SPICE Up Your Projects with State-of-the-Art Amplifier and Comparator Models

By Jerry Steele – 12-17-2018

Good SPICE simulation models are essential to an efficient development process for your products and ON Semiconductor is now offering top quality models for all of our newer **operational amplifier**, **current sense amplifier** and **comparator products**.

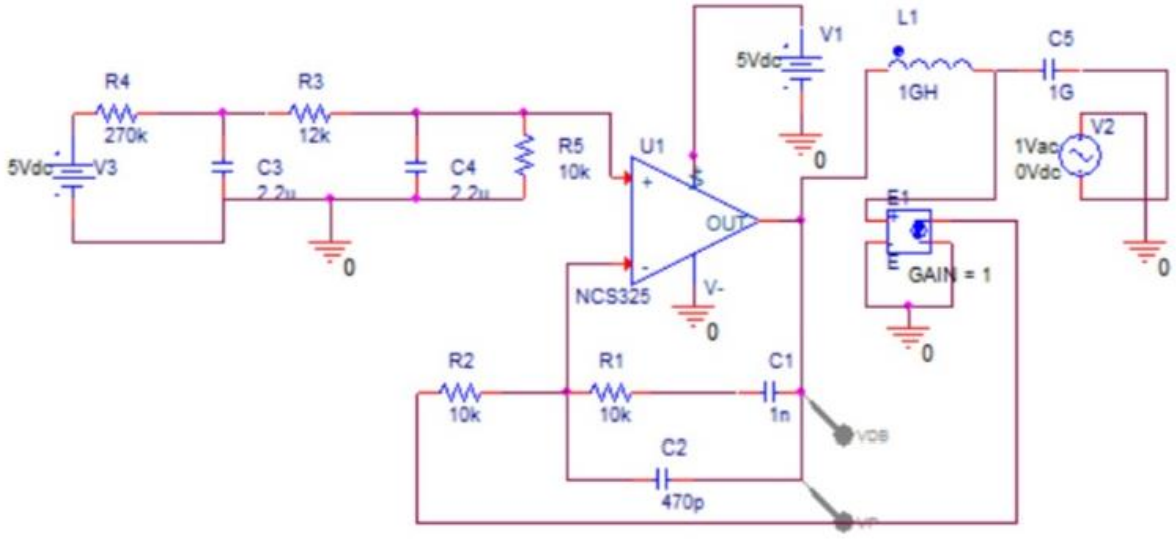
The objective is that a designer should be able to simulate a circuit with results as close as possible to that of the actual hardware. Good simulation models are an essential part of working towards that goal. ON Semiconductor is in the process of offering top quality models for all of our newer parts being released as well as new models for our most popular amplifiers. Examples of recent new products include **NCS2250** and **NCS210R through NCS214R**.

Among the performance attributes that are modeled to insure your success in simulation are:

- Output swing
- Output current flows through the supply rails
- V_{os}
- V_{os} vs. Common-mode voltage
- TC_{VOS} (input offset over temperature
- P_{SRR}
- C_{MRR}
- Bandwidth (gain and phase)
- Slew rate
- Output impedance (open loop)
- Voltage noise
- Input bias current
- ESD **diode**s on pins
- Common mode range
- Overload recovery time
- Allowable capacitive load
- Quiescent current

While many companies offer SPICE models optimized for use with their captive simulation tools, encrypted models or models designed to operate only limited choices of tools, ON Semiconductor's models are open source, fully tested and verified for accuracy and convergence in all popular simulators. Model netlists include recommendations or settings in the event that default analysis options should be changed. Often included are settings

recommendations for speeding up simulation where reduced accuracy or feature set is acceptable.



In response to demand for popular widely used general purpose operational amplifiers, we have introduced new versions of the following op amps. These models have been designed to faithfully reproduce the actual behavior of these devices including phase reversal in negative common-mode and crossover distortion due to the class-B output stage.

- **LM224**
- **LM258**
- **LM321**
- **LM324**
- **LM358**
- **LM2902**
- **LM2904**

All of these SPICE models can be conveniently found on product landing page for the respective devices.

All new products will have these quality models and we are working to offer these improved models for our most recent product releases. In the event there is more than one model listed for any amplifier, examine the header in the SPICE model netlist. If you see the line: “ON SEMICONDUCTOR NEXT GEN MODEL” you have the correct model.