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850 nm transverse-coupled-cavity vertical-cavity surface-emitting laser with direct modulation bandwidth of over 30 GHz

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APPLIED PHYSICS EXPRESS

Volume: 8 Issue: 8
 Article Number: 082702
 DOI: 10.7567/APEX.8.082702
 Published: AUG 2015
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Abstract

An 850-nm-band transverse-coupled-cavity vertical-cavity surface-emitting laser (VCSEL) is demonstrated for the first time, showing a 3 dB modulation bandwidth of over 30 GHz, which is the record for VCSELs. The transverse-coupled cavity is formed by making lithography-defined, battledore-shaped mesas. The coupling strength can be increased by reducing the absorption loss in a passive feedback cavity. Further increase in the coupling strength and/or mode selection via current injection into the feedback cavity shows the possibility of overclocking the device by optical equalization. Large-signal measurement shows eye-opening at 40 Gb/s. After the coupled mode is stabilized, higher bitrate modulation can be expected. (C) 2015 The Japan Society of Applied Physics

Keywords

KeyWords Plus: ERROR-FREE; HIGH-SPEED; VCSELS; ARRAYS; GBIT/S

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Funding

Funding Agency	Grant Number
Deanship of Scientific Research (DSR), King Abdulaziz University (KAU)	20-130-35-RG
Ministry of Education, Culture, Sports, Science and Technology of Japan	15H02248
DSR of KAU	

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Publisher

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

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