

Re: Driving a transistor base from a voltage divider

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Jon Danniken wrote:

Hi, I am trying to determine the operating specs for operating a transistor base (as a switch) from a voltage divider.

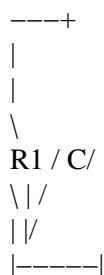
What I am trying to figure out is the appropriate values of R1 and R2, given a desired Base current and source voltage/source current available (I know the source voltage, and how much current I can pull from it).

If I eliminate the "bottom" (R2) resistor in the voltage divider and only use one resistor, I can easily determine the current that flows through that resistor (E/R), and therefore the current that flows through the base ($(E-0.7)/R$), which is just computing the value of a Base resistor.

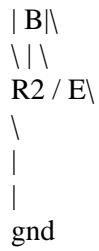
Right now I am getting hung up on what effect the "bottom" resistor has on the base current. I know that without the transistor, I can figure out the voltage at the center point as a ratio of the resistances, and the current through both resistors, but what current is available from the center point to drive a transistor base?

The closest I have come is by calculating a "resistance" for the transistor Base/Emitter junction by dividing 0.7V by the desired base current, and treating the transistor as a resistance in parallel with R1, but I'm not very confident with that solution.

BTW, here is an ascii of what I have:



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Thanks for any help,

Jon

If the current through $R1 + R2$ is much larger than the required base current then the junction will set the base voltage. That will allow you to set the collector current anywhere between zero and maximum.

However for a switch the transistor would be hard on or hard off. In which case a single resistor will limit base current to a safe level, at the point where its switched hard on.

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Best Regards:
Baron.

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