



Enter Part Number or Upload BC



Talk to a team member!

+1-888-251-5467

REQUEST A QUOTE 

Industry Information

[Home](#) ▶ [Industry Information](#)

Stratix FPGAs



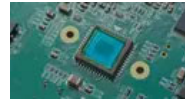
May 5, 2023

What Are Stratix FPGAs?

More from the Category

Among the leading FPGA families available in the market, Stratix FPGAs, developed by Intel, have exceptional performance, reliability, and versatility. These highly advanced FPGAs have earned a reputation and are widely recognized for their ability to meet the demanding requirements of a broad range of applications across various industries.

Stratix FPGAs, with their advanced architecture, features, and application support, is a nice choice for engineers and developers tackling system designs. Their performance, reliability, and versatility make them well-suited for various applications in high-performance computing, communications, video and image processing, industrial automation, automotive systems, and beyond. By harnessing the power of Stratix FPGAs, engineers can unlock new possibilities, drive innovation, and propel technological advancements across various industries.



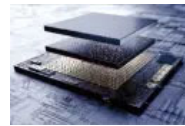
NXP Sensors

September 18, 2023



Analog Devices
Microcontrollers

November 20, 2023



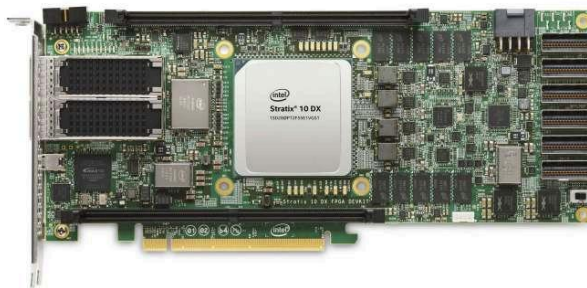
Analog Devices Clock and
Timing Products

January 3, 2024



Independence From Intel:
A New Chapter for Altera

February 24, 2025



Architecture and Design

Configurable Logic Elements

Stratix FPGAs are built on a hierarchical architecture encompassing several key components. The first component is the configurable logic elements, which consist of look-up tables (LUTs), registers, and multiplexers. These elements can be interconnected to implement



complex digital functions, providing the foundational building blocks for designing custom logic circuits. The flexibility of these logic elements allows designers to create tailored solutions that meet their specific requirements.

Adaptive Logic Modules (ALMs)

To further enhance flexibility, Stratix FPGAs feature Adaptive Logic Modules (ALMs). ALMs combine multiple logic elements and support various arithmetic and logical operations. This combination of logic elements within ALMs increases the versatility of Stratix FPGAs, enabling designers to implement complex algorithms and computations efficiently. The inclusion of ALMs empowers designers to create sophisticated designs that can handle a wide range of applications.

Embedded Memory Resources

These resources include RAM blocks, ROM blocks, and FIFO buffers. Highly configurable and offering high-speed access, these memories are ideal for data buffering, storage, and processing within the FPGA. The configurable nature of these memory resources allows designers to efficiently manage large datasets and implement data-intensive algorithms, contributing to the overall performance of the FPGA design.

Digital Signal Processing (DSP)

These DSP blocks offer optimized resources for implementing digital signal processing algorithms. They support operations such as multiply-accumulate (MAC) operations and finite impulse response (FIR) filters, enabling high-performance signal processing applications. With these dedicated hardware blocks, Stratix FPGAs are well-suited for applications such as audio and video



processing, telecommunications, and software-defined radio.

High-Speed Transceivers

Stratix FPGAs are equipped with high-speed transceivers capable of transmitting and receiving data at multi-gigabit rates. These transceivers support various industry-standard protocols, including PCIe, Ethernet, and USB. This feature allows for seamless integration with external devices and networks. Stratix FPGAs can serve as powerful interfaces between different components of a system or interface with external systems, providing efficient and high-bandwidth communication capabilities.

Clocking Resources

These are crucial for reliable and efficient operation in digital designs. Stratix FPGAs offer a comprehensive suite of clocking resources, including phase-locked loops (PLLs), clock dividers, and delay-locked loops (DLLs). PLLs generate stable and precise clock signals, clock dividers allow for frequency division to meet different timing requirements, and DLLs align data signals with the system clock. With these clocking resources, designers can achieve accurate clock generation, synchronization, and distribution throughout their FPGA designs, ensuring reliable operation and efficient timing management.

Stratix FPGA Families and Variants

Stratix 10 Family: This represents the latest generation of Stratix FPGAs, offering a combination of performance, power efficiency, and density. These FPGAs feature advanced process technology,



high-capacity embedded memory, and a wide range of I/O options. Designed for demanding applications, Stratix 10 FPGAs find their use in data centers, high-performance computing, wireless communication, and advanced driver assistance systems (ADAS). With their powerful capabilities, Stratix 10 FPGAs provide an ideal solution for computationally intensive tasks that require high-speed processing, data storage, and efficient I/O communication.

Stratix V Family: These FPGAs strike a balance between logic capacity, power efficiency, and performance. Stratix V FPGAs offer a variety of variants with different logic densities, high-speed transceivers, and embedded memory options. This versatility enables their application in various fields, including communications, video processing, aerospace, and **defense**. Stratix V FPGAs are trusted for their ability to handle complex algorithms, data processing, and real-time tasks, making them a preferred choice for industries requiring high-performance computing solutions.

Stratix IV Family: Delivers a combination of high performance and cost-effectiveness. These FPGAs offer a range of logic densities, embedded memory, and I/O capabilities to accommodate diverse application requirements. Stratix IV FPGAs find applications in areas such as wireless communication, industrial automation, and medical imaging. They are valued for their ability to provide a cost-effective solution without compromising on performance. Stratix IV FPGAs are suitable for applications that demand a balance between functionality, cost, and power consumption.

Other Variants: These variants include low-power FPGAs designed for battery-operated devices, high-bandwidth FPGAs suitable for data-intensive



applications, and specialty FPGAs optimized for specific tasks such as digital signal processing or image processing. These specialized variants offer tailored features and capabilities to address specific application requirements, ensuring optimal performance and power efficiency.

Application Areas

High-Performance Computing Applications:

Providing accelerated processing capabilities. They are used for tasks such as algorithm acceleration, data compression, encryption/decryption, and real-time data analysis. Stratix FPGAs enable HPC systems to achieve high computational throughput, low latency, and energy efficiency. They excel in accelerating computationally intensive algorithms, such as machine learning algorithms (e.g., neural networks), cryptographic algorithms (e.g., AES, RSA), and scientific simulations (e.g., finite element analysis, computational fluid dynamics). By offloading these algorithms to FPGAs, significant performance gains can be achieved compared to traditional CPU-based implementations. Stratix FPGAs are increasingly being deployed in data centers to accelerate workloads, enhance network infrastructure, and optimize power consumption. FPGAs can be used to offload tasks such as data compression, encryption, search acceleration, and database acceleration, resulting in improved data center performance, reduced latency, and lower operational costs. In the field of communications and networking, Stratix FPGAs enable the development of high-bandwidth, low-latency systems that support a wide range of protocols and standards. FPGAs are utilized in applications such as wireless infrastructure, data communication, software-defined networking (SDN), and network function virtualization (NFV).



Wireless Infrastructure Applications: Including base stations, remote radio heads, and small cell deployments. They provide the flexibility to implement advanced signal processing algorithms, modulation schemes, and multiple-input multiple-output (MIMO) technologies, enabling efficient and reliable wireless communication. Stratix FPGAs play a vital role in high-speed data communication systems, such as routers, switches, and optical transport networks. With their high-speed transceivers, programmable packet processing capabilities, and support for various communication protocols, FPGAs enable the development of efficient and flexible networking solutions.

Video and Image Processing Applications: Can be effectively addressed using Stratix FPGAs. FPGAs offer parallel processing capabilities, enabling real-time video encoding, decoding, transcoding, and image processing tasks. These FPGAs are employed in applications such as broadcast and professional video equipment, video surveillance systems, and image analytics. Stratix FPGAs provide the performance and flexibility required in broadcast and professional video applications. They support video compression standards (e.g., H.264, H.265), high-resolution video processing, real-time video effects, and video format conversions. FPGAs enable the implementation of advanced video processing pipelines for video production, broadcasting, and post-production workflows. Stratix FPGAs are utilized in video surveillance systems to perform real-time video analysis, object detection and tracking, video content analysis, and video compression. FPGAs enable the processing of high-resolution video streams from multiple cameras, facilitating intelligent video surveillance, smart city applications, and security systems.



Industrial Automation and Control Systems:

Stratix FPGAs offer a reliable and flexible platform for implementing complex control algorithms, interfacing with various sensors and actuators, and ensuring real-time responsiveness. FPGAs are used in programmable logic controllers (PLCs), factory automation systems, robotic control, and industrial machine vision applications. Stratix FPGAs provide the computational power and flexibility required in modern PLCs. They enable the implementation of custom control logic, high-speed I/O interfaces, communication protocols (e.g., EtherCAT, Profinet), and advanced diagnostics. FPGAs help optimize PLC performance, increase system reliability, and enable rapid customization for different industrial applications. Stratix FPGAs are employed in factory automation systems to control and monitor manufacturing processes, coordinate robotics, and enable seamless integration with enterprise systems. FPGAs facilitate real-time data processing, machine vision, motion control, and industrial communication protocols, supporting the transition towards Industry 4.0 and smart factories.

Automotive Industry: They contribute to the development of advanced driver assistance systems (ADAS) and in-vehicle infotainment (IVI) systems. FPGAs enable real-time sensor data processing, high-speed connectivity, and reliable control algorithms, enhancing vehicle safety, comfort, and entertainment. Stratix FPGAs play a critical role in ADAS applications, which include features such as adaptive cruise control, lane departure warning, collision detection and avoidance, and pedestrian detection. FPGAs enable real-time sensor fusion, image processing, and decision-making algorithms, providing the necessary computational power and low-latency processing required for ADAS functionalities. Stratix FPGAs are utilized in IVI systems to provide high-quality audio and video processing,



touchscreen interfaces, connectivity options, and multimedia integration. FPGAs enable the implementation of user-friendly interfaces, advanced audio/video processing, seamless connectivity with mobile devices, and support for emerging IVI standards, enhancing the overall in-car entertainment experience.

Conclusion

Stratix FPGAs, developed by Intel, have firmly established themselves as a leading FPGA family, renowned for their exceptional performance, reliability, and versatility. Widely adopted in a range of industries and applications, Stratix FPGAs excel in high-performance computing, communications and networking, video and image processing, industrial automation, automotive systems, and more. Their advanced architecture, parallel processing capabilities, and robust features empower engineers to design and implement complex systems with ease, delivering significant performance gains and energy efficiency.

Stratix FPGAs are particularly prominent in high-performance computing, where they accelerate complex algorithms and computationally intensive tasks, surpassing traditional CPU-based implementations. In communications and networking, these FPGAs provide the processing power, high-speed transceivers, and support for various protocols, enabling efficient and flexible systems. In video and image processing, Stratix FPGAs deliver real-time processing, supporting advanced video effects and high-resolution formats. They also excel in industrial automation, powering control systems and machine vision applications. Additionally, Stratix FPGAs contribute to the advancement of automotive technology, enhancing driver assistance systems and in-vehicle

infotainment experiences. With their exceptional performance, reliability, and versatility, Stratix FPGAs are at the forefront of FPGA technology, driving innovation and transforming a wide array of industries.

Learn more at [Altera FPGAs](#) here.

Need help sourcing parts? Our IC & Semiconductor Specialists can help you today, on our [RFQ page](#)!

REQUEST A QUOTE 



Contact Info

 Call us

+1-888-251-5467 (Toll Free)

+1-813-463-9988 (US)

+49 030 30015566 (DE)

 Email:

sales@microchipusa.com

 Location:

4511 N Himes Ave, Suite 100,

Tampa, FL 33614



Our Services

Premier Distributor

Supply Chain Optimization

Risk and Obsolescence Management

Cost-Saving Opportunities

PCB Manufacturing

Excess Inventory Management

 **WE'RE HIRING!**

Open Hours

Monday - Thursday

9:00AM - 5:30PM EST

Friday

9:00AM - 4:30PM EST



© 2025 Microchip USA. All rights reserved.

[Customer Portal](#)

[Privacy Policy](#)