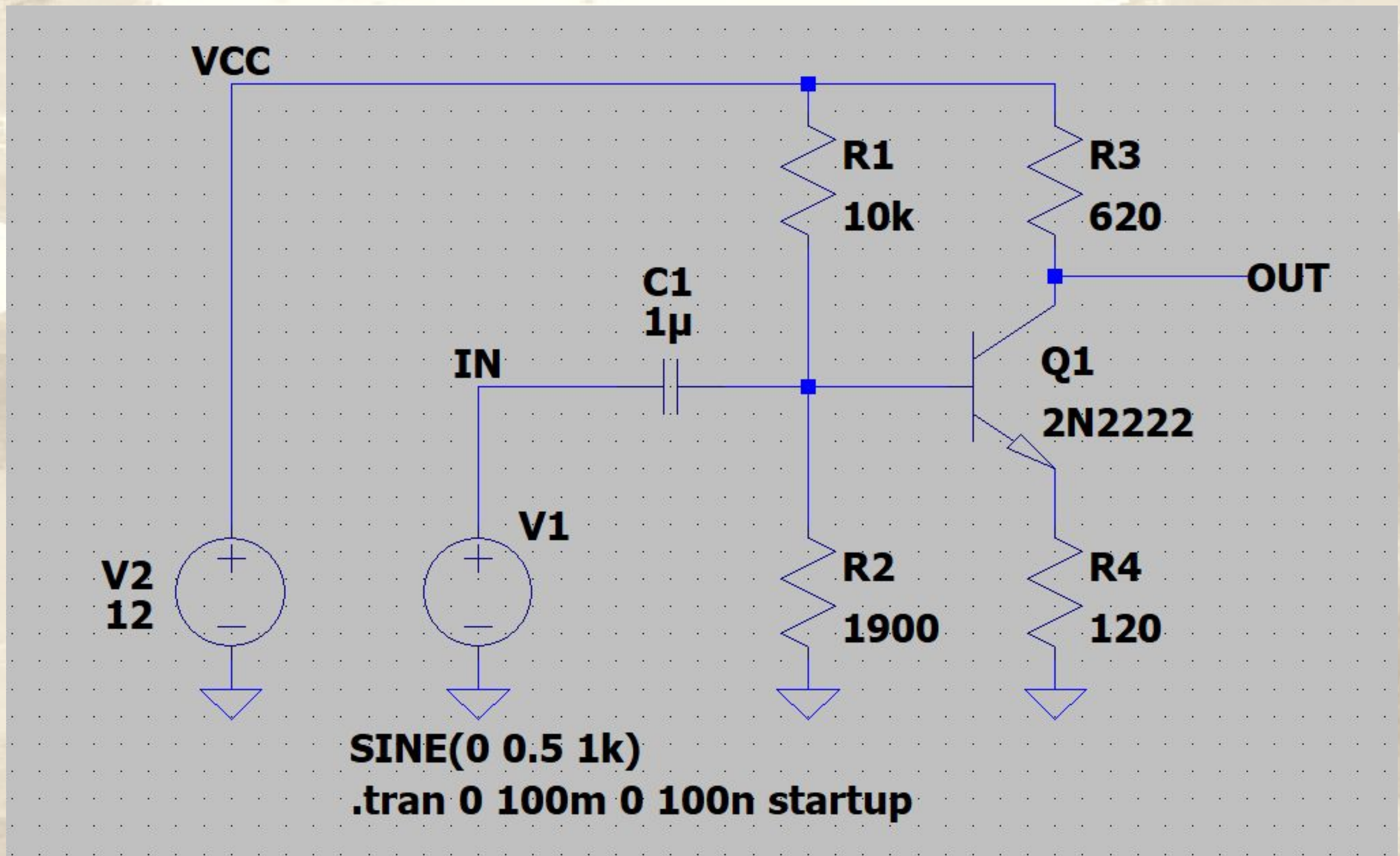


Drops of LTSpice

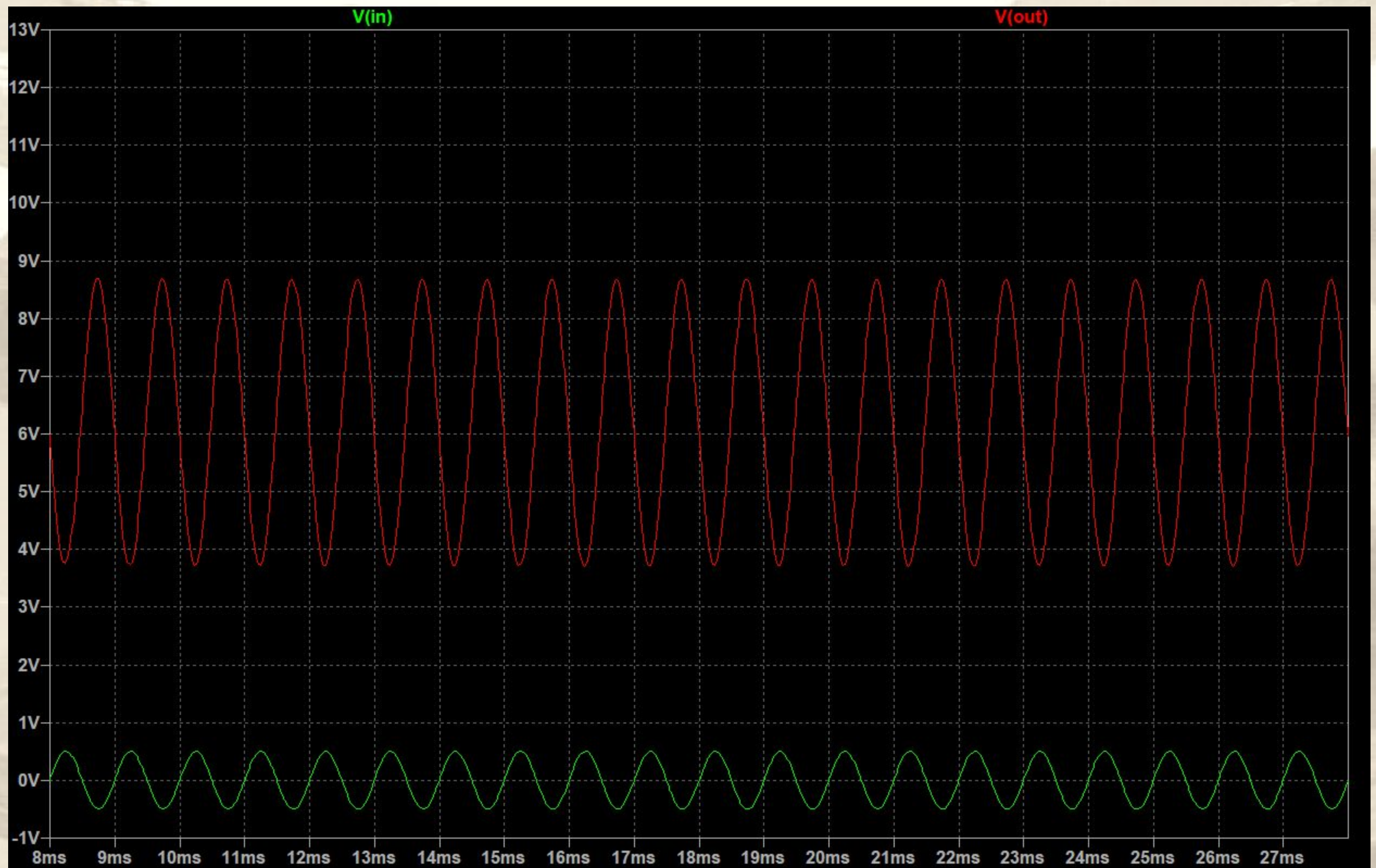


How to do AC Analysis?

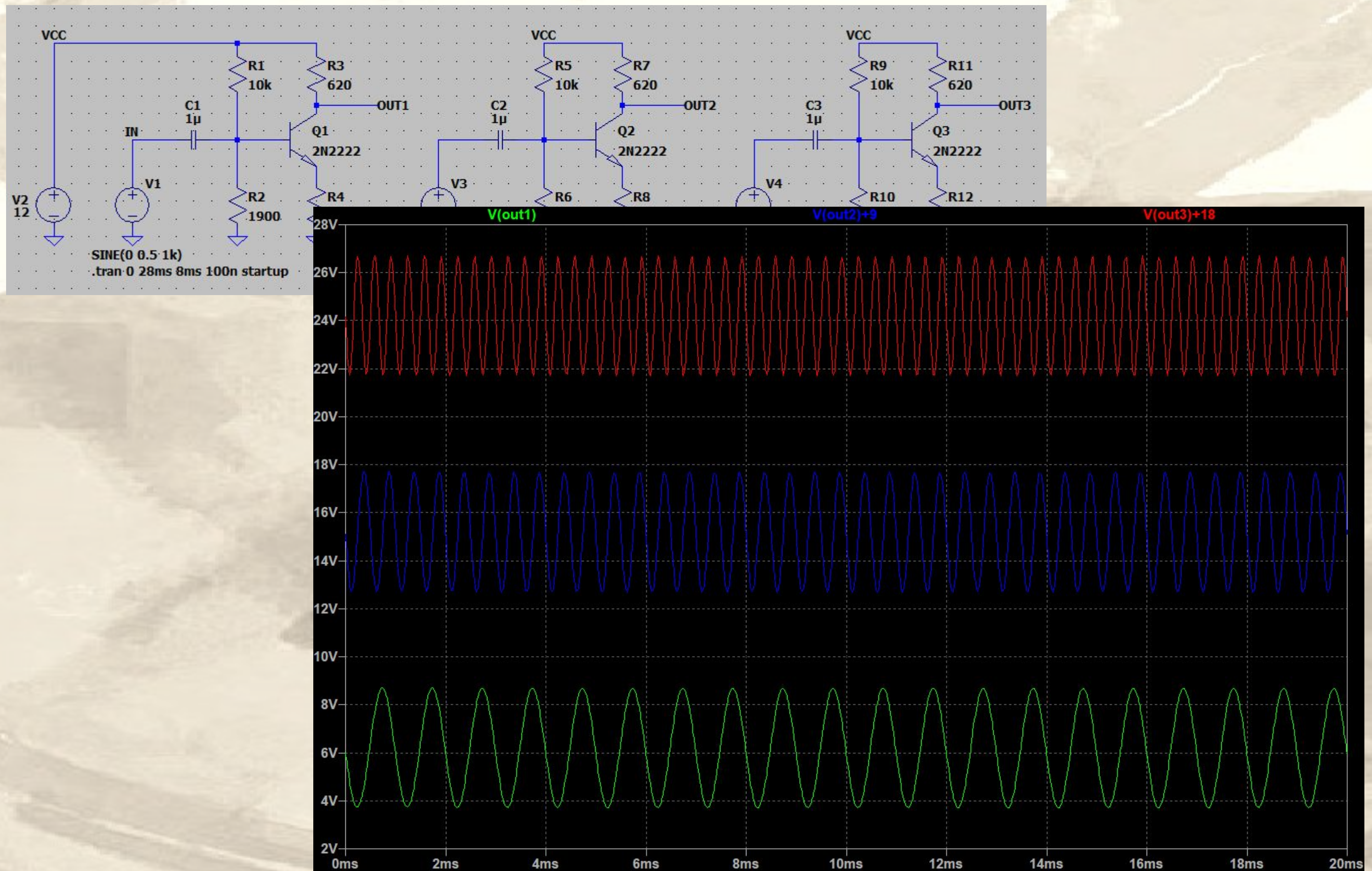
Let's imagine you've made a transistor amplifier.



Of course it works great!

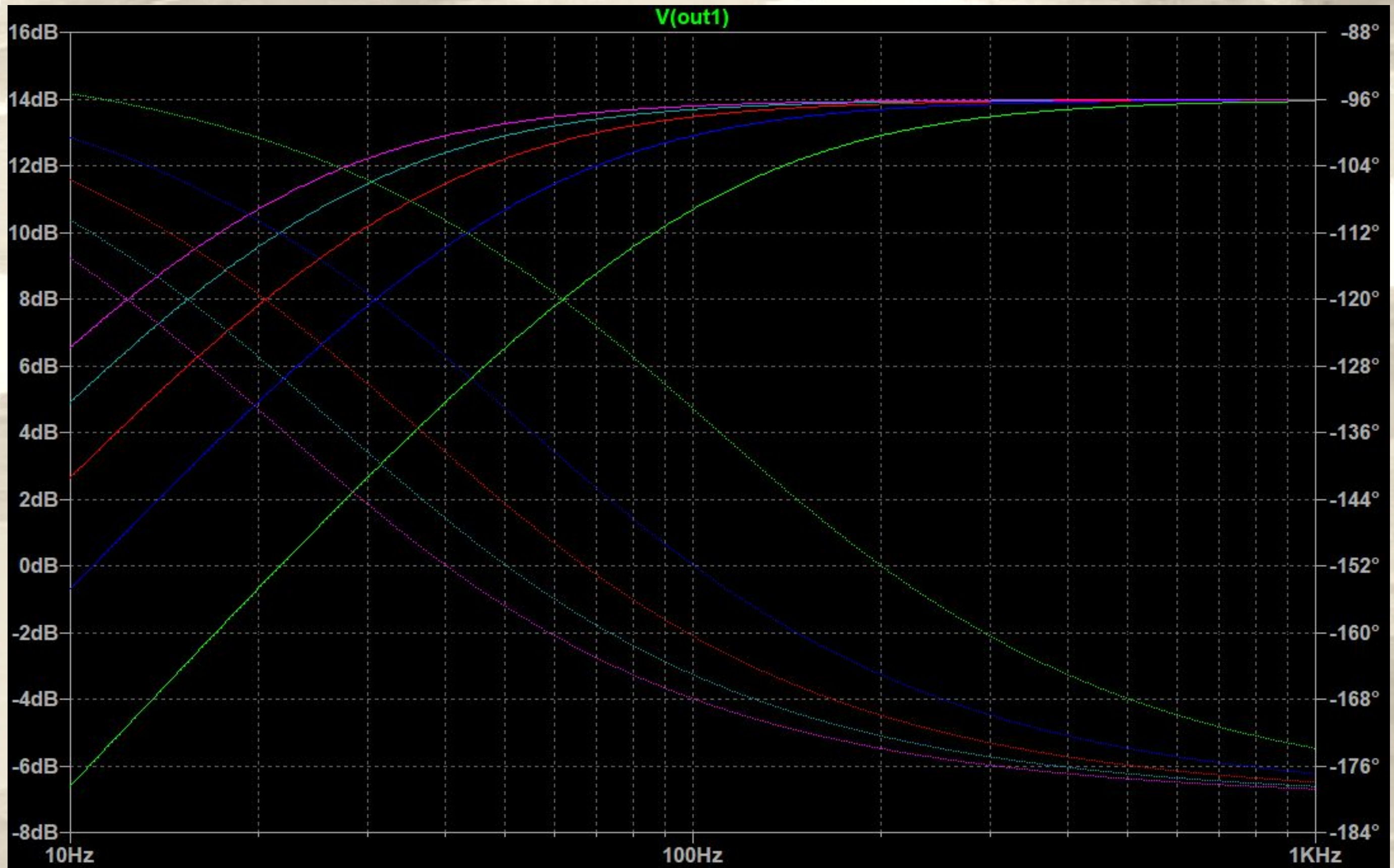


But how does it behave at different frequencies?



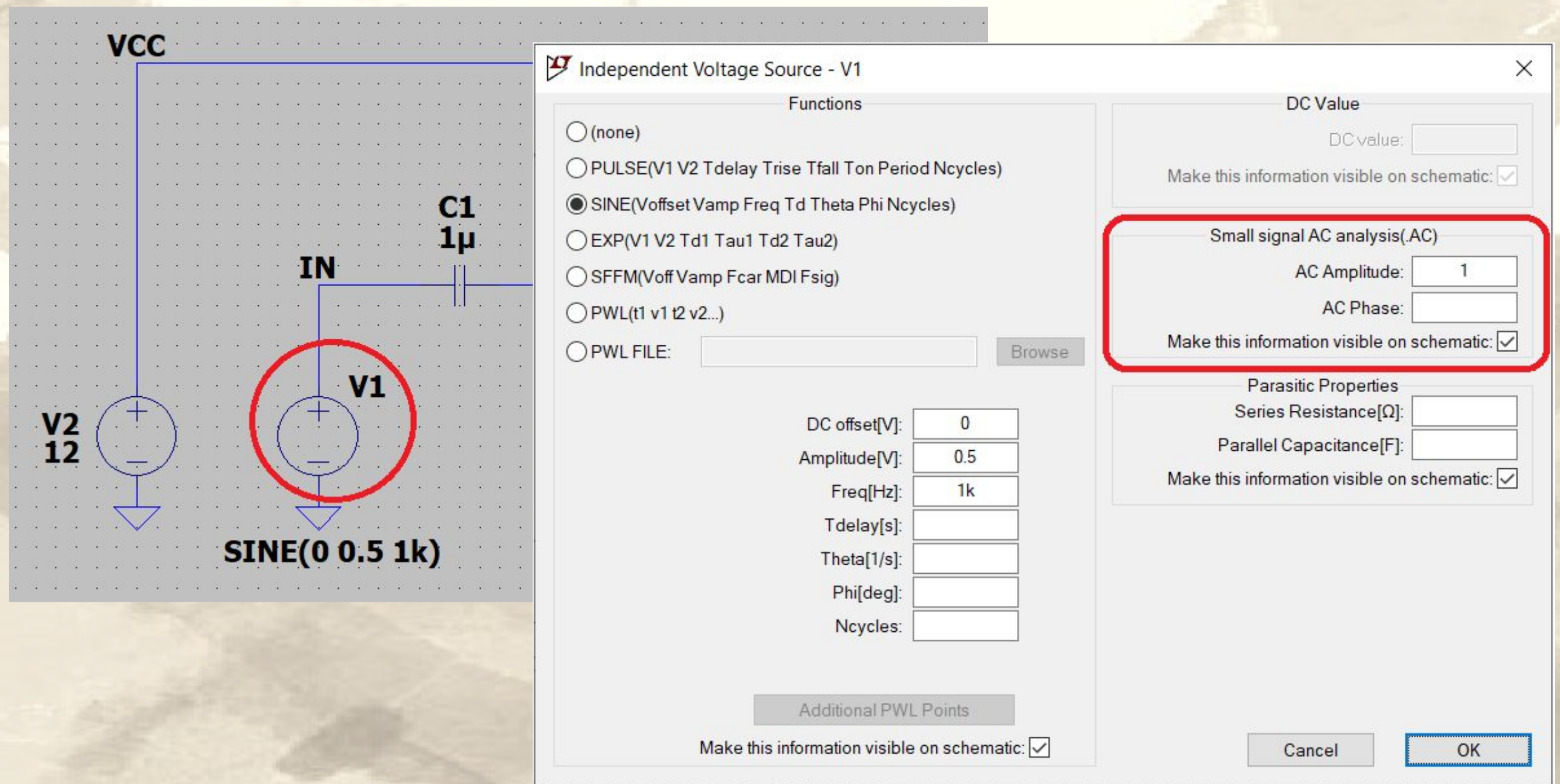
It's hard to test all the possibilities.

But there is a simpler way!



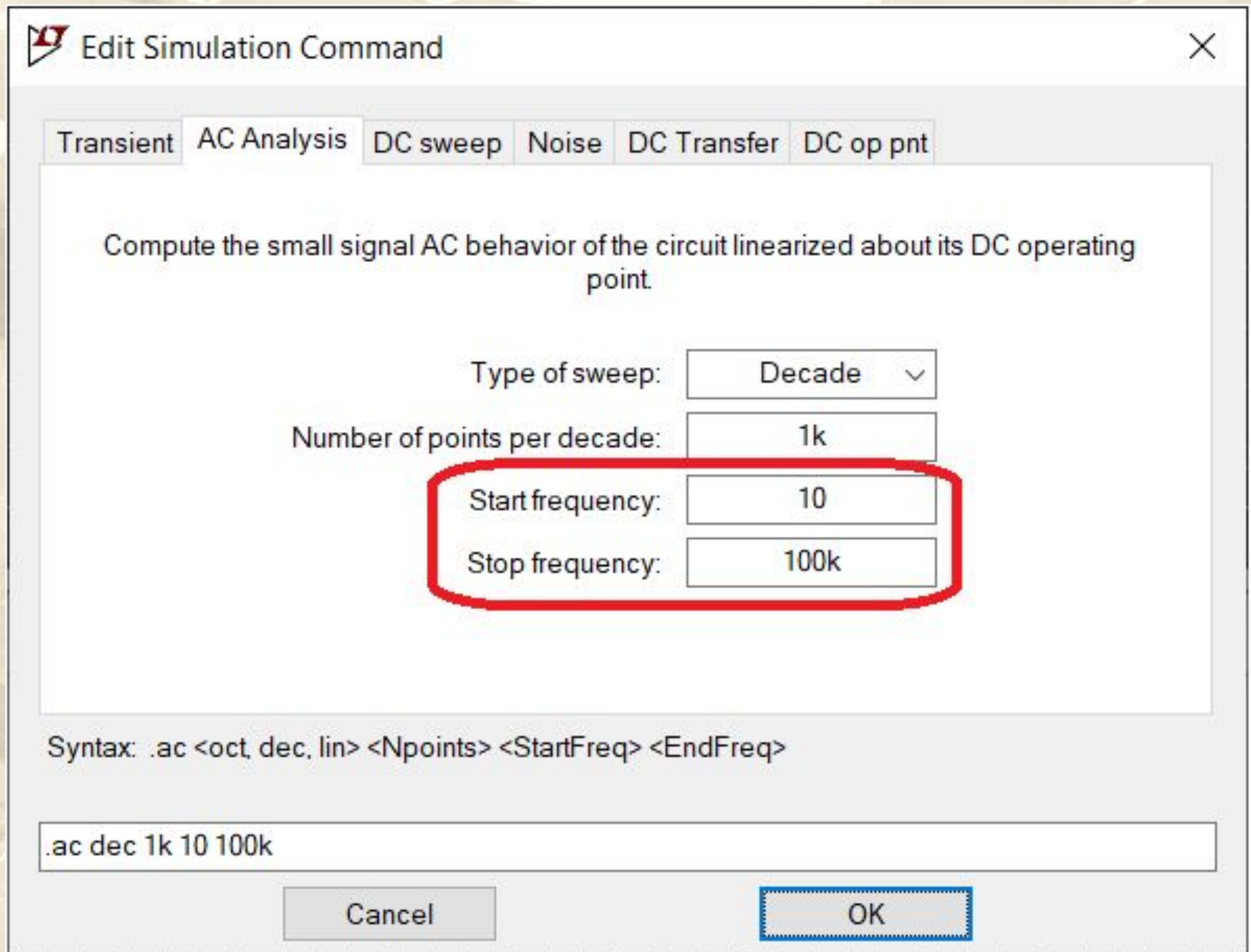
LTSpice analyzes the frequency response for you.

First, let's open the advanced properties of your signal source.



Write 1 in the AC Amplitude. This value means 0dB, which will make our analysis simpler.

Change the simulation command to AC Analysis. For this circuit, the 10Hz to 100KHz range looks good.



The image shows a screenshot of the 'Edit Simulation Command' dialog box in a circuit simulation software. The 'AC Analysis' tab is selected. The dialog box contains fields for 'Type of sweep' (Decade), 'Number of points per decade' (1k), 'Start frequency' (10), and 'Stop frequency' (100k). The last two fields are highlighted with a red rectangle. At the bottom, there is a text box showing the command '.ac dec 1k 10 100k' and buttons for 'Cancel' and 'OK'.

Edit Simulation Command

Transient AC Analysis DC sweep Noise DC Transfer DC op pnt

Compute the small signal AC behavior of the circuit linearized about its DC operating point.

Type of sweep: Decade

Number of points per decade: 1k

Start frequency: 10

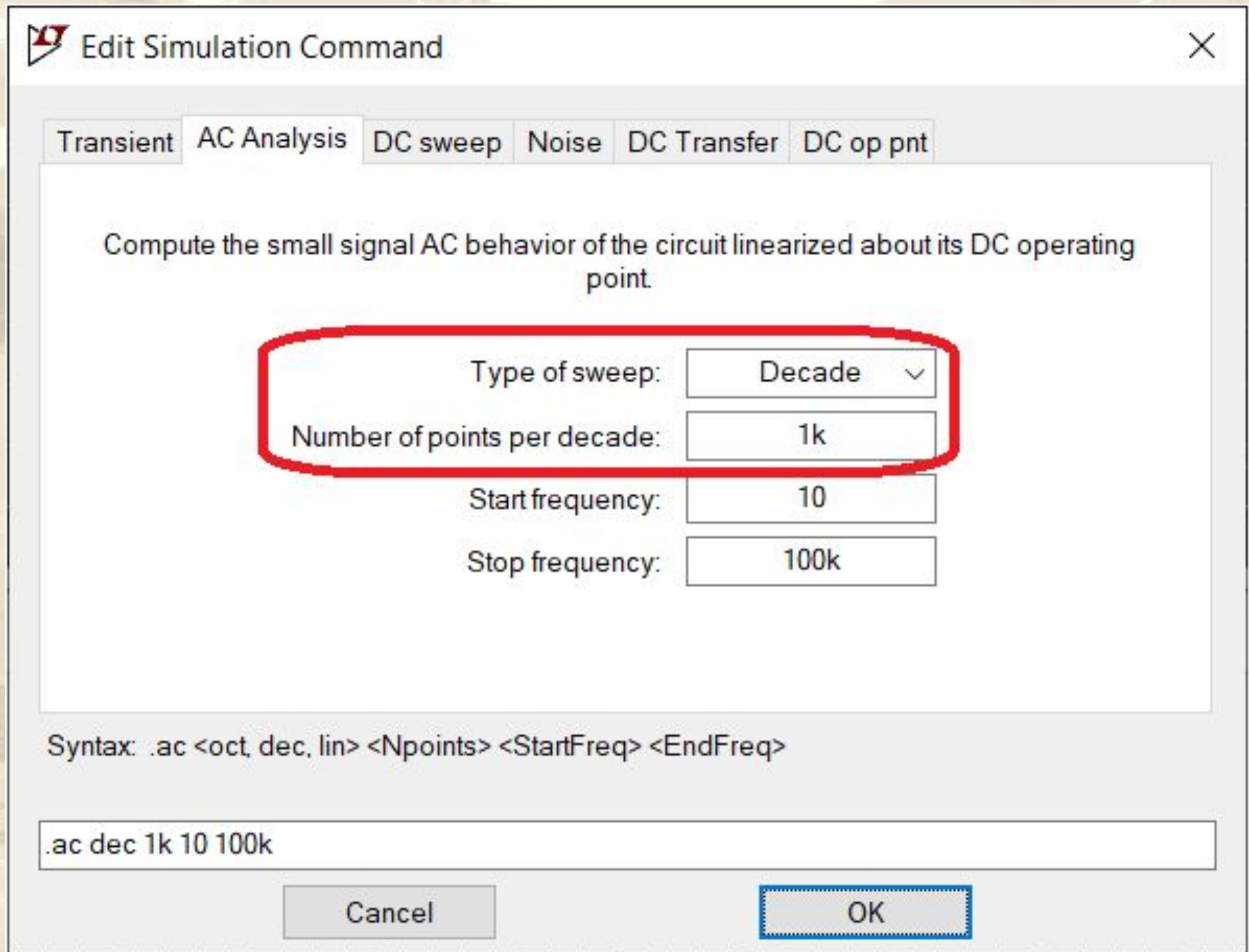
Stop frequency: 100k

Syntax: .ac <oct, dec, lin> <Npoints> <StartFreq> <EndFreq>

.ac dec 1k 10 100k

Cancel OK

The X-axis is typically logarithmic, and 1K per decade is fine.

The image shows a screenshot of the 'Edit Simulation Command' dialog box in a circuit simulation software. The 'AC Analysis' tab is selected. The dialog contains fields for 'Type of sweep' (set to 'Decade'), 'Number of points per decade' (set to '1k'), 'Start frequency' (set to '10'), and 'Stop frequency' (set to '100k'). A red rectangle highlights the 'Type of sweep' and 'Number of points per decade' fields. At the bottom, there is a syntax field showing '.ac dec 1k 10 100k' and 'OK' and 'Cancel' buttons.

✖ Edit Simulation Command

Transient AC Analysis DC sweep Noise DC Transfer DC op pnt

Compute the small signal AC behavior of the circuit linearized about its DC operating point

Type of sweep: Decade ▾

Number of points per decade: 1k

Start frequency: 10

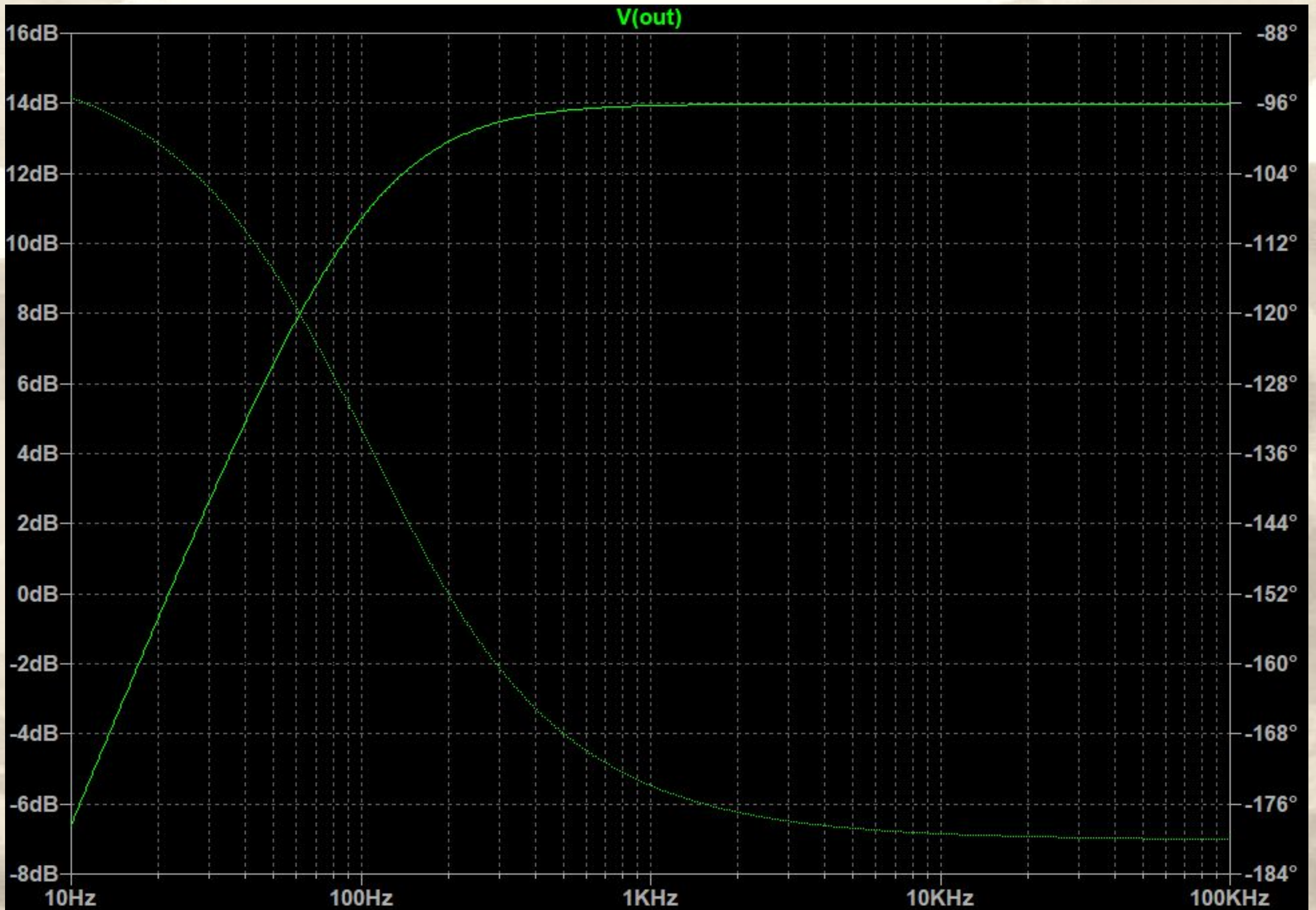
Stop frequency: 100k

Syntax: .ac <oct, dec, lin> <Npoints> <StartFreq> <EndFreq>

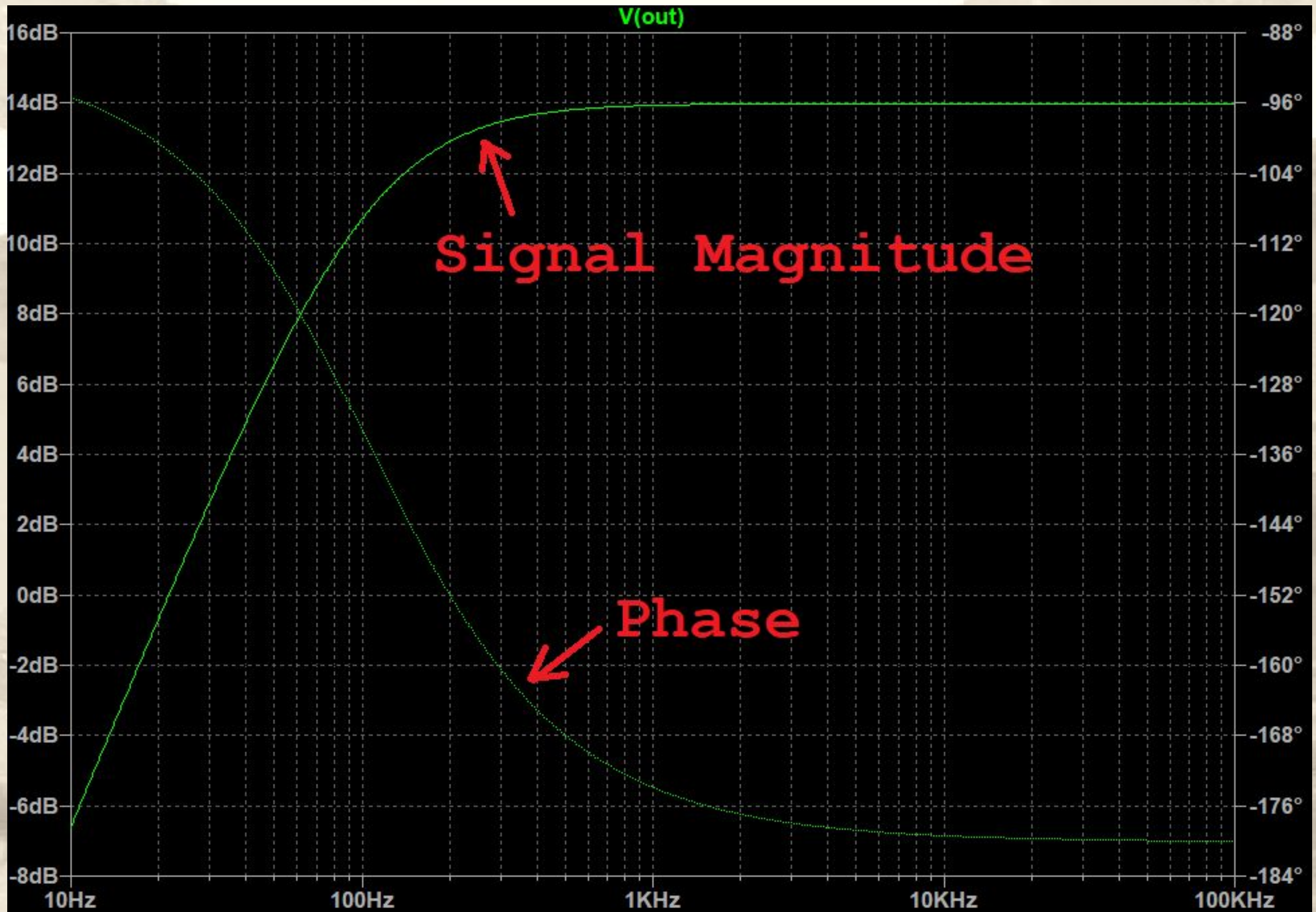
.ac dec 1k 10 100k

Cancel OK

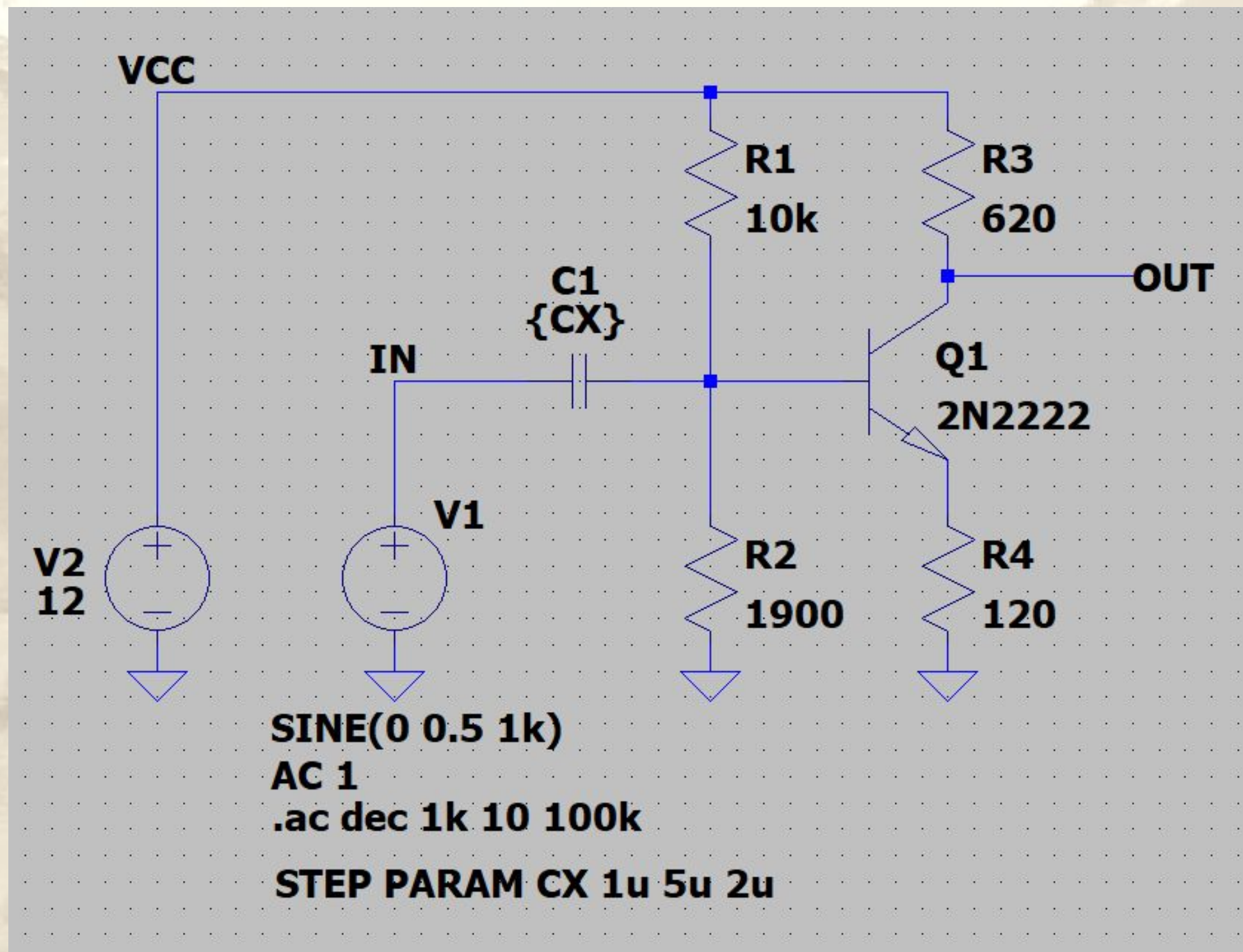
And that's it. Your circuit now displays the frequency response!



The solid line is the frequency response. The dotted line is the phase of the signal.

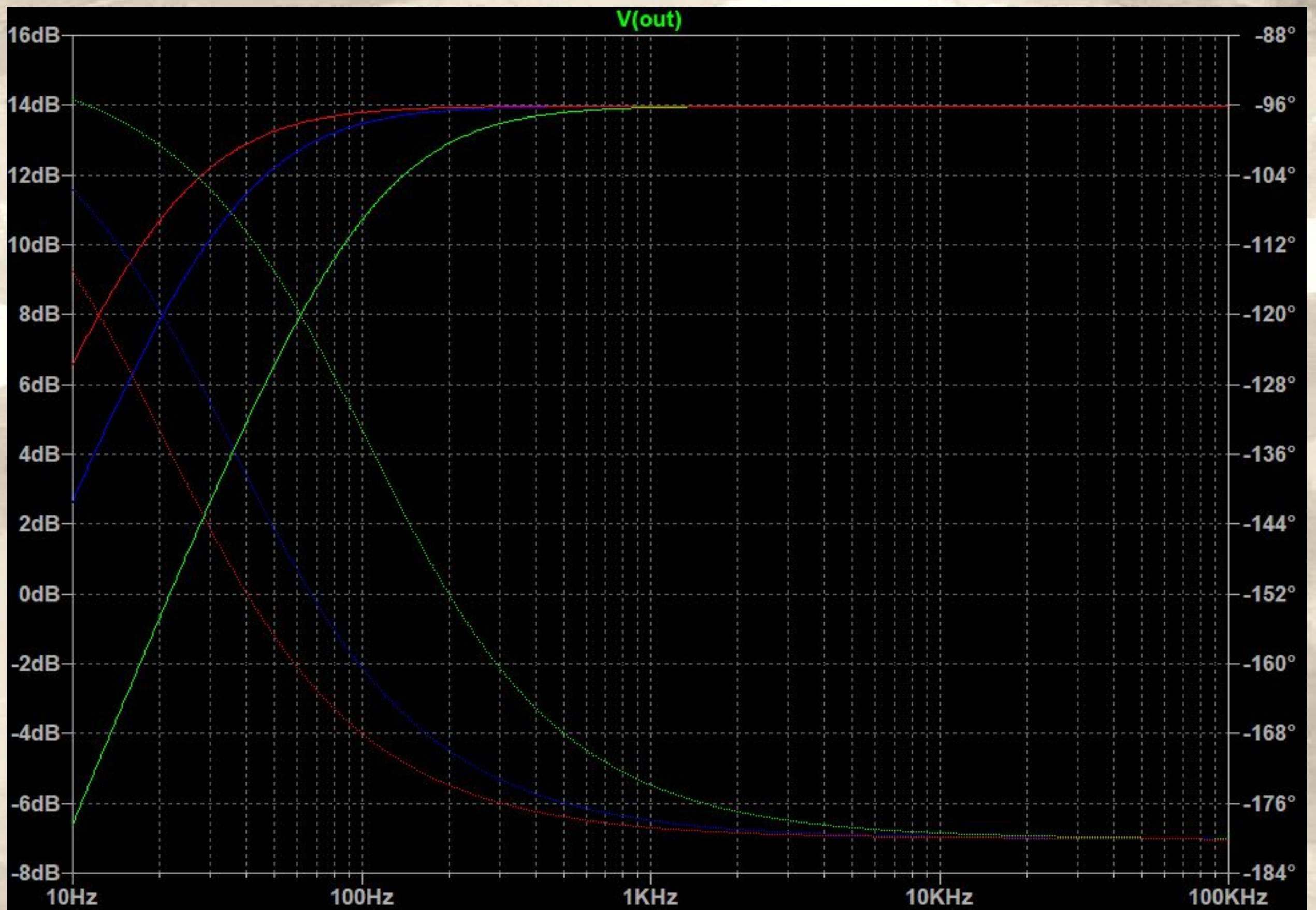


Using the STEP directive, you can parse multiple component values.



Here I tested the capacitor between 1uF, 3uF and 5uF.

And the result is beautiful!



Francesco Sacco

[linkedin.com/in/saccofrancesco](https://www.linkedin.com/in/saccofrancesco)