Consumer

Controller **PS5013-E13T**

Features	Specifications
Host Interface	• PCIe Gen 3x4 (Bandwidth: 8GT/s x4) • Compatible with PCIe Gen I(2.5Gbps), Gen II(5Gbps), Gen III(8Gbps) • Compliance with PCI Express Base Specification Revision 3.1 • Compliance with NVMe 1.3 • Host Memory Buffer (HMB) support
Processor	• Single-CPU architecture with built-in 32-bit microcontroller • TSMC 28nm process technology
Flash Controller	• Up to 4 Channels with 16 chips enable (CE) • Flash Transfer rate up to 800MT/s • Capacity up to 2TB • Support 3D TLC and QLC NAND flash memory • Compliance with Toggle 3.0 and ONFi 4.0 • Flash IO operating voltage supply 1.2V/1.8V
DRAM Controller	• DRAM-less
Data Reliability	• Phison 4th generation LDPC ECC & RAID ECC • End-To-End Data Path Protection
Security	• AES 256 • TCG Opal • Pyrite
Performance	• Sequential Read up to 2500MB/s • Sequential Write up to 2100MB/s • 4K Random Read up to 230K IOPS • 4K Random Write up to 400K IOPS
Power Management	• L1.2 < 2.5mW
Temperature Range	• Operating range: 0~70˚C • Storage range: -40~85˚C • Operating junction temperature: -40~125˚C
Package	• 216-ball TFBGA, 8 mm x 12 mm • 198-ball HSTFBGA, 7 mm x 11 mm
Peripheral	• Built-in internal thermal sensor • GPIO pins • Built-in UART function • I2C and SPI for external ROM

PHISON Knows What You Need

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PERFORMANCE NUMBERS MAY VARY BASED ON SYSTEM CONFIGURATION AND TESTING CONDITIONS.

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Solutions

PS5013-E13T

Capacity[1]	128GB	256GB	512GB	1024GB	2048GB
Interface	PCIe Gen3x4 NVMe 1.3				
Form Factor	M.2 2280 / M.2 2242 / CFX / BGA SSD				
NAND Flash	3D TLC / 3D QLC				
Performance (Up to)[2, 3, 5]					
Sequential Read	2200 MB/s	2300 MB/s	2500 MB/s	2500 MB/s	2500 MB/s
Sequential Write	600 MB/s	1200 MB/s	2100 MB/s	2100 MB/s	2100 MB/s
4K Random Read	115K IOPS	179K IOPS	240K IOPS	295K IOPS	295K IOPS
4K Random Write	130K IOPS	270K IOPS	430K IOPS	430K IOPS	430K IOPS
Power					
Supply Voltage	M.2 3.3V ± 5%				
Active (Average)[4]	3.15W	3.45W	3.5W	3.68W	3.75W
Idle					
Low Power PS4 (L1.2)	2 mW	2 mW	2 mW	2 mW	2 mW
Temperature					
Operating	0°C - 70°C				
Non-Operating	-40°C - 85°C				
Advanced Features	• DRAM-less • Pyrite/OPAL Support • End-to-End Data Protection • Thermal Monitoring				

[1] 1GB = 1,000,000,000 bytes
[2] 1MB/s = 1,000,000 bytes / second
[3] Performance is based on Crystal Disk Mark 6.0.0, test size 1GiB, and test drive set as secondary
[4] Measured with MobileMark 2014
[5] Host memory buffer enabled

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