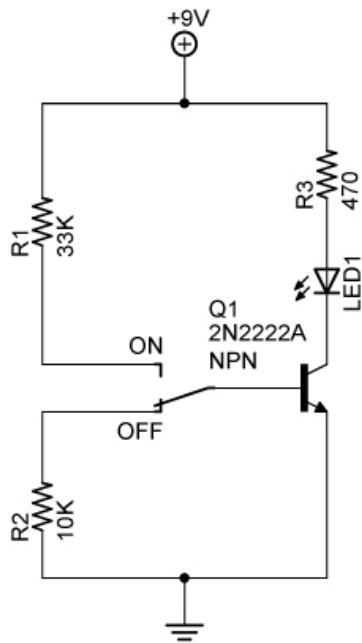
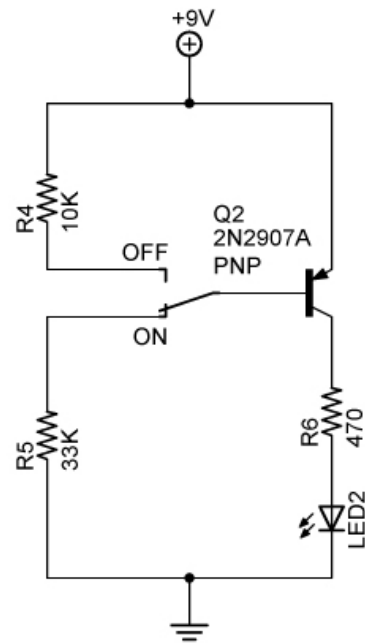


## NPN and PNP Transistor Switches



NPN Transistor Switch



PNP Transistor Switch

Explanation: In the NPN transistor circuit, when the switch is pushed to the ON position, the transistor base is biased correctly and current will flow through the collector-emitter junction. When the switch is turned OFF, the transistor base is grounded and the LED is turned off.

Similarly, the PNP transistor is biased properly when the switch is set to the ON position, turning on the LED.

The current through the NPN and PNP bases is approximately 0.24 mA; the current through the collectors is approximately 13.1 mA. The amplification by the transistor is defined as the collector current divided by the base current.

$$\beta = I_C / I_B$$

Where:  $\beta$  = Amplification  
 $I_C$  = Collector current  
 $I_B$  = Base current

In our case,  $\beta = 13.1 \text{ mA} / 0.24 \text{ mA}$ ,  $\beta = 55$

Related Web Sites:

[http://www.electronics-tutorials.ws/transistor/tran\\_4.html](http://www.electronics-tutorials.ws/transistor/tran_4.html)

<http://www.ermicro.com/blog/?p=423>

<http://www.mayothi.com/transistors.html>