2nd Generation Intel® Core™ Processor Desktop Platform

The 2nd Generation Intel® Core™ desktop processor family delivers smart, energy-efficient desktop processors that enable innovative, small and stylish desktop PC designs. These new processors, combined with the Intel® 6 Series Chipset family, deliver visibly smart performance for a sharper and richer-looking experience.

New 2nd Generation Intel® Core™ i7, i5 and i3 desktop processors, with built-in enhanced visual features, achieve several milestones for Intel platforms:

- **Revolutionary new microarchitecture** delivered on Intel’s cutting-edge 32nm process technology with second-generation high-k metal gate transistors. This new microarchitecture features vastly improved cores that are better connected with an innovative ring interconnect for improved data bandwidth, performance and power efficiency.

- **Industry’s first integration of processor graphics** featuring a new execution pipeline which significantly increases performance to deliver new features and enhanced visual features focused on the areas where most users are computing today: HD video, mainstream gaming, Stereo 3-D, multi-tasking and online socializing and multimedia.

- **New built-in visual features** – New visual capabilities built into every 2nd Generation Intel® Core™ processor deliver everything you need to enjoy a stunning and seamless visual experience. These features include:
  
  - **Intel® Quick Sync Video** – Incredibly fast conversion of video for portable media players, online sharing, and video editing and authoring.
  - **Intel® Clear Video HD Technology** – Visual quality and color fidelity enhancements for HD playback and immersive Web browsing.
  - **Intel® InTru™ 3D** – Stereoscopic 3-D Blu-ray® playback in full 1080p resolution over HDMI* 1.4 and premium audio.
  - **Intel® Insider™** – Unlock a world of premium HD movies and entertainment with your PC.

- **Introduction of the Intel® H67, P67, Q67, Q65, and B65 Express Chipsets** supporting 2nd Generation Intel® Core™ processors. These new chipsets continue to push innovation with a new architecture designed to deliver quality, performance and industry leading I/O technologies.

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Below are additional details for the all new 2011 Intel® Core™ desktop processors and chipsets:

2nd Generation Intel® Core™ i7, i5 and i3 Desktop Processors (formerly codenamed “Sandy Bridge”)

- **Intel® Turbo Boost Technology for Intel Core i5 and i7 processors**: Intel® Turbo Boost Technology operation on 2nd Generation Intel® Core™ processors has been optimized for the new microarchitecture and takes advantage of power control unit (PCU) enhancements and improved power sharing between processor and graphics. Intel Turbo Boost Technology boosts power levels to achieve performance gains for high intensity “dynamic” workloads. In addition, a new power averaging algorithm manages power and thermal headroom to optimize performance.

- **Intel® Hyper-Threading Technology (Intel® HT Technology)** (Available on Intel® Core i7 and Core i3 desktop processors only) – Delivers two processing threads per physical core for a total of eight threads on quad core Intel Core i7 processors and four threads on dual core Intel Core i3 processors for massive computational throughput. With Intel® HT Technology, highly threaded applications can get more work done in parallel, completing their tasks sooner.

- **Intel® Insider™** – Intel Insider is hardware-based technology on 2nd Generation Intel® Core™ processors that creates a protected environment for the distribution, storage and playback of premium content. Intel Insider offers movie studios and online video services an additional level of protection over existing software-based solutions providing access to more movies and entertainment in high definition than previous generation PCs.

- **Intel® Advanced Vector Extensions (Intel® AVX)** - A new 256-bit instruction set that builds upon the highly successful SSE4/SIMD instructions. Intel® AVX provides the infrastructure and building blocks for delivering the performance required by the growing needs of applications such as financial analysis, media content creation, natural resource industry, and HPC computing. The AVX instruction set can benefit operations such as image processing, audio and some business usage.

- **Intel® Smart Cache** – This large last-level cache enables dynamic and efficient allocation of shared cache to all cores to match the needs of various applications for ultra-efficient data storage and manipulation, significantly reducing latency to frequently used data and improving performance.

- **Integrated Memory Controller and DDR3 support** – An integrated memory controller offers excellent memory read/write performance through efficient pre-fetching algorithms, lower latency, and higher memory bandwidth. 2nd Generation Intel® Core™ desktop processors include support for both single and dual channel DDR3 memory technology up to 1333 MHz.

- **Unlocked Core Multipliers** – Select 2nd Generation Intel® Core i7 and Core i5 processors feature unlocked multipliers, allowing the user to easily increase the core and memory frequencies independently from the rest of the system. This flexibility improves the user’s ability to reach high core and memory clock speeds that go beyond the processor specifications.

- **Intel® Virtualization Technology (Intel® VT-x)** – 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.

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• **Intel® Virtualization Technology for Directed I/O (VT-d)** – Intel® VT-d extends Intel's Virtualization Technology roadmap by providing hardware assists for I/O virtualization solution.

• **Advanced Encryption Standard New Instructions (AES-NI)** – New AES instructions add hardware acceleration to AES algorithms and speeds up the execution of AES applications.

• **Intel® Trusted Execution Technology (Intel® TXT)** – Highly versatile set of hardware extensions for select Intel processors and chipsets which, with appropriate software, enhance platform security capabilities.

• **Multi-channel bit streaming audio** – Enables professional-grade audio capabilities with multi-channel bit streaming support for Dolby* TrueHD and DTS* Premium Suite.

**Intel® 6 Series Chipset Family**
The Intel® 6 Series Chipset family continues to push innovation with a new architecture designed to deliver quality, performance and industry leading I/O technologies on platforms powered by the all new 2011 2nd Generation Intel® Core™ processors. Feature highlights include:

• **Intel® vPro™ Technology** – PCs with a processor from the Intel® Core™ vPro™ processor family enable IT to take advantage of hardware-assisted security and manageability capabilities that enhance their ability to maintain, manage and protect their business PCs.

• **Intel® Active Management Technology 7.0** – Using built-in platform capabilities and popular third-party management and security applications, Intel® Active Management Technology allows IT to better discover, heal and protect their networked computing assets.

• **Intel® Rapid Storage Technology** – Intel® RST provides quicker access to digital photo, video and data files with RAID 0, 5, and 10, and greater data protection against a hard disk drive failure with RAID 1, 5, and 10. Support for external SATA (eSATA) enables the full SATA interface speed outside the chassis, up to 3 Gb/s.

• **Intel® Rapid Recover Technology** – Intel’s latest data protection technology provides a recovery point that can be used to quickly recover a system should a hard drive fail or in the event of data corruption. The clone can also be mounted as a read-only volume to allow a user to recover individual files.

• **Intel® Flexible Display Interface** – An innovative path for two independently controlled channels of integrated graphics display data to be transported to the Intel® 6 Series Chipset. Works in conjunction with Intel® Core™ processors with built-in visuals.

• **Support for HDMI, DisplayPort, embedded DisplayPort and DVI** – High Definition Multimedia Interface (HDMI) and DisplayPort and embedded DisplayPort interfaces deliver uncompressed HD video and uncompressed multi-channel audio in a single cable, supporting all HD formats including 720p, 1080i and 1080p. Dual Independent Display expands the viewable workspace to two monitors.

• **PCI Express® 2.0 interface** – Offers up to 5GT/s for fast access to peripheral devices and networking with up to 8 PCI Express® 2.0 x1 ports, configurable as x2 and x4 depending on motherboard designs.
• **Intel® High-Definition Audio** - Integrated audio support enables premium digital surround sound and delivers advanced features such as multiple audio streams and jack re-tasking.

• **Universal Serial Bus (USB)** - High-speed USB 2.0, provides greater enhancement in performance with a design data rate of up to 480 megabits per second (Mbps) with up to 14 USB 2.0 ports.

• **USB 2.0 rate matching hub** - Enables lower power requirements and manages the transition of the communication data rate from the high speed of the host controller to the lower speed of USB full speed/low speed devices.

• **USB port disable** - Enables individual USB ports to be enabled or disabled as needed. This feature provides added protection of data by preventing malicious removal or insertion of data through USB ports.

• **Serial ATA (SATA)** - High-speed storage interface supporting up to 6 Gb/s transfer rate for improved data access. Provides up to 6 SATA ports at 3 Gb/s with up to 2 ports supporting 6 Gb/s transfer rates.

• **eSATA** - SATA interface designed for use with external SATA devices. It provides a link for 3 Gb/s data speeds to eliminate bottlenecks found with current external storage solutions.

• **SATA port disable** - Enables individual SATA ports to be enabled or disabled as needed. This feature provides added protection of data by preventing malicious removal or insertion of data through SATA ports. Especially targeted for eSATA ports.

• **Intel® integrated 10/100/1000 MAC** - Support for the Intel® 82579LM and 82579V Gigabit Network Connection LAN.

• **Green technology** - Manufactured with lead-free and halogen-free component packages.

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1 Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products.

2 Intel® Turbo Boost Technology is exclusively available with Intel® Core™ i5 and i7 processor series only. Intel® Turbo Boost Technology performance varies depending on hardware, software and overall system configuration. Check with your PC manufacturer on whether your system delivers Intel® Turbo Boost Technology. For more information, see [www.intel.com/technology/turboboost](http://www.intel.com/technology/turboboost).

3 Intel® Hyper-Threading Technology requires a computer system with a processor supporting HT Technology and an HT Technology-enabled chipset, BIOS, and operating system. Performance will vary depending on the specific hardware and software you use. For more information including details on which processors support HT Technology, see [www.intel.com/info/hyperthreading](http://www.intel.com/info/hyperthreading).

4 Built-in visual features, including processor graphics overlocking, require Intel® 6 Series Chipsets with display enabled (H67, Q67, Q65, B65). When a discrete graphics solution is populated in the PCI Express slot, all built-in visuals are turned off except Intel® Advanced Vector Extensions (Intel®AVX) which is available on all Intel® 6 Series Chipset configurations.
Intel® Rapid Storage Technology (Intel® RST) requires the computer have an Intel® RST-enabled Intel chipset, RAID controller in the BIOS enabled and the Intel Rapid Storage Technology software driver installed. Please consult your system vendor for more information.

Warning: Altering clock frequency and/or voltage may (i) reduce system stability and useful life of the system and processor; (ii) cause the processor and other system components to fail; (iii) cause reductions in system performance; (iv) cause additional heat or other damage; and (v) affect system data integrity. Intel has not tested, and does not warranty, the operation of the processor beyond its specifications. With unlocked Intel® Core™ processors, users can increase core and memory ratios, as well as the TDP (watts) and current (amps) limits beyond their default tested values. Intel® Core™ i7 and Intel® Core™ i5 processors with a K processor number extension support overclocking. In order to overclock 2nd Generation Intel® Core™ processors, an Intel® P67 Express Chipset is required.

Intel® vPro™ Technology, Intel® Virtualization Technology (Intel® VT), and Intel® Trusted Execution Technology (Intel® TXT) 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.

Intel® High Definition Audio requires a system with an appropriate Intel chipset and a motherboard with an appropriate codec and the necessary drivers installed. System sound quality will vary depending on actual implementation, controller, codec, drivers and speakers. For more information about Intel® HD audio, refer to www.intel.com/design/chipsets/hdaudio.htm.

Viewing stereo 3-D content requires 3-D glasses and a 3-D-capable display. Physical risk factors may be present when viewing 3-D material.

Intel® Insider™ is a hardware-based content protection mechanism. Requires Intel Insider enabled PC, internet connection, and content purchase or rental from a qualified provider. Consult your system manufacturer. For more information, visit www.intel.com.

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