PCIe 5.0
SSD Storage Platform
for Datacenter Servers and Storage Arrays

Turnkey Storage Solution with FLASH Controller, Customizable Firmware, and OCP Datacenter NVMe SSD 2.0

FADU's PCIe 5.0 NVMe SSDs are designed to meet the increasing demands placed on next generation 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 and virtually eliminates thermal throttling issues. As a result, FADU SSDs deliver industry leading KIOPS/Watt performance while supporting superior QoS.

The FC5161 Controller makes FADU's PCIe 5.0 SSD Platform the first OCP SSD to support FDP, offers 64 Physical functions, reducing the WAF, and improving QoS. FDP allows full random access and the FC5161 is backward compatible with the strong block interface. Its specification leads the industry in lower power and performance with availability ready for data center deployments in 2023.

The SSDs support a variety of features for modern data centers, including hardware-based security, advanced telemetry, visualization functions, data path, and power loss protection. FADU's PCIe 5.0 SSD Platform is based on industry standard specifications including PCIe 5.0 x 4, NVMe 2.0, and OCP Datacenter NVMe SSD 2.0.

Storage Platform
ECHO

Interface
PCIe 5.0 x 4

Specifications
NVMe 2.0 | OCP Datacenter NVMe SSD 2.0

FLASH Controller
FADU FC5161

SSD Designs
E1.S | E3.S | U.2 Form Factors
2TB | 4TB | 8TB | 16TB | 32TB Capacities

SSD Performance Up To
Sequential Read		14,000 MB/s
Sequential Write		10,000 MB/s
Random Read		3,200 KIOPS
Random Write	OP 7	450 KIOPS
	OP 28	800 KIOPS

SSD Power Consumption
Active: <20W   Idle: <5W

Benefits
- FADU's PCIe 5.0 SSDs are designed for industry-leading KIOPS/Watt
- Consistent, low latency for superior Quality of Service (QoS)
- Leading edge, trusted industry security standards
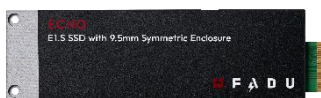
E1.S

E3.S

U.2

FC5161 Controller

PCIe 5.0 SSD Specifications

FADU PCIe 5.0 SSDs deliver industry-leading performance at low power for higher sustained QoS at low latency.

Specifications	PCIe 5.0 SSDs				Notes
Interface	PCIe 5.0 x 4				
NVMe	NVMe 2.0				
OCP Compliance	OCP Datacenter NVMe SSD 2.0				
Controller	FADU FC5161				
NAND	3D TLC NAND				
Supported Capacity	2/4/8/16TB				
Form Factor	U.2 - Enterprise SSD Form Factor				
	E1.S (5.9mm/9.5mm/15mm/25mm) - Enterprise Datacenter SSD Form Factor (EDSFF) optimized for 1U platforms				
	E3.S - EDSFF E3 is a family of form factors designed to update and replace the traditional U.2 2.5-inch form factor in servers and storage systems				
Performance [1]					
Capacity (GB) [2]	1,920	3,840	7,680	15,360	
Sequential Read (MB/s)	14,000	14,000	14,000	14,000	IO Size = 128KB
Sequential Write (MB/s)	4,200	8,600	10,000	10,000	
Random Read (KIOPS)	2,300	3,200	3,200	3,200	IO Size = 4KB
Random Write (KIOPS) @ OP 7	200	380	450	450	
Random Write (KIOPS) @ OP 28	400	700	800	800	
Random Read Latency (µs)	55	55	55	55	
Random Write Latency (µs)	10	10	10	10	
Power Consumption					
Active (W)	< 20				
Idle (W)	< 5				
Reliability					
MTBF (Hour)	2.5 M				
UBER	1 Sector per 10^{17} Read				
Retention	3 Months @ 40°C (EOL)				
Warranty	OP 7		OP 28		
DWPD	1.0		3.0		
Period	5 Years		5 Years		
Operating Temperature (°C)	0 ~ 70				

1) The performance numbers shown in the table depends on the target NAND media and it also includes optimization target numbers and thus subject to change in the actual product due to variable parameters on product configuration.
2) Capacity with OP 7

PCIe 5.0 SSD Security Features

PCIe 5.0 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 5.0 SSD Data Center Features

PCIe 5.0 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 512NS)
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
NVMe-MI 1.2/ Vital Product Data (VPD) over SMBus and PCIe VDM	Standardized SSD monitoring system support for enhanced and streamlined maintenance
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
Flexible Direct Placement (FDP) Supported	FDP can significantly reduce write amplification, which can improve performance and reliability