PLATFORM BRIEF
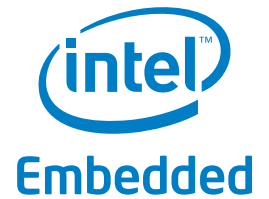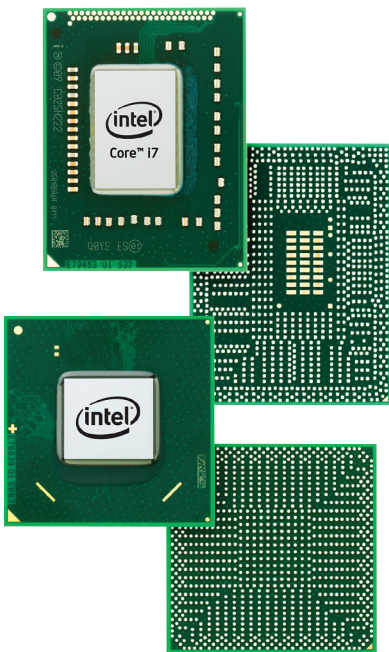Intel® Core™ i7 and Core™ i5 processors
with Intel® QM67 Express and
Intel® HM65 Express Chipsets
Embedded Computing

(intel™)

Embedded

2ⁿᵈ Generation Intel® Core™ i7 (2710QE, 2715QE) and Intel® Core™ i5 (2510E, 2515E) Processor-based Platforms for Embedded Computing

Product Overview

These Intel® Core™ i7 and Intel® Core™ i5 processors are based on the 2ⁿᵈ generation Intel® Core™ microarchitecture on 32nm process technology, featuring new levels of performance for embedded, compute-intensive applications along with advanced features for remote management capabilities and reliability. When paired with the Intel® QM67 Express or Intel® HM65 Express chipset, these two-chip platforms provide excellent media, graphics, and I/O flexibility, stunning and seamless visual experiences, as well as error correcting code (ECC) memory[1]. These platforms meet the requirements of a broad range of embedded applications, including retail and transaction solutions, signage, gaming platforms, industrial automation and medical equipment.

Processors offer quad-core and dual-core processing with industry-leading performance capabilities. While incorporating advanced technology, they remain software-compatible with previous IA-32 processors.

The next-generation graphics engine, Intel® HD Graphics 3000, doubles graphics performance compared with previous Intel® Core™ processor-based platforms. Full integration of the CPU, media/graphics capabilities and memory controller reduces overall platform footprint and provides faster performance as well as board real estate savings. Additionally, developers can create one board design and scale their product line between quad- and dual-core processors using the same socket. Thermal design power (TDP) options are 35W and 45W.

Product Highlights

Intel® HD Graphics 3000: Supports high-end enhanced media/graphics capabilities and performance while reducing overall platform power requirements.

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

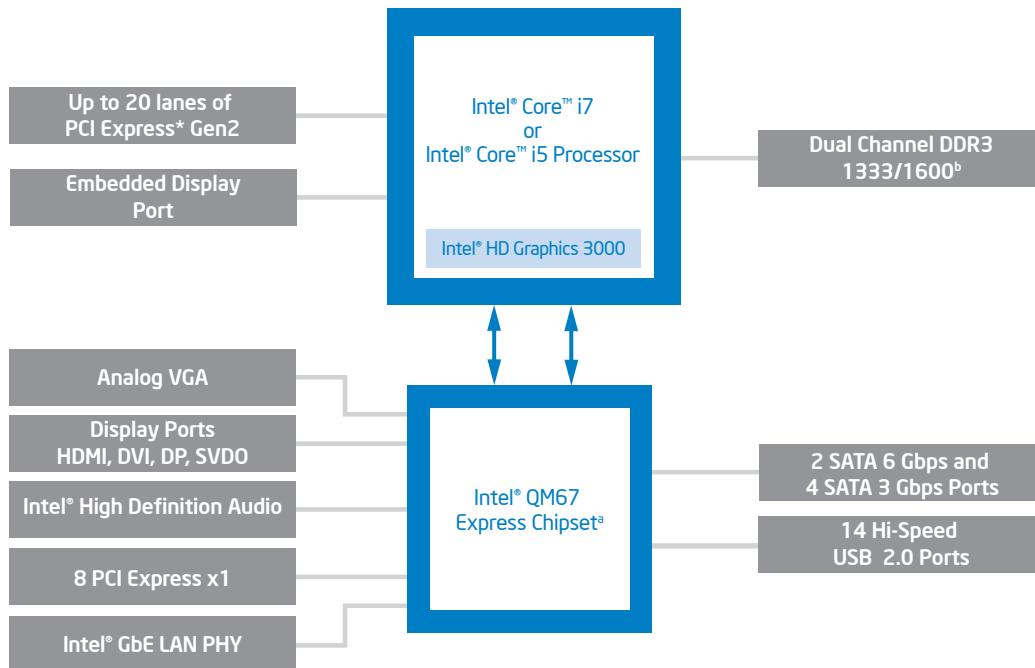**Intel® Quick Sync Video:** Improves media/video performance and frees up the CPU for other tasks.

ECC[1]: Provides a high level of data integrity, reliability, and system uptime (select SKUs).

Intel® Intelligent Power Technology[2]: Reduces idle power consumption through architectural improvements such as integrated power gates and automated low-power states.

Intel® Turbo Boost Technology[3] 2.0: Runs applications faster by using available thermal headroom to run at a higher frequency.

Intel® Hyper-Threading Technology[4]: Simultaneous multi-threading helps boost performance for parallel, multi-threaded applications.

Intel® vPro™ Technology[5]: When paired with the Intel QM67 Express chipset, this platform delivers unprecedented hardware support for vital security and management functions utilizing Intel® Virtualization Technology,[6] Intel® Active Management Technology,[7] and Intel® Trusted Execution Technology.[8]

Up to 20 lanes of
PCI Express* Gen2

Embedded Display
Port

Intel® Core™ i7
or
Intel® Core™ i5 Processor

Intel® HD Graphics 3000

Dual Channel DDR3
1333/1600ᵇ

Analog VGA

Display Ports
HDMI, DVI, DP, SVDO

Intel® High Definition Audio

8 PCI Express x1

Intel® GbE LAN PHY

Intel® QM67
Express Chipsetᵃ

2 SATA 6 Gbps and
4 SATA 3 Gbps Ports

14 Hi-Speed
USB 2.0 Ports

ᵃIntel® HM65 Express chipset also available with a subset of features.
ᵇAll SKUs support 1333 MT/s, 1 DIMM per channel (1 DPC); the PGA 4-core SKU supports 1333 MT/s, 2 DIMMs per channel (2 DPC);
the PGA 4-core SKU also supports 1600 MT/s but only with 1 DIMM per channel (1DPC).

Software Overview

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

OPERATING SYSTEM	CONTACT	BIOS
Microsoft Windows* 7	Intel provides drivers[9]	American Megatrends
Microsoft Windows* XP SP3	Intel provides drivers[9]	Insyde Software
Microsoft Windows Embedded Standard 7	Intel provides drivers[9]	Phoenix Technologies
Microsoft Windows Embedded Standard 2009	Intel provides drivers[9]	Byosoft
Microsoft Windows Embedded POSReady (WEPOS)	Intel provides drivers[9]	
Red Hat Enterprise Linux* 6.1	Red Hat	
SUSE SLE* 11 SP1	Novell	
Wind River Linux* 3.0	Wind River	
Wind River VxWorks* 6.8	Wind River	

Platform Features and Benefits

FEATURES	BENEFITS
Supports key embedded platform requirements	Ideal for compute-intensive embedded applications.
Extended life cycle product support	Protects system investment by enabling extended product availability for embedded customers.
Embedded ecosystem support	Along with a strong ecosystem of hardware and software vendors, including members of the Intel® Embedded Alliance (intel.com/go/embeddedalliance), Intel helps to cost-effectively meet development challenges and speed time-to-market.
Intel® Advanced Vector Extensions	Enables faster performance on digital signal image and digital signal 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[3] 2.0	Boosts performance for specific workloads by increasing processor frequency.
Intel® HD Graphics 3000	Excellent 3D performance for a broad range of embedded applications with support for dual LVDS and hybrid multi-monitor configurations.
Intel® Hyper-Threading Technology[4]	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	Large on-die shared Last-Level Cache reduces latency to data, improving performance and power efficiency.
Intel® AES New Instructions (Intel® AES-NI)	New instructions added to the architecture help accelerate data encryption and decryption, and improve performance.
Error Correcting Code memory[1] (select SKUs)	Detects multiple-bit memory errors; locates and corrects single-bit errors to keep the system up and running.
Intel® Intelligent Power Technology[2]	Automated energy efficiency reduces power consumption.
Intel® Quick Sync Video Technology	Speeds up video conversion, editing and sharing for embedded applications such as video surveillance.
Automated low-power states	Adjusts system power consumption based on real-time processor loads.
Intel® Clear Video HD Technology	Visual quality and color fidelity enhancements deliver spectacular HD media playback for embedded applications such as digital signage and gaming.
Intel® vPro™ Technology[5]	Remote management, flexible virtualization, and enhanced security capabilities enable solutions that are trusted and cost-effective.
Intel® Active Management Technology[7]	The latest remote management and maintenance capabilities enable vendors to rollback firmware image; remote host-based provisioning helps to ease provisioning of end device.
Intel® Virtualization Technology[6]	Speeds the transfer of platform control and movement of data between the virtual machine monitor (VMM) and other platform agents (including guest operating systems 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 Intel® Core™ i5 Processors for Embedded Computing

PROCESSOR NUMBER[Δ]	CORES/ THREADS	CORE FREQUENCY (GHz)			LAST-LEVEL CACHE	THERMAL DESIGN POWER	PACKAGE	ERROR CORRECTING CODE
		BASE FREQUENCY	1 CORE TURBO (MAX)	2 CORE TURBO (MAX)				
Intel® Core™ i7-2710QE	4/8	2.1	3.0	2.9	6 MB	45 W	FCPGA988	No
Intel® Core™ i7-2715QE	4/8	2.1	3.0	2.9	6 MB	45 W	FCBGA1023	Yes
Intel® Core™ i5-2510E	2/4	2.5	3.1	3.0	3 MB	35 W	FCPGA988	No
Intel® Core™ i5 2515E	2/4	2.5	3.1	3.0	3 MB	35 W	FCBGA1023	Yes

PROCESSOR NUMBER[Δ]	INTEL® AES-NI	INTEL® TURBO BOOST TECHNOLOGY	INTEL® HYPER-THREADING TECHNOLOGY	INTEL® vPRO™ TECHNOLOGY[a]		
				INTEL® VIRTUALIZATION TECHNOLOGY	INTEL® ACTIVE MANAGEMENT TECHNOLOGY	INTEL® TRUSTED EXECUTION TECHNOLOGY
Intel® Core™ i7-2710QE	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Core™ i7-2715QE	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Core™ i5-2510E	Yes	Yes	Yes	Yes	Yes	Yes
Intel® Core™ i5 2515E	Yes	Yes	Yes	Yes	Yes	Yes

[a]When paired with Intel® QM67 Express chipset.

Intel® QM67 and Intel® HM65 Express Chipsets for Embedded Computing

PRODUCT	PRODUCT CODE	PACKAGE	FEATURES
Intel® BD82QM67 Platform Controller Hub	BD82QM67	FCBGA 989	Supports Intel® vPro™ technology; 6 SATA ports; 14 Hi-Speed USB 2.0 ports; 8 PCI Express* I/O ports
Intel® BD82HM65 Platform Controller Hub	BD82HM65	FCBGA 989	4 SATA ports; 12 USB ports; 6 PCI Express* I/O ports

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