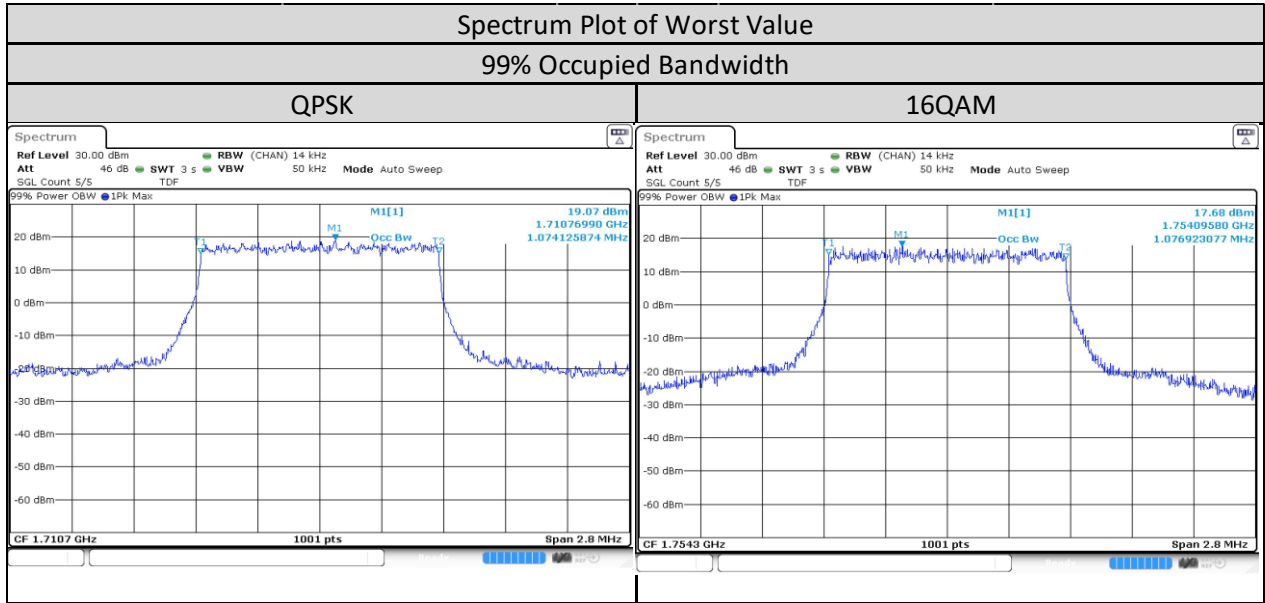
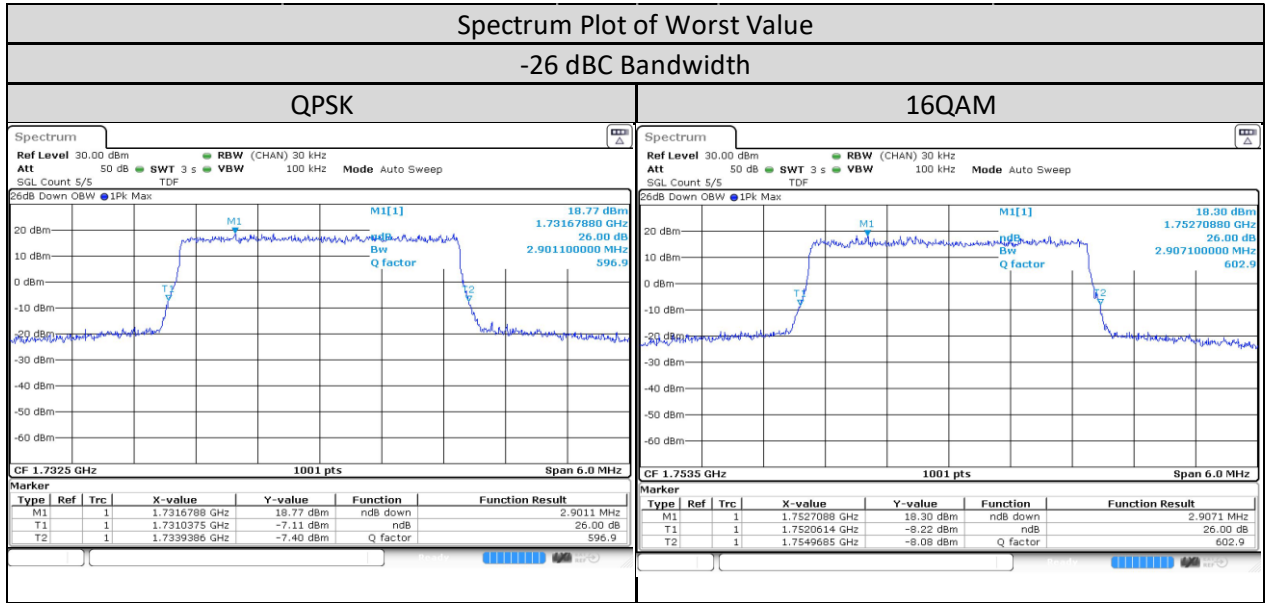


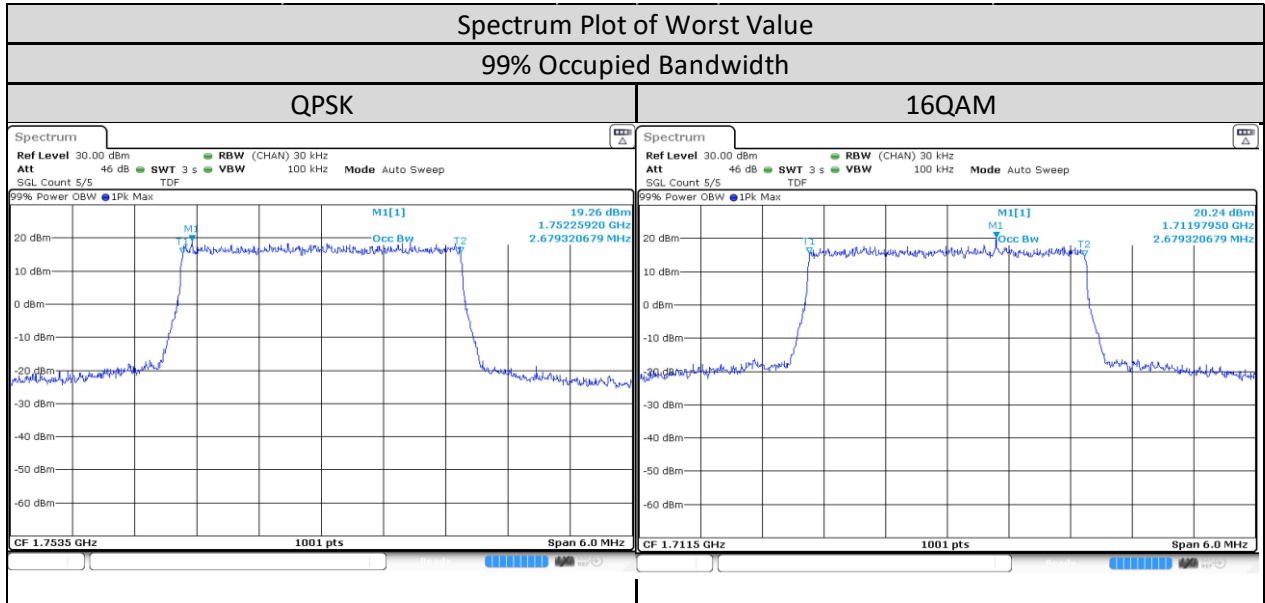
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 4/1.4MHz/6/0	Low CH 19957	1710.7 MHz	1.074	1.071
	Mid CH 20175	1732.5 MHz	1.071	1.074
	High CH 20393	1754.3 MHz	1.071	1.077



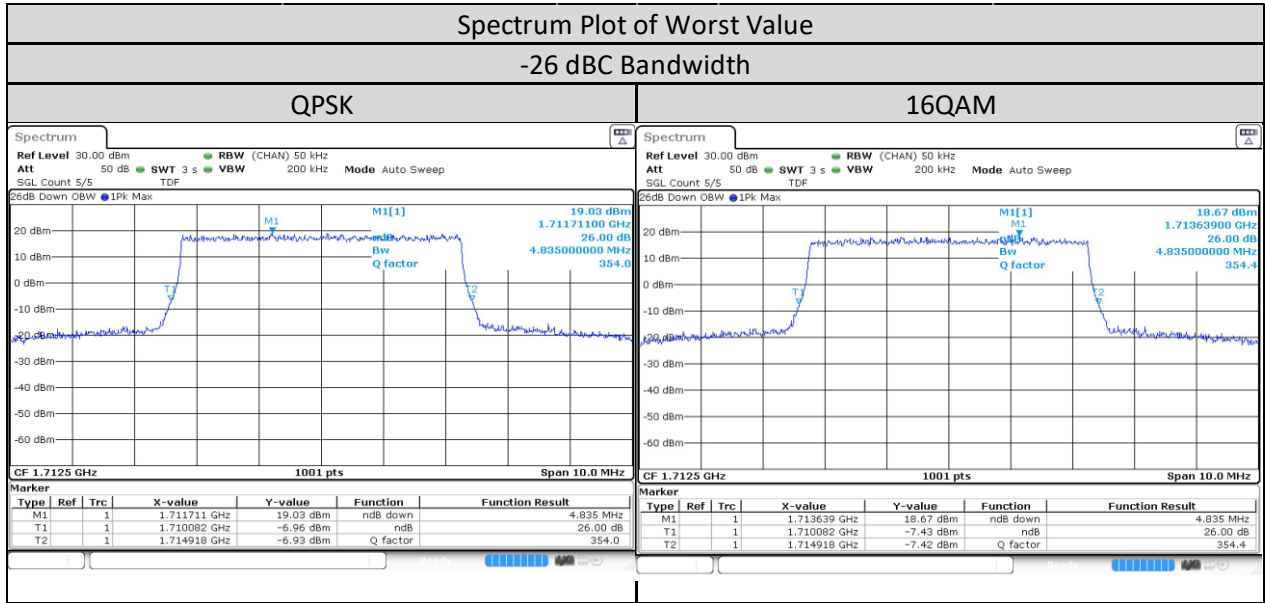
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 4/3MHz/15/0	Low CH 19965	1711.5 MHz	2.883	2.877
	Mid CH 20175	1732.5 MHz	<b>2.901</b>	2.895
	High CH 20385	1753.5 MHz	2.895	<b>2.907</b>



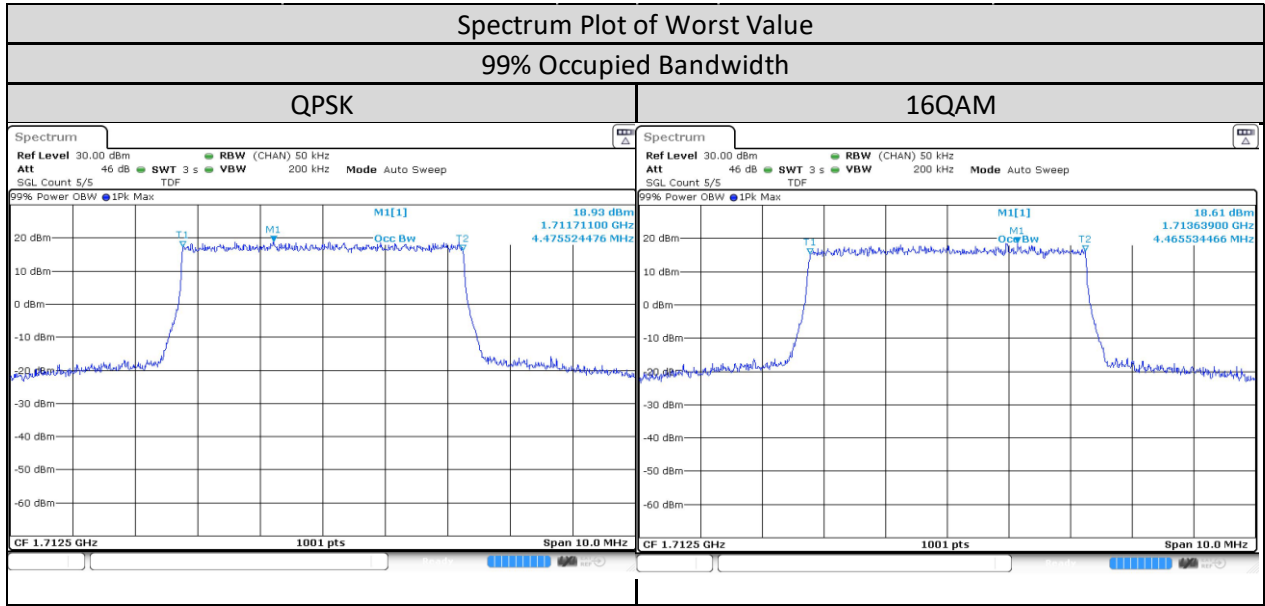
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 4/3MHz/15/0	Low CH 19965	1711.5 MHz	2.673	<b>2.679</b>
	Mid CH 20175	1732.5 MHz	2.673	2.679
	High CH 20385	1753.5 MHz	<b>2.679</b>	2.679



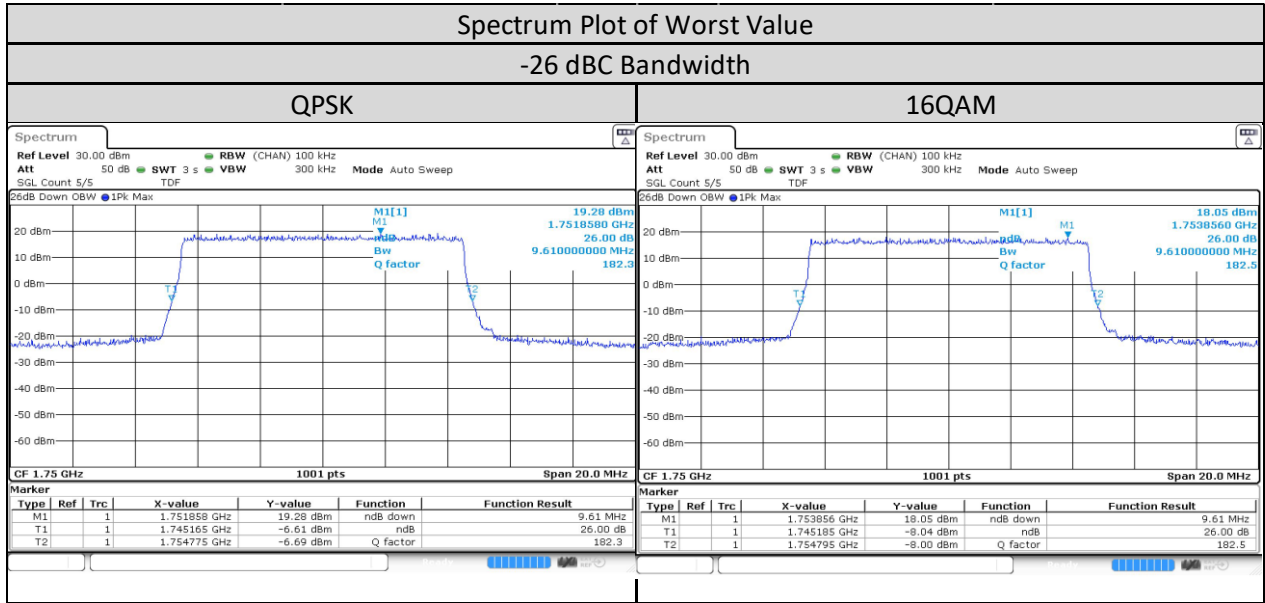
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 4/5MHz/25/0	Low CH 19975	1712.5 MHz	<b>4.835</b>	<b>4.835</b>
	Mid CH 20175	1732.5 MHz	4.815	4.795
	High CH 20375	1752.5 MHz	4.835	4.835



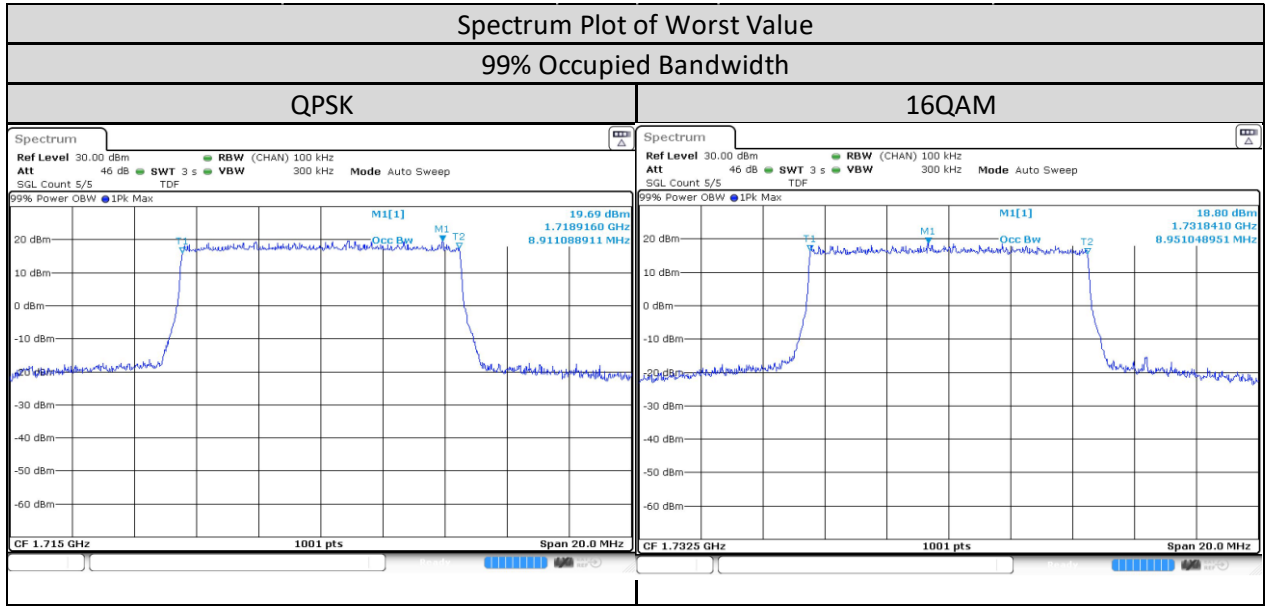
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 4/5MHz/25/0	Low CH 19975	1712.5 MHz	<b>4.476</b>	<b>4.466</b>
	Mid CH 20175	1732.5 MHz	4.466	4.456
	High CH 20375	1752.5 MHz	4.476	4.466



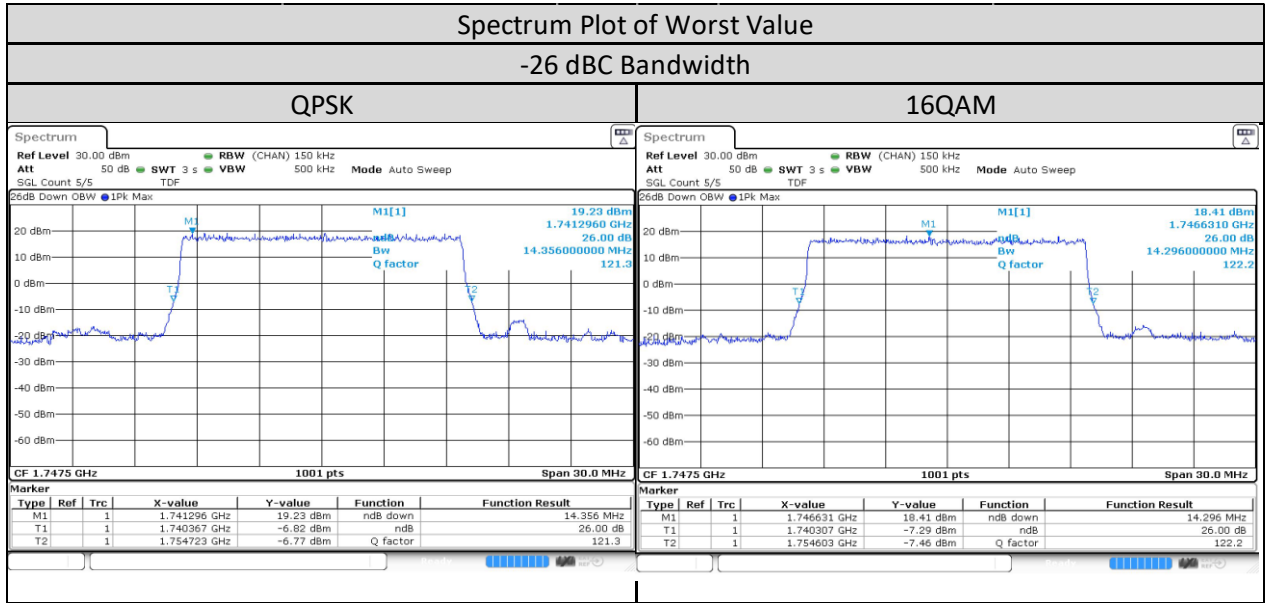
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 4/10MHz/50/0	Low CH 20000	1715 MHz	9.55	9.55
	Mid CH 20175	1732.5 MHz	9.59	9.57
	High CH 20350	1750 MHz	<b>9.61</b>	<b>9.61</b>



LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 4/10MHz/50/0	Low CH 20000	1715 MHz	8.911	8.911
	Mid CH 20175	1732.5 MHz	8.911	8.951
	High CH 20350	1750 MHz	8.911	8.911

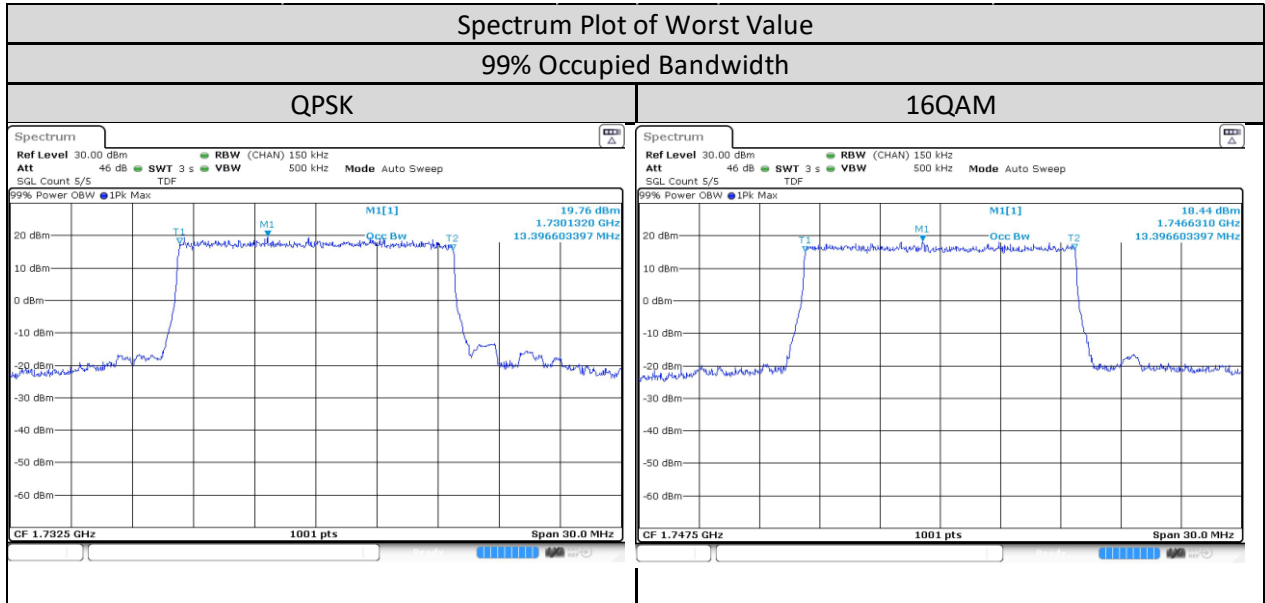


LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 4/15MHz/75/0	Low CH 20025	1717.5 MHz	14.296	14.236
	Mid CH 20175	1732.5 MHz	14.206	14.206
	High CH 20325	1747.5 MHz	<b>14.356</b>	<b>14.296</b>

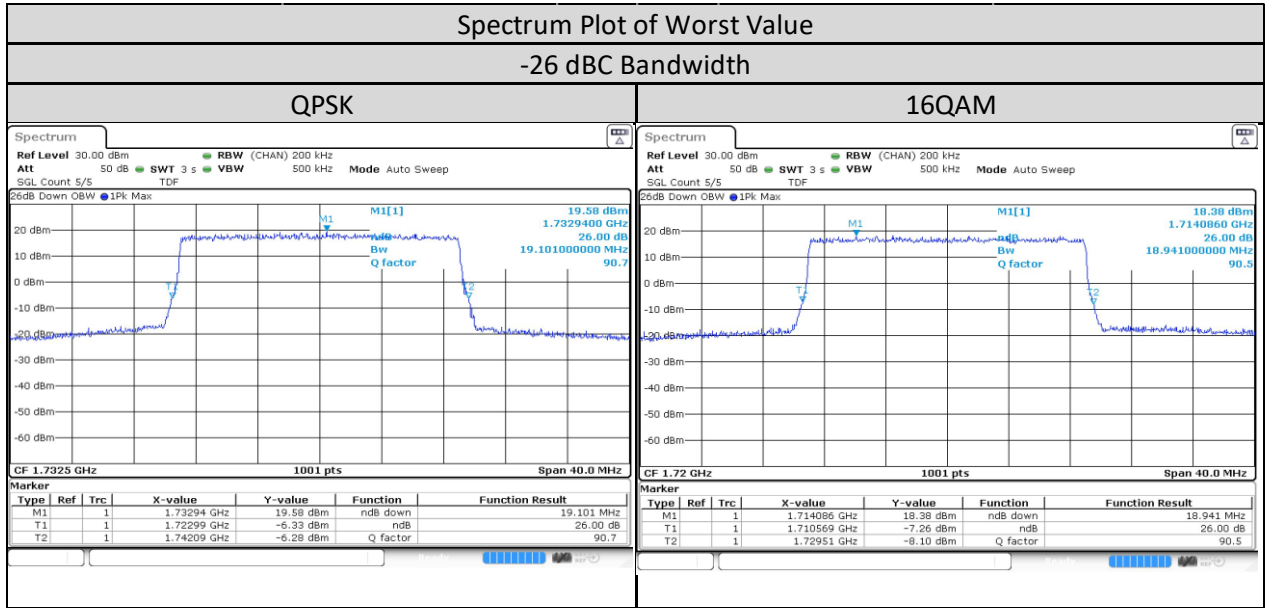




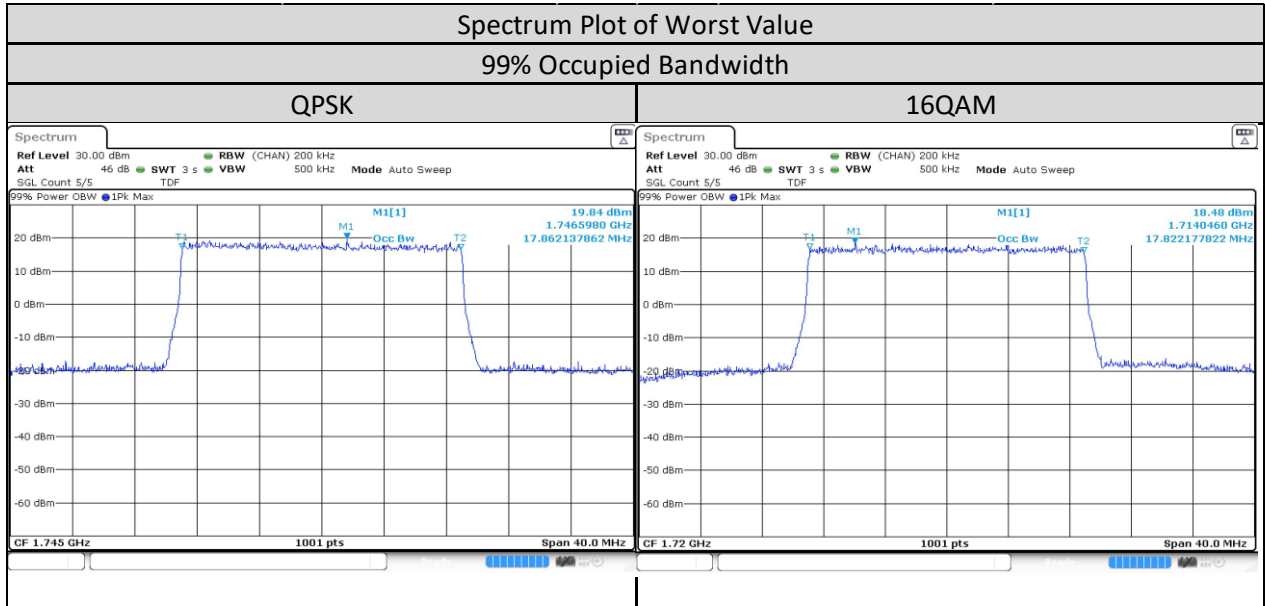
LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 4/15MHz/75/0	Low CH 20025	1717.5 MHz	13.367	13.367
	Mid CH 20175	1732.5 MHz	<b>13.397</b>	13.367
	High CH 20325	1747.5 MHz	13.367	<b>13.397</b>



LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	-26 dBc Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 4/20MHz/100/0	Low CH 20050	1720 MHz	18.981	<b>18.941</b>
	Mid CH 20175	1732.5 MHz	<b>19.101</b>	18.821
	High CH 20300	1745 MHz	18.901	18.901

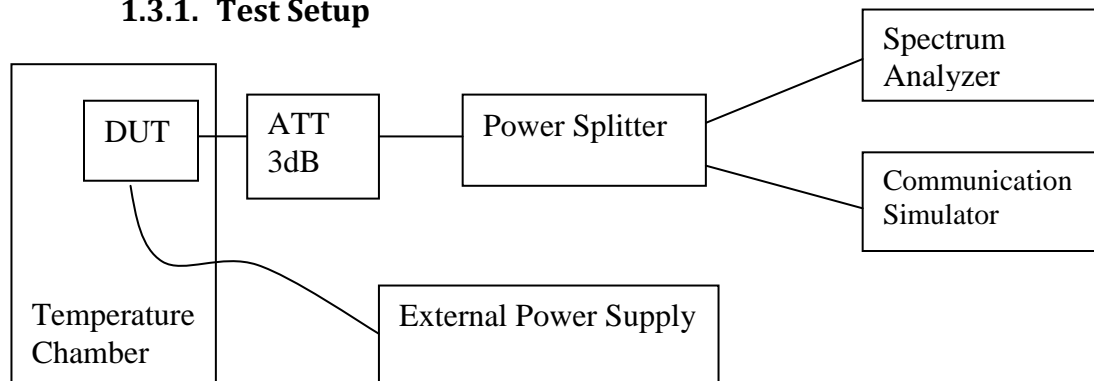


LTE Band/BW/RB Size/RB Offset	Channel Number	Tx Frequency	99% Occupied Bandwidth (MHz)	
			QPSK Modulation	16QAM Modulation
Band 4/20MHz/100/0	Low CH 20050	1720 MHz	17.822	<b>17.822</b>
	Mid CH 20175	1732.5 MHz	17.822	17.822
	High CH 20300	1745 MHz	<b>17.862</b>	17.822



### 1.3. Frequency Stability

#### 1.3.1. Test Setup



- 1) The DUT is placed in the temperature chamber and DUT is power up by external power supply to control the DC input voltage.
- 2) The temperature chamber could control the temperature and humidity and external power supply could control the test voltage range from minimum to maximum operating voltage.
- 3) Measured frequency error from the communication simulator by vary below step :
  - i. Vary temperature of the temperature chamber from -30 ~ 60 deg C (10 deg C / Step) and set external supply voltage constant at nominal voltage.
  - ii. Vary external supply voltage from minimum to maximum operation voltage support by DUT and set temperature chamber constant at room temp.
- 4) All the measurement was done at mid channel for each band.

#### 1.3.2. Test Limit

As per manufacturer declared product operating at -30 to 60 deg C with spec of +/- 0.1ppm.

### 1.3.3. Frequency Stability – LTE Band 4 (1710-1755MHz)

Band	Temp ( Deg C)	Frequency Error VS Temperature			
		Channel Bandwidth: 1.4 MHz			
		Low Channel		High Channel	
		1710.7MHz		1754.3MHz	
LTE Band 4		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	60	1710.699989	-0.006414	1754.299992	-0.004297
	50	1710.699994	-0.003261	1754.299999	-0.005716
	40	1710.700012	0.006798	1754.299992	-0.005382
	30	1710.699991	-0.005335	1754.300001	0.005969
	20	1710.700009	0.005109	1754.299992	-0.00442
	10	1710.700001	0.005937	1754.299993	-0.003792
	0	1710.699991	-0.005427	1754.299987	-0.00751
	-10	1710.700009	0.005502	1754.300006	0.003637
	-20	1710.699993	-0.003863	1754.299993	-0.004085
-30	1710.700017	0.010219	1754.299991	-0.004901	

Band	Voltage (V)	Frequency Error VS Voltage			
		Channel Bandwidth: 1.4 MHz			
		Low Channel		High Channel	
		1710.7MHz		1754.3MHz	
LTE Band 4		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	9	1710.700015	0.008488	1754.299991	-0.005414
	7.5	1710.700015	0.008922	1754.299989	-0.006124
	6	1710.700011	0.006355	1754.299991	-0.005064

Band	Temp ( Deg C)	Frequency Error VS Temperature			
		Channel Bandwidth: 3 MHz			
		Low Channel		High Channel	
		1711.5MHz		1753.5MHz	
LTE Band 4		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	60	1711.500008	0.004731	1753.500009	0.005237
	50	1711.500007	0.004288	1753.500007	0.004022
	40	1711.500009	0.005065	1753.500007	0.004438
	30	1711.500009	0.005157	1753.500008	0.004675
	20	1711.500008	0.004856	1753.500001	0.005596
	10	1711.500008	0.004848	1753.500008	0.00452
	0	1711.500008	0.004396	1753.500009	0.00536
	-10	1711.500009	0.005157	1753.500008	0.004756
	-20	1711.500001	0.005867	1753.500008	0.004764
	-30	1711.500011	0.006695	1753.500001	0.005841

Band	Voltage (V)	Frequency Error VS Voltage			
		Channel Bandwidth: 3 MHz			
		Low Channel		High Channel	
		1711.5MHz		1753.5MHz	
LTE Band 4		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	9	1711.500007	0.004104	1753.500006	0.003622
	7.5	1711.500008	0.004798	1753.500008	0.004487
	6	1711.500008	0.004965	1753.500008	0.004675

Band	Temp ( Deg C)	Frequency Error VS Temperature			
		Channel Bandwidth: 5 MHz			
		Low Channel		High Channel	
		1712.5MHz		1752.5MHz	
LTE Band 4		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	60	1712.500011	0.006424	1752.499994	-0.003257
	50	1712.500001	0.005755	1752.499994	-0.003232
	40	1712.500009	0.005154	1752.499994	-0.003665
	30	1712.500001	0.005572	1752.499992	-0.004351
	20	1712.500011	0.006591	1752.499994	-0.003608
	10	1712.500009	0.005522	1752.499994	-0.0036
	0	1712.500009	0.005522	1752.499993	-0.004163
	-10	1712.500001	0.005747	1752.499993	-0.003861
	-20	1712.500001	0.00558	1752.499995	-0.003012
	-30	1712.500009	0.00538	1752.499995	-0.002939

Band	Voltage (V)	Frequency Error VS Voltage			
		Channel Bandwidth: 5 MHz			
		Low Channel		High Channel	
		1712.5MHz		1752.5MHz	
LTE Band 4		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	9	1712.500011	0.006374	1752.499993	-0.004253
	7.5	1712.500009	0.005396	1752.499959	-0.023411
	6	1712.500009	0.005229	1752.499994	-0.003592

Band	Temp ( Deg C)	Frequency Error VS Temperature			
		Channel Bandwidth: 10 MHz			
		Low Channel		High Channel	
		1715MHz		1750MHz	
LTE Band 4		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	60	1714.999994	-0.003703	1750.000008	0.004439
	50	1714.999993	-0.003954	1750.000006	0.003703
	40	1714.999994	-0.003779	1750.000008	0.004529
	30	1714.999993	-0.004371	1750.000008	0.00448
	20	1714.999995	-0.003011	1750.000001	0.00573
	10	1714.999994	-0.00362	1750.000001	0.005559
	0	1714.999993	-0.004004	1750.000008	0.004529
	-10	1714.999994	-0.003353	1750.000009	0.005387
	-20	1714.999993	-0.003912	1750.000008	0.004708
	-30	1715.000005	0.003011	1750.000009	0.005297

Band	Voltage (V)	Frequency Error VS Voltage			
		Channel Bandwidth: 10 MHz			
		Low Channel		High Channel	
		1715MHz		1750MHz	
LTE Band 4		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	9	1714.999992	-0.004888	1750.000008	0.004749
	7.5	1714.999993	-0.00382	1750.000009	0.005207
	6	1714.999993	-0.004371	1750.000007	0.003817



Band	Temp ( Deg C)	Frequency Error VS Temperature			
		Channel Bandwidth: 15 MHz			
		Low Channel		High Channel	
		1717.5MHz		1747.5MHz	
LTE Band 4		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	60	1717.500006	0.003706	1747.500006	0.0037
	50	1717.500007	0.003865	1747.500007	0.004289
	40	1717.500006	0.003365	1747.499995	-0.002988
	30	1717.500006	0.003656	1747.500006	0.003618
	20	1717.500007	0.003881	1747.500008	0.004429
	10	1717.500007	0.003906	1747.500007	0.004249
	0	1717.500007	0.004231	1747.500007	0.004052
	-10	1717.500007	0.003998	1747.500007	0.003766
	-20	1717.500007	0.00399	1747.500008	0.004486
	-30	1717.500006	0.003365	1747.500007	0.003937

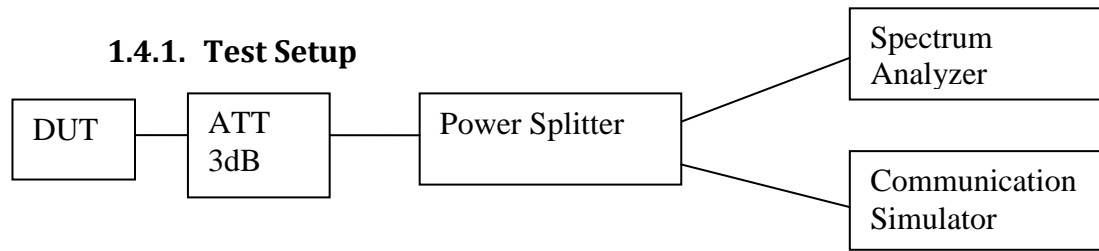
Band	Voltage (V)	Frequency Error VS Voltage			
		Channel Bandwidth: 15 MHz			
		Low Channel		High Channel	
		1717.5MHz		1747.5MHz	
LTE Band 4		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	9	1717.500006	0.003656	1747.499994	-0.003373
	7.5	1717.500006	0.003773	1747.500006	0.003356
	6	1717.500006	0.00344	1747.500012	0.006819

Band	Temp ( Deg C)	Frequency Error VS Temperature			
		Channel Bandwidth: 20 MHz			
		Low Channel		High Channel	
		1720MHz		1745MHz	
LTE Band 4		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	60	1720.000008	0.00494	1744.999993	-0.004123
	50	1720.000008	0.004774	1744.999992	-0.004648
	40	1720.000007	0.004333	1744.999994	-0.003722
	30	1720.000009	0.00499	1744.999991	-0.005099
	20	1720.000009	0.005389	1744.999994	-0.003476
	10	1720.000008	0.004791	1744.999993	-0.003746
	0	1720.000009	0.005007	1744.999994	-0.003599
	-10	1720.000008	0.004366	1744.999993	-0.003738
	-20	1720.000008	0.004857	1744.999992	-0.004869
	-30	1720.000007	0.004183	1744.999993	-0.004017

Band	Voltage (V)	Frequency Error VS Voltage			
		Channel Bandwidth: 20 MHz			
		Low Channel		High Channel	
		1720MHz		1745MHz	
LTE Band 4		Frequency (MHz)	Frequency Error (ppm)	Frequency (MHz)	Frequency Error (ppm)
	9	1720.000009	0.005273	1744.999993	-0.003755
	7.5	1720.000007	0.004192	1744.999992	-0.004451
	6	1720.000007	0.004183	1744.999993	-0.003894

## 1.4. Band Edge Conducted Spurious Emission

### 1.4.1. Test Setup



- 1) The DUT transmitter output port was connected to communication simulator with above setup.
- 2) Path loss for the measurement included.
- 3) Set DUT to transmit maximum power through communication simulator.
- 4) The band edges of lowest and highest channels with the highest RF powers were measured.
- 5) The center frequency of spectrum is the band edge frequency, span is 3MHz, RBW is 1~3% of EBW and VBW is at least 3 times of RBW
- 6) Record the maximum trace plot into the test report.

### 1.4.2. Test Limit

For operations in the 1710-1755 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  dB. In the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.