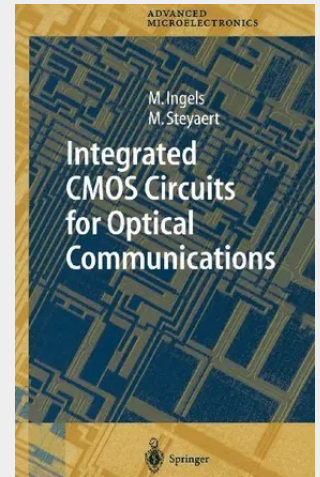


Integrated CMOS Circuits for Optical Communications

This work investigates the feasibility of the integration of interface circuits for optical communication systems in a standard unmodified digital CMOS process. This paves the way for single chip communication systems where the optical interfaces are integrated on the same die as the required digital circuitry. The optical receiver is a key element in the optical communication link. In this work, a transimpedance amplifier, which consists of a voltage amplifier with resistive feedback, is used as the first stage. Unlike for many other circuits, the optimal place of its dominant pole is the input node. It is also demonstrated that a high gain of the voltage amplifier is primordial to obtain good performances and that this may be obtained through the use of multiple stages. Noise aspects are investigated and the conclusion is drawn that the amplifier's input capacitance can be smaller than the photodiode's capacitance for optimal performance.

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