Product Brief

Intel® Core™2 Duo Processor

Intel® Core™2 Duo Desktop Processor

Built on the innovative Intel® Core™ microarchitecture, the Intel Core 2 Duo desktop processor delivers revolutionary dual-core performance and breakthrough processor energy efficiency. With Intel® Wide Dynamic Execution, Intel® Smart Memory Access, Intel® Advanced Smart Cache, and Intel® Digital Media Boost, this new processor is designed to do more in less time. Additional features to support enhanced security, virtualization, and 64-bit computing makes the Intel Core 2 Duo the most impressive processor developed for an increasingly multimedia-centered, high-definition world.

Product Description

PC users are running multiple, intense software applications simultaneously, increasing demand on hardware resources. In the office, PC usage has changed from data entry and word processing to e-Commerce, online collaboration, and an ever-increasing need for continual security and virus protection. In the home, interests have shifted from low-bandwidth photos and Internet surfing to downloading and viewing high definition videos, as well as advanced photo and video editing. The Intel® Core™2 Duo processor was developed to meet all these demands.

Energy Efficiency

Design changes in the Intel Core 2 Duo processors that improve performance also increase processor energy efficiency by operating at lower frequencies that require less power to run. Intel® Intelligent Power Capability, a feature that optimizes energy usage of the processor cores, turns on computing functions only when needed. These more energy-efficient processors support smaller, more capable, and quieter desktop PCs to conserve critical power resources.

Features and Benefits of the Intel® Core™2 Duo Desktop Processor

Features	Benefits
Dual-Core Processing	Two independent processor cores in one physical package run at the same frequency, and share up to 4 MB of L2 cache as well as up to a 1333 MHz[1] Front Side Bus, for truly parallel computing.
Intel® Wide Dynamic Execution	Improves execution speed and efficiency, delivering more instructions per clock cycle. Each core can complete up to four full instructions simultaneously.
Intel® Smart Memory Access	Optimizes the use of the data bandwidth from the memory subsystem to accelerate out-of-order execution. A newly designed prediction mechanism reduces the time in-flight instructions have to wait for data. New pre-fetch algorithms move data from system memory into fast L2 cache in advance of execution. These functions keep the pipeline full, improving instruction throughput and performance.
Intel® Advanced Smart Cache	The shared L2 cache is dynamically allocated to each processor core based on workload. This efficient, dual-core optimized implementation increases the probability that each core can access data from fast L2 cache, significantly reducing latency to frequently used data and improving performance.
Intel® Advanced Digital Media Boost	Accelerates the execution of Streaming SIMD Extension (SSE) instructions to significantly improve the performance on a broad range of applications, including video, audio, image and photo processing, multi-media, encryption, financial, engineering and scientific applications. The 128-bit SSE instructions are now issued at a throughput rate of one per clock cycle effectively doubling their speed of execution on a per clock basis over previous generation processors.
Intel® Virtualization Technology (Intel® VT)[2/3]	Intel® VT allows one hardware platform to function as multiple "virtual" platforms. For businesses, Intel VT offers improved manageability, limiting downtime and maintaining worker productivity by isolating computing activities into separate partitions.
Intel® Trusted Execution Technology (Intel® TXT)[2/3]	Intel® TXT provides hardware-based mechanisms to help protect against software-based attacks and help protect the confidentiality and integrity of data stored or created on the system. It does this by enabling a trusted environment where applications can run within their own space, protected from all other software on the system.
Intel® 64[2] Architecture	Enables the processor to access larger amounts of memory. With appropriate 64-bit supporting hardware and software, platforms based on an Intel processor supporting Intel 64 architecture can allow the use of extended virtual and physical memory.
Execute Disable Bit[4]	Provides enhanced virus protection when deployed with a supported operating system. The Execute Disable Bit allows memory to be marked as executable or non-executable, allowing the processor to raise an error to the operating system if malicious code attempts to run in non-executable memory, thereby preventing the code from infecting the system.
Intel Designed Thermal Solution for Boxed Processors	Includes a 4-pin connector for fan speed control to help minimize the acoustic noise levels generated from running the fan at higher speeds for thermal performance.[5] Fan speed control technology is based on actual CPU temperature and power usage.

Better Acoustics

Intel Core 2 Duo processors are equipped with a Digital Thermal Sensor (DTS) that enables efficient processor and platform thermal control. Thermal sensors located within the processor measure the maximum temperature on the die at any given time. Intel® Quiet System Technology, included in the Intel® Express Chipset families[6], uses the DTS to regulate the system and processor fan speeds. The acoustic benefit of temperature monitoring is that system fans spin only as fast as needed to cool the system, and slower spinning fans generate less noise.

Platform Support

A platform based on an Intel® Express Chipset family[6] with an optimized memory engine for improved system performance is the ideal compliment for the Intel Core 2 Duo processor. New and enhanced technologies in the area of graphics, sound, and manageability offer an array of capabilities. This combination of processor and chipset brings an unparalleled level of performance to the desktop.

[1] Intel® Core™2 Duo processors support an 800 MHz, 1066 MHz, or 1333 MHz system bus. For information on a specific processor, see the Processor Spec Finder at http://processorfinder.intel.com or contact your Intel representative for more information.

[2] Intel® Virtualization Technology (Intel® VT), Intel® Trusted Execution Technology (Intel® TXT), and Intel® 64 architecture require a computer system with a processor, chipset, BIOS, enabling software and/or operating system, device drivers and applications designed for these features. Performance will vary depending on your configuration. Contact your vendor for more information.

[3] Not all specified units of this processor support Intel® VT or Intel® TXT. See the Processor Spec Finder at http://processorfinder.intel.com or contact your Intel representative for more information.

[4] Enabling Execute Disable Bit functionality requires a computer system with a processor with Execute Disable Bit capability and a supporting operating system. Check with your vendor on whether your system delivers Execute Disable Bit functionality.

[5] The acoustic benefits of the 4-pin header are reliant on a properly designed motherboard. Contact your board manufacturer for compatibility.

[6] Intel® Express Chipsets 965 and 3 Series families support Intel® Quiet System Technology. Contact your board manufacturer for compatibility.