

Poster Presentations

Photo-illumination effects on the current -voltage characteristics of Ga₂SeS photodiodes

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Abstract

The photoexcitation effects on the electrical properties of the Ag/Ga₂SeS/Ag photodiodes were studied and analyzed. The photodiodes were excited by four different types of lasers of wavelengths of 406, 632.5, 850 and 1550 nm. The power of the laser light was also altered in the range of 0.5-6.0 mW. The photogenerated current was observed to increase with increasing biasing electric field and increasing power of radiation when the applied laser light energy was greater than the energy band gap of the crystal (2.4 eV). This case applied to laser light of 406 nm wavelength. On the other hand, when the laser light energy was less than the energy band gap, the photocurrent of the diode decreases with increasing biasing electric field. This behavior of the photodiode is ascribed to the interband transitions effects which force electron-hole generations to recombine through the energy levels in the band gap before reaching the conduction band. The dynamics of these photodiodes nominate it for use as an ultraviolet detectors.

Keywords: Photodiode; laser; ultraviolet; Ga₂SeS crystal