TESLA P6

PB-08482-001_v02 | August 2017

Product Brief

DOCUMENT CHANGE HISTORY

PB-08482-001_v02

Version	Date	Authors	Description of Change
01	March 24, 2017	VK, DV	Initial release
02	August 31, 2017	VK, DV	Removed NVIDIA Confidential information

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OVERVIEW

The NVIDIA® Tesla® P6 is an MXM 3.1 Type B card with a single NVIDIA® Pascal™ GP104 graphics processing unit (GPU). It has 16 GB GDDR5 video memory and a 90 Watt maximum power limit.

This board is intended for accelerated graphics in virtual remote workstation and virtual desktop environments, as well as for single precision GPU compute tasks. Tesla P6 is specifically optimized for space constrained systems like blade servers.

NVIDIA does not ship this board with a cooling solution attached, however NVIDIA does provide thermal specifications for OEMs to design their custom heat sinks.

A main feature of the Tesla P6 board is the support of NVIDIA® GRID™ software which includes NVIDIA® GRID™ vGPU™. This technology enables the virtualization of physical GPUs into full-featured virtual GPUs providing maximum performance and scalability.

For performance optimization, this board utilizes NVIDIA GPU BOOST™. By adjusting the GPU clock dynamically, maximum performance is achieved within the power cap limit (90 W).

Tesla P6 supports H.264 and H.265 hardware encoding, which is particularly important for reducing round-trip latency and image quality for virtual desktops and applications.

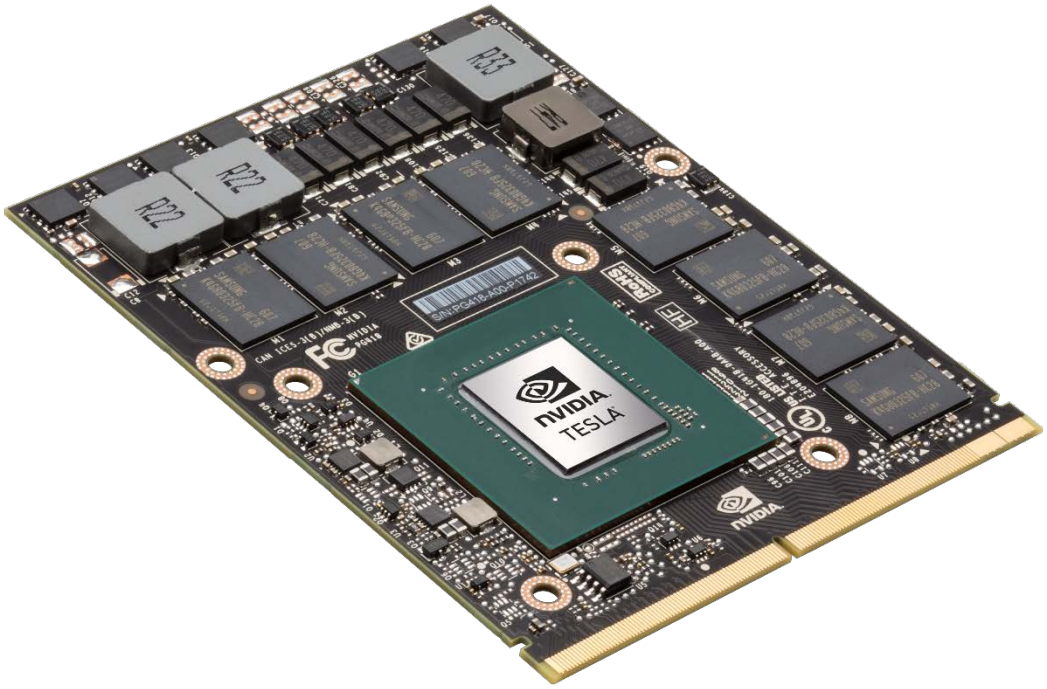

Figure 1. Tesla P6 Board

SPECIFICATIONS

PRODUCT SPECIFICATION

Table 1 provides the product specifications for the Tesla P6 board.

Table 1. Product Specifications

Specification		Description
Board SKU		PG418 SKU 200
Total board power		90 W (70 W optional)
GPU SKU		GP104-995
IDs		DEVID: 0x1BB4 SSID: 0x11C6
Form Factor		MXM 3.1 Type B
NVIDIA® CUDA® cores		2048
GPU clocks	Base	1012 MHz (TGP: 90 W)
	Boost	1506 MHz (TGP: 90 W)
PCI Express interface		P0: Gen3 16 lanes, 16.0 Gbps P8: Gen1 16 lanes, 2.5 Gbps

Table 2 provides the memory specifications for the Tesla P6 graphics board.

Table 2. Memory Specifications

Specification	Description
Memory clock	3003 MHz
Memory size	16 GB
Memory I/O	256-bit
Memory configuration	16 pcs 256M × 16 GDDR5s
Memory bandwidth	192.2 GB/s

Table 3 provides the software feature specifications.

Table 3. Software Feature Specifications

Specification	Description
EEPROM size	4 Mb Serial ROM
PCI class code	PCI base class: 0x03 PCI sub-class: 0x02
ECC support	Supported (enabled by default)
SMBPBI (SMBus Post Box Interface)	Supported

Table 4 provides the thermal specifications for the Tesla P6 graphics board.

Table 4. Thermal Specifications

Action	T_j (°C)
GPU shutdown temperature	94
GPU slowdown temperature	91
GPU maximum operating temperature	89
GPU hardware slowdown amount	50%

DESIGN DISCUSSION

FORM FACTOR

Tesla P6 follows the MXM 3.1 Type B mechanical specifications. For more details on the mechanical specifications, refer to the latest version of the *MXM Electromechanical Specification.*

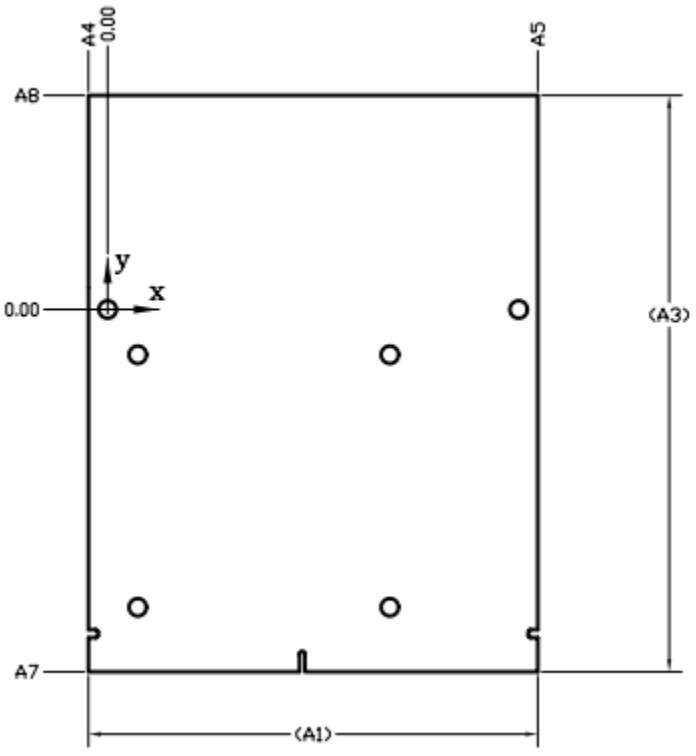

Figure 2. Tesla P6 Board Outline

Table 5. Tesla P6 Board Outline Specifications

Symbol	mm			inches		
	Minimum	Nominal	Maximum	Minimum	Nominal	Maximum
A1		82.00			3.228	
A2		70.00			2.756	
A3		105.00			4.134	
A4	3.37	3.50	3.63	0.133	0.138	0.143
A5	78.37	78.50	78.63	3.085	3.091	3.096
A6	3.87	4.00	4.13	0.152	0.157	0.163
A7	65.87	66.00	66.13	2.593	2.598	2.604
A8	38.87	39.00	39.13	1.530	1.535	1.541

MXM PCB MOUNTING HOLES

The module has six holes. Two are used to secure the board to the system and the other four to fasten the thermal solution to the module.

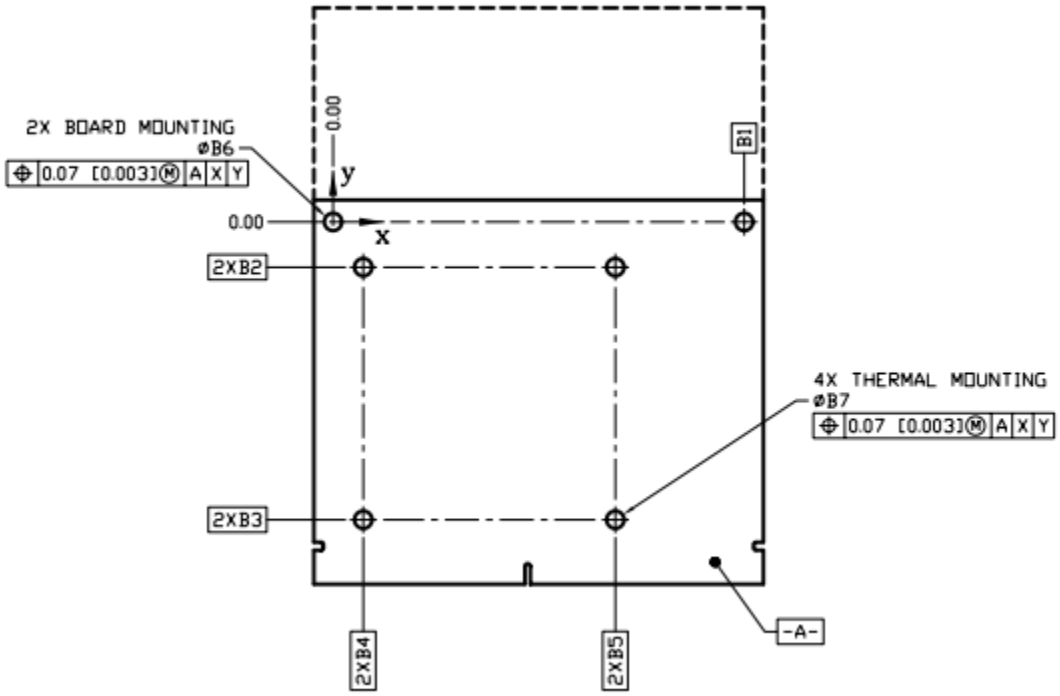

Figure 3. Mounting Holes

Table 6. Mounting Holes Specifications

Symbol	mm			inches		
	Minimum	Nominal	Maximum	Minimum	Nominal	Maximum
B1		75.00			2.953	
B2		8.25			0.325	
B3		54.25			2.136	
B4		5.50			0.217	
B5		51.50			2.028	
B6	3.07	3.20	3.33	0.121	0.126	0.131
B7	3.07	3.20	3.33	0.121	0.126	0.131

COMPUTE MODE

In contrast to Tesla M6, Tesla P6 is offered only in compute mode. Starting with Pascal-generation boards, switching between graphics and compute mode is no longer required. NVIDIA GRID software automatically handles most setting adjustments previously requiring the switch to graphics mode. Nevertheless, ECC must be disabled before running NVIDIA GRID software.

Table 7 provides details of the compute mode settings.

Table 7. Compute Mode Settings

Setting	Value	Notes
Class code	3D Controller	This class code indicates to operating systems (OS) that the GPU is not intended for use as a primary display device.
Memory BAR	16 gigabytes	Tesla GPUs expose a large memory base address register (BAR) for direct access to the frame buffer from the CPU, and other PCI Express devices.
I/O base BAR	Disabled	The GPU need not consume any legacy I/O resources when used as a non-display device.
ECC protection	Enabled	Error Correcting Code (ECC) is enabled on the GPU frame buffer to protect against single- and multi-bit memory errors. ECC can be turned off.

SUPPORT INFORMATION

CERTIFICATES AND AGENCIES

Certifications

- Windows Hardware Quality Lab (WHQL):
  - Certified Windows 7, Windows 8.1, and Windows 10
  - Certified Windows Server 2008 R2, Windows Server 2012 R2, and Windows Server 2016
- 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)
- Underwriters Laboratories (cUL, UL)
- Voluntary Control Council for Interference (VCCI)