

Fabrication of InGaAs P-I-N Micro-Photodiode Sensor Array

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Abstract : In this letter, we reported the fabrication of InGaAs micro-photodiode sensor array with the rapid thermal diffusion (RTD) technique. The spin-on dopant source Zn was used to form the p-type region in InP layer. Through the RTD technique, the InP/InGaAs heterostructure was formed. We improved our fabrication on the p-i-n photodiode to micro size which pixel is 7.8 μ m, and the pitch is 12.8 μ m. The proper SiN_x was deposited to form the passivation layer. The leakage current of single pixel decrease to 3.3pA at -5V, and 35fA at -10mV. The leakage current densities of each voltage are 21 μ A/cm² at -5V and 0.223 μ A/cm² at -10mV. As we focus on the wavelength from 0.9 μ m to 1.7 μ m, the optimized Si/Al₂O₃ bilayers are deposited to form the AR-coating.

Keywords : InGaAs, micro sensor array, p-i-n photodiode, rapid thermal diffusion, Zn diffusion

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