ADATA® INDUSTRIAL

PRODUCT CATALOG

GLOBAL LEADER IN INDUSTRIAL-GRADE STORAGE

ABOUT ADATA

Founded May 4, 2001

Founder, Chairman,and CEO: Simon Chen

World's 2nd largest DRAM and global branded SSD module manufacturer (DRAMeXchange)

More than 500 patents owned

As a global leader of industrial-grade memory, ADATA Industrial is devoted to provide durable and reliable industrial-grade storage products, including SSDs, memory cards, embedded storage products and DRAM modules to customers worldwide. We have a global presence and is able to offer high-quality technical and after services to customers regardless of geographic location. At the same time, ADATA Industrial is also able to leverage its R&D and manufacturing capabilities to provide customized products and solutions that meet the unique needs of individual customers. With its commitment to quality and innovation, ADATA Industrial is ready to serve the industrial sector with the widest range of memory solutions and work hand-in-hand with customers to create a better world and enrich lives. For more information, please visit industrial.adata.com.

Leading of the Edge

*Ranked No.3 DRAM Module Manufacturer (TrendForce, 2022)

*Ranked No.2 Global Branded SSD Module Maker (DRAMeXchange, 2022)

Leading DRAM Module Maker
Ranked #3 in 2022

A Global SSD Leader
Ranked #2 in 2022
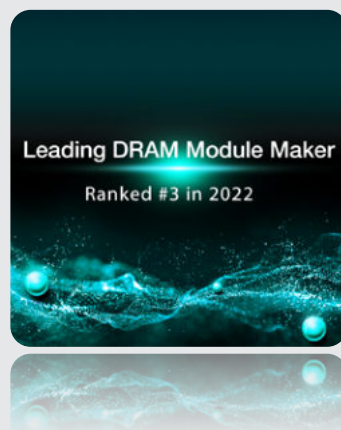
Worldwide Service and Presence

We offer direct and instant technical support to customers and end users by the solid global FAE and sales teams.

USA
San Jose

USA
Los Angeles

USA
Baltimore

France
Strasbourg

The Netherlands
Eindhoven

Germany
Munich

China, Beijing

China, Shanghai
China, Shenzhen

India, Mumbai

Tokyo, Japan

ADATA HQ
Taipei, Taiwan

Australia

Quality and Environmental Certifications

It's our commitment to provide the finest quality and service for complete customer satisfaction.

Quality Management

- IATF 16949
- ISO 9001
- ISO 9001 Plus

Hazardous Substance Process Management

- IECQ QC 080000
- B2B Green Partner
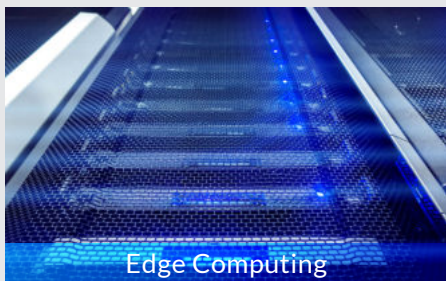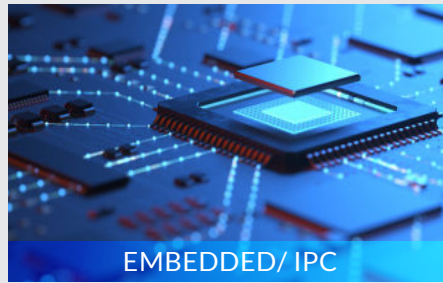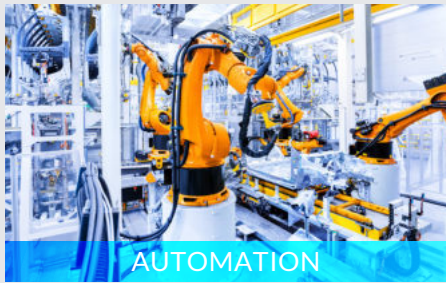
Occupational Health & Safety

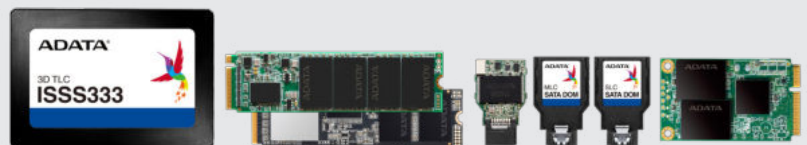- ISO 45001
- CNS 15506

Environmental Management

- ISO14001

Target Applications

AUTOMATION

EMBEDDED/ IPC

GAMING

HEALTHCARE

AIoT

IN-VEHICLE

MILITARY

NETWORKING

RETAIL (POS/ DIGITAL SIGNAGE/ MFP)

Edge Computing

SURVEILLANCE

TRANSPORTATION

Product Portfolio

| DRAM Modules

| Solid State Drives

| eMMC

| Memory Cards

| USB Flash Drive

Product Dimensions Comparison

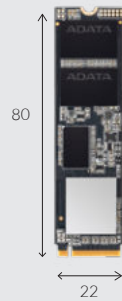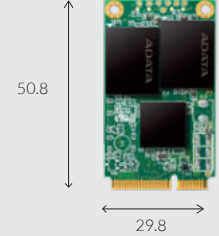## Flash Storage

Unit: mm

| 2.5" SSD

69.9
100

| M.2 2280 SSD

80
22

| M.2 2242 SSD

42
22

| mSATA SSD (MO-300)

50.8
29.8

| Half-Slim SSD (MO-297)
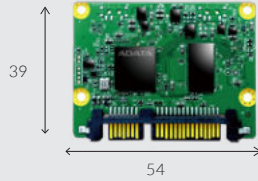
39
54

| SATA DOM

32.8
23.6

| USB DOM

36.9
26.6

| CFexpress Card

38.5
29.6

| CFast Card

36.4
42.8

| CF Card

36.4
42.8

| SD Card

32
24

| microSD Card

11
15

| eMMC

11.5
13
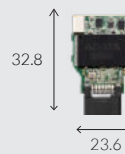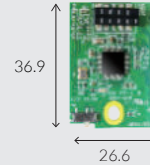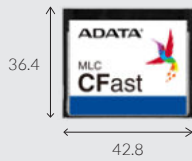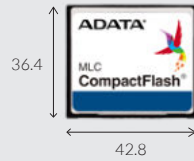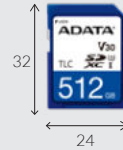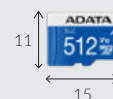
DRAM Module

Unit: mm

| R-DIMM

30
133

| U-DIMM

30
133

| VLP -DIMM

18.7
133

| SO-DIMM

30
70

Featured Technologies

A⁺ SLC

ADATA's proprietary A⁺ SLC technology combines reliability and cost efficiency. It uses customized NAND Flash firmware to simulate SLC performance on MLC and 3D TLC NAND Flash, effectively improving reliability and extending product life. A⁺ SLC provides more competitive advantages for MLC and 3D TLC NAND flash storage products and is widely used in various industrial applications.

MLC can store 2 bits of data, represented by 00, 01, 10 or 11 respectively, and TLC can store 3 bits of data, represented by 000, 001, 010, 011, 100, 101, 110, 111, while SLC only stores 1 bit of data, namely 0 or 1. ADATA's A⁺ SLC simulates the storage of 2 bits of MLC and 3 bits of 3D TLC into a storage method of storing 1 bit of data by customized firmware and algorithm. Compared to SLC NAND Flash, A⁺ SLC can greatly optimize the product reliability and longevity.

MLC:
Higher risk of data error due to charge drift

MLC

1 1   1 0   0 0   0 1

A⁺ SLC mode:
Better proformance on error tolerance

A⁺ SLC

1   0

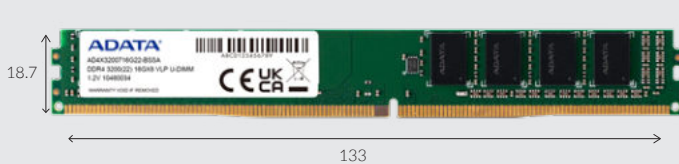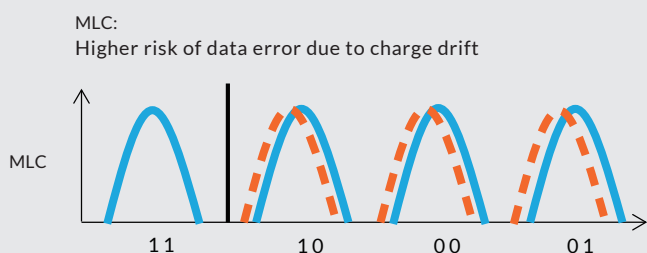| Type	P/E Cycle (times)	Features
SLC	60K	High cost, Ultra high endurance
A⁺ SLC	30K	Better performance, High enduance and error tolerance
MLC/3D TLC	3K	Moderate cost, Good performance

Anti-Sulfuration

ADATA applies the anti-sulfuration technology to its industrial-grade SSDs and DRAM modules to counter corrosion and enhance the stability and longevity of these products. It can effectively prevents the negtive impact of silver sulfide on NAND flash and DRAM products, making them more durable when used in environments with excessive sulfur.

Components with anti-sulfuration technology are screened for reliability and resilience to sulfuration:

Anti-sulfur Material

Overcoating

Electroplated Layer

Resistor

Side conductor

Substrate
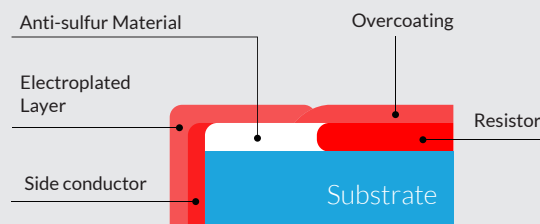
When normal resistor is under sulfur atmosphere(H2S), silver sulfide(Ag2S), which is a kind of insulator, will be generated at top conductor (Ag), resulting in open circuit fail. By using anti-sulfur material as top conductor, sulfuration is prevented. By using anti-sulfur material as top conductor, sulfuration is prevented.

Top Conductor(Ag)

Sulfur Atmosphere (H₂S)
Ag+S ➡ Ag₂S

Overcoating

Electroplated Layer

Resistor

Side conductor

Substrate

Anti-sulfur Material

Sulfur Atmosphere (H₂S)
Ag+S ➡ Ag₂S

Overcoating

Electroplated Layer

Resistor

Side conductor

Substrate
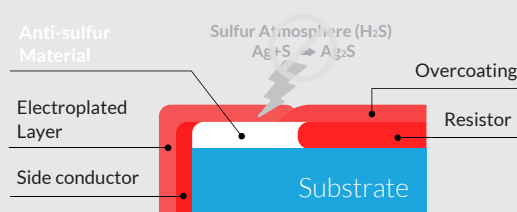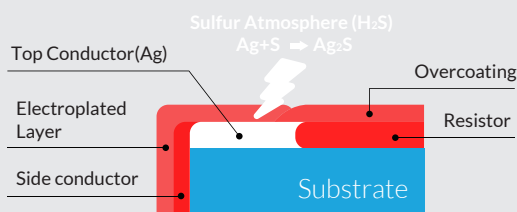
Power Loss Protection

PLP (Power Loss Protection) is a key technology associated with SSD reliability and is becoming widely adopted for improving overall system reliability. It leverages firmware and hardware to protect important data when encountering abnormal power spikes or outages.

ADATA PLP technology integrates sensitive voltage detectors with banks of power-retaining Tantalum polymer capacitors, supplying SSDs with enough power to continue buffered read-write operations until completion. Should power loss occur, the monitoring circuit detects the power drop and instructs the controller to back up all data in the buffer before power drains from capacitor banks. Through this method, all important data can be saved and free from data corruption.

Voltage
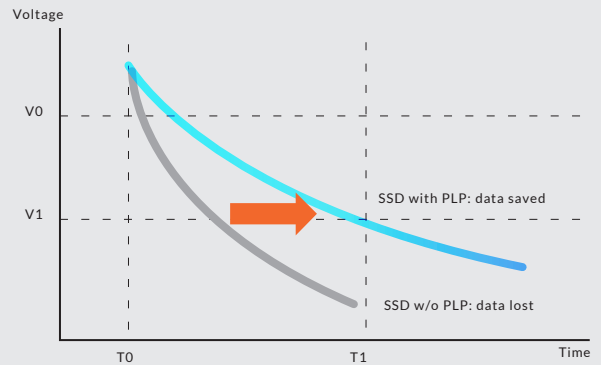
V0

V1

SSD with PLP: data saved

SSD w/o PLP: data lost

T0   T1   Time

Applications

Healthcare   Networking   Server   Surveillance   Transportation

- V0: SSD normal voltage
- V1: Spec. of minimum voltage limit for flash IC
- T0: Controller detects voltage drop
- T1: Controller finishes data backup
- T1-T0: Time to do data backup

A+ Security

ADATA's proprietary A+ Security data protection technologies are implemented in ADATA industrial-grade flash storage products, including data erase, data encryption, and write protect. These can be widely used in various industrial applications to elevate data security. With A+ Security, confidential data can be effectively protected from being leaked or tampered with.

1

Secure Erase
It's effective for erasing data from every corner of an SSD. There are two approaches to erase: a short pin circuit for Secure Erase or giving the ATA command to conduct data erasing.

2

Data Encryption
We offer AES 256-bit encryption technology and meet the TCG Opal 2.0 protocol to enhance the security level of confidential data.

3

Write Protect
The Write Protect function is enabled by hardware or software settings. It can prevent data from being tampered with and written on the SSD improperly.

Applications

Edge Computing   Gaming   Healthcare   Server   Surveillance

Proprietary Software

A⁺ SSDTOOL

ADATA's A⁺ SSDTOOL is a powerful tool that help our customers monitor and manage any status of each ADATA SSD inside customers' systems. It facilitates the monitoring and managing of the drives with SSD S.M.A.R.T. and lifespan information.

The A⁺ SSDTOOL provides various features, including drive information, diagnostics, utilities, system optimization and system information.

Drive Info
Get assigned drive information.

Diagnostics
Includes quick diagnostics and full diagnostics.

System Info
Displays current system information.

Utilities
Includes secure erase, firmware update, SSD Toolbox upgrade, and export log.

System Optimization
Provides simple settings for SSD optimization.
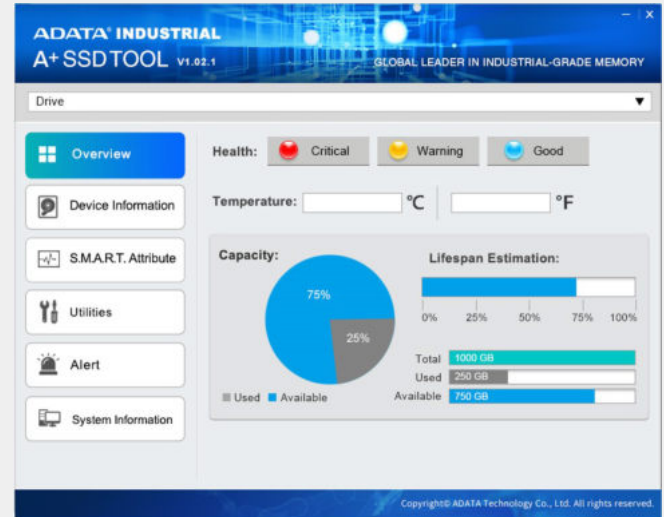
A⁺ OPAL

With ADATA's proprietary A⁺ OPAL software, users can easily execute TCG OPAL SED (self-encryption drive) for all ADATA's industrial-grade NVMe and SATA III SSDs, which support TCG OPAL. It activates the encrypted features of an SSD's controller. Thanks to intuitive A⁺ OPAL management, it can be widely used in diverse applications which require high-level data security, such as defense, networking, server, healthcare, surveillance and more.

- Fully compliant with the TCG OPAL 2.0 specification
- Equipped with H/W based AES 256-bit key
- Deletes data immediately when destroying the AES key

1	Initial setup to activate A⁺ OPAL
2	Set the SID/Admin passwords
3	Pre-boot Authentication (PBA)
4	Locking Range Setting
5	Reset the disk to factory default status
6	Show the locking information & TCG OPAL support features
7	Unlock USB external TCG OPAL SSD
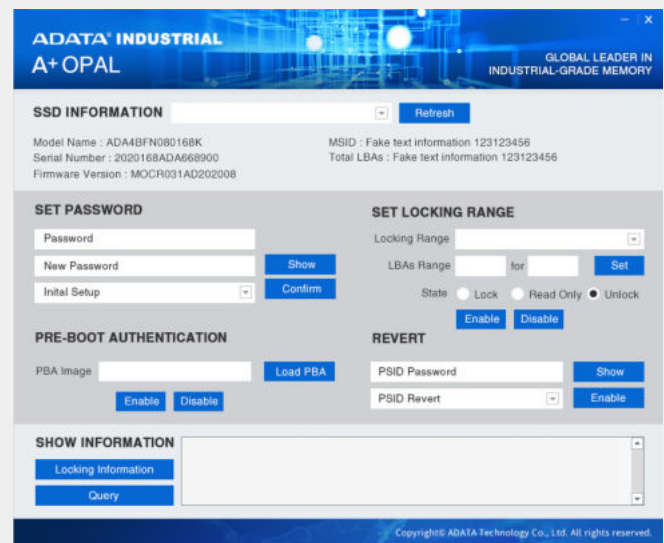
Rigorous Manufacturing and Testing
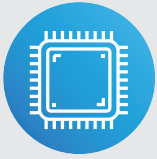
Strict NAND Flash IC Sorting

ADATA uses proprietary methods to test NAND Flash and sort out the best ICs for industrial-grade SSDs by an automatic testing process. To ensure the consistent high quality and yield rate, all ADATA's industrial-grade SSDs have to pass both electrical and function tests.

Electrical Tests

- Open/ Short Circuit
- Leakage / Standby Current
- NAND Flash ID Check

Function Tests

- Async./ sync. Interface check
- ECC 20bit/1KB
- Random Read/ Write
- Bad block numbers
- User capacity > 99.5%
- Validate quality of Block 0-3

SSD Manufacturing Process

SMT Process				Inspection & Labeling	
Solder Paste Printing	SPI	Pick & Place	Reflow	PCBA Inspection	Labeling De-Panel
Have Solder Paste printed on PCB	Inspect shape and thickness of solder paste on PCB	Have correct components placed on PCB	Attach components on PCBs by high temperature	Check if the apprence of PCBA is qualified	Give a unique serial number for each product

SSD Testing Process

SMT Process					Inspection	Packing
MST F/W Initialization	MST	MP F/W Initialization	Integration Test	Assembly & Labeling	FQC	Packing
Program MST F/W	Run MST Test	Program MP F/W	F/W Capacity Check Speed Test Burn-in Test GDN Check	Cover Assembly & Auto Labeling	Sampling check to satisfy customers' quality criteria	Product packing & storage

F/W Initialization   MST Test   Integration Test   Assembly & Labeling   Packing

NAND FLASH STORAGE PRODUCTS

- 2.5" SSD
- M.2 SSD
- mSATA SSD
- USB / SATA DOM

BiCS5 READY
112-LAYER 3D TLC SERIES

For increasing demands of big data analysis, machine learning, AI, IoT applications, high-performance storage devices are required to process even more data. ADATA provides a full lineup of 112-layer 3D NAND (BiCS5) solid state drives and memory cards in various form factors, featuring higher capacity up to 4TB, greater realibility, as well as wide temperature support from -40°C to 85°C for stable operation in harsh environment. The BiCS5 series are designed to be energy efficient, feature high capacities, and are well suited for high-load industrial systems relating to industrial computing, embedded devices, automation, networking, transportation, and other fields.

RELIABLE DURABILITY
3K
P/E CYCLE

ORIGINAL IC WDC/ KIOXIA
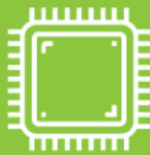
WIDE-TEMP. (-40°C to 85°C)

HIGH CAPACITY

2.5" SSD

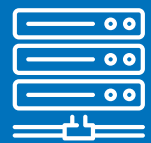| Model	ISSS31C	ISSS31AP	ISSS333 PLP
Features	1. Supports RAID Engine, SLC Cache and Thermal Throttling 2. End-to-End (E2E) Data Path Protection 3. ESD Support (IEC/EN 61000-4-2 Level 4) 4. With DRAM Buffer 5.Supports Extended Temp.(-20℃ to 75℃)	1. Power Loss Protection 2. Large capacity of 4TB 3. Supports RAID Engine, SLC Cache and Thermal Throttling 4. With DRAM Buffer	1. Power Loss Protection 2. Supports RAID Engine, SLC Cache and Thermal Throttling 3. With DRAM Buffer
Interface	SATA III 6.0Gbps	SATA III 6.0Gbps	SATA III 6.0Gbps
Flash Type	112L 3D TLC	96L 3D TLC	64L 3D TLC
Capacity	128GB - 4TB	4TB	64GB - 1TB
Max. Seq. R/W Speed (MB/s)	560/500	560/520	560/520
Operating Voltage	5V	5V	5V
Max. Power Consumption	2.3W	2.8W	2.3W
Operating Temp. (Standard)	0°C to 70°C	0°C to 70°C	0°C to 70°C
Operating Temp. (Industrial)	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
P/E Cycle (times)	3K	3K	3K
ECC Engine	LDPC ECC	LDPC ECC	LDPC ECC
A+ SLC Mode	Available by request	—	—
Environment	Vibration: 20G (20 - 2000Hz), Shock: 1500G/0.5ms, Half Sine Wave, MTBF: > 3 million hours		
Dimensions (L x W x H)	100 x 70 x 7mm		

Model	ISSS333	ISSS316	ISSS332
Features	1. Supports RAID Engine, SLC Cache and Thermal Throttling 2. With DRAM Buffer	1. Supports RAID Engine, SLC Cache, and Thermal Throttling 2. End-to-End (E2E) Data Path Protection 3. Wear Leveling, Bad Block Management	1. Supports S.M.A.R.T. Monitor 2. Power Loss Protection(Optional) 3. With DRAM Buffer
Interface	SATA III 6.0Gbps	SATA III 6.0Gbps	SATA III 6.0Gbps
Flash Type	96L 3D TLC	112L 3D TLC	MLC
Capacity	64GB - 1TB	128GB - 2TB	32GB – 1TB
Max. Seq. R/W Speed (MB/s)	560/510	560/520	540/450
Operating Voltage	5V	5V	5V
Max. Power Consumption	2.1W	1.35W	3.2W
Operating Temp. (Standard)	0°C to 70°C	0°C to 70°C	0°C to 70°C
Operating Temp. (Industrial)	—	-40°C to 85°C	-40°C to 85°C
P/E Cycle (times)	3K	3K	3K
ECC Engine	LDPC ECC	LDPC ECC	BCH ECC
A+ SLC Mode	Available by request	Available by request	Ready
Environment	Vibration: 20G (20 - 2000Hz), Shock: 1500G/0.5ms, Half Sine Wave, MTBF: > 3 million hours		
Dimensions (L x W x H)	100 x 70 x 7mm		

Product specifications are subject to change without prior notice

2.5" SSD

BiCS5

Model	ISSS31D
Features	1. Supports RAID Engine, SLC Cache, and Thermal Throttling 2. End-to-End (E2E) Data Path Protection 3. Wear Leveling, Bad Block Management
Interface	SATA III 6.0Gbps
Flash Type	112L 3D TLC
Capacity	128GB - 2TB
Max. Seq. R/W Speed (MB/s)	560/480
Operating Voltage	5v
Max. Power Consumption	1.1W
Operating Temp. (Standard)	0°C to 70°C
Operating Temp. (Industrial)	——
P/E Cycle (times)	3K
ECC Engine	LDPC ECC
A+ SLC Mode	——
Environment	Vibration: 20G (20 - 2000Hz), Shock: 1500G/0.5ms, Half Sine Wave, MTBF: > 3 million hours
Dimensions (L x W x H)	100 x 70 x 7mm

Product specifications are subject to change without prior notice

M.2 NVMe SSD

NVMe™ 1.4/ 1.3 Compliant
Original IC Implement
3K-100K P/E cycles for high endurance
S.M.A.R.T. Monitor, Wear Leveling, NCQ,and TRIM Command

Model	IM2P42B8	IM2P41B8	IM2P41B8 (eTLC)	IM2P32A8
Features	1. Supports RAID Engine, SLC Cache and Thermal Throttling 2. ESD Support (IEC/EN 61000-4-2 Level 4)	1. Supports RAID Engine, SLC Cache and Thermal Throttling 2. End-to-End (E2E) Data Path Protection 3. Supports AES 256-bit Data Encryption and TCG OPAL 2.0 4. With DRAM Buffer	1. Supports RAID Engine, SLC Cache and Thermal Throttling 2. End-to-End (E2E) Data Path Protection 3. Supports AES 256-bit Data Encryption and TCG OPAL 2.0 4. With DRAM Buffer 5. DWPD = 1.8	1. Supports RAID Engine, SLC Cache and Thermal Throttling 2. End-to-End (E2E) Data Path Protection 3. ESD Support (IEC/EN 61000-4-2 Level 4) 4. Host Memory Buffer (HMB)
Interface	PCIe Gen4x4 (NVMe 1.4)	PCIe Gen4x4 (NVMe 1.4)	PCIe Gen4x4 (NVMe 1.4)	PCIe Gen3x4 (NVMe 1.4)
Form Factor	M.2 2280 (M Key)	M.2 2280 (M Key)	M.2 2280 (M Key)	M.2 2280 (M Key)
Flash Type	176L 3D TLC	112L 3D TLC	112L 3D eTLC	112L 3D TLC
Capacity	512GB - 2TB	512GB - 4TB	480GB - 1.92TB	128GB - 2TB
Max. Seq. R/W Speed (MB/s)	5100/4500	7000/6500	7000/6200	3000/2800
Operating Voltage	3.3V	3.3V	3.3V	3.3V
Max. Power Consumption	4.22W	8W	8W	3.79W
Operating Temp. (Standard)	0°C to 70°C	0°C to 70°C	0°C to 70°C	0°C to 70°C
Operating Temp. (Industrial)	—	-40°C to 85°C	—	-40°C to 85°C
P/E Cycle (times)	3K	3K	7K	3K
ECC Engine	LDPC ECC	LDPC ECC	LDPC ECC	LDPC ECC
A$^+$ SLC Mode	—	—	—	Available by request
Environment	Vibration: 20G (20 - 2000Hz), Shock: 1500G/0.5ms, Half Sine Wave, MTBF: > 3 million hours			
Dimensions (L x W x H)	80 x 22 x 2.25mm			

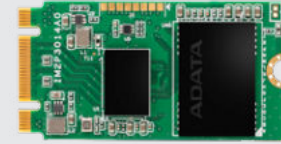| Model	IM2P33F8	IM2P33E8	IM2P33E8 PLP
Features	1. Supports RAID Engine, SLC Cache and Thermal Throttling 2. End-to-End (E2E) Data Path Protection 3. Host Memory Buffer (HMB)	1. Supports RAID Engine, SLC Cache and Thermal Throttling 2. End-to-End (E2E) Data Path Protection 3. With DRAM Buffer	1. Power Loss Protection 2. Supports RAID Engine, SLC Cache and Thermal Throttling 3. End-to-End (E2E) Data Path Protection 4. With DRAM Buffer
Interface	PCIe Gen3x4 (NVMe 1.3)	PCIe Gen3x4 (NVMe 1.3)	PCIe Gen3x4 (NVMe 1.3)
Form Factor	M.2 2280 (M Key)	M.2 2280 (M Key)	M.2 2280 (M Key)
Flash Type	112L 3D TLC	96L 3D TLC	96L 3D TLC
Capacity	128GB - 1TB	256GB - 2TB	256GB - 2TB
Max. Seq. R/W Speed (MB/s)	2100/1600	3400/1800	3400/1900
Operating Voltage	3.3V	3.3V	3.3V
Max. Power Consumption	3.8W	5.2W	5.8W
Operating Temp. (Standard)	0°C to 70°C	0°C to 70°C	0°C to 70°C
Operating Temp. (Industrial)	—	—	—
P/E Cycle (times)	3K	3K	3K
ECC Engine	LDPC ECC	LDPC ECC	LDPC ECC
A$^+$ SLC Mode	—	—	—
Environment	Vibration: 20G (20 - 2000Hz), Shock: 1500G/0.5ms, Half Sine Wave, MTBF: > 3 million hours		
Dimensions (L x W x H)	80 x 22 x 2.25mm	80 x 22 x 2.25mm	42 x 22 x 3.5mm

Product specifications are subject to change without prior notice

M.2 NVMe SSD

NVMe™ 1.4/ 1.3 Compliant
Original IC Implement
3K-100K P/E cycles for high endurance
S.M.A.R.T. Monitor, Wear Leveling, NCQ,and TRIM Command

BiCS5

Model	IM2P32A4	IM2P3014
Features	1. Supports RAID Engine, SLC Cache and Thermal Throttling 2. End-to-End (E2E) Data Path Protection 3. ESD Support (IEC/EN 61000-4-2 Level 4) 4. Host Memory Buffer (HMB)	1. Supports RAID Engine, SLC Cache and Thermal Throttling 2. End-to-End (E2E) Data Path Protection 3. AES 256-bit Data Encryption 4. Host Memory Buffer (HMB)
Interface	PCIe Gen3x4 (NVMe 1.4)	PCIe Gen3x2 (NVMe 1.3)
Form Factor	M.2 2242 (M Key)	M.2 2242 (B+M Key)
Flash Type	112L 3D TLC	96L 3D TLC
Capacity	128GB - 1TB	64GB - 1TB
Max. Seq. R/W Speed (MB/s)	3100/1700	1700/1300
Operating Voltage	3.3V	3.3V
Max. Power Consumption	2.79W	2.3W
Operating Temp. (Standard)	0°C to 70°C	0°C to 70°C
Operating Temp. (Industrial)	-40°C to 85°C	—
P/E Cycle (times)	3K	3K
ECC Engine	LDPC ECC	LDPC ECC
A+ SLC Mode	Optional	Optional
Environment	Vibration: 20G (20 - 2000Hz), Shock: 1500G/0.5ms, Half Sine Wave, MTBF: > 3 million hours	
Dimensions (L x W x H)	80 x 22 x 2.25mm	

Product specifications are subject to change without prior notice

Original IC Implement
3K-100K P/E cycles for high endurance
S.M.A.R.T. Monitor, Wear Leveling, NCQ and TRIM Command

Model	IM2S31C8	IM2S31D8	IM2S3168	IM2S3338
Features	1. Supports RAID Engine, SLC Cache and Thermal Throttling 2. End-to-End (E2E) Data Path Protection 3. ESD Support (IEC/EN 61000-4-2 Level 4) 4. With DRAM Buffer 5. Supports Extended Temp. (-20°C to 75°C)	1. Supports RAID Engine, SLC Cache, and Thermal Throttling 2. End-to-End (E2E) Data Path Protection 3. Wear Leveling, Bad Block Management	1. 112L (BiCS5) 3D TLC Implement 2. Supports RAID Engine, SLC Cache and Thermal Throttling	1. Supports RAID Engine, SLC Cache and Thermal Throttling 2. With DRAM Buffer
Interface	SATA III 6.0Gbps	SATA III 6.0Gbps	SATA III 6.0Gbps	SATA III 6.0Gbps
Form Factor	M.2 2280 (B+M Key)	M.2 2280 (B+M Key)	M.2 2280 (B+M Key)	M.2 2280 (B+M Key)
Flash Type	112L 3D TLC	112L 3D TLC	112L 3D TLC	96L 3D TLC
Capacity	128GB - 2TB	128GB - 2TB	128GB - 2TB	64GB - 1TB
Max. Seq. R/W Speed (MB/s)	560/500	560/550	560/520	550/480
Operating Voltage	3.3V	3.3V	3.3V	3.3V
Max. Power Consumption	2.4W	1.4W	1.58W	2W
Operating Temp. (Standard)	0°C to 70°C	0°C to 70°C	0°C to 70°C	0°C to 70°C
Operating Temp. (Industrial)	-40°C to 85°C	—	-40°C to 85°C	—
P/E Cycle (times)	3K	3K	3K	3K
ECC Engine	LDPC ECC	LDPC ECC	LDPC ECC	LDPC ECC
A⁺ SLC Mode	Available by request	—	Available by request	Available by request
Environment	Vibration: 20G (20 - 2000Hz), Shock: 1500G/0.5ms, Half Sine Wave, MTBF: > 3 million hours			
Dimensions (L x W x H)	80 x 22 x 2.25mm			

Model	IM2S31C4	IM2S31D4	IM2S3164	IM2S3314
Features	1. 112L (BiCS5) 3D TLC Implement 2. Supports RAID Engine, SLC Cache and Thermal Throttling 3. End-to-End (E2E) Data Path Protection 4. With DRAM Buffer	1. Supports RAID Engine, SLC Cache, and Thermal Throttling 2. End-to-End (E2E) Data Path Protection 3. Wear Leveling, Bad Block Management	1. 112L (BiCS5) 3D TLC Implement 2. Supports RAID Engine, SLC Cache and Thermal Throttling 3. End-to-End (E2E) Data Path Protection	1. Supports S.M.A.R.T. Monitor 2. Wear Leveling, Bad Block Management, Garbage Collection 3. BCH ECC Engine
Interface	SATA III 6.0Gbps	SATA III 6.0Gbps	SATA III 6.0Gbps	SATA III 6.0Gbps
Form Factor	M.2 2242 (B+M Key)	M.2 2242 (B+M Key)	M.2 2242 (B+M Key)	M.2 2242 (B+M Key)
Flash Type	112L 3D TLC	112L 3D TLC	112L 3D TLC	MLC
Capacity	128GB - 1TB	128GB - 1TB	128GB - 1TB	16GB – 256GB
Max. Seq. R/W Speed (MB/s)	560/490	560/550	560/480	540/350
Operating Voltage	3.3V	3.3V	3.3V	3.3V
Max. Power Consumption	2.2W	1.1W	1.37W	1.8W
Operating Temp. (Standard)	0°C to 70°C	0°C to 70°C	0°C to 70°C	0°C to 70°C
Operating Temp. (Industrial)	-40°C to 85°C	—	-40°C to 85°C	-40°C to 85°C
P/E Cycle (times)	3K	3K	3K	3K
ECC Engine	LDPC ECC	LDPC ECC	LDPC ECC	BCH ECC
A⁺ SLC Mode	Available by request	—	Available by request	Available by request
Environment	Vibration: 20G (20 - 2000Hz), Shock: 1500G/0.5ms, Half Sine Wave, MTBF: > 3 million hours			
Dimensions (L x W x H)	42 x 22 x 3.5mm			

Product specifications are subject to change without prior notice

M.2 SATA SSD

Model	IM2S3328E
Features	1. Supports S.M.A.R.T. Monitor 2. Power Loss Protection(Optional) 3. With DRAM Buffer
Interface	SATA III 6.0Gbps
Form Factor	M.2 2280 (B+M Key)
Flash Type	MLC
Capacity	32GB - 512GB
Max. Seq. R/W Speed (MB/s)	550/430
Operating Voltage	3.3V
Max. Power Consumption	3.5W
Operating Temp. (Standard)	0°C to 70°C
Operating Temp. (Industrial)	-40°C to 85°C
P/E Cycle (times)	3K
ECC Engine	BCH ECC
A+ SLC Mode	Available by request
Environment	Vibration: 20G (20 - 2000Hz), Shock: 1500G/0.5ms, Half Sine Wave, MTBF: > 3 million hours
Dimensions (L x W x H)	80 x 22 x 2.25mm

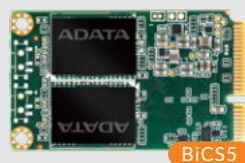| Model	IM2S3134N
Features	1. Supports S.M.A.R.T. Monitor 2. Wear Leveling, Bad Block Management, Garbage Collection 3. BCH ECC Engine 4. With DRAM Buffer
Interface	SATA III 6.0Gbps
Form Factor	M.2 2242 (B+M Key)
Flash Type	MLC
Capacity	64GB - 256GB
Max. Seq. R/W Speed (MB/s)	550/320
Operating Voltage	3.3V
Max. Power Consumption	2.5W
Operating Temp. (Standard)	0°C to 70°C
Operating Temp. (Industrial)	—
P/E Cycle (times)	3K
ECC Engine	BCH ECC
A+ SLC Mode	—
Environment	Vibration: 20G (20 - 2000Hz), Shock: 1500G/0.5ms, Half Sine Wave, MTBF: > 3 million hours
Dimensions (L x W x H)	42 x 22 x 3.5mm

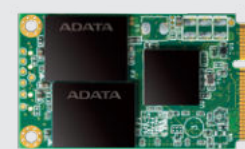Product specifications are subject to change without prior notice

mSATA SSD

Original IC Implement
Wide-Temp. Support (-40°C to 85°C)
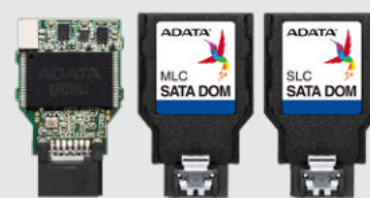S.M.A.R.T. Monitor, Wear Leveling, NCQ and TRIM Command

Model	IMSS31C	IMSS316	IMSS332
Features	1. 112L (BiCS5) 3D TLC Implement 2. Supports SLC Cache, RAID Engine, and Thermal Throttling 3. With DRAM Buffer	1. 112L (BiCS5) 3D TLC Implement 2. Supports SLC Cache, RAID Engine, and Thermal Throttling	1. MLC NAND Flash and 3K P/E Cycle Rating 2. With DRAM Buffer
Interface	SATA III 6.0Gbps	SATA III 6.0Gbps	SATA III 6.0Gbps
Form Factor	mSATA (MO-300A)	mSATA (MO-300A)	mSATA (MO-300A)
Flash Type	112L 3D TLC	112L 3D TLC	MLC
Capacity	128GB - 1TB	128GB - 2TB	16GB - 512GB
Max. Seq. R/W Speed (MB/s)	560/480	560/520	550/400
Operating Voltage	3.3V	3.3V	3.3V
Max. Power Consumption	2.1W	1.67W	3.3W
Operating Temp. (Standard)	0°C to 70°C	0°C to 70°C	0°C to 70°C
Operating Temp. (Industrial)	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
P/E Cycle (times)	3K	3K	3K
ECC Engine	LDPC ECC	LDPC ECC	BCH ECC
H/W PLP Function	Optional	Optional	Optional
A$^+$ SLC Mode	Available by request	Ready	Ready
Anti-Sulfuration Protection	Optional	Optional	Optional
Environment	Vibration: 20G (20 - 2000Hz), Shock: 1500G/0.5ms, Half Sine Wave, MTBF: > 3 million hours		
Dimensions (L x W x H)	50.80 x 29.85 x 4.5mm		

DOM (Disk-On-Module)

Model	IUMU23C	IUMU211	ISMS331	
Features	1. SLC NAND Flash for great reliability 2. BCH ECC Engine 3. H/W Write Protect 4. Wear Leveling, Bad Block Management, Garbage Collection	1. BCH ECC Engine 2. Wear Leveling, Bad Block Management, Garbage Collection	1. BCH ECC Engine 2. H/W Write Protect 3. Wear Leveling, Bad Block Management, Garbage Collection	
Interface	USB 2.0	USB 2.0	SATA III 6.0Gbps	SATA III 6.0Gbps
Form Factor	USB 10 Pin	USB 10 Pin	SATA DOM	SATA DOM
Flash Type	SLC	MLC	SLC	MLC
Capacity	512MB - 4GB	8GB - 32GB	8GB	8GB - 128GB
Max. Seq. R/W Speed (MB/s)	18/16	43/32	40/35	340/200
Operating Voltage	5V	5V	5V	5V
Max. Power Consumption	0.6W	0.5W	0.8W	1.6W
Operating Temp. (Standard)	0°C to 70°C	0°C to 70°C	—	0°C to 70°C
Operating Temp. (Industrial)	—	—	-40°C to 85°C	-40°C to 85°C
P/E Cycle (times)	60K	3K	60K	3K
ECC Engine	BCH ECC	BCH ECC	BCH ECC	BCH ECC
A$^+$ SLC Mode	—	—	—	Available by request
Environment	Vibration: 20G (20 - 2000Hz), Shock: 1500G/0.5ms, Half Sine Wave, MTBF: > 3 million hours			
Dimensions (L x W x H)	(2.54mm): 36.9 x 26.6 x 8.5mm (2.0mm): 36.9 x 26.6 x 5.75mm	(2.54mm): 36.9 x 26.6 x 8.5mm (2.0mm): 36.9 x 26.6 x 5.75mm	(Vertical) w/o Housing: 38.4 x 23.4 x 8.45mm	(Horizontal) w/ Housing: 34.63 x 24.94 x 18.51mm w/o Housing: 32.56 x 23.4 x 17.33mm (Vertical) w/ Housing: 40.47 x 24.94 x 6.8mm w/o Housing: 38.4 x 23.4 x 8.45mm

Product specifications are subject to change without prior notice

INDUSTRIAL-GRADE MEMORY CARDS

- CFexpress
- CFast
- Compact Flash
- SD / microSD
- eMMC

CFexpress Card

Model	ICFP301
Features	1. Supports RAID Engine and Thermal Throttling 2. End-to-End (E2E) Data Path Protection 3. Supports AES 256-bit Data Encryption (optional) and TCG OPAL 2.0 (optional)
Interface	PCIe Gen3x2
Form Factor	CFexpress Type-B
Flash Type	3D TLC
Capacity	64GB - 512GB
Max. Seq. R/W Speed (MB/s)	1600/1200
Operating Voltage	3.3V
Max. Power Consumption	1.6W
Operating Temp. (Standard)	0°C to 70°C
Operating Temp. (Industrial)	-40°C to 85°C
P/E Cycle (times)	3K
ECC Engine	LDPC ECC
A$^+$ SLC Mode	Available by request
Environment	Vibration: 20G (20 - 2000Hz), Shock: 1500G/0.5ms, Half Sine Wave, MTBF: > 3 million hours
Dimensions (L x W x H)	38.5 x 29.6 x 3.8mm

Product specifications are subject to change without prior notice

CFast Card
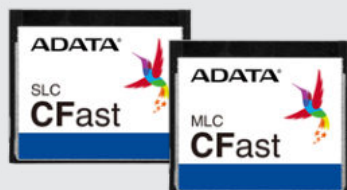
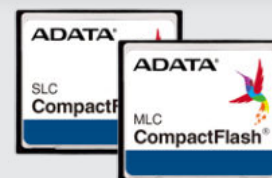| Model	ISC3E	ICFS31C
Interface	SATA III 6.0Gbps	SATA III 6.0Gbps
Form Factor	CFast 2.0	CFast 2.0
Flash Type	MLC / SLC	112L 3D TLC
Capacity	4GB - 256GB	80GB - 1TB
Max. Seq. R/W Speed (MB/s)	500/400	560/490
Operating Voltage	3.3V	3.3V
Max. Power Consumption	2W	2W
Operating Temp. (Standard)	0°C to 70°C	0°C to 70°C
Operating Temp. (Industrial)	-40°C to 85°C	-40°C to 85°C
P/E Cycle (times)	3K - 60K	3K - 100K
ECC Engine	BCH ECC	LDPC ECC
A$^+$ SLC Mode	Ready	Ready
Environment	Vibration: 20G (20 - 2000Hz), Shock: 1500G/0.5ms, Half Sine Wave, MTBF: > 3 million hours	
Dimensions (L x W x H)	36.4 x 42.8 x 3.6mm	

CF Card

Model	IPC17	IPC39
Interface	PATA	PATA
Form Factor	CF50 pin type 1	CF50 pin type 1
Flash Type	SLC	SLC/MLC
Capacity	128MB - 8GB	2GB-128GB
Max. Seq. R/W Speed (MB/s)	40/30	125/125
Operating Voltage	3.3V/ 5V	3.3V/ 5V
Max. Power Consumption	0.5W	1W
Operating Temp. (Standard)	0°C to 70°C	0°C to 70°C
Operating Temp. (Industrial)	-40°C to 85°C	-40°C to 85°C
P/E Cycle (times)	60K	3K - 60K
ECC Engine	BCH ECC	BCH ECC
A$^+$ SLC Mode	—	Available by request (For MLC Model)
Environment	Vibration: 20G (20 - 2000Hz), Shock: 1500G/0.5ms, Half Sine Wave, MTBF: > 3 million hours	
Dimensions (L x W x H)	36.4 x 42.8 x 3.3mm	

Product specifications are subject to change without prior notice

SD Card

Model	ISDD33K	IDC3B	ISDD361
Interface	SD 6.1	SD 3.0	SD 2.0/3.0
Flash Type	112L 3D TLC	MLC	SLC
Capacity	8GB - 512GB	8GB - 256GB	256MB - 32GB
Max. Seq. R/W Speed (MB/s)	93/84	95/69	98/74
Operating Voltage	3.6V	3.6V	3.6V
Max. Power Consumption	1.12W	0.72W	0.5W
Operating Temp. (Standard)	-25°C to 85°C	-25°C to 85°C	—
Operating Temp. (Industrial)	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
P/E Cycle (times)	3K	3K	60K
ECC Engine	LDPC ECC	BCH ECC	BCH ECC
A⁺ SLC Mode	Ready	Available by request	—
Environment	Vibration: 20G (20 - 2000Hz), Shock: 1500G/0.5ms, Half Sine Wave, MTBF: > 3 million hours		
Dimensions (L x W x H)	32 x 24 x 2.1mm		

microSD Card

Model	IUDD33K	IUDD33H	IDU3A	IUDD362
Interface	SD 6.1	SD 3.0	SD 3.0	SD 3.0
Flash Type	112L 3D TLC	MLC	MLC	SLC
Capacity	16GB - 512GB	4GB - 16GB	8GB - 64GB	1GB - 8GB
Max. Seq. R/W Speed (MB/s)	97/83	97/35	96/67	31/29
Operating Voltage	3.6V	3.6V	3.6V	3.6V
Max. Power Consumption	0.99W	0.36W	0.61W	0.5W
Operating Temp. (Standard)	-25°C to 85°C	-25°C to 85°C	-25°C to 85°C	—
Operating Temp. (Industrial)	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C	-40°C to 85°C
P/E Cycle (times)	3K - 100K	3K	3K	60K
ECC Engine	LDPC ECC	BCH ECC	BCH ECC	BCH ECC
A⁺ SLC Mode	Ready	Available by request	Available by request	—
Environment	Vibration: 20G (20 - 2000Hz), Shock: 1500G/0.5ms, Half Sine Wave, MTBF: > 3 million hours			
Dimensions (L x W x H)	11 x 15 x 1mm			

Product specifications are subject to change without prior notice

eMMC
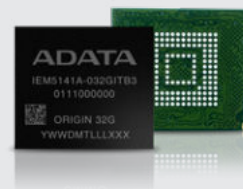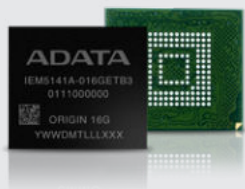
Model	IEM5141A (MLC)	IEM5141A (3D TLC)
Interface	eMMC 5.1	eMMC 5.1
Flash Type	MLC	3D TLC
Capacity	8GB (Standard) | 16GB (Industrial)	16GB (Standard) | 32GB (Industrial)
Max. Seq. R/W Speed (MB/s)	300/120	300/180
Operating Voltage	2.7V - 3.6V	2.7V - 3.6V
Data Bus Widths	1 bit (default), 4 bit, 8 bit	1 bit (default), 4 bit, 8 bit
Operating Temp. (Standard)	-25°C to 85°C (8GB)	-25°C to 85°C (16GB)
Operating Temp. (Industrial)	-40°C to 85°C (16GB)	-40°C to 85°C (32GB)
P/E Cycle (times)	3K	3K
Data Retention	10 years (at +55°C for fresh device)	10 years (at +55°C for fresh device)
ECC Engine	LDPC ECC	LDPC ECC
Thermal Throttling	X	V
TBW (Max.)	40TB	87TB
Dimensions (L x W x H)	11.5 x 13 x 0.8mm (153 balls)	11.5 x 13 x 1.0mm (153 balls)

USB Flash Drive

Model	UV131	UV350
Interface	USB 3.2 Gen 1	USB 3.2 Gen 1
Flash Type	MLC	96L 3D TLC
Capacity	8GB - 64GB	32GB - 128GB
Max. Seq. R/W Speed (MB/s)	166/79	262/45
Operating Voltage	5V	5V
Max. Power Consumption	1.02W	1.6W
Dimensions (L x W x H)	44.2 x 16.8 x 8.0mm	42.4 x 14.9 x 5.3mm
Weight	8g	5.9g
Operating Temp. (Standard)	0°C to 70°C	0°C to 70°C
P/E Cycle (times)	3K	3K
ECC Engine	BCH ECC	BCH ECC
Environment	Vibration: 20G (20 - 2000Hz), Shock: 1500G/0.5ms, Half Sine Wave, MTBF: > 3 million hours	
Operating System Requirements	Windows XP or later, Mac OS X 10.6 or later, Linux Kemel 2.6 or later	

Product specifications are subject to change without prior notice

DRAM MODULES

Embedded Series

Server Series

Wide-Temperature Series

Stringent Validation and Tests

ADATA's Proprietary MRS Test

What is MRS?

ADATA has developed proprietary software to test DRAM modules – **MRS.** MRS integrates the advantages of a self-developed algorithm and Memtest software, simulating system behaviors, including heavy loading, random read/write operation, and multi-cores operation.

The Advantages of MRS

With MRS we can:

- Collect data on motherboards and DRAM modules for management control during manufacturing
- Record the speed, capacity, timing, and voltage of modules
- Easily identify defective DRAM module components via a graphic interface

Memtest Software

MRS

ADATA Self-Developed Algorithm
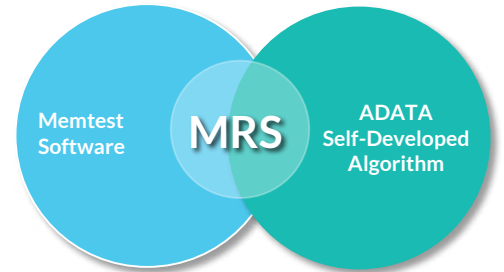
Multiple Reliability Tests

With large chambers, we are able to conduct various reliability tests, including dynamic environment tests by batches and systems and ensure the consistent quality of our products. Meanwhile we can also conduct MTBF, HTOL, LTOL tests per customers' requests or by different products.

Dynamic Environment Tests

- By batches and systems

Product Reliability Tests

- Simulate various extreme environment conditions

Consistant Quality

- Ensures the consistent product quality at design and MP stages

Wide-Temperature Testing

Wide-Temp. IC Sorting
via Automatic Test Equipment (ATE)

Testing Process of Wide-Temperature Modules

Low Temp. (-40℃)	High Temp. (85℃)	ICT Test	ATE Test (65℃)	SLT Test (60℃)
DC Timing Speed Function Data Retention	DC Timing Speed Function Data Retention	Open-Short Circuit VREF SPD Programming and Verification	Speed Read & Write Voltage & Current	Read & Write

Fully Automated Production

SMT Line

Chip Mounter

AOI
(Automated Optical Inspection)

Auto Labeling

ATE (Automatic Test Equipment)

ATE (Automatic Test Equipment) is used for DRAM specification testing. Testing capability equals that of semiconductor industry-level machinery. This guarantees ADATA's modules meet DRAM specifications, including fun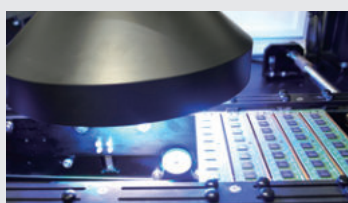ction, DC, AC, timing, and frequency. ADATA has industry-leading ATE test equipment and has achieved digital and networked control for test programs, data collection, and analysis.

- Open, short, and continuous tests
- DC Test (leakage, IDD, VREF)
- Speed Test (timing parameter check, data BGR check
- Function Test (H/L CDD, Refresh, Self-refresh, Read/Write Opertion, Data Mask, OTF)

Product Features

|			30μ Gold Finger	Wide Temperature Support	Temperature Sensor	Conformal Coating	Anti-sulfuration
Embedded	DDR3L	U-DIMM	▲	▲	▲	▲	▲
		SO-DIMM	▲	▲	▲	▲	▲
	DDR4	U-DIMM	▲	▲	▲	▲	▲
		VLP U-DIMM	▲	▲	▲	▲	▲
		SO-DIMM	▲	▲	▲	▲	▲
	DDR5	U-DIMM	▲	▲	●	▲	▲
		SO-DIMM	▲	▲	●	▲	▲
Server	DDR3L	R-DIMM	●	▲	●	▲	▲
		ECC U-DIMM	●	▲	●	▲	▲
		ECC SO-DIMM	●	▲	●	▲	▲
	DDR4	R-DIMM	●	▲	●	▲	▲
		ECC U-DIMM	●	▲	●	▲	▲
		ECC SO-DIMM	●	▲	●	▲	▲
		VLP ECC U-DIMM	●	▲	●	▲	▲
		VLP R-DIMM	●	▲	●	▲	▲
	DDR5	R-DIMM	●	▲	●	▲	▲
		ECC U-DIMM	●	▲	●	▲	▲
		ECC SO-DIMM	●	▲	●	▲	▲
Wide-Temp.	DDR3L	SO-DIMM	▲	●	●	▲	▲
		ECC SO-DIMM	●	●	●	▲	▲
	DDR4	R-DIMM	●	●	●	▲	▲
		SO-DIMM	▲	●	●	▲	▲
		ECC SO-DIMM	●	●	●	▲	▲

▲ By Request   ● Supported

DDR5 MEMORY MODULES

EMPOWERING HIGH SPEED COMPUTING AND 5G

To meet the emerging demands of 5G, AIoT, Edge Computing, HPC, and more, ADATA has unveiled new industrial-grade DDR5 memory modules. They are capable of reaching speeds of up to 4800 MT/s and yet only operates on 1.1V. In addition, the are equipped with a Power Management IC (PMIC) to enhance power supply stability.

Why DDR5

ADATA's industrial-grade DDR5 memory modules feature the advantages below, making them ideal for automation, networking, surveillance, IPCs, embedded systems, servers. At present, ADATA DDR5 series are being widely implemented for automation and servers.

DDR5	38.4GBps	4800 MT/s
DDR4	25.6GBps	3200 MT/s
DDR3	12.8GBps	1600 MT/s

Voltage

DDR4   DDR5
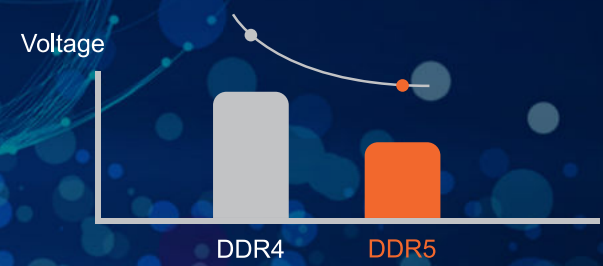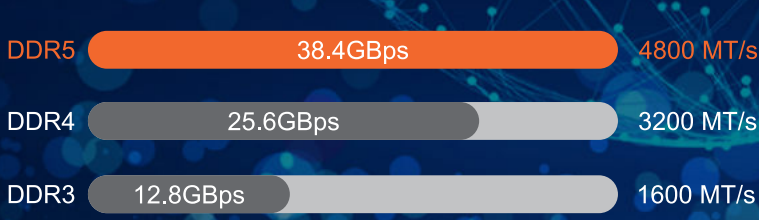
4800 MT/s	1.5X Faster transfer rate compared to DDR4
1.1V	Consumes 9% less power compared to DDR4
OG IC	SAMSUNG Original IC for great reliability
On-die ECC	For more reliable data transmissions
PMIC	Power Management IC for improved power supply stability
32GB	Ample storage capacity up to 32GB

Embedded

Unbuffered DIMM

Interface	DDR5	DDR4	DDR3L
Module Type	U-DIMM	U-DIMM	U-DIMM
Frequency (MT/s)	4800/5600	2400 / 2666 / 3200	1600
Capacity	8GB, 16GB, 32GB	4GB, 8GB, 16GB, 32GB	2GB, 4GB, 8GB
Pin Count	288 Pin	288 Pin	240 Pin
PCB Height (inch/ cm)	1.23 inches/3.12cm	1.23 inches/3.12cm	1.18 inches/3cm
Operating Voltage	1.1V	1.2V	1.35V
Operating Temp.	0°C to 85°C	0°C to 85°C	0°C to 85°C
Customized Services (Optional)	Anti-Sulfuration Protection, Conformal Coating		

SO-DIMM

Interface	DDR5	DDR4	DDR3L
Module Type	SO-DIMM	SO-DIMM	SO-DIMM
Frequency (MT/s)	4800 / 5600	2400 / 2666 / 3200	1600
Capacity	8GB, 16GB, 32GB	4GB, 8GB, 16GB, 32GB	1GB, 2GB, 4GB, 8GB
Pin Count	262 Pin	260 Pin	204 Pin
PCB Height (inch/ cm)	1.18 inches/3cm	1.18 inches/3cm	1.18 inches/3cm
Operating Voltage	1.1V	1.2V	1.35V
Operating Temp.	0°C to 85°C	0°C to 85°C	0°C to 85°C
Customized Services (Optional)	Anti-Sulfuration Protection, Conformal Coating		

Embedded VLP U-DIMM

Interface	DDR4
Module Type	VLP U-DIMM
Frequency (MT/s)	2400 / 2666 / 3200
Capacity	2400MT/s: 2GB, 4GB, 8GB, 16GB 2666MT/s: 2GB, 4GB, 8GB, 16GB 3200MT/s: 8GB, 16GB
Pin Count	288 Pin
PCB Height (inch/ cm)	0.73 inches/ 1.85cm
Operating Voltage	1.2V
Operating Temp.	0°C to 85°C
Customized Services (Optional)	Anti-Sulfuration Protection, Conformal Coating

Product specifications are subject to change without prior notice

Server

Registered DIMM
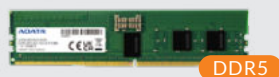
	DDR5	DDR4	DDR3L
Interface	DDR5	DDR4	DDR3L
Module Type	R-DIMM	R-DIMM	R-DIMM
Frequency (MT/s)	4800 / 5600	2666 / 3200	1600
Capacity	16GB, 32GB	2666MT/s: 4GB, 8GB, 16GB, 32GB 3200MT/s: 8GB, 16GB, 32GB	8GB
Pin Count	288 Pin	288 Pin	240 Pin
PCB Height (inch/ cm)	1.23 inches/ 3.12cm	1.23 inches/ 3.12cm	1.18 inches/3cm
Operating Voltage	1.1V	1.2V	1.35V
Operating Temp.	0°C to 85°C	0°C to 85°C	0°C to 85°C
30μ PCB Gold Plating	V	V	V
Customized Services (Optional)	Anti-Sulfuration Protection, Conformal Coating		

VLP ECC U-DIMM

	DDR4	DDR3L
Interface	DDR4	DDR3L
Module Type	VLP ECC U-DIMM	VLP ECC U-DIMM
Frequency (MT/s)	2400 / 2666 / 3200	1600
Capacity	2400MT/s: 4GB, 8GB, 16GB 2666MT/s: 4GB, 8GB, 16GB 3200MT/s: 8GB, 16GB	2GB, 4GB, 8GB
Pin Count	288 Pin	240 Pin
PCB Height (inch/ cm)	0.73 inches/ 1.85cm	0.73 inches/ 1.85cm
Operating Voltage	1.2V	1.35V
Operating Temp.	0°C to 85°C	0°C to 85°C
30μ PCB Gold Plating	V	V
Customized Services (Optional)	Anti-Sulfuration Protection, Conformal Coating	

Product specifications are subject to change without prior notice

Server

ECC U-DIMM

Interface	DDR5	DDR4	DDR3L
Module Type	ECC U-DIMM	ECC U-DIMM	ECC U-DIMM
Frequency (MT/s)	4800 / 5600	2400 / 2666 / 3200	1600
Capacity	16GB, 32GB	2400MT/s: 4GB, 8GB, 16GB 2666MT/s: 4GB, 8GB, 16GB, 32GB 3200MT/s: 8GB, 16GB, 32GB	2GB, 4GB, 8GB
Pin Count	288 Pin	288 Pin	204 Pin
PCB Height (inch/ cm)	1.23 inches/ 3.12cm	1.23 inches/ 3.12cm	1.18 inches/3cm
Operating Voltage	1.1V	1.2V	1.35V
Operating Temp.	0°C to 85°C	0°C to 85°C	0°C to 85°C
30μ PCB Gold Plating	V	V	V
Customized Services (Optional)	Anti-Sulfuration Protection, Conformal Coating		

ECC SO-DIMM

Interface	DDR5	DDR4	DDR3L
Module Type	ECC SO-DIMM	ECC SO-DIMM	ECC SO-DIMM
Frequency (MT/s)	4800 / 5600	2400 / 2666 / 3200	1600
Capacity	16GB, 32GB	2400MT/s: 2GB, 4GB, 8GB, 16GB, 32GB 2666MT/s: 4GB, 8GB, 16GB, 32GB 3200MT/s: 8GB, 16GB, 32GB	2GB, 4GB, 8GB
Pin Count	262 Pin	260 Pin	204 Pin
PCB Height (inch/ cm)	1.23 inches/ 3.12cm	1.18 inches/3cm	1.18 inches/3cm
Operating Voltage	1.1V	1.2V	1.35V
Operating Temp.	0°C to 85°C	0°C to 85°C	0°C to 85°C
30μ PCB Gold Plating	V	V	V
Customized Services (Optional)	Anti-Sulfuration Protection, Conformal Coating		

Product specifications are subject to change without prior notice

Wide-Temperature Series

SO-DIMM (W.T.)

Interface	DDR4	DDR3L
Module Type	SO-DIMM	SO-DIMM
Frequency (MT/s)	2400 / 2666 / 3200	1600
Capacity	2400MT/s: 4GB, 8GB, 16GB, 32GB 2666MT/s: 4GB, 8GB, 16GB, 32GB 3200MT/s: 8GB, 16GB, 32GB	2GB, 4GB, 8GB
Pin Count	260 Pin	204 Pin
PCB Height (inch/ cm)	1.23 inches/ 3.12cm	1.23 inches/ 3.12cm
Operating Voltage	1.2V	1.35V
Operating Temp.	-40°C to 85°C	-40°C to 85°C
30μ PCB Gold Plating	V	V
Customized Services (Optional)	Anti-Sulfuration Protection, Conformal Coating	

ECC SO-DIMM (W.T.)

Interface	DDR4	DDR3L
Module Type	ECC SO-DIMM	ECC SO-DIMM
Frequency (MT/s)	2666 / 3200	1600
Capacity	2666MT/s: 4GB, 8GB, 16GB, 32GB 3200MT/s: 8GB, 16GB, 32GB	8GB
Pin Count	260 Pin	204 Pin
PCB Height (inch/ cm)	1.18 inches/3cm	1.18 inches/3cm
Operating Voltage	1.2V	1.35V
Operating Temp.	-40°C to 85°C	-40°C to 85°C
30μ PCB Gold Plating	V	V
Customized Services (Optional)	Anti-Sulfuration Protection, Conformal Coating	

Product specifications are subject to change without prior notice

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