

عنوان مقاله:

Responsivity optimization of a metal-semiconductor-metal infrared photodetector include Au-nanoparticles

محل انتشار:

دومین کنفرانس بین المللی مهندسی برق (سال: 1396)

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خلاصه مقاله:

A metal-semiconductor-metal structure -based optical sensors and plasmonic nanoparticles to absorption enhancement, generation exciton improvement, optical responsivity we designed. This design includes metallic nano grating, sub -wavelength aperture, nanoparticles are embedded in an absorption region. We do this for the first time a new structure to capture and transmission-electron-hole pairs generated in the active region to metal electrodes, we have designed. Our simulation finite difference time domain method for solving Maxwell s equations and the theory of the structure Mai, absorption and scattering of light, generation rates, drift-diffusion in terms of our simulation. The results include a factor of absorption enhancement to 30, the responsivity of 45 micro amps per watt, quantum efficiency of 70% at a wavelength of 820 nm. which for the first time with the design of the new structure, optimize the size of the nanoparticles in the active region and the thickness of the metal grating to improve all these parameters achieved in the infrared spectral range

کلمات کلیدی:

photodetector, plasmonic, nanoparticles, responsivity optimization, absorption enhancement, infrared, FDTD method

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