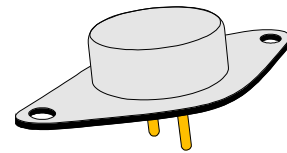
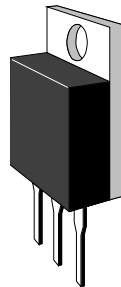
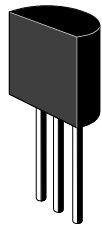


THE TRANSISTOR

Examples of transistors



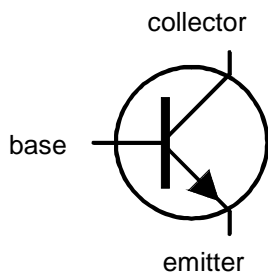
Low power = 20 - 500mA
High gain = 200 - 700
Case type = TO92

Medium power = 1 - 3A
Medium gain = 100 - 200
Case type = TO220

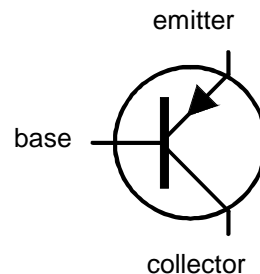
High power = 2 - 30A
Low gain = 20 - 100
Case type = TO3

There are many types of transistors. We shall be looking at **BIPOLAR** transistors.

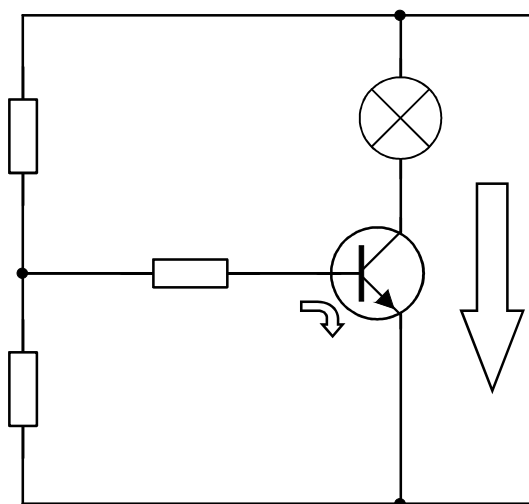
There are two types, NPN and PNP. They come in many different packages, some shown above.



NPN bipolar transistor



PNP bipolar transistor



The transistor is an amplifying device. A small current flow through the **base** to the **emitter** of the transistor (I_{BE}) allows a large current to flow from the **collector** to **emitter** (I_{CE}).

The difference between these currents is known as the transistors **gain** (hfe).

e.g. A transistor with a base current of 1mA and a gain of 100 will allow a current of 100mA to flow from the collector to the emitter.

$$\begin{aligned} I_{CE} &= I_{BE} \times hfe \\ &= 1\text{mA} \times 100 \\ &= 100\text{mA} \end{aligned}$$