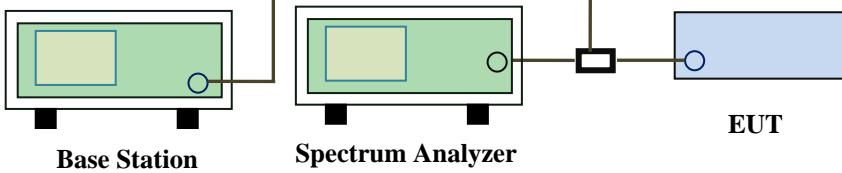


6.5 Spurious Emissions at Antenna Terminals

Temperature	25 °C
Relative Humidity	53%
Atmospheric Pressure	1010mbar
Test date :	December 12, 2017
Tested By :	Aaron Liang

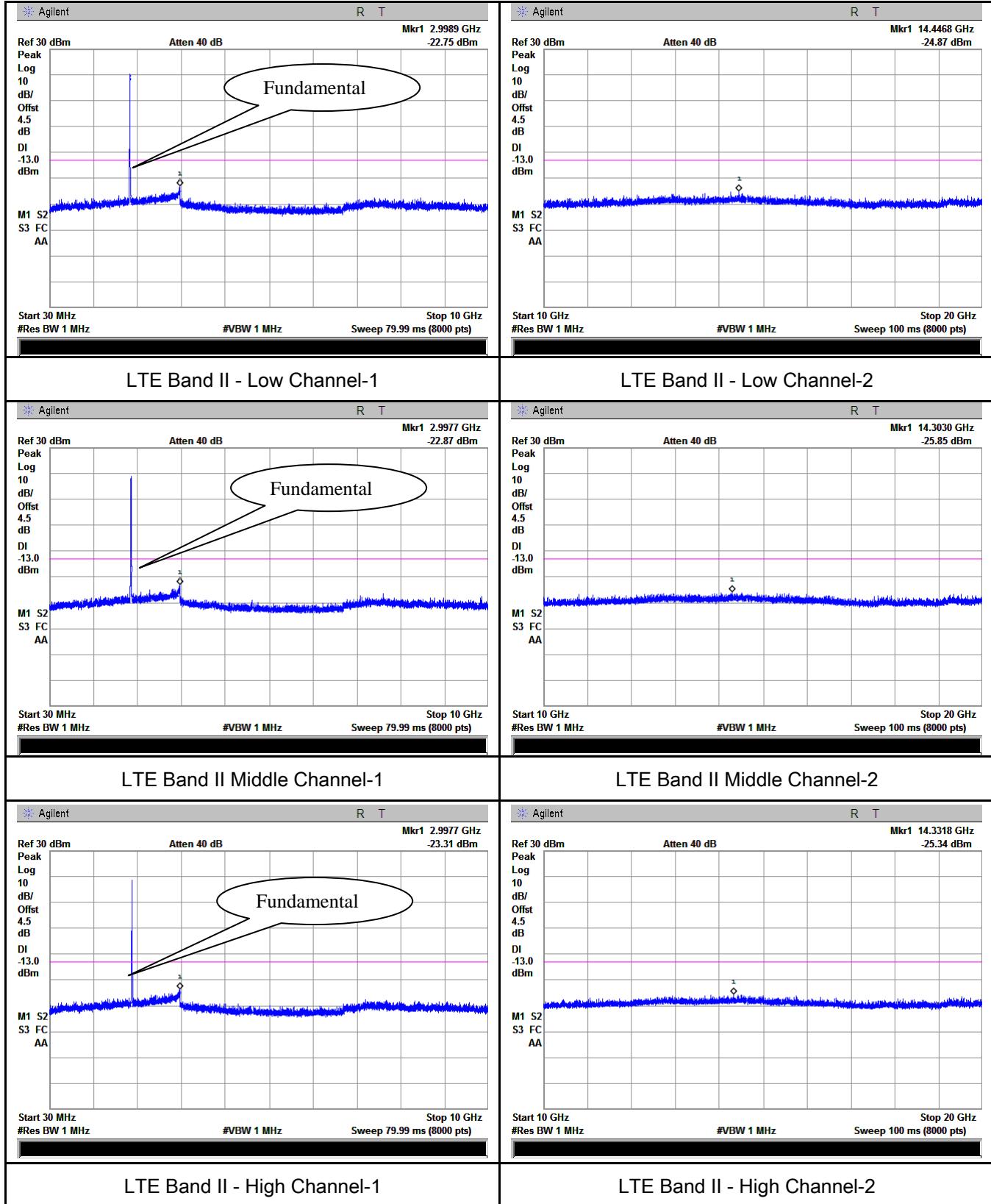
Requirement(s):

Spec	Item	Requirement	Applicable
§2.1051, §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 $43 + 10 \log (P) \text{ dB}$	<input checked="" type="checkbox"/>
Test Setup		 <p style="text-align: center;">Base Station Spectrum Analyzer EUT</p>	
Test Procedure		<ul style="list-style-type: none"> - The EUT was connected to Spectrum Analyzer and Base Station via power divider. - The Band Edges of low and high channels for the highest RF powers were measured. - Setting RBW as roughly BW/100. 	
Remark			
Result	<input checked="" type="checkbox"/> Pass <input type="checkbox"/> Fail		

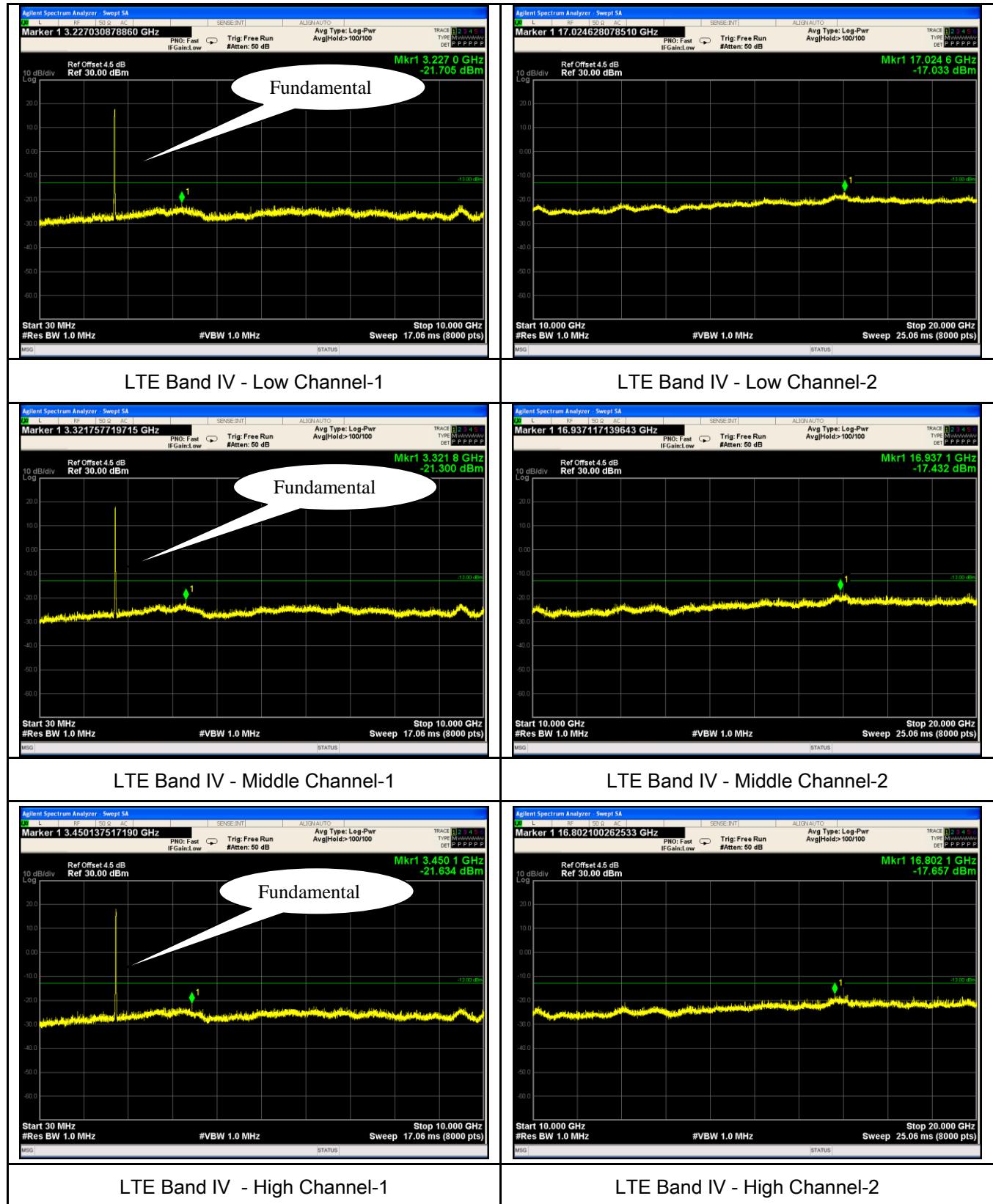
Test Data Yes N/A
 Test Plot Yes (See below) N/A

Test Plots 30MHz-5GHz

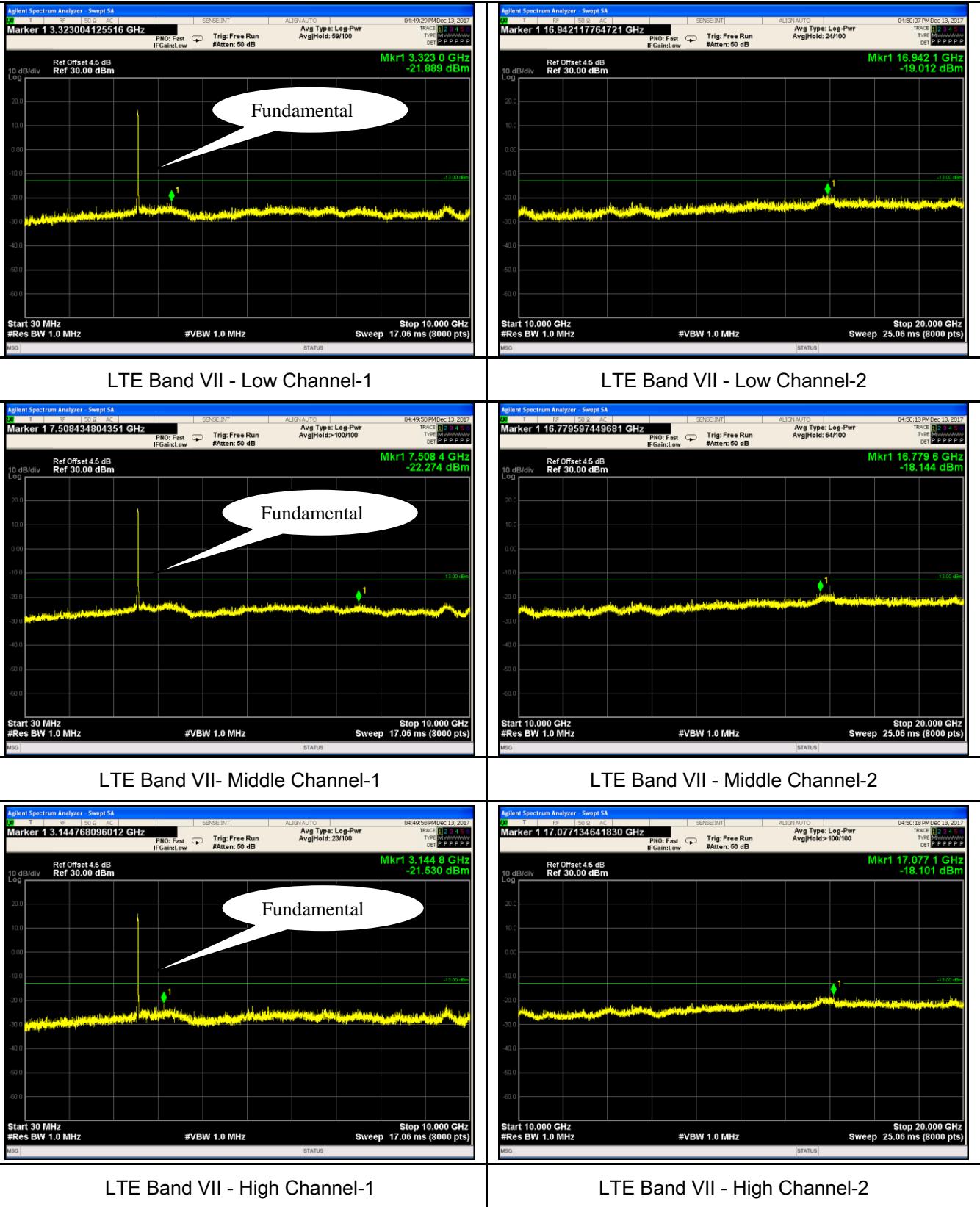
LTE Band II (Part 24E)



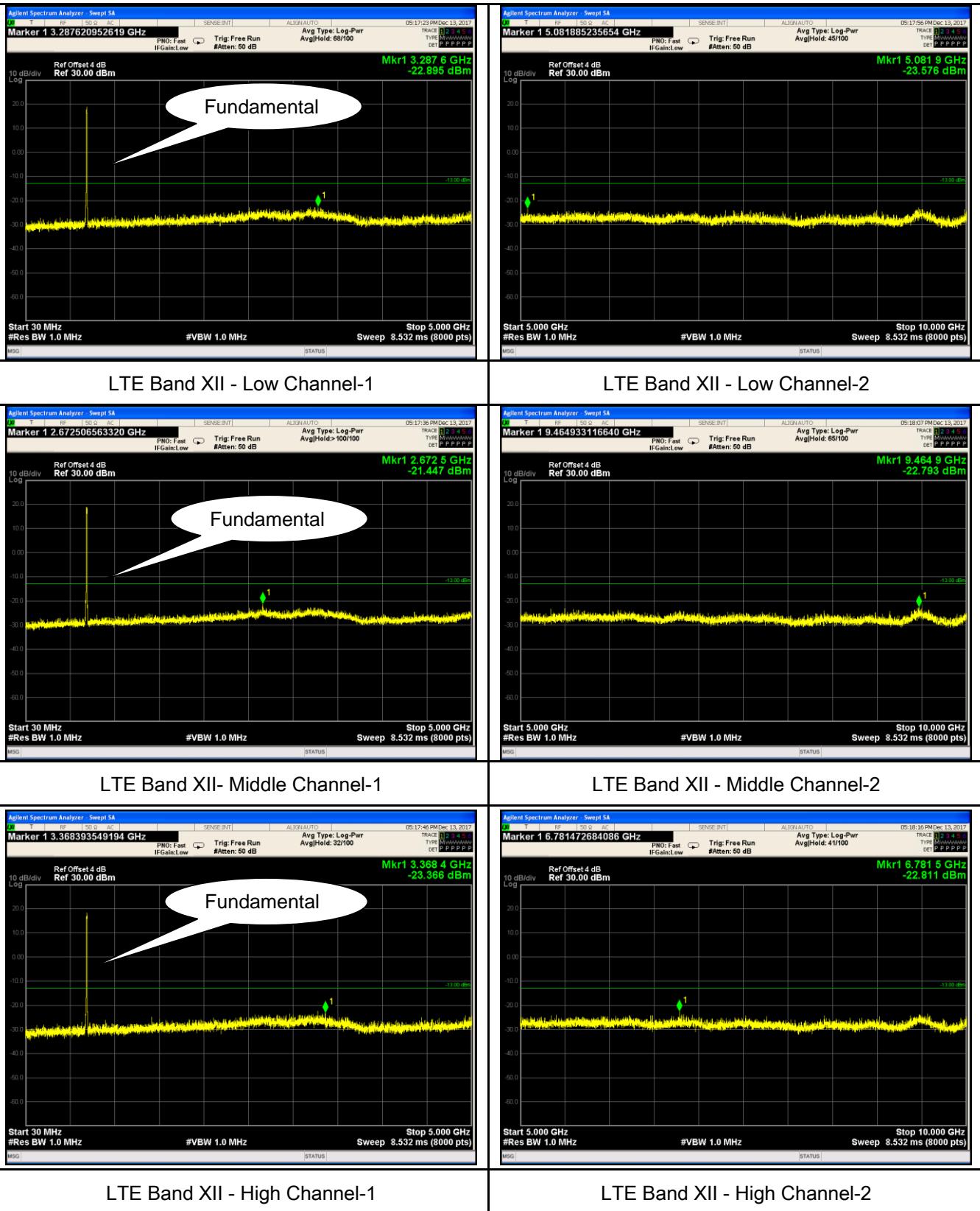
LTE Band IV (Part27) result



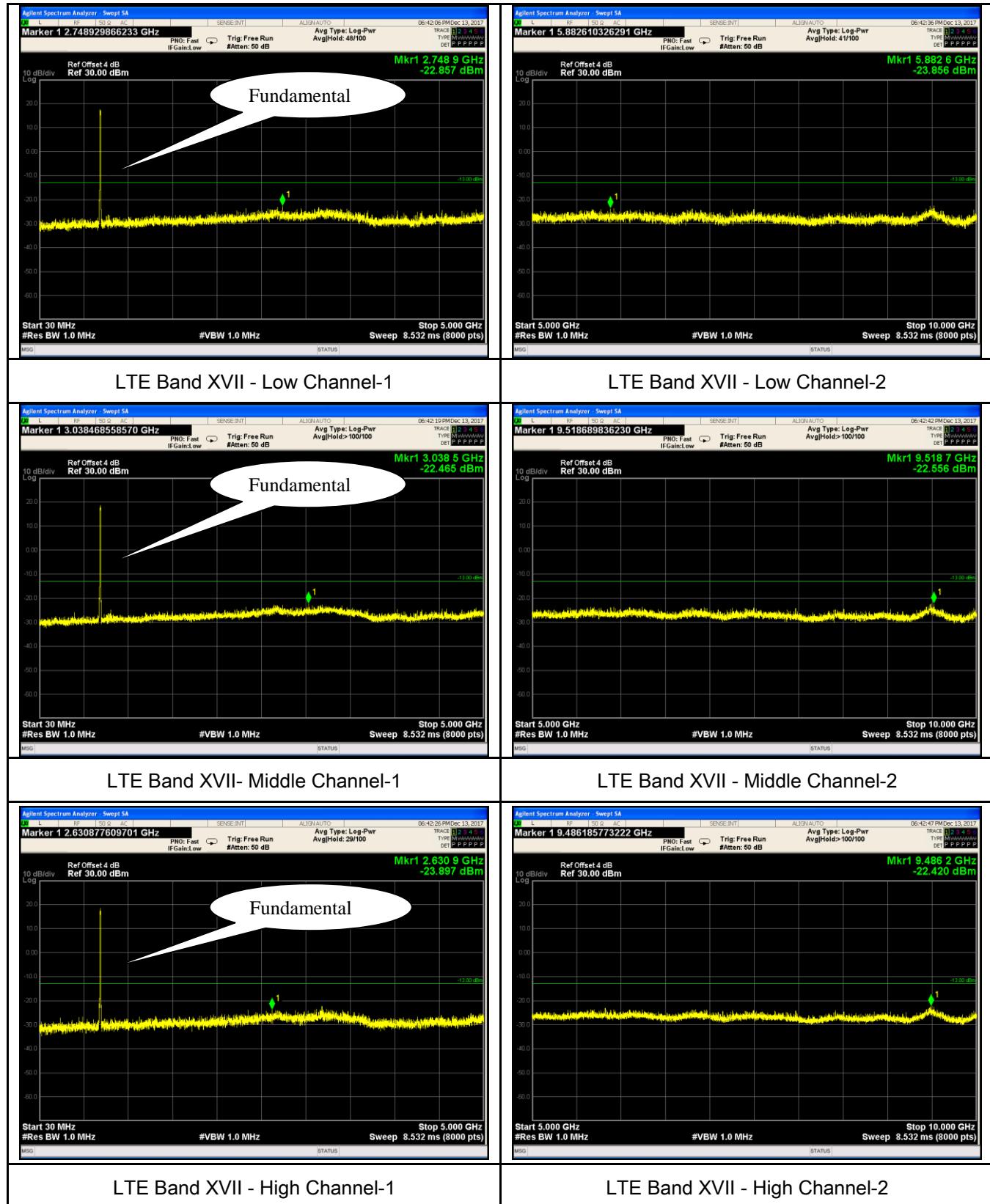
LTE Band VII (Part 27)



LTE Band XII (Part 27)



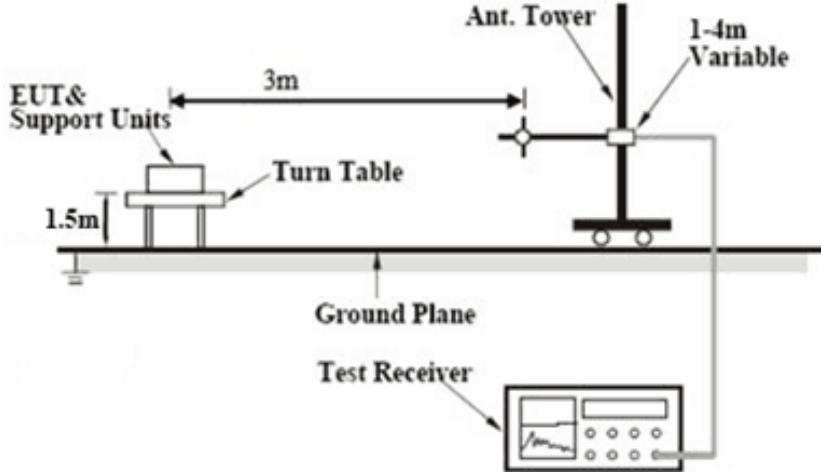
LTE Band XVII (Part 27)



6.6 Spurious Radiated Emissions

Temperature	25 °C
Relative Humidity	53%
Atmospheric Pressure	1010mbar
Test date :	December 12, 2017
Tested By :	Aaron Liang

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"> 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. 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. 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. <p>Sample Calculation:</p> <p>EUT Field Strength = Raw Amplitude (dBμV/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	-47.84	V	10.25	2.73	-40.32	-13	-27.32
3720	-47.73	H	10.25	2.73	-40.21	-13	-27.21
725.63	-45.43	V	6.27	0.42	-39.58	-13	-26.58
452.23	-48.88	H	6.03	0.3	-43.15	-13	-30.15

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	-47.39	V	10.25	2.73	-39.87	-13	-26.87
3760	-46.25	H	10.25	2.73	-38.73	-13	-25.73
559.35	-45.79	V	6.09	0.38	-40.08	-13	-27.08
436.27	-48.79	H	6	0.29	-43.08	-13	-30.08

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	-46.08	V	10.36	2.73	-38.45	-13	-25.45
3800	-46.1	H	10.36	2.73	-38.47	-13	-25.47
347.44	-45.61	V	3.72	0.18	-42.07	-13	-29.07
734.27	-47.11	H	6.29	0.38	-41.2	-13	-28.2

Note:

- 1, The testing has been conformed to 10*1907.5MHz=19,075MHz
- 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 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	-45.57	V	10.06	2.52	-38.03	-13	-25.03
3440	-47.26	H	10.06	2.52	-39.72	-13	-26.72
319.7	-45.23	V	3.69	0.16	-41.7	-13	-28.7
689.78	-47.67	H	6.28	0.43	-41.82	-13	-28.82

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	-47.27	V	10.09	2.52	-39.7	-13	-26.7
3465	-47.97	H	10.09	2.52	-40.4	-13	-27.4
798.15	-47.5	V	6.34	0.41	-41.57	-13	-28.57
714.12	-48.88	H	6.25	0.4	-43.03	-13	-30.03

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	-45.99	V	10.09	2.52	-38.42	-13	-25.42
3490	-46.69	H	10.09	2.52	-39.12	-13	-26.12
623.5	-46.63	V	6.32	0.39	-40.7	-13	-27.7
676.51	-48.9	H	6.33	0.37	-42.94	-13	-29.94

Note:

- 1, The testing has been conformed to 10*1752.5MHz=17,525MHz
- 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 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	-45.4	V	10.29	0.98	-36.09	-13	-23.09
5020	-45.49	H	10.29	0.98	-36.18	-13	-23.18
768.86	-46.3	V	6.31	0.37	-40.36	-13	-27.36
463.18	-49.75	H	5.95	0.27	-44.07	-13	-31.07

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	-44.94	V	10.3	0.99	-35.63	-13	-22.63
5070	-45.12	H	10.3	0.99	-35.81	-13	-22.81
291.31	-44.73	V	3.69	0.2	-41.24	-13	-28.24
711.05	-49.87	H	6.28	0.38	-43.97	-13	-30.97

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	-45.58	V	10.32	1	-36.26	-13	-23.26
5120	-44.38	H	10.32	1	-35.06	-13	-22.06
811.04	-45.21	V	6.26	0.4	-39.35	-13	-26.35
531.26	-47.87	H	5.99	0.32	-42.2	-13	-29.2

Note:

- 1, The testing has been conformed to $10 * 2567.5 \text{ MHz} = 25,675 \text{ MHz}$
- 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	-48.49	V	7.65	0.75	-41.59	-13	-28.59
1408	-46.88	H	7.65	0.75	-39.98	-13	-26.98
277.55	-45.43	V	3.75	0.17	-41.85	-13	-28.85
565.18	-48.45	H	5.95	0.28	-42.78	-13	-29.78

Middle channel

Frequency (MHz)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1415	-47.26	V	7.65	0.75	-40.36	-13	-27.36
1415	-48.3	H	7.65	0.75	-41.4	-13	-28.4
546.24	-46.05	V	6.33	0.41	-40.13	-13	-27.13
418.99	-47.82	H	6.02	0.3	-42.1	-13	-29.1

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	-47.1	V	7.65	0.75	-40.2	-13	-27.2
1422	-47.64	H	7.65	0.75	-40.74	-13	-27.74
590.06	-44.93	V	6.3	0.39	-39.02	-13	-26.02
448.16	-48.17	H	6	0.3	-42.47	-13	-29.47

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)	Substituted level (dBm)	Polarity (H/V)	Antenna Gain Correction (dB)	Cable Loss (dB)	Corrected Reading (dBm)	Limit (dBm)	Margin (dB)
1418	-46.63	V	7.65	0.75	-39.73	-13	-26.73
228.06	-48.57	H	7.65	0.75	-41.67	-13	-28.67
209.8	-50.35	V	3.7	0.18	-46.83	-13	-33.83
204.7	-48.95	H	3.66	0.2	-45.49	-13	-32.49

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	-46.1	V	7.65	0.75	-39.2	-13	-26.2
824.06	-48.34	H	7.65	0.75	-41.44	-13	-28.44
449.87	-49.29	V	6	0.32	-43.61	-13	-30.61
204.8	-48.72	H	3.73	0.16	-45.15	-13	-32.15

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	-47.57	V	7.65	0.75	-40.67	-13	-27.67
599.54	-50.02	H	7.65	0.75	-43.12	-13	-30.12
763.89	-49.32	V	6.29	0.41	-43.44	-13	-30.44
204.3	-48.93	H	3.67	0.18	-45.44	-13	-32.44

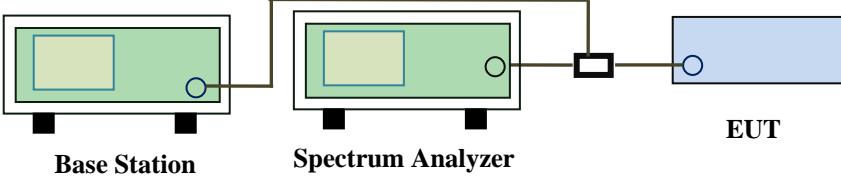
Note:

- 1, The testing has been conformed to $10 \times 713.5\text{MHz} = 7,135\text{MHz}$
- 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.

6.7 Band Edge

Temperature	25 °C
Relative Humidity	53%
Atmospheric Pressure	1010mbar
Test date :	December 12, 2017
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 style="text-align: center;">Base Station Spectrum Analyzer EUT</p>	
Procedure		<ul style="list-style-type: none"> - The EUT was connected to Spectrum Analyzer and Base Station via power divider. - The Band Edges of low and high channels for the highest RF powers were measured. Setting RBW as roughly BW/100. 	
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	-25.856	-13
			16QAM	-23.984	-13
1.4	18900	1910	QPSK	-20.030	-13
			16QAM	-17.081	-13
3	18615	1850	QPSK	-20.578	-13
			16QAM	-21.510	-13
3	19185	1910	QPSK	-17.985	-13
			16QAM	-19.117	-13
5	18625	1850	QPSK	-19.539	-13
			16QAM	-19.657	-13
5	19175	1910	QPSK	-15.743	-13
			16QAM	-15.723	-13
10	18650	1850	QPSK	-17.668	-13
			16QAM	-18.024	-13
10	19150	1910	QPSK	-18.465	-13
			16QAM	-19.118	-13
15	18675	1850	QPSK	-22.141	-13
			16QAM	-21.996	-13
15	19125	1910	QPSK	-14.386	-13
			16QAM	-14.207	-13
20	18700	1850	QPSK	-18.09	-13
			16QAM	-17.17	-13
20	19100	1910	QPSK	-20.90	-13
			16QAM	-20.03	-13

LTE Band IV (Part 27) result

BW(MHz)	Channel	Frequency (MHz)	Mode	Emission (dBm)	Limit (dBm)
1.4	19957	1709.9	QPSK	-25.722	-13
			16QAM	-26.325	-13
1.4	20393	1755	QPSK	-23.753	-13
			16QAM	-23.821	-13
3	19965	1709.9	QPSK	-21.367	-13
			16QAM	-22.521	-13
3	20385	1755	QPSK	-22.363	-13
			16QAM	-22.291	-13
5	19975	1709.9	QPSK	-20.150	-13
			16QAM	-20.043	-13
5	20375	1755	QPSK	-18.903	-13
			16QAM	-18.859	-13
10	20000	1709.9	QPSK	-20.423	-13
			16QAM	-22.784	-13
10	20350	1755	QPSK	-20.702	-13
			16QAM	-21.395	-13
15	20025	1709.9	QPSK	-21.599	-13
			16QAM	-21.536	-13
15	20325	1755	QPSK	-22.652	-13
			16QAM	-22.096	-13
20	20050	1709.9	QPSK	-24.490	-13
			16QAM	-22.410	-13
20	20300	1755	QPSK	-24.183	-13
			16QAM	-23.487	-13

LTE Band XII (Part 27) result

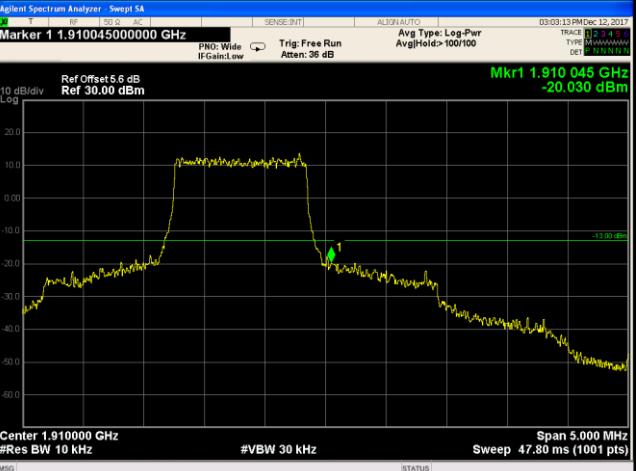
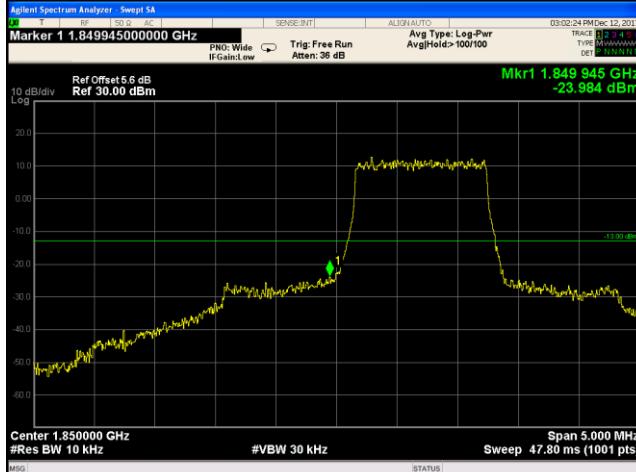
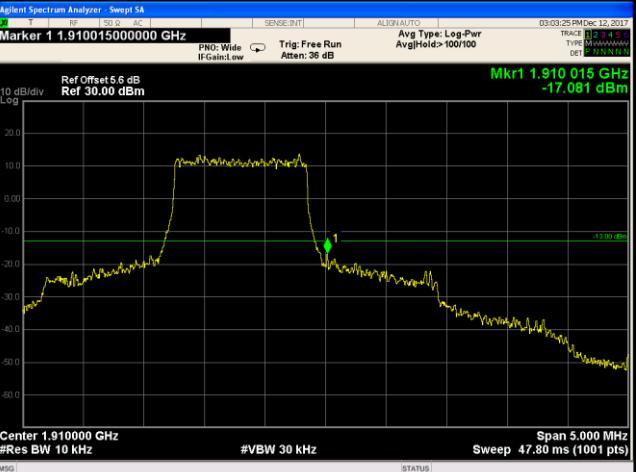
BW(MHz)	Channel	Frequency (MHz)	Mode	Emission (dBm)	Limit (dBm)
1.4	23017	699	QPSK	-22.923	-13
			16QAM	-21.613	-13
1.4	23173	716	QPSK	-22.676	-13
			16QAM	-23.862	-13
3	23025	699	QPSK	-21.375	-13
			16QAM	-21.546	-13
3	23165	716	QPSK	-22.013	-13
			16QAM	-22.258	-13
5	23035	699	QPSK	-19.048	-13
			16QAM	-19.597	-13
5	23155	716	QPSK	-19.689	-13
			16QAM	-18.556	-13
10	23060	698	QPSK	-22.848	-13
			16QAM	-22.547	-13
10	23130	716	QPSK	-18.388	-13
			16QAM	-19.123	-13

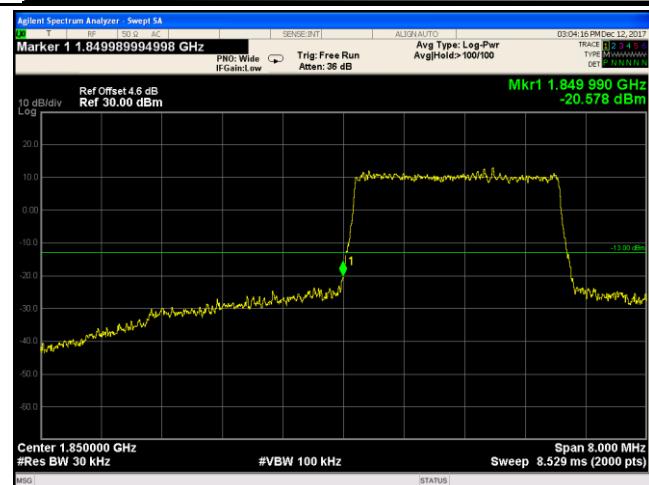
LTE Band XVII (Part 27) result

BW(MHz)	Channel	Frequency (MHz)	Mode	Emission (dBm)	Limit (dBm)
5	23755	704	QPSK	-19.415	-13
			16QAM	-18.750	-13
5	23825	716	QPSK	-20.196	-13
			16QAM	-23.571	-13
10	23780	704	QPSK	-19.216	-13
			16QAM	-18.889	-13
10	23800	716	QPSK	-19.498	-13
			16QAM	-19.218	-13

Test Plots

LTE Band II (Part 24E)

 <p>Marker 1 1.849945000000 GHz Mkr1 1.849 945 GHz -23.984 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 -17.081 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 $(12.84)=4.5+1.1=5.8\text{dB}$</p>	<p>LTE Band II - High Channel QPSK-1.4</p> <p>Note: Offset=Cable loss (4.5) + 10log $(13.10)=4.5+1.1=5.6\text{dB}$</p>
 <p>Marker 1 1.849945000000 GHz Mkr1 1.849 945 GHz -23.984 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 -17.081 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 $(12.97/10)=4.5+1.1=5.6 \text{ dB}$</p>	<p>LTE Band II - High Channel 16QAM-1.4</p> <p>Note: Offset=Cable loss (4.5) + 10log $(13.04/10)=4.5+1.1=5.6 \text{ dB}$</p>



LTE Band II - Low Channel QPSK-3

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

LTE Band II - High Channel QPSK-3

Note: Offset=Cable loss (4.5) + 10log
 $(30.32/30)=4.5+0.1=4.6$ dB

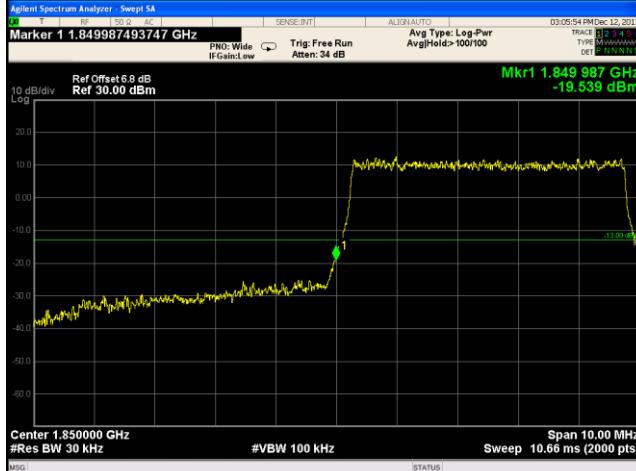


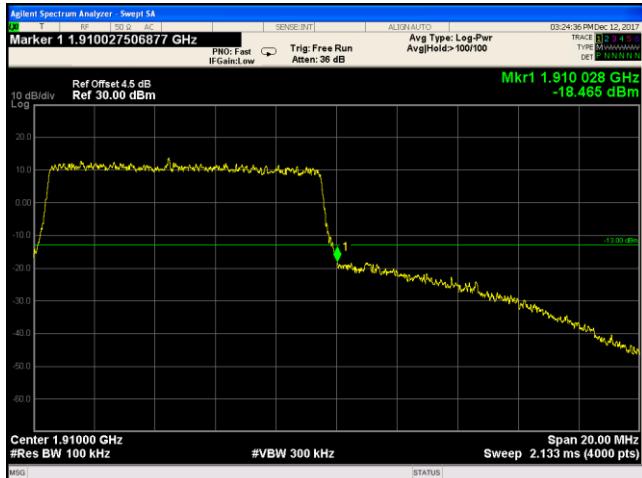
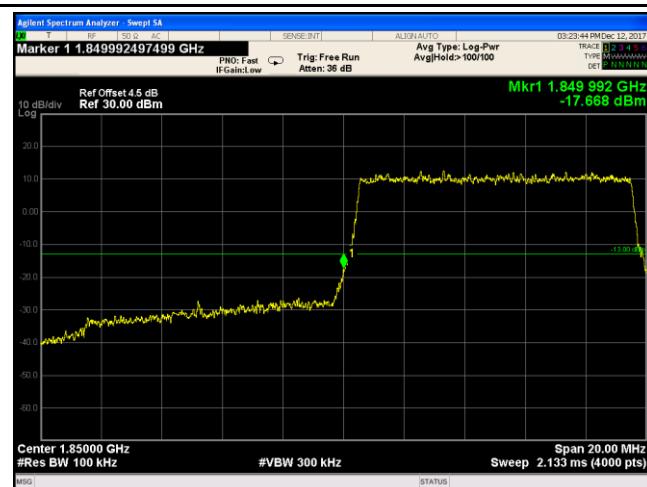
LTE Band II - Low Channel 16QAM-3

Note: Offset=Cable loss (4.5) + 10log
 $(30.71/30)=4.5+0.1=4.6$ dB

LTE Band II - High Channel 16QAM-3

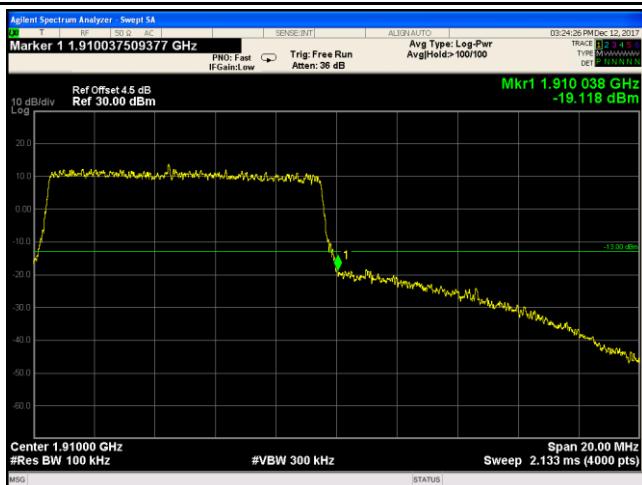
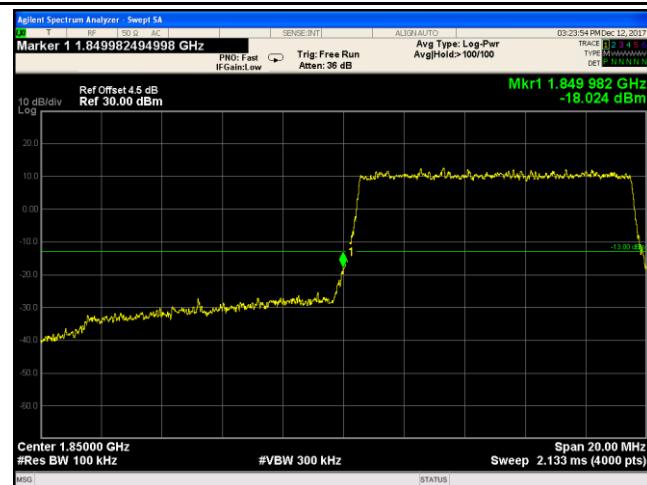
Note: Offset=Cable loss (4.5) + 10log
 $(30.26/30)=4.5+0.0=4.6$ dB

 <p>Marker 1 1.849987493747 GHz PNO: Wide IFGain:Low Trig: Free Run Avg Type: Log-Pwr AvgHold>100/100 Ref Offset 5.8 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 1.850000 GHz #Res BW 30 kHz #VBW 100 kHz Span 10.00 MHz Sweep 10.66 ms (2000 pts) MSG [STATUS]</p>	 <p>Marker 1 1.910011005503 GHz PNO: Wide IFGain:Low Trig: Free Run Avg Type: Log-Pwr AvgHold>100/100 Ref Offset 5.8 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 1.910000 GHz #Res BW 30 kHz #VBW 100 kHz Span 10.00 MHz Sweep 10.66 ms (2000 pts) MSG [STATUS]</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 $(50.40/30)=4.5+2.3=6.8$ dB</p>	<p>Note: Offset=Cable loss (4.5) + 10log $(51.02/30)=4.5+2.3=6.8$ dB</p>
 <p>Marker 1 1.849977488744 GHz PNO: Wide IFGain:Low Trig: Free Run Avg Type: Log-Pwr AvgHold>100/100 Ref Offset 5.7 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 1.850000 GHz #Res BW 30 kHz #VBW 100 kHz Span 10.00 MHz Sweep 10.66 ms (2000 pts) MSG [STATUS]</br></br></p>	 <p>Marker 1 1.910006003002 GHz PNO: Wide IFGain:Low Trig: Free Run Avg Type: Log-Pwr AvgHold>100/100 Ref Offset 5.8 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 1.910000 GHz #Res BW 30 kHz #VBW 100 kHz Span 10.00 MHz Sweep 10.66 ms (2000 pts) MSG [STATUS]</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 $(50.30/30)=4.5+2.2=6.7$ dB</p>	<p>Note: Offset=Cable loss (4.5) + 10log $(50.79/30)=4.5+2.3=6.8$ dB</p>



LTE Band II - Low Channel QPSK-10

LTE Band II - High Channel QPSK-10



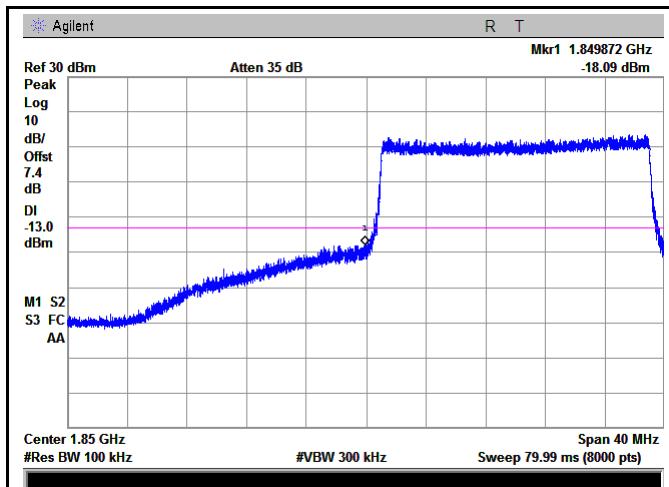
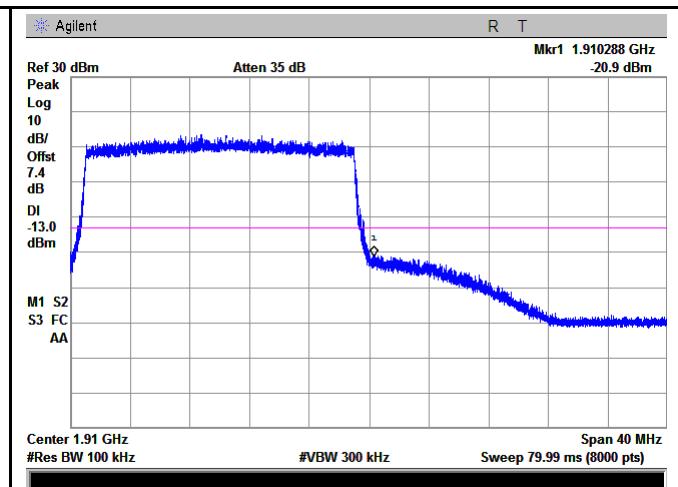
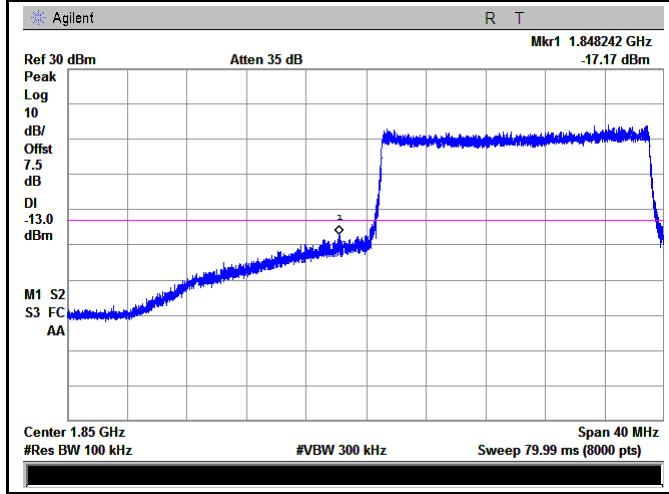
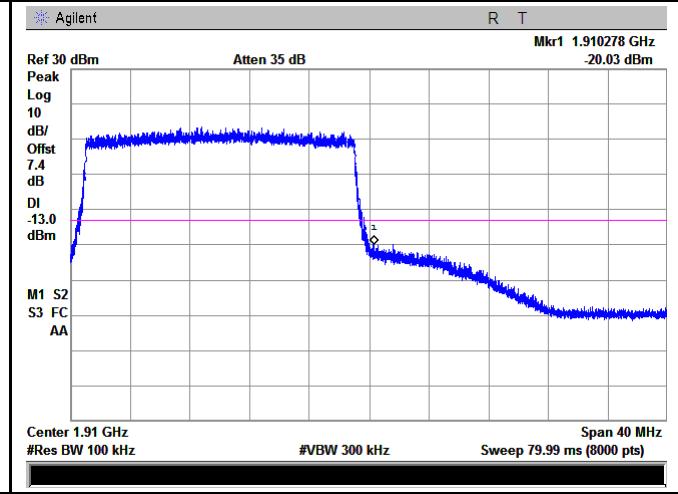
LTE Band II - Low Channel 16QAM-10

LTE Band II - High Channel 16QAM-10

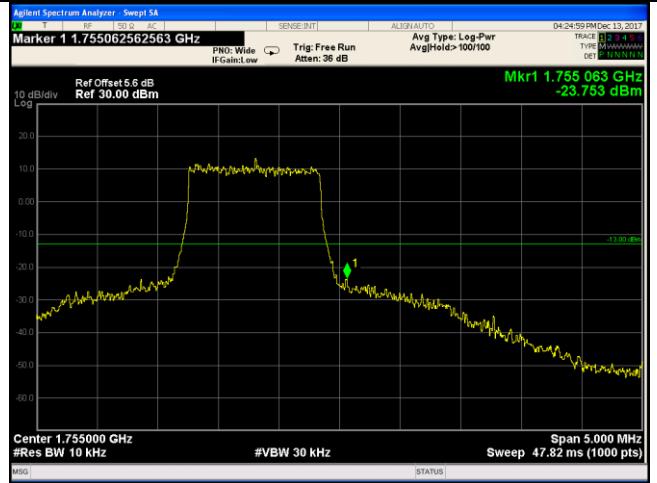
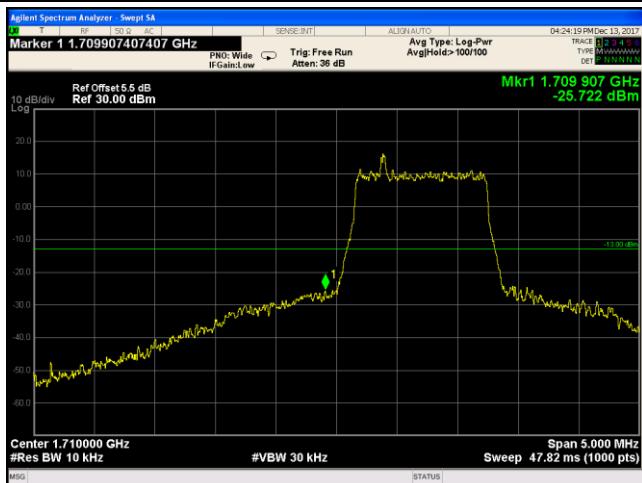
Note: Offset=Cable loss (4.5) + 10log
(100.20/100)=4.5+0.0=4.5 dB

Note: Offset=Cable loss (4.5) + 10log
(100.80/100)=4.5+0.0=4.5 dB

 <p>Marker 1 1.849259282410 GHz PN0: Fast IFGain:Low Trig: Free Run Atten: 34 dB Avg Type: Log-Pwr AvgHold>100/100</p> <p>Mkr1 1.849 259 GHz -22.141 dBm</p> <p>10 dB/div Ref Offset 5.2 dB Ref 30.00 dBm</p> <p>Center 1.85000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 3.200 ms (8000 pts)</p>	 <p>Marker 1 1.910485062196 GHz PN0: Fast IFGain:Low Trig: Free Run Atten: 34 dB Avg Type: Log-Pwr AvgHold>100/100</p> <p>Mkr1 1.910 485 GHz -14.386 dBm</p> <p>10 dB/div Ref Offset 5.2 dB Ref 30.00 dBm</p> <p>Center 1.91000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 3.200 ms (8000 pts)</p>
<p>LTE Band II - Low Channel QPSK-15</p> <p>Note: Offset=Cable loss (4.5) + 10log (149.2/100)=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 (148.0/100)=4.5+1.7=6.2 dB</p>
 <p>Marker 1 1.849240530066 GHz PN0: Fast IFGain:Low Trig: Free Run Atten: 34 dB Avg Type: Log-Pwr AvgHold>100/100</p> <p>Mkr1 1.849 241 GHz -21.996 dBm</p> <p>10 dB/div Ref Offset 5.2 dB Ref 30.00 dBm</p> <p>Center 1.85000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 3.200 ms (8000 pts)</p>	 <p>Marker 1 1.910616328604 GHz PN0: Fast IFGain:Low Trig: Free Run Atten: 34 dB Avg Type: Log-Pwr AvgHold>100/100</p> <p>Mkr1 1.910 616 GHz -14.207 dBm</p> <p>10 dB/div Ref Offset 5.2 dB Ref 30.00 dBm</p> <p>Center 1.91000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 3.200 ms (8000 pts)</p>
<p>LTE Band II - Low Channel 16QAM-15</p> <p>Note: Offset=Cable loss (4.5) + 10log (146.9/100)=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 (147.9/100)=4.5+1.7=6.2 dB</p>

 <p>Agilent R T</p> <p>Mkr1 1.849872 GHz -18.09 dBm</p> <p>Ref 30 dBm Peak Log 10 dB/ Offst 7.4 dB DI -13.0 dBm</p> <p>M1 S2 S3 FC AA</p> <p>Center 1.85 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 79.99 ms (8000 pts)</p>	 <p>Agilent R T</p> <p>Mkr1 1.910288 GHz -20.9 dBm</p> <p>Ref 30 dBm Peak Log 10 dB/ Offst 7.4 dB DI -13.0 dBm</p> <p>M1 S2 S3 FC AA</p> <p>Center 1.91 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 79.99 ms (8000 pts)</p>
<p>LTE Band II - Low Channel QPSK-20</p> <p>Note: Offset=Cable loss (4.5) + 10log (192.0/100)=4.5+2.9=7.4 dB</p>	<p>LTE Band II - High Channel QPSK-20</p> <p>Note: Offset=Cable loss (4.5) + 10log (195.6/100)=4.5+2.9=7.4 dB</p>
 <p>Agilent R T</p> <p>Mkr1 1.848242 GHz -17.17 dBm</p> <p>Ref 30 dBm Peak Log 10 dB/ Offst 7.5 dB DI -13.0 dBm</p> <p>M1 S2 S3 FC AA</p> <p>Center 1.85 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 79.99 ms (8000 pts)</p>	 <p>Agilent R T</p> <p>Mkr1 1.910278 GHz -20.03 dBm</p> <p>Ref 30 dBm Peak Log 10 dB/ Offst 7.4 dB DI -13.0 dBm</p> <p>M1 S2 S3 FC AA</p> <p>Center 1.91 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 79.99 ms (8000 pts)</p>
<p>LTE Band II - Low Channel 16QAM-20</p> <p>Note: Offset=Cable loss (4.5) + 10log (193.7/100)=4.5+2.9=7.4 dB</p>	<p>LTE Band II - High Channel 16QAM-20</p> <p>Note: Offset=Cable loss (4.5) + 10log (191.6/100)=4.5+2.9=7.4 dB</p>

LTE Band IV (Part 27)

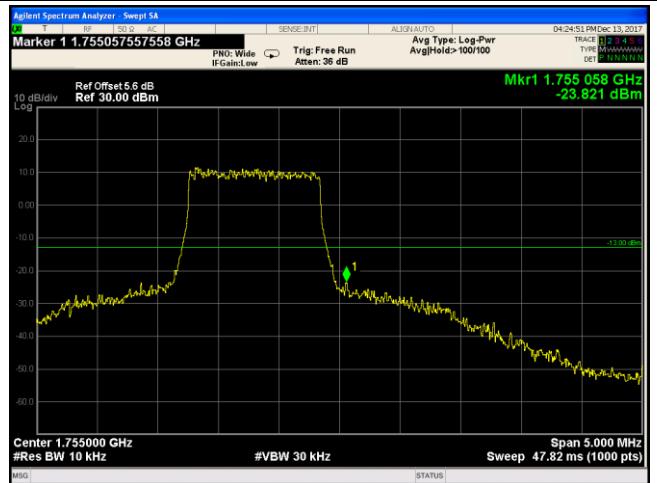
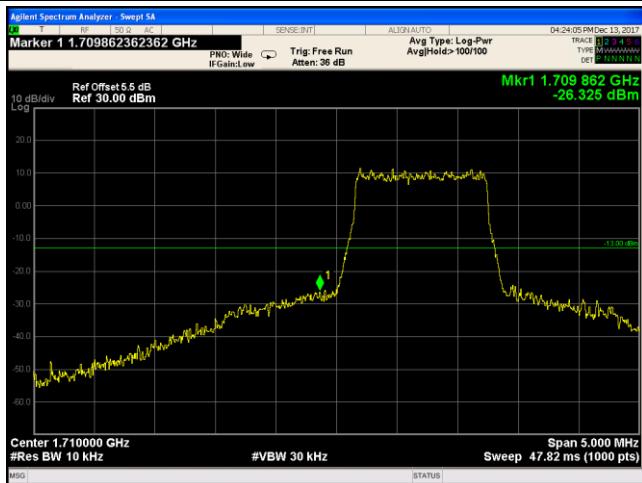


LTE Band IV - Low Channel QPSK-1.4

Note: Offset=Cable loss (4.5) + 10log
(12.72/10)=4.5+1.0=5.5 dB

LTE Band IV - High Channel QPSK-1.4

Note: Offset=Cable loss (4.5) + 10log
(13.03/10)=4.5+1.1=5.6 dB



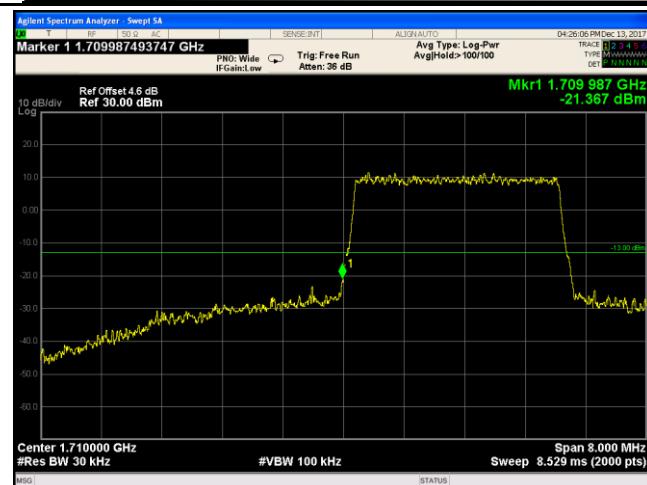
LTE Band IV - Low Channel 16QAM-1.4

Note: Offset=Cable loss (4.5) + 10log
(12.50/10)=4.5+1.0=5.5 dB

LTE Band IV - High Channel 16QAM-1.4

Note: Offset=Cable loss (4.5) + 10log
(12.99/10)=4.5+1.1=5.6 dB

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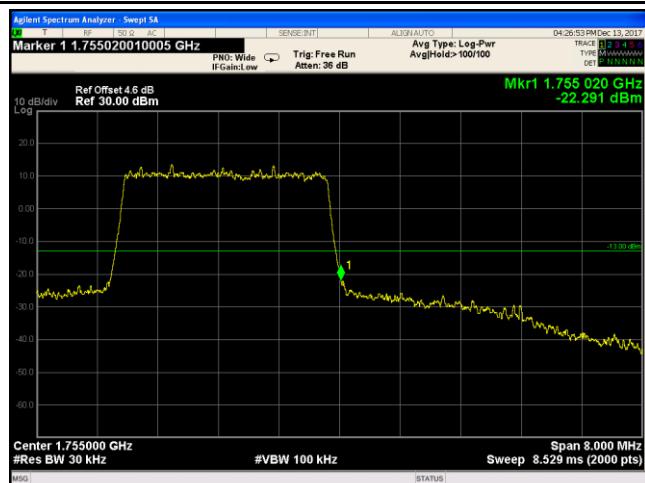
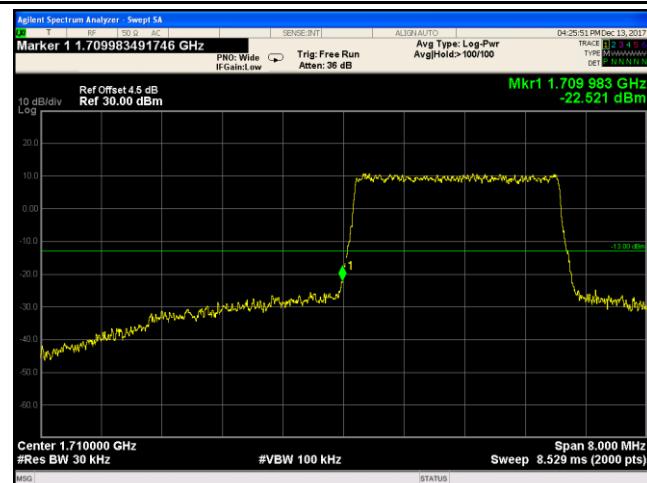


LTE Band IV - Low Channel QPSK-3

Note: Offset=Cable loss (4.5) + 10log
 $(30.35/30)=4.5+0.1=4.6$ dB

LTE Band IV - High Channel QPSK-3

Note: Offset=Cable loss (4.5) + 10log
 $(30.83/30)=4.5+0.1=4.6$ dB



LTE Band IV - Low Channel 16QAM-3

Note: Offset=Cable loss (4.5) + 10log
 $(30.33/30)=4.5+0.0=4.5$ dB

LTE Band IV - High Channel 16QAM-3

Note: Offset=Cable loss (4.5) + 10log
 $(30.92/30)=4.5+0.1=4.6$ dB



LTE Band IV - Low Channel QPSK-5

Note: Offset=Cable loss (4.5) + 10log
 $(50.91/30)=4.5+2.3=6.8$ dB

LTE Band IV - High Channel QPSK-5

Note: Offset=Cable loss (4.5) + 10log
 $(49.97/30)=4.5+2.2=6.7$ dB

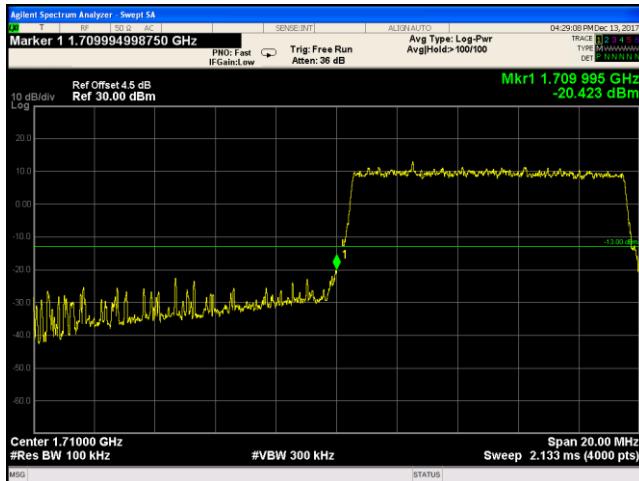


LTE Band IV - Low Channel 16QAM-5

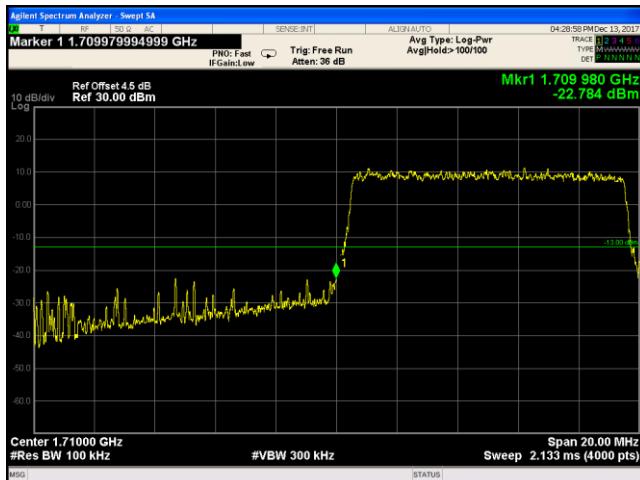
Note: Offset=Cable loss (4.5) + 10log
 $(50.87/30)=4.5+2.3=6.8$ dB

LTE Band IV - High Channel 16QAM-5

Note: Offset=Cable loss (4.5) + 10log
 $(50.43/30)=4.5+2.3=6.8$ dB



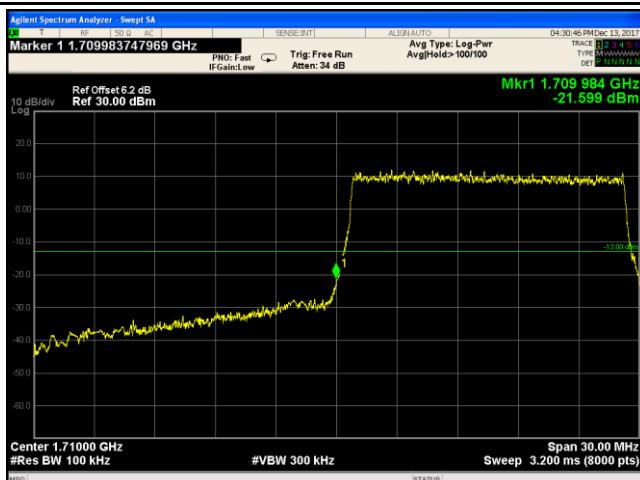
LTE Band IV - Low Channel QPSK-10



LTE Band IV - High Channel QPSK-10



LTE Band IV - Low Channel 16QAM-10



LTE Band IV - High Channel 16QAM-10

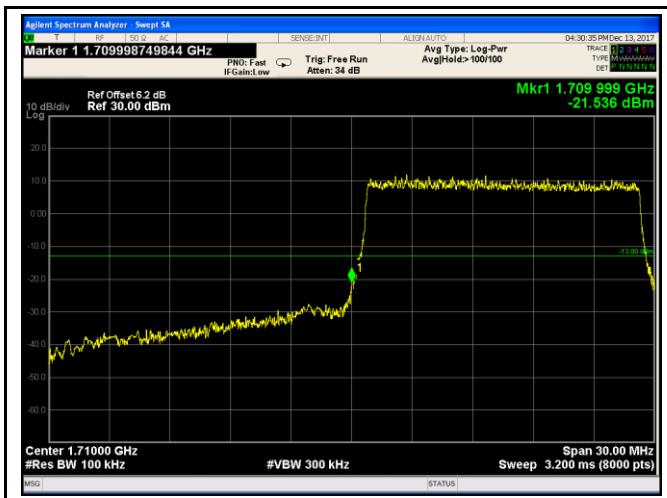
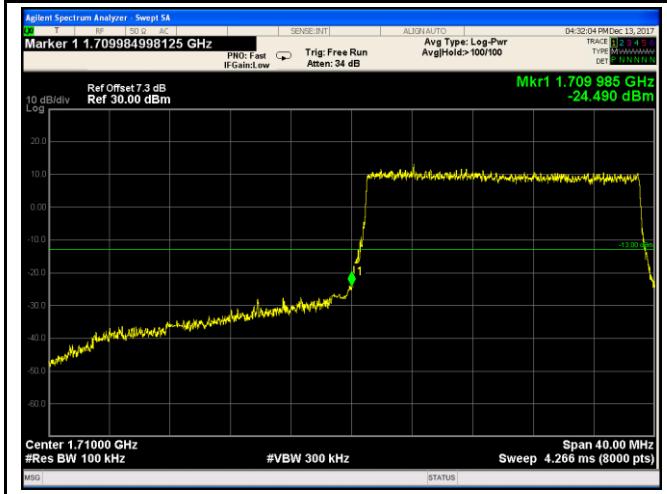


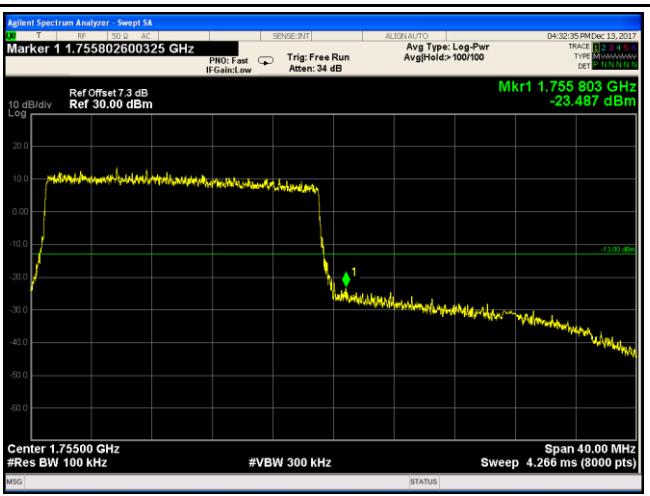
LTE Band IV - Low Channel QPSK-15

Note: Offset=Cable loss (4.5) + 10log
 $(148.0/100)=4.5+1.7=6.2$ dB

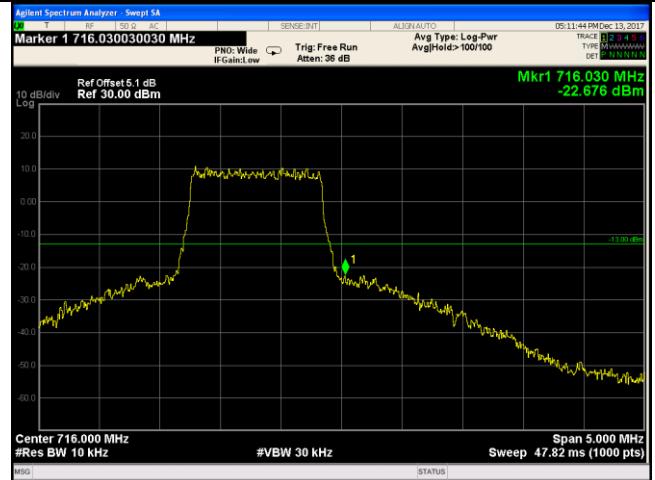
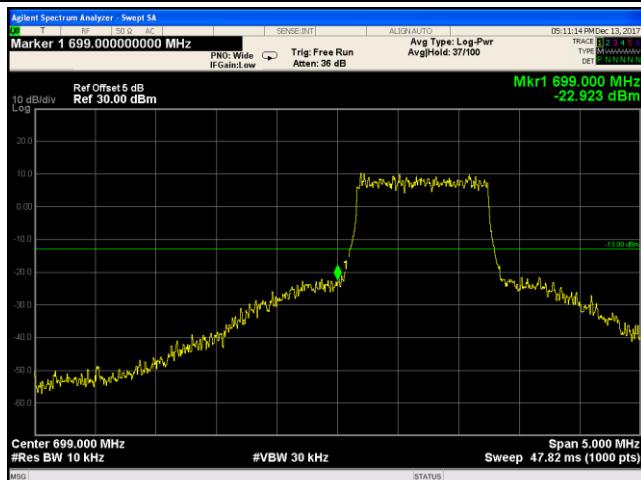
LTE Band IV - High Channel QPSK-15

Note: Offset=Cable loss (4.5) + 10log
 $(147.9/100)=4.5+1.7=6.2$ dB

 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Marker 1 1.7099984998125 GHz</p> <p>PNG: Fast IFGain:Low Trig: Free Run Atten: 34 dB</p> <p>Avg Type: Log-Pwr AvgHold>100/100</p> <p>04:32:04 PM Dec 13, 2017</p> <p>Ref Offset 7.3 dB Ref 30.00 dBm</p> <p>Mkr1 1.709 985 GHz -24.490 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 1.71000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 4.266 ms (8000 pts)</p> <p>MSG [STATUS]</p>	 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Marker 1 1.75502562820 GHz</p> <p>PNG: Fast IFGain:Low Trig: Free Run Atten: 34 dB</p> <p>Avg Type: Log-Pwr AvgHold>100/100</p> <p>04:32:59 PM Dec 13, 2017</p> <p>Ref Offset 7.4 dB Ref 30.00 dBm</p> <p>Mkr1 1.755 503 GHz -24.183 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 1.75500 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 4.266 ms (8000 pts)</p> <p>MSG [STATUS]</p>
<p>LTE Band IV - Low Channel 16QAM-15</p>	<p>LTE Band IV - High Channel 16QAM-15</p>
<p>Note: Offset=Cable loss (4.5) + 10log $(148.0/100)=4.5+1.7=6.2$ dB</p>	<p>Note: Offset=Cable loss (4.5) + 10log $(147.2/100)=4.5+1.7=6.2$ dB</p>
 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Marker 1 1.7099984998125 GHz</p> <p>PNG: Fast IFGain:Low Trig: Free Run Atten: 34 dB</p> <p>Avg Type: Log-Pwr AvgHold>100/100</p> <p>04:32:04 PM Dec 13, 2017</p> <p>Ref Offset 7.3 dB Ref 30.00 dBm</p> <p>Mkr1 1.709 985 GHz -24.490 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 1.71000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 4.266 ms (8000 pts)</p> <p>MSG [STATUS]</p>	 <p>Agilent Spectrum Analyzer - Swept SA</p> <p>Marker 1 1.75502562820 GHz</p> <p>PNG: Fast IFGain:Low Trig: Free Run Atten: 34 dB</p> <p>Avg Type: Log-Pwr AvgHold>100/100</p> <p>04:32:59 PM Dec 13, 2017</p> <p>Ref Offset 7.4 dB Ref 30.00 dBm</p> <p>Mkr1 1.755 503 GHz -24.183 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 1.75500 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 4.266 ms (8000 pts)</p> <p>MSG [STATUS]</p>
<p>LTE Band IV - Low Channel QPSK-20</p>	<p>LTE Band IV - High Channel QPSK-20</p>
<p>Note: Offset=Cable loss (4.5) + 10log $(195.2/100)=4.5+2.8=7.3$ dB</p>	<p>Note: Offset=Cable loss (4.5) + 10log $(191.4/100)=4.5+2.9=7.4$ dB</p>

 <p>Marker 1 1.709994999375 GHz</p> <p>PN0: Fast IFGainLow Trig: Free Run AvgType: Log-Pwr AvgHold>100/100</p> <p>Mkr1 1.709 995 GHz -22.410 dBm</p> <p>10 dB/div Ref Offset 7.3 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 1.71000 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 4.000 MHz (8000 pts)</p>	 <p>Marker 1 1.755802600325 GHz</p> <p>PN0: Fast IFGainLow Trig: Free Run AvgType: Log-Pwr AvgHold>100/100</p> <p>Mkr1 1.755 803 GHz -23.487 dBm</p> <p>10 dB/div Ref Offset 7.3 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 1.75500 GHz #Res BW 100 kHz #VBW 300 kHz Sweep 4.000 MHz (8000 pts)</p>
LTE Band IV - Low Channel 16QAM-20	LTE Band IV - High Channel 16QAM-20
Note: Offset=Cable loss (4.5) + 10log (192.7/100)=4.5+2.8=7.3dB	Note: Offset=Cable loss (4.5) + 10log (191.4/100)=4.5+2.8=7.3 dB

LTE Band XII (Part 27)

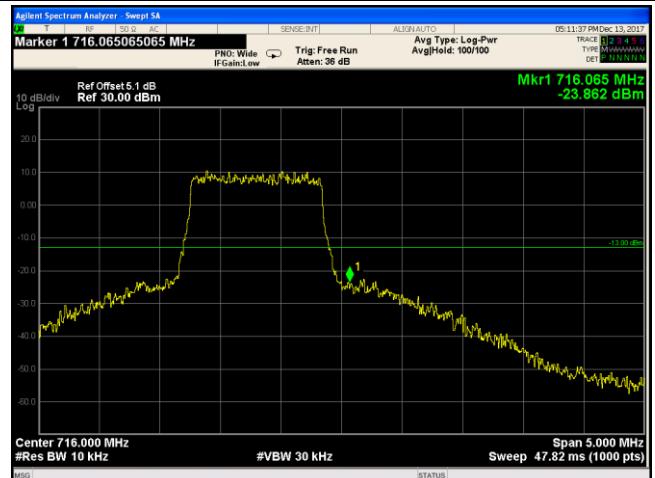
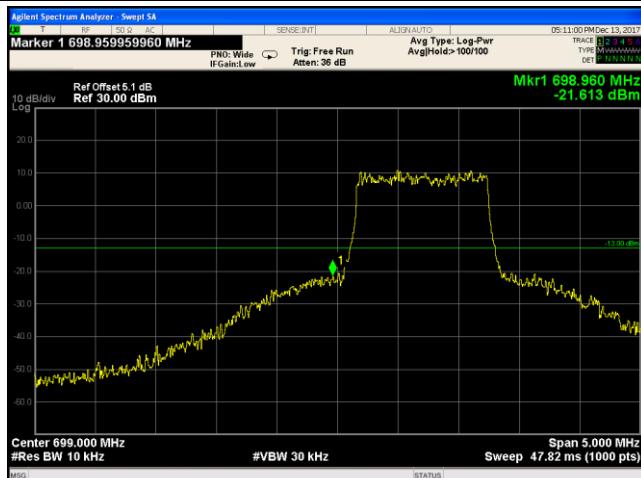


LTE Band XII - Low Channel QPSK-1.4

Note: Offset=Cable loss (4.5) + 10log
(12.73/10)=4.0+1.0=5.0 dB

LTE Band XII - High Channel QPSK-1.4

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

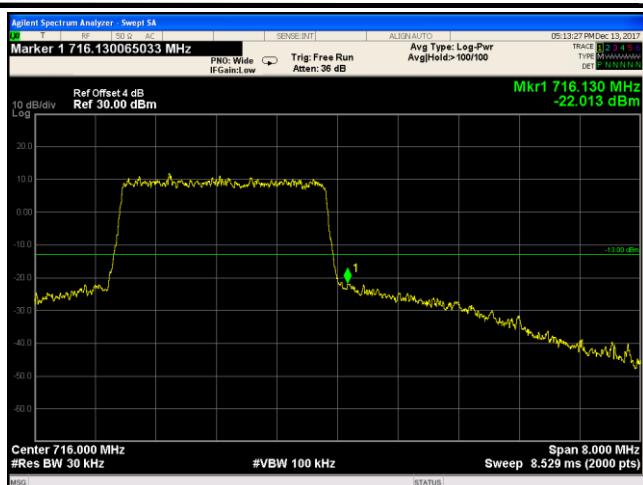
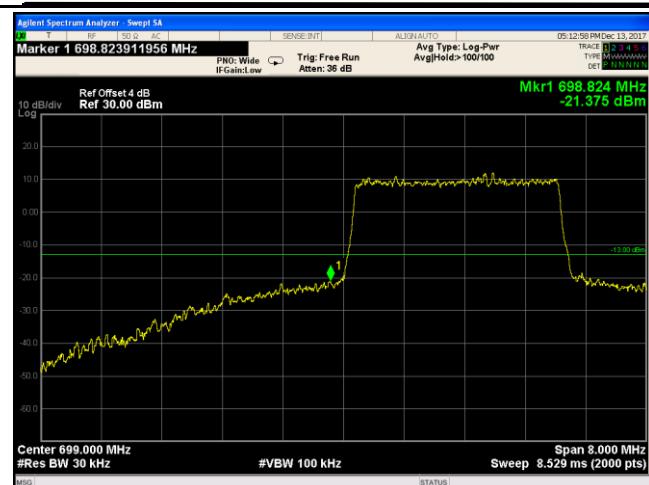


LTE Band XII - Low Channel 16QAM-1.4

Note: Offset=Cable loss (4.5) + 10log
(12.74/10)=4.0+1.1=5.1 dB

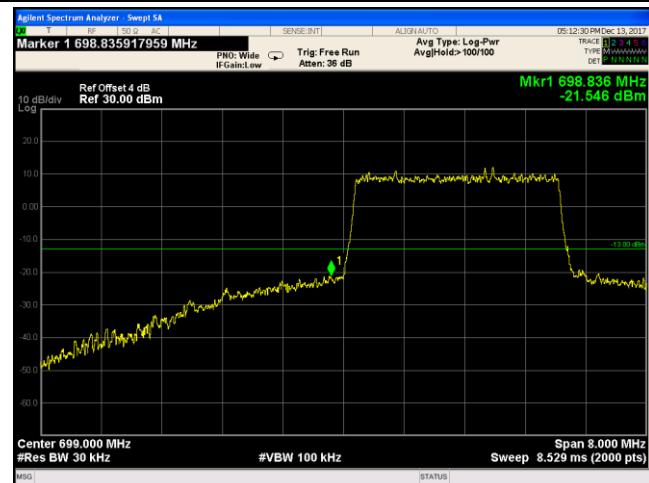
LTE Band XII - High Channel 16QAM-1.4

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



LTE Band XII - Low Channel QPSK-3

Note: Offset=Cable loss (4.5) + 10log
 $(30.39/30)=4.0+0.0=4.0$ dB



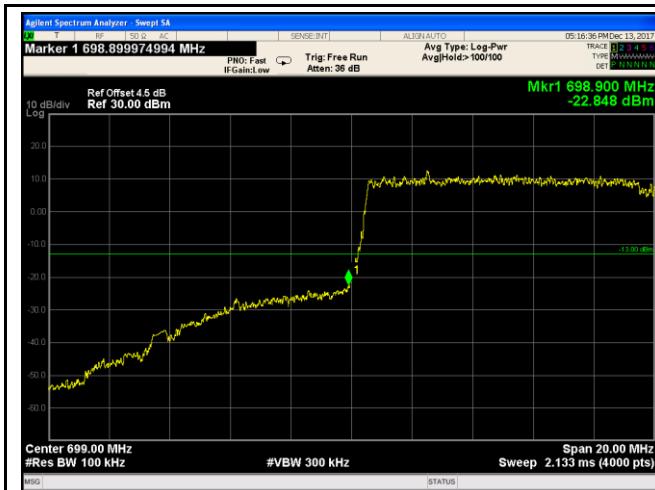
LTE Band XII - Low Channel 16QAM-3

Note: Offset=Cable loss (4.5) + 10log
 $(30.19/30)=4.0+0.0=4.0$ dB

LTE Band XII - High Channel 16QAM-3

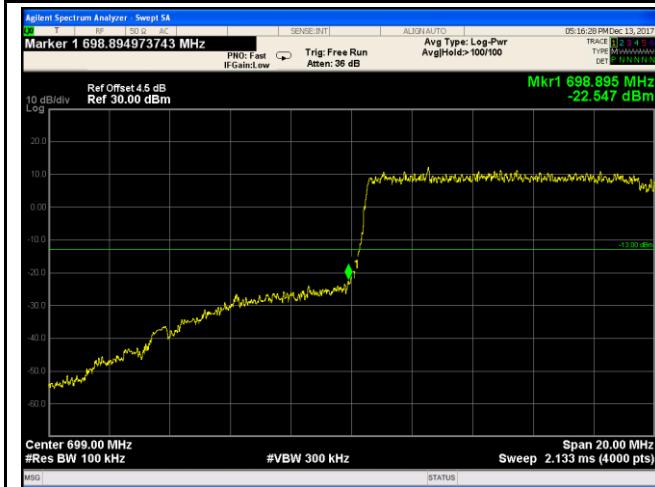
Note: Offset=Cable loss (4.5) + 10log
 $(30.21/30)=4.0+0.0=4.0$ dB

	
<p>LTE Band XII - Low Channel QPSK-5</p> <p>Note: Offset=Cable loss (4.5) + 10log $(50.73/30)=4.0+2.2=6.2 \text{ dB}$</p>	<p>LTE Band XII - High Channel QPSK-5</p> <p>Note: Offset=Cable loss (4.5) + 10log $(49.87/30)=4.0+2.2=6.2 \text{ dB}$</p>
	
<p>LTE Band XII - Low Channel 16QAM-5</p> <p>Note: Offset=Cable loss (4.5) + 10log $(50.10/30)=4.0+2.2=6.2 \text{ dB}$</p>	<p>LTE Band XII - High Channel 16QAM-5</p> <p>Note: Offset=Cable loss (4.5) + 10log $(49.87/30)=4.2+2.2=6.2 \text{ dB}$</p>



LTE Band XII - Low Channel QPSK-10

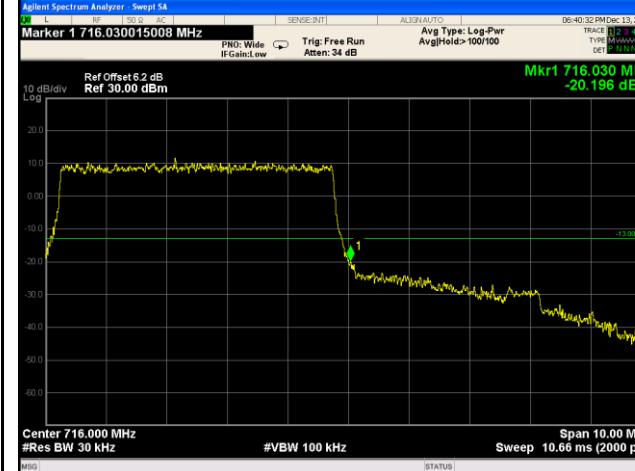
LTE Band XII - High Channel QPSK-10

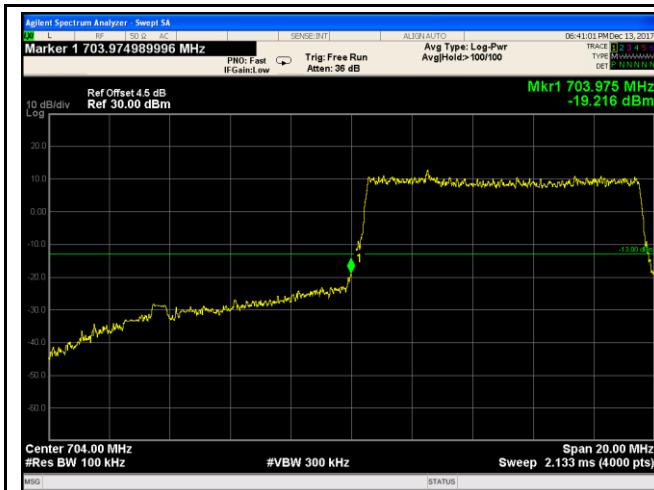


LTE Band XII - Low Channel 16QAM-10

LTE Band XII - High Channel 16QAM-10

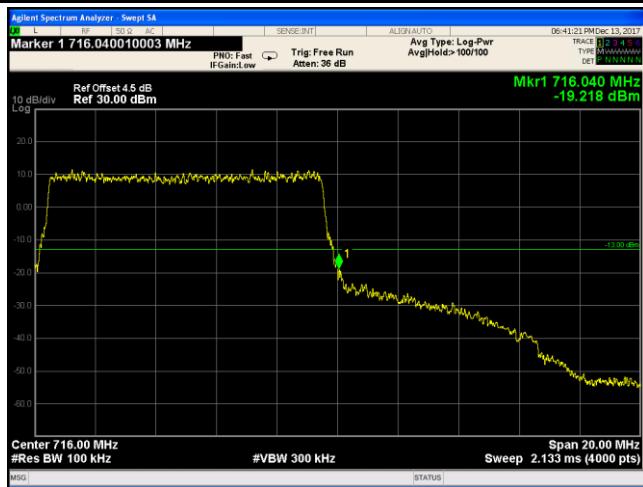
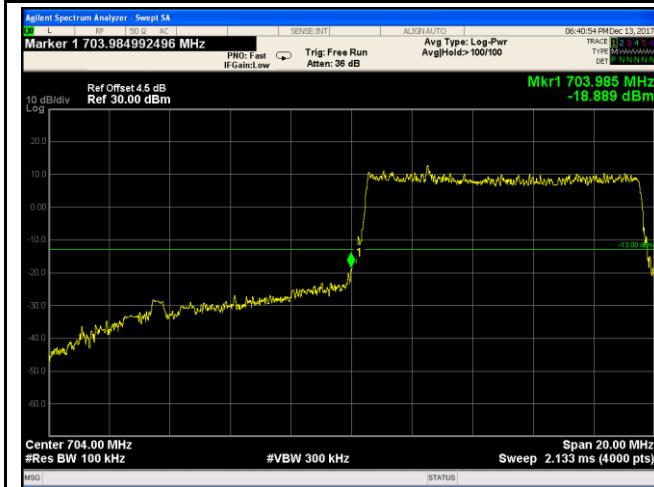
LTE Band XVII (Part 27)

 <p>Agilent Spectrum Analyzer - Swept SA Marker 1 703.927463732 MHz PNO: Wide IF-Gain:Low Trig: Free Run Aten: 34 dB Avg Type: Log-Pwr Avg Hold>100/100</p> <p>Mkr1 703.927 MHz -19.415 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 1 716.030015008 MHz PNO: Wide IF-Gain:Low Trig: Free Run Aten: 34 dB Avg Type: Log-Pwr Avg Hold>100/100</p> <p>Mkr1 716.030 MHz -20.196 dBm</p> <p>Center 716.000 MHz #Res BW 30 kHz #VBW 100 kHz Sweep 10.66 ms (2000 pts)</p>
<p>LTE Band XVII - Low Channel QPSK-5</p> <p>Note: Offset=Cable loss (4.0) + 10log $(50.34/30)=4.0+2.2=6.2 \text{ dB}$</p>	<p>LTE Band XVII - High Channel QPSK-5</p> <p>Note: Offset=Cable loss (4.0) + 10log $(50.22/30)=4.0+2.2=6.2 \text{ dB}$</p>
 <p>Agilent Spectrum Analyzer - Swept SA Marker 1 703.942471236 MHz PNO: Wide IF-Gain:Low Trig: Free Run Aten: 34 dB Avg Type: Log-Pwr Avg Hold>100/100</p> <p>Mkr1 703.942 MHz -18.750 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 1 716.075037519 MHz PNO: Wide IF-Gain:Low Trig: Free Run Aten: 34 dB Avg Type: Log-Pwr Avg Hold>100/100</p> <p>Mkr1 716.075 MHz -23.571 dBm</p> <p>Center 716.000 MHz #Res BW 30 kHz #VBW 100 kHz Sweep 10.66 ms (2000 pts)</p>
<p>LTE Band XVII - Low Channel 16QAM-5</p> <p>Note: Offset=Cable loss (4.0) + 10log $(50.67/30)=4.0+2.2=6.2 \text{ dB}$</p>	<p>LTE Band XVII - High Channel 16QAM-5</p> <p>Note: Offset=Cable loss (4.0) + 10log $(50.06/30)=4.0+2.2=6.2 \text{ dB}$</p>



LTE Band XVII - Low Channel QPSK-10

LTE Band XVII - High Channel QPSK-10



LTE Band XVII - Low Channel 16QAM-10

LTE Band XVII - High Channel 16QAM-10