BUILD A POLARITY-SENSING CONTINUITY TESTER

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A COMPACT polarity-sensing continuity tester can prove a very useful tool on any workbench. With it, you can check for short circuits, open circuits, continuity, and the polarity and condition of rectifier and light-emitting diode and transistor junctions. It can even be used to check most capacitors and any purely resistive component rated at up to 20,000 ohms.

The tester's circuit (see schematic) is very simple, consisting of a 6.3-volt transformer, two LED's, and a current-limiting resistor that is common to both LED's. Owing to the fact that test current comes from the stepped-down 60-Hz ac line, only one LED will come on for each alternation. The forward conduction of one LED protects the other LED from reverse-current conduction during alternating cycles of the ac voltage.

LED'S=MV5023 OR SIMILAR
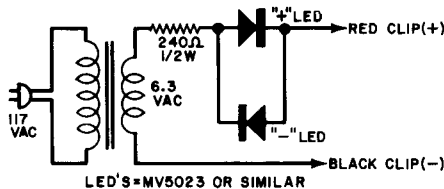
When a unidirectional device (diode or transistor) is tested, current flows in only one direction. Hence, only one LED lights. (Note: If one LED comes on at full brilliance and the other glows very faintly, the device under test can be considered good.) If both LED's come on, the device is shorted. And if neither LED comes on, the device under test is open.

Transistors can be safely tested with this device because of the low current drawn. Less than 5 mA of current produces a bright LED glow, while as little as 200 µA of current can be observed as a faint glow.

The circuit is designed so that, when the red alligator clip is connected to the anode of a diode (or p side of a transistor junction) and the black clip is connected to the cathode of the diode (or n side of the junction), the "+" LED will light. Reversed connections do not require that the leads be transposed; simply observe which of the LED's lights and check the alligator clip hookup.

Continuity for resistance can be observed by the brilliance at which the LED's glow. The brighter the glow, the lower the resistance, and vice versa. Also, capacitances greater than about 0.05 µF will cause a faint glow of both LED's (demonstrating that the capacitor is good at 60 Hz). ◈