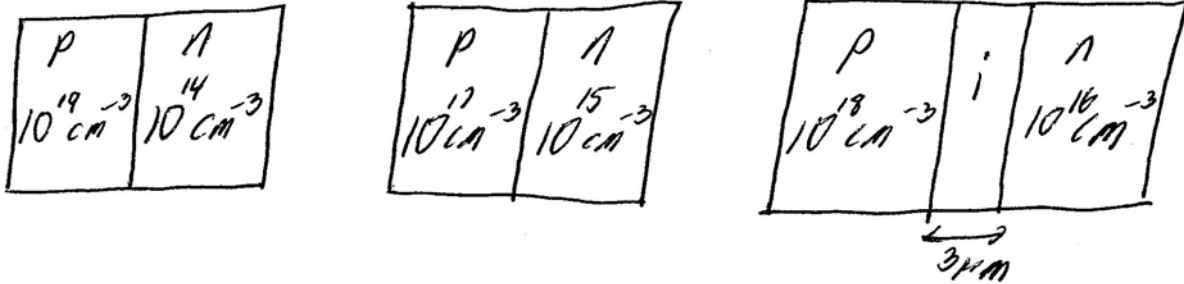
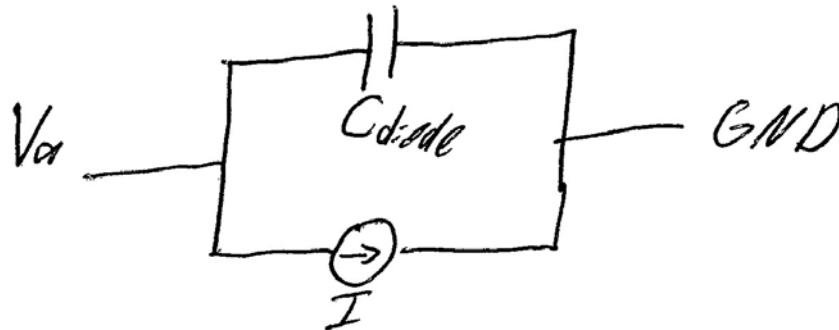


Recitation 7
EE 3161 – Spring 2008

1) Consider the real diodes below.



- a) Which will have the highest small signal capacitance for $V_a = -5V$?
- b) In some cases, a reverse biased diode can be modeled by the circuit diagram shown below. What is the current I for the diode chosen in part a) at $V_a = -5V$? Use $A = 1\text{mm}^2$ and $\tau_n = \tau_p = 1\mu\text{s}$.



2) For a silicon n^+pn bipolar transistor in thermal equilibrium:

- a) Sketch the energy band diagram, keeping in mind the relative dopings.
- b) Sketch $\rho(x)$ vs. x
- c) Sketch $\zeta(x)$ vs. x

Repeat these sketches for a forward active bias (forward bias on the base-emitter junction and reverse bias on the base-collector junction). You can merely superimpose your sketches for b) and c) over the thermal equilibrium case.