Tuning range and output power optimization of an external-cavity GaN diode laser at 455 nm

In this paper we discuss how different feedback gratings affect the tuning range and the output power of external feedback diode laser systems. A tunable high-power narrow-spectrum external-cavity diode laser system around 455 nm is investigated. The laser system is based on a high-power GaN diode laser in a Littrow external-cavity. Both a holographic diffraction grating and a ruled diffraction grating are used as feedback elements in the external cavity. The output power, spectral bandwidth, and tunable range of the external cavity diode laser system are measured and compared with the two gratings at different injected currents. When the holographic grating is used, the laser system can be tuned over a range of 1.4 nm with an output power around 530 mW. When the ruled grating is used, the laser system can be tuned over a range of 6.0 nm with an output power around 80 mW. The results can be used as a guide for selecting gratings for external-cavity diode lasers for different requirements. (C) 2016 Optical Society of America

General information
Publication status: Published
Organisations: Risø National Laboratory for Sustainable Energy, Department of Photonics Engineering, Diode Lasers and LED Systems, Department of Applied Mathematics and Computer Science, Department of Physics, Others, Department of Informatics and Mathematical Modeling
Contributors: Chi, M., Jensen, O. B., Petersen, P. M.
Pages: 2263-2269
Publication date: 2016
Peer-reviewed: Yes

Publication information
Journal: Applied Optics
Volume: 55
Issue number: 9
ISSN (Print): 1559-128X
Ratings:
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.61 SJR 0.695 SNIP 1.157
Web of Science (2016): Impact factor 1.65
Web of Science (2016): Indexed yes
Original language: English
Keywords: OPTICS, TAPERED AMPLIFIER, BLUE LASER, TEMPERATURE, OPERATION
Electronic versions:
Post_print_Vol._55_No._9_March_20_2016_Applied_Optics.pdf
DOIs: 10.1364/AO.55.002263
Source: FindIt
Source ID: 2302937360
Research output: Contribution to journal › Journal article – Annual report year: 2016 › Research › peer-review