



Principles of Solar Cells, LEDs and Diodes: The role of the PN junction

By Adrian Kitai

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This textbook introduces the physical concepts required for a comprehensive understanding of p-n junction devices, light emitting diodes and solar cells.

Semiconductor devices have made a major impact on the way we work and live. Today semiconductor

p-n junction diode devices are experiencing substantial growth: solar cells are used on an unprecedented scale in the renewable energy industry; and light emitting diodes (LEDs) are revolutionizing energy efficient lighting. These two emerging industries based on p-n junctions make a significant contribution to the reduction in fossil fuel consumption.

This book covers the two most important applications of semiconductor diodes - solar cells and LEDs - together with quantitative coverage of the physics of the p-n junction. The reader will gain a thorough understanding of p-n junctions as the text begins with semiconductor and junction device fundamentals and extends to the practical implementation of semiconductors in both photovoltaic and LED devices. Treatment of a range of important semiconductor materials and device structures is also presented in a readable manner.

Topics are divided into the following six chapters:

- Semiconductor Physics
- The PN Junction Diode
- Photon Emission and Absorption
- The Solar Cell
- Light Emitting Diodes
- Organic Semiconductors, OLEDs and Solar Cells

Containing student problems at the end of each chapter and worked example problems throughout, this textbook is intended for senior level undergraduate students doing courses in electrical engineering, physics and materials science. Researchers working on solar cells and LED devices, and those in the electronics

industry would also benefit from the background information the book provides.

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Editorial Review

From the Back Cover

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About the Author

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