Greenliant®

Product Description

The SD / microSD ArmourDrive™ family consists of high-reliability, industrial flash memory cards in a wide selection of capacities and endurance specifications. To better address customer needs, the 93 Series is available with 1-bit-per-cell (SLC), 3-bit-per-cell (TLC) or 4-bit-per-cell (QLC) 3D NAND configurations. Operating at extreme temperatures, SD and microSD ArmourDrive memory cards are ideal for applications requiring removable data storage able to withstand demanding environments.

The 93 Series implements advanced NAND flash management technology to preserve data integrity and extend memory card lifespan. Built in the standard SD and microSD card form factors, and backed by Greenliant's technical support, SD and microSD ArmourDrive memory cards give industrial, medical, gaming, video and imaging customers added flexibility when selecting reliable, hot-swappable solid state storage for space-constrained, embedded systems.

Key Features

SD / microSD Form Factor and Interface
- SD (32 x 24 x 2.1 mm) and microSD (15 x 11 x 1.0 mm)
- Compliant with SD Specification Version 6.10
- Supports SD and SPI protocols

High Performance
- Sequential Read / Write performance up to 100MB/s / 85MB/s
- Bus speed mode up to UHS-I 104
- Class 10 Speed performance rating

Energy Efficient
- 3.3V low power supply
- Active Mode less than 405mA
- Standby Mode less than 1mA

Advanced Flash Management
- Dynamic and static wear leveling algorithms maximize product lifespan
- Replaces bad blocks with spare blocks in the NAND flash to prevent uncorrectable errors

Built-in ECC
- Uses advanced bit error detection and correction optimized for 3D NAND

SSD Lifespan Monitoring
- Supports SMART command-based alerts indicating the remaining useful product life

Data Security
- CPRM support (optional)
- Password protection (optional)

High Reliability
- MTBF: 3M hours (SLC/TLC); 2M hours (QLC)
- Shock (1500G) and vibration (20G) resistant
- Waterproof (water depth up to 1000mm)

Power Interrupt Data Protection
- Helps prevent data corruption during unexpected power failure events

Wide Range of Capacities
- EX Series (SLC): 8 GB - 64 GB
- PX Series (TLC): 32 GB - 256 GB
- QX Series (QLC): 256 GB - 1 TB

Operating Temperature Range
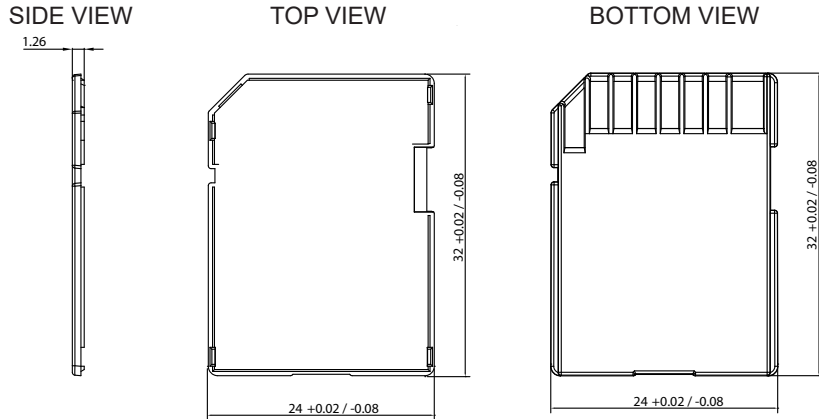- Industrial: -40°C to +85°C
- Wide: -25°C to +85°C

Applications

— *Transportation*
— *Vending*
— *Agriculture*
— *Industrial PC*
— *Navigation*
— *Infotainment*
— *Aviation*
— *Point-of-sales*
— *Security / Surveillance*
— *Industrial automation & control*
— *Data logger*
— *Healthcare*
— *Test & measurement*
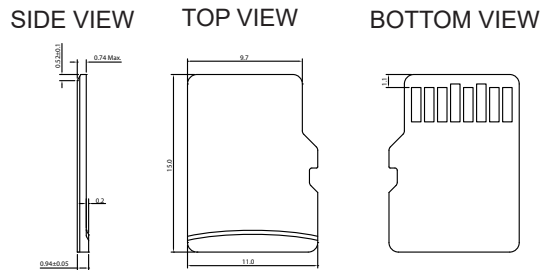— *Networking*
— *Handheld scanner*
— *Professional video / photo*

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SD / microSD ArmourDrive Board Diagrams

SD
32mm x 24mm x 2.1mm
Pb-free (RoHS compliant)

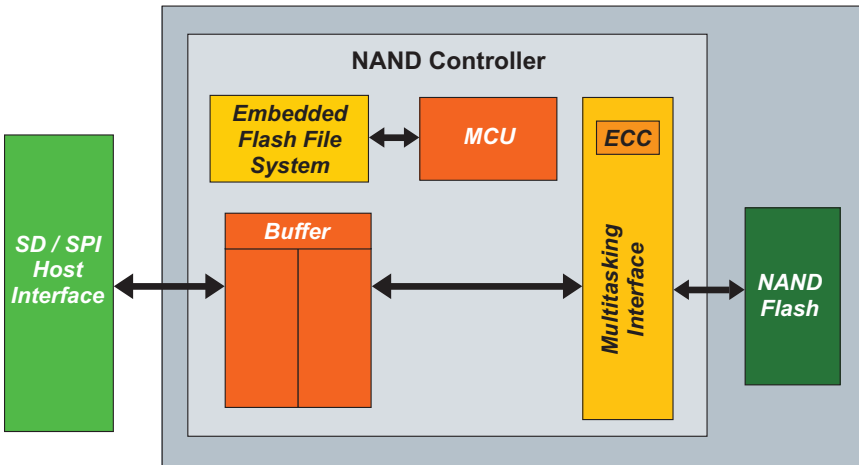SIDE VIEW   TOP VIEW   BOTTOM VIEW

1.26

32 +0.02 / -0.08

24 +0.02 / -0.08

32 +0.02 / -0.08

24 +0.02 / -0.08

microSD
15mm x 11mm x 1.0 mm
Pb-free (RoHS compliant)

SIDE VIEW   TOP VIEW   BOTTOM VIEW

0.74 Max.

9.7

15.0

11.0

0.94±0.05

Note: All dimensions are in millimeters, unless otherwise specified.

SD / microSD ArmourDrive Block Diagram

NAND Controller

- Embedded Flash File System
- MCU
- ECC
- Buffer
- Multitasking Interface

SD / SPI Host Interface

NAND Flash

Product Lineup

93 Series SD / microSD ArmourDrive		
Product Series / Capacity	NAND Configuration / Endurance	Temperature Range
EX 8 GB - 64 GB	1-bit-per-cell SLC NAND / 30K P/E cycles	Industrial -40°C to +85°C
PX 32 GB - 256 GB	3-bit-per-cell TLC NAND / 3K P/E cycles	
PX 32 GB - 256 GB		Wide -25°C to +85°C
QX 256 GB - 1 TB	4-bit-per-cell QLC NAND / 600 P/E cycles	

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ArmourDrive FAQs: www.greenliant.com/armourdrive-faqs
For more information, contact your Greenliant representative: www.greenliant.com/sales

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