

Characterization of the in 0.53 Ga 0.47 as n+nn+ Photodetectors

Authors : Fatima Zohra Mahi, Luca Varani

Abstract : We present an analytical model for the calculation of the sensitivity, the spectral current noise and the detectivity for an optically illuminated In_{0.53}Ga_{0.47}As n+nn+ diode. The photocurrent due to the excess carrier is obtained by solving the continuity equation. Moreover, the current noise level is evaluated at room temperature and under a constant voltage applied between the diode terminals. The analytical calculation of the current noise in the n+nn+ structure is developed. The responsivity and the detectivity are discussed as functions of the doping concentrations and the emitter layer thickness in one-dimensional homogeneous n+nn+ structure.

Keywords : detectivity, photodetectors, continuity equation, current noise

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