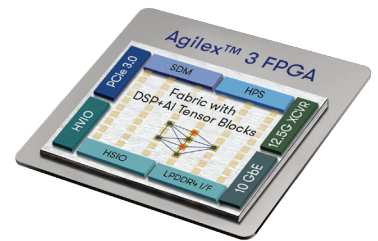


# Agilex™ 3 FPGAs and SoCs

Industry's smallest SoC devices with fabric infused with AI Tensor Blocks for higher compute density.

The Agilex 3 device family brings upgraded performance, integration, and security to power and cost-optimized FPGAs.



Up to

**1.9X**

higher fabric performance <sup>1,3,4</sup>

**38%**

lower total power  
vs. competing FPGAs <sup>1,3,4</sup>

**12.5 Gbps**

transceivers

Unleash the power of cost-efficiency without compromising performance with Altera's Agilex™ 3 FPGAs and SoCs, designed to elevate your project's capabilities through the industry-leading HyperFlex® FPGA architecture, advanced transceiver technology, higher integration, and robust security features. Experience the reliability of Intel's supply chain and the simplicity of the Quartus® Prime Software, ensuring your project's success with a resilient, user-friendly, and secure platform.

Agilex 3 devices also feature enhanced DSP with AI Tensor Blocks, which delivers high-efficiency artificial intelligence (AI) and digital signal processing (DSP) functionality, enabling you to optimize your workloads' performance and power efficiency. With multiple logic densities ranging from 25K to 135K logic elements (LEs), Agilex 3 devices provide scalable solutions tailored to your specific requirements. The variable pitch BGA (VPBGA) packages ensure high I/O density, optimizing space and performance using the same design rules as 0.8 mm ball pitch packaging. Flexible I/O support allows for versatile connectivity options, including high-voltage and high-speed interfaces such as MIPI and 1.25 Gbps low-voltage differential signaling (LVDS). The 12.5 Gbps transceiver, equipped with PCI Express® (PCIe®) 3.0 and 10G Ethernet hard IP blocks, ensures robust data transfer capabilities. Cost-effective memory support with LPDDR4 enhances system efficiency, while the hard processor system (HPS) with dual Arm Cortex®-A55 cores delivers powerful processing capabilities. Agilex 3 devices redefine the landscape of cost-optimized solutions by expanding beyond Altera's renowned MAX® and Cyclone® device series, delivering upgraded performance and capabilities. Harnessing the industry-leading Hyperflex FPGA Architecture built on Intel's advanced Intel® 7 technology, Agilex 3 delivers a diverse, resilient, and secure end-to-end supply chain that is predictable, agile and offers longevity for an unmatched supply experience.

## Focus Markets

### Industrial

- AI in smart factory
- Smart factory automation
- Sensors/motors/connectivity, functional safety, and security
- I/O modules and IoT devices
- Tiny PLC and edge AI

### Surveillance, Retail, and Consumer

- Intelligent video processing
- Smart city/retail, V2X
- Trucks, bus systems, trains and railways, EV charging
- Vision processing

### Video and Medical

- Connectivity and processing
- Video over IP
- Consumer electronics
- Diagnostic imaging and video
- Patient monitoring

### Test and Measurement

- Relay and board management in automated test equipment
- Legacy I/O interfacing in RF instruments

### Military

- Host management port
- Avionics (i.e., control, monitoring, and management for actuators, displays, and sensors)

### Data Center

- Platform root of trust
- Board management control

| Agilex 3 FPGA Features List                 |                                            |
|---------------------------------------------|--------------------------------------------|
| Logic density                               | 25K – 135K LEs                             |
| Package size                                | As small as 12x12 mm                       |
| Power comparison                            | 38% lower vs. Cyclone V FPGA <sup>1</sup>  |
| Fabric performance                          | 1.9X vs. Cyclone V FPGA <sup>1</sup>       |
| Maximum transceiver rate                    | 4 x 12.5 Gbps                              |
| Maximum PCIe and GbE rate                   | PCIe 3.0 x4, 10 GbE                        |
| Maximum external memory interface data rate | LPDDR4 @ 2,133 Mbps                        |
| Peak TOPS INT8                              | 2.54                                       |
| Maximum DSP 18x19 multipliers               | 368                                        |
| Fabric speed                                | 345 MHz                                    |
| HPS                                         | Dual Arm Cortex-A55 processor @ 800 MHz    |
| MIPI                                        | D-PHY v2.1 at up to 14 @ 2.5 Gbps per lane |

| Agilex 3 FPGA Key Innovations                          |                                                                                                                                                                                                                                             |
|--------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Advanced Intel® technologies and processes             | Utilizes advanced Intel 7 process technology, contributing to high performance, power efficiency, and supply chain resiliency.                                                                                                              |
| 2 <sup>nd</sup> generation Hyperflex FPGA architecture | Enables significant design optimization to deliver up to 1.9X higher performance or up to 38% lower total power compared with Cyclone V FPGAs. <sup>4</sup>                                                                                 |
| Transceiver data rates                                 | Supports up to 4 x 12.5 Gbps data rates for data-intensive applications and hardened media access control, physical coding sublayer (PCS), and forward error correction (FEC) up to 4 x 10 Gbps Ethernet (GbE) for networking applications. |
| Hardened PCIe support                                  | Up to PCIe 3.0 x4 interface                                                                                                                                                                                                                 |
| Advanced memory interface support                      | Supports industry-standard LPDDR4                                                                                                                                                                                                           |
| Hardened processors                                    | Dual Arm Cortex-A55 processor (up to 800 MHz)                                                                                                                                                                                               |
| AI Tensor Block                                        | Up to 2.8 Peak INT* (TOPS) and supported in the Altera® FPGA AI Suite for edge AI applications.                                                                                                                                             |
| MIPI support                                           | MIPI D-PHY v2.5 at up to 2.5 Gbps per lane                                                                                                                                                                                                  |

## For More Information

- Agilex FPGAs and SoC FPGAs portfolio page: [intel.com/agilex](https://www.intel.com/agilex)
- Agilex 3 FPGAs and SoC FPGAs product page: [intel.com/agilex3](https://www.intel.com/agilex3)
- Quartus® Prime Software page: [intel.com/quartus](https://www.intel.com/quartus)
- Contact an Altera sales representative for inquiries.



<sup>1</sup> Fabric performance comparison is done between the Cyclone V FPGA and Agilex 3 FPGA.

<sup>2</sup> The performance Quality of Results (QoR) maximum frequency ( $f_{MAX}$ ) represents the geometric mean derived from Altera's QoR design suite of 45 separate designs.

<sup>3</sup> The total power comparison is done with the Agilex 3 FPGA core power at 0.75 V and Cyclone V FPGA core power at 1.1 V, with both devices at 100% utilization running at 150 MHz.

<sup>4</sup> For more information, please contact your Altera sales representative.

Intel technologies may require enabled hardware, software or service activation.

No product or component can be absolutely secure.

Your costs and results may vary.

© Altera Corporation. Altera, the Altera logo, and other Altera marks are trademarks of Altera Corporation or its subsidiaries.

\*Other names and brands may be claimed as the property of others.