Symposium Speaker	
Full Name	Michael Mack
Affiliation	Luxtera Inc.
Presentation Title	Hybrid Packaging for Advanced Silicon Photonics Transceivers

Biography

Michael Mack is currently Director of Engineering at Luxtera, Inc. He earned a BS in Engineering Physics and a BS Electrical Engineering from the State University of New York at Buffalo and a PhD in Electrical Engineering from University of California, Santa Barbara where he worked with Professors Steven Den Baars and Larry Coldren on GaN-based Lasers and LEDs.
After completing his PhD at UCSB, Michael joined Nitres (later CREE) where he worked for 3 years on the development and packaging of high efficiency GaN LEDs.
In 2000, Michael joined Agility Communications (later JDSU) where he worked on the development of high volume test and burn-in platforms for multi section tunable lasers.
Starting in 2006 Michael joined Luxtera where he has spent the last 11 years developing and maturing advanced packaging techniques and platforms for hybrid, wafer-scale packaging of lasers with SiP chips and fiber-to-chip interconnect methods for high volume manufacturing of Silicon Photonics.
Michael has 122 refereed publications and has authored 13 patents.

200 words abstract

We present novel packaging strategies developed specifically for high-volume manufacturing of advanced, silicon-photonics (SiP) transceivers and discuss the roadmap for future development. The approach is driven by the key challenges of: (1) integration of advanced electronic functions with SiP circuits, (2) integration of lasers with SiP circuits and (3) methods for interfacing multi-fiber connectors to SiP dies.
Silicon infamously lacks a way to generate the optical carrier signal monolithically. Accordingly we present a mature, multi-generational silicon Laser Micro-Package (LaMP) platform that employs wafer scale packaging methods to produce a low-cost, high-efficiency, chip-scale, hermetic laser-package in a ready for consumption, automation-friendly format. We also discuss a suite of tools and technologies that were created to support the wafer scale MEMS manufacture and test process, including highly-capable wafer scale burn-in and test processes.
The wafer-scale assembly approach was further exploited with the modification of commercially available die bonders to allow the rapid active alignment and bonding of KG-LaMP package to KG-silicon photonic dies at full 300mm wafer scale.
We present a method for aligning various fiber formats at PCBA panel scale without the need to activate the module under assembly. Finally we discuss roadmap challenges and key areas considered for improvement.