

Apacer

The
Most **Reliable** SSD
For Industries

Industrial SSD Solutions

industrial.apacer.com



Benefit from our
CoreSnapshot
Details on p08.

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What Sets Apacer Apart?

Why Multinational Leaders Depend On Apacer

For over 25 years, the world's top digital device manufacturers have trusted Apacer to supply them with industrial-grade SSDs and DRAM. We supply some of the world's top manufacturers: everyone from established industry giants in defense and healthcare to fast-growing newcomers in IoT and networking. Why do all these top makers turn to us?

- **They know we have one of the strongest firmware development teams in the world**
- **They know we only use brand-name ICs sourced directly from the original manufacturers**
- **They know we have been dedicated to SSD manufacturing and testing for over 25 years**
- **They love the advanced value-adding features we developed and tested in-house**
- **They trust our fixed BOM policy to ensure components remain uniform over time**

We're ready to add your name to the list of our satisfied and successful customers. Browse on to read more about our latest cutting-edge SSDs.

Industrial-grade 3D NAND Flash

- **A summary of the key advantages**

Emergent Technologies

- **Proof of our commitment to innovation**

Specialty

Tailor-made for defense and cloud applications

- **Cloud Series**
- **Defense Series**



SLC-liteX

Optimizes 3D NAND SSDs
to Reach the Industry's Highest 100K P/E Cycles

Maximizing Digital Storage Endurance and Cost-effectiveness



Benefits of Apacer's Industrial 3D NAND Flash Memory with Optimization Solutions

- Greater reliability
- P/E cycle up to 100,000 when TLC adopted SLC-liteX
- Higher performance
- Lower power consumption
- Made with original ICs sourced directly from our long-term partners.
- Operating temperature range is as wide as -40°C~+85 °C

Emergent Technologies

PCIe BGA SSD

Apacer's PCIe BGA SSDs adopt 3D TLC NAND flash memory and made from the meticulously selected industrial-grade wide-temperature ICs. The advantages of being ultra-lightweight and small, it boasts high-speed performance, ultra-low latency, low power consumption, shock resistance, high stability and reliability. It is ideal for 5G high-speed and miniaturized smart applications.



CoreGlacier™ Technology

In many applications, SSDs are subject to challenging conditions. If the working environment is already hot, and the SSD's operation causes it to increase in temperature as well, the result could be damage to the hardware or corrupted data. Apacer's CoreGlacier™ presents superior solution to this problem. It cools both the NAND flash and the controller IC, keeping temperatures low, while still allowing an SSD to deliver high-speed performance.



EDSFF and NGSFF(M.3) SSD

Apacer continuously develops the newest form factor SSDs to deliver flexible solutions for the new revolutionary industry. The EDSFF SSDs and NGSFF SSDs deliver flexible building blocks for scalable solutions, larger capacity, and increase operational efficiency. The easy-to-plug mechanism and compact specifications design is not only easy extraction in compact, interlaced interface devices but also perfectly fits for the new generations data center and server applications.

Specialty Cloud Series SSD

Apacer Cloud Series SSDs designed to monitor and remote management the typical pain points of an IoT edge device network. In addition, it also supports optional CoreSnapshot technology which can provide a full SSD backup and recovery mechanism in one second when key data is lost or system crashes occur. Cloud Series SSDs are greatly reducing the waiting time for troubleshooting and system downtime.



CoreAnalyzer2
Tool for analyzing enterprise platform usage behavior
By collecting data from an emulation of the client's host system, it analyzes equipment usage behavior and recommends the most suitable SSD for the system.

SSDWidget 2.0
Comprehensive SSD monitoring and maintenance software
Can monitor SSD-related information and health status, and provide SSD lifespan and workload analysis.

CoreSnapshot
Recover an SSD's data and OS in just one second
Full backup and recovery of SSD data can be performed in one second, which can instantly eliminate catastrophic system issues or downtime translating into operational risks and losses.

Cloud Series SSDs

Form Factor	2.5"	M.2 2280	M.2 2242	MO-300
Model Name	SV25C-25	SV25C-M280	SV25C-M242	SV25C-300
NAND Flash Type	3D-TLC	3D-TLC	3D-TLC	3D-TLC
Capacity	30GB to 960GB	30GB to 960GB	30GB to 480GB	30GB to 480GB
EST. Seq. R/W Performance (MB/sec)	560/520	560/520	560/515	560/515
EST. IOPS R/W	73K	73K	73K	71K
AES256 Support	Yes	Yes	Yes	Yes
Smart Read Refresh™	Yes	Yes	Yes	Yes
Double-barreled Solution Cloud Edition	Yes	Yes	Yes	Yes
CoreSnapshot	Optional	Optional	Optional	No
Cloud Vender Support	Advantech DeviceOn, Allxon	Allxon	Allxon	Advantech DeviceOn
MTBF (hours)	>3,000,000	>3,000,000	>3,000,000	>3,000,000
Standard Operating Temperature (°C)	0 ~ +70	0 ~ +70	0 ~ +70	0 ~ +70
Extended Operating Temperature (°C)	-40 ~ +85	-40 ~ +85	-40 ~ +85	-40 ~ +85
Storage Temperature (°C)	-40 ~ +100	-40 ~ +100	-40 ~ +100	-40 ~ +100

* Note: More detail specification, please refer to industrial.apacer.com

Specialty Defense Series SSD



Apacer knows that defense manufacturers have to meet some of the toughest standards for reliability in any industry. That's why we created our Defense SSD series. By default, all products in this series are tested to ensure they comply with humidity, altitude, thermal shock and thermal cycling tests. Our engineers carry out these tests at our factory in Taiwan using the latest equipment.



Shock

MIL-STD-202G, Method 213B
MIL-STD-883K, w/CHANGE 2, Method 2002.5

Thermal Shock

MIL-STD-810G Method 503.5
Procedure I-C

Vibration

MIL-STD-810G
Method 514.6

Altitude

MIL-STD-810G
Method 500.5

Humidity

MIL-STD-810G
Method 507.5

Salt fog

MIL-STD-810G
Method 509.5

High/ Low Temp.

MIL-STD-810G Method 501.5
MIL-STD-810G Method 502.5

Radiation Test

MIL-STD-810G Method 505.5
procedur 2

Defense SSD

Form Factor	2.5"	M.2 2280	MO-300	M.2 2280
Model Name	SH24D-25	SH24D-M280	SH24D-300	PV22D-M280
NAND Flash Type	3D TLC	3D TLC	3D TLC	3D TLC
SLC-liteX	Yes	Yes	Yes	No
Capacity	160GB~640GB	160GB~640GB	160GB~640GB	M.2 2280 Single side, M key: 120 GB M.2 2280 Double side, M key: 240/480/1920 GB
Seq. R/W Performance (MB/sec)	560/490	560/490	560/490	1710/1685
IOPS R/W	96K/84K	96K/84K	96K/84K	266K/221K
AES-256	Yes	Yes	Yes	Yes
TCG Opal 2.0	Optional	Optional	Optional	Optional
Instant Keychange™				
MIL Erase*	Software command Hardware: - Connector pin - Pin headers		Software command Hardware: - Connector pin - Slide switch	
Digital Destruction				
Write Protect				
30u Gold Finger	Optional	Optional	Optional	Optional
Sidefill	Optional	Yes	Yes	Yes
MTBF (hours)	>5,000,000	>5,000,000	>5,000,000	>5,000,000
Standard Operating Temperature (°C)	0 ~ + 70	0 ~ + 70	0 ~ + 70	0 ~ + 70
Extended Operating Temperature (°C)	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85
Storage Temperature (°C)	-55 ~ +100	-55 ~ +100	-55 ~ +100	-55 ~ +100

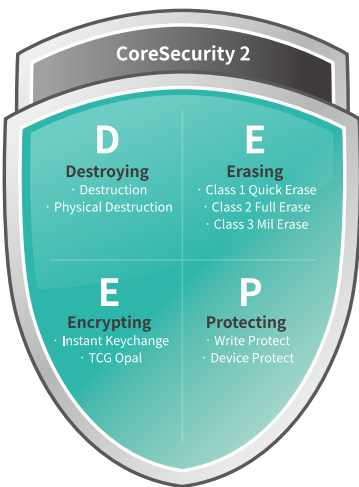
* Note: NSA9-12, DoD 5220.22-M, NSA Manual 130-2, IREC (IRIG) 106, USA-AF AFSSI 5020, USA-Army 380-19, USA Navy NAVSO P-5239-26, NISPOMSUP Chap 8, Sect. 8-501

Featured Technologies



Anti-Sulfuration

Apacer anti-sulfuration technology not only uses special alloy materials but also achieves a complete air barrier through rigorously inspected special materials and technologies to ensure the best protection for electronic products. After two complete accelerated verification tests of MFG (Mixed Fluid Gas and FoS (Flower of Sulfur), it has passed the American National Standards Institute/International Society of Automation 71.04 G3 air corrosion certification.



Truly **DEEP** Security



CoreSecurity2

CoreSecurity2 is a proprietary data protection technology built into Apacer SSD products. It is crucial for mission-critical applications, where data erasure, drive sanitization, and reliability of storage are essential requirements. CoreSecurity2 provides four technologies, including: Destroying, Erasing, Encrypting and Protecting. It is designed with exclusive software commands to meet clients' requirements of a high level of data protection.



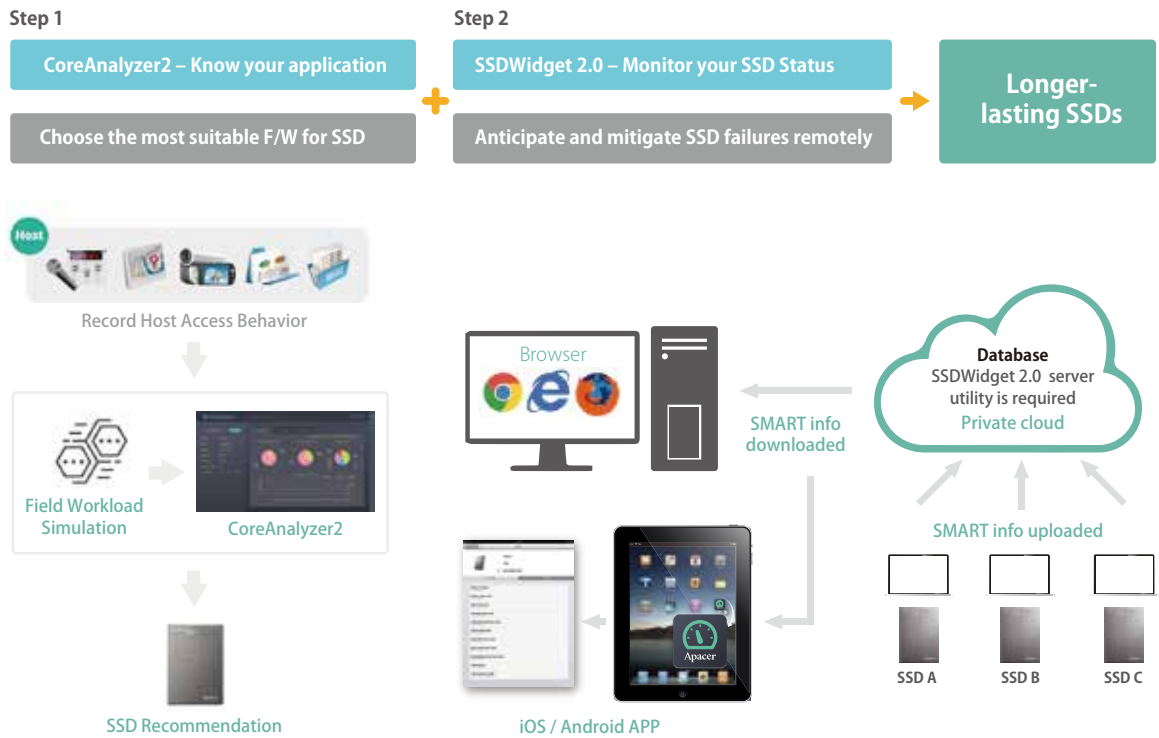
DBS Cloud Edition

Apacer's Double-barreled Solution Cloud Edition is a solution designed to monitor the typical pain points of an IoT edge device network. DBS Cloud Edition automatically collects data related to SSD temperatures, unexpected power outages, remaining lifespan, and operating status, and instantly transmits the data to the back-end management platform. Users can then observe this data as it comes in, thanks to the intuitive dashboard interface.

Advantages:

- Seamless integration with existing RDM platforms
- Alerts can be sent to administrators via eMail, SMS, or apps such as WhatsApp, Line or Wechat
- Anticipating the end of an SSD's lifespan means flawless data integrity
- Unexpected power cycling can be tracked easily
- OS recovery and firmware updating over the air
- Reduces maintenance costs and downtime
- Combats industrial pain points such as reputation damage, security vulnerabilities, and business losses





Existing Integrated Remote Device Management Systems

Apacer has also collaborated with Advantech, Allxon and ASUS Cloud to develop the DBS Cloud Edition. It offers customers greater choice in deploying and remote device management system and adds flexibility while retaining seamless integration to significantly reduce customer deployment time and costs.



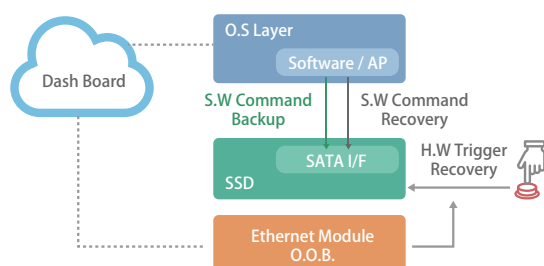
CoreSnapshot

Recover an SSD's data and OS in just one second

Full backup and recovery of SSD data can be performed in one second, which can instantly eliminate catastrophic system issues and prevent data damage or downtime translating into operational risks and losses.

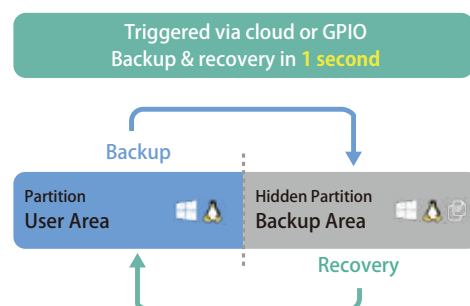
CoreSnapshot Operation Flow

Backup & Recovery via SSD



CoreSnapshot Technology

How Do Backup and Recovery Work?



Data Integrity



CoreSnapshot

Apacer CoreSnapshot, a system disaster's savior, is a firmware based technology that offers an instant whole disk backup and recovery mechanism for SSDs to solve enterprises' unexpected data loss or OS crash immediately.



DataRAID™

Using this algorithm, a certain amount of space is given over to aggregating and resaving the existing parity data used for error checking. So, in the event that data becomes corrupted, the parity data can be compared to the existing uncorrupted data and the content of the corrupted data can be rebuilt.



End-to-end Data Protection

This technology ensures that whenever data moves from the host to the controller or from the controller to DRAM or NAND flash, error checking is applied. In some cases, error correction will also be part of the circuit.



Smart Read Refresh™

Apacer's Smart Read Refresh™ helps avoid read disturb errors from occurring. It ensures that during read operations, when the read operation threshold is reached, the data is refreshed by re-writing it to a different block for future use.

Longevity



Page Mapping

This is an advanced flash management technology and can increase random access speeds, extend SSD lifespans, reduce block erase frequency, and achieve optimal performance.



Over-provisioning

Apacer's SSDs support over-provisioning, which sets aside a certain portion of the physical capacity of the memory to carry out garbage collection, wear-leveling and bad block management. The result is a longer operating lifetime.



SLC-liteX

Apacer's 3D NAND SLC-liteX technology breaks through the limitations of existing technology and provides up to 100,000 P/E cycles, which is over 33 times more than MLC or industrial 3D TLC.



S.M.A.R.T.

S.M.A.R.T. is a self-monitoring system that provides indicators of drive health as well as potential disk problems. It serves as a warning for users from unscheduled downtime by monitoring and displaying critical drive information.

Power Stability



CorePower

This is a hardware-based technology designed to prevent data loss and ensure the stability of data transmission during a power outage using a backup power supply to allow sufficient time to move all cached data to NAND flash.



DEVSLP

Device Sleep is a feature that allows SATA devices to enter a low power mode by designating pin P3 as DEVSLP signal with an aim to reducing power consumption.



DataDefender™

Apacer's DataDefender™ combines both firmware and hardware mechanisms to ensure data integrity. Together, they allow more time for volatile data to be stored in the event of power loss.



Multi-PowerPath

Apacer's Multi-PowerPath technology not only meets the input requirements for power sources of multiple platforms, but also implements an exclusive, innovative power circuit mechanism which protects miniature SSD from being damaged by overheating even when power is concurrently supplied via the three methods.



Power Cable-less

Power Cable-less

Power cable-less is a simplified, innovative design that provides a patented 7-pin SATA connector equipped with a built-in power circuit design to replace an external power cable, thus eliminating the concern over sudden disconnection of power cords.

Security



AES

AES 256-bit Encryption

The security standard trusted by the US government and many international security agencies. It's an efficient and highly secure way of encrypting data to keep it safe from hackers and other bad actors.



ATA Secure Erase

When this command is given, an SSD will reset all its storage cells to empty, releasing trapped electrons and restoring the drive to its original state. This operation completely wipes data from the drive.



Bidirectional Security Identification

A security verification mechanism is implanted between the device and the platform to prevent the data in the device from being stolen if it is subjected to a hacker's invasion.



CoreDestroyer

This functionality is a hardware/software function that renders the entire SSD unusable. This option is chosen in cases where the SSD is about to fall into the hands of a bad actor.



CoreEraser

CoreEraser's functionality is divided into three levels: Quick Erase, Full Erase and MIL Erase. The first option is most useful when speed is the most important factor. Full Erase is more thorough, although also more time consuming, and MIL Erase offers overwriting features that ensure data is deeply and thoroughly scrubbed from the drive.



Instant Keychange™

This function is based on AES encryption, and it can be triggered either via hardware or software. The encrypted data can never be accessed once the original key is destroyed. And destroying the original key and creating a new one takes less than a second – much faster than traditional forms of drive erasure.



NVMe Secure Erase

When this command is given, NVMe Secure Erase can securely wipe out the user data in the drive and protects it from malicious attack.



Signed Firmware

Apacer's Signed Firmware technology is a secure way to update firmware. By including a digital signature, a firmware update will be authenticated by the Apacer SSD before a firmware update is performed. This extra layer of protection keeps drives secure.



TCG Opal 2.0

Apacer offers TCG Opal 2.0-compliant self-encrypting drives (SEDs) which incorporate AES encryption for rock-solid data protection. Buyers love TCG Opal 2.0's Instant Keychange™ technology, which uses cryptographic erasure to scramble a drive in less than a second. This technology is also available independently upon request.



Write Protect

Write protect can prevent drives from unauthorized data writing via a hardware switch/pin or vendor software command.

Survivability



CoreGlacier™

If the working environment is already hot, and an SSD's operation causes it to increase in temperature as well, the result could be damage to the hardware or corrupted data. CoreGlacier™ helps keep an SSD cool and functioning correctly.



ESD Protection

Excellent electrostatic protection which has passed the IEC 61000-4-2: air discharge $\pm 15\text{KV}$ and contact discharge $\pm 8\text{KV}$. Provides protection for electromagnetic susceptibility (EMS) that meets the medical equipment standard EN60601-1-2.



Sidefill

Apacer's Sidefill technology strengthens the connections between solder joints and their board, making them more robust and vibration-resistant. It also allows for heat dissipation to offset thermal damage.



Thermal Sensor

Thermal sensor monitors the temperature of SSD devices via S.M.A.R.T. commands. When a device's operating temperature becomes too high, a thermal sensor will notice and a signal will be sent to reduce operating speed until the temperature declines to a safe level.



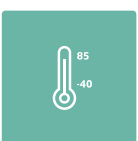
Thermal Cycling

This protection technology prevents damage to components when wild temperature swings take place. Apacer's in-house testing facility can check to ensure thermal cycling resistance and modify a standard product if needed.



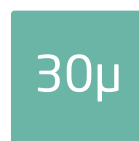
Thermal Throttling

Thermal throttling mechanism dynamically adjusts frequency scaling to enhance data reliability and provides sustained performance while overheating.



Wide Temperature

Products rated for wide temperature operation are designed with wide temperature support to ensure reliable operation in extreme temperatures ranging from -40°C to 85°C .



30 μ Gold Finger

With the 30 μ gold plating, the connector interface is more reliable and can withstand the potential damages in industrial applications.



Conformal Coating



Nano Coating

Protection	Dust, moisture, solvent, chemicals, fungus and corrosion	
Main material used	Acrylic	Parylene
Thickness	0.03 ~ 0.13 mm	0.01 ~ 0.05 mm
Advantages	<ul style="list-style-type: none"> · Simple application and drying process · Can be detected under UV illumination · Compliant with the IP53 rating and MIL-STD-810G 	<ul style="list-style-type: none"> · Produces a highly thin, dense and scratch-resistant film with no pinholes · Compliant with the IP57 rating · Invisible to human eyes
Cost	\$	\$\$\$
Applications	Industrial applications that run in harsh environments	High-end applications such as defense, aerospace, automotive and healthcare
Applicable products	Module type w/o housing *	

Value-added Software



CoreAnalyzer2

CoreAnalyzer2 is an exclusive, analytic data-behavior technology implemented on our SSD products. Featuring collecting and analyzing data of customers' host system, it can help our customers analyze their usage behavior so they can choose the best-suited.



Double-barreled Solution

Apacer's Double-barreled Solution is comprised of CoreAnalyzer2 and SSDWidget2.0. CoreAnalyzer2 helps determine which SSD and firmware are most suitable for a customer, and SSDWidget2.0 lets customers remotely monitor SSD status in real-time.



SSDWidget 2.0

Apacer SSDWidget 2.0 is a comprehensive disk monitoring and maintaining utility. Designed with the concepts of S.M.A.R.T., SSDWidget2.0 can monitor SSD's health-related information and provide SSD status for SSD lifetime monitoring and workload analysis.



Opaque

Apacer has developed the Opaque software as a custom implementation of the TCG Opal 2.0 standard. Its accessible interface allows users to control useful security functions, such as pre-boot authorization and drive revert.

Applications

Transportation

Engage with Intelligent Transportation System,
Exploit the Internet of Vehicles

Internet of Things

Grow the Ecosystem of IoT Devices

Server & Networking

Expand the Boundaries Beyond Limits

Gaming

Protect Your Data
with Our Security Solutions

Healthcare

Security, Safety and Reliability

Defense

Extremely Rugged Design and
Incomparable Reliability

Factory Automation

The Cutting Edge of Remote Device Management

PCIe SSD

- Superb performance and low latency
- Compliant with the NVMe™ specification
- Transmission speed up to 5,080 MB/sec
- Thermal Throttling support
- End-to-end data protection support



Model	PV930-M280	PV920-M280	PV910-M280	PV220-M280	PV210-M280	PH920-M280
Form Factor	M.2 2280	M.2 2280	M.2 2280	M.2.2280	M.2.2280	M.2.2280
Interface	PCIe Gen4 x4	PCIe Gen3 x4	PCIe Gen3 x2	PCIe Gen3 x4	PCIe Gen3 x4	PCIe Gen3 x4
Connector	M.2 M key	M.2 M key	M.2 B & M key	M.2 M key	M.2 M key	M.2 M key
NAND Flash Type	3D TLC	3D TLC	3D TLC	3D TLC	3D TLC	3D TLC
Capacity	480GB-1920GB	Single side: 240GB~480GB Double side: 960GB~1920GB	120GB~960GB	120GB-1920GB	240GB-1920GB	Single side: 160GB Double side: 320GB~640GB
External DRAM	Yes	-	-	-	Yes	-
Max. R/W Performance (MB/sec)	5080/4735	1740/1550	1775/1295	1710/1685	3130/2630	1740/1530
Standard Operating Temperature (°C)	0~ +70	0~ +70	0 ~ + 70	0~ +70	0~ +70	0~ +70
Wide Temperature (°C)	-	-40 ~ + 85	-40 ~ + 85	-40~+85	-40~+85	-40~+85
Shock	Operation: 50G/11ms (compliant with MIL-STD-202G) Non-operation: 1500G/0.5ms (compliant with MIL-STD-883K)					
Vibration	Operation: 7.69 Grms, 20~2000 Hz/random (compliant with MIL-STD-810G) Non-operation: 4.02 Grms, 15 ~ 2000 Hz/sine (compliant with MIL-STD-810G)					
MTBF (hours)	>3,000,000	>3,000,000	>3,000,000	>3,000,000	>3,000,000	>3,000,000
Dimension (mm)	22.00 x 80.00 x 4.08	Single side: 22.00 x 80.00 x 2.58 Double side: 22.00 x 80.00 x 4.08	Single side: 22.00 x 80.00 x 2.38 Double side: 22.00 x 80.00 x 3.88	Single side: 22.00 x 80.00 x 2.38 Double side: 22.00 x 80.00 x 3.88 CoreGlacier: 22.00 x 80.00 X 4.08	Double side: 22.00 x 80.00 x 3.88 CoreGlacier: 22.00 x 80.00 X 4.08	Single side: 22.00 x 80.00 x 2.58 Double side: 22.00 x 80.00 x 4.08

PCIe SSD



Model	PT220-M280	PV910-M242	PV910-CFX	PV140-25
Form Factor	M.2 2280	M.2 2242	CFexpress 2.0 Type B	2.5"
Interface	PCIe Gen3 x4	PCIe Gen3 x2	PCIe Gen3 x2	PCIe Gen3 x4
Connector	M.2 M key	M.2 B & M key	-	U.2 (SFF-8639)
NAND Flash Type	3D TLC	3D TLC	3D TLC	3D TLC
Capacity	128GB~2TB	60GB~480GB	60GB~480GB	960 ~ 3840GB
External DRAM	-	-	-	Yes
Max. R/W Performance (MB/sec)	2480/2275	1775/1255	1775/1255	3340/1175
Standard Operating Temperature (°C)	0 ~ +70	0 ~ +70	0 ~ +70	-
Wide Temperature (°C)	-	-40 ~ +85	-40 ~ +85	-40 ~ +85
Shock	Operation: 50G/11ms (compliant with MIL-STD-202G) Non-operation: 1500G/0.5ms (compliant with MIL-STD-883K)		Non-operation: 1,500(G), half sine wave	
Vibration	Operation: 7.69 Grms, 20~2000 Hz/random (compliant with MIL-STD-810G) Non-operation: 4.02 Grms, 15 ~ 2000 Hz/sine (compliant with MIL-STD-810G)		Non-operation: 20G, 20~2000 Hz/random	
MTBF (hours)	>3,000,000	>3,000,000	>3,000,000	>3,000,000
Dimension (mm)	Single side: 22.00 x 80.00 x 2.38 Double side: 22.00 x 80.00 x 3.88	22.00 x 42.00 x 3.88	29.60 x 38.50 x 3.80	7mm: 100.00 x 69.85 x 7.00

*All product specifications are subject to change without notice.

SATA 2.5" SSD

- Perfect replacement for 2.5" SATA HDDs
- Supports LDPC ECC
- Global wear-leveling technology
- Flash Bad-block Management
- S.M.A.R.T. and SSDWidget support
- Power Failure Management



Model	SV240-25	SV250-25	ST250-25	SH250-25
Interface	SATA 3.2 (6Gb/s)	SATA 3.2 (6Gb/s)	SATA 3.2 (6Gb/s)	SATA 3.2 (6Gb/s)
Connector	(7+15) pin male	(7+15) pin male	(7+15) pin male	(7+15) pin male
NAND Flash Type	3D TLC	3D TLC	3D TLC	3D TLC
Capacity	120GB~1920GB	30GB~960GB	128GB~2TB	10GB~320GB
Max. R/W Performance (MB/sec)	560/495	560/520	560/510	560/520
IOPs (4K Random Write)	85K	73K	70K	73k
Standard Operating Temperature (°C)	0 ~ + 70	0 ~ + 70	0 ~ + 70	0 ~ + 70
Wide Temperature (°C)	-40 ~ + 85	-40 ~ + 85	-	-40 ~ + 85
Storage Temperature (°C)	-55 ~ + 100	-55 ~ + 100	-55 ~ + 100	-55 ~ + 100
Shock	Operation: 50G/11ms (compliant with MIL-STD-202G) Non-operation: 1500G/0.5ms (compliant with MIL-STD-883K)			
Vibration	Operation: 7.69 Grms, 20~2000 Hz/random (compliant with MIL-STD-810G) Non-operation: 4.02 Grms, 15 ~ 2000 Hz/sine (compliant with MIL-STD-810G)			
MTBF (hours)	>3,000,000	>3,000,000	>3,000,000	>3,000,000
Dimension (mm)	7mm: 100.00 x 69.85 x 6.90	7mm: 100.00 x 69.85 x 6.90 9.5mm: 100.00 x 69.85 x 9.30	7mm: 100.00 x 69.85 x 6.90	7mm: 100.00 x 69.85 x 6.90

SATA 2.5" SSD



Model	SM210-25 SM21P-25	SU210-25	SS210-25
Interface	SATA 3.2 (6Gb/s)	SATA 3.2 (6Gb/s)	SATA 3.2 (6Gb/s)
Connector	(7+15) pin male	(7+15) pin male	(7+15) pin male
NAND Flash Type	MLC	MLC	SLC
Capacity	32GB~512GB	16GB~256GB	8GB~240GB
Max. R/W Performance (MB/sec)	510/470 545/475	505/390	530/445
IOPs (4K Random Write)	79K	80K	76K
Standard Operating Temperature (°C)	0 ~ + 70	0 ~ + 70	0 ~ + 70
Wide Temperature (°C)	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85
Storage Temperature (°C)	-40 ~ + 100	-40 ~ + 100	-40 ~ + 100
Shock	Operation: 50G/11ms (compliant with MIL-STD-202G) Non-operation: 1500G/0.5ms (compliant with MIL-STD-883K)		
Vibration	Operation: 7.69 Grms, 20~2000 Hz/random (compliant with MIL-STD-810G) Non-operation: 4.02 Grms, 15 ~ 2000 Hz/sine (compliant with MIL-STD-810G)		
MTBF (hours)	>1,000,000	>1,000,000	>2,000,000
Dimension (mm)	7mm:100.00 x 69.85 x 6.90 9.5mm: 100.00 x 69.85 x 9.30	7mm:100.00 x 69.85 x 6.90 9.5mm: 100.00 x 69.85 x 9.30	7mm:100.00 x 69.85 x 6.90 9.5mm: 100.00 x 69.85 x 9.30

*All product specifications are subject to change without notice.

SATA M.2

- M.2 (NGFF) Connector
- Global wear-leveling and block management
- Built-in ATA secure erase and S.M.A.R.T. functions
- TRIM support
- Thermal Throttling (optional)



Model	SV250-M242	ST250-M242	SM230-M242	SS220-M242	SH250-M242
Form Factor	M.2 2242	M.2 2242	M.2 2242	M.2 2242	M.2 2242
Interface	SATA 3.2 (6Gb/s)	SATA 3.2 (6Gb/s)	SATA 3.2 (6Gb/s)	SATA 3.2 (6Gb/s)	SATA 3.2 (6Gb/s)
Connector	M.2 B & M key	M.2 B & M key	M.2 B & M key	M.2 B & M key	M.2 B & M key
NAND Flash Type	3D TLC	3D TLC	MLC	SLC	3D TLC
Capacity	30GB~960GB	128GB~1TB	8GB~256GB	1GB~64GB	10GB~320GB
External DRAM	-	-	-	Yes	-
Max. R/W Performance (MB/sec)	560/515	560/510	555/470	555/450	560/515
Standard Operating Temperature (°C)	0 ~ +70	0 ~ +70	0 ~ +70	0 ~ +70	0 ~ +70
Wide Temperature (°C)	-40 ~ +85	-	-40 ~ +85	-40 ~ +85	-40 ~ +85
Storage Temperature (°C)	-55 ~ +100	-55 ~ +100	-40 ~ +100	-40 ~ +100	-55 ~ +100
Shock	Operation: 50G/11ms (compliant with MIL-STD-202G) Non-operation: 1500G/0.5ms (compliant with MIL-STD-883K)				
Vibration	Operation: 7.69 Grms, 20~2000 Hz/random (compliant with MIL-STD-810G) Non-operation: 4.02 Grms, 15 ~ 2000 Hz/sine (compliant with MIL-STD-810G)				
MTBF (hours)	>3,000,000	>3,000,000	>1,000,000	>2,000,000	>3,000,000
Dimension (mm)	22.00 x 42.00 x 3.80	22.00 x 42.00 x 3.80	22.00 x 42.00 x 3.80	22.00 x 42.00 x 3.60	22.00 x 42.00 x 3.80

SATA M.2



Model	SV240-M280	SV250-M280	ST250-M280	SM230-M280	SM210-M280	SH250-M280
Form Factor	M.2 2280	M.2 2280	M.2 2280	M.2 2280	M.2 2280	M.2 2280
Interface	SATA 3.2 (6Gb/s)	SATA 3.2 (6Gb/s)	SATA 3.2 (6Gb/s)	SATA 3.2 (6Gb/s)	SATA 3.2 (6Gb/s)	SATA 3.2 (6Gb/s)
Connector	M.2 B & M key	M.2 B & M key	M.2 B & M key	M.2 B & M key	M.2 B & M key	M.2 B & M key
NAND Flash Type	3D TLC	3D TLC	3D TLC	MLC	MLC	3D TLC
Capacity	120GB~1920GB	30GB-960GB	128GB~2TB	32GB~1TB	32GB~512GB	10GB~320GB
External DRAM	Yes	-	-	-	Yes	-
Max. R/W Performance (MB/sec)	560/495	560/520	560/510	560/510	540/485	560/520
Standard Operating Temperature (°C)	0 ~ + 70	0 ~ + 70	0 ~ + 70	0 ~ + 70	0 ~ + 70	0 ~ + 70
Wide Temperature (°C)	-40 ~ + 85	-40 ~ + 85	-	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85
Storage Temperature (°C)	-55 ~ + 100	-55 ~ + 100	-55 ~ + 100	-40 ~ + 100	-40 ~ + 100	-55 ~ + 100
Shock	Operation: 50G/11ms (compliant with MIL-STD-202G) Non-operation: 1500G/0.5ms (compliant with MIL-STD-883K)					
Vibration	Operation: 7.69 Grms, 20~2000 Hz/random (compliant with MIL-STD-810G) Non-operation: 4.02 Grms, 15 ~ 2000 Hz/sine (compliant with MIL-STD-810G)					
MTBF (hours)	3,000,000	>3,000,000	>3,000,000	>1,000,000	>1,000,000	>3,000,000
Dimension (mm)	22.00 x 80.00 x 3.88	Single side: 22.00 x 80.00 x 2.38 Double side: 22.00 x 80.00 x 3.88	Single side: 22.00 x 80.00 x 2.23 Double side: 22.00 x 80.00 x 3.58	Single side: 22.00 x 80.00 x 2.23 Double side: 22.00 x 80.00 x 3.58	Single side: 22.00 x 80.00 x 2.23 Double side: 22.00 x 80.00 x 3.58	Single side: 22.00 x 80.00 x 2.38 Double side: 22.00 x 80.00 x 3.88

*All product specifications are subject to change without notice.

SATA MO-276 / MO-297/ MO-300

- Compliant with JEDEC MO-276 / MO-297 / MO-300 standard
- Global wear-leveling and block management
- Built-in ATA secure erase and S.M.A.R.T. functions
- TRIM support
- DEVSLP support (optional)



Model	SV170-μSSD	SV240-297	ST250-297
Form Factor	JEDEC MO-276	JEDEC MO-297	JEDEC MO-297
Interface	SATA 3.2 (6Gb/s)	SATA 3.2 (6Gb/s)	SATA 3.2 (6Gb/s)
Connector	BGA 156 Ball	(7+15) pin male	(7+15) pin male
NAND Flash Type	3D TLC	3D TLC	3D TLC
Capacity	30GB~120GB	120GB~960GB	128GB~2TB
External DRAM	-	Yes	-
Max. R/W Performance (MB/sec)	560/460	560/520	560/510
Standard Operating Temperature (°C)	0 ~ + 70	0 ~ + 70	0 ~ + 70
Wide Temperature (°C)	-40 ~ + 85	-40 ~ + 85	-
Storage Temperature (°C)	-40 ~ + 100	-55 ~ + 100	-55 ~ + 100
Shock	Operation: 50G/11ms (compliant with MIL-STD-202G) Non-operation: 1500G/0.5ms (compliant with MIL-STD-883K)		
Vibration	Operation: 7.69 Grms, 20~2000 Hz/random (compliant with MIL-STD-810G) Non-operation: 4.02 Grms, 15 ~ 2000 Hz/sine (compliant with MIL-STD-810G)		
MTBF (hours)	>1,000,000	>3,000,000	>3,000,000
Dimension (mm)	16.00 x 20.00 x 1.40	54.00 x 39.80 x 4.00	54.00 x 39.80 x 4.00

SATA MO-276 / MO-297/ MO-300



Model	SV240-300	SV250-300	SH250-300	SS210-300	ST250-300
Form Factor	JEDEC MO-300	JEDEC MO-300	JEDEC MO-300	JEDEC MO-300	JEDEC MO-300
Interface	SATA 3.2 (6Gb/s)	SATA 3.2 (6Gb/s)	SATA 3.2 (6Gb/s)	SATA 3.2 (6Gb/s)	SATA 3.2 (6Gb/s)
Connector	52 pin male	52 pin male	52 pin male	52 pin male	52 pin male
NAND Flash Type	3D TLC	3D TLC	3D TLC	SLC	3D TLC
Capacity	120GB~1920GB	30GB~480GB	10GB~160GB	2GB~128GB	128GB ~ 2TB
External DRAM	Yes	-	-	Yes	-
Max. R/W Performance (MB/sec)	560/495	560/515	560/510	525/445	560/510
Standard Operating Temperature (°C)	0 ~ + 70	0 ~ + 70	0 ~ + 70	0 ~ + 70	0 ~ + 70
Wide Temperature (°C)	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85	-
Storage Temperature (°C)	-55 ~ + 100	-55 ~ + 100	-55 ~ + 100	-40 ~ + 100	-55 ~ + 100
Shock	Operation: 50G/11ms (compliant with MIL-STD-202G) Non-operation: 1500G/0.5ms (compliant with MIL-STD-883K)				
Vibration	Operation: 7.69 Grms, 20~2000 Hz/random (compliant with MIL-STD-810G) Non-operation: 4.02 Grms, 15 ~ 2000 Hz/sine (compliant with MIL-STD-810G)				
MTBF (hours)	>3,000,000	>3,000,000	>3,000,000	>2,000,000	>3,000,000
Dimension (mm)	50.80 x 29.85 x 4.85	50.80 x 29.85 x 4.85	50.80 x 29.85 x 4.85	50.80 x 29.85 x 3.80	50.80 x 29.85 x 3.80

*All product specifications are subject to change without notice.

SATA 7-pin Module

- 7-pin SATA connector
- Write protect by hardware switch (optional)
- TRIM command support
- Built-in ATA secure erase and S.M.A.R.T. functions
- Global wear-leveling and block management
- Unique hook design
- Thermal Throttling (optional)



Model	SV250-7LP2/180D	SDM7-M 7P/180D DP	SDM7-M 7P 180D LP2(H)	SDM5A-M 7P/90D LP(H)	SDM5A-M 7P/180D LP5(H)
Interface	SATA 3.2 (6Gb/s)	SATA 3.1 (6Gb/s)	SATA 3.1 (6Gb/s)	SATA 3.1 (6Gb/s)	SATA 3.1 (6Gb/s)
Connector	7-pin	7-pin	7-pin	7-pin	7-pin
NAND Flash Type	3D TLC	MLC	MLC	MLC	MLC
Capacity	60GB~240GB	32GB ~ 256GB	8GB ~ 64GB	4GB~32GB	16GB ~ 64GB
Max. R/W Performance (MB/sec)	560/510	525/355	135/90	120/40	425/80
Standard Operating Temperature (°C)	0 ~ + 70	0 ~ + 70	0 ~ + 70	0 ~ + 70	0 ~ + 70
Wide Temperature (°C)	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85
Storage Temperature (°C)	-55 ~ + 100	-40 ~ + 100	-40 ~ + 100	-40 ~ + 100	-40 ~ + 100
Housing	-	-	Optional	Optional	Optional
H/W Write Protect	Optional	Optional	Optional	-	Optional
Cable-less Solution	Multi-PowerPath	Multi-PowerPath	Multi-PowerPath	Optional (7+2 pin)	Multi-PowerPath
Shock	Operation: 50G/11 ms (compliant with MIL-STD-202G) Non-operation: 1500G/0.5ms (compliant with MIL-STD-883K)				
Vibration	Operation: 7.69 Grms, 20~2000 Hz/random (compliant with MIL-STD-810G) Non-operation: 4.02 Grms, 15 ~ 2000 Hz/sine (compliant with MIL-STD-810G)				
MTBF (hours)	>3,000,000	>1,000,000	>1,000,000	>1,000,000	>1,000,000
Dimension (mm)	33.00 x 29.30 x 8.85	30.00 x 32.50 x 7.80	Without housing: 33.00 x 29.30 x 8.85 With housing: 35.20 x 30.40 x 9.25	Without housing: 30.00 x 20.00 x 15.20 With housing: 32.50 x 23.13 x 17.80	Without housing: 33.00 x 29.30 x 88.50 With housing: 35.20 x 30.40 x 9.25

SATA 7-pin Module



Model	SDM5A-M 7P/180D Slim2(H)	SDM5A 7P/180D Slim2(H)	SDM5A 7P/180D LP2	SDM5A 7P/90D LP(H)
Interface	SATA 3.1 (6Gb/s)	SATA 3.1 (6Gb/s)	SATA 3.1 (6Gb/s)	SATA 3.1 (6Gb/s)
Connector	7-pin	7-pin	7-pin	7-pin
NAND Flash Type	MLC	SLC	SLC	SLC
Capacity	4GB~32GB	1GB~16GB	8GB~32GB	1GB~16GB
40Max. R/W Performance (MB/sec)	120/40	44/40	435/215	44/40
Standard Operating Temperature (°C)	0 ~ + 70	0 ~ + 70	0 ~ + 70	0 ~ + 70
Wide Temperature (°C)	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85
Storage Temperature (°C)	-40 ~ + 100	-40 ~ + 100	-40 ~ + 100	-40 ~ + 100
Housing	Optional	Optional	-	Optional
H/W Write Protect	-	-	Optional	-
Cable-less Solution	Optional (7+2 pin)	Optional (7+2 pin)	Optional (7+2 pin)	Optional (7+2 pin)
Shock	Operation: 50G/11ms (compliant with MIL-STD-202G) Non-operation: 1500G/0.5ms (compliant with MIL-STD-883K)			
Vibration	Operation: 7.69 Grms, 20~2000 Hz/random (compliant with MIL-STD-810G) Non-operation: 4.02 Grms, 15 ~ 2000 Hz/sine (compliant with MIL-STD-810G)			
MTBF (hours)	>1,000,000	>2,000,000	>2,000,000	>2,000,000
Dimension (mm)	Without housing: 17.00 x 40.00 x 6.10 With housing: 19.80 x 41.40 x 7.50	Without housing: 17.00 x 40.00 x 6.10 With housing: 19.80 x 41.40 x 7.50	33.00 x 29.30 x 9.05	Without housing: 30.00 x 20.00 x 15.20 With housing: 32.50 x 23.10 x 17.80

*All product specifications are subject to change without notice.

Industrial CF Card

- Compliant with CFA 6.0/CF 6.1 specification (CH710-CF)
- Global wear-leveling and block management
- Built-in ATA secure erase and S.M.A.R.T. functions
- Intelligent power failure recovery
- MLC extended temperature support
- Lock switch design for write-protection (optional)
- Support page mapping (CM710-CF/CS710-CF/CH710-CF)



Model	Industrial CF6-M	Industrial CM710-CF	Industrial CF6A-M	Industrial CF6	Industrial CS710-CF	Industrial CF6A	Industrial CH710-CF
Interface	PC Card Memory Mode; PC Card I/O Mode; True IDE Mode	PC Card Memory Mode; PC Card I/O Mode; True IDE Mode	PC Card Memory Mode; PC Card I/O Mode; True IDE Mode	PC Card Memory Mode; PC Card I/O Mode; True IDE Mode	PC Card Memory Mode; PC Card I/O Mode; True IDE Mode	PC Card Memory Mode; PC Card I/O Mode; True IDE Mode	PC Card Memory Mode; PC Card I/O Mode; True IDE Mode
Connector	50-pin	50-pin	50-pin	50-pin	50-pin	50-pin	50-pin
Transfer Mode	PIO Mode-6, MWDMA Mode-4, UDMA Mode-7	PIO Mode-6, MWDMA Mode-4, UDMA Mode-6	PIO Mode-6, MWDMA Mode-4, UDMA Mode-7	PIO Mode-6, MWDMA Mode-4, UDMA Mode-7	PIO Mode-6, MWDMA Mode-4, UDMA Mode-6	PIO Mode-6, MWDMA Mode-4, UDMA Mode-7	PIO Mode-6, MWDMA Mode-4, UDMA Mode-6
NAND Flash Type	MLC	MLC	MLC	SLC	SLC	SLC	SLC-liteX
Capacity	8GB~128GB	8GB~128GB	8GB~64GB	512MB~64GB	128MB~64GB	256MB~32GB	8GB~64GB
Max. R/W Performance (MB/sec)	110/65	90/55	115/75	110/80	55/55	60/65	115/80
Standard Operating Temperature (°C)	0 ~ + 70	0 ~ + 70	0 ~ + 70	0 ~ + 70	0 ~ + 70	0 ~ + 70	0 ~ + 70
Wide Temperature (°C)	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85
Storage Temperature (°C)	-40 ~ + 100	-40 ~ + 100	-40 ~ + 100	-40 ~ + 100	-40 ~ + 100	-40 ~ + 100	-40 ~ + 100
H/W Write Protect	Optional	-	Optional	Optional	-	Optional	-
Shock	Operation: 50G/11ms (compliant with MIL-STD-202G) Non-operation: 1500G/0.5ms (compliant with MIL-STD-883K)						
Vibration	Operation: 7.69 Grms, 20~2000 Hz/random (compliant with MIL-STD-810G) Non-operation: 4.02 Grms, 15 ~ 2000 Hz/sine (compliant with MIL-STD-810G) *Non-operation: 15 G, 10 ~ 2000 Hz/sine_for CF6 and CF6-M only						
MTBF (hours)	>1,000,000	>3,000,000	>1,000,000	>2,000,000	>3,000,000	>2,000,000	>3,000,000
Dimension (mm)	36.40 x 42.80 x 3.30	36.40 x 42.80 x 3.30	36.40 x 42.80 x 3.30	36.40 x 42.80 x 3.30	36.40 x 42.80 x 3.30	36.40 x 42.80 x 3.30	36.40 x 42.80 x 3.30

Industrial CFast Card

- Compliant with CFast 2.0 specification
- Global wear-leveling and block management
- Built-in ATA secure erase and S.M.A.R.T. functions
- Intelligent power failure recovery
- TRIM support
- DEVSLP Support
- Thermal Throttling (optional)



Model	SV250-CFast	SM22P-CFast	SU220-CFast	SM230-CFast	SU230-CFast	SS220-CFast	SH250-CFast
Interface	SATA 3.2 (6Gb/s)	SATA 3.1 (6Gb/s)	SATA 3.1 (6Gb/s)	SATA 3.2 (6Gb/s)	SATA 3.2 (6Gb/s)	SATA 3.1 (6Gb/s)	SATA 3.2 (6Gb/s)
Connector	(7+17) pin male (7+17) pin male (7+17) pin male (7+17) pin male (7+17) pin male (7+17) pin male (7+17) pin male						
Form Factor	CFast	CFast	CFast	CFast	CFast	CFast	CFast
NAND Flash Type	3D TLC	MLC	MLC	MLC	MLC	SLC	3D TLC
SLC-lite/SLC-liteX	-	-	SLC-lite	-	SLC-lite	-	SLC-liteX
Capacity	30GB~480GB	8GB~128GB	8GB~128GB	8GB~256GB	8GB~128GB	8GB~64GB	10GB-160GB
External DRAM	-	Yes	Yes	-	-	Yes	-
Max. R/W Performance (MB/sec)	560/515	475/85	535/480	560/465	555/475	520/455	560/515
Standard Operating Temperature (°C)	0 ~ +70	0 ~ +70	0 ~ +70	0 ~ +70	0 ~ +70	0 ~ +70	0 ~ +70
Storage Temperature (°C)	-55 ~ +100	-40 ~ +100	-40 ~ +100	-40 ~ +100	-40 ~ +100	-40 ~ +100	-55 ~ +100
H/W Write Protect	Optional	-	Optional	Optional	Optional	Optional	Optional
Shock	Operation: 50G/11ms (compliant with MIL-STD-202G) Non-operation: 1500G/0.5ms (compliant with MIL-STD-883K)						
Vibration	Operation: 7.69 Grms, 20~2000 Hz/random (compliant with MIL-STD-810G) Non-operation: 15 Grms, 10 ~ 2000 Hz/sine (compliant with MIL-STD-810G)						
MTBF (hours)	>3,000,000	>3,000,000	>3,000,000	>1,000,000	>1,000,000	>3,000,000	>3,000,000
Dimension (mm)	36.40 x 42.80 x 3.60	36.40 x 42.80 x 3.60	36.40 x 42.80 x 3.60	36.40 x 42.80 x 3.60	36.40 x 42.80 x 3.60	36.40 x 42.80 x 3.60	36.40 x 42.80 x 3.60

*All product specifications are subject to change without notice.

Industrial SD Card

- Compliant with SD3.0 and SD2.0 specification
- S.M.A.R.T. supported
- Global wear-leveling and block management
- Supports class 10 with UHS-I
- Auto standby and sleep mode support
- Low power consumption
- Page mapping (R1 Only)



Model	CV110-SD	CH110-SD	Industrial SD H1-SL	Industrial SD H1-M	Industrial SD	IndustrialSD R1
Interface	SD4.0	SD4.0	SD3.0	SD3.0	SD2.0	SD3.0
NAND Flash Type	3D TLC	3D TLC	MLC	MLC	SLC	SLC
SLC-lite/SLC-liteX	-	SLC-liteX	SLC-lite	-	-	-
Capacity	32GB~256GB	8GB~64GB	SDHC: 4GB~64GB	SDHC: 8GB~128GB	SD:256MB~2GB; SDHC:4GB~32GB	SD:1GB~2GB; SDHC:4GB~16GB
Max. R/W Performance (MB/sec)	90/34	95/80	43/40	43/30	23/17	43/41
Standard Operating Temperature (°C)	-25 ~ + 85	-25 ~ + 85	-25 ~ + 85	-25 ~ + 85	0 ~ + 70	-25 ~ + 85
Wide Temperature (°C)	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85
Storage Temperature (°C)	-40 ~ + 100	-40 ~ + 85	-40 ~ + 100	-40 ~ + 100	-40 ~ + 100	-40 ~ + 100
H/W Write Protect	Yes	Yes	Yes	Yes	Yes	Yes
Shock	Operating: 50G/11ms,(compliant with MIL-STD-202G) Non-operating: 1500G/0.5ms,(compliant with MIL-STD-883K)					
Vibration	Operation: 7.69 Grms, 20~2000 Hz/random (compliant with MIL-STD-810G) Non-operation: 4.02 Grms, 15 ~ 2000 Hz/sine (compliant with MIL-STD-810G)					
MTBF (hours)	>3,000,000	>3,000,000	>3,000,000	>3,000,000	>1,500,000	>3,000,000
Dimension (mm)	32.00 x 24.00 x 2.10	32.00 x 24.00 x 2.10	32.00 x 24.00 x 2.10	32.00 x 24.00 x 2.10	24.00 x 32.00 x 2.10	32.00 x 24.00 x 2.10

Industrial microSD Card

- Compliant with SD3.0 and SD2.0 specification
- S.M.A.R.T. supported
- Supports SD mode and SPI mode
- Global wear-leveling and block management
- Low power consumption
- Page mapping (R1 Only)
- Supports Extended Temperature



Model	CH120-MSD	CV110-MSD	CH110-MSD	Industrial microSD H1-SL	Industrial microSD H1-M	Industrial microSD	Industrial microSD R1
Interface	SD6.1	SD5.0	SD5.0	SD3.0	SD3.0	SD2.0	SD3.0
NAND Flash Type	3D TLC	3D TLC	3D TLC	MLC	MLC	SLC	SLC
SLC-lite/SLC-liteX	SLC-liteX	-	SLC-liteX	SLC-lite	-	-	-
Capacity	16GB~128GB	32GB~256GB	8GB~64GB	4GB~32GB	8GB~64GB	SD: 256MB~2GB SDHC: 4GB	SD: 1GB~2GB SDHC: 4GB~8GB
Max. R/W Performance (MB/sec)	90/80	90/34	95/80	43/40	75/65	20/16	34/28
Standard Operating Temperature (°C)	-25 ~ + 85	-25 ~ + 85	-25 ~ + 85	-25 ~ + 85	-25 ~ + 85	-25 ~ + 85	-25 ~ + 85
Wide Temperature (°C)	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85
Storage Temperature (°C)	-40 ~ + 85	-40 ~ + 100	-40 ~ + 100	-40 ~ + 100	-40 ~ + 100	-40 ~ + 100	-40 ~ + 100
Shock	Operating: 50G/11ms,(compliant with MIL-STD-202G) Non-operating: 1500G/0.5ms,(compliant with MIL-STD-883K)						
Vibration	Operation: 7.69 Grms, 20~2000 Hz/random (compliant with MIL-STD-810G) Non-operation: 4.02 Grms, 15 ~ 2000 Hz/sine (compliant with MIL-STD-810G)						
MTBF (hours)	>3,000,000	>3,000,000	>3,000,000	>3,000,000	>3,000,000	>2,000,000	>3,000,000
Dimension (mm)	15.00 x 11.00 x 1.00	15.00 x 11.00 x 1.00	15.00 x 11.00 x 1.00	15.00 x 11.00 x 1.00	15.00 x 11.00 x 1.00	15.00 x 11.00 x 1.00	15.00 x 11.00 x 1.00

*All product specifications are subject to change without notice.

Industrial USB Drive

- ECC engine
- Power saving implemented
- Implements advanced wear-leveling algorithms
- Optional industrial temp. range -40°C to 85°C
- Chip-On-Board (COB) packaging technology, stored and protected against dust, water and shock (EH163-M)
- Support page mapping (UV110-UFD1/ UH110-UFD4)
- Lock switch design for write-protection (UH110-UFD4 only)
- Air 15KV ESD protection (UV110-UFD5)



Model	EH163-M	EH353-M	EH353	AH321	AH322
Interface	USB3.0	USB3.0	USB3.0	USB2.0	USB2.0
Connector	USB3.0 A Type Plug	USB3.0 A Type Plug	USB3.0 A Type Plug	USB2.0 A Type Plug	USB2.0 A Type Plug
NAND Flash Type	MLC	MLC	SLC	SLC	SLC
Capacity	8GB~64GB	8GB~128GB	256MB~32GB	256MB~32GB	256MB~32GB
Max. R/W Performance (MB/sec)	225/80	205/95	80/70	34/22	34/22
Standard Operating Temperature (°C)	0 ~ +70	0 ~ +70	0 ~ +70	0 ~ +70	0 ~ +70
Wide Temperature (°C)	-	-40 ~ +85	-40 ~ +85	-40 ~ +85	-40 ~ +85
Storage Temperature (°C)	-25 ~ +85	-40 ~ +100	-40 ~ +100	-40 ~ +100	-40 ~ +100
Shock	Operating: 50G/11ms,(compliant with MIL-STD-202G) Non-operating: 1500G/0.5ms,(compliant with MIL-STD-883K)				
Vibration	Operation: 7.69 Grms, 20~2000 Hz/random (compliant with MIL-STD-810G) Non-operation: 4.02 Grms, 15 ~ 2000 Hz/sine (compliant with MIL-STD-810G) (Non-operation: 15 G, 10 ~ 2000 Hz/sine for AH321/ AH322 only)				
MTBF (hours)	>1,000,000	>3,000,000	>3,000,000	>3,000,000	>3,000,000
Dimension (mm)	23.10 x 14.25 x 6.90	59.00 x 18.40 x 9.10	59.00 x 18.40 x 9.10	60.59 x 19.00 x 8.00	55.29 x 18.00 x 8.50

Industrial USB Drive



Model	USZ20-UFD5	US120-UFD5	UM120-UFD5	UV110-UFD5	UV110-UFD1	UH110-UFD4
Interface	USB2.0	USB3.0	USB3.0	USB3.1 gen 1	USB3.1 gen 1	USB3.1 gen 1
Connector	USB2.0 A Type Plug	USB3.0 A Type Plug	USB3.0 A Type Plug	USB3.1 gen 1 A Type Plug	USB3.1 gen 1 A Type Plug	USB3.1 gen 1 A Type Plug
NAND Flash Type	SLC	SLC	MLC	3D TLC	3D TLC	3D TLC
Capacity	256MB~32GB	256MB~32GB	8GB~128GB	64GB~256GB	16GB~256GB	4GB~8GB
Max. R/W Performance (MB/sec)	34/22	80/70	205/95	255/120	260/125	265/50
Standard Operating Temperature (°C)	0 ~ + 70	0 ~ + 70	0 ~ + 70	0 ~ + 70	0 ~ + 70	0 ~ + 70
Wide Temperature (°C)	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85 16GB not support	-40 ~ + 85 4GB not support
Storage Temperature (°C)	-40 ~ + 100	-40 ~ + 100	-40 ~ + 100	-40 ~ + 100	-55 ~ + 100	-55 ~ + 100
Shock	Operating: 50G/11ms,(compliant with MIL-STD-202G) Non-operating: 1500G/0.5ms,(compliant with MIL-STD-883K)					
Vibration	Operation: 7.69 Grms, 20~2000 Hz/random (compliant with MIL-STD-810G) Non-operation: 4.02 Grms, 15 ~ 2000 Hz/sine (compliant with MIL-STD-810G)					
MTBF (hours)	>3,000,000	>3,000,000	>3,000,000	>3,000,000	>3,000,000	>3,000,000
Dimension (mm)	56.05x18.0x8.50	56.05x18.00x8.50	56.05x18.00x8.50	56.05x18.00x8.50	46.85x17.20x7.70	51.15x17.20x7.70

*All product specifications are subject to change without notice.

Industrial USB Disk Module

- Compliant with the standard USB specification
- Compact size and available in various form factors
- Support Linux /Win7 /Win10 or later
- Shock resistance, anti-vibration and low power consumption
- Support page mapping (UV110-UFM1/ UV110-UFM2/ UH110-UFM1)
- Lock switch design for write-protection (optional)



Model	UDM 1U-M	UDM2A-M	UDM 1U	UDM2A
Interface	USB3.0	USB2.0	USB3.0	USB2.0
Connector	20 pin	10 pin	20 pin	10 pin
Connector Pitch (mm)	2.00	90D (Type A, B, C): 2.54 LP 180D (Type D): 2.54 LP 90D (Type E): 2.00	2.00	90D (Type A, B, C): 2.54 LP 180D (Type D): 2.54 LP 90D (Type E): 2.00
NAND Flash Type	MLC	MLC	SLC	SLC
Capacity	8GB~32GB	8GB~128GB	128MB~16GB	256MB~32GB
Max. R/W Performance (MB/sec)	90/48	44/43	40/35	44/41
Standard Operating Temperature (°C)	0 ~ + 70	0 ~ + 70	0 ~ + 70	0 ~ + 70
Wide Temperature (°C)	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85
Storage Temperature (°C)	-40 ~ + 100	-40 ~ + 100	-40 ~ + 100	-40 ~ + 100
Shock	Operating: 50G/11ms,(compliant with MIL-STD-202G) Non-operating: 1500G/0.5ms,(compliant with MIL-STD-883K)			
Vibration	Operation: 7.69 Grms, 20~2000 Hz/random (compliant with MIL-STD-810G) Non-operation: 4.02 Grms, 15 ~ 2000 Hz/sine (compliant with MIL-STD-810G)			
MTBF (hours)	>1,000,000	>1,000,000	>2,000,000	>2,000,000
Dimension (mm)	24.00 x 22.40 x 5.00	90D (Type A): 28.80 x 26.65 x 10.76 90D (Type B): 37.80 x 26.65 x 10.76 90D (Type C): 37.80 x 26.65 x 10.76 LP180D (Type D) with housing: 35.70 x 28.10 x 7.20 LP 90D (Type E): 36.80 x 26.50 x 7.10	24.00 x 22.40 x 5.00	90D (Type A): 28.80 x 26.65 x 10.76 90D (Type B): 37.80 x 26.65 x 10.76 90D (Type C): 37.80 x 26.65 x 10.76 LP180D (Type D) with housing: 35.70 x 28.10 x 7.20 LP 90D (Type E): 36.80 x 26.50 x 7.10

Industrial USB Disk Module



Model	UV110-UFM1	UV110-UFM2	UH110-UFM1
Interface	USB2.0	USB2.0	USB2.0
Connector	10 pin	10 pin	10 pin
Connector Pitch (mm)	90D (Type C): 2.54	90D (Type E): 2.00	90D (Type C): 2.54
NAND Flash Type	TLC	TLC	SLC-liteX
Capacity	16GB~128GB	16GB~128GB	8GB~32GB
Max. R/W Performance (MB/sec)	40/33	40/33	41/25
Standard Operating Temperature (°C)	0 ~ + 70	0 ~ + 70	0 ~ + 70
Wide Temperature (°C)	-40 ~ + 85 16GB not support	-40 ~ + 85 16GB not support	-40 ~ + 85
Storage Temperature (°C)	-40 ~ + 100	-40 ~ + 100	-40 ~ + 100
Shock	Operating: 50G/11ms,(compliant with MIL-STD-202G) Non-operating: 1500G/0.5ms,(compliant with MIL-STD-883K)		
Vibration	Operation: 7.69 Grms, 20~2000 Hz/random (compliant with MIL-STD-810G) Non-operation: 4.02 Grms, 15 ~ 2000 Hz/sine (compliant with MIL-STD-810G)		
MTBF (hours)	>3,000,000	>3,000,000	>3,000,000
Dimension (mm)	36.90 x 26.60 x 9.70	36.80 x 26.50 x 7.50	36.90 x 26.60 x 9.70

*All product specifications are subject to change without notice.

PATA SSD/ Disk Module

- Global wear-leveling and block management
- Built-in ATA secure erase and S.M.A.R.T. functions
- Intelligent power failure recovery
- Master / Slave jumper setting



Model	AFD257-M	AFD257	ADM5S-M	ADM5S
Interface	PATA	PATA	PATA	PATA
Connector	44 pin	44 pin	40 pin/44 pin	40 pin/44 pin
Product Type	44P/180D	44P/180D	40P/180D 44P/90D, 180D, 270D	40P/180D 44P/90D, 180D, 270D
NAND Flash Type	MLC	SLC	MLC	SLC
Capacity	32GB~256GB	8GB~128GB	90D: 8GB~128GB 180D MPH: 8GB~64GB	90D: 128MB~64GB 180D MPH: 128MB~32GB
Max. R/W Performance (MB/sec)	100/90	100/95	105/100	75/65
Standard Operating Temperature (°C)	0 ~ + 70	0 ~ + 70	0 ~ + 70	0 ~ + 70
Wide Temperature (°C)	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85	-40 ~ + 85
Storage Temperature (°C)	-40 ~ + 100	-40 ~ + 100	-40 ~ + 100	-40 ~ + 100
Shock	1500G (complied with MIL-STD810)			
Vibration	15G (complied with MIL-STD810)			
MTBF (hours)	>1,000,000	>2,000,000	>1,000,000	>2,000,000
Dimension (mm)	100.00 x 69.80 x 9.30	100.00 x 69.80 x 9.30	44P/270D: 45.00 x 28.00 x 7.00 40P/180D: 58.99 x 27.83 x 6.25	44P/90D: 45.00 x 28.00 x 6.85 44P/180D: 49.39 x 27.10 x 6.10



About Apacer

Apacer is a global leader in digital storage solutions, and is devoted to innovative storage technology and services. After more than 25 years in the industry, we remain dedicated to “Becoming Better Partners.” Our core values, as always, continue to revolve around reliability and innovation.

The company focuses on embedded applications for a variety of vertical markets, including military, medical, gaming, and industrial, and has become an integration expert in digital storage, innovative applications, and value-added services. Apacer is known for its advanced technologies and product quality and was ranked by Gartner as the top industrial SSD supplier for five consecutive years, from 2012 to 2016. In addition, Apacer is committed to making a positive impact on societal issues and has joined the **Responsible Business Alliance (RBA)**, which is formerly known as Electronic Industry Citizenship Coalition (EICC), a coalition promoting **ESG (Environmental, Social, Governance)** within the global electronics supply chain. We believe that the success of a corporation is marked not by profit but by how we benefit others, whether by caring for the environment or making contributions to society.

Compliance and Associations





The Most Reliable Storage For Industries

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