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Title:Terahertz dual-wavelength quantum cascade laser based on GaN active region
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Abstract:In this paper a novel terahertz (THz) quantum cascade laser (QCL) based on GaN/AlGaN quantum wells has been proposed, which emits at two widely separated wavelengths 33 and 52 mm simultaneously in a single active region. The large LO-phonon energy (-90meV), the ultrafast resonant phonon depopulation of the lower radiative levels, suppression of the electrons that escape to the continuum states and selective carrier injection and extraction all together lead to a considerable enhancement in the operating temperature of the structure. All calculations have been done at a temperature of 265 K. Moreover, similar behavior of the output optical powers is another remarkable feature, which makes both wavelengths useful for special applications. © 2011 Elsevier Ltd. All rights reserved.
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