Spectrum Plot of Worst Value

5MHz / 256QAM

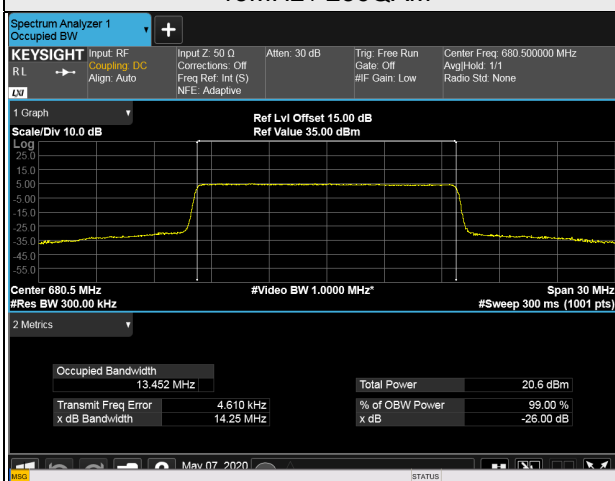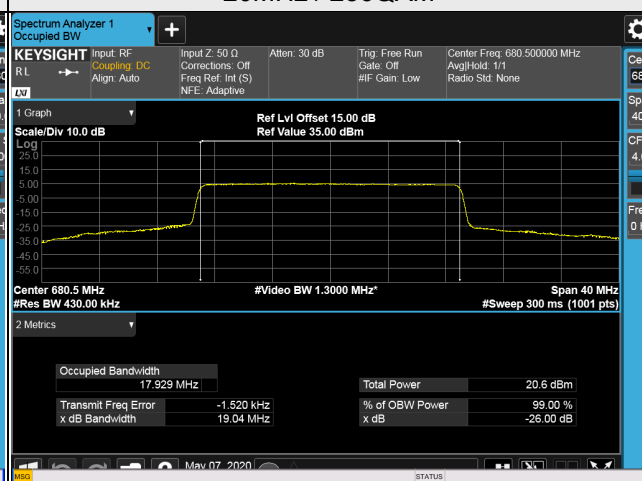| Occupied Bandwidth		Total Power	
	4.4868 MHz		20.4 dBm
Transmit Freq Error	3.140 kHz	% of OBW Power	99.00 %
x dB Bandwidth	4.817 MHz	x dB	-26.00 dB

10MHz / 256QAM

Occupied Bandwidth		Total Power	
	8.9834 MHz		20.8 dBm
Transmit Freq Error	9.928 kHz	% of OBW Power	99.00 %
x dB Bandwidth	9.536 MHz	x dB	-26.00 dB

15MHz / 256QAM

Occupied Bandwidth		Total Power	
	13.452 MHz		20.6 dBm
Transmit Freq Error	4.610 kHz	% of OBW Power	99.00 %
x dB Bandwidth	14.25 MHz	x dB	-26.00 dB

20MHz / 256QAM

Occupied Bandwidth		Total Power	
	17.929 MHz		20.6 dBm
Transmit Freq Error	-1.520 kHz	% of OBW Power	99.00 %
x dB Bandwidth	19.04 MHz	x dB	-26.00 dB

4.5   Channel Edge Measurement

4.5.1   Limits of Band Edge Measurement

For WCDMA Band 4, LTE Band 4, 66
According to FCC 27.53(h) for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 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 Band 7, 38, 41
According to FCC 27.53(m)(4) specified that power of any emission outside of the channel edge must be attenuated below the transmitting power (P) by a factor shall be not less than 40 + 10 log (P) dB on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 log (P) dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 log (P) dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth. In addition, the attenuation factor shall not be less that 43 + 10 log (P) dB on all frequencies between 2490.5 MHz and 2496 MHz and 55 + 10 log (P) dB at or below 2490.5 MHz. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent may be employed.

For LTE Band 12, 71
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 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 763-775 MHz and 793-805 MHz, by a factor not less than 65 + 10 log (P) dB in a 6.25 kHz band segment, for mobile and portable stations

For LTE Band 17
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 Band 30

According to FCC 27.53(a) (4) For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands:

(i)   By a factor of not less than: 43 + 10 log (P) dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than 55 + 10 log (P) dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than 61 + 10 log (P) dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than 67 + 10 log (P) dB on all frequencies between 2328 and 2337 MHz;

(ii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2300 and 2305 MHz, 55 + 10 log (P) dB on all frequencies between 2296 and 2300 MHz, 61 + 10 log (P) dB on all frequencies between 2292 and 2296 MHz, 67 + 10 log (P) dB on all frequencies between 2288 and 2292 MHz, and 70 + 10 log (P) dB below 2288 MHz;

(iii) By a factor of not less than 43 + 10 log (P) dB on all frequencies between 2360 and 2365 MHz, and not less than 70 + 10 log (P) dB above 2365 MHz.

4.5.2   Test Setup
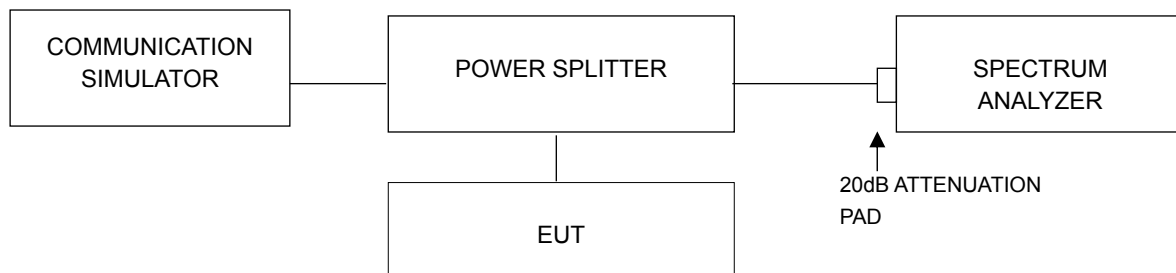
4.5.3　Test Procedures

a. 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, middle and high operational frequency range. Emission mask measurements were done at 3 channels: low and high operational frequency range.

b. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 15kHz and VB of the spectrum is 51kHz (LTE Channel Bandwidth 1.4MHz).

c. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 30kHz and VB of the spectrum is 100kHz (LTE Channel Bandwidth 3MHz).

d. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 51kHz and VB of the spectrum is 160kHz (LTE Channel Bandwidth 5MHz).

e. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (LTE Channel Bandwidth 10MHz).

f. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 150kHz and VB of the spectrum is 470kHz (LTE Channel Bandwidth 15MHz).

g. The center frequency of spectrum is the band edge frequency and span is 1MHz. RB of the spectrum is 200kHz and VB of the spectrum is 1MHz (LTE Channel Bandwidth 20MHz).

h. Except LTE Band 12and LTE Band 17 measurement procedure refer 27.53(g)(m)(6).

i. LTE Band 7, Band 38 and Band 41 operations in the 5 MHz and 10 MHz channel BW mode, extend the 1% range from 1M to 2M above and below the channel edge and then reduce the limit further by 10 log (1000/100)=10dB (i.e. total -10 + -10=-20dB) to compensate for the integration from 100k to 1M.

j. Record the max trace plot into the test report.

4.5.4 Test Results

LTE Band 4

Channel Bandwidth: 1.4MHz					
Channel 19957 (1710.7MHz)	256QAM	1 RB / 0 RB Offset	Channel 20393 (1754.3MHz)	256QAM	1 RB / 5 RB Offset

Channel 19957 (1710.7MHz)	256QAM	6 RB / 0 RB Offset	Channel 20393 (1754.3MHz)	256QAM	6 RB / 0 RB Offset
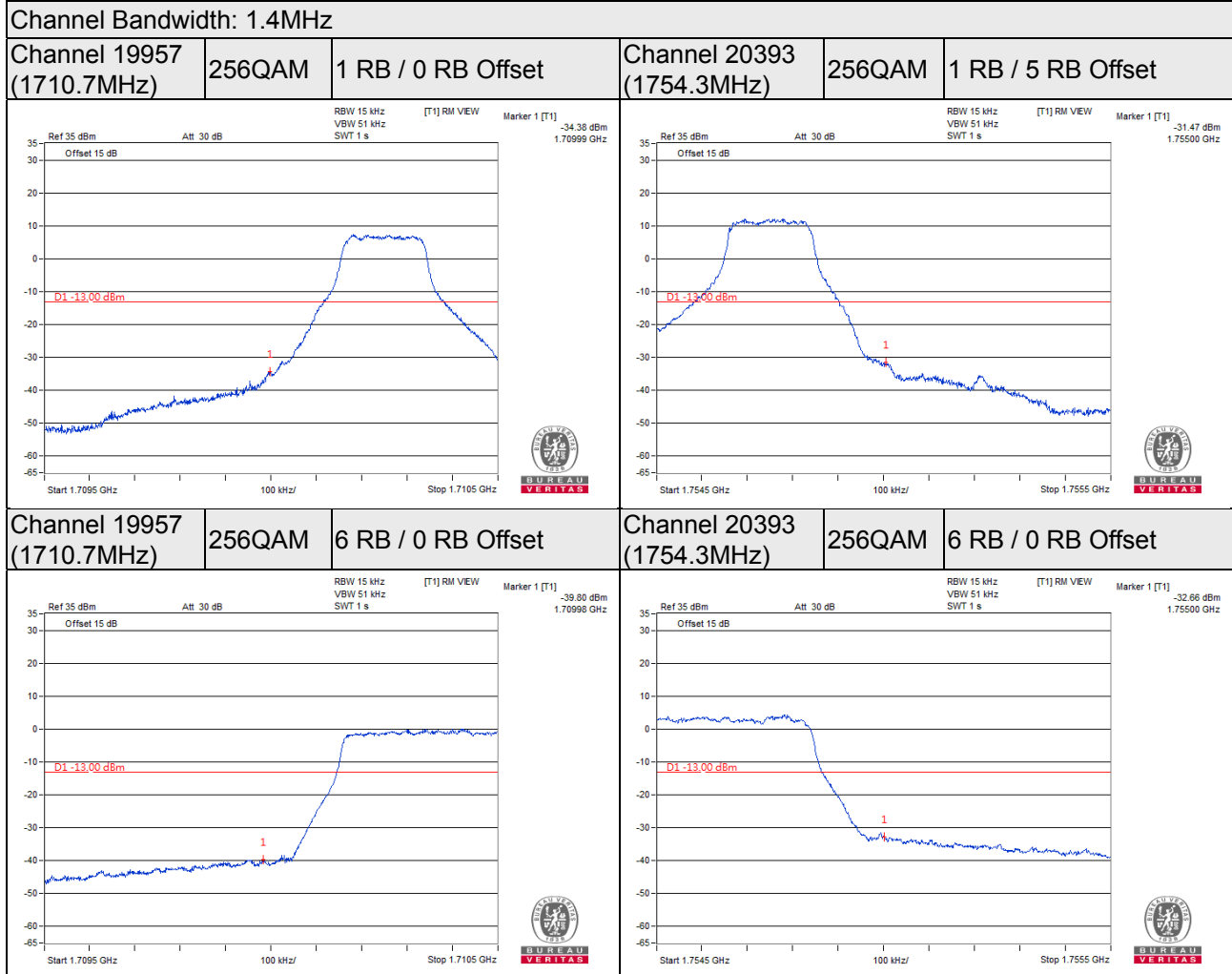
Channel Bandwidth: 3MHz					
Channel 19965 (1711.5MHz)	256QAM	1 RB / 0 RB Offset	Channel 20385 (1753.5MHz)	256QAM	1 RB / 14 RB Offset
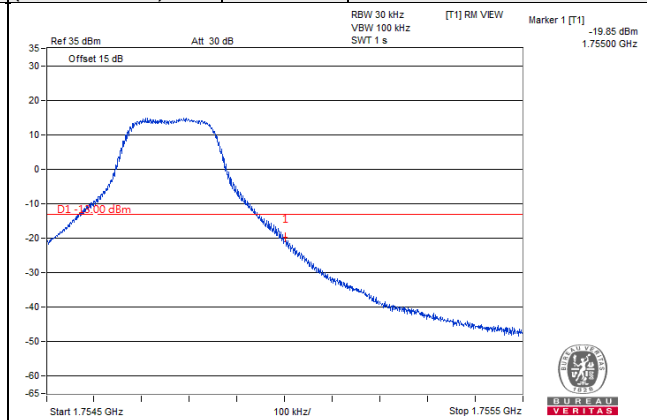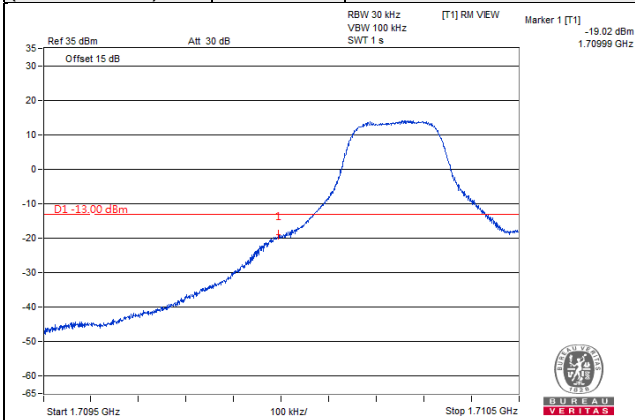
Channel 19965 (1711.5MHz)	256QAM	15 RB / 0 RB Offset	Channel 20385 (1753.5MHz)	256QAM	15 RB / 0 RB Offset
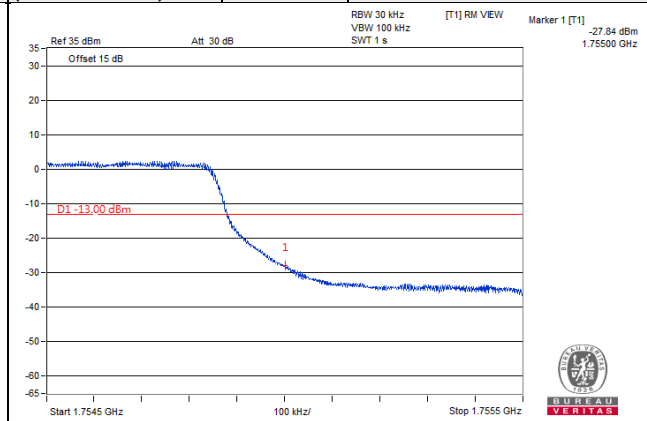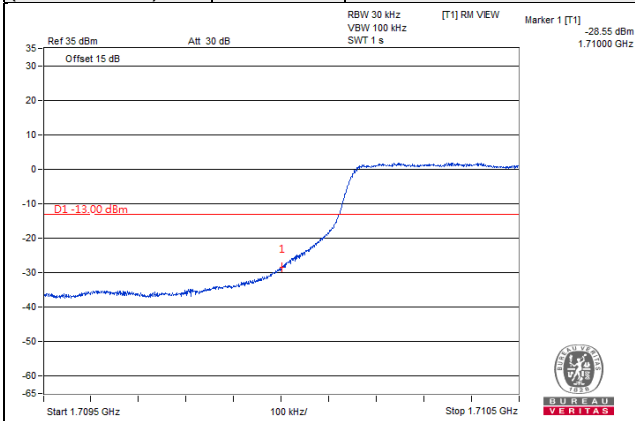
Channel Bandwidth: 5MHz					
Channel 19975 (1712.5MHz)	256QAM	1 RB / 0 RB Offset	Channel 20375 (1752.5MHz)	256QAM	1 RB / 24 RB Offset
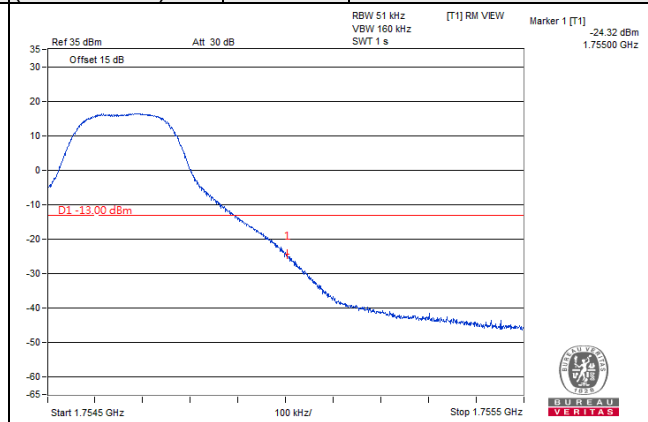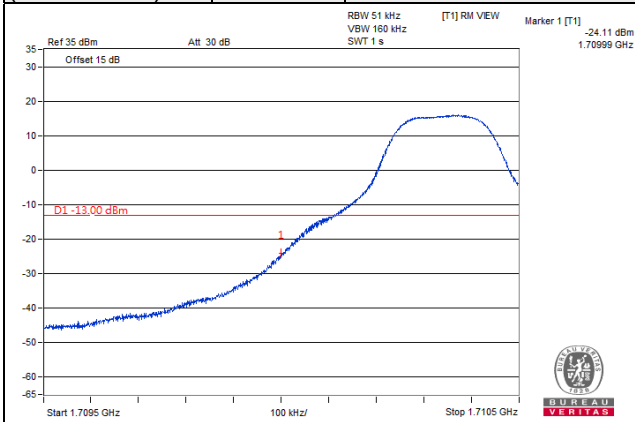
Channel 19975 (1712.5MHz)	256QAM	25 RB / 0 RB Offset	Channel 20375 (1752.5MHz)	256QAM	25 RB / 0 RB Offset
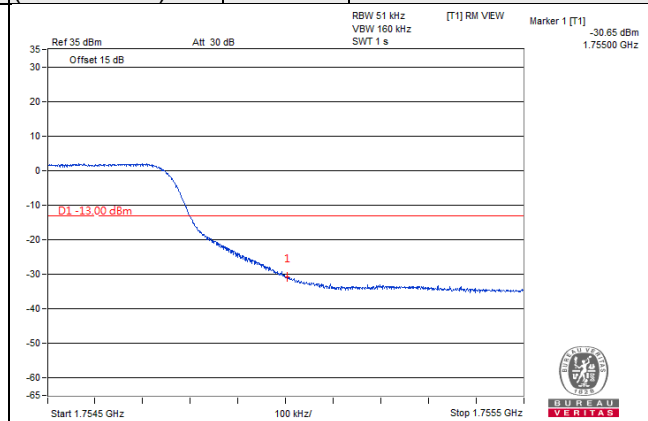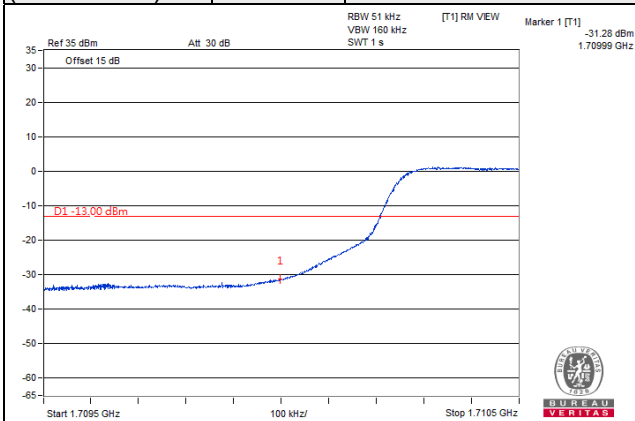
Channel Bandwidth: 10MHz						
Channel 20000 (1715.0MHz)	256QAM	1 RB / 0 RB Offset		Channel 20350 (1750.0MHz)	256QAM	1 RB / 49 RB Offset
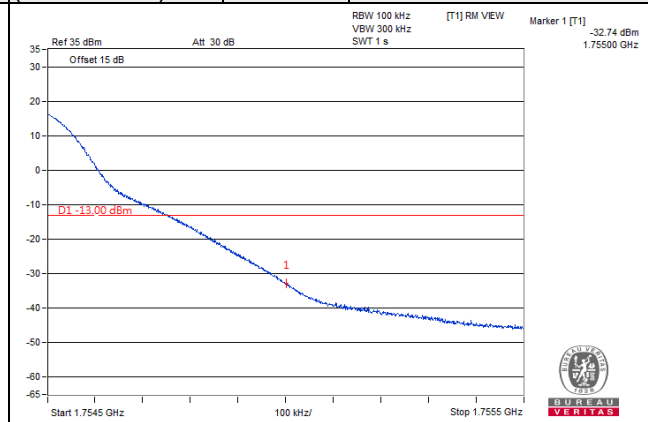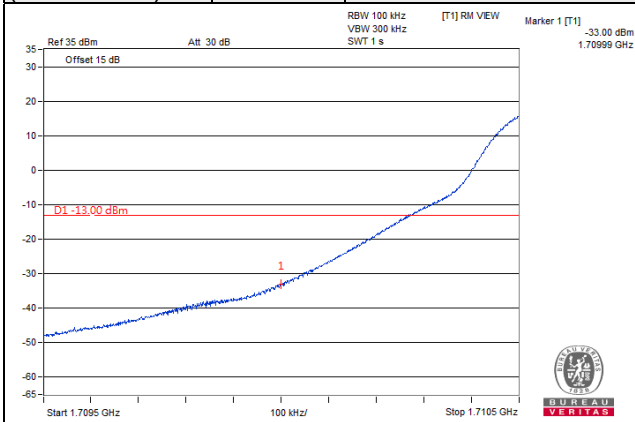
Channel 20000 (1715.0MHz)	256QAM	50 RB / 0 RB Offset		Channel 20350 (1750.0MHz)	256QAM	50 RB / 0 RB Offset
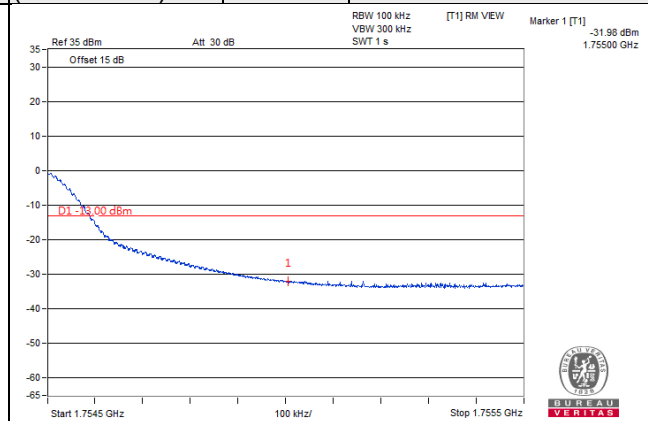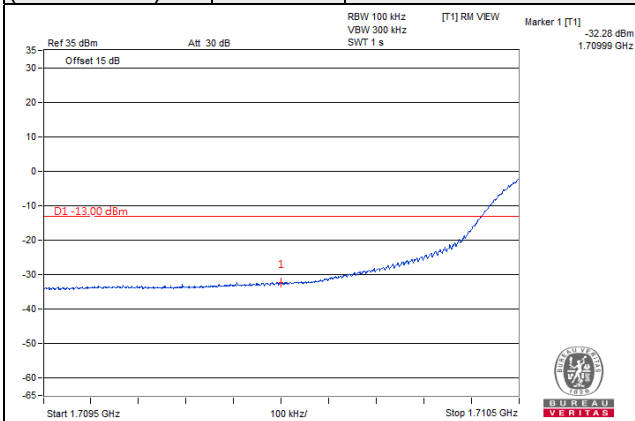
Channel Bandwidth: 15MHz						
Channel 20025 (1717.5MHz)	256QAM	1 RB / 0 RB Offset		Channel 20325 (1747.5MHz)	256QAM	1 RB / 74 RB Offset
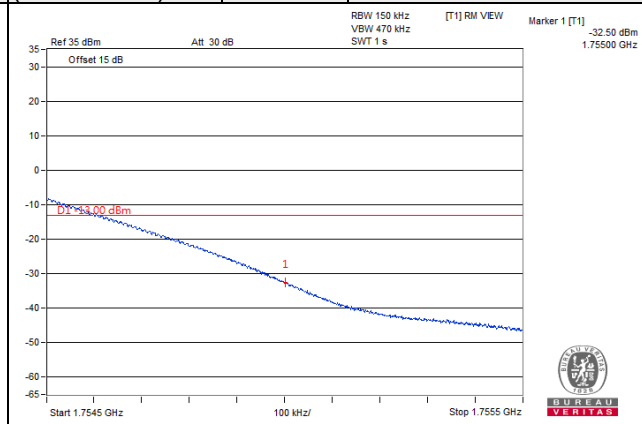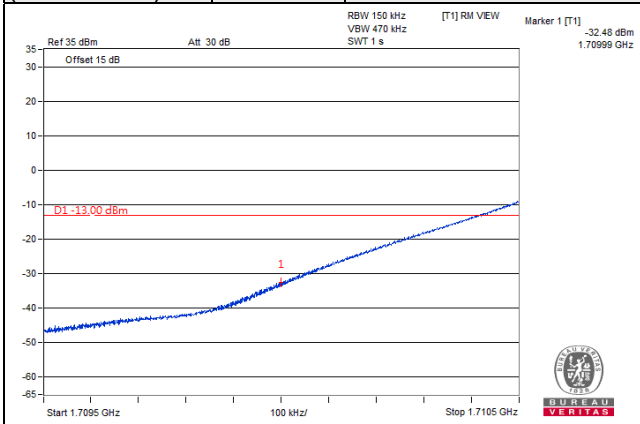
Channel 20025 (1717.5MHz)	256QAM	75 RB / 0 RB Offset		Channel 20325 (1747.5MHz)	256QAM	75 RB / 0 RB Offset
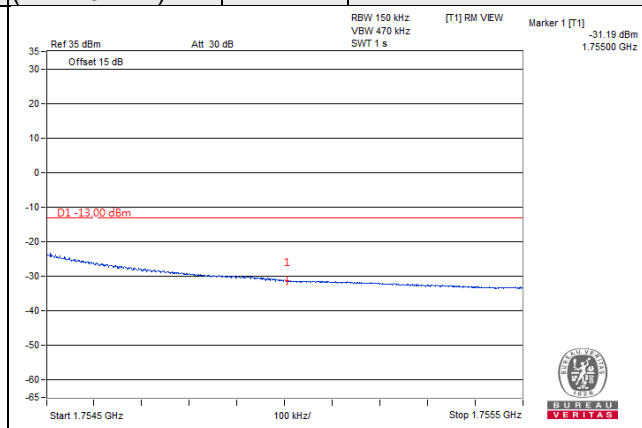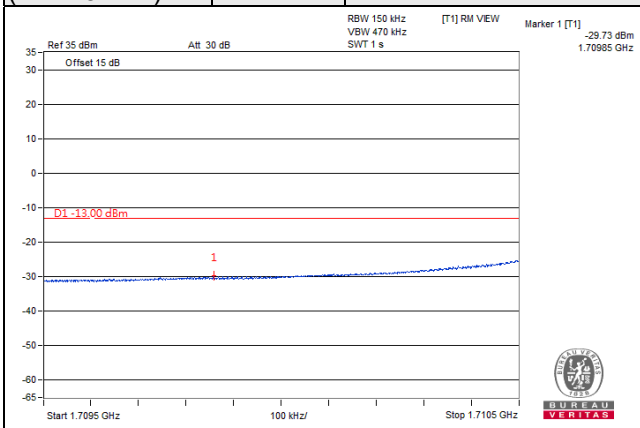
Channel Bandwidth: 20MHz					
Channel 20050 (1720.0MHz)	256QAM	1 RB / 0 RB Offset	Channel 20300 (1745.0MHz)	256QAM	1 RB / 99 RB Offset
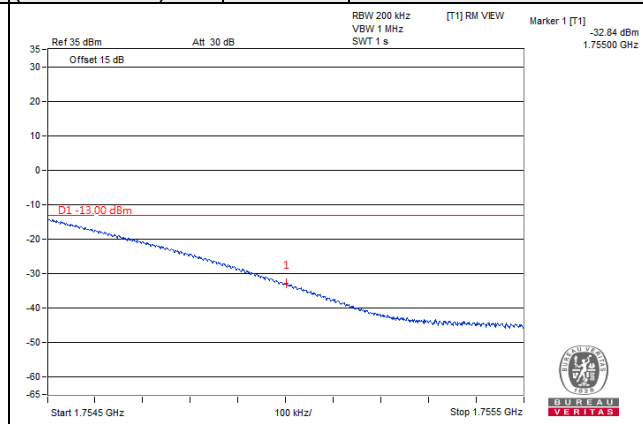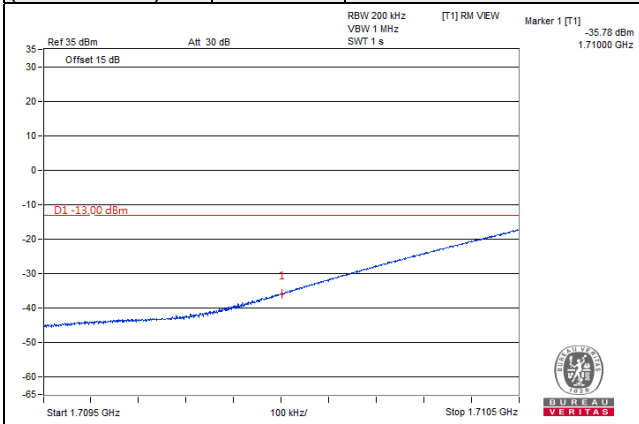
Channel 20050 (1720.0MHz)	256QAM	100 RB / 0 RB Offset	Channel 20300 (1745.0MHz)	256QAM	100 RB / 0 RB Offset
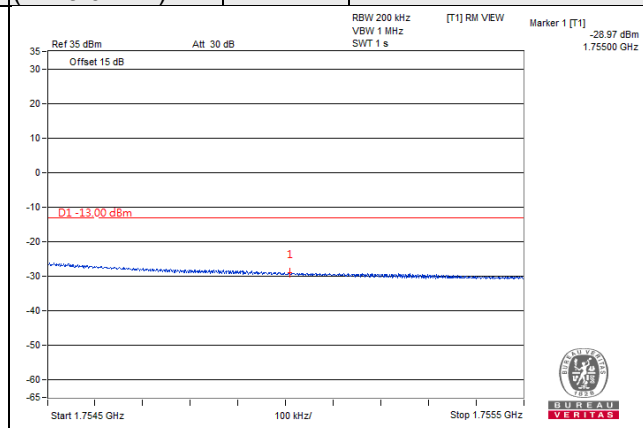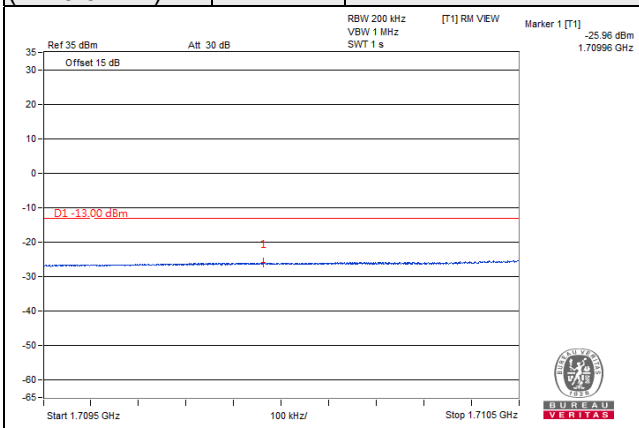
LTE Band 7
Emission Mask:

Channel Bandwidth: 5MHz					
Channel 20775 (2502.5MHz)	256QAM	1 RB / 0 RB Offset	Channel 21100 (2535.0MHz)	256QAM	1 RB / 0 RB Offset

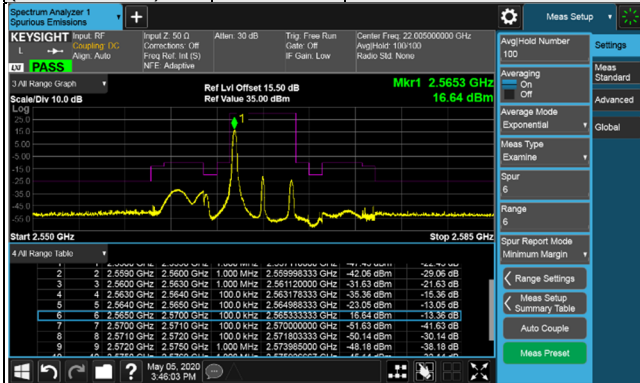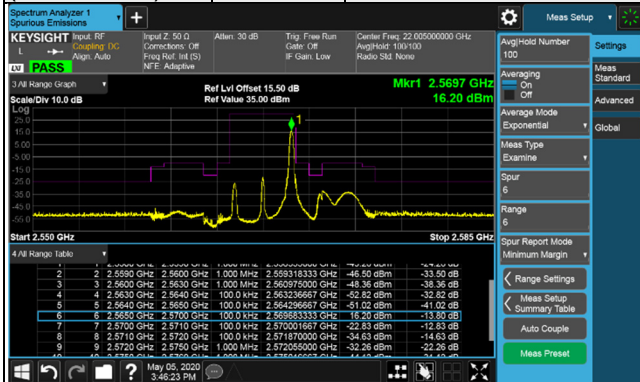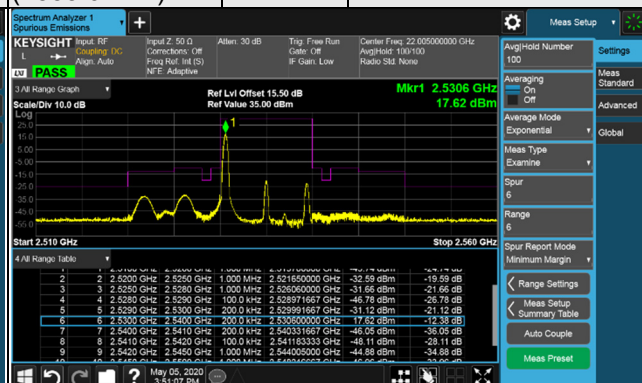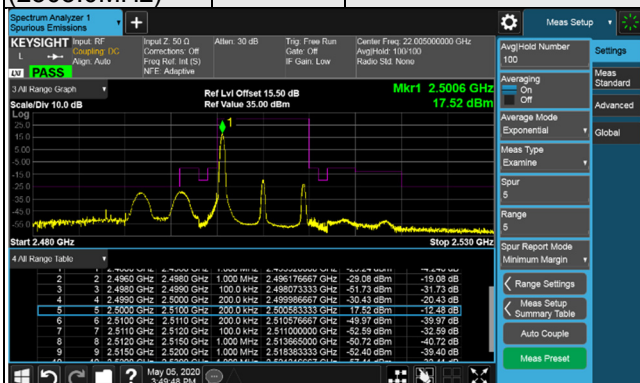| Channel 20775 (2502.5MHz)	256QAM	1 RB / 24 RB Offset	Channel 21100 (2535.0MHz)	256QAM	1 RB / 24 RB Offset
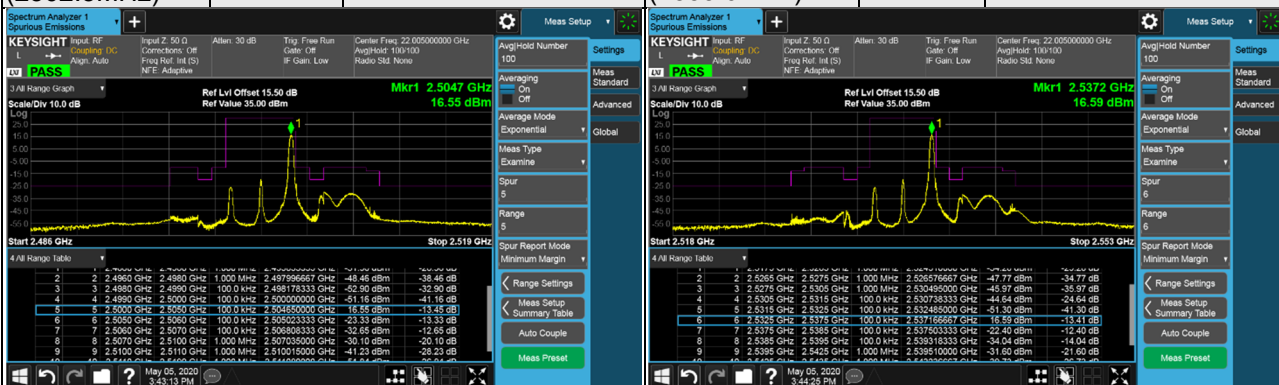
Channel 20775 (2502.5MHz)	256QAM	25 RB / 0 RB Offset	Channel 21100 (2535.0MHz)	256QAM	25 RB / 0 RB Offset

Channel Bandwidth: 5MHz					
Channel 21425 (2567.5MHz)	256QAM	1 RB / 0 RB Offset			
Channel 21425 (2567.5MHz)	256QAM	1 RB / 24 RB Offset			
Channel 21425 (2567.5MHz)	256QAM	25 RB / 0 RB Offset			
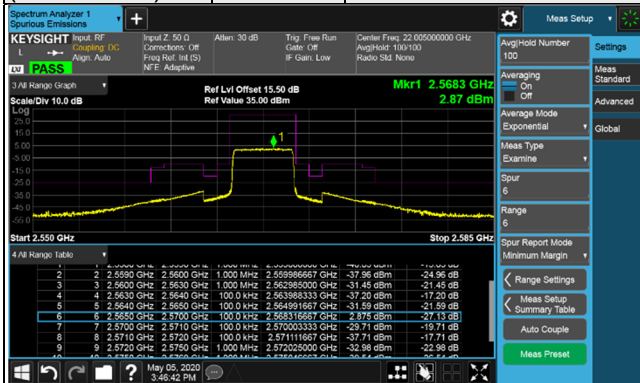
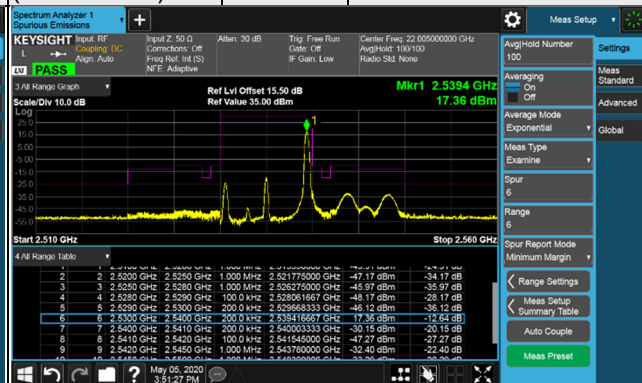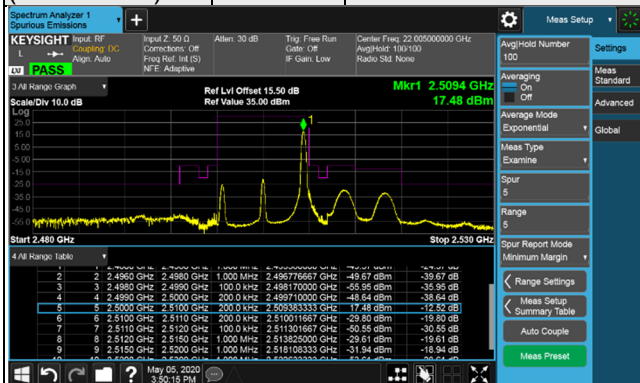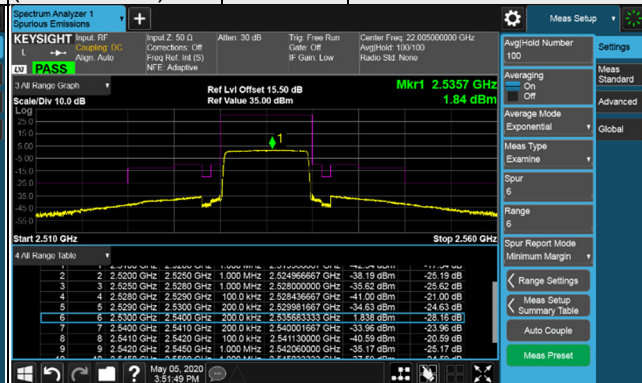| Channel Bandwidth: 10MHz					
Channel 20800 (2505.0MHz)	256QAM	1 RB / 0 RB Offset	Channel 21100 (2535.0MHz)	256QAM	1 RB / 0 RB Offset

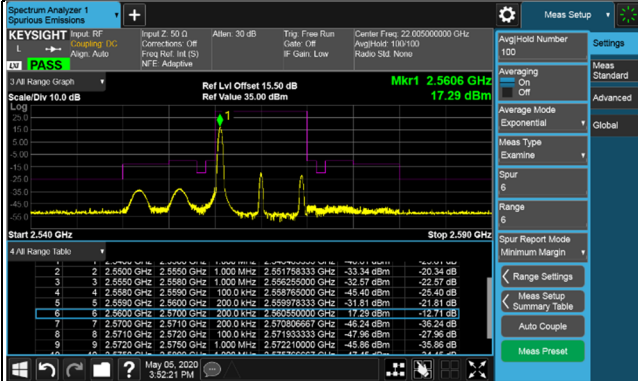| Channel 20800 (2505.0MHz)	256QAM	1 RB / 49 RB Offset	Channel 21100 (2535.0MHz)	256QAM	1 RB / 49 RB Offset

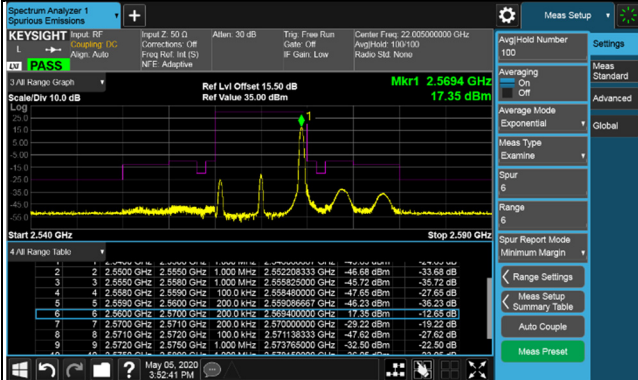| Channel 20800 (2505.0MHz)	256QAM	50 RB / 0 RB Offset	Channel 21100 (2535.0MHz)	256QAM	50 RB / 0 RB Offset
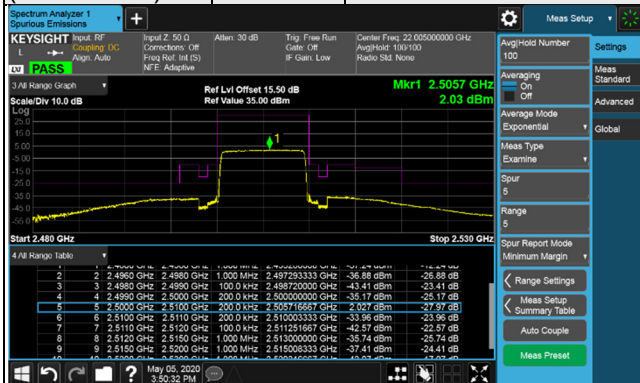
Channel Bandwidth: 10MHz					
Channel 21400 (2565.0MHz)	256QAM	1 RB / 0 RB Offset			
Channel 21400 (2565.0MHz)	256QAM	1 RB / 49 RB Offset			
Channel 21400 (2565.0MHz)	256QAM	50 RB / 0 RB Offset			