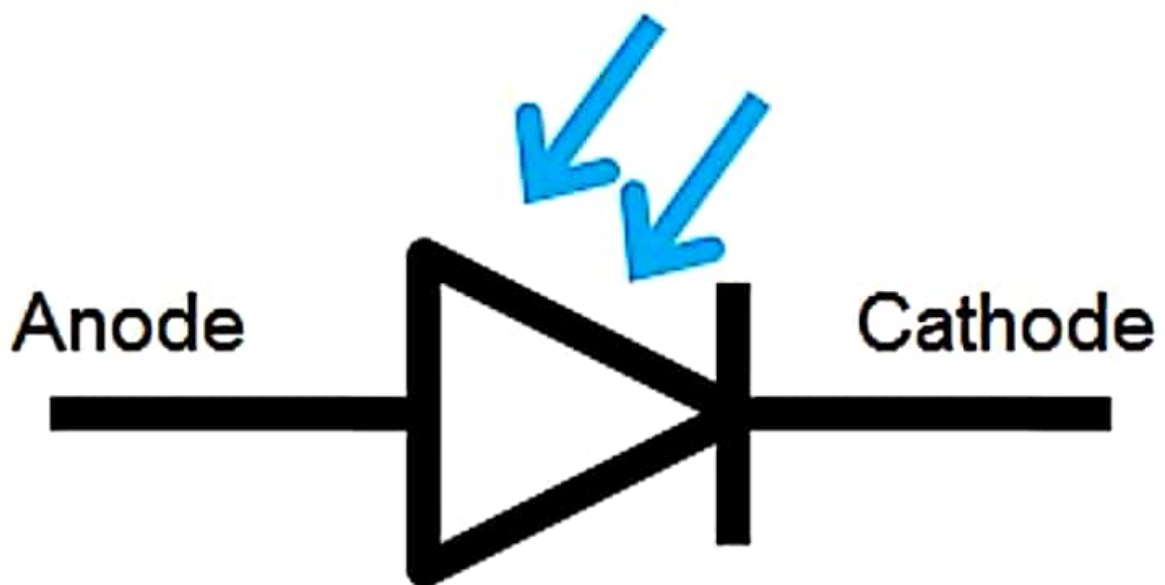


What is a Photodiode?

It is a form of light-weight sensor that converts light energy into electrical voltage or current.

Photodiode is a type of semi conducting device with PN junction. Between the p (positive) and n (negative) layers, an intrinsic layer is present. The photo diode accepts light energy as input to generate electric current.

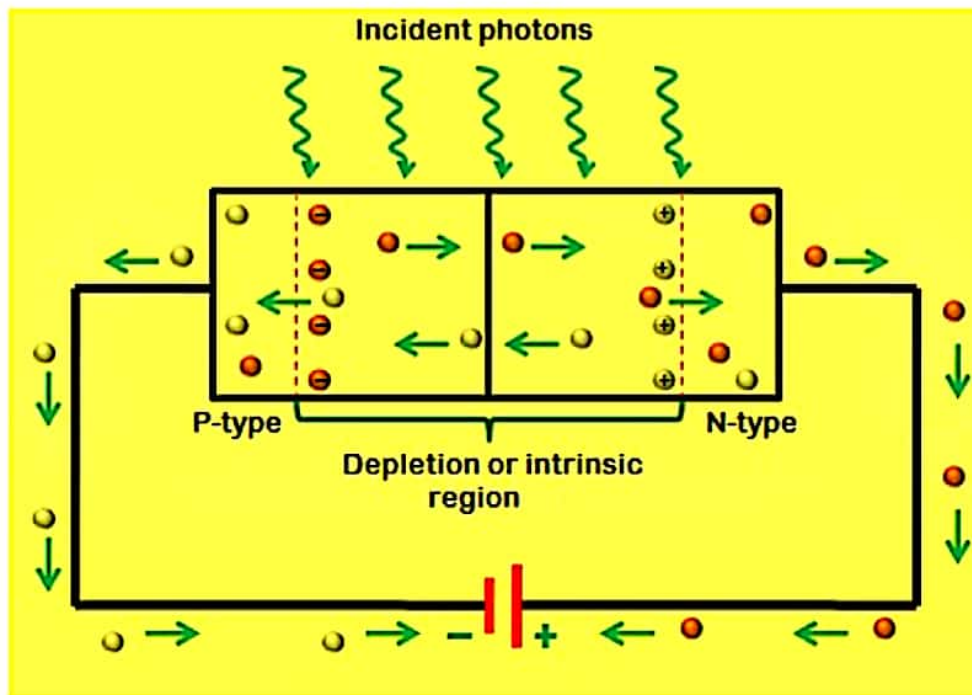
The symbol of the photodiode is similar to that of an LED but the arrows point inwards as opposed to outwards in the LED. The following image shows the symbol of a photodiode.



Photodiode symbol

Working of a Photodiode

Generally, when a light is made to illuminate the PN junction, covalent bonds are ionized. This generates hole and electron pairs. Photocurrents are produced due to generation of electron-hole pairs. Electron hole pairs are formed when photons of energy more than 1.1 eV hits the diode. When the photon enters the depletion region of diode, it hits the atom with high energy. This results in release of electron from atom structure. After the electron release, free electrons and hole are produced.



In general, an electron will have negative charge and holes will have a positive charge. The depletion energy will have built in electric field. Due to that electric field, electron hole pairs move away from the junction. Hence, holes move to anode and electrons move to cathode to produce photo current. The photon absorption intensity and

photon energy are directly proportional to each other. When energy of photos is less, the absorption will be more. This entire process is known as Inner Photoelectric Effect.

Intrinsic Excitations and Extrinsic Excitations are the two methods via which the photon excitation happens. The process of intrinsic excitation happens, when an electron in the valence band is excited by photon to conduction band.