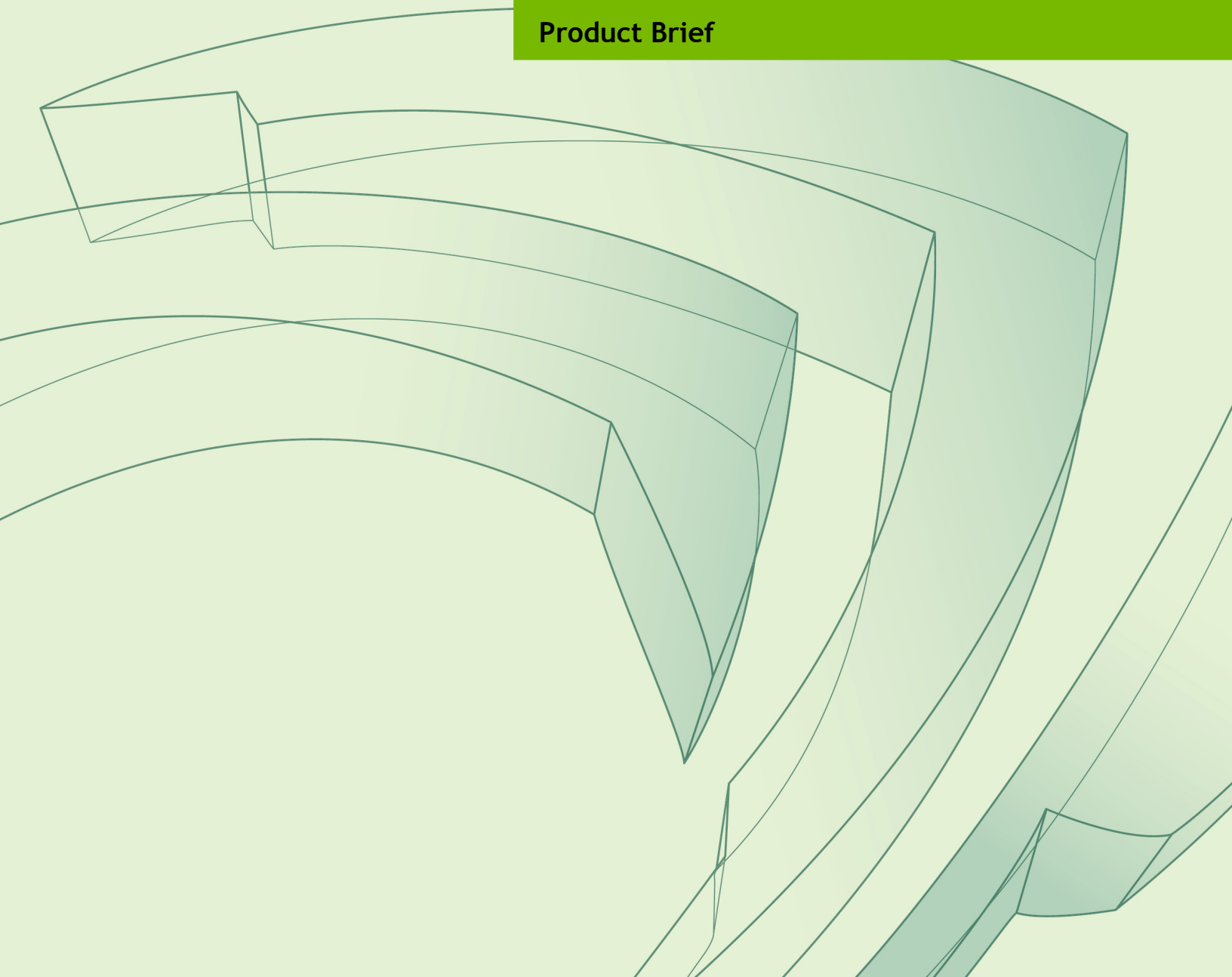




# TESLA M10

PB-08118-001\_v01 | June 2016

**Product Brief**



# DOCUMENT CHANGE HISTORY

PB-08118-001\_v01

Version	Date	Authors	Description of Change
01	June 17, 2016	MD, SM	Initial Release

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# OVERVIEW

The NVIDIA® Tesla® M10 is a dual-slot 10.5 inch PCI Express Gen3 graphics card with four mid-range NVIDIA Maxwell™ graphics processing units (GPUs). The Tesla M10 has 32 GB GDDR5 memory (8 GB per GPU) and a 225 W maximum power limit. The board is passively cooled and supports both airflow directions.

The Tesla M10 is designed to accelerate graphics in virtual desktop and application environments. The main feature of the Tesla M10 board is the support of the 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 of up to 64 users per Tesla M10.

In addition, NVIDIA Maxwell-based Tesla doubles the H.264 encoding capabilities and improves encoding quality, which enables richer colors, preserve more details after video encoding, and results in a high-quality user experience.

Combined, these new capabilities result in an increased number of concurrent users in the same server space and a lower cost per user.

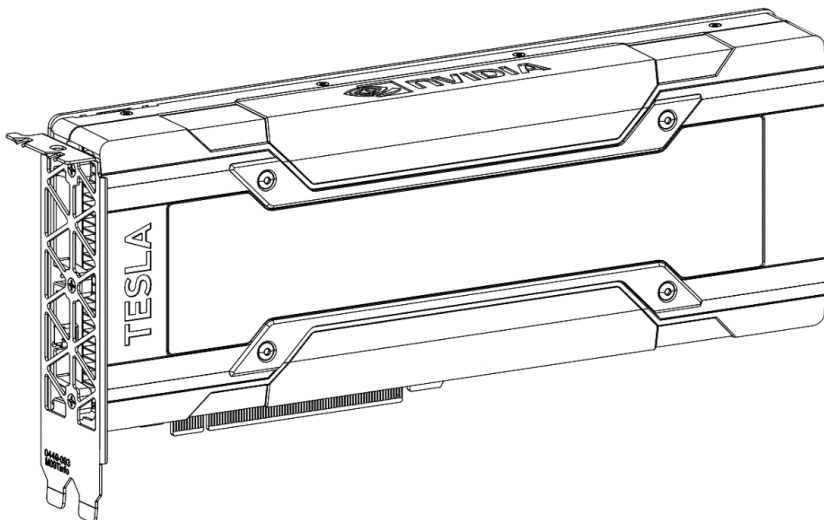


Figure 1. Tesla M10 Board (With Optional I/O Bracket)

## AIRFLOW DIRECTION SUPPORT

The Tesla M10 board is passively cooled and supports airflows in both directions (left-to-right and right-to-left) with a single SKU.

- ▶ Tesla M10 with left-to-right airflow (Figure 2)
- ▶ Tesla M10 with right-to-left airflow (Figure 3)

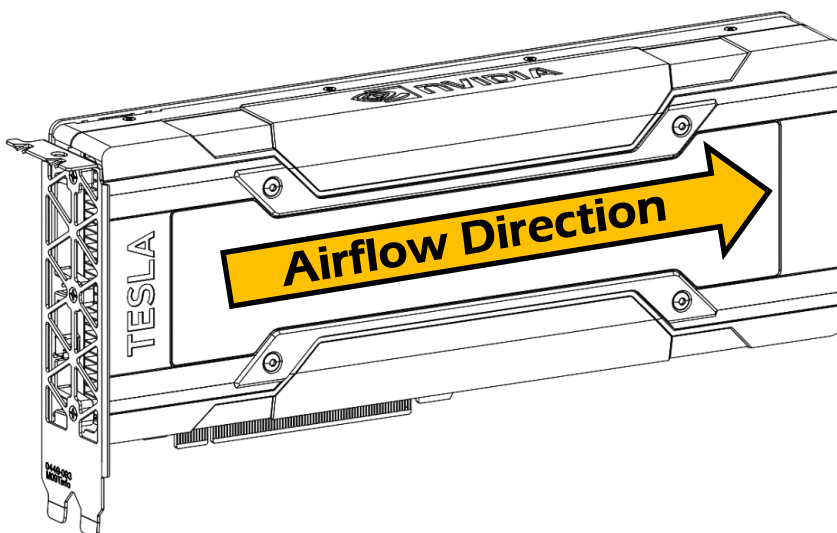


Figure 2. Tesla M10: Left-to-Right Airflow

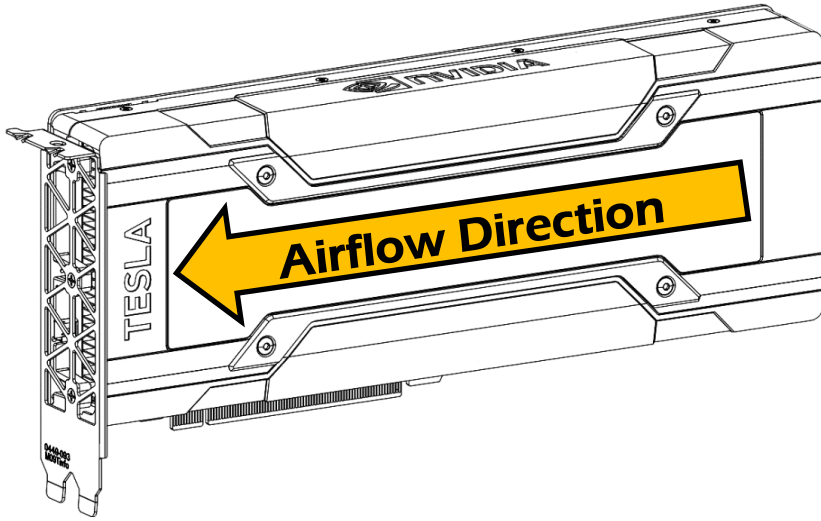


Figure 3. Tesla M10: Right-to-Left Airflow

# SPECIFICATIONS

## PRODUCT SPECIFICATION

Table 1 provides the product specifications for the Tesla M10 board.

Table 1. Product Specifications

Specification		Description
Product SKUs		P2405 SKU 70 (passive bidirectional airflow)
Total board power		225 W
GPU SKU		GM107-570-A2 ×4
NVIDIA® CUDA® cores		2560 (640 per GPU)
GPU clocks	Base	1033 MHz
	Idle	405 MHz
VBIOS	EEPROM size	4 Mbit
	UEFI	Supported
PCI Express interface		PCI Express Gen3 x16 system interface
Power connectors and headers		8-pin PCI Express power connector
Weight without extender and fans		963 grams (without bracket) 992 grams (with bracket)



Table 2 provides the memory specifications for the Tesla M10 board.

**Table 2. Memory Specifications**

Specification		Description
Memory clocks	Performance	2600 MHz
	Idle	405 MHz
Memory size		32 GB (8 GB per GPU)
Memory I/O		128-bit ×4
Memory configuration		32 pcs 512M ×16 GDDR5
Memory bandwidth		83 GB/s ×4

Table 3 provides the software specifications for the Tesla M10 board.

**Table 3. Software Specifications**

Specification	Description
Compatibility mode	Graphics
Base Address Registers (per GPU)	BAR0: 16 MB BAR1: 256 MB BAR2: 32 MB I/O BAR: 4 KB
PCI class code	0x03 - Display controller
PCI sub class codes	0x00 - VGA-compatible controller
ECC support	Not supported

Table 4 provides the environment conditions specifications for the Tesla M10 graphics board.

**Table 4. Board Environmental and Reliability Specifications**

Specification	Condition
Operating temperature	0 °C to 45 °C
Storage temperature	-40 °C to 75 °C
Operating humidity	5% to 95% relative humidity
Storage humidity	5% to 95% relative humidity
Mean time between failures (MTBF)	Uncontrolled environment: TBD hours at 35 °C Controlled environment: TBD hours at 35 °C

## THERMAL SPECIFICATIONS

Table 5 provides the thermal specifications for the Tesla M10 board.

Table 5. Thermal Specifications

Parameter	Value	Units
Total board power	225	W
GPU shutdown temperature	96	°C
GPU slowdown temperature	91	°C
GPU maximum operating temperature	90	°C
GPU hardware slowdown amount	50	%

# DESIGN DISCUSSION

## FORM FACTOR

The Tesla M10 board conforms to the NVIDIA Form Factor 2.0 specification. For details about the NVIDIA Form Factor 2.0 specification consult the *System Design Guide for NVIDIA Enterprise GPU Products (DG-07562-001)*.

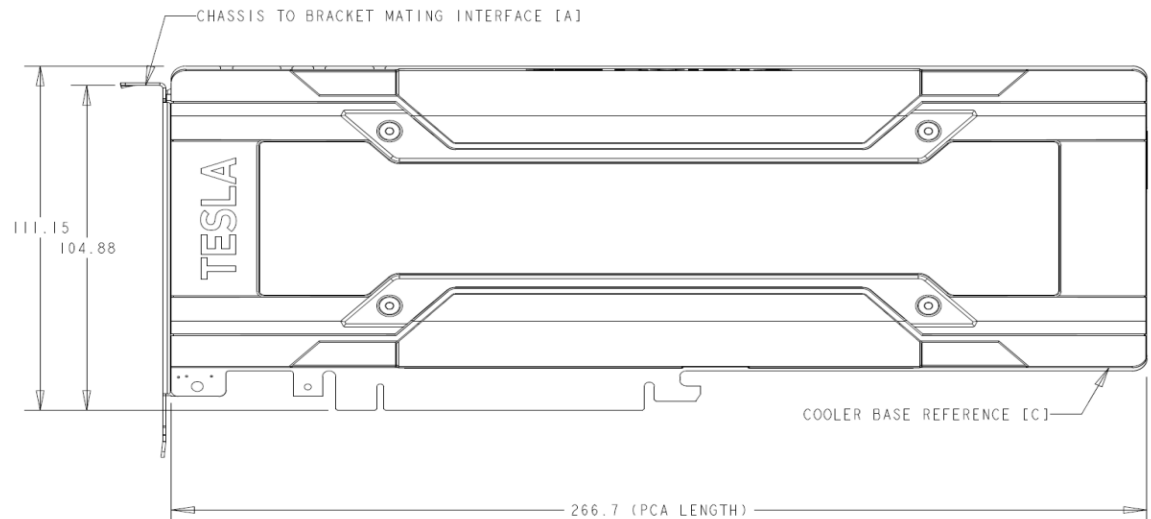


Figure 4. Tesla M10 Board Dimensions (With Optional I/O Bracket)

## POWER CONNECTOR PLACEMENT

The board provides an 8-pin PCI Express power connector on the East edge of the board.

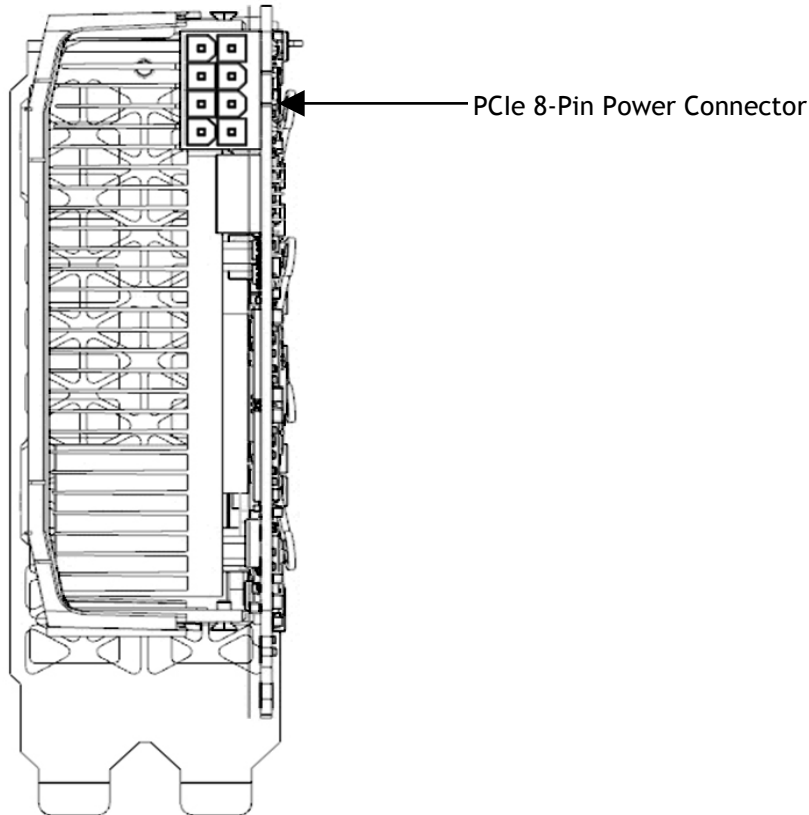


Figure 5. PCIe 8-Pin Power Connector

Table 6. 12V External Power Configuration

Cable Attachment Configuration	Support	Notes
PCIe 8-pin cable	Supported; required	PCIe 8-pin cable must be attached. 8-pin cable must carry up to 150 W.
CPU 8-pin cable	Not supported	CPU 8-pin cable is not compatible with PCIe 8-pin board connector. Plugging in forcibly can cause permanent damage to the board and the system.
PCIe 6-pin cable	Not supported	A 6-pin connector carries insufficient current for the performance needs of this product. A 6-pin cable attached to an 8-pin board connector is an invalid configuration and is not supported.
No auxiliary power cable attached	Not supported	The auxiliary power cable must always be installed.

## EXTENDERS

The Tesla M10 board provides two extender options as shown in the following figures.

- ▶ NVPN: 320-0867-003 – Straight extender (Figure 6)
  - Card + extender = 312 mm
- ▶ NVPN: 320-0866-003 – Long offset extender (Figure 7)
  - Card + extender = 339 mm

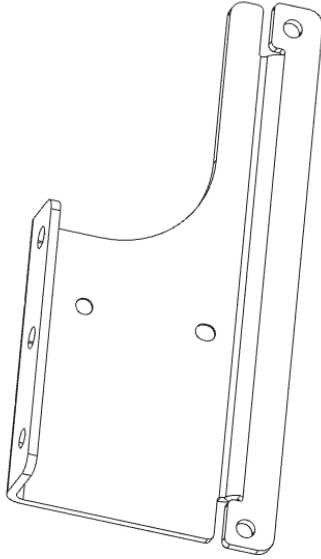


Figure 6. Straight Extender

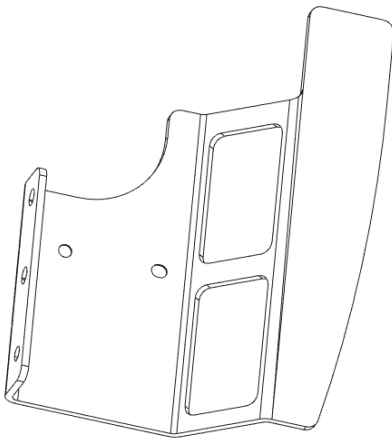


Figure 7. Long Offset Extender

- ▶ Using the standard NVIDIA extender ensures greatest forward compatibility with future NVIDIA product offerings.
- ▶ If the standard extender will not work, OEMs may design a custom attach method using the extender mounting holes on the heat sink baseplate. The extender mounting holes will vary among NVIDIA products, so designing for flexibility is recommended.

# SUPPORT INFORMATION

## CERTIFICATES AND AGENCIES

### Certifications

- ▶ Windows Hardware Quality Lab (WHQL):
  - Certified Windows 7 and Windows 8
- ▶ 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 7. Languages Supported

Languages	Windows <sup>1</sup>	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:**

<sup>1</sup>Windows 7, Windows 8, and Windows 8.1 are supported.



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