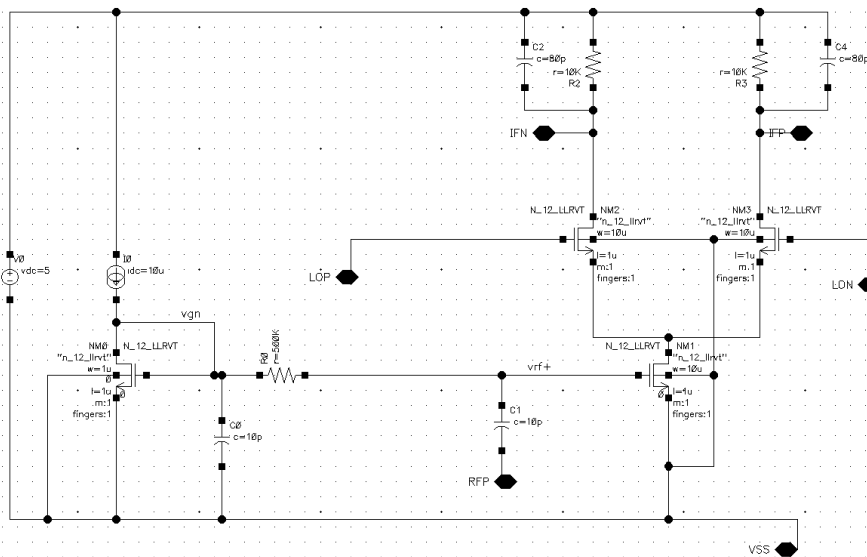
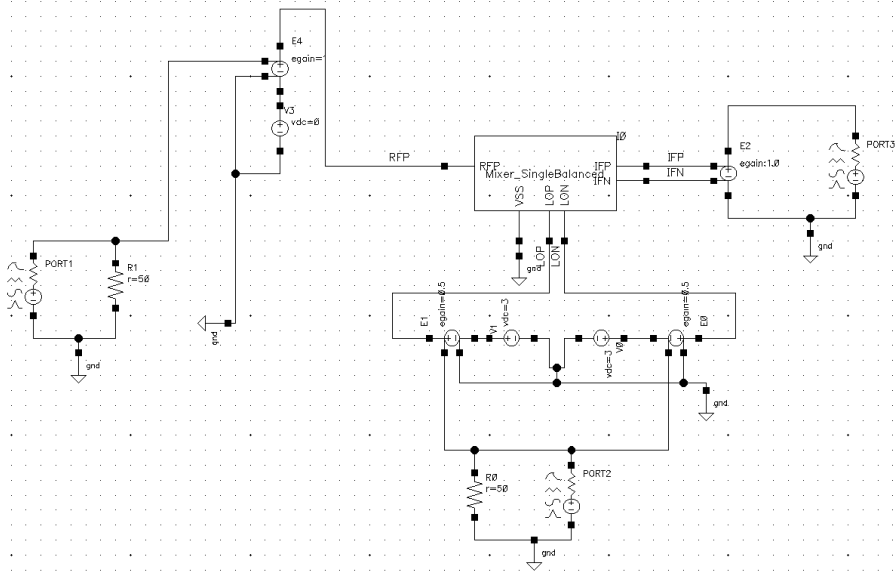


Simulations on Single and Double Balanced Mixer

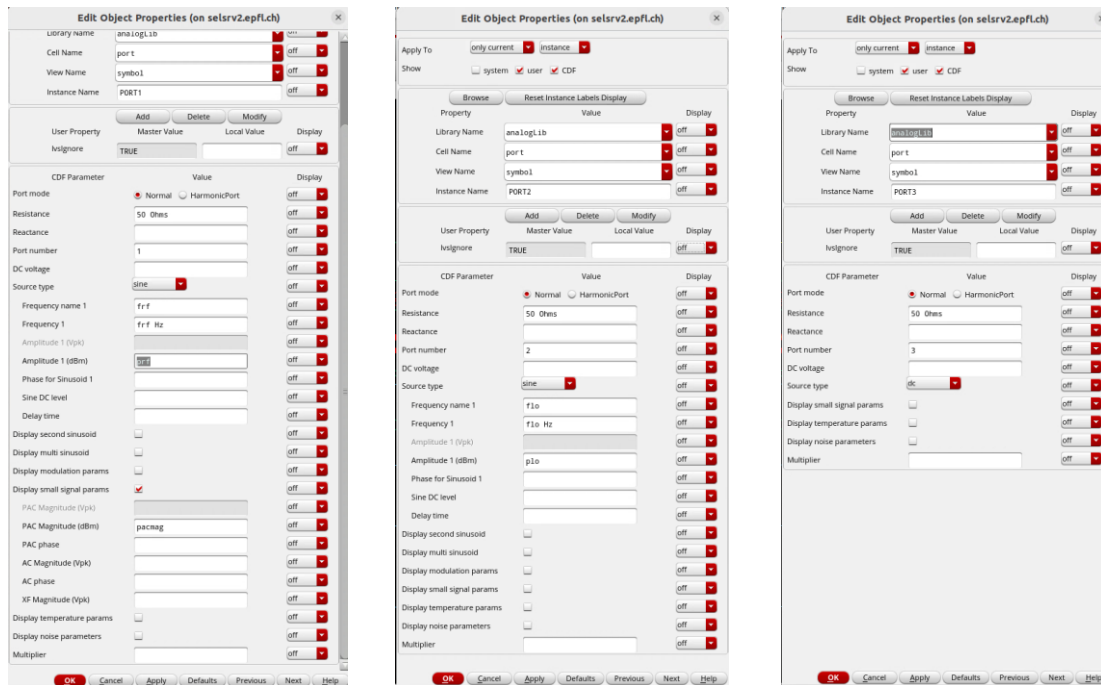
1-Single Balanced Mixer



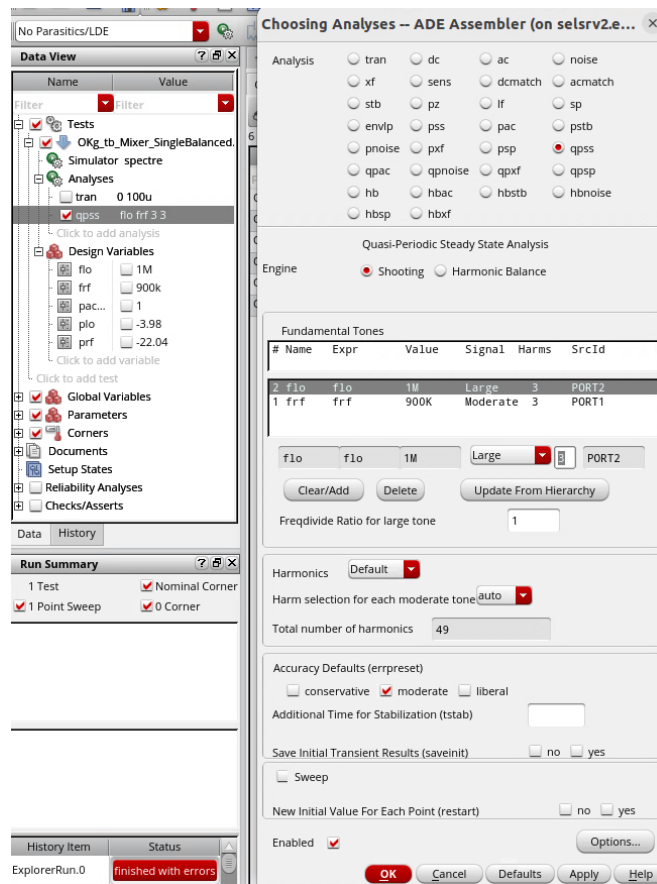
After you construct this schematic, you can create a symbol and use it in the testbench as given below.



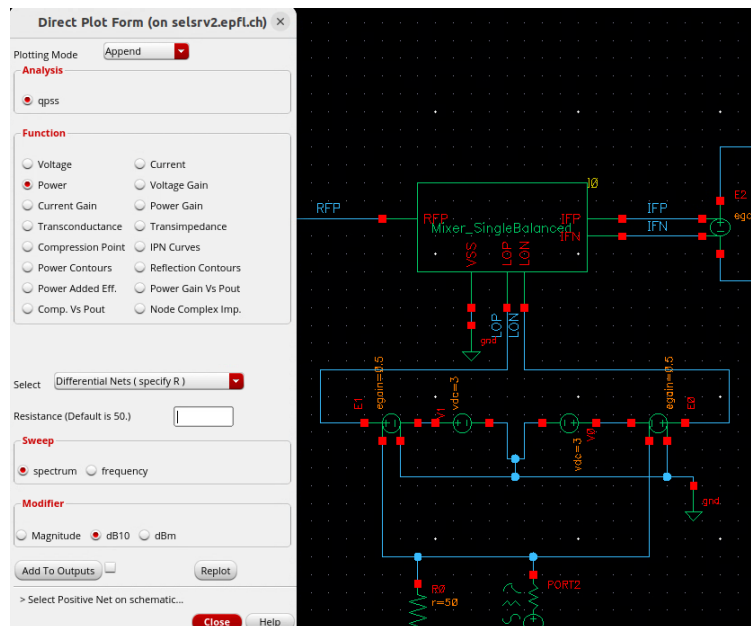
The testbench is as given. You can build it with the ports features as follows:



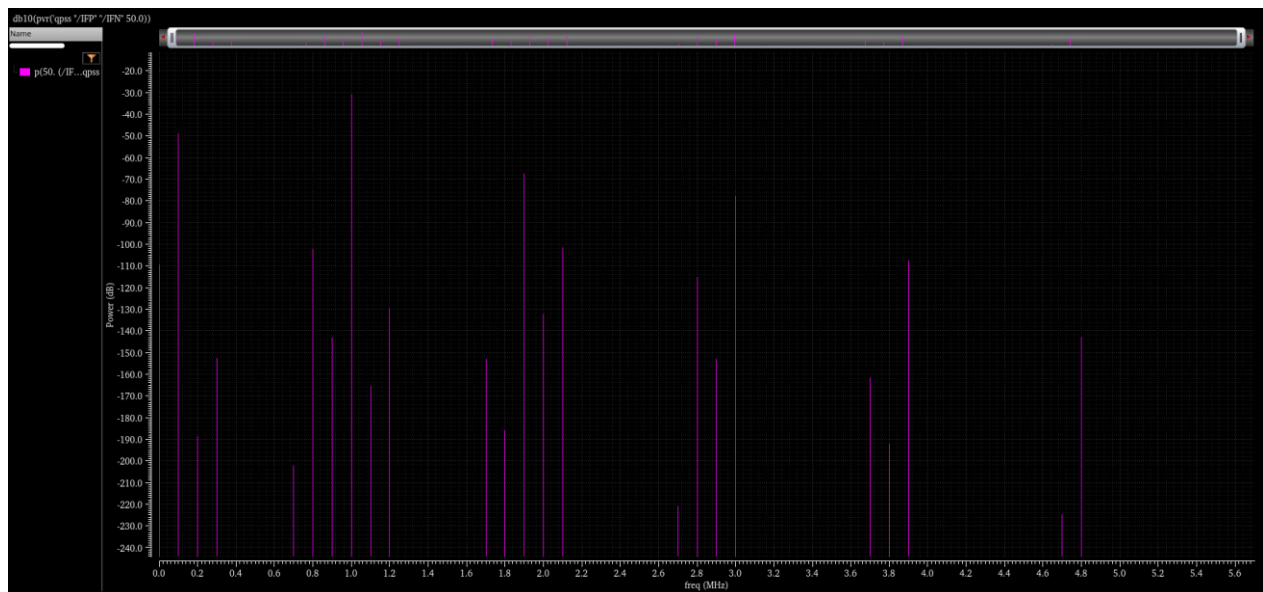
After you setup everything on the testbench schematic, you can launch ADE Assembler and run the two simulations as described below.



Here you can run two different analyses, one of them being the transient analysis and the other one is QPSS analysis. QPSS let us run our simulations directly on frequency domain. After you run the simulation you can launch ADE Explorer -> Results -> Direct Plot -> Main Form

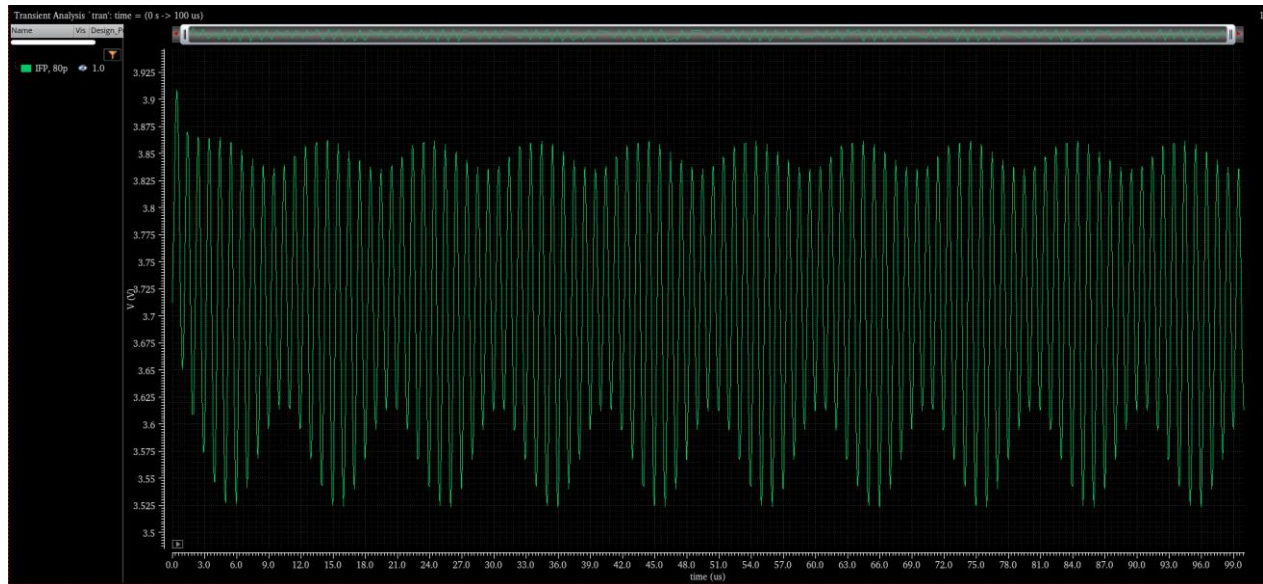


With the given configuration above you can choose first IFP and IFN which will directly plot the output spectrum seen between these two nodes.

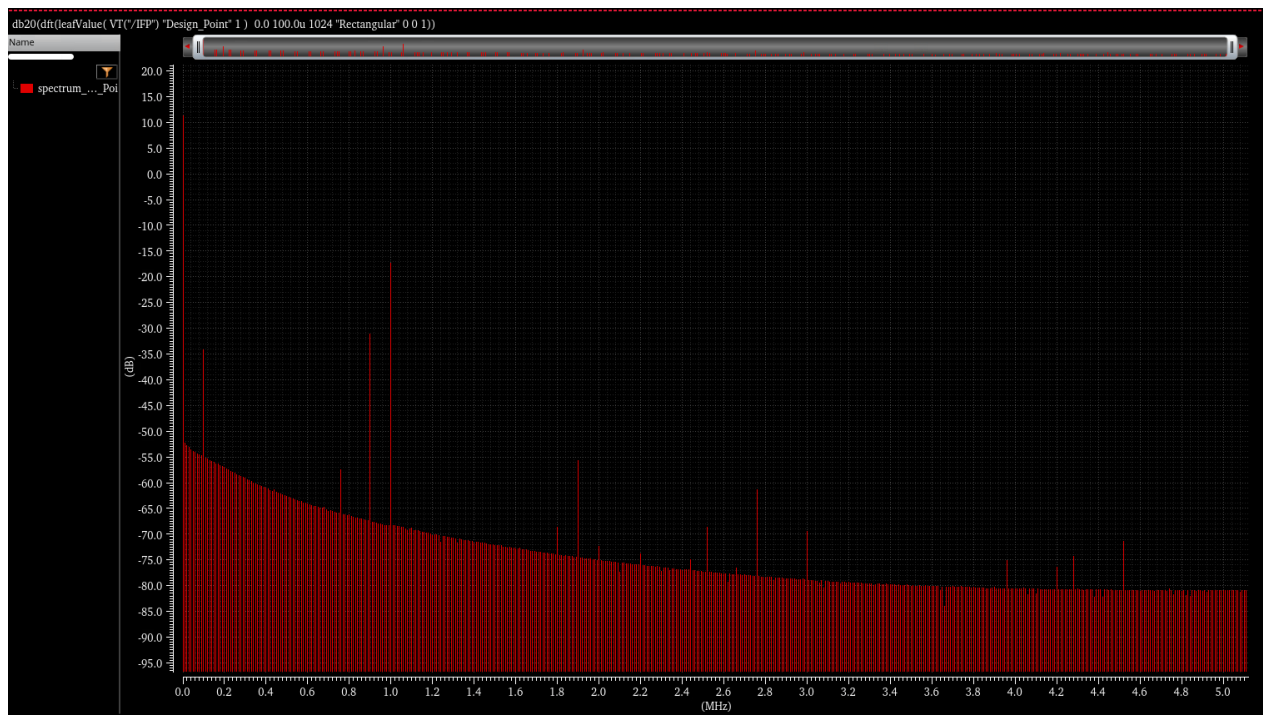


You should see something similar to above figure. You can analyze this plot try to see how each spectrum could be generated.

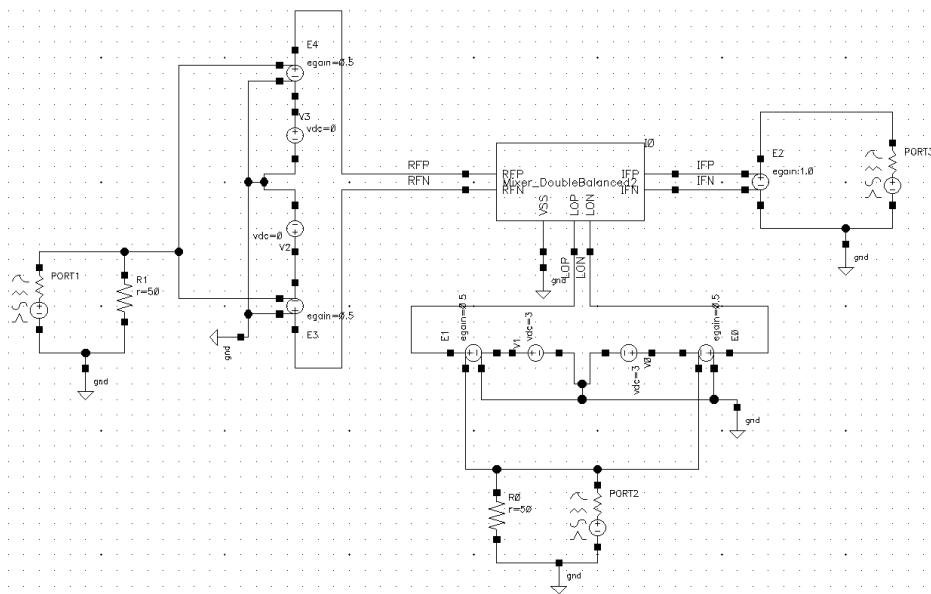
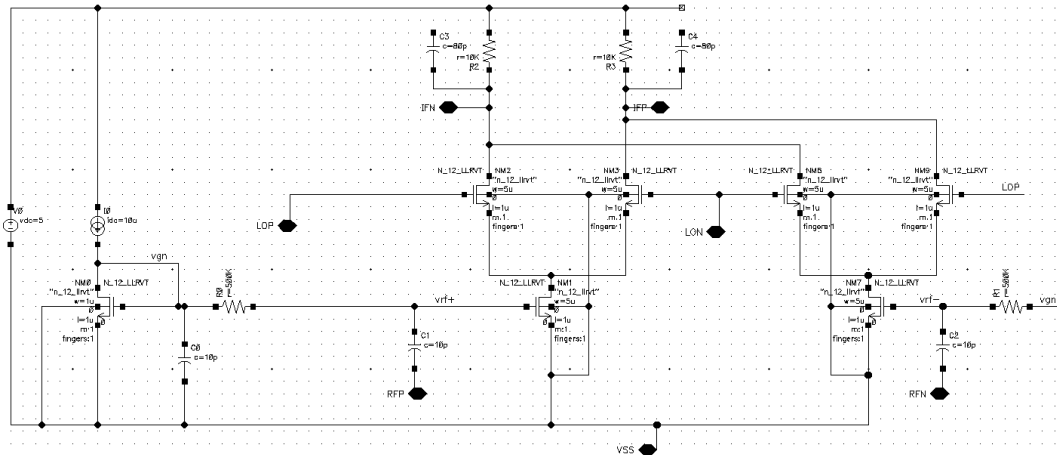
After you run QPSS simulation you can also run the transient simulation to see how real time waveforms generated at the output. You can check the output (IFP, IFP-IFN) waveforms. Once you do the transient simulations you should see a waveform like this:



Also to be able to compare with your QPSS simulation results, you can get the spectrum of this transient simulation result to get FFT of the signal. For this, under the waveform window, you should go with Measurements -> Spectrum. After you choose your waveform, you can press **Plot** and you will see the power spectrum of the signal.



2-Double Balanced Mixer



Here you can implement the above circuits and run the simulations that we already did for the single balanced mixer. After you run the simulations, you should see a QPSS output as given below. Try to see the differences between single and double balanced mixer types.

