# Low dark current P-InAsSbP/n-*InAs/N-InAsSbP/n*$^+$*-InAs* double heterostructure back-side illuminated photodiodes

P.N. Brunkov[1], N.D. Il'inskaya[1], S.A. Karandashev[1], N.G.Karpukhina[2], A.A.Lavrov[1, 2], B.A. Matveev[1], M.A. Remennyi[1], N.M. Stus'[1], A.A. Usikova[1]

[1] Ioffe Institute, 26 Politekhnicheskaya, St. Petersburg 194021, Russian Federation

[2] IoffeLED, Ltd., 26 Politekhnicheskaya, St. Petersburg 194021, Russian Federation

## Abstract

P-*InAsSbP*/n-*InAs*/N-*InAsSbP*/n$^+$-*InAs* double heterostructure photodiodes with linear impurity distribution in the space charge region have been fabricated and studied. The photodiodes showed good perspectives for use in low temperature pyrometry as low dark current ($8\cdot10^{-6}$ A/cm$^2$, $V_{bias}$=-0.5 V, 164 K) and background limited infrared photodetector (BLIP) regime starting from 150 K (2π field of view, $D^*_{3.1\mu m}=1.4\cdot10^{12}$ cm Hz$^{1/2}$/W) have been demonstrated.

**Key words: mid-IR detectors, InAs photodiodes, infrared sensors, dark current, backside illuminated photodiodes, pyrometry, IR gas sensors**

DOI: 10.1016/j.infrared.2016.04.002