



# The Intel® Pentium® 4 Processor

The Center of Your Digital World



Product Brief

## Advanced Processor Performance for Today's Environment and Tomorrow's Technologies

The Intel® Pentium® 4 processor with Intel® NetBurst™ microarchitecture is Intel's newest, most advanced 32-bit microarchitecture. Designed to deliver superior performance, the Pentium 4 processor is ideally suited for the most demanding applications and environments. The Pentium 4 processor brand name reflects breakthrough performance that combines innovative new features with proven Intel quality.

Intel's most powerful desktop processor delivers performance for an awesome digital media experience:

- Audio—Power to quickly encode MP3 files
- Digital Video and Imaging—Performance to create, edit, and share movies and photos quickly and easily
- Communications—Power to communicate quickly and easily with friends and family
- Entertainment—Faster frame rates and smooth animation for lifelike 3D games

The Pentium 4 processor provides headroom for the next generation of software applications, technology and Internet innovations.

## **The Pentium 4 Processor with Intel NetBurst Microarchitecture Offers New Performance-Enhancing Features, Including:**

- **Hyper-Pipelined Technology**

A deeper pipeline enables instructions inside the processor to be queued and executed at the fastest-possible rate, allowing the Pentium 4 processor to achieve the world's highest clock speeds for desktop PCs.

- **Streaming SIMD Extensions 2**

Streaming Single Instruction Multiple Data (SIMD) Extensions 2, which consists of 144 new instructions, includes SIMD double precision floating point, SIMD 128-bit integer, and new cache and memory management instructions. Streaming SIMD Extensions 2 enhances performance to accelerate the most demanding aspects of Internet computing, as well as video, speech, encryption, imaging and non-threaded workstation applications.

- **400-MHz System Bus**

With three times the bandwidth of previous processors, the 400-MHz system bus speeds the transfer of information from the processor to the rest of the system, improving throughput and performance. This breakthrough technology extends the potential for superior processing speeds to the rest of the system.

- **533-MHz System Bus**

Provides a higher bandwidth system bus allowing the processor to obtain data quickly to continue processing at high frequencies, ultimately providing a more responsive computing experience.

- **Advanced Dynamic Execution**

This characteristic extends the Dynamic Execution features found in previous-generation P6 microarchitecture. Improved branch prediction accelerates the flow of work to the processor and helps overcome the deeper pipeline. Very deep, out-of-order speculative execution carries out over 100 instructions speculatively, ensuring that the processor's superscalar execution units remain busy for better overall performance.

- **Enhanced Floating-Point/Multimedia Unit**

A 128-bit floating-point port and a second port for data movement enable smooth lifelike 3D and graphics.

- **Execution Trace Cache**

Advanced L1 instruction cache removes decoder pipeline latency and caches "decoded" instructions, improving efficiency and hit rate to cached instructions.

- **Rapid Execution Engine**

Integer Arithmetic Logic Units (ALUs) clocked at twice the core frequency provide four ALUs of computing bandwidth and allow lower latency execution, increasing performance for specific integer operations.

## **The Pentium 4 Processor Maximizes the Headroom Needed for Your Business**

The Intel Pentium 4 processor delivers the performance that small businesses need to be competitive. With its new architecture and speed capabilities, the Pentium 4 processor takes full advantage of emerging e-Business desktop applications—without sacrificing performance. Equipped with Pentium 4 processor-based systems, your business customers will be better positioned to maximize productivity and performance so they can:

- **Provide Investment Protection for Your Business**

- Provides headroom for emerging applications and operating system upgrades
- Increases platform longevity to extend system life and reduce costly refreshes

- **Attract and Retain New Business**

- Enables more electronic communications with your customers and suppliers: e-mail encryption, data encryption and virus protection
- Make your growing business look like a large enterprise by creating professional quality product brochures and advertising

- **Increase Productivity**

- Faster system response for users of multiple applications: office productivity, database management, financial analysis and inventory/purchasing

- **Benefit From Intel Quality and Design**

- Validated according to the most rigorous industry standards for reliability, stability and compatibility

## Leading-Edge Performance for Entry-Level Workstations

Pentium 4 processor-based entry-level workstations deliver powerful processing capabilities that speed such tasks as running complex data sets and computer-intensive Internet-based applications. Demanding workstation applications benefit from the enhanced floating point and increased memory bandwidth. Pentium 4 processor-based workstations are ideal for running non-threaded applications such as Web content creation, 2D/3D Computer Aided Design and Software Engineering.

## Compatible Platform Integration Solutions

Intel offers system integrators several desktop motherboard solutions that are designed for the Pentium 4 processor. Intel® desktop boards can help you deliver complete platform solutions to your customers quickly and easily. When used with the Pentium 4 processor, Intel's complementary components produce fully compatible desktop solutions, without the inconvenience and risk of buying, assembling and testing separate components.

## Intel's Innovative Chipset Design Allows the Pentium 4 Processor to Deliver Maximum Performance

The Pentium 4 processor is compatible with the Intel® 850 and the Intel® 845 chipsets. To ensure high performance in video, graphics and multimedia, the Intel 850 chipset provides the latest technological enhancements to maximize the power of the Pentium 4 processor. Designed specifically for the Pentium 4 processor, the Intel 850 chipset offers a robust foundation for the most sophisticated end-user applications.

The massive 3.2-gigabytes-per-second bus on the Pentium 4 processor is balanced by 3.2-gigabytes-per-second of memory bandwidth. Dual RDRAM\* memory channels provide a wider pipeline to system memory for bandwidth-hungry applications and environments. The Intel 850 chipset offers dual RAMBUS\* memory channels to eliminate memory bottlenecks that would have negatively impacted system efficiency.

The Intel 845 chipset couples the power of the Pentium 4 processor with memory technologies other than RDRAM\* memory to provide various levels of price and performance for system integrators. Systems based on the Intel 845 chipset can be built with either PC133 SDRAM memory - allowing integrators to build cost sensitive Pentium 4 processor-based systems, or with DDR memory - to provide an additional performance and system price point.

## The Boxed Intel® Pentium® 4 Processor Includes:

- Intel designed thermal solution
- Three-year limited warranty
- Installation instructions
- Certificate of Authenticity
- Integrated fan power cable
- Intel Inside® logo label



Feature:	Benefit:
Processor Core Speeds Up to 2.53 GHz	Maximum performance for a wide range of emerging Internet, PC and workstation applications
Intel® NetBurst™ Microarchitecture, including 400-MHz or 533-MHz System Bus	High bandwidth between the processor and the rest of the system improves throughput and performance
256 or 512-KB L2 Advanced Transfer Cache	Enhances performance by providing fast access to heavily used data and instructions
Hyper-Pipelined Technology	Extended pipeline stages significantly increase overall throughput
Streaming SIMD Extensions 2	144 new instructions accelerate operation across a broad range of demanding applications
Rapid Execution Engine	Arithmetic Logic Units run at twice the core frequency, speeding execution in this performance critical area
128-Bit Floating-Point Port	Floating-point performance boost provides enhanced 3D visualization and scientific calculation
SIMD 128-Bit Integer	Accelerates video, speech, encryption and imaging/photo processing
Execution Trace Cache	Greatly improves instruction cache efficiency, maximizing performance on frequently used sections of software code
Advanced Dynamic Execution	Improved branch prediction enhances performance for all 32-bit applications by optimizing instruction sequences

The Pentium 4 processor is packaged in a 423-pin OLGA on Interposer PGA package and a 478-pin micro Flip Chip PGA package.

**For the most current product information on boxed Intel® Pentium® 4 processors, visit Intel's Web site at: <http://www.intel.com/reseller>**

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