

Antenna Port Conducted Bandedge

90.543(e):

The FCC section 90.543(e)(3) limit is -13dBm for frequency ranges below 758MHz, above 805MHz and between 775MHz and 788MHz. The limit is further reduced by $10 \cdot \log(2)$ per FCC KDB 662911D01 v02r01 due to 2x2 MIMO operation, which brings it down to -16dBm.

In 5MHz channel bandwidth mode, low and high channels as well as dual carrier mode (low channel + high channel) configurations were tested. In 10MHz channel bandwidth mode, unit can only operate in single carrier mode at the center channel. All measurements made on Port 1

Results summary:

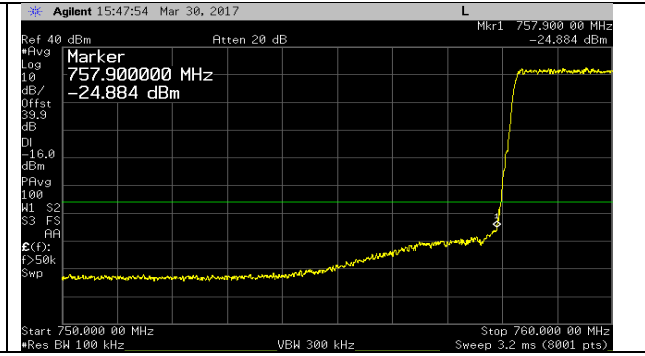
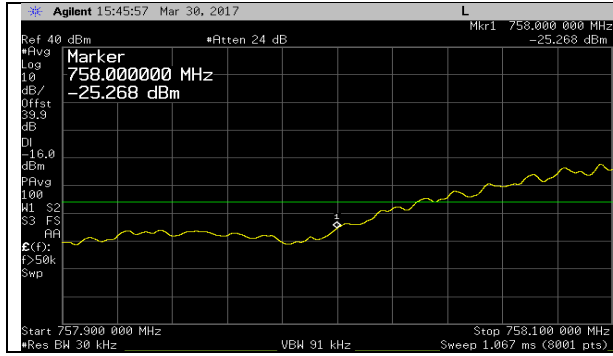
	LTE - QPSK (dBm)		LTE - 16QAM (dBm)		LTE - 64QAM (dBm)		LTE - 256QAM (dBm)	
	Low	High	Low	High	Low	High	Low	High
5M	-24.884	-26.19	-24.437	-24.982	-25.478	-25.963	-23.926	-26.3
10M	-27.498	-28.156	-27.261	-28.169	-26.156	-27.279	-27.424	-27.9
5M Dual	-27.632	-28.623	-25.555	-29.163	-26.319	-29.36	-26.18	-29.009

All corresponding plots are included on the following pages.

Measurements performed in RMS average mode with 100kHz RBW and 300kHz VBW over 100 traces. In 100kHz bands immediately outside and adjacent to the frequency block, resolution bandwidth has been reduced to 30kHz as allowed in 90.543(e)(5).

Total path loss of 39.9dB accounted in via reference level offset to the spectrum analyzer.

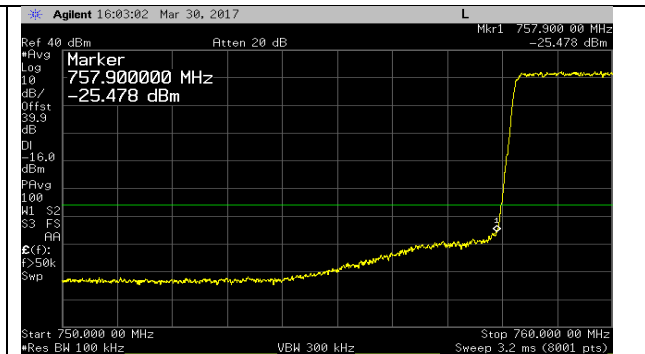
5M - LTE - QPSK - Low



5M - LTE - 16QAM - Low



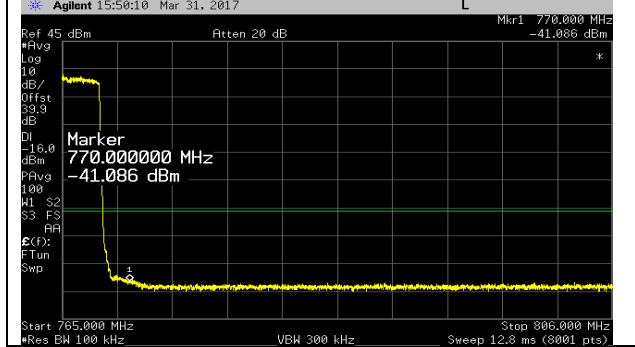
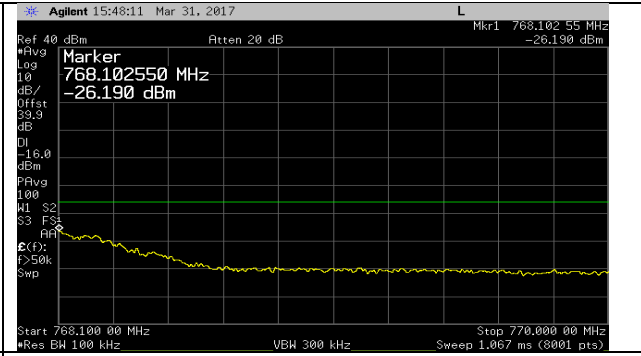
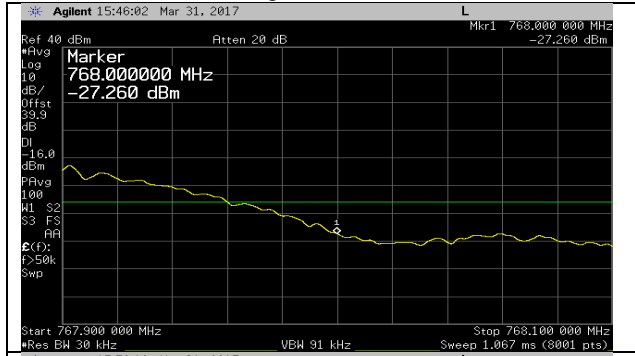
5M - LTE - 64QAM - Low



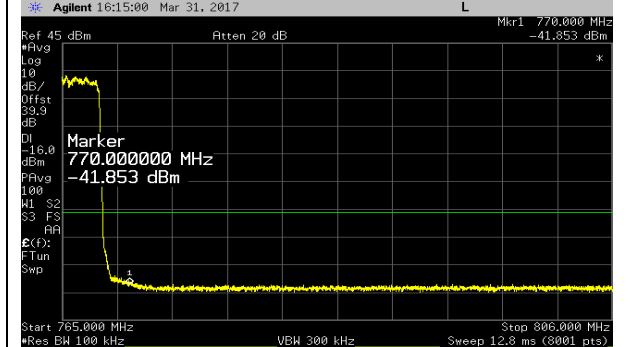
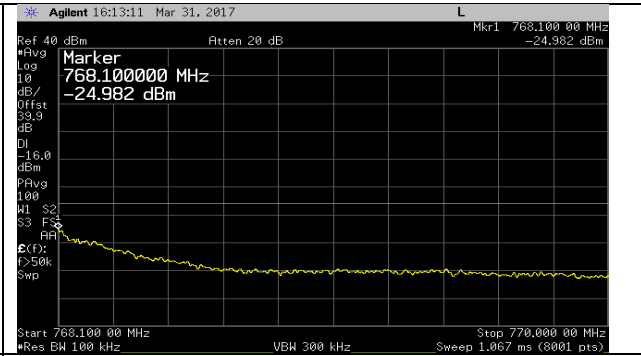
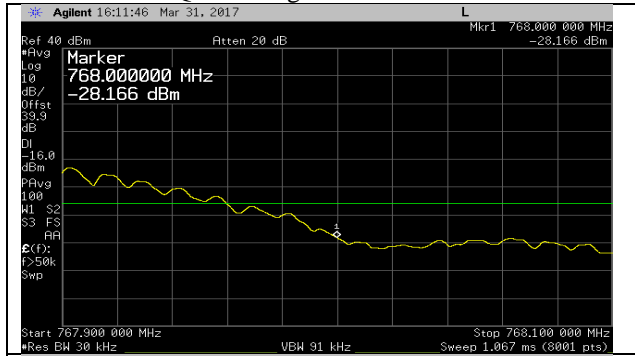
5M - LTE - 256QAM - Low



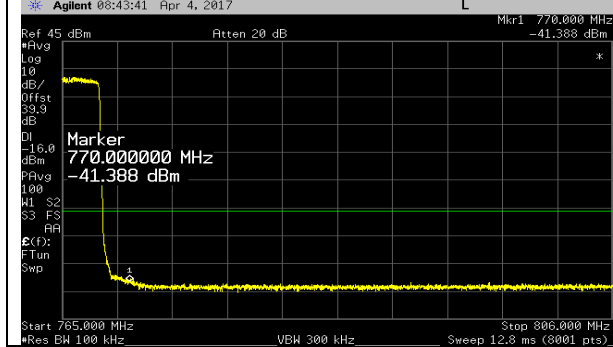
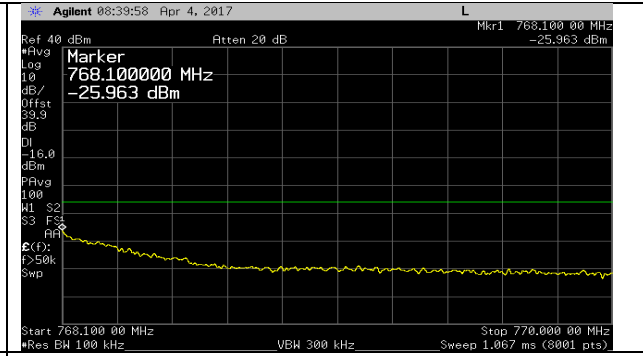
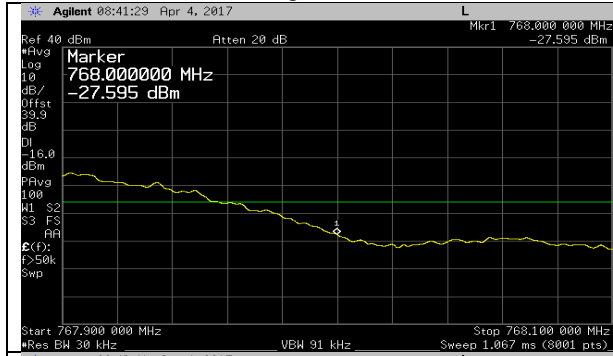
5M - LTE - QPSK - High



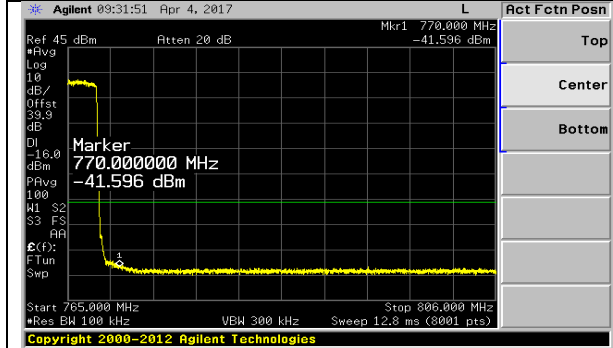
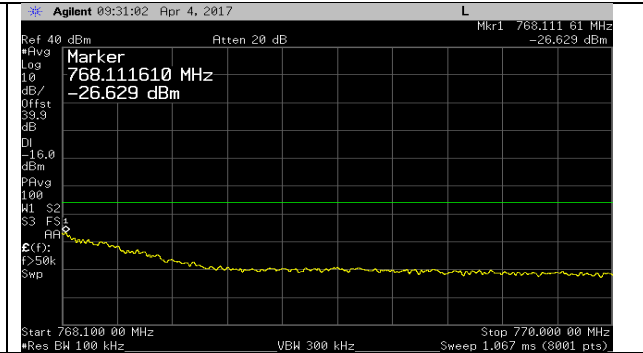
5M - LTE - 16QAM - High



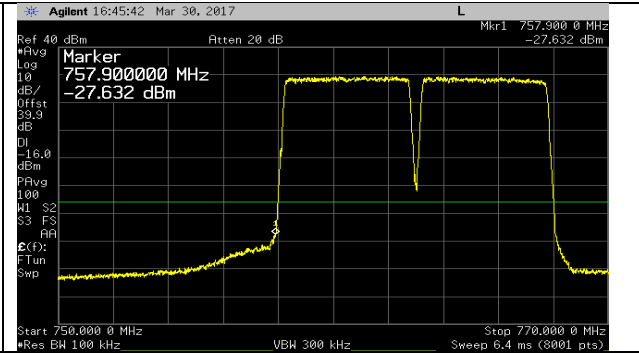
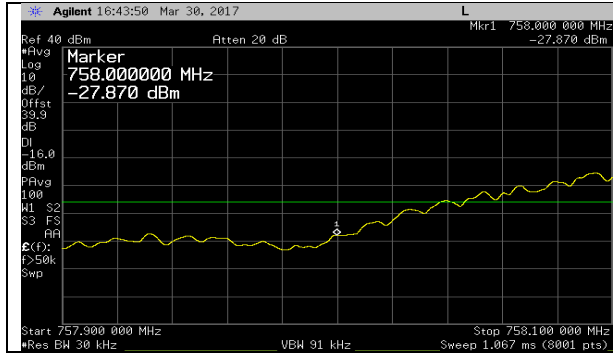
5M - LTE - 64QAM - High



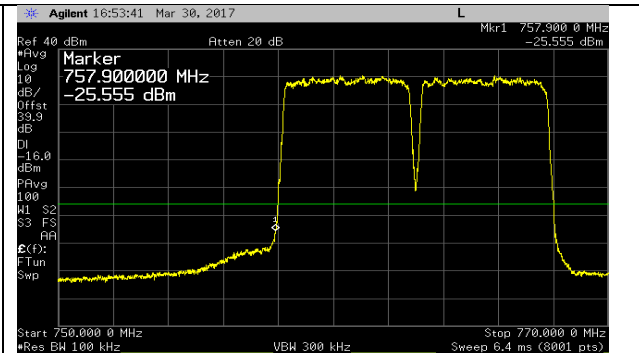
5M - LTE - 256QAM - High



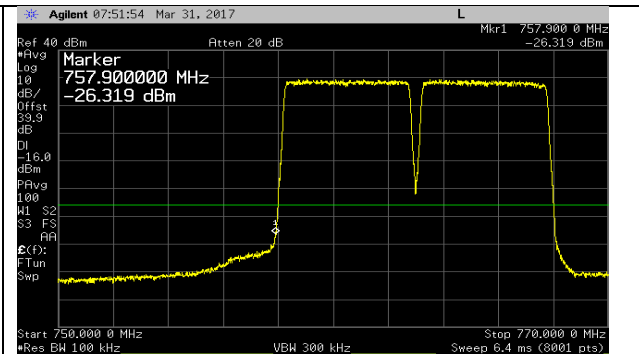
5M Dual Carrier – LTE – QPSK – Low



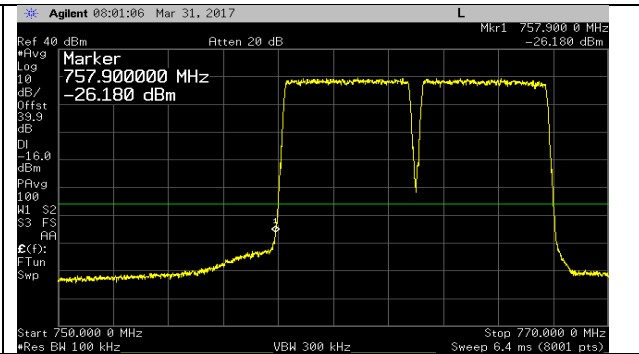
5M Dual Carrier – LTE – 16QAM – Low



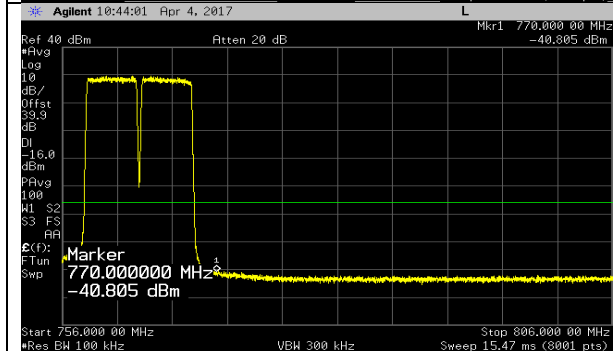
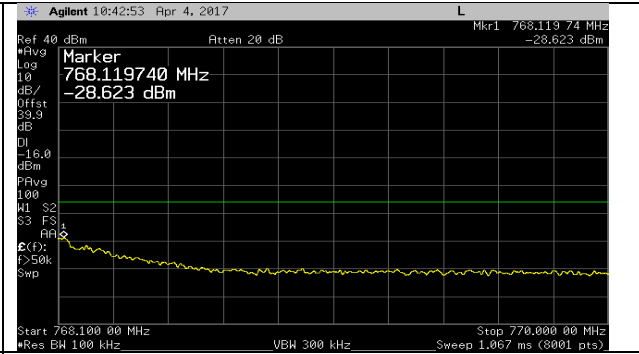
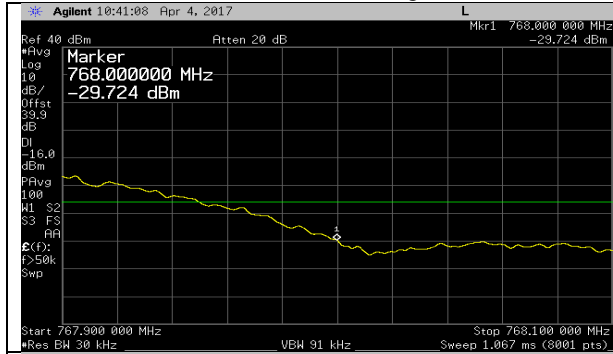
5M Dual Carrier – LTE – 64QAM – Low



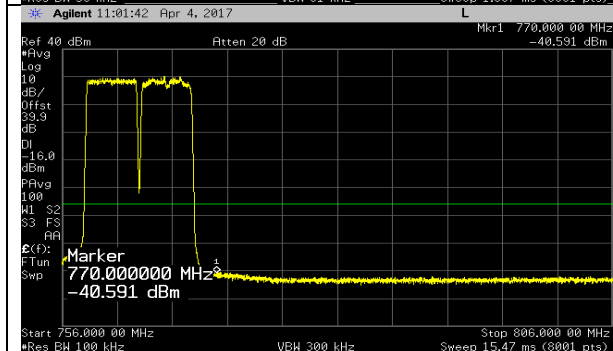
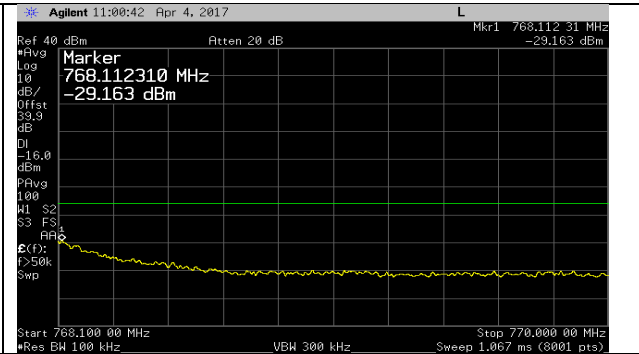
5M Dual Carrier – LTE – 256QAM – Low



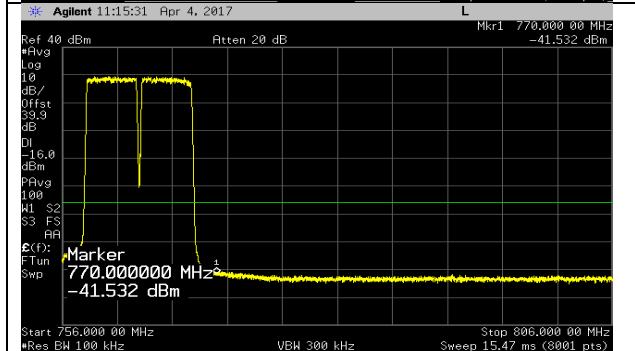
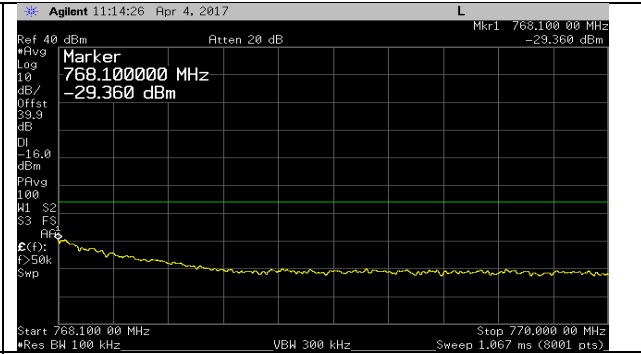
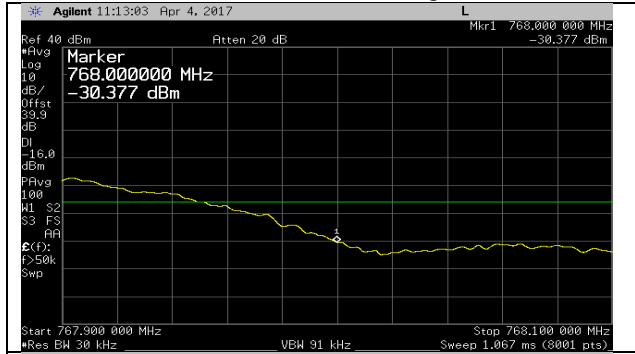
5M Dual Carrier – LTE – QPSK – High



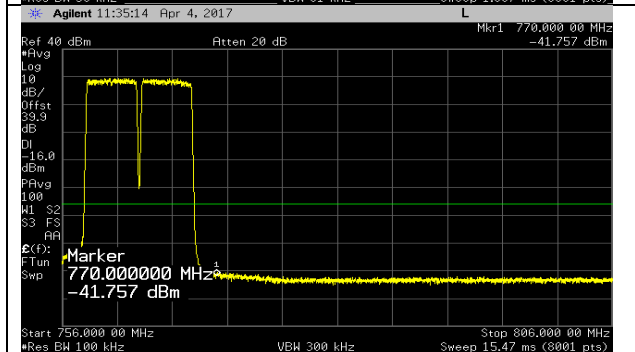
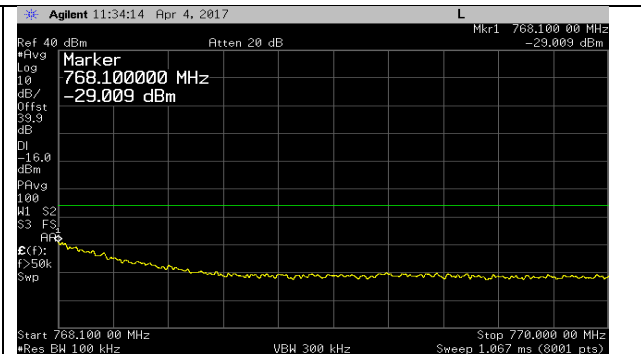
5M Dual Carrier – LTE – 16QAM – High



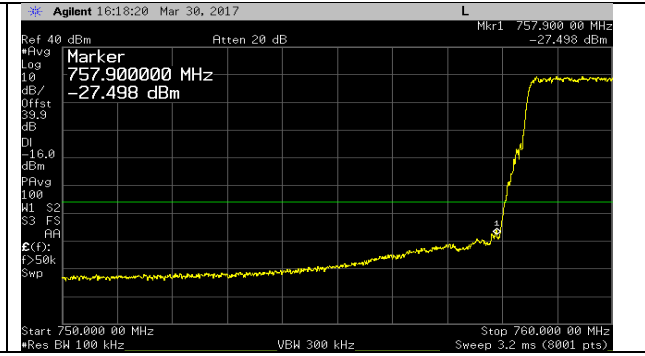
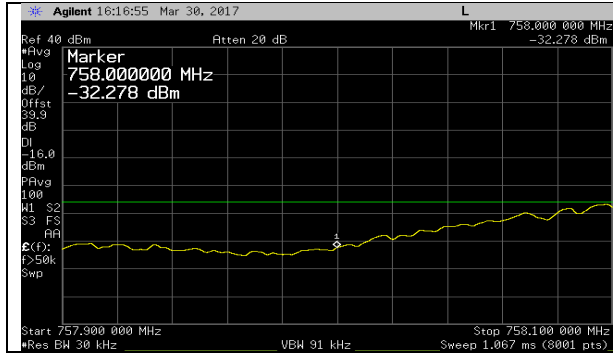
5M Dual Carrier - LTE - 64QAM - High



5M Dual Carrier - LTE - 256QAM - High



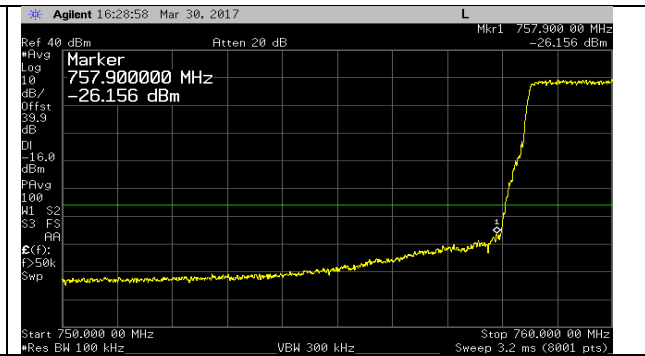
10M - LTE - QPSK - Low



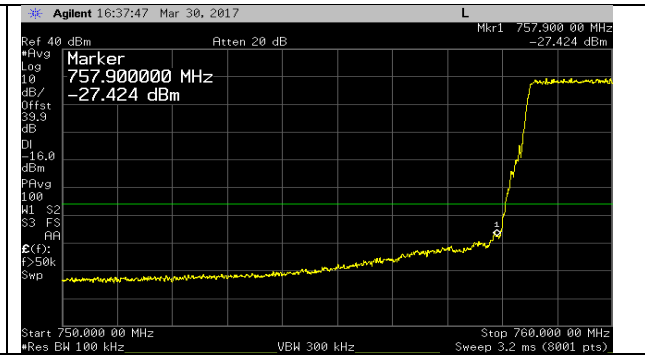
10M - LTE - 16QAM - Low



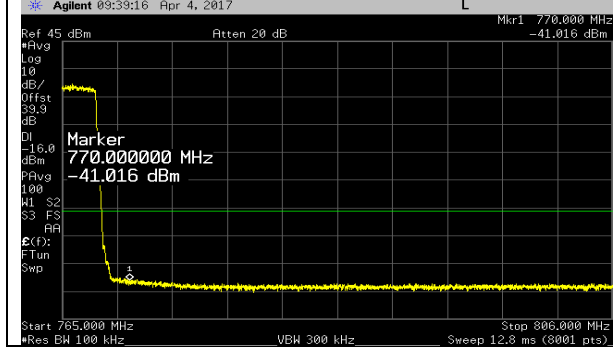
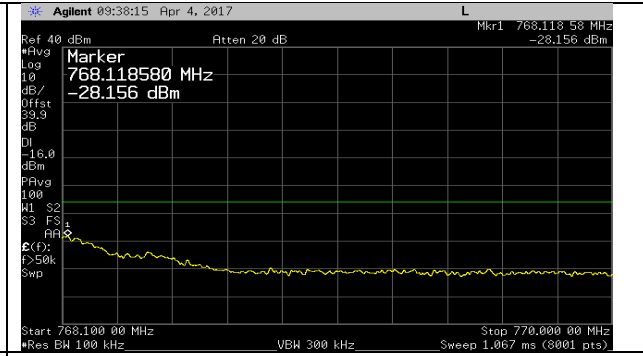
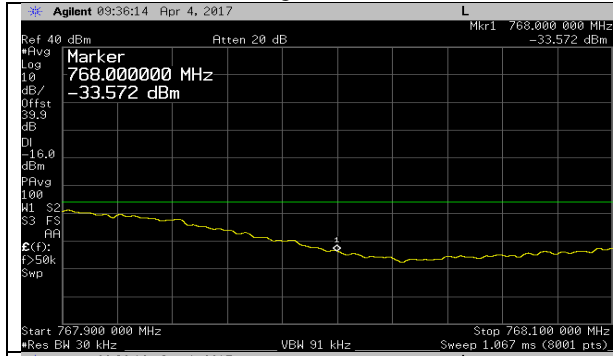
10M - LTE - 64QAM - Low



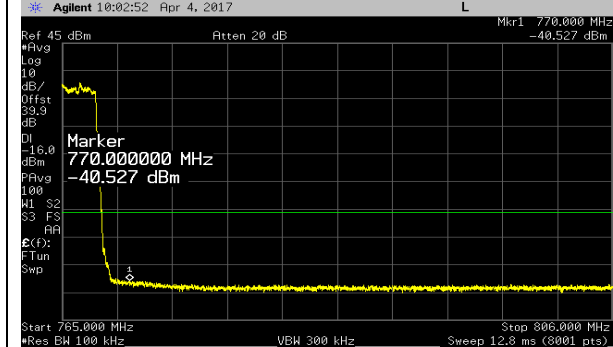
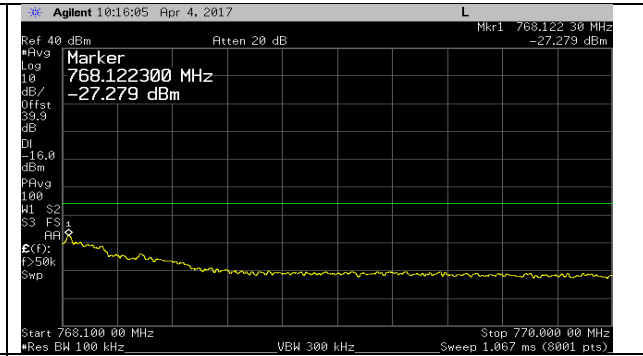
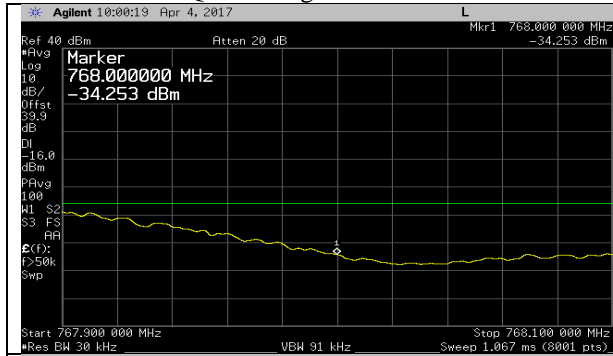
10M - LTE - 256QAM - Low



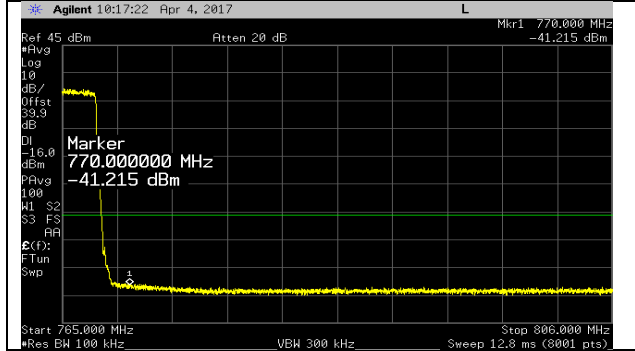
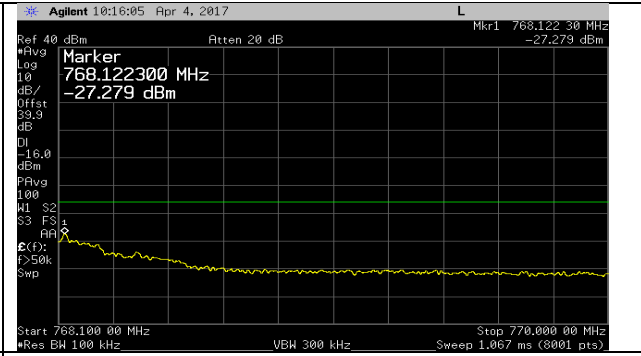
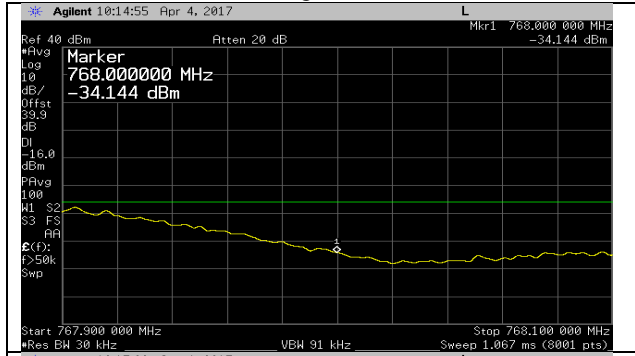
10M - LTE - QPSK - High



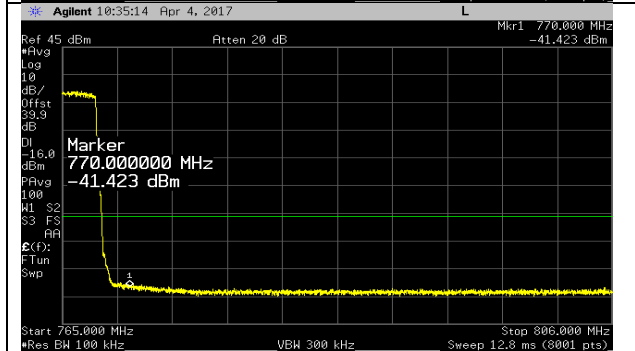
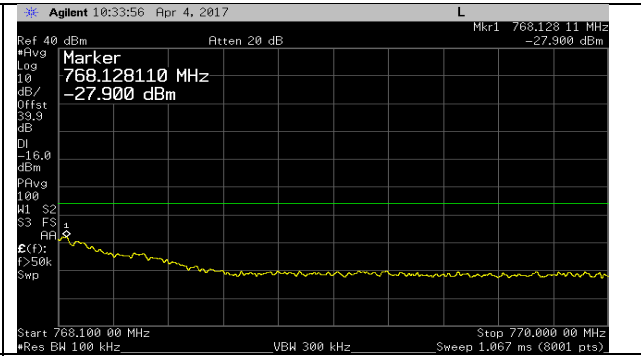
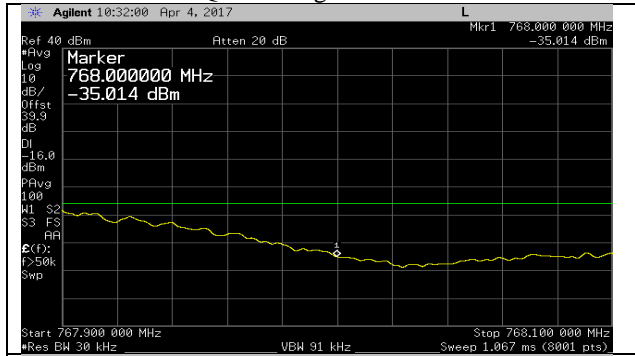
10M - LTE - 16QAM - High



10M - LTE - 64QAM - High



10M - LTE - 256QAM - High



Transmitter Antenna Port Conducted Spurious Emissions

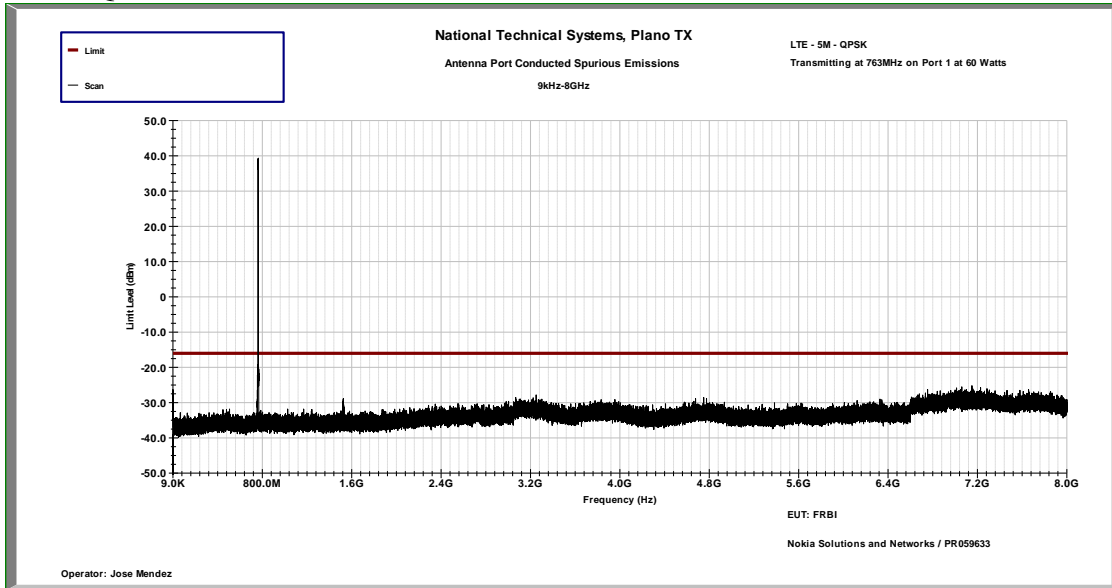
Tests performed at Port 1 on center channel for all modulations and bandwidth modes. Due to 2x2 MIMO operation, limit is -16.03dBm (-13dBm – $10 \cdot \log(2)$) per FCC KDB 662911D01 v02r01.

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

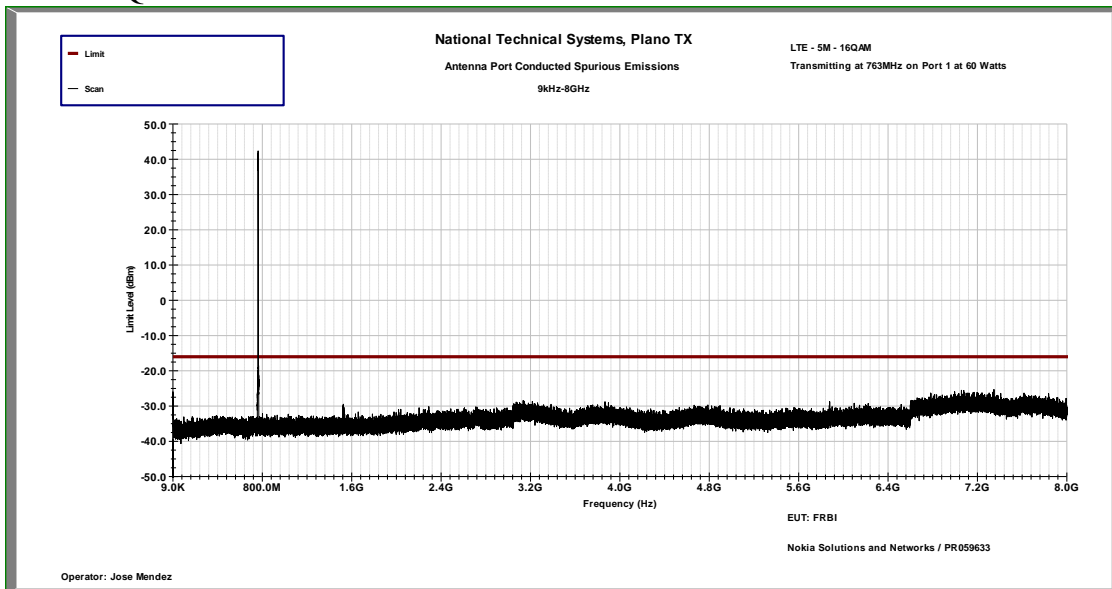
Frequency Range	RBW	VBW	Number of data points	Divided into	Detector	Sweep Time	Max hold over
9kHz-150kHz	1kHz	3kHz	8000	1 segment	Peak	Auto	50 sweeps
150kHz-8GHz	100kHz	300kHz	8000	12 segments	Peak	Auto	50 sweeps

Corresponding plots are included on the following pages.

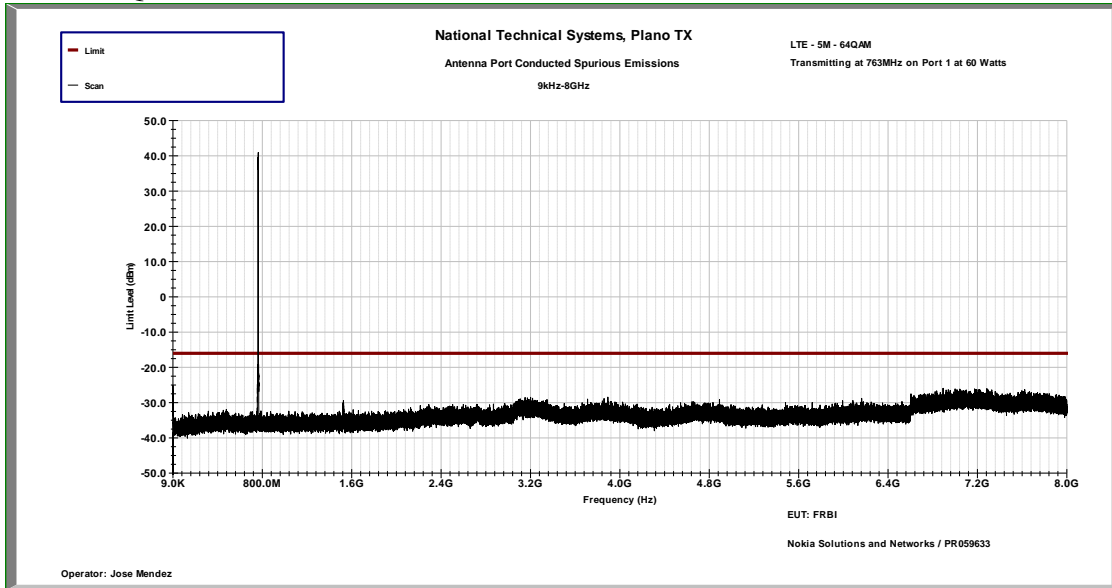
5M - LTE - QPSK



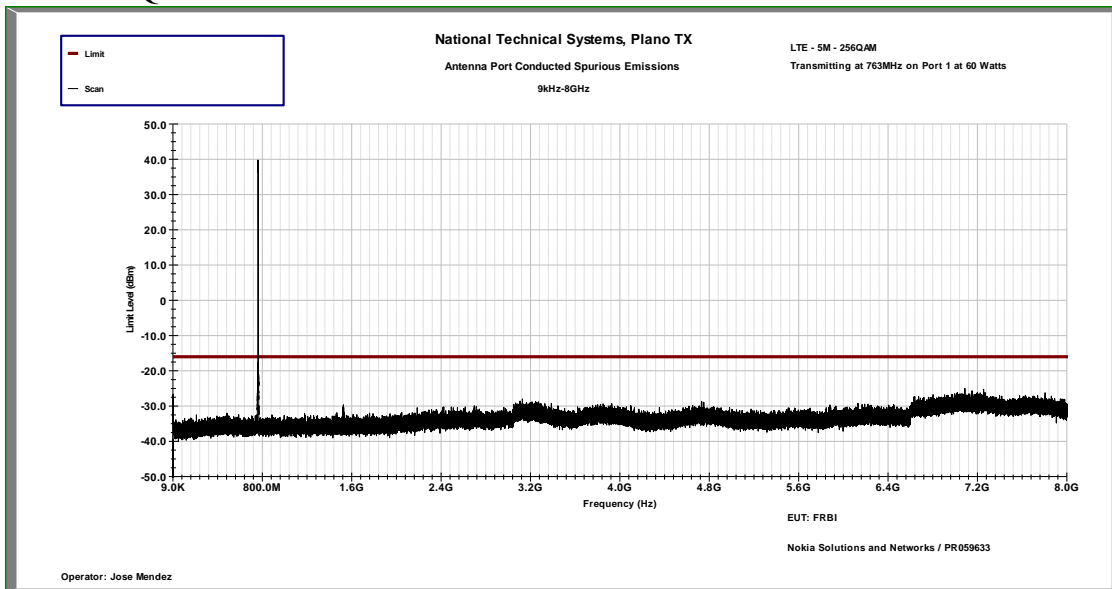
5M - LTE - 16QAM



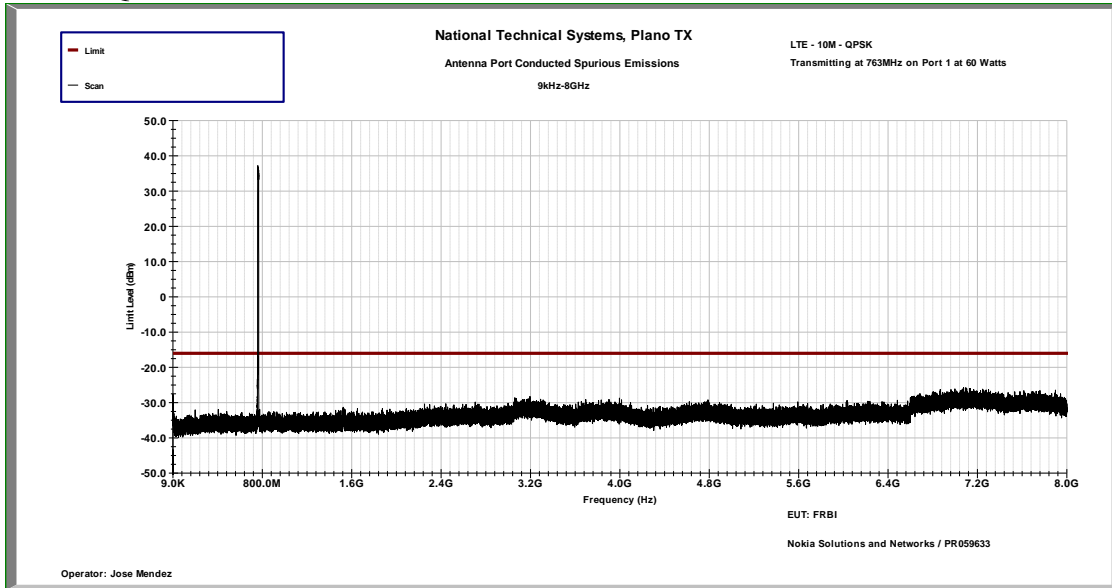
5M - LTE - 64QAM



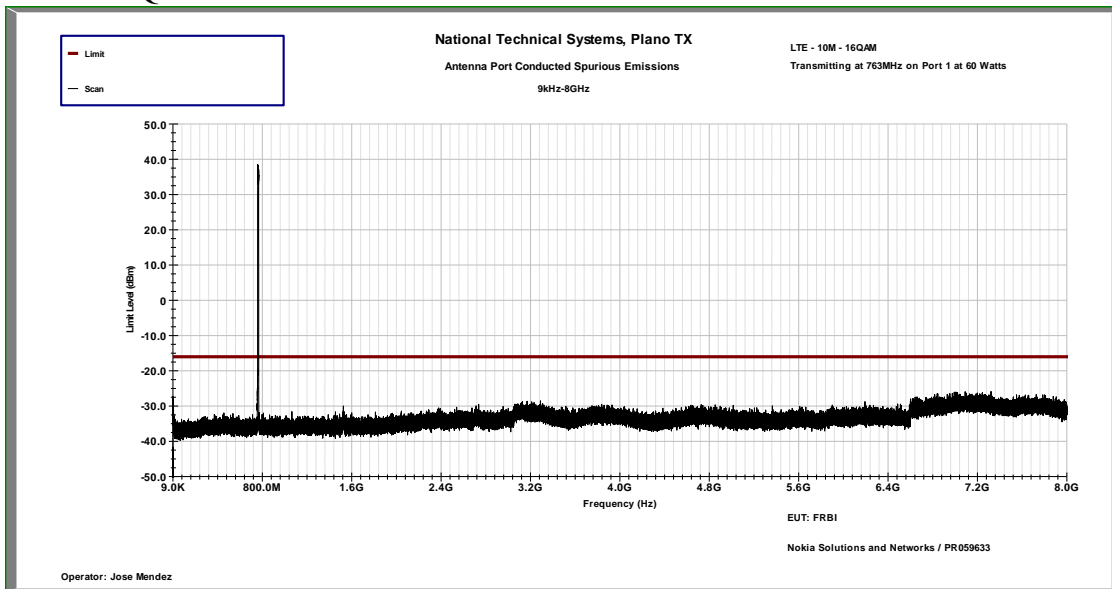
5M - LTE - 256QAM



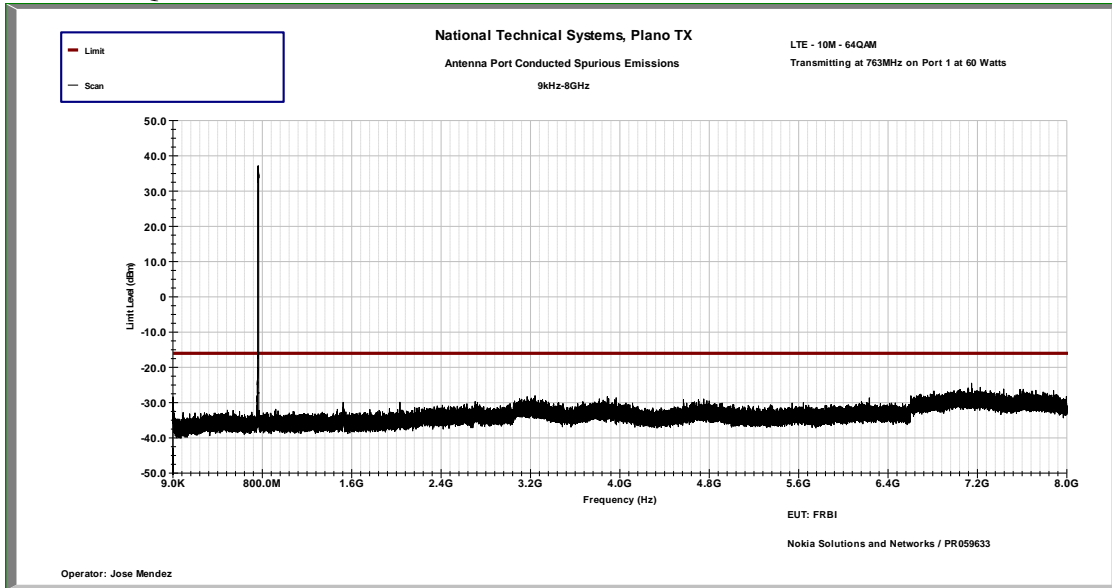
10M – LTE – QPSK



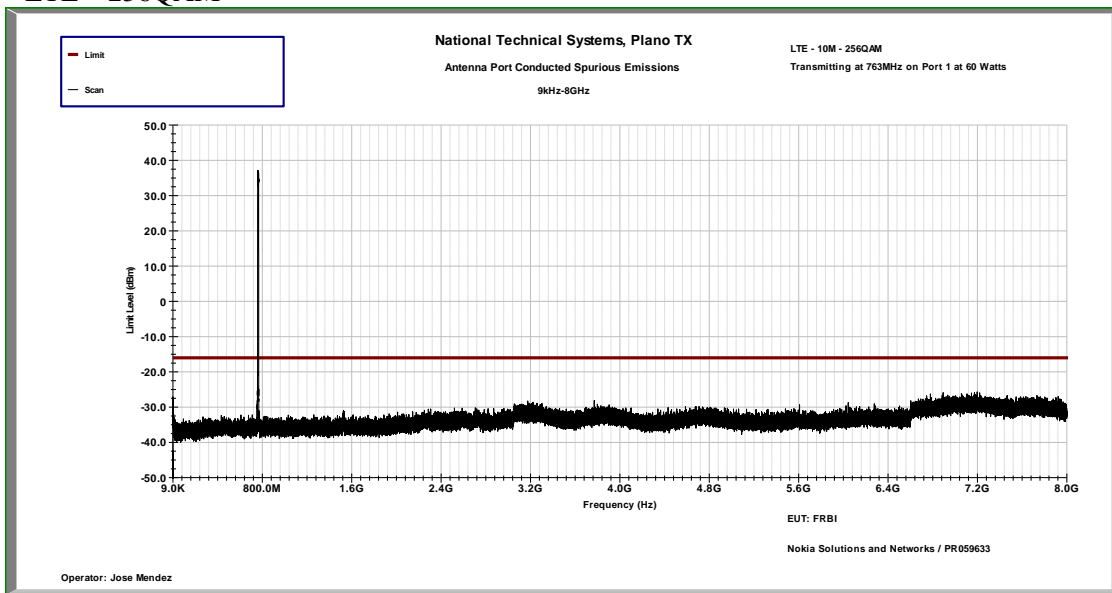
10M – LTE – 16QAM



10M - LTE - 64QAM



10M - LTE - 256QAM



90.543(f):

The FCC section 90.543(e)(1) requires an emission limit of -46dBm for any 6.25 kHz bandwidth (i.e.: $76 + 10\log P$) between frequency bands 769-775 MHz and 799-805 MHz.

Adjusting for the required measurement RBW and two port MIMO requirement the emission limit in these frequency ranges is -37 dBm [i.e.: Limit = -46 dBm/6.25kHz (FCC Limit) + 12dB (BW conversion $10 \log [100\text{kHz}/6.25\text{kHz}]$) - 3dB (2 port MIMO)].

The FCC section 90.543(f) EIRP limit in 1559 to 1610 MHz frequency band is -70dBW/MHz for wideband signals and -80dBW for discrete emissions of bandwidths less than 700Hz. This equates to an EIRP of -40dBm/MHz for wideband emissions and -50dBm/MHz for discrete emissions. Adjusting for two port MIMO (-3dB) the emission limit is -43dBm/MHz for wideband emissions and -53dBm/MHz for discrete emissions.

In 5MHz channel bandwidth mode, low and high channels as well as dual carrier mode (low Channel + high channel) configurations were tested. In 10MHz channel bandwidth mode, unit can only operate in single carrier mode at the center channel.

All measurements were performed on Antenna Port 1. Measurements were made for three frequency ranges; FR1 at 769MHz to 775MHz, FR2 at 799MHz to 805MHz and FR3 at 1559MHz to 1610MHz.

Results summary:

	LTE - QPSK (dBm)			LTE - 16QAM (dBm)			LTE - 64QAM (dBm)			LTE - 256QAM (dBm)		
	FR1	FR2	FR3	FR1	FR2	FR3	FR1	FR2	FR3	FR1	FR2	FR3
5M	-40.095	-73.774	-80.402	-39.876	-73.673	-80.439	-39.876	-81.549	-80.437	-39.78	-81.748	-80.372
10M	-40.585	-81.529	-80.393	-40.787	-81.605	-79.842	-40.753	-81.551	-80.409	-40.559	-81.688	-80.269
5M Dual	-40.775	-81.652	-80.553	-40.515	-81.708	-80.424	-40.59	-81.563	-80.218	-40.686	-81.432	-80.413

For FR1, the measurements were performed in RMS average mode with 100kHz RBW and 300kHz VBW over 1000 traces. The total path loss of 39.9 dB was accounted for via reference level offset of the spectrum analyzer.

For FR2, the measurements were performed in RMS average mode with 100kHz RBW and 300kHz VBW over 100 traces. In order to reduce instrumentation noise floor a carrier blocking filter with a 10dB attenuator was used. The total path loss of 10.3dB was accounted for via reference level offset of the spectrum analyzer.

For FR3, the measurements were performed in RMS average mode with 1MHz RBW and 3MHz VBW over 100 traces. In order to reduce instrumentation noise floor a carrier blocking filter with a 10dB attenuator was used. The total path loss of 11dB was accounted for via reference level offset of the spectrum analyzer.

All corresponding plots are included on the following pages.