

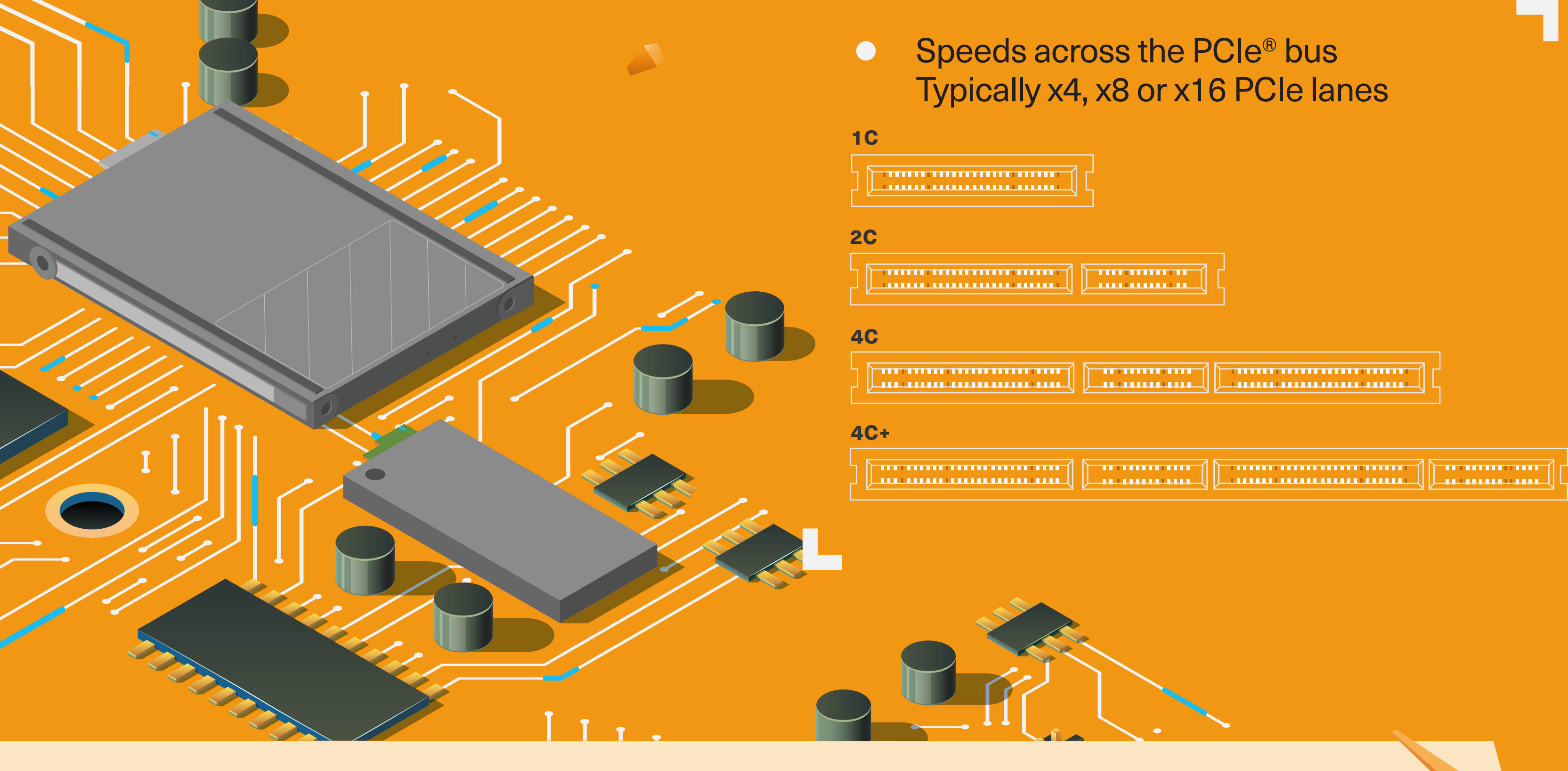
Enterprise and Datacenter Standard Form Factor (EDSFF)

KIOXIA

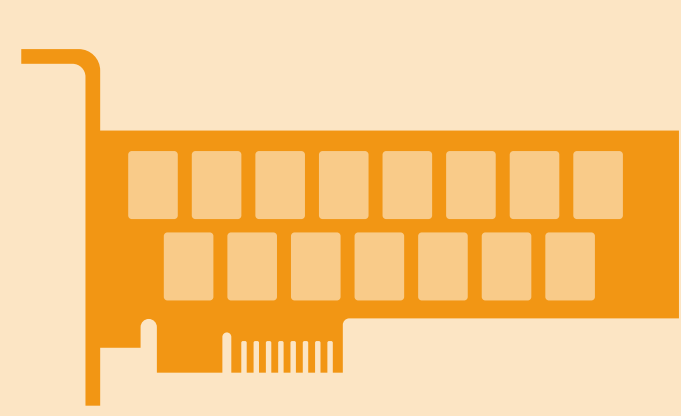
for NVMe Express™ SSDs

What is an NVMe Express™ (NVMe™) SSD?

- Speaks NVMe commands
Built on the NVMe Express base specification
- Speeds across the PCIe® bus
Typically x4, x8 or x16 PCIe lanes

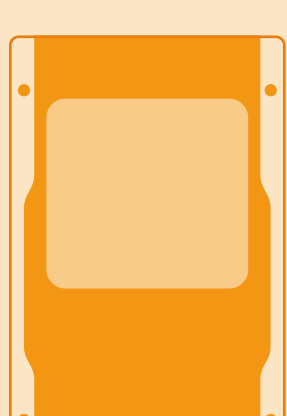


Form Factor Evolution of SSDs



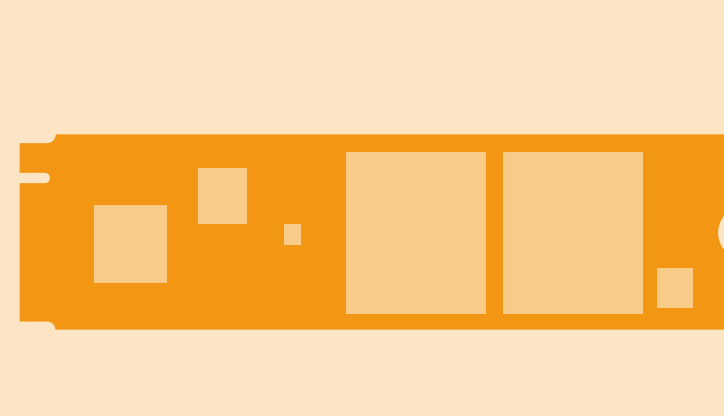
Add-in Card (AIC)

High Performance Storage
Server Accelerator



2.5-inch (U.2)

Data Storage
Cache
Client, Servers, Storage



M.2 (2242, 2280, 22110)

Data Storage
Boot
Client, Servers



BGA (16x20mm) M.2 (2230)

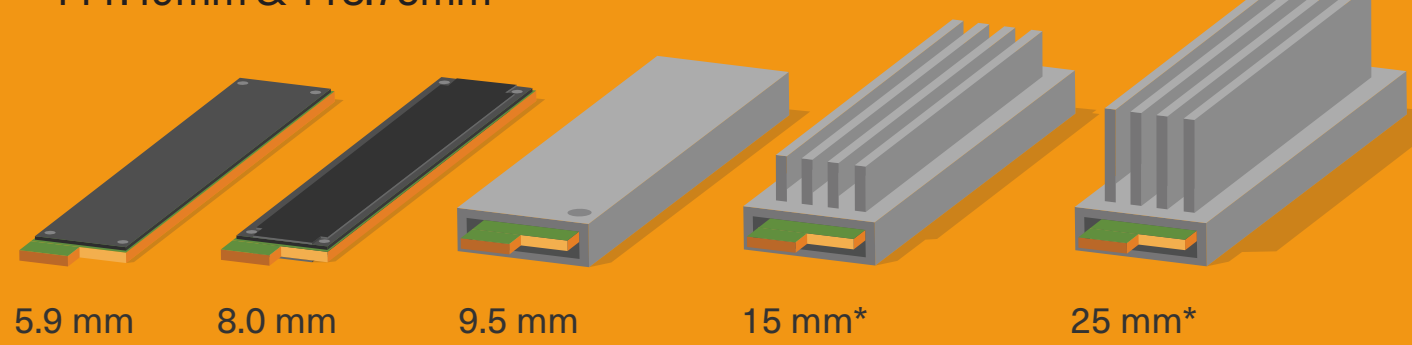
Data Storage
Boot
Laptop, Tablet

EDSFF: Form Factors for the Next Generation Hyperscale and Enterprise Data Centers

E1 – Hyperscale Servers & Storage

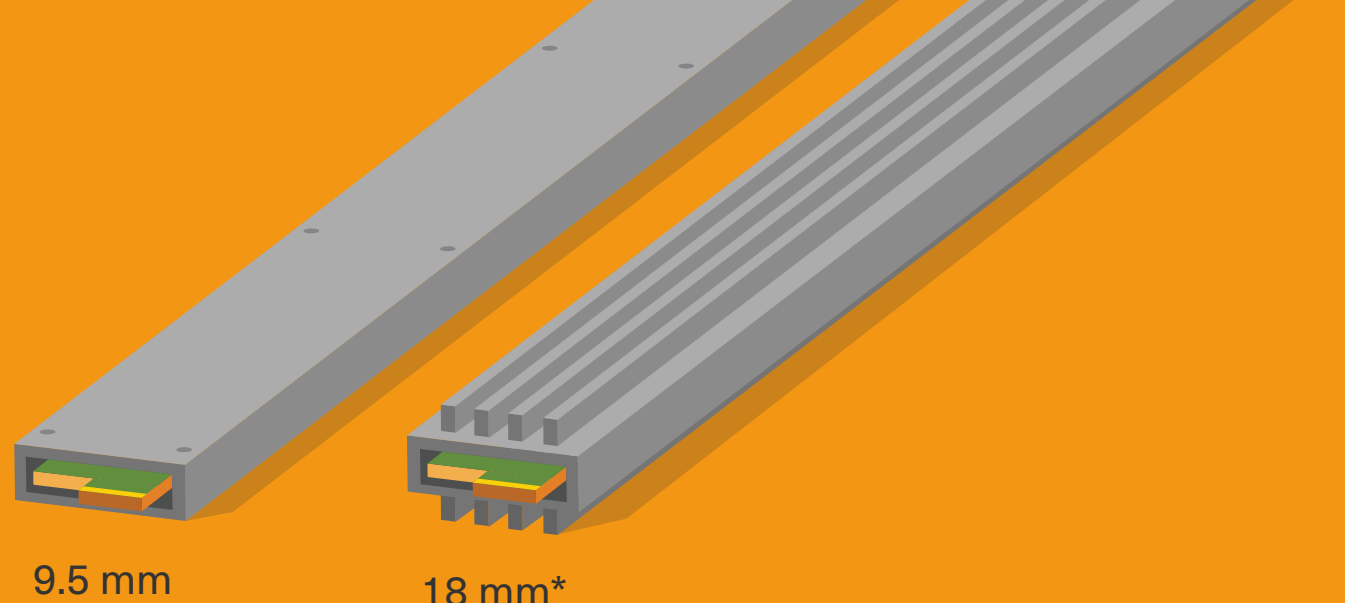
E1.S

111.49mm & 118.75mm



E1.L

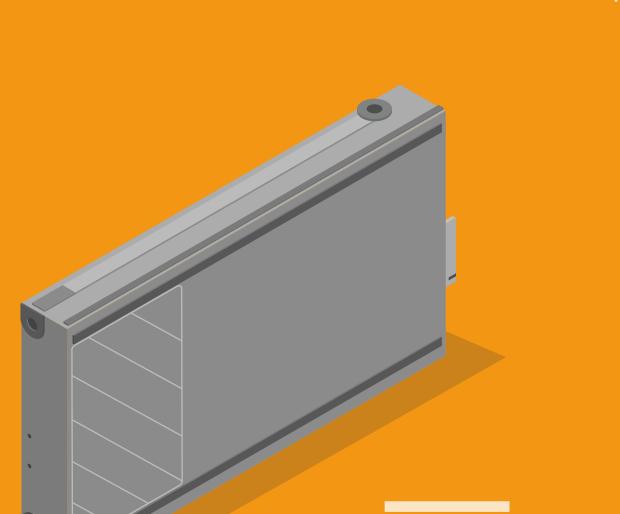
318.75 mm



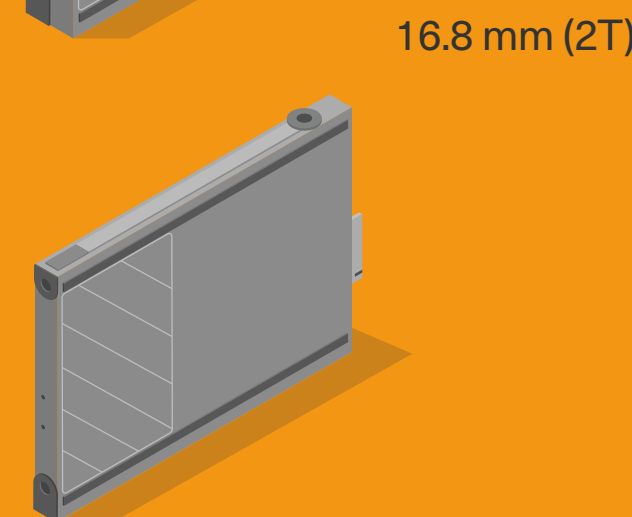
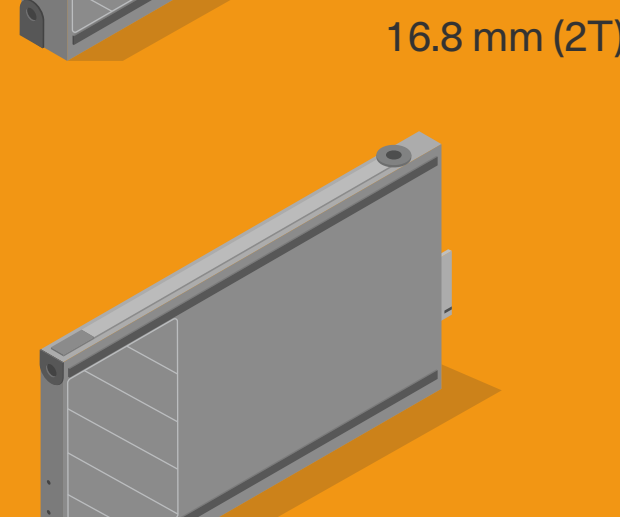
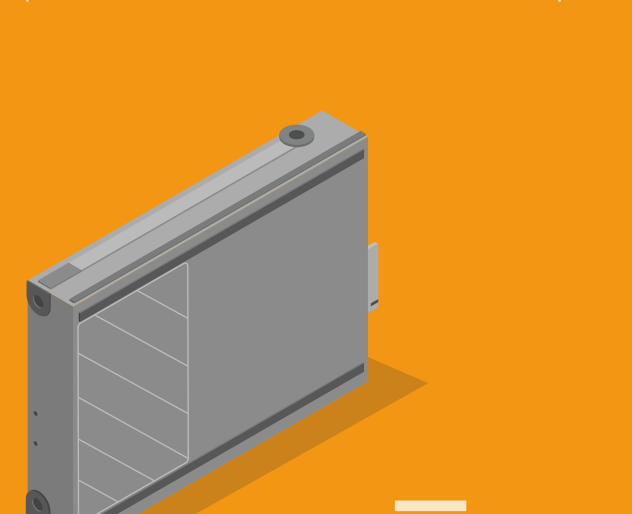
*Heat sinks increases height.

E3 – Enterprise Servers & Storage

E3.L 142.2 mm

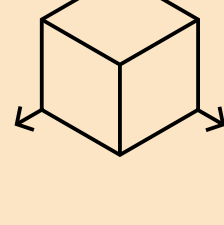


E3.S 112.75 mm



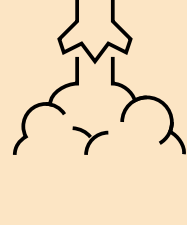
Individual dimensions indicate the device thickness.

Benefits of EDSFF SSDs



Flexibility

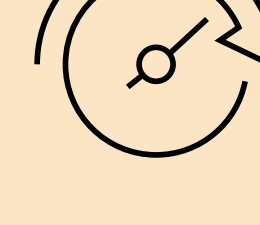
EDSFF connector design is compliant to the same connector standard specification across all EDSFF configurations, and it can be used without limitation on the number of lanes and is flexible to chassis and backplane designs.



Powerful

EDSFF is design to support higher power up to 70W*, delivering superior performance, while 2.5-inch SSDs using the SFF-8639 connector typically max out at 25W.

*The design value of maximum power depends on the device.



Higher Performance

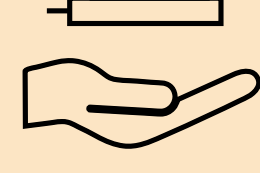
EDSFF can support up to 4x higher performance in a 4C configuration with 16 lanes and 2x higher performance in a 2C configuration with 8 lanes than a 4 lane 2.5-inch SSD (U.2 or U.3).*

*The number of lanes depends on the device. As of March 2023, KIOXIA does not support SSDs beyond PCIe® x4 lanes.



Efficient

The EDSFF is designed with efficient use of space and surface area, improving thermal dissipation and allowing for higher density chassis.



Versatile

EDSFF is designed to support other PCIe® devices, such as NICs or accelerators, that can be used in the same chassis not limited to SSDs.

E1.S

KIOXIA XD6 Series Data Center NVMe™ SSD

- OCP NVMe Cloud SSD 1.0a supported
- NVMe 1.3c and PCIe® 4.0 specification compliant
- 1.92 TB and 3.84 TB capacities
- 1 DWPD endurance



9.5 mm



15 mm



25 mm

KIOXIA XD7P Series Data Center NVMe™ SSD

- OCP Datacenter NVMe™ SSD 2.0 supported
- NVMe 2.0 and PCIe® 4.0 specification compliant
- 1.92 TB, 3.84 TB and 7.68 TB capacities
- 1 DWPD endurance



9.5 mm



15 mm



25 mm



E3.S

KIOXIA CD7 Series Data Center NVMe SSD

- Designed to PCIe® 5.0 specification
- NVMe 1.4 specification compliant
- 1.92 TB, 3.84 TB and 7.68 TB capacities
- 1 DWPD endurance



E3.S

KIOXIA CM7 Series Enterprise NVMe SSD

- PCIe® 5.0, NVMe 1.4 specification compliant
- 1.6 TB to 15.36 TB capacities
- 1 and 3 DWPD endurance

Where to Find More on EDSFF?

Open Compute Project Datacenter NVMe SSD specification

<https://www.opencompute.org/wiki/Storage#Documents>

SNIA SSD Form Factors Web Page

<https://www.snia.org/forums/cmsi/knowledge/formfactors>

E1.S & E1.L

SNIA SFF-TA-1002 – Protocol Agnostic Multi-lane High Speed Connector
 SNIA SFF-TA-1006 – Enterprise and Datacenter 1U Short Device Form Factor (E1.S)
 SNIA SFF-TA-1007 – Enterprise and Datacenter 1U Long Device Form Factor (E1.L)
 SNIA SFF-TA-1009 – Enterprise and Datacenter Standard Form Factor Pin and Signal Specification
 SNIA REF-TA-1012 – Pin Assignment Reference for SFF-TA-1002 Connectors
 SNIA SFF-TA-1023 – Thermal Characterization Specification for EDSFF Devices

E3.S & E3.L

SNIA SFF-TA-1002 – Protocol Agnostic Multi-Lane High Speed Connector
 SNIA SFF-TA-1008 – Enterprise and Datacenter Device Form Factor (E3)
 SNIA SFF-TA-1009 – Enterprise and Datacenter Standard Form Factor Pin and Signal Specification
 SNIA REF-TA-1012 – Pin Assignment Reference for SFF-TA-1002 Connectors
 SNIA SFF-TA-1023 – Thermal Characterization Specification for EDSFF Devices

KIOXIA

In every mention of a KIOXIA product: Definition of capacity - KIOXIA Corporation defines a megabyte (MB) as 1,000,000 bytes, a gigabyte (GB) as 1,000,000,000 bytes and a terabyte (TB) as 1,000,000,000,000 bytes. A computer operating system, however, reports storage capacity using powers of 2 for the definition of 1GB = 2³⁰ bytes = 1,073,741,824 bytes and 1TB = 2⁴⁰ bytes = 1,099,511,627,776 bytes and therefore shows less storage capacity. Available storage capacity (including examples of various media files) will vary based on file size, formatting, settings, software and operating system, and/or pre-installed software applications, or media content. Actual formatted capacity may vary.

Drive Write(s) Per Day, One full drive write per day means the drive can be written and re-written to full capacity once a day, every day, for the specified lifetime. Actual results may vary due to system configuration, usage and other factors.

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