



## **0.35 $\mu\text{m}$ CMOS OPTICAL SENSOR FOR AN INTEGRATED TRANSIMPEDANCE CIRCUIT**

H. Escid , M. Attari, M. Ait aidir, and W. Mechti

Instrumentation Laboratory,

Houari Boumediene University of Sciences and Technology,

BP. 32, Bab Ezzouar 16111, Algiers, Algeria

Mails: hescid@yahoo.fr, attari.mo@gmail.com

Merie\_sb@hotmail.fr, w.mechti@gmail.com

---

*Submitted: July 5, 2011      Accepted: August 18, 2011      Published: September 1, 2011*

---

*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  $\mu\text{m}$  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 $\Omega$ ), and an input current noise level of about 25.8 pA/Hz<sup>0.5</sup>. 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;*