

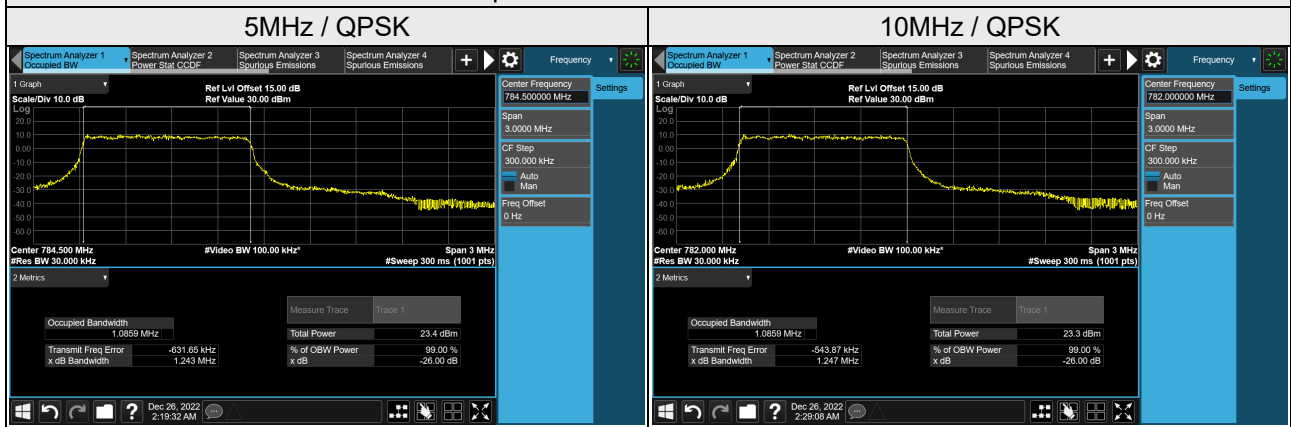
LTE Band 13, Channel Bandwidth 5MHz

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
23205	779.5	1.084	0.910
23230	782.0	1.085	0.908
23255	784.5	1.086	0.911

LTE Band 13, Channel Bandwidth 10MHz

Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
23230	782.0	1.086	0.910

Spectrum Plot of Worst Value



LTE Band 66, Channel Bandwidth 1.4MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
131979	1710.7	1.085	0.914
132322	1745.0	1.085	0.913
132665	1779.3	1.083	0.912

LTE Band 66, Channel Bandwidth 3MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
131987	1711.5	1.083	0.912
132322	1745.0	1.083	0.913
132657	1778.5	1.083	0.914

LTE Band 66, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
131997	1712.5	1.086	0.909
132322	1745.0	1.088	0.910
132647	1777.5	1.089	0.907

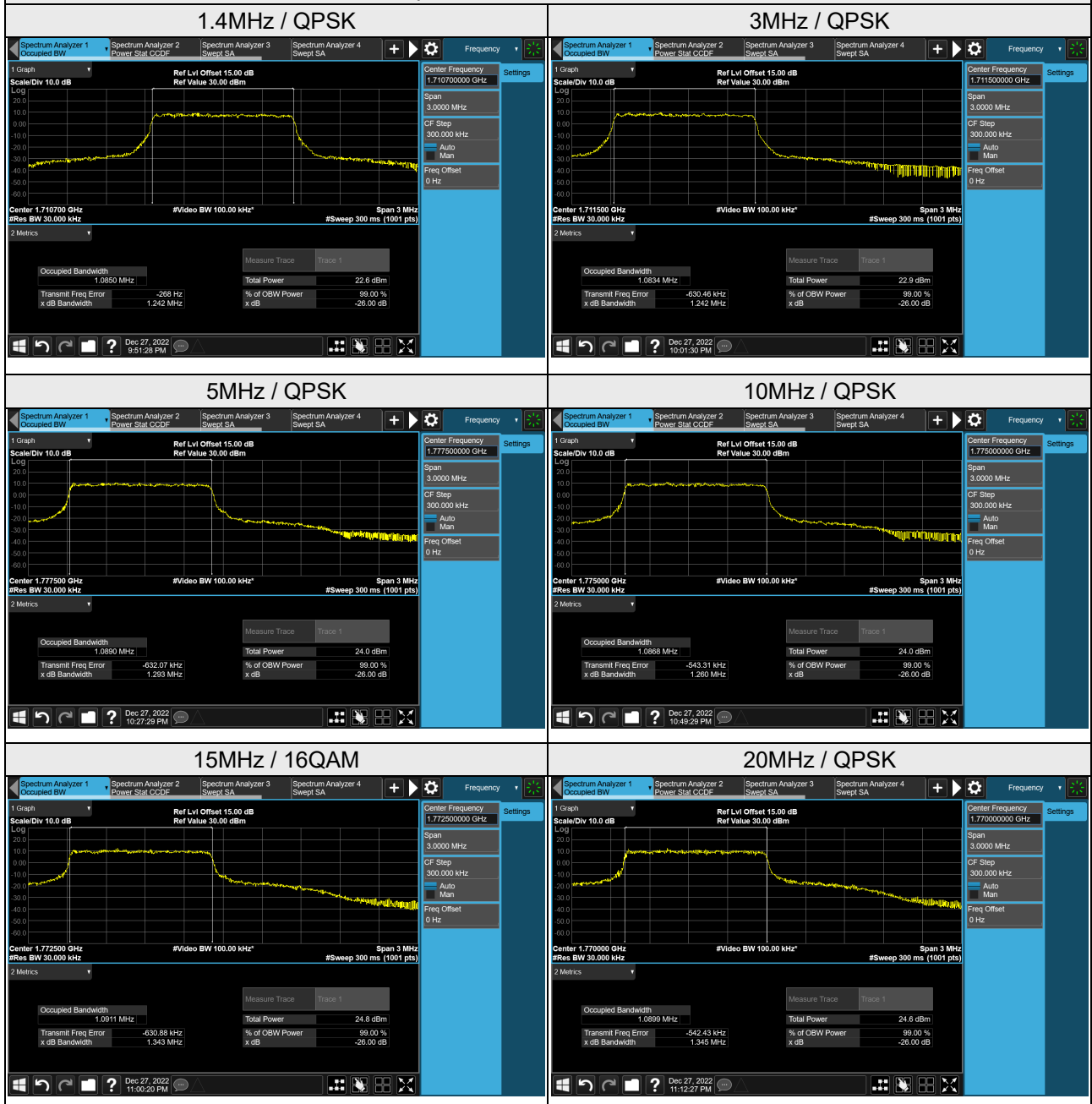
LTE Band 66, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
132022	1715.0	1.086	0.911
132322	1745.0	1.086	0.911
132622	1775.0	1.087	0.912

LTE Band 66, Channel Bandwidth 15MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
132047	1717.5	1.088	0.914
132322	1745.0	1.085	0.911
132597	1772.5	1.091	0.922

LTE Band 66, Channel Bandwidth 20MHz

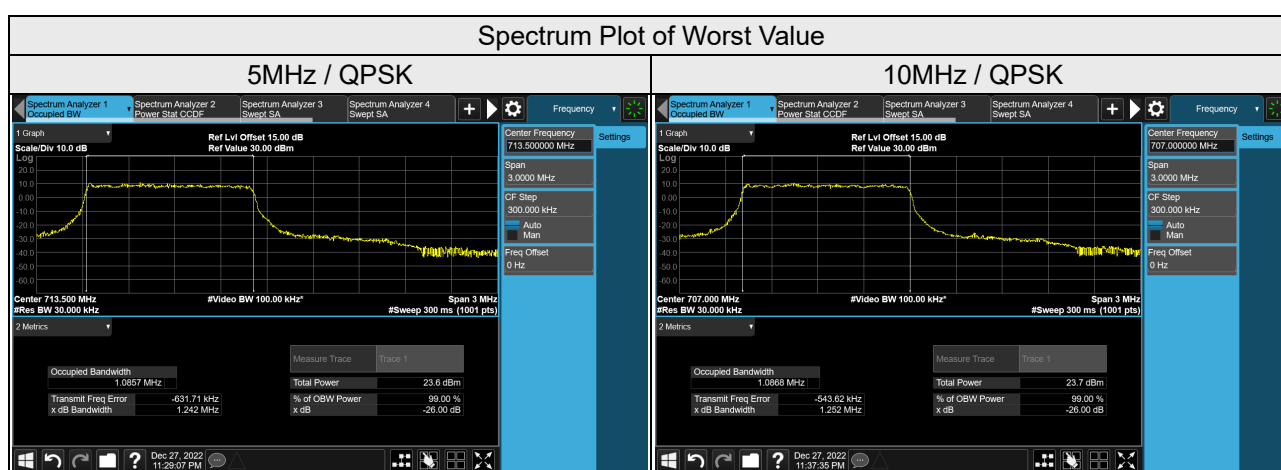
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
132072	1720.0	1.088	0.914
132322	1745.0	1.087	0.910
132572	1770.0	1.090	0.925

Spectrum Plot of Worst Value



LTE Band 85, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
134027	700.5	1.084	0.908
134092	707.0	1.086	0.909
134157	713.5	1.086	0.910

LTE Band 85, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	99% Occupied Bandwidth (MHz)	
		QPSK	16QAM
134052	703.0	1.087	0.909
134092	707.0	1.087	0.909
134132	711.0	1.086	0.912



26dB Bandwidth

LTE Band 4, Channel Bandwidth 1.4MHz			
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	16QAM
19957	1710.7	1.243	1.094
20175	1732.5	1.247	1.085
20393	1754.3	1.243	1.066

LTE Band 4, Channel Bandwidth 3MHz			
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	16QAM
19965	1711.5	1.237	1.071
20175	1732.5	1.240	1.086
20385	1753.5	1.243	1.077

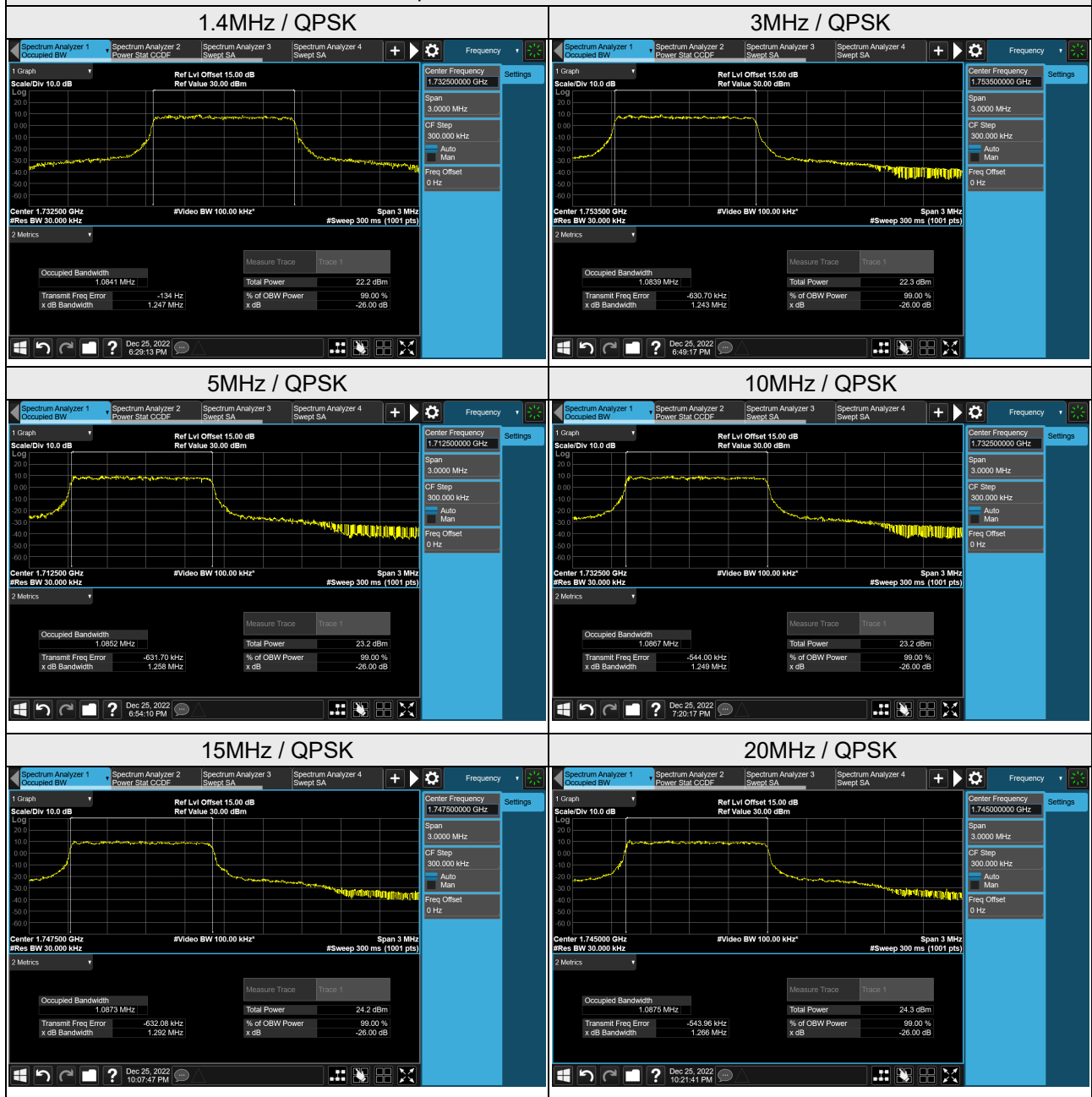
LTE Band 4, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	16QAM
19975	1712.5	1.258	1.088
20175	1732.5	1.230	1.078
20375	1752.5	1.236	1.085

LTE Band 4, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	16QAM
20000	1715.0	1.242	1.088
20175	1732.5	1.249	1.089
20350	1750.0	1.244	1.069

LTE Band 4, Channel Bandwidth 15MHz			
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	16QAM
20025	1717.5	1.283	1.162
20175	1732.5	1.265	1.143
20325	1747.5	1.292	1.126

LTE Band 4, Channel Bandwidth 20MHz			
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	16QAM
20050	1720.0	1.265	1.159
20175	1732.5	1.261	1.112
20300	1745.0	1.266	1.110

Spectrum Plot of Worst Value



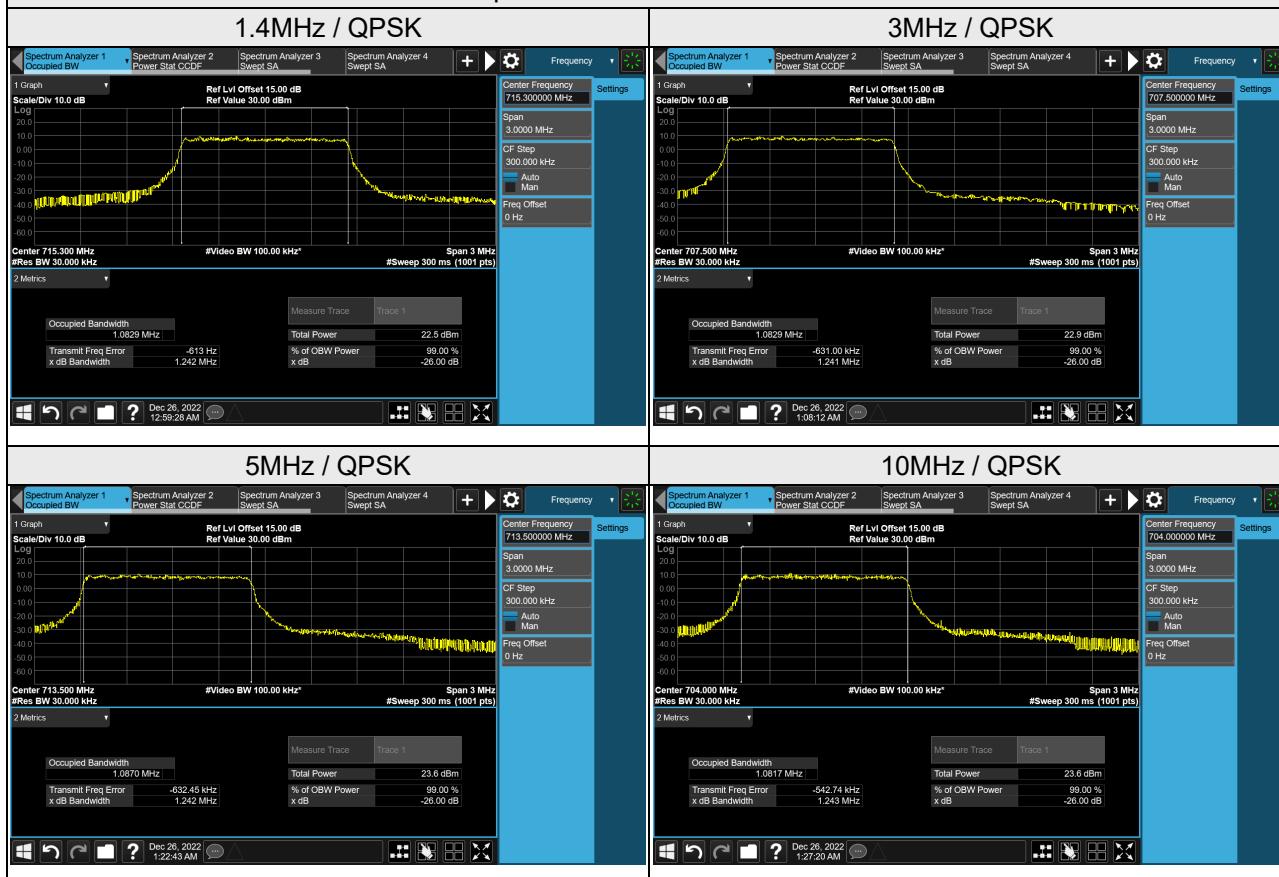
LTE Band 12, Channel Bandwidth 1.4MHz			
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	16QAM
23017	699.7	1.238	1.075
23095	707.5	1.241	1.080
23173	715.3	1.242	1.068

LTE Band 12, Channel Bandwidth 3MHz			
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	16QAM
23025	700.5	1.226	1.075
23095	707.5	1.241	1.065
23165	714.5	1.238	1.118

LTE Band 12, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	16QAM
23035	701.5	1.237	1.076
23095	707.5	1.228	1.071
23155	713.5	1.242	1.082

LTE Band 12, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	16QAM
23060	704.0	1.243	1.079
23095	707.5	1.236	1.087
23130	711.0	1.240	1.093

Spectrum Plot of Worst Value



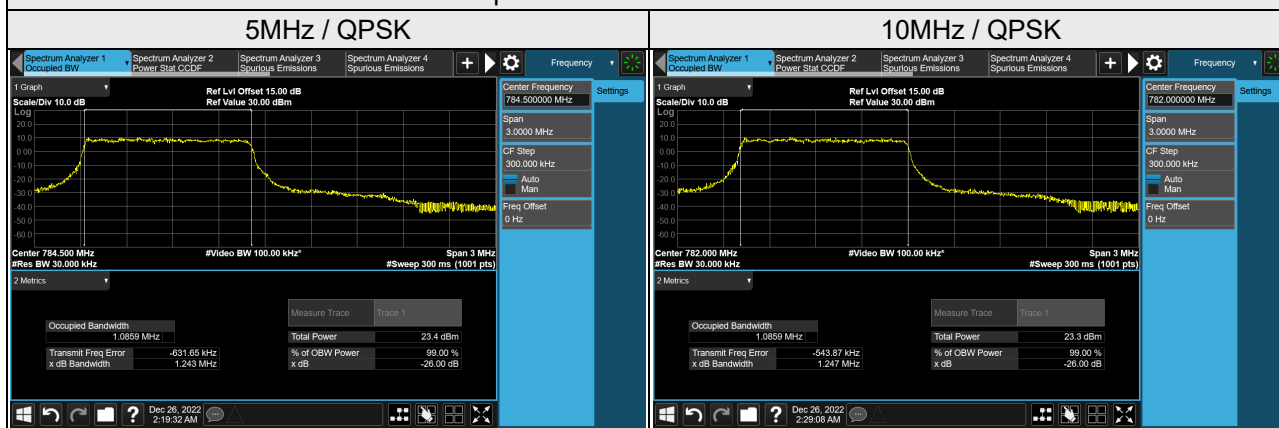
LTE Band 13, Channel Bandwidth 5MHz

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	16QAM
23205	779.5	1.231	1.085
23230	782.0	1.243	1.077
23255	784.5	1.243	1.070

LTE Band 13, Channel Bandwidth 10MHz

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	16QAM
23230	782.0	1.247	1.085

Spectrum Plot of Worst Value



LTE Band 66, Channel Bandwidth 1.4MHz			
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	16QAM
131979	1710.7	1.242	1.065
132322	1745.0	1.245	1.093
132665	1779.3	1.250	1.104

LTE Band 66, Channel Bandwidth 3MHz			
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	16QAM
131987	1711.5	1.242	1.084
132322	1745.0	1.241	1.075
132657	1778.5	1.241	1.077

LTE Band 66, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	16QAM
131997	1712.5	1.242	1.083
132322	1745.0	1.239	1.073
132647	1777.5	1.293	1.080

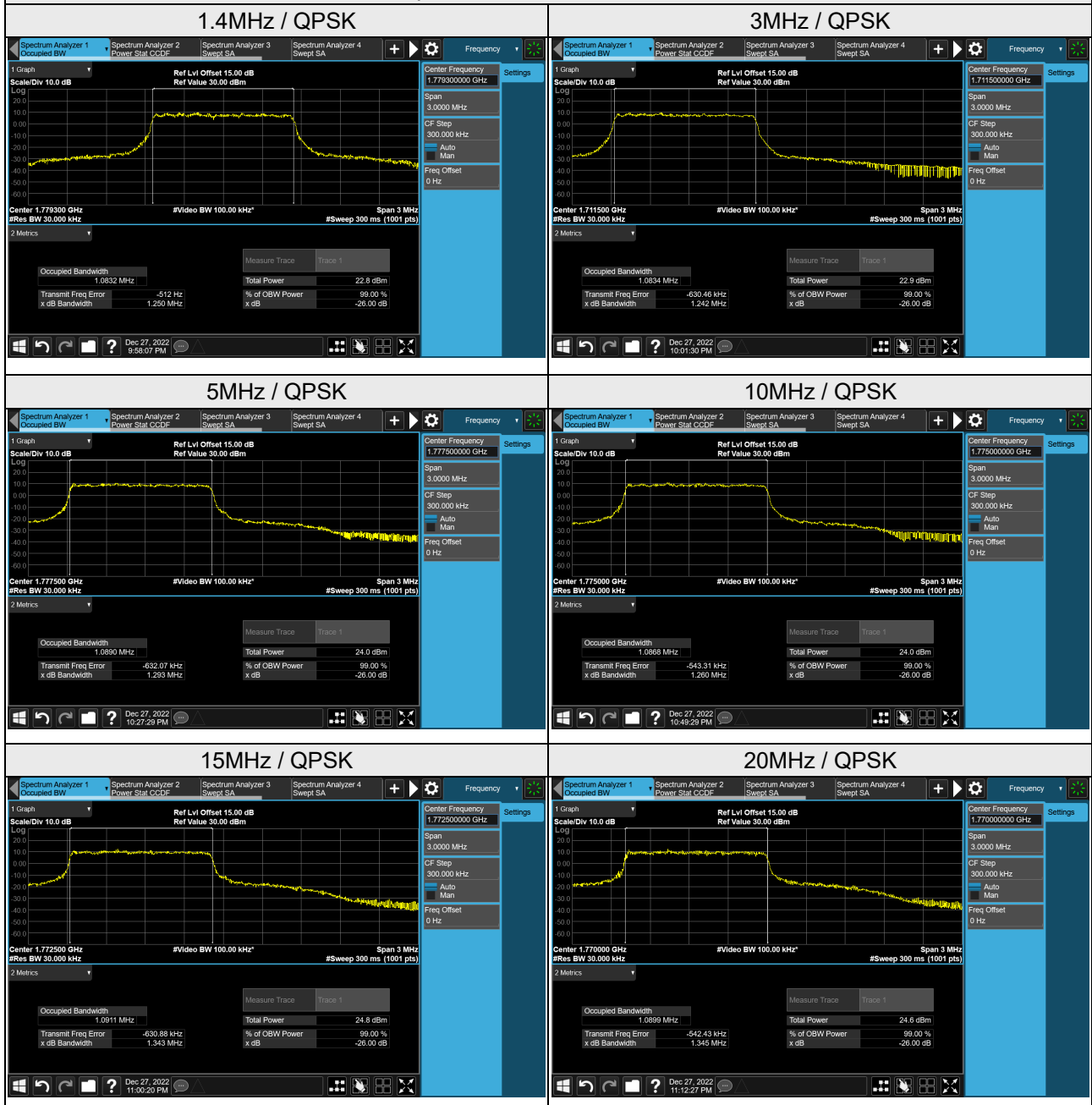
LTE Band 66, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	16QAM
132022	1715.0	1.242	1.093
132322	1745.0	1.231	1.085
132622	1775.0	1.260	1.163

LTE Band 66, Channel Bandwidth 15MHz			
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	16QAM
132047	1717.5	1.292	1.136
132322	1745.0	1.254	1.082
132597	1772.5	1.343	1.562

LTE Band 66, Channel Bandwidth 20MHz

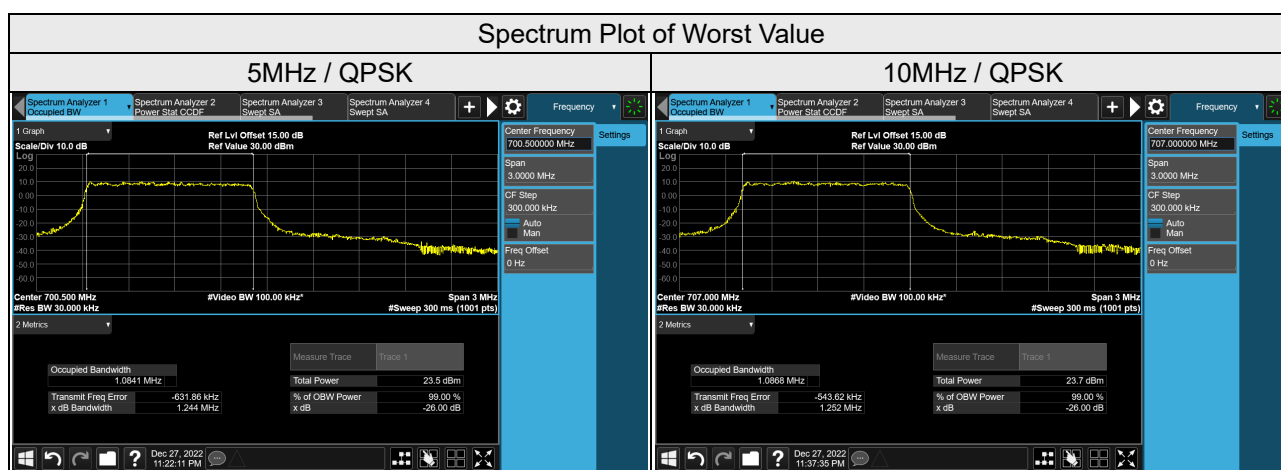
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	16QAM
132072	1720.0	1.256	1.132
132322	1745.0	1.248	1.097
132572	1770.0	1.345	1.652

Spectrum Plot of Worst Value



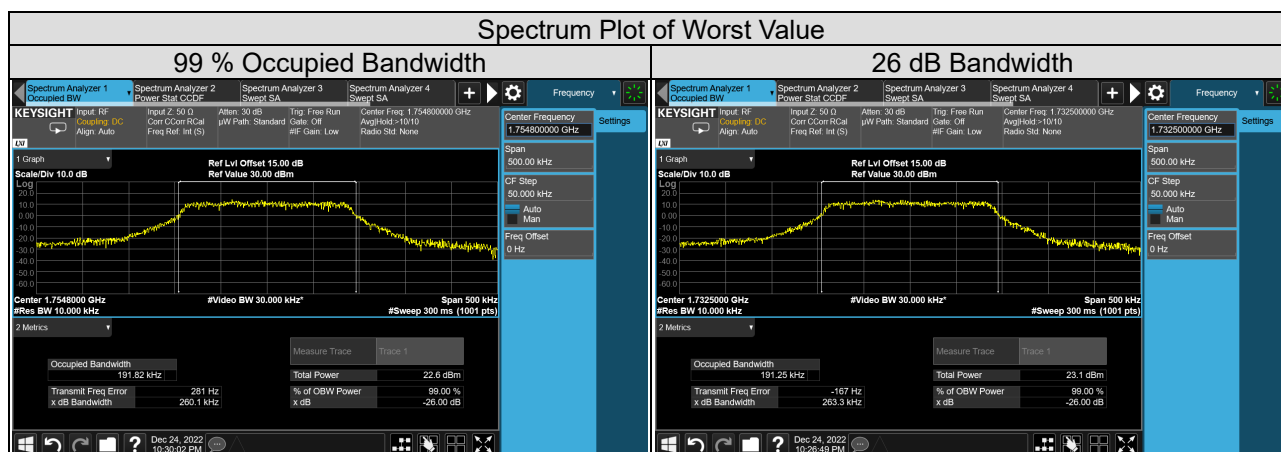
LTE Band 85, Channel Bandwidth 5MHz			
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	16QAM
134027	700.5	1.244	1.082
134092	707.0	1.242	1.077
134157	713.5	1.242	1.079

LTE Band 85, Channel Bandwidth 10MHz			
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		QPSK	16QAM
134052	703.0	1.246	1.080
134092	707.0	1.252	1.097
134132	711.0	1.248	1.095

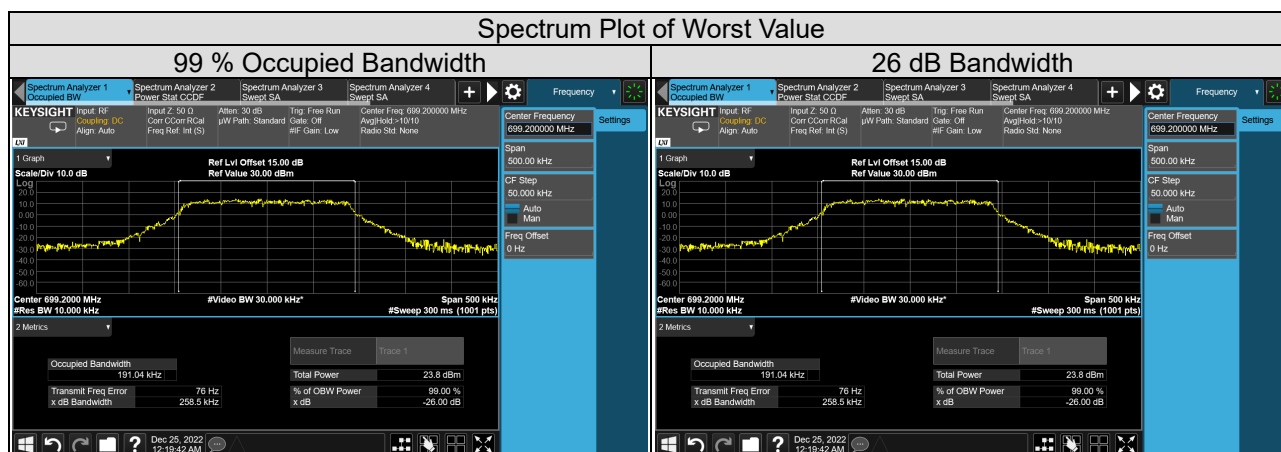


NB-IoT

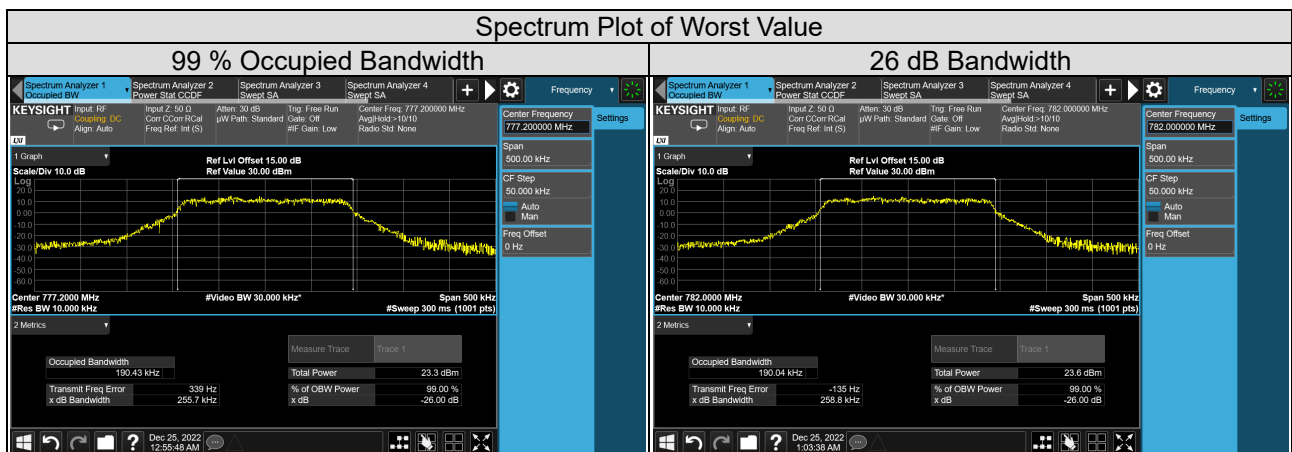
LTE Band 4						
Channel	Frequency (MHz)	Modulation	N _{tones}	Sub-carrier Spacing (kHz)	99 % Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
19952	1710.2	BPSK	1@0	3.75	82.80	82.52
		QPSK	12@0	15	190.85	254.70
20175	1732.5	BPSK	1@0	3.75	83.87	83.21
		QPSK	12@0	15	191.25	263.30
20398	1754.8	BPSK	1@47	3.75	85.30	83.32
		QPSK	12@0	15	191.82	260.10



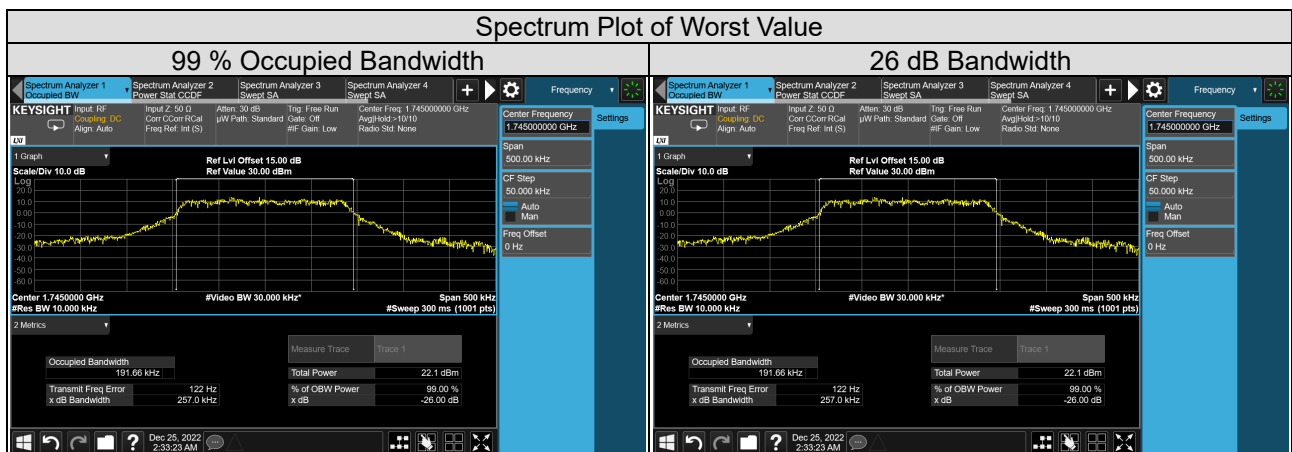
LTE Band 12						
Channel	Frequency (MHz)	Modulation	N _{tones}	Sub-carrier Spacing (kHz)	99 % Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
23012	699.2	BPSK	1@0	3.75	90.64	84.07
		QPSK	12@0	15	191.04	258.50
23095	707.5	BPSK	1@0	3.75	81.19	80.76
		QPSK	12@0	15	189.35	247.50
23178	715.8	BPSK	1@47	3.75	84.45	81.99
		QPSK	12@0	15	189.89	253.80



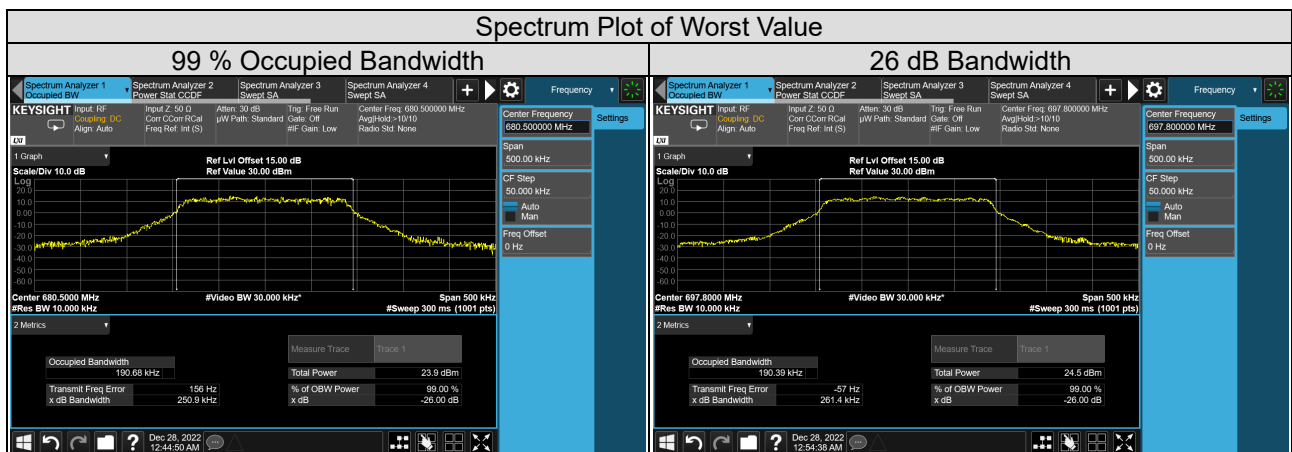
LTE Band 13						
Channel	Frequency (MHz)	Modulation	N _{tones}	Sub-carrier Spacing (kHz)	99 % Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
23182	777.2	BPSK	1@0	3.75	82.65	81.10
		QPSK	12@0	15	190.43	255.70
23230	782	BPSK	1@0	3.75	86.28	83.17
		QPSK	12@0	15	190.04	258.80
23278	786.8	BPSK	1@47	3.75	90.52	82.87
		QPSK	12@0	15	190.23	256.80



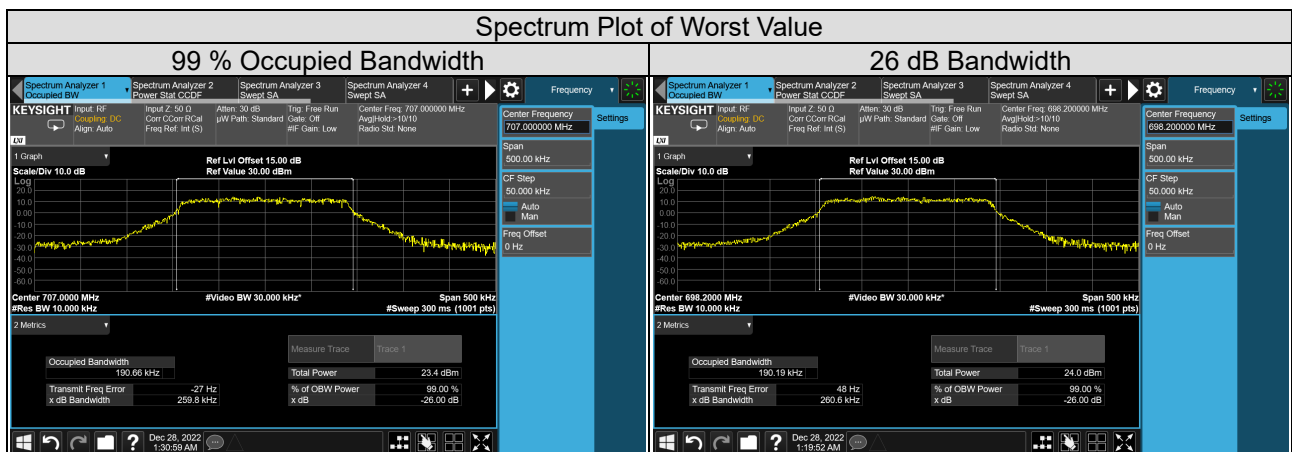
LTE Band 66						
Channel	Frequency (MHz)	Modulation	N _{tones}	Sub-carrier Spacing (kHz)	99 % Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
131974	1710.2	BPSK	1@0	3.75	84.31	78.18
		QPSK	12@0	15	190.32	254.40
132322	1745	BPSK	1@0	3.75	66.59	67.08
		QPSK	12@0	15	191.66	257.00
132670	1779.8	BPSK	1@47	3.75	67.26	66.97
		QPSK	12@0	15	191.65	263.40



LTE Band 71						
Channel	Frequency (MHz)	Modulation	N _{tones}	Sub-carrier Spacing (kHz)	99 % Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
133124	663.2	BPSK	1@0	3.75	68.28	67.67
		QPSK	12@0	15	190.39	257.40
133297	680.5	BPSK	1@0	3.75	65.81	65.92
		QPSK	12@0	15	190.68	250.90
133470	697.8	BPSK	1@47	3.75	66.66	66.77
		QPSK	12@0	15	190.39	261.40



LTE Band 85						
Channel	Frequency (MHz)	Modulation	N _{tones}	Sub-carrier Spacing (kHz)	99 % Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
134004	698.2	BPSK	1@0	3.75	68.08	67.71
		QPSK	12@0	15	190.19	260.60
134092	707	BPSK	1@0	3.75	67.33	67.59
		QPSK	12@0	15	190.66	259.80
134180	715.8	BPSK	1@47	3.75	82.94	83.71
		QPSK	12@0	15	190.07	255.60



4.5 Channel Edge / Out-of-Band Emissions Measurement

4.5.1 Limits of Band Edge / Out-of-Band Emissions Measurement

For LTE and NB-IoT Band 4, LTE and NB-IoT Band 66:

According to FCC 27.53(h) for operations in the 1695-1710MHz, 1710-1755MHz, 1755-1780 MHz, 1915-1920MHz, 1995-2000 MHz, 2000-2020MHz, 2110-2155MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log (P)$ dB.

For LTE and NB-IoT Band 12, NB-IoT Band 71, LTE and NB-IoT Band 85:

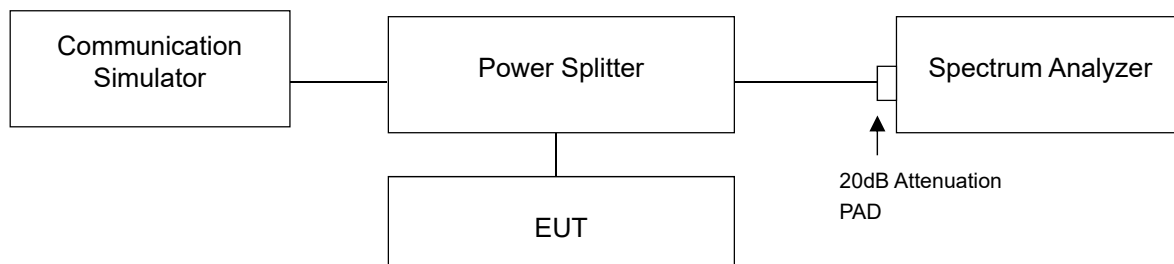
According to FCC 27.53(g) for operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least $43 + 10 \log (P)$ dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater.

For LTE and NB-IoT Band 13:

According to FCC 27.53(c)(2) for on any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB.

According to 27.53(c)(4) On all frequencies between 763-775MHz and 793-805MHz, by a factor not less than $65 + 10 \log (P)$ dB in a 6.25 kHz band segment, for mobile and portable stations

4.5.2 Test Setup



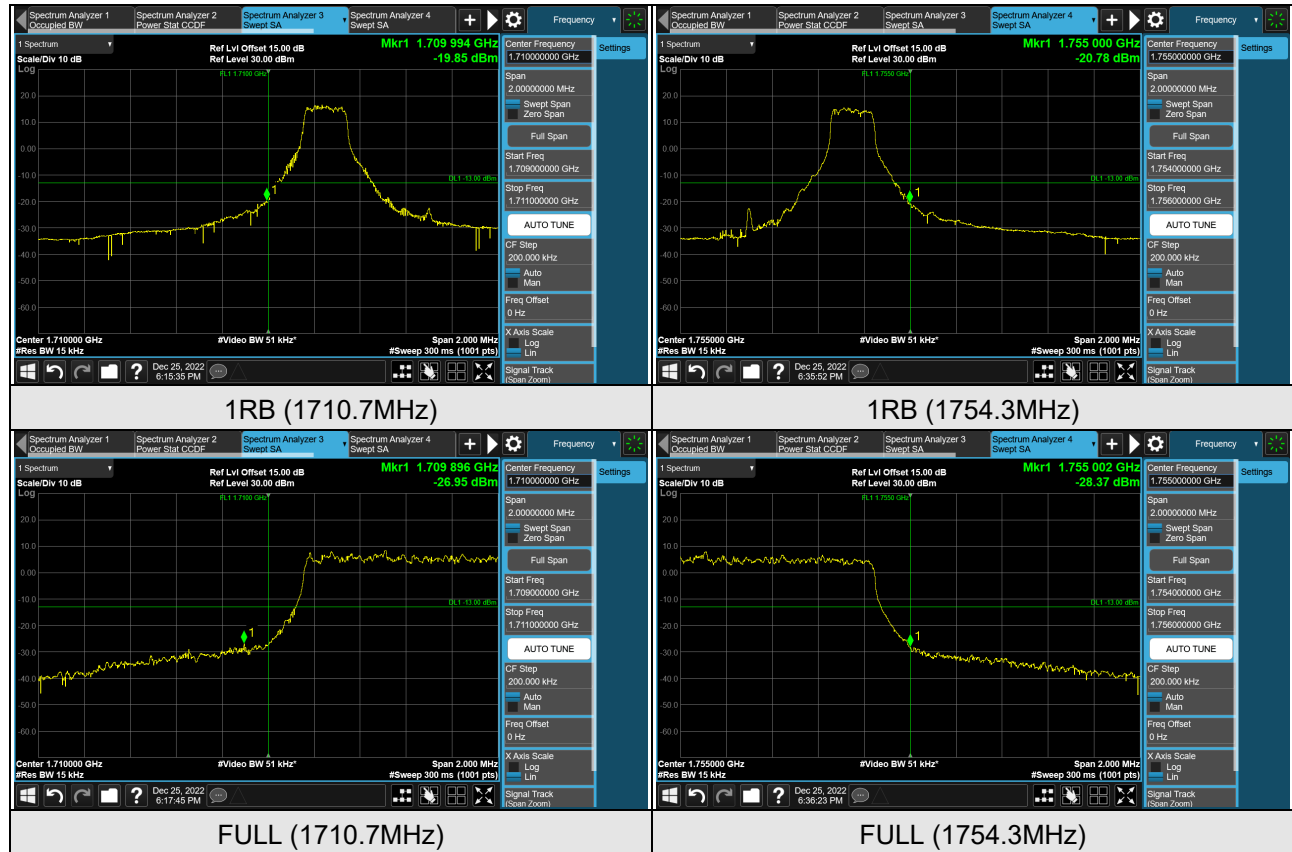
4.5.3 Test Procedures

- The EUT was set up for the rated peak power. The power was measured with Spectrum Analyzer. Band edge measurements were done at 2 channels: low and high operational frequency range.
- Measurement refer to ANSI C63.26 section 5.7.
- Measuring frequency band edge, narrow RBW (no less than 1% of the OBW) is used for conducted emission measurement. VBW $\geq 3 \times$ RBW, Detector = Average.
- The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 15kHz and VB of the spectrum is 51kHz (eMTC: LTE Band 4).
- The center frequency of spectrum is the band edge frequency and span is 2MHz. RB of the spectrum is 30kHz and VB of the spectrum is 100kHz (eMTC: LTE Band 12, 13, 66, 85; NB-IoT: LTE Band 4, 12, 13, 66, 71, 85).
- For Cat-M1 Band 13, NB-IoT Band 13 measurements in the 763 - 775 MHz and 793 - 805 MHz band, the FCC limit is $65 + 10 \log (P[\text{watt}])$ in a 6.25 kHz bandwidth. Since it was not possible to set the resolution bandwidth to 6.25 kHz with the available equipment, a bandwidth of 6.8 kHz was used instead to show compliance, and the correction factor is compensated at the spectrum.
- Record the max trace plot into the test report.

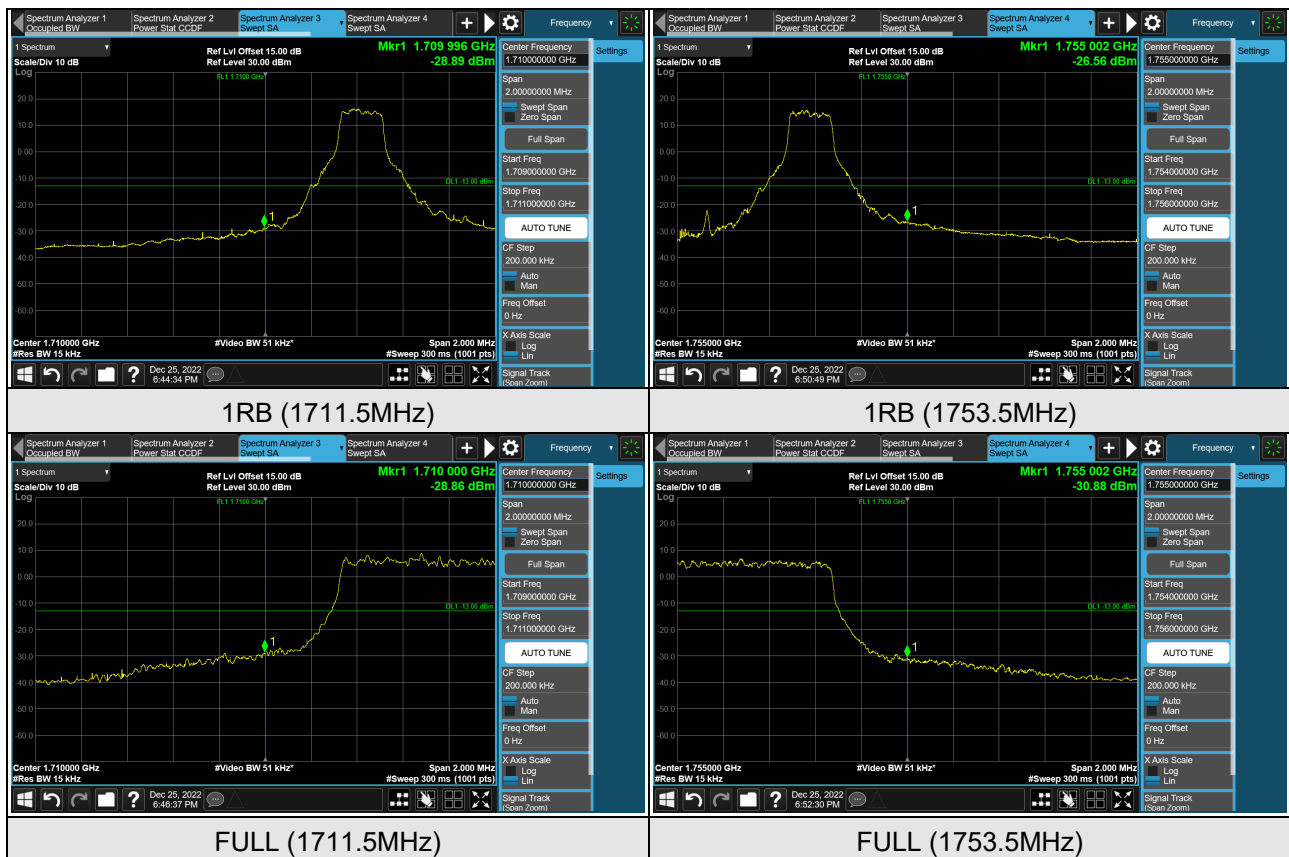
4.5.4 Test Results

Band Edge eMTC

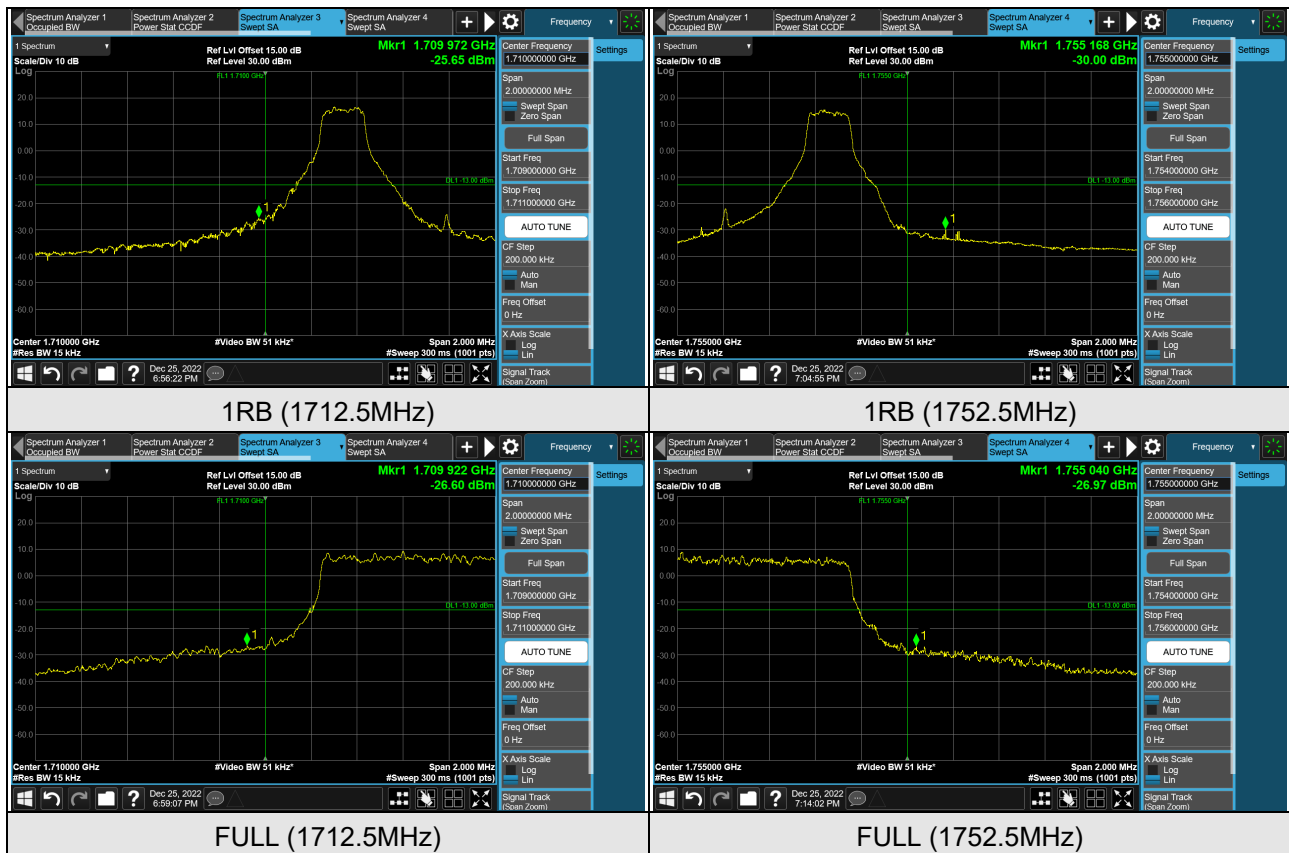
LTE Band 4 (Channel Bandwidth 1.4MHz)



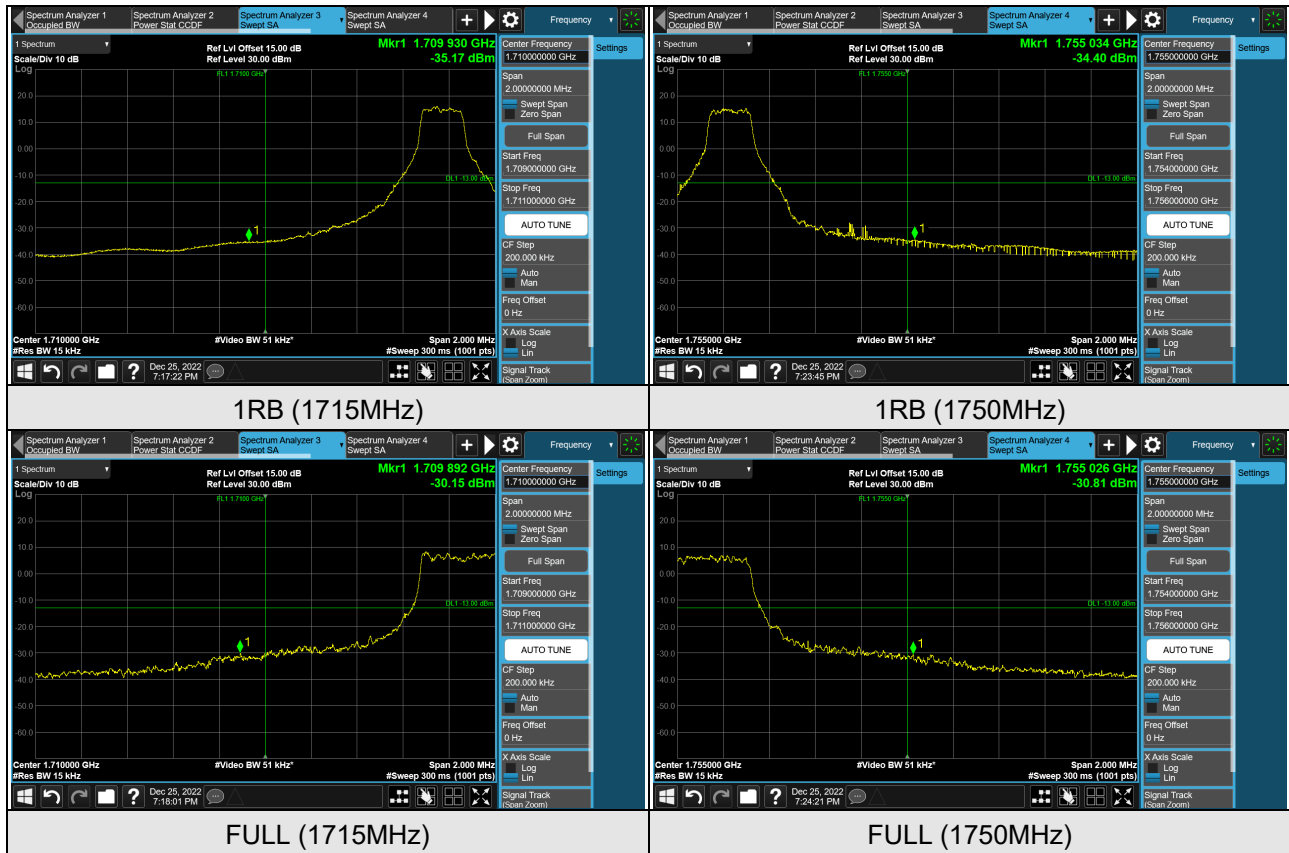
LTE Band 4 (Channel Bandwidth 3MHz)



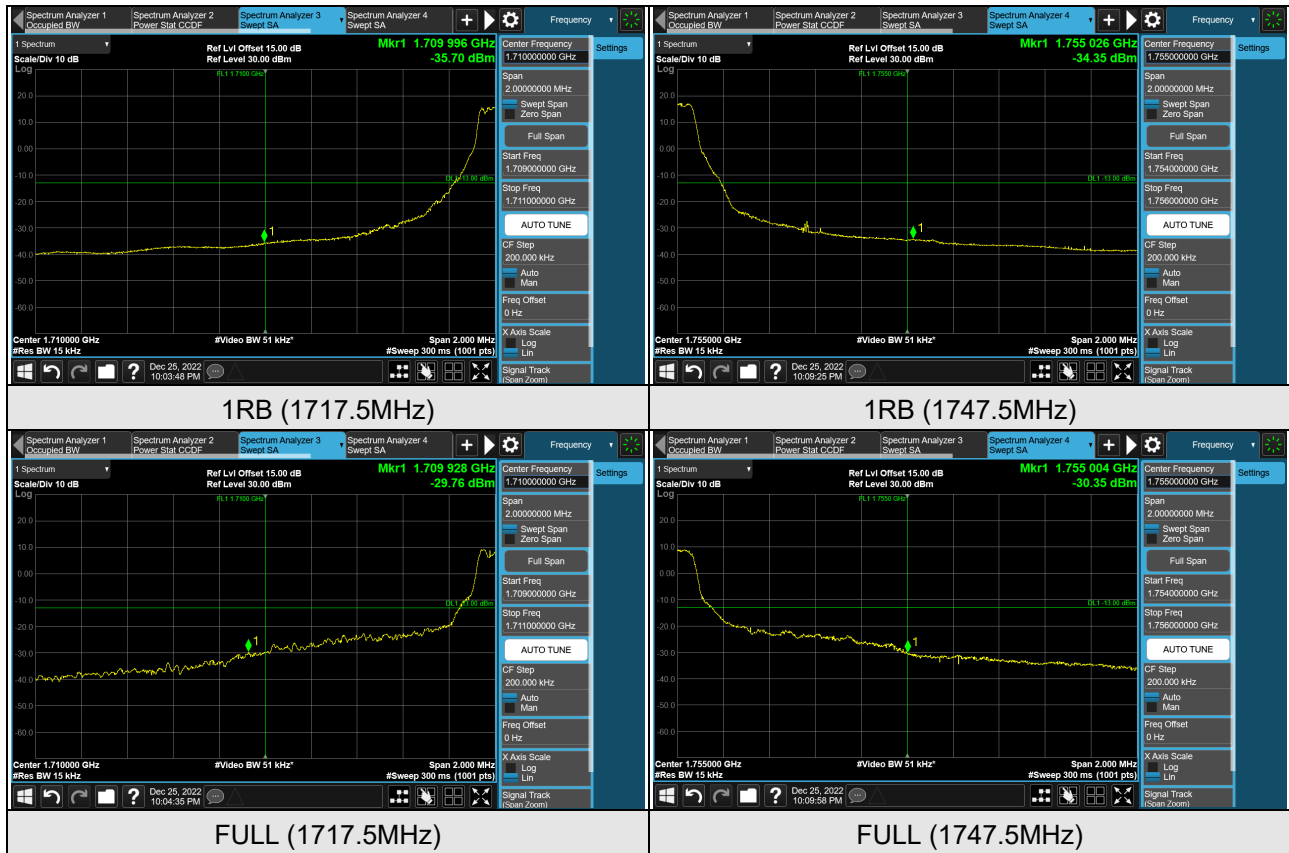
LTE Band 4 (Channel Bandwidth 5MHz)



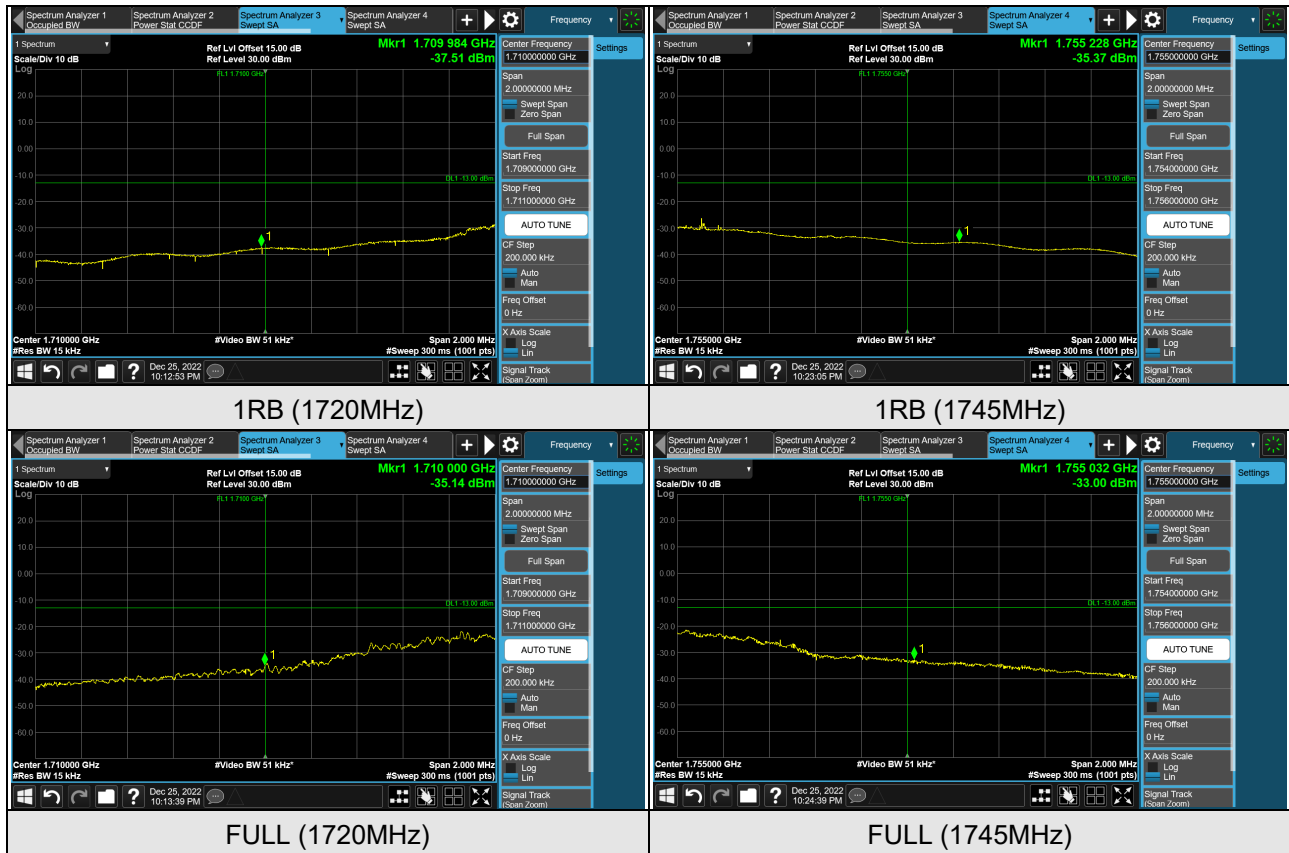
LTE Band 4 (Channel Bandwidth 10MHz)



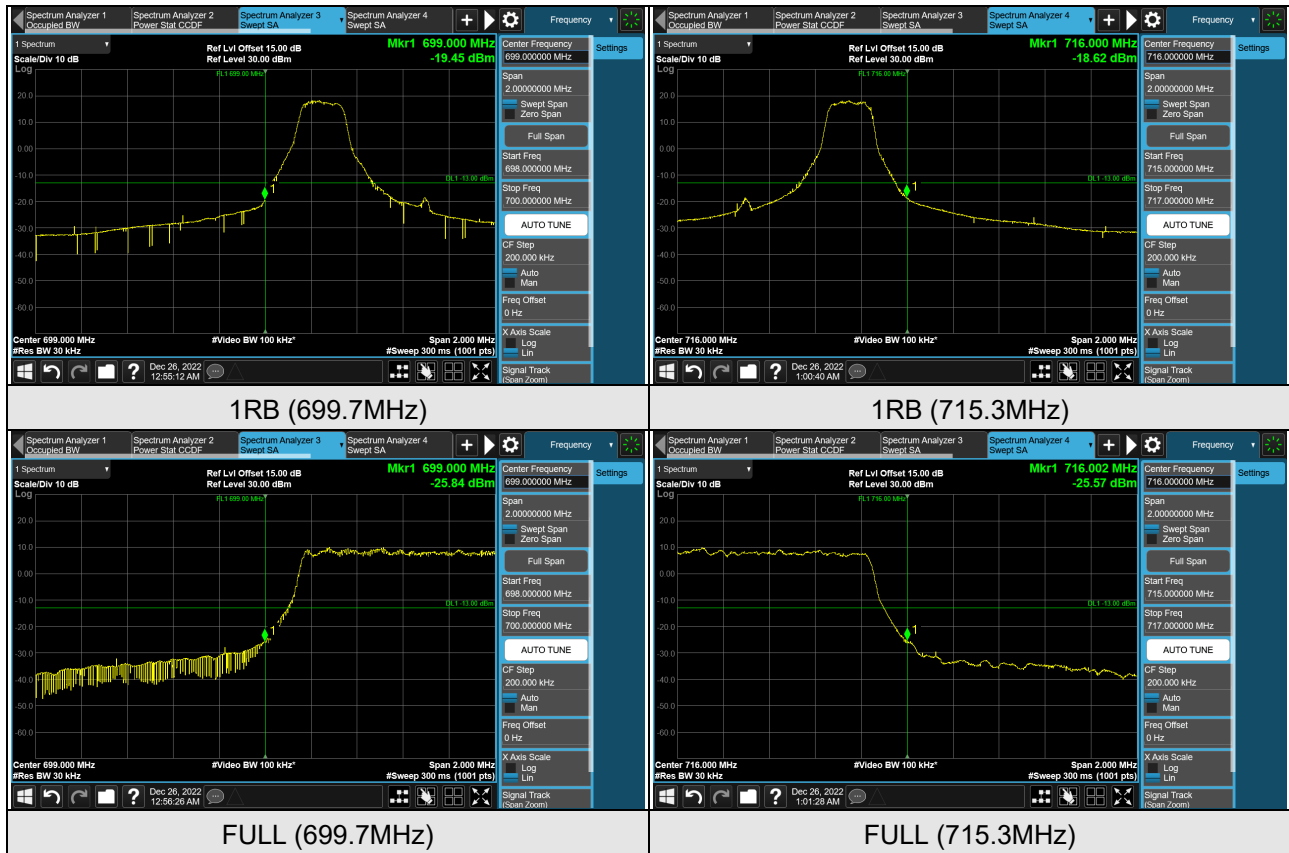
LTE Band 4 (Channel Bandwidth 15MHz)



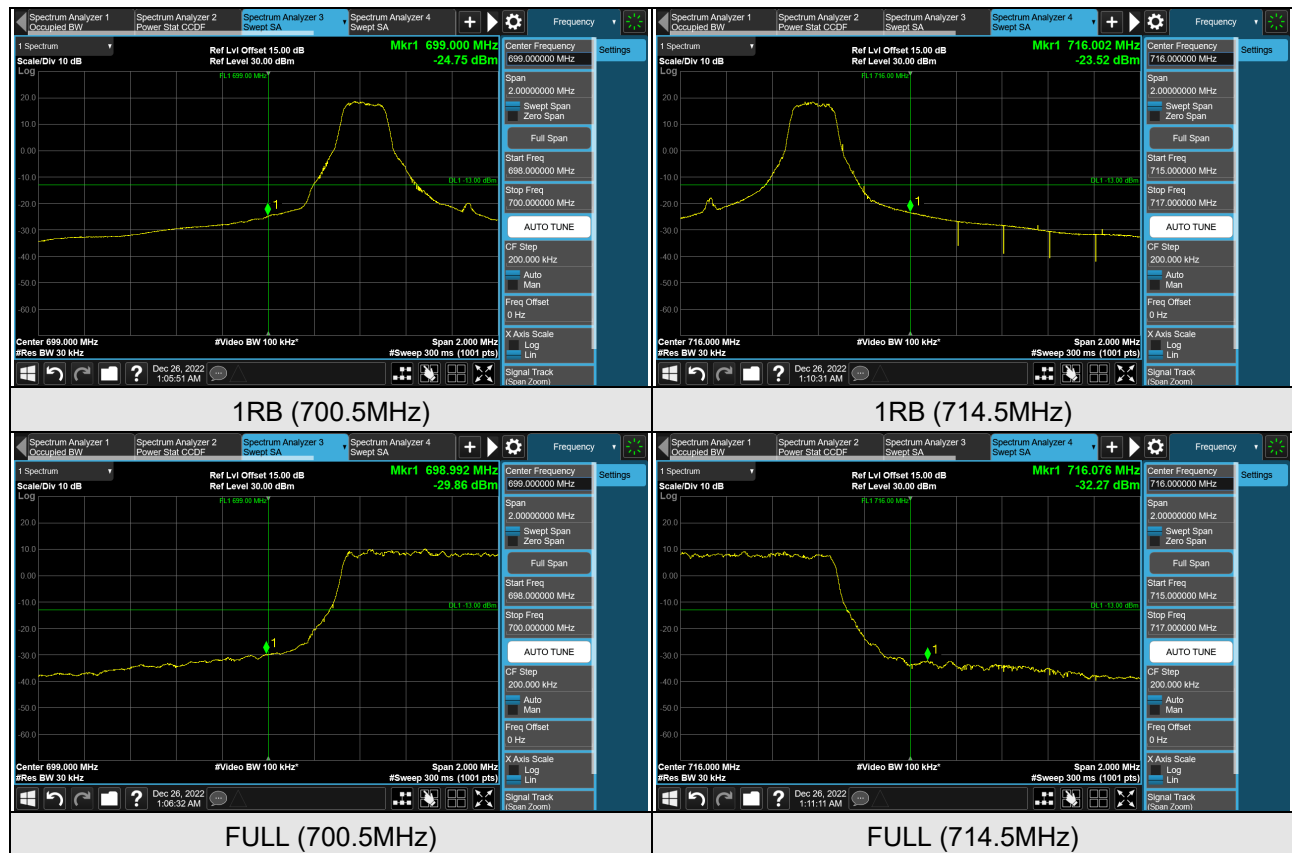
LTE Band 4 (Channel Bandwidth 20MHz)



LTE Band 12 (Channel Bandwidth 1.4MHz)



LTE Band 12 (Channel Bandwidth 3MHz)



LTE Band 12 (Channel Bandwidth 5MHz)

