Intel Core i9-12900KS processor

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Intel	

Intel® Gaussian & Neural Accelerator
Intel® Gaussian & Neural Accelerator (GNA) is an ultra-low power accelerator block designed to run audio and speed-centric AI workloads. Intel® GNA is designed to run audio based neural networks at ultra-low power, while simultaneously relieving the CPU of this workload.

Intel® Deep Learning Boost (Intel® DL Boost)
A new set of embedded processor technologies designed to accelerate AI deep learning use cases. It extends Intel AVX-512 with a new Vector Neural Network Instruction (VNNI) that significantly increases deep learning inference performance over previous generations.

Intel® Optane™ Memory Supported
Intel® Optane™ memory is a revolutionary new class of non-volatile memory that sits in between system memory and storage to accelerate system performance and responsiveness. When combined with the Intel® Rapid Storage Technology Driver, it seamlessly manages multiple tiers of storage while presenting one virtual drive to the OS, ensuring that data frequently used resides on the fastest tier of storage. Intel® Optane™ memory requires specific hardware and software configuration. Visit www.intel.com/OptaneMemory for configuration requirements.

Intel® Speed Shift Technology
Intel® Speed Shift Technology uses hardware-controlled P-states to deliver dramatically quicker responsiveness with single-threaded, transient (short duration) workloads, such as web browsing, by allowing the processor to more quickly select its best operating frequency and voltage for optimal performance and power efficiency.

Zusammenfassung

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Intel Core i9-12900KS, Intel® Core™ i9, LGA 1700, Intel, i9-12900KS, 64-bit, 12th gen Intel® Core™ i9

Intel Core i9-12900KS. Processor family: Intel® Core™ i9, Processor socket: LGA 1700, Processor manufacturer: Intel. Memory channels: Dual-channel, Maximum internal memory supported by processor: 128 GB, Memory types supported by processor: DDR4-SDRAM, DDR5-SDRAM. On-board graphics card model: Intel UHD Graphics 770, On-board graphics card outputs supported: Embedded DisplayPort (eDP) 1.4b, DisplayPort 1.4a, HDMI 2.1, On-board graphics card base frequency: 300 MHz. Market segment: Desktop, Use conditions: PC/Client/Tablet, PCI Express slots version: 4.0, 5.0. Intel® Turbo Boost Max Technology 3.0 frequency: 5.3 GHz, Intel® Thermal Velocity Boost Temperature: 50 °C, Intel® Thermal Velocity Boost Frequency: 5.5 GHz

Merkmale

Logistics data

Harmonized System (HS) code	85423119

Operational conditions

Tjunction	90 °C

Packaging data

Package type	Retail box

Weight & dimensions

Processor package size	45 x 37.5 mm

Other features

L2 cache	14336 KB
Maximum internal memory	128 GB
Graphics output	eDP 1.4b, DP 1.4a, HDMI 2.1

Technical details

Target market	Gaming, Content Creation
OpenCL version	2.1
Launch date	Q1'22
Status	Launched

Memory

Maximum internal memory supported by processor	128 GB
Memory types supported by processor	DDR4-SDRAM, DDR5-SDRAM
Memory channels	Dual-channel
ECC	Y
Memory bandwidth (max)	76.8 GB/s

Features

Execute Disable Bit	Y
Idle States	Y
Thermal Monitoring Technologies	Y
Market segment	Desktop
Use conditions	PC/Client/Tablet
Maximum number of PCI Express lanes	20
PCI Express slots version	4.0, 5.0
PCI Express configurations	1x16+1x4, 2x8+1x4
Supported instruction sets	SSE4.1, SSE4.2, AVX 2.0
Scalability	1S
CPU configuration (max)	1
Embedded options available	N
Direct Media Interface (DMI) Revision	4.0
Export Control Classification Number (ECCN)	5A992CN3
Commodity Classification Automated Tracking System (CCATS)	G167599

Graphics

On-board graphics card	Y
Discrete graphics card	N
On-board graphics card model	Intel UHD Graphics 770
On-board graphics card outputs supported	Embedded DisplayPort (eDP) 1.4b, DisplayPort 1.4a, HDMI 2.1
On-board graphics card base	300 MHz

frequency	
On-board graphics card dynamic frequency (max)	1550 MHz
Number of displays supported (on-board graphics)	4
On-board graphics card DirectX version	12.0
On-board graphics card OpenGL version	4.5
On-board graphics card maximum resolution (DisplayPort)	7680 x 4320 pixels
On-board graphics card maximum resolution (eDP - Integrated Flat Panel)	5120 x 3200 pixels
On-board graphics card maximum resolution (HDMI)	4096 x 2160 pixels
On-board graphics card refresh rate at maximum resolution (DisplayPort)	60 Hz
On-board graphics card refresh rate at maximum resolution (eDP - Integrated Flat Panel)	120 Hz
On-board graphics card refresh rate at maximum resolution (HDMI)	60 Hz
On-board graphics card ID	0x4680
Discrete graphics card model	Not available
Number of execution units	32
Multi-Format Codec Engines	2

Processor

Processor manufacturer	Intel
Processor generation	12th gen Intel® Core™ i9
Processor model	i9-12900KS
Processor family	Intel® Core™ i9
Processor cores	16
Processor socket	LGA 1700
Processor threads	24
Processor operating modes	64-bit
Performance cores	8
Efficient cores	8
Processor boost frequency	5.5 GHz
Performance-core boost frequency	5.2 GHz
Performance-core base frequency	3.4 GHz
Efficient-core boost frequency	4 GHz
Efficient-core base frequency	2.5 GHz
Processor cache	30 MB
Processor cache type	Smart Cache
Processor base power	150 W
Maximum turbo power	241 W
Bus type	DMI4
Maximum number of DMI lanes	8
Memory bandwidth supported by processor (max)	76.8 GB/s
Processor codename	Alder Lake
Processor ARK ID	225916

Processor special features

Intel® Hyper Threading Technology (Intel® HT Technology)	Y
Intel® Turbo Boost Technology	2.0
Intel® Quick Sync Video Technology	Y
Intel® Clear Video HD Technology (Intel® CVT HD)	Y
Intel® AES New Instructions (Intel® AES-NI)	Y
Enhanced Intel SpeedStep Technology	Y
Intel Trusted Execution Technology	Y
Intel® Speed Shift Technology	Y
Intel® Thermal Velocity Boost	Y
Intel® Adaptive Boost Technology	Y
Intel® Turbo Boost Max Technology 3.0 frequency	5.3 GHz
Intel® Total Memory Encryption	Y
Intel® Gaussian & Neural Accelerator (Intel® GNA) 3.0	Y
Intel® Thermal Velocity Boost Temperature	50 °C
Intel® Thermal Velocity Boost Frequency	5.5 GHz
Intel® Control-flow Enforcement Technology (CET)	Y
Intel® Thread Director	Y
Intel VT-x with Extended Page Tables (EPT)	Y
Intel® Secure Key	Y
Intel® Active Management Technology (Intel® AMT)	Y
Intel® OS Guard	Y
Intel 64	Y
Intel Virtualization Technology (VT-x)	Y
Intel Virtualization Technology for Directed I/O (VT-d)	Y
Intel Turbo Boost Max Technology 3.0	Y
Intel® Optane™ Memory Ready	Y
Intel® Boot Guard	Y
Intel® Deep Learning Boost (Intel® DL Boost)	Y
Intel® Volume Management Device (VMD)	Y
Mode-based Execute Control (MBE)	Y
Intel® vPro™ Platform Eligibility	Y
Intel® Standard Manageability (ISM)	Y
Intel® One-Click Recovery	Y
Intel® Virtualization Technology with Redirect Protection (VT-rp)	Y
Intel vPro® Enterprise Platform Eligibility	Y
Intel® Threat Detection Technology (TDT)	Y
Intel® Hardware Shield Eligibility	Y
Intel® Total Memory Encryption - Multi Key	Y