



Broadband Opto-Electrical Receivers in Standard CMOS [

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Monografía

Broadband Opto-Electrical Receivers in Standard CMOS fits in the quest for integrated opto-electrical solutions, and focuses on the receiver front-end. To further reduce the cost, the cheapest technology is selected: standard CMOS, without any optical tricks or flavors. The emphasis is on the analysis, design and implementation of high-performance analog receiver circuits. Broadband Opto-Electrical Receivers in Standard CMOS starts from the basic fundamentals, necessary for the design of opto-electronic interface circuits. The book continues with an in-depth analysis of the photodiode, transimpedance amplifier (TIA) and limiting amplifier (LA). To thoroughly understand the light detection mechanisms in silicon, first a one-dimensional and second a two-dimensional model is developed. Analytical design equations are derived to guide the design of the amplifying circuits. For the TIA, the focus lies on the sensitivity-speed trade-off. For the LA, a high gain-bandwidth is pursued. Several practical design examples reveal the subtleties and challenges encountered during the design of high-performance analog circuits. Broadband Opto-Electrical Receivers in Standard CMOS covers the total design flow of monolithic CMOS optical receivers. All material is experimentally verified with several CMOS implementations, with ultimately a fully integrated Gbit/s optical receiver front-end including photodiode, TIA and LA. The book is essential reading for analog design engineers and researchers in the field and is also suitable as a text book for an advanced course on the subject

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