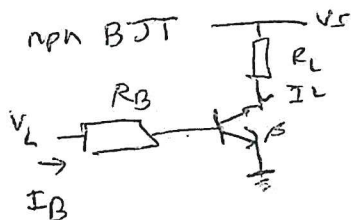


Transistor Switching

• small low current dc loads can be supplied directly, but can't source more than 40mA.

• to drive a real load, like a motor, we need higher voltage / current

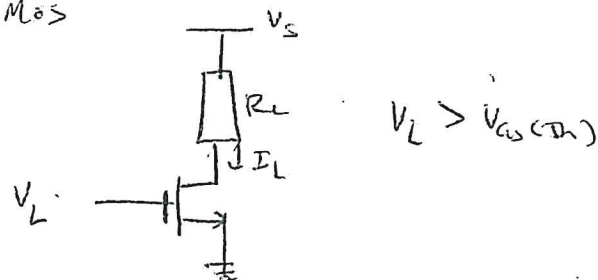
- use an interface circuit



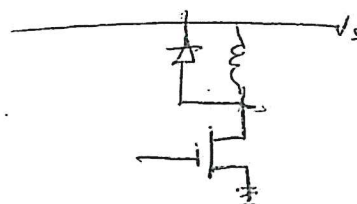
$$I_B \geq \frac{I_L}{\beta}$$

$$R_B \leq \frac{V_L - 0.7}{I_B}$$

nMOS



inductive load with nMOS



• diode is called a "Free-wheeling diode"  
↳ when motor is off, inductive load needs somewhere to drain its stored energy

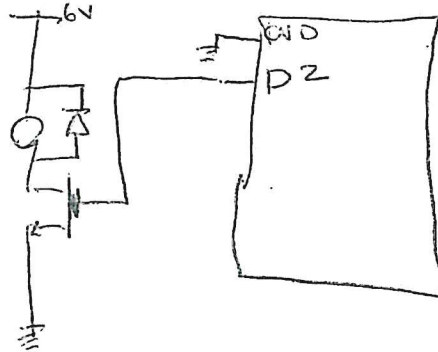
↳ otherwise could destroy MOSFET

• for this class, we will use  $\pm$ RLB 8721

$$V_{GS(th)} = 2.35V$$

↳ pinball switches 0-30V, this MOSFET works!

+6V

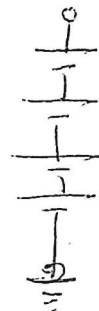


DEX:

Diode is 1N4001

Transistor as described

+6V



• write a program that switches a motor on and off (1S on, 1S off)

↳ increase frequency until you can't tell when it is switching.

↳ how does this compare to speed when motor on for longer?

In class exercise