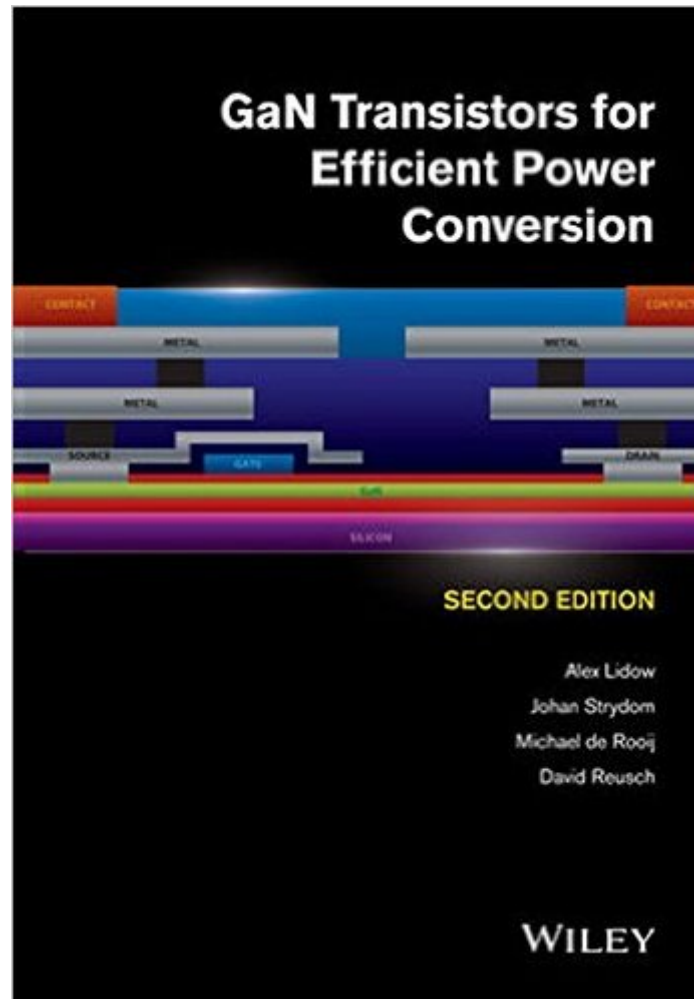


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# GaN Transistors For Efficient Power Conversion



## Synopsis

Gallium nitride (GaN) is an emerging technology that promises to displace silicon MOSFETs in the next generation of power transistors. As silicon approaches its performance limits, GaN devices offer superior conductivity and switching characteristics, allowing designers to greatly reduce system power losses, size, weight, and cost. This timely second edition has been substantially expanded to keep students and practicing power conversion engineers ahead of the learning curve in GaN technology advancements. Acknowledging that GaN transistors are not one-to-one replacements for the current MOSFET technology, this book serves as a practical guide for understanding basic GaN transistor construction, characteristics, and applications. Included are discussions on the fundamental physics of these power semiconductors, layout and other circuit design considerations, as well as specific application examples demonstrating design techniques when employing GaN devices. With higher-frequency switching capabilities, GaN devices offer the chance to increase efficiency in existing applications such as DC-DC conversion, while opening possibilities for new applications including wireless power transfer and envelope tracking. This book is an essential learning tool and reference guide to enable power conversion engineers to design energy-efficient, smaller and more cost-effective products using GaN transistors. Key features:

- Written by leaders in the power semiconductor field and industry pioneers in GaN power transistor technology and applications.
- Contains useful discussions on device-circuit interactions, which are highly valuable since the new and high performance GaN power transistors require thoughtfully designed drive/control circuits in order to fully achieve their performance potential.
- Features practical guidance on formulating specific circuit designs when constructing power conversion systems using GaN transistors – see companion website for further details.

A valuable learning resource for professional engineers and systems designers needing to fully understand new devices as well as electrical engineering students.

## Book Information

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## Customer Reviews

The authors have presented a thorough presentation of the characteristics and importance of the emerging GaN transistor field. The book is is topically very well organized. Starting with the fundamental physics the presentation proceeds to working physical structures. Comparisons of GaN devices with existing power Mosfet transistors is well made. Numerous applied circuit examples are given and the volume is richly filled with excellent diagrams and illustrations. I recommend this work to all doing transistorized equipment design and, also, to those interested in the economic potential of this transitional technology.

Reviewed by Dennis Feucht on April 23, 2015Format: HardcoverThe lead author is an industry pioneer in semiconductor processing of power devices. He continues his pioneering work by moving into enhancement-mode gallium-nitride (eGaN) MOSFETs, which are now transitioning from research to commercial use and, given their characteristics, are bound to be of major significance to power electronics engineers. Among their most notable attributes: they are fast.This book offers an introduction to eGaN MOSFETs, which are devices that have been brought to market by Efficient Power Conversion (EPC), the company at which this bookâ™s authors work. While this text is by no means complete, it offers readers a good first step in learning about an important new power device. GaN MOSFETs do not behave in quite the same way as silicon MOSFETs and this book emphasizes differences so that power circuits designers can make the best use of them and exploit their advantages.A supplemental sequel is the book Wireless Power Handbook by Michael A. de Rooij subtitled âœThe eGaN FET Journey Continuesâ •. It is about the use of high-frequency magnetic fields to effect âœhighly-resonant wireless power transferâ •, and the fast switching circuits used in its implementation.For a more details, please see my complete review in How2Power Today on the How2Power website in the .com domain.

This book is an excellent and practical reference for all power conversion design engineers or students. A must have!

Impressive book, the best of I have seen on GaN power applications. I would have liked to have seen more on GaN processing and GaN HEMT.

Excellent book for understanding and applying eGaN MOSFET technology. Well written for those skilled in the art of circuit design.

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