

Preface

The increasing demand for high-speed transport of data has revitalized optical communications, leading to extensive work on high-speed device and circuit design. This book has been written to address the need for a tutorial text dealing with the analysis and design of integrated circuits (ICs) for optical communication systems and will prove useful to both graduate students and practicing engineers. The book assumes a solid understanding of analog design, e.g., at the level of *Design of Analog CMOS Integrated Circuits* by B. Razavi or *Analysis and Design of Analog Integrated Circuits* by P. Gray, P. Hurst, S. Lewis, and R. Meyer.

The book comprises ten chapters. Chapter 1 provides an introduction to optical communications, setting the stage for subsequent developments. Chapter 2 describes basic concepts, building the foundation for analysis and design of circuits. Chapter 3 deals with optical devices and systems, bridging the gap between optics and electronics.

Chapter 4 addresses the design of transimpedance amplifiers, focusing on low-noise broadband topologies and their trade-offs. Chapter 5 extends these concepts to limiting amplifiers and output buffers, introducing methods of achieving a high gain with a broad bandwidth.

Chapter 6 presents oscillator fundamentals, and Chapter 7 focuses on LC oscillators. Chapter 8 describes the design of phase-locked loops, and Chapter 9 applies the idea of phase locking to clock and data recovery circuits. Chapter 10 deals with high-speed transmitter circuits such as multiplexers and laser drivers.

The book can be adopted for a graduate course on high-speed IC design. In a quarter system, parts of Chapters 3, 4, and 10 may be skipped. In a semester system, all chapters can be covered.

A website for the book provides additional resources for the reader, including an image set and web links. Visit www.mhhe.com/razavi for more information.

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Behzad Razavi
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