Product Brief

Intel® Q45 and Q43 Express Chipsets

Advancing business solutions by enhancing manageability and security

The new Intel Q45 and Q43 Express Chipsets, when combined with the Intel® Core™2 processor family, deliver innovative capabilities and energy-efficient performance for business platforms. Delivering industry-leading advancements in both security and manageability, the Intel Q45 Express Chipset is designed to support Intel® Core™2 processor with vPro™ technology. The Intel® Q43 Express Chipset provides standard manageability to meet basic management needs for business users.

The Intel Q45 and Q43 Express Chipsets

Desktop PC Platforms based on the Intel Q45 and Q43 Express chipsets are designed to meet the latest business needs and provide a small power footprint, allowing designs to meet or exceed international power standards. The Intel Q45 Express Chipset supports Intel vPro technology which enhances security, provides always available manageability, and enables energy efficient performance. The Intel Q43 Express Chipset includes Intel® Standard Manageability and an Intel® Trusted Platform Module. Both chipsets introduce a new graphics core—

the Intel® Graphics Media Accelerator 4500 (Intel GMA 4500) — which supports Microsoft* DirectX 10 and enhanced high definition playback support with integrated dual display options. Intel® Quiet System Technology enables quieter systems and new form factors, while Intel® Fast Memory Access delivers increased system performance. Complementary technologies such as Intel® Matrix Storage Technology with the Intel® Rapid Recover Technology provide data protection and improve system availability and performance. The Intel Q45 and Q43 Express Chipsets are designed to meet the demands of today's business environment.

Intel® Core™2 processor with vPro™ technology

The Intel Q45 Express Chipset enables full support for the Intel Core 2 processor with vPro technology and also supports manageability standards such as DASH. The best PCs for business are built with vPro technology, providing the following benefits:

- **Security without compromising manageability**. Manage PCs in Endpoint Access Control secured networks, add extra virus and agent present checks, and stream OS or applications into partitions secured with Intel® Virtualization Technology and Intel® Trusted Execution Technology.
- **Manageability whenever, wherever.** Remotely diagnose problems (even if the PC is outside the enterprise firewall), collect hardware and software inventory data on PCs regardless of their power or health state, and deploy patches to PCs that are turned off.
- **Energy Efficiency without compromising manageability**. Save energy and money by powering down systems at night without losing manageability – PCs can be securely powered on at any time for patches and system maintenance.

In addition, the Intel Q43 Express Chipset supports Intel Standard manageability, enabling the same DASH profiles as Intel® vPro™ technology platforms but extending the PC

capabilties beyond what DASH provides, including basic fix and repair capabilities for remote client management. Existing manageability consoles can manage Intel Standard Manageability desktops capabilities for remote client management.
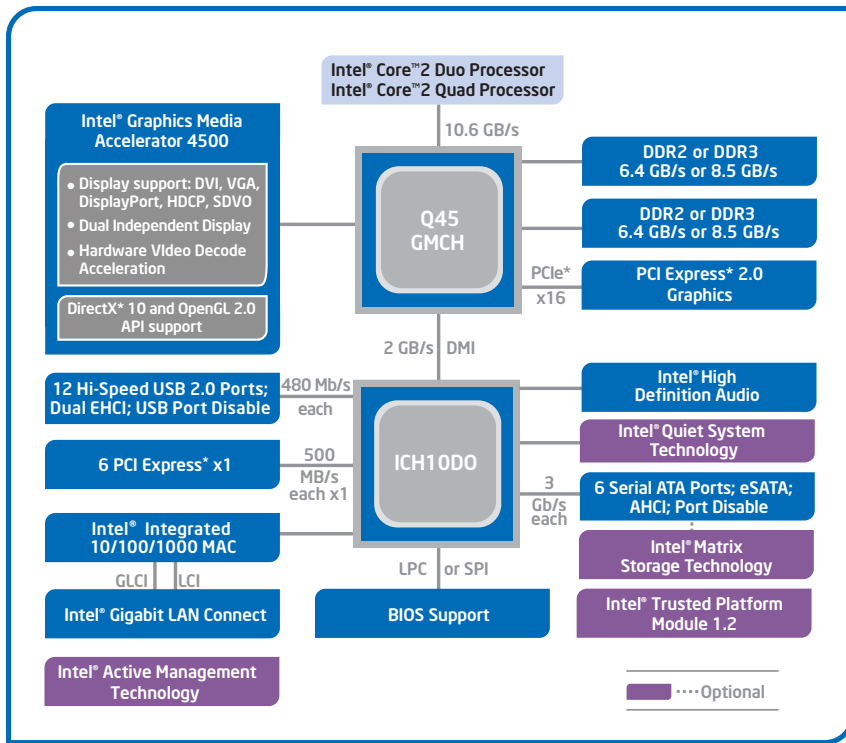
Intel® Stable Image Platform Program

Reducing the variety of supported hardware greatly simplifies enterprise and small medium business PC management , which is reflected in a lower total cost of ownership. One critical element in reducing PC hardware variations involves deploying standardized desktop and laptop PC configurations. The Intel® Stable Image Platform Program (Intel® SIPP) can help companies to identify and deploy standardized, stable image PC platforms for at least 15 months. Both the Intel Q45 and Q43 Express Chipsets support Intel SIPP.

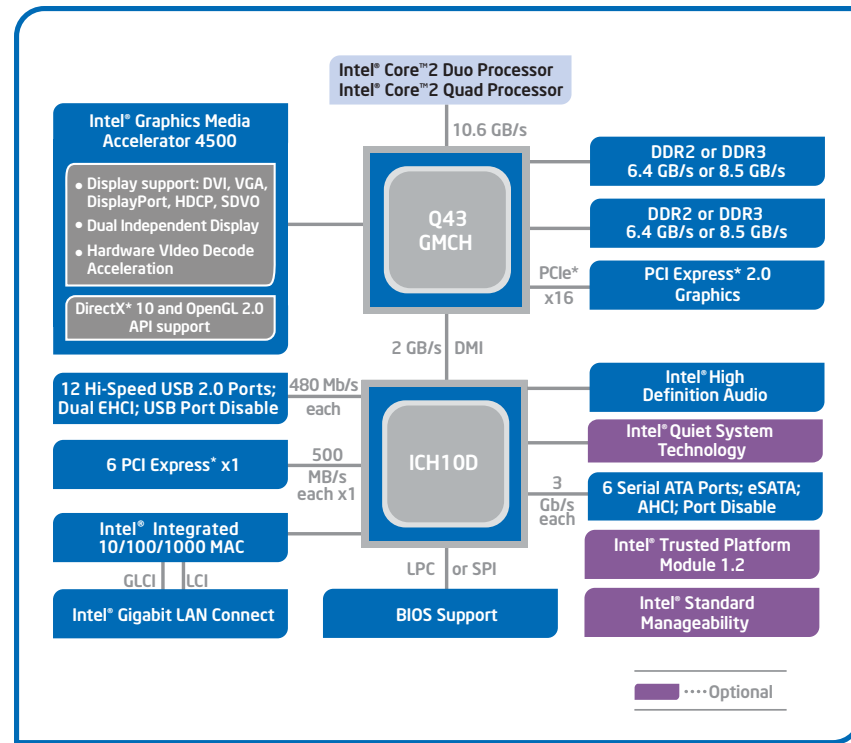## Intel Graphics Media Accelerator 4500 (Intel GMA 4500)

The Intel Q45 and Q43 Express Chipsets with Intel GMA 4500 deliver an excellent blend of graphics performance and features to meet business needs. With integrated dual display support, performance and support for Microsoft DirectX* 10, Shader Model 4.0 and OpenGL* 2.0, Intel GMA 4500 delivers excellent video and 3D graphics with outstanding graphics responsiveness. These enhancements deliver the performance and compatibility needed for today's and tomorrow's business applications. The Intel Q45 and Q43 Express Chipsets include support for the latest PC operating systems, including Windows Vista*.

Faster System Performance

The Intel Q45 and Q43 Graphics Memory Controller Hubs (GMCH) incorporates an updated GMCH backbone architecture that significantly increases overall system performance through the optimization of available bandwidth with the new 1333 MHz system bus and reduction of memory access latency with Intel Fast Memory Access. The updated GMCH also includes support for the next-generation 45 nm Intel® Core™ processor family and wider internal data buses that support dual-channel DDR3 memory technology at 1066 MHz (up to 17 GB/s of peak memory bandwidth in dual-channel interleaved mode).

Intel® Q45 Express Chipset Block Diagram

Intel® Core™2 Duo Processor / Intel® Core™2 Quad Processor

10.6 GB/s

Q45 GMCH

- DDR2 or DDR3 — 6.4 GB/s or 8.5 GB/s
- DDR2 or DDR3 — 6.4 GB/s or 8.5 GB/s
- PCIe* x16 — PCI Express* 2.0 Graphics

Intel® Graphics Media Accelerator 4500
- Display support: DVI, VGA, DisplayPort, HDCP, SDVO
- Dual Independent Display
- Hardware Video Decode Acceleration
- DirectX* 10 and OpenGL 2.0 API support

2 GB/s DMI

ICH10DO

- 12 Hi-Speed USB 2.0 Ports; Dual EHCI; USB Port Disable — 480 Mb/s each
- 6 PCI Express* x1 — 500 MB/s each x1
- Intel® Integrated 10/100/1000 MAC — GLCI / LCI
- Intel® Gigabit LAN Connect
- LPC or SPI — BIOS Support
- Intel® Active Management Technology

- Intel® High Definition Audio
- Intel® Quiet System Technology
- 6 Serial ATA Ports; eSATA; AHCI; Port Disable — 3 Gb/s each
- Intel® Matrix Storage Technology
- Intel® Trusted Platform Module 1.2

▪▪▪▪Optional

Intel® Q45 Express Chipset Block Diagram

Intel® Q43 Express Chipset Block Diagram

Intel® Core™2 Duo Processor / Intel® Core™2 Quad Processor

10.6 GB/s

Q43 GMCH

- DDR2 or DDR3 — 6.4 GB/s or 8.5 GB/s
- DDR2 or DDR3 — 6.4 GB/s or 8.5 GB/s
- PCIe* x16 — PCI Express* 2.0 Graphics

Intel® Graphics Media Accelerator 4500
- Display support: DVI, VGA, DisplayPort, HDCP, SDVO
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2 GB/s DMI

ICH10D

- 12 Hi-Speed USB 2.0 Ports; Dual EHCI; USB Port Disable — 480 Mb/s each
- 6 PCI Express* x1 — 500 MB/s each x1
- Intel® Integrated 10/100/1000 MAC — GLCI / LCI
- Intel® Gigabit LAN Connect
- LPC or SPI — BIOS Support

- Intel® High Definition Audio
- Intel® Quiet System Technology
- 6 Serial ATA Ports; eSATA; AHCI; Port Disable — 3 Gb/s each
- Intel® Trusted Platform Module 1.2
- Intel® Standard Manageability

▪▪▪▪Optional

Intel® Q43 Express Chipset Block Diagram

DDR3 Memory Support

The Intel Q45 Express Chipset supports the new dual-channel DDR3 memory technology at 1066 MHz while also maintaining support for DDR2 memory. The key advantages of DDR3 are the higher bandwidth and the increase in performance at lower power than DDR2. The DDR3 SDRAM devices operating at 1066 MHz, offer peak data transfer rates of up to 17 GB/s (when operated in dual-channel interleaved mode). The Intel Q45 Express Chipset operates at a lower memory voltage, resulting in approximately 20% lower DIMM power consumption and reduced heat dissipation, while taking advantage of the higher bandwidth, faster system performance, and higher performance per watt at 1066[1].

Intel® I/O Controller Hub 10 (Intel® ICH10DO and Intel® ICH10D)

The Intel® ICH10 I/O controller hub as part of the Intel Q45 and Q43 Express Chipset integrates several capabilities to provide flexibility for connecting I/O devices.

▪ **Intel® Matrix Storage Technology**[2]: Native support of external SATA ports (eSATA), combined with Intel Matrix Storage Technology (Intel® MST), provides the flexibility to add an external drive for increased data storage with up to 6 times faster performance than USB* 2.0 or IEEE 1394 400[3]. Support for eSATA enables the full SATA interface speed of up to 3 Gb/s outside the chassis. 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). In addition, the Intel ICH10DO provides sup-port for RAID levels 0, 1, 5, and 10, enabling greater reliability for data or improved storage performance for intensive applications.

▪ **Intel® Rapid Recover Technology** (when configured with ICH10DO I/O controller): With the ability to boot off a clone, Intel Rapid Recover Technology (part of Intel Matrix Storage 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® Quiet System Technology (Intel® QST)**: Integrated in both Intel ICH10D and Intel ICH10DO, Intel QST can help reduce system noise and heat through more intelligent fan speed control algorithms.

▪ **Intel® Trusted Platform Module 1.2**: Integrated as part of the chipset; customer may choose to replace the discrete TPM with Intel® TPM providing a higher level of integration, simplifying board layouts and reducing BOM cost.

Intel® Q45 and Q43 Express Chipset Features at a Glance

Feature	Benefit	Q45	Q43
1333/1066/800 MHz System Bus	Supports the Intel® Core™2 Duo and Intel® Core™2 Quad processors, Intel Pentium® dual core processors, and Intel® Celeron® processors.	Yes	Yes
PCI Express* 2.0 Interface	Support for the PCI Express 2.0 interface provides 16 GB/s bandwidth for add-in graphics cards.	Yes	Yes
Intel® Fast Memory Access	Updated GMCH backbone architecture that improves system performance by optimizing the use of available memory bandwidth and reducing the latency of the memory accesses.	Yes	Yes
Dual-Channel DDR2 Memory Support	Delivers up to 12.8 GB/s (DDR2 800 dual 6.4 GB/s) of bandwidth and 16 GB maximum supported memory size for faster system responsiveness and support of 64-bit computing.	Yes	Yes
Dual-Channel DDR3 Memory Support	Delivers up to 17 GB/s (DDR3 1066 dual 8.5 GB/s) of bandwidth and 8 GB maximum supported memory size for faster system responsiveness and support of 64-bit computing.	Yes	Yes
Intel® Flex Memory Technology	Facilitates easier upgrades by allowing different memory sizes to be populated and remain in dual-channel mode.	Yes	Yes
Intel® Graphics Media Accelerator 4500	Built-in graphics engine delivers an excellent blend of graphics performance and features to meet business users needs. Delivers Microsoft DirectX* 10 enabling support for highest levels of Windows Vista experience.	Yes	Yes
Support for DisplayPort and DVI	Support for the DisplayPort* interface with up to 2560 x 1600 resolution, and the Digital Video Interface (DVI) with up to 2048 x 1536 resolution.	Yes	Yes
Intel® High Definition Audio[4]	Integrated audio support enables premium digital surround sound and delivers advanced features such as multiple audio streams and jack re-tasking.	Yes	Yes
Intel® Matrix Storage Technology[2]	With additional hard drives added, 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.	Yes	No
Intel® Rapid Recover Technology	Intel's latest data protection technology provides a recovery point to quickly recover a system should a hard drive fail or if data is corrupted. The clone can also be mounted as a read-only volume to allow a user to recover individual files.	Yes	No
Serial ATA (SATA) 3 Gb/s	High-speed storage interface supports faster transfer rate for improved data access with up to 6 SATA ports.	Yes	Yes
eSATA	SATA interface designed for use with external SATA devices. It provides a link for 3 Gb/s data speeds to eliminate bottle-necks found with current external storage solutions.	Yes	Yes
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.	Yes	Yes
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.	Yes	Yes
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.	Yes	Yes
Intel® Core™2 Processor with vPro Technology	Provides enhanced security, remote manageability, and energy efficient performance built into the chip.	Yes	No
Intel® Standard Manageability	Provides basic management functions.	Yes	Yes
Intel® Trusted Platform Module 1.2	Provides BOM savings by integrating the industry standard TPM 1.2 into the chipset.[5]	Yes	Yes

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

[1] Performance tests and ratings are measured using specific computer systems and/or components and reflect the approximate performance of Intel products as measured by those tests. Any difference in system hardware or software design or configuration may affect actual performance. Buyers should consult other sources of information to evaluate the performance of systems or components they are considering purchasing. For more information on performance tests and on the performance of Intel products, visit Intel Performance Benchmark Limitations http://www.intel.com/performance/resources/benchmark_limitations.htm.

[2] Intel® Matrix Storage Technology requires the computer have an Intel MST-enabled Intel chipset, RAID controller in the BIOS enabled and the Intel Matrix Storage Technology software driver installed. Please consult your system vendor for more information.

[3] Performance based on interface speed specifications for eSATA, USB 2.0 and Firewire 400.

[4] 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

[5] Intel TPM is an optional feature and may be disabled by the system OEM or motherboard. Third party TPM 1.2 components are also supported by the Intel Q45 and Q43 Express Chipsets.

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