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Altri autori (Persone)	SeongTae-Yeon
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Nota di contenuto	1: Introduction Part A. Progress and prospect of growth of wide-band-gap III-nitrides; Hiroshi Amano -- 2: Introduction Part B. Ultra-efficient solid-state lighting: likely characteristics, economic benefits, technological approaches; Jeff Y. Tsao, et al -- 3: Epitaxy Part A. LEDs Based on Heteroepitaxial GaN on Si Substrates; Takashi Egawa and Osamu Oda -- 4: Epitaxy Part B. Epitaxial Growth of GaN on Patterned Sapphire Substrates; Kazuyuki Tadatomo -- 5: Growth and optical properties of GaN-based non- and semipolar LEDs; Michael Kneissl et al -- 6: Active region Part A. Internal Quantum Efficiency in Light Emitting Diodes; Elison Matioli and Claude Weisbuch -- 7: Active region Part B. Internal Quantum Efficiency; Jong-In Shim -- 8: Electrical properties, reliability issues, and ESD robustness of InGaN-based LEDs; Matteo Meneghini, et al -- 9: Light extraction efficiency Part A. Ray Tracing for Light Extraction Efficiency (LEE) Modeling in Nitride LEDs; C. Lalau Keraly, et al -- 10: Light extraction efficiency Part B. Light Extraction of High Efficient Light-Emitting Diodes; Ja-Yeon Kim, et al -- 11: Packaging. Phosphors and white LED packaging; Rong-Jun Xie and Naoto Hirosaki -- 12: High voltage LED; Wen-Yung Yeh, et al -- 13: Color Quality of White LEDs; Yoshi Ohno -- 14: Emerging System Level Applications for LED Technology; Robert F. Karlicek, Jr.
Sommario/riassunto	Light emitting diodes (LEDs) are already used in traffic signals, signage lighting, and automotive applications. However, its ultimate goal is to replace traditional illumination through LED lamps since LED lighting

significantly reduces energy consumption and cuts down on carbon-dioxide emission. Despite dramatic advances in LED technologies (e.g., growth, doping and processing technologies), however, there remain critical issues for further improvements yet to be achieved for the realization of solid-state lighting. This book aims to provide the readers with some contemporary LED issues, which have not been comprehensively discussed in the published books and, on which the performance of LEDs is seriously dependent. For example, most importantly, there must be a breakthrough in the growth of high-quality nitride semiconductor epitaxial layers with a low density of dislocations, in particular, in the growth of Al-rich and In-rich GaN-based semiconductors. The materials quality is directly dependent on the substrates used, such as sapphire, Si, etc. In addition, efficiency droop, growth on different orientations and polarization are also important. Chip processing and packaging technologies are key issues. This book presents a comprehensive review of contemporary LED issues. Given the interest and importance of future research in nitride semiconducting materials and solid state lighting applications, the contents are very timely. The book is composed of chapters written by leading researchers in III-nitride semiconducting materials and device technology. This book will be of interest to scientists and engineers working on LEDs for lighting applications. Postgraduate researchers working on LEDs will also benefit from the issues this book provides.
