

# Transistor tester fits into your pocket

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IT CAN BE HELPFUL to rapidly and easily determine the polarity (npn or pnp) and function of a transistor. The pocket-transistor tester in **Figure 1** is ideal for quickly testing without regard to such parameters as gain and frequency response. You connect the transistor, or device under test, between the collectors, T, of an astable multivibrator. Thus, the  $V_{CE}$  voltage of the device under test is alternately positive and negative. Two LEDs connected in an antiparallel configuration to the device alternately light as long as the device is not conducting. The frequency of the multivibrator is a function of the values of C and  $R_B$ . If the device under test conducts in only one

**TABLE 1—TESTING RESULTS**

Test	D <sub>1</sub>	D <sub>2</sub>	S <sub>1</sub>	Comments
1	On	Off	Off	Wrong connection? Invert C and B.
2	Off	On	Off	Wrong connection? Invert C and B.
3	Off	Off	Off	Device under test shorted (bad).
4	On	On	Off	Device under test is OK if test 5 or 6 is OK.
5	On	Off	On	Device under test is npn.
6	Off	On	On	Device under test is npn.

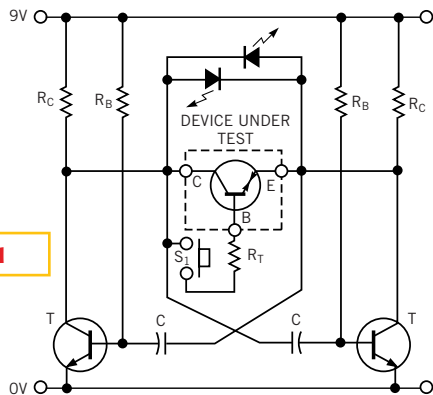
direction, then only one LED turns off. If the device conducts in both directions, then both LEDs turn off. You can leave the base of the device unconnected to check for excessive leakage current or short circuits between base and collector or base and emitter. Using the switch, S<sub>1</sub>, you can connect the base to the collector to inject current into the base of the device under test. **Table 1** sums up the behavior of the tester.

You can also test diodes connected between C and E, FETs, small thyristors, and triacs. You can mount the

entire circuit inside a small housing, such as one measuring 20×30×60 mm. You can effect the external connections to the device under test with wires terminated in alligator clips or by using a connector. It is practical and economical to use a five-pole DIN plug with the pinout

- Position 1 is On, with no base current (S<sub>1</sub> open).
- Position 2 is Off (middle position).
- Position 3 is On, with base current (S<sub>1</sub> closed).

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**Figure 1**

**NOTES:**  
TRANSISTORS (T) ARE BC108, BC547, 2N3904, 2N2222...  
CAPACITORS (C) ARE 100 nF.  
 $R_C=470\Omega$ ,  $R_B=39\text{ k}\Omega$  AND  $R_T=3.9\text{ k}\Omega$ .  
LEDs ARE PREFERABLY RED.

This simple tester allows you to test the polarity and function of a transistor.

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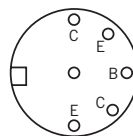
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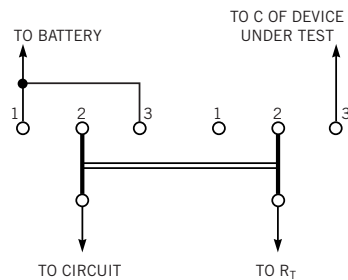
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**Figure 2**



(a)



(b)

A DIN connector (a) allows you to easily connect transistors; a DPDT switch provides various testing options (b).