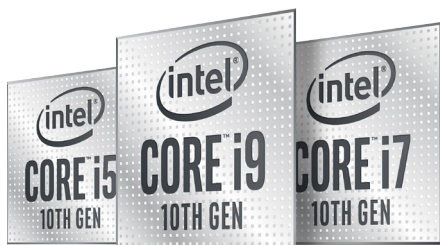(intel®)
experience
what's inside™

10TH GEN BRINGS YOU THE FASTEST MOBILE PROCESSOR[1]

NEW 10TH GEN INTEL® CORE™ MOBILE PROCESSORS

Break the 5 GHz barrier with the new 10th Gen Intel® Core™ H-series mobile processor family and experience real-world performance that matters – incredible, high fps gaming and precious time-saving content creation, plus exceptional wireless connectivity with the latest integrated Wi-Fi technology (Intel® Wi-Fi 6[2] AX201 Gig+) on the market. For the most demanding users, Thunderbolt™ 3 support ensures a blazing fast, versatile wired connection for displays, peripherals, docks, and storage. If you don't want to sacrifice capacity for speed, look for systems with Intel® Optane™ memory H10 with Solid State Storage, so you can experience the responsiveness you expect from an SSD, with enough space for your favorite games and media files.

For more complete information about performance and benchmark results, visit intel.com/benchmarks.

1 Based on Intel® Core™ i9-10980HK's highest achievable max turbo frequency of 5.3GHz, exceeding all other mobile products available as of April 2020. Includes use of Intel® Thermal Velocity Boost. User experience varies with workload. See end notes for details.

INTELLIGENTLY OPTIMIZED FOR MAXIMUM PERFORMANCE

ULTIMATE PERFORMANCE, OPTIMIZED

The all new Intel Core i9-10980HK raises the bar once again – with up to 5.3 GHz thanks to enhanced Intel® Thermal Velocity Boost[3] (Intel® TVB) and Intel® Turbo Boost Max Technology 3.0. With 16 threads across 8 cores and completely unlocked for overclocking,[4] the Intel Core i9-10980HK delivers breakthrough performance for even the most discerning gamer, creator, or enthusiast.

10th Gen Intel Core mobile processors are fine-tuned with intelligent performance optimizations like Intel Turbo Boost Max Technology 3.0, Intel Speed Optimizer, Intel Thermal Velocity Boost,[3] and Intel Adaptix Dynamic Tuning for extracting maximum computing power from your system.

- Intel Turbo Boost Max Technology 3.0 optimizes for lightly-threaded performance by identifying your processor's fastest cores and directing your most critical workloads to them.

- Intel® Speed Optimizer is a simple one-click overclocking[4] feature built into Intel® Extreme Tuning Utility (Intel® XTU) that leverages thermal and power delivery headroom to improve multi-threaded performance scenarios.

- Intel® Thermal Velocity Boost[3] (Intel® TVB) is a feature supported on all 10th Gen mobile H-series Intel® Core™ i7, Intel® Core i9, and Intel® Xeon® processors. It opportunistically and automatically increases clock frequency by up to 200 MHz if the processor temperature is 65°C or lower and turbo power budget is available.

- Intel® Adaptix™ Dynamic Tuning is a powerful software toolkit that enables laptop manufacturers to extract the highest performance from the 10th Gen Intel Core mobile processor by monitoring variables such as system temperature, fan speed, power source (AC or DC), usage mode, current processor state, etc., and dynamically adjust processor power to maximize performance within the unique thermal constraints of their system.

GAME LIKE A CHAMPION ON 10TH GEN INTEL CORE

ELEVATE YOUR GAME

Every frame matters, which is why 10th Gen Intel Core mobile processors deliver frequencies that enable incredible, fast-twitch, high fps AAA gameplay, even while recording and streaming.

Experience unbelievably fast downloads and smooth streaming with low latency and enhanced wireless security on the newly integrated Intel Wi-Fi 6[2] AX201 (Gig+) – so you can confidently ditch your ethernet cable and game wirelessly.

Intel Optane memory H10 with solid state storage integrates Optane memory with up to 1TB of QLC 3D NAND for accelerating game launching and level loading.

AMPLIFY YOUR CREATIVE POTENTIAL

CONQUER YOUR CONTENT

Create. Edit. Share. – Systems with 10th Gen Intel Core processors deliver stunningly fast photo editing and up to 8k video editing for demanding mobile power users.

Optimize your workflow. – Intel Optane memory helps accelerate the launching and loading of your most used apps and projects, while Thunderbolt 3 enhances your creative capabilities with fast single wire access to external 4K monitors, extended storage, peripherals, and docks.

ULTRA-HIGH DEFINITION ENTERTAINMENT

Laptop computers based on the 10th Generation Intel Core mobile processors integrate advanced media technologies that bring premium, high quality content to your PC, 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-screen immersive viewing experiences with 4K video and 360-degree viewing.
  - High Dynamic Range (HDR) and Rec. 2020 (Wide Color Gamut) for life-like luminescence to provide enhanced image and video viewing experiences.

BRING PREMIUM HIGH-QUALITY CONTENT TO YOUR PC

HIGH FREQUENCY OPTIONS FROM TOP TO BOTTOM

IMPRESSIVE RANGE FROM TOP TO BOTTOM

From the peak performance of the Intel Core i9-10980HK processor – with up to 5.3 GHz and 16 threads, to the first ever mobile 5.0 GHz Core i7, to the 4.5 GHz Core i5 – the NEW 10th Gen Intel Core H-Series processors offer impressive options for everyone.

Get ready to experience the ultimate in gaming, professional content creation, vivid entertainment and powerhouse productivity with the latest processors from Intel.
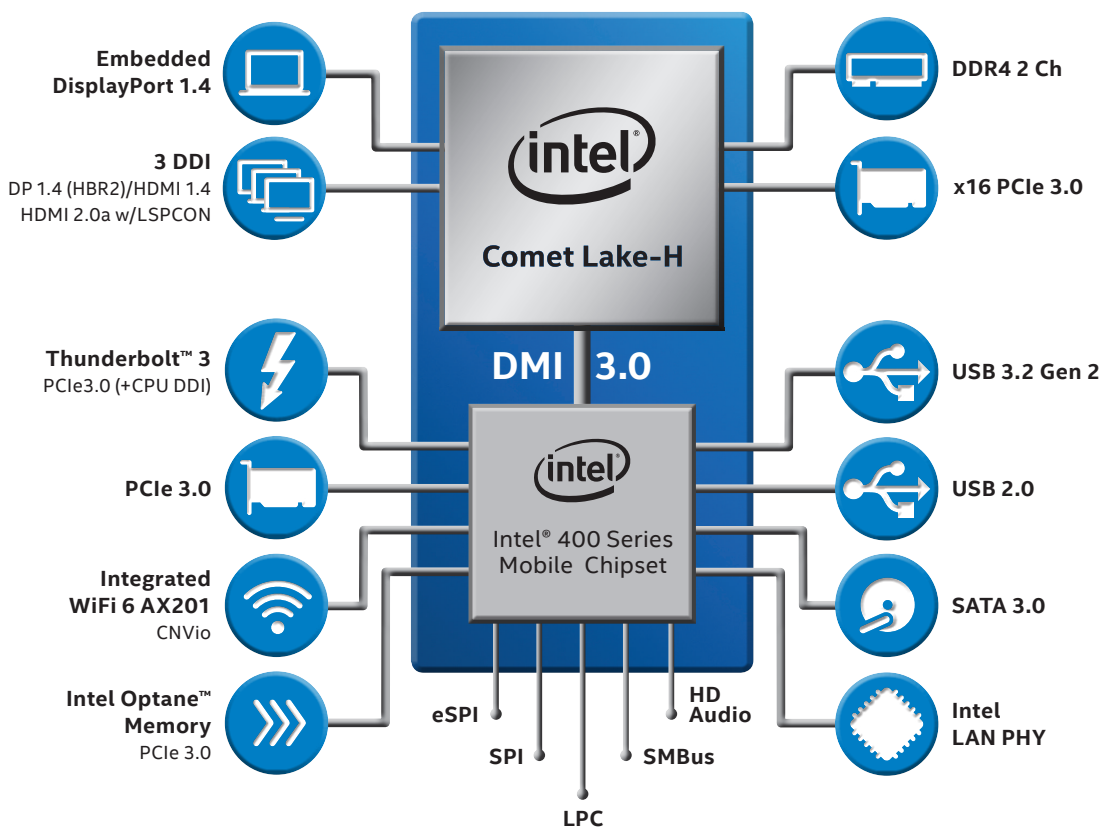
NEW 10ᵀᴴ GEN INTEL® CORE™ MOBILE PROCESSORS FEATURES AT A GLANCE

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 pre-fetching 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.
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[4]	• 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.[3]
PCI Express* 3.0 Interface	• Offers up to 8 GT/s for fast access to peripheral devices with up to 16 lanes.[6] The lanes can be configured as 1x16, 2x8, or 1x8 and 2x4 depending on motherboard designs.
Intel® Optane™ Memory Support	• Smart memory technology that accelerates computers' responsiveness. It accesses your computer's frequently used documents, pictures, videos and applications quickly and remembers them after you power off – enabling you to create, game, and produce with less waiting.
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 helping increase protections by game-changing security features.
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 increased internet and email content protection, plus fast, responsive disk encryption.
Intel® Transactional Synchronization Extensions (Intel® TSX)	• A set of instructions focused on enterprise-level multi-threaded 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)[5]	• 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.

FEATURES[1]	BENEFITS
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 more 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 helps restore 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:
	  • Measured Boot – measures the initial boot block into the platform storage device such as a trusted platform module (TPM) or Intel® Platform Trust Technology.
	  • 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	• A hardware-based security feature that helps protect 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

10TH GEN INTEL® CORE™ MOBILE PROCESSOR OVERVIEW

Embedded DisplayPort 1.4

3 DDI
DP 1.4 (HBR2)/HDMI 1.4
HDMI 2.0a w/LSPCON

Thunderbolt™ 3
PCIe3.0 (+CPU DDI)

PCIe 3.0

Integrated WiFi 6 AX201
CNVio

Intel Optane™ Memory
PCIe 3.0

Comet Lake-H

DMI 3.0

Intel® 400 Series Mobile Chipset

DDR4 2 Ch

x16 PCIe 3.0

USB 3.2 Gen 2

USB 2.0

SATA 3.0

Intel LAN PHY

eSPI

SPI

LPC

SMBus

HD Audio

NEW 10TH GEN INTEL® CORE™ MOBILE PROCESSORS COMPARISONS[1]

	10TH GEN INTEL® CORE™ **i9** MOBILE PROCESSORS	10TH GEN INTEL® CORE™ **i7** MOBILE PROCESSORS	10TH GEN INTEL® CORE™ **i5** MOBILE PROCESSORS
Maximum Processor Frequency (GHz)	Up to 5.3	Up to 5.1	Up to 4.6
Number of Processor Cores/Threads	8/16	6/12 to 8/16	4/8
Intel® Turbo Boost Technology 2.0	Yes	Yes	Yes
Intel® Turbo Boost Max Technology 3.0	Yes	Yes	No
Intel® Hyper-Threading Technology	Yes	Yes	Yes
Intel® Smart Cache Size (MB)	16	12-16	8
Memory Type support	DDR4-2933	DDR4-2933	DDR4-2933
Number of Memory Channels	2	2	2
Intel® UHD Graphics	Yes	Yes	Yes
Graphics Dynamic Frequency (MHZ)	Up to 1250	Up to 1200	Up to 1100
Intel® Quick Sync Video	Yes	Yes	Yes
CPU/Graphics/Memory Overclocking[4]	Yes	Partial (with i7-10850H)	No
Intel® Optane™ Memory Support	Yes	Yes	Yes
Intel® Virtualization Technology	Yes	Yes	Yes
Intel® Thermal Velocity Boost	Yes	Yes	No
Intel® AES-NI	Yes	Yes	Yes
Intel® TSX	Yes	Yes	Yes
Intel® AVX2[5]	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

For more information on the new 10th Gen Intel® Core™ mobile processors, visit **www.intel.com/products/mobile/processors.**

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 www.intel.com/benchmarks.

1 Based on Intel® Core™ i9-10980HK's highest achievable max turbo frequency of 5.3GHz, exceeding all other mobile products available as of April 2020. Includes use of Intel® Thermal Velocity Boost. User experience varies with workload.

2 Best in Class Wi-Fi 6: Intel® Wi-Fi 6 (Gig+) products support optional 160 MHz channels, enabling the fastest possible theoretical maximum speeds (2402 Mbps) for typical 2x2 802.11 AX PC Wi-Fi products. Premium Intel® Wi-Fi 6 (Gig+) products enable 2-4X faster maximum theoretical speeds compared standard 2x2 (1201 Mbps) or 1x1 (600 Mbps) 802.11 AX PC Wi-Fi products, which only support the mandatory requirement of 80 MHz channels.

3 Includes the effect of Intel® Thermal Velocity Boost (Intel® TVB), a feature that opportunistically and automatically increases clock frequency above single-core and multi-core Intel® Turbo Boost Technology frequencies based on how much the processor is operating below its maximum temperature and whether turbo power budget is available. The frequency gain and duration is dependent on the workload, capabilities of the processor and the processor cooling solution.

4 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 addtional details.

5 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.

6 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.

Intel technologies may require enabled hardware, software or service activation.

No product or component can be absolutely secure.

Your costs and results may vary.

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