8TH GEN INTEL® CORE™ PROCESSORS

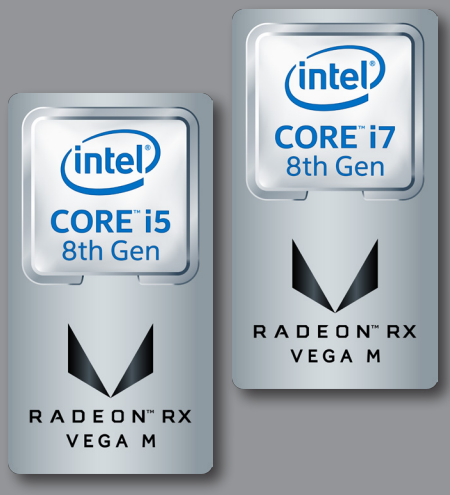
NEXT LEVEL PERFORMANCE IN SLEEK, THIN & LIGHT COMPUTERS

The new 8th Gen Intel® Core™ mobile processor with Radeon™ RX Vega M graphics is Intel's first processor and discrete graphics bundled in a single package. This unprecedented design unlocks performance levels previously unseen in thin and light form factors with Intel processors due to its ultra-small footprint and unique power sharing capability. This new processor is for the high performing, small form factor computers like 2-in-1's, thin and light notebooks and mini-PC's.

EXPERIENCE SMOOTH FRAME RATES

EXCEPTIONAL PERFORMANCE IN INNOVATIVE DESIGNS

The performance begins with Intel's® powerful 45W mobile processor, delivering four cores and eight threads on each processor. Users will see frequency up to 4.2 GHz thanks to Intel® Turbo Technology 2.0 as well as up to 8 MB of cache memory. This enthusiast processor is then connected to a custom discrete Radeon™ RX Vega M graphics processor via Intel's® high speed PCIe lanes directly connected to the processor. This enables the bandwidth needed for the CPU to feed the graphics compute units (up to 24 Compute Units) to run up to 1190 MHz boost frequency and deliver buttery smooth frame rates on your favorite games. The final touch is the low power dedicated graphics memory that comes in the form of 4 GB of High Bandwidth Memory Gen 2 (HBM2) with class leading memory bandwidth up to 205GB/s, to quickly store and retrieve information critical to a great graphics experience.



VAST RANGE OF USAGE & PERFORMANCE FLEXIBILITY

THIS NEW ENTHUSIAST 8TH GENERATION INTEL® CORE™ PROCESSOR DELIVERS:

- Two levels of performance: one for advanced content creation and entry gaming and the other for great gaming in full HD and VR experiences.
- First Intel® platform to dynamically share power between the compute and discrete graphics processor to efficiently deliver great performance (with Intel® Dynamic Tuning).
- Intel® Turbo Boost 2.0 technology to give you that extra burst of performance when you need it.
- Intel® Hyper-Threading technology on all processors, which allows each processor core to work on two tasks at the same time, improves multitasking, speeds up workflows and accomplishes more in less time.
- The ability to overclock the CPU, GPU and HBM2 for a vast range of usage and performance flexibility.

NEXT LEVEL PERFORMANCE ON THE GO

Great performance is now available in new innovative designs like thin and light notebooks, 2in1's and mini-PC's. Whether creating, editing or viewing 4K content, mega tasking while playing your favorite game or exploring exotic places in VR and Windows* MR, the 8th Gen Intel® Core™ mobile processor with Radeon™ RX Vega M graphics delivers balanced performance to experience what's coming next at home or on the go.

Product Innovation

Systems integrating this new processor will be able to deliver high-performance processing and the discrete graphics required for rich content creation, 4K video editing, smooth game play at high-resolution settings and immersive VR experiences.

Getting the most out of compute and graphics processors in thin designs requires intimate knowledge of the silicon as well as the rest of the hardware and software on the platform, from I/O to thermal capabilities to software workloads. Integrating the Intel® Embedded Multi-die Interconnect Bridge (Intel® EMIB) is a good example of this knowledge coming to bare in unique ways on this product. The Intel® EMIB acts as an intelligent information bridge between the discrete graphics chip and high bandwidth memory, allowing us to bundle those components closely together in the same package. This creates up to 50% space savings[1], which enables OEMs more freedom and flexibility when it comes to creating innovative thin and light devices that still deliver enthusiast performance.

TAKE YOUR PROJECT OR GAME ON THE GO

Intel brings years of power sharing experience in lower power platforms into this solution through Intel® Dynamic Tuning. This required custom drivers and interfaces to the discrete graphics processor and dedicated graphics memory. Intel® Dynamic Tuning synthesizes information from the platform and then directs power policies to the CPU, GPU and HBM2 to deliver great performance under the conditions reported. Not only does it help manage temperature, power delivery and performance state in real time, it also enables system designers to adjust the ratio of power sharing between the processor and graphics based on workloads and usages, like performance gaming. Balancing power between our high-performing processor and the graphics subsystem is critical to achieve great performance across both processors as systems get thinner.

This new solution from Intel combines the knowledge gained over decades and synthesizes it into intelligent software that has fine grained control over each piece of silicon to deliver great performance across a broad range of workloads.

Sleek Form Factors

Thin and light and 2in1 notebooks with a 8th Gen Intel® Core™ mobile processor with Radeon™ RX Vega M graphics deliver great battery life so you can easily take your project or game on the go. Rotate the screen and use your stylus for writing.

Mini-PC's delivering high performance home entertainment center for playing your favorite video games, immersing yourself in VR and streaming 4K content without being intrusive.

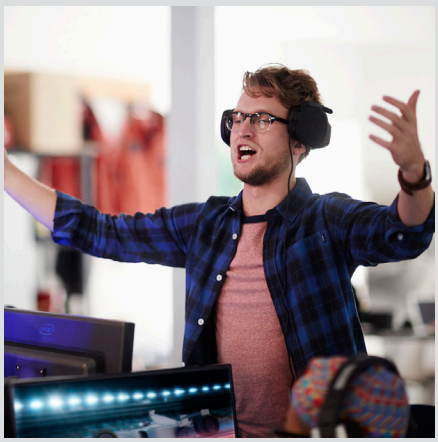
Performance to Tackle Big Tasks

Create like a Pro – create 3D images from scratch and edit videos seamlessly with the next level of processing performance, at home or on the go, using your favorite creative applications. 3D rendering, shading and complex physics calculations on a small form-factor computer with a 8th Gen Intel® Core™ mobile processor with Radeon™ RX Vega M graphics introduces a new definition of small and fast.

Play your favorite games in high resolution and settings on the go or in your living room with smooth motion and exquisite detail bringing to life a vividly immersive experience.

Get a rich and deep immersive VR experience in a thin & light ultra-portable laptop or Mini-PC powered by a 8th Gen Intel® Core™ mobile processor with Radeon™ RX Vega M graphics. VR in a compact computer has never been as easily available as now.

SMOOTH MOTION AND EXQUISITE DETAIL



Software

Users will also be able to experience the latest software features available from Intel and Radeon, features like Intel® Extreme Tuning Utility, Radeon™ Chill, Radeon™ ReLive and Radeon™ Wattman. Users can download drivers to support the latest game releases from Intel's website and find settings recommendation for hundreds of popular games at Gameplay.intel.com.

Other Features

Notebooks with versatile Thunderbolt™ 3—the USB-C that does it all—provide incredible I/O performance. Declutter your desk with a single cable that conveniently supports up to 40 Gb/s transfer speeds, two 4K UHD 60 Hz displays, system charging up to 100W, and Thunderbolt™ networking to bolster productivity and deliver amazing experiences on your PC.

Stronger protection for your enabled security[1] software is enabled in the hardware of this 8th Generation Intel® Core™ processors through Intel® Software Guard Extensions (Intel® SGX) 1, Intel® BIOS Guard and Intel® Boot Guard.

Intel's first processor ever packaged with discrete graphics will make you rethink the amount of performance you should expect out of your small form factor computers.

8TH GENERATION INTEL® CORE™ PROCESSOR WITH RADEON™ RX VEGA M GRAPHICS FEATURES AT A GLANCE

FEATURES[1]	BENEFITS
Intel® Turbo Boost Technology 2.0	Dynamically increases the processor's frequency, as needed, by taking advantage of thermal and power.
Intel® Hyper-Threading Technology	Delivers two processing threads per physical core. Highly threaded applications can get more work done in parallel, completing tasks sooner.
Intel® Smart Cache	Dynamically allocates shared cache to each processor core, based on workload, reducing latency and improving performance.
Radeon™ RX Vega M Graphics	Customized discrete GPU that integrates key features that optimize for low power, front-end and back-end processing and decreased silicon footprint.
Intel® Dynamic Tuning	A platform level hardware/software solution for power and thermal management providing a coordinated approach for different policies to change the hardware state of a device based on system conditions.
Intel® HD Graphics	Play 4K UHD videos with exceptional clarity and view and edit even the smallest details of photos efficiently.
Intel® Quick Sync Video	Delivers excellent video conferencing capability, fast video conversion, online sharing, and fast video editing and authoring.
Processor Core/Memory/ Graphics Overclocking[2]	When unlocked processors are paired with select chipset SKUs, processor core, graphics, and memory can be set to run at frequencies above the specification frequency of the processor resulting in higher performance.
Integrated Memory Controller	Offers stunning memory read/write performance through efficient prefetching algorithms, lower latency, and higher memory bandwidth.
PCI Express* 3.0 Interface	Offers up to 8 GT/s for fast access to peripheral devices with up to 8 lanes. The lanes can be configured as 1x8 or 2x4 depending on motherboard designs.
Intel® Power Optimizer and Processor C-States	Intel® Power Optimizer increases periods of silicon sleep state across the platform ingredients, including the processor, chipset, and third-party system components, to reduce power. Processor C-states (C8- C10) provide low idle power.
Intel® Virtualization Technology	Allows one hardware platform to function as multiple "virtual" platforms. Offers improved manageability by limiting downtime and maintaining productivity by isolating computing activities into separate partitions.
VMCS Shadowing	VMCS shadowing allows a Virtual Machine Manager (VMM) running in a guest (nested virtualization) to access a shadow VMCS memory area using the normal VMRead/VMWrite instructions. This technology reduces overhead for a more natural and responsive user experience. It also allows users to take control of their personal and professional data and apps while being protected by game-changing security.
Intel® Advanced Encryption Standard New Instructions (Intel® AES-NI)	A set of instructions that can be used to accelerate a variety of encryption apps, including whole disk encryption, file storage encryption, conditional access of 4K UHD content, Internet security, and VoIP. Consumers benefit from protected internet and email content, plus fast, responsive disk encryption.
Intel® Transactional Synchronization Extensions (Intel® TSX)	A set of instructions focused on enterprise-level multithreaded performance scaling, making parallel operations more efficient via improved control of software threads and locks. This offers performance benefits for enterprise-level big data analytics/business intelligence and visualization apps, which involve multi-user collaboration.

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8TH GENERATION INTEL® CORE™ PROCESSOR WITH RADEON™ RX VEGA M GRAPHICS FEATURES AT A GLANCE

FEATURES[2]	BENEFITS
Intel® Advanced Vector Extensions 2 (Intel® AVX2)[3]	A set of 256-bit instructions to deliver enhanced performance on floating point- and integer-intensive apps. Includes instructions for FMA (Fused Multiply Add) which can deliver better performance on media and floating point computations, including face recognition, professional imaging, high-performance computing, consumer video and imaging, compression, and encryption.
Intel® Software Guard Extensions (Intel® SGX)	A collection of instructions, APIs, libraries, and tools to help protect select code and data from disclosure or modification through the use of enclaves, which are protected areas of execution in memory.
Intel® BIOS Guard	An augmentation of existing chipset-based BIOS flash protection capabilities targeted to address the increasing malware threat to BIOS flash storage. It helps protect the BIOS flash from modification without platform manufacturer authorization, helps defend the platform against low-level DOS (denial of service) attacks, and restores BIOS to a known good state after an attack.
Intel® Boot Guard	Hardware-based boot integrity protection that helps prevent unauthorized software and malware takeover of boot blocks critical to a system's function, thus providing added level of platform security based on hardware. Configurable boot types include: **Measured Boot** – measures the initial boot block into the platform storage device such as a trusted platform module (TPM) or Intel® Platform Trust Technology. **Verified Boot** – cryptographically verifies the platform initial boot block using the boot policy key.
Intel® OS Guard	A hardware-based security feature that protects the OS (operating system) kernel. OS Guard helps prevent use of malicious data or attack code located in areas of memory marked as user mode pages from taking over or compromising the OS kernel. OS Guard is not application-specific and protects the kernel from any application.
Intel® Identity Protection Technology	Protect your one-time-password (OTP) credentials and public key infrastructure (PKI) certificates and add a layer of encrypted, second factor authentication for online transactions.
Intel® Secure Key	Security hardware-based random number generator that can be used for generating high-quality keys for cryptographic (encryption and decryption) protocols. Provides quality entropy that is highly sought after in the cryptography world for added security.

EXPERIENCE WHAT'S COMING NEXT

8TH GENERATION INTEL® CORE™ PROCESSOR WITH RADEON™ RX VEGA M GRAPHICS PRODUCT FEATURES

	INTEL® CORE™ i7-8809G PROCESSOR	INTEL® CORE™ i7-8709G PROCESSOR	INTEL® CORE™ i7-8706G PROCESSOR	INTEL® CORE™ i7-8705G PROCESSOR	INTEL® CORE™ i5-8305G PROCESSOR
Maximum Processor Frequency (GHz)	4.2	4.1	4.1	4.1	3.8
Base Clock Frequency (GHz)	3.1	3.1	3.1	3.1	2.8
Number of Processor Cores/Threads	4/8	4/8	4/8	4/8	4/8
Cache Size (MB)	8	8	8	8	6
Number of Memory Channels	2	2	2	2	2
Memory Type	DDR4-2400	DDR4-2400	DDR4-2400	DDR4-2400	DDR4-2400
Discrete Graphics	Radeon™ RX Vega M GH	Radeon™ RX Vega M GH	Radeon™ RX Vega M GL	Radeon™ RX Vega M GL	Radeon™ RX Vega M GL
Intel® HD Graphics	630	630	630	630	630
• Graphics Dynamic Frequency (MHz)	Up to 1100	Up to 1100	Up to 1100	Up to 1100	Up to 1100
• Intel® Quick Sync Video	Yes	Yes	Yes	Yes	Yes
Intel® Turbo Boost Technology 2.0[5]	Yes	Yes	Yes	Yes	Yes
Intel® Hyper-Threading Technology	Yes	Yes	Yes	Yes	Yes
Intel® vPro™ Technology	No	No	Yes	No	No
Processor Core/Graphics & System Memory Overclocking[4]	Yes	Yes	Yes	Yes	No
Discrete GPU & HBM Overclocking	Yes	No	No	No	No
Intel® Optane™ Memory Support	Yes	Yes	Yes	Yes	Yes
Intel® Virtualization Technology	Yes	Yes	Yes	Yes	Yes
Intel® AES-NI	Yes	Yes	Yes	Yes	Yes
Intel® TSX	No	No	Yes	No	No
Intel® AVX2[3]	Yes	Yes	Yes	Yes	Yes
Intel® SGX	Yes	Yes	Yes	Yes	Yes
Intel® BIOS Guard	Yes	Yes	Yes	Yes	Yes
Intel® Boot Guard	Yes	Yes	Yes	Yes	Yes
Intel® OS Guard	Yes	Yes	Yes	Yes	Yes
Intel® Identity Protection Technology	Yes	Yes	Yes	Yes	Yes

8TH GENERATION INTEL® CORE™ PROCESSOR WITH RADEON™ RX VEGA M GRAPHICS PRODUCT FEATURES

	INTEL® CORE™ i7-8809G PROCESSOR	INTEL® CORE™ i7-8709G PROCESSOR	INTEL® CORE™ i7-8706G PROCESSOR	INTEL® CORE™ i7-8705G PROCESSOR	INTEL® CORE™ i5-8305G PROCESSOR
Discrete Graphics Version	Radeon™ RX Vega M GH Graphics	Radeon™ RX Vega M GH Graphics	Radeon™ RX Vega M GL Graphics	Radeon™ RX Vega M GL Graphics	Radeon™ RX Vega M GL Graphics
Compute Units	24	24	20	20	20
Stream Processors	1536	1536	1280	1280	1280
Base GPU Clock	1063 MHz	1063 MHz	931 MHz	931 MHz	931 MHz
Boost GPU Clock	1190 MHz	1190 MHz	1011 MHz	1011 MHz	1011 MHz
Memory Bandwidth	204.8 GB/s	204.8 GB/s	179.2 GB/s	179.2 GB/s	179.2 GB/s
Peak SP Performance	Up to 3.7 TFLOPS	Up to 3.7 TFLOPS	Up to 2.6 TFLOPS	Up to 2.6 TFLOPS	Up to 2.6 TFLOPS
Texture Units	96	96	80	80	80
ROPs	64 pix/clk	64 pix/clk	32 pix/clk	32 pix/clk	32 pix/clk
High Bandwidth Cache	4GB HBM2	4GB HBM2	4GB HBM2	4GB HBM2	4GB HBM2
Memory Interface Width	1024 bit HBM2	1024 bit HBM2	1024 bit HBM2	1024 bit HBM2	1024 bit HBM2
Memory Interface Data Rate	1.6 Gbps	1.6 Gbps	1.4 Gbps	1.4 Gbps	1.4 Gbps

For more information, visit **www.intel.com/content**

1 Board space savings calculated by comparing the 8th Gen Intel® Core™ processor with Radeon™* RX Vega M graphics and 7th Gen Intel® Core™ H processor with discrete graphics and 4GB of GDDR5 down on the motherboard, includes PCIe trace length savings.

2 Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. Check with your system manufacturer or retailer or learn more at www.intel.com.

3 Intel® Core™ i7 processors designated by "K" and "X" in the processor number are unlocked for performance tuning.

4 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.

5 Intel® Turbo Boost Technology: Requires a system with Intel® Turbo Boost Technology. Intel Turbo Boost Technology and Intel Turbo Boost Technology 2.0 are only available on select Intel® processors. Consult your PC manufacturer. Performance varies depending on hardware, software, and system configuration. For more information, visit http://www.intel.com/go/turbo