



QUICK REFERENCE GUIDE

10TH GEN INTEL[®] CORE[™] PROCESSORS

Elite real-world performance

INTELLIGENT PERFORMANCE THAT ADAPTS TO YOU

Combining an optimal balance of frequency, cores and threads, advanced tuning support, and blazing connectivity, new 10th Gen Intel[®] Core[™] processors help supercharge desktop PCs and enable incredible new experiences and productivity. Whether you're seeking to overclock for an added advantage, choose your own discrete graphics solution, or just take advantage of amazingly versatile performance, there's a new 10th Gen Intel[®] Core[™] processor for you.



NEW KEY DESKTOP FEATURES

- Up to 5.3 GHz clock speed with Intel[®] Thermal Velocity Boost¹
- Intel[®] Turbo Boost Max Technology 3.0
- Memory Support with DDR4-2933²
- Up to 10 cores and 20 threads
- Intel[®] Hyper-Threading Technology from the Intel[®] Core[™] i9 to the Intel[®] Core[™] i3 desktop processor
- New 2.5 G Ethernet⁶
- New Wi-Fi 6 (Gig+)⁷



CREATE, PLAY, SHARE & ENJOY

Whether you're gaming, creating or simply getting things done, when it comes to computing, speed is king. Frequency is measured in gigahertz (GHz)—it's kind of like the speed limit of the data lanes inside your processor. Higher GHz speeds mean that all of the data blasting through your processor can move faster, allowing your system to perform more tasks in less time and delivering the best possible experience.

This means less waiting when running multiple demanding applications and the power to run multiple demanding applications with abandon. The 10th Gen Intel® Core™ i9-10900K is the world's fastest gaming processor.⁹ That means it can help enable a great experience for whatever you're looking to do.

MAKE THE MOST OF YOUR COMPUTING EXPERIENCE WITH INTEL

Choose Intel and you get more than just a great processor, you also get a host of complementary technologies available only on Intel processor-based PCs. Take advantage of innovations like:

TECHNOLOGY	BENEFIT
Intel® Thermal Velocity Boost ¹	Gamers and creators get up to a blazing 5.3 GHz, right out of the box, for fast performance.
Intel® Turbo Boost Max Technology 3.0	Delivers an automatic performance boost on lightly threaded applications.
Intel® Hyper-Threading Technology	Now available across the entire processor stack—from the entry-level Intel® Core™ i3 to the unbeatable Intel® Core™ i9.
Intel® Optane™ Technology	Get enhanced performance to allow you to do what you do most, incredibly fast, smooth and easy. From system startup to program launch, Intel® Optane™ technology can help accelerate the tasks you do most frequently and also help accelerate the launch and accessibility of large files.
Thunderbolt™ 3	Accelerate business productivity with the most advanced single-cable docking solution available. Thunderbolt™ 3 is the most advanced, efficient, and versatile I/O solution available with up to 40 Gb/s for data and video. Its single-cable docks with charging, external graphics, and built-in networking open up fresh possibilities.
Intel® Wi-Fi 6 AX201	Now integrated into 10th Gen Intel® Core™ desktop processors, Intel® Wi-Fi 6 (Gig+) delivers nearly 3X faster downloads, and more reliable connections. Delivers best-in-class wireless experiences with the freedom and flexibility to be productive anywhere throughout the home or office. ⁷
Intel® Ethernet Connection I225	Now available on platforms featuring 10th Gen Intel® Core™ processors, the 2.5G Intel® Ethernet Connector I225 delivers greater than 2X the network speeds of 1GB Ethernet on existing cabling. ⁶
Intel® Graphics Command Center	Optimize your internal graphics experience. ⁸



ENHANCED TOOLS FROM INTEL ENABLE OVERCLOCKING

Exceptionally Overclockable. Precisely tweak, tune and get more from unlocked 10th Gen Intel® Core™ processors with new precision overclocking controls designed for gamers, content creators and overclocking enthusiasts.⁴ Features like new enhanced voltage frequency control, PCIe overclocking and per-core hyper-threading controls give overclockers more control than ever before.

Intel® Performance Maximizer. Enhanced Intel® Performance Maximizer offers an active core group tuning feature that overclocks each core group, increasing their performance potential—enabling maximum gaming performance.³

Intel® Extreme Tuning Utility. Push the limits of high-performance desktops in new & innovative ways with a benchmarking tool designed for use by experienced overclockers.^{3,4}

Intel® Extreme Memory Profile Technology. Vastly simplify the memory overclocking experience by removing the guess work when custom-tuning memory speeds.⁴

MOTHERBOARDS

To make the most of the powerful new features of new 10th Gen Intel® Core™ desktop processors, select a compatible Intel® based 400 Series motherboard.

	INTEL® BASED 400 SERIES Z490	INTEL® BASED 400 SERIES Q470	INTEL® BASED 400 SERIES B460	INTEL® BASED 400 SERIES H470	INTEL® BASED 400 SERIES H410
Optimized for	Gaming, overclocking & multitasking	Remotely managing, diagnosing & updating computers	Office productivity, 4K video streaming, photo editing	4K video streaming, photo editing & backup	Everyday computing such as online browsing
Recommended Processors	10th Gen Intel® Core™ Processors that are Unlocked & Overclockable	10th Gen Intel® Core™ Processors with Intel® vPro™ Technology	10th Gen Intel® Core™ Processors	10th Gen Intel® Core™ Processors	Intel® Pentium® Gold Intel® Celeron®
Intel® Optane™ Memory can accelerate the things that matter most to you; turning your unique computing habits into productivity advantages ⁸	✓	✓	✓	✓	
Overclocking allows the computer processor to operate out of specification to boost performance ⁵	✓				
Intel® vPro™ Technology provides hardware enhanced security features and remote manageability ⁹		✓ ^{11,12}			
Intel® RST PCIe Raid improves I/O performance and data storage reliability best used for video or image processing	✓	✓ ¹¹		✓	

PROCESSOR NUMBER	BASE FREQUENCY (GHZ)	INTEL® SINGLE CORE TURBO FREQUENCY (GHZ)	INTEL® TURBO BOOST MAX TECHNOLOGY 3.0 FREQUENCY (GHZ)	INTEL® THERMAL VELOCITY BOOST TECHNOLOGY SINGLE / ALL CORE TURBO FREQUENCY (GHZ) ¹	INTEL® ALL CORE TURBO FREQUENCY (GHZ)	CORES/ THREADS	THERMAL DESIGN POWER	TOTAL PLATFORM PCIE 3.0 LANES	UNLOCKED ⁴	INTEL® SMART CACHE	MEMORY SUPPORT ²	PROCESSOR GRAPHICS	INTEL® OPTANE™ MEMORY ⁵ SUPPORT
i9-10900K	Up to 3.7	Up to 5.1	Up to 5.2	Up to 5.3 / 4.9	Up to 4.8	10/20	125	Up to 40	✓	20M	Two Channels DDR4-2933	Intel® UHD Graphics 630	✓
i9-10850K	Up to 3.6	Up to 5.0	Up to 5.1	Up to 5.2 / 4.8	Up to 4.7	10/20	125	Up to 40	✓	20M	Two Channels DDR4-2933	Intel® UHD Graphics 630	✓
i7-10700K	Up to 3.8	Up to 5.0	Up to 5.1	NA	Up to 4.7	8/16	125	Up to 40	✓	16M	Two Channels DDR4-2933	Intel® UHD Graphics 630	✓
i5-10600K	Up to 4.1	Up to 4.8	NA	NA	Up to 4.5	6/12	125	Up to 40	✓	12M	Two Channels DDR4-2666	Intel® UHD Graphics 630	✓
i9-10900	Up to 2.8	Up to 5.0	Up to 5.1	Up to 5.2 / 4.6	Up to 4.5	10/20	65	Up to 40		20M	Two Channels DDR4-2933	Intel® UHD Graphics 630	✓
i7-10700	Up to 2.9	Up to 4.7	Up to 4.8	NA	Up to 4.6	8/16	65	Up to 40		16M	Two Channels DDR4-2933	Intel® UHD Graphics 630	✓
i5-10600	Up to 3.3	Up to 4.8	NA	NA	Up to 4.4	6/12	65	Up to 40		12M	Two Channels DDR4-2933	Intel® UHD Graphics 630	✓
i5-10500	Up to 3.1	Up to 4.5	NA	NA	Up to 4.2	6/12	65	Up to 40		12M	Two Channels DDR4-2666	Intel® UHD Graphics 630	✓
i5-10400	Up to 2.9	Up to 4.3	NA	NA	Up to 4.0	6/12	65	Up to 40		12M	Two Channels DDR4-2666	Intel® UHD Graphics 630	✓
i3-10320	Up to 3.8	Up to 4.6	NA	NA	Up to 4.4	4/8	65	Up to 40		8M	Two Channels DDR4-2666	Intel® UHD Graphics 630	✓
i3-10300	Up to 3.7	Up to 4.4	NA	NA	Up to 4.2	4/8	65	Up to 40		8M	Two Channels DDR4-2666	Intel® UHD Graphics 630	✓
i3-10100	Up to 3.6	Up to 4.3	NA	NA	Up to 4.1	4/8	65	Up to 40		6M	Two Channels DDR4-2666	Intel® UHD Graphics 630	✓
i9-10900KF	Up to 3.7	Up to 5.1	Up to 5.2	Up to 5.3 / 4.9	Up to 4.8	10/20	125	Up to 40		20M	Two Channels DDR4-2933	NA	✓
i7-10700KF	Up to 3.8	Up to 5.0	Up to 5.1	NA	Up to 4.7	8/16	125	Up to 40		16M	Two Channels DDR4-2933	NA	✓
i5-10600KF	Up to 4.1	Up to 4.8	NA	NA	Up to 4.5	6/12	125	Up to 40		12M	Two Channels DDR4-2933	NA	✓
i9-10900F	Up to 2.8	Up to 5.0	Up to 5.1	Up to 5.2 / 4.6	Up to 4.5	10/20	65	Up to 40		20M	Two Channels DDR4-2933	NA	✓
i7-10700F	Up to 2.9	Up to 4.7	Up to 4.8	NA	Up to 4.6	8/16	65	Up to 40		16M	Two Channels DDR4-2933	Intel® UHD Graphics 630	✓

For more information, visit <http://intel.com/technologyprovider>

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 those 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 visit www.intel.com/benchmarks.

Performance results are based on testing as of dates shown in configurations and may not reflect all publicly available updates. See backup for configuration details. No product or component can be absolutely secure.

Includes the effect of Intel® Thermal Velocity Boost (Intel® TVB), 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 are dependent on the workload, capabilities of the processor and the processor cooling solution.

Intel Wi-Fi 6: Intel® Wi-Fi 6 (Gig+) products support optional 160 MHz channels, enabling the fastest possible theoretical maximum speeds (2402 Mbps) for typical 2x2 802.11 AX PC Wi-Fi products. Premium Intel® Wi-Fi 6 (Gig+) products enable 2-4X faster maximum theoretical speeds compared standard 2x2 (1201 Mbps) or 1x1 (600 Mbps) 802.11 AX PC Wi-Fi products, which only support the mandatory requirement of 80 MHz channels.

Intel technologies may require enabled hardware, software or service activation. No product or component can be absolutely secure.

1 Available only on 10th Gen Intel® Core™ i7 and i9 desktop processors. 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.

2 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.

3 This tool requires download from intel.com.

4 Unlocked features are present with select chipsets and processor combinations. Altering clock frequency or voltage may void any product warranties and reduce stability, security, performance, and life of the processor and other components. Check with system and component manufacturers for details.

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

6 I225 v1 (B1 stepping) reaches 2.5GbE on select switches/routers. Check out www.intel.com/i225v1 for a list of validated switches/routers. I225 v2 (B2 stepping) is now in production and works at 2.5GbE on all compliant 2.5GbE Link partners.

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

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

9 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: 4x8GB DDR4 (2666, 2933 or 3200 per highest speed of the corresponding processor), Storage: Intel Optane SSD 905P, OS Windows 10 Pro 1909 v720 19H2(RS6). Results: 10th Gen Intel® Core™ i9-10900K scored better on the majority of the 25+ game titles tested.

10 Some features and capabilities require eligible processors.

11 Certain features may not be present in all SKUs.

12 Intel® SIPP, Intel vPro™, & Intel® AMT support requires select 10th gen Intel® Core™ processors and select Intel® 400 series chipsets

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