



BEST-IN-CLASS PERFORMANCE  
AND LOWEST-POWER FPGAS FOR  
COST-SENSITIVE MARKETS

## XILINX ARTIX-7 FPGAS: A NEW PERFORMANCE STANDARD FOR POWER-LIMITED, COST-SENSITIVE MARKETS

### » The Challenge: The Need to Reduce Power & Cost

- Reducing power for greater portability
- Delivering highest performance while reducing cost
- Providing advanced functionality in a small form factor

### » The Solution: Xilinx Artix-7 FPGAs

- 50% power reduction versus previous generation
- Highest system performance per-watt per-dollar
- Small footprint for compactness
- Scalable optimized architecture for rapid design migration

### Sub-Watt Performance for 100,000 Logic Cells

The digital revolution has changed expectations for novice and savvy FPGA designers alike. Competing in cost-sensitive markets such as aerospace and defense, communications infrastructure, medical, industrial, and consumer electronics calls for a strong portfolio of high-performance features. Without sacrificing performance, developers must be able to extend use models for greater portability and application reach while keeping power — a critical resource — to a minimum.

The Xilinx® Artix®-7 family of FPGAs has redefined cost-sensitive solutions by cutting power consumption in half from the previous generation while providing advanced functionality for edge applications. Designers can leverage twice the logic for the same power budget. The newest generation of 7 series devices are built on advanced 28nm process technology to produce the lowest-cost, lowest power FPGA for products like portable medical equipment, military radios, and compact wireless infrastructure. Artix-7 FPGAs meet the needs of size, weight, power and cost (SWaP-C) sensitive markets like avionics and communications.

### Best-in-Class Performance for Cost-Sensitive Markets

Artix-7 FPGAs redefine low-cost alternatives with twice the performance and logic capacity of the Xilinx Spartan®-6 FPGAs. Flexible built-in interfaces, high-speed digital signal processors (DSP) slices and transceivers, and DDR3 memory interfaces enable a new class of high-throughput, low-cost applications.

As part of the 7 series, Artix-7 FPGAs also offer many high-end features such as integrated, advanced Analog Mixed Signal (AMS) technology. Whether implementing a simple analog-to-digital converter or replacing more costly system-on-a-chip (SoC) functions, analog is the next level of integration that is efficiently accomplished with the independent dual 12-bit, 1MSPS, 17-channel analog-to-digital converters in Artix-7 FPGAs.

### A Low-Risk Accelerated Path to Production

Artix-7 FPGAs offer an exceptionally low-risk path with the power of programmability. Applications previously limited to ASICs, ASSPs, and less-powerful FPGAs can benefit from a proven high-performance architecture and Xilinx industry expertise. Leveraging the 7 series scalable optimized architecture, Artix-7 designs can be easily migrated to other families within the series. With the industry's fastest ramp up, Xilinx puts designers on an accelerated path to market for highly differentiated cost-sensitive solutions.

## Key Capability Overview

### Twice the Capacity, Half the Power

- 50% lower total power compared to previous generation
- Sub-watt performance in 100,000 logic cells
- 2x logic, 2.5x BRAM, 5.7x DSP more slices than Spartan-6 FPGAs

### New Levels of Performance

- 6.6 Gb/s transceivers enabling 211 Gb/s peak bandwidth (full duplex)
- Single and double differential I/O standards with speeds of up to 1.25 Gb/s
- 740 DSP48E1 slices with up to 930 GMACs of signal processing
- 1,066 Mb/s DDR3 memory including SODIMMs support
- Integrated memory interface for streamlined access to video and data

### Smallest Package

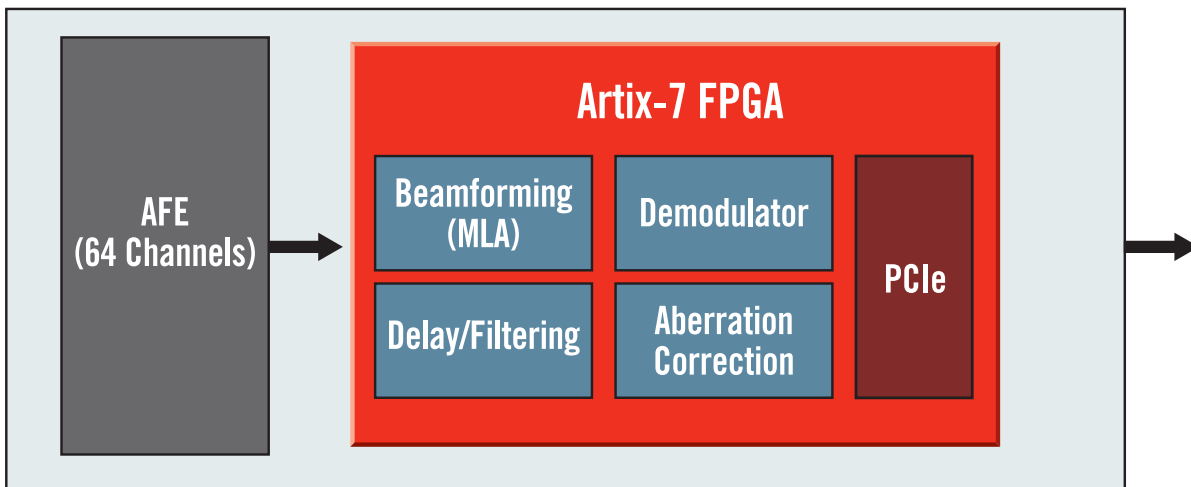
- Low-cost, wire-bond, chip-scale BGA packaging
- Over 50,000 logic cells in a 10 x 10 mm package for maximum system integration
- Package migration across the entire family

### Low Risk, Rapid Ramp-Up

- Proven 28nm process, architecture, and quality
- New hard IP blocks to reduce development time and risk
- Integrated wizards for rapid development of built-in blocks
- Development kits with IP and reference designs for quick design starts

## Enabling Next-Generation Systems

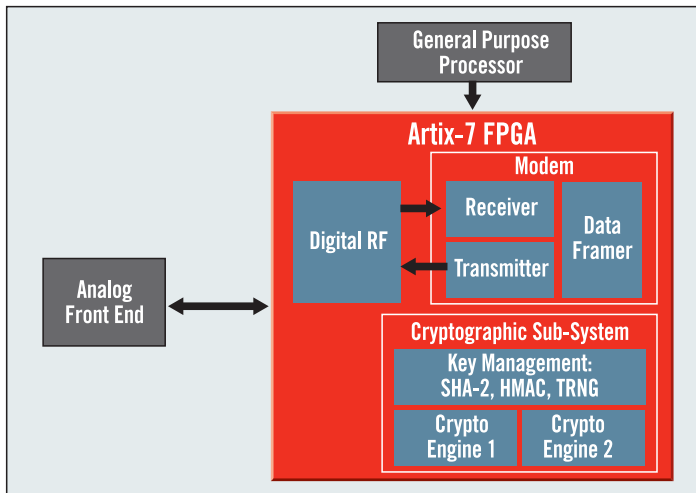
### MEDICAL: PORTABLE ULTRASOUND



Designers can deploy a fully programmable 64-channel portable ultrasound implementation that scales up to 196 or 256 channels for high-end cart solutions or down to 32 channels for hand-held form factors.

- Lowest-power single chip implementation of 64-channel portable ultrasound at 35% lower cost, and 57% smaller form factor compared to previous generation FPGAs
- Up to 930 GMACs of DSP processing for high quality image rendering
- Built-in support for PCIe x4 Gen2 enables high-bandwidth interface to host system
- Small form factor for laptop- and tablet-sized devices
- 6.6 Gb/s to interface to support next generation JEDEC JESD204B analog interface

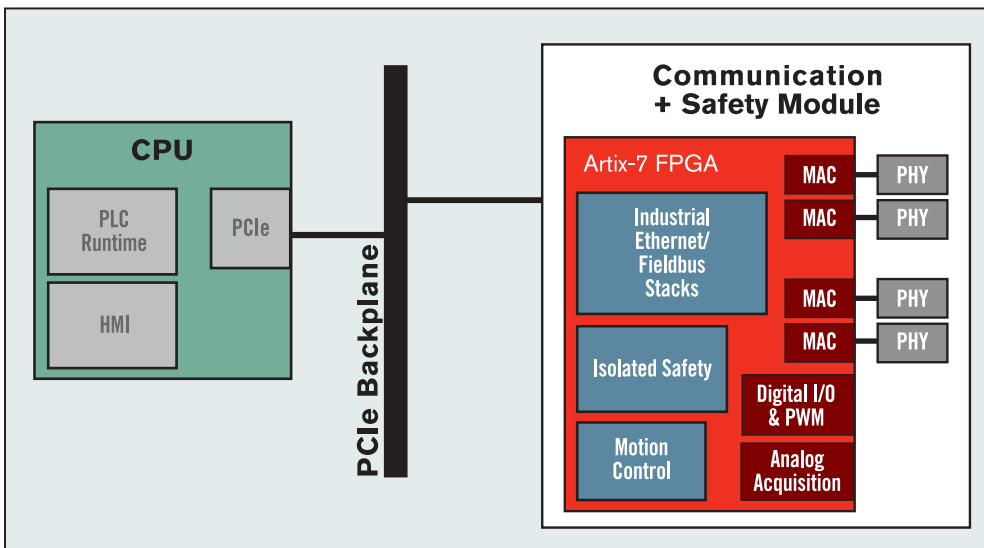
## AEROSPACE AND DEFENSE: SECURE SOFTWARE-DEFINED RADIO



The Artix-7 FPGA delivers the industry's most integrated Type-1 single-chip cryptography (SCC) solution for superior, secure SWaP-C results. Extensive DSP resources allow for waveform processing capacity to integrate both the modem and cryptographic engine on a single chip.

- High parallel and serial I/O performance with 1.25 Gb/s LVDS and PCIe x4 Gen2
- 1,066 Mbps DDR3 memory interfaces enables video data buffers using commodity memories
- Up to 930 GMACS for baseband signal pre-processing and RF signal improvements
- System integration in a 19x19 mm package for battery-powered hand-held radios

## INDUSTRIAL: PROGRAMMABLE LOGIC CONTROLLER



Employing the Artix-7 FPGA and Xilinx IP solutions enables a smaller form factor programmable logic controller (PLC) with greater flexibility, lower BOM cost, and lower power consumption compared to traditional architectures. Serving as a companion device to the main processor, the FPGA replaces communication expansion modules.

- MicroBlaze 32 processor for real-time control off loads Industrial Ethernet tasks from main CPU
- High performance, high precision motor control drive functions
- Isolation Design Flow to separate safe and non-safe hardware functions in a single device
- Small footprint (15 x 15mm) and single chip solution for small form factor modules
- High density I/O support for maximum connectivity
- Reprogrammable fabric for upgradeability and future-proof design

## Boards and Kits



To get started with the Artix-7 device family, Xilinx offers the Artix-7 FPGA AC701 Evaluation Kit enabling quick prototyping for cost-sensitive applications. This includes all the basic components of hardware, design tools, IP, and pre-verified reference designs. This also features a targeted reference design enabling high-performance serial connectivity and advanced memory interfacing equipped with a full license for the Northwest Logic DMA engine. Visit [www.xilinx.com/ac701](http://www.xilinx.com/ac701) to learn more.

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**Take the NEXT STEP**

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For more information, contact your local sales office.

For more product details or to watch the latest videos on topics such as low power approaches, please visit: [www.xilinx.com/artix7](http://www.xilinx.com/artix7)

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