

# Marvell® 88SS1322 SSD Controller

PCIe® Gen 4x4, 4-Channel DRAMless High-Performance SSD Controller with NVMe™ 1.3c Interface

## Overview

The Marvell® 88SS1322 enables high performance and high capacity SSDs for use in small form factor applications, for example, cloud data center compute server storage, enterprise boot drives, PC client storage and gaming storage as well as emerging industrial and edge device applications.

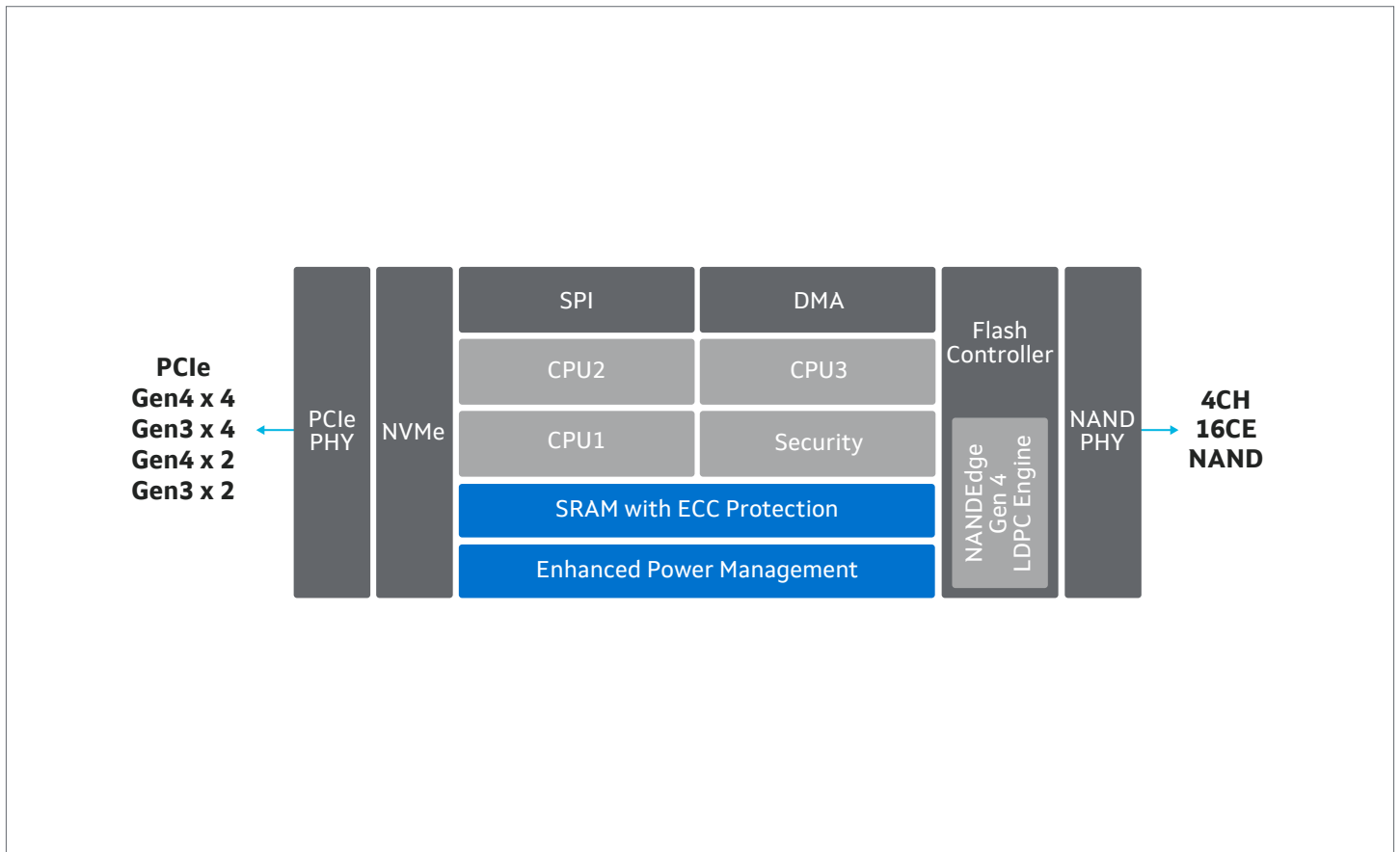
Leveraging a tri-core Arm® Cortex® R5 architecture that supports DRAMless operations, the product is ideally suited for m.2 2230, 2242, 2280 SSDs in single and double-sided form factors. It also supports BGA 1113 and BGA1620 FF SSDs. The Marvell 88SS1322 controller supports PCIe Gen 4 and four ONFI and TOGGLE NAND channels operating at up to 1200MT/s, that enable high capacity, high throughput and low latency storage over a wide range of use cases.

The common hardware and firmware controller architecture in 12nm process technology provides the best-in-class electrical and thermal characteristics as well as ultra-low power consumption.

The 88SS1322 leverages the 4th generation of the Marvell NANDEdge™ LDPC engine for extracting the highest level of error correction capability and low-latency read retries and endurance to support next generation TLC and QLC memories.

The SSD controller also supports TCG standards including an AES engine and OTP storage for secure drive configuration.

## Block Diagram



## Key Features

Features	Benefits
Processor	<ul style="list-style-type: none"><li>• Tri-Cortex R5 CPUs</li></ul>
Interface	<ul style="list-style-type: none"><li>• PCIe Gen 4x4; Gen 4x2; Gen 3x4 and Gen 3x2</li><li>• 6G SATA</li></ul>
DDR Controller	<ul style="list-style-type: none"><li>• DRAMless</li></ul>
Flash Controller	<ul style="list-style-type: none"><li>• 4 Channels @ 1200MT/s</li><li>• Up to 16 CEs (4CH x 4 CE/Channel)</li><li>• Compatible with ONFI 2.2/2.3/3.0/4.0/4.1, JEDEC mode and Toggle 1.0/2.0/3.0/4.0</li><li>• Hardware RAID</li><li>• 4th generation of Marvell NANDEdge™ LDPC engine</li></ul>
NVMe	<ul style="list-style-type: none"><li>• NVMe Standard Revision 1.3c compliance</li><li>• Supports Host Memory Buffer (HMB) Option</li></ul>
Data Protection & Security	<ul style="list-style-type: none"><li>• End-to-end data protection</li><li>• OTP support for secure drive configuration</li><li>• AES encryption hardware</li></ul>
Temperature Support	<ul style="list-style-type: none"><li>• 0C to 70C (C-temp)</li><li>• -40C to 85C (I-temp)</li><li>• On-Die Temperature Sensor</li></ul>
Performance	<ul style="list-style-type: none"><li>• 128KB Sequential Read up to 3.9 GB/s</li><li>• 128KB Sequential Write up to 3.3 GB/s</li><li>• 4K Random Read up to 500K IOPS</li><li>• 4K Random Write up to 400K IOPS</li></ul>
Deep Sleep Idle Power	<ul style="list-style-type: none"><li>• PS4 (L.1.2): ~1mW</li></ul>
Package	<ul style="list-style-type: none"><li>• 8mm x 11mm (234 ball) FC-TFBGA package</li></ul>

## Target Applications

- PC Client
- Gaming
- Industrial
- Data Center
- Enterprise Boot-Drive DRAMless SSDs



Marvell first revolutionized the digital storage industry by moving information at speeds never thought possible. Today, that same breakthrough innovation remains at the heart of the company's storage, networking and connectivity solutions. With leading intellectual property and deep system-level knowledge, Marvell semiconductor solutions continue to transform the enterprise, cloud, automotive, industrial, and consumer markets. For more information, visit [www.marvell.com](http://www.marvell.com).

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