A Toshiba Group Company

Z-Drive 4500 Series

PCIe Enterprise SSD

Z-Drive 4500 Series at a Glance

- Innovative storage system that combines SSD hardware with software managed solutions (such as WXL Windows acceleration and VXL virtualization)
- Cost-effective MLC-based design with leading performance and enterprise-class endurance and reliability
- Advanced feature set includes power loss data protection, end-to-end data protection and advanced ECC
- Flexible usage as either a local flash volume, a flash cache resource or a combination of both
- Available in Full-Height/Half-Length format
- Backed by a 5-year warranty

The Pinnacle of Storage Performance

- Delivers the performance of hundreds of hard disk drives in a single server
- Reduces I/O and bandwidth bottlenecks with sustained read performance up to 2,900 MB/s, sustained write performance up to 2,200 MB/s, random 4K block read throughput up to 252,000 IOPS and random 4K block write throughput up to 76,000 IOPS

Proprietary Virtualized Controller Architecture™ (VCA) 2.0

- Provides a multifaceted virtualization layer that interfaces with the host system
- Delivers highly efficient performance aggregation
- Extends NAND flash life at a block level
- Manages redundancy
- Enables TRIM Command support and SMART health monitoring
- Features internal storage controller delivering highly efficient performance aggregation while reducing the burden on host resources

Key Differentiators

- **Leading MLC-based enterprise PCIe** edge card performance driven by OCZ VCA Technology

- **Integrates with powerful OCZ software solutions** supporting Windows application acceleration (through OCZ WXL Software) and flash virtualization (through OCZ VXL Software)

- **Features a more robust design** over previous Z-Drive R4 models

- **Designed in a Full-Height/ Half-Length** (FH/HL) format supporting 800GB, 1.6TB and 3.2TB usable capacities

- **Bootable as a direct-attached device**

- **Delivers temperature sensing and thermal throttling** to maintain consistent operating conditions even under adverse temperature variances

- **Provides complete power loss data protection**, end-to-end data protection, advanced ECC and other capabilities that extend drive life and protect data

- **New SSD casing** for a more stable and cooler thermal environment

- **Installation drivers support package files** (RPM, DEB) that automate the deployment process

- **Backed by a 5-year warranty**

READY

Superior Enterprise-Class Endurance & Reliability

- Power loss data protection prevents data loss in the event of a sudden power failure
- End-to-end data protection performs data integrity checks at every juncture where data is transmitted, received, processed and stored
- Advanced ECC effectively corrects up to 55 bits per 512-byte sector
- Advanced security with 128-bit AES encryption support
- Temperature sensing and thermal throttling maintains consistent operating conditions even under adverse temperature variances

Specifications

Physical

Usable Capacities (IDEMA)	800GB / 1600GB / 3200GB
NAND Components	Multi-Level Cell (MLC)
Interface	PCIe Gen 2 x8
Form Factor	Full-Height/Half-Length (FH/HL)
Storage Controller	VCA 2.0 (Virtualized Controller Architecture™)
Dimenstions (L x W x H)	126.3mm x 180.9mm x 21.6mm
Weight	350g

Sustained Performance
(based on ZD4RPFC8MT320-3200 model)

Max Read	Up to 2,900 MB/s
Max Write	Up to 2,200 MB/s
Sustained Random 4K Reads[1]	Up to 252,000 IOPS
Sustained Random 4K Writes[1]	Up to 76,000 IOPS
Sustained Random 8K Reads[1]	Up to 155,000 IOPS
Sustained Random 8K Writes[1]	Up to 31,000 IOPS

[1] Based on SNIA (Storage Networking Industry Association) workloads

Environmental

Power Consumption	800GB: 18.4W Idle, 20.8W Active 1600GB: 20.3W Idle, 23.1W Active 3200GB: 20W Idle, 22.8W Active
Operating Temperature	0°C ~ 55°C
Non-Operating Temperature	-45°C ~ 85°C
Airflow Requirements	300LFM (Linear Feet per Minute) at 25°C 550LFM (Linear Feet per Minute) at 40°C
Certifications and Declarations	RoHS, FCC , CE, BSMI, C-TICK, VCCI, KCC, UL

Reliability/Security

Mean Time Between Failures (MTBF)	2 million hours
Endurance Rating	Minimum of 0.68PB (800GB), 1.3PB (1600GB), 2.5PB (3200GB)
Power Fail Protection	Full in-flight data protection for unexpected system power loss
Data Path Protection	End-to-end data path protection at every data juncture
Data Reliability	Read Unrecoverable Bit Error Rate (UBER) 10^{-17}
Data Encryption	Data compression, Data de-duplication, and AES 128bit encryption
Product Health Monitoring	Self-Monitoring, Analysis and Reporting Technology (SMART) Support with enterprise attributes
Data Recovery	In case of block failures, RAID mechanisms are used to recover data

Compatibility

PCI Express	PCI Express x8 or x16 slot; Fully compliant with the PCI Express Electromechanical Specification Rev. 2.0, and PCI Express Base Specification Rev. 2.0
Serial ATA (SATA)	SATA Rev. 2.6 compliant ATA feature set; ATA-8 compliant
Operating Systems	32/64-bit Microsoft Windows 7, 8, 8.1 32/64-bit Windows Server 2008 R2, 2012, 2013 R2 64-bit Linux Red Hat Enterprise, Oracle & Centos 6.x 64-bit SLES 11 SP1-3 64-bit Ubuntu Server 10.04 LTS, 12.x, 13.x VMware ESX/ESXi 4.1, 5.x
Power Management	Supports ATA Power Management Specification
Power Requirements	PCIe 12V & 3.3V

Additional Features

Performance Optimization	TRIM (requires OS support)
Temperature Sensor	Temperature sensing and thermal throttling without sacrificing performance under normal operation
Custom Configuration Options	Allow performance aggregation across multiple cards for increased performance
Proprietary Virtualized Controller Architecture (VCA) 2.0	Virtualizes SSD devices into a massively parallel array of memory Consolidated SMART support
Upgradable Firmware	Field-upgradable firmware
Service & Support	5-year warranty; Dedicated FAE support

Dramatically Accelerating Enterprise Applications

It's storage that evolves with your ever-changing data center. More than just a high-performing SSD, the new Z-Drive 4500 is a full-featured flash solution that integrates robust performance, reliability, data protection, and monitoring functions for critical enterprise applications and demanding big data environments. Z-Drive 4500 also includes the latest software features to deliver low-latency flash resources across your infrastructure, and OCZ's proprietary Virtualized Controller Architecture (VCA) Technology coupled with proven controller technology enables industry-leading sustained performance. As OCZ's most advanced PCIe edge card to date, Z-Drive 4500 offers a complete acceleration, caching, and flash management solution for your enterprise storage applications.

The Z-Drive 4500 Series is integrated with OCZ's new Windows Accelerator (WXL) Software – a flash management and caching solution for Windows Server-based applications. It enables IT managers to dramatically improve the performance and latency on SAN and DAS systems by intelligently caching the most frequently accessed data on a flash-based Z-Drive 4500 SSD. Through deep statistical 'out-of-band' processing, each Z-Drive 4500 SSD can selectively determine what data to cache for I/O acceleration while avoiding processing in the data path itself. The result is expedited I/O, Windows applications spending less time waiting for data, SAN resources available for other applications, and a reduction in latency-related bottlenecks.

For flash-based virtualization, the new Z-Drive 4500 Series works in conjunction with OCZ's VXL Virtualization Software distributing flash cache resources on-demand across virtual machines (VMs) to accelerate application performance. It distributes the flash between VMs based on need making sure that no VM inefficiently occupies flash when it could be better used elsewhere in the environment. As a result, the Z-Drive 4500's flash cache is optimally utilized at all times regardless of how many VMs are running concurrently, data traffic to and from the SAN is reduced, and critical data is locally available in the Z-Drive 4500 card for immediate use by VMs.

Ordering Information

	Part Number	UPC	Raw	IDEMA	Endurance
	ZD4RPFC8MT300-0800	842024034308	1024GB	800GB	680TBW min
Z-Drive 4500 (FH/HL)	ZD4RPFC8MT310-1600	842024034315	2048GB	1600GB	1300TBW min
	ZD4RPFC8MT320-3200	842024034322	4096GB	3200GB	2500TBW min