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7 GB/s Through 4 Channels

Phison PS5025-E25 (E25) is a cutting-edge SSD controller IC solution designed to take full advantage of the PCIe Gen4x4 bandwidth. With a 4-channel design capable of powering NAND flash data transfers at 2400MT/s, the E25 touches the interface ceiling with over 7GB/s in SSD sequential operation while maintaining superior cost-effectiveness and power-efficiency, making it the perfect solution for premium laptops and mobile devices.

Applications

High-end Desktop and Laptop

PHISON PS5025-E25

Product Features

Market-leading Performance

Paired with state-of-the-art 3D NAND flash memory chips, the E25 handles application payloads immaculately at up to 2400 MT/s with minimal latency, boasting sequential performances up to 7200 MB/s and random performance up to 1200K IOPs.

Outstanding Cost-effectiveness

The E25 saturates the PCIe Gen4x4 interface bandwidth as well as any 8-channel solution does, but it does so while retaining compelling cost-savings in silicon, creating invaluable design-in opportunities in cost-sensitive consumer markets.

Superb Power Efficiency

Through its 4-channel design and LPDDR compatibility, the E25 offers serious reduction in power consumption versus competing solutions. With advanced power management measures such as support of the PS0 (under 8.25mW) and PS4 (under 3.5mW) power states, the E25 is able to further limit motherboard power consumption during idle periods.

Extensive Compliance

The E25 solution portfolio has undergone various certification programs and compliance verifications from industry giants like Intel, AMD, Microsoft, as well as renowned third-party institutions such as the PCI-SIG. Let Phison E25 connect you to the world and create the synergy you need.

CONTROLLER

PS5025-E25

Features	Specifications
Host Interface	- PCIe 4.0x4 (Bandwidth: 16GT/s x4) - Backward compatible with existing PCIe generation transfer rates - Compliance with PCI Express Base Specification Revision 4.0 - Compliance with NVMe 2.0
Processor	- Dual-CPU architecture with built-in 32-bit microcontroller - TSMC 12nm process technology
Flash Controller	- Up to 4 Channels with 16 Chips Enable (CE) counts - Flash transfer rate up to 2,400MT/s - Capacity up to 4TB - Support 3D TLC and QLC NAND flash memory - Compliance with Toggle 5.0 and ONFi 5.0 - Flash I/O operating voltage supply 1.2V
DRAM Controller	- LPDDR4/DDR4 (32 bit, 2666Mbps)
Data Reliability	- Phison 5th generation LDPC ECC & RAID ECC - DDR ECC engine - End-To-End Data Path Protection
Security	- Pyrite - AES 256 - SHA 512 - RSA 4096 - TCG Opal 2.02
Performance	- Sequential Read up to 7200MB/s - Sequential Write up to 7000MB/s - 4K Random Read up to 1200K IOPS - 4K Random Write up to 1200K IOPS
Power Management	- L1.2 < 3.5mW
Temperature Range	- Operating range: 0~70 °C - Storage range: -40~85 °C
Package	- 361-ball HSFCCSP, 12.5mm x 12.5mm
Peripheral	- Built-in internal thermal sensor - GPIO pins - Built-in UART function - I2C and SPI for external ROM

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Find more information and resources at: **phisonblog.com** and **phison.com**

SOLUTIONS

PS5025-E25

Capacity [1]	512GB	1TB	2TB	4TB
Interface	PCIe Gen 4.0 x4 NVMe 2.0			
Form Factor	M.2 2280			
NAND Flash	3D TLC			
Performance [2]				
Sequential Read	6850 MB/s	7100 MB/s	7100 MB/s	7000 MB/s [6]
Sequential Write	4000 MB/s	6900 MB/s	7050 MB/s	6900 MB/s [6]
4K Random Read	680K IOPS	1050K IOPS	1150K IOPS	1150K IOPS [6]
4K Random Write	700K IOPS	1200K IOPS	1200K IOPS	1200K IOPS [6]
Power Consumption [3]				
Supply Voltage	M.2 3.3V ± 5%			
Active (Average)	< 8.25W	< 8.25W	< 8.25W	< 10W [6]
Idle	< 25mW	< 25mW	< 25mW	< 35mW [6]
Low Power PS4 (L1.2)	< 3.5mW	< 3.5mW	< 3.5mW	< 3.5mW [6]
Environmental				
Operating Temperature	0°C - 70°C			
Non-Operating Temperature	-40°C - 85°C			
Certification	Intel PCL, AMD AVL, PCI-SIG Certified, Microsoft Direct Storage, Windows Modern Standby, Athena Modern Standby (<3 mW), MobileMark® 2018 (<100mW), MobileMark® 2025 (<160mW)			
Reliability & Warranty				
TBW [5]	300TB	600TB	1200TB	1200TB
Warranty	5 years			
MTBF	1.5 million hours	2 million hours		
UBER	<10^{-15} bits			
Advanced Features				

- End-to-End Data Protection
- TCG OPAL 2.02 and Crypto Erase
- GPIO Pins, Built-in UART function and I2C feature support

[1] 1 GB = 1,000,000,000 bytes
[2] Sequential Performance is based on CrystalDiskMark v8, 1 GB range,command size =1MB, QD=32, Thread=1 , and test drive set as secondary
[3] Random Performance is based on CrystalDiskMark v8, 1 GB range, ,command size =4KB, QD=32, Thread=16 , and test drive set as secondary
[4] Power consumption is measured during the sequential read and write operations performed by CrystalDiskMark with the conditions described in (2)
[5] TBW is Total Bytes Written and the results are obtained in compliance with JESD218 Standards
[6] Numbers are estimated value.

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