

## **1.55 $\mu\text{m}$ VERTICAL-CAVITY LASERS MODELING AND SIMULATION**

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### **ABSTRACT**

Modeling and simulation of Vertical-Cavity Surface-Emitting Lasers (VCSELs) diode operating at 1.55  $\mu\text{m}$  is demonstrated for application in long wavelength optical communication. The simulated PL spectra and optical spectrum exhibits lasing wavelength at 1.55  $\mu\text{m}$  with single longitudinal mode operation. The VCSELs diode demonstrated a threshold current of 1.05 mA, threshold current density of 1.53  $\text{kA}/\text{cm}^2$ , 0.5609 of differential quantum efficiency, 0.2817 power conversion efficiency, voltage threshold of 0.95 V, turn-on voltage of 0.8 V and DBR series resistance of 142.86  $\Omega$ . A symmetric and circular emitted beam with beam divergence of  $2^\circ$  is observed from the near-field and far-field simulation.

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