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Nota di contenuto	Broadband Circuits for Optical Fiber Communication; Preface; Contents; I Introduction; 2 Optical Fiber; 2.1 Loss and Bandwidth; 2.2 Dispersion; 2.3 Nonlinearities; 2.4 Pulse Spreading due to Chromatic Dispersion; 2.5 Summary; 2.6 Problems; 3 Photodetectors; 3.1 p-i-n Photodetector; 3.2 Avalanche Photodetector; 3.3 p-i-n Detector with Optical Preamplifier; 3.4 Summary; 3.5 Problems; 4 Receiver Fundamentals; 4.1 Receiver Model; 4.2 Bit-Error Rate; 4.3 Sensitivity; 4.4 Personick Integrals; 4.5 Power Penalty; 4.6 Bandwidth; 4.7 Adaptive Equalizer; 4.8 Nonlinearity; 4.9 Jitter 4.10 Decision Threshold Control 4.11 Forward Error Correction; 4.12 Summary; 4.13 Problems; 5 Transimpedance Amplifiers; 5.1 TIA Specifications; 5.1.1 Transimpedance; 5.1.2 Input Overload Current; 5.1.3 Maximum Input Current for Linear Operation; 5.1.4 Input-Referred Noise Current; 5.1.5 Bandwidth and Group-Delay Variation; 5.2 TIA Circuit Concepts; 5.2.1 Low- and High-Impedance Front-Ends; 5.2.2 Shunt Feedback TIA; 5.2.3 Noise Optimization; 5.2.4 Adaptive

Transimpedance; 5.2.5 Post Amplifier; 5.2.6 Common-Base/Gate Input Stage; 5.2.7 Current-Mode TIA; 5.2.8 Active-Feedback TIA  
5.2.9 Inductive Input Coupling 5.2.10 Differential TIA and Offset Control; 5.2.11 Burst-Mode TIA; 5.2.12 Analog Receiver; 5.3 TIA Circuit Implementations; 5.3.1 MESFET and HFET Technology; 5.3.2 BJT, BiCMOS, and HBT Technology; 5.3.3 CMOS Technology; 5.4 Product Examples; 5.5 Research Directions; 5.6 Summary; 5.7 Problems; 6 Main Amplifiers; 6.1 Limiting vs. Automatic Gain Control (AGC); 6.2 MA Specifications; 6.2.1 Gain; 6.2.2 Bandwidth and Group-Delay Variation; 6.2.3 Noise Figure; 6.2.4 Input Dynamic Range; 6.2.5 Input Offset Voltage; 6.2.6 Low-Frequency Cutoff; 6.2.7 AM-to-PM Conversion  
6.3 MA Circuit Concepts 6.3.1 Multistage Amplifier; 6.3.2 Techniques for Broadband Stages; 6.3.3 Offset Compensation; 6.3.4 Automatic Gain Control; 6.3.5 Loss of Signal Detection; 6.3.6 Burst-Mode Amplifier; 6.4 MA Circuit Implementations; 6.4.1 MESFET and HFET Technology; 6.4.2 BJT and HBT Technology; 6.4.3 CMOS Technology; 6.5 Product Examples; 6.6 Research Directions; 6.7 Summary; 6.8 Problems; 7 Optical Transmitters; 7.1 Transmitter Specifications; 7.2 Lasers; 7.3 Modulators; 7.4 Limits in Optical Communication Systems; 7.5 Summary; 7.6 Problems; 8 Laser and Modulator Drivers  
8.1 Driver Specifications 8.1.1 Modulation and Bias Current Range (Laser Drivers); 8.1.2 Output Voltage Range (Laser Drivers); 8.1.3 Modulation and Bias Voltage Range (Modulator Drivers); 8.1.4 Power Dissipation; 8.1.5 Rise and Fall Times; 8.1.6 Pulse-Width Distortion; 8.1.7 Jitter Generation; 8.1.8 Eye-Diagram Mask Test; 8.2 Driver Circuit Concepts; 8.2.1 Current-Steering Output Stage; 8.2.2 Back Termination; 8.2.3 Predriver; 8.2.4 Pulse-Width Control; 8.2.5 Data Retiming; 8.2.6 Automatic Power Control (Lasers); 8.2.7 End-of-Life Detection (Lasers) 8.2.8 Automatic Bias Control (MZ Modulators)

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## Sommario/riassunto

An expert guide to the new and emerging field of broadband circuits for optical fiber communication This exciting publication makes it easy for readers to enter into and deepen their knowledge of the new and emerging field of broadband circuits for optical fiber communication. The author's selection and organization of material have been developed, tested, and refined from his many industry courses and seminars. Five types of broadband circuits are discussed in detail: \* Transimpedance amplifiers \* Limiting amplifiers \* Automatic gain control (AGC) amplifiers \* Lasers driver

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