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% lower power vs. previous generation
- Best-in-class performance-per-watt
- Small footprint and packaging
- Part of the broadest All Programmable Low-End Portfolio

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 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 over a broad density range. 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 High Performance, Low Power (HPL) 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.
Key Capability Overview

**Twice the Capacity, Half the Power, Comparable Cost**

- 50% lower total power compared to previous generation
- Sub-watt performance ranging from 15,000–200,000 logic cells
- 2X logic, 2.5X block RAM, 5.7X DSP more slices than Spartan-6 FPGAs
- Lowest-power Industrial speed grade offering (-1LI)

**Smallest Package**

- Low-cost, wire-bond, chip-scale BGA packaging
- Available in a 10x10mm package for maximum system integration
- Package migration across the family

**New Levels of Performance**

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

**Low Risk, Rapid Ramp-Up**

- Production proven 28nm process, architecture, and quality
- Integrated 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

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

Artix-7 devices deliver the industry’s lowest power, highest performance, and most optimized transceivers. This family is the perfect fit for low-end applications that need high-end features. The Artix-7 family is the industry’s low-end leader in nearly every category of performance, including logic fabric, signal processing, embedded memory, LVDS I/O, memory interfaces, and in particular, transceivers.

As part of the 7 series, Artix-7 FPGAs also offer other system integration 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.

**Part of the Broadest All Programmable Low-End Portfolio**

The Artix-7 family is part of the broadest cost effective, All Programmable Low-End Portfolio—delivering the best value for a given application. The Low-End Portfolio also includes Spartan®-6 FPGAs, which deliver I/O optimization, and Zynq®-7000 All Programmable SoCs (Z-7010, Z-7015, and Z-7020), which deliver system integration and optimization for system-on-chip (SoC) applications.
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
- 6.6Gb/s 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 1.25Gb/s LVDS and PCIe® x4 Gen2
- 1,066Mb/s 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 19x19mm 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-bit 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 (15x15mm) 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
Getting Started with Evaluation Kits

To get started with the Artix-7 family, Xilinx offers both the Artix-7 FPGA AC701 and Artix-7 50T FPGA Evaluation Kits, enabling quick prototyping for cost-sensitive applications. These include all the basic components of hardware, design tools, IP, and pre-verified reference designs. Visit [www.xilinx.com/boards-and-kits](http://www.xilinx.com/boards-and-kits) to learn more about Xilinx and partner development boards.

Take the NEXT STEP

Visit [www.xilinx.com](http://www.xilinx.com) to learn more about the Xilinx wireless Download ISE® and Vivado® design tools: [www.xilinx.com/ise](http://www.xilinx.com/ise) or [www.xilinx.com/vivado](http://www.xilinx.com/vivado)

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)