CMOS Photonics™ For High Speed Interconnects

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Abstract

Luxtera has used Freescale Semiconductor’s production 0.13µm SOI process to implement optical communications capability for high bandwidth LAN, SAN, shelf-to-shelf and chip-to-chip communications. These optical transceiver cores operate at 10Gbps and offer superior reach, power consumption, latency, die area, and scalability compared to emerging standards for electrical interconnect. The transceivers are monolithically fabricated alongside SOI CMOS circuitry in the same die, containing 10s of optical components and 100,000s of transistors. Thus, for the first time in history, high speed optical communications directly between silicon die can be accomplished at a price/performance point superior to traditional electrical interconnect. Germanium on Si detectors are being investigated for the receiver module. Devices with high responsivity and large bandwidth integrated in Freescale's production 0.13um SOI process have been demonstrated.

Figure 1. Overview of CMOS Photonics technology.