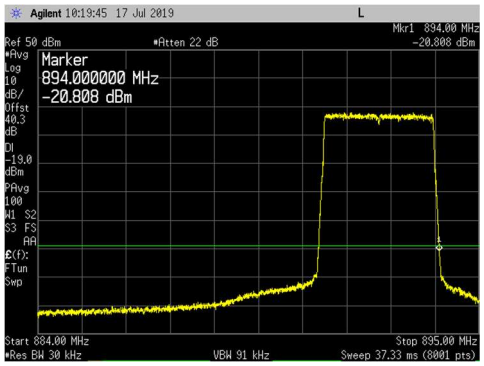
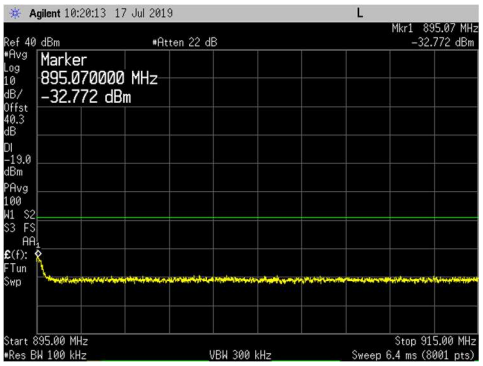
LTE3 Upper Band Edge Plots for Antenna Port 2:

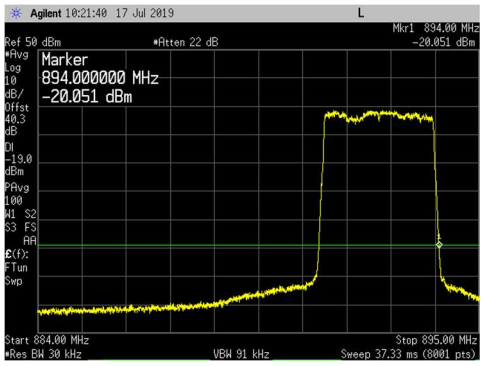
QPSK_ Top Channel_ 884 to 895MHz



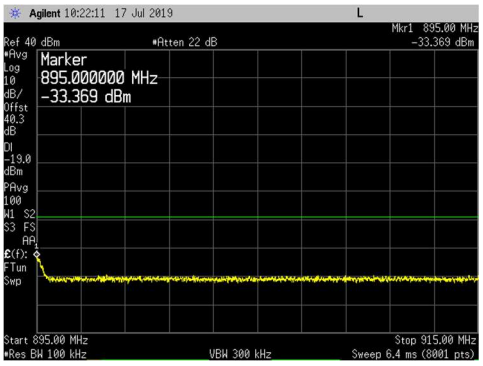
QPSK_ Top Channel_ 895 to 915MHz



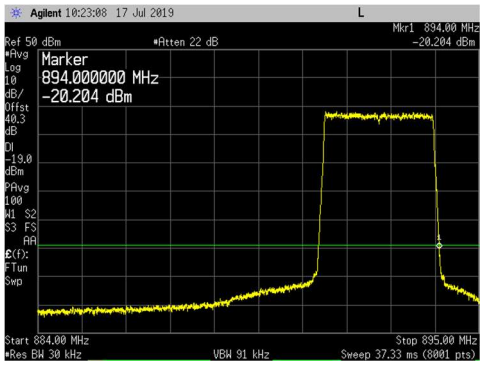
16QAM_ Top Channel_ 884 to 895MHz



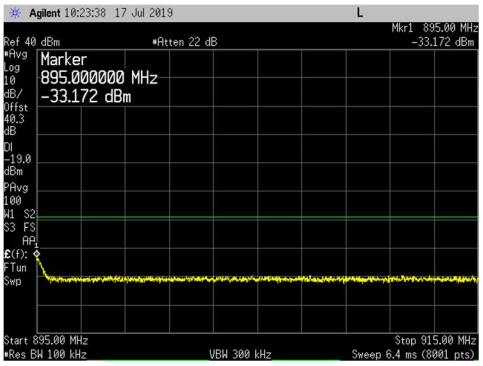
16QAM_ Top Channel_ 895 to 915MHz



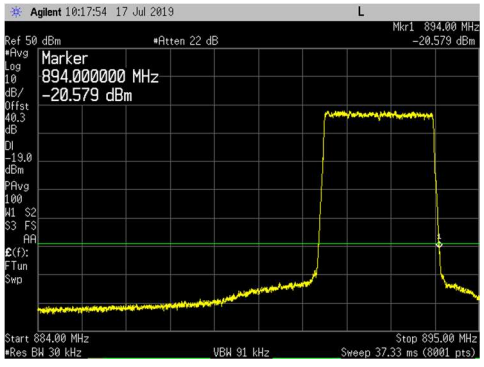
64QAM_ Top Channel_ 884 to 895MHz



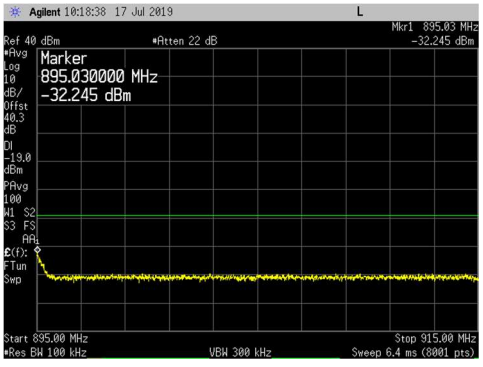
64QAM_ Top Channel_ 895 to 915MHz



256QAM_ Top Channel_ 884 to 895MHz

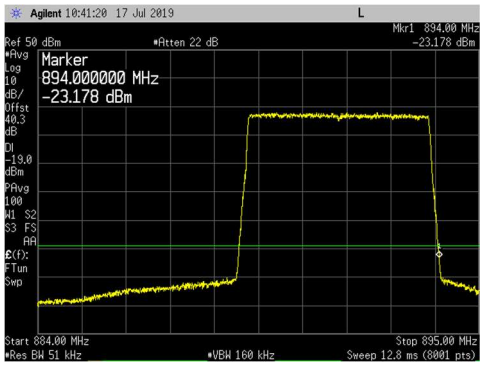


256QAM_ Top Channel_ 895 to 915MHz

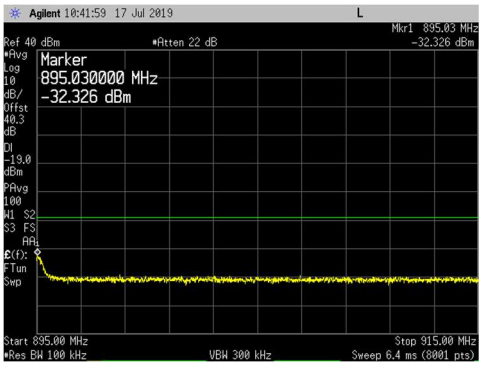


LTE5 Upper Band Edge Plots for Antenna Port 2:

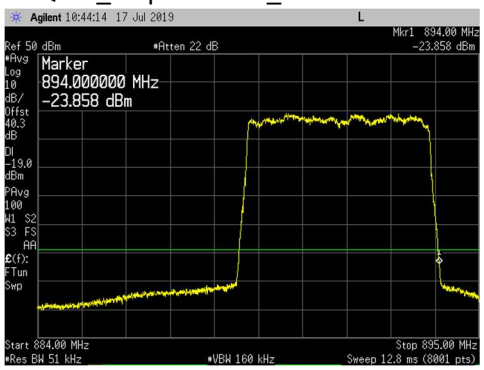
QPSK_ Top Channel_ 884 to 895MHz



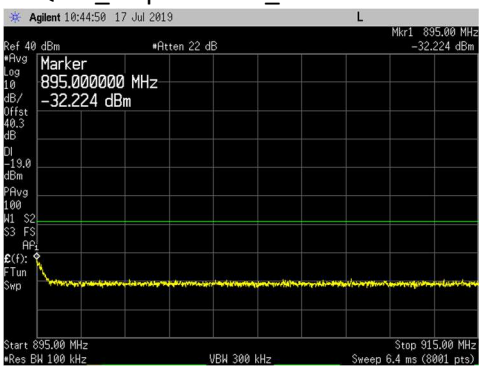
QPSK_ Top Channel_ 895 to 915MHz



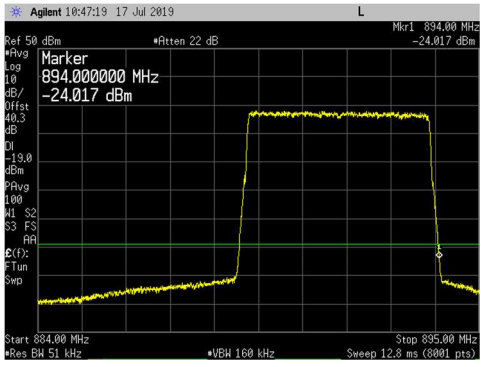
16QAM_ Top Channel_ 884 to 895MHz



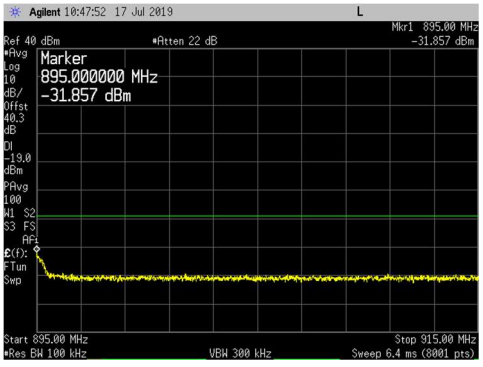
16QAM_ Top Channel_ 895 to 915MHz



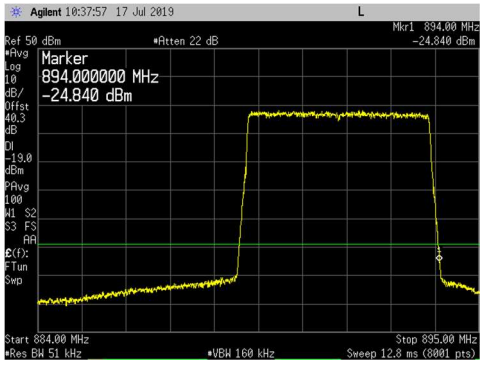
64QAM_ Top Channel_ 884 to 895MHz



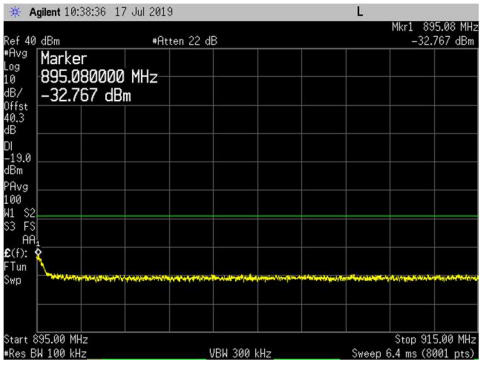
64QAM_ Top Channel_ 895 to 915MHz



256QAM_ Top Channel_ 884 to 895MHz

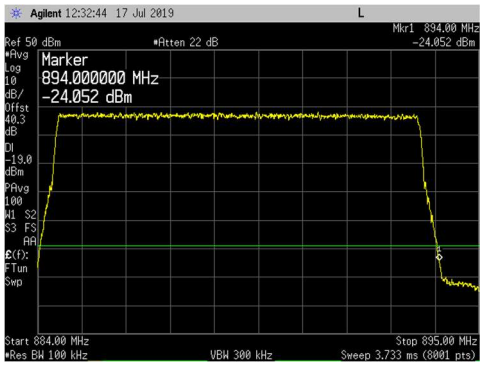


256QAM_ Top Channel_ 895 to 915MHz

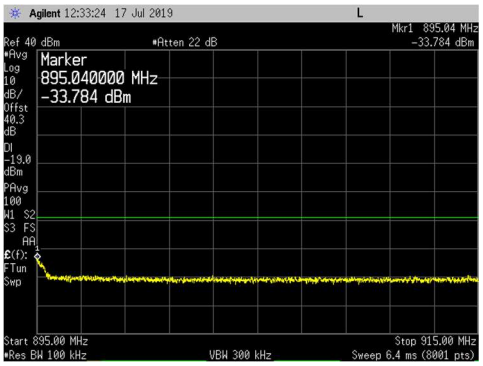


LTE10 Upper Band Edge Plots for Antenna Port 2:

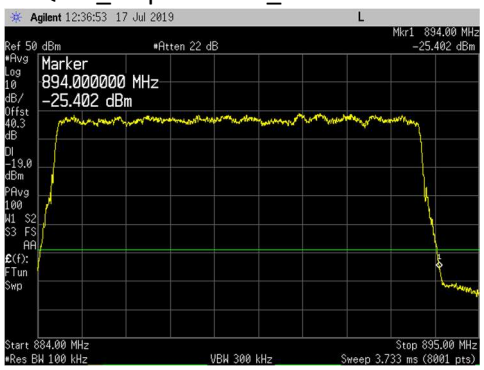
QPSK_ Top Channel_ 884 to 895MHz



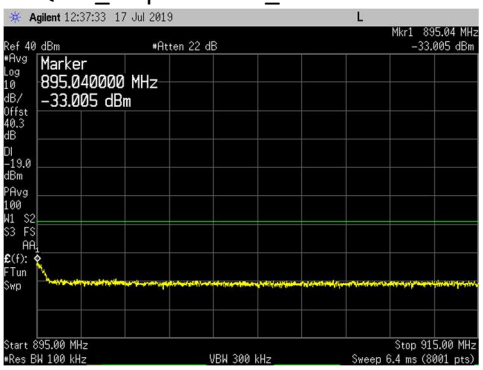
QPSK_ Top Channel_ 895 to 915MHz



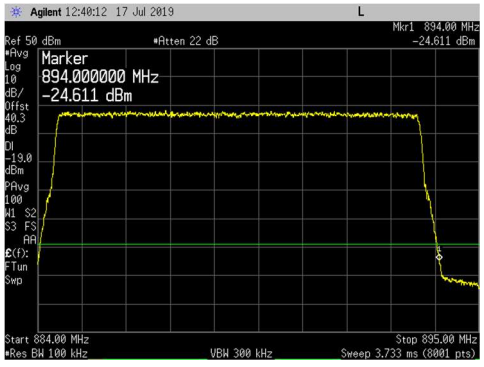
16QAM_ Top Channel_ 884 to 895MHz



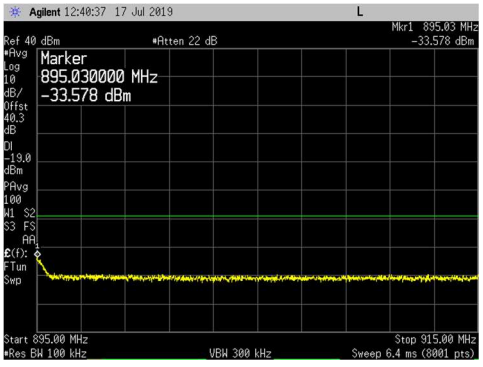
16QAM_ Top Channel_ 895 to 915MHz



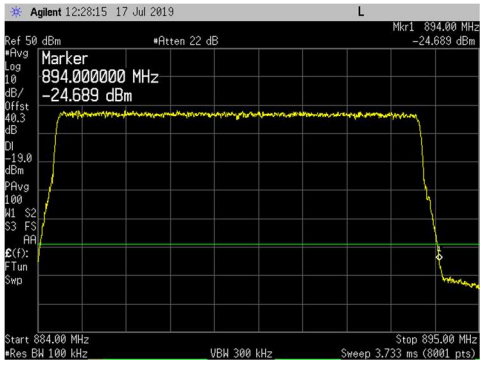
64QAM_ Top Channel_ 884 to 895MHz



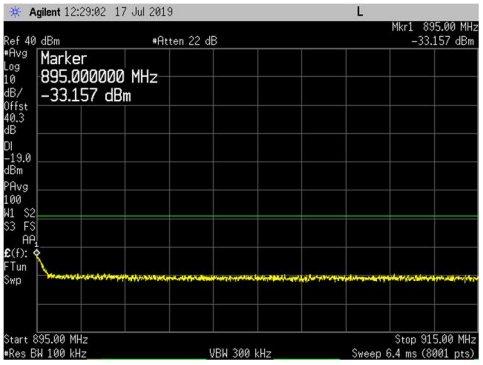
64QAM_ Top Channel_ 895 to 915MHz



256QAM_ Top Channel_ 884 to 895MHz

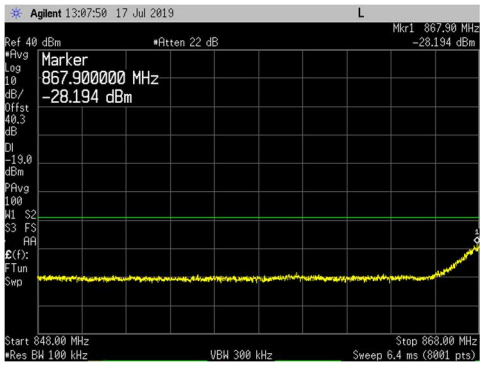


256QAM_ Top Channel_ 895 to 915MHz

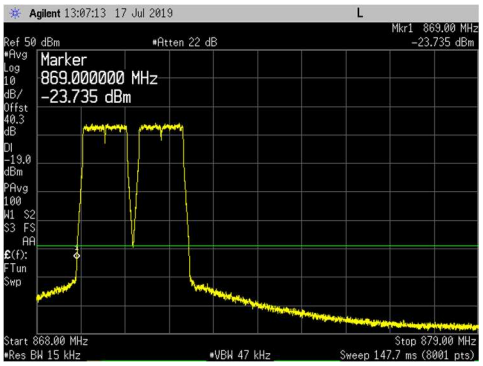


Band 5 Multicarrier LTE1.4 Lower Band Edge Plots for Antenna Port 2:

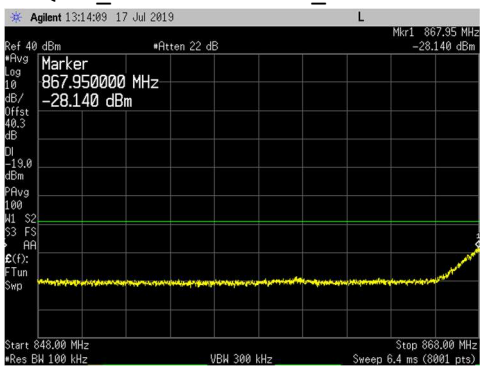
QPSK_ Bottom Channel_ 848 to 868MHz



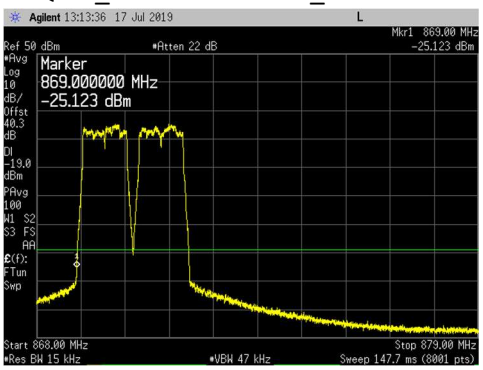
QPSK_ Bottom Channel_ 868 to 879MHz



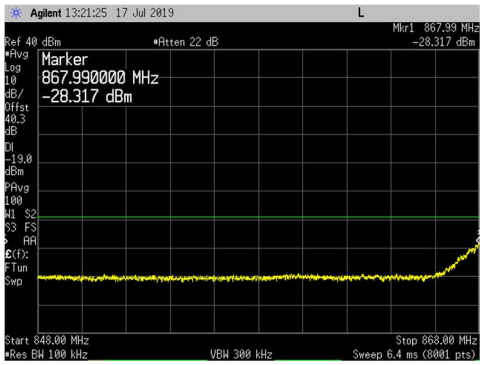
16QAM_ Bottom Channel_ 848 to 868MHz



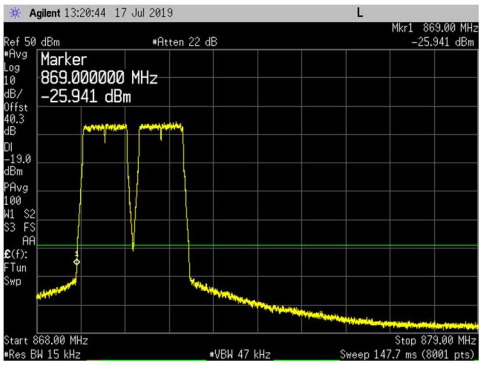
16QAM_ Bottom Channel_ 868 to 879MHz



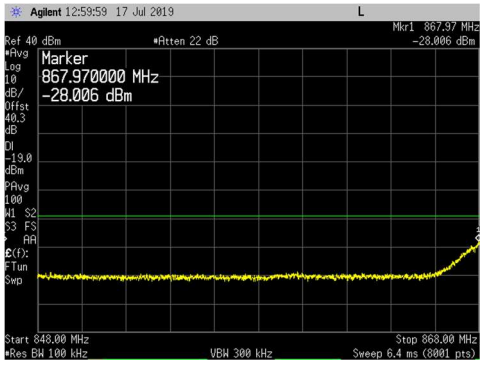
64QAM_ Bottom Channel_ 848 to 868MHz



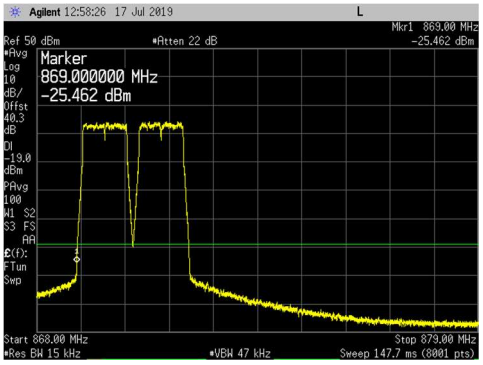
64QAM_ Bottom Channel_ 868 to 879MHz



256QAM_ Bottom Channel_ 848 to 868MHz

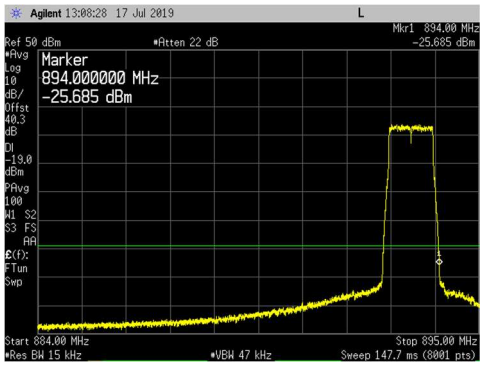


256QAM_ Bottom Channel_ 868 to 879MHz

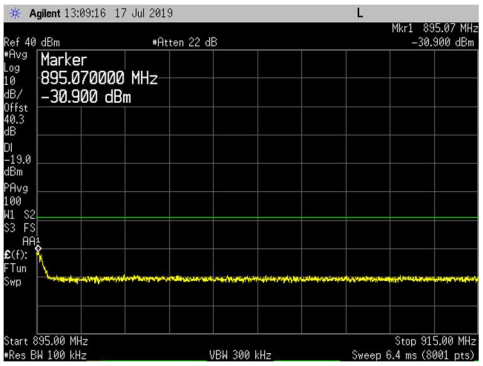


Band 5 Multicarrier LTE1.4 Upper Band Edge Plots for Antenna Port 2:

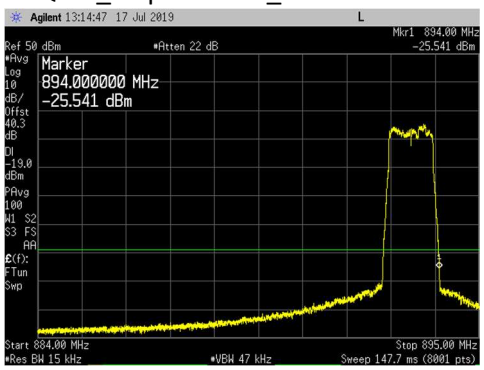
QPSK_ Top Channel_ 884 to 895MHz



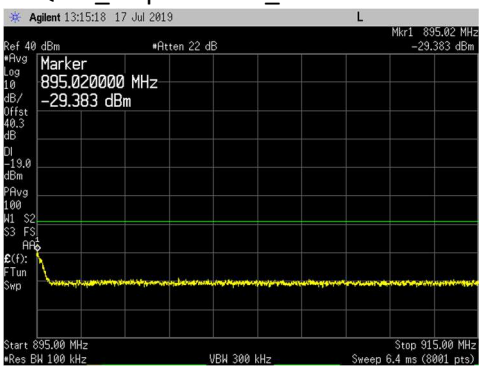
QPSK_ Top Channel_ 895 to 915MHz



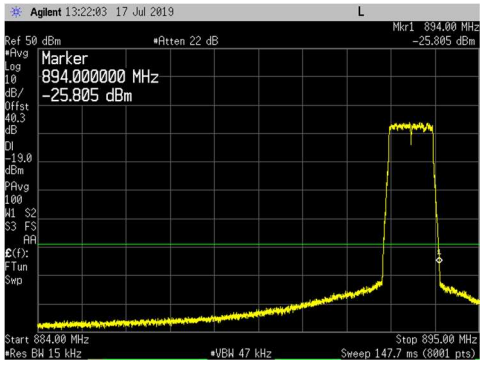
16QAM_ Top Channel_ 884 to 895MHz



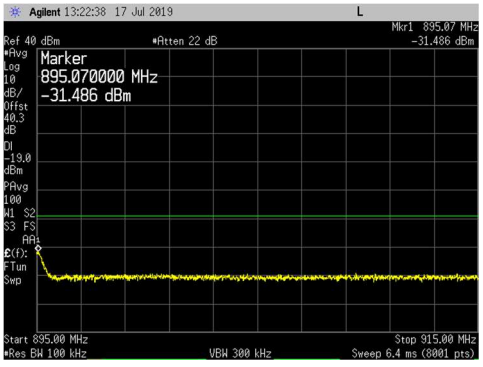
16QAM_ Top Channel_ 895 to 915MHz



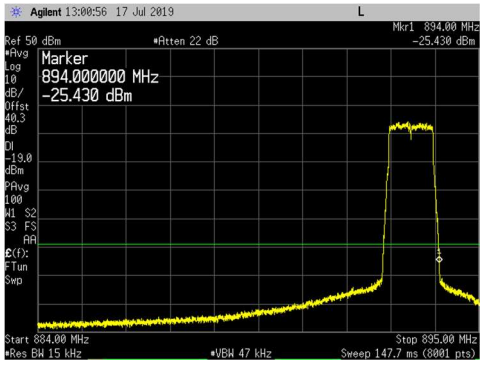
64QAM_ Top Channel_ 884 to 895MHz



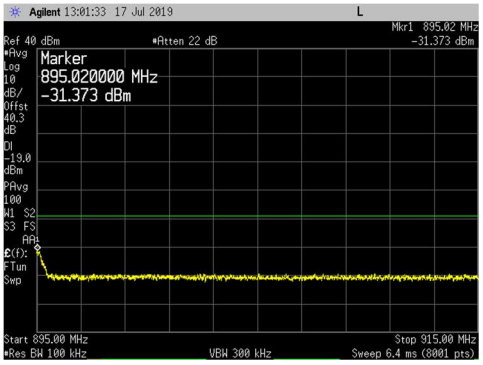
64QAM_ Top Channel_ 895 to 915MHz



256QAM_ Top Channel_ 884 to 895MHz



256QAM_ Top Channel_ 895 to 915MHz



Transmitter Antenna Port Conducted Emissions

Transmitter conducted emission measurements were made at RRH antenna port 2. Measurements were performed over the 9kHz to 9GHz frequency range.

Single Carrier Test Cases

The RRH was operated on the Band 5 middle channel (881.5MHz) and Band 29 middle channel (722.5MHz) simultaneously with all LTE modulation types (QPSK, 16QAM, 64QAM and 256QAM) for all available LTE bandwidths (Band 5: 1.4MHz, 3MHz, 5MHz and 10MHz; Band 29: 5MHz and 10MHz). The same LTE bandwidth was used for both frequency bands when available. If the same LTE bandwidth for both bands were not available, then the smallest LTE bandwidth was used. The Band 5 and Band 29 carriers were enabled at maximum power (80 watts/port and 40 watts/carrier).

Multicarrier Multiband Test Case

In Band 5_Three LTE1.4 carriers (based upon KDB 971168 D03v01) using two carriers (with minimum spacing between carrier frequencies) at the lower band edge (EARFCN 2407: 869.7 MHz and EARFCN 2421: 871.1 MHz) and a third carrier with maximum spacing between the other two carrier frequencies (EARFCN 2643: 893.3 MHz) at the upper band edge. In Band 29_ Two LTE5 carriers with maximum spacing at the lower and upper band edges (EARFCN 9685: 719.5 & EARFCN 9745: 725.5MHz. Three carrier operation is not available because it exceeds the Band 29 downlink bandwidth. The smallest channel bandwidth was selected to maximize carrier power spectral density. The carriers were operated at maximum power (~13W/Band 5 carrier and ~20W/Band 29 carrier) with at total port power of 80 watts (40W for Band 5 carriers + 40W for Band 29 carriers). The same modulation type was used for both Band 5 and Band 29 carriers.

The test configuration parameters are provided below:

Band 5 Transmission Parameters			**Band 29 Transmission Parameters**		
Carrier Frequency	**Channel Bandwidth**	**Carrier Power**	**Carrier Frequency**	**Channel Bandwidth**	**Carrier Power**
881.5MHz (Mid Ch)	LTE1.4 – LTE10	40 Watts	722.5MHz (Mid Ch)	LTE5 & LTE 10	40 Watts
869.7, 871.1 & 893.3MHz (BC, BC+1, and TC)	LTE1.4	13+13+13 Watts	719.5 & 725.5MHz (BC & TC)	LTE5	20 + 20 Watts

The limit of -19dBm was used in the certification testing. The limit is adjusted to -19dBm [-13dBm -10 log (4)] per FCC KDB 662911D01 v02r01 because the BTS may operate as a 4 port MIMO Band 5 transmitter. The required measurement parameters include a 100kHz bandwidth with power measured in average value (since transmitter power was measured in average value).

Measurements were performed with a spectrum analyzer using a peak detector with maximum hold over 50 sweeps (except for the 700MHz to 1100MHz frequency range). The measurements for the 700MHz to 1.1GHz frequency range were performed with the spectrum analyzer in the RMS average mode over 100 traces.

The limit for the 9kHz to 150kHz frequency range was adjusted to –39dBm to correct for a spectrum analyzer RBW of 1kHz versus required RBW of 100kHz [i.e.: -39dBm = -19dBm -10log(100kHz/1kHz)]. The limit for the 150kHz to 20MHz frequency range was adjusted to –29dBm to correct for a spectrum analyzer RBW of 10kHz versus required RBW of 100kHz [i.e.: -29dBm = -19dBm -10log(100kHz/10kHz)]. The required limit of -19dBm with a RBW of ≥100kHz was used for all other frequency ranges. The spectrum analyzer settings that were used for this test are summarized in the following table.

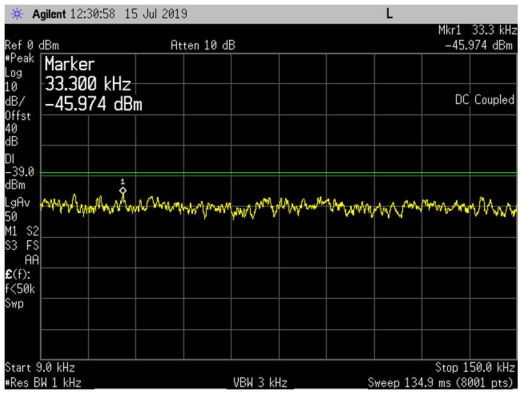
Frequency Range	RBW	VBW	Number of Data Points	Detector	Sweep Time	Max Hold over	Offset Note 1
9kHz to 150kHz	1kHz	3kHz	8001	Peak	Auto	50 Sweeps	40.0dB
150kHz to 20MHz	10kHz	30kHz	8001	Peak	Auto	50 Sweeps	39.9dB
20MHz to 700MHz	200kHz	600kHz	8001	Peak	Auto	50 Sweeps	40.3dB
700MHz to 1.1GHz	100kHz	300kHz	8192	Average	Auto	Note 2	40.3dB
1.1GHz to 9GHz	2MHz	6MHz	8192	Peak	Auto	50 Sweeps	25.0dB

Note 1: The total measurement RF path loss of the test setup (attenuators, filters and test cables) is accounted for by the spectrum analyzer reference level offset.
Note 2: Max Hold not used and instead measurements were performed with the spectrum analyzer in the RMS average mode over 100 traces.

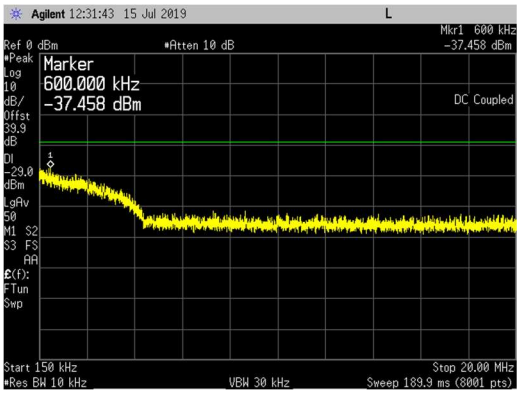
A high pass filter was used to reduce measurement instrumentation noise floor for the frequency ranges above 1100MHz. The total measurement RF path loss of the test setup (attenuators, high pass filter and test cables) as shown in the table is accounted for by the spectrum analyzer reference level offset. The display line on the plots reflects the required limit.
Conducted spurious emission plots/measurements are provided in the following pages.

LTE1.4 & LTE5 Ch BWs _ QPSK _ Middle Channels (722.5MHz and 881.5MHz) at 40 watts/carrier:

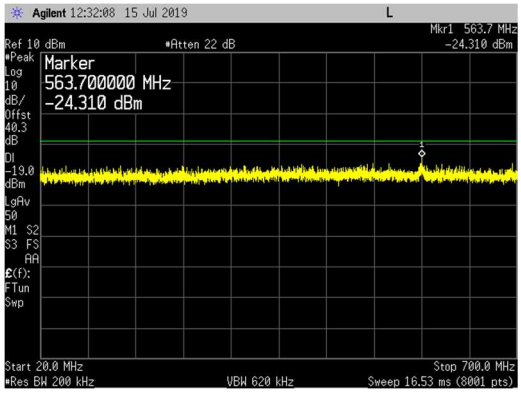
9kHz to 150kHz



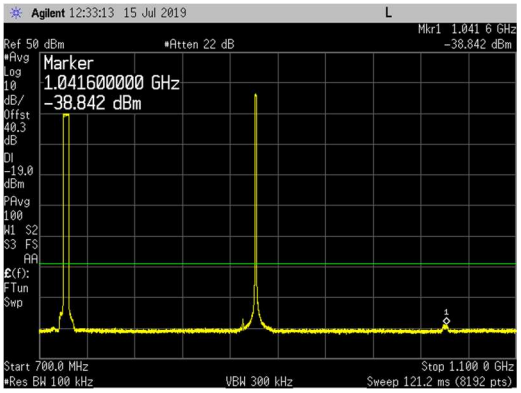
150kHz to 20MHz



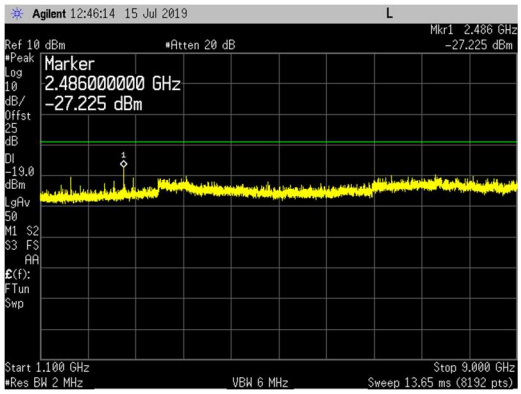
20MHz to 700MHz



700MHz to 1100MHz

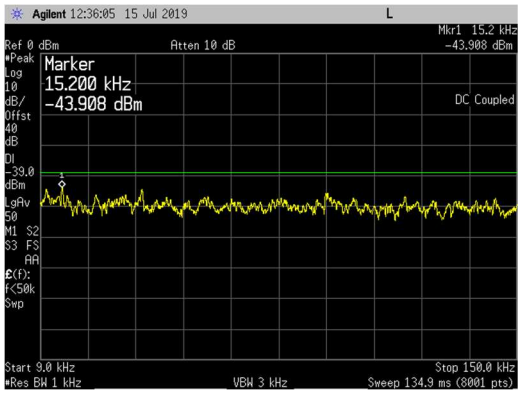


1.1GHz to 9GHz

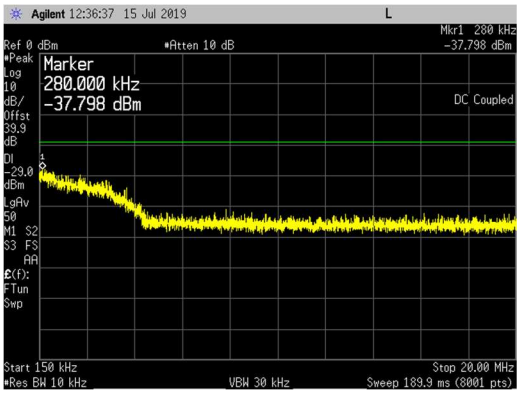


LTE1.4 & LTE5 Ch BWs _ 16QAM _ Middle Channels (722.5MHz and 881.5MHz) at 40 watts/carrier:

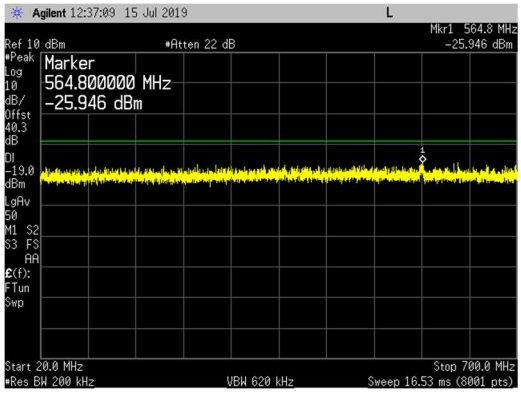
9kHz to 150kHz



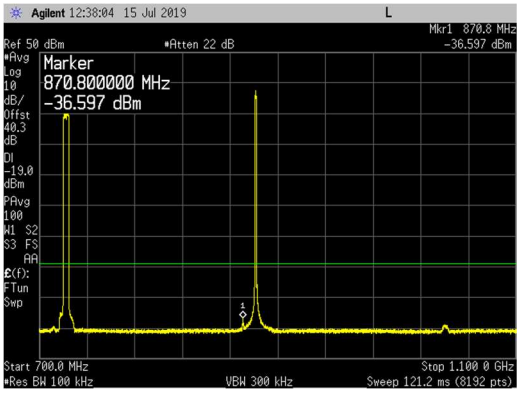
150kHz to 20MHz



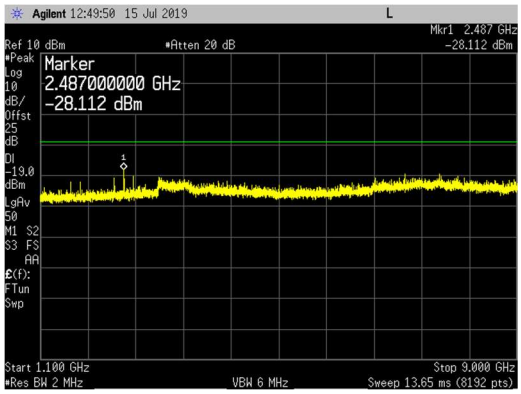
20MHz to 700MHz



700MHz to 1100MHz

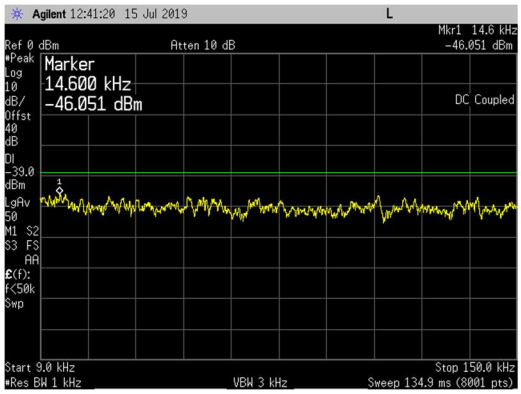


1.1GHz to 9GHz

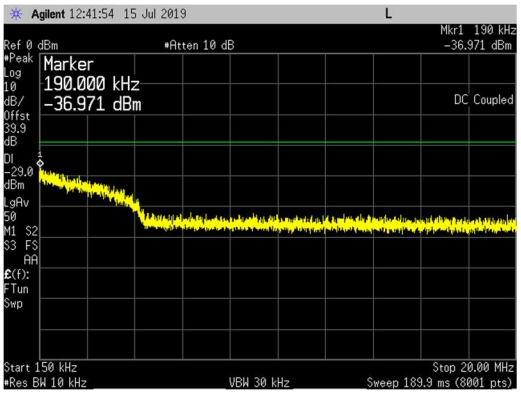


LTE1.4 & LTE5 Ch BWs _ 64QAM _ Middle Channels (722.5MHz and 881.5MHz) at 40 watts/carrier:

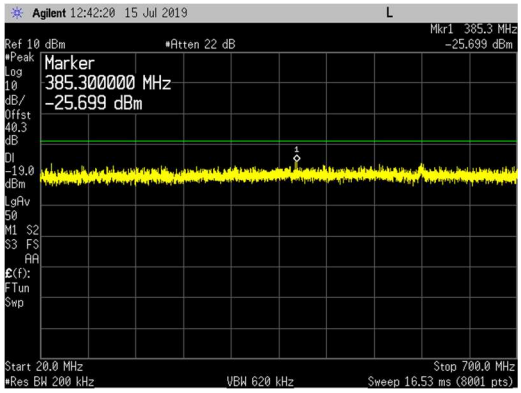
9kHz to 150kHz



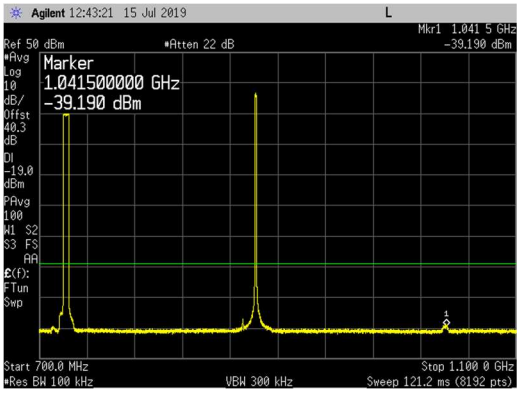
150kHz to 20MHz



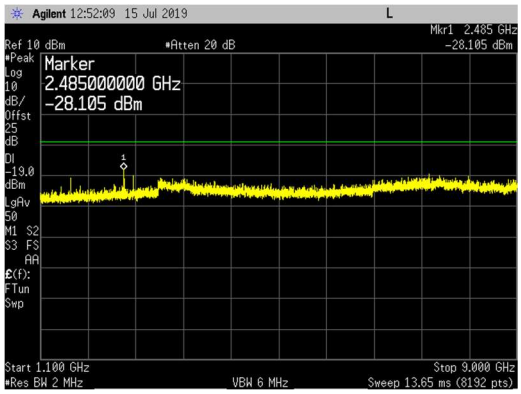
20MHz to 700MHz



700MHz to 1100MHz

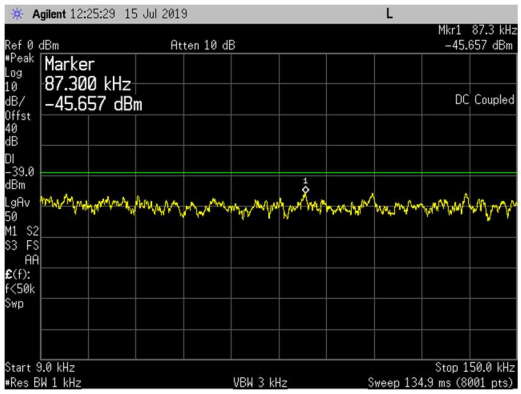


1.1GHz to 9GHz

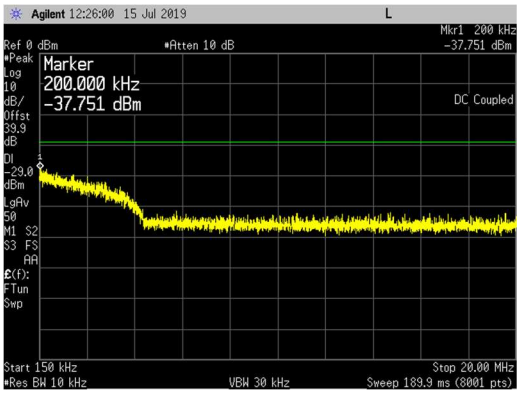


LTE1.4 & LTE5 Ch BWs _ 256QAM _ Middle Channels (722.5MHz and 881.5MHz) at 40 watts/carrier:

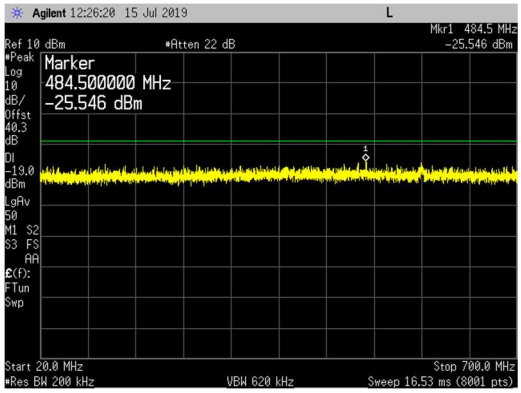
9kHz to 150kHz



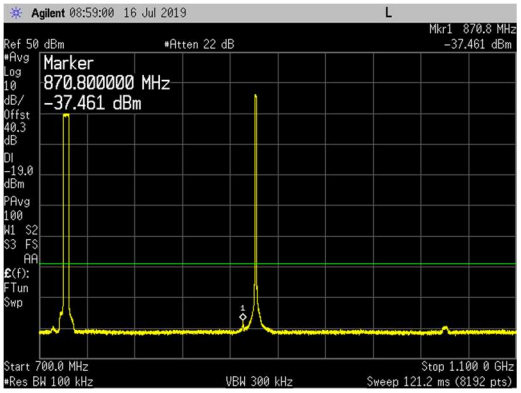
150kHz to 20MHz



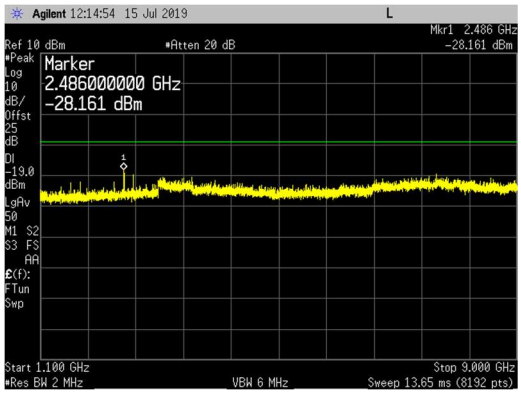
20MHz to 700MHz



700MHz to 1100MHz

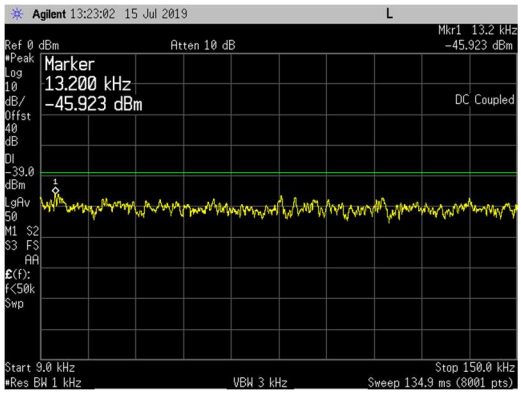


1.1GHz to 9GHz

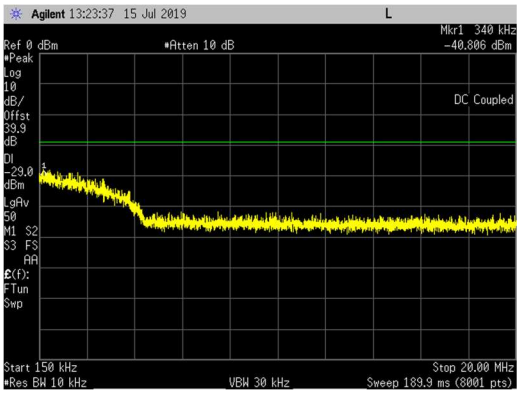


LTE3 & LTE5 Ch BWs _ QPSK _ Middle Channels (722.5MHz and 881.5MHz) at 40 watts/carrier:

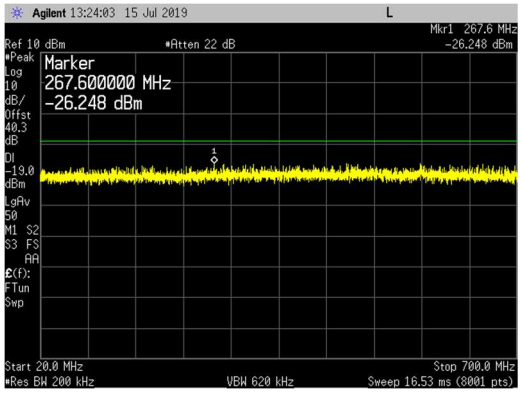
9kHz to 150kHz



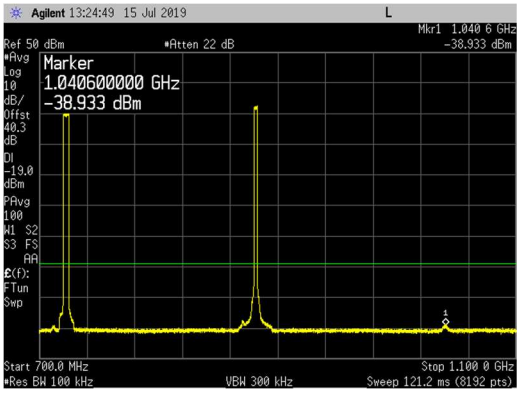
150kHz to 20MHz



20MHz to 700MHz



700MHz to 1100MHz



1.1GHz to 9GHz