Generating Stability Plots using PSpice for TI

ABSTRACT

The purpose of this FAQ is to walk through the generation of stability (bode) plots using Texas Instruments' PSpice simulation tool. In order to work through the creation of the schematic itself, find the link to the PSpice Schematic Creation listed in the E2E post.

Step 1: Create a new simulation profile by clicking the waveform plus button on the upper-right hand tabs of the screen. Figure 1 shows the pop up that will populate the screen once this button is pressed. Label this as AC_Sweep to designate its simulation type.
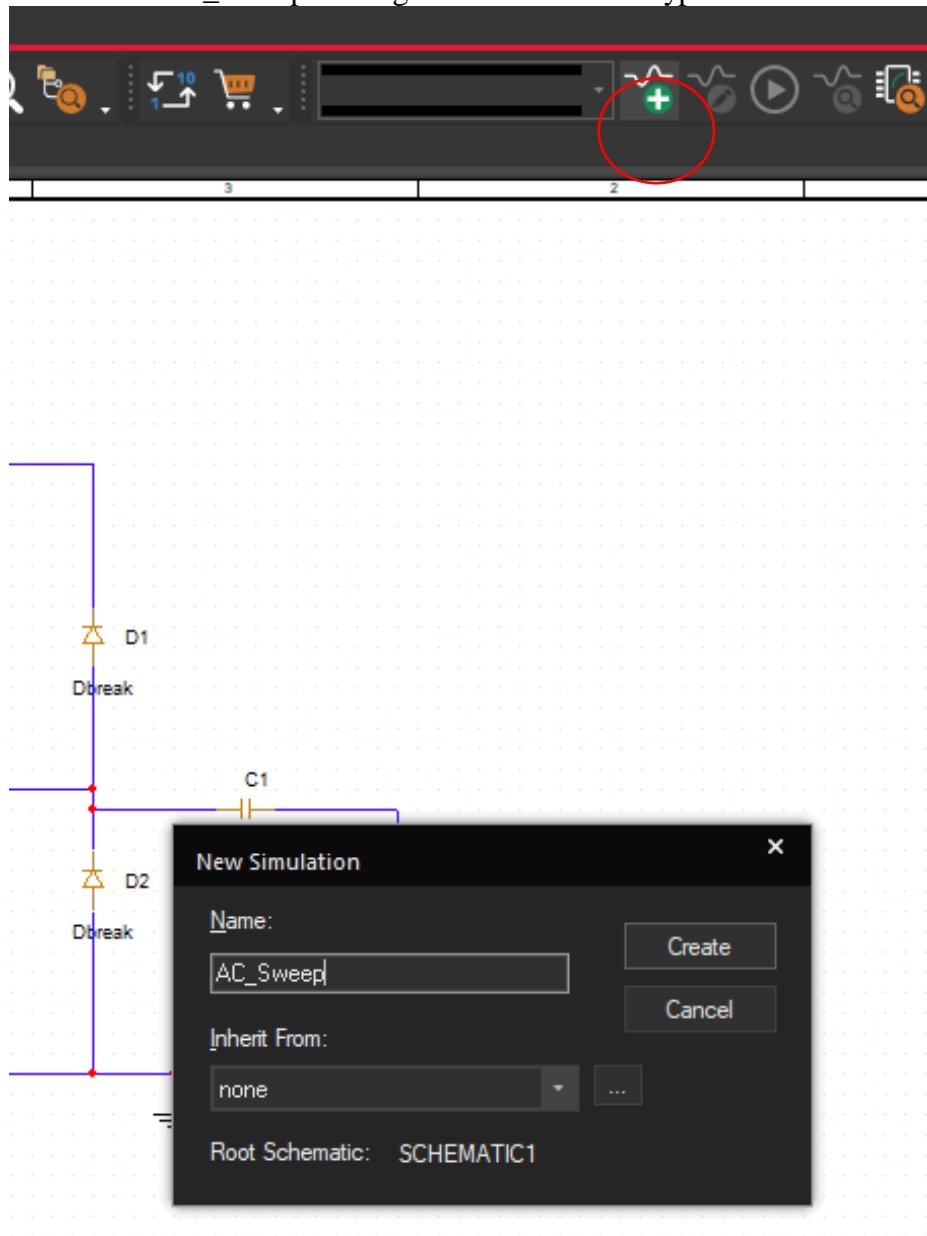

Figure 1: Defining a new simulation profile

Step 2: Once you click "Create", a new window will pop up. Navigate to the Analysis tab and click on "Analysis Type." Figure 2 shows the drop-down menu that will appear. Select AC Sweep/Noise. To the right, options for Start and End Frequency will appear for the sweep. Configure these as per the specifications that you want to analyze. Click on "OK" to save these settings.
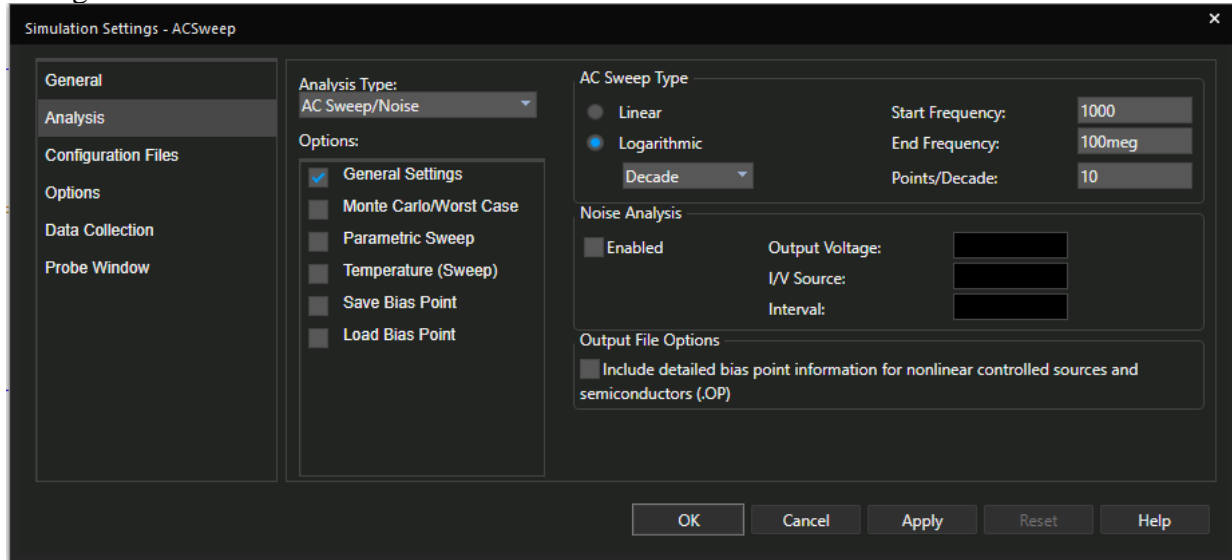

Figure 2: The analysis tab with AC Sweep/Noise selected

Step 3: Click on the tab in the upper left corner labeled "PSpice" and select "Markers" from this tab. From here, select "Plot Window Templates..." and scroll down to select "Bode Plot - dual Y axes".

You may also find additional markers by clicking on "Advanced" tab instead of "Plot Window Templates...". If there is a specific parameter you would like to isolate, such as the phase or voltage of a specific net, you will likely find them here.
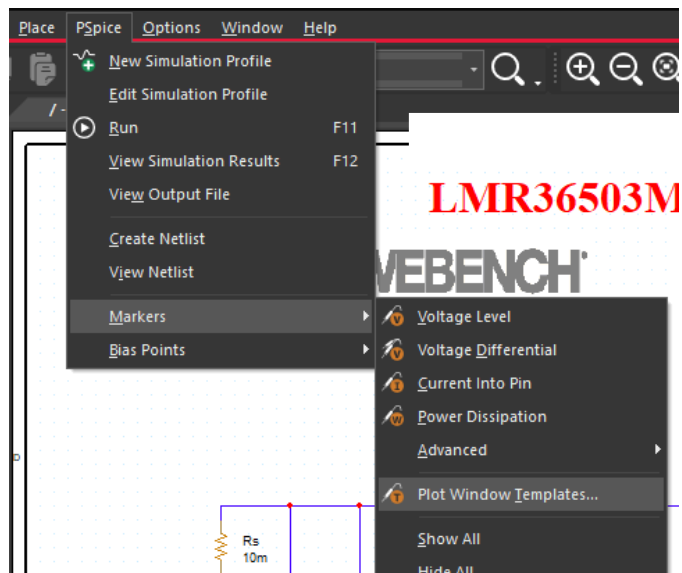

Figure 3: Direct path from "PSpice" to "Plot Window Templates"

Step 4: Place any markers on the output net of the circuit. Run the PSpice simulation by selecting the "Run PSpice" symbol from the top bar on the right-hand side.

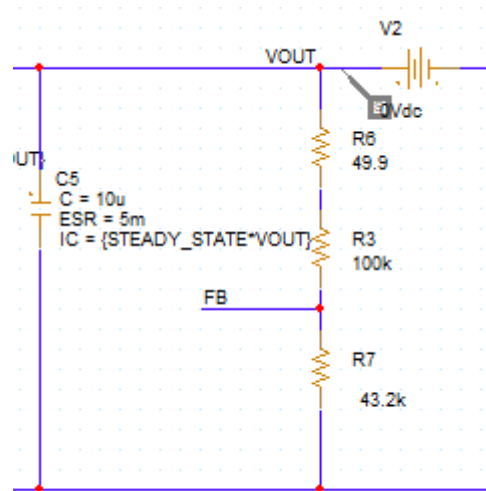In Figure 4, you can see the marker placed on the Vout net.

Figure 4: The Bode Plot - dual Y axes marker placed on the Vout net

Step 5: After a few minutes, a bode plot with both the phase and magnitude will be graphed according to the frequency settings previously set. This will be your completed stability plot. As stated before, you can modulate your output based on the markers you place.
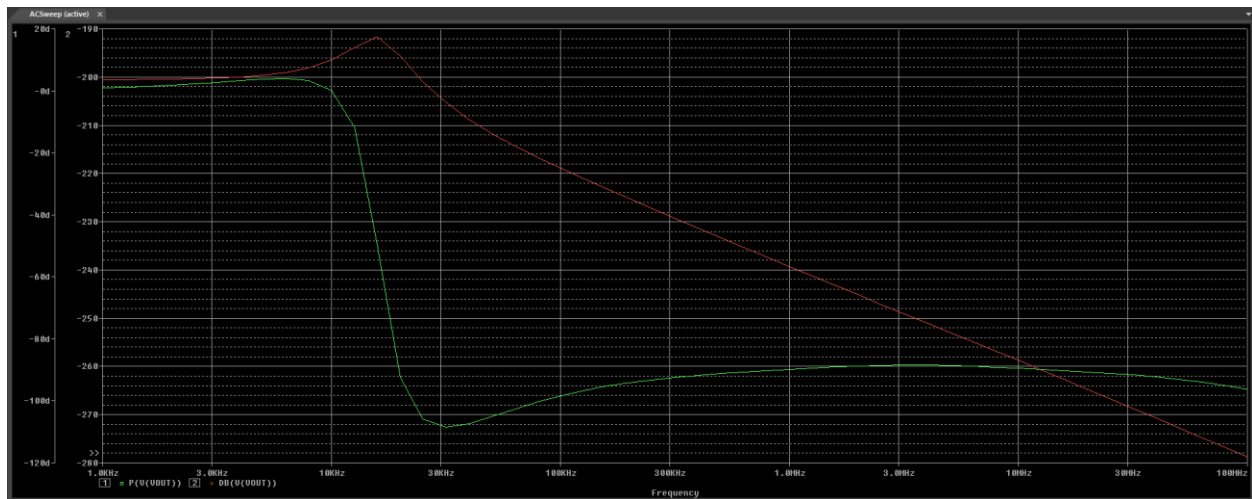

Figure 5: Completed steady state bode plot