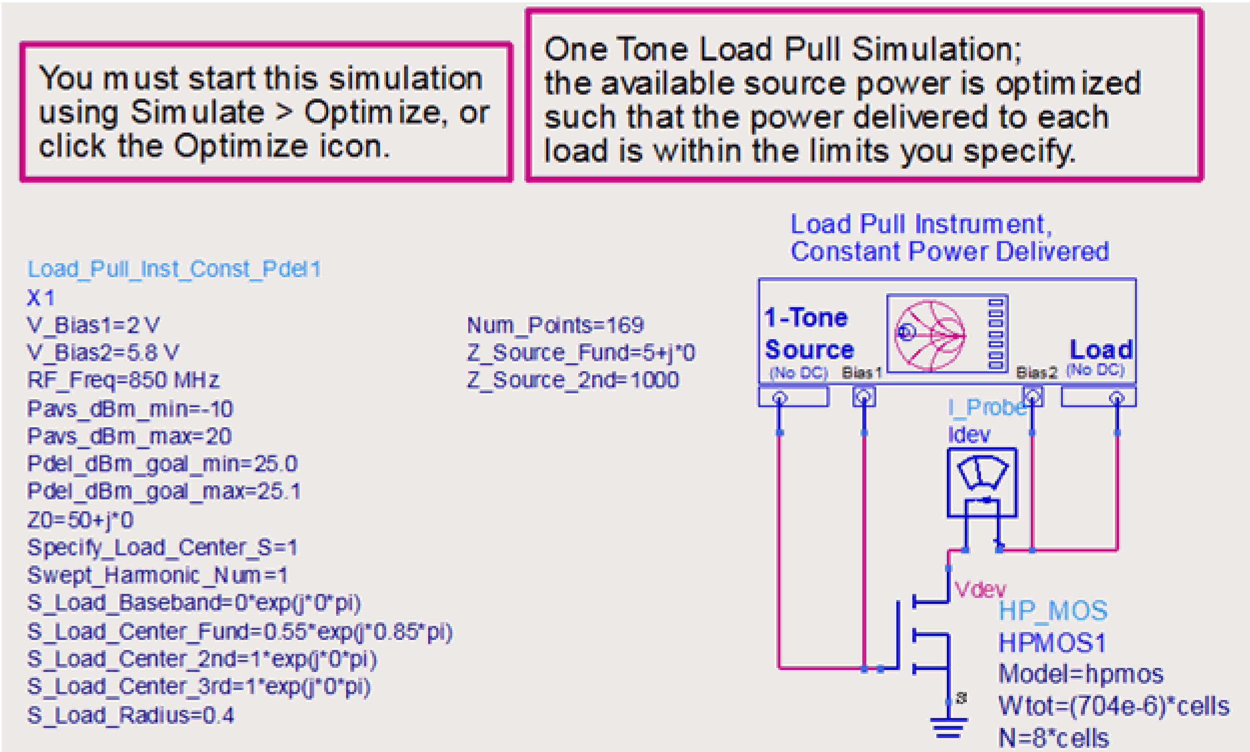
# One Tone, Constant Power Delivered Load Pull

The **One Tone, Constant Power Delivered Loadpull (HB1Tone_LoadPull_ConstPdel)** simulation optimizes the available source power level until the desired power is delivered to each load reflection coefficient. You would use this if your device or amplifier needs to deliver a particular power level and you want to choose the optimum load considering other performances (such as gain, gain compression, PAE, and bias current.)

This setup sweeps the load reflection coefficient in a circular region of the Smith Chart and optimizes the source power level for each load reflection coefficient until the desired power is delivered to the load. The data display shows contours of constant PAE, bias current, gain, and gain compression. The input reflection coefficient is also shown for a particular load that you specify. These data allow you to pick the optimal load that produces the best PAE, gain, gain compression, or bias current, or make trade-offs amongst these specifications.




You have to make the same types of edits to this schematic as with the others described above . Also, you have to specify the minimum and maximum allowed values of the available source power, Pavs_dBm_min and Pavs_dBm_max, respectively.

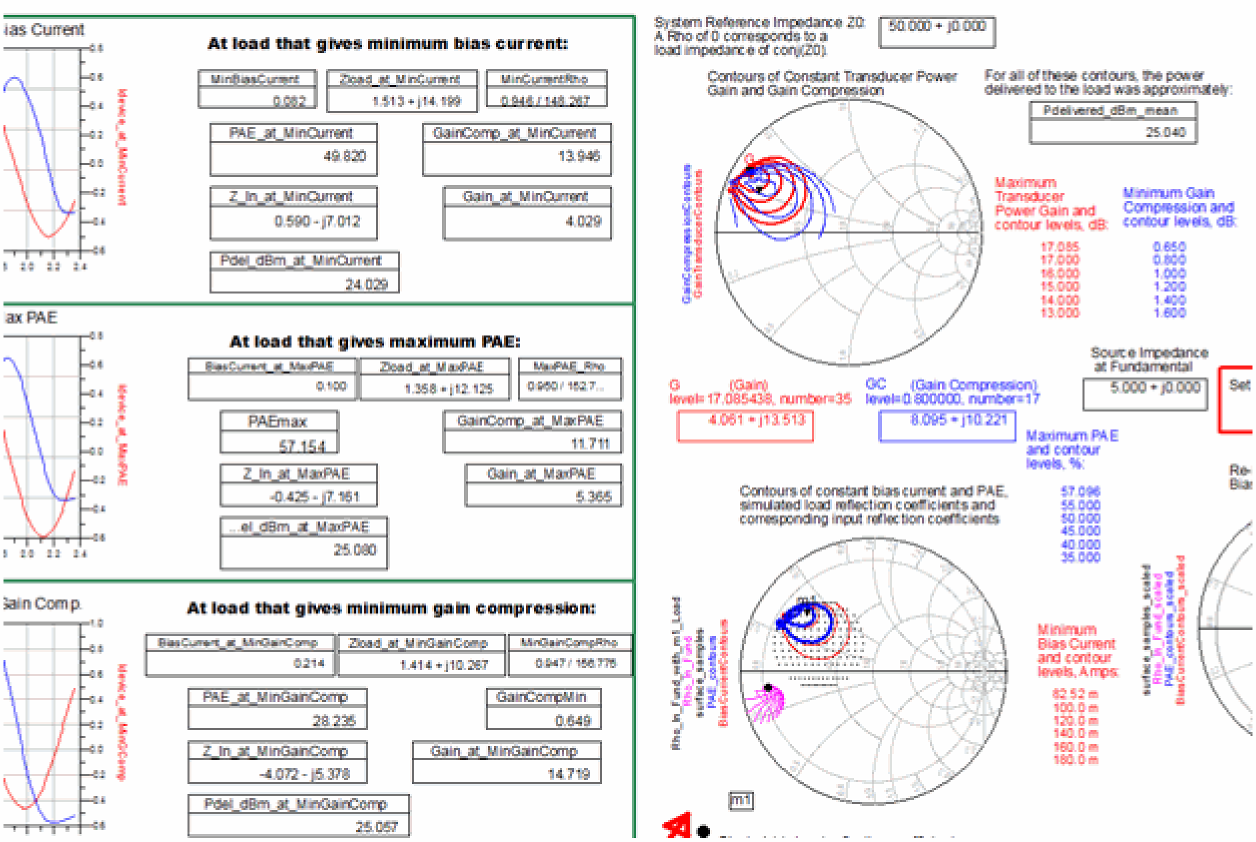
During the optimization, the available source power is adjusted within these limits until the power that you want is delivered to the load. Depending on how high a power you want delivered to the load and the gain of the device, you may have to adjust the Pavs_dBm_max limit.

In this example, the power delivered (based on Pdel_dBm_goal_min and

Pdel_dBm_goal_max) is to be between 25 and 25.1 dBm. With this value and a Pavs_dBm_max value of 20 dBm, it is specified that the lowest transducer power gain accepted is 5 dB.
You may also specify different load impedances or reflection coefficients at the harmonic frequencies and (for the source) at the fundamental and harmonic frequencies.

To launch the simulation, click the *Optimize* icon . If the simulation is started by hitting the F7 key or by selecting **Simulate > Simulate**, then an optimization is not executed and the simulation results are not displayed correctly in the data display.

After running the optimization, the **HB1Tone_LoadPull_ConstPdel** data display shows the results.

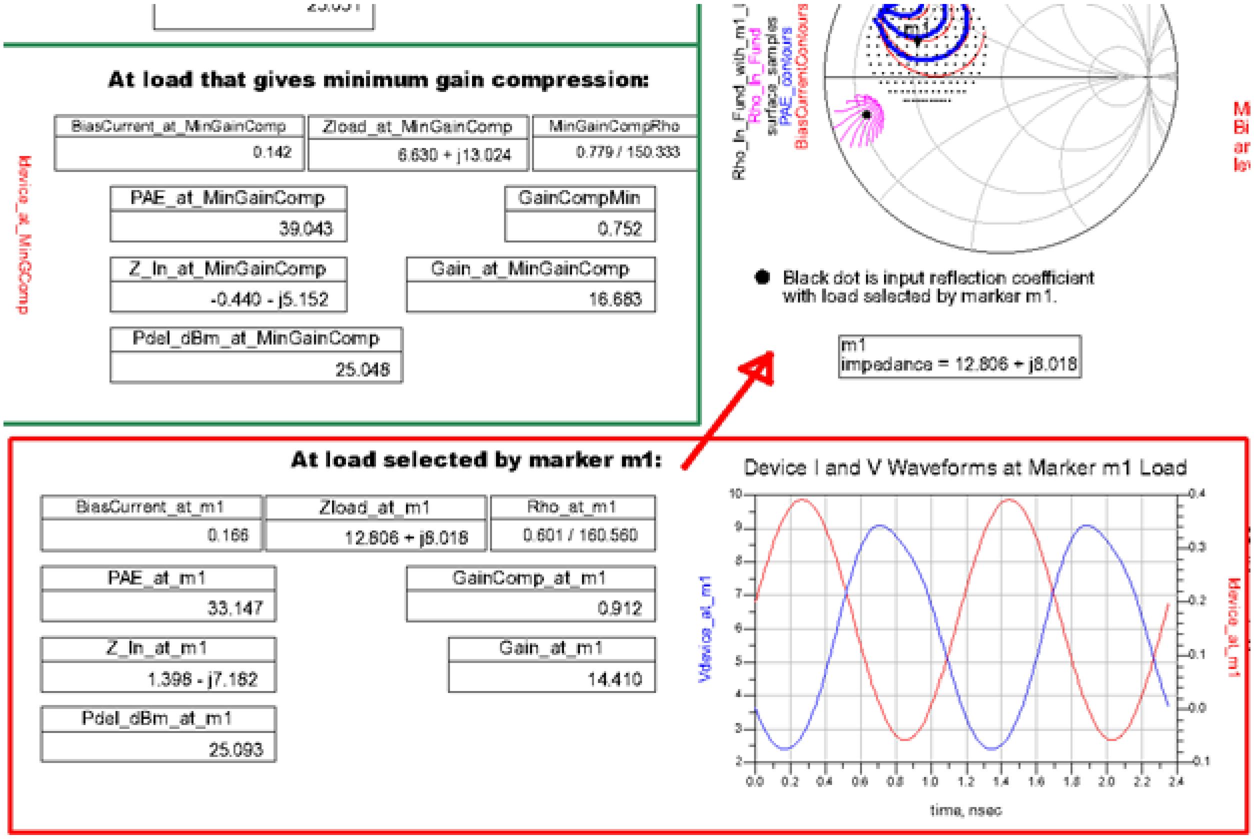



To see the contours effectively, you may need to change the `CurrentStep`, `PAE_step`, `Gain_step`, and `GainCompStep` variables. These set the step sizes between the contours.

The upper Smith Chart shows contours of constant gain and gain compression. The lower left Smith Chart shows contours of constant bias current and power-added efficiency (PAE), as well as the simulated load reflection coefficients and the corresponding input reflection coefficients.

In the green boxes on the left side are data that correspond to a particular optimal condition such as minimum bias current, maximum PAE, or minimum gain compression. However, you have to make sure that the desired power delivered was actually achieved. For some load impedances close to the edge of the Smith Chart this may be difficult.

You also have the option of selecting any of the simulated load reflection coefficients with marker m1. The corresponding data appears in a separate box.




Data within the red box corresponds to the reflection coefficient selected by marker M1.