

# NEW 10<sup>TH</sup> GEN INTEL<sup>®</sup> CORE<sup>™</sup> S-SERIES PROCESSOR LAUNCH

EMBARGOED UNTIL APRIL 30, 2020 AT 6AM PACIFIC TIME



© Intel Corporation. Intel, the Intel logo and other Intel marks are trademarks of Intel Corporation or its subsidiaries. Other names and brands may be claimed as the property of others.



# WORLD'S FASTEST GAMING PROCESSOR<sup>1</sup>

For more complete information about performance and benchmark results, visit [www.intel.com/benchmarks](http://www.intel.com/benchmarks).



Embargoed until April 30, 2020 at 6am Pacific Time

# WHY FREQUENCY MATTERS

- New 10th Gen Intel® Core™ S-Series Processors with up to 5.3GHz
- Games and most applications continue to depend on high frequency cores
- Better performance required to drive high framerates, a foundation element of achieving lower latency – this is where frequency matters



# BEST OVERCLOCKING EXPERIENCE<sup>12</sup>

For more complete information about performance and benchmark results, visit [www.intel.com/benchmarks](https://www.intel.com/benchmarks).



Embargoed until April 30, 2020 at 6am Pacific Time

# NEW OVERCLOCKING ENHANCEMENTS

- New Overclocking knobs
  - Per-core HT Disable/Enable
  - PEG/DMI OC
  - Enhanced Voltage/Frequency curve controls
- Refreshed Intel® Extreme Tuning Utility
  - Graphical enhancements
  - New feature support
- Updated Intel Performance Maximizer



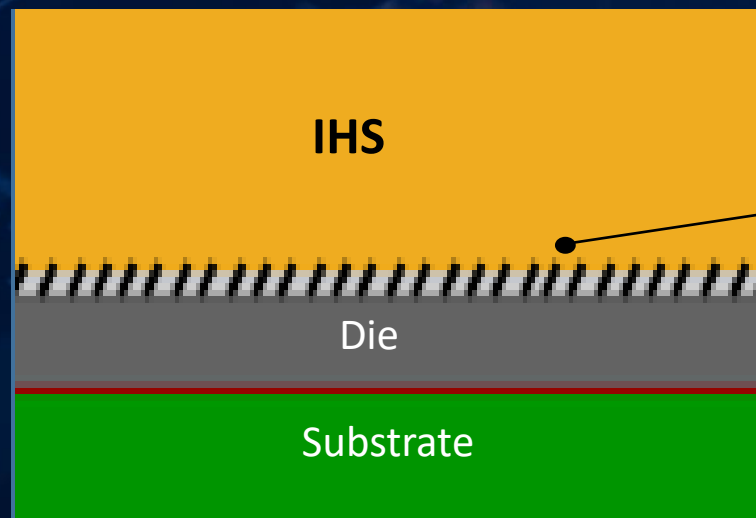
Altering clock frequency or voltage may void any product warranties and reduce stability, security, performance, and life of the processor and other components. Check with system and component manufacturers for details.



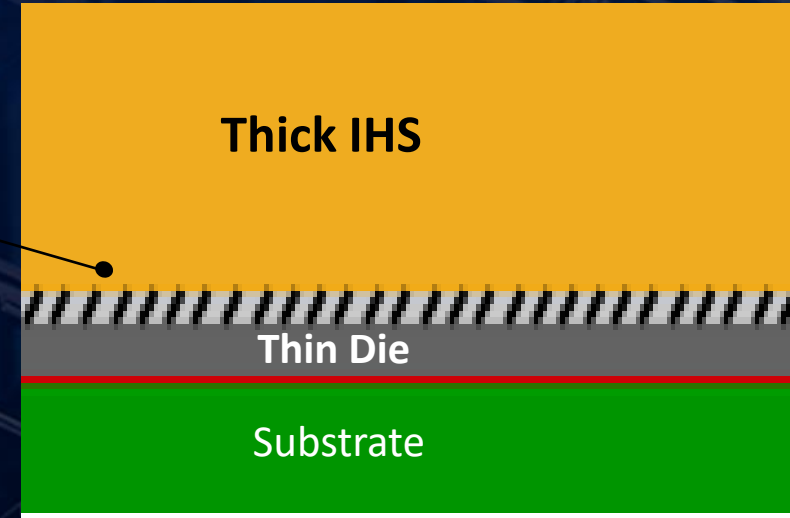
Embargoed until April 30, 2020 at 6am Pacific Time

# THIN DIE SOLDER THERMAL INTERFACE MATERIAL

STIM



Thin Die STIM



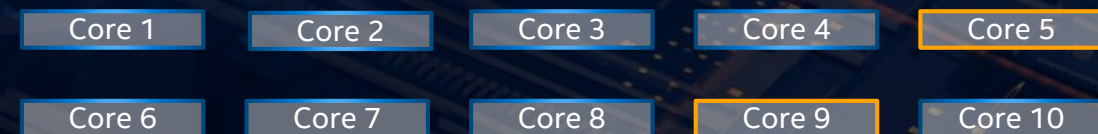
## THIN DIE STIM IMPROVES THERMAL PERFORMANCE

# NEW INTEL® TURBO BOOST MAX TECHNOLOGY 3.0

- Identifies the best performing cores to provide increased performance.
- 10<sup>th</sup> Gen Intel® Core™ desktop processors features its two best cores operating in this mode for improved single and dual-core turbo performance.
- There is no increase in voltage applied to these cores.

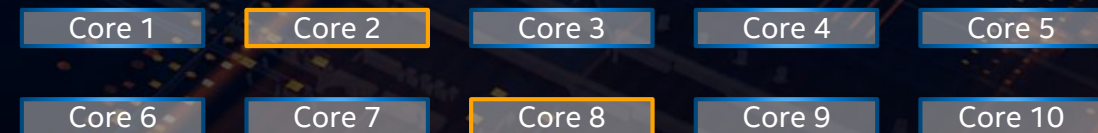
## BEST PERFORMING CORE

### PROCESSOR 1



VS.

### PROCESSOR 2



For more complete information about performance and benchmark results, visit [www.intel.com/benchmarks](https://www.intel.com/benchmarks).

Results have been estimated based on internal Intel® analysis and are provided for informational purposes only. Any difference in system hardware or software design or configuration may affect actual performance.



Embargoed until April 30, 2020 at 6am Pacific Time

# NEW 10<sup>TH</sup> GEN INTEL<sup>®</sup> CORE<sup>™</sup> i9-10900K



## WORLD'S FASTEST GAMING PROCESSOR<sup>1</sup>

UP TO  
**5.3\***  
GHZ

**10**  
CORES

**20**  
THREADS

For more complete information about performance and benchmark results, visit [www.intel.com/benchmarks](http://www.intel.com/benchmarks).

\* Includes the effect of Intel<sup>®</sup> Thermal Velocity Boost (Intel<sup>®</sup> TVB), a feature that opportunistically and automatically increases clock frequency above single-core and multi-core Intel<sup>®</sup> 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 Corporation. Intel, the Intel logo and other Intel marks are trademarks of Intel Corporation or its subsidiaries. Other names and brands may be claimed as the property of others.



Embargoed until April 30, 2020 at 6am Pacific Time

# ELITE REAL-WORLD PERFORMANCE FOR GAMING AND CREATING



UP TO  
**33%** MORE  
FPS  
vs. previous  
gen<sup>2</sup>



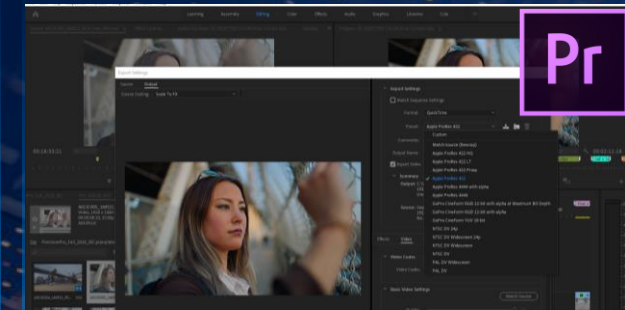
UP TO  
**13%** MORE  
FPS  
vs. previous  
gen<sup>4</sup>



UP TO  
**10%** MORE  
FPS  
vs. previous  
gen<sup>6</sup>



UP TO  
**187** FPS on  
PUBG  
GAME +  
STREAM +  
RECORD<sup>8</sup>



UP TO  
**18%** FASTER 4K  
VIDEO  
EDITING  
vs. previous  
gen<sup>10</sup>

UP TO  
**81%** MORE  
FPS  
vs. 3 yr.  
old PC<sup>3</sup>

UP TO  
**37%** MORE  
FPS  
vs. 3 yr.  
old PC<sup>5</sup>

UP TO  
**63%** MORE  
FPS  
vs. 3 yr.  
old PC<sup>7</sup>

UP TO  
**2X** BETTER  
MEGATASKING  
vs. 3 yr. old PC<sup>9</sup>

UP TO  
**35%** FASTER 4K  
VIDEO  
EDITING  
vs. 3 yr. old PC<sup>11</sup>



For more complete information about performance and benchmark results, visit [intel.com/benchmarks](https://www.intel.com/benchmarks).

Embargoed until April 30, 2020 at 6am Pacific Time

# OPTIMIZED TO WIN **TOTAL WAR: THREE KINGDOMS**

Optimized and threaded features like AI Animations, and physics, for Intel CPU Architecture in order to get maximum number of units displayed on screen while maintaining playable framerates.

Developed in partnership with Intel, Dynasty Mode is a new horde-style arcade mode for Total War: THREE KINGDOMS where you choose three heroes to fight off as many waves of units as you can.



For more complete information about performance and benchmark results, visit [www.intel.com/benchmarks](http://www.intel.com/benchmarks).

Embargoed until April 30, 2020 at 6am Pacific Time



# OPTIMIZED TO WIN **REMNANT: FROM THE ASHES**

Remnant: From the Ashes implemented Software Masked Occlusion Culling utilizing more CPU resources, resulting in better game play.

Developed on the Unreal Engine, this game as well takes advantage of years of engine optimization driven in part by Intel's multi-year engagement with the Unreal Engine.



For more complete information about performance and benchmark results, visit [www.intel.com/benchmarks](http://www.intel.com/benchmarks).

Embargoed until April 30, 2020 at 6am Pacific Time



# WHAT OUR GAMING PARTNERS ARE SAYING ABOUT THE NEW INTEL® 10<sup>TH</sup> GEN CORE™ PROCESSOR FAMILY



WARGAMING.NET

With the 10th Generation of their Core® platform, Intel is once again pushing the boundaries of the modern CPU architecture. The performance boost compared to the predecessors will ensure the World of Tanks Core engine fully unleashes its potential, allowing for deeper immersion and more enjoyable gameplay

*Vladimir Ostapenko, Head of Development, World of Tanks*

The decade-long partnership between Creative Assembly and Intel delivers results which directly benefit our players. Through a keener understanding of new hardware architecture, engine optimizations and new load-balancing techniques, our partnership enables the Total War engine to evolve with every iteration, placing us on a sounder technological footing each time and providing class-leading strategy experiences for players, in both gameplay and performance terms.

*- Creative Assembly*



Embargoed until April 30, 2020 at 6am Pacific Time

# WHAT OUR GAMING PARTNERS ARE SAYING ABOUT THE NEW INTEL® 10<sup>TH</sup> GEN CORE™ PROCESSOR FAMILY



Intel has been **providing us with invaluable assistance** to deliver new levels of gaming experiences for our fans and players. We're excited to be a part of the 10th gen Core Intel launch!"  
- TaleWorlds Entertainment

IO Interactive and Intel have been working together on Hitman 2 to **deliver new levels of gaming experiences for our fans and players**. We're excited to be part of the 10th gen Core Intel launch!  
- IO Interactive



Firaxis is excited to **bring Sid Meier's Civilization VI to our fans around the world with Intel** as part of their 10th generation launch.

- John Kloetzli, Lead Graphics Programmer, Firaxis Games

Embargoed until April 30, 2020 at 6am Pacific Time



# NEW 10TH GEN INTEL® CORE™ DESKTOP PROCESSORS

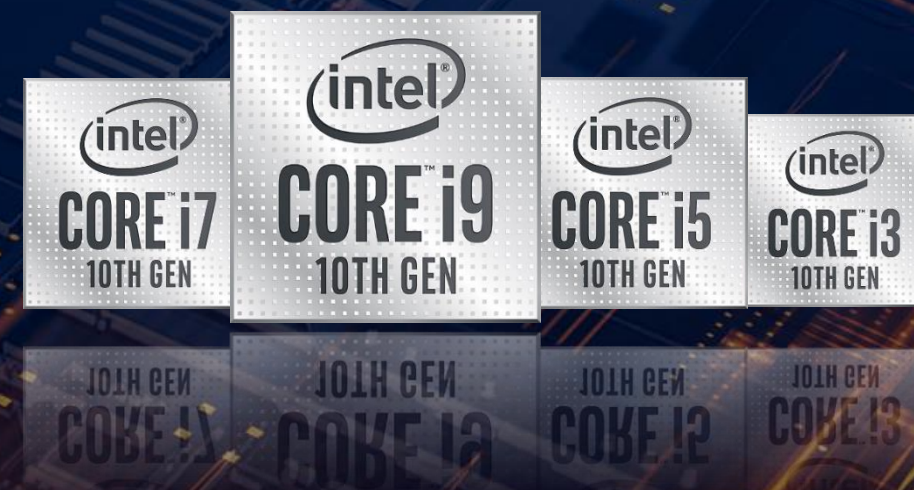
## NEW AND FEATURED TECHNOLOGIES

NEW

- **NEW** Up to 5.3 GHz with Intel® Thermal Velocity Boost
- **NEW** Intel® Turbo Boost Max Technology 3.0
- **NEW** Intel® Hyperthreading Technology across Intel® Core™ i9 to i3 processors
- **NEW** Up to 10 cores with 20M Intel® Smart Cache
- **NEW** Up to DDR4-2933 support
- **NEW** Enhanced Core & Memory Overclocking<sup>1, 2</sup>
- **NEW** Intel® 400 Series Chipset
- **NEW** 2.5G Intel® Ethernet Connection I225 (Foxville) support\*\*
- **NEW** Integrated Intel® Wi-Fi 6 AX201 (Gig+) support using CNVi<sup>‡</sup>

FEATURED

- Intel® performance tuning support (Intel® Performance Maximizer, Intel® eXtreme Tuning Utility)<sup>1</sup>
- Up to 40 platform PCIe lanes
- Thunderbolt™ 3 support
- Intel® Optane™ technology support<sup>♦</sup>



Embargoed until April 30, 2020 at 6am Pacific Time



Includes the effect of Intel Thermal Velocity Boost  
Unlocked features are present with select processors.

<sup>1</sup>Intel® Wi-Fi 6 AX201 requires specific hardware configurations.

<sup>2</sup>Intel® Optane™ memory requires specific hardware and software configuration.  
Visit [www.intel.com/OptaneMemory](http://www.intel.com/OptaneMemory) for configuration requirements.

\*\* I225 v2 (B2 stepping) is now in production and works at 2.5GbE on all compliant 2.5GbE Link partners. For more complete information about performance and benchmark results, visit [intel.com/benchmarks](http://intel.com/benchmarks).

Performance results are based on testing as of the date set forth in the configurations and may not reflect all publicly available security updates.

See configuration disclosure for details. No product or component can be absolutely secure.

# 10<sup>TH</sup> GEN INTEL® CORE™ DESKTOP PROCESSORS

PROCESSOR NUMBER	BASE CLOCK SPEED (GHZ)	INTEL® TURBO BOOST TECHNOLOGY 2.0 MAXIMUM 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) <sup>1</sup>	INTEL® ALL CORE TURBO FREQUENCY (GHZ)	CORES/ THREADS	THERMAL DESIGN POWER	UNLOCKED <sup>2</sup>	PLATFORM PCIE 3.0 LANES	MEMORY SUPPORT <sup>3</sup>	PROCESSOR GRAPHICS	INTEL® OPTANE™ MEMORY <sup>4</sup>	RCP PRICING (USD 1K)
<b>i9-10900K</b>	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	Two Channels DDR4-2933	Intel® UHD Graphics 630	✓	\$488
<b>i9-10900KF</b>	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	Two Channels DDR4-2933		✓	\$472
<b>i9-10900</b>	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	Two Channels DDR4-2933	Intel® UHD Graphics 630	✓	\$439
<b>i9-10900F</b>	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	Two Channels DDR4-2933		✓	\$422
<b>i7-10700K</b>	Up to 3.8	Up to 5.0	Up to 5.1	NA	Up to 4.7	8/16	125	✓	Up to 40	Two Channels DDR4-2933	Intel® UHD Graphics 630	✓	\$374
<b>i7-10700KF</b>	Up to 3.8	Up to 5.0	Up to 5.1	NA	Up to 4.7	8/16	125	✓	Up to 40	Two Channels DDR4-2933		✓	\$349
<b>i7-10700</b>	Up to 2.9	Up to 4.7	Up to 4.8	NA	Up to 4.6	8/16	65		Up to 40	Two Channels DDR4-2933	Intel® UHD Graphics 630	✓	\$323
<b>i7-10700F</b>	Up to 2.9	Up to 4.7	Up to 4.8	NA	Up to 4.6	8/16	65		Up to 40	Two Channels DDR4-2933		✓	\$298

Intel® processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. All processors are lead-free (per EU RoHS directive July 2006) and halogen free (residual amounts of halogens are below November 2007 proposed IPC/JEDEC J-STD-709 standards). All processors support Intel® Virtualization Technology (Intel® VT-x).

• <sup>1</sup>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.

• <sup>3</sup>Intel® Optane™ memory requires specific hardware and software configuration. Visit [www.intel.com/Optanememory](http://www.intel.com/Optanememory) for configuration requirements.

• <sup>4</sup>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.



Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No product or component can be absolutely secure. Check with your system manufacturer or retailer or learn more at [intel.com](http://intel.com).

**Embargoed until April 30, 2020 at 6am Pacific Time**

# 10<sup>TH</sup> GEN INTEL® CORE™ DESKTOP PROCESSORS

PROCESSOR NUMBER	BASE CLOCK SPEED (GHZ)	INTEL® TURBO BOOST TECHNOLOGY 2.0 MAXIMUM 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) <sup>1</sup>	INTEL® ALL CORE TURBO FREQUENCY (GHZ)	CORES/ THREADS	THERMAL DESIGN POWER	UNLOCKED <sup>2</sup>	PLATFORM PCIE 3.0 LANES	MEMORY SUPPORT <sup>3</sup>	PROCESSOR GRAPHICS	INTEL® OPTANE™ MEMORY <sup>4</sup>	RCP PRICING (USD 1K)
<b>i5-10600K</b>	Up to 4.1	Up to 4.8	NA	NA	Up to 4.5	6/12	125	✓	Up to 40	Two Channels DDR4-2666	Intel® UHD Graphics 630	✓	\$262
<b>i5-10600KF</b>	Up to 4.1	Up to 4.8	NA	NA	Up to 4.5	6/12	125	✓	Up to 40	Two Channels DDR4-2666		✓	\$237
<b>i5-10600</b>	Up to 3.3	Up to 4.8	NA	NA	Up to 4.4	6/12	65		Up to 40	Two Channels DDR4-2666	Intel® UHD Graphics 630	✓	\$213
<b>i5-10500</b>	Up to 3.1	Up to 4.5	NA	NA	Up to 4.2	6/12	65		Up to 40	Two Channels DDR4-2666	Intel® UHD Graphics 630	✓	\$192
<b>i5-10400</b>	Up to 2.9	Up to 4.3	NA	NA	Up to 4.0	6/12	65		Up to 40	Two Channels DDR4-2666	Intel® UHD Graphics 630	✓	\$182
<b>i5-10400F</b>	Up to 2.9	Up to 4.3	NA	NA	Up to 4.0	6/12	65		Up to 40	Two Channels DDR4-2666		✓	\$157
<b>i3-10320</b>	Up to 3.8	Up to 4.6	NA	NA	Up to 4.4	4/8	65		Up to 40	Two Channels DDR4-2666	Intel® UHD Graphics 630	✓	\$154
<b>i3-10300</b>	Up to 3.7	Up to 4.4	NA	NA	Up to 4.2	4/8	65		Up to 40	Two Channels DDR4-2666	Intel® UHD Graphics 630	✓	\$143
<b>i3-10100</b>	Up to 3.6	Up to 4.3	NA	NA	Up to 4.1	4/8	65		Up to 40	Two Channels DDR4-2666	Intel® UHD Graphics 630	✓	\$122

Intel® processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. All processors are lead-free (per EU RoHS directive July 2006) and halogen free (residual amounts of halogens are below November 2007 proposed IPC/JEDEC J-STD-709 standards). All processors support Intel® Virtualization Technology (Intel® VT-x).

- <sup>1</sup>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.
- <sup>3</sup>Intel® Optane™ memory requires specific hardware and software configuration. Visit [www.intel.com/Optanememory](http://www.intel.com/Optanememory) for configuration requirements.
- <sup>4</sup>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.



Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No product or component can be absolutely secure. Check with your system manufacturer or retailer or learn more at [intel.com](http://intel.com).

**Embargoed until April 30, 2020 at 6am Pacific Time**

# 10<sup>TH</sup> GEN INTEL® CORE™ DESKTOP PROCESSORS

PROCESSOR NUMBER	BASE CLOCK SPEED (GHZ)	INTEL® TURBO BOOST TECHNOLOGY 2.0 MAXIMUM 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) <sup>1</sup>	INTEL® ALL CORE TURBO FREQUENCY (GHZ)	CORES/ THREADS	THERMAL DESIGN POWER	UNLOCKED <sup>2</sup>	PLATFORM PCIE 3.0 LANES	MEMORY SUPPORT <sup>3</sup>	PROCESSOR GRAPHICS	INTEL® OPTANE™ MEMORY <sup>4</sup>	RCP PRICING (USD 1K)
<b>Pentium Gold G6600</b>	Up to 4.2	NA	NA	NA	NA	2/4	58		Up to 40	Two Channels DDR4-2666	Intel® UHD Graphics 630	✓	\$86
<b>Pentium Gold G6500</b>	Up to 4.1	NA	NA	NA	NA	2/4	58		Up to 40	Two Channels DDR4-2666	Intel® UHD Graphics 630	✓	\$75
<b>Pentium Gold G6400</b>	Up to 4.0	NA	NA	NA	NA	2/4	58		Up to 40	Two Channels DDR4-2666	Intel® UHD Graphics 610	✓	\$64
<b>Celeron G5920</b>	Up to 3.5	NA	NA	NA	NA	2/2	58		Up to 40	Two Channels DDR4-2666	Intel® UHD Graphics 610	✓	\$52
<b>Celeron G5900</b>	Up to 3.4	NA	NA	NA	NA	2/2	58		Up to 40	Two Channels DDR4-2666	Intel® UHD Graphics 610	✓	\$42

Intel® processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. All processors are lead-free (per EU RoHS directive July 2006) and halogen free (residual amounts of halogens are below November 2007 proposed IPC/JEDEC J-STD-709 standards). All processors support Intel® Virtualization Technology (Intel® VT-x).

- <sup>1</sup>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.
- <sup>3</sup>Intel® Optane™ memory requires specific hardware and software configuration. Visit [www.intel.com/Optanememory](http://www.intel.com/Optanememory) for configuration requirements.
- <sup>4</sup>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.

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No product or component can be absolutely secure. Check with your system manufacturer or retailer or learn more at [intel.com](http://intel.com).

**Embargoed until April 30, 2020 at 6am Pacific Time**



# 10<sup>TH</sup> GEN INTEL® CORE™ DESKTOP PROCESSORS

PROCESSOR NUMBER	BASE CLOCK SPEED (GHZ)	INTEL® TURBO BOOST TECHNOLOGY 2.0 MAXIMUM SINGLE CORE TURBO FREQUENCY (GHZ)	INTEL® TURBO BOOST TECHNOLOGY 3.0 FREQUENCY (GHZ)	INTEL® THERMAL VELOCITY BOOST TECHNOLOGY SINGLE / ALL CORE TURBO FREQUENCY (GHZ) <sup>1</sup>	INTEL® ALL CORE TURBO FREQUENCY (GHZ)	CORES/ THREADS	THERMAL DESIGN POWER	UNLOCKED <sup>2</sup>	PLATFORM PCIE 3.0 LANES	MEMORY SUPPORT <sup>3</sup>	PROCESSOR GRAPHICS	INTEL® OPTANE™ MEMORY <sup>4</sup>	RCP PRICING (USD 1K)
<b>i9-10900T</b>	Up to 1.9	Up to 4.5	Up to 4.6	NA	Up to 3.7	10/20	35		Up to 40	Two Channels DDR4-2933	Intel® UHD Graphics 630	✓	\$439
<b>i7-10700T</b>	Up to 2.0	Up to 4.4	Up to 4.5	NA	Up to 3.7	8/16	35		Up to 40	Two Channels DDR4-2933	Intel® UHD Graphics 630	✓	\$325
<b>i5-10600T</b>	Up to 2.4	Up to 4.0	NA	NA	Up to 3.7	6/12	35		Up to 40	Two Channels DDR4-2666	Intel® UHD Graphics 630	✓	\$213
<b>i5-10500T</b>	Up to 2.3	Up to 3.8	NA	NA	Up to 3.5	6/12	35		Up to 40	Two Channels DDR4-2666	Intel® UHD Graphics 630	✓	\$192
<b>i5-10400T</b>	Up to 2.0	Up to 3.6	NA	NA	Up to 3.2	6/12	35		Up to 40	Two Channels DDR4-2666	Intel® UHD Graphics 630	✓	\$182
<b>i3-10300T</b>	Up to 3.0	Up to 3.9	NA	NA	Up to 3.6	4/8	35		Up to 40	Two Channels DDR4-2666	Intel® UHD Graphics 630	✓	\$143
<b>i3-10100T</b>	Up to 3.0	Up to 3.8	NA	NA	Up to 3.5	4/8	35		Up to 40	Two Channels DDR4-2666	Intel® UHD Graphics 630	✓	\$122
<b>Pentium Gold G6500T</b>	Up to 3.5	NA	NA	NA	NA	2/4	35		Up to 40	Two Channels DDR4-2666	Intel® UHD Graphics 630	✓	\$75
<b>Pentium Gold G6400T</b>	Up to 3.4	NA	NA	NA	NA	2/4	35		Up to 40	Two Channels DDR4-2666	Intel® UHD Graphics 610	✓	\$64
<b>Celeron G5900T</b>	Up to 3.2	NA	NA	NA	NA	2/2	35		Up to 40	Two Channels DDR4-2666	Intel® UHD Graphics 610	✓	\$42

Intel® processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. All processors are lead-free (per EU RoHS directive July 2006) and halogen free (residual amounts of halogens are below November 2007 proposed IPC/JEDEC J-STD-709 standards). All processors support Intel® Virtualization Technology (Intel® VT-x).

- <sup>1</sup>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.
- <sup>3</sup>Intel® Optane™ memory requires specific hardware and software configuration. Visit [www.intel.com/Optanememory](http://www.intel.com/Optanememory) for configuration requirements.
- <sup>4</sup>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.

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No product or component can be absolutely secure. Check with your system manufacturer or retailer or learn more at [intel.com](http://intel.com).

**Embargoed until April 30, 2020 at 6am Pacific Time**



# LEGAL DISCLAIMERS

All information provided here is subject to change without notice. Contact your Intel representative to obtain the latest Intel product specifications, roadmaps, and related information.

Performance results are based on testing as of April 17, 2020 in configurations and may not reflect all publicly available updates. See backup for configuration details. No product or component can be absolutely secure.

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 about performance and benchmark results, visit <http://www.intel.com/benchmarks>

Intel technologies may require enabled hardware, software or service activation.

Your costs and results may vary.

Statements in this document that refer to Intel's plans and expectations for the quarter, the year, and the future, are forward-looking statements that involve a number of risks and uncertainties. A detailed discussion of the factors that could affect Intel's results and plans is included in Intel's SEC filings, including the annual report on Form 10-K.

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.

© Intel Corporation. Intel, the Intel logo, and other Intel marks are trademarks of Intel Corporation or its subsidiaries. Other names and brands may be claimed as the property of others.



# PERFORMANCE DISCLAIMERS

## Testing done by Intel as of April 17<sup>th</sup>, 2020:

1. 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: 10<sup>th</sup> 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 v20H2 (RS6). Results: 10<sup>th</sup> Gen Intel® Core™ i9-10900K scored better on the majority of the 25+ game titles tested. Intel will be marketing the 10<sup>th</sup> Gen Intel® Core™ i9-10900K with the tag line “Elite Real World Performance” in certain jurisdictions, including PRC and Vietnam. Intel will be marketing the 10<sup>th</sup> Gen Intel® Core™ i9-10900K with the tag line “Intel’s Fastest Gaming Processor” in certain jurisdictions, including Argentina, Belarus, Belize, Chile, Egypt, El Salvador, Guatemala, Honduras, Italy, Japan, Panama, Peru, Saudi Arabia, Turkey, Russia, and Ukraine. If you are media, an influencer or a marketer from these countries, or otherwise communicating directly to residents in these countries (e.g., on local-language social media), please only refer to the tag line Intel will be using in that country in lieu of the claim on this slide/document.
2. As measured by Mount & Blade2:Bannerlord on 10<sup>th</sup> Gen Intel® Core™ i9-10900K vs. 9<sup>th</sup> Gen Intel® Core™ i9- 9900K
3. As measured by Mount & Blade2:Bannerlord on 10<sup>th</sup> Gen Intel® Core™ i9-10900K vs. 7<sup>th</sup> Gen Intel® Core™ i7-7700K
4. As measured by Monster Hunter World: Iceborn on 10<sup>th</sup> Gen Intel® Core™ i9-10900K vs. 9<sup>th</sup> Gen Intel® Core™ i9- 9900K
5. As measured by Monster Hunter World: Iceborn on 10<sup>th</sup> Gen Intel® Core™ i9-10900K vs. 7<sup>th</sup> Gen Intel® Core™ i7-7700K
6. As measured by Players Unknown Battleground (PUBG) on 10<sup>th</sup> Gen Intel® Core™ i9-10900K vs. 10<sup>th</sup> Gen Intel® Core™ i9- 9900K
7. As measured by Players Unknown Battleground (PUBG) on 10<sup>th</sup> Gen Intel® Core™ i9-10900K vs. 7<sup>th</sup> Gen Intel® Core™ i7-7700K
8. As measured by Megatasking workload on PUBG on 10<sup>th</sup> Gen Intel® Core™ i9-10900K
9. As measured by Megatasking workload on PUBG on 10<sup>th</sup> Gen Intel® Core™ i9-10900K vs. 7<sup>th</sup> Gen Intel® Core™ i7-7700K
10. As measured by Adobe Premier Pro CC 4K video editing workload on 10<sup>th</sup> Gen Intel® Core™ i9-10900K vs. 9<sup>th</sup> Gen Intel® Core™ i9- 9900K
11. As measured by Adobe Premier Pro CC 4K video editing workload on 10<sup>th</sup> Gen Intel® Core™ i9-10900K vs. 7<sup>th</sup> Gen Intel® Core™ i7-7700K
12. Based on enhanced overclocking ability enabled by Intel's comprehensive tools and unique architectural tuning capabilities. Your results may vary. Overclocking may void warranty or affect system health. For details see [intel.com/overclocking](https://www.intel.com/overclocking).



# CONFIGURATIONS

## Testing done by Intel as of April 17<sup>th</sup>, 2020:

- 10th Gen Intel® Core™ i9-10900K processor PL1=125W TDP, 10C20T, Motherboard: Pre production Asus ROG Maximus XII Formula Memory: 32 GB DDR4-2933, Storage: Intel SSD 905P 960GB, Display Resolution: 1920x1080, OS: Microsoft Windows 10 Pro 1909 V720 19H2(RS6), Graphics card: NVIDIA RTX 2080Ti, Graphics driver: 442.59 Bios version 403
- 9th Gen Intel® Core™ i9-9900K processor PL1=95W TDP, 8C16T, Motherboard: Production Prime Asus Z390-A Memory: 32 GB DDR4-2666, Storage: Intel SSD 905P 960GB, Display Resolution: 1920x1080, OS: Microsoft Windows 10 Pro 1909 V720 19H2(RS6), Graphics card: NVIDIA RTX 2080Ti, Graphics driver: 442.59 Bios version 1401
- 7th Gen Intel® Core™ i7-7700K processor PL1=91W TDP, 4C8T, Motherboard: Production Asus Z170-M Plus Memory: 32 GB DDR4-2133, Storage: Intel SSD 905P 960GB, Display Resolution: 1920x1080, OS: Microsoft Windows 10 Pro 1909 V720 19H2(RS6), Graphics card: NVIDIA RTX 2080Ti, Graphics driver: 442.59 Bios version 1302
- 9th Gen Intel® Core™ i9-9900KS processor PL1=127W TDP, 8C16T, Motherboard: Production Asus Prime Z390A Memory: 32 GB DDR4-2666, Storage: Intel SSD 905P 960GB, Display Resolution: 1920x1080, OS: Microsoft Windows 10 Pro 1909 V720 19H2(RS6), Graphics card: NVIDIA RTX 2080Ti, Graphics driver: 442.59 Bios version 1401
- AMD Ryzen™ 9 3950X Processor; PL1 = 105W, 16C32T, Max boost clock up to 4.7GHz, Motherboard: Production OG Crosshair Hero VIII; Memory: 32 GB DDR4-3200; Storage: Intel SSD 905P 960GB, Display Resolution: 1920x1080, OS: Microsoft Windows 10 Pro 1909 V720 19H2(RS6), Graphics card: NVIDIA RTX 2080Ti, Graphics driver: 442.59 Bios version 1302

# GAME TITLES

Testing done by Intel as of April 17<sup>th</sup>, 2020:

GAME TITLE	VERSION
Ashes of the Singularity: Escalation - Crazy Settings - DX12 - CPU Focused Test - Average Framerate	v2.92.73675
Assassin's Creed Odyssey - Benchmark - DX11- 1080p High Avg FPS	v1.5.3
Borderlands 3 - Benchmark - DX11- 1080p High Avg FPS	v1.0.7_CL_214933
Civ 6: Expansion DX12 - Gathering Storm - AI - Avg Turn Time - 1080p High Settings (secs)	1.0.0.341(443561)
Counterstrike Global Offensive - DX11- 1080p High Avg FPS	v13746
DOTA2 - DX11 - 1080p High Avg FPS	v7.25
F1 2019 Benchmark - DX11- 1080p High Avg FPS	v1.22
Far Cry New Dawn DX12 1080p High Avg FPS	v1.0.5
Final Fantasy XV - Benchmark - 1080p High Avg FPS	v1.0
Grand Theft Auto V - Benchmark - DX11 1080p High Avg FPS	v1868
Hitman 2 DX12 1080p High Avg FPS	v2.72.0
League of Legends - 1080p High Avg FPS	v10.7
Metro Exodus - Benchmark - DX12 1080p High Avg FPS	v0.1.0.35
Middle Earth: Shadow of War - Benchmark - DX11- 1080p High Avg FPS	v1.21
Red Dead Redemption 2 - Vulkan - 1080p High Avg FPS	v1.0.1232.48
Rocket League Benchmark - DX11- 1080p High Avg FPS	v1.75
Rise of the Tomb Raider - Benchmark - DX12 - 1080p High Avg FPS	v1.0 build 820.0_64
Shadow of the Tomb Raider DX12 1080p High Avg FPS	v1.0 build 296.0_64
Strange Brigade Vulkan - 1080p High Avg FPS	v1.47.22.14 Vulkan
Tom Clancy's Rainbow Six Siege - GPU DX11 1080p High Avg FPS	Y5S1.1
Tom Clancy's The Division 2 - Benchmark - DX12- 1080p High Avg FPS	v2913517
Total War: Warhammer 2 - Laboratory DX11 1080p High Avg FPS	v1.8.3
War Thunder Tank Battle(CPU) - Benchmark - DX11- 1080p High Avg FPS	v1.97.1.47
World Of Warcraft BfA BM DX11- 1080p High Avg FPS	v. 8.3.0.33941
World War Z Vulkan - 1080p High Avg FPS	v1.59



# BENCHMARK AND WORKLOAD DESCRIPTIONS

Testing done by Intel as of April 17<sup>th</sup>, 2020:

**RUG 1209 - Adobe Premier Pro CC RUG** measures the time it takes to export a Premiere\* Project timeline to 4K HEVC video using the 'Software Encoding' option which is CPU only. The project "RUG\_4K\_Sony\_Camping\_Demo" contains a single 2minute and 7 second 4K video clip of 4K H.265 MP4 footage recorded at a bitrate of approximately 75.8 Mbps. The input file size is 1.17 GB. The video stream is 3840x2160 (4K) in H.265 format with a framerate of 60 FPS. The performance test measures the time to export the timeline to a 4K H.265 MP4 format using SW (CPU only) Encoding. The output is a high quality 4K video file. Credit: The source video file for this workload is from: <https://4kmedia.org/sony-camping-in-nature-4k-demo/>

**RUG 1190 - PLAYER UNKNOWN'S BATTLEGROUNDS (PUBG) Mega-tasking** workload uses a "SOLO | TPP" game mode on the 'Erangel' map to create a replay that is used to evaluate game performance while streaming to Twitch using OBS and recording gameplay using OBS; with the "Software(x264)" and "veryfast" presets. FPS is recorded using PresentMon. This workload will report: 1. The average FPS of game play as reported by PresentMon a. 5min of the game replay is captured with PresentMon using this workload. 2. Version number used of both PUBG & OBS Studio. **PUBG** is a battle royale shooter that pits 100 players against each other in a struggle for survival. Gather supplies and outwit your opponents to become the last person standing.

**FPS on Mount & Blade2:Bannerlord** -DX11 1080p High Settings - v1.0.0

**FPS on Monster Hunter World: Iceborn** - DX12 High Settings - v13.01.00

**FPS on Player Unknown Battleground (PUBG)** - DX11 1080p High Avg - v7.2.8



# SYSTEM CONFIGURATIONS

	KBL i7-7700K (4C8T)	CFL-S R i9-9900K (8C16T)	CML-S i9-10900K (10C20T)	AMD Matisse 3950X (16C32T)	CFL-S R i9-9900KS (8C16T)
Brand	Intel	Intel	Intel	AMD	Intel
Architecture	KBL	CFL-S R	CML-S	Matisse	CFL-S R
Model Number	i7-7700K	i9-9900K	i9-10900K	3950X	i9-9900KS
Cores	4	8	10	16	8
Threads	8	16	20	32	16
Last Level Cache Size (MB)	8MB	16MB	20MB	64MB	16MB
CPU Base Frequency (MHz)	4200	3600	3700	3500	4000
CPU Single Core Turbo Frequency (MHz)	4500	5000	5300	4700	5000
CPU All Core Frequency (MHz)	4400	4700	4800	3900	5000
TDP (W)	91W	95W	125W	105W	127W
Graphics Vendor	NVIDIA	NVIDIA	NVIDIA	NVIDIA	NVIDIA
Graphics Brand Name	NVIDIA	NVIDIA	NVIDIA	NVIDIA	NVIDIA
Device Name	RTX 2080TI	RTX 2080TI	RTX 2080TI	RTX 2080TI	RTX 2080TI
GFX Driver Version	442.59	442.59	442.59	442.59	442.59
Motherboard Vendor	Asus	Asus	Asus	Asus	Asus
Motherboard Name	Prime Z270-A	Prime Z390-A	ROG Maximus XII Formula	ROG Crosshair Hero VIII	Prime Z390A
Motherboard Type (Production, CRB, RVP)	Production	Production	Pre-Production	Production	Production
BIOS Version	1302	1401	403	1302	1401
Memory Manufacturer	G.Skill	G.Skill	G.Skill	G.Skill	G.Skill
Memory Type	DDR4	DDR4	DDR4	DDR4	DDR4
Memory Configuration	4x8GB	4x8GB	4x8GB	4x8GB	4x8GB
Memory Speed (MHz)	2400	2666	2933	3200	2666
Total Memory Size	32GB	32GB	32GB	32GB	32GB
Storage Vendor	Intel	Intel	Intel	Intel	Intel
Storage Type (SSD, HDD, eMMC)	SSD	SSD	SSD	SSD	SSD
Storage Model	905P	905P	905P	905P	905P
Storage Size	960GB	960GB	960GB	960GB	960GB
Storage Speed (if applicable)	N/A	N/A	N/A	N/A	N/A
Operating System Name	Win 10 Pro	Win 10 Pro	Win 10 Pro	Win 10 Pro	Win 10 Pro
Operating System Version Number	1909 v720	1909 v720	1909 v720	1909 v720	1909 v720
Operating System Service Pack	19H2 (RS6)	19H2 (RS6)	19H2 (RS6)	19H2 (RS6)	19H2 (RS6)
Screen Size	1920x1080	1920x1080	1920x1080	1920x1080	1920x1080
Water Cooling	No	Yes	Yes	Yes	Yes
Tamper Protection (RS6)	OFF	OFF	OFF	OFF	OFF
Defender	OFF	OFF	OFF	OFF	OFF
Long Duration Package Power Limit			125W		
Package Power Time Window (Tau)			56secs		
Short Duration Power Limit			250W		



