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Sommario/riassunto

"This reference book provides a fully integrated novel approach to the development of high power, single transverse mode, edge-emitting diode lasers by addressing the complementary topics of device engineering (Part 1), reliability engineering (Part 2) and device diagnostics (Part 3) in the same book in altogether nine comprehensive chapters, and thus closes the gap in the current book literature. Diode laser fundamentals are discussed, followed by an elaborate discussion of problem-oriented design guidelines and techniques, and by a systematic treatment of the origins of laser degradation and a thorough exploration of the engineering means to address for effective remedies and enhanced optical strength. The discussion covers also stability criteria of critical laser characteristics and key laser robustness factors. Clear design considerations are discussed in the context of reliability engineering concepts and models, along with typical programs for reliability tests and laser product qualifications. A final extended part of novel, advanced diagnostic methods covers in detail, for the first time in book literature, performance- and reliability-impacting factors such as temperature, stress and material instabilities. Further key features include: Furnishes comprehensive practical design guidelines by considering also reliability related effects and key laser robustness factors, and discusses basic laser fabrication and packaging issues. Discusses in detail diagnostic investigations of diode lasers, the

fundamentals of the applied approaches and techniques, many of them pioneered by the author to be fit-for-purpose and novel in the application. Provides a systematic insight into laser degradation modes such as catastrophic optical damage, and covers a wide range of technologies to increase the optical strength of diode lasers. Discusses basic concepts and techniques of laser reliability engineering, and provides for the first time in a book details on a standard commercial program for testing the reliability of high power diode laser.

Semiconductor Laser Engineering, Reliability and Diagnostics reflects the extensive expertise of the author in the diode laser field both as a top scientific researcher as well as a key developer of highly reliable devices. It features two hundred figures and tables illustrating numerous aspects of diode laser engineering, fabrication, packaging, reliability, performance, diagnostics and applications, and an extensive list of references to all addressed technical topics at the end of each chapter. With invaluable practical advice, this novel reference book is suited to practising researchers in diode laser technologies, and to postgraduate engineering students. "--

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