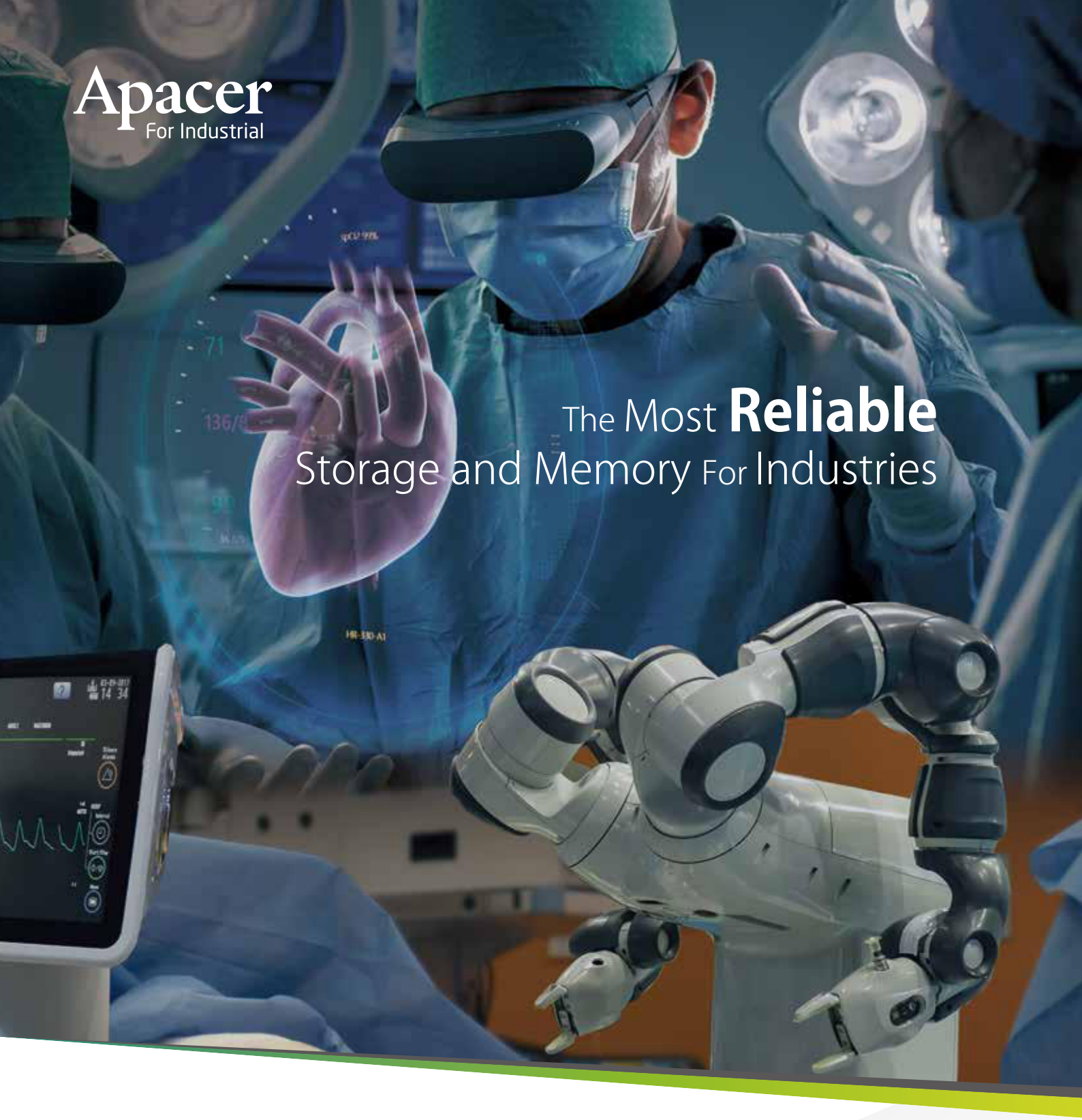
Apacer
For Industrial



The Most **Reliable** Storage and Memory For Industries

Healthcare Solutions

industrial.apacer.com

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What Sets Apacer Apart?

Professional Technique

- Strong HW/FW engineering know-how
- Customized design with a variety of solutions
- State-of-the-art technology

Quality Assurance

- **100% reliable & compliant**
  - Wide temperature test
  - Thermal shock test
  - Strict ORT (Ongoing Reliability Test)
  - Power cycle test
  - Humidity test
  - Altitude test
  - Reliability test (Vibration/Shock)

Extensive Experience

- Tier 1 industrial SSD & memory supplier; delivered over 135 million units
- Comprehensive experience in product customization (across industries)

Reliable Service

- Fixed BOM solution
- Longevity of supply, EOL & LTB notice
- Manufacturing in Taiwan protects IP

Trustworthy Supplier

- A global-scale service and maintenance system
- Responsive local FAE technical support
- 24/7 flexible and quick delivery service
- Complete RMA system

Challenges and Requirements for Healthcare Applications

As people live longer and disease treatments continuously evolve, the need for technological solutions is becoming greater every day. Advances in IoT, big data and AI analysis have also affected the healthcare industry. Recording comprehensive patient data now requires more reliable storage solutions.

Luckily, Apacer is here to offer them. Thanks to Apacer's SSDs, healthcare devices can store more data, and with Apacer's DRAM modules, medical professionals can speedily analyze the data and make decisions.

Industry giants such as Google, Qualcomm and Apple have been experimenting with digital solutions for European healthcare providers for years, showing that this market vision is optimistic. Now it's time to bring that vision to the rest of the world.

Hospital, Home and In Between

IT Solution

2.5"/M.2/mSATA

- Data reliability
- Harsh environment

Blood Tester

CF

- Data reliability
- Removable

Data Center

2.5"/M.2

- Data reliability
- Data security
- High performance

CPAP

USB/Card

- Data reliability
- Longevity

Portable Health Monitor

SD

- Power saving
- Removable

Challenges and Requirements

Data integrity is crucial: Corruption is unacceptable

Obviously, the integrity of data in the healthcare industry is of the highest importance. Corrupted or incomplete data could lead to misdiagnoses with serious health consequences. Apacer uses the latest in redundant protection technology to ensure that data integrity is as high as possible.

Strong enough to survive

Our SSDs have been incorporated into innovative new products such as mobile nursing stations. These can be wheeled from one patient's room to another, gathering data at the source and preserving it for later analysis. Not surprisingly, this means our products have to be tough enough to survive shocks and vibration. Meeting MIL-STD-810G and employing underfill technology makes our products that much tougher.

Privacy is paramount: Encryption protects against intrusion

Patients also want to make sure that their data is protected against outside intrusion. Apacer offers SSDs with AES 256-bit encryption to ensure that even if the hardware is stolen or lost, this powerful encryption prevents hackers from accessing the data. And since the laws of many nations require the destruction of personal information when it is no longer needed for business reasons, Apacer offers technology options that include the ability to totally erase and overwrite data when needed.

Featured Technologies for Healthcare Applications

Smart Healthcare refers to smart, connected medical devices that provide clinical information, remote connectivity management, and access to patient data. All of these require a robust embedded solution.

Apacer's Industrial SSD team has more than 20 years of experience in the embedded storage industry. We focus on manufacturing products designed to deliver high performance, high reliability and excellent quality in the smart healthcare industry, aiming to provide complete solutions and help our customers build reliable, flexible and low-cost systems.

Data Integrity

- End-to-end Data Protection
- Smart Read Refresh™

Data Security

- Bidirectional Security Identification
- Signed Firmware
- CoreEraser
- TCG Opal 2.0

Reliability & Endurance

- Conformal Coating
- ESD Protection
- SLC-liteX
- CE/FCC
- MIL-STD-810G

Longevity

- CoreSnapshot
- SSDWidget 2.0
- Fixed BOM
- 6+6 PCN/EOL Policy

Data Integrity

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 Smart Read Refresh™ plays a proactive role in avoiding read disturb errors from occurring to ensure health status of all blocks of NAND flash. Developed for read-intensive applications in particular, Smart Read Refresh™ is employed to make sure that during read operations, when the read operation threshold is reached, the data is refreshed by re-writing it to a different block for subsequent use.

Data Security

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.

CoreEraser

The CoreEraser comes in three types of block sanitizations (Quick Erase, Full Erase and Mil Erase) and can be implemented through software commands or through the hardware architecture.

Signed Firmware

A digital signature that works inside firmware which can ensure the firmware comes from a trusted device and avoid malicious attacks.

TCG Opal 2.0

Advanced encryption mechanism for data security

Apacer has stepped in with TCG Opal-compliant SSDs as the demand for more invincible data security solutions gives self-encrypting drives (SEDs) a strong foothold in the industrial SSD market.

- AES 256-bit encryption
- 100 % hardware encryption
- Fast data encryption
- Pre-boot authentication
- LBA range assignment

Reliability & Endurance

Conformal Coating

Conformal coating improves product reliability when applied on the surface of printed circuit boards. This protective film can safeguard devices from dust ingression and liquid immersion.

ESD Protection

Excellent electrostatic protection which has passed the test conditions of IEC 61000-4-2: air discharge ±15KV and contact discharge ±8KV. Provides a high standard of protection for electromagnetic susceptibility (EMS) that meets the medical equipment standard EN60601-1-2.

SLC-liteX

Apacer's 3D NAND SLC-liteX technology breaks through the limitations of existing technology and provides up to 30,000 P/E cycles, which is 10 times more than MLC or industrial 3D TLC.

SLC-lite

SLC-lite is Apacer's proprietary technology that strikes a cost-performance balance between MLC and SLC flash types, making it an ideal alternative solution for mission-critical embedded or industrial applications.

Longevity

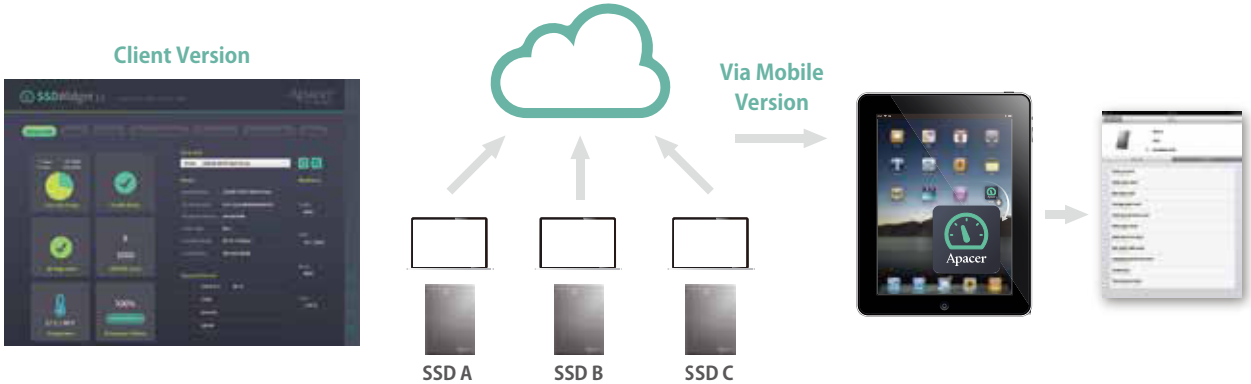
CoreSnapshot

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 from translating into operational risks and losses.

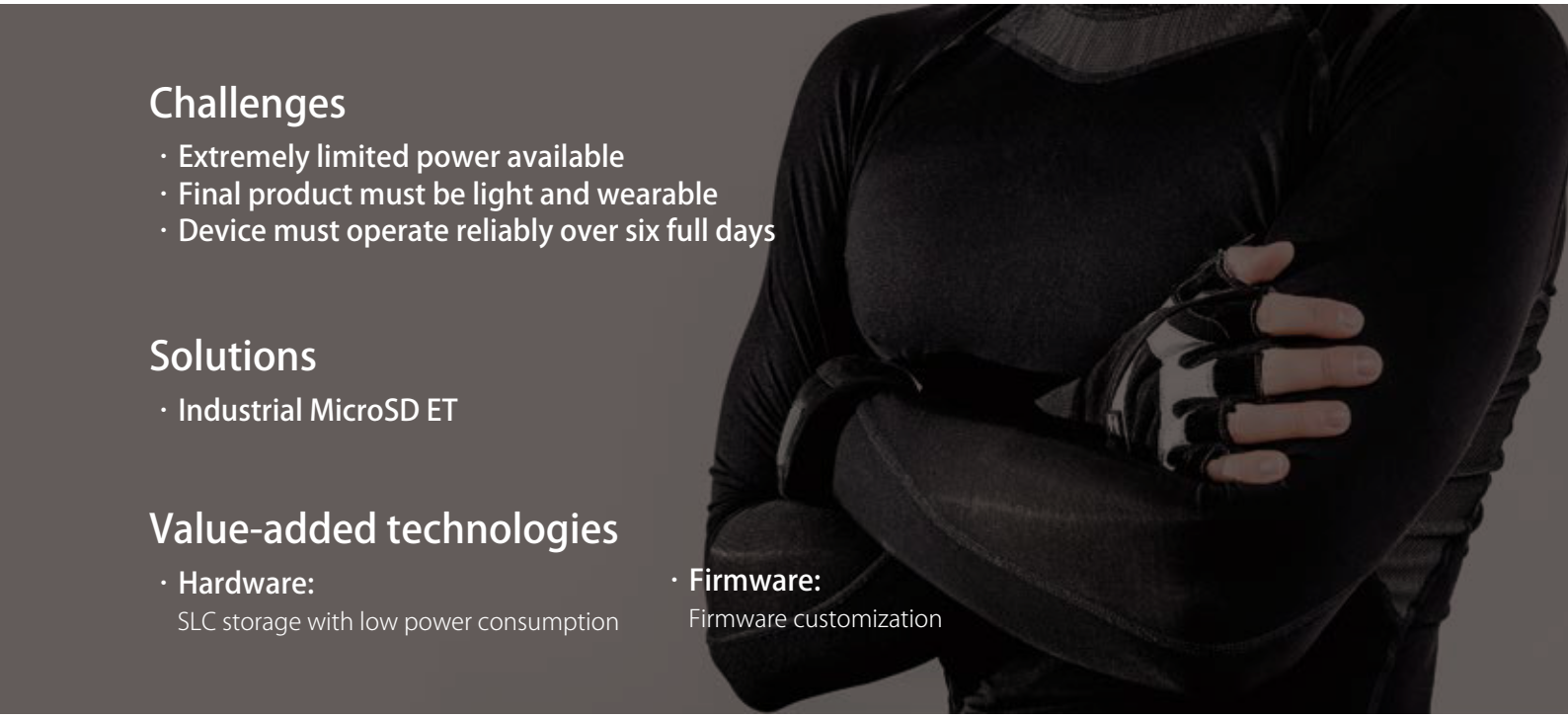
SSDWidget 2.0

Intelligent and comprehensive monitoring and maintaining software

This program features advanced monitoring that allows users to get more detailed read and write records for further use-behavior analysis. The SSD self-test and performance optimization are also included.



Success Story - They Chose Apacer



Challenges

- Extremely limited power available
- Final product must be light and wearable
- Device must operate reliably over six full days

Solutions

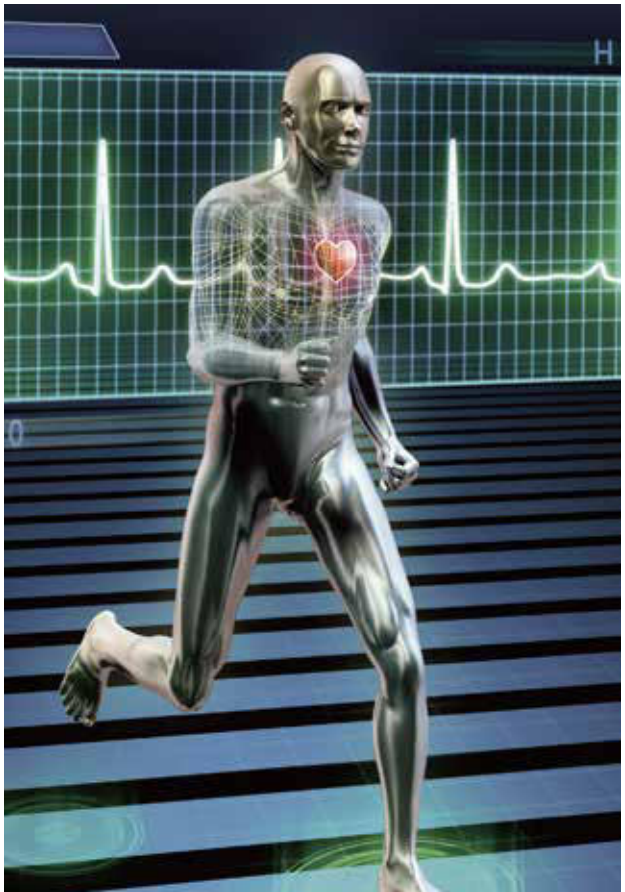
- Industrial MicroSD ET

Value-added technologies

- **Hardware:**
  SLC storage with low power consumption
- **Firmware:**
  Firmware customization

The Customer and the Application: Heartbeat Detector and Recorder

Our customer is a major leading manufacturer of healthcare equipment, ranging from devices used in top hospitals to products aimed at home use. Their latest product, still in the design stages, was a heartbeat detector and recorder, worn by patients to allow doctors to remotely monitor their recovery.



Challenges

The customer had certain hardware requirements that made finding a suitable storage solution difficult. For one thing, their products were made to be lightweight and wearable. A bulky, heavy battery pack was out of the question. Instead, a small, compact battery had been selected, but this could only supply a small fixed amount of power to the many components required. So they needed a storage solution that would draw only an extremely limited amount of power during operation, and would enter sleep mode when not in use.

Another issue was that the doctor needed to monitor each patient for 6 full days. The heartbeat detector needed to function smoothly and reliably for this entire period, and there would be no opportunity to replace or recharge the battery during this time.

Solutions and Technologies

The customer's R&D team had tried various storage solutions, but had not been able to find a product that could run on such a small amount of current and still operate for six full days. But they had an idea which company could help them overcome this hurdle – Apacer. They came to us and laid out the problem, and our technical experts tackled the issue right away.

First of all, our programmers began tweaking the device's command set. In a short period of time, they had adjusted various internal settings to allow the device to operate without problems even when the current drawn was extremely low. They also set up a power-saving mode within the firmware so that power would not be consumed when it was not needed. Soon they were able to make the heartbeat detector run for longer periods of time, but despite their best efforts, the 6-day threshold had not been reached.

But Apacer wasn't giving up. After a brainstorming session, the team switched to a different NAND chip configuration. Although this meant that the total volume of storage available was reduced, it was still enough to store 6 full days' worth of data. And the new chip was capable of operating while drawing even less current than the previous one. Finally, the tests proved that a Industrial MicroSD ET storage solution could store all the data needed while still providing accurate monitoring over the entire 6-day period.

Results and Benefits

As the product ended up helping doctors and patients around the world, demand grew steadily for the client's heartbeat monitor. They continue to work with us to help them create innovative healthcare devices, as they trust Apacer to advise them on which storage solutions can meet or exceed their strict design requirements.

Additional Support

Longevity

Fixed BOM solution,
EOL & LTB notice

Strong customization capabilities

Strong HW/FW
engineering know-how

Service

Real-time and responsive
after-sales service

Apacer's Strengths

Extremely durable designs

Industrial solutions for healthcare applications

ISO 13485 CE FC MIL-STD 810G RoHS REACH IP 67

Longevity

- Fixed BOM support
- 6+6 PCN/EOL Policy
- Unique S/N for RMA tracking

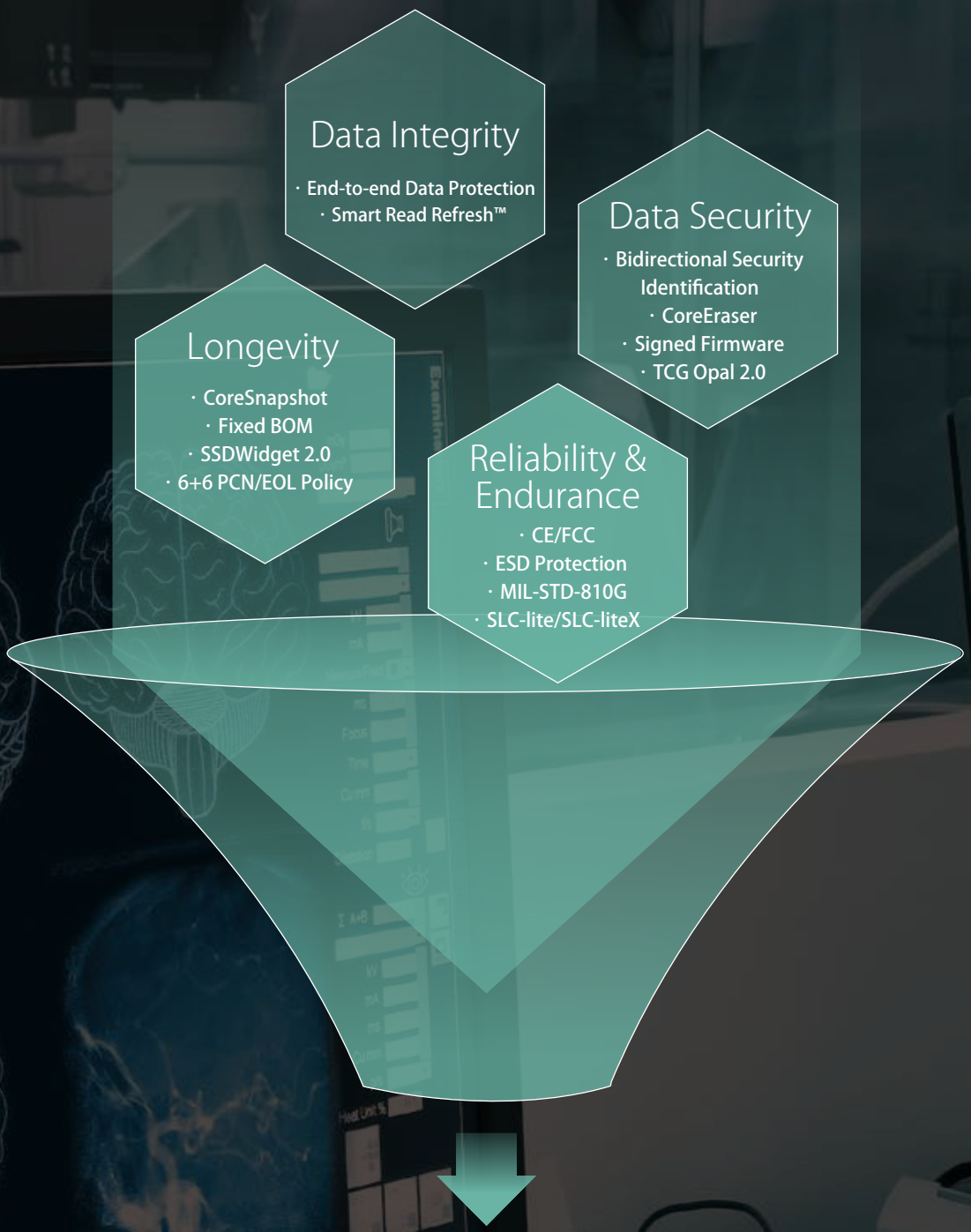
Strong R&D and customization capabilities

Apacer's Premium Package: WellnessPro™

A Tailor-made Technology Set for Healthcare Applications

Apacer has developed a tailor-made technology set, "WellnessPro™", to meet the multi-faceted requirements of health-care applications and help customers find the right solutions, further simplifying the process of implementation.

WellnessPro is classified into three levels based on customers' requirements and Apacer's strong industry background.



2.5" SATA SSD

Model	SV250-25	SM230-25	SU210-25	SS210-25
Interface	SATA 3.0 (6Gb/s)	SATA 3.0 (6Gb/s)	SATA 3.0 (6Gb/s)	SATA 3.0 (6Gb/s)
NAND Flash Type	3D TLC	MLC	MLC	SLC
Connector	(7+15) pin male	(7+15) pin male	(7+15) pin male	(7+15) pin male
Form Factor	2.5"	2.5"	2.5"	2.5"
Capacity	30GB~480GB	With AES 256 support: 32GB~1TB With TCG Opal 2.0 support: 32GB~512GB	16GB~256GB	8GB~240GB
External DRAM	No	No	Yes	Yes
Sustained Read Performance (MB/sec)	Up to 560	Up to 530	Up to 545	Up to 530
Sustained Write Performance (MB/sec)	Up to 520	Up to 520	Up to 450	Up to 445
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
Thermal Sensor	Yes	Yes	Yes	Yes
ECC Engine	Low-Density Parity-Check (LDPC) Code	Built-in 40-bit per 1K bytes BCH ECC	Built-in 40-bit per 1K bytes BCH ECC	Built-in 40-bit per 1K bytes BCH ECC
IOPS (4K Random Write)	73K	65K	80K	76K
Shock	Operating:50G/11ms,(compliant with MIL-STD-202G) Non-operating: 1500G/0.5ms,(compliant with MIL-STD-883K)			
Vibration	Operating: 7.69 GRMS, 20~2000Hz/random,(compliant with MIL-STD-810G) Non-operating: 4.02Grms,, 15~2000Hz/sine, (compliant with MIL-STD-810G)			
Operating Voltage	5.0 V ± 5%	5.0 V ± 5%	5.0 V ± 5%	5.0 V ± 5%
Power Consumption	Active mode: 290 mA / Idle mode: 55 mA	Active mode: 500 mA / Idle mode: 100	Active mode: 680 mA & Idle mode: 125	Active mode: 500 mA / Idle mode: 125
Dimension (mm)	7mm: 100.00 x 69.85 x 6.90 9.5mm: 100.00 x 69.85 x 9.30	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 9.3	7mm: 100.00 x 69.85 x 6.90 9.5mm: 100.00 x 69.85 x 9.3
MTBF	>1,000,000	>1,200,000	>1,000,000	>2,000,000

mSATA MO-300




Model	SM210-300	SM230-300	SU210-300	SS210-300
Interface	SATA 3.0 (6Gb/s)	SATA3.0	SATA 3.0 (6Gb/s)	SATA 3.0 (6Gb/s)
NAND Flash Type	MLC	MLC	MLC	SLC
Connector	52 pin	52 pin	52 pin	52 pin
Form Factor	JEDEC MO-300	JEDEC MO-300	JEDEC MO-300	JEDEC MO-300
Capacity	8GB~512GB	32GB~512GB	8GB~256GB	2GB~128GB
External DRAM	Yes	No	Yes	Yes
Sustained Read Performance (MB/sec)	Up to 545	Up to 560	Up to 555	Up to 525
Sustained Write Performance (MB/sec)	Up to 490	Up to 510	Up to 465	Up to 445
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
Thermal Sensor	Yes	Yes	Yes	Yes
ECC Engine	Built-in 40-bit per 1K bytes BCH ECC	Built-in 40-bit per 1K bytes BCH ECC	Built-in 40-bit per 1K bytes BCH ECC	Built-in 40-bit per 1K bytes BCH ECC
IOPS (4K Random Write)	78K	58K	78K	76K
Shock	Operating:50G/11ms,(compliant with MIL-STD-202G) Non-operating: 1500G/0.5ms,(compliant with MIL-STD-883K)			
Vibration	Operating: 7.69 GRMS, 20~2000Hz/random,(compliant with MIL-STD-810G) Non-operating: 4.02Grms,, 15~2000Hz/sine, (compliant with MIL-STD-810G)			
Operating Voltage	3.3 V ± 5%	3.3 V ± 5%	3.3 V ± 5%	3.3 V ± 5%
Power Consumption	Active mode: 960 mA & Idle mode: 180 mA	Active mode: 935 mA / Idle mode: 130 mA	Active mode: 785 mA / Idle mode: 105 mA	Active mode: 685 mA / Idle mode: 180 mA
Dimension (mm)	50.80 x 29.85 x 3.8	50.80 x 29.85 x 3.8	50.8 x 29.85 x 3.8	50.80 x 29.85 x 3.8
MTBF	>1,000,000	>1,000,000	>1,000,000	>2,000,000
Security	No	AES TCG Opal2.0	No	No

M.2 2280 / M.2 2242

Model	ST170-M280	SM230-M280	SS210-M280	SV250-M242	SM230-M242
Interface	SATA 3.0 (6Gb/s)	SATA3.0	SATA3.0	SATA3.0	SATA3.0
NAND Flash Type	3D TLC	MLC	SLC	3D TLC	MLC
Connector	75-pin SATA-based M.2 module pinout	M.2 B & M key	M.2 B & M key	M.2 B & M key	M.2 B & M key
Form Factor	M.2 2280-D5-B-M	M.2 2280-D5-B-M	M.2 2280-D5-B-M	M.2 2242-D5-B-M	M.2 2242-D5-B-M
Capacity	30GB ~ 960GB	32GB~1TB	Single side: 16~64 GB Double side: 128 GB	30GB~480GB	8GB~256GB
External DRAM	No	No	Yes	No	No
Sustained Read Performance (MB/sec)	Up to 560	Up to 560	Up to 555	Up to 560	Up to 555
Sustained Write Performance (MB/sec)	Up to 515	Up to 510	Up to 445	Up to 520	Up to 470
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)	-40 ~ + 100	-40 ~ + 100	-40 ~ + 100	-40 ~ + 100	-40 ~ + 100
Thermal Sensor	Yes	Yes	Yes	Yes	Yes
ECC Engine	Low-Density Parity-Check (LDPC) Code	Built-in up to 76-bit per 1K bytes BCH ECC	Built-in up to 72-bit per 1K bytes BCH ECC	Low-Density Parity-Check (LDPC) Code	Built-in up to 72-bit per 1K bytes BCH ECC
IOPS (4K Random Write)	87K	63K	75K	75K	41K
Shock	Operating:50G/11ms,(compliant with MIL-STD-202G) Non-operating: 1500G/0.5ms,(compliant with MIL-STD-883K)				
Vibration	Operating: 7.69 GRMS, 20~2000Hz/random,(compliant with MIL-STD-810G) Non-operating: 4.02Grms,, 15~2000Hz/sine, (compliant with MIL-STD-810G)				
Operating Voltage	3.3 V ± 5%	3.3 V ± 5%	3.3 V ± 5%	3.3 V ± 5%	3.3 V ± 5%
Power Consumption	Active mode: 540mA & Idle mode: 95 mA	Active mode: 840mA & Idle mode: 145 mA	Active mode: 705mA & Idle mode: 155 mA	Active mode: 405 mA & Idle mode: 70 mA	Active mode: 695mA & Idle mode: 135 mA
Dimension (mm)	80.00 x 22.00 x 3.58	80 x 22.00 x 3.60	80 x 22.00 x 3.60	42.00 x 22.00 x 3.80	42.00 x 22.00 x 3.80
MTBF	>1,000,000	>1,000,000	>2,000,000	>1,000,000	>1,000,000
Security	No	AES TCG Opal2.0	No	AES TCG Opal2.0	AES TCG Opal2.0

Industrial microSD Card/ SD/ CF/ USB Drive




Model	Industrial SDHC 5.1 H2-M	Industrial microSD R1	IndustrialSD R1	Industrial CF6 (SLC)	CS710-CF	EH353
Interface	SD 5.1	SD3.0	SD3.0	PC Card Memory Mode; PC Card I/O Mode; True IDE Mode	PC Card Memory Mode; PC Card I/O Mode; True IDE Mode	USB3.0
NAND Flash Type	MLC	SLC	SLC	SLC	SLC	SLC
Connector	8-pin	8-pin	9-pin	50-pin	50-pin	USB3.0 A Type Plug
Form Factor	microSD	microSD	SD	CompactFlash Type I	CompactFlash Type I	USB flash drive
Capacity	SDHC:4GB~32GB	SD:1GB~2GB;SDHC:4~8GB SD:1GB~2GB;SDHC:4~8GB	SD:1GB~2GB; SDHC:4~16GB	512MB~64GB	128MB~64GB	265MB~32GB
Sustained Read Performance (MB/sec)	Up to 90	Up to 34	Up to 43	Up to 110	Up to 55	Up to 80
Sustained Write Performance (MB/sec)	Up to 42	Up to 28	Up to 41	Up to 80	Up to 55	Up to 70
Standard Operating Temperature(°C)	-25 ~ + 85	-25 ~ + 85	-25 ~ + 85	0 ~ + 70	0 ~ + 70	0 ~ + 70
Wide Temperature (°C)	-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
ECC Engine	Built-in 42-bit per 1K bytes BCH ECC	Built-in 43-bit per 1K bytes BCH ECC	Built-in 43-bit per 1K bytes BCH ECC	Built-in 72-bit per 1K bytes BCH ECC	Built-in BCH ECC capable of correcting up to 96 bits in 1KB data	Built-in 24-bit per 1K bytes BCH ECC
Shock	(Operating)1,500G, 0.5ms	(Operating) 1,500G, 0.5ms	(Operating) 1,000G, 0.5ms	Operation: 50G, 11ms Non-operation: 1500G, 0.5ms		
Vibration	20Hz~80Hz/1.52mm (frequency/ displacement) 80Hz~2,000Hz/20G (frequency/accelerate)	Operating: 7.69(Grms), 20~2000(Hz)/random (comply with MIL-STD-810G) Non-operating: 4.02(Grms), 15~2000(Hz)/ random (comply with MIL-STD-810G)	10Hz~50Hz/3mm (frequency/ displacement) 50Hz~2,000Hz/15G (frequency/accelerate)	Operation: 7.69 Grms, 20~2000 Hz/random (compliant with MIL-STD-810G) Non-operation: 15 G, 10 ~ 2000 Hz/sine		
Operating Voltage	3.3 V ± 5%	3.3 V ± 5%	3.3 V ± 5%	3.3 V / 5.0 V ± 5%	3.3 V / 5.0 V ± 5%	5.0 V ± 5%
Power Consumption	Active mode: 105 mA & Idle mode: 270 uA	Active mode: 115 mA & Idle mode: 265 uA	Active mode: 120 mA & Idle mode: 260 uA	Active mode: 310 mA, Standby mode: 5 mA	Active mode: 310 mA, Standby mode: 5 mA	Active mode: 225 mA & Idle mode: 65 mA
Dimension (mm)	15x11x1	15x11x1	32x24x2.1	36.4 x 42.8 x 3.3	36.4 x 42.8 x 3.3	59 x 18.4 x 9.1
MTBF (hours)	>3,000,000	>3,000,000	>3,000,000	>2,000,000	>2,000,000	>2,000,000

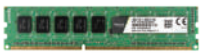
SODIMM

Model	DDR4 SODIMM	DDR3 SODIMM
Module Type	SODIMM	SODIMM
Memory Technology	DDR4	DDR3
Frequency	2133/2400/2666	1066/1333/1600/1866
Density	2G/4G/8G/16G	1G/2G/4G/8G/16G
Voltage	1.2v	1.5v/1.35v
Pin Count	260-Pin	204-Pin
Width	64-Bit	64-Bit
PCB Height	1.18"	1.18"
Operation Temperature	TC=-0℃ to 85℃ / -40℃ to +85℃	TC=-0℃ to 85℃ / -40℃ to +85℃
Value-Added	Underfill, Conformal Coating	Underfill, Conformal Coating

ECC SODIMM

Model	DDR4 ECC SODIMM	DDR3 ECC SODIMM
Module Type	ECC SODIMM	ECC SODIMM
Memory Technology	DDR4	DDR3
Frequency	2133/2400/2666	1066/1333/1600/1866
Density	4G/8G/16G	1G/2G/4G/8G/16G
Voltage	1.2v	1.5v/1.35v
Pin Count	260-Pin	204-Pin
Width	72-Bit	72-Bit
PCB Height	1.18"	1.18"
Operation Temperature	TC=-0℃ to 85℃ / -40℃ to +85℃	TC=-0℃ to 85℃ / -40℃ to +85℃
Value-Added	Thermal Sensor, 30µ, Underfill, Conformal Coating	Thermal Sensor, 30µ, Underfill, Conformal Coating

ECC UDIMM

Model	DDR4 ECC UDIMM	DDR3 ECC UDIMM
Module Type	ECC UDIMM	ECC UDIMM
Memory Technology	DDR4	DDR3
Frequency	2133/2400/2666	1066/1333/1600/1866
Density	4G/8G/16G	1G/2G/4G/8G/16G
Voltage	1.2v	1.5v/1.35v
Pin Count	288-Pin	240-Pin
Width	72-Bit	72-Bit
PCB Height	1.23"	1.18"
Operation Temperature	TC=-0℃ to 85℃ / -40 to +85	TC=-0℃ to 85℃ / -40 to +85
Value-Added	Thermal Sensor, 30µ, Underfill, Conformal Coating	Thermal Sensor, 30µ, Underfill, Conformal Coating

VLP ECC UDIMM / VLP ECC SODIMM



Model	DDR4 VLP ECC UDIMM	DDR3 VLP ECC UDIMM	DDR4 VLP ECC SODIMM
Module Type	VLP ECC UDIMM	VLP ECC UDIMM	VLP ECC SODIMM
Memory Technology	DDR4	DDR3	DDR4
Frequency	2133/2400/2666	1066/1333/1600	2133/2400/2666
Density	4G/8G/16G	1G/2G/4G/8G	4G/8G
Voltage	1.2v	1.5v/1.35v	1.2v
Pin Count	288-Pin	204-Pin	260-Pin
Width	72-Bit	72-Bit	72-Bit
PCB Height	0.738"	0.738"	0.7"
Operation Temperature	TC=-0℃ to 85℃	TC=-0℃ to 85℃	TC=-0℃ to 85℃
Value-Added	Thermal Sensor, 30µ, Underfill, Conformal Coating	Thermal Sensor, 30µ, Underfill, Conformal Coating	Thermal Sensor, 30µ, Underfill, Conformal Coating

About Apacer

Apacer is a global leader in digital storage solutions devoted to innovative storage technology and services. After 20 years in the industry, we remain dedicated to our belief in "persistence in doing the right things." 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 **corporate social responsibility (CSR)** 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

ISO 9001:2015 ISO 14001:2015 OHSAS 18001:2015 IECQ CQ80000