Re: LED Reverse Polarity Protection

Source: http://sci.tech−archive.net/Archive/sci.electronics.basics/2008−02/msg00242.html

- *From*: "Stephen J. Rush" <sjrush@xxxxxxxxxxx>
- *Date*: Sun, 10 Feb 2008 00:27:13 −0600

On Sat, 09 Feb 2008 22:10:38 −0800, BobW wrote:

> "Dave.H" <the1930s@xxxxxxxxxxxxxx> wrote in message
> news:227bac2d−4517−4cd5−8880−d8eaca9b7c4a@xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
>
> > Hi, I'm considering using a high brightness LED in an old incandescent
> > flashlight, in series with a 220 ohm resistor, for use with a 6 volt
> > lantern battery, but I also want some type of reverse polarity
> > protection for the led, as I'm putting the LED, resistor, etc. in a
> > regular flashlight lamp base. I assume this would most likely be done
> > with a diode, perhaps a 1N400x type, but how would I wire this up?
>
> You're on the right track. You don't need a high−current diode like a
> 1N400x, however. A 1N4148 or 1N914 will work fine because the maximum
> current will always be very low (6V/220ohm = okay for a small signal diode).
>
> Anyway, just put the diode across the led backwards. That is, put the anode
> of the diode to the cathode of the led, and the cathode of the diode to the
> anode of the led. That way, if your flashlight batteries are installed
> backwards, the diode will conduct the current (I=6V/200ohms) and the reverse
> voltage across the led will be limited to under 1V.

A high−brightness white LED might well draw more current than a
small−signal diode can handle, so a 1N4001 (50V, 1A) diode might be
better. Any of the 1N400x series will work; they're all cheap and easy to
find, but the 4001 is the cheapest. I'd put the diode in series with the
LED and adjust the value of the ballast resistor to allow for the 0.6 volt
forward drop of the diode. A better solution would be to look up one of
the switching regulators usually used with high−power LEDs.
With a simple resistive ballast and 6 volts, the resistor will dissipate
at least as much power as the LED.
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