



## Midterm #2 Review

- Decibels
- Bode Plots
  - Magnitude Response
  - Phase Response
    - Superposition of LPF and HPF
- Op-Amps
  - Model
  - Summing Point Constraints
  - Different Configurations
    - Arithmetic operations
    - A-D conversion
    - Active Filters
- Semiconductor Devices
  - Silicon Atom, crystal structure



## Midterm #2 Review Cont'd

- Semiconductor Devices
  - Dopants
  - Charge Concentration
  - Conductivity and resistivity
    - Scattering, drift velocity
    - Sheet resistance
- Diodes
  - Semiconductor Physics
    - Built-in Potential Barrier
    - Junction width
    - Junction Capacitance
    - I-V Characteristics
  - Zener Diodes
  - Load Line Analysis
  - Models (Ideal vs. Large signal)



## Midterm #2 Review Cont'd

### ■ Diode Applications

- ☐ Rectifiers
- ☐ Diode Logic
- ☐ Photoelectric effect
  - Solar cells
  - Photodetectors
  - LEDs

### ■ MOSFET

- ☐ Semiconductor Structure
- ☐ NFET and PFET
- ☐  $I_g$  vs.  $V_{gs}$
- ☐  $I_d$  vs.  $V_{gs}$



## Midterm #2 Review Cont'd

### ■ MOSFET

- ☐  $I_d$  vs.  $V_{gs}$ 
  - Saturation vs. Triode
- ☐  $I_d$  vs.  $V_{ds}$ 
  - Saturation vs. Triode
  - Channel Length Modulation
- ☐ Load Line analysis
  - Finding the Q-point
- ☐ Small Signal Model
  - Finding small signal parameters  $g_m$ ,  $r_o$ .
  - Finding the small signal gains and small signal impedances for the circuit