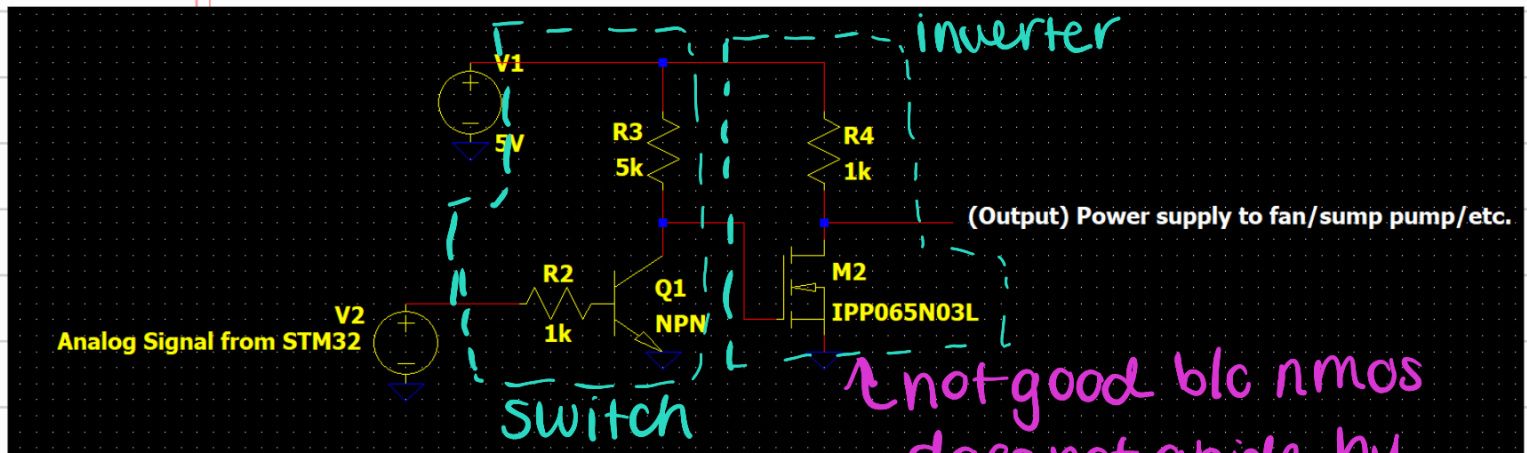


Switch Using NPN BJT or NmosFET

*Original Design for switch:

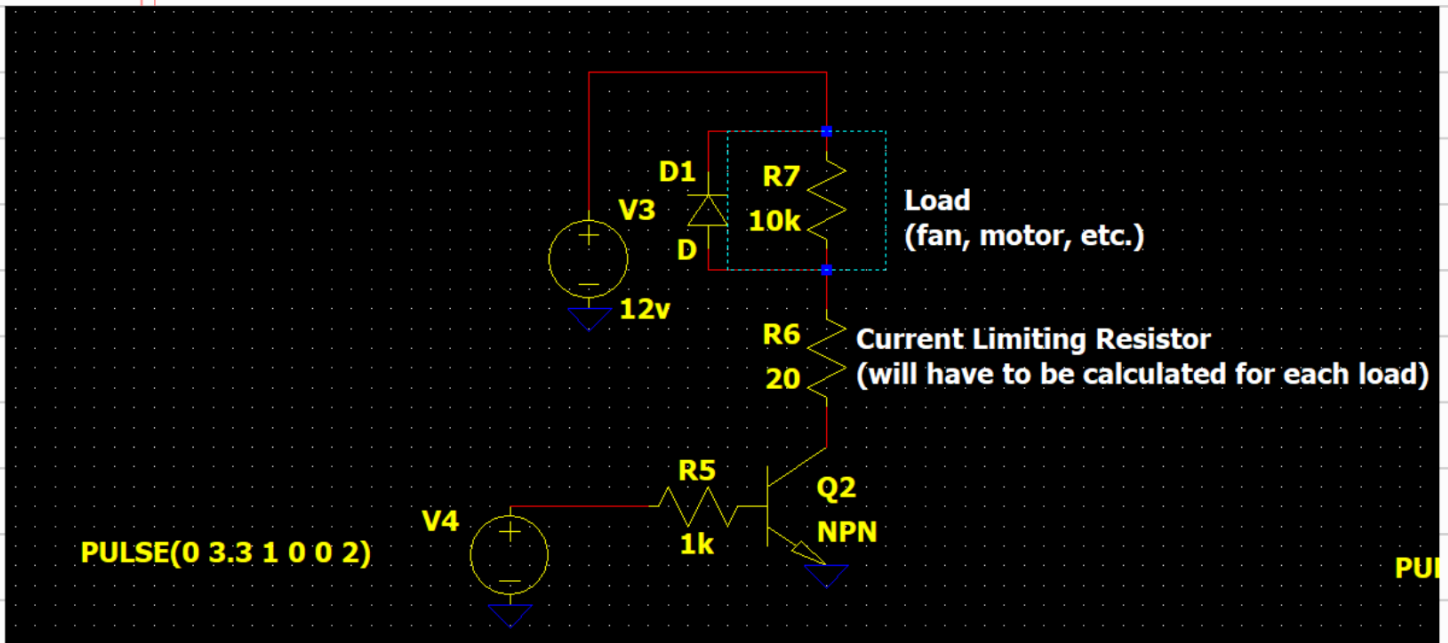


↑ not good b/c nmos does not abide by voltage divider rule, and this switch does not behave as it should when it is hooked up to a load.

*Need to come up w/ a new design which does the switching better.

→ use either just a mosfet or just a BJT

NPN BJT Switch:



Specs for NPN BJT

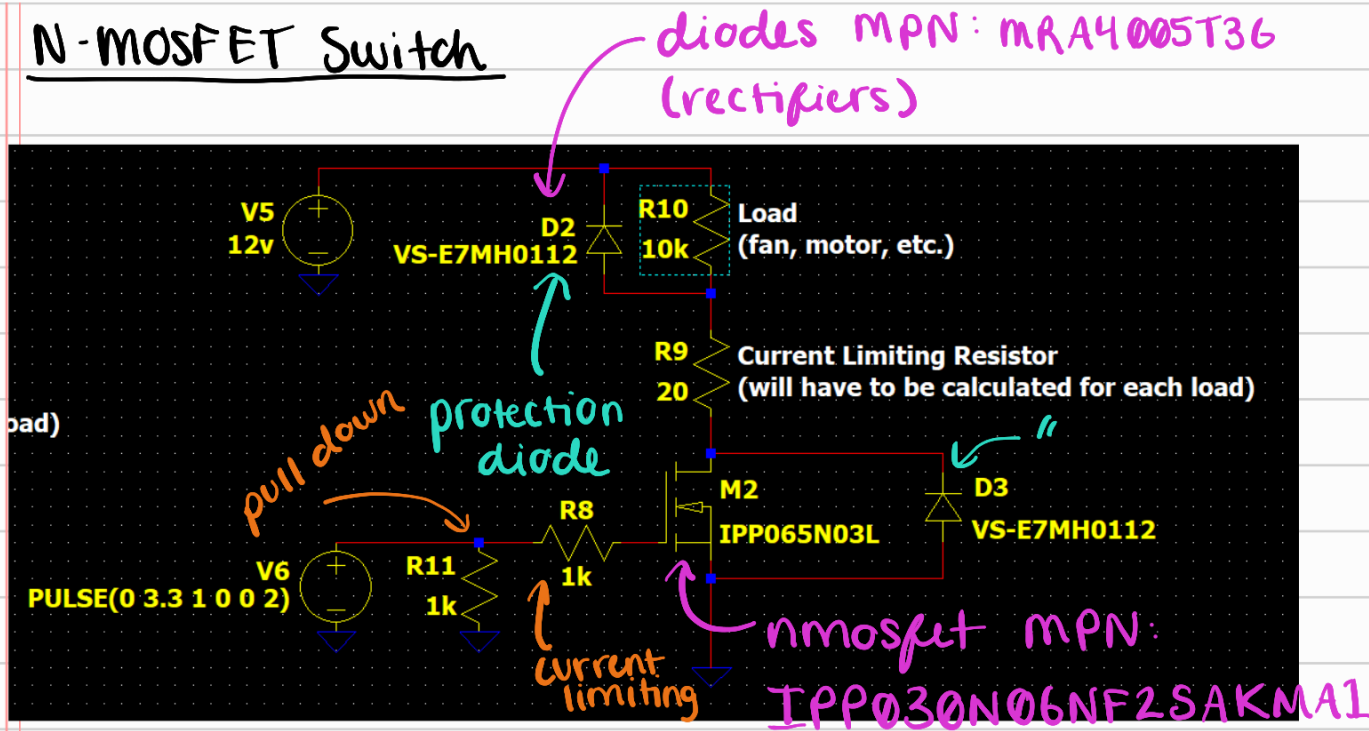
- Base can handle 3.3V source with 8mA of current going into it
 - 8mA will "turn on" the BJT
 - BJT can handle being connected to 12V, 5V and 3.3V
- current output from STM32 GPIO

Things to be Careful of:

- * don't have too much current go into the base region of BJT

At the end of the day, the MOSFET switch is preferable. The STM32 sends out signals that are voltage based, and our switches should align with this ideal.

N-MOSFET Switch



Specs for NMOSFET

- Must be able to handle $V_{ds} = 12 \rightarrow V_{ds\ max} = 60V$
- I_d must be able to handle the current coming from the power source $\rightarrow I_{d\ max} = 119A$
- V_{gs} (or V_{th}) must be able to handle 12V fire. $\rightarrow V_{gs\ max} = \pm 20V$
- current must be limited to gate.

Simulation

