GlobalFoundries Announces Next Generation in Silicon Photonics Solutions and Collaborates with Industry Leaders to Advance a New Era of More in the Data Center

March 7, 2022

First-of-its-kind silicon photonics platform available now addresses explosive growth of soaring data volumes while significantly reducing power consumption

MALTA, N.Y., March 7, 2022 /PRNewswire/ -- GlobalFoundries Inc (Nasdaq: GFS) (GF) today announced it is collaborating with industry leaders including Broadcom, Cisco Systems, Inc, Marvell and NVIDIA, along with breakthrough photonic leaders including Ayar Labs, Lightmatter, PsiQuantum, Ranovus and Xanadu, to deliver innovative, unique, feature-rich solutions to solve some of the biggest challenges facing data centers today.

The more than 42 billion connected IoT devices generating ~177 ZB of data annually[1] combined with the rise of power consumption in data centers, is driving the need for innovative solutions to move and compute data faster and more energy efficiently. These key market trends and implications have catalyzed GF's focus on groundbreaking semiconductor solutions that harvest the potential of photons, instead of electrons to move data and position GF to continue to be the manufacturing leader in the optical networking module market that is projected to grow at a CAGR of 26% between 2021 and 2026, reaching about USD 4 billion by 2026.[2]

Today GF is proud to announce GF Fotonix™, its next generation, widely disruptive silicon photonics platform. GF has active design wins with major customers, significant market share today and expects its growth in this segment to outpace the market.

GF also announced it is partnering with industry leader Cisco Systems, Inc., on a custom silicon photonics solution for DCN and DCI applications, including an interdependent Process Design Kit (PDK) in close collaboration with our GF manufacturing services team.

Customers and Partner support for GF Silicon Photonics Solutions

"We're working closely with GlobalFoundries to design high-bandwidth, low-power optical interconnects for some of our leading-edge data center products. NVIDIA interconnect solutions manufactured with the monolithic GF Fotonix platform will boost high performance computing and AI applications, enabling breakthrough advances." Edward Lee, vice president of Mixed-Signal Design, NVIDIA

"As one of our trusted semiconductor partners across a broad range of technologies and process nodes, we are happy to see Global Foundries extend their investments for enabling a photonics ecosystem across components and integrated solutions," Liming Tsau, vice president of Foundry Engineering, Broadcom Inc.

"The demands of today and tomorrow's networking and communications infrastructure are requiring higher performance technologies for the design and manufacture of our optical transceiver modules," said Bill Gartner, senior vice president and general manager of Optical Systems and Optics Group, Cisco Systems, Inc. "Our heavy investment and leadership in silicon photonics, combined with GF's feature rich manufacturing technology, allows us to deliver best in class products."

"Marvell continues to lead the industry with the highest performance transimpedance amplifiers and modulator drivers for next-generation optical connectivity solutions for the cloud data centers and carrier markets," said Dr. Loi Nguyen, executive vice president, Optical and Copper Connectivity Group, Marvell. "GF's latest silicon germanium (SiGe) technology enables us to achieve the high bandwidth speeds and power efficiencies that our customers require to meet their ever-increasing data demands."

"Since our earliest days, Ayar Labs and GlobalFoundries have partnered on the development of GF Fotonix, from incorporating our PDK requirements and process optimizations to demonstrating the first working silicon on the platform," says Charles Wuischpard, CEO, Ayar Labs. "The combination of our leading monolithic electronic/photonic solution and GF Fotonix unlocks a tremendous market opportunity for chip-to-chip optical I/O and sets the stage for us to deliver substantial volume shipments by

year end."

"At Lightmatter, our technology delivers compute that is faster and more efficient than anything else in the market—results like these aren't possible with conventional chips," said Nicholas Harris, CEO of Lightmatter. "Our next-generation technology is made possible by GlobalFoundries' best-in-class photonic foundry technology and together we're changing the way the world thinks about photonics. This is just the start."

"Our telecoms, defense and data center customers need innovative new ways to transmit, connect and compute data at the speed of light," said Martin Zirngibl, vice president and general manager at Macom. "GlobalFoundries offers the features in its silicon photonics platform that can be leveraged to scale communications to the next level."

"We are leveraging GF's new Fotonix™ platform to develop custom silicon photonics chips that meet our advanced quantum computing requirements," said Fariba Danesh, chief operating officer of PsiQuantum.

"We are delighted to share our multi-disciplinary silicon-photonics IP cores and chiplets, and advanced packaging solutions with our customers who are driving the adoption of novel data center architectures based on integrating best-in-class chiplets and co-packaged optics," said Hojjat Salemi, chief business development officer of RANOVUS. "Our close collaboration with GlobalFoundries underlines our joint commitment to deliver a fully featured set of qualified IP cores and chiplets with OSAT-ready high-volume manufacturing flows and supporting ecosystem to enable the huge potential of monolithic silicon photonics."

"Many chips, operating in parallel and networked together, are required to process the large number of qubits involved in fault-tolerant quantum computing algorithms," said Zachary Vernon, head of hardware at Xanadu. "Leveraging an existing advanced 300mm platform like GF Fotonix gives us a huge advantage in the race to deliver a useful, error-corrected quantum computer."

"Silicon photonics is now recognized as a necessary technology for the datacenter revolution, and our leading semiconductor manufacturing technology platform accelerates adoption into the mainstream," said Amir Faintuch, senior vice president and general manager of Compute and Wired Infrastructure at GF. "GF Fotonix is a feature-rich platform that addresses the most urgent, complex and difficult challenges in areas such as optical networking, super and quantum computing, fiber-to-the-home (FTTH), 5G networks, aeronautics and defense."

GF solutions to move and compute data at speed of light

GF Fotonix is a monolithic platform, the first in the industry to combine its differentiated 300mm photonics features and 300GHz-class RF-CMOS on a silicon wafer, delivering best-in-class performance at scale. GF Fotonix consolidates complex processes that were previously distributed across multiple chips onto a single chip by combining a photonic system, radio frequency (RF) components and high-performance complementary metal–oxide–semiconductor (CMOS) logic on a single silicon chip.

GF is the only pure-play foundry with a 300mm monolithic silicon photonics solution that has demonstrated the industry's highest data rate per fiber (0.5Tbps/fiber). This enables 1.6-3.2Tbps optical chiplets, which deliver faster, more efficient transmission of data, more efficiently with better signal integrity. In addition, the up to 10,000x improvement in system error rate enables next generation artificial intelligence (AI).

GF Fotonix enables the highest level of integration onto a photonics integrated circuit (PIC) so customers can integrate more product functions and simplify their bill of materials (BOMs). End customers can realize greater performance through increased capacity and capability. The new solution also enables innovative packaging solutions, such as the passive attachment for larger fiber arrays, support for 2.5D packaging, and on-die lasers.

GF Fotonix solutions will be manufactured at the company's advanced manufacturing facility in Malta, N.Y., with the PDK 1.0 available in April 2022. EDA partners Ansys, Cadence Design Systems, Inc., and Synopsys provide design tools and flows to support GF's customers and their solutions. GF provides customers with reference design kits, MPWs, testing, pre- and post-fab, turnkey and semiconductor manufacturing services to help customers get to market faster.

In addition, for customers needing discrete, high-performance RF solutions for optical systems, GF also announced it is adding new features onto the GF SiGe platform. High-performance silicon germanium (SiGe) solutions from GF are designed to deliver the speed and bandwidth required to transport information through next generation fiber optic high speed networks.

About GF

GlobalFoundries® (GF®) is one of the world's leading semiconductor manufacturers. GF is redefining innovation and semiconductor manufacturing by developing and delivering feature-rich process technology solutions that provide leadership performance in pervasive high growth markets. GF offers a unique mix of design, development and fabrication services. With a talented and diverse workforce and an at-scale manufacturing footprint spanning the U.S., Europe and Asia, GF is a trusted technology source to its worldwide customers. For more information, visit www.gf.com.

View original content to download multimedia:https://www.prnewswire.com/news-releases/globalfoundries-announces-next-generation-in-silicon-photonics-solutions-and-collaborates-with-industry-leaders-to-advance-a-new-era-of-more-in-the-data-center-301496360.html

SOURCE GlobalFoundries (GF)

Shannon Love, GlobalFoundries, (480) 225-7325, Shannon.love@gf.com