addlink
Industrial

Reliable and Innovation Solutions
Industrial Storage Products

2022 Product Catalog

Smart Factory • Industrial Automation • Edge AI for Smart City
Surveillance • POS / Kiosk / Digital Signage • Defense / Public Safety

About addlink

Innovation. Reliable. Trusted.

Founded in 2013, addlink Technology Corp. established its office in Taipei, Taiwan, intending to provide trusted innovative storage products and solutions. addlink offers comprehensive quality flash, Application-Oriented solutions, and global logistics support. addlink has always been an innovator in developing and manufacturing high-quality, high-performance storage solutions. We cooperate closely with our partners to help providing complete solutions for wide array of applications across diverse industries to ensure a positive experience for each and every customer.

Quality Assurance

From product development to mass production, all addlink industrial storage is fully tested to ensure the perfect reliability and stability. In addition, addlink also fields a process development team that oversees efficiency improvements at the factory level.

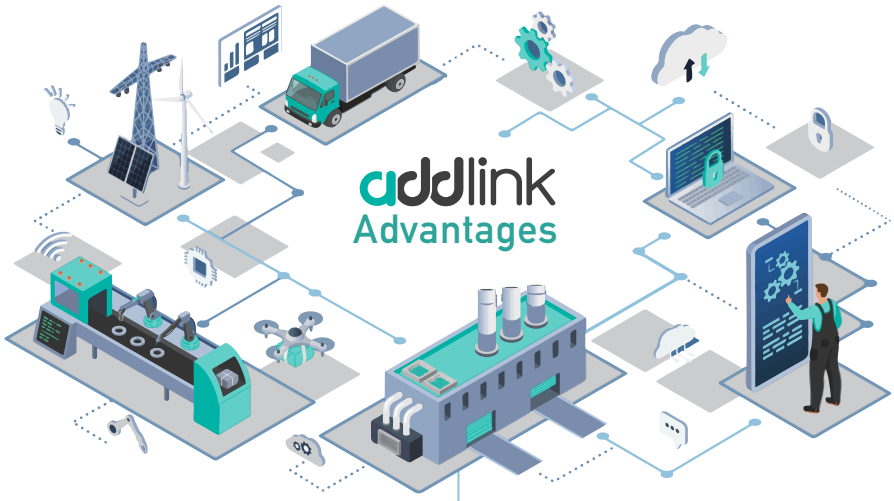
100% Screening For Industrial-Grade Controller

100% Screening For Industrial-Grade Flash

100% Functional Test (ex. High/Low Temperature)

100% Vibration Screening Before Shipment

100% MIT
Made in Taiwan



Shock/Vibration Protection MIL-STD-810G

Wide Temperature -40~85°C

Advanced Thermal Solutions

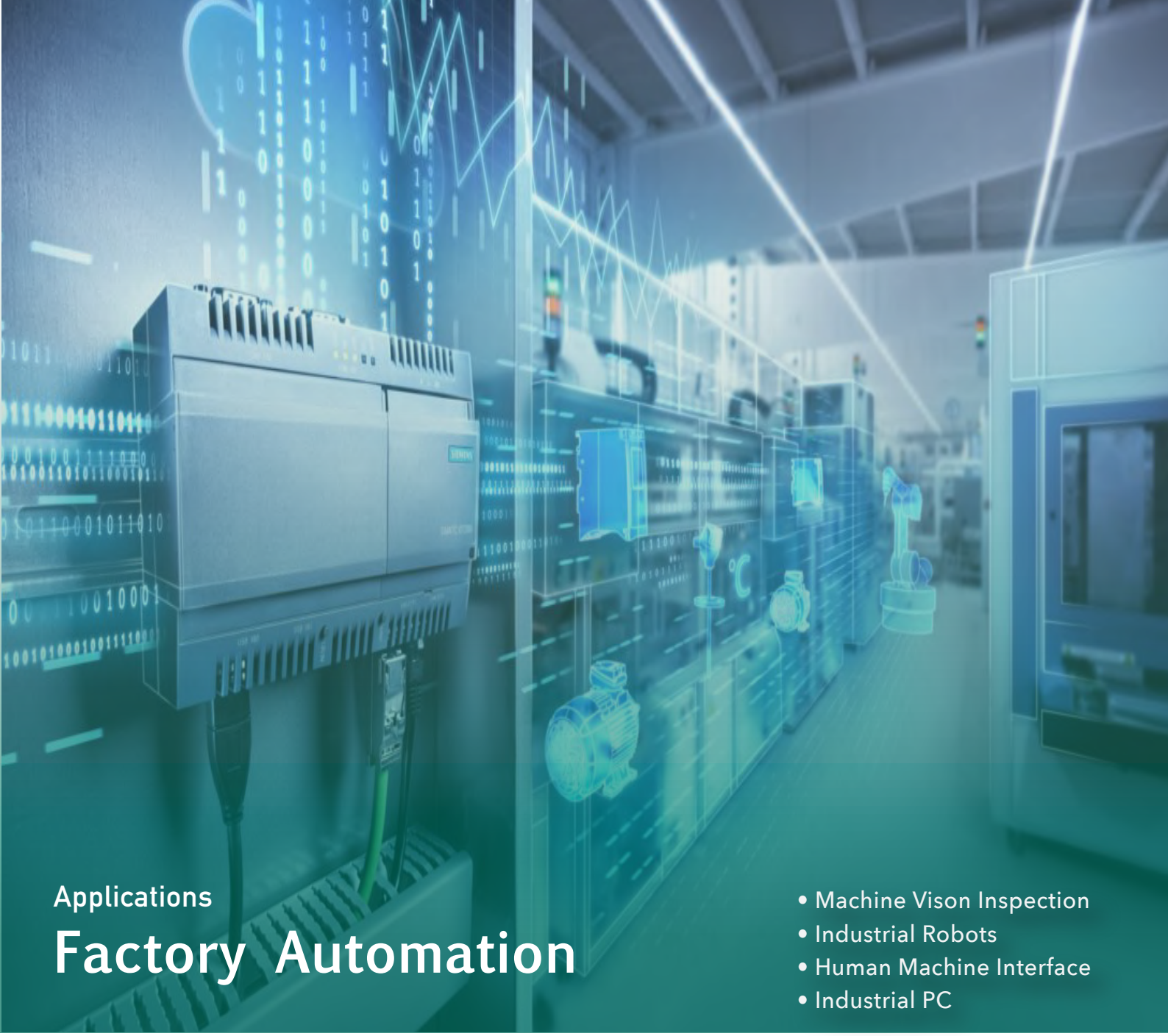
Completed Data Security TCG-OPAL, Data Erase

Industrial Grade Flash/Controller

Storage Self Health Monitoring Tool

Application-Oriented Solutions

Table of Contents



Applications

Factory Automation

- Machine Vison Inspection
- Industrial Robots
- Human Machine Interface
- Industrial PC

Application Scenario

The factory automation includes PLCs. HMIs, robots, Industrial PC, machine tools, and machine vision systems… to perform repetitive tasks. Today, industry 4.0 allows interconnecting all these traditional systems to perform joint management and diagnosis of the entire production process, which also allows us to analyze this data to improve quality, competitiveness and maintenance.

Challenges and Requirements

To process and manage all this massive data, industrial automation manufacturers are looking for fast, reliable and secure storage for systems to monitor and enhance the performances. The traditional HDDS have higher latency, longer read/ write times, and support fewer IOPS compared to the SSDs. On the other hand, consumer SSDs are fast and support more IOPS but they have lower endurance, lack of security features and not as reliable under industrial automation's requirements.

Solutions

- High Endurance & Longevity
- Thermal Throttling
- Power Loss protection
- Secure Erase
- TCG OPAL
- Smart Toolbox

Product Highlight

- M.2 NVMe SSD

H45E E45E E35G E35D E34D

- SATA SSD

E20A/E20B E20C/E20CP | E25A/E25B E25C/E25CP | E21A/E21B E21C/E21CP | E24A/E24B E24C/E24CP

- CFX/CFast

E26C/E26CP E36D

Applications

Smart Retail

- Smart Vending Machine
- POS Machine
- KIOSK
- Self-checkout System
- Digital Signage

Application Scenario

Smart Retail Systems like Kiosks, POS, Smart Payment systems, Intelligent Vending Machines and Self-Checkout systems requires integrate processes from checking inventory, tracking orders and recording customer purchase information. These systems can be deployed in restaurants, supermarkets, department stores, hospitals, movie theaters and even public transportations.

Challenges and Requirements

1. Some Smart Retail machines might be placed outdoor but a normal consumer SSD can support temperatures from 0°C ~ 70°C (32°F ~ 158°F)
2. Unauthorized persons might try to steal critical data, so the SSD has to be equipped with an encryption feature to prevent unauthorized access.

Solutions

- High Endurance & Longevity
- Power Loss protection
- Secure Erase
- TCG OPAL
- Write Protect
- Smart Toolbox

Product Highlight

- **M.2 NVMe SSD**


E35D


E34D

- **SATA SSD**


E20A/E20B E20C/E20CP


E25A/E25B E25C/E25CP


e21A/E21B E21C/E20CP


E24A/E24B E20C/E20CP

- **SD/MicroSD/USB Drive**


ES2H/ES2HP


EM2H/EM2HP


EU2J

Applications

Surveillance & Edge AI for Smart City

- Public Safety
- Traffic Monitoring
- Transportation Surveillance
- Facility Protection

Application Scenario

Video surveillance is commonly used for modern cities services includes, traffic monitoring, facility protection, public safety remote video monitoring, patients protection and even public transportation will benefit from video surveillance. With the increase in the resolution of the images captured by the surveillance systems and intelligent video analytics software, the functions of surveillance systems (DVR/NVR) have become more power, which requires faster transfer speed and larger storage capacity.

Challenges and Objectives

1. Video surveillance storage can keep up at least 24/7.
2. Video surveillance systems that require reliable, high-speed and more extensive capacity storage for data.
3. Video surveillance systems deployed outdoor will face wide range of changes in temperature.

Solutions

- High Endurance & Longevity
- Wide Temperature -40~85°C
- Thermal Throttling
- TCG OPAL
- Write Protect
- Smart Toolbox

Product Highlight

- M.2 NVMe SSD

H45E E45E E35G E35D E34D

- SATA SSD

E20B/E20C E25B/E25C E21B/E21C E24B/E24C

- CFX/CFast/SD/MicroSD

E26C/E26CP E36D ES2H/ES2HP EM2H/EM2HP

Applications

Military & Defense

- Military Laptop / Tablet
- Aerospace
- Armored Vehicle

Application Scenario

Twenty-First century combat happens not only on the physical battleground but also command center, ground-control station or even behind a screen. The old fashion of spycraft has been replaced by information, electronic, and cyber warfare. Therefore, one of the most important strategies is to decide how to protect all the critical data from data theft and cyber hackers with the latest SSD solutions.

Challenges and Objectives

1. Consumer SSDs cannot survive the extreme environment conditions (ex. Wide temperature, Humidity, Extreme Shock/ Vibrations.)
2. Consumer SSDs do not have extra security protections against sophisticated hackers.
3. Once the normal SSD got stolen, it will leave important data at high-risks.

Solutions

- Wide Temperature -40~85°C
- Secure Erase/Military Erase Destroy SSD
- MIL-STD-810G
- TCP OPAL

Product Highlight

- M.2 NVMe SSD

H45E

E35G

- SATA SSD

E20B/E20A /E20C

E25B/E25A /E25C

E21B/E21A /E21C

E24B/E24A /E24C

- SD/MicroSD

ES2H/ES2HP

EM2H/EM2HP

Solutions

High Endurance Flash

- Industrial Grade Components
- Support Wide Temperature Flash: -40~85°C
- 3~5 Years Longevity Support

pSLC (Pseudo SLC)

addlink select qualify industrial TLC flash and high endurance pSLC flash as the storage solution for industrial applications. pSLC is a TLC NAND drive that has been formatted to store one bit per cell instead of their native 3 or 4 bits per cell to increase its reliability to meet the SLC level. addlink's pSLC uses a specialized firmware formatting technique to configure the NAND, making each cell only holds one bit. This reduces cell cross-talk, data corruption, read disturbance, power loss, and retention. In essence, the drive becomes SLC and provides all the benefits of faster read/write speeds, maximize endurance, and better protection against radiation. As a result, this specific technique will allow addlink's drive to have 10 times more of the P/E Count compare to other drives in the market.

Higher Performance and Endurance

	SLC Single Level Cell	pSLC	MLC Multi-Level Cell	3D TLC Triple Level Cell
Bit per cell	1		2	3
P/E Cycle	50,000		3,000	< 1,500
Power Consumption	Low		Low	Average
Cost Per GB	$$$$		$$$	$$
Application	Embedded		Embedded	Embedded / Consumer

	SLC	pSLC	MLC	3D TLC
Chip Capacity	Low	Low	Medium	High
Cost per GB	High	High	Medium	Low
Endurance	High	High	Medium	Low
Bit Per Cell	1 / 0 — 1 Bit	1 / 0 — 1 Bit	11 / 10 / 01 / 00 — 2 Bits	111 / 110 / 101 / 100 / 011 / 010 / 001 / 000 — 3 Bits

Higher Capacity and Lower Cost

Application

- Factory Automation
- POS/ KIOSK
- Smart Vending Machine

Product Highlight

- M.2 NVMe SSD
- SATA SSD
- CFast/SD/MicroSD/USB Drive

E45E E25CP E20CP E21CP E24CP E26CP ES2HP EM2HP EU2J (pSLC Mode)

Solutions

Advanced Thermal Solution

- Internal & External Thermal Sensors
- Thermal Throttling
- Thermal Dissipation

Challenges and Objectives

While edge A.I. and computer vision are growing faster, they present challenges when running deep learning or intelligent video analytics softwares that require extremely powerful systems. The ideal systems not only require faster transmission speed storage but also having the ability to prevent from overheating.

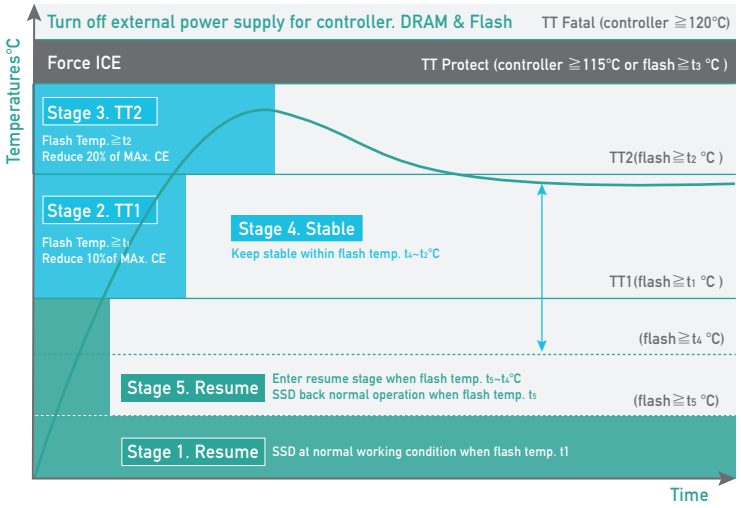
Advanced Thermal Solution

addlink's SSDs are equipped with default-designed thermal sensors to detect temperature and offers thermal dissipation option when needed.

1. Thermal Sensors

The external thermal sensor on the PCB board is used to detect temperature of flash, and the On-die thermal sensor is in the internal controller to monitor temperature of the controller.

Thermal Throttling Schematic



2. Thermal Throttling

The thermal throttling solution prevents any components in the SSD from overheating. Through the detection of thermal sensors, the firmware can be applied to different levels of throttling to efficiently and proactively offer protection via S.M.A.R.T. Toolbox utility reading.

3. Thermal Dissipation Solution

Premium Aluminum heatsink, Cross-cutting fins, and Heat-conducting Silica Gel Pad to cool down addlink SSDs.

Thermal Throttling Setting

	Operation Temp. of Normal-temp. grade:0-70°C	Operation Temp. of wide-temp. grade:-40-85°C
t_1	68°C	82°C
t_2	70°C	85°C
t_3	80°C	95°C
t_4	64°C	78°C
t_5	60°C	74°C

[Notes] 1. TT shown on Figure 2-1 means "Thermal Throttling". 2. CE = Chip Enable. 3. temp.=temperature

Application

- Factory Automation
- Edge AI for Smart City
- Gaming

Product Highlight

- M.2 NVMe SSD
- SATA SSD
- CFX/CFast

H45E E45E E35G E35D E34D E25B/E25C E20B/E20C E21B/E21C E24B/E24C E26C E36D

Solutions

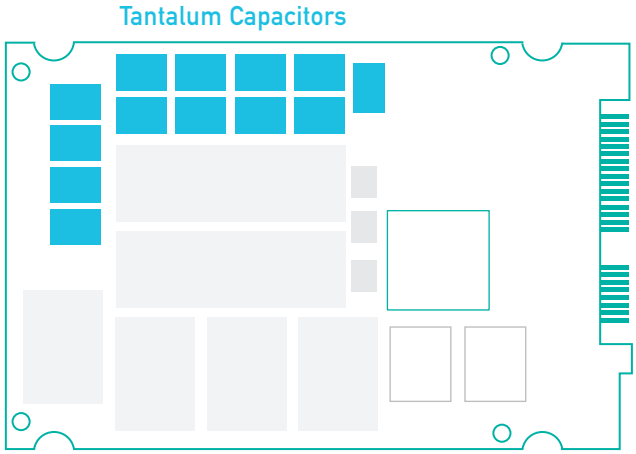
Power Loss Protection

Challenges and Objectives

There are three key components in an SSD: NAND Flash, DRAM, and a controller. When an SSD receives data from the host, the data will first be processed by DRAM, which acts as a data buffering cache. But since DRAM cannot store data without power, data is only temporarily stored inside the DRAM buffer. Without a power-loss protection mechanism, data in the DRAM will be lost or corrupted when unexpected power loss occurs. Once everything is ready, then the data will be written onto the NAND.

Power Loss Protection Solution

To prevent data loss or corruption from unexpected power loss event, addlink has added hardware power loss data protection circuit with capacitor components on the board design for all the SSDs. These capacitors act like a UPS (Uninterruptible Power Supply) for the SSDs, the capacitors will be charged upon powering up and be prepared for emergency cases. When unexpected power loss happens, the capacitors can provide additional power up time for the controller to manage and flush all the critical information (Cached user data and physical- to-logical table) in the DRAM to NAND to ensure data integrity and prevent data loss.



Application

- Logistic/ Fleet Management
- Filed Service

Product Highlight

- M.2 NVMe SSD
- SATA SSD


E35G


E25B


E20B


E24B

Solutions

Erase Features

- Secure Erase
- Quick Erase
- Military
- Crypto Erase
- Destroy Erase

Challenges and Objectives

When deleting files for multi-stage or removing them from Recycle Bin, are the files really delete? The Answer is no. Even "formatting drives" cannot erase data completely. These deleting methods only delete the pointer/ table of the files and mark these disk sectors as "available for overwriting", which means these data can still be restored by data recovery software.

Erase Solution

How do we completely erase or destroy data from the SSD to prevent data breaches? Here are some tips provided by addlink professionals.

Secure Erase

Secure Erase is a default feature for addlink SSDs. It not only deletes all the data but also write in data with "0xFF". When SSD controllers receive the secure erase command, the erase process will reset all blocks and erase all of the user data in the SSD.

Quick Erase

Quick Erase is an erase method trigger by specific GPIO pin and firmware setting. When enabling the Quick Erase feature, the controller will erase data mapping table completely.

Military Erase

Depending on Military standard techniques.

Crypto Erase

Crypto Erase is a feature that erases all data of an OPAL-activated SSD drive by resetting the cryptographic key of the disk. Since the key is modified, the previously encrypted data will become useless, achieving the purpose of data security.

Destroy SSD

It not only erase data mapping table and data, but also erase SSD firmware.

Application

- Military
- Aerospace Defense
- Edge AI for Smart city
- POS / Kiosk

Product Highlight

- M.2 NVMe SSD
- SATA SSD
- CFX/CFast

Solutions

Low Power Consumption

Challenges and Objectives

Most of the frontline workers spend over 8 hours staying outdoors with their rugged tablets and laptops. An extraordinary power consumption can greatly improve not only device's battery lives but also worker's efficiency.

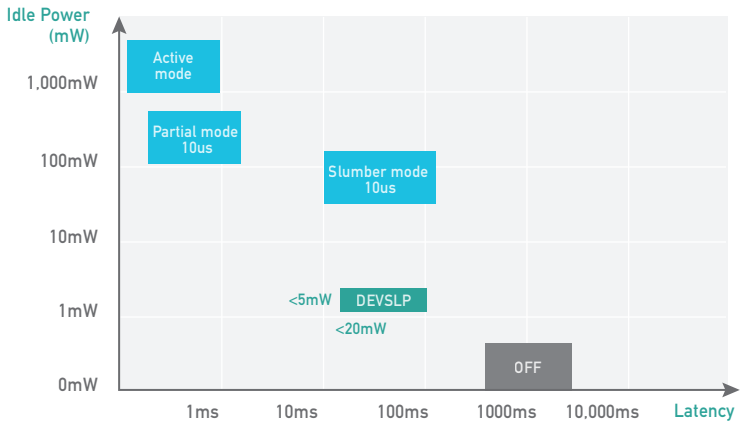
Low Power Consumption Solution

addlink's SATA SSD offers three low power consumption modes to ensure the SSD can extended battery life efficiently.

1. Partial Mode:
PHY is in a reduced power mode where the exit time is less than 10 microseconds.

2. Slumber Mode:
PHY is in a reduced power mode, lower than Partial mode, and where the exit time is less than ten milliseconds.

3. DEVSLP Mode:
DEVSLP is a new power management mode for hosts and devices. With DEVSLP, a host or device can completely power down their PHY and subsystems. In SATA SSD, partial, slumber, and DEVSLP are the critical tools to manage device power consumption. In addition, the device can collaborate with SSD power more efficiently to ensure extended battery life.



Application

- Filed Service
- Medical
- Field sales

Product Highlight

- SATA SSD
- CFX/CFast


E25A/E25B/E25C


E20A/E20B/E20C


E21A/E21B/E21C


E24A/E24B/E24C


E26C

Products Lines

PCIe Series

addlink M.2 PCIe NVMe modules and CFexpress card are specifically applicable for server, storage cache/ accelerators, and data communications applications requiring reliable internal storage with a small footprint. Utilizing a PCIe interface, M.2 PCIe NVMe modules are easily integrated into a host system without any special BIOS modifications or additional device drivers.

Form Factor

- M.2 2280
- M.2 2242
- CFexpress

Key Features

- Advance Thermal Solution
- Power Failure Protection
- Write Protect
- Secure Erase
- Crypto Erase
- TCG OPAL
- ToolBox
- High Performance

Recommended Applications

- Factory Automation
- Edge AI for Smart City
- Retail POS
- Smart Vending Machine

2280

H45E Series

E45E Series

E35G Series

	H45E Series	E45E Series	E35G Series
Form Factor	M.2 2280	M.2 2280	M.2 2280
Interface	PCIe Gen4x4	PCIe Gen4x4	PCIe Gen3x4
Connector	M.2 M key with PCIe pin out	M.2 M key with PCIe pin out	M.2 M key with PCIe pin out
Flash	3D TLC	3D TLC	3D TLC
Capacity	480~3840GB	480~3840GB	240~1920GB
Sequential Read	7200 MB/s	7200 MB/s	3300 MB/s
Sequential Write	6500 MB/s	6500 MB/s	1000 MB/s
Max. Endurance (Capacity)	6,800 TBW (3480GB)	6,800 TBW (3480GB)	2,800 TBW (1920GB)
Max. Power Consumption (R/W)	11/11W	11/11W	5.3/5.5W
Idle	2W	2W	2W
Supply (V)	3.3V + -5%	3.3V + -5%	3.3V + -5%
Shock	1500G, Peak/0.5ms	1500G, Peak/0.5ms	1500G, Peak/0.5ms
Vibration	20G, Peak/80~2000Hz	20G, Peak/80~2000Hz	20G, Peak/80~2000Hz
Operating Temp.	0~70°C / -40~85°C	0~70°C / -40~85°C	0~70°C / -40~85°C
addlilnk ToolBox Utility	Supported	Supported	Supported

2280 / 2242 / CFX

E35D Series

E34D Series

E36D Series

	E35D Series	E34D Series	E36D Series
Form Factor	M.2 2280	M.2 2242	Cfexpress Card
Interface	PCIe Gen3x4	PCIe Gen3x4	PCIe Gen3x2
Connector	M.2 M key with PCIe pin out	M.2 M key with PCIe pin out	Cfexpress (Type B)
Flash	3D TLC	3D TLC	3D TLC
Capacity	128~2048GB	128~2048GB	256~1024GB
Sequential Read	2450 MB/s	2500 MB/s	1700 MB/s
Sequential Write	1900 MB/s	1800 MB/s	1600 MB/s
Max. Endurance (Capacity)	2,400 TBW (2048GB)	2,400 TBW (2048GB)	1,120 TBW (1024GB)
Max. Power Consumption (R/W)	3.5/3.4W	3.5/3.4W	2.8/2.6W
Idle	1.5W	1.5W	0.8W
Supply (V)	3.3V + -5%	3.3V + -5%	3.3V + -5%
Shock	1500G, Peak/0.5ms	1500G, Peak/0.5ms	1500G, Peak/0.5ms
Vibration	20G, Peak/80~2000Hz	20G, Peak/80~2000Hz	20G, Peak/80~2000Hz
Operating Temp.	0~70°C / -40~85°C	0~70°C / -40~85°C	0~70°C / -40~85°C
addlilnk ToolBox Utility	Supported	Supported	Supported

	TCG OPAL	Write Protect	Secure Erase	Crypto Erase	ToolBox	Advance Thermal Solution	Power Failure Protection
H45E / E45E	○	○	●	–	●	○	–
E35G	○	○	●	○	●	○	○
E35D / E34D	○	–	●	○	●	○	–
CFX	○	–	●	○	●	○	–

● Default Implemented ○ On Request – Not Available

Products Lines

SATA Series

The addlink SATA SSDs offers different form fact and target embedded applications which require solid state drives in small, removable form factors. The SSD modules are designed for robustness against frequent temperature changes within the -40°C to 85°C range, withstand high shock and vibration and offer superior performance and endurance. The amount and type of write access define the required endurance in TBW.

Key Features

- Advance Thermal Solution
- Write Protect
- Secure Erase
- Destroy Erase
- Power Failure Protection
- Crypto Erase
- TCG OPAL
- Quick Erase
- ToolBox
- DEVSLP Mode

Form Factor

- 2.5″
- M.2 2280
- M.2 2242
- mSATA
- CFast

Recommended Applications

- Logistic / Fleet Management
- Aerospace Defense
- Factory Automation / Warehousing
- Data Center

2.5 Inch

E20B Series

E20C Series

	E20B Series	E20C Series
Form Factor/ Interface	2.5" SATAIII SSD	2.5" SATAIII SSD
Connector	7 + 15 pin SATA	7 + 15 pin SATA
Flash	TLC	TLC
Capacity	240~7680GB	64~2048GB
Sequential Read	550 MB/s	550 MB/s
Sequential Write	520 MB/s	510 MB/s
Max. Endurance (Capacity)	14,000 TBW (7680GB)	2,900 TBW (2TB)
Maximum Power Consumption (R/W)	2.6/3.7W	1.5/1.8 W
Idle	1.5W	0.215W
Supply (V)	5V + -5%	5V + -5%
Shock	1500G, Peak/0.5ms	1500G, Peak/0.5ms
Vibration	20G, Peak/80~2000Hz	20G, Peak/80~2000Hz
Operating Temp.	0~70°C / -40~85°C	0~70°C / -40~85°C
addlilnk ToolBox Utility	Supported	Supported

2.5 Inch

E20CP Series

E20A Series

	E20CP Series	E20A Series
Form Factor/ Interface	2.5" SATAIII SSD	2.5" SATAIII SSD
Connector	7 + 15 pin SATA	7 + 15 pin SATA
Flash	pSLC	TLC
Capacity	32~256GB	64~512GB
Sequential Read	550 MB/s	550 MB/s
Sequential Write	510 MB/s	495 MB/s
Max. Endurance (Capacity)	13,000 TBW (7680GB)	355 TBW (512GB)
Maximum Power Consumption (R/W)	1.35/1.25	1.25/1.4W
Idle	0.2W	0.285W
Supply (V)	5V + -5%	5V + -5%
Shock	1500G, Peak/0.5ms	1500G, Peak/0.5ms
Vibration	20G, Peak/80~2000Hz	20G, Peak/80~2000Hz
Operating Temp.	0~70°C / -40~85°C	0~70°C / -40~85°C
addlilnk ToolBox Utility	Supported	Supported

	TCG OPAL	Write Protect	Secure Erase	Crypto Erase	Destroy Erase	ToolBox	Advance Thermal Solution	Power Failure Protection	DEVSLP Mode
E20B	○	○	●	○	–	●	○	○	○
E20C / E20CP	○	○	●	○	○	●	○	–	○
E20A	–	○	●	–	○	●	○	–	○

● Default Implemented ○ On Request – Not Available

2280

E25B Series

E25C Series

	E25B Series	E25C Series
Form Factor/ Interface	M.2 2280/SATA III	M.2 2280/SATA III
Connector	M.2 with B+M Key SATA Pin-out	M.2 with B+M Key SATA Pin-out
Flash	TLC	TLC
Capacity	240~1920GB	64~2TB
Sequential Read	550 MB/s	550 MB/s
Sequential Write	530 MB/s	510 MB/s
Max. Endurance (Capacity)	3,259 TBW (1920GB)	2,900 TBW (2TB)
Maximum Power Consumption (R/W)	2/3W	1.5/1.8 W
Idle	1.2W	0.21W
Supply (V)	3.3V + -5%	3.3V + -5%
Shock	1500G, Peak/0.5ms	1500G, Peak/0.5ms
Vibration	20G, Peak/80~2000Hz	20G, Peak/80~2000Hz
Operating Temp.	0~70°C / -40~85°C	0~70°C / -40~85°C
addlilnk ToolBox Utility	Supported	Supported

2280

E25CP Series

E25A Series

	E25CP Series	E25A Series
Form Factor/ Interface	M.2 2280/SATA III	M.2 2280/SATA III
Connector	M.2 with B+M Key SATA Pin-out	M.2 with B+M Key SATA Pin-out
Flash	pSLC	TLC
Capacity	32~256GB	64~512GB
Sequential Read	550 MB/s	550 MB/s
Sequential Write	510 MB/s	495 MB/s
Max. Endurance (Capacity)	13,000 TBW (256GB)	355 TBW (512GB)
Maximum Power Consumption (R/W)	1.32/1.2W	1.075/1.18W
Idle	0.175W	0.2W
Supply (V)	3.3V + -5%	3.3V + -5%
Shock	1500G, Peak/0.5ms	1500G, Peak/0.5ms
Vibration	20G, Peak/80~2000Hz	20G, Peak/80~2000Hz
Operating Temp.	0~70°C / -40~85°C	0~70°C / -40~85°C
addlilnk ToolBox Utility	Supported	Supported

	TCG OPAL	Write Protect	Quick Erase	Secure Erase	Crypto Erase	Destroy Erase	ToolBox	Advance Thermal Solution	Power Failure Protection	DEVSLP Mode
E25B	○	○	○	●	○	–	●	○	○	○
E25C / E25CP	○	○	○	●	○	○	●	○	–	○
E25A	–	○	○	●	–	○	●	○	–	○

● Default Implemented ○ On Request – Not Available

2242

E24B Series

E24C Series

Form Factor/ Interface	M.2 2242/SATA III	M.2 2242/SATA III
Connector	M.2 with B+M Key SATA Pin-out	M.2 with B+M Key SATA Pin-out
Flash	TLC	TLC
Capacity	240-480 GB	64~1TB
Sequential Read	550 MB/s	550 MB/s
Sequential Write	340 MB/s	500 MB/s
Max. Endurance (Capacity)	659 TBW (480GB)	1,080 TBW (1TB)
Maximum Power Consumption (R/W)	1.9/2.4W	1.2/1.4W
Idle	1.2W	0.195W
Supply (V)	3.3V + -5%	3.3V + -5%
Shock	1500G, Peak/0.5ms	1500G, Peak/0.5ms
Vibration	20G, Peak/80~2000Hz	20G, Peak/80~2000Hz
Operating Temp.	0~70°C / -40~85°C	0~70°C / -40~85°C
addlilnk ToolBox Utility	Supported	Supported

2242

E24CP Series

E24A Series

Form Factor/ Interface	M.2 2242/SATA III	M.2 2242/SATA III
Connector	M.2 with B+M Key SATA Pin-out	M.2 with B+M Key SATA Pin-out
Flash	pSLC	TLC
Capacity	32~256GB	64~512GB
Sequential Read	550 MB/s	550 MB/s
Sequential Write	510 MB/s	495 MB/s
Max. Endurance (Capacity)	13,000 TBW (256GB)	355 TBW (512GB)
Maximum Power Consumption (R/W)	1.32/1.2W	1.075/1.18W
Idle	0.175W	0.2W
Supply (V)	3.3V + -5%	3.3V + -5%
Shock	1500G, Peak/0.5ms	1500G, Peak/0.5ms
Vibration	20G, Peak/80~2000Hz	20G, Peak/80~2000Hz
Operating Temp.	0~70°C / -40~85°C	0~70°C / -40~85°C
addlilnk ToolBox Utility	Supported	Supported

	TCG OPAL	Write Protect	Quick Erase	Secure Erase	Crypto Erase	Destroy Erase	ToolBox	Advance Thermal Solution	Power Failure Protection	DEVSLP Mode
E24B	○	–	–	●	○	–	●	○	○	○
E24C / E24CP	○	○	○	●	○	○	●	○	–	○
E24A	–	○	○	●	–	○	●	○	–	○

● Default Implemented ○ On Request – Not Available

mSATA

E21C Series

pSLC

E21CP Series

E21A Series

	E21C Series	E21CP Series	E21A Series
Form Factor/ Interface	mSATA (29.85x50.8mm) / SATAIII	mSATA (29.85x50.8mm) / SATAIII	mSATA (29.85x50.8mm) / SATAIII
Connector	Mini PCIe with SATA Pin out	Mini PCIe with SATA Pin out	Mini PCIe with SATA Pin out
Flash	TLC	pSLC	TLC
Capacity	64~2TB	32~256GB	64~512GB
Sequential Read	550 MB/s	550 MB/s	550 MB/s
Sequential Write	510 MB/s	510 MB/s	495 MB/s
Max. Endurance (Capacity)	2,900 TBW (2TB)	13,000 TBW (256GB)	355 TBW (512GB)
Maximum Power Consumption (R/W)	1.45/1.75W	1.32/1.2W	1.075/1.18W
Idle	0.21W	0.175W	0.2W
Supply (V)	3.3V + -5%	3.3V + -5%	3.3V + -5%
Shock	1500G, Peak/0.5ms	1500G, Peak/0.5ms	1500G, Peak/0.5ms
Vibration	20G, Peak/80~2000Hz	20G, Peak/80~2000Hz	20G, Peak/80~2000Hz
Operating Temp	0~70°C / -40~85°C	0~70°C / -40~85°C	0~70°C / -40~85°C
addlilnk ToolBox Utility	Supported	Supported	Supported

CFast

E26C Series

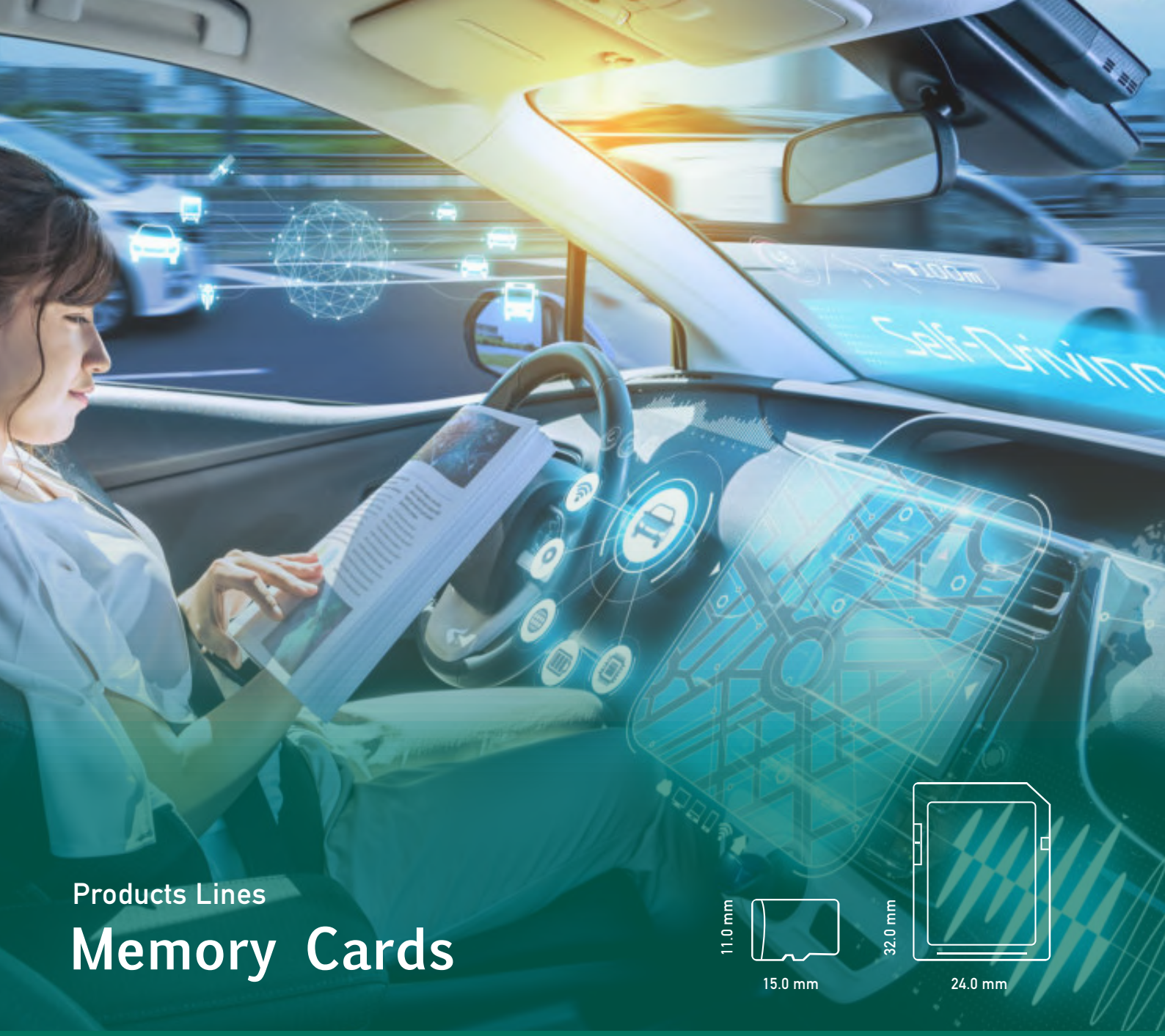
pSLC

E26CP Series

	E26C Series	E26CP Series
Form Factor/ Interface	Cfast (36 x 43 mm)	Cfast (36 x 43 mm)
Connector	SATA III	SATA III
Flash	TLC	pSLC
Capacity	64~1TB	32~128GB
Sequential Read	550 MB/s	550 MB/s
Sequential Write	500 MB/s	500 MB/s
Max. Endurance (Capacity)	1,080 TBW (1TB)	6,400 TBW (128GB)
Maximum Power Consumption (R/W)	1.15/1.4W	1.25/1.2W
Idle	0.180W	0.175W
Supply (V)	3.3V + -5%	3.3V + -5%
Shock	1500G, Peak/0.5ms	1500G, Peak/0.5ms
Vibration	20G, Peak/80~2000Hz	20G, Peak/80~2000Hz
Operating Temp	0~70°C / -40~85°C	0~70°C / -40~85°C
addlilnk ToolBox Utility	Supported	Supported

	Write Protect	Quick Erase	Secure Erase	Crypto Erase	TCG OPAL	Destroy Erase	ToolBox	Advance Thermal Solution	DEVSLP Mode
E21C / E21CP	○	○	●	○	○	○	●	○	○
E21A	○	○	●	–	–	○	●	○	○
E26C / E26CP	○	○	●	○	○	–	●	○	○

● Default Implemented ○ On Request – Not Available



Products Lines

Memory Cards

addlink SD and microSD memory cards are designed to operate in extreme conditions. They have a higher tolerance for hot and cold temperatures, vibration, shocks, and high humidity. It is a robust and reliable solution for all kinds of special needs. They comply with industry standards, including:

- ISO 9001, ISO 14001, ISO/TS 16949
- IEC 60529 (water/dustproof): SD IP67 and microSD IP57
- Select AEC-Q100 test items and conditions

Key Features

Form Factor

- SD
- microSD

Recommended Applications

- Automotive
- Digital Signage / POS
- Dash Cam / Fleet Management
- Video Surveillance
- Public Safety

SD

ES2H

ES2HP

	ES2H	ES2HP
Form Factor	SD (24 x 32 mm)	SD (24 x 32 mm)
Interface/ SPEC	UHS-I, A2, V30, U3	UHS-I, A2, V30, U3
Connector	SD 9 pin	SD 9 pin
Flash	TLC	pSLC
Capacity	64~256GB	16~128GB
Sequential Read	95 MB/s	95 MB/s
Sequential Write	85 MB/s	85 MB/s
Endurance (P/E)	3K	30K
Maximum Read/Write Current	400/400mA	400/400mA
Standby Current	1mA	1mA
Supply (V)	2.7V~3.6V	2.7V~3.6V
AEC-Q100	Yes	Yes
Dust/Water Proof	IP67	IP67
Operating Temp.	0~70°C / -40~85°C	0~70°C / -40~85°C

microSD

EM2H

EM2HP

	EM2H	EM2HP
Form Factor	Micro SD (11 x 15 mm)	Micro SD (11 x 15 mm)
Interface/ SPEC	UHS-I, A2, V30, U3	UHS-I, A2, V30, U3
Connector	SD 8 pin	SD 8 pin
Flash	TLC	pSLC
Capacity	64~256GB	16~128GB
Sequential Read	95 MB/s	95 MB/s
Sequential Write	85 MB/s	85 MB/s
Endurance (P/E)	3K	30K
Maximum Read/Write Current	400/400mA	400/400mA
Standby Current	1mA	1mA
Supply (V)	2.7V~3.6V	2.7V~3.6V
AEC-Q100	Yes	Yes
Dust/Water Proof	IP57	IP57
Operating Temp.	0~70°C / -40~85°C	0~70°C / -40~85°C

	Write Protect	CPRM	Password Protection	IPX7	AEC-Q100	ToolBox	Auto Read Refresh	Sudden Power off Protection
ES2H / ES2HP	○	○	○	●	●	●	●	○
EM2H / EM2HP	○	○	○	●	●	●	●	○

● Default Implemented ○ On Request – Not Available

Products Lines

USB Flash Drives

USB Flash Drives address the need for enhanced reliability with the industry's best-in-class read and write speeds, providing reliable operation over the product life cycle. addlink USB Flash Drives offer both USB 2.0 and USB 3.2 high speed bus protocols, and are designed as the main boot and storage devices in embedded systems.

Form Factor

- USB Drive

Key Features

pSLC Mode

Wide Temperature -40~85°C

ToolBox

Robust Housing

Recommended Applications

- Digital Signage
- Kiosk
- Factory Automation
- Gamming

USB Drives

EU2J

Item	USB Drive
Interface	USB 3.2/2.0/1.1
Connector	USB Type A
Dimension (mm)	55 x 16.8 x 7.2
Flash	TLC
Capacity	64GB~512GB
Sequential Read	265 MB/s
Sequential Write	175 MB/s
Shock	1500G/0.5ms duration
Vibration	20Hz~80Hz/1.52mm, 80Hz~2000Hz/20G
Max. Read/Write Current	230/220mA
Standby Current	1.5mA
Operating Temp.	0~70°C / -40~85°C
SMART ToolBox	Supported

	pSLC Mode	Wide Temperature -40~85°C	ToolBox	Robust Housing
EU2J	○	○	●	○

● Default Implemented ○ On Request – Not Available

Special Features For Industrial Requirements

addlink SSD built with reliable industrial grade controller and NAND Flash, supports the latest LDPC ECC technology, advanced Wear Leveling, Bad Block Management, and Over-Provisioning technology to ensure data accuracy and a longer SSD lifetime. Furthermore, they product optional built with a AES 256bit encryption feature and fully complaint with TCG OPAL specification. The drive also comes with Smart ToolBox feature for your company to analyze and manage the SSDs' health. Utilizing flash technology backed with proven world-class support, addlink's industrial flash products designs and manufactures high performance military and industrial SSDs with military standard encryption, secure data elimination and write-protect features.

Industrial Design & Technology

Robustness

MIL-STD-810G (Shock/Vibration Proof)

MIL-STD-810G is a US military specification that guarantees a level of durability for a piece of technology. addlink's SSDs comply with MIL-STD-810G, protecting them against shock and vibration in harsh environments.

EC 60529 (Water/Dustproof) SD IP67 and MicroSD IP57

IP Code or Ingress Protection Code is defined in IEC 60529 which classifies and provides a guideline to the degree of protection provided by mechanical casings and electrical enclosures against intrusion, dust, accidental contact, and water.

Advance Thermal Solution

Customized with the Premium Aluminum heatsink, Crosscutting fat fins, and heat-conducing silica gel pad that increase surface and airflow to helps disperse heat by up to 30% for different system.

Wide Temperature -40~85°C

The products are designed and approved for reliable operation over a wide temperature range.

Automotive AEC-Q100/IATF16949

Meet Automotive Grade Quality IATF 16949, Reliability AEC-Q100

Power Protection

Power Loss Protection (SSD)

Power Loss protection (SSD) is provided using additional circuitry and capacitors installed to continue to provide power to the SSD in the event of a sudden power loss.

Sudden Power off Protection (SD/microSD)

If a power loss occurs when the data is writing to block, the firmware will check that specific block that was being written right before losing power. If ECC uncorrectable, SD/MicroSD firmware will copy the correct data to a new block before ECC uncorrectable occurred.

Low Power Consumption

Electronic devices with low power consumption features (Partial mode, Slumber Mode, and DEVSLP Mode) generally have longer battery life, no overheating issues and also decrease the energy cost for charging.

High Endurance

Quality Flash

Industrial Grade TLC, pSLC (Industrial Grade TLC)

pSLC

addlink select qualify industrial TLC flash and high endurance pSLC (Pseudo SLC) as the storage solution for industrial applications.
pSLC (Pseudo SLC) is a TLC NAND drive that has been formatted to store one bit per cell instead of their native 3 or 4 bits per cell to increase its reliability to meet the SLC level. This specific technique will allow addlink's drive to have 10 times more of the P/E Count compare to other drives in the market.

Data Security

Write Protect

When the write protect function enabled, SSD Controller will ignore any write/Erase command from host and only Read is permitted. The features is provide for special application ex. Surveillance or public safety to prevent the stored data from being erased.

AES Encryption

Advanced Encryption Standard (AES) An AES 256-bit encryption key is generated in the drive's security controller before the data got stored on the NAND flash. When the controller or firmware fails, the data securely stored in the encryption key becomes inaccessible through the NAND flash.

TCG Opal

The Opal specification is a set of specifications for self-encrypting. The Opal Security Subsystem Class(SSC) 2.0 defines the details of data management in storage devices and the classes authority for data access, and secures data from theft and tampering by unauthorized persons who are able to gain access to the storage device or host system. TCG Opal 2.0 Main Features are including AES 256-bitHardware Self Encryption, Deploy Storage Device & Take Ownership, Activate or Enroll Storage Device, and Lock & Unlock Storage Device.

CPRM

Supports optional CPRM
(Content Protection for Recordable Media)
of SD Card

Security Erase

Quick Erase

Crypto Erase

Destroy Erase

Quick Erase	Erase: table
Secure Erase	Erase: table + Data
Crypto Erase	Erase: table + Data (for support OPAL 2.0 SSD)
FW Destroy	Erase: table + Data + FW
Advance Erase	Erase: table + Change Key
Military Erase	By Military SPEC

Data Integrity

Auto-Read Refresh

Auto-Read Refresh is especially applied on devices that read data mostly but rarely write data, such as GPS. When blocks are continuously read, then the device cannot activate wear leveling since it can only be applied while writing data. Thus, errors will accumulate and become uncorrectable. Accordingly, to avoid errors exceed the amount ECC can correct and blocks turn bad, addlink's SD/MiroSDs' firmware will automatically refresh the bit errors when the error number in one block approaches the threshold.

End to End Data Protection

New SSD controller solutions incorporate full data error detection with recovery engines to provide enhanced data integrity throughout the entire Host-to-NAND- to-Host data path. The data recovery algorithm can effectively detect any error in the SSD data path.

LDPC + RAID ECC

It is an exclusive technology that, alongside our industry-best low-density parity check (LDPC) algorithm, guarantee unparalleled error checking and correction (ECC) capabilities in our flash storage devices.

Device Health Monitoring

SMART ToolBox

Self-Monitoring, Analysis and Reporting Technology, is a software that offers an easy way to analyze and manage your SSDs' Health. You will be able to:

- Review drive information
- Scan and diagnostic drive's health
- Track the drive's identify device command
- Monitor SMART Status
- Perform secure erase

Flash Products Naming Rule

addlink's storage solutions portfolio covers all relevant interfaces and form factors including SD and microSD memory cards, CompactFlash, CFast cards, 2.5" SATA SSDs and mSATA SSDs, M.2 in SATA and PCIe NVMe, and USB Flash Drives (UFD). Our sophisti- cated flash handling algorithms optimize the performance and life of the SLC, MLC and 3D NAND flash used in our products.

addlink Capacity

a d 2 T B **E 2 0 A P A**

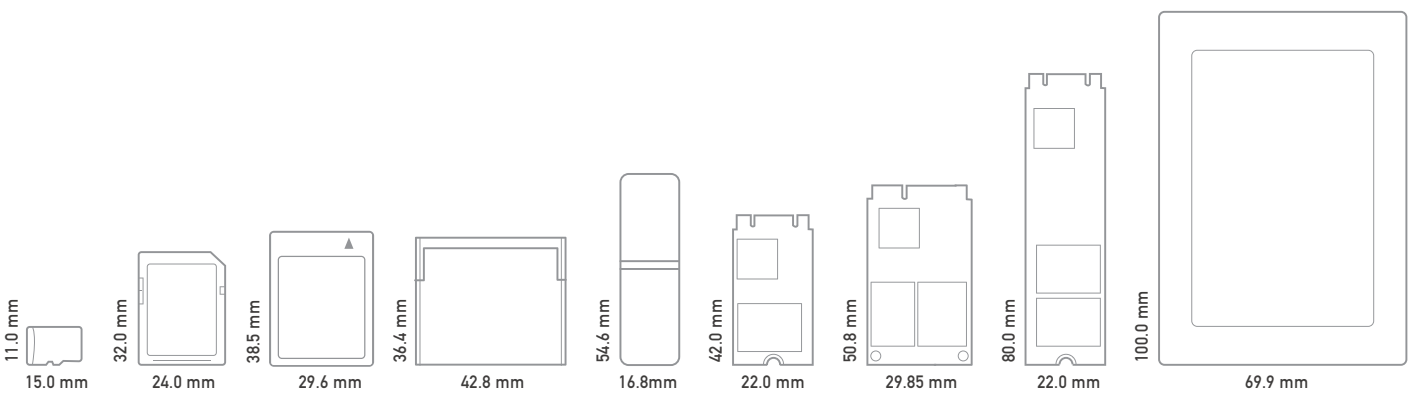
Heatsink
with heatsink : H
w/o heatsink : E

Interface
SATA3 2.5" : 20
mSATA : 21
mSATA mini : 22
M.2 SATA 2242 : 24
M.2 SATA 2280 : 25
M.2 G3x2 2280 : 33
M.2 G3x4 2242 : 34
M.2 G3x4 2280 : 35
M.2 G4x2 2280: 43
M.2 G4x4 2242: 44
M.2 G4x4 2280: 45
Cfast : 26
Cfexpress: 36
Industrial SD : S2
MicroSD: M2
USB Flash Drive: EU2

Control
S11T : A
S12DI : B
S17TI : C
E13TI : D
E18DI : E
E21TI : F
E12DI: G
PS8132: H
PS2251-11:J

Flash
SLC :S
MLC: M
TLC : T
pSLC (TLC) : P

Temperature
-40°C ~ +85°C : A
-25°C ~ +85°C : B
0°C ~ +70°C : C



addlink
Industrial

The Thermal Experts in Specialty Storage and Memory Solutions

For more product details, please contact addlink sales team or visit our website.

Headquarters
6F, No.300, Ruiguang Rd., Neihu Dist.,
Taipei City 114, Taiwan

Contact US
Email :Sales@addlink.com.tw
Phone:886-2-8797 3116

Website