LED

LED (Light Emitting Diode) is basically a small light emitting device that comes under “active” semiconductor electronic components.
It’s quite comparable to the normal general purpose diode, with the only big difference being its capability to emit light in different colors.
The two terminals (anode and cathode) of a LED when connected to a voltage source in the correct polarity, may produce lights of different colors, as per the semiconductor substance used inside it.

Working Principle:
A light-emitting diode is a two-lead semiconductor light source. It is a **direct band-gap** p–n junction diode that emits light when activated. When a suitable voltage is applied to the leads, electrons are able to recombine with holes within the device, releasing energy in the form of photons. This effect is called electroluminescence, and the color of the light (corresponding to the energy of the photon) is determined by the energy band gap of the semiconductor.
Different wavelengths involved in the process determine the different colors produced from the LEDs. Hence, light emitted by the device depends on the type of semiconductor material used.

Infrared light is produced by using Gallium Arsenide (GaAs) as a semiconductor.

Red or yellow light is produced by using Gallium-Arsenide-Phosphorus (GaAsP) as a semiconductor.

Red or green light is produced by using Gallium-Phosphorus (GaP) as a semiconductor.

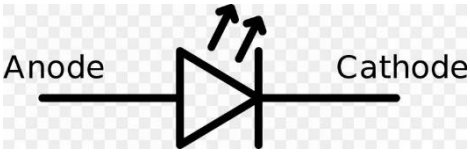
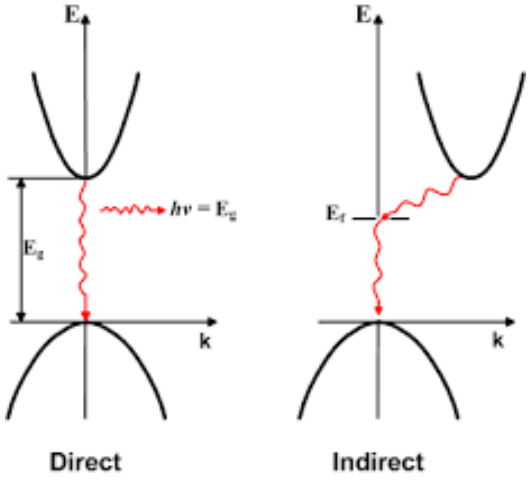


FIG: CIRCUIT SYMBOL



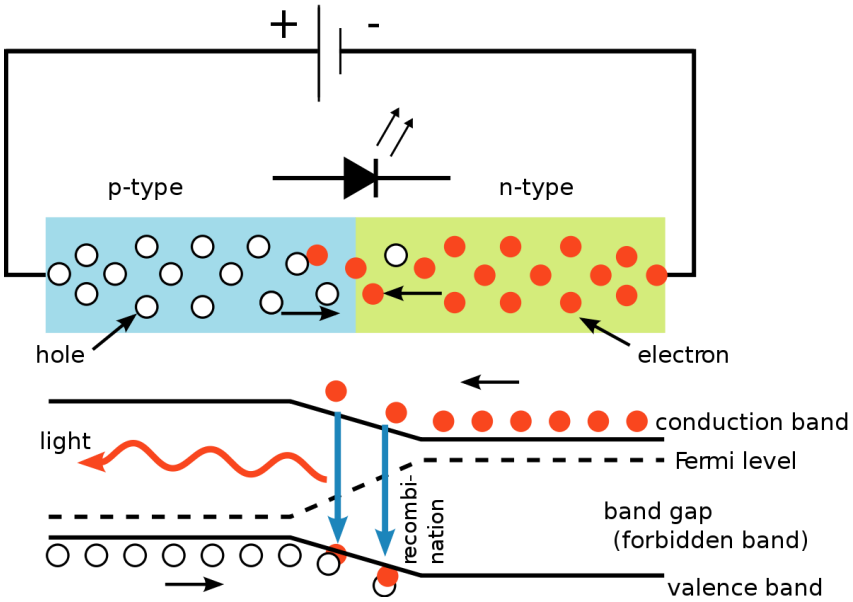


FIG: ENERGY-BANG DIAGRAM OF LED