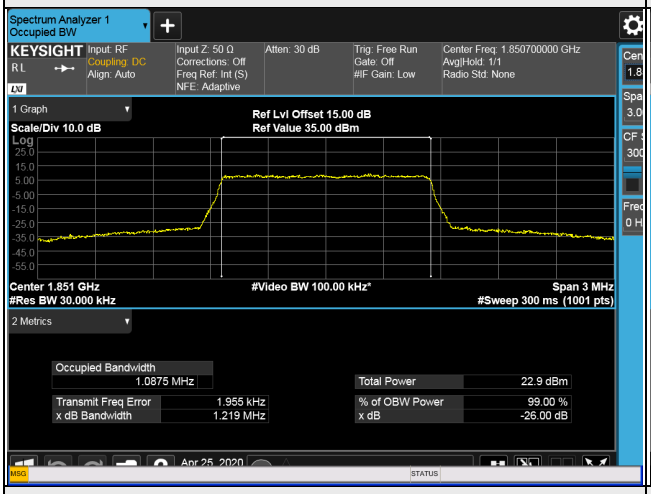
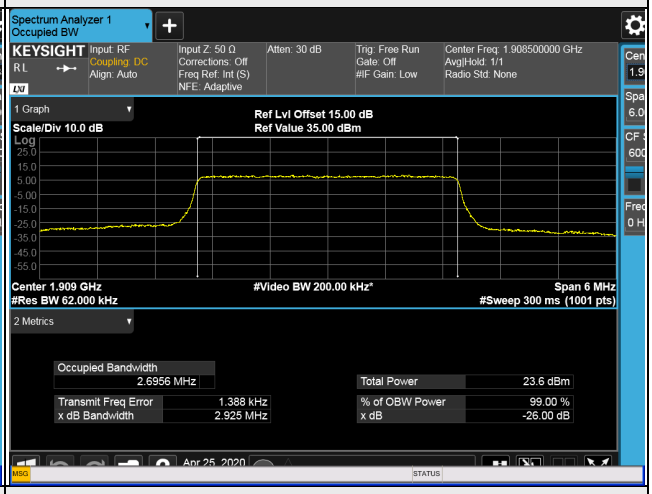
Spectrum Plot of Worst Value

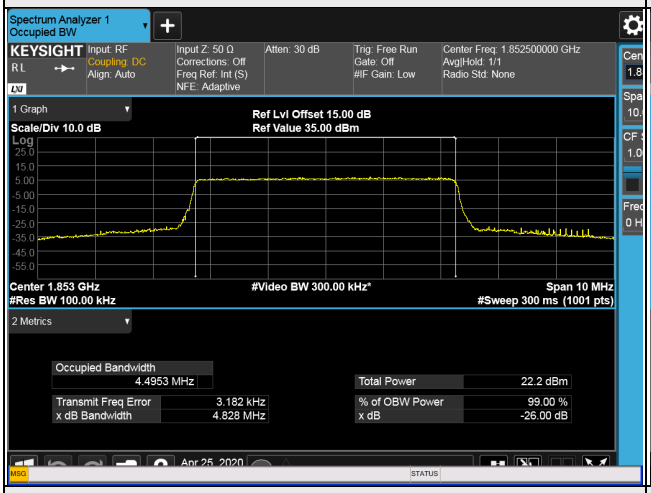
1.4MHz / 64QAM



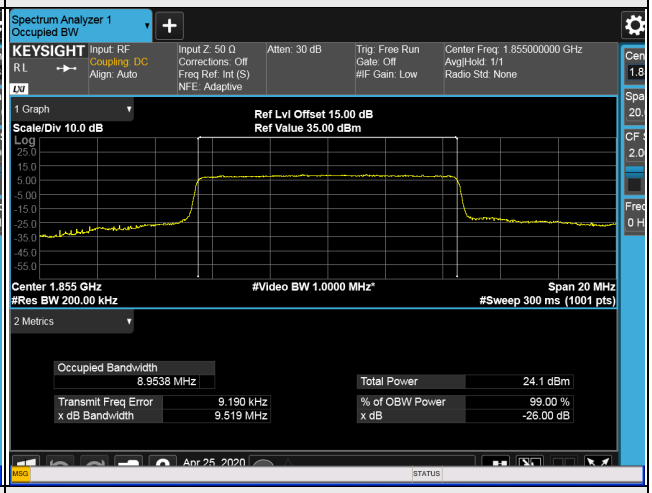
3MHz / 16QAM



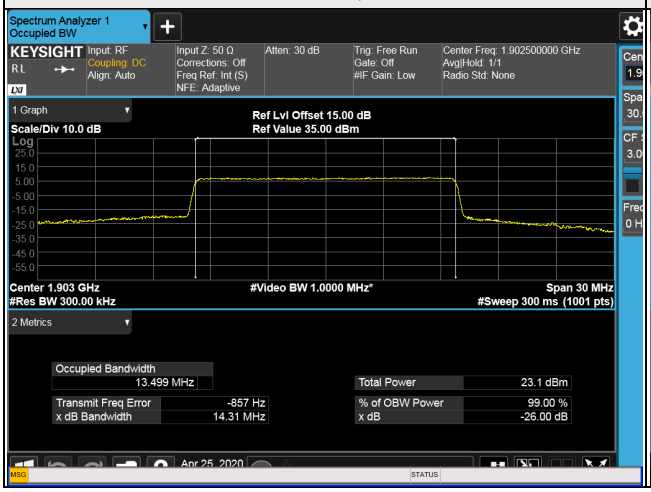
5MHz / 64QAM



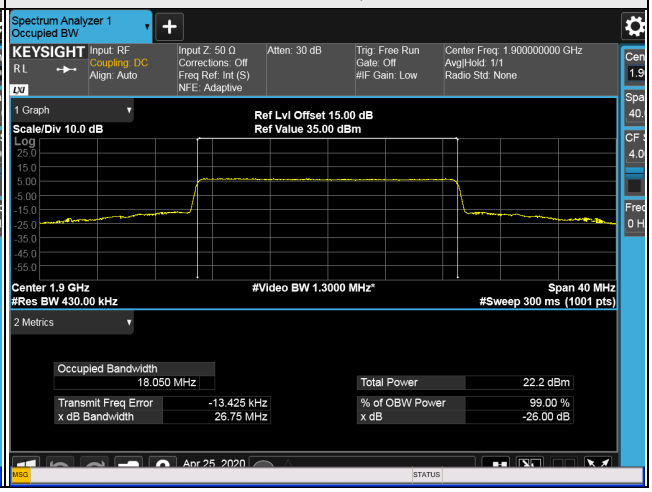
10MHz / QPSK



15MHz / QPSK



20MHz / QPSK



LTE Band 25, Channel Bandwidth 1.4MHz				
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		
		QPSK	16QAM	64QAM
26047	1850.7	1.22	1.22	1.22
26365	1882.5	1.21	1.22	1.22
26683	1914.3	1.22	1.22	1.22

LTE Band 25, Channel Bandwidth 3MHz				
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		
		QPSK	16QAM	64QAM
26055	1851.5	2.92	2.94	2.92
26365	1882.5	2.91	2.93	2.92
26675	1913.5	2.92	2.94	2.92

LTE Band 25, Channel Bandwidth 5MHz				
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		
		QPSK	16QAM	64QAM
26065	1852.5	4.79	4.80	4.80
26365	1882.5	4.81	4.79	4.79
26665	1912.5	4.81	4.80	4.81

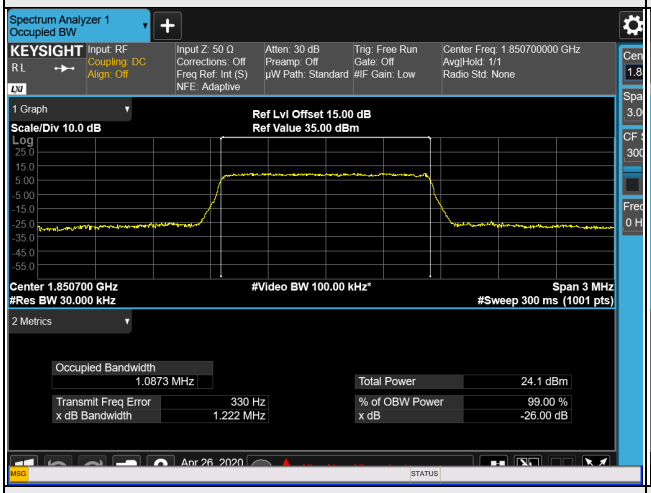
LTE Band 25, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		
		QPSK	16QAM	64QAM
26090	1855.0	9.51	9.51	9.51
26365	1882.5	9.50	9.51	9.51
26640	1910.0	9.51	9.51	9.51

LTE Band 25, Channel Bandwidth 15MHz				
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		
		QPSK	16QAM	64QAM
26115	1857.5	14.24	14.25	14.23
26365	1882.5	14.24	14.26	14.25
26615	1907.5	14.24	14.25	14.25

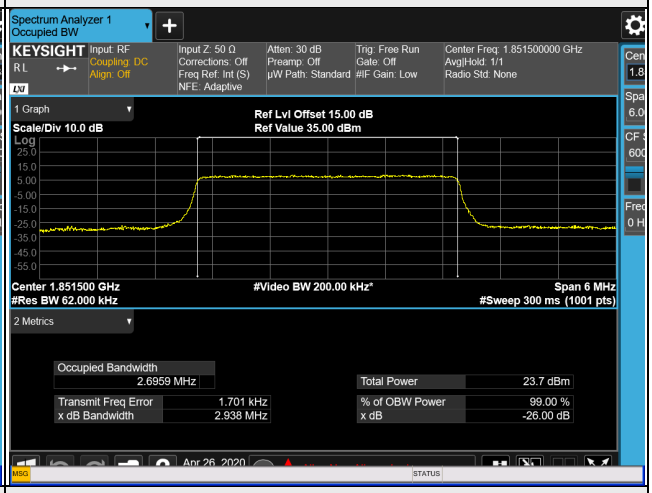
LTE Band 25, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)		
		QPSK	16QAM	64QAM
26140	1860.0	19.01	19.02	19.04
26365	1882.5	19.02	19.03	19.03
26590	1905.0	19.04	19.03	19.08

Spectrum Plot of Worst Value

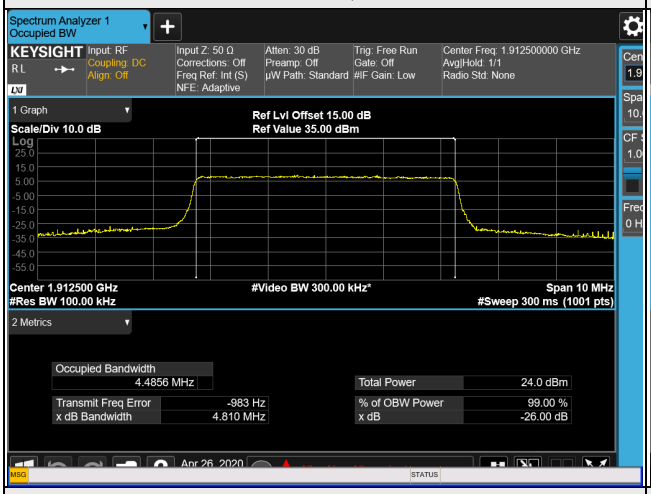
1.4MHz / 64QAM



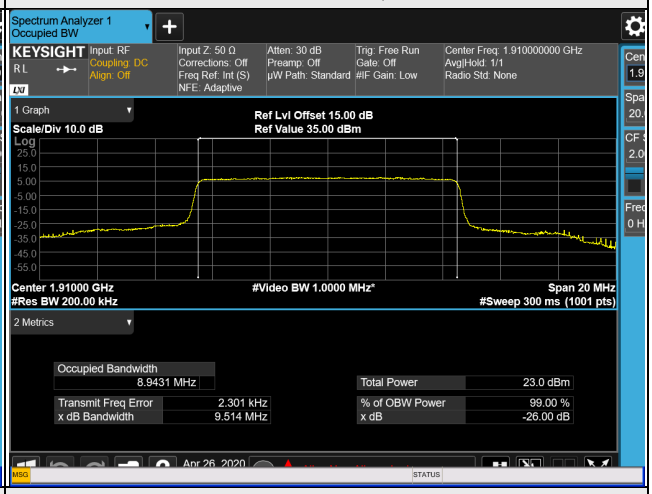
3MHz / 16QAM



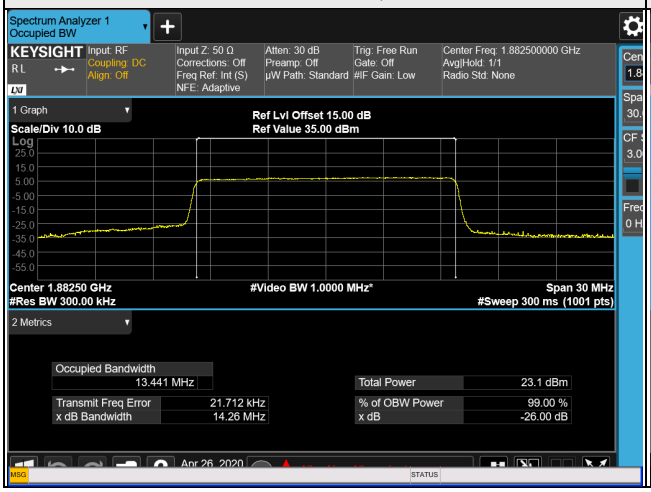
5MHz / QPSK



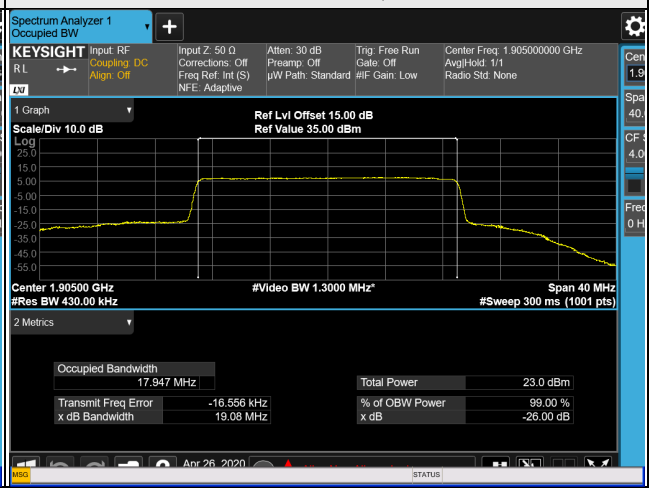
10MHz / 64QAM



15MHz / 16QAM

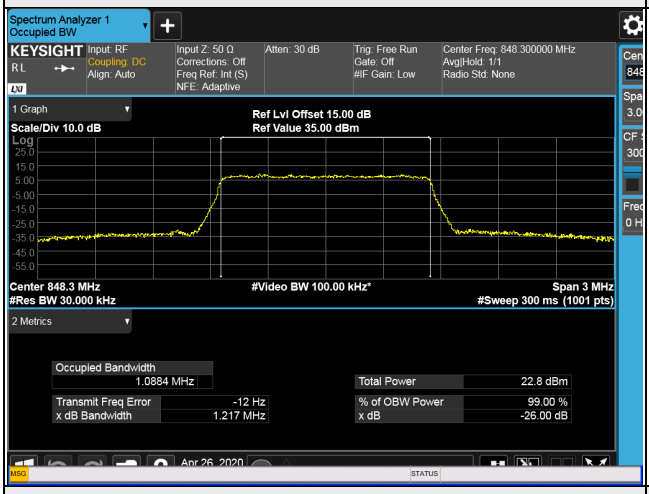
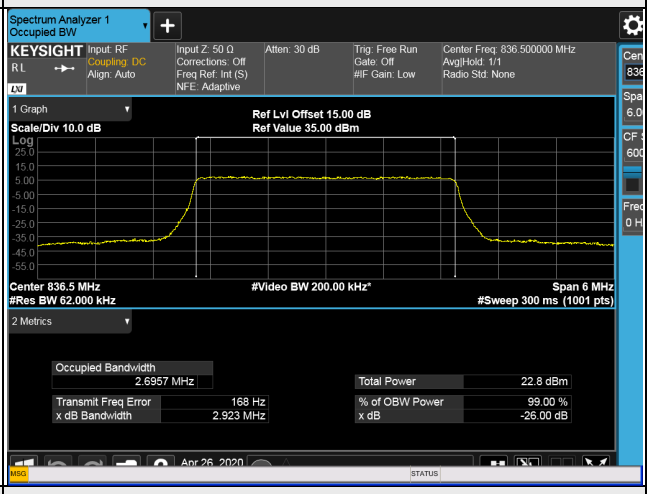
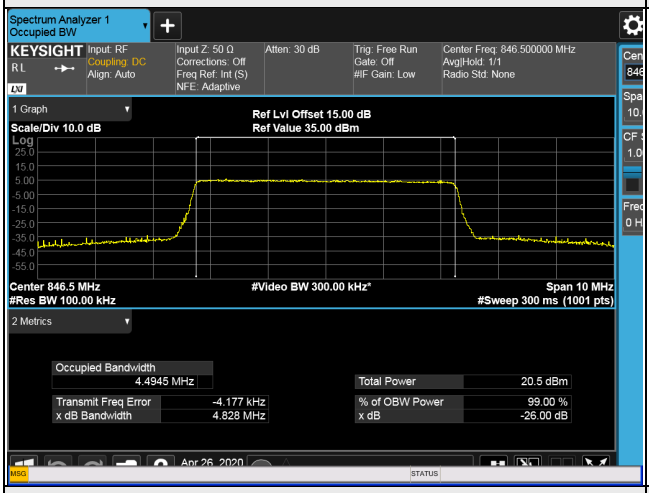
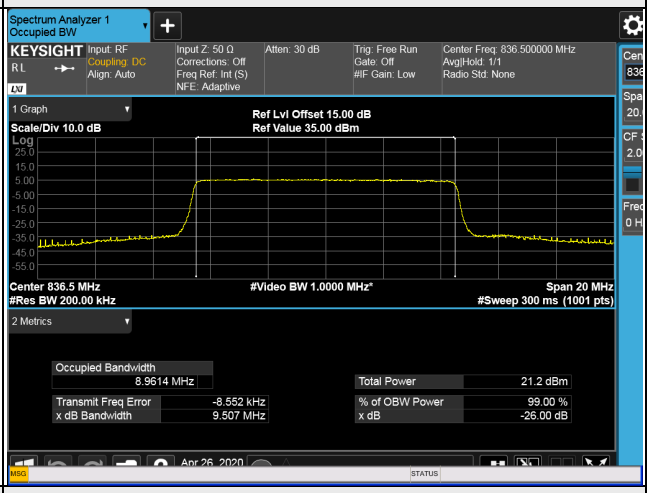
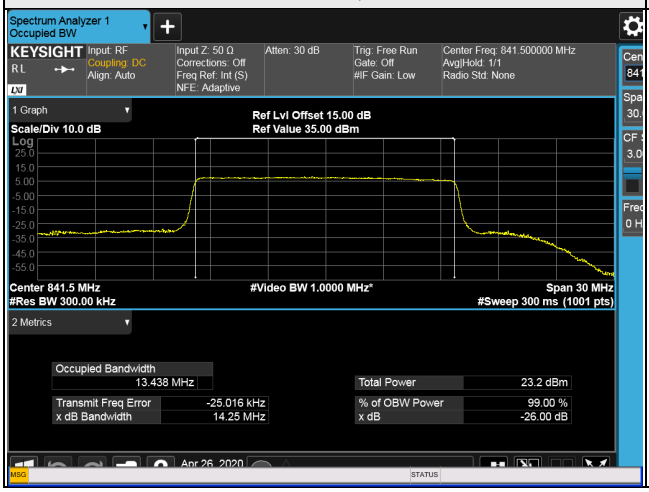


20MHz / 64QAM



LTE Band 26 (Part 22)

LTE Band 26 (Part 22), Channel Bandwidth 1.4MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
26797	824.7	1.21	1.21	1.21
26915	836.5	1.21	1.21	1.21
27033	848.3	1.21	1.22	1.22
LTE Band 26 (Part 22), Channel Bandwidth 3MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
26805	825.5	2.92	2.92	2.90
26915	836.5	2.92	2.92	2.91
27025	847.5	2.92	2.92	2.90
LTE Band 26 (Part 22), Channel Bandwidth 5MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
26815	826.5	4.79	4.79	4.82
26915	836.5	4.79	4.80	4.83
27015	846.5	4.80	4.80	4.83
LTE Band 26 (Part 22), Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
26840	829.0	9.49	9.49	9.50
26915	836.5	9.51	9.50	9.51
26990	844.0	9.48	9.49	9.50
LTE Band 26 (Part 22), Channel Bandwidth 15MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
26865	831.5	14.23	14.22	14.23
26915	836.5	14.24	14.23	14.24
26965	841.5	14.25	14.23	14.22

Spectrum Plot of Worst Value	
1.4MHz / 16QAM	3MHz / 16QAM
	
5MHz / 64QAM	10MHz / 64QAM
	
15MHz / QPSK	
	

LTE Band 26 (Part 90)

LTE Band 26 (Part 90), Channel Bandwidth 1.4MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
26697	814.7	1.22	1.22	1.21
26740	819.0	1.21	1.22	1.21
26783	823.3	1.21	1.22	1.21

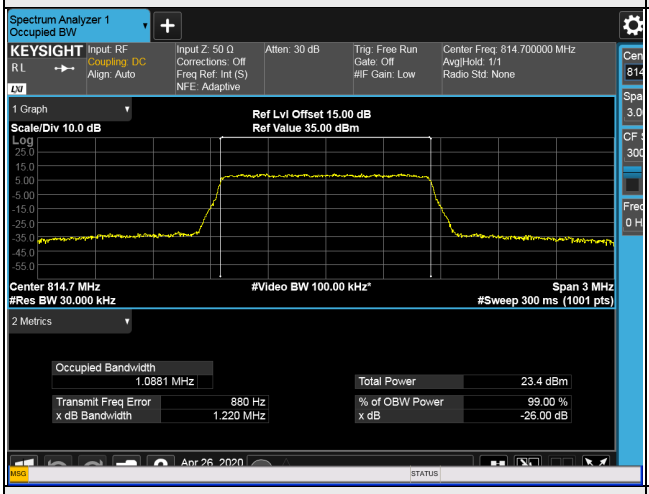
LTE Band 26 (Part 90), Channel Bandwidth 3MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
26705	815.5	2.91	2.92	2.92
26740	819.0	2.92	2.92	2.93
26775	822.5	2.91	2.92	2.92

LTE Band 26 (Part 90), Channel Bandwidth 5MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
26715	816.5	4.79	4.79	4.81
26740	819.0	4.78	4.80	4.80
26765	821.5	4.80	4.80	4.79

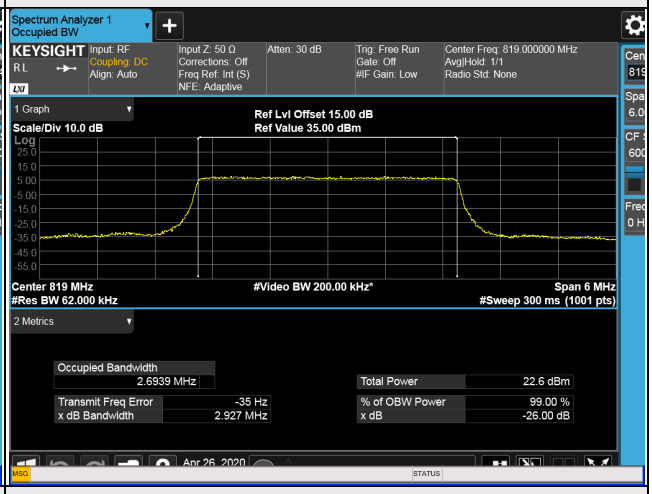
LTE Band 26 (Part 90), Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
26740	819.0	9.52	9.51	9.50

Spectrum Plot of Worst Value

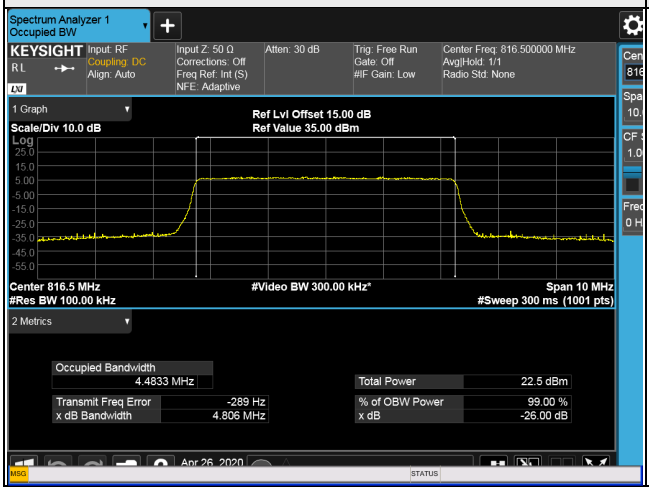
1.4MHz / 16QAM



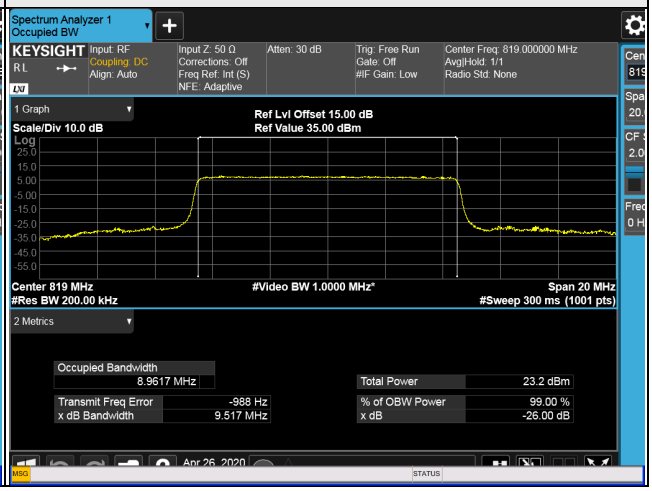
3MHz / 64QAM



5MHz / 64QAM

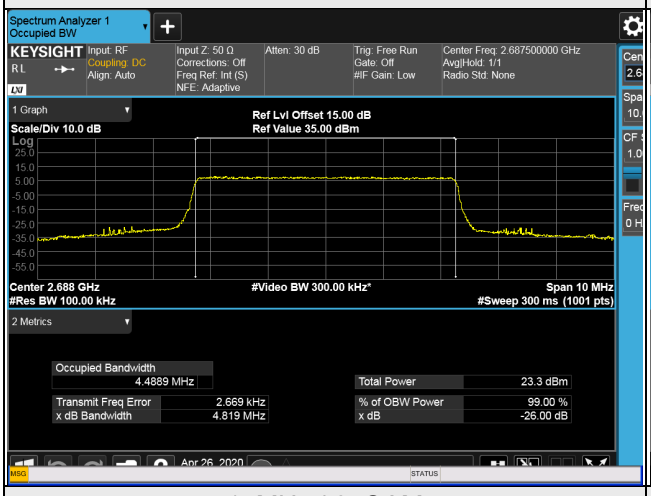
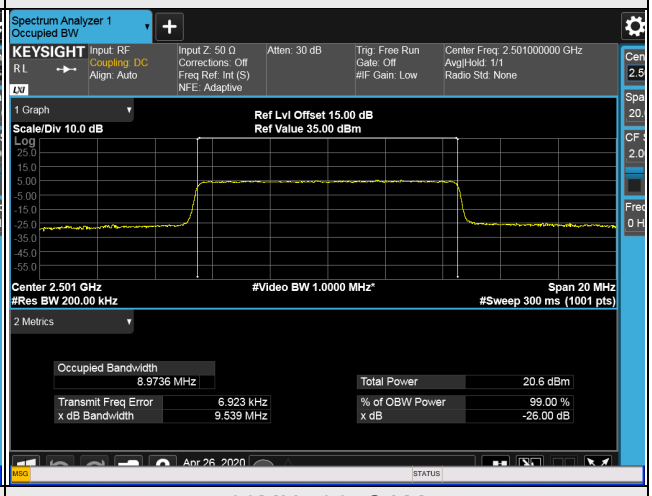
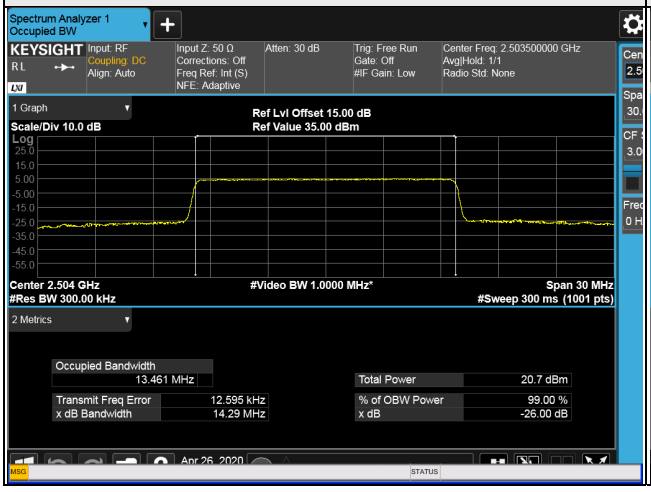
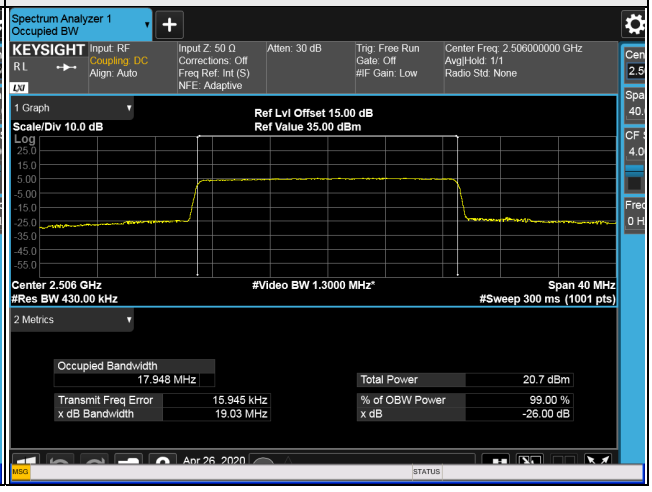


10MHz / QPSK



LTE Band 41

LTE Band 41, Channel Bandwidth 5MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
39675	2498.5	4.80	4.80	4.79
40620	2593	4.80	4.80	4.78
41565	2687.5	4.82	4.78	4.81
LTE Band 41, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
39700	2501	9.46	9.52	9.54
40620	2593	9.49	9.50	9.51
41540	2685	9.48	9.50	9.50
LTE Band 41, Channel Bandwidth 15MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
39725	2503.5	14.27	14.24	14.29
40620	2593	14.27	14.24	14.23
41515	2682.5	14.24	14.22	14.25
LTE Band 41, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
39750	2506	19.02	19.01	19.03
40620	2593	19.00	18.99	19.01
41490	2680	18.99	19.01	19.01

Spectrum Plot of Worst Value	
5MHz / QPSK	10MHz / 64QAM
	
15MHz / 64QAM	20MHz / 64QAM
	

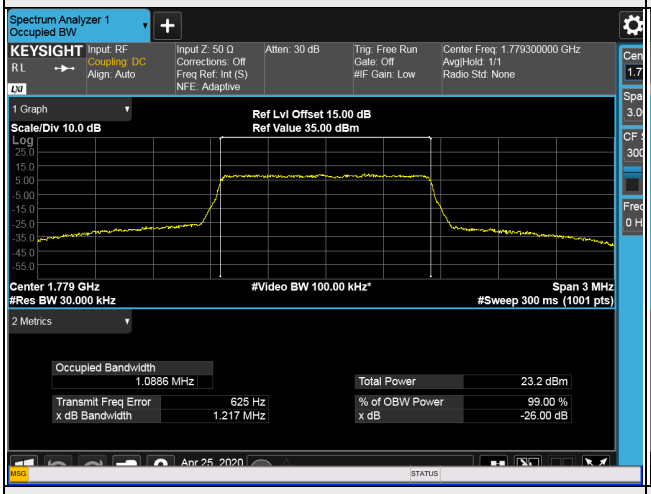
LTE Band 66

LTE Band 66, Channel Bandwidth 1.4MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
131979	1710.7	1.21	1.21	1.21
132322	1745.0	1.22	1.22	1.21
132665	1779.3	1.22	1.22	1.22
LTE Band 66, Channel Bandwidth 3MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
131987	1711.5	2.92	2.93	2.91
132322	1745.0	2.91	2.93	2.91
132657	1778.5	2.92	2.94	2.89
LTE Band 66, Channel Bandwidth 5MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
131997	1712.5	4.81	4.80	4.83
132322	1745.0	4.80	4.79	4.83
132647	1777.5	4.79	4.79	4.83
LTE Band 66, Channel Bandwidth 10MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
132022	1715.0	9.51	9.50	9.52
132322	1745.0	9.50	9.51	9.51
132622	1775.0	9.51	9.51	9.52
LTE Band 66, Channel Bandwidth 15MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
132047	1717.5	14.25	14.25	14.22
132322	1745.0	14.25	14.26	14.25
132597	1772.5	14.28	14.28	14.29

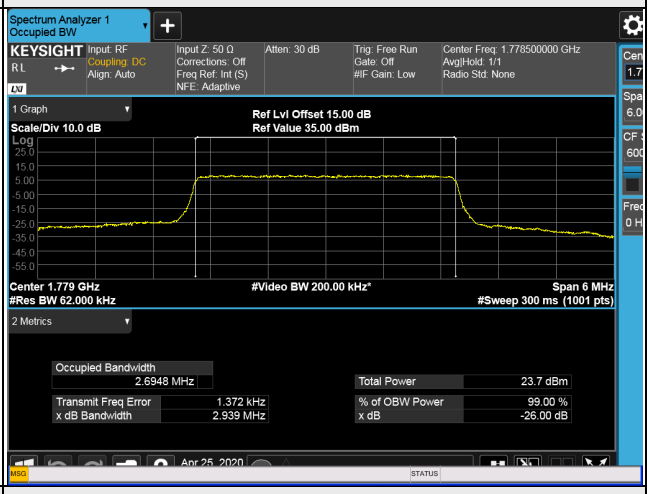
LTE Band 66, Channel Bandwidth 20MHz				
Channel	Frequency (MHz)	26dB Bandwidth (MHz)		
		QPSK	16QAM	64QAM
132072	1720.0	19.04	19.02	19.01
132322	1745.0	19.04	19.04	19.06
132572	1770.0	19.22	19.18	19.13

Spectrum Plot of Worst Value

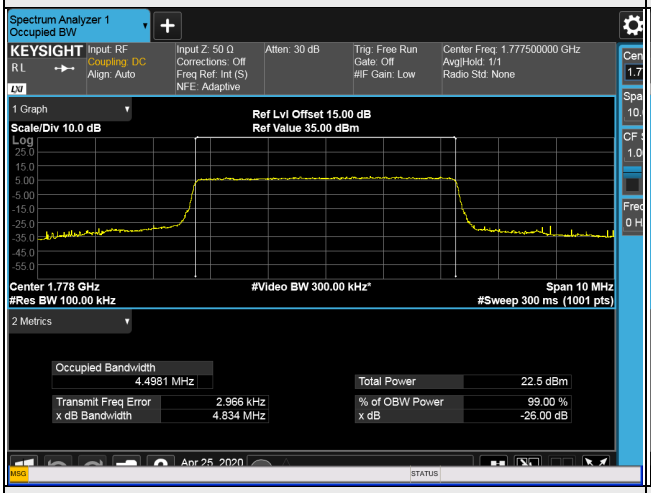
1.4MHz / 64QAM



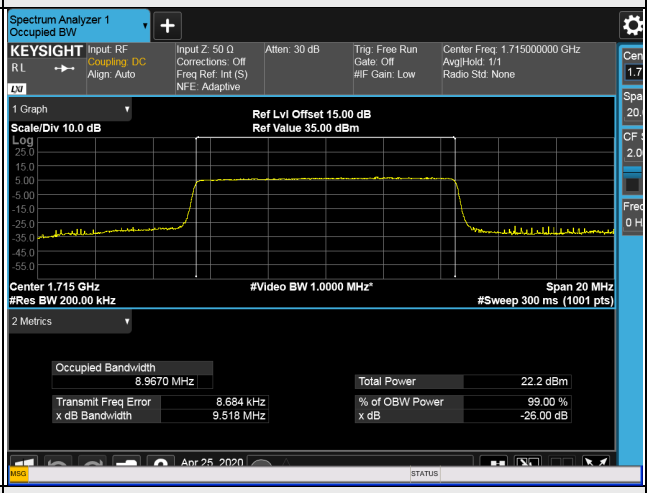
3MHz / 16QAM



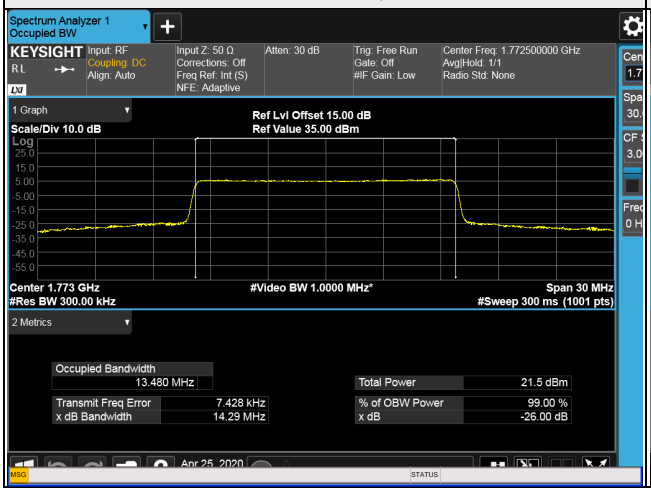
5MHz / 64QAM



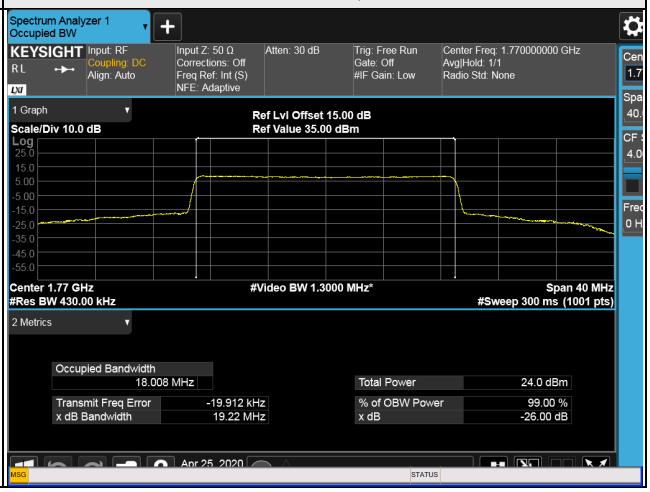
10MHz / 64QAM



15MHz / 64QAM



20MHz / QPSK



4.5 Channel Edge Measurement

4.5.1 Limits of Band Edge Measurement

For n41
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 2, LTE Band 25, LTE Band 26
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. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

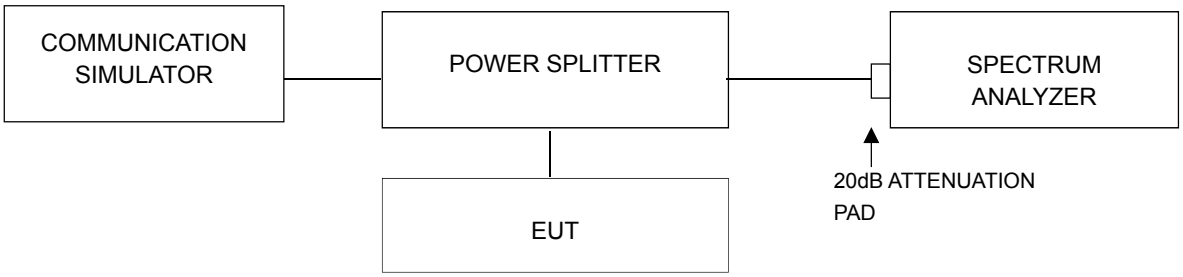
LTE Band 26 (Part 90):
Emission Mask:
According to FCC part 90.691 shall be tested the emission mask. For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 $Log_{10}(f/6.1)$ decibels or 50 + $10Log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.
For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + $10Log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

For § 90.691(a), RBW=300 Hz for offset less than 37.5 kHz from channel edge and RBW=100 kHz for offsets greater than 37.5 kHz is allowed, tested in accordance with FCC KDB 971168 D02 section VIII.

For LTE Band 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 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.

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. n41 operations in the 20 MHz to 100 MHz channel BW mode, extend the 1% range from 1M to 2M above and below the channel edge and then reduce the limit. As an alternative, the highest power level measured in a narrower RBW (relative to the specified reference bandwidth) can be scaled by applying a correction factor determined from: 10 log [(reference bandwidth) / (resolution or measurement bandwidth)] measurement procedure refer to ANSI 63.26 section 5.7.2 a)

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

For LTE Band 26 (Part 22)

a. All measurements were done at low and high operational frequency range.

b. The center frequency of spectrum is the band edge frequency and span is 10MHz. RB of the spectrum is 51kHz and VB of the spectrum is 150kHz (WCDMA / HSDPA / HSUPA).

c. 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).

d. 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).

e. 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).

f. 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).

g. 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).

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

For LTE Band 26 (Part 90)

a. The measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

b. Record the test plot.

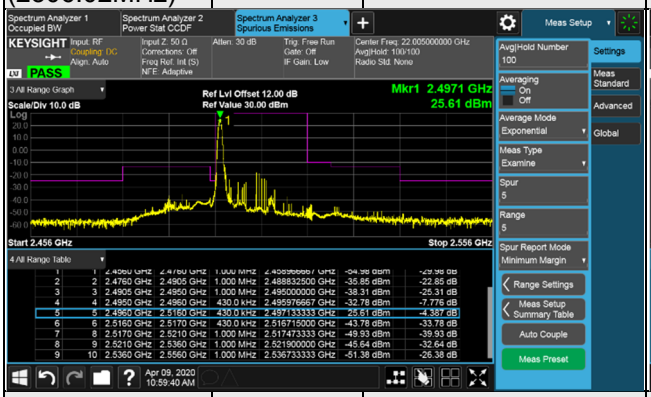
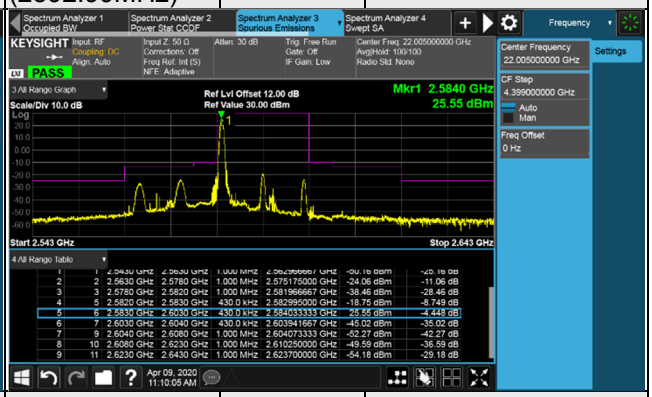
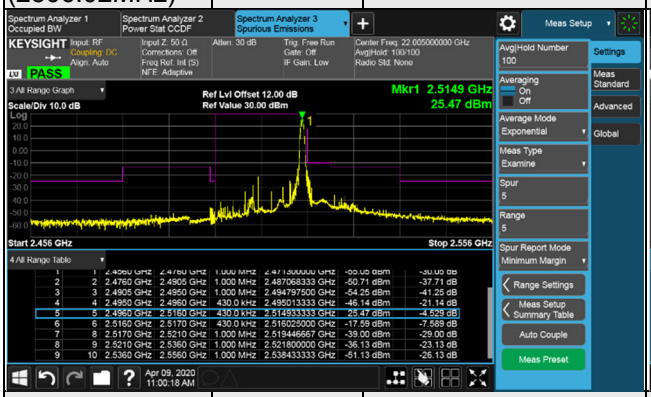
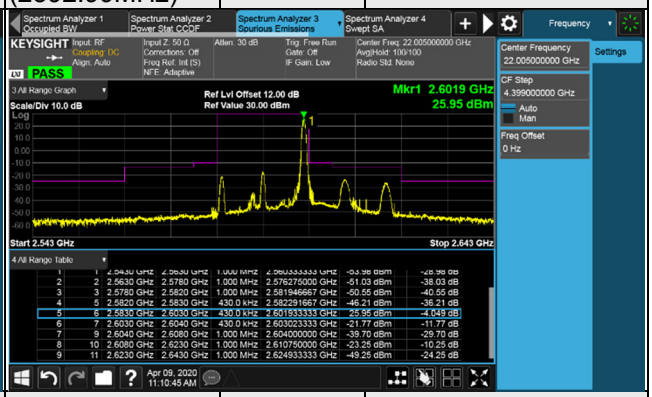
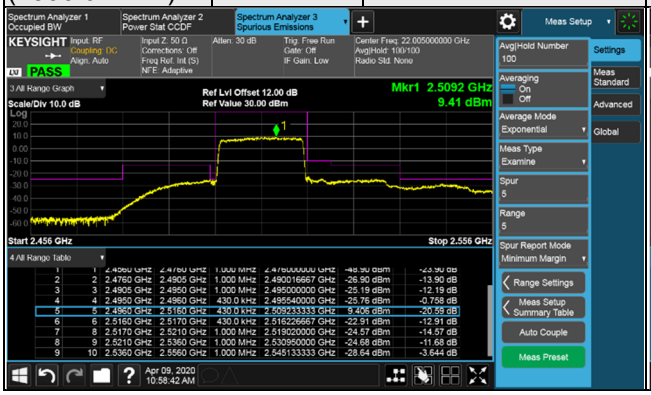
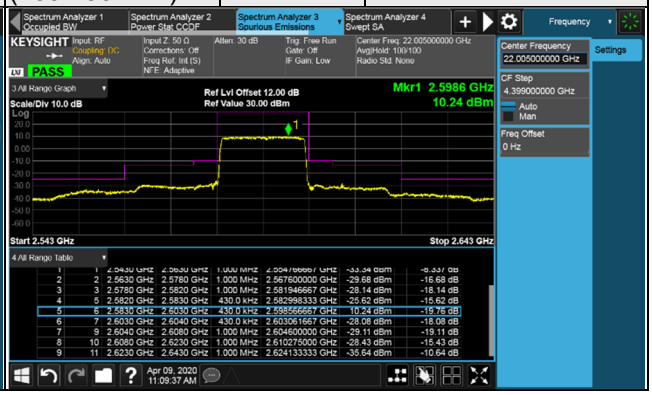
For LTE Band 41, LTE Band 66

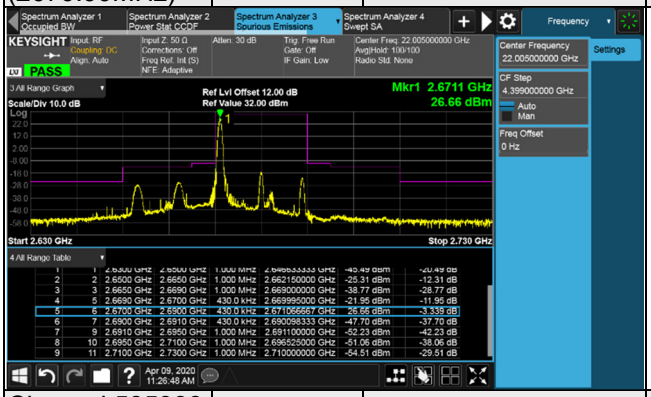
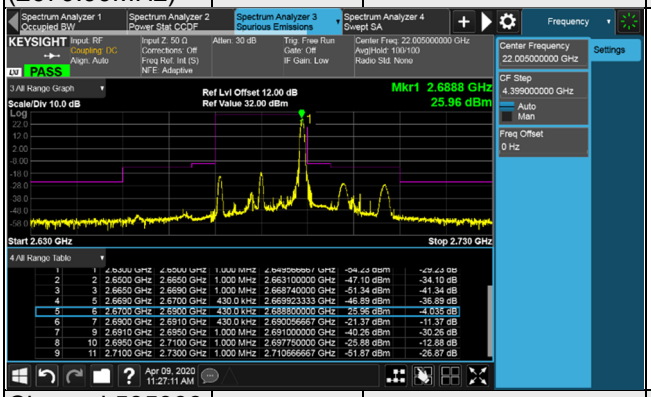
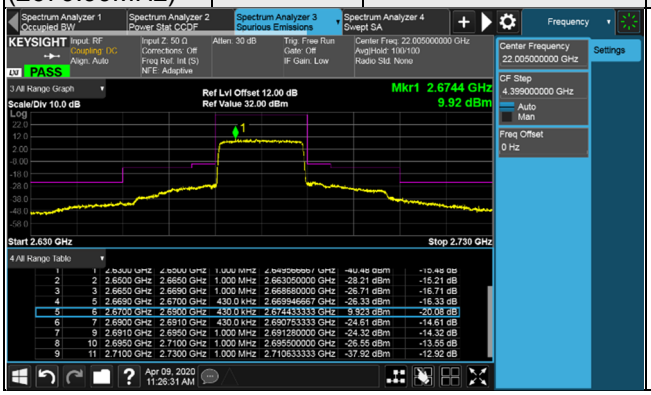
a. The EUT was set up for the rated peak power. The power was measured with Spectrum Analyzer. Band edge measurements were done at 2 channels: low, middle and high operational frequency range. Emission mask measurements were done at 3 channels: low and high operational frequency range.
b. The center 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. LTE 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.
i. Record the max trace plot into the test report.

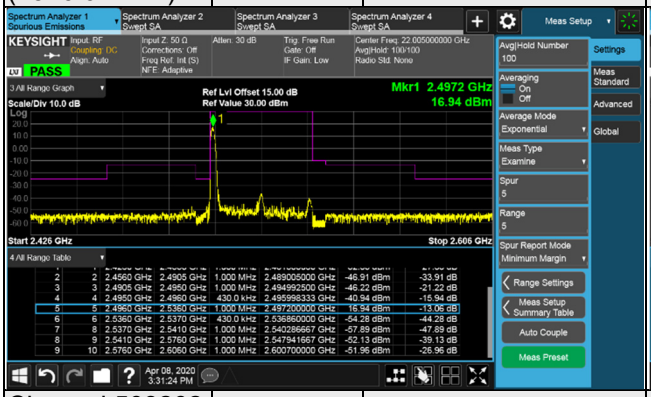
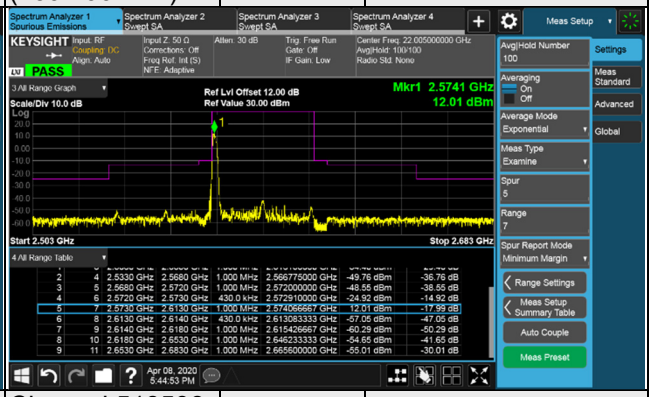
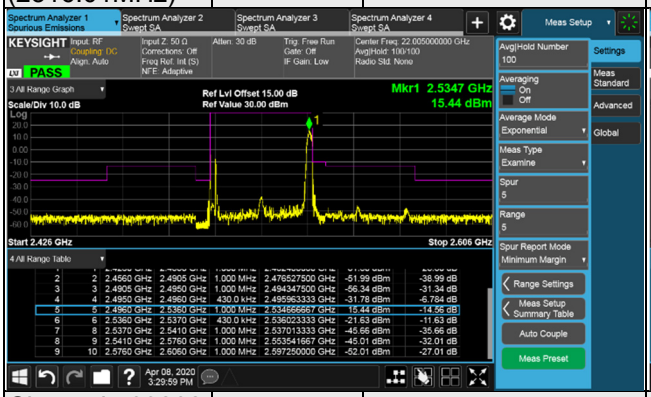
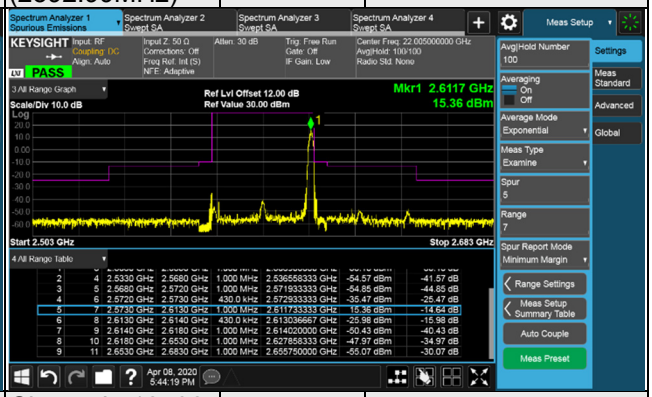
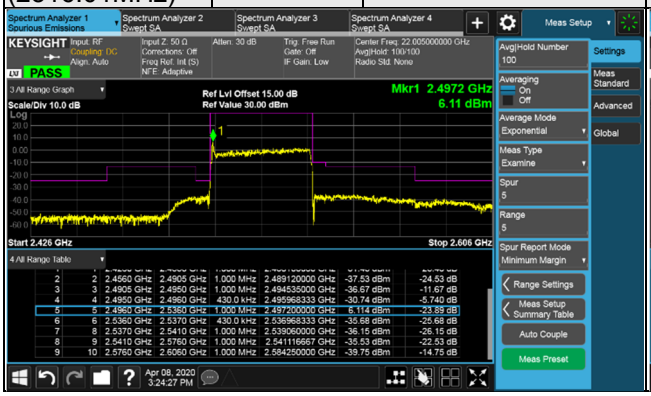
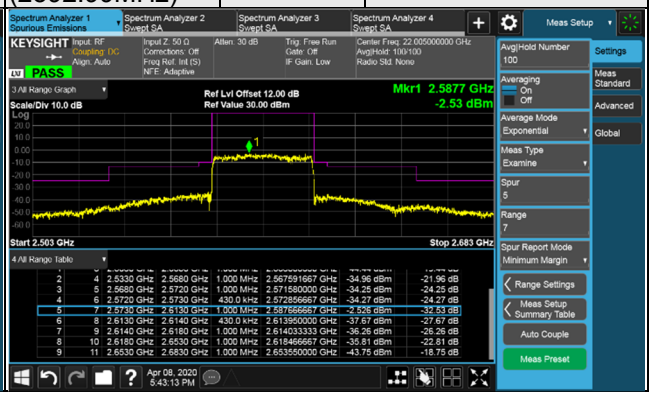
4.5.4 Test Results

n41

Emission Mask:

Channel Bandwidth: 20MHz					
Channel 501204 (2506.02MHz)	$\pi/2$ BPSK	1 RB / 0 RB Offset	Channel 518598 (2592.99MHz)	$\pi/2$ BPSK	1 RB / 0 RB Offset
					
Channel 501204 (2506.02MHz)	$\pi/2$ BPSK	1 RB / 50 RB Offset	Channel 518598 (2592.99MHz)	$\pi/2$ BPSK	1 RB / 50 RB Offset
					
Channel 501204 (2506.02MHz)	$\pi/2$ BPSK	51 RB / 0 RB Offset	Channel 518598 (2592.99MHz)	$\pi/2$ BPSK	51 RB / 0 RB Offset
					

Channel Bandwidth: 20MHz					
Channel 535998 (2679.99MHz)	$\pi/2$ BPSK	1 RB / 0 RB Offset			
					
Channel 535998 (2679.99MHz)	$\pi/2$ BPSK	1 RB / 50 RB Offset			
					
Channel 535998 (2679.99MHz)	$\pi/2$ BPSK	51 RB / 0 RB Offset			
					

Channel Bandwidth: 40MHz					
Channel 503202 (2516.01MHz)	$\pi/2$ BPSK	1 RB / 0 RB Offset	Channel 518598 (2592.99MHz)	$\pi/2$ BPSK	1 RB / 0 RB Offset
					
Channel 503202 (2516.01MHz)	$\pi/2$ BPSK	1 RB / 105 RB Offset	Channel 518598 (2592.99MHz)	$\pi/2$ BPSK	1 RB / 105 RB Offset
					
Channel 503202 (2516.01MHz)	$\pi/2$ BPSK	106 RB / 0 RB Offset	Channel 518598 (2592.99MHz)	$\pi/2$ BPSK	106 RB / 0 RB Offset