



# 8TH GENERATION INTEL® CORE™ PROCESSORS

Mobile U-Series: Peak Performance on the Go



The new 8th Generation Intel® Core™ mobile U-series processor—for sleek notebooks and 2 in 1s—elevates your computing experience with an astounding 40 percent leap in productivity performance over 7th Generation Intel Core U-series processor-based PCs,<sup>1</sup> brilliant 4K UHD entertainment, and easier, more convenient ways to interact with your PC. With 10-hour battery life<sup>2</sup> and robust I/O support, Intel's first quad-core U-series processors enable portable, powerhouse thin and light PCs, so you can accomplish more on the go.

## Extraordinary Performance and Responsiveness

With Intel's latest power-efficient microarchitecture, advanced process technology, and silicon optimizations, the 8th Generation Intel Core U-series processor is Intel's fastest 15W processor<sup>3</sup> with up to 40 percent greater productivity than 7th Gen processors and 2X more productivity vs. comparable 5-year-old processors.<sup>4</sup>

- Get fast and responsive web browsing with Intel® Speed Shift Technology.
- Intel® Turbo Boost Technology 2.0 lets you work more productively by dynamically controlling the processor's frequency—across cores and graphics—boosting performance precisely when it is needed.
- With up to four cores, 8th Generation Intel Core U-series processor with Intel® Hyper-Threading Technology supports up to eight threads, making every day content creation a compelling experience on 2 in 1s and ultra-thin clamshells.
- For those on the go, PCs enabled with Microsoft Windows\* Modern Standby wake instantly at the push of a button, so you don't have to wait for your system to start up.

## Immersive Entertainment

Impressive built-in media capabilities enhance your editing and viewing experiences with 4K UHD video, 360° video, and premium content streaming, enabling new ways to enjoy and engage content across a range of form factors. Intel® UHD Graphics, integrated into these next-generation processors, deliver advanced, efficient performance for visual brilliance, so you can easily watch, create, edit, share, and game. Our media engine, with power-efficient VP9 and HEVC 10-bit hardware acceleration, means great battery life, even with 4K UHD viewing and content creation. You can root for your favorite sports team and stream movies and TV shows in rich, detailed 4K UHD from a burgeoning content ecosystem. Gamers can play their favorite games on the go in UHD with fluid, texture-rich graphics.

For an enhanced gaming experience, connecting to an external graphics dock via Thunderbolt™ 3 delivers spectacular gaming performance with one simple connection, even with a thin and light notebook. Enjoy the freedom—and the results.

8th Generation Intel Core U-series processors will be Microsoft Mixed Reality-ready<sup>5</sup>—great for 360° photos and video, including discovering new HoloTour places.

### Simply, Convenient, Intuitive

With today's diverse designs supporting touch, voice, and stylus input, the 8th Generation Intel Core U-series processor is designed to deliver intuitive experiences, enabling you to simplify your interactions and unleash your creativity. Supporting digital assistants like Windows Cortana\* and capabilities like Windows Ink\*, new PCs offer flexible and natural ways to communicate and express yourself. On notebooks with fingerprint sensors or cameras supporting Windows Hello\* facial recognition, you can securely<sup>5</sup> log into your PC and websites hassle-free.

Intel® Online Connect technology takes this convenience even further, making secure payments a breeze while shopping online, enabling hardened password managers, and providing built-in 2-factor authentication for some of your favorite sites.<sup>5</sup>

### Extended Battery Life

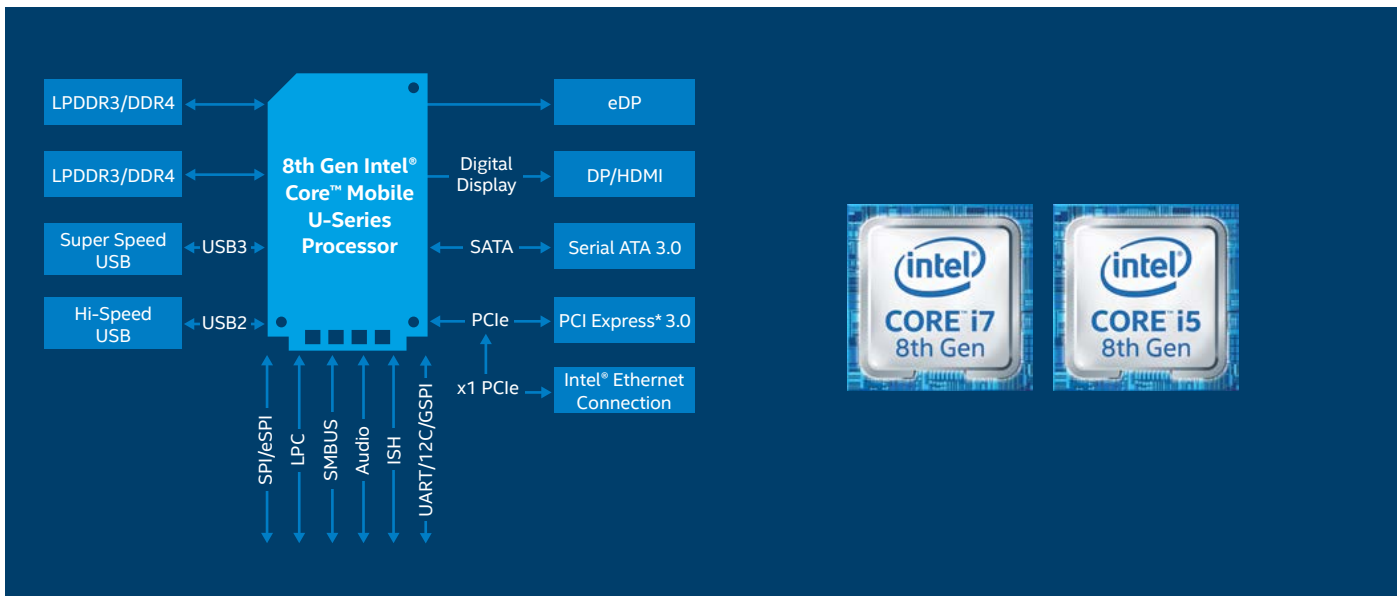
By meticulously engineering power efficiency at a processor and platform level, Intel delivers performance without sacrificing battery life,<sup>6</sup> enabling enhanced productivity and creativity in increasingly slim form factors. Dedicated hardware acceleration dramatically reduces power consumption, enabling exceptional battery life during 4K UHD video playback.

### I/O Support

8th Generation Intel Core U-series processor I/O support includes PCIe\* 3.0, delivering data transfer rates at 8 GT/s versus 5 GT/s with PCIe 2.0. The latest Intel® Rapid Storage Technology supports NVMe\* PCIe 3.0 x4 Solid State Drives. The Intel® Context Sensing SDK for the Intel® Integrated Sensor Solution allows third-party software vendors to develop exciting sensor-enhanced applications. This rich combination of technologies means fast response and movement of data throughout the platform for unique user experiences.

### Thunderbolt™ 3: The USB-C that Does it All

Notebooks with versatile Thunderbolt 3—the USB-C that does it all—provide incredible I/O performance. Declutter your desk with a single cable that conveniently supports up to 40 Gb/s transfer speeds, two 4K UHD 60 Hz displays, system charging up to 100W, external graphics, and Thunderbolt networking to bolster productivity and deliver amazing experiences on your PC.



## 8TH GENERATION INTEL® CORE™ PROCESSOR FEATURES AT A GLANCE

FEATURES <sup>5</sup>	BENEFITS
<b>Intel® Turbo Boost Technology 2.0</b>	Dynamically increases the processor's frequency, as needed, by taking advantage of thermal and power headroom when operating below specified limits.
<b>Intel® Hyper-Threading Technology</b>	Delivers two processing threads per physical core. Highly threaded applications can get more work done in parallel, completing tasks sooner.
<b>Intel® UHD Graphics</b>	Play 4K UHD videos with exceptional clarity, view and edit even the smallest details of photos, and play today's modern games.  Intel® Quick Sync Video—Delivers excellent video conferencing capability, fast video conversion, online sharing, and fast video editing and authoring.
<b>Integrated Memory Controller</b>	Offers stunning memory read/write performance through efficient prefetching algorithms, lower latency, and higher memory bandwidth.
<b>Intel® Smart Cache</b>	Dynamically allocates shared cache to each processor core, based on workload, reducing latency and improving performance.
<b>Intel® Virtualization Technology</b>	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.
<b>Intel® Advanced Encryption Standard New Instructions (Intel® AES-NI)</b>	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.
<b>Intel® Power Optimizer and Processor C-States</b>	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.
<b>Configurable TDP Power</b>	With Configurable TDP, the processor is now capable of modulating the maximum sustained power vs. performance. Configurable TDP thus provides design and performance flexibility to control system performance based on the cooling capability and usage scenarios. For example, a detachable Ultrabook™ may need more performance when used in a full clamshell mode (vs. tablet mode), or when balanced performance is needed in a quiet conference room setting.
<b>Intel® Secure Key</b>	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.
<b>Intel® Advanced Vector Extensions 2 (Intel® AVX2)</b>	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.
<b>Collaborative Processor Performance Control (CPPC)</b>	A technology based on the ACPI 5.0 specification that dynamically modulates performance vs. active application power. It reduces active power to deliver better battery life and allows deep low power states to be reached.
<b>Intel® Software Guard Extensions (Intel® SGX)</b>	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.
<b>Intel® BIOS Guard</b>	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.
<b>Intel® Boot Guard</b>	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:  Measured Boot—Measures the initial boot block into the platform storage device such as trusted platform module (TPM) or Intel® Platform Trust Technology.  Verified Boot—Cryptographically verifies the platform initial boot block using the boot policy key.
<b>Intel® Platform Trust Technology</b>	A trusted element of the platform execution that provides enhanced security by verifying the boot portion of the boot sequence which helps protect against viruses and malicious software attacks.
<b>Intel® Rapid Storage Technology (Intel® RST)</b>	Offers excellent levels of performance, responsiveness, and expandability. Take advantage of the enhanced performance and lower power consumption available with Intel® RST with one or more SATA or PCIe storage drives. With additional SATA drives, Intel RST provides quicker access to digital photo, video, and data files with RAID 0, 5, and 10, and greater data protection against a storage disk drive failure with RAID 1, 5, and 10. Dynamic Storage Accelerator unleashes the incredible performance of Solid State Drives (SSD) when multitasking.

## 8TH GENERATION INTEL® CORE™ PROCESSOR FEATURES AT A GLANCE, CONTINUED

FEATURES <sup>5</sup>	BENEFITS
<b>Intel® Speed Shift Technology</b>	Delivers dramatically quicker responsiveness with single-threaded, transient (short duration) workloads, such as web browsing, by allowing the processor to more quickly select its best operating frequency and voltage for optimal performance and power efficiency.
<b>Intel® High Definition Audio</b>	Integrated audio support enables premium digital surround sound and delivers advanced features such as multiple audio streams and jack re-tasking.
<b>Intel® Smart Sound Technology</b>	A dedicated audio Digital Signal Processor designed to process audio for media playback and voice for PC interactions like Cortana*, Nuance Dragon*, or Skype*. Enables long battery life while providing new usages and maintaining high-end audio playback.
<b>Universal Serial Bus 3.0</b>	Integrated USB 3.0 support enhances performance with a design data rate of up to 5 Gb/s with up to 6 USB 3.0 ports.
<b>Universal Serial Bus 2.0</b>	Hi-Speed USB 2.0 support with a design data rate of up to 480 Mb/s with up to 10 USB 2.0 ports.
<b>Serial ATA (SATA) 6 Gb/s</b>	High-speed storage interface supporting up to 6 Gb/s transfer rates for optimal data access with up to 3 SATA 6 Gb/s ports.
<b>SATA Port Disable</b>	Enables individual SATA ports to be enabled or disabled as needed. This feature helps provide added protection of data by preventing malicious removal or insertion of data through SATA ports.
<b>PCI Express* 3.0 Interface</b>	Offers up to 8 GT/s for fast access to peripheral devices and networking with support for up to 6 devices across 12 lanes configurable as x1, x2, and x4 depending on motherboard designs.
<b>USB Port Disable</b>	Enables individual USB ports to be enabled or disabled as needed. This feature helps provide added protection of data by preventing malicious removal or insertion of data through USB ports.
<b>Intel® Integrated 10/100/1000 MAC</b>	Support for the Intel® Ethernet Connection I219-LM and I219-V.

Intel Core U-series processors have integrated platform input/output. The following table summarizes the two configurations supported.

### U-SERIES PROCESS PLATFORM INPUT/OUTPUT CONFIGURATION

FEATURE <sup>5</sup>	PREMIUM (U-SERIES)
<b>Independent Displays Supported</b>	3
<b>Intel® Rapid Storage Technology</b>	RAID, AHCI support
<b>Intel® Smart Response Technology</b>	Yes
<b>Intel® High Definition Audio</b>	Yes
<b>Intel® Smart Sound Technology</b>	Yes
<b>USB 3.0 Ports</b>	Up to 6
<b>USB 2.0 Ports</b>	10
<b>PCIe Express* 3.0</b>	Up to 12 lanes
<b>SATA Ports</b>	Up to 3 SATA 6 Gb/s
<b>I2C</b>	6
<b>UART</b>	3
<b>SDXC</b>	1



For more information, visit [www.intel.com/core](http://www.intel.com/core).



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. For more complete information visit <http://www.intel.com/benchmarks>.

Not all features are available on all processors or chipsets. For more information on which processors support the capability, see [ark.intel.com](http://ark.intel.com).

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 [intel.com](http://intel.com).

<sup>1</sup> As measured on Intel Reference Platform on Intel® Core™ i7-8550U vs. previous generation: Intel® Core™ i7-7500U using SYSmark® 2014 SE (Second Edition).

<sup>2</sup> As projected on Intel Reference Platform using a 40Whr battery and 25x14 Panel on Windows® 10 1080p 24fps Local Video Playback Intel® Core™ i7-8550U Processor, PL1=15W TDP, 4C8T, Turbo up to 4.0GHz, Memory: 8GB DDR4-2400, Storage: Intel 600p SSD, Intel UHD Graphics 620, OS: Windows® 10, Battery Size: 40Whr, Screen: 25x14 12", Windows 10 Power Slider - Better Performance.

<sup>3</sup> As measured on Intel Reference Platform Intel® Core™ i7-8650U vs. previous generation: Intel® Core™ i7-7600U using SPEC®int\_rate\_base2006 (n copy)

<sup>4</sup> As measured on Intel Reference Platform: Intel® Core™ i5-8250U vs. a 5-year old PC: Intel® Core™ i5-3317U using SYSmark® 2014 SE.

<sup>5</sup> 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 [intel.com](http://intel.com).

<sup>6</sup> As projected on Intel Reference Platform using a 70Whr Battery and 4K Panel on Windows 10® 4K 24fps 10bit HEVC Local Video Playback: Intel® Core™ i7-8550U Processor, PL1=15W TDP, 4C8T, Turbo up to 4.0GHz, Memory: 8GB DDR4-2400, Storage: Intel 600p SSD, Intel UHD Graphics 620, OS: Windows® 10, Battery Size: 70Whr, Screen: 4K, Windows 10 Power Slider - Better Performance.

#### System Configurations:

Battery life measurements on Intel Reference Platform unless otherwise noted (i.e., YouTube 4K Streaming). Intel Reference Platform is an example new system. Products available from systems manufacturers will not be identical in design, and performance will vary.

System power management policy: DC balanced for battery life measurements, AC balanced for performance measurements on 3rd Generation system and AC High Performance on 8th and 7th Generation systems. Wireless: On and connected.

#### 8th Generation Processors:

Intel® Core™ i5-8250U Processor, PL1=15W TDP, 4C8T, Turbo up to 3.4GHz, Memory: 8GB DDR4-2400, Storage: Intel 600p SSD, Intel UHD Graphics 620, OS: Windows® 10 Display.

Intel® Core™ i7-8550U Processor, PL1=15W TDP, 4C8T, Turbo up to 4.0GHz, Memory: 8GB DDR4-2400, Storage: Intel 600p SSD, Intel UHD Graphics 620, OS: Windows® 10.

Intel® Core™ i7-8650U Processor, PL1=15W TDP, 4C8T, Turbo up to 4.2GHz, Memory: 8GB DDR4-2400, Storage: Intel SSD, Intel UHD Graphics 620, OS: Windows® 10

#### 7th Generation Processor:

Intel® Core™ i7-7500U Processor, PL1=15W TDP, 2C4T, Turbo up to 3.5GHz, Memory: 8GB DDR4-2133, Storage: Intel 600p SSD, Intel HD Graphics 620, OS: Windows® 10.

Intel® Core™ i7-7600U Processor, PL1=15W TDP, 2C4T, Turbo up to 3.9GHz, Memory: 8GB DDR4-2133, Storage: Intel SSD, Intel HD Graphics, OS: Windows® 10

#### 3rd Generation Processor (5 Year old):

Intel® Core™ i5-3317U Processor, PL1=15W TDP, 2C4T, Turbo up to 3.6GHz, on Dell® XPS 12, Memory: 8GB DDR3, Storage: SSD, Intel HD Graphics 4000, OS: Windows® 10.

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