Bipolar Junction Transistors (BJTs) - Structure

BJT transistors provide circuit designers with a compact and efficient means of controlling a current with a separate much smaller current. They are used for two primary purposes: to electronically switch signals on and off, and to amplify signals. In figure 1 we see a BJT in a leaded, TO-92 package. BJT's get their name from the two pn-junctions they contain.

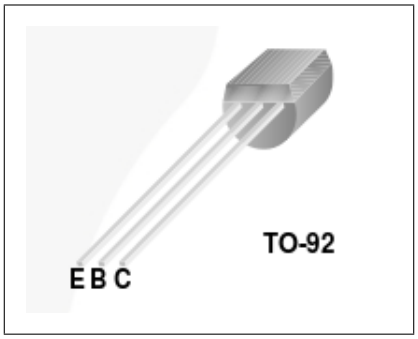

Figure 1: A BJT in Through-Hole Packaging

In figure 2 are the schematic symbols and reference voltage and currents for both NPN and PNP BJTs. Reference voltages and currents are defined identically for both NPN and PNP transistors, even though these symbols represent different types of transistor. You should become familiar with the voltages and currents of the BJT.

The separate PN junctions within the transistors do actually exist and can be checked. If the emitter-base, and collector-base junctions each show correct diode behavior, the BJT is not seriously damaged. This is a very simple test that can form a *go-no-go* test for the BJT.

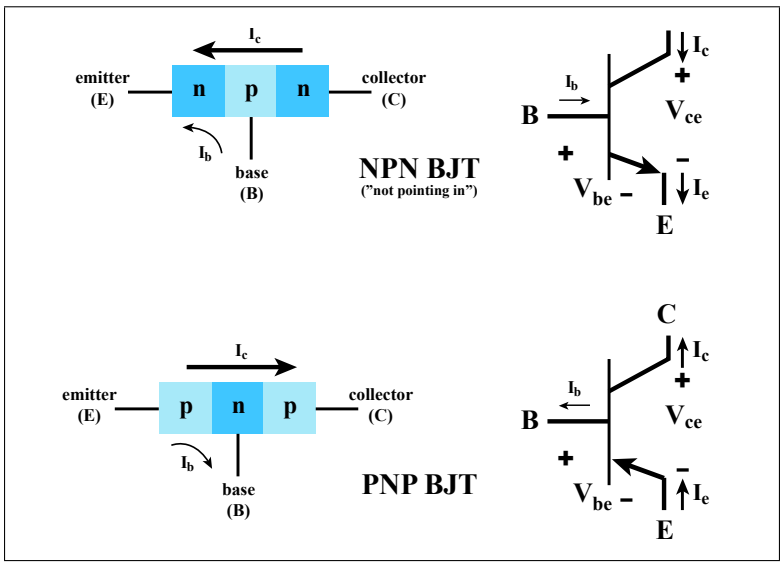

Figure 2: BJT Simplified Internal Structure