

PLATFORM BRIEF

Intel® Core™ i7 and Core™ i5 Processors with
Mobile Intel® HM76 and QM77 Express Chipsets
Intelligent Systems



3rd Generation Intel® Core™ i7 and Intel® Core™ i5 Processor-based Platforms for Intelligent Systems

Ideal for Intelligent Systems—context-aware, securely managed embedded devices that connect seamlessly to networks, clouds and each other.



Product Overview

Manufactured on industry-leading 22nm process technology with 3D Tri-Gate transistors, these 3rd generation Intel® Core™ i7 and Core™ i5 processors offer superior performance, enhanced media and graphics capabilities and flexibility, making them ideal for a wide range of intelligent systems including retail transaction terminals, digital signage, digital security and surveillance, gaming platforms, industrial automation and medical equipment. As with the 2nd generation Intel® Core™ processor family, full integration of the CPU, media/graphics capabilities and memory controller reduces overall platform footprint and saves on-board real estate.

These processors offer quad-core and dual-core capabilities with performance and thermal design power (TDP) options ranging from 17 W to 45 W. Processors in the BGA package support error correcting code (ECC) memory.¹ When paired with either the Mobile Intel® HM76 or Mobile Intel® QM77 Express chipset, this platform offers faster connectivity with integrated next-generation I/O technologies such as PCI Express* Gen 3.0 and USB 3.0. Intel® Rapid Start Technology² provides increased system responsiveness, while support for DDR3L memory improves power efficiency.

Next-generation Intel® graphics engines significantly improve graphics and media performance compared to 2nd generation Intel Core processor-based platforms. This platform supports three independent

displays, enabling one system to deliver multiple displays without the need for a discrete graphics card. Built-in visual features, including Intel® Clear Video HD technology and Intel® Quick Sync Video, mean smoother visual quality, improved ability to decode and transcode simultaneous video streams, and spectacular HD media playback. Additionally, the platform supports next-generation graphics APIs, such as Microsoft DirectX* 11.

Intel® vPro™ technology,³ enabled when processors are paired with the Mobile Intel® QM77 Express chipset, delivers intelligent security, expanded management capabilities and improved power management. The technology supports operating system-absent manageability and down-the-wire security even when the system is powered off, the operating system is unresponsive, or software agents are disabled. While incorporating advanced technology, these processors remain software-compatible with previous IA-32 processors.

This 3rd generation Intel Core processor family and Intel® 7 Series chipsets are pin and package compatible with the 2nd generation Intel Core processor family and Intel® 6 Series chipsets, allowing developers to mix and match processors and chipsets to better suit their design needs. Developers can create one board design and scale a product line, using the same sockets to help cut design costs and accelerate time-to-market.

Product Highlights

Intel® HD Graphics 4000: Enhanced, high-end media and graphics capabilities and performance.

Intel® Quick Sync Video 2.0: Significantly improves decode and transcode performance and frees up the CPU for other tasks.

ECC¹: High level of data integrity, reliability, and system uptime (select SKUs).

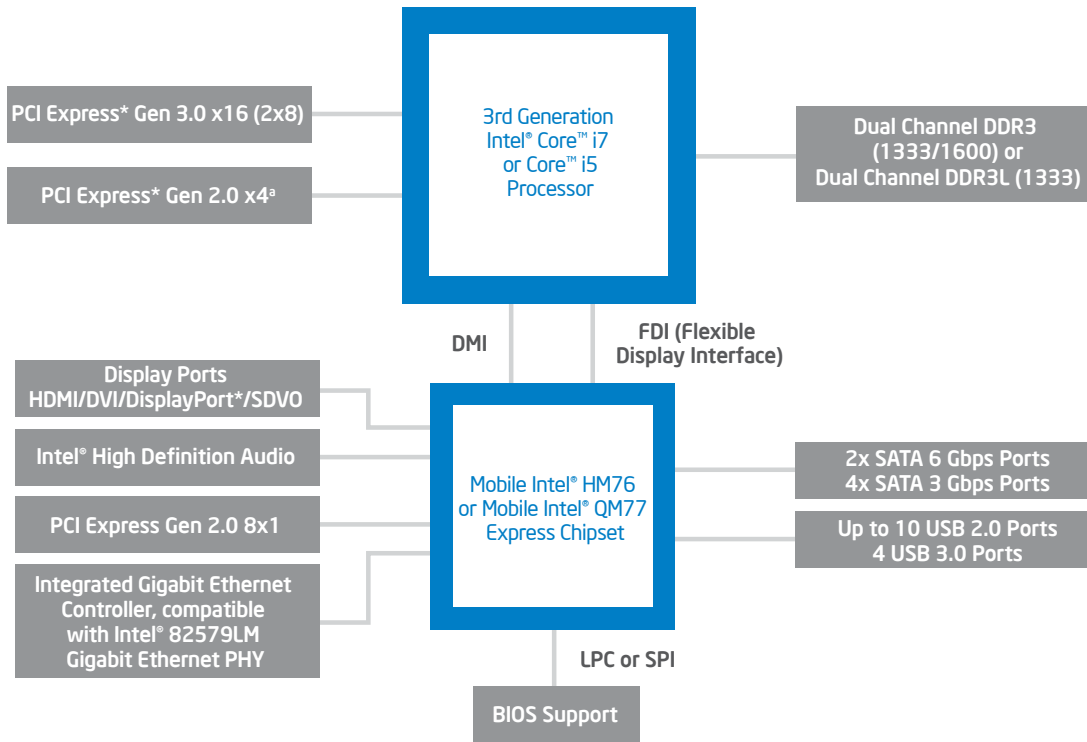
Intel® Advanced Vector Extensions: Accelerated floating-point compute performance for signal and image processing applications.

Intel® Intelligent Power Technology: Reduced idle power consumption through architectural improvements such as integrated power gates and automated low-power states.

Intel® Turbo Boost Technology⁴ 2.0: Runs applications faster by using available thermal headroom to run at a higher frequency.

Intel® Hyper-Threading Technology⁵: Simultaneous multi-threading helps boost performance for parallel, multi-threaded applications.

Intel® vPro™ Technology³: Delivers unprecedented hardware support for vital security and management functions with Intel® Active Management Technology⁶, Intel® Virtualization Technology⁷ and Intel® Trusted Execution Technology⁸ (enabled when processors are paired with the Mobile Intel QM77 Express chipset).



^aIntel® Core™ i7-3610QE processor SKU only.

Software Overview

The following independent operating system and BIOS vendors provide support for these platforms.

OPERATING SYSTEM

Microsoft Windows* 7
 Microsoft Windows* XP SP3
 Microsoft Windows* 2008 Server
 Microsoft Windows Embedded Standard 7
 Microsoft Windows Embedded Standard 2009
 Microsoft Windows Embedded POSReady 7
 Microsoft Windows Embedded POSReady (WEPOS)
 Red Hat Enterprise Linux* 6.1
 SUSE SLE* 11 SP1
 Wind River Linux* 3.0
 Wind River VxWorks* 6.8

CONTACT

Intel provides drivers⁹
 Intel provides drivers⁹
 Intel provides drivers⁹
 Intel provides drivers⁹
 Intel provides drivers⁹
 Intel provides drivers⁹
 Intel provides drivers⁹
 Red Hat
 Novell
 Wind River
 Wind River

BIOS

American Megatrends
 Insyde Software
 Phoenix Technologies
 Byosoft

Platform Features and Benefits

FEATURES	BENEFITS
Key Embedded Support	
Extended life cycle product support	<ul style="list-style-type: none"> Protects system investment by enabling extended product availability for embedded customers.
Embedded ecosystem support	<ul style="list-style-type: none"> Along with a strong ecosystem of hardware and software vendors, including members of the Intel® Embedded Alliance (intel.com/go/eca), Intel helps to cost-effectively meet development challenges and speed time-to-market.
Built-In Visuals	
Intel® HD Graphics 4000	<ul style="list-style-type: none"> Delivers enhanced visual experiences, including excellent 3D performance, for a broad range of intelligent systems. Provides support for dual LVDS, three independent displays and hybrid multi-monitor configurations. Integrated processor graphics help minimize power consumption while maximizing performance for decoding, encoding, and transcoding workloads with hardware acceleration of video codecs.
Intel® Quick Sync Video 2.0	<ul style="list-style-type: none"> Improved ability to decode and transcode simultaneous video streams for intelligent systems that include medical imaging and video surveillance functions.
Intel® Clear Video HD Technology	<ul style="list-style-type: none"> Provides visual quality and color fidelity enhancements for spectacular HD media playback for applications such as digital signs and gaming platforms.
Security	
Intel® AES New Instructions (Intel® AES-NI) ¹⁰ and Intel® Secure Key ¹¹	<ul style="list-style-type: none"> Helps protect media, data and assets from loss. Intel AES-NI accelerates data encryption/decryption and improves performance.
Intel® OS Guard	<ul style="list-style-type: none"> Helps detect and prevent malware.
Performance	
Intel® Advanced Vector Extensions	<ul style="list-style-type: none"> Faster performance on digital signal and image processing workloads for compute-intensive applications such as radar detection, hurricane command center, ruggedized navigation systems and remote medical image processing.
Intel® Turbo Boost Technology ⁴ 2.0	<ul style="list-style-type: none"> Boosts performance for specific workloads by increasing processor frequency.
Intel® Hyper-Threading Technology ⁵	<ul style="list-style-type: none"> Enables simultaneous multi-threading within each processor core, up to two threads per core; reduces computational latency, making optimal use of every clock cycle.
Intel® Smart Cache Technology	<ul style="list-style-type: none"> Large on-die shared Last-Level Cache reduces latency to data, improving performance and power efficiency.
Error Correcting Code memory ¹ (select SKUs)	<ul style="list-style-type: none"> Detects multiple-bit memory errors; locates and corrects single-bit errors to keep the system up and running.
Power Efficiency	
Intel® Intelligent Power Technology	<ul style="list-style-type: none"> Automated energy efficiency to reduce power consumption.
Automated low-power states	<ul style="list-style-type: none"> Adjusts system power consumption based on real-time processor loads.
Intel® Rapid Start Technology ²	<ul style="list-style-type: none"> Improves OS boot time and wakes up from deep sleep state more quickly than previous generations for better system responsiveness.
Intel® vPro™ Technology³ (platforms paired with Mobile Intel® QM77 Express chipset)	
Intel® Active Management Technology ⁶	Provides remote management and maintenance capabilities which enable vendors to roll back firmware image; Remote host-based provisioning eases provisioning of end device.
Intel® Virtualization Technology ⁷	Speeds transfer of platform control and movement of data between the virtual machine monitor (VMM) and other platform agents (including guest OSs and I/O devices). By lowering the workload on the VMM, this technology addresses many embedded system design challenges, like migrating legacy software, increasing real-time performance, and making applications more secure.
Intel® Trusted Execution Technology ⁸	Protects embedded devices and virtual environments against rootkit and other system-level attacks. Using an industry-standard TPM 1.2 to store keys and other protected data, this portion of Intel® vPro™ technology boots the BIOS, operating system, and software into a “trusted” execution state, verifying the integrity of the virtual machine and protecting the platform from unauthorized access.

Intel® Core™ i7 and Core™ i5 Processors for Intelligent Systems

PROCESSOR NUMBER^Δ

	INTEL® CORE™ i7-3615QE PROCESSOR	INTEL® CORE™ i7-3612QE PROCESSOR	INTEL® CORE™ i7-3610QE PROCESSOR	INTEL® CORE™ i7-3555LE PROCESSOR	INTEL® CORE™ i7-3517UE PROCESSOR	INTEL® CORE™ i5-3610ME PROCESSOR
Core Frequency (GHz)						
Base Frequency	2.3	2.1	2.3	2.5	1.7	2.7
1 Core Turbo (Max)	3.3	3.1	3.3	3.2	2.8	3.3
2 Core Turbo (Max)	3.2	3.0	3.2	3.0	2.6	3.1
Cores/Threads	4/8	4/8	4/8	2/4	2/4	2/4
Last-Level Cache	6 MB	6 MB	6 MB	4 MB	4 MB	3 MB
Thermal Design Power	45 W	35 W	45 W	25 W	17 W	35 W
Package	FCBGA 1023	FCBGA 1023	FCPGA 988	FCBGA 1023	FCBGA 1023	FCPGA 988, FCBGA 1023
Error Correcting Code	Yes	Yes	Yes	Yes	Yes	No (PGA), Yes (BGA)
Intel® AES-NI	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Turbo Boost Technology 2.0	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Hyper-Threading Technology	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Virtualization Technology	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Active Management Technology [§]	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Trusted Execution Technology [§]	Yes	Yes	Yes	Yes	Yes	Yes

^ΔWhen paired with the Mobile Intel® QM77 Express chipset.

Mobile Intel® HM76 and QM77 Express Chipsets for Intelligent Systems

PRODUCT	PRODUCT CODE	PACKAGE	FEATURES
Mobile Intel® BD82HM76 Platform Controller Hub	BD82HM76	FCBGA 989	4 SATA ports; 8 USB 2.0 ports; 4 USB 3.0 ports; 8 PCI Express* I/O ports
Mobile Intel® BD82QM77 Platform Controller Hub	BD82QM77	FCBGA 989	6 SATA ports; 10 USB2.0 ports; 4 USB 3.0 ports; 8 PCI Express I/O ports; supports Intel® vPro™ Technology

Intel in Embedded and Communications: intel.com/embedded

^Δ Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. Go to: http://www.intel.com/products/processor_number.

¹ Error Correcting Code memory is available only on Intel® Core™ processors which come in a Ball Grid Array (BGA) package and these SKUs were specifically developed by the Intel® Intelligent Systems Group.

² Requires a select Intel® processor, Intel® software and BIOS update, and Intel® Solid-State Drive (SSD). Depending on system configuration, your results may vary. Contact your system manufacturer for more information.

³ Intel® vPro™ Technology is sophisticated and requires setup and activation. Availability of features and results will depend upon the setup and configuration of your hardware, software and IT environment. To learn more visit: <http://www.intel.com/technology/vpro>.

⁴ 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>.

⁵ 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>.

⁶ 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 <http://www.intel.com/technology/platform-technology/intel-amt>.

⁷ 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>.

⁸ No computer system can provide absolute security under all conditions. Intel® Trusted Execution Technology (Intel® TXT) requires a computer with Intel® Virtualization Technology, an Intel TXT-enabled processor, chipset, BIOS, Authenticated Code Modules and an Intel TXT-compatible measured launched environment (MLE). Intel TXT also requires the system to contain a TPM v1.s. For more information, visit <http://www.intel.com/technology/security>.

⁹ Drivers available at: downloadcenter.intel.com (enter chipset name).

¹⁰ 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 <http://software.intel.com/en-us/articles/intel-advanced-encryption-standard-instructions-aes-ni>.

¹¹ No system can provide absolute security. Requires an Intel® Secure Key-enabled PC with a 3rd gen Intel® Core™ vPro™ processor and software optimized to support Intel Secure Key. Consult your system manufacturer for more information.

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