

Cat. No. 22-330

OWNER'S MANUAL

Please read before using this equipment.

Electronic Components Tester



RadioShack®

OPERATION

DIODE — press to check all types of diodes.

SCR — press to check SCRs and TRIACs.


CONT  — press to check for continuity.

ANODE/NPN and **ANODE/PNP** — light to show the anode of a diode or the junction type of a transistor.

BAD — lights if the tester determines that a component is faulty.

BASE3, BASE2, BASE1 — light, flash, or remain off to show specific information about the junction of a device connected to the test sockets or test clips.

To test a device with three legs, connect it to the **BASE3**, **BASE2**, and **BASE1** test sockets (under **TRANSISTORS** on the front of the tester) or to the test clips. To test a device with two legs, connect it using the – and + component slots (below **ANODE/NPN** and **ANODE/PNP** on the front of the tester), **BASE3** and **BASE1** test sockets, or black and red test clips. Then, depending on the type of device you are testing, press one of the following:

- **CONT**  to test continuity
- **DIODE** to test a diode. The tester shows you which lead is the anode.
- **SCR** to test an SCR or TRIAC. The tester shows the SCR's gate and anode, and identifies a TRIAC.

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- **TRANS** to test a bipolar, JFET, MOSFET, or IGBT transistor. The tester shows the transistor's base and collector, gate and drain (if you are checking an FET), and tests if it is working properly.

TESTING CONTINUITY

To test a device for continuity, connect the device between – and +, **BASE3** and **BASE1**, or the black and red test clips, then press **CONT**. The tester determines the state of the device for continuity, based on the following rules:

- If there is continuity between the connected test points, the tester beeps and **ANODE/NPN** and **ANODE/PNP** light.

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- If there is no continuity between the connected test points, the tester does not beep and no lights turn on.

Notes:

- Because the tester checks for continuity in both directions, it will not respond if you connect a good diode.
- A resistor that is less than about 7.1K ohms ($\pm 20\%$) and most capacitors rated above .1 μ F ($\pm 20\%$) will show continuity.

TESTING DIODES

Caution: Do not connect a diode to any of the **BASE** test sockets. This might damage the tester.

You can use the tester to find a diode's anode and to test if the diode is working properly.

To test a diode, connect it between – and + or the black and red test clips, then press **DIODE**.

If the diode is good, **ANODE/NPN** or **ANODE/PNP** lights above the diode's anode lead and the tester checks if the diode is conducting only in one direction.

- If you connected an open diode to the tester or pressed **DIODE** without connecting a diode, **BAD** lights.
- If you connected a shorted diode to the tester, **BAD**, **ANODE/PNP**, and **ANODE/NPN** light.

Note: Your tester cannot accurately test some high-voltage diodes or two LEDs that are connected in series.

TESTING TRANSISTORS

To test a transistor, connect it to **BASE3**, **BASE2**, and **BASE1** or the black, yellow, and red test clips, then press **TRANS**.

The tester determines the type of transistor you connected based on the following rules:

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- If the transistor is good, the **BASE** indicator above the transistor's base leg lights, the one above the collector flashes, and the one above the emitter remains off. Also, **ANODE/NPN** or **ANODE/PNP** lights to show if the transistor is an NPN or PNP.

If you connected a good JFET, the **BASE** indicator above the JFET's drain and source legs flashes and the one above the gate leg lights. Also, **ANODE/NPN** flashes if the JFET is an N-channel device or **ANODE/PNP** flashes if the JFET is a P-channel device.

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- If the transistor has a shorted PN junction, **BAD** lights and **BASE1** and **BASE3**, **BASE1** and **BASE2**, or **BASE2** and **BASE3** light, showing the shorted junction.
 - If there is no transistor connected to the tester, **BASE3**, **BASE2**, and **BAD** light and **ANODE/NPN** and **ANODE/PNP** flash.

Notes:

- If the transistor has no valid PN junction, the tester tries to find out if the transistor is an IGBT (see "IGBTs" on Page 22).
- If there is a common PN junction to two other leads, the tester tries to find out if the transistor is a bipolar or JFET device.

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- If the transistor has only one PN junction or a shorted PN junction, or if it is an SCR or shorted-junction TRIAC, the tester tries to find out if the transistor is a MOSFET (see “MOSFETs” on Page 21).
 - A MOSFET with a protection diode might register as a JFET.
 - The tester will not detect a JFET that is actually shorted.
 - If the internal base-to-emitter resistance in a power transistor is less than about 7.1 kilohms, the tester might not find the base and will instead show that the transistor is bad and shorted.

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- If the tester cannot identify a JFET's drain and source leads, the **BASE** indicators under those leads flash.
 - The tester might not accurately check some types of very high-gain Darlington or JFET transistors.

TESTING SCRS

To test an SCR, connect it to **BASE3**, **BASE2**, and **BASE1** or the black, yellow, and red test clips, then press **SCR**. The tester tests the SCR based on the following rules:

- The **BASE** indicator over the SCR's gate lights and the **BASE** indicator over the SCR's anode flashes.

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- If the SCR has a shorted PN junction, **BAD** lights. Since the tester cannot always accurately show the shorted junction, any of the tester's indicators might light, flash, or turn off.
 - If the SCR has an open junction or there is no SCR connected to the tester, **BAD** and **BASE2** light and **BASE3** flashes.

Notes:

- The tester cannot test an SCR for a latch-up condition.
- The tester might indicate that some types of high-current or power SCRs are TRIACs, or that some bad TRIACs are good SCRs.

COMPONENT NOTES

MOSFETs

To test a MOSFET, connect it to the tester the same way you connect a transistor. The **BASE** indicator above the MOSFET's drain leg flashes and the one above the gate leg lights. Also, **ANODE/NPN** flashes if the MOSFET is an N-channel device or **ANODE/PNP** flashes if the MOSFET is a P-channel device.

If the MOSFET is bad, **BAD** lights.

Notes:

- Since some MOSFETs can conduct in both directions at very low currents and voltages, the tester might show that some types of MOSFETs are bad and shorted.
- If a MOSFET has a protection diode with a forward voltage that exceeds the tester's test voltages, the tester might show that the MOSFET is bad.

IGBTs

The tester cannot distinguish MOSFETs from IGBTs with built-in protection diodes.

The tester might incorrectly identify the collector and emitter of an IGBT. If the tester is successful in identifying the correct pin configuration, it will show the pinout. If no pinout is detected, the IGBT registers as bad.

TRIACs

The tester might indicate that some types of high-current or power SCRs are TRIACs, or that some bad TRIACs are good SCRs.

CARE

To enjoy your tester for a long time:

- Keep the tester dry. If it gets wet, wipe it dry immediately.
- Use and store the tester only in normal temperature environments.
- Handle the tester carefully. Don't drop it.
- Keep the tester away from dust and dirt.
- Wipe the tester with a damp cloth occasionally to keep it looking new.

Modifying or tampering with the tester's internal components can cause a malfunction and invalidate its warranty. If your tester is not performing as it should, take it to your local RadioShack store for assistance.

SPECIFICATIONS

Test Voltage	4.50 Volts
PN Conducting Limit	2.25 Volts
PN Not Conducting Limit	2.26 Volts
PN Current (shorted)	450 μ Amps
PN Current (open)	0 μ Amps
Shorted Voltage (any pin)	0.64 Volts
Beta Voltage	4.50 Volts
Beta Current	45 μ Amps
Transistor On Limit	2.25 Volts
Transistor Off Limit	2.26 Volts
Buzzer Frequency	2.04 kHz
Buzzer Volume	64 dB (min.)
PN Test Time	10 mSec (max)

Display Time	1 Second
Dimensions (HWD)	$2\frac{7}{16} \times 2\frac{3}{16} \times 1\frac{1}{4}$ Inches (62.5 × 56 × 31.5 mm)
Weight	2.25 oz. (64 g)

Note: All voltages and currents are $\pm 20\%$

Specifications are typical; individual units might vary.
Specifications are subject to change and improvement
without notice.

Limited Ninety-Day Warranty

This product is warranted by RadioShack against manufacturing defects in material and workmanship under normal use for ninety (90) days from the date of purchase from RadioShack company-owned stores and authorized RadioShack franchisees and dealers. EXCEPT AS PROVIDED HEREIN, RadioShack MAKES NO EXPRESS WARRANTIES AND ANY IMPLIED WARRANTIES, INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO THE DURATION OF THE WRITTEN LIMITED WARRANTIES CONTAINED HEREIN. EXCEPT AS PROVIDED HEREIN, RadioShack SHALL HAVE NO LIABILITY OR RESPONSIBILITY TO CUSTOMER OR ANY OTHER PERSON OR ENTITY WITH RESPECT TO ANY LIABILITY, LOSS OR DAMAGE CAUSED DIRECTLY OR INDIRECTLY BY USE OR PERFORMANCE OF THE PRODUCT OR ARISING OUT OF ANY BREACH OF THIS WARRANTY, INCLUDING, BUT NOT LIMITED TO, ANY DAMAGES RESULTING FROM INCONVENIENCE, LOSS OF TIME, DATA, PROPERTY, REVENUE, OR PROFIT OR ANY INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, EVEN IF RadioShack HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Some states do not allow the limitations on how long an implied warranty lasts or the exclusion of incidental or consequential damages, so the above limitations or exclusions may not apply to you. *(Continued)*

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In the event of a product defect during the warranty period, take the product and the RadioShack sales receipt as proof of purchase date to any RadioShack store. RadioShack will, at its option, unless otherwise provided by law: (a) correct the defect by product repair without charge for parts and labor; (b) replace the product with one of the same or similar design; or (c) refund the purchase price. All replaced parts and products, and products on which a refund is made, become the property of RadioShack. New or reconditioned parts and products may be used in the performance of warranty service. Repaired or replaced parts and products are warranted for the remainder of the original warranty period. You will be charged for repair or replacement of the product made after the expiration of the warranty period.

This warranty does not cover: (a) damage or failure caused by or attributable to acts of God, abuse, accident, misuse, improper or abnormal usage, failure to follow instructions, improper installation or maintenance, alteration, lightning or other incidence of excess voltage or current; (b) any repairs other than those provided by a RadioShack Authorized Service Facility; (c) consumables such as fuses or batteries; (d) cosmetic damage; (e) transportation, shipping or insurance costs; or (f) costs of product removal, installation, set-up service adjustment or reinstallation. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

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