

## COMMANDS

### SPICE Analysis

.OP	find the DC operating point
.TRAN	perform nonlinear transient analysis
.AC	perform small signal AC analysis
.DC	perform DC source sweep analysis
.TF	find the DC small-signal transfer function
.NOISE	perform noise analysis

### SPICE Directives

.BACKANNO	annotate subcircuit pin names on port currents
.END	end of netlist
.ENDS	end of subcircuit definition
.FOUR	compute fourier component
.FUNC	user defined functions
.FERRET	download a file from URL
.GLOBAL	declare global nodes
.IC	set initial conditions
.INCLUDE	include file
.LIB	include library
.LOADBIAS	load a previously solved DC solution
.MACHINE	arbitrary state machine
.MEASURE	evaluate user-defined electrical quantities
.MODEL	define a SPICE model
.NET	compute network parameters in .AC analysis
.NODESET	supply hints for initial DC solution
.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
.TEXT	user-defined string
.WAVE	write selected nodes to a .WAV file

## SHORTCUTS

### Schematic and Symbol Editing Modes

Windows	Choose Mode then select component Exit mode: Press <b>[Esc]</b> or right-click	Apple
<b>[F5]</b> or <b>[Delete]</b> or <b>[Ctrl][X]</b>	cut/delete	<b>[F5]</b>
<b>[F6]</b> or <b>[Ctrl][C]</b>	copy/duplicate*	<b>[F6]</b>
<b>[F7]</b>	move* unselected wires remain	<b>[F7]</b>
<b>[F8]</b>	drag* connected wires adjust	<b>[F8]</b>
<b>[Esc]</b>	exit current mode or right-click	<b>[Esc]</b>

### Zoom and Grid

Windows	Zoom in and out with scroll wheel or track pad pinch	Apple
<b>[Ctrl][Z]</b>	Schematic zoom area (drag over area) zoom in (click on scheme) Waveform zoom area is default mode <b>[F9]</b> for previous zoom Symbol zoom in	
<b>[Ctrl][B]</b>	zoom out	
<b>[Space]</b>	zoom to fit (schematic viewer)	<b>[Space]</b>
<b>[Ctrl][E]</b>	zoom extents (waveform viewer)	
<b>[Ctrl][G]</b>	toggle grid	

## TRICKS

### Waveforms

Windows	when clicking waveform label	Apple
click	add cursor and see measure	click
<b>[Alt]</b> click	highlight corresponding net in schematic	<b>[⌘]</b> click
<b>[Ctrl]</b> click	integrate waveform	<b>[Ctrl]</b> click

### Schematics

Windows		Apple
<b>[Alt]</b> click	<b>component:</b> plot instantaneous power <b>wire:</b> plot current	<b>[⌘]</b> click
hold <b>[Ctrl]</b>	draw wires at an angle	hold <b>[Shift]</b>
<b>[Ctrl][Alt][Shift]</b> <b>[H]</b>	show hidden component values/text, e.g. parallel or series resistance and capacitance	

any text preceded by an underscore, e.g. "\_FAULT" is displayed with an overbar, active low, signal

### Place Component Modes\*

Windows	Press <b>[Esc]</b> or right-click to exit place component mode	Apple
<b>[R]</b>	resistor	<b>[R]</b>
<b>[C]</b>	capacitor	<b>[C]</b>
<b>[L]</b>	inductor	<b>[L]</b>
<b>[D]</b>	diode	<b>[D]</b>
<b>[G]</b>	ground	<b>[G]</b>
<b>[V]</b>	voltage	<b>[V]</b>
<b>[S]</b>	.op spice directive right-click text field to open "Help me Edit" dialog	<b>[S]</b>
<b>[T]</b>	text/comment	<b>[T]</b>
<b>[F2]</b>	component	<b>[F2]</b>
<b>[F3]</b>	draw wire	<b>[F3]</b>
<b>[F4]</b>	label net	<b>[F4]</b>
	bus tap	<b>[B]</b>

### \*Rotate and Mirror

Windows	*enabled in place modes	Apple
<b>[Ctrl][R]</b>	rotate	<b>[⌘][R]</b>
<b>[Ctrl][E]</b>	mirror	<b>[⌘][E]</b>

### Undo/Redo

Windows	### Levels of Undo	Apple
<b>[F9]</b>	undo	<b>[F9]</b> or <b>[⌘][Z]</b>
<b>[⌘][F9]</b> or <b>[Ctrl][⌘][Z]</b>	redo	<b>[⌘][F9]</b> or <b>[⌘][⌘][Z]</b>

## NUMBERS

### Prefixes (Case Insensitive)

LTspice	Means	Value
T or t	tera	10 <sup>12</sup>
G or g	giga	10 <sup>9</sup>
meg	mega	10 <sup>6</sup>
K or k	kilo	10 <sup>3</sup>
M or m	milli	10 <sup>-3</sup>
U or u	micro	10 <sup>-6</sup>
N or n	nano	10 <sup>-9</sup>
P or p	pico	10 <sup>-12</sup>
F or f	femto	10 <sup>-15</sup>

### Constants

LTspice	Means
e	Euler's number
pi	π
k	Boltzmann constant
q	charge constant
true	1
false	0
mil	25.4×10 <sup>-6</sup> m



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