12th Gen Intel® Core™ HX Processors
May 10, 2022
Expanding

12th Gen Intel Core Mobile Processor Family

H-series
Enthusiast
55W

P-series
Performance Thin & Light
45W

U-series
Modern Thin & Light
28W

15W
9W

Scalable Architecture For All Laptop Segments
Introducing

12th Gen Intel® Core™ HX Processors

Unrivaled Mobile Performance

World’s Best Mobile Workstation Platform

Built for Engineers, Scientists & Enthusiasts

1 - Source: Intel. Based on performance estimated with measurements on 12th Gen Intel Core i9-12900HX with RTX 3080Ti against Intel Core i9-11980HK with RTX 3080, Intel Core i9-12900HK with RTX 3080Ti, AMD Ryzen 9 6900HX with RTX 3060, AMD Ryzen 9 6900HS with Radeon 6700S, Intel Core i7-12700H with RTX 3050Ti and Apple M1 Max MacBook Pro 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).

2 - Source: Intel. Based on unique features and estimates derived from SPECworkstation™ v3.1 CPU Scores: Media and Entertainment, product development, life sciences, financial services and energy measurements on 12th Gen Intel Core i9-12900HX with RTX 3080Ti vs 11th Gen Intel Core i9-11980HK with RTX 3080, vs 12th Gen Intel Core i9-12900HK with RTX 3080Ti and AMD Ryzen R9 6900HX with RTX 3060. OS: Win 11.

For all workload and configuration details, see www.intel.com/PerformanceIndex. Results may vary.
12th Gen Intel Core HX Processors

Desktop-caliber technology in a mobile package

45 x 37.5 x 4.4mm LGA package

45 x 37.5 x 2.0 mm BGA package

for the world’s most advanced mobile workstations
**Key Features**

12th Gen Intel® Core™ HX Platform

**CPU**
- 8P+8E
- 32EU

**New Core Architecture**
- Up to 16-core: 8 P-cores + 8 E-cores
- Intel® Thread Director
- Overclocking support on all SKUs

**Broad Memory Support**
- Support for DDR4-3200 and DDR5-4800
- Up to 128GB (4 DIMM, 2DPC)
- Error Correcting Code (ECC)*

**Advanced PCI Express**
- Support for PCIe Gen5 (x16 or 2x8)
- Up to 4x SSDs
- Up to 2x discrete Thunderbolt Controllers

*Optional Error Correcting Code (ECC) Memory only on select SKUs
For engineers, data scientists, and other in-field professionals

Intel-based Mobile Workstation

Pro Performance
- 12th Gen Intel® Core™ HX Processors – up to 16-core
- Support for DDR5 2DPC – up to 128GB
- PCIe Gen5 – up to 2X faster

Data Integrity
- Error Correcting Code (ECC) memory*
- RAID 1, 0, and 5 for data redundancy or speed

Certified Software
- Ensuring stability and compatibility with applications such as AutoCAD, Revit, and Premier Pro through OEM platform certifications

*Error Correcting Code (ECC) Memory only on select SKUs
At 40 Gbps, Thunderbolt™ 4 delivers the best—the fastest, simplest and most reliable—cable solution. See [www.intel.com/PerformanceIndex (Connectivity)] for details. Results may vary.

*Error Correcting Code (ECC) Memory only on select SKU's
12th Gen Intel Core HX Processors

Unrivaled Mobile Performance

Single Thread Performance
SPECint®_rate_base2017IC 2021.2 (t-copy estimated)

- Core i9-12900HX: +17% performance
- Core i9-12900HK
- Core i9-11980HK: baseline
- Ryzen R9-6900HX
- M1 Max

Multi Thread Performance
SPECint®_rate_base2017IC 2021.2 (n-copy estimated)

- Core i9-12900HX: +64% performance
- Core i9-12900HK
- Core i9-11980HK: baseline
- Ryzen R9-6900HX
- M1 Max

For all workload and configuration details, see www.intel.com/PerformanceIndex. Results may vary.
12th Gen Intel Core HX Processors

Unrivaled Mobile Performance

3D Rendering Performance
Blender 3.12 – Car Demo – Time (lower is better)

- Core i9-12900HX: +81% performance
- Core i9-12900HK
- Core i7-12700H
- Ryzen R9-6900HX
- Ryzen R9-6900HS
- Core i9-11980HK: baseline
- M1 Max

CrossMark Performance
Creativity Scenario (higher is better)

- Core i9-12900HX: +33% performance
- Core i9-12900HK
- M1 Max
- Core i7-12700H
- Ryzen R9-6900HX
- Ryzen R9-6900HS
- Core i9-11980HK: baseline

For all workload and configuration details, including Blender & CrossMark results, see www.intel.com/PerformanceIndex. Results may vary.
12th Gen Intel Core HX Processors

Professional-Grade Performance

AUTODESK AutoCAD
Cadalyst - Total Index

Core i9-12900HX  +12% performance
Core i9-12900HK
Core i9-11980HK
Ryzen R9 6900HX
macOS – Will not run

AUTODESK Revit
Model Creation – Total Score in Time (lower is better)

Core i9-12900HX  +28% performance
Core i9-12900HK
Core i9-11980HK
Ryzen R9-6900HX
macOS – Will not run

AUTODESK Inventor
InvMark – Overall Score (higher is better)

Core i9-12900HX  +21% performance
Core i9-12900HK
Core i9-11980HK
Ryzen R9-6900HX
macOS – Will not run

Measured on best available configurations at time of testing. Specific system features and thermal capabilities vary. For workload and configuration details, see www.intel.com/PerformanceIndex. Results may vary.
12th Gen Intel Core HX Processors

**Professional-Grade Performance**

SPECworkstation* 3.1 – CPU tests only

- Core i9-11980HK
- Ryzen R9-6900HX
- Core i9-12900HK
- Core i9-12900HX
- macOS: SPECworkstation not supported

**Media & Entertainment**
- Blender
- Handbrake
- Lux Render

**Product Development**
- Rodinia
- WPCcfd
- CalculiX

**Life Sciences**
- LAMMPS
- NAMD
- Rodinia

**Financial Services**
- Monte Carlo
- Black-Scholes
- Binomial Options

**Energy**
- FFTW
- Convolution
- SRMP
- Kirchhoff Migration
- Poisson

Measured on best available configurations at time of testing. Specific system features and thermal capabilities may vary. For workload and configuration details, see www.intel.com/PerformanceIndex. Results may vary.
12th Gen Intel Core HX Processors

Incredible Mobile Gaming Performance

Up to **128fps**
Far Cry 6

Up to **149fps**
Forza Horizon 5

Up to **151fps**
Hitman 3: Dartmoore

Up to **142fps**
The Riftbreaker

Up to **472fps**
Tom Clancy’s Rainbow Six Siege

Up to **114fps**
Total War: Warhammer III - Battle

12th Gen Intel® Core™ i9-12900HX
With RTX 3080 Ti – 64GB DDR5-4800

For workload and configuration details, see [www.intel.com/PerformanceIndex](http://www.intel.com/PerformanceIndex). Results may vary. Framerates reported as averages.
12th Gen Intel Core HX Processors

Powerful Multitasking for Creative Professionals

**Foreground**

Unreal Engine 5.0

*Update Texture and Bake Lights for the Scene*
Update the blend mode of a character’s texture, then build the lighting in the scene for a visual check.

- >4X faster
- 79% less time

**Background**

*CPU 3D Render*
Local CPU video render of a game asset for team assessment and approval.

- Core i9-12900HX: 1.7X faster
  - 41% less time

For workload and configuration details, see www.intel.com/PerformanceIndex. Results may vary.
12th Gen Intel Core HX Processors

Memory & Core Overclocking

Memory Overclocking
- DDR5 Overclocking, in addition to DDR4
- Intel® XMP 3.0 support for DDR5
- New Intel® Dynamic Memory Boost feature

Core Overclocking
- New Efficient-core overclocking
- Updated Intel® Speed Optimizer
- Enhanced Intel® Extreme Tuning Utility
12th Gen Intel Core HX Processors

Mobile Workstation and Gaming Laptops

- HP Omen 17
- ASUS ROG Strix Scar 17 SE
- ExpertBook B6
- GIGABYTE Aorus 17X/15X
- MSI GT77 Titan
- MSI GE77/67 Raider
- DELL Precision 7670/7770
- Lenovo Legion 7i

...And More to Come
For Mobile Workstations and Gaming Laptops

12th Gen Intel® Core™ HX Processors

<table>
<thead>
<tr>
<th>Processor Number</th>
<th>Processor Cores</th>
<th>Processor Threads</th>
<th>Performance Cores</th>
<th>Efficient Cores</th>
<th>L3 Cache</th>
<th>Max Turbo Frequency P-cores</th>
<th>Max Turbo Frequency E-cores</th>
<th>Base Frequency P-cores</th>
<th>Base Frequency E-cores</th>
<th>Processor Graphics</th>
<th>Max Graphics Frequency</th>
<th>Processor Base Power</th>
<th>Max Turbo Power</th>
<th>Intel vPro®</th>
<th>ECC</th>
<th>Over Clock</th>
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<tbody>
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<td>i9-12950HX</td>
<td>16C</td>
<td>24T</td>
<td>8P</td>
<td>8E</td>
<td>30 MB</td>
<td>5.0 GHz</td>
<td>3.6 GHz</td>
<td>2.3 GHz</td>
<td>1.7 GHz</td>
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Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. The frequency of cores and core types varies by workload, power consumption and other factors. Visit https://www.intel.com/content/www/us/en/architecture-and-technology/turbo-boost/turbo-boost-technology.html for more information. Max Turbo Frequency for P-cores may include Intel Turbo Boost Max 3.0.

All SKUs listed above support up to DDR5 (4800 MT/S)/DDR4 (3200 MT/S) memory. See ark.intel.com for more specification details.
Notice and 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 configuration disclosure for details. No product or component can be absolutely secure. Your costs and results may vary.

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

Built into the hardware, Intel® Thread Director is provided only in performance hybrid architecture configurations of 12th Gen Intel® Core™ processors; OS enablement is required. Available features and functionality vary by OS.

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Thank You