

Optical and electrical properties of a barrier-diode heterostructure based on InSb

K. A. Savin¹, I. I. Minaev¹, A. V. Klekovkin¹, G. N. Eroshenko¹, V. S. Krivobok^{1,2}, S. N. Nikolaev¹, A. E. Goncharov³, A. A. Pruchkina¹, D. A. Pashkeev¹ and D. E. Sviridov¹

¹ P. N. Lebedev Physical Institute of the Russian Academy of Sciences
53 Leninsky Ave., Moscow, 119991, Russia
E-mail: kolob7040@gmail.com

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

³ Orion R&P Association, JSC
9 Kosinskaya st., Moscow, 111538, Russia

Received 18.06.2024; revised 1.07.2024; accepted 9.07.2024

Using molecular beam epitaxy on InSb(100) substrates, a barrier-diode (nBn) structure with a unipolar $\text{In}_{0.8}\text{Al}_{0.2}\text{Sb}$ barrier was obtained. The crystalline perfection of the structure and compliance with the nominal design was confirmed by X-ray diffraction analysis. The electronic subsystem of the resulting nBn structure was characterized using current spreading resistance at the (011) split.

Keywords: current spreading resistance, molecular beam epitaxy, IR photodetector, InSb, barrier-diode heterostructures.

REFERENCES

1. Klipstein P. et al., Proc. of SPIE **7660**, 76602Y-1–76602Y-9 (2010).
2. Ting D. Z. Y. et al., Inf. Phys. Technol. **54**, 267–272 (2011).
3. Kim H. S. et al., Appl. Phys. Lett. **101**, 161114-1–161114-3 (2012).
4. Klaassen F. M., Blok J. and De Hoog F. J., Physica **27** (2), 185–196 (1961).
5. Maimon S. and Wicks G. W., Appl. Phys. Lett. **89**, 151109 (2006).
6. Dong J. T. et al., Journal of Vacuum Science & Technology B **41** (3), (2023).