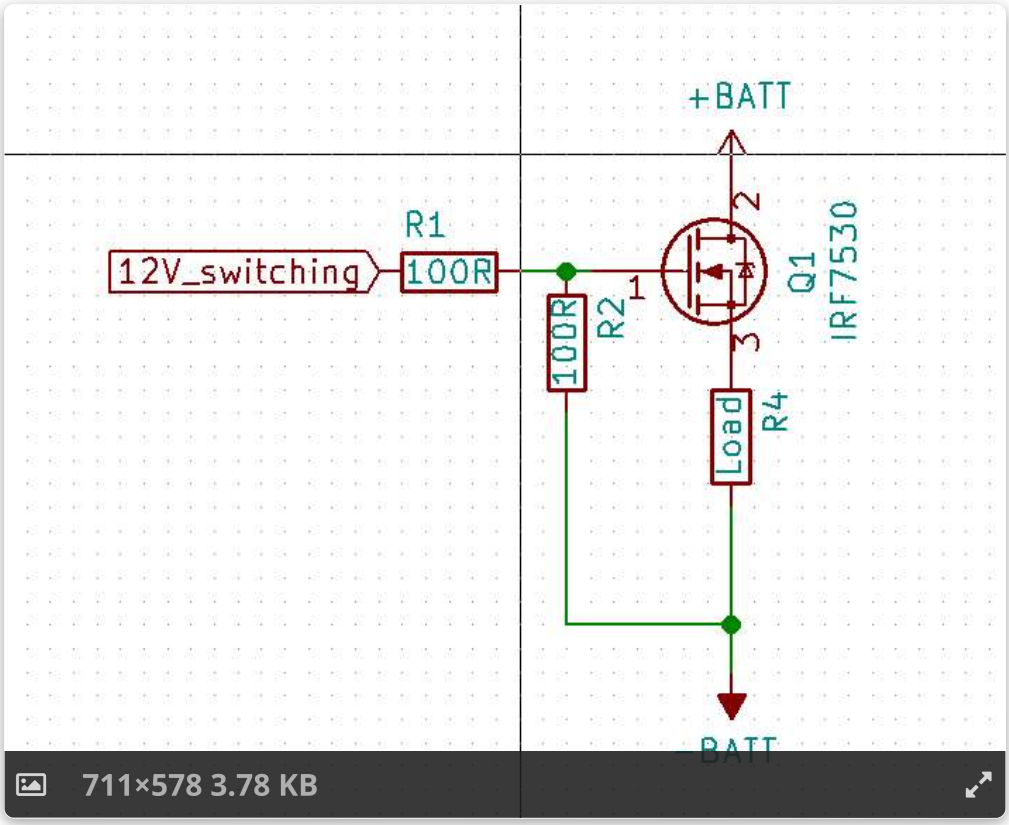
Using High side mosfet switching for high current apps

MikeLemon jun '18 post #1

Hello,

I'm trying to learn about using mosfets for high current applications and there are a few practical things I don't understand some are about why they get so hot easily if they are such wonder devices and for now what is the advantage and disadvantage of driving n channel mosfets at high and low sides (from what I understand low side switching is way more popular...

here is the general High side switching circuit, could that work?:



Thanks for your time.

Hoppa till huvudinnehållet

LarryD jun '18 post #2

That is an N channel MOS FET.
Put the load in the drain leg.
R2 is too low, try 10K.

See

irf7530pbf.pdf

1 B

LarryD jun '18 post #3

Watch this:

DVDdoug jun '18 post #4

How much current?

What's your +BATT voltage? I assume -BATT is ground? With high-side switching of an N-channel MOSFET the Gate voltage has to be higher than the Drain voltage, because when switched on the Drain and Source voltages are equal and you need V_{GS} to turn-the device on.

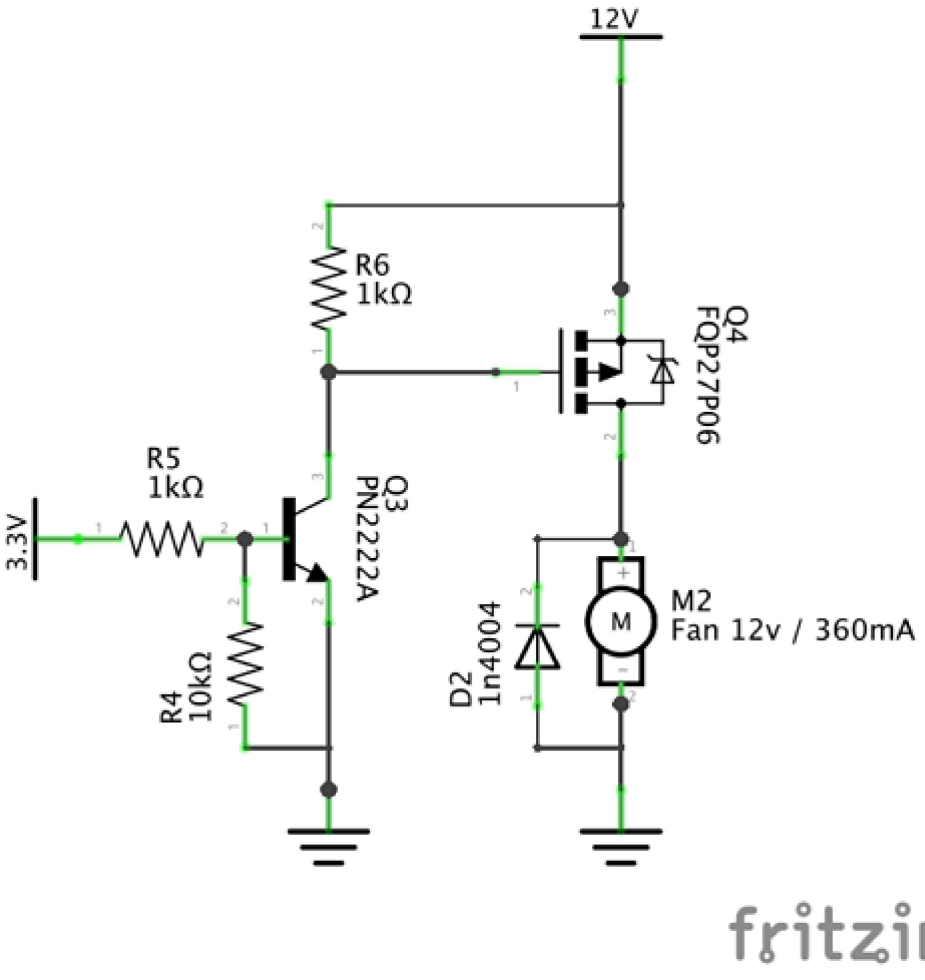
What's the nature of your 12V switching voltage? When off, is it open/disconnected or pulled-down to ground?

Two equal-value resistors cutting the gate voltage in half. R2 should be a much higher value than R1, if you need it at all.

jremington jun '18 post #5

For high side switch use a P-channel MOSFET, like this:

Hoppa till huvudinnehållet



Pololu makes some nice high side, high current **switch modules** that can be controlled either by an MCU or an on board switch.

MikeLemon **jun '18** **post #6**

That doesn't explain why you can't use a N channel mosfet for high side switching. and the current varies from 5A to 60A

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jremington **jun '18** **post #7**

You **can** use an N channel MOSFET as a high side switch, but you need the gate voltage to be about 10V higher than the source or output load voltage, in order to turn on the MOSFET.

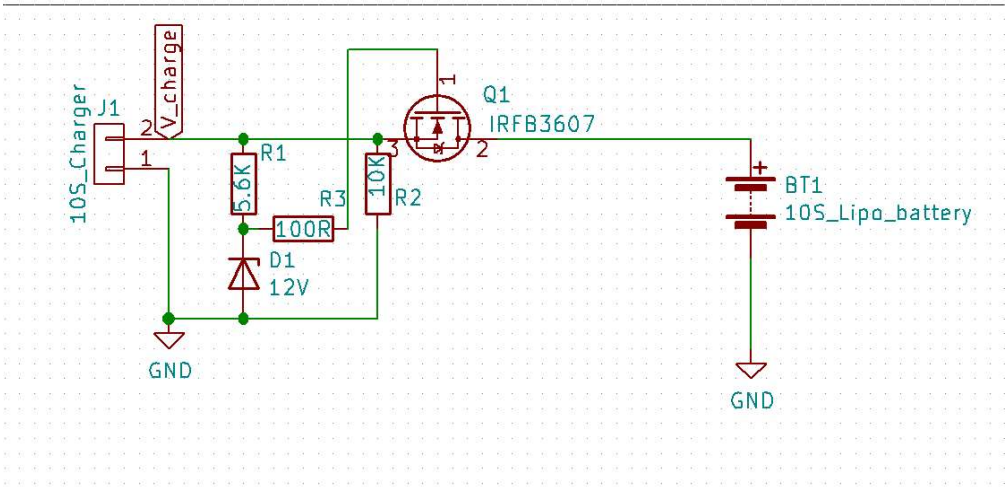
Decide for yourself how easy that will be to implement.

MikeLemon **jun '18** **post #8**

Hoppa till huvudinnehållet

> jremington:
> You **can** use an N channel MOSFET as a high side switch, but you need the gate voltage to be about 10V higher than the source or output load voltage, in order to turn on the MOSFET.
>
> Decide for yourself how easy that will be to implement.

But I managed to make this circuit maybe partly work somehow...:



Any idea?

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jremington **jun '18** **post #9**

See your other post. That circuit doesn't work at all.

LarryD **jun '18** **post #10**

Sounds like you just want to argue.

You have been told to use a P channel MOS FET, or Schottky diode.

Did you watch the Youtube video?

Enough time spent on this, you have the answer, good luck learning by producing smoke.

MikeLemon **jun '18** **post #11**

> larryd:
> argue.

Hoppa till huvudinnehållet

> You have been told to use a P channel MOS FET, or Schottky diode.
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> Did you watch the Youtube video?
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> Enough time spent on this, you have the answer, good luck learning by producing smoke.

Yes I've watched the video for the 10th time...

Shottky diode is just too bulky and inefficient for the application and not suitable because of the voltage drop.

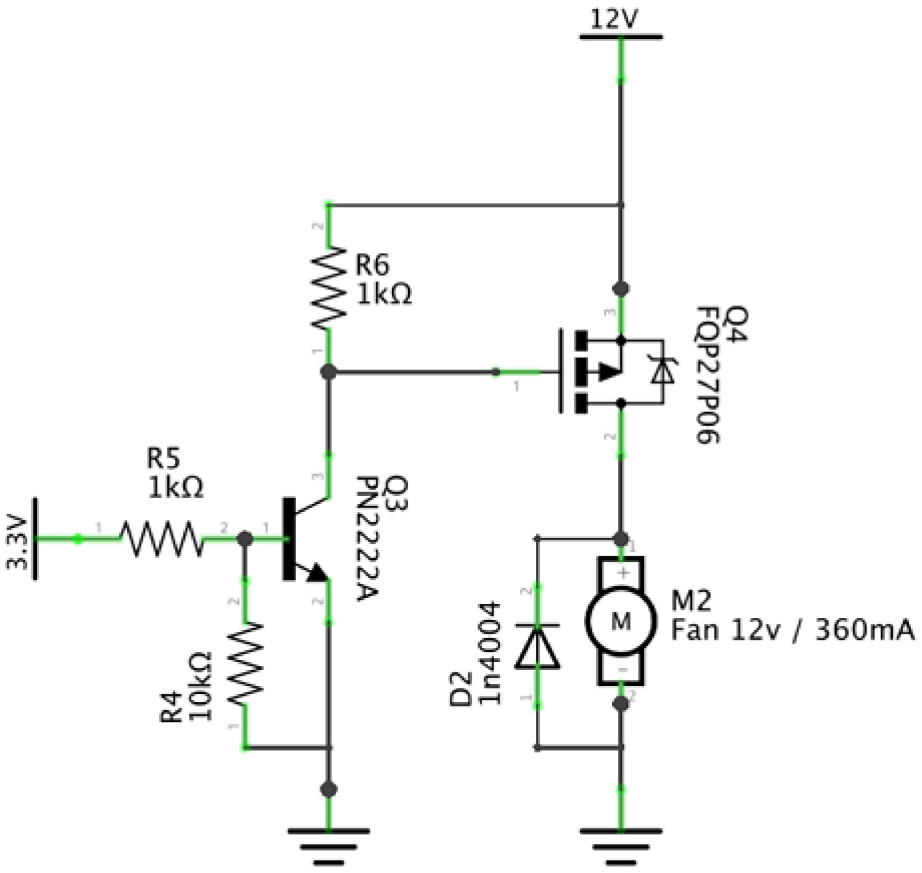
And how do you suggest I use a P channel mosfet for this application as I need to do High side switching with a positive voltage input with a P channel mosfet?

LarryD **jun '18 post #12**

I know you have your N channel transistor already, but it is not what you needed.

If you watched the video then you know your cct. will not work.

This has been offered to you already.



Hoppa till huvudinnehållet

"Shottky diode is just too bulky"
That Schottky diode is similar in size to a power MOS FET.
It has a voltage drop of only .2 to .3 volts, not significant to your application.

Edit:
Have you considered a simple on/off key switch rated at the charge current needed?

Hoppa till huvudinnehållet

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