

# 12LP

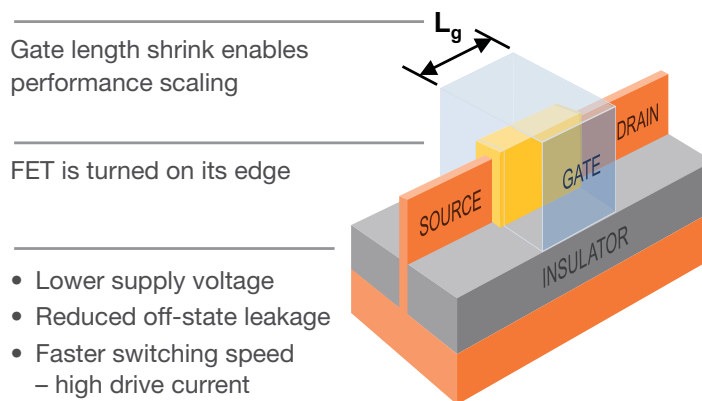
## 12nm FinFET Technology

### Highlights

- 12nm FinFET technology
  - + Manufactured in state-of-the-art facilities in Saratoga County, New York
  - + Volume production in Computing, Networking, Mobile and Server applications
  - + Offers higher performance, power and scaling by enabling an ultrahigh density library
- Ideal for high-performance, power-efficient SoC applications
  - + Machine Learning and Artificial Intelligence
  - + Cloud / Data Center servers
  - + CPU and GPU
  - + Mobile processors
  - + Automotive ADAS
  - + Wired and wireless networking
  - + IoT edge computing
  - + Consumer
  - + FPGAs
- Comprehensive design ecosystem
  - + Full foundation and complex IP libraries
  - + PDK and reference flows supported by major EDA and IP partners
  - + Robust DFM solutions
- Complete services and supply chain support
  - + Regularly scheduled MPWs
  - + Advanced packaging and test solutions, including 2.5/3D products

GLOBALFOUNDRIES 12LP 12nm FinFET process technology platform is ideal for high-performance, power-efficient SoCs in demanding, high-volume applications.

3D FinFET transistor technology provides best-in-class performance and power with significant cost advantages from 12nm area scaling. FinFET benefits include high drive current, superior mismatch and  $V_{min}$  and >10x SER reduction vs planar technology. 12LP technology can provide up to 10% logic area shrink and >6% performance boost compared to the base 14LPP technology.



### Target Applications and Solutions

Mobile Apps Processor	High Performance Compute & Networking	
60% power reduction	60% power reduction	2x # cores
80% higher performance, >2.2GHz	>3GHz maximum performance	
45% area reduction	55% area reduction	
~2x output increase per wafer	>56G SerDes, 32 channels	

(max. benefit compared to 28nm technology)

## Technology Overview

- Twin-well CMOS bulk FinFET (4 Core device Vt's)
- Two gate dielectrics: thin (SG) and medium I/O (EG)
- Full suite of passive devices
- Optional MIM capacitor, Mx/Vx eFuse, OTP/MTP
- VDD: 0.8V nominal or 1.0V overdrive
- Standard temperature range: -40°C to 125°C

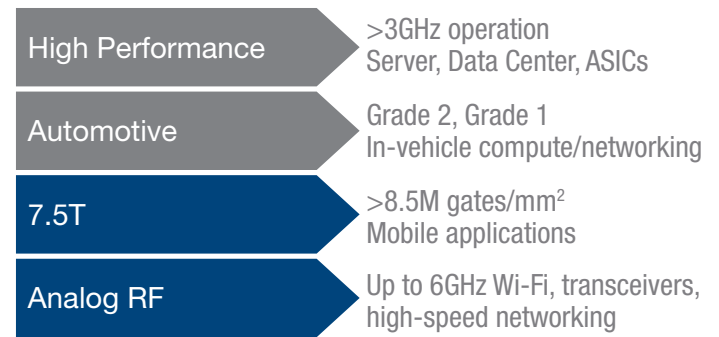
## IP Overview

The comprehensive 12LP FinFET Platform IP portfolio includes a wide range of silicon-proven high performance, power-optimized solutions for a broad set of applications.

Foundation IP		
Std Cell 7.5T	Std Cell 9T (14LPP)	
GPIO / ESD	PLL	Temp Sensor
ROM Compiler	SRAM Compiler/TCAM	
Interface IP		
DDR3/4	LPDDR3/4	PCIe G1.1/2/3/4
MIPI G1/2/3	SATA I/II/III	SerDes (6G-56G)
USB2/3.x	HDMI/DP	
Memory		
High density memories	NVM: Electrical Fuse	NVM: OTP
SRAM Compiler/TCAM	ROM Compiler	
Processors	Analog / mixed-signal	
Segment-specific (Cloud / Data Center, Networking, IoT)		

Contact GF for IP availability.

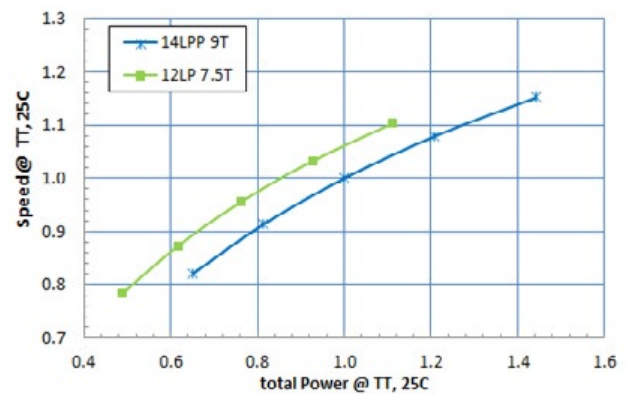
## Application-optimized Platform Extensions



## Performance, Power, Cost Advantages from 12nm Area Scaling

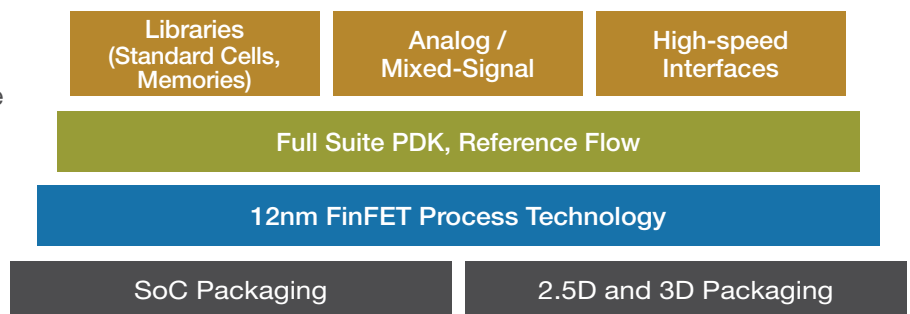
6% performance improvement at iso power

15% power reduction at iso frequency



## GLOBALSOLUTIONS® Design and Manufacturing Ecosystem

GLOBALSOLUTIONS is the sum of internal resources and external partners, combined into an ecosystem that efficiently enables the fastest time-to-volume for customers. This ecosystem includes partners in all aspects of design enablement and turnkey services, OPC and mask operations, and advanced capabilities in assembly solutions.



GLOBALFOUNDRIES®

2600 Great America Way, Santa Clara, CA 95054 USA  
Tel: +1 408-462-3900 [globalfoundries.com/contact-us](http://globalfoundries.com/contact-us)

The information contained herein is the property of GLOBALFOUNDRIES and/or its licensors. This document is for informational purposes only, is current only as of the date of publication and is subject to change by GLOBALFOUNDRIES at any time without notice. GLOBALFOUNDRIES, the GLOBALFOUNDRIES logo and combinations thereof are trademarks of GLOBALFOUNDRIES Inc. in the United States and/or other jurisdictions. Other product or service names are for identification purposes only and may be trademarks or service marks of their respective owners. © GLOBALFOUNDRIES Inc. 2018. Unless otherwise indicated, all rights reserved. Do not copy or redistribute except as expressly permitted by GLOBALFOUNDRIES.