

Intel Core i5-12600K processor



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Intel	

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® 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® 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.

Intel® Clear Video HD Technology

Intel® Clear Video HD Technology, like its predecessor, Intel® Clear Video Technology, is a suite of image decode and processing technologies built into the integrated processor graphics that improve video playback, delivering cleaner, sharper images, more natural, accurate, and vivid colors, and a clear and stable video picture. Intel® Clear Video HD Technology adds video quality enhancements for richer color and more realistic skin tones.

Cache

CPU Cache is an area of fast memory located on the processor. Intel® Smart Cache refers to the architecture that allows all cores to dynamically share access to the last level cache.

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.

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.

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.

Max Turbo Frequency

Max Turbo Frequency is the maximum single-core frequency at which the processor is capable of operating using Intel® Turbo Boost Technology and, if present, Intel® Turbo Boost Max Technology 3.0 and Intel® Thermal Velocity Boost. Frequency is typically measured in gigahertz (GHz), or billion cycles per second.

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® 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.

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.

Intel® Quick Sync Video

Intel® Quick Sync Video delivers fast conversion of video for portable media players, online sharing, and video editing and authoring.

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® 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.

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.

Secure Key

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

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® 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.

Instruction Set Extensions

Instruction Set Extensions are additional instructions which can increase performance when the same operations are performed on multiple data objects. These can include SSE (Streaming SIMD Extensions) and AVX (Advanced Vector Extensions).

Intel® Turbo Boost Max Technology 3.0

Intel® Turbo Boost Max Technology 3.0 identifies the best performing core(s) on a processor and provides increased performance on those cores through increasing frequency as needed by taking advantage of power and thermal headroom.

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® 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.

Mode-based Execute Control (MBE)

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

Intel® Boot Guard

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

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.

Zusammenfassung

Intel® Virtualization Technology for Directed I/O (VT-d)

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Intel Core i5-12600K, Intel® Core™ i5, LGA 1700, Intel, i5-12600K, 64-bit, 12th gen Intel® Core™ i5

Intel Core i5-12600K. Processor family: Intel® Core™ i5, 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: HDMI 2.1, DisplayPort 1.4a, Embedded DisplayPort (eDP) 1.4b, On-board graphics card base frequency: 300 MHz. Market segment: Desktop, Use conditions: PC/Client/Tablet, PCI Express slots version: 5.0, 4.0. Package type: Retail box

Merkmale

Logistics data

Harmonized System (HS) code	85423119
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Operational conditions

Tjunction	100 °C
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Packaging data

Package type	Retail box
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Weight & dimensions

Processor package size	45 x 37.5 mm
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Other features

Maximum internal memory	128 GB
Graphics output	eDP 1.4b, DP 1.4a, HDMI 2.1

Technical details

Target market	Gaming
OpenCL version	2.1
Launch date	Q4'21
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	Yes
Non-ECC	Yes
Memory bandwidth (max)	76.8 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
Thermal solution specification	PCG 2020A
Export Control Classification Number (ECCN)	5A992CN3
Commodity Classification	G167599
Automated Tracking System (CCATS)	

Graphics

On-board graphics card	Yes
Discrete graphics card	No
On-board graphics card model	Intel UHD Graphics 770

On-board graphics card outputs supported	HDMI 2.1, DisplayPort 1.4a, Embedded DisplayPort (eDP) 1.4b
On-board graphics card base frequency	300 MHz
On-board graphics card dynamic frequency (max)	1450 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

Processor

Processor manufacturer	Intel
Processor generation	12th gen Intel® Core™ i5
Processor model	i5-12600K
Processor family	Intel® Core™ i5
Processor cores	10
Processor socket	LGA 1700
Component for	PC
Processor threads	16
Processor operating modes	64-bit
Performance cores	6
Efficient cores	4
Processor boost frequency	4.9 GHz
Performance-core boost frequency	4.9 GHz
Performance-core base frequency	3.7 GHz
Efficient-core boost frequency	3.6 GHz
Efficient-core base frequency	2.8 GHz
Processor cache	20 MB
Processor cache type	Smart Cache
Box	Yes
Cooler included	No
Processor base power	125 W
Maximum turbo power	150 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	134589

Processor special features

Intel® Hyper Threading Technology (Intel® HT Technology)	Yes
Intel® Turbo Boost Technology	2.0
Intel® Quick Sync Video Technology	Yes
Intel® Clear Video HD Technology (Intel® CVT HD)	Yes
Intel® AES New Instructions (Intel® AES-NI)	Yes
Enhanced Intel SpeedStep Technology	Yes
Intel Trusted Execution Technology	Yes
Intel® Speed Shift Technology	Yes
Intel® Total Memory Encryption	Yes
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® Active Management Technology (Intel® AMT)	Yes
Intel Stable Image Platform Program (SIPP)	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	No
Intel® Optane™ Memory Ready	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® vPro™ Platform Eligibility	Yes
Intel® Standard Manageability (ISM)	Yes
Intel® One-Click Recovery	Yes
Intel® Virtualization Technology with Redirect Protection (VT-rp)	Yes
Intel vPro® Enterprise Platform Eligibility	Yes
Intel® Threat Detection Technology (TDT)	Yes
Intel® Hardware Shield Eligibility	Yes
Intel® Total Memory Encryption - Multi Key	Yes