PRODUCT BRIEF

AMD Artix™ UltraScale+ FPGA

OVERVIEW

AMD Artix™ UltraScale+™ devices are the industry's only cost-optimized FPGAs based on a production-proven 16nm architecture for exceptional performance/watt, along with packaging innovation for ultra-compact form factor and compute density.

With up to 16 Gbps transceivers for advanced protocols and the high DSP performance in their class, Artix UltraScale+ FPGAs match I/O bandwidth to compute to maximize system performance for cost-sensitive and low power applications in machine vision, secure networking, 4K broadcast, and a range of industrial IoT and edge markets.

HIGHLIGHTS

Highest I/O Bandwidth and Compute in a Cost-Optimized FPGA
> 2.4X fabric performance/watt vs. Artix 7 FPGAs
> Up to 16 Gbps transceivers for emerging protocols in networking, video, and vision
> Exceptional fixed- and floating-point DSP compute in its class
> 2500 Mbps MIPI performance for the latest sensor technologies

Packaging Innovation for Industry’s Highest Compute Density
> Integrated Fan-Out (InFO) packaging for ultra compact form factor
> "Near die-size" ball pitch (0.5 mm) for no loss of pins
> 75% less area (than flip-chip packaging) for better thermal & power distribution
> Exceptional I/O bandwidth and compute / mm² in its class

Multi-Level Safeguards for Cybersecurity and IP Protection
> RSA-4096 authentication to verify design source
> AES-CGM decryption (NIST-approved) with faster configuration
> Security monitor IP to adapt to security threats across the product life cycle
> Range of safeguards - including anti-tamper and SEU performance

Scalable to Mid-Range and High-End UltraScale+ FPGA Families
> Scale to higher logic density, compute, and transceiver performance as needed
> Common silicon architecture, tool flows, and ecosystem for a common platform
> Preserve investments in SW, IP, tools, and PCB design across the portfolio
> Leverage a platform strategy for developing a multi-product portfolio

TARGET APPLICATIONS

Industrial
> Machine Vision
> Industrial Networking (Time-Sensitive Networking)
> Industrial Controllers

Medical
> Portable and Desktop Ultrasound
> Surgical Vision
> Endoscopy

Networking
> Cost-sensitive Nx10 G and 25 G Networking
> Network Bridging for Nx100 G Systems

AV Broadcasting
> LED Video Walls
> Digital Signage
> KVM Switch
> Video Mini-Converters

Aerospace & Defense
> MILCOM Radio
> Missiles & Munitions

READY TO CONNECT? VISIT www.amd.com/artix-ultrascale-plus
Artix UltraScale+ FPGAs leverage production-proven architectural blocks of the UltraScale™ architecture.

### FEATURES OVERVIEW

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<th>Feature</th>
<th>Summary</th>
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<tr>
<td>Enhanced Programmable Logic Architecture</td>
<td>Based on TSMC’s 16 nm FinFET+ process&lt;br&gt;2.4X performance/watt vs. Artix 7 FPGAs&lt;br&gt;Voltage scaling to tune power and performance on the same device&lt;br&gt;Enhanced CLB/LUTs, routing, and ASIC-class clocking for high utilization</td>
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<td>High-Performance Transceivers</td>
<td>Up to 16 Gbps transceiver line rates (minimum of 12 Gbps across the family)&lt;br&gt;Power-optimized architecture vs. Artix 7 FPGAs&lt;br&gt;Single oscillator for fabric and SerDes eliminates extra clocking components</td>
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<td>PCI Express® Gen3, Gen4 Support</td>
<td>PCI Express Gen3 x8, Gen4 x8 compatible&lt;br&gt;_DMA IP for complete end-to-end solution</td>
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<td>Exceptional DSP Compute in its Class</td>
<td>Highest bandwidth in a cost-optimized FPGA&lt;br&gt;1,860 GOP/s, 620 GFLOPs (FP32) in the largest device&lt;br&gt;Up to 50% fewer resources for equivalent computation vs. Artix 7 FPGAs</td>
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<td>Safety and Multi-Level Security Features</td>
<td>RSA-4096 authentication to verify design source&lt;br&gt;NIST AES-CGM decryption approved, for faster configuration&lt;br&gt;Permanent tamper penalty to prevent adversaries from accessing security features&lt;br&gt;Security monitoring IP to adapt to security threats across the product life cycle</td>
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<td>DDR4-2400 Performance</td>
<td>DDR4-2400 for highest memory interface performance in a cost-optimized FPGA&lt;br&gt;Memory bandwidth to match on-chip compute&lt;br&gt;Reduced memory controller fabric utilization and power vs. Artix 7 FPGAs</td>
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<td>Outstanding MiPI and LVDS Performance</td>
<td>Up to 2500 Mbps MiPI and LVDS performance&lt;br&gt;Support for advanced vision sensors (MIPI, SLVS-EC)</td>
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<td>Analog Mixed-Signal Monitoring Block</td>
<td>Voltage, current, and temperature tracking for safe, secure, and reliable operation&lt;br&gt;Helps meet requirements for key standards: FIPS 140-2, IEC 61508, ISO26262&lt;br&gt;Allows for integration of low-amplitude sensors</td>
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Scalable to mid- and high-end FPGA families to increase feature-set while preserving design investment

### FEATURES

- **Artix UltraScale+**
  - Up to 308 K System Logic Cells
  - Up to 1,200 DSP Slices
  - Up to 16 Gbps Transceivers

- **Kintex UltraScale+**
  - Up to 1,843 K System Logic Cells
  - Up to 3,528 DSP Slices
  - Up to 32.75 Gbps Transceivers

- **Virtex UltraScale+**
  - Up to 8,938 K System Logic Cells
  - Up to 12,288 DSP Slices
  - Up to 58 Gbps Transceivers

### TAKE THE NEXT STEP

Artix UltraScale+ FPGAs are supported by comprehensive development tools, reference designs, an IP catalog, and evaluation platforms. For more information, visit [www.amd.com/artix-ultrascale-plus](http://www.amd.com/artix-ultrascale-plus).