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High-speed operation of bow-tie-shaped oxide aperture VCSELs with photon-photon resonance

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APPLIED PHYSICS EXPRESS

Volume: 7 Issue: 2
 Article Number: 022102
 DOI: 10.7567/APEX.7.022102
 Published: FEB 2014
[View Journal Impact](#)

Abstract

This paper presents experimental and modeling results for extending the 3-dB modulation bandwidth of a 980-nm quasi-single-mode (QSM) vertical-cavity surface-emitting laser (VCSEL) with a passive transverse-coupled cavity (TCC). While the bandwidth of a conventional VCSEL is 9 GHz, the 3-dB modulation bandwidth of a QSM TCC VCSEL with the same epi-wafer structure can reach 27 GHz, which is three times larger than the conventional VCSEL without optical feedback. A clear eye opening is obtained for large-signal modulations at 36 Gbps. A numerical simulation for further enhancement of the bandwidth is also conducted. (C) 2014 The Japan Society of Applied Physics

Keywords

KeyWords Plus: CAVITY LASERS; BANDWIDTH

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Funding

Funding Agency	Grant Number
Ministry of Education, Culture, Sports, Science and Technology of Japan	22226008

[View funding text](#)

Publisher

IOP PUBLISHING LTD, TEMPLE CIRCUS, TEMPLE WAY, BRISTOL BS1 6BE, ENGLAND

Categories / Classification

Research Areas: Physics
 Web of Science Categories: Physics, Applied

Document Information

Document Type: Article
 Language: English

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Accession Number: WOS:000331454000012

ISSN: 1882-0778

eISSN: 1882-0786

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Other Information

IDS Number: AB0AK

Cited References in Web of Science Core Collection: 14

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