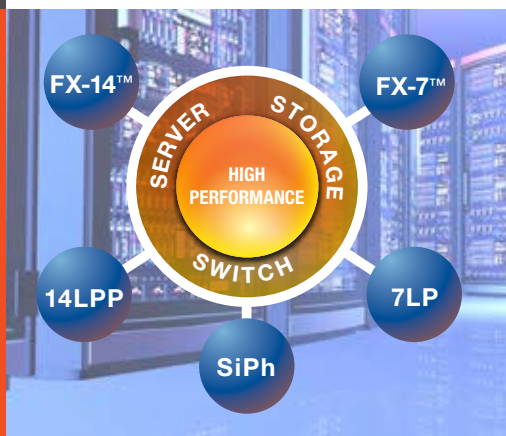




GLOBALFOUNDRIES®



Communications and Data Center Solutions

GF Solutions – Highlights

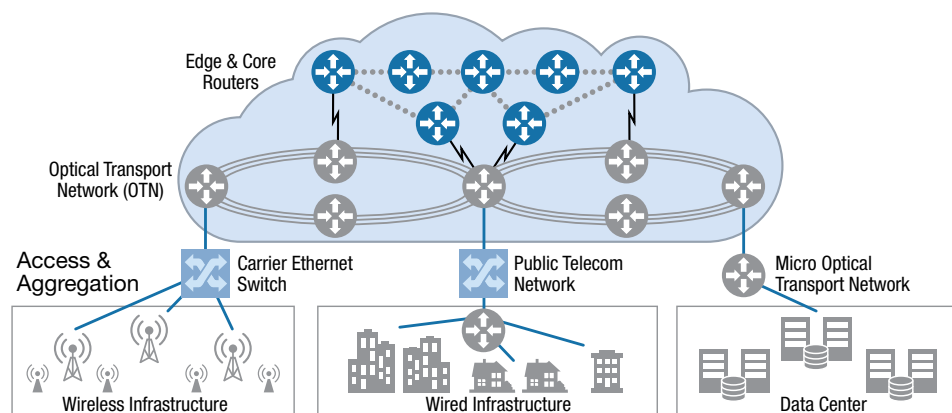
- Industry-leading technologies—14nm, 7nm and 22FDX™—complete foundry services and supply chain support
- ASIC Turnkey product offerings (FX-14™, FX-7™): Compute, Network, Storage, Infrastructure
- Broad product portfolio with best-in-class IP solutions: Foundation IP, Complex IP
- High speed transceivers (30G/56G/112G) supporting chip-to-chip and backplane connectivity meeting 100Gb/s to Tb/s bandwidth
- World-class memory compilers for on-chip SRAM and TCAM, and PHY controllers for off-chip DDR, HBM, HMC, and Flash memories
- Advanced packaging capabilities with interposer and stacking technologies for 2.5D, 3D, HD_FO and Silicon Photonics integration
- Silicon Photonics solutions for both inter- and intra-data center connectivity meeting up to 600Gb/s bandwidth

**Enabling
Connected
Intelligence**

Accelerating Hyper Cloud Data Center Solutions with Breakthrough Integration Technologies

The cloud is changing data center industry dynamics. Cloud deployments are driving most of the server, network and storage growth in data centers which include Enterprise, Cloud Computing, Big Data Analytics, High Performance Computing and Artificial Intelligence. As more and more workloads are being deployed in the cloud, IP traffic is overwhelming the internet bandwidth. This transformation in the data center is driving new requirements for scalability, performance, security, reliability and system power, with a focus on reducing total cost of ownership. Semiconductor solutions for these markets are becoming increasingly challenging as companies pursue more demanding performance, area, integration and power-efficiency objectives.

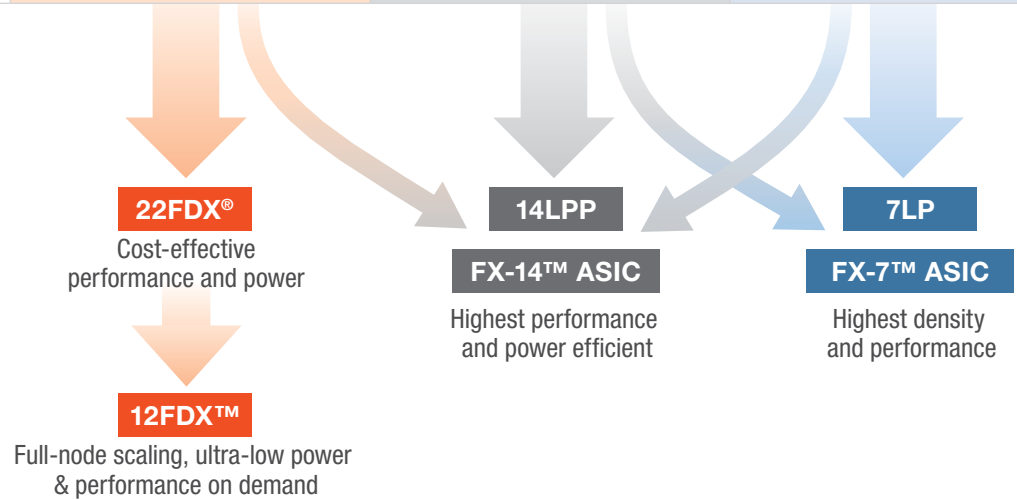
GLOBALFOUNDRIES accelerates the transformation of the network infrastructure and rise of hyperscale data centers by collaborating with industry leaders to deliver high-value, highly-optimized semiconductor technologies and services for system-level differentiation. GF offers leading-edge process technologies and targeted solutions for integrated, next-generation communication infrastructure hardware to help you keep pace with network evolution and rising access, bandwidth and capacity demands.



Forging Hyper-Scale Performance and Power

Solutions for Data Center & Infrastructure

Applications	Low End	Mid-Range	High End
Core Clock (SoC)	<600MHz	Up to 2GHz	3GHz+
Memory Density	<100Mb	200 – 800Mb	1Gb+
SerDes Speeds	<16G	28G – 56G	56G – 112G
External Memory	LP DDR	+ DDR3/4	+ DDR5, HBM2.0, HMC
Packaging & Integration	IP + 2D	IP + 2.5D / 3D + Si Photonics	IP + 2.5D / 3D + Si Photonics



Product Capabilities

Key Requirement	14LPP	7LP	22FDX®
Compute CPU Arm®, MIPS	●	○	●
Compute CPU X86, OpenPOWER (Up to 3GHz+)	●	○	
On Chip Memory (SRAM, TCAM) Multi-gigabit, 1GHz+, High density TCAM	●	○	SRAM ●
External Memory Standard Memories: DDR, SRAM	●	○	●
External Memory High speed Memories: HBM, HMC (Up to 3.2GHz DDR; HBM2.0)	●	○	
Connectivity I/O General purpose I/O- (TTL/HSTL/SSTL, LVDS)	●	○	●
Connectivity I/O Analog I/O (ADC, DAC,)			○
High Speed Transceivers (Chip to chip, Backplane, Modules) Up to 56G, NRZ & PAM4	●	112G ○	
High Speed Transceivers (Chip to chip, Backplane, Modules) Up to 12.5G, NRZ	●	○	25G ● / ○
Packaging & Integration (2D, 2.5D, 3D) Organic, MCM	●	○	●
Packaging & Integration (2D, 2.5D, 3D) Interposer, TSV, Si Photonics	●	○	

● Available ○ In Development

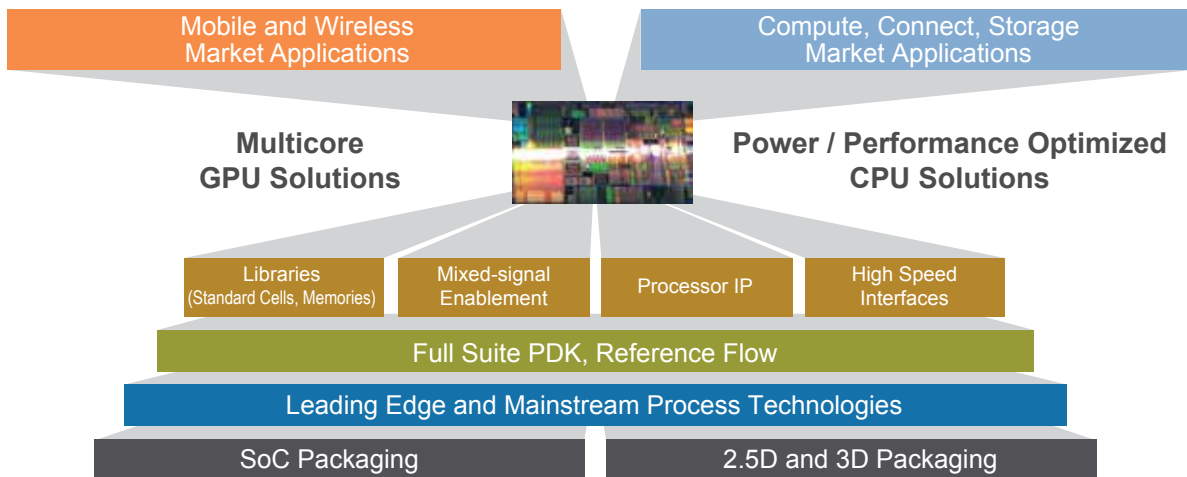
Contact GF for latest availability and support

IP Libraries

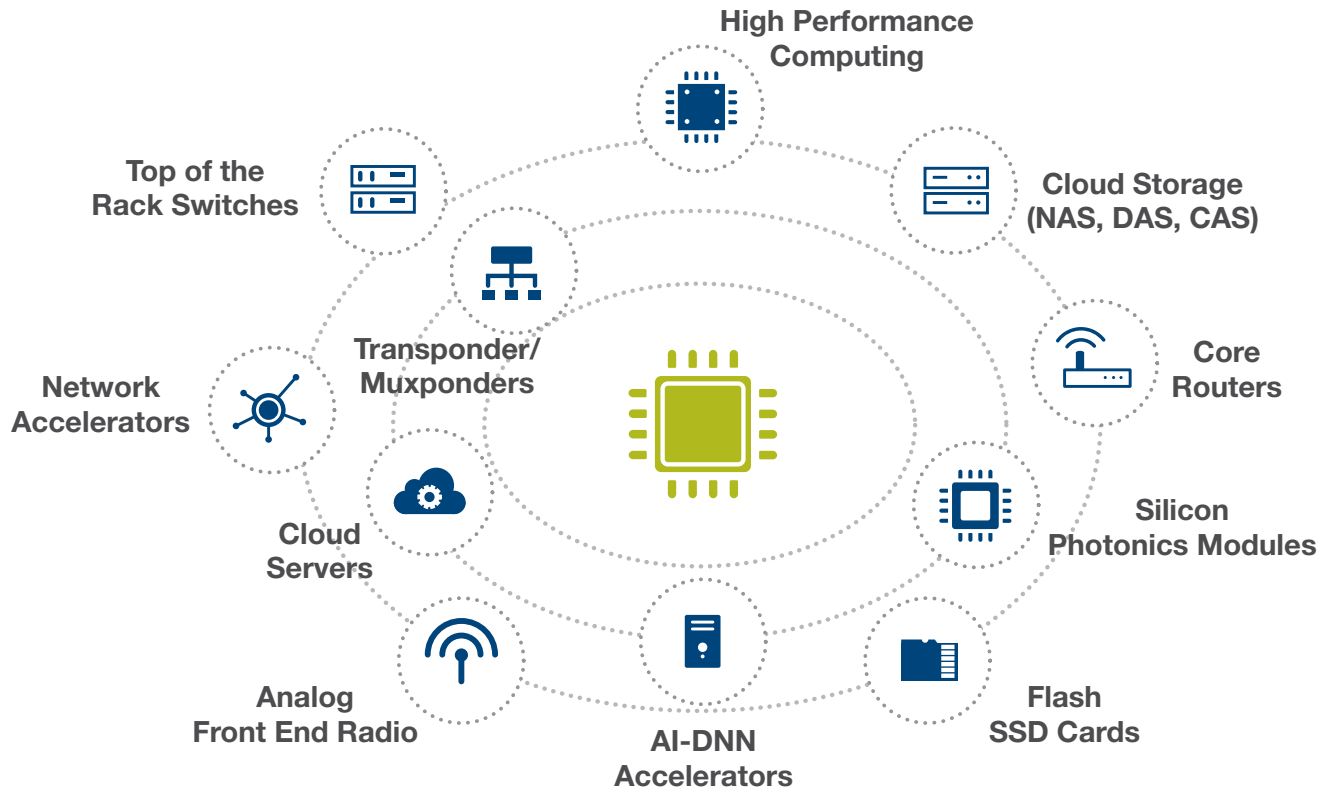
IP Category	Description	14LPP	FX-14™	7LP	FX-7™	22FDX®
Foundation Library IP	Standard Cell	7.5T/9T/10.5T ●	7.5T/9T/10.5T ●	6T / 9T ○	6T / 9T ○	7.5T/8T/12T ●
	GPIO / ESD	●	●	○	○	●
	PLL	●	●	○	○	●
	SRAM / TCAM Compiler	SRAM/TCAM ●	Dense, Performance ●	○	Dense, Performance, Algorithmic ○	SRAM ●
	ROM Compiler	●	●	○	○	●
	Temp Sensor	●	●	○	○	●
Non Volatile Memory	Electrical Fuse	●	●	○	○	●
	OTP	●	●	○	○	●
Complex IP	DDR3/4	●	●	○	○	○
	LPDDR3/4	●	●	○	○	●
	PCIe G1.1/2/3/4	●	●	○	○	●
	MIPI D-PHY, M-PHY	●		○		●
	SATA I/II/III	●	●	○	○	●
	SerDes (6G-56G)	Up to 56G ●	16G, 30G, 56G Long Reach ●	>56G ○	112G ○	Up to 12.5G / 25G ● / ○
	USB2/3.x	●	●	○	○	●
	HDMI 2.0/DP	●		○		● / ○
V-by-One PHY	●		○			
Core	Arm® Cortex®-A53		●		○	
	Arm® Cortex®-A72		●		○	
Packaging	2.5D, 3D		2.5D ●		2.5D, 3D	

● Available ○ In Development
 Contact GF for latest IP availability and support

GLOBALSOLUTIONS® Design and Manufacturing Ecosystem



GF Solutions – Customer Applications



Global Presence for Semiconductor Manufacturing



GLOBALFOUNDRIES

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