

# The AMD Athlon™ and AMD Athlon X2 Dual-Core Processors, for Today's High-Performance Embedded Solutions



## A performance and power balance for embedded systems

The performance demands on embedded systems are increasing, and AMD Athlon™ and AMD Athlon X2 dual-core processors provide unique features and high performance for high-end and more traditional embedded designs.

Based on the award-winning AMD64 technology with Direct Connect Architecture, the AMD Athlon family of processor helps provide a balanced foundation for storage, telecommunications, point-of-sale, networking, military, imaging, and gaming systems, as well as other traditional embedded markets like single-board computing and industrial control.

AMD64 technology is designed to bring a balanced approach to raw processing power, memory performance, I/O throughput, and scalability. Add 32- and 64-bit application support with native multi-core computing in a consistent thermal envelope and many embedded designers are finding their next-generation systems deliver record-breaking application performance.

## What can a balanced architecture deliver?

AMD Athlon and AMD Athlon X2 dual-core processors with Direct Connect Architecture can improve overall system performance and efficiency by helping eliminate traditional bottlenecks inherent in legacy architectures, where traditional front-side buses restrict and interrupt the flow of data. With AMD64 processors, there are no front-side buses. Instead, the processors, memory controller, and I/O are directly connected to the CPU. Further, the integrated memory controller dramatically reduces memory latency while HyperTransport™ technology delivers a very high I/O bandwidth. Data speeds through the system without encountering the traditional front-side bus bottleneck that plagues competing x86 platforms.

And all this performance comes in a low-power processor. AMD64 technology offers low operational costs with reduced power draw and heat dissipation. It also features Cool'n'Quiet™ technology with Optimized Power Management, which can deliver performance on demand and minimize power consumption.

## The innovation of AMD64, the ease of x86, the choice for embedded systems

In addition to performance, AMD Athlon and AMD Athlon X2 dual-core processors for the embedded market are NEBS-friendly and offer Error Correcting Code (ECC) to help deliver reliability and secure data transactions for embedded systems. Innovations like AMD Virtualization™ technology can help customers maximize server efficiency, while AMD's Torrenza initiative is designed to make it easy to incorporate application-specific FPGAs or co-processors directly onto the AMD64 platform.

AMD is committed to providing our embedded customers with choices, and designing on the industry-standard x86 platform provides access to thousands of software, hardware, and development tools. AMD processors are compatible with the major Microsoft® Windows® operating systems as well as Linux.® Our goal is allowing you maximum opportunity to design the embedded system you envision and your customers demand.

\* As part of a comprehensive security program, AMD strongly recommends enabling Enhanced Virus Protection (EVP) and using up to date third party anti-virus software.

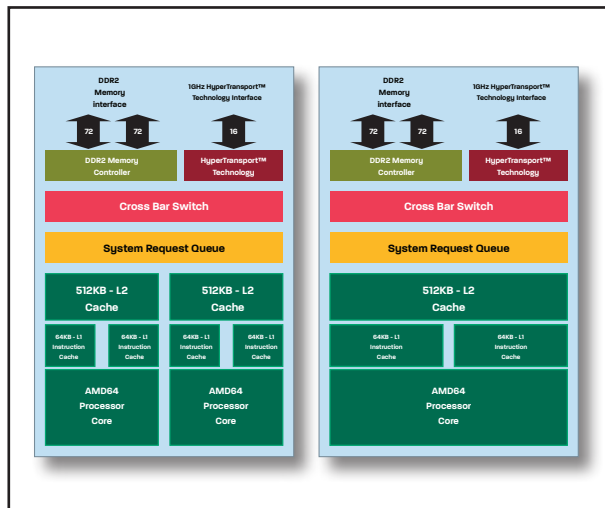
# AMD Athlon™ Processors Key Architecture Features

## Beyond outstanding processors: longevity, exceptional design support, quick time to market

The AMD64 Longevity Program is designed so that the high-performance processors you select for an embedded design will be available for a longer than standard time frame. AMD understands the unique requirements of the embedded market and our AMD64 Longevity Program is in place to maximize the available choice of industry-standard x86 processors—delivering a wide range of performance, power, thermal, and packaging features.

AMD has a strong design support program in place. From Reference Design Kits (RDKit) to extensive and readily available documentation to a suite of leading debug tools, our goal is to make your design cycle quick and efficient, and to help you get your embedded products on the market quickly. Add this to the improved time-to-market achieved with utilizing commercial off-the-shelf products like the industry-standard x86 AMD Athlon™ and AMD Athlon X2 dual-core processors.

## Block Diagram



### The AMD Athlon™ and AMD Athlon X2 dual-core processor core

- Leading-edge performance for 32- and 64-bit applications
- 40-bit physical addresses, 48-bit virtual addresses
- Sixteen 64-bit integer registers
- Sixteen 128-bit SSE/SSE2/SSE3 registers
- AMD Digital Media Xpress™ technology provides support for SSE, SSE2, SSE3, and MMX™ instructions
- Enhanced Virus Protection\*
- JTAG interface for debug support

### A high-bandwidth, low-latency integrated DDR memory controller

- Support for 64-bit DDR2 SDRAM memory—PC2-6400 (DDR2-800), PC2-5300 (DDR2-667), PC2-4200 (DDR2-533), or PC2-3200 (DDR2-400) SDRAM, unbuffered DIMMs
- Up to 10.6GB/s memory bandwidth
- ECC checking with double-bit detect and single-bit correct

### HyperTransport™ technology for high-speed I/O communication

- Up to 8GB/s HyperTransport™ I/O bandwidth
- Up to 20.8GB/s total delivered processor-to-system bandwidth (HyperTransport bus + memory bus)

### Large high-performance on-chip cache

- 64KB Level 1 instruction cache per core
- 64KB Level 1 data cache per core
- 512KB Level 2 cache with single-core processors
- Up to 1MB Level 2 cache per core with dual-core processors

### Socket AM2 Packaging

- Lidded micro pin grid array (PGA)
- 31x31 grid array
- 1.27mm pin pitch
- Compliant with RoHS (EU Directive 2002/95/EC)

## www.amd.com/embedded

### ABOUT AMD

AMD (NYSE:AMD) designs and produces innovative microprocessors and low-power processor solutions for the computer, communications, and consumer electronics industries. AMD is dedicated to delivering standards-based, customer-focused solutions for technology users, ranging from enterprises and governments to individual consumers.

### WWW.AMD.COM

One AMD Place  
P.O. Box 3453  
Sunnyvale, CA 94088-3453, USA  
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TWX: 910-339-9280  
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Europe & UK: +44-0-1276-803299  
Europe & UK Fax: +44-0-1276-803298  
France: 0800-908-621  
Germany: +49-89-450-53199  
Italy: 800-877224  
Europe E-mail: euro.tech@amd.com

China Fax: 86-10-8518-1777  
Hong Kong Fax: 852-2956-0588  
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