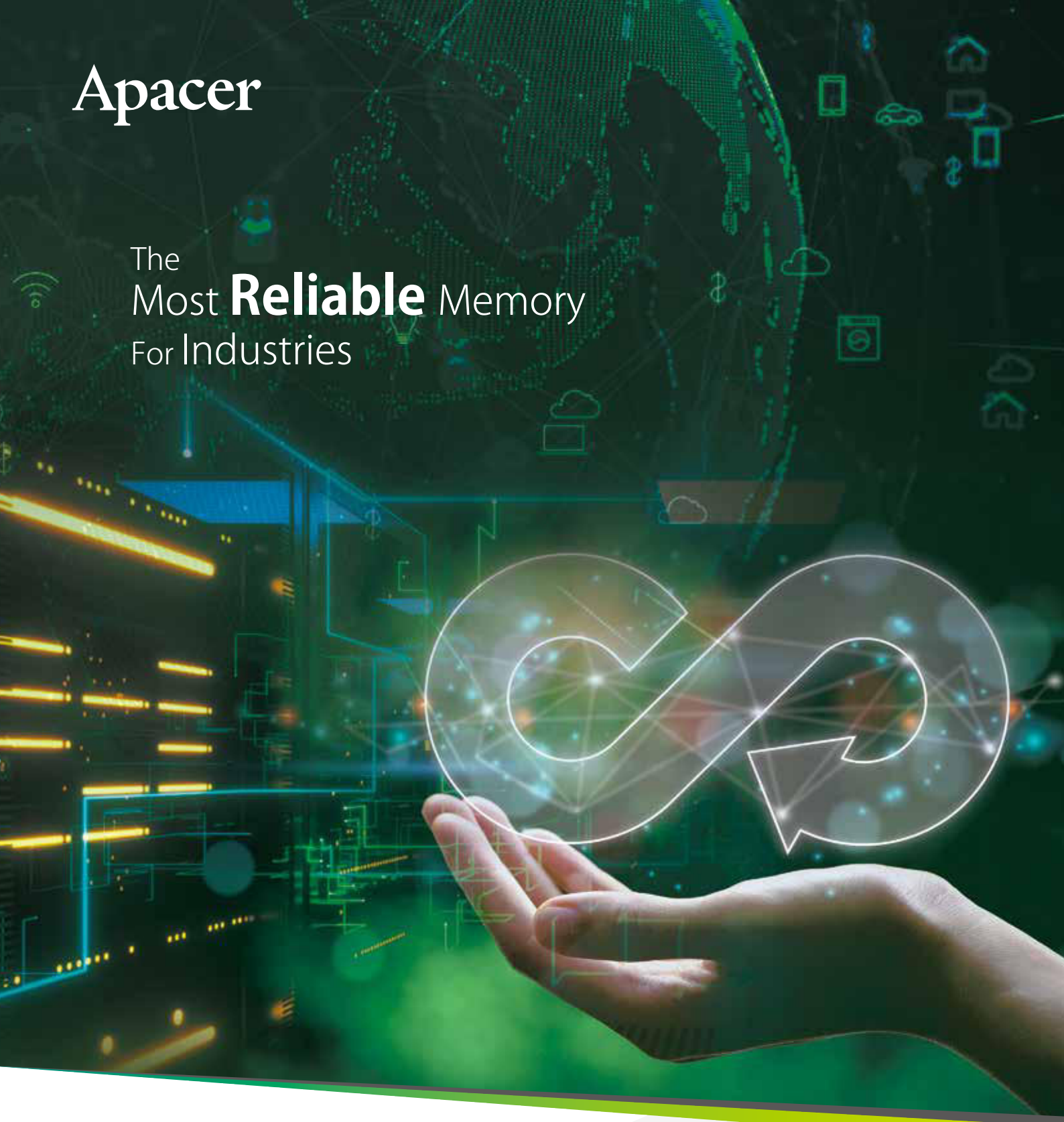
Apacer



Industrial DRAM Solutions

www.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

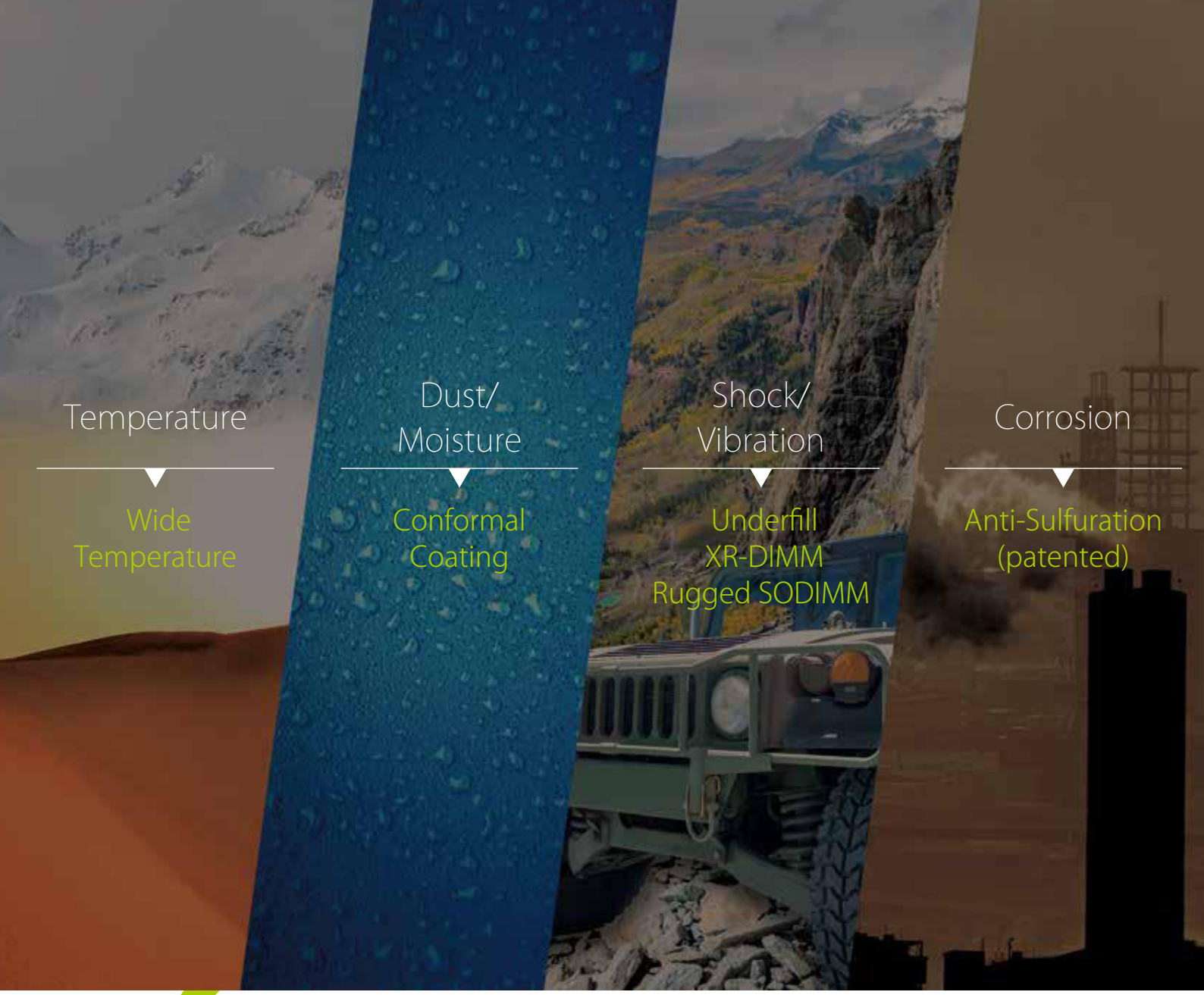
- Tier 1 industrial SSD & memory supplier; delivered over 352 million units
- Comprehensive experience in product customization (across industries)

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



Solutions for Extreme Environments

Nowadays, as industrial memory products have been widely used in various kinds of applications, the need for memory modules that can maintain highly stable operating performance in harsh conditions is remarkably increasing.

As an industrial solution veteran and leading memory brand, Apacer always takes an outside-in perspective and strives for new breakthroughs, providing many value-added solutions and technologies for extreme environments to ensure product reliability, stability and durability.

Technologies and Advantages

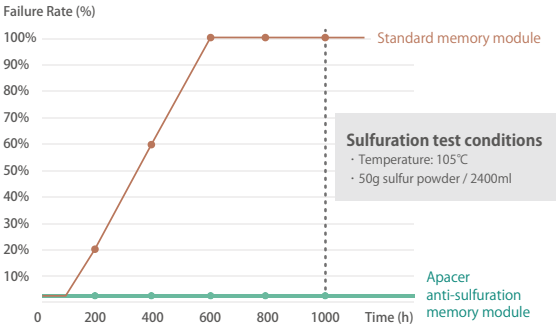
Anti-Sulfuration

PATENTED

Apacer's patented anti-sulfuration memory modules replace standard silver electrodes with an exclusive alloy which has passed the ASTM B809-95 anti-sulfuration test.

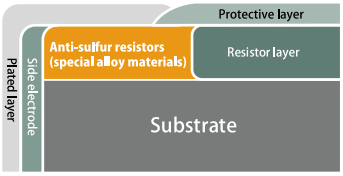
- **World's first anti-sulfuration memory modules**
- **Solve corrosion problems effectively and increase overall system lifespan**

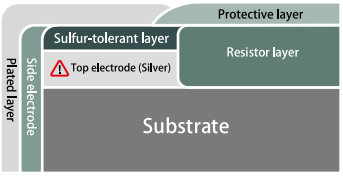
Anti-sulfuration test



Anti-sulfuration technology comparison

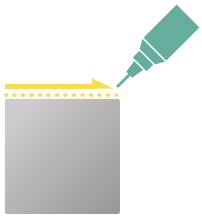
	Apacer's advanced anti-sulfuration technology	Traditional anti-sulfuration technology
Method	Adopts exclusive and improved alloy materials replace normal electrode	Covers an sulfur-tolerant layer to protect the electrode
Advantages / Disadvantages	Reliable anti-sulfuration performance, improved product reliability and durability	Unstable anti-sulfuration performance due to process failure



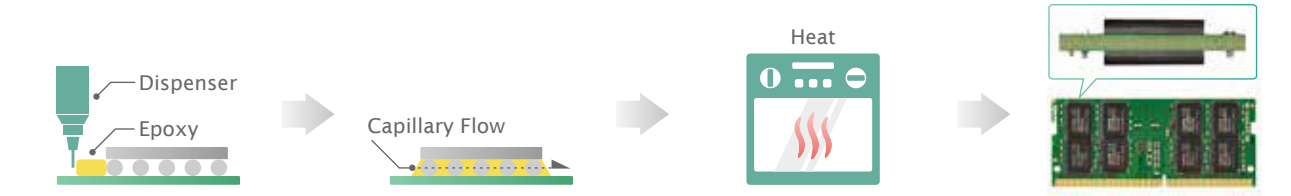


Underfill

Apacer provides underfill technology to increase product reliability and resistance to various thermal and mechanical shocks, ensuring that products continue to operate normally in high vibration and under extreme changes in environmental temperature.



- **Strengthens the solder joints between solder balls and printed circuit board**
- **Increases the product's resistance against shock and vibration**
- **Reduces thermal stress damage**
- **Complies with MIL-STD-810G shock and vibration requirements**
- **Increases product reliability and lifespan**

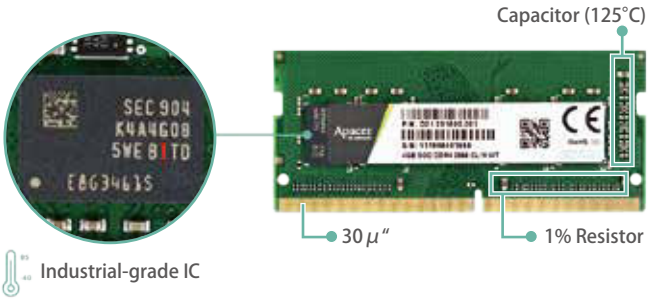


Wide Temperature

Especially designed for harsh climates and special environmental conditions.

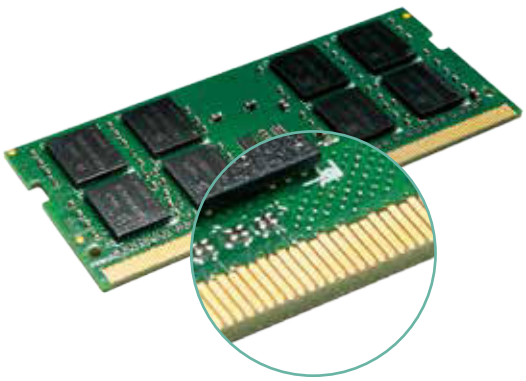
- **Operating temperature range: -40 °C ≤ TC ≤ 85°C**
- **All industrial-grade components (DRAM, PCB, resistors and capacitors) ensure stability and reliability**
- **High/Low temp. test / Temp. cycling test**
- **Power cycling test**

Insists on using industrial-grade DRAM ICs



Apacer's strengths of wide temperature memory

Apacer industrial-grade wide temp. memory		Standard memory (Commercial)
Industrial-grade (-40 ~ +85°C) Suitable for extreme high and low temperature environment	**DRAM**	Commercial-grade (0 ~ +85°C)
30 μ" Avoids gold finger oxidation and ensures the stability of signal transmission	**PCB plating thickness**	3 μ"
Up to +125°C Ensures more stable voltage supply in high-temperature environment	**Capacitor temp. specification**	+85°C
± 1% tolerance Increases circuit stability and durability	**Resistor specification**	± 5% tolerance



30μ Gold Finger

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

Conformal Coating

Enhances reliability of products by applying coatings on the surface of printed circuit boards. The protective film can safeguard devices from dust ingression and liquid immersion.

- **Uses automated spraying to maintain precise coating thickness**
- **Enhances product reliability**
- **Prolongs DRAM modules' lifespan**

Apacer DRAM module with conformal coating

Extremely Rugged XR-DIMM

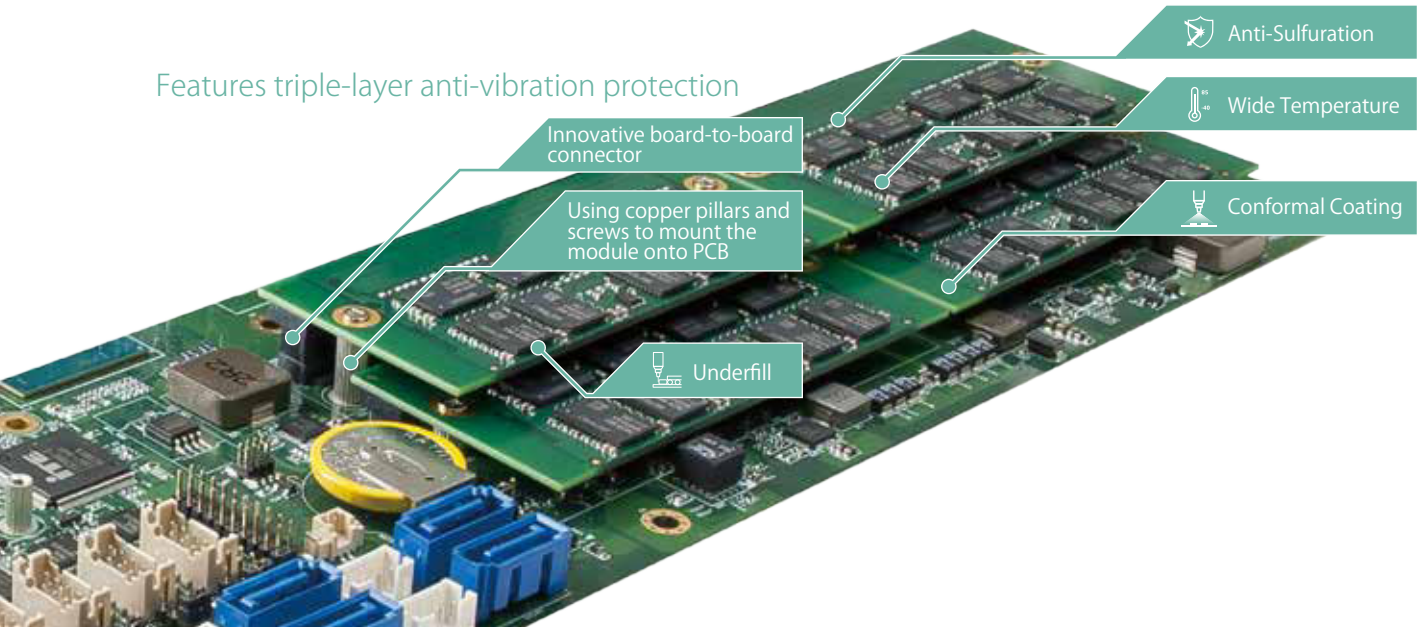
- **Innovative board-to-board connector design**
- **Adopts highly durable 300-pin connector and mounting holes to improve the anti-vibration and anti-shock reliability**
- **Dual anti-shock and vibration certification: RTCA DO-160G / MIL-STD-810G**
- **Supports multiple protection technologies and value-added applications**

Rugged Memory Comparison

	XR-DIMM Rugged Memory	Onboard memory
Anti-shock & anti-vibration ability	Great	Great
Memory upgradability	Yes	No
Repair difficulty	Easy	Difficult
RMA cost	Low	High
Stackable design	Yes	No
Motherboard space usage	Flexible	Uniform and inflexible

Supports multiple value-added applications

Features triple-layer anti-vibration protection



Embedded

UDIMM (Unbuffered DIMM)

- JEDEC-compliant design
- Applicable for desktop computers, industrial computers and embedded systems

Model	DDR5 UDIMM	DDR4 UDIMM	DDR3 UDIMM	DDR2 UDIMM	DDR UDIMM
Module Type	UDIMM	UDIMM	UDIMM	UDIMM	UDIMM
Memory Technology	DDR5	DDR4	DDR3	DDR2	DDR
Frequency	4800/5600	2133/2400/2666 2933/3200	1066/1333/1600/1866	533/667/800	266/333/400
Density	8G/16G/32G	2G/4G/8G/16G/32G	1G/2G/4G/8G/16G	1G/2G/4G	512M/1G
Voltage	1.1v	1.2v	1.5v/1.35v	1.8v	2.5v/2.6v
Pin Count	288-Pin	288-Pin	240-Pin	240-Pin	184-Pin
Width	64-Bit	64-Bit	64-Bit	64-Bit	64-Bit
PCB Height	1.23"	1.23"	1.18"	1.18"	1.25"
Operation Temperature	TC=0℃ to 85℃	TC=0℃ to 85℃	TC=0℃ to 85℃	TC=0℃ to 85℃	TA=0℃ to 70℃
Application	Gaming / Healthcare / IoT / Factory Automation				
Value-Added	Underfill, Conformal Coating	Underfill, Conformal Coating	Underfill, Conformal Coating	Underfill, Conformal Coating	Conformal Coating

SODIMM (Small Outline DIMM)

- JEDEC-compliant design
- Applicable for space-constraint systems, such as notebook computers, small-size industrial computers and embedded systems

Model	DDR5 SODIMM	DDR4 SODIMM	DDR3 SODIMM	DDR2 SODIMM	DDR SODIMM
Module Type	SODIMM	SODIMM	SODIMM	SODIMM	SODIMM
Memory Technology	DDR5	DDR4	DDR3	DDR2	DDR
Frequency	4800/5600	2133/2400/2666 2933/3200	1066/1333/1600/1866	533/667/800	266/333/400
Density	8G/16G/32G	2G/4G/8G/16G/32G	1G/2G/4G/8G/16G	1G/2G/4G	512M/1G
Voltage	1.1v	1.2v	1.5v/1.35v	1.8v	2.5v/2.6v
Pin Count	262-Pin	260-Pin	204-Pin	200-Pin	200-Pin
Width	64-Bit	64-Bit	64-Bit	64-Bit	64-Bit
PCB Height	1.18"	1.18"	1.18"	1.18"	1.25"
Operation Temperature	TC=0℃ to 85℃	TC=0℃ to 85℃	TC=0℃ to 85℃	TC=0℃ to 85℃	TA=0℃ to 70℃
Application	Gaming / IoT / Transportation / Factory Automation				
Value-Added	Underfill, Conformal Coating	Underfill, Conformal Coating	Underfill, Conformal Coating	Underfill, Conformal Coating	Underfill, Conformal Coating

Server/Workstation

RDIMM (ECC Registered DIMM)

- Includes a register to enhance clock, command and control signals
- Supports ECC error detection and correction
- Supports a built-in temperature-monitoring thermal sensor
- Applicable for enterprise servers and cloud data centers



Model	DDR5 RDIMM	DDR4 RDIMM	DDR3 RDIMM
Module Type	RDIMM	RDIMM	RDIMM
Memory Technology	DDR5	DDR4	DDR3
Frequency	4800	2133/2400/2666/2933/3200	1066/1333/1600/1866
Density	16G/32G/64G/128G	4G/8G/16G/32G/64G/128G	4G/8G
Voltage	1.1v	1.2v	1.5v/1.35v
Pin Count	288-Pin	288-Pin	240-Pin
Width	80-Bit	72-Bit	72-Bit
PCB Height	1.23"	1.23"	1.18"
Operation Temperature	TC=0℃ to 85℃	TC=0℃ to 85℃	TC=0℃ to 85℃
Application	Healthcare / Server & Networking		
Value-Added			

LRDIMM (Load Reduced DIMM)

- Includes a register to enhance clock, command and control signals
- Enhanced data signal with placing data buffer
- Supports ECC error detection and correction
- Supports a built-in temperature-monitoring thermal sensor
- Applicable for enterprise servers and cloud data centers

Model	DDR4 LRDIMM
Module Type	LRDIMM
Memory Technology	DDR4
Frequency	2666/2933/3200
Density	64G/128G
Voltage	1.2v
Pin Count	288-Pin
Width	72-Bit
PCB Height	1.23"
Operation Temperature	TC=0℃ to 85℃
Application	Healthcare / Server & Networking
Value-Added	

Server/Workstation

ECC UDIMM (ECC Unbuffered DIMM)

- Supports ECC error detection and correction
- Supports a built-in temperature-monitoring thermal sensor
- Applicable for servers and workstations that require highly stable operation




Model	DDR5 ECC UDIMM	DDR4 ECC UDIMM	DDR3 ECC UDIMM	DDR2 ECC UDIMM
Module Type	ECC UDIMM	ECC UDIMM	ECC UDIMM	ECC UDIMM
Memory Technology	DDR5	DDR4	DDR3	DDR2
Frequency	4800/5600	2133/2400/2666/2933/3200	1066/1333/1600/1866	533/667/800
Density	16G/32G	4G/8G/16G/32G	2G/4G/8G/16G	1G/2G/4G
Voltage	1.1v	1.2v	1.5v/1.35v	1.8v
Pin Count	288-Pin	288-Pin	240-Pin	240-Pin
Width	72-Bit	72-Bit	72-Bit	72-Bit
PCB Height	1.23"	1.23"	1.18"	1.18"
Operation Temperature	TC=0℃ to 85℃	TC=0℃ to 85℃	TC=0℃ to 85℃	TC=0℃ to 85℃
Application	Healthcare / IoT / Server & Netwoking / Factory Automation			
Value-Added	Thermal Sensor, 30µ Gold Finger, Underfill, Conformal Coating	Thermal Sensor, 30µ Gold Finger, Underfill, Conformal Coating	Thermal Sensor, 30µ Gold Finger, Underfill, Conformal Coating	30µ Gold Finger, Underfill, Conformal Coating

ECC SODIMM (ECC Small Outline DIMM)

- Supports ECC error detection and correction
- Supports a built-in temperature-monitoring thermal sensor
- Applicable for microservers, workstations, networking platforms and embedded systems



Model	DDR5 ECC SODIMM	DDR4 ECC SODIMM	DDR3 ECC SODIMM
Module Type	ECC SODIMM	ECC SODIMM	ECC SODIMM
Memory Technology	DDR5	DDR4	DDR3
Frequency	4800/5600	2133/2400/2666/2933/3200	1066/1333/1600/1866
Density	16G/32G	4G/8G/16G/32G	2G/4G/8G/16G
Voltage	1.1v	1.2v	1.5v/1.35v
Pin Count	262-Pin	260-Pin	204-Pin
Width	72-Bit	72-Bit	72-Bit
PCB Height	1.18"	1.18"	1.18"
Operation Temperature	TC=0℃ to 85℃	TC=0℃ to 85℃	TC=0℃ to 85℃
Application	IoT / Server & Networking / Transportation / Factory Automation		
Value-Added	Thermal Sensor, 30µ Gold Finger, Underfill, Conformal Coating	Thermal Sensor, 30µ Gold Finger, Underfill, Conformal Coating	30µ Gold Finger, Underfill, Conformal Coating

Server/Workstation

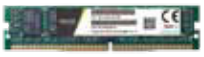
SORDIMM (Small Outline ECC Registered DIMM)

- Achieves signal synchronization and stability with the use of a register
- Supports ECC error detection and correction
- Supports a built-in temperature-monitoring thermal sensor
- Applicable for small-sized microserver and networking equipment, such as switches and routers

Model	DDR4 SORDIMM
Module Type	(VLP) SORDIMM
Memory Technology	DDR4
Frequency	2133/2400/2666
Density	4G/8G/16G
Voltage	1.2v
Pin Count	260-Pin
Width	72-Bit
PCB Height	0.738"/1.18"
Operation Temperature	TC=0℃ to 85℃
Application	Server & Networking
Value-Added	Thermal Sensor, 30µ Gold Finger, Underfill, Conformal Coating

VLP Mini RDIMM / VLP Mini ECC UDIMM

- Supports a built-in temperature-monitoring thermal sensor
- High capacity, high performance and high stability
- Supports ECC error detection and correction
- Measures only 80mm long
- Applicable for space-constrained networking, communication, server and embedded system



Model	DDR4 Mini RDIMM	DDR4 VLP Mini ECC UDIMM
Module Type	(VLP) Mini RDIMM	VLP Mini ECC UDIMM
Memory Technology	DDR4	DDR4
Frequency	2133/2400/2666	2133/2400/2666
Density	4G/8G/16G	4G/8G/16G
Voltage	1.2v	1.2v
Pin Count	288-Pin	288-Pin
Width	72-Bit	72-Bit
PCB Height	0.738"/1.23"	0.738"
Operation Temperature	TC=0℃ to 85℃	TC=0℃ to 85℃
Application	Server & Networking	Server & Networking
Value-Added	Thermal Sensor, 30µ Gold Finger, Underfill, Conformal Coating	Thermal Sensor, 30µ Gold Finger, Underfill, Conformal Coating

Very Low Profile

VLP UDIMM (Very Low Profile Unbuffered DIMM)

- Measures only 0.72~0.738-inch in height
- Prevents mechanical issues, and improves heat dissipation
- Applicable for space-constrained systems, such as small-size industrial computers and embedded systems




Model	DDR5 VLP UDIMM	DDR4 VLP UDIMM	DDR3 VLP UDIMM	DDR2 VLP UDIMM
Module Type	VLP UDIMM	VLP UDIMM	VLP UDIMM	VLP UDIMM
Memory Technology	DDR5	DDR4	DDR3	DDR2
Frequency	4800/5600	2133/2400/2666/2933/3200	1066/1333/1600	533/667/800
Density	16G/32G	4G/8G/16G/32G	1G/2G/4G/8G	1G/2G/4G
Voltage	1.1v	1.2v	1.5v/1.35v	1.8v
Pin Count	288-Pin	288-Pin	240-Pin	240-Pin
Width	64-Bit	64-Bit	64-Bit	64-Bit
PCB Height	0.738"	0.738"	0.738"	0.72"
Operation Temperature	TC=0℃ to 85℃	TC=0℃ to 85℃	TC=0℃ to 85℃	TC=0℃ to 85℃
Application	IoT / Server & Networking			
Value-Added	Underfill, Conformal Coating	Underfill, Conformal Coating	Underfill, Conformal Coating	Underfill, Conformal Coating

VLP SODIMM (Very Low Profile SODIMM) / VLP ECC SODIMM (Very Low Profile ECC SODIMM)

- Measures only 0.7~0.709-inch in height
- Saves up to 40% board space
- Applicable for space-constrained systems, such as small form-factor industrial computers and embedded systems


Model	DDR4 VLP SODIMM	DDR4 VLP ECC SODIMM
Module Type	VLP SODIMM	VLP ECC SODIMM
Memory Technology	DDR4	DDR4
Frequency	2133/2400/2666/2933/3200	2133/2400/2666/2933/3200
Density	4G/8G	4G/8G
Voltage	1.2V	1.2V
Pin Count	260-Pin	260-Pin
Width	64-Bit	72-Bit
PCB Height	0.709"	0.7"
Operation Temperature	TC=0℃ to 85℃	TC=0℃ to 85℃
Application	IoT / Transportation	
Value-Added	30µ Gold Finger, Underfill, Conformal Coating	Thermal Sensor, 30µ Gold Finger, Underfill, Conformal Coating

Very Low Profile

VLP RDIMM (Very Low Profile Registered DIMM)

- Measures only 0.738-inch in height
- Prevents mechanical issues, and improves heat dissipation
- Supports ECC error detection and correction
- Supports a built-in temperature-monitoring thermal sensor
- Applicable for space-constrained systems and systems that require high stability, such as blade servers, 1U rack servers and various embedded systems.


Model	DDR4 VLP RDIMM	DDR3 VLP RDIMM
Module Type	VLP RDIMM	VLP RDIMM
Memory Technology	DDR4	DDR3
Frequency	2133/2400/2666/2933/3200	1066/1333/1600
Density	4G/8G/16G/32G	1G/2G/4G/8G
Voltage	1.2v	1.5v/1.35v
Pin Count	288-Pin	240-Pin
Width	72-Bit	72-Bit
PCB Height	0.738"	0.738"
Operation Temperature	TC=0℃ to 85℃	TC=0℃ to 85℃
Application	Healthcare / Server & Networking	
Value-Added	Thermal Sensor, 30µ Gold Finger, Underfill, Conformal Coating	Thermal Sensor, 30µ Gold Finger, Underfill, Conformal Coating

VLP ECC UDIMM (Very Low Profile ECC Unbuffered DIMM)

- Measures only 0.738-inch in height
- Prevents mechanical issues, and improves heat dissipation
- Supports ECC error detection and correction
- Supports a built-in temperature-monitoring thermal sensor
- Applicable for space-constrained, servers and workstations that require high stability



Model	DDR5 VLP ECC UDIMM	DDR4 VLP ECC UDIMM	DDR3 VLP ECC UDIMM
Module Type	VLP ECC UDIMM	VLP ECC UDIMM	VLP ECC UDIMM
Memory Technology	DDR5	DDR4	DDR3
Frequency	4800/5600	2133/2400/2666/2933/3200	1066/1333/1600
Density	16G/32G	4G/8G/16G/32G	1G/2G/4G/8G
Voltage	1.1v	1.2v	1.5v/1.35v
Pin Count	288-Pin	288-Pin	240-Pin
Width	72-Bit	72-Bit	72-Bit
PCB Height	0.738"	0.738"	0.738"
Operation Temperature	TC=0℃ to 85℃	TC=0℃ to 85℃	TC=0℃ to 85℃
Application	Healthcare / Server & Networking		
Value-Added	Thermal Sensor, 30µ Gold Finger, Underfill, Conformal Coating	Thermal Sensor, 30µ Gold Finger, Underfill, Conformal Coating	Thermal Sensor, 30µ Gold Finger, Underfill, Conformal Coating

Wide Temperature

Wide Temp UDIMM (Wide Temperature UDIMM)

- Able to operate in temperatures ranging from -40℃ to 85℃
- Uses industrial-grade SDRAM components
- With 30u gold plating PCB to improve anti-oxidation and ensure stability of signal transmission
- Applicable for industrial, defense, aeronautical and vehicular systems that face extreme environmental challenges

Model	DDR4 Wide Temp. UDIMM	DDR3 Wide Temp. UDIMM
Module Type	Wide Temperature UDIMM	Wide Temperature UDIMM
Memory Technology	DDR4	DDR3
Frequency	2133/2400/2666/2933/3200	1066/1333/1600
Density	4G/8G/16G/32G	2G/4G/8G
Voltage	1.2v	1.5v/1.35v
Pin Count	288-Pin	240-Pin
Width	64-Bit	64-Bit
PCB Height	1.23"	1.18"
Operation Temperature	TC=-40℃ to 85℃	TC=-40℃ to 85℃
Application	Defense / IoT / Transportation / Factory Automation	
Value-Added	Wide Temperature, 30µ Gold Finger, Underfill, Conformal Coating	Wide Temperature, 30µ Gold Finger, Underfill, Conformal Coating

Wide Temp SODIMM (Wide Temperature SODIMM)

- Able to operate in temperatures ranging from -40℃ to 85℃
- Uses industrial-grade SDRAM components
- With 30u gold plating PCB to improve anti-oxidation and ensure stability of signal transmission
- Applicable for industrial, defense, aeronautical and vehicular systems that face extreme environmental challenges

Model	DDR4 Wide Temp. SODIMM	DDR3 Wide Temp. SODIMM	DDR2 Wide Temp. SODIMM	DDR Wide Temp. SODIMM
Module Type	Wide Temperature SODIMM	Wide Temperature SODIMM	Wide Temperature SODIMM	Wide Temperature SODIMM
Memory Technology	DDR4	DDR3	DDR2	DDR
Frequency	2133/2400/2666/2933/3200	1066/1333/1600	533/667/800	266/333/400
Density	4G/8G/16G/32G	2G/4G/8G	1G/2G	512M/1G
Voltage	1.2v	1.5v/1.35v	1.8v	2.5v/2.6v
Pin Count	260-Pin	204-Pin	200-Pin	200-Pin
Width	64-Bit	64-Bit	64-Bit	64-Bit
PCB Height	1.18"	1.18"	1.18"	1.25"
Operation Temperature	TC=-40℃ to 85℃	TC=-40℃ to 85℃	TC=-40℃ to 85℃	TA=-40℃ to 85℃
Application	Defense / IoT / Transportation / Factory Automation			
Value-Added	Wide Temperature, 30µ Gold Finger, Underfill, Conformal Coating	Wide Temperature, 30µ Gold Finger, Underfill, Conformal Coating	Wide Temperature, 30µ Gold Finger, Underfill, Conformal Coating	Wide Temperature, 30µ Gold Finger, Underfill, Conformal Coating

Wide Temperature

Wide Temp ECC UDIMM (Wide Temperature ECC UDIMM)

- Able to operate in temperatures ranging from -40℃ to 85℃
- Uses industrial-grade SDRAM components
- With 30u gold plating PCB to improve anti-oxidation and ensure stability of signal transmission
- Applicable for industrial, defense, aeronautical and vehicular systems that face extreme environmental challenges


Model	DDR4 Wide Temperature ECC UDIMM	DDR3 Wide Temperature ECC UDIMM
Module Type	Wide Temperature ECC UDIMM	Wide Temperature ECC UDIMM
Memory Technology	DDR4	DDR3
Frequency	2133/2400/2666/2933/3200	1066/1333/1600
Density	4G/8G/16G/32G	2G/4G/8G
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=-40℃ to 85℃	TC=-40℃ to 85℃
Application	Defense / IoT / Transportation / Factory Automation	
Value-Added	Wide Temperature, 30μ Gold Finger, Thermal Sensor, Underfill, Conformal Coating	Wide Temperature, 30μ Gold Finger, Thermal Sensor, Underfill, Conformal Coating

Wide Temp ECC SODIMM (Wide Temperature ECC SODIMM)

- Able to operate in temperatures ranging from -40℃ to 85℃
- Uses industrial-grade SDRAM components
- With 30u gold plating PCB to improve anti-oxidation and ensure stability of signal transmission
- Applicable for industrial, defense, aeronautical and vehicular systems that face extreme environmental challenges


Model	DDR4 Wide Tempe. ECC SODIMM	DDR3 Wide Tempe. ECC SODIMM
Module Type	Wide Temperature ECC SODIMM	Wide Temperature ECC SODIMM
Memory Technology	DDR4	DDR3
Frequency	2133/2400/2666/2933/3200	1066/1333/1600
Density	4G/8G/16G/32G	2G/4G/8G
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=-40℃ to 85℃	TC=-40℃ to 85℃
Application	Defense / IoT / Transportation / Factory Automation	
Value-Added	Wide Temperature, 30μ Gold Finger, Thermal Sensor, Underfill, Conformal Coating	Wide Temperature, 30μ Gold Finger, Thermal Sensor, Underfill, Conformal Coating

Anti-Sulfuration (Apacer Patented)

Anti-Sulfuration Memory Modules

- World's first anti-sulfuration memory modules for the sulfur-containing environment
- The innovative design is now patented
- Applicable for equipment exposed in highly contaminated environment and electronic equipment used in areas of high-concentration sulfur gas




Model	DDR5 Anti-Sulfuration UDIMM	DDR4 Anti-Sulfuration UDIMM	DDR5 Anti-Sulfuration SODIMM	DDR4 Anti-Sulfuration SODIMM
Module Type	Anti-Sulfuration UDIMM	Anti-Sulfuration UDIMM	Anti-Sulfuration SODIMM	Anti-Sulfuration SODIMM
Memory Technology	DDR5	DDR4	DDR5	DDR4
Frequency	4800/5600	2133/2400/2666/2933/3200	4800/5600	2133/2400/2666/2933/3200
Density	8G/16G/32G	4G/8G/16G/32G	8G/16G/32G	4G/8G/16G/32G
Voltage	1.1v	1.2v	1.1v	1.2v
Pin Count	288-Pin	288-Pin	262-Pin	260-Pin
Width	64-Bit	64-Bit	64-Bit	64-Bit
PCB Height	1.23"	1.23"	1.18"	1.18"
Operation Temperature	TC=0℃ to 85℃	TC=0℃ to 85℃	TC=0℃ to 85℃	TC=0℃ to 85℃ / -40℃ to 85℃
Application	Defense / Healthcare / IoT / Transportation / Factory Automation			
Value-Added	30µ Gold Finger, Underfill, Conformal Coating	30µ Gold Finger, Underfill, Conformal Coating	30µ Gold Finger, Underfill, Conformal Coating	30µ Gold Finger, Underfill, Conformal Coating






Model	DDR5 Anti-Sulfuration RDIMM	DDR4 Anti-Sulfuration RDIMM	DDR5 Anti-Sulfuration ECC UDIMM	DDR4 Anti-Sulfuration ECC UDIMM	DDR5 Anti-Sulfuration ECC SODIMM	DDR4 Anti-Sulfuration ECC SODIMM
Module Type	Anti-Sulfuration RDIMM	Anti-Sulfuration RDIMM	Anti-Sulfuration ECC UDIMM	Anti-Sulfuration ECC UDIMM	Anti-Sulfuration ECC SODIMM	Anti-Sulfuration ECC SODIMM
Memory Technology	DDR5	DDR4	DDR5	DDR4	DDR5	DDR4
Frequency	4800	2133/2400/2666/ 2933/3200	4800/5600	2133/2400/2666/ 2933/3200	4800/5600	2133/2400/2666/ 2933/3200
Density	16G/32G	4G/8G/16G/32G	16G/32G	4G/8G/16G/32G	16G/32G	4G/8G/16G/32G
Voltage	1.1v	1.2v	1.1v	1.2v	1.1v	1.2v
Pin Count	288-Pin	288-Pin	288-Pin	288-Pin	262-Pin	260-Pin
Width	80-Bit	72-Bit	72-Bit	72-Bit	72-Bit	72-Bit
PCB Height	1.23"	1.23"	1.23"	1.23"	1.18"	1.18"
Operation Temperature	TC=0℃ to 85℃	TC=0℃ to 85℃	TC=0℃ to 85℃	TC=0℃ to 85℃	TC=0℃ to 85℃	TC=0℃ to 85℃
Application	Defense / Healthcare / IoT / Transportation / Factory Automation					
Value-Added	Thermal Sensor, 30µ Gold Finger	Thermal Sensor, 30µ Gold Finger	Thermal Sensor, 30µ Gold Finger	Thermal Sensor, 30µ Gold Finger	Thermal Sensor, 30µ Gold Finger	Thermal Sensor, 30µ Gold Finger

Rugged Memory

Rugged SODIMM

- Designed with two mounting holes to secure the memory module to the board to achieve shock and vibration resistance
- Dual anti-shock and vibration certification: RTCA DO-160G / MIL-STD-883K
- Applicable for transportation, automation, wind power geneation, energy, defense and aeronautical equipment that requires shock and vibration resistance

Model	DDR4 Rugged SODIMM
Module Type	Rugged SODIMM
Memory Technology	DDR4
Frequency	2133/2400/2666/2933/3200
Density	8G/16G/32G
Voltage	1.2v
Pin Count	260-Pin
Width	64-Bit/72-Bit
PCB Height	1.377"
Operation Temperature	TC=0℃ to 85℃ / -40℃ to 85℃
Application	Defense / Transportation
Value-Added	30μ Gold Finger, Underfill, Conformal Coating

XR-DIMM

- Designed for shock and vibration environments
- Innovative design with highly rugged 300-pin connector and mounting holes
- Dual anti-shock and vibration certification: RTCA DO-160G / MIL-STD-810G
- Improves the stability of signal transmission
- Applicable for transportation, defense and aeronautical equipment that requires shock and vibration resistance

Model	DDR4 XR-DIMM
Module Type	XR-DIMM
Memory Technology	DDR4
Frequency	2133/2400
Density	8G/16G
Voltage	1.2v
Pin Count	300-Pin
Width	72-Bit
PCB Height	1.466"
Operation Temperature	TC=-40℃ to 85℃
Application	Defense / Transportation
Value-Added	Wide Temperature, Thermal Sensor, Anti-Sulfuration, Underfill, Conformal Coating

Fully Lead-Free

Fully Lead-Free Memory Module

- The world's first Fully Lead-Free memory module, surpassing RoHS environmental standards.
- Fully compliant with RoHS standards, no RoHS exemptions required
- Uses Fully Lead-Free Resistors without RoHS 7(c)-I exemption
- Meeting the market demand for environmentally friendly products

					
Model	**DDR5 Fully lead-free UDIMM**	**DDR5 Fully lead-free SODIMM**	**DDR5 Fully lead-free RDIMM**	**DDR5 Fully lead-free ECC UDIMM**	**DDR5 Fully lead-free ECC SODIMM**
Module Type	Fully lead-free UDIMM	Fully lead-free SODIMM	Fully lead-free RDIMM	Fully lead-free ECC UDIMM	Fully lead-free ECC SODIMM
Memory Technology	DDR5	DDR5	DDR5	DDR5	DDR5
Frequency	4800/5600	4800/5600	4800	4800/5600	4800/5600
Density	8G/16G/32G	8G/16G/32G	16G/32G	16G/32G	16G/32G
Voltage	1.1v	1.1v	1.1v	1.1v	1.1v
Pin Count	288-Pin	262-Pin	288-Pin	288-Pin	262-Pin
Width	64-Bit	64-Bit	80-Bit	72-Bit	72-Bit
PCB Height	1.23"	1.18"	1.23"	1.23"	1.18"
Operating Temperature	TC=0℃ to 85℃	TC=0℃ to 85℃	TC=0℃ to 85℃	TC=0℃ to 85℃	TC=0℃ to 85℃
Application	Gaming / Healthcare / IoT / Factory Automation	Gaming / IoT / Transportation / Factory Automation	Healthcare / Server & Networking	Healthcare / IoT / Server & Netwoking / Factory Automation	IoT / Server & Networking / Transportation / Factory Automation
Value-Added					

About Apacer

Apacer is a global leader in digital storage solutions devoted to innovative storage technology and services. After 25 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

The Most Reliable Memory For Industries

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