



器件制备及器件物理

氧化光栅型垂直腔面发射激光器的研究

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摘要：通过分析矩形出光孔径和亚波长金属光栅结构,发现大孔径高功率垂直腔面发射激光器(VCSEL)的偏振控制的难点在于横模非常复杂。因此提出一种新型的氧化光栅型VCSEL结构,不仅能够很好地在有源区内引入各项异性的增益结构,并且最大的优势还在于能够完美地控制大孔径VCSEL的横模。通过有限元软件对器件有源区的电流分布进行了模拟,发现当光栅脊的宽度为1.8 μm时,载流子在光栅两端聚集的现象基本上可以消除,而且其电流密度分布差可以达到很高。

关键词：垂直腔面发射激光器 氧化光栅 偏振控制

Study of Oxide-grating Vertical-cavity Surface-emitting Lasers

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Abstract: The difficulty of controlling the polarization of lager aperture VCSEL is the complicated transverse modes after analysing the structures of rectangle aperture VCSEL and sub-wavelength metal-grating VCSEL. So we put forward a new type of structure-oxidation type grating VCSEL structure. This structure can not only introduce anisotropy gain into active region but its biggest advantage is able to perfect control of large aperture VCSEL transverse mode. The sturcture was simuilited by finite element software, and it is found that the structure achieve two goals when the grating ridge is 1.8 μm.

Keywords: vertical-cavity surface-emitting laser oxide-grating polarization controlling

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