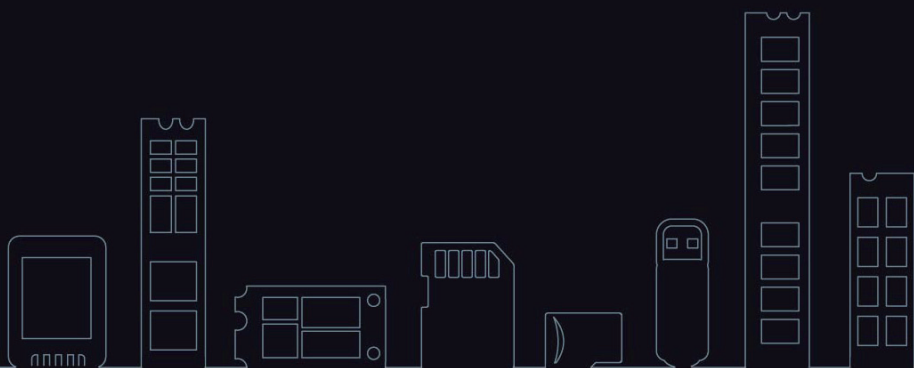


INDUSTRIAL SOLUTIONS



Silicon Power
INDUSTRIAL



Contents

Introduction	2
Applications / Quality / Technology	3-12

Industrial Products

SSD 13

U.2 2.5" NVMe SSD	14
M.2 2280 / 2242 NVMe SSD	15-16
2.5" SATA SSD	17-18
IDE SSD	19
M.2 2280 SATA SSD	20
M.2 2280 / 2260 SATA SSD	21
M.2 2242 SATA SSD	22
mSATA SSD	23-24

Flash Card 25

Cinema Card	26
CFast Card	27-28
Compact Flash Card	29
SLC SD / microSD Card	30
SD Card	31
microSD Card	32

USB Flash Drive 33

USB 3.0	34
USB 2.0	35

DRAM Modules 36

DDR4 DRAM	37
DDR3 DRAM	38



SP Silicon Power

INDUSTRIAL

With over 17 years of experience, Silicon Power has become a trusted service-driven provider of professional NAND flash storage and DRAM modules for industrial and enterprise applications.

With a focus on in-house design, we develop SMART IoT Toolbox, chip-sorting technology, customized FW adjustment, and personalized testing procedures under a strict project management system and in accordance with the NPI process. We maintain our competitive edge by understanding key design concerns for our customers and tailoring our products to make the best possible solutions for integration within our interconnected world.

With dedicated in-house manufacturing, we produce under rigorously monitored quality control measures and comprehensive testing systems. This allows for a 100% traceability via production record. In addition, our 90% automatized manufacturing process allows us to maintain superior levels of consistency amongst our products.

Over the years, we've continued to sharpen our expertise in fulfilling unique customization requests and specialize in complete phase planning with fixed BOM solutions and an extended longevity supply. Our direct hand in design and manufacturing contributes to the dependability of these services.

In a world filled with commodity suppliers, Silicon Power stands out by delivering a combination of top-notch quality, reliability, and technical support for solutions to maximize potential.

Founded in
2003



Made
in Taiwan



Headquartered in
Taipei, Taiwan



500+
Employees

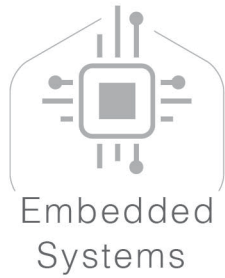


120+
Global Awards



100+
Country Sales
Coverage





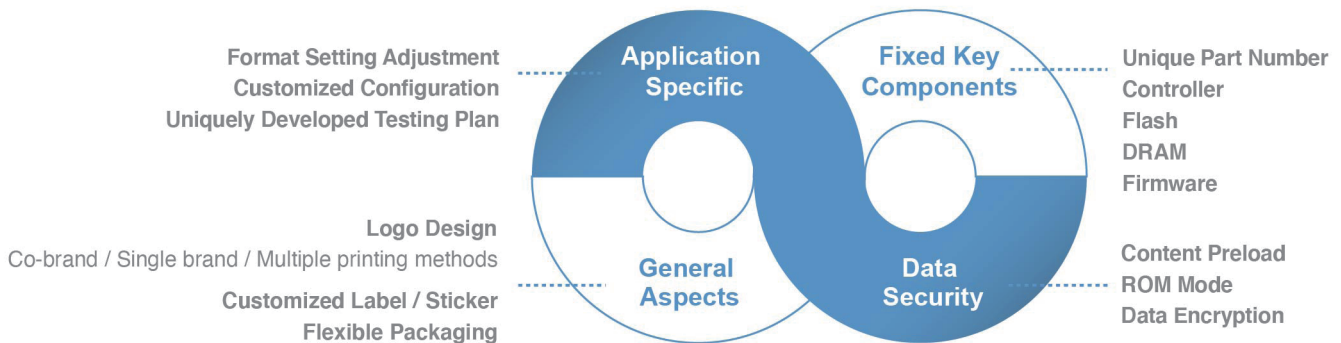
Target Markets



Service Customization

One of the most critical aspects of industrial applications is that each design is unique and performs a specific task, while the platform configuration is usually tailor-made and fixed. From the design phase to the end of the life cycle, the selected components are designed to remain unchanged to eliminate any compatibility risks. This is why we only change our key components with well-in-advance ECN/PCN/EOL notices to provide enough time for a smooth re-qualification process and Last Time Buy service. On top of BOM control, we offer different levels of customization services. Our expertise ranges from general customization to application-specific configurations, firmware adjustments, and personalized testing procedures.

Central Platform Control Process





Flexibility with Pseudo-SLC Flash and Industrial Temperature Solution

Flexibility and a wide range of product options are essential parts of our portfolio, so that you will find an embedded solution that is expertly tailored to your storage needs.

Pseudo-SLC Flash

Filling the gap between our SLC and MLC solutions, we offer pseudo-SLC Flash. It is an advanced variant of MLC and outperforms MLC in speed, program erase cycles, and overall reliability. Pseudo-SLC operates like SLC but with fewer program erase cycles, which makes it a cost-effective alternative to SLC.

Industrial Temperature Solutions

Products with industrial applications often have to withstand extreme temperature conditions. We offer solutions that are able to operate in all systems and environments, including harsh operating environments and industries such as logistics and telecommunications.



SP Toolbox

Specifically developed for our industrial flash products, SP Toolbox is intuitive software with a range of powerful features. Easily change settings and efficiently monitor product health - whatever you need to check or adapt to, SP Toolbox hands you exactly the tools you need.

SMART Toolbox

Utility application that monitors the health and status of SP flash products (Windows, Linux).

SMART Embedded

Application including the C++ compiler development environment which offers seamless device integration (Windows and Linux Ubuntu/Yocto Embedded OS).



SMART IoT

Cloud service with alarm and maintenance notifications that monitors and analyzes the health and status of SP SSDs inside connected devices (Windows, Linux Ubuntu/Yocto).



Dedicated and Complete Supply Chain Management

Component Management

We prioritize practicing stringent control over original flash sourcing and flash life cycle management to ensure the highest quality possible. Our vendor approval system provides qualified and stable sourcing. We also support fixed BOM for consistent and long-term supply of certified key components.

Reliability Testing Procedure

Each of our industrial products is tested for 100% reliability and functionality. Various tests are applied at the development and verification stages to comply with customer platform requirements and multiple international standards.

Quality Assurance

Before our industrial products are packaged, each one must score 100% on chamber screening and burn-in tests. Our in-house QA laboratory and validation team administer exacting quality management systems with stringent examination criteria.



NPD Process & Quality Check Point

New product concept evaluation or customer RFQ

Kick-off



Engineering Sample (EVT)

Sample Run (DVT)

Pilot Run (PVT)



MP

Service

Verify

- Design Quality RD
- Testing Quality RD
- Reliability Quality QA
- Component Quality RD
- Process Quality PE
- Service Quality RMA

Validation → NPD Platform



SSD Mass Production Flow

PCBA Assembly

Automated Optical Inspection (AOI)

Reliability Demonstration Testing (RDT)

Initialization

Function & Performance Test

Dynamic Burn-in

FQC

Shipment



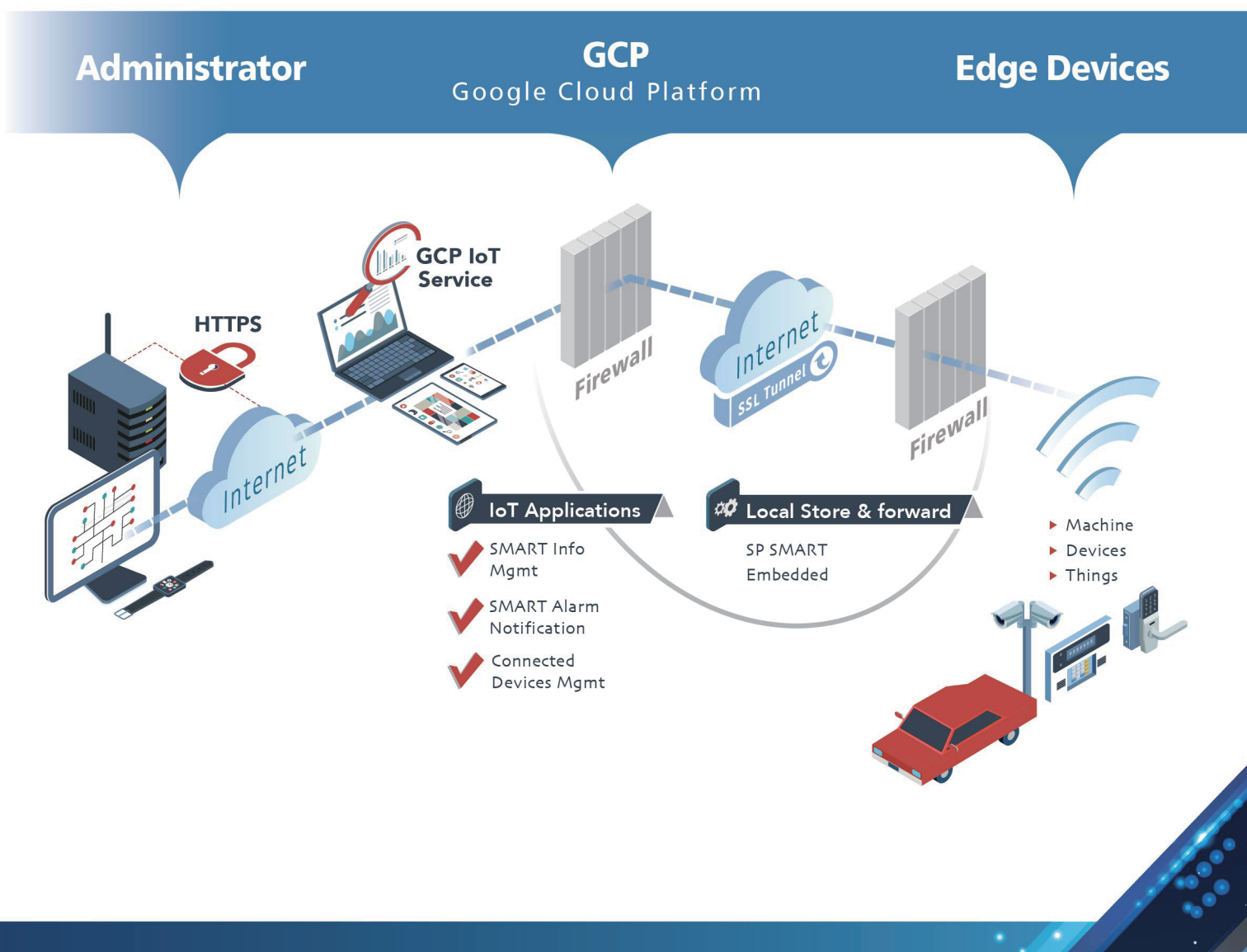
SMART Embedded Application and SMART IoT Sphere Service Platform

SP developed a SMART Embedded application to deliver real-time SMART information without interrupting equipment operation.

Inside the intranet or private cloud environment, SP can offer a customized data format and interface to connect with a customer's server and database. Customers can easily build a monitoring system to manage the healthy status of flash disk inside their equipment and set alarm notifications for administrators.

The SMART Embedded application also establishes a connection with Node-RED, which is a free programming tool for combining hardware devices, APIs, and online services developed by IBM. It is an essential tool for developing IoT applications.

SP also provides a SMART IoT Sphere service platform to provide proof of concept before you invest in your own server and cloud environment. SP develops IoT applications and secure data connections under the Google Cloud Platform (GCP), which is one of the most popular and secure cloud platforms for IoT applications. Customers can apply for a free 15-day trial (for up to 3 connected devices) upon installation of an SP flash disk to their equipment. SP can support equipment using Intelx86 and ARM-based CPU under Window OS and Linux platforms.



Dual Secure Design for Power Failure Protection

What is Power Failure Protection (PFP)?

PFP is the methodology that protects data in an SSD against unexpected power loss during operation. When unexpected power loss occurs on an SSD power source, the SSD controller will perform a safety measure to protect the data from the DRAM buffer and save it into the NAND Flash.

There are different types of data that are temporarily stored in DRAM cache memory to optimize SSD performance while the SSD is in operation, but DRAM is a volatile memory, which means DRAM always needs external power in order to retain its data.

There are two ways for a user to power-off an SSD:

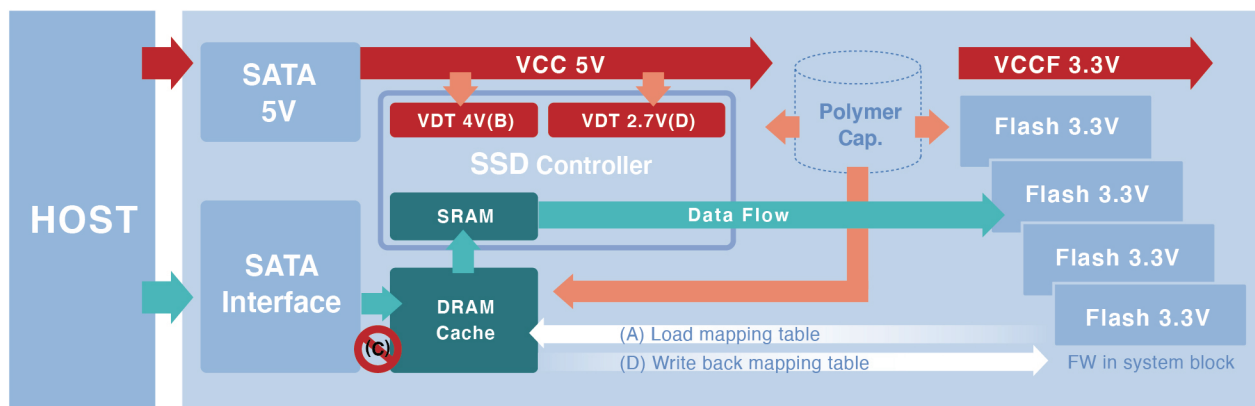
- In the normal power-off sequence: HOST issues the FLUSH and STANDBY commands to an SSD, the SSD flushes DRAM cache data save into FLASH, then powers off.
- In the unexpected power loss sequence: When an SSD power source changes from 5V → 4V, the SSD controller will enable the Power Shielding function to stop receiving host commands. As the power source drops from 4V → 2.7V, the SSD advanced PFP function will enable a backup circuit and start to flush DRAM cache data save into FLASH to secure the user data in a limited time.

How Silicon Power solves power failure: Dual Secure Design for Power Failure Protection

Power shielding firmware architecture provides protection by sensing unstable voltage and powering down to stop receiving host commands.

Implement Advanced PFP with industrial grade polymer capacitors during sudden power-off situations to gain more time for the data flushing process from DRAM cache to FLASH.

How does the SSD controller manage power failure? (2.5"SSD R series)



Reliably Erasing Data from an SSD

Reliably erasing data from storage media (sanitizing the media) is a critical component of secure data management.

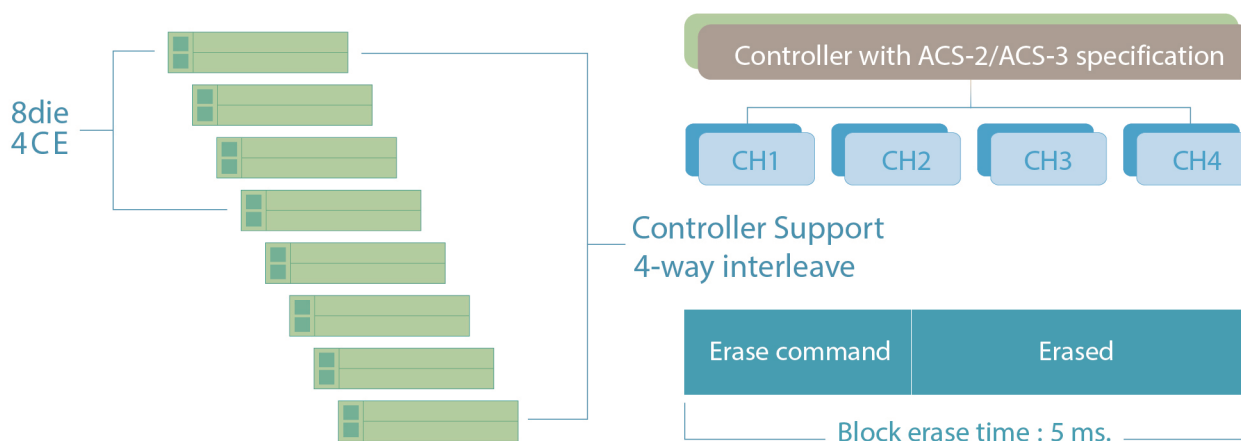
Flash-based solid-state drives (SSDs) differ from hard drives in both the technology they use to store data (flash chips vs. magnetic disks) and the algorithms they use to manage and access that data. SSDs maintain a layer (Flash Translation Layer (FTL)) of indirection between the logical block addresses that computer systems use to access data and the raw flash addresses that identify physical storage. The layer of indirection enhances SSD performance and reliability by hiding the flash memory's idiosyncratic interface and managing its limited lifetime. However, it can also produce copies of the data that are invisible to the user but recoverable by a sophisticated attacker. For this reason, it is so important to sanitize the media completely.

Built-in sanitize commands

Most modern drives have built-in sanitize commands that instruct on-board firmware to run a sanitization protocol on the drive.

ACS-2/ACS-3 specifications incorporate a "Block Erase" command as part of its SANITIZE feature set. It instructs a drive to perform a "Block Erase" on all memory blocks containing user data, even if they are not user-accessible. SP Industrial 2.5" SSDs support ACS-2/ACS-3 specifications to provide a 4-way Interleave Multiple Block Erase function to sanitize a whole drive effectively. For example, 1TB SSD (SP010TISSD301RW0) or pSLC 512GB SSD (SP512GISSD501RW0) can be triggered by a 5-pin Feature Connector to execute a 4-way Interleave Multiple Block Erase function to complete whole-drive sanitization in around 10 seconds.

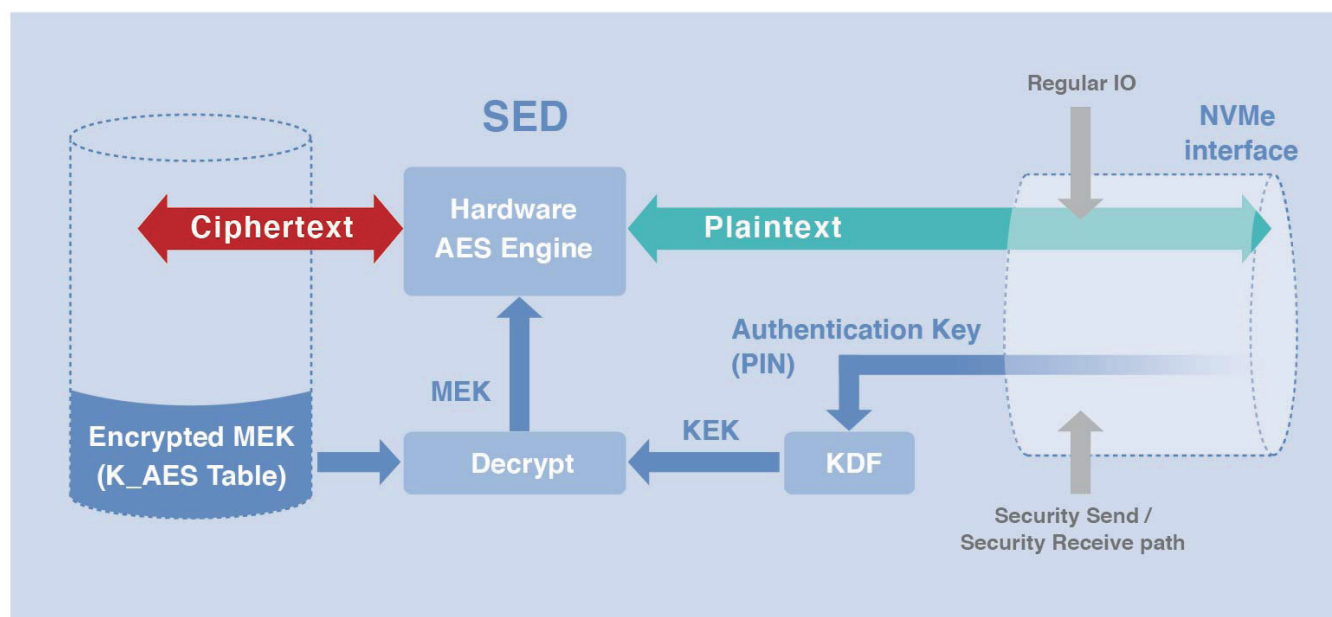
SP Industrial 2.5" SSDs are designed with a 5-pin Feature Connector to make external triggers easily via short Pin 4 and GND and execute multiple "Block Erase" commands.



Pin	Function	I/O	Function Description
1	Write Protect	input	short to GND pin to enable write protection
2	GND	n/a	system ground
3	Device activity indicator	output	connect to an LED to indicate device activity
4	Security Erase trigger	input	short to GND pin to trigger security erase function
5	Erase activity indicator	output	connect to an LED to indicate erase function activity

TCG/Opal 2.0 Compliant Self-Encrypting Drive (SED)

A Self-Encrypting Drive (SED) is a Storage Device that integrates encryption of user data at rest. All of the user data written to the Storage Device is encrypted by specialized hardware implemented inside the Storage Device Controller. The security and privacy benefits of SEDs are essential in the Internet of Things (IoT), medical devices, industrial systems, retail systems, defense equipment, transportation systems, etc.



Copyright © 2004-2015 Trusted Computing Group®
(www.trustedcomputinggroup.org) All Rights Reserved

Copyright © 2007-2015 NVM Express, Inc.
(www.nvmexpress.org) All Rights Reserved

The Drive Trust Alliance brings together the state of the art in SED technology. Storage Device Makers, Storage Security Software Vendors, IT departments, and normal End Users will learn how to employ SED technology to solve many of today's massive and serious data leakage problems.

The Drive Trust Alliance maintains the popular "sedutil" application, which eases configuration of Self-Encrypting Drives implementing the TCG/Opal specification for SATA and NVMe SEDs.

TCG/Opal SSC (Security Subsystem Class) v.2.0 makes hardware encryption manageable. The specification standard stipulates that the hardware encryption is permanently active. Nowadays, TCG/Opal v.2.0 is one of the main standards for self-encrypting drives.

SP offers TCG/Opal 2.0 compliant Industrial SATA III and NVMe SSDs

SP Industrial SATA III and NVMe SSDs are equipped with an AES-256 encryption engine, providing hardware-based, secure data encryption, with SED function support and no SSD performance loss. If TCG/Opal features are enabled, the SSDs will follow the TCG/Opal specification and integrate encryption of user data at rest.



Direct-to-TLC and SLC Caching Algorithms for Optimal Sustained Read and Write Performance with 3D TLC NAND

SP's 3D TLC SSD is designed with Direct-to-TLC technology and SLC Caching algorithm. When the SLC-programmed buffer gets full, the SSD will start to write incoming data directly to the TLC Flash. This algorithm decreases wear on the Flash, but the 'fold method' involved forces the SSD to slow down the incoming data once the fast SLC buffer is full. The 'fold method' allows the SSD to make space available for more incoming data, but it does so by pushing data to the slower TLC area.

Capacity for accelerated performance is derived from the adaptive usage of the SSD's native NAND array, without sacrificing user-addressable storage. SSD firmware achieves acceleration by switching between SLC and TLC modes to create a high-speed SLC pool that changes in size and location based on usage conditions.



Industrial SD and microSD Cards for Edge Surveillance Devices

Edge surveillance devices, such as dash cam driving recorders for telematics fleet management, require reliable and high endurance storage for usage under extreme environments, especially temperature.

Advanced File Fidelity Writing

SP Industrial SD and microSD cards are designed with the Advanced File Fidelity Writing feature to ensure video data integrity. Video data recorded for telematics fleet management is critical and important for management. This is an important feature for fail-safe storage for mission-critical deployments.

Optimized Firmware for Continuous Recording

Providing stable recording performance is another requirement for edge surveillance devices. Firmware must be optimized to support steady state performance to guarantee all frames are recorded. Most importantly, firmware should avoid garbage collection, which would compromise video recording performance.

Sudden Power-Off Recovery (SPOR) Resilient Firmware

A dash cam driving recorder is installed inside a vehicle with unstable power conditions. It is inevitable to have sudden power-off or an unstable power situation. SP Industrial SD and microSD cards are designed with SPOR resilient firmware to avoid a firmware crash when sudden power loss occurs during video recording and device initialization.

SMART Health Status Monitoring System

A SMART health status monitoring system is essential to track the health of a storage device and provide preventative maintenance before any unexpected failures occur. SP offers a SMART Embedded application to seamlessly integrate with an edge device's operating system. Furthermore, SP's SMART IoT sphere service platform also integrates this feature to alert administrators when replacement is necessary.

pSLC High Endurance Offering

SP Industrial SD and microSD cards offer pSLC technology, which can provide nearly 10 times the amount of PE cycles versus regular offerings. This feature reduces system downtime and maintenance costs, which lowers the total cost of ownership (TCO).

Anti-Sulfuration

Introduction

Sulfur corrosion-related failures with high levels of atmospheric pollution and with high relative humidity levels commonly found in the Asia georegion. It has all led to increased rates of hardware failures associated with particulate and gaseous contamination. Especially the growth of silver sulfide, resulting from silver corrosion, can cause an increase in resistance and eventually, an electrical open of the chip resistor.

There are two solutions to solve the threat of sulfur corrosion. First one is making the products more robust against sulfur corrosion. The best method to increase the robustness of resistors in high sulfur environments is to employ Anti-Sulfur Resistors. Second one is gaining better understanding of the allowable levels of contamination, temperature and humidity under which IT equipment can operate reliably.

It is very important for Silicon Power Industrial products to classify the robustness against sulfur corrosion of electronics hardware for industrial applications especially for networking equipments in datacenter, IIoT devices, automotive and medical segments.

Methods of Anti-Sulfuration

There are several methods to elevate the anti-sulfur corrosion capacity of electronics equipment including anti-sulfur chip resistor and conformal coating application.

The typical chip resistor with silver electrode can be replaced with an anti-sulfur chip resistor. Besides, conformal coating is a system-level solution which can protect the board and component to prevent the sulfur corrosion occurrence.

According to research paper "Evaluation of the Anti-Sulfur Corrosion Capacity for Chip Resistor and Conformal Coating by Way of Flower-of-Sulfur(FoS) Methodology", published on International Microsystems, Packaging Assembly and Circuits Technology Conference, the international standard of EIA-977 FoS test was adopted to evaluate the anti-sulfur corrosion capacity for chip resistor and conformal coating. EIA-977 FoS test is the latest sulfur corrosion qualification for the electronic passive components exposure to atmospheric sulfur which was published in 2017. This test method is a modified form of ASTM B 809 and also suitable for electronic passive components exposure to atmospheric sulfur.

Anti-Sulfur Chip Resistor

Typical chip resistors with silver-based inner electrodes can lose conductivity when the silver reacts with sulfur in a high-sulfur environment. The electrodes can lose all conductivity and disconnect the circuit as sulfuration continues.

Anti-sulfur chip resistors and arrays are designed to protect against sulfuration of the resistor electrodes and pass ASTM B809-95 105°C, 750 hours anti-sulfuration FOS testing.

Effectiveness of Anti-Sulfur Corrosion Capacity

DRAM Modules with anti-sulfur chip resistors and arrays without conformal coating can survive for at least 600 hours (25 days) in the research paper. According to ISA Standard 71.04 G2 level is the most recognized severity level of airborne contaminants in developed regions for applications in Data centers. Silicon Power DDR4 modules are ready to equip the industrial standard anti-sulfur chip resistors and arrays to withstand ISA standard 71.04 G2 severity level with 3-year warranty.

Classification of Severity of Airborne Contaminants-Gases

Guideline from the ISA standard 71.04-2013 was used to classify the measured thickness of airborne contaminants into the various severity level rankings :

ISA Standard S71.04-2013			
Severity Level	Reactivity Level	Copper Corrosion	Silver Corrosion
G1	Mild	< 300 Angstroms / 30 days	< 200 Angstroms / 30 days
G2	Moderate	< 1000 Angstroms / 30 days	< 1000 Angstroms / 30 days
G3	Harsh	< 2000 Angstroms / 30 days	< 2000 Angstroms / 30 days
G4	Severe	> 2000 Angstroms / 30 days	> 2000 Angstroms / 30 days

ISA 71.04-G2 Severity Level	Expected Film Thickness for Corrosion	
	Silver (Ag)	Copper (Cu)
1-year warranty (12 months)	12,000	12,000
2-year warranty (24 months)	24,000	24,000
3-year warranty (36 months)	36,000	36,000

Conformal Coating

Benefits of Conformal Coating

Conformal coatings are the materials applied in thin layers onto printed circuit boards or other electronic substrates to protect against environmental damage, thermal shock damage and mechanical damage to extend life of product.

Protects against

- Environmental damage: such as humidity, corrosive chemical
- Thermal shock damage: such thermal variation and shocks
- Mechanical shock damage: such as vibration and mechanical shocks

Global Recognized Coating Materials

- UL-94 V-0 flammability rating, UL 746E recognized
- IPC-CC-830, MIL-I-46058C approved
- RoHS 2.0 Compliant

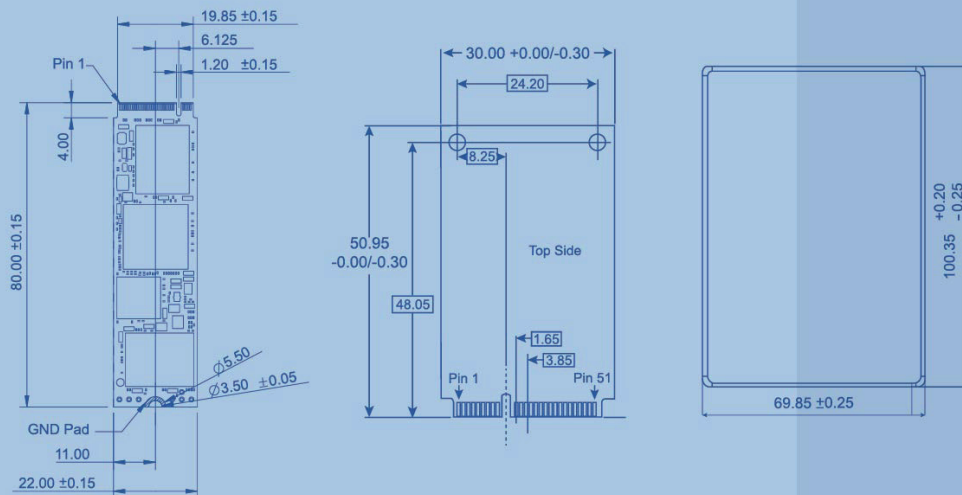
Coating material	Thickness	Temp. Range	Humidity resistance	Dielectric properties	Abrasion resistance	Chemical & Solvent resistance	Easy to Repair
Acrylic HumiSeal 1B73, Peters SL 1307 FLZ/234	30um- 130um	Good -65 to +125°C	Good	Excellent	Good	Poor	Excellent
Silicone Dow Corning DC1-2577-LV	50um- 210um	Excellent -65 to +200°C	Fair	Good	Fair	Excellent	Poor

Reliable Conformal Coating Process

- Automatic Dispensing Machine to make sure consistent coating process
- Complaint with IPC A-610 E2 Conformal coating process standard & IPC A-610 E3 coating thickness standard



Industrial SSD





U.2 2.5" NVMe SSD

- ▶ Compliant with NVMe Express 1.3
- ▶ Support Data Security with AES 256 Encryption (Optional)
- ▶ Support SP Toolbox SMART health monitoring software
- ▶ 0.8/1/3 DWPD



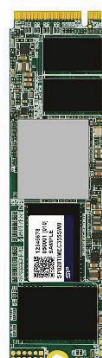
Model	SSU3F0P	SSU3F0R
Flash Technology	3D TLC	3D TLC
Interface	PCIe Gen3x4, NVMe	PCIe Gen3x4, NVMe
Capacity	960GB ~ 3840GB / 1600GB~3200GB	960GB ~ 7680GB
Seq. Performance Read (max.)	3,400 MB/s	3,200 MB/s
Seq. Performance Write (max.)	2,800 MB/s	1,000 MB/s
Random 4K Read (IOPS max.)	640,000	400,000
Random 4K Write (IOPS max.)	250,000	30,000
Power Requirement	DC 3.3V	DC 3.3V
Power Consumption (max.)	1100 mA	800 mA
Power Consumption (idle)	300 mA	TBD
Dimension (mm)	100.35 x 69.85 x 15.0	100.35 x 69.85 x 7.0
MTBF (est)	≅2,000,000 hrs	≅2,000,000 hrs
Temperature & Humidity (IEC-60068)		
Operating 0°C ~ 70°C: Standard	SP***GISSU3F1PV0	SP***GISSU3F1RV0
Operating -15°C ~ 85°C: Extended		
Operating -40°C ~ 85°C: Wide		SP***GISSU3F1RW0
Storage Temperature	-55°C ~ 95°C	-55°C ~ 95°C
Operating Humidity	10% ~ 95% (30°C Max. Wet Bulb Temp)	
Mechanical (IEC-60068)		
Vibration	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz
Drop	75cm	75cm
Shock	1,500G@0.5ms	1,500G@0.5ms
Key Features		
Power Shield	◆	◆
PFP	◆	◆
End-to-End Data Protection	◆	◆
TRIM	◆	◆
S.M.A.R.T	◆	◆
DEVSLP	◆	◆
AES 256	◆	◆
SP SMART Utility	◆	◆
Warranty	3 years and within TBW	

*1. The read and write values may vary depending on different capacities and testing platforms.

*2. ◆=Default ◇=By Request

M.2 2280 NVMe SSD

- ▶ Compliant with NVMe Express 1.3
- ▶ Support Data Security with AES 256 Encryption (Optional)
- ▶ Support SP Toolbox SMART health monitoring software



Model	MEC350R	MEC350S	MEC350E
Flash Technology	3D TLC	3D TLC	3D TLC
Interface	PCIe Gen3x4, NVMe	PCIe Gen3x4, NVMe	PCIe Gen3x4, NVMe
Capacity	128GB ~ 2TB	128GB ~ 2TB	128GB ~ 1TB
Seq. Performance Read (max.)	3,400 MB/s (estimated)	3,400 MB/s	1,700 MB/s
Seq. Performance Write (max.)	2,900 MB/s (estimated)	2,900 MB/s	1,510 MB/s
Random 4K Read (IOPS max.)	345,000 (estimated)	345,000	230,000
Random 4K Write (IOPS max.)	350,000 (estimated)	350,000	225,000
Power Requirement	DC 3.3V	DC 3.3V	DC 3.3V
Power Consumption (max.)	2450 mA	2450 mA	2050 mA
Power Consumption (idle)	230 mA	230 mA	150 mA
Dimension (mm)	80.0 x 22.0 x 3.6	80.0 x 22.0 x 3.6	80.0 x 22.0 x 3.6
MTBF (est)	≅ 2,000,000 hrs	≅ 2,000,000 hrs	≅ 2,000,000 hrs
Temperature & Humidity (IEC-60068)			
Operating 0°C ~ 70°C: Standard	SP***GIMEC35*RV0	SP***GIMEC35*SV0	SP***GIMEC35*EV0
Operating -15°C ~ 85°C: Extended	SP***GIMEC35*RE0	SP***GIMEC35*SE0	
Operating -40°C ~ 85°C: Wide	SP***GIMEC35*RW0	SP***GIMEC35*SW0	
Storage Temperature	-55°C ~ 95°C	-55°C ~ 95°C	-55°C ~ 95°C
Operating Humidity	10% ~ 95% (30°C Max. Wet Bulb Temp)		
Mechanical (IEC-60068)			
Vibration	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz
Drop	75cm	75cm	75cm
Shock	1,500G@0.5ms	1,500G@0.5ms	1,500G@0.5ms
Key Features			
Power Shield	◆	◆	◆
PFP	◆		
End-to-End Data Protection	◆	◆	◆
TRIM	◆	◆	◆
S.M.A.R.T	◆	◆	◆
DEVSLP	◆	◆	◆
AES 256	◆	◆	
SP SMART Utility	◆	◆	◆
Warranty	3 years and within TBW		

*1. The read and write values may vary depending on different capacities and testing platforms.

*2. ◆=Default ◇=By Request



M.2 2280/2242 NVMe SSD

- ▶ Compliant with NVMe Express 1.3
- ▶ Support Data Security with AES 256 Encryption (Optional)
- ▶ Support SP Toolbox SMART health monitoring software

NEW
Dynamic
SLC
Cache



NEW
High
Sustained
Write



Model	MEC3K0E	MEC3F0S	MEA3K0E
Flash Technology	3D TLC	3D TLC	3D TLC
Interface	PCIe Gen3x4, NVMe	PCIe Gen3x4, NVMe	PCIe Gen3x4, NVMe
Capacity	64GB ~ 2TB	1TB ~ 4TB	64GB ~ 512GB
Seq. Performance Read (max.)	2,600 MB/s	3,100 MB/s (estimated)	2,000 MB/s (estimated)
Seq. Performance Write (max.)	2,000 MB/s	2,500 MB/s (estimated)	1,500 MB/s (estimated)
Random 4K Read (IOPS max.)	295,000 (estimated)	95,000 (estimated)	220,000 (estimated)
Random 4K Write (IOPS max.)	210,000 (estimated)	70,000 (estimated)	200,000 (estimated)
Power Requirement	DC 3.3V	DC 3.3V	DC 3.3V
Power Consumption (max.)	1500 mA		
Power Consumption (idle)	280 mA		
Dimension (mm)	80.0 x 22.0 x 3.6	80.0 x 22.0 x 3.6	42.0 x 22.0 x 3.6
MTBF (est)	≅ 2,000,000 hrs	≅ 2,000,000 hrs	≅ 2,000,000 hrs
Temperature & Humidity (IEC-60068)			
Operating 0°C ~ 70°C: Standard	SP***GIMEC3K*EV0	SP***GIMEC3F*SV0	SP***GIMEA3K*EV0
Operating -15°C ~ 85°C: Extended			
Operating -40°C ~ 85°C: Wide			
Storage Temperature	-55°C ~ 95°C	-55°C ~ 95°C	-55°C ~ 95°C
Operating Humidity	10% ~ 95% (30°C Max. Wet Bulb Temp)		
Mechanical (IEC-60068)			
Vibration	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz
Drop	75cm	75cm	75cm
Shock	1,500G@0.5ms	1,500G@0.5ms	1,500G@0.5ms
Key Features			
Power Shield	◆	◆	◆
PFP			
End-to-End Data Protection	◆	◆	◆
TRIM	◆	◆	◆
S.M.A.R.T	◆	◆	◆
DEVSLP	◆	◆	◆
AES 256		◆	
SP SMART Utility	◆	◆	◆
Warranty	3 years and within TBW		

*1. The read and write values may vary depending on different capacities and testing platforms.

*2. ◆=Default ◇=By Request

2.5" SATA SSD

- Compliant with Serial ATA Revision 3.1 Standard with 6.0 Gb/s transfer rate
- Equipped with advanced PFP technology
- Supports Data Security AES Encryption (optional)
- Feature connector supports Security Erase and Write Protect
- Supports SP Toolbox SMART Health Monitoring System software
- SATA DEVSLP for advanced power saving



Model	SSD700R	SSD500R	SSD300R	SSD300S
Flash Technology	SLC	pSLC (MLC)	MLC	MLC
Interface	SATA III/6.0Gbps	SATA III/6.0Gbps	SATA III/6.0Gbps	SATA III/6.0Gbps
Capacity	8GB ~ 128GB	16GB ~ 512GB	16GB ~ 1TB	16GB ~ 1TB
Seq. Performance Read (max.)	190 MB/s	530 MB/s	520 MB/s	530 MB/s
Seq. Performance Write (max.)	180 MB/s	450 MB/s	450 MB/s	450 MB/s
Random 4K Read (IOPS max.)	TBD	79,000	79,000	79,000
Random 4K Write (IOPS max.)	TBD	73,000	73,000	73,000
Power Requirement	DC 5.0V	DC 5.0V	DC 5.0V	DC 5.0V
Power Consumption (max.)	295 mA	790 mA	790 mA	790 mA
Power Consumption (idle)	90 mA	90 mA	90 mA	90 mA
Dimension (mm)	100.4 x 69.9 x 6.8	100.4 x 69.9 x 6.8	100.4 x 69.9 x 6.8	100.4 x 69.9 x 6.8
MTBF (est)	≅2,000,000 hrs	≅2,000,000 hrs	≅2,000,000 hrs	≅2,000,000 hrs
Temperature & Humidity (IEC-60068)				
Operating 0°C ~ 70°C: Standard	SP***GISSD701RV0	SP***GISSD50*RV0	SP***GISSD30*RV0	SP***GISSD30*SVO
Operating -15°C ~ 85°C: Extended	SP***GISSD701RE0	SP***GISSD50*RE0	SP***GISSD30*RE0	SP***GISSD30*SE0
Operating -40°C ~ 85°C: Wide	SP***GISSD701RW0	SP***GISSD50*RW0	SP***GISSD30*RW0	SP***GISSD30*SW0
Storage Temperature	-55°C ~ 95°C	-55°C ~ 95°C	-55°C ~ 95°C	-55°C ~ 95°C
Operating Humidity	10% ~ 95% (30°C Max. Wet Bulb Temp)			
Mechanical (IEC-60068)				
Vibration	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz
Drop	75cm	75cm	75cm	75cm
Shock	1,500G@0.5ms	1,500G@0.5ms	1,500G@0.5ms	1,500G@0.5ms
Key Features				
Power Shield	◆	◆	◆	◆
PFP	◆	◆	◆	
Feature Connector	◇	◇	◇	
TRIM	◆	◆	◆	◆
S.M.A.R.T	◆	◆	◆	◆
DEVSLP	◆	◆	◆	◆
AES 256	◆	◆	◆	
SP SMART Utility	◆	◆	◆	◆
Warranty	5 years and within TBW	5 years and within TBW	3 years and within TBW	3 years and within TBW

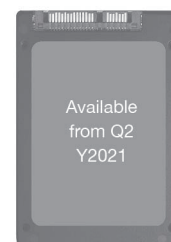
*1. The read and write values may vary depending on different capacities and testing platforms.

*2. ◆=Default ◇=By Request



2.5" SATA SSD

- Compliant with Serial ATA Revision 3.1 Standard with 6.0 Gb/s transfer rate
- Equipped with advanced PFP technology
- Supports Data Security AES Encryption (optional)
- Feature connector supports Security Erase and Write Protect
- Supports SP Toolbox SMART Health Monitoring System software
- SATA DEVSLP for advanced power saving



Model	SSD550R	SSD350R	SSD350S	SSD3K0E
Flash Technology	pSLC (3D TLC)	3D TLC	3D TLC	3D TLC
Interface	SATA III/6.0Gbps	SATA III/6.0Gbps	SATA III/6.0Gbps	SATA III/6.0Gbps
Capacity	32GB ~ 512GB	32GB ~ 2TB	32GB ~ 2TB	64GB ~ 4TB
Seq. Performance Read (max.)	560 MB/s	560 MB/s	560 MB/s	540 MB/s
Seq. Performance Write (max.)	520 MB/s	520 MB/s	520 MB/s	515 MB/s
Random 4K Read (IOPS max.)	95,000	95,000	95,000	80,000 (estimated)
Random 4K Write (IOPS max.)	91,000	91,000	91,000	75,000 (estimated)
Power Requirement	DC 5.0V	DC 5.0V	DC 5.0V	DC 5.0V
Power Consumption (max.)	700 mA	700 mA	700 mA	TBD
Power Consumption (idle)	110 mA	110 mA	110 mA	TBD
Dimension (mm)	100.4 x 69.9 x 6.8	100.4 x 69.9 x 6.8	100.4 x 69.9 x 6.8	100.4 x 69.9 x 6.8
MTBF (est)	≅2,000,000 hrs	≅2,000,000 hrs	≅2,000,000 hrs	≅2,000,000 hrs
Temperature & Humidity (IEC-60068)				
Operating 0°C ~ 70°C: Standard	SP***GISSD55*RV0	SP***GISSD35*RV0	SP***GISSD35*SV0	SP***GISSD3K*EV0
Operating -15°C ~ 85°C: Extended	SP***GISSD55*RE0	SP***GISSD35*RE0	SP***GISSD35*SE0	
Operating -40°C ~ 85°C: Wide	SP***GISSD55*RW0	SP***GISSD35*RW0	SP***GISSD35*SW0	
Storage Temperature	-55°C ~ 95°C	-55°C ~ 95°C	-55°C ~ 95°C	-55°C ~ 95°C
Operating Humidity	10% ~ 95% (30°C Max. Wet Bulb Temp)			
Mechanical (IEC-60068)				
Vibration	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz
Drop	75cm	75cm	75cm	75cm
Shock	1,500G@0.5ms	1,500G@0.5ms	1,500G@0.5ms	1,500G@0.5ms
Key Features				
Power Shield	◆	◆	◆	◆
PFP	◆	◆		
Feature Connector	◇	◇		
TRIM	◆	◆	◆	◆
S.M.A.R.T	◆	◆	◆	◆
DEVSLP	◆	◆	◆	◆
AES 256	◆	◆	◆	◆
SP SMART Utility	◆	◆	◆	◆
Warranty	5 years and within TBW	3 years and within TBW	3 years and within TBW	3 years and within TBW

*1. The read and write values may vary depending on different capacities and testing platforms.

*2. ◆=Default ◇=By Request

2.5" IDE SSD

- 2.5" standard form factor with 44 Pins PATA Standard Interface connector
- Compliant with ATA/ATAPI-8 Standard command protocol
- Supports SMART feature command set
- Supports 28/48 bit LBA addressing

IDE Flash Module

- ATA/ATAPI-7 command compliance
- Support PIO mode 4, Multi-word DMA mode 2, and Ultra DMA mode 5
- Supports SMART feature command set



Model	IDE SSD-I20(SLC)	IDE SSD-I20(MLC)	IDE IFM-I20
Flash Technology	SLC	MLC	SLC
Interface	IDE / PATA	IDE / PATA	IDE 40PIN Vertical
Capacity	4GB ~ 64GB	32GB ~ 128GB	128MB ~ 1GB
Seq. Performance Read (max.)	115 MB/s	110 MB/s	50 MB/s
Seq. Performance Write (max.)	95 MB/s	70 MB/s	40 MB/s
Random 4K Read (IOPS max.)			
Random 4K Write (IOPS max.)			
Power Requirement	DC 5.0V	DC 5.0V	DC 3.0V / 5.0V
Power Consumption (max.)	420 mA	195 mA	200 mA
Power Consumption (idle)	0.7 mA	0.7 mA	2 mA
Dimension (mm)	100.5 x 69.9 x 9.5	100.5 x 69.9 x 9.5	48.0 x 32.5 x 5.0
MTBF (est)	≅2,000,000 hrs	≅2,000,000 hrs	≅2,000,000 hrs
Temperature & Humidity (IEC-60068)			
Operating 0°C ~ 70°C: Standard	SP***GBSSDMMSI25*T	SP***GBSSDMMNI25*T	SP****BIFMAFOV11*T
Operating -40°C ~ 85°C: Wide	SP***GBSSDMWSI25*T	◇	SP****BIFMAFOW11*T
Storage Temperature	-55°C ~ 95°C	-55°C ~ 95°C	-55°C ~ 95°C
Operating Humidity	10% ~ 95% (30°C Max. Wet Bulb Temp)		
Mechanical (IEC-60068)			
Vibration	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz
Drop	75cm	75cm	75cm
Shock	1,500G@0.5ms	1,500G@0.5ms	1,500G@0.5ms
Key Features			
Power Shield	◆	◆	
S.M.A.R.T	◆	◆	◆
Write Protection			◆
SP SMART Utility	◆	◆	◆
Warranty	5 years and within TBW	3 years and within TBW	5 years and within TBW

*1. The read and write values may vary depending on different capacities and testing platforms.

*2. ◆=Default ◇=By Request



M.2 2280 SATA SSD

- Compliant with Serial ATA Revision 3.1 standard with 6.0 Gb/s transfer rate
- Support SP Toolbox SMART health monitoring software
- SATA DEVSLP for advanced power saving



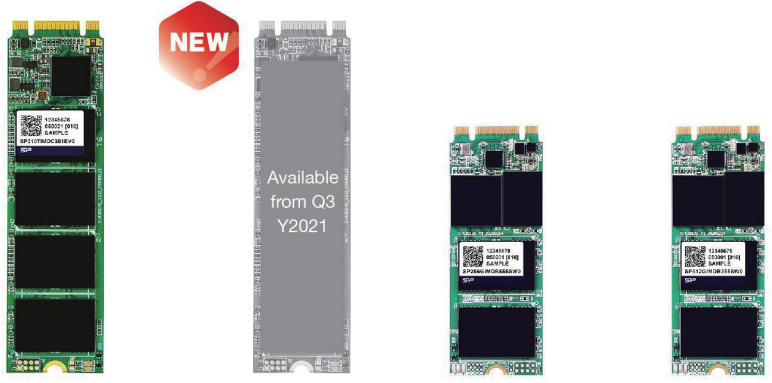
Model	MDC550R	MDC350R	MDC550S	MDC350S
Flash Technology	pSLC (3D TLC)	3D TLC	pSLC (3D TLC)	3D TLC
Interface	SATA III/6.0Gbps	SATA III/6.0Gbps	SATA III/6.0Gbps	SATA III/6.0Gbps
Capacity	32GB ~ 256GB	64GB ~ 1TB	32GB ~ 256GB	64GB ~ 1TB
Seq. Performance Read (max.)	560 MB/s	560 MB/s	560 MB/s	560 MB/s
Seq. Performance Write (max.)	520 MB/s	520 MB/s	520 MB/s	520 MB/s
Random 4K Read (IOPS max.)	94,000	94,000	94,000	94,000
Random 4K Write (IOPS max.)	89,000	89,000	89,000	89,000
Power Requirement	DC 3.3V	DC 3.3V	DC 3.3V	DC 3.3V
Power Consumption (max.)	750 mA	750 mA	750 mA	750 mA
Power Consumption (idle)	110 mA	110 mA	110 mA	110 mA
Dimension (mm)	80.0 x 22.0 x 3.5	80.0 x 22.0 x 3.5	80.0 x 22.0 x 3.5	80.0 x 22.0 x 3.5
MTBF (est)	≒2,000,000 hrs	≒2,000,000 hrs	≒2,000,000 hrs	≒2,000,000 hrs
Temperature & Humidity (IEC-60068)				
Operating 0°C ~ 70°C: Standard	SP***GIMDC55*RV0	SP***GIMDC35*RV0	SP***GISSD35*SV0	SP***GIMDC35*SV0
Operating -15°C ~ 85°C: Extended	SP***GIMDC55*RE0	SP***GIMDC35*RE0	SP***GISSD35*SE0	SP***GIMDC35*SE0
Operating -40°C ~ 85°C: Wide	SP***GIMDC55*RW0	SP***GIMDC35*RW0	SP***GISSD35*SW0	SP***GIMDC35*SW0
Storage Temperature	-55°C ~ 95°C	-55°C ~ 95°C	-55°C ~ 95°C	-55°C ~ 95°C
Operating Humidity	10% ~ 95% (30°C Max. Wet Bulb Temp)			
Mechanical (IEC-60068)				
Vibration	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz
Drop	75cm	75cm	75cm	75cm
Shock	1,500G@0.5ms	1,500G@0.5ms	1,500G@0.5ms	1,500G@0.5ms
Key Features				
Power Shield	◆	◆	◆	◆
PFP	◆	◆	◆	◆
TRIM	◆	◆	◆	◆
S.M.A.R.T	◆	◆	◆	◆
DEVSLP	◆	◆	◆	◆
AES 256	◆	◆	◆	◆
SP SMART Utility	◆	◆	◆	◆
Warranty	5 years and within TBW	3 years and within TBW	5 years and within TBW	3 years and within TBW

*1. The read and write values may vary depending on different capacities and testing platforms.

*2. ◆=Default ◇=By Request

M.2 2280/2260 SATA SSD

- Compliant with Serial ATA Revision 3.1 standard with 6.0 Gb/s transfer rate
- Support SP Toolbox SMART health monitoring software
- SATA DEVSLP for advanced power saving



Model	MDC350E	MDC3K0E	MDB550S	MDB350S
Flash Technology	3D TLC	3D TLC	pSLC (3D TLC)	3D TLC
Interface	SATA III/6.0Gbps	SATA III/6.0Gbps	SATA III/6.0Gbps	SATA III/6.0Gbps
Capacity	64GB ~ 1TB	128GB ~ 1TB	32GB ~ 256GB	64GB ~ 1TB
Seq. Performance Read (max.)	560 MB/s	540 MB/s	560 MB/s	560 MB/s
Seq. Performance Write (max.)	520 MB/s	515 MB/s	520 MB/s	520 MB/s
Random 4K Read (IOPS max.)	51,000	80,000 (estimated)	78,000	78,000
Random 4K Write (IOPS max.)	53,000	75,000 (estimated)	86,000	86,000
Power Requirement	DC 3.3V	DC 3.3V	DC 3.3V	DC 3.3V
Power Consumption (max.)	550 mA	TBD	580 mA	580 mA
Power Consumption (idle)	100 mA	TBD	110 mA	110 mA
Dimension (mm)	80.0 x 22.0 x 3.5	80.0 x 22.0 x 3.5	60.0 x 22.0 x 3.5	60.0 x 22.0 x 3.5
MTBF (est)	≅2,000,000 hrs	≅2,000,000 hrs	≅2,000,000 hrs	≅2,000,000 hrs
Temperature & Humidity (IEC-60068)				
Operating 0°C ~ 70°C: Standard	SP***GIMDC35*EVO	SP***GIMDC3K*EVO	SP***GIMDB55*SV0	SP***GIMDB35*SV0
Operating -15°C ~ 85°C: Extended			SP***GIMDB55*SE0	SP***GIMDB35*SE0
Operating -40°C ~ 85°C: Wide			SP***GIMDB55*SW0	SP***GIMDB35*SW0
Storage Temperature	-55°C ~ 95°C	-55°C ~ 95°C	-55°C ~ 95°C	-55°C ~ 95°C
Operating Humidity	10% ~ 95% (30°C Max. Wet Bulb Temp)			
Mechanical (IEC-60068)				
Vibration	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz
Drop	75cm	75cm	75cm	75cm
Shock	1,500G@0.5ms	1,500G@0.5ms	1,500G@0.5ms	1,500G@0.5ms
Key Features				
Power Shield	◆	◆	◆	◆
PFP				
TRIM	◆	◆	◆	◆
S.M.A.R.T	◆	◆	◆	◆
DEVSLP	◆	◆	◆	◆
AES 256		◆	◆	◆
SP SMART Utility	◆	◆	◆	◆
Warranty	3 years and within TBW	3 years and within TBW	5 years and within TBW	3 years and within TBW

*1. The read and write values may vary depending on different capacities and testing platforms.
 *2. ◆=Default ◇=By Request



M.2 2242 SATA SSD

- ▶ Compliant with Serial ATA Revision 3.1 standard with 6.0 Gb/s transfer rate
- ▶ Support SP Toolbox SMART health monitoring software
- ▶ SATA DEVSLP for advanced power saving



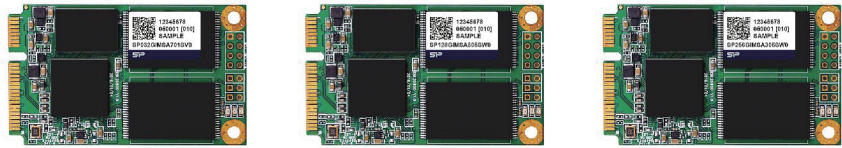
Model	MDA550S	MDA350S	MDA3K0E
Flash Technology	pSLC (3D TLC)	3D TLC	3D TLC
Interface	SATA III/6.0Gbps	SATA III/6.0Gbps	SATA III/6.0Gbps
Capacity	32GB ~ 128GB	64GB ~ 512GB	64GB ~ 512GB
Seq. Performance Read (max.)	520 MB/s	520 MB/s	540 MB/s
Seq. Performance Write (max.)	400 MB/s	400 MB/s	515 MB/s
Random 4K Read (IOPS max.)	29,000	29,000	75,000 (estimated)
Random 4K Write (IOPS max.)	26,000	26,000	68,000 (estimated)
Power Requirement	DC 3.3V	DC 3.3V	DC 3.3V
Power Consumption (max.)	520 mA	520 mA	TBD
Power Consumption (idle)	160 mA	160 mA	TBD
Dimension (mm)	42.0 x 22.0 x 3.5	42.0 x 22.0 x 3.5	42.0 x 22.0 x 4.7
MTBF (est)	≅2,000,000 hrs	≅2,000,000 hrs	≅2,000,000 hrs
Temperature & Humidity (IEC-60068)			
Operating 0°C ~ 70°C: Standard	SP***GIMDA55*SV0	SP***GIMDA35*SV0	SP***GIMDA3K*EV0
Operating -15°C ~ 85°C: Extended	SP***GIMDA55*SE0	SP***GIMDA35*SE0	
Operating -40°C ~ 85°C: Wide	SP***GIMDA55*SW0	SP***GIMDA35*SW0	
Storage Temperature	-55°C ~ 95°C	-55°C ~ 95°C	-55°C ~ 95°C
Operating Humidity	10% ~ 95% (30°C Max. Wet Bulb Temp)		
Mechanical (IEC-60068)			
Vibration	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz
Drop	75cm	75cm	75cm
Shock	1,500G@0.5ms	1,500G@0.5ms	1,500G@0.5ms
Key Features			
Power Shield	◆	◆	◆
TRIM	◆	◆	◆
S.M.A.R.T	◆	◆	◆
DEVSLP	◆	◆	◆
AES 256	◆	◆	◆
SP SMART Utility	◆	◆	◆
Warranty	5 years and within TBW	3 years and within TBW	3 years and within TBW

*1. The read and write values may vary depending on different capacities and testing platforms.

*2. ◆=Default ◇=By Request

mSATA SSD

- MO-300 standard form factor
- Compliant with Serial ATA Revision 3.1 Standard with 6.0 Gb/s transfer rate
- Support SP Toolbox SMART health monitoring software
- SATA DEVSLP for advance power saving



Model	MSA700S	MSA500S	MSA300S
Flash Technology	SLC	pSLC (MLC)	MLC
Interface	SATA III/6.0Gbps	SATA III/6.0Gbps	SATA III/6.0Gbps
Capacity	8GB ~ 64GB	16GB ~ 256GB	16GB ~ 512GB
Seq. Performance Read (max.)	560 MB/s	560 MB/s	560 MB/s
Seq. Performance Write (max.)	450 MB/s	380 MB/s	380 MB/s
Random 4K Read (IOPS max.)	36,000	79,000	79,000
Random 4K Write (IOPS max.)	37,000	74,000	74,000
Power Requirement	DC 3.3V	DC 3.3V	DC 3.3V
Power Consumption (max.)	400 mA	780 mA	780 mA
Power Consumption (idle)	95 mA	95 mA	95 mA
Dimension (mm)	51.0 x 30.0 x 3.5	51.0 x 30.0 x 3.5	51.0 x 30.0 x 3.5
MTBF (est)	≅2,000,000 hrs	≅2,000,000 hrs	≅2,000,000 hrs
Temperature & Humidity (IEC-60068)			
Operating 0°C ~ 70°C: Standard	SP***GIMSA701SV0	SP***GIMSA50*SV0	SP***GIMSA30*SV0
Operating -15°C ~ 85°C: Extended	SP***GIMSA701SE0	SP***GIMSA50*SE0	SP***GIMSA30*SE0
Operating -40°C ~ 85°C: Wide	SP***GIMSA701SW0	SP***GIMSA50*SW0	SP***GIMSA30*SW0
Storage Temperature	-55°C ~ 95°C	-55°C ~ 95°C	-55°C ~ 95°C
Operating Humidity	10% ~ 95% (30°C Max. Wet Bulb Temp)		
Mechanical (IEC-60068)			
Vibration	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz
Drop	75cm	75cm	75cm
Shock	1,500G@0.5ms	1,500G@0.5ms	1,500G@0.5ms
Key Features			
Power Shield	◆	◆	◆
TRIM	◆	◆	◆
S.M.A.R.T	◆	◆	◆
DEVSLP	◆	◆	◆
AES 256	◇	◇	◇
SP SMART Utility	◆	◆	◆
Warranty	5 years and within TBW	5 years and within TBW	3 years and within TBW

*1. The read and write values may vary depending on different capacities and testing platforms.

*2. ◆=Default ◇=By Request



mSATA SSD

- MO-300 standard form factor
- Compliant with Serial ATA Revision 3.1 Standard with 6.0 Gb/s transfer rate
- Support SP Toolbox SMART health monitoring software
- SATA DEVSLP for advance power saving



Model	MSA550S	MSA350S	MSA3K0E
Flash Technology	pSLC (3D TLC)	3D TLC	3D TLC
Interface	SATA III/6.0Gbps	SATA III/6.0Gbps	SATA III/6.0Gbps
Capacity	32GB ~ 256GB	32GB ~ 1TB	64GB ~ 1TB
Seq. Performance Read (max.)	560 MB/s	560 MB/s	540 MB/s
Seq. Performance Write (max.)	520 MB/s	520 MB/s	515 MB/s
Random 4K Read (IOPS max.)	96,000	78,000	29,000
Random 4K Write (IOPS max.)	87,000	60,000	87,000
Power Requirement	DC 3.3V	DC 3.3V	DC 3.3V
Power Consumption (max.)	650 mA	650 mA	TBD
Power Consumption (idle)	170 mA	170 mA	TBD
Dimension (mm)	51.0 x 30.0 x 3.5	51.0 x 30.0 x 3.5	51.0 x 30.0 x 3.5
MTBF (est)	≒2,000,000 hrs	≒2,000,000 hrs	≒2,000,000 hrs
Temperature & Humidity (IEC-60068)			
Operating 0°C ~ 70°C: Standard	SP***GIMSA55*SV0	SP***GIMSA35*SV0	SP***GIMSA3K*EV0
Operating -15°C ~ 85°C: Extended	SP***GIMSA55*SE0	SP***GIMSA35*SE0	
Operating -40°C ~ 85°C: Wide	SP***GIMSA55*SW0	SP***GIMSA35*SW0	
Storage Temperature	-55°C ~ 95°C	-55°C ~ 95°C	-55°C ~ 95°C
Operating Humidity	10% ~ 95% (30°C Max. Wet Bulb Temp)		
Mechanical (IEC-60068)			
Vibration	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz
Drop	75cm	75cm	75cm
Shock	1,500G@0.5ms	1,500G@0.5ms	1,500G@0.5ms
Key Features			
Power Shield	◆	◆	◆
TRIM	◆	◆	◆
S.M.A.R.T	◆	◆	◆
DEVSLP	◆	◆	◆
AES 256	◆	◆	◆
SP SMART Utility	◆	◆	◆
Warranty	5 years and within TBW	3 years and within TBW	3 years and within TBW

*1. The read and write values may vary depending on different capacities and testing platforms.

*2. ◆=Default ◇=By Request



Cinema Card

- Designed for film, television, commercial, and independent production
- Especially made for 4K UHD digital film cameras without compromising detail
- Multiple techniques supported for guaranteed reliability



Model	Cinema EX	Cinema X	Cinema Pro
Flash Technology	3D TLC	pSLC (MLC)	MLC
Interface	CFexpress/TypeB/PCIe Gen3x2	CFast 2.0/SATA III/6.0Gbps	CFast 2.0/SATA III/6.0Gbps
Capacity	128GB, 256GB, 512GB	128GB, 256GB	128GB, 256GB, 512GB
Seq. Performance Read (max.)	1550 MB/s (estimated)	540 MB/s	530 MB/s
Seq. Performance Write (max.)	950 MB/s (estimated)	450 MB/s	330 MB/s
Random 4K Read (IOPS max.)	230,000 (estimated)	35,000	32,000
Random 4K Write (IOPS max.)	180,000 (estimated)	35,000	32,000
Power Requirement	DC 3.3V	DC 3.3V	DC 3.3V
Power Consumption (max.)	TBD	710 mA	710 mA
Power Consumption (idle)	30 mA	120 mA	120 mA
Dimension (mm)	38.5 x 29.6 x 3.8	36.4 x 42.8 x 3.6	36.4 x 42.8 x 3.6
MTBF (est)	≅ 2,000,000 hrs	≅ 2,000,000 hrs	≅ 2,000,000 hrs
Temperature & Humidity (IEC-60068)			
Operating 0°C ~ 70°C: Standard	SP****ICEB3F1NV0	SP***GICFX511NV0BM	SP***GICFX311NV0BM
Storage Temperature	-55°C ~ 95°C	-55°C ~ 95°C	-55°C ~ 95°C
Operating Humidity	10% ~ 95% (30°C Max. Wet Bulb Temp)		
Mechanical (IEC-60068)			
Vibration	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz
Drop	75cm	75cm	75cm
Shock	1,500G@0.5ms	1,500G@0.5ms	1,500G@0.5ms
Key Features			
Power Shield	◆	◆	◆
TRIM	◆	◆	◆
S.M.A.R.T	◆	◆	◆
DEVSLP		◆	◆
SP SMART Utility	◆	◆	◆
Warranty	3 years and within TBW		

*1. The read and write values may vary depending on different capacities and testing platforms.

*2. ◆=Default ◇=By Request

CFast Card

- CFast Type I standard form factor
- Compliant with Serial ATA Revision 3.1 Standard with 6.0 Gb/s transfer rate
- Supports SP Toolbox SMART Health Monitoring System software



Model	CFX710	CFX550	CFX510
Flash Technology	SLC	pSLC (3D TLC)	pSLC (MLC)
Interface	CFast 2.0/SATA III/6.0Gbps	CFast 2.0/SATA III/6.0Gbps	CFast 2.0/SATA III/6.0Gbps
Capacity	4GB ~ 64GB	32GB ~ 128GB	8GB ~ 256GB
Seq. Performance Read (max.)	440 MB/s	540 MB/s	540 MB/s
Seq. Performance Write (max.)	360 MB/s	450 MB/s	450 MB/s
Random 4K Read (IOPS max.)	35,000	74,000	35,000
Random 4K Write (IOPS max.)	29,000	53,000	35,000
Power Requirement	DC 3.3V	DC 3.3V	DC 3.3V
Power Consumption (max.)	400 mA	560 mA	710 mA
Power Consumption (idle)	110 mA	110 mA	120 mA
Dimension (mm)	36.4 x 42.8 x 3.6	36.4 x 42.8 x 3.6	36.4 x 42.8 x 3.6
MTBF (est)	≅2,000,000 hrs	≅2,000,000 hrs	≅2,000,000 hrs
Temperature & Humidity (IEC-60068)			
Operating 0°C ~ 70°C: Standard	SP***GICFX711NV0	SP***GICFX55*SV0	SP***GICFX51*NV0
Operating -15°C ~ 85°C: Extended		SP***GICFX55*SE0	
Operating -40°C ~ 85°C: Wide	SP***GICFX711NW0	SP***GICFX55*SW0	SP***GICFX51*NW0
Storage Temperature	-55°C ~ 95°C	-55°C ~ 95°C	-55°C ~ 95°C
Operating Humidity	10% ~ 95% (30°C Max. Wet Bulb Temp)		
Mechanical (IEC-60068)			
Vibration	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz
Drop	75cm	75cm	75cm
Shock	1,500G@0.5ms	1,500G@0.5ms	1,500G@0.5ms
Key Features			
Write Protect Switch	◇	◇	◇
Power Shield	◆	◆	◆
PFP	◇		◇
TRIM	◆	◆	◆
S.M.A.R.T	◆	◆	◆
DEVSLP	◆	◆	◆
SP SMART Utility	◆	◆	◆
Warranty	5 years and within TBW		

*1. The read and write values may vary depending on different capacities and testing platforms.

*2. ◆=Default ◇=By Request



CFast Card

- CFast Type I standard form factor
- Compliant with Serial ATA Revision 3.1 Standard with 6.0 Gb/s transfer rate
- Supports SP Toolbox SMART Health Monitoring System software



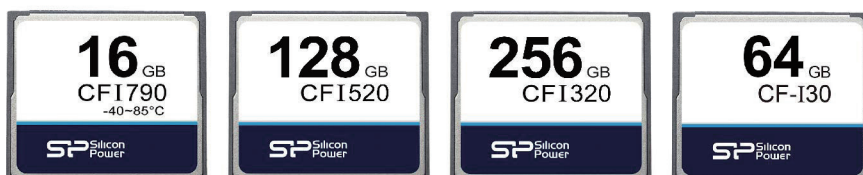
Model	CFX350	CFX310N	CFX310R
Flash Technology	3D TLC	MLC	MLC
Interface	CFast 2.0/SATA III/6.0Gbps	CFast 2.0/SATA III/6.0Gbps	CFast 2.0/SATA III/6.0Gbps
Capacity	64GB ~ 512GB	8GB ~ 512GB	16GB ~ 256GB
Seq. Performance Read (max.)	530 MB/s	530 MB/s	480 MB/s
Seq. Performance Write (max.)	390 MB/s	330 MB/s	320 MB/s
Random 4K Read (IOPS max.)	74,000	32,000	32,000
Random 4K Write (IOPS max.)	53,000	32,000	32,000
Power Requirement	DC 3.3V	DC 3.3V	DC 3.3V
Power Consumption (max.)	560 mA	710 mA	700 mA
Power Consumption (idle)	110 mA	120 mA	110 mA
Dimension (mm)	36.4 x 42.8 x 3.6	36.4 x 42.8 x 3.6	36.4 x 42.8 x 3.6
MTBF (est)	≅2,000,000 hrs	≅2,000,000 hrs	≅2,000,000 hrs
Temperature & Humidity (IEC-60068)			
Operating 0°C ~ 70°C: Standard	SP***GICFX35*SV0	SP***GICFX31*NV*	SP***GICFX31*RV*
Operating -15°C ~ 85°C: Extended	SP***GICFX35*SE0	SP***GICFX31*NE*	
Operating -40°C ~ 85°C: Wide	SP***GICFX35*SW0	SP***GICFX31*NW*	SP***GICFX31*RW*
Storage Temperature	-55°C ~ 95°C	-55°C ~ 95°C	-55°C ~ 95°C
Operating Humidity	10% ~ 95% (30°C Max. Wet Bulb Temp)		
Mechanical (IEC-60068)			
Vibration	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz
Drop	75cm	75cm	75cm
Shock	1,500G@0.5ms	1,500G@0.5ms	1,500G@0.5ms
Key Features			
Write Protect Switch	◇	◇	◇
Power Shield	◆	◆	◆
PFP			◇
TRIM	◆	◆	◆
S.M.A.R.T	◆	◆	◆
DEVSLP	◆	◆	◆
SP SMART Utility	◆	◆	◆
Warranty	3 years and within TBW		

*1. The read and write values may vary depending on different capacities and testing platforms.

*2. ◆=Default ◇=By Request

Compact Flash Card

- Follows Type I CompactFlash storage card dimensions
- CompactFlash specification 6.0 version compliant (PC Card ATA protocol or True IDE mode)
- Supports PIO Mode 6, Multi-word DMA Mode 4, and Ultra Mode 7
- Supports SP Toolbox SMART Health Monitoring System software



Model	CFI790	CFI520	CFI320	CF-I30
Flash Technology	SLC	pSLC (MLC)	MLC	SLC
Interface	CF 6.0	CF 6.0	CF 6.0	CF 6.0
Capacity	128MB ~ 16GB	4GB ~ 128GB	8GB ~ 256GB	1GB ~ 64GB
Seq. Performance Read (max.)	60 MB/s	115 MB/s	115 MB/s	120 MB/s
Seq. Performance Write (max.)	30 MB/s	90 MB/s	90 MB/s	90 MB/s
Power Requirement	DC 3.3V or DC 5.0V	DC 3.3V or DC 5.0V	DC 3.3V or DC 5.0V	DC 3.3V or DC 5.0V
Power Consumption (max.)	160 mA	360 mA	360 mA	340 mA
Power Consumption (idle)	4.5 mA	300 mA	300 mA	0.3 mA
Dimension (mm)	42.8 x 36.4 x 3.3	42.8 x 36.4 x 3.3	42.8 x 36.4 x 3.3	42.8 x 36.4 x 3.3
MTBF (est)	≅2,000,000 hrs	≅2,000,000 hrs	≅2,000,000 hrs	≅2,000,000 hrs
Temperature & Humidity (IEC-60068)				
Operating 0°C ~ 70°C: Standard		SP***GICFI52*NV0	SP***GICFI32*NV0	SP****BCFI000V71*T
Operating -15°C ~ 85°C: Extended		SP***GICFI52*NE0	SP***GICFI32*NE0	
Operating -40°C ~ 85°C: Wide	SP****ICFI791NW0			SP****BCFI000W71*T
Storage Temperature	-55°C ~ 95°C	-55°C ~ 95°C	-55°C ~ 95°C	-55°C ~ 95°C
Operating Humidity	10% ~ 95% (30°C Max. Wet Bulb Temp)			
Mechanical (IEC-60068)				
Vibration	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz
Drop	75cm	75cm	75cm	75cm
Shock	1,500G@0.5ms	1,500G@0.5ms	1,500G@0.5ms	1,500G@0.5ms
Key Features				
Write Protect Switch	◆	◆	◆	◆
Power Shield	◆	◆	◆	◆
S.M.A.R.T	◆	◆	◆	◆
SP SMART Utility	◆	◆	◆	◆
Warranty	5 years and within TBW	5 years and within TBW	3 years and within TBW	5 years and within TBW

*1. The read and write values may vary depending on different capacities and testing platforms.

*2. ◆=Default ◇=By Request



SLC SD/microSD

- ▶ Compliant with SD Memory Card Specification 3.0 and backwards-compatible with 2.0, 1.1, and 1.01
- ▶ Suitable for Embedded system OS boot up and event log applications
- ▶ Supports SP Toolbox SMART Health Monitoring System software
- ▶ Supports SD and SPI modes



Model	SDI790	SDI730	SDT730	SD-I20
Flash Technology	SLC	SLC	SLC	SLC
Interface	SD 3.0 / UHS-I	SD 3.0 / UHS-I	SD 3.0 / UHS-I	SD 2.0
Capacity	1GB ~ 8GB	1GB ~ 32GB	1GB ~ 8GB	128MB ~ 1GB
Seq. Performance Read (max.)	35 MB/s	40 MB/s	32 MB/s	20 MB/s
Seq. Performance Write (max.)	30 MB/s	30 MB/s	28 MB/s	18 MB/s
Power Requirement	DC 3.3V	DC 3.3V	DC 3.3V	DC 3.3V
Power Consumption (max.)	140 mA	65 mA	70 mA	50 mA
Power Consumption (idle)	3.5 mA	140 uA	140 uA	150 uA
Dimension (mm)	32.0 x 24.0 x 2.1	32.0 x 24.0 x 2.1	15.0 x 11.0 x 1.0	32.0 x 24.0 x 2.1
MTBF (est)	≅2,000,000 hrs	≅2,000,000 hrs	≅2,000,000 hrs	≅2,000,000 hrs
Temperature & Humidity (IEC-60068)				
Operating -25°C ~ 85°C: Standard				
Operating -40°C ~ 85°C: Wide	SP***GISDI791NW0	SP***GISDI731NW0	SP***GISDT731NW0	SP****BSDI000W20**
Storage Temperature	-40°C ~ 85°C	-40°C ~ 85°C	-40°C ~ 85°C	-40°C ~ 85°C
Operating Humidity	10% ~ 95% (30°C Max. Wet Bulb Temp)			
Mechanical (IEC-60068)				
Vibration	30G, 10 ~ 2000Hz	30G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz	30G, 10 ~ 2000Hz
Drop	150cm	150cm	150cm	150cm
Shock	1,500G@0.5ms	1,500G@0.5ms	1,500G@0.5ms	1,500G@0.5ms
Key Features				
Write Protect Switch	◆	◆		◆
Torque	0.15Nm	0.15Nm	0.15Nm	0.15Nm
Bending	10N	10N	10N	10N
Duration (cycles)	10,000	10,000	10,000	10,000
S.M.A.R.T	◆	◆	◆	
SP SMART Utility	◆	◆	◆	
Warranty	5 years and within TBW			

*1. The read and write values may vary depending on different capacities and testing platforms.

*2. ◆=Default ◇=By Request

SD Card

- Compliant with SD Memory Card Specification 3.0 and backwards-compatible with 2.0, 1.1, and 1.01
- High endurance suitable for 24/7 continuous video recording
- Steady performance design to ensure all frames are recorded
- Supports SP Toolbox SMART Health Monitoring System software (optional)



Model	SDI5R0	SDI530	SDI3R0	SDI330	SDI320
Flash Technology	pSLC (3D TLC)	pSLC (MLC)	3D TLC	MLC	MLC / 3D TLC
Interface	SD 3.0 / UHS-I	SD 3.0 / UHS-I	SD 3.0 / UHS-I	SD 3.0 / UHS-I	SD 3.0 / UHS-I
Capacity	8GB ~ 64GB	4GB ~ 128GB	32GB ~ 256GB	8GB ~ 256GB	8GB ~ 256GB
Seq. Performance Read (max.)	93 MB/s	81 MB/s	93 MB/s	81 MB/s	95 MB/s
Seq. Performance Write (max.)	80 MB/s	46 MB/s	80 MB/s	46 MB/s	50 MB/s
Power Requirement	DC 3.3V	DC 3.3V	DC 3.3V	DC 3.3V	DC 3.3V
Power Consumption (max.)	100 mA	300 mA	100 mA	300 mA	145 mA
Power Consumption (idle)	300 uA	300 uA	300 uA	300 uA	140 uA
Dimension (mm)	32.0 x 24.0 x 2.1	32.0 x 24.0 x 2.1	32.0 x 24.0 x 2.1	32.0 x 24.0 x 2.1	32.0 x 24.0 x 2.1
MTBF (est)	≅2,000,000 hrs	≅2,000,000 hrs	≅2,000,000 hrs	≅2,000,000 hrs	≅2,000,000 hrs
Temperature & Humidity (IEC-60068)					
Operating -25°C ~ 85°C: Standard	SP***GISDI5R5NE0		SP***GISDI3R5NE0		SP***GISDI325NE0
Operating -40°C ~ 85°C: Wide		SP***GISDI535NW0		SP***GISDI335NW0	
Storage Temperature	-40°C ~ 85°C	-40°C ~ 85°C	-40°C ~ 85°C	-40°C ~ 85°C	-40°C ~ 85°C
Operating Humidity	10% ~ 95% (30°C Max. Wet Bulb Temp)				
Mechanical (IEC-60068)					
Vibration	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz
Drop	150cm	150cm	150cm	150cm	150cm
Shock	1,500G@0.5ms	1,500G@0.5ms	1,500G@0.5ms	1,500G@0.5ms	1,500G@0.5ms
Key Features					
Write Protect Switch	◆	◆	◆	◆	◆
Torque	0.15Nm	0.15Nm	0.15Nm	0.15Nm	0.15Nm
Bending	10N	10N	10N	10N	10N
Duration (cycles)	10,000	10,000	10,000	10,000	10,000
S.M.A.R.T	◆	◆	◆	◆	◆
SP SMART Utility	◆	◆	◆	◆	◇
Warranty	5 years and within TBW			3 years and within TBW	

*1. The read and write values may vary depending on different capacities and testing platforms.

*2. ◆=Default ◇=By Request



microSD

- ▶ Compliant with SD Memory Card Specification 3.0 and backwards-compatible with 2.0, 1.1, and 1.01
- ▶ High endurance suitable for 24/7 continuous video recording
- ▶ Steady performance design to ensure all frames are recorded
- ▶ Supports SP Toolbox SMART Health Monitoring System software (optional)

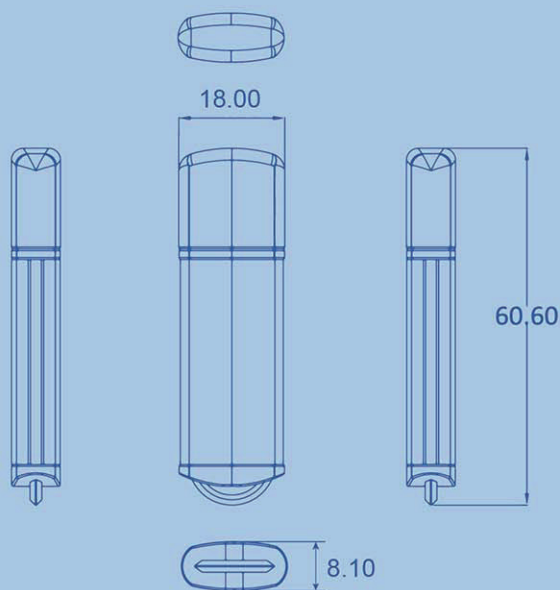
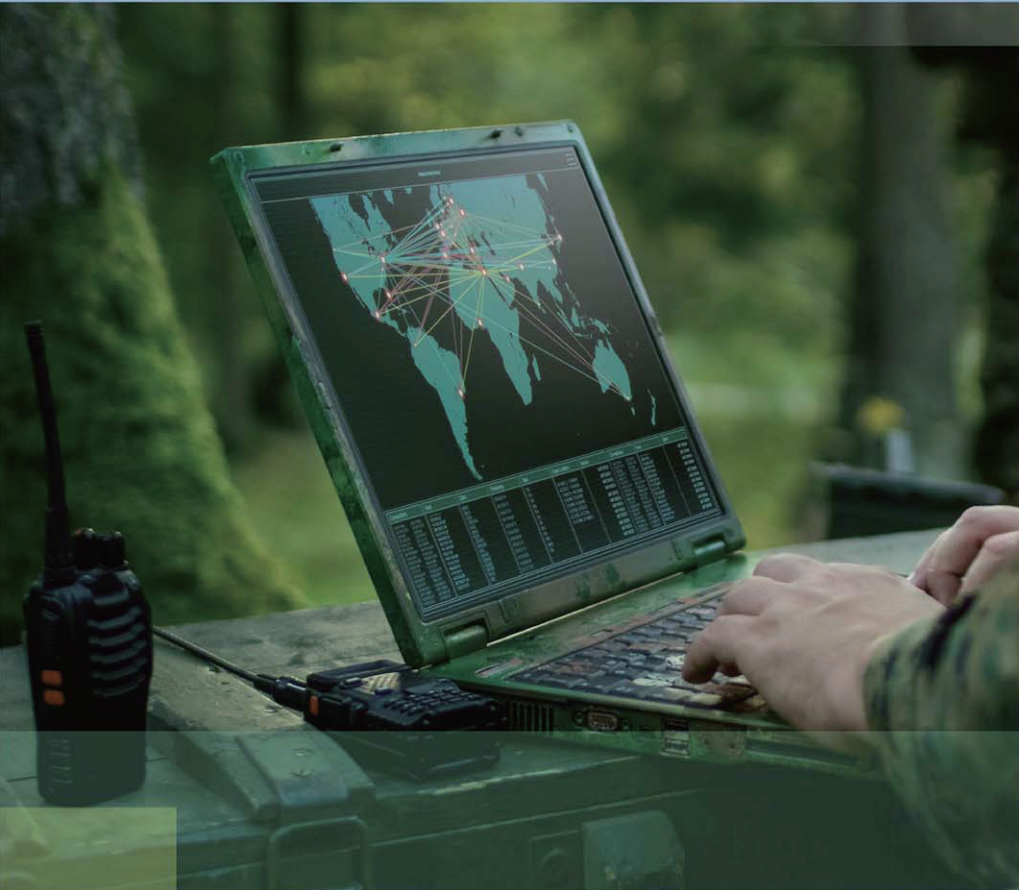


Model	SDT5R0	SDT530	SDT3R0	SDT330	SDT320
Flash Technology	pSLC (3D TLC)	pSLC (MLC)	3D TLC	MLC	MLC / 3D TLC
Interface	SD 3.0 / UHS-I	SD 3.0 / UHS-I	SD 3.0 / UHS-I	SD 3.0 / UHS-I	SD 3.0 / UHS-I
Capacity	8GB ~ 64GB	4GB ~ 64GB	32GB ~ 256GB	8GB ~ 128GB	8GB ~ 128GB
Seq. Performance Read (max.)	93 MB/s	81 MB/s	93 MB/s	81 MB/s	81 MB/s
Seq. Performance Write (max.)	80 MB/s	46 MB/s	80 MB/s	46 MB/s	46 MB/s
Power Requirement	DC 3.3V	DC 3.3V	DC 3.3V	DC 3.3V	DC 3.3V
Power Consumption (max.)	100 mA	191 mA	100 mA	191 mA	58 mA
Power Consumption (idle)	300 uA	292 uA	300 uA	292 uA	90 uA
Dimension (mm)	15.0 x 11.0 x 1.0	15.0 x 11.0 x 1.0	15.0 x 11.0 x 1.0	15.0 x 11.0 x 1.0	15.0 x 11.0 x 1.0
MTBF (est)	≧2,000,000 hrs	≧2,000,000 hrs	≧2,000,000 hrs	≧2,000,000 hrs	≧2,000,000 hrs
Temperature & Humidity (IEC-60068)					
Operating -25°C ~ 85°C: Standard	SP***GISDI5R5NE0		SP***GISDT3R5NE0		SP***GISDT325NE0
Operating -40°C ~ 85°C: Wide		SP***GISDT535NW0		SP***GISDT335NW0	
Storage Temperature	-40°C ~ 85°C	-40°C ~ 85°C	-40°C ~ 85°C	-40°C ~ 85°C	-40°C ~ 85°C
Operating Humidity	10% ~ 95% (30°C Max. Wet Bulb Temp)				
Mechanical (IEC-60068)					
Vibration	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz
Drop	150cm	150cm	150cm	150cm	150cm
Shock	1,500G@0.5ms	1,500G@0.5ms	1,500G@0.5ms	1,500G@0.5ms	1,500G@0.5ms
Key Features					
Torque	0.15Nm	0.15Nm	0.15Nm	0.15Nm	0.15Nm
Bending	10N	10N	10N	10N	10N
Duration (cycles)	10,000	10,000	10,000	10,000	10,000
S.M.A.R.T	◆	◆	◆	◆	◆
SP SMART Utility	◆	◆	◆	◆	◇
Warranty	5 years and within TBW		3 years and within TBW		

*1. The read and write values may vary depending on different capacities and testing platforms.

*2. ◆=Default ◇=By Request

Industrial USB





USB 3.0

- Compliant with USB standard specification 3.0, backward compatible with USB 2.0 and USB 1.1
- Support USB mass Storage Command Protocol
- Operating as Boot Disk, or Code Storage Device for Embedded Operating System



Model	UFD790	UFD350	UFD320	UFD150
Flash Technology	SLC	3D TLC	3D TLC	MLC
Interface	USB 3.0	USB 3.0	USB 3.0	USB 3.0
Capacity	1GB ~ 16GB	32GB ~ 512GB	32GB ~ 256GB	8GB ~ 64GB
Seq. Performance Read (max.)	90 MB/s	200 MB/s	90 MB/s	195 MB/s
Seq. Performance Write (max.)	45 MB/s	140 MB/s	70 MB/s	85 MB/s
Power Requirement	DC 5.0V	DC 5.0V	DC 5.0V	DC 5.0V
Power Consumption (max.)	200 mA	330 mA	240 mA	330 mA
Power Consumption (idle)	75 mA	65 mA	80 mA	65 mA
Dimension (mm)	60.6 x 18.0 x 8.1	60.6 x 18.0 x 8.1	60.6 x 18.0 x 8.1	60.6 x 18.0 x 8.1
MTBF (est)	≅2,000,000 hrs	≅2,000,000 hrs	≅2,000,000 hrs	≅2,000,000 hrs
Temperature & Humidity (IEC-60068)				
Operating 0°C ~ 70°C: Standard	SP***IUFD791NV0	SP***GIUFD351NV0	SP***GIUFD32*NV0	SP***GBUF3DNPV*2*U
Storage Temperature	-55°C ~ 95°C	-55°C ~ 95°C	-55°C ~ 95°C	-55°C ~ 95°C
Operating Humidity	10% ~ 95% (30°C Max. Wet Bulb Temp)			
Mechanical (IEC-60068)				
Vibration	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz
Drop	75cm	75cm	75cm	75cm
Shock	1,500G@0.5ms	1,500G@0.5ms	1,500G@0.5ms	1,500G@0.5ms
Key Features				
Duration (cycles)	10,000	10,000	10,000	10,000
SP SMART Utility	◇			
Warranty	5 years and within TBW		3 years and within TBW	

*1. The read and write values may vary depending on different capacities and testing platforms.

*2. ◆=Default ◇=By Request

USB 2.0

- ▶ Compliant with USB Standard Specification 2.0 and backwards-compatible with USB 1.1
- ▶ Supports USB Mass Storage Command Protocol
- ▶ Operates as Boot Disk or Code Storage Device for Embedded Operating System
- ▶ Supports SP Toolbox SMART Health Monitoring System software (optional)
- ▶ Security partition drive available by request

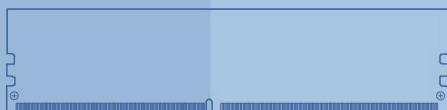
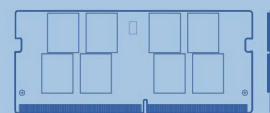
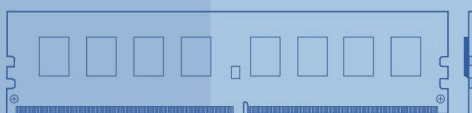


Model	UFD710	UFD510	UFD310
Flash Technology	SLC	pSLC (MLC)	MLC
Interface	USB 2.0	USB 2.0	USB 2.0
Capacity	512MB ~ 16GB	4GB ~ 16GB	8GB ~ 32GB
Seq. Performance Read (max.)	22 MB/s	20 MB/s	20 MB/s
Seq. Performance Write (max.)	19 MB/s	15 MB/s	15 MB/s
Power Requirement	DC 5.0V	DC 5.0V	DC 5.0V
Power Consumption (max.)	110 mA	110 mA	110 mA
Power Consumption (idle)	1.2 mA	1.2 mA	1.2 mA
Dimension (mm)	60.6 x 18.0 x 8.1	60.6 x 18.0 x 8.1	60.6 x 18.0 x 8.1
MTBF (est)	≅2,000,000 hrs	≅2,000,000 hrs	≅2,000,000 hrs
Temperature & Humidity (IEC-60068)			
Operating 0°C ~ 70°C: Standard	SP***GIUFD711NV0	SP***GIUFD51*NV0	SP***GIUFD31*NV0
Storage Temperature	-55°C ~ 95°C	-55°C ~ 95°C	-55°C ~ 95°C
Operating Humidity	10% ~ 95% (30°C Max. Wet Bulb Temp)		
Mechanical (IEC-60068)			
Vibration	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz	15G, 10 ~ 2000Hz
Drop	75cm	75cm	75cm
Shock	1,500G@0.5ms	1,500G@0.5ms	1,500G@0.5ms
Key Features			
Duration (cycles)	10,000	10,000	10,000
SP SMART Utility	◇	◇	◇
Warranty	5 years and within TBW	5 years and within TBW	3 years and within TBW

*1. The read and write values may vary depending on different capacities and testing platforms.

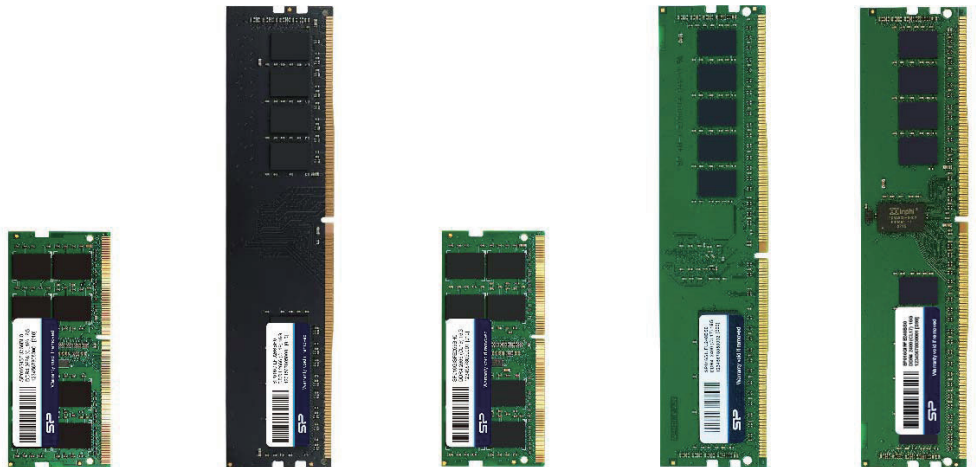
*2. ◆=Default ◇=By Request

Industrial DRAM Module



DDR4 DRAM Modules

- High performance transfer bandwidth reaches up to 19.2GB/s
- Low voltage of 1.2V for less power consumption
- Original and high quality memory module
- 100% tested for stability, durability, and compatibility
- 30 micro inches Gold Finger Plating (optional)
- Supports operating temperatures from -40°C ~ 85°C
- Wide Temperature version available by request
- 3200MHz is only available at 8GB and 16GB



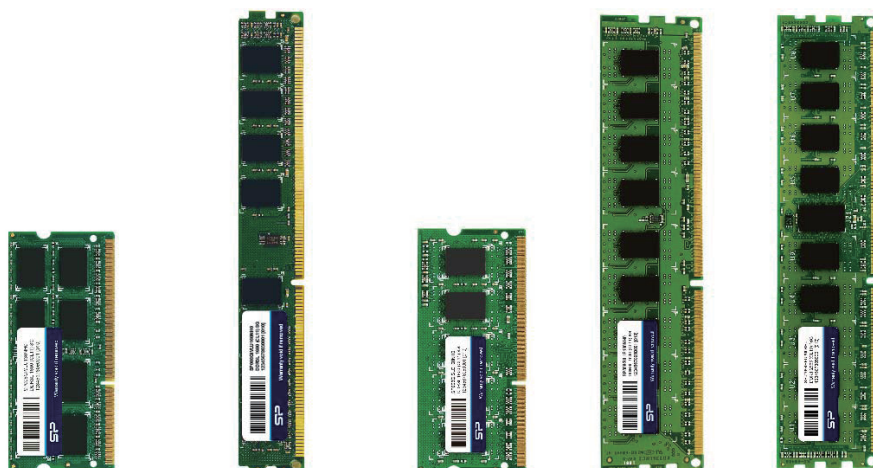
Model	SODIMM	UDIMM	ECC SODIMM	ECC UDIMM	ECC RDIMM
DRAM Type	DDR4	DDR4	DDR4	DDR4	DDR4
Capacity	2GB, 4GB, 8GB, 16GB, 32GB	2GB, 4GB, 8GB, 16GB, 32GB	4GB, 8GB, 16GB, 32GB	4GB, 8GB, 16GB, 32GB	4GB, 8GB, 16GB
Data Rate	2400 / 2666 / 3200*MHz	2400 / 2666 / 3200*MHz	2400 / 2666 / 3200*MHz	2400 / 2666 / 3200*MHz	2400 / 2666MHz
CAS Latency	CL17 / CL19 / CL22	CL17 / CL19 / CL22	CL17 / CL19 / CL22	CL17 / CL19 / CL22	CL17 / CL19
Voltage	1.2V	1.2V	1.2V	1.2V	1.2V
Pin Count	260pin	288pin	260pin	288pin	288pin
Data Width	64Bits	64Bits	72Bits	72Bits	72Bits
PCB Height	1.18" (30.13mm)	1.23" (31.40mm)	1.18" (30.13mm)	1.23" (31.40mm)	1.23" (31.40mm)
Temperature & Humidity (IEC-60068)					
Operating 0°C ~ 85°C: Standard	SP***GISFU*****	SP***GILFU*****	SP***GISFE*****	SP***GILFE*****	SP***GIRFE*****
Operating -40°C ~ 85°C: Wide	SP***GISFV*****	SP***GILFV*****	SP***GISFF*****	SP***GILFF*****	SP***GIRFF*****
Storage Temperature	-55°C ~ 95°C	-55°C ~ 95°C	-55°C ~ 95°C	-55°C ~ 95°C	-55°C ~ 95°C
Operating Humidity	10% ~ 95% (30°C Max. Wet Bulb Temp)				
Key Features					
Warranty	10 years				

*3200MHz is only available at 8GB and 16GB
 *2GB's PNs ends with WNO and only NT is available.



DDR3 DRAM Modules

- ▶ High performance transfer bandwidth reaches up to 12.8GB/s
- ▶ Low voltage of 1.35V for less power consumption
- ▶ Original and high quality memory module
- ▶ 100% tested for stability, durability, and compatibility
- ▶ 30 micro inches Gold Finger Plating (optional)
- ▶ Supports operating temperatures from -40°C ~ 85°C
- ▶ Wide Temperature version available by request



Model	SODIMM	UDIMM / VLP UDIMM	ECC SODIMM	ECC UDIMM	ECC RDIMM
DRAM Type	DDR3L	DDR3L	DDR3L	DDR3L	DDR3L
Capacity	2GB, 4GB, 8GB	2GB, 4GB, 8GB	4GB, 8GB	4GB, 8GB	8GB
Data Rate	1600MHz	1600MHz	1600MHz	1600MHz	1600MHz
CAS Latency	CL11	CL11	CL11	CL11	CL11
Voltage	1.35V	1.35V	1.35V	1.35V	1.35V
Pin Count	204pin	240pin	204pin	240pin	240pin
Data Width	64Bits	64Bits	72Bits	72Bits	72Bits
PCB Height	1.2" (30.50mm)	1.2" (30.50mm) 0.74" (18.90mm) - VLP	1.2" (30.50mm)	1.2" (30.50mm)	1.2" (30.50mm)
Temperature & Humidity(IEC-60068)					
Operating 0°C ~ 85°C: Standard	SP***GISLU****H0	SP***GILLU****H0 SP***GIVLU****H0 (VLP)	SP***GISLE****H0	SP***GILLE****H0	SP***GIRLE****H0
Operating -40°C ~ 85°C: Wide	SP***GISLV****H0	SP***GILLV****H0 SP***GIVLV****H0 (VLP)	SP***GISLF****H0	SP***GILLF****H0	SP***GIRLF****H0
Storage Temperature	-55°C ~ 95°C	-55°C ~ 95°C	-55°C ~ 95°C	-55°C ~ 95°C	-55°C ~ 95°C
Operating Humidity	10% ~ 95% (30°C Max. Wet Bulb Temp)				
Key Features					
Warranty	10 years				



SILICON POWER WORLDWIDE

Global Headquarter

TAIWAN

7F., No.106, Zhouzi St., Neihu District, Taipei City 114, Taiwan

Tel: +886-2-8797-8833

E-mail: service@silicon-power.com

Global Branch Offices

JAPAN

Japan Subsidiary 日本本社

7F Ueno SK Bld., 1-4-10 Shitaya, Taito-ku, Tokyo 110-0004 Japan

110-0004東京都台東区下谷1丁目4番10号 上野SKビル7階

Tel: +81-3-5830-2051(Support)+81-3-5830-2061

E-mail: japan_service@silicon-power.com

Osaka Office 西日本営業所

5F Shin-nakajima Bld., 1-9-20 Nishinakajima, Yodogawa-ku, Osaka, 532-0011 Japan

532-0011大阪府大阪市淀川区西中島1丁目9番20号 新中島ビル5階

Tel: +81-6-6886-3232

E-mail: japan_service@silicon-power.com

THE NETHERLANDS

Antennestraat 16, 1322AB, Almere, The Netherlands

Tel: +31(0)85-5600010

E-mail: service@eu.silicon-power.com

USA

4590 Enterprise Street, Fremont CA 94538

Tel: +1-510-490-1885

E-mail: USTech@silicon-power.com



3M000306

www.silicon-power.com

Information may be changed or updated without notice.

All trademarks, brands and names are the property of their respective owners.
©2021 SILICON POWER Computer & Communications, Inc., All Rights Reserved.

Memory is personal