

Razor-Thin Laptops Meets Ultra-Fast Tablets with Intel® Core™ M Processor Platforms





Intel's 14nm process delivers substantial improvements in performance and energy efficiency for thin, light, highly mobile devices – perfect for 2 in 1 fanless detachables.

An entirely new platform

Manufacturing innovation and processor efficiency take huge leaps forward with the Intel $^{\circ}$ Core $^{\text{TM}}$ M processor.

As the first commercial processor built on 14nm manufacturing process technology, it marks the arrival of a new generation of 2 in 1 platforms.

Next generation 2 in 1 platforms with Intel® Core™ M processors deliver significant performance advancements²²—including vastly improved graphics—and battery life²³ in lightweight razor thin designs. New enhancements include:

- An energy efficient design combined with 14nm manufacturing technology enables a 60% reduction in the thermal design point (TDP) for thinner quieter designs
- A new multichip package that has an almost 50% smaller footprint than 4th Generation Intel® Core™ processors (Y series) allowing even smaller platform designs
- The new lower-power processor delivers faster processor performance and better graphics performance compared to previous generations²²

Power consumption is reduced vs.

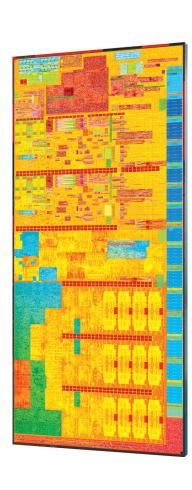
prior generations enabling even longer battery life²³

Smart Efficient Design and Manufacturing Enables Innovative 2 in 1 Platforms

- Lowest Core™ Processor thermal design point (TDP) levels for optimized designs and performance
- Configurable thermal design points for flexible scalable designs
- Intelligent I/O enables configurability and power management

Next Generation Graphics Architecture & Audio

- Intel HD Graphics 5300 is a highly efficient graphics architecture designed for 2 in 1 platforms
- Watch 1080p video with exceptional clarity. Edit your videos and photos, and play popular games all on the go
- Intel® Smart Sound Technology delivers enhanced audio processing and voice recognition with low power draw giving longer battery life



Energy efficiency and small footprint for innovative 2 in 1 designs

The Intel® Core™ M processor based platform enables innovative 2 in 1 platforms that have the mobility of tablets and the capabilities of a PC. Intel's 14nm manufacturing process combined with innovations in packaging allow customers to develop sleek and silent platforms.

- Lower processor thermal design points (TDP) that are 60% less than 4th Generation Intel® Core™ processors (Y series).
- Configurable thermal design points enable customers to design systems that scale in performance
- Reduced package footprint dimensions that allow sleeker system design.

Excellent performance for a great experience

The Intel® Core™ M processor takes advantage of the power efficiency of the

14nm process combined with improvements in processor instructions plus graphics architectural enhancements to deliver fast performance. The focus on efficiency in the manufacturing process and processor enhancements enables increased CPU and graphics performance at low thermal design points

Low power for long battery life

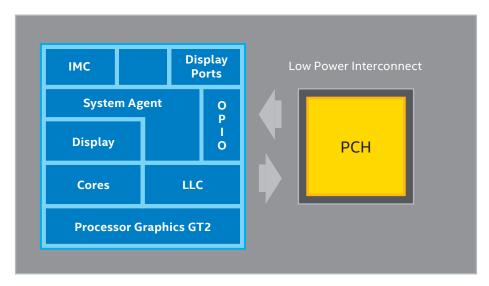
Processor power design improvements across CPU, graphics, I/O and power management plus the increased power efficiency of Intel's 14nm manufacturing process deliver lower power vs. 4th Generation Intel® Core™ processors (Y series).²³

Intel® Smart Sound Technology

Our latest micro-architecture now includes a specialized Digital Signal Processor (DSP) dedicated for audio media playback and voice interaction. This helps to offload the main CPU to save platform power while giving new capabilities, for example, waking your system using only your voice or en-

abling longer battery life while watching a movie. Intel Smart Sound Technology includes:

- Audio Post Processing in the DSP supporting Waves* and DTS* technologies for the best audio experience
- Intel® Wake on Voice¹⁷ that allows the DSP to recognize your distinctive voice and wake the system from Microsoft InstantGo*. Intel WOV also saves power while you use your device for work or play since our DSP does work the CPU would normally do.



Ultra-low-power Intel® Core™ M processor

Intel $^{\circ}$ Core $^{\mathsf{m}}$ M processor features at a glance

FEATURES ²⁷	BENEFITS	
Intel® Turbo Boost Technology 2.06	Dynamically increases the processor's frequency, as needed, by taking advantage of thermal and power headroom when operating below specified limits.	
Intel® Hyper-Threading Technology ⁷	Delivers two processing threads per physical core. Highly threaded applications can get more work done in parallel, completing tasks sooner.	
Built-In Visuals	Intel® Quick Sync Video — Delivers excellent video conferencing capability, fast video conversion, online sharing, and fast video editing and authoring.	
	Intel® Clear Video HD— Visual quality and color fidelity enhancements for HD playback.	
	Intel $^\circ$ HD Graphics 5300 — Allows playing of HD videos with exceptional clarity, viewing and editing of even the smallest details of photos, and playing today's popular games.	
	Intel® Wireless Display³— Lets you beam your apps and personal and online content such as movies, photos, and music to an HDTV with a simple wireless connection.	
Integrated Memory Controller	An integrated memory controller offers stunning memory read/write performance through efficient prefetching algorithms, lower latency, and higher memory bandwidth.	
Intel® Smart Cache	The shared cache is dynamically allocated to each processor core, based on workload. This reduces latency and improves performance.	
Intel® Virtualization Technology⁵	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.	
Intel® Advanced Encryption Standard New Instructions (Intel® AES–NI)®	A fast, secure AES engine for a variety of encryption apps, including whole disk encryption, file storage encryption, conditional access of HD content, internet security, and VoIP. Consumers benefit from protected internet and email content, plus fast, responsive disk encryption.	
Intel® Power Optimizer and Processor C-States	Intel® Power Optimizer increases periods of silicon sleep state across the platform ingredients, including the CPU, chipset, and third-party system components, to reduce power. Processor C-states (C8-C10) provide low idle power.	
Fully Integrated Voltage Regulator (FIVR)	The voltage regulator is integrated into Intel® Core™ M processors, improving battery life and providing design-cost and space savings for OEMs. This integration also allows finer power control for efficiency.	
Configurable Thermal Design Point (TDP)	With Configurable TDP, the processor is now capable of modulating the maximum sustained power vs. performance. Configurable TDP thus provides design and performance flexibility to control system performance based on the cooling capability and usage scenarios. For example, a detachable Ultrabook™ may need more performance when used in a full clamshell mode (vs. tablet mode), or when balanced performance is needed in a quiet conference room setting.	
Intel® Secure Key ¹³ (formerly Digital Random Number Generator [DRNG])	Security hardware-based random number generator that can be used for generating high-quality keys for cryptographic (encryption and decryption) protocols. This provides quality entropy that is highly sought after in the cryptography world for added security.	
LINS	A set of instructions that works in conjunction with AVX 2.0 instructions to accelerate CPU performance during certain operations that include high-definition content decoding, encryption during compression/decompression, and cryptographic security protocols.	
Intel® Advanced Vector Extensions (Intel® AVX) 2.0 ²⁴	AVX 2.0 is an extension of AVX 1.0 with new optimized instructions to deliver enhanced performance on floating point–intensive apps. AVX 2.0 adds 256bit integer instructions and new instructions for FMA (Fused Multiply Add). FMA delivers excellent performance on media and floating point computations, including face recognition; professional imaging; high-performance computing; consumer video and imaging; compression; and encryption.	

Intel $^{\circ}$ Core $^{\mathsf{m}}$ M processor features at a glance

FEATURES ²⁷	BENEFITS		
Collaborative Processor Performance Control (CPPC)	A technology based on the ACPI 5.0 specification that dynamically modulates performance vs. active application power. It reduces active power to deliver long battery life and allows deep low power states to be reached.		
Intel® BIOS Guard (Codename Platform Flash Armoring Technology [PFAT]) ²¹	Intel® BIOS Guard is an augmentation of existing chipset-based BIOS flash protection capabilities targeted to address the increasing malware threat to BIOS flash storage. It protects 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 Guard¹9	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 trusted platform module (TPM) or Intel® Platform Trust Technology (PTT).		
	Verified Boot —Cryptographically verifies the platform initial boot block using the boot policy key.		
Intel® OS Guard¹4	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® Platform Trust Technology ²⁰	A trusted element of the platform execution that provides enhanced security by verifying the boot portion of the boot sequence.		
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® Active Management Technology (Intel® AMT) ²	Using built-in platform capabilities and popular third-party management and security applications, Intel AMT allows IT to discover, heal, and protect computing assets on wired and wireless networks.		
Intel® Small Business Advantage (Intel® SBA) ¹⁰	Helps small businesses enhance the security and productivity of their small business with a range of out of the box features, including software monitor, data backup and restore, USB port blocker, health center, and wireless display.		
Intel® Rapid Storage Technology (Intel® RST)	Offers excellent levels of performance, responsiveness, and expandability. Take advantage of the enhanced performance and lower power consumption available with Intel® RST with one or more SATA or PCIe storage drives. With additional SATA drives, Intel® RST provides quicker access to digital photo, video, and data files with RAID 0, 5, and 10, and greater data protection against a storage disk drive failure with RAID 1, 5, and 10 ¹⁶ . Dynamic Storage Accelerator unleashes the maximum performance of Solid State Drives (SSD) when multitasking ¹⁶		
Intel® Smart Response Technology⁴	Spend less time waiting, with fast access to the files and applications you use the most.		
Intel® Smart Connect Technology®	Stay current with automatic, no-wait updates to your email and social networks, even when your device is asleep. Combine with Intel® WiFi HotSpot Assistant ²⁶ to automatically connect to free and paid WiFi hotspots and refresh content in more locations worldwide.		

Intel $^{\circ}$ Core $^{\mathsf{m}}$ M processor features at a glance

FEATURES ²⁷	BENEFITS
Intel® Identity Protection Technology ¹²	Protect your one-time-password (OTP) credentials and PKI certificates and add a layer of encrypted second factor authentication for online transactions.
	Log into your system or make secure credit card purchases on your system using near-field communica- tion (NFC)–enabled cards.
Intel® High Definition Audio¹5	Integrated audio support enables premium digital surround sound and delivers advanced features such as multiple audio streams and jack re-tasking.
Intel® Smart Sound Technology	A dedicated Audio Digital Signal Processor designed to process Audio for Media playback, and Voice for PC interactions like Nuance Dragon* or Skype*. Enables long battery life while providing new usages and maintaining high end audio playback.
Universal Serial Bus 3.0	Integrated USB 3.0 support enhances performance with a design data rate of up to 5 gigabits per second (Gbps) with up to 4 USB 3.0 ports. ¹
Universal Serial Bus 2.0	Hi-Speed USB 2.0 support with a design data rate of up to 480 megabits per second (Mbps) with up to 10 USB 2.0 ports. ¹
USB 2.0 Rate Matching Hub	Enables lower power requirements and manages the transition of the communication data rate from the high speed of the host controller to the lower speed of USB full-speed/low-speed devices.
Serial ATA (SATA) 6 Gb/s	Next-generation high-speed storage interface supporting up to 6 Gb/s transfer rates for optimal data access with up to 4 SATA 6Gb/s ports.¹ The PCH SATA controller also supports SATA 3 Gb/s and 1.5 Gb/s transfer capabilities.
eSATA	SATA interface designed for use with external SATA devices. Provides a link for 3 Gb/s data speeds to help eliminate bottlenecks found with current external storage solutions. ¹
SATA Port Disable	Enables individual SATA ports to be enabled or disabled as needed. This feature provides added protection of data by preventing malicious removal or insertion of data through SATA ports. Especially targeted for eSATA ports.
PCI Express* 2.0 Interface	Offers up to 5 GT/s for fast access to peripheral devices and networking with up to 12 lanes and 6 ports. PCI Express ports can be configured as x1, x2 and x4 depending on motherboard designs.
USB Port Disable	Enables individual USB ports to be enabled or disabled as needed. This feature provides added protection of data by preventing malicious removal or insertion of data through USB ports.
Intel® Integrated 10/100/1000 MAC	Support for the Intel® I218LM and I218V Gigabit Network Connections.
Green Technology	Manufactured with lead-free and halogen-free component packages.
Conflict Free	"Conflict-free" means "DRC conflict-free", which is defined by the Securities and Exchange Commission rules to mean products that do not contain conflict minerals (tin, tantalum, tungsten and/or gold) that directly or indirectly finance or benefit armed groups in the Democratic Republic of the Congo (DRC) or adjoining countries.

Product Brief Intel® Core™ M processor

Processor comparisons

INTEL® CORE™ M PROCESSOR LINE	INTEL® CORE™ M 5Y70 PROCESSOR	INTEL® CORE™ M 5Y10A PROCESSOR	INTEL® CORE™ M 5Y10 PROCESSOR
Number of Processor Cores/Threads	2/4	2/4	2/4
Intel® Turbo Boost Technology 2.06	Yes	Yes	Yes
Number of Memory Channels	2 (DDR3L 1600 MHz, LPDDR3 1333-1600MHz)	2 (DDR3L 1600 MHz, LPDDR3 1333-1600MHz)	2 (DDR3L 1600 MHz, LPDDR3 1333-1600MHz)
Intel® Hyper-Threading Technology ⁷	Yes	Yes	Yes
Intel® Smart Cache	Yes	Yes	Yes
Intel® Power Optimizer and Processor C-States	Yes	Yes	Yes
Intel® AES–New Instructions (AES–NI)8	Yes	Yes	Yes
Intel® Advanced Vector Extensions (AVX) 2.0 ²⁴	Yes	Yes	Yes
Intel® HD Graphics	Yes	Yes	Yes
Intel® Quick Sync Video	Yes	Yes	Yes
Intel® Clear Video HD	Yes	Yes	Yes
Intel® Wireless Display³	Yes	Yes	Yes
Intel® Virtualization Technology ⁵ (Intel® VT)	Yes	Yes	Yes
Windows 8.1* Instant Go* Capable	Yes	Yes	Yes
Intel® Smart Connect Technology®	Yes	Yes	Yes
Intel® Active Management Technology 10.0²	Yes	No	No
Intel® Small Business Advantage¹0	Yes	Yes	Yes
Intel® Identity Protection Technology¹²	Yes	Yes	Yes
Intel® Secure Key ¹³	Yes	Yes	Yes
Intel® Platform Trust Technology ²⁰	Yes	Yes	Yes
Intel® Boot Guard ¹⁹	Yes	Yes	Yes
Intel® OS Guard ¹⁴	Yes	Yes	Yes
Intel® BIOS Guard ²¹	Yes	Yes	Yes
Conflict Free	Yes	Yes	Yes

Product Brief Intel® Core™ M processor

Intel® Core™ M processors platform input/output

The Intel® Core™ M processor has integrated platform input/output. The following table summarizes the supported configuration.

Platform input/output configuration

FEATURE²⁷

3 ²⁵	
RAID, AHCI support	
Yes	
Yes ²⁶	
Yes	
No	
Up to 10 USB 2.0 (Up to 4 USB 3.0) ¹	
Up to 6 devices across 12 lanes¹	
Up to 4 SATA 6Gbps ¹	
21	
2	
1	
1	
2	

For more information about new Intel microarchitecture found in Intel Core M processors, please visit www.intel.com/microarchitecture.

- ¹ Actual number of ports available may vary by processor number and system configuration. Please refer to the specifications corresponding to the processor number of interest or consult your system vendor for more information.
- Requires activation and a system with a corporate network connection, an Intel® AMT—enabled chipset, network hardware, and software. For notebooks, Intel AMT may be unavailable or limited over a host OS-based VPN, when connecting wirelessly, on battery power, sleeping, hibernating, or powered off. Results dependent upon hardware, setup, and configuration. For more information, visit Intel® Active Management Technology.
- ³ Requires an Intel® Wireless Display—enabled PC, tablet, or smartphone, a compatible adapter, and a TV. 1080p and Blu-Ray* or other protected content playback only available on select Intel® processors with built-in visuals enabled. Consult your PC manufacturer. For more information, see www.intel.com/go/widi.
- ⁴ Requires an Intel® Core® processor, an enabled chipset, Intel® Rapid Storage Technology software, and a properly configured hybrid drive (HDD + small SSD). Depending on system configuration, your results may vary. Contact your system manufacturer for more information.
- Intel Virtualization Technology requires a computer system with an enabled Intel processor, BIOS, and virtual machine monitor (VMM). Functionality, performance or other benefits will vary depending on hardware and software configurations. Software applications may not be compatible with all operating systems. Consult your PC manufacturer. For more information, visit http://www.intel.com/go/virtualization.
- ⁶ 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 system manufacturer. Performance varies depending on hardware, software, and system configuration. For more information, visit http://www.intel.com/go/turbo.
- ⁷ Available on select Intel® Core™ processors. Requires an Intel® HT Technology-enabled system. Consult your PC manufacturer. Performance will vary depending on the specific hardware and software used. For more information, including details on which processors support HT Technology, visit http://www.intel.com/info/hyperthreading.
- ⁸ Intel[®] AES-NI requires a computer system with an AES-NI enabled processor, as well as non-intel software to execute the instructions in the correct sequence. AES-NI is available on select Intel[®] processors. For availability, consult your reseller or system manufacturer. For more information, see Intel[®] Advanced Encryption Standard Instructions (AES-NI).
- ⁹ Intel[®] Smart Connect Technology requires an Intel[®] processor, Intel[®] software and BIOS update, and Internet connectivity. Solid-state memory or drive equivalent may be required. Depending on system configuration, your results may vary. Contact your system manufacturer for more information.
- ¹⁰ Requires an Intel® Small Business Advantage enabled system and proper configuration. Availability of features will depend upon the setup and configuration by your PC manufacturer. Consult your system manufacturer.
- 11 No system can provide absolute security under all conditions. Requires an enabled chipset, BIOS, firmware and software, and a subscription with a capable Service Provider. Consult your system manufacturer and Service Provider for availability and functionality. Service may not be available in all countries. Intel assumes no liability for lost or stolen data and/or systems or any other damages resulting thereof. For more information, visit http://www.intel.com/go/anti-theft.

Product Brief

Intel® Core™ M processor

- 12 No system can provide absolute security under all conditions. Requires an Intel® Identity Protection Technology—enabled system, including a 2nd gen or higher Intel® Core™ processor enabled chipset, firmware and software, and participating website. Consult your system manufacturer. Intel assumes no liability for lost or stolen data and/or systems or any resulting damages. For more information, visit http://ipt.intel.com/.
- 13 No system can provide absolute security. Requires an Intel® Secure Key-enabled platform, available on select Intel processors, and software optimized to support Intel Secure Key. Consult your system manufacturer for more information.
- 14 No system can provide absolute security. Requires an Intel® OS Guard-enabled platform, available on select Intel processors, and an enabled operating system. Consult your system manufacturer for more information
- 15 Requires an Intel® HD Audio enabled system. Consult your PC manufacturer for more information. Sound quality will depend on equipment and actual implementation. For more information about Intel HD Audio, refer to Intel® High Definition Audio. Intel Smart Sound technology and Intel High Definition Audio Interface cannot be used concurrently.
- 16 Requires a select Intel® Core™ processor, an enabled chipset, Intel® Rapid Storage Technology software, and a properly configured storage device.
- ¹⁷ Intel® Wake on Voice requires software applications to operate and must be enabled by the device manufacturer.
- 18 Intel Smart Sound Technology requires the use of an I2S based CODEC for operation. Intel SST cannot be used concurrently with Intel High Definition Audio. Not available on all systems. Consult your PC manufacturer for more information. Sound quality will depend on equipment and actual implementation.
- 19 No system can provide absolute security. Requires an Intel® Boot Guard-enabled platform, available on select Intel processors, and an enabled operating system. Consult your system manufacturer for more information.
- ²⁰ No system can provide absolute security. Requires an Intel® Platform Trust Technology—enabled platform, available on select Intel processors, and an enabled operating system. Consult your system manufacturer for more information.
- 21 No system can provide absolute security. Requires an Intel® BIOS Guard—enabled platform, available on select Intel processors, and an enabled operating system. Consult your system manufacturer for more information
- ²² Performance comparison based on Intel® Core™ M 5Y70 processor vs. Intel® Core™ i5 4302Y processor. 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.
- ²³ Battery life comparison based on Intel® Core™M 5Y70 processor vs. Intel® Core™ i5 4302Y processor. System configuration: 35WHr, 11.6" panel, 19x10, SSD, 4GB memory 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.
- ²⁴ 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 2.0 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® 17 Turbo Boost Technology 2.0, visit http://www.intel.com/go/turbo
- ²⁵ Display performance may vary depending on SoC power, resolution, and application.
- ²⁶ Requires an Intel® HD Audio enabled system. Consult your PC manufacturer for more information. Sound quality will depend on equipment and actual implementation. For more information about Intel HD Audio, refer to Intel® High Definition Audio.
- ²⁷ Not all features available on all systems.

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