



# Intel® Core™ i9-12900E Processor

30M Cache, up to 5.00 GHz

Spec Code

SRL6B

Ordering Code

CM8071504619020

Intel® Core™ i9-12900E Processor (30M Cache- up to 5.00 GHz)	
Essentials	
Product Collection	12th Generation Intel® Core™ i9 Processors
Code Name	Products formerly Alder Lake
Vertical Segment	Embedded
Processor Number	i9-12900E
Status	Launched
Launch Date	Q1'22
Lithography	Intel 7
Use Conditions	Embedded Broad Market Commercial Temp
Recommended Customer Price	494
CPU Specifications	
Total Cores	16
# of Performance-cores	8
# of Efficient-cores	8
Total Threads	24
Max Turbo Frequency	5.00 GHz
Intel® Turbo Boost Technology 2.0 Frequency‡	5.00 GHz
Performance-core Max Turbo Frequency	5.00 GHz
Efficient-core Max Turbo Frequency	3.80 GHz
Performance-core Base Frequency	2.30 GHz
Efficient-core Base Frequency	1.70 GHz
Cache	30 MB Intel® Smart Cache
Total L2 Cache	14 MB
Processor Base Power	65 W
Supplemental Information	
Embedded Options Available	Yes
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
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
Multi-Format Codec Engines	2
Intel® Quick Sync Video	Yes
Intel® Clear Video HD Technology	Yes
# of Displays Supported ‡	4
Device ID	0x4680
OpenCL* Support	2.1
Expansion Options	
Direct Media Interface (DMI) Revision	4
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
TJUNCTION	100°C
Package Size	45.0 mm x 37.5 mm
Advanced Technologies	
Intel® Gaussian & Neural Accelerator	3
Intel® Thread Director	Yes
Intel® Deep Learning Boost (Intel® DL Boost)	Yes
Intel® Optane™ Memory Supported ‡	No
Intel® Speed Shift Technology	Yes
Intel® Turbo Boost Max Technology 3.0 ‡	No
Intel® Turbo Boost Technology ‡	2
Intel® Hyper-Threading Technology ‡	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
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® AES New Instructions	Yes
Secure Key	Yes
Intel® OS Guard	Yes
Execute Disable Bit ‡	Yes
Intel® Boot Guard	Yes
Mode-based Execute Control (MBEC)	Yes
Intel® Control-Flow Enforcement Technology	Yes