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epitaxy; 4.3.5 Chemical beam epitaxy; 4.4 Strained Layer Epitaxy; 4.5 Selective Area Growth; 4.5.1 Model of SAG; 4.5.2 Materials growth using SAG; 4.6 Amplifier Designs; 4.6.1 Leakage current; 4.7 Growth of QWR and QD Materials; 4.8 References; 5. Low Reflectivity Facet Designs; 5.1 Introduction; 5.2 Low Reflectivity Coatings; 5.3 Buried Facet Amplifiers; 5.4 Tilted Facet Amplifiers; 5.5 Amplified Spontaneous Emission and Optical Gain; 5.6 References; 6. Amplifier Rate Equations and Operating Characteristics; 6.1 Introduction 6.2 Amplifier Rate Equations for Pulse Propagation 6.3 Pulse Amplification; 6.4 Multichannel Amplification; 6.5 Amplifier Application in Optical Transmission Systems; 6.5.1 In-line amplifiers; 6.5.2 Optical pre-amplifier; 6.5.3 Power amplifier; 6.6 Amplifier Noise; 6.6.1 Noise analysis for optical transmission; 6.7 Gain Dynamics; 6.7.1 Model of gain recovery; 6.7.2 Quantum dot SOA; 6.8 References; 7. Photonic Integrated Circuit Using Amplifiers; 7.1 Introduction; 7.2 Integrated Laser and Amplifier; 7.3 Multichannel WDM Sources with Amplifiers; 7.4 Spot Size Conversion (SSC) 7.5 Mach-Zehnder Interferometer 7.6 References; 8. Functional Properties and Applications; 8.1 Introduction; 8.2 Four-Wave Mixing; 8.2.1 CW FWM results; 8.2.1.1 FWM analysis; 8.2.2 Pulsed FWM results; 8.2.3 FWM bandwidth; 8.3 Cross Gain Modulation; 8.3.1 Rate equations for multiple pulse propagation; 8.3.2 Bandwidth of cross gain modulation; 8.4 Cross Phase Modulation; 8.4.1 Mach-Zehnder interferometer; 8.5 Wavelength Conversion; 8.6 Optical Demultiplexing; 8.6.1 Four-wave mixing based scheme; 8.6.2 Cross phase modulation based scheme; 8.7 OTDM System Applications; 8.7.1 Clock recovery 8.7.2 OTDM transmission

Sommario/riassunto

This invaluable book provides a comprehensive treatment of the design and applications of the semiconductor optical amplifier (SOA). SOAs are important components for optical communication systems with applications as in-line amplifiers and as functional devices in evolving optical networks. The functional applications of SOAs were first studied in the early 1990's; since then, the diversity and scope of such applications have been steadily growing. Semiconductor Optical Amplifiers is self-contained and unified in presentation. The treatments in the book are detailed enough to capture
