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| **Title:** | Optimization of a Near-Infrared 980nm VCSEL for Obtaining Improved Modulation Performance | | | |
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| **Abstract:** |  |
| In this work, an optimization method for obtaining improved modulation performance of a near-infrared 980nm VCSEL has been presented. Optimum values of relative intensity noise (RIN) and frequency modulation (FM) noise of the VCSEL have been obtained by optimizing differential gain, injection current, number of quantum wells (QWs) and active radius. After a number of trials the optimum values of the above mentioned parameters have been obtained where, the noise level has been found as low during modulation. The optimum value of RIN of -160.86 dB/Hz and the FM noise of 107.68 dB have been obtained for the optimum value of the differential gain of 10x10-16 cm2, the injection current of 7.4mA, the number of QW of 3 and the active radius of 4µm. A maximum modulation bandwidth of 24 GHz of the VCSEL is obtained by reducing the noise during modulation. The results thus obtained show improved performance over some recent works. | |