AVO TT169 Transistor Tester

TESTING

Small Signal Transistors

(a) Connect the flexible ended probe to the Tester by inserting the white plug into the white socket mounted on the end of the instrument .and marked NML on the front panel.
(b) Insert the green fixed prod into the single green socket at the opposite end of the Tester.
(c) Set the Normal/Power switch to Normal.
(d) Set the PNP/NPN switch to the required position and make connections to the transistor under test as follows:

Red flexible prod to the collector
White flexible prod to the emitter
Green fixed prod to the base

(e) With the main calibrated control set to maximum (9) the light emitting diode (L.E.D.) should illuminate (in some circuits it may flash).
(f) By reducing the setting of the control, a position should be obtained where the L.E.D. will flash on and off. This indicates a good transistor. The actual control setting will vary according to the circuit arrangement of the transistor under test. If however, the precise setting is known for a particular circuit, the control setting will serve as an indication that the transistor associated circuitry is reasonably correct.
(g) A faulty transistor is indicated by:

(i) Inability of the control adjustment to affect the L.E.D. Indication
(ii) A position· of the control cannot be obtained which will cause the L.E.D. to flash on and off.
(iii) The L.E.D:remains continuously on or off.

Power Transistors

(a) Connect the clip ended lead to the Tester by inserting the black plug into the black socket at the end of the Tester and marked PWR on the front panel. Insert the single green prod into the single green socket at the opposite end of the Tester.
(b) Set the Normal/Power switch to Power.
(c) Set the PNP/NP switch to N.PN. Both pnp and npn power transistors are tested with this switch in the NPN position.
(d) Adjust the main calibrated control for a flashing L.E.D.
(e) Make connections to the transistor under test as follows.

For NPN power transistors:
Clip black lead to the emitter Clip red lead to the collector
For PNP power transistors:
Clip black lead to the collector Clip red lead to the emitter

For both npn and pnp types use the green prod to make connection to the base. If however the base of the transistor under test is shunted by a low resistance path (e.g. line output stage) it will be necessary to remove, this shunt path before connecting the Tester.
(f) For NPN power transistors:
The tungsten lamp should flash on and off in unison with the L.E.D. to indicate a good transistor.
For PNP power transistors:
The tungsten lamp will flash alternately with the L.E.D. for a good transistor.
(g) Faulty transistors are indicated either by a failure of the tungsten lamp to illuminate or remaining continuously alight.

Diodes

(a) Connect the flexible ended probe to the Tester by inserting· the white plug into the white socket marked NML. (The green prod is not used for diode testing).
(b) Set the PNP/NPN switch to the NPN position. In this position the red flexible lead is positive. The Normal/Power switch should be at the Normal position.
(c) Make .connection to the diode as follows:
Red flexible lead to anode and white flexible lead to cathode. The L.E.D. should illuminate indicating forward conduction of a good diode.
(d) Set the PNP/NPN switch to the PNP position. The L.E.D. should not light. Should it do so 'the diode is faulty.
(e) Holding over the Diode Sens. switch to that position increases the sensitivity of indication and is in effect, a Reverse Leakage Current Test.

Thyristors

(a) Connect the clip ended lead to the Tester by inserting the black plug into the black socket at the end of the Tester and marked PWR on the front panel. Insert the green prod into the single green socket at the opposite end of the instrument.
(b) Set Normal/Power switch to Power and the PNP/NPN switch to NPN.
(c) Adjust main calibrated control for a flashing L.E.D.
(d) Connect the clip ended lead to the Thyristor as follows:

Black lead to cathode.
Red lead to anode

The tungsten lamp should not light.
(e) By touching the gate with the green prod the tungsten lamp should illuminate and should remain alight after disconnecting the green prod from the gate. This indicates a good Thyristor. If the tungsten lamp extinguishes when the green prod is disconnected the Thyristor is faulty.
(f) A gate drive current of the order of up to 15mA is available with the batteries in reasonably good condition.

GENERAL

The Tester Type TT 169 is designed specifically as a GO/NO GO Tester for the in situ testing of most pnp or npn signal or power transistors, diodes and thyristors, where the d.c. resistance in circuit, shunting the points of measurement, is not too low. It is a battery operated, lightweight instrument, which can be held and operated in the hand.

Front panel indicators illuminate to identify satisfactory or faulty devices. One, a light emitting diode, is used during the testing of all devices, the other, a tungsten lamp, is only in u'se during the testing of power transistors. These lamps will flash appropriately for a good device or fail to do so for a faulty component. A Diode Sensitivity switch provides additional sensitivity' for use during diode testing only. The low voltage internal power supply ensures that all types of device can be tested without risk of damage. A simple self check procedure indicates serviceability of the Tester for use and battery replacement is easily carried out .

Probes and leads are supplied for connection to the device under test, a moulded probe with flexible leads for use with transistors and diodes, a clip ended lead for power transistor and thyristor testing and a rigid prod also for use during transistor and thyristor testing.

For all tests, inserting the appropriate test lead (Flexible ended probe or Clip ended lead) automatically switches on the instrument.

As the Tester is designed for 'in-circuit' use, higher than normal internal leakages in semiconductor devices may not prevent indication of transistor action. In a minority of cases

the leakage could be sufficient to cause the semiconductor to be unserviceable (e.g. in some RF oscillator stages).

SELF CHECK PROCEDURE

A simple self check procedure indicates correct functioning of the instrument. Plug the clip ended lead into the black socket marked PWR. Set the Normal/Power switch to Power and the PNP!, NPN switch to NPN. Rotate the main calibrated control until the L.E.D. flashes. A failure to flash would indicate that the Tester is not functioning correctly.

POWER REQUIREMENTS

The Tester is designed to operate from three 1·5V cells housed internally (HP7 or equivalent). An external source of 4.5V d.c. can be applied if required.

When maximum current is being drawn from the battery, i.e. when testing power transistors and thyristors, battery life will be approximately 1.5 hours continuous operation. However, it will be appreciated that the Tester will not normally be used under this continuous condition.

Ensure that the Test leads in use are removed from the instrument after testing to conserve the batteries.

BATTERY REPLACEMENT

If the L.E.D. will not illuminate or, if when testing Power transistors with the main control at . 9 a bright light is not obtainable from the . tungsten lamp, the batteries probably require replacement. This is a simple operation.

Remove the end cover of the instrument with the single green socket and single knurled coin slotted screw. With the end cover removed, the batteries will immediately be visible, and will slip out easily.

This end cover carries the connection for the positive pole of the battery. When the battery is replaced ensure that the negative end is inserted first and the end of the battery with t,he centre connection is connected to the positive polarity as marked on the instrument.