

TECHNOLOGY BRIEF

Intel® SSDs Based on EDSFF*



Built with Purpose, Designed for Performance.

Intel® Data Center SSDs based on EDSFF*; the perfect fit



Break free from the limitations of legacy data center SSD form factors with the revolutionary new E1.L and E1.S Intel® SSDs based on EDSFF*. Featuring a common connector and pinout, the array of flexible, future-ready features enable a broad range of interoperable designs. Purpose-built to meet your toughest storage challenges and to always be the perfect fit.

Simply Revolutionary

Designed from the ground up, these revolutionary new EDSFF-based SSDs deliver flexible building blocks for scalable solutions, increased operational efficiency at scale and space-efficient capacity consolidating the storage footprint.

EDSFF was created to limit storage form factor proliferation by defining revolutionary industry standard form factors. This was driven by three guiding principles: enable scale, optimize total cost of ownership, and enable a dynamic range of solutions.

These principles were driven by key data center storage challenges, as surveyed from top IT decision makers: ability to scale capacity to support data and application growth, driving down the cost of storage—lowering operating and capital expenditures, while increasing storage agility, and to deliver required application performance without compromises. With a healthy and growing ecosystem, Intel supports EDSFF as the data center form factor standard of the future.

Now You Have Options

The E1.L and E1.S give you options for a variety of data center needs.

E1.L is a purpose-built form factor optimized for disaggregated systems. Providing high per server capacity, enabling up to 32 drives per rack unit for massive storage power. In addition to capacity, this form factor provides key features of thermal efficiency, full serviceability, scalability, and future ready performance.

E1.S provides the best of U.2 and M.2. E1.S is a scalable, flexible, power, and thermally efficient SSD building block. This form factor was designed for high-volume hyperscale, and allows system flexibility, increased storage density, modular scaling, improved serviceability, and more efficient cooling optimized for 1U servers.



Intentional Design

The inspiration for EDSFF, the Intel® SSD DC P4500 in the “ruler” form factor won an International Design Excellence Award (IDEA) in 2018. This award is a benchmark of design and positions Intel® SSDs based on EDSFF to become an icon in the storage industry. A shift toward intentional industrial design in the storage industry, Intel® SSDs based on EDSFF show how Intel is reimagining data center storage for flash.



Optimized Capacity

EDSFF drives were designed to optimize capacity per drive. With 36 media sites on the E1.L this drive can scale to higher capacities without expensive and complex die stacking. The Intel® E1.L will scale up to 30.72TB of capacity in 2019.³ Using the 30.72TB E1.L form factor, you will be able to reach nearly 1PB of storage in 1U.⁴ This provides up to 10 times rack consolidation⁵ compared to 8TB U.2 15mm drives.

Space Isn't All it Saves

E1.L provides programmable LEDs to quickly locate failed drives, offline drives, and un-populated slots. With a carrier-less design and an integrated latch, the E1.L removes the need for drive carriers. Advanced enclosure management with slot level power control enables single drive isolation. The E1.L is up to 2 times more thermally efficient than U.2 15mm drives,¹ while the E1.S is up to 3 times more thermally efficient than U.2 7mm drives.² With a combination of built in serviceability and thermal efficiency, EDSFF drives allow you to increase operational efficiency at scale.



1. Source – Intel. Comparing airflow required to maintain equivalent temperature of a 4TB U.2 15mm Intel® SSD DC P4500 to a 4TB EDSFF-based form factor for Intel® SSD DC P4500. Results have been estimated or simulated using internal analysis or architecture simulation or modeling, and provided for informational purposes. Simulation involves three drives for each form factor in a sheet metal representation of a server, 12.5mm pitch for the EDSFF-based form factor, 1000m elevation, limiting SSD on case temp of 70°C or thermal throttling performance, whichever comes first. 5°C guard band. Results used as a proxy for airflow anticipated on EDSFF spec compliant form factor Intel® SSD P4510.
2. Source – Intel. Comparing airflow required to maintain equivalent temperature of an 8TB U.2 7mm Intel® SSD DC P4500 to a 8TB EDSFF E1.S form factor for Intel® SSD DC P4510. Results have been estimated or simulated using internal analysis or architecture simulation or modeling, and provided for informational purposes. Simulation involves comparing the 1U server implementations of each form factor. E1.S is vertically oriented at an 11mm pitch, and the U.2 7mm is horizontally oriented at an 18mm pitch. Both form factors are surrounded in a sheet metal representation of a server. Each form factor is limited by condition to initiate thermal throttling.
3. Source- Intel. 30.72TB EDSFF-based SSD coming in 2019. All information provided here is subject to change without notice. Contact your Intel Representative to obtain the latest Intel product specification and roadmaps.
4. Source- Intel. 983TB total using 32 30.72TB SSDs; 32 SSDs per 1U node using E1.L form factor. Based on 30.72TB Intel® SSD D5-P4326 available at a future date.
5. Source- Intel. Comparing maximum capacity per 1 rack unit of 32 Intel® SSD D5-P4326 30.72TB (available at a later date) of 983TB to 10 rack units of Intel® SSD DC P4500 8TB of 960TB.

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Learn more at intel.com, or from the OEM or retailer.

Intel disclaims all express and implied warranties, including without limitation, the implied warranties of merchantability, fitness for a particular purpose, and non-infringement, as well as any warranty arising from course of performance, course of dealing, or usage in trade.

No license (express or implied, by estoppel or otherwise) to any intellectual property rights is granted by this document. The products described may contain design defects or errors known as errata which may cause the product to deviate from published specifications. Current characterized errata are available on request.

Intel and the Intel logo are trademarks of Intel Corporation in the U.S. and/or other countries.

*Other names and brands may be claimed as the property of others.