



NVIDIA A2 Tensor Core GPU

Product Brief

Document History

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Version	Date	Authors	Description of Change
01	November 8, 2021	AV, SM	Initial Release

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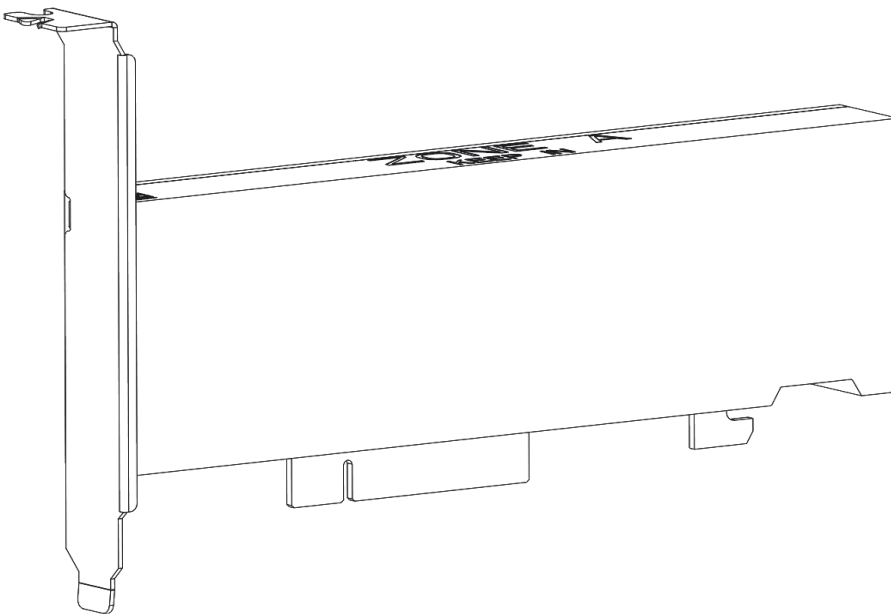
Overview

The NVIDIA A2 Tensor Core GPU is a compact, lower power product, that delivers entry-level acceleration for Deep Learning, Graphics and Video processing in any server. It is a half-height (low profile), half-length, single slot card featuring 16 GB of GDDR6 memory and a 60 W maximum power limit. The A2 supports x8 PCIe Gen4 connectivity. It is a passively cooled card with a superior thermal design that requires system airflow to operate and handles challenging ambient environments with ease (NEBS-3 capable).

The NVIDIA A2 is powered by the NVIDIA Ampere Architecture. It provides revolutionary multi-precision performance to accelerate deep learning and machine learning training, as well as inference, video transcoding, AI audio and video effects, rendering, data analytics, virtual workstation, virtual desktop, and many other workloads.

As part of NVIDIA AI, the A2 supports all AI frameworks and network models, delivering dramatic performance and efficiency that maximizes the utility of at-scale deployments.

Figure 1. NVIDIA A2 NVFF 5.0 HHL with Full Height Bracket



Specifications

Product Specifications

Table 1 through Table 3 provide the product, memory, and software specifications for the NVIDIA A2 PCIe card.

Table 1. Product Specifications

Specification	NVIDIA A2
Product SKU	PG179 SKU 220 NVPN: 699-2G179-0220-xxx
Total board power	60 W default 60 W maximum 40 W minimum
Thermal solution	Passive
Mechanical Form Factor	HHHL-SS (half-height, half-length, single-slot)
PCI Device IDs	Device ID: 0x25B6 Vendor ID: 0x10DE Sub-Vendor ID: 0x10DE Sub-System ID: 0x157E
Four part ID (VID:DEVID:SVID:SSID) ¹	10DE:25B6:10DE:157E
GPU clocks	Base: 1440 MHz Maximum boost: 1770 MHz
VBIOS	EEPROM size: 16 Mbit UEFI: Supported
PCI Express interface	Physical x8 PCIe lanes PCIe Gen4 x8, x4; Gen3 x8 Lane and polarity reversal supported
Performance States	P0, P8
Secure Boot	Supported
Zero Power	Not supported

Specification	NVIDIA A2
NEBS readiness	Supported
Weight	Board: 260 Grams (excluding bracket) Bracket (Full height) with screws: 14 Grams Bracket (Half height) with screws: 9 Grams
Note: ¹ The NVIDIA A2 is uniquely identified by its complete four part ID.	

Table 2. Memory Specifications

Specification	Description
Memory clock	6251 MHz
Memory type	GDDR6
Memory size	16 GB
Memory bus width	128 bits
Peak memory bandwidth	200 GB/sec

Table 3. Software Specifications

Specification	Description ¹
SR-IOV support	Supported: 16 VF (virtual functions)
BAR address (physical function)	BAR0: 16 MiB ¹ BAR1: 16 GiB ¹ BAR3: 32 MiB ¹
BAR address (virtual function)	BAR0: 4 MiB (256 KiB per VF) ¹ BAR1: 32 GiB, 64-bit (2 GiB per VF) ¹ BAR3: 512 MiB, 64-bit (32 MiB per VF) ¹
Message signaled interrupts	MSI-X: Supported MSI: Not supported
ARI Forwarding	Supported
Driver support	R470.82 (or later)
CEC firmware	v6.07 (or later)
NVIDIA® CUDA® support	CUDA 11.1 (or later)
Virtual GPU software support	Supports vGPU 14.0 (or later)
NVIDIA-Certified Systems™ Program	NVIDIA-Certified Systems v2.5 (or later)
PCI class code	0x03 – Display Controller
PCI sub-class code	0x02 – 3D Controller
ECC support	Enabled (by default); can be disabled using software

Specification	Description ¹
SMBus (8-bit address)	0x9E (write), 0x9F (read)
SMBus direct access	Supported
SMBPBI (SMBus Post-Box Interface)	Supported

Note:

¹The KiB, MiB, and GiB notation emphasizes the “power of two” nature of the values. Thus,

- 256 KiB = 256 x 1024
- 16 MiB = 16 x 1024²
- 64 GiB = 64 x 1024³

Environmental and Reliability Specifications

Table 4 provides the environment conditions specifications for the A2 PCIe card.

Table 4. Board Environmental and Reliability Specifications

Specification	Description
Ambient operating temperature	0 °C to 50 °C
Ambient operating temperature (short term) ^{3, 4}	-5 °C to 55 °C
Storage temperature	-40 °C to 75 °C
Operating humidity (short term) ³	5% to 93% relative humidity
Operating humidity	5% to 85% relative humidity
Storage humidity	5% to 95% relative humidity
Mean time between failures (MTBF)	Uncontrolled environment: ¹ TBD hours at 35 °C Controlled environment: ² TBD hours at 35 °C

Notes:

¹Some environmental stress with limited maintenance (GF35).

²No environmental stress with optimum operation and maintenance (GB35).

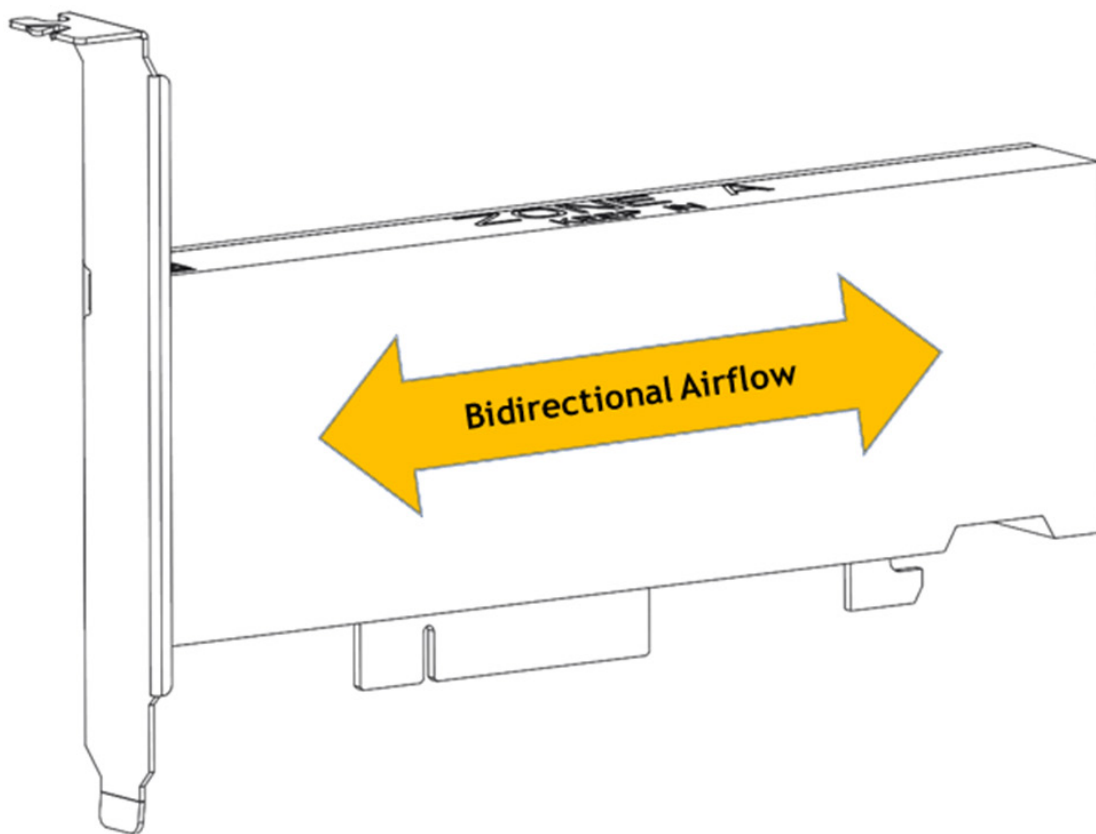
³A period not more than 96 hours consecutive, not to exceed 15 days per year.

⁴Short-term operating conditions include 55 °C at 6000 feet, per NEB’s objective. Cooling guidance approximates for sea-level non-pressure-controlled testing.

Airflow Direction Support

The NVIDIA A2 PCIe card employs a bidirectional heat sink, which accepts airflow either left-to-right or right-to-left directions.

Figure 2. NVIDIA A2 Airflow Direction



Product Features

PCI Express Interface Specifications

The following subsections describe the PCIe interface specifications for the A2 PCIe card.

PCIe Support

The A2 card supports PCIe Gen4. Gen4 x8 interface should be used when connecting to the A2 PCIe card.

Polarity Inversion and Lane Reversal Support

Lane Polarity Inversion, as defined in the PCIe specification, is supported on the A2 PCIe card.

Lane Reversal, as defined in the PCIe specification, is supported on the A2 PCIe card. When reversing the order of the PCIe lanes, the order of both the Rx lanes and the Tx lanes must be reversed.

CEC Hardware Root of Trust

The NVIDIA A2 provides secure boot capability via CEC. Implementing code authentication, rollback protection and key revocation, the CEC device authenticates the contents of the GPU firmware ROM before permitting the GPU to boot from its ROM.

It also provides out-of-band (OOB) secure firmware update, secure application processor recovery, and remote attestation.

Form Factor

In this product brief, nominal dimensions are shown.

Figure 3. NVIDIA A2 PCIe Card Dimensions with Full Height Bracket

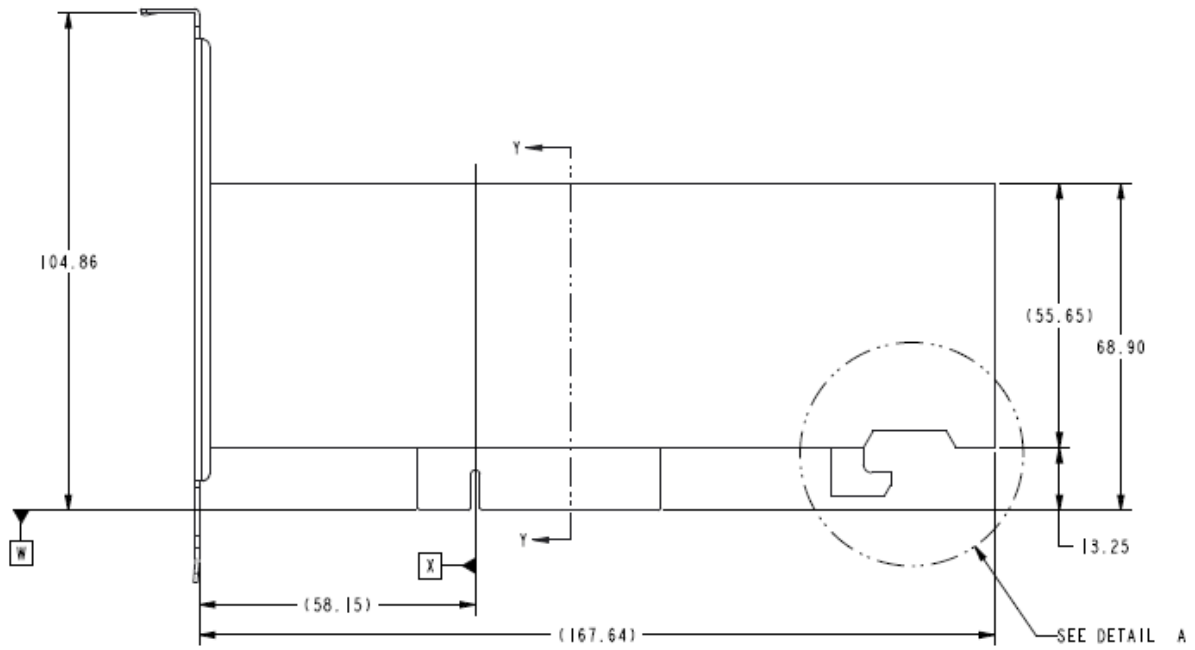
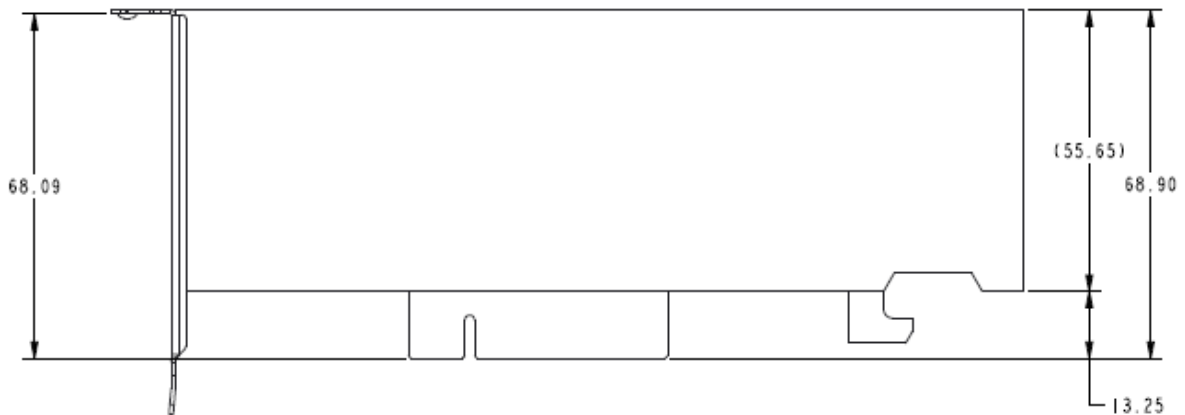


Figure 4. NVIDIA A2 PCIe Card Dimensions with Low Profile Bracket



Hockey Stick Board Retention

The NVIDIA A2 enables south edge board retention using a “hockey stick” tab located to the east of the PCIe card fingers, as shown in Figure 5. The A2 hockey stick tab is optional. A2 hockey stick tab assembly is depicted in Figure 6.

Figure 5. NVIDIA A2 Removable Hockey Stick Tab

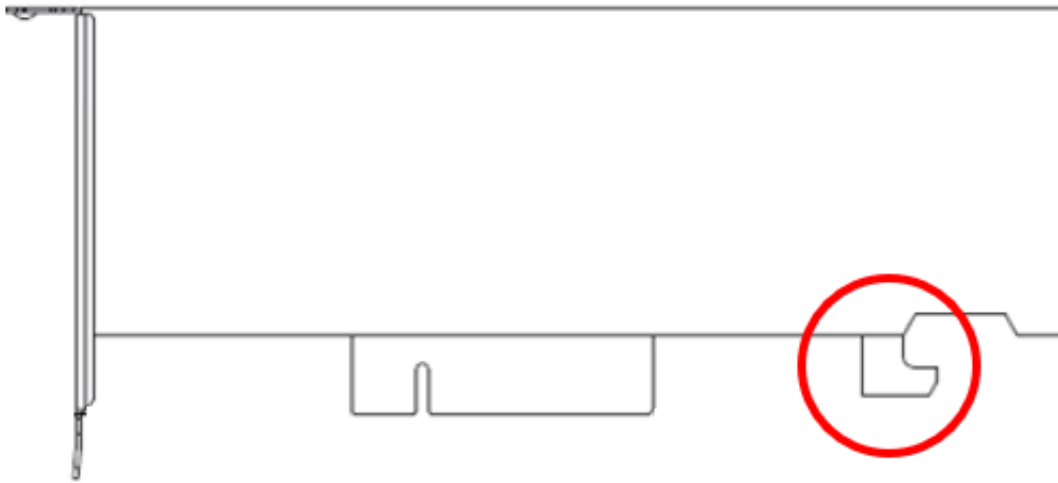
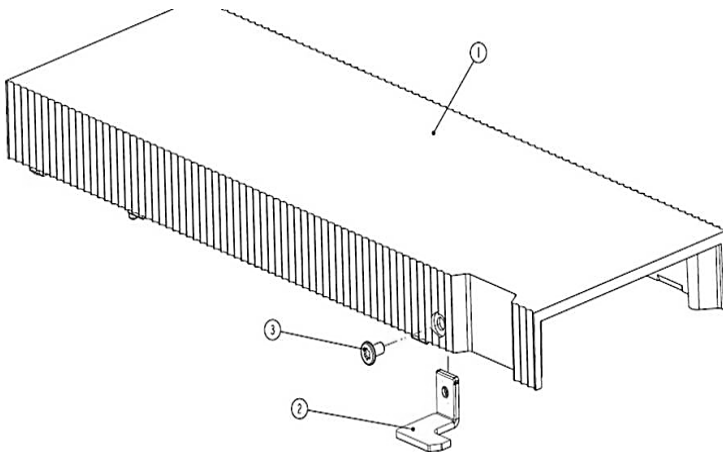


Figure 6. NVIDIA A2 Removable Hockey Stick Tab Assembly



NO.	NVPN	Q'TY	DESCRIPTION
1	367-0541-000	1	COVER-A
2	097-0299-000	1	HOCKEY STICK
3	151-1133-000	1	SCREW-HOCKEY STICK

1. ALIGNMENT FIXTURE FOR HOCKEY-STICK POSITIONING IS REQUIRED
2. TORQUE SCREW TO 2.0-2.5 in-lbf

Support Information

Certifications

- ▶ Windows Hardware Quality Lab (WHQL):
 - Certified Windows 7, Windows 8.1, Windows 10
 - Certified Windows Server 2008 R2, 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 and Media Authority and New Zealand Radio Spectrum Management (RCM)
- ▶ 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 5. 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, Windows Server 2012 R2, and Windows 2016 are supported.

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