

Re: Formula for minimum drive current for mosfet

Source: <http://sci.tech-archive.net/Archive/sci.electronics.design/2008-04/msg02049.html>

- *From:* "Paul E. Schoen" <pstech@xxxxxxxx>
 - *Date:* Sun, 13 Apr 2008 03:40:13 -0400
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"gearhead" <nospam@xxxxxxxxxxxx> wrote in message
<news:be00fe5b-5dc3-420f-8f1b-07643cb42a5a@xx>
On Apr 12, 7:54 pm, "Paul E. Schoen" <pst...@xxxxxxxx> wrote:

<m...@xxxxxxxx> wrote in message

<news:3e667771-ed64-4a9e-a065-ced0e13f718f@xx>

On Apr 12, 1:33 pm, "Jon Slaughter" <Jon_Slaugh...@xxxxxxxx> wrote:

BTW, this should point to an optimal switching frequency
for least
power
dissipation? Anyone know the formula?

(snip)

If your intent is to drive directly from the uP, you may want to consider how the load switching will effect the uP. You will probably get ground bounce. In addition, as you increase VGS, there will be current flow from CDG. If the drain voltage is falling like a rock, it will generate current that opposes your gate drive. What I'm leading to here is you should probably buffer the uP from the power fet.

I just finished looking into various MOSFET gate drivers for my design.

(snip)

I also played around with a homebrew MOSFET driver using an NPN and PNP transistor, and a few resistors and diodes, and it seemed to work pretty well in the simulator. I also set it up with a bootstrap to the MOSFET drain, with the idea that maybe a driver could be built into a MOSFET,

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but

it's probably better to tie the voltage supply for the driver to a 5 volt or 12 volt supply. So you can omit some of this circuitry, but it is probably a good idea to have some sort of limiting resistor. I tried a simpler driver with an NPN and PNP with bases tied together as the input and emitters tied together as the output, with collectors across a 12 volt supply, and somehow there was simultaneous conduction and one of the transistors popped.> Paul

Did you use a resistors in each base, or just tie them together?

I just tied them together. It's basically two emitter followers. They should never be both on at the same time, but if one is slower than the other, I guess it can happen, and did. The simulation looked OK.

Paul

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