

Re: How to design an infra-red circuit to detect small obstacle (e.g. finger) ?

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"anwar" <anwar09@yahoo.com> wrote in message
news:1108333459.965812.199980@o13g2000cwo.googlegroups.com...
> *Larry,*
> *– I do need a narrow detection indeed. So if I have a 2 feet*
> *separation and there is a narrow beam where if someone place a finger*
> *or pass his finger thru the narrow beam quickly it should detect that.*
>
> *– As per level of gain– I need to make a sound of a certain frequency*
> *when the obstacle is detected.*
>
> *So, if you can please provide me details on how to make a circuit like*
> *that it will be wonderful.*

I'm not going to do the detail design or any simulation on this. I have built similar circuits and used the NE567 in this manner, so I can assure you that this technique will work with appropriate design and adjustments for your specific application.

The NE567 provides these functional blocks:

1. An RC oscillator with a useful semi-digital output on pin 5. This can drive a low-power LED directly or, with an extra transistor, as much as your LED can take.
2. A synchronous demodulator, multiplying the signal on pin 3 to produce filtered baseband on pin 1. You can set the demodulator bandwidth according to how fast you want detection to happen versus how much out-of-band noise you wish to reject.
3. A reference and comparator to detect when the level on pin 3 exceeds a threshold, producing an open-collector output on pin 8.

You most likely need to provide some gain between the photocurrent signal and pin 3 of the NE567. The net response of that stage, from photo-current to pin 3,

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should have 90 degrees of phase shift to work well with the NE567 demodulator. (That might be 270 degrees, so the LED might have to be turned around or the polarity of its BJT driver inverted.) For modest gain, a phototransistor can be used in a circuit with the following topology to provide this function:

V