

Marvell® Bravera™ SC5 SSD Controllers

PCIe 5.0 SSD Controller supporting up to 16 NAND Channels for enabling next generation cloud storage solutions

Overview

The Marvell Bravera SC5 SSD controllers enable next-generation solid-state drives for cloud and data center flash storage applications. The products in the Bravera SSD family- MV-SS1331 and MV-SS1333 support 8 or 16 high performance NAND channels respectively.

The Bravera SC5 SSD controllers are NVMe 1.4b compliant and feature end-to-end data protection with support for up to 4 PCIe lanes, or a dual port up to 2 PCIe lanes per port.

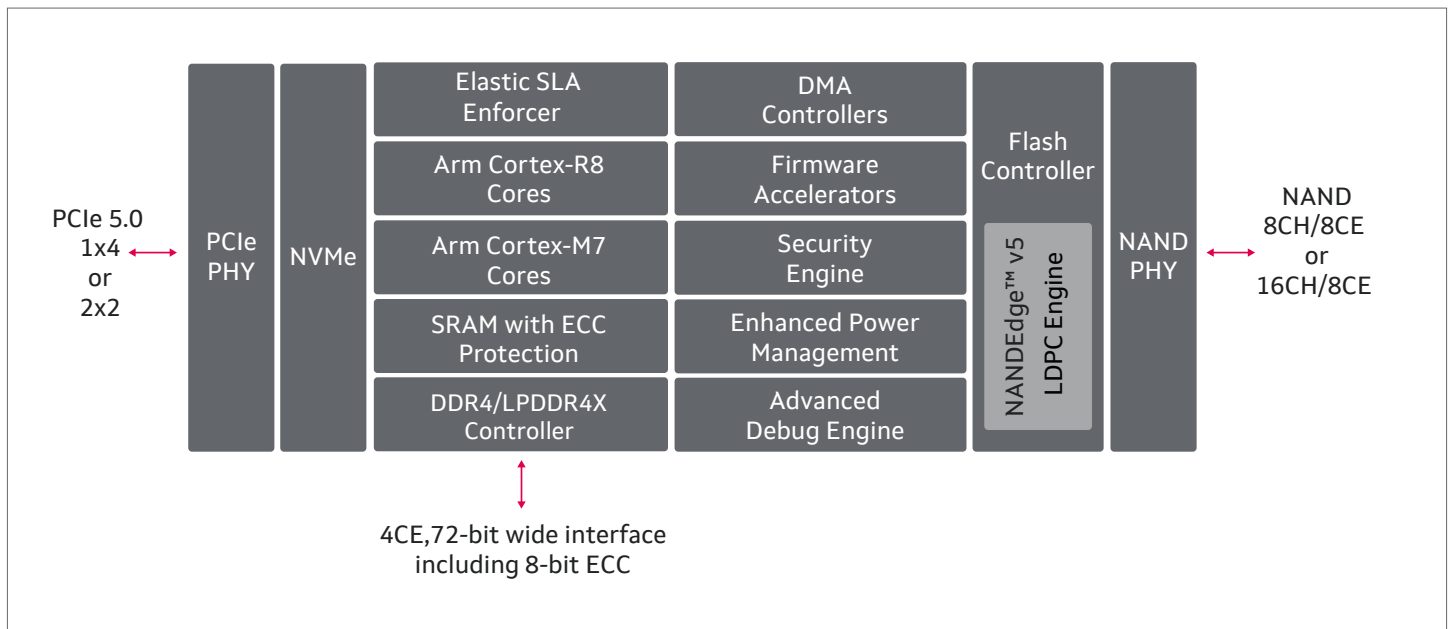
The flash controller issues read, write, or erase commands to the NAND and has a hardware RAID engine. Its error correction engine, the Marvell 5th generation of NANDEdge™, uses low-density parity coding (LDPC) that is compatible with a variety of NAND types: SLC, MLC, TLC, and QLC from all NAND vendors.

The Bravera SC5 SSD controllers feature 72-bit DDR interface with the option of using either DDR4 or LPDDR4X and has 10 embedded processor cores: Arm® Cortex®-R8 cores plus additional Cortex-M7 cores for providing further flexibility. In addition, a Cortex-M3 processor core with integrated instruction/data SRAM and crypto engines (AES, SHA, RSA, ECC) in a secure boundary handles the security (TCG) standards for all secure drive control and key management.

Featuring ultra low latency (< 6us) can enable SSD storage solutions that offer levers to control and meter performance at the drive level being able to offload hypervisors and free up host system resources.

Available in 20x20mm package, these controllers can enable new EDSFF factors including 16CH E1.S solutions.

Block Diagram



Key Features

Features	Benefits
Marvell MV-SS1331 with 8 NAND channels Marvell MV-SS1333 with 16 NAND channels	• Both controllers support latest NAND devices up to 1600MT/s
PCIe Gen5x4	• Offers 2x bandwidth over PCIe 4.0
Sequential Read: 14 GB/s Sequential Write: 9 GB/s Random Read: 2M IOPS Random Write: 1M IOPS	• Enables highest performance PCIe Gen5 SSDs
AES-256 Encryption with FIPS compliant root of trust	• Best in class security
End-to-end data path protection	• Minimizes risk of data loss/corruption
16 Physical Functions and 32 Virtual Functions	• Easy hardware based virtualization
DDR4 @3200MHz / LPDDR4x @4266MHz	• Enables highest performance SSD
< 6us Latency with granular arbitration control	• Cutting edge deterministic QoS
8CH Power < 8.7W 16CH Power < 9.8W	• Unprecedented power to performance ratio
20x20mm package	• Smallest 16CH SSD controller, can enable EDSFF E1.S
Advanced telemetry and hardware debug features	• Enabling flexible datacenter ready solutions

Target Applications

- OCP SSD
- Software Enabled Flash SSD
- Enterprise Dual Port SSD
- Zoned Name Space SSD



To deliver the data infrastructure technology that connects the world, we're building solutions on the most powerful foundation: our partnerships with our customers. Trusted by the world's leading technology companies for 25 years, we move, store, process and secure the world's data with semiconductor solutions designed for our customers' current needs and future ambitions. Through a process of deep collaboration and transparency, we're ultimately changing the way tomorrow's enterprise, cloud, automotive, and carrier architectures transform—for the better.

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