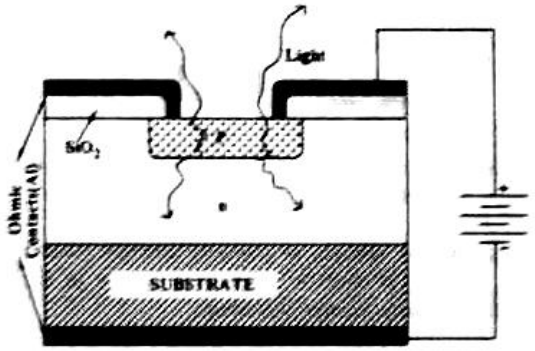
PLANER LED

Since the light is emitted from a plane surface it is called planar LED (or) surface emitting LED.

Principle:

Injection luminescence is the principle used in LED's. when LED is forward biased, the majority charge carriers moves from p to n and similarly from n to p region and becomes excess minority charge carriers. Then these excess minority charge carriers diffuse through the junction and recombines with the majority carriers in n and p region respectively to produce light.

Construction:



In order to increase the probability of radiative recombination, the thickness of the 'n' layer is taken higher than that of the thickness of the 'p' layer. Contacts are made with the help of Al in such a way that top layer of the 'p' material is left uncovered, for the emission of light. Biasing can be applied at the contacts. The whole p-n junction is surrounded by plastic material so that the losses due to reflection can be minimized.

Working:

Due to forward bias, the majority carriers from ‘n’ and ‘p’ regions cross the junction and become minority carriers in the other junction (ie) electrons, which are majority carriers in ‘n’ region cross the junction and go to ‘p’ region.

Similarly holes which are majority carriers in ‘p’ region cross the junction and becomes minority carriers in ‘n’ region,

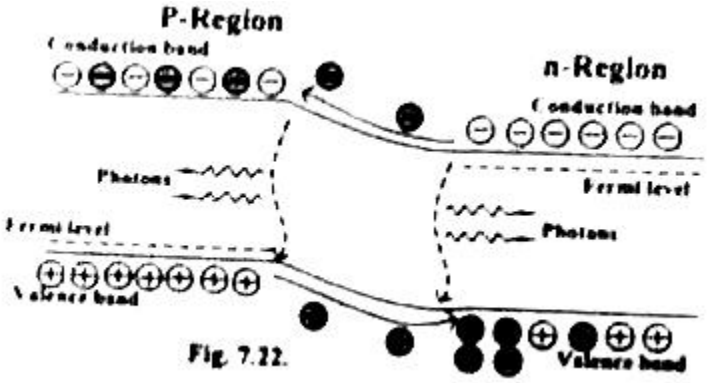


Fig. 7.22.

By similar process, the excess of minority carriers are injected in both ‘p’ and ‘n’ regions. This phenomenon is called minority carriers injection. The electrons which are excess minority carriers in p-region recombines with the holes which are majority carriers in ’p’ region and emit light. Similarly, the holes which are excess minority carriers in ‘n’ region recombine with the electrons which are majority carriers in ‘n’ region and emit light.

Therefore electron-hole pair recombination process occurs more and thereby producing light through the top layer of the p-material which is left uncovered.

Disadvantage:

- Reflection losses will be more.

Source : http://mediatoget.blogspot.in/2011/08/planer-led.html