

DESIGN SHOWCASE

Dummy Load Maintains Constant Current

Unlike conventional, resistive-type dummy-load circuits, that of **Figure 1** maintains a constant but adjustable current for voltages in the range 1.2 to 50V. The adjustable load is useful for testing power supplies, power amplifiers, and drivers for LEDs, relays, and solenoids. It overcomes the limitations of other techniques: power rheostats are bulky and have coarse setting accuracy, and power decade boxes are large, expensive, and have limited resolution.

With the compact **Figure 1** circuit, you simply switch to the desired range (0-1A or 0-10A) and dial in a load current with the high-resolution, 10-turn potentiometer R_6 . The power MOSFET and sense resistor

dissipate load power, and the control circuit draws so little current that a 6V or 9V battery can power it for several months. Battery operation also provides isolation and eliminates grounding problems.

In operation, the voltage reference (IC₁) maintains an output of approximately 1.3V with very low temperature coefficient. You calibrate the system by adjusting R_3 and R_5 , setting the top of R_6 to 1.000V for the 10A range and to 0.100V for the 1A range. The wiper of R_6 then provides a reference to the op amp (IC₂), whose input common-mode range includes ground. Feedback assures that the wiper voltage appears across the sense resistor (R_9), forcing a desired load current through the MOSFET.

(Circle 5)

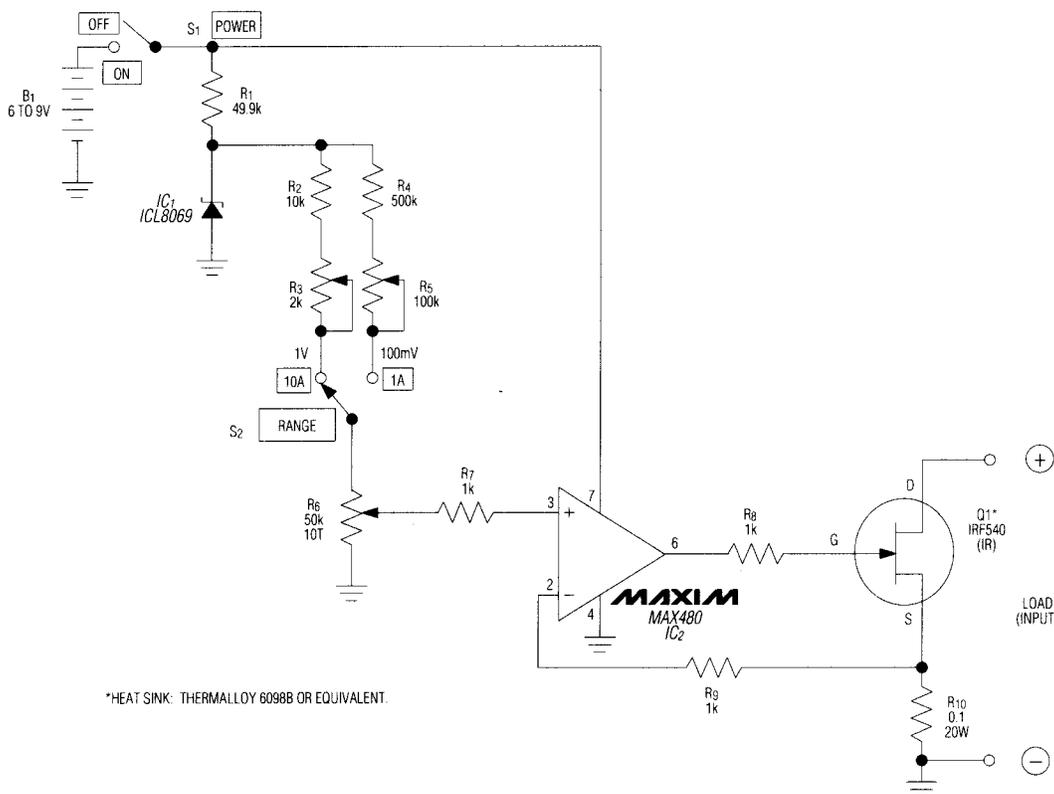


Figure 1. This adjustable load features a low-power control circuit that enables the high-resolution potentiometer (R_6) to control as much as 10A of load current through the power MOSFET.