

12TH GEN INTEL® CORE™ DESKTOP PROCESSORS COMPARISONS

	Intel® Core™ i9-12900K 257292 / 257243 i9-12900KF ⁴ 257293 / 257242	Intel® Core™ i7-12700K 257294 / 257240 i7-12700KF ⁴ 257295 / 257241	Intel® Core™ i5-12600K 257296 / 257238 i5-12600KF ⁴ 257298 / 257239
Max Turbo Frequency [GHz]	Up to 5.2	Up to 5.0	Up to 4.9
Intel® Turbo Boost Max Technology 3.0 Frequency [GHz]	Up to 5.2	Up to 5.0	n/a
Single P-core Turbo Frequency [GHz]	Up to 5.1	Up to 4.9	Up to 4.9
Single E-core Turbo Frequency [GHz]	Up to 3.9	Up to 3.8	Up to 3.6
P-core Base Frequency [GHz]	3.2	3.6	3.7
E-core Base Frequency [GHz]	2.4	2.7	2.8
Processor Cores (P-cores + E-cores)	16 (8P + 8E)	12 (8P + 4E)	10 (6P + 4E)
Intel® Hyper-Threading Technology ⁵	Yes	Yes	Yes
Total Processor Threads	24	20	16
Intel® Thread Director ¹	Yes	Yes	Yes
Intel® Smart Cache (L3) Size [MB]	30	25	20
Total L2 Cache Size [MB]	14	12	9.5
Max Memory Speed [MT/s]	Up to DDR5 4800 Up to DDR4 3200	Up to DDR5 4800 Up to DDR4 3200	Up to DDR5 4800 Up to DDR4 3200
Number of Memory Channels	2	2	2
CPU PCIe 5.0 Lanes	16	16	16
CPU PCIe 4.0 Lanes	4	4	4
Enhanced Intel® UHD Graphics driven by Xe Architecture	Intel® UHD Graphics 770	Intel® UHD Graphics 770	Intel® UHD Graphics 770
Graphics Dynamic Frequency [MHz]	Up to 1550	Up to 1500	Up to 1450
Processor P-core/E-core/Graphics/Memory Overclocking ²	Yes	Yes	Yes
Intel® Quick Sync Video	Yes	Yes	Yes
Intel® Deep Learning Boost (Intel® DL Boost)	Yes	Yes	Yes
Intel® Advanced Vector Extensions 2 (Intel® AVX2)	Yes	Yes	Yes
Intel® Gaussian and Neural Accelerator (GNA) 3.0	Yes	Yes	Yes
Intel® Virtualization Technology (Intel® VT-x / VT-d)	Yes	Yes	Yes
Mode-based Execution Control (MBEC)	Yes	Yes	Yes
Intel® Threat Detection Technology (Intel® TDT)	Yes	Yes	Yes
Intel® Control-Flow Enforcement Technology (Intel® CET)	Yes	Yes	Yes
Intel® Advanced Encryption Standard New Instructions (Intel® AES-NI)	Yes	Yes	Yes
Intel® BIOS Guard	Yes	Yes	Yes
Intel® Boot Guard	Yes	Yes	Yes
Intel® OS Guard	Yes	Yes	Yes
Intel® Advanced Programmable Interrupt Controller Virtualization (Intel® APIC-v)	Yes	Yes	Yes
Intel® Secure Key	Yes	Yes	Yes
Intel® Platform Trust Technology (Intel® PTT)	Yes	Yes	Yes

¹Intel® Thread Director is designed into 12th Gen Intel® Core™ processors and helps supporting operating systems to more intelligently channel workloads to the right core. No user action required. See intel.com for details.

²Based on memory bandwidth results using Intel® Memory Latency Checker Tool v3.9a System A: Core i9-12900K on Asus Z690 TUF DDR4 Motherboard. 2x16GB G.Skill TridentZ 3200MHz CL14 RAM System B: Core i9-12900K on Asus Z690 Prime-P DDR5 Motherboard. 2x16GB SK.Hynix 4400MHz CL40 RAM.

³Altering 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.

⁴Processor names with an 'F' suffix do not have processor graphics and require a discrete graphics solution. Without processor graphics the processor display output ports will not function.

⁵Intel® Hyper-Threading Technology is only available on P-cores.