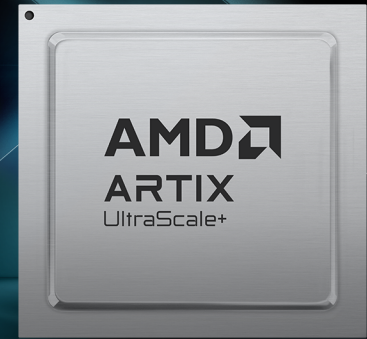


## PRODUCT BRIEF

# AMD ARTIX™ ULTRASCALE+™ FPGAs



together we advance\_



## OVERVIEW

AMD Artix™ UltraScale+™ devices are based on the production-proven 16 nm architecture for exceptional transceiver and digital signal processing bandwidth, along with packaging innovation for ultra-compact form factor and compute density.

With up to 16 Gb/s 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 Gb/s transceivers for emerging protocols in networking, video, and vision
- Exceptional fixed- and floating-point DSP compute in its class
- 2500 Mb/s 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 / mm<sup>2</sup> in its class

### MULTI-LEVEL SAFEGUARDS FOR CYBERSECURITY AND IP PROTECTION

- RSA-2048 authentication to verify design source
- AES-GCM decryption (NIST-approved) with faster configuration
- Security monitor IP to adapt to security threats across the product lifecycle
- 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

# FEATURES

Artix UltraScale+ FPGAs leverage production-proven architectural blocks of the UltraScale™ architecture.

FEATURE HIGHLIGHTS	
<b>ENHANCED PROGRAMMABLE LOGIC ARCHITECTURE</b>	<ul style="list-style-type: none"> <li>• Based on TSMC's 16 nm FinFET+ process</li> <li>• 2.4X performance/watt vs. Artix 7 FPGAs</li> <li>• Voltage scaling to tune power and performance on the same device</li> <li>• Enhanced CLB/LUTs, routing, and ASIC-class clocking for high utilization</li> </ul>
<b>HIGH-PERFORMANCE TRANSCEIVERS</b>	<ul style="list-style-type: none"> <li>• Up to 16 Gb/s transceiver line rates (minimum of 12 Gb/s across the family)</li> <li>• Power-optimized architecture vs. Artix 7 FPGAs</li> <li>• Single oscillator for fabric and SerDes eliminates extra clocking components</li> </ul>
<b>PCI EXPRESS® GEN3, GEN4 SUPPORT</b>	<ul style="list-style-type: none"> <li>• PCI Express Gen3 x8, Gen4 x8 compatible</li> <li>• DMA IP for complete end-to-end solution</li> </ul>
<b>EXCEPTIONAL DSP COMPUTE IN ITS CLASS</b>	<ul style="list-style-type: none"> <li>• Highest bandwidth in a cost-optimized FPGA</li> <li>• 1,860 GOP/s, 620 GFLOPs (FP32) in the largest device</li> <li>• Up to 50% fewer resources for equivalent computation vs. Artix 7 FPGAs</li> </ul>
<b>SAFETY AND MULTI-LEVEL SECURITY FEATURES</b>	<ul style="list-style-type: none"> <li>• RSA-2048 authentication to verify design source</li> <li>• NIST AES-GCM decryption approved, for faster configuration</li> <li>• Permanent tamper penalty to prevent adversaries from accessing security features</li> <li>• Security monitoring IP to adapt to security threats across the product lifecycle</li> </ul>
<b>DDR4-2400 PERFORMANCE</b>	<ul style="list-style-type: none"> <li>• DDR4-2400 for high memory interface performance in a cost-optimized FPGA</li> <li>• Memory bandwidth to match on-chip compute</li> <li>• Reduced memory controller fabric utilization and power vs. Artix 7 FPGAs</li> </ul>
<b>OUTSTANDING MIPI AND LVDS PERFORMANCE</b>	<ul style="list-style-type: none"> <li>• Up to 2500 Mb/s MIPI and LVDS performance</li> <li>• Support for advanced vision sensors (MIPI, SLVS-EC)</li> </ul>
<b>ANALOG MIXED-SIGNAL MONITORING BLOCK</b>	<ul style="list-style-type: none"> <li>• Voltage, current, and temperature tracking for safe, secure, and reliable operation</li> <li>• Helps meet requirements for key standards: FIPS 140-2, IEC 61508, ISO26262</li> <li>• Allows for integration of low-amplitude sensors</li> </ul>

Scalable to mid- and high-end FPGA families to increase feature-set while preserving design investment

 <ul style="list-style-type: none"> <li>• Up to 308K System Logic Cells</li> <li>• Up to 1,200 DSP Slices</li> <li>• Up to 16 Gb/s Transceivers</li> </ul>	 <ul style="list-style-type: none"> <li>• Up to 1,843K System Logic Cells</li> <li>• Up to 3,528 DSP Slices</li> <li>• Up to 32.75 Gb/s Transceivers</li> </ul>	 <ul style="list-style-type: none"> <li>• Up to 8,938K System Logic Cells</li> <li>• Up to 12,288 DSP Slices</li> <li>• Up to 58 Gb/s Transceivers</li> </ul>
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## NEXT STEPS

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).

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