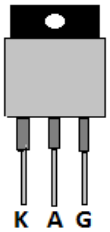
How to check a SCR with digital multimeter?

SCR – Silicon Controlled Rectifier.

The name THYRISTOR is derived by a combination of the capital letters from **THYR**atron and trans**ISTOR**. The thyristor is a solid-state device like a transistor and has characteristics similar to that of a thyratron tube version. Types of thyristor family like,



A. TRIAC-Bidirectional triode
B. DIAC- Bidirectional diode
C. SUS – Silicon unilateral switch.
D. SCS – Silicon controlled switch.
F. LASCR – Light activated SCR.
G. LASCS – Light activated SCS.
H. PUT – Programmable unijunction transistor.
I. GTO – Gate tuned-off thyristor.

(SCR) Silicon controlled rectifier.

A SCR is a 4-layer, 3 junction, p-n-p-n semiconductor switching device. It has 3 terminals namely:

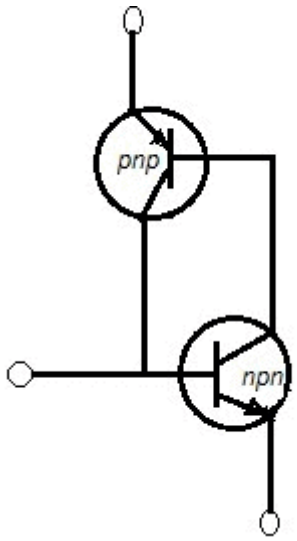
1. ANODE (A)
2. CATHODE (C)
3. GATE(G)

THEORY:

Through forward biased (Anode: +ve, Cathode: -ve), it will not conduct, until V at k exceeds a value called forward break over voltage V brf, when the SCR is turned ON. The value of V brf can be controlled by the level of gate current.
An SCR acts like a switch.

Below forward break over voltage V brf it is OFF.
When V brf it is ON as long as the gate current is above the “holding current”
Once the SCR is ON, gate loses control that is reduction of gate current does not turn OFF the SCR.

SCR-TYN612-Data sheet



SCR DOES NOT CONDUCT DURING THE REVERSE CONDITION – HENCE THE NAME RECTIFIER.

FIRST TIME USING DIGITAL MULTIMETER

DMM means Digital multimeter-TESTING WITH DMM – (Diode Mode)

- Never exceed the protection limit values indicated in specifications for each range of measurement.
- When the value scale to be measured is unknown beforehand set the range selector at the highest position.
- When the meter is linked to measurement circuit, do not touch unused terminals.
- Before rotating the range selector to change functions, disconnect the test-leads from the circuit under test.
- Never perform resistance measurements on live circuit.
- Always be careful when working with voltage above 60v dc of 30v ac rms.
- Keep the fingers behind the probe barriers while measuring.
- Before attempting to insert transistors for testing, always be sure that test leads have been disconnected from any measurement circuit.
- Components should not be connected to the hfe socket when making voltage measurements with test leads.

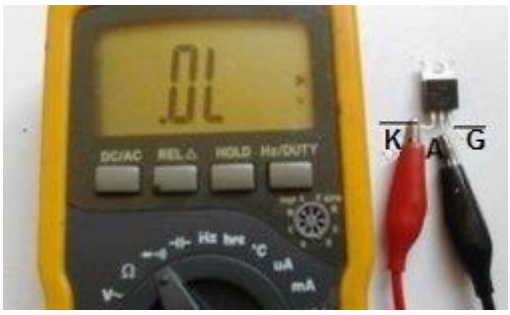
IMPORTANT:

- If the resistance being measured exceeds the maximum value of the range selected or the input is not connected, an over range indication "!" will be displayed.
- When checking in-circuit resistance, be sure the circuit under test has all power removed and that all capacitors have been discharged fully.
- For measuring resistance above 1M ohms the meter may take a few seconds to get stable reading., this is normal for high resistance measurements.

HOW TO TEST SCR WITH DMM? – SELECT DIODE MODE IN DIGITAL MULTIMETER.

STEP-1.

- Connect **Positive test-lead** to cathode
- **Negative test-lead** to Anode= DMM READING Shows OL or 1 or open.



STEP-2.

- Connect **Negative test-lead** to cathode
- **Positive test-lead** to Anode= DMM READING SHOWS OL or 1 or open
- **Positive test-lead** to Gate = .235V DDM READING = 235 mV. (This Gate voltage is very important) otherwise the short of open.

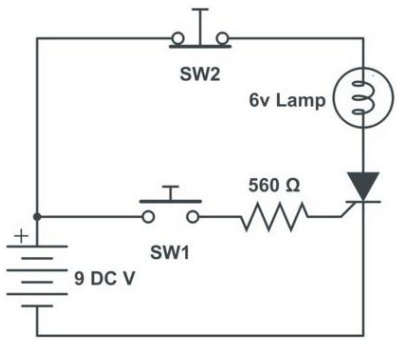
STEP-3.

- Connect **Positive test-lead** to cathode
- **Negative test-lead** to Anode = DMM READING SHOWS OL or 1 or open

STEP-4.

- Connect **Negative test lead t**o cathode
- **Positive test-lead** to Anode= DMM READING SHOWS OL or '1' or open (MEANS OPEN) the condition is **GOOD.**

Verification: If you get reading in forward bias as 0000 or OL or 1 or open and in reverse bias as 0000 (or) low values the device can be FAULTY and needs replacement.
SCR Testing with power supply.



SCR Test Circuit.