Product Brief

Intel® G45 Express Chipset

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Flexibility and scalability for digital home computing and entertainment

The Intel® G45 Express Chipset, when combined with the Intel® Core™2 processor family, delivers new technologies and innovative capabilities for digital home consumers. With major advancements in video, graphics, responsiveness, and scalability, the Intel G45 Express Chipset allows your PC to be the center of home computing, communications, and entertainment.

Enhanced Video Playback and Advanced Digital Display Support

The Intel G45 Express Chipset includes the next-generation Intel® Graphics Media Accelerator X4500HD (Intel® GMA X4500HD), with built-in support for full 1080p high-definition video playback, including Blu-ray* movies. This powerful video engine provides users with a rich, new media experience to deliver smooth HD playback without the need for add-in video cards or decoders. Intel GMA X4500HD comes with Intel® Clear Video Technology, a combination of video processing hardware and software technologies designed to enhance the visual experience. In addition to stutter-free HD playback and vibrant color controls, Intel Clear Video Technology delivers crystal clear images without the imperfections and artifacts typically associated with PC-based video content. Intel Clear Video Technology allows the PC to connect to a wide range of digital displays by supporting the latest digital display

Intel® Clear Video Technology

Feature	Benefit
Enhanced HD Video Playback	Full hardware acceleration for MPEG2, AVC, and VC1 formats to deliver Intel's ultimate high-definition playback experience, including Blu-ray* playback.
Sharper Image Quality	Advanced de-interlacing and post-processing algorithms provide enhanced picture clarity by minimizing artifacts of standard or high-definition video.
Precise Color Control	Built-in ProcAmp color control settings allow user adjustment of hue, saturation, brightness, and contrast for standard and high-definition videos.
Advanced Digital Display Support	Support for the latest digital displays, including DisplayPort*, HDMI*, and DVI, allows a simple and easy connection between the PC and set-top box, DVD player, and video monitor/DTV.

interfaces, including the High-Definition Multimedia Interface* (HDMI*) and DisplayPort*. HDMI carries uncompressed HD video and uncompressed multichannel audio in a single cable, supporting all HD formats including 720p, 1080i, and 1080p.

Graphics Enhancements

In addition to video, the Intel® G45 Express Chipset with Intel® GMA X4500HD delivers an excellent blend of graphics performance and features to meet mainstream consumer needs. With optimized performance and support for Microsoft DirectX* 10, Shader Model 4.0, and OpenGL* 2.0[1], Intel GMA X4500HD delivers excellent 3D graphics and outstanding graphics responsiveness. These 3D graphics enhancements deliver the performance and compatibility you need for entertaining everyday gameplay for the most popular game titles. In addition, the Intel G45 Express Chipset includes support for the latest PC operating systems, including Windows Vista*.

Faster System Performance

The Intel G45 Graphics Memory Controller Hub (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. This updated GMCH also includes support for the next-generation 45nm Intel® Core™2 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).

DDR3 Memory

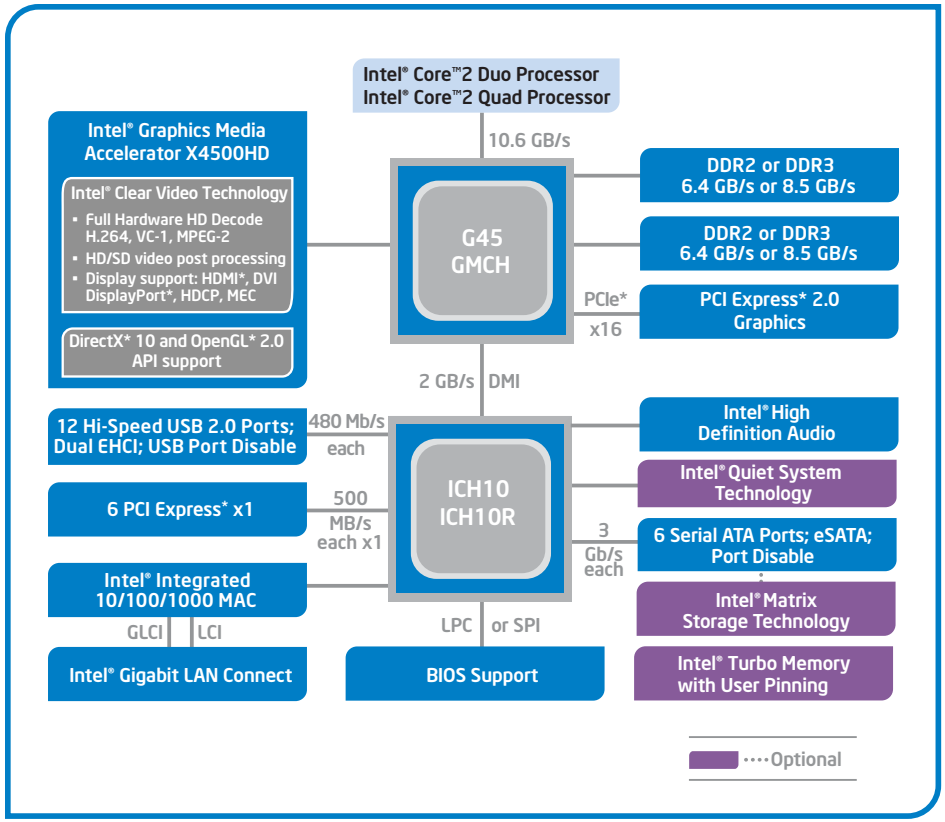
The Intel G45 Express Chipset supports the new dual-channel DDR3 memory technology at 1066 MHz while also maintaining support for DDR2 memory. The key advantages of DDR3 are the higher bandwidth and the increase in performance at a lower power than DDR2. The DDR3 SDRAM devices operating at 1066 MHz offer peak data transfer rates of up to 17 GB/s (when operated in dual-channel interleaved mode). The Intel G45 Express Chipset operates at a lower memory voltage, resulting in lower power consumption and reduced heat dissipation, while taking advantage of the higher bandwidth, faster system performance, and higher performance per watt at 1066 MHz[2].

Intel® I/O Controller Hub 10 (Intel® ICH10/Intel® ICH10R)

The Intel® ICH10 I/O controller hub of the Intel® G45 Express Chipset integrates several capabilities to provide flexibility for connecting I/O devices.

- **Intel® Matrix Storage Technology[3] (when configured with Intel® ICH10R I/O controller):** 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[4]. 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 multitasking performance with Native Command Queuing (NCQ). In addition, support for RAID levels 0, 1, 5, and 10 enables greater reliability for personal data or improved storage performance for intensive applications.
- **Intel® Rapid Recover Technology:** 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® Turbo Memory:** The Intel G45 Express Chipset with the Intel ICH10R also supports Intel Turbo Memory, an innovative flash memory-based overall system performance and boot-time accelerator. This feature is easily implemented using a PCI Express* x1 module and can be used with any SATA hard drive to improve system responsiveness. Intel Turbo memory enables faster application loading and concurrent performance enhancements when used in conjunction with Intel Matrix Storage Technology. Intel Turbo Memory, paired with the Intel G45 Express Chipset, also allows the user to easily control the applications or data in the cache using the new Intel® Turbo Memory Dashboard interface, boosting performance further.
- **Intel® Quiet System Technology:** Integrated in both Intel ICH10 and Intel ICH10R, Intel Quiet System Technology can help reduce system noise and heat through more intelligent fan speed control algorithms.

Intel® G45 Express Chipset Block Diagram



Intel® G45 Express Chipset 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[5], Intel® Core™2 processors with Viiv™ Technology[6] and Intel® Celeron® processors.
PCI Express* 2.0 Interface	The PCI Express 2.0 provides 16 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 16 GB maximum supported memory size for faster system responsiveness and support of 64-bit computing.
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.
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 X4500HD	3D enhancements deliver the graphics performance you need for entertaining everday games and improved realism with support for Microsoft DirectX* 10, Shader Model 4.0, and OpenGL* 2.0[1]. Intel® GMA X4500HD also supports the highest levels of the Windows Vista* experience.
Intel® Clear Video Technology	Video processing hardware and software delivers enhanced high-definition video playback, sharper images with advanced de-interlacing, and ProcAmp color controls.
Support for High-Definition Multimedia Interface* (HDMI*), DisplayPort*, and DVI	HDMI delivers uncompressed HD video and uncompressed multi-channel audio in a single cable, supporting all HD formats including 720p, 1080i, and 1080p. This chipset also supports the DisplayPort interface with up to 2560 x 1600 resolution.
Intel® High Definition Audio[7]	Integrated audio support enables premium digital surround sound and delivers advanced features such as multiple audio streams and jack re-tasking.
Intel® Matrix Storage Technology[3]	With additional hard drives 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 data corruption. The clone can also be mounted as a read-only volume to allow a user to recover individual files.
Intel® Turbo Memory	Intel's innovative NAND cache is designed to improve the responsiveness of applications, application load times, and system boot performance. Intel Turbo Memory, paired with the Intel® G45 Express Chipset, also allows the user to easily control the applications or data in the cache using the new Intel® Turbo Memory Dashboard interface, boosting performance further.
Serial ATA (SATA) 3 Gb/s	High-speed storage interface supports faster transfer rate for improved data access with up to 6 SATA ports.
eSATA	SATA interface designed for use with external SATA devices. It provides a link for 3 Gb/s data speeds to eliminate bottlenecks found with current 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.
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.

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

[1] OpenGL* 2.0 support expected in mid-2008.

[2] 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 www.intel.com/performance/resources/benchmark_limitations.htm.

[3] 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.

[4] Performance based on interface speed and data transfer rate specifications for eSATA, USB 2.0, and IEEE 1394 400.

[5] Intel® Virtualization Technology requires a computer system with an enabled Intel® processor, BIOS, virtual machine monitor (VMM), and, for some uses, certain platform 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.

[6] Home networking capability and many Intel® Viiv™ technology-based usage models will require additional hardware devices, software, or services. Functionality of Intel Viiv technology-verified devices will vary; check product details for desired features. System and component performance and functionality will vary depending on your specific hardware and software configurations. See www.intel.com/go/viiv_info for more information.

[7] 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 www.intel.com

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