

# CLIENT GRAPHICS

## ENHANCED BUILT-IN VISUALS on 3rd GENERATION INTEL® CORE™ PROCESSOR FAMILY<sup>1,2</sup>

### Intel® Built-In Visuals—Built for Mainstream Desktop and Mobile PC Users

Intel® Built-In Visuals provide superb visual performance for sharper images, richer color, and lifelike video and audio. Watch movies and Internet videos in high definition, play popular casual and mainstream game titles, and get full support for Microsoft® Windows® 7 and Windows® 8. - Enhanced Intel Built-In Visuals are available on 3rd generation Intel® Core™ processor family.

|   | <b>Processor</b>   | <b>3rd generation Intel® Core™ processor family</b>   | <b>2nd generation Intel® Core™ processor family (Intel® Core™ i7, Intel® Core™ i5, and Intel® Core™ i3)</b> |
|---|--|---|---|
| <b>FEATURE</b>                          | <b>BENEFIT</b>   |   |   |
| <b>Intel® Quick Sync Video</b>          | Saves valuable time for PC users who want to create and edit video, sync it to other devices, and share it—at home and on the Internet. Intel® Quick Sync Video uses dedicated media processing to accelerate video encoding. Users can also create and edit 3-D videos and convert their 2D videos into 3D at blazing speed and enjoy premium HD video conferencing at high quality | Yes<br>(Faster <sup>3</sup> , new support for stereoscopic 3D videos and smooth HD video conferencing)                        | Yes   |
| <b>Intel® InTru™ 3D</b>                 | Enjoy the ultimate 3-D visual experience—seamlessly from your PC. Now you can watch your favorite 3-D Blu-ray* movies using passive glasses or active shutter glasses all delivered in full 1080p resolution on your stereo 3-D over HDMI* 1.4.  | Yes<br>(New support for passive glasses)  | Yes<br>(Active shutter glasses only)  |
| <b>Intel® Clear Video HD Technology</b> | Provides visual quality and color fidelity enhancements for spectacular 1080p HD playback and immersive Web browsing.  | Yes<br>(Quality enhancements)   | Yes<br>(Quality enhancements)   |
| <b>Intel® Wireless Display</b>          | Intel® Wireless Display lets you enjoy all of your personal content like pictures, video, audio and premium online content like movies, TV, videos from Youtube, Netflix and Hulu, on a big screen with a simple wireless connection.  | Yes<br>(Improved quality, video smoothness and reduced latency. New support for full 1080p stereoscopic content) <sup>6</sup> | Yes<br>(Full 1080p protected content support)   |
| <b>Intel® Insider™</b>                  | Stream or download 1080p HD premium movies on your PC through participating distributor sites across the world. Enables users to purchase content and view later across multiple platforms using Ultraviolet* support  | Yes<br>(New support for Ultraviolet* and view later. More content and storefronts)  | Yes   |
| <b>Intel® HD Graphics</b>               | Intel® HD Graphics is built into the processor and delivers immersive mainstream gaming, 3-D experiences and smooth and fast next generation browser experience  | Yes<br>(Intel® HD Graphics 2500/4000)<br>(Support for DirectX 11 games. Faster and smoother experience)                       | Yes<br>(Intel® HD Graphics 3000/2000) <sup>1</sup>  |

|  |   |                 |     |
|--|---|-----------------|-----|
|  |   | and more games) |     |
| <b>Intel® Advanced Vector Extensions</b> | Intel® Advanced Vector Extensions gives more computing power to application developers with a new 256-bit instruction set extensions to Intel® SSE. | Yes             | Yes |

**Intel® Quick Sync Video**

Intel® Quick Sync Video makes fast work of creating, editing, syncing, and sharing your videos—at home and online. Intel Quick Sync Video, built into 3<sup>rd</sup> and 2<sup>nd</sup> generation Intel® Core™ processors, delivers breakthrough hardware acceleration that lets you complete in minutes what used to take hours. Create DVDs or Blu-ray\* discs, edit videos, convert video files for your portable media device, and convert videos for upload to your favorite social networking sites—all in a flash.

|                         | <b>Processor</b>  | <b>3rd generation Intel® Core™ processor family (Intel® Core™ i7)</b> | <b>2nd generation Intel® Core™ processor family (Intel® Core™ i7, Intel® Core™ i5, and Intel® Core™ i3)</b> |
|-------------------------|---|---|---|
| <b>FEATURE</b>          | <b>BENEFIT</b>  |   |   |
| <b>AVC/H.264 Encode</b> | Saves valuable time when creating and editing Blu-ray* discs, and other videos in h.264 format. | Yes   | Yes   |
| <b>MPEG2 Encode</b>     | Saves valuable time when creating and editing DVDs, and other videos in MPEG2 format.           | Yes (Partial)   | Yes (Partial)   |
| <b>MVC HW Encode</b>    | Saves valuable time when creating and editing stereoscopic 3D videos                            | Yes (partial)   | No  |

## Intel® Clear Video HD Technology

Intel® Clear Video HD Technology delivers seamless video and brings imagery to life with rich, accurate colors when you are browsing the Web, watching videos, and enjoying your favorite HD programs. Intel Clear Video HD Technology in 3<sup>rd</sup> and 2nd generation Intel® Core™ processors lets you view images as they were meant to be seen.

|   | Processor   | 3rd generation Intel® Core™ processor family | 2nd generation Intel® Core™ processor family (Intel® Core™ i7, Intel® Core™ i5, and Intel® Core™ i3) |
|---|---|--|--|
| FEATURE                                 | BENEFIT   |  |  |
| <b>Blu-ray* Disc Playback</b>           | High-density optical disc format designed for the storage of data and high-definition video.                            | Yes  | Yes  |
| <b>Blu-ray Stereo 3-D Disc Playback</b> | Playback of Blu-ray* stereo 3-D content on your PC.   | Yes  | Yes (with HDMI* 1.4)   |
| <b>Intel® Clear Video HD Technology</b> | Delivers enhanced high-definition video playback, sharper images, and precise color control.                            | Yes  | Yes  |
| <b>DVD Upscaling</b>                    | Provides high-quality DVD upscaling through Windows* 7.   | Yes  | Yes  |
|   | <b>HD Hardware Acceleration</b>   |  |  |
| <b>AVC/H.264, MPEG2, VC1 Decode</b>     | Enables smoother playback and longer battery life when viewing h.264, MPEG2, or VC1 DVD, Blu-ray, or streaming content. | Yes  | Yes  |
| <b>Dual Video Decode</b>                | Enables Blu-ray picture-in-picture hardware acceleration.   | Yes  | Yes  |
| <b>HW Decode MFTs</b>                   | Enables faster Windows 7 drag and drop transcoding for MPEG2, VC1, and h.264 content.                                   | Yes  | Yes  |
|   | <b>Video Sharpness / Detail</b>   |  |  |
| <b>Skin Tone Enhancement</b>            | Enhances skin tones to look more real and natural.  | Yes  | New  |
| <b>Total Color Control</b>              | Enables adjustment of saturation levels per base color for brighter, richer colors.                                     | Yes  | New  |
| <b>Auto Contrast Enhancement</b>        | Fixes underexposed or overexposed areas of your videos.   | Yes  | New  |
| <b>De-interlacing</b>                   | Reduces static and motion artifacts, improving the clarity and stability of the video picture.                          | Advanced                                     | Advanced   |
| <b>Sharpness Detail</b>                 | Sharpens the image to provide finer detail and improved image quality.  | Yes  | Yes  |
| <b>Noise Reduction</b>                  | Filters out unwanted noise to provide finer detail and cleaner images.  | Yes  | Yes  |
| <b>Film Mode Detection</b>              | Detects film cadence and recovers original film content to improve image quality.                                       | Yes  | Yes  |
| <b>Video Scaling / Panel Scalar</b>     | Provides high-quality scaling to view content clearly in non-native resolution.   | Yes (8x8 polyphase)                          | Yes (8x8 polyphase)  |
|   | <b>Vibrant Color</b>  |  |  |
| <b>Deep Color and x.v.Color</b>         | Together, Deep Color and x.v.Color enable future HDTVs to display more natural, accurate, and vivid colors.             | Yes  | Yes  |
| <b>ProcAmp / Color Control</b>          | Enhances fine detail of video playback and allows for user control over brightness, contrast, and saturation.           | Yes  | Yes  |

## Display and Audio Features Comparison

Connect to a wide range of digital displays and resolutions, including the latest digital interfaces such as HDMI\* and DisplayPort\*. In addition, 2nd generation Intel® Core™ processors support high-definition resolutions, including 720p, 1080i, and 1080p.

|   | Processor   | 3rd generation Intel® Core™ processor family | 2nd generation Intel® Core™ processor family (Intel® Core™ i7, Intel® Core™ i5, and Intel® Core™ i3) |
|---|---|--|--|
| FEATURE                                   | BENEFIT   |  |  |
| <b>New Control Panel</b>                  | New look and feel, easier to use, with custom resolution settings.  | Yes (Enhancements)                           | Yes  |
| <b>Maximum Display Resolution</b>         | Higher pixel resolutions allow the PC to show more image detail.  | DisplayPort* 2560 x 1600, HDMI*, VGA         | DisplayPort* 2560 x 1600, HDMI*, VGA   |
|   | <b>Display Support</b>  |  |  |
| <b>Independent Digital Displays</b>       | Allows a user to connect multiple displays to the PC  | 3  | 2  |
| <b>HDMI* with HDCP</b>                    | Provides a user-friendly, single-cable connector that enables transmission of superior, uncompressed digital video and audio. | Version 1.4                                  | Version 1.4 (3-D, Deep Color, premium audio, auto lip-sync)  |
| <b>DisplayPort* with HDCP</b>             | Highly scalable and efficient display interface for the PC.   | Version 1.1 (with audio)                     | Version 1.1 (with audio)   |
| <b>Embedded DisplayPort</b>               | Highly scalable and efficient display interface for notebooks.  | Yes  | Yes (Mobile Only)  |
| <b>LVDS</b>                               | Low-voltage digital display interface.  | Yes  | Yes <sup>5</sup>   |
| <b>DVI with HDCP</b>                      | Digital video interface that maximizes the visual quality of digital displays such as LCD displays and digital projectors.    | Yes  | Yes  |
| <b>VGA</b>                                | Standard analog display interfaces, such as VGA, provide basic visual quality when connected to CRTs, LCDs, or HDTVs.         | Yes  | Yes  |
|   | <b>Audio Support</b>  |  |  |
| <b>Dolby* TrueHD, DTS* Premium Suite*</b> | Supported on a significant number of Blu-ray* titles for the highest quality audio.   | Yes  | Yes  |

### 3-D Features Comparison

Intel® Core™ processors with Intel® HD Graphics deliver a responsive, attractive 3-D visual experience for casual and mainstream PC games. When you buy a PC equipped with Intel HD graphics, you get a cost-effective solution with the performance for more gaming fun.

|                         | Processor  | 3rd generation Intel® Core™ processor family | 2nd generation Intel® Core™ processor family (Intel® Core™ i7, Intel® Core™ i5, and Intel® Core™ i3) |
|-------------------------|--|--|--|
| FEATURE                 | BENEFIT  |  |  |
| <b>Video Memory</b>     |  | Up to 1.70 GB                                | Up to 1.70 GB  |
| <b>DirectX* Support</b> | Standardized programming interface used in games as an interface to the system's graphics through Microsoft* Windows*. | DirectX* 11                                  | DirectX* 10.1  |
| <b>OpenGL* Support</b>  | Standardized programming interface used by 2-D and 3-D graphics applications.  | 3.1  | 3.1  |
| <b>OpenCL* Support</b>  | Standard programming interface for accessing Compute units in CPU and GPU  | 1.1  | No   |

For more information, visit

[www.intel.com/technology/visualtechnology/index.htm](http://www.intel.com/technology/visualtechnology/index.htm)

[www.intel.com/technology/quicksynch/index.thm](http://www.intel.com/technology/quicksynch/index.thm)

[www.intel.com/technology/graphics/intelhd.htm](http://www.intel.com/technology/graphics/intelhd.htm)

[www.intel.com/technology/graphics/ctv.htm](http://www.intel.com/technology/graphics/ctv.htm)

<sup>1</sup> Built-in Visuals available on select SKUs only

<sup>2</sup> 3rd generation Intel® Core™ processor family products will be launched in first and/or second quarter of 2012

<sup>3</sup> Faster on select SKUS

<sup>5</sup> For desktops, only supported with the Intel® A57 Express Chipset

<sup>6</sup> New features available after launch

All products and dates specified are preliminary based on current expectations and are subject to change without notice. Availability in different channels may vary.

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