The circuit given below gives the appropriate DC offset and differential Vpp to drive the ADRF6755 quadrature modulator chip. The resistors set the DC bias to 0.5V and the voltage swing to 1Vpp. The inductors and capacitors form a Butterworth LPF with a cutoff frequency of 10MHz. The circuit is intended to be driven with the differential outputs of the AD9761 which output currents between 0-10mA.

The cutoff frequency of the filter is set to the Nyquist Frequency (Fs/2). The AD9761 can take a maximum samples input rate of 20MSPS. Internally, it uses a 2x interpolation and digital filter to relax the requirements on the external filter.

The below plot of the transient response driven by a 0-10mA sine wave at a frequency of 100KHz shows that the circuit converts the current into a 0.5Vpp single ended (1Vpp differential) centered at 0.5V as desired.

The frequency response shows a ripple free pass band with a cutoff frequency of just over 10MHz.

The simulation results are taken from the common node of L1, C4, and R3.

