



AMD OPTERON™ 6000 SERIES EMBEDDED PLATFORM:

The world's first 16-core x86 processor, delivering a rich mix of performance, scalability and efficiency for today's highly threaded computing environments

MULTITHREADED PERFORMANCE, SCALABLE, WITH PLATFORM LONGEVITY

The AMD Opteron™ 6300 Series Embedded processor is a 16-core x86 processor, delivering a rich mix of performance, scalability and efficiency for today's highly threaded embedded environments such as networking, storage and medical imaging systems. These high performance scalable applications benefit from the modular design that offer from 60-100% more cores than competition¹ and improved performance² than AMD's current products.

The AMD Opteron 6300 Series Embedded processor delivers the highest number of x86 CPU cores for challenging embedded enterprise workloads yet still delivers a scalable punch in a given system power budget and provides robust configurations in a platform that leverages previous versions of AMD Opteron 6000 Series Embedded processors.

Embedded enterprise applications—including networking, storage, rendering embedded servers and security appliances—need predictable multithreaded performance that is enhanced by the AMD Opteron 6300 Series Embedded processor using 2nd generation core architecture code named "Piledriver". Power efficiency features enable a dramatic performance boost of up to 15% in the same power and thermal footprint as AMD Opteron 6200 Series Embedded processors², resulting in better efficiency for applications like networking and storage in which power is a key component.

The AMD Opteron 6300 Series Embedded processor utilizes AMD Turbo CORE technology, enabling processors to independently boost their clock speeds up to 500MHz-1.3GHz automatically to respond to the dynamic need for more application performance in embedded enterprise systems.³

The AMD Opteron 6300 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. Memory-intensive environments, such as core network routing and storage de-duplication, can take advantage of the four channel memory controller, and Northbridge enhancements to reach unprecedented throughput of up to 70GB/s (2P) and 140GB/s (4P).⁴

Technical applications like military command and control systems and medical imaging can take advantage of the innovative design of the Flex FP that brings 256-bit floating point processing to the mainstream with more throughput for both 128-bit and 256-bit technical applications. In addition, the FMAC units in the Flex FP help boost computational horsepower, driving more performance by executing FMA4 instructions and offer up to 140% more GFLOPs in 128-bit mode and up to 20% more in 256-bit mode compared to similarly-price competitive processors.⁴ AVX and SSE instructions can also be performed in one cycle on the two different Flex FP pipelines. With up to eight 256-bit Flex FP units, which can also act as 16 128-bit FPUs, the AMD Opteron 6300 Series Embedded processor is capable of delivering up to 332.8 GFLOPs per 2P node.⁵

Core network routers and storage appliances require high performance network connectivity and disk throughput and the AMD Opteron 6300 Series Embedded processor with the AMD SR56x0/SP5100 chipset provides tremendous I/O connectivity to PCIe® Gen 2 interfaces such as 10Gb Ethernet, Infiniband, FCoE, and SAS. This data throughput helps to meet the I/O performance required by today's systems, as well as tomorrow's system demands.

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

Straight-through computing capability of the innovative "Bulldozer" core architecture gives each core up to 16 threads of their own dedicated processing resources when computing demands increase removing contention between integer threads in compute-intense embedded applications.

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 6300 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 can find their next-generation systems can enable application performance beyond their expectations.



AMD OPTERON™ 6300 SERIES EMBEDDED PROCESSORS OFFER THE FOLLOWING UNIQUE ADVANTAGES FOR EMBEDDED ENTERPRISE SYSTEMS:

Outstanding performance scalability

Leadership x86-64 16-core processor with quad memory channel.

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 6200 Series Embedded processor-based systems.

Reliable, scalable

Reliability is key in selecting embedded system components.

The AMD Opteron 6300 Series Embedded processor provides scalability options with glueless multi-processing from one to four socket systems. This, combined with the reliability of AMD64 technology, helps enable an embedded design that can provide customers a long range plan for the life cycle of their systems.

Sage EDK provides a complete Integrated Development Environment (IDE) for debug and software development.

BEYOND OUTSTANDING PROCESSORS: EXCEPTIONAL DESIGN SUPPORT, QUICK TIME TO MARKET

AMD understands the unique requirements of the embedded market and our AMD Embedded Solutions are 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™ 6300 Series Processors: Socket G34							
Model ¹	OPN ^{2,3}	Core Freq. (Nominal/Boost) ⁴	Cache	Max TDP	Memory Interface ⁵	HyperTransport™ Interface	Socket/Package
6376 ⁶	OS6376WKTGGHKS	2.3/3.3GHz	L2: 8x2MB (2MB per core pair = 16 cores) L3: 16MB	115W	DDR3-1600, 4-ch, Registered ECC DIMM & Chipkill	Four 16-lane @ up to 6400MT/s, Full Duplex	G34
6366 HE ⁶	OS6366VATGGHKS	1.8/3.1GHz	L2: 8x2MB (2MB per core pair = 16 cores) L3: 16MB	85W			

- Processors include the following features: C1E, AMD Cool Speed, Precision Thermal Monitor, Remote Power Management Interface, DDPM, AMD CoolCore™ technology, Enhanced AMD PowerNow!¹ 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.
- Product longevity is defined by Ordering Part Number (OPN) rather than model number.
- OPN remains consistent throughout the longevity period (5 years + 2 years possible EOL contract).
- 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.
- Supports registered Ultra LV-DDR3 (1.25V) and LV-DDR3 (1.35V).
- 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 16 cores using straight-through computing
- Scalability up to 4 sockets or 64 cores
- AMD Turbo CORE technology for increased performance by utilizing additional power headroom
- Memory bandwidth with 4-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 processors
- Platform compatibility with today's AMD Opteron 6200 Series Embedded processor-based solutions

1. AMD Opteron™ 6300 Series processors have up to 16 cores. Intel Xeon E5-2600 Series processors have up to 8 cores per processor. Intel Xeon E7-4800 Series has up to 10 cores per processor. See www.intel.com/pricelist.cfm as of 4/2/12. SVR-140
 2. Based on internal testing of AMD Opteron 6376 versus AMD Opteron 6276 September, 2012.
 3. Like the AMD Opteron 6200 Series Processors, the AMD Opteron 6300 Series Processor experience all core boost of up to 500MHz (P2 base to P1 boost state) and up to 1.3GHz max turbo boost (half or fewer cores boost from P2 to P0 boost state). SVR-27
 4. 4P: 146GB/s using 4 x AMD Opteron 6200 Series processors in “Drachma” reference design kit, 64GB (16 x 4GB DDR3-1600) memory, SuSE Linux® Enterprise Server 64-bit, 2P: 73GB/s using 2 x AMD Opteron 6200 Series processors in “Dinar” reference design kit, 32GB (8 x 4GB DDR3-1600) memory, SuSE Linux® Enterprise Server 64-bit. SVR-26
 5. Based on two 2.6GHz AMD Opteron 6200 Series processors, each with 16 128-bit FPUs each able to handle 4 instructions per cycle or 8 256-bit Flex FP units handling 8 instructions per cycle. SVR-29

