

Protokoll

Projektvorstellungen

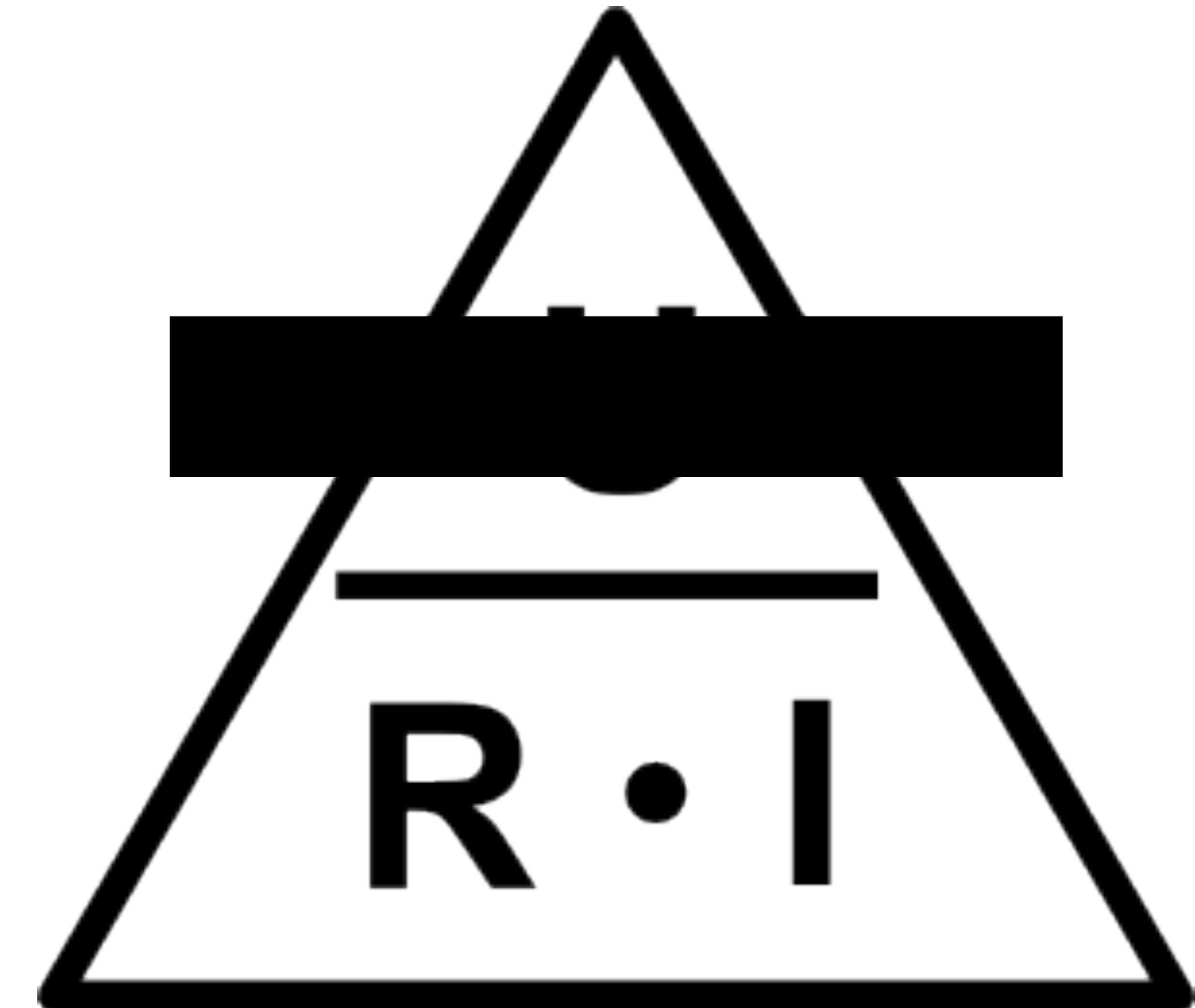
Spannung

Opportunistisches Prototyping

$$\frac{U}{R \cdot I}$$

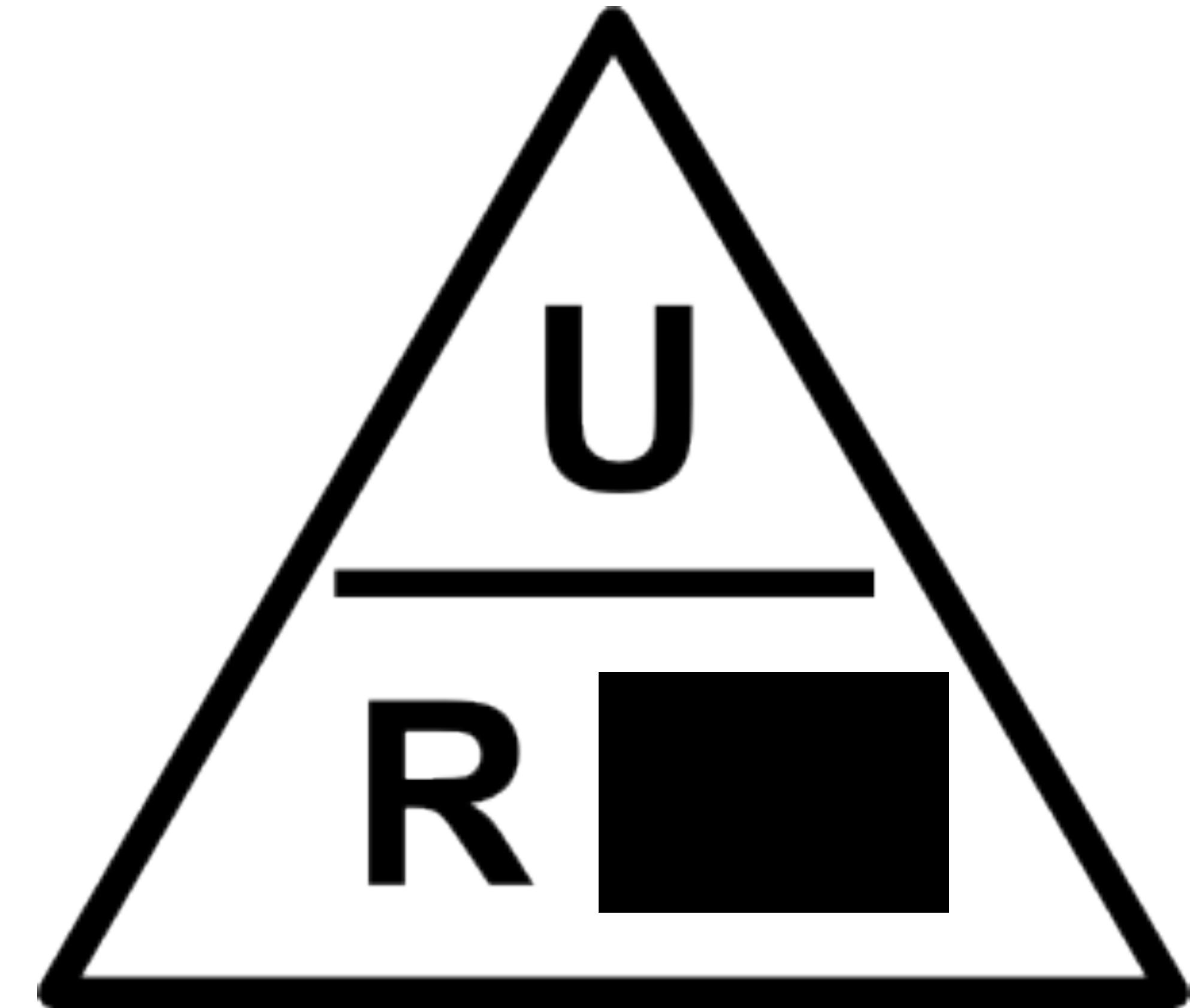
Ohmsches Gesetz

U (Spannung) = R (Widerstand) * I (Stromstärke)



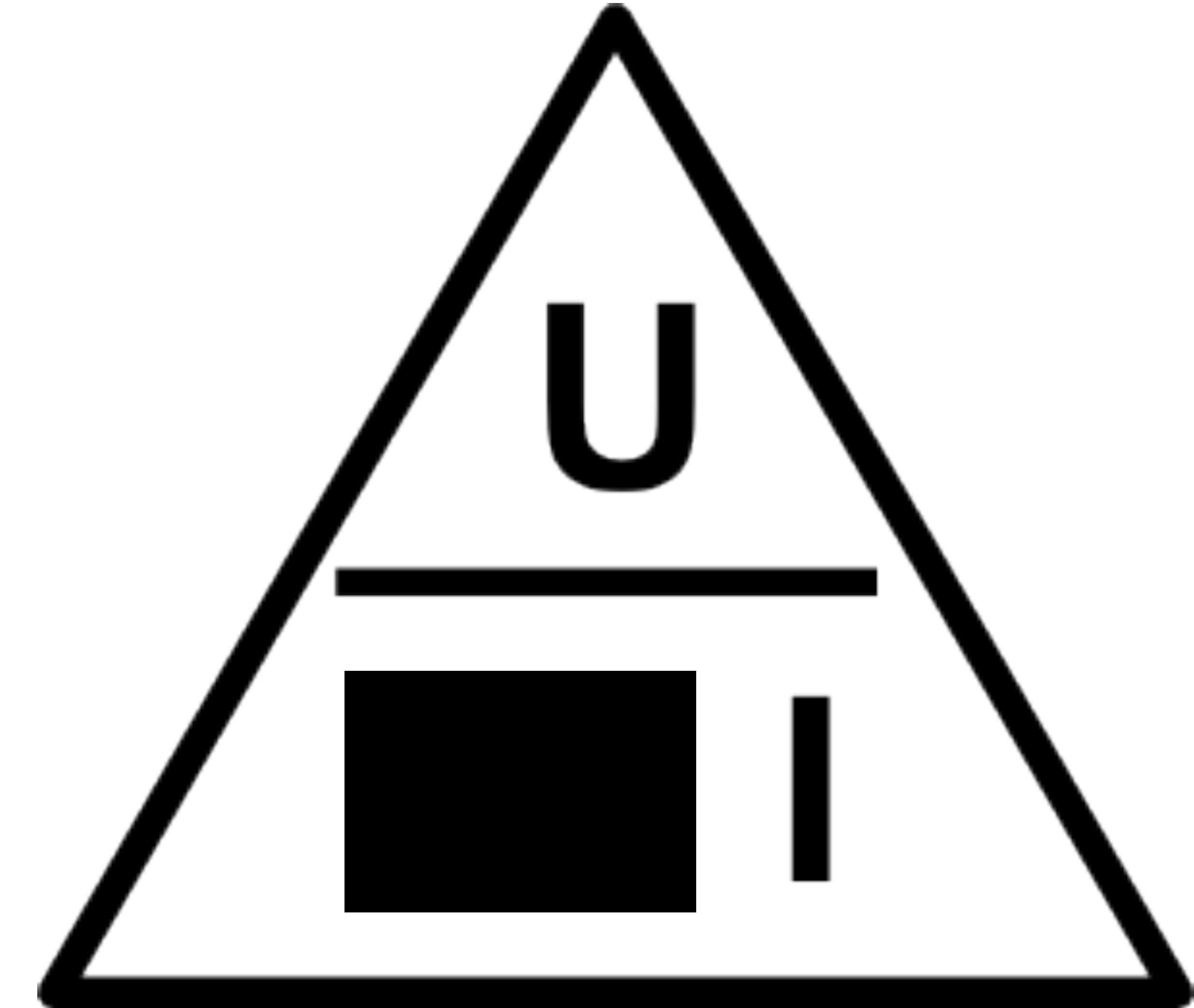
Ohmsches Gesetz

I (Stromstärke) = U (Spannung) / R (Widerstand)



Ohmsches Gesetz

$$R \text{ (Widerstand)} = U \text{ (Spannung)} / I \text{ (Stromstärke)}$$

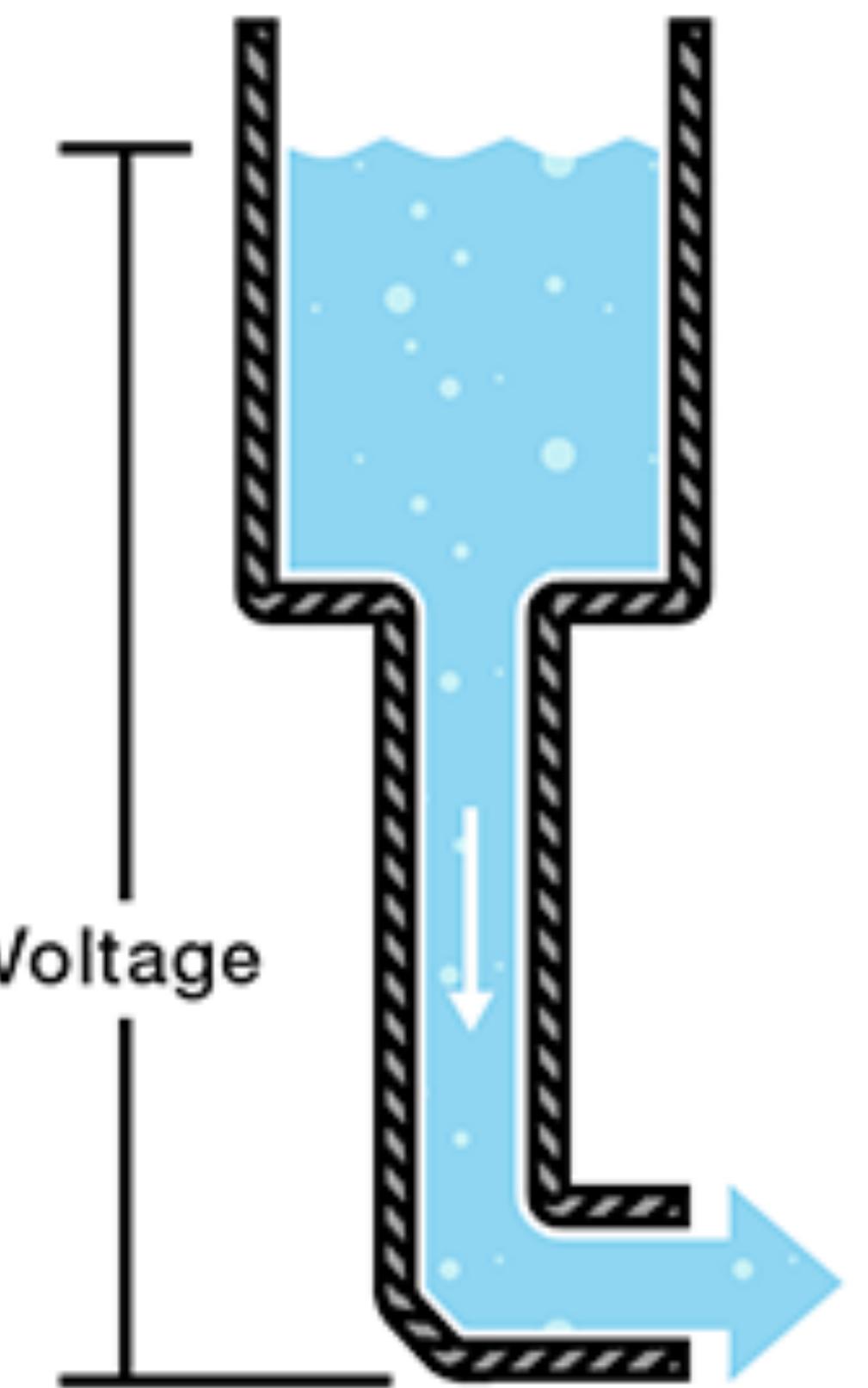


Ohmsches Gesetz

U (Formelzeichen)

V (Einheitenzeichen)

Elektrische Spannung

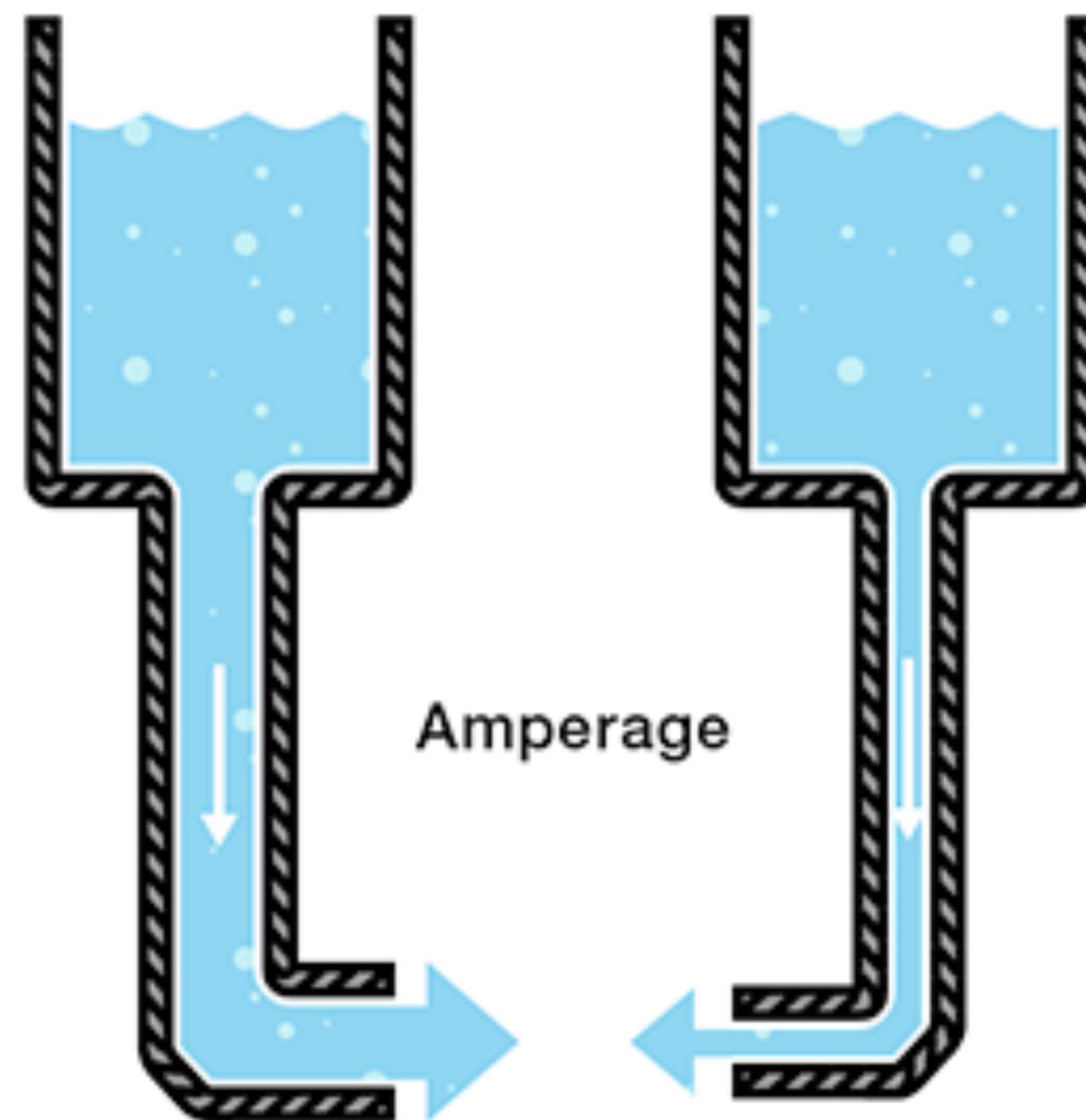


Elektrische Spannung

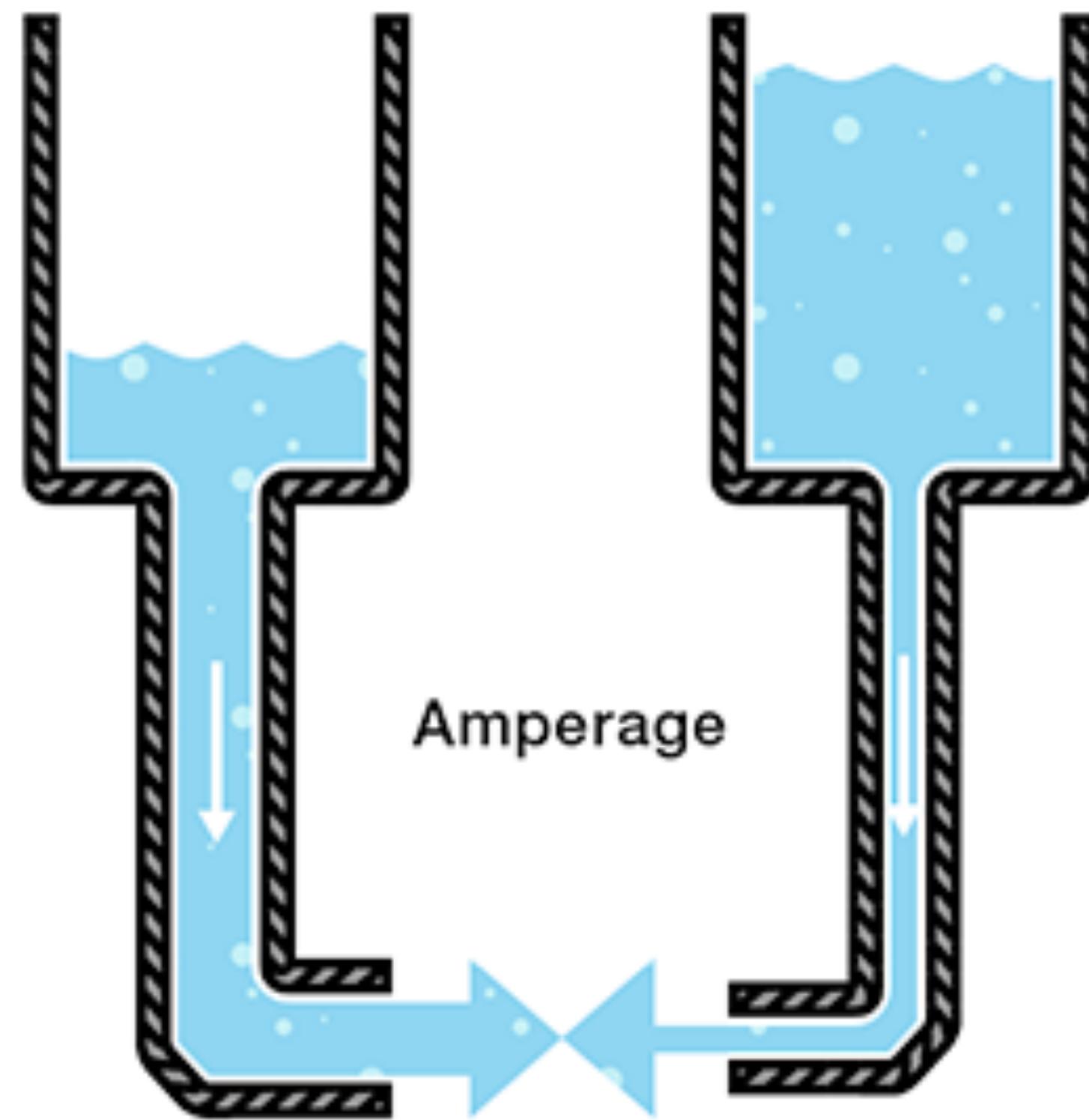
I (Formelzeichen)

A (Einheitenzeichen)

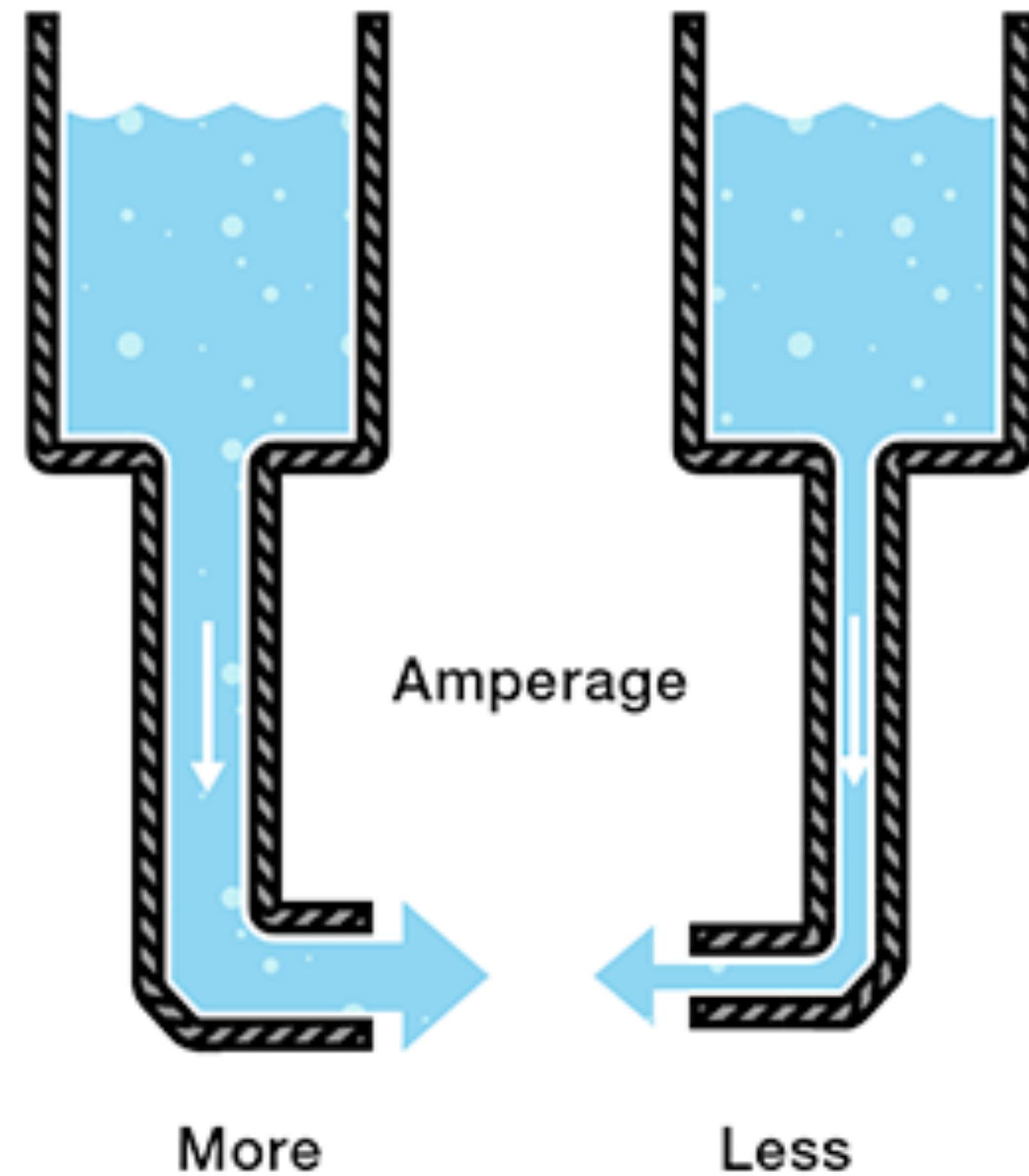
Elektrische Stromstärke



Elektrische Stromstärke



Elektrische Stromstärke



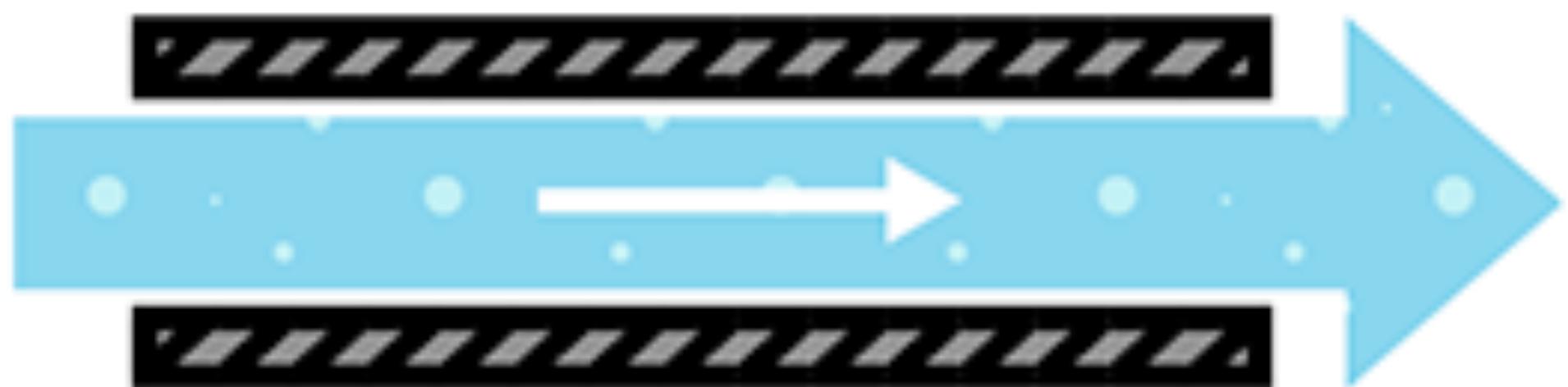
Elektrische Stromstärke

R (Formelzeichen)

Ω (Einheitenzeichen)

Resistance

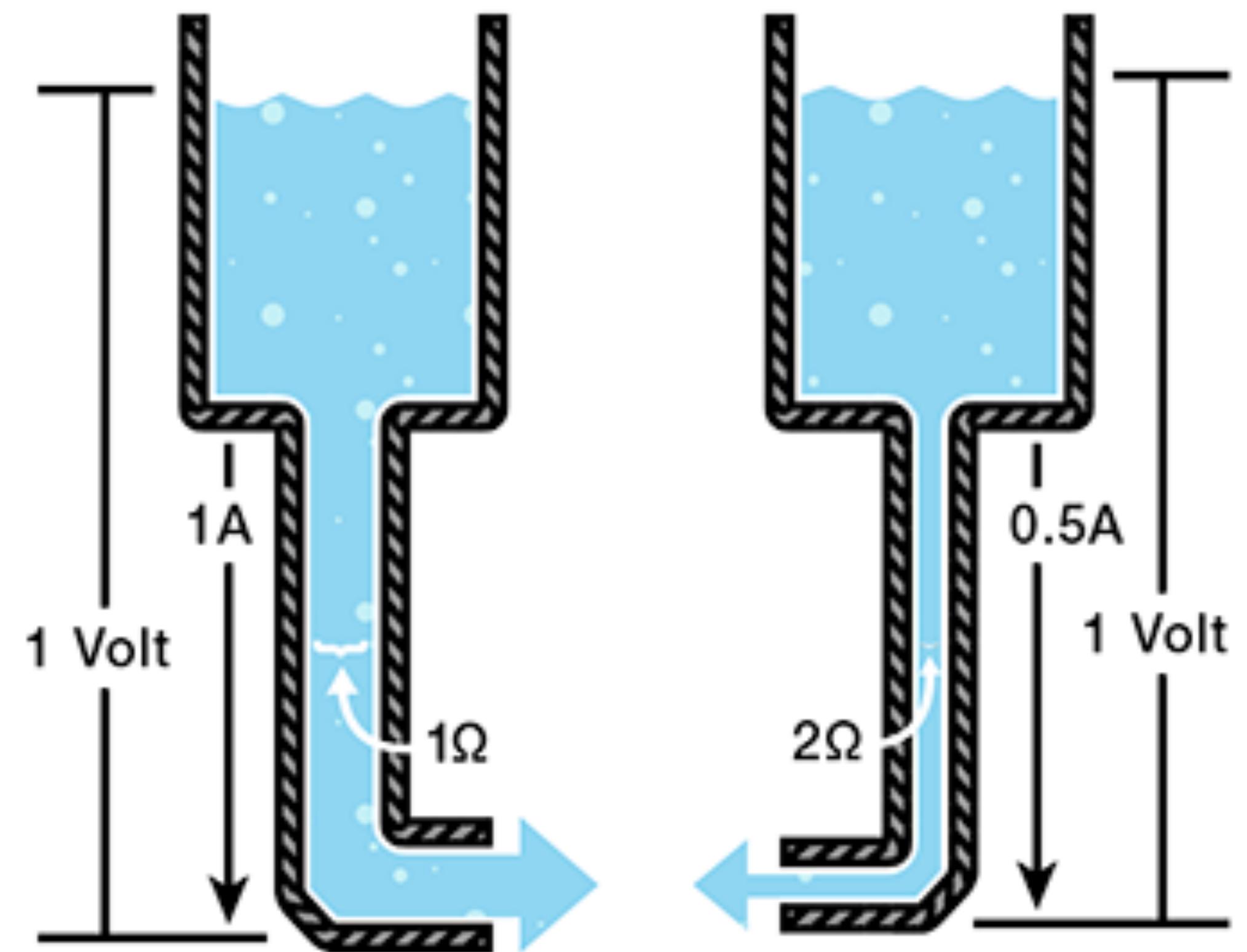
Less resistance



More resistance

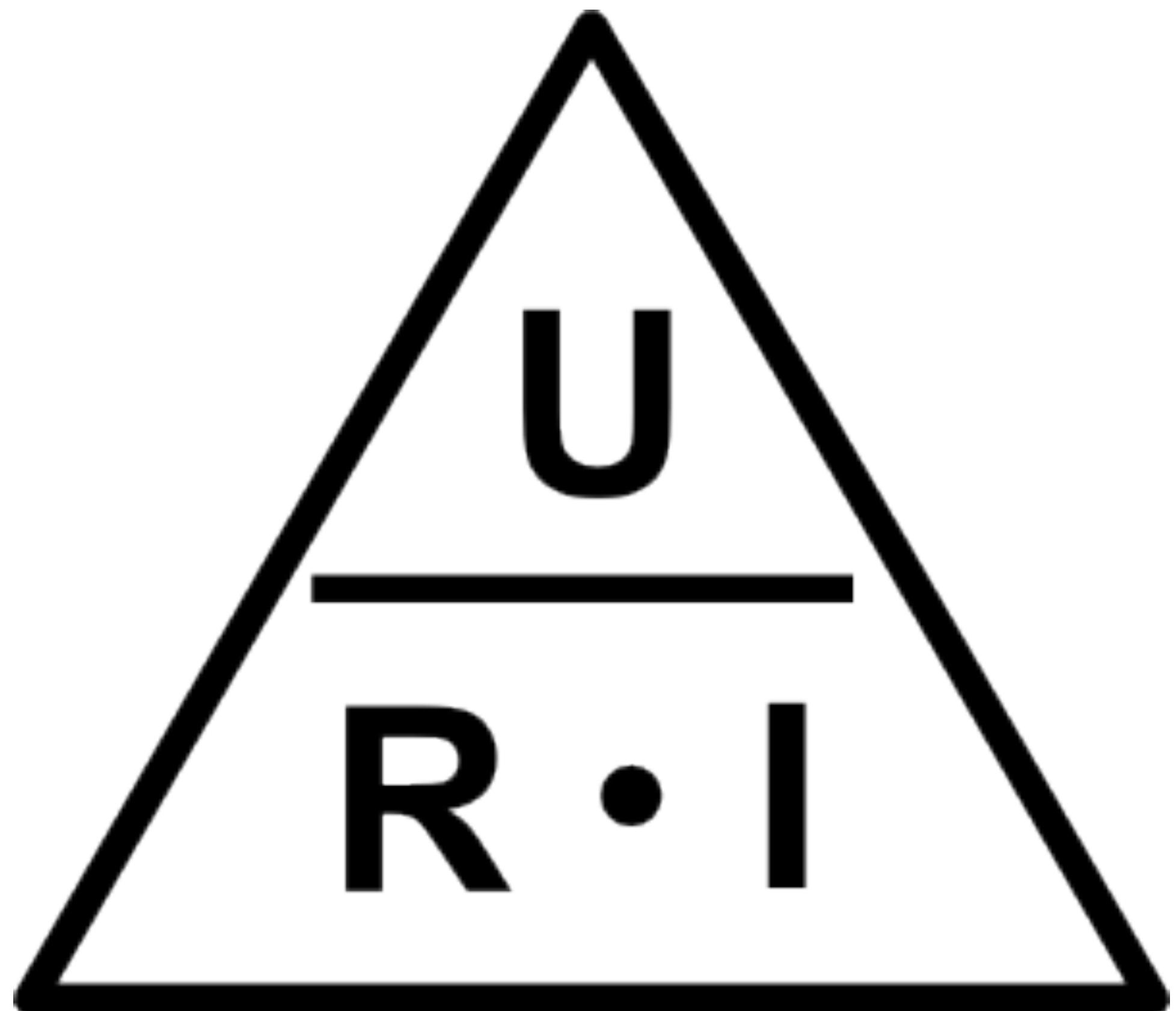


Widerstand



P (Formelzeichen)
W (Einheitenzeichen)

Elektrische Leistung



Widerstand berechnen

Rechenbeispiel

$$R = U / I$$

Rechenbeispiel

$$R = 3V / 14mA$$

Rechenbeispiel

$$R = 3v / 0,014A$$

Rechenbeispiel

$$214 \Omega = 3V / 0,014A$$

Rechenbeispiel

$$220 \Omega = 3V / 0,02A$$

Rechenbeispiel

$$P = U * I$$

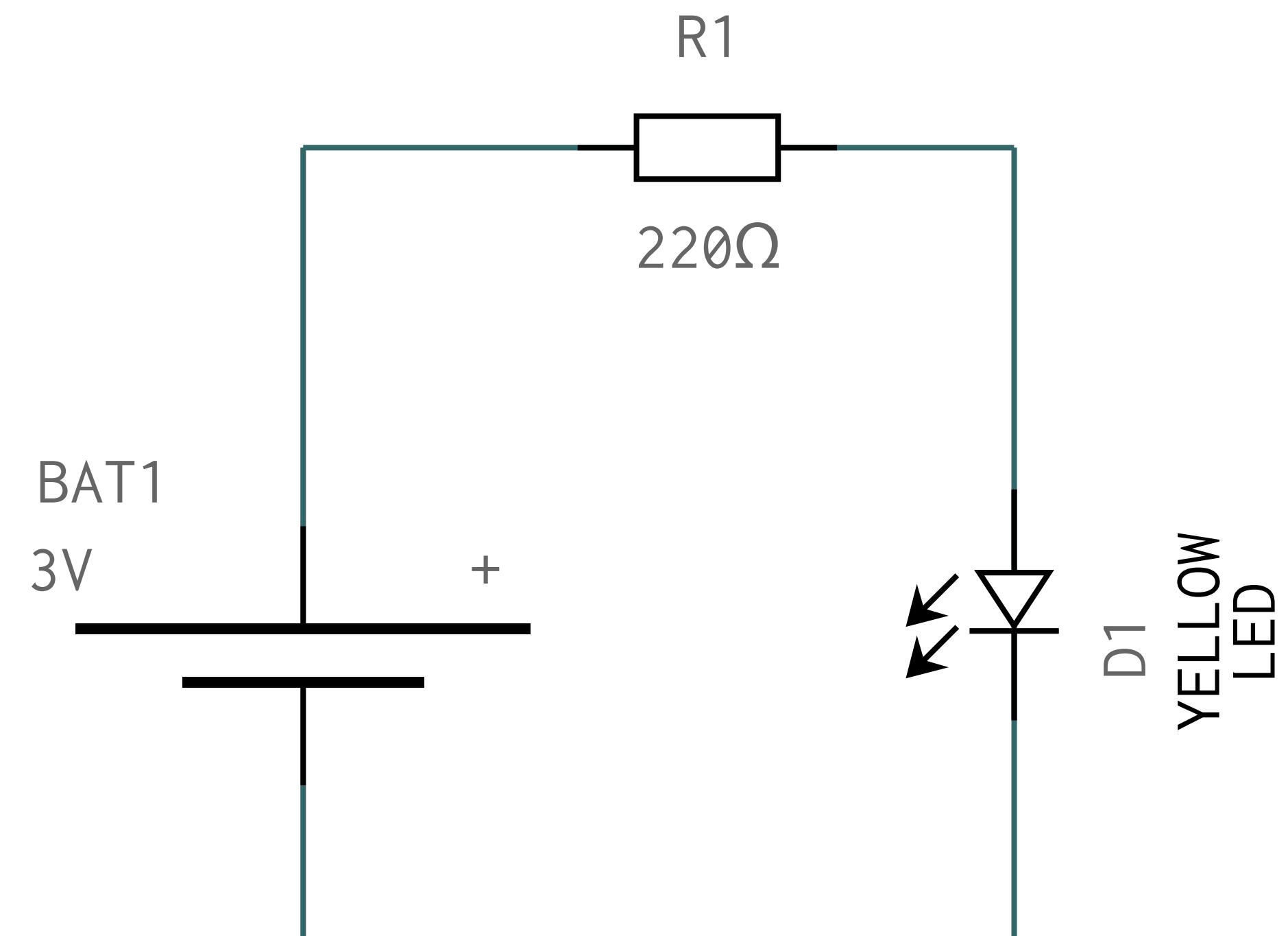
Rechenbeispiel

$$P = 20V * 10A$$

Rechenbeispiel

$$200W = 20V * 10A$$

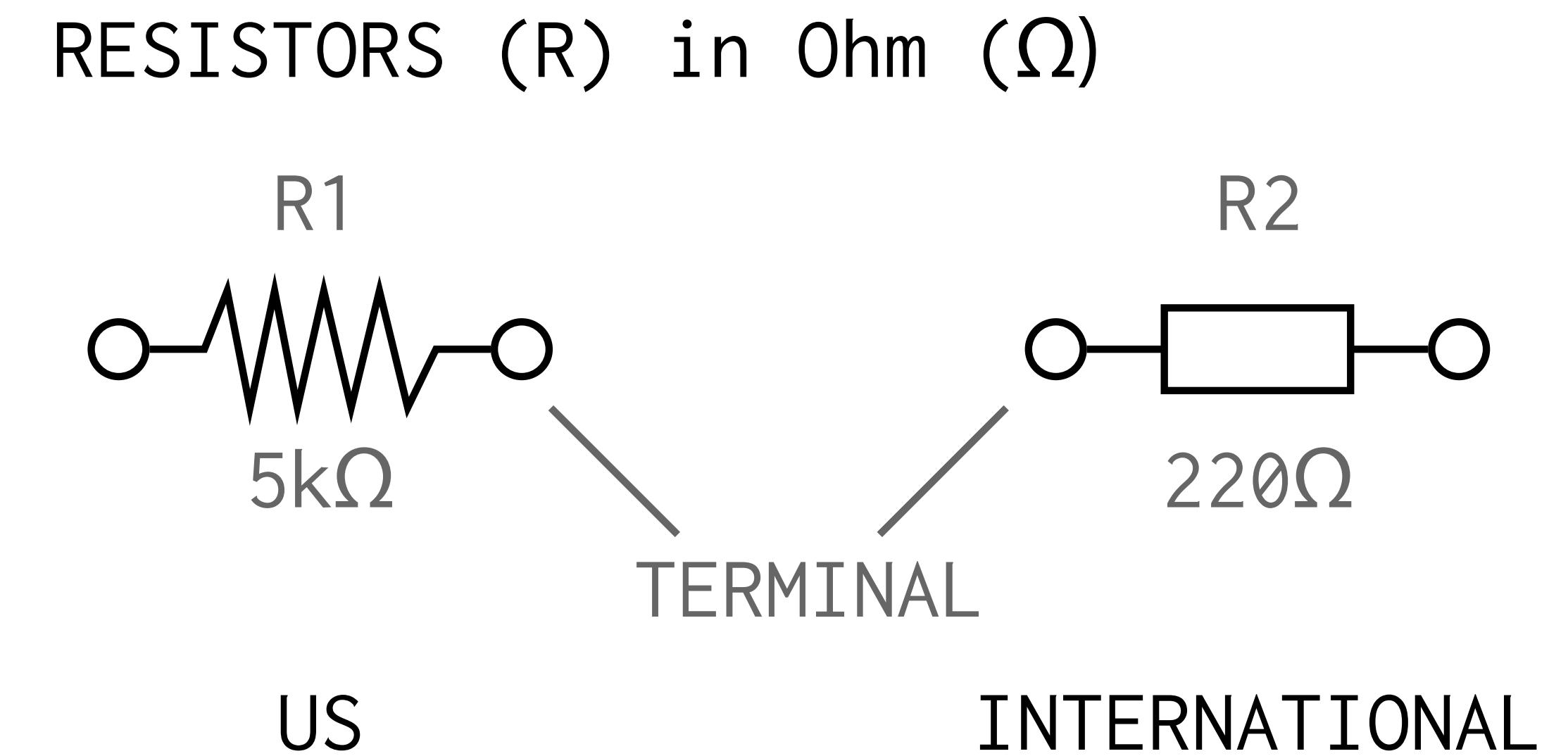
Rechenbeispiel



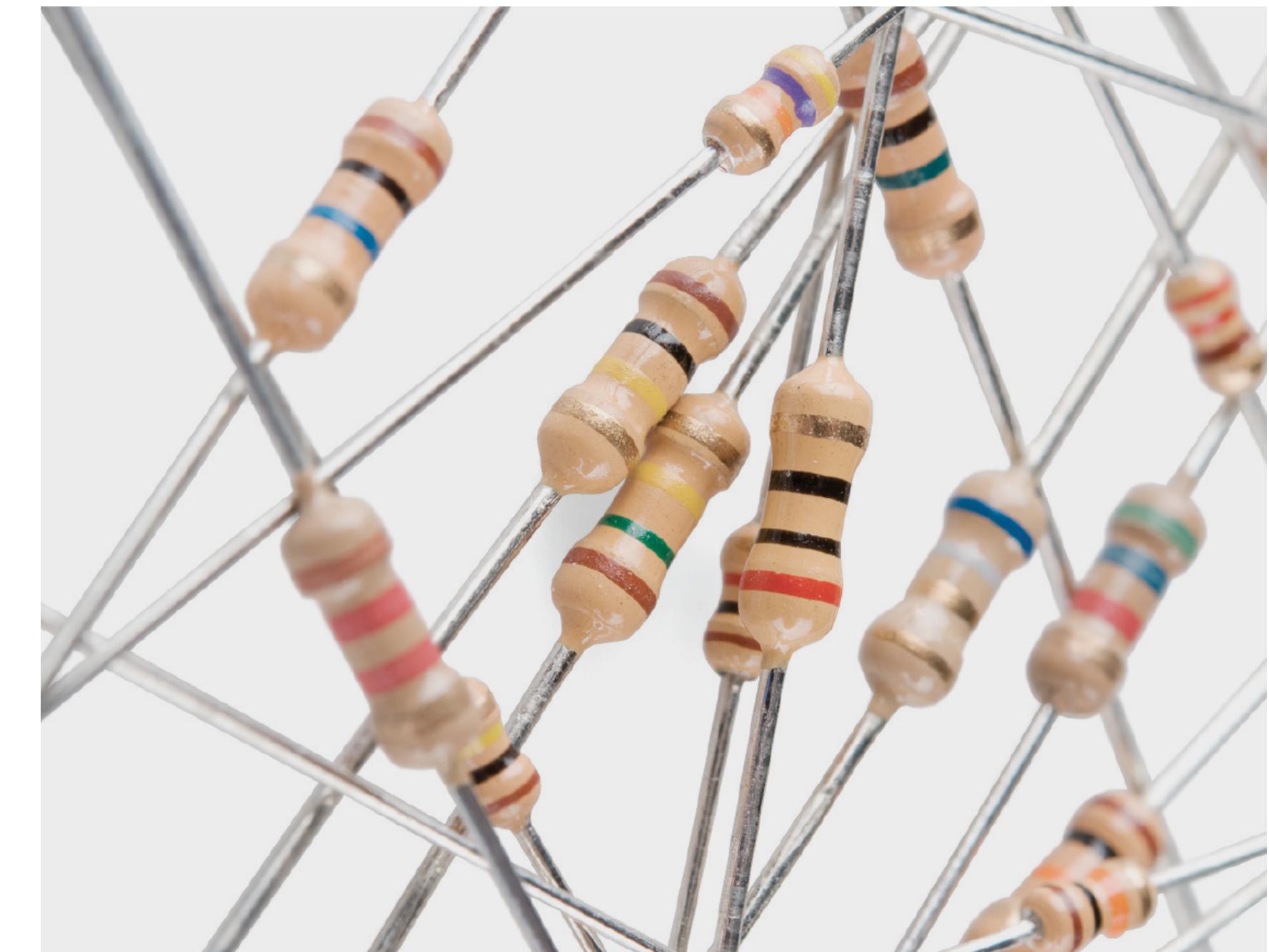
Rechenbeispiel

Schaltkreise

Schaltkreise

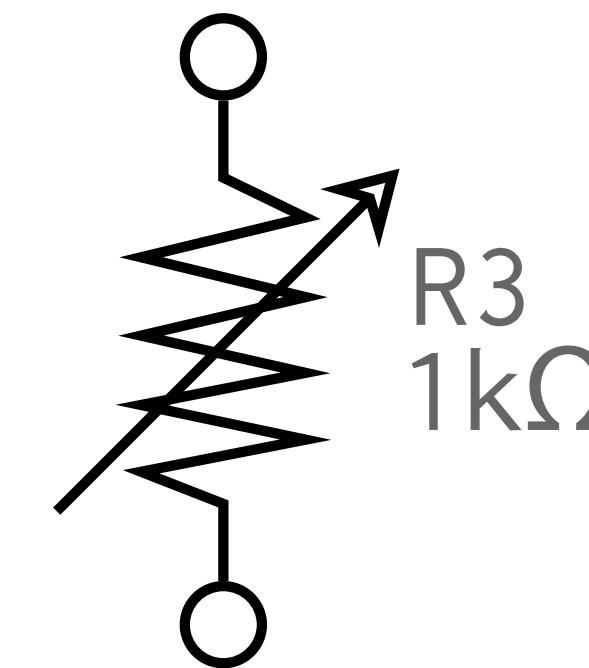


<https://www.digikey.de/de/resources/conversion-calculators/conversion-calculator-resistor-color-code-4-band>

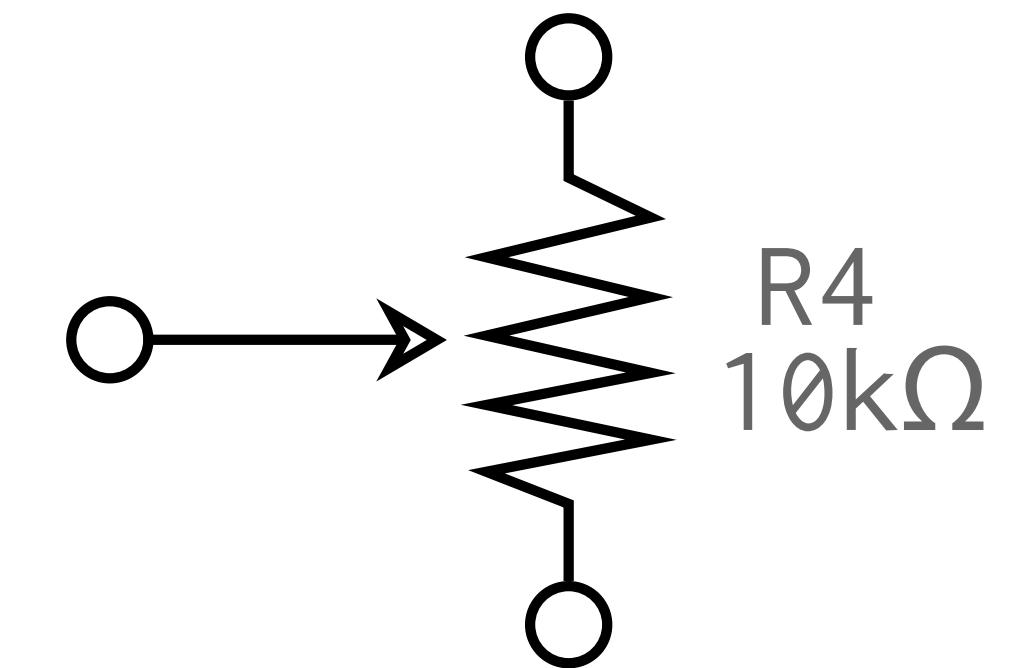


Schaltkreise

MORE RESISTORS (R) in Ohm (Ω)



VARIABLE



POTENTIOMETER

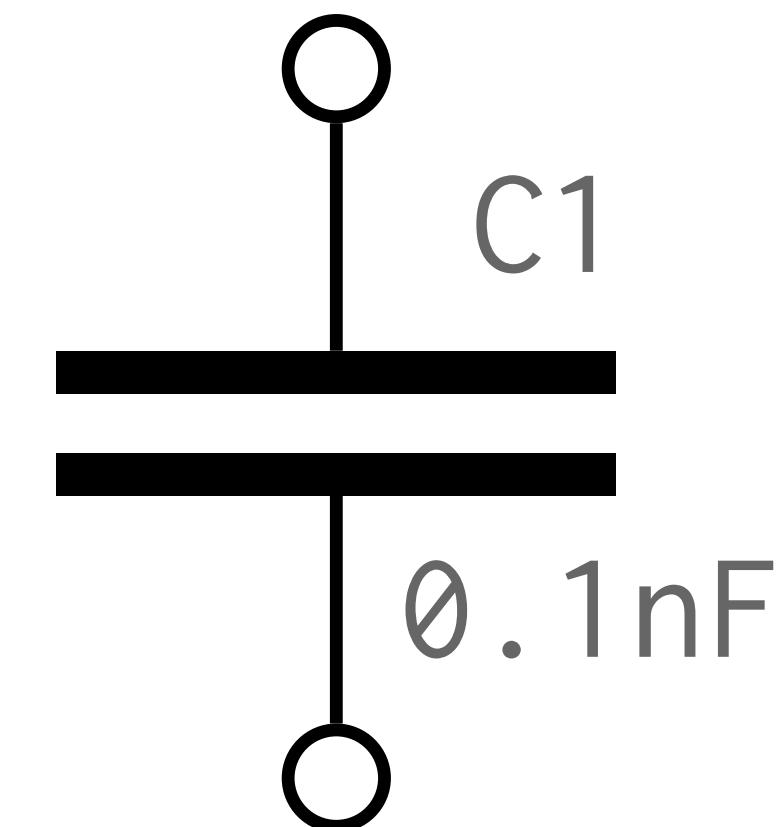


Schaltkreise

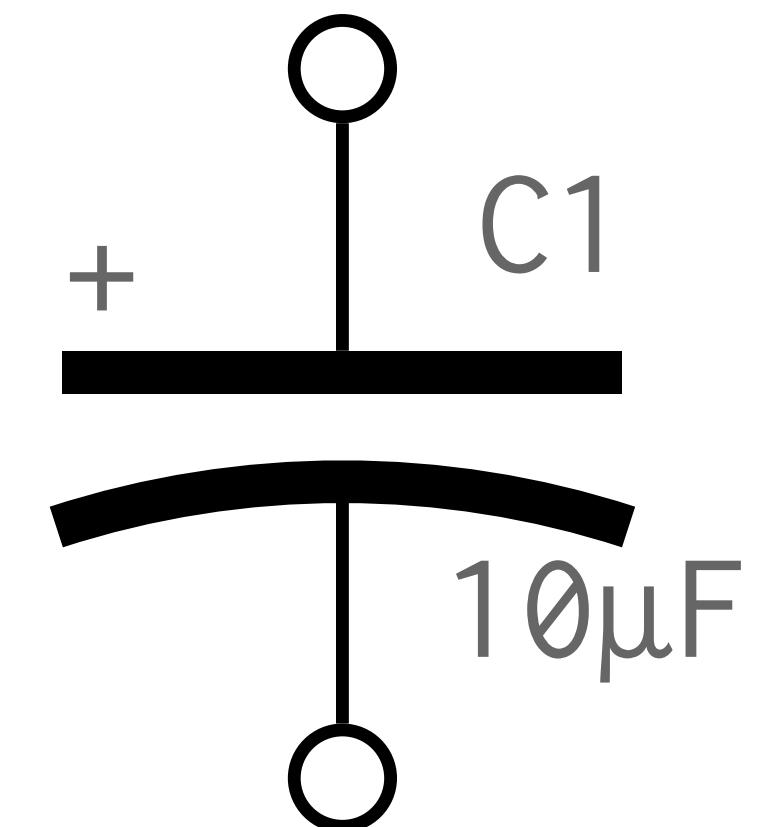


Schaltkreise

CAPACITORS (C) in Farad



NON-POLARIZED

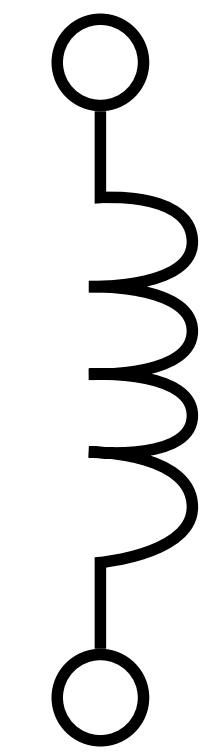


POLARIZED

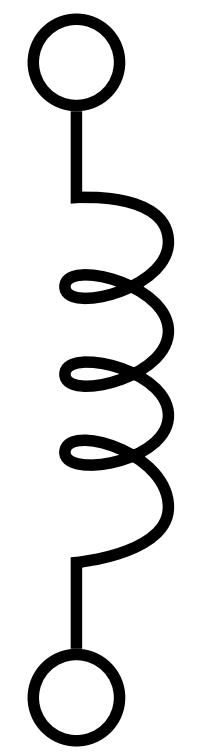


Schaltkreise

INDUCTORS (L) in Henry (H)



L1
 $47\mu\text{H}$



L2
 22nH



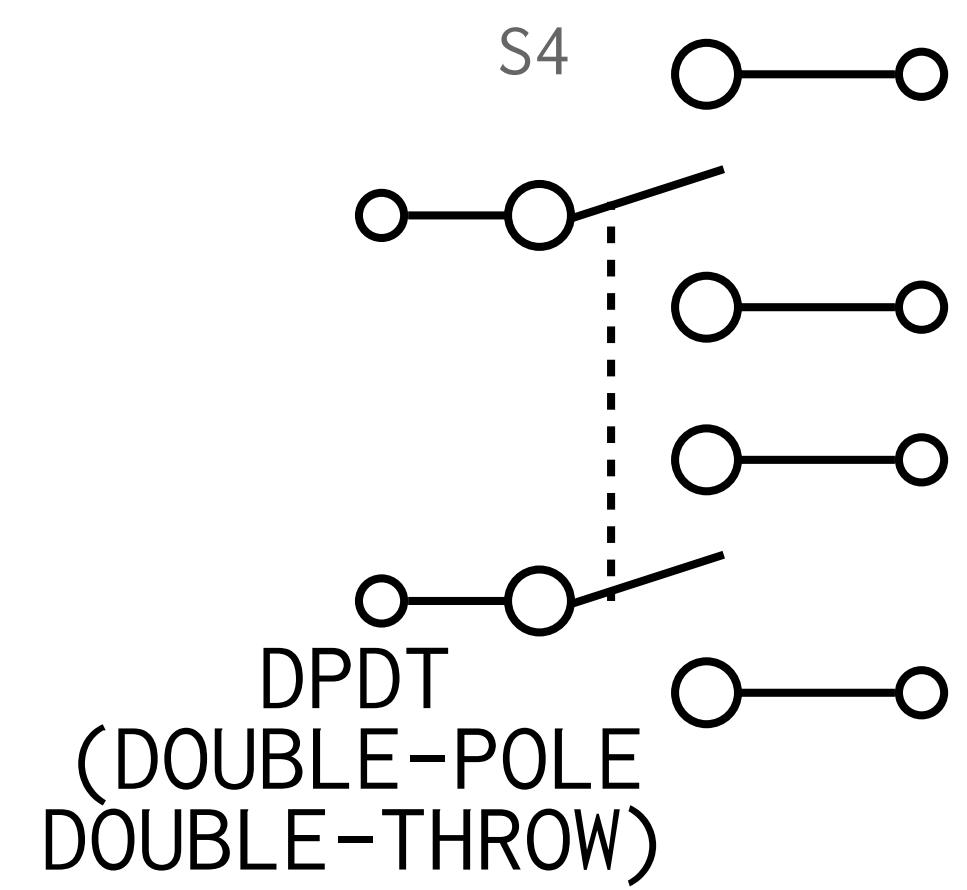
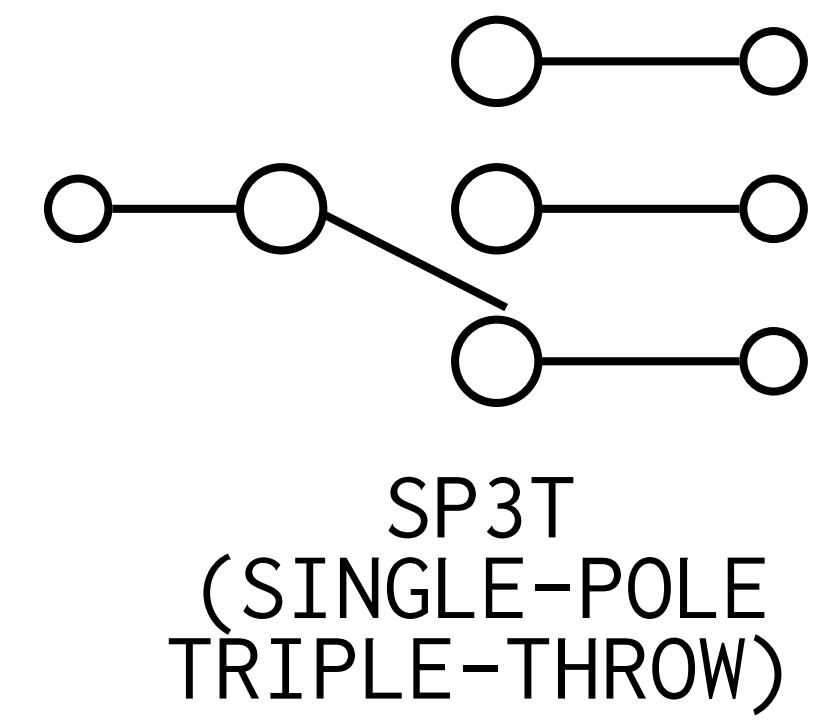
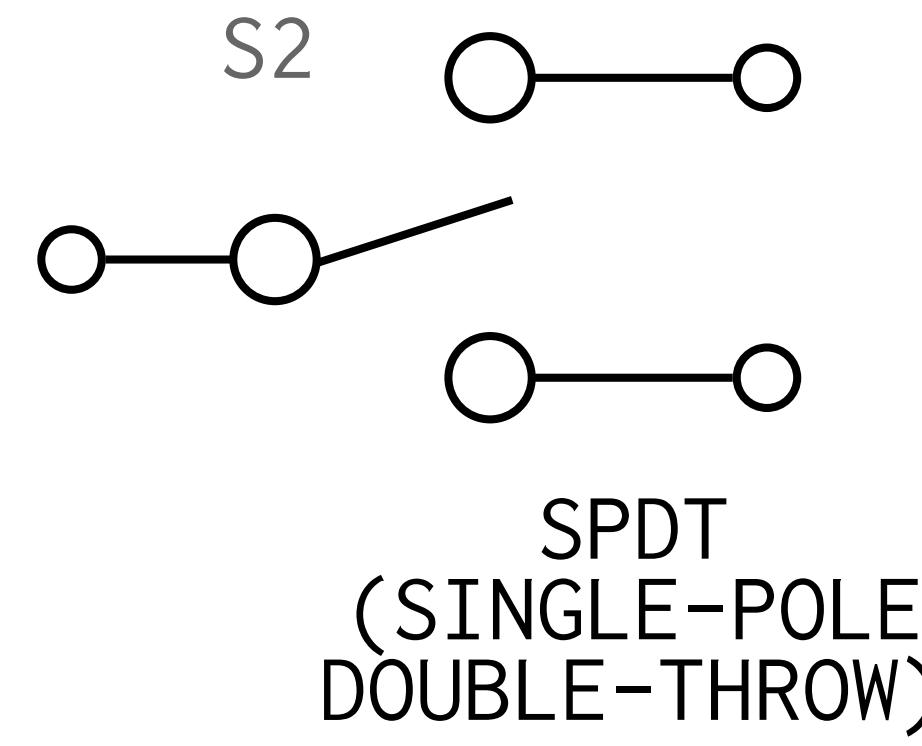
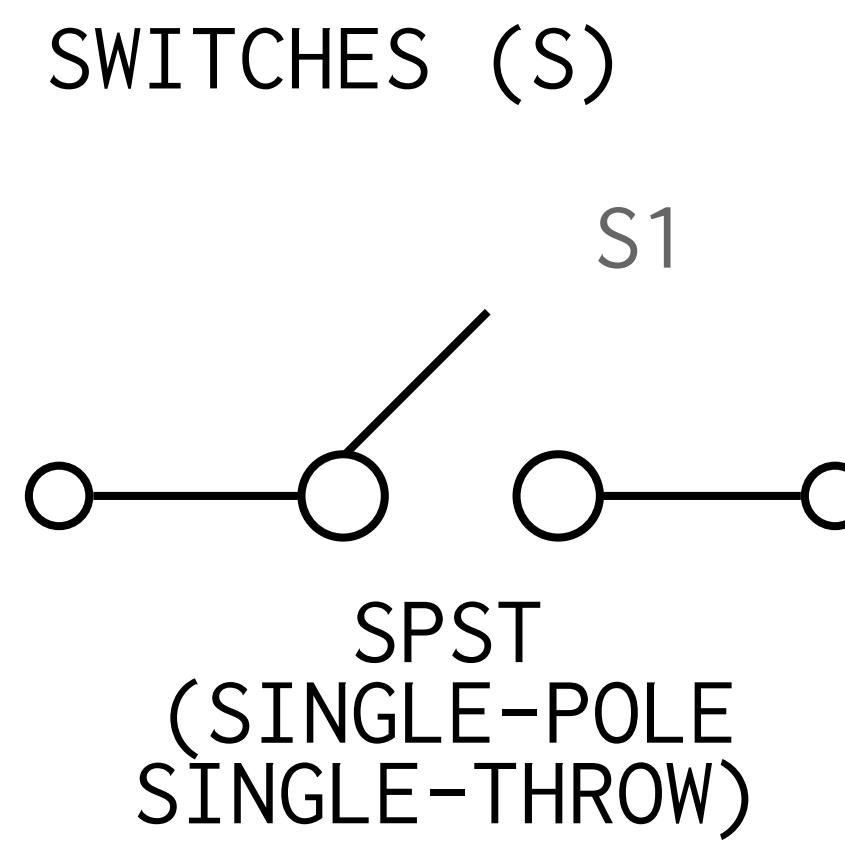
L3
 6mH

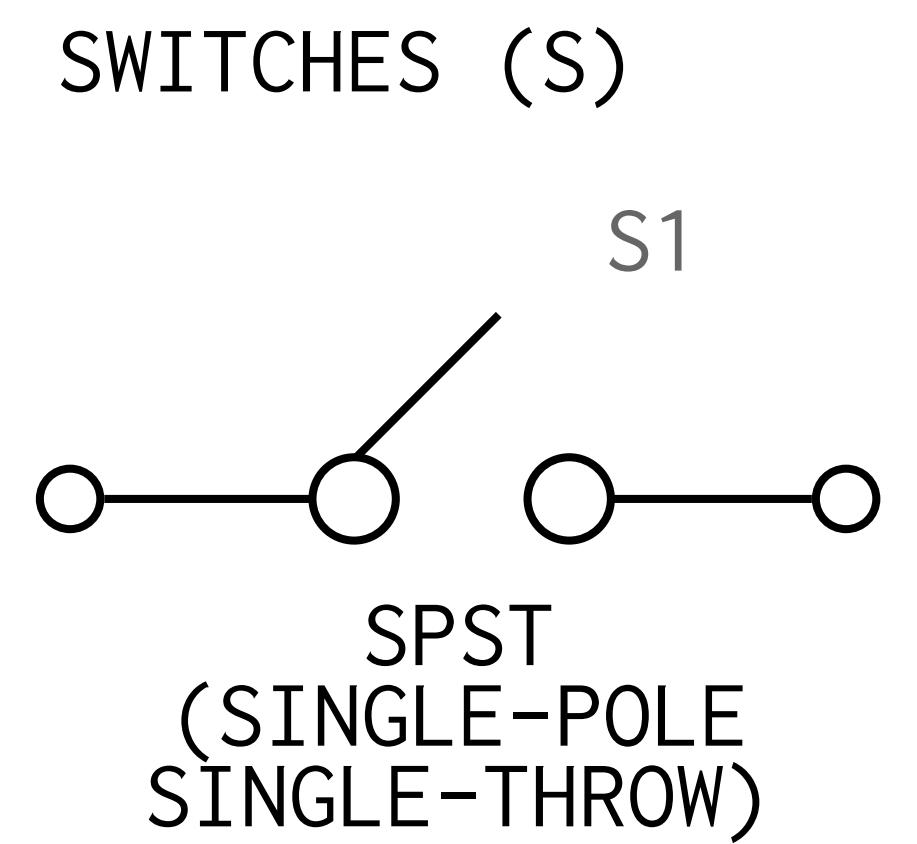
US

INTERNATIONAL

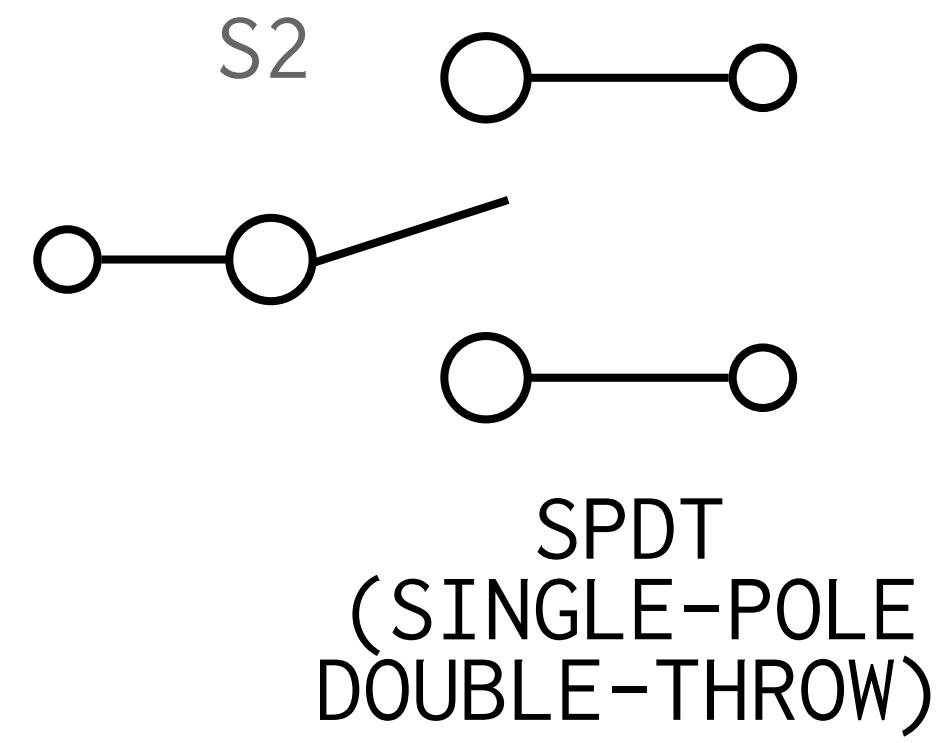


Schaltkreise

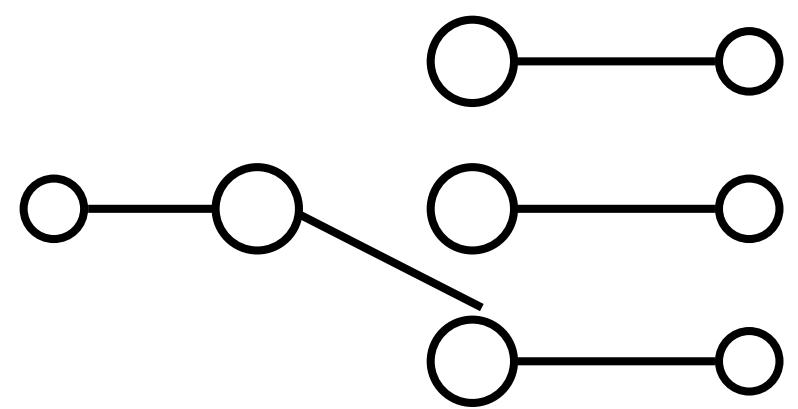




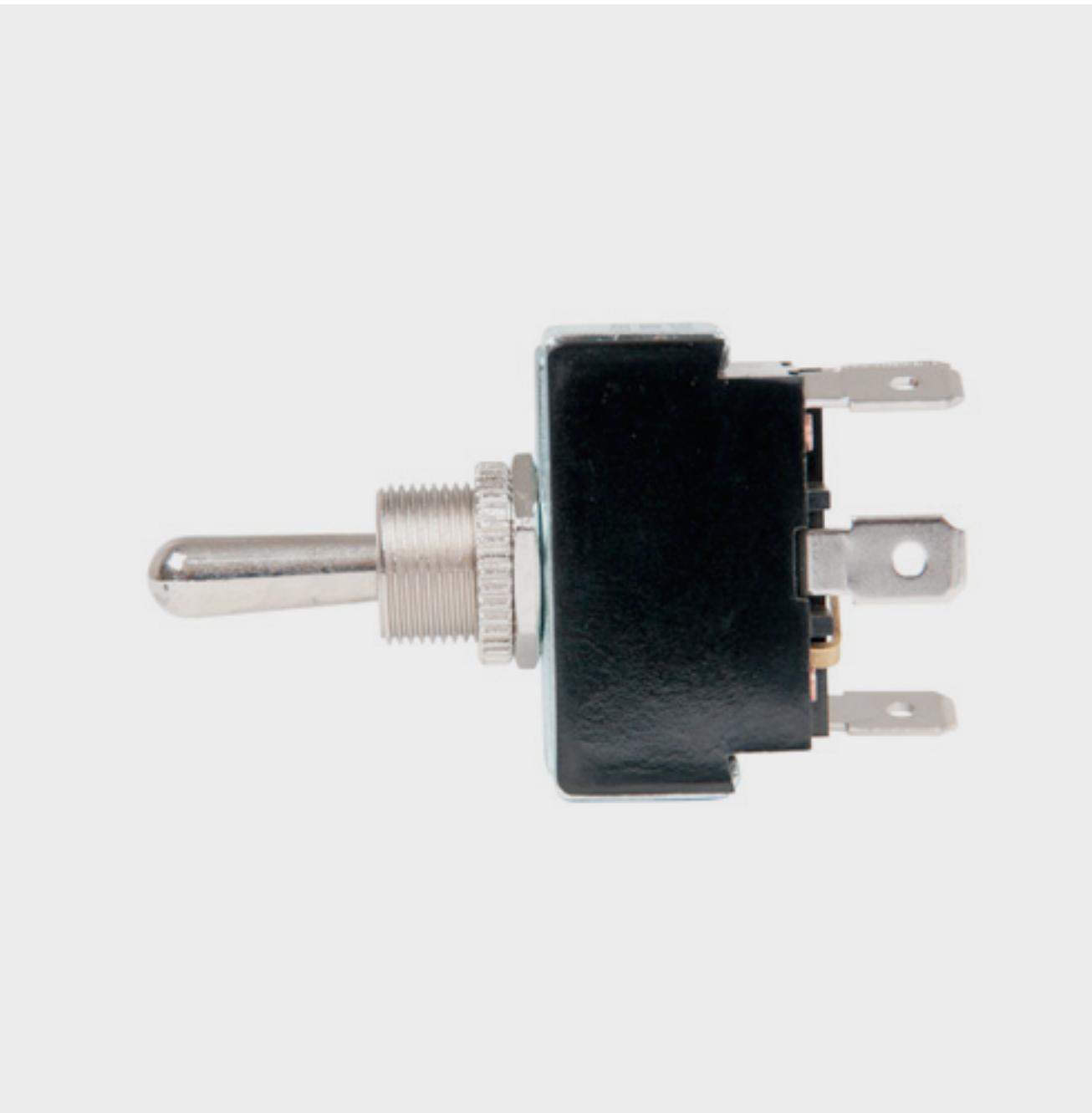
Schaltkreise



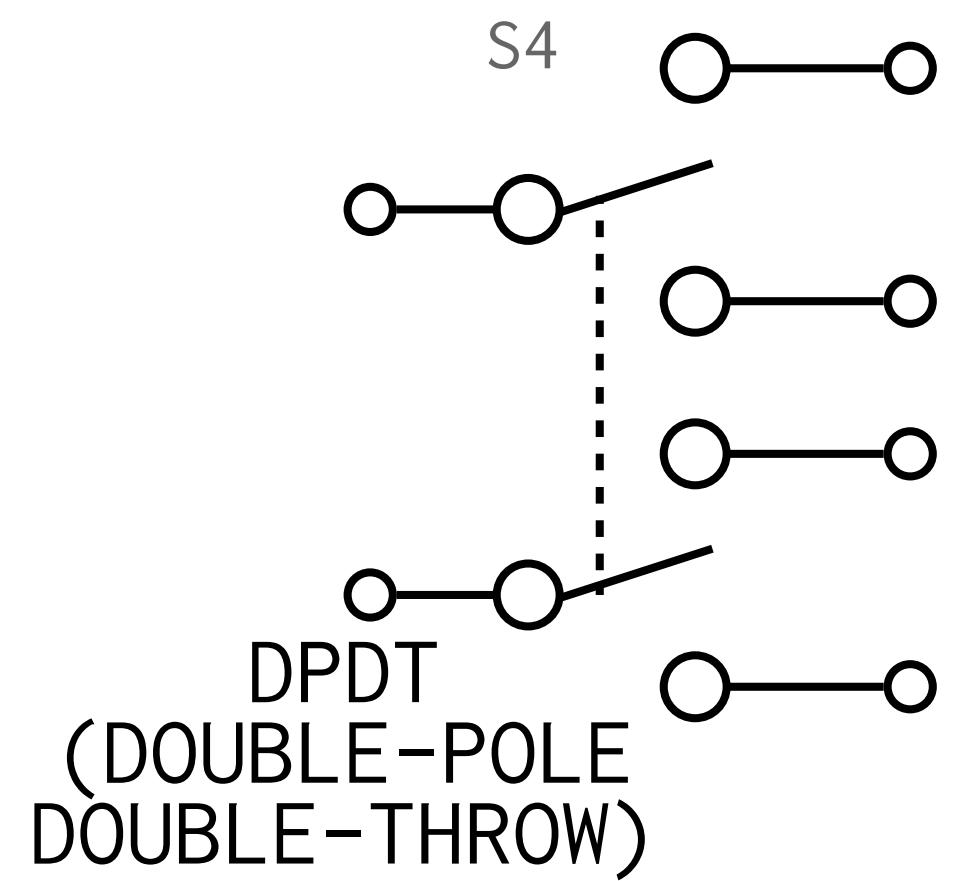
Schaltkreise



SP3T
(SINGLE-POLE
TRIPLE-THROW)

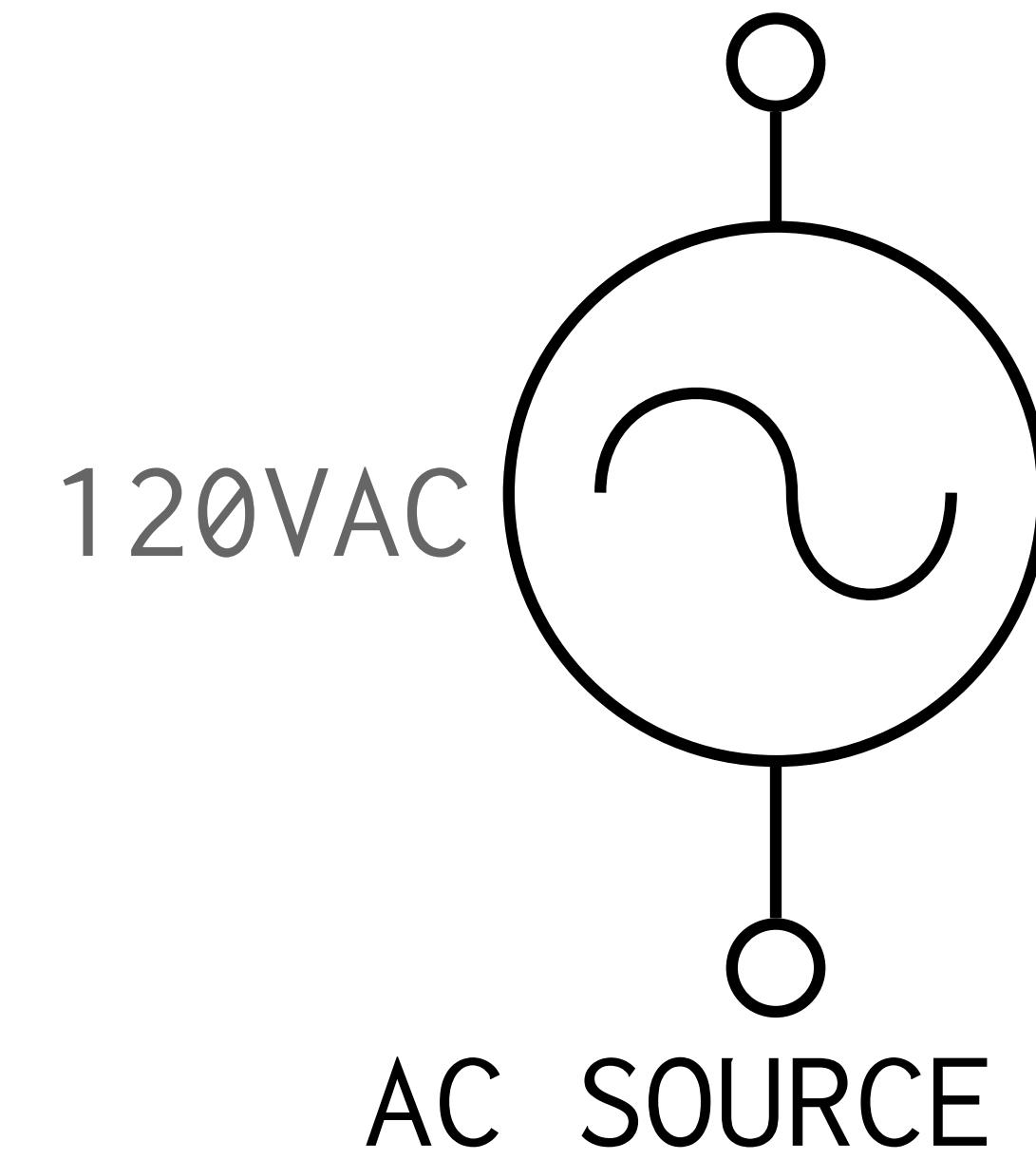
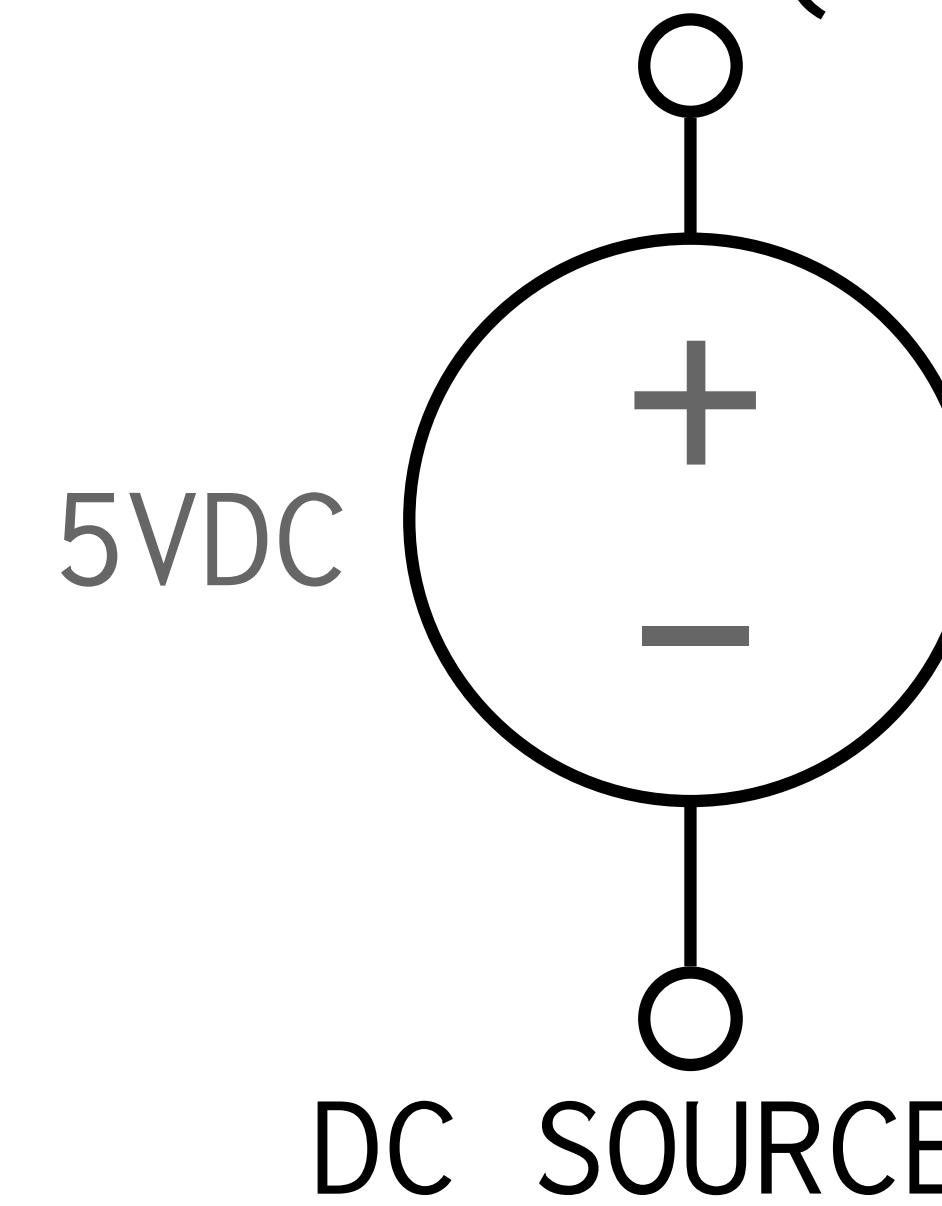


Schaltkreise



Schaltkreise

POWER SOURCES (DIRECT/ALTERNATING CURRENT)

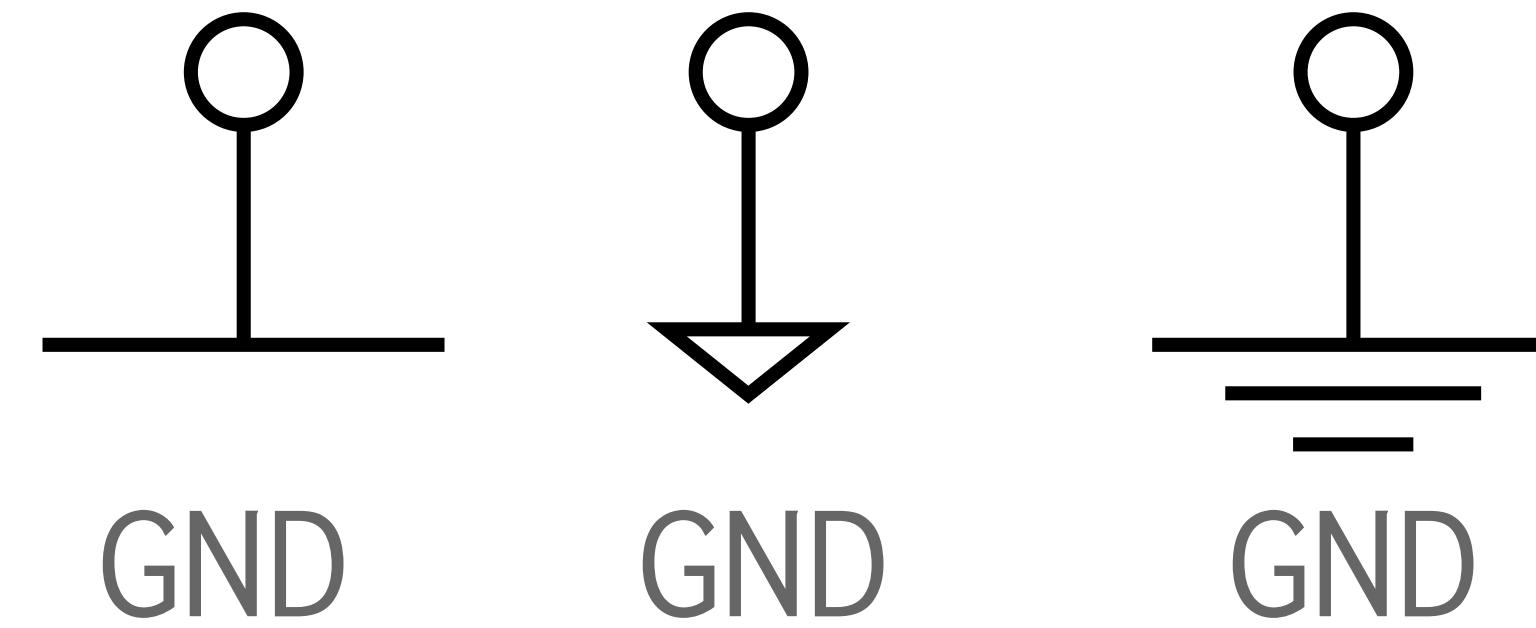
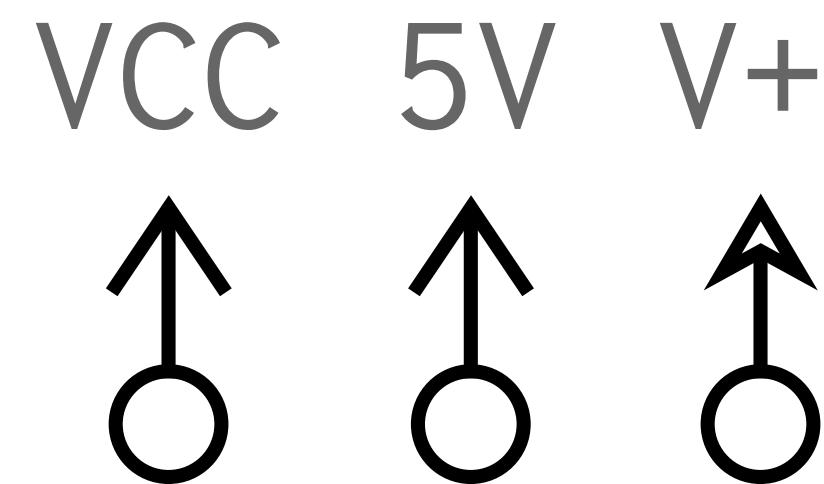




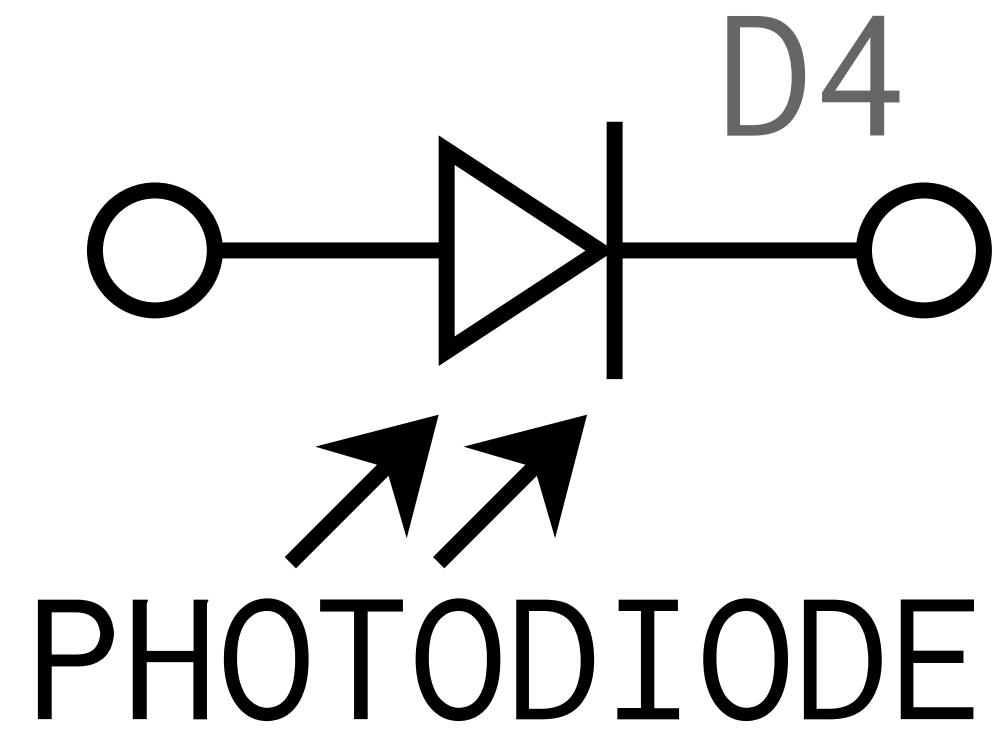
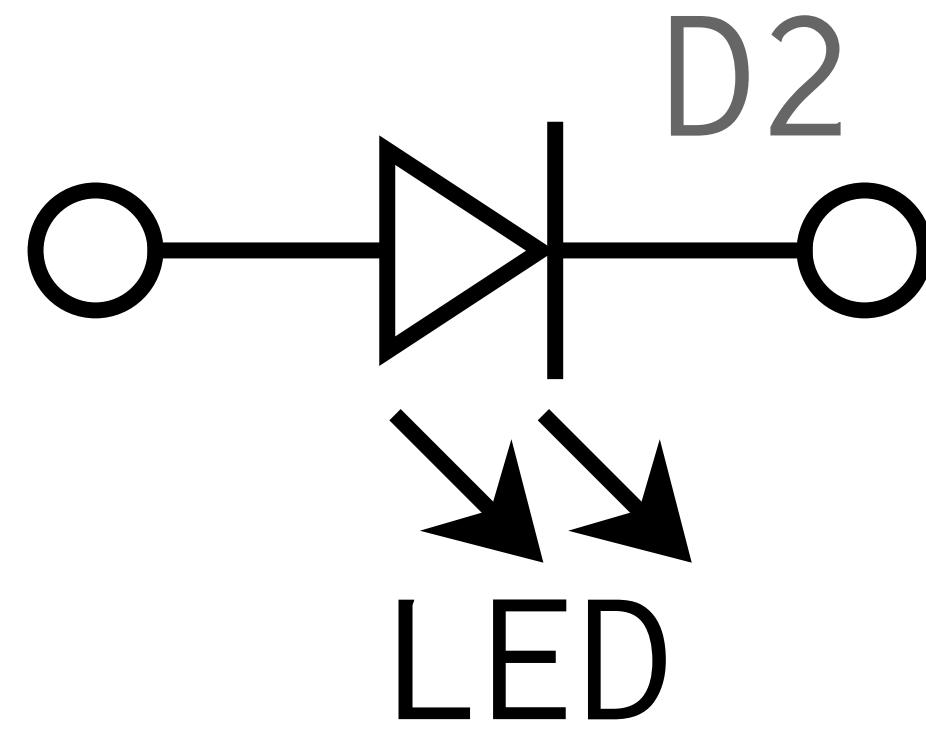
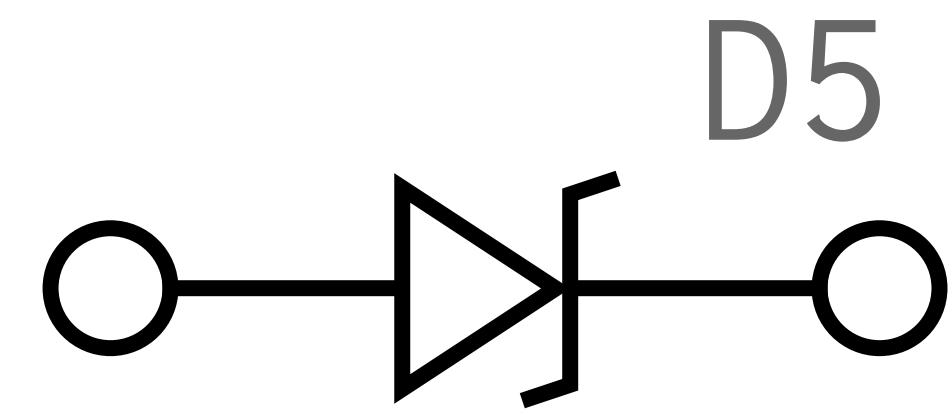
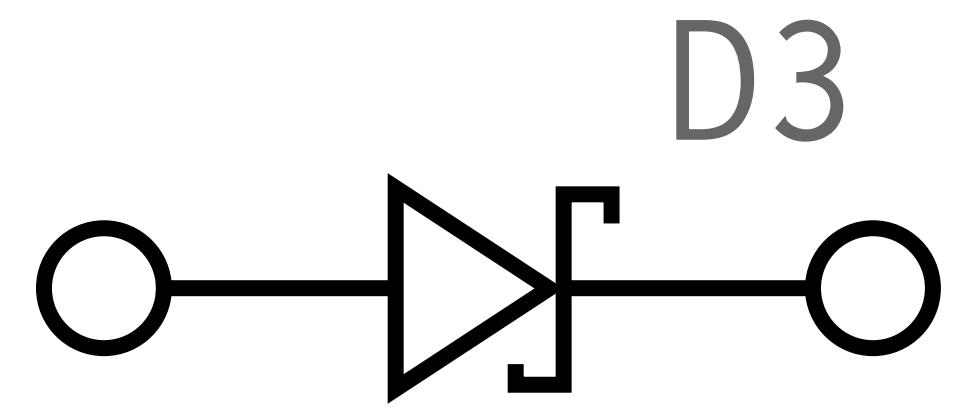
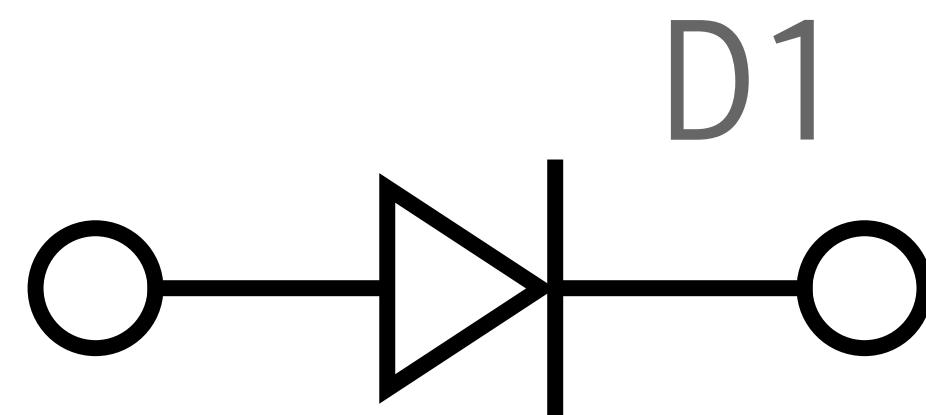
Schaltkreise

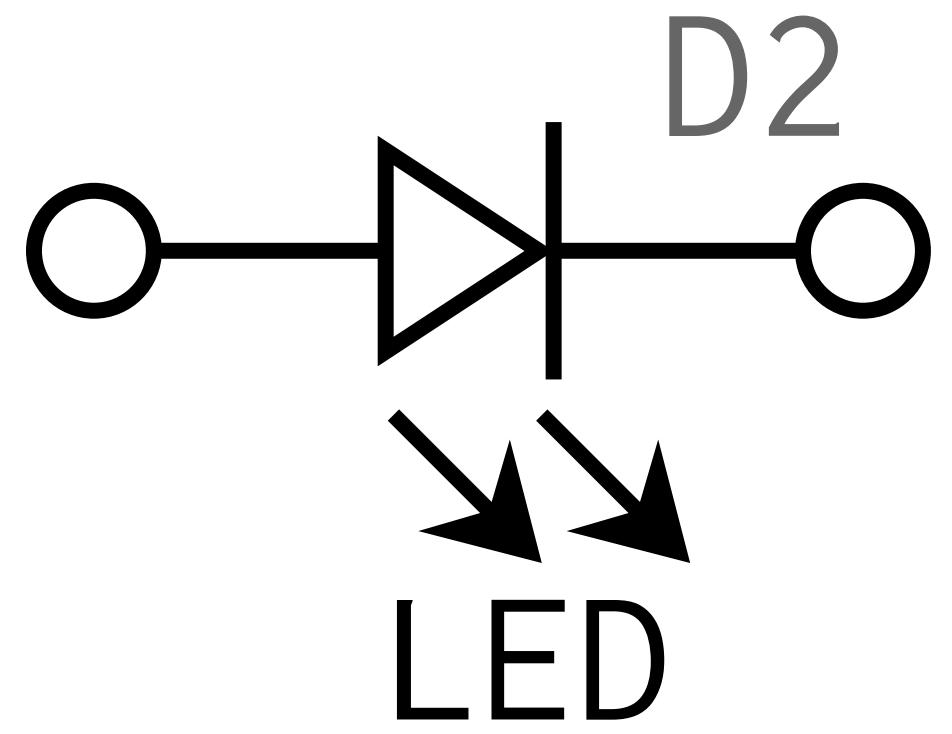
VOLTAGE NODES

VCC 5V V+

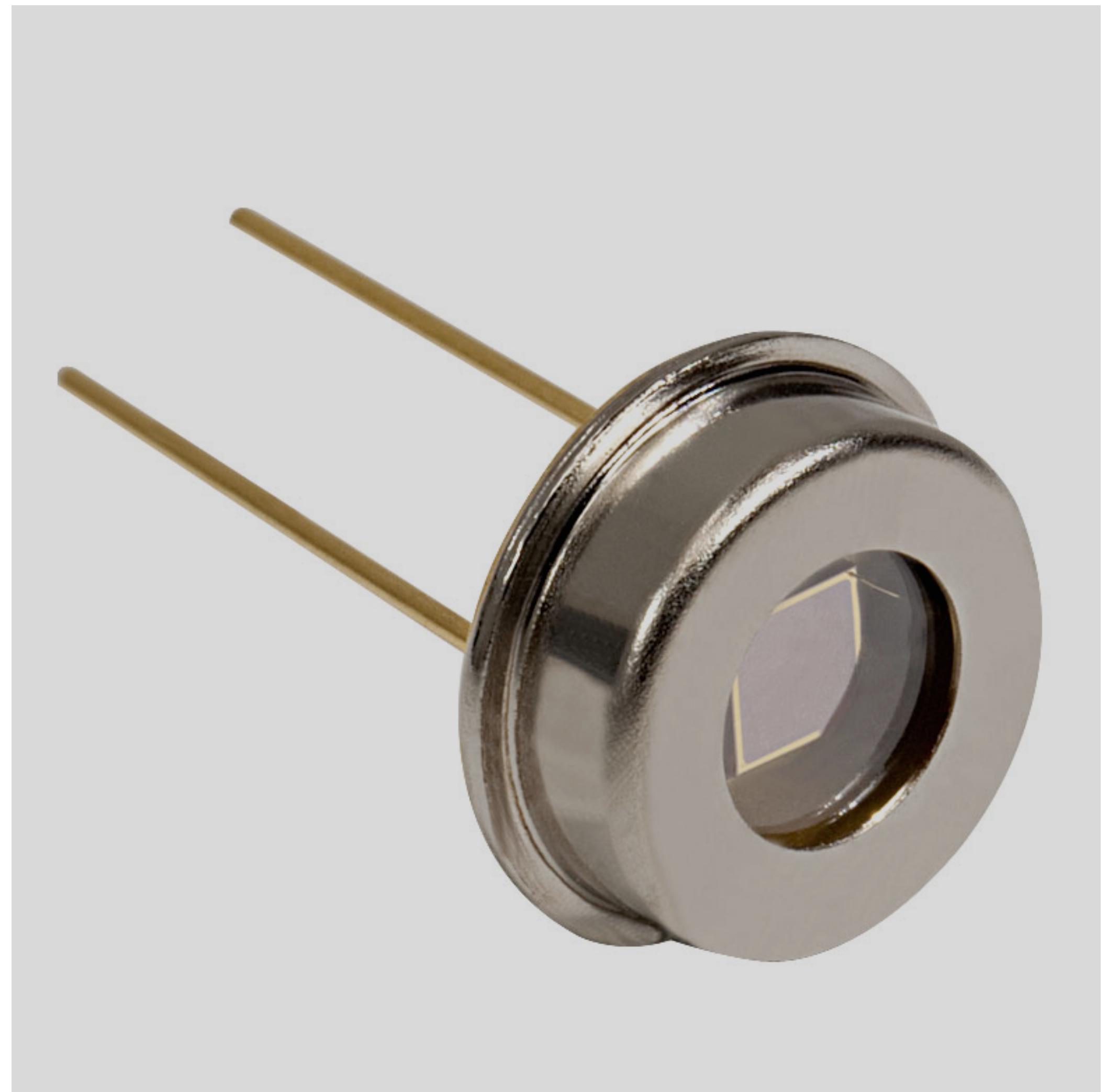
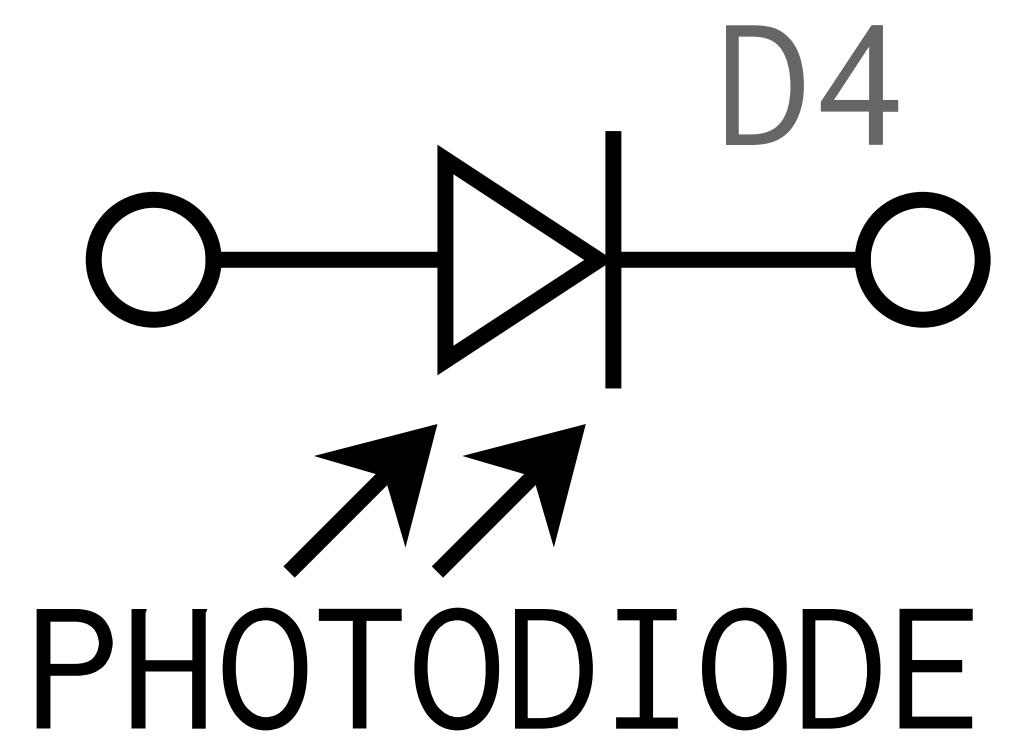


DIODES (D)

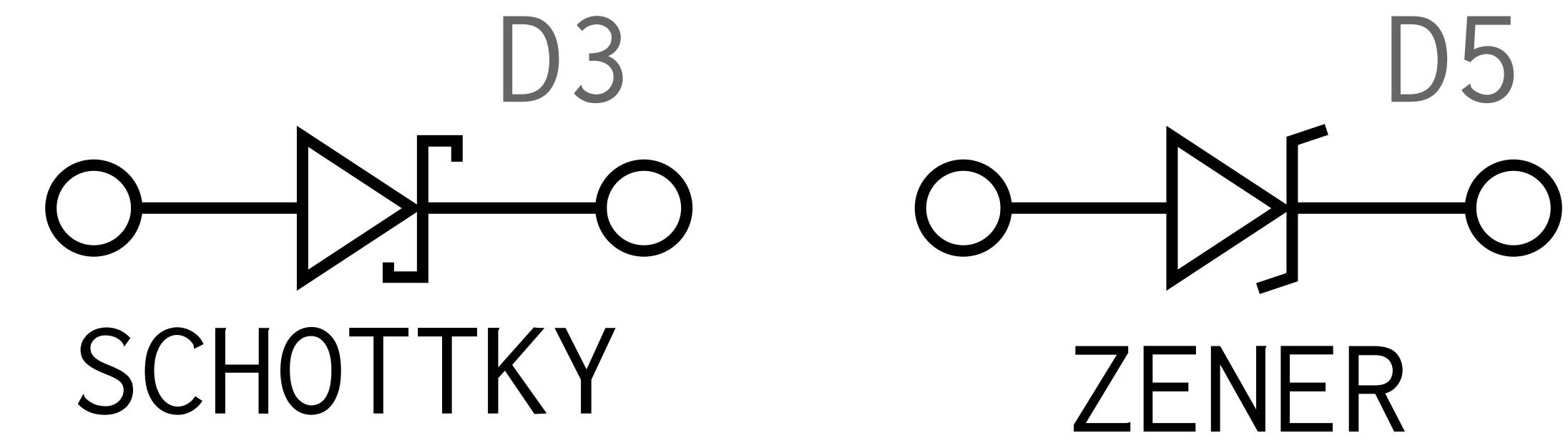




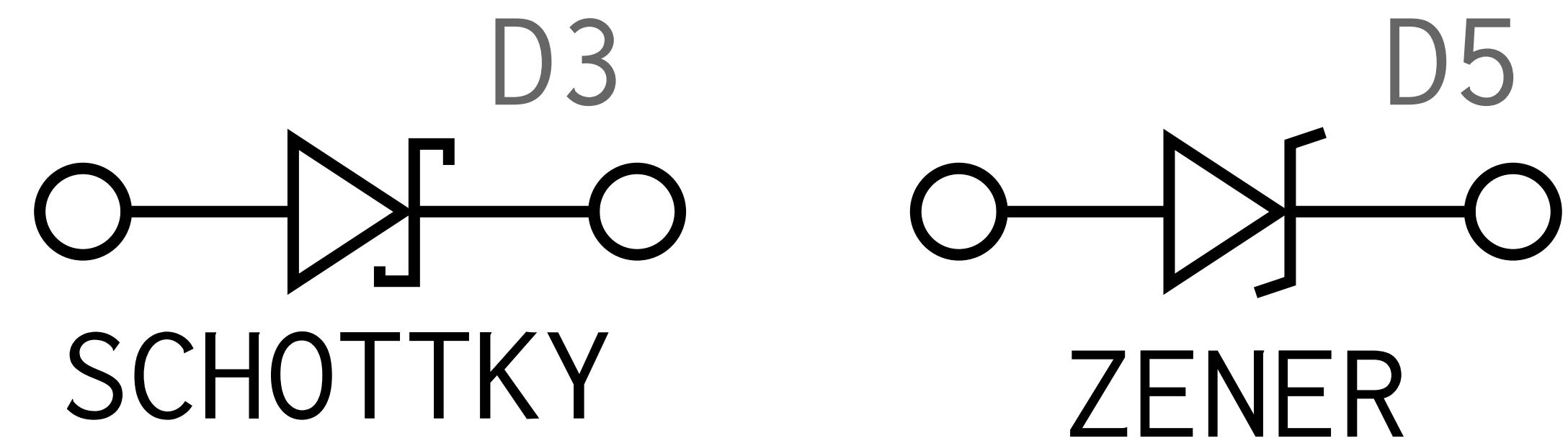
Schaltkreise



Schaltkreise



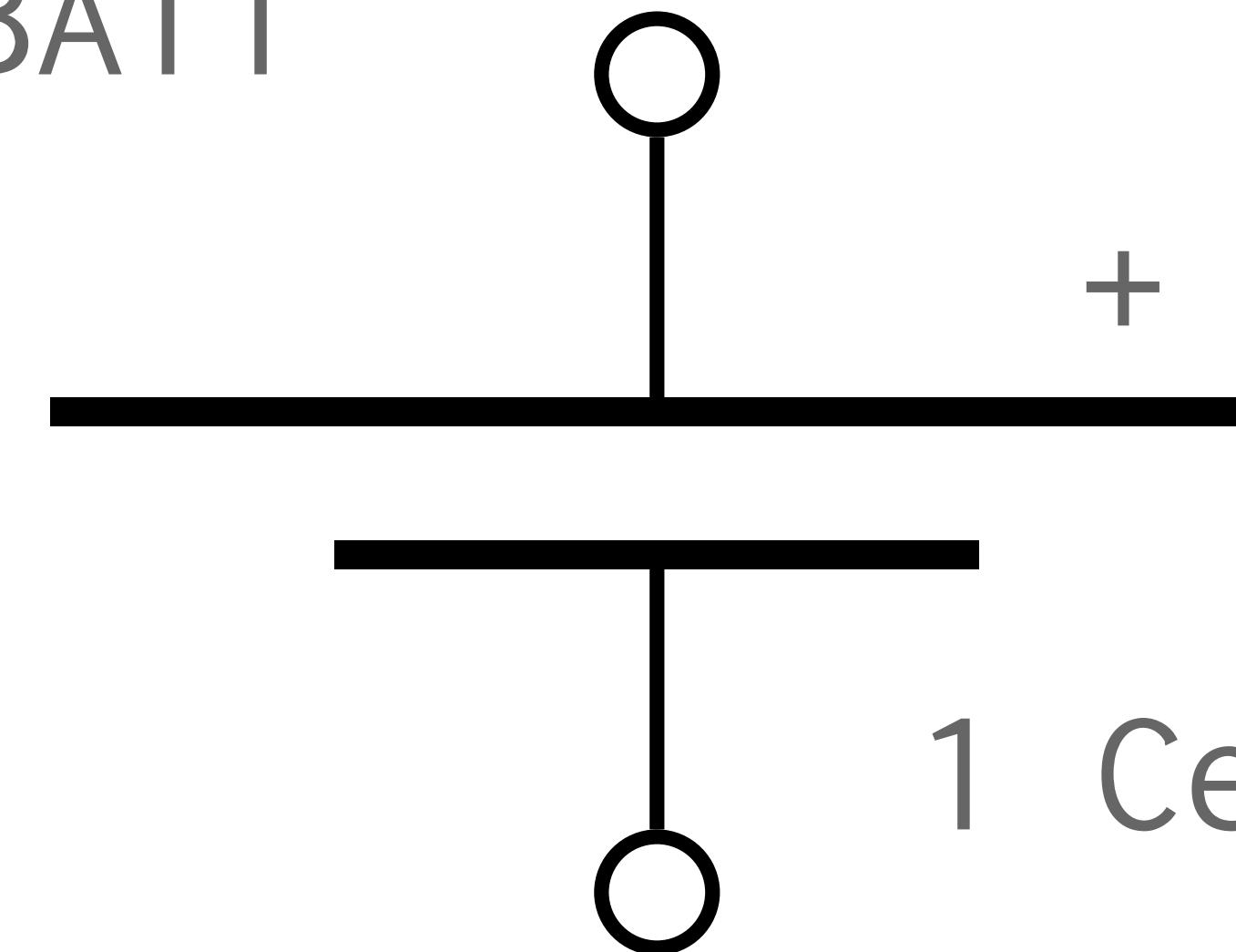
Schaltkreise



Schaltkreise

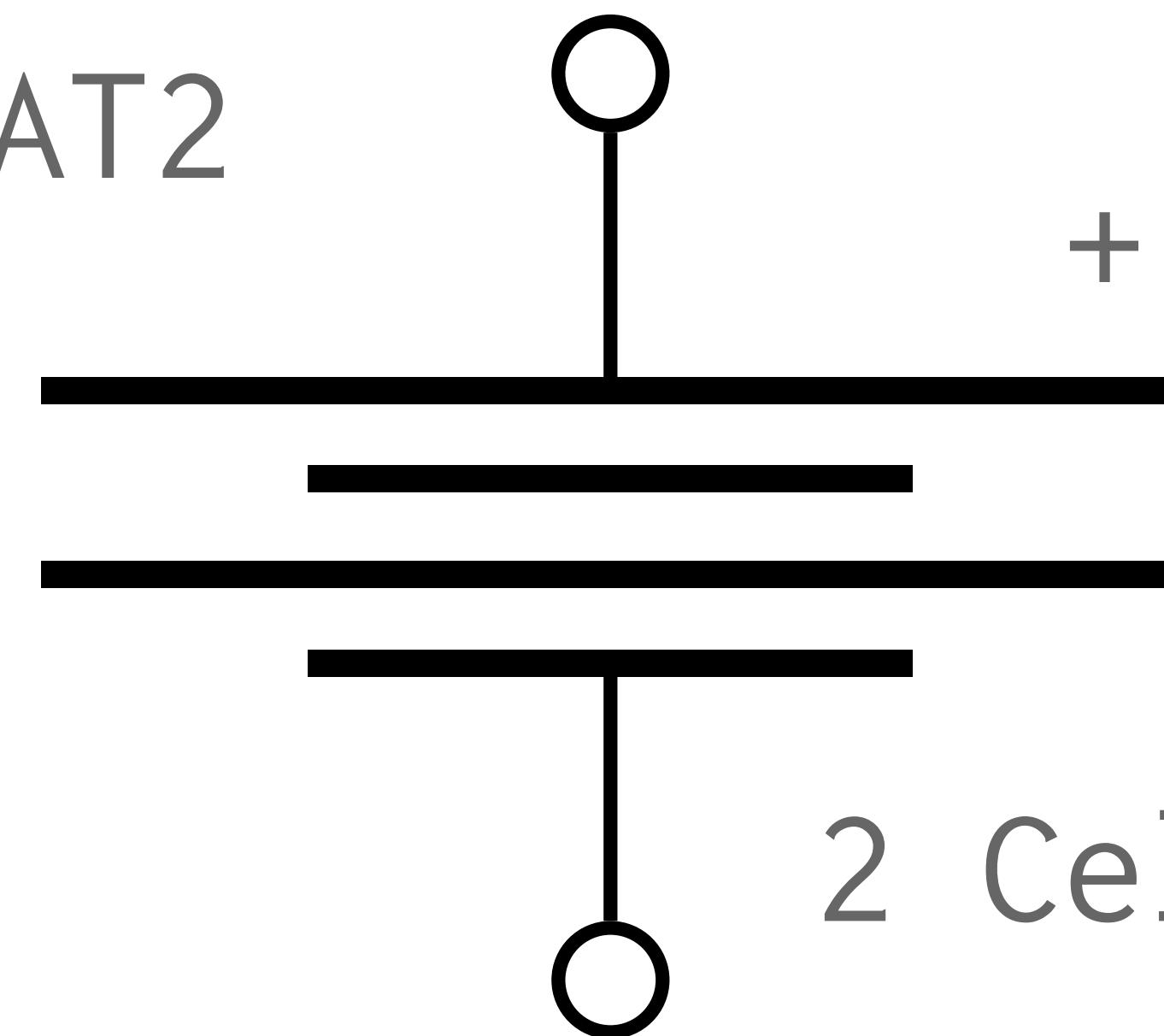
BATTERIES (BAT)

BAT1



1 Cell

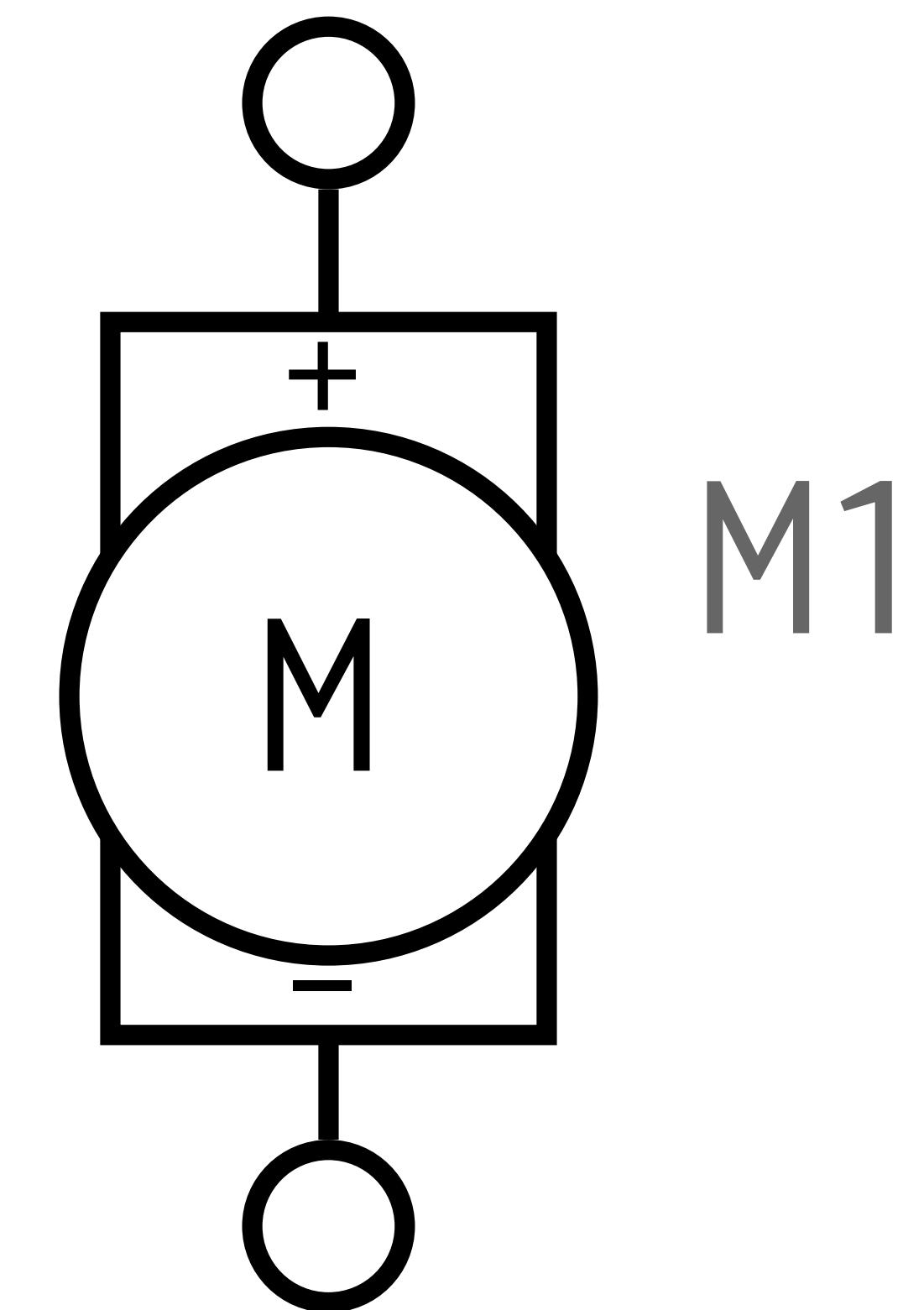
BAT2



2 Cells

LONG LEAD: POSITIVE TERMINAL

MOTORS (M)

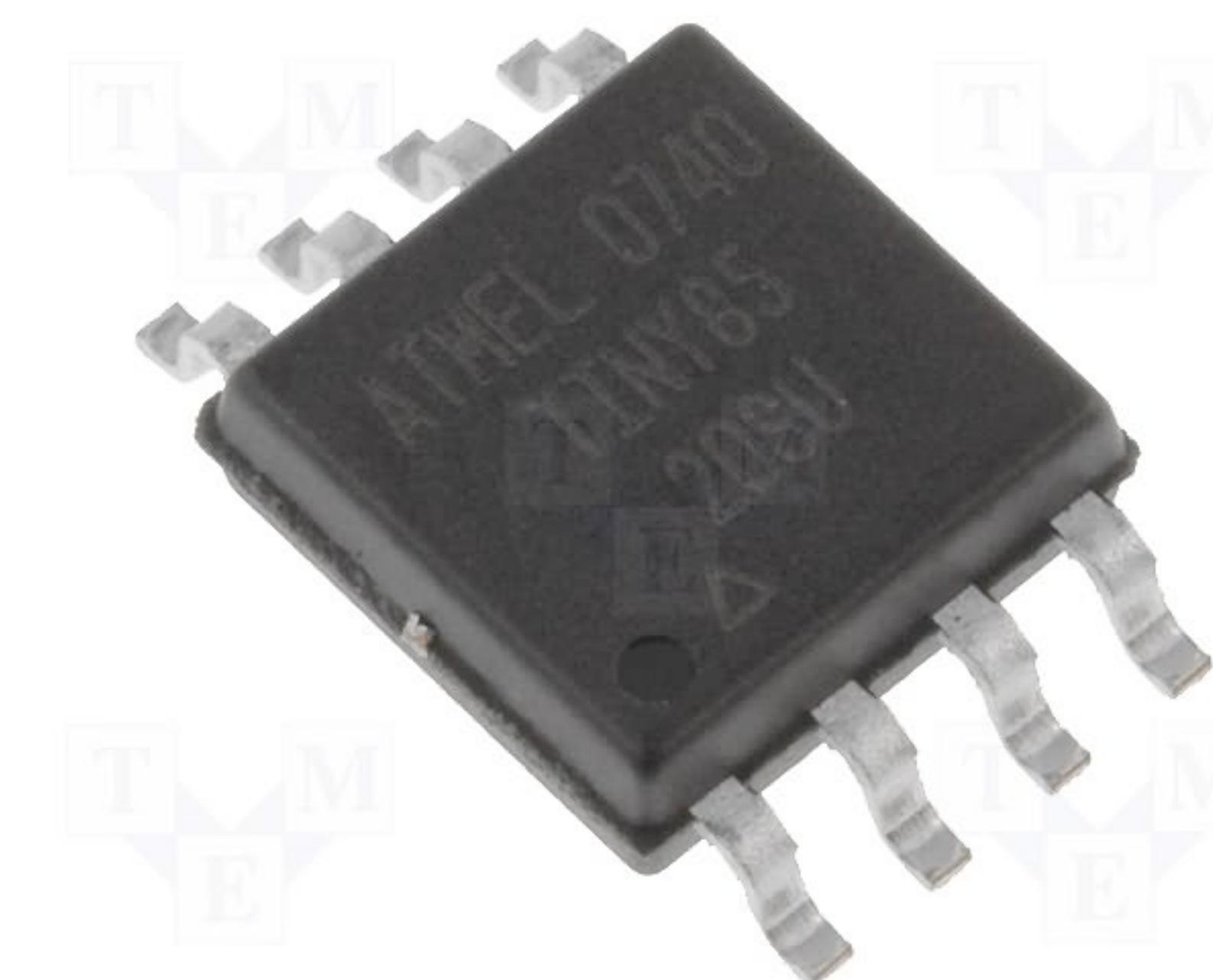
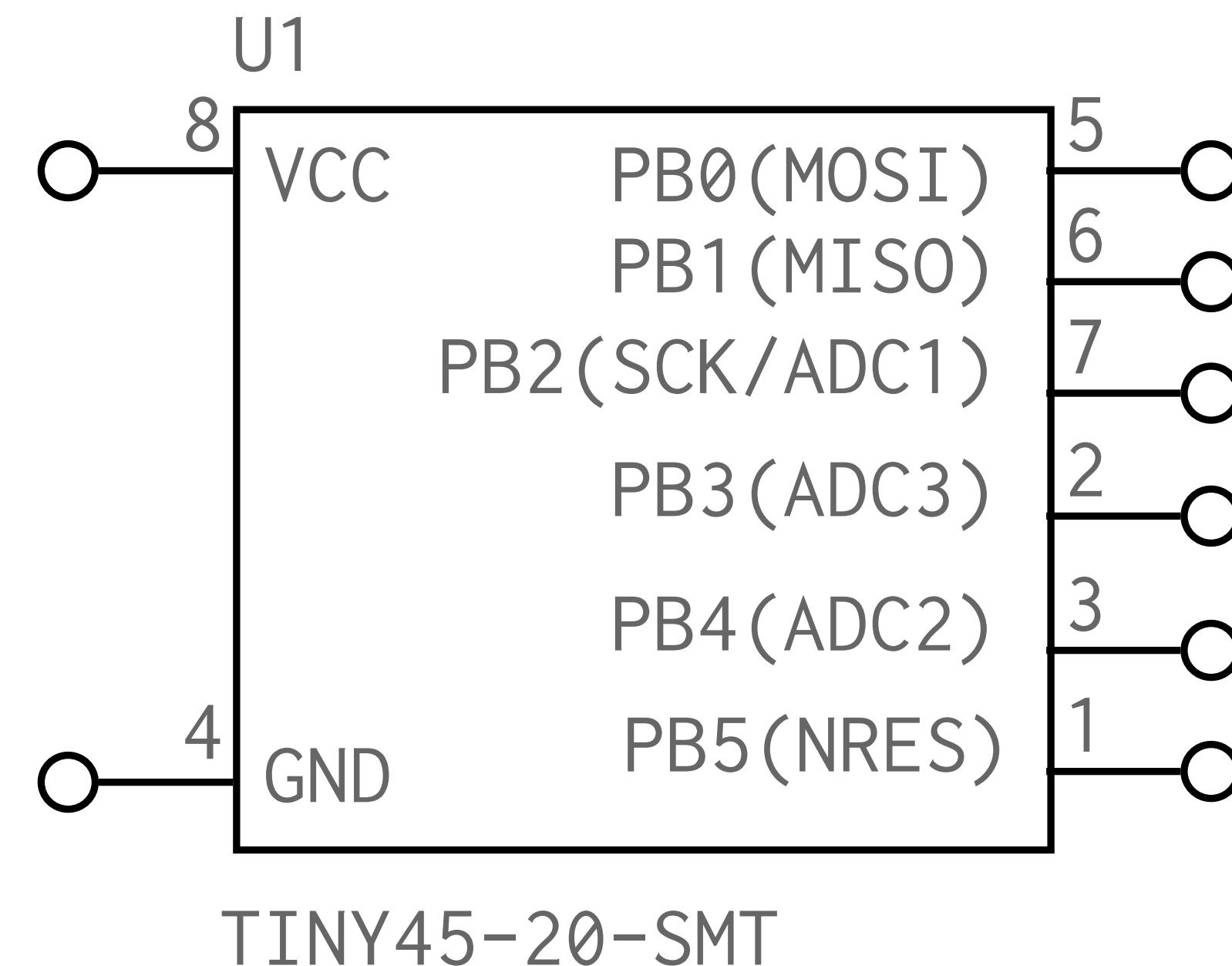


M1



Schaltkreise

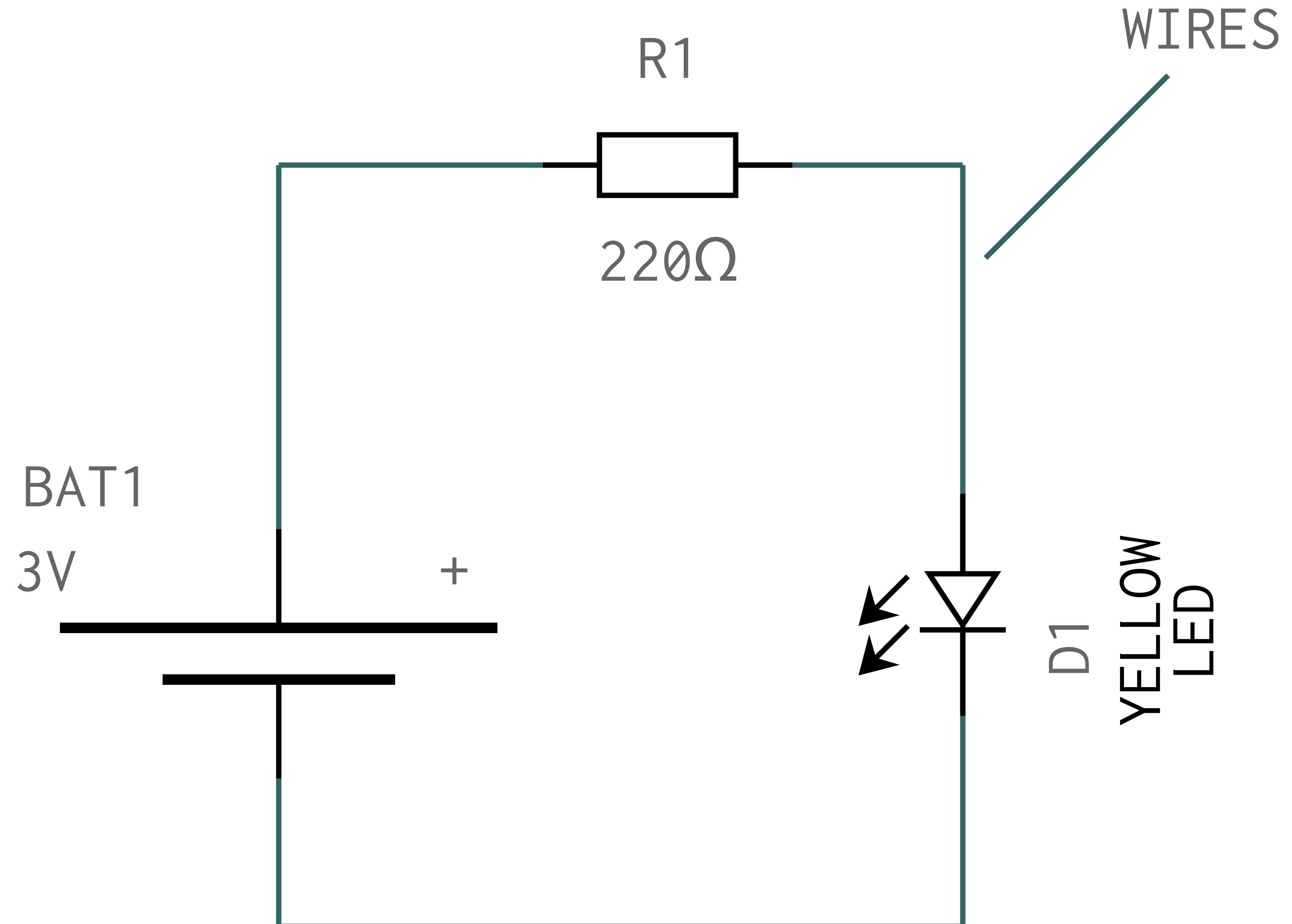
INTEGRATED CIRCUITES (U)



SMT = SURFACE-MOUNT TECHNOLOGY (FLAT IC)
DIP/DIL = DUAL IN-LINE PACKAGE (BUG IC)

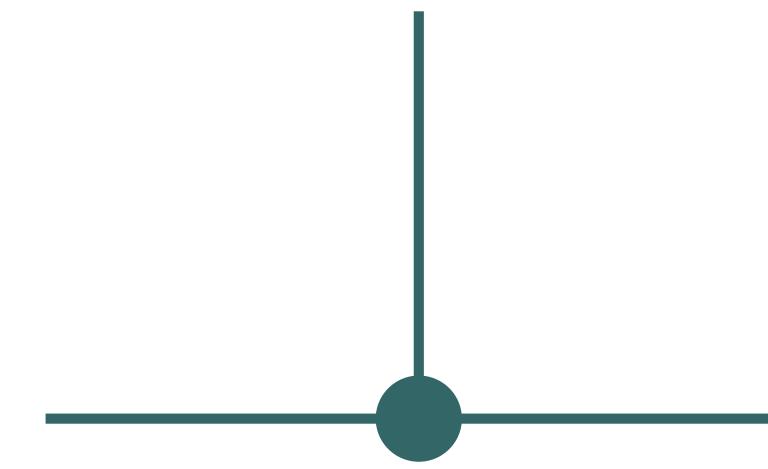
Schaltkreise





Schaltkreise

A NODE

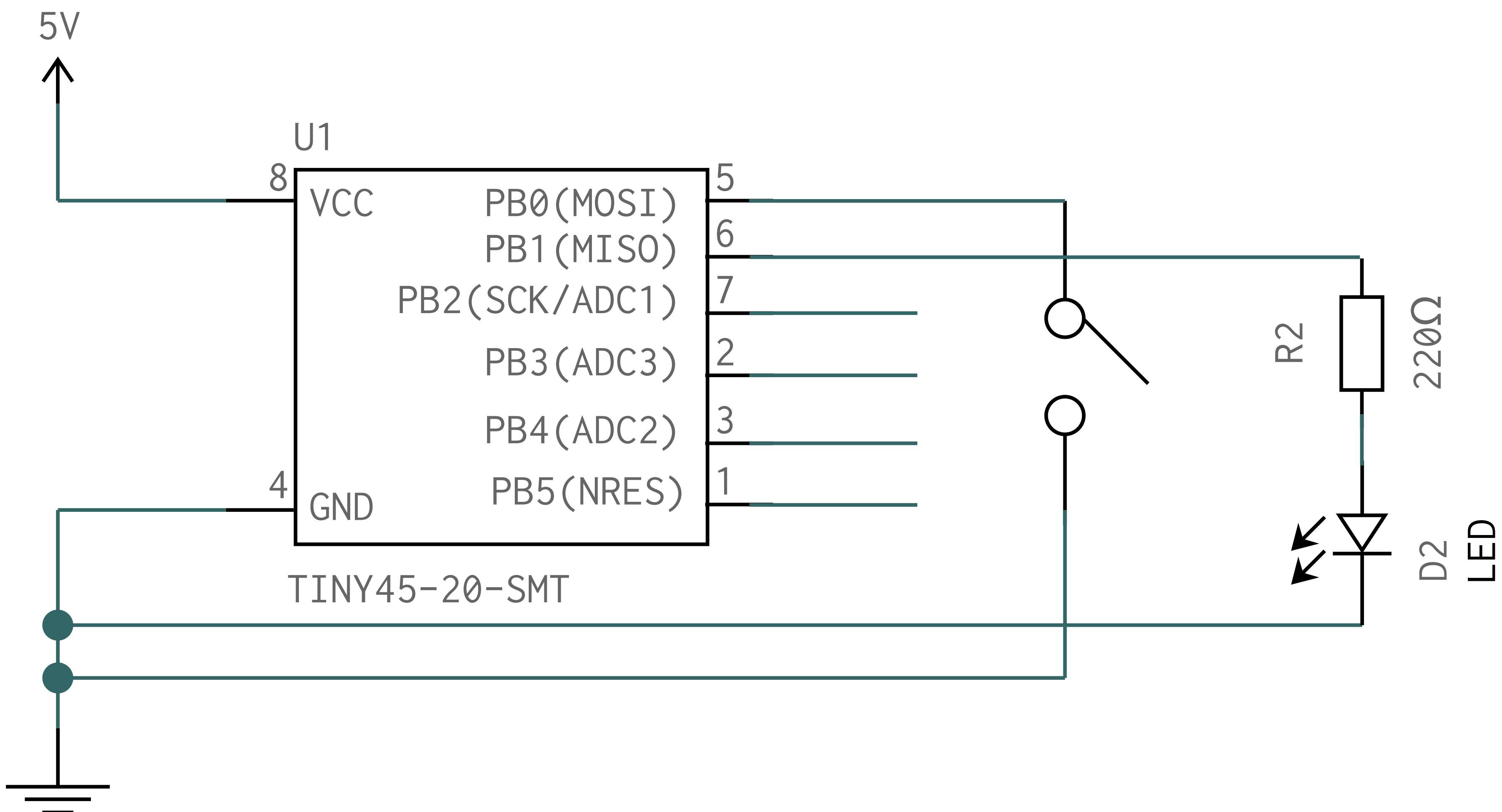


THESE TWO WIRES CROSSING THE JUNCTION ARE CONNECTED.



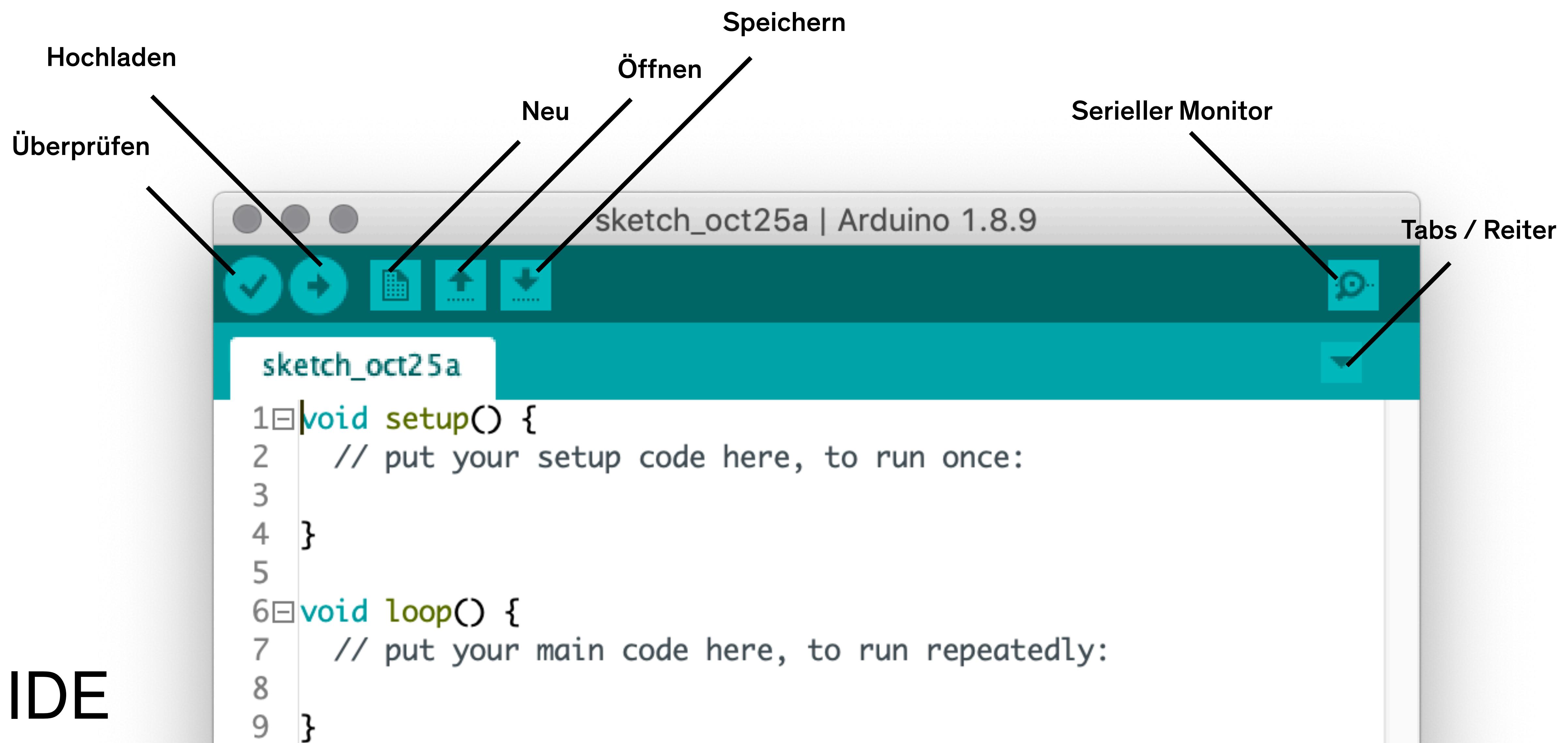
HERE THEY ARE NOT CONNECTED

EXAMPLE CIRCUIT OF A TINY45 IC

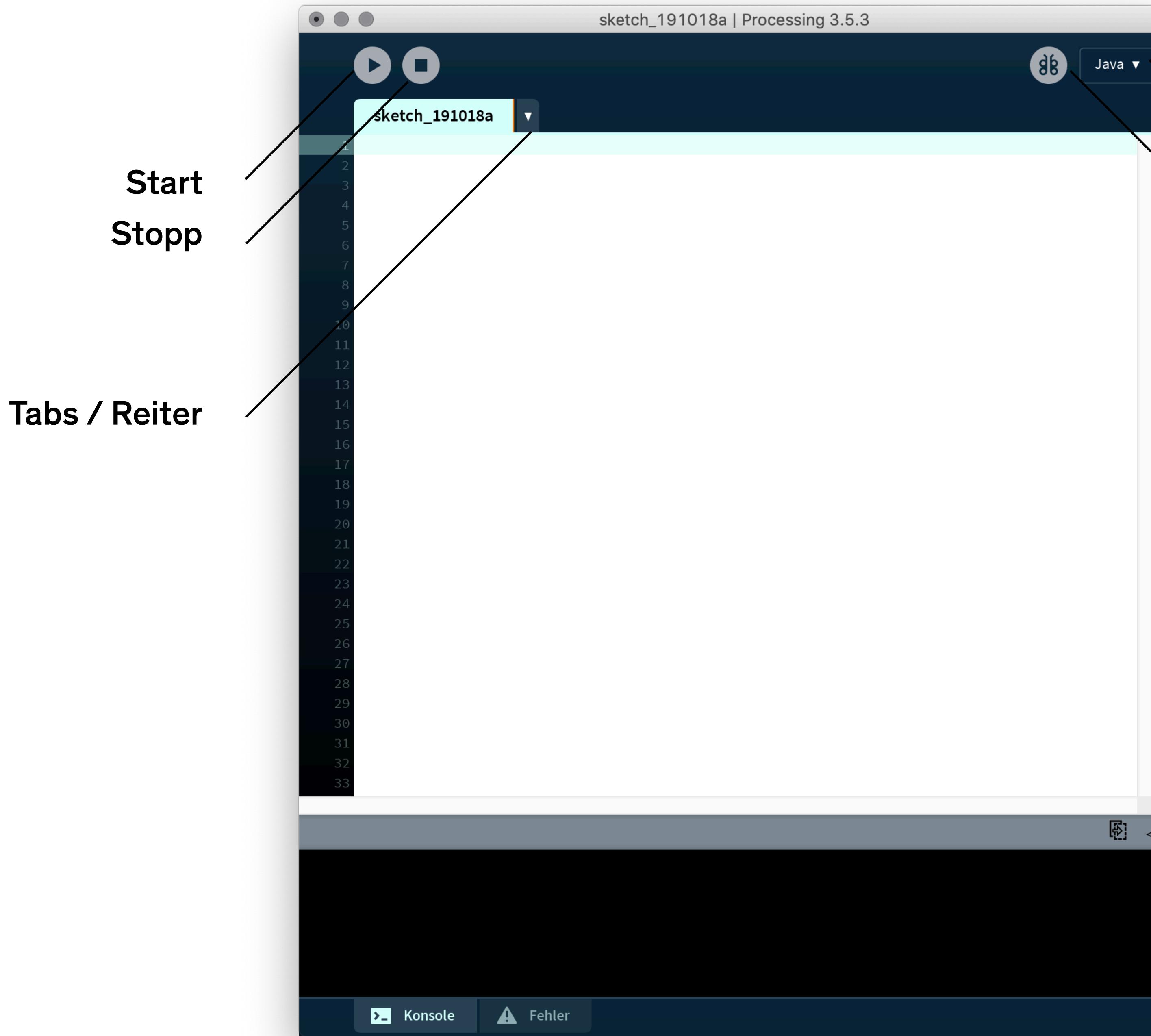


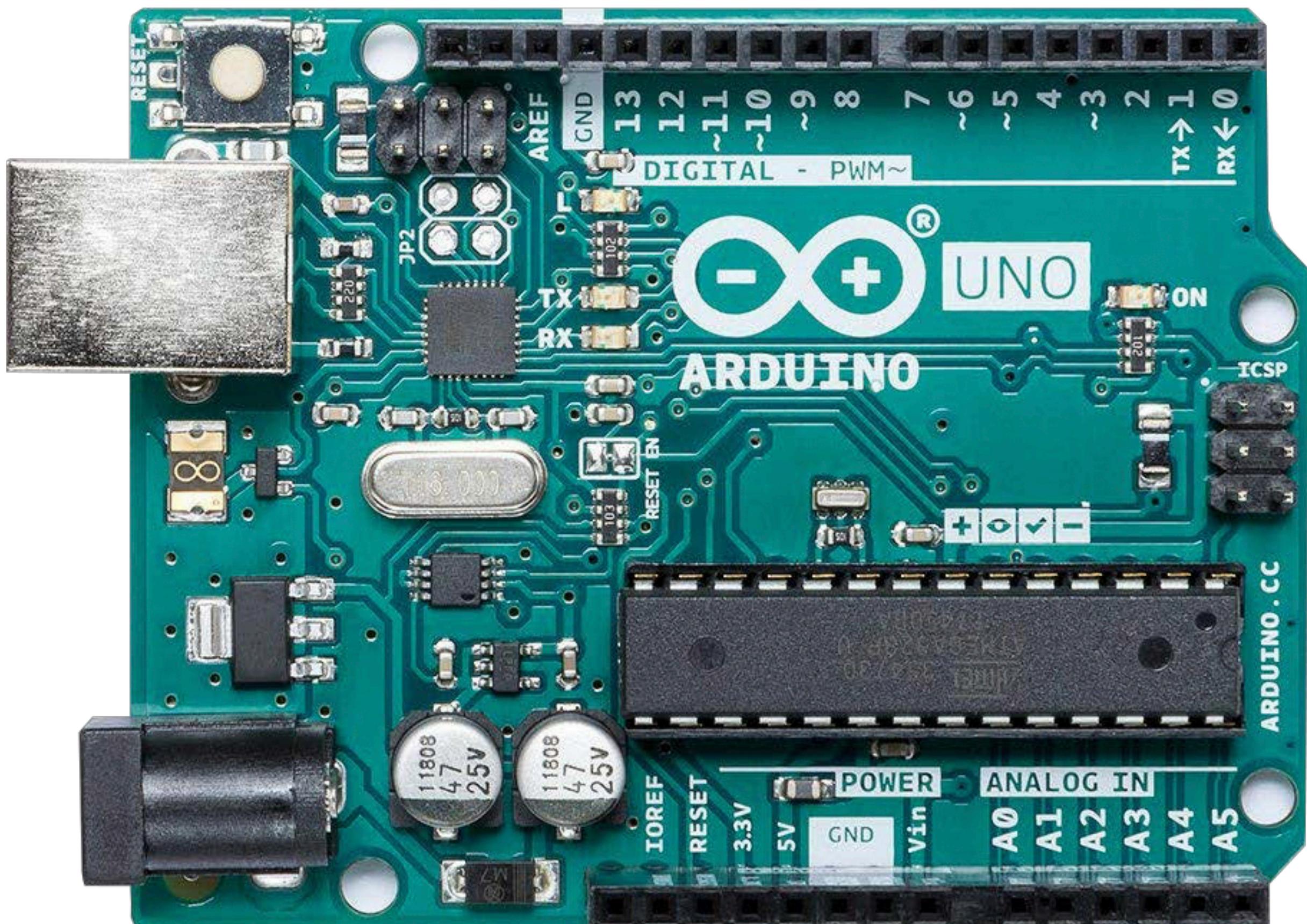
Arduino





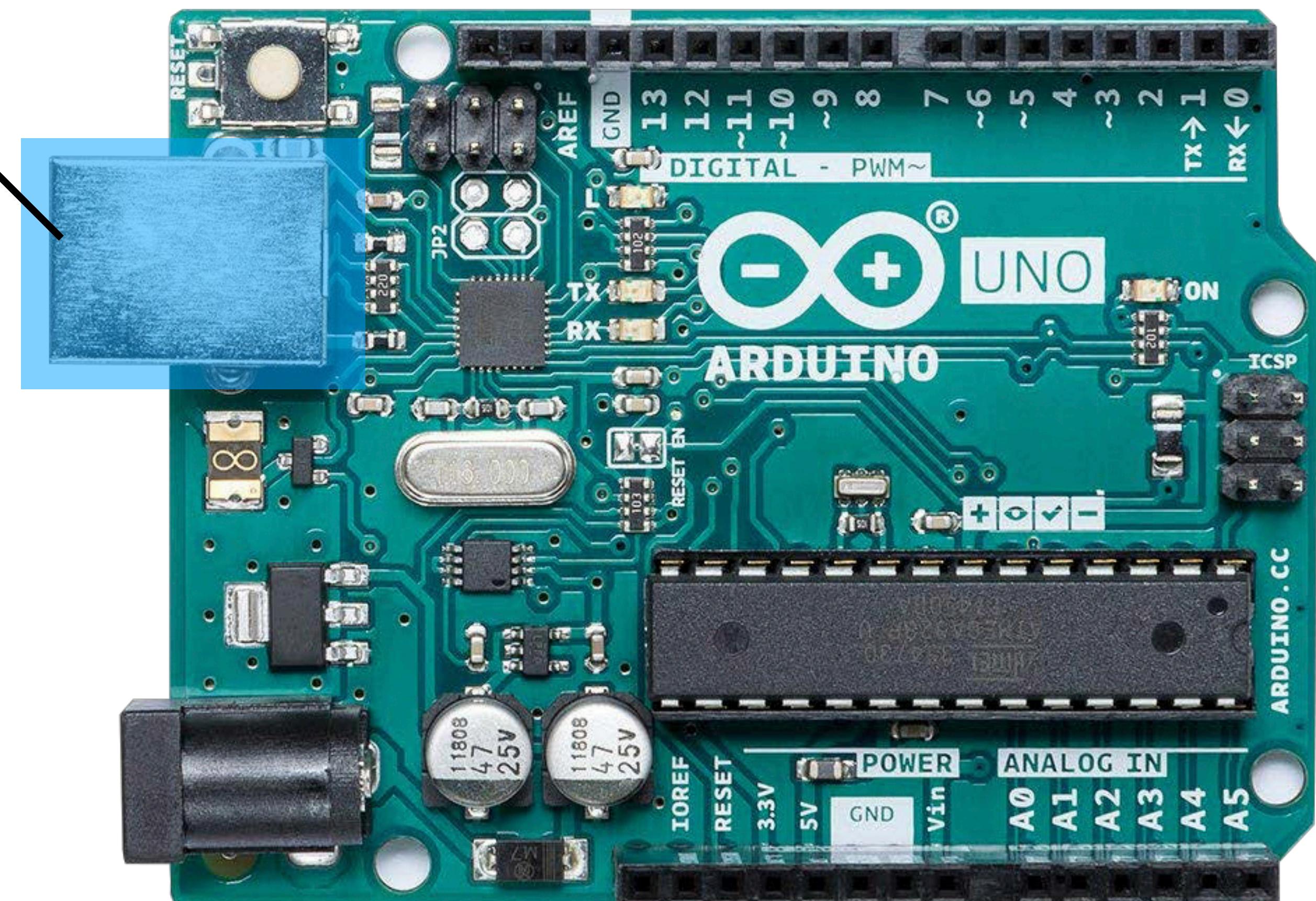
IDE



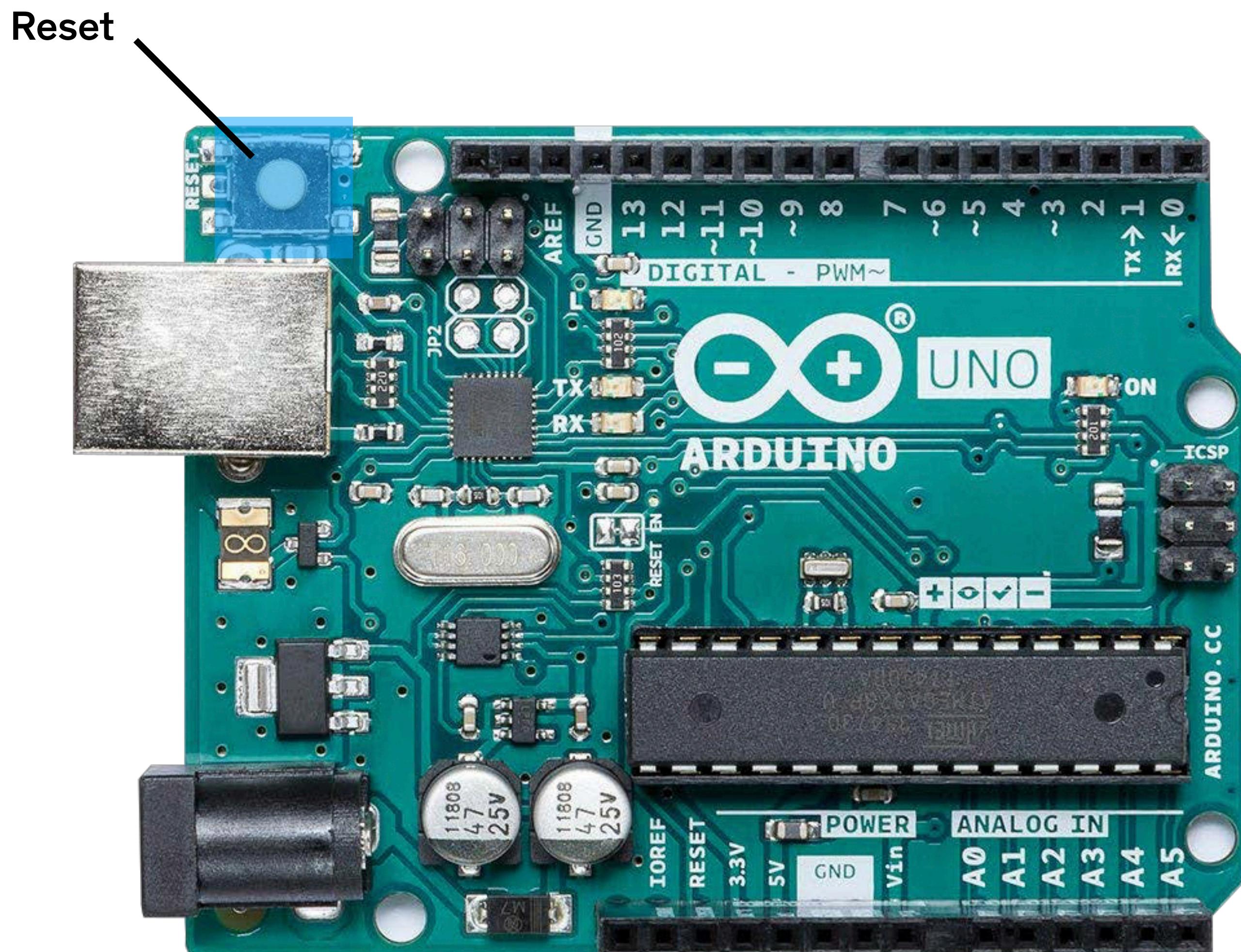


Arduino

USB (5V)

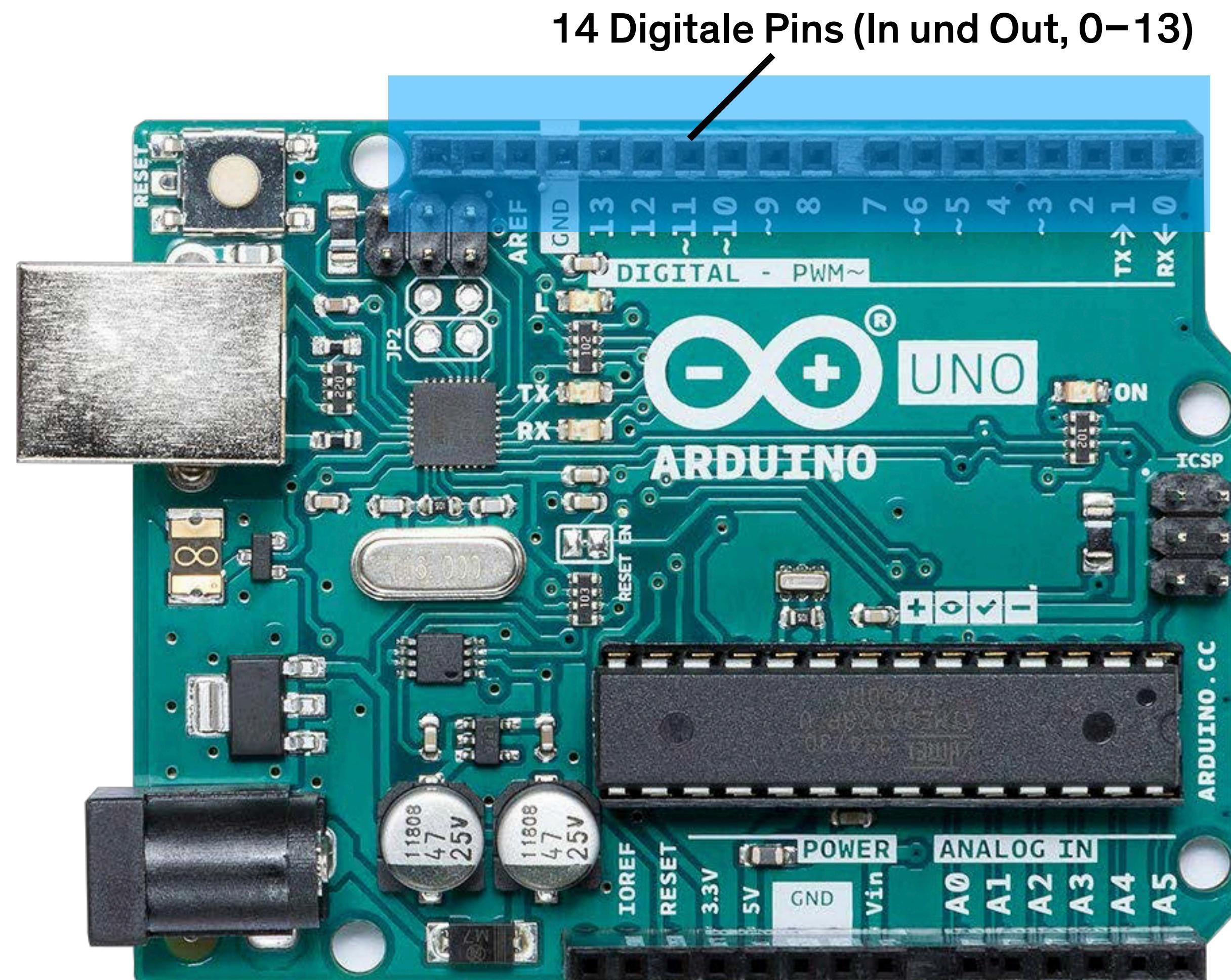


Arduino



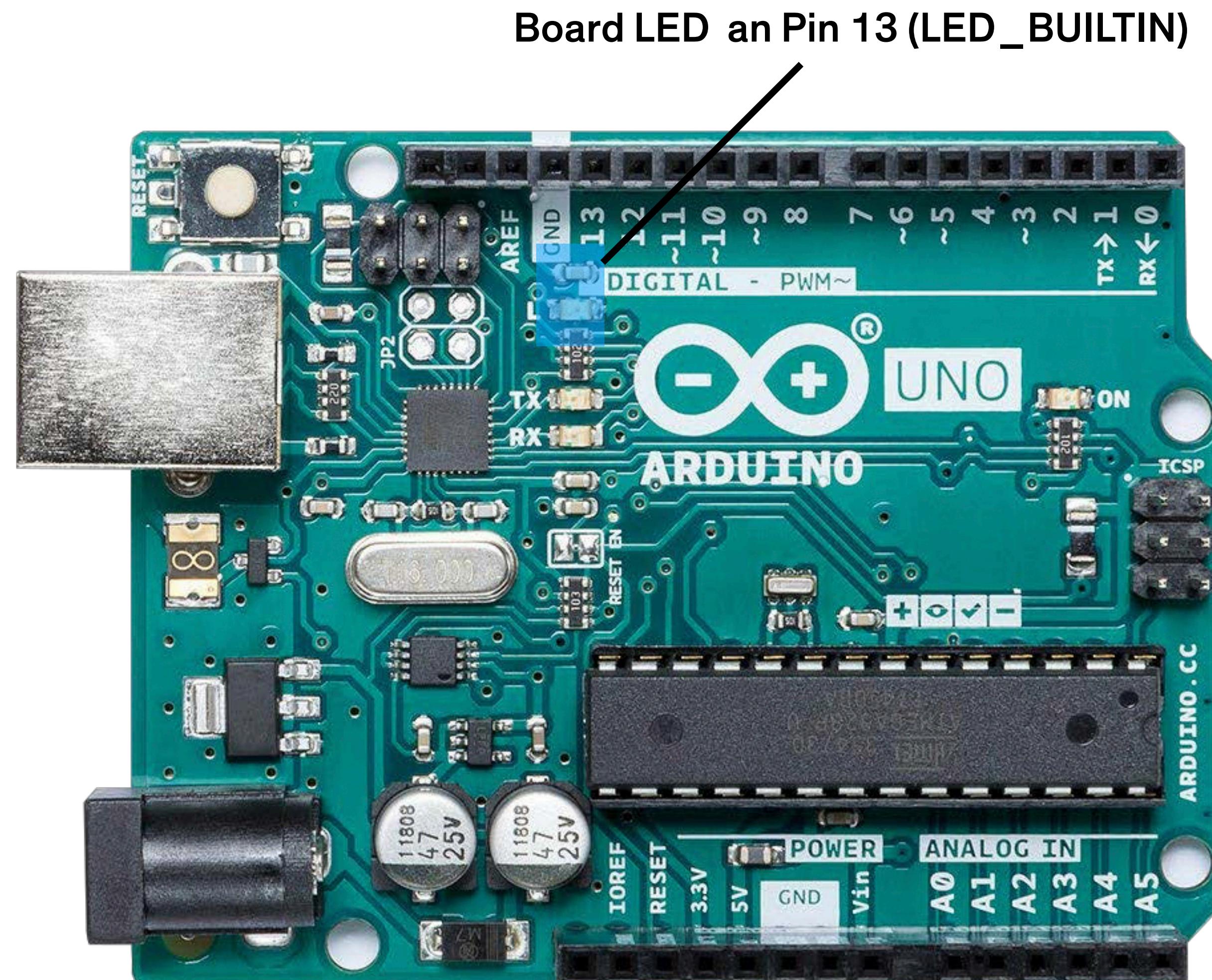
Arduino

Arduino

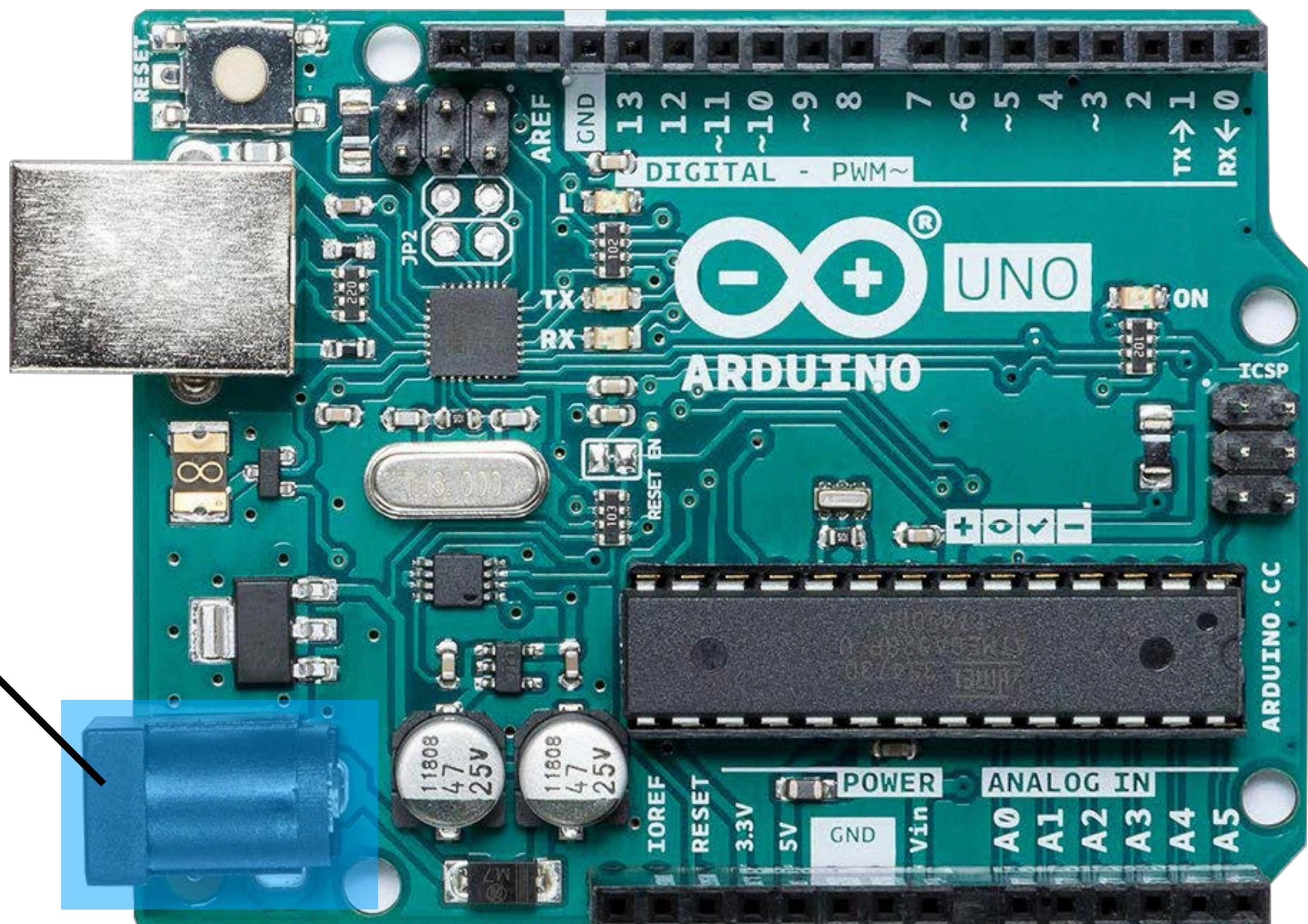


14 Digitale Pins (In und Out, 0–13)

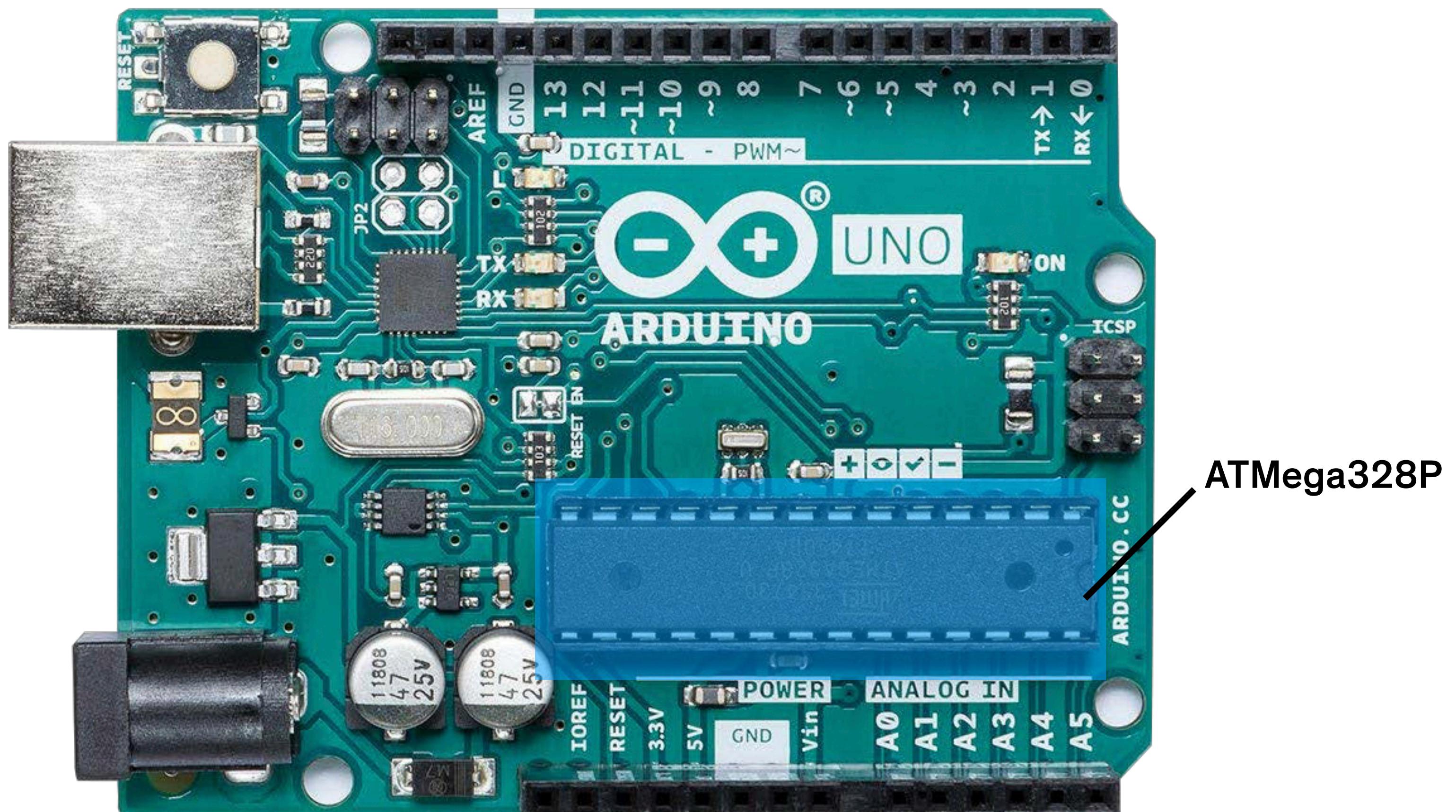
Arduino



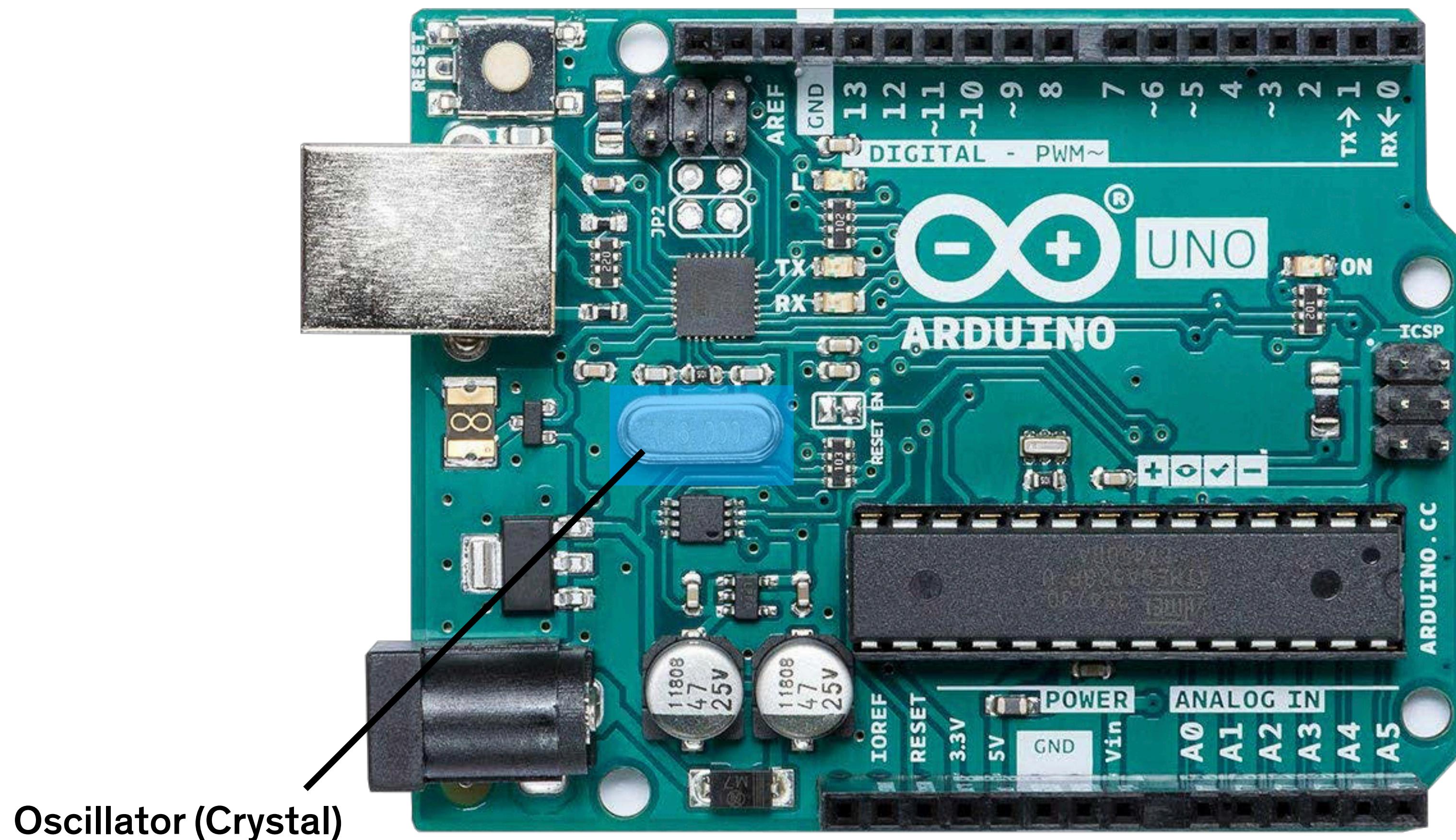
Strom (7V – 12V)



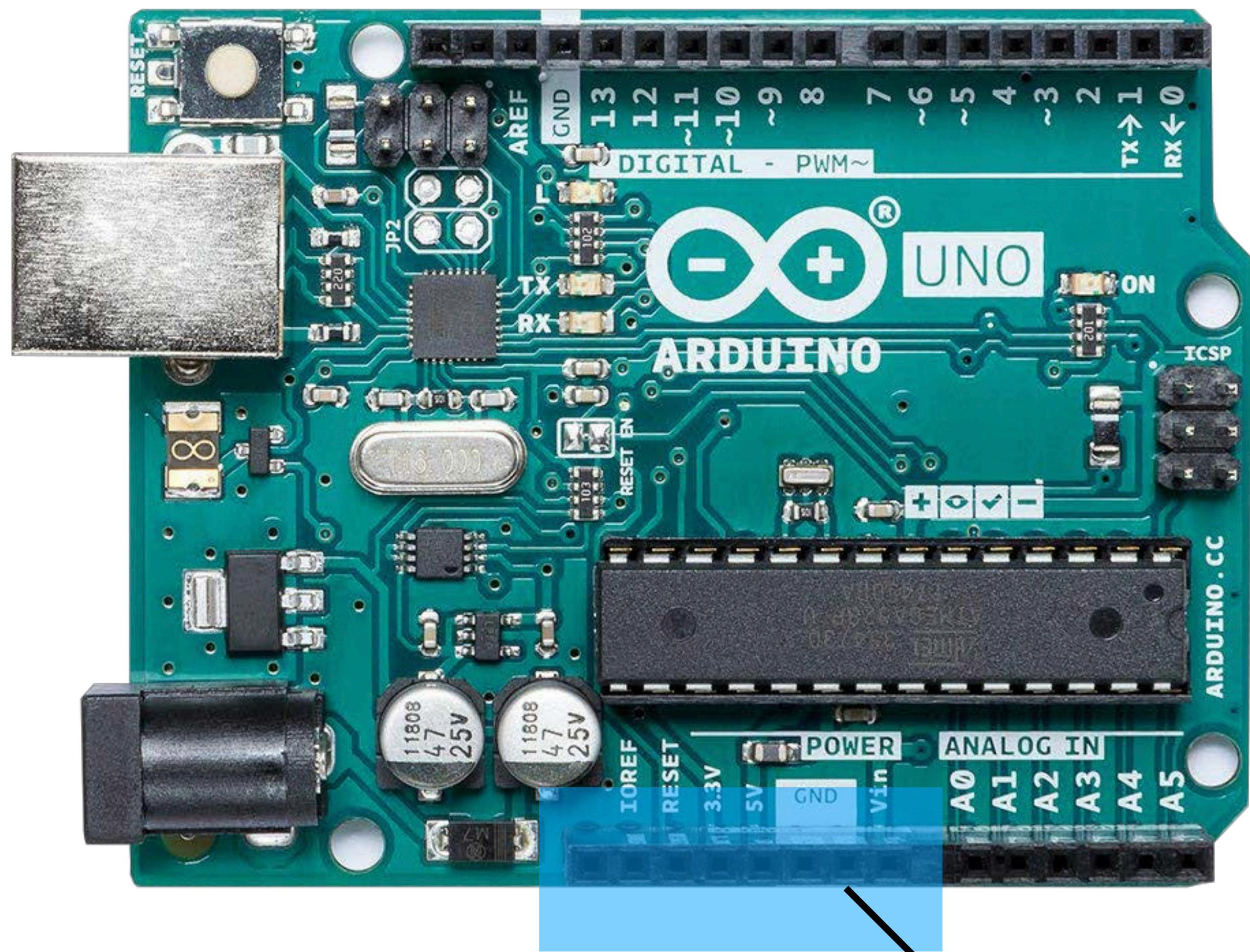
Arduino



Arduino

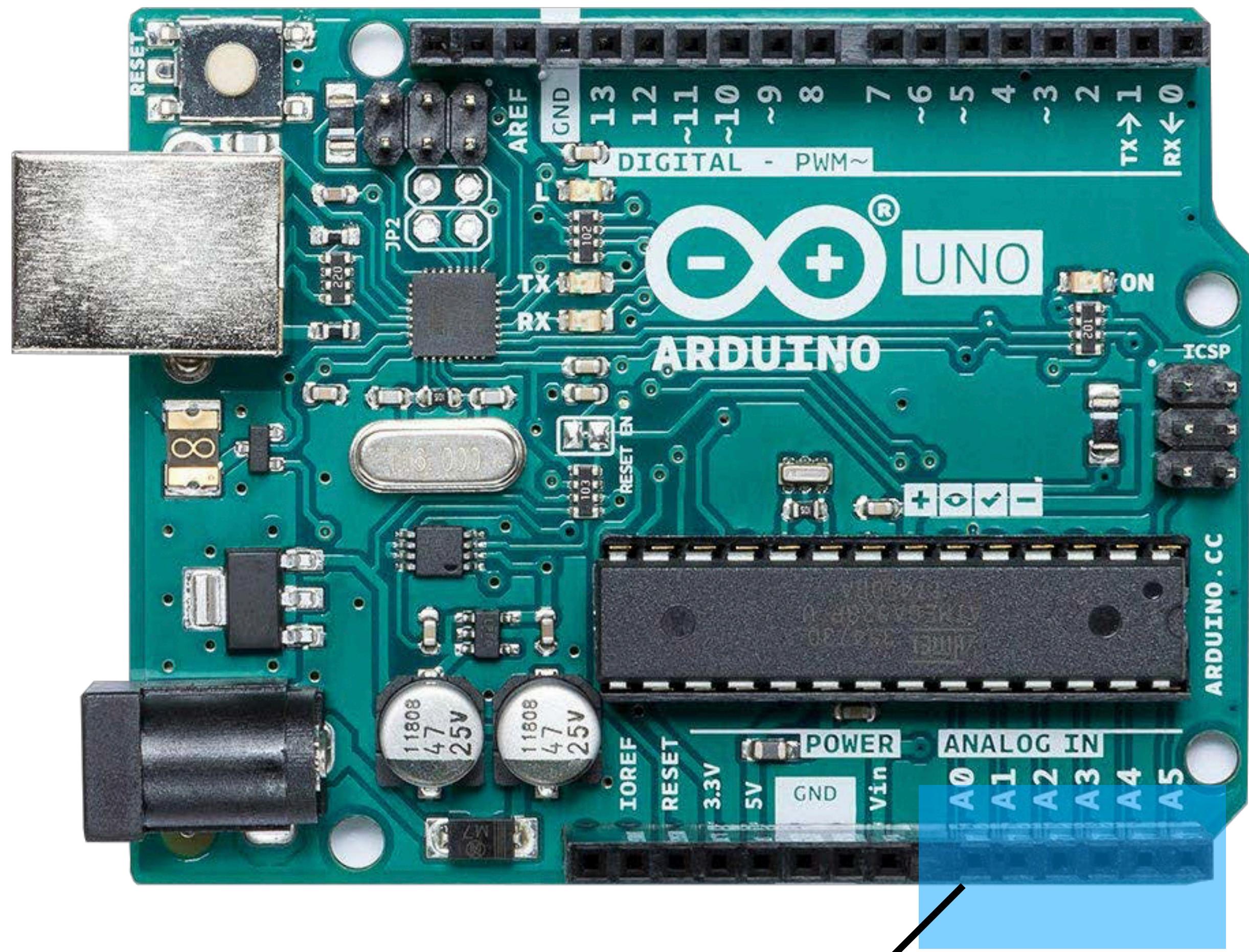


Arduino



Spannung ("In" und "Out")

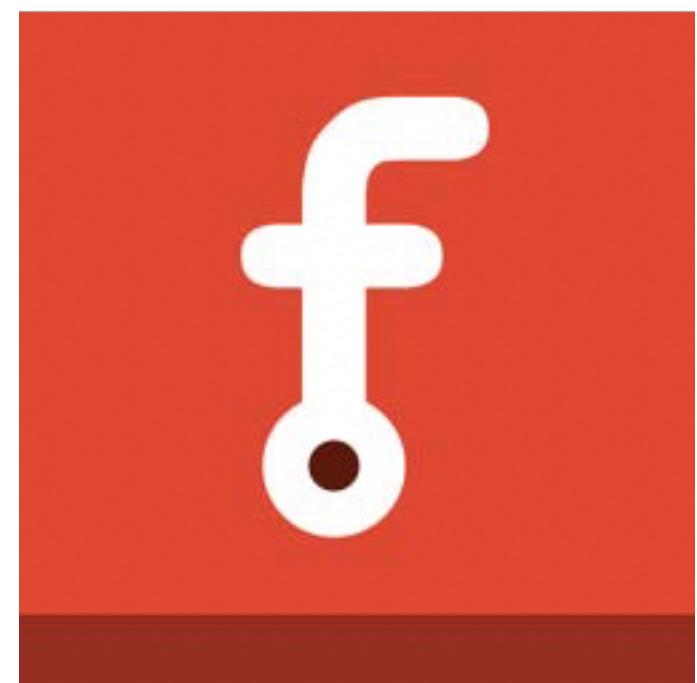
Arduino

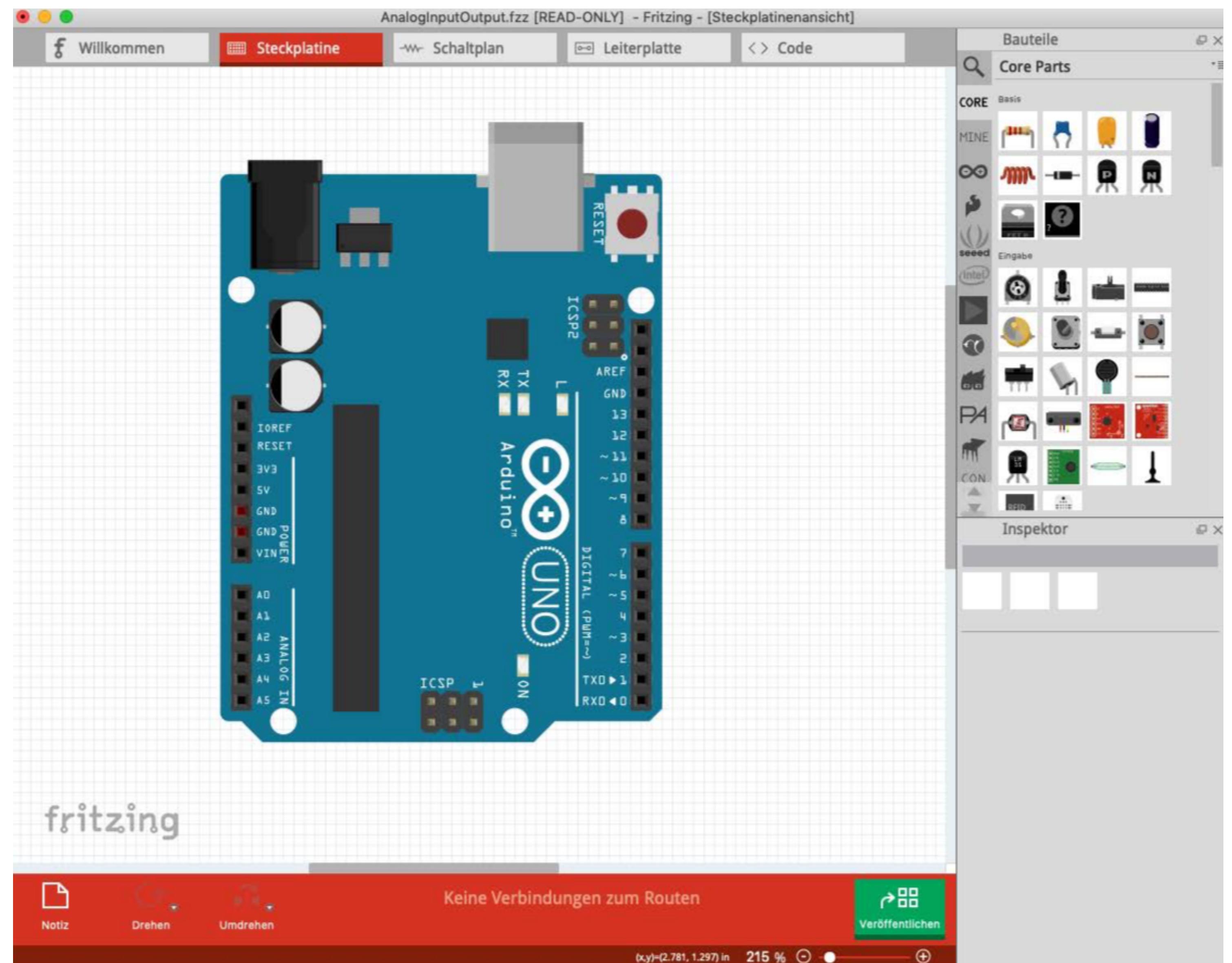


6 Analog Pins (A0 – A5)

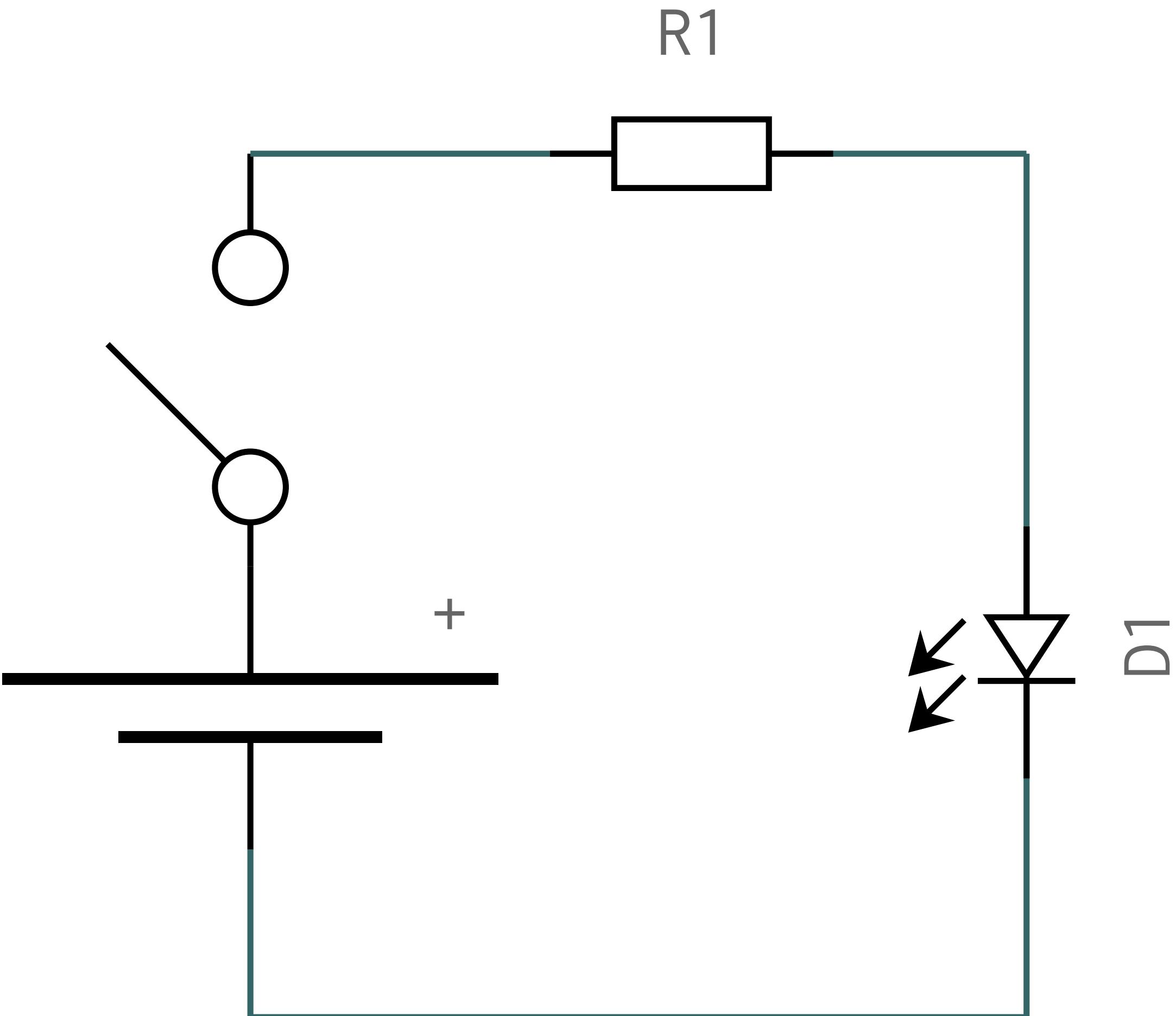
Arduino

Fritzing

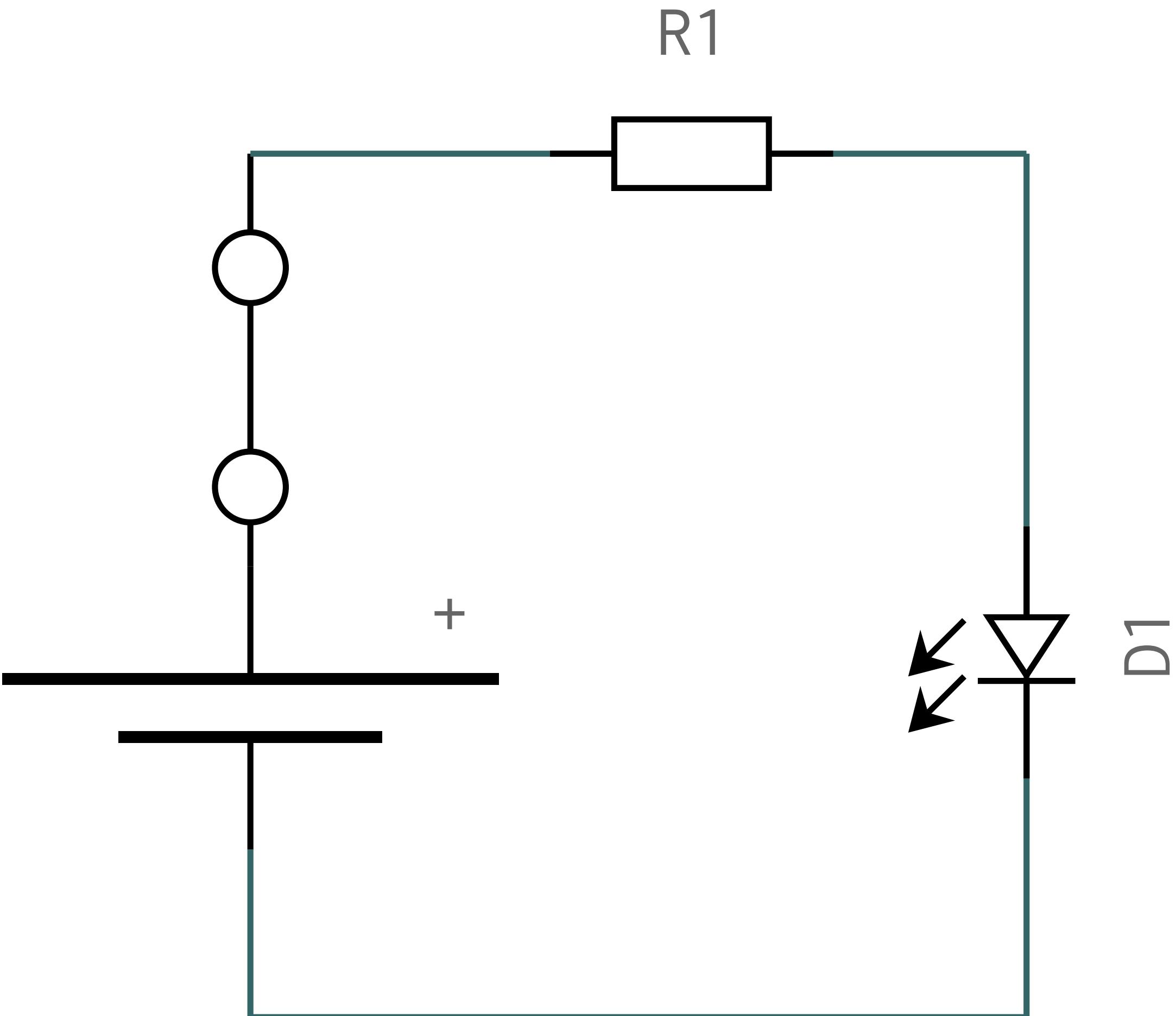




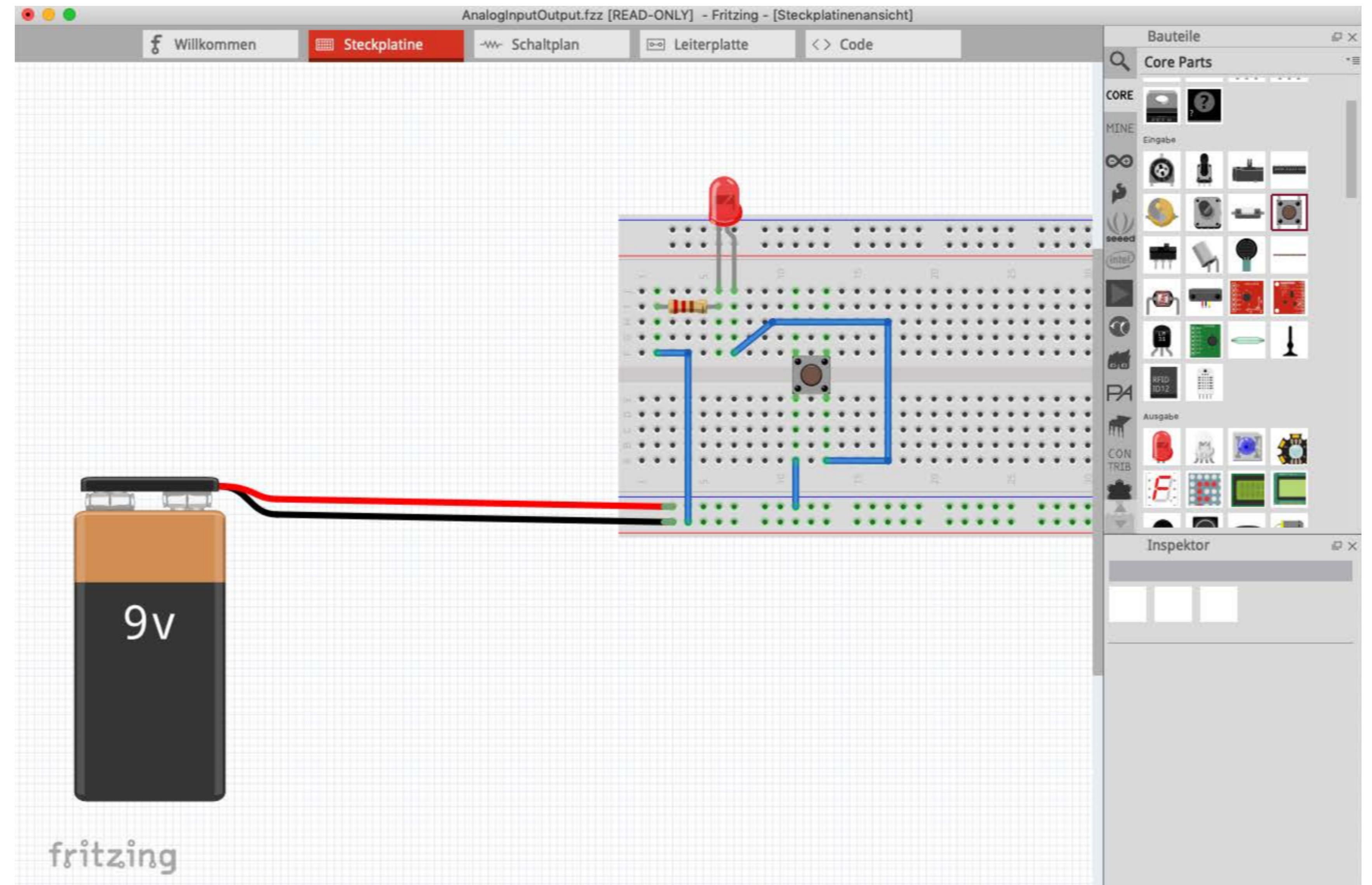
Fritzing



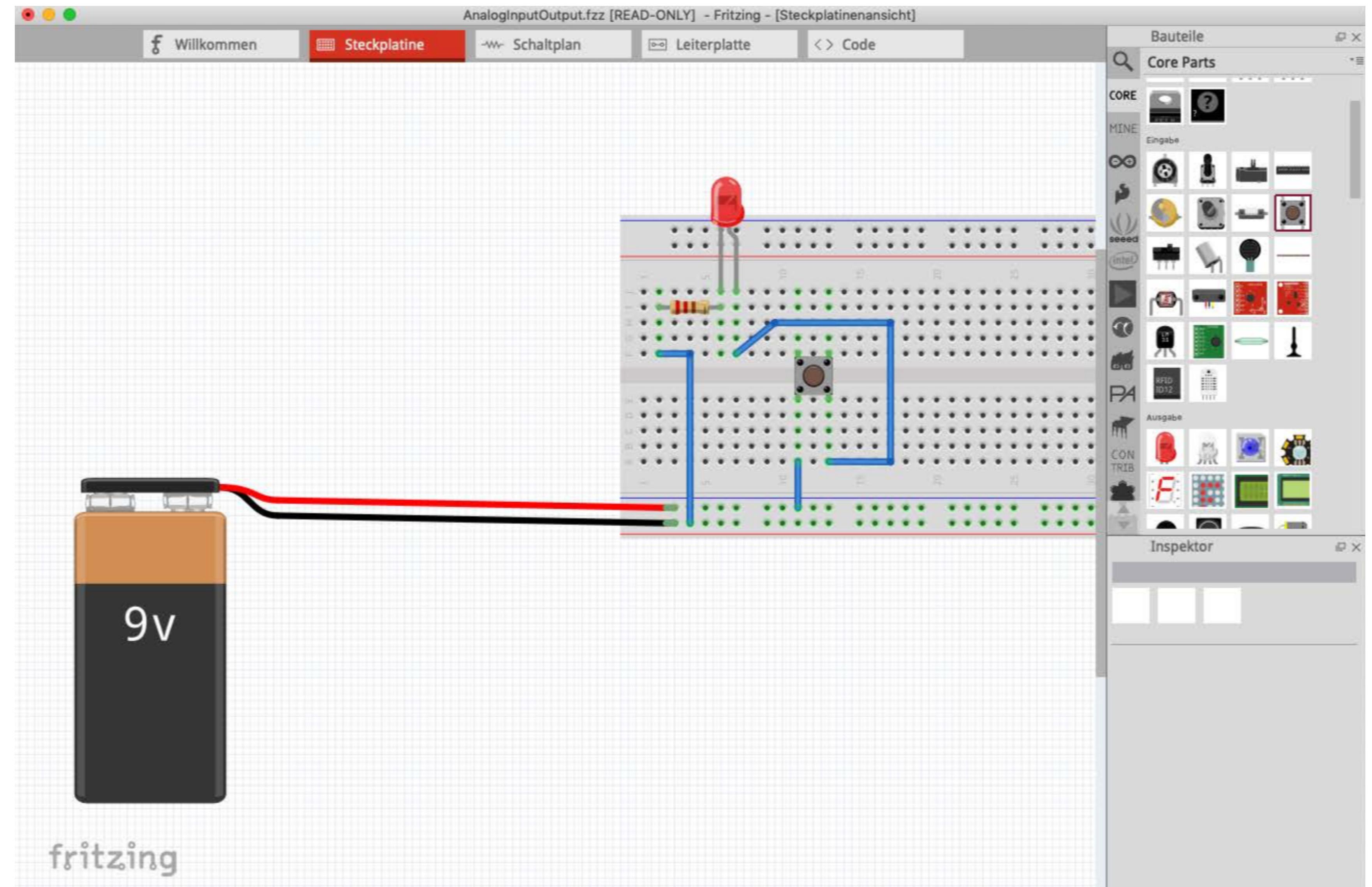
Fritzing



Fritzing



Fritzing



Fritzing

Baut einen LED-Lichtdimmer.

- Breadboard
- Jumperkabel
- LED
- Potentiometer
- Widerstand (URI)
- 9V Block
- Stromversorgung für Breadboard

Aufgabe 2 – Bis 08.11.2019

- 1. Plant euren Aufbau in Fritzing**
- 2. Zeichnet den Schaltplan per Hand auf**
- 3. Dokumentiert:**
 - Fotos: Echter Aufbau + Schaltplan**
 - Screenshots: Fritzing**

Aufgabe 2 – Bis 08.11.2019