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Title:Indirectly pumped 3.7 THz InGaAs/InAlAs quantum-cascade lasers grown by metal-organic vapor-phase epitaxy
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Abstract:Device-performances of 3.7 THz indirect-pumping quantum-cascade lasers are demonstrated in an InGaAs/InAlAs material system grown by metal-organic vapor-phase epitaxy. The lasers show a low threshold-current-density of ∼420 A/cmsup2/sup and a peak output power of ∼8 mW at 7 K, no sign of parasitic currents with recourse to well-designed coupled-well injectors in the indirect pump scheme, and a maximum operating temperature of T infmax/inf∼100 K. The observed roll-over of output intensities in current ranges below maximum currents and limitation of Tinfmax/inf are discussed with a model for electron-gas heating in injectors. Possible ways toward elevation of Tinfmax/inf are suggested. © 2012 Optical Society of America.
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