

BIPOLAR JUNCTION TRANSISTOR

BJT stands for Bipolar Junction Transistor. It is a three-layered device which is mainly used for amplification or used as an electronic switch. BJT has three regions- Emitter, Base and Collector.

WORKING: In NPN Transistor, current at the base controls the flow of electrons from emitter to the collector. This current allows Bipolar Junction Transistor (BJT) to do its major applications like amplification or used as a switch in digital devices.

APPLICATION: Bipolar Junction Transistor (BJT) has many applications in the electronic world nowadays. Like:

- **Amplification-** Amplification is the mostly used application of BJT in the electronic circuits (i.e. BJT amplifies the weak signal to the stronger one).
- **Switching-** Switching is another commonly used application of BJT in digital logic circuits, by controlling current at base, transistor can be turned on or off, interrupting the flow of current between collector & emitter.

TYPES: There are two main types of BJT:

- 1. NPN-** In this transistor, the majority charge carriers are electrons and minority charge carriers are holes. When a small current is applied at the base then the electrons flow from the emitter to collector.
- 2. PNP-** In this transistor, the majority charge carriers are holes and minority charge carriers are electrons. When a small current is applied at the base then the holes flow from the emitter to the collector.

SYMBOL:

NPN TRANSISTOR -

In the symbol, the arrow points in the outward direction from the transistor, indicating the direction of conventional current (i.e. from collector to emitter).

PNP TRANSISTOR -

In the symbol, the arrow points in the inward direction from the transistor, indicating the direction of conventional current (i.e. from emitter to collector).

CHARACTERISTICS CURVE :

BJT has three characteristics curves-

- **Collector emitter input characteristics-** This curve shows relation between input current (i_B) and input voltage (v_{BE}) which keeping output voltage (v_{CE}) constant.

- **Common collector output characteristics-**

This curve shows relation between output current (i_C) and the output voltage (v_{CE}) while keeping input current (i_B) constant.

- **Transfer characteristics-** This curve shows relation between input current (i_B) & output current (i_C) for different values of collector-emitter voltage (v_{CE}).