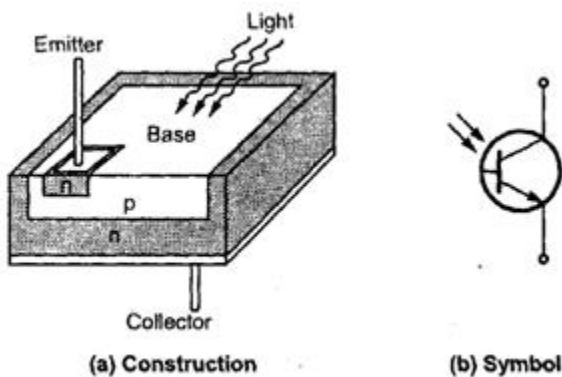


# PHOTO TRANSISTOR

The phototransistor has a light sensitive collector to base junction. A lens is used in a transistor package to expose base to an incident light. When no light is incident, small leakage current flows from collector to emitter called  $I_C$  due to small thermal generation. This is very small current, of the order of nA. This is called a dark current.

When the base is exposed to the light, the base current is produced which is proportional to the light intensity. Such photo induced base current is denoted as  $I_{ph}$ . The resulting collector current is given by,

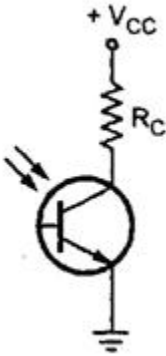
$$I_C \approx h_{fe} I_{ph}$$



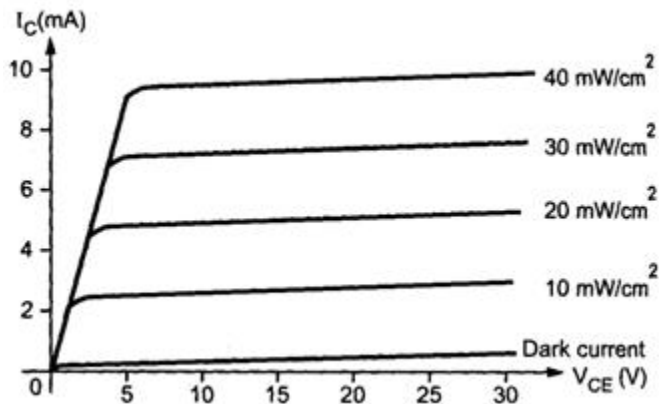
A phototransistor can be either a two lead or a three lead device. In a three lead device, the base lead is brought out so that it can be used as a conventional BJT with or without the light sensitivity feature.

In a two lead device, the base is not electrically available and the device use is totally light dependent. The use of phototransistor as a two lead device is

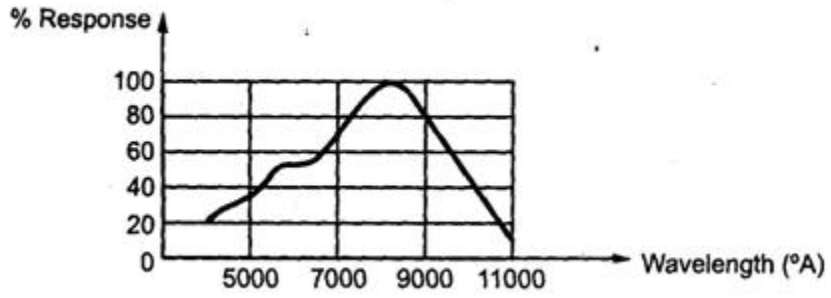
shown in  
Fig.



while the Fig shows the typical collector characteristic curves.



Each curve on the characteristic graph is related to specific light intensity. The collector current level increases corresponding to increase in the light intensity. In most of the applications the phototransistor is used as a two lead device. The phototransistor is not sensitive to all the light but sensitive to light within a certain range. The graph of response against wavelength is called spectral response. A typical spectral response is shown in the Fig.



Source : <http://mediatoget.blogspot.in/2011/09/photo-transistor.html>