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| **Title:** | Performance Analysis of a 980 nm In0.2Ga0.8As/GaAs MQW VCSEL Considering Thermal Effect | | | |
| **Author(s) Name:** | **Rinku Basak** and Saiful Islam | | | |
| **Contact Email(s):** | rinku@aiub.edu | | | |
| **Published Journal Name:** | AIUB Journal of Science and Engineering (AJSE) | | | |
| **Type of Publication:** | Journal | | | |
| **Volume:** | 10 | | Issue | 1 |
| **Publisher:** | AIUB Office of Research and Publication | | | |
| **Publication Date:** | August 2011 | | | |
| **ISSN:** | | 1608-3679 (Print) | | |
| **DOI:** |  | | | |
| **URL:** | https://orp.aiub.edu/ajse-10-01 | | | |
| **Other Related Info.:** |  | | | |
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| **Abstract:** |  |
| In this work, the performance characteristics of a GaAs-based 980 nm multiple quantum well (MQW) VCSEL have been obtained through computations considering thermal effect. The obtained characteristics have been analyzed for obtaining better performance. For achieving a superior performance, the concentrations of InGaAs QW material have been chosen using the results of other research works. The material gain of a compressively strained In0.2Ga0.8As/GaAs MQW VCSEL has been theoretically computed. Using the peak material gain obtained from this computation the performance characteristics of the designed VCSEL have been obtained. At 300K, the threshold current of the VCSEL has been obtained as 2.5 mA for a corresponding bias voltage of 3.6 volt. A maximum output power of 22.499 mW has been obtained for this designed VCSEL at 44 mA injection current. This figure of power is better compared to other similar VCSELs. Corresponding to this the modulation bandwidth has been obtained as 39 GHz which indicates superior performance of the designed VCSEL compared to the similar results of other research works. | |