

# Intel® Core™ i9-12900 Processor

30M Cache, up to 5.10 GHz

<b>Product Collection</b>	12th Generation Intel® Core™ i9 Processors
<b>Code Name</b>	Products formerly Alder Lake
<b>Vertical Segment</b>	Desktop
<b>Processor Number</b>	i9-12900
<b>Status</b>	Launched
<b>Launch Date</b>	Q1'22
<b>Lithography</b>	Intel 7
<b>Use Conditions</b>	PC/Client/Tablet, Workstation
<b>Recommended Customer Price</b>	\$538.00 - \$568.00

## CPU Specifications

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 †	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

## Supplemental Information

Embedded Options Available	Yes
<a href="#">Datasheet</a> View now	

## Memory Specifications

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 †	Yes

## Processor Graphics

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

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

## Package Specifications

Sockets Supported	FCLGA1700
Max CPU Configuration	1
Thermal Solution Specification	PCG 2020C

$T_{\text{JUNCTION}}$	100°C
Package Size	45.0 mm x 37.5 mm

## Advanced Technologies

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

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

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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