PCIe 4.0
SSD Storage Platform
for Datacenter Servers and Storage Arrays

Turnkey Storage Solution with FLASH Controller, Customizable Firmware, and SSD Designs

FADU's PCIe 4.0 NVMe SSDs are designed to meet the increasing demands placed on Hyperscaler, Hyper-converged, Enterprise, and Edge data centers.

At the heart of FADU's SSDs is an innovative SSD controller architecture that enables ultra-low and consistent latency while virtually eliminating thermal throttling issues. As a result, FADU SSDs deliver industry leading KIOPS/Watt performance while supporting superior QoS.

It consumes up to 30% less power and operates up to twice as fast as other PCIe 4.0 SSDs, leading to the industry's best IOPS/Watt.

The SSDs support a variety of features for modern data centers, including hardware-based security, advanced telemetry, data path, and power loss protection.

FADU's PCIe 4.0 SSD Platform is based on industry standard specifications including NVMe 1.4b, PCIe 4.0 x 4, and OCP NVMe Cloud SSD 1.0a.

Storage Platform
DELTA

Interface
PCIe 4.0 x 4

Specifications
NVMe 1.4b | OCP NVMe Cloud SSD 1.0a

FLASH Controller
FADU FC4121

SSD Designs
E1.S | U.2 Form Factors
1TB | 2TB | 4TB | 8TB Capacities

SSD Performance Up To

Sequential Read		7,050 MB/s
Sequential Write		4,200 MB/s
Random Read		1,350 KIOPS
Random Write	OP7	200 KIOPS
	OP28	390 KIOPS

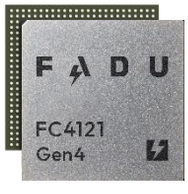
SSD Power Consumption
Active: <14.5W Idle: <3.5W

Benefits

- Twice the throughput of FADU's PCIe 3.0 SSDs
- Industry-leading KIOPS/Watt with up to 25% lower power than other PCIe 3.0 SSDs
- Consistent, low latency for superior Quality of Service (QoS) up to 9x better than most industry leading SSDs
- Leading edge, trusted industry security standards

E1.S

U.2



FC4121 Controller

PCIe 4.0 SSD Specifications

FADU PCIe 4.0 SSDs deliver industry-leading performance at low power for higher sustained QoS at low latency.

Specifications		PCIe 4.0 SSDs								Notes
Interface		PCIe 4.0 x 4								
NVMe		NVMe 1.4b								
OCP Compliance		OCP NVMe Cloud SSD 1.0a								
Controller		FADU FC4121								
NAND		SKH V6 128 Layer 4D eTLC								
Form Factor		U.2 (15mm) - Enterprise SSD Form Factor								
		E1.S (5.9mm/9.5mm/15mm/25mm) - Enterprise Datacenter SSD Form Factor (EDSFF) optimized for 1U platforms								
U.2. and E1.S Performance		OP7				OP28				
Capacity (GB)		960	1,920	3,840	7,680	800	1,600	3,200	6,400	
Sequential Read (MB/s)		6,850	7,050	7,050	7,050	6,850	7,050	7,050	7,050	Queue Depth = 128 IO Size = 128KB
Sequential Write (MB/s)		1,800	3,100	4,200	4,200	1,800	3,100	4,200	4,200	
Random Read (KIOPS)		1,100	1,350	1,350	1,350	1,100	1,350	1,350	1,350	Queue Depth = 128 IO Size = 4KB
Random Write (KIOPS)		55	140	190	200	155	310	380	390	
Random Read Latency (µs)		70	70	70	70	70	70	70	70	Queue Depth = 1 IO Size = 4KB
Random Write Latency (µs)		20	15	15	15	15	15	15	15	
QoS (99.9%) Random Read (µs)		85/330	85/235	85/200	85/220	85/325	85/325	85/200	85/200	Queue Depth = 1/64 IO Size = 4KB
QoS (99.9%) Random Write (µs)		100/1,920	25/740	25/535	25/485	25/1,020	25/370	25/325	25/245	
Power Consumption										
U.2	Active Write (W)	< 7.5	< 10.5	< 13.0	< 14.5	< 7.5	<10.5	< 13.0	< 14.5	
	Active Read (W)	< 8.5	< 9.5	< 10.5	< 12.5	< 8.5	< 9.5	< 10.5	< 12.5	
E1.S	Active Write (W)	< 7.5	< 10.0	< 12.5	< 13.5	< 7.5	< 10.0	< 12.5	< 13.5	
	Active Read (W)	< 8.5	< 9.5	< 10.5	< 12.5	< 8.5	< 9.5	< 10.5	< 12.5	
Idle (W)		< 3.5								
Reliability										
MTBF (Hour)		2.5 M								
UBER		1 Sector per 10^{17} Read								
Retention		3 Months @ 40°C (EOL)								
Warranty										
DWPD		0.85	1.0			3.0				
Period		5 Years								
Operating Temperature (°C)		0 ~ 70								

PCIe 4.0 SSD Security Features

PCIe 4.0 SSDs offer state-of-the-art security features to ensure data integrity in Hyperscaler, Hyper-Converged, Enterprise, and Edge data center storage.

Security Features	Benefit
Data-path E2E Protection (SECDED)	End-to-end data protection ensures the integrity of data transmission along the entire pathway from the host to the SSD storage medium
Internal RAID	Supports internal redundant array of independent disks to protect data
Self Encrypting Drive (AES-XTS)	Self-encrypting drives (SEDs) provide strong data encryption on the fly without performance degradation
Secure Boot	Supports secure boot to prevent malicious software from loading at start up
TCG/TCG OPAL 2.01	Supports Trusted Computing Group OPAL standards

PCIe 4.0 SSD Data Center Features

PCIe 4.0 SSDs are designed for streamlined and standardized monitoring and management in scalable data center environments with a high degree of configurability, reducing the total cost of ownership.

Data Center Features	Benefit
Multiple Namespaces (NS)	Data center level requirement support (Max 128NS)
SMART / Health Log / Telemetry Log	Fully supports all OCP log requirements, providing data center-level monitoring and debugging capabilities
Latency Monitoring Feature	Addresses bottlenecks and performance issues quickly and efficiently
Out of Band Management	Standardized SSD monitoring system support for Enhanced and Streamlined Maintenance (NVMe-MI, MCTP over SMBUS, MCTP over PCIe VDM)
Power Loss Protection (PLP)	Ensures data is not lost while the SSD is writing data during a power failure
Multiple Sector Size Support	Support for 512 and 4096-byte sectors to satisfy multiple platforms, various workloads, and operating systems