Record Nr. UNINA9910557351703321
Autore Medidoub Farid

Wide Bandgap Based Devices: Design, Fabrication and Applications

Pubbl/distr/stampa Basel, Switzerland, : MDPI - Multidisciplinary Digital Publishing

Institute, 2021

Descrizione fisica 1 electronic resource (242 p.)

Soggetti Technology: general issues

Inglese

Formato Materiale a stampa

Livello bibliografico Monografia

Sommario/riassunto

Lingua di pubblicazione

Titolo

Emerging wide bandgap (WBG) semiconductors hold the potential to advance the global industry in the same way that, more than 50 years ago, the invention of the silicon (Si) chip enabled the modern computer era. SiC- and GaN-based devices are starting to become more commercially available. Smaller, faster, and more efficient than their counterpart Si-based components, these WBG devices also offer greater expected reliability in tougher operating conditions. Furthermore, in this frame, a new class of microelectronic-grade semiconducting materials that have an even larger bandgap than the previously established wide bandgap semiconductors, such as GaN and SiC, have been created, and are thus referred to as "ultra-wide bandgap" materials. These materials, which include AlGaN, AlN, diamond, Ga2O3, and BN, offer theoretically superior properties, including a higher critical breakdown field, higher temperature operation, and potentially higher radiation tolerance. These attributes, in turn, make it possible to use revolutionary new devices for extreme environments, such as highefficiency power transistors, because of the improved Baliga figure of merit, ultra-high voltage pulsed power switches, high-efficiency UV-LEDs, and electronics. This Special Issue aims to collect high quality research papers, short communications, and review articles that focus on wide bandgap device design, fabrication, and advanced characterization. The Special Issue will also publish selected papers from the 43rd Workshop on Compound Semiconductor Devices and

Integrated Circuits, held in France (WOCSDICE 2019), which brings together scientists and engineers working in the area of III–V, and other compound semiconductor devices and integrated circuits.