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Optimization of infrared detector HgCdTe in photoconductive in the spectral region 2-6 μm

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Abstract

In this paper a new method in design and modeling of infrared detector HgCdTe in photoconductive mode is presented. In this method after scrutiny mechanical, optical, electrical properties of semiconductor HgCdTe and solving the photoconductive equations, software of equations is programmed and with initial value and repeat cycle, their changes to key parameters such as thickness, wavelength and amount of impurities are calculated and finally, performance of detector is optimized. Modeling of photoconductive detector has been done in temperature of 300K and 2-6 μm wavelength range, according to obtained results, optimal specific detectivity is 3×10^{9} $cmHz^{1/2}W^{-1}$ in 5.77 μm wavelength.

Keywords: low band gap semiconductor, HgCdTe, photoconductive, infrared detector

For full article, refer to the Persian section