

12th Gen Intel® Core™ Mobile Processors— H-Series

Gaming and creation power



Unrivaled mobile performance¹

Performance hybrid design



World's best mobile gaming platform²

Ultimate gameplay on a laptop—low latency Wi-Fi 6E³



Built for content creators

Blazing fast video editing, 3D modeling, and rendering



12th Gen Intel Core Mobile Processors—H-Series

12th Gen Intel Core Mobile Processor	Processor cores	Processor threads	Number of P-cores ⁴	Number of E-cores ⁴	Intel Smart Cache	Maximum turbo frequency (GHz) ⁵		Base frequency (GHz) ⁵		Processor graphics	Max graphics frequency (GHz)	Compare to this processor
						P-core	E-core	P-core	E-core			
i9-12900HK	14	20	6	8	24 MB	5.0	3.8	2.5	1.8	96 EU	1.45	AMD Ryzen 9 6900HX
i9-12900H	14	20	6	8	24 MB	5.0	3.8	2.5	1.8	96 EU	1.45	AMD Ryzen 9 6900HX
i7-12800H	14	20	6	8	24 MB	4.8	3.7	2.4	1.8	96 EU	1.4	AMD Ryzen 9 6900HX
i7-12700H	14	20	6	8	24 MB	4.7	3.5	2.3	1.7	96 EU	1.4	AMD Ryzen 9 6900HX
i7-12650H	10	16	6	4	24 MB	4.7	3.5	2.3	1.7	64 EU	1.4	AMD Ryzen 7 6800H
i5-12600H	12	16	4	8	18 MB	4.5	3.3	2.7	2.0	80 EU	1.4	AMD Ryzen 7 6800H
i5-12500H	12	16	4	8	18 MB	4.5	3.3	2.7	2.0	80 EU	1.4	AMD Ryzen 7 6800H

AAA Gaming⁶

12th Gen Intel Core i9 H-Series

The Intel Core i9-12900HK processor delivers higher performance across six games compared to the Intel Core i9-11980HK processor



up to
22%
higher average frames per second (FPS) *The Riftbreaker*

up to
21%
higher average FPS *Tom Clancy's Rainbow Six Siege*

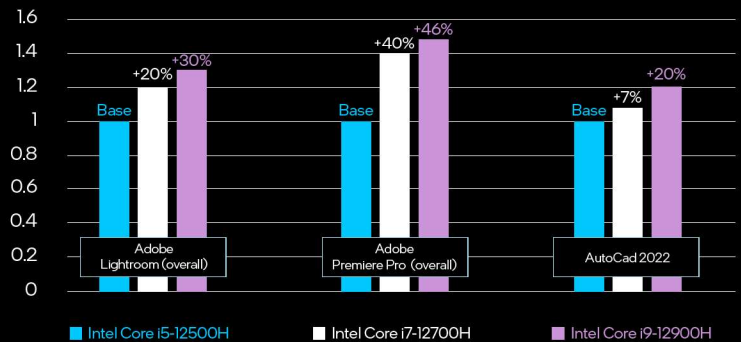
up to
30%
higher average FPS *Hitman 3: Dartmoor*

up to
16%
higher average FPS *Far Cry 6*

up to
8%
higher average FPS *Forza Horizon 5*

up to
3%
higher average FPS *Total War: Warhammer III*

12th Gen Intel Core i5-12500H vs. 12th Gen Intel Core i7-12700H vs. 12th Gen Intel Core i9-12900H⁷



Workloads

Testing by Intel as of 4/28/2022

Measured average frames per second at 1080p High settings for the title The Riftbreaker.
Measured average frames per second at 1080p High settings for the title Tom Clancy's Rainbow Six Siege.
Measured average frames per second at 1080p High settings for the title Hitman 3: Dartmoor.
Measured average frames per second at 1080p High settings for the title Far Cry 6.
Measured average frames per second at 1080p High settings for the title Forza Horizon 5.
Measured average frames per second at 1080p High settings for the title Total War: Warhammer III.

PugetBench for Adobe Premiere Pro is a video editing performance measurement benchmark developed by Puget Systems and is a part of Content creation benchmark suite. The benchmark can be accessed from: <https://www.pugetsystems.com/labs/articles/PugetBench-for-Premiere-Pro-1519/>

PugetBench for Adobe Lightroom Classic is a photo editing performance measurement benchmark developed by Puget Systems and is a part of Content creation benchmark suite. The benchmark can be accessed from: <https://www.pugetsystems.com/labs/articles/Puget-Bench-for-Lightroom-Classic-1571/>

The Cadalyst 2015 v5.5 - Autodesk AutoCad 2022.1.2 v162.0 benchmark is designed to help evaluate and compare the performance of PCs running AutoCAD. The Cadalyst Systems Benchmark reports a total index score and four component index scores keyed to specific performance areas, as well as individual numbers for each subroutine of the test. Note: the index numbers are simply a ratio of the base time for an operation compared to the current test time for an operation. Larger index numbers indicate better performance.

Configurations

Processor: Intel Core i5-12500H (up to 4.8 GHz, 4 cores, 8 threads); tested on reference platform; memory: 32 GB LPDDR5, 5,200 MHz; storage: 512 GB Samsung SSD; display resolution: 1920x1080; PC BIOS: 2021; OS: Windows 11 Enterprise v.9/.0.10/2./6; Intel® Iris™ Xe graphics, GFX driver version: 30.0.101.1298; power mode: best performance (balanced plan).

Processor: Intel Core i7-12700H (up to 4.7 GHz, 6 cores, 8 E-cores); tested on reference platform; memory: 16 GB LPDDR4, 5,200 MHz; storage: 512 GB Samsung SSD; display resolution: 2880x1800; PC BIOS: 304; OS: Windows 11 21H2; Intel Iris Xe graphics, GFX driver version: 30.0.101.1369; power mode: best performance (balanced plan).

Processor: Intel Core i9-12900H (up to 5.0 GHz, 6 P-cores, 8 E-cores); tested on reference platform; memory: 16 GB LPDDR5, 4,800 MHz; storage: 512 GB Samsung SSD; display resolution: 2880x1800; PC BIOS: 304; OS: Windows 11 21H2; Intel Iris Xe graphics, GFX driver version: 30.0.101.1369; power mode: best performance (balanced plan).

Processor: Intel Core i9-12900HX (up to 5 GHz, 8 performance-cores, 8 efficient-cores, 24 threads); tested on a pre-production OEM design; memory: 4 x 16 GB DDR5, 4,800 Mhz; storage: Samsung 980 Pro 1 TB; display resolution: 1920x1080; OS: Windows 11 Pro (OS build 22000.593); Edge version: v95.0.1020.53; graphics card: NVIDIA RTX 3080Ti; graphics driver: 30.0.15.1215; max GFX power: 175W; BIOS version: E17Q1IMS.00F; GPU mode: hybrid; power plan set to balanced; power mode: best performance; OEM power application (MSI Center) set to MSI Center: "Extreme performance"; VBS enabled, Defender enabled, and Tamper Protection enabled.

Processor: Intel Core i9-11980HK (up to 5 GHz, 8 cores, 16 threads); system: MSI GE76; memory: 2 x 32 GB DDR4, 3,200 MHz; storage: Samsung 980 Pro 1 TB; display resolution: 1920x1080; OS: Windows 11 Home (OS build 22000.593); graphics card: NVIDIA RTX 3080Ti; graphics driver: 30.0.15.1215; max GFX power: 165W, BIOS Version: E17K3IMS.11D; GPU mode: hybrid; power plan set to balanced; power mode: best performance; OEM power application (MSI Center) set to MSI Center: "Extreme performance"; VBS enabled, Defender enabled, and Tamper Protection enabled.

¹ Based on performance estimated with measurements on 12th Generation Intel Core i9-12900HX processors with RTX 3080Ti against Intel Core i9-11980HK processors with RTX 3080, Intel Core i9-12900HK processors with RTX 3080Ti, AMD Ryzen 9 6900HX processors with RTX 3060Ti, AMD Ryzen 9 6900HS processors with Radeon 6700S, Intel Core i7-12700H processors with RTX 3050Ti and Apple M1 Max MacBook Pro processors with 32 core integrated GPU. Best available compilers selected for all processors. Binaries compiled with ICC for Intel/AMD, binaries compiled with Xcode 13.1 for Apple. The metric used is the geometric mean of C/C++ integer benchmarks in SPEC^{int}_rate_base2017 2021.2 LLVM (1-copy) and SPEC^{int}_rate_base2017 2021.2 LLVM (n-copy). April 28, 2022. See www.intel.com/PerformanceIndex for additional workload and configuration details. Results may vary. Other names and brands may be claimed as the property of others.

² World's best mobile gaming platform. As measured by unique features and superior in-game benchmark mode performance of 12th Gen Intel Core i9-12900HK with NVIDIA RTX 3080 GPU vs. 11th Gen Intel Core i9-11980HK with same GPU and vs. AMD R9-5900HX with same GPU. Configurations for all systems include Windows 11 21H2 (OS Build 22000.282) and 1920 x 1080 resolution – high quality graphics preset. See www.intel.com/PerformanceIndex for additional workload and configuration details. Results may vary. Other names and brands may be claimed as the property of others.

³ Wi-Fi 6E usage subject to 6 GHz band availability, operating system support, and router compatibility. Details at www.intel.com/performanceindex (connectivity).

⁴ Performance hybrid architecture combines two core microarchitectures, Performance-cores (P-cores) and Efficient-cores (E-cores), on a single processor die.

Select 12th Gen Intel Core processors (certain 12th Gen Intel Core i5 processors and lower) do not have performance hybrid architecture, only P-cores.

⁵ The frequency of cores and core types varies by workload, power consumption, and other factors. Visit www.intel.com/content/www/us/en/architecture-and-technology/turbo-boost/turbo-boost-technology.html for more information.

⁶ Based on superior performance of the 12th Gen Intel Core i9-12900HK processor on the majority of the 31 game titles tested as measured by frames per second on similarly configured systems with 11th Gen Intel Core i9-11980HK processors. See www.intel.com/PerformanceIndex for additional details.

⁷ Based on the superior performance of the 12th Gen Intel Core i9-12900HK processor on similarly configured systems with 11th Gen Intel Core i9-11980HK processors. See www.intel.com/PerformanceIndex for additional details.

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 configuration disclosure for additional details.

No product or component can be absolutely secure.

Your costs and results may vary.

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