

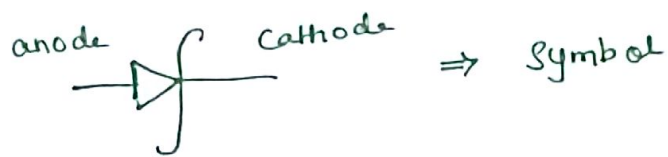
Schottky diode

- german physicist Walter H. Schottky.

* Hot carrier diode - forms junction of semiconductor with a metal

⇒ low forward voltage drop

→ fast switching actions.



used in early days as Cat Whistler detector and metal rectifier -

When sufficient forward voltage is applied current flows in forward direction.

* Schottky voltage 150-450mV, due to this lower forward voltage, high switching speeds and better system efficiency is achieved.

- Metal side acts as anode

n-type semiconductor acts as the cathode of the diode.

* Metal + semiconductor ⇒ determines

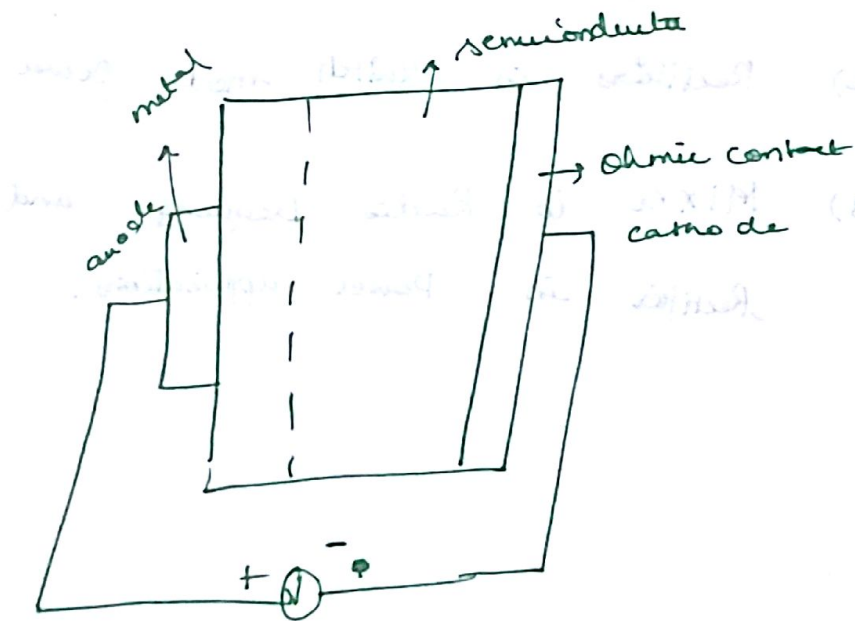
forward voltage of the diode.

- Both p and n-type can develop Schottky barriers. but p - lower forward voltage,

because Reverse leakage current ↑ with lowering

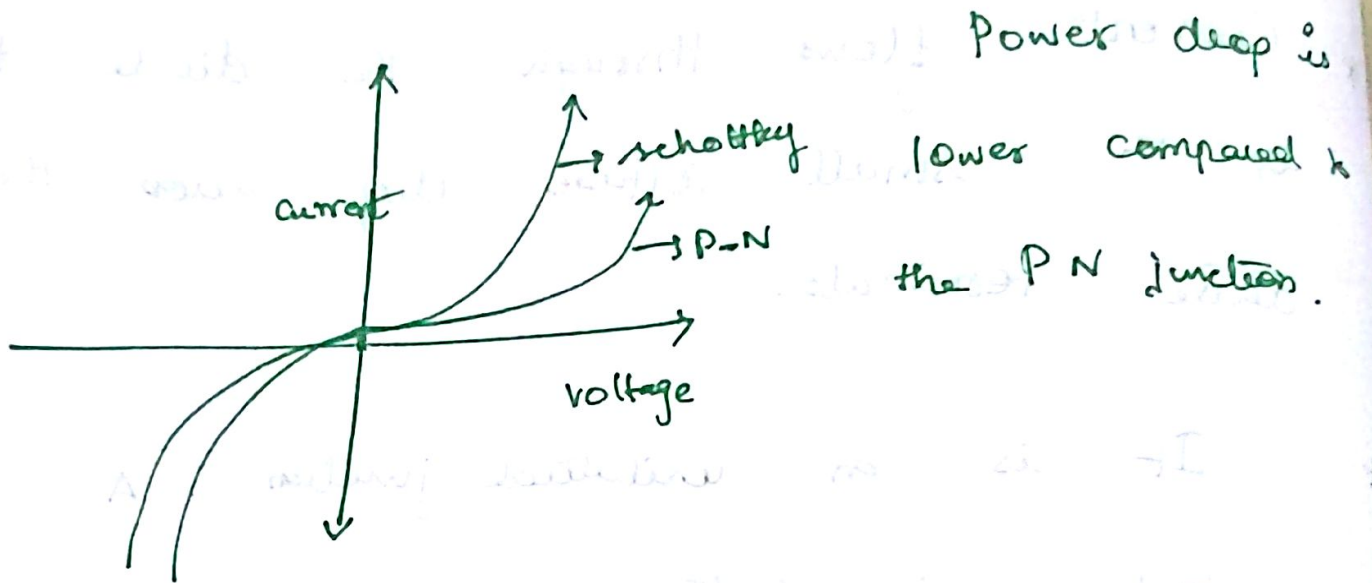
* Current flows through the diode there is a small voltage drop across the diode terminals.

* It is an unilateral junction. A metal semiconductor junction is formed at one end another metal semiconductor is formed at the other end.



It is an ideal ohmic bidirectional contact with no potential existing between the metal & semiconductor & it is non rectifying.

It is a function of temperature dropping, $I \uparrow$ and $I \downarrow$ the temperature doping concentration in N-type semiconductor.



Applications

- 1) Voltage Clamping
- 2) Rectifiers in Switch mode power supply.
- 3) Mixer in Radio frequency and Rectifier in Power applications.