

Analytical model of quantum efficiency of photodiodes based on indium antimonide

V. S. Kovshov^{1,2}, N. I. Yakovleva¹, and A. V. Nikonov²

¹ Orion R&P Association, JSC
9 Kosinskaya st., Moscow, 111538, Russia
E-mail: kovshov@phystech.etu

² Moscow Institute of Physics and Technology
9 Institutskiy per., Dolgoprudny, Moscow Region, 141701, Russia

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Spectral photoresponse of photodetectors based on indium antimonide, intended for detection, recognition and identification of thermal objects in the middle wavelength infrared (MWIR) has been investigated. Quantum efficiency depending on design parameters of photodiodes has been calculated taking into account the radiation transmission through the antireflection coating, and its reflection from the interface «p⁺-layer/ohmic contact» with subsequent reabsorption in the photodiode structure. An analytical model of the indium antimonide absorption coefficient has been developed taking into account the Burstein-Moss effect and the Urbach rule. The optimal thickness of the photodiode base layer has been determined for the various values of minority lifetime.

Keywords: InSb, quantum efficiency, spectral sensitivity, photodiode, FPA.

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