Marvell® 88NV1160
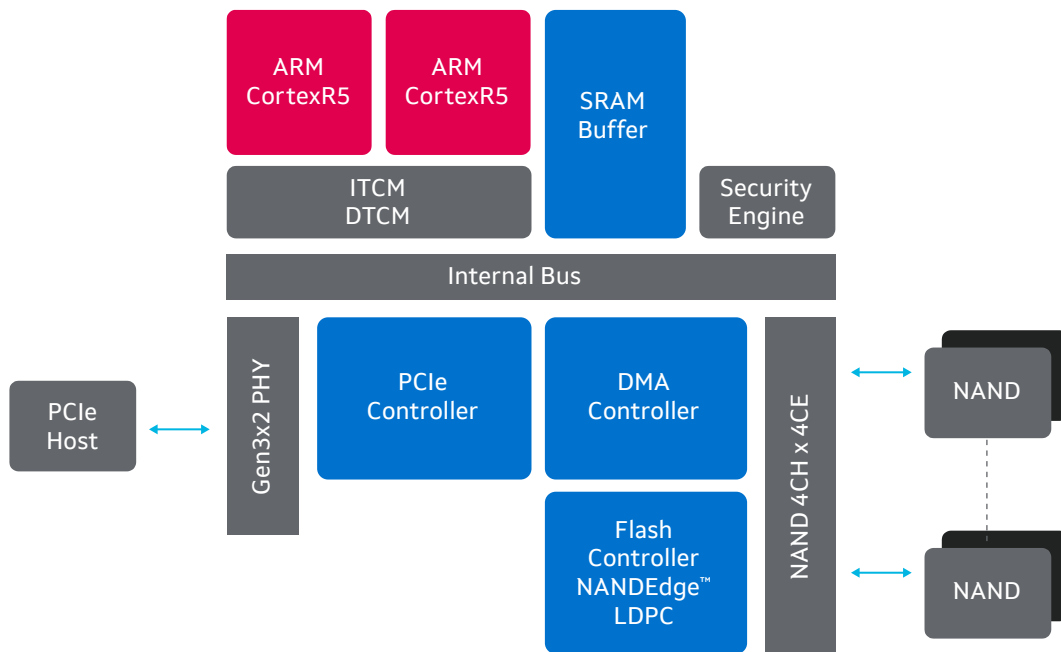
PCIe Gen3x2 NVMe DRAM-less BGA SSD Controller

Overview

The Marvell® 88NV1160 is the latest solution in its solid-state drive (SSD) portfolio of Non-Volatile Memory (NVM) Express DRAM-less SSD controllers, which includes its 88NV1120 SATA and 88NV1140 PCIe Gen3x1 NVMe products. The 88NV1160 provides industry-leading performance per Watt and up to 1600MB/s read speeds. The 88NV1160 can be used in a single ball grid array (BGA) package SSD, as well as in a standalone controller in a small 9x10mm package, which makes it compatible with M.2230 and M.2242 form factors. These features are optimized for the new generation of slim-computing devices such as productivity tablets and ultrabooks.

Marvell's 88NV1160 enables Peripheral Component Interconnect Express (PCIe) Gen3x2 NVMe BGA SSD, and provides full support for 2D and 3D NAND, ONFI and Toggle, MLC, TLC and QLC. The 88NV1160 facilitates BGA SSD support for both 16x20mm and 11.5x13mm form factors.

Block Diagram

Key Features

Features	Benefits
NAND Interface	· 4 NAND Channel with 4 CEs · Up to 533MT/s Toggle2 and ONFI3 standards · VccQ 1.2V and 1.8V
Flash Memory Controller	· Hardware sequencer to reduce firmware intervention of descriptor programming and interrupt handling · NANDEdge™ Third generation LDPC to support 15/16nm MLC/TLC as well as 3D NAND · Support for Out-of-Order completion · Auxiliary data insertion/extraction support · Advanced ECC scheme, exceeding the requirements from NAND flash memory vendors · Programmable drive strengths of IOs for different NAND flash devices and different configuration · Adaptive read (retry) support
Host Interface	· PCIe Gen3x2 NVMe 1.3 · Host memory buffer support · L1.2 Low power support
CPU System	· Dual ARM Cortex R5 up to 400MHz · Shared ITCM · Shared DTCM · SRAM buffer / DRAM-less architecture
Security	· AES 256 encryption engine · TCG standards supported
Peripherals	· SPI interface · UART interface · Temperature sensor support · Adaptive Voltage Scaling (AVS)
Package	· 9x10mm 0.65mm ball pitch TFBGA · Known Good Die (KGD) option: · 11.5x13mm and 16x20mm BGA SSD support

Target Applications

· Productivity tablets
· Industrial SSD
· Ultrabooks
· Server boot drives