Opto-Electronics Review, 2015, volume 23, issue 2, pp. 131-136

Numerical investigation of an impact of a top gold metallization on output power of a p-up III-N-based blue-violet edge-emitting laser diode

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DOI: https://doi.org/10.1515/oere-2015-0019

Abstract:

The effect of modifications in epi-side (top) gold metallization on a thermal performance and on power roll-over of blue-vio- let III-N-based p-up edge-emitting ridge-waveguide laser diode (RW EEL) was explored in this paper. The calculations were carried out using a two-dimensional self-consistent electrical-thermal model combined with a simplified optical model tuned to a RW EEL fabricated in the Institute of High Pressure Physics (Unipress). Our results suggest that with proper modifica- tions in the III-N-based RW EEL, excluding modifications in its inner structure, it is possible to considerably improve the thermal performance and, thus, increase the maximal output power.