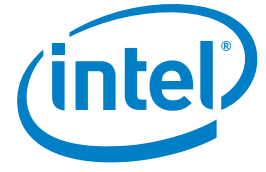


# Guide

Intel® Xeon® Processor E3-1200 v3  
Product Family

Intel® HD Graphics P4600



## Intel® HD Graphics P4600

### A Significant Step Forward In Processor Graphics Performance

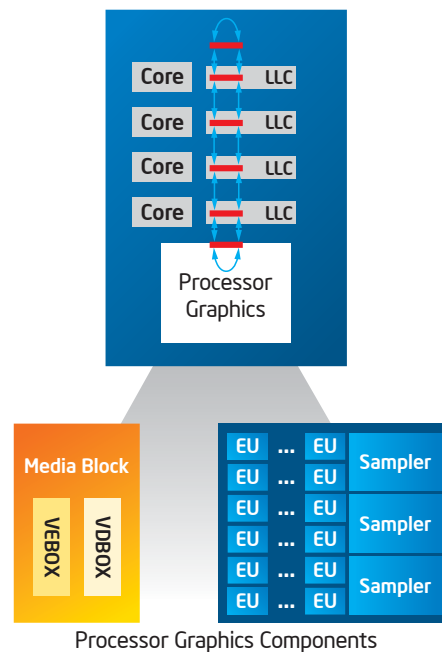
The Intel® Xeon® processor E3-1200 v3 product family is built on Intel's 22nm process using 3D Tri-Gate transistors. The new Intel® HD Graphics P4600<sup>1</sup> is considered to be an advancement of the previous-generation Intel® HD Graphics technologies that were first introduced in 2010. Each version including the new Intel HD graphics P4600 represents not a copy of the previous design, but an improvement, and today represents a new high-end offering of processor-based graphics for entry-level workstations. It offers an integrated ring bus technology that connects all CPU components (computational cores, L3 cache, graphics, and system agent with the memory controller) to enable an optimized approach of communicating with the system memory – via the fast L3 cache. The Intel HD Graphics P4600 processor-based graphics will support Microsoft DirectX11.1\*, OpenGL\* 4.0, OpenCL\* 1.2 and DirectCompute 5.0 standards. In addition to improvements in both 2D and 3D graphics performance, Intel® Quick Sync Video 2.0 technology almost doubles the H.264 transcoding speed of its predecessors and now supports up to 4K display resolutions. The graphics core microarchitecture improvements have produced noticeable improvement in 3D performance, of as much as 25%<sup>2</sup> via 20 execution units and L3 cache.

If your systems are to be employed by users of applications like the Autodesk AutoCAD\*/Inventor\*/Revit\*; Adobe Premiere\*; Adobe Photoshop\*; After Effects\*; SolidWorks\* and other similar volume professional software applications, the Intel Xeon processor E3-1200 v3 product family with Intel HD Graphics P4600 offers competitive performance to entry-level professional discrete graphics cards.

The Intel Xeon processor E3-1200 v3 product family with Intel HD Graphics P4600 represents a significant evolution for graphics and media capabilities. Updates to processor graphics include:

- A scalable architecture partitioned into 5 domains consisting of:
  - Global assets: Includes geometry front-end up to setup
  - Slice common: Includes rasterizer, L3\$ and pixel back-end
  - Slice: shaders (EUs), IC\$, samplers, Addr\$ Gen
  - CODEX and media
  - Displays

- Significant 3D enhancements include Microsoft DirectX11, hardware tessellation, two programmable stages (HS and DS) and one fixed-function Tessellator as well as new compressed texture format support for BC6H/7.
- More key changes include:
  - Increased number of Execution Units
  - Enhanced compute shader support for data parallelism, UAVs, atomics, barriers
  - Improved shared local memory for compute shaders
  - Support for scatter gather
  - Provision for shader model 5.1 (new DX11 instructions)
  - Improved geometry performance
  - Increase in Hi-Z performance



**Table 1.** Graphics Comparison Table

<b>SPECIFICATIONS</b>	<b>INTEL® HD GRAPHICS P4600<sup>1</sup></b>	<b>INTEL® HD GRAPHICS 4600/4400</b>
Processor Support	Intel® Xeon® processor E3-1200 v3 family (12X5 series) <sup>2</sup>	Intel® Core™ i3 processor, Intel® Core™ i5 processor, Intel® Core™ i7 processor
Processor Based	Yes	Yes
ECC Memory Support	Yes	No
Optimized and certified for professional applications	Yes	No
Processor Clock Speed	Up to 4.0 GHz	Up to 3.9 GHz
Intel® Turbo Boost Technology 2.0 <sup>4</sup> Support	Yes	Yes
Execution Units	20	20/16
Shared L3 Cache	Yes	Yes
Graphics Frequency (MAX)	Up to 1300 MHz	Up to 1200 MHz
Max Dynamic Video Memory (Vista*/Windows* 7 for 1 GB/2 GB/>4 GB System Memory)	256 MB/>783 MB/1692 MB	256 MB/>783 MB/1692 MB
Shader Model Support 5.1	Yes	Yes
Number of Displays	3	3
Intel® Flexible Display Interface	Yes	Yes
Max Resolution	DisplayPort*/HDMI- 3840x2160@60Hz, 4096x2304@24Hz, VGA	DisplayPort*/HDMI- 3840x2160@60Hz, 4096x2304@24Hz, VGA
Dual Simultaneous HDMI Support	Yes	Yes
Display Port Standard	1.2	1.2
HDMI (V.1.4 with 3D)	Yes	Yes
Bit Color Depth 12bpc DisplayPort, DVI, VGA, SDVD	Yes	Yes
8-Channel LPCM	Yes	Yes
Display Port Audio	Yes	Yes
Dolby TrueHD* and DTS*-HD Master Audio	Yes	Yes
Encoding/Decoding Hardware Acceleration	Yes	Yes
H.264	Yes	Yes
MPEG2 Encode	Yes	Yes
AVC, MPEG, VC1 Encode	Yes	Yes
Video Decode Streams	12	12
Total Color Control	Yes	Yes
Skin Tone Detection/Correction	Yes	Yes
Auto Contrast Enhancement	Yes	Yes
ProcAMP	Yes	Yes
Sharpness	Yes	Yes
xvYCC	Yes	Yes
Advanced De-Interlacing	Yes	Yes
Film Mode Detection	Yes	Yes
Noise Detection	Yes	Yes
Scaling 8x8 Polyphase	Yes	Yes

**Table 2.** Top-Level Processor Comparison

<b>FEATURE</b>	<b>INTEL® XEON® PROCESSOR E3-1200 V3 PRODUCT FAMILY</b>	<b>4TH GEN INTEL® CORE™ i7 PROCESSOR</b>	<b>4TH GEN INTEL® CORE™ i5 PROCESSOR</b>	<b>4TH GEN INTEL® CORE™ i3 PROCESSOR</b>
Cache Size	8 MB	8 MB	6 MB	3 MB
Intel® Hyper-Threading Technology <sup>5</sup>	Yes	Yes	No	Yes
Intel® Turbo Boost Technology 2.0 <sup>4</sup>	Yes	Yes	Yes	No
Intel® HD Graphics <sup>1</sup>	Intel® HD Graphics P4600	Intel® HD Graphics P4600	Intel® HD Graphics 4600	Intel® HD Graphics 4600
Max number of displays	3	3	3	3
Professional CAD/Imaging/DCC application certifications	Certified on 15 applications from Autodesk, Adobe, Solid Works, Bentley and Siemens	No	No	No

To learn more about Intel® HD Graphics, Intel® Turbo Boost Technology and Intel® HD Graphics Dynamic Frequency Technology, go to:

[www.intel.com/technology/turboboost/](http://www.intel.com/technology/turboboost/)

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

[software.intel.com/en-us/articles/quick-reference-guide-to-intel-integrated-graphics](http://software.intel.com/en-us/articles/quick-reference-guide-to-intel-integrated-graphics)

<sup>1</sup> Intel® HD P4600 introduces 4 additional execution units going from 16 in the Intel® HD P4000 to 20 in the Intel HD P4600. Optimized Intel® HD Graphics P4600 only available on select models of the Intel® Xeon® processor E3-1200 v3 product family. For more information, visit <http://www.intel.com/content/www/us/en/architecture-and-technology/hd-graphics/hd-graphicsdeveloper>.

<sup>2</sup> There are 25% more execution units associated with the new Intel® HD Graphics P4600.

<sup>3</sup> Optimized Intel® HD Graphics P4600 only available on select models of the Intel® Xeon® processor E3 family. To learn more about Intel® Xeon® processors for workstation visit [www.intel.com/go/workstation](http://www.intel.com/go/workstation).

<sup>4</sup> Requires a system with Intel® Turbo Boost Technology. Intel Turbo Boost Technology and Intel Turbo Boost Technology 2.0 are only available on select Intel® processors. Consult your system manufacturer. Performance varies depending on hardware, software, and system configuration. For more information, visit <http://www.intel.com/go/turbo>.

<sup>5</sup> Available on select Intel® Core™ and Intel® Xeon® processors. Requires an Intel® HT Technology enabled system, check with your PC manufacturer. Performance will vary depending on the specific hardware and software used. Not available on Intel® Core™ i5-750. For more information including details on which processors support HT Technology, visit <http://www.intel.com/info/hyperthreading>.

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