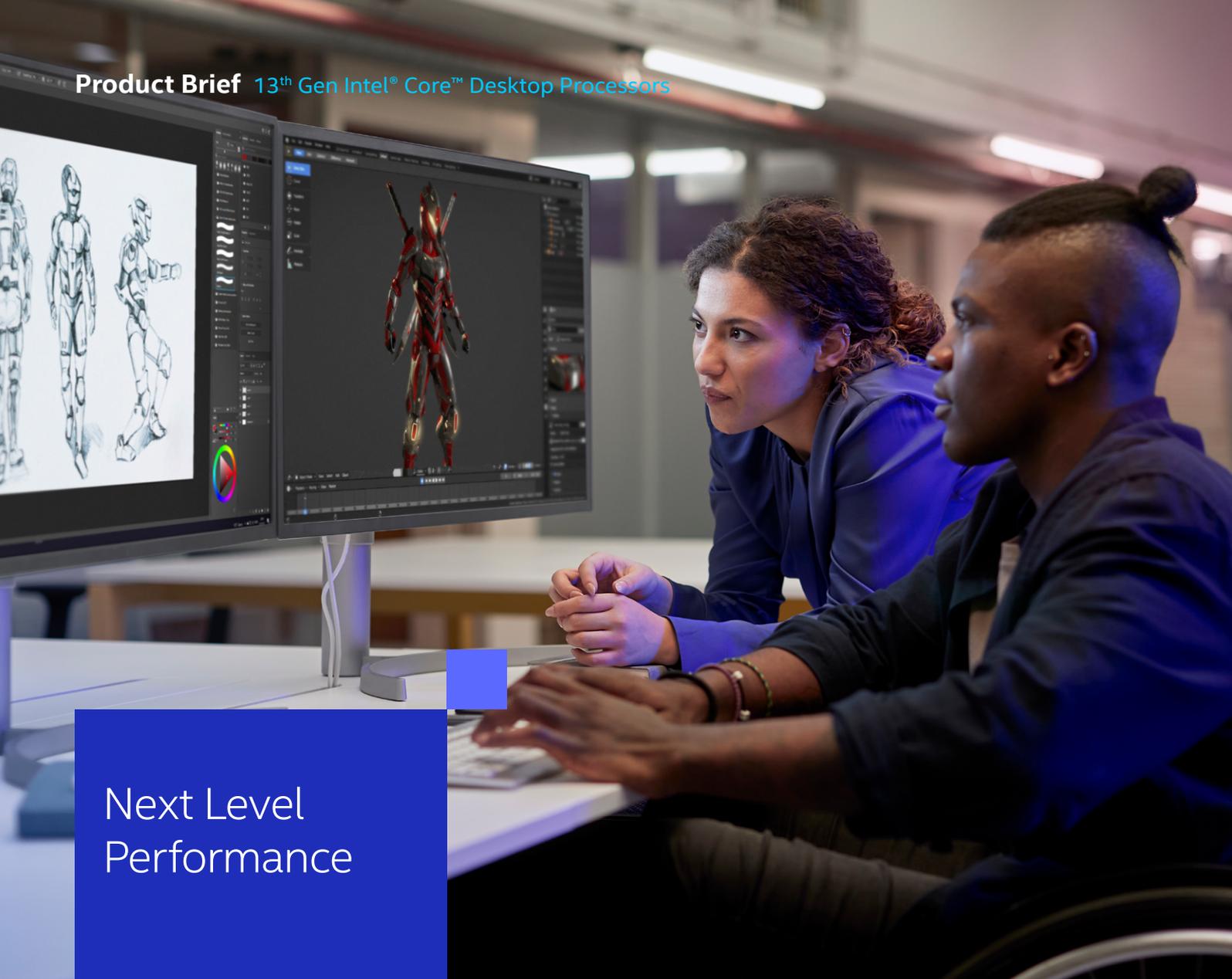


13th Gen Intel[®] Core[™] Desktop Processors

The 13th Gen Intel[®] Core desktop processors pave the way for the future of power and performance.

With an increase in core count,¹ these processors continue to utilize Intel's performance hybrid architecture² to optimize your gaming, content creation, and productivity. Leverage industry-first bandwidth of up to 16 PCIe 5.0 lanes³ and DDR5 memory up to 5600 MT/s.^{4,5} Supercharge your CPU performance with a powerful suite of tuning and overclocking tools. Enjoy your favorite experiences in up to 4 simultaneous 4K60 displays or up to 8K60 HDR Video with dynamic noise suppression. Support for the Intel[®] 700 series chipsets and backwards compatibility with the Intel[®] 600 series chipsets allow you to access the features you need for any task. Whether you are working, streaming, gaming, or creating, the 13th Gen Intel[®] Core desktop processors deliver the next generation of breakthrough performance.



Next Level Performance

The 13th Gen Intel® Core desktop processors deliver the next generation of breakthrough core performance. Now with up to 24 cores (8 Performance-cores and 16 Efficient-cores) and up to 32 threads, plus Performance-cores are capable of reaching 5.8 GHz⁶ with Intel® Thermal Velocity Boost to elevate performance. Intel® Turbo Boost Max Technology 3.0⁷ further strengthens lightly threaded performance by identifying the best-performing Performance-cores. Meanwhile, additional E-cores enable an increase in Intel® Smart Cache (L3) for more efficient processing of larger data sets and better performance. The P-core and E-core L2 cache has also increased compared to the previous generation of Intel® processors, minimizing the amount of time spent swapping data between cache and memory to speed up your workflow.⁸ Unleash the power of next-level performance with the 13th Gen Intel® Core desktop processor advantage.



Dynamic Platform Features

Loaded with the latest platform technologies, 13th Gen Intel® Core desktop processors accelerate system performance. Up to 16 PCIe 5.0² lanes doubles I/O throughput for accelerated processing power. Take advantage of the latest DDR5 support that is transforming the industry for fast speeds up to 5600 MT/s,³ high bandwidth, and enhanced productivity, as well as continued DDR4 support up to 3200 MT/s. Comprehensive advanced tuning and overclocking⁹ support—including Intel® Extreme Tuning Utility,¹⁰ Intel® Extreme Memory Profile, and Intel® Dynamic Memory Boost¹¹—deliver intelligent overclocking performance on demand so that both new and experienced overclockers can get more from their unlocked processors. And backwards compatibility with Intel's 600 and 700 series chipsets offers you the flexibility to upgrade without compromising on performance or features.

GPU Usage
652
GPU Utilization
0.04%
Fan Speed

GPU Clock
900
VRAM Clock
1092

Performance tuning - auto settings



Seamless Immersion

The 13th Gen Intel® Core desktop processors bring you the ultimate immersive experiences, whether you are engaged in intense gaming and creating or highly focused work sessions. Enhanced Intel® UHD Graphics driven by X^e Architecture¹² deliver vibrant, high-quality

visual support for up to 8K60 HDR video and up to 4 simultaneous 4K60 displays. Enjoy efficient noise suppression and professional voice output with the Intel® Gaussian & Neural Accelerator 3.0 (Intel® GNA). These premier sensory experiences are enabled by the best-in-class wired and wireless connectivity provided by Intel® Killer™ Wi-Fi 6/6E,¹³ which intelligently manages and routes your Internet traffic to help you stay connected to the fastest channels. The 13th Gen Intel® Core desktop processors deliver a seamless, immersive user experience to power your creativity and focus.

13TH GEN INTEL® CORE DESKTOP PROCESSORS: FEATURES AT A GLANCE

FEATURE	BENEFIT
Performance-core (P-core)	The highest-performing CPU core ever built by Intel, designed to handle single-threaded, lightly threaded, or burst workloads like 4K gaming and 3D design.
Efficient-core (E-core)	Designed to handle multi-threaded and background tasks such as minimized browser tabs, IT services, and cloud syncing, leaving P-cores free to deliver incredible performance without interruption.
Performance Hybrid Architecture ²	Integrates two core microarchitectures into a single die, prioritizing and distributing workloads to optimize performance.
Intel® Thread Director ^{1,14}	Optimizes workloads by helping the OS scheduler intelligently distribute workloads to the optimal cores.
PCIe 5.0 ² up to 16 Lanes	Offers readiness for up to 32 GT/s for fast access to discrete graphics, storage, and peripheral devices with up to 16 PCI Express 5.0 lanes.
PCIe 4.0 up to 4 Lanes	Offers up to 16 GT/s for fast access to storage and peripheral devices with up to 4 PCI Express 4.0 lanes.
Up to DDR5 5600 MT/s ³	Delivers the latest, industry-leading innovation in memory capabilities for fast speeds, high bandwidth, and enhanced workflow productivity.
Up to DDR4 3200 MT/s	Continued support of existing memory technology and speeds.
L3 and L2 Cache	Increased shared Intel® Smart Cache (L3) and L2 cache sizes allow users to work faster, with larger datasets.
Intel® Deep Learning Boost	Accelerates AI inference to improve performance for deep learning workloads.
Gaussian & Neural Accelerator 3.0 (GNA 3.0)	Processes AI speech and audio applications such as neural noise cancellation while simultaneously freeing up CPU resources for overall system performance and responsiveness.
Intel® Adaptive Boost Technology	Intel® ABT improves performance by opportunistically allowing higher multi-core turbo frequencies, while operating within system power and temperature specifications when current, power, and thermal headroom exists.
Intel® Thermal Velocity Boost	Intel® Thermal Velocity Boost opportunistically and automatically increases clock frequency of select 13 th Gen Intel® Core desktop processors by up to 100 MHz if the processor is at a temperature of 70°C or lower and turbo power budget is available.
Intel® Turbo Boost Max Technology 3.0 ⁵	Identifies the processor's fastest cores and directs critical workloads to them.
Intel® UHD Graphics driven by X ^e Architecture ⁹	Rich media and intelligent graphics capabilities enable amplified visual complexity, enhanced 3D performance, and faster image processing.
Overclocking ⁵ Features and Capabilities	When paired with the Intel® Z790 or Z690 chipset, processor P-cores, E-cores, graphics, and memory can be set to run at frequencies above the processor specification resulting in higher performance.
Intel® Extreme Tuning Utility ⁷	A precision toolset for tuning and overclocking, featuring memory and hybrid processor overclocking, so that new and experienced users can get more from their unlocked processors. ⁶
Intel® Extreme Memory Profile 3.0	Simplifies the memory overclocking experience with increased flexibility, additional profiles, and expanded voltage controls.
Intel® Dynamic Memory Boost ⁸	Intelligent memory overclocking performance on-demand that optimizes platform performance based on usage.

13TH GEN INTEL® CORE DESKTOP PROCESSORS COMPARISON

	 Intel® Core™ i9K and i9KF	 Intel® Core™ i7K and i7KF	 Intel® Core™ i5K and i5KF
Max Turbo Frequency [GHz]	Up to 5.8	Up to 5.4	Up to 5.1
Intel® Turbo Boost Max Technology 3.0 Frequency [GHz]	Up to 5.7	Up to 5.4	n/a
Performance-core Max Turbo Frequency [GHz]	Up to 5.4	Up to 5.3	Up to 5.1
Efficient-core Max Turbo Frequency [GHz]	Up to 4.3	Up to 4.2	Up to 3.9
Performance-core Base Frequency [GHz]	3.0	3.4	3.5
Efficient-core Base Frequency [GHz]	2.2	2.5	2.6
Processor Cores (P-cores + E-cores)	24 (8P+16E)	16 (8P+8E)	14 (6P+8E)
Intel® Hyper-Threading Technology	Yes		
Total Processor Threads	32	24	20
Intel® Thread Director	Yes		
Intel® Smart Cache (L3) Size [MB]	36 MB	30 MB	24 MB
Total L2 Cache Size [MB]	32 MB	24 MB	20 MB
Max Memory Speed [MT/s]	DDR5-5600 DDR4-3200		
Number of Memory Channels	2		
CPU PCIe 5.0 Lanes	Up to 16		
CPU PCIe 4.0 Lanes	4		
Enhanced Intel® UHD Graphics driven by Xe Architecture	i9K: Intel® UHD Graphics 770 i9KF: no	i7K: Intel® UHD Graphics 770 i7KF: no	i5K: Intel® UHD Graphics 770 i5KF: no
Graphics Dynamic Frequency [MHz]	1650	1600	1550
Processor P-core / E-core / Graphics / Memory Overclocking	Yes		
Intel® Quick Sync Video	Yes		
Intel® Deep Learning Boost (Intel® DL Boost)	Yes		
Intel® Advanced Vector Extensions 2 (Intel® AVX2)	Yes		
Intel® Gaussian and Neural Accelerator (GNA)	Yes		

Product Brief 13th Gen Intel® Core™ Desktop Processors

Notices & Disclaimers

Performance varies by use, configuration and other factors. Learn more at www.intel.com/PerformanceIndex

Performance results are based on testing as of dates shown in configurations and may not reflect all publicly available updates. See backup for configuration details. No product or component can be absolutely secure.

Results have been estimated or simulated.

Altering clock frequency or voltage may void any product warranties and reduce stability, security, performance, and life of the processor and other components. Check with system and component manufacturers for details.

1. Increased cores from previous generation on the unlocked i9, i7, and i5 processors.
2. Performance hybrid architecture combines two core microarchitectures, Performance-cores (P-cores) and Efficient-cores (E-cores), on a single processor die first introduced on 12th Gen Intel Core processors. Select 13th Gen Intel Core processors do not have performance hybrid architecture, only P-cores, and have same cache size as prior generation; see ark.intel.com for sku details.
3. CPU PCIe 5.0 lanes are only validated for discrete graphics (x16) and PCIe storage (1x4). 1x16 bifurcation to 2x8 supported on select Intel® 600 and 700 Series chipsets.
4. Maximum memory speeds are associated with 1 DIMM per Channel (1DPC) configurations. Up to DDR5-5600 MT/s 1DPC UDIMM 1Rx8, 1Rx16 and DDR5-5200 1Rx8, 1Rx16, 2Rx8.
5. On select processor SKUs.
6. With Intel® Thermal Velocity Boost.
7. Available only on Intel® Core i9 processors and Intel® Core i7 processors.
8. Increased cores from previous generation on the unlocked i9, i7, and i5 processors.
9. Overclocking Disclaimer: Unlocked features are present with select chipsets and processor combinations. Altering clock frequency or voltage may void any product warranties and reduce stability, security, performance, and life of the processor and other components. Check with system and component manufacturers for details.
10. Users must download this app from intel.com.
11. This feature requires motherboard BIOS support. Please see your motherboard supplier for details.
12. Available only on 12th and 13th Gen Intel® Core processors featuring integrated graphics.
13. Best in Class wired and wireless connectivity with 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 802.12ax 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) 802.12ax PC Wi-Fi products, which only support the mandatory requirement of 80 MHz channels. Gigabit Wi-Fi Requirements: To achieve speed of over 1 Gbps requires Gig internet service, router/gateway with either Wi-Fi 6 or 12ac with 160 MHz channel support, and PC with Intel® Wireless 9260/9560 or Intel® Wi-Fi 6 (Gig+) AX200/AX201.
14. Built into the hardware, Intel® Thread Director is provided only in performance hybrid architecture configurations of 12th Gen or newer Intel® Core processors; OS enablement is required. Available features and functionality vary by OS.
15. With Intel® Thermal Velocity Boost.

