

# The optical and electrical properties of Zinc Oxide films on the N/P silicon substrates

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## ABSTRACT

In this work, we investigated the ZnO thin film on the N/P type silicon substrates by the RF magnetron sputtering method. We study the optical and electrical properties by IV-curve, photoconductivity and persistent photoconductivity. The thermal-emission is very important when metal connects to the semiconductor or in the experimental of N / P type silicon. The characteristic of non-ohmic contact is formed because of the carrier can not pass through the barrier. The energy barrier can be obtained by the Schottky effect model. Investigating the oxygen defect of ZnO thin film, we can use the optical absorption edge and energy gap by the photoconductivity and the persistent photoconductivity measurement. The persistent photoconductivity effect fitting curves corresponded to the stretch exponential effect [ $I(t)=I_0(t)\exp(-t/\tau)$ ] indicates that defect exist in the energy gap with the 30.5meV from the conduction band.

Keywords : ZnO、thin film、Schottky、defect

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