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IN THE DATA-DRIVEN RACE

How Adolite Breaks the Optical Interconnect Supply Chain Bottleneck

Hyperscale datacenter is all about ramping up quickly, gracefully and cost-effectively. So, it's ironic that data center infrastructure vendors are the ones struggling to scale up. Those that can't find new ways to manufacture faster and more cost effectively will lose business as mobile operators, cloud computing providers and enterprises turn to rivals that can meet demand.

The major bottleneck is optical interconnects. Not only are their requirements doubling every eight to 10 months, but vendors can't build them fast enough. Starting in the second half of 2016, demand for 100GbE Ethernet transceivers began to exceed supply.¹ This shortage continues today and is a major reason why large data centers, especially in Asia, continue to deploy 40 GbE (40G) products.

Making do with underpowered transceivers can undermine a data center operator's competitive position, especially against the biggest providers, which are already looking beyond 100GbE. For example, the research firm LightCounting expects Amazon, Facebook and Microsoft to skip 200GbE optics in favor of 400GbE—assuming that the latter are available in time and in sufficient quantity. That might not be the case. Indeed, the earlier and wider availability of 200GbE optics could prompt large data center operators to settle with 200GbE for longer than they would like, LightCounting says.

Telecom providers, especially mobile operators, will be early adopters of 400G modules because the first-generation solutions' cost, size and power will be prohibitively high for large data center applications. For mobile operators, 400G will be key for supporting the fifth-generation (5G) networks that will make their commercial debut around 2020 and deliver speeds of up to 1 Gbps on the radio side. That means 5G's core infrastructure—including the optical interconnects—must be able to keep up rather than becoming the bottleneck for bandwidth-intensive and latency-sensitive applications such as connected vehicles and streaming 4K/8K video.

For advanced data center/cloud computing service infrastructure vendors, these trends can be either problems or opportunities. They're problems for vendors that can't meet quickly growing demand. But for vendors willing and able to take a fresh approach to manufacturing, these trends are opportunities to grow market share. Read on to learn how Adolite enables that fresh approach.



Only a Revolutionary Approach Can Break the Optical Transceivers Supply Bottleneck

Adolite is developing the world's most sophisticated, high-performance transceivers and on-board optics, including 100G today and a near-term roadmap that includes 200G and 400G. Enabled by major breakthroughs in material science and precision manufacturing, the company is able to produce in extremely high volumes, enabling vendors to scale up quickly to meet customer demand.

Traditional transceiver manufacturing relies on designs that are complex, which means they require time-consuming and error-prone production processes. These design center featured multi-layer, rigid circuit boards, multiple lenses and complex assemblies, and are plagued by fiber alignment challenges. Instead, Adolite embeds optical waveguides and electrical circuits into a single layer of flexible printed circuit board (FPC) and directly integrate lasers and photo diodes onto the FPC using flip-chip bonding techniques. This approach enables Adolite to manufacture transceivers in high volume with higher throughput. Figure 1 compares Adolite's design with traditional approaches.

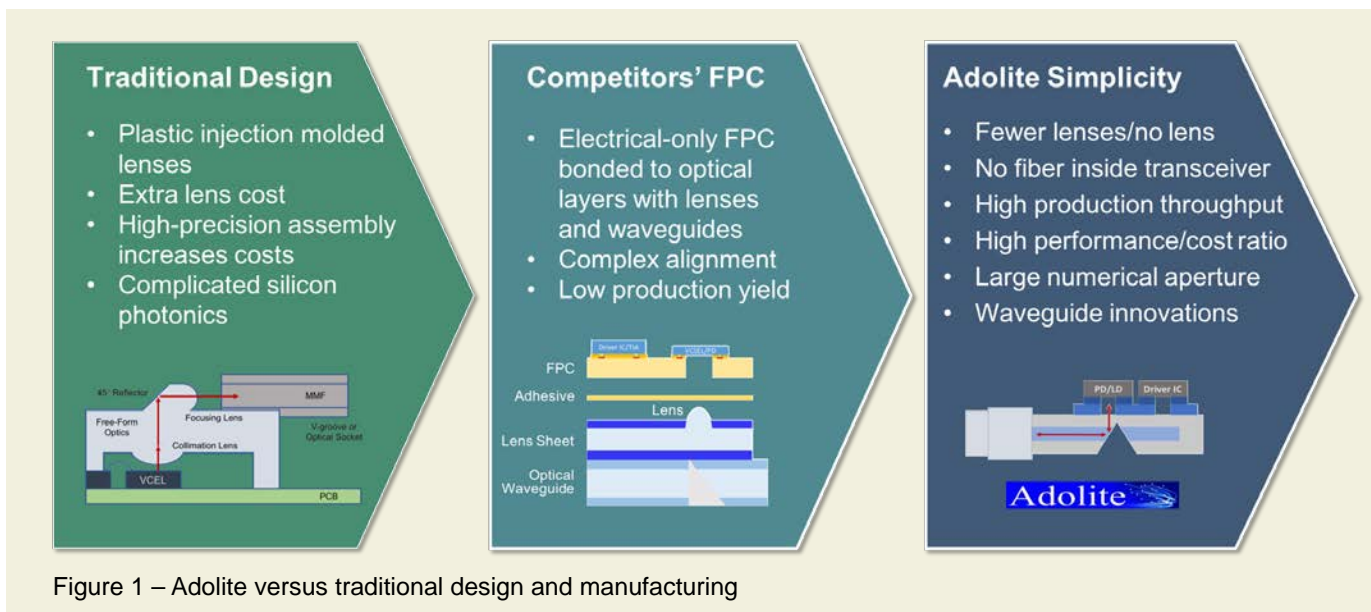
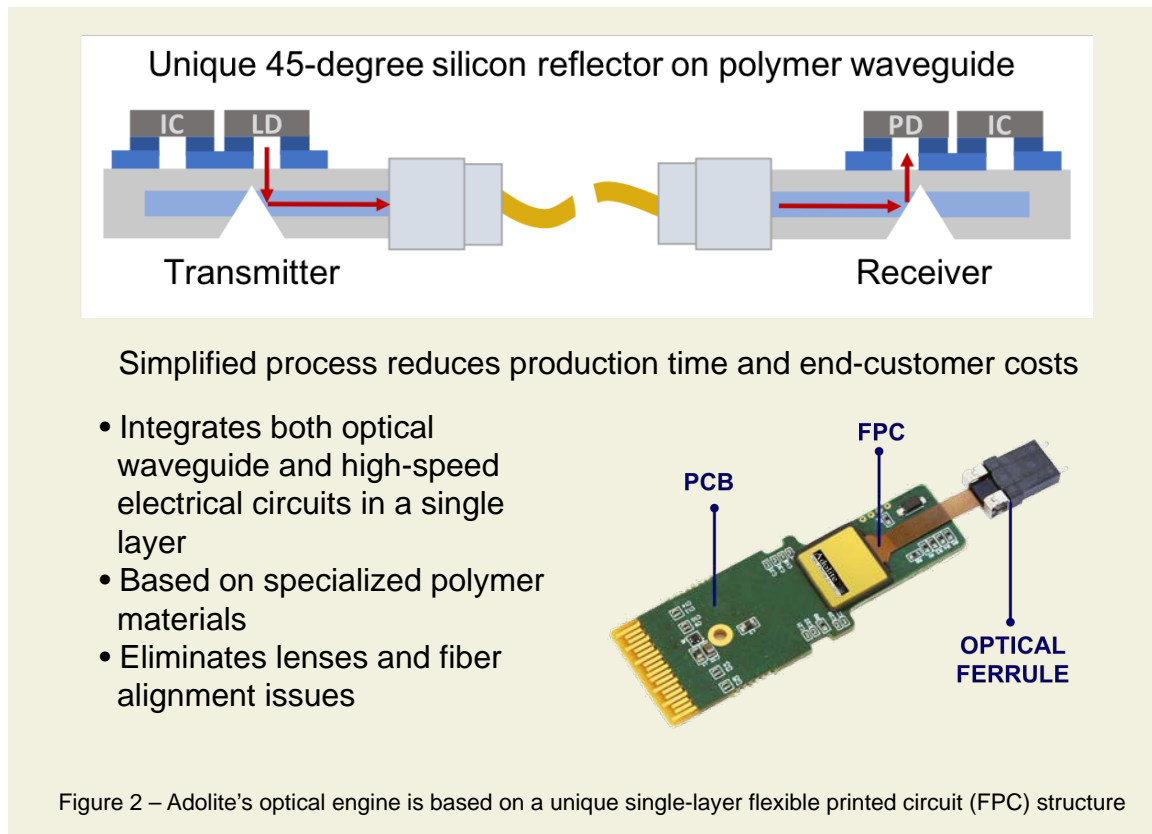


Figure 1 – Adolite versus traditional design and manufacturing



Adolite's breakthrough architecture eliminates lenses and the need for fiber alignment, which is a time-consuming and error-prone process. In fact, eliminating optical fiber assembly saves 20-80 seconds in the final production stage. It also means significantly higher throughput than traditional processes, enabling Adolite customers to meet demand.

Figures 2 and 3 illustrate the Adolite's optical design, structure and manufacturing advantages.



Adolite's design also uses significantly less power – as little as 10 percent that of its competitors, which means lower operating expenses for customers. That efficiency gives data center infrastructure vendors yet another market differentiator, especially in the eyes of companies with green energy initiatives and those operating in areas with high electric rates. Adolite has a robust group of strong pending patents, and proprietary technology for its optical design, structure and manufacturing processes.

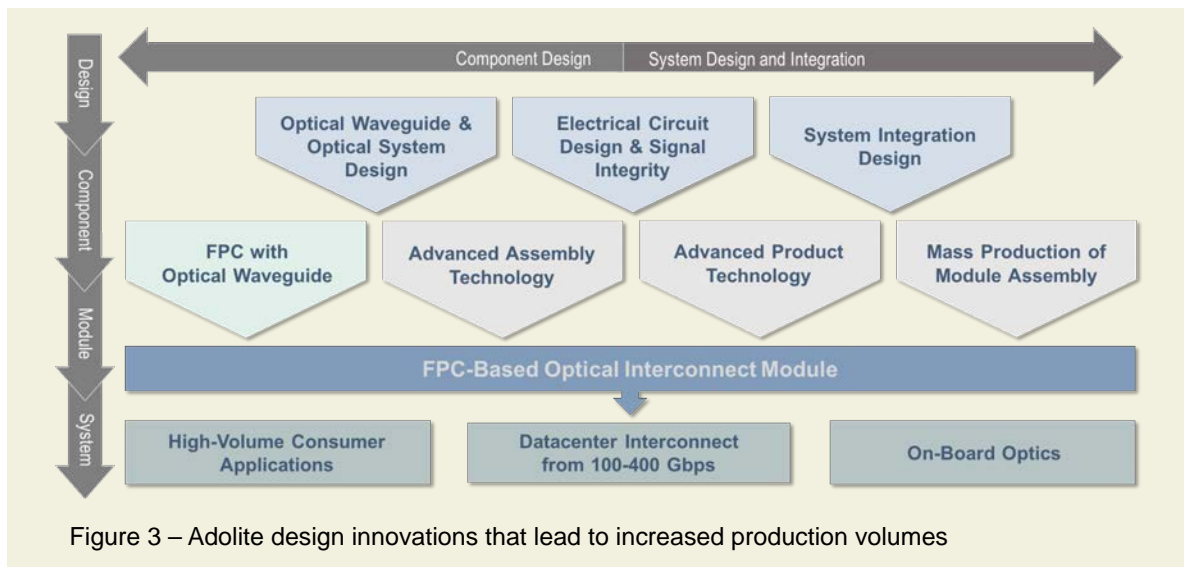


Figure 3 – Adolite design innovations that lead to increased production volumes

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Quality and Expertise

Now in their second generation, Adolite's products are manufactured with the kind of rigorous quality control that's key for technologies that are the backbone of on-premise and cloud data centers. Adolite uses a line quality-control system that's error-proof, with foolproof and complete final inspection, as well as full traceability. Adolite also uses Industry 4.0 automation and is on track to receive ISO 9001: 2015 certification in the 2nd half of 2018.

Adolite's leadership team has over 100 years of combined experience in building companies from scratch to capitalize on market opportunities. The management team also has decades of experience as leaders and innovators at such companies as Apple, IBM, Cisco, Intel, JDSU, TSMC, ASE, PMC-Sierra, Silicon Valley Communications (Arris/C-Cor), Applied Material, AOI, Acer, Sharp, PayEase, Universal Sci and others.

¹Source: LightCounting, High-Speed Ethernet Optics Report, March 2017.



Learn How Adolite Can Speed Your Pace in the Data-Driven Race

The bottom line: Only Adolite is capable of manufacturing transceivers and on-board optics in extremely high volumes, unblocking data center infrastructure vendors' supply chains so they can meet the immediate and long-term demand for 100G to 400G and beyond. That's because only Adolite has the breakthrough technologies and processes, and veteran leadership team, capable of enabling data center infrastructure vendors to innovate faster and manufacture.

To learn more, visit Adolite online.

Adolite develops optical communications products to help providers keep up with accelerating data growth to meet market demands. The company's optical interconnect solutions for data centers, cloud computing providers and 5G mobile operators include the world's most sophisticated, high-performance transceivers and on-board optics-at 100G, 400G and beyond-to help unblock the supply chain bottleneck, support data center expansion and speed market innovation.

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