

Re: A few novice questions

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On May 2, 4:13 pm, Tomás Ó hÉilidhe <t...@xxxxxxxxxxxxx> wrote:

OK here's an example:

I have 26 LED's. Instead of them all being on at the same time, I'm going to light each of them for 100 microseconds and then move onto the next one (i.e. display multiplexing).

The LED's I'm using have a maximum current rating of 25 mA, but since they'll only be on for one twenty-sixth of the time, I'm going to put about half an ampere thru them. To achieve this, I'm not even going to use a resistor, I'm just gonna go straight from Vcc to LED to ground. (I've tested this in my project this year and it works perfectly).

Now my microcontroller pin won't be able to supply half an ampere, so I'll use the microcontroller pin to turn on a transistor which will allow the half ampere to flow from Vcc to the LED to ground.

So my question is, what's the best transistor to use? The supply voltage is 5 V and it's powering an LED.

This is the second post in a week that wants to drive LEDs without a current-limiting resistor. Is there something in the water that's making people think like this? :-)

Regarding the transistor, just pick a cheap one that will take the desired current and circuit voltage without stress – having a current rating e.g. 50% or more higher than the current it will be switching, same with the voltage rating. For example, the 2N2222 and plastic versions are rated to 800mA.

Now, about those LEDs. Don't do it. In the first place, LEDs have a maximum pulse rating as well as a continuous rating. For example, I just looked one up that has a 30mA continuous rating, and a 160mA peak pulse rating. That is to say, you can't just do the multiplexing thing ad infinitum at the equivalent brightness of the continuous rating. And while I've got your attention ;-) please, use resistors to limit your LED current in a controlled way. In every circuit,

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something is limiting the current. Without resistors in your case it can be the LED, the transistor, power supply voltage sag, or any combination. You certainly won't have control over any of those factors, and you are just as certainly stressing one or more of those components, and they will start failing, probably right after your devices are installed in Siberia or the Sahara. Add a resistor, let Ohm's Law be your friend.

Mike

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