

Measurement of: Resistivity and sheet resistance by Four Point Probe

Equipment: Four Point Probe (QuadProM-302-8): Resistivity and sheet resistance measurement set up, M/s Signatone, LucasLABs, USA

Property Measured:

Quad Pro Resistivity System measures sheet resistance, resistivity and V/I as well as doping type for up to 10-200 mm diameter, flat semiconductor wafer and films- a very useful tool for electrical/electronic characterization of virgin and doped Si, Ge, GaAs etc. semiconductor samples.

Photograph (small size)



Signatone LucasLABs, USA; QuadPro-302

Basic Principle: A four point probe is a simple apparatus for measuring the resistivity of semiconductor samples. Resistivity is an important semiconductor parameter because it can be related directly to the impurity content of the sample. By passing a current through two outer probes and measuring the voltage through the inner probes allows the measurement of the substrate resistivity. The doping concentration can be calculated from the resistivity. The sheet resistivity of the doped semiconductor (top emitter layer) is a very important parameter not only for solar cell but for any p-n junction based semiconductor devices. Experimentally, It can be measured very easily using a "four point probe". A current is passed through the outer probes and induces a voltage in the inner voltage probes. The junction between the n and p -type materials behaves as an insulating layer.

Capabilities:

QuadPro Resistivity System measures sheet resistance, resistivity and V/I as well as doping type testing for up to 10-200 mm diameter, flat semiconductor wafer and films- a very useful tool for electrical/electronic characterization of virgin and doped Si, Ge, GaAs etc. samples

Sample Requirement:

1. Expected range of sheet resistance and resistivity should be provided
2. Sample thickness
3. Sample size: 10-200 mm diameter/square