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[1]	Integrates two core microarchitectures into a single die, prioritizing and distributing workloads to optimize performance.
Intel® Thread Director[2]	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[10]	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[3,4]	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[3,4]	Intel® Thermal Velocity Boost opportunistically and automatically increases clock frequency of select 13th 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[3]	Identifies the processor's fastest cores and directs critical workloads to them.
Intel® UHD Graphics driven by Xe Architecture[7]	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[5]	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[2,11]	Intelligent memory overclocking performance on-demand that optimizes platform performance based on usage.

INTEL® CORE™ DESKTOP PROCESSORS COMPARISON

	Intel® Core i9 Processors	Intel® Core i7 Processors	Intel® Core i5 Processors	Intel® Core i3 Processors
Max Turbo Frequency [GHz]	Up to 6.0	Up to 5.6	Up to 5.3	Up to 4.7
Intel® Turbo Boost Max Technology 3.0 Frequency [GHz]	Up to 5.8	Up to 5.6	n/a	n/a
Performance-core Max Turbo Frequency [GHz]	Up to 5.6	Up to 5.5	Up to 5.1	Up to 4.7
Efficient-core Max Turbo Frequency [GHz]	Up to 4.4	Up to 4.3	Up to 3.9	n/a
Processor Cores (P-cores + E-cores)	24 (8P+16E)	20 (8P+12E)	14 (6P+8E)	4 (4P+0E)
Intel® Hyper-Threading Technology	Yes			
Total Processor Threads	32	28	20	8
Intel® Thread Director	Yes			No
Intel® Smart Cache (L3) Size [MB]	36	33	24	12
Total L2 Cache Size [MB]	32	28	20	5
Max Memory Speed [MT/s]	Up to DDR5-5600 DDR4-3200			DDR5 4800 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	i9: Intel® UHD Graphics 770 i9F: no	i7: Intel® UHD Graphics 770 i7F: no	i5: Intel® UHD Graphics 770 i5F: no	i3: Intel® UHD Graphics 730 i3F: no
Graphics Dynamic Frequency [MHz]	1650	1600	1550	1500
Processor P-core / E-core / Graphics / Memory Overclocking	Yes			No
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			