(intel®) Leap ahead

Intel® Q35 and Q33 Express Chipsets
Advancing business solutions by enhancing manageability and security

The new Intel® Q35 and Q33 Express Chipsets will deliver support for Intel's upcoming 45nm processors. Intel is also bringing higher performance in combination with greater energy efficiency and supply critical building blocks for continued Energy Star* support. The Intel Q35 Express Chipset is continuously advancing capabilities of the Intel® vPro™ processor technology by providing leading security and manageability.

The Intel Q35 and Q35 Express Chipsets

Desktop PC platforms based on the Intel® Q35 and Q33 Express Chipset, combined with either the Intel® Core™2 Duo or Intel® Core™2 Quad processor, deliver new technologies and innovating capabilities for all the latest business needs. In combination with support for Intel® next-generation 45nm Intel® Core™2 processor family, including a faster 1333 MHz system bus, the Intel Q35 and Q33 Express Chipsets manifest outstanding computing performance for small, medium and large business. The Intel Q35 Express Chipset enhances Intel vPro processor technology with the addition of hardened security, strong data protection, ease of manageability, lower power consumption and increased performance. The new technologies featured are Intel® Virtualization Technology[1] for directed I/O, Intel® Trusted Execution Technology[2] and Intel® Active Management Technology[3] release 3.0. Both, the Intel Q35 and Q33 Express Chipsets lower idle and maximum power consumption—by over 50% of last year's Intel professional business platforms. Intel® Quiet System Technology enables quieter system and innovative form factors, while Intel® Fast Memory Access deliver increased system performance. The combination of complementary technologies provides superb platform scalability. Innovative I/O technologies such as Intel® Matrix Storage Technology[4] with Intel® Rapid Recover Technology
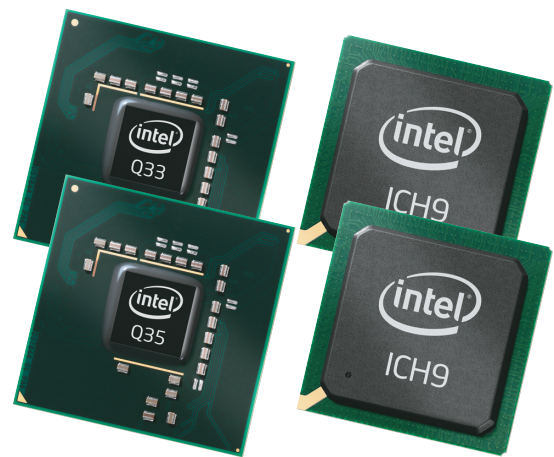
provides data protection and improve overall system responsiveness for the Intel Q35 and Q33 Express Chipsets. The Intel Q35 and Q33 Express Chipset families are designed to help all businesses better manage costs, provide a safer computing environment and deploy more responsive PCs.

Intel® vPro™ processor technology

Intel vPro processor technology[5] powered by the revolutionary Intel Core 2 Duo processor or Intel Core 2 Quad processor, adds a new level of performance and reliability to computers for businesses. This processor technology for the digital office allows you to focus on building complete solutions that directly address the needs of your customers, while helping you to develop stronger client relationships and increase your margins through new service offerings.

(intel®) Q33 EXPRESS CHIPSET   (intel®) Q35 EXPRESS CHIPSET
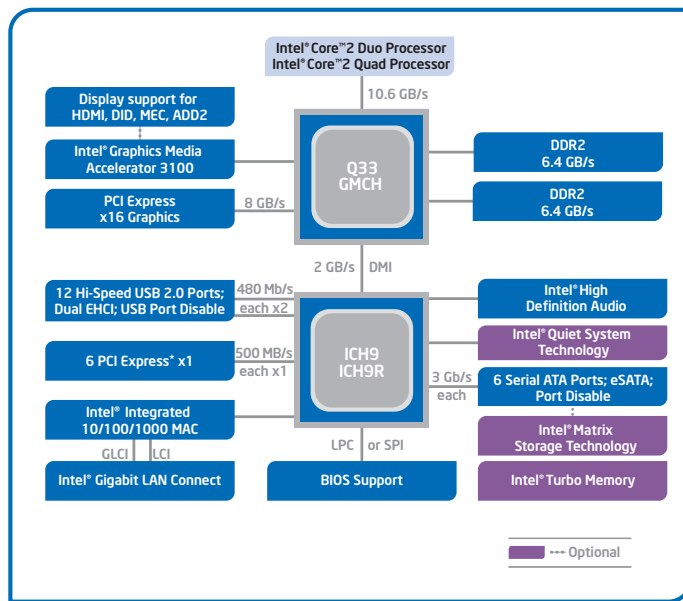
Intel® Q33 Express Chipset Block Diagram
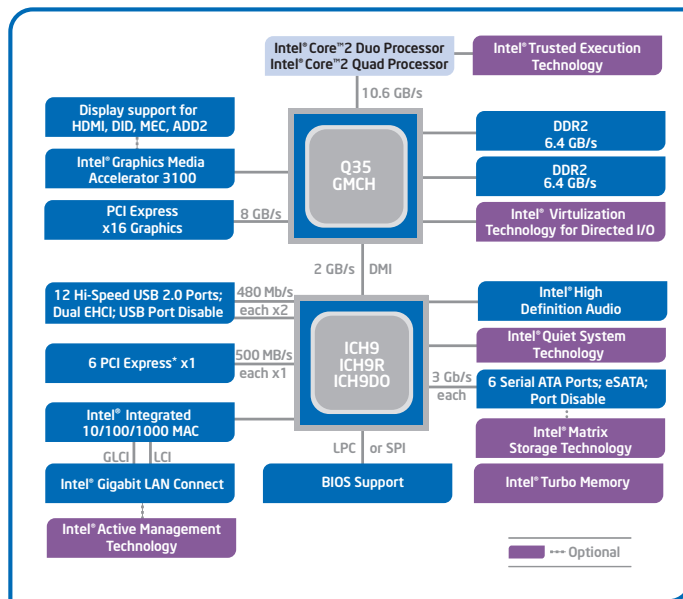
Intel® Q35 Express Chipset Block Diagram

Intel® Stable Image Platform Program

Reducing the variety of supported hardware platforms greatly simplifies enterprise PC management, which in turn lowers total cost of ownership. One critical element in reducing PC hardware variation involves deploying standardized desktop and laptop PC configurations. The Intel® Stable Image Platform Program (Intel® SIPP) can help your company identify and deploy standardized, stable image PC platforms for at least 15 months. Both, the Intel Q35 and Q33 Express Chipsets enable Intel Stable Image Platform Program.

Intel® Graphics Media Accelerator 3100 (Intel® GMA 3100)

The Intel® 3 Series Chipset family features Intel's low-power graphics core with Intel® GMA 3100. The new core allows for reduced power and noise without sacrificing the performance business users need. The Intel Q35 and Q33 Express Chipsets are ideal for business users seeking support for advanced operating systems like Windows Vista* and both chipsets are capable of supporting the Windows Vista Premium logo program. The Intel Q35 and Q33 Express Chipsets support both ADD2 and Media Expansion Cards (MECs). When combined with an ADD2 or MEC,

these chipsets can support dual independent display—enabling a business user to expand their visual workspace without constant toggling between applications. The single graphics driver capability of the Intel 3 Series Express Chipset family allows businesses to reduce software qualification and maintenance costs across mobile and desktop platforms.

Intel® I/O Controller Hub (Intel® ICH9/R/DO)

The Intel® ICH9 I/O controller hub of the Intel Q35 and Q33 Express Chipsets integrates several capabilities to provide flexibility for connecting I/O devices.

- **Intel® Quiet System Technology** integrated into all the different versions of the Intel ICH9 can help reduce system noise and heat through more intelligent fan speed control algorithms.

- **Intel® High Definition Audio[6] (Intel® HD Audio)** enables premium digital sound in the PC. Support for multiple audio streams can enable users to conduct high-quality Internet phone calls and listen to ambient system sound simultaneously. When coupled with support for microphone array, Intel HD Audio can enable high-quality, low-cost Internet phone call implementations by eliminating the need for a separate discrete audio card.

- **Intel® Matrix Storage Technology:** With native support of external SATA* ports (eSATA) and support for Command Based Port Multipliers, Intel Matrix Storage Technology provides flexibility to add a external drives for increased data protection with up to 6 times faster performance than USB* or Firewire* 400[7]. Support for eSATA enables the full SATA interface speed outside the chassis, up to 3 Gb/s. Support for RAID levels 0, 1, 5 and 10 enable greater reliability for personal data, or maximum storage performance for intensive applications. The Advanced Host Controller Interface (AHCI) provides easier expandability with support for eSATA devices and native hot plug, while boosting boot and multi-tasking performance with Native Command Queuing (NCQ).

- **Intel® Rapid Recover Technology:** With the ability to instantly boot off of a clone, Intel® Rapid Recover Technology provides a fast, easy to use method for the end user to recover their data and return their system to an operational status. Intel Rapid Recover Technology provides the flexibility for the user to choose between continuously updating or periodically updating the recover volume. The recover volume can also be mounted as a read-only volume allowing the user to easily drag and drop files for data recovery.

Intel® Q35 and Q33 Express Chipsets Features at a Glance

Feature	Benefit
1333/1066/800 MHz System Bus	• Supports the Intel® Core™2 Duo and Intel® Core™2 Quad processors with Intel® Virtualization Technology[1], Dual-Core Intel® Pentium® processor, and Intel® Celeron® processor.
PCI Express* 1.1 Interface	• The PCI Express 1.1 provides 8 Gb/s bandwidth for platform graphics.
Intel® Fast Memory Access	• Updated Graphics Memory Controller Hub (GMCH) backbone architecture that improves system performance by optimizing the use of available memory bandwidth and reducing the latency of the memory accesses.
Dual-Channel DDR2 Memory Support	• Delivers up to 12.8 Gb/s (DDR2 800 dual 6.4 Gb/s) of bandwidth and 8 Gb memory addressability 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.
Intel® Graphics Media Accelerator 3100	• 3D enhancements enable greater flexibility and scalability and improved realism with support for Microsoft DirectX* 9.0c Shader Model 2.0, OpenGL* 1.4. Intel® Graphics also support the highest levels of the Windows Vista* Aero experience.
Intel® High Definition Audio[6]	• Integrated audio support enables premium digital sound and delivers advanced features such as multiple audio streams and jack re-tasking.
Intel® Matrix Storage Technology[4]	• With a second hard drive added, provides quicker access to digital photo, video and data files with RAID 0, 5, and 10, and greater data protection against a hard disk drive failure with RAID 1, 5, and 10. Support for external SATA* (eSATA) enables the full SATA interface speed outside the chassis, up to 3 Gb/s.
Intel® Rapid Recover Technology	• Intel's latest data protection technology provides a recovery point that can be used to quickly recover a system should a hard drive fail or if there is massive data corruption. The clone can also be mounted as a read-only volume to allow a user to recover individual files.
Serial ATA* (SATA) 3 Gb/s	• High-speed storage interface supports faster transfer rate for improved data access.
eSATA*/Port Multiplier	• SATA interface 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. Intel also supports natively port multipliers. Combining port multipliers, eSATA, and Intel® Matrix Storage Technology provides great flexibility and expandability for external storage solutions.
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 available on the outside of the system.
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® Quiet System Technology	• Intelligent system fan speed control algorithms use operating temperature ranges more efficiently to reduce system noise by minimizing fan speed changes.

▪ **Intel® Trusted Execution Technology[5]** for safer computing is a versatile set of hardware extensions to Intel® processors and chipsets that enhance the digital office platform with security capabilities such as measured launch and protected execution. Intel® Trusted Execution Technology provides hardware-based mechanisms that help protect against software-based attacks and protects the confidentiality and integrity of data stored or created on the client PC. It does this by enabling an environment where applications can run within their own space, protected from all other software on the system. These capabilities provide the protection mechanisms, rooted in hardware, that are necessary to provide trust in the application's execution environment. In turn, this can help to protect vital data and processes from being compromised by malicious software running on the platform.

▪ **Intel® Virtualization Technology for Directed I/O (Intel® VT-d)** is the next important step toward comprehensive hardware support for the virtualization of Intel® platforms. Intel® VT-d extends the Intel Virtualization Technology (VT) roadmap from existing support for IA-32 (VT-x) virtualization to include new support for I/O device virtualization.

▪ **Intel® Active Management Technology[6] (Intel® AMT)** is a hardware- and firmware-based solution that is powered by the system's auxiliary power plane to provide 24 x 7 availability to IT administrators, provided the enabled system is connected to a power source and an active network port. Intel AMT stores hardware and software information in non-volatile memory and allows IT to "discover" assets, even while the enabled systems are powered off. With built-in manageability, it provides out-of-band (OOB) management capabilities to allow IT to remotely "heal" systems after OS failures. Intel AMT also helps "protect" networks by making it easier to keep software and virus protection schemes consistent and up-to-date across your business. The "protect" capability is raised to a new level in 2006 with the addition of the System Defense feature. Through inbound and outbound filtering and real-time agent presence, System Defense can help block incoming software attacks, isolate a client from the network if it does become infected and proactively alert IT if critical software agents are missing.

For more information, visit the Intel Web site: www.intel.com/products/desktop/chipsets