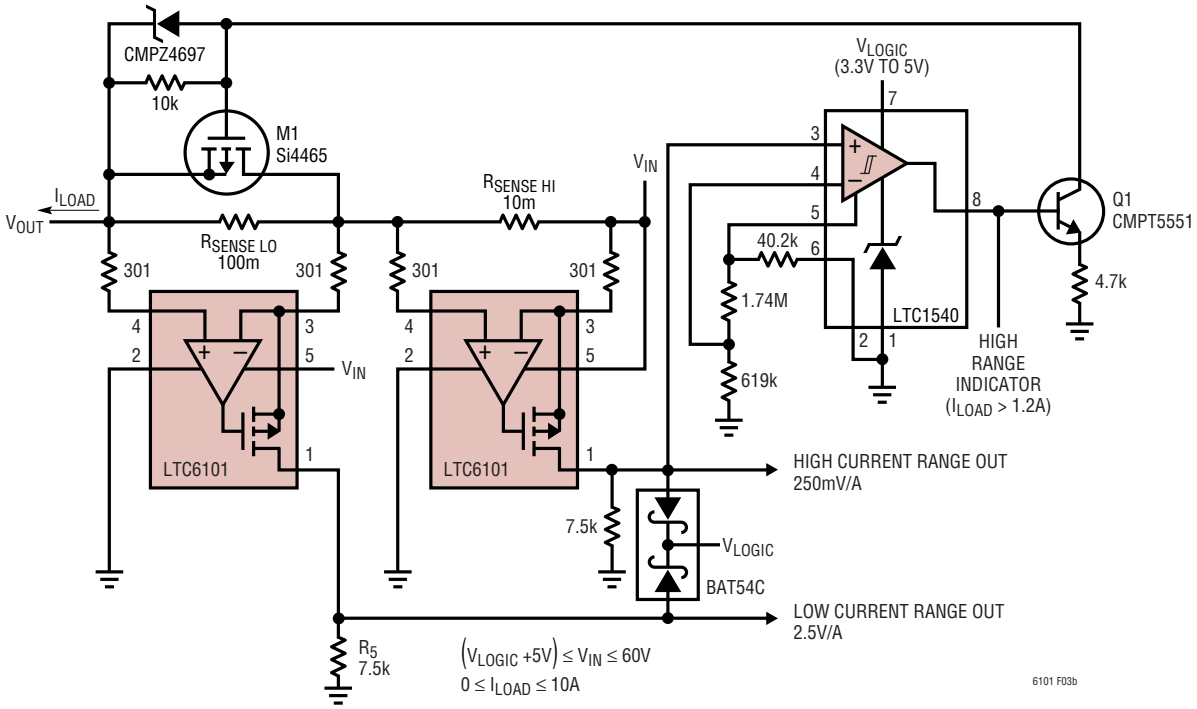
Wide Range

To measure current over a wide range of values requires gain changing in the current sense amplifier. This allows the use of a single value of sense resistor. The alternative approach is to switch values of sense resistor. Both approaches are viable for wide range current sensing.

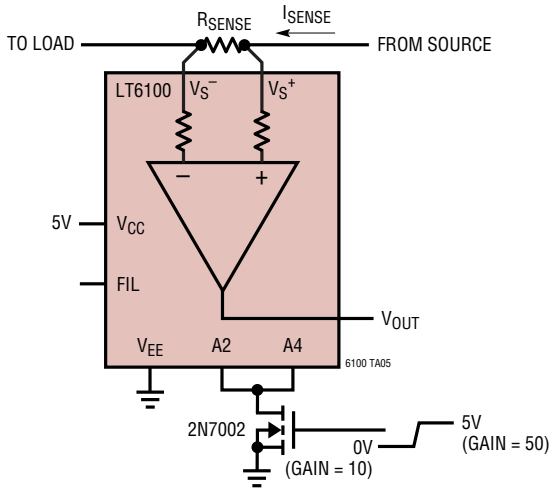
To see other chapters in this Application Note, return to the Introduction.

Dual LTC6101's Allow High-Low Current Ranging



Using two current sense amplifiers with two values of sense resistors is an easy method of sensing current over a wide range. In this circuit the sensitivity and resolution of measurement is 10 times greater with low currents, less than 1.2 Amps, than with higher currents. A comparator detects higher current flow, up to 10 Amps, and switches sensing over to the high current circuitry.

Adjust Gain Dynamically for Enhanced Range



Instead of having fixed gains of 10, 12.5, 20, 25, 40, and 50, this circuit allows selecting between two gain settings. An NMOSFET switch is placed between the two gain-setting terminals (A2, A4) and ground to provide selection of gain = 10 or gain = 50, depending on the state of the gate drive. This provides a wider current measurement range than otherwise possible with just a single sense resistor.