

The Challenges in High Volume Manufacturing of Photonic Devices

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Abstract

Internet traffic has been growing at an exponential level, continuously driven by video streaming, 3D imaging, IoT, VR/AR, and other emerging data applications. The data generated by internet traffic is enormous and the data centers are crucial to support data communications, storage and processing through cloud computing. Photonic devices such as optical transceivers play vital roles in modern data centers. Demand for photonic devices is at an unprecedented level. And the technology upgrades are expected to happen at the same time of this volume ramp, e.g. 40G to 100G and to 200G/400G and beyond.

These requirements have posed significant challenges to photonic device manufacturing. To support data center build-up, the photonic device companies need to respond fast to data center customer's demands, and at the same time to maintain low manufacturing costs to produce profits. This calls for much higher levels of manufacturing automation than the photonic industry ever had before. In addition, the co-existence of many product standards requires that the manufacturing automation is flexible to handle high mix of products without sacrificing throughput. Furthermore, advanced technologies demand increasing precision in assembly automations, again without sacrificing speed and throughput. High speed, high precision, and high flexibility for the high volume manufacturing of photonic devices require closer collaboration than ever between device designers, process developers, manufacturing engineers, and automation equipment suppliers. We will discuss in details regarding these trends, challenges, and opportunities.

Short Bio: Dr. Yi Qian is the Vice President of Product Management at MRSI Systems. He joined MRSI Systems in 2015 to help develop the company's market strategy and product roadmaps, drive the development of new products, and diversify MRSI product offerings to target higher growth market segments. He has over 20 years of experience in large corporations and small start-up companies, developing and marketing advanced optoelectronic and mechanical components and systems with integrated hardware and software, for fiber optics / photonics, sensors, medical devices and other industries. Prior to MRSI Systems he was Director of Product Management and Marketing at Cambridge Technology, a Novanta company, delivering high performance laser scanners for multiple industries. Before that, he worked at Oclaro as Director of Product Management for 40G/100G optical transceivers and line cards business. He was Vice President of Engineering in Dimensional Photonics International, a 3D laser sensor system startup that was acquired by Danaher Dental. Prior to that he was Director of Engineering making high speed and high power semiconductor laser diodes and modules in Corning's Lasertron division. He started his career in industry at Lasertron, Inc. before Corning's acquisition. Dr. Qian received a Bachelor's Degree in Electrical Engineering from Zhejiang University, China and a Ph.D. Degree in Physics from Institute of Semiconductors, Chinese Academy of Sciences. He was a postdoctoral researcher at Cornell University focusing on wafer-bonded long wavelength VCSELs, new compliant substrate structures and materials, and advanced nanofabrication technologies. He holds 10 issued and pending patents and has published more than 45 articles in the areas of nano-Silicon, high power and high speed lasers, and 3D optical sensing systems.