

Re: does this circuit use conventional current?

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- *From:* Mike <nospam@xxxxxxxxxxxx>
  - *Date:* Fri, 21 Apr 2006 08:08:18 -0400
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Chris wrote:

Mike wrote:

KodKodKod Learning Consulting wrote:

Hi,

Sorry, I didn't read carefully! You used the right term as John Fields said.

For a diode, the bar is the cathode and the edge of the triangle is the anode. And current flows from anode to cathode.

LED is just a diode. It can have both hole or electron flows (depends on how it is made). LED is forward biased when the anode has higher potential than the cathode and current (conventional) flows from anode to cathode. For electron, it flows in the opposite direction (from -ve to +ve as it is attracted by the E-field) and for hole, it flows from +ve to -ve as repelled by the E-field. However, since electron has -ve charge and hole has +ve charge, they contribute to the conventional current in the same direction.

So when you deal with diode, to determine whether it is forward biased or reverse biased, it is better to inspect the terminal voltage instead of how it is connected. In this case, we are sure the anode always has higher voltage than the cathode (which is connected to the

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ground). So the LED is forward biased. (Of course, the anode voltage is changing during operation and it can be too low (but still  $>$  or  $=$  ground) to turn on the LED and it doesn't lid).

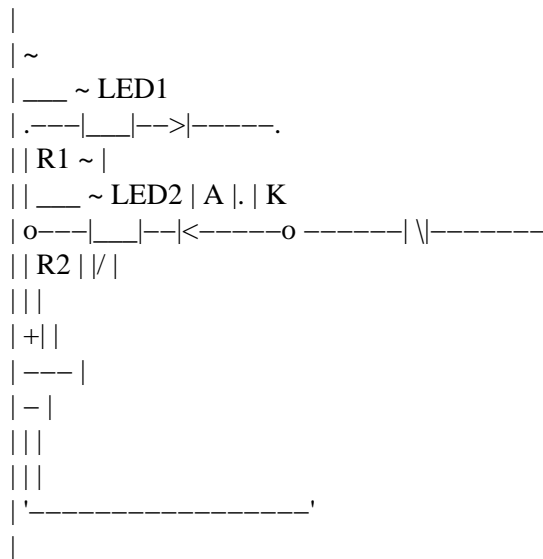
Regards,

KodKodKod Learning Consulting

Thanks for the explanation of hole/electron flow. So, the answer to my question is: "Yes, this circuit uses conventional flow"?

—  
Mike

Hi, Mike. I'm not sure whether you're confident you've gotten a satisfactory answer yet. Here's a picture that might help (view in fixed font or MS Notepad):



(created by AACircuit v1.28.6 beta 04/19/05 www.tech-chat.de)

Looking at the simple circuit diagram, there's a 3V battery and two resistor-LED strings. In the picture, LED1 will be ON, and LED2 will be off. If the anode (A) is more positive than the cathode (K), the diode is said to be forward-biased, like LED1. If the cathode is more positive than the anode, the diode is said to be reverse-biased. A forward-biased diode permits current to flow, and a reverse-biased diode prevents current flow.



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subject. I wasn't aware that current could flow in to the output of a gate.

By the way, don't connect the battery negative or anything else in this circuit to ground. The symbol is a way of saying circuit common (COM), or the negative terminal of the battery.

The ground symbol? Isn't this circuit connecting negative to ground? It seems like those two sentences are contradictory :)

You sound like an intelligent guy, and just need some background in the basics to be able to have a lot more understanding. I'd recommend finding a copy of Don Lancaster's "CMOS Cookbook" for more straightforward, non-technical background on CMOS circuits. Actually, most of what's in your application circuit is covered in his book. It's available at many libraries, Amazon, or Mr. Lancaster's website:

My background is in software development, but electronics always has been a part-time hobby that I just never got into deeply. I understand a lot of the basic principles, including ohm's law, Kirchoff's law, capacitance, inductance, etc, but one of the things books (at least the ones I have) don't emphasize well enough is giving examples of breaking down schematics. Do you have any recommendations for a book devoted to this subject? I'll check out that CMOS cookbook you mentioned also. Thanks for taking the time to explain.

<http://www.tinaja.com/>

Good luck  
Chris

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Mike

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