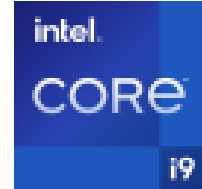


# Intel® Core™ i9-12900 Processor

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[intel ark.intel.com/content/www/us/en/ark/products/134597/intel-core-i9-12900-processor-30m-cache-up-to-5-10-ghz.html](https://ark.intel.com/content/www/us/en/ark/products/134597/intel-core-i9-12900-processor-30m-cache-up-to-5-10-ghz.html)

30M Cache, up to 5.10 GHz



## Essentials

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- Product Collection [12th Generation Intel® Core™ i9 Processors](#)
- Processor Number [i9-12900](#)

## CPU Specifications

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- [Total Cores](#) 16
- # of Performance-cores 8
- # of Efficient-cores 8
- [Total Threads](#) 24
- [Max Turbo Frequency](#) 5.10 GHz
- [Intel® Turbo Boost Max Technology 3.0 Frequency](#)<sup>‡</sup> 5.10 GHz
- [Performance-core Max Turbo Frequency](#) 5.00 GHz
- [Efficient-core Max Turbo Frequency](#) 3.80 GHz
- Performance-core Base Frequency 2.40 GHz
- Efficient-core Base Frequency 1.80 GHz
- [Cache](#) 30 MB Intel® Smart Cache
- Total L2 Cache 14 MB
- [Processor Base Power](#) 65 W
- [Maximum Turbo Power](#) 202 W

## Memory Specifications

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- [Max Memory Size \(dependent on memory type\)](#) 128 GB
- [Memory Types](#) Up to DDR5 4800 MT/s  
Up to DDR4 3200 MT/s
- [Max # of Memory Channels](#) 2
- [Max Memory Bandwidth](#) 76.8 GB/s
- [ECC Memory Supported](#)<sup>‡</sup> Yes

## Processor Graphics

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- Processor Graphics ‡ Intel® UHD Graphics 770
- Graphics Base Frequency 300 MHz
- Graphics Max Dynamic Frequency 1.55 GHz
- Graphics Output eDP 1.4b, DP 1.4a, HDMI 2.1
- Execution Units 32
- Max Resolution (HDMI)‡ 4096 x 2160 @ 60Hz
- Max Resolution (DP)‡ 7680 x 4320 @ 60Hz
- Max Resolution (eDP - Integrated Flat Panel)‡ 5120 x 3200 @ 120Hz
- DirectX\* Support 12
- OpenGL\* Support 4.5
- OpenCL\* Support 3.0
- Multi-Format Codec Engines 2
- Intel® Quick Sync Video Yes
- Intel® Clear Video HD Technology Yes
- # of Displays Supported † 4
- Device ID 0x4680

## Expansion Options

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- Direct Media Interface (DMI) Revision 4.0
- Max # of DMI Lanes 8
- Scalability 1S Only
- PCI Express Revision 5.0 and 4.0
- PCI Express Configurations ‡ Up to 1x16+4, 2x8+4
- Max # of PCI Express Lanes 20

## Advanced Technologies

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- Intel® Gaussian & Neural Accelerator 3.0
- Intel® Thread Director Yes
- Intel® Deep Learning Boost (Intel® DL Boost) Yes
- Intel® Optane™ Memory Supported ‡ Yes
- Intel® Speed Shift Technology Yes
- Intel® Turbo Boost Max Technology 3.0 ‡ Yes
- Intel® Turbo Boost Technology ‡ 2.0
- Intel® Hyper-Threading Technology ‡ Yes
- Intel® 64 ‡ Yes
- Instruction Set 64-bit
- Instruction Set Extensions Intel® SSE4.1, Intel® SSE4.2, Intel® AVX2
- Idle States Yes
- Enhanced Intel SpeedStep® Technology Yes
- Thermal Monitoring Technologies Yes
- Intel® Volume Management Device (VMD) Yes

## Security & Reliability

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- Intel vPro® Eligibility‡ Intel vPro® Enterprise, Intel vPro® Essentials
- Intel® Threat Detection Technology (TDT) Yes
- Intel® Active Management Technology (AMT)‡ Yes
- Intel® Standard Manageability (ISM)‡ Yes
- Intel® One-Click Recovery † Yes
- Intel® Hardware Shield Eligibility‡ Yes
- Intel® Control-Flow Enforcement Technology Yes
- Intel® Total Memory Encryption - Multi Key Yes
- Intel® Total Memory Encryption Yes
- Intel® AES New Instructions Yes
- Secure Key Yes
- Intel® OS Guard Yes
- Intel® Trusted Execution Technology‡ Yes
- Execute Disable Bit ‡ Yes
- Intel® Boot Guard Yes
- Mode-based Execute Control (MBEC) Yes
- Intel® Stable IT Platform Program (SIPP) Yes
- Intel® Virtualization Technology with Redirect Protection (VT-rp) † Yes
- Intel® Virtualization Technology (VT-x)‡ Yes
- Intel® Virtualization Technology for Directed I/O (VT-d)‡ Yes
- Intel® VT-x with Extended Page Tables (EPT)‡ Yes