Viper User Guide

Installation and Compliance

v1.10 | 2025-01-14

Document History

Version	Date	Authors	Description of Change
v1.00	2024-06-25	Neuchips	Initial release
v1.01	2024-07-31	Neuchips	Update system requirement
v1.02	2024-08-13	Neuchips	Update system requirement
v1.10	2025-01-14	Neuchips	Update information

Table of Contents

List of Figures

List of Tables

1 Overview

Thank you for choosing the Neuchips Viper.

The Neuchips Viper is a power efficient AI accelerator of PCIe HHHL, Half Height Half Length, single slot card, compliant with PCIe Gen5 x8 lanes, providing up/downstream bandwidth up to 32GB/s. The Viper is equipped with 200 TOPS in int8 under TDP, Thermal Defined Power, of 55 Watts. This application specific AI accelerator of Viper is sophisticated for DLRM, Deep Learning Recommendation Model, performing best queries per watt in MLPerf v3.0 submission in early 2023. Along with the emerging of generative AI, Viper is configured to demonstrate Llama model on real-time application scenarios.

This user guide explains the installation and operation of the Neuchips Viper accelerator card. Before installing the Neuchips Viper, please ensure the host PC meets the hardware and software requirements listed below.

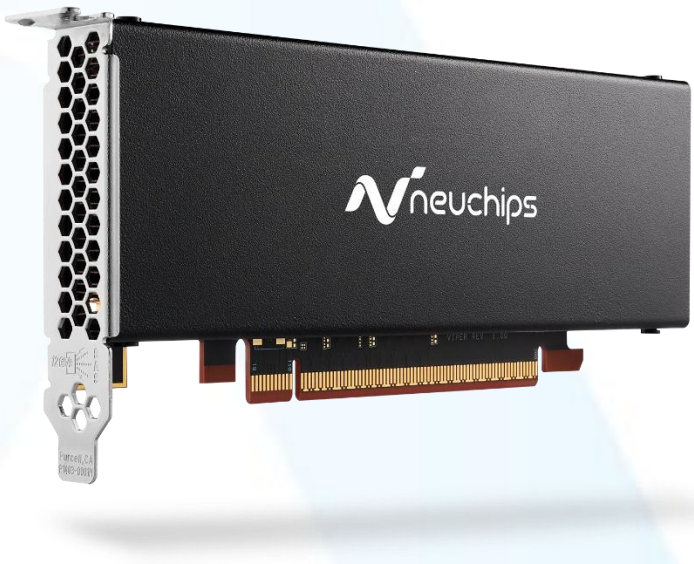


Figure 1 Neuchips Viper

2 System Requirements

Before installing the Neuchips Viper, the following system requirements must be met.

Table 1 Minimum Requirements

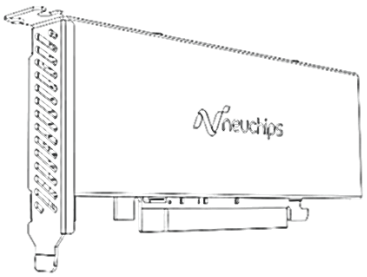
HW/SW	Item	Minimum Requirements
Hardware	PCIe x16 slot	**Clearance**: 7.1″ (180 mm) L x 3.0″ (76 mm) W. **Power**: The PCIe slot should be powered
Software	Operating system	Linux 64-bit (Linux kernel version 5.15.0 or newer)
	Available space	40 GB of available hard disk space (per model)
	Internet	An Internet connection to download software

3 Unpacking

Prior to unpacking the Neuchips Viper, it is important to make sure that all system requirements are met to ensure smooth installation. Be sure to inspect each piece of equipment shipped in the packing box. If anything is missing or damaged, contact your reseller.

The following items are included in the Neuchips Viper box.

Table 2 List of contents

Qty	Description	Image
1	Neuchips Viper	

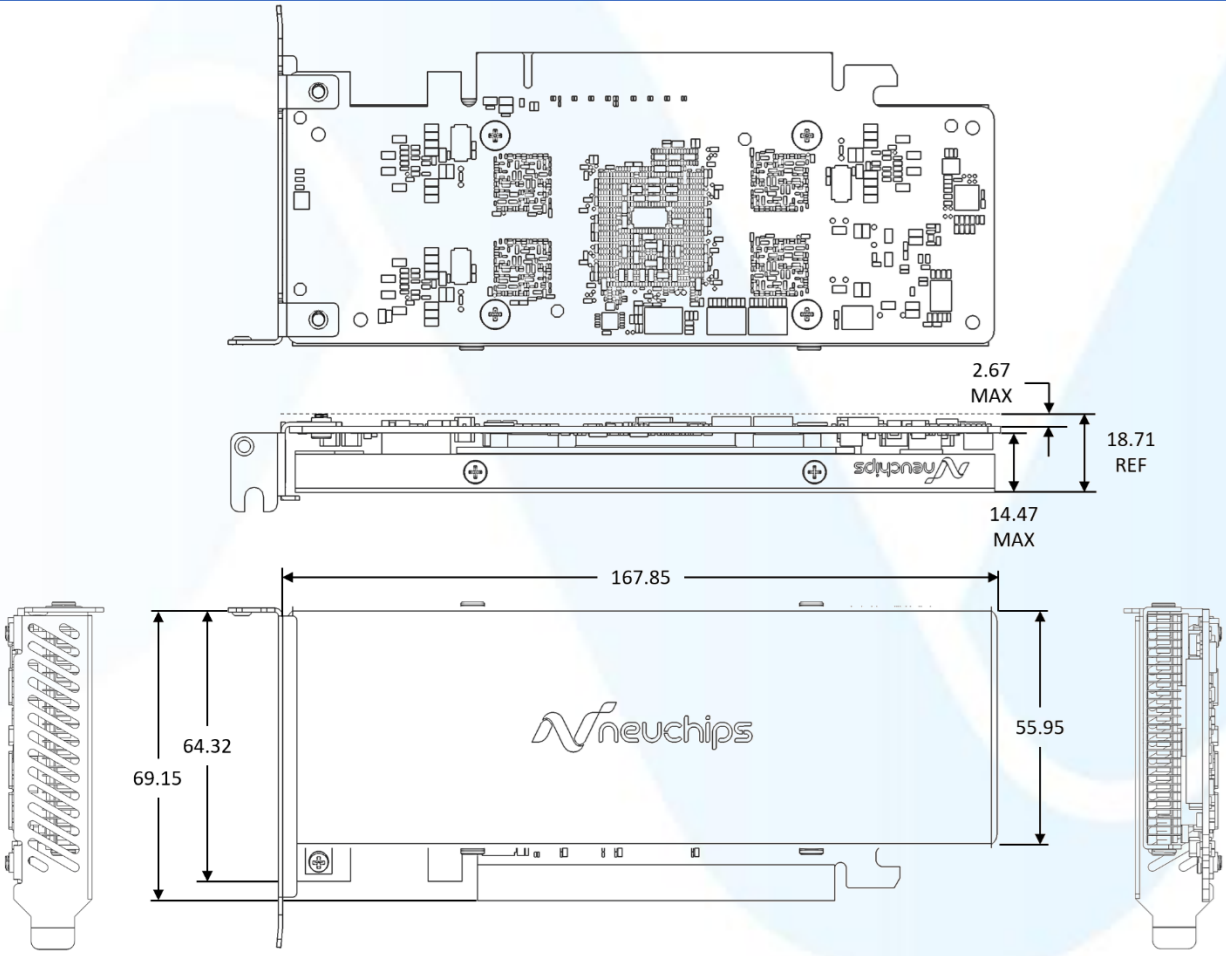


Figure 2 Neuchips Viper mechanical drawing

4 Hardware Installation

This section describes the installation of the Neuchips Viper into the host PC. Please follow all the installation instructions carefully.

WARNING:
Failure to follow the safety instructions can result in damage to the computer or injury to the user. Please follow ALL instructions carefully.

4.1 Safety Instructions

To reduce the risk of fire, electric shock, or injury, always follow basic safety precautions.

- DO place the product securely on a stable surface. Serious damage may result if it falls.
- DO NOT install this card with I/O downward.
- DO NOT operate this product near water or when your hands or body are wet.
- DO NOT place this product on soft surfaces that could block the ventilation slots and cause overheating.
- DO NOT place this product near a heating register or radiator.
- DO NOT allow anything to rest on the power cord.
- DO NOT place this product where a person can step or trip on the power cord.
- Do NOT touch the surface of heatsink of product when product is working.

4.2 Before You Begin

The Neuchips Viper is a PCI Express 5.0 x 8 accelerator card. Your computer may already have an accelerator card installed in the PCI Express slot. If so, you will need to remove that accelerator card and replace it with the Viper.

Because Viper is an accelerator card, your computer needs to install a graphics card first before you install accelerator card.

If you do not have an accelerator card, there is no action that needs to be taken before installing your new accelerator card.

4.3 Installing the Accelerator Card

The following instructions are given as a general guideline for installing the Viper cards. Due to variations between computer systems, it is not possible to provide specific instructions for every system. Please consult the system documentation that came with the computer for system-specific instructions.

WARNING:
Risk of electric shock. Disconnect the computer from its power source before opening. Failure to disconnect the power could lead to shock, possibly resulting in serious injury or death.

CAUTION:
Risk of static discharge. Discharge static electricity by touching a grounded surface before touching the accelerator card. An anti-static wrist strap or other precautions is recommended to protect equipment from static damage.

WARNING:
Risk of burning. The accelerator card can become very hot after prolonged use. Make sure to let the card cool down before taking it out of the system.

Use the following procedure to install the Viper PCIe accelerator card into your computer system.

1. **Turn off the computer and monitor and disconnect the power cord.** Depending on your computer system, you may need to disconnect the cable going to the back of the back of your system. Mark the cables so you can make sure you reconnect them properly.
2. **Open the computer.** Remove the cover and side panels to access the inside of the computer. Refer to the computer documentation from the original manufacturer for assistance.
3. **Remove any existing accelerator card(s).** If there is already an accelerator card in the system, it should be removed before proceeding. Save the hardware (such as screws and brackets) in a safe place until needed during Viper installation.

4. **Remove slot covers.** Remove one adjacent slot cover as shown in the following diagram.
5. **Plug the Viper into the primary PCIe x16 slot.** The Viper should be installed in the primary PCIe x16 slot. This slot will be labeled as x16 and is usually (but not always) the closest slot to the CPU. Open the retention lever, insert the card carefully but firmly into the slot, then lock the retention lever.

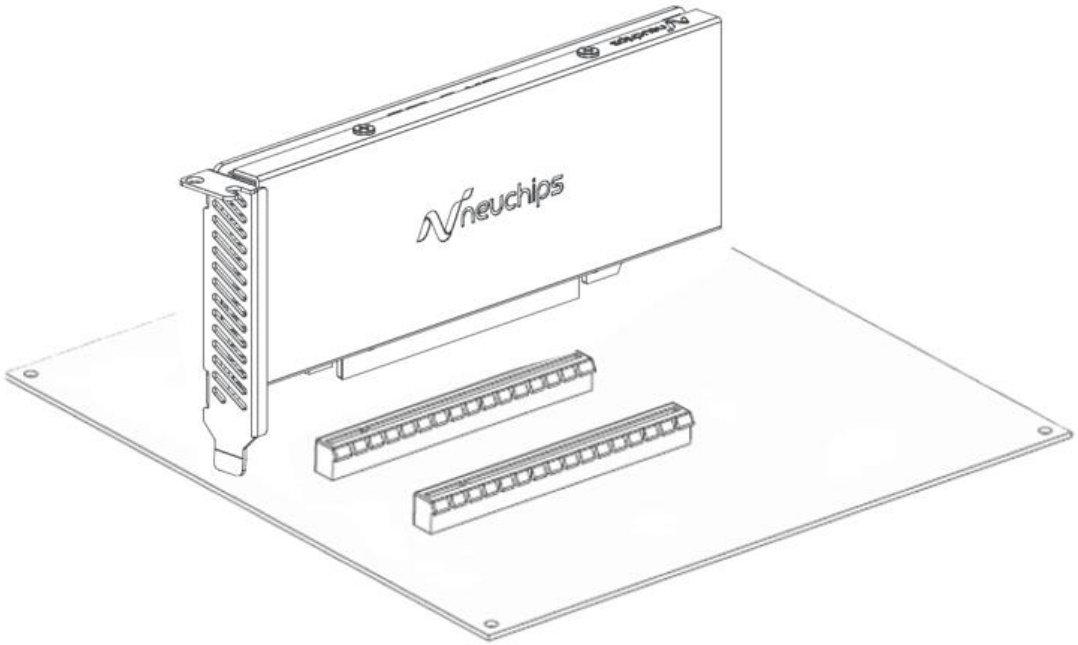


Figure 3 Install the Viper accelerator card on motherboard

6. **Reinstall the cover** using the reverse procedure as during removal.
7. **Reconnect the power cord** to the PC and the monitor.
8. **Check the system air flow** with the Viper accelerator card (for Viper Passive SKU).

Table 3 System Airflow Requirement (for Passive thermal solution SKU)

Ambient Temperature	Airflow (CFM)
25	23.5
35	35.0
45	50.0
50	70.0

5 Software Installation

With the hardware installed, it is now time to install the Neuchips software and accelerator card driver.

Contact Neuchips support team to get the latest Software Development Kit, the SDK, consisting of Neuchips Viper PCIe driver, model compilation libraries, and interface wrapper to connecting popular AI frameworks.

Please refer to the SDK user guide to install the Software stack.

NOTE:
Installation may take several minutes. During this time, the screen may go blank multiple times for a few seconds at a time. This is the expected behavior.

Congratulations!

Your Viper is now ready to use.

6 Compliance

The Neuchips Viper PCIe accelerator card is compliant with the following regulations:

Table 4 List of Regulation compliance

State or Territory	Regulatory Body
United States	Federal Communications Commission (FCC) Underwriters Laboratories (UL)
Canada	Innovation, Science and Economic Development Canada (ISED)
European Union	European Conformity; Conformité Européenne (CE)
United Kingdom	UK Conformity Assessed (UKCA)
Taiwan	Bureau of Standards, Metrology & Inspection (BSMI)

Trademarks

Neuchips, the Neuchips logo, and RecAccel are trademarks and/or registered trademarks of Neuchips in the U.S. and other countries. Other company and product names may be trademarks of the respective companies with which they are associated.

Copyright

Neuchips Inc.
https://www.neuchips.ai/