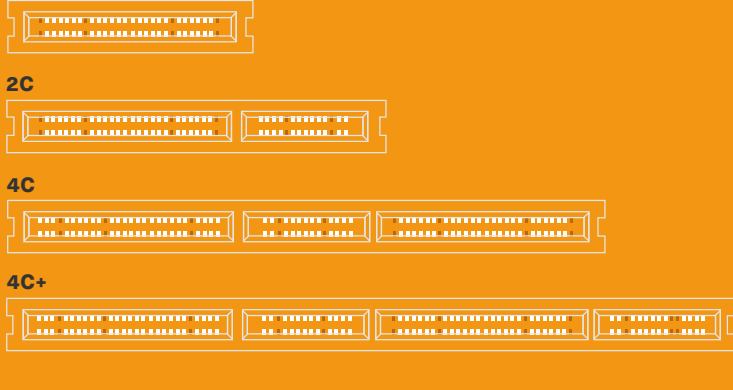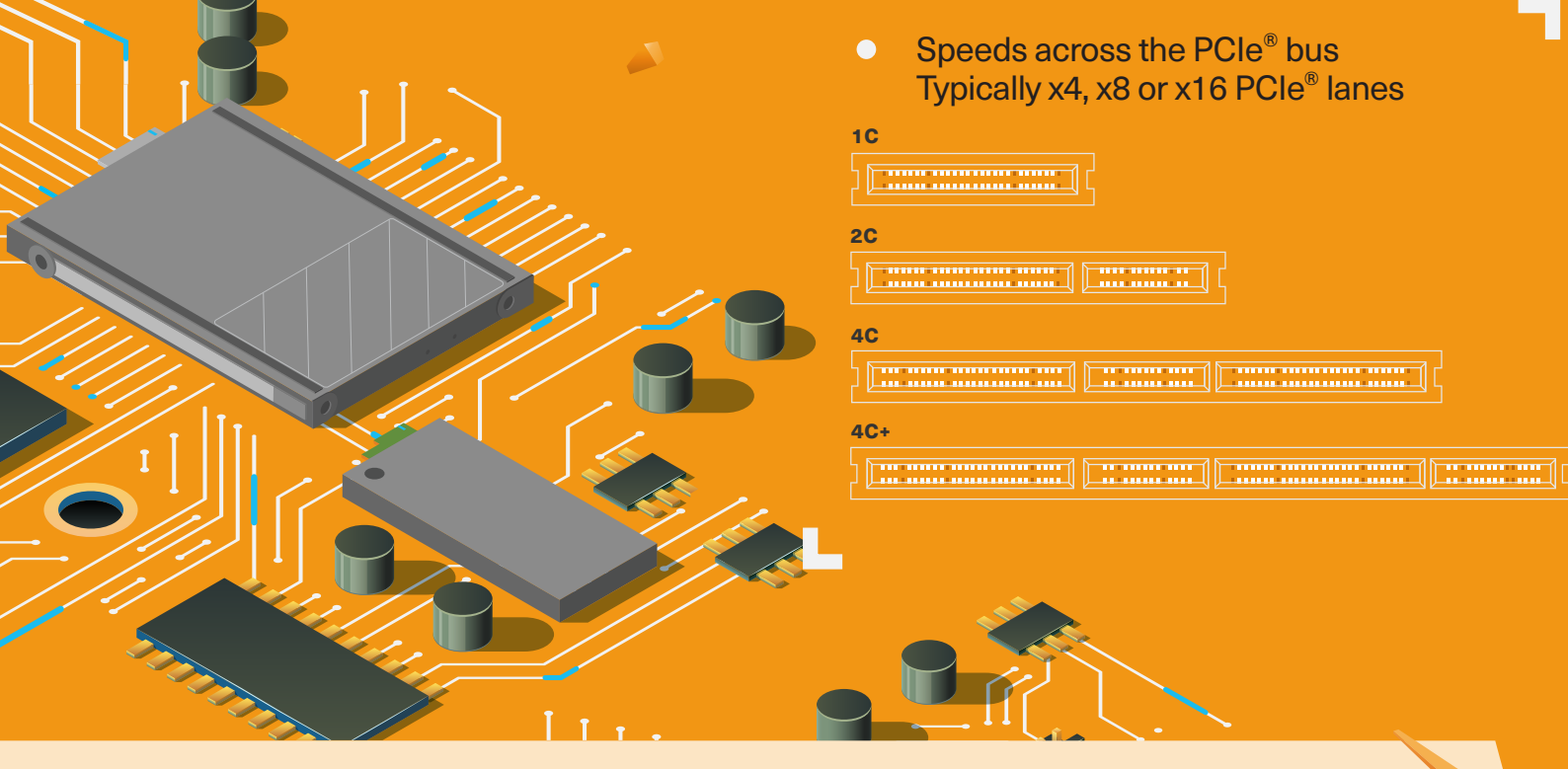# Enterprise and Datacenter Standard Form Factor (EDSFF)

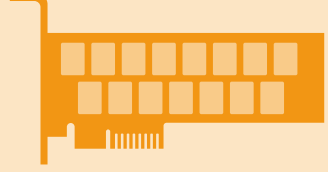*for NVM Express™ SSDs x4*

KIOXIA

What is an NVM Express™ (NVMe™) SSD?

- Speaks NVMe™ commands
  Built on the NVM Express™ base specification

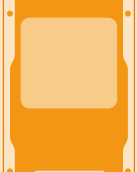- Speeds across the PCIe® bus
  Typically x4, x8 or x16 PCIe® lanes
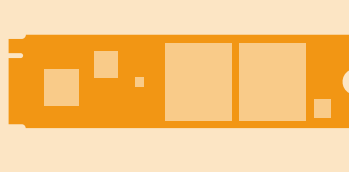
1C
2C
4C
4C+

Form Factor Evolution of SSDs

Add-in Card (AIC)
High Performance Storage
Server Accelerator

2.5-inch (U.2/U.3)
Data Storage
Cache
Client, Servers, Storage

M.2 (2242, 2280, 22110)
Data Storage
Boot
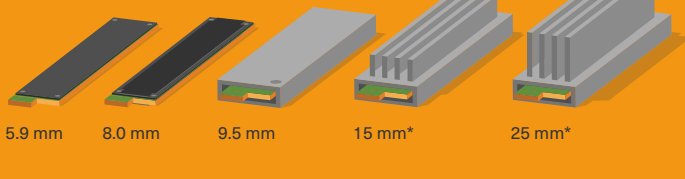Client, Servers

BGA (16x20mm) M.2 (2230)
Data Storage
Boot
Laptop, Tablet

EDSFF: Form Factors for the Next Generation Hyperscale and Enterprise Data Centers
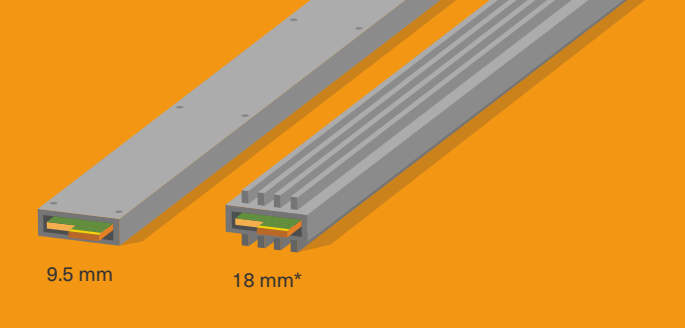
E1– Hyperscale Servers & Storage
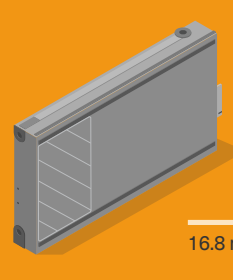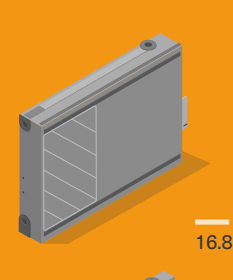
E1.S
111.49 mm & 118.75 mm

5.9 mm   8.0 mm   9.5 mm   15 mm*   25 mm*

E1.L
318.75 mm

9.5 mm   18 mm

*Heatsink increases thickness.

E3– Enterprise Servers & Storage

E3.L 142.2 mm   **E3.S** 112.75 mm
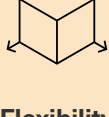
16.8 mm (2T)   16.8 mm (2T)

7.5 mm   7.5 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 October 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.

KIOXIA EDSFF E1.S Offerings

KIOXIA XD7P Series Data Center NVMe™ SSD

- PCIe® Gen4 x4 (16 GT/s x4)
- NVMe™ 2.0 specification compliant
- OCP Datacenter NVMe™ SSD 2.0 supported
- 1.92 TB, 3.84 TB and 7.68 TB capacities
- 1 DWPD endurance

9.5 mm   15 mm   25 mm

KIOXIA XD6 Series Data Center NVMe™ SSD

- PCIe® Gen4 x4 (16 GT/s x4)
- NVMe™ 1.3c specification compliant
- OCP NVMe™ Cloud SSD 1.0a supported
- 1.92 TB and 3.84 TB capacities
- 1 DWPD endurance

9.5 mm   15 mm   25 mm

KIOXIA EDSFF E3.S Offerings

KIOXIA CM7   KIOXIA CD8P   KIOXIA CD7

KIOXIA CM7 Series Enterprise NVMe™ SSD

- PCIe® Gen5 x4 (32 GT/s x4)
- NVMe™ 2.0 specification compliant
- OCP Datacenter NVMe™ SSD 2.0 supported
- 1.6 TB to 15.36 TB capacities
- 1 and 3 DWPD endurances

KIOXIA CD8P Series Data Center NVMe™ SSD

- PCIe® Gen5 x4 (32 GT/s x4)
- NVMe™ 2.0 specification compliant
- OCP Datacenter NVMe™ SSD 2.0 supported
- 1.6 TB to 15.36 TB capacities
- 1 and 3 DWPD endurances

KIOXIA CD7 Series Data Center NVMe™ SSD

- Designed to PCIe® Gen5 x4 (32 GT/s x4)
- NVMe™ 1.4 specification compliant
- 1.92 TB, 3.84 TB and 7.68 TB capacities
- 1 DWPD endurance

Where to Find More on EDSFF?

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 SFF-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 SFF-TA-1012 – Pin Assignment Reference for SFF-TA-1002 Connectors
SNIA SFF-TA-1023 – Thermal Characterization Specification for EDSFF Devices

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