

EE 3113

INTRODUCTION INTO RF

CIRCUIT DESIGN

Lecture Notes for A-term 1999

LECTURE 17

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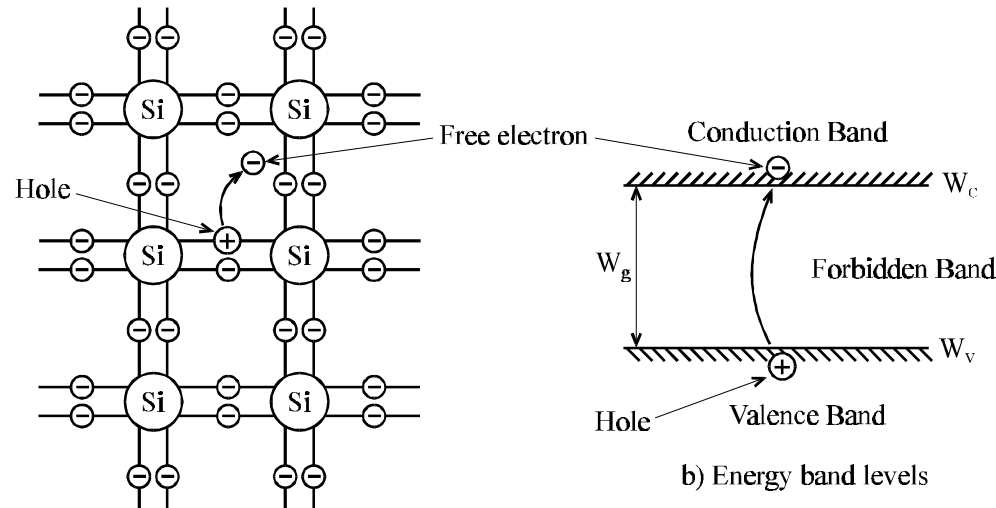
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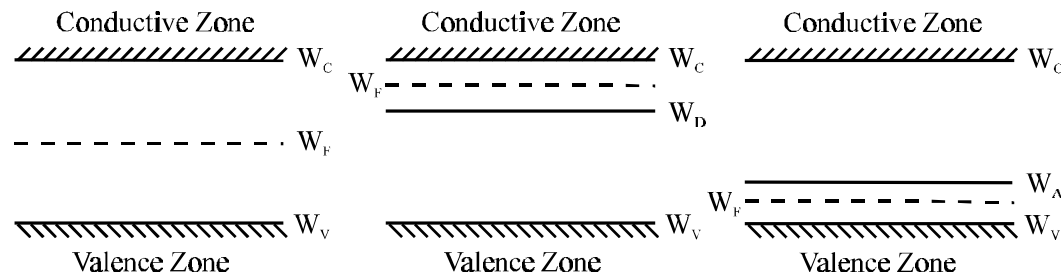
Semiconductor fundamentals

- Basic semiconductor **lattice structure**

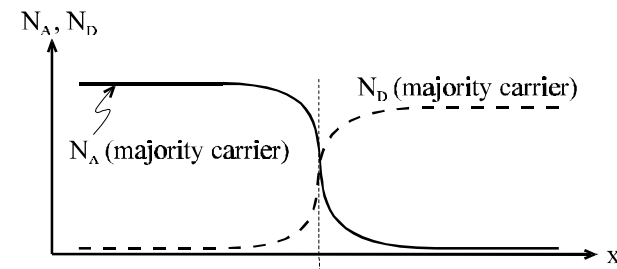
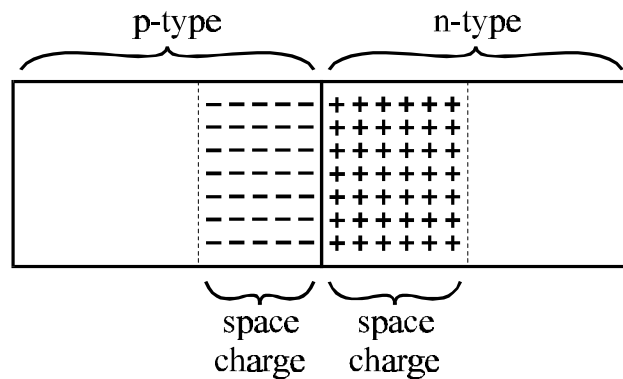


a) Planar representation of covalent bonds

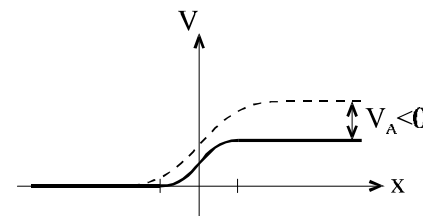
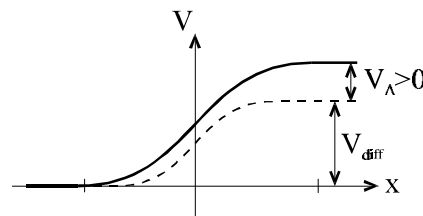
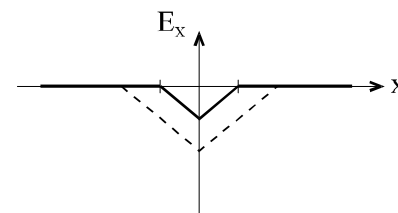
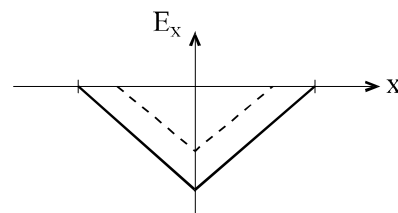
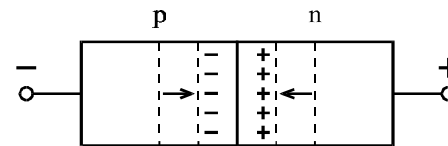
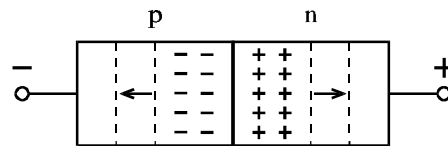
- intrinsic, n and p-type** semiconductors



- Space charge formation across the pn junction

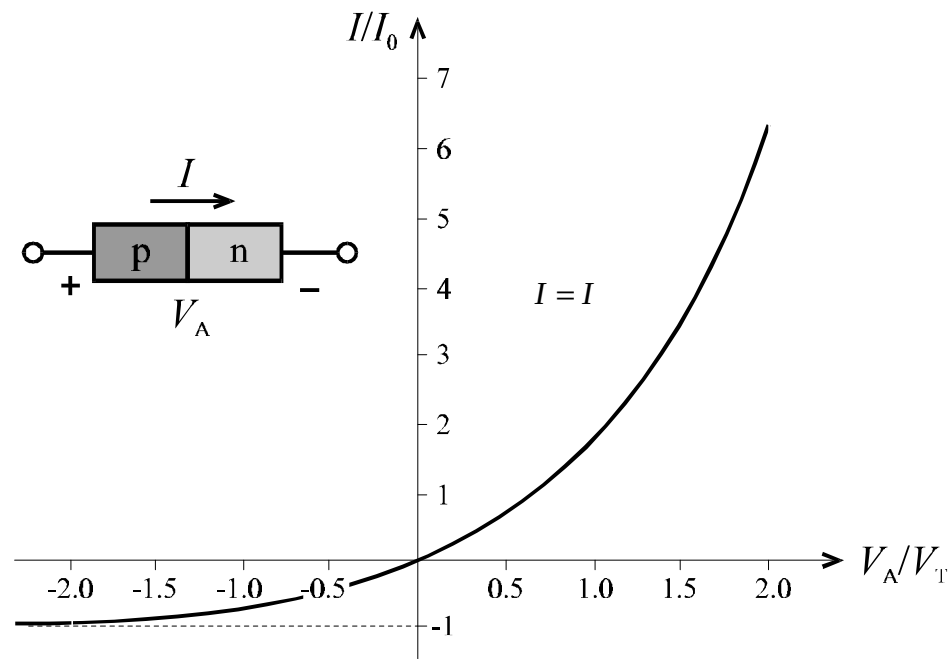


- Behavior of junction due to an applied voltage



Voltage-Current response of conventional diode

V-I current behavior



$$I = I_0(e^{V_A/V_T} - 1)$$

Key terms

- Concentrations (n_n , n_p , p_p , p_n)
- Band model, Fermi energy
- Barrier voltage
- Space charge, junction capacitance
- reverse and forward biasing
- V/I characteristics