

# EP-0241

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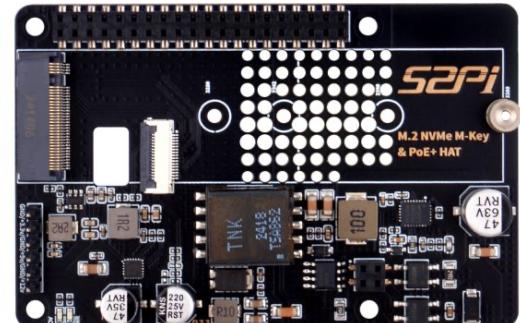
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## M.2 NVME M-key & PoE+ Hat for RPi 5

## Descriptions

The M.2 NVME M-key & PoE+ Hat for Raspberry Pi 5 is an innovative accessory that significantly expands the capabilities of the Raspberry Pi 5. Designed with versatility in mind, this PoE+ (Power over Ethernet) Hat allows for a streamlined setup by enabling the Raspberry Pi to draw power directly from an Ethernet port through the use of a PoE switch or PoE power supply. This eliminates the need for a separate power supply and simplifies the overall system architecture.



## Features

- **Power over Ethernet (PoE+) Capability:** Streamlines the power supply setup by allowing the Raspberry Pi 5 to be powered through the Ethernet port.
- **5.1V/4.5A Output:** Ensures that the Raspberry Pi 5 and any connected peripherals receive adequate power for optimal performance.
- **Compatibility:** Specifically designed for the Raspberry Pi 5, ensuring a seamless integration with the device.
- **Safety Warning:** A clear note to avoid connecting a power supply to the USB-C port when using the PoE+ Hat to prevent potential device damage.

## Specifications

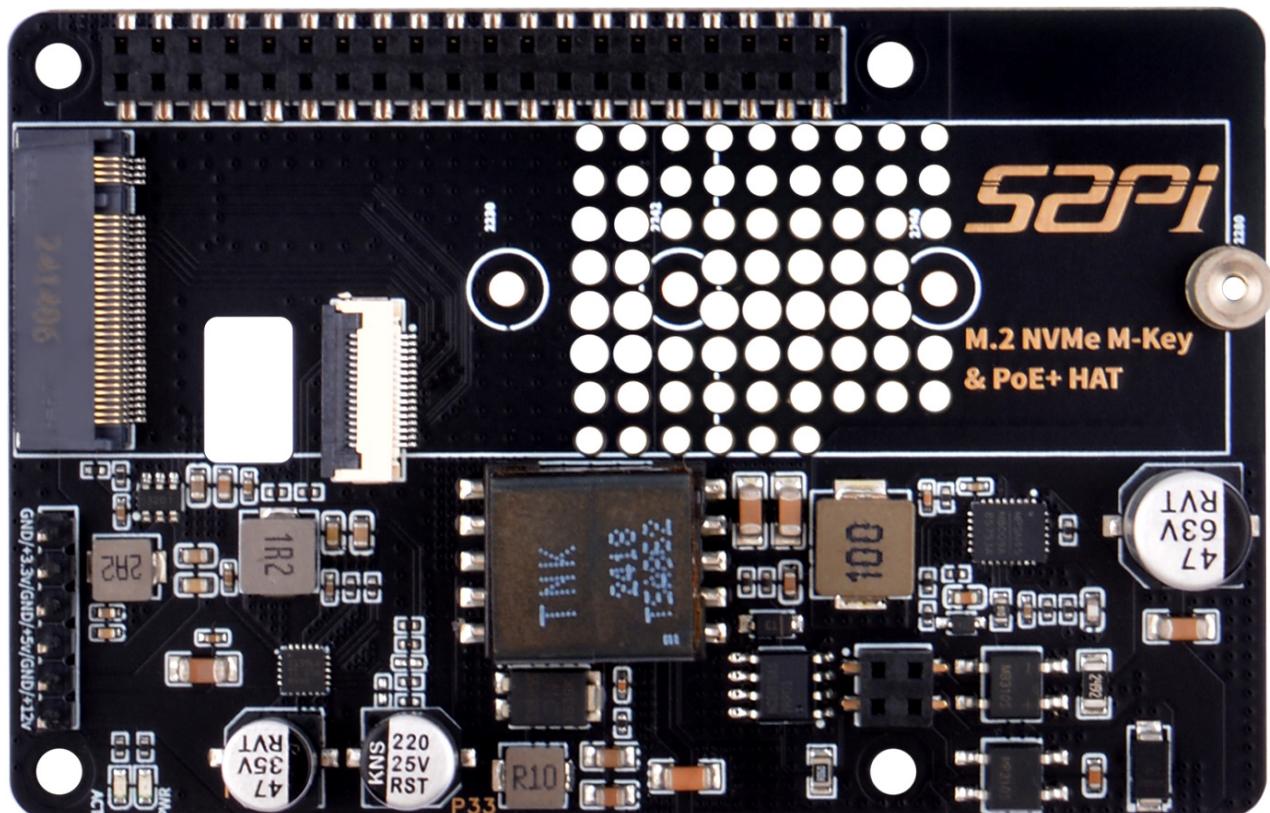
- PoE type: PoE+
- Interface: M.2 NVME M-key
- SSD size: 2230/2242/2260/2280
- Power Input: Ethernet (PoE+) 802.3at protocol, upto 25.5w

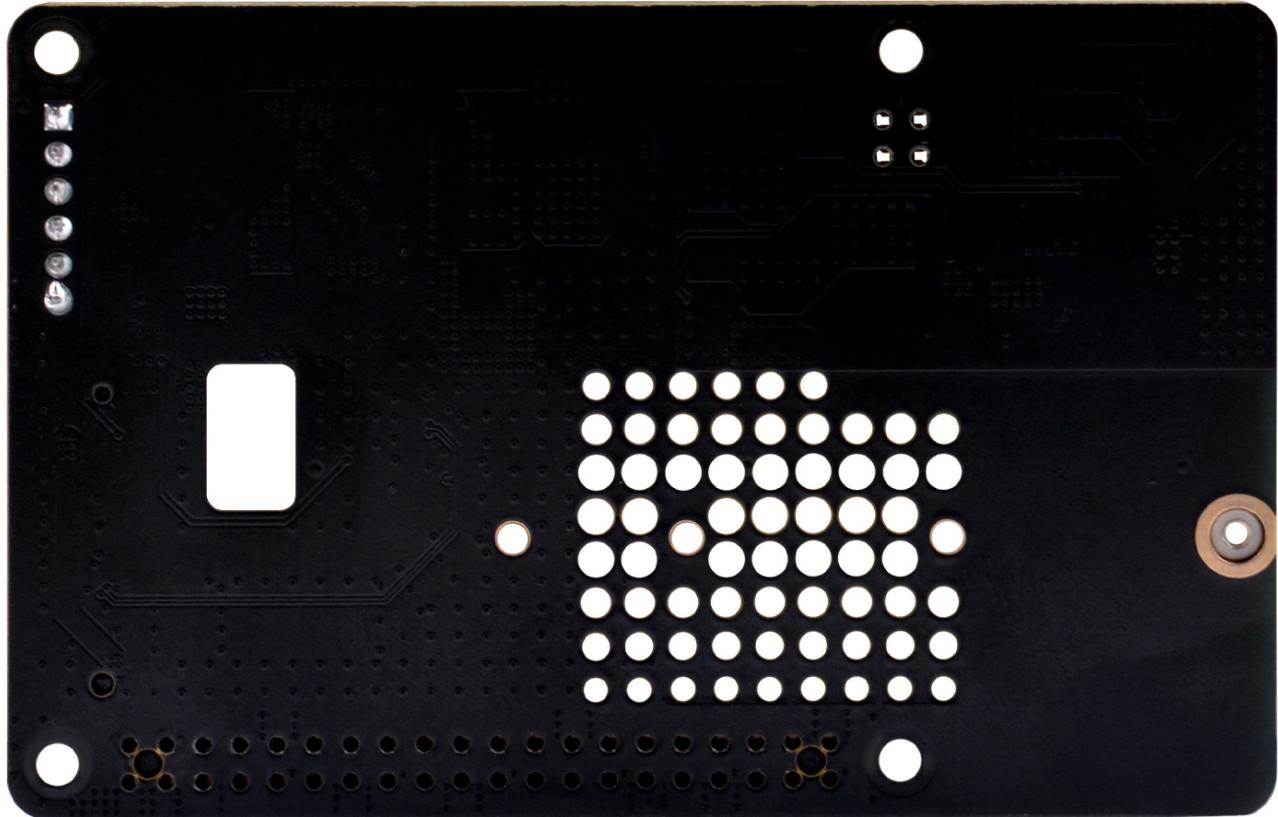
- Output Voltage: 5.1V
- Output Current: 4.5A
- Compatibility: Raspberry Pi 5
- Safety: **Do not connect power supply to USB-C port when PoE+ Hat is in use.**

## Gallery

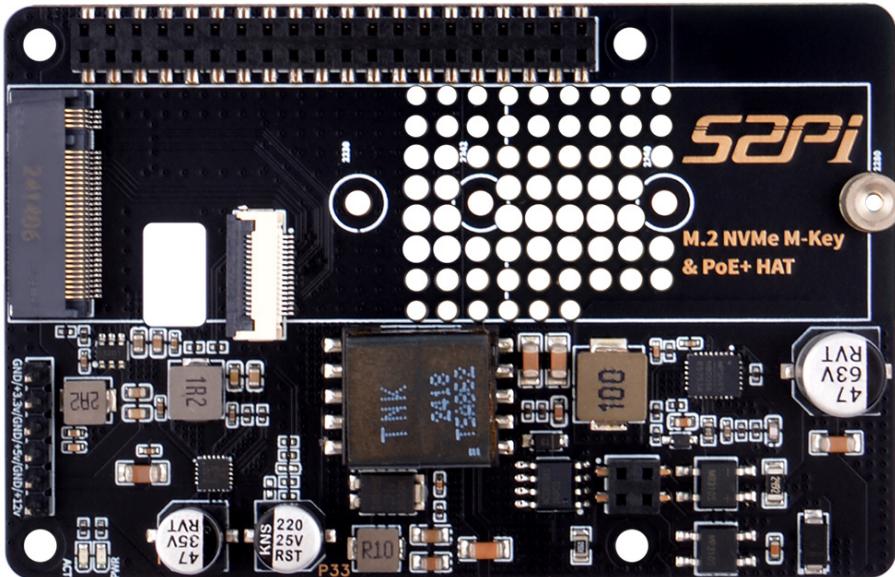
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- Product Outlook

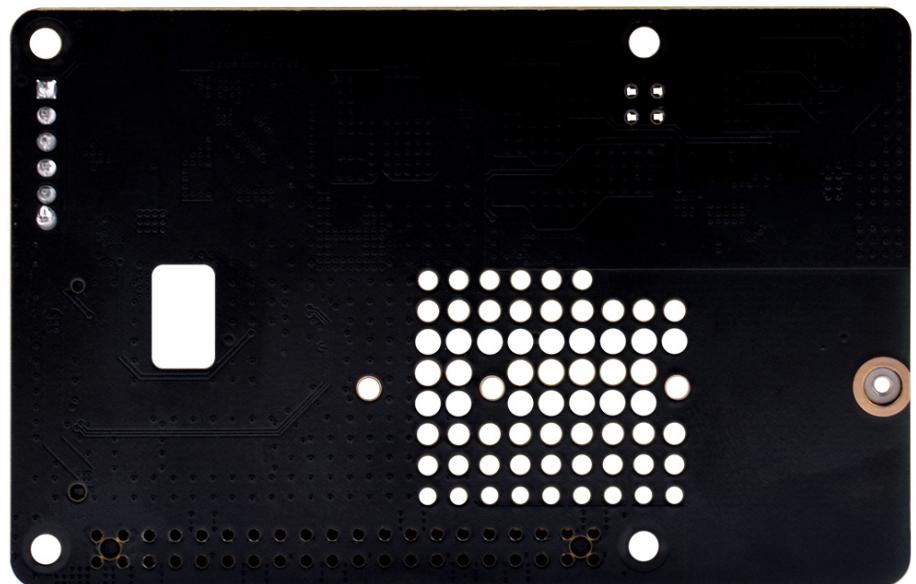




- Front face and back face

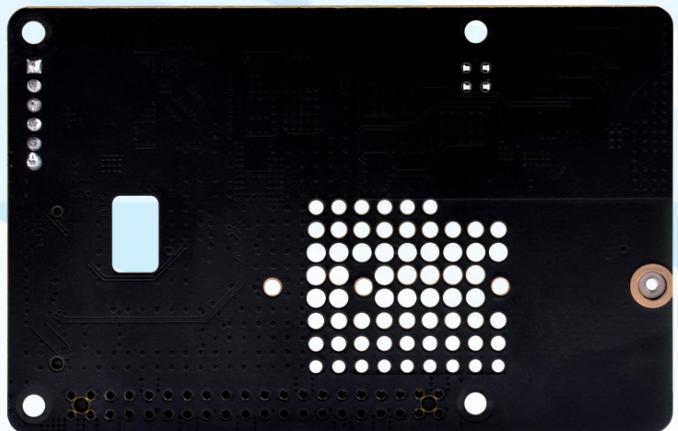
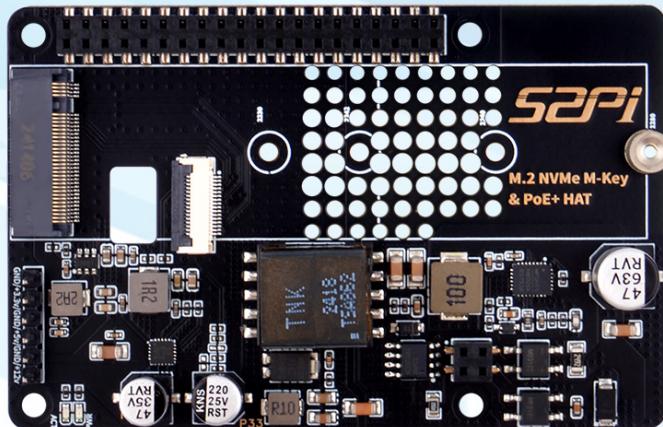


(Front)



(Back)

- Specifications

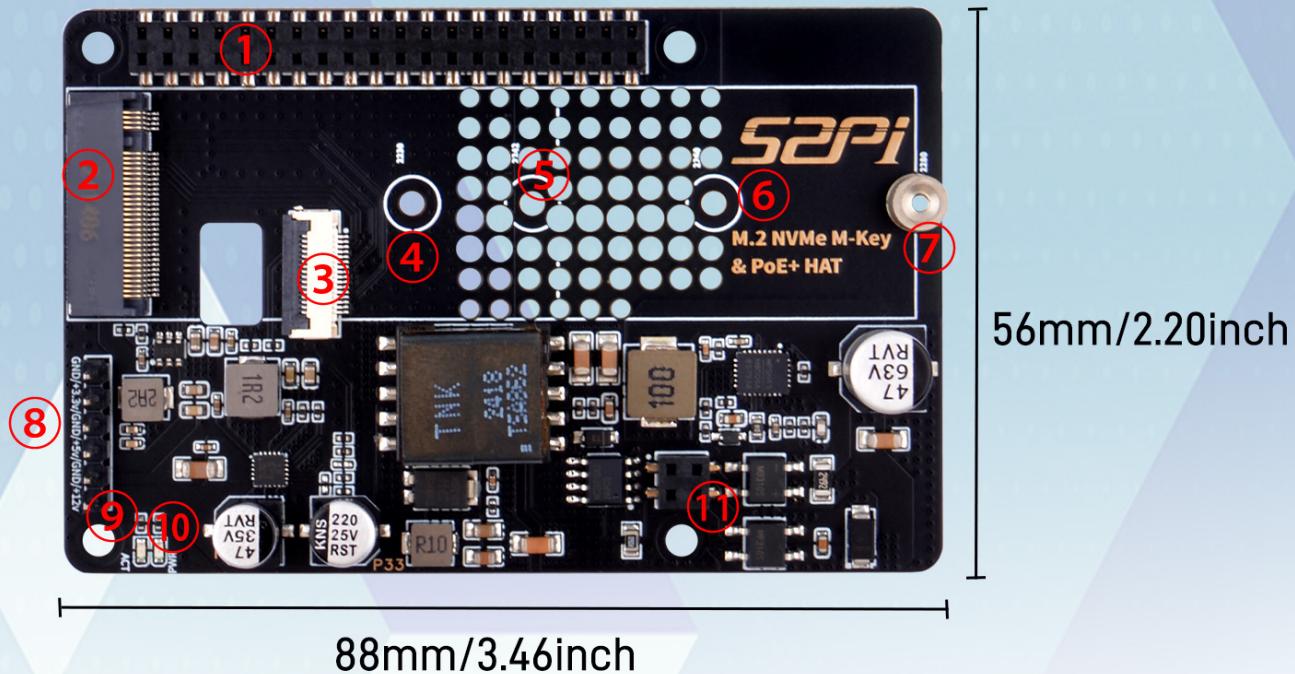


## Specifications

Interface:	M.2 NVME M-key
Power Input:	Ethernet (PoE)
Output Voltage:	5.1V
Output Current:	4.5A
Compatibility:	Raspberry Pi 5

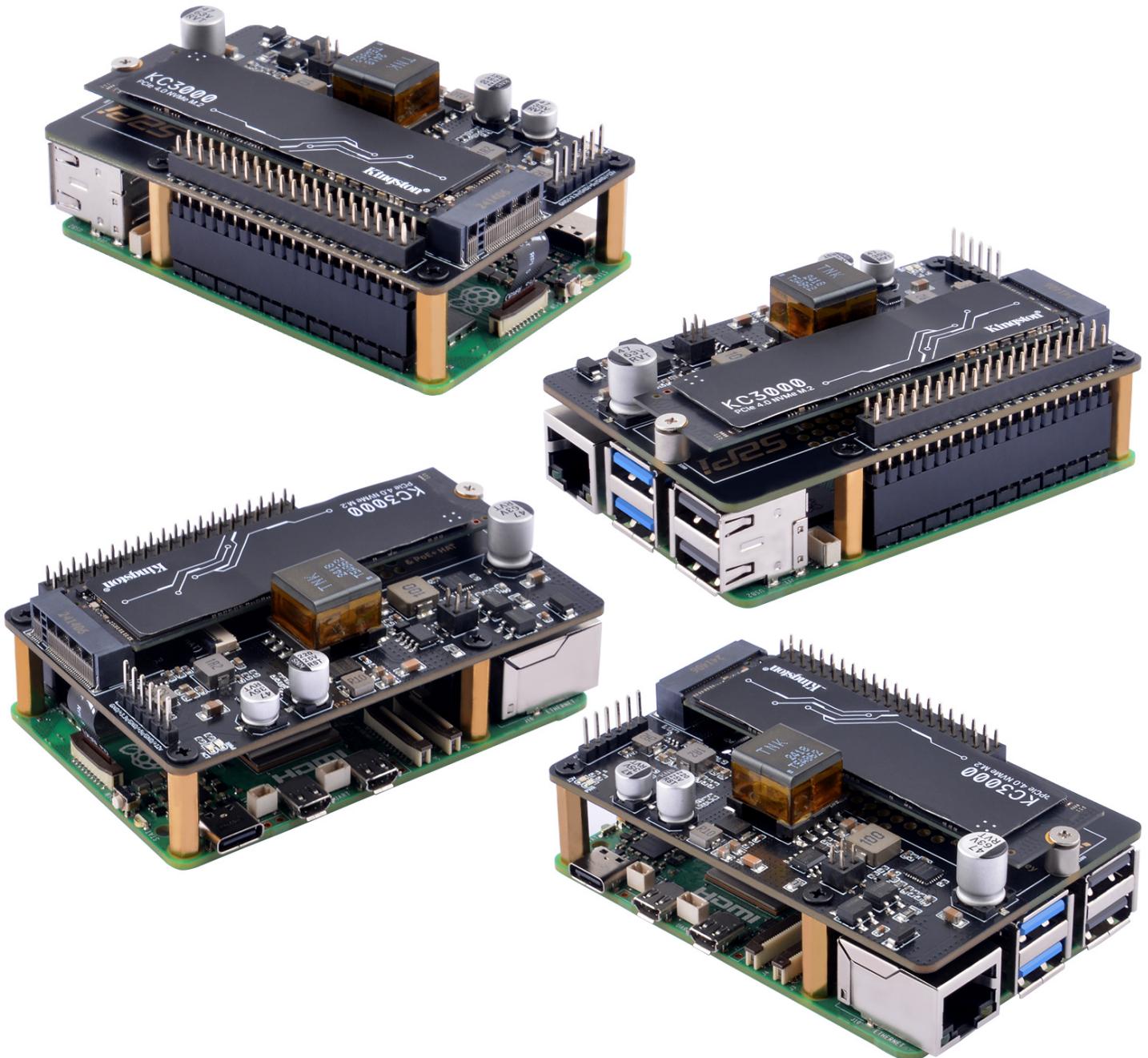
- Definitions on board

# WHAT'S ON THE BOARD ?



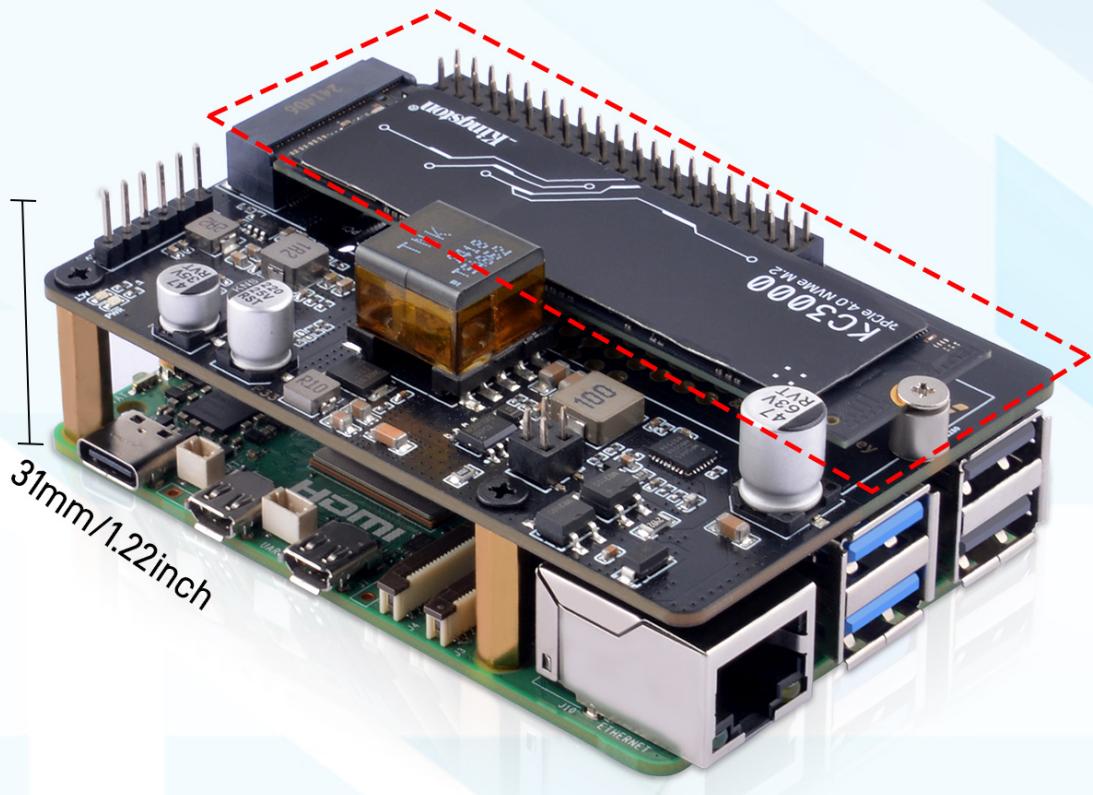
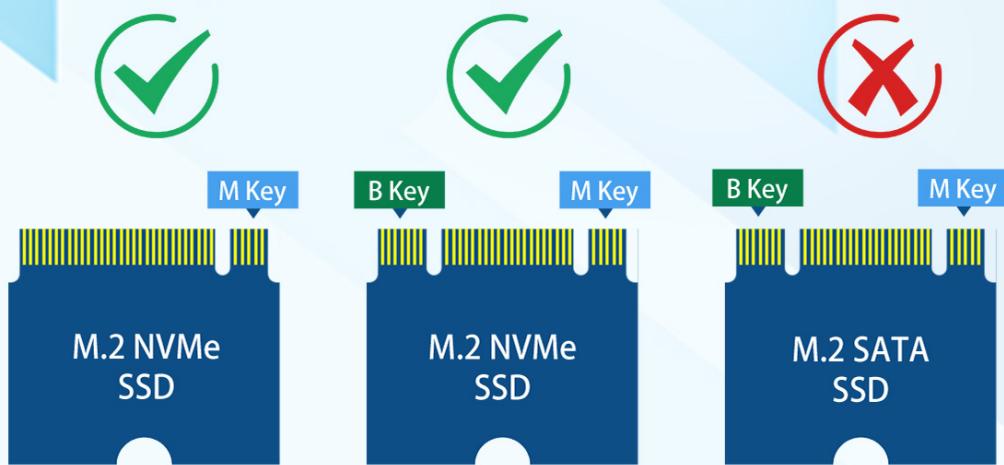
1. 40 Pin GPIO Pin header	7. M.2 NVMe 2280 SSD mounting hole
2. M.2 M-key Sock	8. Power supply Pin (GND/3.3V/GND/+5V/GND/+12V)
3. PCIe sock	9. Active LED indicator
4. M.2 NVMe 2230 SSD mounting hole	10. Power status LED indicator
5. M.2 NVMe 2242 SSD mounting hole	11. PoE Power header (4Pin header)
6. M.2 NVMe 2260 SSD mounting hole	

- Application scenario

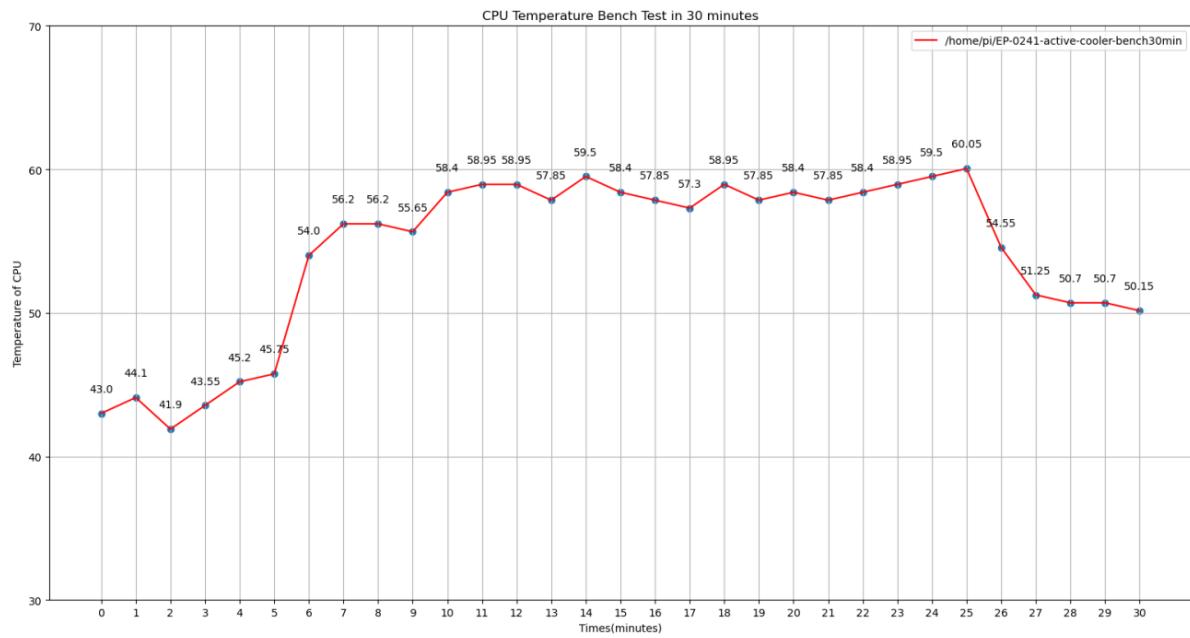


- Supported M.2 NVMe SSD types

# Supported M.2 NVMe SSD Types



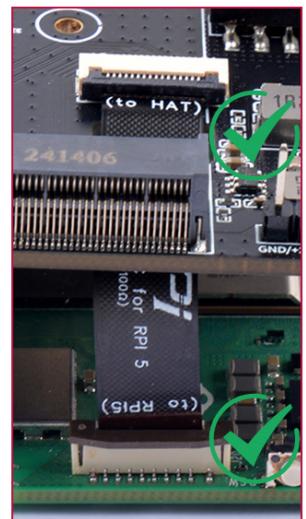
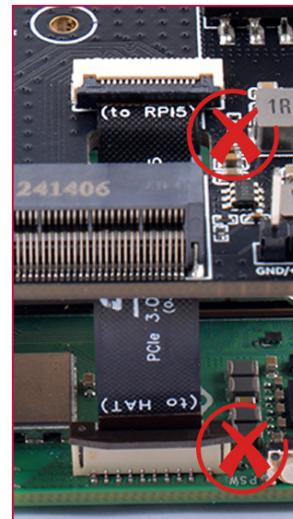
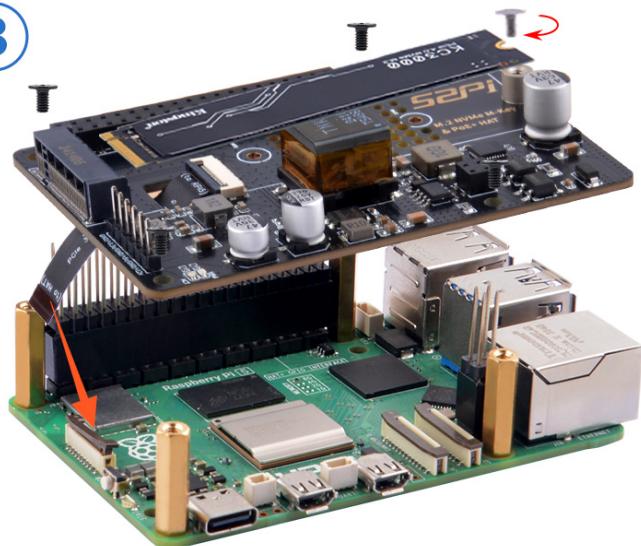
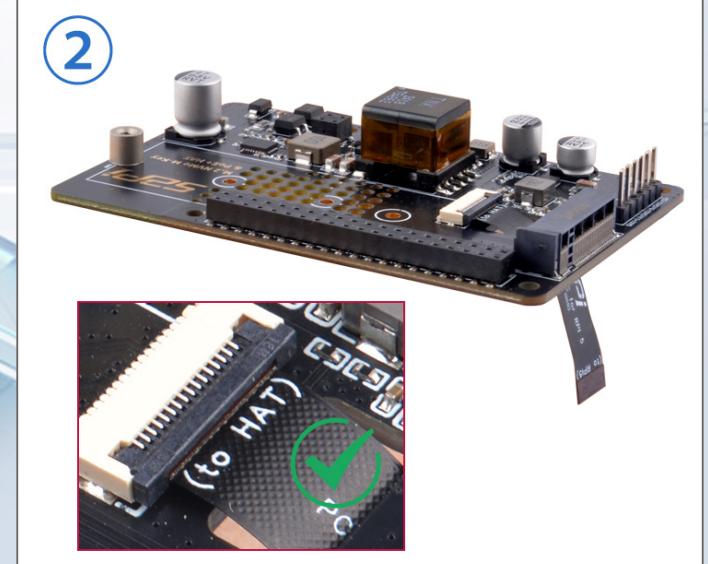
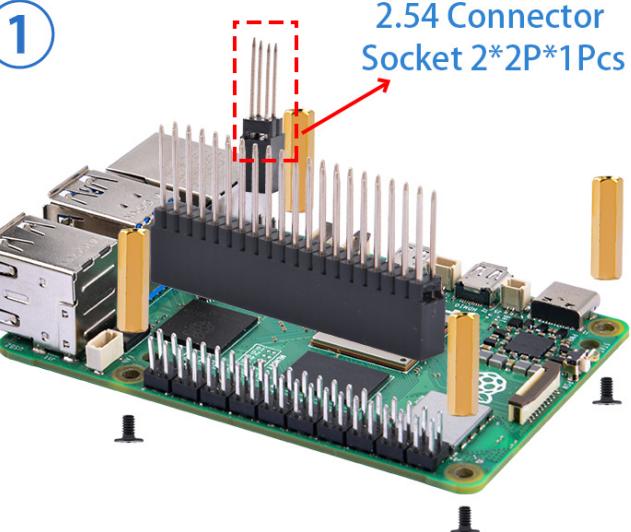
- Heat dissipation effect with active cooler



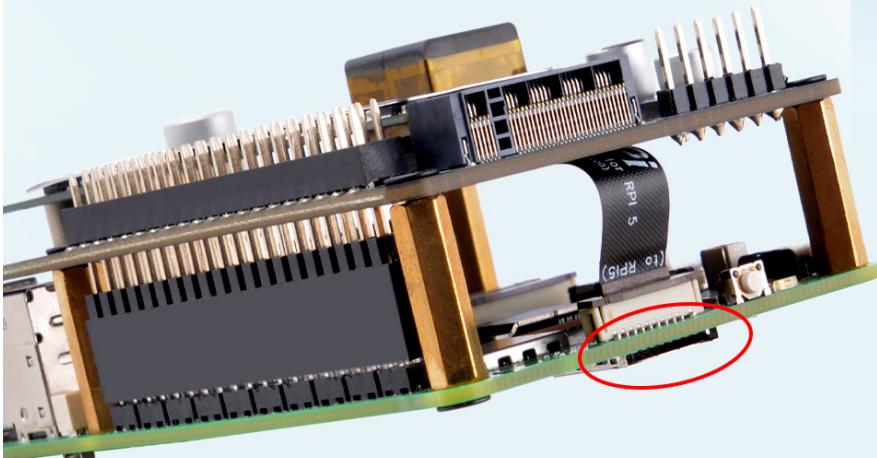
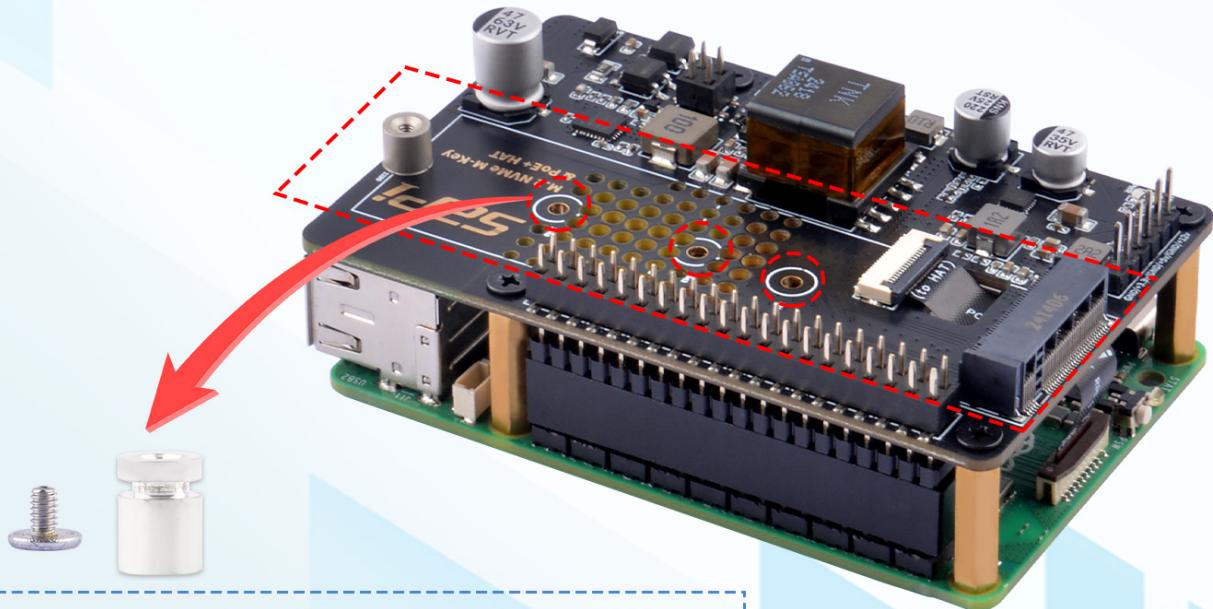
## How to assemble it?

- Please assemble it according to following figure.

# INSTALLATION STEPS

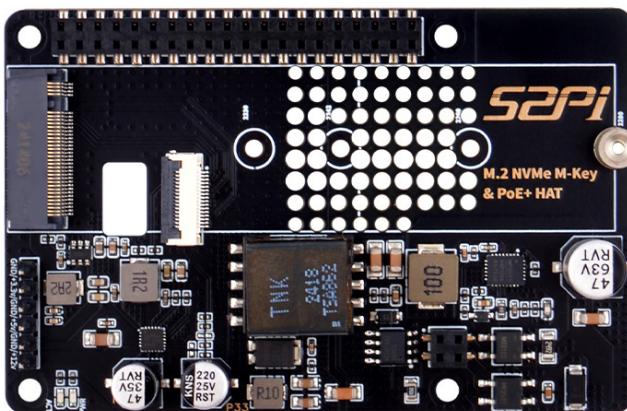


**NOTE: Raspberry Pi 5 and M.2 Peripheral does not include in the package.**



## Package Includes

# PACKAGE INCLUDES



P33 M.2 NVMe 2280 PoE+HAT



M2/1.5+5 Hard drive copper pillars



M2\*3 Flat head screw



M2.5\*4mm Flat head screw



M2.5\*17 mm Double-pass copper pillar



8.5\*40mm PCIe FFC cable



40Pin PC104 Pin Header



2.54 Connector  
Socket 2\*2P\*1PcS



Screw driver

## How to enable PCIe on Raspberry Pi 5?

- Modify /boot/firmware/config.txt and adding following parameters:

```
dtparam=pcie=1
```

And the connection is certified for Gen 2.0 speed (5 GT/sec), but you can force it to Gen 3.0 (10 GT/sec) if you add the following line after:

```
dtparam=pcie=1_gen=3
```

You can run devices at PCIe Gen 3.0 speeds if you test and they run stable.

- Enable auto detection PCIe and booting from NVME.

```
sudo rpi-eeprom-config --edit
```

Adding following parts:

```
PCIE_PROBE=1
BOOT_ORDER=0xf416
```

The 6 means to enable booting from nvme. Reboot Raspberry Pi 5 and try to use `lsblk` or `lspci -vvv` to get more details of the PCIe device.

- Partitioning and formatting

```
sudo lsblk
```

Find out the deivce name like: `/dev/nvme0n1` Partitioning by executing following commands:

```
sudo fdisk /dev/nvme0n1
```

and then input:

```
> p
> n
> p
> 1
> Enter
> Enter
> w
> q
* Format the partition
<pre>
sudo mkfs.ext4 /dev/nvme0n1p1
```

- Create mounting point and mounting the partion to the mounting point.

```
mkdir ~/mydata
sudo mount -t ext4 /dev/nvme0n1p1 /home/pi/mydata -v
```

- Automount configuration, edit /etc/fstab file and adding following parameters:

```
sudo vim.tiny /etc/fstab
```

adding:

```
/dev/nvme0n1p1      /home/pi/mydata    ext4    defaults,noatime  0  0
```

Save it and test it:

```
sudo mount -a
df -Th
```

check if the disk has been mounted on /home/pi/mydata location, if not, plesae check if the parameter is correct, do not reboot raspberry pi right now. it may crash the OS.

## Keywords

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- M.2 NVME M-key & PoE+ Hat for Raspberry Pi 5
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