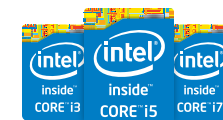




# Client Graphics Highlights



## ENHANCED BUILT-IN VISUALS ON THE 4TH 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. There's no need for an extra add-in graphics card—full graphics and media support is already built in. Enhanced Intel Built-In Visuals are available on the 4th gen Intel® Core™ processor family.

		Processor	4th generation Intel® Core™ processor family (Intel® Iris™ Pro graphics 5200 / Intel® Iris™ graphics 5100, Intel® HD graphics 5000 / 4600 / 4400 / 4200)	3rd generation Intel® Core™ processor family (Intel® HD graphics 4000 / 2500)
FEATURE	BENEFIT			
Intel® Quick Sync Video	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 2-D videos into 3-D videos at blazing speed and enjoy premium HD video conferencing at high quality.		Yes (Faster <sup>2</sup> )	Yes
Intel® InTru™ 3D	Enjoy the ultimate 3-D visual experience—seamlessly from your PC. Now you can watch your favorite 3-D Blu-ray* movies all delivered in full 1080p resolution on your stereo 3-D monitor.		Yes (HDMI* 1.4 and DisplayPort* 1.2)	Yes (HDMI* 1.4)
Intel® Clear Video HD Technology	Provides visual quality and color fidelity enhancements for spectacular 1080p HD playback and immersive Web browsing.		Yes	Yes
Intel® Wireless Display	Intel® Wireless Display lets you beam your apps, personal, and online content such as movies, photos, or music to TV with a simple wireless connection.		Yes <i>New features include:</i> ▪ Brand new touch user interface ▪ Context-aware user experience ▪ Lower latency for gaming ▪ Cinematic sync for smoother video playback ▪ USB over WiFi*	Yes
Intel® Insider™	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 (More content and storefronts)	Yes
Intel® Iris™ graphics	Intel® Iris™ graphics and Iris™ Pro graphics are new trademarked names for the two highest levels of graphics in select upcoming 4th gen Intel® Core™ processors. Iris graphics is included in 28 W 4th gen Intel Core processors geared for Ultrabook™. Iris™ Pro graphics is focused on higher performance notebooks and desktop All-in-One PCs (47 W processors and higher) delivering up to 2X <sup>3</sup> graphics performance.		Yes	No
Intel® HD graphics	Intel® HD graphics is built into the processor and delivers immersive mainstream gaming, 3-D experiences, and a smooth and fast next-generation browser experience.		Yes (Improved performance, support for DirectX* 11.1, OpenCL* 1.2, OpenGL* 4.0)	Yes (Support for DirectX* 11, OpenCL* 1.1, OpenGL* 4.0) (Support for DirectX* 11.1, OpenCL* 1.2 is available with latest graphics drivers)

## 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 4th and 3rd gen 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.

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FEATURE	BENEFIT			
<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 (Full) (Faster encode)	Yes (Partial)
<b>MVC HW Encode</b>	Saves valuable time when creating and editing stereoscopic 3-D videos.		Yes (Full) (Faster encode)	Yes (Partial)
<b>SVC HW Encode<sup>4</sup></b>	Smoother video streaming and conferencing.		Yes	No
<b>JPEG/MJPEG Hardware Encode</b>	Saves time encoding high resolution JPEG images and motion JPEG images (video) from webcam.		Yes (Faster)	No (Software only)

## 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 4th and 3rd gen Intel® Core™ processors lets you view images as they were meant to be seen.

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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 (with HDMI* 1.4)	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.		<b>New</b>	Yes
<b>Total Color Control</b>	Enables adjustment of saturation levels per base color for brighter, richer colors.		<b>New</b>	Yes
<b>Auto Contrast Enhancement</b>	Fixes underexposed or overexposed areas of your videos.		<b>New</b>	Yes
<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

## INTEL® WIRELESS DISPLAY

		Processor	4th generation Intel® Core™ processor family (Intel® Iris™ Pro graphics 5200 / Intel® Iris™ graphics 5100, Intel® HD graphics 5000 / 4600 / 4400 / 4200)	3rd generation Intel® Core™ processor family (Intel® HD graphics 4000 / 2500)
FEATURE	BENEFIT			
<b>First Touch User Interface for Intel® WiDi</b>	Brand new touch-friendly modern user interface so you can push PC to TV by just using touch.		Yes	No
<b>Context-Aware User Experience for Intel WiDi</b>	The new context aware Intel WiDi automatically detects what the user is doing and adjusts its settings, delivering the best possible experience. (For example, it auto-connects a laptop to a TV, auto-minimizes the application, cinematic sync auto-adjusts your display frame rate to the movie to give you smoother video playback, and low-power panel refresh saves your laptop battery while beaming content.)		Yes	No
<b>Premium Protected Content over Intel WiDi</b>	Bring your movie theater experience home and wirelessly send protected premium content in full HD and 5.1 surround such as your Blu-ray* DVDs, UltraViolet* movies, full-resolution S3D content from PC to TV.		Yes (HDCP 2.1)	Limited (HDCP 2.0 only)
<b>Low Delay Mode for Intel WiDi</b>	Real-time interaction between your PC and TV screens with no lag time, allowing for usages such as PC gaming on TV without any wires.		Yes (<66ms for games)	Limited (<150ms for games)
<b>WiFi Display User Input Back Channel (UIBC) over Intel WiDi</b>	Wirelessly connect your PC's peripherals such as a keyboard, mouse, gamepad or a webcam directly to your TV without any wires.		Yes (USB 2 supports more devices such as a webcam or a TV remote)	Limited (HID devices only such as keyboard / mouse)

## 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, the 4th and 3rd gen Intel® Core™ processors support high-definition resolutions, including 720p, 1080i, and 1080p.

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FEATURE	BENEFIT			
<b>Maximum Display Resolution</b>	Higher pixel resolutions allow the PC to show more image detail.		DisplayPort* 1.2 / eDP* H-Processors: 3840 x 2160 @ 60 Hz (Ultra-HD) U-Processors: 3200 x 2000 @ 60 Hz, 3840 x 2160 @ 30Hz Y-Processors: 2560 x 1600 @ 60 Hz HDMI* 4096 x 2304, 3840 x 2160 @ 24Hz / 24bpp DVI 1920 x 1200 @ 60Hz	DisplayPort* 1.1 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	3 (with restrictions on display types)
<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 (3-D, Deep Color, premium audio, auto lip-sync, Ultra-HD)	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 1.2 (with audio)	Version 1.1 (with audio)
<b>Embedded DisplayPort</b>	Highly scalable and efficient display interface for notebooks.		Yes (eDP version 1.2 on Desktop and eDP version 1.3 on Mobile)	Yes
<b>LVDS</b>	Low-voltage digital display interface.		Yes <sup>4</sup>	Yes
<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>	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 deliver a responsive, attractive 3-D visual experience for casual and mainstream PC games. When you buy a PC equipped with Intel® Iris™ graphics or Intel® HD graphics, you get a cost-effective solution with the performance for more gaming fun.

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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* 11.1	DirectX* 11
<b>OpenGL* Support</b>	Standardized programming interface used by 2-D and 3-D graphics applications.		4.0	4.0
<b>OpenCL* Support</b>	Standard programming interface for accessing Compute units in CPU and GPU.		1.2	1.1 (1.2 available with latest graphics drivers)

For more information, visit  
[www.intel.com/graphics](http://www.intel.com/graphics)  
[www.intel.com/go/biv](http://www.intel.com/go/biv)

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

<sup>2</sup> Faster on select SKUs.

<sup>3</sup> 4th Gen Intel® Core™ i5-4558U processor (28W, 2.40 GHz (Turbo up to 2.90 GHz), 2C/4T, Intel® Iris™ graphics 5100 1.10 GHz, Graphics driver: 15.31.3063) compared to 3rd Gen Intel® Core™ i3-3687U processor (17W, 1.90 GHz, 2C/4T, Intel® HD graphics 4000 1.10 GHz, Graphics driver: 15.28.2875, 15.31.3063)

<sup>4</sup> Feature available on U-processor series only.

Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products.

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