



# Ferroelectric Devices 2nd Edition

*Kenji Uchino*

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## Ferroelectric Devices 2nd Edition Kenji Uchino

Updating its bestselling predecessor, **Ferroelectric Devices, Second Edition** assesses the last decade of developments—and setbacks—in the commercialization of ferroelectricity. Field pioneer and esteemed author Uchino provides insight into why this relatively nascent and interdisciplinary process has failed so far without a systematic accumulation of fundamental knowledge regarding materials and device development.

Filling the informational void, this collection of information reviews state-of-the-art research and development trends reflecting nano and optical technologies, environmental regulation, and alternative energy sources. Like the first edition, which became a standard in the field, this volume provides a general introduction to ferroelectrics with theoretical background. It then addresses practical design and device manufacturing, including recently developed processes and applications. Updating old data with a forecast of future developments, the text analyzes improvements to original ferroelectric devices to aid the design process of new ones.

The second edition includes new sections on:

- Pb-free piezoelectrics
- Size effect on ferroelectricity
- Electrocaloric devices
- Micro mass sensor
- Piezoelectric energy harvesting
- Light valves and scanners
- Multi-ferroic devices, including magneto-electric sensors

Uchino provides a general introduction to the theoretical background of ferroelectric devices, practical materials, device designs, drive/control techniques, and typical applications. He presents frequently asked questions from students, lab demonstrations for practical understanding, and "check point" quizzes and model solutions to monitor understanding.

After a thorough exploration of ferroelectric devices and their past, this book looks to the industry's future, assessing market size and remaining reliability/lifetime issues. The author also unveils his strategy for developing "best-selling" ferroelectric devices.

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