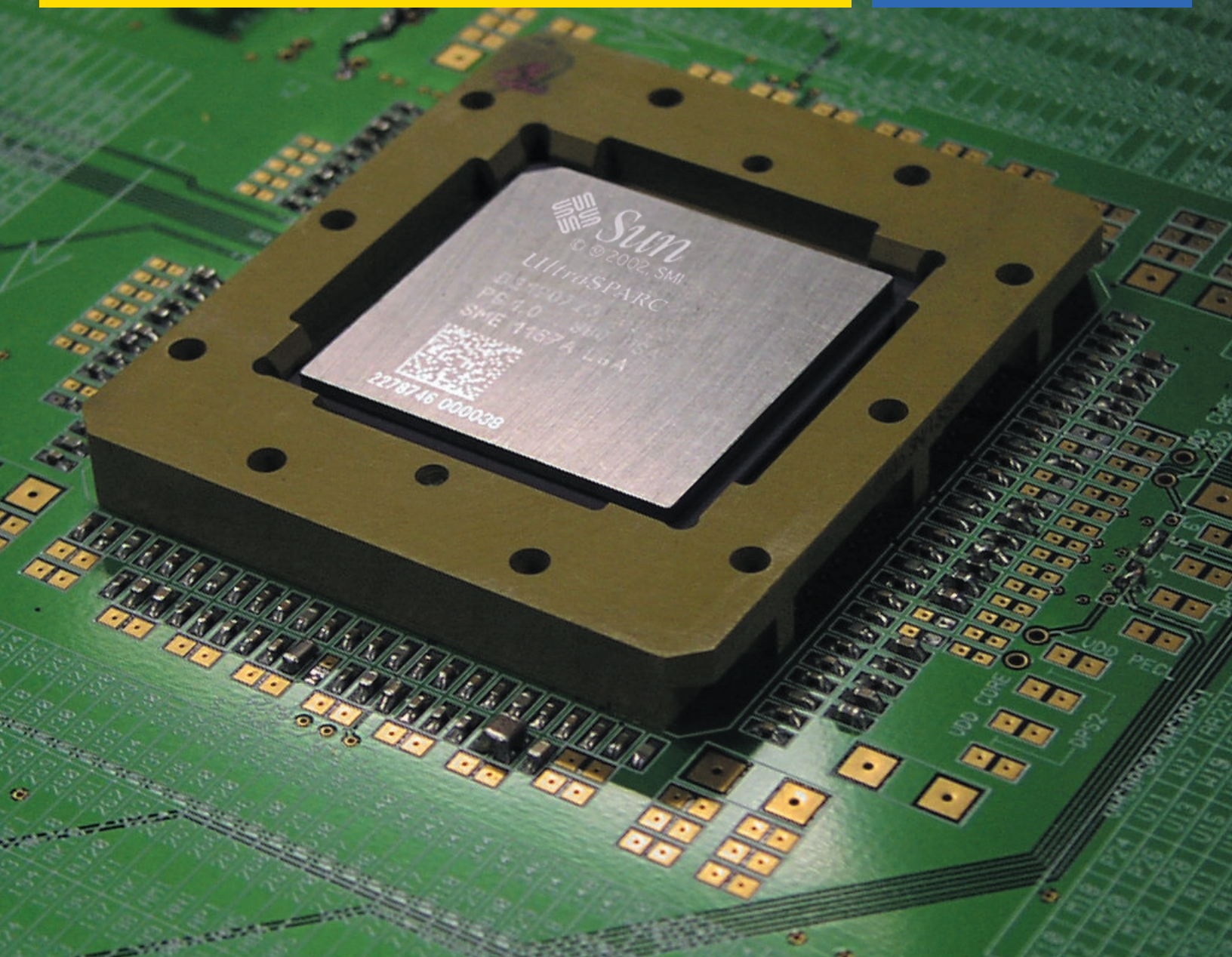


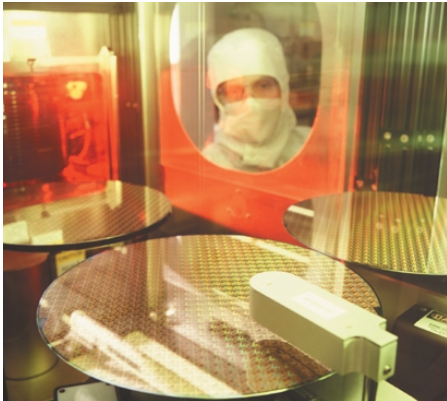


UltraSPARC® Processors



Design Engineered to Make the Net Work.





UltraSPARC® is the industry-leading 64-bit processor family offering customers seamless binary compatibility at a variety of design points.

Why Does Sun Design its Own UltraSPARC® Processors?

Customers have told us. And we listened.

Providing computing solutions to enable Sun customers to maintain leadership positions in their fields is a challenge we enjoy. It requires unwavering customer-focus, unrelenting commitment to design engineering excellence and flawless execution.

Sun has always distinguished itself by refusing to take a second-hand approach to providing customer satisfaction. Unlike some system repackagers, Sun conceives, designs and develops components critical to its products. Microprocessors, the software stack and system design are all fine-tuned through a synergistic development process to deliver maximum customer value. UltraSPARC® processors are based on the open SPARC V9 instruction set, controlled and managed by SPARC International—an independent administering body founded in 1989. The UltraSPARC processor family is a key element of Sun's customer-driven design philosophy, and together with the Solaris™ Operating Environment, it provides the foundation for a robust and a scalable computing platform.

It's Really About Software

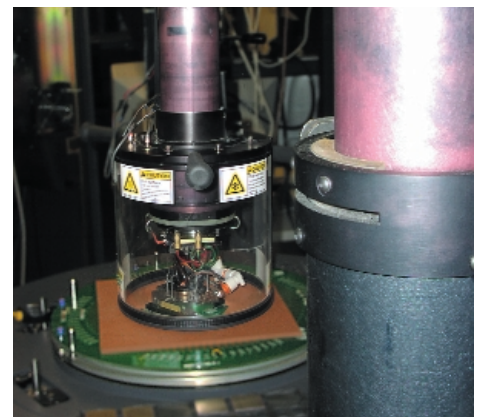
Although UltraSPARC processors are one of Sun's most important competitive strengths, we understand it's the application software that keeps our customers' businesses up and running. It really doesn't matter what's under the hood in an IT solution, as long as the application software works at maximum efficiency.

We also understand that investment protection *rules* in an ever-changing business climate. Therefore Sun has made software binary compatibility mandatory across all UltraSPARC processors. With 15 years of binary compatibility behind us, and determination to maintain it, software written for any generation of UltraSPARC processor will run on future generations of UltraSPARC processors.

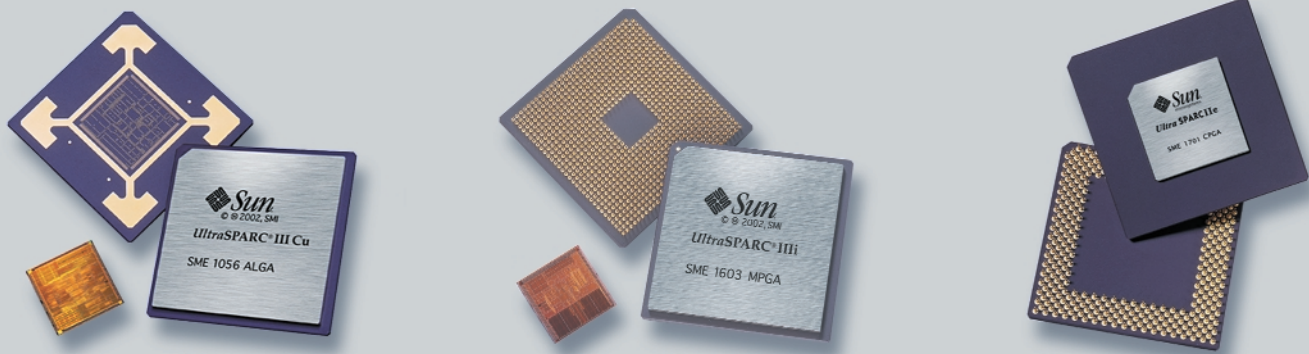
Sun's record of building a computing infrastructure based on open standards and proven technologies has resulted in overwhelming support from the ISV/developer community. Applications can be developed on any UltraSPARC-based system and subsequently scaled up or down and deployed on any other Sun system. With thousands of available applications, the SPARC/Solaris platform has attracted the largest 64-bit developer community in the world.

Making the Right Choices

Despite its reputation for relentless innovation, Sun does not pursue technology for its own sake. At Sun, to innovate is to choose among design and engineering alternatives. With customer satisfaction as our compass, however, our solutions present textbook case studies of technology innovation in our customers' interest.



UltraSPARC® Processor Family



One Size Never Fits All - Well

Microprocessors that support industrial strength computing workloads are constantly driven to provide the right balance of performance, scalability, reliability, cost, and power consumption. The scalability requirements of an enterprise-class server managing an auction website vary quite significantly from those of a high performance engineering workstation. Similarly, a high-density blades server places far more stringent requirements on a processor's power consumption than a workgroup server. It's not surprising that UltraSPARC processors are designed at multiple design points to address specific application requirements.

High-end Processors

In large data center deployments, Sun understands the impact of down-time on customer productivity. Accordingly, "high-end" UltraSPARC processor designs incorporate industry-leading RAS features to ensure data integrity. These processors also support large-way, vertically-scalable, SMP (symmetric multiprocessing) environments, currently up to over 100 processors in a Sun Fire™ 15K server.

Mid-range Processors

For mid-sized, horizontally-scalable environments, small-way multiprocessing capabilities make more sense. UltraSPARC "mid-range" processors target 1 to 4-way systems while still incorporating the world-class RAS features. With high levels of on-chip integration, these processors may include memory and I/O controllers, large on-chip caches, and a less complex system bus reducing the overall system costs.

Blades Processors

Sun's forthcoming processor family is designed for Blade Computing. Designed for the uni-processor blade compute form factor, these UltraSPARC processors fit within the smallest power envelope for SPARC/Solaris platforms. This series will move toward "server-on-a-chip" designs, where single chips will deliver the performance of one of today's mid-range SMP systems.

- *Processor design — our core competency:* Underpinning Sun's processor design excellence is a durable business model. In 1987, Sun engaged with Texas Instruments, a leader in semiconductor technology, to make good on a strategy to sharpen Sun's ability to design and deliver industry-leading microprocessors. As Sun focuses on its core competency of processor design excellence, TI supplies world-class manufacturing technology to make UltraSPARC processors. The result is a relationship that has kept Sun ahead of the processor game at affordable R&D investment levels.
- *Allocating the transistor budget — a balanced approach:* UltraSPARC architects take a balanced approach to allocating transistors which perform work in a processor design. This transistor budget strategy has led to microprocessors, which not only excel in performance in real-world

applications, but also provide other features customers care about including scalability, RAS (reliability, availability, serviceability), binary compatibility, and low-TCO (total cost of ownership).

- *Throughput computing:* Sun's throughput computing strategy aims to radically cut the cost and complexity of network computing. Since network computing workloads are inherently multithreaded, why not design processors that are optimized for multiple threads? Sun's chip multithreading (CMT) processors, which can execute tens of threads simultaneously, are being designed to maximize application throughput — or the aggregate amount of work done. Within two years, Sun plans to deliver today's blade application throughput by 15 times. Beyond 2005, expect to see systems with 30 times today's performance.

Commitment, Commitment and Commitment

Consistent with its commitment to the SPARC architecture, Sun continues to make significant strategic investments for the future. With a growing team of over 1,400 design engineers, Sun is a vortex for leading-edge processor design engineering. The Sun Processor Compute Ranch Infrastructure incorporates a nationwide grid of more than 2,000 systems and over 7,500 CPUs that support the design, simulation, and verification of UltraSPARC processors at three different design sites (Sunnyvale, CA; Burlington, MA; Austin, TX). Sun senior management continues to drive strategies and make commitments to ensure that the SPARC architecture remains the processor foundation of Sun's open, integratable hardware-software stack.

After all, SPARC is a proven, sound investment in customer benefit and market success.



UltraSPARC Processor Family Values

- Innovation:** Innovation is fundamental to the Sun business model. We never stop when it comes to creating real-world solutions to meet or exceed customer requirements. Innovation is one of the main reasons that the UltraSPARC III processor won the prestigious *Microprocessor Report* 2001 Analyst's Choice Award for the Best Server/Workstation Processor from Cahners In-Stat MicroDesign Resources.
- Targeted Designs:** Close relationships with our customers over the years have developed a keen understanding of specific application requirements for technical and enterprise computing. We firmly believe in providing multiple design points addressing specific requirements for targeted applications and expect to fan out to cover more kinds of computing workloads as technology progresses.
- Peace-of-Mind:** Companies today cannot afford to jeopardize their competitive position with risky or inflexible technology choices. With attributes such as real-world performance, industry-leading RAS, binary compatibility and reduced-TCO, Sun customers can be confident in their SPARC/Solaris platform investments.
- Open Ears, Active Minds:** At Sun, we judge our success by the success of our customers. We want to hear from you as we continue to execute on our commitments to provide customer-centric technologies powering real-world applications.

For more information, please visit <http://www.sun.com/ultrasparc>.

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