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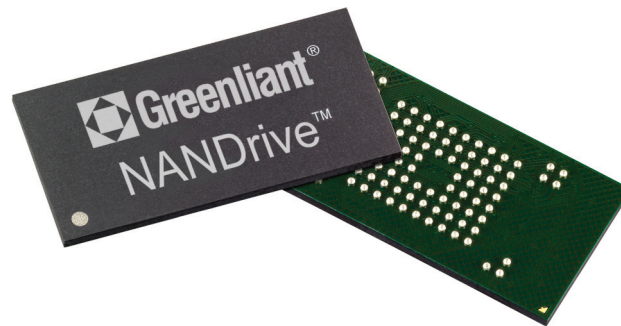
By leveraging more than 20 years of solid state storage design expertise, Greenliant Systems is dedicated to developing energy-efficient, highly reliable and secure storage solutions for the embedded systems and enterprise datacenter markets. The company is headquartered in Silicon Valley with product development in Santa Clara, Beijing, Shanghai and Hsinchu, and marketing teams in North America, Europe and Asia.

Greenliant is a major supplier of solid state storage, controller and flash memory products to leading automotive, industrial and networking companies.

The award-winning NANDrive™ 85 Series offers the broadest range of ball grid array (BGA) form-factor solid state drives (SSDs) for long-life, energy-efficient embedded applications. Available in three different interfaces, NANDrive is based on Greenliant's industrial grade NAND controllers. Offered with 1-bit-per-cell (SLC) or 2-bits-per-cell (MLC) NAND, these versatile managed NAND devices enable compact, embedded systems that require rugged and reliable data storage.

As an integrated single-chip solution, NANDrive eliminates the need for long qualification cycles when there is a change of NAND flash technology; customers need only qualify NANDrive as a mass storage subsystem. NANDrive SSDs have the same pin-out across all capacities in each family for backward compatibility and simplifying board design.

With its ease-of-use and widely adopted industry-standard ATA/IDE interface, PATA NANDrive revolutionized the way embedded system designers utilize NAND flash devices. It is also an ideal replacement for high-density NOR, mDOC and CompactFlash card-based designs that require smaller size, higher security and better performance storage. PATA NANDrive can be seamlessly integrated in systems that don't have an ATA interface by connecting the device to a standard memory bus.



PATA NANDrive (SLC)

85LD / LP Series: Industrial Grade PATA NANDrive Embedded Solid State Drives								
Part Number	Interface	NAND Configuration	Capacity	Voltage	Temperature Range	Sequential Performance (Max)		Package Type
						Read	Write	
GLS85LD0512-60-RI-LBTE	ATA / IDE	1 bit per cell	512 MByte	3.3V or 5V	Industrial -40°C to +85°C	17 MByte/sec	5 MByte/sec	LBGA-91 12 x 24 x 1.40 mm
GLS85LP0512P-S-I-LBTE	ATA / IDE	1 bit per cell	512 MByte	3.3V	Industrial -40°C to +85°C	25 MByte/sec	6 MByte/sec	LBGA-91 12 x 24 x 1.40 mm
GLS85LD1001T-60-RI-LBTE	ATA / IDE	1 bit per cell	1 GByte	3.3V or 5V	Industrial -40°C to +85°C	30 MByte/sec	10 MByte/sec	LBGA-91 12 x 24 x 1.40 mm
GLS85LP1002P-S-I-FTE	ATA / IDE	1 bit per cell	2 GByte	3.3V	Industrial -40°C to +85°C	25 MByte/sec	15 MByte/sec	BGA-91 14 x 24 x 1.90 mm
GLS85LP1004P-S-I-FTE	ATA / IDE	1 bit per cell	4 GByte	3.3V	Industrial -40°C to +85°C	50 MByte/sec	30 MByte/sec	BGA-91 14 x 24 x 1.90 mm
GLS85LP1008P-S-I-FTE	ATA / IDE	1 bit per cell	8 GByte	3.3V	Industrial -40°C to +85°C	50 MByte/sec	35 MByte/sec	BGA-91 14 x 24 x 1.90 mm

Learn about our Long-Term Availability (LTA) program at www.greenliant.com/support/#LTA_program

PATA NANDrive (MLC)

85LP Series: Commercial & Industrial Temperature PATA NANDrive Embedded Solid State Drives

Part Number	Interface	NAND Configuration	Capacity	Voltage	Temperature Range	Sequential Performance (Max)		Package Type
						Read	Write	
GLS85LP1002A-M-C-LBTE	ATA / IDE	2 bits per cell	2 GByte	3.3V	Commercial 0°C to +70°C	30 MByte/sec	5 MByte/sec	LBGA-91 12 x 24 x 1.40 mm
GLS85LP1002A-M-I-LBTE	ATA / IDE	2 bits per cell	2 GByte	3.3V	Industrial -40°C to +85°C	30 MByte/sec	5 MByte/sec	LBGA-91 12 x 24 x 1.40 mm
GLS85LP1004B-M-C-FTE	ATA / IDE	2 bits per cell	4 GByte	3.3V	Commercial 0°C to +70°C	30 MByte/sec	5 MByte/sec	LBGA-91 14 x 24 x 1.90 mm
GLS85LP1004B-M-I-FTE	ATA / IDE	2 bits per cell	4 GByte	3.3V	Industrial -40°C to +85°C	30 MByte/sec	5 MByte/sec	BGA-91 14 x 24 x 1.90 mm
GLS85LP1008B-M-C-FTE	ATA / IDE	2 bits per cell	8 GByte	3.3V	Commercial 0°C to +70°C	30 MByte/sec	10 MByte/sec	BGA-91 14 x 24 x 1.90 mm
GLS85LP1008B-M-I-FTE	ATA / IDE	2 bits per cell	8 GByte	3.3V	Industrial -40°C to +85°C	30 MByte/sec	10 MByte/sec	BGA-91 14 x 24 x 1.90 mm
GLS85LP1016B-M-C-FTE	ATA / IDE	2 bits per cell	16 GByte	3.3V	Commercial 0°C to +70°C	60 MByte/sec	20 MByte/sec	BGA-91 14 x 24 x 1.90 mm
GLS85LP1016B-M-I-FTE	ATA / IDE	2 bits per cell	16 GByte	3.3V	Industrial -40°C to +85°C	60 MByte/sec	20 MByte/sec	BGA-91 14 x 24 x 1.90 mm
GLS85LP1032A-M-C-FTE	ATA / IDE	2 bits per cell	32 GByte	3.3V	Commercial 0°C to +70°C	60 MByte/sec	30 MByte/sec	BGA-91 14 x 24 x 1.90 mm
GLS85LP1032A-M-I-FTE	ATA / IDE	2 bits per cell	32 GByte	3.3V	Industrial -40°C to +85°C	60 MByte/sec	30 MByte/sec	BGA-91 14 x 24 x 1.90 mm

PATA NANDrive Key Features

One of the Industry's Smallest SSDs

- 12mm x 24mm 91-ball LBGA package
- 14mm x 24mm 91-ball BGA package

Industry Standard ATA/IDE Interface

- Host Interface: 8- or 16-bit access
- Supports up to PIO Mode-6
- Supports up to Multi-Word DMA Mode-4
- Supports up to Ultra DMA Mode-6

Energy Efficient

- Reduces power consumption by putting unused circuitry into sleep mode without host intervention

Multitasking Technology Increases Performance

- Sustained Read Performance up to 60 MB/sec
- Sustained Write Performance up to 35 MB/sec

Robust Pre-programmed Firmware

- Advanced wear leveling maximizes product lifespan
- Configurable algorithms support global and group wear leveling
- Embedded flash file system for seamless capacity upgrade with no change to host software

Power Interrupt Data Protection

- Prevents data corruption when power is lost or unstable

Bad Block Management

- Replaces bad blocks with spare blocks in the NAND flash to prevent uncorrectable errors

Built-in ECC

- Uses advanced hardware engine to correct bit errors

Expanded Data Protection

- WP#/PD# pin configurable by firmware for prevention of data overwrites
- Added data security through user-selectable protection zones and security erase/purge commands

SSD Lifespan Monitoring

- Enables SMART command-based alerts indicating the remaining useful product life
- Estimates optimal SSD capacity based upon specific application usage models

Multiple Capacities with Same Pin-out

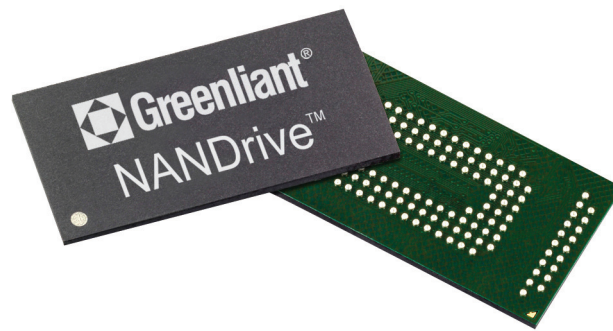
- 512 MB, 1 GB, 2 GB, 4 GB, 8 GB, 16 GB, 32 GB
- 1mm ball spacing enables use of lower cost PCBs

Commercial and Industrial Temperatures

- Commercial operation: 0°C to +70°C
- Industrial operation: -40°C to +85°C

Compatible with the latest generation chipsets, SATA NANDrive[™] SSDs are ideal for compact embedded systems that require secure, long-life and energy-efficient data storage. Compared to hard disk drives, SATA NANDrive products provide superior functionality, performance, data integrity and reliability.

By using standard ATA protocols and built-in flash management firmware, NANDrive does not require any special host software. Greenliant offers a suite of monitoring and analysis tools allowing system engineers to maximize NANDrive lifespan, and address various usage models.



SATA NANDrive (SLC)

85LS Series: Industrial Grade SATA NANDrive Embedded Solid State Drives

Part Number	Interface	NAND Configuration	Capacity	Voltage	Temperature Range	Sequential Performance (Max)		Package Type
						Read	Write	
GLS85LS1002P-S-I-FZJE	SATA I / II	1 bit per cell	2 GByte	1.2V and 3.3V	Industrial -40°C to +85°C	35 MByte/sec	20 MByte/sec	BGA-145 14 x 24 x 1.95 mm
GLS85LS1004P-S-I-FZJE	SATA I / II	1 bit per cell	4 GByte	1.2V and 3.3V	Industrial -40°C to +85°C	70 MByte/sec	40 MByte/sec	BGA-145 14 x 24 x 1.95 mm
GLS85LS1008P-S-I-FZJE	SATA I / II	1 bit per cell	8 GByte	1.2V and 3.3V	Industrial -40°C to +85°C	70 MByte/sec	50 MByte/sec	BGA-145 14 x 24 x 1.95 mm
GLS85LS1016P-S-I-FZJE	SATA I / II	1 bit per cell	16 GByte	1.2V and 3.3V	Industrial -40°C to +85°C	70 MByte/sec	55 MByte/sec	BGA-145 14 x 24 x 1.95 mm
GLS85LS1032P-S-I-FZJE	SATA I / II	1 bit per cell	32 GByte	1.2V and 3.3V	Industrial -40°C to +85°C	120 MByte/sec	80 MByte/sec	BGA-145 14 x 24 x 1.95 mm

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SATA NANDrive (MLC)

85LS Series: Commercial & Industrial Temperature SATA NANDrive Embedded Solid State Drives								
Part Number	Interface	NAND Configuration	Capacity	Voltage	Temperature Range	Sequential Performance (Max)		Package Type
						Read	Write	
GLS85LS1002A-M-C-FZJE	SATA I / II	2 bits per cell	2 GByte	1.2V and 3.3V	Commercial 0°C to +70°C	35 MByte/sec	10 MByte/sec	BGA-145 14 x 24 x 1.95 mm
GLS85LS1002A-M-I-FZJE	SATA I / II	2 bits per cell	2 GByte	1.2V and 3.3V	Industrial -40°C to +85°C	35 MByte/sec	10 MByte/sec	BGA-145 14 x 24 x 1.95 mm
GLS85LS1004A-M-C-FZJE	SATA I / II	2 bits per cell	4 GByte	1.2V and 3.3V	Commercial 0°C to +70°C	35 MByte/sec	10 MByte/sec	BGA-145 14 x 24 x 1.95 mm
GLS85LS1004A-M-I-FZJE	SATA I / II	2 bits per cell	4 GByte	1.2V and 3.3V	Industrial -40°C to +85°C	35 MByte/sec	10 MByte/sec	BGA-145 14 x 24 x 1.95 mm
GLS85LS1008B-M-C-FZJE	SATA I / II	2 bits per cell	8 GByte	1.2V and 3.3V	Commercial 0°C to +70°C	35 MByte/sec	10 MByte/sec	BGA-145 14 x 24 x 1.95 mm
GLS85LS1008B-M-I-FZJE	SATA I / II	2 bits per cell	8 GByte	1.2V and 3.3V	Industrial -40°C to +85°C	35 MByte/sec	10 MByte/sec	BGA-145 14 x 24 x 1.95 mm
GLS85LS1016B-M-C-FZJE	SATA I / II	2 bits per cell	16 GByte	1.2V and 3.3V	Commercial 0°C to +70°C	70 MByte/sec	20 MByte/sec	BGA-145 14 x 24 x 1.95 mm
GLS85LS1016B-M-I-FZJE	SATA I / II	2 bits per cell	16 GByte	1.2V and 3.3V	Industrial -40°C to +85°C	70 MByte/sec	20 MByte/sec	BGA-145 14 x 24 x 1.95 mm
GLS85LS1032B-M-C-FZJE	SATA I / II	2 bits per cell	32 GByte	1.2V and 3.3V	Commercial 0°C to +70°C	70 MByte/sec	30 MByte/sec	BGA-145 14 x 24 x 1.95 mm
GLS85LS1032B-M-I-FZJE	SATA I / II	2 bits per cell	32 GByte	1.2V and 3.3V	Industrial -40°C to +85°C	70 MByte/sec	30 MByte/sec	BGA-145 14 x 24 x 1.95 mm
GLS85LS1064B-M-C-FZJE	SATA I / II	2 bits per cell	64 GByte	1.2V and 3.3V	Commercial 0°C to +70°C	110 MByte/sec	60 MByte/sec	BGA-145 14 x 24 x 1.95 mm
GLS85LS1064B-M-I-FZJE	SATA I / II	2 bits per cell	64 GByte	1.2V and 3.3V	Industrial -40°C to +85°C	110 MByte/sec	60 MByte/sec	BGA-145 14 x 24 x 1.95 mm

SATA NANDrive Key Features

Small Form Factor SATA Solid State Drive

- 14 x 24 x 1.95mm 145-ball BGA package

Industry Standard Serial ATA Interface

- SATA 1.5 Gbit/sec or SATA 3.0 Gbit/sec
- ATA/ATAPI-8 compliant
- Supports 48-bit address feature set

Energy Efficient

- 3.3V and 1.2V low power supply
- Active Mode as low as 360mW (typical)
- Sleep Mode, 70mW (typical)

Multitasking Technology Increases Performance

- Sustained Read Performance up to 120 MB/sec
- Sustained Write Performance up to 80 MB/sec

Robust Pre-programmed Firmware

- Global advanced wear leveling maximizes product lifespan
- Configurable algorithms optimize wear leveling and data retention
- Embedded flash file system for seamless capacity upgrade with no change to host software

Power Interrupt Data Protection

- Prevents data corruption when power is lost or unstable

Bad Block Management

- Replaces bad blocks with spare blocks in the NAND flash to prevent uncorrectable errors

Built-in ECC

- Uses advanced hardware engine to correct bit errors

Advanced Data Security

- Added data security through user-selectable protection zones and security erase/purge commands

SSD Lifespan Monitoring

- Enables SMART command-based alerts indicating the remaining useful product life
- Estimates optimal SSD capacity based upon specific application usage models

Multiple Capacities with Same Pin-out

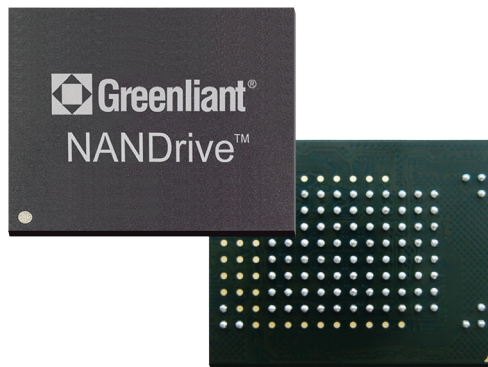
- 2 GB, 4 GB, 8 GB, 16 GB, 32 GB, 64 GB
- 1mm ball spacing enables use of lower cost PCBs

Commercial and Industrial Temperatures

- Commercial operation: 0°C to +70°C
- Industrial operation: -40°C to +85°C

Designed for rigorous automotive, industrial and networking environments, eMMC NANDrive[™] is offered in a 100-ball grid array (BGA) package, with 1mm ball pitch for increased long-term reliability. It is compatible with many Freescale, NVIDIA, TI and other popular chipsets. eMMC NANDrive operates at full industrial temperatures between -40 and +85 degrees Celsius, giving customers a space-saving SSD that can withstand the most severe conditions.

All NANDrive products include security features such as a unique device ID and password protection, and allow the user to select specific areas of the SSD to erase/purge sensitive content. NANDrive SSDs implement advanced wear leveling to enhance data integrity and maximize product lifespan.



eMMC NANDrive (SLC)

85VM Series: Industrial Grade eMMC NANDrive Embedded Solid State Drives

Part Number	Interface	NAND Configuration	Capacity	Voltage	Temperature Range	Sequential Performance (Max)		Package Type
						Read	Write	
GLS85VM0512P-S-I-LFWE	eMMC 4.4	1 bit per cell	512 MByte	3.3V	Industrial -40°C to +85°C	30 MByte/sec	15 MByte/sec	BGA-100 14 x 18 x 1.40 mm
GLS85VM1001P-S-I-LFWE	eMMC 4.4	1 bit per cell	1 GByte	3.3V	Industrial -40°C to +85°C	55 MByte/sec	35 MByte/sec	BGA-100 14 x 18 x 1.40 mm

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eMMC NANDrive (MLC)

85VM Series: Industrial Temperature eMMC NANDrive Embedded Solid State Drives								
Part Number	Interface	NAND Configuration	Capacity	Voltage	Temperature Range	Sequential Performance (Max)		Package Type
						Read	Write	
GLS85VM1004A-M-I-LFWE	eMMC 4.4	2 bits per cell	4 GByte	3.3V	Industrial -40°C to +85°C	30 MByte/sec	7 MByte/sec	BGA-100 14 x 18 x 1.40 mm
GLS85VM1008A-M-I-LFWE	eMMC 4.4	2 bits per cell	8 GByte	3.3V	Industrial -40°C to +85°C	30 MByte/sec	10 MByte/sec	BGA-100 14 x 18 x 1.40 mm
GLS85VM1016A-M-I-LFWE	eMMC 4.4	2 bits per cell	16 GByte	3.3V	Industrial -40°C to +85°C	55 MByte/sec	20 MByte/sec	BGA-100 14 x 18 x 1.40 mm
GLS85VM1032A-M-I-LFWE	eMMC 4.4	2 bits per cell	32 GByte	3.3V	Industrial -40°C to +85°C	60 MByte/sec	30 MByte/sec	BGA-100 14 x 18 x 1.40 mm

eMMC NANDrive Key Features

Industry Standard eMMC Interface

- Supports JEDEC / eMMC 4.4 Standard, JESD84-A44 compliant
- Backward compatible with eMMC 4.3

Wide Range of eMMC Products

- Available with 2-bits-per-cell (MLC) and 1-bit-per-cell (SLC) NAND to meet various endurance (program-erase cycles) and data retention requirements

Multitasking Technology Increases Performance

- Sequential Read Performance up to 60 MB/sec
- Sequential Write Performance up to 35 MB/sec
- Clock Speed up to 52 MHz
- Supports Dual Data Rate (DDR) Mode

Power Management

- Supports eMMC auto-sleep mode to reduce power consumption

Robust Pre-programmed Firmware

- Implements advanced wear leveling to maximize product lifespan
- Configurable algorithms support global and group wear leveling
- Embedded flash file system enables seamless capacity migrations with no change to host software

Built-in ECC

- Uses advanced hardware engine to correct bit errors

Bad Block Management

- Replaces bad blocks with spare blocks in the NAND flash when uncorrected errors occur

Data Security

- Permanent, temporary and power-on write protection options for entire device or specific device partitions
- Secure erase and TRIM commands protect sensitive data
- Dedicated pin (WP#) provides write protection for entire device

Multiple Densities with Same Pin-out

- 512 MB, 1 GB, 4 GB, 8 GB, 16 GB, 32 GB (64 GB, 128 GB under development)
- 100-ball LBGA / BGA package
- 1mm ball spacing increases long-term reliability

Full I-temp Capability

- Industrial operation: -40°C to +85°C



NANDrive[™] Embedded SSDs

The power of solid state storage in a tiny package

The mSATA ArmourDrive[™] 86 Series is based on Greenliant's SATA NANDrive, combined with robust power interrupt data protection. These SSDs offer the features and benefits of NANDrive on a small, removable printed circuit board (PCB) module. Operating at extreme temperatures, mSATA ArmourDrive is ideal for applications requiring data storage able to withstand the most demanding environments.

Built in the standard JEDEC MO-300 form factor, mSATA ArmourDrive surpasses Serial ATA hard disk drives with its superior functionality, endurance and reliability. Dedicated power failure detection and backup power circuitry is built-in to prevent data integrity issues due to sudden power interruptions. mSATA ArmourDrive SSDs also include advanced security features to protect confidential information.



mSATA ArmourDrive (SLC)

86FA Series: Industrial Grade mSATA ArmourDrive Removable Solid State Drives								
Part Number	Interface	NAND Configuration	Capacity	Voltage	Temperature Range	Sequential Performance (Max)		Package Type
						Read	Write	
GLS86FA008G1	SATA I / II	1 bit per cell	8 GByte	3.3V	Industrial -40°C to +85°C	70 MByte/sec	50 MByte/sec	JEDEC MO-300 29.85 x 50.80 x 4.85 mm
GLS86FA016G1	SATA I / II	1 bit per cell	16 GByte	3.3V	Industrial -40°C to +85°C	70 MByte/sec	55 MByte/sec	JEDEC MO-300 29.85 x 50.80 x 4.85 mm
GLS86FA032G1	SATA I / II	1 bit per cell	32 GByte	3.3V	Industrial -40°C to +85°C	120 MByte/sec	80 MByte/sec	JEDEC MO-300 29.85 x 50.80 x 4.85 mm

mSATA ArmourDrive (MLC)

86FB Series: Industrial Temperature mSATA ArmourDrive Removable Solid State Drives									
Part Number	Interface	NAND Configuration	Capacity	Voltage	Temperature Range	Sequential Performance (Max)		Package Type	
						Read	Write		
GLS86FB008G2	SATA I / II	2 bits per cell	8 GByte	3.3V	Industrial -40°C to +85°C	35 MByte/sec	10 MByte/sec	JEDEC MO-300 29.85 x 50.80 x 4.85 mm	
GLS86FB016G2	SATA I / II	2 bits per cell	16 GByte	3.3V	Industrial -40°C to +85°C	70 MByte/sec	20 MByte/sec	JEDEC MO-300 29.85 x 50.80 x 4.85 mm	
GLS86FB032G2	SATA I / II	2 bits per cell	32 GByte	3.3V	Industrial -40°C to +85°C	70 MByte/sec	30 MByte/sec	JEDEC MO-300 29.85 x 50.80 x 4.85 mm	
GLS86FB064G2	SATA I / II	2 bits per cell	64 GByte	3.3V	Industrial -40°C to +85°C	110 MByte/sec	60 MByte/sec	JEDEC MO-300 29.85 x 50.80 x 4.85 mm	

mSATA ArmourDrive Key Features

Small Form Factor SATA Solid State Drive

- 29.85mm x 50.80mm x 4.85mm
- JEDEC MO-300, full length

Industry Standard Serial ATA Bus Interface

- SATA 1.5 Gbit/sec or SATA 3.0 Gbit/sec
- ATA/ATAPI-8 compliant
- Supports 48-bit address feature set

Energy Efficient

- 3.3V low power supply
- Standby Mode as low as 380mW
- Sleep Mode, 110mW (typical)

Multitasking Technology Increases Performance

- Supports TRIM command
- Sequential Read Performance up to 110 MB/s
- Sequential Write Performance up to 60 MB/s

Pre-programmed Firmware

- Global advanced wear leveling maximizes product lifespan
- Configurable algorithms optimize wear leveling and data retention
- Embedded flash file system enables seamless capacity upgrade with no change to host software

Built-In Power Interrupt Data Protection

- Prevents data corruption when power is lost or unstable

Bad Block Management

- Replaces bad blocks with spare blocks in the NAND flash to prevent uncorrectable errors

Built-in ECC

- Uses advanced hardware engine to correct bit errors

Advanced Data Security

- User-configurable protection zones
- Security erase/purge commands

SSD Lifespan Monitoring

- Enables SMART command-based alerts indicating the remaining useful product life
- Estimates optimal SSD capacity based upon specific application usage models

Wide Range of mSATA Solid State Drives

- 8 GB, 16 GB, 32 GB, 64 GB (128 GB, 256 GB under development)
- Available with 2-bits-per-cell (MLC) or 1-bit-per-cell (SLC) NAND to meet various endurance (program-erase cycles) and data retention requirements

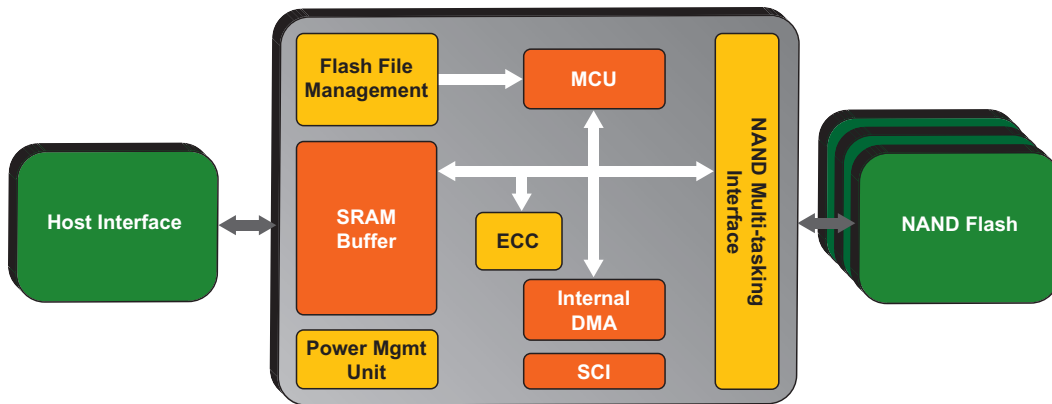
Full I-temp Capability

- Industrial operation: -40°C to +85°C



Greenliant's 55 Series NAND controllers are built upon more than two decades of NAND flash memory controller design expertise. They intelligently manage the inherent deficiencies of NAND flash, taking this burden off the host system and making the designer's job easier. Greenliant's NAND controllers are the foundation for NAND flash-based modules and solid state drives that require better performance, long product life, high reliability and low power consumption.

The 55 Series NAND controllers utilize advanced wear-leveling technology coupled with robust error correction and data integrity protection during power interrupts. Embedded reconfigurable firmware enables seamless upgrades of the NAND controller firmware for better performance while ensuring support of ever-evolving MLC and SLC NAND flash technology.

NAND Flash Controller Block Diagram


55 Series: NAND Flash Controllers (CompactFlash Interface)*										
Part Number	Voltage		ECC	NAND Programming Page Size			Temperature Range	Sustained Performance (Max.)		Package Type
	Supply	I/O		1-ch	2-ch	4-ch		Write	Read	
GLS55LC200-60-C-TQWE	3.3V	3.3V or 5V	8 bits/ 512 Byte	2 KB/ 4 KB	2 KB	-	Commercial 0°C to +70°C	30 MByte/sec	30 MByte/sec	TQFP-100 14x14x1.20 mm
GLS55LC200-60-I-TQWE	3.3V	3.3V or 5V	8 bits/ 512 Byte	2 KB/ 4 KB	2 KB	-	Industrial -40°C to +85°C	30 MByte/sec	30 MByte/sec	TQFP-100 14x14x1.20 mm

55 Series: NAND Flash Controllers (ATA / IDE Interface)*										
Part Number	Voltage		ECC	NAND Programming Page Size			Temperature Range	Sustained Performance (Max.)		Package Type
	Supply	I/O		1-ch	2-ch	4-ch		Write	Read	
GLS55LD040M-133-C-BZJE	3.3V	3.3V	24 bits/ 1 KByte	2KB/ 4KB/ 8KB	2KB/ 4KB/ 8KB	2KB/ 4KB/ 8KB	Commercial 0°C to +70°C	109 MByte/sec	109 MByte/sec	TFBGA-145 12x12x1.17 mm
GLS55LD040M-133-I-BZJE	3.3V	3.3V	24 bits/ 1 KByte	2KB/ 4KB/ 8KB	2KB/ 4KB/ 8KB	2KB/ 4KB/ 8KB	Industrial -40°C to +85°C	109 MByte/sec	109 MByte/sec	TFBGA-145 12x12x1.17 mm
GLS55VD020-60-C-TQWE	3.3V	3.3V or 5V	8 bits/ 512 Byte	2KB/ 4KB	2KB	-	Commercial 0°C to +70°C	30 MByte/sec	30 MByte/sec	TQFP-100 14x14x1.20 mm
GLS55VD020-60-I-TQWE	3.3V	3.3V or 5V	8 bits/ 512 Byte	2KB/ 4KB	2KB	-	Industrial -40°C to +85°C	30 MByte/sec	30 MByte/sec	TQFP-100 14x14x1.20 mm

* Minimum volume requirements apply.

Greenliant's Specialty Flash Memory portfolio includes the CSF™ (Concurrent SuperFlash™), Many-Time Programmable (MTP) and SSF™ (Small-Sector Flash™) product families. These products provide high performance, superior reliability of more than 100 years data retention, low power consumption and a small footprint, making them well-suited for code storage applications and space-constrained systems.

The MTP 27 and 37 Series products combine the erase capability of flash with the cost effectiveness of EPROM/OTP memory, while the SSF 29 Series is ideal for applications requiring fine data granularity. The multi-bank architecture and Read-while-Write operations of the CSF 36 Series make it well-suited for automotive, communications and industrial applications.


27 / 37 Series: Many-Time Programmable

Part Number	Type	Voltage	Density	Read Access Speed	Grade	Temperature Range	Package Type
GLS27SF512-70-3C-NHE	64K x8 Many-Time Programmable	4.5V - 5.5V	512 Kbit	70 ns	Commercial	0°C to +70°C	PLCC-32 13x15x2.8 mm
GLS27SF010-70-3C-NHE	128K x8 Many-Time Programmable	4.5V - 5.5V	1 Mbit	70 ns	Commercial	0°C to +70°C	PLCC-32 13x15x2.8 mm
GLS27SF010-70-3C-PHE	128K x8 Many-Time Programmable	4.5V - 5.5V	1 Mbit	70 ns	Commercial	0°C to +70°C	PDIP-32 16x42x5 mm
GLS27SF020-70-3C-NHE	256K x8 Many-Time Programmable	4.5V - 5.5V	2 Mbit	70 ns	Commercial	0°C to +70°C	PLCC-32 13x15x2.8 mm
GLS27SF020-70-3C-PHE	256K x8 Many-Time Programmable	4.5V - 5.5V	2 Mbit	70 ns	Commercial	0°C to +70°C	PDIP-32 16x42x5 mm
GLS37VF010-70-3C-NHE	128K x8 Many-Time Programmable	2.7V - 3.6V	1 Mbit	70 ns	Commercial	0°C to +70°C	PLCC-32 13x15x2.8 mm
GLS37VF020-70-3C-NHE	256K x8 Many-Time Programmable	2.7V - 3.6V	2 Mbit	70 ns	Commercial	0°C to +70°C	PLCC-32 13x15x2.8 mm
GLS37VF020-70-3C-WHE	256K x8 Many-Time Programmable	2.7V - 3.6V	2 Mbit	70 ns	Commercial	0°C to +70°C	TSOP-32 8x14x1.2 mm
GLS37VF040-70-3C-NHE	512K x8 Many-Time Programmable	2.7V - 3.6V	4 Mbit	70 ns	Commercial	0°C to +70°C	PLCC-32 13x15x2.8 mm

29 Series: Small-Sector Flash Page-Write EEPROM							
Part Number	Type	Voltage	Density	Read Access Speed	Grade	Temperature Range	Package Type
GLS29EE512-70-4C-EHE	64K x8 Page-Write EEPROM, 128 Bytes per Page	4.5V - 5.5V	512 Kbit	70 ns	Commercial	0°C to +70°C	TSOP-32 8x20x1.2 mm
GLS29EE512-70-4I-EHE	64K x8 Page-Write EEPROM, 128 Bytes per Page	4.5V - 5.5V	512 Kbit	70 ns	Industrial	-40°C to +85°C	TSOP-32 8x20x1.2 mm
GLS29EE512-70-4C-NHE	64K x8 Page-Write EEPROM, 128 Bytes per Page	4.5V - 5.5V	512 Kbit	70 ns	Commercial	0°C to +70°C	PLCC-32 13x15x2.8 mm
GLS29EE512-70-4I-NHE	64K x8 Page-Write EEPROM, 128 Bytes per Page	4.5V - 5.5V	512 Kbit	70 ns	Industrial	-40°C to +85°C	PLCC-32 13x15x2.8 mm
GLS29EE010-70-4C-EHE	128 x8 Page-Write EEPROM, 128 Bytes per Page	4.5V - 5.5V	1 Mbit	70 ns	Commercial	0°C to +70°C	TSOP-32 8x20x1.2 mm
GLS29EE010-70-4I-EHE	128 x8 Page-Write EEPROM, 128 Bytes per Page	4.5V - 5.5V	1 Mbit	70 ns	Industrial	-40°C to +85°C	TSOP-32 8x20x1.2 mm
GLS29EE010-70-4C-NHE	128 x8 Page-Write EEPROM, 128 Bytes per Page	4.5V - 5.5V	1 Mbit	70 ns	Commercial	0°C to +70°C	PLCC-32 13x15x2.8 mm
GLS29EE010-70-4I-NHE	128 x8 Page-Write EEPROM, 128 Bytes per Page	4.5V - 5.5V	1 Mbit	70 ns	Industrial	-40°C to +85°C	PLCC-32 13x15x2.8 mm
GLS29EE010-70-4C-PHE	128 x8 Page-Write EEPROM, 128 Bytes per Page	4.5V - 5.5V	1 Mbit	70 ns	Commercial	0°C to +70°C	PDIP-32 16x42x5 mm
GLS29EE010-70-4C-WHE	128 x8 Page-Write EEPROM, 128 Bytes per Page	4.5V - 5.5V	1 Mbit	70 ns	Commercial	0°C to +70°C	TSOP-32 8x14x1.2 mm

Atmel cross-reference guide available at www.greenliant.com/products/flash_memory.dot

36 Series: Concurrent SuperFlash							
Part Number	Type	Voltage	Density	Read Access Speed	Grade	Temperature Range	Package Type
GLS36VF1601G-70-4I-EKE	16 Mbit (x8/x16) Concurrent SuperFlash, Bottom Boot	2.7V - 3.6V	1 Mbit x16 or 2 Mbit x 8	70 ns	Industrial	-40°C to +85°C	TSOP-48 12x20x1.2 mm
GLS36VF1601G-70-4I-B3KE	16 Mbit (x8/x16) Concurrent SuperFlash, Bottom Boot	2.7V - 3.6V	1 Mbit x16 or 2 Mbit x 8	70 ns	Industrial	-40°C to +85°C	TFBGA-48 6x8x1.1 mm
GLS36VF3203-70-4I-EKE	32 Mbit (x8/x16) Concurrent SuperFlash, Bottom Boot	2.7V - 3.6V	4 Mbit x8 or 2 Mbit x 16	70 ns	Industrial	-40°C to +85°C	TSOP-48 12x20x1.2 mm
GLS36VF3203-70-4E-B3KE	32 Mbit (x8/x16) Concurrent SuperFlash, Bottom Boot	2.7V - 3.6V	4 Mbit x8 or 2 Mbit x 16	70 ns	Extended	-20°C to +85°C	TFBGA-48 6x8x1.1 mm
GLS36VF3203-70-4I-B3KE	32 Mbit (x8/x16) Concurrent SuperFlash, Bottom Boot	2.7V - 3.6V	4 Mbit x8 or 2 Mbit x 16	70 ns	Industrial	-40°C to +85°C	TFBGA-48 6x8x1.1 mm
GLS36VF3204-70-4I-EKE	32 Mbit (x8/x16) Concurrent SuperFlash, Top Boot	2.7V - 3.6V	4 Mbit x8 or 2 Mbit x16	70 ns	Industrial	-40°C to +85°C	TSOP-48 12x20x1.2 mm

Atmel cross-reference guide available at www.greenliant.com/products/flash_memory.dot

Focus Markets and Applications

Automotive		<ul style="list-style-type: none"> • Black-box data recorder • Driver information system • GPS and telematics • Hands-free communications • In-vehicle infotainment (IVI)
Communications & Networking		<ul style="list-style-type: none"> • Base station • Network firewall • Router / Switch • Server • VoIP gateway / PBX
Defense & Aerospace		<ul style="list-style-type: none"> • Black-box data recorder • Flight instrumentation • Military imaging • Radar / Sonar
Industrial		<ul style="list-style-type: none"> • Factory automation system • Industrial panel PC • Single-board computer • Test & measurement instrumentation • Transportation system
Medical		<ul style="list-style-type: none"> • Data logger • Defibrillator • MRI and CAT scanner • Patient monitoring system • Ultrasound imaging
Portable Computing		<ul style="list-style-type: none"> • Rugged tablet PC • Portable multimedia player • Portable navigation device • Portable printer
Video Content & Delivery		<ul style="list-style-type: none"> • Digital signage • Internet TV • Set-top box • Video conferencing • Video surveillance

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