



SM2324

Ultra High-Speed, High-Capacity USB4 Portable SSD Controller

The SM2324 is Silicon Motion's most advanced single-chip controller for portable SSDs, purpose-built for next-generation AI workloads, edge devices, and high-resolution multimedia systems. With native USB4 support, it delivers the performance, efficiency, and integration required by modern data-intensive applications.

Integrated USB Power Delivery – Built-In Efficiency for Next-Gen SSDs

The SM2324 features a fully integrated USB Type-C interface with native USB Power Delivery (PD 3.1) support, eliminating the need for external PD controllers and streamlining BOM complexity. This true single-chip solution ensures full USB4 compatibility while simplifying hardware design and reducing board space.

By unifying NAND and power delivery management, the SM2324 accelerates development cycles, reduces vendor coordination overhead, and shortens time-to-market. It delivers a compact, power-efficient architecture ideally suited for today's high-speed, high-density portable SSDs.

Designed for creators, gamers, and mobile professionals, the SM2324 enables ultra-fast, space-efficient solutions capable of handling demanding tasks like 8K video capture, AI inference, and real-time media processing—without compromising portability.

Unparalleled Performance with Greater Capacity

As AI workloads and high-resolution content creation become increasingly data-intensive, portable SSDs must evolve to offer both blazing-fast performance and scalable capacity.

Built on TSMC's advanced 12nm process technology, the SM2324 leverages a USB4 Gen 3x2 interface with 40Gbps bandwidth and features a highly optimized four-channel NAND architecture, supporting speeds up to 1,600 MT/s per channel.

With sequential read/write speeds reaching 4,000 MB/s and support for up to 32TB capacity, the SM2324 offers the throughput and storage headroom required for modern high-resolution workflows and mobile workstation caching. Its high-throughput architecture ensures ultra-low latency and responsiveness for bandwidth-heavy tasks, such as raw content editing, 8K video recording, and AI-assisted data workflows.

NANDXtend® 4KB ECC and End-to-End Data Protection

The SM2324 incorporates Silicon Motion's proprietary NANDXtend® 4KB LDPC error correction technology to enhance endurance and data retention for 3D TLC and QLC NAND, even under sustained workloads or long-term use. This intelligent ECC engine helps maintain consistent performance and extends drive lifespan in demanding portable environments.

Security is also a top priority. The SM2324 provides robust data protection with AES 256-bit encryption, end-to-end data path protection, and integrated SRAM ECC, delivering comprehensive security from NAND to host. These features ensure data integrity and system reliability across the entire data lifecycle—critical for professional and security-sensitive applications.

KEY FEATURES

- **Ultra-High Performance**
 - Sequential Read: up to 4,000 MB/s
 - Sequential Write: up to 4,000 MB/s
- **Low Power Consumption**
 - Supports Flash devices operating at 1.2V
- **Data Integrity and Security**
 - Supports Fingerprint Security
 - Self-encrypting drive (SED) with AES 128/256 and TCG Opal
 - Data retention extension with NANDXtend®
- **Broad Host Device Compatibility**
 - Backward compatible with all existing USB standards
 - Supports Apple ProRes Recording and MFi Specification
 - Compliant with USB Type-C Spec Release 2.1
 - Compliant with USB Power Delivery Specification Revision 3.1

SPECIFICATIONS

SM2324

Host Interface	USB4 Gen 3x2 (40Gbps)
	Compliance USB 3.2 Gen2x2 (20 Gbps)
	Compliance USB 3.2 Gen2x1 (10 Gbps)
	Compliance USB 3.2 Gen1 (5 Gbps)
	Compliance USB 2.0 (480 Mbps)
Processor	Dual ARM Cortex R5 CPU
Channel/CE	4CH/32CE
NAND Flash Support	3D TLC/QLC NAND
	ONFI5.0/Toggle3.0 DDR NAND Flash
	VCCQ 1.2V
Max Capacity	Up to 32TB
Max Performance	Sequential Read 4,000 MB/s
	Sequential Write 4,000 MB/s
Security	Real time full drive encryption with AES 128/256
	TCG Opal 2.0 compliant
	Hardware SHA 384/256 and TRNG
	Supports Fingerprint Secure
Operating System Support	Windows XP and later versions
	Mac OS 10.x and later versions
	Linux kernel 2.4 and later versions
Package	FCCSP-C (9mm x 9mm)
	Lead-free and RoHS compliant