

# Marvell 88SS1093 Flash Memory Controller

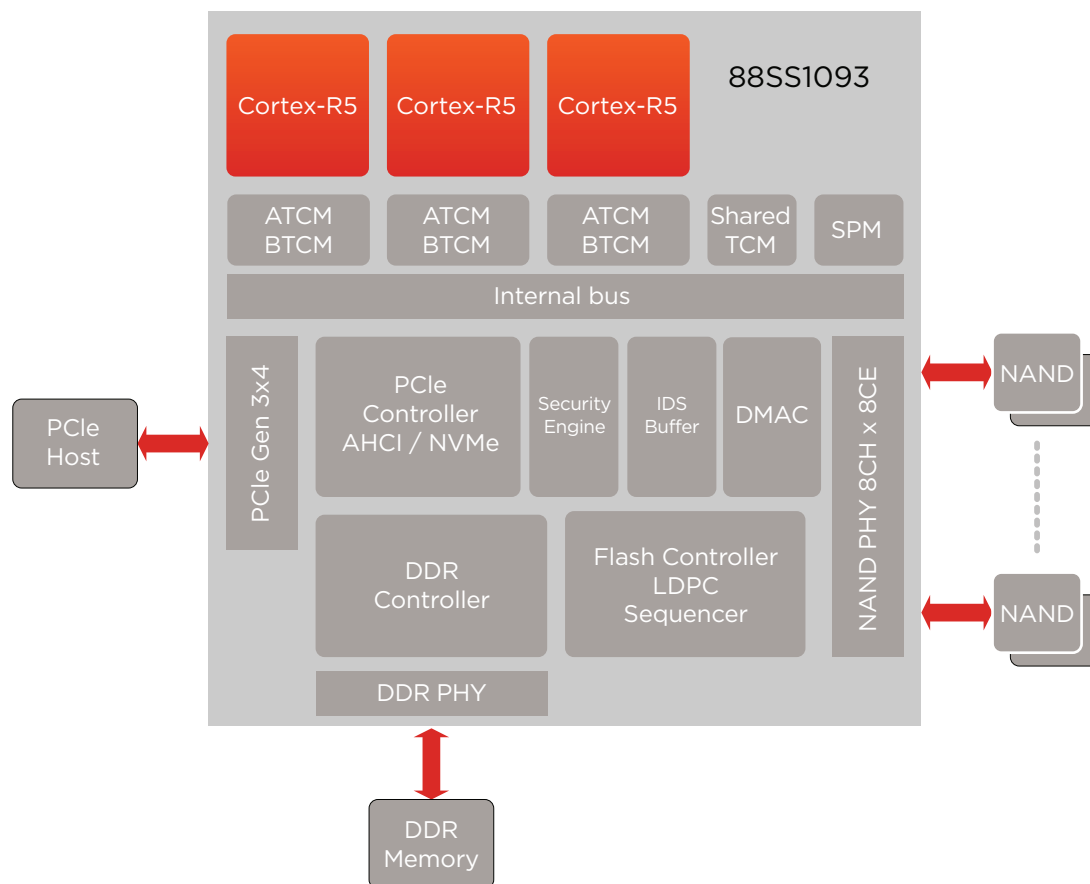
PCIe Gen3x4 NVMe SSD Controller with 8 NAND Channels

## PRODUCT OVERVIEW

The Marvell® 88SS1093 is a NVM Express SSD controller that provides support for PCI Express Gen3x4 host interface and 8 channel NAND interface up to 8 devices (CE's) per channel. It also features Marvell's 3rd-generation LDPC technology for reliability enhancement, endurance boost and TLC NAND device support on top of MLC NAND.

The Marvell 88SS1093 supports both AHCI 1.3 and the NVM Express 1.1b as the host command protocols. The NVM Express minimizes the host command processing overhead and reduce the command latency significantly. The IDS buffer feature gives the 88SS1093 the ability to support speeds of over 3GB/s.

## BLOCK DIAGRAM



## KEY FEATURES AND BENEFITS

FEATURES	BENEFITS
NAND Interface	<ul style="list-style-type: none"> <li>• 8 NAND Channel with 8 CE's</li> <li>• Up to 533MT/s Toggle2 and ONFI3 standards</li> <li>• VccQ 1.2V and 1.8V</li> </ul>
Flash Memory Controller	<ul style="list-style-type: none"> <li>• Hardware Sequencer to reduce firmware intervention of descriptor programming and interrupt handling</li> <li>• Third generation LDPC to support 15/16nm MLC/TLC as well as 3D NAND</li> <li>• Support for Out-of-Order completion</li> <li>• Auxiliary data insertion/extraction support</li> <li>• Advanced ECC scheme, exceeding the requirements from NAND flash memory vendors</li> <li>• Programmable drive strengths of IO's for different NAND flash devices and different configuration</li> <li>• Adaptive read (retry) support</li> <li>• Hardware RAID 18KB x 12</li> </ul>
Host Interface	<ul style="list-style-type: none"> <li>• PCIe Gen 3 x 4 lanes</li> <li>• AHCI 1.3 and NVMe 1.1b</li> <li>• Supports SRIS</li> <li>• Low-power features               <ul style="list-style-type: none"> <li>- Link Power Management: ASPM L0s, L1 support</li> <li>- Low Power: L1.2 supported</li> <li>- Latency Tolerance Reporting (LTR)</li> </ul> </li> </ul>
CPU System	<ul style="list-style-type: none"> <li>• Triple ARM Cortex R5 up to 500MHz</li> <li>• ATCM 96KB per core</li> <li>• BTCM 64KB per core</li> <li>• Shared TCM 64KB</li> <li>• ScratchPad Memory 128KB</li> <li>• IDS buffer 128KB</li> </ul>
DRAM Interface	<ul style="list-style-type: none"> <li>• 32-bit DRAM interface</li> <li>• Support DDR3, DDR4, LPDDR2 and LPDDR3, up to 2GB</li> </ul>
Security	<ul style="list-style-type: none"> <li>• AES 256 encryption engine</li> <li>• TCG standards supported</li> </ul>
Peripherals	<ul style="list-style-type: none"> <li>• SPI interface</li> <li>• UART</li> <li>• Temperature sensor support</li> <li>• Adaptive Voltage Scaling (AVS)</li> </ul>
Package	<ul style="list-style-type: none"> <li>• 17x17mm with 0.65mm ball pitch 556-ball TFBGA</li> </ul>

## TARGET APPLICATIONS

- High Performance SSD for Personal Computer
- High Performance SSD for Data Centers
- High Performance SSD for All-Flash-Arrays

**THE MARVELL ADVANTAGE:** Marvell chipsets come with complete reference designs which include board layout designs, software, manufacturing diagnostic tools, documentation, and other items to assist customers with product evaluation and production. Marvell's worldwide field application engineers collaborate closely with end customers to develop and deliver new leading-edge products for quick time-to-market. Marvell utilizes world-leading semiconductor foundry and packaging services to reliably deliver high-volume and low-cost total solutions.

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