

UPGRADING FROM A SATA 2.5-IN. SSD TO AN M.2 NVME SSD

by Francis Chao
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TuCS COMPUTER
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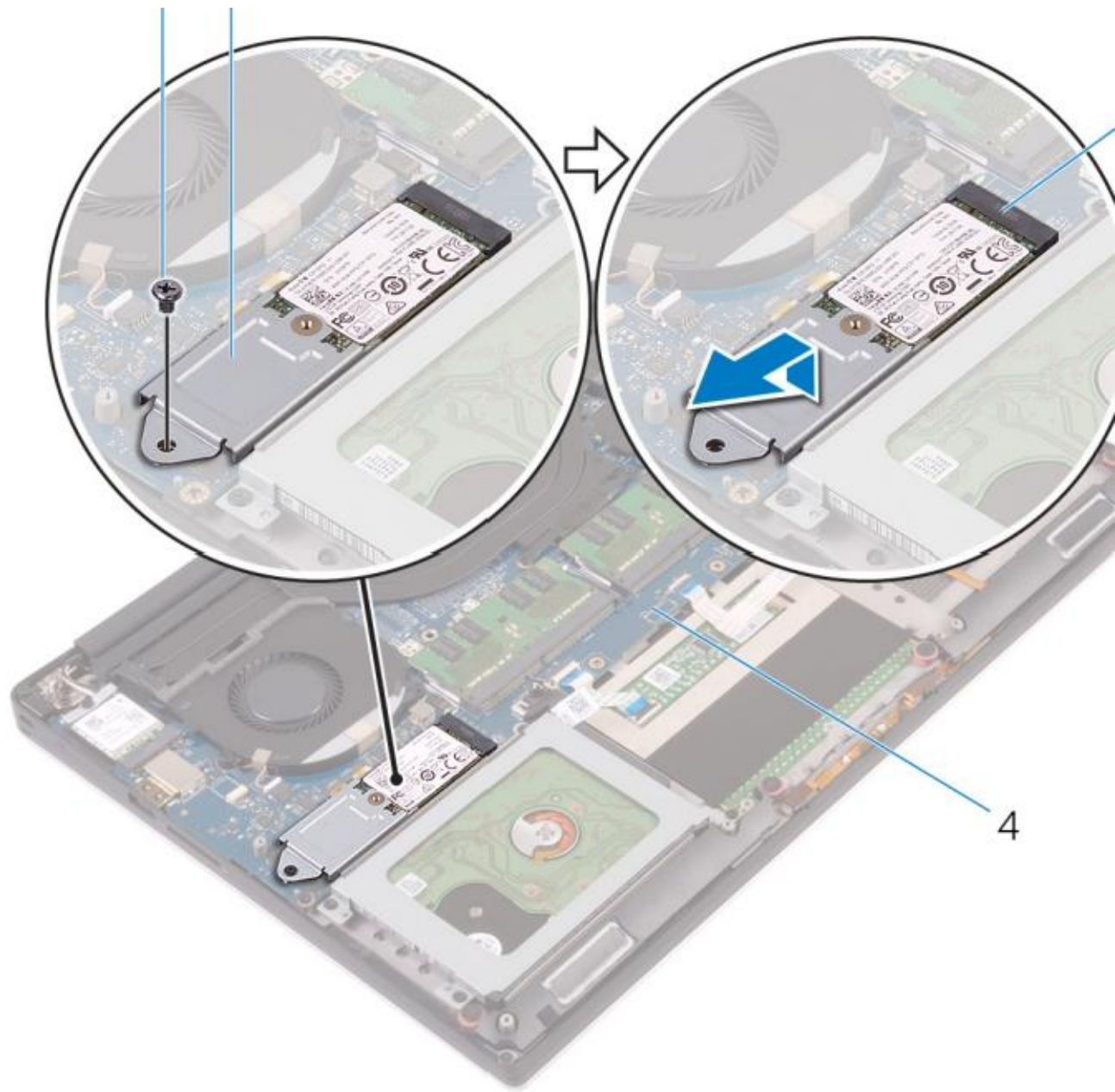
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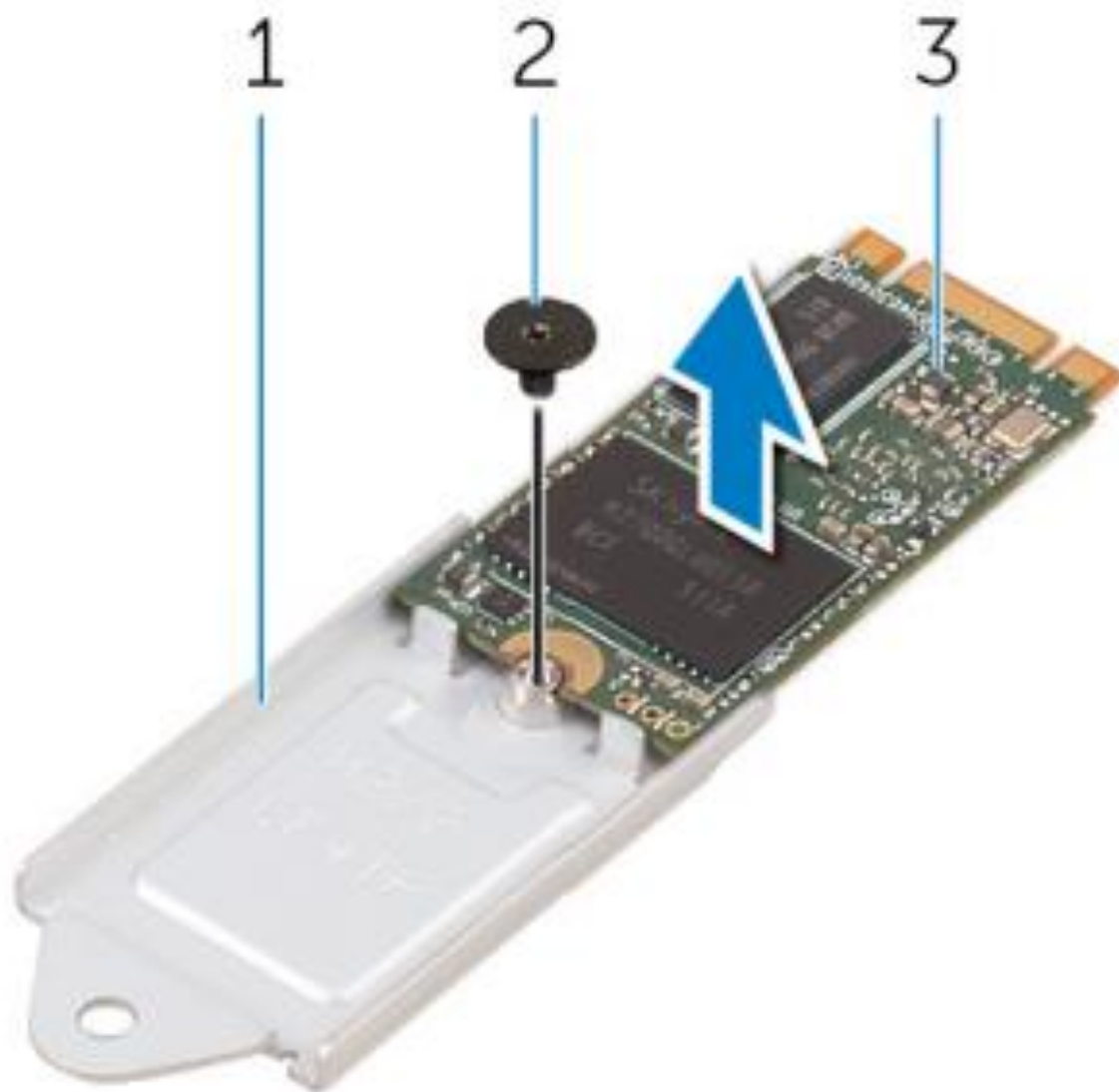
<http://aztcs.apcug.org>

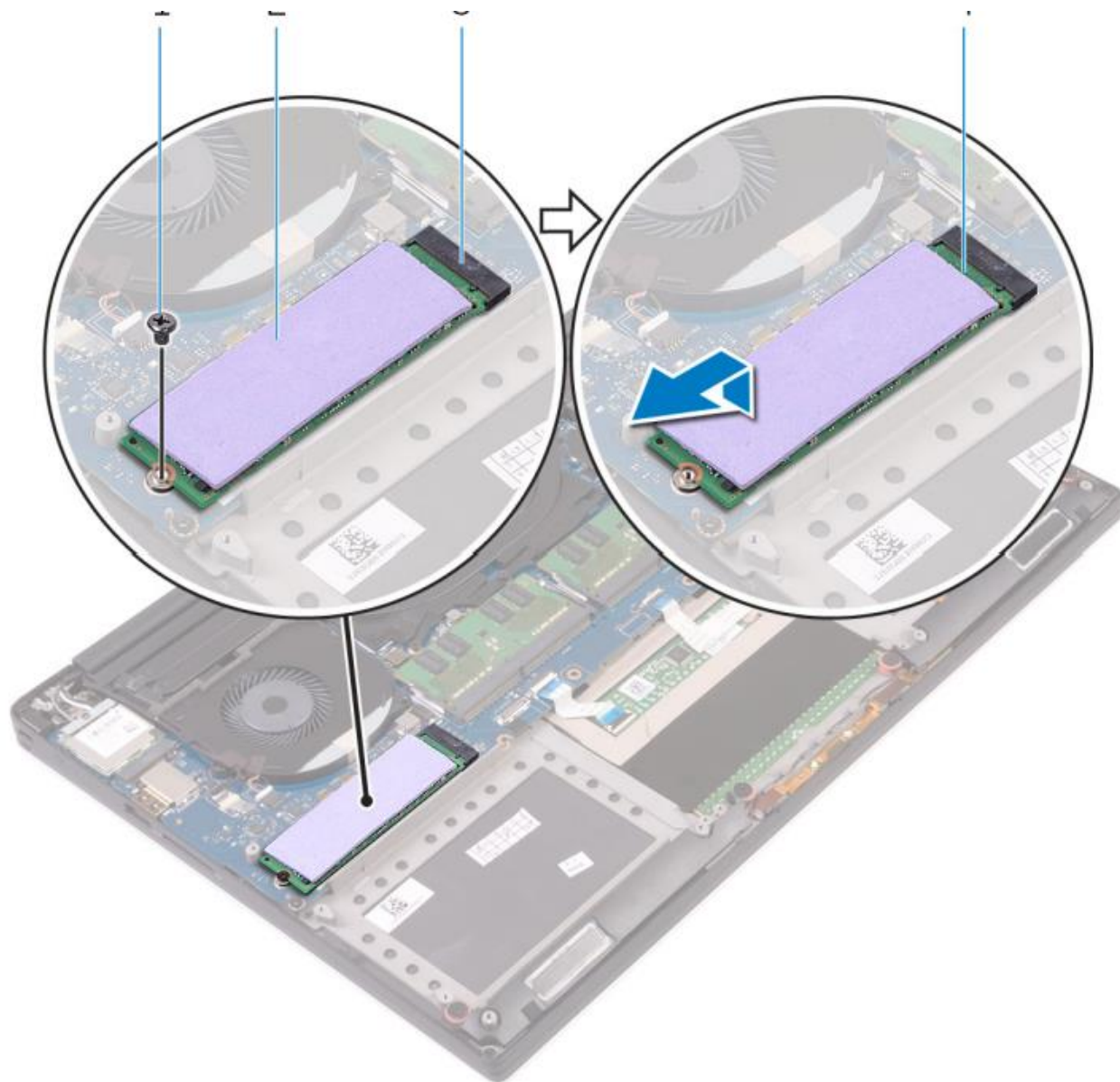
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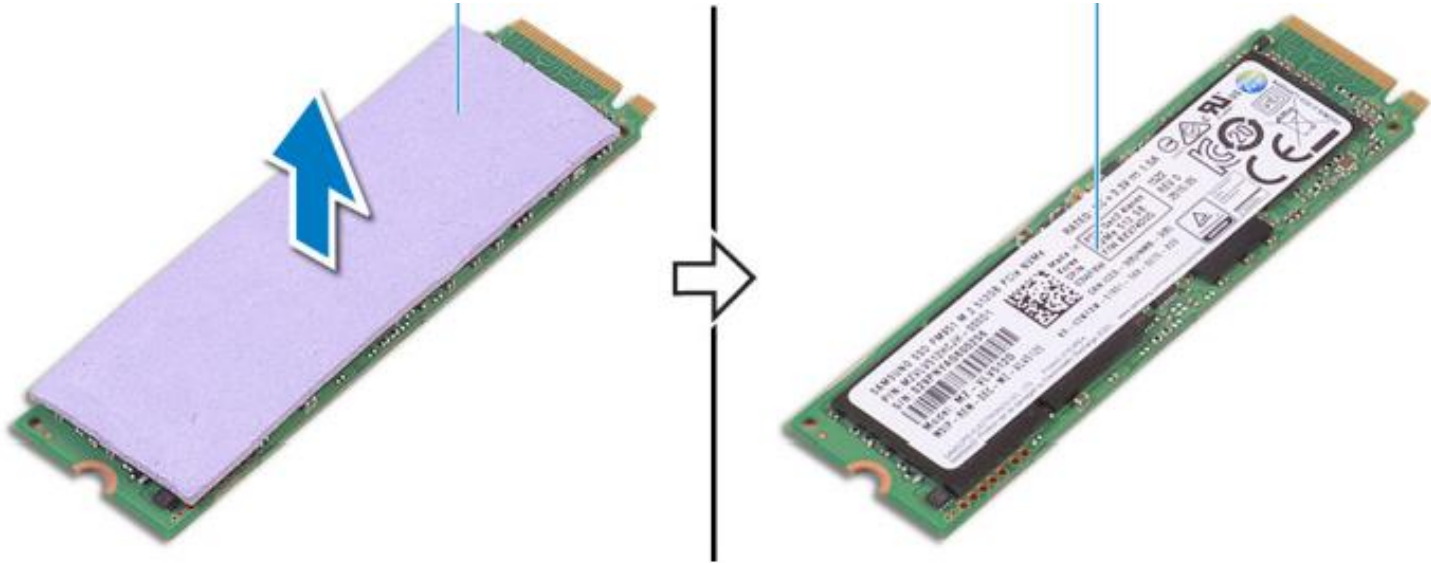


Figure 12. Removing the thermal pad

1 thermal pad

2 solid-state drive

M.2 NVME SSD ADVICE

- Original 3 1/2-inch SATA hard drives compared to the M.2 SSDs
- Speed advantages of M.2 SATA SSDs over M.2 NVME SSDs
- S.M.A.R.T. temperature readings can reveal problems such as speed throttling caused by overheating M.2 SSDs
- Passive heat sinks and silicon rubber pads are sometimes adequate for

M.2 NVME SSD ADVICE (continued)

- Passive heat sinks and silicon rubber pads are sometimes adequate for heat dissipation
- Fan-based active M.2 cooling devices are often required for heat dissipation of M.2 SSDs

M.2 NVME SSD ADVICE (continued)

- Most computers that we added M.2 SSDs to did not provide enough space for passive heat sinks and/or fan-based heat sinks for M.2 SSDs. We ended up using M.2 extension adapters to resolve these deficiencies.

M.2 NVME SSD ADVICE (continued)

- All of the external M.2 enclosures that we tested cause their enclosed M.2 SSDs to overheat. Because of this, fan-based heat sinks to both internal M.2 SSDs and M.2 SSDs inside external M.2 enclosures.

M.2 NVME SSD ADVICE (continued)

- NVME

=

Non-Volatile Memory Host Controller
Interface Specification

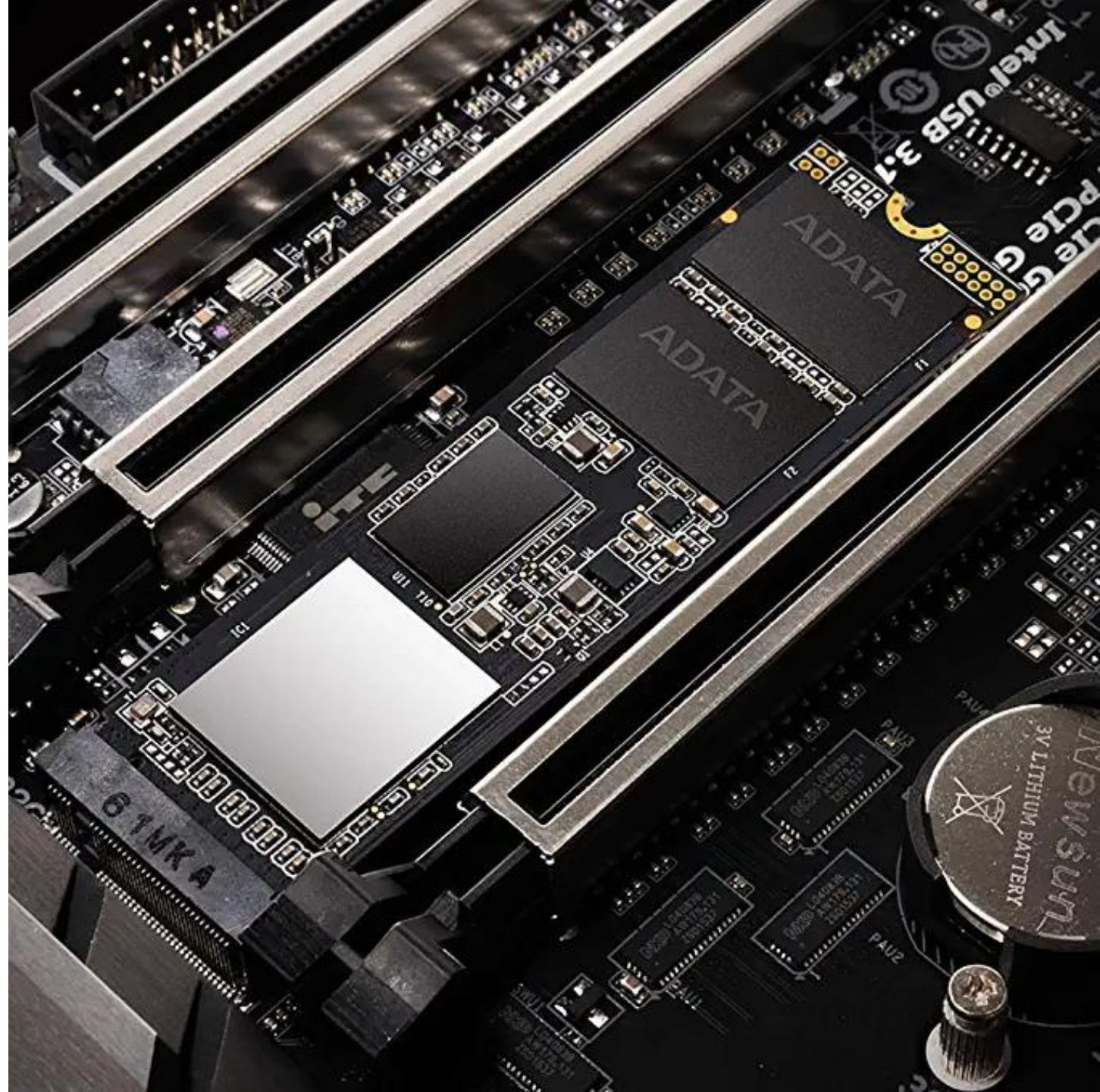
(for SSDs; not for RAM modules)

- https://en.wikipedia.org/wiki/NVM_Express

"ADATA" M.2 NVME SSD

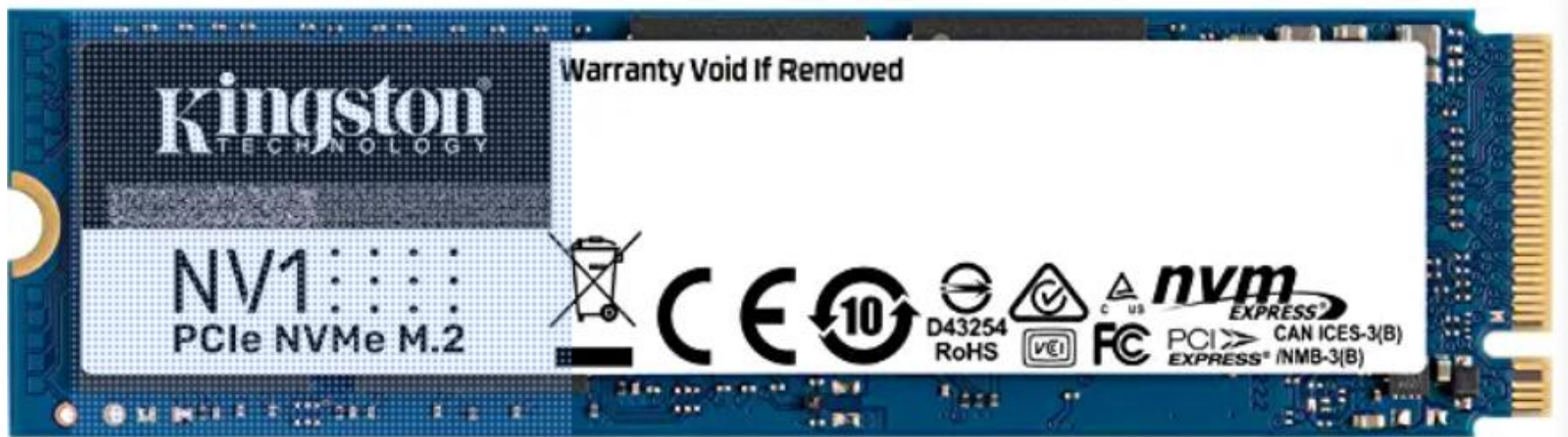
https://www.amazon.com/XPG-SX8200-Gen3x4-3000MB-ASX8200PNP-1TT-C/dp/B07TY2TN64/ref=sr_1_6?crid=2FZX A4S5MGRXR&keywords=adata%2Basx8200&qid=1663467565&s=electronics&prefix=adata%2Basx8200%2Celectronics%2C144&sr=1-6&th=1





KINGSTON M.2 NVME SSD

https://www.amazon.com/Kingston-2280-Internal-SNVS-2000G/dp/B091BG4HDW/ref=sr_1_3?crid=23FE2PCNX5KDP&keywords=kingston%2Bm.2%2Bnvme%2B2tb&qid=1663557698&prefix=kingston%2Bm.2%2Bnvme%2B2%2Btb%2Caps%2C113&sr=8-3&th=1



SINTECH M.2 EXTENDER

https://www.amazon.com/Sintech-M-Key-Extension-Cable-20CMS/dp/B07DZCCGJN/ref=sr_1_4?crid=2YDO0BAZU3B7Y&keywords=m.2+extender&qid=1663476084&sprefix=m.2+extender%2Caps%2C118&sr=8-4

Kingston NV1
2TB M.2 2280
NVMe PCIe
Internal SSD Up
to 2100 MB/s
SNVS/2000G

[Visit the Kingston Store](#)

★★★★☆ ▾ 8,043
ratings

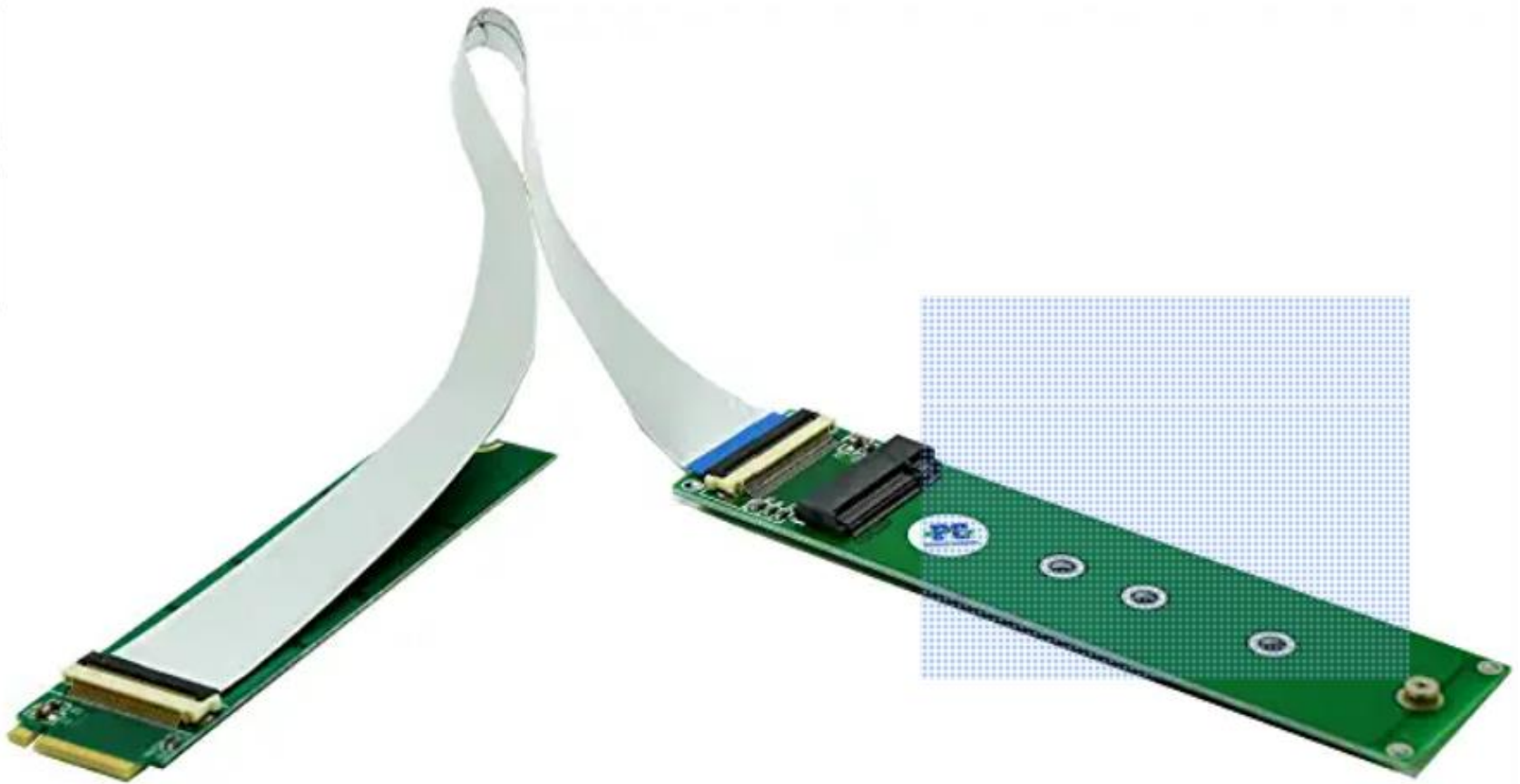
| 72 answered questions

Amazon's **Choice** for "kingst

-30% \$139⁹⁹

List Price: ~~\$199.99~~ ⓘ

& **FREE Returns** ▾



Sintech M.2
NVME
Extender, NGFF M-
Key PCIe SSD
Extension Card
with Anti-
electromagnetic
Foiled Cable
20CMS (Silver
Cable)

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★★★★☆ ∨ [32 ratings](#)

ACIDALIE M.2 HEATSINK WITH FAN

https://www.amazon.com/ACIDALIE-Heatsink-Cooler-Pcie-Cooling/dp/B09L6FGDY3/ref=sr_1_98?crid=37TVULJ4D47JY&keywords=m.2+cooler&qid=1663476575&sprefix=m.2+cooler%2Caps%2C122&sr=8-98



ACIDALIE M.2 Heatsink,SSD Cooler for Pcie NVMe or SATA M2 2280 SSD Cooling with Fan

Brand: ACIDALIE



28 ratings | 4 answered questions

\$29⁹⁹

POWER SUPPLY FOR AN M.2 COOLER THAT HAS A FAN

TWO OPTIONS:

Option 1:

Fan power supply

(with a "PWM" plug = "2501 plug")

Option 2:

Power supply portion of a powered

USB-to-SATA adapter

and

a Molex to PWM adapter₂₄

POWER SUPPLY FOR AN M.2 COOLER THAT HAS A FAN

OPTION 1 DETAILS:

Fan power supply

(with a "PWM" plug = "2501 plug")

POWER SUPPLY FOR AN M.2 COOLER THAT HAS A FAN OPTION 1 DETAILS:

https://www.amazon.com/Coolerguys-Power-Supply-Length-Multi-Functional/dp/B084JG4619/ref=sr_1_3?crid=372EVOUIAPJ0B&keywords=%22COOLERGUYSS%22+POWER+SUPPLY&qid=1663822175&srefix=coolerguys+power+supply%2Caps%2C98&sr=8-3



Coolerguys 12V
Fan Power
Supply, Length:
5ft, Input Power:
100-240vAC,
Output Power:
12vDC Volts,
Multi-Functional,
Highly
Compatible

[Visit the coolerguys Store](#)

★★★★★ ∨ 466 ratings

| 8 answered questions

\$7⁹⁹

POWER SUPPLY FOR AN M.2 COOLER THAT HAS A FAN

OPTION 2 DETAILS:

Power supply portion of a powered
USB-to-SATA adapter
and
a Molex to PWM adapter

POWER SUPPLY FOR AN M.2 COOLER THAT HAS A FAN

OPTION 2 DETAILS (continued):

Power supply portion of a powered
USB-to-SATA adapter:

https://www.amazon.com/dp/B00BIE996S?psc=1&ref=ppx_yo2ov_dt_b_product_details

POWER SUPPLY FOR AN M.2 COOLER THAT HAS A FAN

OPTION 2 DETAILS (continued)

Power supply portion of a powered
USB-to-SATA adapter:

https://www.amazon.com/dp/B00BIE996S?psc=1&ref=ppx_yo2ov_dt_b_product_details

POWER SUPPLY FOR AN M.2 COOLER THAT HAS A FAN

TWO OPTIONS:

OPTIONS 2 DETAILS (continued):

..and a Molex to PWM 2510 extension
cable:

[https://www.amazon.com/gp/product/
B08TR61LDH/ref=ppx_yo_dt_b_sear
ch_asin_title?ie=UTF8&psc=1](https://www.amazon.com/gp/product/B08TR61LDH/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1)

LENTION USB-C TO M.2 ENCLOSURE

https://www.amazon.com/LENTION-Enclosure-Adapter-Supports-Compatible/dp/B09JCBNWXV/ref=sr_1_35?crid=1M2QPDQHRDVA5&keywords=m.2+enclosure&qid=1663476881&srefix=m.2+enclosure%2Caps%2C115&sr=8-35







LENTION USB C to NVMe &
SATA M.2 SSD Enclosure, USB
3.1 Gen 2 M Key & B&M Key
Hard Drive Adapter, Supports
UASP for SSD Size
2280/2260/2242/2230,
Compatible Mac OS, Windows,
Linux, More(CB-C9b, Black)

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★★★★★ ∨ 16 ratings

-15% \$22⁹⁹

Was: ~~\$26.99~~ ⓘ

A USB-C CABLE WITH AN E-MARKER
CHIP MIGHT BE NEEDED IF YOU WISH
TO HAVE A 6 TO 15 FOOT CABLE FOR
THE M.2 SSD ENCLOSURE

https://www.amazon.com/gp/product/B08F9LYNV9/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&psc=1






USB C to C Cable [4.5m/14.8FT], RIITOP USB 3.1 Type-C (Gen 2) Long Cable SuperSpeed 10Gbps 20V 5A Charging Cord with E- Marker Chipset Compatible with Gaming Box, Digital Camera, Oculus Quest 2 Link

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ONE OR MORE PWM FAN EXTENSION
CABLES MIGHT BE NEEDED TO
CONNECT THE M.2 COOLER TO THE
M.2 POWER SUPPLY:

<https://www.amazon.com/Noctua-NA-SEC1-chromax-Green-Extension-Cables/dp/B07656CD2F/>



Noctua NA-SEC1
chromax.Green, 3.
Pin/4-Pin
Extension Cables
(30cm, Green)

[Visit the Noctua Store](#)



34 ratings

\$9⁹⁵

USE A 3 X 5-IN. PLASTIC BOX TO
STORE THE M.2 SSD AND M.2
COOLER ASSEMBLY WHEN IT IS NOT
IN USE

[https://www.amazon.com/Filexec-
Products-Inches-Index-50306-
20233/dp/B00974KTCE/](https://www.amazon.com/Filexec-Products-Inches-Index-50306-20233/dp/B00974KTCE/)



Filexec Products 3 x 5 Inches Index Card Case, Clear, Pack of 2 (50306-20233)

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237 ratings

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PROTECT THE M.2 FAN AND M.2 SSD
WHEN STORING IT IN A BOX

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B07CQMRD8F/ref=ppx_yo_dt_b_sea
rch_asin_title?ie=UTF8&th=1](https://www.amazon.com/gp/product/B07CQMRD8F/ref=ppx_yo_dt_b_search_asin_title?ie=UTF8&th=1)



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inch, Premium
Anti Static Bag
for SSD HDD and
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★★★★★ ∨ 523 ratings

| 4 answered questions

\$9⁴⁵

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