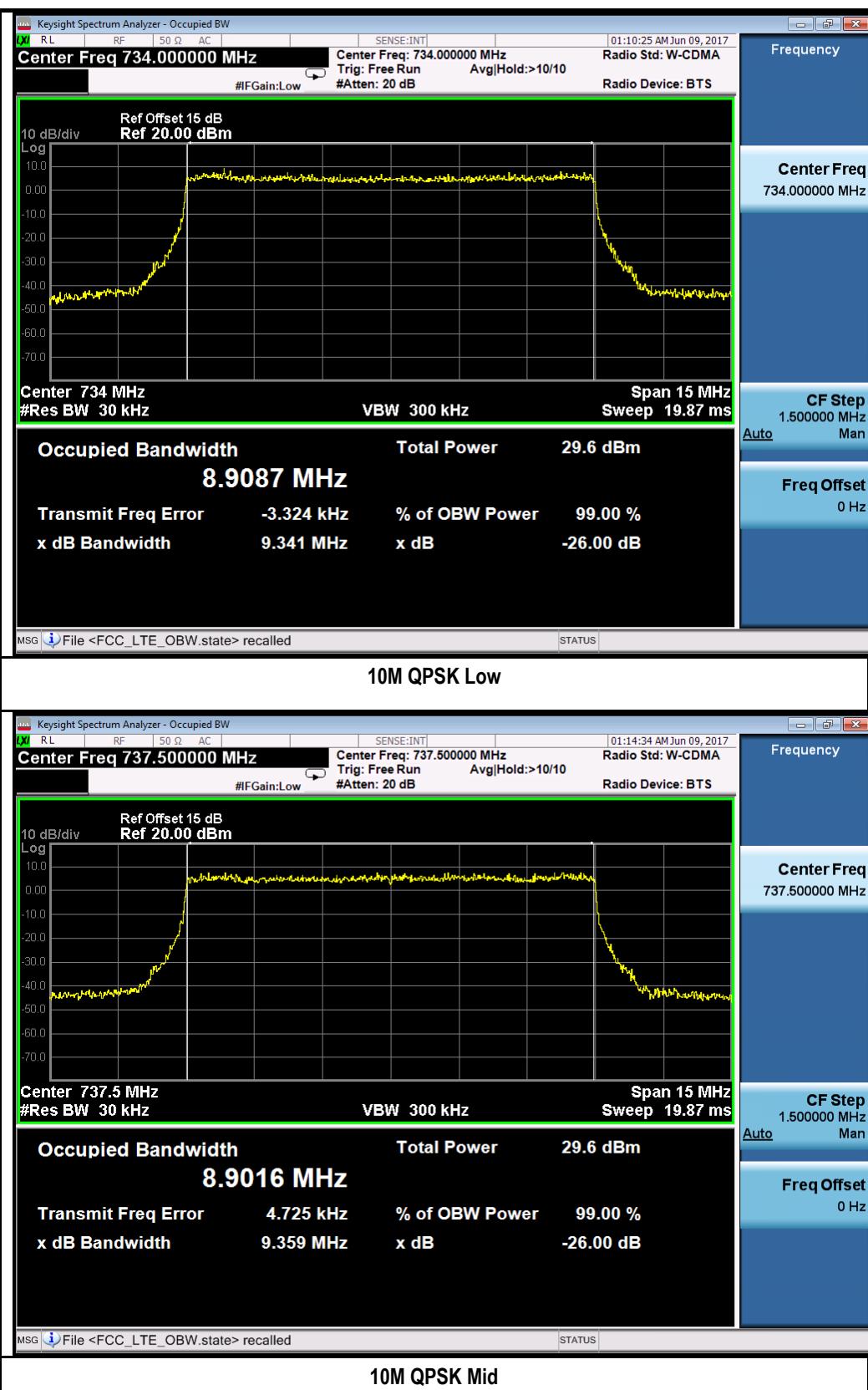


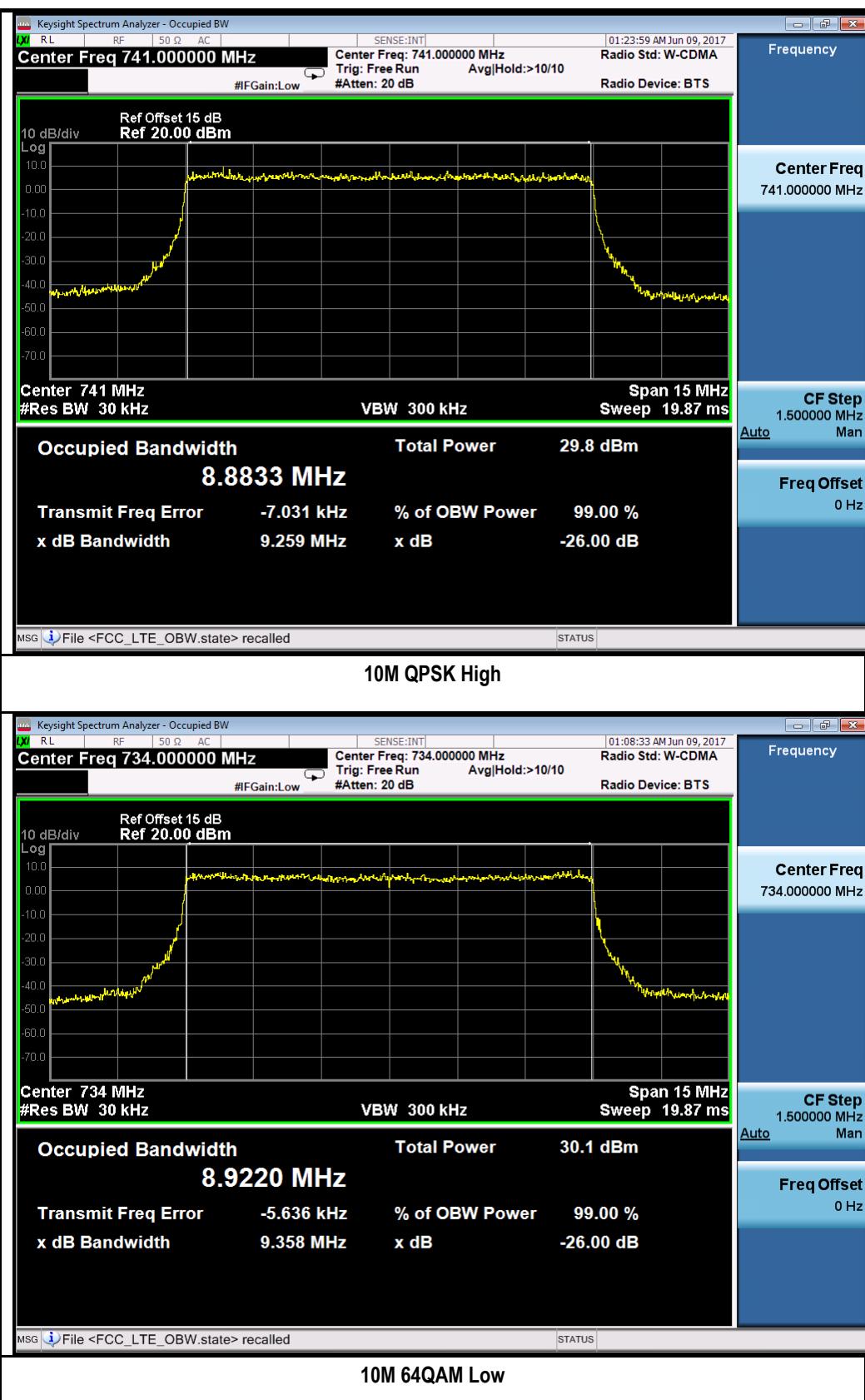
Test Plots for LTE band 12:

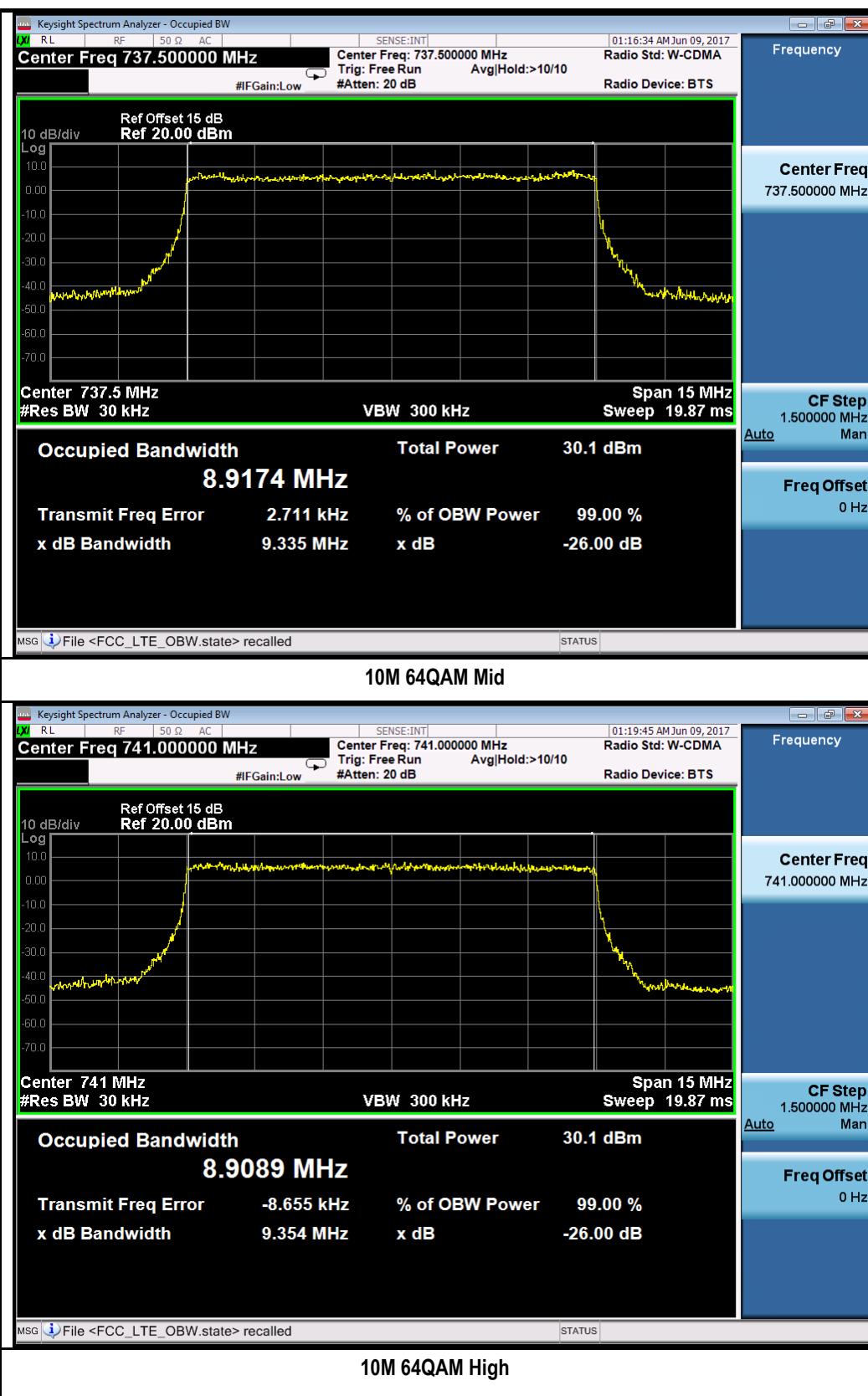






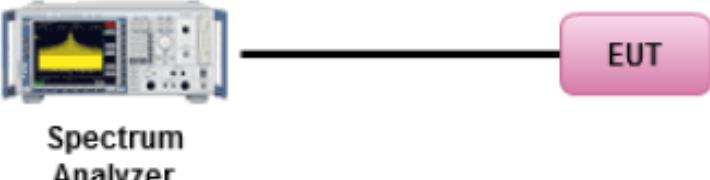






10.4 Band Edge

Requirement(s):

Spec	Item	Requirement	Applicable
47CFR27.53	-	Out of band emissions. 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.	<input checked="" type="checkbox"/>
Test Setup		 <p>Spectrum Analyzer ————— EUT</p>	
Test Procedure		<ol style="list-style-type: none"> EUT was set for low , mid, high channel with modulated mode and highest RF output power. The spectrum analyzer was connected to the antenna terminal. A RBW of 1% greater than the 26 dB emission bandwidth should be used for band edge measurement or if narrower RBW is used, a correct factor calculated with formula $10 \log(EBW/BW_{meas})$ will be added to the result. 	
Test Date	01/13/2017 – 06/09/2017	Environmental condition	Temperature 22°C Relative Humidity 48% Atmospheric Pressure 1008mbar
Remark	<p>The EUT was scanned up to 25GHz. Both horizontal and vertical polarities were investigated. The results show only the worst case.</p> <p>Limit calculation: $Emission\ limit = PdBm - [43 + 10 \log(PW)] = 10 \log(1000 \times PW) - 43 - 10 \log(PW) = 30\ dBm - 43 = -13\ dBm$</p> <p>100KHz RBW was used to make measurement for LTE Band 4 with 20MHz BW, so the correction factor will be added to correct the result to be using 200 KHz RBW.</p>		
Result	<input checked="" type="checkbox"/> Pass	<input type="checkbox"/> Fail	

Test Data Yes N/A

Test Plot Yes (See below) N/A

Test was done by Chen Ge at RF Test Site.

Test Plots for band 4:

Chain 1:

