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Another Explanation About the Transistor as an Amplifier

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Abstract:
We reached to an explanation for the small voltage turning out to be large one in the transistor. Our explanation is based on the repelling energy among electrons bearing the same negative charge when two currents of them n and n meet coming from the shared half between two circuits one reverse to the other forming the transistor, this shared half between the two circuits is known as the base, in n-p-n or in the other direction in the transistor as p-n-p. p and n are nothing but the negative and positive poles in one circuit, whit two circuits one is reverse to the other in direction, then no escape from the repelling meeting between two groups of electrons bearing the same negative charge. The number of the electrons has nothing to do with the small voltage turns out to be large one in the transistor, again only the meeting between two currents bearing the same negative charges where each current repel the other current strongly in the two shared circuits forming the transistor.

1- The usual explanation of the transistor as an amplifier:

Let us here continue showing more explanation about the transistor as an amplifier. I her choose the clearer one I have ever found in this field. The transistor consists of two PN diodes connected back to back. It has three terminals namely emitter, base and collector. The base is the middle section which is made up of thin layer. The right part of the diode is called emitter-base diode, and the left part is called collector-base diode. The emitter based junction of the transistor is connected to forward bias and the collector- base junction is connected in reverse bias which offers a high resistance.

When the emitter junction is in forward biased and the collector junction is in reverse bias , then it is said to be in the active region. Thus the transistor has two junctions which can be biased in different ways. The collector current is depend on the emitter current. This emitter current caused by the input signal contributes the collector current , which when flows through the load resistance results in a large voltage drop across it. Therefore a small input voltage results in a large output voltage showing that the transistor works as an amplifier(1). In fact this explanation is also not enough or useful for describing the work of the transistor as an amplifier.

It is well known that usually silicon is used for making the transistor because of its high voltage rating greater current and less temperature sensitivity.

2- The other explanation about the transistor as an amplifier :

The transistor is nothing but electrons moving between two circles, any circle in the universe consists of two equal and opposite halves one of them is negative n, the other relative to the other circle is positive p, if there is only one circle, then the electrons in one directed current will move their normal motion between the two opposite halves n and p in the circle or the previously mentioned diode, but when another circle or diode shares the first one in one half being positive p or negative n , we have then(n- p- n) or (p- n- p) . When electrons enter the shared half between the two circles p or n, then they will go through the two similar halves in the two circles in the same time, and because they are particles bearing the same charge then the two currents will repel each other strongly, n with n or p with p and this results in enlarging the entering voltage , this situation makes us remember the last layer in the structure of the Sun called the corona where after the hydrogen surface of the Sun, electrons no longer are attached to their protons and therefore one layer of free electrons and free protons is formed , as electrons are the lighter they are the faster. Now there is one layer of electrons only, because all of them bearing the same negative charge every electron will repel another electron resulting in a high degree of temperature ranges from one million to millions of kelvens(2) , when our Earth faces the Sun through its daily motion around its axis these free energetic electrons hit the gaseous envelope of the Earth causing the light of the day in this face of the Earth(3). Similarly two currents of free electrons meet in the two shared circles of the transistor repel each other strongly resulting in very great voltage comparing to the small voltage entering the transistor.

Now, there is no need to use the holes theory in explaining the work of the transistor as amplifier, where the base current in the transistor causes the electrons to move into the collector region creating holes in the base region , the base therefore has less number of electrons comparing to the emitter, then the few electrons in the emitter are combined with the holes of the base region and the remaining electrons are moved toward the collector region and constitute the collector current, the large collector current is obtained by varying the base region(4). In fact such explanation is not useful at all in understanding the work of the transistor as an amplifier!

Conclusion :

In one circuit the electrons move their normal circular motion between the two equal and opposite halves of the circuit, but if another circuit shares it in one of its halves where it is opposite in direction to the first one we have the transistor where the electrons will move from the shared half to the two halves of the two circles in the same time , the meeting between the two currents bearing the same negative charge and in addition to that in opposite directions will be a great clash results from repelling each other, and this raises the weak entering voltage strongly in the transistor.

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