



0.35 μm CMOS OPTICAL SENSOR FOR AN INTEGRATED TRANSIMPEDANCE CIRCUIT

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Abstract- This paper presents an integrated optical receiver which consists of an integrated photodetector, and a transimpedance circuit. A series inductive peaking is used for enhancing the bandwidth. The proposed structure operates at a data rate of 10 Gb/s with a BER of 10^{-20} and was implemented in a 0.35 μm CMOS process.

The integrated photodiode has a capacitance of 0.01 pF which permits to the structure to achieve a wide bandwidth (5.75 GHz) with only one inductor before the last stage; hence a smaller silicon area is maintained. The proposed TIA has a gain of 36.56 dB (67.57 K Ω), and an input current noise level of about 25.8 pA/Hz^{0.5}. It consumes a DC power of 87.4 mW from 3.3 V supply voltage.

Index terms: CMOS technology, Integrated photodiode; SML photodiode; Transimpedance, bandwidth enhancement; shunt and series peaking;