Product Detail Page: FerriSSD PCIe Gen3 Module

PART NUMBER	DESCRIPTION
ME681GXCKAG3T	64GB Ferri-PCIe Gen3 BGA SSD, WD BICS5 3D TLC, C-temp, TLC Mode, M.2 2280
ME681GXDKAG3T	128GB Ferri-PCIe Gen3 BGA SSD, WD BICS5 3D TLC, C-temp, TLC Mode, M.2 2280
ME681GXEKAG3T	256GB Ferri-PCIe Gen3 BGA SSD, WD BICS5 3D TLC, C-temp, TLC Mode, M.2 2280
ME681GXFKAG3T	512GB Ferri-PCIe Gen3 BGA SSD, WD BICS5 3D TLC, C-temp, TLC Mode, M.2 2280
ME681GECKAG3T	64GB Ferri-PCIe Gen3 BGA SSD, WD BICS5 3D TLC, I-temp, TLC Mode, M.2 2280
ME681GEDKAG3T	128GB Ferri-PCIe Gen3 BGA SSD, WD BICS5 3D TLC, I-temp, TLC Mode, M.2 2280
ME681GEEKAG3T	256GB Ferri-PCIe Gen3 BGA SSD, WD BICS5 3D TLC, I-temp, TLC Mode, M.2 2280
ME681GEFKAG3T	512GB Ferri-PCIe Gen3 BGA SSD, WD BICS5 3D TLC, I-temp, TLC Mode, M.2 2280
ME681GXCKAG3S	20GB Ferri-PCIe Gen3 BGA SSD, WD BICS5 3D TLC, C-temp, SLC Mode, M.2 2280
ME681GXDKAG3S	40GB Ferri-PCIe Gen3 BGA SSD, WD BICS5 3D TLC, C-temp, SLC Mode, M.2 2280
ME681GXEKAG3S	80GB Ferri-PCIe Gen3 BGA SSD, WD BICS5 3D TLC, C-temp, SLC Mode, M.2 2280
ME681GXFKAG3S	160GB Ferri-PCIe Gen3 BGA SSD, WD BICS5 3D TLC, C-temp, SLC Mode, M.2 2280
ME681GECKAG3S	20GB Ferri-PCIe Gen3 BGA SSD, WD BICS5 3D TLC, I-temp, SLC Mode, M.2 2280
ME681GEDKAG3S	40GB Ferri-PCIe Gen3 BGA SSD, WD BICS5 3D TLC, I-temp, SLC Mode, M.2 2280
ME681GEEKAG3S	80GB Ferri-PCIe Gen3 BGA SSD, WD BICS5 3D TLC, I-temp, SLC Mode, M.2 2280
ME681GEFKAG3S	160GB Ferri-PCIe Gen3 BGA SSD, WD BICS5 3D TLC, I-temp, SLC Mode, M.2 2280

PART NUMBER	DESCRIPTION
MD681GXCKAG3T	64GB Ferri-PCIe Gen3 BGA SSD, WD BICS5 3D TLC, C-temp, TLC Mode
MD681GXDKAG3T	128GB Ferri-PCIe Gen3 BGA SSD, WD BICS5 3D TLC, C-temp, TLC Mode
MD681GXEKAG3T	256GB Ferri-PCIe Gen3 BGA SSD, WD BICS5 3D TLC, C-temp, TLC Mode
MD681GXFKAG3T	512GB Ferri-PCIe Gen3 BGA SSD, WD BICS5 3D TLC, C-temp, TLC Mode
MD681GECKAG3T	64GB Ferri-PCIe Gen3 BGA SSD, WD BICS5 3D TLC, I-temp, TLC Mode
MD681GEDKAG3T	128GB Ferri-PCIe Gen3 BGA SSD, WD BICS5 3D TLC, I-temp, TLC Mode
MD681GEEKAG3T	256GB Ferri-PCIe Gen3 BGA SSD, WD BICS5 3D TLC, I-temp, TLC Mode
MD681GEFKAG3T	512GB Ferri-PCIe Gen3 BGA SSD, WD BICS5 3D TLC, I-temp, TLC Mode
MD681GXCKAG3S	20GB Ferri-PCIe Gen3 BGA SSD, WD BICS5 3D TLC, C-temp, SLC Mode
MD681GXDKAG3S	40GB Ferri-PCIe Gen3 BGA SSD, WD BICS5 3D TLC, C-temp, SLC Mode
MD681GXEKAG3S	80GB Ferri-PCIe Gen3 BGA SSD, WD BICS5 3D TLC, C-temp, SLC Mode
MD681GXFKAG3S	160GB Ferri-PCIe Gen3 BGA SSD, WD BICS5 3D TLC, C-temp, SLC Mode
MD681GECKAG3S	20GB Ferri-PCIe Gen3 BGA SSD, WD BICS5 3D TLC, I-temp, SLC Mode
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MD681GEEKAG3S	80GB Ferri-PCIe Gen3 BGA SSD, WD BICS5 3D TLC, I-temp, SLC Mode
MD681GEFKAG3S	160GB Ferri-PCIe Gen3 BGA SSD, WD BICS5 3D TLC, I-temp, SLC Mode

Product specifications

PCIe NVMe FerriSSD modules are designed optimally to be easily adapted for a wide range of industrial embedded applications requiring faster access, industrial standard form factor, and reliable PCIe non-volatile memory storage.

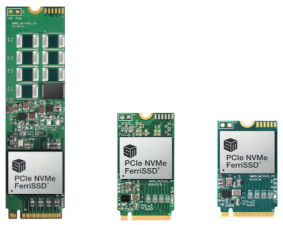
FerriSSD Modules provide for customized firmware - enabling highly reliable and differentiable storage solutions, a perfect choice for boot-SSD in server, automotive IVI, network appliances, and other systems.

Adopting FerriSSD Modules will accelerate development time, enable upgradability and replace the ability of the storage system as well as enhance the overall performance, eliminate potential downtime, and reduce the total cost of ownership.

Armed with SMI proprietary technologies and programmable firmware, the PCIe NVMe FerriSSD is the ultimate non-volatile storage solution that is easy to design and manufacture. The PCIe NVMe FerriSSD series features a high throughput transfer rate with optional embedded DRAM to enhance data storage efficiency and high random read/write IOPS. The PCIe NVMe FerriSSD leverages Silicon Motion's most advanced technologies, including IntelligentScan, DataRefresh, high bandwidth LDPC ECC engine with SMI group RAID, and End-to-end data path protection to provide unsurpassed data integrity in a non-volatile storage device. All PCIe NVMe FerriSSD series support 3D SLCmode and TLCmode NAND flash options.

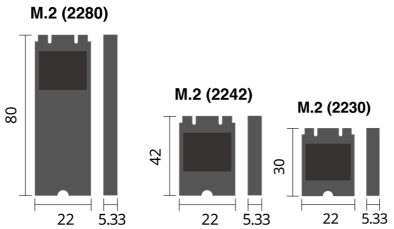
This makes the FerriSSD modules ideal for a wide range of applications, including car computing, navigation systems, thin clients, point-of-sale terminals, multifunction printers, telecommunications equipment, factory automation tools, and an array of server applications. Whether for business or personal use, the FerriSSD provides ultimate storage performance in a compact form factor, making it an essential component for any embedded computing device.

Specifications- FerriSSD Modules



Module Name	FerriSSD® M.2 module		
Form Factor	M.2 (22x30mm)	M.2 (22x42mm)	M.2 (22x80mm)
Connector	M.2 PCIe		
DC Supply	3.3V ± 5%		
Capacity	3D SLCmode	4 - 160GB	
	3D MLCmode	8 - 320GB	
	3D TLCmode	16 - 480GB	
Temperature Support	Commercial Temp (0°C to + 70°C)		
	Industrial Temp (-40°C to + 85°C)		

Dimensions



SiliconMotion

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Why PCIe NVMe FerriSSD® Module

Lower total cost of ownership & Easy to use

- Plug and Play: Only requires format/fdisk prior to use
- Rugged & Reliable: No moving parts
- Cost-saving with flexible TLCmode™/SLCmode™, configurable capacities

Eliminate down time
- IntellligentScan™/DataRefresh™ : Supports self-scanning w/ proactive data protection
- IntelligentLog™ : Enables self-monitoring, analysis and AER (Advance Error Warning)
- Field programmable firmware available

Full design service from design to after sales support
- SSD life simulation and validation
- Fixed BOM and firmware from ordering part number
- Dedicated technical support team

Key Features

High-Efficiency Error Correction
- Advanced Hardware LDPC (ECC) Engine
- StaticDataRefresh™ and EarlyRetirement™ technologies ensure the data reliability

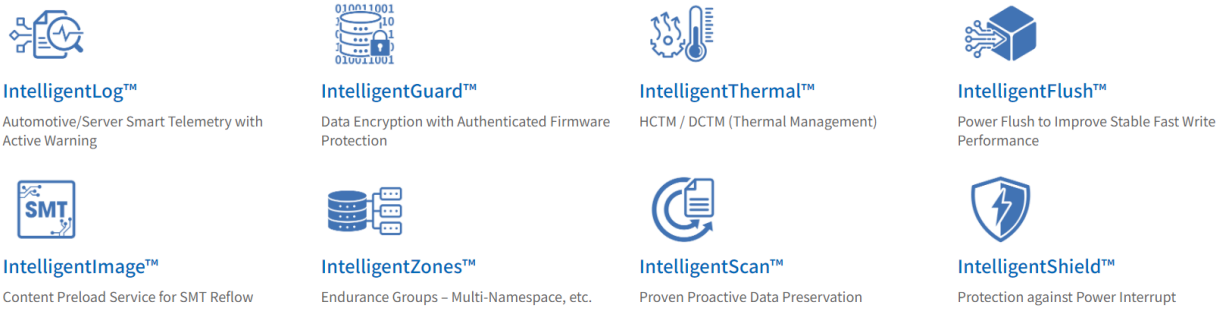
Power Efficiency
- Dynamic power management technology enables multiple power saving modes

Advanced Global Wear Leveling to Enhance Reliability
- Even distribution of program / erase cycles across all NAND flash chips
- Maximizes the lifespan with low Write Amplification Index (WAI)

Robust Data Protection
- Advanced system level protection against unstable power
- Software / hardware write protect option
- Multiple user data security zones
- Software / hardware secure erase function
- PowerShield and DataPhoenix technologies support power-down data protection

Storage Solutions & Technologies - IntelligentSeries™

SMI is committed to developing innovative storage solutions and harnessing the advanced technologies to ensure that our products deliver the highest levels of data integrity, reliability and quality for mission-critical applications.



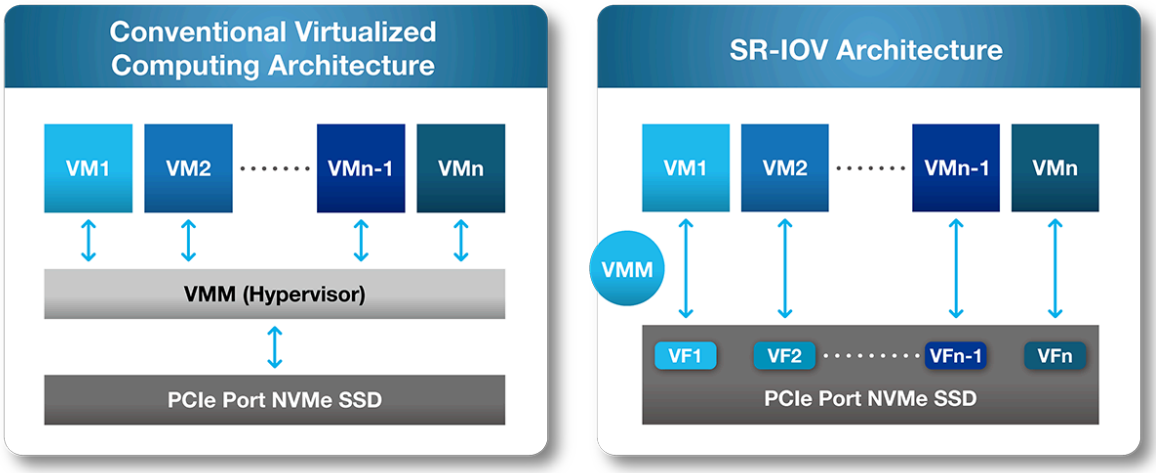
For industrial, commercial, and automotive applications that require high-performance, customized single-chip SSDs for small-footprint equipment operating in demanding environments.

Technologies

FerriSSD® Supports Single Root-IO Virtualization

One Storage Directly Support Virtual I/Os to Multiple VFs

The SR-IOV architecture applies the concept of virtualization. Its architecture provides for the direct connection of multiple automotive modules to an SSD via PCIe channels. This provides the flexibility to run a VM on any supported hardware target and optimizes the usage of the available hardware resources.



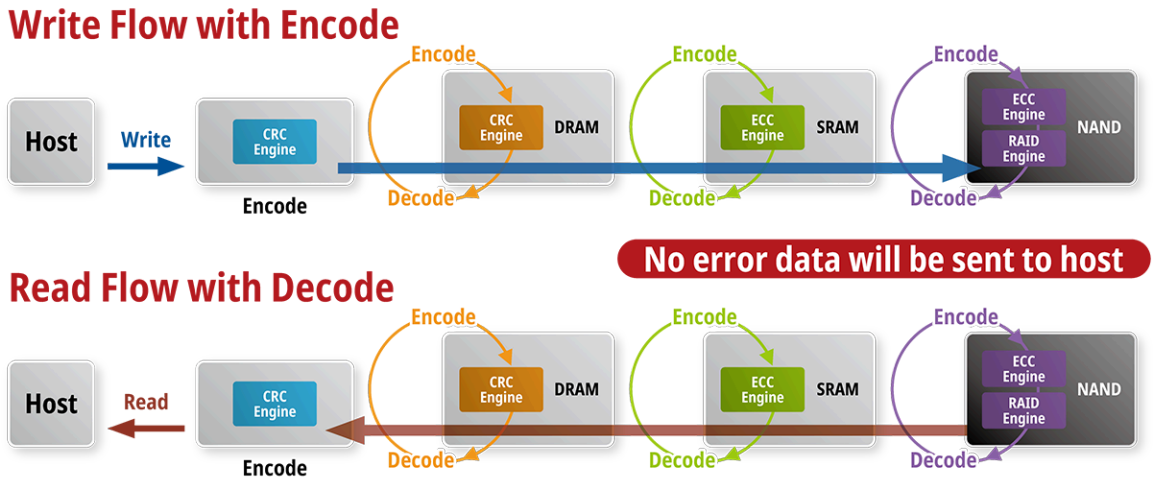
The advantage of virtualized architecture is that data transfers no longer need to be routed via the hypervisor (virtual machine manager, or VMM), thus eliminating the delay caused by translating software code from PCIe format into hypervisor format and back again. This also reduces the burden on the CPU in which the hypervisor runs.

Now offered with built-in SR-IOV capability, a single FerriSSD® device from Silicon Motion in a virtualized architecture can support up to eight VMs, which are implemented in hardware on the embedded SSD

controller, providing a direct, high-speed PCIe interface to each VM via a dedicated virtual function (VF) implemented in the SSD controller.
Benefits:
Cost saving – replacing multiple, lower performance, less robust storage devices with a single, high-performance SSD.
Low Latency – the SR-IOV capability provides for near-native QoS in a flexible virtualized architecture.
Reduced CPU utilization – thanks to the elimination of the hypervisor layer between virtual machines and an SR-IOV-enabled SSD.

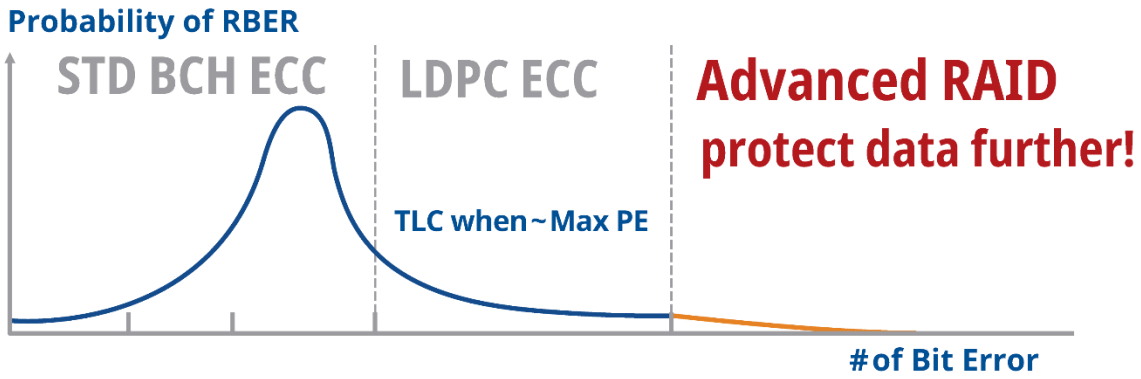
FerriSSD®: End to End Data Path Protection to Guarantee Data Integrity

Silicon Motion's FerriSSDs incorporate full data error detection with recovery engines to provide enhanced data integrity throughout the entire Host-to-NAND-to-Host data path. The FerriSSD® data recovery algorithm can effectively detect any error in the SSD data path, including hardware (i.e. ASIC) errors, firmware errors, and memory errors arising in SRAM, DRAM, or NAND.



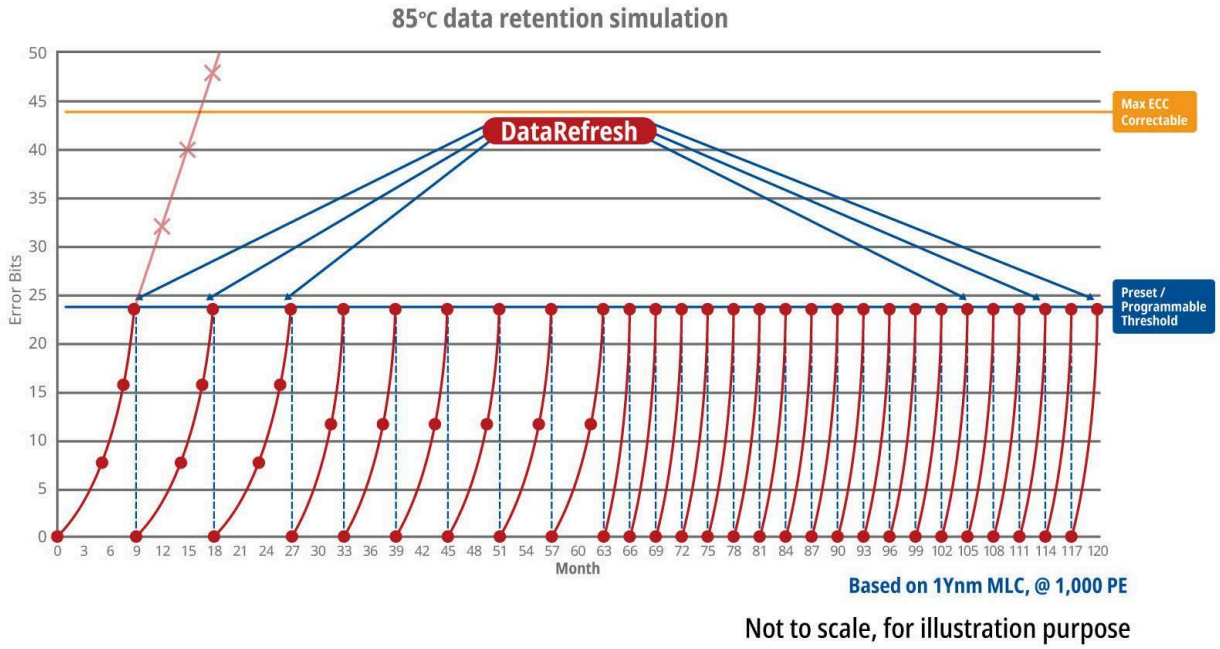
FerriSSD®: NANDXtend® ECC technology to Extend Operating Lifetime

Conventional SSDs employ standard BCH and RS ECC (error correction coding) engines to initiate first-level correction using NAND shift-read-retries. In addition to this first-level error correction, FerriSSDs also implement a highly efficient second-level correction scheme using an LDPC (low-density parity-check) code and an advanced RAID algorithm (a highly efficient redundant backup) to reduce potential dPPM at customer site while extending the service life of SSD.



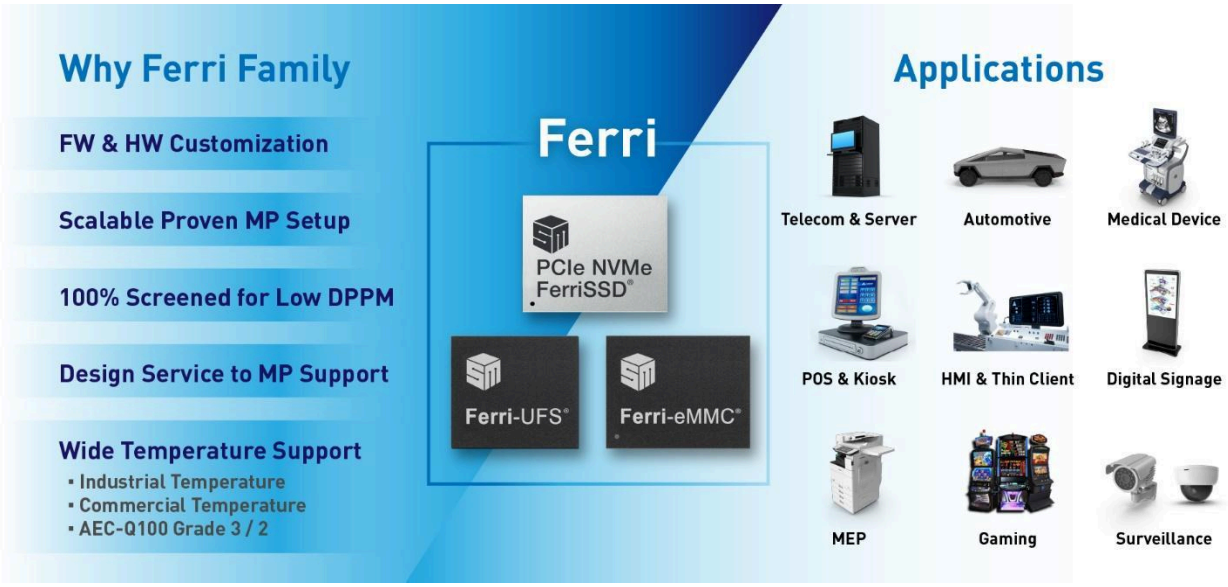
IntelligentScan™ and DataRefresh™ to Enhance Data Retention in High Temperature Environment

Silicon Motion's proprietary IntelligentScan function will activate automatically to scan recharge, repair or retire the cell block (DataRefresh) according to the host behavior and working environment (eg. ambient temperature). As a result of the combination of IntelligentScan and DataRefresh, Ferri-UFS® can effective prolong its service life much beyond typical NAND specifications.



Not to scale, for illustration purpose

Ferri Family Enabling the NAND Flash Storage in Comprehensive Applications



Video

Documents

FerriSSD® Selection Guide-Ax series PCIe Module
FerriSSD® for Server Applications
FerriSSD® for Embedded Computing Applications
FerriSSD® Modules
Silicon Motion's Ferri Family: AEC-Q100 Qualified Embedded Storage
Silicon Motion's FerriSSD Offers the Stability and Data Security Required in Medical Equipment
Silicon Motion's PCIe NVMe FerriSSD Enables High Speed and High Reliability for Digital Signage
Silicon Motion's PCIe FerriSSD® Designed Specifically for Industrial/Embedded Applications
Silicon Motion's Ferri Family Optimizes Embedded Flash-based Storage for Automotive Use
Silicon Motion's New FerriSSD® Boosts Server Performance in a BGA-SSD
Silicon Motion FerriSSD® for Embedded Boot Load Applications

Video

Ferri Family Overview:
Automotive storage solution