(l)(2) For mobile operations in the 3700-3980 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed −13 dBm/MHz. Compliance with this paragraph (l)(2) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be either one percent of the emission bandwidth of the fundamental emission of the transmitter or 350 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

(n)(2) For mobile operations in the 3450-3550 MHz band, the conducted power of any emission outside the licensee's authorized bandwidth shall not exceed −13 dBm/MHz. Compliance with this paragraph (n)(2) is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed, but limited to a maximum of 200 kHz. In the bands between 1 and 5 MHz removed from the licensee's frequency block, the minimum resolution bandwidth for the measurement shall be 500 kHz. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01
The transmitter output was connected to either CMW500 Test Set or E7515B Test set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

WDDMA/LTE/5G NR

a) Set the RBW = 1 - 1.5 % of OBW(Typically limited to a minimum RBW of 1% of the OBW)
b) Set VBW ≥ 3 × RBW;
c) Set span ≥ 1.5 times the OBW;
d) Sweep time = Auto;
e) Detector = RMS;
f) Ensure that the number of measurement points ≥ 2*Span/RBW;
g) Trace Mode = Average (100);

NOTE1

For frequency range of 763-775 MHz and 793-806 MHz, 769-775 MHz and 799-805 MHz.(LTE Band 13)

a) Set the RBW = 6.25 kHz (The minimum RBW setting value for the Spectrum analyzer is 6.8 kHz)

b) Set VBW ≥ 3 × RBW;

c) Sweep time = 1 second ;

d) Detector = RMS;

e) Ensure that the number of measurement points ≥ 2*Span/RBW;

f) Trace Mode = Average;

NOTE2

Note that the spurious emissions outside of the channel include narrowband signals. These signals are all below the -13dBm / -25dBm limits. Although the measurement bandwidth is less than the reference bandwidth of 1MHz no addental correction is applied as ANSI C63.26 section 4.2.3 only requires the correction to be applied when the OBW of the emission being measured is wider than the measurement bandwidth (Where the OBW of the signal under measurement is less than the RBW of the measuring instrument, no bandwidth correction or integration will be required.) Plots for low and high channels show the level of the emission measured with the reduced bandwidth and the level of the same emission measured using the integration method over the 1MHz reference bandwidth are very close, indicating the emissions are narrowband.

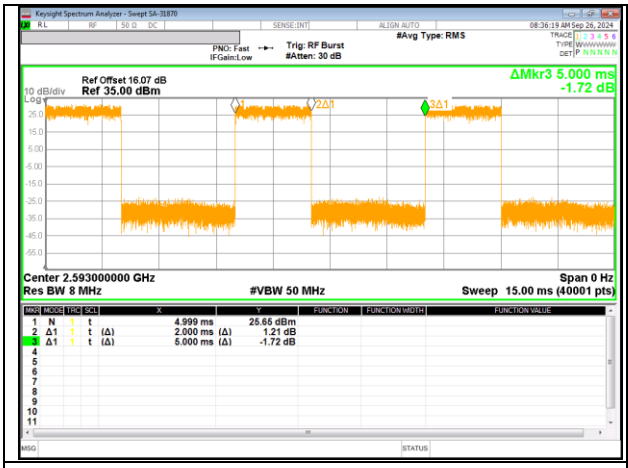
NOTE3

For Band-Edge extended:

CH BW (MHz)	RB Used (kHz)	CF for emissions more than 100kHz	CF for emissions more than 1MHz
1.4	15	+8.2 dB	+18.2 dB
3	30	+5.2 dB	+15.2 dB
5	51	+2.9 dB	+12.9 dB
10	100	N/A	+10.0 dB
15	150	N/A	+8.2 dB
20	200	N/A	+7.0 dB
25	250	N/A	+6.0 dB
30	300	N/A	+5.2 dB
35	350	N/A	+4.6 dB
40	400	N/A	+4.0 dB

For the band edge value measured in [RB Used], even if [CF for emissions reference bandwidth 100kHz/1MHz] is applied, it is below -13dBm.

NOTE4

	
For LTE Band 41/ LTE Band 41C (ULCA) (Gate trigger off): RF Path Loss: 16.07 dB & DCF 4 dB: 10log(2/5) Measure offset: 16.07 dB+4 dB = **20.07 dB**	For 5G NR n41 (Gate trigger off): RF Path Loss: 16.07 dB & DCF 7 dB: 10log(1/5) Measure offset: 16.07 dB+7 dB = **23.07 dB**
	
For 5G NR n77 (Gate trigger off): RF Path Loss: 16.09 dB & DCF 7 dB: 10log(1/5) Measure offset: 16.09 dB+7 dB = **23.09 dB**	

NOTE5

5G NR: All Waveforms (CP-OFDM vs DFT-s_OFDM) and modulations (π/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM) 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.

NOTE6

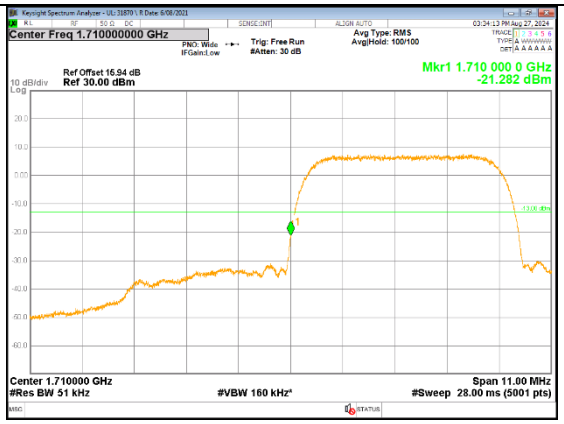
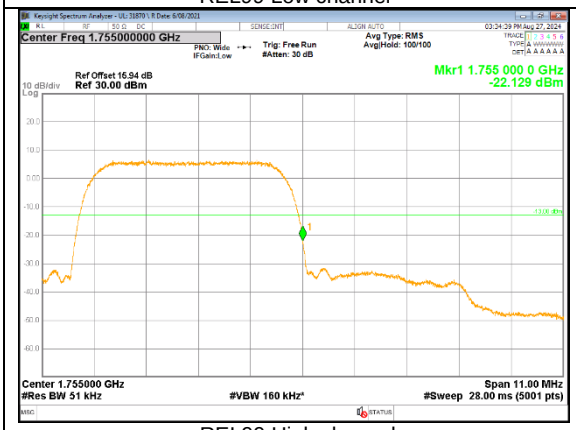
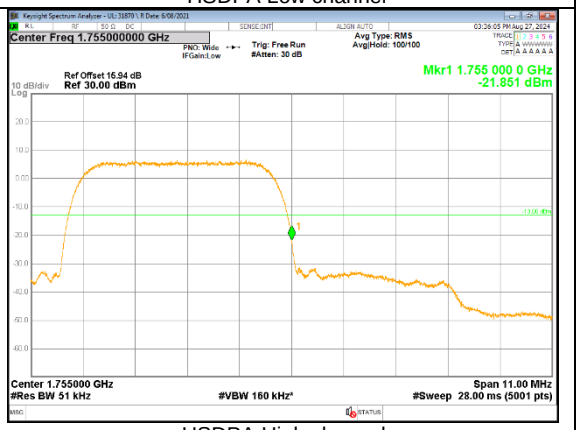
Emission Mask: All 1RB Positions (Edge RB, Outer RB, Inner RB) and modulations (QPSK, 16QAM, 64QAM, 256QAM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

RESULTS

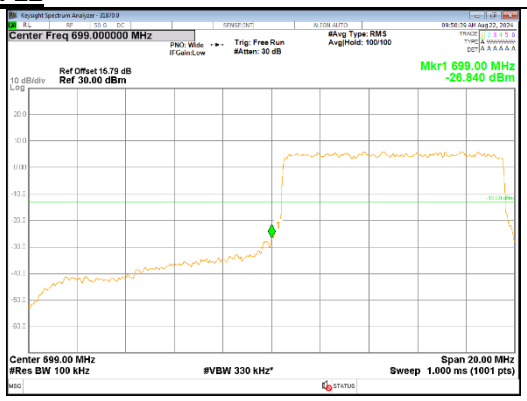
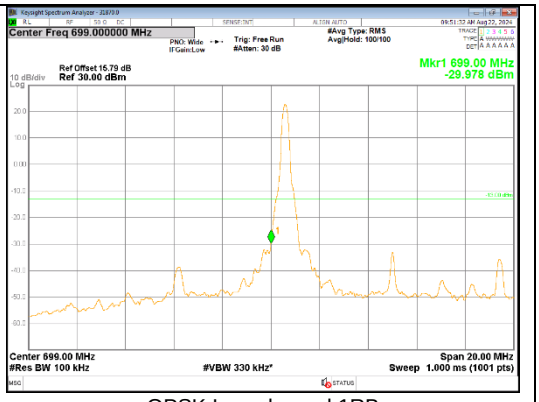
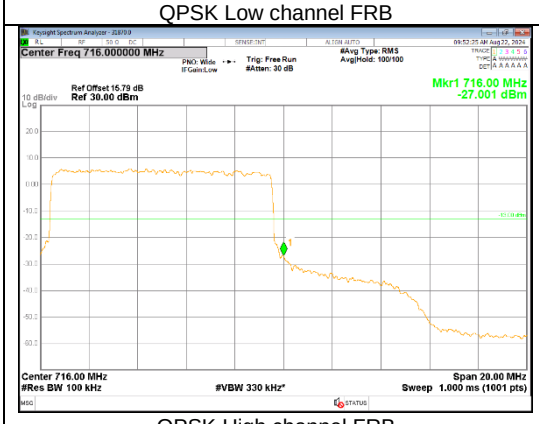
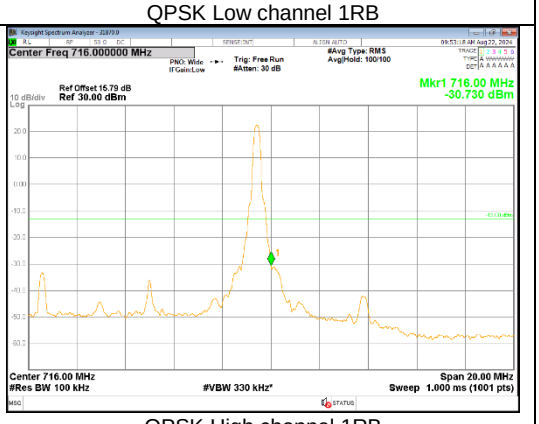
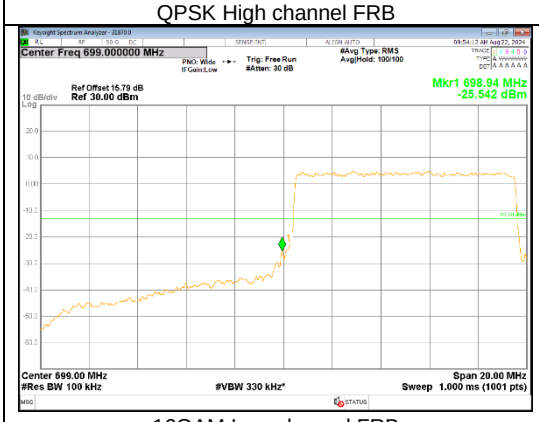
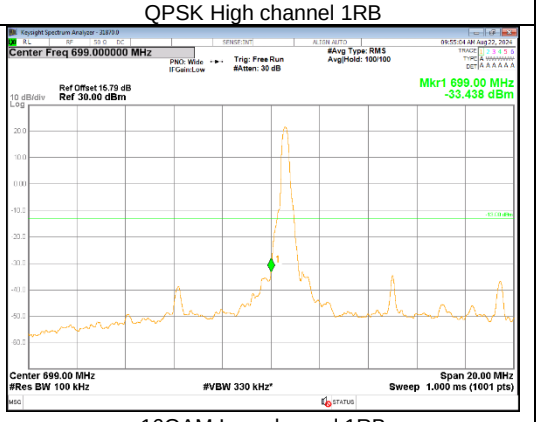
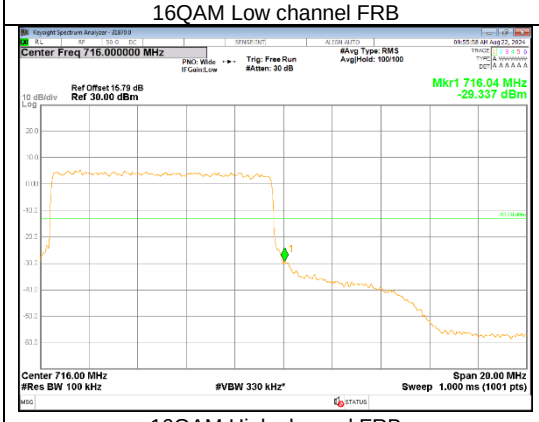
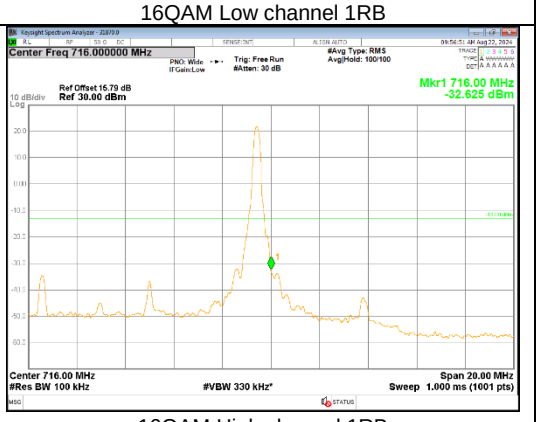
See the following pages.

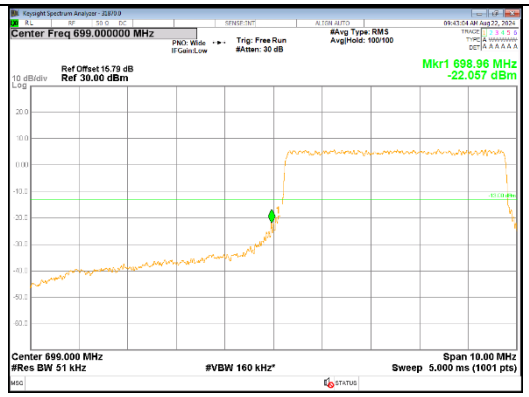
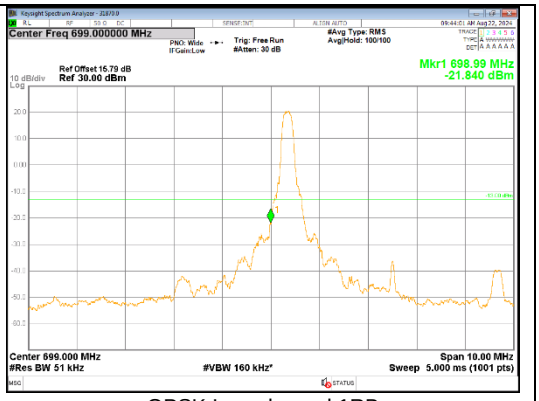
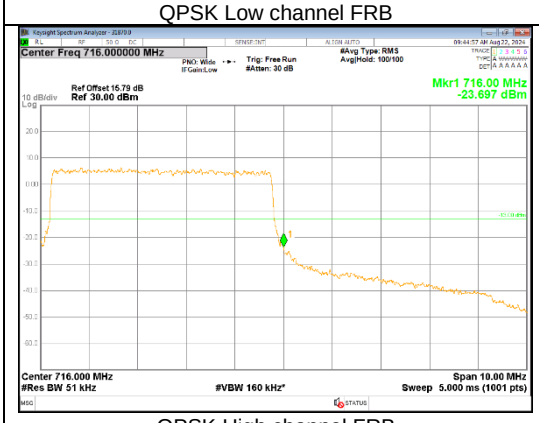
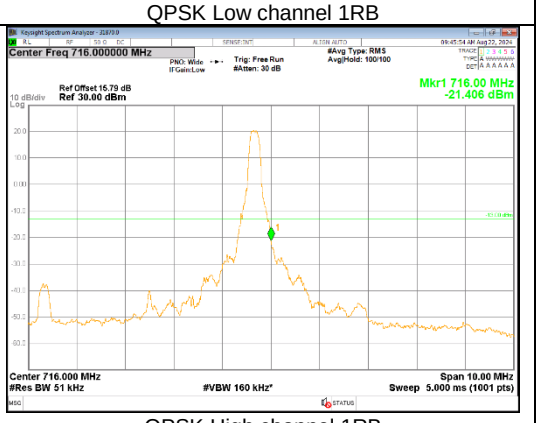
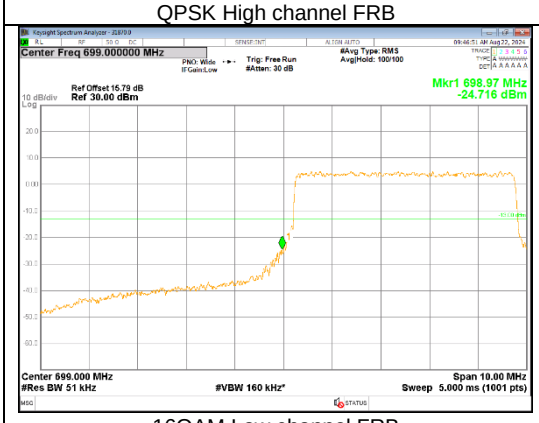
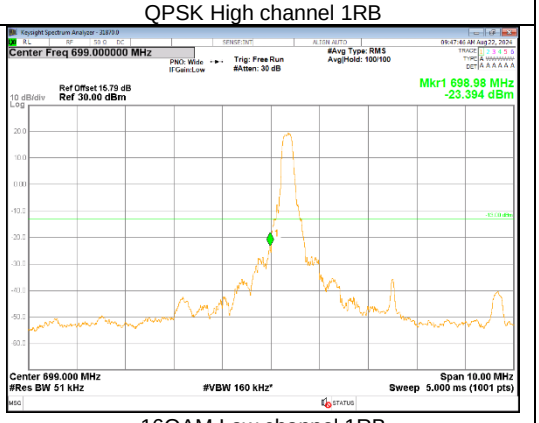
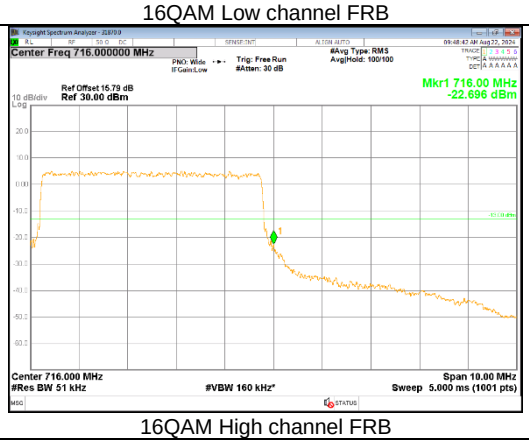
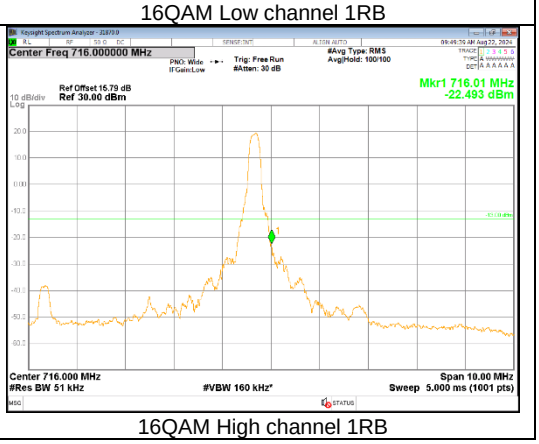
8.4.1. BAND EDGE RESULT

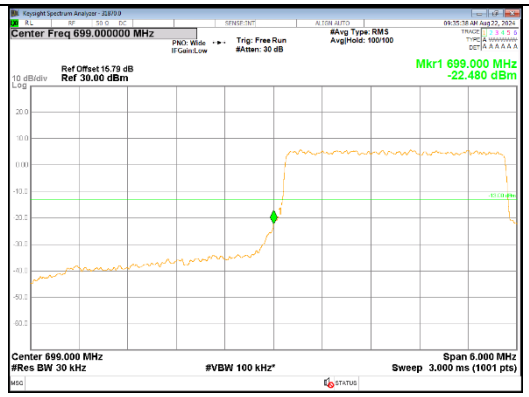
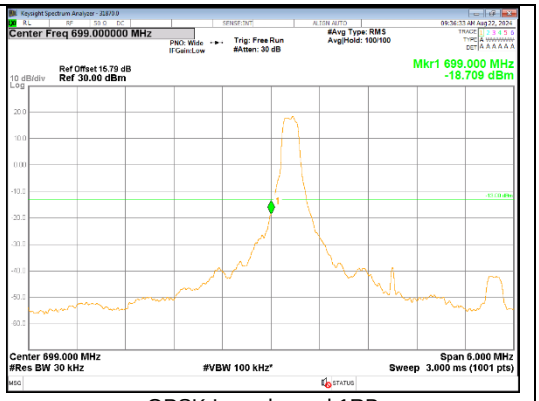
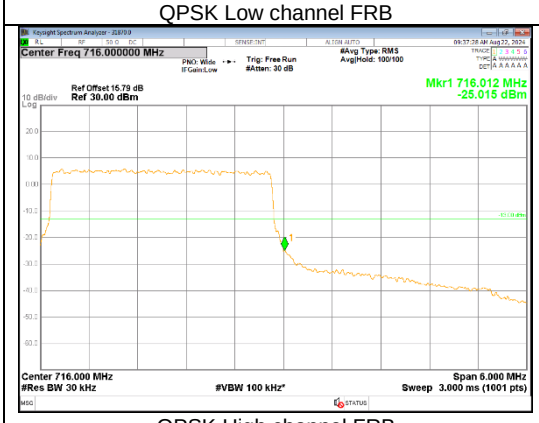
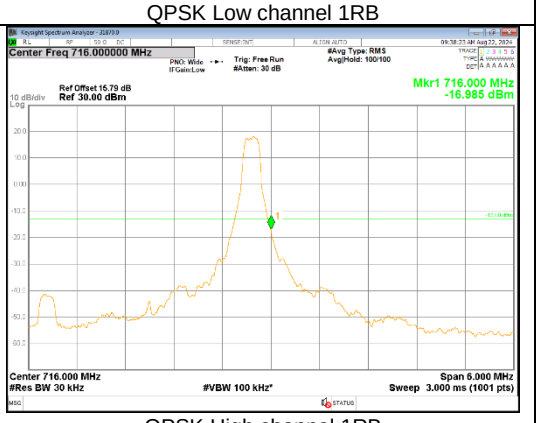
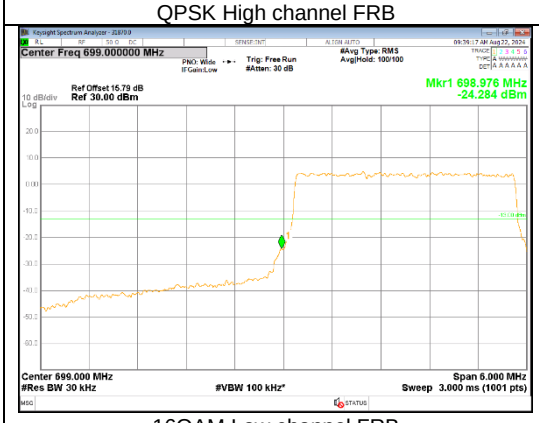
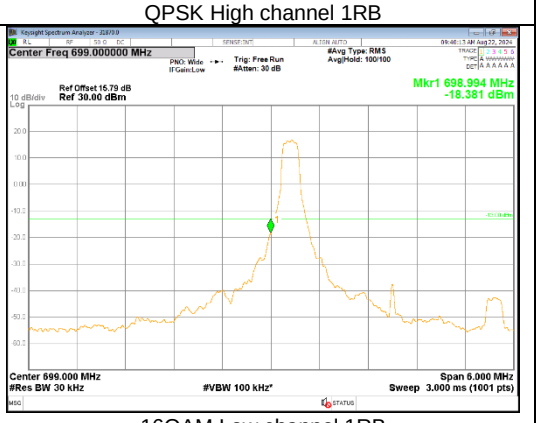
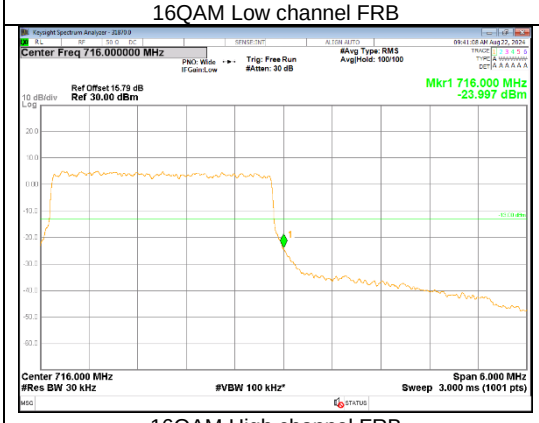
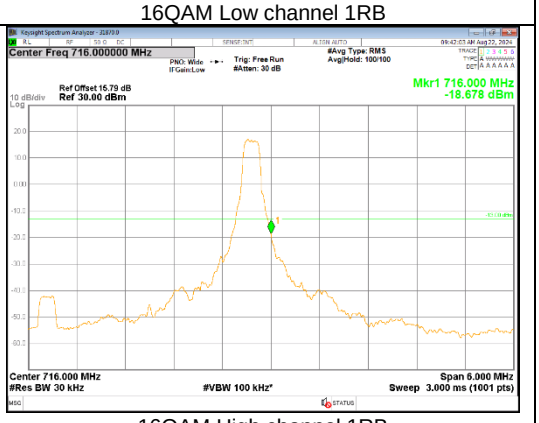
WCDMA

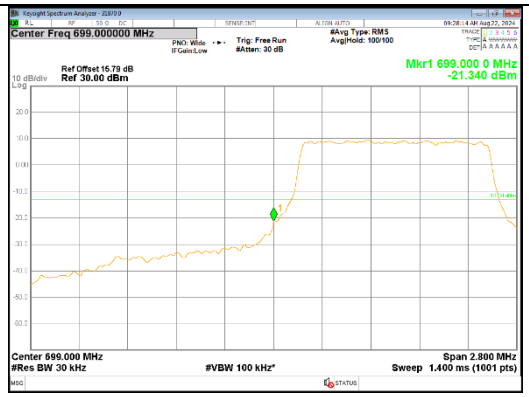
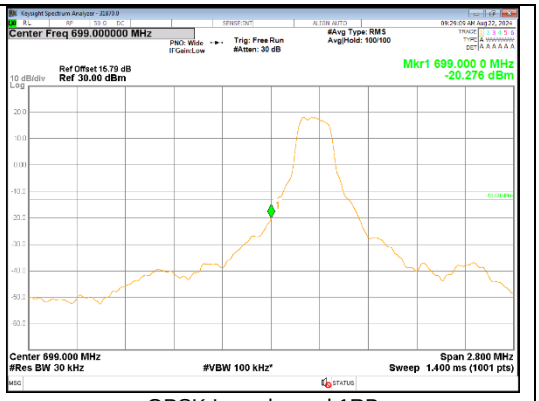
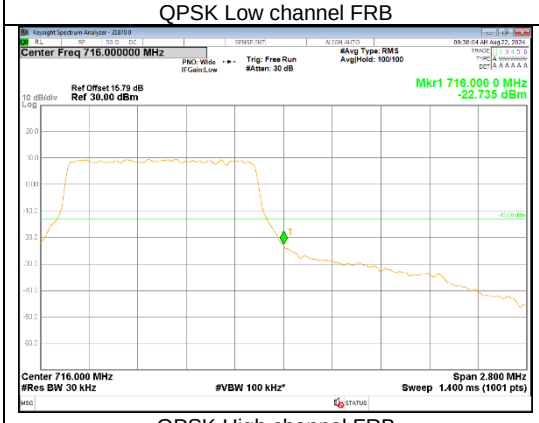
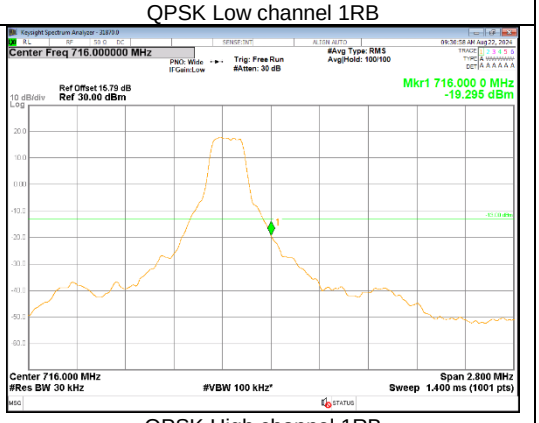
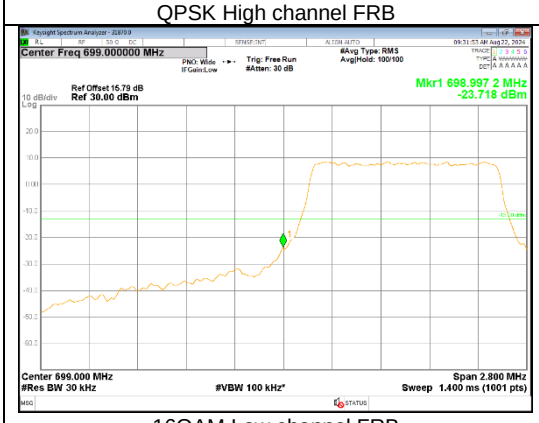
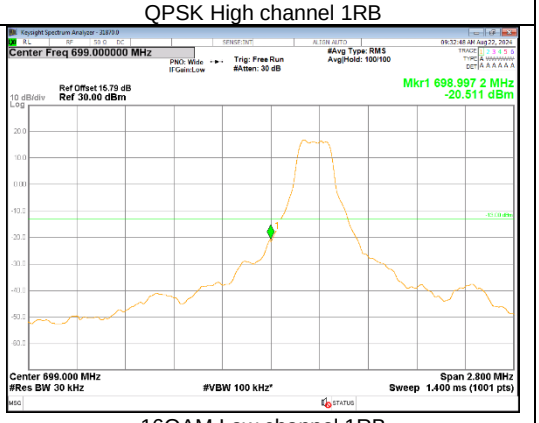
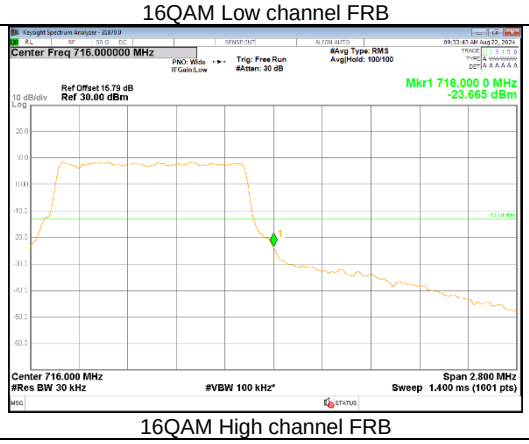
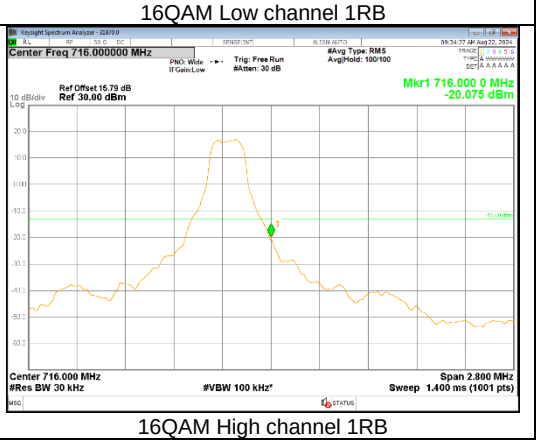
Band 4	 REL99 Low channel	 HSDPA Low channel
	 REL99 High channel	 HSDPA High channel

LTE Band 12

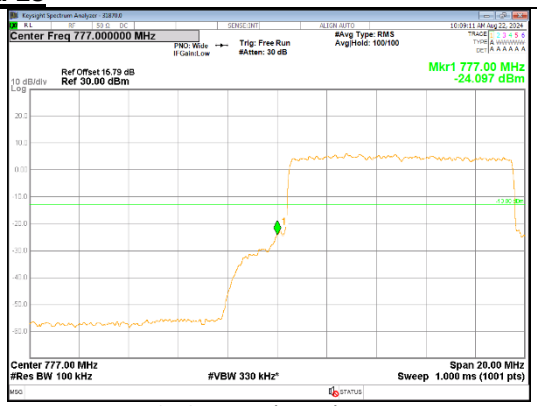
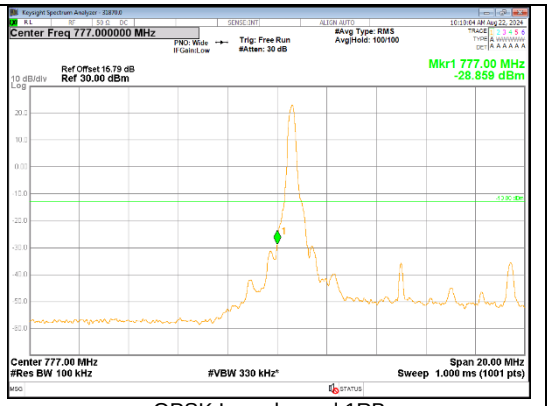
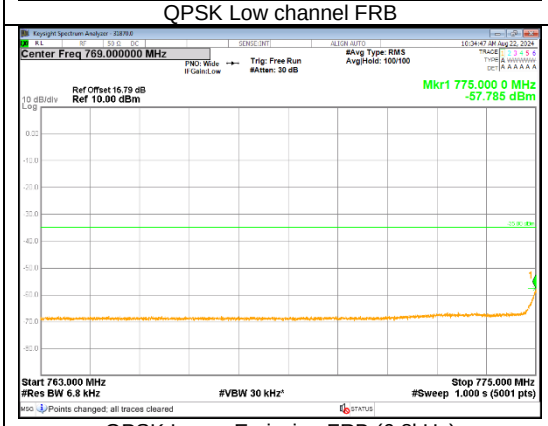
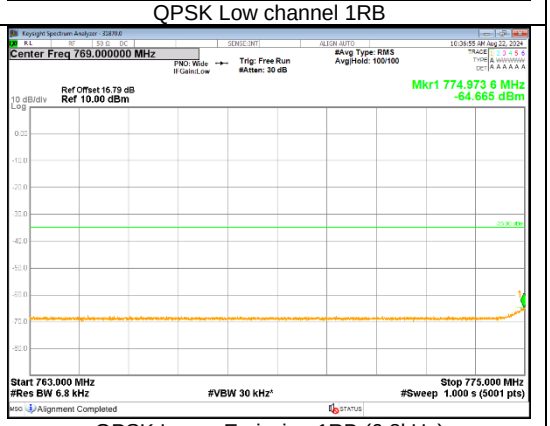
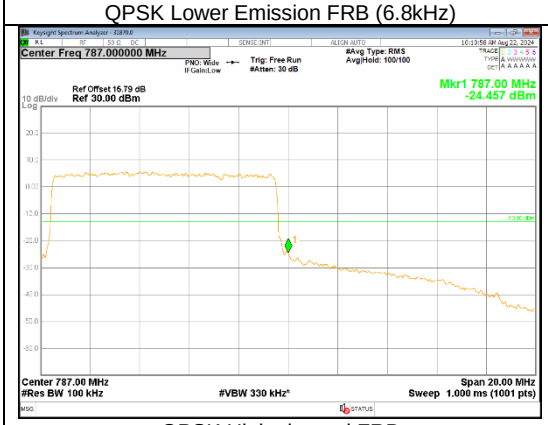
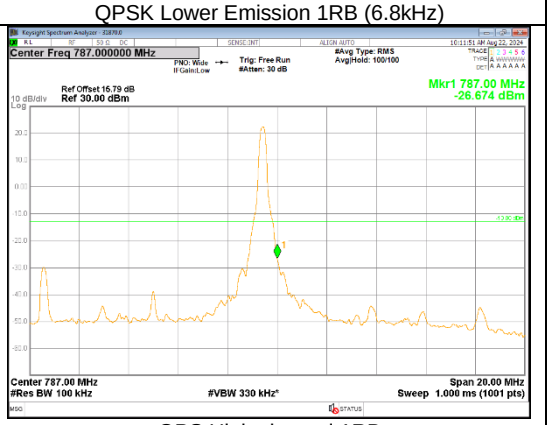
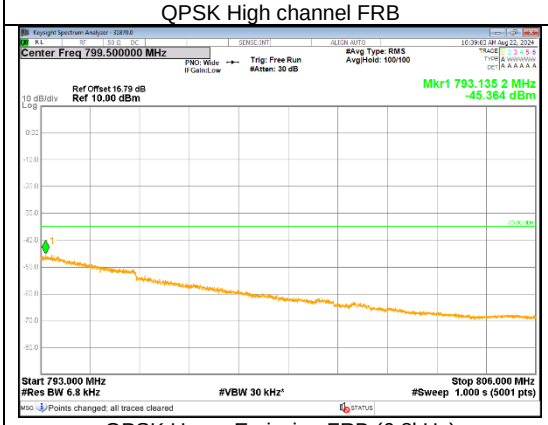
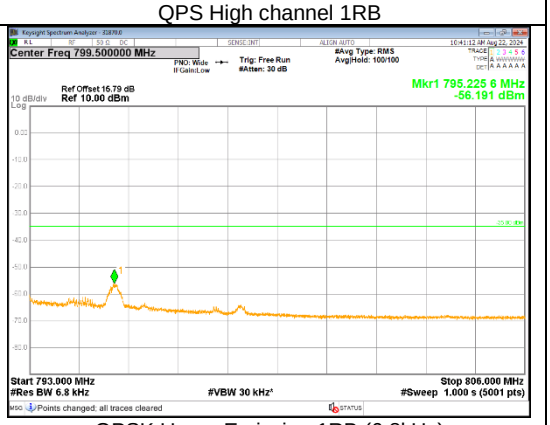
10MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB

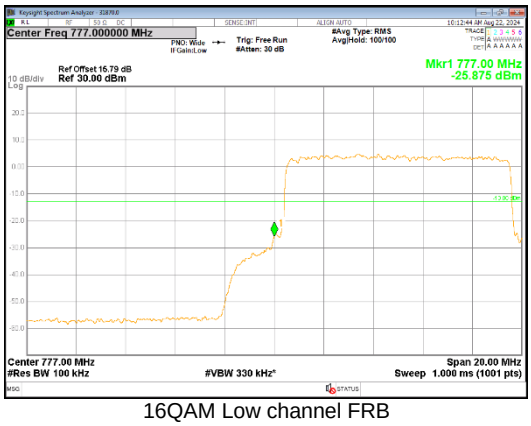
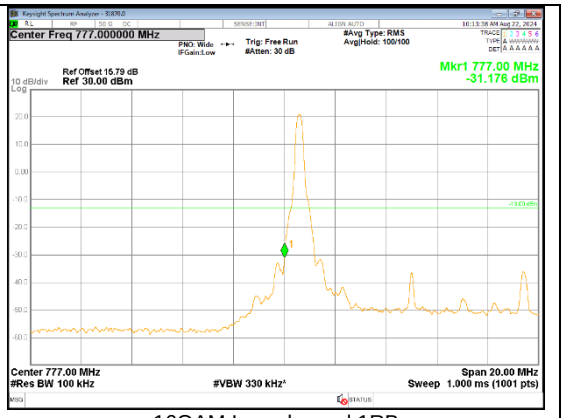
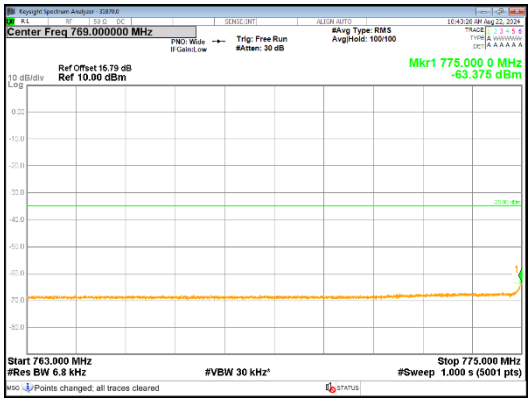
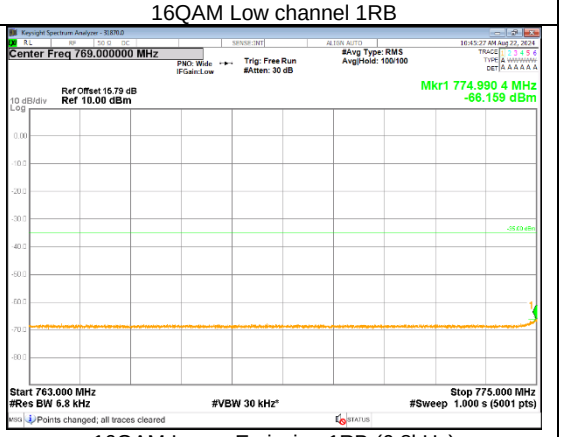
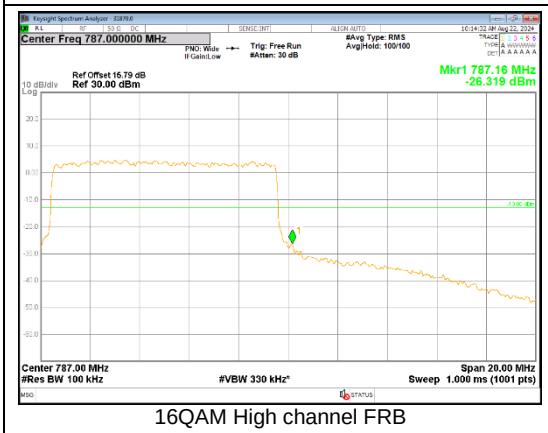
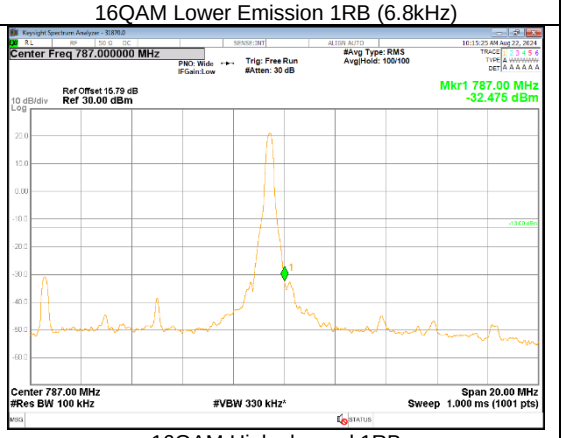
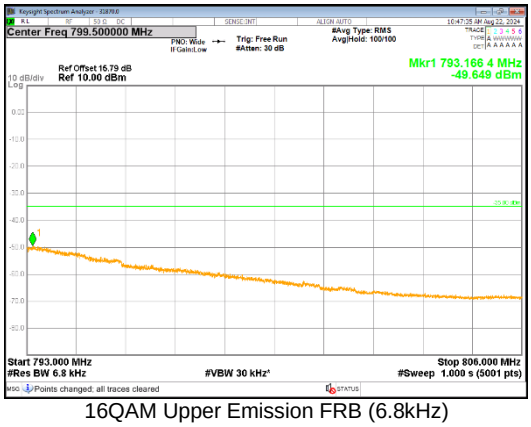
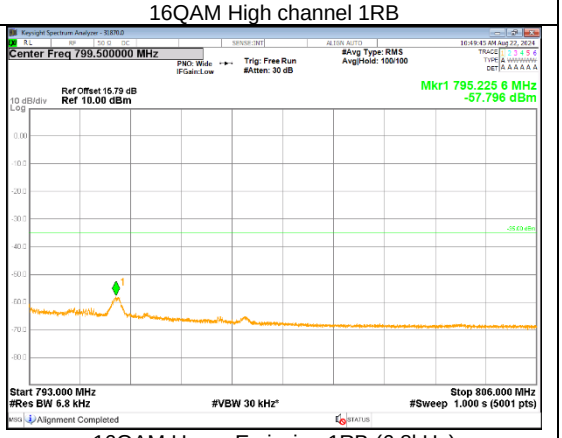
5MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB

3MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB

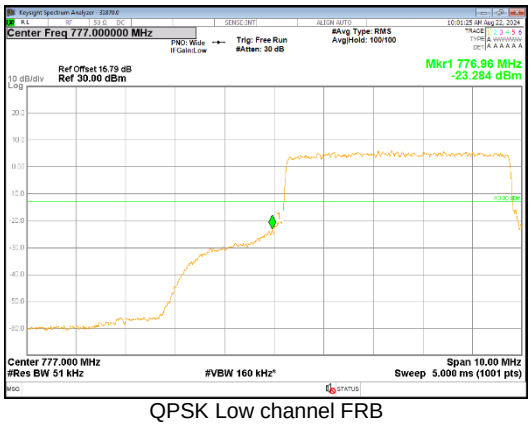
1.4MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB

LTE Band 13

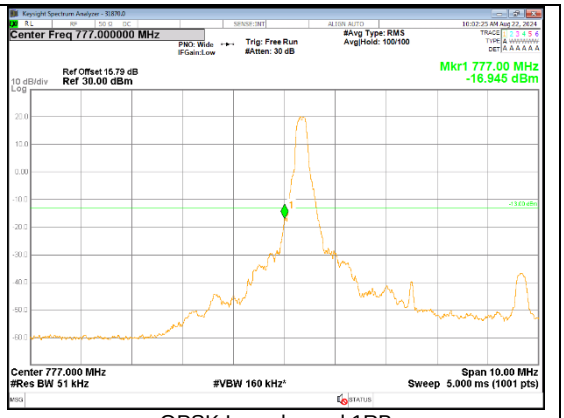
10MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK Lower Emission FRB (6.8kHz)	 QPSK Lower Emission 1RB (6.8kHz)
	 QPSK High channel FRB	 QPS High channel 1RB
	 QPSK Upper Emission FRB (6.8kHz)	 QPSK Upper Emission 1RB (6.8kHz)

10MHz	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM Lower Emission FRB (6.8kHz)	 16QAM Lower Emission 1RB (6.8kHz)
	 16QAM High channel FRB	 16QAM High channel 1RB
	 16QAM Upper Emission FRB (6.8kHz)	 16QAM Upper Emission 1RB (6.8kHz)

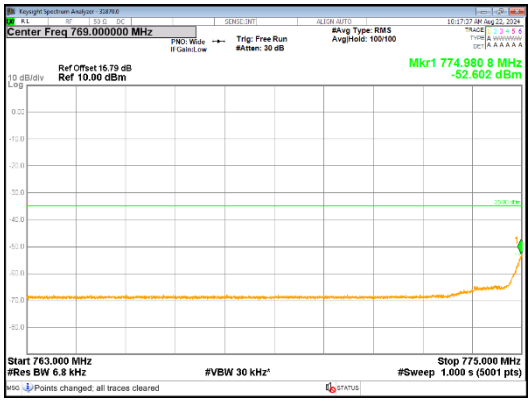
5MHz



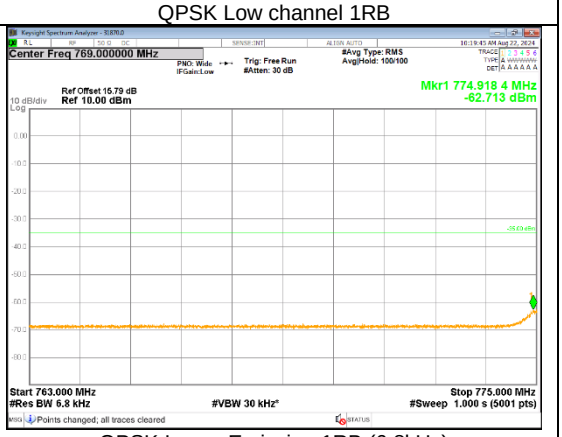
QPSK Low channel FRB



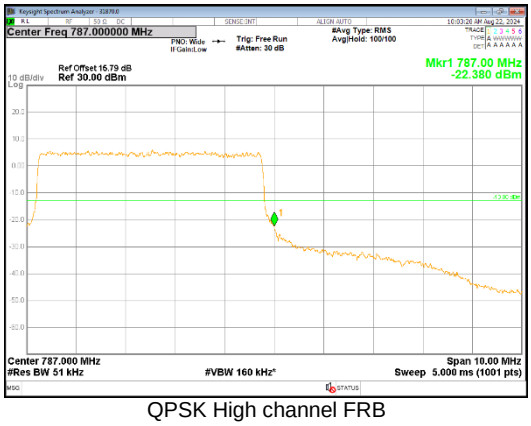
QPSK Low channel 1RB



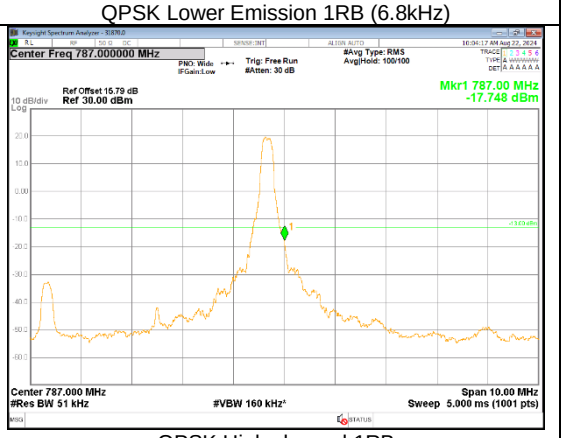
QPSK Lower Emission FRB (6.8kHz)



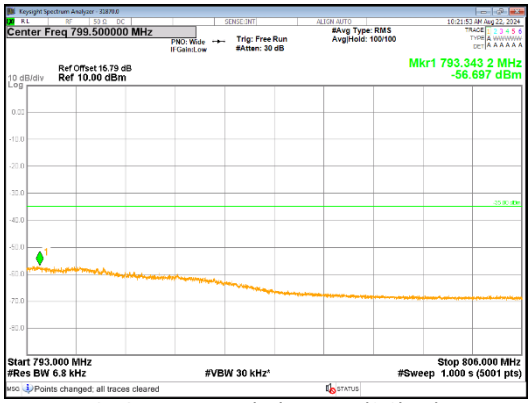
QPSK Lower Emission 1RB (6.8kHz)



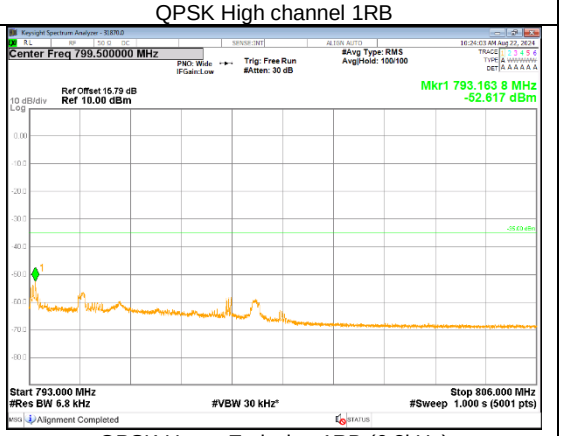
QPSK High channel FRB



QPSK High channel 1RB

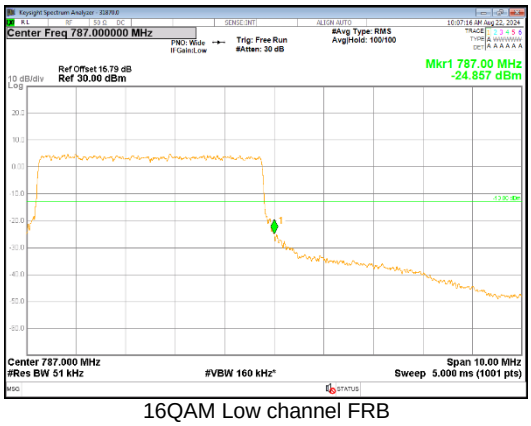


QPSK Upper Emission FRB (6.8kHz)

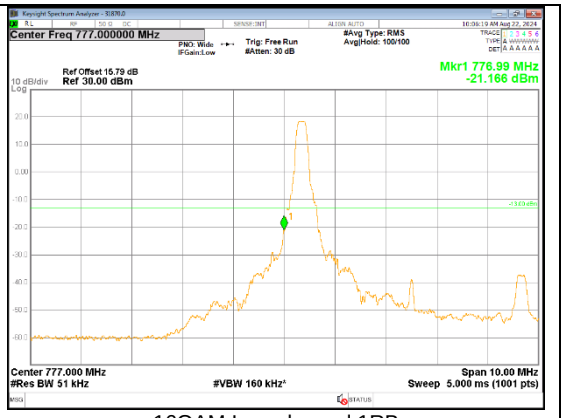


QPSK Upper Emission 1RB (6.8kHz)

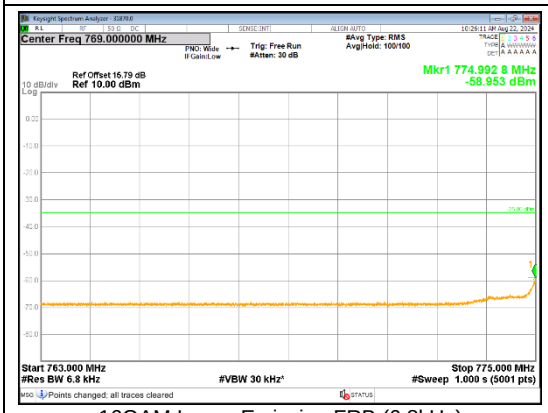
5MHz



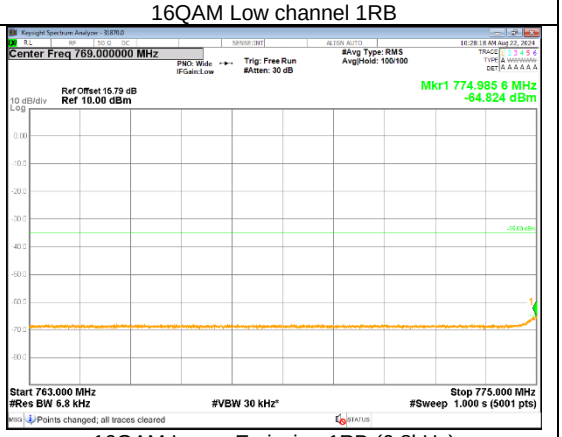
16QAM Low channel FRB



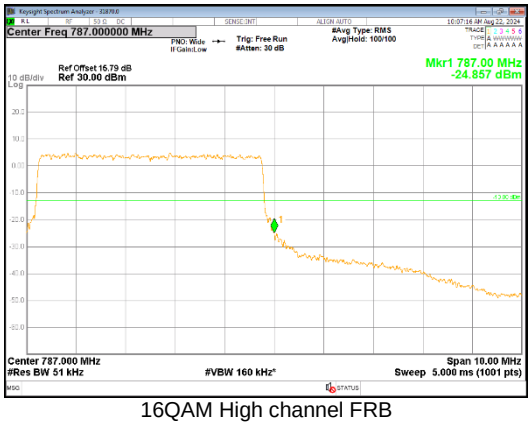
16QAM Low channel 1RB



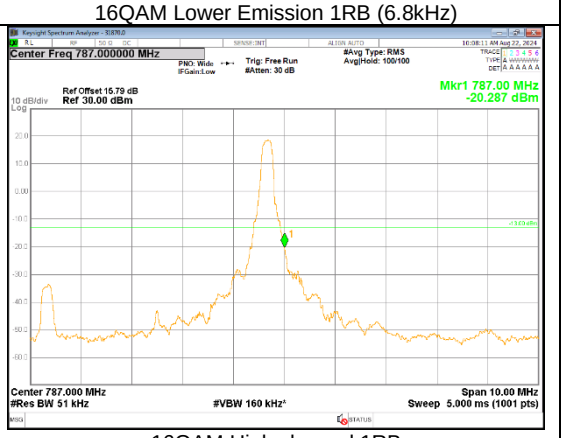
16QAM Lower Emission FRB (6.8kHz)



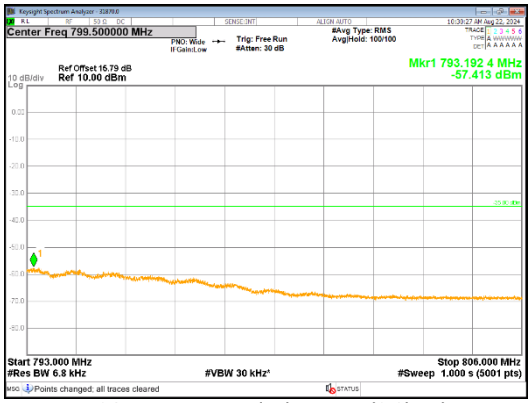
16QAM Lower Emission 1RB (6.8kHz)



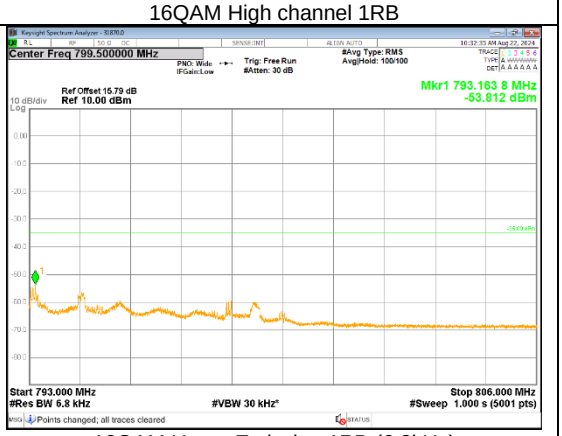
16QAM High channel FRB



16QAM High channel 1RB

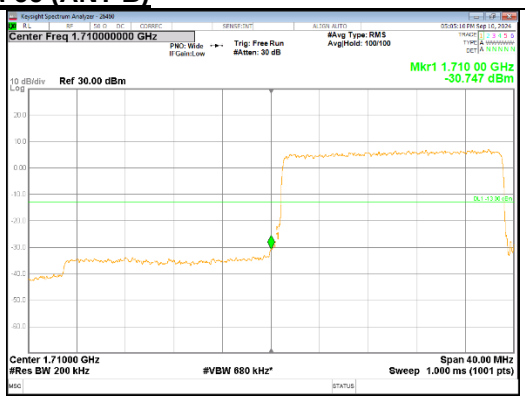
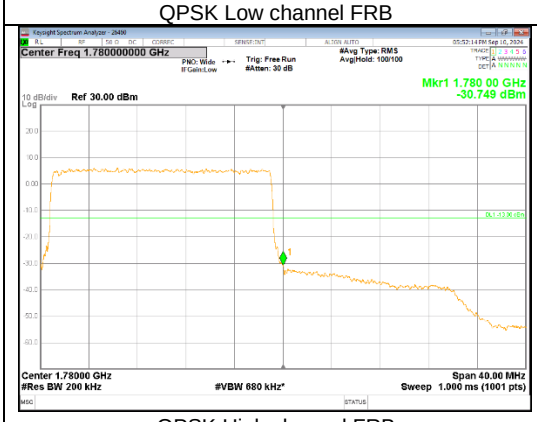
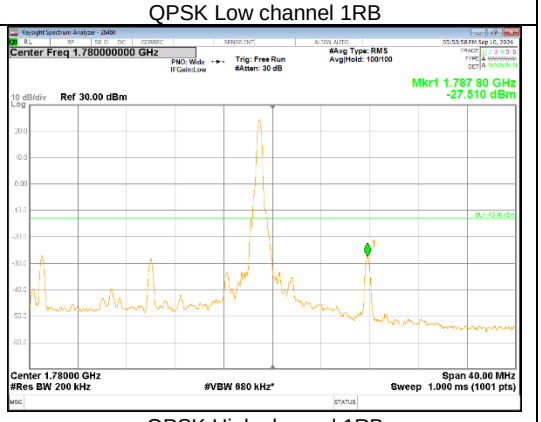
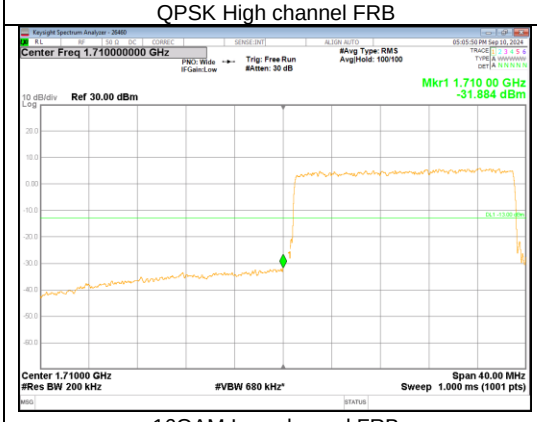
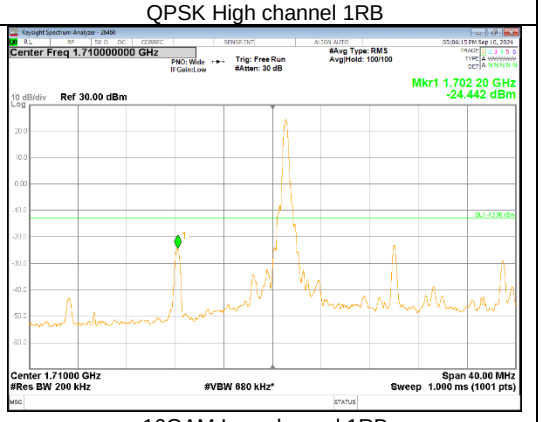
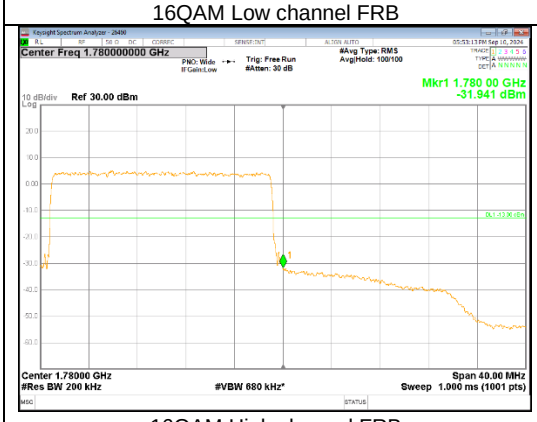
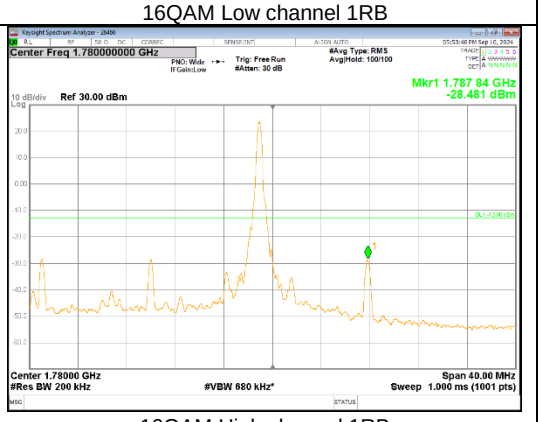


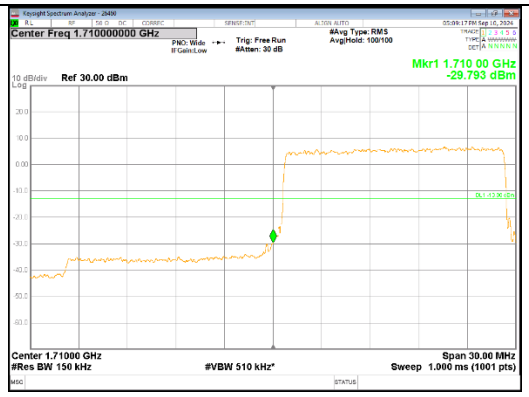
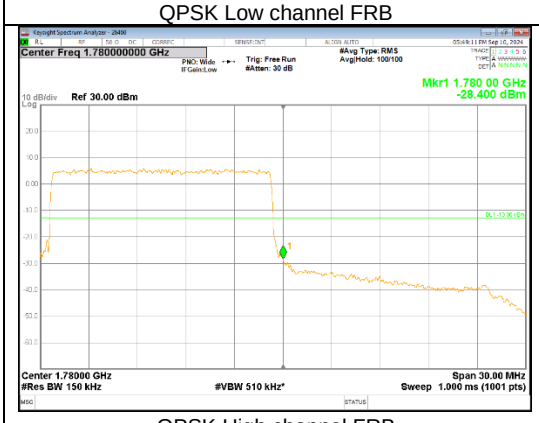
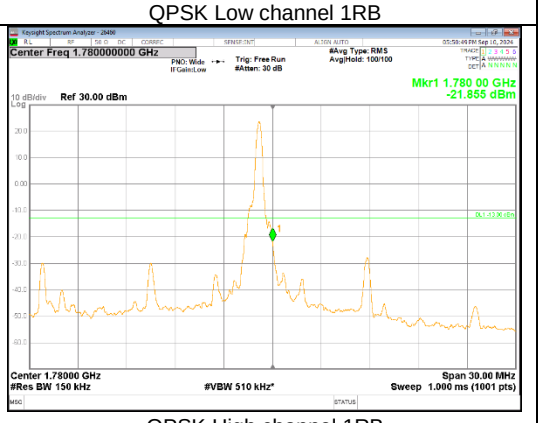
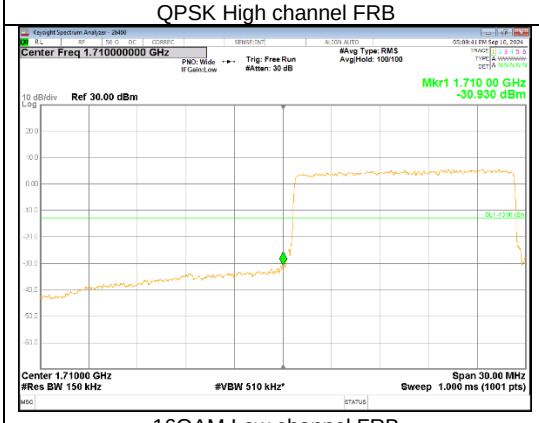
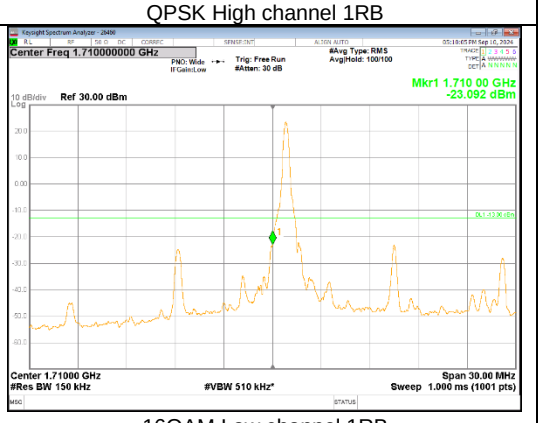
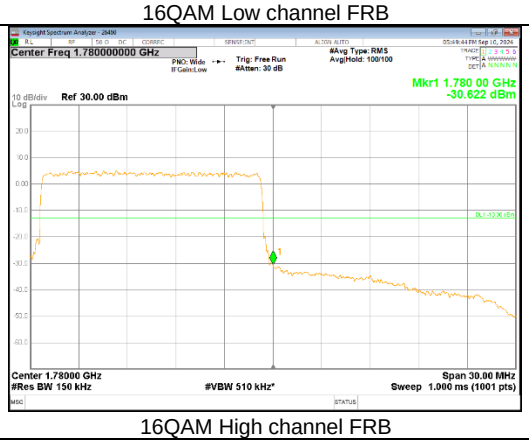
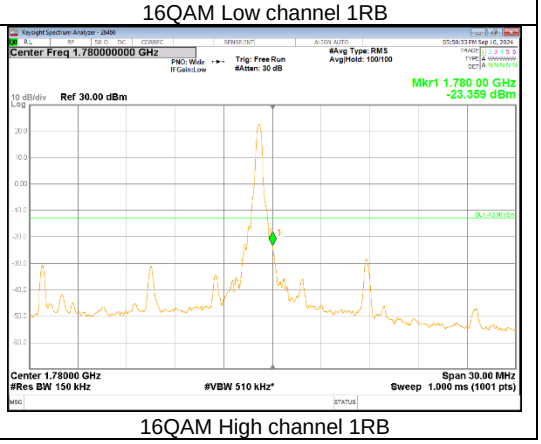
16QAM Upper Emission FRB (6.8kHz)

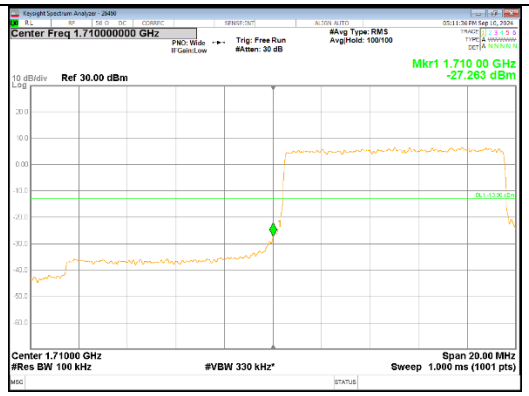
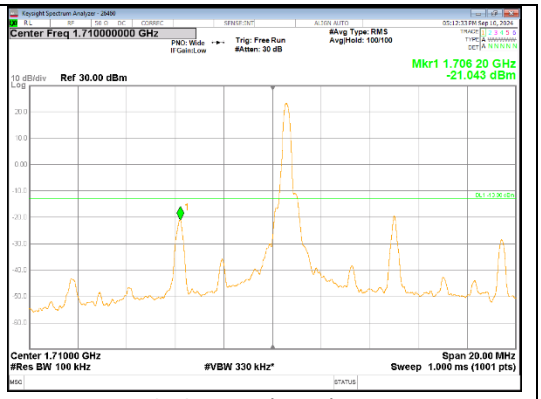
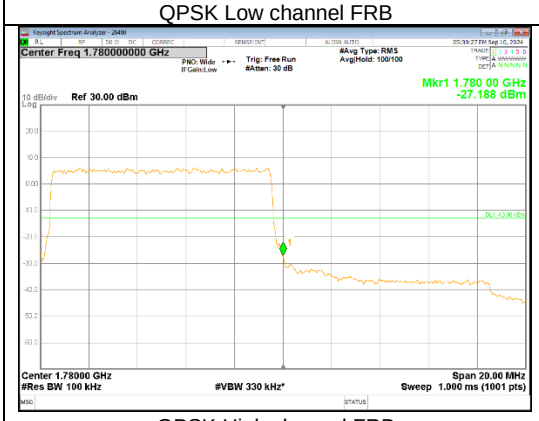
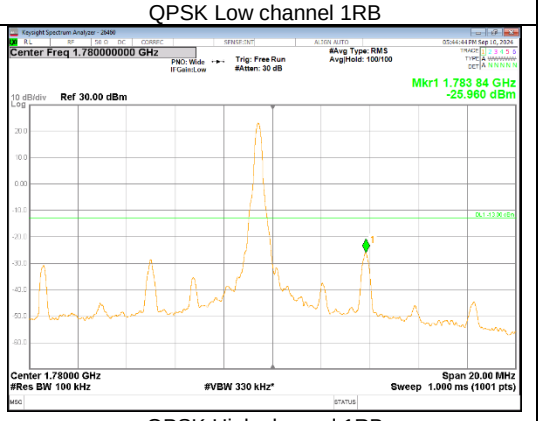
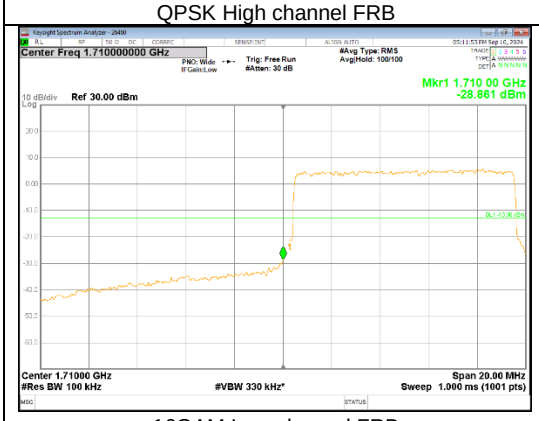
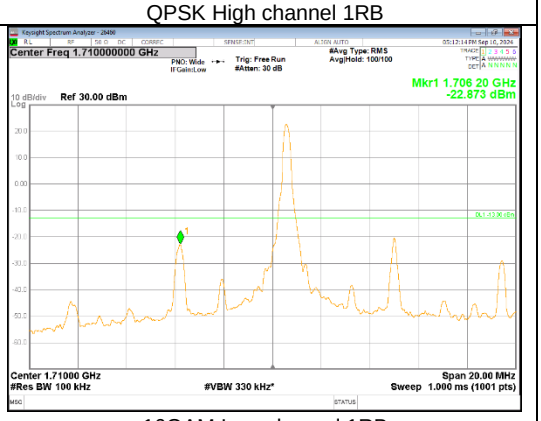
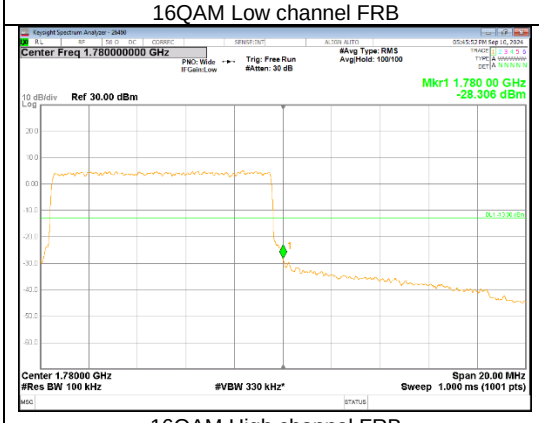
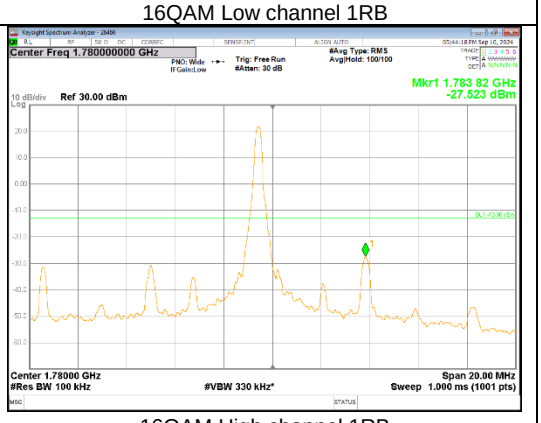


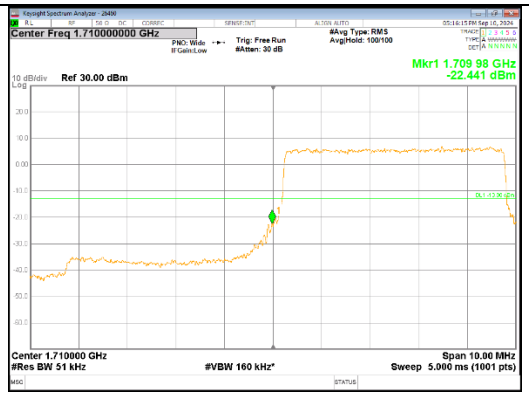
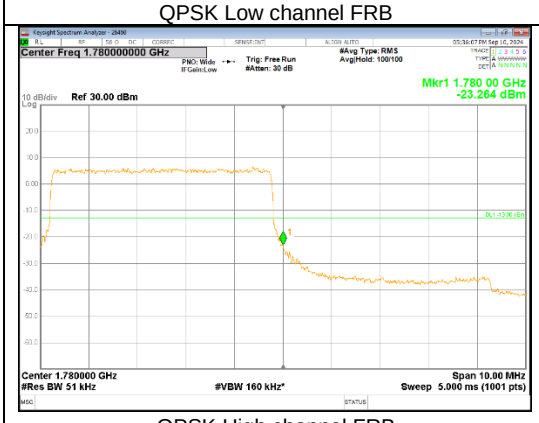
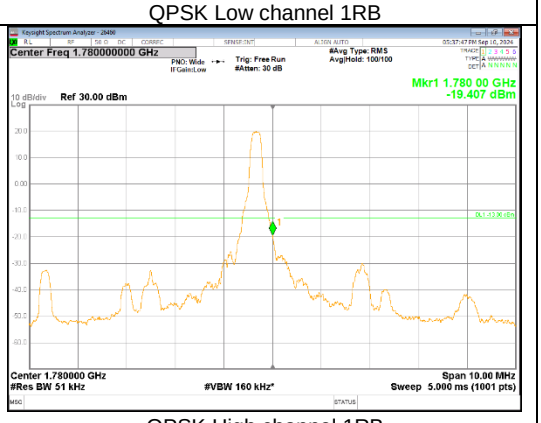
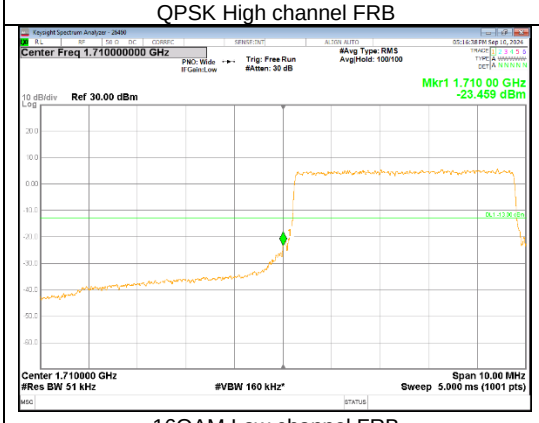
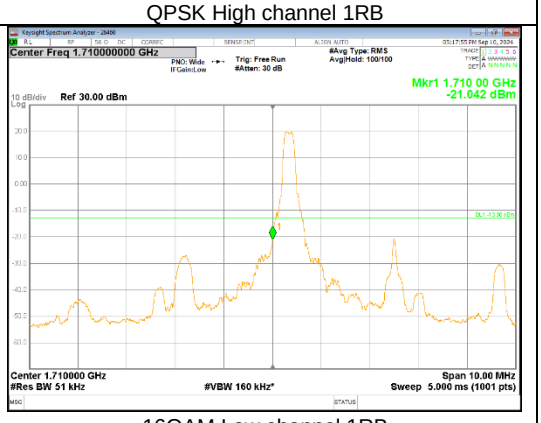
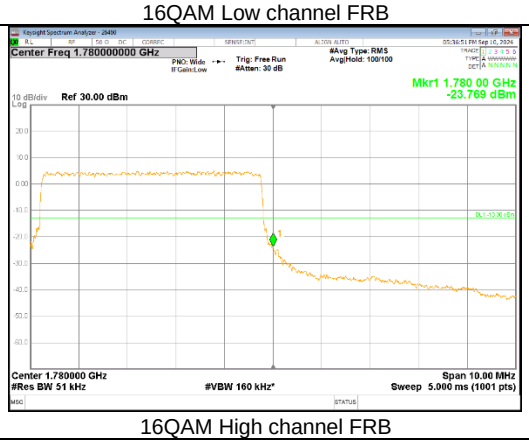
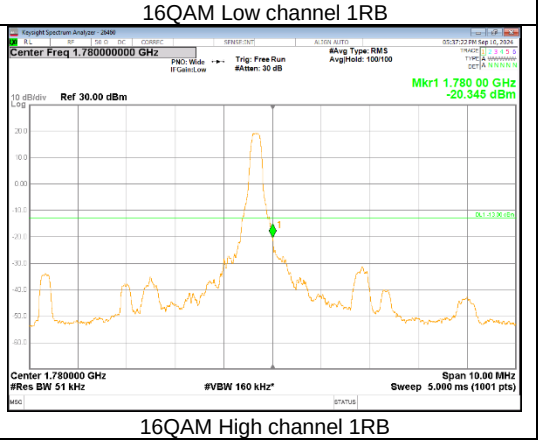
16QAM Upper Emission 1RB (6.8kHz)

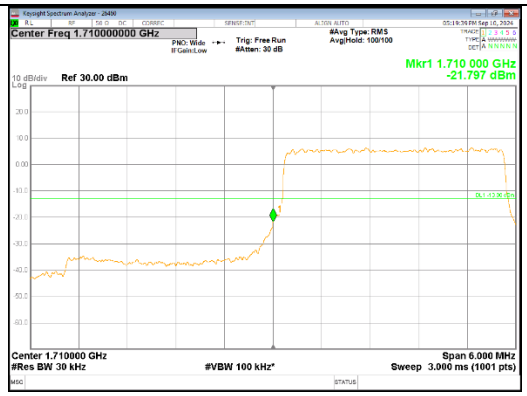
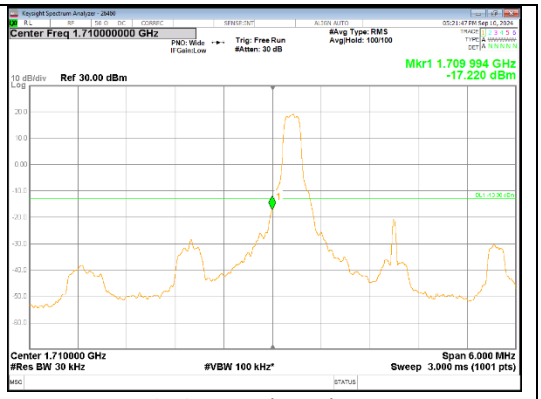
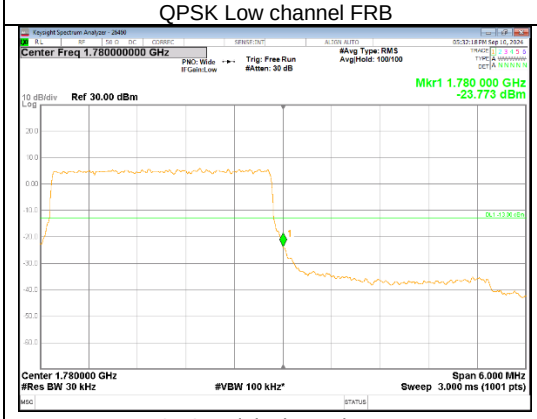
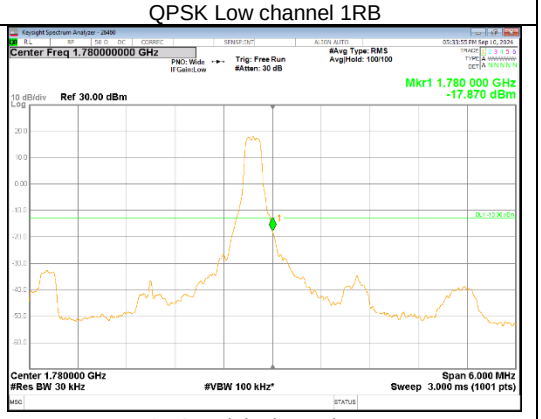
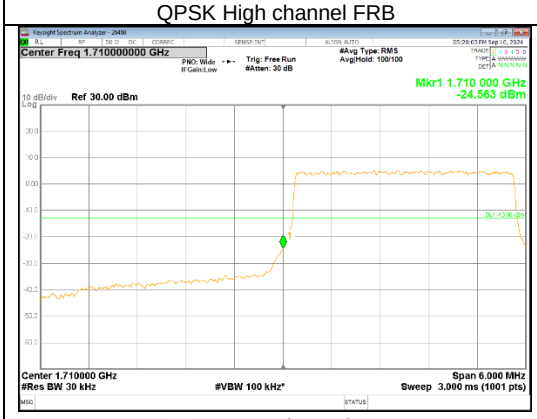
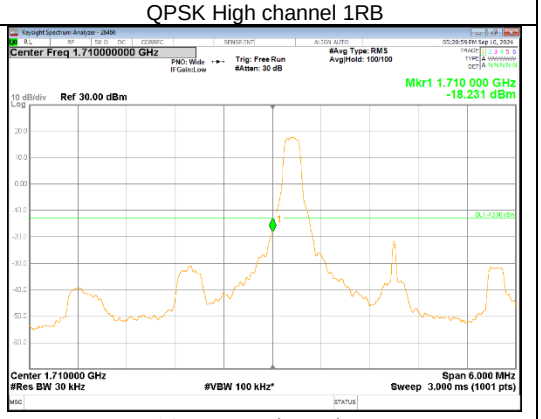
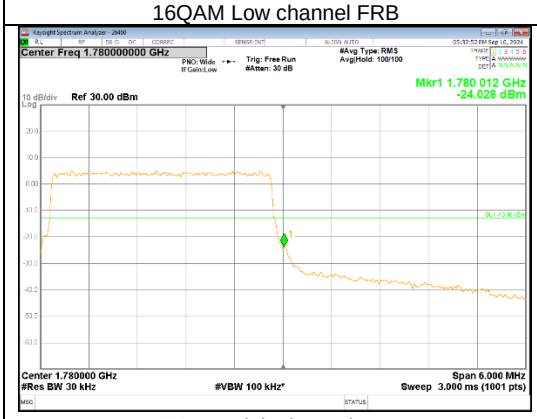
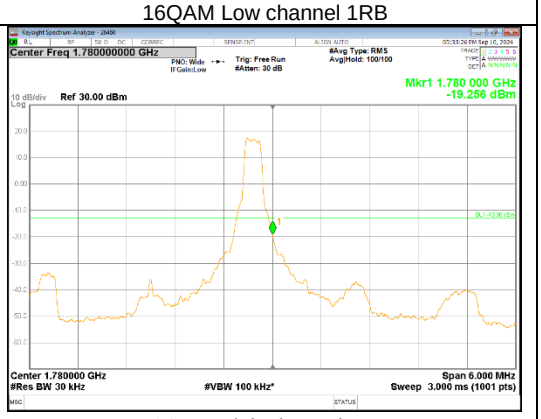
LTE Band 66 (ANT B)

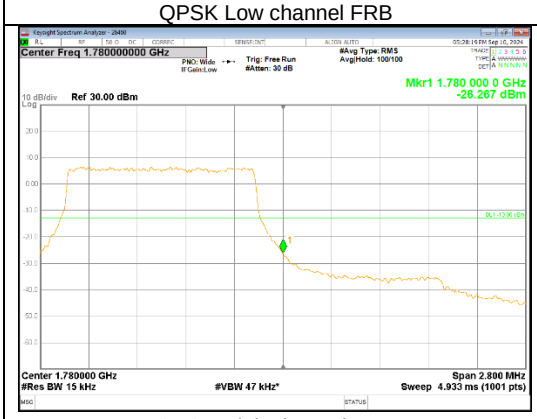
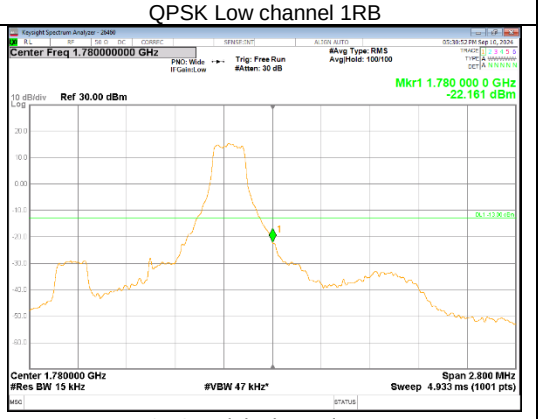
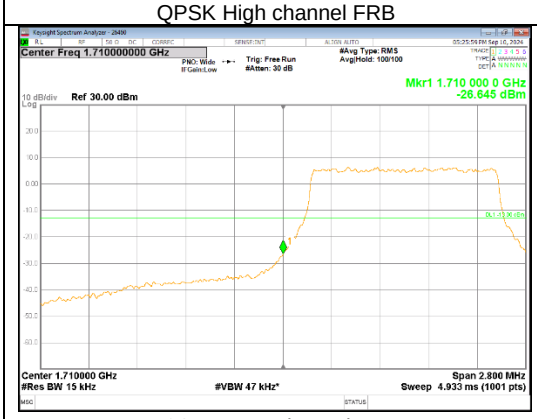
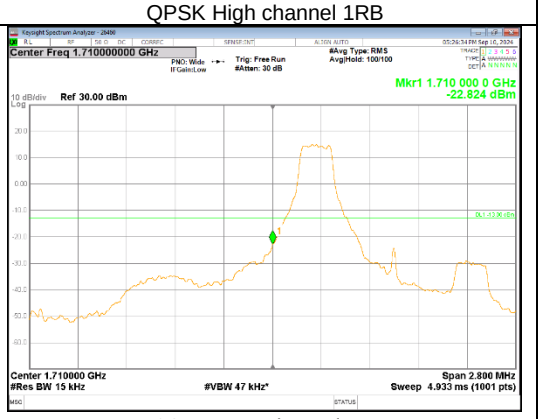
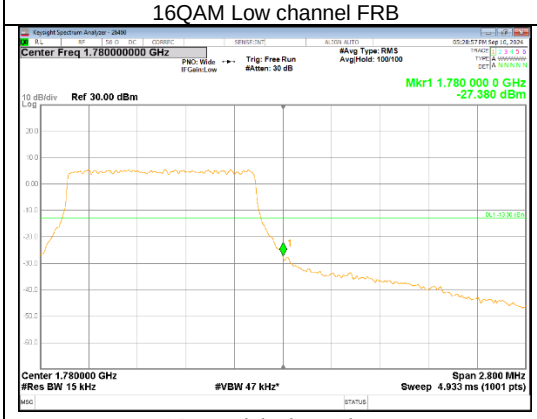
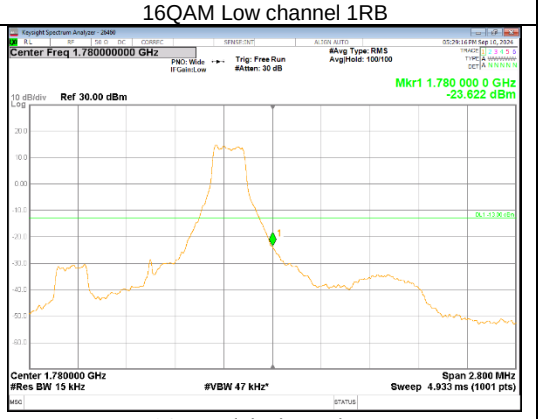
20MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB

15MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB

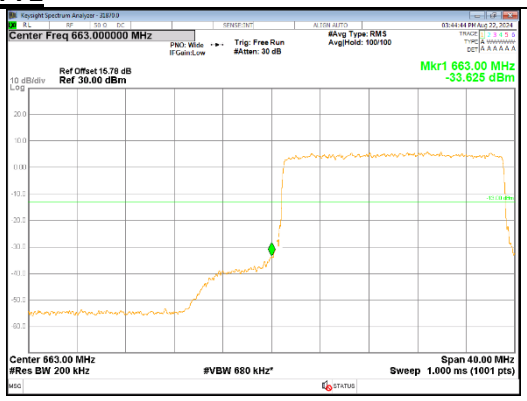
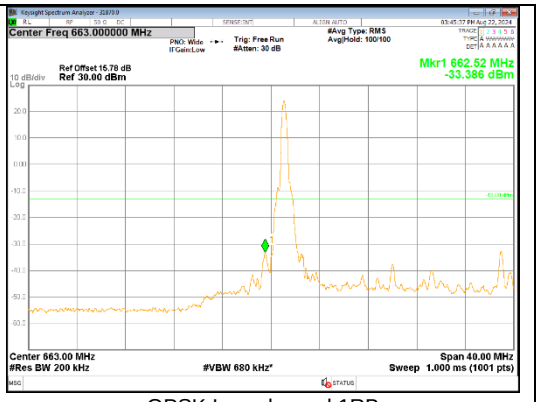
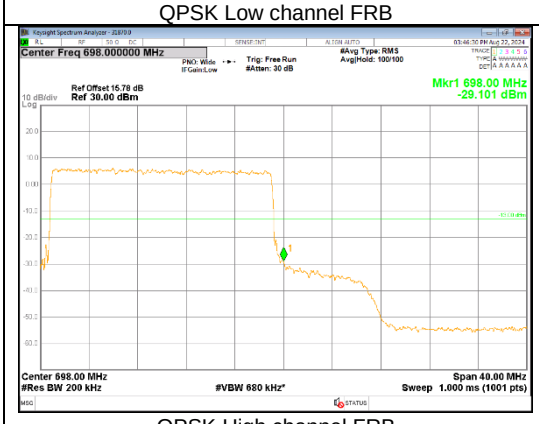
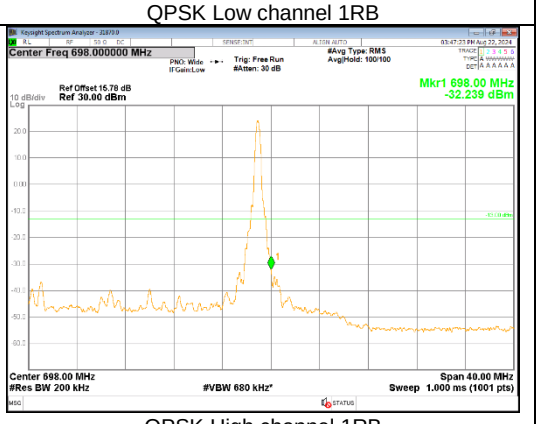
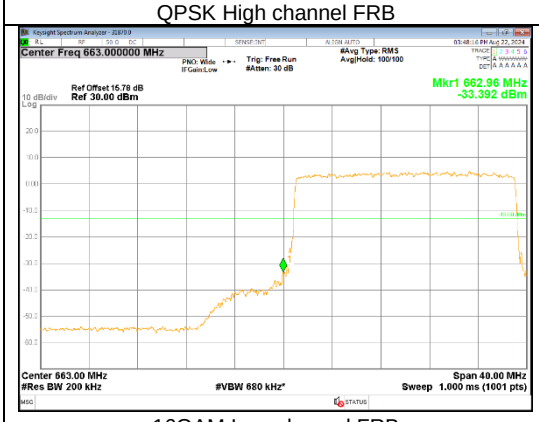
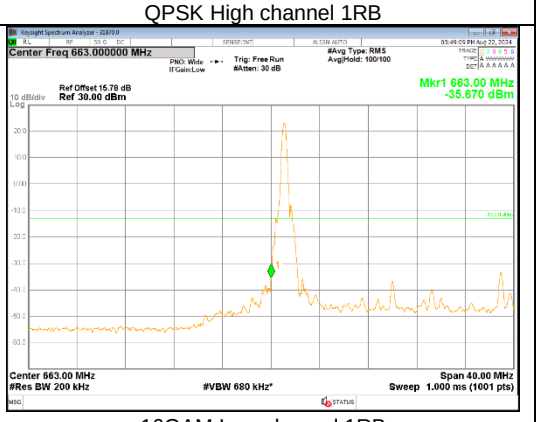
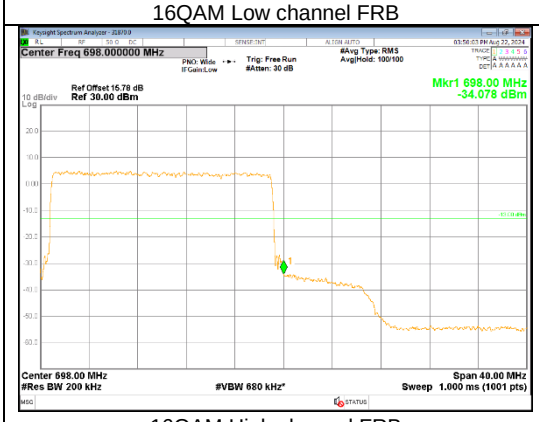
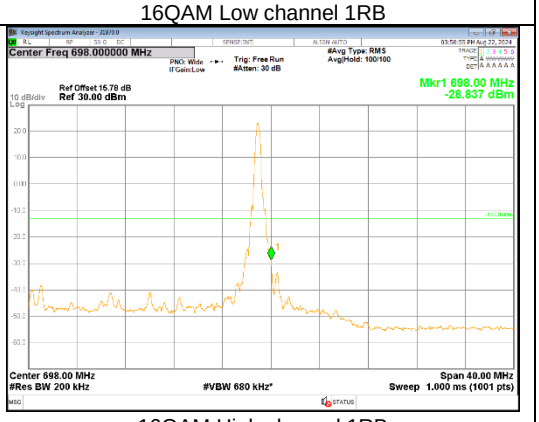
10MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB

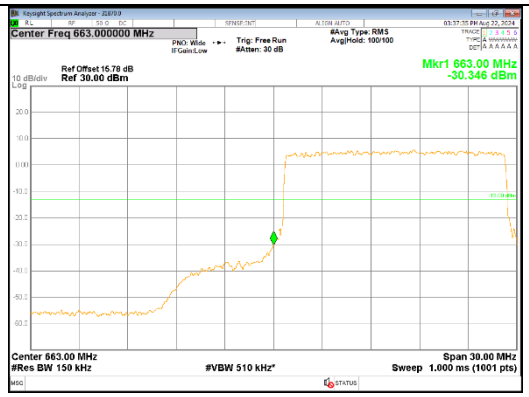
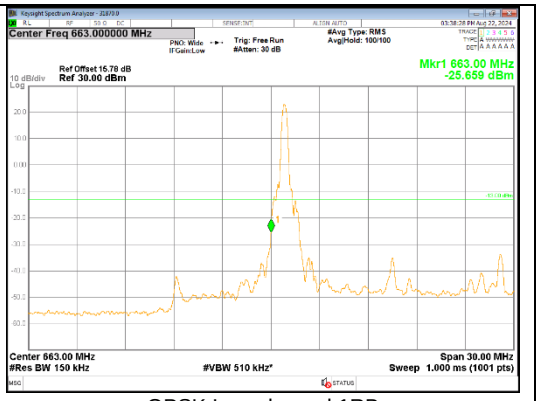
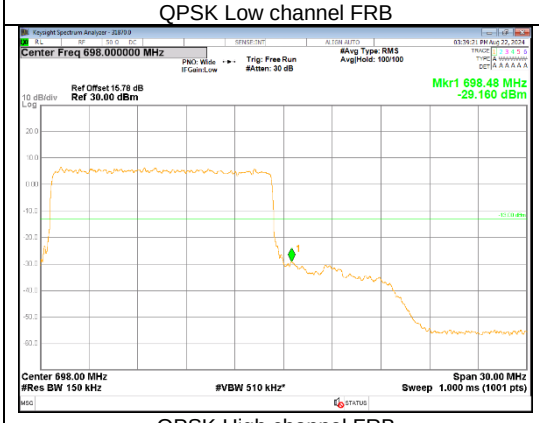
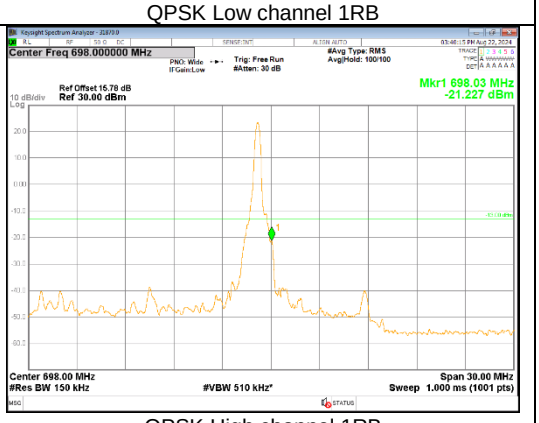
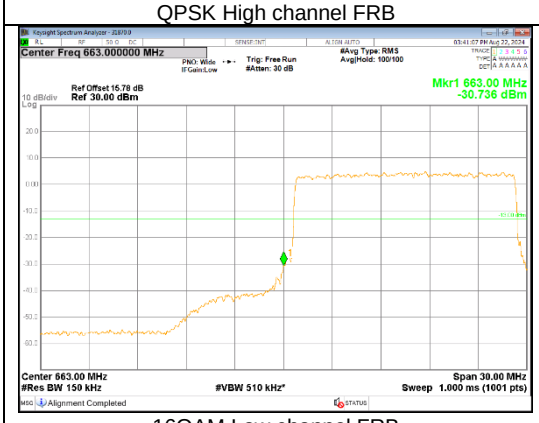
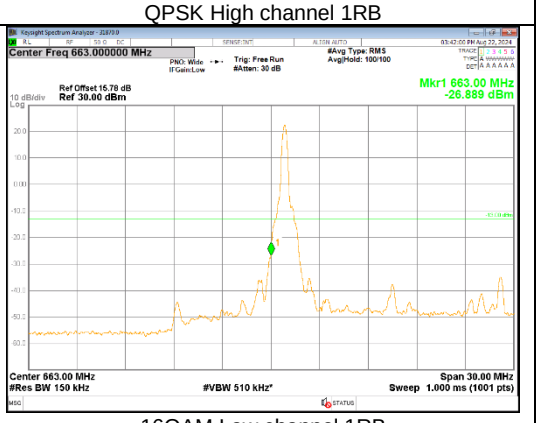
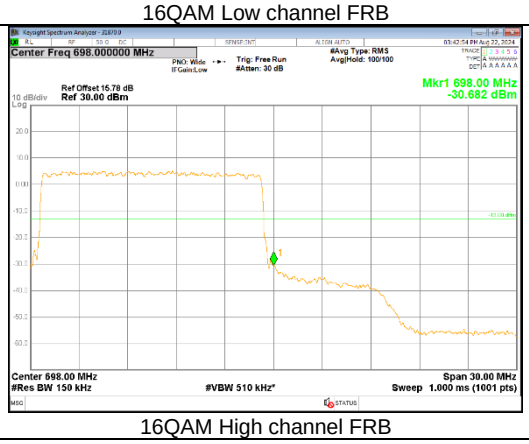
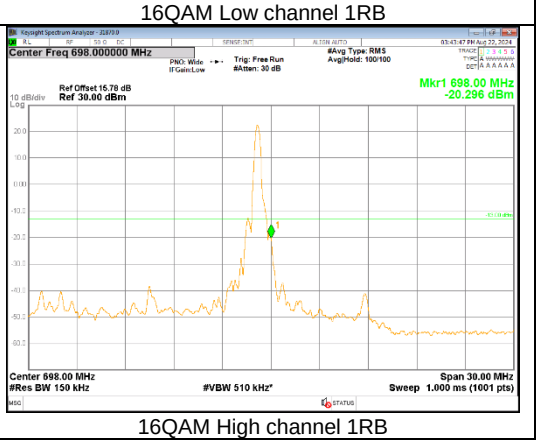
5MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB

3MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB

1.4MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB

LTE Band 71

20MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB

15MHz	 QPSK Low channel FRB	 QPSK Low channel 1RB
	 QPSK High channel FRB	 QPSK High channel 1RB
	 16QAM Low channel FRB	 16QAM Low channel 1RB
	 16QAM High channel FRB	 16QAM High channel 1RB