

**EFFECT OF NITROGEN CONCENTRATION ON THE OPTICAL
AND ELECTRICAL PERFORMANCE OF $\text{Ga}_{0.66}\text{In}_{0.34}\text{N}_y\text{As}_{1-y}/\text{GaAs}$
QUANTUM WELL LASER DIODES**

**S. N. SUPARDAN, M. FAIEZ ALI, R. FAUZI, M. H. HASSAN,
N. SAZANI, K. MOHAMED & M. KAMIL ABD- RAHMAN**

Faculty of Applied Sciences, Universiti Teknologi MARA, 40450 Shah Alam, Selangor, Malaysia

ABSTRACT

Design optimization of $\text{Ga}_{0.66}\text{In}_{0.34}\text{N}_y\text{As}_{1-y}$ quantum well (QW) for long wavelength semiconductor laser is conducted by using RSoft LaserMOD. The effect of different nitrogen (N) concentration ranging from 2.0 to 3.2 % with a stepped of 0.3 % in $\text{Ga}_{0.66}\text{In}_{0.34}\text{N}_y\text{As}_{1-y}$ QW system is investigated in term of its electrical and optical performances. It was found that the increment of N concentration up to 2.6% significantly elongating the emission of lasing wavelength (λ) up to 1.44 μm , elevating the output power (P_{out}) to 83.5 mW and reducing the threshold current density (J_{th}) to 431.25 A/cm^2 .

KEYWORDS: GaInNAs, Quantum Well (QW), Laser Diodes (LD), Nitrogen Concentration