

## LTE Band XII (Part27) result

### Low channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1408	V	-36.28	-13	-23.28
1408	H	-31.17	-13	-18.17
412.56	V	-34.15	-13	-21.15
646.73	H	-34.13	-13	-21.13

### Middle channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1415	V	-28.95	-13	-15.95
1415	H	-36.37	-13	-23.37
454.85	V	-40.88	-13	-27.88
811.29	H	-34.8	-13	-21.8

### High channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1422	V	-30.08	-13	-17.08
1422	H	-35.59	-13	-22.59
344.41	V	-40.55	-13	-27.55
543.54	H	-32.93	-13	-19.93

#### Note:

- 1, The testing has been conformed to 10\*715.3MHz=7,153MHz
- 2, All other emissions more than 30 dB below the limit
- 3, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.

## LTE Band XVII (Part27) result

### Low channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1418	V	-36.4	-13	-23.4
1418	H	-37.5	-13	-24.5
320.71	V	-35.97	-13	-22.97
713.19	H	-33.95	-13	-20.95

### Middle channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1420	V	-32.38	-13	-19.38
1420	H	-39.04	-13	-26.04
238.63	V	-39.51	-13	-26.51
564.62	H	-35.91	-13	-22.91

### High channel

Frequency (MHz)	Antenna Polarization (H/V)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1422	V	-30.86	-13	-17.86
1422	H	-36.82	-13	-23.82
816.44	V	-39.57	-13	-26.57
433.89	H	-36.21	-13	-23.21

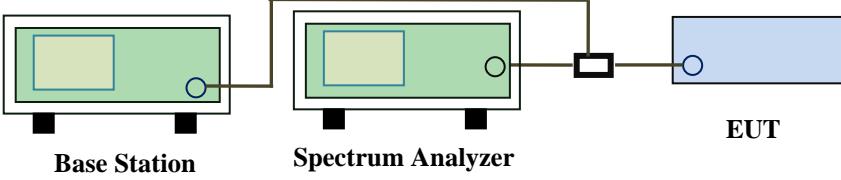
#### Note:

- 1, The testing has been conformed to 10\*713.5MHz=7,135MHz
- 2, All other emissions more than 30 dB below the limit
- 3, X-Axis, Y-Axis and Z-Axis were investigated. The results above show only the worst case.

## 6.7 Band Edge

Temperature	25 °C
Relative Humidity	57%
Atmospheric Pressure	1024mbar
Test date :	January 24&27, 2018
Tested By :	Aaron Liang

### Requirement(s):

Spec	Item	Requirement	Applicable
§22.917(a) §24.238(a) § 27.53(h)	a)	The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.	<input checked="" type="checkbox"/>
Test setup		 <p>Base Station      Spectrum Analyzer      EUT</p>	
Procedure		<ul style="list-style-type: none"> <li>- The EUT was connected to Spectrum Analyzer and Base Station via power divider.</li> <li>- The Band Edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100.</li> </ul>	
Remark			
Result		<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	

Test Data  Yes  N/A

Test Plot  Yes (See below)  N/A

### LTE Band II (Part 24E) result

BW(MHz)	Channel	Frequency (MHz)	Mode	Emission (dBm)	Limit (dBm)
1.4	18607	1850	16QAM	-23.686	-13
			QPSK	-23.612	-13
1.4	18900	1910	16QAM	-21.865	-13
			QPSK	-22.074	-13
3	18615	1850	16QAM	-23.493	-13
			QPSK	-22.722	-13
3	19185	1910	16QAM	-19.586	-13
			QPSK	-20.136	-13
5	18625	1850	16QAM	-18.002	-13
			QPSK	-17.156	-13
5	19175	1910	16QAM	-19.601	-13
			QPSK	-16.429	-13
10	18650	1850	16QAM	-15.691	-13
			QPSK	-19.397	-13
10	19150	1910	16QAM	-20.593	-13
			QPSK	-19.19	-13
15	18675	1850	16QAM	-17.397	-13
			QPSK	-16.781	-13
15	19125	1910	16QAM	-18.262	-13
			QPSK	-18.088	-13
20	18700	1850	16QAM	-22.495	-13
			QPSK	-23.501	-13
20	19100	1910	16QAM	-23.422	-13
			QPSK	-25.11	-13

### LTE Band IV (Part 27) result

BW(MHz)	Channel	Frequency (MHz)	Mode	Emission (dBm)	Limit (dBm)
1.4	19957	1709.9	16QAM	-26.753	-13
			QPSK	-25.614	-13
1.4	20393	1755	16QAM	-26.236	-13
			QPSK	-26.82	-13
3	19965	1709.9	16QAM	-24.097	-13
			QPSK	-21.615	-13
3	20385	1755	16QAM	-21.209	-13
			QPSK	-20.641	-13
5	19975	1709.9	16QAM	-15.885	-13
			QPSK	-15.845	-13
5	20375	1755	16QAM	-18.402	-13
			QPSK	-17.938	-13
10	20000	1709.9	16QAM	-16.29	-13
			QPSK	-16.397	-13
10	20350	1755	16QAM	-16.723	-13
			QPSK	-17.977	-13
15	20025	1709.9	16QAM	-17.111	-13
			QPSK	-16.15	-13
15	20325	1755	16QAM	-16.946	-13
			QPSK	-17.503	-13
20	20050	1709.9	16QAM	-23.682	-13
			QPSK	-23.088	-13
20	20300	1755	16QAM	-23.211	-13
			QPSK	-24.036	-13

### LTE Band XII (Part 27) result

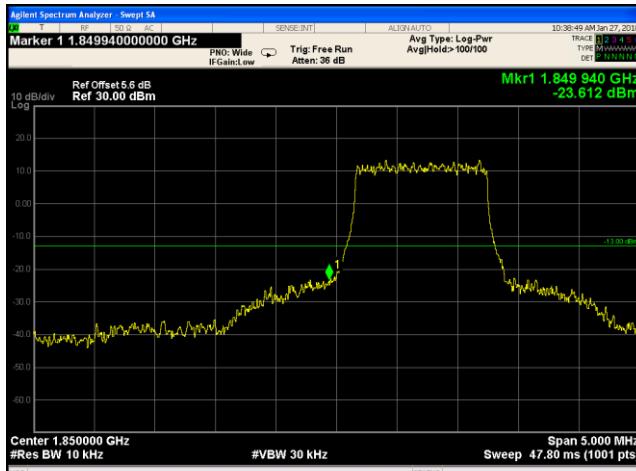
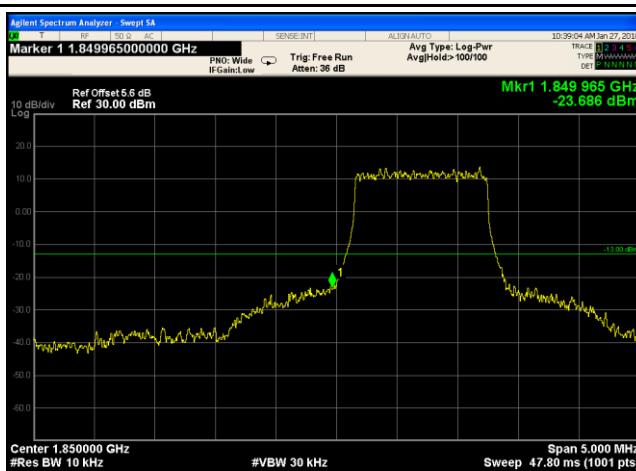
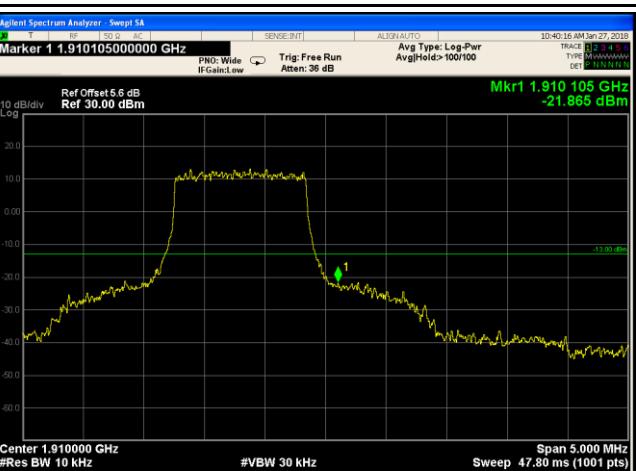
BW(MHz)	Channel	Frequency (MHz)	Mode	Emission (dBm)	Limit (dBm)
1.4	23017	699	16QAM	-19.842	-13
			QPSK	-18.602	-13
1.4	23173	716	16QAM	-19.299	-13
			QPSK	-18.166	-13
3	23025	699	16QAM	-17.227	-13
			QPSK	-17.957	-13
3	23165	716	16QAM	-19.875	-13
			QPSK	-19.635	-13
5	23035	699	16QAM	-20.861	-13
			QPSK	-22.669	-13
5	23155	716	16QAM	-16.829	-13
			QPSK	-19.308	-13
10	23060	698	16QAM	-26.168	-13
			QPSK	-23.21	-13
10	23130	716	16QAM	-21.114	-13
			QPSK	-20.016	-13

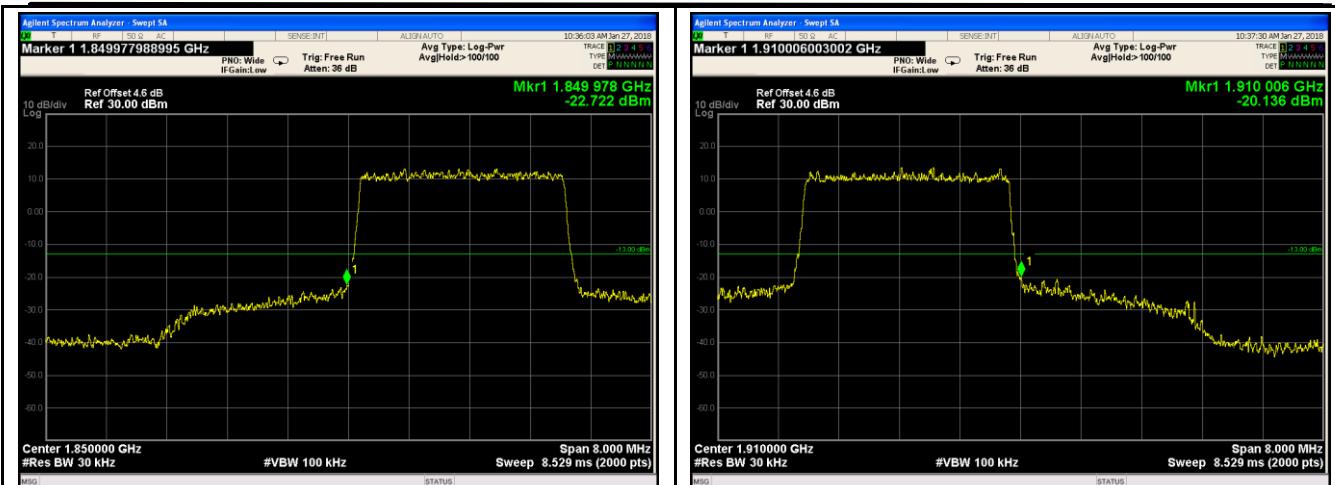
### LTE Band XVII (Part 27) result

BW(MHz)	Channel	Frequency (MHz)	Mode	Emission (dBm)	Limit (dBm)
5	23755	704	16QAM	-18.794	-13
			QPSK	-16.883	-13
5	23825	716	16QAM	-18.21	-13
			QPSK	-17.897	-13
10	23780	704	16QAM	-18.406	-13
			QPSK	-18.54	-13
10	23800	716	16QAM	-19.747	-13
			QPSK	-20.665	-13

## Test Plots

### LTE Band II (Part 24E)

 <p>Marker 1 1.849940000000 GHz Mkr1 1.849 940 GHz -23.612 dBm</p> <p>Center 1.850000 GHz #Res BW 10 kHz #VBW 30 kHz Span 5.000 MHz Sweep 47.80 ms (1001 pts)</p>	 <p>Marker 1 1.910030000000 GHz Mkr1 1.910 030 GHz -22.074 dBm</p> <p>Center 1.910000 GHz #Res BW 10 kHz #VBW 30 kHz Span 5.000 MHz Sweep 47.80 ms (1001 pts)</p>
<p>LTE Band II - Low Channel QPSK-1.4</p> <p>Note: Offset=Cable loss (4.5) + 10log (13.09)=4.5+1.1=5.6dB</p>	<p>LTE Band II - High Channel QPSK-1.4</p> <p>Note: Offset=Cable loss (4.5) + 10log (13.15)=4.5+1.1=5.6dB</p>
 <p>Marker 1 1.849965000000 GHz Mkr1 1.849 965 GHz -23.686 dBm</p> <p>Center 1.850000 GHz #Res BW 10 kHz #VBW 30 kHz Span 5.000 MHz Sweep 47.80 ms (1001 pts)</p>	 <p>Marker 1 1.910105000000 GHz Mkr1 1.910 105 GHz -21.865 dBm</p> <p>Center 1.910000 GHz #Res BW 10 kHz #VBW 30 kHz Span 5.000 MHz Sweep 47.80 ms (1001 pts)</p>
<p>LTE Band II - Low Channel 16QAM-1.4</p> <p>Note: Offset=Cable loss (4.5) + 10log (13.20/10)=4.5+1.1=5.6 dB</p>	<p>LTE Band II - High Channel 16QAM-1.4</p> <p>Note: Offset=Cable loss (4.5) + 10log (13.10)=4.5+1.1=5.6dB</p>

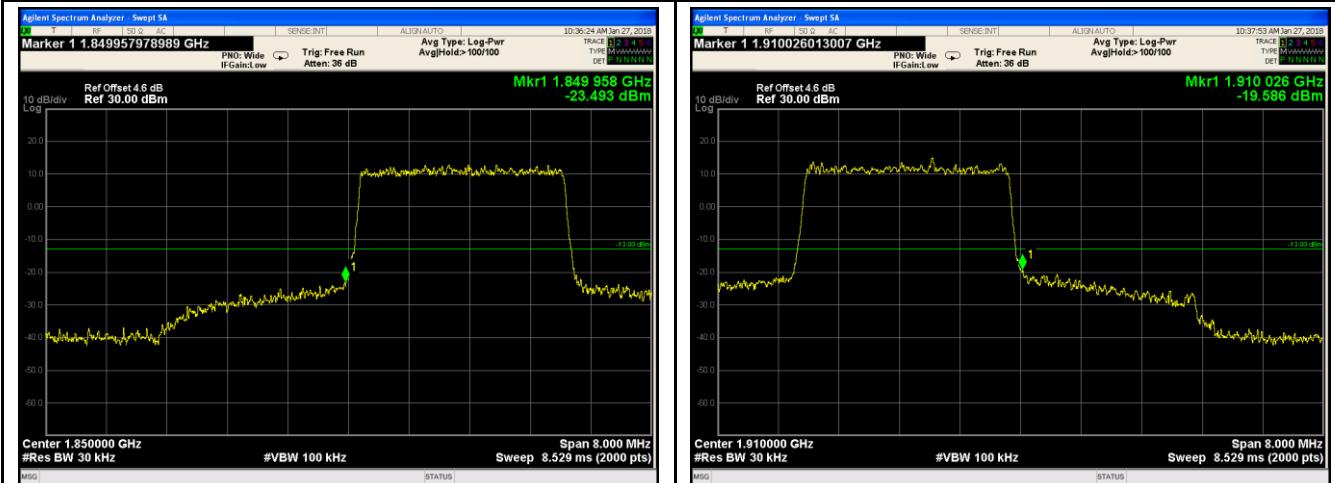


#### LTE Band II - Low Channel QPSK-3

Note: Offset=Cable loss (4.5) + 10log  
 $(30.58/30)=4.5+0.1=4.6$  dB

#### LTE Band II - High Channel QPSK-3

Note: Offset=Cable loss (4.5) + 10log  
 $(31.00/30)=4.5+0.1=4.6$  dB

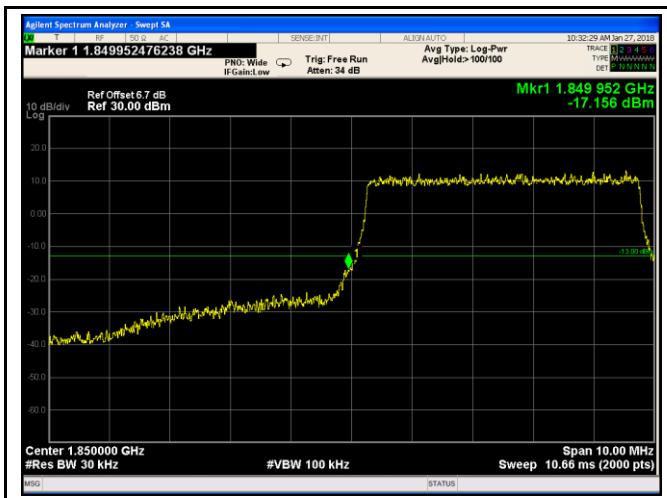
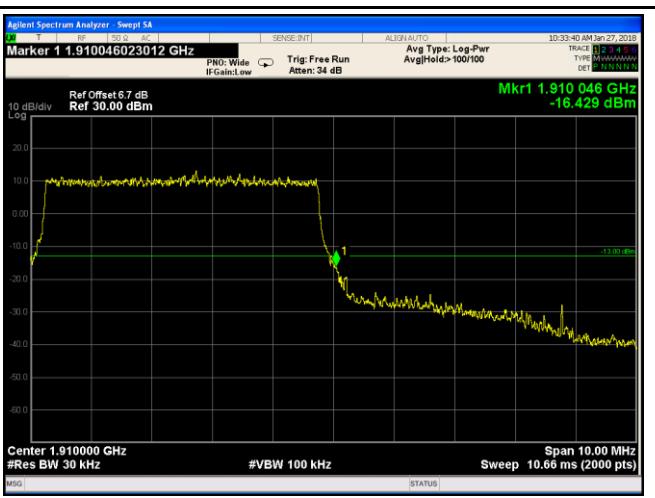
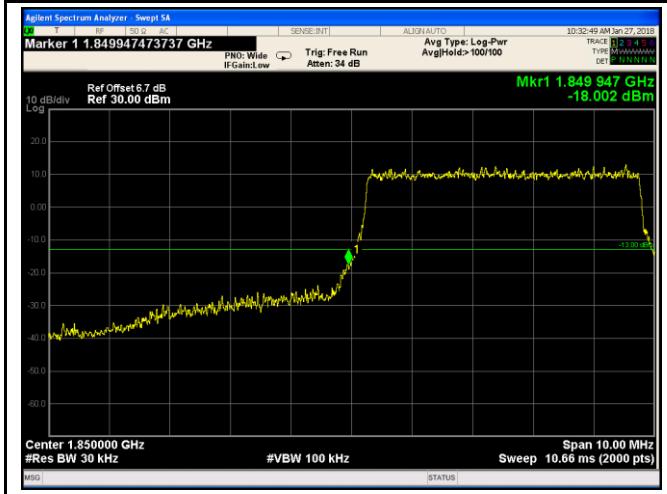
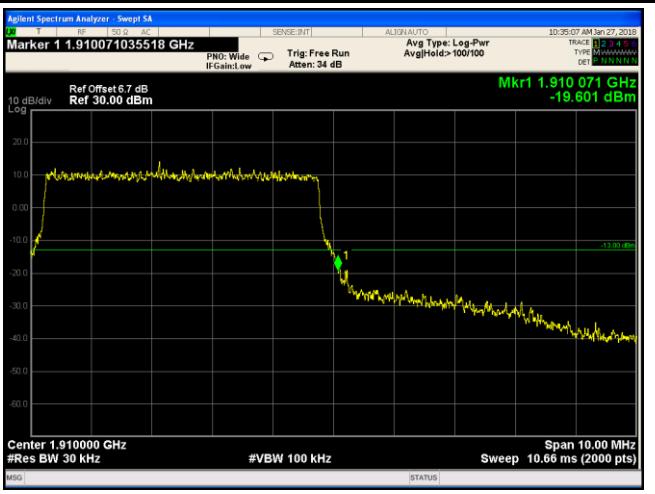


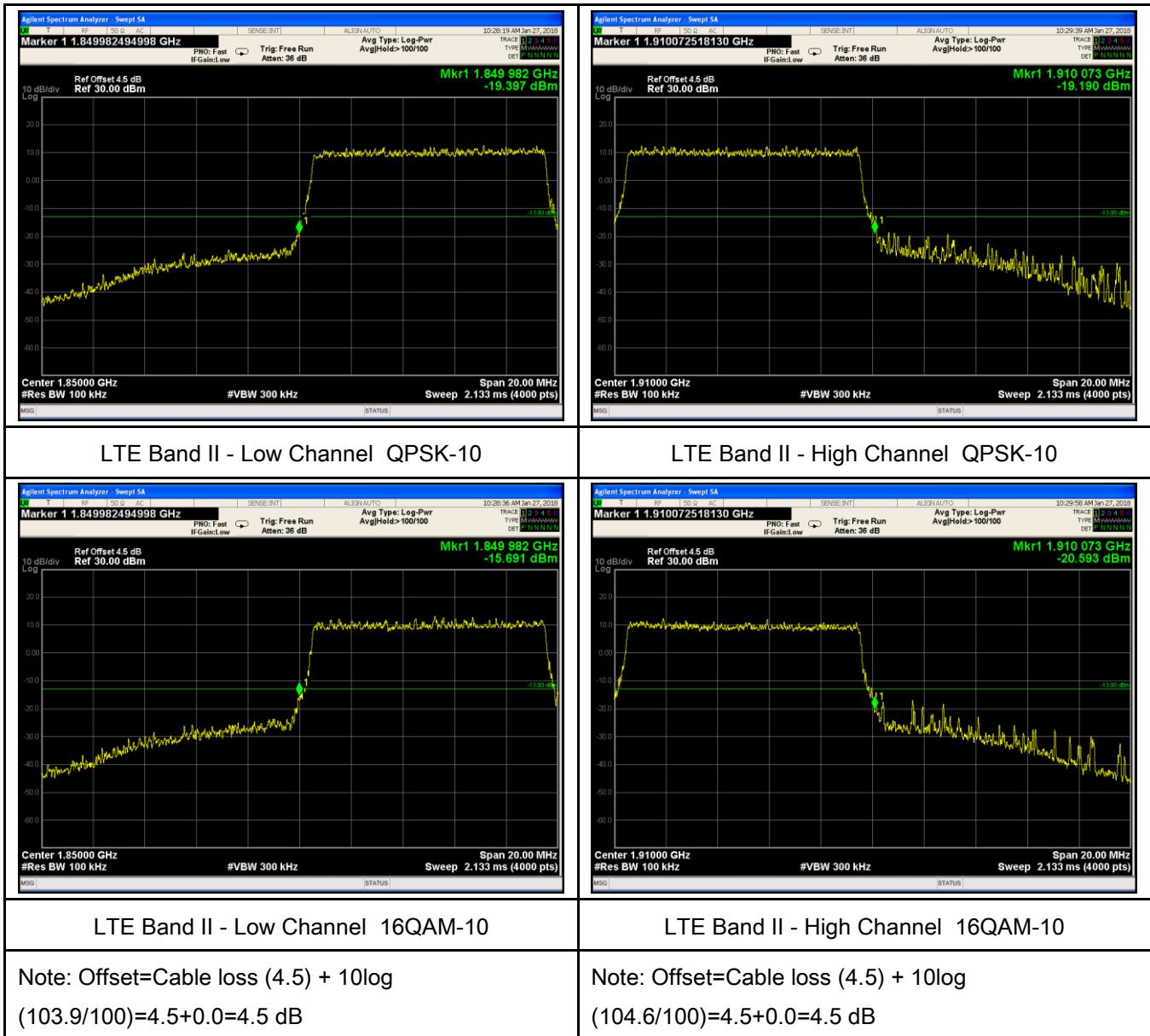
#### LTE Band II - Low Channel 16QAM-3

Note: Offset=Cable loss (4.5) + 10log  
 $(30.66/30)=4.5+0.1=4.6$  dB

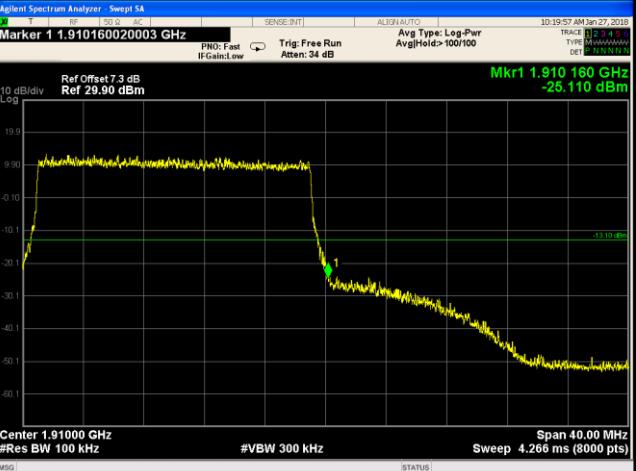
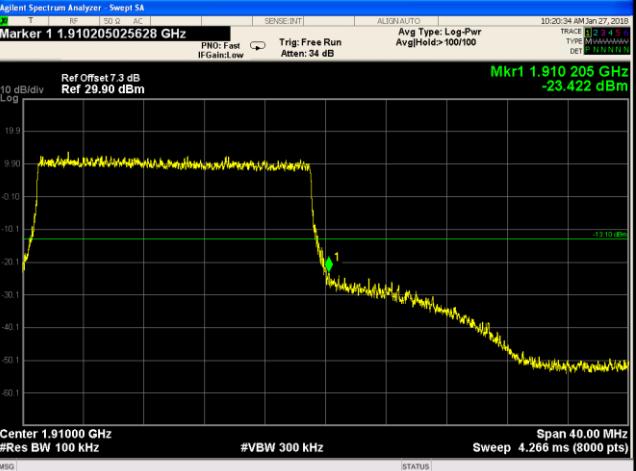
#### LTE Band II - High Channel 16QAM-3

Note: Offset=Cable loss (4.5) + 10log  
 $(30.57/30)=4.5+0.1=4.6$  dB

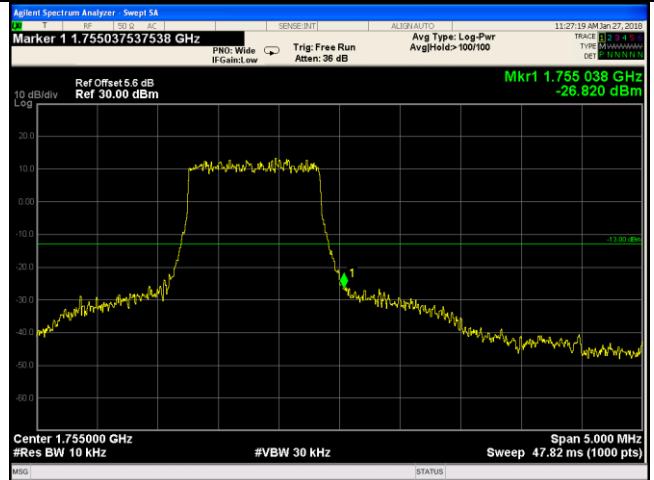
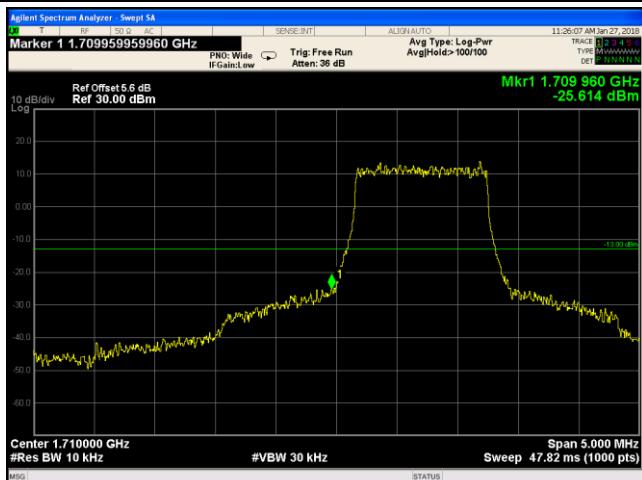
 <p>Agilent Spectrum Analyzer - Swept SA Marker 1 1.849952476238 GHz PNO: Wide IF-Gain:Low Trig: Free Run Atten: 34 dB Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>Mkr1 1.849 952 GHz -17.156 dBm</p> <p>10 dB/div Ref Offset 6.7 dB Ref 30.00 dBm</p> <p>Log</p> <p>20.0 10.0 0.0 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0</p> <p>Center 1.850000 GHz #Res BW 30 kHz #VBW 100 kHz Sweep 10.00 MHz (2000 pts)</p>	 <p>Agilent Spectrum Analyzer - Swept SA Marker 1 1.910046023012 GHz PNO: Wide IF-Gain:Low Trig: Free Run Atten: 34 dB Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>Mkr1 1.910 046 GHz -16.429 dBm</p> <p>10 dB/div Ref Offset 6.7 dB Ref 30.00 dBm</p> <p>Log</p> <p>20.0 10.0 0.0 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0</p> <p>Center 1.910000 GHz #Res BW 30 kHz #VBW 100 kHz Sweep 10.00 MHz (2000 pts)</p>
<p>LTE Band II - Low Channel QPSK-5</p>	<p>LTE Band II - High Channel QPSK-5</p>
<p>Note: Offset=Cable loss (4.5) + 10log <math>(51.95/30)=4.5+2.2=6.7</math> dB</p>	<p>Note: Offset=Cable loss (4.5) + 10log <math>(52.81/30)=4.5+2.2=6.7</math> dB</p>
 <p>Agilent Spectrum Analyzer - Swept SA Marker 1 1.849947473737 GHz PNO: Wide IF-Gain:Low Trig: Free Run Atten: 34 dB Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>Mkr1 1.849 947 GHz -18.002 dBm</p> <p>10 dB/div Ref Offset 6.7 dB Ref 30.00 dBm</p> <p>Log</p> <p>20.0 10.0 0.0 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0</p> <p>Center 1.850000 GHz #Res BW 30 kHz #VBW 100 kHz Sweep 10.00 MHz (2000 pts)</p>	 <p>Agilent Spectrum Analyzer - Swept SA Marker 1 1.910071035518 GHz PNO: Wide IF-Gain:Low Trig: Free Run Atten: 34 dB Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>Mkr1 1.910 071 GHz -19.601 dBm</p> <p>10 dB/div Ref Offset 6.7 dB Ref 30.00 dBm</p> <p>Log</p> <p>20.0 10.0 0.0 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0</p> <p>Center 1.910000 GHz #Res BW 30 kHz #VBW 100 kHz Sweep 10.00 MHz (2000 pts)</p>
<p>LTE Band II - Low Channel 16QAM-5</p>	<p>LTE Band II - High Channel 16QAM-5</p>
<p>Note: Offset=Cable loss (4.5) + 10log <math>(51.81/30)=4.5+2.2=6.7</math> dB</p>	<p>Note: Offset=Cable loss (4.5) + 10log <math>(52.79/30)=4.5+2.2=6.7</math> dB</p>



 <p>Agilent Spectrum Analyzer - Swept SA Marker 1 1.849934366798 GHz</p> <p>Ref Offset 6.2 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Center 1.85000 GHz #Res BW 100 kHz #VBW 300 kHz Avg Type: Log-Pwr Span 3.00 MHz Avg[Hold]&gt;100/100 Trig: Free Run Attenuation: 34 dB</p> <p>Mkr1 1.849 934 GHz -16.781 dBm</p> <p>150.1/100 = 4.5 + 1.7 = 6.2 dB</p>	 <p>Agilent Spectrum Analyzer - Swept SA Marker 1 1.910046257345 GHz</p> <p>Ref Offset 6.2 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Center 1.91000 GHz #Res BW 100 kHz #VBW 300 kHz Avg Type: Log-Pwr Span 3.00 MHz Avg[Hold]&gt;100/100 Trig: Free Run Attenuation: 34 dB</p> <p>Mkr1 1.910 046 GHz -18.088 dBm</p> <p>151.5/100 = 4.5 + 1.7 = 6.2 dB</p>
<p>LTE Band II - Low Channel QPSK-15</p> <p>Note: Offset=Cable loss (4.5) + 10log (150.1/100)=4.5+1.7=6.2 dB</p>	<p>LTE Band II - High Channel QPSK-15</p> <p>Note: Offset=Cable loss (4.5) + 10log (151.5/100)=4.5+1.7=6.2 dB</p>
 <p>Agilent Spectrum Analyzer - Swept SA Marker 1 1.849915614452 GHz</p> <p>Ref Offset 6.2 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Center 1.85000 GHz #Res BW 100 kHz #VBW 300 kHz Avg Type: Log-Pwr Span 3.00 MHz Avg[Hold]&gt;100/100 Trig: Free Run Attenuation: 34 dB</p> <p>Mkr1 1.849 916 GHz -17.397 dBm</p> <p>152.2/100 = 4.5 + 1.7 = 6.2 dB</p>	 <p>Agilent Spectrum Analyzer - Swept SA Marker 1 1.910076261096 GHz</p> <p>Ref Offset 6.2 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Center 1.91000 GHz #Res BW 100 kHz #VBW 300 kHz Avg Type: Log-Pwr Span 3.00 MHz Avg[Hold]&gt;100/100 Trig: Free Run Attenuation: 34 dB</p> <p>Mkr1 1.910 076 GHz -18.262 dBm</p> <p>151.8/100 = 4.5 + 1.7 = 6.2 dB</p>
<p>LTE Band II - Low Channel 16QAM-15</p> <p>Note: Offset=Cable loss (4.5) + 10log (152.2/100)=4.5+1.7=6.2 dB</p>	<p>LTE Band II - High Channel 16QAM-15</p> <p>Note: Offset=Cable loss (4.5) + 10log (151.8/100)=4.5+1.7=6.2 dB</p>

 <p>Agilent Spectrum Analyzer - Swept SA Marker 1 1.850014376797 GHz</p> <p>PWD: Fast IFGain:Low Trig: Free Run Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>Ref Offset 7.3 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Mkr1 1.850 014 GHz -22.495 dBm</p> <p>Center 1.85000 GHz #Res BW 100 kHz #VBW 300 kHz Span 4.00 MHz Sweep 4.266 ms (8000 pts)</p>	 <p>Agilent Spectrum Analyzer - Swept SA Marker 1 1.910205025628 GHz</p> <p>PWD: Fast IFGain:Low Trig: Free Run Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>Ref Offset 7.3 dB Ref 29.90 dBm</p> <p>10 dB/div Log</p> <p>Mkr1 1.910 205 GHz -23.422 dBm</p> <p>Center 1.91000 GHz #Res BW 100 kHz #VBW 300 kHz Span 4.00 MHz Sweep 4.266 ms (8000 pts)</p>
<p>LTE Band II - Low Channel QPSK-20</p> <p>Note: Offset=Cable loss (4.5) + 10log <math>(192.3/100)=4.5+2.8=7.3</math> dB</p>	<p>LTE Band II - High Channel QPSK-20</p> <p>Note: Offset=Cable loss (4.5) + 10log <math>(194.1/100)=4.5+2.8=7.3</math> dB</p>
 <p>Agilent Spectrum Analyzer - Swept SA Marker 1 1.850014376797 GHz</p> <p>PWD: Fast IFGain:Low Trig: Free Run Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>Ref Offset 7.3 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Mkr1 1.850 014 GHz -22.495 dBm</p> <p>Center 1.85000 GHz #Res BW 100 kHz #VBW 300 kHz Span 4.00 MHz Sweep 4.266 ms (8000 pts)</p>	 <p>Agilent Spectrum Analyzer - Swept SA Marker 1 1.910205025628 GHz</p> <p>PWD: Fast IFGain:Low Trig: Free Run Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>Ref Offset 7.3 dB Ref 29.90 dBm</p> <p>10 dB/div Log</p> <p>Mkr1 1.910 205 GHz -23.422 dBm</p> <p>Center 1.91000 GHz #Res BW 100 kHz #VBW 300 kHz Span 4.00 MHz Sweep 4.266 ms (8000 pts)</p>
<p>LTE Band II - Low Channel 16QAM-20</p> <p>Note: Offset=Cable loss (4.5) + 10log <math>(196.0/100)=4.5+2.8=7.3</math> dB</p>	<p>LTE Band II - High Channel 16QAM-20</p> <p>Note: Offset=Cable loss (4.5) + 10log <math>(196.7/100)=4.5+2.8=7.3</math> dB</p>

## LTE Band IV (Part 27)

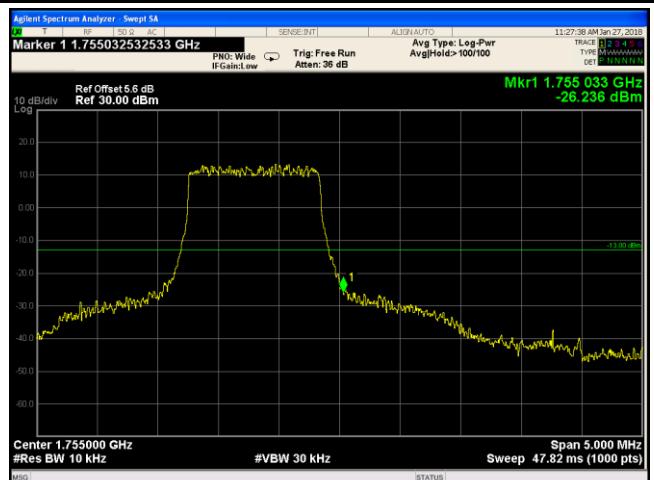


LTE Band IV - Low Channel QPSK-1.4

Note: Offset=Cable loss (4.5) + 10log  
 $(13.27/10)=4.5+1.1=5.6$  dB

LTE Band IV - High Channel QPSK-1.4

Note: Offset=Cable loss (4.5) + 10log  
 $(13.09/10)=4.5+1.1=5.6$  dB

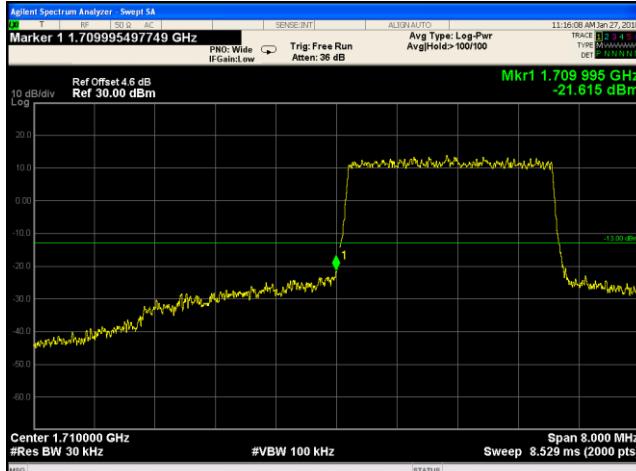
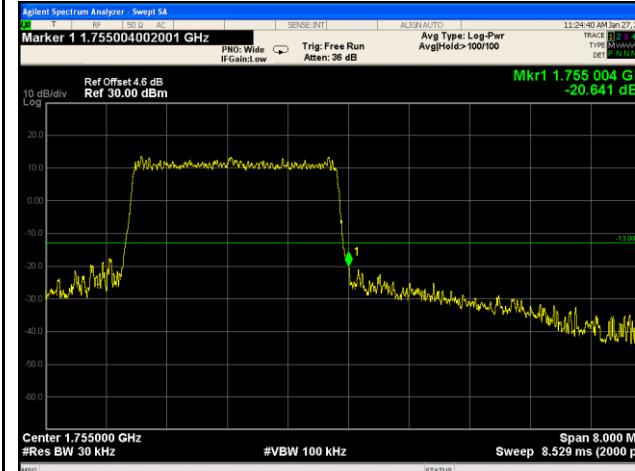
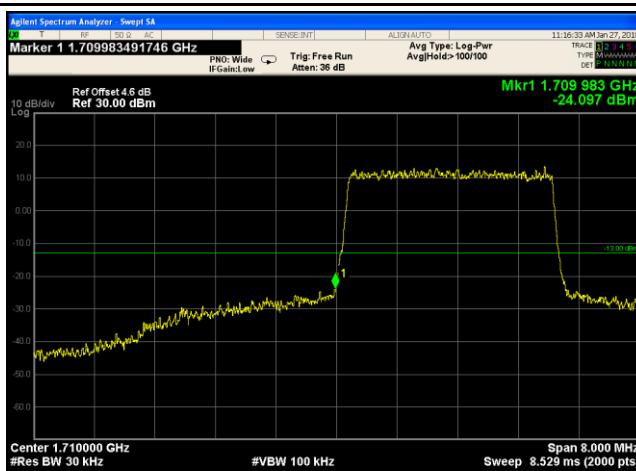
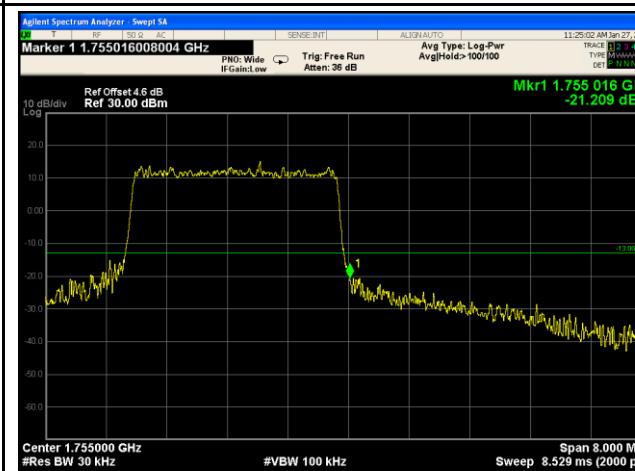


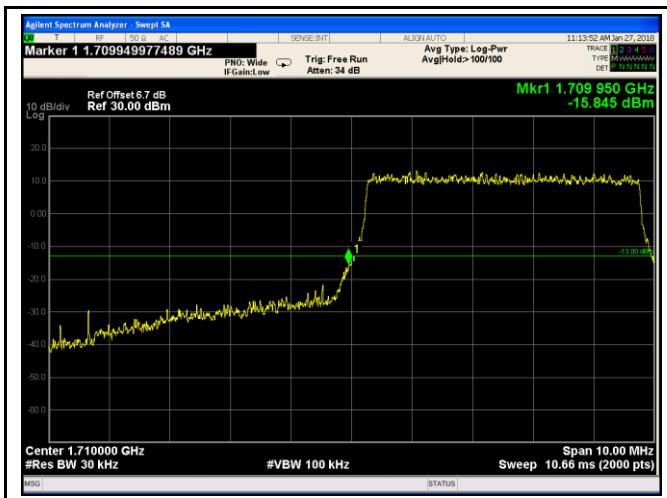
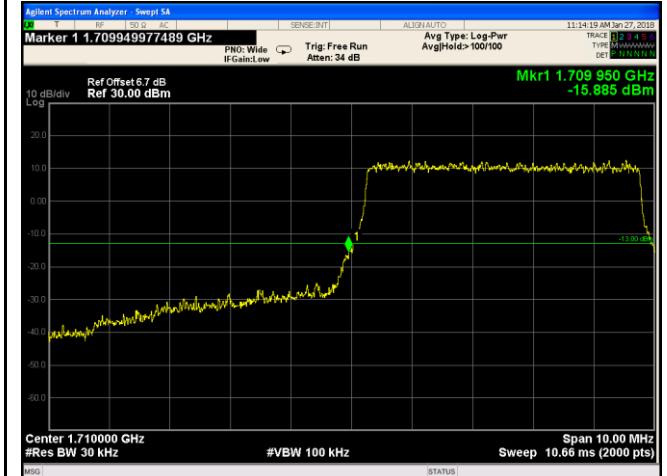
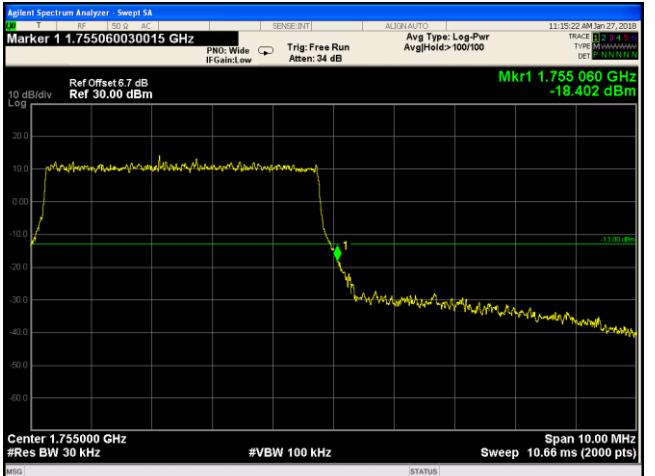
LTE Band IV - Low Channel 16QAM-1.4

Note: Offset=Cable loss (4.5) + 10log  
 $(13.28/10)=4.5+1.1=5.6$  dB

LTE Band IV - High Channel 16QAM-1.4

Note: Offset=Cable loss (4.5) + 10log  
 $(13.07/10)=4.5+1.1=5.6$  dB

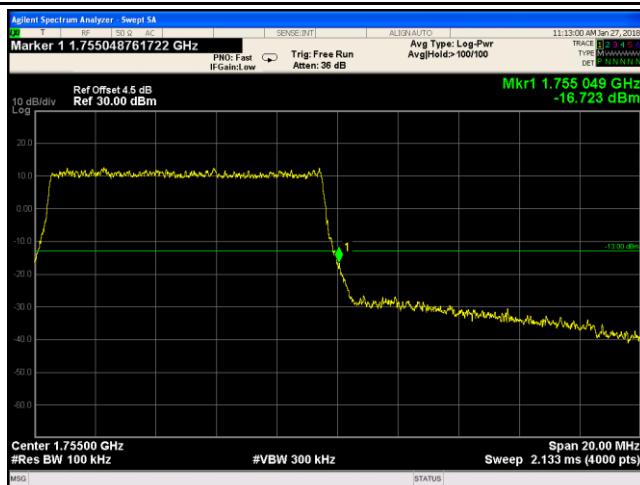
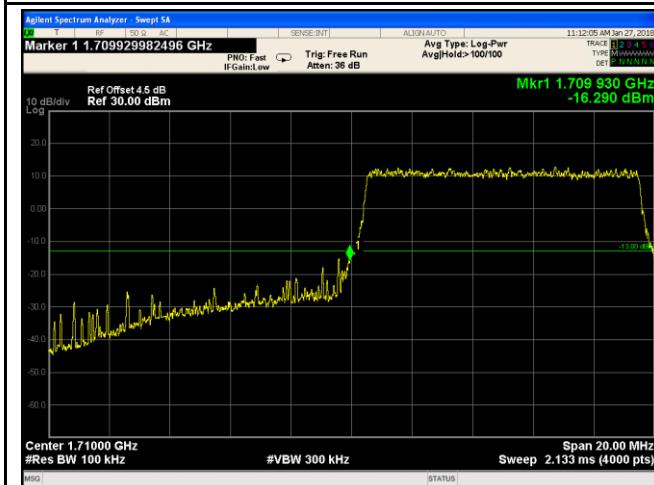
 <p>Marker 1.709995497749 GHz PNO: Wide IFGain:Low Trig: Free Run Atten: 36 dB</p> <p>Mkr1 1.709 995 GHz -21.615 dBm</p> <p>Ref Offset 4.6 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Center 1.710000 GHz #Res BW 30 kHz #VBW 100 kHz Sweep 8.000 MHz Span 8.529 ms (2000 pts)</p>	 <p>Marker 1.755004002001 GHz PNO: Wide IFGain:Low Trig: Free Run Atten: 36 dB</p> <p>Mkr1 1.755 004 GHz -20.641 dBm</p> <p>Ref Offset 4.6 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Center 1.755000 GHz #Res BW 30 kHz #VBW 100 kHz Sweep 8.000 MHz Span 8.529 ms (2000 pts)</p>
<p>LTE Band IV - Low Channel QPSK-3</p> <p>Note: Offset=Cable loss (4.5) + 10log <math>(30.14/30)=4.5+0.1=4.6</math> dB</p>	<p>LTE Band IV - High Channel QPSK-3</p> <p>Note: Offset=Cable loss (4.5) + 10log <math>(30.04/30)=4.5+0.1=4.6</math> dB</p>
 <p>Marker 1.709983491746 GHz PNO: Wide IFGain:Low Trig: Free Run Atten: 36 dB</p> <p>Mkr1 1.709 983 GHz -24.097 dBm</p> <p>Ref Offset 4.6 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Center 1.710000 GHz #Res BW 30 kHz #VBW 100 kHz Sweep 8.000 MHz Span 8.529 ms (2000 pts)</p>	 <p>Marker 1.755016008004 GHz PNO: Wide IFGain:Low Trig: Free Run Atten: 36 dB</p> <p>Mkr1 1.755 016 GHz -21.209 dBm</p> <p>Ref Offset 4.6 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Center 1.755000 GHz #Res BW 30 kHz #VBW 100 kHz Sweep 8.000 MHz Span 8.529 ms (2000 pts)</p>
<p>LTE Band IV - Low Channel 16QAM-3</p> <p>Note: Offset=Cable loss (4.5) + 10log <math>(29.96/30)=4.5+0.1=4.6</math> dB</p>	<p>LTE Band IV - High Channel 16QAM-3</p> <p>Note: Offset=Cable loss (4.5) + 10log <math>(30.10/30)=4.5+0.1=4.6</math> dB</p>

 <p>Agilent Spectrum Analyzer - Swept SA      Marker 1 1.709949977489 GHz      PNO: Wide IF-Gain:Low Trig: Free Run Avg Type: Log-Pwr AvgHold&gt;100/100      Ref Offset 5.7 dB Ref 30.00 dBm      10 dB/div Log      Center 1.710000 GHz #Res BW 30 kHz #VBW 100 kHz Span 10.00 MHz Sweep 10.66 ms (2000 pts)      MSG STATUS</p>	 <p>Agilent Spectrum Analyzer - Swept SA      Marker 1 1.755030015008 GHz      PNO: Wide IF-Gain:Low Trig: Free Run Avg Type: Log-Pwr AvgHold&gt;100/100      Ref Offset 5.7 dB Ref 30.00 dBm      10 dB/div Log      Center 1.755000 GHz #Res BW 30 kHz #VBW 100 kHz Span 10.00 MHz Sweep 10.66 ms (2000 pts)      MSG STATUS</p>
<p>LTE Band IV - Low Channel QPSK-5</p> <p>Note: Offset=Cable loss (4.5) + 10log  <math>(50.54/30)=4.5+2.2=6.7</math> dB</p>	<p>LTE Band IV - High Channel QPSK-5</p> <p>Note: Offset=Cable loss (4.5) + 10log  <math>(52.05/30)=4.5+2.2=6.7</math> dB</p>
 <p>Agilent Spectrum Analyzer - Swept SA      Marker 1 1.709949977489 GHz      PNO: Wide IF-Gain:Low Trig: Free Run Avg Type: Log-Pwr AvgHold&gt;100/100      Ref Offset 5.7 dB Ref 30.00 dBm      10 dB/div Log      Center 1.710000 GHz #Res BW 30 kHz #VBW 100 kHz Span 10.00 MHz Sweep 10.66 ms (2000 pts)      MSG STATUS</p>	 <p>Agilent Spectrum Analyzer - Swept SA      Marker 1 1.755060030015 GHz      PNO: Wide IF-Gain:Low Trig: Free Run Avg Type: Log-Pwr AvgHold&gt;100/100      Ref Offset 5.7 dB Ref 30.00 dBm      10 dB/div Log      Center 1.755000 GHz #Res BW 30 kHz #VBW 100 kHz Span 10.00 MHz Sweep 10.66 ms (2000 pts)      MSG STATUS</p>
<p>LTE Band IV - Low Channel 16QAM-5</p> <p>Note: Offset=Cable loss (4.5) + 10log  <math>(52.16/30)=4.5+2.2=6.7</math> dB</p>	<p>LTE Band IV - High Channel 16QAM-5</p> <p>Note: Offset=Cable loss (4.5) + 10log  <math>(51.66/30)=4.5+2.2=6.7</math> dB</p>



LTE Band IV - Low Channel QPSK-10

LTE Band IV - High Channel QPSK-10



LTE Band IV - Low Channel 16QAM-10

LTE Band IV - High Channel 16QAM-10

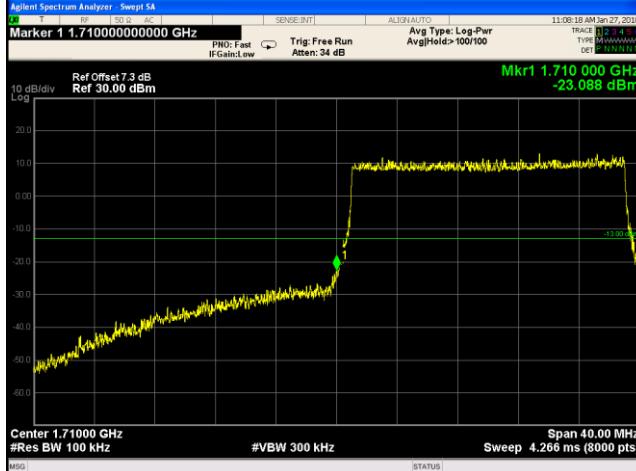


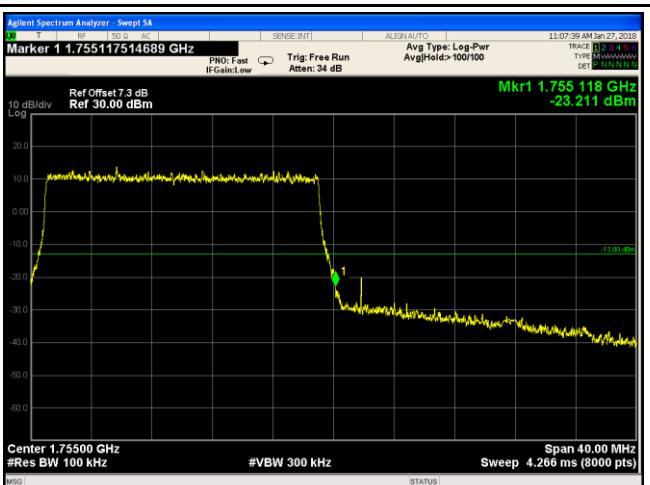
LTE Band IV - Low Channel QPSK-15

LTE Band IV - High Channel QPSK-15

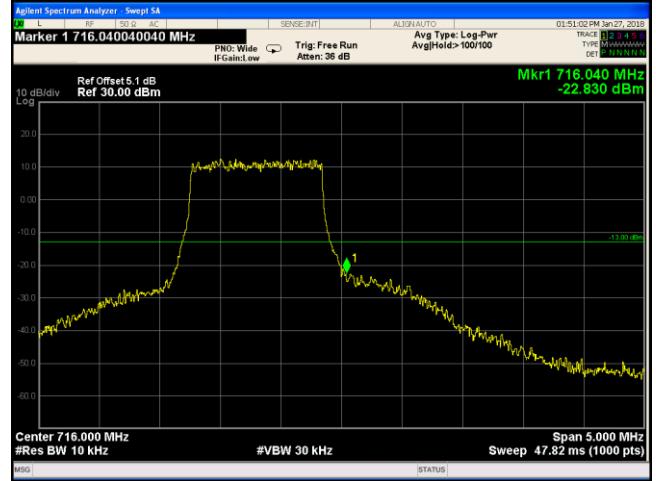
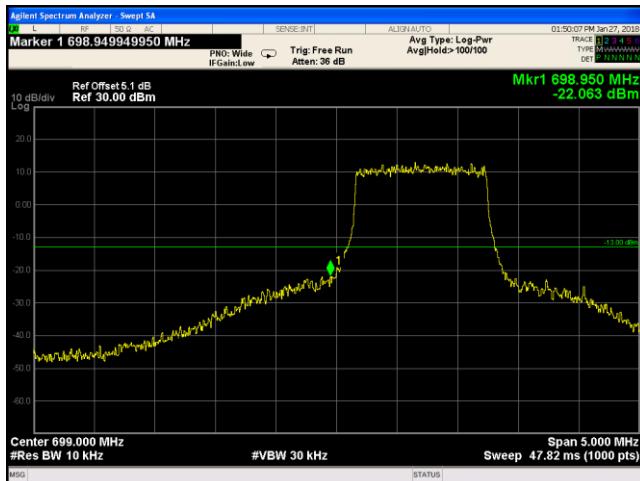
Note: Offset=Cable loss (4.5) + 10log  
(150.3/100)=4.5+1.7=6.2 dB

Note: Offset=Cable loss (4.5) + 10log  
(152.0/100)=4.5+1.7=6.2 dB

 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Marker 1 1.70992032538 GHz</p> <p>PWD: Fast IFGain:Low Trig: Free Run Atten: 34 dB</p> <p>Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>11:09:41 AM Sep 27, 2018</p> <p>Ref Offset 5.2 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Mkr1 1.709 920 GHz -17.111 dBm</p> <p>Center 1.71000 GHz #Res BW 100 kHz #VBW 300 kHz Span 30.00 MHz Sweep 3.200 ms (8000 pts)</p> <p>(STATUS)</p>	 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Marker 1 1.755071258907 GHz</p> <p>PWD: Fast IFGain:Low Trig: Free Run Atten: 34 dB</p> <p>Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>11:10:53 AM Sep 27, 2018</p> <p>Ref Offset 6.2 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Mkr1 1.755 071 GHz -16.946 dBm</p> <p>Center 1.75500 GHz #Res BW 100 kHz #VBW 300 kHz Span 30.00 MHz Sweep 3.200 ms (8000 pts)</p> <p>(STATUS)</p>
<p>LTE Band IV - Low Channel 16QAM-15</p> <p>Note: Offset=Cable loss (4.5) + 10log (150.3/100)=4.5+1.7=6.2 dB</p>	<p>LTE Band IV - High Channel 16QAM-15</p> <p>Note: Offset=Cable loss (4.5) + 10log (151.1/100)=4.5+1.7=6.2 dB</p>
 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Marker 1 1.710000000000 GHz</p> <p>PWD: Fast IFGain:Low Trig: Free Run Atten: 34 dB</p> <p>Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>11:08:18 AM Sep 27, 2018</p> <p>Ref Offset 7.3 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Mkr1 1.710 000 GHz -23.088 dBm</p> <p>Center 1.71000 GHz #Res BW 100 kHz #VBW 300 kHz Span 40.00 MHz Sweep 4.266 ms (8000 pts)</p> <p>(STATUS)</p>	 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Marker 1 1.755122515314 GHz</p> <p>PWD: Fast IFGain:Low Trig: Free Run Atten: 34 dB</p> <p>Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>11:07:13 AM Sep 27, 2018</p> <p>Ref Offset 7.3 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Mkr1 1.755 123 GHz -24.036 dBm</p> <p>Center 1.75500 GHz #Res BW 100 kHz #VBW 300 kHz Span 40.00 MHz Sweep 4.266 ms (8000 pts)</p> <p>(STATUS)</p>
<p>LTE Band IV - Low Channel QPSK-20</p> <p>Note: Offset=Cable loss (4.5) + 10log (195.9/100)=4.5+2.8=7.3 dB</p>	<p>LTE Band IV - High Channel QPSK-20</p> <p>Note: Offset=Cable loss (4.5) + 10log (196.8/100)=4.5+2.8=7.3 dB</p>

 <p>Marker 1 1.709964995624 GHz PN0: Fast IFGainLow Trig: Free Run AvgType: Log-Pwr AvgHold&gt;100/100</p> <p>Mkr1 1.709 985 GHz -23.682 dBm</p> <p>10 dB/div Ref Offset 7.3 dB Ref 30.00 dBm</p> <p>Center 1.71000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 4.000 MHz Span 40.00 MHz</p>	 <p>Marker 1 1.755117514689 GHz PN0: Fast IFGainLow Trig: Free Run AvgType: Log-Pwr AvgHold&gt;100/100</p> <p>Mkr1 1.755 118 GHz -23.211 dBm</p> <p>10 dB/div Ref Offset 7.3 dB Ref 30.00 dBm</p> <p>Center 1.75500 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 4.000 MHz Span 40.00 MHz</p>
LTE Band IV - Low Channel 16QAM-20	LTE Band IV - High Channel 16QAM-20
Note: Offset=Cable loss (4.5) + 10log (198.9/100)=4.5+2.8=7.3dB	Note: Offset=Cable loss (4.5) + 10log (196.2/100)=4.5+2.8=7.3 dB

## LTE Band XII (Part 27)

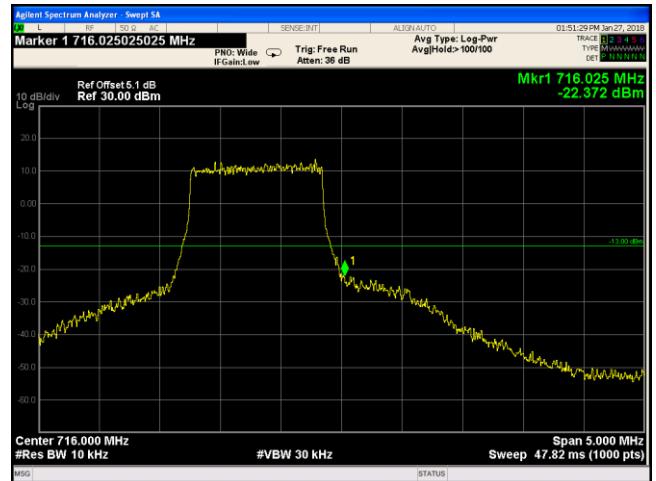
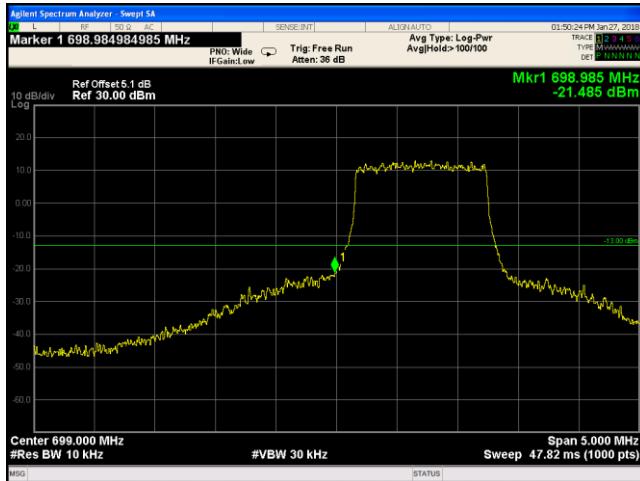


LTE Band XII - Low Channel QPSK-1.4

Note: Offset=Cable loss (4.5) + 10log  
(13.14/10)=4.0+1.1=5.1 dB

LTE Band XII - High Channel QPSK-1.4

Note: Offset=Cable loss (4.5) + 10log  
(13.02/10)=4.0+1.1=5.1 dB

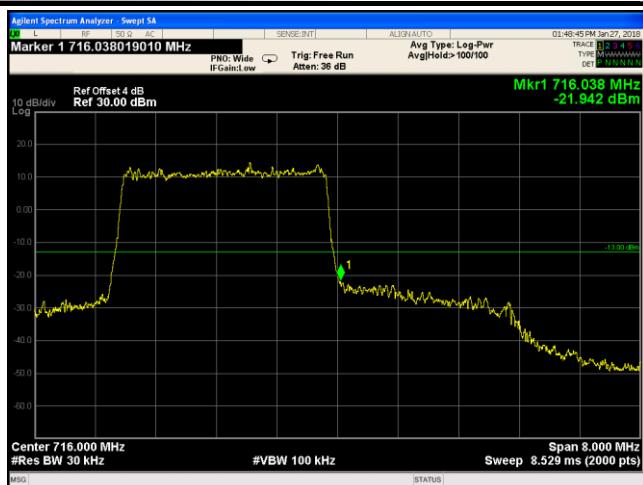


LTE Band XII - Low Channel 16QAM-1.4

Note: Offset=Cable loss (4.5) + 10log  
(13.30/10)=4.0+1.1=5.1 dB

LTE Band XII - High Channel 16QAM-1.4

Note: Offset=Cable loss (4.5) + 10log  
(13.05/10)=4.0+1.1=5.1 dB



#### LTE Band XII - Low Channel QPSK-3

Note: Offset=Cable loss (4.5) + 10log  
 $(29.87/30)=4.0+0.0=4.0$  dB

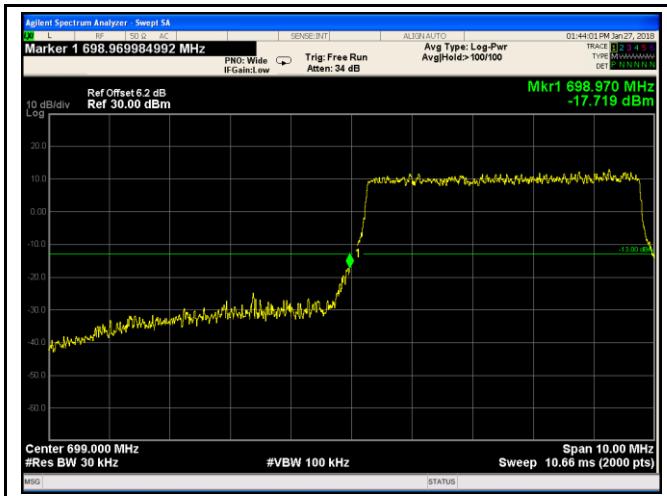
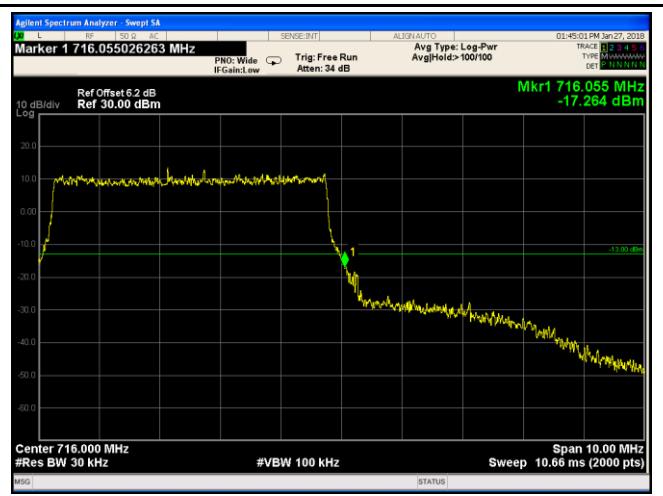
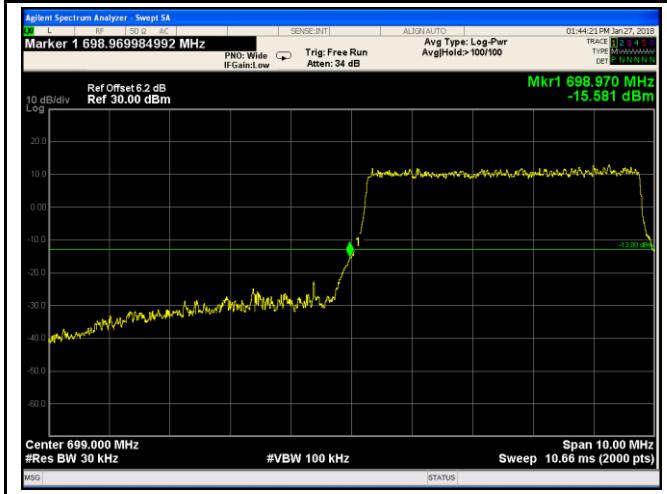
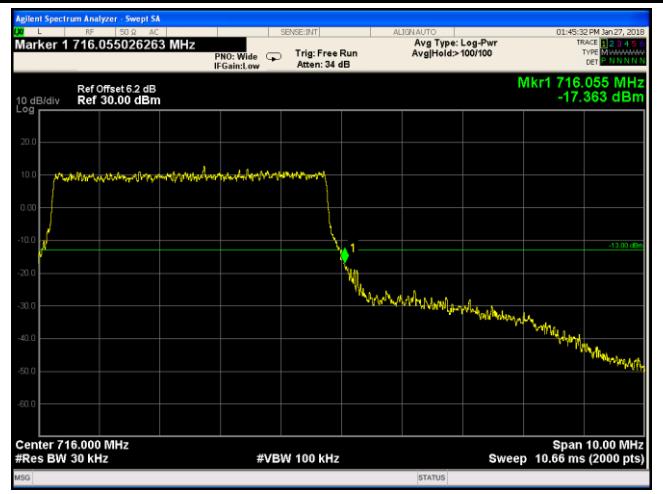


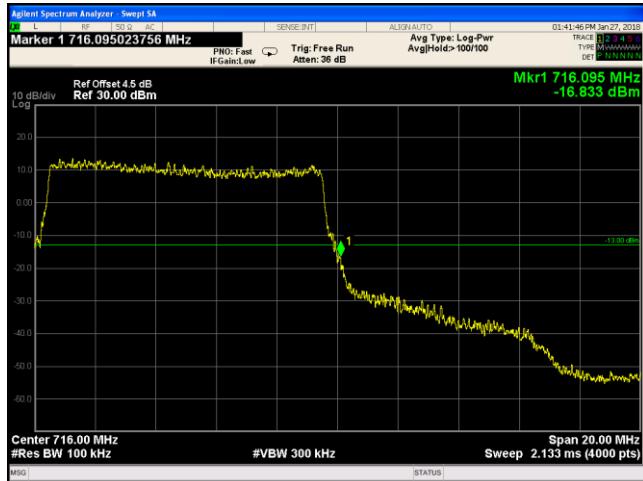
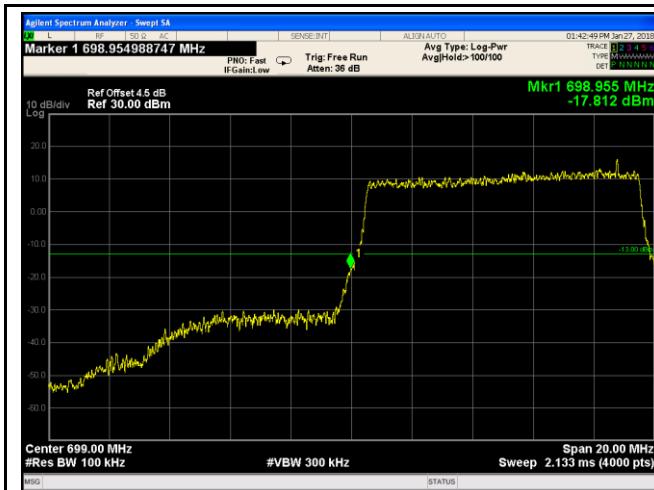
#### LTE Band XII - Low Channel 16QAM-3

Note: Offset=Cable loss (4.5) + 10log  
 $(30.29/30)=4.0+0.0=4.0$  dB

#### LTE Band XII - High Channel QPSK-3

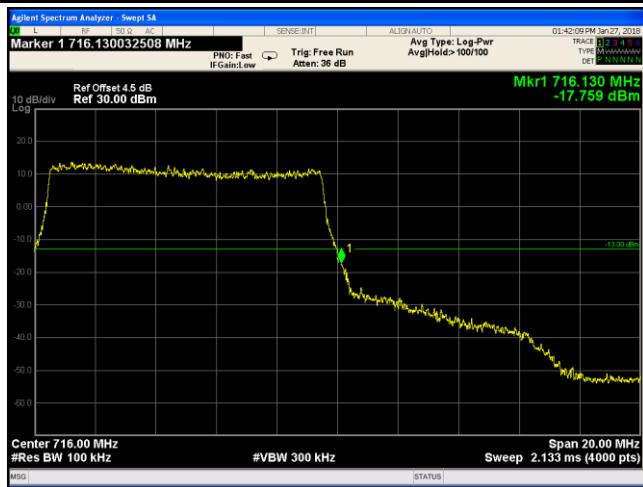
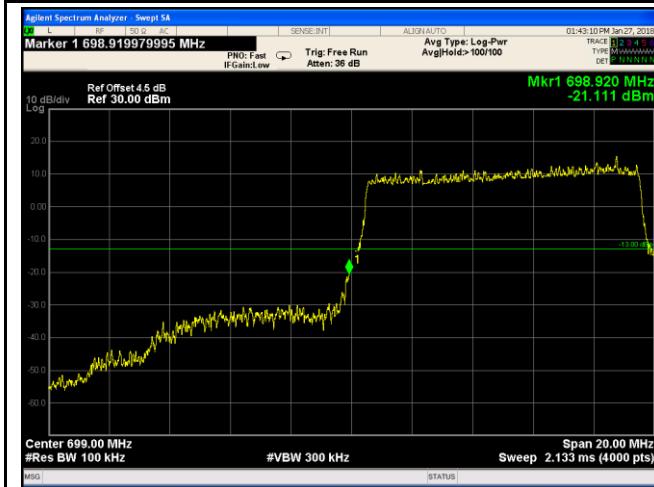
Note: Offset=Cable loss (4.5) + 10log  
 $(30.02/30)=4.0+0.0=4.0$  dB

	
<p>LTE Band XII - Low Channel QPSK-5</p> <p>Note: Offset=Cable loss (4.5) + 10log  <math>(51.56/30)=4.0+2.2=6.2 \text{ dB}</math></p>	<p>LTE Band XII - High Channel QPSK-5</p> <p>Note: Offset=Cable loss (4.5) + 10log  <math>(52.02/30)=4.0+2.2=6.2 \text{ dB}</math></p>
	
<p>LTE Band XII - Low Channel 16QAM-5</p> <p>Note: Offset=Cable loss (4.5) + 10log  <math>(52.24/30)=4.0+2.2=6.2 \text{ dB}</math></p>	<p>LTE Band XII - High Channel 16QAM-5</p> <p>Note: Offset=Cable loss (4.5) + 10log  <math>(52.97/30)=4.0+2.2=6.2 \text{ dB}</math></p>



LTE Band XII - Low Channel QPSK-10

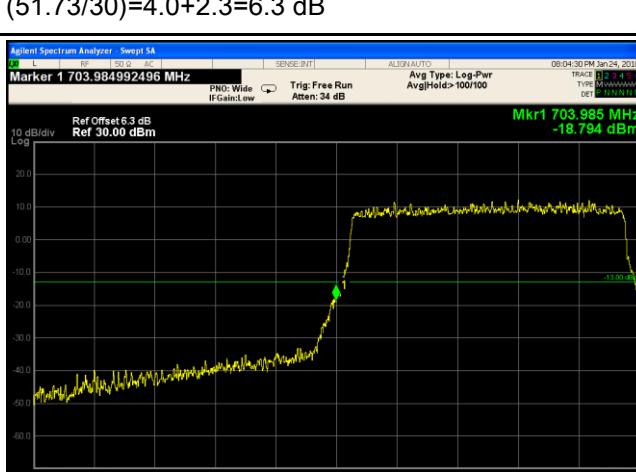
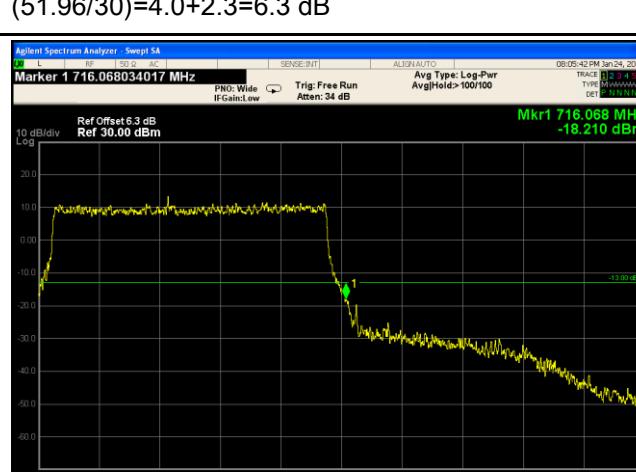
LTE Band XII - High Channel QPSK-10

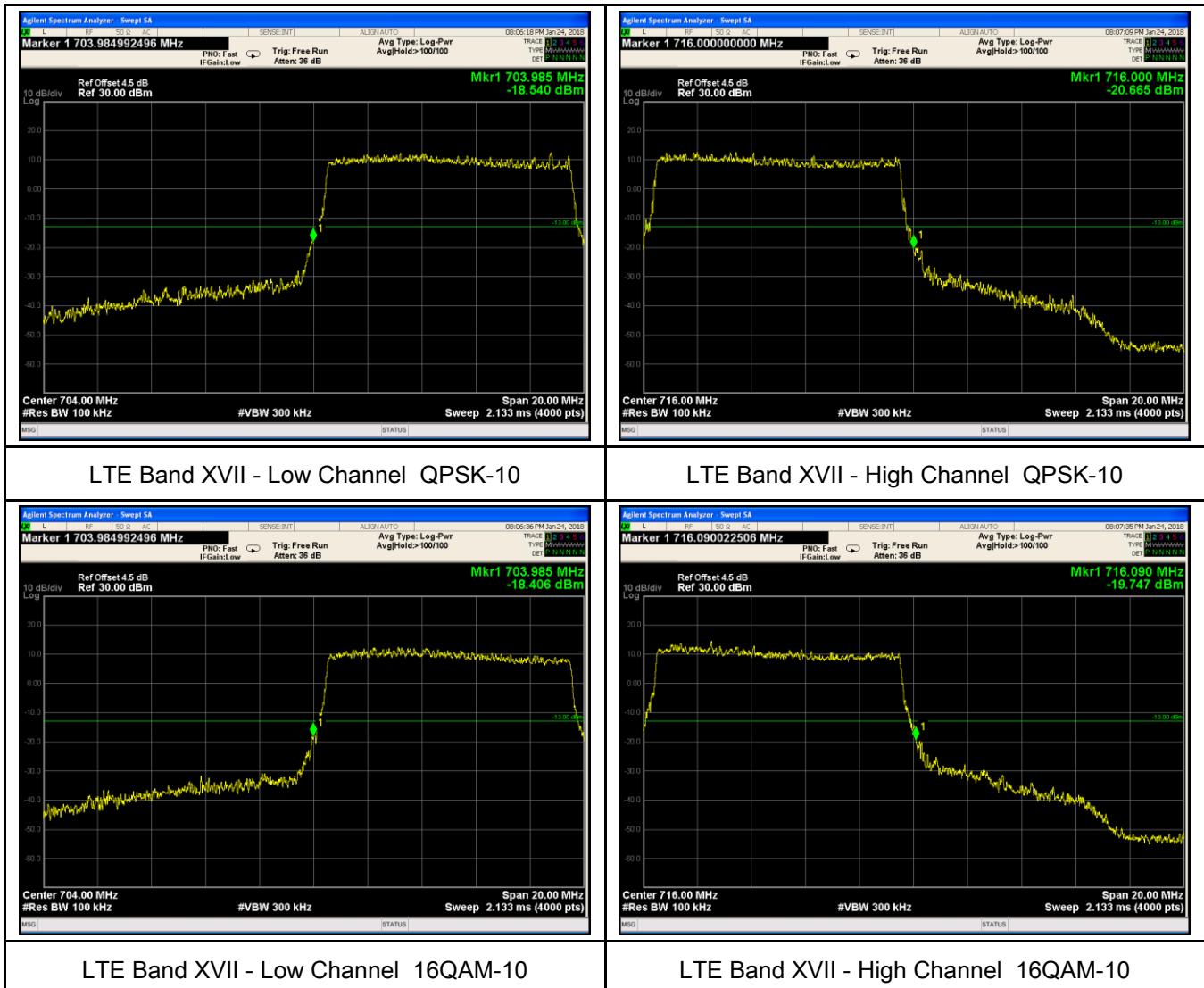


LTE Band XII - Low Channel 16QAM-10

LTE Band XII - High Channel 16QAM-10

## LTE Band XVII (Part 27)

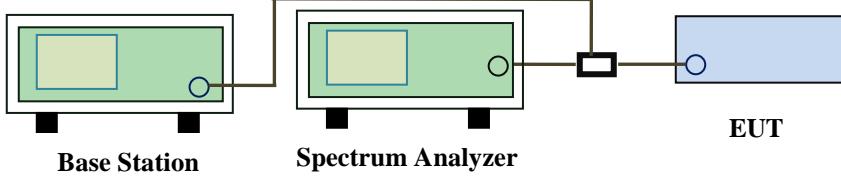
 <p>Agilent Spectrum Analyzer - Swept SA      Marker 1 703.984992496 MHz      PNO: Wide IF-Gain:Low Trig: Free Run Aten: 34 dB Avg Type: Log-Pwr Avg/Hold: &gt;100/100</p> <p>Mkr1 703.985 MHz -16.883 dBm</p> <p>Ref Offset 6.3 dB Ref 30.00 dBm</p> <p>Center 704.000 MHz #Res BW 30 kHz #VBW 100 kHz Sweep 10.66 ms (2000 pts)</p>	 <p>Agilent Spectrum Analyzer - Swept SA      Marker 1 716.068034017 MHz      PNO: Wide IF-Gain:Low Trig: Free Run Aten: 34 dB Avg Type: Log-Pwr Avg/Hold: &gt;100/100</p> <p>Mkr1 716.068 MHz -17.897 dBm</p> <p>Ref Offset 6.3 dB Ref 30.00 dBm</p> <p>Center 716.000 MHz #Res BW 30 kHz #VBW 100 kHz Sweep 10.66 ms (2000 pts)</p>
<p><b>LTE Band XVII - Low Channel QPSK-5</b></p> <p>Note: Offset=Cable loss (4.0) + 10log  <math>(51.73/30)=4.0+2.3=6.3 \text{ dB}</math></p>	<p><b>LTE Band XVII - High Channel QPSK-5</b></p> <p>Note: Offset=Cable loss (4.0) + 10log  <math>(51.96/30)=4.0+2.3=6.3 \text{ dB}</math></p>
 <p>Agilent Spectrum Analyzer - Swept SA      Marker 1 703.984992496 MHz      PNO: Wide IF-Gain:Low Trig: Free Run Aten: 34 dB Avg Type: Log-Pwr Avg/Hold: &gt;100/100</p> <p>Mkr1 703.985 MHz -18.794 dBm</p> <p>Ref Offset 6.3 dB Ref 30.00 dBm</p> <p>Center 704.000 MHz #Res BW 30 kHz #VBW 100 kHz Sweep 10.66 ms (2000 pts)</p>	 <p>Agilent Spectrum Analyzer - Swept SA      Marker 1 716.068034017 MHz      PNO: Wide IF-Gain:Low Trig: Free Run Aten: 34 dB Avg Type: Log-Pwr Avg/Hold: &gt;100/100</p> <p>Mkr1 716.068 MHz -18.210 dBm</p> <p>Ref Offset 6.3 dB Ref 30.00 dBm</p> <p>Center 716.000 MHz #Res BW 30 kHz #VBW 100 kHz Sweep 10.66 ms (2000 pts)</p>
<p><b>LTE Band XVII - Low Channel 16QAM-5</b></p> <p>Note: Offset=Cable loss (4.0) + 10log  <math>(51.79/30)=4.0+2.3=6.3 \text{ dB}</math></p>	<p><b>LTE Band XVII - High Channel 16QAM-5</b></p> <p>Note: Offset=Cable loss (4.0) + 10log  <math>(51.91/30)=4.0+2.3=6.3 \text{ dB}</math></p>



## 6.8 Band Edge 27.53(m)

Temperature	25 °C
Relative Humidity	57%
Atmospheric Pressure	1024mbar
Test date :	January 24, 2018
Tested By :	Aaron Liang

### Requirement(s):

Spec	Requirement	Applicable
§27.53(m)	<p>According to FCC 27.53(m)(4) specified that power of any emmission ouutside of the channel edge must be attenuated below the transmitting power(P) by a factor shall be not less than <math>43+10\log(P)</math>dB at the channel edge, the limit of emission equal to -13dBm.</p> <p>And <math>55+10\log(P)</math>dB at 5.5MHz from the channel edges, the limit of emission equal to -25dBm. In the 1MHz bands immediately outside and adjacent to the frenqency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.</p>	<input checked="" type="checkbox"/>
Test Setup	 <p>Base Station      Spectrum Analyzer      EUT</p>	
Test Procedure	<ul style="list-style-type: none"> <li>The EUT was connected to Spectrum Analyzer and Base Station via power divider.</li> <li>The 99% and 26 dB occupied bandwidth (BW) of the middle channel for the highest RF powers.</li> </ul>	
Remark		
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail	

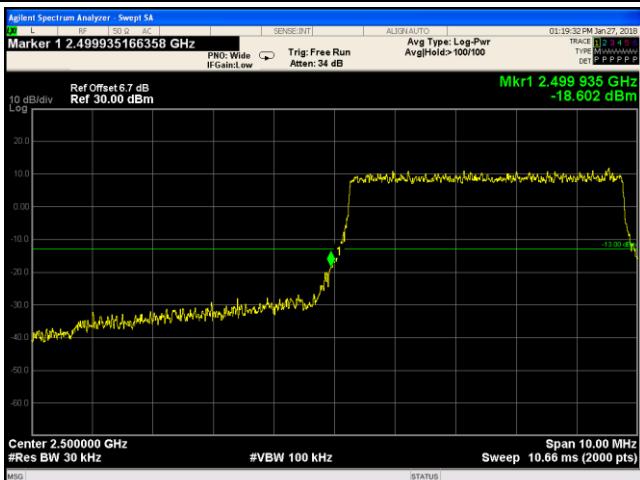
Test Data  Yes  N/A

Test Plot  Yes (See below)  N/A

### LTE Band VII (Part 27) result

BW(MHz)	Channel	Frequency (MHz)	Mode	Emission (dBm)	Limit (dBm)
5	20775	2500	16QAM	-21.485	-13
			QPSK	-22.063	-13
5	21425	2570	16QAM	-22.372	-13
			QPSK	-22.83	-13
10	20800	2500	16QAM	-22.825	-13
			QPSK	-21.652	-13
10	21400	2570	16QAM	-22.484	-13
			QPSK	-21.942	-13
15	20825	2500	16QAM	-15.581	-13
			QPSK	-17.719	-13
15	21400	2570	16QAM	-17.363	-13
			QPSK	-17.264	-13
20	20850	2500	16QAM	-21.111	-13
			QPSK	-17.812	-13
20	21350	2571	16QAM	-17.759	-13
			QPSK	-16.833	-13

## LTE Band VII (Part 27)

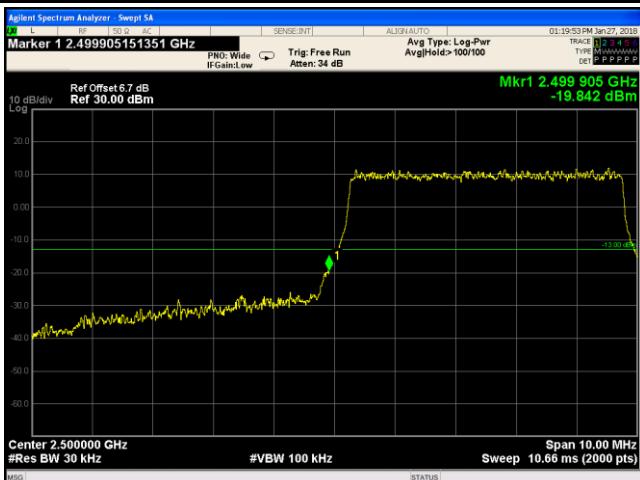


LTE Band VII - Low Channel QPSK-5

Note: Offset=Cable loss (4.5) + 10log  
 $(51.50/30)=4.5+2.2=6.7$  dB

LTE Band VII - High Channel QPSK-5

Note: Offset=Cable loss (4.5) + 10log  
 $(50.36/30)=4.5+2.2=6.7$  dB

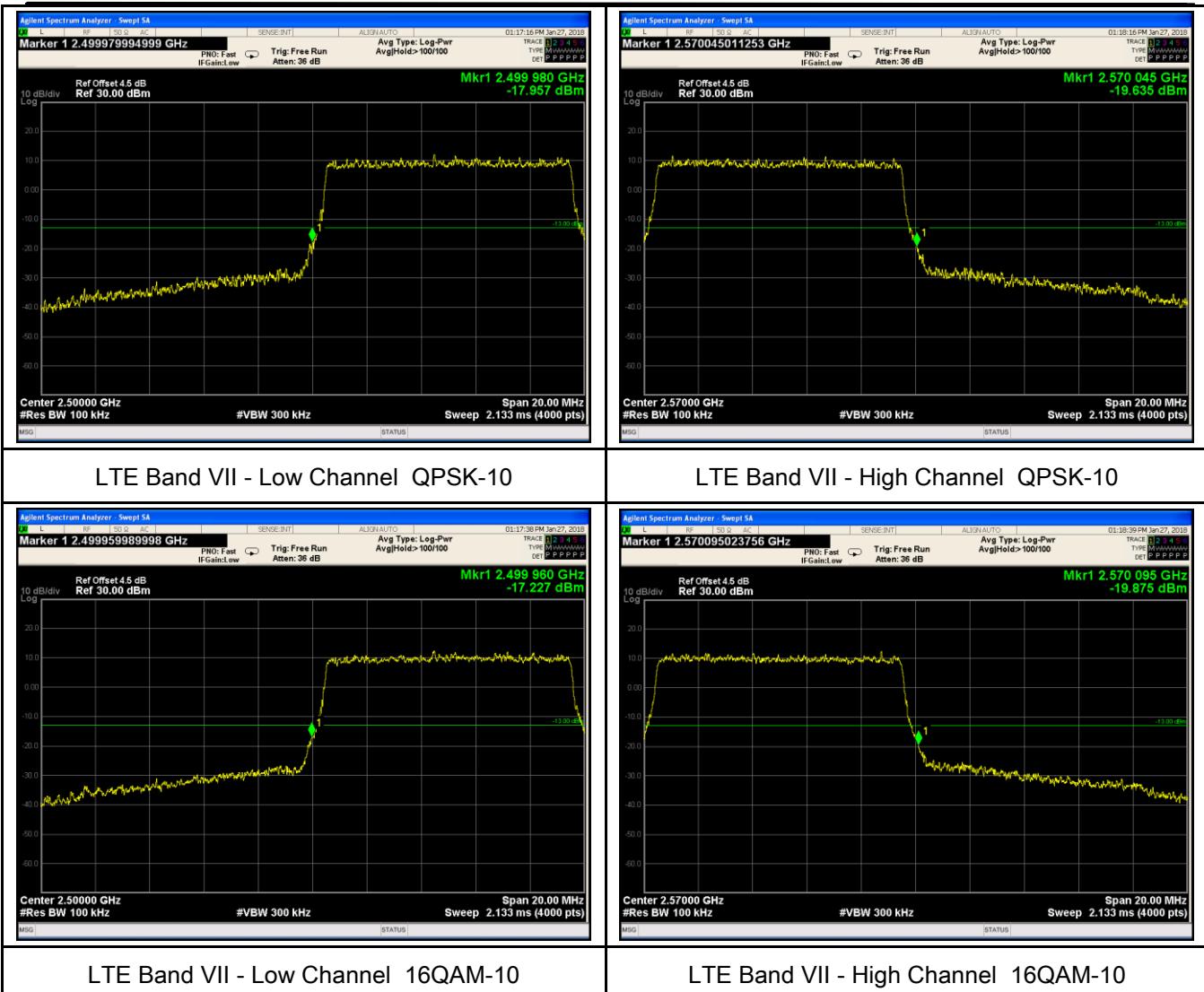


LTE Band VII - Low Channel 16QAM-5

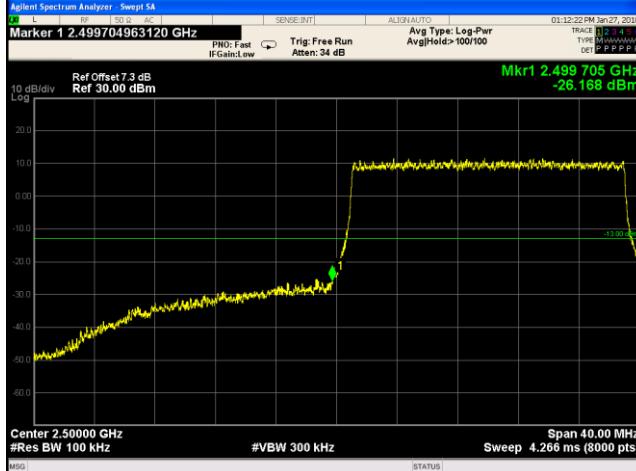
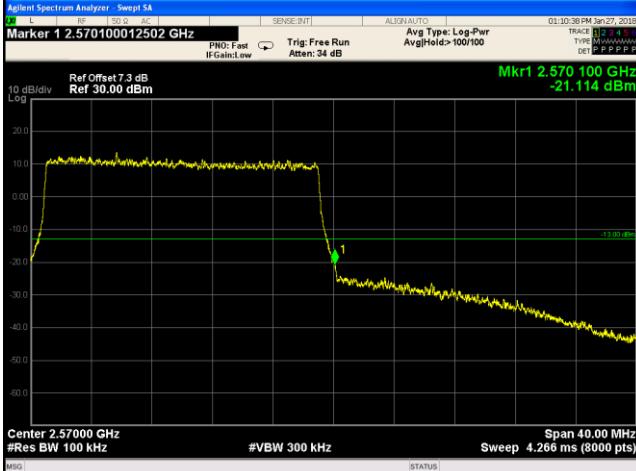
Note: Offset=Cable loss (4.5) + 10log  
 $(51.49/30)=4.5+2.2=6.7$  dB

LTE Band VII - High Channel 16QAM-5

Note: Offset=Cable loss (4.5) + 10log  
 $(51.96/30)=4.5+2.2=6.7$  dB



 <p>Agilent Spectrum Analyzer - Swept SA Marker 1 2.499859981873 GHz</p> <p>PWD: Fast IFGain:Low Trig: Free Run Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>Ref Offset 6.2 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Mkr1 2.499 860 GHz -22.669 dBm</p> <p>Center 2.50000 GHz #Res BW 100 kHz #VBW 300 kHz Span 30.00 MHz Sweep 3.200 ms (8000 pts)</p>	 <p>Agilent Spectrum Analyzer - Swept SA Marker 1 2.570075009376 GHz</p> <p>PWD: Fast IFGain:Low Trig: Free Run Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>Ref Offset 6.2 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Mkr1 2.570 075 GHz -18.308 dBm</p> <p>Center 2.57000 GHz #Res BW 100 kHz #VBW 300 kHz Span 30.00 MHz Sweep 3.200 ms (8000 pts)</p>
<p>LTE Band VII - Low Channel QPSK-15</p> <p>Note: Offset=Cable loss (4.5) + 10log (150.2/100)=4.5+1.7=6.2 dB</p>	<p>LTE Band VII - High Channel QPSK-15</p> <p>Note: Offset=Cable loss (4.5) + 10log (151.5/100)=4.5+1.7=6.2 dB</p>
 <p>Agilent Spectrum Analyzer - Swept SA Marker 1 2.499867482810 GHz</p> <p>PWD: Fast IFGain:Low Trig: Free Run Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>Ref Offset 6.2 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Mkr1 2.499 867 GHz -20.861 dBm</p> <p>Center 2.50000 GHz #Res BW 100 kHz #VBW 300 kHz Span 30.00 MHz Sweep 3.200 ms (8000 pts)</p>	 <p>Agilent Spectrum Analyzer - Swept SA Marker 1 2.570138767346 GHz</p> <p>PWD: Fast IFGain:Low Trig: Free Run Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>Ref Offset 6.2 dB Ref 30.00 dBm</p> <p>10 dB/div Log</p> <p>Mkr1 2.570 139 GHz -16.829 dBm</p> <p>Center 2.57000 GHz #Res BW 100 kHz #VBW 300 kHz Span 30.00 MHz Sweep 3.200 ms (8000 pts)</p>
<p>LTE Band VII - Low Channel 16QAM-15</p> <p>Note: Offset=Cable loss (4.5) + 10log (151.8/100)=4.5+1.7=6.2 dB</p>	<p>LTE Band VII - High Channel 16QAM-15</p> <p>Note: Offset=Cable loss (4.5) + 10log (152.2/100)=4.5+1.7=6.2 dB</p>

 <p>Agilent Spectrum Analyzer - Swept SA Marker 1 2.499704963120 GHz PNO: Fast IFGain:Low Trig: Free Run Avg Type: Log-Pwr AvgHold&gt;100/100 Ref Offset 7.3 dB Ref 30.00 dBm 10 dB/div Log 20.0 10.0 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0 Center 2.50000 GHz #Res BW 100 kHz #VBW 300 kHz Span 4.00 MHz Sweep 4.266 ms (8000 pts) MSG [STATUS]</p>	 <p>Agilent Spectrum Analyzer - Swept SA Marker 1 2.570100012502 GHz PNO: Fast IFGain:Low Trig: Free Run Avg Type: Log-Pwr AvgHold&gt;100/100 Ref Offset 7.3 dB Ref 30.00 dBm 10 dB/div Log 20.0 10.0 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0 Center 2.57000 GHz #Res BW 100 kHz #VBW 300 kHz Span 4.00 MHz Sweep 4.266 ms (8000 pts) MSG [STATUS]</p>
<p>LTE Band VII - Low Channel QPSK-20</p> <p>Note: Offset=Cable loss (4.5) + 10log <math>(196.4/100)=4.5+2.8=7.3\text{dB}</math></p>	<p>LTE Band VII - High Channel QPSK-20</p> <p>Note: Offset=Cable loss (4.5) + 10log <math>(195.2/100)=4.5+2.8=7.3\text{dB}</math></p>
 <p>Agilent Spectrum Analyzer - Swept SA Marker 1 2.4997050705 GHz PNO: Fast IFGain:Low Trig: Free Run Avg Type: Log-Pwr AvgHold&gt;100/100 Ref Offset 7.3 dB Ref 30.00 dBm 10 dB/div Log 20.0 10.0 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0 Center 2.50000 GHz #Res BW 100 kHz #VBW 300 kHz Span 4.00 MHz Sweep 4.266 ms (8000 pts) MSG [STATUS]</br></br></p>	 <p>Agilent Spectrum Analyzer - Swept SA Marker 1 2.570100012502 GHz PNO: Fast IFGain:Low Trig: Free Run Avg Type: Log-Pwr AvgHold&gt;100/100 Ref Offset 7.3 dB Ref 30.00 dBm 10 dB/div Log 20.0 10.0 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0 Center 2.57000 GHz #Res BW 100 kHz #VBW 300 kHz Span 4.00 MHz Sweep 4.266 ms (8000 pts) MSG [STATUS]</p>
<p>LTE Band VII - Low Channel 16QAM-20</p> <p>Note: Offset=Cable loss (4.5) + 10log <math>(195.5/100)=4.5+2.8=7.3 \text{ dB}</math></p>	<p>LTE Band VII - High Channel 16QAM-20</p> <p>Note: Offset=Cable loss (4.5) + 10log <math>(193.2/100)=4.5+2.8=7.3 \text{ dB}</math></p>