



QUADRO P620

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Product Specification



DOCUMENT CHANGE HISTORY

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OVERVIEW

The NVIDIA® Quadro® P620 workstation graphics board is powered by NVIDIA® Pascal™ graphics processing unit (GPU) technology and 2 GB of GDDR5 memory. The Quadro P620 graphics board is targeted for professional CAD, DCC and visualization designers, engineers and users. Get the budget friendly highest performing graphics board to drive today's demanding professional workflows in a compact footprint. Flexible single-slot and low-profile form factor makes this card compatible with even the most space and power constrained workstation chassis.

The Quadro P620 graphics board delivers amazing creative experiences across a variety of professional 3D applications.

The Quadro P620 graphics board (PG212 SKU 505) is based on the Pascal GPU architecture. It utilizes the world's fastest and most power-efficient GPU architecture. Key performance features and capabilities include:

- ▶ 2 GB GDDR5 graphics memory allows designers and animators to model, store and render characters and scenes at unprecedented scale, complexity, and richness.
- ▶ 512 streaming multiprocessor (SMX) cores deliver incredible performance with a peak power consumption of 40 W in a cool and quiet single slot form factor.
- ▶ Supports four simultaneous displays and up to 5K resolution with VESA® DisplayPort™ 1.4 (output).

ATTACHMENTS

The following files are attached to this product specification.

- ▶ *Quadro P620 3D Model*
- ▶ *Quadro P620 2D Drawing*

Note: The 3D model files are mechanical 3D models (STP file) of the fully assembled graphics card. The components of the model may be separated visually (translated along x, y, and z axes) or rendered visible or invisible, using appropriate viewing software. The 2D drawings are PDFs file illustrating the dimensions of the graphics card.

To access the attached files, click the **Attachment** icon on the left hand toolbar on this PDF (using Adobe Acrobat Reader or Adobe Acrobat). Select the file and use the Tool Bar options (**Open, Save**) to retrieve the documents. Files with the .nvzip extension can be extracted using 7-Zip file archive software, or may be renamed to .zip and extracted with other archive software.

Figure 1 shows how to get access to the attachments of this PDF file.

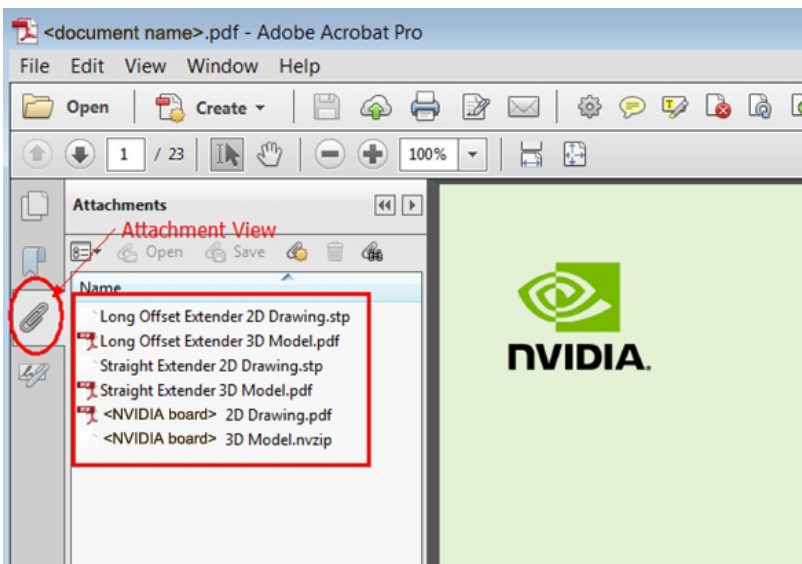


Figure 1. Access to PDF Attachments

SPECIFICATIONS

PRODUCT SPECIFICATIONS

Table 1 provides the product specifications for the Quadro P620 graphics board.

Table 1. Product Specifications

Specification		Description
Product SKU(s)		Quadro P620 NVPN: 699-5G212-0505-xxx
Total board power		40 W
GPU SKU		GP107-855
PCI IDs		Device ID: 0x1CB6 Vendor ID: 0x10DE Sub-Vendor ID: 0x10DE Sub-System ID: 0x1264
NVIDIA® CUDA® cores		512
GPU clocks	Base	1265 MHz
	Boost	1354 MHz
VBIOS	EEPROM size	4 Mbit
	UEFI	Supported
PCI Express interface		PCI Express 3.0 ×16
Thermal cooling solution		Active
Physical dimensions		2.713 inches × 5.7 inches, single-slot
Display connectors		Four mini-DisplayPort connectors
Power connectors and headers		None
Weight		129 grams

Table 2 provides the memory specifications for the Quadro P620 graphics board.

Table 2. Memory Specifications

Specification	Description
Maximum memory clock	2500 MHz
Memory size	2 GB
Memory bus width	128-bit
Memory configuration	4 pcs 128M x 32 GDDR5
Peak memory bandwidth	Up to 80 GB/s

Table 3 provides the software specifications.

Table 3. Software Specifications

Specification	Description
Base address	BAR0: 16 MB BAR1: 256 MB I/O BAR: 4 KB
PCI class code	0x03 - Display controller
PCI sub-class code	0x00 - VGA compatible controller
Memory ECC	Not supported
SMBus (8-bit address)	0x9E (write), 0x9F (read)
SMBus direct access	Supported
SMBPBI (SMBus Post Box Interface)	Supported
HDCP support	2.2

Table 4 provides the display specifications.

Table 4. Display Specifications

Specifications	Description
Dual-link internal TMDS (DVI 1.0)	Maximum resolution over digital port (single GPU): 2560 × 1600 × 32 bpp at 60 Hz (reduced blanking)
Single-link internal TMDS (DVI 1.0)	Maximum resolution over digital port (single GPU): 1920 × 1200 × 32 bpp at 60 Hz (reduced blanking)
DisplayPort 1.4 ¹	Maximum pixel clock: 1050 MPixels per second Maximum bandwidth: 32.4 Gbps Example of maximum resolutions with CVT-RB timings: <ul style="list-style-type: none"> • 7680 × 4320 × 24 bpp at 120 Hz² • 7680 × 4320 × 24 bpp at 60 Hz³ • 5120 × 2880 × 24 bpp at 60 Hz
HDMI™ 2.0b	Maximum resolution: <ul style="list-style-type: none"> • 5120 × 2880 × 24 bpp at 60 Hz
Simultaneous display support	Up to four simultaneous displays

Note:

¹ DisplayPort 1.2 Certified, DisplayPort 1.3 and 1.4 ready.

² 7680 × 4320 × 24 bpp at 120 Hz resolution requires four DisplayPort 1.3 links

³ 7680 × 4320 × 24 bpp at 60 Hz resolution requires two DisplayPort 1.3 links

Table 5 provides the environmental condition specifications for the Quadro P620 graphics board.

Table 5. Board Environmental and Reliability Specifications

Specification	Condition
Operating temperature	0 °C to 55 °C
Storage temperature	-40 °C to 75 °C
Operating humidity	5% to 90% relative humidity
Storage humidity	5% to 95% relative humidity
Mean time between failures (MTBF)	Uncontrolled environment: 828602 hours at 35 °C Controlled environment: 1581181 hours at 35 °C

THERMAL SPECIFICATIONS

Table 6 provides the thermal specifications for the Quadro P620 graphics board.

Table 6. Thermal Specifications

Parameter	Value	Units
Total board power	40	W
GPU shutdown temperature	103	°C
GPU slowdown temperature (50% clock slowdown)	100	°C
GPU maximum operating temperature	98	°C
GPU target temperature	83	°C
Maximum fan inlet temperature for single GPU configuration	55	°C

Note: Refer to the *System Design Guide for NVIDIA Enterprise Products (DG-07562-001)* for definitions of these parameters.

Table 7 provides the thermal qualification parameters for the Quadro P620 graphics board.

Table 7. Thermal Qualification Parameters

Parameter	Description
System	ASUS X99-E WS Intel Core i7-5930K, 3.5 GHz HyperX 16 GB, DDR4, 2133 MHz Windows 10, 64-bit 4096 × 2160
TDP application	3DMark11-GT1
TDP application settings	Graphics Test 1: Select Reset to Performance level: Select Resolution: 1280 × 720 (16:9)(720P) MSAA Sample Count: 1 (default) Texture Filtering Mode: Trilinear (default)

POWER AND ELECTRICAL SPECIFICATIONS

Table 8 provides the Input EDP Continuous specifications for input rails. The Input EDP Continuous is specified over a 1 second time scale. The peak input power over a 1 second moving average will not exceed the specified Input EDP Continuous value.

Table 8. Input EDP Continuous Specifications

Input Rails	Maximum Value	Time Scale
PCI Express edge connector (12V \pm 8%)	66 W	1 s
	5.5 A	1 s
PCI Express edge connector (3V3 \pm 9%)	10 W	1 s
	3 A	1 s
Total graphic power ¹	40 W	1 s

Note:

¹Individual rails are specified at their absolute maximum values, but the total power consumption of the board during operation will never exceed the specified total graphic power.

Table 9 provides the 1 ms Input EDP Peak specifications for 12V input rails. The Input EDP Peak is specified over a 1 ms moving average. The peak input current over a 1 ms moving average will not exceed the specified Input EDP Peak value, and may occur with a duration of up to 50 ms.

Table 9. Input EDP Peak Specifications (1 ms)

Input Rails	Maximum Value	Moving Average	Duration
PCI Express edge connector (12V)	6 A	1 ms	50 ms MAX ¹

Note:

¹The 1 ms moving average current can be sustained for up to 50 ms.

Table 10 provides the power management specifications.

Table 10. Power Management Specifications

Parameter	Value	Units
Power capping threshold	40	W
Power capping response time ¹ (typical)	50	Ms
Power capping response time ¹ (maximum)	100	ms

Note:

¹This is the length of time taken to bring peak input excursions to TGP power capping threshold.

Table 11 provides the energy regulations for the Quadro P620 graphics board.

Table 11. Energy Regulations

Specification	Description
Version	Energy Star 6
Result	Pass
Maximum power to idle power ratio: ASPM OFF	≥ 5:1
Short idle power: ASPM OFF	6.6 W
Long idle power: ASPM OFF	4.7 W
Maximum power: ASPM OFF	34.3 W

Power Brake

The Power Brake feature allows the system to trigger hardware slowdown in the GPU with the external input. For example, the system can assert Power Brake during an emergency power or thermal event. Note that the Power Brake should not be used as a way to dynamically control the power consumption of the GPU. That is, Power Brake is intended for emergency power reduction purposes only.

The system can assert Power Brake signal (PB#) via Pin B30 on the PCIe edge connector. The typical response time as seen at the system power supplies after assertion is noted in Table 12. In addition, system designs must keep Power Brake asserted for a minimum duration listed in Table 12.

Table 12. Power Brake Specifications

Parameter	Value
PB# PCIe pin assignment	B30
Power Brake response time (typical)	150 μ s
PB# input assertion low time (minimum)	250 ms
Power Brake hardware slowdown factor	4 x

Table 13 provides the acoustic specifications for the Quadro P620 graphics board.

Table 13. Acoustic Specifications

Test Condition	Acoustic Specification
Idle	22 dBA maximum
TDP room	28 dBA maximum
TDP maximum	38 dBA maximum

PRODUCT FEATURES

FORM FACTOR

Figure 2 shows the form factor of the Quadro P620. The Quadro P620 is a single-slot active cooling graphics board.



Note: The Quadro P620 board supports both ATX and low profile brackets.

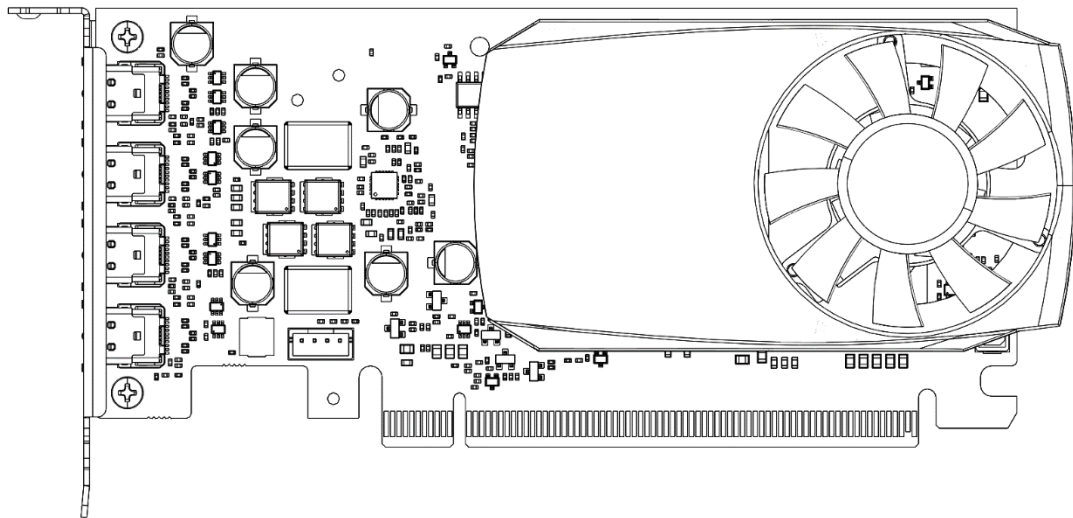


Figure 2. Quadro P620 Board Dimensions

PLACEMENT OF STANDARD I/O CONNECTORS

Figure 3 shows the standard placement of the connectors for the Quadro P620 graphics board with the display numbering.

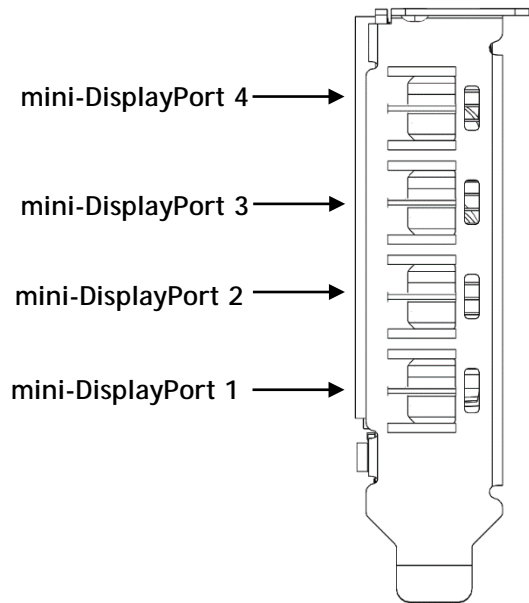


Figure 3. Standard Connector Placement

NVIDIA GPU BOOST

The Quadro P620 graphics board provides NVIDIA GPU Boost 3.0, and can achieve higher application performance without exceeding the power and thermal envelope of the board. The NVIDIA Pascal technology maximizes the boost potential of the GPU. NVIDIA GPU Boost 3.0 is enabled by default in order to efficiently offer the best application performance possible.

The algorithm will be disabled in the following scenario:

If the user manually selects the "Prefer Consistent Performance" Control Panel option to lock explicitly to the base clock. This can be useful for performance tuning during application development.

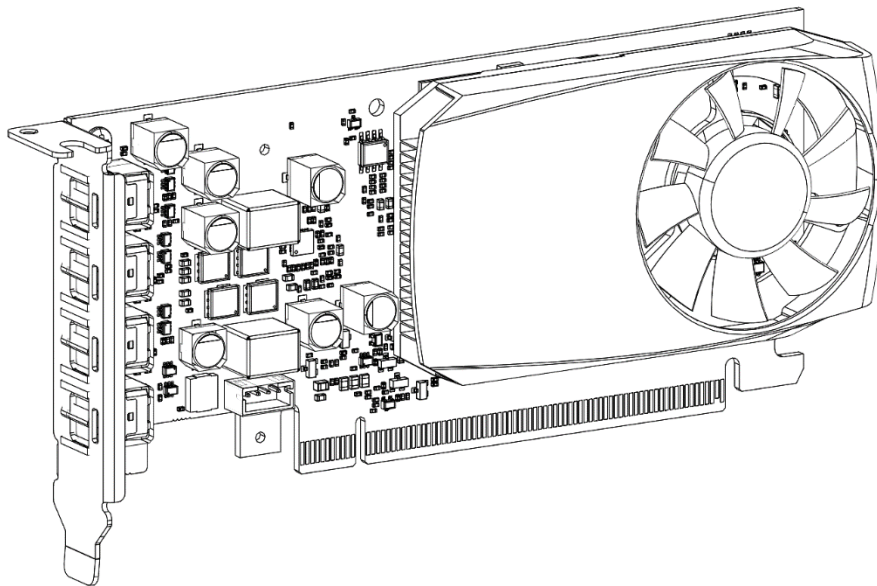


Figure 4. Quadro P620 Graphics Board with NVIDIA GPU Boost

SUPPORT INFORMATION

CERTIFICATES

- ▶ Windows Hardware Quality Lab (WHQL):
 - Certified Windows 7, Windows 8.1, and Windows 10
 - Certified Windows Server 2008 R2 and Windows Server 2012 R2
- ▶ Ergonomic requirements for office work W/VDTs (ISO 9241)
- ▶ EU Reduction of Hazardous Substances (EU RoHS)
- ▶ Joint Industry guide (J-STD) / Registration, Evaluation, Authorization, and Restriction of Chemical Substance (EU) – (JIG / REACH)
- ▶ Halogen Free (HF)
- ▶ EU Waste Electrical and Electronic Equipment (WEEE)

AGENCIES

- ▶ Australian Communications Authority and Radio Spectrum Management Group of New Zealand (C-Tick)
- ▶ Bureau of Standards, Metrology, and Inspection (BSMI)
- ▶ Conformité Européenne (CE)
- ▶ Federal Communications Commission (FCC)
- ▶ Industry Canada - Interference-Causing Equipment Standard (ICES)
- ▶ Korean Communications Commission (KCC)
- ▶ Underwriters Laboratories (cUL, UL)
- ▶ Voluntary Control Council for Interference (VCCI)

LANGUAGES

Table 14. Languages Supported

Languages	Windows ¹	Linux
English (US)	Yes	Yes
English (UK)	Yes	Yes
Arabic	Yes	
Chinese, Simplified	Yes	
Chinese, Traditional	Yes	
Czech	Yes	
Danish	Yes	
Dutch	Yes	
Finnish	Yes	
French (European)	Yes	
German	Yes	
Greek	Yes	
Hebrew	Yes	
Hungarian	Yes	
Italian	Yes	
Japanese	Yes	
Korean	Yes	
Norwegian	Yes	
Polish	Yes	
Portuguese (Brazil)	Yes	
Portuguese (European/Iberian)	Yes	
Russian	Yes	
Slovak	Yes	
Slovenian	Yes	
Spanish (European)	Yes	
Spanish (Latin America)	Yes	
Swedish	Yes	
Thai	Yes	
Turkish	Yes	

Note:

¹Microsoft Windows 7, Windows 8, Windows 8.1, Windows 10, Windows Server 2008 R2, and Windows Server 2012 R2 are supported.

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