

 CTK Co., Ltd. The Prime Leader of Global Regulatory Certification	CTK Co., Ltd. (Ho-dong), 113, Yejik-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea Tel: +82-31-339-9970 Fax: +82-31-624-9501	Report No.: CTK-2017-00947 Page (26) / (124) Pages	
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6. Spurious Emission at Antenna Terminal

§ 27.53 Emission limits

For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log (P)$ dB;

$$46 \text{ dBm} - (43 + 10 \log(40)) = -13 \text{ dBm}, 47.78 \text{ dBm} - (43 + 10 \log(60)) = -13 \text{ dBm}$$

(2) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $76 + 10 \log (P)$ dB in a 6.25 kHz band segment, for base and fixed stations;

$$46 \text{ dBm} - (76 + 10 \log(40)) = -46 \text{ dBm}, 47.78 \text{ dBm} - (76 + 10 \log(60)) = -46 \text{ dBm}$$

(3) Compliance with the provisions of paragraphs (1) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

(4) Compliance with the provisions of paragraphs (2) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to $-70 \text{ dBW/MHz} (-40 \text{ dBm / MHz})$ equivalent isotropically radiated power (EIRP) for wideband signals, and $-80 \text{ dBW} (-50 \text{ dBm})$ EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

Test Procedures :

The RF Output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.

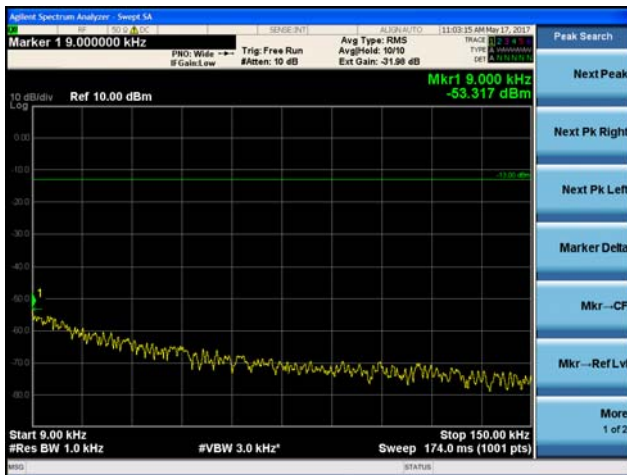
The resolution bandwidth of the spectrum analyzer was set at 100 kHz(below 1 GHz), 1 MHz(Above 1 GHz). Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

Notes :

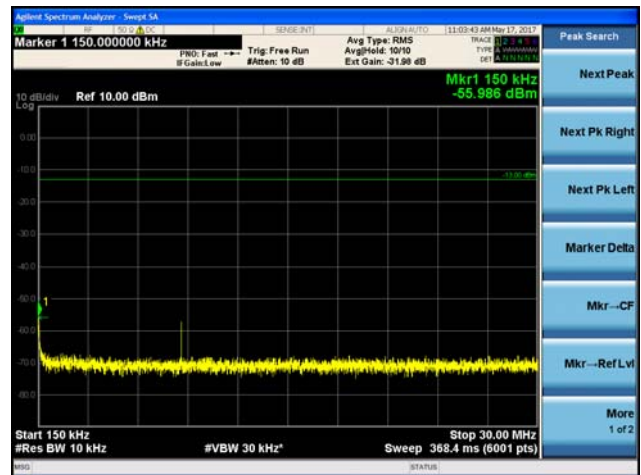
1. In 9 kHz - 10 kHz and 150 kHz - 30 MHz bands, RBW was reduced to 1% and 10% of the reference bandwidth for measuring unwanted emission level(typically, 100 kHz if the authorized frequency band is below 1 GHz) and power was integrated.(1% = +20 dB, 10% = +10 dB)
2. Because the test results are similar trend value for each port, attached plots were only the port 0 test result.

Spurious Emissions at antenna terminal
Test Data at Output Port 0(4TX)
[QPSK]

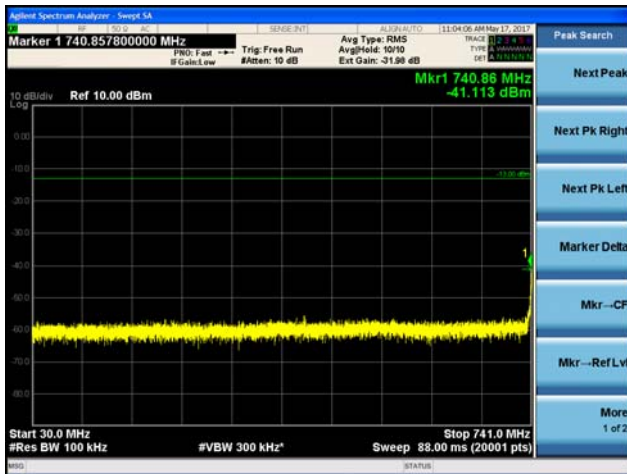
9 kHz - 150 kHz



150 kHz - 30 MHz



30 MHz - 741 MHz



741 MHz - 745.9 MHz



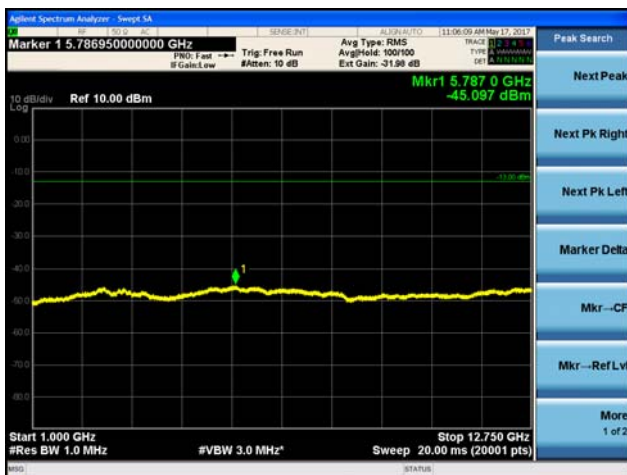
756.1 MHz - 761 MHz



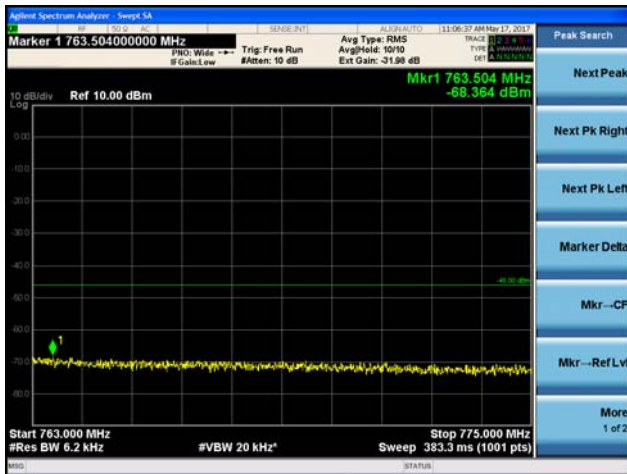
761 MHz - 1 GHz



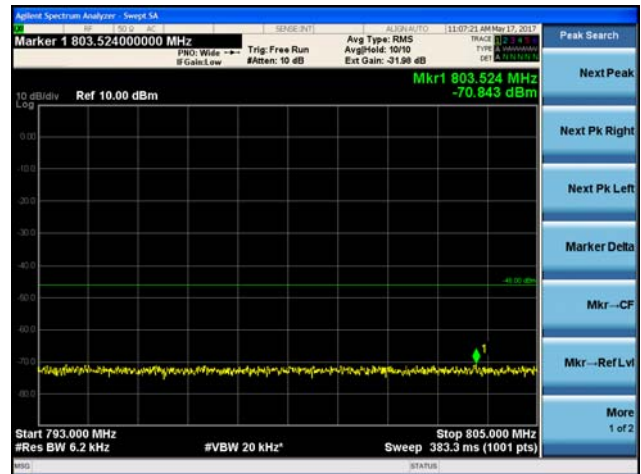
1 GHz - 12.75 GHz



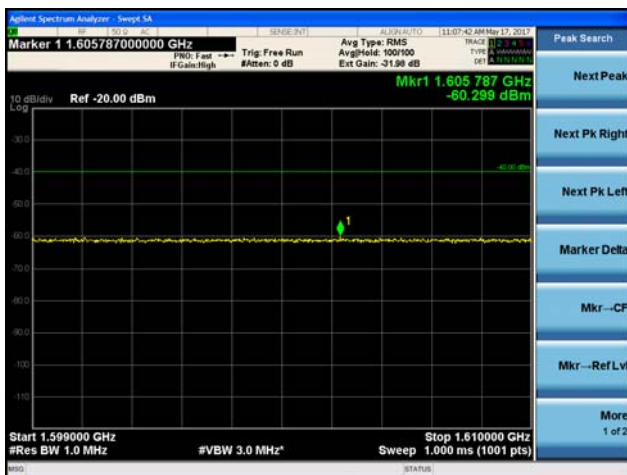
763 MHz - 775 MHz



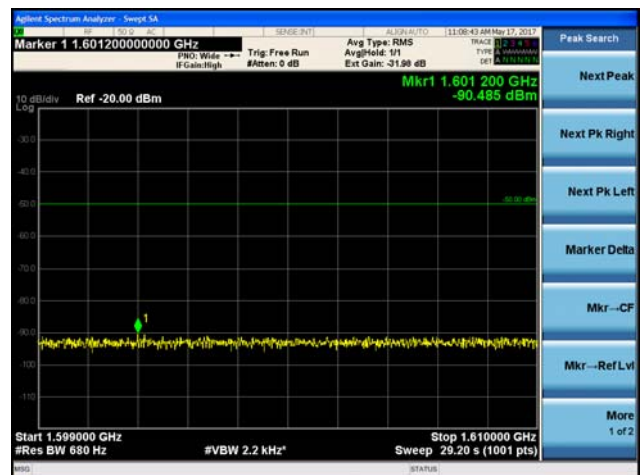
793 MHz - 805 MHz



1599 MHz - 1610 MHz (1)

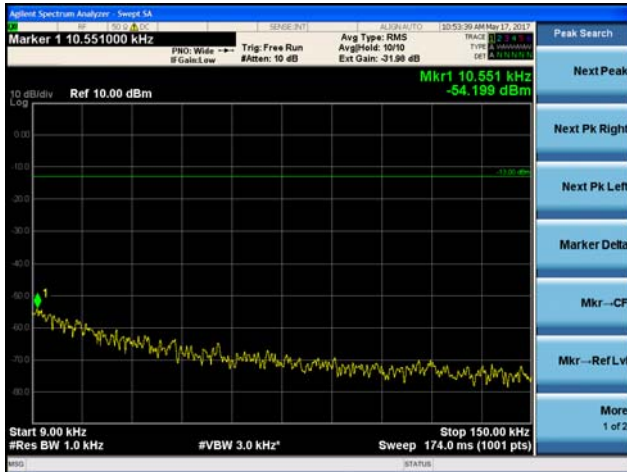


1599 MHz - 1610 MHz (2)

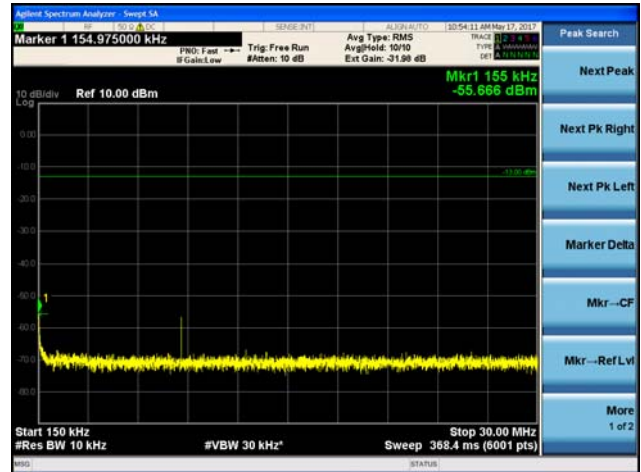


Spurious Emissions at antenna terminal
Test Data at Output Port 0(4TX)
[16QAM]

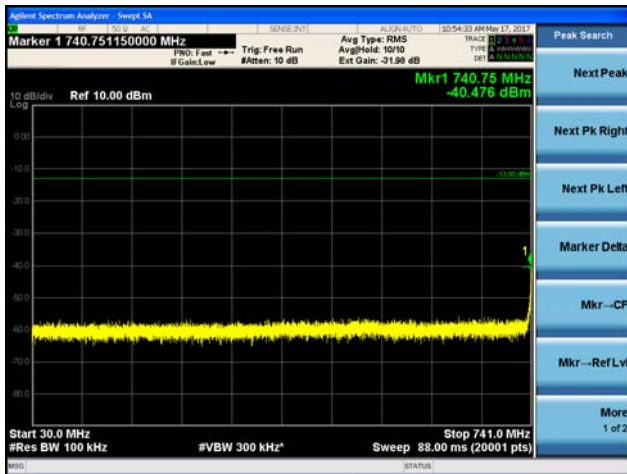
9 kHz - 150 kHz



150 kHz - 30 MHz



30 MHz - 741 MHz



741 MHz - 745.9 MHz



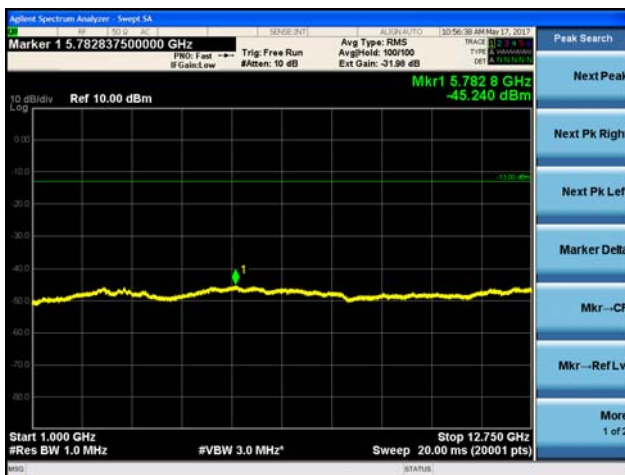
756.1 MHz - 761 MHz



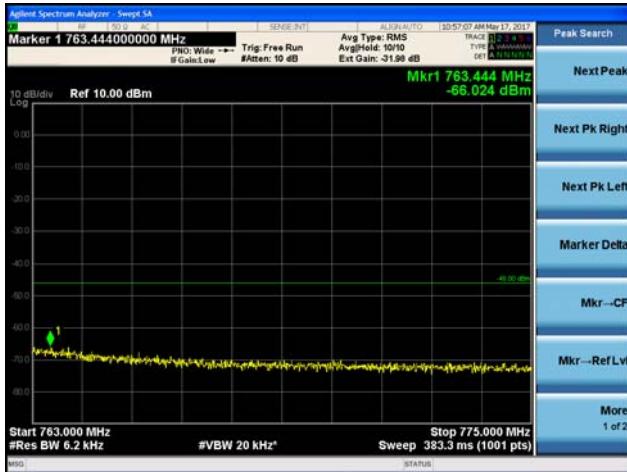
761 MHz - 1 GHz



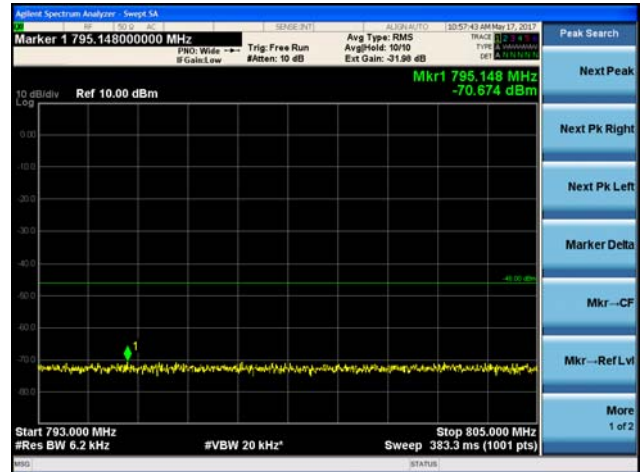
1 GHz - 12.75 GHz



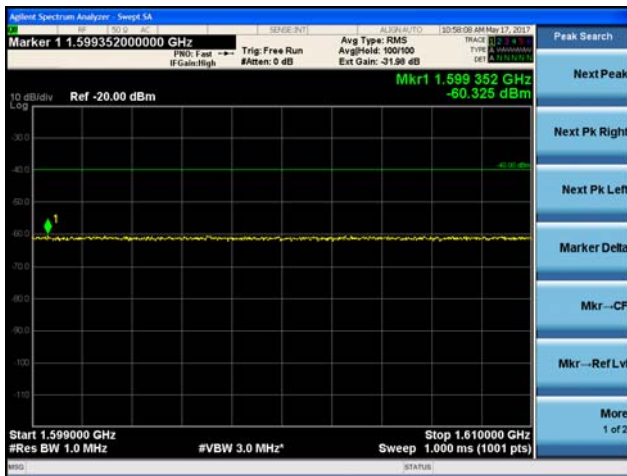
763 MHz - 775 MHz



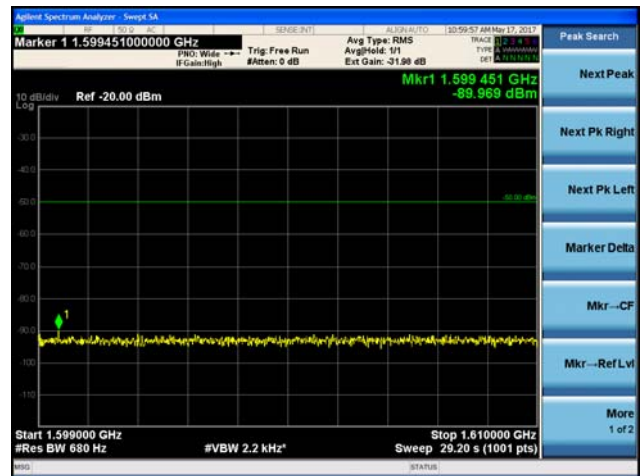
793 MHz - 805 MHz



1599 MHz - 1610 MHz (1)



1599 MHz - 1610 MHz (2)

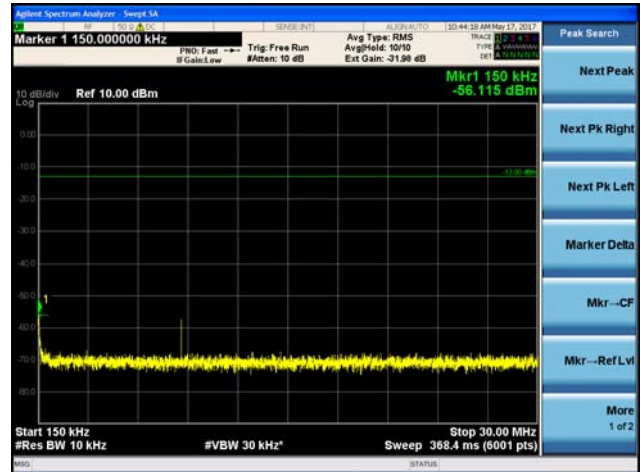


Spurious Emissions at antenna terminal
Test Data at Output Port 0(4TX)
[64QAM]

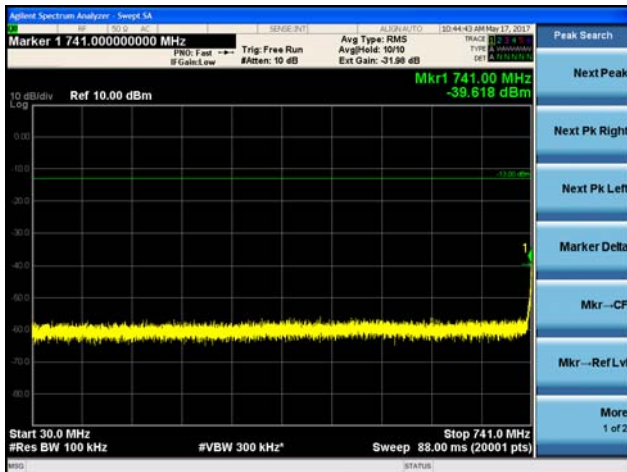
9 kHz - 150 kHz



150 kHz - 30 MHz



30 MHz - 741 MHz



741 MHz - 745.9 MHz





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756.1 MHz - 761 MHz



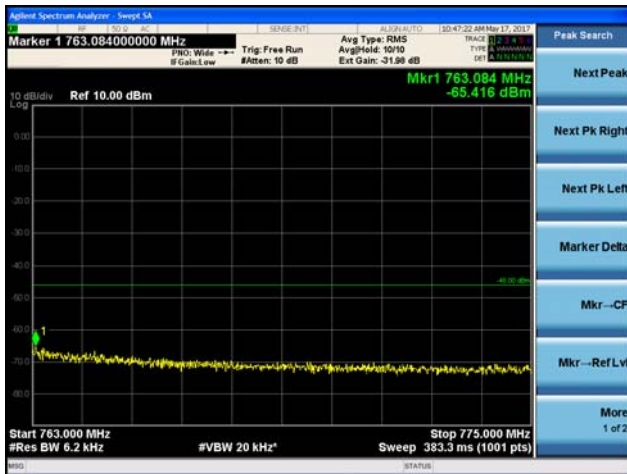
761 MHz - 1 GHz



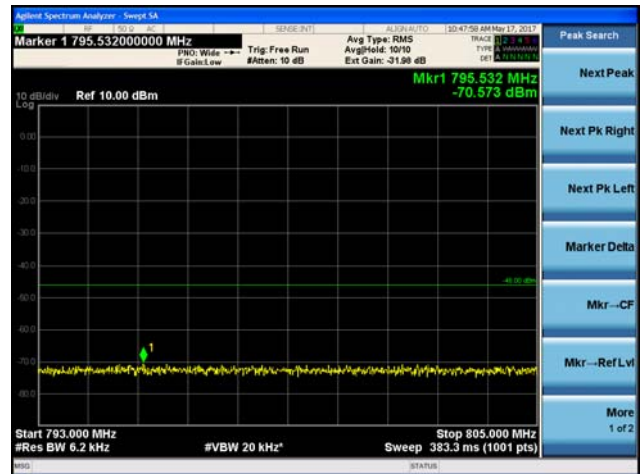
1 GHz - 12.75 GHz



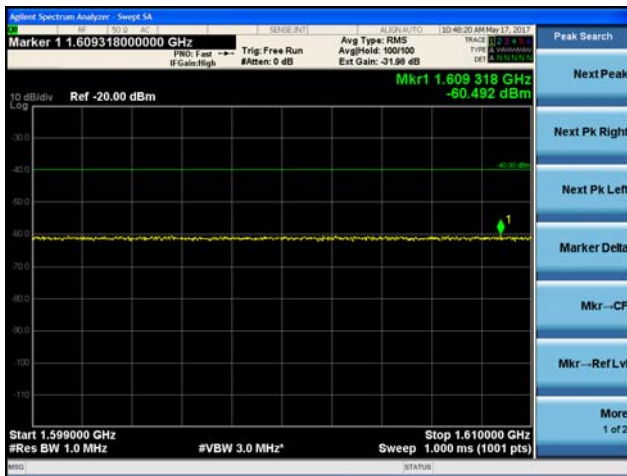
763 MHz - 775 MHz



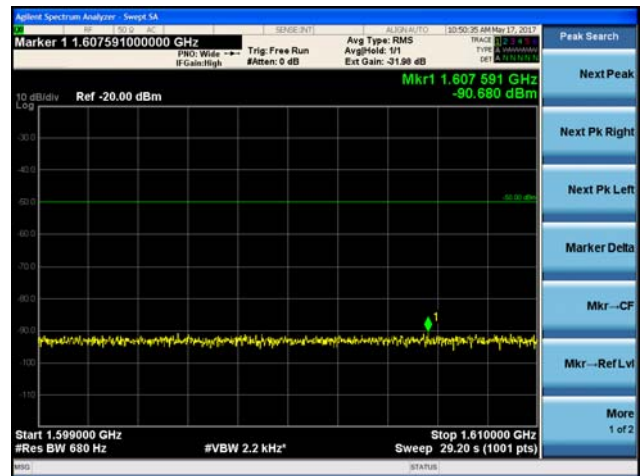
793 MHz - 805 MHz



1599 MHz - 1610 MHz (1)

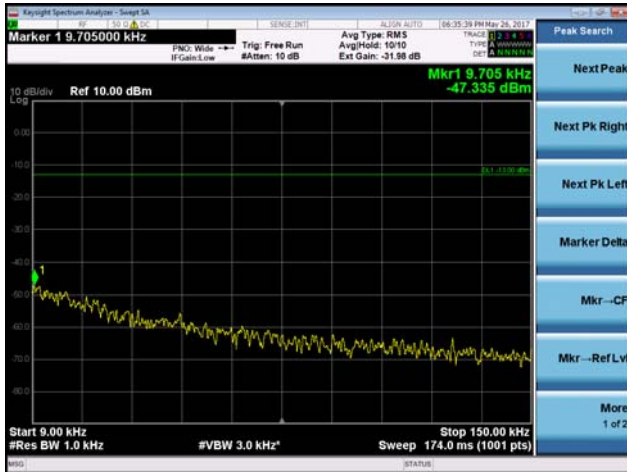


1599 MHz - 1610 MHz (2)

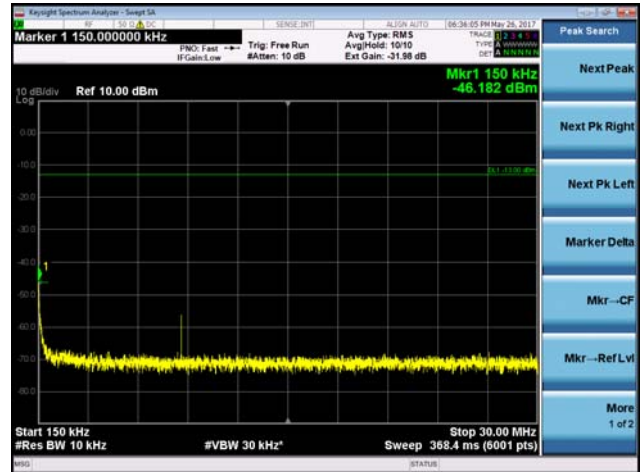


Spurious Emissions at antenna terminal
Test Data at Output Port 0(4TX)
[256QAM]

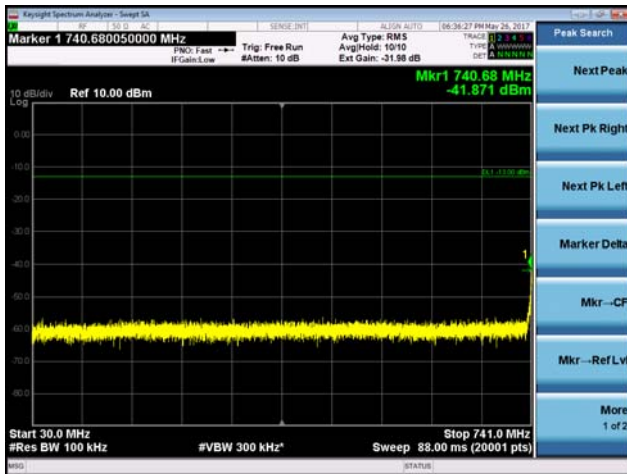
9 kHz - 150 kHz



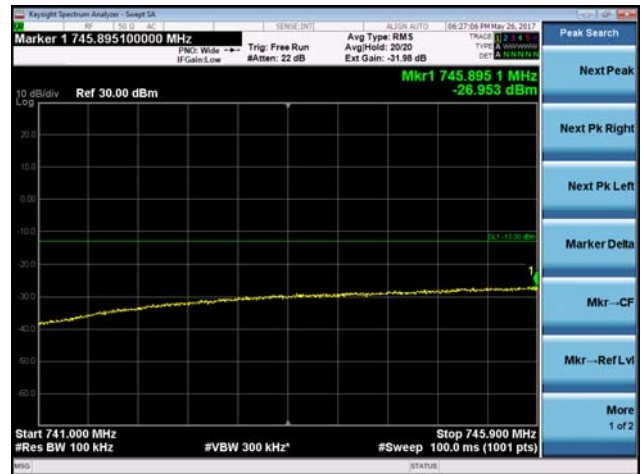
150 kHz - 30 MHz



30 MHz - 741 MHz



741 MHz - 745.9 MHz



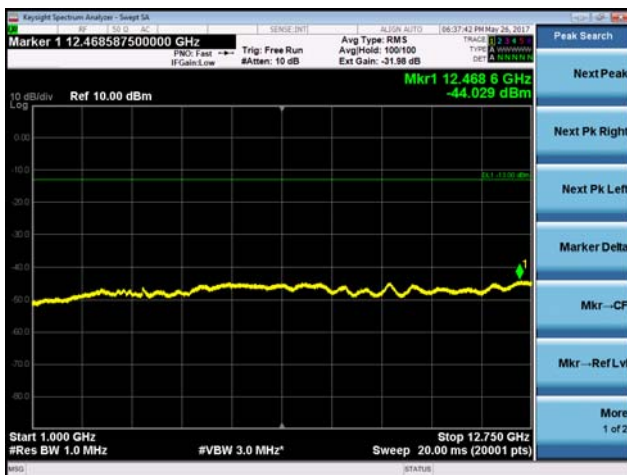
756.1 MHz - 761 MHz



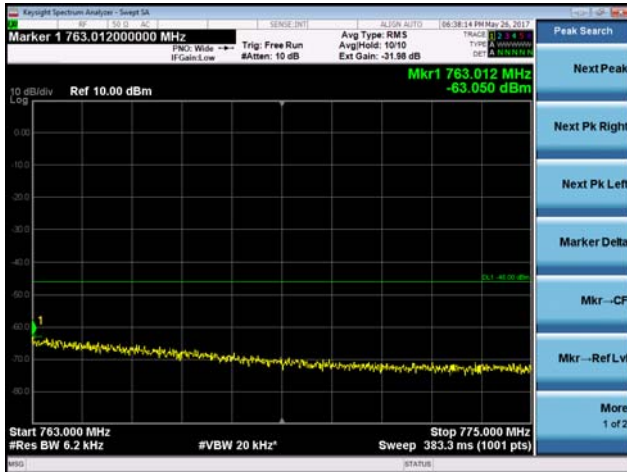
761 MHz - 1 GHz



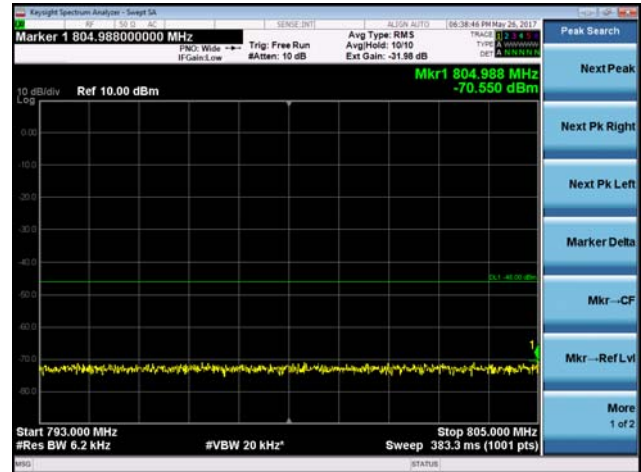
1 GHz - 12.75 GHz



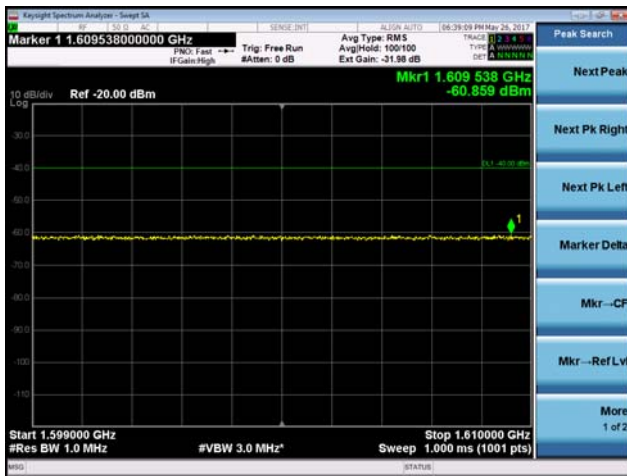
763 MHz - 775 MHz



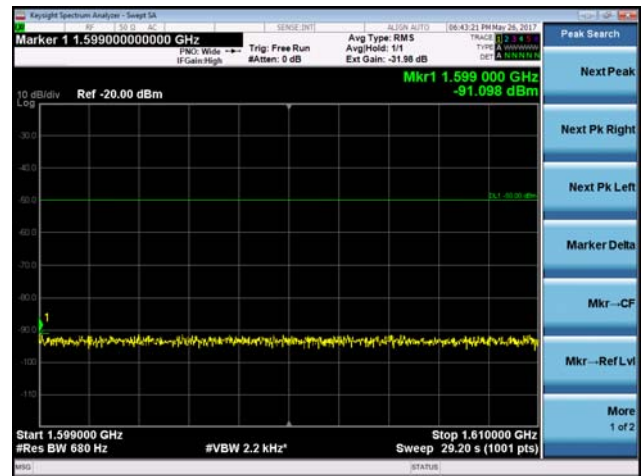
793 MHz - 805 MHz



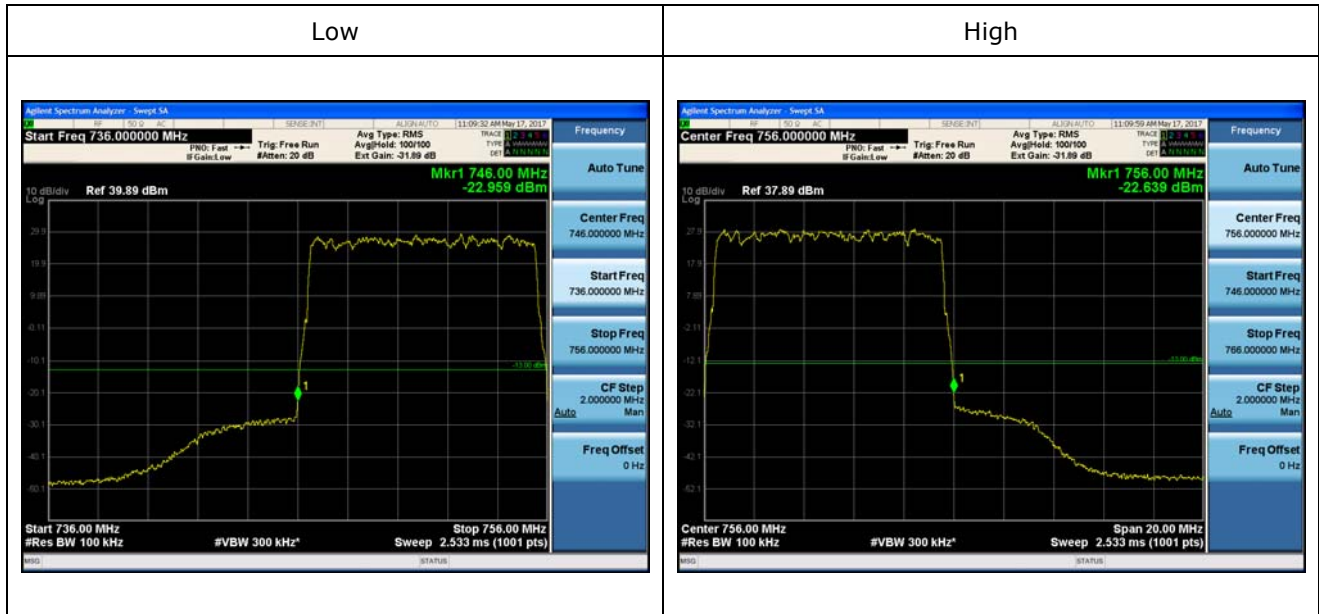
1599 MHz - 1610 MHz (1)



1599 MHz - 1610 MHz (2)



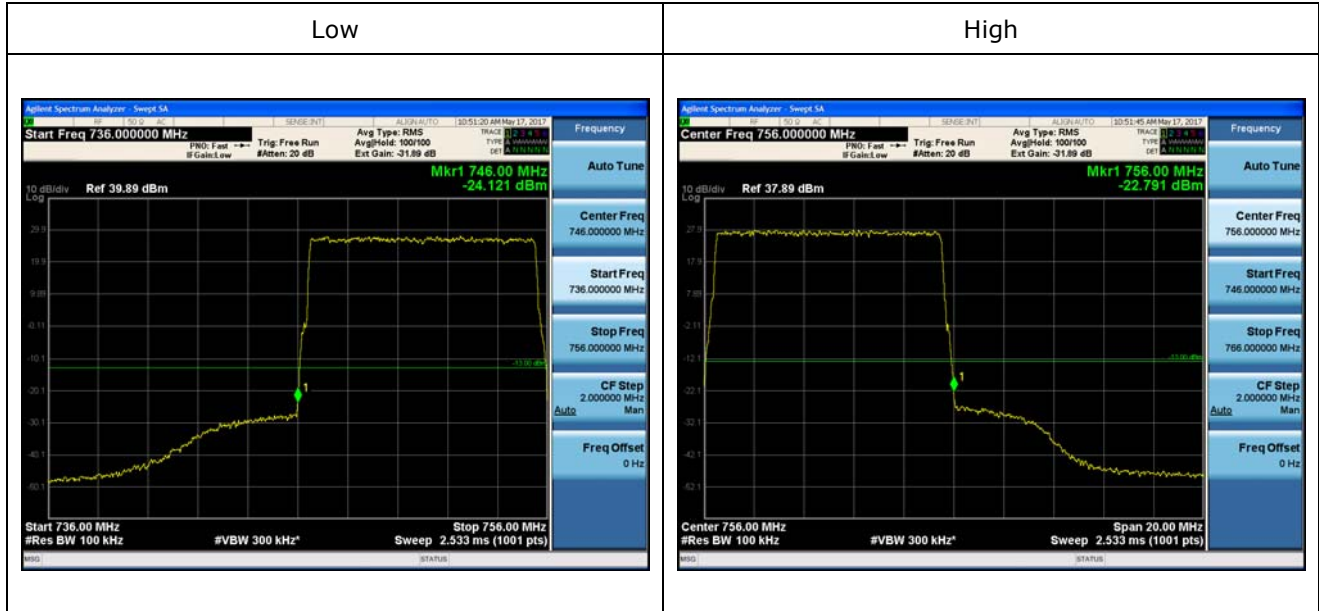
Band Edge
Test Data at Output Port 0(4TX)
[QPSK]



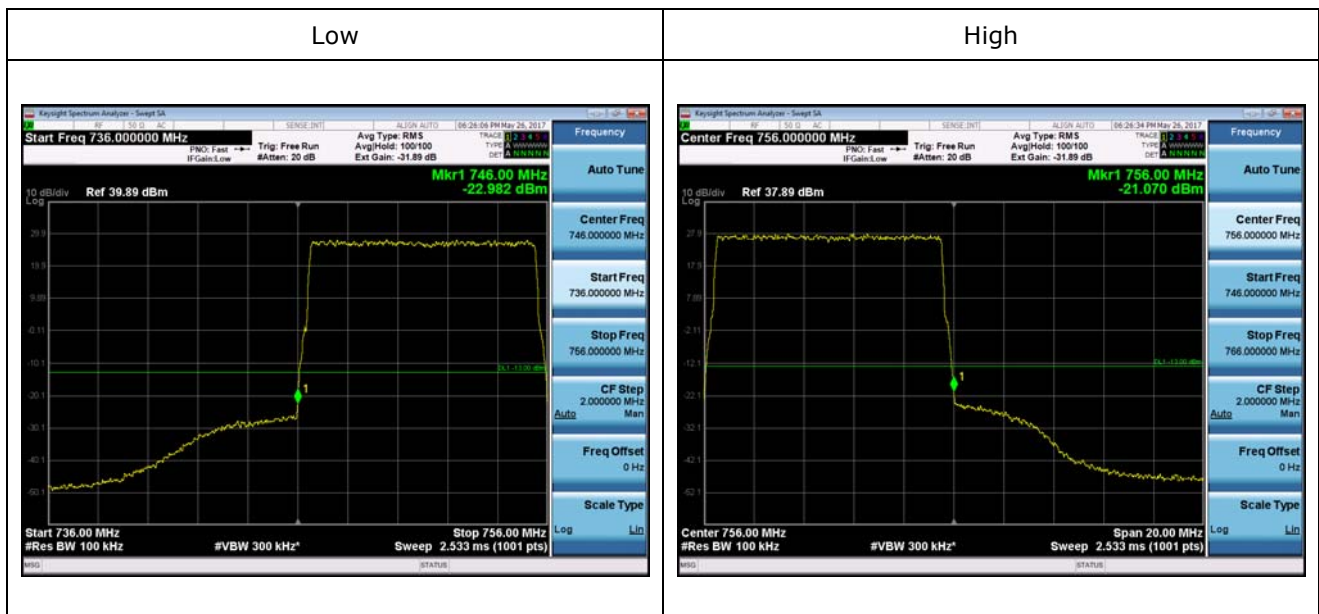
[16QAM]



[64QAM]

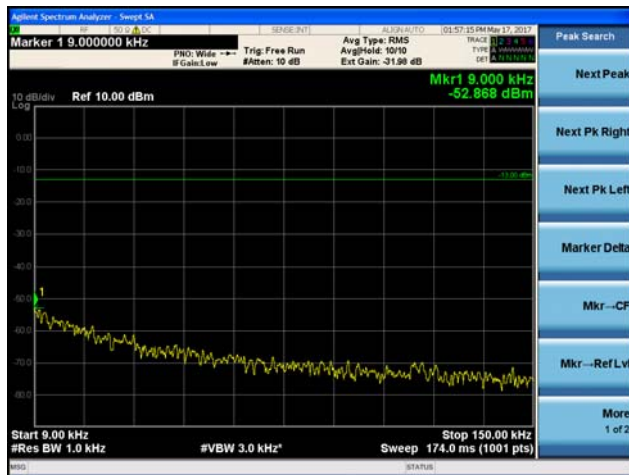


[256QAM]

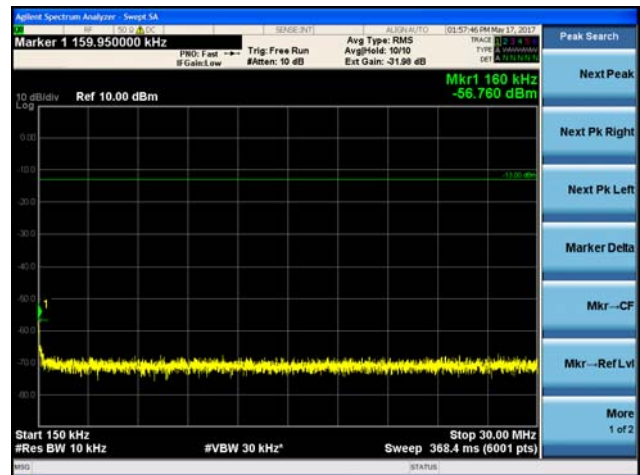


Spurious Emissions at antenna terminal
Test Data at Output Port 1(4TX)
[QPSK]

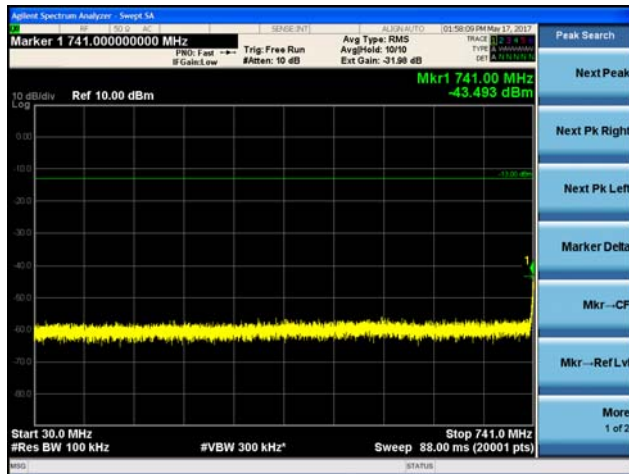
9 kHz - 150 kHz



150 kHz - 30 MHz



30 MHz - 741 MHz



741 MHz - 745.9 MHz



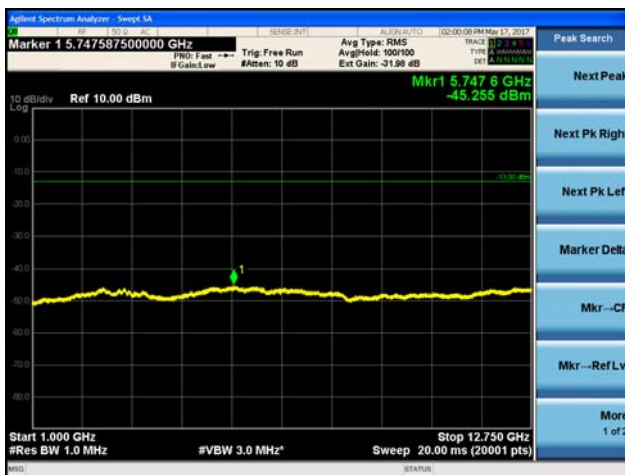
756.1 MHz - 761 MHz



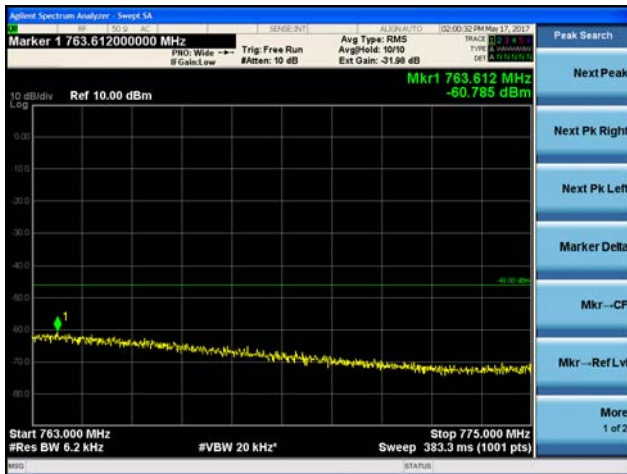
761 MHz - 1 GHz



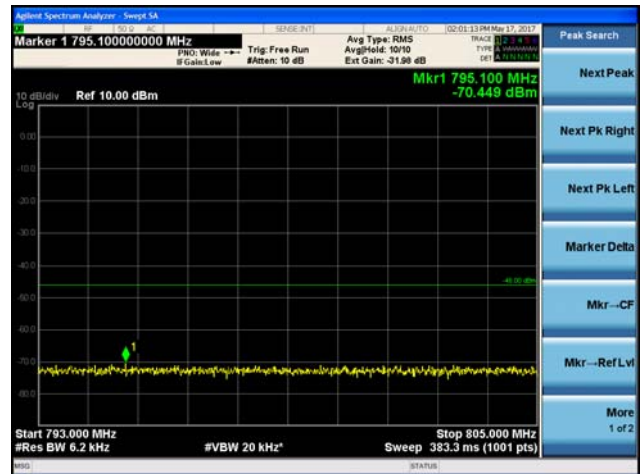
1 GHz - 12.75 GHz



763 MHz - 775 MHz



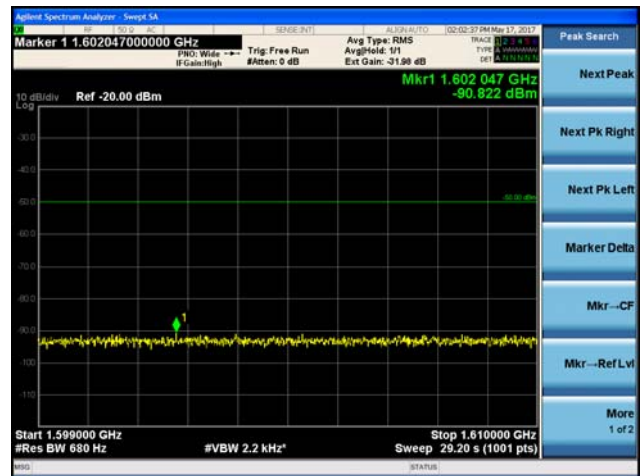
793 MHz - 805 MHz



1599 MHz - 1610 MHz (1)



1599 MHz - 1610 MHz (2)

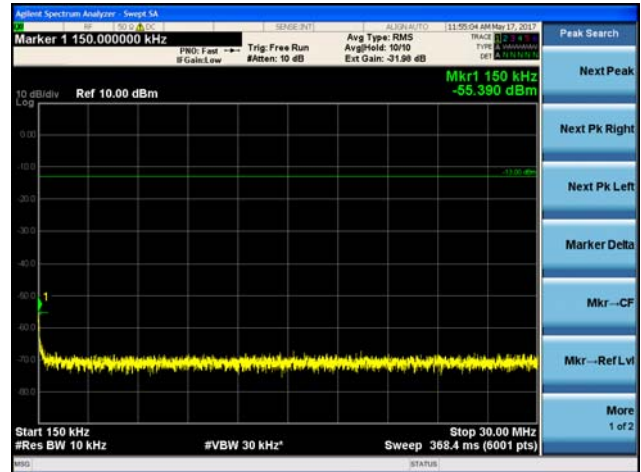


Spurious Emissions at antenna terminal
Test Data at Output Port 1(4TX)
[16QAM]

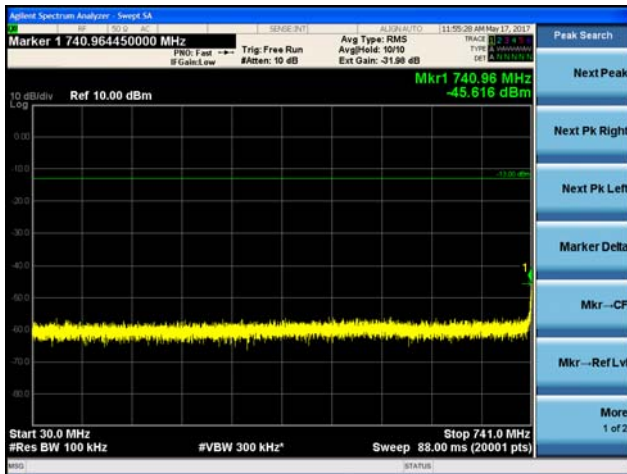
9 kHz - 150 kHz



150 kHz - 30 MHz



30 MHz - 741 MHz



741 MHz - 745.9 MHz



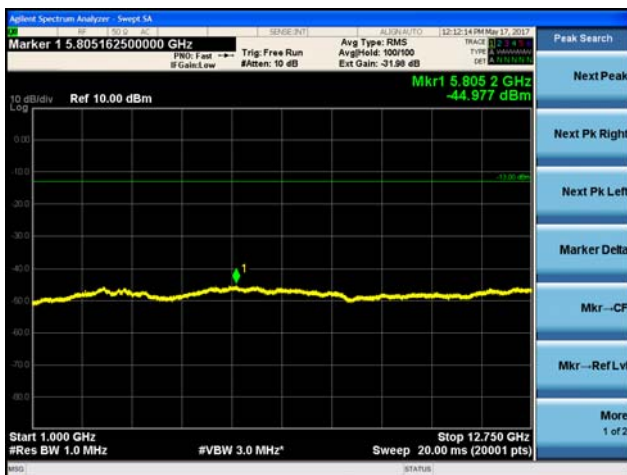
756.1 MHz - 761 MHz



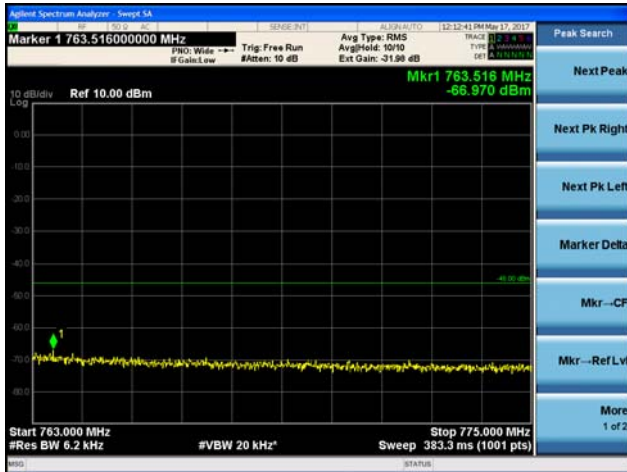
761 MHz - 1 GHz



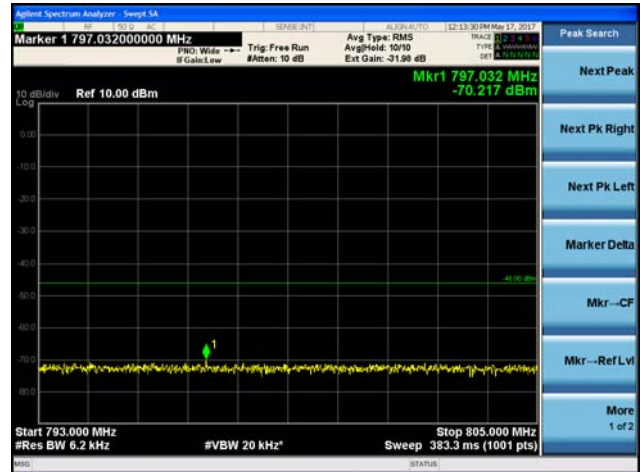
1 GHz - 12.75 GHz



763 MHz - 775 MHz



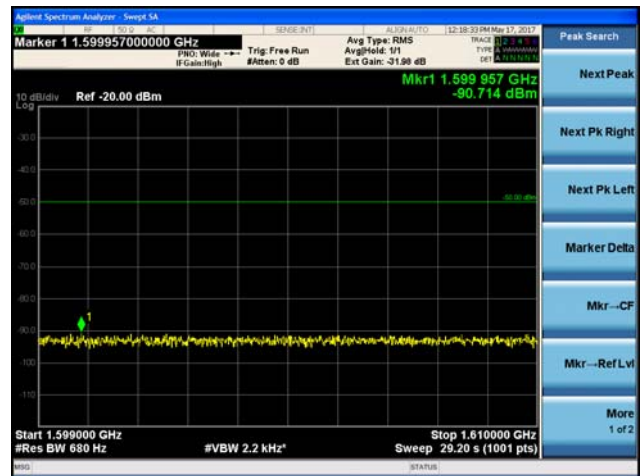
793 MHz - 805 MHz



1599 MHz - 1610 MHz (1)

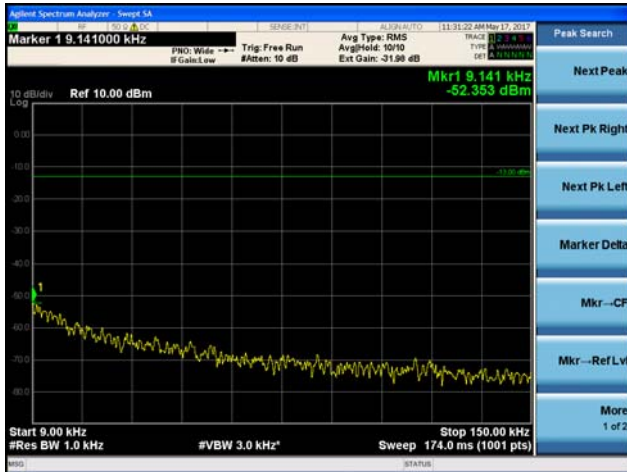


1599 MHz - 1610 MHz (2)

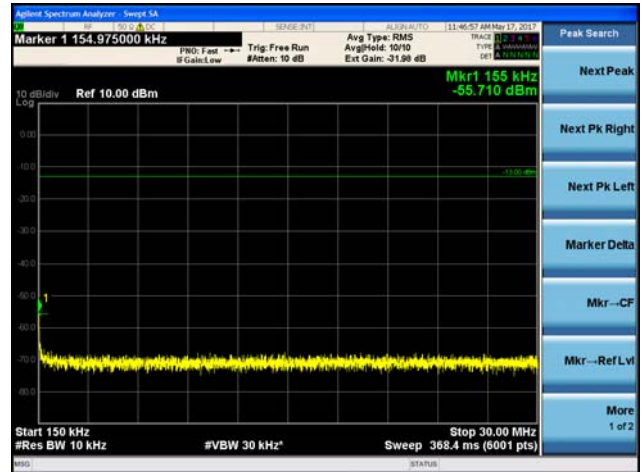


Spurious Emissions at antenna terminal
Test Data at Output Port 1(4TX)
[64QAM]

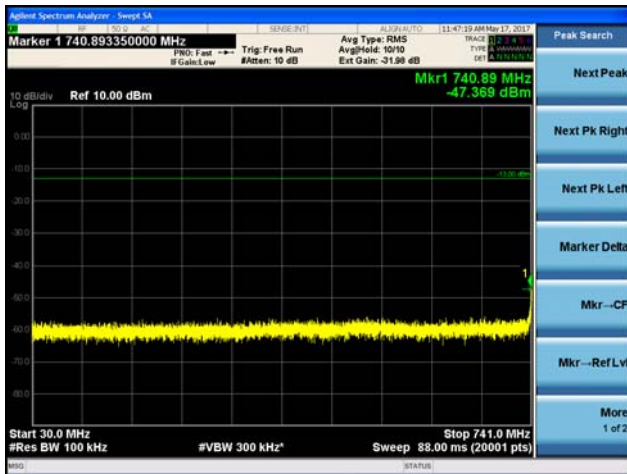
9 kHz - 150 kHz



150 kHz - 30 MHz



30 MHz - 741 MHz



741 MHz - 745.9 MHz



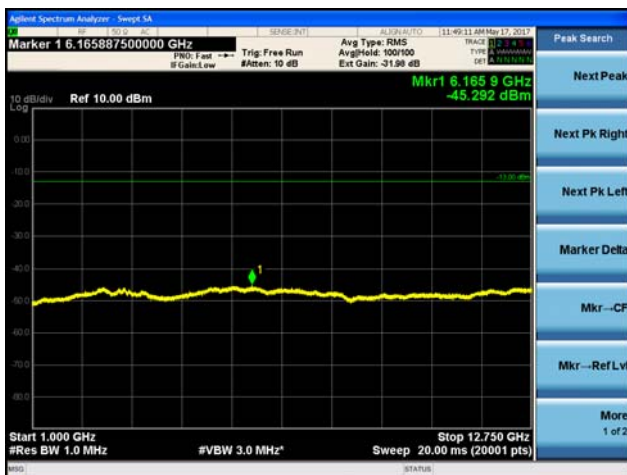
756.1 MHz - 761 MHz



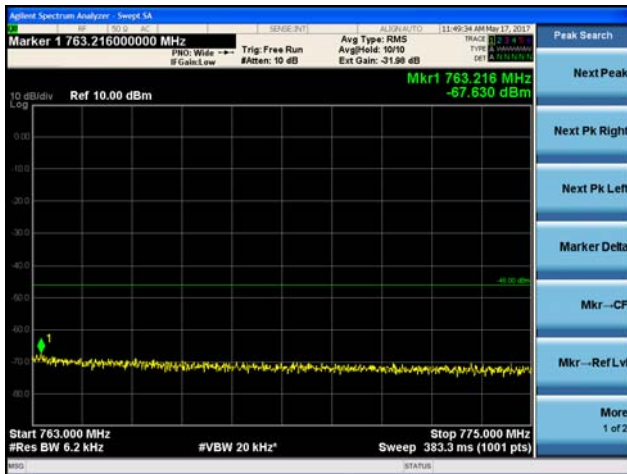
761 MHz - 1 GHz



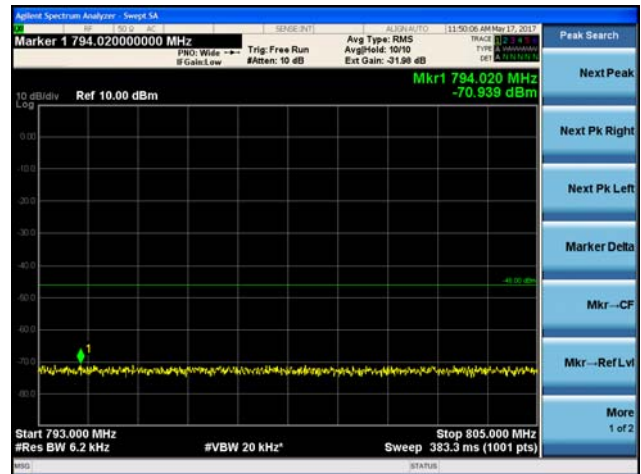
1 GHz - 12.75 GHz



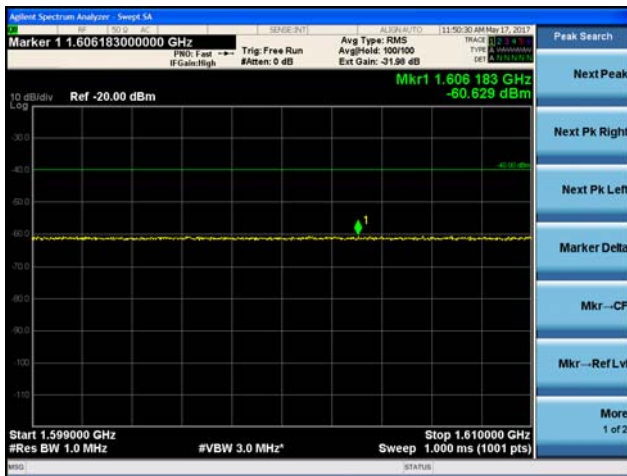
763 MHz - 775 MHz



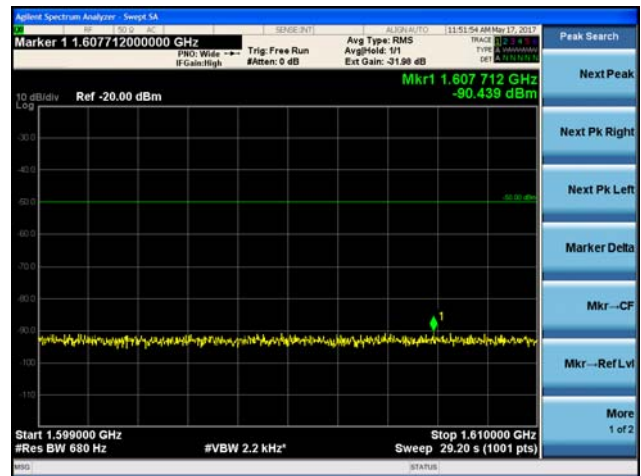
793 MHz - 805 MHz



1599 MHz - 1610 MHz (1)

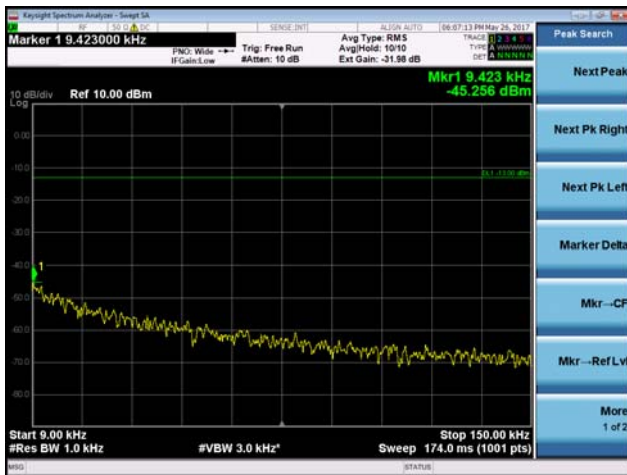


1599 MHz - 1610 MHz (2)

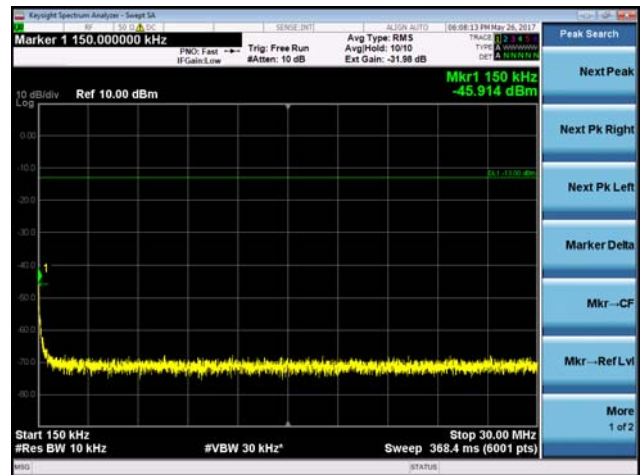


Spurious Emissions at antenna terminal
Test Data at Output Port 1(4TX)
[256QAM]

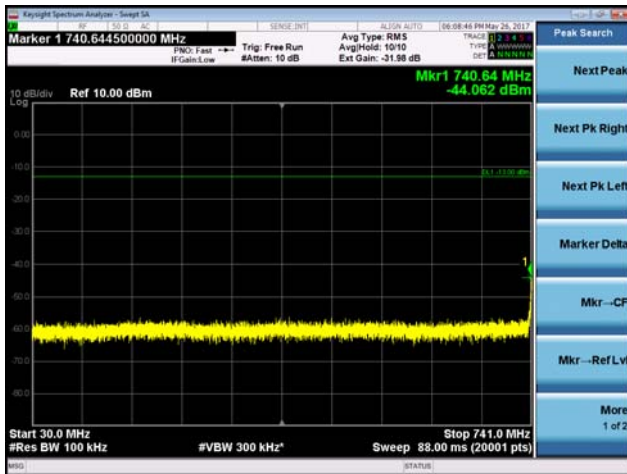
9 kHz - 150 kHz



150 kHz - 30 MHz



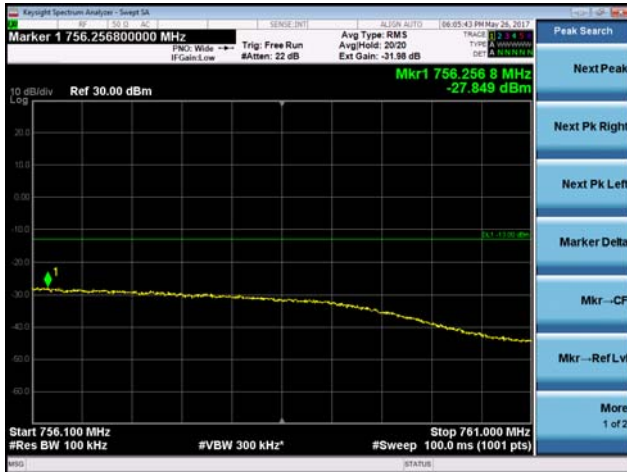
30 MHz - 741 MHz



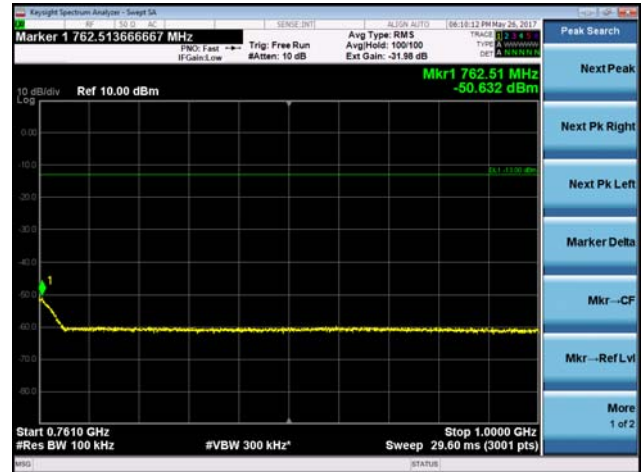
741 MHz - 745.9 MHz



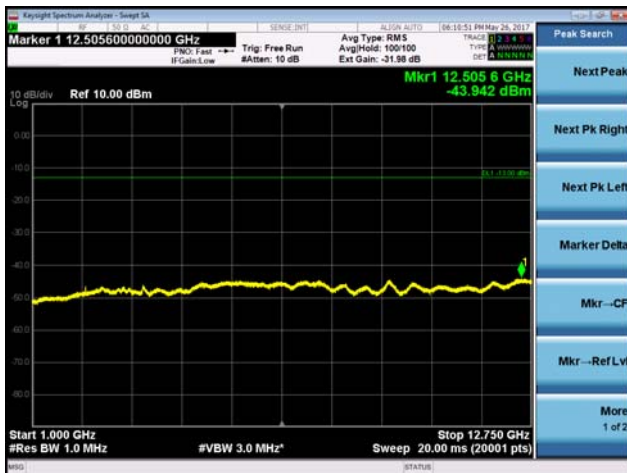
756.1 MHz - 761 MHz



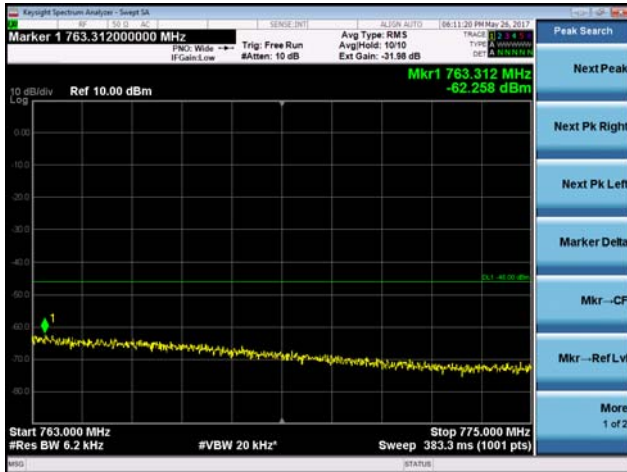
761 MHz - 1 GHz



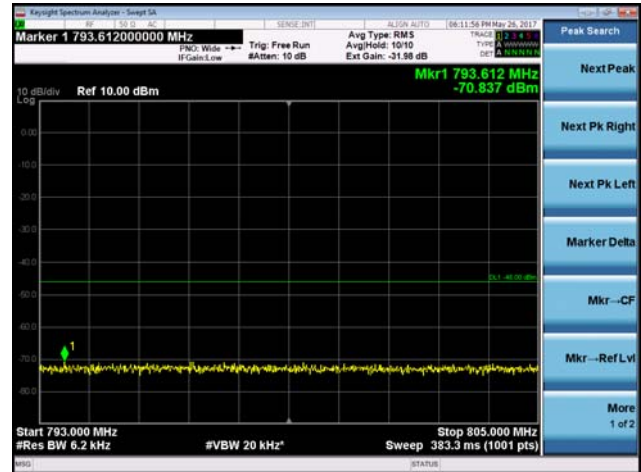
1 GHz - 12.75 GHz



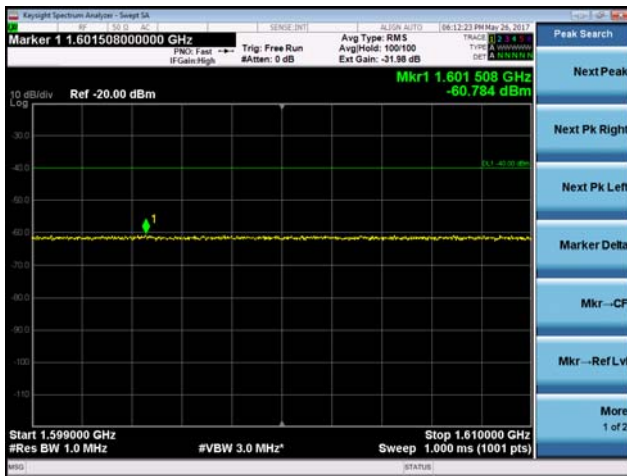
763 MHz - 775 MHz



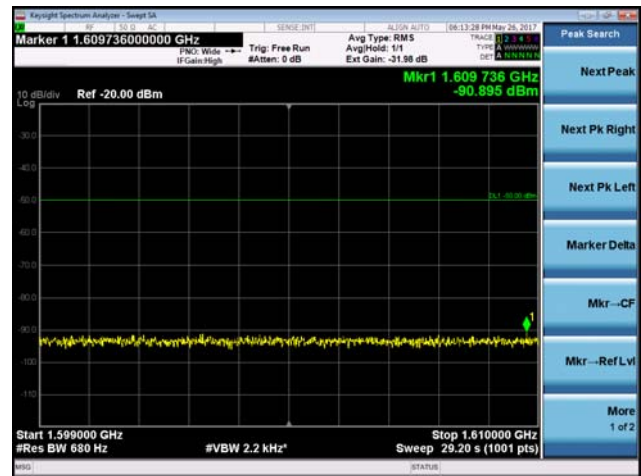
793 MHz - 805 MHz



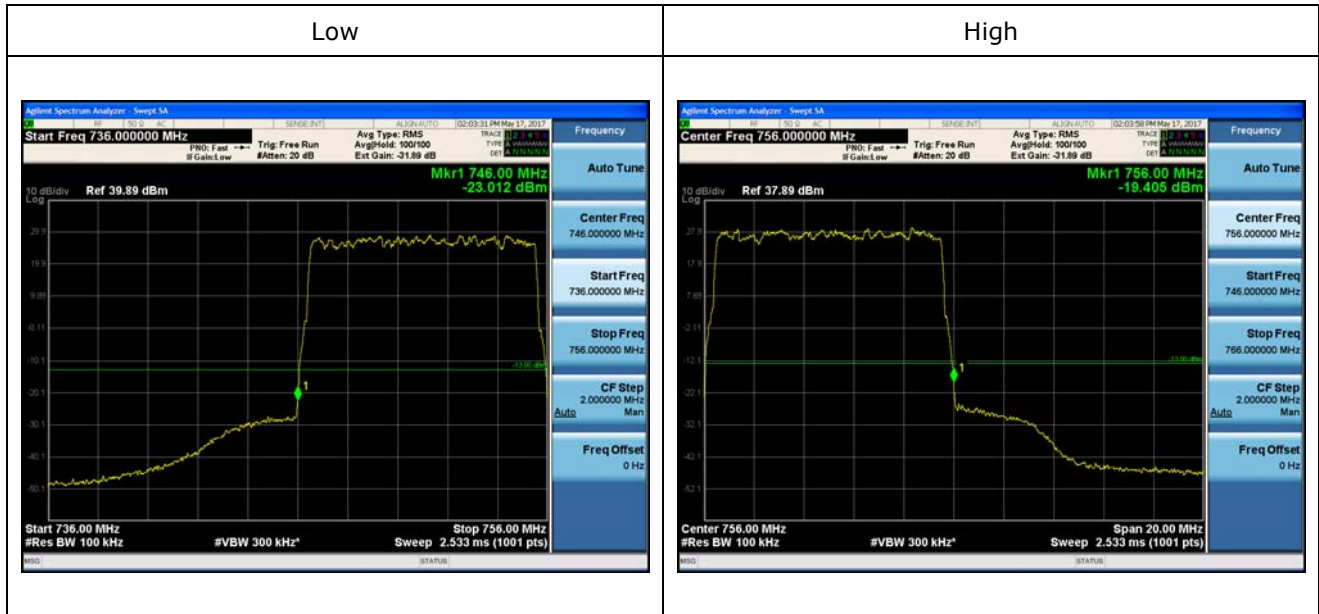
1599 MHz - 1610 MHz (1)



1599 MHz - 1610 MHz (2)



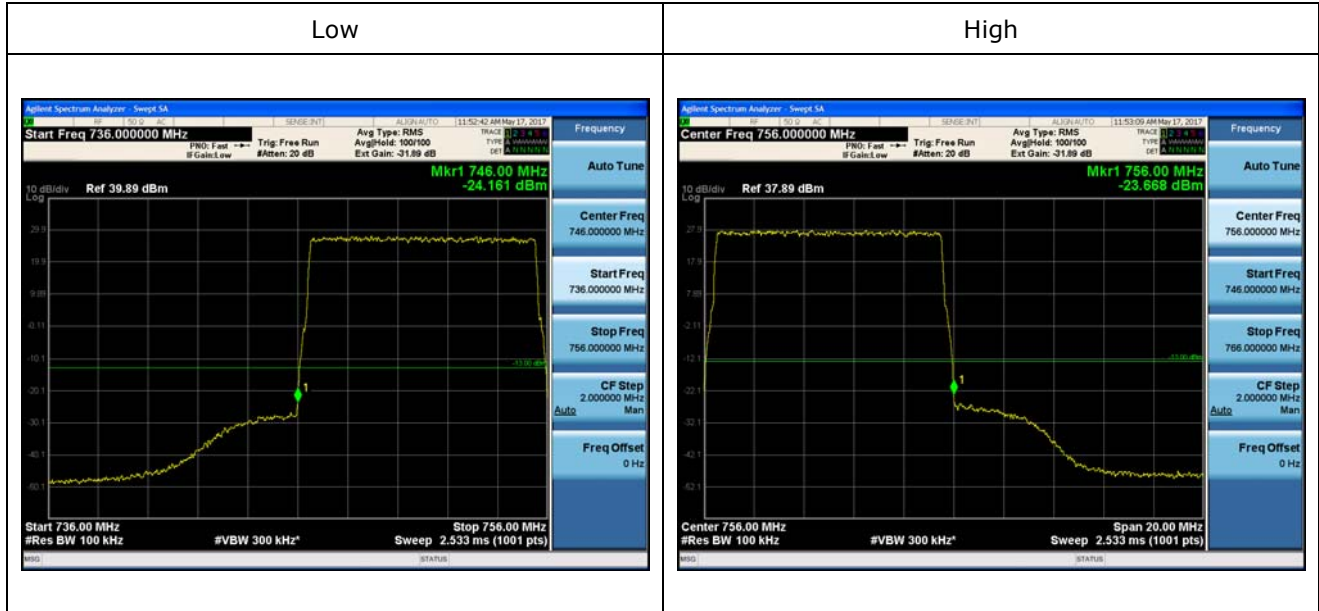
Band Edge
Test Data at Output Port 1(4TX)
[QPSK]



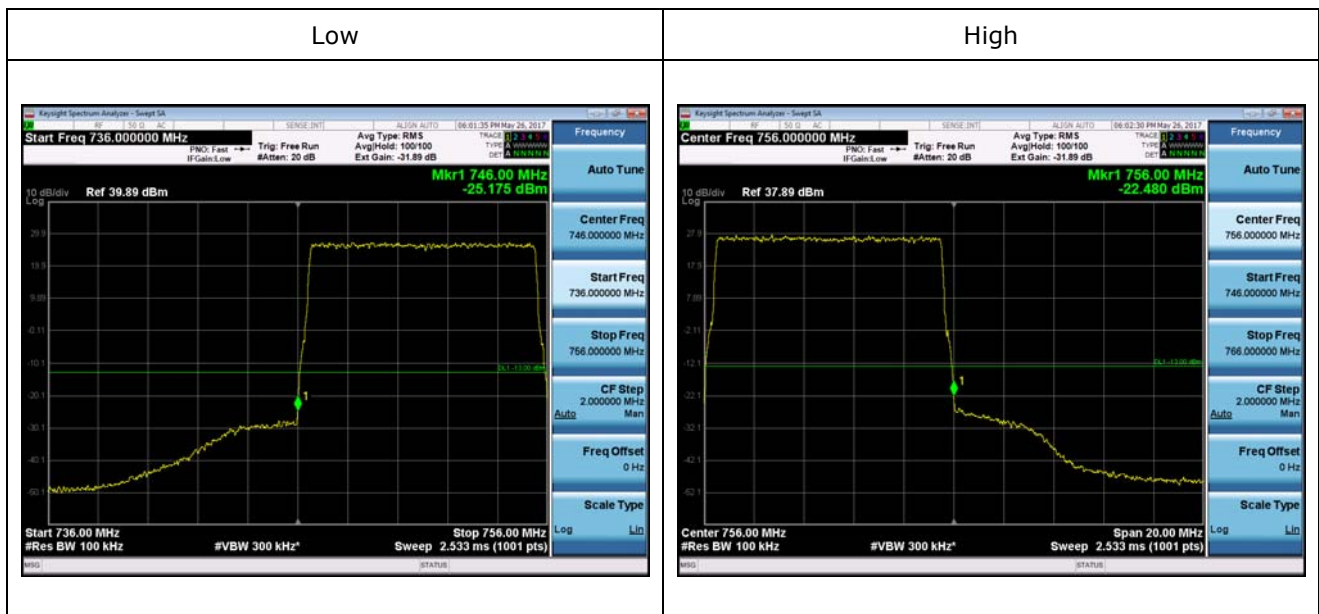
[16QAM]



[64QAM]

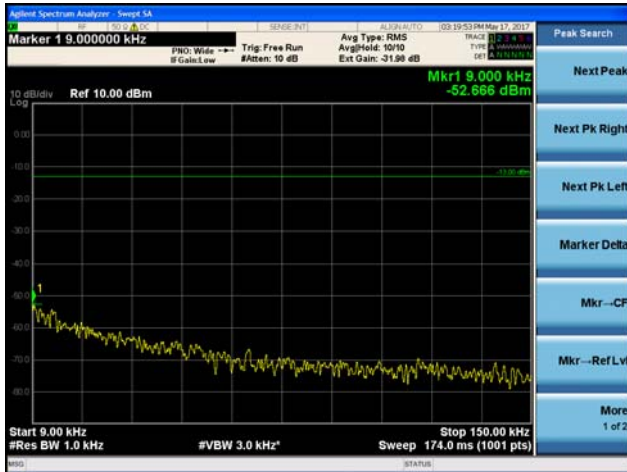


[256QAM]

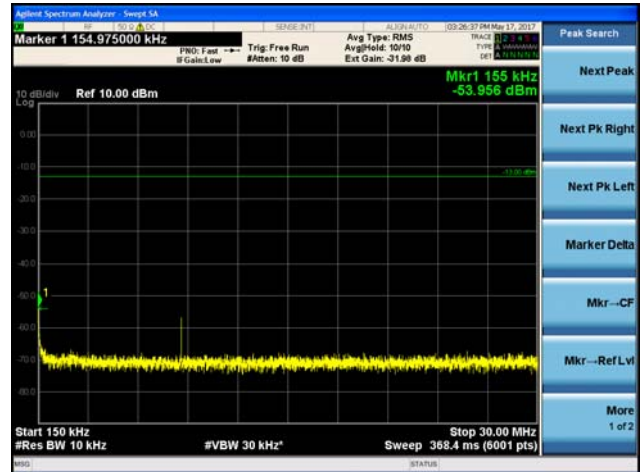


Spurious Emissions at antenna terminal
Test Data at Output Port 2(4TX)
[QPSK]

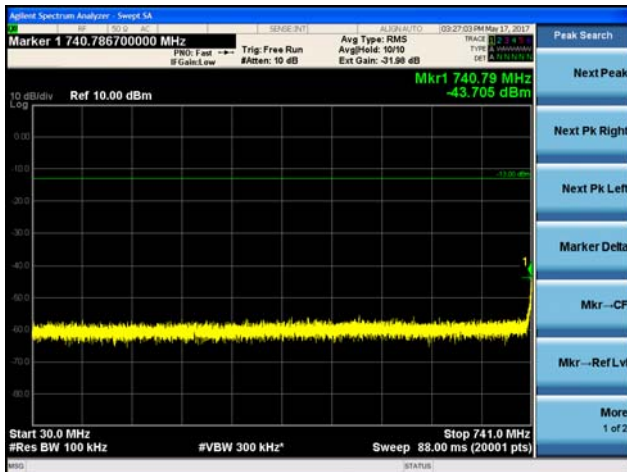
9 kHz - 150 kHz



150 kHz - 30 MHz



30 MHz - 741 MHz



741 MHz - 745.9 MHz



756.1 MHz - 761 MHz



761 MHz - 1 GHz



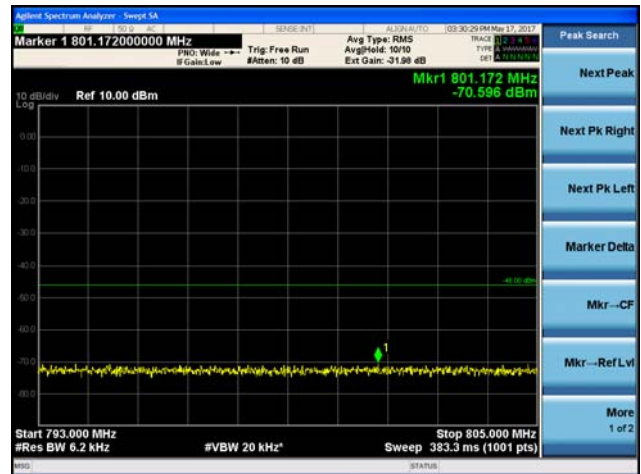
1 GHz - 12.75 GHz



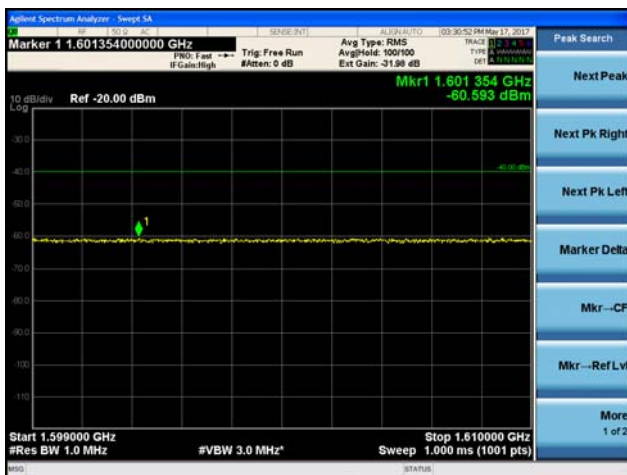
763 MHz - 775 MHz



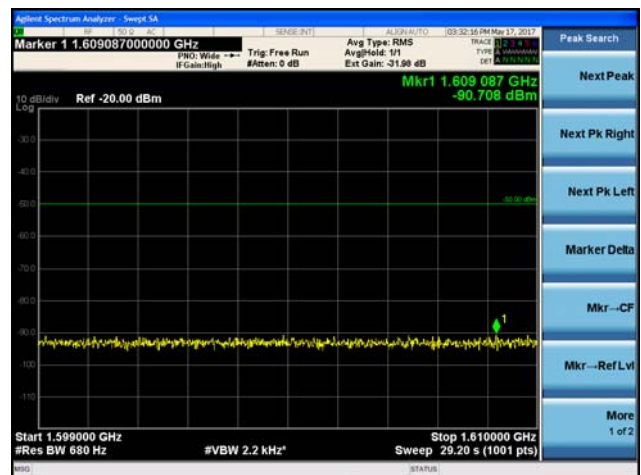
793 MHz - 805 MHz



1599 MHz - 1610 MHz (1)



1599 MHz - 1610 MHz (2)

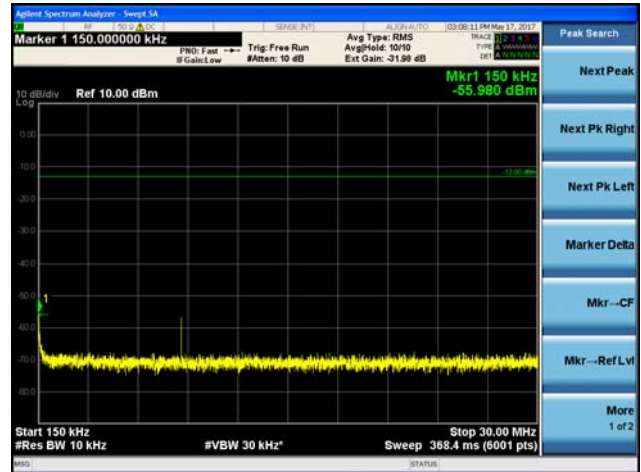


Spurious Emissions at antenna terminal
Test Data at Output Port 2(4TX)
[16QAM]

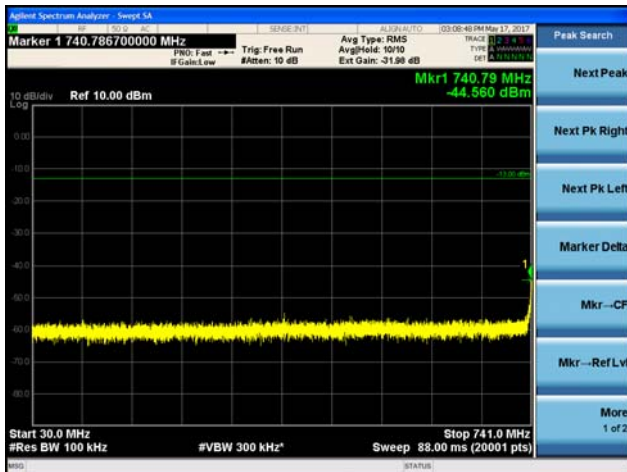
9 kHz - 150 kHz



150 kHz - 30 MHz



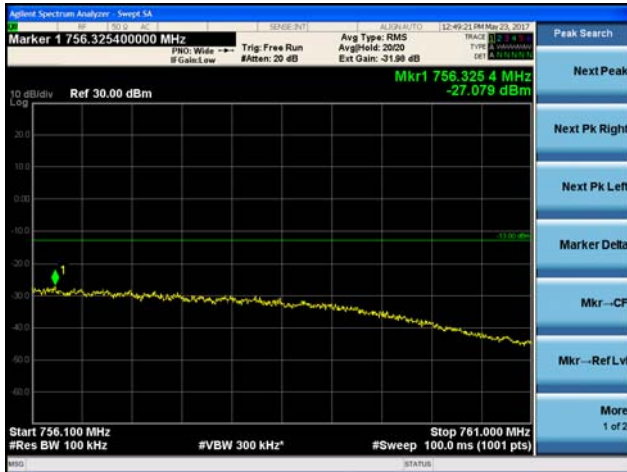
30 MHz - 741 MHz



741 MHz - 745.9 MHz



756.1 MHz - 761 MHz



761 MHz - 1 GHz



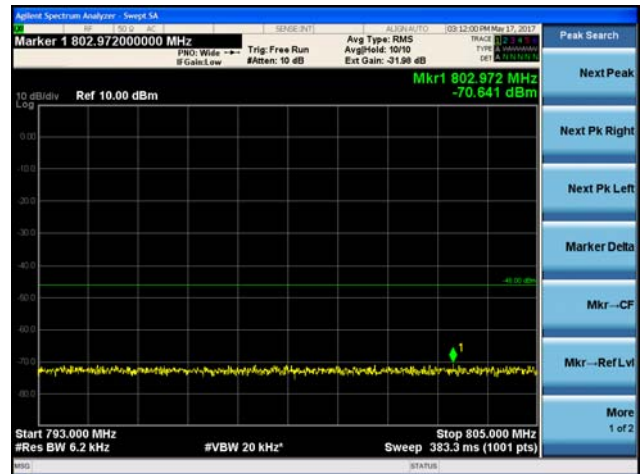
1 GHz - 12.75 GHz



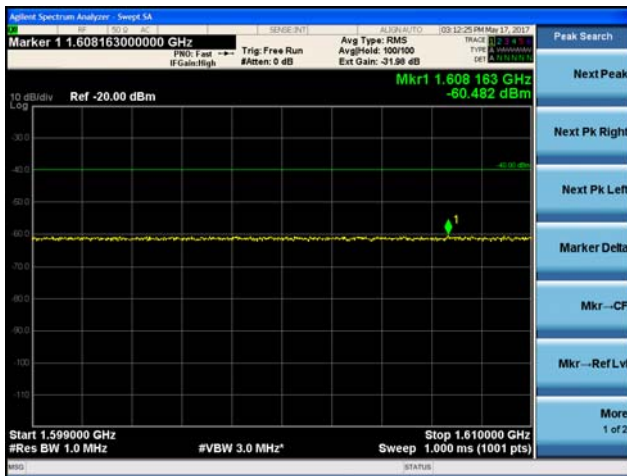
763 MHz - 775 MHz



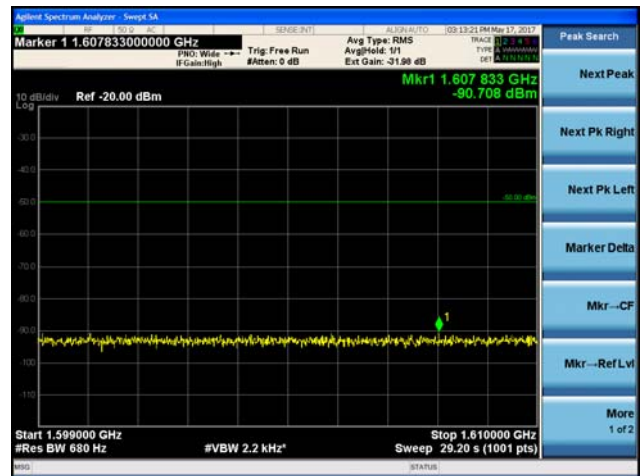
793 MHz - 805 MHz



1599 MHz - 1610 MHz (1)



1599 MHz - 1610 MHz (2)

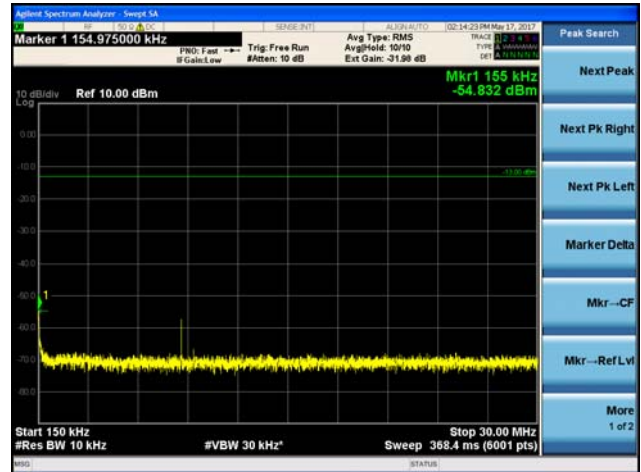


Spurious Emissions at antenna terminal
Test Data at Output Port 2(4TX)
[64QAM]

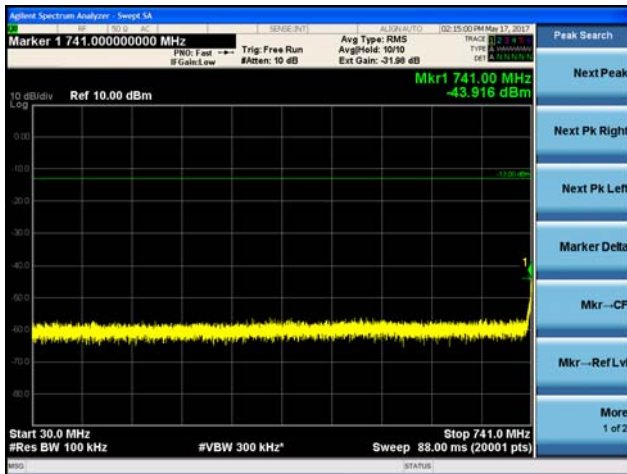
9 kHz - 150 kHz



150 kHz - 30 MHz



30 MHz - 741 MHz



741 MHz - 745.9 MHz



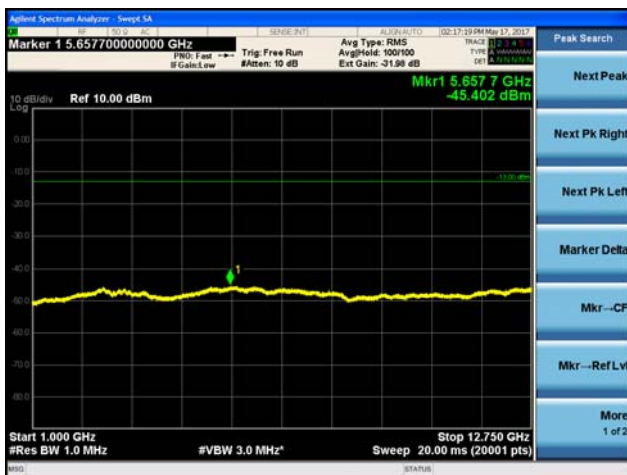
756.1 MHz - 761 MHz



761 MHz - 1 GHz



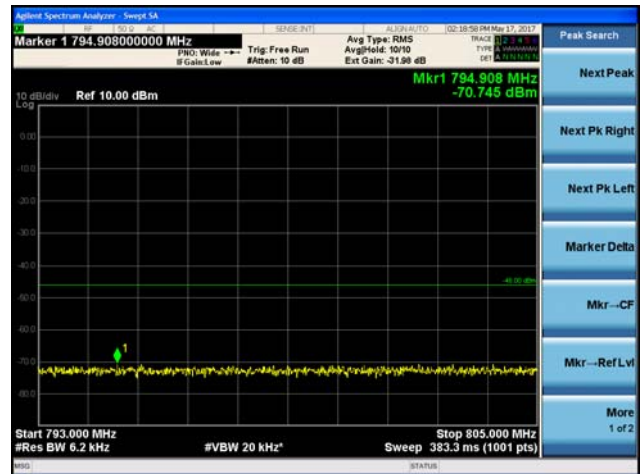
1 GHz - 12.75 GHz



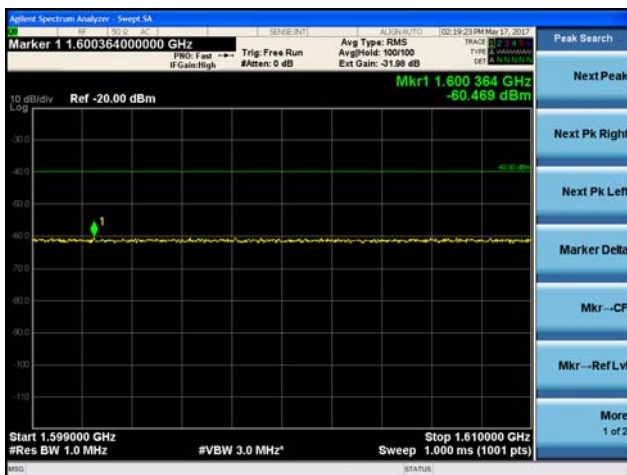
763 MHz - 775 MHz



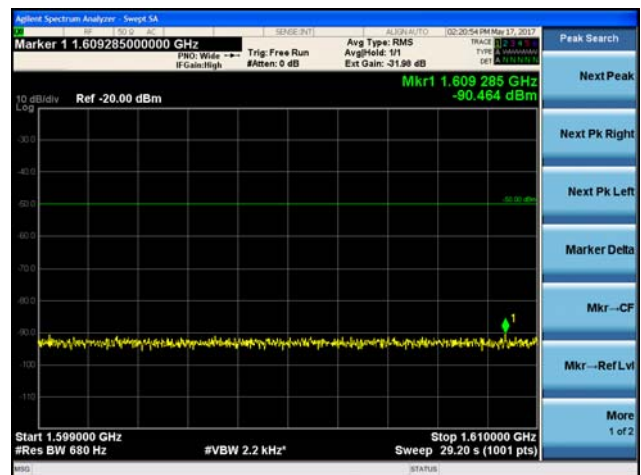
793 MHz - 805 MHz



1599 MHz - 1610 MHz (1)

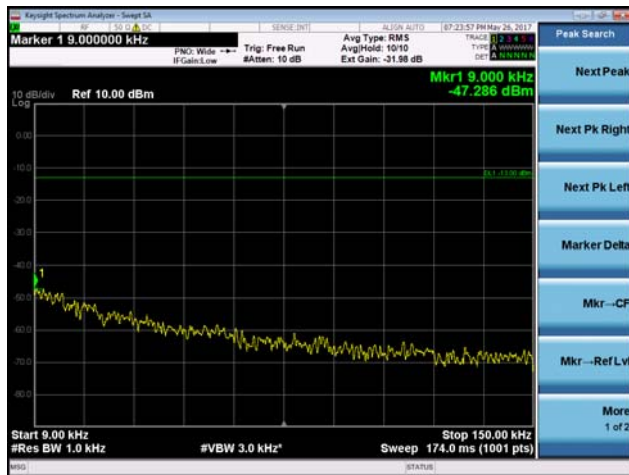


1599 MHz - 1610 MHz (2)

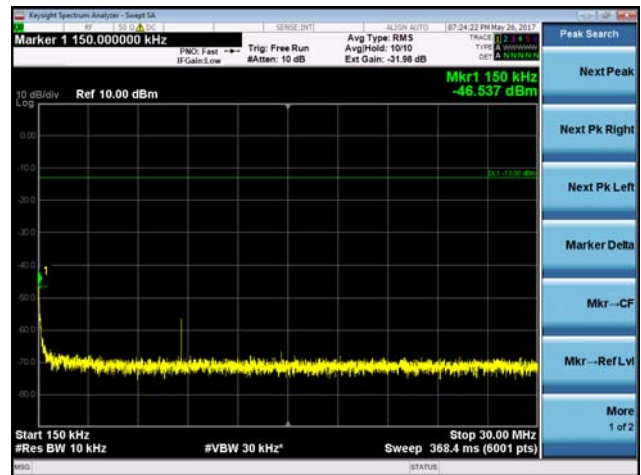


Spurious Emissions at antenna terminal
Test Data at Output Port 2(4TX)
[256QAM]

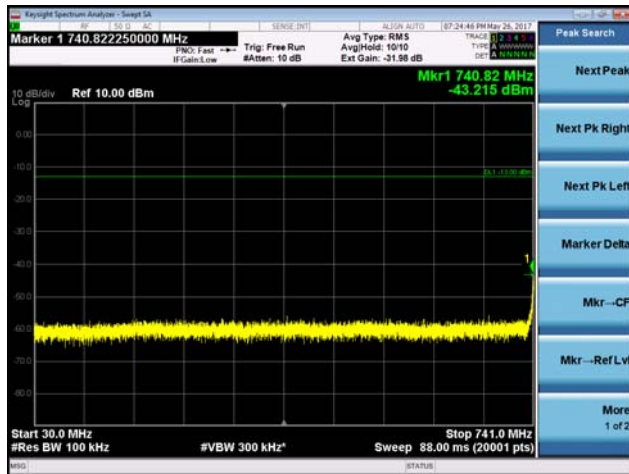
9 kHz - 150 kHz



150 kHz - 30 MHz



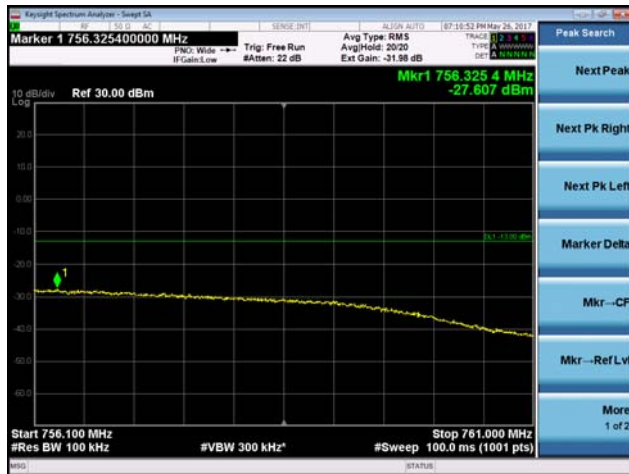
30 MHz - 741 MHz



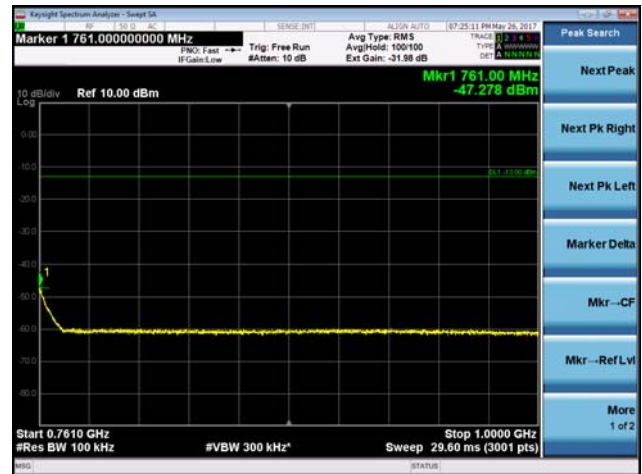
741 MHz - 745.9 MHz



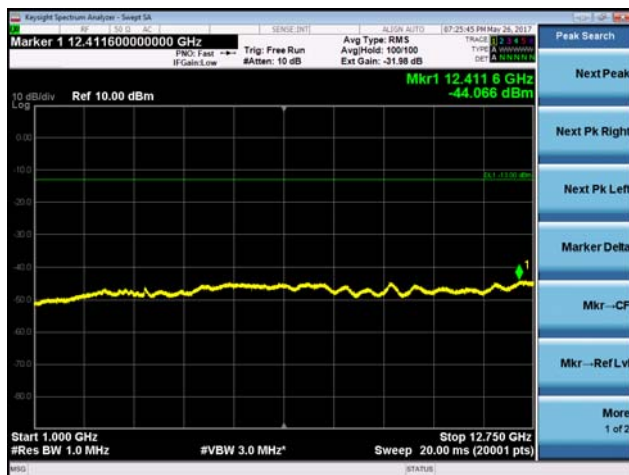
756.1 MHz - 761 MHz



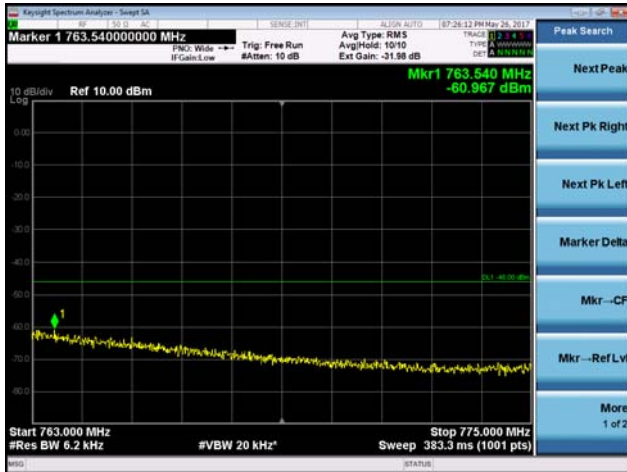
761 MHz - 1 GHz



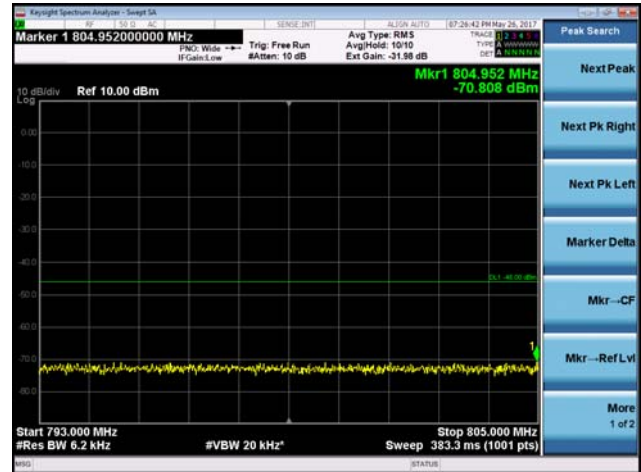
1 GHz - 12.75 GHz



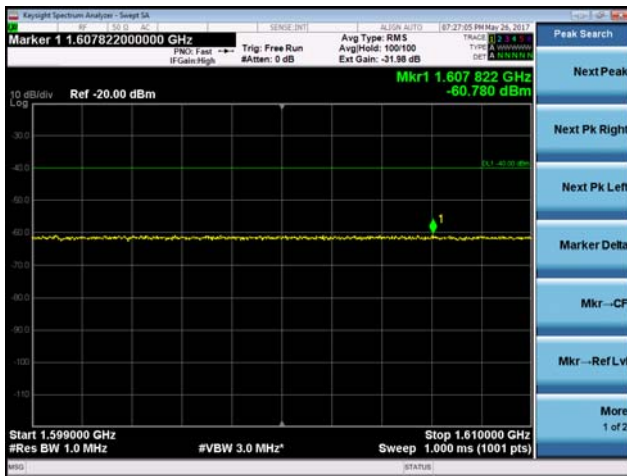
763 MHz - 775 MHz



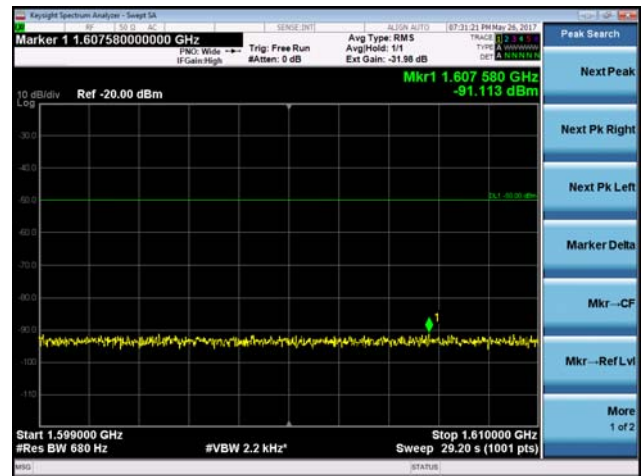
793 MHz - 805 MHz



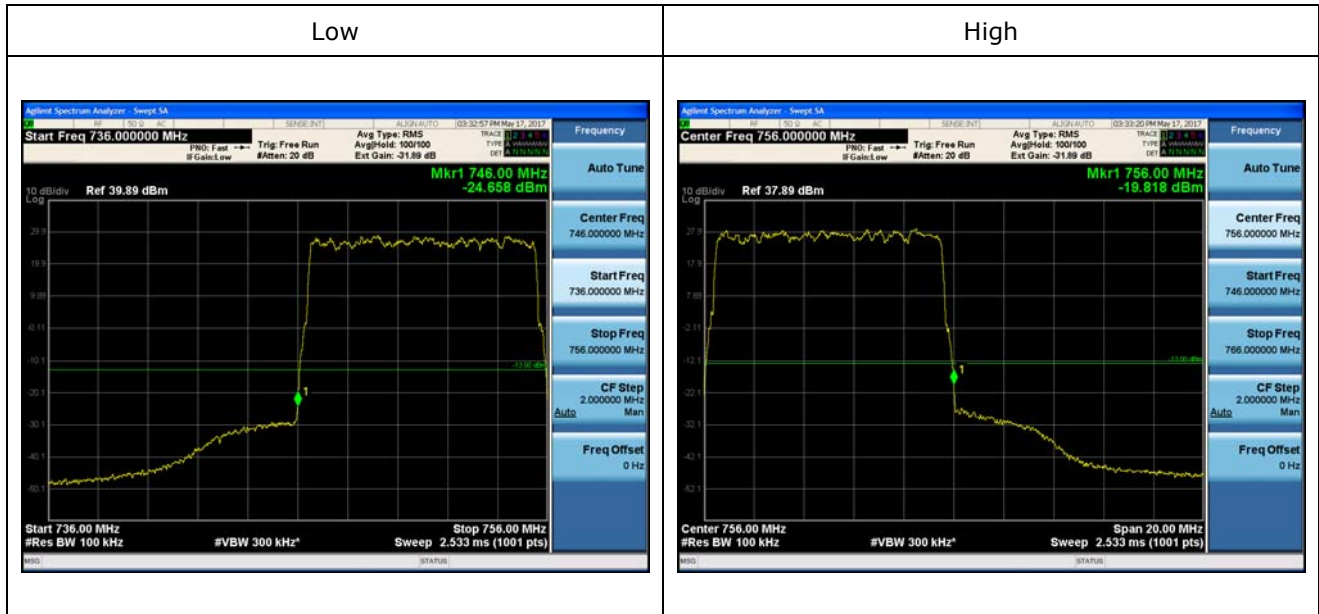
1599 MHz - 1610 MHz (1)



1599 MHz - 1610 MHz (2)



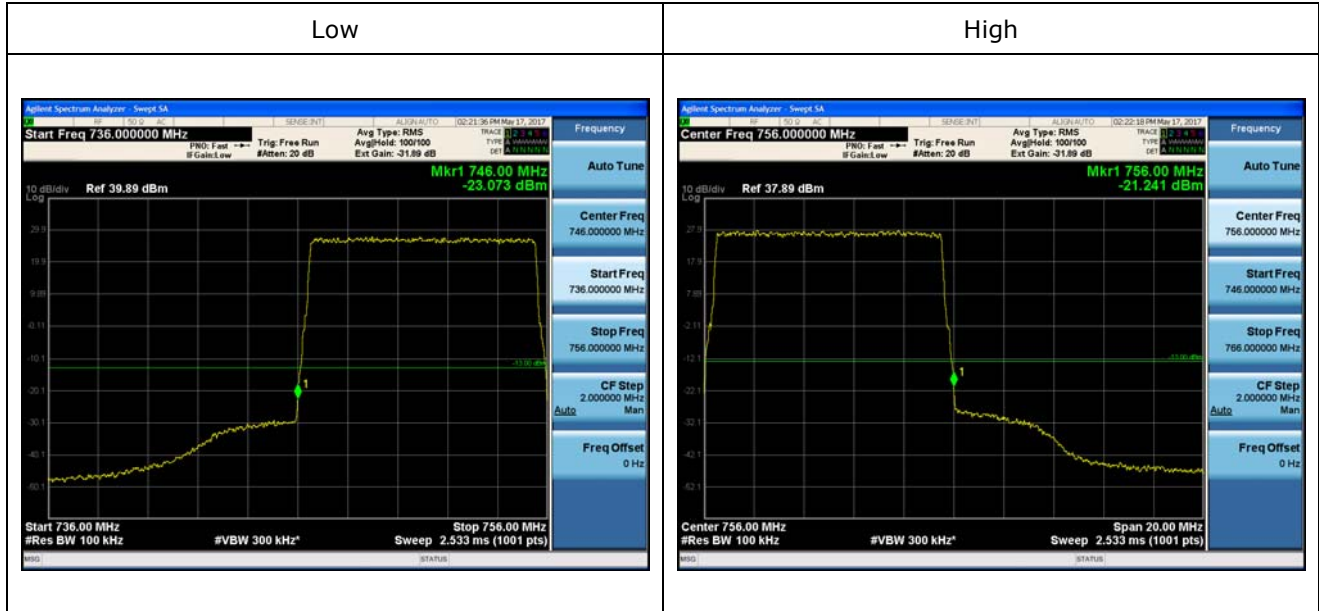
Band Edge
Test Data at Output Port 2(4TX)
[QPSK]



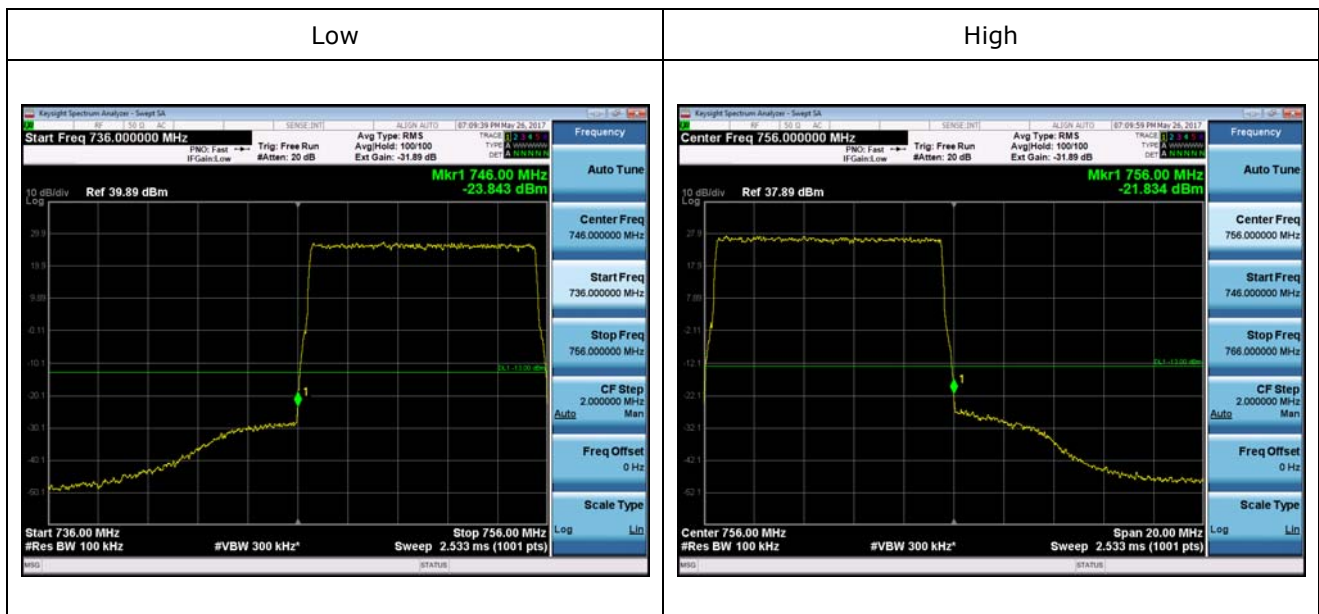
[16QAM]



[64QAM]



[256QAM]

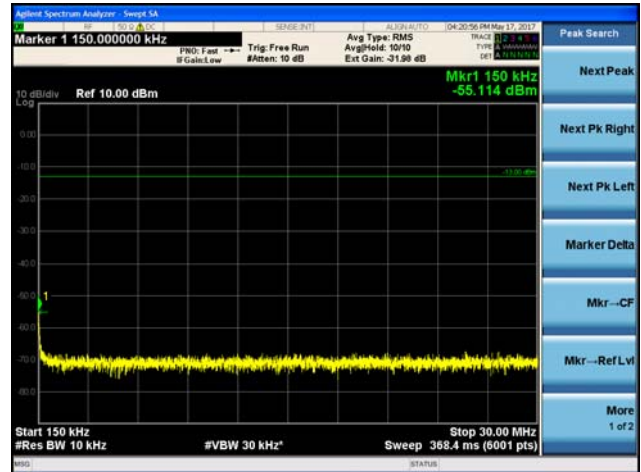


Spurious Emissions at antenna terminal
Test Data at Output Port 3(4TX)
[QPSK]

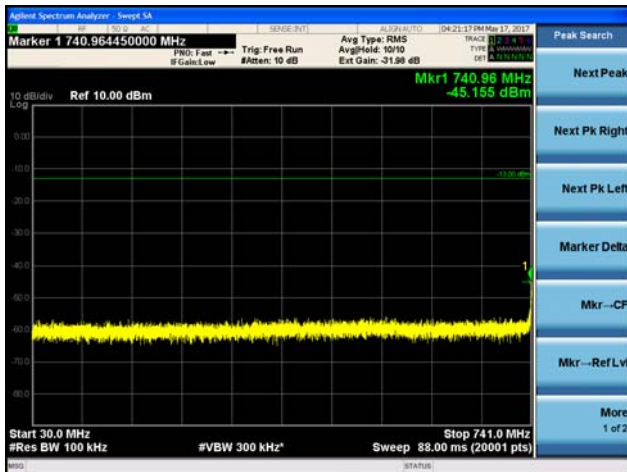
9 kHz - 150 kHz



150 kHz - 30 MHz



30 MHz - 741 MHz



741 MHz - 745.9 MHz





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756.1 MHz - 761 MHz



761 MHz - 1 GHz



1 GHz - 12.75 GHz

