Intel Graphics — Built for Mainstream Desktop and Mobile PC Users

Intel Graphics are the #1 choice of personal computer buyers worldwide[1], delivering smooth, high-quality HD video playback, advanced 3D capabilities, and full support for the new Windows Vista* operating system. Whether you are a mainstream gamer or multimedia buff, Intel Graphics deliver a unique solution for a broad array of users without the costs typically associated with add-on graphics cards.

Intel Graphics fully support Windows Aero* and all of its features. In addition, PCs based on Intel Graphics that are configured with memory devices of adequate amount and speed (as determined by Microsoft) are eligible for the Windows Vista* premium logo.[2]

3D Features

Intel Graphics deliver optimized 3D performance with new capabilities for greater game compatibility and realism. When you buy a PC with Intel Graphics, you get a cost-effective solution with the performance you need.

	Intel Graphics Core	Intel® GMA 950	Intel® GMA 3000	Intel® GMA 3100	Intel® GMA X3000	Intel® GMA X3100	Intel® GMA X3500
	Intel® Chipset	945G, 945GM	946GZ, Q963, Q965	G31, G33, Q33, Q35	G965	GM965, GL960	G35
Feature	**Benefit**						
Video Memory	Enables more realistic game play and provides greater resolution and color depth settings to the system's video and graphics subsystem	Up to 256 MB	Up to 256 MB	Up to 256 MB	Up to 384 MB	Up to 384 MB	Up to 384 MB
DirectX* Support	Standardized programming interface provides a much faster interface to the system's graphics than the standard Windows* functions. Used in most modern games.	DirectX* 9.0c	DirectX* 9.0c	DirectX* 9.0c	DirectX* 9.0c	DirectX* 10[3]	DirectX* 10[3]
OpenGL Support	Widely used programming interface that accelerates 2D and 3D performance in PCs	1.4 + Extensions	1.4 + Extensions	1.4 + Extensions	OpenGL 1.5	OpenGL 1.5	OpenGL 2.0
Hardware T&L	Enables improvements in gaming performance and increases the number of games supported	No	No	No	YES[4]	YES[4]	YES[4]
Shader Model Support	Enables complex animations and visual effects in games with realistic shading, lighting, and textures	2.0	2.0	2.0	3.0[4]	4.0[3]	4.0[3]

Intel® GMA = Intel® Graphics Media Accelerator

Video Features

Today's digital home consumers are demanding high-quality video playback and sharp image quality from their PC. Intel Graphics with Intel® Clear Video Technology[5] provide advanced processing capabilities to enable a richer entertainment experience. Intel Graphics also support the latest in high-definition formats including HD DVD and Blu-ray.

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Feature	**Benefit**						
Intel® Clear Video Technology	Delivers enhanced high-definition video playback, sharper images and precise color control	No	No	YES (G33 chipset only)	YES	YES	YES
HD Hardware Acceleration							
MPEG-2 Decode Supported[6]	Enables smooth playback of high-definition MPEG-2 content while freeing up the CPU for other tasks	YES (HW MC)	YES (HW MC)	YES (G31, Q33, Q35: HW MC, G33: VLD + iDCT + MC)	YES (VLD + iDCT + MC)	YES (VLD + iDCT + MC)	YES (VLD + iDCT + MC)
VC-1 Decode Supported[7]	Enables smooth Windows Media* Video HD playback while freeing up the CPU for other tasks	No (can support through software)	No (can support through software)	No (can support through software)	YES (MC + In Loop Filter – WMV9 only)	YES (MC + In Loop Filter – WMV9 only)	YES (MC + In Loop Filter)
HD Video Playback							
HD-DVD media	High-density optical disc format designed for the storage of data and high-definition video	No	No	YES[8] (G33 chipset only)	YES[8]	YES[8]	YES[8]
Blu-ray disc	High-density optical disc format designed for the storage of data and high-definition video	No	No	YES[8] (G33 chipset only)	YES[8]	YES[8]	YES[8]
MPEG-2	Standard video compression format used on DVDs, broadcast, and broadband content	1080p, 1080i, and 720p	1080p, 1080i, and 720p	1080p, 1080i, and 720p	1080p, 1080i, and 720p	1080p, 1080i, and 720p	1080p, 1080i, and 720p
VC-1	Microsoft-developed video compression format which delivers superior quality compared to the same bit-rate MPEG-2 content	1080p, 1080i, and 720p	1080p, 1080i, and 720p	1080p, 1080i, and 720p	1080p, 1080i, and 720p	1080p, 1080i, and 720p	1080p, 1080i, and 720p
AVC/H.264[9]	Third-generation video compression technology that enables the storing and playback of high-bit-rate, high-definition digital video	1080i and 720p	1080i and 720p	1080i and 720p	1080i and 720p	1080i and 720p	1080i and 720p
Video Sharpness/Detail							
De-interlacing	Reduces static and motion artifacts, improving the clarity and stability of the video picture	Adaptive	Advanced (Best)	Adaptive	Advanced (Best)	Advanced (Best)	Advanced (Best)
Sharpness/Detail and Noise Reduction	Provides sharper, cleaner images and enhances standard-definition content on HDTVs	No	No	No	YES	YES	YES
Video Scaling/ Panel Scalar	Provides high-quality scaling to view content clearly in non-native resolution	Bilinear	Bilinear or 4x4	Bilinear	Bilinear or 4x4	Bilinear or 4x4	Bilinear or 4x4
Vibrant Color							
ProcAmp/Color Control	Enhances fine-detail of video playback and allows for user control over brightness, contrast and saturation	No	No	YES (G33 chipset only)	YES	YES	YES
Color Model Range	Range of colors from 0 to 255 that are allowed by the monitor or display	PC RGB (0-255 colors)	PC RGB (0-255 colors)	PC RGB (0-255 colors)	PC RGB (0-255 colors)	PC RGB (0-255 colors)	PC RGB (0-255 colors)

Display Features

Intel Graphics allow the PC to connect to a wide range of digital displays and resolutions, including the latest digital interfaces like HDMI. In addition, Intel Graphics support all high-definition resolutions, including 720p, 1080i, and 1080p.

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Feature	**Benefit**						
TV Set-up Utility[10]	Provides step-by-step configuration wizard for seamless TV setup and configuration	No	No	Intel® TV Wizard (G33 chipset only)	No	Intel® TV Wizard	Intel® TV Wizard
Content Protection	Prevents transmission of non-encrypted high-definition content over DVI and HDMI connections	COPP/PMP w/ HDCP	COPP/PMP w/ HDCP	COPP/PMP w/ HDCP	COPP/PMP w/ HDCP	COPP/PMP w/ HDCP	COPP/PMP w/ HDCP
Maximum Resolution	Higher pixel resolutions allow the PC to show more image detail	QXGA 75 Hz (2048x1536)	QXGA 75 Hz (2048x1536)	QXGA 75 Hz (2048x1536)	QXGA 75 Hz (2048x1536)	QXGA 75 Hz (2048x1536)	QXGA 75 Hz (2048x1536)
Display Support							
HDMI[11]	Provides a user-friendly, single-cable connector that enables transmission of superior, uncompressed digital video and audio	YES (945GM chipset only)	No	YES (G33 chipset only)	YES	YES	YES
S-Video[11]	Analog connection that carries high-bandwidth 480i or 576i resolution video, resulting in sharper images than standard RGB video	YES	YES	YES	YES	YES	YES
DVI[11]	Digital video interface that maximizes the visual quality of digital display devices such as LCD computer displays and digital projectors	YES	YES	YES	YES	YES	YES
Analog Outputs[11]	Standard analog display interfaces, such as VGA, provide basic visual quality when connected to CRTs, LCDs, or HDTVs	YES	YES	YES	YES	YES	YES

Intel® Clear Video Technology[5]

Intel® Clear Video Technology is a combination of video processing hardware and software technologies that delivers enhanced HD video playback, sharper images, precise color control and advanced support for a wide range of digital displays – without the extra expense of an add-on video card.

Feature	Benefit
Enhanced High-Definition Video Playback	Experience high-definition video playback without the need for expensive add-in video cards or decoders. Enables smoother video playback and multi-stream playback for picture-in-picture
Sharper Image Quality	Maintain sharp image quality even at high resolutions, and reduce annoying artifacts through both analog and digital video signals
Vibrant Colors	Allows user adjustment of hue, saturation, brightness and contrast enabling more accurate color of video clips under any environmental lighting condition
Advanced Digital Display Support	Allows your PC to connect to a wide range of digital displays by supporting the latest digital display interfaces, including the High-Definition Multimedia Interface (HDMI), which carries uncompressed HD video and multi-channel audio in one cable

Intel Clear Video technology uses advanced de-interlacing technology and ProcAmp color controls to deliver sharper, more vibrant video images.

[1] Mercury Research, PC Graphics 2007 - Updated Edition Q12007 (includes integrated and discrete graphics).

[2] Platforms based on the Intel® 945G/945GM Express Chipset and above, when configured with memory devices of adequate amount and speed, meet all current requirements for the Windows Vista* Premium OS system logo.

[3] DirectX* 10 and Shader Model 4.0 software driver support expected in Q1 2008.

[4] Hardware T&L and Shader Model 3.0 software driver support expected in August 2007.

[5] Intel® Clear Video Technology, including improved video playback and quality are available only on the Intel® G965, G33, and G35 Express Chipsets, and the Mobile Intel® GM965 and GL960 Express Chipsets.

[6] HW accelerated MPEG-2 VLD not currently supported on Windows Vista* due to OS issue (to be resolved in Vista* SP1).

[7] HW accelerated WMV9b/VC-1 not supported on Windows Vista* until August 2007.

[8] HD-DVD or Blu-ray disc media playback requires the use of a third-party decoder card and appropriate software drivers.

[9] Ability to play back AVC/H2.64 content is dependent on system configuration, content bitrate and resolution.

[10] TV Wizard utility is available through a software graphics driver which is available for download at www.support.intel.com.

[11] Requires SDVO card.

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