

Reliable and Secure Storage for Embedded Systems



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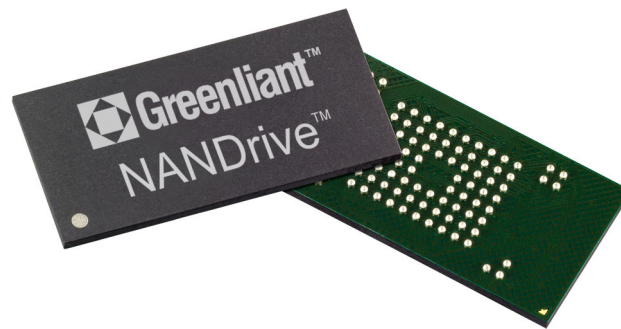
By leveraging more than 20 years of solid state storage design expertise, Greenliant Systems is dedicated to developing energy-efficient, highly reliable and secure storage solutions for the embedded system, data center and mobile Internet markets. The company is headquartered in Silicon Valley with product development in Santa Clara, Beijing, Shanghai and Hsinchu, and sales 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, networking, medical, military and consumer electronics companies.

The award-winning NANDrive™ 85 Series offers a wide range of BGA form-factor solid state drives for long-life, energy-efficient embedded applications. Available in both industrial and commercial temperatures, these versatile managed NAND devices enable compact, embedded systems that require rugged and reliable data storage. NANDrive SSDs have the same pin-out across all capacities in each family for backward compatibility and simplifying board design.

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 the NANDrive as a mass storage subsystem.

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: PATA NANDrive Embedded Solid State Drives								
Part Number	Interface	NAND Configuration	Capacity	Voltage	Temperature Range	Sustained Performance (Max.)		Package Type
						Write	Read	
GLS85LD0512-60-RI-LBTE	ATA / IDE	1 bit per cell	512 MByte	3.3V or 5V	Industrial -40°C to +85°C	5 MByte/sec	17 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	6 MByte/sec	25 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	8 MByte/sec	28 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	11 MByte/sec	28 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	10 MByte/sec	25 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	20 MByte/sec	50 MByte/sec	BGA-91 14 x 24 x 1.90 mm
GLS85LP1016P-S-I-FTE*	ATA / IDE	1 bit per cell	16 GByte	3.3V	Industrial -40°C to +85°C	35 MByte/sec	60 MByte/sec	BGA-91 14 x 24 x 1.90 mm
GLS85LP1032P-S-I-FTE*	ATA / IDE	1 bit per cell	32 GByte	3.3V	Industrial -40°C to +85°C	45 MByte/sec	60 MByte/sec	BGA-91 14 x 24 x 1.90 mm

* Under development

PATA NANDrive (MLC)

85LP Series: PATA NANDrive Embedded Solid State Drives									
Part Number	Interface	NAND Configuration	Capacity	Voltage	Temperature Range	Sustained Performance (Max.)		Package Type	
						Write	Read		
GLS85LP1002A-M-C-LBTE	ATA / IDE	2 bits per cell	2 GByte	3.3V	Commercial 0°C to +70°C	5 MByte/sec	26 MByte/sec	LBGA-91 12 x 24 x 1.40 mm	
GLS85LP1004B-M-C-LFTE	ATA / IDE	2 bits per cell	4 GByte	3.3V	Commercial 0°C to +70°C	4 MByte/sec	26 MByte/sec	LBGA-91 14 x 24 x 1.45 mm	
GLS85LP1008B-M-C-LFTE	ATA / IDE	2 bits per cell	8 GByte	3.3V	Commercial 0°C to +70°C	9 MByte/sec	49 MByte/sec	LBGA-91 14 x 24 x 1.45 mm	
GLS85LP1008B-M-C-FTE*	ATA / IDE	2 bits per cell	8 GByte	3.3V	Commercial 0°C to +70°C	10 MByte/sec	30 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	10 MByte/sec	30 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	20 MByte/sec	60 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	20 MByte/sec	60 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	30 MByte/sec	60 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	30 MByte/sec	60 MByte/sec	BGA-91 14 x 24 x 1.90 mm	
GLS85LP1064A-M-C-FTE*	ATA / IDE	2 bits per cell	64 GByte	3.3V	Commercial 0°C to +70°C	30 MByte/sec	60 MByte/sec	BGA-91 14 x 24 x 1.90 mm	
GLS85LP1064A-M-I-FTE*	ATA / IDE	2 bits per cell	64 GByte	3.3V	Industrial -40°C to +85°C	35 MByte/sec	60 MByte/sec	BGA-91 14 x 24 x 1.90 mm	

* Under development

PATA NANDrive Key Features

One of the Industry's Smallest SSDs

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

Multi-tasking Technology Increases Performance

- Fast, Sustained Read Performance (Flash to Host), up to 50 MB/sec
- Fast, Sustained Write Performance (Host to Flash), up to 39 MB/sec

Power Management

- Reduces power consumption by putting unused circuitry into sleep mode without host intervention
- Zero wake-up latency

Pre-programmed Firmware in Embedded SuperFlash® Memory

- Implements advanced wear leveling to maximize product lifespan
- Configurable algorithms support global and group wear leveling
- Executes industry standard ATA/IDE commands
- Embedded flash file system for seamless capacity upgrade with no change to host software

Robust Power-Down Data Protection

- Prevents data corruption when power is lost or unstable

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

S.M.A.R.T. Commands

- Enables alerts indicating the remaining product life

Multiple Densities with Same Pin-out

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

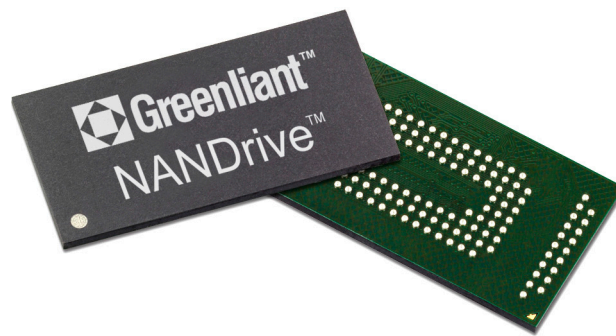
Commercial and Industrial Temperatures

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

Compatible with the latest generation chipsets, SATA NANDrive™ extends Greenliant's portfolio of high performance, fully integrated solid state drives. Compared to hard disk drives, SATA NANDrive products provide superior functionality, performance, data integrity and reliability.

The advanced security features of SATA and PATA NANDrive include a unique device ID, password protection and four independent zones that the user can set to different protection levels. In addition, NANDrive allows the user to select specific areas of the SSD to instantly wipe sensitive content, instead of having to erase the entire drive.

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 the NANDrive lifespan and address various usage models.



SATA NANDrive (SLC)

85LS Series: SATA NANDrive Embedded Solid State Drives								
Part Number	Interface	NAND Configuration	Capacity	Voltage	Temperature Range	Sustained Performance (Max.)		Package Type
						Write	Read	
GLS85LS1002P-S-I-FZJE	SATA I / II	1 bit per cell	2 GByte	1.2V and 3.3V	Industrial -40°C to +85°C	20 MByte/sec	35 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	8 MByte/sec	28 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	15 MByte/sec	65 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	30 MByte/sec	65 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	55 MByte/sec	110 MByte/sec	BGA-145 14 x 24 x 1.95 mm

* Under development

SATA NANDrive (MLC)

85LS Series: SATA NANDrive Embedded Solid State Drives								
Part Number	Interface	NAND Configuration	Capacity	Voltage	Temperature Range	Sustained Performance (Max.)		Package Type
						Write	Read	
GLS85LS1002A-M-C-FZJE	SATA I / II	2 bits per cell	2 GByte	1.2V and 3.3V	Commercial 0°C to +70°C	8 MByte/sec	35 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	8 MByte/sec	35 MByte/sec	BGA-145 14 x 24 x 1.95 mm
GLS85LS1008A-M-C-FZJE	SATA I / II	2 bits per cell	8 GByte	1.2V and 3.3V	Commercial 0°C to +70°C	15 MByte/sec	70 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	8 MByte/sec	35 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	8 MByte/sec	35 MByte/sec	BGA-145 14 x 24 x 1.95 mm
GLS85LS1016A-M-C-FZJE	SATA I / II	2 bits per cell	16 GByte	1.2V and 3.3V	Commercial 0°C to +70°C	30 MByte/sec	70 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	15 MByte/sec	70 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	15 MByte/sec	70 MByte/sec	BGA-145 14 x 24 x 1.95 mm
GLS85LS1032A-M-C-FZJE	SATA I / II	2 bits per cell	32 GByte	1.2V and 3.3V	Commercial 0°C to +70°C	30 MByte/sec	70 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	30 MByte/sec	70 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	30 MByte/sec	70 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	60 MByte/sec	110 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	60 MByte/sec	110 MByte/sec	BGA-145 14 x 24 x 1.95 mm

* Under development

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 335mW (typical)
- Sleep Mode, 10mW (typical)

Multi-tasking Technology Increases Performance

- Fast, Sustained Read Performance (Flash to Host), up to 110 MB/sec
- Fast, Sustained Write Performance (Host to Flash), up to 50 MB/sec

Pre-programmed Firmware in Embedded SuperFlash® Memory

- 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

Robust Power Down Data Protection

- Prevents data corruption when power is lost or unstable

Bad Block Management

- Replaces defect blocks when uncorrected errors occur

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 S.M.A.R.T. command-based alerts indicating the remaining useful product life
- Estimates optimal SSD capacity based upon specific application usage models

Multiple Densities with Same Pin-out

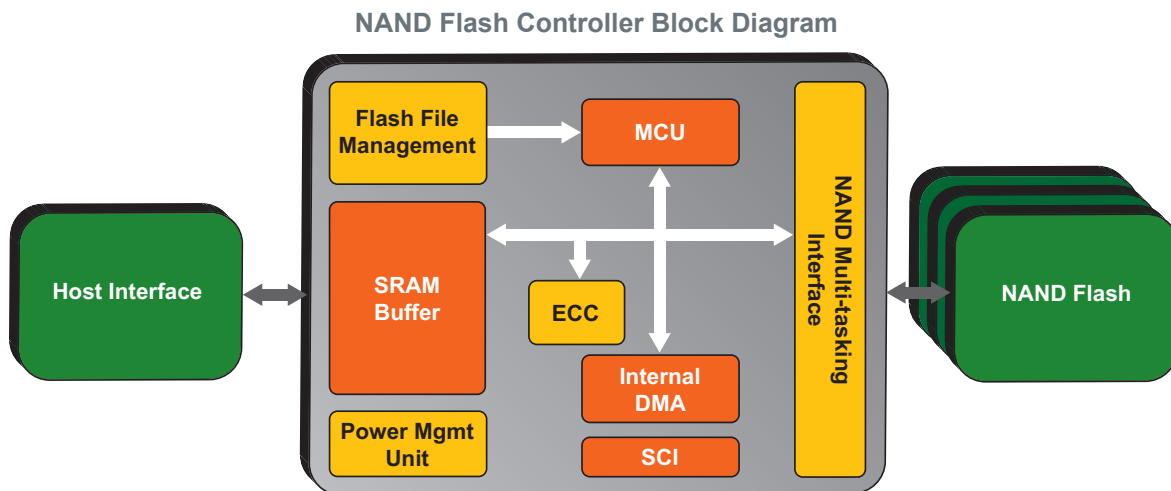
- 2 GB, 4 GB, 8 GB, 16 GB, 32 GB, 64 GB
- 1mm ball spacing enables use of lower cost PCBs

Commercial and Industrial Temperatures

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

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.



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

Greenliant's Specialty Flash Memory portfolio includes the CSF™ (Concurrent SuperFlash™), Many-Time Programmable 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 Many-Time Programmable 27 and 37 Series products combine the erase capability of flash with the cost effectiveness of EPROM/OTP memory, while the Small-Sector Flash™ 29 Series is ideal for applications requiring fine data granularity.

27 / 29 Series: Many-Time Programmable and Page-Write EEPROM

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
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.

29 / 37 Series: Small-Sector Flash and Many-Time Programmable

Part Number	Type	Voltage	Density	Read Access Speed	Grade	Temperature Range	Package Type
GLS29SF020-55-4C-NHE	256K x8 Small-Sector Flash, 128 Bytes per Sector	4.5V - 5.5V	2 Mbit	55 ns	Commercial	0°C to +70°C	PLCC-32 13x15x2.8 mm
GLS29SF020-55-4I-NHE	256K x8 Small-Sector Flash, 128 Bytes per Sector	4.5V - 5.5V	2 Mbit	55 ns	Industrial	-40°C to +85°C	PLCC-32 13x15x2.8 mm
GLS29SF020-55-4C-WHE	256K x8 Small-Sector Flash, 128 Bytes per Sector	4.5V - 5.5V	2 Mbit	55 ns	Commercial	0°C to +70°C	TSOP-32 8x14x1.2 mm
GLS29SF020-55-4I-WHE	256K x8 Small-Sector Flash, 128 Bytes per Sector	4.5V - 5.5V	2 Mbit	55 ns	Industrial	-40°C to +85°C	TSOP-32 8x14x1.2 mm
GLS29SF040-55-4C-NHE	512K x8 Small-Sector Flash, 128 Bytes per Sector	4.5V - 5.5V	4 Mbit	55 ns	Commercial	0°C to +70°C	PLCC-32 13x15x2.8 mm
GLS29SF040-55-4I-NHE	512K x8 Small-Sector Flash, 128 Bytes per Sector	4.5V - 5.5V	4 Mbit	55 ns	Industrial	-40°C to +85°C	PLCC-32 13x15x2.8 mm
GLS29SF040-55-4C-WHE	512K x8 Small-Sector Flash, 128 Bytes per Sector	4.5V - 5.5V	4 Mbit	55 ns	Commercial	0°C to +70°C	TSOP-32 8x14x1.2 mm
GLS29SF040-55-4I-WHE	512K x8 Small-Sector Flash, 128 Bytes per Sector	4.5V - 5.5V	4 Mbit	55 ns	Industrial	-40°C to +85°C	TSOP-32 8x14x1.2 mm
GLS29VF020-70-4C-NHE	256K x8 Small-Sector Flash, 128 Bytes per Sector	2.7V - 3.6V	2 Mbit	70 ns	Commercial	0°C to +70°C	PLCC-32 13x15x2.8 mm
GLS29VF020-70-4I-NHE	256K x8 Small-Sector Flash, 128 Bytes per Sector	2.7V - 3.6V	2 Mbit	70 ns	Industrial	-40°C to +85°C	PLCC-32 13x15x2.8 mm
GLS29VF020-70-4C-WHE	256K x8 Small-Sector Flash, 128 Bytes per Sector	2.7V - 3.6V	2 Mbit	70 ns	Commercial	0°C to +70°C	TSOP-32 8x14x1.2 mm
GLS29VF020-70-4I-WHE	256K x8 Small-Sector Flash, 128 Bytes per Sector	2.7V - 3.6V	2 Mbit	70 ns	Industrial	-40°C to +85°C	TSOP-32 8x14x1.2 mm
GLS29VF040-70-4C-NHE	512K x8 Small-Sector Flash, 128 Bytes per Sector	2.7V - 3.6V	4 Mbit	70 ns	Commercial	0°C to +70°C	PLCC-32 13x15x2.8 mm
GLS29VF040-70-4I-NHE	512K x8 Small-Sector Flash, 128 Bytes per Sector	2.7V - 3.6V	4 Mbit	70 ns	Industrial	-40°C to +85°C	PLCC-32 13x15x2.8 mm
GLS29VF040-70-4C-WHE	512K x8 Small-Sector Flash, 128 Bytes per Sector	2.7V - 3.6V	4 Mbit	70 ns	Commercial	0°C to +70°C	TSOP-32 8x14x1.2 mm
GLS29VF040-70-4I-WHE	512K x8 Small-Sector Flash, 128 Bytes per Sector	2.7V - 3.6V	4 Mbit	70 ns	Industrial	-40°C to +85°C	TSOP-32 8x14x1.2 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
GLS37VF010-70-3C-WHE	128K x8 Many-Time Programmable	2.7V - 3.6V	1 Mbit	70 ns	Commercial	0°C to +70°C	TSOP-32 8x14x1.2 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
GLS37VF040-70-3C-WHE	512K x8 Many-Time Programmable	2.7V - 3.6V	4 Mbit	70 ns	Commercial	0°C to +70°C	TSOP-32 8x14x1.2 mm

Atmel cross-reference guide available at www.greenliant.com.

The multi-bank architecture and Read-while-Write operations of the Concurrent SuperFlash™ 36 Series make it well-suited for automotive, communications and industrial applications.

36 Series: Concurrent SuperFlash							
Part Number	Type	Voltage	Density	Read Access Speed	Grade	Temperature Range	Package Type
GLS36VF1601G-70-4C-EKE	16 Mbit (x8/x16) Concurrent SuperFlash, Bottom Boot	2.7V - 3.6V	1 Mbit x16 or 2 Mbit x 8	70 ns	Commercial	0°C to +70°C	TSOP-48 12x20x1.2 mm
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-70-4C-B3KE	16 Mbit (x8/x16) Concurrent SuperFlash, Bottom Boot	2.7V - 3.6V	1 Mbit x16 or 2 Mbit x 8	70 ns	Commercial	0°C to +70°C	TFBGA-48 6x8x1.1 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
GLS36VF1601G-70-4I-L1PE	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	LFBGA-56 8x10x1.3 mm
GLS36VF3203-70-4E-EKE	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	TSOP-48 12x20x1.2 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
GLS36VF3204-70-4E-EKE	32 Mbit (x8/x16) Concurrent SuperFlash, Top Boot	2.7V - 3.6V	4 Mbit x8 or 2 Mbit x16	70 ns	Extended	-20°C to +85°C	TSOP-48 12x20x1.2 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
GLS36VF3204-70-4E-B3KE	32 Mbit (x8/x16) Concurrent SuperFlash, Top Boot	2.7V - 3.6V	4 Mbit x8 or 2 Mbit x16	70 ns	Extended	-20°C to +85°C	TFBGA-48 6x8x1.1 mm
GLS36VF3204-70-4I-B3KE	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	TFBGA-48 6x8x1.1 mm

Atmel cross-reference guide available at www.greenliant.com.



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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"> • Netbook / Smartbook • Portable multimedia player • Portable navigation device • Tablet PC
Video Content & Delivery		<ul style="list-style-type: none"> • Digital signage • Internet TV • Set-top box • Video conferencing • Video surveillance

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