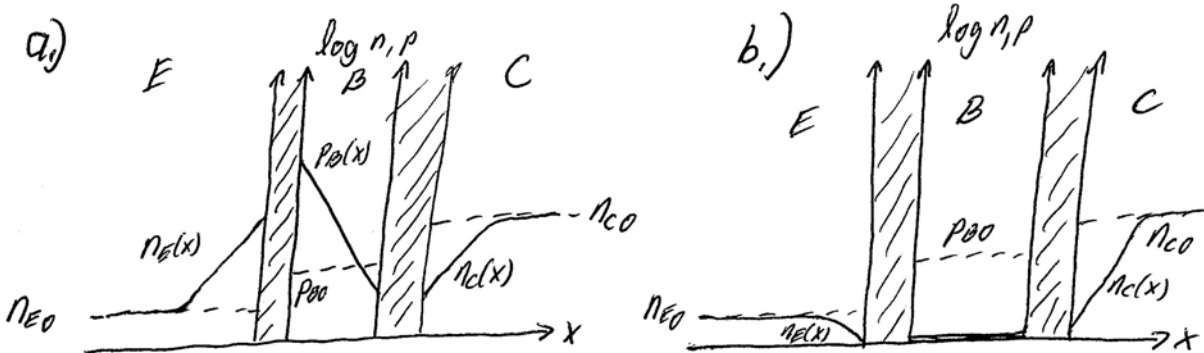


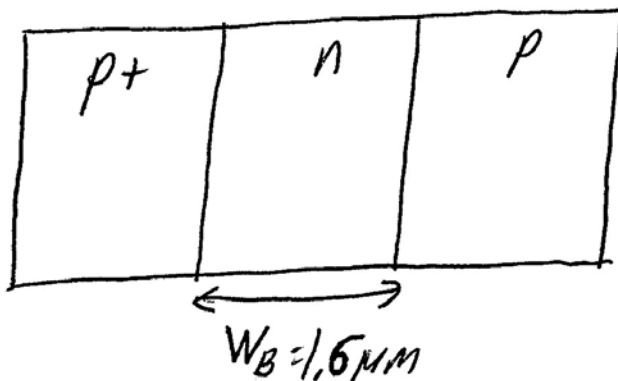
Recitation 8
EE 3161 – Spring 2008

- 1) In the following two diagrams, are the BJTs shown biased in Forward Active, Inverse Active, Saturation, or Cutoff?

Sketch your own plot of $\log(n,p)$ vs. x for the case of an npn transistor in saturation.



- 2) For the silicon p^+np bipolar transistor shown below, what are α_T , γ , and β if we do not include base recombination and the device is biased in forward active? What if the device is biased in inverse active? (Ignore depletion region changes when using W for inverse active.) Why are the numbers so different?



$$p^+: N_a = 5 \times 10^{17} \text{ cm}^{-3}$$

$$n: N_d = 3 \times 10^{16} \text{ cm}^{-3}$$

$$p: N_a = 6 \times 10^{15} \text{ cm}^{-3}$$

$$\tau_E = \tau_B = 0.2 \mu\text{s}; \tau_C = 1 \mu\text{s}$$

$$A = 1 \text{ cm}^2$$

$$V_{EB} = 0.3 \text{ V}$$

$$V_{CB} = -3 \text{ V}$$