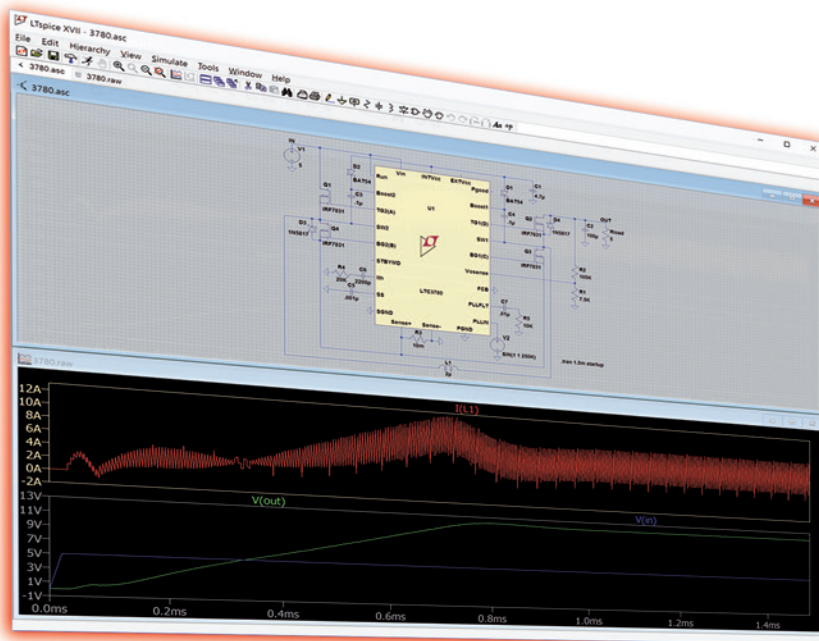


LTspice



- Freely Distributed
- Unlimited Nodes/Nets
- Fast Simulations

LTspice® is a high performance SPICE simulator, schematic capture and waveform viewer with enhancements and models for easing the simulation of analog circuits. Our enhancements to SPICE have made simulating switching regulators extremely fast compared to normal SPICE simulators, allowing the user to view waveforms for most switching regulators in just a few minutes.



www.analog.com/LTspice

Included in the download of LTspice are macromodels for a majority of Analog Devices switching regulators and amplifiers, as well as a library of devices for general circuit simulation.



www.twitter.com/LTspice

Follow @ LTspice on Twitter for up-to-date information on models, demo circuits, events and user tips.

| LTspice HotKeys | | | | |
|-----------------|--------------------------|---------------------------|-----------------------------|--|
| | Schematic | Symbol | Waveform | Netlist |
| Modes | ESC – Exit Mode | ESC – Exit Mode | | |
| | F3 – Draw Wire | | | |
| | F5 – Delete | F5 – Delete | F5 – Delete | |
| | F6 – Duplicate | F6 – Duplicate | | |
| | F7 – Move | F7 – Move | | |
| | F8 – Drag | F8 – Drag | | |
| | F9 – Undo | F9 – Undo | F9 – Undo | F9 – Undo |
| | Shift+F9 – Redo | Shift+F9 – Redo | Shift+F9 – Redo | Shift+F9 – Redo |
| View | Ctrl+Z – Zoom Area | Ctrl+Z – Zoom Area | Ctrl+Z – Zoom Area | |
| | Ctrl+B – Zoom Back | Ctrl+B – Zoom Back | Ctrl+B – Zoom Back | |
| | Space – Zoom Fit | | Ctrl+E – Zoom Extents | |
| | Ctrl+G – Toggle Grid | | Ctrl+G – Toggle Grid | Ctrl+G – Goto Line # |
| | U – Mark Unncon. Pins | Ctrl+W – Attribute Window | 'O' – Clear | |
| | A – Mark Text Anchors | Ctrl+A – Attribute Editor | Ctrl+A – Add Trace | |
| | Atl+Click – Power | | Ctrl+Y – Vertical Autorange | Ctrl+R – Run Simulation |
| | Ctrl+Click – Attr. Edit | | Ctrl+Click - Average | |
| | Ctrl+H – Halt Simulation | | Ctrl+H – Halt Simulation | Ctrl+H – Halt Simulation |
| Place | R – Resistor | R – Rectangle | Command Line Switches | |
| | C – Capacitor | C – Circle | | |
| | L – Inductor | L – Line | Flag | Short Description |
| | D – Diode | A – Arc | -ascii | Use ASCII .raw files. (Degrades performance!) |
| | G – GND | | -b | Run in batch mode. |
| | S – Spice Directive | | -big or -max | Start as a maximized window |
| | T – Text | T – Text | -encrypt | Encrypt a model library |
| | F2 – Component | | -FastAccess | Convert a binary .raw file to Fast Access Format |
| | F4 – Label Net | | -netlist | Convert a schematic to a netlist |
| | Ctrl+E – Mirror | Ctrl+E – Mirror | -nowine | Prevent use of WINE(Linux) workarounds |
| | Ctrl+R – Rotate | Ctrl+R – Rotate | -PCBnetlist | Convert a schematic to a PCB netlist |

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| Simulator Directives – Dot Commands | |
|-------------------------------------|--|
| Command | Short Description |
| .AC | Perform a Small Signal AC Analysis |
| .BACKANNO | Annotate Subcircuit Pin Names on Port Currents |
| .DC | Perform a DC Source Sweep Analysis |
| .END | End of Netlist |
| .ENDS | End of Subcircuit Definition |
| .FOUR | Compute a Fourier Component |
| .FUNC | User Defined Functions |
| .FERRET | Download a File Given the URL |
| .GLOBAL | Declare Global Nodes |
| .IC | Set Initial Conditions |
| .INCLUDE | Include another File |
| .LIB | Include a Library |
| .LOADBIAS | Load a Previously Solved DC Solution |
| .MEASURE | Evaluate User-Defined Electrical Quantities |
| .MODEL | Define a SPICE Model |
| .NET | Compute Network Parameters in a .AC Analysis |
| .NODESET | Supply Hints for Initial DC Solution |
| .NOISE | Perform a Noise Analysis |
| .OP | Find the DC Operating Point |
| .OPTIONS | Set Simulator Options |
| .PARAM | User-Defined Parameters |
| .SAVE | Limit the Quantity of Saved Data |
| .SAVEBIAS | Save Operating Point to Disk |
| .STEP | Parameter Sweeps |
| .SUBCKT | Define a Subcircuit |
| .TEMP | Temperature Sweeps |
| .TF | Find the DC Small-Signal Transfer Function |
| .TRAN | Do a Nonlinear Transient Analysis |
| .WAVE | Write Selected Nodes to a .WAV file |

| Suffix | | Suffix | | Constants | |
|--------|------|--------|---------|-----------|------------------------|
| | | f | 1e-15 | E | 2.7182818284590452354 |
| T | 1e12 | p | 1e-12 | Pi | 3.14159265358979323846 |
| G | 1e9 | n | 1e-9 | K | 1.3806503e-23 |
| Meg | 1e6 | u | 1e-6 | Q | 1.602176462e-19 |
| K | 1e3 | M | 1e-3 | TRUE | 1 |
| | | Mil | 25.4e-6 | FALSE | 0 |