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Collana	Handbook of Nitride Semiconductors and Devices (VCH)
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Nota di contenuto	Handbook of Nitride Semiconductors and Devices; Contents; Preface; Color Tables; 1 Light-Emitting Diodes and Lighting; Introduction; 1.1 Current-Conduction Mechanism in LED-Like Structures; 1.2 Optical Output Power; 1.3 Losses and Efficiency; 1.4 Current Crowding; 1.5 Packaging; 1.6 Perception of Visible Light and Color; 1.7 Visible-Light Terminology; 1.7.1 Luminous Efficacy; 1.7.2 Chromaticity Coordinates and Color Temperature; 1.8 Inroads by LEDs; 1.9 Nitride LED Performance; 1.9.1 LEDs on Sapphire Substrates; 1.9.1.1 Blue and Green LEDs; 1.9.1.2 Amber LEDs; 1.9.1.3 UV LEDs 1.9.1.4 Resonant Cavity-Enhanced LED1.9.1.5 Effect of Threading Dislocation on LEDs; 1.9.2 LEDs on SiC Substrates; 1.9.3 LEDs on Si Substrates; 1.9.4 LEDs Utilizing Rare Earth Transitions; 1.10 On the Nature of Light Emission in Nitride-Based LEDs; 1.10.1 Pressure Dependence of Spectra; 1.10.2 Current and Temperature Dependence of Spectra; 1.11 LED Degradation; 1.12 LED Efficiency; 1.13 Monochrome Applications of LEDs; 1.14 Luminescence Conversion and White-Light Generation with Nitride LEDs; 1.14.1 Color as Related to White-Light LEDs; 1.14.2 Color Rendering Index

1.15 Approaches to White-Light Generation
1.15.1 White Light from Three-Chip LEDs; 1.15.2 White Light from Four-Chip LEDs; 1.15.3 Combining LEDs and Phosphor(s); 1.15.4 Other Photon Conversion Schemes; 1.16 Toward the White-Light Applications; 1.17 Organic/Polymeric LEDs (OLED, PLED); 1.17.1 OLED Structures; 1.17.2 Charge and Energy Transport Fundamentals; 1.17.3 Properties of Organic Crystals; 1.17.4 Light Emission Dynamics; 1.17.4.1 Nonradiative Recombination; 1.17.4.2 Internal Conversion; 1.17.4.3 Intersystem Crossing; 1.17.4.4 Singlet Fission; 1.17.4.5 Aggregation and Davydov Splitting
1.17.4.6 Charge-Transfer Excitons
1.17.5 OLED Devices; 1.17.5.1 White OLEDs; 1.17.5.2 Displays; 1.17.6 Lighting with OLEDs; References; 2 Semiconductor Lasers; Introduction; 2.1 A Primer to the Principles of Lasers; 2.2 Waveguiding; 2.2.1 Refractive Index of GaN and AlGaIn; 2.2.2 Refractive Index of InGaIn; 2.2.3 Analytical Solution to the Waveguide Problem; 2.2.4 Numerical Solution of the Waveguide Problem; 2.2.5 Far-Field Pattern; 2.3 Loss, Threshold, and Cavity Modes; 2.4 Optical Gain; 2.4.1 A Glossary for Semiconductor Lasers; 2.4.2 Optical Gain in Bulk Layers: A Semiconductor Approach
2.4.2.1 Relating Absorption Rate to Absorption Coefficient
2.4.2.2 Relating Stimulated Emission Rate to Absorption Coefficient; 2.4.2.3 Relating Spontaneous Emission Rate to Absorption Coefficient; 2.4.2.4 Fermi's Golden Rule, Stimulated and Spontaneous Emission Rates, and Absorption Coefficient Within the k-Selection Rule; 2.4.3 Gain in Quantum Wells; 2.5 Coulombic Effects; 2.6 Numerical Gain Calculations for GaN; 2.6.1 Optical Gain in Bulk GaN; 2.6.2 Gain in GaN Quantum Wells; 2.6.3 Gain Calculations in Wz GaN Q Wells Without Strain; 2.6.4 Gain Calculations in Wz Q Wells with Strain
2.6.5 Gain in ZB Q Wells Without Strain

Sommario/riassunto

The three volumes of this handbook treat the fundamentals, technology and nanotechnology of nitride semiconductors with an extraordinary clarity and depth. They present all the necessary basics of semiconductor and device physics and engineering together with an extensive reference section. Volume 3 deals with nitride semiconductor devices and device technology. Among the application areas that feature prominently here are LEDs, lasers, FETs and HBTs, detectors and unique issues surrounding solar blind detection.
