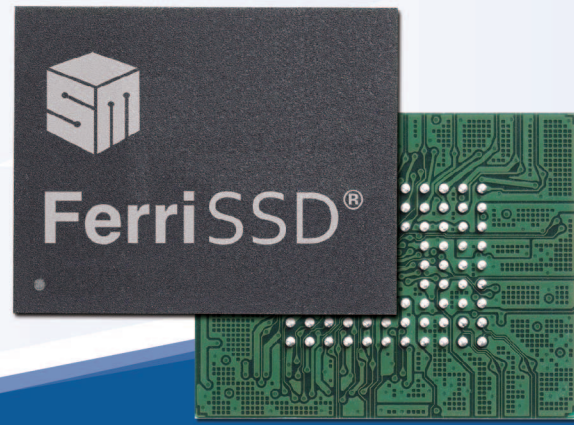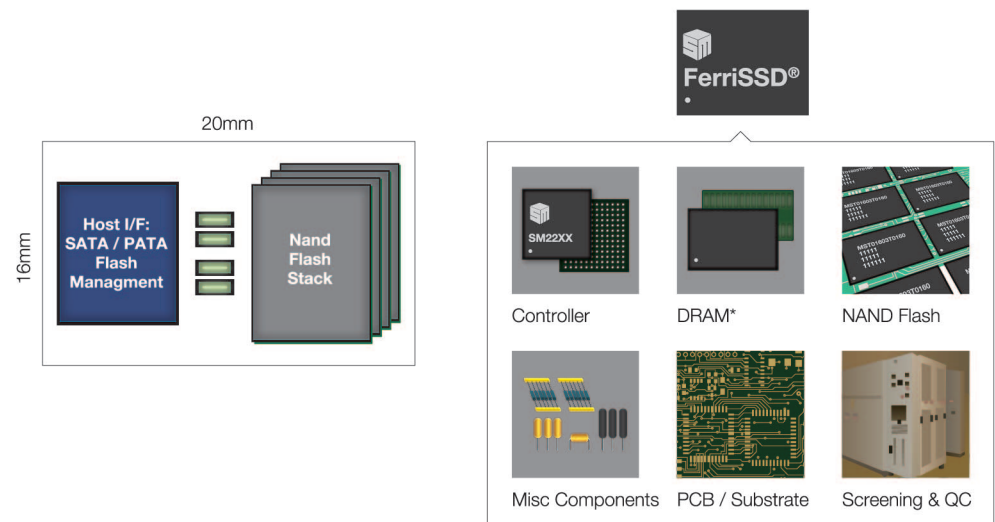# FerriSSD®

## Quick Reference

### FerriSSD®
### BGA Solid-State Drive

The FerriSSD® is designed optimally for a wide range of embedded applications requiring faster access, small form factor and reliable SATA/PATA storage. By combining industry proven controller technology, NAND flash and passive components into a single BGA package with 1.0mm ball-pitch size, FerriSSD® simplifies design efforts, reduces time-to-market while protecting from NAND technology migration concerns. FerriSSD® also comes with advanced firmware features as well as the provision for customized firmware – enabling highly reliable and differentiable storage solutions.

The FerriSSD® family consists of the latest SM619 and SM659 series featuring SATA 6Gb/s transfer rate with embedded DRAM to enhance data storage efficiency and high random read/write IOPS of up to 75,000. Also available in the family are the SM651/SM631/SM611 SATA 3Gb/s series as well as the SM621/SM641/SM601 PATA series single-package SSDs. All FerriSSD® series support SLC, SLCmode and MLC NAND flash options.

### SMI BGA-SSD
### Overview



20mm

16mm

Host I/F: SATA / PATA Flash Managment

Nand Flash Stack

FerriSSD®

| Controller | DRAM* | NAND Flash |
| Misc Components | PCB / Substrate | Screening & QC |

SM22XX

*Available in SM619/SM659 series

### Why FerriSSD®?

**Easy to use**
• Plug & Play only requires format/fdisk prior to use
• Small footprint for space-limited design

**Lower total cost of ownership**
• Rugged & Reliable (no moving parts)
• Eliminate requalification cost from NAND generation change
• Cost saving with low density FerriSSD, HDD are typically > 160GB capacity

**Eliminate down time**
• Supports self-monitoring, analysis and reporting technology commands (S.M.A.R.T.)
• Field programmable firmware available

## Applications

Embedded applications that are currently using HDD but require only small density can migrate to FerriSSD® for customizable density with a small form factor !

Telecom & Server

Multifunction Printer

POS & Kiosk

Testing Instrument

Ind. Handheld Device

HMI & Thin Client

Ind. / Embedded MB

In-Vehicle Infotainment

Medical Equipment

## Specifications

| | |
|---|---|
| **Data Retention** | JESD47G compliant |
| **Form Factor** | 20mm x 16mm BGA |
| **Green Product** | RoHs compliant / Halogen free |
| **Temperature Support** | Commercial Temp ( 0°C ~ +70°C )<br>Industrial Temp ( -40°C ~ +85°C ) |

## Available Density

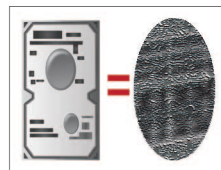| FerriSSD® Series | PATA | SATA 3Gb/s | SATA 6Gb/s with DRAM |
|---|---|---|---|
| **SLC** | SM621 (1~32GB) | SM631 (1~32GB) | -- |
| **SLCmode** | SM641 (1~32GB)* | SM651 (1~32GB)* | SM659 (8~32GB)* |
| **MLC** | SM601 (4~64GB)** | SM611 (2~64GB)** | SM619 (16~64GB)** |

*64GB in Q1'15; **128GB in Q4'14

## FerriSSD® Unique Features
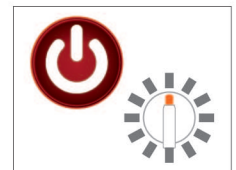
### GENERAL FEATURES

Hardware Quick Erase

Secured Erase

Secured Password Protection

Hardware Data Flush

### ADVANCED FEATURES

Full Slumber / Energy Save Mode

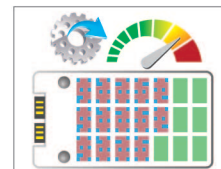Full Disk AES Encryption

Diagnostic Port

SSDLifeGuard (Monitoring AP)

Advance Field FW Update

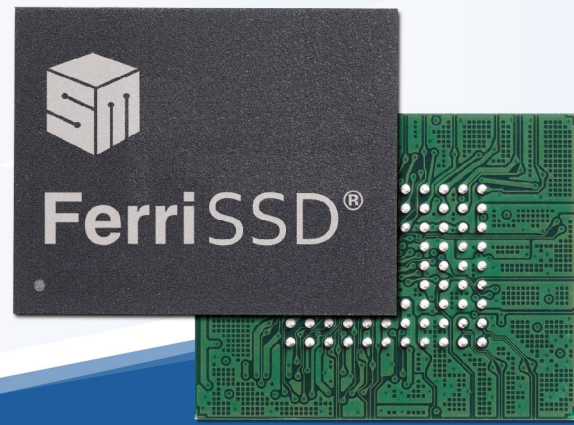Built-in Temperature Sensor

Intelligent Clean

Intelligent Scan + DataRefresh

For more information about FerriSSD®, please go to www.siliconmotion.com or send e-mail to **ferri@siliconmotion.com**

![SiliconMotion logo]
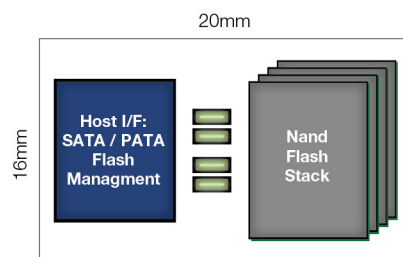
# FerriSSD®

## For Server Applications



## FerriSSD®
## BGA Solid-State Drive

The FerriSSD® is designed optimally for a wide range of embedded applications requiring faster access, small form factor and reliable SATA/PATA storage. By combining industry proven controller technology, NAND flash and passive components into a single BGA package with 1.0mm ball-pitch size, FerriSSD® simplifies design efforts, reduces time-to-market while protecting from NAND technology migration concerns. FerriSSD® also comes with advanced firmware features as well as the provision for customized firmware – enabling highly reliable and differentiable storage solutions.

The FerriSSD® family consists of the latest SM619 and SM659 series featuring SATA 6Gb/s transfer rate with embedded DRAM to enhance data storage efficiency and high random read/write IOPS of up to 75,000. Also available in the family are the SM651/SM631/SM611 SATA 3Gb/s series as well as the SM621/SM641/SM601 PATA series single-package SSDs. All FerriSSD® series support SLC, SLCmode and MLC NAND flash options.

## SMI BGA-SSD
## Overview



### Available Density

| FerriSSD® Series | PATA | SATA 3Gb/s | SATA 6Gb/s with DRAM |
|---|---|---|---|
| SLC | SM621 (1~32GB) | SM631 (1~32GB) | -- |
| SLCmode | SM641 (1~32GB)* | SM651 (1~32GB)* | SM659 (8~32GB)* |
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*64GB in Q1'15; **128GB in Q4'14
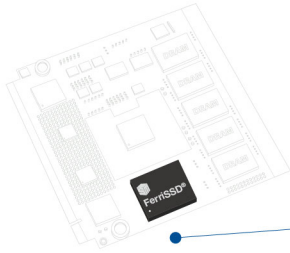
## Server Applications

- Blade Server
- Router / Switch
- Application Server
- Telecom Base Station
- Network Firewall Server
- VoIP Server
- Business Telecom System

### Specifications

| | |
|---|---|
| **Data Retention** | JESD47G compliant |
| **Form Factor** | 20mm x 16mm BGA |
| **Green Product** | RoHs compliant / Halogen free |
| **Temperature Support** | Commercial Temp ( 0°C ~ +70°C )<br>Industrial Temp ( -40°C ~ +85°C ) |

# Application Examples :
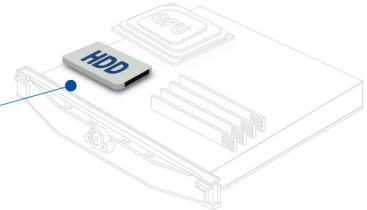
## FerriSSD®

**1**

**Serving as HDD on a space imited server board**

20x16mm compact size makes a perfect fit for single board computer / embedded motherboard, and server board applications. With Intelligent Scan & DataRefresh algorithm, FerriSSD® is designed to meet the toughest embedded storage requirement.
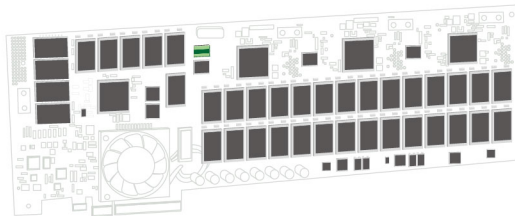
**2**

**Replacing boot drive & serve as Data Caching**

As a cost saving option, FerriSSD® serve as HDD replacement for OS/Application/log file and DRAM temp data cache.

**3**

**Replacing RAID SSD: multiple SSD controller + NAND**

FerriSSD®'s compact size with extreme high IOPS enables a perfect RAID SSD/HDD replacement in Compact PCI / Slot CPU boards.
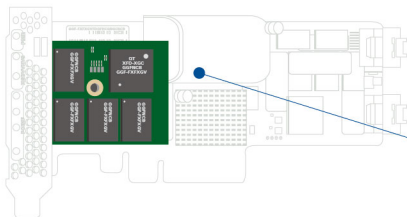
**4**

**Replacing SSD controller + NAND for simple manufacturing**

Coming in a single-BGA package, FerriSSD® is already initialized, 100% tested, screened out early failure to ensure extreme low dPPM defect during full usage life.
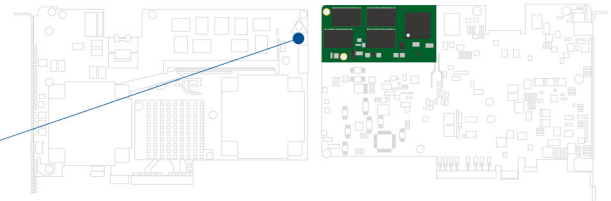
**5**

**Serving as Server DRAM backup during sudden power lost**

In the mission critical application, data lost is not acceptable even during sudden power lost. FerriSSD® extreme fast performance in a compact size is the best non volatile solution for DRAM data backup.

**6**

**Replacing CF card on servers for cost down (reducing component) & performance improvement**

FerriSSD® in PATA interface serve as direct replacement for CF at higher performance.
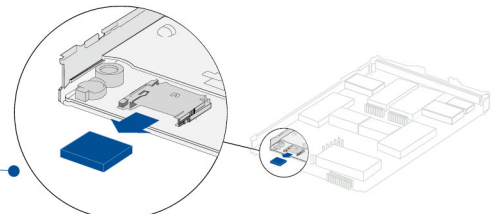
For more information about FerriSSD®, please go to www.siliconmotion.com or send e-mail to **ferri@siliconmotion.com**

# SiliconMotion

# FerriSSD®

## For Embedded Computing Applications

## FerriSSD®
## BGA Solid-State Drive

The FerriSSD® is designed optimally for a wide range of embedded applications requiring faster access, small form factor and reliable SATA/PATA storage. By combining industry proven controller technology, NAND flash and passive components into a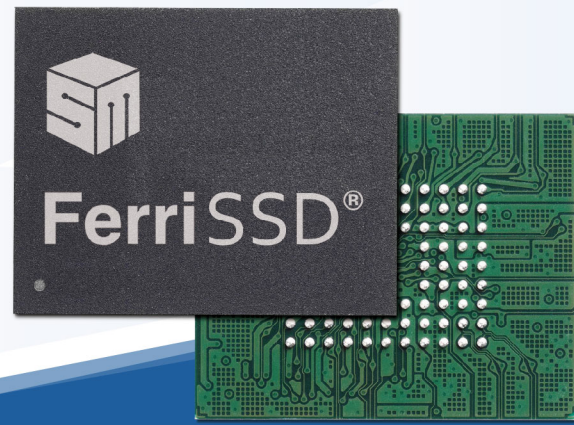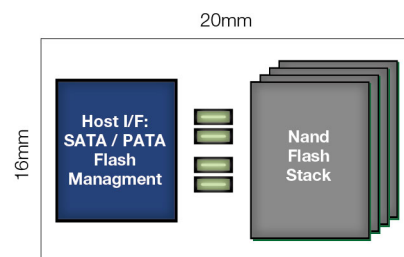 single BGA package with 1.0mm ball-pitch size, FerriSSD® simplifies design efforts, reduces time-to-market while protecting from NAND technology migration concerns. FerriSSD® also comes with advanced firmware features as well as the provision for customized firmware – enabling highly reliable and differentiable storage solutions.

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## SMI BGA-SSD
## Overview

20mm

16mm

Host I/F:
SATA / PATA
Flash
Managment

Nand
Flash
Stack

## Available Density

| FerriSSD® Series | PATA | SATA 3Gb/s | SATA 6Gb/s with DRAM |
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*64GB in Q1'15; **128GB in Q4'14

## Embedded Computing
## Applications

- POS / Kiosk
- Video Arcade Gaming
- Multifunction Printer
- In-Vehicle Infotainment
- Surveillance (DVR)
- Thin Client
- HMI / Factory Automation
- Medical Equipment

## Specifications

| | |
|---|---|
| **Data Retention** | JESD47G compliant |
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# FerriSSD®

## Application Examples :

**Fast Performance**

**Solid Durability**

**High Reliability**

**Low Power-Consumption**

### Multifunction Printer
Enable faster scan & pages per minutes

### POS / Kiosk
Faster boot up with firmware customization available

### Video Arcade Gaming
Extreme random access speed for high resolution video display

### In-Vehicle Infotainment
Robust data lost protection against Read Disturbance & Data Retention

### Surveillance (DVR)
Added security with AES HW encryption

### Thin Client
Cost saving with small density offering

### HMI / Factory Automation
Long product life-cycle supply

### Medical Equipment
Flexible in various form factors

**Noise Free**

**Cost Saving**

**Security Customization**

**Flexible Form Factor**

#### Inner wheel labels:
- Hardware Quick Erase
- Secured Password Protection
- Built-in Temperature Sensor
- Secured Erase
- Full Slumber / Energy Save Mode
- SSDLifeGuard (Monitoring AP)
- Intelligent Clean
- Full Disk AES Encryption
- Intelligent Scan + DataRefresh
- Hardware Data Flush

FerriSSD®

Life Guard On Duty

For more information about FerriSSD®, please go to www.siliconmotion.com or send e-mail to **ferri@siliconmotion.com**

**SiliconMotion**

www.siliconmotion.com

**Silicon Motion, Inc.**
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