



AMD OPTERON™ 4000 SERIES EMBEDDED PLATFORM: Delivering Performance and Scalability at the Right Power with Overall Customer Value

POWER EFFICIENT, CONFIGURABLE, WITH PLATFORM LONGEVITY

The AMD Opteron™ 4300 Series Embedded processor, while designed for challenging embedded enterprise workloads, still delivers a performance punch in a given system power budget and provides robust configurations in a platform that leverages previous versions of AMD Opteron 4000 Series Embedded processors.

Embedded enterprise applications—including telecommunications, storage, network and security appliances—need predictable multithreaded performance that is enhanced by the AMD Opteron 4300 Series Embedded processor using the second generation architecture. This technology provides up to 10% improvement¹ in IPC and is able to maintain the compute density by using more efficient, 8-core design while maintaining the same power/thermal ranges.

The AMD Opteron 4300 Series Embedded processor utilizes AMD Turbo CORE technology, enabling processors to independently boost their clock speeds up to 300MHz-1GHz to respond automatically to the dynamic need for more application performance in embedded enterprise markets.²

The AMD Opteron 4300 Series Embedded processor uses advanced power management techniques, such as TDP power gating, to more efficiently deliver a balance of performance and power and to allow more CPU nodes for overall system density.

Take budgets further, with affordable embedded processor choices from 1P to 2P, 4 to 8 cores and 35W to 95W TDP power levels with up to seven years of planned longevity.

Telecom systems need to meet the stringent NEBS (Network Equipment Building System) environmental stress tests. One of the tests requires operation at 55°C ambient for 96 hours. The AMD Opteron 4300 Series embedded processors at a TDP of 35W and 65W is designed for ambient temperatures up to 55°C.

Network systems require high memory bandwidth and the AMD Opteron 4300 Series Embedded processor supports DDR3-1600 with a theoretical peak of 26GB/s bandwidth. For securing transactions and speeding encryption, AMD has added AES encryption acceleration to help streamline the security authentication processing.

Storage appliances require high performance network connectivity and disk throughput and the AMD Opteron 4300 Series Embedded processor with the AMD SR56x0/SP5100 chipset provides tremendous I/O connectivity to PCIe® Gen 2 interfaces such as 10 Gigabit Ethernet, Infiniband, FCoE, and SAS. This data throughput helps to meet the I/O performance required by today's systems.

Embedded enterprise systems can benefit from the no-compromise scalability and performance at low power of AMD Opteron 4300 Series Embedded processors.

THE INNOVATION OF STRAIGHT-THROUGH COMPUTING, THE CHOICE FOR EMBEDDED SYSTEMS

Straight-through Computing capability of the innovative "Piledriver" core architecture gives each core up to eight threads of their own dedicated processing resources when computing demands increase so that compute-intensive embedded applications don't have contention between integer threads.

AMD's Direct Connect Architecture 2.0 continues to deliver a balanced approach to raw processing power, memory performance, I/O throughput, power efficiency, and scalability.

The AMD Opteron 4300 Series Embedded processor is software compatible with previous generations of AMD Opteron processors and boasts improved AMD Virtualization™ (AMD-V™) technology features, which can help customers maximize embedded system efficiency, security and provide new innovative embedded system architectures.

With 64-bit x86 application support and multi-core computing, high memory bandwidth, and outstanding I/O performance in a consistent thermal envelope, many embedded designers are finding their next-generation systems can enable application performance beyond their expectations.

1. Reflects expected generational uplift based on preliminary AMD engineering estimates for SPECint®_rate2006 performance as of 7/17/12 and subject to change. SVR-206
2. AMD Opteron 4300 Series processors experience all core boost of up to 300 MHz (P2 base to P1 boost state) and up to 1 GHz max turbo boost (half or fewer cores boost from P2 to P0 boost state). SVR-204



AMD OPTERON™ 4300 SERIES EMBEDDED PROCESSORS OFFER THE FOLLOWING UNIQUE ADVANTAGES FOR EMBEDDED ENTERPRISE SYSTEMS:

Outstanding performance per watt

Industry's x86 embedded enterprise processor that provides 2P scalability at only 35W at a worst case TDP.

Innovative “Piledriver” core architecture

Provides the right balance of price-performance per watt by sharing resources—such as fetch and decode logic—to help reduce power and die size, and increase execution units for improved performance. This redesigned architecture optimizes execution paths that help reduce the total power consumption by actually optimizing the way software runs.

New power management and power saving capabilities

New power management capabilities allow for larger parts of the processor to be almost completely powered off when not being used, dramatically reducing idle core power consumption and enabling active cores to run at a higher frequency.

New power saving features like TDP-based power capping put the customer in control of more aspects of power efficiency than ever before on AMD Opteron processor-based embedded platforms.

Consistent platform with Socket C32 and the AMD SR56x0/SP5100 chipset offers a platform compatibility with existing AMD Opteron 4200 Series processor-based systems.

Reliable, scalable

Reliability is key in selecting embedded system components. Select SKUs of AMD Opteron processors are NEBS-friendly—either with higher Tcase support or p-state control during extreme temperature conditions—supporting telecommunications industry requirements for reliability.

The AMD Opteron 4300 Series Embedded processor provides multi-processing scalability options from one to two socket systems. This, combined with the reliability of AMD64 technology, helps enable an embedded design that may provide customers a long range plan for the life cycle of their systems.

Sage IDE provides tools for debug and software development.

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 are available when you need them. AMD understands the unique requirements of the embedded market and our AMD64 Longevity Program is in place to help maximize the available choice of leading edge x86 processors—delivering a wide range of performance, power, thermal, and packaging features. AMD has a strong design support program in place. From reference designs 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.

AMD Opteron™ 4300 Series Processors: Socket C32							
Model ¹	OPN ^{2,3}	Core Freq. (Nominal/Boost) ⁴	Cache	Max TDP	Memory Interface ⁵	HyperTransport™ Interface	Socket/Package
4386 ⁶	OS4386WLU8KHKS	3.1/3.8GHz	L2: 4x2MB (2MB per core pair = 8 cores) L3: 8MB	95W	DDR3-1600, 4-ch, Registered ECC DIMM & Chipkill	Two 16-lane @ up to 6400MT/s, Full Duplex	C32
43GK HE	OE43GKOHU8KHKE	2.6/3.6GHz	L2: 4x2MB (2MB per core pair = 8 cores) L3: 8MB	65W			
43CX EE	OE43CXHPU4KHKE	2.2/3.0GHz	L2: 2x2MB (2MB per core pair = 4 cores) L3: 8MB	35W			

1. Processors include the following features: C1E, AMD Cool Speed, Precision Thermal Monitor, Remote Power Management Interface, DDPM, AMD CoolCore™ technology, Enhanced AMD PowerNow!™ technology, AMD Wide Floating Point Accelerator, AMD Memory Optimizer Technology, AMD Balanced Smart Cache, AMD Virtualization™ (AMD-V™), EVP, and OPMA support. Always refer to the processor data sheets for technical specifications. Feature information is provided for reference only.
 2. Product longevity is defined by Ordering Part Number (OPN) rather than model number.
 3. OPN remains consistent throughout the longevity period (5 years + 2 years possible EOL contract).
 4. AMD Turbo CORE technology allows processors to independently boost their clock speeds, scaling frequency up 500MHz-1GHz automatically to respond to the need for more application performance.
 5. Supports registered Ultra LV-DDR3 (1.25V) and LV-DDR3 (1.35V).
 6. Standard. Server SKUs. Please contact your AMD sales representative to discuss longevity extensions.

WHAT CAN THIS BALANCED ARCHITECTURE DELIVER?

- High compute performance with up to 8 cores using Straight-through Computing
- Scalability up to 2 sockets or 16 cores
- AMD Turbo CORE technology for increased performance by utilizing additional power headroom
- Memory bandwidth with 2-channel DDR3 memory controller
- Tremendous I/O bandwidth with three HyperTransport™ 3.0 technology links between processors and I/O
- Software compatible with existing AMD Opteron processors
- Platform compatibility with today's AMD Opteron 4200 Series processor solutions
- Embedded longevity with AMD Embedded Solutions program

