

Fundamentals of Solid-State Lighting: LEDs, OLEDs, and Their Applications in Illumination and Displays

By Vinod Kumar Khanna

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Compared to traditional electrical filaments, arc lamps, and fluorescent lamps, solid-state lighting offers higher efficiency, reliability, and environmentally friendly technology. LED / solid-state lighting is poised to take over conventional lighting due to cost savings?there is pretty much no debate about this. In response to the recent activity in this field, **Fundamentals of Solid-State Lighting: LEDs, OLEDs, and Their Applications in Illumination and Displays** covers a range of solid-state devices, technologies, and materials used for lighting and displays. It also examines auxiliary but critical requirements of efficient applications, such as modeling, thermal management, reliability, and smart lighting.

The book discusses performance metrics of LEDs such as efficiency, efficacy, current–voltage characteristics, optical parameters like spectral distribution, color temperature, and beam angle before moving on to luminescence theory, injection luminescence, radiative and non-radiative recombination mechanisms, recombination rates, carrier lifetimes, and related topics. This lays down the groundwork for understanding LED operation. The book then discusses energy gaps, light emission, semiconductor material, special equipment, and laboratory facilities. It also covers production and applications of high-brightness LEDs (HBLEDs) and organic LEDs (OLEDs).

LEDs represent the landmark development in lighting since the invention of electric lighting, allowing us to create unique, low-energy lighting solutions, not to talk about their minor maintenance expenses. The rapid strides of LED lighting technology over the last few years have changed the dynamics of the global lighting market, and LEDs are expected to be the mainstream light source in the near future. In a nutshell, the book traces the advances in LEDs, OLEDs, and their applications, and presents an up-to-date and analytical perspective of the scenario for audiences of different backgrounds and interests.

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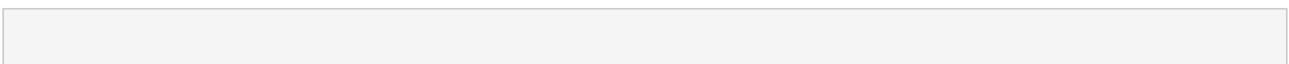
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