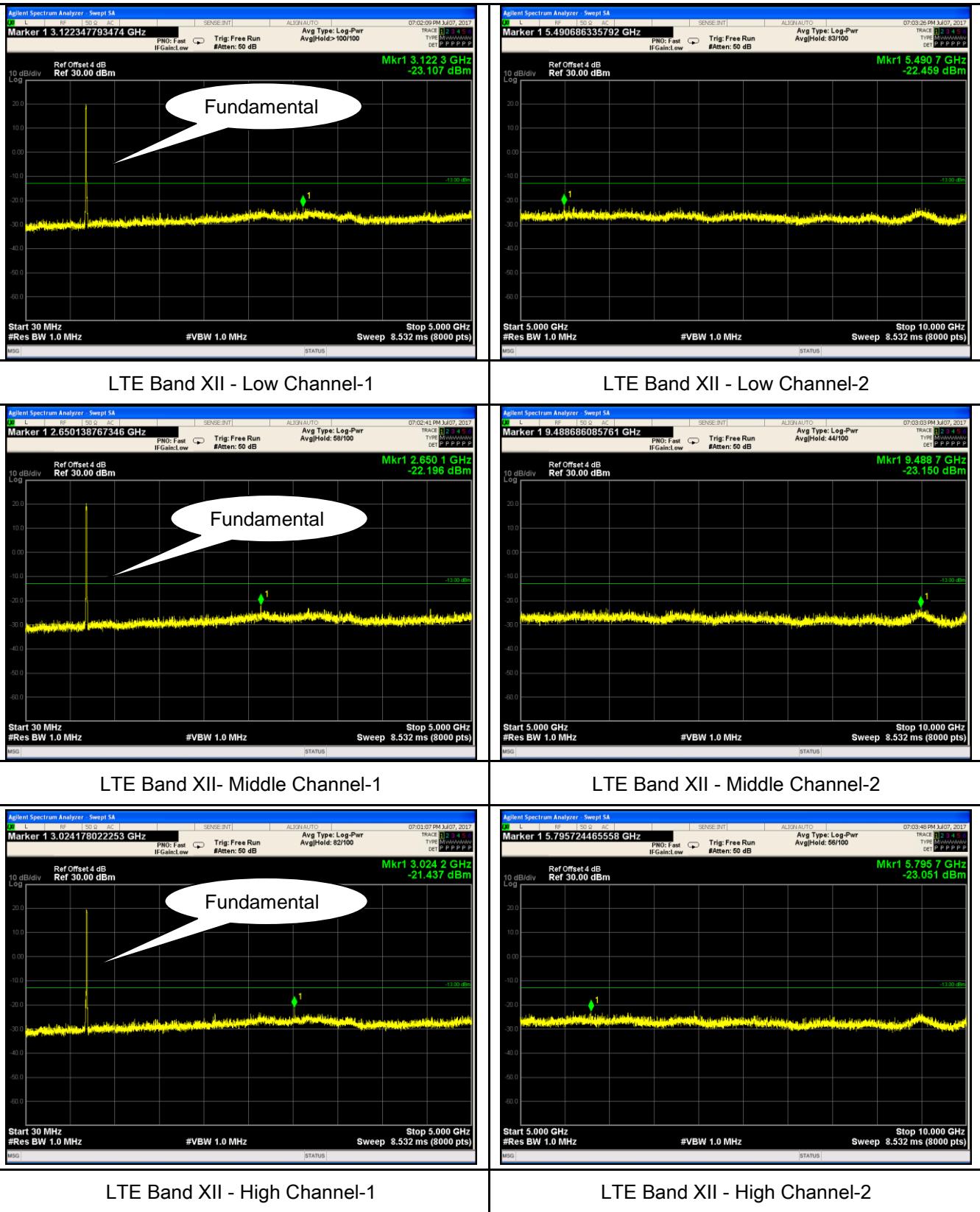
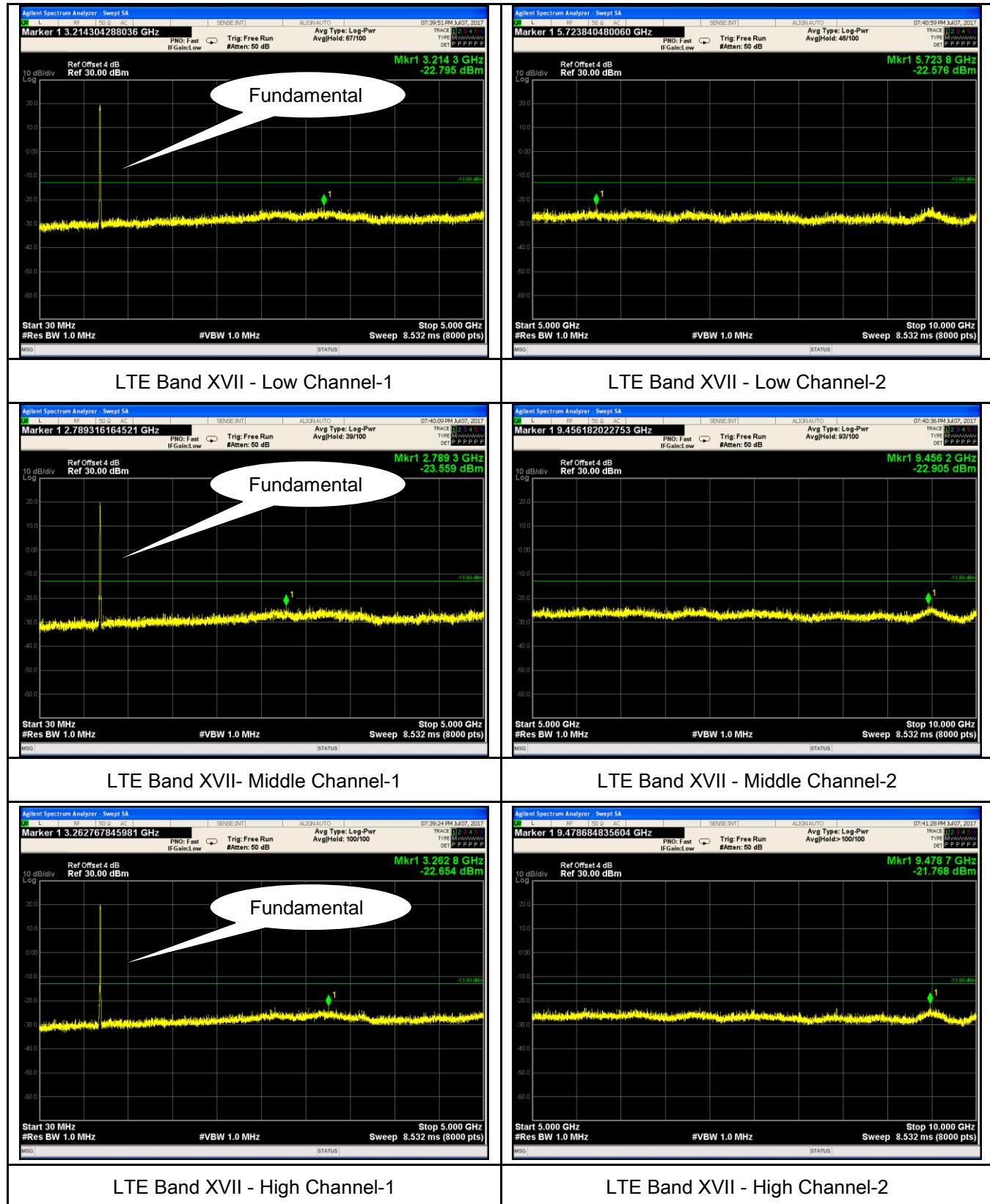


## LTE Band XII (Part 27)



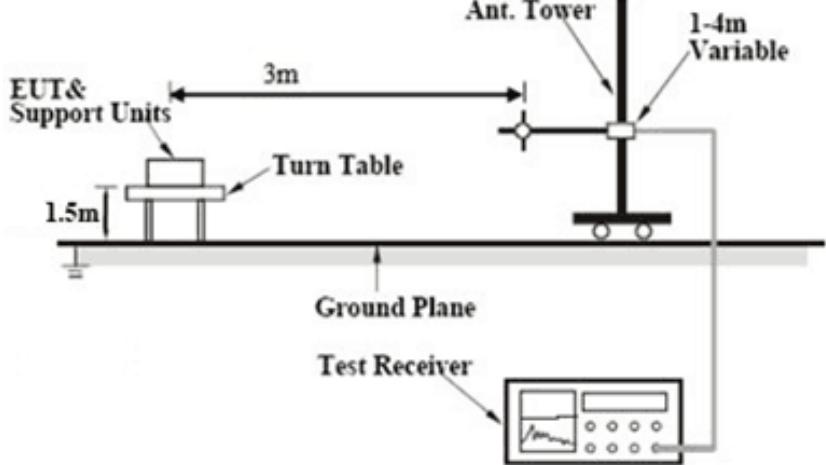
## LTE Band XVII (Part 27)



## 6.6 Spurious Radiated Emissions

Temperature	25 °C
Relative Humidity	57%
Atmospheric Pressure	1015mbar
Test date :	August 07, 2017
Tested By :	Loren Luo

### Requirement(s):

Spec	Item	Requirement	Applicable
§2.1053, §22.917 & §24.238 § 27.53(h)	a)	The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB. The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.	<input checked="" type="checkbox"/>
Test setup			
Test Procedure	<ol style="list-style-type: none"> <li>1. The transmitter was placed on a wooden turntable, and it was transmitting into a non-radiating load which was also placed on the turntable.</li> <li>2. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.</li> <li>3. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.</li> </ol> <p>Sample Calculation:</p> <p>EUT Field Strength = Raw Amplitude (dB<math>\mu</math>V/m) – Amplifier Gain (dB) + Antenna Factor (dB) + Cable Loss (dB) + Filter Attenuation (dB, if used)</p>		

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

### Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3720	-46.98	V	10.25	2.73	-39.46	-13	-26.46
3720	-45.21	H	10.25	2.73	-37.69	-13	-24.69
51.2	-46.87	V	-4.4	0.11	-51.38	-13	-38.38
203.9	-45.32	H	3.7	0.18	-41.8	-13	-28.8

### Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3760	-46.99	V	10.25	2.73	-39.47	-13	-26.47
3760	-46.21	H	10.25	2.73	-38.69	-13	-25.69
59.8	-44.38	V	-1.7	0.11	-46.19	-13	-33.19
154.2	-49.51	H	1	0.19	-48.7	-13	-35.7

### High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3800	-47.25	V	10.36	2.73	-39.62	-13	-26.62
3800	-46.84	H	10.36	2.73	-39.21	-13	-26.21
60.8	-43.15	V	-1.7	0.11	-44.96	-13	-31.96
199.8	-49.87	H	3.7	0.18	-46.35	-13	-33.35

#### Note:

- 1, The testing has been conformed to  $10 * 1907.5 \text{ MHz} = 19,075 \text{ MHz}$
- 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 IV (Part27) result

#### Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3440	-46.75	V	10.06	2.52	-39.21	-13	-26.21
3440	-48.23	H	10.06	2.52	-40.69	-13	-27.69
40.6	-46.11	V	-12.2	0.1	-58.41	-13	-45.41
251.9	-47.35	H	6	0.24	-41.59	-13	-28.59

#### Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3465	-45.38	V	10.09	2.52	-37.81	-13	-24.81
3465	-44.27	H	10.09	2.52	-36.7	-13	-23.7
69.7	-45.13	V	-1	0.12	-46.25	-13	-33.25
298.3	-42.03	H	5.6	0.25	-36.68	-13	-23.68

#### High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
3490	-46.28	V	10.09	2.52	-38.71	-13	-25.71
3490	-45.37	H	10.09	2.52	-37.8	-13	-24.8
51.4	-49.11	V	-4.4	0.11	-53.62	-13	-40.62
311.5	-47.53	H	5.6	0.25	-42.18	-13	-29.18

#### Note:

- 1, The testing has been conformed to  $10 \times 1752.5\text{MHz} = 17,525\text{MHz}$
- 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.
- 4, The radiated spurious test above 18GHz is subcontracted to SIEMIC (Nanjing-China) Laboratories. and found 30dB below the limit at least.

### LTE Band V (Part22H) result

#### Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1658	-46.25	V	7.95	0.78	-39.08	-13	-26.08
1658	-45.83	H	7.95	0.78	-38.66	-13	-25.66
49.6	-49.13	V	-4.4	0.11	-53.64	-13	-40.64
498.6	-46.27	H	6.1	0.34	-40.51	-13	-27.51

#### Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1673	-45.87	V	7.95	0.78	-38.7	-13	-25.7
1673	-45.62	H	7.95	0.78	-38.45	-13	-25.45
70.4	-48.53	V	-1	0.12	-49.65	-13	-36.65
146.2	-41.03	H	1	0.19	-40.22	-13	-27.22

#### High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1688	-43.59	V	7.95	0.78	-36.42	-13	-23.42
1688	-43.27	H	7.95	0.78	-36.1	-13	-23.1
102.5	-46.18	V	-0.1	0.16	-46.44	-13	-33.44
305.7	-47.29	H	5.6	0.25	-41.94	-13	-28.94

#### Note:

- 1, The testing has been conformed to  $10 \times 846.5\text{MHz} = 8,465\text{MHz}$
- 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.
- 4, The radiated spurious test above 18GHz is subcontracted to SIEMIC (Nanjing-China) Laboratories. and found 30dB below the limit at least.

### LTE Band VII (Part27) result

#### Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
5020	-48.16	V	10.29	0.98	-38.85	-13	-25.85
5020	-47.65	H	10.29	0.98	-38.34	-13	-25.34
68.4	-48.32	V	-1	0.12	-49.44	-13	-36.44
203.9	-44.19	H	3.7	0.18	-40.67	-13	-27.67

#### Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
5070	-47.52	V	10.3	0.99	-38.21	-13	-25.21
5070	-46.38	H	10.3	0.99	-37.07	-13	-24.07
89.6	-44.19	V	1.4	0.13	-42.92	-13	-29.92
302.7	-49.92	H	5.6	0.25	-44.57	-13	-31.57

#### High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
5120	-46.23	V	10.32	1	-36.91	-13	-23.91
5120	-45.17	H	10.32	1	-35.85	-13	-22.85
99.3	-46.98	V	-0.1	0.16	-47.24	-13	-34.24
406.1	-45.11	H	6	0.3	-39.41	-13	-26.41

#### Note:

- 1, The testing has been conformed to  $10 \times 2567.5\text{MHz} = 25,675\text{MHz}$
- 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.
- 4, The radiated spurious test above 18GHz is subcontracted to SIEMIC (Nanjing-China) Laboratories. and found 30dB below the limit at least.

### LTE Band XII (Part27) result

#### Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1408	-46.25	V	7.65	0.75	-39.35	-13	-26.35
1408	-45.31	H	7.65	0.75	-38.41	-13	-25.41
553.6	-49.75	V	6.4	0.35	-43.7	-13	-30.7
849.7	-48.31	H	6.2	0.44	-42.55	-13	-29.55

#### Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1415	-46.28	V	7.65	0.75	-39.38	-13	-26.38
1415	-45.33	H	7.65	0.75	-38.43	-13	-25.43
497.5	-48	V	6.1	0.34	-42.24	-13	-29.24
803.5	-47.11	H	6.1	0.44	-41.45	-13	-28.45

#### High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1422	-46.85	V	7.65	0.75	-39.95	-13	-26.95
1422	-47.32	H	7.65	0.75	-40.42	-13	-27.42
456.3	-50.31	V	6	0.29	-44.6	-13	-31.6
748.3	-48.13	H	6.4	0.43	-42.16	-13	-29.16

#### Note:

- 1, The testing has been conformed to  $10 \times 2567.5\text{MHz} = 25,675\text{MHz}$
- 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.
- 4, The radiated spurious test above 18GHz is subcontracted to SIEMIC (Nanjing-China) Laboratories. and found 30dB below the limit at least.

### LTE Band XVII (Part27) result

#### Low channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1418	-46.52	V	7.65	0.75	-39.62	-13	-26.62
1418	-45.37	H	7.65	0.75	-38.47	-13	-25.47
50.6	-49.82	V	-4.4	0.11	-54.33	-13	-41.33
310.9	-50.13	H	5.6	0.25	-44.78	-13	-31.78

#### Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1420	-44.32	V	7.65	0.75	-37.42	-13	-24.42
1420	-43.75	H	7.65	0.75	-36.85	-13	-23.85
60.7	-46.87	V	-1.7	0.11	-48.68	-13	-35.68
402.8	-42.56	H	6	0.3	-36.86	-13	-23.86

#### High channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1422	-44.65	V	7.65	0.75	-37.75	-13	-24.75
1422	-44.35	H	7.65	0.75	-37.45	-13	-24.45
90.1	-47.13	V	1.4	0.13	-45.86	-13	-32.86
553.7	-49.28	H	6.4	0.35	-43.23	-13	-30.23

#### Note:

- 1, The testing has been conformed to  $10 \times 2567.5\text{MHz} = 25,675\text{MHz}$
- 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.
- 4, The radiated spurious test above 18GHz is subcontracted to SIEMIC (Nanjing-China) Laboratories. and found 30dB below the limit at least.

## 6.7 Band Edge

Temperature	25 °C
Relative Humidity	53%
Atmospheric Pressure	1010mbar
Test date :	July 12, 2017
Tested By :	Loren Luo

### 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			
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	QPSK	-20.980	-13
			16QAM	-20.896	-13
1.4	18900	1910	QPSK	-17.669	-13
			16QAM	-17.165	-13
3	18615	1850	QPSK	-22.271	-13
			16QAM	-20.918	-13
3	19185	1910	QPSK	-15.888	-13
			16QAM	-17.452	-13
5	18625	1850	QPSK	-18.051	-13
			16QAM	-17.822	-13
5	19175	1910	QPSK	-17.450	-13
			16QAM	-16.341	-13
10	18650	1850	QPSK	-20.810	-13
			16QAM	-20.526	-13
10	19150	1910	QPSK	-17.302	-13
			16QAM	-18.000	-13
15	18675	1850	QPSK	-21.003	-13
			16QAM	-22.368	-13
15	19125	1910	QPSK	-17.377	-13
			16QAM	-17.264	-13
20	18700	1850	QPSK	-23.218	-13
			16QAM	-23.008	-13
20	19100	1910	QPSK	-18.463	-13
			16QAM	-18.482	-13

### LTE Band IV (Part 27) result

BW(MHz)	Channel	Frequency (MHz)	Mode	Emission (dBm)	Limit (dBm)
1.4	19957	1709.9	QPSK	-21.07	-13
			16QAM	-21.67	-13
1.4	20393	1755	QPSK	-16.39	-13
			16QAM	-16.39	-13
3	19965	1709.9	QPSK	-16.17	-13
			16QAM	-16.39	-13
3	20385	1755	QPSK	-14.85	-13
			16QAM	-14.02	-13
5	19975	1709.9	QPSK	-16.57	-13
			16QAM	-15.81	-13
5	20375	1755	QPSK	-16.19	-13
			16QAM	-14.42	-13
10	20000	1709.9	QPSK	-15.99	-13
			16QAM	-16.25	-13
10	20350	1755	QPSK	-14.19	-13
			16QAM	-14.41	-13
15	20025	1709.9	QPSK	-17.26	-13
			16QAM	-16.89	-13
15	20325	1755	QPSK	-16.87	-13
			16QAM	-16.24	-13
20	20050	1709.9	QPSK	-18.38	-13
			16QAM	-17.73	-13
20	20300	1755	QPSK	-16.93	-13
			16QAM	-16.00	-13

### LTE Band V (Part 22H) result

BW(MHz)	Channel	Frequency (MHz)	Mode	Emission (dBm)	Limit (dBm)
1.4	20407	823.9	QPSK	-20.533	-13
			16QAM	-20.069	-13
1.4	20643	849	QPSK	-15.285	-13
			16QAM	-15.167	-13
3	20415	824	QPSK	-18.816	-13
			16QAM	-19.671	-13
3	20635	849	QPSK	-13.693	-13
			16QAM	-13.775	-13
5	20425	824	QPSK	-18.646	-13
			16QAM	-18.593	-13
5	20625	849	QPSK	-14.909	-13
			16QAM	-15.196	-13
10	20450	824	QPSK	-16.707	-13
			16QAM	-16.163	-13
10	20800	849	QPSK	-16.186	-13
			16QAM	-15.706	-13

### LTE Band XII (Part 27) result

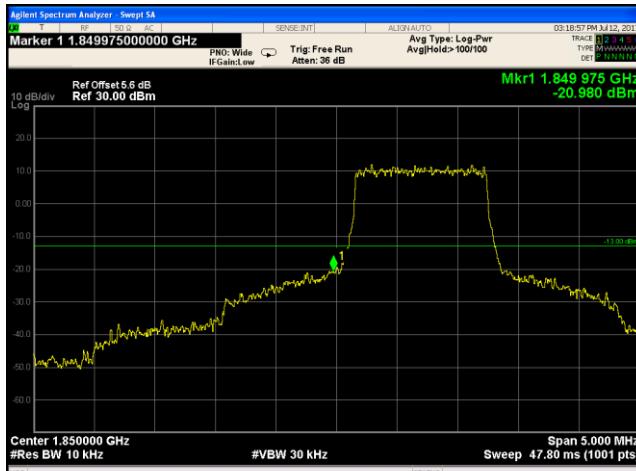
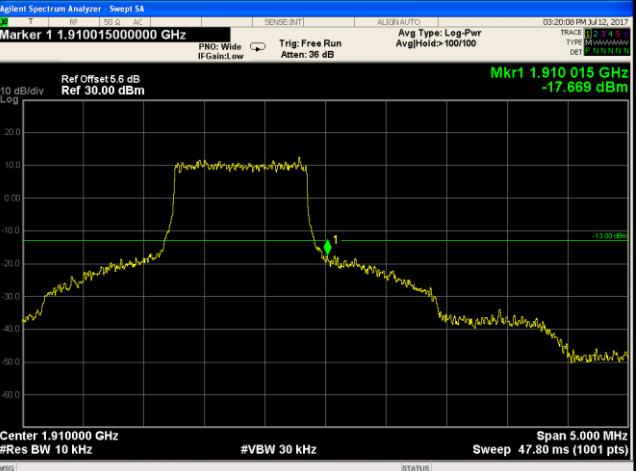
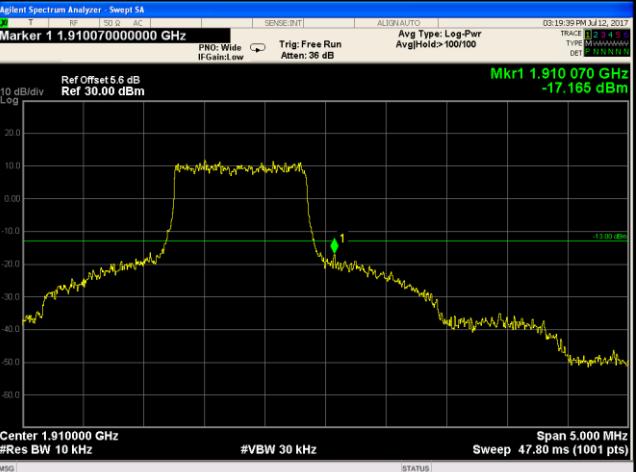
BW(MHz)	Channel	Frequency (MHz)	Mode	Emission (dBm)	Limit (dBm)
1.4	23017	699	QPSK	-27.715	-13
			16QAM	-27.783	-13
1.4	23173	716	QPSK	-26.890	-13
			16QAM	-26.940	-13
3	23025	699	QPSK	-18.843	-13
			16QAM	-19.090	-13
3	23165	716	QPSK	-19.829	-13
			16QAM	-19.161	-13
5	23035	699	QPSK	-17.049	-13
			16QAM	-15.226	-13
5	23155	716	QPSK	-18.490	-13
			16QAM	-17.370	-13
10	23060	698	QPSK	-17.240	-13
			16QAM	-18.478	-13
10	23130	716	QPSK	-17.358	-13
			16QAM	-15.070	-13

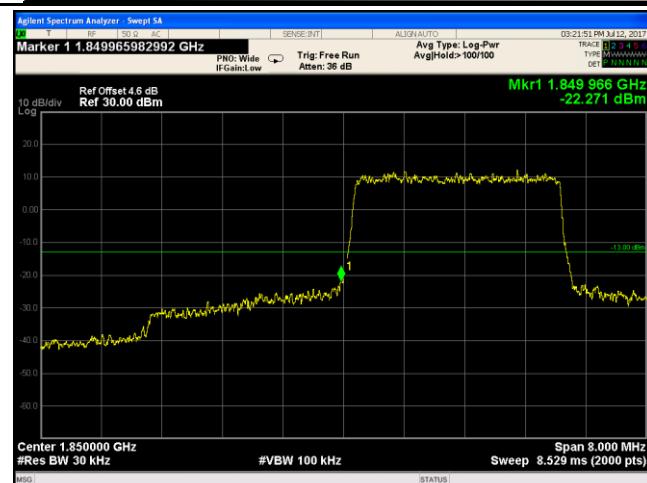
### LTE Band XVII (Part 27) result

BW(MHz)	Channel	Frequency (MHz)	Mode	Emission (dBm)	Limit (dBm)
5	23755	704	QPSK	-15.702	-13
			16QAM	-16.246	-13
5	23825	716	QPSK	-18.108	-13
			16QAM	-17.775	-13
10	23780	704	QPSK	-17.736	-13
			16QAM	-16.019	-13
10	23800	716	QPSK	-16.788	-13
			16QAM	-16.049	-13

## Test Plots

### LTE Band II (Part 24E)

 <p>Marker 1 1.849975000000 GHz Mkr1 1.849 975 GHz -20.980 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 1.910015000000 GHz Mkr1 1.910 015 GHz -17.669 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>LTE Band II - High Channel QPSK-1.4</p>
<p>Note: Offset=Cable loss (4.5) + 10log <math>(12.89/10)=4.5+1.1=5.6\text{dB}</math></p>	<p>Note: Offset=Cable loss (4.5) + 10log <math>(13.03/10)=4.5+1.1=5.6\text{dB}</math></p>
 <p>Marker 1 1.849995000000 GHz Mkr1 1.849 995 GHz -20.896 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 1.910070000000 GHz Mkr1 1.910 070 GHz -17.165 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>LTE Band II - High Channel 16QAM-1.4</p>
<p>Note: Offset=Cable loss (4.5) + 10log <math>(12.94/10)=4.5+1.1=5.6 \text{ dB}</math></p>	<p>Note: Offset=Cable loss (4.5) + 10log <math>(13.01/10)=4.5+1.1=5.6 \text{ dB}</math></p>



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

Note: Offset=Cable loss (4.5) + 10log  
 $(30.43/30)=4.5+0.1=4.6$  dB



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

Note: Offset=Cable loss (4.5) + 10log  
 $(30.70/30)=4.5+0.1=4.6$  dB

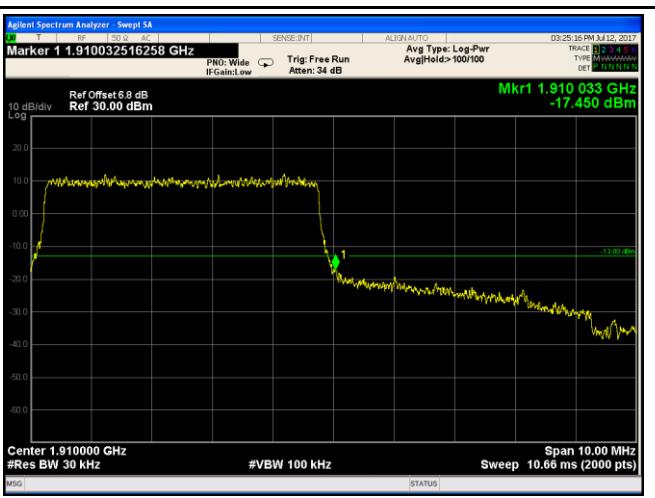
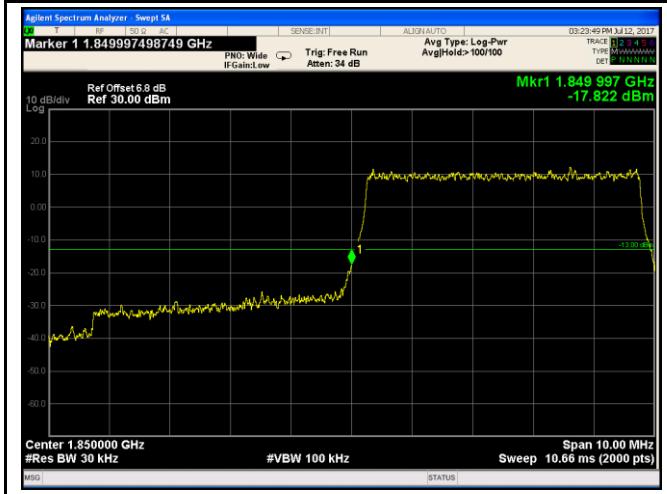


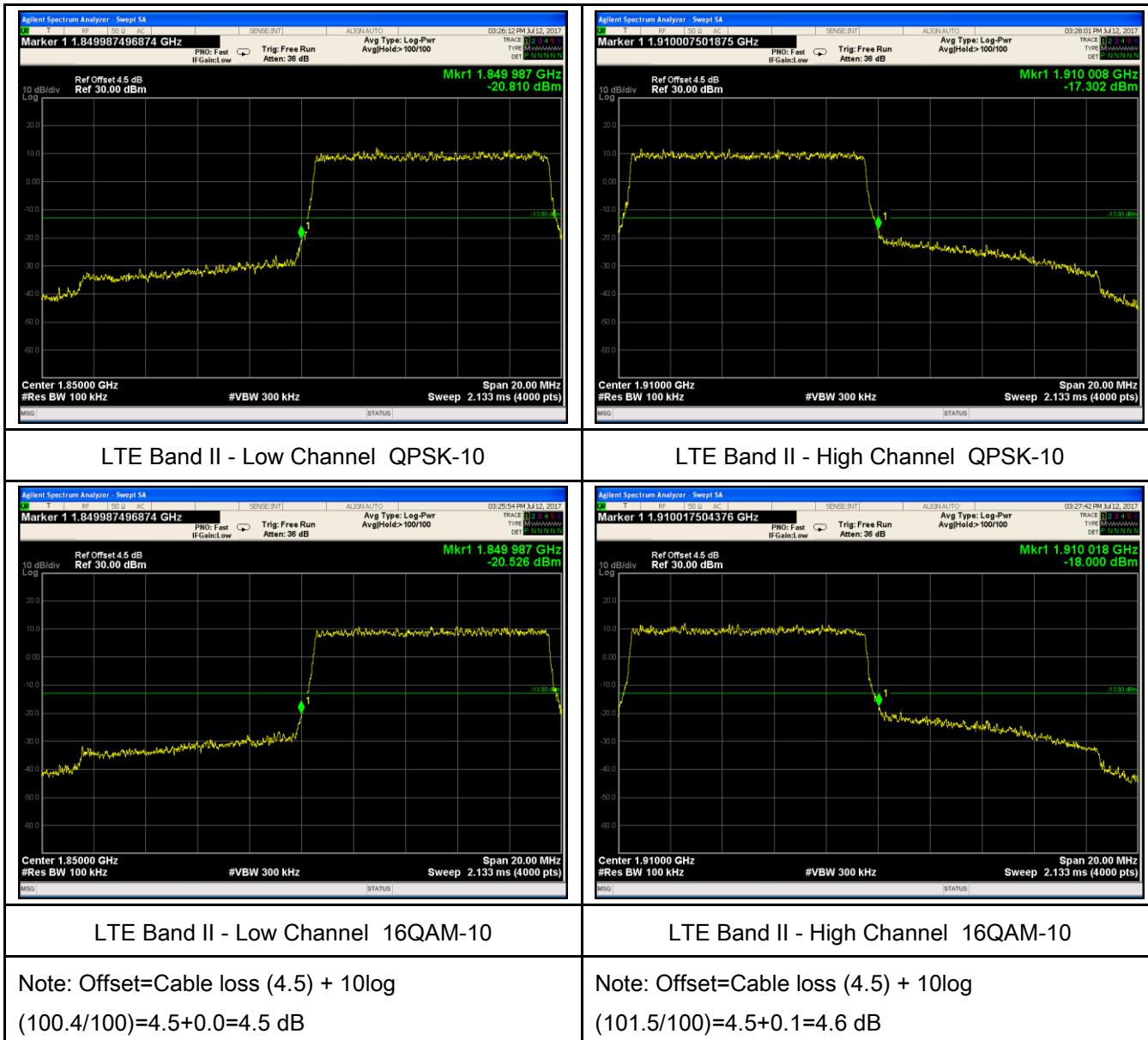
#### LTE Band II - Low Channel 16QAM-3

Note: Offset=Cable loss (4.5) + 10log  
 $(30.49/30)=4.5+0.1=4.6$  dB

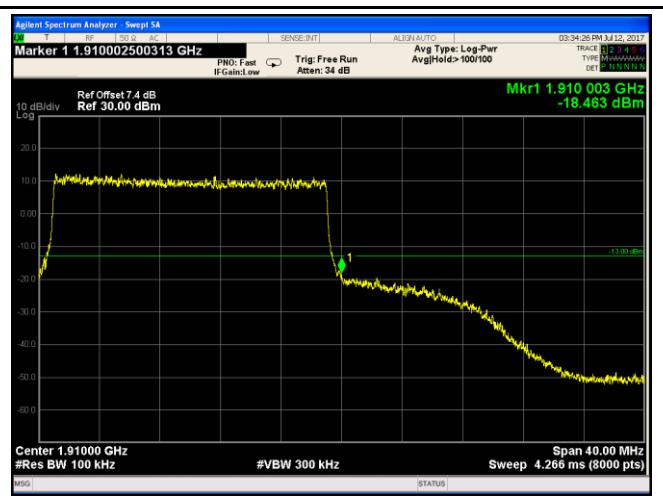
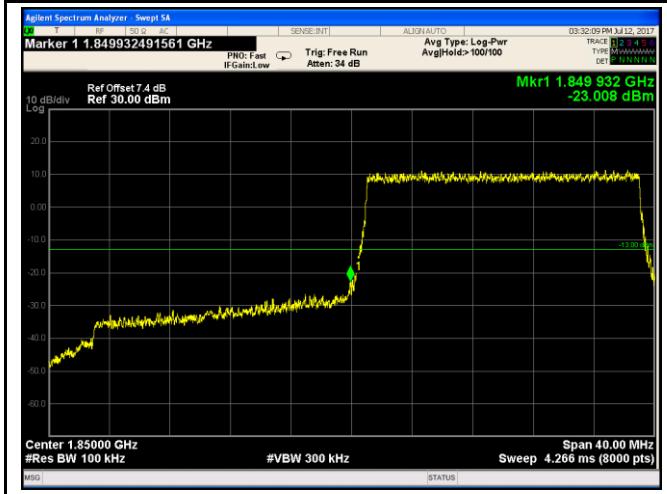
#### LTE Band II - High Channel 16QAM-3

Note: Offset=Cable loss (4.5) + 10log  
 $(30.61/30)=4.5+0.1=4.6$  dB

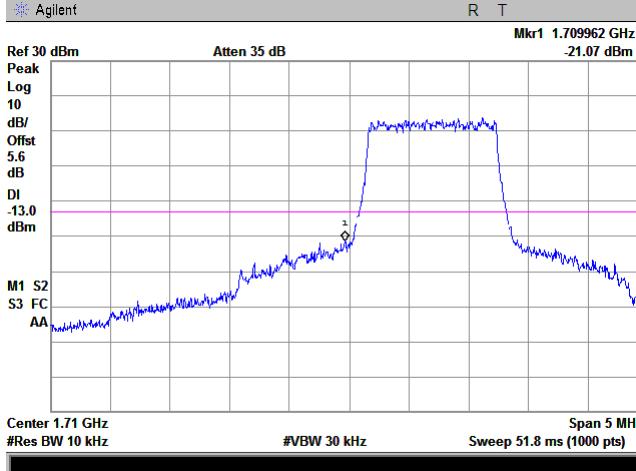
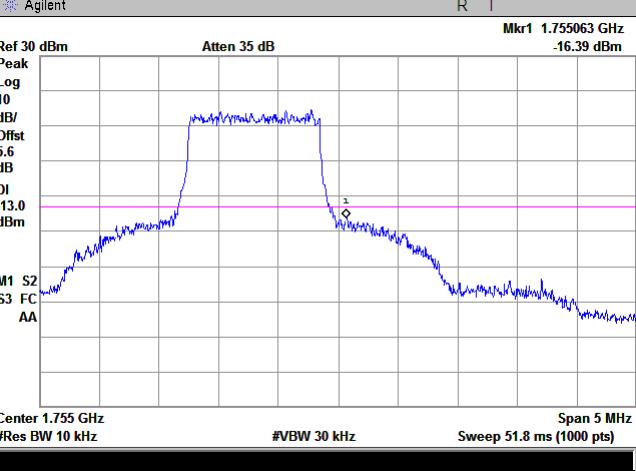
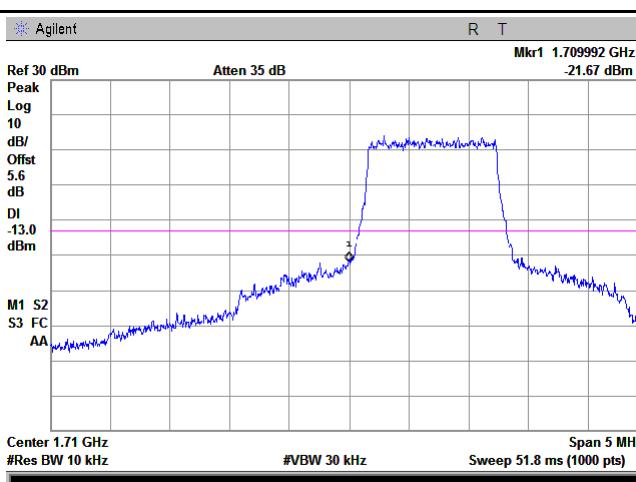
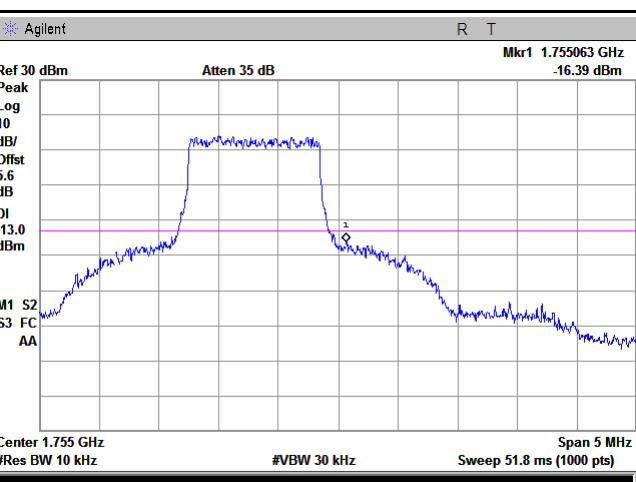
 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Marker 1 1.849997498749 GHz</p> <p>PNG: Wide IF-Gain:Low Trig: Free Run Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>Ref Offset 6.8 dB Ref 30.00 dBm</p> <p>Mkr1 1.849 997 GHz -18.051 dBm</p> <p>10 dB/div Log</p> <p>20.0 10.0 0.0 -10.0 -20.0 -30.0 -40.0 -50.0 -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</p> <p>Marker 1 1.910032516258 GHz</p> <p>PNG: Wide IF-Gain:Low Trig: Free Run Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>Ref Offset 6.8 dB Ref 30.00 dBm</p> <p>Mkr1 1.910 033 GHz -17.450 dBm</p> <p>10 dB/div 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 (50.83/30)=4.5+2.3=6.8 dB</p>	<p>Note: Offset=Cable loss (4.5) + 10log (50.83/30)=4.5+2.3=6.8 dB</p>
 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Marker 1 1.849997498749 GHz</p> <p>PNG: Wide IF-Gain:Low Trig: Free Run Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>Ref Offset 6.8 dB Ref 30.00 dBm</p> <p>Mkr1 1.849 997 GHz -17.822 dBm</p> <p>10 dB/div 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</p> <p>Marker 1 1.910032516258 GHz</p> <p>PNG: Wide IF-Gain:Low Trig: Free Run Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>Ref Offset 6.8 dB Ref 30.00 dBm</p> <p>Mkr1 1.910 033 GHz -16.341 dBm</p> <p>10 dB/div 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 (50.92/30)=4.5+2.3=6.8 dB</p>	<p>Note: Offset=Cable loss (4.5) + 10log (50.91/30)=4.5+2.3=6.8 dB</p>

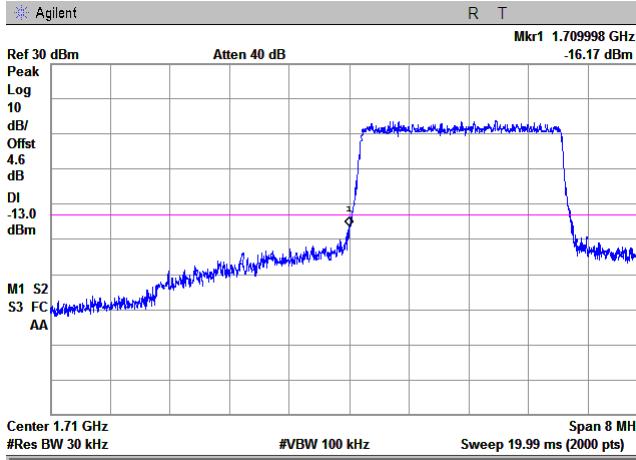
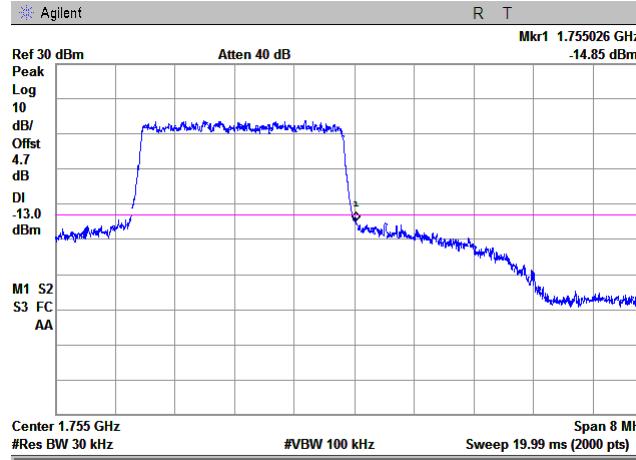
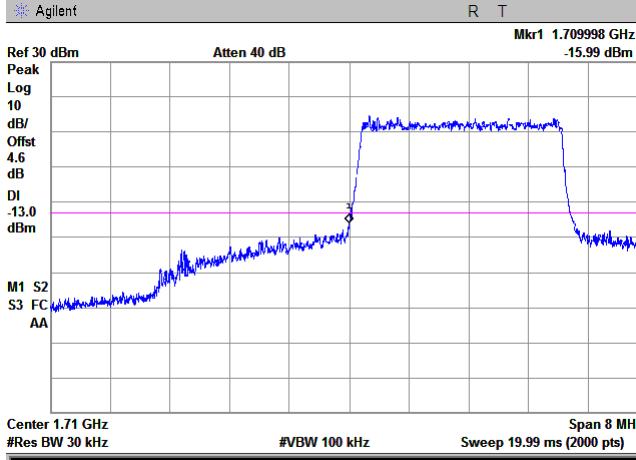
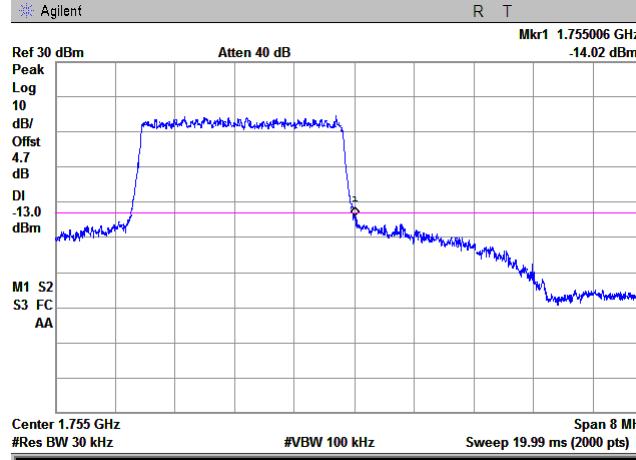


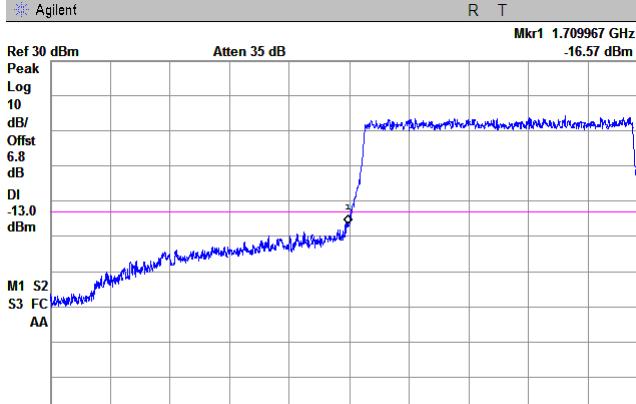
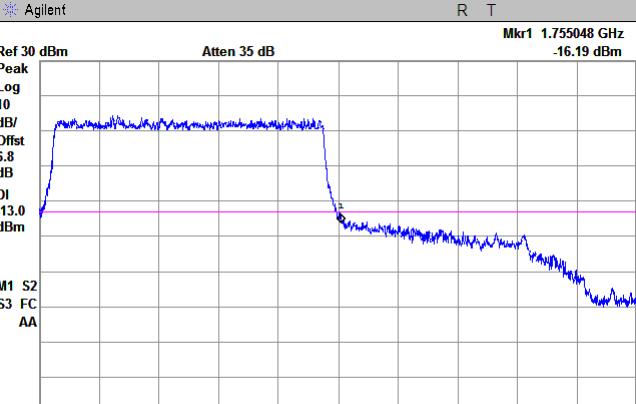
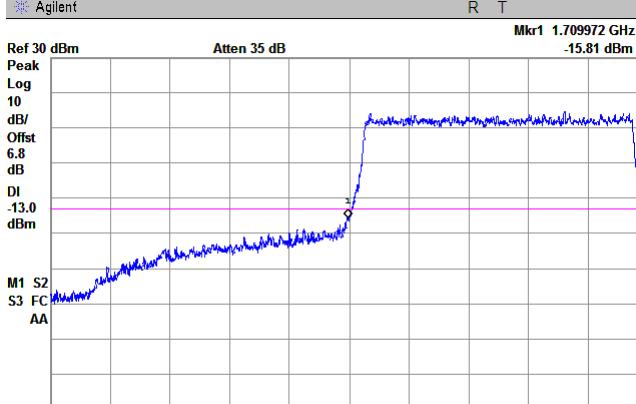
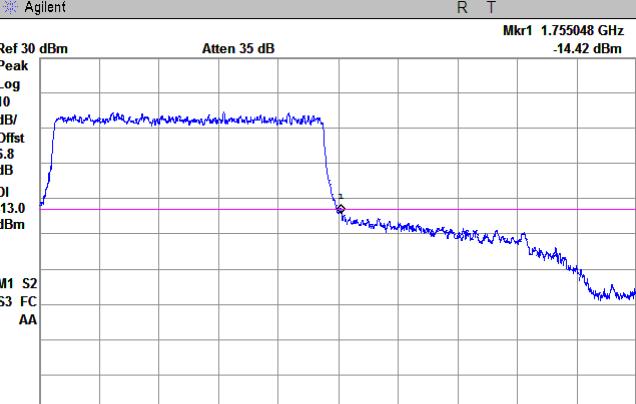
 <p>Marker 1 1.84998687359 GHz PN0: Fast IFGain:Low Trig: Free Run Atten: 34 dB Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>Mkr1 1.849 987 GHz -21.003 dBm</p> <p>10 dB/div Ref Offset 6.2 dB Ref 30.00 dBm</p> <p>Center 1.85000 GHz #Res BW 100 kHz #VBW 300 kHz Span 3.000 MHz Sweep 3.200 ms (8000 pts)</p>	 <p>Marker 1 1.91041067635 GHz PN0: Fast IFGain:Low Trig: Free Run Atten: 34 dB Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>Mkr1 1.910 411 GHz -17.377 dBm</p> <p>10 dB/div Ref Offset 6.2 dB Ref 30.00 dBm</p> <p>Center 1.91000 GHz #Res BW 100 kHz #VBW 300 kHz Span 3.000 MHz Sweep 3.200 ms (8000 pts)</p>
<p>LTE Band II - Low Channel QPSK-15</p> <p>Note: Offset=Cable loss (4.5) + 10log <math>(148.2/100)=4.5+1.7=6.2</math> dB</p>	<p>LTE Band II - High Channel QPSK-15</p> <p>Note: Offset=Cable loss (4.5) + 10log <math>(148.0/100)=4.5+1.7=6.2</math> dB</p>
 <p>Marker 1 1.849994374297 GHz PN0: Fast IFGain:Low Trig: Free Run Atten: 34 dB Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>Mkr1 1.849 994 GHz -22.368 dBm</p> <p>10 dB/div Ref Offset 6.2 dB Ref 30.00 dBm</p> <p>Center 1.85000 GHz #Res BW 100 kHz #VBW 300 kHz Span 3.000 MHz Sweep 3.200 ms (8000 pts)</p>	 <p>Marker 1 1.91041067635 GHz PN0: Fast IFGain:Low Trig: Free Run Atten: 34 dB Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>Mkr1 1.910 411 GHz -17.264 dBm</p> <p>10 dB/div Ref Offset 6.2 dB Ref 30.00 dBm</p> <p>Center 1.91000 GHz #Res BW 100 kHz #VBW 300 kHz Span 3.000 MHz Sweep 3.200 ms (8000 pts)</p>
<p>LTE Band II - Low Channel 16QAM-15</p> <p>Note: Offset=Cable loss (4.5) + 10log <math>(148.4/100)=4.5+1.7=6.2</math> dB</p>	<p>LTE Band II - High Channel 16QAM-15</p> <p>Note: Offset=Cable loss (4.5) + 10log <math>(148.6/100)=4.5+1.7=6.2</math> dB</p>

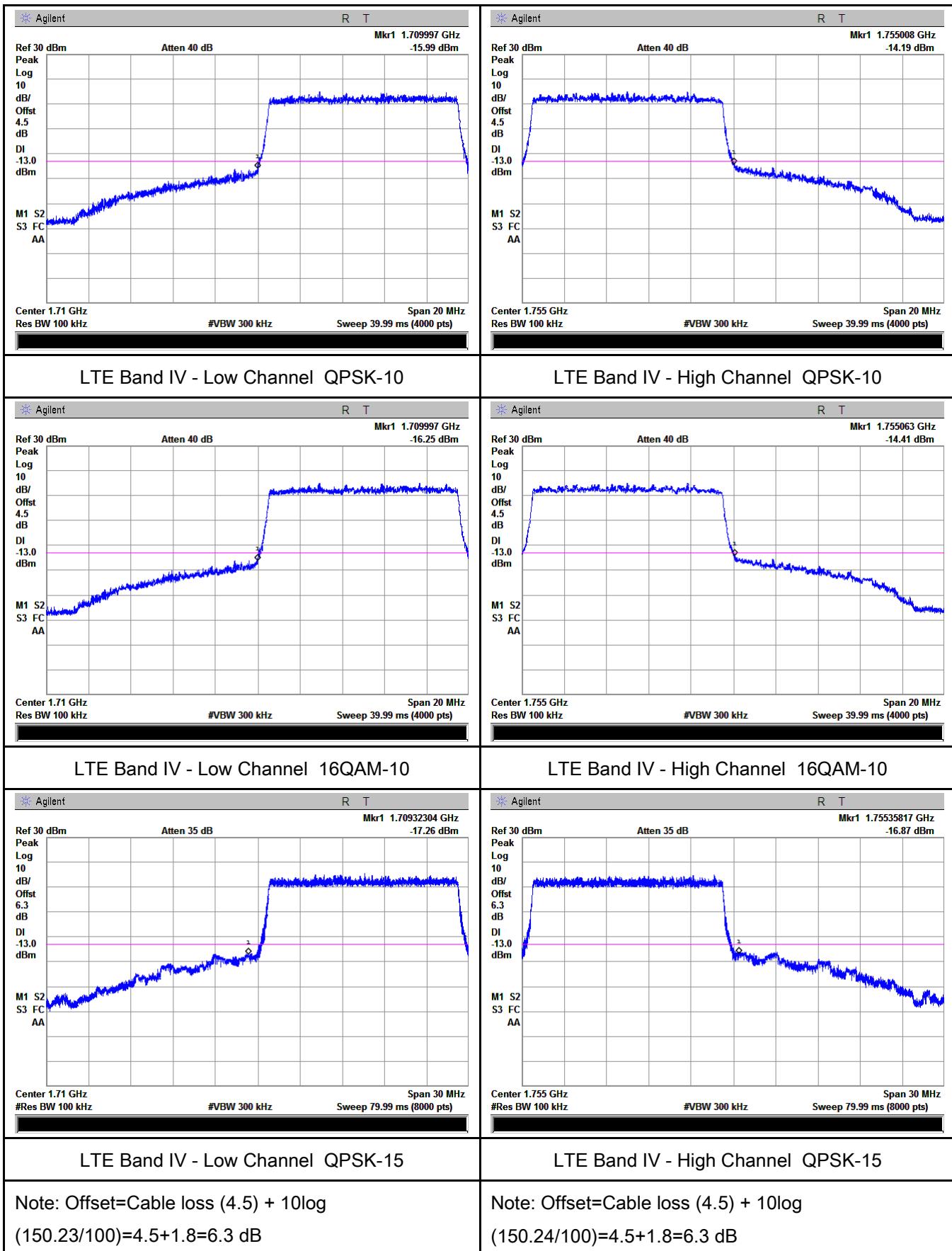
 <p>Marker 1 1.849972496562 GHz PN0: Fast IFGain:Low Trig: Free Run Atten: 34 dB Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>Mkr1 1.849 972 GHz -23.218 dBm</p> <p>Center 1.85000 GHz #Res BW 100 kHz #VBW 300 kHz Span 4.00 MHz Sweep 4.266 ms (8000 pts)</p>	 <p>Marker 1 1.910002500313 GHz PN0: Fast IFGain:Low Trig: Free Run Atten: 34 dB Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>Mkr1 1.910 003 GHz -18.463 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>(194.6/100)=4.5+2.9=7.4</math> dB</p>	<p>LTE Band II - High Channel QPSK-20</p> <p>Note: Offset=Cable loss (4.5) + 10log <math>(194.8/100)=4.5+2.9=7.4</math> dB</p>
 <p>Marker 1 1.849932491561 GHz PN0: Fast IFGain:Low Trig: Free Run Atten: 34 dB Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>Mkr1 1.849 932 GHz -23.008 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>Marker 1 1.910952619077 GHz PN0: Fast IFGain:Low Trig: Free Run Atten: 34 dB Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>Mkr1 1.910 953 GHz -18.482 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>(195.2/100)=4.5+2.9=7.4</math> dB</p>	<p>LTE Band II - High Channel 16QAM-20</p> <p>Note: Offset=Cable loss (4.5) + 10log <math>(194.8/100)=4.5+2.9=7.4</math> dB</p>

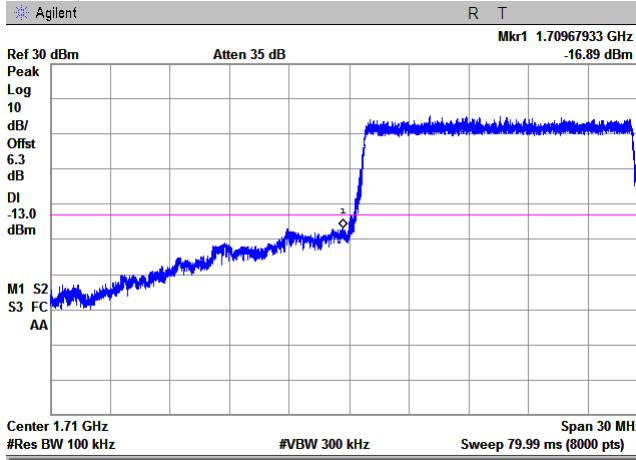
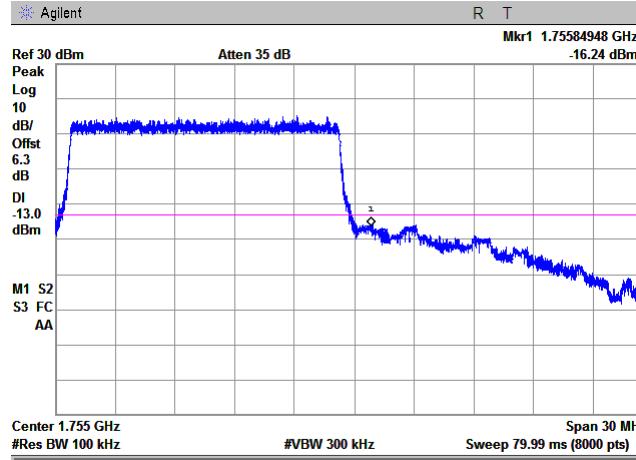
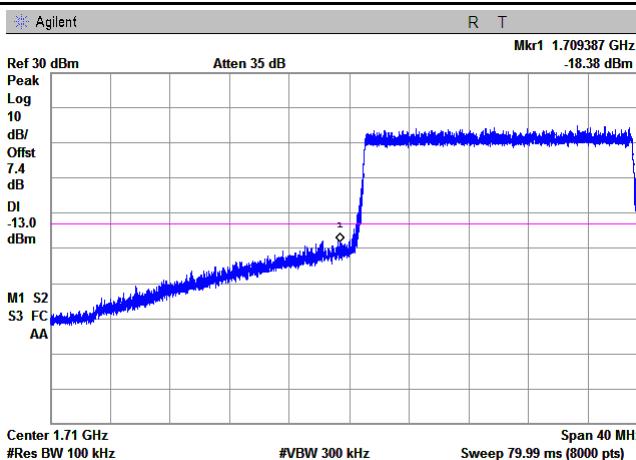
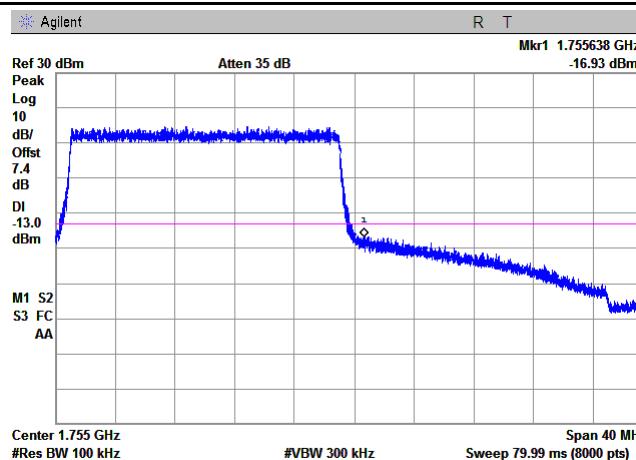
## LTE Band IV (Part 27)

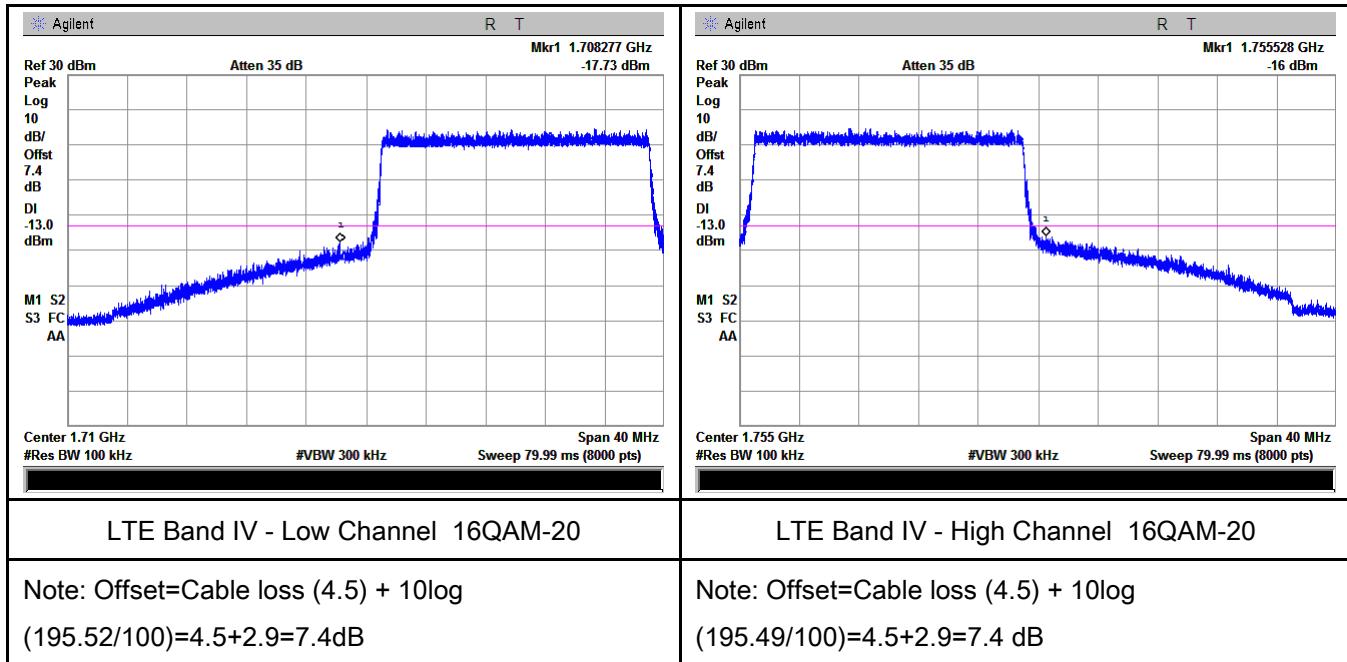
 <p>Agilent R T</p> <p>Ref 30 dBm Atten 35 dB Mkr1 1.70996 GHz -21.07 dBm</p> <p>Peak Log 10 dB/ Offst 5.6 dB DI -13.0 dBm</p> <p>M1 S2 S3 FC AA</p> <p>Center 1.71 GHz #Res BW 10 kHz #VBW 30 kHz Sweep 51.8 ms (1000 pts) Span 5 MHz</p>	 <p>Agilent R T</p> <p>Ref 30 dBm Atten 35 dB Mkr1 1.755063 GHz -16.39 dBm</p> <p>Peak Log 10 dB/ Offst 5.6 dB DI -13.0 dBm</p> <p>M1 S2 S3 FC AA</p> <p>Center 1.755 GHz #Res BW 10 kHz #VBW 30 kHz Sweep 51.8 ms (1000 pts) Span 5 MHz</p>
<p>LTE Band IV - Low Channel QPSK-1.4</p> <p>Note: Offset=Cable loss (4.5) + 10log (12.86/10)=4.5+1.1=5.6 dB</p>	<p>LTE Band IV - High Channel QPSK-1.4</p> <p>Note: Offset=Cable loss (4.5) + 10log (12.92/10)=4.5+1.1=5.6 dB</p>
 <p>Agilent R T</p> <p>Ref 30 dBm Atten 35 dB Mkr1 1.709992 GHz -21.67 dBm</p> <p>Peak Log 10 dB/ Offst 5.6 dB DI -13.0 dBm</p> <p>M1 S2 S3 FC AA</p> <p>Center 1.71 GHz #Res BW 10 kHz #VBW 30 kHz Sweep 51.8 ms (1000 pts) Span 5 MHz</p>	 <p>Agilent R T</p> <p>Ref 30 dBm Atten 35 dB Mkr1 1.755063 GHz -16.39 dBm</p> <p>Peak Log 10 dB/ Offst 5.6 dB DI -13.0 dBm</p> <p>M1 S2 S3 FC AA</p> <p>Center 1.755 GHz #Res BW 10 kHz #VBW 30 kHz Sweep 51.8 ms (1000 pts) Span 5 MHz</p>
<p>LTE Band IV - Low Channel 16QAM-1.4</p> <p>Note: Offset=Cable loss (4.5) + 10log (12.86/10)=4.5+1.1=5.6 dB</p>	<p>LTE Band IV - High Channel 16QAM-1.4</p> <p>Note: Offset=Cable loss (4.5) + 10log (12.84/10)=4.5+1.1=5.6 dB</p>

 <p>Agilent R T</p> <p>Ref 30 dBm Atten 40 dB Mkr1 1.709998 GHz -16.17 dBm</p> <p>Peak Log 10 dB/ Offst 4.6 dB DI -13.0 dBm</p> <p>M1 S2 S3 FC AA</p> <p>Center 1.71 GHz #Res BW 30 kHz #VBW 100 kHz Sweep 19.99 ms (2000 pts) Span 8 MHz</p>	 <p>Agilent R T</p> <p>Ref 30 dBm Atten 40 dB Mkr1 1.755026 GHz -14.85 dBm</p> <p>Peak Log 10 dB/ Offst 4.7 dB DI -13.0 dBm</p> <p>M1 S2 S3 FC AA</p> <p>Center 1.755 GHz #Res BW 30 kHz #VBW 100 kHz Sweep 19.99 ms (2000 pts) Span 8 MHz</p>
<p>LTE Band IV - Low Channel QPSK-3</p> <p>Note: Offset=Cable loss (4.5) + 10log (30.93/30)=4.5+0.1=4.6 dB</p>	<p>LTE Band IV - High Channel QPSK-3</p> <p>Note: Offset=Cable loss (4.5) + 10log (31.21/30)=4.5+0.2=4.7 dB</p>
 <p>Agilent R T</p> <p>Ref 30 dBm Atten 40 dB Mkr1 1.709998 GHz -15.99 dBm</p> <p>Peak Log 10 dB/ Offst 4.6 dB DI -13.0 dBm</p> <p>M1 S2 S3 FC AA</p> <p>Center 1.71 GHz #Res BW 30 kHz #VBW 100 kHz Sweep 19.99 ms (2000 pts) Span 8 MHz</p>	 <p>Agilent R T</p> <p>Ref 30 dBm Atten 40 dB Mkr1 1.755006 GHz -14.02 dBm</p> <p>Peak Log 10 dB/ Offst 4.7 dB DI -13.0 dBm</p> <p>M1 S2 S3 FC AA</p> <p>Center 1.755 GHz #Res BW 30 kHz #VBW 100 kHz Sweep 19.99 ms (2000 pts) Span 8 MHz</p>
<p>LTE Band IV - Low Channel 16QAM-3</p> <p>Note: Offset=Cable loss (4.5) + 10log (30.94/30)=4.5+0.1=4.6 dB</p>	<p>LTE Band IV - High Channel 16QAM-3</p> <p>Note: Offset=Cable loss (4.5) + 10log (31.17/30)=4.5+0.2=4.7 dB</p>

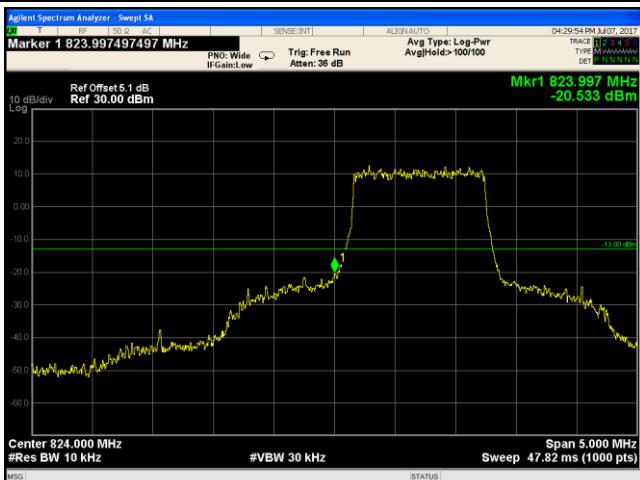
 <p>Agilent R T</p> <p>Ref 30 dBm Atten 35 dB Mkr1 1.709967 GHz -16.57 dBm</p> <p>Peak Log 10 dB/ Offst 6.8 dB DI -13.0 dBm</p> <p>M1 S2 S3 FC AA</p> <p>Center 1.71 GHz Span 10 MHz #Res BW 30 kHz #VBW 100 kHz Sweep 19.99 ms (2000 pts)</p>	 <p>Agilent R T</p> <p>Ref 30 dBm Atten 35 dB Mkr1 1.755048 GHz -16.19 dBm</p> <p>Peak Log 10 dB/ Offst 6.8 dB DI -13.0 dBm</p> <p>M1 S2 S3 FC AA</p> <p>Center 1.755 GHz Span 10 MHz #Res BW 30 kHz #VBW 100 kHz Sweep 19.99 ms (2000 pts)</p>
<p>LTE Band IV - Low Channel QPSK-5</p> <p>Note: Offset=Cable loss (4.5) + 10log (50.96/30)=4.5+2.3=6.8 dB</p>	<p>LTE Band IV - High Channel QPSK-5</p> <p>Note: Offset=Cable loss (4.5) + 10log (50.91/30)=4.5+2.3=6.8 dB</p>
 <p>Agilent R T</p> <p>Ref 30 dBm Atten 35 dB Mkr1 1.709972 GHz -15.81 dBm</p> <p>Peak Log 10 dB/ Offst 6.8 dB DI -13.0 dBm</p> <p>M1 S2 S3 FC AA</p> <p>Center 1.71 GHz Span 10 MHz #Res BW 30 kHz #VBW 100 kHz Sweep 19.99 ms (2000 pts)</p>	 <p>Agilent R T</p> <p>Ref 30 dBm Atten 35 dB Mkr1 1.755048 GHz -14.42 dBm</p> <p>Peak Log 10 dB/ Offst 6.8 dB DI -13.0 dBm</p> <p>M1 S2 S3 FC AA</p> <p>Center 1.755 GHz Span 10 MHz #Res BW 30 kHz #VBW 100 kHz Sweep 19.99 ms (2000 pts)</p>
<p>LTE Band IV - Low Channel 16QAM-5</p> <p>Note: Offset=Cable loss (4.5) + 10log (50.99/30)=4.5+2.3=6.8 dB</p>	<p>LTE Band IV - High Channel 16QAM-5</p> <p>Note: Offset=Cable loss (4.5) + 10log (50.93/30)=4.5+2.3=6.8 dB</p>



 <p>Agilent R T</p> <p>Ref 30 dBm Atten 35 dB Mkr1 1.70967933 GHz -16.89 dBm</p> <p>Peak Log 10 dB/ Offst 6.3 dB DI -13.0 dBm</p> <p>M1 S2 S3 FC AA</p> <p>Center 1.71 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 79.99 ms (8000 pts) Span 30 MHz</p>	 <p>Agilent R T</p> <p>Ref 30 dBm Atten 35 dB Mkr1 1.75584948 GHz -16.24 dBm</p> <p>Peak Log 10 dB/ Offst 6.3 dB DI -13.0 dBm</p> <p>M1 S2 S3 FC AA</p> <p>Center 1.755 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 79.99 ms (8000 pts) Span 30 MHz</p>
<p>LTE Band IV - Low Channel 16QAM-15</p> <p>Note: Offset=Cable loss (4.5) + 10log (150.59/100)=4.5+1.8=6.3 dB</p>	<p>LTE Band IV - High Channel 16QAM-15</p> <p>Note: Offset=Cable loss (4.5) + 10log (150.51/100)=4.5+1.8=6.3 dB</p>
 <p>Agilent R T</p> <p>Ref 30 dBm Atten 35 dB Mkr1 1.709387 GHz -18.38 dBm</p> <p>Peak Log 10 dB/ Offst 7.4 dB DI -13.0 dBm</p> <p>M1 S2 S3 FC AA</p> <p>Center 1.71 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 79.99 ms (8000 pts) Span 40 MHz</p>	 <p>Agilent R T</p> <p>Ref 30 dBm Atten 35 dB Mkr1 1.755638 GHz -16.93 dBm</p> <p>Peak Log 10 dB/ Offst 7.4 dB DI -13.0 dBm</p> <p>M1 S2 S3 FC AA</p> <p>Center 1.755 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 79.99 ms (8000 pts) Span 40 MHz</p>
<p>LTE Band IV - Low Channel QPSK-20</p> <p>Note: Offset=Cable loss (4.5) + 10log (195.45/100)=4.5+2.9=7.4 dB</p>	<p>LTE Band IV - High Channel QPSK-20</p> <p>Note: Offset=Cable loss (4.5) + 10log (195.15/100)=4.5+2.9=7.4 dB</p>



## LTE Band V (Part 22H)

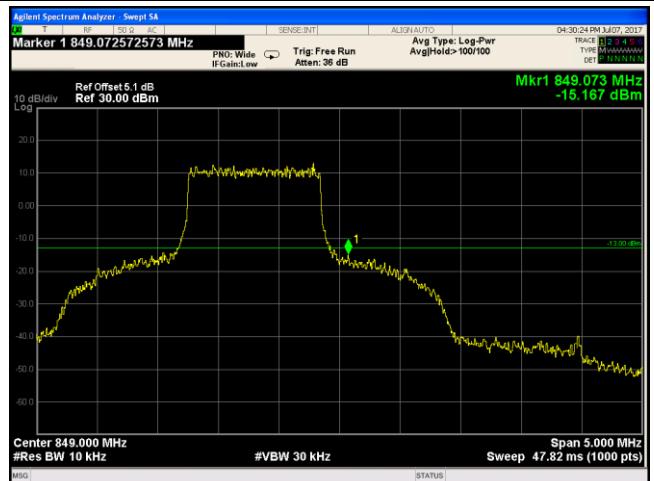
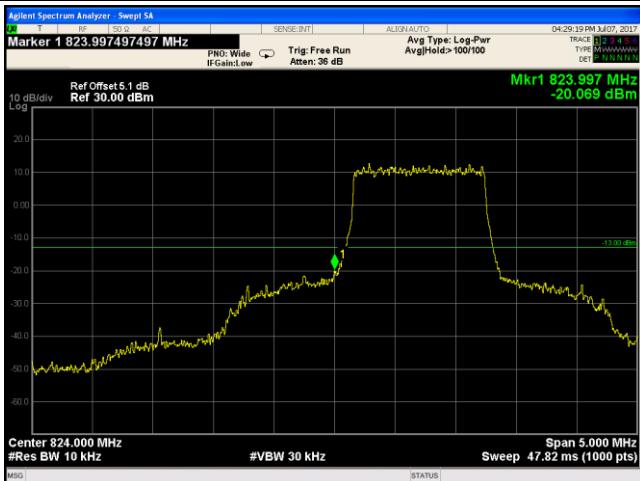


LTE Band V - Low Channel QPSK-1.4

Note: Offset=Cable loss (4.5) + 10log  
(12.97/10)=4.0+1.1=5.1 dB

LTE Band V - High Channel QPSK-1.4

Note: Offset=Cable loss (4.5) + 10log  
(12.91/10)=4.0+1.1=5.1 dB

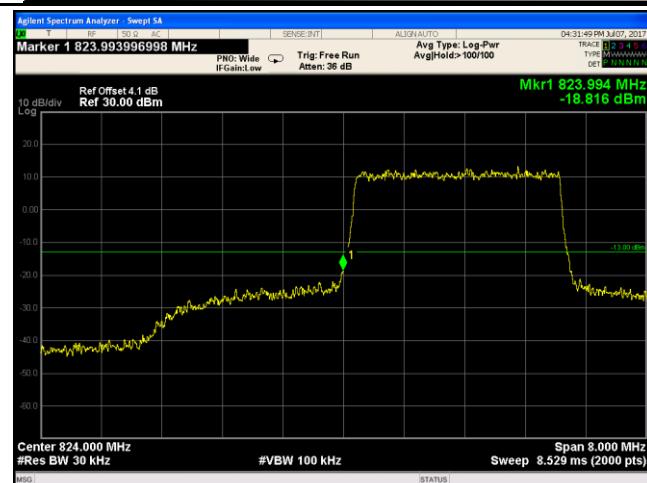


LTE Band V - Low Channel 16QAM-1.4

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

LTE Band V - High Channel 16QAM-1.4

Note: Offset=Cable loss (4.5) + 10log  
(12.95/10)=4.0+1.1=5.1 dB

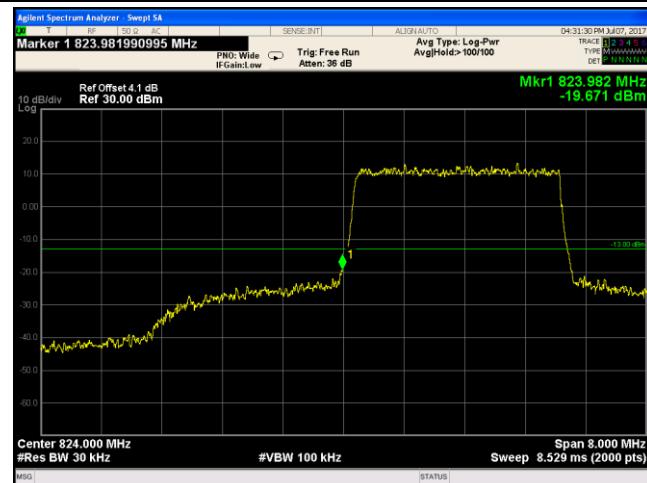


#### LTE Band V - Low Channel QPSK-3

Note: Offset=Cable loss (4.5) + 10log  
 $(30.72/30)=4.0+0.1=4.1$  dB

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

Note: Offset=Cable loss (4.5) + 10log  
 $(30.73/30)=4.0+0.1=4.1$  dB

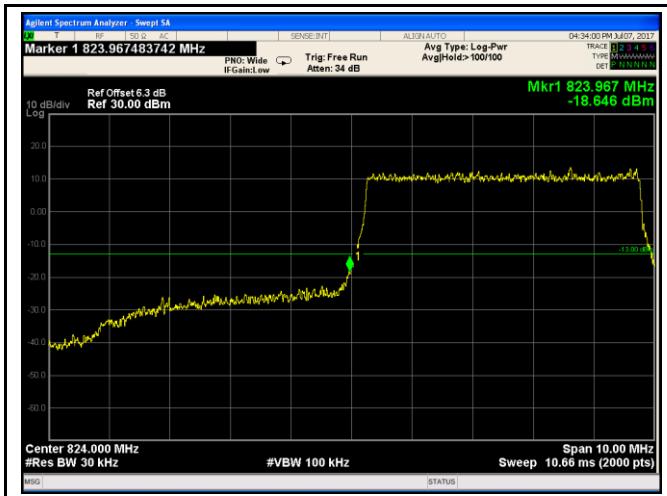


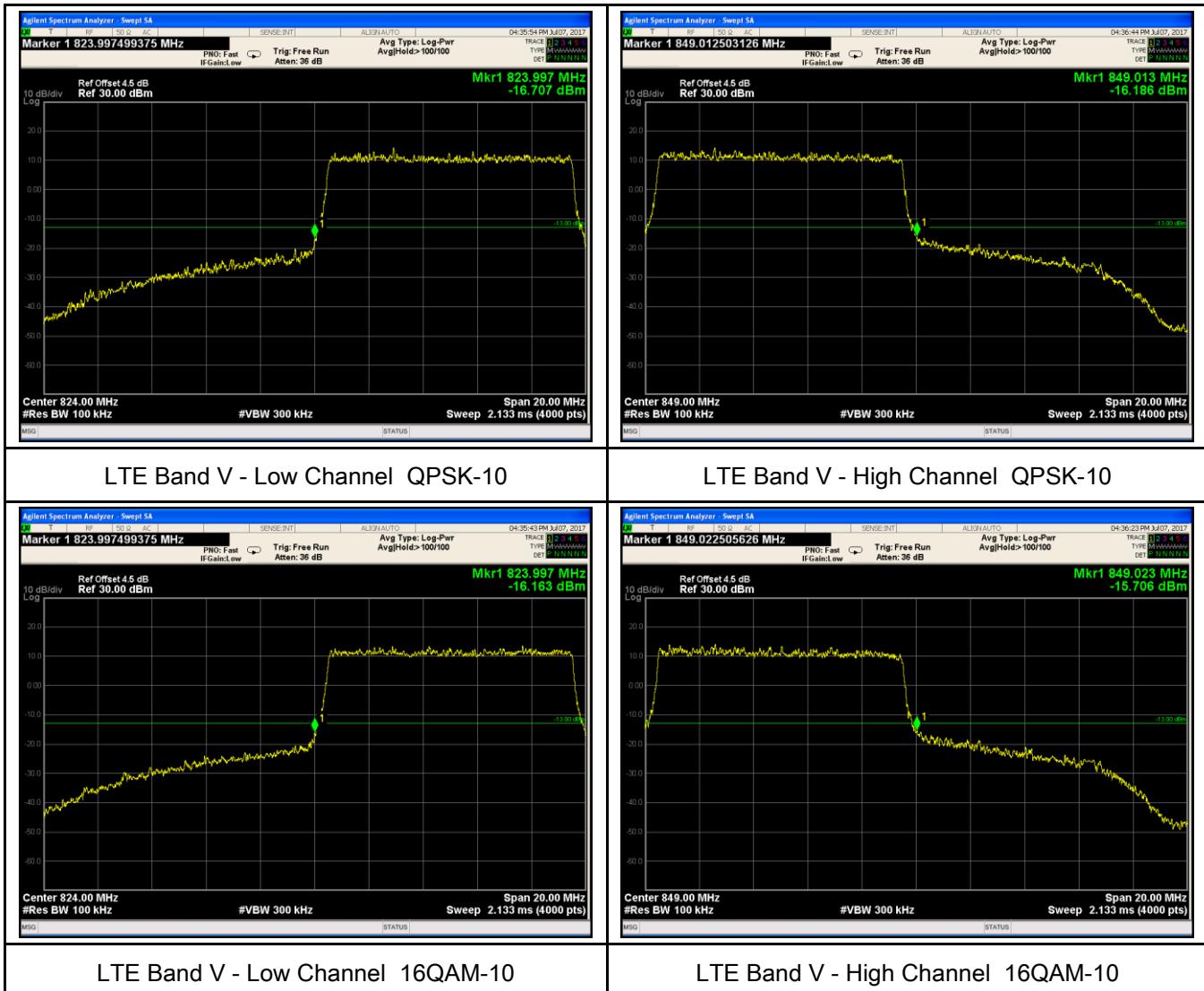
#### LTE Band V - Low Channel 16QAM-3

Note: Offset=Cable loss (4.5) + 10log  
 $(30.73/30)=4.0+0.1=4.1$  dB

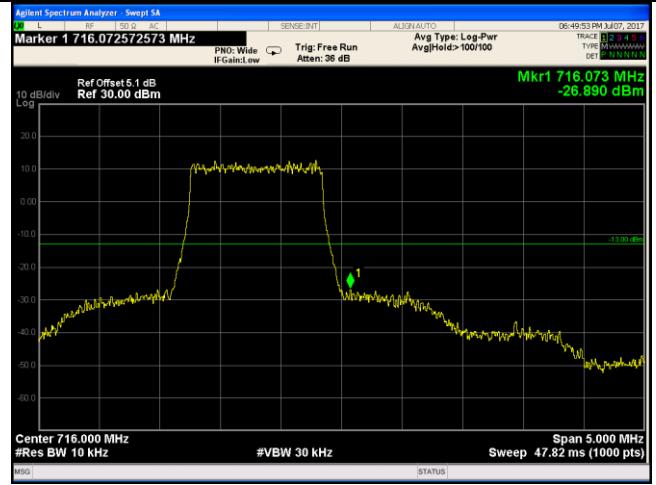
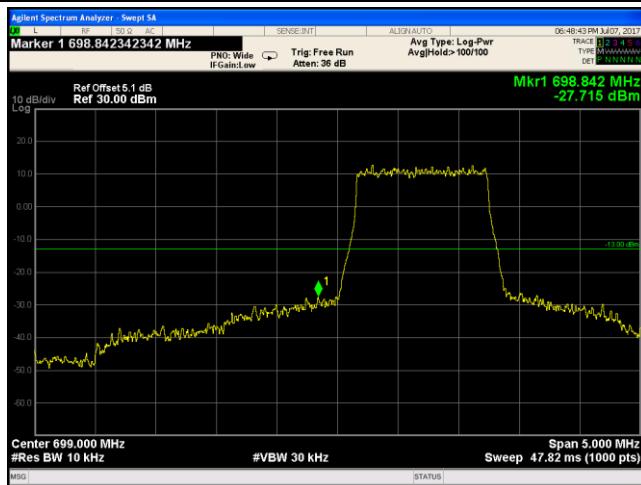
#### LTE Band V - High Channel 16QAM-3

Note: Offset=Cable loss (4.5) + 10log  
 $(30.73/30)=4.0+0.1=4.1$  dB

 <p>Marker 1 823.967483742 MHz PNO: Wide IF-Gain:Low Trig: Free Run Atten: 34 dB Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>Mkr1 823.967 MHz -18.646 dBm</p> <p>10 dB/div Ref Offset 5.3 dB Ref 30.00 dBm</p> <p>Center 824.000 MHz #Res BW 30 kHz #VBW 100 kHz Span 10.00 MHz Sweep 10.66 ms (2000 pts)</p>	 <p>Marker 1 849.027513757 MHz PNO: Wide IF-Gain:Low Trig: Free Run Atten: 34 dB Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>Mkr1 849.028 MHz -14.909 dBm</p> <p>10 dB/div Ref Offset 5.3 dB Ref 30.00 dBm</p> <p>Center 849.000 MHz #Res BW 30 kHz #VBW 100 kHz Span 10.00 MHz Sweep 10.66 ms (2000 pts)</p>
<p>LTE Band V - Low Channel QPSK-5</p> <p>Note: Offset=Cable loss (4.5) + 10log <math>(50.95/30)=4.0+2.3=6.3</math> dB</p>	<p>LTE Band V - High Channel QPSK-5</p> <p>Note: Offset=Cable loss (4.5) + 10log <math>(50.96/30)=4.0+2.3=6.3</math> dB</p>
 <p>Marker 1 823.967483742 MHz PNO: Wide IF-Gain:Low Trig: Free Run Atten: 34 dB Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>Mkr1 823.967 MHz -18.593 dBm</p> <p>10 dB/div Ref Offset 5.3 dB Ref 30.00 dBm</p> <p>Center 824.000 MHz #Res BW 30 kHz #VBW 100 kHz Span 10.00 MHz Sweep 10.66 ms (2000 pts)</p>	 <p>Marker 1 849.032516258 MHz PNO: Wide IF-Gain:Low Trig: Free Run Atten: 34 dB Avg Type: Log-Pwr AvgHold&gt;100/100</p> <p>Mkr1 849.033 MHz -15.196 dBm</p> <p>10 dB/div Ref Offset 5.3 dB Ref 30.00 dBm</p> <p>Center 849.000 MHz #Res BW 30 kHz #VBW 100 kHz Span 10.00 MHz Sweep 10.66 ms (2000 pts)</p>
<p>LTE Band V - Low Channel 16QAM-5</p> <p>Note: Offset=Cable loss (4.5) + 10log <math>(51.08/30)=4.0+2.3=6.3</math> dB</p>	<p>LTE Band V - High Channel 16QAM-5</p> <p>Note: Offset=Cable loss (4.5) + 10log <math>(50.91/30)=4.0+2.3=6.3</math> dB</p>



## LTE Band XII (Part 27)

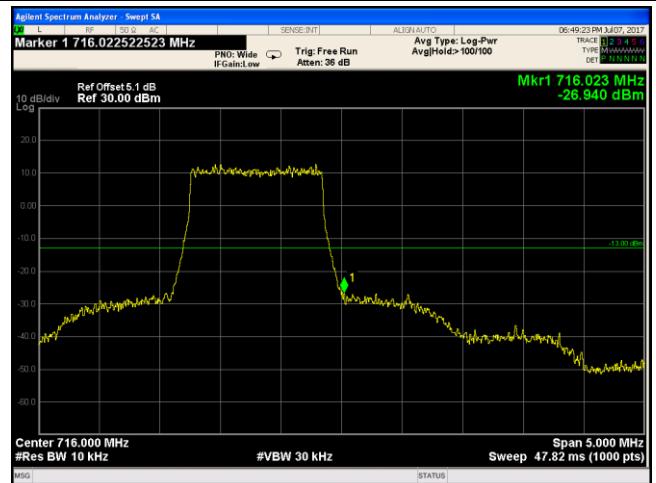
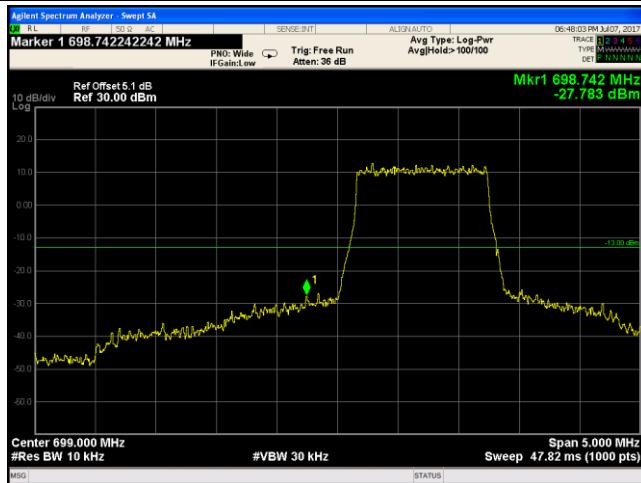


LTE Band XII - Low Channel QPSK-1.4

Note: Offset=Cable loss (4.5) + 10log  
(12.90/10)=4.0+1.1=5.1 dB

LTE Band XII - High Channel QPSK-1.4

Note: Offset=Cable loss (4.5) + 10log  
(12.98/10)=4.0+1.1=5.1 dB

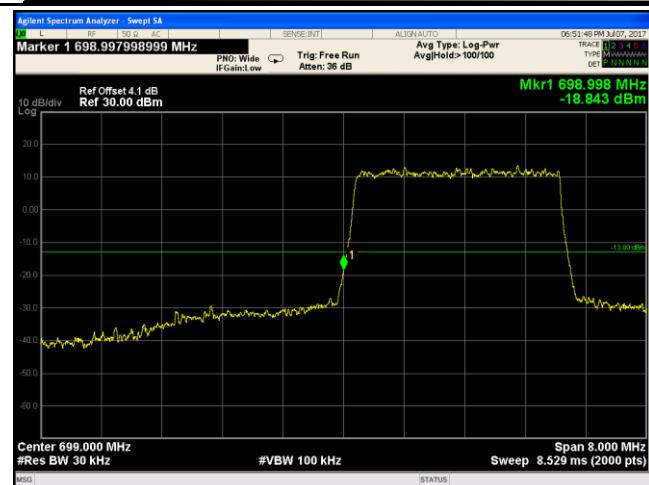


LTE Band XII - Low Channel 16QAM-1.4

Note: Offset=Cable loss (4.5) + 10log  
(12.99/10)=4.0+1.1=5.1 dB

LTE Band XII - High Channel 16QAM-1.4

Note: Offset=Cable loss (4.5) + 10log  
(12.99/10)=4.0+1.1=5.1 dB



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

Note: Offset=Cable loss (4.5) + 10log  
 $(30.49/30)=4.0+0.1=4.1$  dB

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

Note: Offset=Cable loss (4.5) + 10log  
 $(30.65/30)=4.0+0.1=4.1$  dB

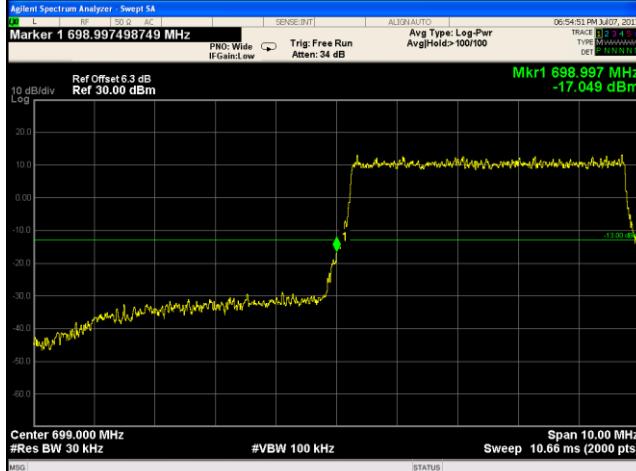
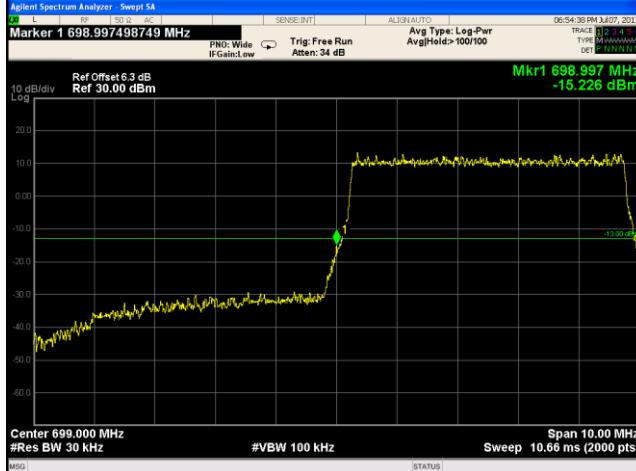


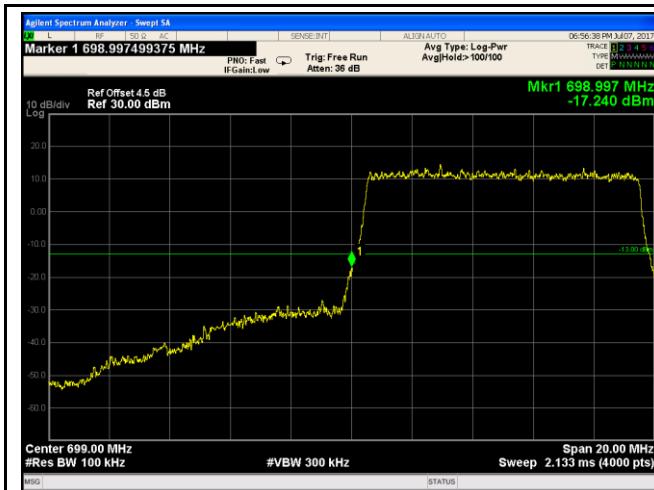
#### LTE Band XII - Low Channel 16QAM-3

Note: Offset=Cable loss (4.5) + 10log  
 $(30.52/30)=4.0+0.1=4.1$  dB

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

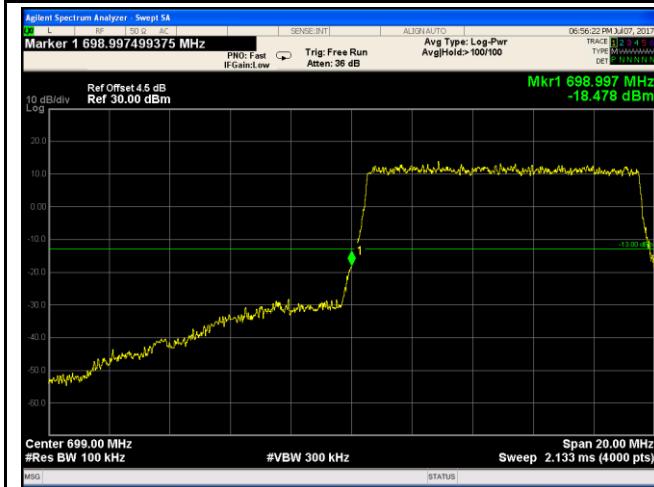
Note: Offset=Cable loss (4.5) + 10log  
 $(30.54/30)=4.0+0.1=4.1$  dB

	
<p>LTE Band XII - Low Channel QPSK-5</p> <p>Note: Offset=Cable loss (4.5) + 10log  <math>(51.96/30)=4.0+2.3=6.3</math> dB</p>	<p>LTE Band XII - High Channel QPSK-5</p> <p>Note: Offset=Cable loss (4.5) + 10log  <math>(50.86/30)=4.0+2.3=6.3</math> dB</p>
	
<p>LTE Band XII - Low Channel 16QAM-5</p> <p>Note: Offset=Cable loss (4.5) + 10log  <math>(51.06/30)=4.0+2.3=6.3</math> dB</p>	<p>LTE Band XII - High Channel 16QAM-5</p> <p>Note: Offset=Cable loss (4.5) + 10log  <math>(50.79/30)=4.0+2.3=6.3</math> dB</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