

# PCIe 5.0 SSD

## High Performance and Power Efficiency



## PBlaze<sup>®</sup> 7 7A40 Series NVMe<sup>™</sup> SSD

The PBlaze7 7A40 series PCIe 5.0 enterprise NVMe SSDs, featuring exceptional power efficiency alongside outstanding performance, are aimed at further accelerating applications such as AI, databases, cloud computing, and virtualization. Notably, this groundbreaking performance has made it the first of its kind to surpass one million IOPS for 4K random write operations.

### Outstanding Performance

As the latest member of the PBlaze product family, PBlaze7 7A40 is developed based on the MUFP, with deep optimization of hardware and firmware, it delivers 3,300K IOPS for 4K random reads and 1,000K IOPS for 4K random writes, respectively, which is 3x and 2.5x the performance of maintain PCIe 4.0 SSDs. The sequential read and write speeds are 14.2GB/s and 11GB/s, leading the enterprise PCIe 5.0 SSD market.

### Latency as Low as 5 $\mu$ s

The PBlaze7 7A40 leverages its controller architecture to reduce latency significantly by optimizing the I/O path, streamlining processing flows, and enhancing data layouts. This results in a 4K random read latency as low as 55 $\mu$ s and a random write latency of 5 $\mu$ s. Additionally, with enhanced flow control and intelligent sequential flow prefetch technology, its sequential read latency can also be as low as 6 $\mu$ s, boosting performance under low workloads and providing stronger support for various latency-sensitive business applications.

### Remarkable Power Efficiency

The PBlaze7 7A40 offers a 110% improvement in 4K random read performance per watt and a 73% increase in 4K random write performance per watt compared to its predecessor products. It consumes 13W for sequential reads and 18W for sequential writes, with an optimized thermal design to minimize thermal impact in dense deployment scenarios.

### Comprehensive Enterprise-grade Feature Support

The PBlaze7 7A40 supports NVMe 2.0 and NVMe-MI 1.2b protocols, providing essential enterprise-grade features such as full data path protection, power-loss data protection, firmware upgrade without reset, secure erase and so on.

#### Key Features

PCIe 5.0, NVMe2.0  
3.2TB - 15.36 TB  
3300K IOPS 4K Ran.Read  
1000K IOPS 4K Ran.Write  
14.2 GB/s 128K Seq.Read  
11.3 GB/s 128K Seq.Write  
Latency R/W 55/5 $\mu$ s

#### Reliability

Sanitize  
AES 256 Data Encryption  
Full Data Path Protection  
Power Failure Protection

#### Easy-to-use

NVMe-MI 1.2  
Telemetry  
Firmware Upgrade  
without Reset  
Persistent Event Log

#### Advanced Feature Support

Timestamp  
8TB/s Enterprise TRIM

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### PRODUCT BRIEF

<b>PBlaze7 7A40 Series</b> <sup>[1]</sup>	<b>7A40</b>			<b>7A46</b>		
User Capacity (TB)	3.84	7.68	15.36	3.2	6.4	12.8
128KB Sequential Read(GB/s)	14.2	14.2	12	14.2	14.2	12
128KB Sequential Write(GB/s)	5.9	11.2	10	5.9	11.3	10
Sustained Random Read (4KB) IOPS	3300K	3300K	2950K	3300K	3300K	2950K
Sustained Random Write (4KB) IOPS (Steady State)	280K	500K	484K	580K	1000K	971K
Lifetime Endurance DWPD <sup>[2]</sup>	1			3		
Random R/W Latency	55 / 5 μs					
Sequential R/W Latency	6 / 5 μs					
Form Factor	2.5-inch U.2					
Interface	PCIe 5.0 x 4					
Operating Temperature	Case: 0°C to 77°C					
Uncorrectable Bit Error Rate	< 10 <sup>-18</sup>					
Mean Time Between Failures	2.5 million hours					
Protocol	NVMe 2.0					
NAND Flash Memory	3D TLC NAND					
Operation System	RHEL, SLES, CentOS, Ubuntu, Windows Server, VMware ESXi					
Power Consumption	< 25 W					
Basic Feature Support	Power Failure Protection, Full Data Path Protection, S.M.A.R.T, Hot Pluggable					
Advanced Feature Support	TRIM, EUI64/NGUID, Format, Firmware Upgrade without Reset, Sanitize, Timestamp, Persistent Event Log, Telemetry, NVMe-MI/SMBus					
Software Support	Open-source management tool, CLI debug tool OS in-box driver (Easy system integration)					

#### Applications & Workloads

Database  
 Searching, Indexing, CDN  
 Cloud and Hyper-scale Computing  
 High Performance Software-defined Storage  
 Deep Learning and Big Data Analytics  
 High Performance Storage System  
 ERP, SAP HANA  
 BOSS, Banking, Taxing  
 High Frequency Trading  
 Online Payment



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#### NOTES:

[1] Performance may vary due to different system configurations and firmware version.  
 [2] DWPD, Drive Writes per Day for 5 years.

[memblaze.com](http://memblaze.com)



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