

ADATA® INDUSTRIAL

PRODUCT CATALOG

**GLOBAL LEADER IN
INDUSTRIAL STORAGE**





ABOUT ADATA

| Founded May 4, 2001

| Founder, Chairman, and CEO: Simon Chen

| TOP 2 Branded SSD Module Maker

| TOP 3 DRAM Module Manufacturer

| More than 500 patents owned

As a global leader in industrial-grade embedded memory, ADATA Industrial upholds the belief of “Infinite Innovation, Intelligent Future”, continuously launching industry-leading high-performance products and services. Leveraging the strength of the ADATA brand, we integrate both hardware and software to deliver optimal storage solutions for our customers and partners, driving the advancement of intelligent applications and edge computing across industries.

ADATA Industrial extends its brand spirit through the infinity symbol (∞), represented by five signature industrial colors—Intelligent Green, Innovative Blue, Solid Blue, Passionate Orange, and Agile Yellow—each symbolizing our distinct identity and technological strength. Carrying forward ADATA Group’s sustainable vision of “Innovate Today, Embrace Tomorrow”, ADATA Industrial is committed to developing eco-friendly products and actively contributing to global sustainability efforts—using innovative technologies to shape a smarter, greener future for all. For more information, please visit industrial.adata.com.

Leading of the Edge

 TOP 2 Global Branded SSD Module Maker (TrendForce, 2024)

 TOP 3 DRAM Module Manufacturer (TrendForce, 2024)



Worldwide Service and Presence

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



Quality and Environmental Certifications

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



Quality Management

- ISO 9001
- IATF 16949

Hazardous Substance Process Management

- IECQ QC 080000
- B2B Green Partner

Electrostatic Protection Management

- ANSI/ESD S20.20

Occupational Health & Safety

- ISO 45001
- CNS 45001

Environmental Management

- ISO 14001
- ISO 14064-1

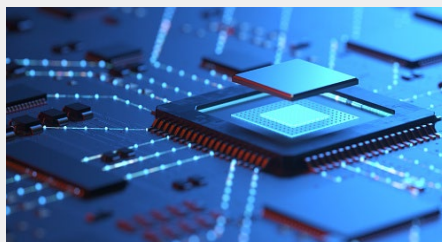
Informational Security

- ISO 27001

Target Applications



AUTOMATION



EMBEDDED/ IPC



GAMING



HEALTHCARE



AIoT



IN-VEHICLE



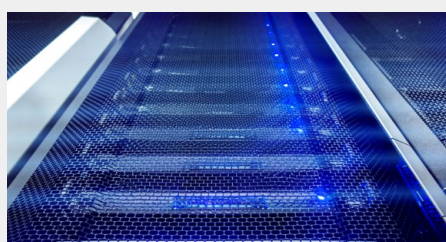
MILITARY



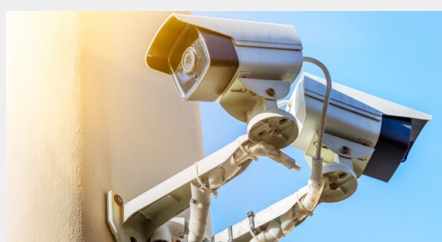
NETWORKING



RETAIL (POS/ DIGITAL SIGNAGE/ MFP)



EDGE COMPUTING



SURVEILLANCE



TRANSPORTATION

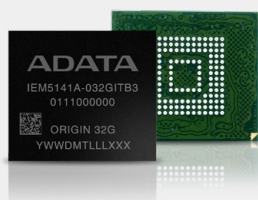
Product Portfolio



DRAM Modules



Solid State Drives



eMMC



Memory Cards



USB Flash Drive

Product Dimensions Comparison

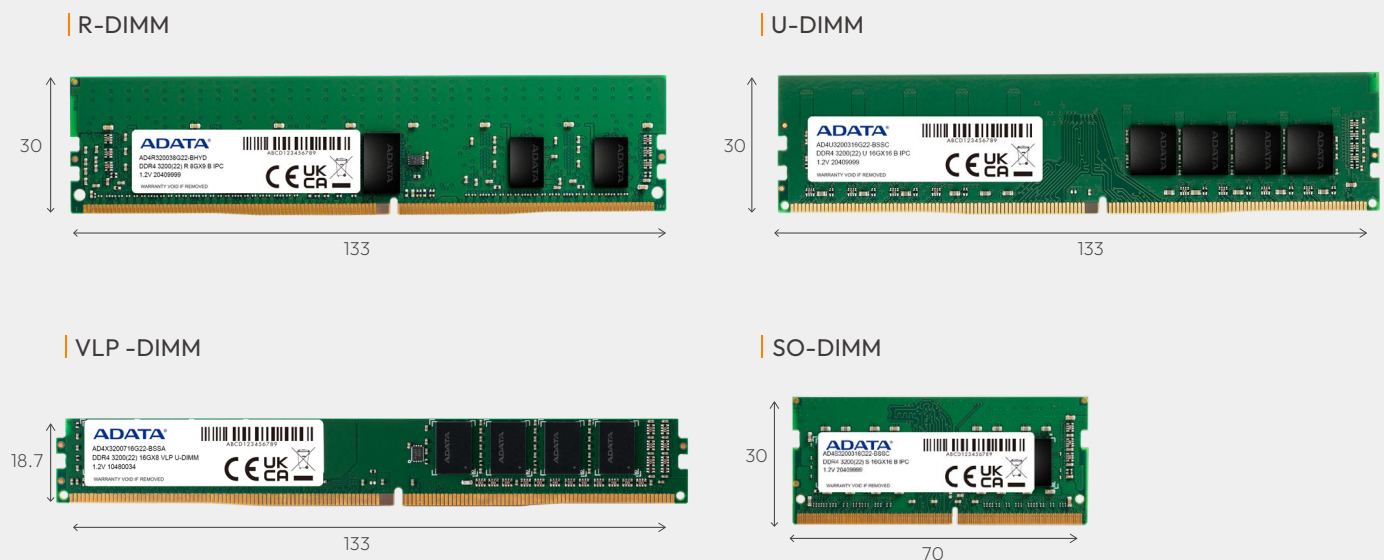
Flash Storage

Unit: mm



DRAM Module

Unit: mm



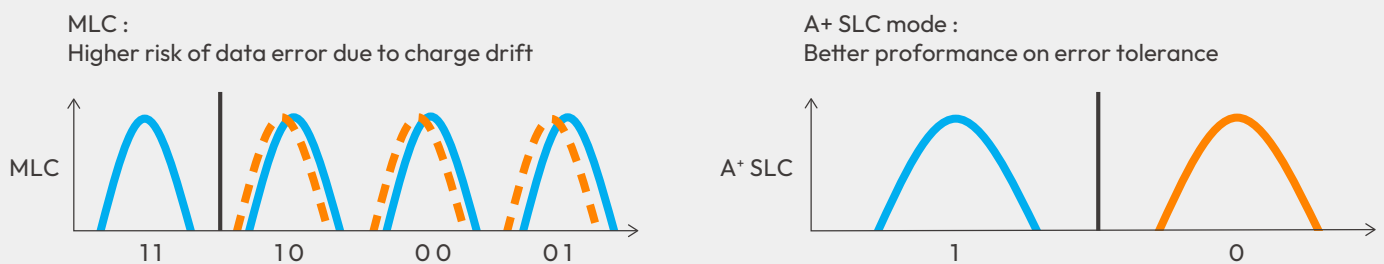
Featured Technologies



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.



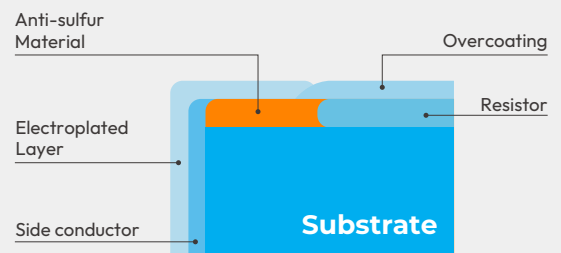
Type	P/E Cycle (times)	Features
SLC	60K	High cost, Ultra high endurance
A+ SLC	30K-100K	Better performance, High endurance and error tolerance
MLC/3D TLC	3K	Moderate cost, Good performance



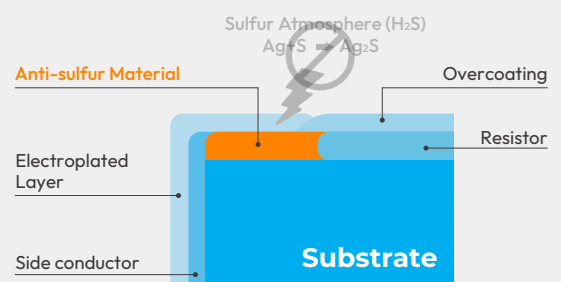
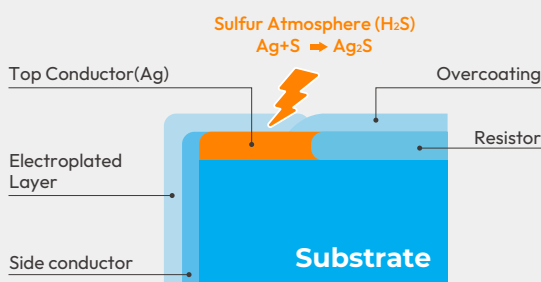
Anti-Sulfuration

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 prevent the negative 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:



When normal resistor is under sulfur atmosphere (H_2S), silver sulfide (Ag_2S), 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.



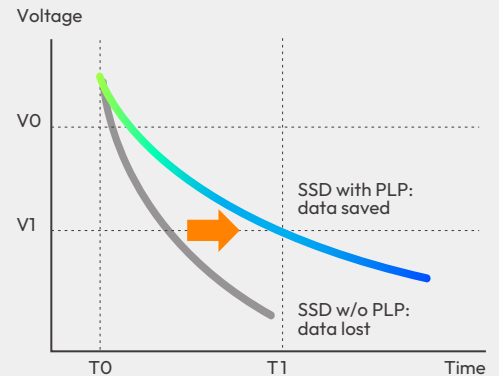
Featured Technologies



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.



- 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

Applications



Edge computing



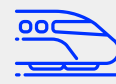
Healthcare



Networking



Surveillance



Transportation



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



Surveillance

Proprietary Software



A+ IntelliManager

ADATA's "A+ IntelliManager" is a cloud management platform for industrial-grade SSDs. Users can install it on private clouds or public clouds and access the platform anytime, anywhere to centrally manage and monitor SSD temperature, usage capacity, lifespan, status, system parameters, etc. on multiple devices.



Centralized control across multiple devices

Regularly updates S.M.A.R.T. data across multiple devices to the user end



Remote management and real-time monitoring

The user terminal can remotely observe the real-time S.M.A.R.T. data of any device at any time.



Advanced deployment provides accurate warning

Set different warning thresholds for each device and receive timely warning notifications



Multi-dimensional comprehensive analysis

Not only monitors SSD data, but also checks CPU MEMORY, OS version, and managed device information



Smart grouping and precise management

Set up management groups to distinguish between different users and monitor different devices



A+ Duplicator

ADATA's A+ Duplicator is a software and hardware integration technology designed for enterprises to reduce the risk of data loss and restore data quickly. Users can backup important data in advance with the software to prevent unexpected data loss. It also helps users quickly clone the current system to a new ADATA SSD.

DATA RECOVERY

Backup and recover unexpected data loss immediately

FREE & RELIABLE

Supports all ADATA SSDs and customers

SYSTEM CLONE

Clone the current system to a new ADATA SSD

EASY ACCESS

Easy to install
Flexible disk selection



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, S.M.A.R.T. attributes, utilities, Alert email and system information.

Drive Info



Get assigned drive information.

S.M.A.R.T. Attributes



Analyze usable blocks, remaining lifespan, system temperature, and more.

System Info



Displays current system information.

Utilities



Includes secure erase and export log.

Alert



When abnormal conditions occur, the system will send a pre-alert email.



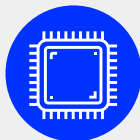
A+ OPAL

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

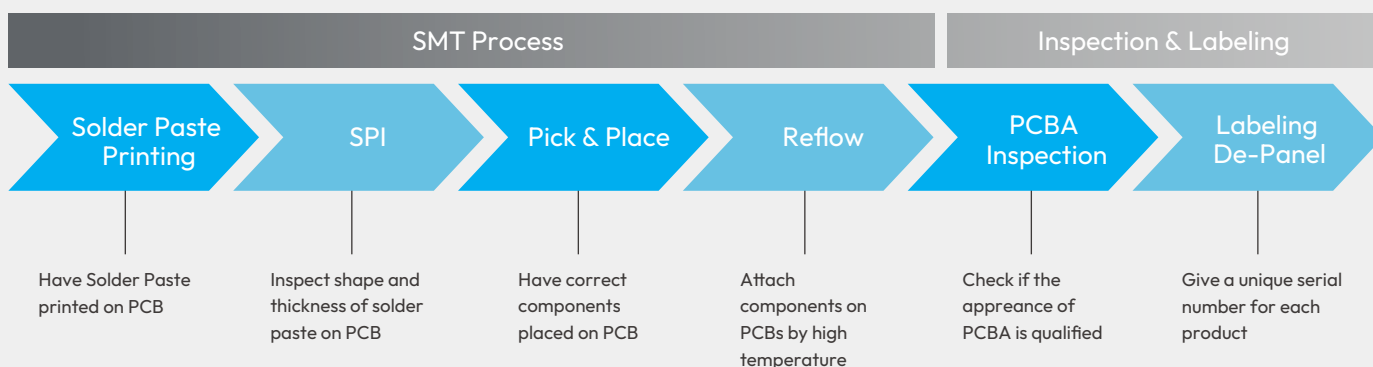
- Open/ Short Circuit
- Leakage / Standby Current
- NAND Flash ID Check

Function Tests

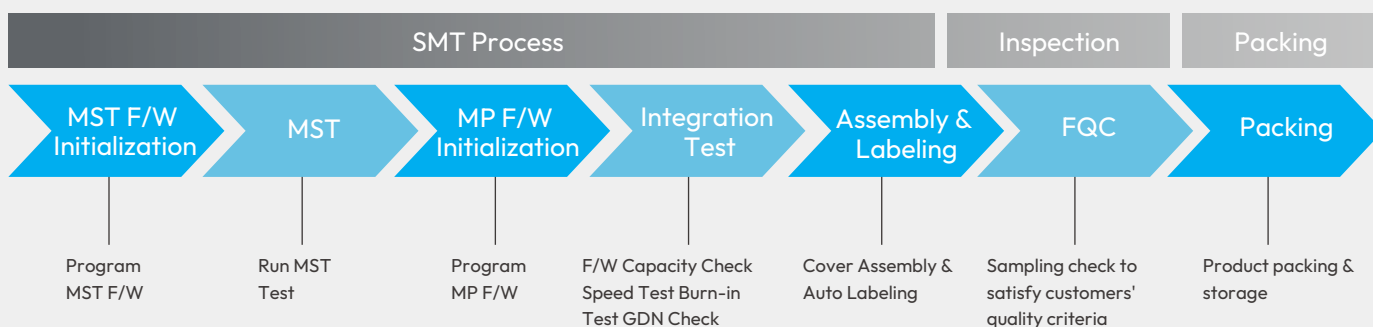
- Async./ sync. Interface check
- ECC 20bit/1KB
- Random Read/ Write
- Bad block numbers
- User capacity > 99.5%
- Validate quality of Block 0-3



SSD Manufacturing Process



SSD Testing Process



F/W Initialization



MST Test



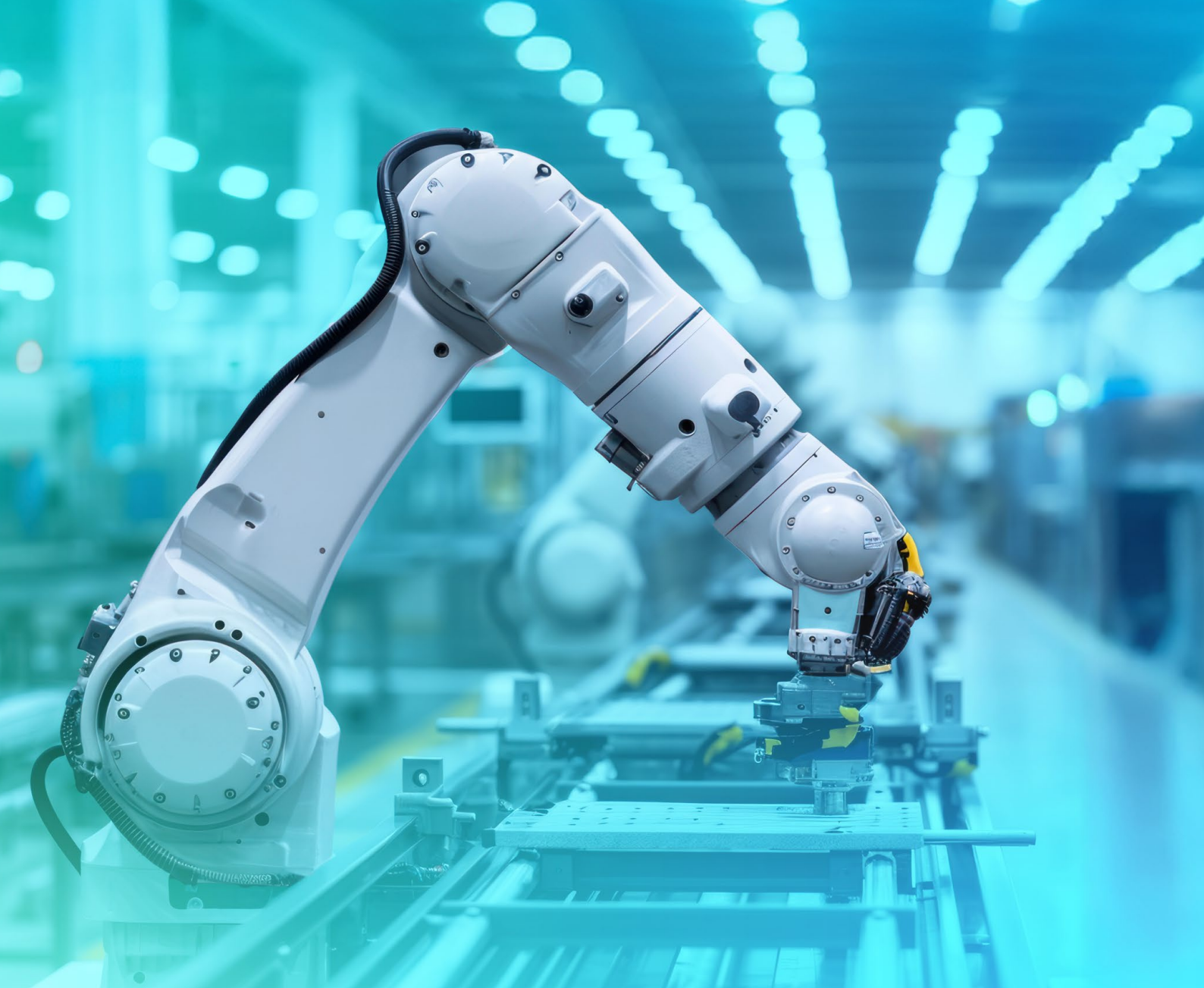
Integration Test



Assembly & Labeling



Packing



NAND FLASH STORAGE PRODUCTS

2.5" SSD

M.2 SSD

mSATA SSD

USB / SATA DOM



BiCS8

218-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 218-layer 3D NAND (BiCS8) solid state drives and memory cards in various form factors, featuring higher capacity up to 8TB, greater reliability, as well as wide temperature support from -40°C to 85°C for stable operation in harsh environment. The BiCS8 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

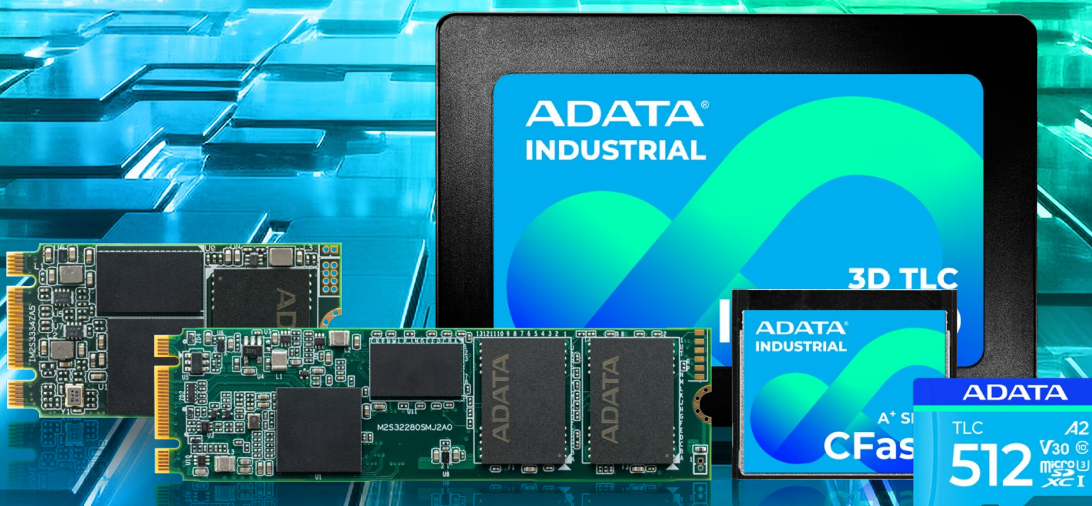
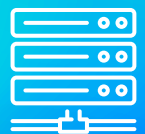
ORIGINAL IC
WDC/ KIOXIA



WIDE-TEMP.
(-40°C to 85°C)



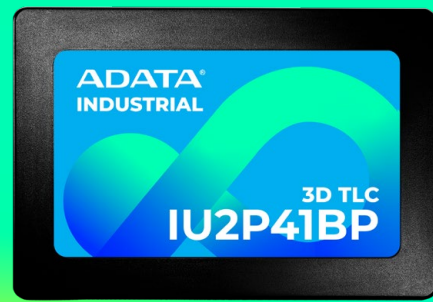
HIGH
CAPACITY



U.2 SSD



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



Model Name	IU2P41BP
Features	<ul style="list-style-type: none">1. Supports LDPC ECC, RAID Engine, and SLC Cache2. End-to-End (E2E) Data Path Protection3. Host Memory Buffer (HMB)4. ESD Support IEC/EN61000-4-25. A+ power protect
Interface	PCIe Gen4x4
Flash Type	112L 3D TLC
Capacity	512GB~4TB
Max. Seq. R/W Speed (MB/s)	7000/6000
Operating Voltage	12V
Max. Power Consumption	9W
Operating Temp. (Standard)	0°C to 70°C
Operating Temp. (Industrial)	-40°C to 85°C
DRAM Cache	Supported
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

2.5" SSD



112-layer (BiCS5)/ 3D TLC NAND Flash
Original IC Implement
High capacity up to 8TB
Wide-Temperature Support: -40°C to 85°C
S.M.A.R.T. Monitor, Wear Leveling, NCQ and TRIM Command



Model Name	ISSS31I(P)	ISSS31AP eTLC	ISSS31AP
Features	<ol style="list-style-type: none"> 1. A+ power protect 2. Support RAID Engine, SLC Cache and Thermal Throttling 3. ESD Support IEC/EN61000-4-2 level 4 4. H/W PLP Function 	<ol style="list-style-type: none"> 1. A+ Power Protect 2. Supports RAID Engine, SLC Cache and Thermal Throttling 3. End-to-End (E2E) Data Path Protection 4. ESD Support (IEC/EN 61000-4-2 Level 4) 5. Supports AES 256-bit Data Encryption and TCG OPAL 2.0 6. DWPD 1.7 7. HW PLP function 	<ol style="list-style-type: none"> 1. HW PLP function 2. Supports RAID Engine, SLC Cache and Thermal Throttling 3. End-to-End (E2E) Data Path Protection 4. ESD Support (IEC/EN 61000-4-2 Level 4) 5. Supports AES 256-bit Data Encryption and TCG OPAL 2.0
Interface	SATA III 6.0Gbps	SATA III 6.0Gbps	SATA III 6.0Gbps
Flash Type	218L 3D TLC	112L 3D eTLC	112L 3D TLC
Capacity	256GB-2TB	3.84TB-7.68TB	4TB-8TB
Max. Seq. R/W Speed (MB/s)	560/500	560/520	550/520
Operating Voltage	5V	5V	5V
Max. Power Consumption	2.5W	3.3W	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
DRAM Cache	-	Supported	Supported
P/E Cycle (times)	3K	7K	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)	100 x 70 x 7mm		

Model Name	ISSS31CP eTLC	ISSS31CP
Features	<ol style="list-style-type: none"> 1. A+ Power Protect 2. Supports RAID Engine, SLC Cache and Thermal Throttling 3. End-to-End (E2E) Data Path Protection 4. ESD Support (IEC/EN 61000-4-2 Level 4) 5. Supports AES 256-bit Data Encryption and TCG OPAL 2.0 6. DWPD 1.6 7. HW PLP function 	<ol style="list-style-type: none"> 1. A+ Power Protect 2. Supports RAID Engine, SLC Cache and Thermal Throttling 3. End-to-End (E2E) Data Path Protection 4. ESD Support (IEC/EN 61000-4-2 Level 4) 5. HW PLP function
Interface	SATA III 6.0Gbps	SATA III 6.0Gbps
Flash Type	112L 3D eTLC	112L 3D TLC
Capacity	480GB-1.92TB	128GB-2TB
Max. Seq. R/W Speed (MB/s)	550/380	560/490
Operating Voltage	5V	5V
Max. Power Consumption	2.2W	2.5W
Operating Temp. (Standard)	0°C to 70°C	0°C to 70°C
Operating Temp. (Industrial)	-	-
DRAM Cache	Supported	Supported
P/E Cycle (times)	7K	3K
ECC Engine	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)	100 x 70 x 7mm	

2.5" SSD



112-layer (BiCS5)/ 3D TLC NAND Flash
Original IC Implement
High capacity up to 8TB
Wide-Temperature Support: -40°C to 85°C
S.M.A.R.T. Monitor, Wear Leveling, NCQ and TRIM Command



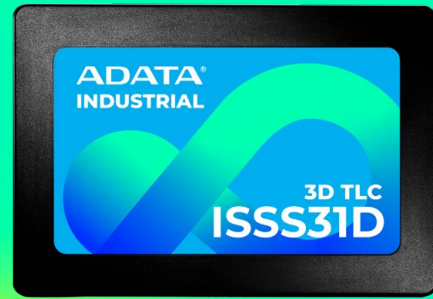
Model Name	ISSS31C	ISSS316	ISSS31D
Features	<ol style="list-style-type: none"> 1. Supports RAID Engine, SLC Cache and Thermal Throttling 2. End-to-End (E2E) Data Path Protection 3. ESD Support (IEC/EN 61000-4-2 Level 4) 4. Supports Extended Temp. (-20°C to 75°C) 5. Supports AES 256-bit Data Encryption and TCG OPAL 2.0 	<ol style="list-style-type: none"> 1. Supports RAID Engine, SLC Cache, and Thermal Throttling 2. End-to-End (E2E) Data Path Protection 3. Wear Leveling, Bad Block Management 	<ol style="list-style-type: none"> 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	SATA III 6.0Gbps	SATA III 6.0Gbps
Flash Type	112L 3D TLC	112L 3D TLC	112L 3D TLC
Capacity	128GB - 4TB	128GB - 2TB	128GB - 2TB
Max. Seq. R/W Speed (MB/s)	560/490	560/520	560/490
Operating Voltage	5V	5V	5V
Max. Power Consumption	2.6W	1.55W	1.1W
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
DRAM Cache	Supported	-	-
P/E Cycle (times)	3K/100K(A+SLC)	3K/100K(A+SLC)	3K
ECC Engine	LDPC ECC	LDPC ECC	LDPC ECC
A+ SLC Mode	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)	100 x 70 x 7mm		

Product specifications are subject to change without prior notice

2.5" SSD



112-layer (BiCS5)/ 3D TLC NAND Flash
Original IC Implement
High capacity up to 8TB
Wide-Temperature Support: -40°C to 85°C
S.M.A.R.T. Monitor, Wear Leveling, NCQ and TRIM Command



Model Name	ISSS333 PLP	ISSS333	ISSS332
Features	<ol style="list-style-type: none"> 1. A+ Power Protect 2. Supports RAID Engine, SLC Cache and Thermal Throttling 3. With DRAM Buffer 4. HW PLP function 	<ol style="list-style-type: none"> 1. Supports RAID Engine, SLC Cache and Thermal Throttling 2. With DRAM Buffer 	<ol style="list-style-type: none"> 1. Supports S.M.A.R.T. Monitor 2. Power Loss Protection(Option-al) 3. With DRAM Buffer
Interface	SATA III 6.0Gbps	SATA III 6.0Gbps	SATA III 6.0Gbps
Flash Type	64L 3D TLC	96L 3D TLC	MLC
Capacity	64GB - 2TB	64GB - 2TB	16GB - 1TB
Max. Seq. R/W Speed (MB/s)	560/520	560/520	540/450
Operating Voltage	5V	5V	5V
Max. Power Consumption	2.3W	2.2W	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	-40°C to 85°C
DRAM Cache	Supported	Supported	Supported
P/E Cycle (times)	3K	3K	3K
ECC Engine	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)	100 x 70 x 7mm		

Product specifications are subject to change without prior notice

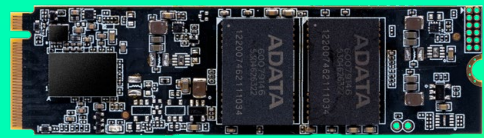
M.2 NVMe SSD

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 Name	IM2P41F8	IM2P41B8 eTLC	IM2P41B8P	IM2P41B8	IM2P41E8
Features	<ol style="list-style-type: none"> Supports LDPC ECC, RAID Engine, and SLC Cache End-to-End (E2E) Data Path Protection Host Memory Buffer (HMB) ESD Support (IEC/EN61000-4-2) A+ power protect H/W PLP Function 	<ol style="list-style-type: none"> Supports RAID Engine, SLC Cache and Thermal Throttling End-to-End (E2E) Data Path Protection Supports AES 256-bit Data Encryption and TCG OPAL 2.0 ESD Support (IEC/EN 61000-4-2 Level 4) DWPD 1.8 	<ol style="list-style-type: none"> Supports RAID Engine, SLC Cache and Thermal Throttling End-to-End (E2E) Data Path Protection HW PLP function 	<ol style="list-style-type: none"> Supports RAID Engine, SLC Cache and Thermal Throttling End-to-End (E2E) Data Path Protection Supports AES 256-bit Data Encryption and TCG OPAL 2.0 ESD Support (IEC/EN 61000-4-2 Level 4) 	<ol style="list-style-type: none"> Supports RAID Engine, SLC Cache and Thermal Throttling End-to-End (E2E) Data Path Protection ESD Support (IEC/EN 61000-4-2 level 4)
Interface	PCIe Gen4x4 (NVMe 2.0)	PCIe Gen4x4 (NVMe 1.4)	PCIe Gen4x4 (NVMe 1.4)	PCIe Gen4x4 (NVMe 1.4)	PCIe Gen4x4 (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)	M.2 2280 (M Key)
Flash Type	218L 3D TLC	112L 3D eTLC	112L 3D TLC	112L 3D TLC	112L 3D TLC
Capacity	256GB - 4TB	480GB - 1.92TB	256GB - 4TB	256GB - 8TB	128GB - 2TB
Max. Seq. R/W Speed (MB/s)	7000/6000	7000/6200	7000/6500	7000/6500	4900/4200
Operating Voltage	3.3V	3.3V	3.3V	3.3V	3.3V
Max. Power Consumption	4.5W	8W	8.6W	6.8W	6.3W
Operating Temp. (Standard)	0°C to 70°C	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	-
DRAM Cache	-	Supported	Supported	Supported	-
P/E Cycle (times)	3K	7K	3K	3K	3K
ECC Engine	LDPC ECC	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 Name	IM2P42B8	IM2P32A8	IM2P33F8	IM2P33E8	IM2P33E8 PLP
Features	<ol style="list-style-type: none"> Supports RAID Engine, SLC Cache and Thermal Throttling End-to-End (E2E) Data Path Protection ESD Support (IEC/EN 61000-4-2 level 4) 	<ol style="list-style-type: none"> Supports RAID Engine, SLC Cache and Thermal Throttling End-to-End (E2E) Data Path Protection ESD Support (IEC/EN 61000-4-2 Level 4) Host Memory Buffer (HMB) 	<ol style="list-style-type: none"> Supports RAID Engine, SLC Cache and Thermal Throttling End-to-End (E2E) Data Path Protection Host Memory Buffer (HMB) 	<ol style="list-style-type: none"> Supports RAID Engine, SLC Cache and Thermal Throttling End-to-End (E2E) Data Path Protection With DRAM Buffer 	<ol style="list-style-type: none"> Power Loss Protection Supports RAID Engine, SLC Cache and Thermal Throttling End-to-End (E2E) Data Path Protection With DRAM Buffer Supports AES 256-bit encryption
Interface	PCIe Gen4x4 (NVMe 1.4)	PCIe Gen3x4 (NVMe 1.4)	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)	M.2 2280 (M Key)	M.2 2280 (M Key)
Flash Type	176L 3D TLC	112L 3D TLC	112L 3D TLC	96L 3D TLC	96L 3D TLC
Capacity	512GB - 2TB	128GB - 2TB	128GB - 1TB	256GB - 2TB	256GB - 2TB
Max. Seq. R/W Speed (MB/s)	5100/4700	3300/2900	2100/1600	3400/2800	3500/2900
Operating Voltage	3.3V	3.3V	3.3V	3.3V	3.3V
Max. Power Consumption	4.8W	3.76W	3.8W	5.8W	5.8W
Operating Temp. (Standard)	0°C to 70°C	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	-	-	-
P/E Cycle (times)	3K	3K	3K	3K	3K
ECC Engine	LDPC ECC	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				

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 Name	IM2P41E4	IM2P32A4	IM2P3014
Features	<ol style="list-style-type: none"> Supports RAID Engine, SLC Cache and Thermal Throttling End-to-End (E2E) Data Path Protection Host Memory Buffer (HMB) 	<ol style="list-style-type: none"> Supports RAID Engine, SLC Cache and Thermal Throttling End-to-End (E2E) Data Path Protection Supports AES 256-bit Data Encryption and TCG OPAL 2.0 ESD Support (IEC/EN 61000-4-2 Level 4) Host Memory Buffer (HMB) 	<ol style="list-style-type: none"> Supports RAID Engine, SLC Cache and Thermal Throttling End-to-End (E2E) Data Path Protection AES 256-bit Data Encryption Host Memory Buffer (HMB)
Interface	PCIe Gen4x4 (NVMe 1.4)	PCIe Gen3x4 (NVMe 1.4)	PCIe Gen3x2 (NVMe 1.3)
Form Factor	M.2 2242 (M Key)	M.2 2242 (M Key)	M.2 2242 (B+M Key)
Flash Type	112L 3D TLC	112L 3D TLC	96L 3D TLC
Capacity	128GB - 2TB	128GB - 1TB	64GB - 1TB
Max. Seq. R/W Speed (MB/s)	5000/ 2400	3000/ 2000	1700/1300
Operating Voltage	3.3V	3.3V	3.3V
Max. Power Consumption	6.3W	3.03W	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	-
DRAM Cache	-	-	-
P/E Cycle (times)	3K/100K(A+SLC)	3K/100K(A+SLC)	3K/30K(A+SLC)
ECC Engine	LDPC ECC	LDPC ECC	LDPC ECC
A+ SLC Mode	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)	100 x 70 x 7mm		

Product specifications are subject to change without prior notice

M.2 SATA SSD

Original IC Implement

3K-100K P/E cycles for high endurance

S.M.A.R.T. Monitor, Wear Leveling, NCQ and TRIM Command



BiCS5



BiCS5

Model Name	IM2S31C8	IM2S31D8	IM2S3168	IM2S3338
Features	<ol style="list-style-type: none"> Supports RAID Engine, SLC Cache and Thermal Throttling End-to-End (E2E) Data Path Protection ESD Support (IEC/EN 61000-4-2 Level 4) Supports Extended Temp. (-20°C to 75°C) 	<ol style="list-style-type: none"> Supports RAID Engine, SLC Cache, and Thermal Throttling End-to-End (E2E) Data Path Protection Wear Leveling, Bad Block Management 	<ol style="list-style-type: none"> 112L (BiCS5) 3D TLC Implement Supports RAID Engine, SLC Cache and Thermal Throttling 	<ol style="list-style-type: none"> Supports RAID Engine, SLC Cache and Thermal Throttling 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 - 4TB	128GB - 2TB	128GB - 2TB	64GB - 1TB
Max. Seq. R/W Speed (MB/s)	560/480	560/480	560/520	550/470
Operating Voltage	3.3V	3.3V	3.3V	3.3V
Max. Power Consumption	2.4W	1.5W	1.49W	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	-40°C to 85°C	-
DRAM Cache	Supported	-	-	Supported
P/E Cycle (times)	3K/100K(A+SLC)	3K	3K/100K(A+SLC)	3K/100K(A+SLC)
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 Name	IM2S31C4	IM2S31D4	IM2S3164	IM2S3314
Features	<ol style="list-style-type: none"> 112L (BiCS5) 3D TLC Implement Supports RAID Engine, SLC Cache and Thermal Throttling End-to-End (E2E) Data Path Protection 	<ol style="list-style-type: none"> Supports RAID Engine, SLC Cache, and Thermal Throttling End-to-End (E2E) Data Path Protection Wear Leveling, Bad Block Management 	<ol style="list-style-type: none"> 112L (BiCS5) 3D TLC Implement Supports RAID Engine, SLC Cache and Thermal Throttling End-to-End (E2E) Data Path Protection 	<ol style="list-style-type: none"> Supports S.M.A.R.T. Monitor Wear Leveling, Bad Block Management, Garbage Collection 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	560/480	560/480	540/350
Operating Voltage	3.3V	3.3V	3.3V	3.3V
Max. Power Consumption	2.2W	1.6W	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	-40°C to 85°C
DRAM Cache	Supported	-	-	-
P/E Cycle (times)	3K/100K(A+SLC)	3K	3K/100K(A+SLC)	3K/30K(A+SLC)
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 3.6mm			

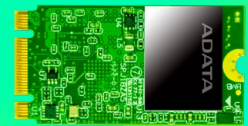
Product specifications are subject to change without prior notice

M.2 SATA SSD

Original IC Implement

3K-30K P/E cycles for high endurance

S.M.A.R.T. Monitor, Wear Leveling, NCQ and TRIM Command



Model Name		IM2S3328E
Features	<ol style="list-style-type: none"> 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	16GB-1TB	
Max. Seq. R/W Speed (MB/s)	550/450	
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	
DRAM Cache	Supported	
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 3.6mm	

Model Name		IM2S3134N
Features	<ol style="list-style-type: none"> 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	
Form Factor	M.2 2242 (B+M Key)	
Flash Type	MLC	
Capacity	64GB - 256GB	
Max. Seq. R/W Speed (MB/s)	500/320	
Operating Voltage	3.3V	
Max. Power Consumption	2.5W	
Operating Temp. (Standard)	0°C to 70°C	
Operating Temp. (Industrial)	-	
DRAM Cache	Supported	
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: > 2 million hours	
Dimensions (L x W x H)	42 x 22 x 3.5mm	

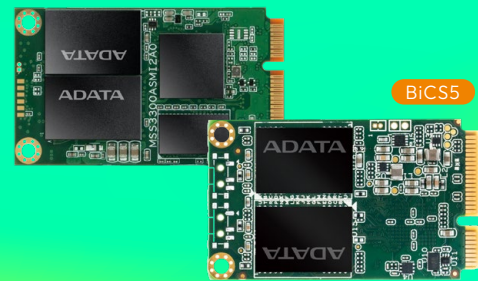
mSATA SSD

Original IC Implement

3K-100K P/E cycles for high endurance

Wide-Temp. Support (-40°C to 85°C)

S.M.A.R.T. Monitor, Wear Leveling, NCQ and TRIM Command



Model Name	IMSS31C	IMSS31D	IMSS316	IMSS332
Features	1. Supports SLC Cache, RAID Engine, and Thermal Throttling	1. Supports SLC Cache, RAID Engine, and Thermal Throttling	1. Supports SLC Cache, RAID Engine, and Thermal Throttling	-
Interface	SATA III 6.0Gbps	SATA III 6.0Gbps	SATA III 6.0Gbps	SATA III 6.0Gbps
Form Factor	mSATA (MO-300A)	mSATA (MO-300A)	mSATA (MO-300A)	mSATA (MO-300A)
Flash Type	112L 3D TLC	112L 3D TLC	112L 3D TLC	MLC
Capacity	128GB - 2TB	128GB - 2TB	128GB - 2TB	16GB - 512GB
Max. Seq. R/W Speed (MB/s)	560/490	560/490	560/510	550/450
Operating Voltage	3.3V	3.3V	3.3V	3.3V
Max. Power Consumption	2.6W	1.1W	1.46W	3.4W
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
DRAM Cache	Supported	-	-	Supported
P/E Cycle (times)	3K	3K	3K	3K
ECC Engine	LDPC ECC	LDPC ECC	LDPC ECC	BCH ECC
H/W PLP Function	Available by request	-	-	Available by request
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)	50.80 x 29.85 x 4.5mm			

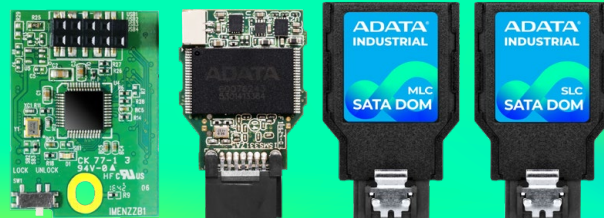
Product specifications are subject to change without prior notice

DOM (Disk-On-Module)

Error Correcting Code

H/W Write Protect

Wear Leveling



Model Name	IUMU23C	IUMU211	ISMS331	
Features	<ol style="list-style-type: none"> 1. SLC NAND Flash for great reliability 2. BCH ECC Engine 3. H/W Write Protect 4. Wear Leveling, Bad Block Management, Garbage Collection 	<ol style="list-style-type: none"> 1. BCH ECC Engine 2. Wear Leveling, Bad Block Management, Garbage Collection 	<ol style="list-style-type: none"> 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 and EMBEDDED MEMORY

CFEXPRESS
CFAST
COMPACT FLASH
SD / MICROSD
EMMC
UFS



CFexpress Card

NVMe 1.3 compliant

Wide-Temp. Support (-40°C to 85°C)

Supports S.M.A.R.T. Monitor and Wear Leveling



Model Name	ICFP301
Features	<ol style="list-style-type: none">1. Supports RAID Engine and Thermal Throttling2. End-to-End (E2E) Data Path Protection3. 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

Error Correcting Code

Wide-Temp. Support (-40°C to 85°C)

S.M.A.R.T., Wear Leveling, NCQ and TRIM Command



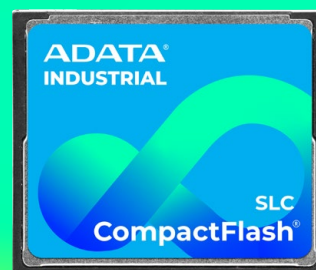
Model Name	ISC3E	ICFS31C
Interface	SATA III 6.0Gbps	SATA III 6.0Gbps
Form Factor	CFast 2.0	CFast 2.0
Flash Type	MLC / SLC	112L 3D TLC
Capacity	4GB - 256GB	80GB - 1TB
Max. Seq. R/W Speed (MB/s)	540/400	560/490
Operating Voltage	3.3V	3.3V
Max. Power Consumption	2W	2W
Operating Temp. (Standard)	0°C to 70°C	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(A+SLC)
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)	36.55x42.9x3.6mm	36.55x42.9x4.0mm

CF Card

Error Correcting Code

Wide-Temp. Support (-40°C to 85°C)

Wear Leveling, Bad Block Management



Model Name	IPC17	IPC39
Interface	PATA	PATA
Form Factor	CF50 pin type 1	CF50 pin type 1
Flash Type	SLC	SLC/MLC
Capacity	512MB - 8GB	8GB-128GB
Max. Seq. R/W Speed (MB/s)	40/ 30	125/125
Operating Voltage	3.3V	3.3V
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	

SD Card

Error Correcting Code

Wide-Temp. Support (-40°C to 85°C)

Wear Leveling, S.M.A.R.T. Monitor



Model Name	ISDD33K	IDC3B
Interface	SD 6.1	SD 3.0
Flash Type	3D TLC	MLC
Capacity	8GB - 512GB	8GB - 256GB
Max. Seq. R/W Speed (MB/s)	93/84	95/69
Operating Voltage	2.7V~3.6V	2.7V~3.6V
Max. Power Consumption	1.12W	0.72W
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
P/E Cycle (times)	3K	3K
ECC Engine	LDPC 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

Error Correcting Code

Wide-Temp. Support (-40°C to 85°C)

Wear Leveling, Bad Block Management

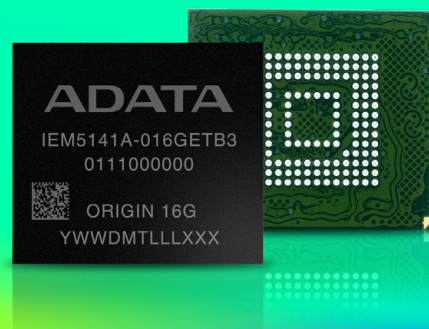


Model Name	IUDD33K	IUDD33H	IDU3A	IUDD362
Interface	SD 6.1	SD 3.0	SD 3.0	SD 3.0
Flash Type	112L 3D TLC	MLC	MLC	SLC
Capacity	16GB - 512GB	4GB - 16GB	8GB - 64GB	1GB - 8GB
Max. Seq. R/W Speed (MB/s)	97/80	97/35	96/67	31/29
Operating Voltage	2.7V~3.6V	2.7V~3.6V	2.7V~3.6V	2.7V~3.6V
Max. Power Consumption	0.71W	0.36W	0.63W	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

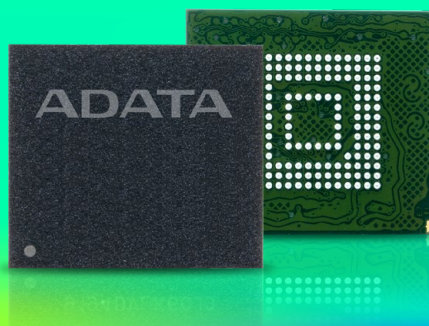
3K P/E Cycle Rating
Auto Sleep on/off Mode
Partitioning Management
Wide-Temp. Support (-40°C to 85°C)



Model Name	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
Core Voltage	2.7V - 3.6V	2.7V - 3.6V
Support three 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)

UFS

Fit for a wide variety of portable devices
Dynamic power management
multiple NAND technology transitions



Model Name	UFS100
Interface	UFS3.1
Flash Type	112L 3D TLC
Capacity	128GB-256GB
Max. Seq. R/W Speed(MB/s)	2000/900
Max. Voltage VCC	2.70 ~ 3.6V
Operating Temp.	-25°C ~ 85°C
P/E Cycles	3K
ECC Engine	LDPC ECC
Signaling Mode	PWM G1-G4 HS-G1-G4
Dimensions(LxWxH)	11.5x13.0x1.0mm(153ball)

USB Flash Drive



3K P/E Cycle Rating
USB 3.2 Interface
Metallic Enclosure
Wear Leveling
Error Correcting Code



Model Name	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 Kernel 2.6 or later	

Product specifications are subject to change without prior notice



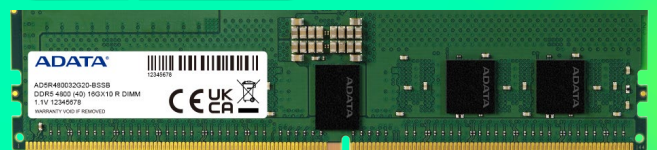
DRAM MODULES



EMBEDDED SERIES

SERVER SERIES

WIDE-TEMPERATURE SERIES



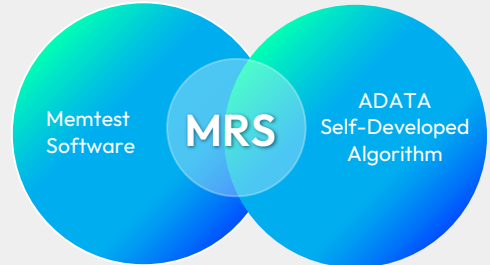
Stringent Validation and Tests



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

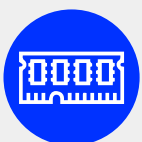
With MRS we can:

- 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



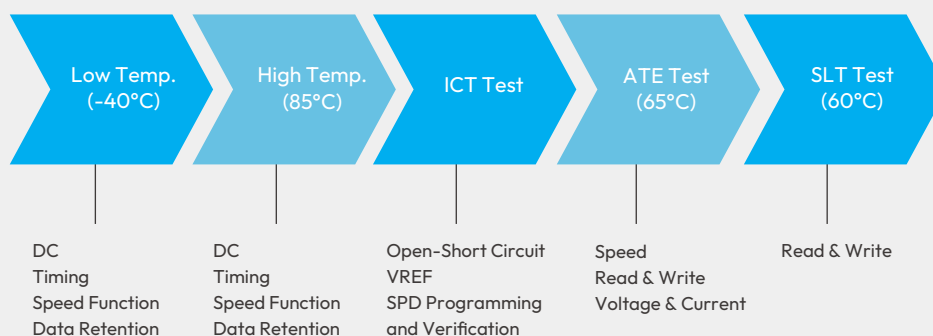
Multiple Reliability Tests

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.



Wide-Temperature Testing

Testing Process of Wide-Temperature Modules



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



Stringent Validation and Tests

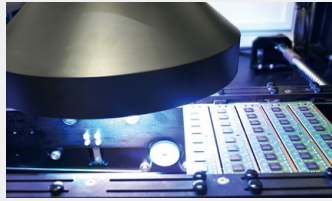
Fully Automated Production



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 function, 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 Operation, 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		●	▲	●	▲	▲	

▲ By Request ● Supported

DDR5 MEMORY MODULES

EMPOWERING HIGH SPEED COMPUTING AND 5G

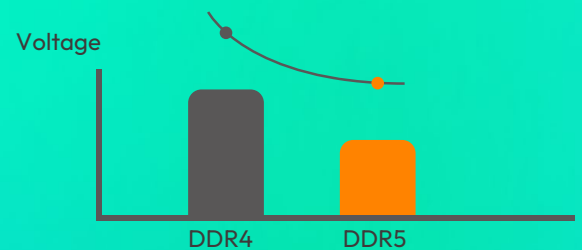
To meet the emerging demands of 5G, AIoT, Edge Computing, HPC, and more, ADATA has unveiled new industrial-grade DDR5 memory modules. They are capable of reaching speeds of up to 5600 MT/s and yet only operates on 1.1V. In addition, they are equipped with a Power Management IC (PMIC) to enhance power 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	44.8 GBps	5600 MT/s
DDR4	25.6 GBps	3200 MT/s
DDR3	12.8 GBps	1600 MT/s



5600 MT/s

1.5X Faster transfer rate
compared to DDR4



1.1V

Consumes 9% less power
compared to DDR4



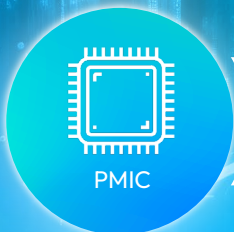
OG IC

Original IC
for great reliability



On-die ECC

For more reliable
data transmissions



PMIC

Power Management IC
for improved power
supply stability



48GB

Ample storage capacity
up to 48GB

Embedded

Unbuffered DIMM



DDR5

Interface	DDR5	DDR5	DDR4	DDR3L
Module Type	CU-DIMM	U-DIMM	U-DIMM	U-DIMM
Frequency (MT/s)	6400	4800/5600	2400 / 2666 / 3200	1600
Capacity	8GB, 16GB, 32GB	8GB, 16GB, 24GB, 32GB, 48GB	4GB, 8GB, 16GB, 32GB	2GB, 4GB, 8GB
Pin Count	288 Pin	288 Pin	288 Pin	240 Pin
PCB Height (inch/ mm)	1.23 inches/3.12cm	1.23 inches/3.12cm	1.23 inches/3.12cm	1.18 inches/3cm
Operating Voltage	1.1V	1.1V	1.2V	1.35V
Operating Temp.	0°C to 95°C (Tc)	0°C to 95°C (Tc)	0°C to 85°C	0°C to 85°C
Customized Services (Optional)	Anti-Sulfuration Protection, Conformal Coating, Wide-Temp. Support			

SO-DIMM



DDR5

Interface	DDR5	DDR5	DDR4	DDR3L
Module Type	CSO-DIMM	SO-DIMM	SO-DIMM	SO-DIMM
Frequency (MT/s)	6400	4800 / 5600	2400 / 2666 / 3200	1600
Capacity	8GB, 16GB, 32GB	8GB, 16GB, 24GB, 32GB, 48GB	4GB, 8GB, 16GB, 32GB	1GB, 2GB, 4GB, 8GB
Pin Count	262 Pin	262 Pin	260 Pin	204 Pin
PCB Height (inch/ mm)	1.23 inches/3.12cm	1.23 inches/ 3.12cm	1.23 inches/ 3.12cm	1.18 inches/3cm
Operating Voltage	1.1V	1.1V	1.2V	1.35V
Operating Temp.	0°C to 95°C (Tc)	0°C to 85°C	0°C to 85°C	0°C to 85°C
Customized Services (Optional)	Anti-Sulfuration Protection, Conformal Coating, Wide-Temp. Support			

Embedded VLP U-DIMM



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

Server

Registered DIMM



DDR5

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/ mm)	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 95°C (Tc)	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, Wide-Temp. Support		

VLP ECC U-DIMM



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/ mm)	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, Wide-Temp. Support	

Server

ECC U-DIMM



DDR5

Interface	DDR5	DDR5	DDR4	DDR3L
Module Type	ECC CU-DIMM	ECC U-DIMM	ECC U-DIMM	ECC U-DIMM
Frequency (MT/s)	6400	4800 / 5600	2400 / 2666 / 3200	1600
Capacity	8GB, 16GB, 32GB	16GB, 32GB	2400MT/s: 4GB, 8GB, 16GB 2666MT/s: 4GB, 8GB, 16GB, 32GB 3200MT/s: 8GB - 32GB	2GB, 4GB, 8GB
Pin Count	288 Pin	288 Pin	288 Pin	204 Pin
PCB Height (inch/ mm)	1.23 inches/ 3.12cm	1.23 inches/ 3.12cm	1.23 inches/ 3.12cm	1.18 inches/3cm
Operating Voltage	1.1V	1.1V	1.2V	1.35V
Operating Temp.	0°C to 95°C (Tc)	0°C to 95°C (Tc)	0°C to 85°C	0°C to 85°C
30μ PCB Gold Plating	V	V	V	V
Customized Services (Optional)	Anti-Sulfuration Protection, Conformal Coating, Wide-Temp. Support			

ECC SO-DIMM



DDR5

Interface	DDR5	DDR5	DDR4	DDR3L
Module Type	ECC CSO-DIMM	ECC SO-DIMM	ECC SO-DIMM	ECC SO-DIMM
Frequency (MT/s)	6400	4800 / 5600	2400 / 2666 / 3200	1600
Capacity	8GB, 16GB, 32GB	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	262 Pin	260 Pin	204 Pin
PCB Height (inch/ mm)	1.23 inches/ 3.12cm	1.23 inches/ 3.12cm	1.23 inches/ 3.12cm	1.18 inches/3cm
Operating Voltage	1.1V	1.1V	1.2V	1.35V
Operating Temp.	0°C to 95°C (Tc)	0°C to 95°C (Tc)	0°C to 85°C	0°C to 85°C
30μ PCB Gold Plating	V	V	V	V
Customized Services (Optional)	Anti-Sulfuration Protection, Conformal Coating, Wide-Temp. Support			

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