12LP
12nm FinFET Technology

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 Vmin 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.

**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

**Target Applications and Solutions**

<table>
<thead>
<tr>
<th>Mobile Apps Processor</th>
<th>High Performance Compute &amp; Networking</th>
</tr>
</thead>
<tbody>
<tr>
<td>60% power reduction</td>
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</tr>
<tr>
<td>80% higher performance, &gt;2.2GHz</td>
<td>2x # cores</td>
</tr>
<tr>
<td>45% area reduction</td>
<td>&gt;3GHz maximum performance</td>
</tr>
<tr>
<td>~2x output increase per wafer</td>
<td>55% area reduction</td>
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*(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

<table>
<thead>
<tr>
<th>Library</th>
<th>Std Cell 7.5T</th>
<th>Std Cell 9T (14LPP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPIO / ESD</td>
<td>PLL Temp Sensor</td>
<td></td>
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<tr>
<td>ROM Compiler</td>
<td>SRAM Compiler/TCAM</td>
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</tbody>
</table>

### Interface IP

|----------------|--------|----------|-----------------|-------------|---------------|-----------------|----------|---------|

### Memory

<table>
<thead>
<tr>
<th>Library</th>
<th>High density memories</th>
<th>NVM: Electrical Fuse</th>
<th>NVM: OTP</th>
<th>SRAM Compiler/TCAM</th>
<th>ROM Compiler</th>
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</table>

### Processors

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<tr>
<th>Library</th>
<th>Segment-specific (Cloud / Data Center, Networking, IoT)</th>
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Contact GF for IP availability.

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.