PRODUCT BRIEF

# 8TH GENERATION INTEL® CORE™ DESKTOP PROCESSORS

**Prepare to be Amazed with the 8th Generation Intel® Core™ Desktop Processor Family**

Be ready for amazing experiences in gaming, VR, and entertainment wherever your computing takes you with the 8th Generation Intel® Core™ processor family. This new generation of processors extends all the capabilities users have come to love in our desktop platforms with advanced innovations that deliver exciting new features to immerse you in incredible experiences on a variety of form factors.

## Exceptional Platform Performance

The 8th Generation Intel Core processors redefine mainstream desktop PC performance with up to six cores for more processing power—that's two more cores than the previous generation Intel Core processor family—Intel® Turbo Boost 2.0 technology to increase the maximum turbo frequency up to 4.7 GHz, and up to 12 MB of cache memory.[1] Intel® Hyper-Threading Technology[1] delivers up to 12-way multitasking support in the latest generation of Intel Core processors. For the enthusiast, the unlocked 8th Generation Intel® Core™ i7-8700K processor provides you the opportunity to tweak the platform performance to its fullest potential and enjoy great gaming and VR experiences.

The new 8th Generation Intel Core processor family delivers:

- An impressive portfolio of standard and unlocked systems for a broad range of usages and performance levels.
- New system acceleration when paired with Intel® Optane™ memory to deliver amazing system responsiveness.[1]
- Intel Turbo Boost 2.0 technology to give you that extra burst of performance when you need it.
- Intel Hyper-Threading technology, which allows each processor core to work on two tasks at the same time, improving multitasking, speeding up workflows, and accomplishing more in less time.
- DDR4 RAM memory technology support, which allows systems to have up to 64 GB of memory and up to 2666 MT/s memory transfer speeds.
- The ability to set an overclocked ratio per core with unlocked processors,[1] when paired with select chipset SKUs, to provide you more control and more granularity for overclocking[2] your platform.

## Experience Amazing

8th Generation Intel Core processor-based desktop platforms are loaded with new and enhanced features to deliver amazing experiences that five-year-old systems can't handle.

### Incredible VR

Great VR experiences involve the entire platform, not just any one component. The ideal combination of processor, graphics, I/O connectivity, display, and audio are required. A high-performance processor is key to achieving a balanced platform to make your VR experiences great. Attach your premium head-mounted display (HMD) to an Intel Core i7 or i5 processor-based PC, and prepare to be amazed.

### Great Gaming

Outstanding gaming experiences extend beyond your personal smooth gameplay to your entire gaming community. The 8th Generation Intel Core processor family makes it easy to share those experiences by live-streaming or recording, editing, and posting your epic highlights. To perform at your best, get a great gaming PC powered by an 8th Generation Intel Core i7 processor that lets you live—and share—the ultimate gaming experience.

### Ultra-high Definition Entertainment

To play premium movie streams in stunning 4K UHD, get an advanced platform that supports the latest media technologies enabling today's great entertainment. Desktop computers based on the 8th Generation Intel Core processors integrate advanced media technologies that bring premium, high-quality content to your desktop, including:

- HEVC 10-bit encode/decode, VP9 10-bit decode:
  - Delivering smooth streaming of premium 4K UHD entertainment to your PC from leading online providers.
  - Providing full-size, screen-immersive viewing experiences with 4K video and 360-degree viewing.
  - Enabling incredible 4K video creation and sharing with ease.
- High Dynamic Range (HDR) and Rec. 2020 (Wide Color Gamut) for life-like luminesces to provide enhanced image and video viewing experiences.
- Intel® Quick Sync Video technology to accelerate most video capabilities, allowing users to create and share in real-time and multitask without interruption.

## Ultimate Protection Built Into the Silicon[1]

8th Generation Intel Core processors integrate hardware-level technologies that strengthen the protection of your enabled security[1] software. Hardware-based security helps you experience online and offline activities with peace of mind, enabled by features that include:

- Intel® Software Guard Extensions (Intel® SGX)[1] to help applications protect your system and your data.
- Intel® BIOS Guard and Intel® Boot Guard to help protect your system during startup.

## Scalable Portfolio of Processors

The 8th Generation Intel Core processor family is a great investment in your desktop experiences—whether for gaming, entertainment, or general-purpose computing wherever your life takes you. From the jaw-dropping performance of the 8th Generation Intel Core i7-8700K processor with six cores to the practical capabilities of the 8th Generation Intel Core i3-8100 processor, our latest generation of desktop processors fits a wide range of budgets and needs. Whether you're a performance-hungry professional, an exceptional enthusiast, or a first-time buyer, there is an 8th Generation Intel Core processor that will enable the experiences you seek. If form factor is your priority, the 8th Generation Intel Core processor family offers a range of processors designed for desktop PCs from high-performance gaming towers, to slick and stylish all-in-ones, to compact living room minis.

## Prepare to be Amazed with the 8th Generation Intel Core Desktop Processor Family

The 8th Generation Intel Core processors are raising the bar of desktop computing with innovations to drive exciting experiences, capabilities, and form factors. Experience all the amazing things you and a new 8th Generation Intel Core processor-powered PC can do.

| 8TH GENERATION INTEL® CORE™ DESKTOP PROCESSOR FEATURES AT A GLANCE | |
|---|---|
| **FEATURES[1]** | **BENEFITS** |
| **Intel® Turbo Boost Technology 2.0** | Dynamically increases the processor's frequency, as needed, by taking advantage of thermal and power headroom when operating below specified limits. |
| **Intel® Hyper-Threading Technology** | Delivers two processing threads per physical core. Highly threaded applications can get more work done in parallel, completing tasks sooner. |
| **Intel® Smart Cache** | Dynamically allocates shared cache to each processor core, based on workload, reducing latency and improving performance. |
| **Integrated Memory Controller** | Offers stunning memory read/write performance through efficient prefetching algorithms, lower latency, and higher memory bandwidth. |
| **Intel® UHD Graphics** | Play 4K UHD videos with exceptional clarity, view and edit even the smallest details of photos, and play today's modern games.<br>Intel® Quick Sync Video – Delivers excellent video conferencing capability, fast video conversion, online sharing, and fast video editing and authoring. |
| **Processor Core/Memory/ Graphics Overclocking[2]** | When unlocked processors are paired with select chipset SKUs, processor core, graphics, and memory can be set to run at frequencies above the specification frequency of the processor resulting in higher performance. |
| **PCI Express* 3.0 Interface** | Offers up to 8 GT/s for fast access to peripheral devices with up to 16 lanes.[4] The lanes can be configured as 1x16, 2x8, or 1x8 and 2x4 depending on motherboard designs. |
| **Intel® Optane™ Memory Support** | Provides performance improvements as well as fast app response times for system acceleration and responsiveness when paired with an Intel Optane memory module. |
| **Intel® Power Optimizer and Processor C-States** | Intel® Power Optimizer increases periods of silicon sleep state across the platform ingredients, including the processor, chipset, and third-party system components, to reduce power. Processor C-states (C8-C10) provide low idle power. |
| **Intel® Virtualization Technology** | Allows one hardware platform to function as multiple "virtual" platforms. Offers improved manageability by limiting downtime and maintaining productivity by isolating computing activities into separate partitions. |
| **VMCS Shadowing** | VMCS shadowing allows a Virtual Machine Manager (VMM) running in a guest (nested virtualization) to access a shadow VMCS memory area using the normal VMRead/VMWrite instructions. This technology reduces overhead for a more natural and responsive user experience. It also allows users to take control of their personal and professional data and apps while being protected by game-changing security. |
| **Intel® Advanced Encryption Standard New Instructions (Intel® AES-NI)** | A set of instructions that can be used to accelerate a variety of encryption apps, including whole disk encryption, file storage encryption, conditional access of 4K UHD content, Internet security, and VoIP. Consumers benefit from protected internet and email content, plus fast, responsive disk encryption. |
| **Intel® Transactional Synchronization Extensions (Intel® TSX)** | A set of instructions focused on enterprise-level multithreaded performance scaling, making parallel operations more efficient via improved control of software threads and locks. This offers performance benefits for enterprise-level big data analytics/business intelligence and visualization apps, which involve multi-user collaboration. |
| **Intel® Advanced Vector Extensions 2 (Intel® AVX2)[3]** | A set of 256-bit instructions to deliver enhanced performance on floating point- and integer-intensive apps. Includes instructions for FMA (Fused Multiply Add) which can deliver better performance on media and floating point computations, including face recognition, professional imaging, high-performance computing, consumer video and imaging, compression, and encryption. |
| **Intel® Software Guard Extensions (Intel® SGX)** | A collection of instructions, APIs, libraries, and tools to help protect select code and data from disclosure or modification through the use of enclaves, which are protected areas of execution in memory. |
| **Intel® BIOS Guard** | An augmentation of existing chipset-based BIOS flash protection capabilities targeted to address the increasing malware threat to BIOS flash storage. It helps protect the BIOS flash from modification without platform manufacturer authorization, helps defend the platform against low-level DOS (denial of service) attacks, and restores BIOS to a known good state after an attack. |
| **Intel® Boot Guard** | Hardware-based boot integrity protection that helps prevent unauthorized software and malware takeover of boot blocks critical to a system's function, thus providing added level of platform security based on hardware. Configurable boot types include:<br>Measured Boot – measures the initial boot block into the platform storage device such as a trusted platform module (TPM) or Intel® Platform Trust Technology.<br>Verified Boot – cryptographically verifies the platform initial boot block using the boot policy key. |
| **Intel® OS Guard** | A hardware-based security feature that protects the OS (operating system) kernel. OS Guard helps prevent use of malicious data or attack code located in areas of memory marked as user mode pages from taking over or compromising the OS kernel. OS Guard is not application-specific and protects the kernel from any application. |
| **Intel® Identity Protection Technology** | Protect your one-time-password (OTP) credentials and public key infrastructure (PKI) certificates and add a layer of encrypted, second factor authentication for online transactions. |
| **Intel® Secure Key** | Security hardware-based random number generator that can be used for generating high-quality keys for cryptographic (encryption and decryption) protocols. Provides quality entropy that is highly sought after in the cryptography world for added security. |

| 8TH GENERATION INTEL® CORE™ DESKTOP PROCESSOR COMPARISONS[1] | CORE i7 | CORE i5 | CORE i3 |
|---|---|---|---|
| **Maximum Processor Frequency (GHz)** | Up to 4.7 | Up to 4.3 | Up to 4.0 |
| **Number of Processor Cores/Threads** | 6/12 | 6/6 | 4/4 |
| **Intel® Turbo Boost Technology 2.0** | Yes | Yes | No |
| **Intel® Hyper-Threading Technology** | Yes | No | No |
| **Intel® Smart Cache Size (MB)** | 12 | 9 | Up to 8 |
| **Memory Type Support** | DDR4-2666 | DDR4-2666 | DDR4-2400 |
| **Number of Memory Channels** | 2 | 2 | 2 |
| **Intel® UHD Graphics** | 630 | 630 | 630 |
| **Graphics Dynamic Frequency (MHz)** | Up to 1200 | Up to 1150 | Up to 1150 |
| **Intel® Quick Sync Video** | Yes | Yes | Yes |
| **Processor Core/Graphics/Memory Overclocking[2]** | Yes (with select SKUs) | Yes (with select SKUs) | Yes (with select SKUs) |
| **Intel® Optane™ Memory Support** | Yes | Yes | Yes |
| **Intel® Virtualization Technology** | Yes | Yes | Yes |
| **Intel® AES-NI** | Yes | Yes | Yes |
| **Intel® TSX** | Yes | Yes | Yes |
| **Intel® AVX2[3]** | Yes | Yes | Yes |
| **Intel® SGX** | Yes | Yes | Yes |
| **Intel® BIOS Guard** | Yes | Yes | Yes |
| **Intel® Boot Guard** | Yes | Yes | Yes |
| **Intel® OS Guard** | Yes | Yes | Yes |
| **Intel® Identity Protection Technology** | Yes | Yes | Yes |

8th Generation Intel Core desktop processors require a motherboard based on the Intel® 300 Series chipset.

For more information on the new 8th Generation Intel Core desktop processor family, visit **www.intel.com/products/desktop/processors**.

[1] Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at www.intel.com.

[2] Altering clock frequency or voltage may damage or reduce the useful life of the processor and other system components, and may reduce system stability and performance. Product warranties may not apply if the processor is operated beyond its specifications. Check with the manufacturers of system and components for additional details.

[3] Intel® Advanced Vector Extensions (Intel® AVX) are designed to achieve higher throughput to certain integer and floating-point operations. Due to varying processor power characteristics, utilizing AVX instructions may cause a) some parts to operate at less than the rated frequency and b) some parts with Intel® Turbo Boost Technology 2.0 to not achieve any or maximum turbo frequencies. Performance varies depending on hardware, software, and system configuration and you should consult your system manufacturer for more information. *Intel® Advanced Vector Extensions refers to Intel® AVX, Intel® AVX2 or Intel® AVX-512. For more information on Intel® Turbo Boost Technology 2.0, visit http://www.intel.com/go/turbo.

[4] Actual number of lanes available may vary by processor number and system configuration. Please refer to the specifications corresponding to the processor number of interest or consult your system vendor for more information.

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