

2. (3min) I have an LED in a dark room. I bias the LED at a voltage just below the bandgap E_G (in eV) and see efficient light emission with wavelength $\lambda=1240/E_G$ (in nm) (photon energy = E_G).

Why do I find this strange? What is happening?

3. (3min) Suppose I have two parallel plates. One is heated to a high temperature, say 1800K. The other plate is at room temperature: 300K. Between the plates there is a vacuum.

Can you sketch the current-voltage characteristics of this two-terminal device?