

Electronics 101

Thomas Braipson

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Menu

- ▶ Powering up a circuit
- ▶ Moving things
- ▶ Sensing things
- ▶ Tips

Powering up a circuit

- ▶ LDO
- ▶ DC-DC converter
- ▶ Charge pump
- ▶ The importance of decoupling capacitors

Moving things

- ▶ DC motor
- ▶ Stepper motor
- ▶ Servo motor
- ▶ Electromagnetic pusher

These devices need driving circuits!

- ▶ H-bridge
- ▶ Darlingtons (e.g. ULN2003)
- ▶ MOSFET
- ▶ Fly-back diodes

Sensing things

- ▶ Distance: ultrasounds, Sharp, active IR
- ▶ Presence of a heat source: passive IR
- ▶ Hall effect
- ▶ Potentiometer
- ▶ Colour sensor
- ▶ Accelerometer/gyroscope
- ▶ ...

Tips

Things not to do:

- ▶ Reversing polarity of electrolytic capacitors
- ▶ Burning devices (expensive devices tend to be fragile...)
- ▶ Forgetting decoupling capacitors/diodes
- ▶ Underdimensionning things (e.g. motor not powerful enough, driver not able to provide/withstand the current required by a motor)

Tips

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Things to (automatically) do:

- ▶ Thinking twice
- ▶ Making schematics (Kicad is your best friend)
- ▶ Checking the power supply with an oscilloscope
- ▶ Checking signals with an oscilloscope