

## Single-IC circuit tests relays

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A circuit (figure) designed around an LM339 quad comparator performs a fast and simple Go/No-Go reed-relay test. It tests coil and contact resistance of 5V relays (with or without coil-protection diodes), such as Hamlin's Model HE721A0500 or Gordos's 831A-5.

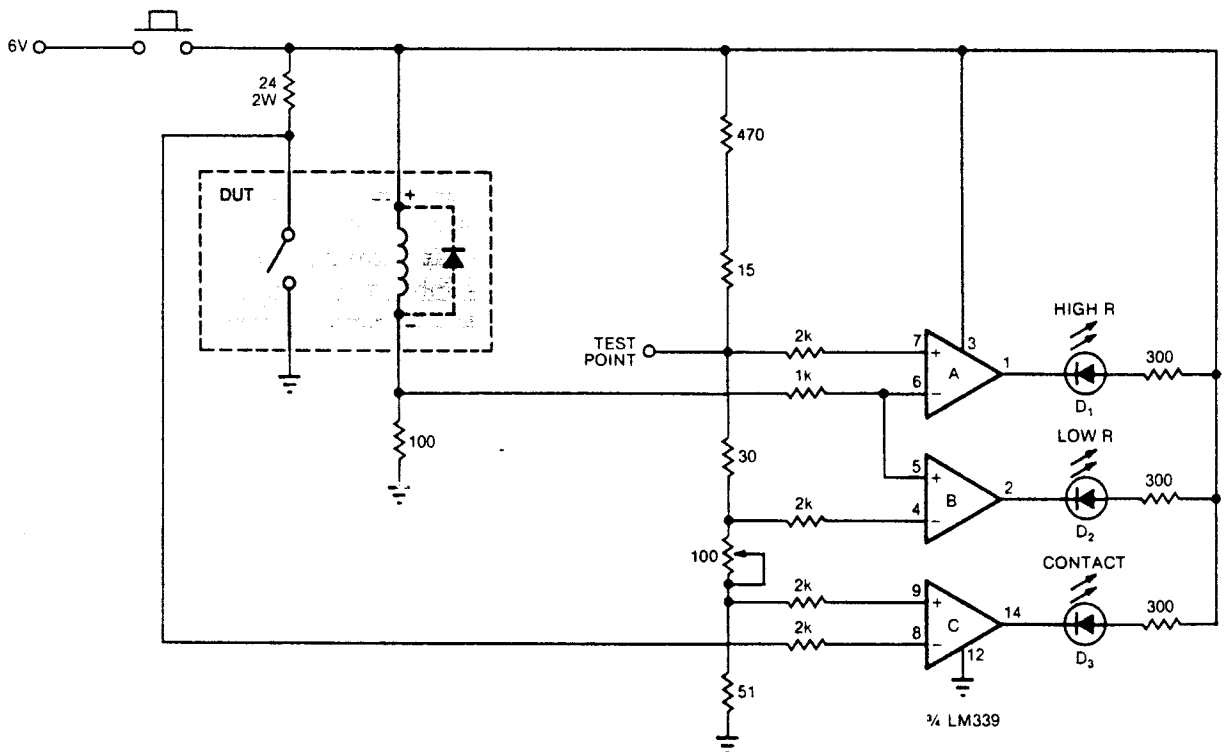
The comparators' input voltage-divider chain consists of five resistors; by changing these resistor values, you can accommodate other relay voltages (eg, 12 or 24V). In this example, the values are set to test relays with  $500\Omega \pm 10\%$  coil resistance and 0.2 $\Omega$  max contact resistance at 250 mA. The comparators function with supplies as high as 36V (choose LED current-limiting resistors based on the supply employed).

Comparators A and B form a limit detector, with limits set 5% over and under the coil-resistance spec—a provision that allows headroom for temperature testing, accommodating  $\pm 5\%$  resistance variation over 12 to 38°C. For 25°C-only testing, set limits at the specified  $\pm 10\%$ .

The circuit tests contact resistance by forcing the rated current through the relay's contacts. This example's 24 $\Omega$  resistor fixes the current at the specified 250-mA value; comparator C compares the contact's voltage drop with a 51-mV reference.

If no LED lights, the relay under test is good in all respects. An illuminated D<sub>1</sub> or D<sub>2</sub> indicates out-of-spec coil resistance; D<sub>3</sub> ON shows excessive contact resistance. Calibrate the tester by adjusting the 100 $\Omega$  potentiometer for 1.15V at the test point. **EDN**

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A quad comparator IC and a voltage divider form a simple reed-relay tester. Tailor the divider values to your relay's contact- and coil-resistance specs. One potentiometer calibrates all parameter limits.