Zynq-7000 All Programmable SoC

Target Markets

- Aerospace & Defense
- Automotive
- Industrial, Scientific, and Medical
- Wired Communications Infrastructure
- Wireless Infrastructure

Best-in-class Performance and Power

- 25% faster ARM Cortex-A9 than competing SoCs
- 66% faster FPGA logic than competing fabric
- 55% power advantage over competing solutions

Built with Security in Mind

- Integrated system offers high physical security
- Secure system boot ensures proper operation
- Aerospace-grade security features keep IP safe

BOM Cost Reduction

- Fewer external components reduce design complexity
- All programmable for adaptability and reuse
- 10 different devices for varying design needs

XILINX
ALL PROGRAMMABLE™

ZYNQ®

Industry Standard SoC

The Zynq®-7000 All Programmable SoC redefines the possibilities for embedded systems, giving system architects and software developers a flexible platform to launch their new solutions, while providing traditional ASIC and SoC users a fully programmable alternative. ARM® Cortex™-A9 processors, skillfully integrated with the industry's leading performance-per-watt 28nm programmable logic, achieve power and performance levels exceeding that of discrete processor and FPGA systems. The Zynq-7000 SoC is the industry's first all programmable SoC and market leader in its class. Available in dual-core (Zynq-7000 devices) and single-core (Zynq-7000S devices) Cortex-A9 configurations, the Zynq-7000 family boasts the best price to performance-per-watt, making it the best option for a wide range of embedded applications, including small cell base stations, multi-camera drivers assistance systems, machine vision for industrial automation, medical endoscopy, and 4K2K Ultra-HDTV.

Racing Highly Differentiated Applications to Market

Enabling these silicon capabilities is the most extensive library of industry-standard tools and IP, which leverages the ARM partner community and is bolstered by Xilinx's Vivado® Design Suite and Vivado High Level Synthesis (HLS) tool. Complete with Xilinx's SDSoC™ development environment, the industry's first C/C++ full-system optimizing compiler, the software ecosystem enables design teams to go from concept to working implementation in the absolute minimum amount of time, allocating more resources to focus on system features. More time for optimization, algorithm development, and feature extensions ultimately creates highly differentiated products, from cost-effective to feature-rich and high performance.

Designed for Longevity in the Field

Embedded systems built upon the all programmable foundation of the Zynq-7000 SoC are ensured functionality and relevance in long running applications. Field upgradability via software updates to the ARM processing system can fix errors or retool the system for new tasks. The ARM processing system is also responsible for the reconfiguration of the programmable logic. Changing market requirements no longer necessitate new designs and deployment. The Zynq-7000 is the most versatile and programmable SoC for embedded solutions.

The Zynq-7000 family comprises single and dual ARM Cortex-A9 equipped devices, providing processor scalability across the platform:

Zynq-7000S devices are the cost-optimized entry point to the Zynq-7000 SoC platform. With a single-core ARM Cortex-A9 processor mated with 28nm Artix®-7 based programmable logic, Zynq-7000S devices are ideal for industrial IoT applications such as motor control and embedded vision.

Zynq-7000 devices are optimized for performance-per-watt and maximum design flexibility. Dual-core ARM Cortex-A9 processors are integrated with 7 series programmable logic (up to 6.6M logic cells of logic and 12.5Gb/s transceivers) to enable highly differentiated designs for a wide range of embedded applications.

FEATURES OVERVIEW	
Dual- or Single-core ARM Cortex-A9 with CoreSight™ Technology Unmatched performance-per-watt	• ARM Cortex-A9 processor chosen for optimal performance-per-watt ratio in popular applications • Single and double-precision floating point support • Up to 1GHz operation
Largest and Highest-Performance Memory System Features the fastest memory controllers and largest on-chip memory in its class	• 512KB L2 Cache • 256KB On-Chip Memory fits an entire real-time operating system • Integrated memory controllers support up to DDR3-1866
7 Series 28nm Programmable Logic HPL process for optimal performance-per-watt	• Artix®-7 FPGA fabric for low power and low cost • Kintex®-7 FPGA fabric for best price/performance/watt
Integrated Memory Mapped Peripherals Leverage commonly used protocols	• 2x USB 2.0 (OTG) w/DMA • 2x Tri-mode Gigabit Ethernet w/DMA • 2x SD/SDIO w/DMA • 2x UART, 2x CAN 2.0B, 2x I2C, 2x SPI, 32b GPIO
All Programmable Power Management Multiple power optimization technologies across processing system and programmable logic	• Flexible, tunable power envelope for adjustable processor, interconnect, and memory speeds • ARM low power modes • Partial reconfiguration to reduce programmable logic requirement
AMBA Open Standard Interconnect Ports High bandwidth interconnect between processing system and programmable logic	• 64-bit AXI ACP port for enhanced hardware acceleration and cache coherency for additional soft processors • Up to 100Gb/s bandwidth between PS and PL
Massive Parallel Signal Processing Enables hardware acceleration including video processing and analytics	• Dedicated, full custom, low-power DSP slices • Up to 2,020 DSP blocks delivering over 2,662 GMACs
Advanced Security, Safety & Reliability State of the art technology for hardware, secure system boot, and software execution	• Processor-first boot using on-chip-memory with secure ROM code • Anti-Tamper (AT) technology can 'zeroize' the device if tampering is sensed • Secure system boot with RSA-based authentication, AES-256 decryption, and SHA-256 data authentication • Full ARM TrustZone® support

Software and Ecosystem Features *Xilinx Offers Full, End-to-End, No-Charge Software and Tools Solutions*	
Real-Time Operating Systems Comprehensive collection from open-source to best-in-class commercial operating systems	• Linux – For general-purpose computing. Available as source code on GitHub, within Xilinx PetaLinux, or as industry-standard Yocto recipes • FreeRTOS – Ideal for simple, high-performance tasks • Bare-Metal – Best for high-performance, low-level applications • Android – For feature-rich, user-friendly graphical applications
Development Tools SoC-centric tools and familiar environments to develop software and hardware on both the processing system and programmable logic	• Xilinx Software Development Kit (XSDK) tools – Manage the full development and debug cycle for multiprocessor designs • SDSoC development environment – Compiles C/C++ applications into an optimized, fully functional Zynq-7000 AP SoC system • Vivado Design Suite – Implement hardware designs with RTL or High Level Synthesis
Reference Designs and IP Block Portfolio A solid foundation for value added custom designs	• Xilinx-verified reference designs included in hardware development kits • Extensive Alliance partner reference designs available • Expansive IP block catalog for accelerators and peripherals across most application spaces
Hardware Development Platforms Platforms ship fully equipped and ready for immediate system design	• ZedBoard – Low-cost evaluation boards • ZC702 Evaluation Kit – Complete embedded processing platform • ZC706 Evaluation Kit – Expands ZC702 with high-speed serial transceivers • Zynq-7000 AP SoC Video Kit – Expands ZC702 to enable video applications development
Virtual Development Platforms Prototype designs without the hardware requirements	• Zynq-7000 AP SoC Virtual Platform by Cadence, for both processing system and programmable logic development • QEMU complete emulation platform of the Zynq-7000 AP SoC for fast software development, architecture investigation, and design porting

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Boards and Kits

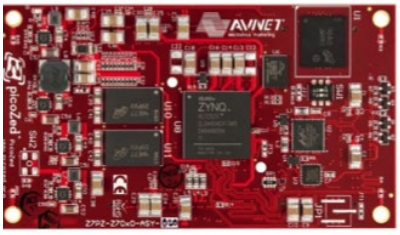
Xilinx and its Alliance partners offer a broad array of evaluation kits that enable rapid development for highly differentiated embedded applications based on Zynq-7000 AP SoCs. This includes all the basic components of hardware, design tools, IP, and pre-verified reference designs. To learn more, visit: Zynq-7000 AP SoC Boards and Kits.

Xilinx Zynq-7000 All Programmable SoC ZC702 Evaluation Kit

Xilinx Zynq-7000 All Programmable SoC ZC706 Evaluation Kit

Avnet MicroZed™ Evaluation Kit

Avnet MicroZed Embedded Vision Development Kit



Avnet PicoZed™

Avnet PicoZed SDR SOM Z7035/ AD9361 Development Kit

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