

Homework 9

EE 362 Electronic, Magnetic, & Optical Properties of Materials (Spring 2025)

Monday, April 14, 2025

- 1) 10.2b Also, find V_t and ϕ_{fp} . **Let $n_i = 5 \times 10^{11} \text{ cm}^{-3}$ at 350 K, other properties same.**
- 2) 10.4 Change N_a to 10^{16} cm^{-3} . **Part b) has typo, should be n^+ polysilicon.** Hint: Read Example 10.2. Assume 300 K.
- 3) 10.11 Also, find ϕ_{fn} , x_{dT} , $|Q_{SD}'(\text{max})|$, and C_{ox} .
- 4) 10.16
- 5) 10.23abc Change doping to $N_a = 10^{15} \text{ cm}^{-3}$. **Assume $Q'_{ss} = 0$.**
- 6) 10.24abc Change doping to $N_d = 10^{16} \text{ cm}^{-3}$. **Assume $Q'_{ss} = 0$.**

Due Wednesday, April 23, 2025

Notes:

- Carry *at least* **6** significant figures on constants/parameters in calculations. Give answers with **4-5** significant figures.
- If a solution requires the use of a graph, include the graph with work shown.