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Title

On metal contacts of terahertz quantum cascade lasers with a metal-metal waveguide

Source

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Abstract

This paper reports an experimental study of the effects of different metal claddings on the performance of terahertz quantum cascade lasers. The experimental results show that by using a metal cladding made of Ta/Cu/Au to replace that of Pd/Ge/Ti/Pt/Au, the maximum lasing temperature of the devices is increased from 132 to 172 K, and the threshold current density of the devices at 10 K can be reduced from 0.74 to 0.68 kA cm(-2). The improvement of the device performance is attributed to lower optical losses associated with the metal cladding layers. The different effects of the metal contacts on device optical properties and electrical properties are also discussed.