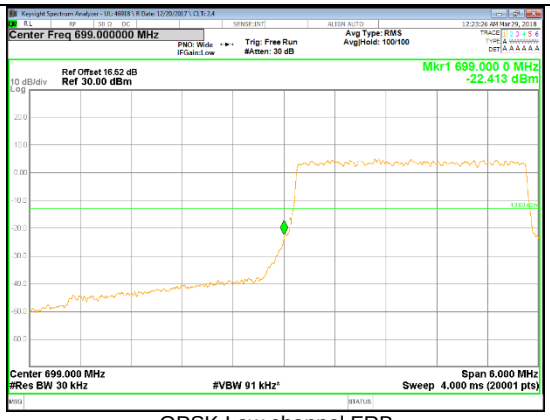
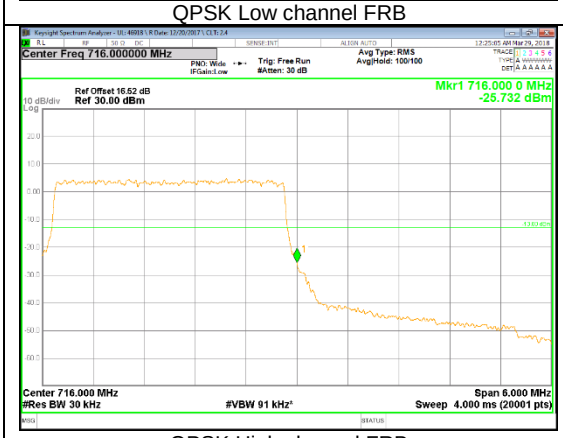
Band 12

3MHz

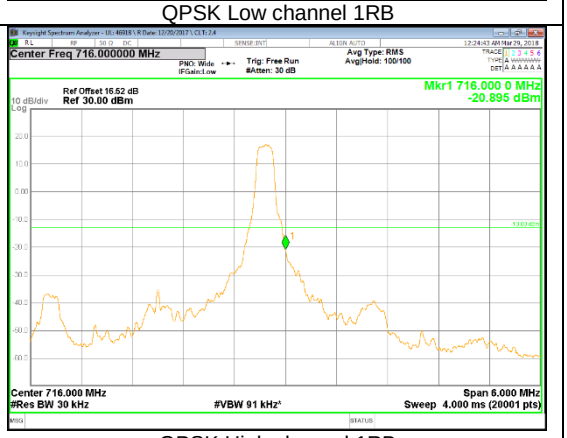


QPSK Low channel FRB

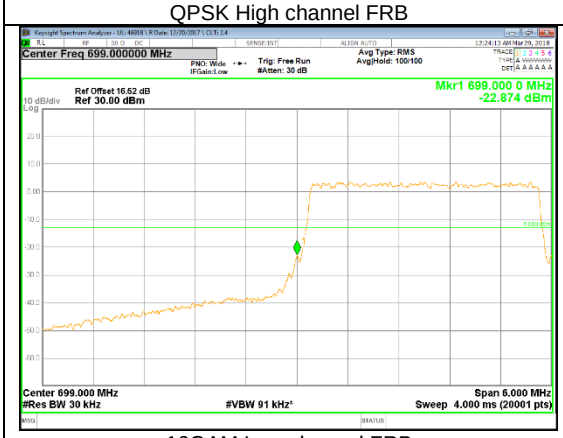
QPSK Low channel 1RB



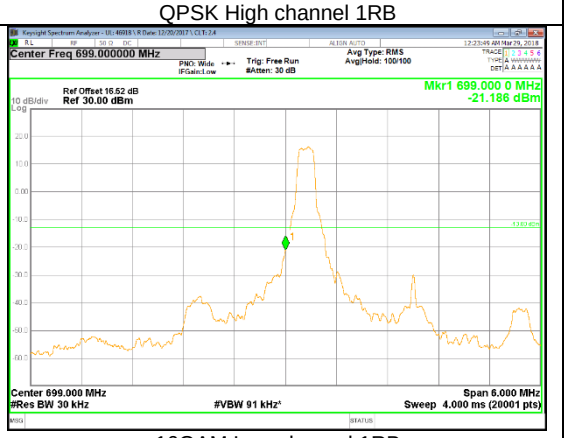
QPSK High channel FRB



QPSK High channel 1RB



16QAM Low channel FRB



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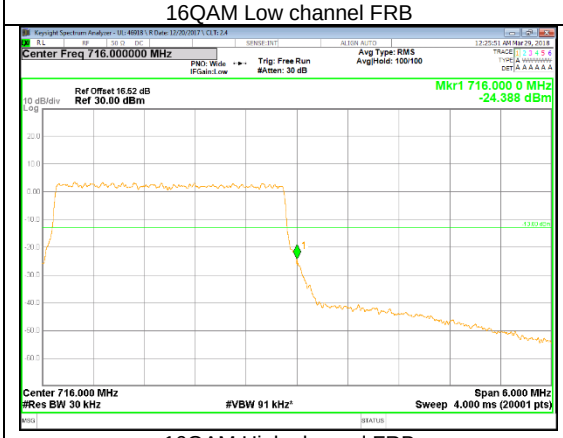
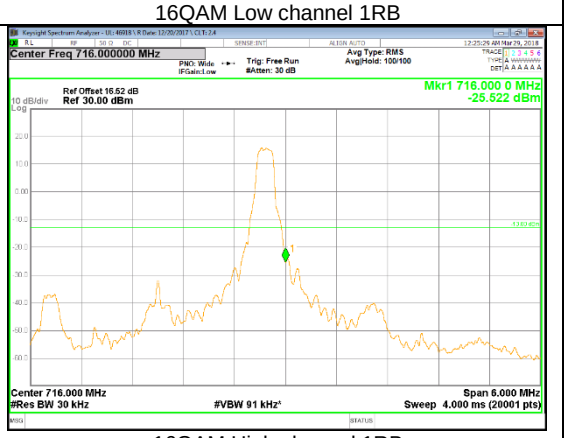


16QAM High channel FRB



16QAM High channel 1RB

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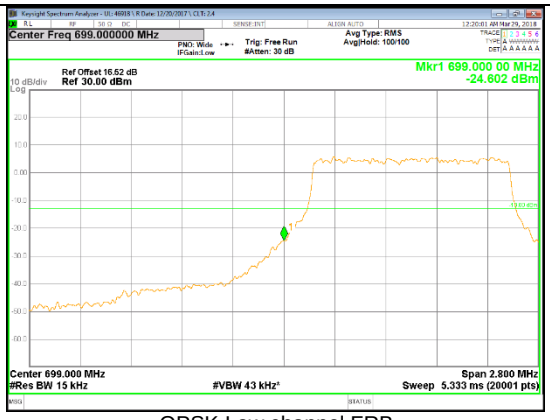
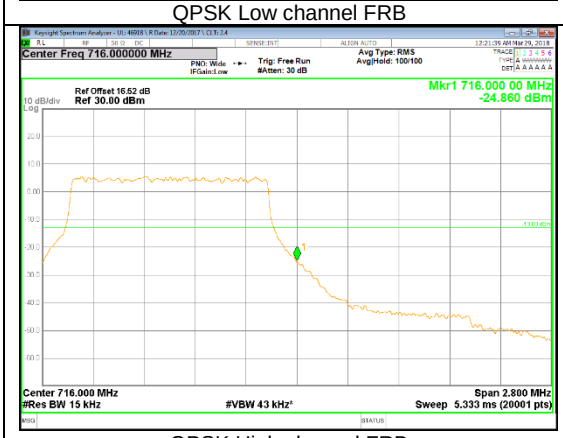
Band 12

1.4MHz

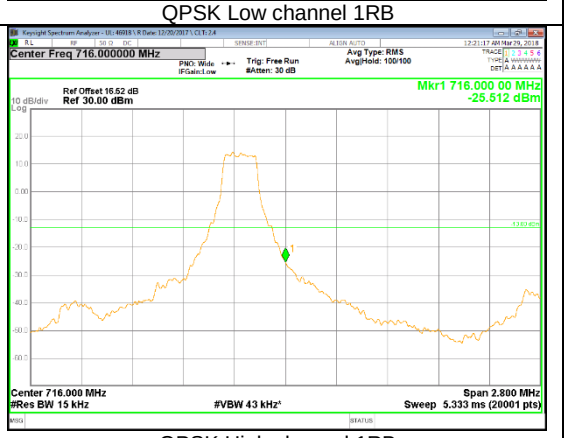


QPSK Low channel FRB

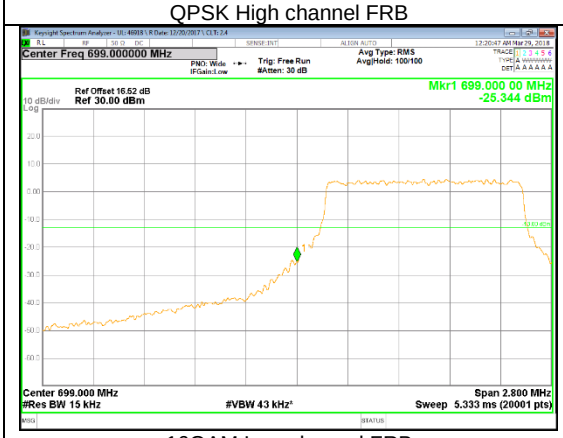
QPSK Low channel 1RB



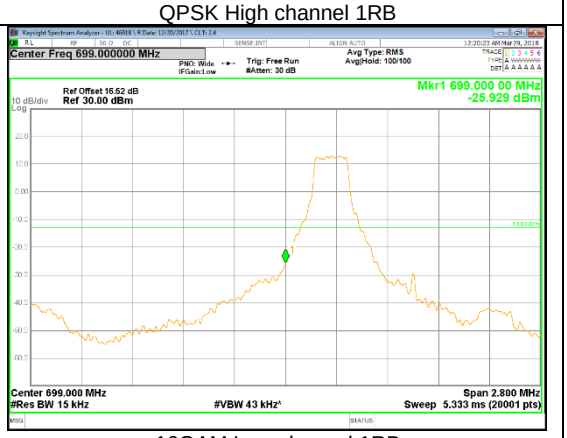
QPSK High channel FRB



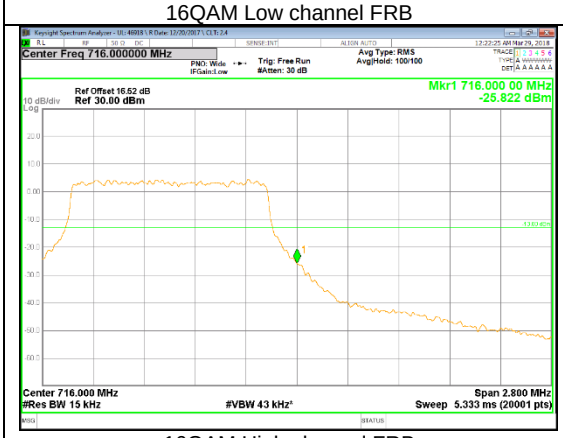
QPSK High channel 1RB



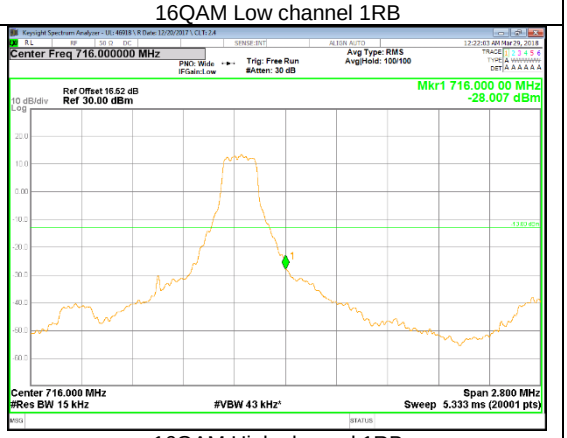
16QAM Low channel FRB



16QAM Low channel 1RB



16QAM High channel FRB



16QAM High channel 1RB

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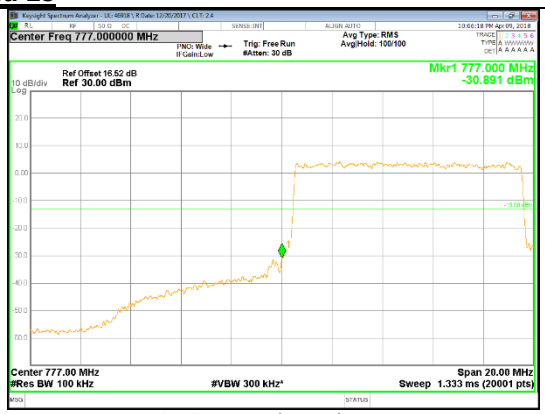
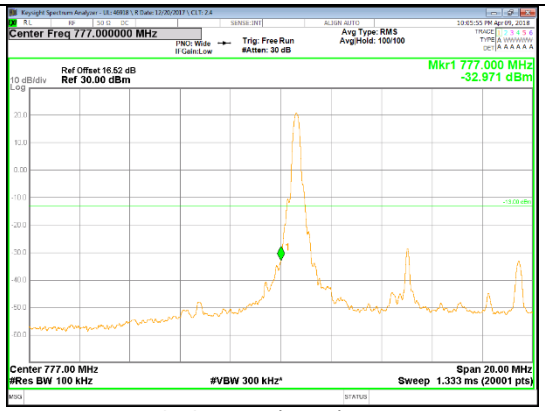
LTE Band 13

Band 13

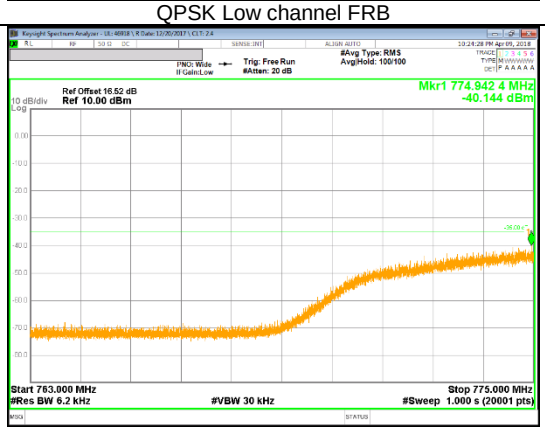
10MHz



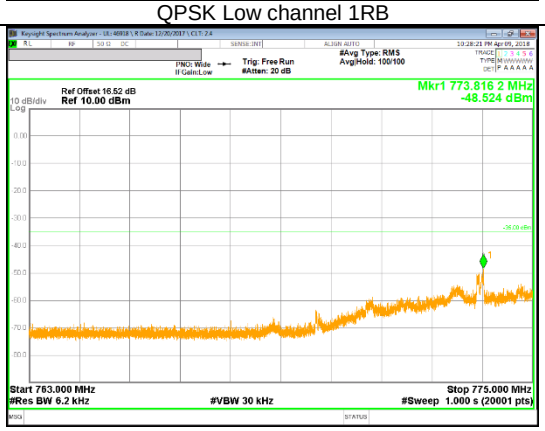
QPSK Low channel FRB



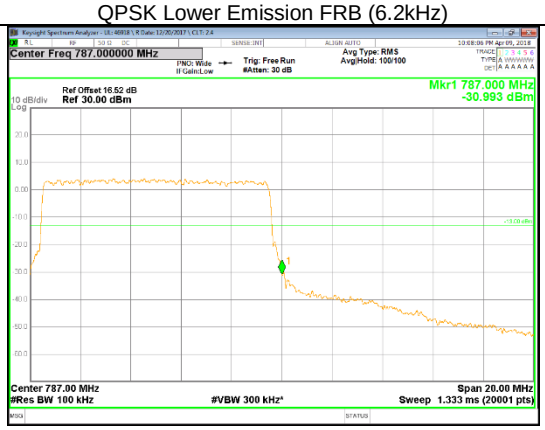
QPSK Low channel 1RB



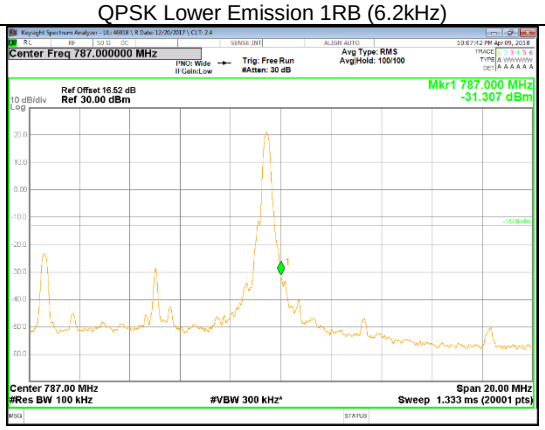
QPSK Lower Emission FRB (6.2kHz)



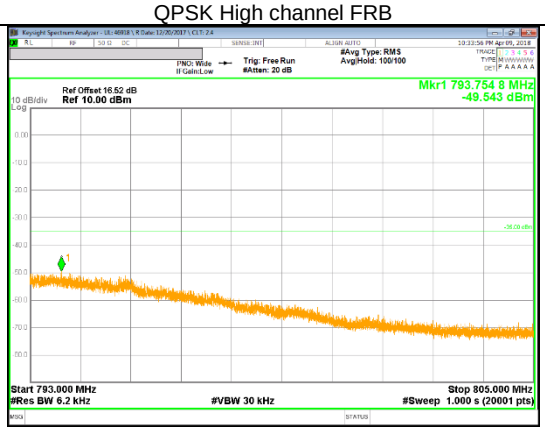
QPSK Lower Emission 1RB (6.2kHz)



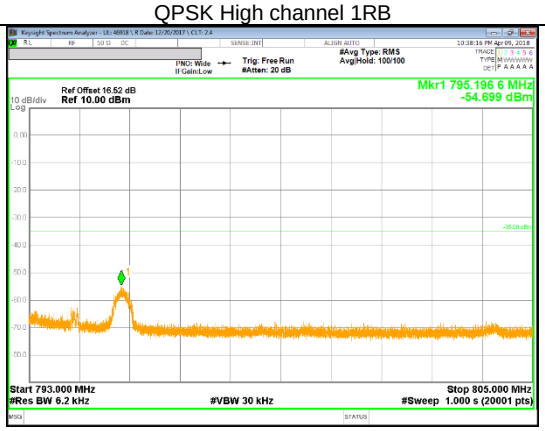
QPSK High channel FRB



QPSK High channel 1RB



QPSK Upper Emission FRB (6.2kHz)



QPSK Upper Emission 1RB (6.2kHz)

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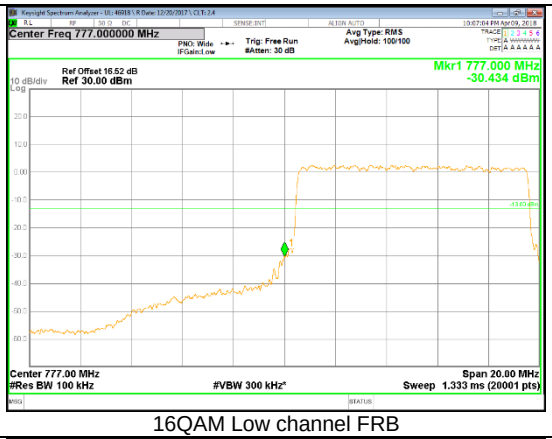
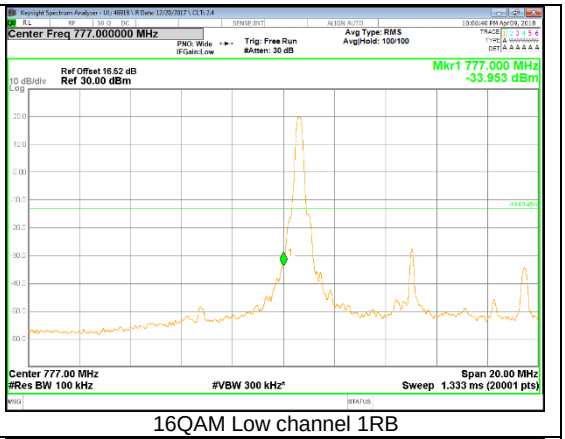
Band 13

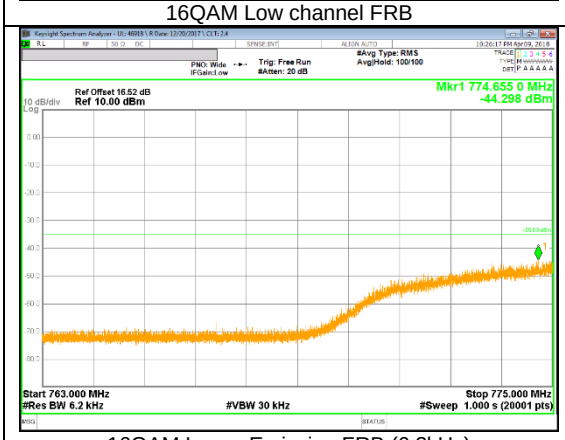
10MHz



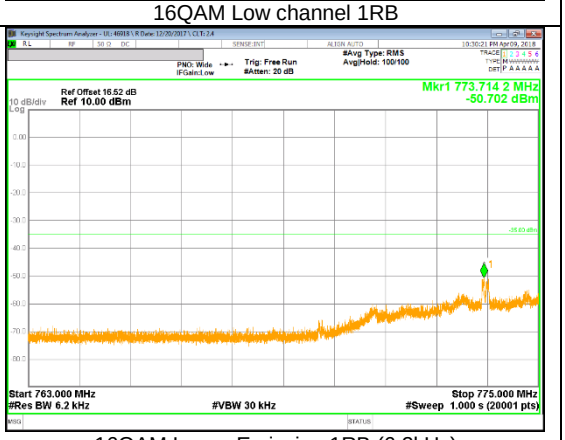
16QAM Low channel FRB



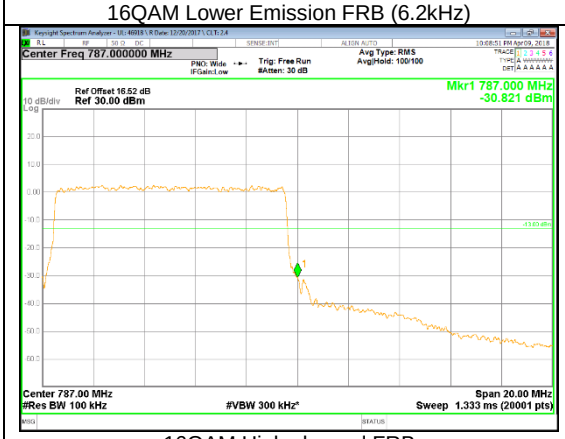
16QAM Low channel 1RB



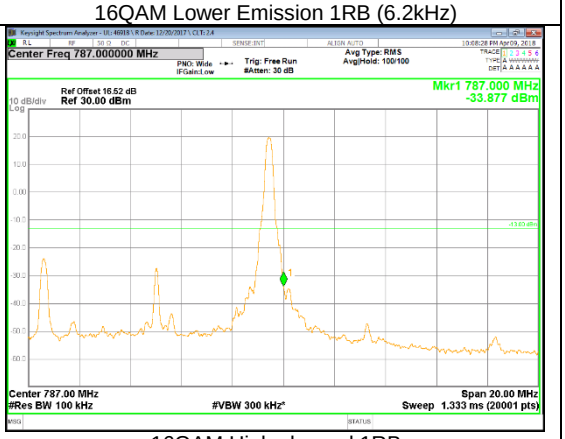
16QAM Lower Emission FRB (6.2kHz)



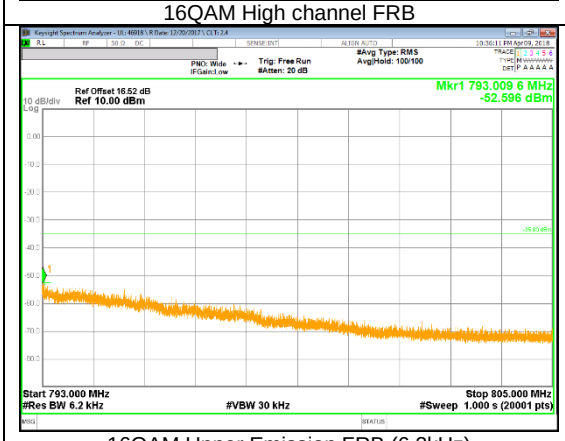
16QAM Lower Emission 1RB (6.2kHz)



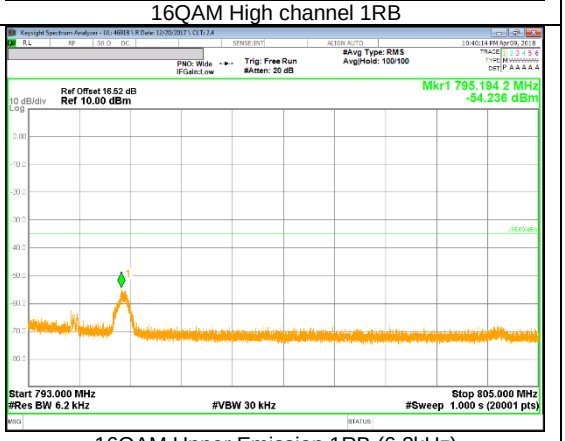
16QAM High channel FRB



16QAM High channel 1RB



16QAM Upper Emission FRB (6.2kHz)



16QAM Upper Emission 1RB (6.2kHz)

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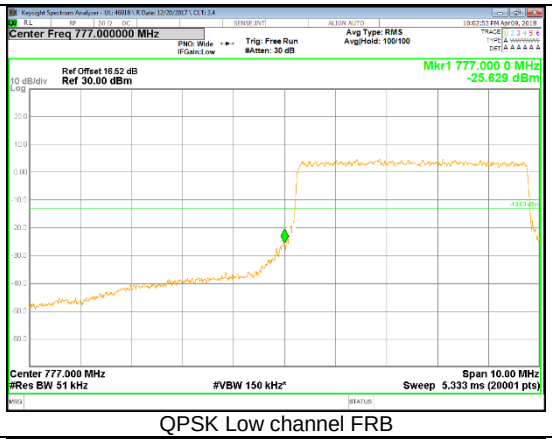
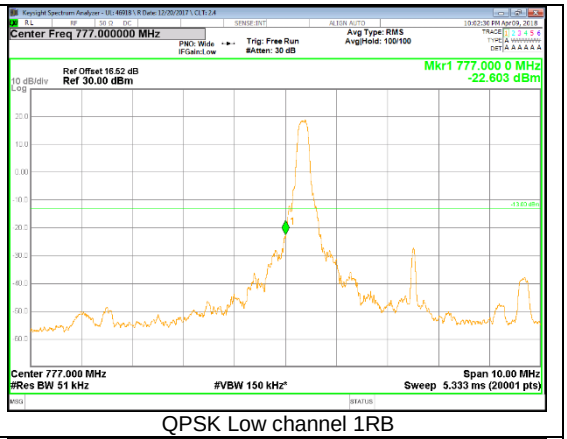
Band 13

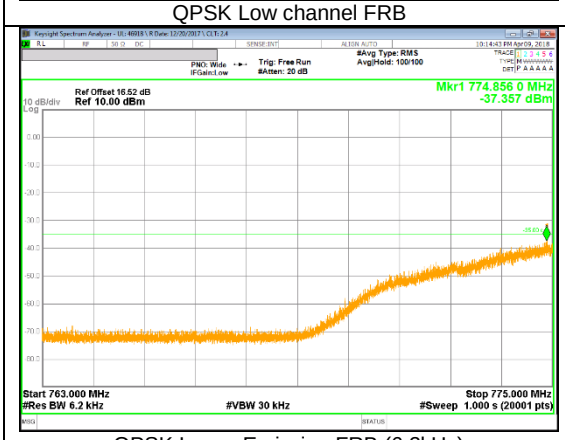
5MHz



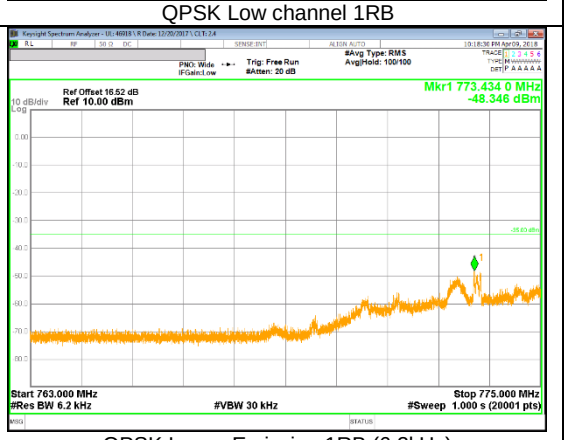
QPSK Low channel FRB



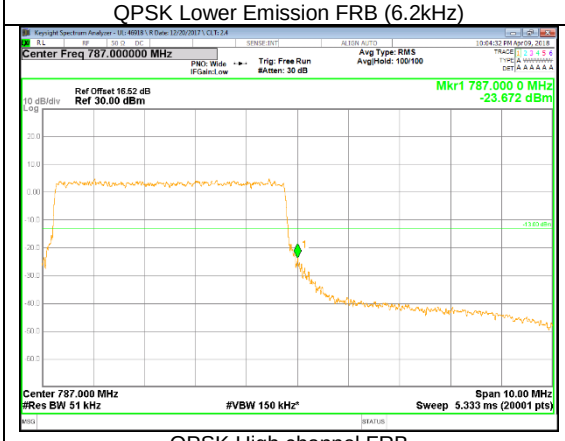
QPSK Low channel 1RB



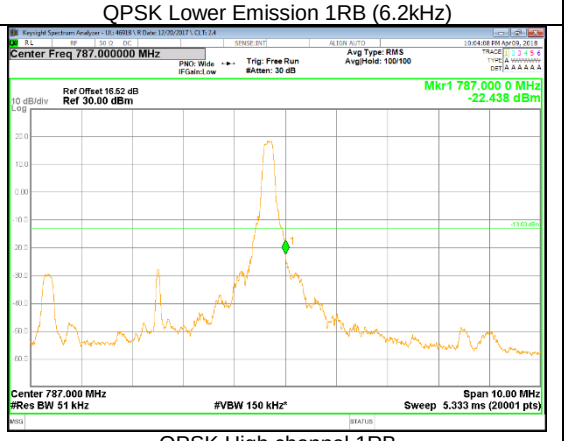
QPSK Lower Emission FRB (6.2kHz)



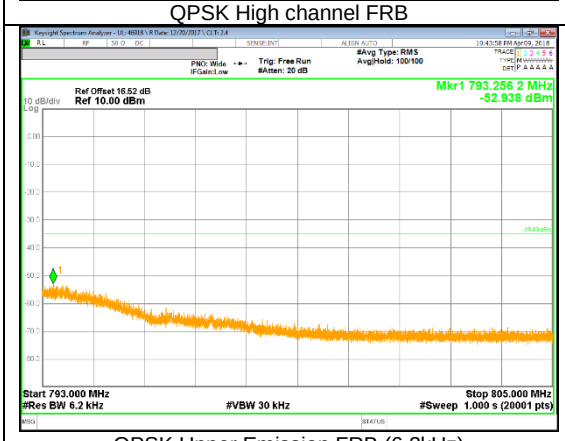
QPSK Lower Emission 1RB (6.2kHz)



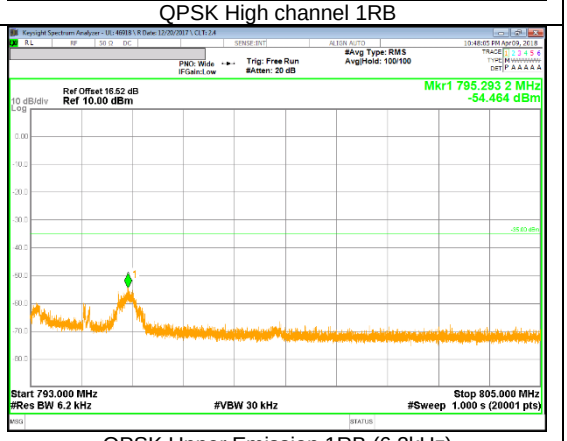
QPSK High channel FRB



QPSK High channel 1RB



QPSK Upper Emission FRB (6.2kHz)



QPSK Upper Emission 1RB (6.2kHz)

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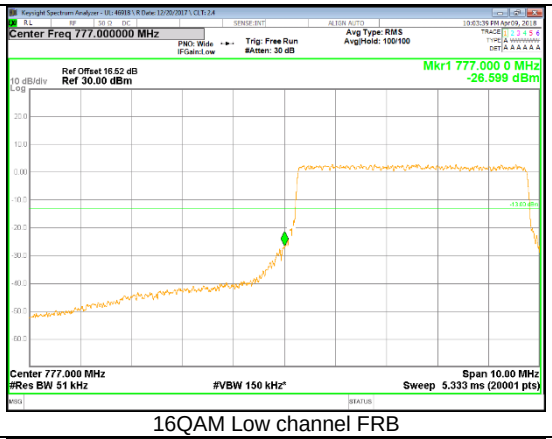
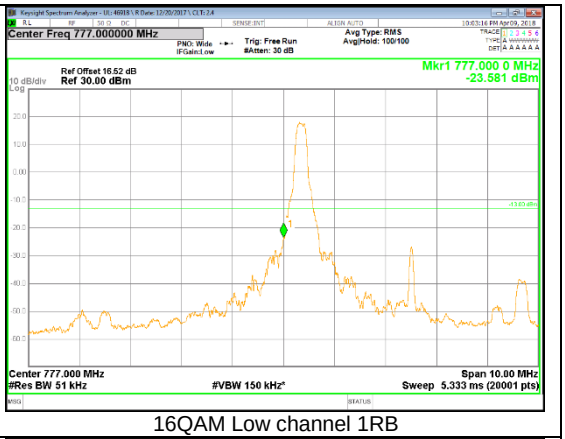
Band 13

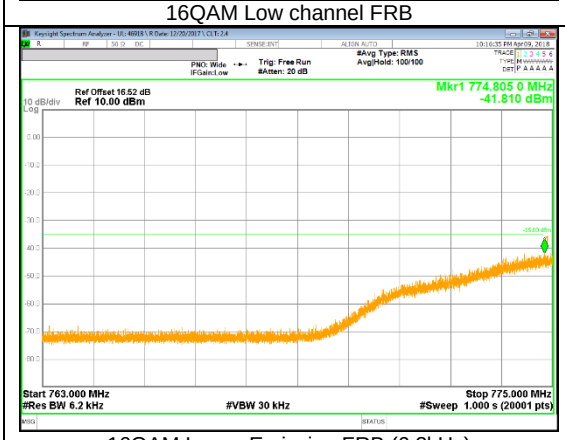
5MHz



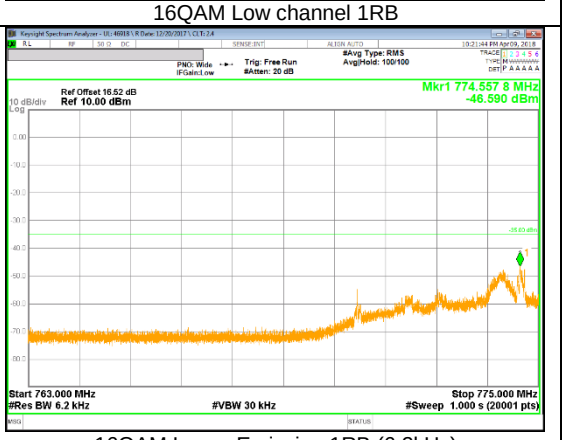
16QAM Low channel FRB



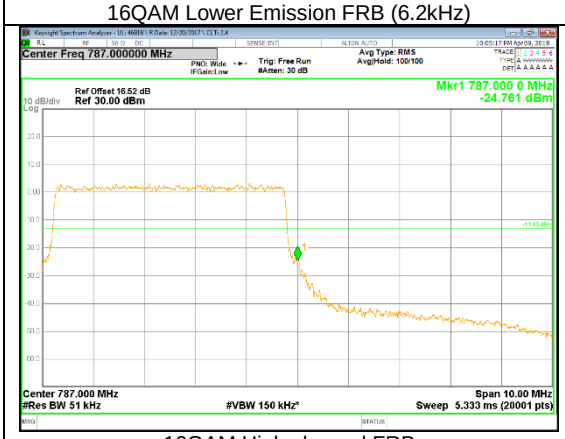
16QAM Low channel 1RB



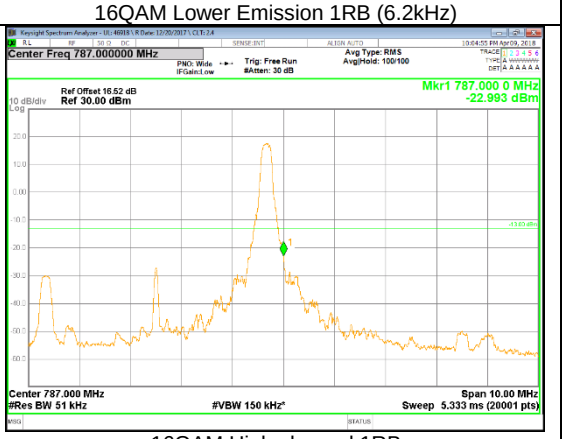
16QAM Lower Emission FRB (6.2kHz)



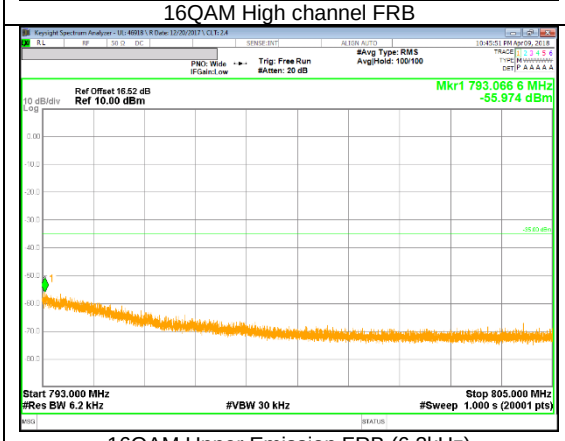
16QAM Lower Emission 1RB (6.2kHz)



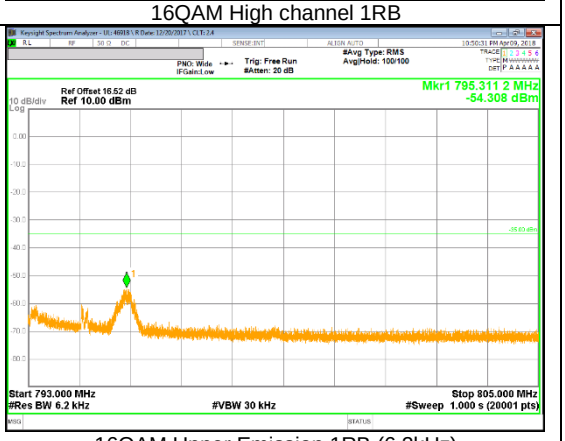
16QAM High channel FRB



16QAM High channel 1RB



16QAM Upper Emission FRB (6.2kHz)



16QAM Upper Emission 1RB (6.2kHz)

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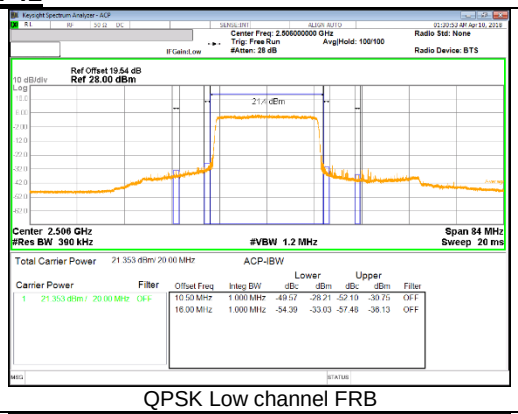
9.2.1. EMISSION MASK PLOTS

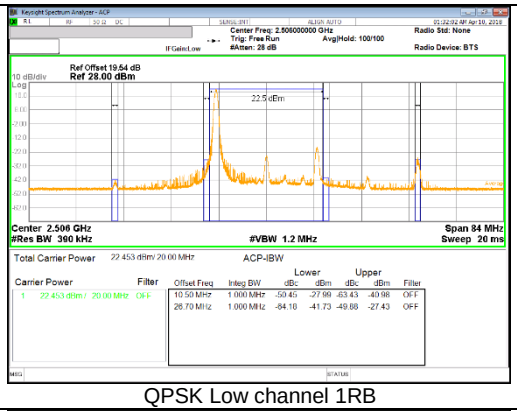
LTE Band 41

Band 41

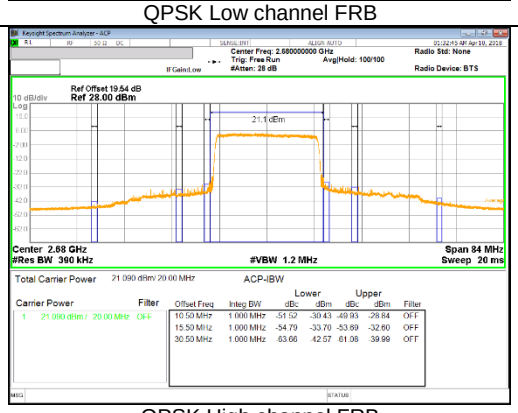
20MHz



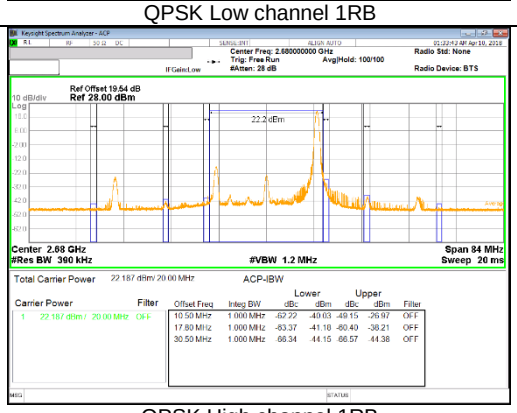
QPSK Low channel FRB



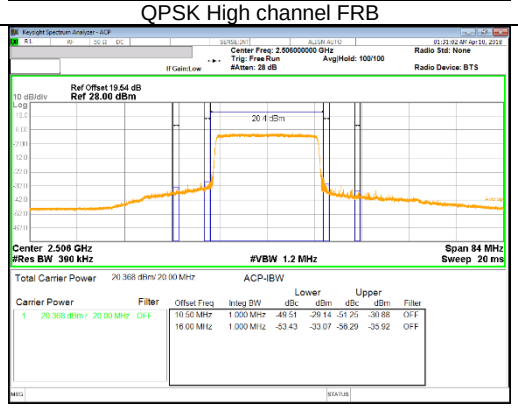
QPSK Low channel 1RB



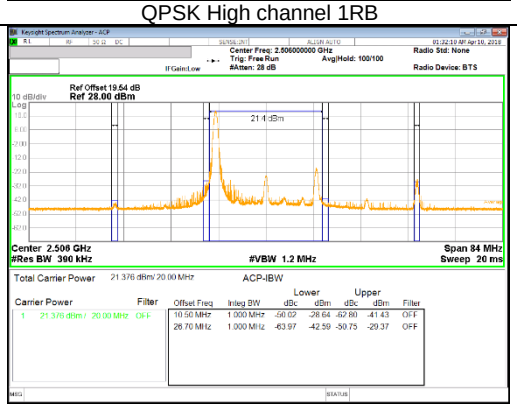
QPSK High channel FRB



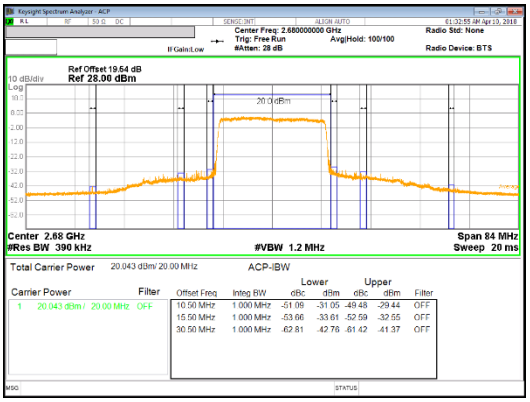
QPSK High channel 1RB



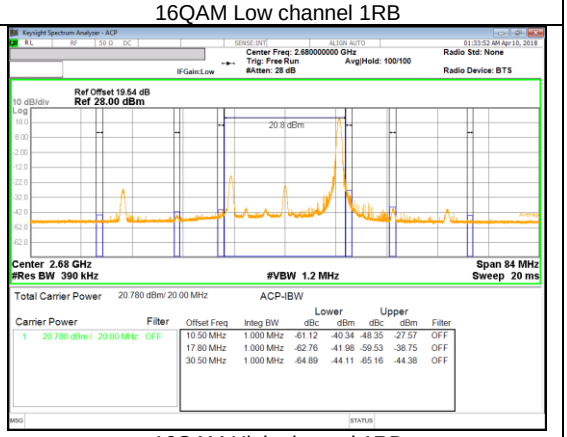
16QAM Low channel FRB



16QAM Low channel 1RB



16QAM High channel FRB



16QAM High channel 1RB

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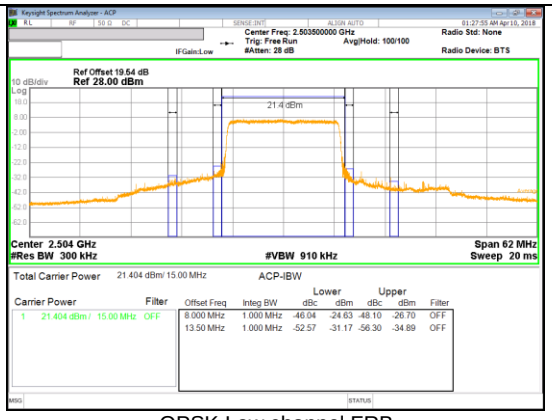
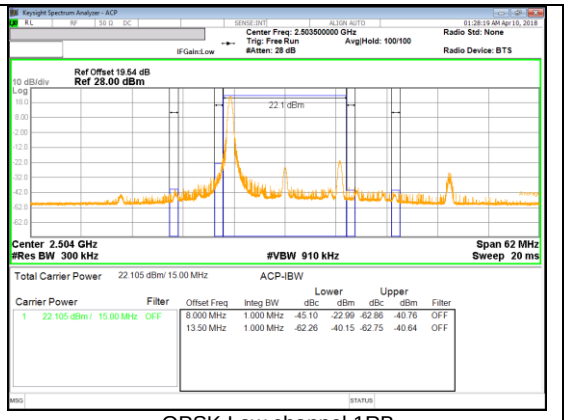
Band 41

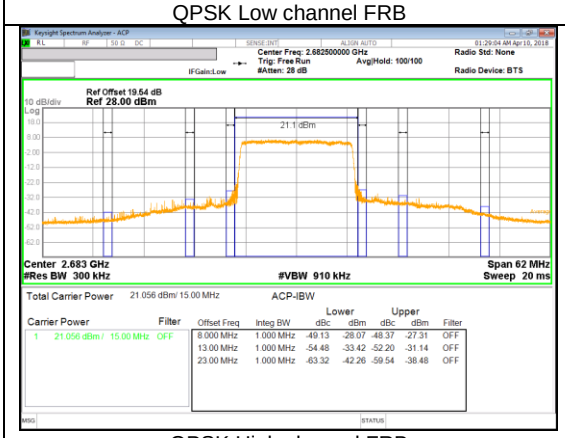
15MHz



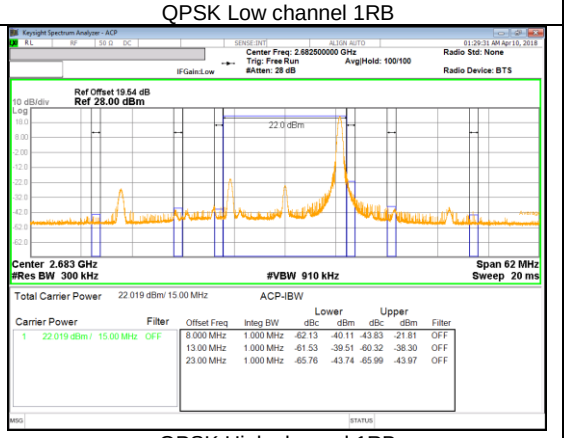
QPSK Low channel FRB



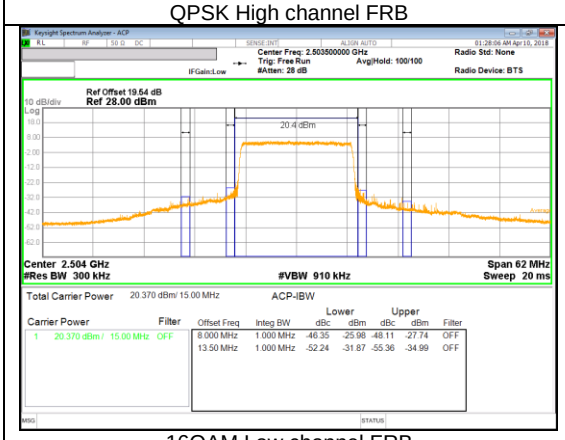
QPSK Low channel 1RB



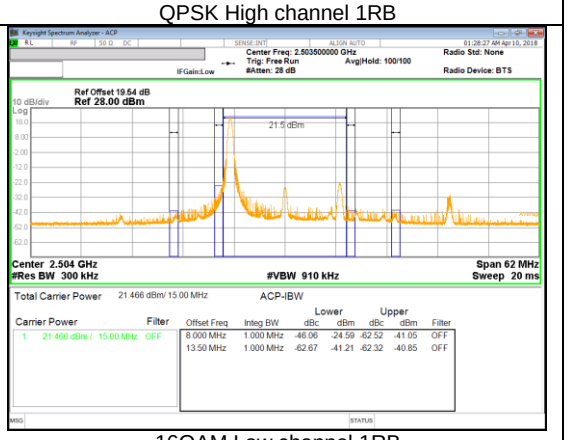
QPSK High channel FRB



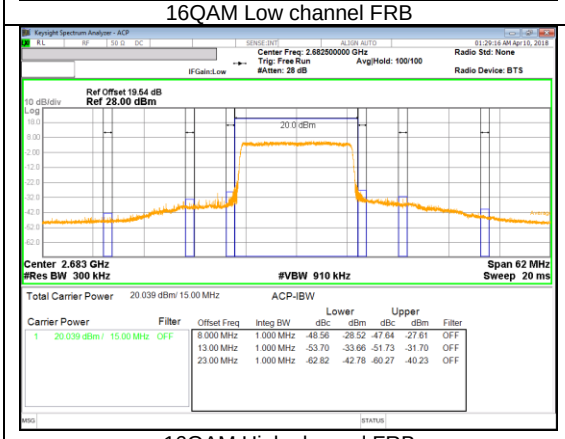
QPSK High channel 1RB



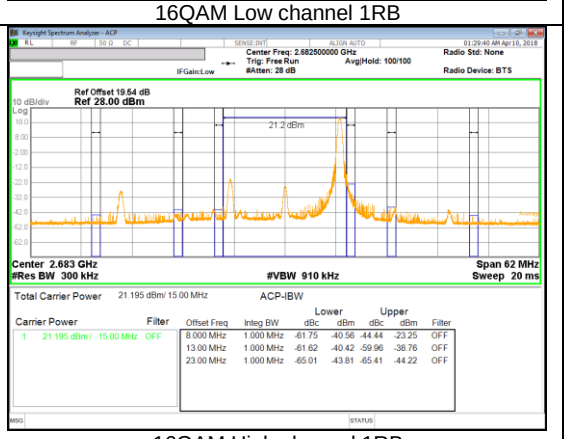
16QAM Low channel FRB



16QAM Low channel 1RB



16QAM High channel FRB



16QAM High channel 1RB

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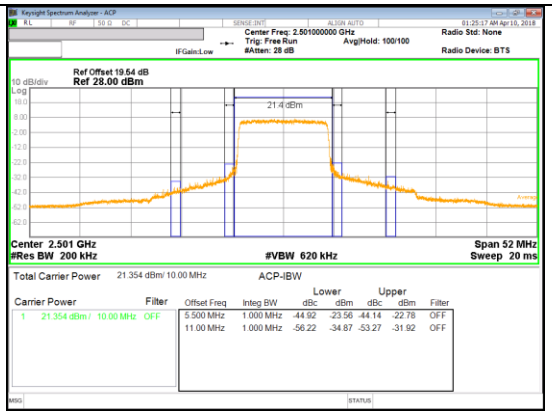
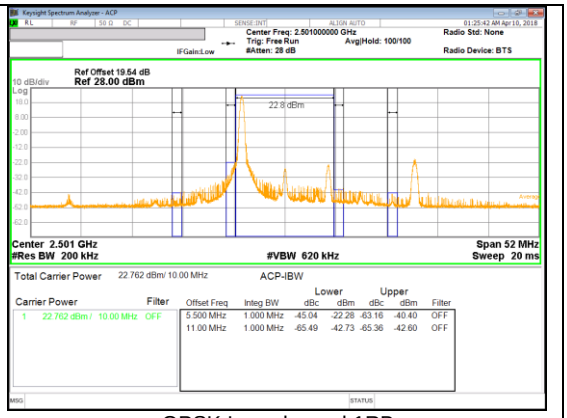
Band 41

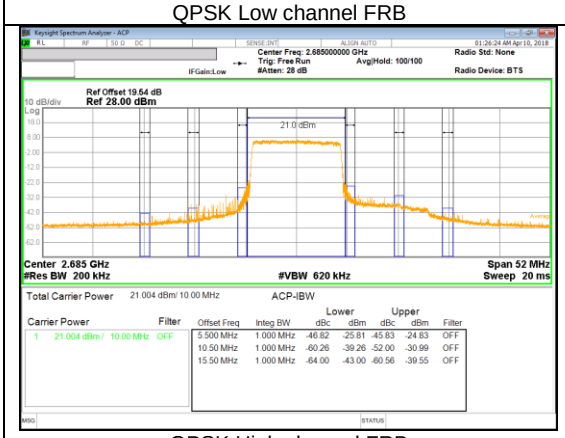
10MHz



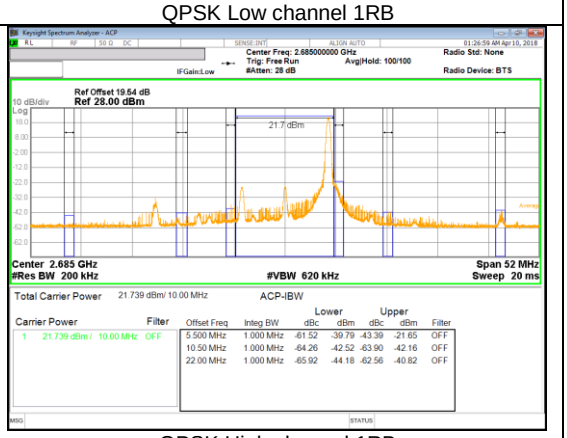
QPSK Low channel FRB



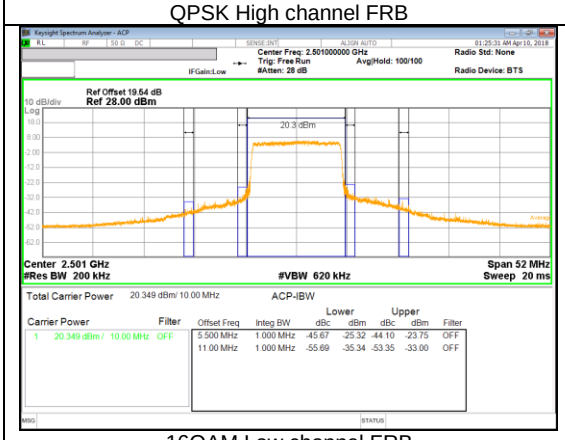
QPSK Low channel 1RB



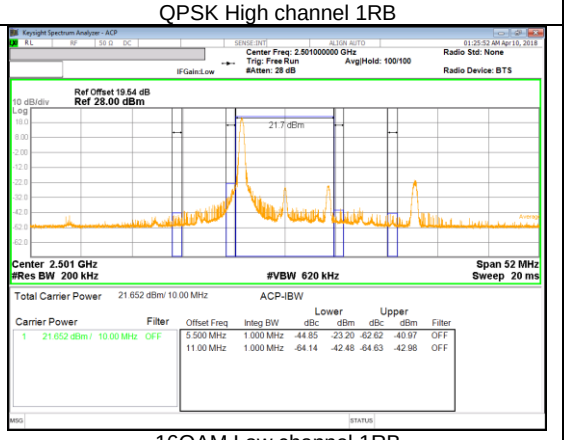
QPSK High channel FRB



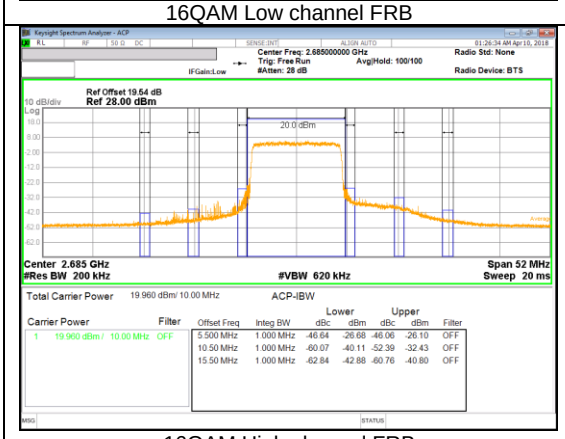
QPSK High channel 1RB



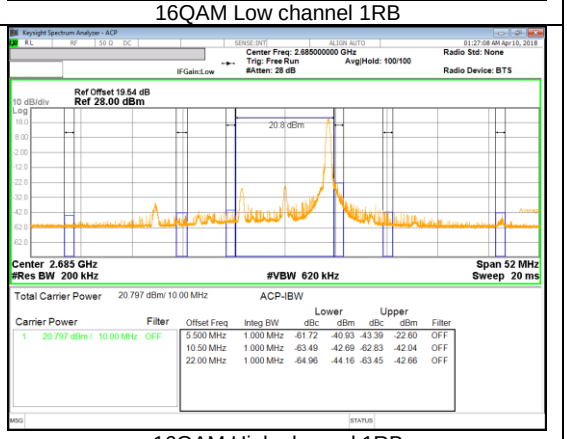
16QAM Low channel FRB



16QAM Low channel 1RB



16QAM High channel FRB



16QAM High channel 1RB

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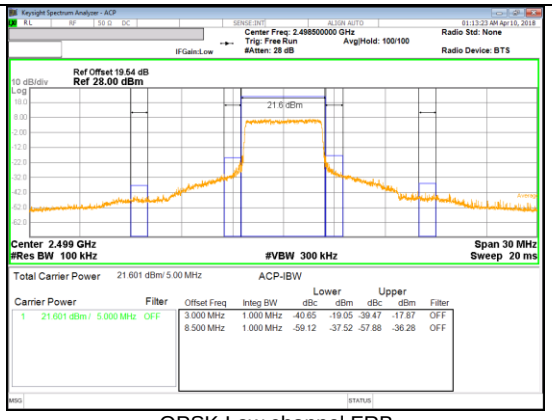
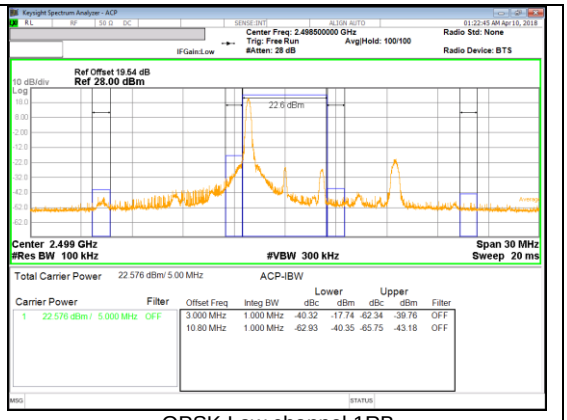
Band 41

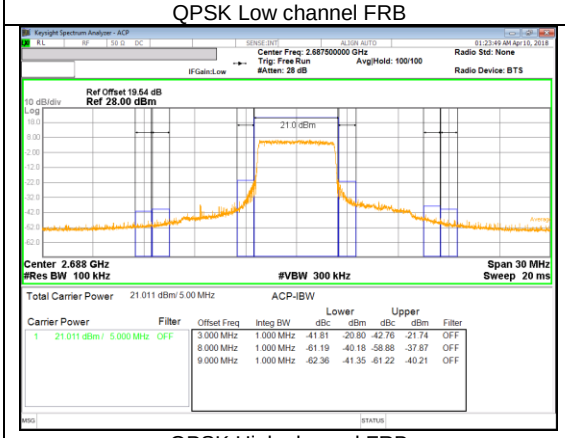
5MHz



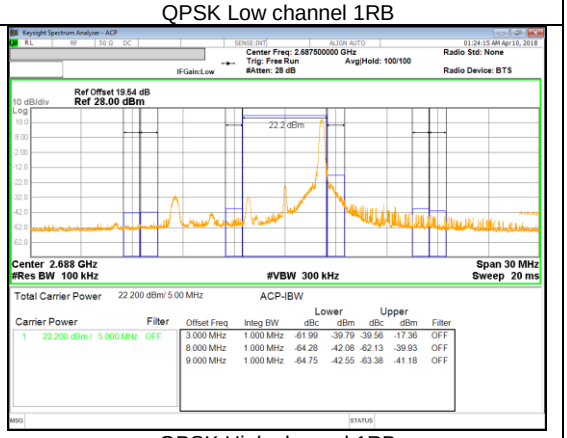
QPSK Low channel FRB



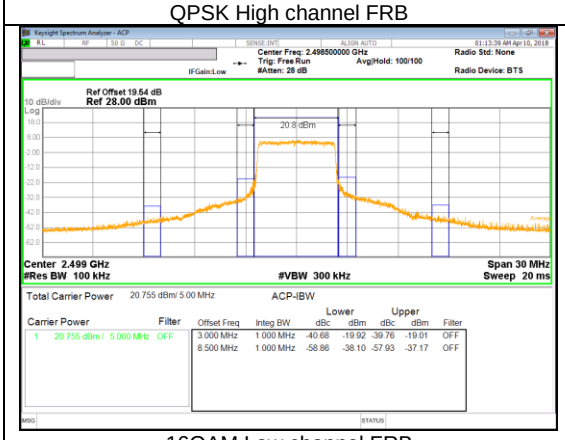
QPSK Low channel 1RB



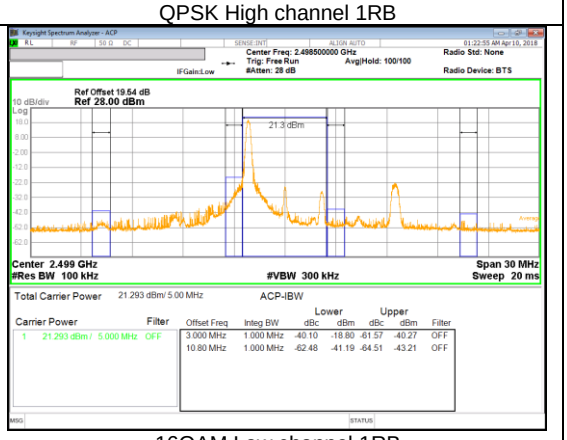
QPSK High channel FRB



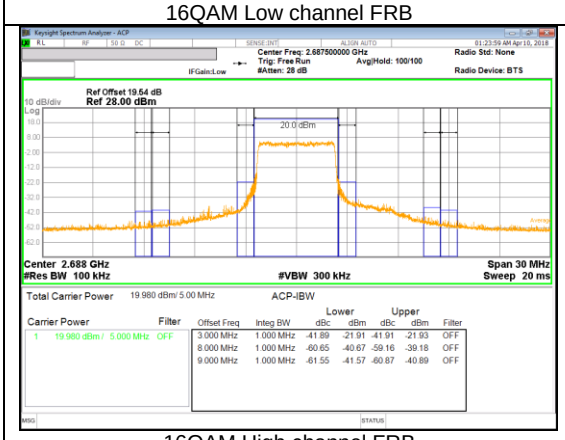
QPSK High channel 1RB



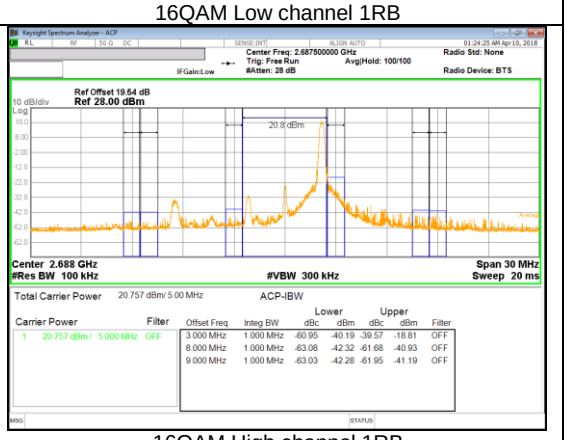
16QAM Low channel FRB



16QAM Low channel 1RB



16QAM High channel FRB



16QAM High channel 1RB

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9.3. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §22.901, §22.917, §24.238 and §27. 53

LIMITS

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.

Part 27: (m)(4) For mobile station, the attenuation factor shall be not less than 43 + 10 log (P) dB at the channel edge and (55 + 10 log (P)dB) at the 5.5 MHz from the channel edges.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03
The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

a) Set the RBW = 100KHz for emission below 1GHz and 1MHz for emissions above 1GHz (Tests were performed 1MHz [Worst case], to sweep 1 time for all frequency range)

b) Set VBW ≥ 3 × RBW;

c) Set span ≥ 1.5 times the OBW;

d) Sweep time = auto couple;

e) Detector = peak;

f) Ensure that the number of measurement points = Max (40001);

g) Trace mode = max hold;

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RESULTS

GSM

Band	Mode	f [MHz]	Spurious [dBm]	Limit [dBm]
GSM850	GPRS	824.2	-21.26	-13.00
		836.6	-22.37	
		848.8	-22.57	
	EGPRS	824.2	-22.56	
		836.6	-21.96	
		848.8	-22.19	
GSM1900	GPRS	1850.2	-22.05	
		1880.0	-21.36	
		1909.8	-22.10	
	EGPRS	1850.2	-22.52	
		1880.0	-21.06	
		1909.8	-21.91	

WCDMA

Band	Mode	f [MHz]	Spurious [dBm]	Limit [dBm]
Band 5	REL99	826.4	-32.15	-13.00
		836.6	-32.63	
		846.6	-32.57	
	HSDPA	826.4	-32.47	
		836.6	-33.14	
		846.6	-32.70	
Band 4	REL99	1712.4	-31.91	
		1732.6	-32.34	
		1752.6	-31.98	
	HSDPA	1712.4	-31.84	
		1732.6	-31.74	
		1752.6	-32.23	
Band 2	REL99	1852.4	-32.16	
		1880.0	-32.59	
		1907.6	-32.09	
	HSDPA	1852.4	-31.97	
		1880.0	-32.18	
		1907.6	-32.79	

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LTE 5

Bandwidth	Mode	f [MHz]	Spurious [dBm]	Limit [dBm]
10 MHz	QPSK	829.0	-30.00	-13.00
		836.5	-30.80	
		844.0	-31.29	
	16QAM	829.0	-31.38	
		836.5	-30.63	
		844.0	-31.20	
5 MHz	QPSK	826.5	-31.27	
		836.5	-30.80	
		846.5	-31.08	
	16QAM	826.5	-30.68	
		836.5	-30.06	
		846.5	-31.04	
3 MHz	QPSK	825.5	-31.35	
		836.5	-31.05	
		847.5	-31.41	
	16QAM	825.5	-31.23	
		836.5	-31.01	
		847.5	-30.76	
1.4 MHz	QPSK	824.7	-31.25	
		836.5	-31.22	
		848.3	-30.75	
	16QAM	824.7	-30.53	
		836.5	-31.07	
		848.3	-31.04	

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LTE 66

Bandwidth	Mode	f [MHz]	Spurious [dBm]	Limit [dBm]
20 MHz	QPSK	1720.0	-28.47	-13.00
		1745.0	-28.44	
		1770.0	-28.25	
	16QAM	1720.0	-28.46	
		1745.0	-29.04	
		1770.0	-28.74	
15 MHz	QPSK	1717.5	-28.70	
		1745.0	-28.18	
		1772.5	-28.46	
	16QAM	1717.5	-29.35	
		1745.0	-28.83	
		1772.5	-27.97	
10 MHz	QPSK	1715.0	-28.67	
		1745.0	-27.87	
		1775.0	-28.65	
	16QAM	1715.0	-29.11	
		1745.0	-28.93	
		1775.0	-28.20	
5 MHz	QPSK	1712.5	-28.24	
		1745.0	-28.21	
		1777.5	-28.04	
	16QAM	1712.5	-29.03	
		1745.0	-28.64	
		1777.5	-28.02	
3 MHz	QPSK	1711.5	-28.78	
		1745.0	-28.24	
		1778.5	-27.87	
	16QAM	1711.5	-28.47	
		1745.0	-29.08	
		1778.5	-28.88	
1.4 MHz	QPSK	1710.7	-28.55	
		1745.0	-28.90	
		1779.3	-28.11	
	16QAM	1710.7	-28.34	
		1745.0	-28.77	
		1779.3	-28.76	

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LTE 2

Bandwidth	Mode	f [MHz]	Spurious [dBm]	Limit [dBm]
20 MHz	QPSK	1860.0	-28.66	-13.00
		1880.0	-28.24	
		1900.0	-28.66	
	16QAM	1860.0	-28.58	
		1880.0	-28.98	
		1900.0	-28.78	
15 MHz	QPSK	1857.5	-29.36	
		1880.0	-27.38	
		1902.5	-28.58	
	16QAM	1857.5	-28.72	
		1880.0	-28.64	
		1902.5	-28.55	
10 MHz	QPSK	1855.0	-27.73	
		1880.0	-28.83	
		1905.0	-27.87	
	16QAM	1855.0	-29.02	
		1880.0	-28.40	
		1905.0	-28.80	
5 MHz	QPSK	1852.5	-29.27	
		1880.0	-29.02	
		1907.5	-28.74	
	16QAM	1852.5	-28.78	
		1880.0	-28.55	
		1907.5	-29.16	
3 MHz	QPSK	1851.5	-29.29	
		1880.0	-28.91	
		1908.5	-28.75	
	16QAM	1851.5	-28.80	
		1880.0	-28.84	
		1908.5	-28.07	
1.4 MHz	QPSK	1850.7	-28.61	
		1880.0	-28.33	
		1909.3	-28.06	
	16QAM	1850.7	-28.46	
		1880.0	-28.20	
		1909.3	-28.91	

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LTE 12

Bandwidth	Mode	f [MHz]	Spurious [dBm]	Limit [dBm]
10 MHz	QPSK	704.0	-31.22	-13.00
		707.5	-31.23	
		711.0	-30.62	
	16QAM	704.0	-30.88	
		707.5	-31.80	
		711.0	-31.37	
5 MHz	QPSK	701.5	-31.08	
		707.5	-30.10	
		713.5	-30.82	
	16QAM	701.5	-31.18	
		707.5	-31.28	
		713.5	-31.55	
3 MHz	QPSK	700.5	-31.16	
		707.5	-31.27	
		714.5	-30.80	
	16QAM	700.5	-31.60	
		707.5	-31.56	
		714.5	-31.09	
1.4 MHz	QPSK	699.7	-30.92	
		707.5	-31.82	
		715.3	-31.27	
	16QAM	699.7	-30.58	
		707.5	-31.16	
		715.3	-31.28	

LTE Band 4

LTE Band 4 (Frequency range: 1710-1755 MHz) is covered by LTE Band 66 (Frequency range: 1710-1780 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

LTE Band 17

LTE Band 17 (Frequency range: 704-716 MHz) is covered by LTE Band 12 (Frequency range: 699-716 MHz) due to overlapping frequency range, same maximum tune-up limit and same channel bandwidth.

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LTE 13

Bandwidth	Mode	f [MHz]	Spurious [dBm]	Limit [dBm]
10 MHz	QPSK	782.0	-31.95	-13.00
	16QAM	782.0	-30.91	
5 MHz	QPSK	779.5	-31.44	
		782.0	-31.52	
		784.5	-30.79	
	16QAM	779.5	-31.09	
		782.0	-31.04	
		784.5	-30.34	

LTE 41

Bandwidth	Mode	f [MHz]	Spurious [dBm]	Limit [dBm]
20 MHz	QPSK	2506.0	-30.50	-25.00
		2593.0	-30.68	
		2680.0	-30.71	
	16QAM	2506.0	-30.15	
		2593.0	-30.81	
		2680.0	-30.74	
15 MHz	QPSK	2503.5	-30.90	
		2593.0	-31.04	
		2682.5	-30.54	
	16QAM	2503.5	-30.61	
		2593.0	-30.91	
		2682.5	-30.49	
10 MHz	QPSK	2501.0	-30.96	
		2593.0	-30.39	
		2685.0	-30.53	
	16QAM	2501.0	-30.08	
		2593.0	-30.90	
		2685.0	-29.77	
5 MHz	QPSK	2498.5	-31.19	
		2593.0	-31.27	
		2687.5	-30.73	
	16QAM	2498.5	-31.16	
		2593.0	-30.91	
		2687.5	-30.43	

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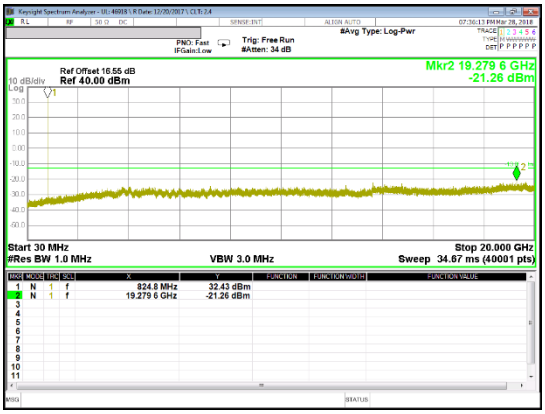
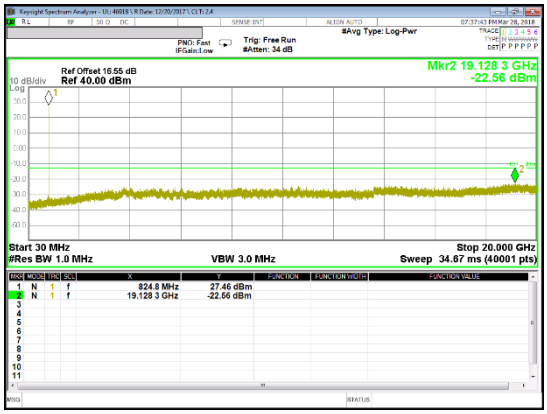
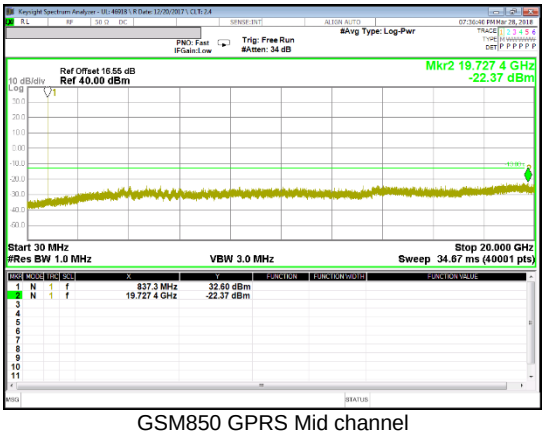
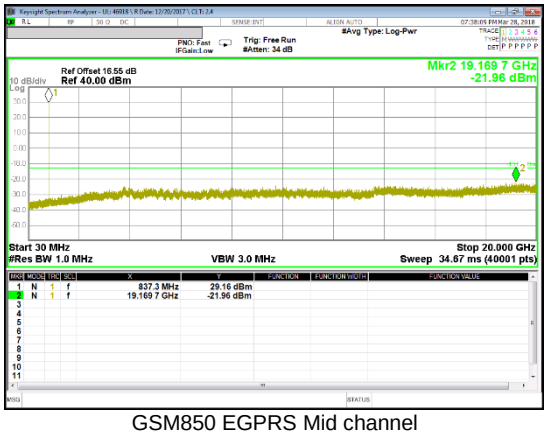
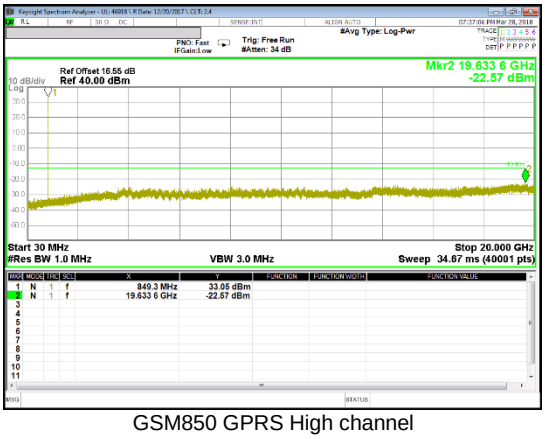
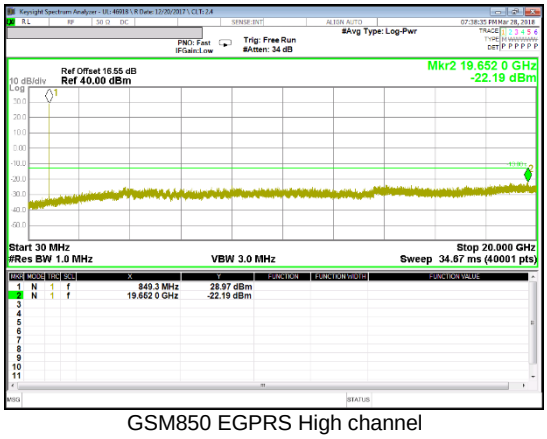
9.3.1. OUT OF BAND EMISSIONS PLOTS

GSM 850

GSM 850	 GSM850 GPRS Low channel	 GSM850 EGPRS Low channel
	 GSM850 GPRS Mid channel	 GSM850 EGPRS Mid channel
	 GSM850 GPRS High channel	 GSM850 EGPRS High channel

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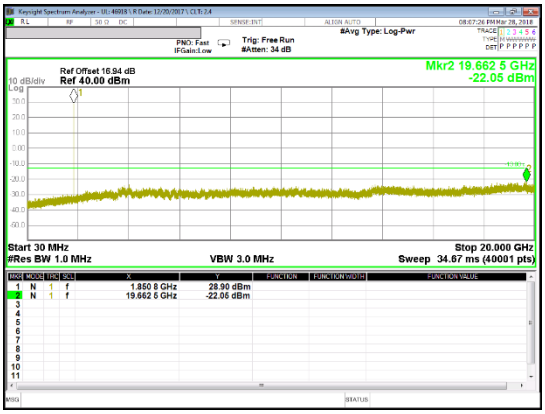
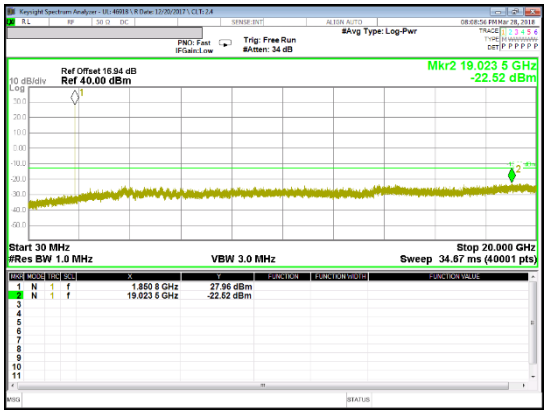
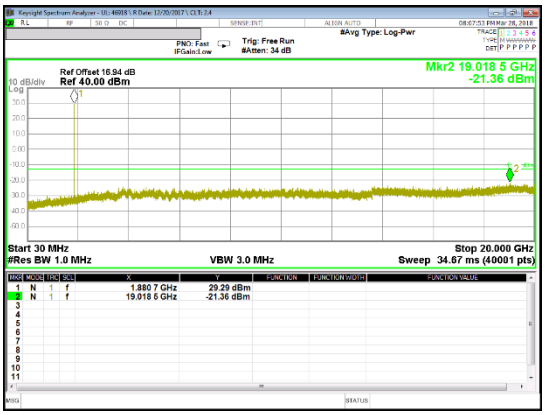
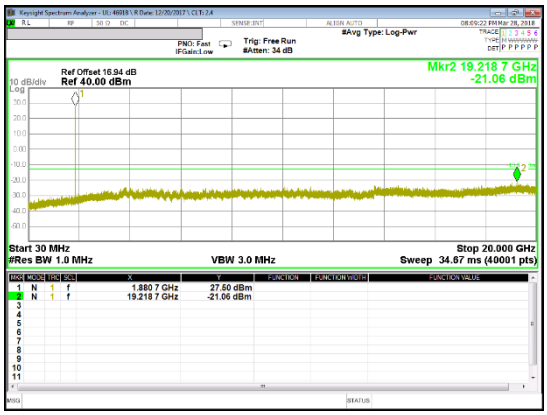
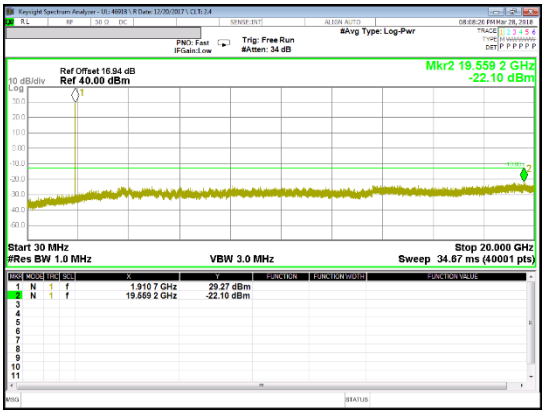
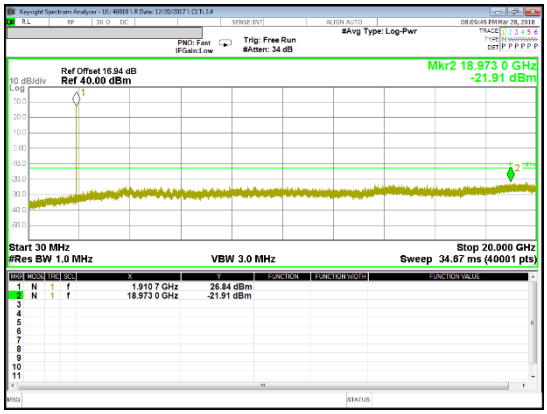
GSM 1900

GSM 1900	 GSM1900 GPRS Low channel	 GSM1900 EGPRS Low channel
	 GSM1900 GPRS Mid channel	 GSM1900 EGPRS Mid channel
	 GSM1900 GPRS High channel	 GSM1900 EGPRS High channel

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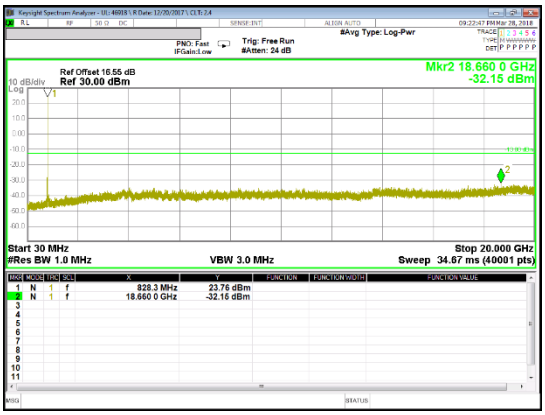
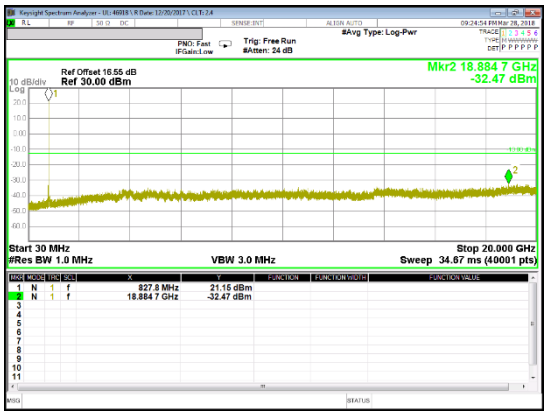
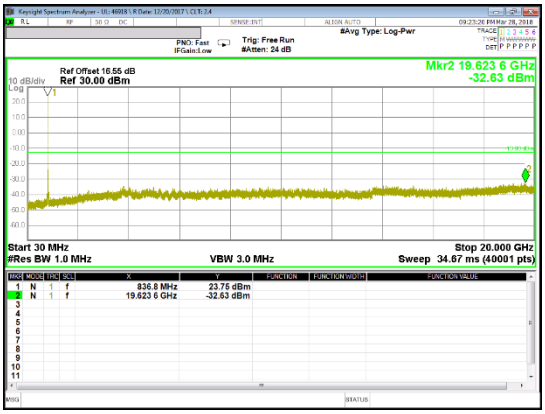
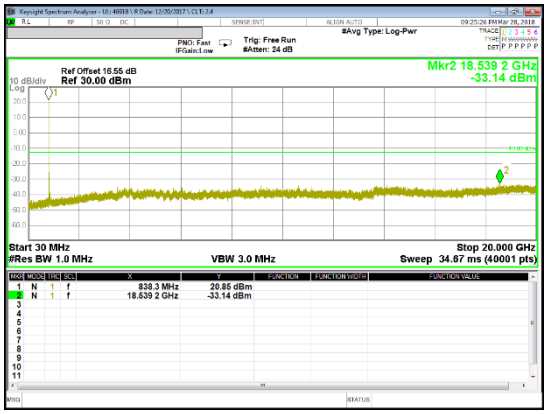
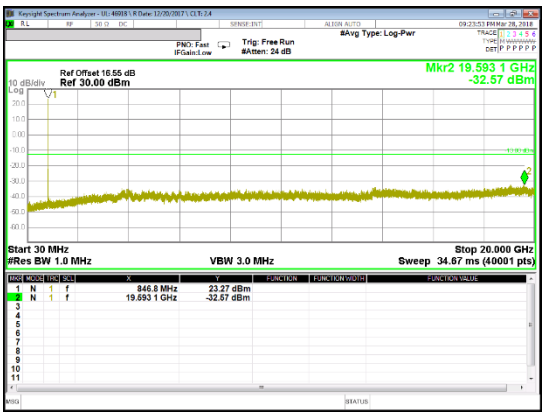
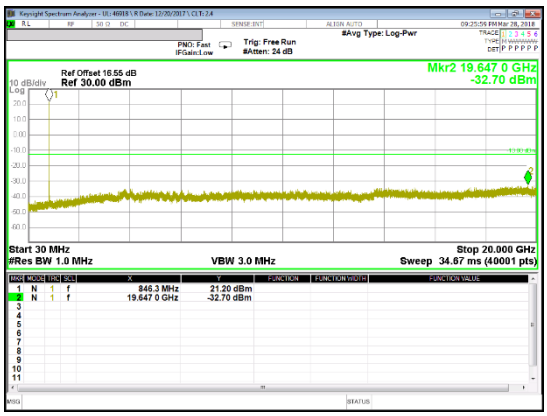
WCDMA Band 5

Band 5	 REL99 Low channel	 HSDPA Low channel
	 REL99 Mid channel	 HSDPA Mid channel
	 REL99 High channel	 HSDPA High channel

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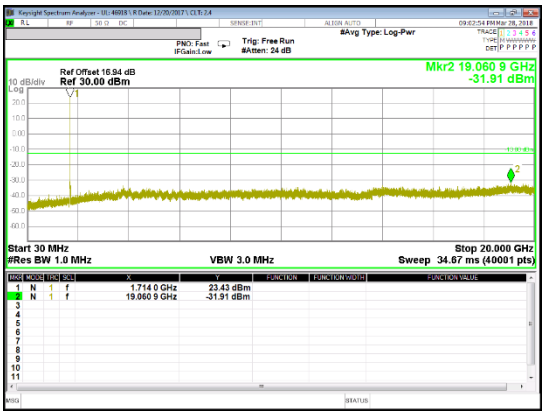
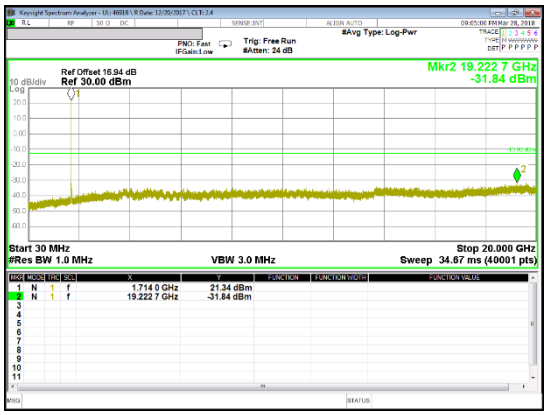
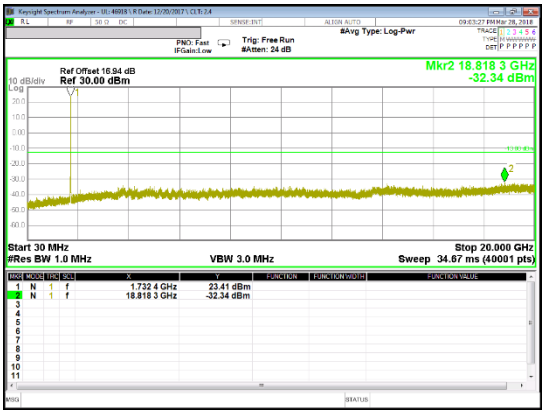
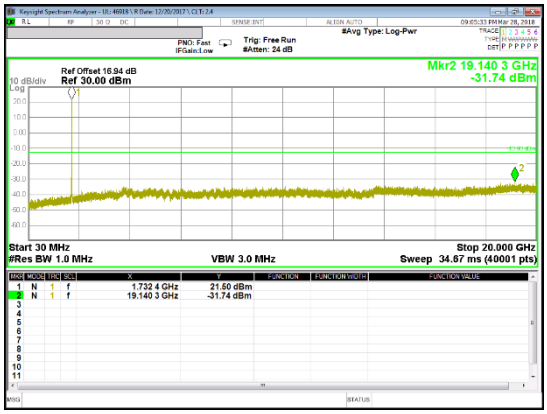
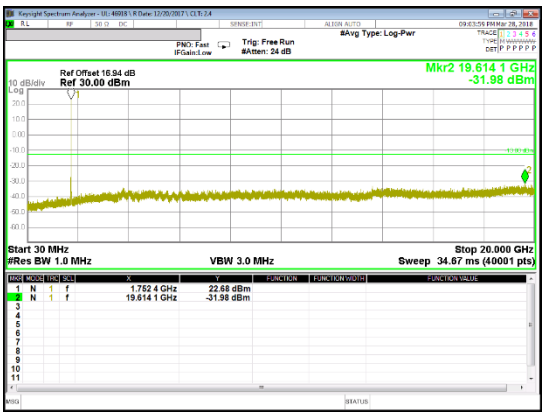
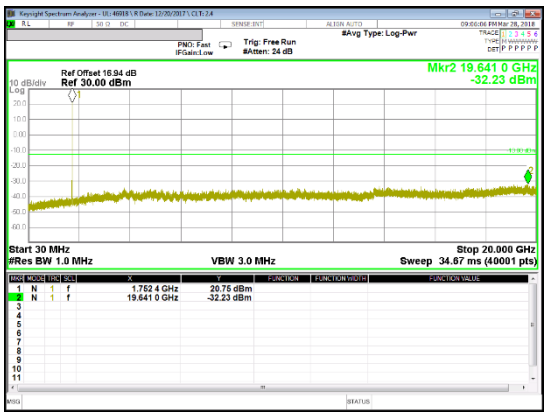
WCDMA Band 4

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

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