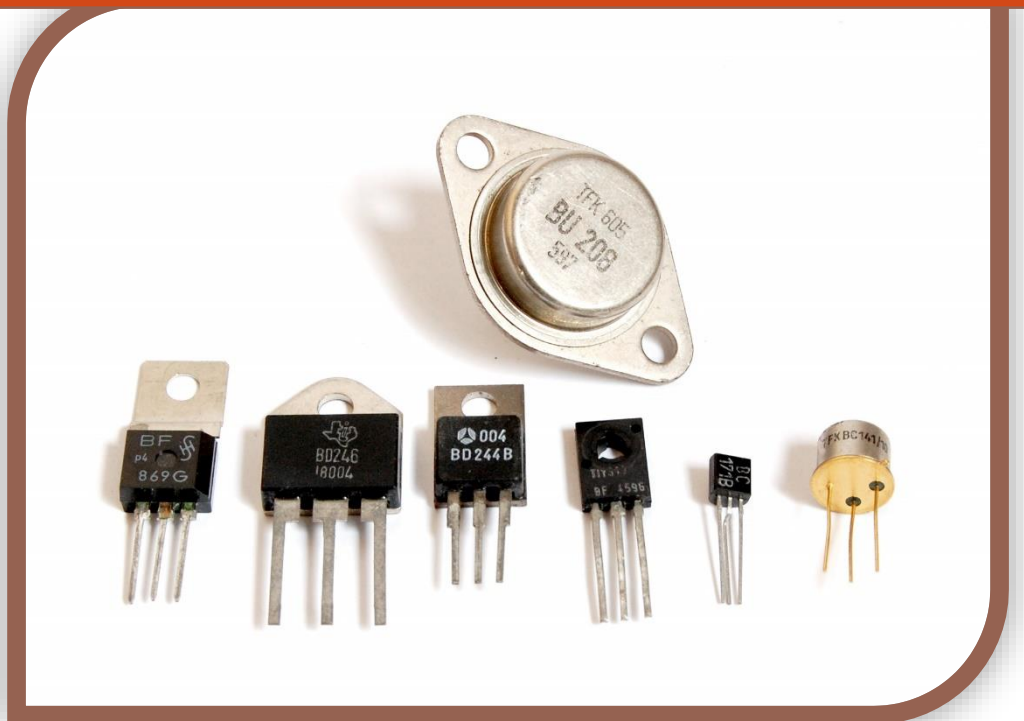


## COMPONENTS – The Transistor



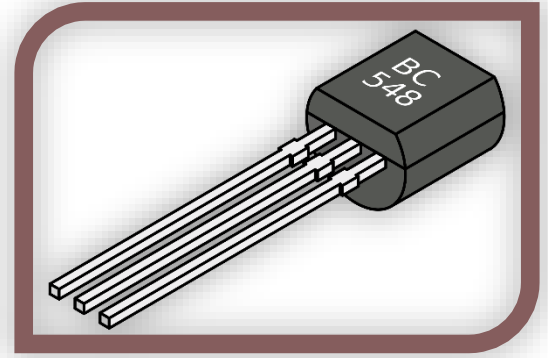
Exploring the “Transistor”

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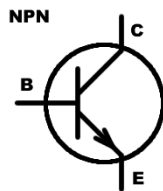
## What is a transistor?

A transistor is the semiconductor that changed the world. It is the successor to the vacuum tube, and essentially the technology that drives everything we know. It has 3 legs and is commonly used to amplify signals and to switch circuits rapidly.

Note that FETs are included, the pins are interchangeable between gate, drain and source – and base, collector and emitter.



## What is the schematic symbol for a transistor?



The symbol above is for an NPN type transistor. PNP will be quite similar, with the arrow reversed. If you can identify this symbol you will know you are looking at a transistor, and a quick google search can help you narrow down the exact type.

You may notice the letters B,C and E on there. They are to represent the 3 legs: Base, Collector and Emitter.

## How do I tell its value?

There will be a part number on the flat face of the component. A google search will result in all the info you need to know. There are other components that come in the same package as you commonly see transistors in, however by simply typing the part number into google you can easily get data on the part. You can purchase a transistor identifier, which you could plug a random transistor into, and it will tell you the characteristics and type of the component.

## What are some common uses?

Transistors are commonly used as really fast, solid-state relays or switches. You place current on the significant leg, and it will allow current to freely flow between the other legs. The particular legs and amount of current needed to switch – as well as the time taken to do so – are all dependent on the part used. Different parts offer different characteristics depending on what you need.

## What are transistors made of?

Transistors are a sandwich of 3 layers of semiconductor. PNP, NPN etc depending on the device in question. They are usually housed in plastic casings, however metal casings and strange part layouts are common due to this component being an extremely common one. When they say a microchip has x amount of transistors they essentially mean it has x amount of pnp or npn type junctions within its structure.

## How do transistors work?

Transistors are quite a complex topic, and the way they work cannot be explained within this scope. Suffice to say that they work like switches, and can be used to amplify circuits. As you forage into electronics you will gain a deep understanding of transistors. I would suggest some youtube watching on how they work etc.



## Example Use:

You might use a transistor to drive a high-current load, such as a motor or large LED. Another common use would be to turn an LED on when the voltage reaches its threshold value, this can be used in conjunction with voltage shifting circuits to drive LEDs, like the ones in your network card to show activity.

## Useful Resources etc:

[Wikipedia](#) (As always)

[Youtube](#) (Just linked the search, choose videos that seem good to you...this way you will stay interested)