325 Notes –(Electronics)

Collected by :Dr.Hamed Alsewaidan

Chapter 1 :Introduction to Semiconductors

1.1 Electronic Configuration
1.2 Representing the energy levels of atoms and crystals
1.3 Conductors, insulators and semiconductors
1.4 semiconductor intrinsic
1.5 Crystal structure and covalent bonding of a pure semiconductor
1.6 Electrons and holes in semiconductors
1.7 Extrinsic semiconductor
1.8 N-type semiconductors
1.9 P-type semiconductor

1.10 charge density in semiconductors

1.11 Drift current
1.12 Diffusion current

Chapter 2 : The P-N Junction Diode

- The diode symbol
- p-n junction in thermal equilibrium
- Forward and Reverse Bias of diode
- I-V Characters
- Diode Equivalent circuit
- Ideal Diode Models
- Practical Diode Model
- Complete Diode Models
- The effect of temperature on diode's characteristics

Ch3 Diode Applications and Special Diodes

3.1 Half wave rectifier

Effect of barrier potential on Half wave rectifier ouput

Peak inverse voltage (PIV)

Half wave rectifier with transformer -coupled input voltage

3.2 Full wave rectifier

The Bride full wave rectifier

3.3 Power supply filters

3.4 Zener Diode

Ch 4: Bipolar Junction Transistor (BJT)

- Common-base configuration
- Common-Emitter configuration
- common-collector configuration
- transistor parameters (α, β, ɣ)
- BJT transistor Characteristics curves
  - Analysis of BJT Transistor
  - BJT Transistor as a switch
  - BJT Transistor as an amplifier

ch5:

- Field – Effect Transistor (FET)
- Junction Field Effect Transistors (N-Channel JFET & P-Channel JFET)
- JFET characteristics curves
- JFET parameters (Drain resistance, Transconductance, μ)
- JFET vs BJT