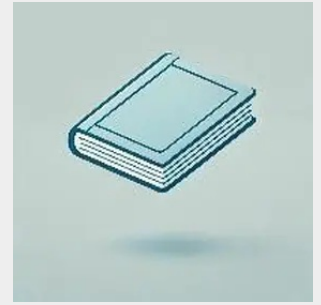


Next-Generation Electronics

Devices, Circuits, and Applications

The book focuses on critical aspects of next generation electronics like advanced devices, signal processing circuits and system level applications. It covers topics such as nanosheet field-effect transistor modeling and simulations, integration of artificial intelligence and machine learning in VLSI design, digital circuits for system security, and advanced system design. This book: - Discusses next-generation devices like Graphene field-effect transistors, FinFET, and carbon nanotube field-effect transistors. - Focuses on device-to-circuit applications in thrust areas like memory design, repeaters, static random-access memory, domino circuits, and multi-stage synchronous counters. - Covers signal processing modules at the circuit and higher levels of design for applications with a focus on novel circuit design and architectures to maximize performance metrics. - Presents design and investigation of various critical modules of analog, digital, and mixed integrated circuits ranging from memory to repeaters, interconnects and arithmetic units. - Includes case studies of device-to-circuit co-design wherein the device parameters of advanced devices are extracted and then utilized as device symbols in circuit simulation. It is primarily written for senior undergraduates, graduate students, and academic researchers in electrical engineering, electronics, and communications engineering.



148,50 €

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*vorbestellbar, Erscheinungstermin ca.
Dezember 2026*

Artikelnummer: 9781032987644

Medium: Buch

ISBN: 978-1-032-98764-4

Verlag: Taylor & Francis Ltd

Erscheinungstermin: 15.12.2026

Sprache(n): Englisch

Auflage: 1. Auflage 2026

Serie: Electronic Materials, Devices,
Systems and Manufacturing

Produktform: Gebunden

Seiten: 352

Format (B x H): 156 x 234 mm

