

Intel® G45 Express Chipset for Embedded Computing

Product Overview

The Intel® G45 Express chipset provides major advancements in video, graphics, responsiveness and scalability for embedded computing. When combined with the Intel® Core™2 processor family, this platform is ideal for embedded applications requiring enhanced media functionality such as retail and transaction solutions (point-of-service, ATMs, kiosks, digital signage, transaction terminals), gaming machines and medical appliances.

The Intel G45 Express chipset consists of the Intel® 82G45 Graphics Memory Controller Hub (GMCH) and Intel® I/O Controller Hub (ICH) 10. The GMCH 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* content. This powerful video engine provides embedded applications with a rich media experience, delivering smooth HD playback without the need for add-in video cards or decoders. The 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 video content. It supports the latest range of digital display interfaces, including High-Definition Multimedia Interface* (HDMI*) and DisplayPort.*



Media Processing

With optimized performance and support for Microsoft DirectX* 10 and OpenGL* 2.0, Intel GMA X4500HD delivers outstanding media processing capabilities such as full hardware HD decode, video de-interlacing and 3D graphics rendering. This provides the performance and compatibility required for the media-intensive, realistic visual computing needs of digital signage, gaming, and retail applications.

System Performance

An updated backbone architecture in the Intel 82G45 GMCH optimizes available bandwidth with the 1333 MHz system bus and reduces memory access latency with Intel® Fast Memory Access. It supports members of the 45nm Intel Core 2 processor, Intel® Pentium® processor, and Intel® Celeron® processor families.

DDR3 Memory

While maintaining support for DDR2 memory, the chipset supports dual-channel DDR3 SDRAM memory devices operating at 1066 MHz. This offers peak data transfer rates up to 17 GB/s when operated in dual-channel interleaved mode, resulting in higher bandwidth and increased performance at a lower power than DDR2. Lower memory voltage results in lower power consumption and reduced heat dissipation, while taking advantage of the higher bandwidth, faster system performance, and higher performance-per-watt.

Intel® I/O Controller Hub 10

Numerous integrated capabilities within the I/O Controller Hub provide flexibility for connecting I/O devices. Additionally, Intel® Quiet System Technology helps reduce system noise and heat while integrated Intel® High Definition Audio¹ enables premium digital surround sound.

Software Overview

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

Operating System

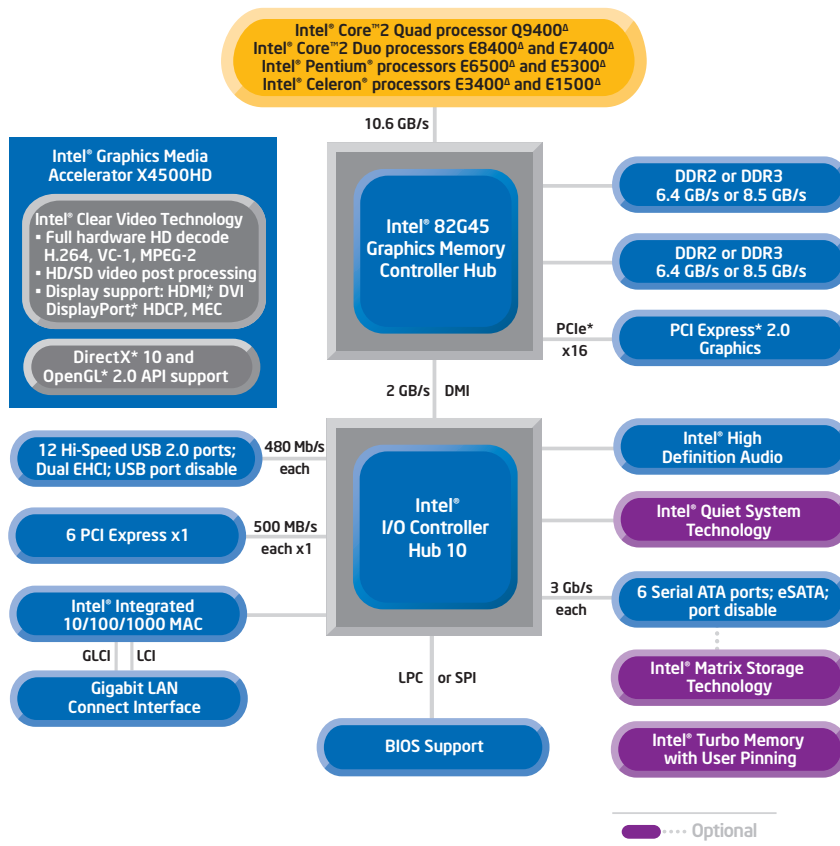
Operating System	Contact
Microsoft Windows* XP	Intel provides drivers ²
Microsoft Windows* Embedded Standard	Intel provides drivers ²
Microsoft Windows* Embedded POSReady	Intel provides drivers ²
Red Hat Enterprise Linux* 5	Red Hat
Novell SUSE Linux* Enterprise 10	Novell
Wind River Linux*	Wind River
Wind River VxWorks* 6.6	Wind River

BIOS

American Megatrends
Insyde Software
Phoenix Technologies

This and other chipsets are supported by the Intel® Embedded Graphics Drivers and video BIOS, developed specifically for embedded products and applications (developer.intel.com/design/intarch/SWsup/graphics_drivers.htm).

For the most recent software updates, please visit downloadcenter.intel.com, and enter the product name.



Features

Benefits

1333/1066/800 MHz System Bus	<ul style="list-style-type: none"> Validated with a variety of processors to meet a wide range of performance needs, including the Intel® Core™2 Quad processor Q9400, Intel® Core™2 Duo processors E8400 and E7400, Intel® Pentium® processors E6500 and E5300, and Intel® Celeron® processors E3400 and E1500.
PCI Express* 2.0 Interface	<ul style="list-style-type: none"> 16 GB/s bandwidth for platform graphics.
Intel® Fast Memory Access	<ul style="list-style-type: none"> Updated GMCH backbone architecture improves system performance by optimizing use of available memory bandwidth and reducing latency of memory accesses.
Dual-channel DDR2 Memory Support	<ul style="list-style-type: none"> Up to 12.8 GB/s (6.4 GB/s per channel with DDR2 800 MHz) bandwidth and 16 GB maximum supported memory size for fast system responsiveness and support of 64-bit computing.
Dual-channel DDR3 Memory Support	<ul style="list-style-type: none"> Up to 17 GB/s (8.5 GB/s per channel with DDR3 1066 MHz) bandwidth and 8 GB maximum supported memory size for faster system responsiveness and support of 64-bit computing.
Intel® Flex Memory Technology	<ul style="list-style-type: none"> Facilitates easier upgrades by allowing different memory sizes to be populated and remain in dual-channel mode.
Intel® Graphics Media Accelerator X4500HD	<ul style="list-style-type: none"> Built-in graphics engine provides 3D enhancements which deliver performance needed for media-intense embedded applications with support for Microsoft DirectX* 10 and OpenGL* 2.0.
Intel® Clear Video Technology	<ul style="list-style-type: none"> Full hardware acceleration for MPEG2, AVC, and VC1 formats delivers impressive HD playback experience, including Blu-ray* content. Advanced de-interlacing and post-processing algorithms provide enhanced image clarity by minimizing artifacts of standard or high-definition video. Built-in ProcAmp color control settings allow user precise color control with adjustment of hue, saturation, brightness, and contrast for standard and high-definition videos. Advanced digital display support, including DisplayPort,* HDMI,* and DVI, provides simple and easy connection between embedded applications and video monitor/DTV.
High-Definition Multimedia Interface* (HDMI*), DisplayPort* and DVI	<ul style="list-style-type: none"> Uncompressed HD video and multi-channel audio in a single cable, supports all HD formats including 720p, 1080i, and 1080p. DisplayPort interface with up to 2560 x 1600 resolution. Digital Video Interface (DVI) with up to 2048 x 1536 resolution.
Intel® High Definition Audio ¹	<ul style="list-style-type: none"> Premium digital surround sound with advanced features such as multiple audio streams and jack re-tasking.
Serial ATA (SATA) up to 3 Gb/s	<ul style="list-style-type: none"> Faster transfer rate for improved data access with up to six SATA ports.
eSATA	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Enables individual SATA ports to be enabled or disabled 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	<ul style="list-style-type: none"> Enables individual USB ports to be enabled or disabled as needed. Provides added protection of data by preventing malicious removal or insertion of data through USB ports.
Intel® Quiet System Technology	<ul style="list-style-type: none"> Helps reduce 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.
Ecosystem Support	<ul style="list-style-type: none"> Along with a strong ecosystem of hardware and software vendors, including members of the Intel® Embedded and Communications Alliance (intel.com/go/eca), Intel helps cost-effectively meet development challenges and speed time-to-market.
Embedded Lifecycle Support	<ul style="list-style-type: none"> Protects system investment by enabling extended product availability for embedded customers.

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Product	Product Code	Package	Features
Intel® 82G45 Graphics Memory Controller Hub (GMCH)	AC82G45	34x34 mm 1254 FC-BGA	1333/1066/800 MHz system bus; DDR2 or DDR3 memory; Intel® Graphics Media Accelerator X4500HD; PCI Express* x16 Gen 2.0.
Intel® I/O Controller Hub 10 (Intel® ICH10)	AF82801JIB	31x31 mm 676 PBGA	Four PCI masters and six PCI Express x1 channels; six SATA ports; 12 Hi-Speed USB 2.0 ports, dual EHCI controllers, individual port disable; integrated 10/100/1000 MAC.

Intel in Embedded and Communications: intel.com/embedded

⁴ Intel processor numbers are not a measure of performance. Processor numbers differentiate features within each processor family, not across different processor families. See http://www.intel.com/products/processor_number for details.

¹ 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

² Drivers available at: downloadcenter.intel.com (enter chipset name).

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