NVIDIA Quadro K4200

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Part No. VCQK4200-PB

Overview

NVIDIA Quadro K4200 – Incredible 3D Application Performance and Capability

The NVIDIA Quadro K4200 delivers incredible 3D application performance and capability, allowing you to take advantage of dual copy-engines for seamless data movement within GPU memory—all in a flexible, single-slot form factor. 4 GB of GDDR5 GPU memory with ultra-fast bandwidth is ideal for creating and rendering large, complex models. An all-new display engine drives up to four displays with DisplayPort 1.2 support for ultra-high resolutions like 3840 x 2160 at 60 Hz with 30-bit color. The Quadro K4200 is also fully compatible with NVIDIA Quadro Sync, which allows you to frame-lock multiple displays together, and also supports NVIDIA’s SDI input and output boards for broadcast or digital cinema production workflows.

Designed and built specifically for professional workstations, NVIDIA Quadro GPUs power more than 200 professional applications across a broad range of industries including manufacturing, media and entertainment, sciences, and energy. Professionals trust them to realize their most ambitious visions—whether its product design, visualization and simulation, or spectacular visual storytelling—and get results to market faster.

CUDA Cores 1344
GPU Memory 4 GB GDDR5
Memory Interface 256-bit
Memory Bandwidth 173 GB/s
System Interface PCI Express 2.0 x16
Display Connectors DVI-D DL + DP 1.2 + DP 1.2
DisplayPort 1.2 Yes
Warranty 3 Years
PNY Part Number VCQK4200-PB

PNY provides unsurpassed service and commitment to its professional graphics customers offering: 3 year warranty, pre and post-sales support, dedicated Quadro Field Application engineers and direct tech support hot lines. In addition, PNY delivers a complete solution including the appropriate adapters, cables, brackets, software installation disc and documentation to ensure a quick and successful install.
<table>
<thead>
<tr>
<th>Specifications</th>
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<tbody>
<tr>
<td>CUDA Cores</td>
<td>1344</td>
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<td>256-bit</td>
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<td>Memory Bandwidth</td>
<td>173 GB/s</td>
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<td>System Interface</td>
<td>PCI Express 2.0 x16</td>
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<tr>
<td>Maximum Power Consumption</td>
<td>105 W</td>
</tr>
<tr>
<td>Energy Star Enabling</td>
<td>Yes</td>
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<tr>
<td>Thermal Solution</td>
<td>Ultra-quiet active fansink</td>
</tr>
<tr>
<td>Form Factor</td>
<td>4.376” H x 9.50” L, Single Slot</td>
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<tr>
<td>Display Connectors</td>
<td>DVI-D DL + DP 1.2 + DP 1.2</td>
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<tr>
<td>DisplayPort 1.2</td>
<td>Yes</td>
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<tr>
<td>DisplayPort with Audio</td>
<td>Yes</td>
</tr>
<tr>
<td>DVI-D Single-Link Connector</td>
<td>Via included adapter</td>
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<tr>
<td>VGA Support</td>
<td>Via included adapter</td>
</tr>
<tr>
<td>Number of Displays Supported</td>
<td>4 (DP 1.2 Multi-Streaming)</td>
</tr>
<tr>
<td>Maximum DP 1.2 Resolution</td>
<td>3840 x 2160 at 60Hz (direct connect)</td>
</tr>
<tr>
<td>Maximum DVI-I DL Resolution</td>
<td>2560 x 1600 at 60Hz</td>
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<tr>
<td>Maximum DVI-I SL Resolution</td>
<td>1920 x 1200 at 60Hz</td>
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<tr>
<td>Maximum VGA Resolution</td>
<td>2048 x 1536 at 85Hz</td>
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<tr>
<td>HDCP Support</td>
<td>Yes</td>
</tr>
<tr>
<td>Professional 3D Support</td>
<td>Yes, via included stereo connector bracket</td>
</tr>
<tr>
<td>Quadro Sync Compatible</td>
<td>Yes</td>
</tr>
<tr>
<td>HD SDI Capture/Output Compatible</td>
<td>Yes</td>
</tr>
<tr>
<td>NVIDIA GPU Direct Compatible</td>
<td>Yes</td>
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</tbody>
</table>
**Graphics APIs**  
Shader Model 5.0, OpenGL 4.4, DirectX 11

**Compute APIs**  
CUDA, DirectCompute, OpenCL

**NVIEW**  
Yes

**NVIDIA Mosaic**  
Yes (Windows 8.1, 8, 7, and Linux)

**NVIDIA 3D Vision and 3D Vision Pro**  
Yes

**Warranty**  
3 Years

**PNY Part Number**  
VCQK4200-PB

### 3D Graphics Architecture

- Scalable geometry architecture
- Hardware tessellation engine
- NVIDIA GigaThread™ engine with dual copy engines
- Shader Model 5.0 (OpenGL 4.4 and DirectX 11)
- Up to 16K x 16K texture and render processing
- Transparent multisampling and super sampling
- 16x angle independent anisotropic filtering
- 128-bit floating point performance
- 32-bit per component floating point texture filtering and blending
- 64X full scene antialiasing (FSAA)
- FXAA and TXAA full scene antialiasing
- Decode acceleration for MPEG-2, MPEG-4 Part 2 Advanced Simple Profile, H.264, MVC, VC1, DivX (version 3.11 and later), and Flash (10.1 and later)
- Dedicated H.264 encoder (requires application support)
- Blu-ray dual-stream hardware accelerating (supporting HD picture-in-picture playback)
- Quadro Boost (Automatically adjusts GPU engine throughput to maximize application performance.)

### Parallel Computing Capabilities

- SMX architecture (streaming multi-processor design that delivers greater processing and efficiency)
- HyperQ (allows multiple CPU cores to simultaneously utilize a single K4200 GPU to execute independent compute kernels)
- API support including: CUDA C, CUDA C++, DirectCompute 5.0, OpenCL, Java, Python, and Fortran
- NVIDIA Parallel Data Cache hierarchy (configurable L1 and unified L2 caches)
- 64KB of RAM (configurable partitioning of shared memory and L1 cache)
Advanced Display Features

- 30-bit color (10-bit per each red, green and blue channel)
- Support for any combination of three directly connected displays
- DisplayPort 1.2 (up to 3840 x 2160 at 60Hz and 2560 x 1600 at 120Hz)
- DVI-I Dual-Link output (up to 2560 x 1600 at 60Hz and 1920 x 1200 at 120Hz)
- DVI-D Dual-Link output (up to 2560 x 1600 at 60Hz and 1920 x 1200 at 120Hz)
- Internal 400MHz DAC DVI-I output (analog display up to 2048 x 1536 at 85Hz)
- DisplayPort 1.2, HDMI 1.4, and HDCP support (HDMI requires 3rd party adapter)
- 10-bit internal display processing
- NVIDIA 3D Vision™ technology, 3D DLP, interleaved, and other 3D stereo format support
- Full OpenGL quad buffered stereo support
- Underscan/overscan compensation and hardware scaling
- Support for NVIDIA quadro Mosaic, NVIDIA NVIEW multi-display technology, NVIDIA Enterprise Management Tools
- Support for large-scale, ultra-high resolution visualization using the NVIDIA SVS platform which includes NVIDIA Mosaic, NVIDIA Sync and NVIDIA Warp/Blend technologies

DisplayPort and HDMI Digital Audio

- Dolby Digital (AC3), DTS 5.1, multi-channel (7.1) LPCM, Dolby Digital Plus (DD+), and MPEG-2/MPEG-4 AAC
- Data rates of 44.1KHz, 48KHz, 88.2KHz, 96KHz, 176KHz, and 192KHz
- Word sizes of 16-bit, 20-bit, and 24-bit

Minimum System Requirements

- Microsoft Windows® 8.1, 8, 7, Vista, XP SP3, Linux®, or Solaris®
- PCIe x16 expansion slot
- 1GB or more of system memory, 2GB recommended
- 200MB of available disk space for full driver installation
- Blu-ray or DVD-ROM drive
- Internet connection (if preferred for driver installation)
- DisplayPort, DVI, or VGA compatible display(s)

Features & Benefits

GPU FEATURES

NVIDIA CUDA Architecture
Parallel-computing architecture that tightly integrates advanced visualization and compute features to significantly accelerate professional workflows.

NVIDIA Scalable Geometry Engine
Dramatically improves geometry performance across a broad range of CAD, DCC and medical
applications, enabling you to work interactively with models and scenes that are an order of magnitude more complex than ever before.

**Large Framebuffers with Ultra-Fast Bandwidth**
Large GPU memory with fast bandwidth for display of complex models and scenes, as well as computation of large datasets.

**NVIDIA Parallel DataCache™**
Supports a true cache hierarchy combined with on-chip shared memory. L1 and L2 caches drive exception throughput, accelerating features such as real-time ray tracing, physics, and texture filtering.

**Dual Copy Engines**
Enables the highest rates of parallel data processing and concurrent throughput between the GPU and host, accelerating techniques such as ray tracing, color grading and physical simulation.

**Bindless Textures**
Dramatically increases the number of unique textures available to shaders at run-time, enabling vastly more different materials and richer texture detail in scenes.

**NVIDIA Streaming Multiprocessor**
Delivers more processing performance and efficiency through this new, innovative streaming multiprocessor design that allows a greater percentage of space to be applied to processing cores versus control logic.

**H.264 encoder**
Dedicated H.264 encode engine that independent of 3D/compute pipeline and delivers faster than real-time performance for transcoding, video editing, and other encoding applications (requires application support).

**PCI Express 2.0 Compliance**
Supports data transfer rate up to 5 GT/sec per lane for an aggregate bandwidth of 16 GB/sec bi-directional (8 GB/sec in each direction.)

**Unified Driver Architecture (UDA)**
Guarantees forward and backward compatibility with software drivers, simplifying upgrading to a new Quadro solution whenever you’re ready.

**Ultra-Quiet Design**
Silent cooling design enables lower acoustics for an ultra-quiet desktop environment.

**NVIDIA GPU Boost**
Maximum application performance through automatic adjustment of the GPU clock to take maximum advantage of the power and thermal headroom of the card in real-time.

**IMAGE QUALITY**
Full-Scene Antialiasing (FSAA)
Up to 64X FSAA for dramatically reducing visual aliasing artifacts or "jaggies," resulting in unparalled image quality and highly realistic scenes.

NVIDIA FXAA and TXAA
Reduces visible aliasing and delivers higher image quality without the performance hit by harnessing the power of the GPU's CUDA cores and new film-style AA techniques.

GPU Tessellation
Quadro Tessellation Engines automatically generate finely detailed geometry for cinematic quality environments and scenes, without sacrificing performance.

16K Texture and Render Processing
Provides the ability to texture from and render to 16K x 16K surfaces. Beneficial for applications that demand the highest resolution and quality image processing.

DISPLAY FEATURES

NVIDIA Quadro Mosaic Technology
Enables transparent scaling of the desktop and applications across up to 16 displays from 4 GPUs from a single workstation while delivering full performance and image quality.

Multi-Display Support
The all-new display engine in the NVIDIA GPU drives up to four displays simultaneously, whether they’re directly connected to the board or connected using a single cable using DisplayPort 1.2’s new multi-streaming capabilities. With support for the next-generation DisplayPort 1.2 standard, each DisplayPort connector is also capable of driving ultra-high resolutions like 3840x2160 at 60 Hz with 30-bit color. The flexible display connectivity of the Quadro family makes it easy to deploy multiple displays across a desktop, build an expansive digital signage wall, or create a sophisticated stereoscopic 3D CAVE environment.

NVIDIA NVIEW Advanced Desktop Software
This software delivers maximum flexibility for single large display or multi-display options, providing unprecedented end-user control of the desktop experience for increased productivity.

DisplayPort 1.2 Support (with Audio)
Compact and secure DisplayPort 1.2 connectors support multi-stream technology, stream cloning and ultra-high-resolution panels (up to 3840 x 2160 at 60Hz ). This enables maximum range, resolution, refresh rate, and color depth designed to support the latest display technologies.

30-Bit Color Fidelity
10-bits per red, green, and blue). Enables billions of color variations for rich, vivid image quality with the broadest dynamic range.

HD SDI Capture and Output
Industry’s only GPU-accelerated solution for real-time acquisition, processing, and delivery of high-
SDI video, across traditional and now 3D video broadcast, environments. Supports uncompressed 8-, 10-, 12-bit SDI via available Quadro SDI Capture and Quadro SDI Output cards.

**Quadro Sync**
Synchronizes the display and image output from one system or across a cluster of multiple systems. The Quadro Sync board manages up to 16 displays from 4 GPUs in one system, reducing the number of machines needed to power a video wall or multi-projector visualization environment, and supports image and frame synchronization between up to four GPUs when running Quadro Mosaic or independent GPUs in cluster. Quadro Sync also allows synchronization to an external timing source (also known as genlock or house sync). Quadro Sync enables advanced visualization systems to scale the resolution of the display surface with multiple projectors or displays with standard applications or applications designed for clusters.

**NVIDIA 3D Vision® and 3D Vision Pro®**
Advanced active shutter glasses that deliver crystal-clear stereoscopic 3D visualization for the most immersive experience. Infrared (3D Vision) or RF (3D Vision Pro) technology enable a range of immersive environments from your desktop workstation to collaborative work spaces. 3D Vision and 3D Vision Pro are sold separately.

**OpenGL Quad Buffered Stereo Support**
Provides a smooth and immersive 3D Stereo experience for professional applications.

**Professional 3D Stereo Synchronization**
Enables robust control of stereo effect through a dedicated three-pin mini-din connection to directly synchronize 3D stereo hardware to Quadro graphics card.

**Deep Color Processing and Display**
Preserves color detail and precision throughout the processing and display pipeline for smooth gradients transitions, even on high dynamic range imagery. Each color component can be processed at up to 32-bit floating point precision and displayed at up to 12-bit precision with supported DisplayPort 1.2 or HDMI 1.4 displays.

**SOFTWARE SUPPORT**

**NVIDIA CUDA Parallel Computing Architecture**
Quadro solutions leverage general-purpose GPU computing using standard programming languages like C/C++ and Fortran, and emerging APIs such as OpenCL and Direct Compute. This broad adoption of CUDA accelerates techniques like ray tracing, video and image processing, and computation fluid dynamics.

**NVIDIA GPUDirect**
NVIDIA GPUDirect capability increases compute performance when data throughput or latency reduction are key considerations by allowing direct access to GPU memory by 3rd-party devices such as SDI video adapters, NICs and SSDs.

**NVIDIA GPUDirect for Video**
NVIDIA GPUDirect for Video technology allows 3rd party hardware to communicate directly with NVIDIA
GPUs. By taking advantage of this new API the historical issues of introducing too much delay or latency are gone. With NVIDIA GPUDirect for Video, devices are fully synchronized and the CPU doesn't waste cycles copying data between device drivers.

**NVIDIA Enterprise-Management Tools**
Exhaustive tools for maximizing your system uptime by enabling seamless wide-scale deployment. This allows remote query and control of graphics and display settings for systems spread across installations.

**MULTI-GPU TECHNOLOGY**

**NVIDIA Multi-GPU Technology**
NVIDIA Multi-GPU powered workstations combine the visualization and interactive design capability of multiple GPUs, by leveraging any combination of Quadro and Tesla GPUs to intelligently scale the performance of your application and dramatically speed up your production workflow.

**Package Contains**

- NVIDIA Quadro K4200 professional graphics board
- Stereo connector bracket
- DisplayPort to DVI-D SL adapter
- DVI-I to VGA adapter
- Driver DVD for Windows 8.1, 8, 7, and Vista (32- and 64-bit)
- Printed QuickStart Guide