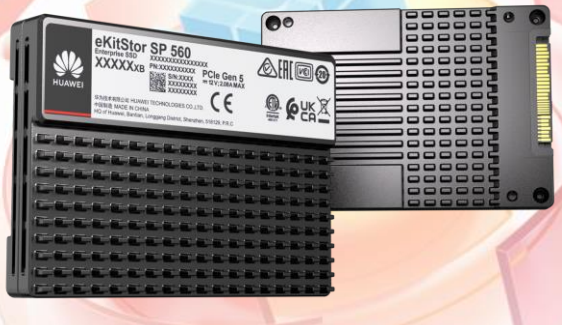
HUAWEI

Data Sheet

High-End SSDs for AI

Huawei eKitStor SP 560



The HUAWEI AI SSD is a high-end, high-performance, large-capacity SSD specially designed for modern AI workloads. It boosts training efficiency and inference by improving GPU training and inference efficiency, slashing cost per token, and enhancing AI data reliability. This accelerates the intelligent transformation of various industries and strengthens AI infrastructure foundations.

The eKitStor SP 560 Superior-performance AI SSD is designed for cutting-edge application scenarios like AI, machine learning (ML), online transaction processing (OLTP), and high-performance computing (HPC). It provides a wealth of capacity and durability options to meet mixed use service needs.

eKitStor SP 560 is equipped with Huawei-developed SSD controllers and uses the Non-Volatile Memory Express (NVMe) 2.0 storage protocol and Peripheral Component Interconnect Express (PCIe) 5.0 high-speed interconnection interfaces. It integrates innovative Huawei media application technologies like hardware-accelerated I/O path, intelligent multi-stream, enhanced low-density parity check (LDPC) + Smart flash signal processing (FSP) 3.0 error correction algorithms, and advanced power supply modules. This enables software-hardware synergy for fast, green, and resilient AI SSD storage.

Highlights

Fast

- Read/Write performance remains stable even in multi-load scenarios. The product offers up to 11 GB/s sequential write bandwidth, 1.05M random write IOPS, and write latency as low as 7 µs.

Resilient

- The uncorrectable bit error rate (UBER) is as low as 10^{-18}, 10 times better than the industry standard. This provides a strong foundation for data resilience and improves the long-term stability and service life of SSDs.

Green

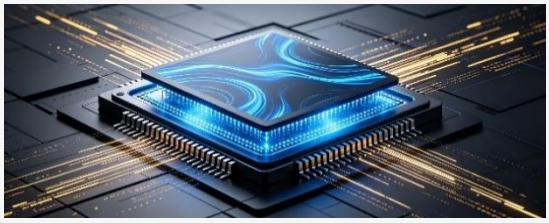
- Up to 704 MB/s per Watt sequential read energy efficiency and 523 MB/s per Watt sequential write energy efficiency boost performance and reduce energy consumption per unit of throughput.

Fast

The brand-new SSD-dedicated controller, advanced NVMe 2.0 protocol, and PCIe 5.0 high-speed interface—combined with Huawei-developed technologies such as a hardware-accelerated I/O path, intelligent prefetch, and data-control plane separation—deliver higher bandwidth and lower latency.

SSD Controller

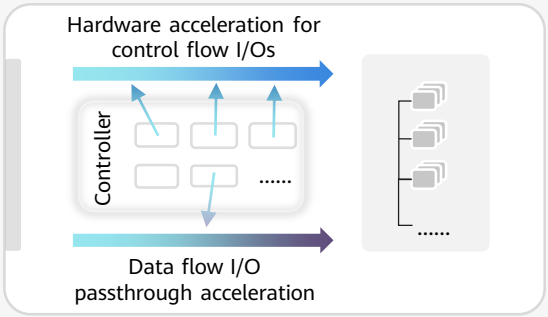
The new-gen Huawei-developed controller dedicated to SSDs greatly improves data read and write efficiency. Sequential read bandwidth reaches up to 14.8 GB/s and sequential write bandwidth reaches up to 11 GB/s. Random read performance reaches up to 3.5M IOPS, while random write performance reaches up to 1.05M IOPS, with write latency as low as 7 µs.



Hardware-Accelerated I/O Path

Control flow: The dedicated hardware acceleration engine replaces conventional CPU computing, significantly boosting the FTL query and update efficiency.

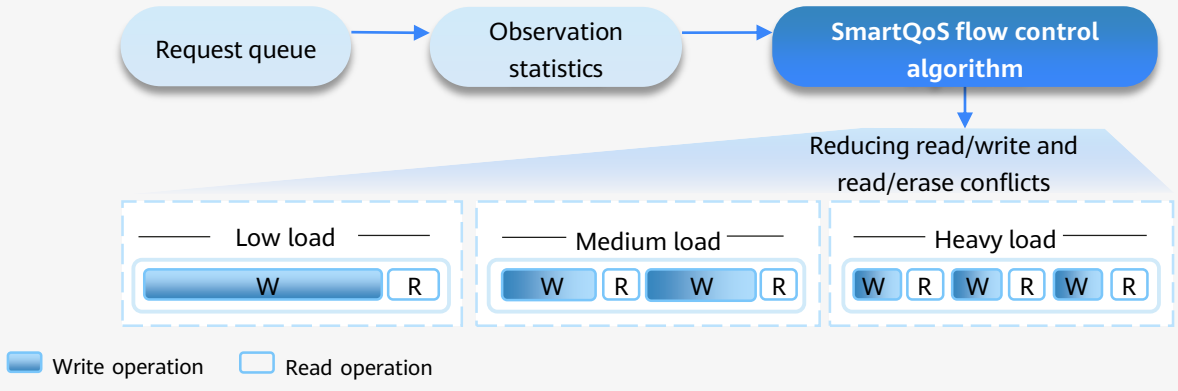
Data flow: The independent module performs data flow encoding and decoding without waiting for the control flow processing results, significantly boosting data read and write efficiency.



* Flash Translation Layer (FTL): maps the logical address space of the host to the physical address space of the flash memory.

SmartQoS Flow Control

The SmartQoS flow control algorithm is used with task information statistics such as the read/write ratio to adaptively adjust the parameters. This enables QoS balancing for multiple workloads and enhances the read latency stability for different loads.

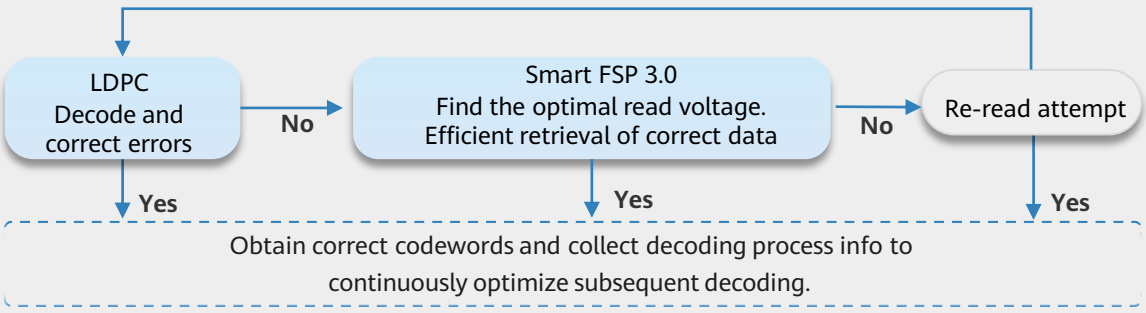


Resilient

Huawei has developed advanced technologies that deliver high stability, endurance, and reliable data protection for complex environments and demanding workloads. These technologies include the enhanced LDPC code error correction, intelligent wear leveling, and end-to-end data protection.

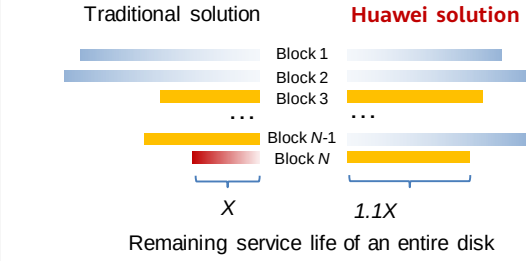
LDPC + Smart FSP 3.0

The enhanced LDPC code error correction algorithm and Smart Flash Signal Processor (FSP) 3.0 are integrated to efficiently read correct data and improve data read reliability for NAND flash in a high-wear state. The uncorrectable bit error rate (UBER) of the SSD is as low as 10^{-18}.



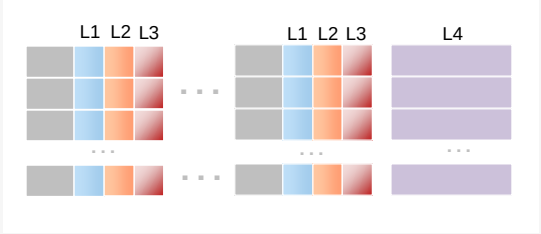
Intelligent wear leveling

Block health assessment technology accurately identifies block service lives and mitigates the impact of the weakest block using multiple policies, such as aging block isolation and program-erase (P/E) cycle control with wear leveling. Consequently, the overall P/E cycles of a disk is increased by as much as 10%.



Four-layer data protection mechanism

The four-layer data protection mechanism, including DIF, intra-SSD CRC, ECC encoding and decoding, and dynamic RAID, ensures end-to-end data resilience.

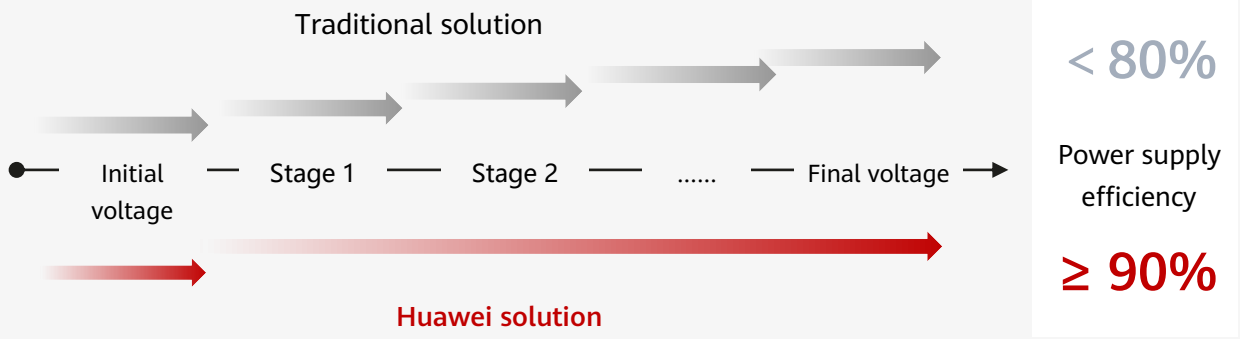


Green

Huawei-developed power supply modules and advanced data-control plane separation architecture balance the high performance of SSDs with the low power consumption requirements of servers, achieving better energy efficiency.

Huawei-Developed Power Supply Modules

A Huawei-developed power management integrated circuit (PMIC) supports efficient high-voltage power supply even in high-density layouts. Voltage can be adjusted to the correct level for data reading at a time, improving the power supply efficiency of the entire disk from 80% to 90%.



Intelligent

Huawei DiskBooster is an AI-powered O&M tool that reliably predicts failures and disk service lives. After detecting slow disks, it reminds IT personnel to replace or repair the disks or back up data to improve service performance. This reduces the impact of faulty or sub-healthy disks on services, ensuring data resilience and service continuity.

Pre-failure detection

By analyzing over 20 key indicators, including wear degree, UNC threshold-crossing, and die failure, the impact of disk faults on services is halved.

Disk life prediction

Over 10 disk service life indicators and advanced predication algorithms enable disk service life prediction with an accuracy of within five days (down from over a month).

Slow disk detection

Over 10 slow disk criteria are collected and analyzed by decision and processing algorithms, delivering a detection accuracy of 99%.

Disk logical failure repair

The multi-level incremental repair policy reduces the fault return rate by 50%.

Technical Specifications

Huawei eKitStor SP 560

Model Number	HSSD-E423T8P5L7N	HSSD-E427T6P5LDN	HSSD-E4215TP5LDN	HSSD-E423T2P5V7N	HSSD-E426T4P5VDN
Basic Specifications					
Form Factor	U.2 2.5-inch (15mm thickness)				
Interface Protocol	PCIe 5.0 1 x4，NVMe 2.0				
Capacity[1]	3.84TB	7.68TB	15.36TB	3.2TB	6.4TB
Performance					
128KB Sequential Read Bandwidth (MB/s)	14,800	14,800	14,800	14,800	14,800
128KB Sequential Write Bandwidth (MB/s)	8,500	11,000	11,000	8,500	11,000
4KB Random read IOPS	3,500k	3,500k	3,500k	3,500k	3,500k
4KB Random write IOPS	550k	550k	550k	1,000k	1,050k
Average Read Latency(μs)	51	52	55	51	52
Average write Latency(μs)	7	7	7	7	7
Reliability					
Endurance[2]	1 DWPD, 5 years			3 DWPD, 5 years	
Reliability	MTBF(Mean Time Between Failures): 2.5 million hours; AFR(Annual Failure Rate) : ≤ 0.35%; UBER(Uncorrectable Bit Error Rate) : 10^{-18}				
Temperature	Non-operational: –40°C to 85°C (–40° F to 185°F); operational: 0°C to 83°C (32°F to 181.4°F)				
TRIM	Supported				
Power Failure Protection	Supported				
Media Failure Protection	Supported				
Power Consumption					
Average Power Consumption (idle, Active)	<5.5W, 21W	<5.5W, 21W	<5.5W, 21W	<5.5W, 21W	<5.5W, 21W

Notes: Performance results are based on internal testing and use. Results and performance may vary according to configurations and systems, including device capacity, operating system versions, and test tools.
1. Capacity definition: 1 TB = 1,000 GB, 1 GB = 1,000,000,000 bytes.
2. DWPD represents drive writes per day tested according to the JESD219 standards. An SSD can be used for five years if the DWPD stays below the specified value; otherwise, the SSD service life will be affected.

For More Information

To learn more about Huawei storage, please contact your local Huawei office or visit the Huawei eKit website: http://ekit.huawei.com.

Huawei eKit APP

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