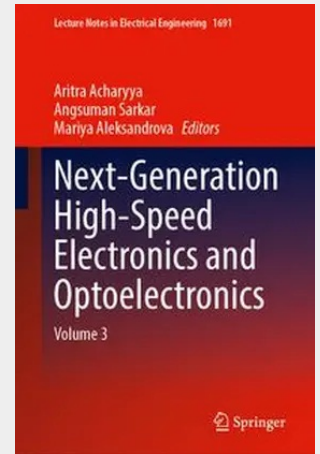


Next-Generation High-Speed Electronics and Optoelectronics

Volume 3

The book presents latest innovations enabling ultrafast, energy-efficient, and reliable technologies across electronic and photonic domains. The book advances beyond the foundations of previous volumes by integrating developments in wide- and ultra-wide-bandgap semiconductors, two-dimensional materials, ferroelectrics, and spintronics with novel device architectures including HEMTs, nanosheet and fork sheet FETs, TFETs, NC-FETs, and in-memory computing systems. Circuit-level topics encompass nanosheet-based RF building blocks, photonic–electronic hybrids, fault-tolerant VLSI, and advanced interconnects. Emphasis is also placed on terahertz and photonic frontiers, highlighting high-capacity communication, imaging, and quantum technologies. Application-driven perspectives include MEMS–AI healthcare platforms, stress hormone and dopamine biosensors, photovoltaic forecasting, and wide-bandgap devices for electric vehicles and smart grids. With contributions from international experts, the volume addresses both fundamental principles and real-world applications, serving as a valuable reference for graduate students, researchers, and professionals seeking insights into the future of high-speed electronics and optoelectronics.

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