DIODE

What a diode actually is ?

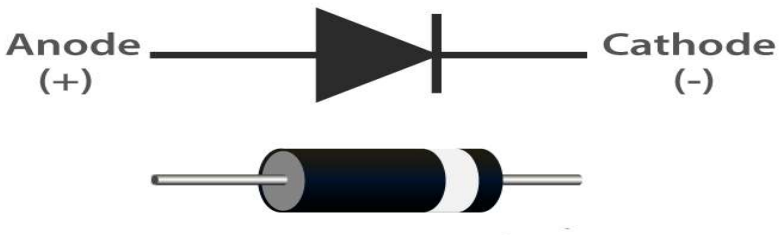
Construction

How does it work

Uses

WHAT A DIODE ACTUALLY IS ?

- Diode is a semiconductor device which is formed by merging P and N type semiconductor . It has two terminals ,P side is the positive on and N side is the negative one of the p-n Junction. It allows current to flow in only one direction and restricts and acts as a resistance in other direction .



CONSTRUCTION

- P type semiconductor is formed when a trivalent impurity is doped on extrinsic semiconductor , and when pentavalent impurities are added to extrinsic semiconductor the n type is formed. When we merge P and N type semiconductor then PN junction is formed . P side of the junction works as Anode and N type works as a cathode.

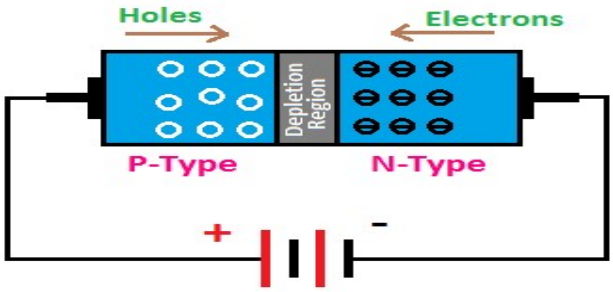
WORKING

Diode have two regions ,P type and N type . In P type holes are the majority charge carriers and electrons are in minority but in N type , electrons are in majority and holes are minority charge carriers. A depletions region s formed when we combine P and N type semiconductors.

When positive terminal of battery is connected with P type and negative is connected with N type then diode is in forward bias. When positive terminal of battery is connected with N type and -ve is connected with p type then diode is in reverse bias.

In Forward bias :

Positive charge repels the holes present In P type and negative charge repels the electrons of n type .Due to this ,depletion layer electrons crosses the depletions layer and moves towards the electric field and there is a current flows to the opposite of flow of electrons.

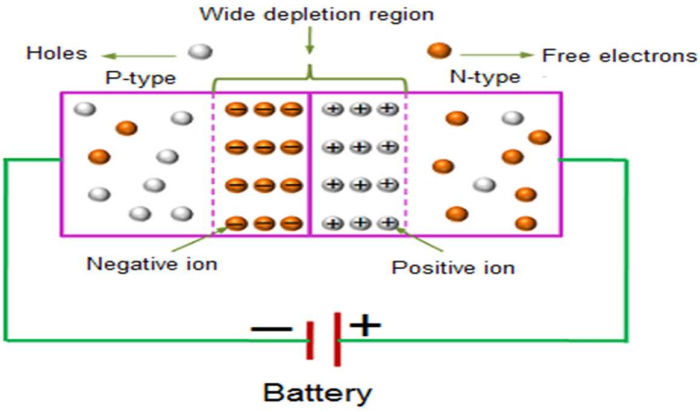


PN Junction Diode Forward Biasing

Reverse bias :

If we talk about reverse bias ,when the potential is higher than barrier potential , positive terminal attracts the electrons present in n side and negative charge attracts the holes which are present in P side ,and due to this width of depletion Layer increases . There is no current through reverse biased diode.

But when current in reverse bias is increased very much, reverse current increases suddenly . This is called Breakdown of diode.



Reverse bias

USES

i) Uses as solar cell
ii) It can be used as LED when diode is in forward bias.
iii) Used as rectifier in many circuits .
iv) Used as photodiode.