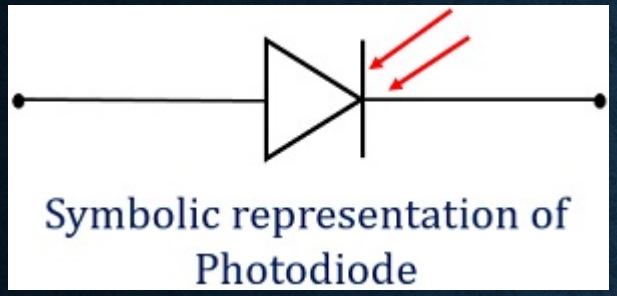
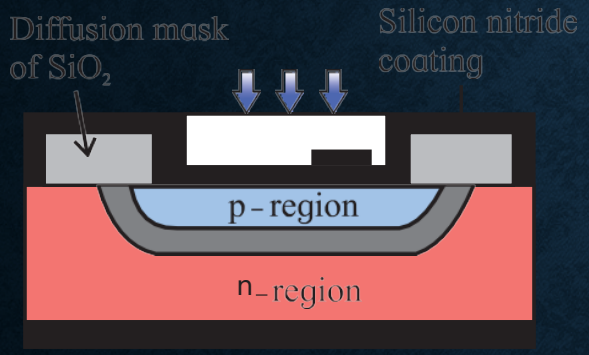
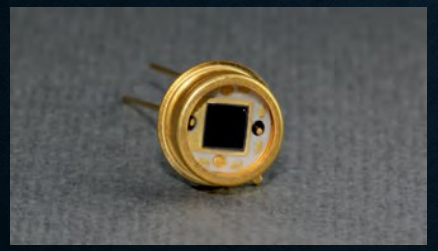
SEMICONDUCTOR

Chap-16

PHOTO DIODE

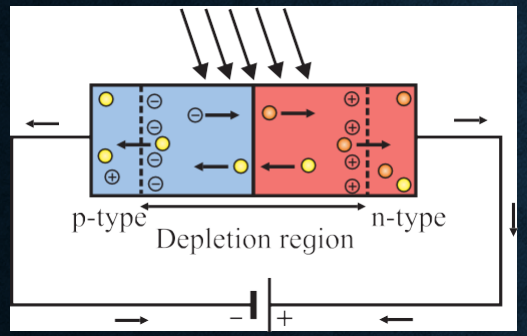






- A photodiode is a special type of a p-n junction diode which converts light energy into electrical energy
- It generates current when exposed to light.
- It operates in reverse biased mode
- *Only minority current flows through a photodiode*
- Figure shows schematic of the structure of a photodiode
- The p-n junction of a photodiode is placed inside a glass material so that only the junction of a photodiode is exposed to light
- Other part of the diode is generally painted with an opaque colour or covered.
- When a p-n junction diode is reverse biased, a reverse saturation current flows through the junction
- This current is due to the minority carriers on its either side
- *The reverse current depends only on the concentration of the minority carriers and not on the applied voltage*
- This current is called the dark currant in a photodiode because it flows even when the photodiode is not illuminated

WORKING OF PHOTO DIODE



- When a p-n junction is illuminated, electron-hole pairs are generated in the depletion region
- The energy of the incident photons should be larger than the band gap of the semiconductor material used to fabricate the photodiode
- The electrons and the holes are separated due to the intrinsic electric field present in the depletion region