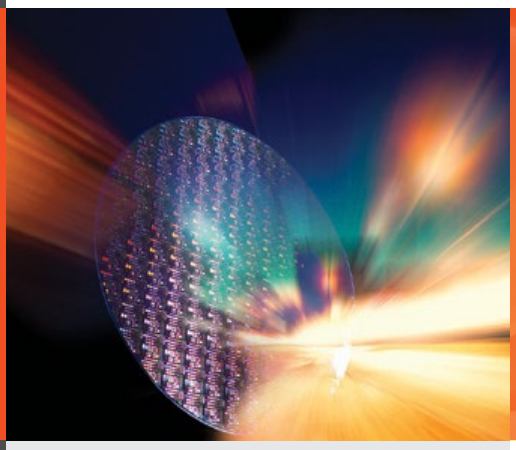
GLOBALFOUNDRIES®



Silicon photonics technologies

Highlights

- Monolithic integration capabilities for cost-effective power, area and performance advantages
- Electro-optic process design kits featuring a Cadence design environment with a comprehensive O-band library, path tool, models, LVS and DRC
- High-volume, advanced 300 mm processing and controls that leverage CMOS infrastructure and methodologies
- Automated high-volume inline test that brings CMOS-like processing and wafer acceptance criteria controls to optics
- World-class technology development team delivering ongoing innovation, including laser attach and low-loss fiber attach
- Aggressive offering roadmap features freeform design enablement, low loss waveguides, CWDM and more

Handle more data—per watt, per fiber, per laser—for next-generation optical communications

We are beyond the era where computers are simply connected. “Thinking” machines, ranging from smart IoT sensors to AI-enabled hardware, are now a reality.

Transporting the massive volumes of data generated by these intelligent devices fuels bandwidth challenges. To meet this demand, there is a growing need for semiconductor solutions that can leverage light to move more data. As a result, optical communications chips are poised to enable new levels of performance in hyperscale data centers, cloud computing and 5G-driven network transformation.

The GLOBALFOUNDRIES (GF) silicon photonics (SiPh) foundry portfolio is designed to help you deliver more data faster, farther and more efficiently than traditional CMOS technologies. The initial offering, 90WG, is an industry-first SiPh foundry solution. Built on a production-ready, differentiated 90 nm SOI platform, the offering is manufactured at the GF 300 mm facility in East Fishkill, NY, enabling you to leverage high-volume manufacturing along with advanced processing and controls that utilize proven CMOS manufacturing methodologies and infrastructure.

Designed for the most demanding applications

The GF SiPh portfolio is optimized to help you take optical communications to the next level across a range of evolving and emerging applications:

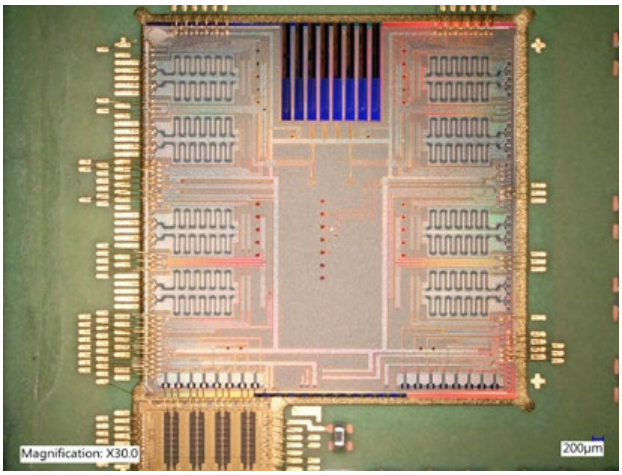
- 5G backhaul/front haul (1310/1550 nm wavelength)
- Short reach, intra data center (1310 nm wavelength)
- Data center interconnect (1550 nm wavelength)
- Chip-to-chip interconnect (1310 nm wavelength)
- Metro telecom (1550 nm wavelength)
- Long haul telecom (1550 nm wavelength)
- Automotive (1310 nm wavelength)

Differentiation, built in

GF's 90WG platform enables you to take advantage of:

- Monolithic integration of RF and digital elements, silicon photonics and fiber coupling
- Electro-optic PDK that enables co-design of both electrical and optical components at 1310 nm
- Extensive investment in test capabilities from wafer to module level, including wafer characterization that enables the fine tuning of SiPh manufacturing processes based on real-time measured results
- Fast prototyping through cost-effective multi-project wafer runs

GF 90WG technology in a 25 Gb Ethernet module



The technology features best-in-class performance in key parameters, including: SOI waveguide loss; undercut thermal phase shifter; input/output single mode fiber fiber-to-chip coupling loss and optical return loss; and Mach-Zehnder Interferometer (MZI) and photodiode bandwidth.

Ongoing innovation

For future-proof innovation, you can take advantage of GF's expertise, world-class development team and an aggressive SiPh roadmap. The roadmap incorporates continued photonic feature enhancements and additions, along with process advances that leverage high-performance 45 nm RF SOI foundry technology for advanced monolithic solutions. Roadmap highlights include:

- Freeform design enablement
- Low loss waveguides
- Coarse wavelength division multiplexing (CWDM)
- Laser cavity and under bump metallurgy
- 50 Gbps+ per lambda
- Avalanche photodiodes
- C-band library
- Passive fiber alignment

Learn more

Harness the power of light with SiPh foundry technologies from GF. To learn more, visit globalfoundries.com

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