10th Gen Intel® Core™ Desktop Processors

Intel helps power the world’s fastest gaming desktop PCs with the 10th Gen Intel® Core™ i9-10900K processor

With an optimal balance of frequency, cores and threads, advanced tuning support, and blazing connectivity, new 10th Generation Intel® Core™ processors help supercharge desktop PCs and enable incredible experiences and productivity for gamers, content creators, and mainstream users. Shatter the performance barrier and enter the realm of immersive 4K entertainment experiences and play the latest gaming titles like never before. Or simply get work done in less time by supercharging the latest business productivity applications for a higher level of collaboration and productivity. Whether you’re seeking great performance out of the box, or just want to take advantage of overclocking, there’s a new 10th Generation Intel® Core™ processor for you.
We're introducing Intel's fastest gaming processor with the 10th Gen Intel® Core™ i9-10900k and you can gain a competitive edge in both work and play. Prepare to unleash your ideas like never before, enjoy and share incredible PC gaming or get work done in less time.

When it comes to your desktop PC, you can't have too much speed. Whether enjoying the latest games or getting more done with the latest productivity apps, processor speed matters. That's why Intel engineers developed Intel® Thermal Velocity Boost. By enabling processor speeds of up to 5.3GHz right out of the box, you're free to enjoy fast performance—whatever you're looking to accomplish.

Sometimes you need your PC to bring an extra boost—whether it's transcoding that 4K video edit or launching that new game you just installed. Now, with Intel® Turbo Boost Max Technology 3.0, you can experience an automatic performance boost when running lightly threaded applications. And with Intel® Hyper-Threading Technology now available across the entire 10th Gen Intel® Core™ processor family, you can multitask with confidence, and do more simultaneously, no matter which Intel® Core™ processor you choose.

Your PC runs at its best when its components work great together. System RAM plays a vital role in helping to enable smooth, responsive performance. With select processors supporting the latest cutting-edge DDR4-2933 RAM speeds, you can be confident that your entire desktop PC platform will be able to offer exceptional responsiveness.

By collaborating with over 200 top independent software vendors, Intel's engineers have worked tirelessly to ensure that many of today's most popular games, game engines, and middleware run great on Intel processor-based desktop PCs and help enable elite gaming experiences. By focusing on things like high frame rates, exceptional visual fidelity, and smooth game play, Intel continues to show our commitment to bringing exceptional gaming to life. When you want to play with your desktop PC, you can make the most of it with performance from Intel.

**ELITE PERFORMANCE**

We're introducing Intel's fastest gaming processor with the 10th Gen Intel® Core™ i9-10900k and you can gain a competitive edge in both work and play. Prepare to unleash your ideas like never before, enjoy and share incredible PC gaming or get work done in less time.

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**Up To**

**4.8 GHz**

Clock Speed with All-Core Turbo Frequency

**Up To**

**5.3/4.9 GHz**

Clock Speed with Intel® Thermal Velocity Boost Frequency Single/All-core Turbo

**Up To**

**5.2 GHz**

Clock Speed with Intel® Turbo Boost Max Technology Frequency

10TH GEN INTEL® CORE™

i9-10900K PROCESSOR

INTEL'S FASTEST GAMING PROCESSOR

GET AMAZING OVERCLOCKING HEADROOM WITH AN UNLOCKED 10TH GEN INTEL® CORE™ PROCESSOR
Unleash the flexibility to do more with best-in-class connectivity, immersive entertainment and enhanced streaming.

Enjoy fast transfers of large files with greater than 2X the network speeds5,6 of 1GB Ethernet—no new cabling required. New 10th Gen Intel® Core™ processor-based desktop PCs support the new Intel® Ethernet Connection I225. Or cut the cord and take things wireless with Intel® Wi-Fi 6 AX201.

Wi-Fi 6 networks deliver enhanced performance to PCs with Intel® Wi-Fi 6 (Gig+), even when many devices are connected simultaneously.5,6

You don’t have to suffer through long wait times, frequent buffering, and glitchy gaming—experience faster Wi-Fi performance with Intel® Wi-Fi 6 (Gig+) PCs, even on home networks with a growing variety of devices.

Smooth streaming and HD entertainment enable immersive, full-screen 4K and 360° viewing. Tackle that PowerPoint, polish some photos in Lightroom, or stream back-to-back episodes of your favorite Netflix show, all with the confidence that you’re getting the performance you need, when you need it.

You’ll be able to experience more responsive online experiences and file transfers, nearly 3X faster downloads, and more reliable connections with support for the latest generation of gigabit Wi-Fi. Who wouldn’t appreciate the freedom and flexibility to connect anywhere throughout the home or office?5,6

Gain ultimate control when overclocking your processor and key system components with features enabled by new unlocked and overclockable 10th Gen Intel® Core™ processors. For those looking to push the limits of performance when gaming or running demanding productivity applications, overclocking is your path to a higher level of experience. Precisely tune and get even more performance from unlocked 10th Gen Intel® Core™ processors with new precision overclocking controls designed for gamers, content creators and overclocking enthusiasts.3

Get precise control when pushing the limits of performance with new Enhanced Voltage Frequency Control. You’ll be able to dial in your processor’s GHz when setting the speed of your processor above the factory default settings.

For a visual experience that goes beyond the limits, new PCIe Overclocking enables the overclocking of discrete graphics performance to push the visual envelope. With new Per-Core Hyper-Threading Controls, experienced overclockers can opt to turn Hyper-Threading on or off on a per-core basis for even more granular control.

If you’re ready to take advantage of advanced tuning support to overclock, look for the letter “K” in a processor number—this is your sign that it’s unlocked and overclockable.
“UNLOCKED” 10TH GEN INTEL® CORE™ PROCESSORS

Unlocked 10th Gen Intel® Core™ desktop processors are optimized for enthusiast gamers, overclockers and serious content creators looking to take advantage of amazing overclocking and unleash the performance capabilities of these new processors. With an optimal balance of frequency, cores and threads, advanced tuning support, and blazing connectivity, unlocked 10th Gen Intel® Core™ processors supercharge desktops for a competitive edge.3

Take full advantage of these unlocked processors by downloading Intel® Performance Maximizer. This Intel-exclusive software application can help you dynamically dial in your system’s optimal performance based upon your processor’s unique performance DNA. Or, if you’d prefer to go hands-on, check out Intel® Extreme Tuning Utility, which helps you directly adjust your processor’s settings and perfect your overclock. For added peace of mind, choose the Intel® Performance Tuning Protection Plan, which lets you claim a free replacement processor in the unlikely event that yours fails due to overclocking.

“LOCKED” 10TH GEN INTEL® CORE™ PROCESSORS

10th Gen Intel® Core™ desktop processors are built for the everyday desktop user; this platform delivers amazing performance for everything from mainstream gaming and creation to productivity. With an optimal balance of frequency, cores and threads, and blazing connectivity, 10th Gen Intel® Core™ processors supercharge desktops and All-in-One PCs for premium performance.

10TH GEN INTEL® CORE™ PROCESSORS REQUIRING DISCRETE GRAPHICS

10th Gen Intel® Core™ “KF” and “F” SKU desktop processors are built for gamers and creators with the same 10th gen innovations, specifications, and performance, but without processor graphics features. As a result, they can deliver added value when CPU performance is the top priority. With an optimal balance of frequency, cores and threads, optional advanced tuning support,3 and blazing connectivity, 10th Gen Intel® Core™ processors supercharge desktops for competitive and premium performance. Processors with a “KF” in their processor number also offer overclocking capabilities.

TAKE ADVANTAGE OF 10TH GENERATION INTEL® CORE™ PROCESSORS

Whether you’re looking to fully experience the latest games and entertainment or boost your productivity when creating or running the latest business productivity apps, Intel’s newest lineup of desktop processors delivers powerful features that empower you to do more.
## Features at a Glance

<table>
<thead>
<tr>
<th>Feature</th>
<th>Benefit</th>
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</thead>
<tbody>
<tr>
<td>Intel® Thermal Velocity Boost Technology¹</td>
<td>Gamers and creators get up to a blazing 5.3GHz, right out of the box, for fast performance.</td>
</tr>
<tr>
<td>Intel® Turbo Boost Max Technology 3.0</td>
<td>Delivers an automatic performance boost on lightly threaded applications.</td>
</tr>
<tr>
<td>Support for up to DDR4-2933 Memory¹³</td>
<td>Enjoy smooth game play, immersive realism, faster multitasking and productivity when creating.</td>
</tr>
<tr>
<td>Intel® Hyper-Threading Technology</td>
<td>Now available across the entire processor stack—from the entry-level Intel® Core™ i3 to the incredible Intel® Core™ i9 processor.</td>
</tr>
<tr>
<td>Thunderbolt™ 3 Support</td>
<td>Travel light, game heavy, and save expansive game libraries and files to an external Thunderbolt™ 3 SSD. Thunderbolt™ 3 ports are the fastest USB-C available, so you can take Thunderbolt™ 3 SSDs to LAN parties and play games with lightning-fast data transfers of huge files.</td>
</tr>
<tr>
<td>Intel® Optane™ Technology Support²</td>
<td>Smart memory and storage technology that helps accelerate computers' responsiveness. Accesses your computer’s frequently used documents, pictures, videos and applications quickly—enabling you to create, game, and produce with less waiting.</td>
</tr>
<tr>
<td>Intel® Ethernet Connection I225</td>
<td>Delivers greater than 2X the network speeds of 1GB Ethernet on existing cabling.⁵,⁶</td>
</tr>
<tr>
<td>Intel® Wi-Fi 6 AX201</td>
<td>Delivers responsive game play, nearly 3X faster downloads, and more reliable connections plus best-in-class wireless experiences with the freedom and flexibility to game or create anywhere throughout the home or office.⁵,⁶</td>
</tr>
<tr>
<td>Intel® UHD Graphics</td>
<td>Play 4K UHD videos with exceptional clarity, view and edit even the smallest details of photos, and play today’s modern games.</td>
</tr>
<tr>
<td>Intel® Quick Sync Video</td>
<td>Delivers excellent video conferencing capability, fast video conversion, online sharing, and fast video editing and authoring.</td>
</tr>
</tbody>
</table>
## 10th Gen Intel® Core™ Desktop Processor Comparisons

### Maximum Base Frequency (GHz)
- **Core i9**: 3.7
- **Core i7**: 3.8
- **Core i5**: 4.1
- **Core i3**: 3.8

### Intel® Thermal Velocity Boost Technology
- **Core i9**: Up to 3.7
- **Core i7**: Up to 5.1
- **Core i5**: n/a
- **Core i3**: n/a

### Single / All Core Turbo Frequency (GHz)
- **Core i9**: Up to 5.3/4.9
- **Core i7**: Up to 5.1
- **Core i5**: n/a
- **Core i3**: n/a

### Intel® Turbo Boost Technology 3.0
- **Core i9**: Up to 5.2
- **Core i7**: Up to 5.0
- **Core i5**: Up to 4.8
- **Core i3**: Up to 4.6

### Intel® Single Core Turbo Frequency
- **Core i9**: Up to 10/20
- **Core i7**: Up to 8/16
- **Core i5**: Up to 6/12
- **Core i3**: Up to 4/8

### Max Number of Cores/Threads
- **Core i9**: Yes
- **Core i7**: Yes
- **Core i5**: Yes
- **Core i3**: Yes

### Intel® Hyper-Threading Technology
- **Core i9**: Yes
- **Core i7**: Yes
- **Core i5**: Yes
- **Core i3**: Yes

### Intel® Smart Cache Size (MB)
- **Core i9**: Up to 32
- **Core i7**: Up to 20
- **Core i5**: Up to 16
- **Core i3**: Up to 10

### Memory Type Support
- **Core i9**: Yes
- **Core i7**: Yes (with select SKUs)
- **Core i5**: Yes
- **Core i3**: Yes (with select SKUs)

### Number of Memory Channels
- **Core i9**: up to 2
- **Core i7**: 2
- **Core i5**: Up to 2
- **Core i3**: 2

### Intel® UHD Graphics
- **Core i9**: Up to DDR4-2933
- **Core i7**: Up to DDR4-2933
- **Core i5**: Up to DDR4-2666
- **Core i3**: Up to DDR4-2666

### Graphics Dynamic Frequency (MHz)
- **Core i9**: Up to 630
- **Core i7**: Up to 630
- **Core i5**: Up to 630
- **Core i3**: Up to 630

### Intel® Quick Sync Video
- **Core i9**: Yes
- **Core i7**: Yes
- **Core i5**: Yes
- **Core i3**: Yes

### Processor Core/Graphics/Memory Overclocking
- **Core i9**: Yes (with select SKUs)
- **Core i7**: Yes
- **Core i5**: Yes
- **Core i3**: Yes

### Intel® Optane Memory Support
- **Core i9**: Yes
- **Core i7**: Yes
- **Core i5**: Yes
- **Core i3**: Yes

### Intel® Virtualization Technology
- **Core i9**: Yes
- **Core i7**: Yes
- **Core i5**: Yes
- **Core i3**: Yes

### Intel® AES-NI
- **Core i9**: Yes
- **Core i7**: Yes
- **Core i5**: Yes
- **Core i3**: Yes

### Intel® TSX
- **Core i9**: Yes
- **Core i7**: Yes
- **Core i5**: Yes
- **Core i3**: Yes

### Intel® AVX2
- **Core i9**: Yes
- **Core i7**: Yes
- **Core i5**: Yes
- **Core i3**: Yes

### Intel® SGX
- **Core i9**: Yes
- **Core i7**: Yes
- **Core i5**: Yes
- **Core i3**: Yes

### Intel® BIOS Guard
- **Core i9**: Yes
- **Core i7**: Yes
- **Core i5**: Yes
- **Core i3**: Yes

### Intel® Boot Guard
- **Core i9**: Yes
- **Core i7**: Yes
- **Core i5**: Yes
- **Core i3**: Yes

### Intel® OS Guard
- **Core i9**: Yes
- **Core i7**: Yes
- **Core i5**: Yes
- **Core i3**: Yes

### Intel® Identity Protection Technology
- **Core i9**: Yes
- **Core i7**: Yes
- **Core i5**: Yes
- **Core i3**: Yes

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**10th Gen Intel® Core™ Desktop Processors Require a Motherboard Based on the Intel® 400 Series Chipset**
1 Available only on 10th Gen Intel® Core™ i7 and i9 desktop processors.

2 Intel® Optane™ memory requires specific hardware and software configuration. Visit www.intel.com/OptaneMemory for configuration requirements.

3 Unlocked features are present with select chipsets and processor combinations. Altering clock frequency or voltage may damage or reduce the useful life of the processor and other system components, and may reduce system stability and performance. Product warranties may not apply if the processor is operated beyond its specifications. Check with the manufacturers of system and components for additional details.

4 This tool requires download from intel.com.

5 Intel® Wi-Fi 6 AX201 requires specific hardware configurations. Discrete Intel® Wi-Fi 6 AX200 available for chipsets not supporting connectivity integration.

6 802.11ax 2x2 160MHz enables 2402Mbps maximum theoretical data rates, ~3X (2.8X) faster than standard 802.11ac 2x2 80MHz (867Mbps) as documented in IEEE 802.11 wireless standard specifications, and require the use of similarly configured 802.11ax wireless network routers.

7 Available only on 10th Gen Intel® Core™ processors featuring integrated graphics.

8 Intel® Thermal Velocity Boost feature is opportunistic at a temperature of 70°C or lower and when turbo power budget is available. The frequency gain and duration is dependent on the workload (best for bursty workloads); capabilities of the individual processor, and the processor cooling solution. Frequencies may reduce over time and longer workloads may start at the max frequency but drop as processor temperature increases.

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10 Intel® Advanced Vector Extensions (Intel® AVX) are designed to achieve higher throughput to certain integer and floating-point operations. Due to varying processor power characteristics, utilizing AVX instructions may cause a) some parts to operate at less than the rated frequency and b) some parts with Intel® Turbo Boost Technology 3.0 to not achieve any or maximum turbo frequencies. Performance varies depending on hardware, software, and system configuration and you should consult your system manufacturer for more information. *Intel® Advanced Vector Extensions refers to Intel® AVX, Intel® AVX2 or Intel® AVX-512. For more information on Intel® Turbo Boost Technology 3.0, visit http://www.intel.com/go/turbo.

11 Available on select processor SKUs.

12 As measured by in-game benchmark mode performance (score or frames per second) where available, or frames per second where benchmark mode is unavailable. PC Gaming Processors Compared: 10th Gen Intel® Core™ i9-10900K, Intel® Core™ i9-9900KS, AMD Ryzen™ 9 3950X. Prices of compared products may differ. Configurations: Graphics: Nvidia GeForce RTX 2080 Ti, Memory: 4x4GB DDR4 (2666, 2933 or 3200 per highest speed of the corresponding processor), Storage: Intel® Optane™ SSD 905P, OS: Windows 10 Pro 1909 v720 19H2(R56). Results: 10th Gen Intel® Core™ i9-10900K scored better on the majority of the 25+ game titles tested.

13 DDR4 maximum speed support is 1 and 2 DPC for UDIMMs but only 1 DPC for SODIMMs. DDR4 2DPC UDIMM 2933 or 2666 is capable when same UDIMM part number are populated with in each channel.

FTC disclosure: Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYsMark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of these factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. For more complete information about performance and benchmark results, visit http://www.intel.com/benchmarks.

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