

Abstract Submitted
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GaAs-based InGaAsN Lasers CHANGSI PENG¹, TOMI JOUHTI, JANNE KONTTINEN, MARKUS PESSA — We demonstrated 1262 nm high performance single mode InGaAsN lasers. 4 μm stripe ridge waveguide InGaAsN lasers were processed. For as-cleaved case, pulsed threshold current was only 15 mA (313 A/cm²) for 1200- μm -long chips at room temperature (RT). The laser can work beyond 120 °C. After AR/HR coating, pulsed emission was up to 250 mW at RT. For cw operation, the lasers show a very low threshold of 25 mA and maximum output was up to 40 mW for 1200 μm length chip at RT. All the emission above was kink-free and single mode. New InGaAsN quantum well (QW) structures were designed. Comparing with the conventional InGaAsN QW structures, photoluminescence (PL) investigations show a significant improvement. After 3000 sec of annealing at 700 °C, the PL peak area is about 20 times higher while the wavelength keeps 25 nm longer. After 800 sec of annealing, the PL quenched slowly for the conventional structures because of the strain relaxation, while the PL of the new structures increased rapidly and show no saturation after 3000 sec of annealing.

¹Changsi.Peng@orc.tut.fi

Changsi Peng
ORC, Tampere University of Technology, P.O.Box 692, FIN-33101, Tampere

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