



# Reliability and Failure of Electronic Materials and Devices

By Milton Ohring

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## **Reliability and Failure of Electronic Materials and Devices** By Milton Ohring

Suitable as a reference work for reliability professionals or as a text for advanced undergraduate or graduate students, this book introduces the reader to the widely dispersed reliability literature of microelectronic and electronic-optical devices.

**Reliability and Failure of Electronic Materials and Devices** integrates a treatment of chip and packaging level failures within the context of the atomic mechanisms and models used to explain degradation, and the statistical handling of lifetime data. Electromigration, dielectric radiation damage and the mechanical failure of contacts and solder joints are among the failure mechanisms considered. An underlying thread of the book concerns product defects--their relation to yield and reliability, the role they play in failure, and the way they are experimentally exposed.

The reader will gain a deeper physical understanding of failure mechanisms in electronic materials and devices, acquire skills in the mathematical handling of reliability data, and better appreciate future technology trends and the reliability issues they raise.

### Key Features

- \* Discusses reliability and failure on both the chip and packaging levels
- \* Handles the role of defects in yield and reliability
- \* Includes a tutorial chapter on the mathematics of reliability
- \* Focuses on electromigration, dielectric breakdown, hot-electron effects, electrostatic discharge, corrosion, radiation damage and the mechanical failure of packages, contacts, and solder joints
- \* Considers defect detection methods and failure analysis techniques

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## Reliability and Failure of Electronic Materials and Devices By Milton Ohring Bibliography

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### Editorial Review

#### From the Back Cover

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#### ABOUT THE AUTHOR

Dr. Milton Ohring, author of two previously acclaimed Academic Press books, *The Materials Science of Thin Films* (1992), and *Engineering Materials Science* (1995), has taught courses on reliability and failure in electronics at Bell Laboratories (AT&T and Lucent Technologies). From this perspective and the well-written tutorial style of the book, the reader will gain deeper physical understanding of failure mechanisms in electronic materials and devices; acquire skills in the mathematical handling of reliability data; and better appreciate future technology trends and the reliability issues they raise.

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