

Increasing the resistance of highly sensitive photodetectors to optical signal overload

*A. A. Koronnov^{1,2,3}, M. M. Zemlyanov¹, A. E. Safutin¹, M. Yu. Kuznetsov¹
and N. O. Zhuravlev¹*

¹ JSC “Polyus Research Institute of M. F. Stelmakh”

1, 3 Vvedenskogo st., Moscow, 117342, Russia

E-mail: koronnov@inbox.ru

² MIREA – Russian Technological University

(M.V. Lomonosov Institute of Fine Chemical Technologies)

86 Vernadsky Ave., Moscow, 119571, Russia

³ Peoples Friendship University of Russia (RUDN University)

6 Miklukho-Maklaya st., Moscow, 117198, Russia

Received 28.10.2022; revised 10.11.2022; accepted 15.11.2022

Photodiode structures resistance to laser radiation analysis has been carried out. The expediency of using germanium photodiodes to provide increased resistance of photoreceiver to powerful illumination is shown. The main mechanisms that determine the recovery time of the sensitivity of a photoreceiver after intense illumination are presented. A circuit solution is considered to reduce the recovery time of the sensitivity of a photoreceivers after powerful illumination by laser radiation.

Keywords: photoreceiver, pulsed laser rangefinder.

DOI: 10.51368/2307-4469-2023-11-1-32-41

REFERENCES

1. Catalog: www.polyus.info
2. Catalog: www.analogmodules.com
3. . M. Zemlyanov, A. E. Safutin and N. V. Sokolova, Laser-Inform, № 10 (577), 8 (2016).
4. A. A. Koronnov, G. M. Zverev, M. M. Zemlyanov, E. V. Baranova and D. V. Marsagishvili, Applied Physics, № 4, 54 (2015) [in Russian].
5. V. V. Chesnokov, D. V. Chesnokov and V. B. Shleshinskii, J. Opt. Technol. **78** (6), 377 (2011).
6. I. M. Belousova, O. B. Danilov and A. I. Sidorov, J. Opt. Technol. **76** (4), 223 (2009).
7. F Patent № 63054.
8. A. A. Koronnov, A. E. Safutin, M. M. Zemlyanov and G. M. Zverev, Applied Physics, № 6, 65 (2015) [in Russian].
9. G. M. Zverev, M. M. Zemlyanov and A. A. Koronnov, Applied Physics, № 2, 79 (2015) [in Russian].
10. S. Sze, Physics of Semiconductors Devices, Wiley, 2007; Moscow, Mir, 1984.
11. F Patent № 2083958.
12. J. Gowar, Optical Communication Systems, Prentice-Hall Int., 1984; Moscow, Radio i sviaz, 1989.
13. G. A. Gavrilov, B. A. Matveev and G. U. Sotnikova, Tech. Phys. Lett., № 18, 50 (2011).
14. F Patent № 165106.