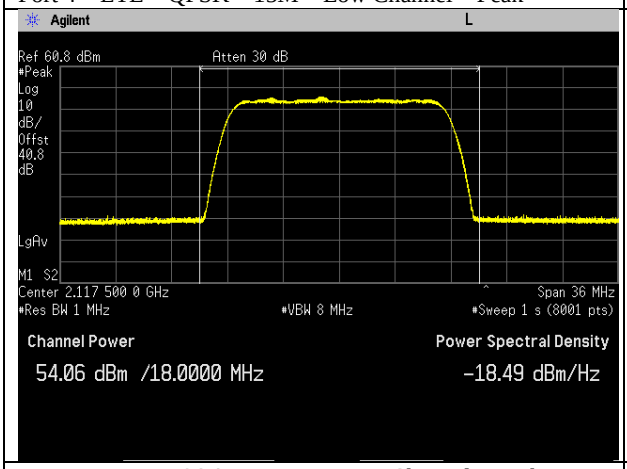
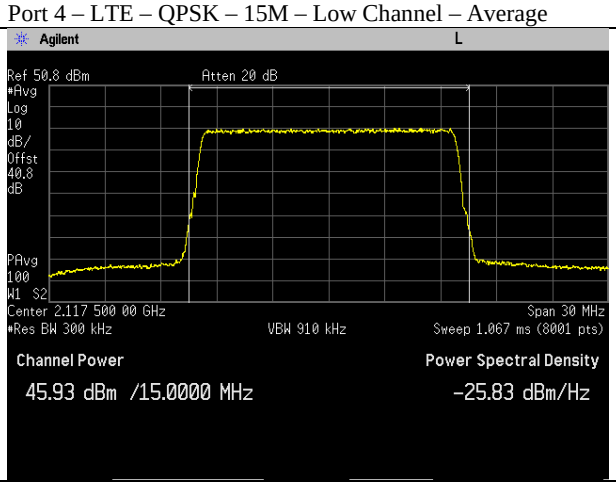
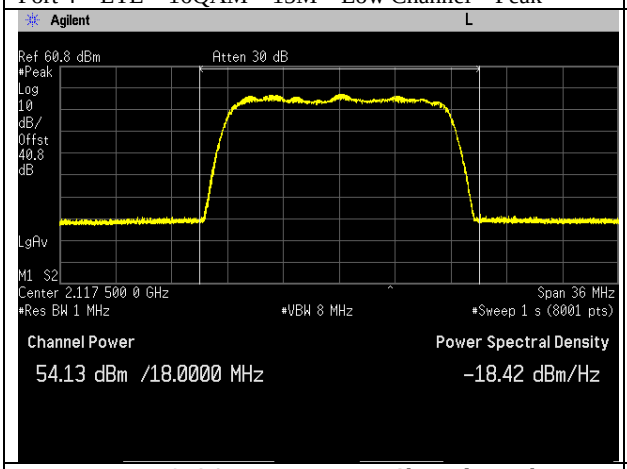
Port 4 – LTE – QPSK – 15M – Low Channel – Peak



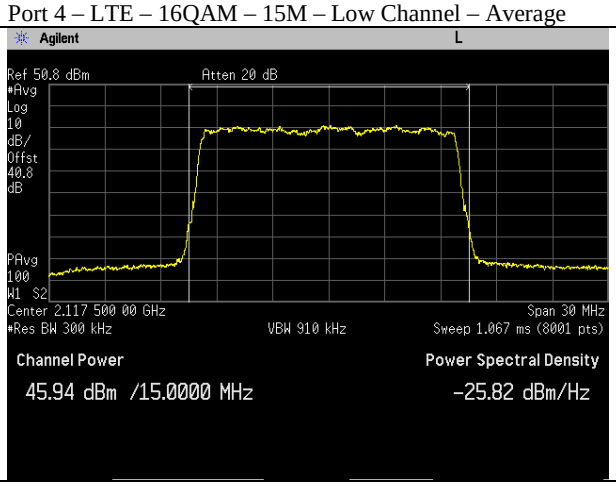
Port 4 – LTE – QPSK – 15M – Low Channel – Average



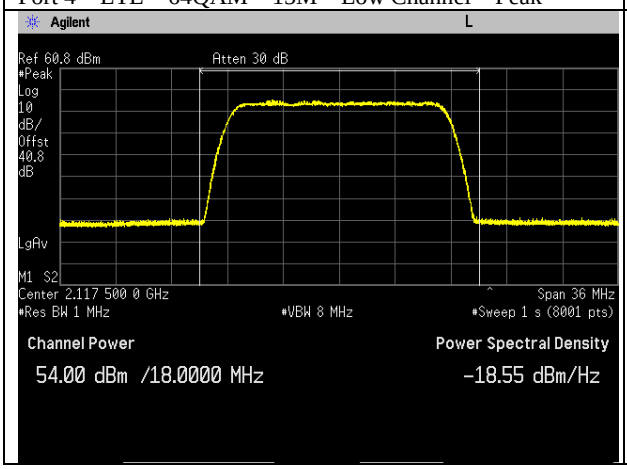
Port 4 – LTE – 16QAM – 15M – Low Channel – Peak



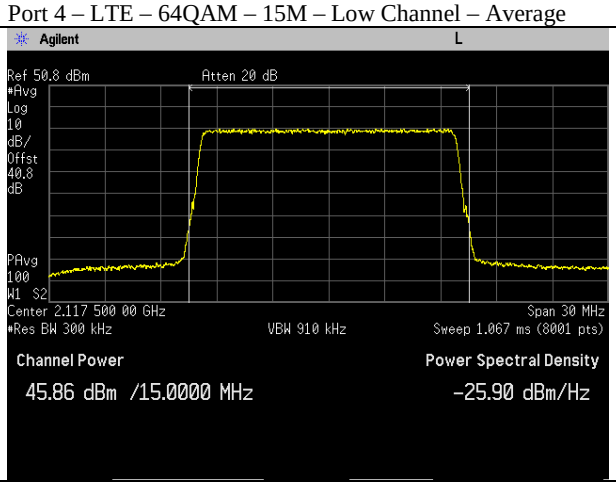
Port 4 – LTE – 16QAM – 15M – Low Channel – Average



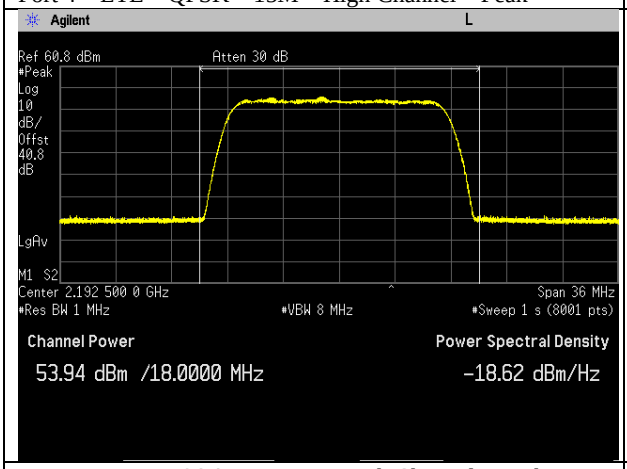
Port 4 – LTE – 64QAM – 15M – Low Channel – Peak



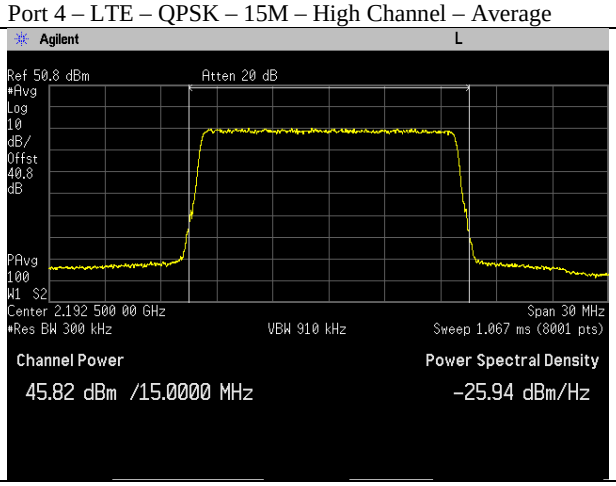
Port 4 – LTE – 64QAM – 15M – Low Channel – Average



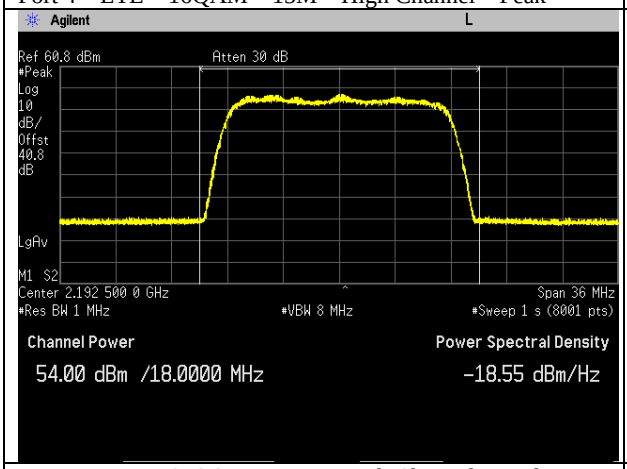
Port 4 – LTE – QPSK – 15M – High Channel – Peak



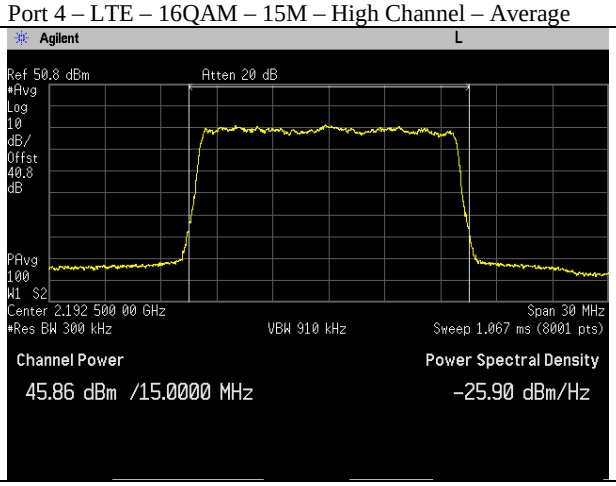
Port 4 – LTE – QPSK – 15M – High Channel – Average



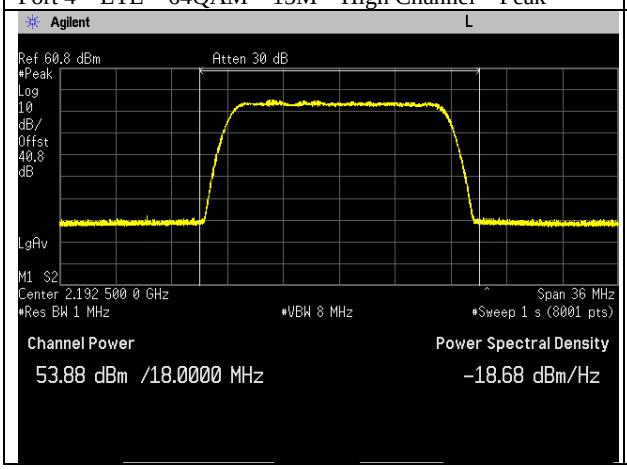
Port 4 – LTE – 16QAM – 15M – High Channel – Peak



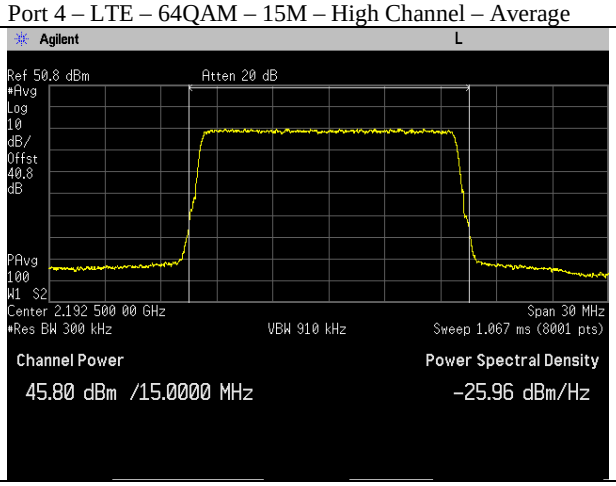
Port 4 – LTE – 16QAM – 15M – High Channel – Average



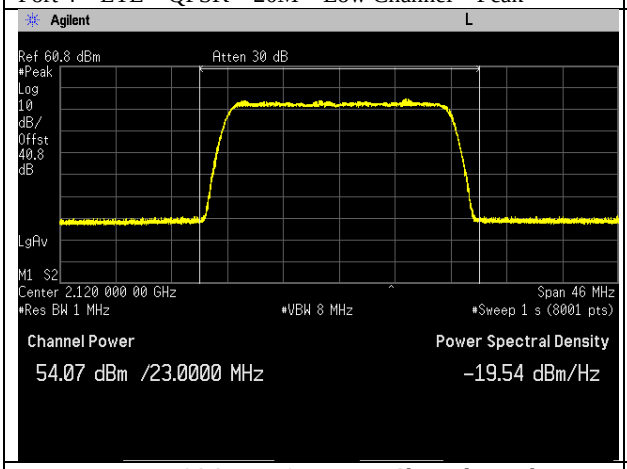
Port 4 – LTE – 64QAM – 15M – High Channel – Peak



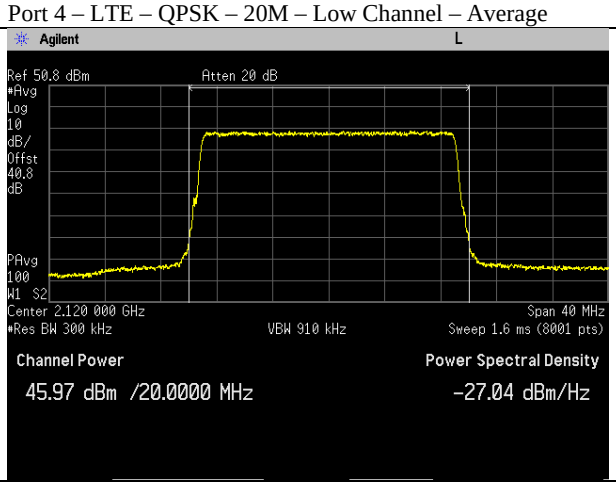
Port 4 – LTE – 64QAM – 15M – High Channel – Average



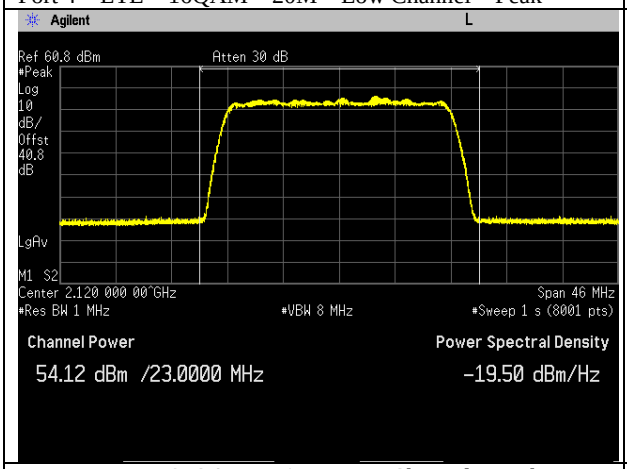
Port 4 – LTE – QPSK – 20M – Low Channel – Peak



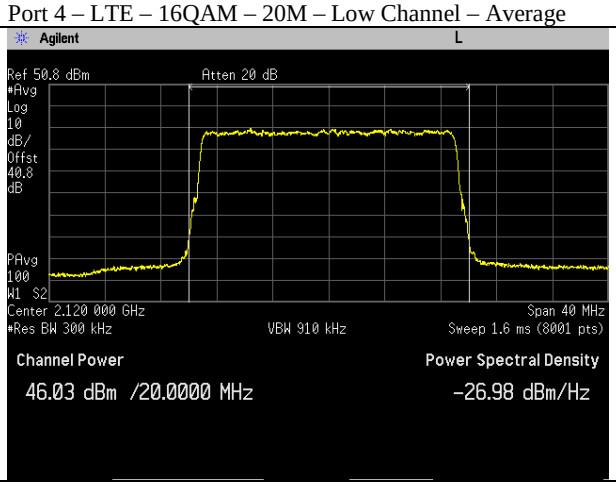
Port 4 – LTE – QPSK – 20M – Low Channel – Average



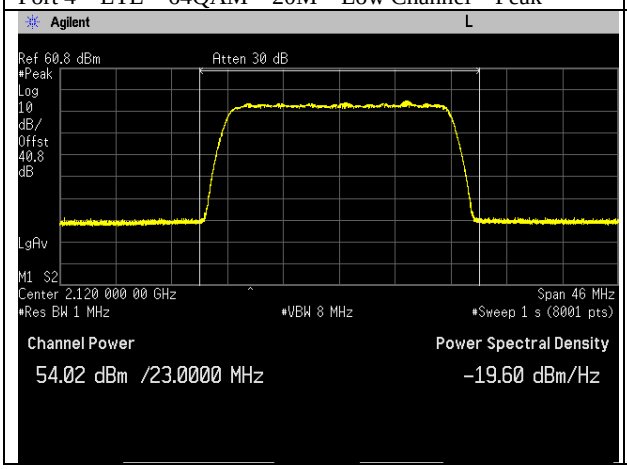
Port 4 – LTE – 16QAM – 20M – Low Channel – Peak



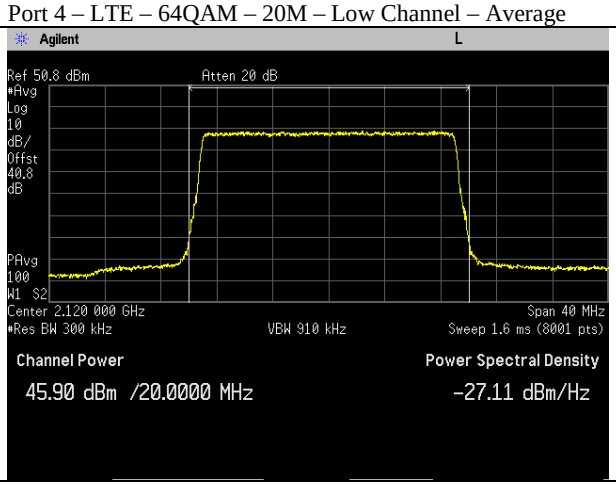
Port 4 – LTE – 16QAM – 20M – Low Channel – Average



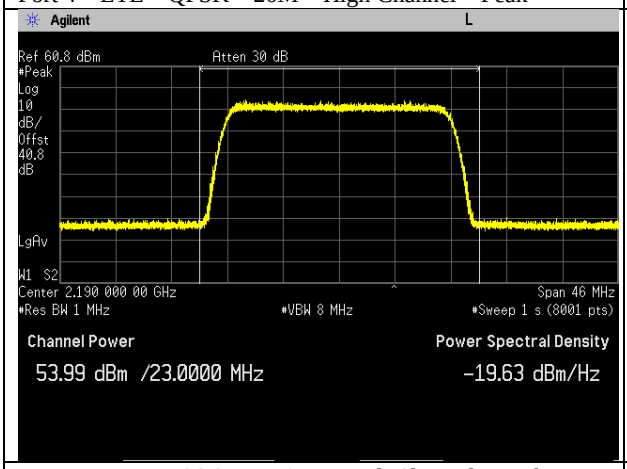
Port 4 – LTE – 64QAM – 20M – Low Channel – Peak



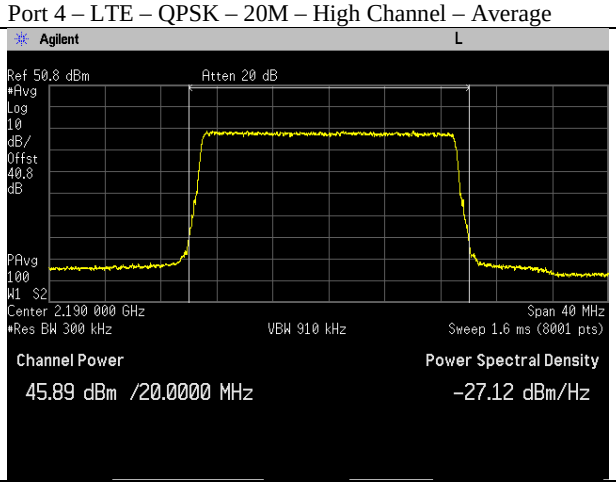
Port 4 – LTE – 64QAM – 20M – Low Channel – Average



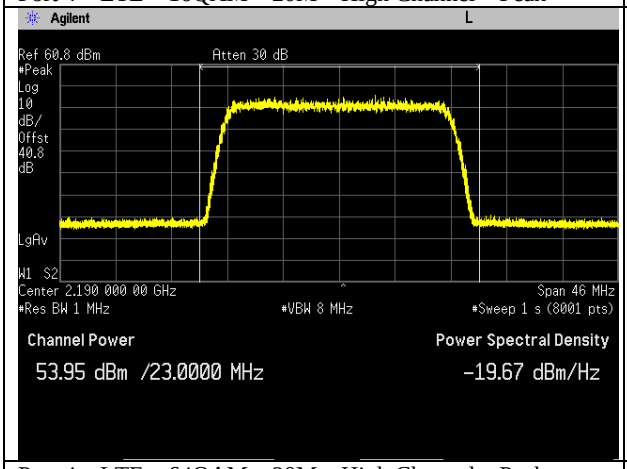
Port 4 – LTE – QPSK – 20M – High Channel – Peak



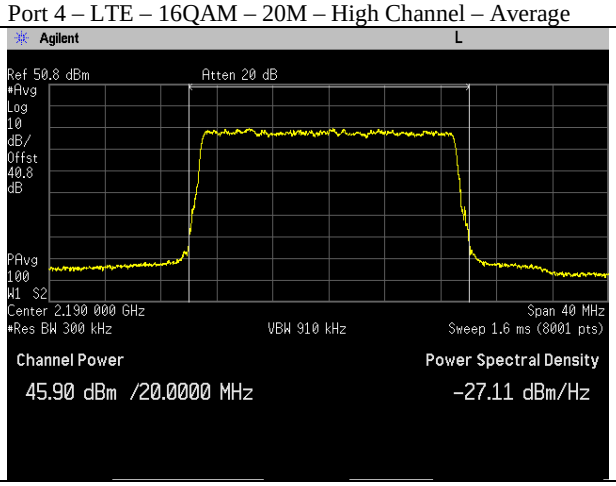
Port 4 – LTE – QPSK – 20M – High Channel – Average



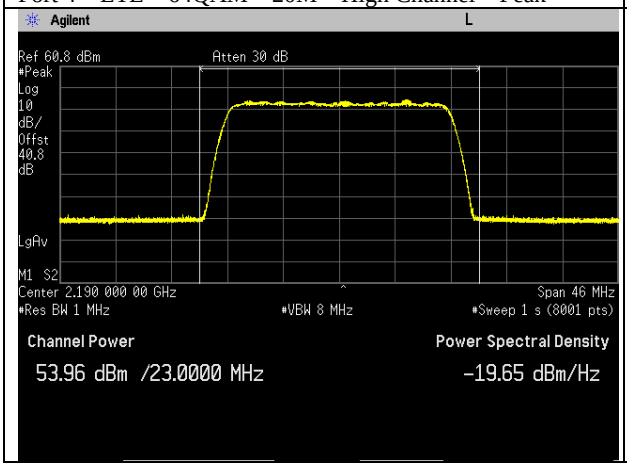
Port 4 – LTE – 16QAM – 20M – High Channel – Peak



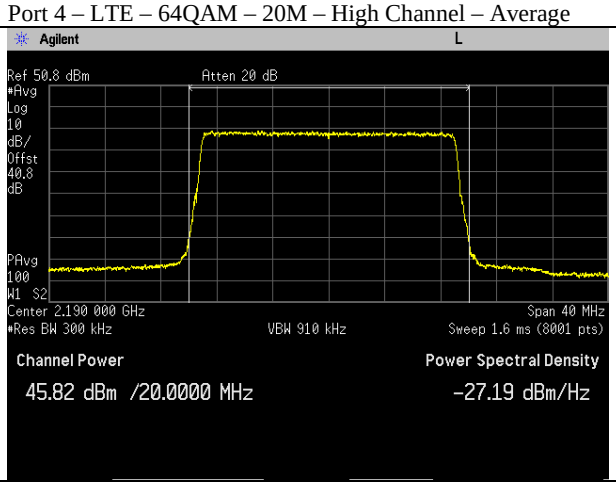
Port 4 – LTE – 16QAM – 20M – High Channel – Average



Port 4 – LTE – 64QAM – 20M – High Channel – Peak

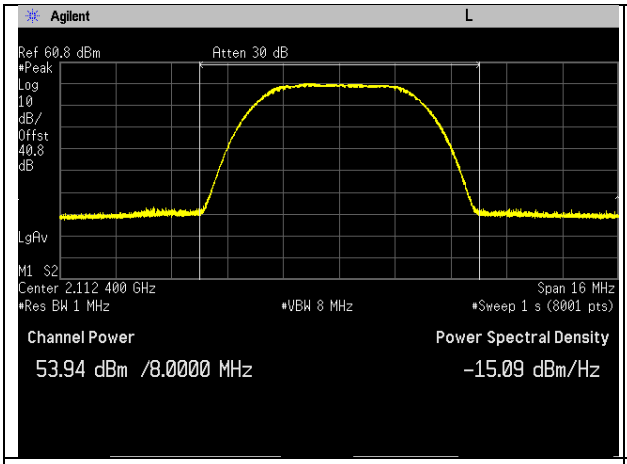


Port 4 – LTE – 64QAM – 20M – High Channel – Average

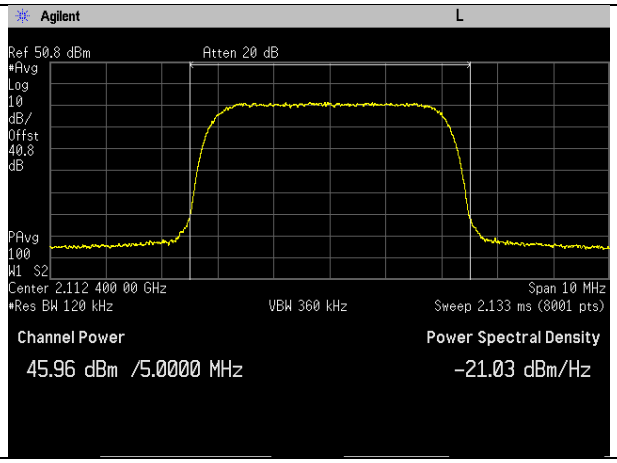


Port 4 – WCDMA – QPSK - Low Channel – Peak

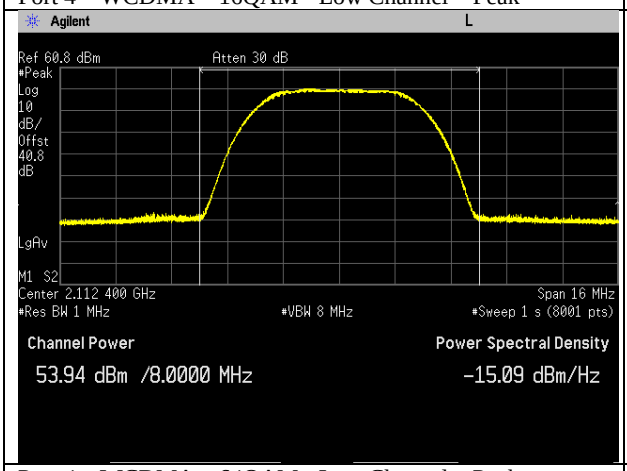
Port 4 – WCDMA – QPSK - Low Channel – Average



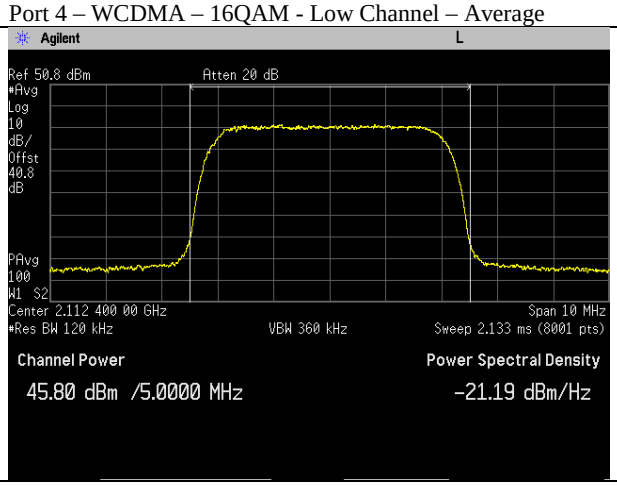
Port 4 – WCDMA – 16QAM - Low Channel – Peak



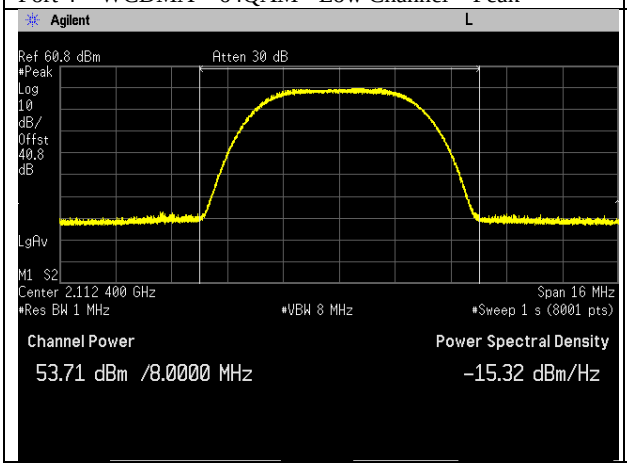
Port 4 – WCDMA – 16QAM - Low Channel – Average



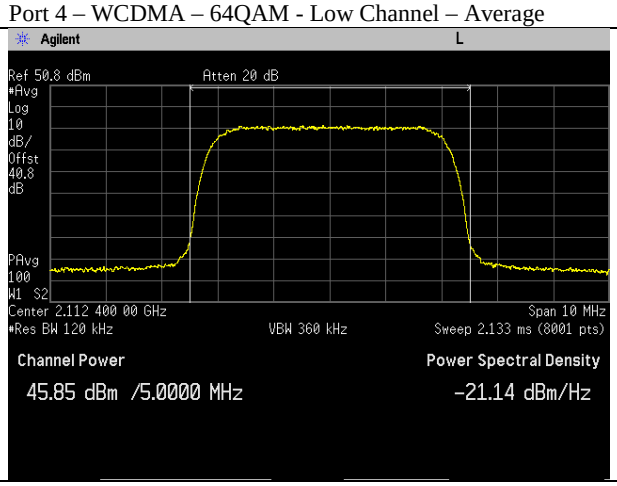
Port 4 – WCDMA – 64QAM - Low Channel – Peak



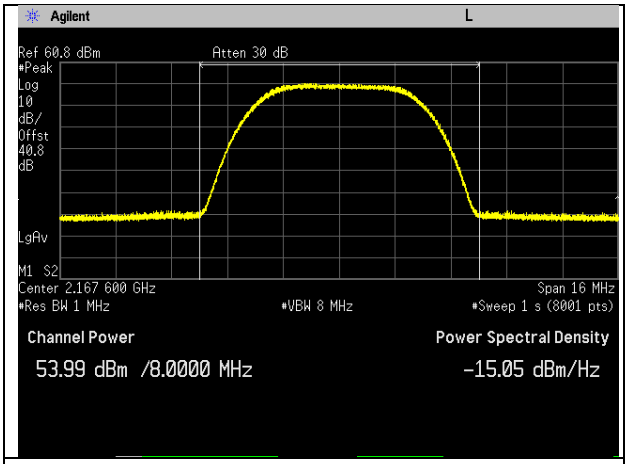
Port 4 – WCDMA – 64QAM - Low Channel – Average



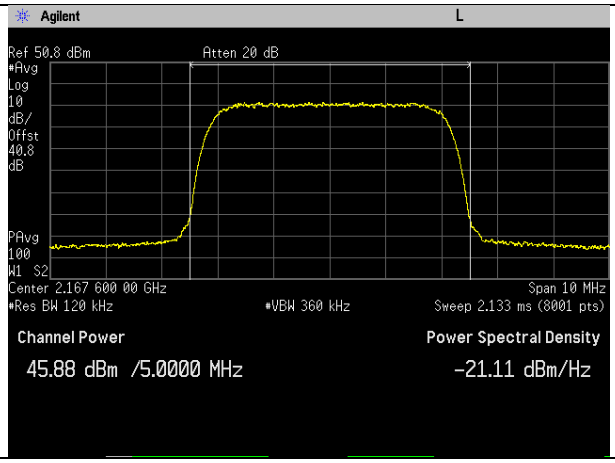
Port 4 – WCDMA – QPSK - High Channel – Peak



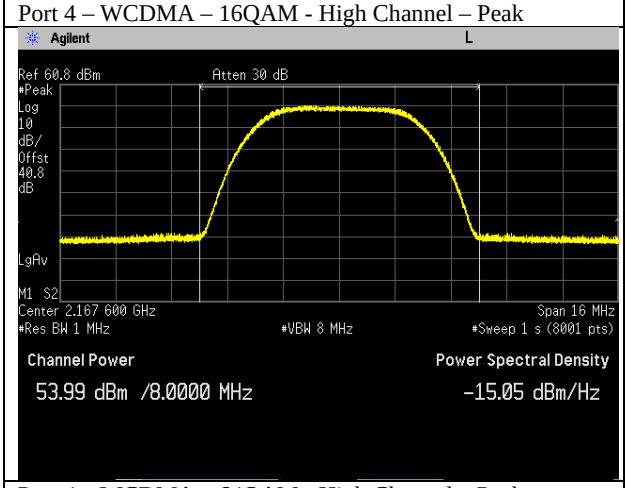
Port 4 – WCDMA – QPSK - High Channel – Average



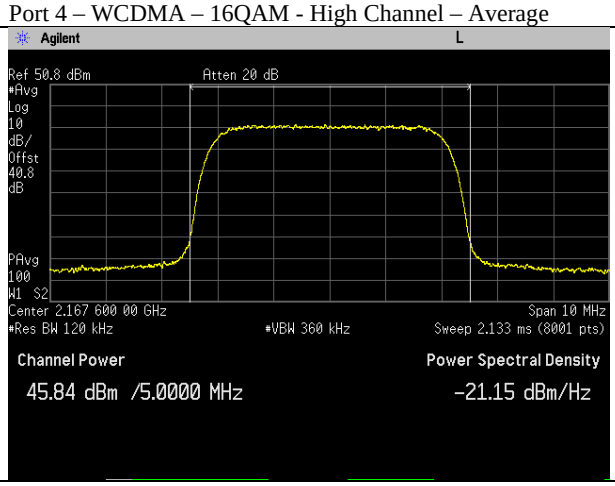
Port 4 – WCDMA – 16QAM - High Channel – Peak



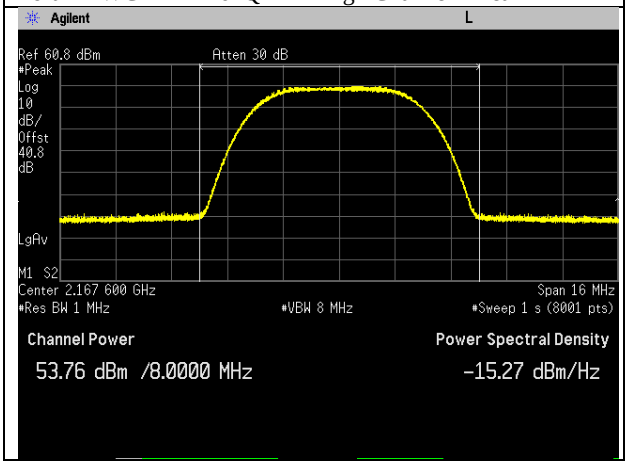
Port 4 – WCDMA – 16QAM - High Channel – Average

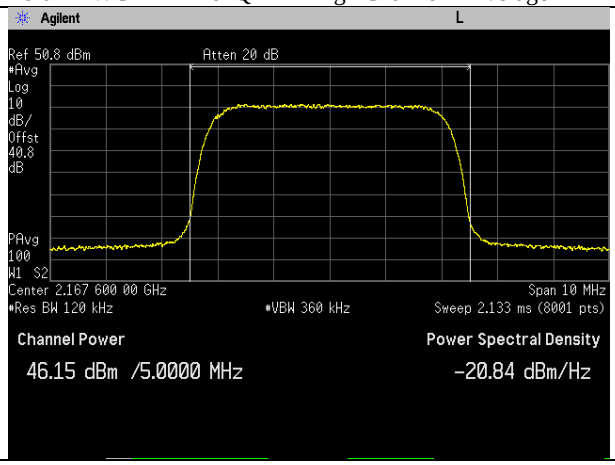


Port 4 – WCDMA – 64QAM - High Channel – Peak



Port 4 – WCDMA – 64QAM - High Channel – Average





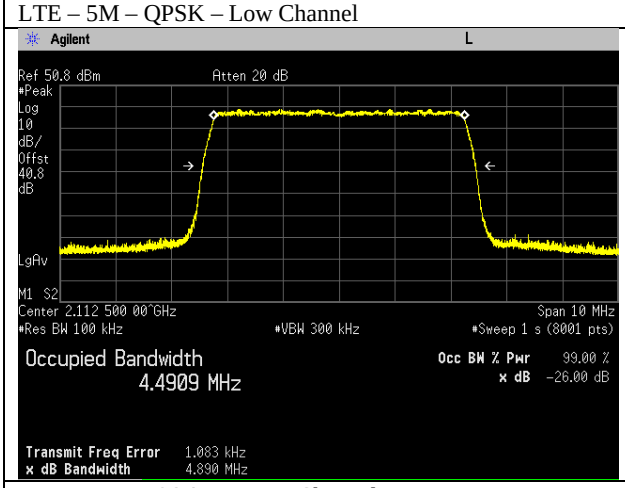
Emission Bandwidths (26dB and 99%)

Emissions bandwidths were measured at Port 4 on low and high channels in 5MHz, 10MHz, 15MHz, and 20MHz LTE channel bandwidths and WCDMA for all modulations and results presented below.

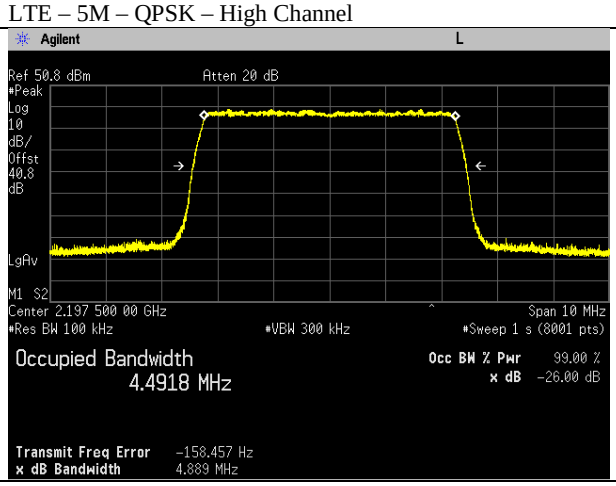
	QPSK				16QAM				64QAM			
	Low		High		Low		High		Low		High	
	26dB (MHz)	99% (MHz)	26dB (MHz)	99% (MHz)	26dB (MHz)	99% (MHz)	26dB (MHz)	99% (MHz)	26dB (MHz)	99% (MHz)	26dB (MHz)	99% (MHz)
5M LTE	4.89	4.4909	4.889	4.4918	4.861	4.4809	4.868	4.4824	4.866	4.5015	4.867	4.4984
10M LTE	9.73	8.9835	9.735	8.9876	9.698	9.0005	9.71	9.0029	9.77	8.993	9.728	8.9844
15M LTE	14.561	13.4812	14.563	13.4731	14.547	13.4979	14.532	13.4928	14.627	13.4792	14.6	13.479
20M LTE	19.443	17.9494	19.423	17.9525	19.379	18.006	19.388	17.9828	19.462	17.9422	19.432	17.9462
WCDMA	4.594	4.1002	4.598	4.0992	4.589	4.1024	4.589	4.1032	4.599	4.0969	4.598	4.1004

Corresponding plots included on the following pages.

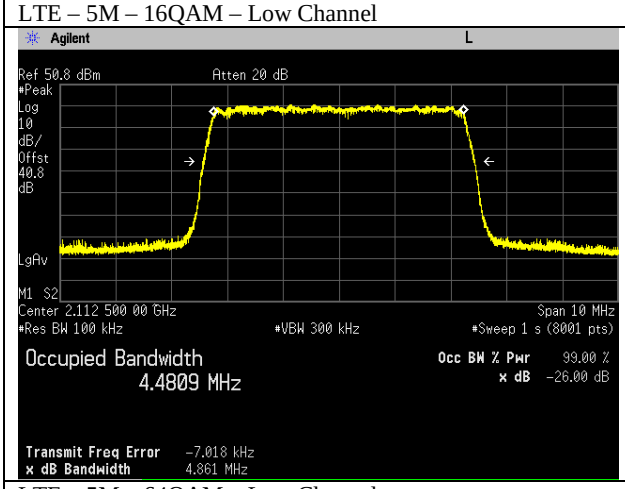
LTE – 5M – QPSK – Low Channel



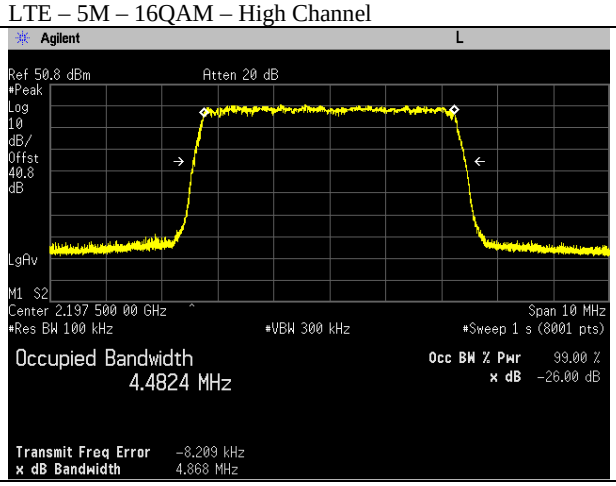
LTE – 5M – QPSK – High Channel



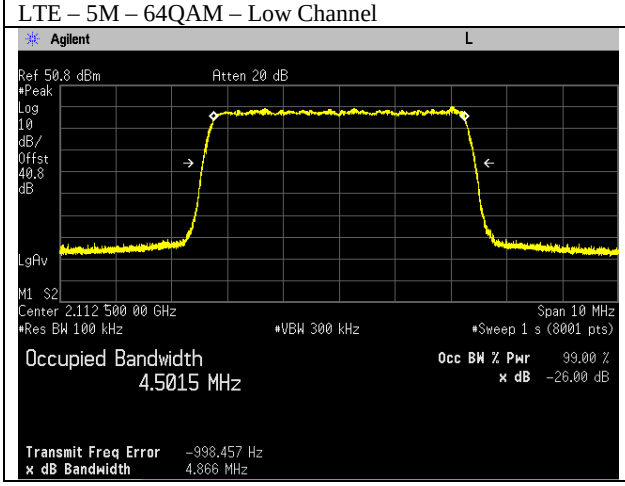
LTE – 5M – 16QAM – Low Channel



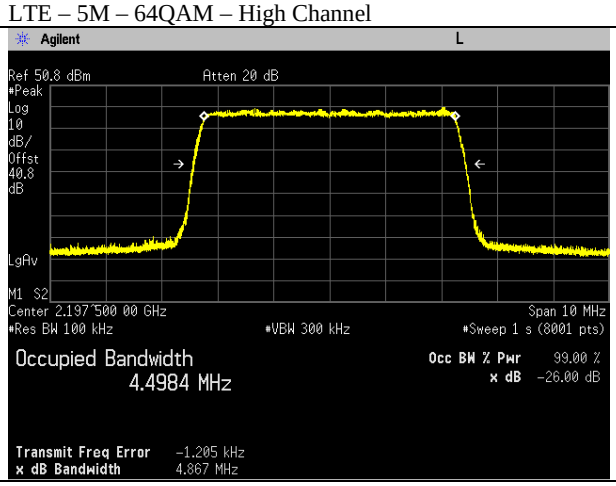
LTE – 5M – 16QAM – High Channel



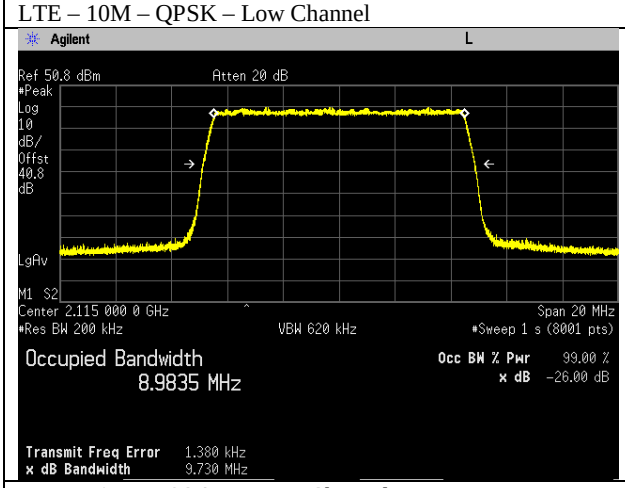
LTE – 5M – 64QAM – Low Channel



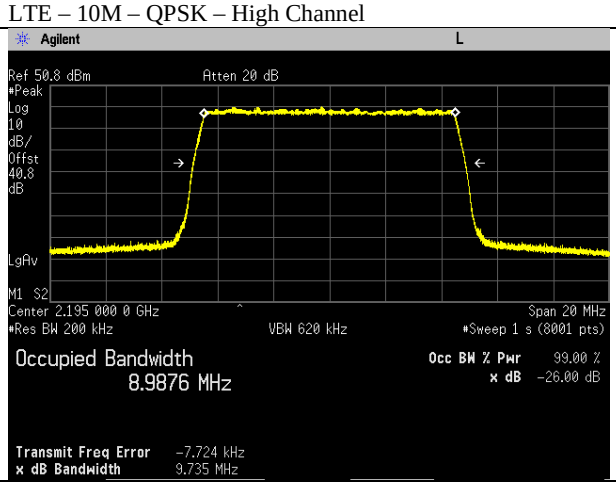
LTE – 5M – 64QAM – High Channel



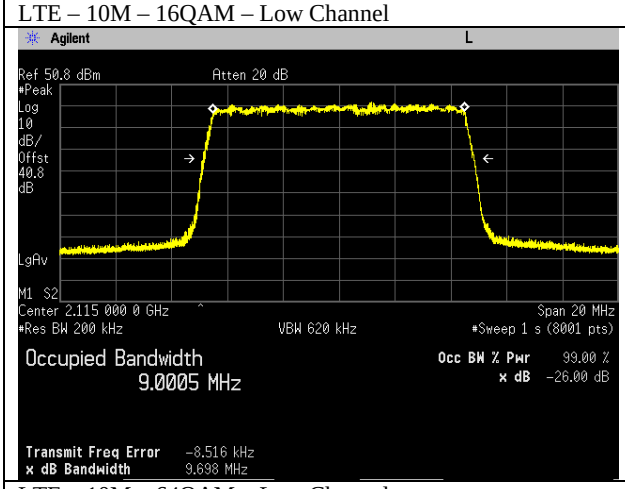
LTE – 10M – QPSK – Low Channel



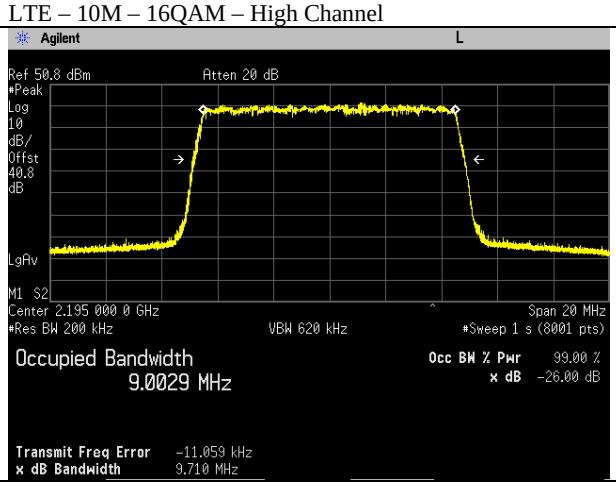
LTE – 10M – QPSK – High Channel



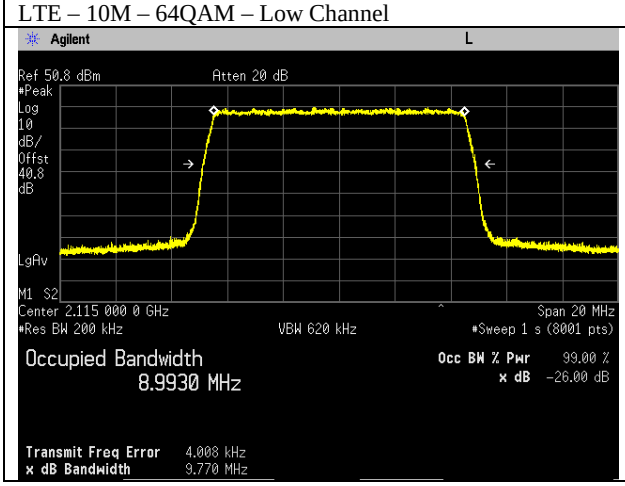
LTE – 10M – 16QAM – Low Channel



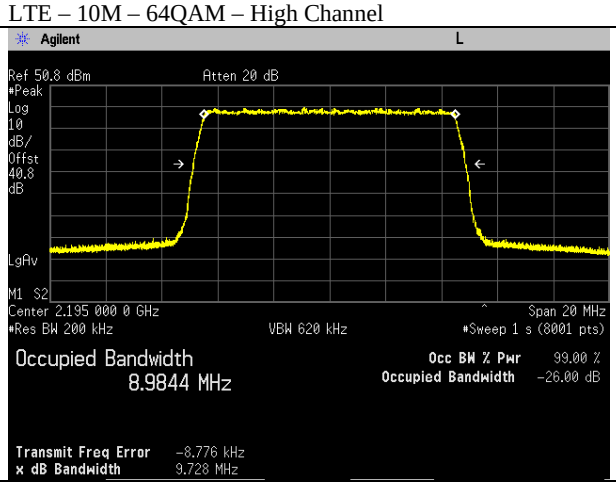
LTE – 10M – 16QAM – High Channel



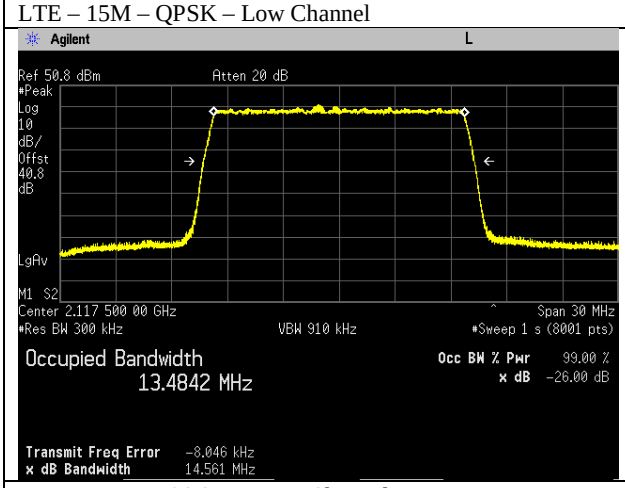
LTE – 10M – 64QAM – Low Channel



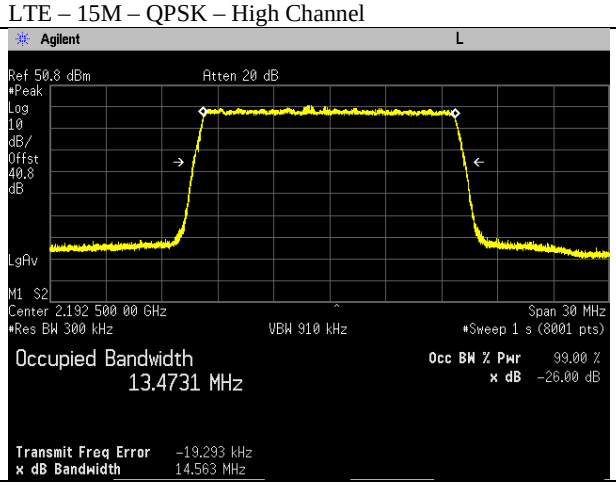
LTE – 10M – 64QAM – High Channel



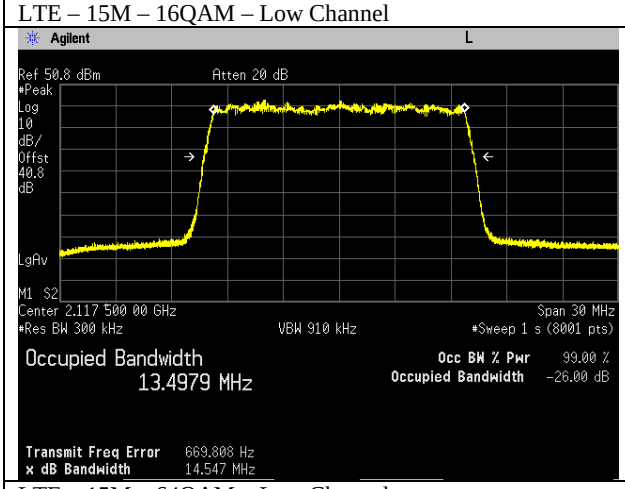
LTE – 15M – QPSK – Low Channel



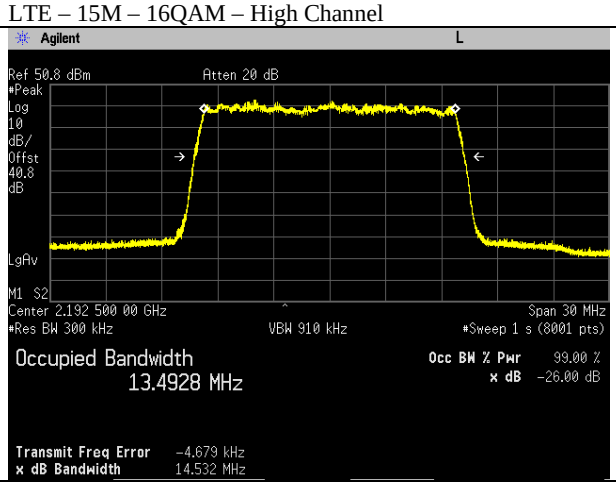
LTE – 15M – QPSK – High Channel



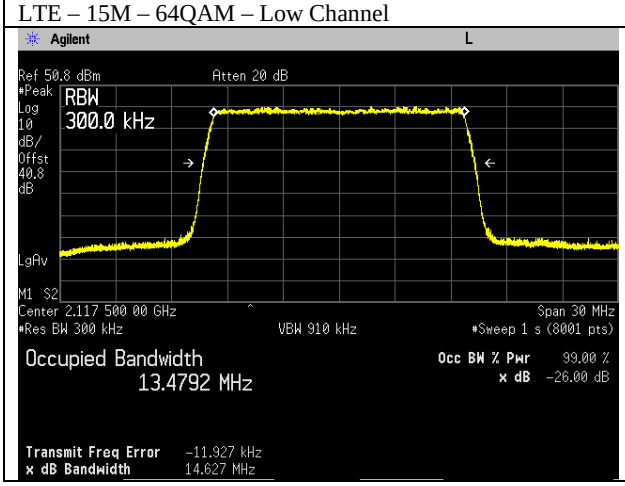
LTE – 15M – 16QAM – Low Channel



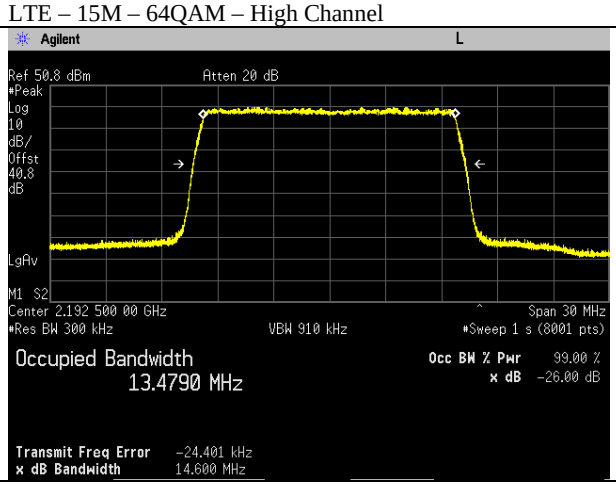
LTE – 15M – 16QAM – High Channel



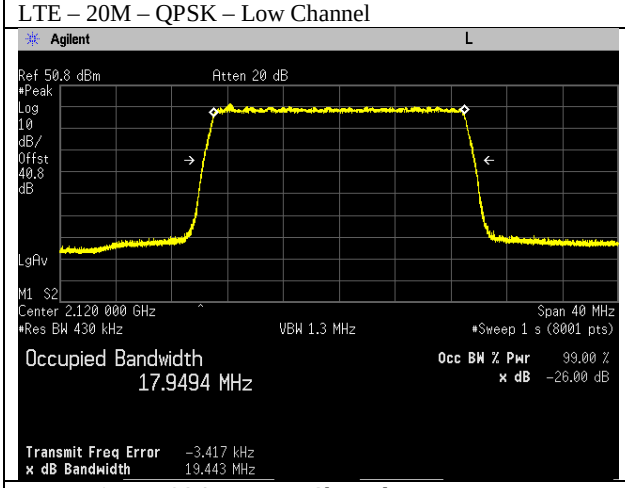
LTE – 15M – 64QAM – Low Channel



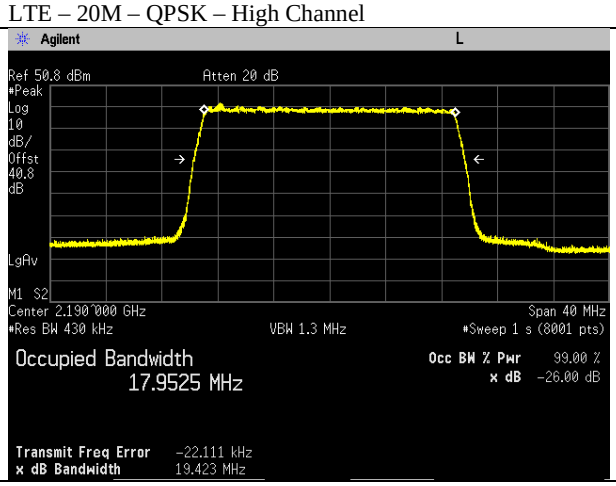
LTE – 15M – 64QAM – High Channel



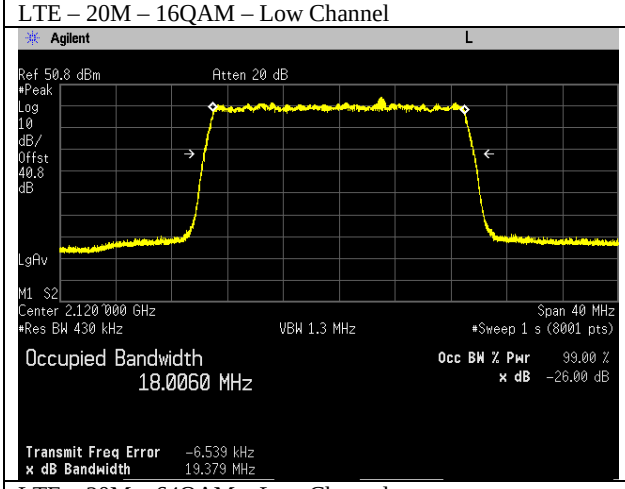
LTE – 20M – QPSK – Low Channel



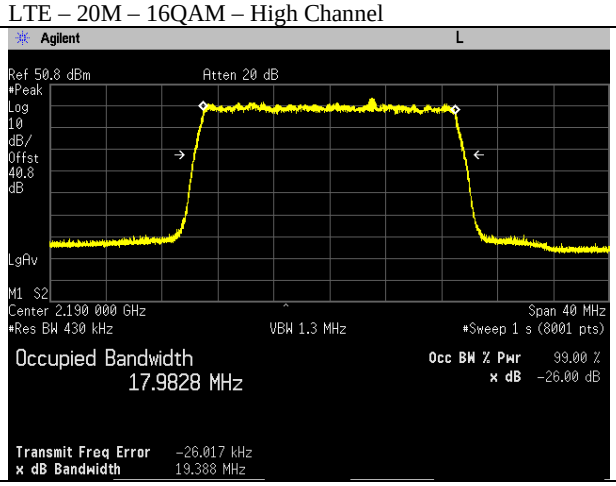
LTE – 20M – QPSK – High Channel



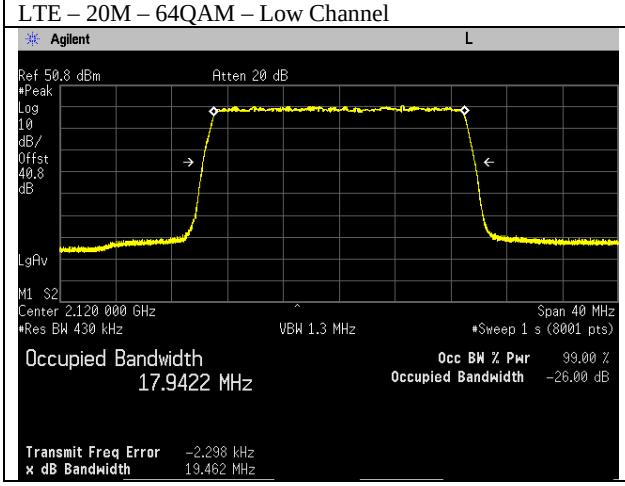
LTE – 20M – 16QAM – Low Channel



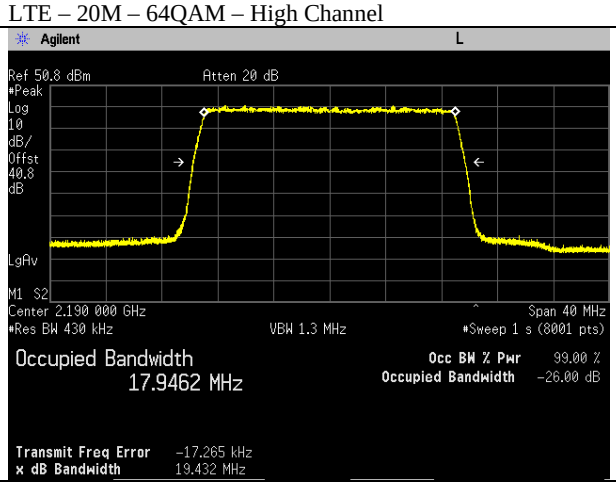
LTE – 20M – 16QAM – High Channel



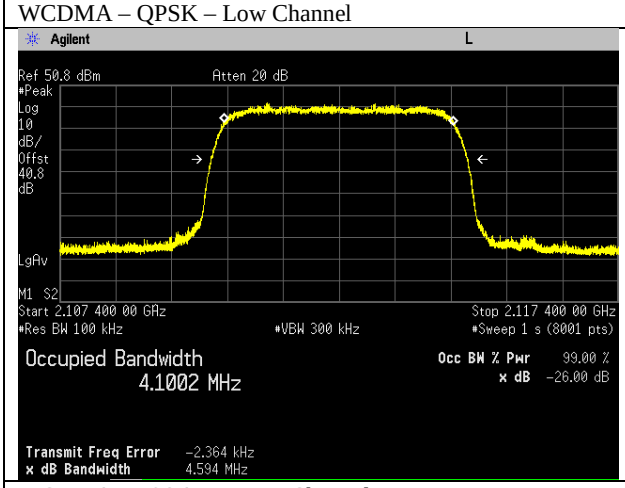
LTE – 20M – 64QAM – Low Channel



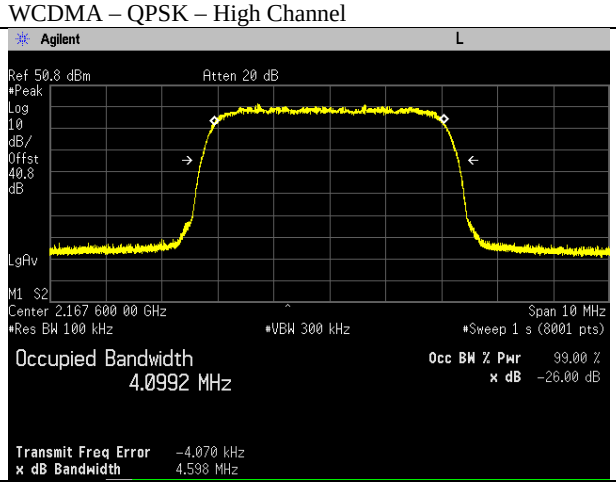
LTE – 20M – 64QAM – High Channel



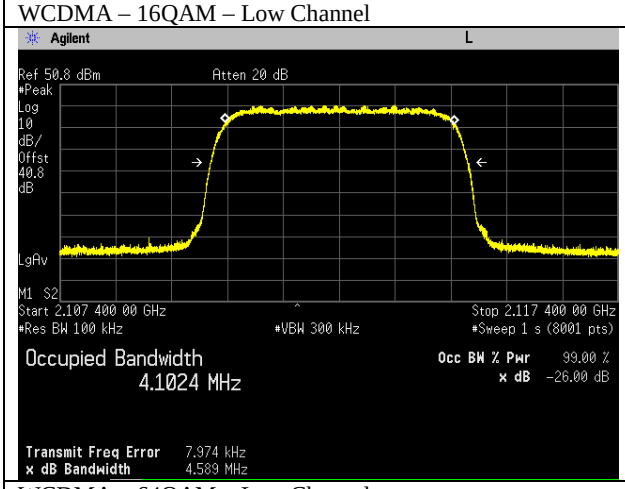
WCDMA – QPSK – Low Channel



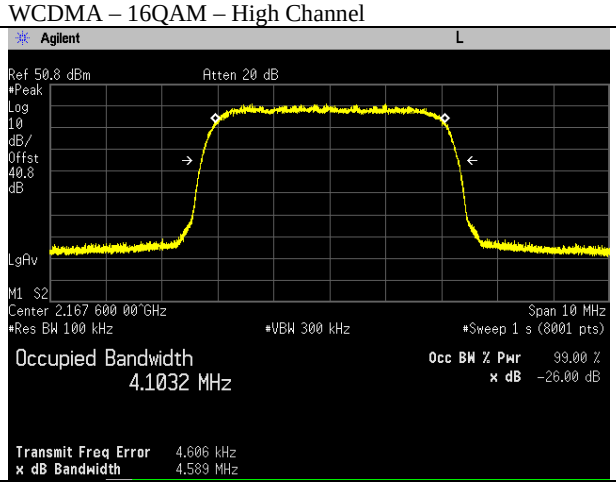
WCDMA – QPSK – High Channel



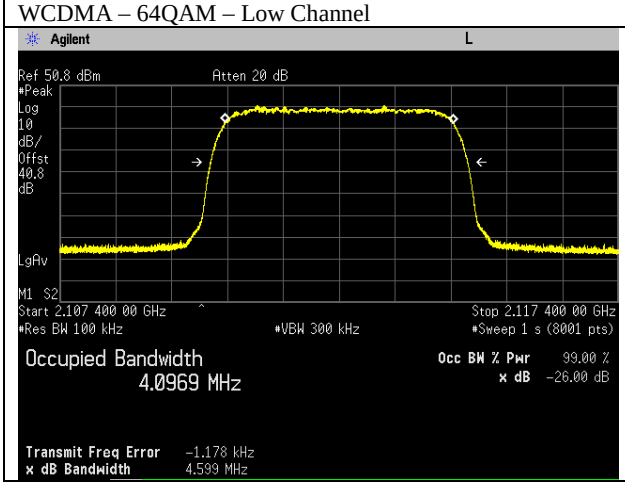
WCDMA – 16QAM – Low Channel



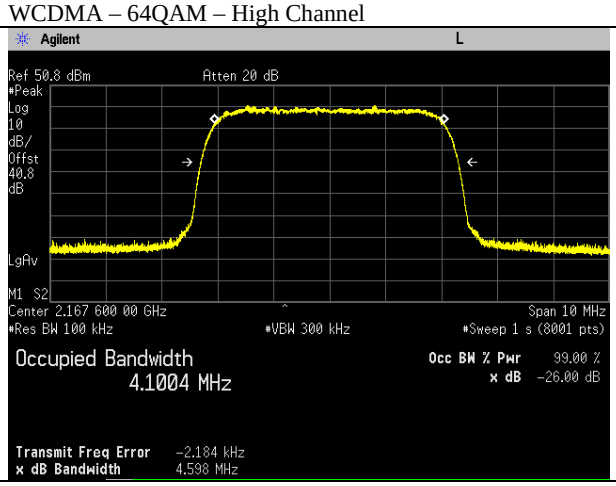
WCDMA – 16QAM – High Channel



WCDMA – 64QAM – Low Channel



WCDMA – 64QAM – High Channel



Antenna Port Conducted Bandedge

Limit is -13dBm and is further reduced by 10*log(4) per FCC KDB 662911D01 v02r01 due to 4x4 MIMO operation, which brings it down to -19.03dBm.

Tests performed at Port 4 on lowest and highest channels for all modulations and channel bandwidth modes.

Results summary:

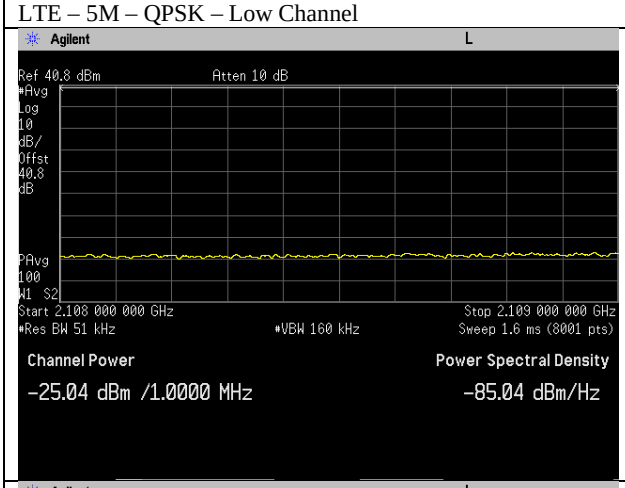
	QPSK		16QAM		64QAM	
	Low	High	Low	High	Low	High
5M LTE	-23.060dBm	-21.509dBm	-23.740dBm	-21.401dBm	-23.487dBm	-22.435dBm
10M LTE	-23.141dBm	-24.317dBm	-25.079dBm	-24.553dBm	-25.106dBm	-25.053dBm
15M LTE	-21.521dBm	-22.272dBm	-21.629dBm	-21.340dBm	-22.220dBm	-20.739dBm
20M LTE	-26.188dBm	-25.311dBm	-26.238dBm	-25.847dBm	-25.589dBm	-25.496dBm
5M Dual LTE	-22.088dBm	-21.317dBm	-21.712dBm	-20.430dBm	-21.295dBm	-20.659dBm
WCDMA	-21.244dBm	-20.433dBm	-21.227dBm	-20.192dBm	-21.213dBm	-21.005dBm
WCDMA DUAL	-23.229dBm	-24.35dBm	-23.865dBm	-24.70dBm	-23.722dBm	-25.491dBm

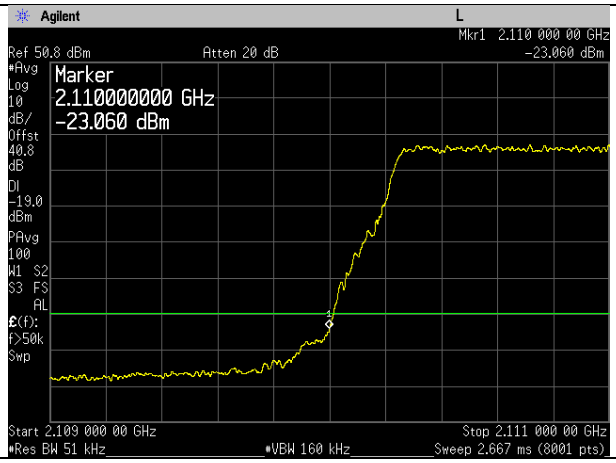
Measurements were performed in RMS average mode with 1MHz RBW and 3MHz VBW over 100 traces. In 1MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of 1% of the emission bandwidth has been used. In 1 to 2 MHz frequency range outside bandedge (i.e.: 2108-2109 MHz and 2201-2202 MHz bands for LTE; 2108-2109 MHz and 2171-2172 MHz bands for WCDMA) the RBW was again reduced to 1% of the emission bandwidth and power was integrated (over 1 MHz).

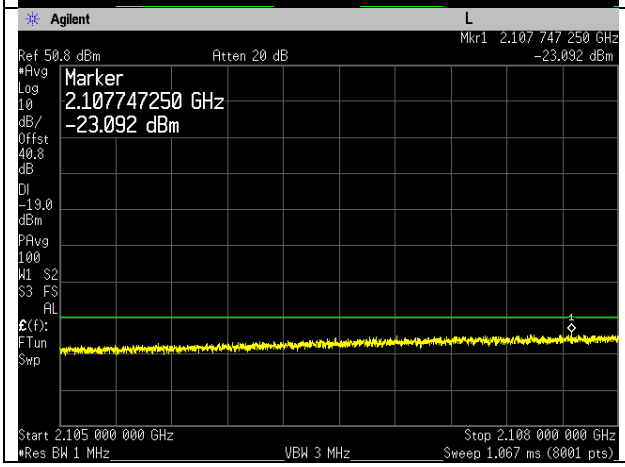
Total path loss of 40.8dB accounted in via reference level offset to the spectrum analyzer.

All corresponding plots are included on the following pages.

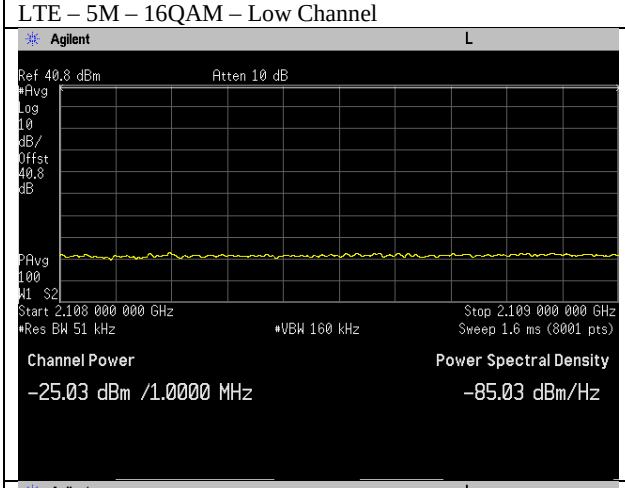
LTE – 5M – QPSK – Low Channel

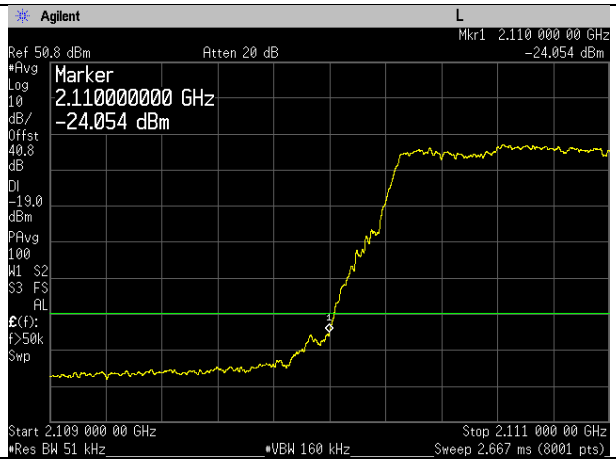


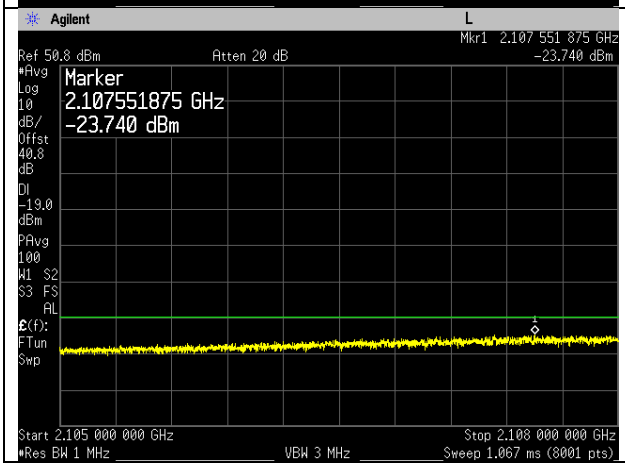




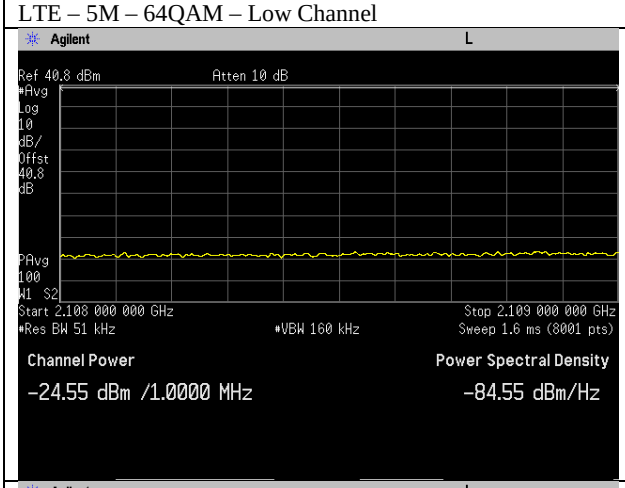
LTE – 5M – 16QAM – Low Channel

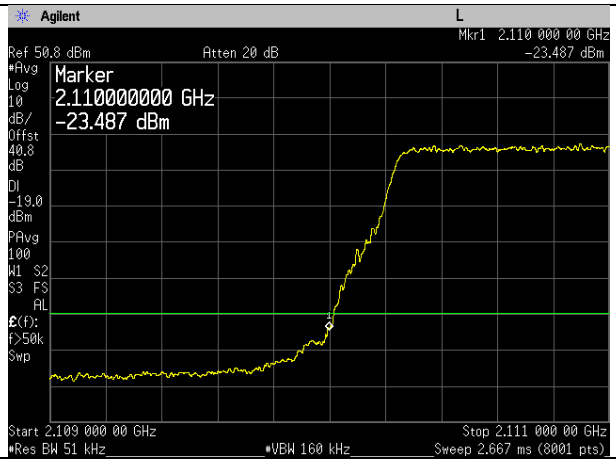


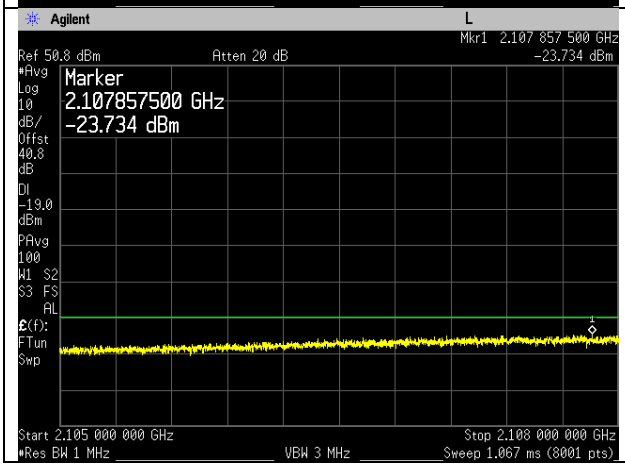




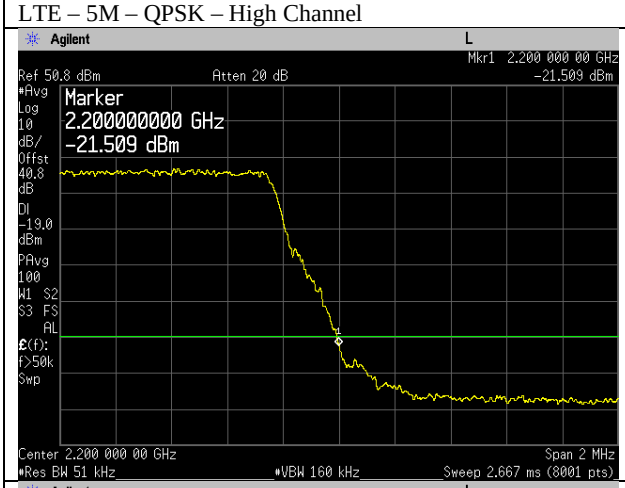
LTE – 5M – 64QAM – Low Channel

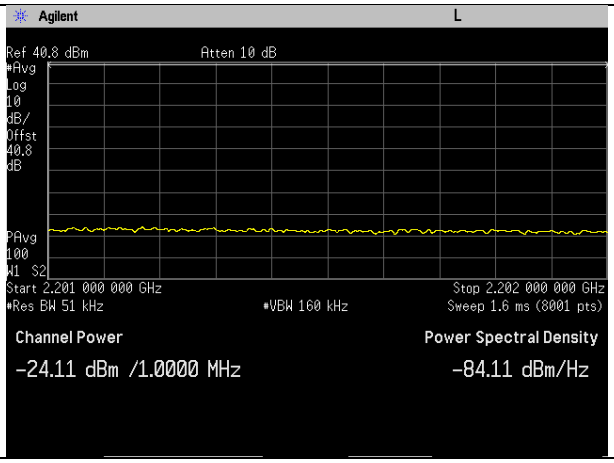


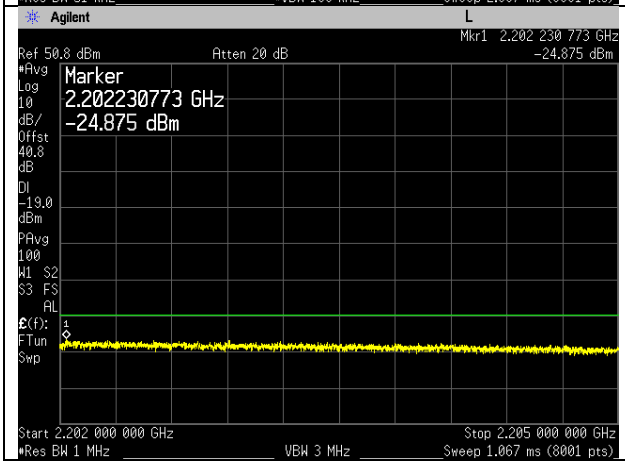




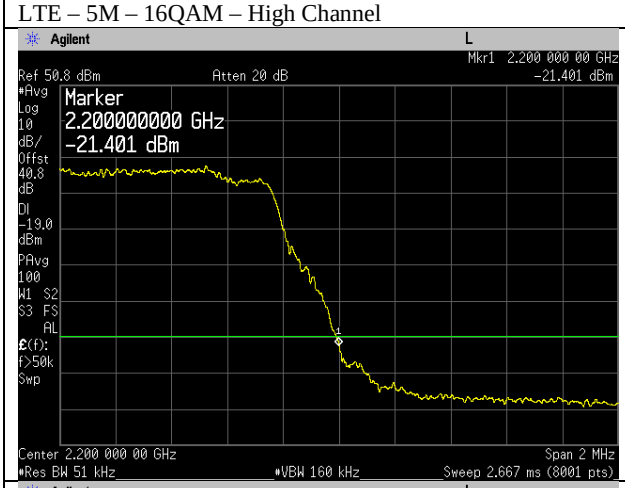
LTE – 5M – QPSK – High Channel

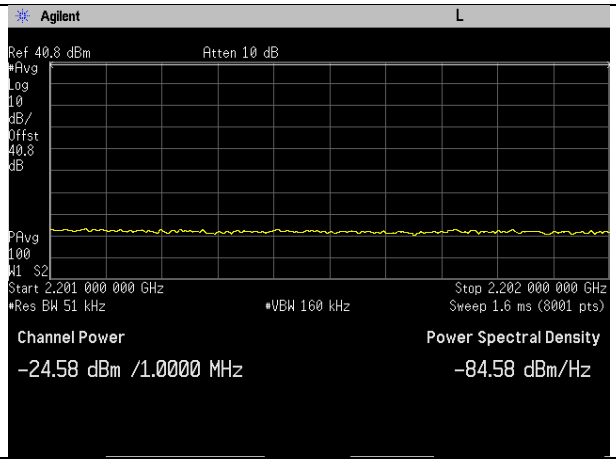


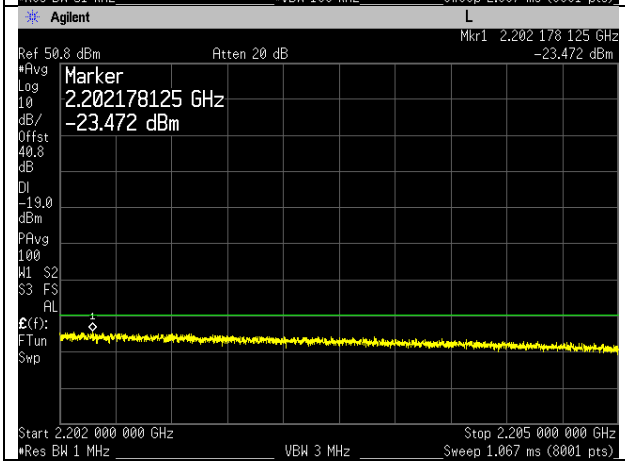




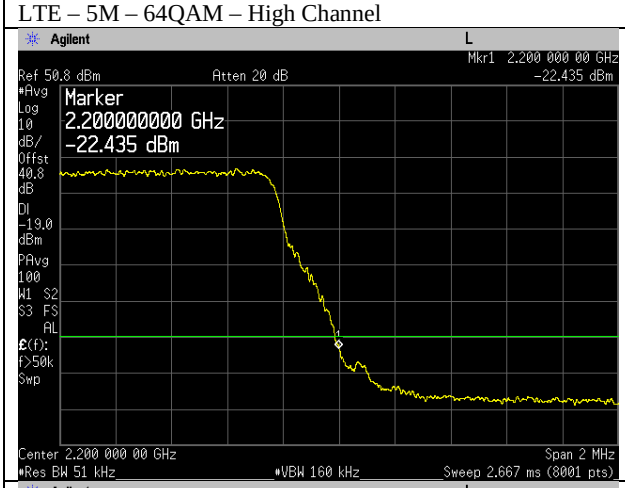
LTE – 5M – 16QAM – High Channel

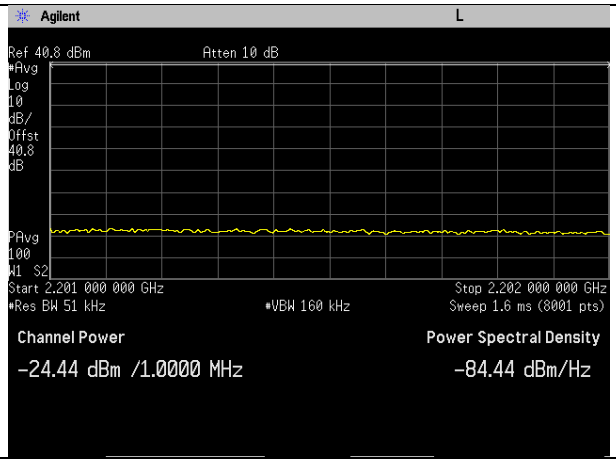


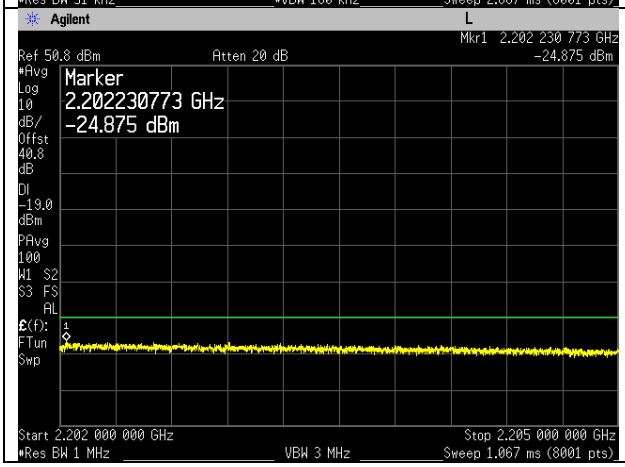




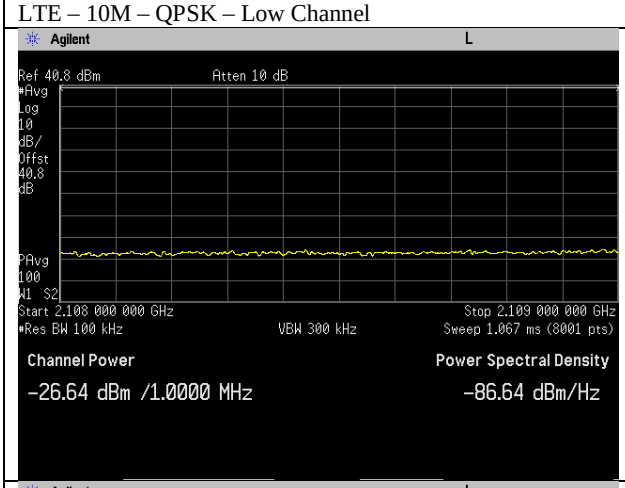
LTE – 5M – 64QAM – High Channel

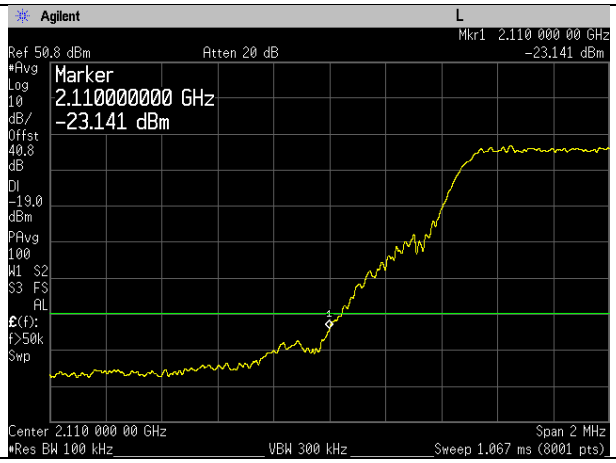


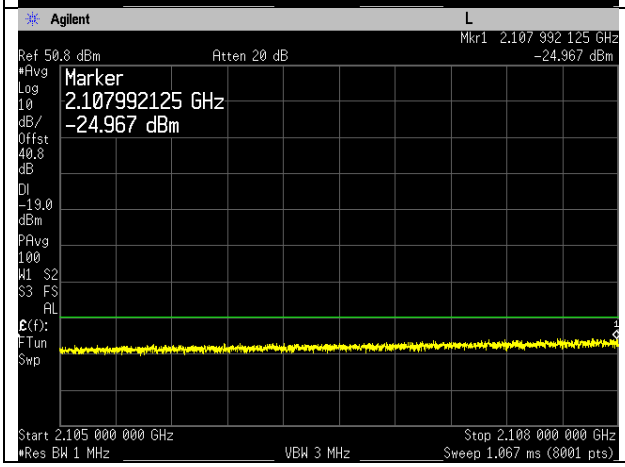




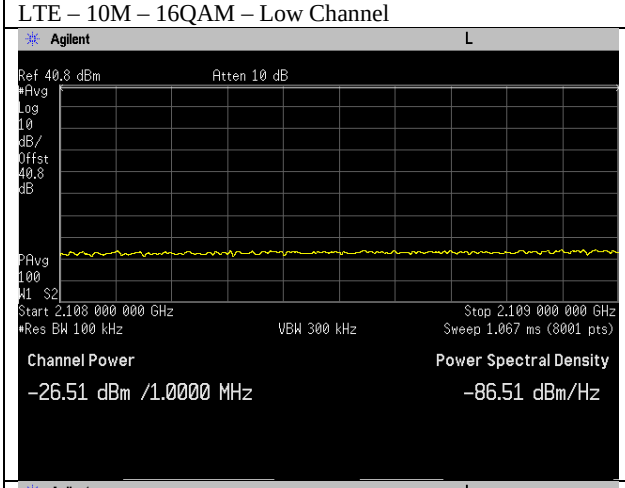
LTE – 10M – QPSK – Low Channel

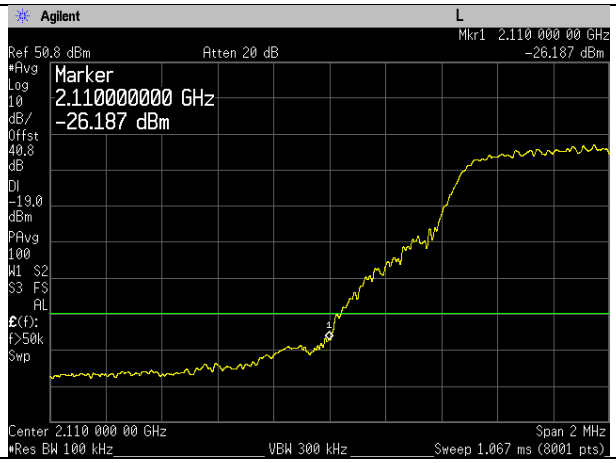


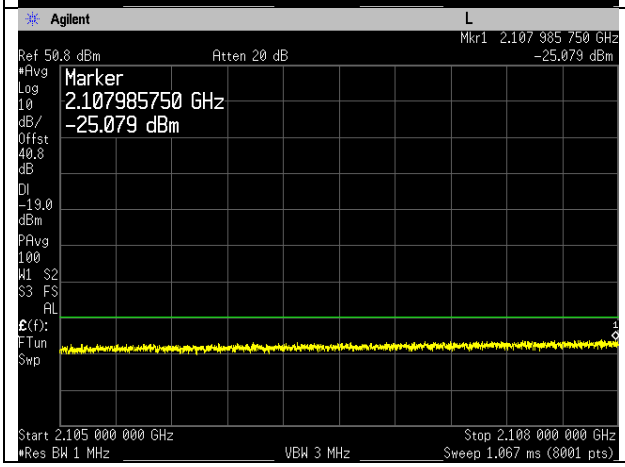




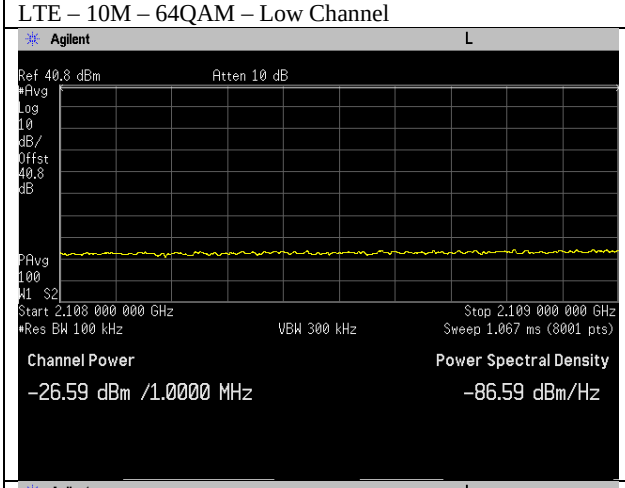
LTE – 10M – 16QAM – Low Channel

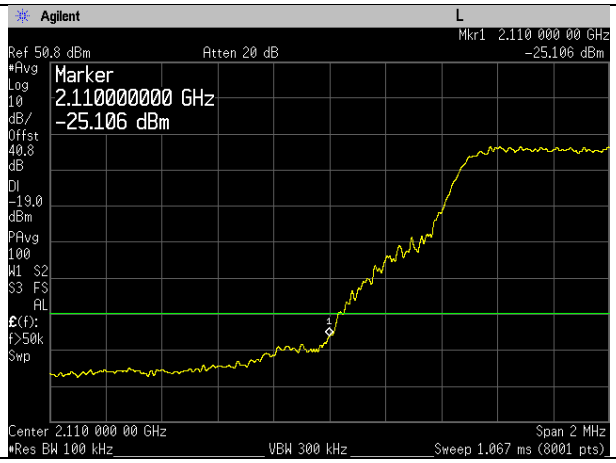


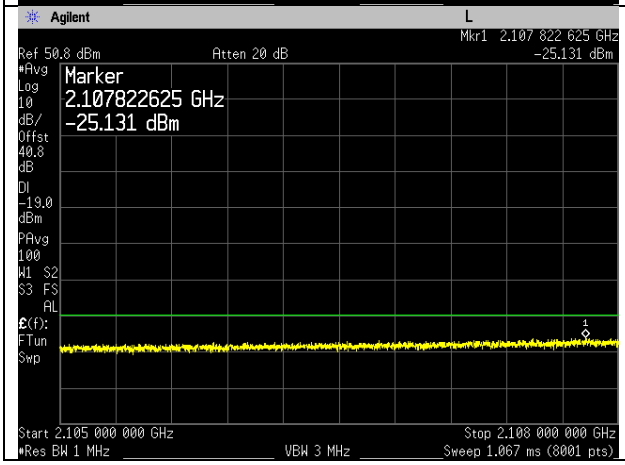




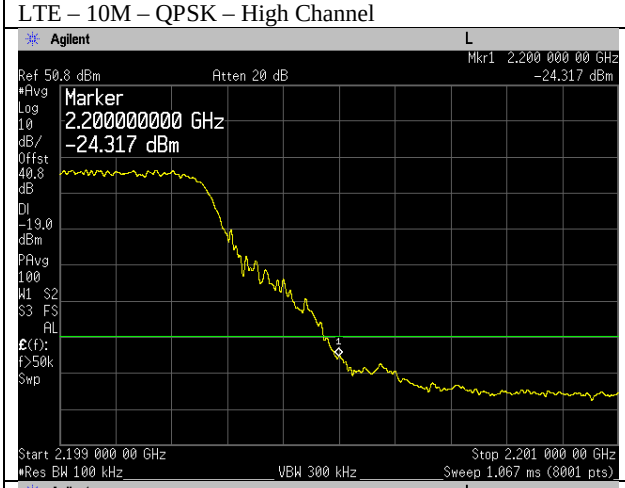
LTE – 10M – 64QAM – Low Channel

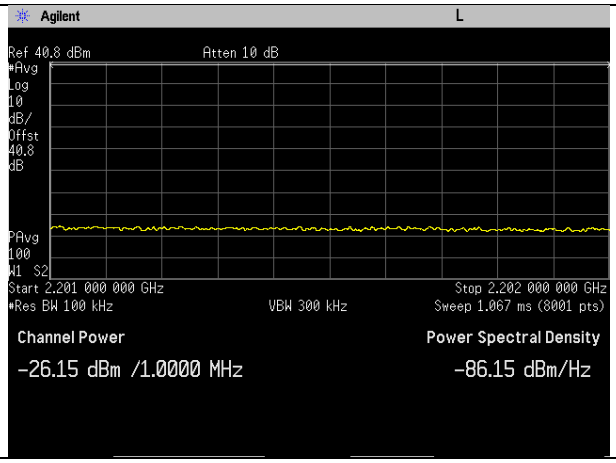


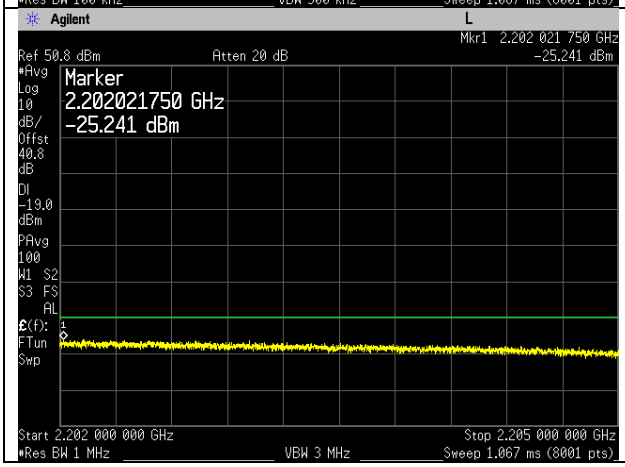




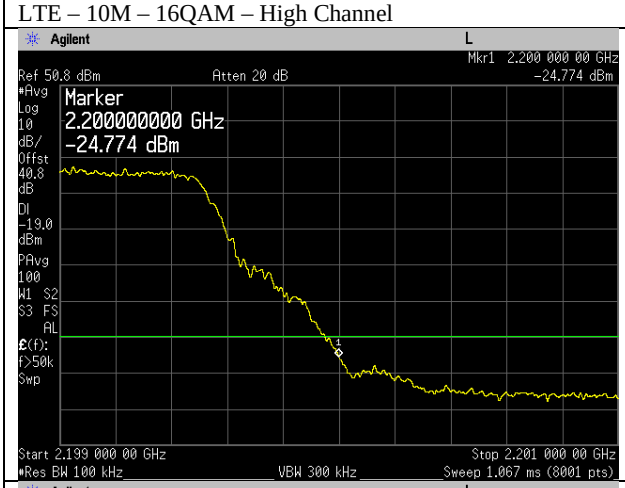
LTE – 10M – QPSK – High Channel

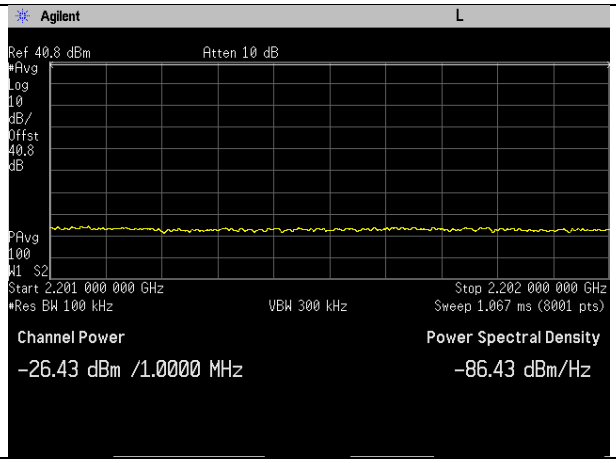


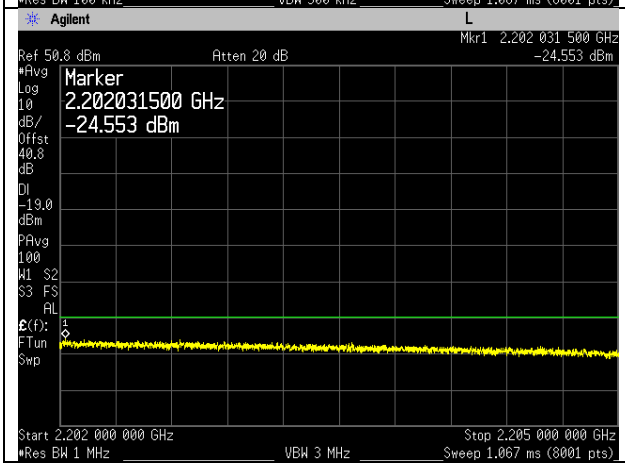




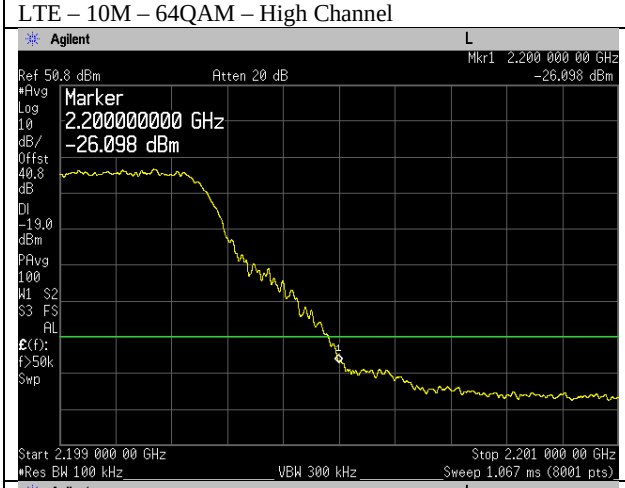
LTE – 10M – 16QAM – High Channel

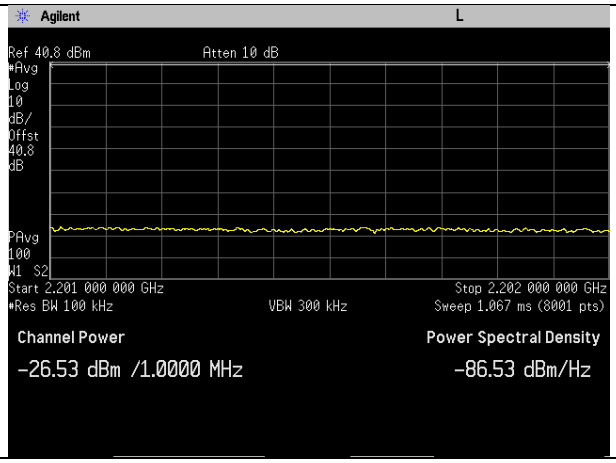


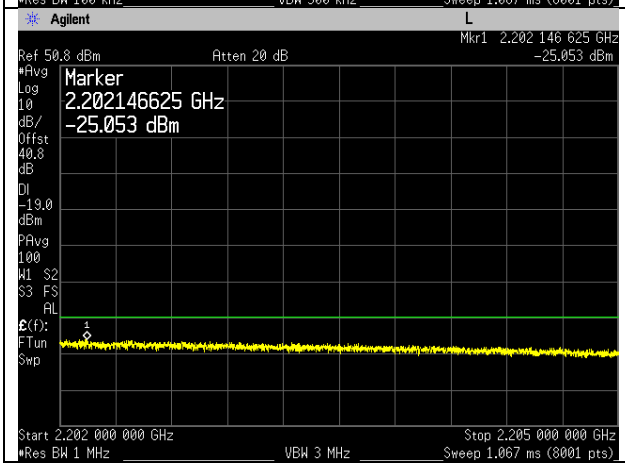




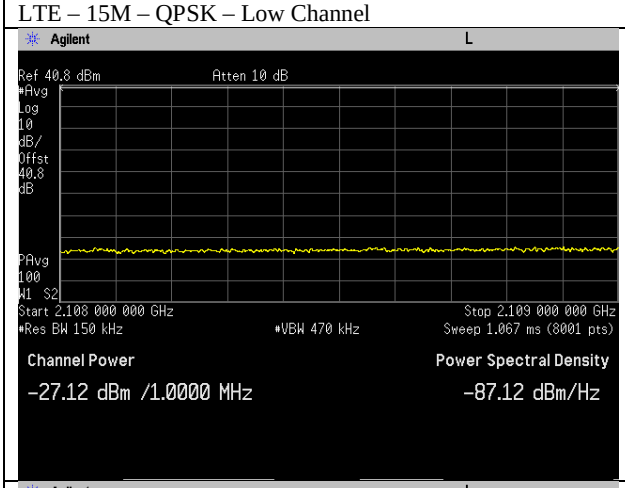
LTE – 10M – 64QAM – High Channel

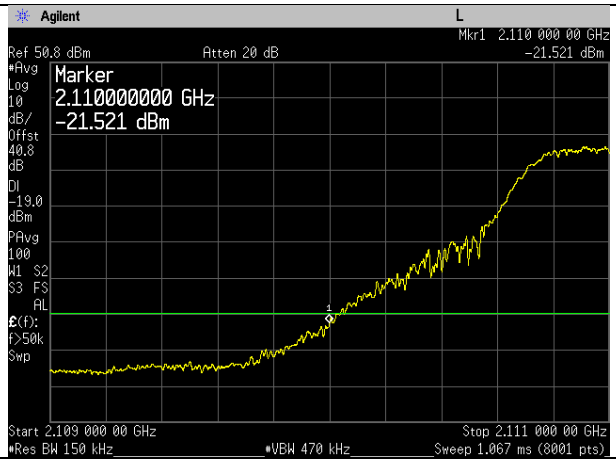


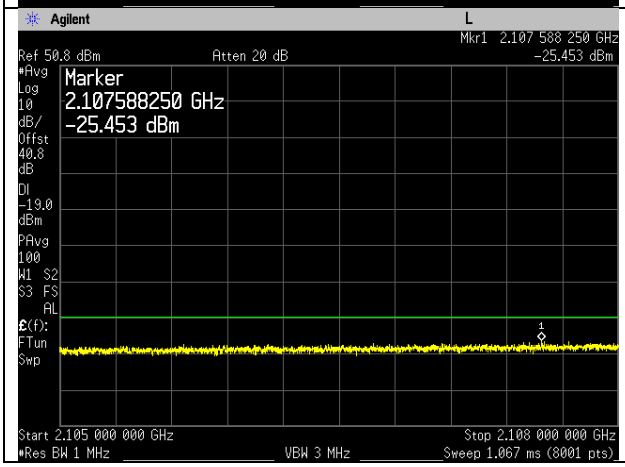




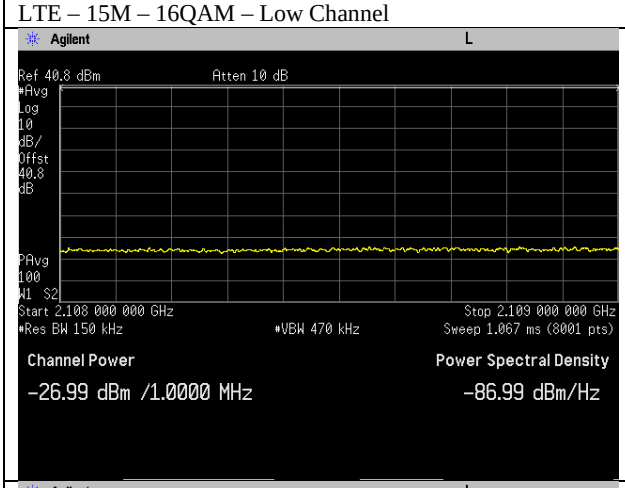
LTE – 15M – QPSK – Low Channel

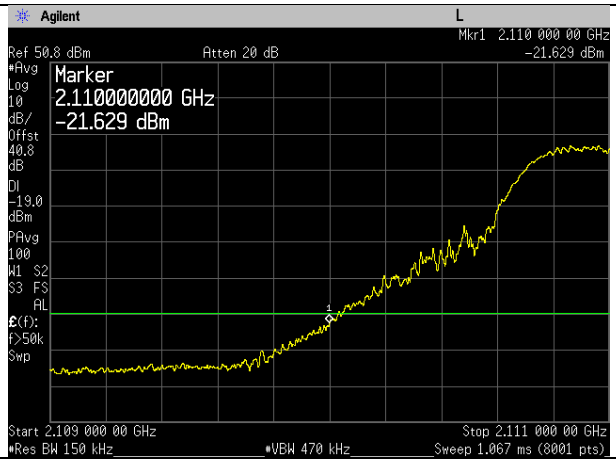


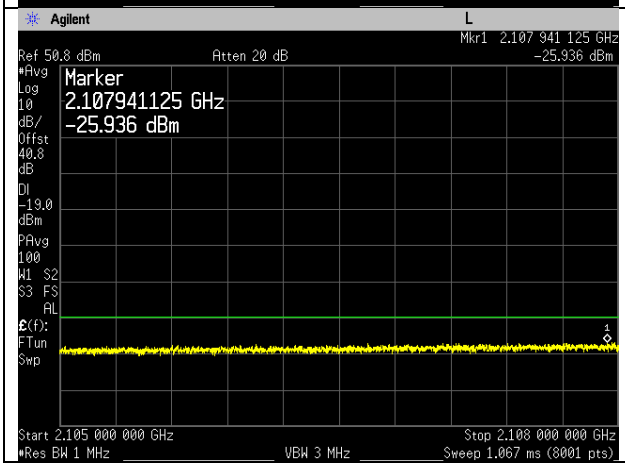




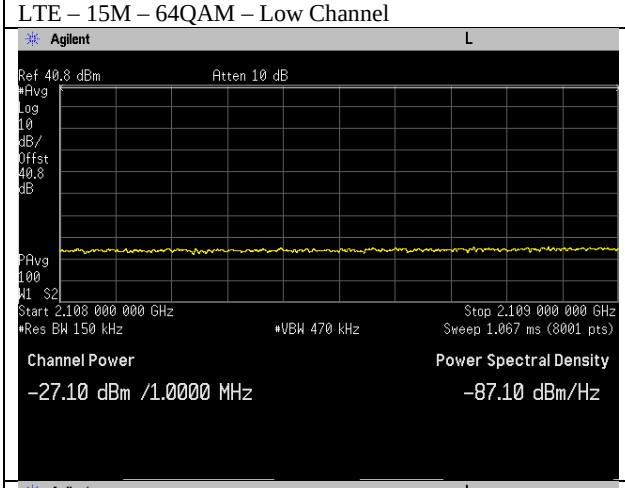
LTE – 15M – 16QAM – Low Channel

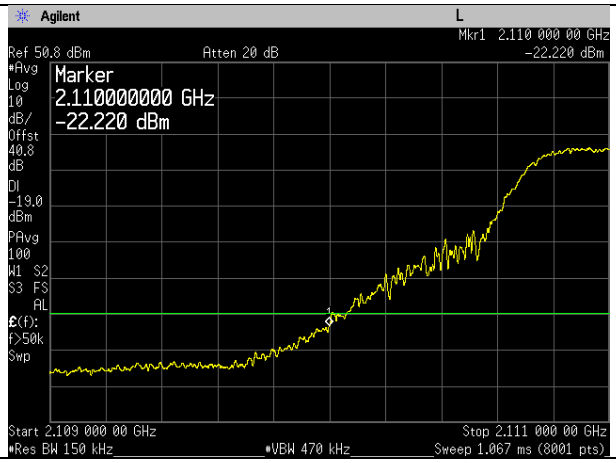


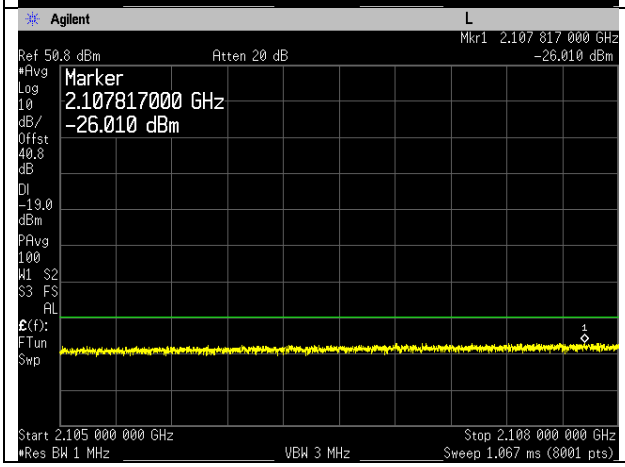




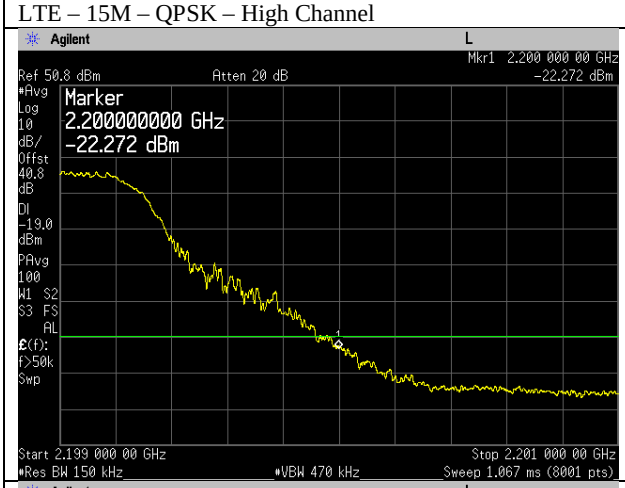
LTE – 15M – 64QAM – Low Channel

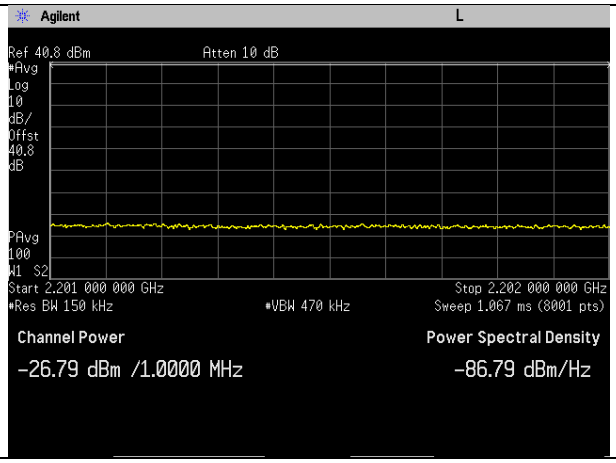


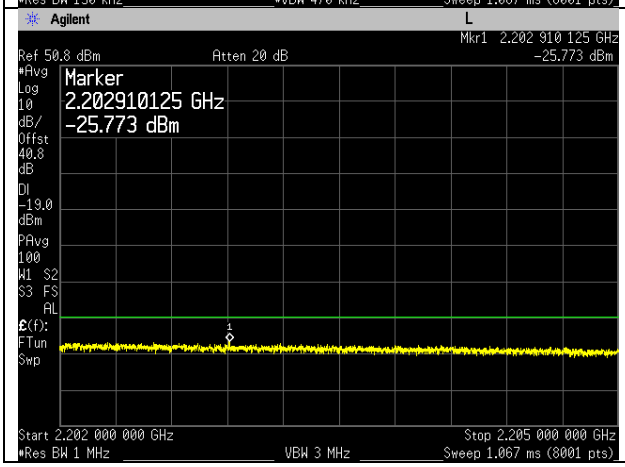




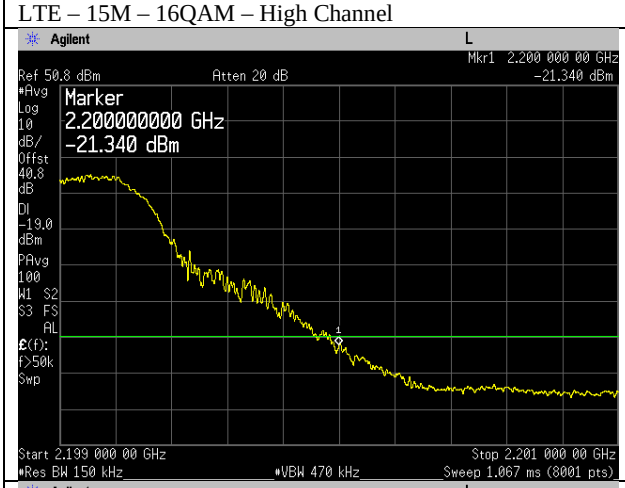
LTE – 15M – QPSK – High Channel

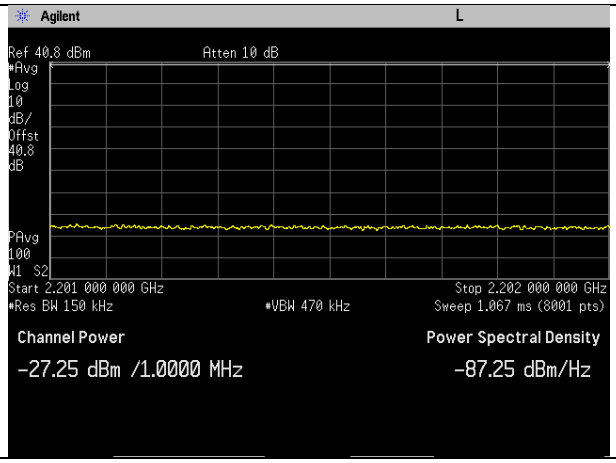


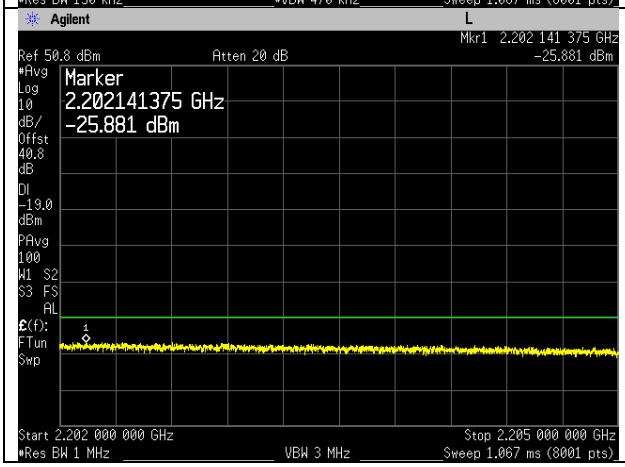




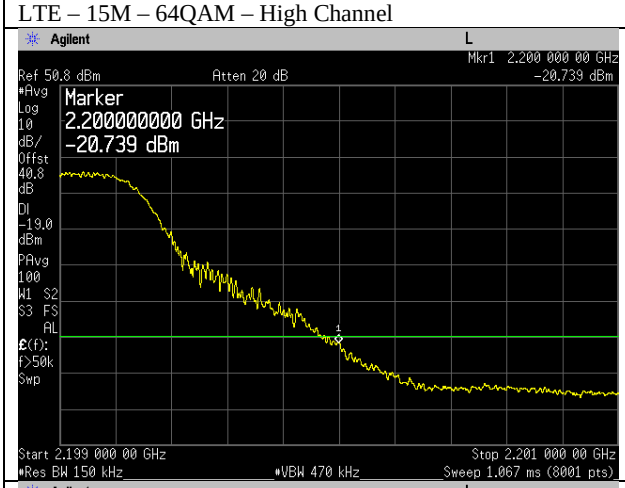
LTE – 15M – 16QAM – High Channel

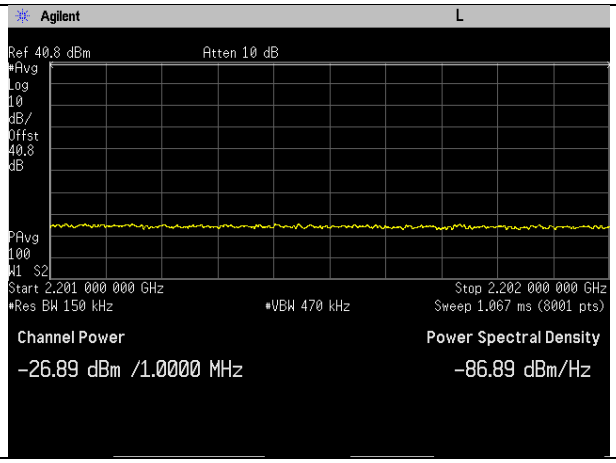


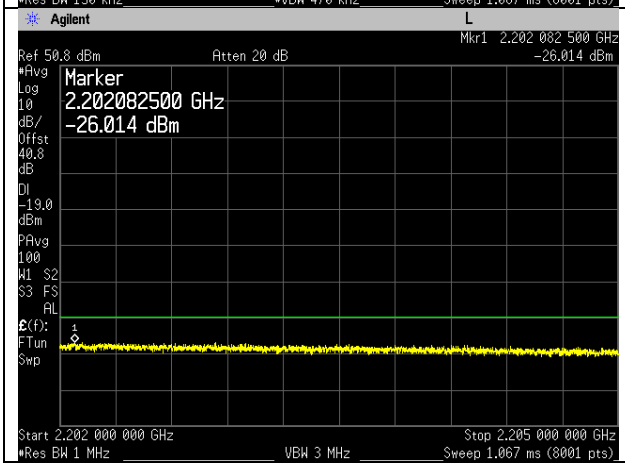




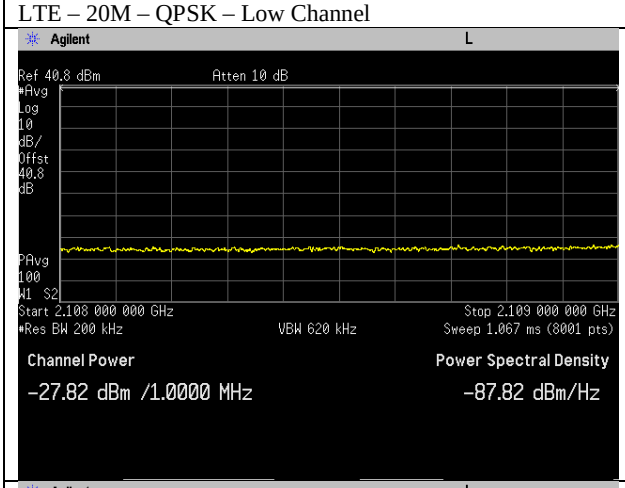
LTE – 15M – 64QAM – High Channel

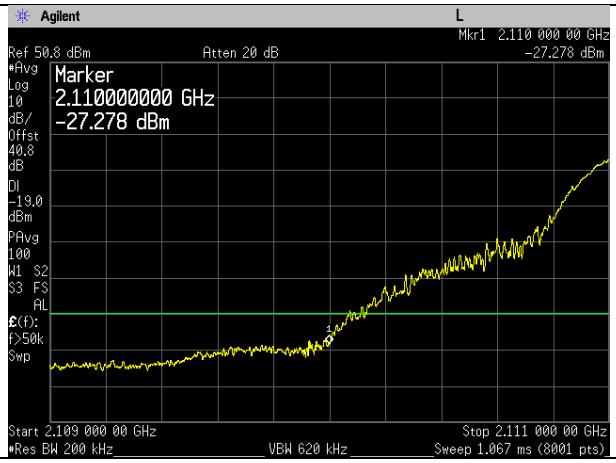


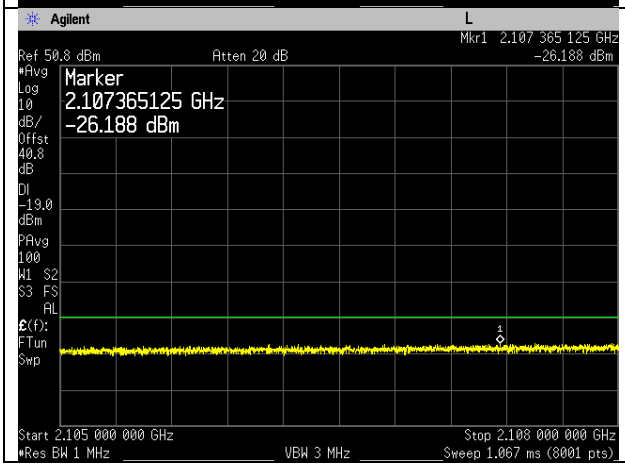




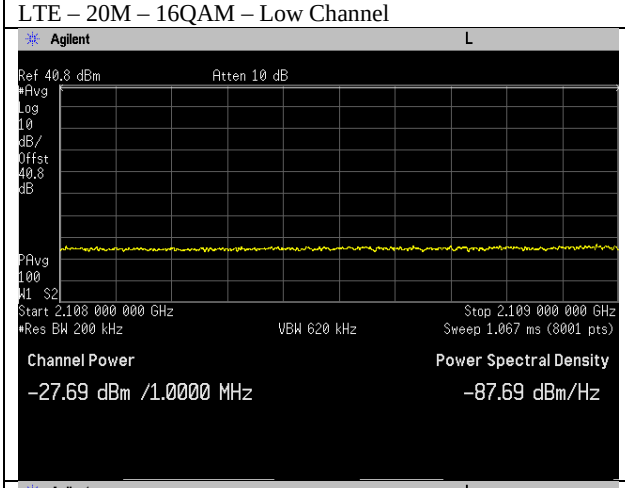
LTE – 20M – QPSK – Low Channel

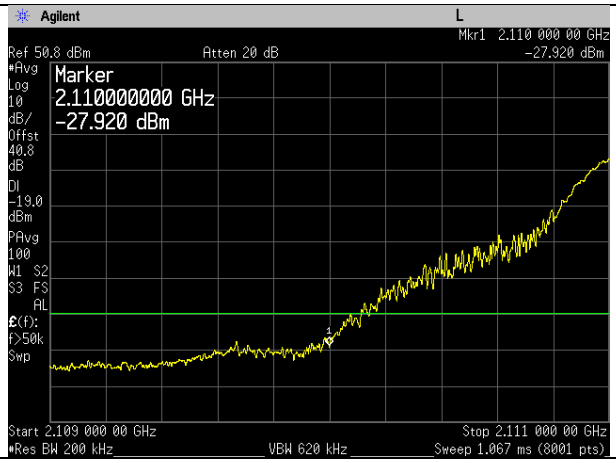


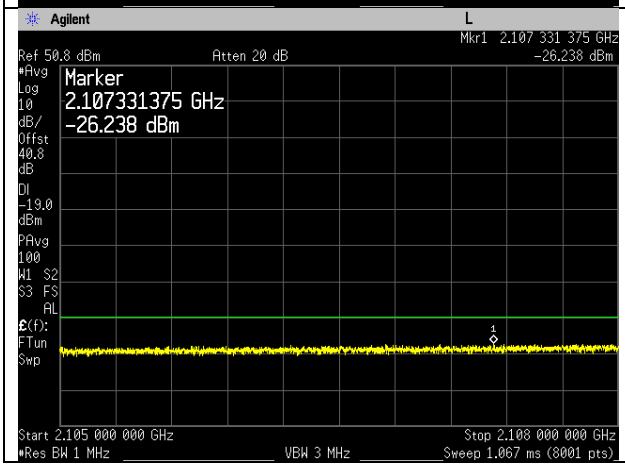




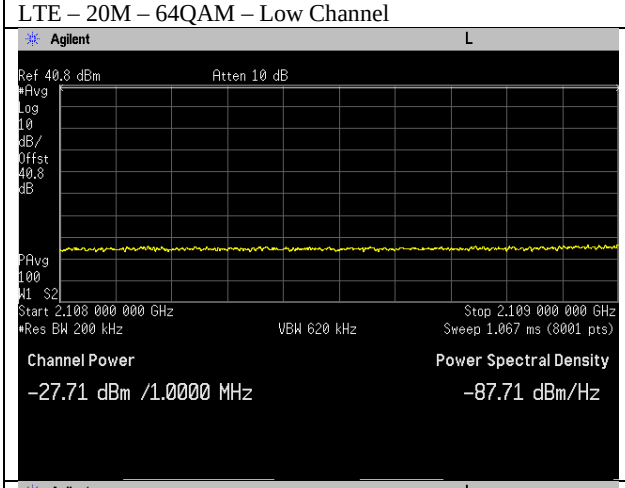
LTE – 20M – 16QAM – Low Channel

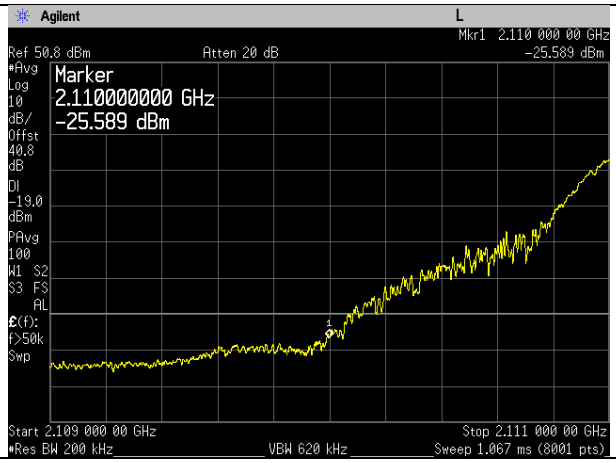


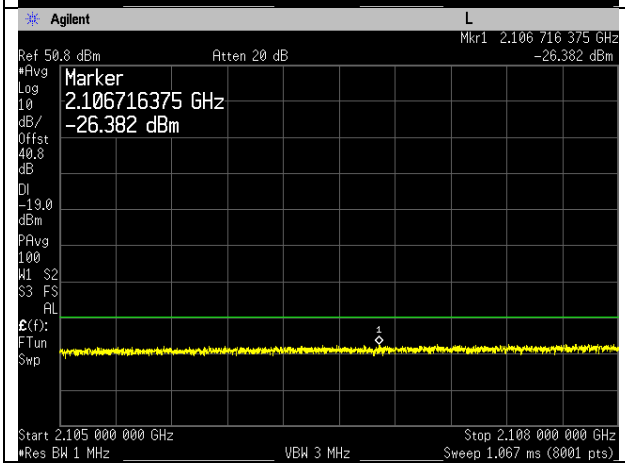




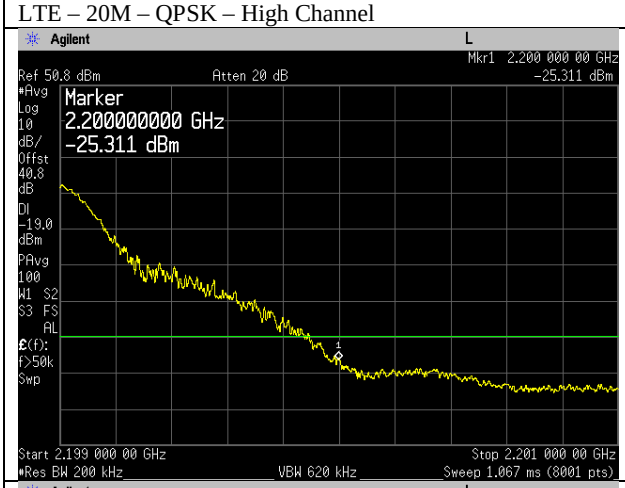
LTE – 20M – 64QAM – Low Channel

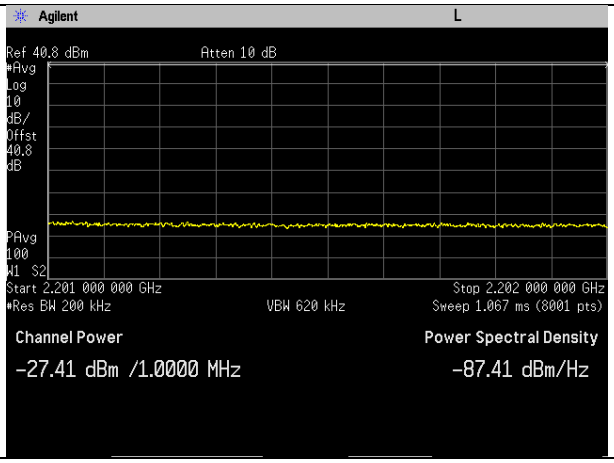


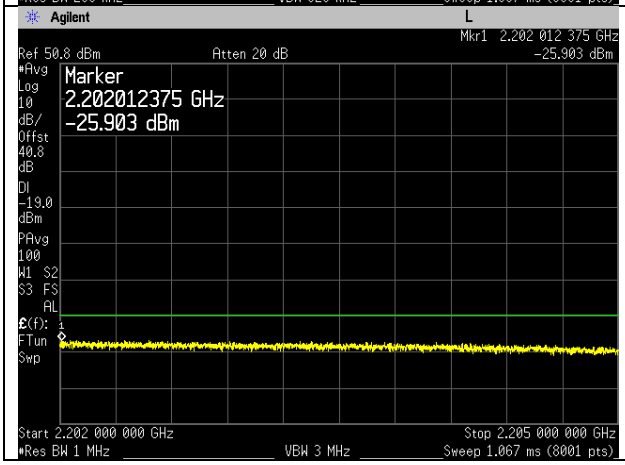




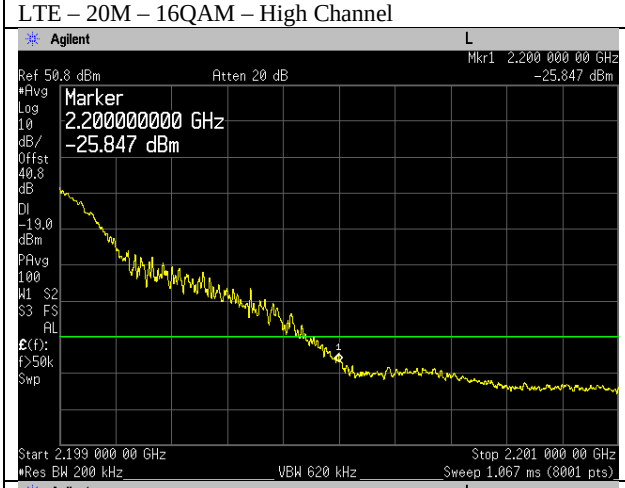
LTE – 20M – QPSK – High Channel

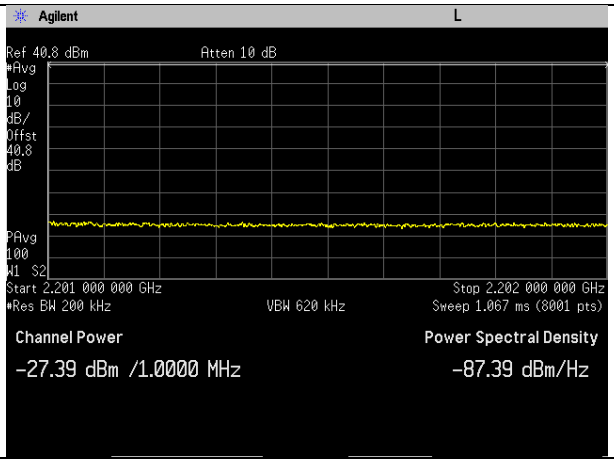


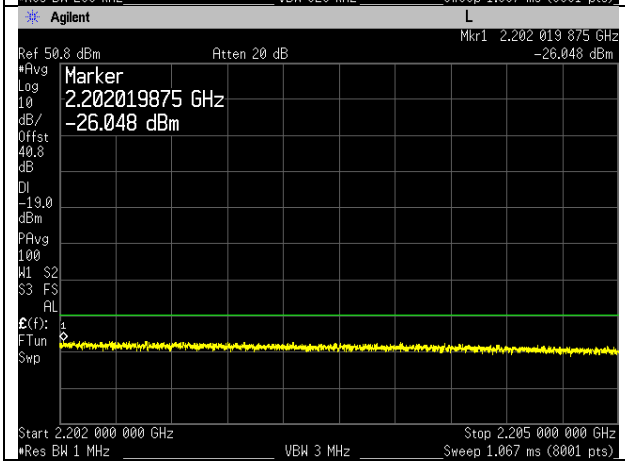




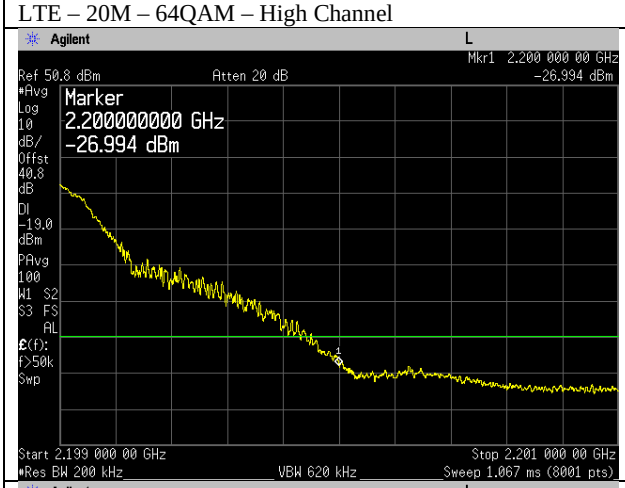
LTE – 20M – 16QAM – High Channel

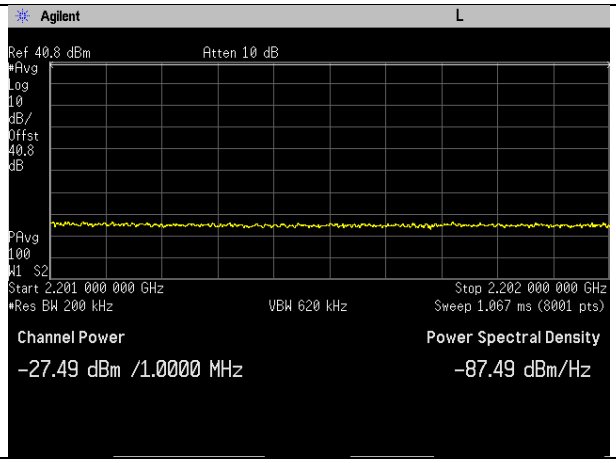


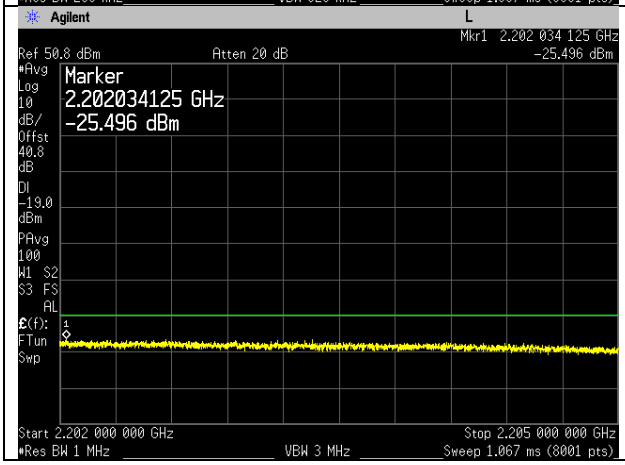




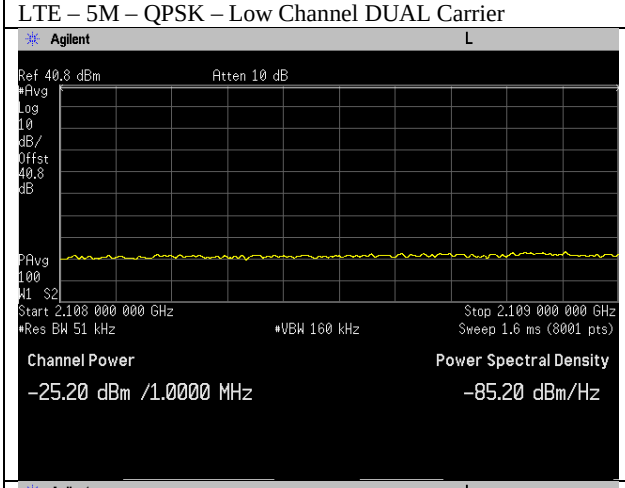
LTE – 20M – 64QAM – High Channel

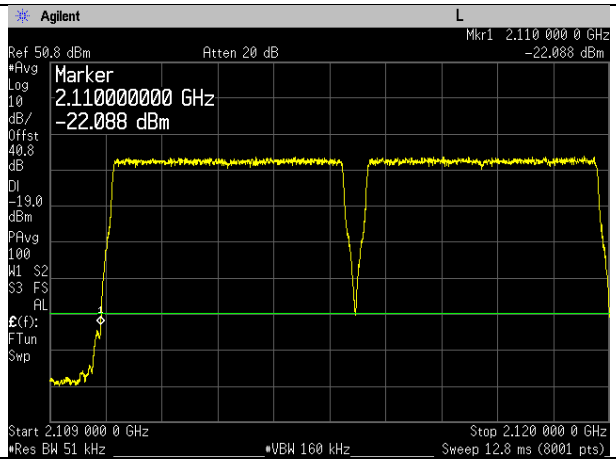


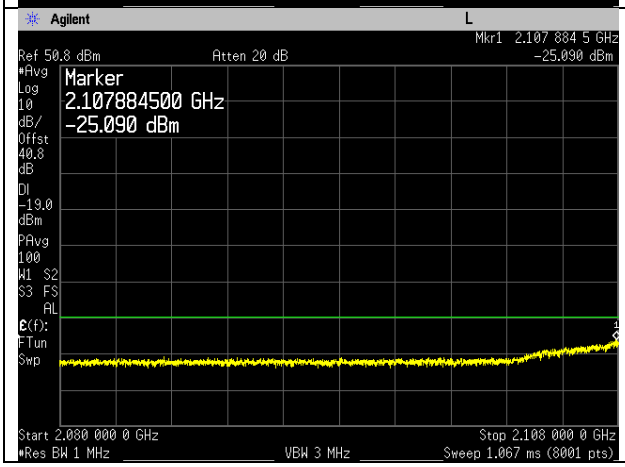




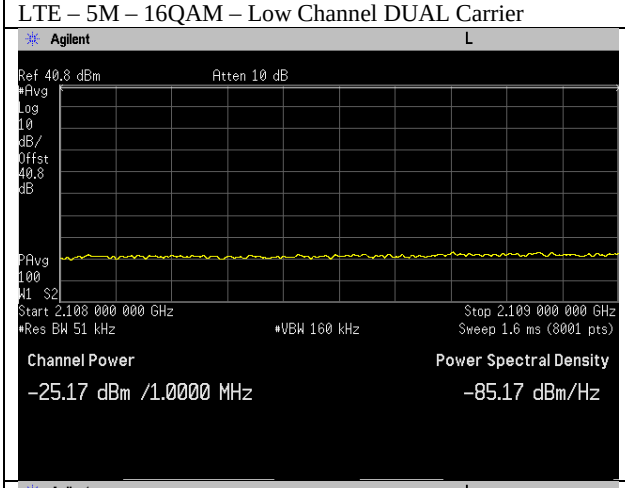
LTE – 5M – QPSK – Low Channel DUAL Carrier

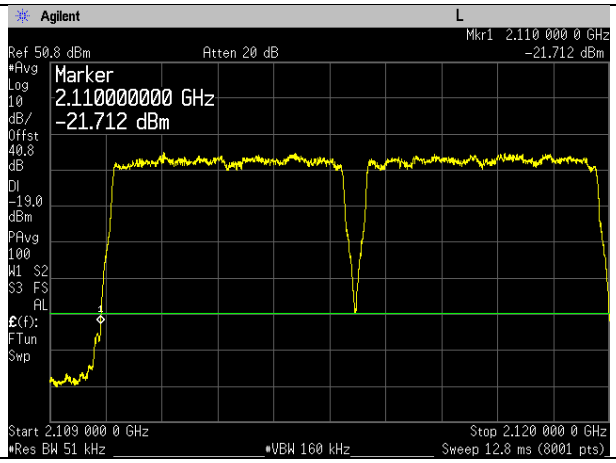


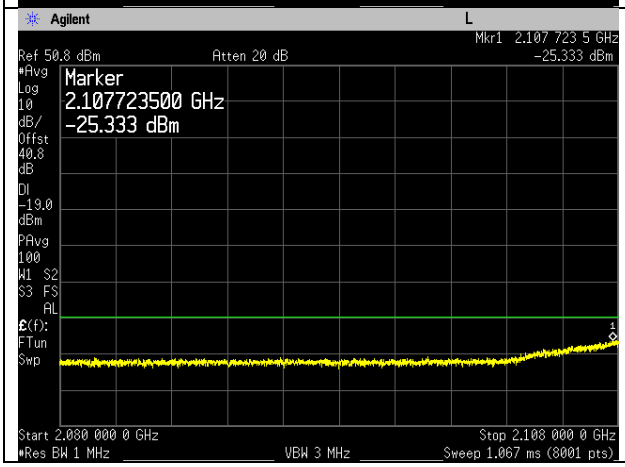




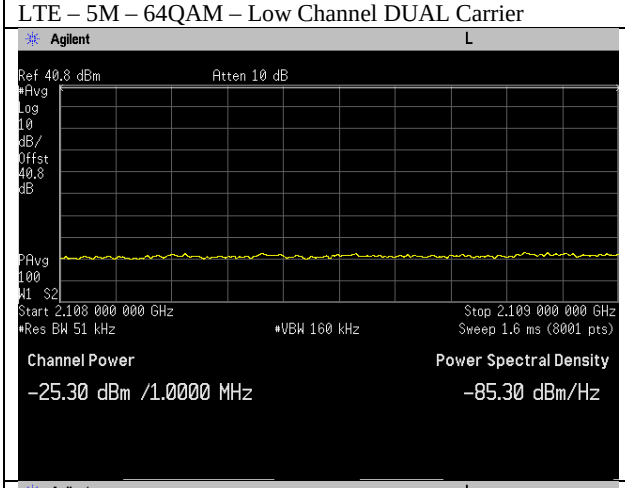
LTE – 5M – 16QAM – Low Channel DUAL Carrier

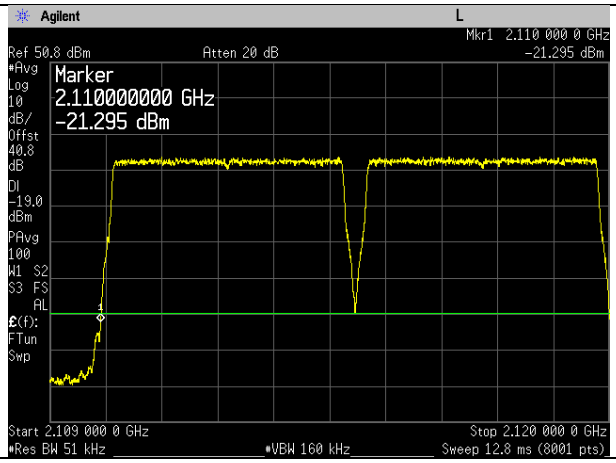


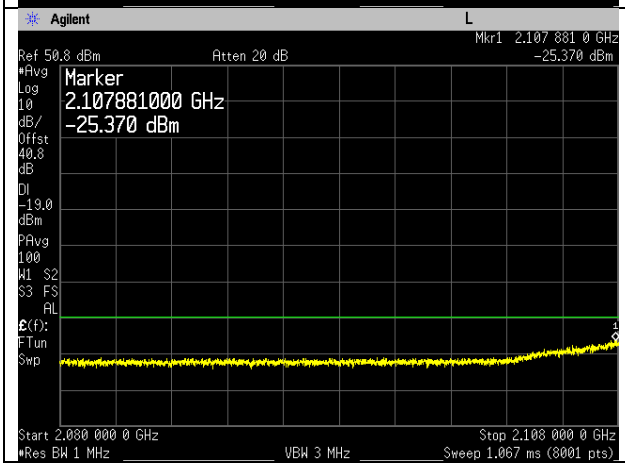




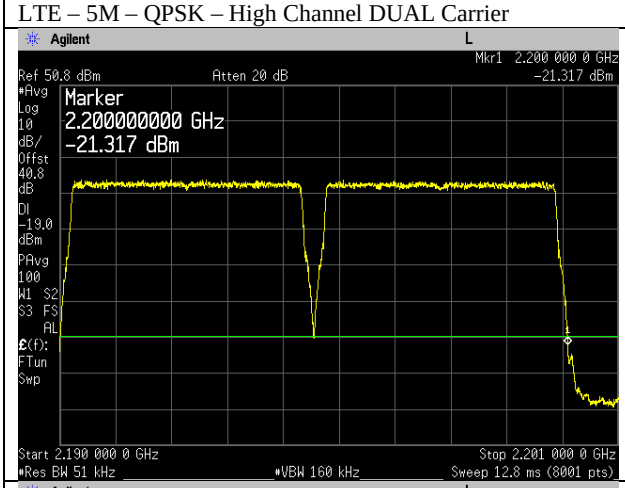
LTE – 5M – 64QAM – Low Channel DUAL Carrier

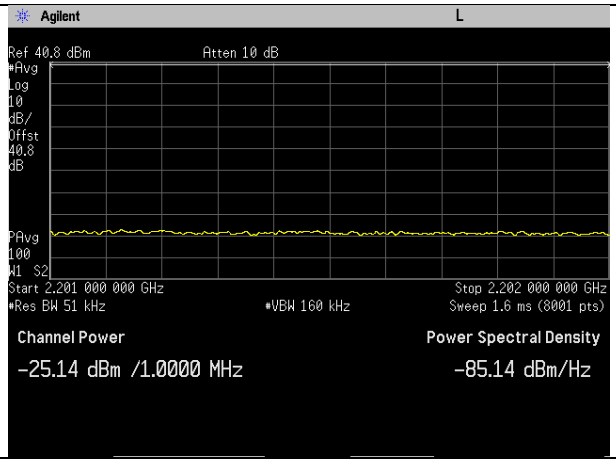


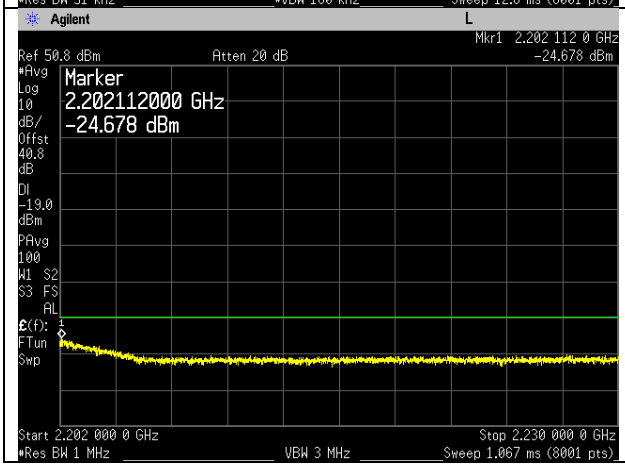




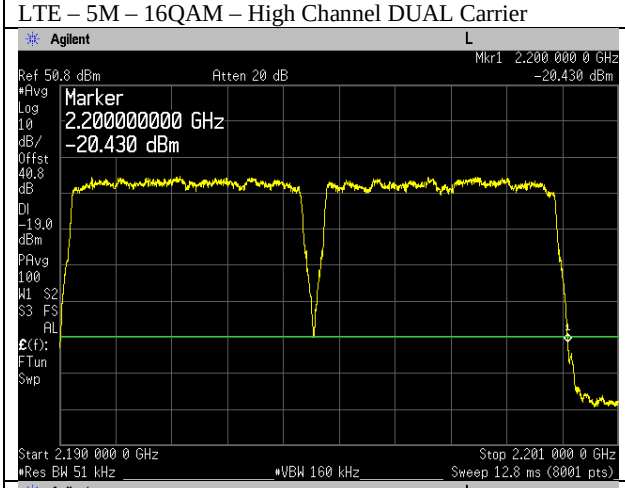
LTE – 5M – QPSK – High Channel DUAL Carrier

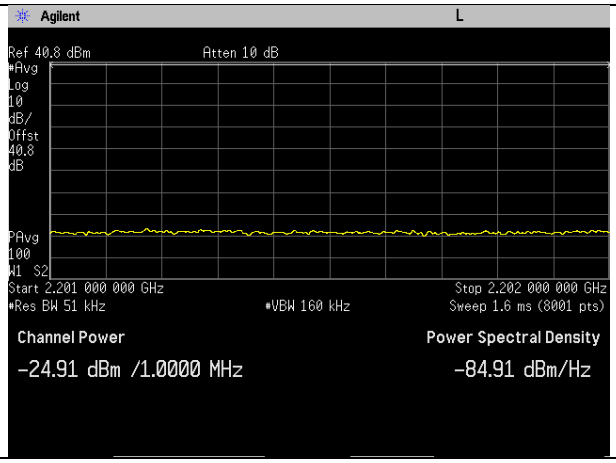


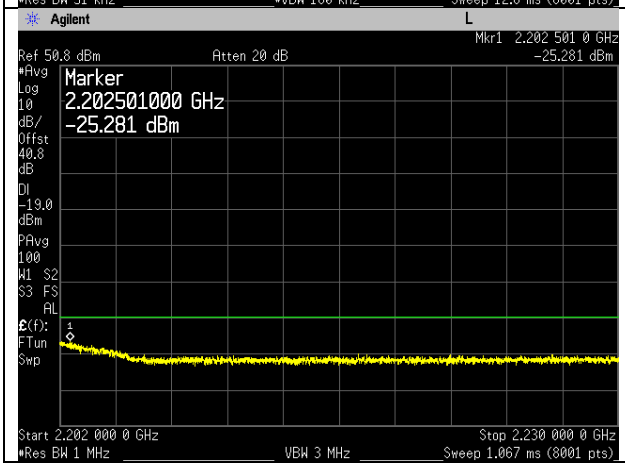




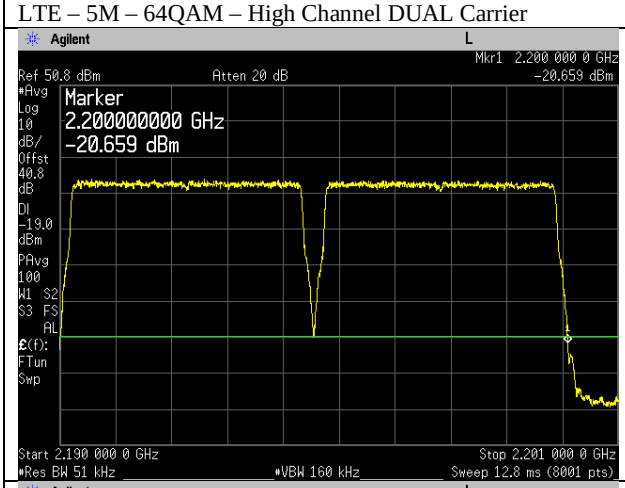
LTE – 5M – 16QAM – High Channel DUAL Carrier

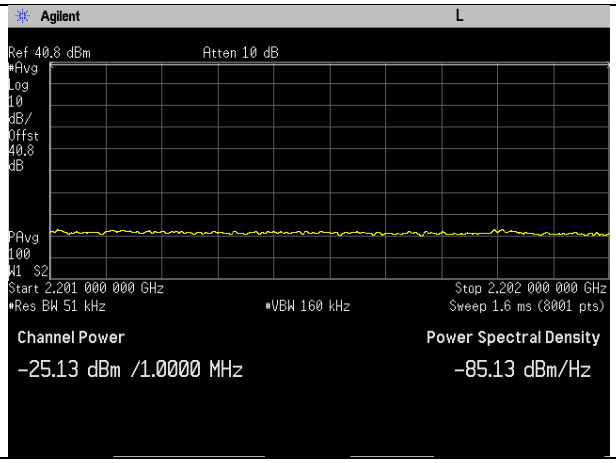


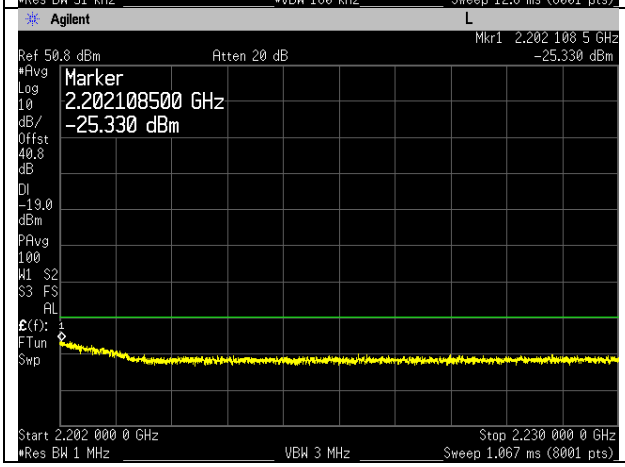




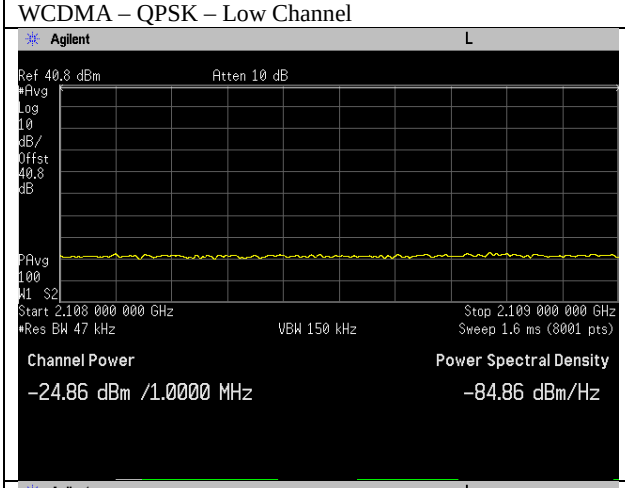
LTE – 5M – 64QAM – High Channel DUAL Carrier

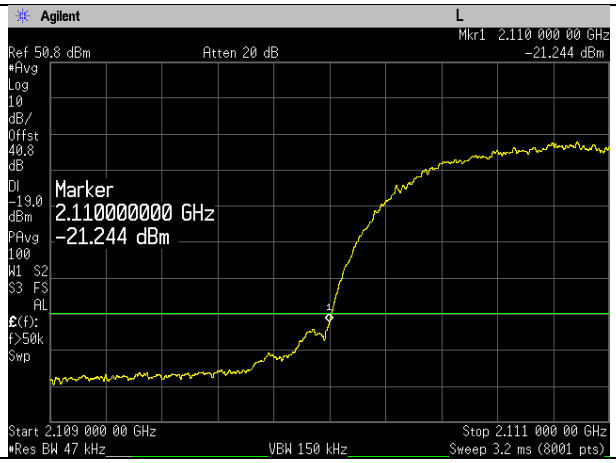


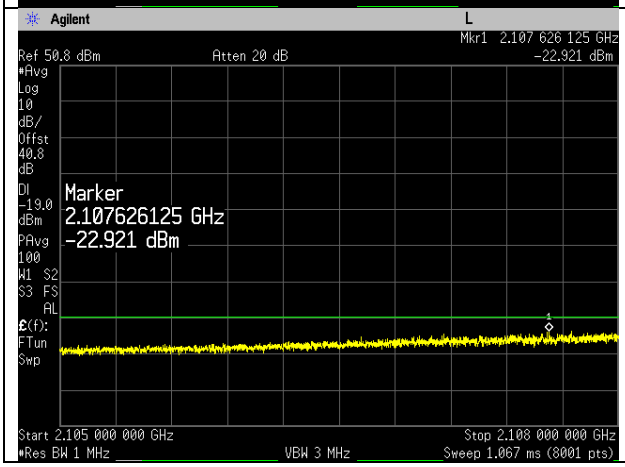




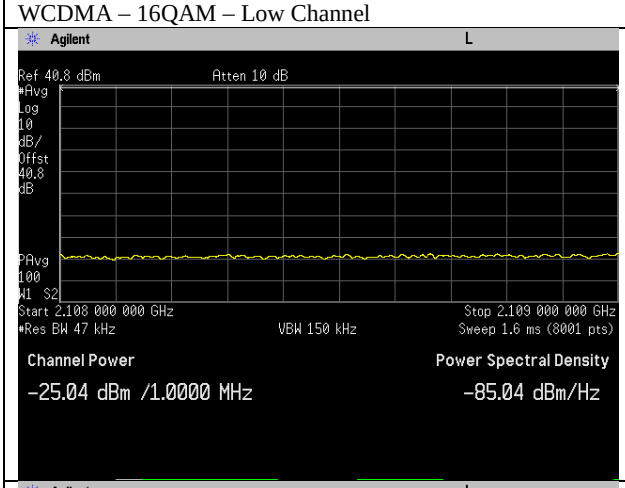
WCDMA – QPSK – Low Channel

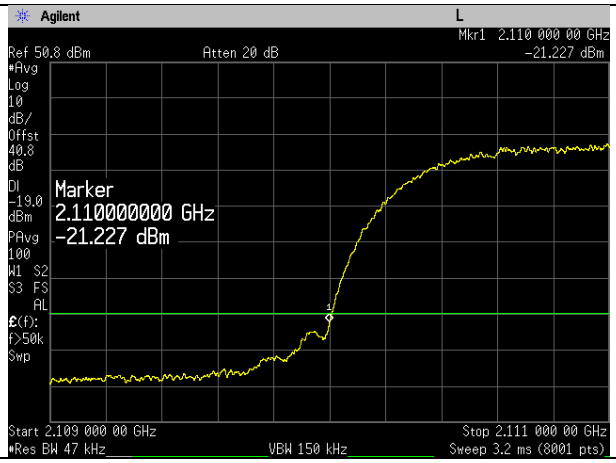


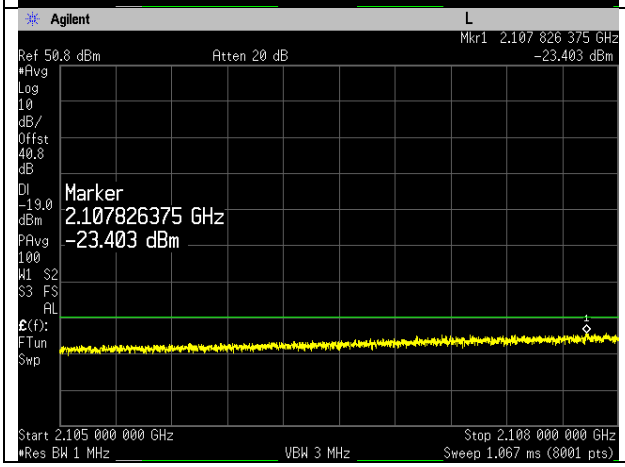




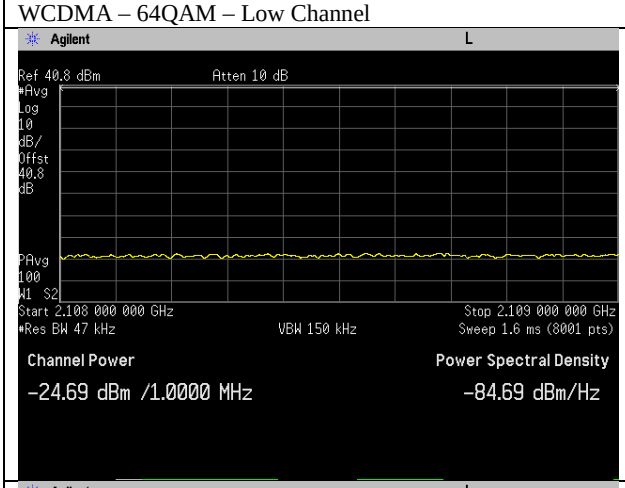
WCDMA – 16QAM – Low Channel

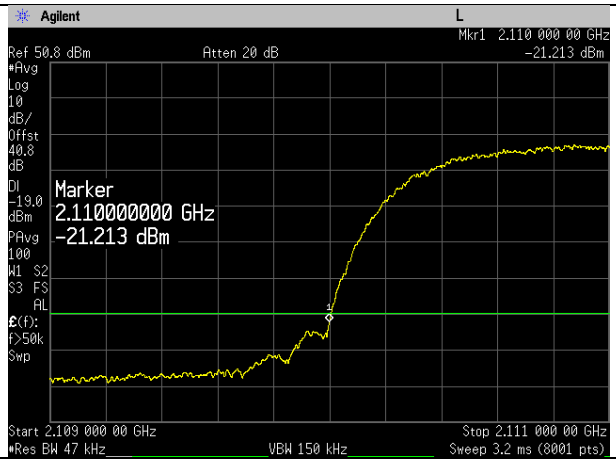


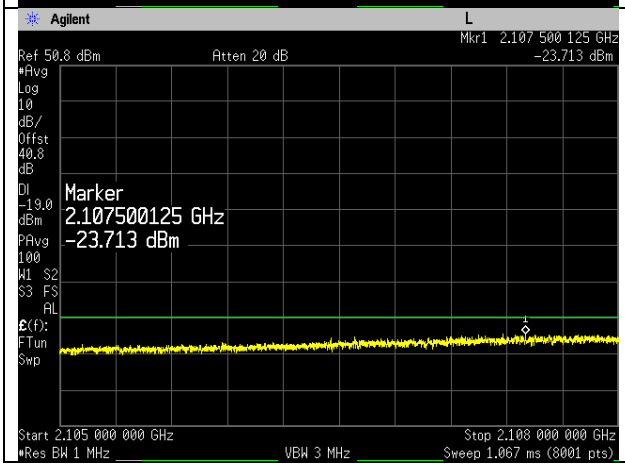




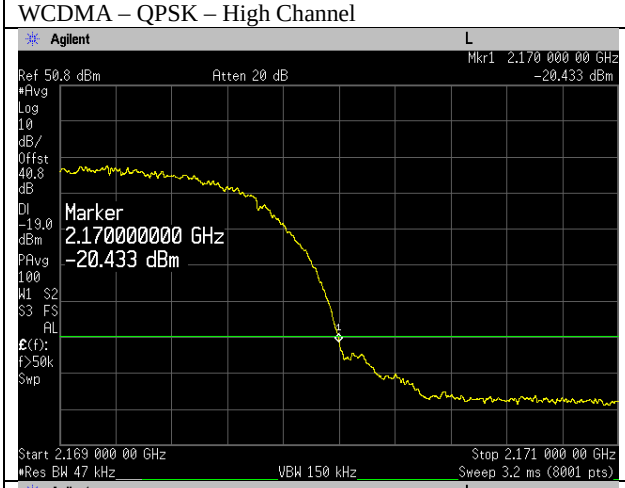
WCDMA – 64QAM – Low Channel

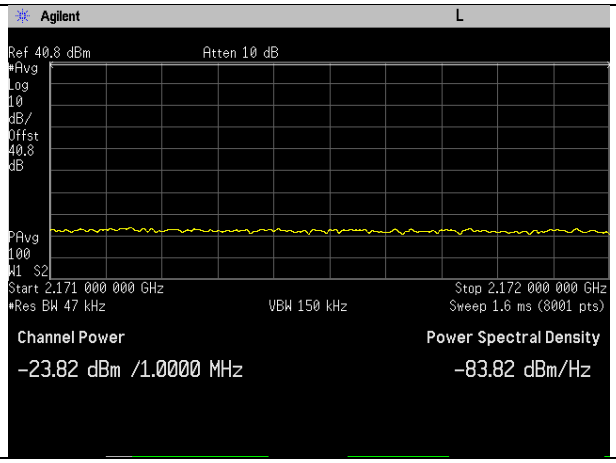


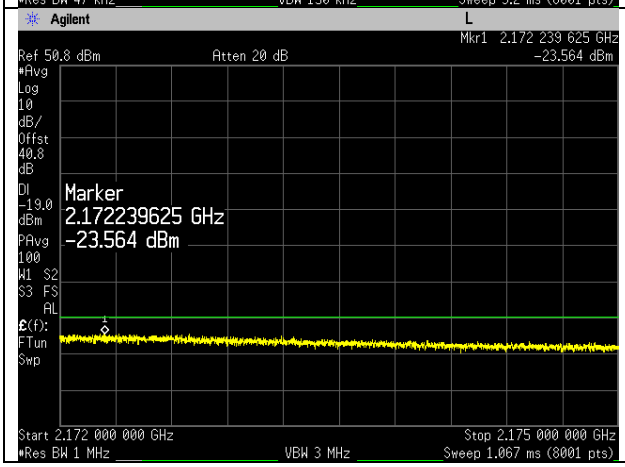




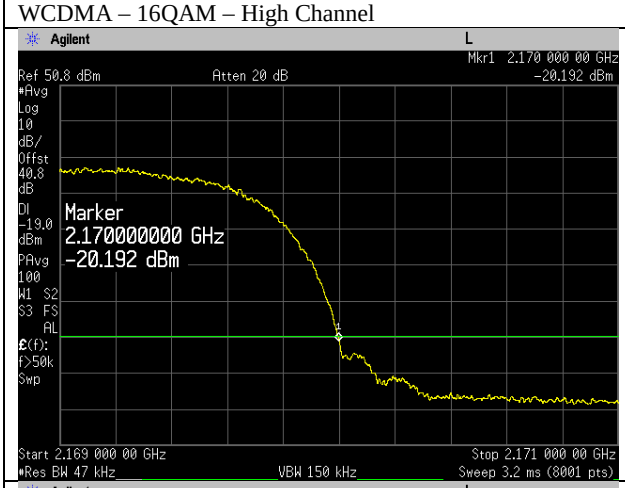
WCDMA – QPSK – High Channel

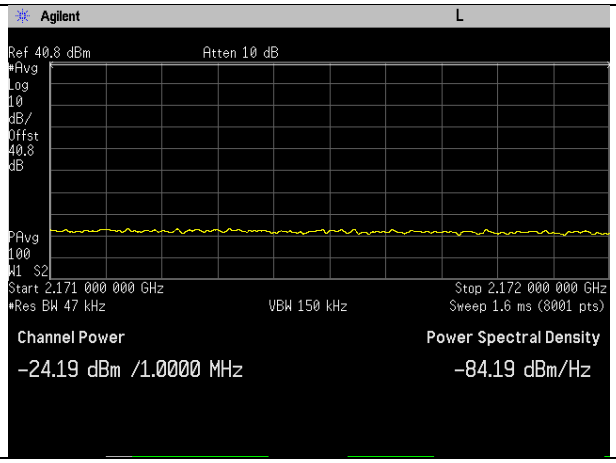


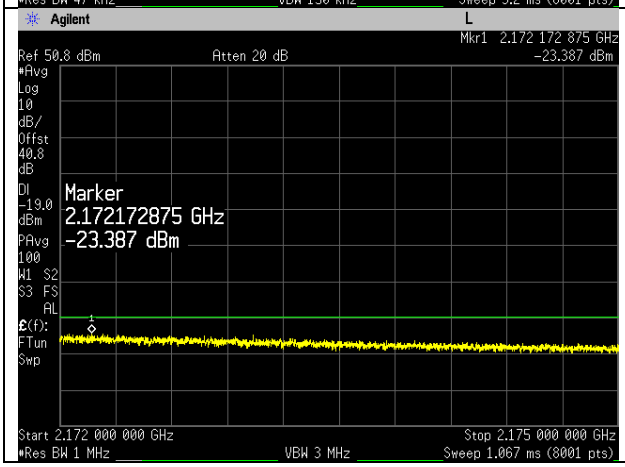




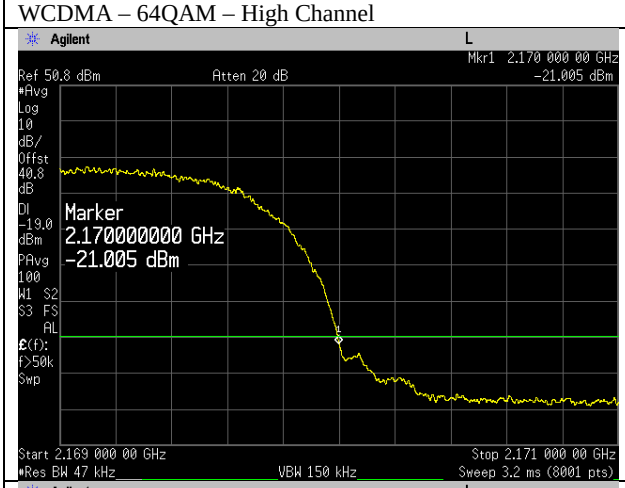
WCDMA – 16QAM – High Channel

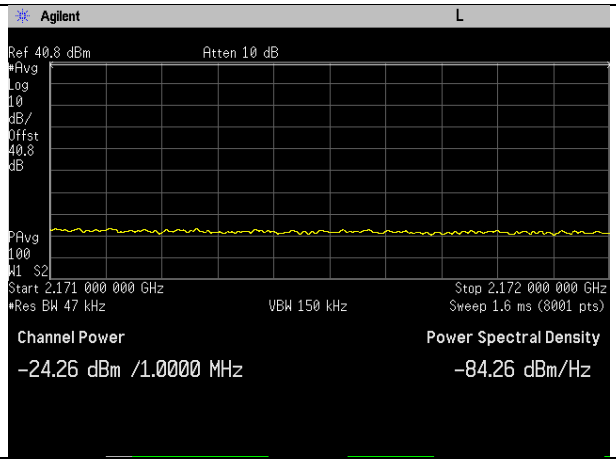


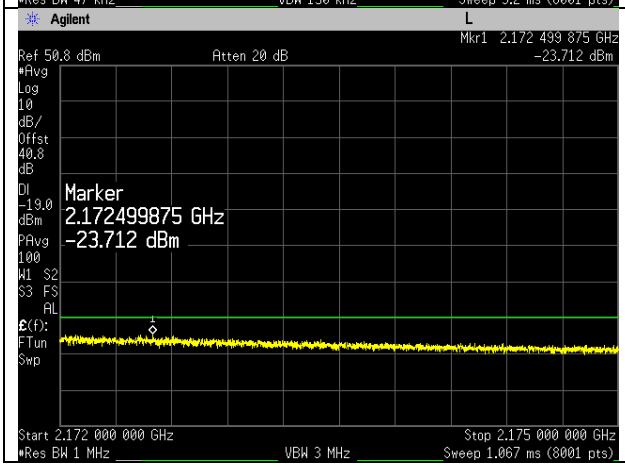




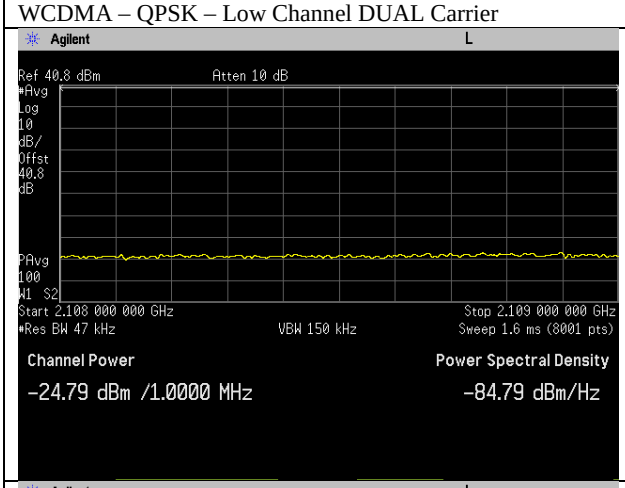
WCDMA – 64QAM – High Channel

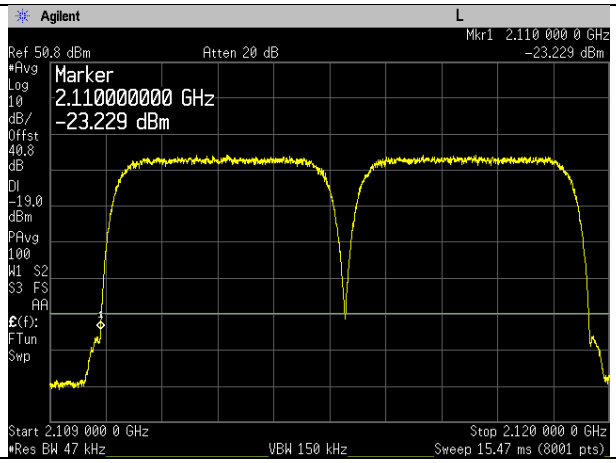


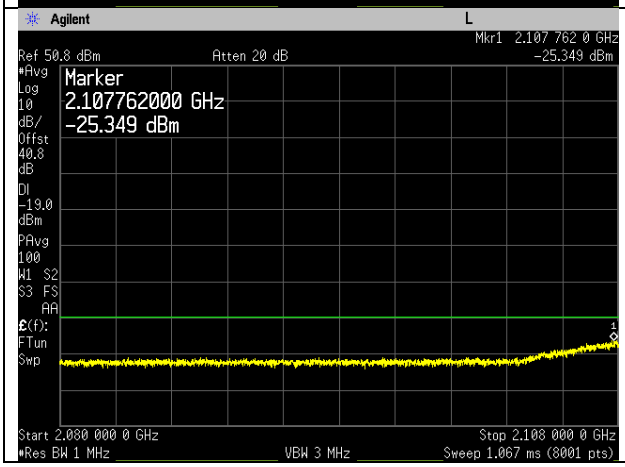




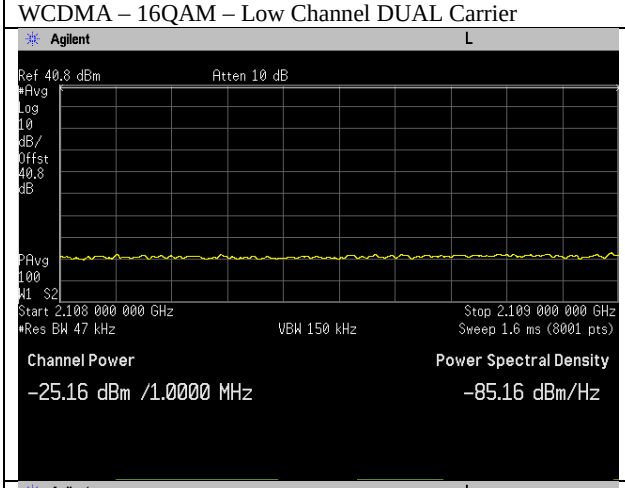
WCDMA – QPSK – Low Channel DUAL Carrier

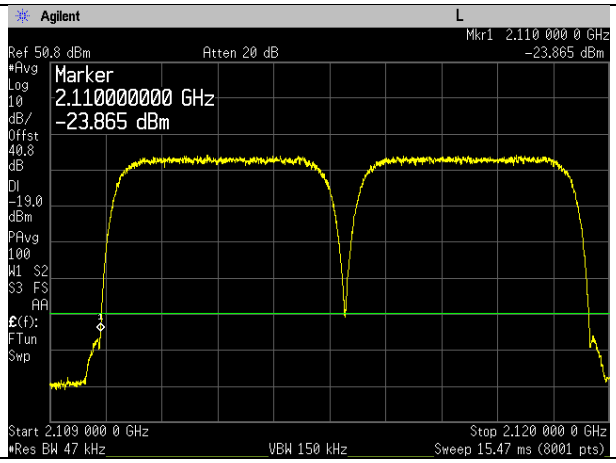


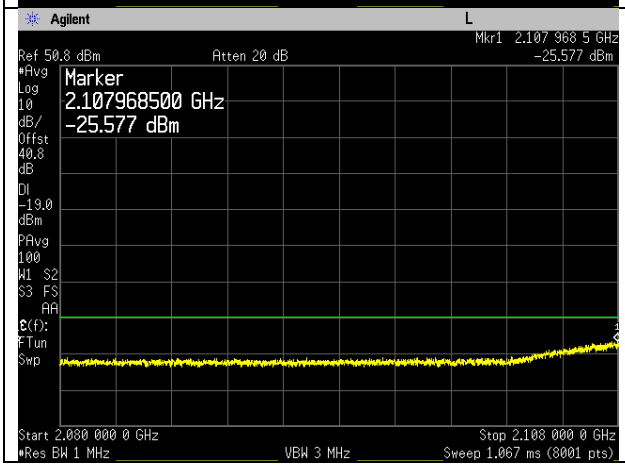




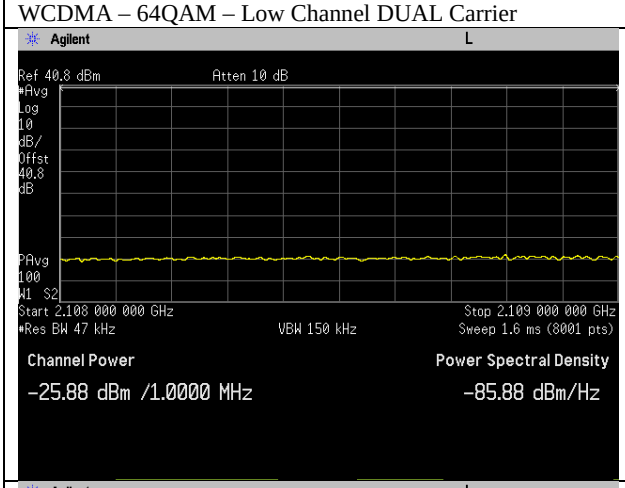
WCDMA – 16QAM – Low Channel DUAL Carrier

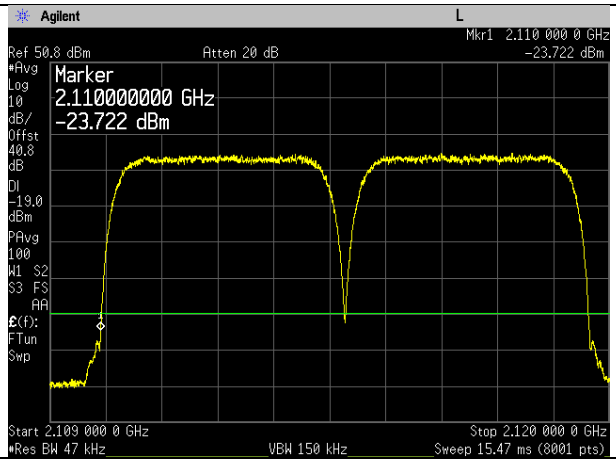


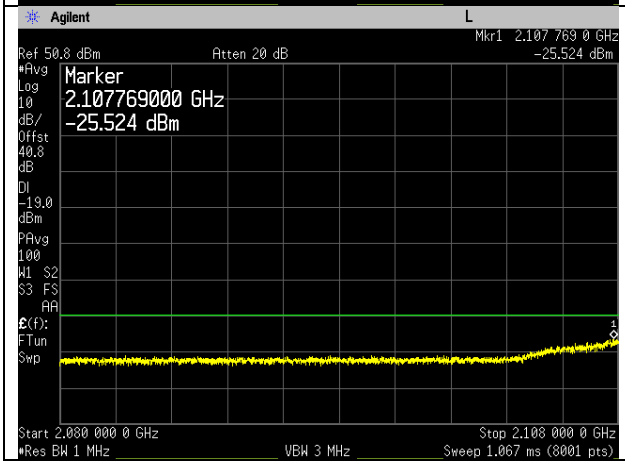




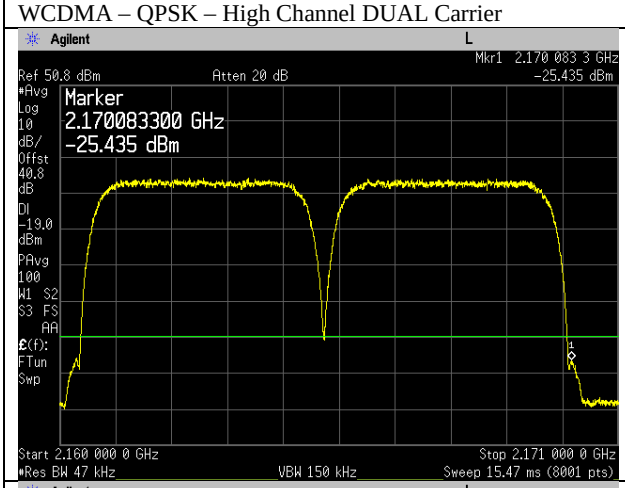
WCDMA – 64QAM – Low Channel DUAL Carrier

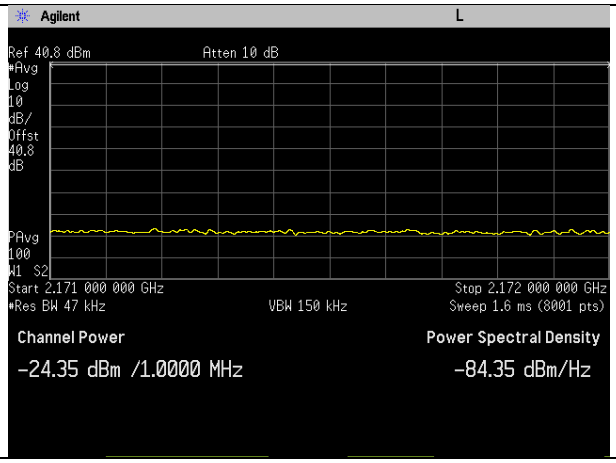


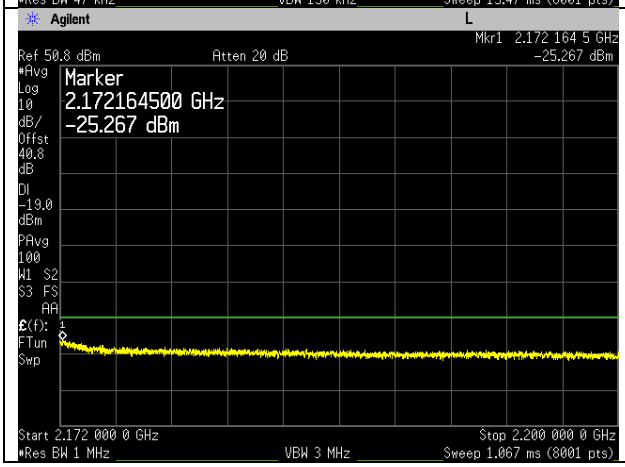




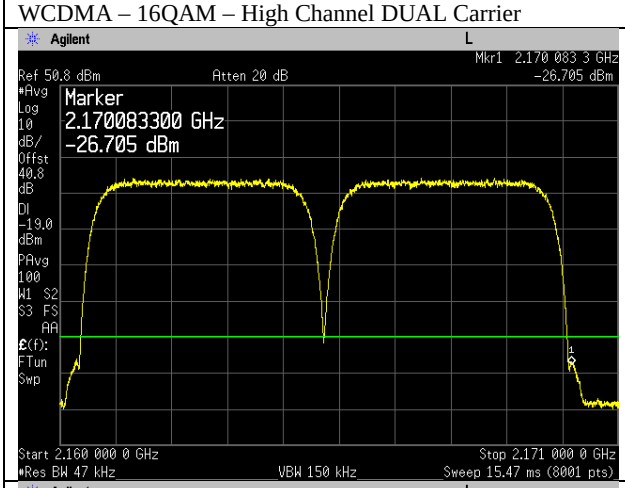
WCDMA – QPSK – High Channel DUAL Carrier

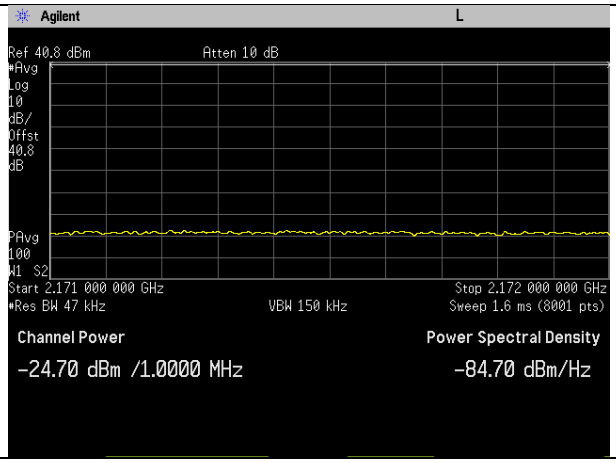


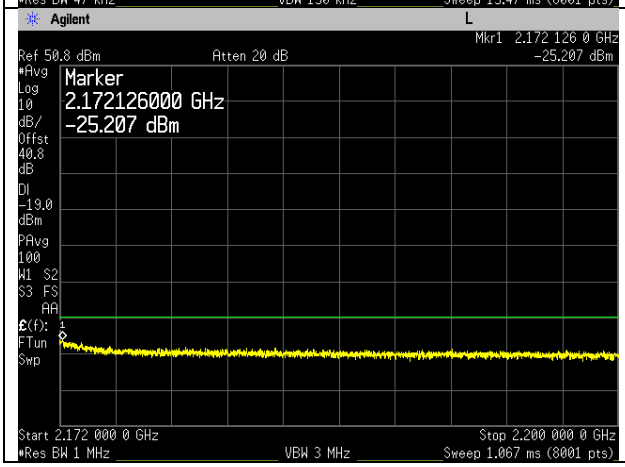




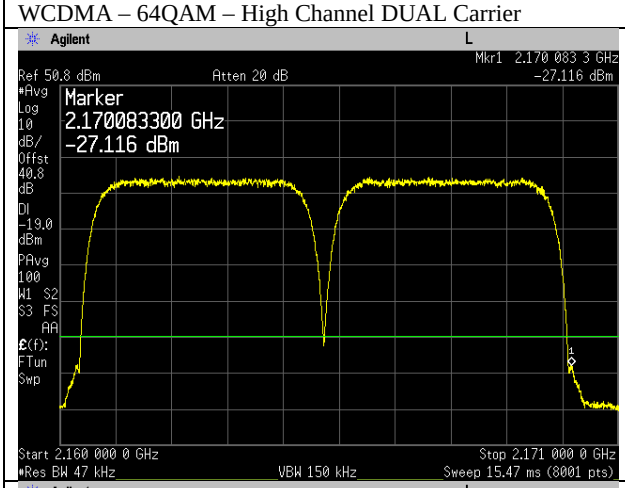
WCDMA – 16QAM – High Channel DUAL Carrier

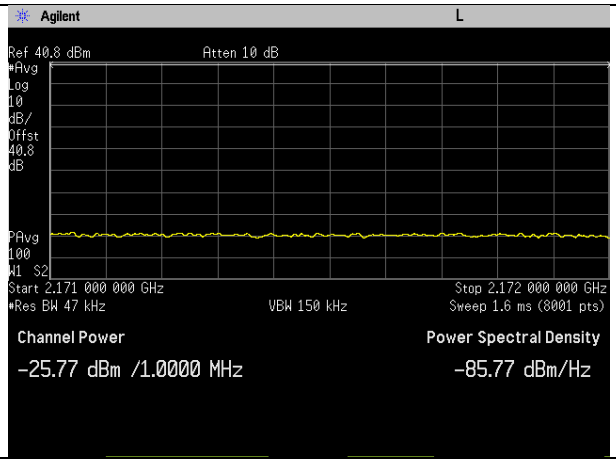


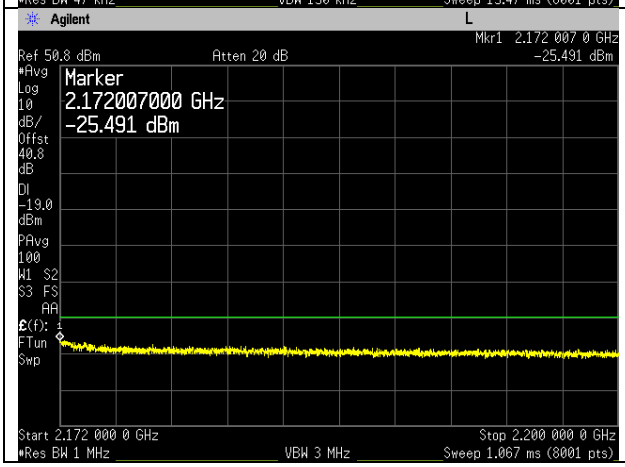




WCDMA – 64QAM – High Channel DUAL Carrier







Transmitter Antenna Port Conducted Spurious Emissions

Tests performed at Port 4 on center channel for all modulations and bandwidth modes. Due to 4x4 MIMO operation, limit is -19.03dBm (-13dBm – 10*log(4)) per FCC KDB 662911D01 v02r01.

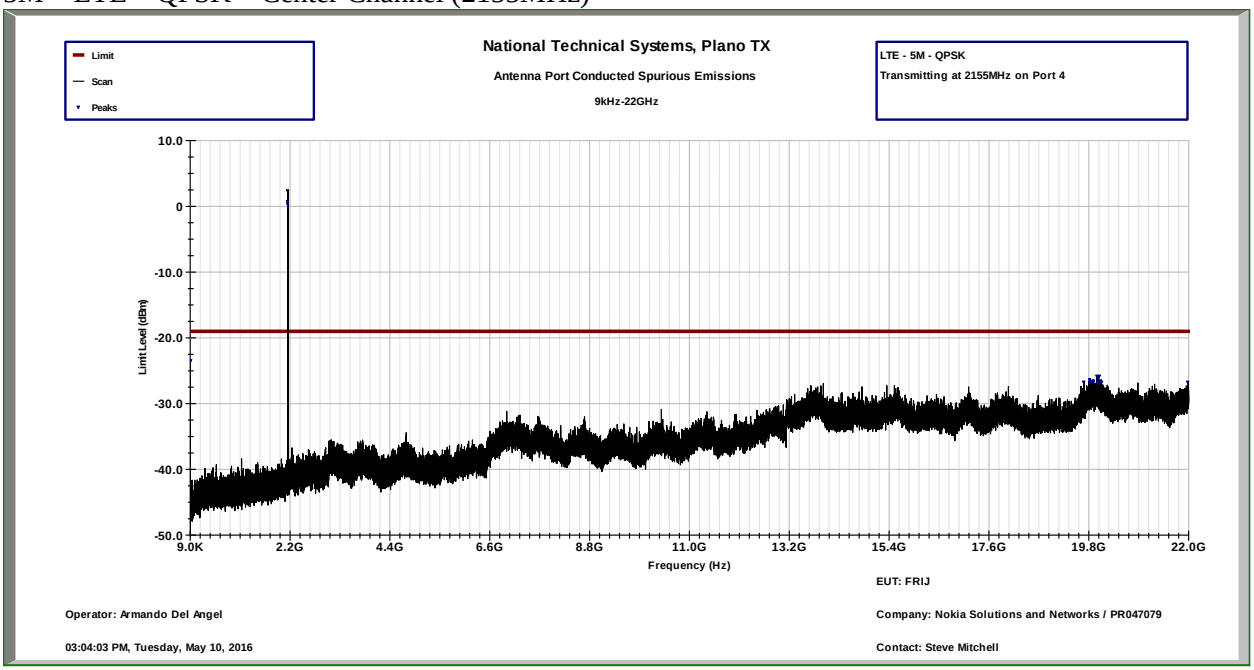
TILE6 measurement software was used during testing with the following settings:

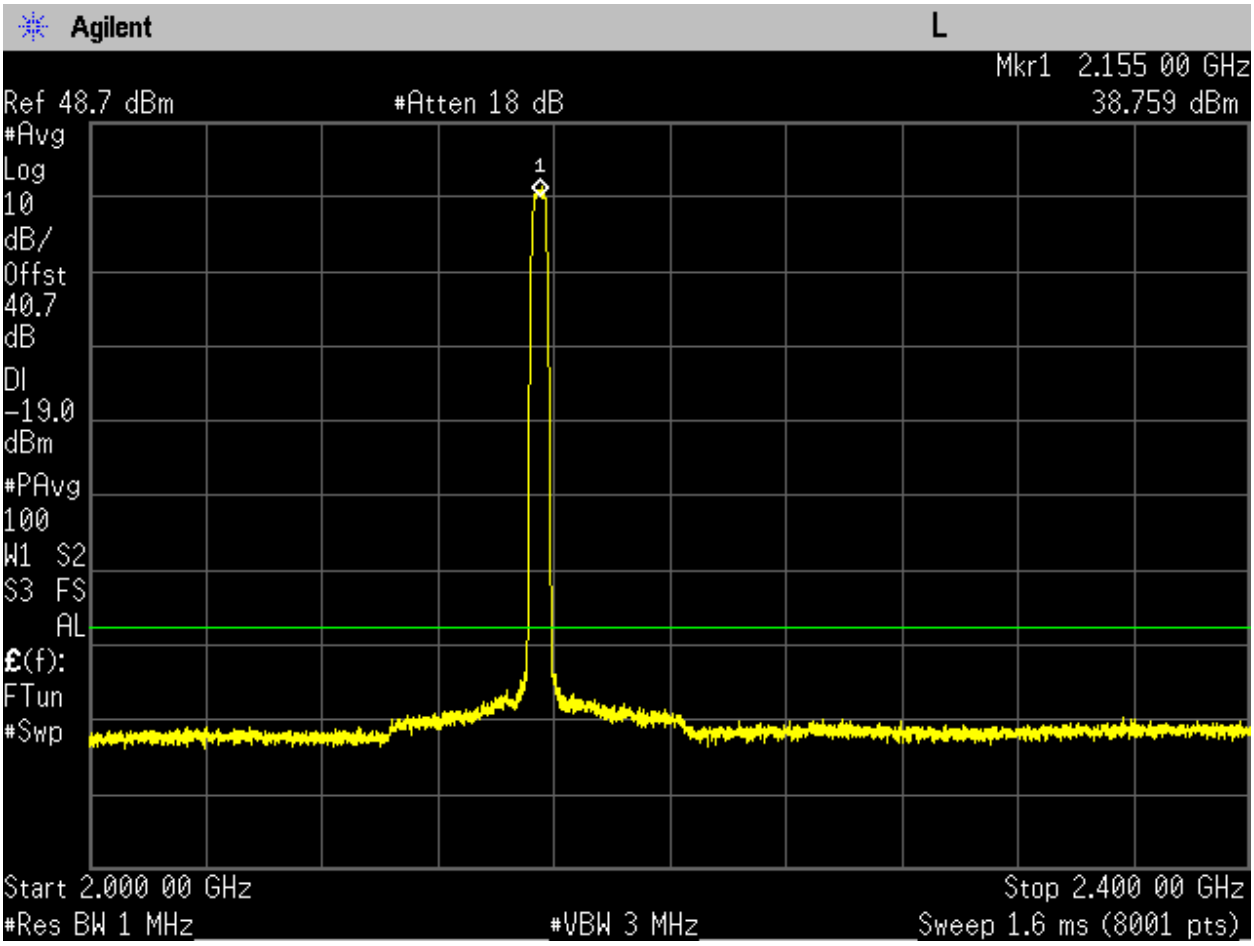
Frequency Range	**RBW**	**VBW**	**Number of data points**	**Divided into**	**Detector**	**Sweep Time**	**Max hold over**
9kHz-150kHz	1kHz	3kHz	8000	1 segment	Peak	Auto	50 sweeps
150kHz-1.5MHz	100kHz	300kHz	8000	1 segments	Peak	Auto	50 sweeps
1.5MHz-22GHz	1MHz	3MHz	8000	10 segments	Peak	Auto	50 sweeps

In order to reduce the measurement instrumentation noise floor in addition to a 40dB attenuator a notch filter was also used and the PSA's internal attenuation was reduced to 0dB. An additional measurement was taken without the filter in order to measure the filter's stop-band. In that case, only 40db of external attenuation was used.

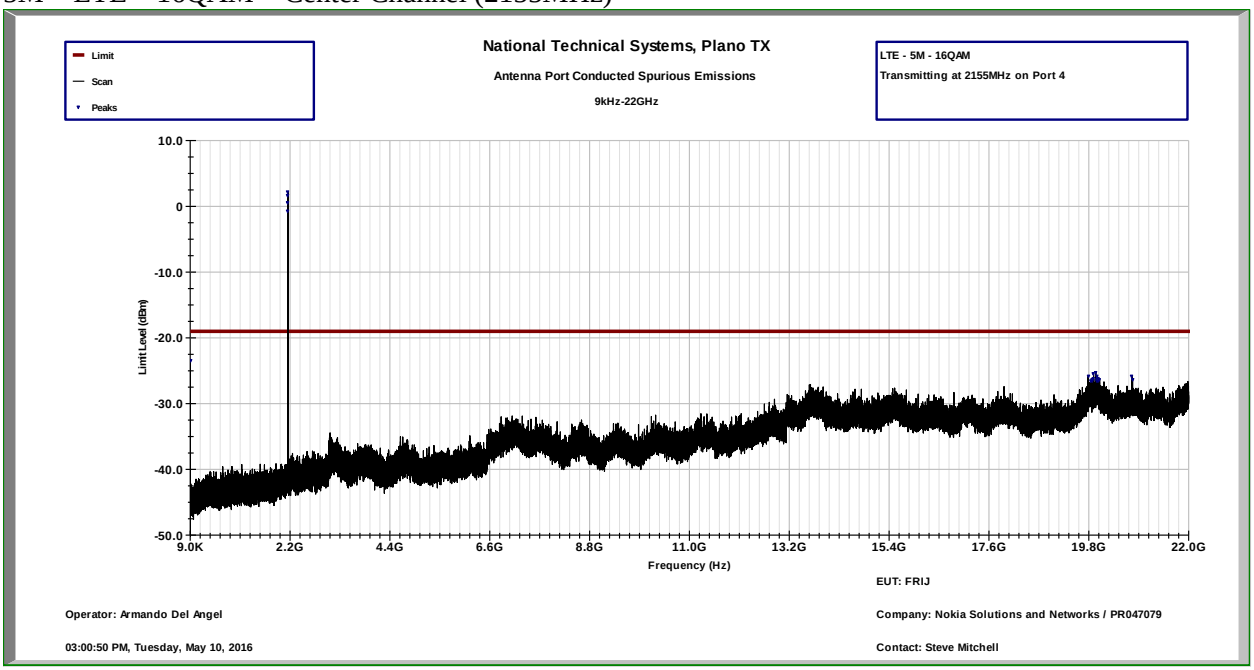
Corresponding plots are included on the following pages.

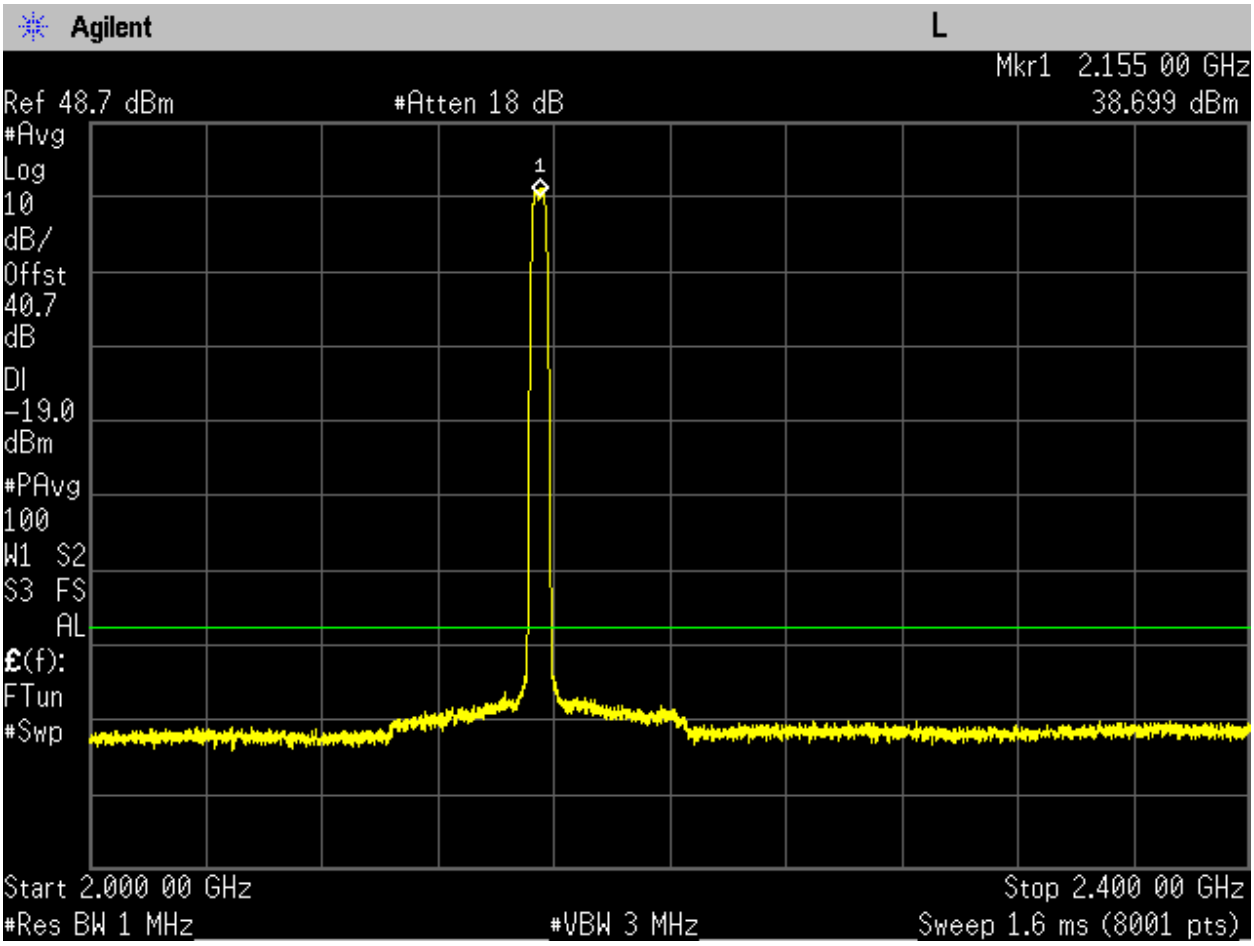
5M – LTE – QPSK – Center Channel (2155MHz)



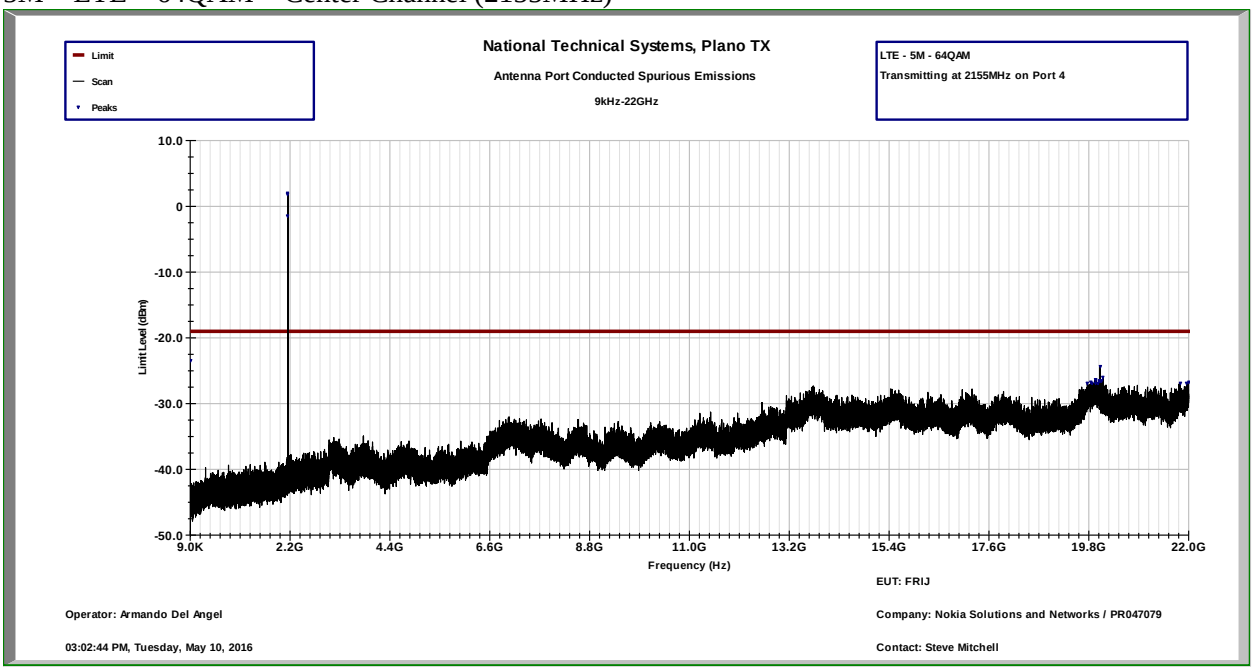


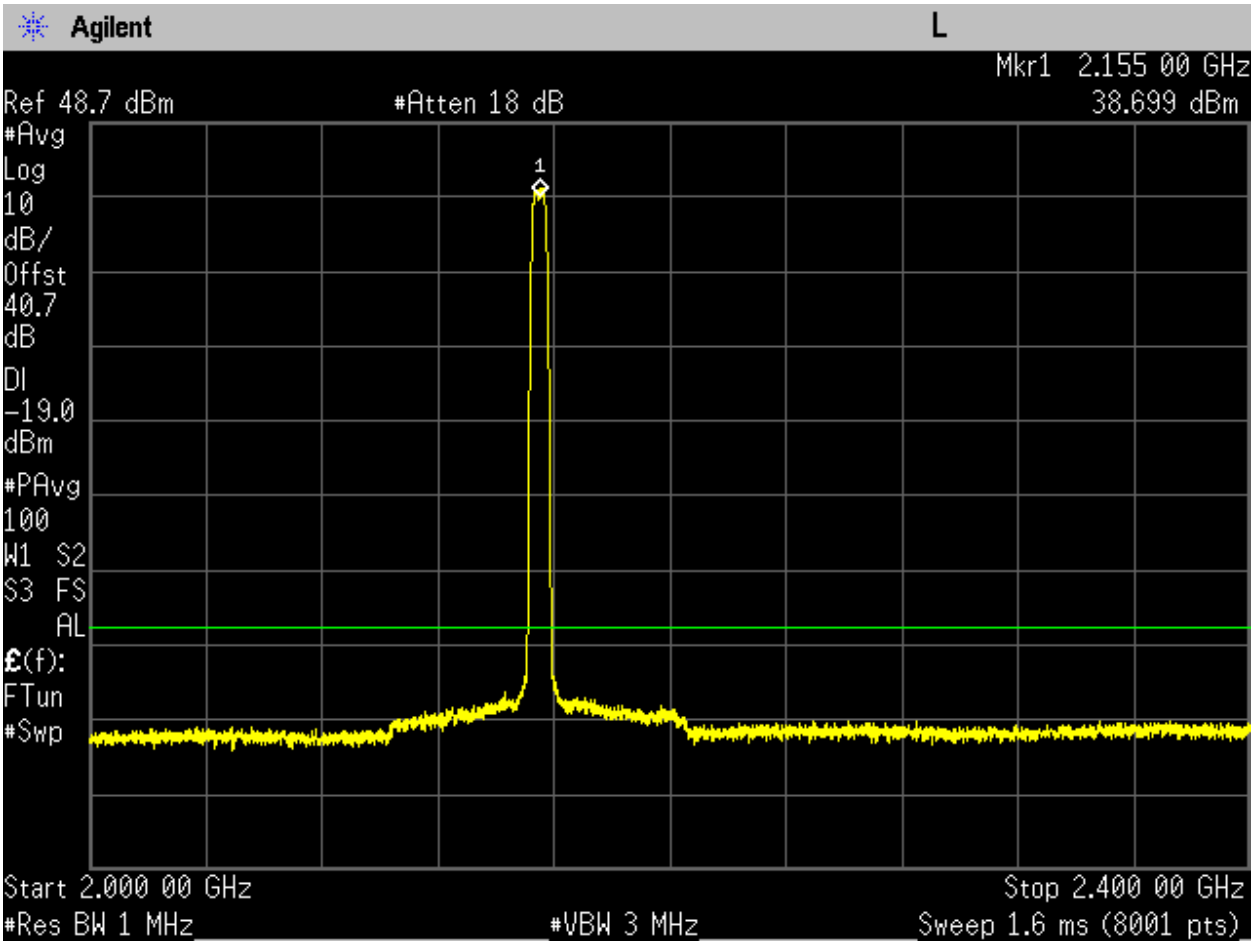
5M – LTE – 16QAM – Center Channel (2155MHz)



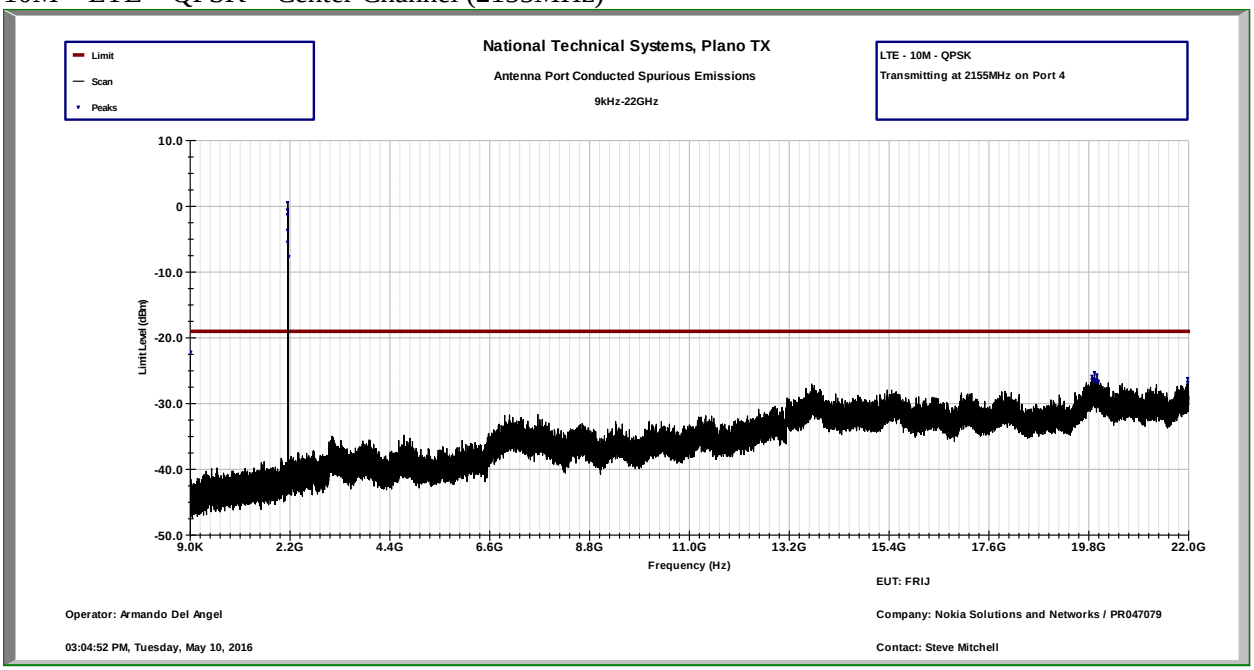


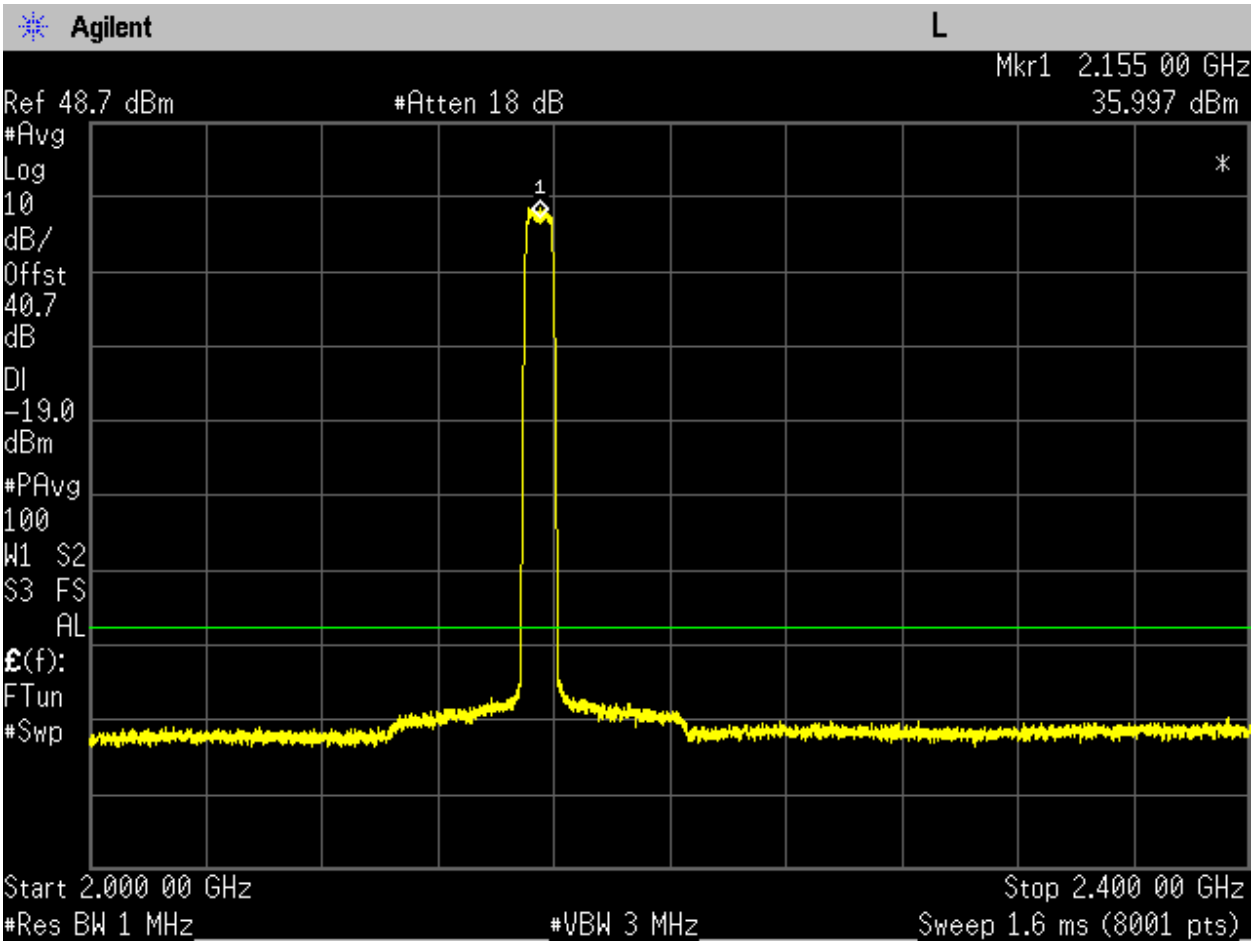
5M – LTE – 64QAM – Center Channel (2155MHz)



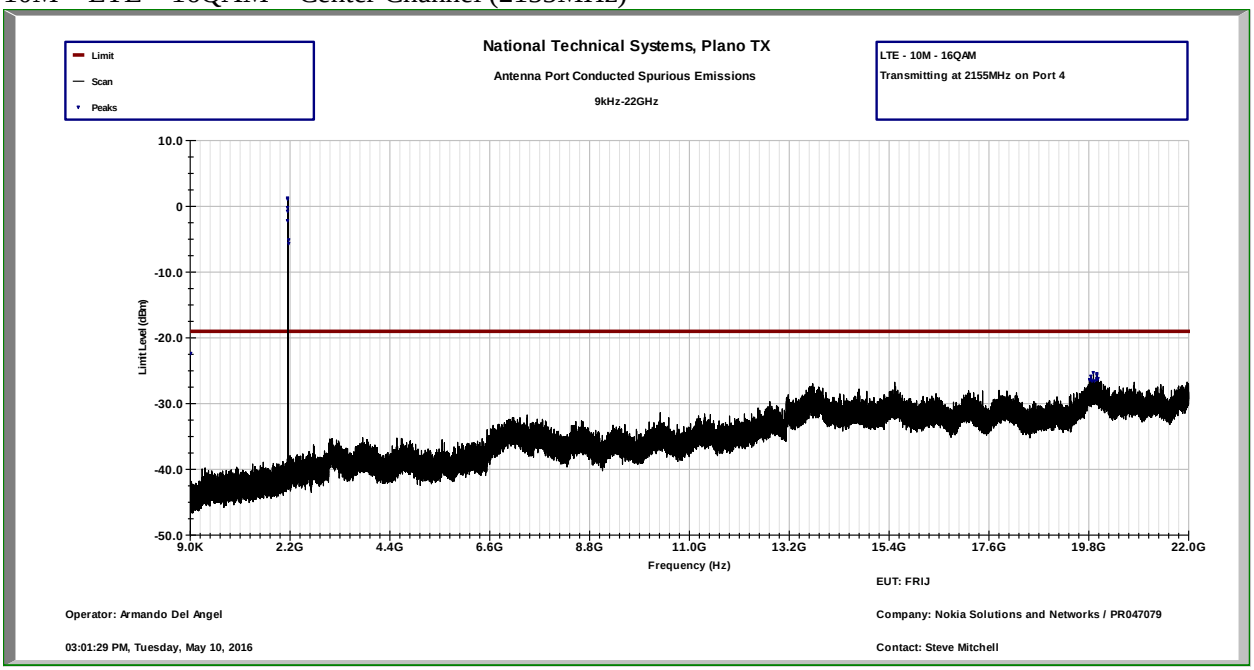


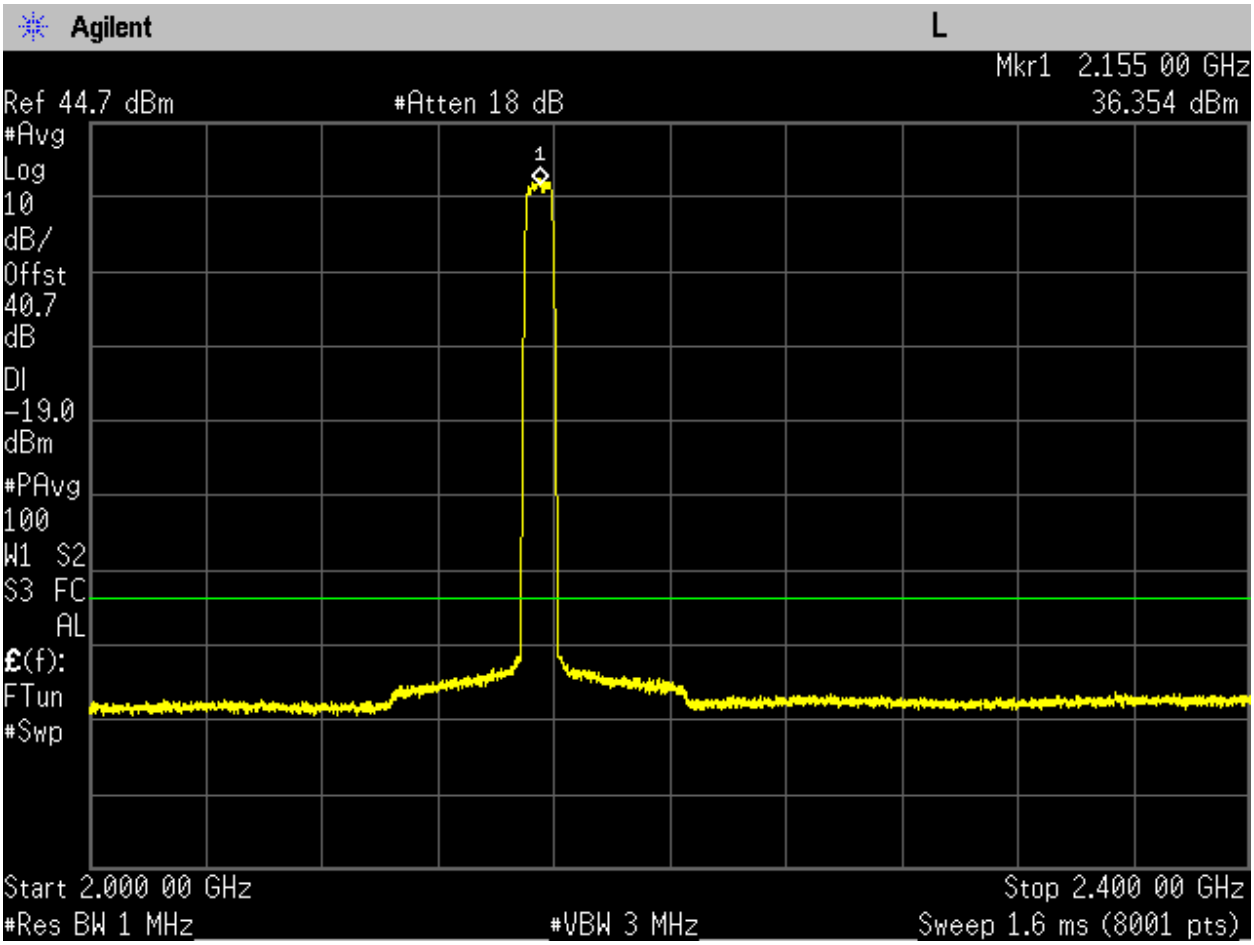
10M – LTE – QPSK – Center Channel (2155MHz)



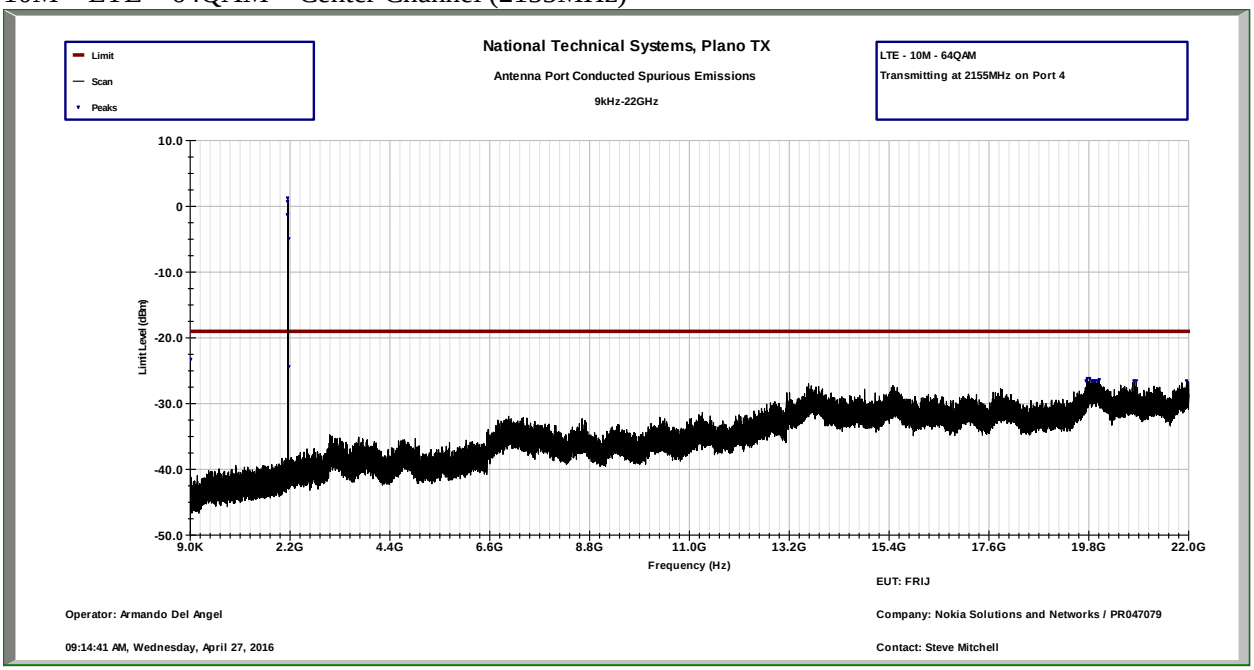


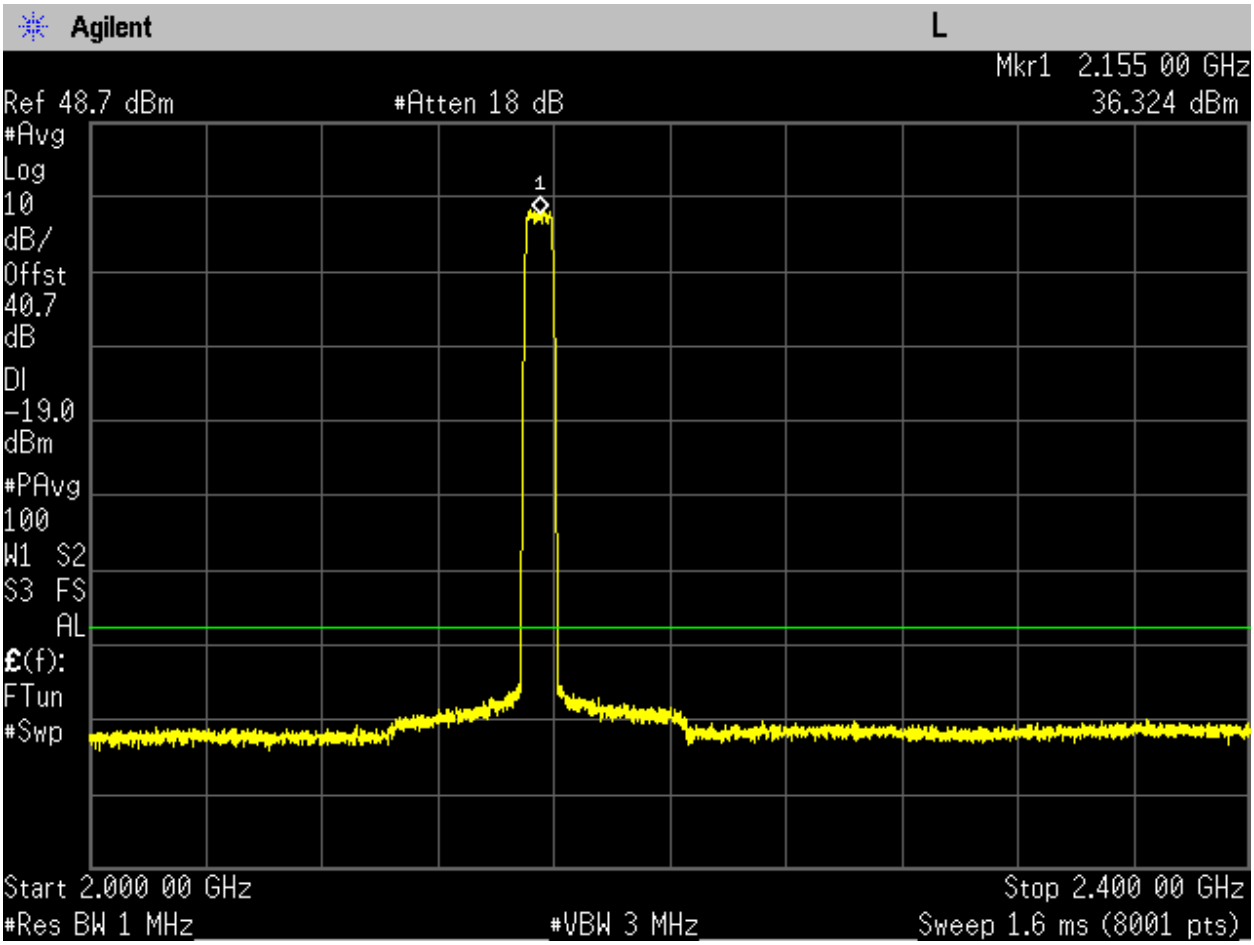
10M – LTE – 16QAM – Center Channel (2155MHz)



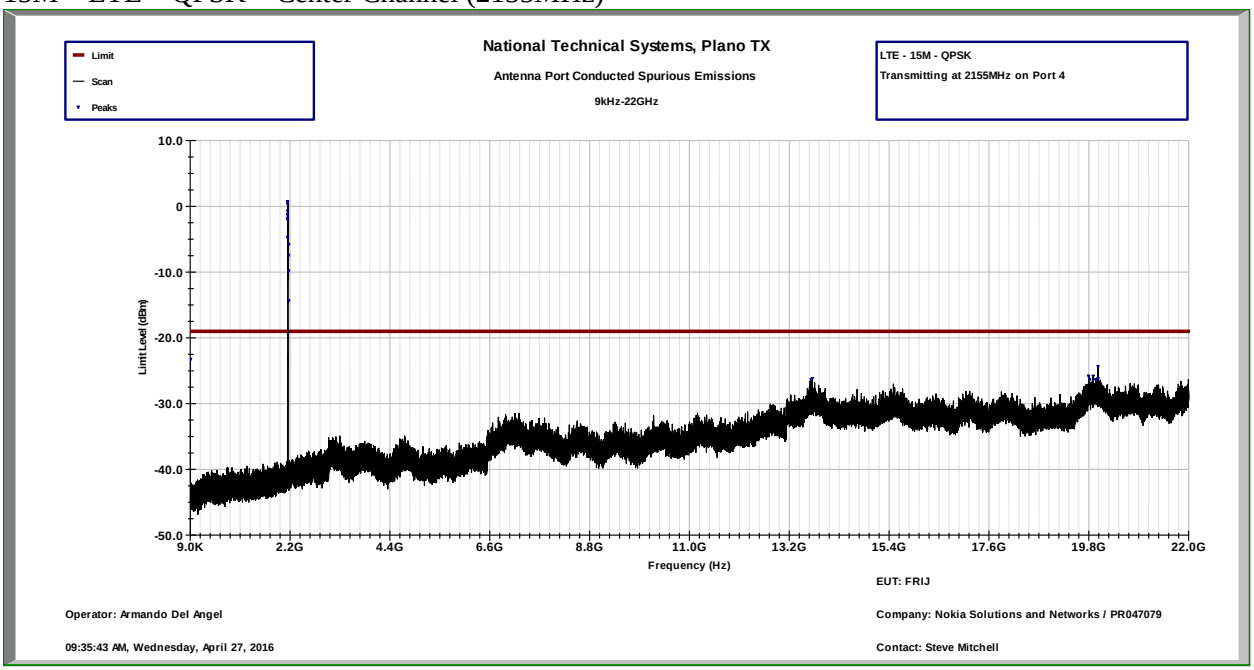


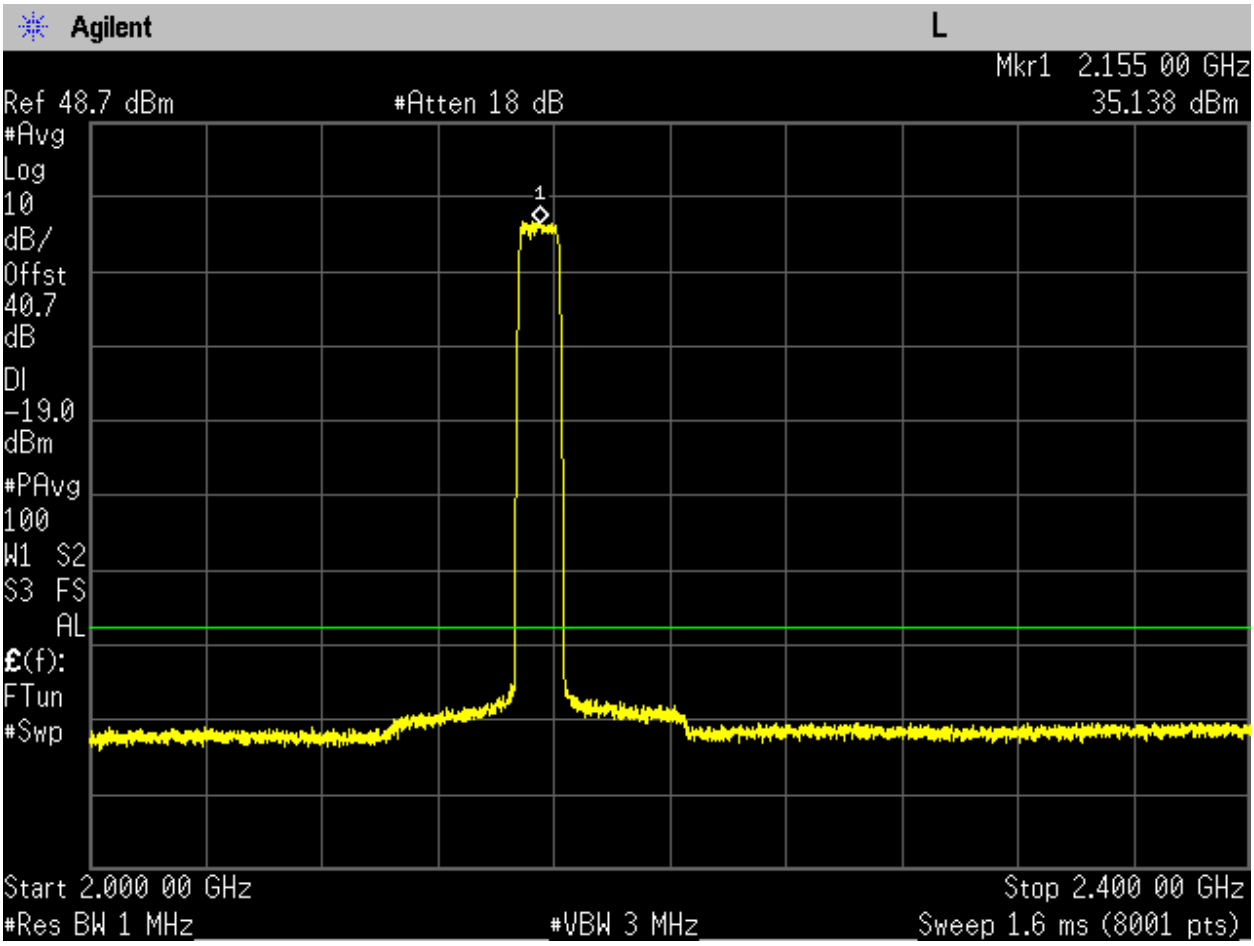
10M – LTE – 64QAM – Center Channel (2155MHz)





15M – LTE – QPSK – Center Channel (2155MHz)





15M – LTE – 16QAM – Center Channel (2155MHz)