What's New with LTspice IV?

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New Video: "SAR ADC Driver Interface"
www.linear.com/solutions/4679

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BLOG

Check out the LTspice blog (www.linear.com/solutions/LTspice) for tech news, insider tips and interesting points of view regarding LTspice.

New Video on the Blog: "SAR ADC Driver Interface" www.linear.com/solutions/4679

High performance SAR ADCs offer incredible dynamic range and linearity at increasingly faster sample rates, but achieving top performance requires careful attention to the amplifier and interface at the analog inputs. This video shows how to use LTspice to simulate the analog input interface of high performance SAR ADCs. Linear Technology signal chain applications expert Kris Lokere discusses charge kickback, settling time, noise and how to intelligently balance the trade-offs inherent in achieving sometimes conflicting performance goals.

What is LTspice IV?

LTspice® IV is a high performance SPICE simulator, schematic capture and waveform viewer designed to speed the process of power supply design. LTspice IV adds enhancements and models to SPICE, significantly reducing simulation time compared to typical SPICE simulators, allowing one to view waveforms for most switching regulators in minutes compared to hours for other SPICE simulators.

LTspice IV is available free from Linear Technology at www.linear.com/LTspice. Included in the download is a complete working version of LTspice IV, macro models for Linear Technology's power products, over 200 op amp models, as well as models for resistors, transistors and MOSFETs.

SELECTED DEMO CIRCUITS

For a complete list of example simulations utilizing Linear Technology devices, visit www.linear.com/democircuits.

Linear Regulators

- **LT3081:** Wide safe operating area supply using paralleling regulators (2.7–40V to 1.5V, 3A) www.linear.com/LT3081
- **LT3086:** USB supply with cable drop compensation (1.55–40V to 5V, 2.1A) www.linear.com/LT3086

Buck Switching Regulators

- **LT8614:** Ultralow EMI, µPower buck converter (5.8–42V to 5V, 4A) www.linear.com/LT8614
- **LTC3624:** High efficiency buck regulator with ultralow quiescent current (5.6–17V to 5V, 2A) www.linear.com/LTC3624
- **LTC3875:** High efficiency dual output step-down converter with ultralow DCR sensing and fast transient (4.5-14V to 1V, 30A & 1.5V, 30A) www.linear.com/LTC3875
- **LTM®4633:** Triple 10A step-down µModule® regulator (4.5–16V to 1.0V, 1.2V & 3.3V, 10A) www.linear.com/LTM4633
- **LTM4676:** Single 26A µModule buck regulator with digital interface for control & monitoring (4.5–16V to 1V, 26A) www.linear.com/LTM4676

Boost & Inverting Switching Regulators

- **LT8710:** Synchronous boost converter with output current control (4.5–28V to 5V, 6A) www.linear.com/LT8710
- **LT8710:** Synchronous inverting converter with output current control (4.5–28V to –5V, 6A) www.linear.com/LT8710

Flyback, Forward and Isolated Controllers

- **LT8301:** µPower isolated flyback converter (10–32V to 5V, 0.7A) www.linear.com/LT8301
- **LT8309 & LT3748:** 60W, 12V output, isolated telecom supply (36–72V to 12V, 5A) www.linear.com/LT8309

Overvoltage & Overcurrent Protection

- **LTC4364:** 4A, 12V overvoltage output regulator with reverse current protection www.linear.com/LTC4364-1

ADC Drivers

- **LT1637/LT1468/LT5400:** ±10V single-ended to ±5V fully differential ADC driver for LTC2378-20 using matched resistors www.linear.com/LT1637

SELECT MODELS

To search the LTspice library for a particular Linear Technology device model, choose Edit > Component (or press F2) and enter its part number in the search box or browse to the device/component needed. Since LTspice is often updated with new features and models, it is good practice to update to the current version via the menu command Tools > Sync Release. LTspice's changelog.txt file (in the root installation directory) lists the LTspice revision history.

Linear Regulators

- **LT3065:** 45V input, 500mA low noise, linear regulator with programmable current limit and power good www.linear.com/LT3065

Buck Switching Regulators

- **LT3874:** PolyPhase® step-down synchronous slave controller for LTC3866/LTC3875/LTC3774 with sub-milliohm DCR sensing www.linear.com/LTC3874
- **LTC3624:** 17V, 2A synchronous step-down regulator with 3.5µA quiescent current www.linear.com/LTC3624
- **LTC3870:** PolyPhase step-down slave controller for LTC3880/LTC3883 with digital power system management www.linear.com/LTC3870
- **LTM8058:** 3.1V to 31V input isolated µModule DC/DC converter with LDO post regulator www.linear.com/LTM8058

Boost Switching Regulators

- **LT3048-15:** Low noise bias generator www.linear.com/LT3048-15
- **LTC3784:** 60V PolyPhase synchronous boost controller www.linear.com/LTC3784

Multitopology Switching Regulators

- **LT8471:** Dual multitopology DC/DC converters with 2A switches and synchronization www.linear.com/LT8471
- **LT8710:** Synchronous SEPIC/ inverting/ boost controller with output current control www.linear.com/LT8710

Flyback, Forward and Isolated Controllers

- **LT3752:** Active clamp synchronous forward controllers with internal housekeeping controller www.linear.com/LT3752
- **LT8301:** 42V input micropower no-opto isolated flyback converter with 65V/1.2A switch www.linear.com/LT8301
- **LT8309:** Secondary-side synchronous rectifier driver www.linear.com/LT8309
- **LT8311:** Synchronous rectifier controller with opto-coupler driver for forward converters www.linear.com/LT8311 ■

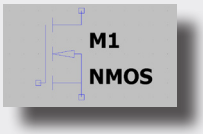
Power User Tip

USE LTspice INTRINSIC SYMBOL FOR THIRD-PARTY MODEL

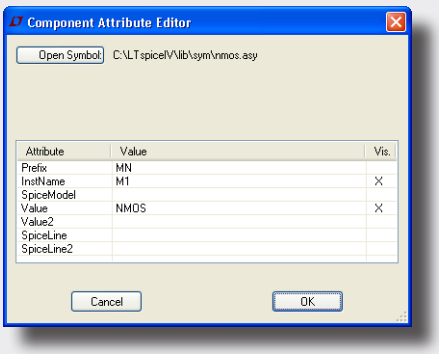
LTspice can automatically create a symbol for a third-party model, or you can associate a third-party subcircuit with an LTspice intrinsic symbol, as long as the third-party .SUBCKT model and the intrinsic symbol share an identical pin/port netlist order.

For example, to add an N-channel MOSFET transistor symbol to a schematic and define it with an IRF_7401 .SUBCKT statement:

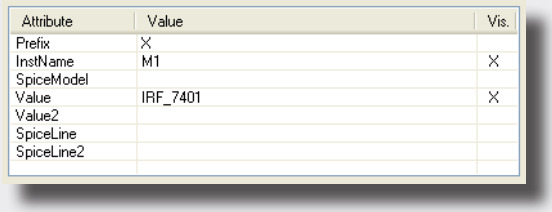
1. Add an instance of the N-channel MOSFET transistor symbol to your schematic.



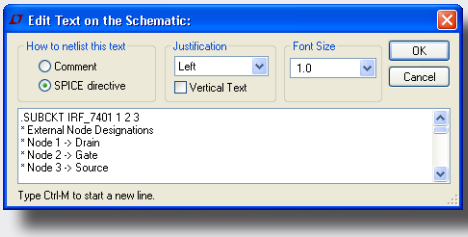
2. Move the cursor over the body of the MOSFET symbol and Ctrl + Right-Click. A dialog box appears.



3. Change Prefix: "MN" to "X". The symbol now netlists as a subcircuit instead of an intrinsic NMOS transistor.
4. Change "NMOS" to be "IRF_7401", corresponding to the name on the .SUBCKT line.



5. Click OK.
6. Either add the .SUBCKT IRF_7401 lines to your schematic or reference the library containing it (.INCLUDE third_party.lib) as a SPICE directive.



Again, this assumes the third-party model you're adding follows popular pin order conventions. When in doubt, use the automatic symbol generation feature because it takes care of any discrepancies with regard to pin and port netlist order. For more about automatic symbol generation, see Help > Schematic Capture > Creating New Symbols > Automatic Symbol Generation.

Happy simulations!