Introduction to Electronics

Chapter Outline

1 The Atom
2 Materials Used in Electronics
3 Current in Semiconductors
4 *N*-Type and *P*-Type Semiconductors
5 The *PN* Junction
GreenTech Application: *Solar Power*

Chapter Objectives

- Describe the structure of an atom
- Discuss insulators, conductors, and semiconductors and how they differ
- Describe how current is produced in a semiconductor
- Describe the properties of *n*-type and *p*-type semiconductors
- Describe how a *pn* junction is formed

Key Terms

- Atom
- Proton
- Electron
- Shell
- Valence
- Ionization
- Free electron
- Orbital
- Insulator
- Conductor
- Semiconductor
- Silicon
- Crystal
- Hole
- Doping
- *PN* junction
- Barrier potential

Visit the Companion Website

Study aids for this chapter are available at http://www.pearsonhighered.com/electronics

Introduction

Electronic devices such as diodes, transistors, and integrated circuits are made of a semiconductive material. To understand how these devices work, you should have a basic knowledge of the structure of atoms and the interaction of atomic particles. An important concept introduced in this chapter is that of the *pn* junction that is formed when two different types of semiconductive material are joined. The *pn* junction is fundamental to the operation of devices such as the solar cell, the diode, and certain types of transistors.