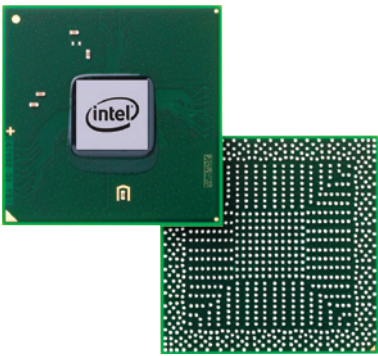


# Intel® Q57 Chipset and Intel® 3450 Chipset for Embedded Computing



## Product Overview

When combined with Intel® Core™ micro-architecture-based processors on 32nm and 45nm process technologies, the Intel® Q57 chipset and Intel® 3450 chipset provide the latest advancements in graphics, security and always-available manageability for embedded applications. These platforms are ideal for developing high-performance systems for industrial control and automation, retail, gaming, print imaging and digital signage.

These chipsets support Intel® vPro™ technology and, when paired with a processor that also supports this technology, the platform enables solutions that are trusted and cost-effective.

Each chipset consists of a one-chip platform controller hub (PCH). Along with a compatible processor, this innovative two-chip solution provides board real estate savings over previous, three-chip platforms. Each PCH has two display streams supported in any combination of DisplayPorts (DP), HDMI, DVI, SDVO and analog (VGA). These chipsets also provide additional USB, PCI Express\* and SATA ports compared to previous generations.

## Product Highlights

**Error Correcting Code (ECC):** The Intel 3450 chipset provides support for ECC memory, providing a higher level of data integrity, reliability and system uptime.

**Intel vPro Technology:** Unprecedented hardware support for vital security and management functions with Intel® Virtualization Technology,<sup>1</sup> Intel Active Management Technology<sup>2</sup> (Intel® AMT), and Intel® Trusted Execution Technology.<sup>3</sup>

**Intel® AMT 6.0:** A component of Intel vPro technology, Intel AMT performs remote asset tracking and checks the presence of management agents virtually anytime. Devices can be remotely turned on/off to reduce energy consumption during non-peak operating times. In addition to the existing features, including remote alerts, secured access in Microsoft NAP\* environments, "fast call for help," and remote schedule maintenance, Intel AMT 6.0 supports IPv6 network stack and hardware-based keyboard/video/mouse for enhanced security and manageability.

## New digital and analog interfaces:

By integrating the display into the PCH, these chipsets provide a total of four display ports: one analog (VGA) and three digital (HDMI/DVI/DP/SDVO).

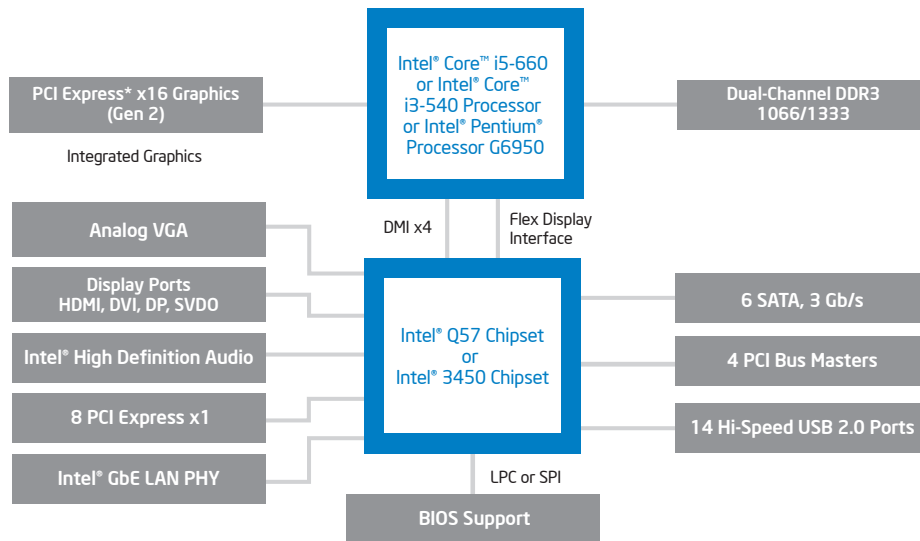
**Intel® Rapid Recover Technology:** With the ability to boot off a clone, this technology provides a fast, easy-to-use method to recover data and return a system to operational status.

**Intel® Quiet System Technology:** Reduces system noise and heat through intelligent system fan speed control algorithms.

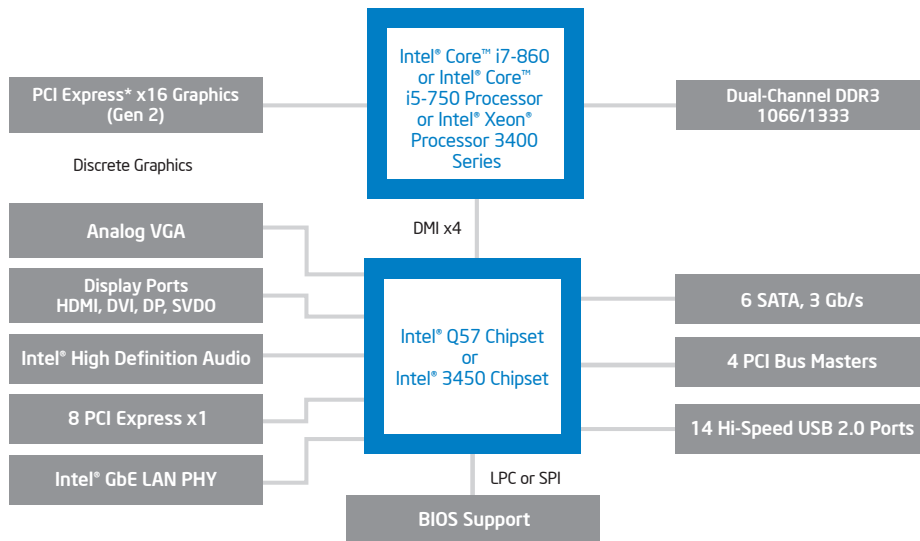
## Intel® Trusted Platform Module 1.2<sup>4</sup>

**(Intel® TPM):** Customer may choose to replace the discrete TPM with Intel TPM to provide a higher level of integration, simplify board layouts and reduce BOM.

### Platform Diagram with 32nm Processors



### Platform Diagram with 45nm Processors



### Intel® Q57 Chipset and Intel® 3450 Chipset/Processor Compatibility

PROCESSOR <sup>a</sup>	PROCESS TECHNOLOGY	INTEL® Q57 CHIPSET	INTEL® 3450 CHIPSET	INTEL® vPRO™ TECHNOLOGY		
				INTEL® VIRTUALIZATION TECHNOLOGY	INTEL® ACTIVE MANAGEMENT TECHNOLOGY 6.0	INTEL® TRUSTED EXECUTION TECHNOLOGY
Intel® Core™ i7-860 Processor	45nm	▪		▪	▪	▪
Intel® Core™ i5-750 Processor	45nm	▪		▪		
Intel® Xeon® Processor X3450	45nm		▪	▪	▪	▪
Intel® Xeon® Processor X3430	45nm		▪	▪	▪	▪
Intel® Core™ i5-660 Processor	32nm	▪	▪	▪	▪	▪
Intel® Core™ i3-540 Processor	32nm	▪	▪	▪		
Intel® Pentium® Processor G6950	32nm	▪	▪	▪		

## Features and Benefits

FEATURES	BENEFITS
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 ( <a href="http://intel.com/go/eca">intel.com/go/eca</a> ), Intel helps to cost-effectively meet development challenges and speed time-to-market.
Error Correcting Code memory (Intel® 3450 chipset)	Detects multiple-bit memory errors, and locates and corrects single-bit errors to keep the system up and running.
PCI Express* 2.0 interface	16 GB/s bandwidth for platform graphics.
Intel® Fast Memory Access	Updated graphic memory controller hub backbone architecture improves system performance by optimizing use of available memory bandwidth and reducing latency of memory accesses.
Dual-Channel DDR3 memory support	Up to 17 GB/s (8.5 GB/s per channel with DDR3 1066 MHz) of bandwidth and 8 GB maximum supported memory size for faster system responsiveness and support of 64-bit computing.
Intel® Flex Memory Technology	Facilitates easier upgrades by allowing different memory sizes to be populated and remain in dual-channel mode.
Support for DisplayPort and DVI	Support for the DisplayPort interface (up to 2560x1600 resolution) and Digital Video Interface (up to 2048x1536 resolution).
Intel® High Definition Audio <sup>5</sup>	Premium digital surround sound with advanced features such as multiple audio streams and jack re-tasking.
Intel® Matrix Storage Technology (Intel® MST)	With additional hard drives added, Intel MST provides quicker access to applications and data files with RAID 0 and 10, and greater data protection against a hard disk drive failure with RAID 1, 5, and 10. Support for external SATA enables the full SATA interface speed outside the chassis, up to 3 Gb/s.
Intel® Rapid Recover Technology	Quick system recovery in the case of hard drive failure or data corruption. With the ability to boot off a clone, it provides a fast, easy-to-use method for the end user to recover data and return a system to operational status. Clone can be mounted as read-only volume to allow recovery of individual files.
Serial ATA 3 Gb/s	Faster transfer rate for improved data access with up to six SATA ports.
eSATA	Designed for use with external SATA devices. Provides a link for 3 Gb/s data speeds to eliminate bottlenecks found with current external storage solutions.
SATA Port Disable	Enables or disables individual SATA ports as needed. Provides added protection of data by preventing malicious removal or insertion of data through SATA ports. Especially targeted for eSATA ports.
USB Port Disable	Enables or disables individual USB ports as needed. Provides added protection of data by preventing malicious removal or insertion of data through USB ports.
Intel® Quiet System Technology	Reduces system noise and heat. Intelligent system fan speed control algorithms use operating temperature ranges more efficiently to reduce system noise by minimizing fan speed changes.
Intel® Trusted Platform Module <sup>4</sup> 1.2	Provides BOM savings by integrating industry-standard TPM 1.2 into the chipset.
Intel® Active Management Technology <sup>2</sup> 6.0 (Intel® AMT)	The latest remote management and maintenance capabilities enable IT professionals to query, fix, and protect networked embedded devices, even when they're powered off, not responding or have software issues. As part of Intel® vPro™ technology, Intel AMT helps perform remote asset tracking and checks the presence of management agents virtually anytime. Also, devices can be remotely turned on/off to reduce energy consumption during non-peak operating times.
Intel® Virtualization Technology <sup>1</sup>	Speeds up the transfer of platform control and the 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 <sup>3</sup>	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® Q57 Chipset and Intel® 3450 Chipset for Embedded Computing

PRODUCT NAME	PRODUCT CODE	PACKAGE	FEATURES
Intel® BD82Q57 Platform Controller Hub	BD82Q57	27X27 FCBGA	Intel® Active Management Technology 6.0; six eSATA ports; 14 USB ports; eight PCIe Express* I/O ports
Intel® BD3450 Platform Controller Hub	BD3450	27X27 FCBGA	Intel® Active Management Technology 6.0; six eSATA ports; 14 USB ports; eight PCIe Express I/O ports; Error Correcting Code

## Software Overview

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

### OPERATING SYSTEM

Vista\* SP2  
Windows Server\* 2003/2008  
Windows\* 7  
Windows 7 Embedded<sup>a</sup>  
Microsoft Windows\* XP SP3  
Microsoft Windows Embedded Standard (XPe)  
Microsoft Windows Embedded POSReady (WEPOS)  
Red Hat Enterprise Linux\* 5.1<sup>b</sup>  
Red Hat Enterprise Linux\* 6<sup>c</sup>  
Red Hat Linux\* 4.6<sup>d</sup>  
Fedora Core\* 10<sup>a</sup>  
Fedora Core\* 7<sup>e</sup>  
SUSE SLE\* 11<sup>a</sup>  
SUSE Enterprise Linux\* 10 SP 1<sup>e</sup>  
Wind River Linux\* 3.0  
Wind River VxWorks\* 6.8

### CONTACT

Intel provides drivers<sup>5</sup>  
Intel provides drivers<sup>6</sup>  
Intel provides drivers<sup>6</sup>  
Intel provides drivers<sup>6</sup>  
Intel provides drivers<sup>6</sup>  
Intel provides drivers<sup>6</sup>  
Intel provides drivers<sup>6</sup>  
Red Hat  
Red Hat  
Red Hat  
Red Hat  
Red Hat  
Novell  
Novell  
Wind River  
Wind River

### BIOS

American Megatrends  
Insyde Software  
Phoenix Technologies

## Intel in Embedded and Communications: [intel.com/embedded](http://intel.com/embedded)

<sup>a</sup> Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See [www.intel.com/products/processor\\_number](http://www.intel.com/products/processor_number) for details.

<sup>1</sup> Intel® Virtualization Technology requires a computer system with an enabled Intel® processor, BIOS, virtual machine monitor (VMM) and, for some uses, certain computer system software enabled for it. Functionality, performance or other benefits will vary depending on hardware and software configurations and may require a BIOS update. Software applications may not be compatible with all operating systems. Please check with your application vendor.

<sup>2</sup> Intel® Active Management Technology requires the computer system to have an Intel(R) AMT-enabled chipset, network hardware and software, as well as connection with a power source and a corporate network connection. Setup requires configuration by the purchaser and may require scripting with the management console or further integration into existing security frameworks to enable certain functionality. It may also require modifications of implementation of new business processes. With regard to notebooks, Intel AMT may not be available or certain capabilities may be limited over a host OS-based VPN or when connecting wirelessly, on battery power, sleeping, hibernating or powered off. For more information, see [intel.com/technology/platform-technology/intel-amt/](http://intel.com/technology/platform-technology/intel-amt/).

<sup>3</sup> No computer system can provide absolute security under all conditions. Intel® Trusted Execution Technology (Intel® TXT) requires a computer system with Intel® Virtualization Technology, an Intel TXT-enabled processor, chipset, BIOS, Authenticated Code Modules and an Intel TXT-compatible measured launched environment (MLE). The MLE could consist of a virtual machine monitor, an OS or an application. In addition, Intel TXT requires the system to contain a TPM v1.2, as defined by the Trusted Computing Group and specific software for some uses. For more information, see [intel.com/technology/security](http://intel.com/technology/security).

<sup>4</sup> The original equipment manufacturer must provide TPM functionality, which requires a TPM-supported BIOS. TPM functionality must be initialized and may not be available in all countries.

<sup>5</sup> Intel® High Definition Audio requires a system with an appropriate Intel chipset and a motherboard with an appropriate codec and the necessary drivers installed. System sound quality will vary depending on actual implementation, controller, codec, drivers and speakers. For more information about Intel® HD audio, refer to <http://www.intel.com/>.

<sup>6</sup> Drivers available at: [downloadcenter.intel.com](http://downloadcenter.intel.com) (enter chipset name).

<sup>a</sup> Intel® Core™ i7-860/Core™ i5-750/Core™ i5-660/Core™ i3-540 processors, Intel® Xeon® processor 3400 series only.

<sup>b</sup> Intel® Pentium® processor G6950, Intel® Core™ i7-860 and Core™ i5-750 processors only.

<sup>c</sup> Intel® Core™ i5-660 and Core™ i3-540 processors, Intel® Xeon® processor 3400 series only.

<sup>d</sup> Intel® Core™ i7-860 and Core™ i5-750 processors only.

<sup>e</sup> Intel® Pentium® processor G6950 only.

INFORMATION IN THIS DOCUMENT IS PROVIDED IN CONNECTION WITH INTEL® PRODUCTS. NO LICENSE, EXPRESS OR IMPLIED, BY ESTOPPEL OR OTHERWISE, TO ANY INTELLECTUAL PROPERTY RIGHTS IS GRANTED BY THIS DOCUMENT. EXCEPT AS PROVIDED IN INTEL'S TERMS AND CONDITIONS OF SALE FOR SUCH PRODUCTS, INTEL ASSUMES NO LIABILITY WHATSOEVER, AND INTEL DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY, RELATING TO SALE AND/OR USE OF INTEL PRODUCTS INCLUDING LIABILITY OR WARRANTIES RELATING TO FITNESS FOR A PARTICULAR PURPOSE, MERCHANTABILITY, OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT. UNLESS OTHERWISE AGREED IN WRITING BY INTEL, THE INTEL PRODUCTS ARE NOT DESIGNED NOR INTENDED FOR ANY APPLICATION IN WHICH THE FAILURE OF THE INTEL PRODUCT COULD CREATE A SITUATION WHERE PERSONAL INJURY OR DEATH MAY OCCUR.

Intel may make changes to specifications and product descriptions at any time, without notice. Designers must not rely on the absence or characteristics of any features or instructions marked "reserved" or "undefined." Intel reserves these for future definition and shall have no responsibility whatsoever for conflicts or incompatibilities arising from future changes to them. The information here is subject to change without notice. Do not finalize a design with this information.


The products described in this document may contain design defects or errors known as errata which may cause the product to deviate from published specifications. Current characterized errata are available on request. Contact your local Intel sales office or your distributor to obtain the latest specifications and before placing your product order. Copies of documents which have an order number and are referenced in this document, or other Intel literature, may be obtained by calling 1-800-548-4725, or by visiting Intel's Web site at [www.intel.com](http://www.intel.com).

Copyright © 2009 Intel Corporation. All rights reserved. Intel, the Intel logo, Core, Xeon, vPro, and Pentium are trademarks of Intel Corporation in the U.S. and other countries.

\*Other names and brands may be claimed as the property of others.

Printed in USA

1209/KSC/OCG/XX/PDF

 Please Recycle

322940-002US

