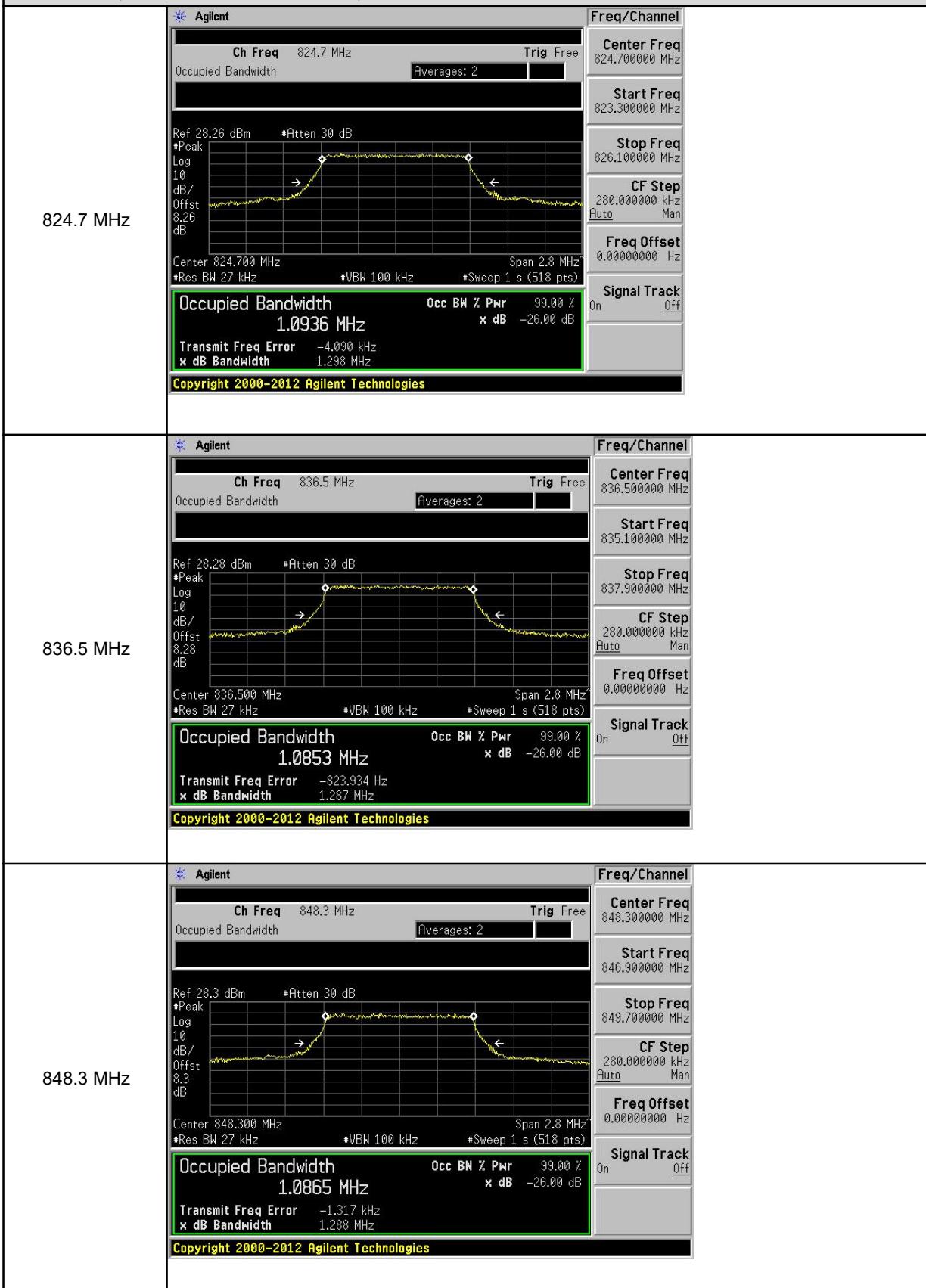
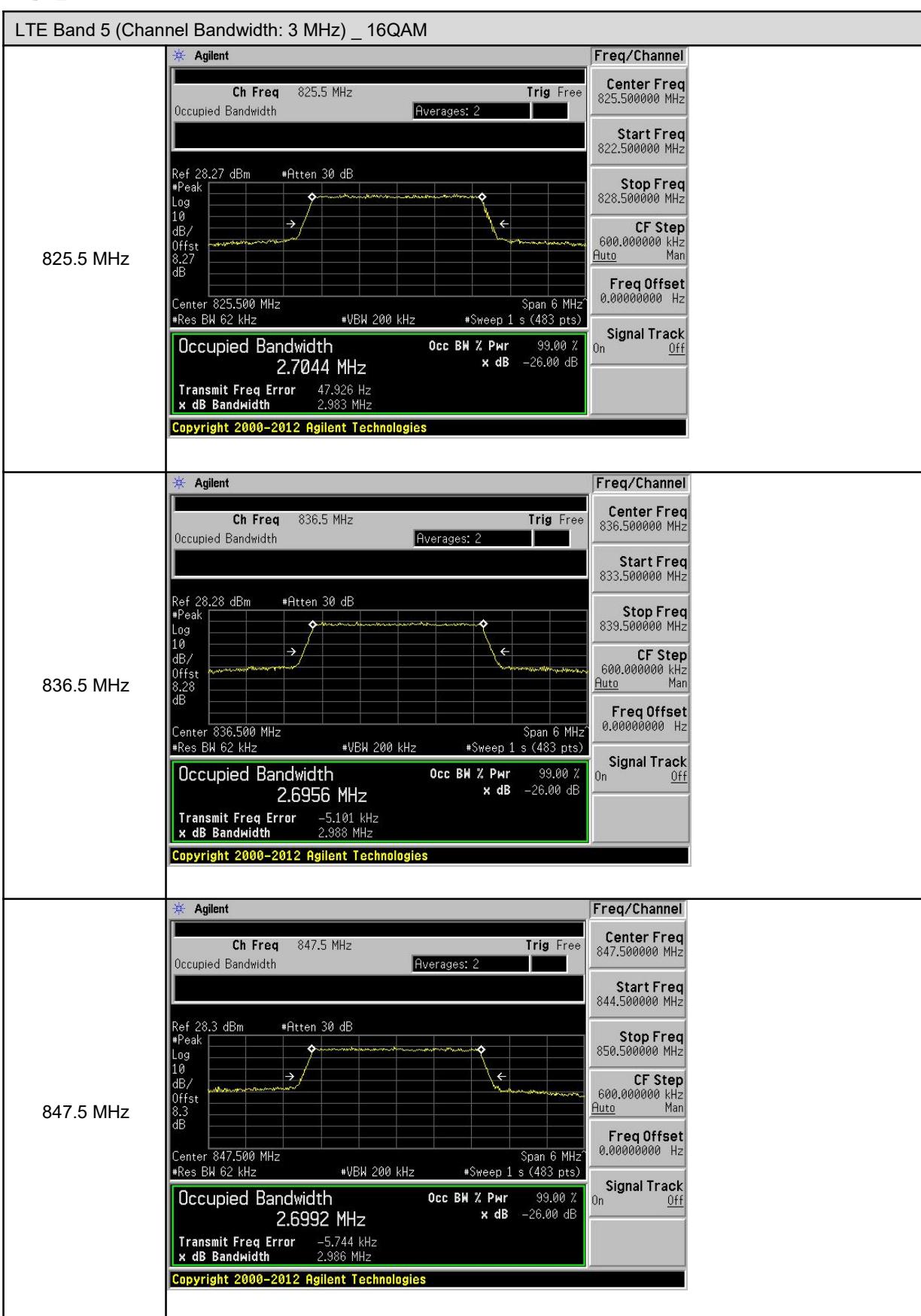
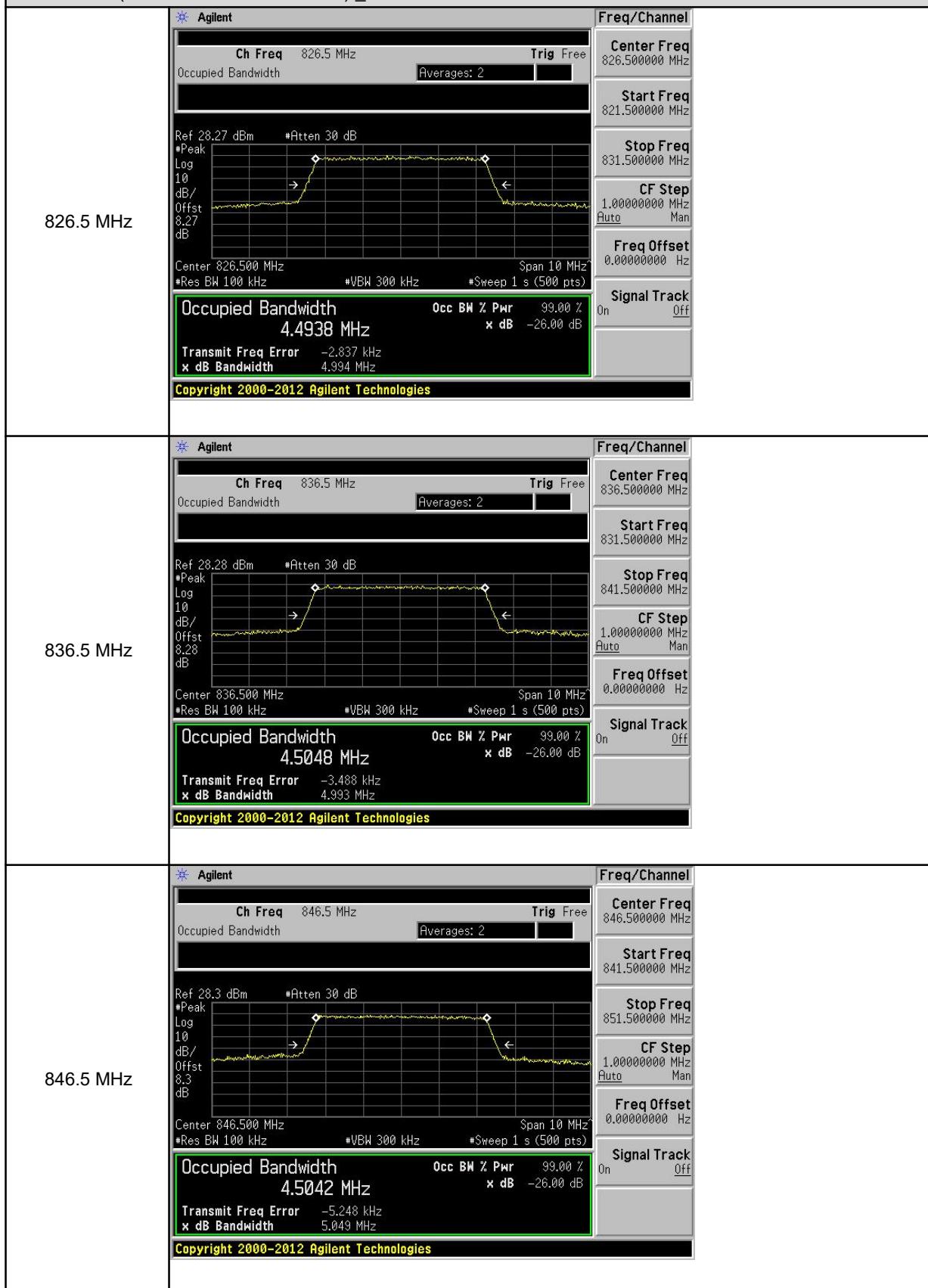


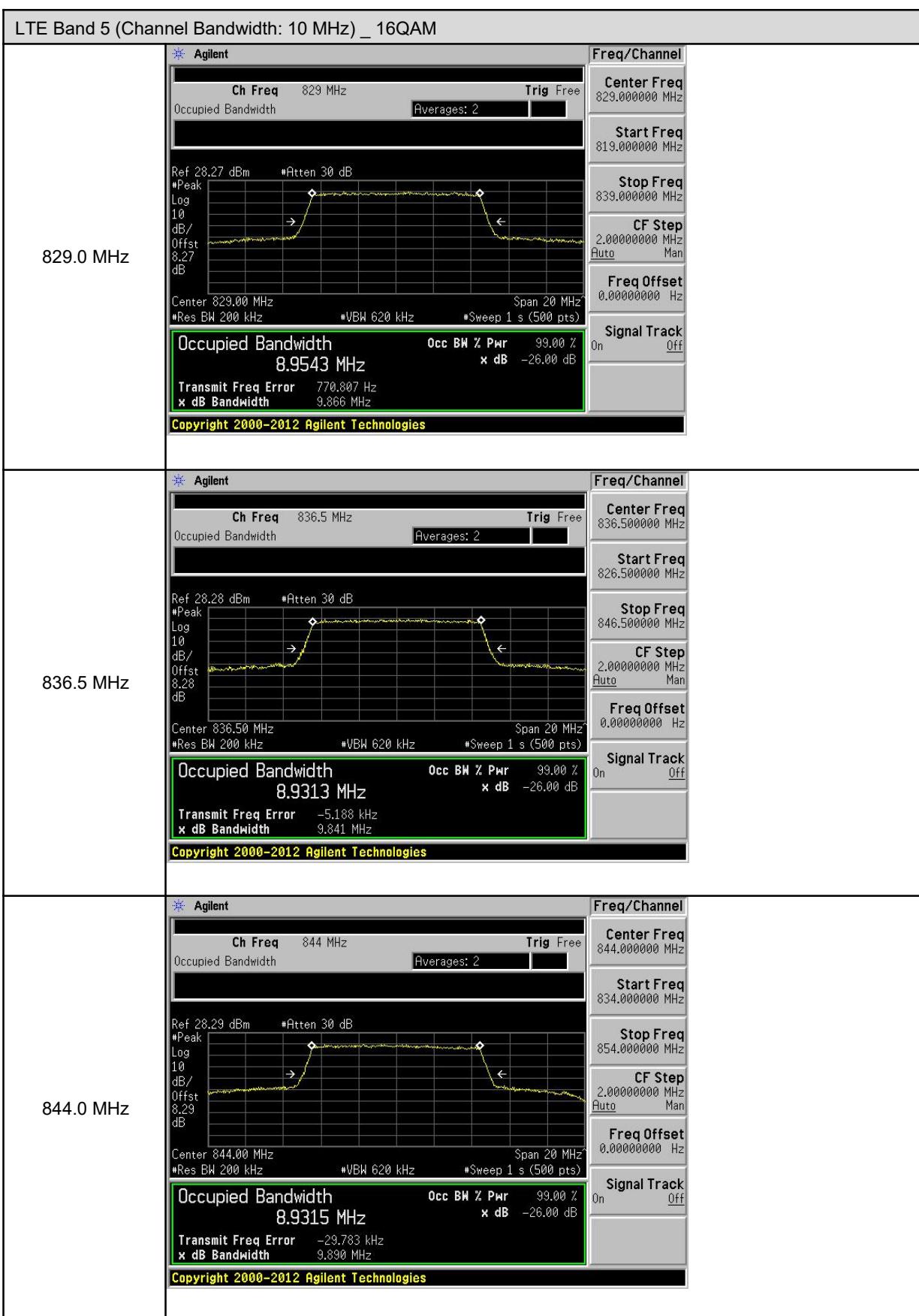
**LTE Band 5 (Channel Bandwidth: 1.4 MHz) \_ 16QAM**


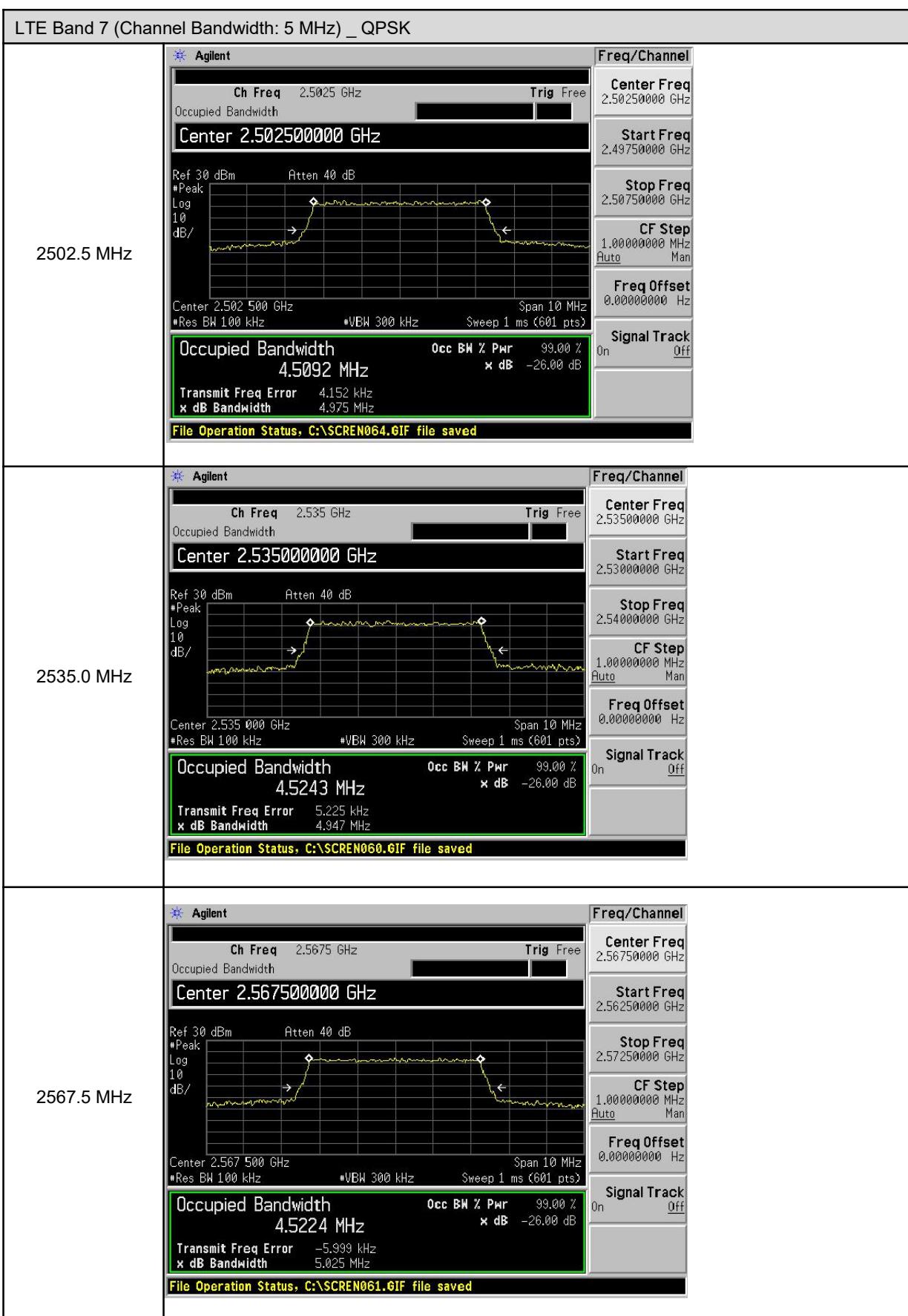




## LTE Band 5 (Channel Bandwidth: 5 MHz) \_ 16QAM

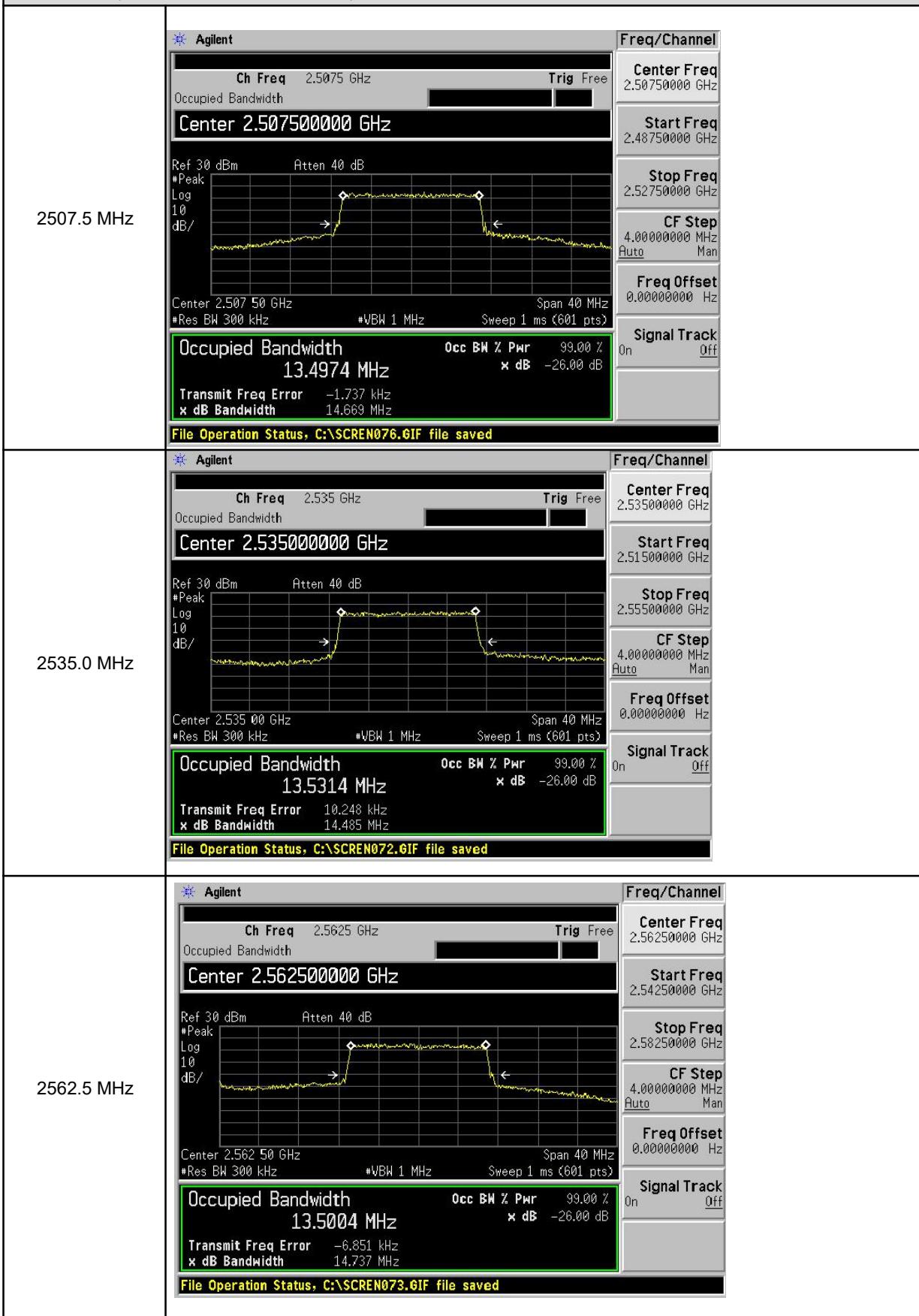


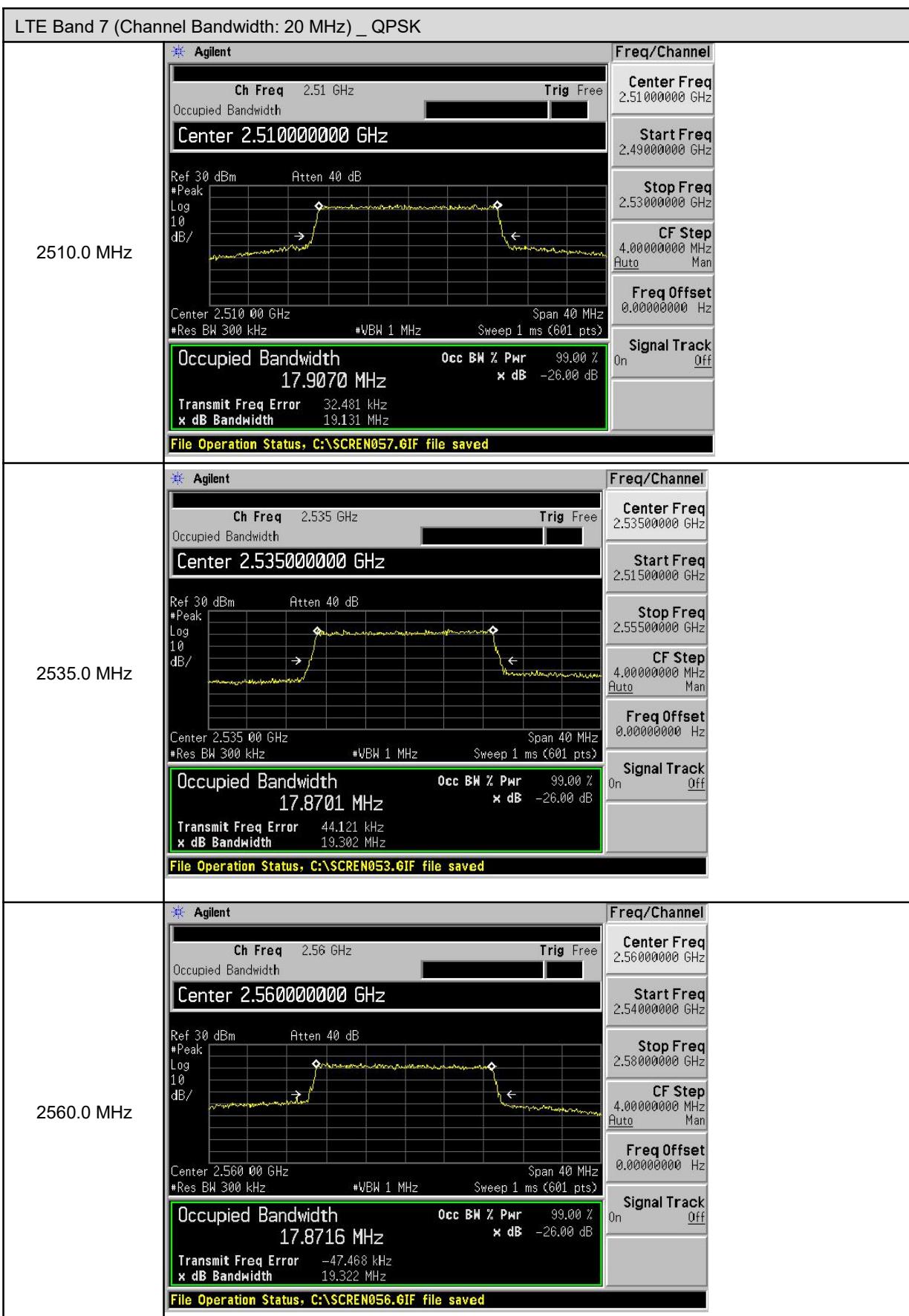


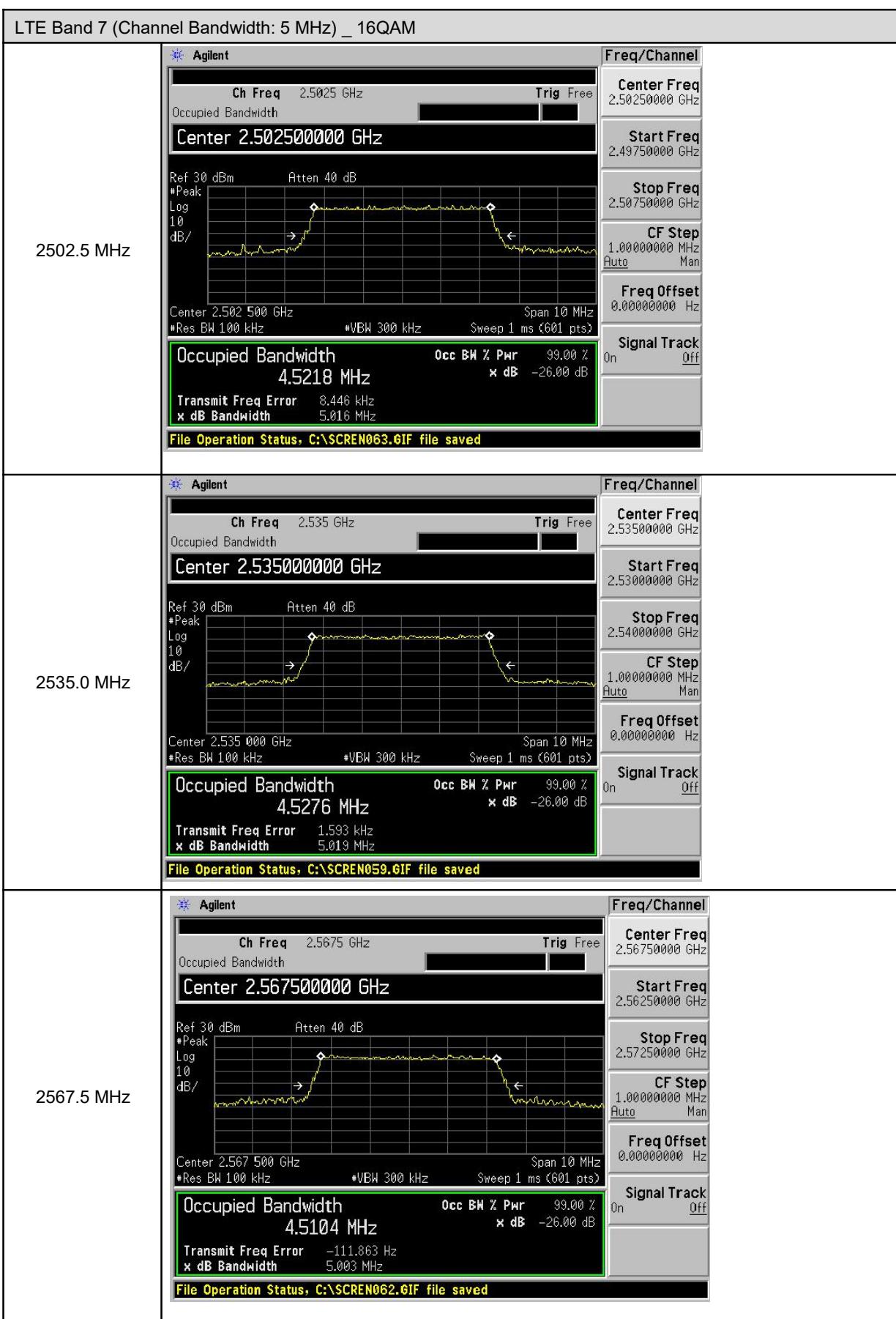


LTE Band 7 (Channel Bandwidth: 10 MHz) _ QPSK	
2505.0 MHz	<p><b>Agilent</b></p> <p>Ch Freq 2.505 GHz Trig Free Occupied Bandwidth</p> <p><b>Center 2.50500000 GHz</b></p> <p>Ref 30 dBm Atten 40 dB #Peak Log 10 dB/ 10 dB/ Center 2.505 00 GHz Span 20 MHz #Res BW 300 kHz *VBW 1 MHz Sweep 1 ms (601 pts)</p> <p><b>Occupied Bandwidth</b> 9.0060 MHz <b>Occ BW % Pwr</b> 99.00 % <b>x dB</b> -26.00 dB Transmit Freq Error 9.059 kHz x dB Bandwidth 10.163 MHz</p> <p><b>File Operation Status: C:\SCREEN070.GIF file saved</b></p> <p><b>Agilent</b></p> <p>Ch Freq 2.535 GHz Trig Free Occupied Bandwidth</p> <p><b>Center 2.53500000 GHz</b></p> <p>Ref 30 dBm Atten 40 dB #Peak Log 10 dB/ 10 dB/ Center 2.535 00 GHz Span 20 MHz #Res BW 300 kHz *VBW 1 MHz Sweep 1 ms (601 pts)</p> <p><b>Occupied Bandwidth</b> 9.0364 MHz <b>Occ BW % Pwr</b> 99.00 % <b>x dB</b> -26.00 dB Transmit Freq Error 19.035 kHz x dB Bandwidth 9.943 MHz</p> <p><b>File Operation Status: C:\SCREEN066.GIF file saved</b></p> <p><b>Agilent</b></p> <p>Ch Freq 2.565 GHz Trig Free Occupied Bandwidth</p> <p><b>Center 2.56500000 GHz</b></p> <p>Ref 30 dBm Atten 40 dB #Peak Log 10 dB/ 10 dB/ Center 2.565 00 GHz Span 20 MHz #Res BW 300 kHz *VBW 1 MHz Sweep 1 ms (601 pts)</p> <p><b>Occupied Bandwidth</b> 9.0045 MHz <b>Occ BW % Pwr</b> 99.00 % <b>x dB</b> -26.00 dB Transmit Freq Error -6.854 kHz x dB Bandwidth 9.971 MHz</p> <p><b>File Operation Status: C:\SCREEN067.GIF file saved</b></p>
2535.0 MHz	<p><b>Freq/Channel</b></p> <p><b>Center Freq</b> 2.5050000 GHz</p> <p><b>Start Freq</b> 2.4950000 GHz</p> <p><b>Stop Freq</b> 2.5150000 GHz</p> <p><b>CF Step</b> 2.0000000 MHz <u>Auto</u> <u>Man</u></p> <p><b>Freq Offset</b> 0.0000000 Hz</p> <p><b>Signal Track</b> <u>On</u> <u>Off</u></p> <p><b>Freq/Channel</b></p> <p><b>Center Freq</b> 2.5350000 GHz</p> <p><b>Start Freq</b> 2.5250000 GHz</p> <p><b>Stop Freq</b> 2.5450000 GHz</p> <p><b>CF Step</b> 2.0000000 MHz <u>Auto</u> <u>Man</u></p> <p><b>Freq Offset</b> 0.0000000 Hz</p> <p><b>Signal Track</b> <u>On</u> <u>Off</u></p> <p><b>Freq/Channel</b></p> <p><b>Center Freq</b> 2.5650000 GHz</p> <p><b>Start Freq</b> 2.5550000 GHz</p> <p><b>Stop Freq</b> 2.5750000 GHz</p> <p><b>CF Step</b> 2.0000000 MHz <u>Auto</u> <u>Man</u></p> <p><b>Freq Offset</b> 0.0000000 Hz</p> <p><b>Signal Track</b> <u>On</u> <u>Off</u></p>
2565.0 MHz	<p><b>Freq/Channel</b></p> <p><b>Center Freq</b> 2.5050000 GHz</p> <p><b>Start Freq</b> 2.4950000 GHz</p> <p><b>Stop Freq</b> 2.5150000 GHz</p> <p><b>CF Step</b> 2.0000000 MHz <u>Auto</u> <u>Man</u></p> <p><b>Freq Offset</b> 0.0000000 Hz</p> <p><b>Signal Track</b> <u>On</u> <u>Off</u></p>

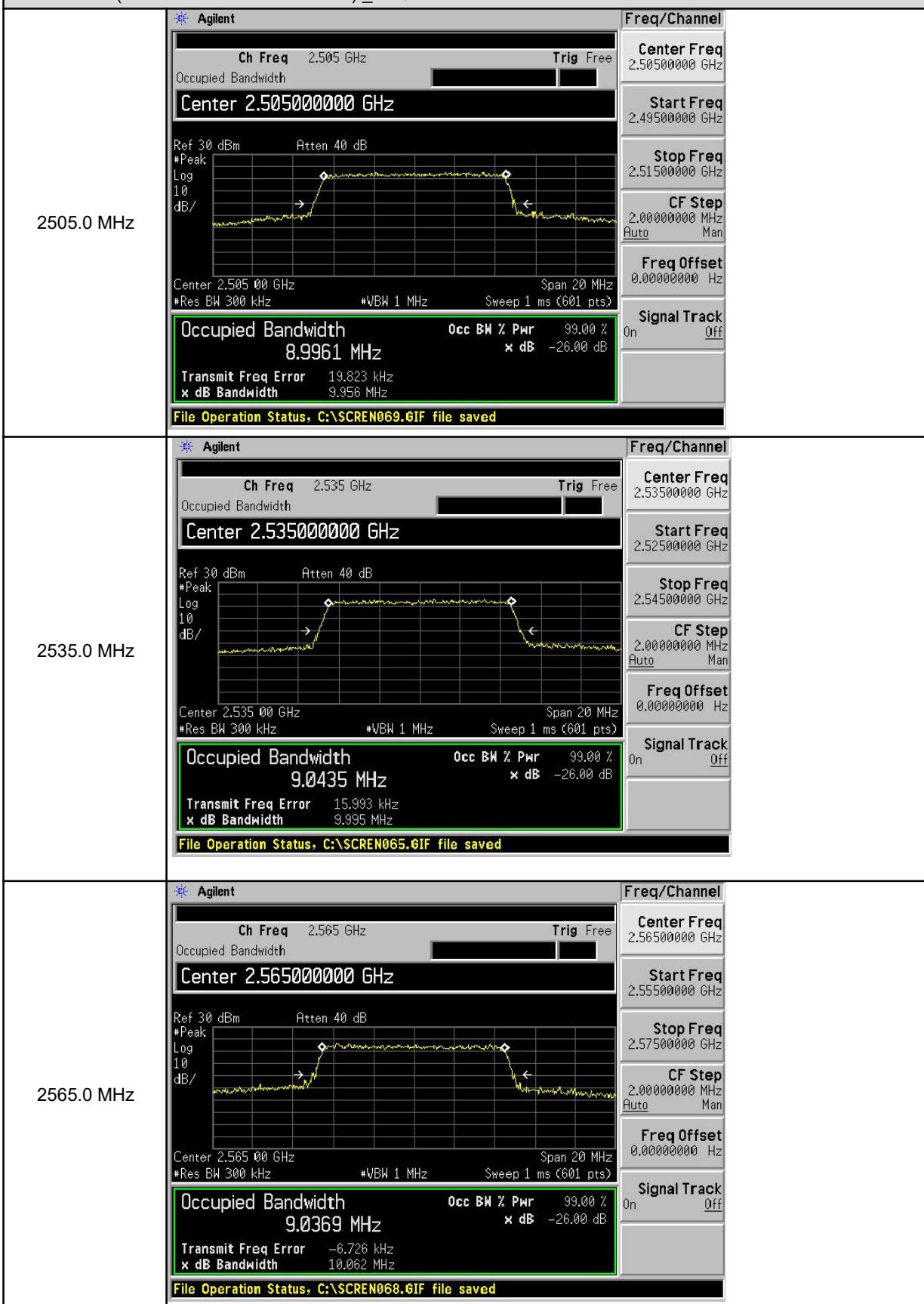
## LTE Band 7 (Channel Bandwidth: 15 MHz) \_ QPSK



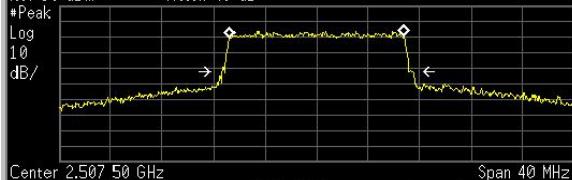
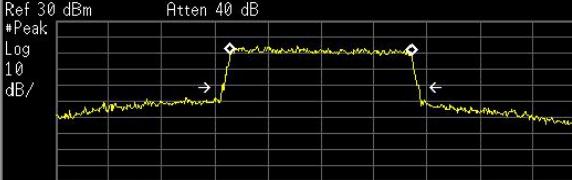




## LTE Band 7 (Channel Bandwidth: 10 MHz) \_16QAM



## LTE Band 7 (Channel Bandwidth: 15 MHz) \_ 16QAM

2507.5 MHz	<p><b>Agilent</b></p> <p>Ch Freq 2.5075 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Center 2.50750000 GHz</p> <p>Ref 30 dBm Atten 40 dB</p> <p>#Peak Log 10 dB/</p>  <p>Center 2.507500 GHz Span 40 MHz</p> <p>#Res BW 300 kHz *VBW 1 MHz Sweep 1 ms (601 pts)</p> <p>Occupied Bandwidth 13.4665 MHz</p> <p>Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 9.890 kHz</p> <p>x dB Bandwidth 14.760 MHz</p> <p>File Operation Status, C:\SCREN075.GIF file saved</p>	<p><b>Freq/Channel</b></p> <p>Center Freq 2.50750000 GHz</p> <p>Start Freq 2.48750000 GHz</p> <p>Stop Freq 2.52750000 GHz</p> <p>CF Step 4.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>
	<p><b>Agilent</b></p> <p>Ch Freq 2.535 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Center 2.53500000 GHz</p> <p>Ref 30 dBm Atten 40 dB</p> <p>#Peak Log 10 dB/</p>  <p>Center 2.535000 GHz Span 40 MHz</p> <p>#Res BW 300 kHz *VBW 1 MHz Sweep 1 ms (601 pts)</p> <p>Occupied Bandwidth 13.4415 MHz</p> <p>Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error 17.601 kHz</p> <p>x dB Bandwidth 14.806 MHz</p> <p>File Operation Status, C:\SCREN071.GIF file saved</p>	<p><b>Freq/Channel</b></p> <p>Center Freq 2.53500000 GHz</p> <p>Start Freq 2.51500000 GHz</p> <p>Stop Freq 2.55500000 GHz</p> <p>CF Step 4.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>
	<p><b>Agilent</b></p> <p>Ch Freq 2.5625 GHz Trig Free</p> <p>Occupied Bandwidth</p> <p>Center 2.56250000 GHz</p> <p>Ref 30 dBm Atten 40 dB</p> <p>#Peak Log 10 dB/</p>  <p>Center 2.562500 GHz Span 40 MHz</p> <p>#Res BW 300 kHz *VBW 1 MHz Sweep 1 ms (601 pts)</p> <p>Occupied Bandwidth 13.5706 MHz</p> <p>Occ BW % Pwr 99.00 % x dB -26.00 dB</p> <p>Transmit Freq Error -15.874 kHz</p> <p>x dB Bandwidth 14.914 MHz</p> <p>File Operation Status, C:\SCREN074.GIF file saved</p>	<p><b>Freq/Channel</b></p> <p>Center Freq 2.56250000 GHz</p> <p>Start Freq 2.54250000 GHz</p> <p>Stop Freq 2.58250000 GHz</p> <p>CF Step 4.00000000 MHz Auto Man</p> <p>Freq Offset 0.00000000 Hz</p> <p>Signal Track On Off</p>

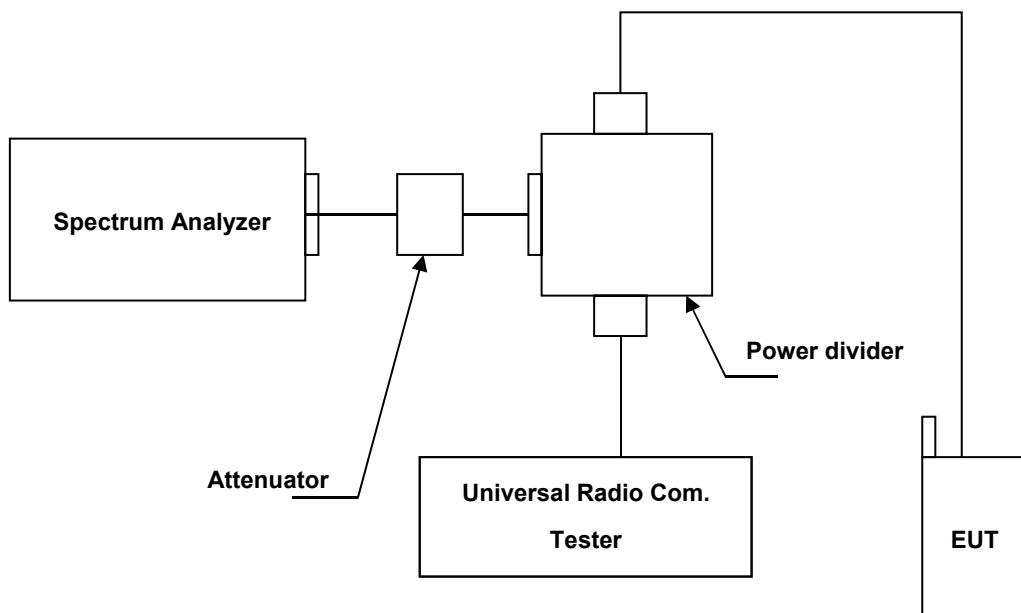
LTE Band 7 (Channel Bandwidth: 20 MHz) _ 16QAM	
2510.0 MHz	<p><b>Agilent</b></p> <p>Ch Freq 2.51 GHz Trig Free Occupied Bandwidth</p> <p><b>Center 2.510000000 GHz</b></p> <p>Ref 30 dBm Atten 40 dB #Peak Log 10 dB/ 10 dB/ Center 2.510.00 GHz Span 40 MHz #Res BW 300 kHz *VBW 1 MHz Sweep 1 ms (601 pts)</p> <p><b>Occupied Bandwidth</b> 17.8639 MHz <b>Occ BW % Pwr</b> 99.00 % <b>x dB</b> -26.00 dB</p> <p>Transmit Freq Error -9.918 kHz x dB Bandwidth 19.302 MHz</p> <p>File Operation Status, C:\SCREEN058.GIF file saved</p>
2535.0 MHz	<p><b>Agilent</b></p> <p>Ch Freq 2.535 GHz Trig Free Occupied Bandwidth</p> <p><b>Center 2.535000000 GHz</b></p> <p>Ref 30 dBm Atten 40 dB #Peak Log 10 dB/ 10 dB/ Center 2.535.00 GHz Span 40 MHz #Res BW 300 kHz *VBW 1 MHz Sweep 1 ms (601 pts)</p> <p><b>Occupied Bandwidth</b> 17.9526 MHz <b>Occ BW % Pwr</b> 99.00 % <b>x dB</b> -26.00 dB</p> <p>Transmit Freq Error 45.936 kHz x dB Bandwidth 18.990 MHz</p> <p>File Operation Status, C:\SCREEN054.GIF file saved</p>
2560.0 MHz	<p><b>Agilent</b></p> <p>Ch Freq 2.56 GHz Trig Free Occupied Bandwidth</p> <p><b>Center 2.560000000 GHz</b></p> <p>Ref 30 dBm Atten 40 dB #Peak Log 10 dB/ 10 dB/ Center 2.560.00 GHz Span 40 MHz #Res BW 300 kHz *VBW 1 MHz Sweep 1 ms (601 pts)</p> <p><b>Occupied Bandwidth</b> 17.9075 MHz <b>Occ BW % Pwr</b> 99.00 % <b>x dB</b> -26.00 dB</p> <p>Transmit Freq Error -28.909 kHz x dB Bandwidth 19.218 MHz</p> <p>File Operation Status, C:\SCREEN055.GIF file saved</p>

## 6 Peak to Average Ratio Test

### 6.1. Limit

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB.

### 6.2. Setup





### 6.3. Test Procedure

The measurement is made according to FCC rules:

- a. Set resolution/measurement bandwidth signal's occupied bandwidth;
- b. Set the number of counts to a value that stabilizes the measured CCDF curve;
- c. Record the maximum PAPR level associated with a probability of 0.1%.



## 6.4. Test Result

LTE Band 2				
Modulation	Channel Bandwidth	Frequency (MHz)	Peak to Average Ratio (dB)	Limit (dB)
QPSK	1.4 MHz	1880.0	4.97	< 13
	3 MHz	1880.0	5.09	< 13
	5 MHz	1880.0	4.96	< 13
	10 MHz	1880.0	4.88	< 13
	15 MHz	1880.0	4.76	< 13
	20 MHz	1880.0	4.48	< 13
16QAM	1.4 MHz	1880.0	6.04	< 13
	3 MHz	1880.0	6.21	< 13
	5 MHz	1880.0	6.12	< 13
	10 MHz	1880.0	6.08	< 13
	15 MHz	1880.0	5.87	< 13
	20 MHz	1880.0	5.62	< 13

LTE Band 4				
Modulation	Channel Bandwidth	Frequency (MHz)	Peak to Average Ratio (dB)	Limit (dB)
QPSK	1.4 MHz	1732.5	4.43	< 13
	3 MHz	1732.5	4.44	< 13
	5 MHz	1732.5	4.31	< 13
	10 MHz	1732.5	4.06	< 13
	15 MHz	1732.5	3.81	< 13
	20 MHz	1732.5	3.62	< 13
16QAM	1.4 MHz	1732.5	5.57	< 13
	3 MHz	1732.5	5.54	< 13
	5 MHz	1732.5	5.48	< 13
	10 MHz	1732.5	5.05	< 13
	15 MHz	1732.5	4.83	< 13
	20 MHz	1732.5	4.69	< 13



LTE Band 5				
Modulation	Channel Bandwidth	Frequency (MHz)	Peak to Average Ratio (dB)	Limit (dB)
QPSK	1.4 MHz	836.5	5.26	< 13
	3 MHz	836.5	5.41	< 13
	5 MHz	836.5	5.31	< 13
	10 MHz	836.5	5.47	< 13
16QAM	1.4 MHz	836.5	6.40	< 13
	3 MHz	836.5	6.61	< 13
	5 MHz	836.5	6.47	< 13
	10 MHz	836.5	6.64	< 13

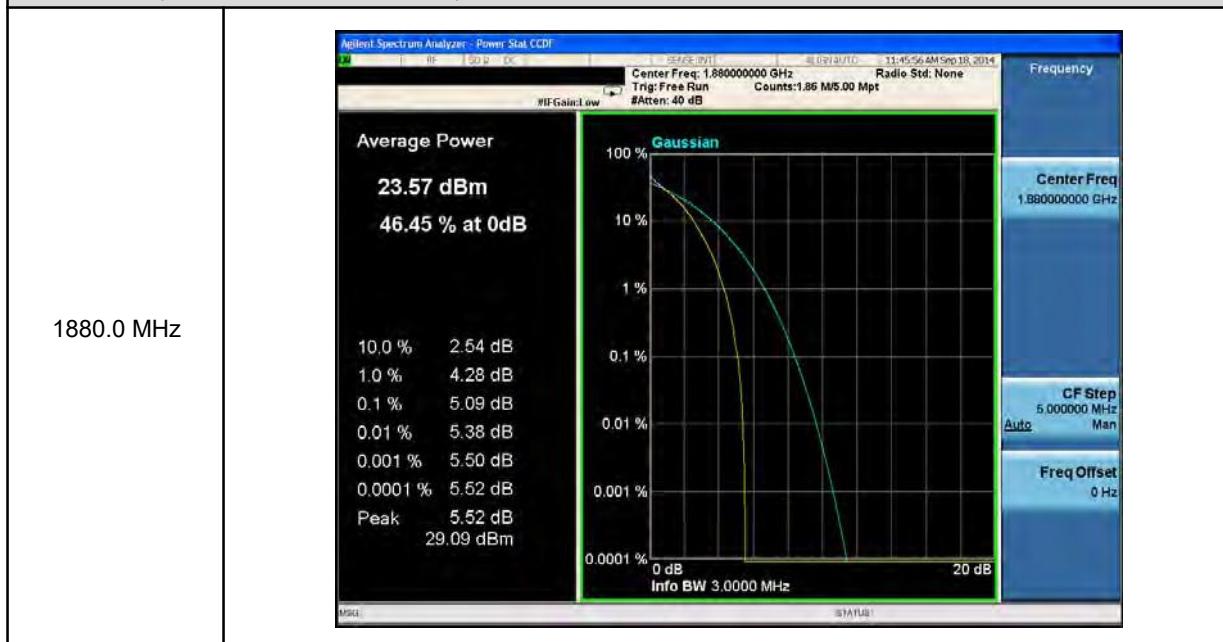
LTE Band 7				
Modulation	Channel Bandwidth	Frequency (MHz)	Peak to Average Ratio (dB)	Limit (dB)
QPSK	5 MHz	2535.0	4.03	< 13
	10 MHz	2535.0	4.18	< 13
	15 MHz	2535.0	4.37	< 13
	20 MHz	2535.0	4.53	< 13
16QAM	5 MHz	2535.0	5.18	< 13
	10 MHz	2535.0	5.32	< 13
	15 MHz	2535.0	5.56	< 13
	20 MHz	2535.0	5.72	< 13

## 6.5. Test Graphs

LTE Band 2 (Channel Bandwidth: 1.4 MHz) \_ QPSK



LTE Band 2 (Channel Bandwidth: 3 MHz) \_ QPSK



## LTE Band 2 (Channel Bandwidth: 5 MHz) \_ QPSK

1880.0 MHz



## LTE Band 2 (Channel Bandwidth: 10 MHz) \_ QPSK

1880.0 MHz



## LTE Band 2 (Channel Bandwidth: 15 MHz) \_ QPSK

1880.0 MHz



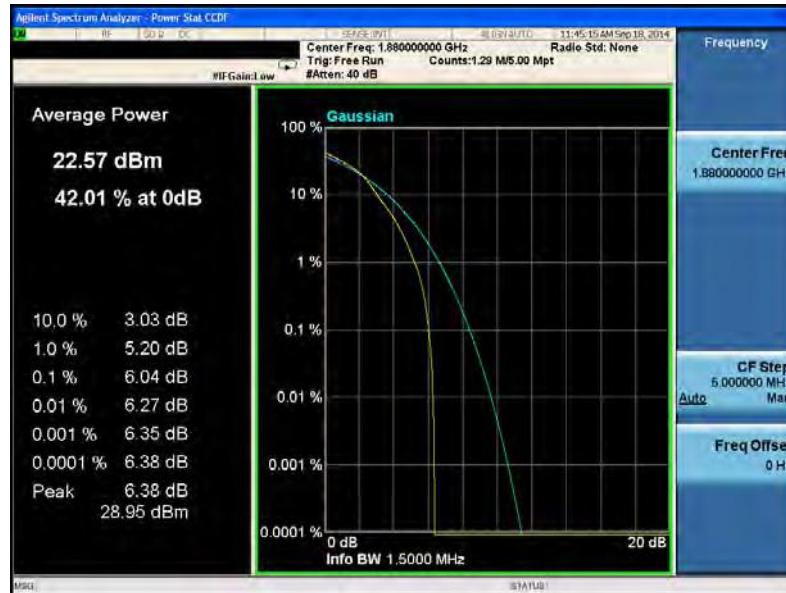
## LTE Band 2 (Channel Bandwidth: 20 MHz) \_ QPSK

1880.0 MHz



## LTE Band 2 (Channel Bandwidth: 1.4 MHz) \_ 16QAM

1880.0 MHz



## LTE Band 2 (Channel Bandwidth: 3 MHz) \_ 16QAM

1880.0 MHz



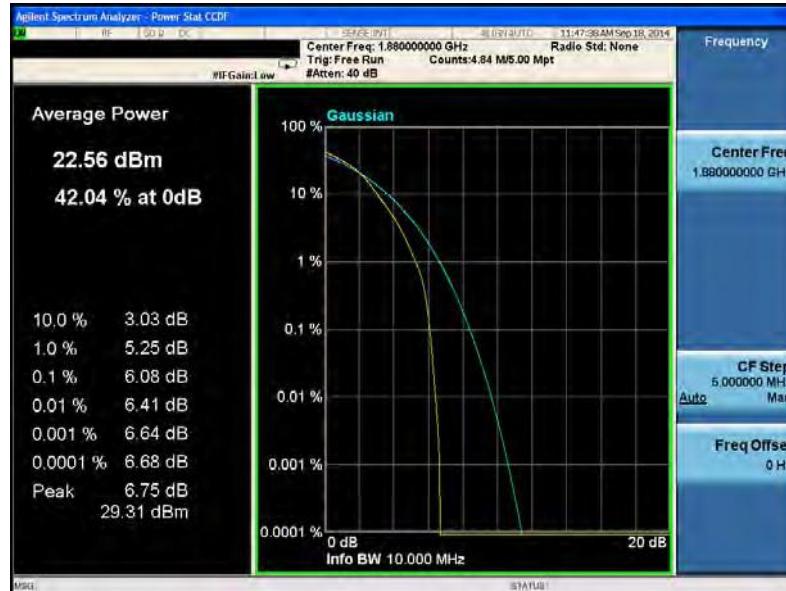
## LTE Band 2 (Channel Bandwidth: 5 MHz) \_ 16QAM

1880.0 MHz



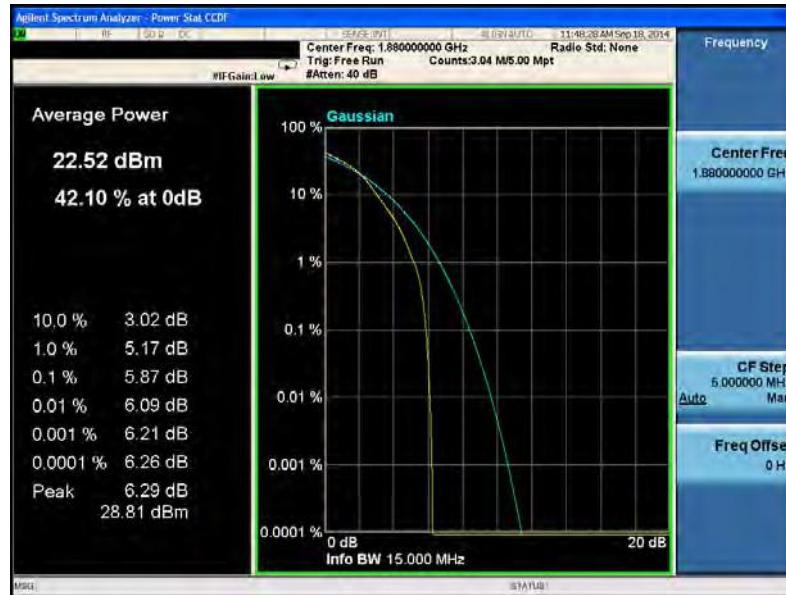
## LTE Band 2 (Channel Bandwidth: 10 MHz) \_ 16QAM

1880.0 MHz



## LTE Band 2 (Channel Bandwidth: 15 MHz) \_ 16QAM

1880.0 MHz



## LTE Band 2 (Channel Bandwidth: 20 MHz) \_ 16QAM

1880.0 MHz



## LTE Band 4 (Channel Bandwidth: 1.4 MHz) \_ QPSK

1732.5 MHz



## LTE Band 4 (Channel Bandwidth: 3 MHz) \_ QPSK

1732.5 MHz



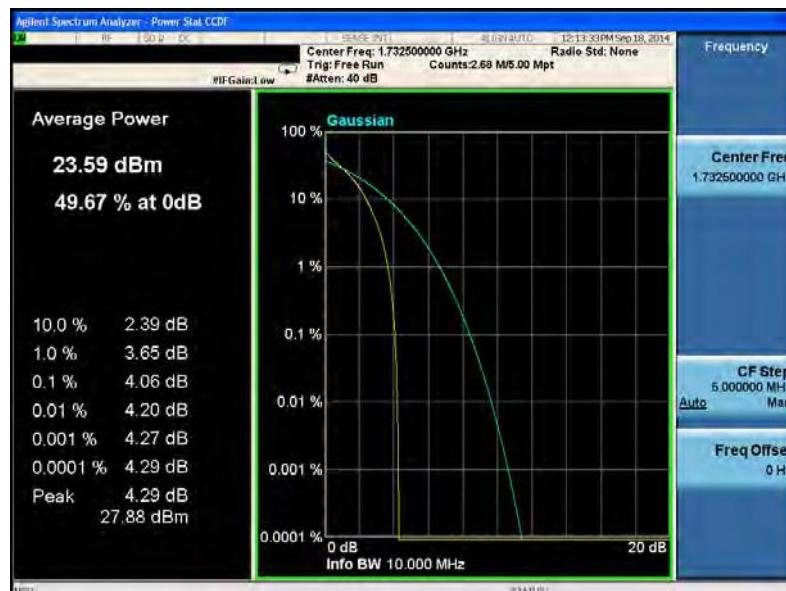
## LTE Band 4 (Channel Bandwidth: 5 MHz) \_ QPSK

1732.5 MHz



## LTE Band 4 (Channel Bandwidth: 10 MHz) \_ QPSK

1732.5 MHz



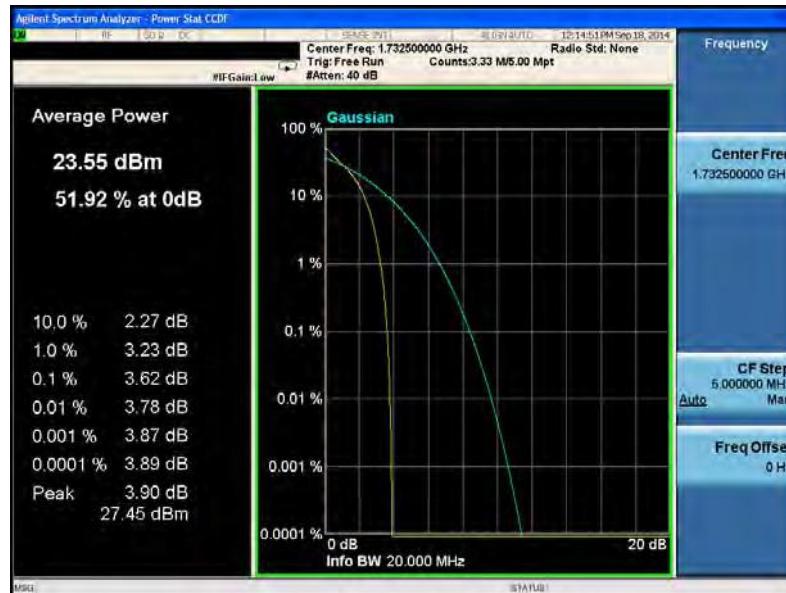
## LTE Band 4 (Channel Bandwidth: 15 MHz) \_ QPSK

1732.5 MHz



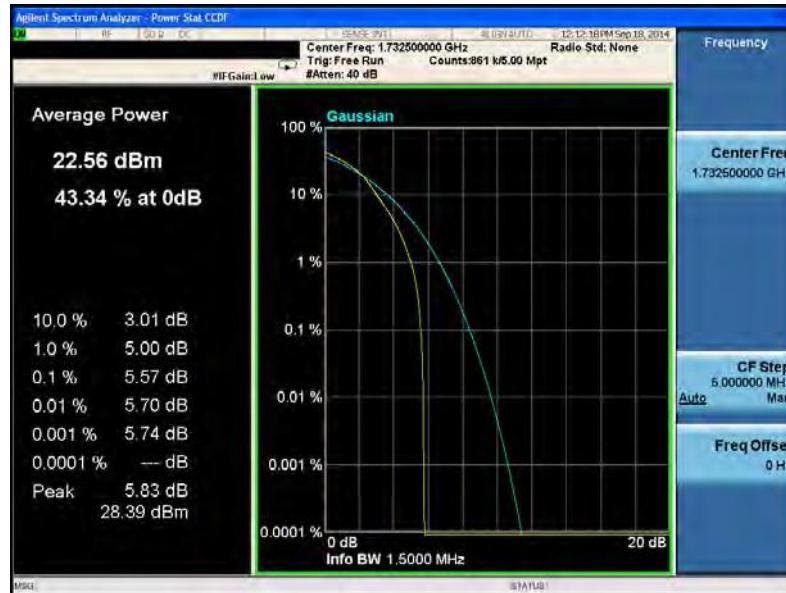
## LTE Band 4 (Channel Bandwidth: 20 MHz) \_ QPSK

1732.5 MHz



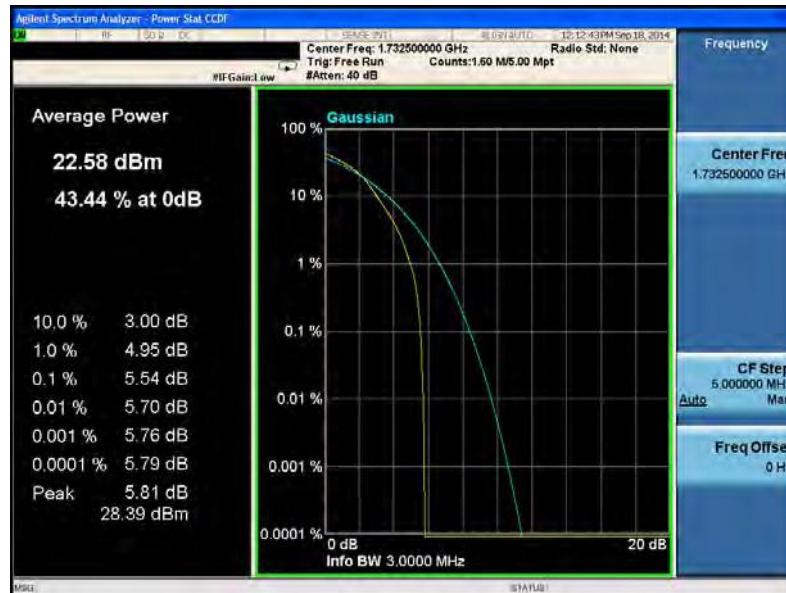
## LTE Band 4 (Channel Bandwidth: 1.4 MHz) \_ 16QAM

1732.5 MHz



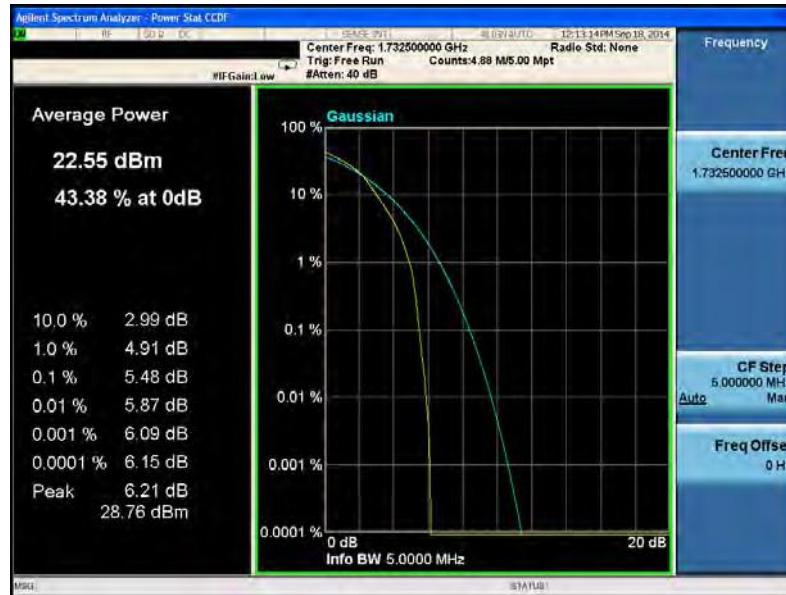
## LTE Band 4 (Channel Bandwidth: 3 MHz) \_ 16QAM

1732.5 MHz



## LTE Band 4 (Channel Bandwidth: 5 MHz) \_ 16QAM

1732.5 MHz



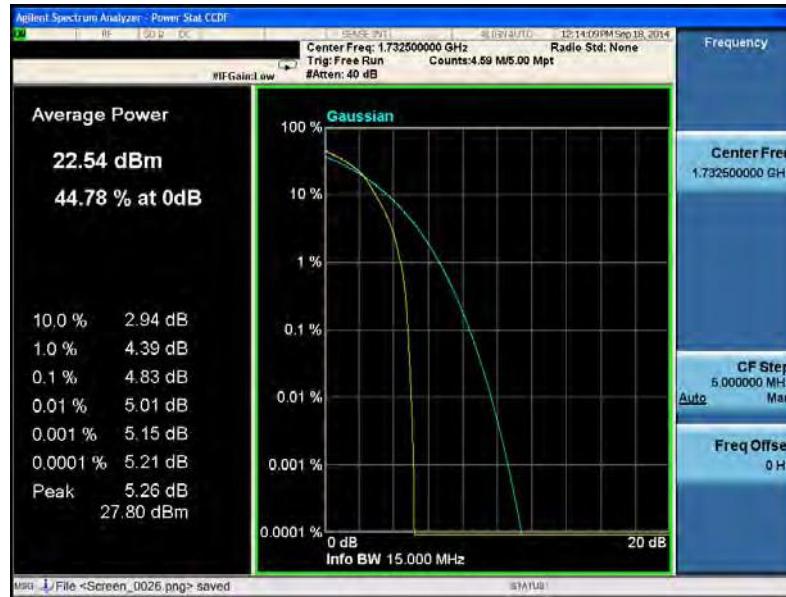
## LTE Band 4 (Channel Bandwidth: 10 MHz) \_ 16QAM

1732.5 MHz



## LTE Band 4 (Channel Bandwidth: 15 MHz) \_ 16QAM

1732.5 MHz



## LTE Band 4 (Channel Bandwidth: 20 MHz) \_ 16QAM

1732.5 MHz



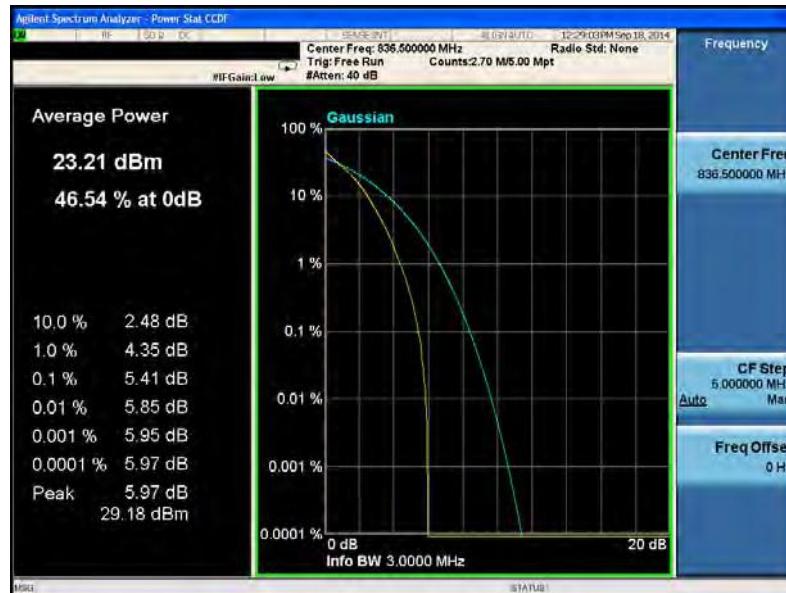
## LTE Band 5 (Channel Bandwidth: 1.4 MHz) \_ QPSK

836.5 MHz



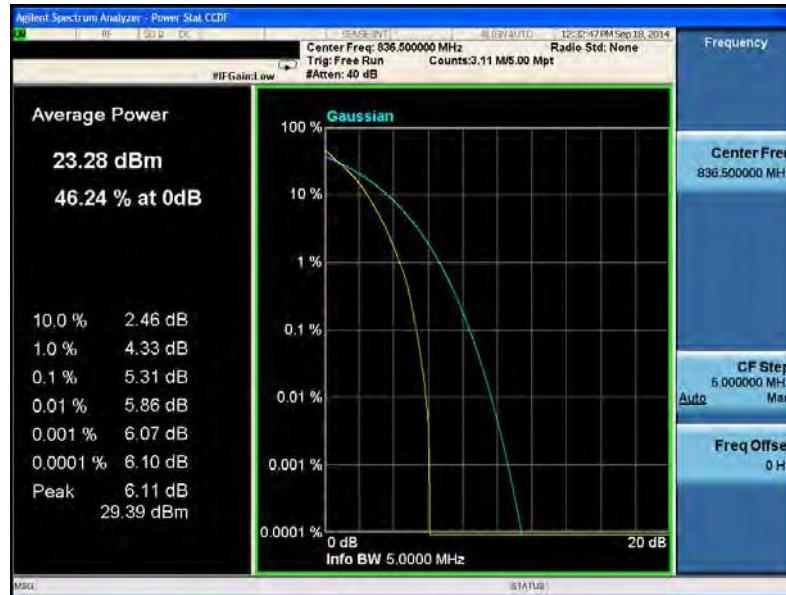
## LTE Band 5 (Channel Bandwidth: 3 MHz) \_ QPSK

836.5 MHz



## LTE Band 5 (Channel Bandwidth: 5 MHz) \_ QPSK

836.5 MHz



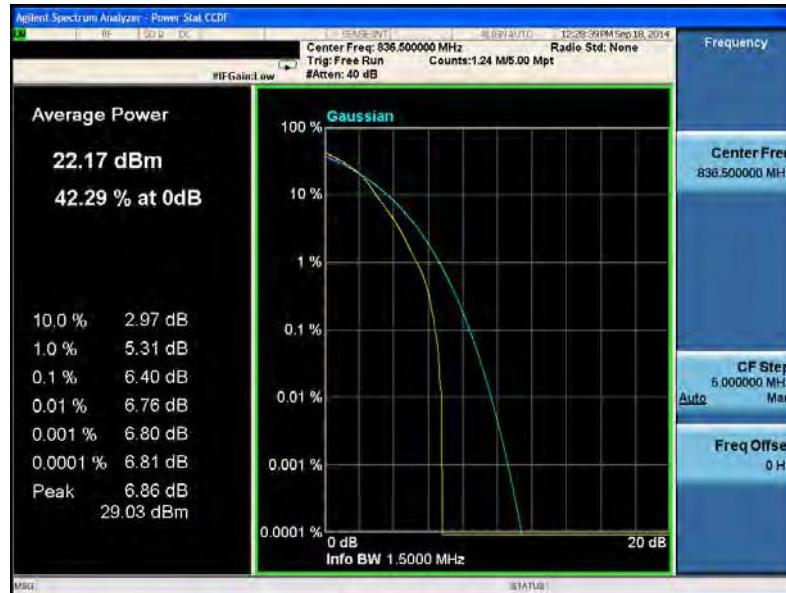
## LTE Band 5 (Channel Bandwidth: 10 MHz) \_ QPSK

836.5 MHz



## LTE Band 5 (Channel Bandwidth: 1.4 MHz) \_ 16QAM

836.5 MHz



## LTE Band 5 (Channel Bandwidth: 3 MHz) \_ 16QAM

836.5 MHz



## LTE Band 5 (Channel Bandwidth: 5 MHz) \_ 16QAM

836.5 MHz



## LTE Band 5 (Channel Bandwidth: 10 MHz) \_ 16QAM

836.5 MHz



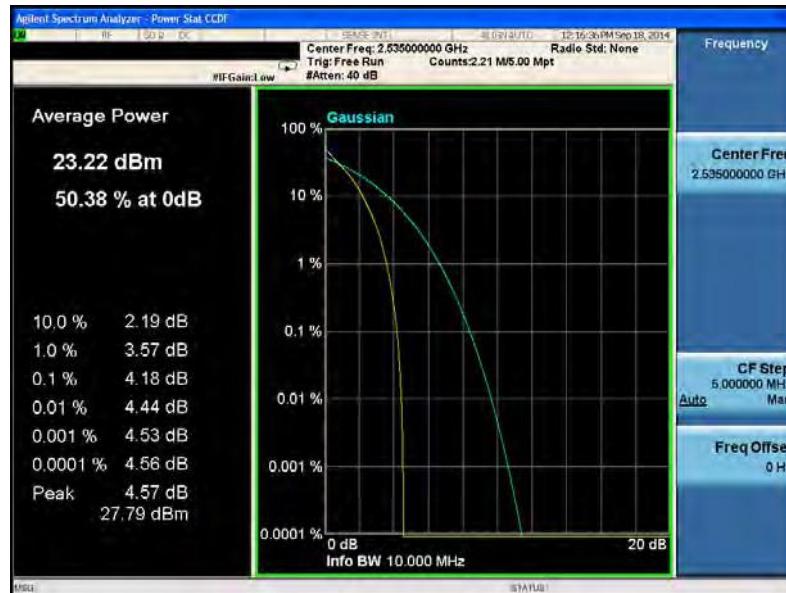
## LTE Band 7 (Channel Bandwidth: 5 MHz) \_ QPSK

2535.0 MHz



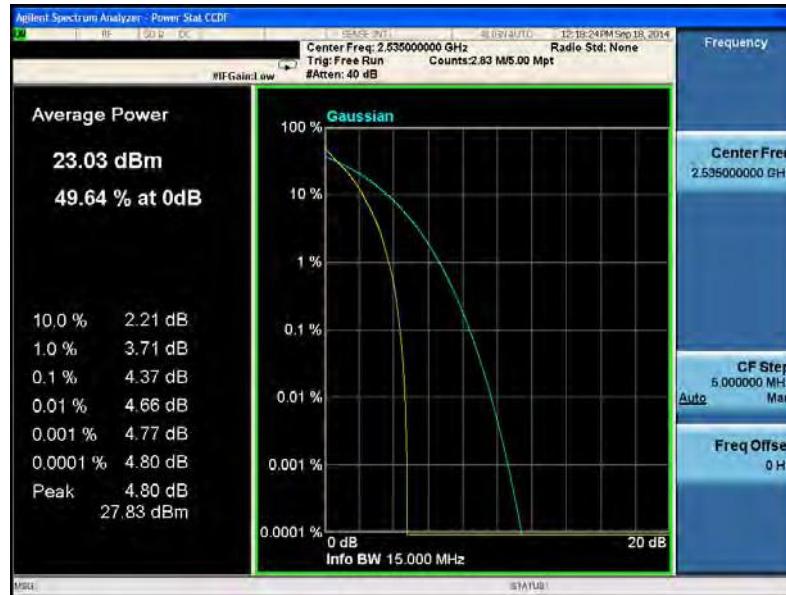
## LTE Band 7 (Channel Bandwidth: 10 MHz) \_ QPSK

2535.0 MHz



## LTE Band 7 (Channel Bandwidth: 15 MHz) \_ QPSK

2535.0 MHz



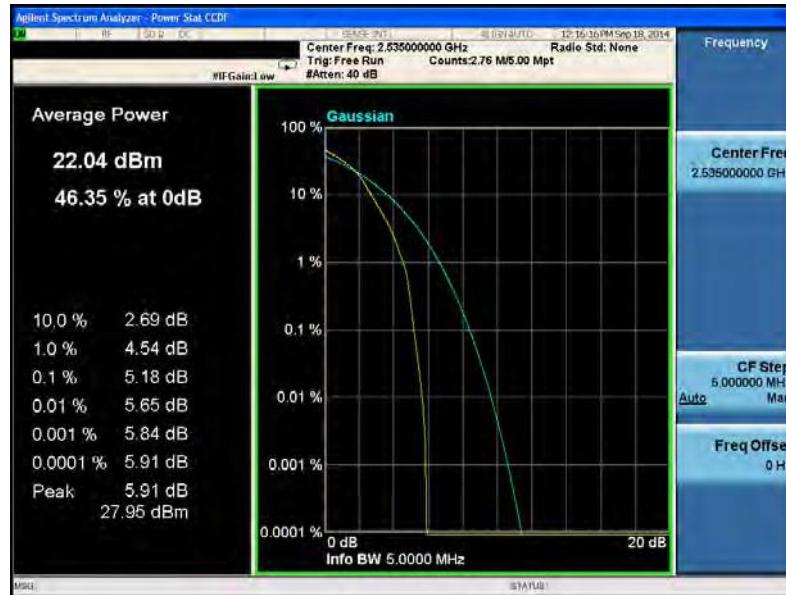
## LTE Band 7 (Channel Bandwidth: 20 MHz) \_ QPSK

2535.0 MHz



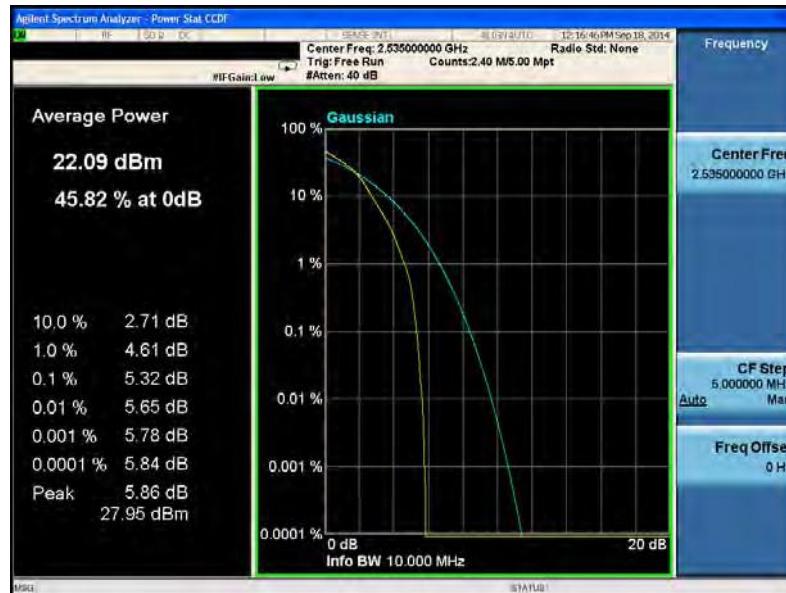
## LTE Band 7 (Channel Bandwidth: 5 MHz) \_ 16QAM

2535.0 MHz



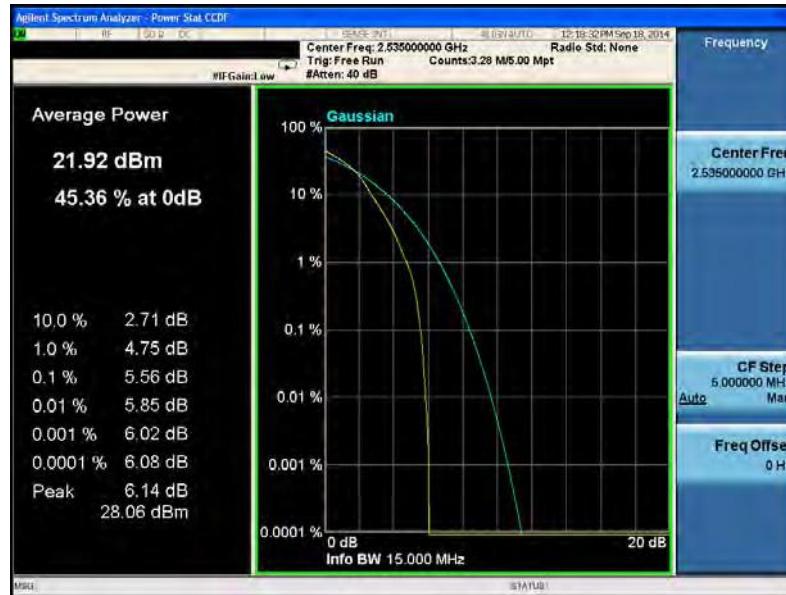
## LTE Band 7 (Channel Bandwidth: 10 MHz) \_ 16QAM

2535.0 MHz



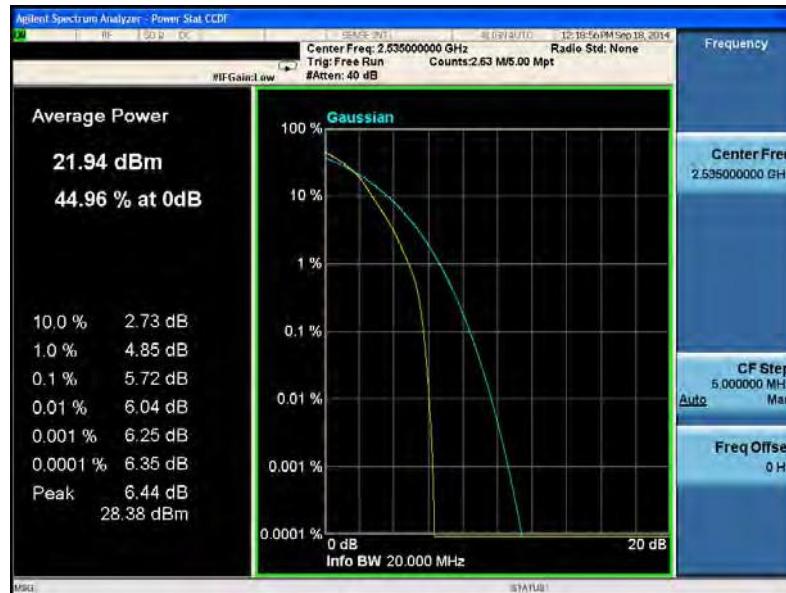
## LTE Band 7 (Channel Bandwidth: 15 MHz) \_ 16QAM

2535.0 MHz



## LTE Band 7 (Channel Bandwidth: 20 MHz) \_ 16QAM

2535.0 MHz





## 7 Band Edge Test

### 7.1. Limit

The Band Edge Limit:

§22.917(a), §24.238(a)

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.

§27.53(c)(2)

On any frequency outside the 777-787 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.

§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.

§27.53(g)

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  dB.

§27.53(m)

For mobile digital stations, the attenuation factor shall be not less than  $43 + 10 \log(p)$  dB at the channel edge and  $55 + 10 \log(P)$  dB at 5.5 megahertz from the channel edges.

Part 27.53(m)(4) / specifies that " For BRS and EBS stations.

For mobile digital stations, the attenuation 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 as defined in paragraph (m)(4) of this section. In addition, the attenuation factor shall not be less than  $43 + 10 \log(P)$  dB on all frequencies between 2490.5 MHz and 2496 MHz and  $55 + 10 \log(P)$  dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.