Intel Core i9-13900KF 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® 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.

Intel® Turbo Boost Technology
Intel® Turbo Boost Technology dynamically increases the processor's frequency as needed by taking advantage of thermal and power headroom to give you a burst of speed when you need it, and increased energy efficiency when you don’t.

Intel® Hyper-Threading Technology
Intel® Hyper-Threading Technology (Intel® HT Technology) delivers two processing threads per physical core. Highly threaded applications can get more work done in parallel, completing tasks sooner.

Intel® 64
Intel® 64 architecture delivers 64-bit computing on server, workstation, desktop and mobile platforms when combined with supporting software.[1] Intel 64 architecture improves performance by allowing systems to address more than 4 GB of both virtual and physical memory.

Instruction Set
An instruction set refers to the basic set of commands and instructions that a microprocessor understands and can carry out. The value shown represents which Intel’s instruction set this processor is compatible with.

Idle States
Idle States (C-states) are used to save power when the processor is idle. C0 is the operational state, meaning that the CPU is doing useful work. C1 is the first idle state, C2 the second, and so on, where more power saving actions are taken for numerically higher C-states.

Enhanced Intel SpeedStep® Technology
Enhanced Intel SpeedStep® Technology is an advanced means of enabling high performance while meeting the power-conservation

needs of mobile systems. Conventional Intel SpeedStep® Technology switches both voltage and frequency in tandem between high and low levels in response to processor load. Enhanced Intel SpeedStep® Technology builds upon that architecture using design strategies such as Separation between Voltage and Frequency Changes, and Clock Partitioning and Recovery.

Thermal Monitoring Technologies
Thermal Monitoring Technologies protect the processor package and the system from thermal failure through several thermal management features. An on-die Digital Thermal Sensor (DTS) detects the core's temperature, and the thermal management features reduce package power consumption and thereby temperature when required in order to remain within normal operating limits.

Intel® Volume Management Device (VMD)
Intel® Volume Management Device (VMD) provides a common, robust method of hot plug and LED management for NVMe-based solid state drives.

Intel® Standard Manageability (ISM)
Intel® Standard Manageability is the manageability solution for Intel vPro® Essentials platforms and is a subset of Intel® AMT with out-of-band management over Ethernet and Wi-Fi, but no KVM or new life cycle management features.

Intel® Control-Flow Enforcement Technology
CET - Intel Control-flow Enforcement Technology (CET) helps protect against the misuse of legitimate code snippets through return-oriented programming (ROP) control-flow hijacking attacks.

Intel® AES New Instructions
Intel® AES New Instructions (Intel® AES-NI) are a set of instructions that enable fast and secure data encryption and decryption. AES-NI are valuable for a wide range of cryptographic applications, for example: applications that perform bulk encryption/decryption, authentication, random number generation, and authenticated encryption.

Secure Key
Intel® Secure Key consists of a digital random number generator that creates truly random numbers to strengthen encryption algorithms.

Execute Disable Bit
Execute Disable Bit is a hardware-based security feature that can reduce exposure to viruses and malicious-code attacks and prevent harmful software from executing and propagating on the server or network.

Intel® Boot Guard
Intel® Device Protection Technology with Boot Guard helps protect the system’s pre-OS environment from viruses and malicious software attacks.

Mode-based Execute Control (MBEC)
Mode-based Execute Control can more reliably verify and enforce the integrity of kernel level code.

Intel® Virtualization Technology (VT-x)
Intel® Virtualization Technology (VT-x) allows one hardware platform to function as multiple “virtual” platforms. It offers improved manageability by limiting downtime and maintaining productivity by isolating computing activities into separate partitions.

Intel® Virtualization Technology for Directed I/O (VT-d)
Intel® Virtualization Technology for Directed I/O (VT-d) continues from the existing support for IA-32 (VT-x) and Itanium® processor (VT-i) virtualization adding new support for I/O-device virtualization. Intel VT-d can help end users improve security and reliability of the systems and also improve performance of I/O devices in virtualized environments.

Intel® VT-x with Extended Page Tables (EPT)
Intel® VT-x with Extended Page Tables (EPT), also known as Second Level Address Translation (SLAT), provides acceleration for memory intensive virtualized applications. Extended Page Tables in Intel® Virtualization Technology platforms reduces the memory and power overhead costs and increases battery life through hardware optimization of page table management.

Intel® Thermal Velocity Boost
Intel® Thermal Velocity Boost (Intel® TVB) is a feature that opportunistically and automatically increases clock frequency above single-core and multi-core Intel® Turbo Boost Technology frequencies based on how much the processor is operating below its maximum temperature and whether turbo power budget is available. The frequency gain and duration is dependent on the workload, capabilities of the processor and the processor cooling solution.

Intel® Stable IT Platform Program (SIPP)
The Intel® Stable IT Platform Program (Intel® SIPP) aims for zero changes to key platform components and drivers for at least 15 months or until the next generational release, reducing complexity for IT to effectively manage their computing endpoints.

Zusammenfassung

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Intel Core i9-13900KF, Intel® Core™ i9, LGA 1700, Intel, i9-13900KF, 64-bit, 13th gen Intel® Core™ i9

Intel Core i9-13900KF. Processor family: Intel® Core™ i9, Processor socket: LGA 1700, Processor manufacturer: Intel. Memory channels: Dual-channel, Maximum internal memory supported by processor: 192 GB, Memory types supported by processor: DDR4-SDRAM, DDR5-SDRAM. Market segment: Desktop, Use conditions: PC/Client/Tablet, PCI Express slots version: 5.0, 4.0. Intel® Turbo Boost Max Technology 3.0 frequency: 5.7 GHz, Intel® Thermal Velocity Boost Frequency: 5.8 GHz. Package type: Retail box

Merkmale

Logistics data

Harmonized System (HS) code	8542310001

Operational conditions

Graphics

On-board graphics card	No
Discrete graphics card	No
On-board graphics card model	Not available
Discrete graphics card model	Not available

Memory

Tjunction	100 °C

Packaging data

Package type	Retail box

Other features

L2 cache	32768 KB
Maximum internal memory	192 GB

Technical details

Target market	Gaming, Content Creation
Launch date	Q4'22
Status	Launched

Maximum internal memory supported by processor	192 GB
Memory types supported by processor	DDR4-SDRAM, DDR5-SDRAM
Memory channels	Dual-channel
Non-ECC	Yes
Memory bandwidth (max)	89.6 GB/s

Features

Execute Disable Bit	Yes
Idle States	Yes
Thermal Monitoring Technologies	Yes
Market segment	Desktop
Use conditions	PC/Client/Tablet
Maximum number of PCI Express lanes	20
PCI Express slots version	5.0, 4.0
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	No
Direct Media Interface (DMI) Revision	4.0
Export Control Classification Number (ECCN)	5A992C
Commodity Classification Automated Tracking System (CCATS)	740.17B1

Processor special features

Intel® Hyper Threading Technology (Intel® HT Technology)	Yes
Intel® Turbo Boost Technology	2.0
Intel® AES New Instructions (Intel® AES-NI)	Yes
Enhanced Intel SpeedStep Technology	Yes
Intel® Speed Shift Technology	Yes
Intel® Thermal Velocity Boost	Yes
Intel® Adaptive Boost Technology	Yes
Intel® Turbo Boost Max Technology 3.0 frequency	5.7 GHz
Intel® Gaussian & Neural Accelerator (Intel® GNA) 3.0	Yes
Intel® Thermal Velocity Boost Frequency	5.8 GHz
Intel® Control-flow Enforcement Technology (CET)	Yes
Intel® Thread Director	Yes
Intel VT-x with Extended Page Tables (EPT)	Yes
Intel® Secure Key	Yes
Intel® OS Guard	Yes
Intel 64	Yes
Intel Virtualization Technology (VT-x)	Yes
Intel Virtualization Technology for Directed I/O (VT-d)	Yes

Intel Turbo Boost Max Technology 3.0	Yes
Intel® Boot Guard	Yes
Intel® Deep Learning Boost (Intel® DL Boost)	Yes
Intel® Volume Management Device (VMD)	Yes
Mode-based Execute Control (MBE)	Yes
Intel® Standard Manageability (ISM)	Yes

Processor

Processor manufacturer	Intel
Processor generation	13th gen Intel® Core™ i9
Processor model	i9-13900KF
Processor family	Intel® Core™ i9
Processor cores	24
Processor socket	LGA 1700
Processor threads	32
Processor operating modes	64-bit
Performance cores	8
Efficient cores	16
Processor boost frequency	5.8 GHz
Performance-core boost frequency	5.4 GHz
Performance-core base frequency	3 GHz
Efficient-core boost frequency	4.3 GHz
Efficient-core base frequency	2.2 GHz
Processor cache	36 MB
Processor cache type	Smart Cache
Box	Yes
Cooler included	No
Processor base power	125 W
Maximum turbo power	253 W
Stepping	B0
Bus type	DMI4
Maximum number of DMI lanes	8
Memory bandwidth supported by processor (max)	89.6 GB/s
Processor codename	Raptor Lake
Processor ARK ID	230497