

MEASUREMENT OF RESISTIVITY OF SEMICONDUCTOR BY FOUR PROBE METHOD AT DIFFERENT TEMPERATURES AND DETERMINATION OF THE BAND GAP
OMEGA TYPE ES-246

OMEGA TYPE ES-246 Experimental Set Up has been designed specifically for measuring the resistivity of semiconductors at different temperatures and determination of the Band Gap by Four Probe Method. The set up is absolutely self contained and requires no other apparatus.

Practical experience on this set up carries great educative value for Science and Engineering Students.

OBJECT

- 01 To measure resistivity of semiconductor at different temperatures by Four Probe Method.
- 02 To plot a graph of resistivity as a function of inverse temperature for a semiconductor.
- 03 To determine Band Gap of the semiconductor.

FEATURES

The Experimental Set-up consists of the following :

- 01 Probes Arrangement :
It has four individually spring loaded probes. The probes are collinear and equally spaced. Whole arrangement is mounted on a suitable stand.
- 02 Sample :
Germanium Crystal in the form of a chip.
- 03 Oven :
For variation of temperature from room temperature to about 150°C (max.)
- 04 Thermometer (0-360°C) :
For measuring temperature.
- 05 Four probe Set-up :
Consisting of the following in cabinet.
- 06 Constant current Generator :
To provide a constant current to outer probes. Variation in current is achieved by a potentiometer provided.

SPECIFICATIONS

- 01 Open Circuit Voltage : 18V
- 02 Current range : 0-20mA
- 03 Resolution : 10mA
- 04 Accuracy : $\pm 0.25\%$ of the reading ± 1 digit
- 05 Load regulation : 0.03% for 0 to full load
- 06 Line Regulation : 0.05% for 10% changes



- 07 Oven power supply :
Suitable voltage for the oven is obtained through a step down transformer with a provision for & high rates of heating. A glowing LED indicates, when the oven power supply is "ON"
- 08 Digital panel meter (for measuring voltages & current).

SPECIFICATIONS

- 01 Voltage range : 0-200mV & 0-2V
- 02 Current range : 0-20mA
- 03 Resolution : 100mV at 200mV range.
- 04 Display :
3½ digit, 7 segment LED (12.5mm height) with auto polarity and decimal indications.
- 05 Over Load Indication :
Sign of 1 on left and blanking of other digits.
- 06 Mains ON/OFF switch, Fuse and Jewel light.
- 07 Weight : 6.8 Kg. (Approx.)
- 08 Dimension : W 340 x H 160 x D 230
- 09 Strongly supported by detailed Operating Instructions, giving details of Object, Theory, Design procedures, Report Suggestions and Book References.

We are committed to the continuous development of our products, and therefore reserve the right to amend specifications without prior notice.

OMEGA ELECTRONICS