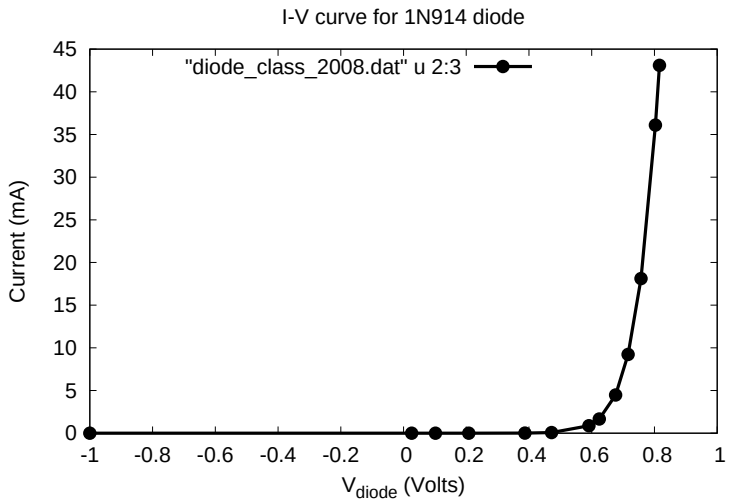
Topic 7

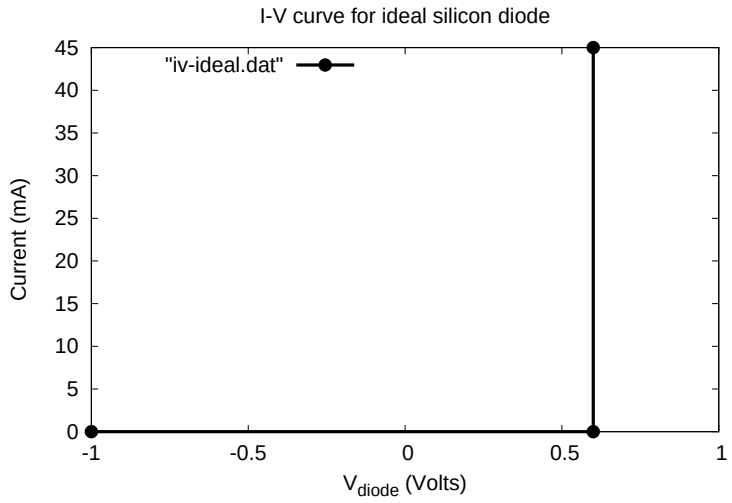
Diodes

7.1 I-V Curve

Actual I-V curve for a real diode obtained in lab:



I-V curve for an idealized silicon diode:



7.2 Rules for diodes based on simple idealized I-V curves

First, determine if diode is forward biased or reverse biased.

- For forward-biased silicon diodes:
  - $\Delta V_{\text{diode}} \simeq 0.6\,\text{V}$. (For other materials the voltage drop will be different.)
  - I_{diode} determined by rest of circuit.
- For reverse-biased diodes:
  - $I_{\text{diode}} \simeq 0$.
  - ΔV_{diode} determined by rest of circuit.

7.3 Diode circuits

- Diodes as rectifiers (as in lab).
- Diodes as voltage clamps.
- Diodes as protection with indcutive loads.