HAGIWARA Solutions

Storage Catalog



HAGIWARA Solutions

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 $\underline{{}^{\text{Look at our website for the latest information on our services.}}} \quad \text{https://www.hagisol.com}$

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Technology development capabilities

Our long years of experience and knowhow combine with our advanced development capabilities to realize storage products able to support long-term stable operation of industrial equipment.

Key Features



In-company developed firmware

Our in-company development of firmware allows us to build storage products optimized for industrial equipment. We can also rapidly respond

to trouble when failures occur.



Product testing

Our thorough testing, using the many testing devices of the Elecom Group, assures quality, performance, and reliability fit to meet severe conditions.



Commitment to quality

We maintain a high level of quality with shipment inspections and quality control backed up by solid experience and knowhow. Pre-shipment burn-in testing greatly contributes to minimizing the percentage of initial defects.



Company Profile

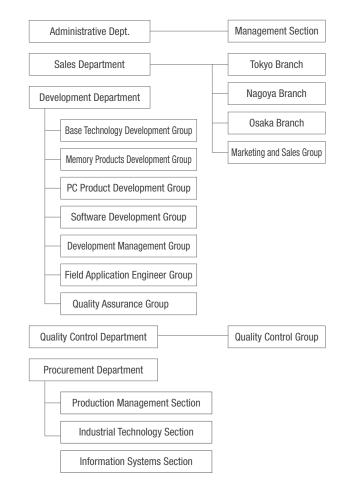
Company name	Hagiwara Solutions Co., Ltd.
Head office	8th Floor, Pacific Square Nagoya Nishiki, 2-5-12 Nishiki, Naka Ward, Nagoya 460-0003
Established	July 4, 2011
Capital	50,000,000 yen
Representative	President and CEO: Junji Hada
Number of employees	81 (including contract and part-time employees) (As of April 2019)
Closing month	March

Hagiwara Solutions has a track record spanning over twenty years as a trailblazer in the manufacture of flash storage for industrial equipment.

Our strength is our high level of reliability backed by our knowhow and achievements so far, and the powerful support of our customers.



Organization Chart



Peace-of-mind technical support system

Field applications engineers (FAE = sales engineer) are stationed in Tokyo, Nagoya, and Osaka.

Working in coordination with development sites, they give rapid and detailed support to users via sales offices and dealerships.

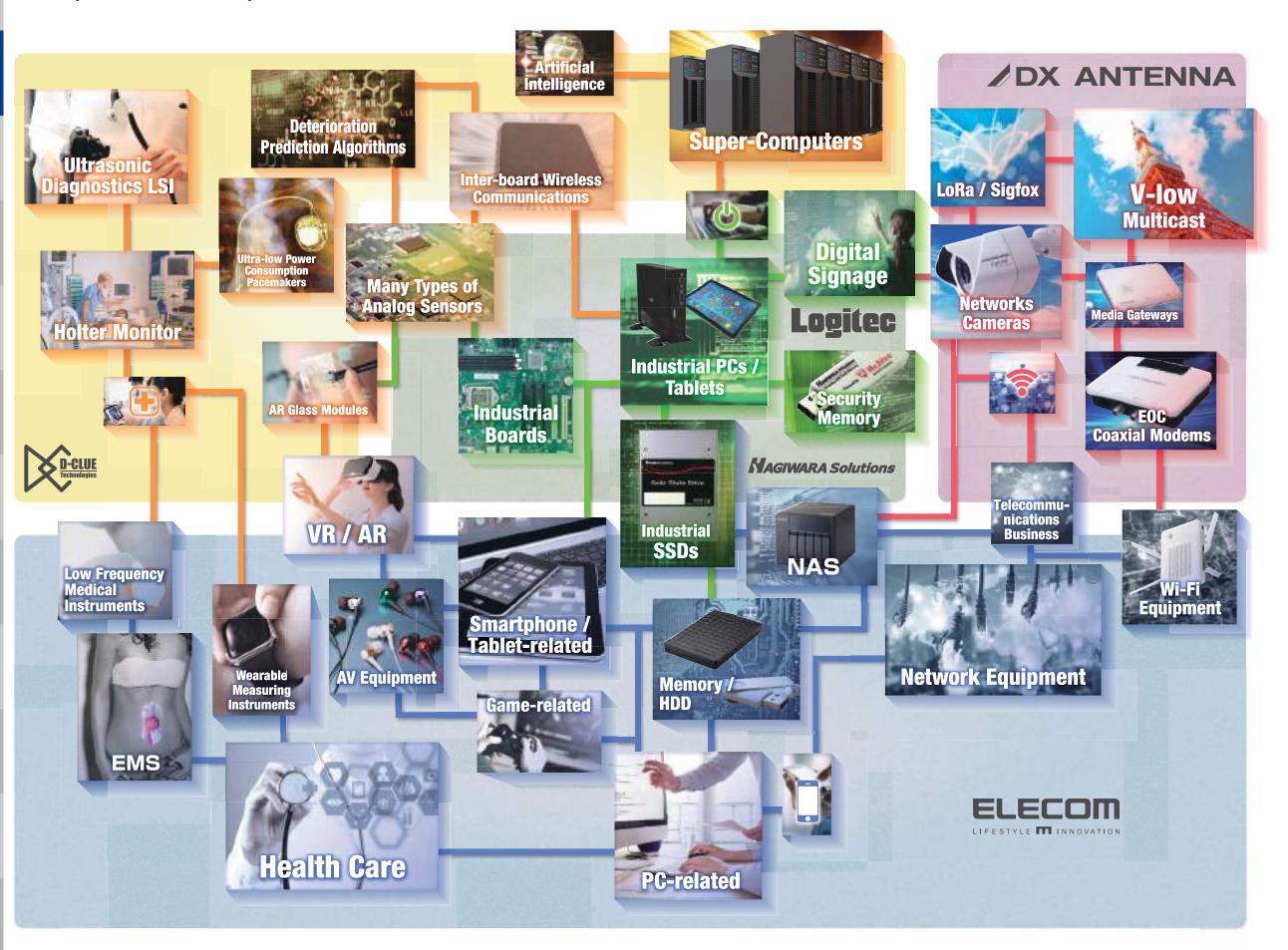


Following our acquisition of Japan Data Systems, from 2018 our lineup now includes embedded computers, motherboards, and IoT gateways for industrial equipment. Combined with flash storage products for industrial equipment, our solutions are much commended by users for their high level of reassurance. The scope of the industrial solutions offered by Hagiwara Solutions continues to broaden.



1 Company Profile

Using group synergy to expand Elecom Group solutions ever further





Elecom Co., Ltd.

Elecom is known as a major computer supplier, branching out in recent years to supply products for tablets and smartphones, digital home field with enhanced development of network products, applications, cloud services, and provision of installation services for wireless LAN access points. The Elecom Group's mission is to serve as a bridge connecting innovations to lifestyles, pursuing user happiness and comfort while constantly seeking to create new

Logitec

Logitec **INA Solutions Co., Ltd.**

With the aim of building direct and lasting relationships with our end-user customers, we began trading in 2011 after splitting off from Logitec. Our policy is to be able to provide what you need whenever you need it. Our aim is to be a company that can find the solutions for all our customers' problems. We will provide products and services that will impress, building on the technological capabilities, specializations, and impetus built up by Logitec over the years.

DX ANTENNA

DX Antenna Co., Ltd.

Advanced transmission technology built up over more than sixty years. We developing new services combining broadcasting and communications as the core of next-generation transmission systems, and exploring new fields for the future, such as disaster preparedness, social welfare, security, and wireless communications.



D-Clue Technologies Co., Ltd.

We became a group company at the end of June 2017. We have superlative engineers in analog, digital, and firmware technology, with the ability to create from scratch entirely new innovations, to provide solutions with greater added value.

3 Elecom Group Introduction



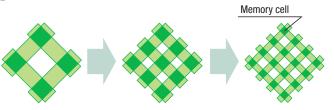
Next-generation Flash Memory 3D NAND

3D NAND

Flash memory with new technology to stack the layers of cells.

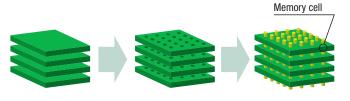
This achieves a leap to much greater capacities than standard 2D memory, improving speed and overall performance.

2D NAND



Capacity is increased by expanding cells with miniaturized surface areas. *The limits of miniaturization. If the distance between cells becomes too narrow, they start to interfere with each other and make errors more

3D NAND



Stacks vertically to allow a wide distance between cells, for high-speed data processing and a further-expanded capacity.

Hagiwara Solutions 3D NAND Based Product Features



High reliability

•Improved error correction capability with Low Density Parity Check (LDPC) • Reliable data protection with internal RAID function

Usage under high and low temperatures

• Temperature monitoring function (Clock gear) *H series only

Extended temperature range from -40°C to 85°C

• Maximized life with NAND management



Improved performance

Improved performance in actual use with SLC cache



Device state observation

· Detailed information on device state with Livemonitor •Timer count in device sleep state due to real-time clock Power ON time can be counted more accurately *H series only

Improved reliability and performance in MLC/SLC mode

•The MLC/SLC mode is provided in addition to the standard TLC mode, allowing customers with existing MLC/SLC NAND products to use it without risk *H series

3D NAND Based Product Lineup

SATA Interface













PCIe Interface









CFast (3D NAND)

SATA 6.0Gbps SN1S-GP / RN1S-GP / HN1S-GP Series

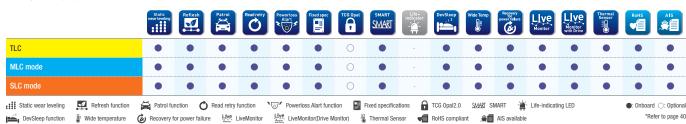


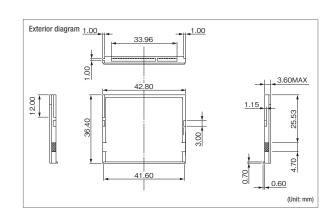




	Flash memory	TLC	MLC mode	SLC mode
Capacity		60 GB to 240 GB	40 GB to 320 GB	20 GB to 160 GB
	Interface	SATA 6.0Gbps		
Operating voltage			3.3V±5%	
Standard			0°C to 70°C	
Operating temperature	Wide temperature		-40°C to 85°C	
Storage temperature			-45°C to 90°C	
	Operating humidity		To 85% (no condensation)	
	Storage humidity		To 95% (no condensation)	
	Dimensions (mm)		42.8 × 36.4 × 3.6	
	DRAM cache	•	•	•
	Sequential reading (MB/s)	495	495	495
	Sequential writing (MB/s)	315	430	430
Maximum transfer rate	Random reading (IOPS)	52,000	55,000	57,000
	Random writing (IOPS)	48,000	52,000	51,000
	20GB	-	-	580
	40GB	-	110	1,160
	60GB	45	-	-
TBW (TB) *1	80GB	-	230	2,380
IBW (IB)	120GB	90	-	-
	160GB	-	480	4,860
	240GB	180	-	-
	320GB	-	1,000	-
	Read (max.)	435	320	
Power concumption (mA)	Write (max.)	565	585	T.B.D.
Power consumption (mA)	Idle mode	165	120	Ι.υ.υ.
	DevSleep mode	3	3	
	Warranty period		1 year	

*1 Total Bytes Written (TBW) is calculated as write load conditions on the basis of JEDEC 219 Client.





oddot Humboi			
	TLC	MLC mode	SLC mode
Standard 0°C to 70°C	SN1S-xxxGP00SN	RN1S-xxxGP00SN	HN1S-xxxGP00SN
Wide temperature -40°C to 85°C	SN1S-xxxGP00JI	RN1S-xxxGP00JI	HN1S-xxxGP00JI

2.5-inch SATA SSD (3D NAND)

SATA 6.0Gbps KN2S-GL K Series SN2S-GP / RN2S-GP / HN2S-GP Series



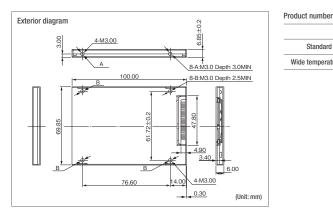






	Flash memory	TLC(K Series)	TLC	MLC mode	SLC mode	
	Capacity	240 GB to 1920 GB	60 GB to 960 GB	40 GB to 640 GB	20 GB to 320 GB	
	Interfaces	SATA 6.0Gbps				
0	perating voltage	5V±5%				
Operating	Standard	0°C to 70°C				
temperature Wide temperature		40°C to 85°C				
Sto	rage temperature	-45°C to 90°C				
Operating humidity			To 85% (no	condensation)		
Storage humidity			To 95% (no	condensation)		
Dimensions (mm)			69.85 ×	99.9 × 7.0		
	DRAM cache	•	•	•	•	
	Sequential reading (MB/s)	500	500	495	495	
Maximum	Sequential writing (MB/s)	470	430	430	430	
transfer rate	Random reading (IOPS)	51,000	55,000	56,000	57,000	
	Random writing (IOPS)	54,000	43,000	52,000	51,000	
	20GB	-	-	-	580	
	40GB	-	-	110	1,160	
	60GB	-	45	-	-	
	80GB	-	-	230	2,380	
	120GB	-	90	-	-	
TBW (TB) *1	160GB	-	-	480	4,860	
IDW (ID)	240GB	T.B.D.	180	-	-	
	320GB	-	-	1,000	11,800	
	480GB	T.B.D.	360	-	-	
	640GB	-	-	2,100	-	
	960GB	T.B.D.	720	-	-	
	1920GB	T.B.D.	-	-	-	
	Read (max.)		360	350		
ower consump-	Write (max.)	T.B.D.	570	585	T.B.D.	
tion (mA)	ldle mode	ע.מ.ו.	120	120	١.۵.υ.	
	DevSleep mode		10	10		
V	Varranty period		1)	year		





	TLC(K Series)	TLC	MLC mode	SLC mode
Standard 0°C to 70°C	KN2S-xxxGL00SN	SN2S-xxxGP00SN	RN2S-xxxGP00SN	HN2S-xxxGP00SN
Wide temperature -40°C to 85°C	-	SN2S-xxxGP00JI	RN2S-xxxGP00JI	HN2S-xxxGP00JI

7 CFast (3D NAND) 2.5inch SATA SSD (3D NAND) 8

mSATA (3D NAND)

SATA 6.0Gbps SNMS-GP / RNMS-GP / HNMS-GP Series



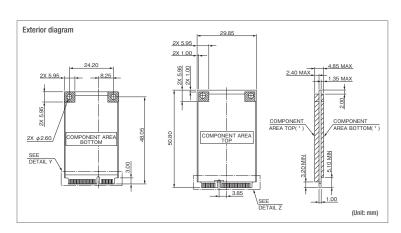




	Flash memory	TLC	MLC mode	SLC mode
	Capacity	60 GB to 240 GB	40 GB to 320 GB	20 GB to 160 GB
	Interfaces	SATA 6.0Gbps		
Operating voltage			3.3V±5%	
Operating temperature Standard Wide temperature			0°C to 70°C	
			-40°C to 85°C	
	Storage temperature		-45°C to 90°C	
	Operating humidity		To 85% (no condensation)	
	Storage humidity		To 95% (no condensation)	
Dimensions (mm)			29.85 × 50.8 × 4.0	
	DRAM cache	•	•	•
Maximum transfer rate	Sequential reading (MB/s)	495	495	495
	Sequential writing (MB/s)	280	430	430
Maximum transfer fate	Random reading (IOPS)	51,000	53,000	57,000
	Random writing (IOPS)	48,000	46,000	51,000
	20GB	-	-	580
	40GB	-	110	1,160
	60GB	45	-	-
TBW (TB) *1	80GB	-	230	2,380
IDW (ID)	120GB	90	-	-
	160GB	-	480	4,860
	240GB	180	-	-
	320GB	-	1,000	-
	Read (max.)	420	320	
Power consumption (mA)	Write (max.)	545	585	T.B.D.
r ower consumption (MA)	Idle mode	155	120	I.D.U.
	DevSleep mode	3	3	
	Warranty period		1 year	

^{*1} Total Bytes Written (TBW) is calculated as write load conditions on the basis of JEDEC 219 Client.





	TLC	MLC mode	SLC mode
Standard 0°C to 70°C	SNMS-xxxGP00SN	RNMS-xxxGP00SN	HNMS-xxxGP00SN
Wide temperature -40°C to 85°C	SNMS-xxxGP00JI	RNMS-xxxGP00JI	HNMS-xxxGP00JI

M.2 (3D NAND)

SATA 6.0Gbps SN4S-GP / RN4S-GP / HN4S-GP Series KN8S-GL K Series









Fla	sh memory	TLC 2242 Size	MLC mode 2242 Size	SLC mode 2242 Size	TLC(K Series) 2280 Size		
- (Capacity	60 GB to 240 GB	40 GB to 320 GB	20 GB to 160 GB	240 GB to 1920 GB		
Interfaces		SATA 6.0Gbps					
Oper	ating voltage		3.3\	V±5%			
Operating	Standard		0°C t	to 70°C			
temperature Wide temperature			-40°C to 85°C				
Storag	je temperature		-45°C	to 90°C			
Opera	ating humidity		To 85% (no	condensation)			
Stora	age humidity		To 95% (no	condensation)			
Dime	ensions (mm)		22.0 × 42.0 × 3.85		22.0 × 80.0 × 3.85		
DP	RAM cache	-	-	-	•		
	Sequential reading (MB/s)	495	495	495	T.B.D.		
Maximum	Sequential writing (MB/s)	280	430	310	T.B.D.		
transfer rate	Random reading (IOPS)	51,000	50,000	42,000	T.B.D.		
	Random writing (IOPS)	48,000	46,000	48,000	T.B.D.		
	20GB	-	-	580	T.B.D.		
	40GB	-	110	1,160	-		
	60GB	45	-	-	-		
L	80GB	-	230	2,380	-		
L	120GB	90	-	-	-		
TBW (TB) *1	160GB	-	480	4,860	-		
IBW (IB)	240GB	180	-	-	T.B.D.		
	320GB	-	1,000	-	-		
	480GB	-	-	-	T.B.D.		
	640GB	-	-	-	-		
	960GB	-	-	-	T.B.D.		
	1920GB	-	-	-	T.B.D.		
	Read (max.)						
Power consump-	Write (max.)		TI	B.D.			
tion (mA)	Idle mode		1.1	D.D.			
	DevSleep mode						
War	ranty period		1	year			

^{*1} Total Bytes Written (TBW) is calculated as write load conditions on the basis of JEDEC 219 Client.

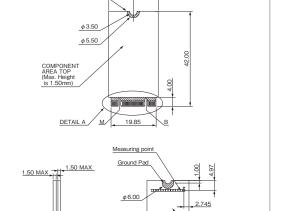
2242 Size

Exterior diagram



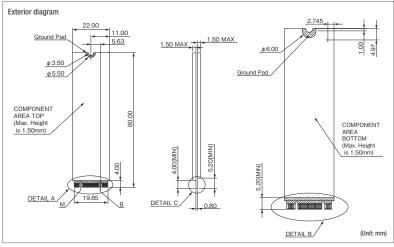
👬 Static wear leveling 🖳 Refresh function 🚔 Patrol function 🖒 Read retry function 🌺 Powerloss Alart function 📳 Fixed specifications 🔒 TCG Opal2.0 SMART 🕌 Life-indicating LED Personal procession of the demonstration of the dem

2280 Size



DETAIL B

22.00 (11.00)



Product	number

ı					
		TLC 2242 Size	MLC mode 2242 Size	SLC mode 2242 Size	TLC(K Series) 2280 Size
	Standard 0°C to 70°C	SN4S-xxxGP00SN	RN4S-xxxGP00SN	HN4S-xxxGP00SN	KN8S-xxxGL00SN
	Wide temperature -40°C to 85°C	SN4S-xxxGP00JI	RN4S-xxxGP00JI	HN4S-xxxGP00JI	-

SATA 6.0Gbps Product Features

Product lineup











CFast

2.5-inch SATA

mSATA

HalfSlim

Functions to ensure stable long-term operation

This product complies with the high-speed Serial ATA interface standard (SATA Gen 3). Designed for embedding in industrial equipment or IoT related machinery, with functions to ensure stable operation even after long periods of continuous use.

Functions to maximize product life

Equipped with functions to maximize efficiency when writing to flash memory, in order to cope with use over long periods of time.

- · Address management by 4K page mapping
- Improved garbage collection efficiency by hot/cold separation
- Cyclic scanning (total area refresh: data retention measure)

Function to ensure constant performance

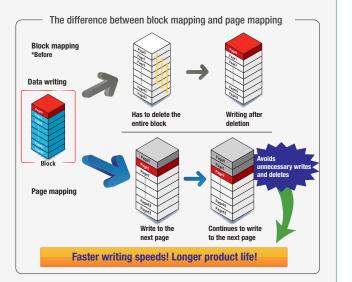
This onboard feature maintains a constant performance from the first time you use the product to the end of its life, for long-term continuous use.

- Fixes the capacity of the user data area and the management domain
- Manages the frequency of garbage collection (data movement) Uses EEC pipeline on-the-fly correction

Approach to maintaining consistent quality

All parts are subject to burn-in testing at shipment to ensure parts are fixed and prevent varying performance.

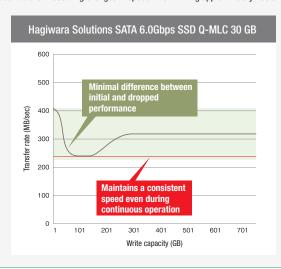
- Hardware designed for noise-resistant performance
- Parts are fixed to prevent performance variation, and initial defects are minimized with burn-in screening
- Visualization of internal status via drive monitoring

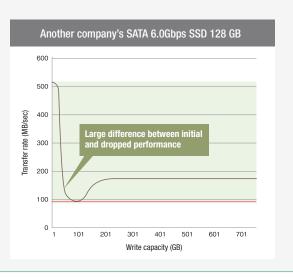


Stable speed performance

Comparison of SSD features Hagiwara Solutions SSDs have a stable transfer rate that doesn't slow down even when writing continuously.

Test conditions: measuring changes in speed when writing approximately 700 GB sequentially.



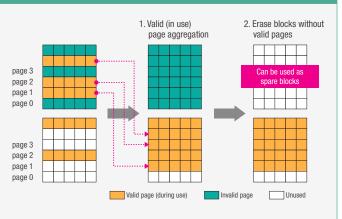


Garbage collection generating empty blocks

The SATA 6.0Gbps Series uses page mapping to improve speeds and maximize product life. This method defines 4 kilobytes as one unit (a page) and adds data to empty blocks, improving speeds through not having to erase blocks while writing data

However, ongoing use results in scattered pages storing unused data, with few empty blocks. This results a block containing a mix of both valid and invalid pages. When this occurs, the valid and invalid data is reordered so that all pages inside the block are invalid pages, allowing it to be erased to free up empty blocks. This process is called "garbage

Garbage collection temporarily slows down the speed, but our SATA 6.0Gbps Series intelligently sorts valid and invalid data to reduce unnecessary garbage collection and ensure stable writing operations.



Compatible with LiveMonitor SSD life diagnostics software

There is a limit to the number of times NAND flash memory in the SSD can be rewritten. Semiconductor storage has the advantages of high durability and performance, yet the ability to predict product life based on the rewrite limit is highly significant for storage for industrial equipment. LiveMonitor is a Windows app capable of SSD product life and failure prediction, based on SSD self-diagnostic S.M.A.R.T. information. The results of this product life prediction allow preventive maintenance by replacing the SSD with a new one before its life expires. Use of access analysis information also allows the SSD to be used effectively, maximizing its product life.

Basic Functions

Display of device information

- S.M.A.R.T. value
- Temperature
- Product life predictio

Access analysis <*1>

- Read/write ratio Transfer size ratio
- - · Seguential access ratio

Other <*2>

- SSD firmware update function
- PDF output for device and access information

Displays device block information <*1>

- Applications
 - . Duty cycle (current status and ongoing changes)
 - Erasure frequency (current status and ongoing changes)
 - . Number of read operations

Device settings <*2>

- Run SSD Secure Erase
- Run PSID Revert to reset TCG Opal settings to factory default
- Enable eDrive IEEE1667 settings for the SSD
- <*1> Display of device block information and access ratio is limited to certain products in the SATA 6.0Gbps Series. For more details on compatible products, refer to our website.
- <*2> The SSD must have functions compatible with the settings.

Drive monitoring function

The drive's internal conditions (e.g. memory fragmentation) can be visualized, supporting system configuration to optimize use of the SSD.

Access analysis

Visualizing the types of transfer sizes for reading/writing. frequency of sequential/random access and other information allows users to determine the optimum access method for their



Acquires device information

Able to predict drive life by calculating relevant indicators such as



Device information

Acquires information from inside the SSD

Checks the usage of each block to determine the optimum product capacity and type, and to configure apps to maximize product life.



Block information, duty cycle

LiveMonitor Plus

In Development

The access analysis function of the life diagnostics monitoring software LiveMonitor enhances detailed visualization of data and improves operability. It can obtain RAS information from the motherboard used as well as the SSD.

Three factors for evaluation to verify whether the computer system can stably provide the expected functions and performance

RAS information

A vailability (Availability)

LiveMonitor Plus acquires information for centralized control of life prediction data for the entire system.

· Acquisition of information for the entire system allows prediction of its overall product life.

- · Information analysis can be fine-tuned e.g. to extract information for a set period.
- · Cloud access allows information acquisition and aggregation to enable predictive maintenance.

SATA 6.0Gbps Product Features

SATA 6.0Gbps Product Features

CFast

SATA 6.0Gbps

LFD10S-GD / XFD10S-GD / HFD10S-GD Series





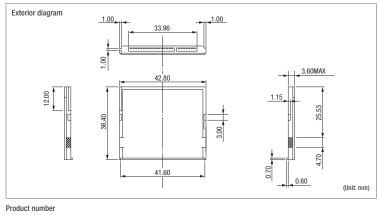


Flash memory		MLC	Q-MLC	SLC
	Capacity	30 GB to 240 GB	15 GB to 120 GB	7 GB to 60 GB
Interface		SATA 6.0Gbps		
	Operating voltage	3.3V±5%		
Operating temperature Standard Wide temperature			0°C to 70°C	
		-25°C	to 85°C	-40°C to 85°C
	Storage temperature		-45°C to 90°C	
	Operating humidity		To 85% (no condensation)	
	Storage humidity		To 95% (no condensation)	
	Dimensions (mm)		42.8 x 36.4 x 3.6	
DRAM cache		•	•	•
	Sequential reading (MB/s)	430	460	480
Maximum transfer rate	Sequential writing (MB/s)	320	410	350
Maximum transfer rate	Random reading (IOPS)	44,000	47,000	45,000
	Random writing (IOPS)	62,000	61,000	50,000
	7 GB	-	-	260
	15 GB	-	91	530
TBW (TB) *1	30 GB	18	180	1000
IDW (ID)	60 GB	36	360	2100
	120 GB	73	730	-
	240 GB	150	-	-
	Read (max.)	350	350	450
Power consumption (mA)	Write (max.)	680	450	580
rower consumption (MA)	Idle mode	30	110	110
	DevSleep mode		3	
	Warranty period		1 year	

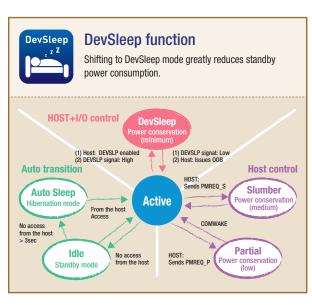
^{*1} Total Bytes Written (TBW) is calculated as write load conditions on the basis of JEDEC 219 Client.







	MLC	Q-MLC	SLC
Standard 0°C to 70°C	LFD10S-xxxGD (A**AH)	XFD10S-xxxGD (A**AH)	HFD10S-xxxGD (A**AE)
Wide temperature -25°C to 85°C	LFD10S-xxxGD (A**AHS	XFD10S-xxxGD (A**AHS	-
Wide temperature -40°C to 85°C	-	-	HFD10S-xxxGD (A**AEI



2.5-inch SATA SSD

SATA 6.0Gbps

LFD25S-GD / XFD25S-GD / HFD25S-GD Series

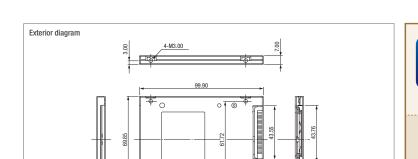


	Flash memory	MLC	Q-MLC	SLC
Capacity		30 GB to 480 GB	15 GB to 480 GB	7 GB to 240 GB
	Interface		SATA 6.0Gbps	
	Operating voltage		5V±5%	
Oncreting townsorture	Standard		0°C to 70°C	
Operating temperature	Wide temperature	-25°C to 85°C -40°C to 85°C		
	Storage temperature		-45°C to 90°C	
	Operating humidity		To 85% (no condensation)	
	Storage humidity		To 95% (no condensation)	
	Dimensions (mm)		69.85 x 99.9 x 7.0	
	DRAM cache	•	•	•
	Sequential reading (MB/s)	440	480	500
Maximum transfer rate	Sequential writing (MB/s)	450	450	380
waxiiiuiii transier rate	Random reading (IOPS)	52,000	53,000	54,000
	Random writing (IOPS)	56,000	53,000	61,000
	7 GB	-	-	260
	15 GB	-	91	530
	30 GB	18	180	1000
TBW (TB) *1	60 GB	36	360	2100
IDW (ID)	120 GB	73	730	4200
	240 GB	150	1700	9700
	480 GB	310	3400	-
	960 GB	620	-	-
	Read (max.)	410	290	440
Power consumption (m^1)	Write (max.)	770	320	520
Power consumption (mA)	Idle mode	90	90	90
	DevSleep mode		10	
	Warranty period		1 year	<u> </u>

^{*1} Total Bytes Written (TBW) is calculated as write load conditions on the basis of JEDEC 219 Client.



(Unit: mm)



roduct number	

	MLC	Q-MLC	SLC
Standard 0°C to 70°C	LFD25S-xxxGD (A**AH)	XFD25S-xxxGD (A**AH)	HFD25S-xxxGD (A**AE)
Wide temperature -25°C to 85°C	LFD25S-xxxGD (A**AHS	XFD25S-xxxGD (A**AHS	-
Wide temperature -40°C to 85°C	-	-	HFD25S-xxxGD (A**AEI

TCG Opal 2.0 function

The high security functions of preboot authentication, security area segmentation, and centralized storage management via remote are realized in the combination of application software compatible with Opal specifications.

Can be performed for drives compatible with TCG Opal

Pre-boot authentication	Access controls
OS launch authentication using pre-boot area	Keys can be made for multiple areas (ranges) Authentication results allow access controls e.g. read/write
Secure erase	eDrive compatible (hardware encryption)
When the encryption key is erased, the data is	eDrive is a security storage specification defined

With Windows you can use BitLocker to utilize TCG Opal functions. Hagiwara Solutions also provides a duplicator able to copy drives compatible with BitLocker hardware encryption.

13 CFast 2.5-inch SATA SSD 14

mSATA

SATA 6.0Gbps

LFDMSS-GD / XFDMSS-GD / HFDMSS-GD Series



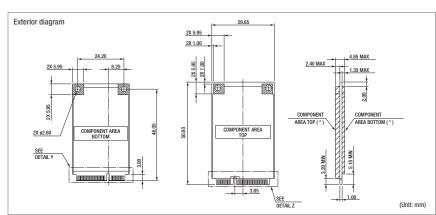




	Flash memory	MLC	Q-MLC	SLC
Capacity		30 GB to 240 GB	15 GB to 120 GB	7 GB to 60 GB
	Interface		SATA 6.0Gbps	
	Operating voltage		3.3V±5%	
0	Standard		0°C to 70°C	
Operating temperature	Wide temperature	-25°C	to 85°C	-40°C to 85°C
	Storage temperature		-45°C to 90°C	
	Operating humidity		To 85% (no condensation)	
	Storage humidity		To 95% (no condensation)	
	Dimensions (mm)		29.85 x 50.8 x 4.0	
	DRAM cache	•	•	•
	Sequential reading (MB/s)	430	460	470
	Sequential writing (MB/s)	320	410	330
Maximum transfer rate	Random reading (IOPS)	34,000	48,000	48,000
	Random writing (IOPS)	60,000	62,000	53,000
	7 GB	-	-	260
	15 GB	-	91	530
	30 GB	18	180	1000
TBW (TB) *1	60 GB	36	360	2100
	120 GB	73	730	-
	240 GB	150	-	-
	Read (max.)	350	350	440
Power consumption (mA)	Write (max.)	670	470	550
rowei consumption (ma)	Idle mode	110	110	110
	DevSleep mode	3		
	Warranty period		1 year	<u> </u>

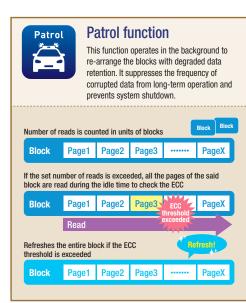
^{*1} Total Bytes Written (TBW) is calculated as write load conditions on the basis of JEDEC 219 Client.





Product number

	MLC	Q-MLC	SLC
Standard 0°C to 70°C	LFDMSS-xxxGD (A**AH)	XFDMSS-xxxGD (A**AH)	HFDMSS-xxxGD (A**AE)
Wide temperature -25°C to 85°C	LFDMSS-xxxGD (A**AHS	XFDMSS-xxxGD (A**AHS	-
Wide temperature -40°C to 85°C	-	-	HFDMSS-xxxGD (A**AEI



HalfSlim

SATA 6.0Gbps

LFDHSS-GD Series

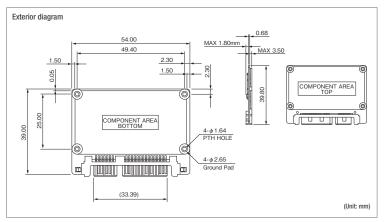


	Flash memory	MLC
Capacity		30 GB to 240 GB
	Interfaces	SATA 6.0Gbps
	Operating voltage	5.0V±10%
0	Standard	0°C to 70°C
Operating temperature	Wide temperature	-25°C to 85°C
	Storage temperature	-45°C to 90°C
	Operating humidity	To 85% (no condensation)
	Storage humidity	To 95% (no condensation)
	Dimensions (mm)	39.00 x 54.00 x 5.98
	DRAM cache	•
	Sequential reading (MB/s)	415
Mariana tanantana ta	Sequential writing (MB/s)	325
Maximum transfer rate	Random reading (IOPS)	41,000
	Random writing (IOPS)	51,000
	30 GB	18
TDW (TD) +1	60 GB	36
TBW (TB) *1	120 GB	73
	240 GB	150
	Read (max.)	270
Power consumption	Write (max.)	520
Power consumption	Idle mode	80
	DevSleep mode	
		1 year

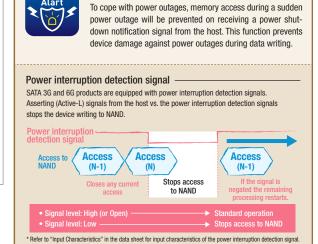
^{*1} Total Bytes Written (TBW) is calculated as write load conditions on the basis of JEDEC 219 Client. *Specifications during development as of November 2017.

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Product number	
	MLC
Standard 0°C to 70°C	LFDHSS-xxxGD (A**AH)
Wide temperature -25°C to 85°C	LFDHSS-xxxGD (A**AHS



Powerloss Alart function

15 mSATA

SATA 6.0Gbps

2242 Size KFDM4S-GK Series

2280 Size KFDM8S-GJ Series

M.2 (K series)



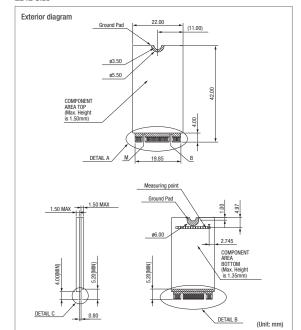


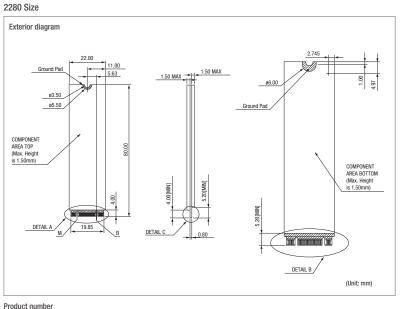
	Flash memory	MLC 2242 Size	MLC 2280 Size
Capacity		30 GB to 480 GB	120 GB to 960 GB
Interfaces		SATA 6	
	Operating voltage	3.3V:	· · · · · · · · · · · · · · · · · · ·
	Standard	0°C to	70°C
Operating temperature	Wide temperature	-	
	Storage temperature	-45°C t	0 90°C
	Operating humidity	To 85% (no c	ondensation)
	Storage humidity	To 95% (no c	ondensation)
	Dimensions (mm)	22.0 x 42.0 x 3.85	22.0 x 80.0 x 3.85
	DRAM cache	-	•
	Sequential reading (MB/s)	430	460
Maximum transfer rate	Sequential writing (MB/s)	410	430
maximum transfer rate	Random reading (IOPS)	77000	67000
	Random writing (IOPS)	76000	76000
	30 GB	45	-
	60 GB	90	-
TBW (TB) *1	120 GB	181	257
IDW (ID)	240 GB	262	514
	480 GB	544	1028
	960 GB	-	2057
	Read (max.)	280	800
Power consumption	Write (max.)	275	1350
rower consumption	Idle mode	105	80
	DevSleep mode	-	-
	Warranty period	1 y	ear



Standard 0°C to 70°C

2242 Size





KFDM4S-xxxGK (A**MH)

SSD Life Diagnostics Software LiveMonitor

for SSD

There is a limit to the number of times NAND flash memory in the SSD can be rewritten. Semiconductor storage has the advantages of high durability and performance. vet the ability to predict product life based on the rewrite limit is highly significant for storage for industrial equipment, LiveMonitor is a Windows app capable of SSD product life and failure prediction, based on SSD self-diagnostic S.M.A.R.T. information. The results of this product life prediction allow preventive maintenance by replacing the SSD with a new one before its life expires. Use of access analysis information also allows the SSD to be used effectively, maximizing its product life.

Basic Functions

Display of device information

- S.M.A.R.T. value
- Temperature
- Product life prediction
- Transfer size ratio

Access analysis <*1>

- Read/write ratio
- Sequential access ratio

Other <*2>

- · SSD firmware update function

Display of device block information <*1>

- Applications
- Duty cycle (current status and ongoing changes)
- Erasure frequency (current status and ongoing changes) Number of read operations
- . Number of alternatives

1. Display of device block information and access ratio is limited to certain products in the SATA 6.0Gbps Series. For more details on compatible products, refer to our website

2. The SSD must have functions compatible with the settings.

Drive monitoring function

The drive's internal conditions (e.g., memory fragmentation) can be visualized, supporting system configuration to optimize use of the SSD.

Access analysis

Visualizing the types of transfer sizes for reading/writing, frequency of sequential/random access and other information allows users to determine the optimum access method for their storage



software LiveMonitor enhances detailed visualization of data and improves operability. It can obtain RAS information from the motherboard used as well as the SSD.

Acquires device information

Able to predict drive life by calculating relevant indicators



Device information

Acquires information from inside the SSD

Run PSID Revert to reset TCG Opal settings to factory default

. Enable eDrive IEEE1667 settings for the SSD

Device settings <*2>

Run SSD Secure Erase

Checks the usage of each block to determine the optimum product capacity and type, and to configure apps to maximize product life.



Block information, duty cycle

LiveMonitor Plus In Development

The access analysis function of the life diagnostics monitoring

provide the expected functions and performance LiveMonitor Plus acquires

Three factors for evaluation to verify whether the computer system can stably

information for centralized control of life prediction data for the entire system

- Acquisition of information for the entire system allows prediction of its overall product life.
- Information analysis can be fine-tuned e.g. to extract information for a set period
- · Cloud access allows information acquisition and aggregation to enable predictive maintenance.

High-speed copying of SSD compatible with Microsoft's BitLocker hardware encryption

SATA Drive Duplicator Compatible with BitLocker

Data copying by standard duplicators can only use BitLocker encryption software, as eDrive is not recognized by the operating system. The load* required when enabling BitLocker can be minimized if eDrive is recognized and embedded in the equipment.

* E.g. data encryption by software requiring time for processing.



Compatible with eDrive duplication

- Duplication is possible of drives meeting the requirements of eDrive, compatible with BitLocker hardware encryption processing.
- · eDrive does not require the time-consuming encryption or decryption when Bitl ocker is active or disabled

Onboard data erasure function

Data copying and comparison function

- Simultaneously copies to 4 drives
- . Supports two copy modes (1) All areas (entire drive) (2) To the final partition
- . Supports a function to compare copied and source data

Onboard screening function

Read / verify test

	Clipping	Compatible (when operated with dedicated computer software)
1 to 4 devices	Compatible SATA drives	2.5-inch / 3.5-inch SSD / HDD * For SSDs other than those above (e.g. CFast or M.2), please prepare a separate conversion adapter. * eDrive duplication has been operationally verified with our SSDs.
while using the dedicated software	Compatible format	FAT16, FAT32, NTFS
partition	Size/weight	W 300 mm x H 285 mm x D 225 mm / 6.7 Kg
	Operation Environment	Temperature: 5°C to 40°C. Humidity: 20% to 80%
Unit command	Attachments	Power supply cable

· Complete data erasure by Security Erase Unit command

Product name / model number	SATA drive duplicator (Product number: DPCB-100A)
Number of connected units	Copy source: 1 device. Copy destination: 1 to 4 devices
Copying speed	18 GB per minute (theoretical value)
Expansion interface	USB 3.0 * Used when connecting to a computer while using the dedicated software
Сору	(1) All areas of the drive (2) To the final partition
Comparison	Comparison of copied and source data
Data erasure	Complete data erasure by Security Erase Unit command
Screening	Read / verify test

17 M.2 (K series) SSD(SATA)

KFDM8S-xxxGJ (A**MH

Forms RAID by connecting two SATA 6.0Gbps drives

SATA 6.0Gbps Interface RAID Board

A high-functionality RAID board connecting to SATA 6.0Gbps installable in a 3.5-inch drive to construct RAID with 2 SSDs/HDDs

SATA 6.0Gbps compatible

- Host interface: SATA 6.0Gbps
- Drive interface: SATA 6.0Gbps

No need for drivers

 Connects to higher SATA without depending on the BIOS or operating system of the system it connects to, enabling multi-function RAID.



Compatible with two RAID modes

- RAID 0: striping mode
- RAID 1: mirroring mode

Function to enhance reliability

- Online rebuild compatible (in RAID 1 operation)
- Hot swap compatible (in RAID 1 operation)
- Equipped with sector read patrol function (detects secondary errors with read and verify)
- The power supply circuit is equipped with EMI safeguard parts

If an error occurs in the connecting drive

- · Overwrites the error point to correct it
- If the drive does not respond, replace using degraded hot swap
- * When operating in RAID 1

Function supporting operation management

- Save in drive connecting to RAID information
- S.M.A.R.T. checks at regular intervals (times can be adjusted)
- Connects with the dedicated RAID Manager software Can check the status of the drive
- Compatible with firmware updates via the host SATA interface

Product specifications SR-DS2LE00J SATA 6.0Gbps Host interface Drive interface SATA 6.0Gbps x 2ch RAID mode RAID 0 (striping) • RAID 1 (mirroring) *Set by Jumper plug Compatible SATA drives Number connecting 2.5-inch / 3.5-inch SSD, HDD / MAX: 2pcs W 84 mm x D 25.4 mm x H 105.5 mm (board size) / 42 g (device board only) Size/weight DC 5V / Max 400mA (Single board) Power/consumption current Operating environment Temperatur: 0°C to 70°C. Humidity: 20% to 80%

Forms RAID 1 with 2.5-inch size

2.5-inch Mirror SSD Drive

Houses 2 mSATA Drive SATA 6.0Gbps SSDs in a 2.5-inch form factor to construct RAID 1 (mirroring). Can construct RAID 1 (mirroring) even in small devices with just 1 drive, greatly enhancing system and data redundancy. If one mSATA SSD fails, the other mSATA SSD by itself can maintain continuous operation, greatly enhancing system operating reliability. Just swapping out the failed mSATA SSD results in an automatic rebuild of the RAID system, allowing the system to easily restore itself to RAID 1.



Constructs RAID 1 in a 2.5-inch form factor

Houses 2 mSATA Drive SATA 6.0Gbps SSDs in a 2.5-inch form factor. Can construct RAID 1 (mirroring) even in small devices with just 1 drive.

Stable operation due to mirroring function (RAID 1)

Even if one SSD fails, the other SSD by itself can easily run continuously with high reliability. When you replace the failed SSD, the data is automatically recovered (rebuilt) to reconstruct RAID 1.

Product specifications	
RAID mode	RAID 1 (mirroring) *Fixed mode
Host interface	SATA 6.0Gbps compliant
Device interface	SATA 6.0Gbps compliant mSATA SSd x 2ch
SATA command standard	ATA/ATAPI-7 compliant
Number of connecting SATA devices	Maximum of 2 (mSATA SSD)
Hot fix	Compatible
Read patrol function	Compatible (the time interval can be changed from the control tool)
Hot swap	Compatible (RAID operation or drive errors after hot swapping during access are not covered by warranty)
Online rebuild	Compatible
RAID control	Compatible with the dedicated control tool RAID Manager
mSATA SSD power control	Compatible (controls each mSATA SSD)
Onboard LED	Power, Slot Status x 2, Slot Error x 2, RAID Status
Size/weight	W 69.85 mm x H 100 mm x D 9.5 mm / 54 g
David and the second	Overall: DC5V±5% / depends on the connecting mSATA SSD.
Power/consumption current	RAID controller: DC5V±5%/400mA
Operating environment	Temperature: 0°C to 70°C. Humidity: 8% to 85%
Frame	2.5-inch drive bay mounting frame

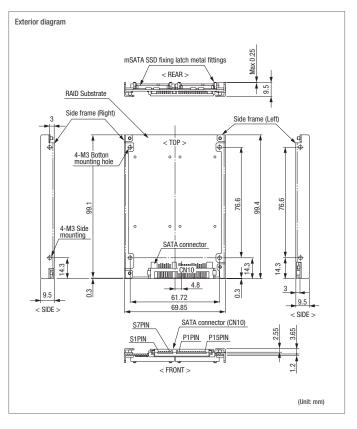
Easy swapping (no need for drivers)

Because it connects to higher SATA, it doesn't depend on the BIOS or operating system of the system it connects to. It doesn't require a special driver and easily constructs a RAID environment simply by swapping it. Ships with mSATA embedded, so assessment of your devices is not required.

Onboard LED

Product is equipped with LEDs to visually indicate the SSD and RAID status.





	MLC	Q-MLC	SLC
Memory capacity	30 GB / 60 GB / 120 GB / 240 GB	15 GB / 30 GB / 60 GB / 120 GB	7 GB / 15 GB / 30 GB / 60 GB
Product number	RFD2LS-xxxGD(A10AH) RFD2XS-xxxxGD(A10AH)	RFD2XS-xxxGD(A10AH)	RFD2HS-xxxGD(A10AH)
Replacement SSD model numbers	RFDMLS-xxxGD(A10AE)	RFDMXS-xxxGD(A10AH)	RFDMHS-xxxGD(A10AH)

9 SATA 6.0Gbps Interface RAID Board

CompactFlash Card

Fixed Disk Type XFD10P-GR / HFD10P-GR Series

Removable Disk Type LCF10P-GR / XCF10P-GR / HCF10P-GR Series



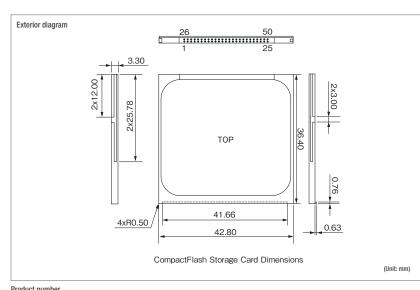




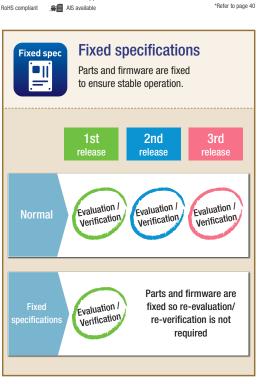
	Flash memory	MLC Q-MLC SLC		SLC
Capacity		16 GB to 128 GB	16 GB to 64 GB	512 MB to 16 GB *1
Interfaces		Parallel ATA [Ultra ATA/66] CFA6.0		
	Operating mode	Removable	Fixed disk	/ removable
	Transfer mode	PIO mode	e0-4 / Multiword DMA mode 0-2 / Ultra DMA	mode 0-4
	Operating voltage		3.3V±5% / 5.0V±10%	
Operating temperature	Standard		0°C to 70°C	
operating temperature	Wide temperature		-	-40°C to 85°C
	Storage temperature		-45°C to 90°C	
	Operating humidity To 85% (no condensation)			
	Storage humidity	To 95% (no condensation)		
	Dimensions (mm)	42.8 x 36.4 x 3.3		
	DRAM cache			-
	Sequential reading (MB/s)	55	50	55
Maximum transfer rate	Sequential writing (MB/s)	45	45	50
Maximum transfer fate	Random reading (IOPS)	-	-	-
	Random writing (IOPS)	-	-	-
	Read (max.) (at 5V)	125	105	150
	Write (max.) (at 5V)	150	120	165
Power consumption	Idle mode (at 5V)	10	10	10
rower consumption	Read (max.) (at 33V)	160	135	185
	Write (max.) (at 33V)	200	155	205
	Idle mode (at 33V)	5	5	5
•	Warranty period 1 year			

^{*1} The lineup for 512 MB to 8 GB is wide temperature only.





Toduct number			
	MLC	Q-MLC	SLC
Standard 0°C to 70°C	[Rem.] LCF10P-xxxGR (A**AH)	[Fixed] XFD10P-xxxGR (A**AH) [Rem.] XCF10P-xxxGR (A**AH)	[Fixed] HFD10P-xxxGR (A**AE [Rem.] HCF10P-xxxGR (A**AE
Wide temperature -40°C to 85°C	-	-	[Fixed] HFD10P-xxxGR (A**AE [Rem.] HCF10P-xxxGR (A**AE



2.5-inch PATA SSD

LFD25P-GD / XFD25P-GD / HFD25P-GD Series

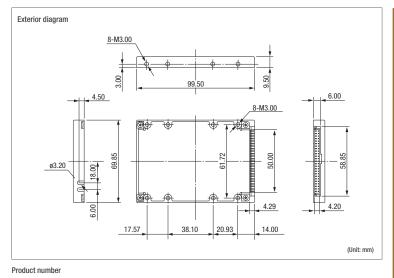






	Flash memory	MLC	Q-MLC	SLC	
	Capacity	30 GB to 240 GB	15 GB to 120 GB	15 GB to 120 GB	
	Interfaces Parallel ATA [Ultra ATA/66]				
	Transfer mode	PIO mode0-4 / Multiword DMA mode 0-2 / Ultra DMA mode 0-5		mode 0-5	
	Operating voltage		5.0V±10%		
Operating temperature	Standard		0°C to 70°C		
operating temperature	Wide temperature	-25°C1	to 85°C	-40°C to 85°C	
	Storage temperature		-45°C to 90°C		
Operating humidity			To 85% (no condensation)		
	Storage humidity	To 95% (no condensation)			
	Dimensions (mm)	69.85 x 99.5 x 9.5			
	DRAM cache	• •		•	
	Sequential reading (MB/s)	75	70	80	
Maximum transfer rate	Sequential writing (MB/s)	75	75	60	
Maximum transfer fate	Random reading (IOPS)	4,500	5,000	5,500	
	Random writing (IOPS)	7,500	7,500	9,000	
	Read (max.)	200	185	235	
Power consumption	Write (max.)	260	200	230	
	ldle mode	115	115	125	
	Warranty period	1 year			





	MLC	Q-MLC	SLC
Standard 0°C to 70°C	LFD25P-xxxGD (A**AH)	XFD25P-xxxGD (A**AH)	HFD25P-xxxGD (A**AE)
Wide temperature -25°C to 85°C	LFD25P-xxxGD (A**AHS	XFD25P-xxxGD (A**AHS	-
Wide temperature -40°C to 85°C	-	-	HFD25P-xxxGD (A**AEI

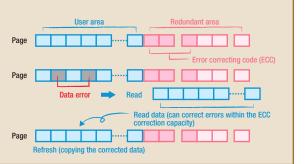


Refresh function

Even if data retention is degraded due to repeated reads at a specific area (block), the data will be automatically relocated to another block before read error occurs, preventing data

Data error correction via ECC -

When saving data in NAND, the error correcting code (ECC) is also saved together with the user data. Data errors inside the ECC correction capacity can be corrected by the ECC circuit, but if the errors are beyond this capacity, no correction can occur: this is an "uncorrectable error." With the refresh function, when a block over the number of data errors is found, the data is copied to another block to recharge it.



21 CompactFlash Card 2.5-inch PATA SSD 22 3.5-inch PATA-SATA Conversion Unit

Equipped with a bridge board for PATA-SATA conversion in a 3.5-inch sized frame, enabling a 2.5-inch SATA device to serve as a 3.5-inch PATA drive.

For 3.5-inch PATA HDDs now in limited supply

- New PATA interface drives are difficult to find now. These are perfect for these items in limited supply
- This bridge board connects SATA devices to the higher PATA host, without requiring any special software for the connection.

Able to acquire S.M.A.R.T information

- · Can obtain S.M.A.R.T. information for recommended SSDs, to enable preventive maintenance asking the user to replace it with a new device when the product life is
- · Can prevent system damage due to the HDD with preventive maintenance and highly reliable SSDs.



Addition of a bridge board model to our lineup



Product name	PATA-SATA conversion board Type A (bridge board model)	PATA-SATA conversion board Type B (3.5-inch bay model)
Product number	PS-STD-J1	PS-STD-U35J
Host interface	ATA (IDE): ATA/ATAPI 7 compliant (40-pin connector) Transfer mode: PIO Mode 0-4 Multi Word DMA Mode 0-2 Ultra DMA Mode 0-6	
Compatible drives / interfaces	2.5-inch SATA Gen 1 (1.5 Gbps) SSD / HDD * SATA Gen 2 (3.0 Gbps) / Gen 3 (6.0 Gbps) SSDs and HDDs can also function, but will do so at 1.5 Gbps.	
Operating environment	Temperature: 0°C to 7°C. Humidity: 8% to 80%	

SD to FD Conversion Drive

A conversion drive allowing an SD card to serve as a floppy disk

Can be installed as it is in the drive bay for a floppy disk drive. Dedicated SD cards can serve as floppy disks.

* Requires a dedicated SD card formatted as a floppy disk Our dedicated SD card models are compatible for this.

The drive is interchangeable with 3.5-inch FD drives

Can connect with 34-pin FDD interface

The computer recognizes it as an FD drive

Lineup now includes items compatible with PC9801/1.2 MB



Product number	HPC-FDS01ADS	HPC-FDS02ADS	HPC-FDS03ADS	HPC-FDSFT01
Content	SD → FD conversion drive + SD card and FD format set	$SD \rightarrow FD$ conversion drive + SD card and FD format set	$SD \rightarrow FD$ conversion drive + SD card and FD format set	SDFDIMG Tool for format conversion
Format specifications	PC9801 format 1.44 MB format compatible	PC9801 format 1.2 MB format compatible	PC/AT transposition 1.44 MB format compatible	Dedicated software

Portable SSD with BitLocker-compatible Security Function In Development

A portable external SSD supporting USB connection and hardware encryption with BitLocker.

BitLocker

This feature is gaining attention for its ability to conveniently protect data in the increasingly popular Windows 10 with encryption functions of the Windows operating system.

Compatible with hardware encryption by BitLocker

Our original technology allows encryption inside the SSD (hardware). Reduces the load on the computer and allows smooth data migration.

USB 3.0 compatible

The USB 3.0 standard enables high-speed data transfers. Speeds are approximately ten times that of the previous USB 2.0 standard, supporting the



Equipped with highly reliable storage with fixed specifications for the primary parts

Equipped with our own SDD with a fine track record. Specifications for controllers, flash memory, and firmware are fixed, to realize stable supply.

Compatible with LiveMonitor life diagnostic software

Predicts SSD product life and failure based on SSD self-diagnostic S.M.A.R.T. information. The results of this product life prediction allow preventive maintenance by replacing the SSD with a new one before its life expires.

Interface	USB 3.0
Power	Runs on USB bus power
Installation requirements	Horizontal
Dimensions	116.5 x 79.0 x 20.5 (mm) *
Mass	TBD
Temperature range for use	0 to 50°C
Humidity range for use	20 to 80% (no condensation)
Acquired standards	VCCI Class B, RoHS Directive compliant
Internal SSD	Hagiwara 2.5-inch SSD
Controller	SATA-USB conversion bridge controller
Case material	Plastic, rubber *
Life diagnostics	Life diagnostics tool compatible
Status LED	Yes (lit = power is on, unlit = power is off, flashing = accessing)
Accessories	USB cable (USB 3.0 micro-B ⇔ USB 3.0 Type A)

^{*} Subject to change

Product capacity	240 to 1920 GB *
Transfer rate (Read)	Max. 400 MB/s
Transfer rate (Write)	Max. 400 MB/s

^{*} Limited by the host-side supply current

Product features of the S Series

Feature 1 Enhanced Random Access characteristics

Product Features of the SD Memory Card S Series

Uses a more advantageous memory management method for Random Write compared to previous products.

Achieves faster Random Write Speed speeds.

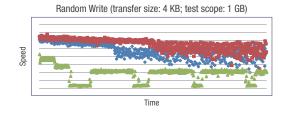
Measuring	Random !	512KByte	e Random 4KByte	
conditions	Read	Write	Read	Write
Previous products	79.20	4.195	6.026	0.304
S Series	85.25	22.87	6.817	1.034
Measuring environment		Ontimizing	1 000000 on	oodo

CrystalDiskMark 3.0 3 Transfer size: 500 MiB

Optimizing access speeds during Random Access

Feature 2 Stabilized performance

Even in cases where speeds of previous SD cards markedly diminish with continuous use, depending on how they are used, the S Series has a memory management system specialized for Random Access, able to maintain a level of performance even with continuous use.

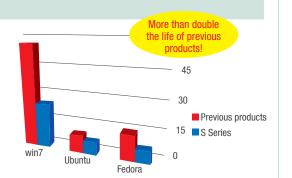


◆ Page Mapping MLC 8 GB (S Series) ■ Page Mapping SLC 8 GB (S Series)

▲ Block Mapping MLC 8 GB (other series)

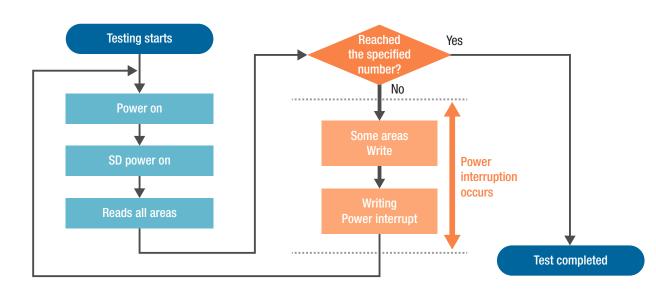
Feature 3 Enhanced product life with improved rewrite efficiency

Even if the writing volume is the same, the volume of data written to NAND flash varies greatly due to the different controller management methods. The S Series has a long product life due to improved writing efficiency.



Feature 4 Strong power interruption resistance

Tests for power interruptions during data writing are carried out to confirm no read errors occur in 10,000 tests.



Feature 5 Mechanical Robustness

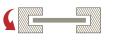
Our SD card for industrial equipment undergoes strength testing to a higher level than ordinary SD standards. It has resistant to physical stresses such as bending or twisting. Its physical strength is confirmed at approximately double the level compared to SD cards of other companies.

Bending tests (The standard SD specification is 10N)





Power	Our H Series	Generic SD
10N	Pass	Pass
20N	Pass	Pass
30N	Pass	Pass
40N	Pass	Opens on the case port side
50N	Slightly curved	Opens on the case port side
60N	Very curved	Opens on the case port side Very curved



0.2510	Pass	Pass
0.30N	Pass	Pass
0.35N	Pass	Pass
0.40N	Pass	Opens on the case port si
0.45N	Slightly curved	Opens on the case port si Slightly curve
0.50N	Slightly curved	Opens on the case port si

Our H Series

Generic SD

Torsion tests (The standard SD specification is 0.15N)

Feature 6 Compatible with product life diagnostic software

Product life diagnostic software dedicated to the the SD Memory Card / S Series. Users can check the status of the SD memory card in their own environment.

SD LiveMonitor function

- 1. Reads S.M.A.R.T. information
- 2. Saves S.M.A.R.T. information as text
- 3. Displays the remaining product life
- 4. Displays the average number of rewrites
- 5. Displays the maximum number of rewrites 6. Displays the total number of rewrites
- 7. Displays the product life of spare blocks

Meter color	Remaining product life
Green	If 20% or over
Yellow	If over 10% but less than 20%
Red	If under 10%





*Windows only

Dedicated card reader for life diagnostics Product number HPC-SDR1AD

Product comparison

SD memory card able to determine product life, developed for embedding in industrial equipment. Our lineup consists of products from various series to meet user needs.

Series name	Reliability	Fixed parts	Rewrite efficiency	Random Write characteristics	Physical strength	Cost	Diagnostic tool	Analysis compatible
S Series	0	0	0	0	0	Δ	0	0
K Series	0	Δ	Δ	Δ	0	0	0	Δ

Product Features of the SD Memory Card S Series Product Features of the SD Memory Card S Series 26

eSD (Embedded SD)

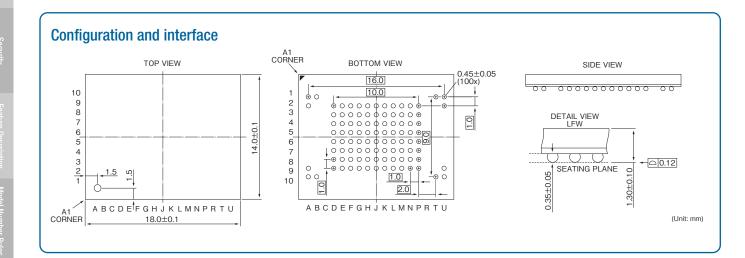
Achieves reliability for SD cards for industrial equipment with onboard storage

Front-mounting SD card with I/F (JEDEC 100-Ball BGA). Utilizes SLC-type memory components to achieve an overwriting life ten times that of the eMMC. A new addition to our lineup that combines reliability with a smaller footprint for the host equipment.



Package	100 Ball BGA (JEDEC standard) for industrial equipment (Ball pitch 1mm)						
Interface	SDA standard compliant (Physical Layer Specification Ver. 3.01)						
NAND used / product capacity	SLC (1 GB / 2 GB / 4 GB / 8 GB / 16 GB)						
Guaranteed number of overwrites	1 GB, 2 GB: 50,000 times per block. 4 GB, 8 GB, 16 GB: 100,000 times per block.						
	1 GB to 16 GB						
	Default speed mode (DS)	3.3 V signaling, maximum frequency 25 MHz, maximum 12.5 MB/s					
	High speed mode (HS)	3.3 V signaling, maximum frequency 50 MHz, maximum 25 MB/s					
	4 GB to 16 GB						
Bus speed mode	SDR12	1.8 V signaling, maximum frequency 25 MHz, maximum 12.5 MB/s					
	SDR25	1.8 V signaling, maximum frequency 50 MHz, maximum 25 MB/s					
	SDR50	1.8 V signaling, maximum frequency 100 MHz, maximum 50 MB/s					
	SDR104	1.8 V signaling, maximum frequency 208 MHz, maximum 104 MB/s					
	DDR50	1.8 V signaling, maximum frequency 50 MHz, maximum 50 MB/s					
Operating voltage	2.7 V to 3.6 V						
Operating temperature	-40°C to 85°C						
	Drive life management function	based on internal information					
	Read disturb error function						
Other	Wear leveling function						
	Power interruption measure fun	nction					
	 Can provide socket boards for of 	debugging					





Utilizes SD card interface

eSDs are standardized under SDA and use SD interfaces equipped in many microcomputers. This means they can easily be embedded in the host device without requiring an special controllers.

Enables stable long-term operation SLC onboard

Equipped with SLC type NAND flash memory that is longer lasting and more reliable compared to the MLC and TLC types primarily used for eMMC.

Uses 1 mm ball pitch

The package used is 100-Ball BGA with 1.0 mm pitch. Because this pitch allows the cables to pass between PADs, there is no need for special PAD on VIA processing

Point Onboard original NAND controller

The reliability of NAND flash memory is greatly affected by the NAND components used and the memory management functions controlling the NAND.

eSDs with original onboard NAND controllers with a track record of use as SDs for industrial equipment can achieve the optimum memory management for industrial equipment without the host being aware of it.

Original Active Refresh function to heighten reliability

Stores output main data e.g. boot loaders and kernels, with an expanded refresh function to deal with read disturb errors caused by repeated reading. Equipped with an original active refresh function incorporating a function to avoid read errors by managing the number NAND reads.

-----,

Point Able to monitor internal status

Can provide various types of tools enabling preventive maintenance and predictive maintenance. Can acquire the necessary information to check the status of the device e.g. number of overwrites and remaining spare block percentage.

Product life assessment software (for Windows)

API (for Windows / Linux)

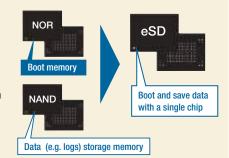
Displays the required commands for product life



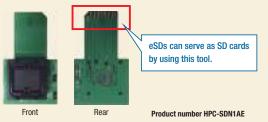
Point Optimum for replacing from the boot memory NOR

Reduces mounting area and costs by also serving as memory for data storage with replacing from

It has major advantages in reliability (e.g. data retention) even compared to the eMMC, which has MLC/TLC NAND flash memory onboard.



SD conversion tool for eSD evaluation We have SD conversion tools for evaluation available. (As a pay service)



Practical example

Using NOR

Issues

Insufficient capacity due to increase in stored data

Solutions

Capacity: 1 GB to 16 GB (NOR: Up to 128 MB)

Using NOR+NAND

Issues

For those wishing to combine devices to reduce

Solutions

eSDs are high reliable capacities

Mounting type reduces

Using eMMC

Issues

Want to use it for long periods, but worry about MLC/TLC reliability

Solutions

Examining SD for embedding

Removable media might result in bad contact due to vibration

Issues

Solutions

Mounting type with

Issues

Inserting the SD card during production requires man-hours

Solutions

Mounting type reduces

eSD (Embedded SD) eSD (Embedded SD) 28 **SD Memory Card**

High-speed Random Access S Series Fixed Specification K Series

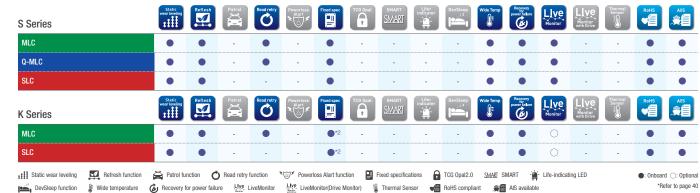




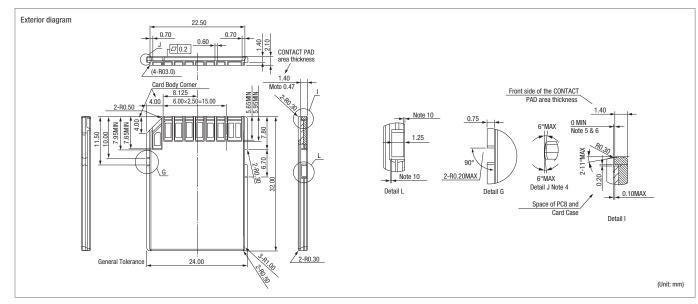




			S Series		KS	eries			
	Flash memory	MLC	Q-MLC	SLC	MLC	SLC			
	8 GB to 256 GB	4 GB to 128 GB	512 MB to 32 GB	2 GB to 128 GB	128 MB, 512 MB to 16 GB				
			SD 3.0 *1						
			2.7 V to 3.6 V						
Wide temperature		-25°C	to 85°C	-	-25°C	to 85°C			
Operating temperature Wide temperature			-	-40°C to 85°C	-	-40°C to 85°C			
\$		-40°C to 85°C		-40°C to 85°C					
	To 95% (no condensation)								
	To 95% (no condensation)								
	Dimensions (mm)	24 x 32 x 2.1							
	Sequential reading (MB/s)	[UHS-1] 89	[UHS-1] 90	[UHS-1] 89	[UHS-1] 90	[UHS-1] 88			
Maximum transfer rate	Sequential writing (MB/s)	[UHS-1] 73	[UHS-1] 80	[UHS-1] 70	[UHS-1] 63	[UHS-1] 79			
Maximum transfer fate	Random reading (IOPS)	-			-	-			
	Random writing (IOPS)	-	-	-	-	-			
Power consumption	Read (max.)	210	160	150	120	110			
rower consumption	Write (max.)	180	180	150	180	130			
	Warranty period			1 year					



*2 Controller/NAND flash processes and firmware are fixed.



Product number

S Series	MLC	Q-MLC	SLC
Wide temperature -25°C to 85°C	NSDB-xxxGS (N**M*S	NSDB-xxxGS (N**Q*S	-
Wide temperature -40°C to 85°C	-	-	NSDB-xxxGS (N**SEI

K Series	MLC	SLC
Wide temperature -25°C to 85°C	NSDB-xxxGK (L**MHI	NSD*-xxxxK (L**SEI
Wide temperature -40°C to 85°C	-	NSD*-xxxxK (***SEI

microSD Memory Card

High-speed Random Access S Series Fixed Specification K Series







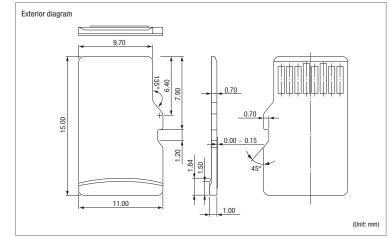


			S Series		K Se	eries				
	Flash memory	MLC	Q-MLC	SLC	MLC	SLC				
	Capacity			1 GB to 8 GB	2 GB to 32 GB	128 MB, 512 MB to 2 GB				
	Interfaces	SD 3.0 ^{*1}								
	Operating voltage	2.7V to 3.6V								
Operating temperature	Wide temperature	-25°C	to 85°C	-	-25°C	to 85°C				
Operating temperature	Wide temperature		-	-40°C to 85°C		-				
	Storage temperature	-40°C to 85°C								
	Operating humidity	To 95% (no condensation)								
	Storage humidity		To 95% (no condensation)							
	Dimensions (mm)			11 x 15 x 1						
	Sequential reading (MB/s)	[UHS-1] 81	[UHS-1] 82	[UHS-1] 30	[UHS-1] 85	20				
Maximum transfer rate	Sequential writing (MB/s)	[UHS-1] 72	[UHS-1] 73	[UHS-1] 27	[UHS-1] 43	18				
Maximum transfer rate	Random reading (IOPS)	-	-	-	-	-				
	Random writing (IOPS)		-							
Power consumption	Read (max.) 190		132	80	105	60				
rower consumption	Write (max.)	150	132	120	115	90				
	Warranty period			1 year						



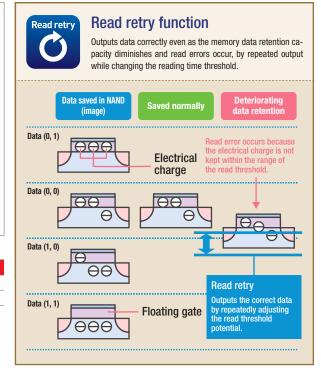
Personant la few for the final power failure with the final power failure

*2 Controller/NAND flash processes and firmware are fixed.



S Series	MLC	Q-MLC	SLC
Wide temperature -25°C to 85°C	MSDB-xxxGS (N**M*S	MSDB-xxxGS (N**Q*S	-
Wide temperature -40°C to 85°C	-	-	MSDB-xxxGS (***SDI

K Series	MLC	SLC
Wide temperature -25°C to 85°C	MSDB-xxxGK (L**MHI	MSD*-xxxxK (L**SEI
Wide temperature -40°C to 85°C	-	-



USB Memory USB 3.0 Model

Fixed parts (compact) model Fixed specifications (compact) model Fixed specifications model



		H Sc	eries	K Se	eries					
	Flash memory	Compact/Fixed Parts MLC	Compact/Fixed Parts SLC	Compact/Fixed Specifications MLC	Fixed Specifications MLC					
	Capacity	4 GB to 32 GB	2 GB to 16 GB	4 GB to 32 GB 4 GB to						
	Interfaces	l	JSB 3.0 (Super Speed) / USB 2.0	(High Speed) / USB 1.1 (Full Speed	l)					
	Operating voltage		5.0\	V±5%						
0	perating temperature	0°C to 70°C	0°C to 70°C	0°C to 50°C	0°C to 50°C					
5	Storage temperature	-20°C to +85°C								
	Operating humidity	To 85% (no condensation)								
	Storage humidity	To 85% (no condensation)								
Dimensions (mm)		43.3 x 17.0 x 8.00 62.1 x 17.0 x 8.0								
Maximum transfer rate	Sequential reading (MB/s)	145	40	145	145					
(USB 3.0)	Sequential writing (MB/s)	37	30	37	37					
	Read (max.)	210	220	210	210					
Power consumption	Write (max.)	210	220	210	210					
	Idle mode (max.)	130	130	130	130					
	Warranty period		1:	year	1 year					

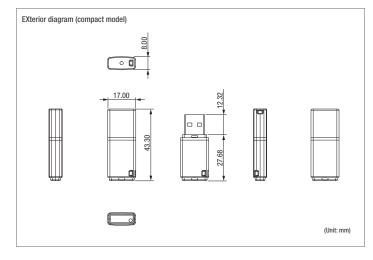
rixou parto, air parto and infinware excitating on a	io iikou.																
H Series	Static wear leveling	Reflesh	Patrol	Read retry	Poworloss Alart	Fixed spec	TCG Opal	SMART SMART	Life- indicater -	DevSleep	Wide Temp	Recovery for power failure	Live	Live Monitor with Drive	Thermal Sensor	RoHS C	Als
Compact/Fixed Parts MLC	•	-	-	-	-	•	-	•	-	-	•	-	-	-	-	•	•
Compact/Fixed Parts SLC	•	-	-	-	-	•	-	•	-	-	•	-	-	-	-	•	•
K Series	Static wear leveling	Reflesh	Patrol	Read retry	Poworloss Alart	Fixed spec	TCG Opal	SMART SMART	Life- indicater	DevSleep	Wide Temp	Recovery for power failure	Live	Live Monitor with Drive	Thermal Sensor	RoHS	AIS
Compact/Fixed Specifications MLC	•	-	-	-	-	•	-	-	-	-	-	-	-	-	-	•	-
Fixed Specifications MLC	•	-	-	-	-	•*	-	-	-	-	-	-	-	-	-	•	-
Static wear leveling Refresh function	Patrol fi	unction C	Read retry	function	°⊘* Power	loss Alart fund	ction 🕎	Fixed specific	ations 🔒	TCG Opal2.0	SMART S	MART -	í- Life-indica	ting LED		: Onboar	d : Optio

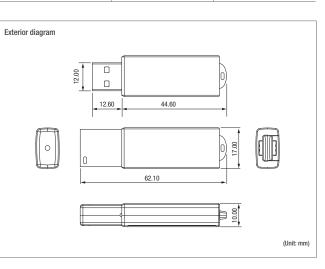
DevSleep function If Wide temperature & Recovery for power failure 💯 LiveMonitor Urive Monitor) If Thermal Sensor 📢 RoHS compliant 🞉 AlS available

* Controller/NAND flash processes and firmware are fixed.

H Series	Compact/Fixed Parts MLC	Compact/Fixed Parts SLC
Operating temperature 0°C to 50°C	-	-
Operating temperature 0°C to 70°C	USA3-xxxGH(B00MH)	USA3-xxxGH(B00SE)

K Series	Compact/Fixed Specifications MLC	Fixed Specifications MLC
Operating temperature 0°C to 50°C	USB3-xxxGH(B00MH)	UBB3-xxxG0(B00MH)
Operating temperature 0°C to 70°C	-	-





USB Memory USB 2.0 Model

Fixed parts model Fixed specifications model



		H So	eries	K Series				
	Flash memory	Fixed Parts MLC	Fixed Parts SLC	Fixed Specifications MLC				
	Capacity	2 GB to 64 GB	128 MB to 32 GB	4 GB to 64 GB				
	Interfaces		USB 2.0 (High Speed) / USB 1.1 (Full Speed)					
	Operating voltage		5.0V±5%					
	Operating temperature	0°C to 70°C	0°C to 70°C	0°C to 50°C				
	Storage temperature	-20°C to +85°C						
	Operating humidity	To 85% (no condensation)						
	Storage humidity	To 85% (no condensation)						
	Dimensions (mm)	62.1 x 17.0 x 8.00						
Maximum transfer rate	Sequential reading (MB/s)	26	25	26				
Waxiiiuiii u alistei Tate	Sequential writing (MB/s)	14	20	14				
	Read (max.)	100	90	100				
Power consumption	Write (max.)	100	90	100				
	Idle mode	50	40	50				
	Warranty period		1 year					

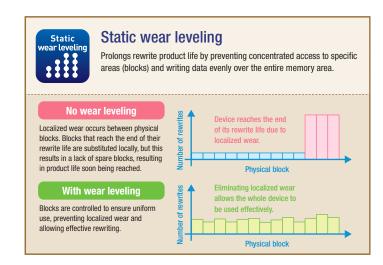
H Series	Static wear leveling	Reflesh	Patrol	Read retry	Poworloss Alart	Fixed spec	TCG Opal	SMART SMART	Life- indicater	DevSleep	Wide Temp	Recovery for power failure	Live	Live Monitor with Drive	Thermal Sensor	RoHS	AIS
Fixed Parts MLC	•	-	-	-	-	•	-	•	-	-	•	-	-	-	-	•	•
Fixed Parts SLC	•	-	-	-	-	•	-	•	-	-	•	-	-	-	-	•	•
K Series	Static wear leveling	Reflesh	Patrol	Read retry	Poworloss Alart	Fixed spec	TCG Opal	SMART SMART	Life- indicater	DevSleep	Wide Temp	Recovery for power failure	Live	Live Monitor with Drive	Thermal Sensor	RoHS	AIS
Fixed Specifications MLC	•	-	-	-	-	•	-	-	-	-	-	-	-	-	-	•	-
III Static wear leveling 🛂 Refresh function 🚔 Patrol function 💍 Read retry function 🔌 Powerloss Alart function 📳 Fixed specifications 🔒 TCG Opal2.0 SMART 🕍 Life-indicating LED 🔹 Onboard 🔾: Optional																	

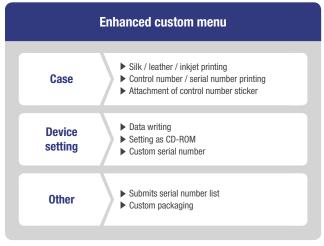
Personantian with the control of the

: Onboard : Optional *Refer to page 40

H Series	Fixed Parts MLC	Fixed Parts SLC			
Operating temperature 0°C to 50°C	-	-			
Operating temperature 0°C to 70°C	UBA2-xxxGH(A00MH)	UBA2-xxxxSRB(TBAIA)			

K Series	Fixed Specifications MLC				
Operating temperature 0°C to 50°C	UBB2-xxxG0(A00MH)				
Operating temperature 0°C to 70°C	-				





31 USB Memory

Memory Module

DDR4 SDRAM DDR3 SDRAM





DDR4 SDRAM										
		S0-E	DIMM		U-DIMM					
ECC/nonECC	EG	CC	Non ECC		E	CC	Non ECC			
SPEED	PC4-19200	PC4-17000	PC4-19200 PC4-17000		PC4-19200 PC4-17000		PC4-19200	PC4-17000		
Data rate	2400 MHz	2133 MHz	2400 MHz	2133 MHz	2400 MHz	2133 MHz	2400 MHz	2133 MHz		
Density	4 GB, 8 G	GB, 16 GB	4 GB, 8 GB, 16 GB		4 GB, 8 GB, 16 GB		4 GB, 8 GB, 16 GB			
DRAM	Sam	sung	Samsung		Samsung		Samsung			
Pins	260) pin	260 pin		288 pin		288 pin			
Height	30	mm	30 mm		31.25 mm		31.25 mm			
Supply voltage	1.2V		1.2V		1.2V		1.2V			
Operating temperature	0 to 85°C		0 to 85°C		0 to	85°C	0 to 85°C			
Part number	GN19NxxxGE-S5819L*	GN17NxxxGE-S5819L *	GN19NxxxGN-S5819L*	GN17NxxxGN-S5819L*	GD19NxxxGE-S5819L*	GD17NxxxGE-S5819L*	GD19NxxxGN-S5819L*	GD17NxxxGN-S5819L*		

Hagiwara control information

DDR3 SDRAM						
	S0-I	DIMM	U-D	IMM		
ECC/nonECC	ECC	Non ECC	ECC	Non ECC		
SPEED	PC3L-	12800	PC3L-12800			
Data rate	1600) MHz	1600 MHz			
Density	2 GB, 4 GB	2 GB, 4 GB, 8 GB	2 GB, 4 GB	2 GB, 4 GB, 8 GB		
DRAM	Sam	sung	Samsung			
Pins	204	l pin	240 pin			
Height	30	mm	30 mm			
Supply voltage	1.35\	I/1.5V	1.35V/1.5V			
Operating temperature	0 to	85°C	0 to 85°C			
Part number	FN12N-xxGE (S*814L*	FN12N-xxGN (S*814L*	FD12N-xxGE (S*814L*	FD12N-xxGN (S*814L*		

^{*} Hagiwara control information

Differences between products designed for embedding and retail products

	Products designed for embedding (SLC)	Retail Products			
Applications	For writing applications e.g. OS/app storage or saving logs	For ordinary users e.g. smartphones/tablets			
	<u> </u>	×			
Rewrite product life	50,000 to 100,000 times per block	No guaranteed figures Actual value of several hundred times or less			
Data minuting		×			
Data retention	10 years after writing 100,000 times	Half a year or less after writing 1000 times			
		×			
Quality	For embedding specifications, NAND initial defect rate is further reduced through burn-in testing. Stable operation is achieved.	Parts are selected at different times Quality is unstable			
Cumply posted		×			
Supply period	1 process approx. 2-3 years	No guarantee of supply period			
		×			
Support	Before introduction: technical support from the product development stage After introduction: analysis reports of operating errors and suggestions to prevent recurrence.	If a problem occurs, the only solution is replacement			



Main examples of problems with retail products

CASE-1 Problem

Frequent problems arise within 1 year after beginning of use.

Cause

Product quickly reaches its lifespan and can no longer be used.



Medical instruments

CASE-2

Problem

Differences from one product to an-

other, despite having the same mode

number. This leads to identification

problems and operating errors.

Cause

The specifications were not fixed,

so even though the products

looked similar, they were different

CASE-3

Problem

Sudden production halts require work to evaluate replacement products. This occurs not just unexpectedly but

Cause

The supply period is not guaranteed, making it hard to indicate in advance when sales will end.



Automotive equipment

CASE-4 Problem

Requested product support to the manufacturer, but they only replace the parts, causing the problem to become long-term.

Cause

Because this is a retail product, the manufacturer had no system in place for analysis and support.



Problems like the ones above do not occur with products designed to be embedded.

Virus check tool for offline devices with a full range of management functions

Vaccine USB3

You can connect it to on offline device to run a virus check on-demand

This is a new model virus check tool in the form of a USB flash drive equipped with a McAfee virus scan engine.

It greatly enhances your management functions, such as operational management or keeping track of offline device assets.



Key features of Vaccine USB3

USB flash drive-type virus check tool

This is a virus check tool equipped with a McAfee virus scan engine. It can delete or quarantine any viruses it detects, handling virus checks for a single or multiple devices.

> The user interface of the Vaccine USB3 is based on that of Vaccine USB2. making for easy migration.

Check the results on the flash drive's LED lights

You can check the results of the virus check with the red and blue LED lights on the flash drive.





A differential scan function looks only at files that changed or were newly added since the last virus check, greatly shortening the time needed for the check.

Scan results saved as a log

The results of the virus check are safely stored in a special memory area on the flash drive as

Licenses are managed on our servers, so there is no need to go through a process to extend the licenses of your individual products.

New function	Timer scan function	

With this function, just connect the flash drive to a device to run virus checks on specified dates and times. You can set the dates and times as a weekday (Monday to Sunday + start time, or a specific date +

Asset information collecting function

This function acquires detailed information on assets in the device. It acquires detailed information on hardware and on installed apps, and saves this as a log on the flash drive. This is effective for collecting information on offline device assets which do not have asset management software.

Cloud service New function

Intensive operation management function

This service enables intensive management of the operating status of the product in the cloud, so that you can determine the results of virus checks remotely. As it's a cloud service you can start small, and control these flash drives in sites inside Japan or overseas.

* You must have a separate contract for the paid service of INFO BANKER Cloud

File acquisition function (Name of service: INFO BANKER Cloud Storage)

With this function you can collect in the flash drive files saved on devices you want to check for viruses, and upload them to a cloud service. It collects files for virus checks and to create logs for the devices, so it can be used for intensive management for operating logs of devices and for visualization in factories. You must have a separate contract for the paid services of INFO BANKER Cloud / INFO BANKER Cloud Storage.

Greatly shortens virus checking times

Enables time-saving license renewal

1-year license model	ULD-VAU31A					
3-year license model	ULD-VAU33A					
5-year license model	ULD-VAU35A					
License extension pack (1-year license extension / with hardware guarantee)						

License extension pack (1-year license extension / with hardware guarantee)						
1 pack	ULD-VAU31RA					
10 packs	ULD-VAU310LR					

Compatible operating systems

Vin	10 8	3.1	8		7	
VIIII	Emb Standar 2009	d E St	mb7 andard	Em	b PO	S Ready7
	server 2016	serv	/er 20 12	. se	rver 1	2012 R2
	server 2008	3 sen	rer 2008	R2		

- * Has several types of usage restrictions. Please view our website for details.
- * Check our website for the latest information on the support period for Windows

License renewal

License renewal procedure

You can see the latest information and download the required application form for Vaccine USB2 license renewal on our website.

http://www.hagisol.co.ip/products/offline/license.html

Vaccine USB3

Please purchase the license extension pack.

Please download the application form from our website.

Enter the license number enclosed in the license extension pack, the 12-digit serial number on the back of the actual product, and other required details in the application form



Please send the application form by email to the specified

Hagiwara Solutions

STEP5 The license server is updated in our company



* Staff in charge of using the Vaccine USB3 do not have to do any special tasks for the

Customer

The license certificate is sent to you be email. ore the license certificate in a safe place



We will deliver a PD

Any viruses found are instantly eliminated. Prevents you from

Simple virus check of the host computer

Virus check function

Runs a check to see if active processes in the connected host PC are infected. Users are informed by an onscreen message if a virus is found (goes as far as virus detection).

Performs a virus check of files written in the USB

Security USB

M McAfee

the USR flash drive user to do so.

flash drive.

carrying infection files

Virus definition files can be provided via the Internet or via in-company servers or McAfee VirusScan Enterprise installed on the computer

Data breach safeguard function

Password lock function

Access to the user's domain is denied until the password is authenticated.

Hardware automatic encryption function

All files written to the USB flash drive are automatically subject to AES 256-bit encryption. Data cannot be read just by removing the flash drive.



When the latest software becomes available, your software will be automatically updated through the silent update feature (setting required for administrator software).

Users of USB flash drives with virus check functions only have to submit the application form for the license to automatically renew. without having to do any other action. (The USB flash drive must be used in an environment able to connect to the Internet for the license renewal to take place.)



Compatible with INFO BANKER

Collection of log information for the relevant products allows early countermeasures and tracking of operation management, virus infections, lost data

Compatible with Security USB Manager

Optional software for administrators allows the settings of the security USB flash drives to be customized according to corporate security policies.



HUD-PUVM

HUD-PUVM1L

HUD-PUVM1LA

* The hardware warranty is for up to 5 years from the purchase date



5-year license model

The virus check function contains settings for the license period. For continued use of the virus check

We have two types of license extensions, convenient for people using multiple USB flash drives, Automatic

extension helps ensure your license will be properly extended and reduces the amount of work needed by

Product lineup 2 GB to 128 GB "xx" shows the product's capacit 1-year license model HUD-PUVM HUD-PUVM

umber
3xxGM1
3xxGM3
3xxGM5

Standard model



Data Breach Safeguard Model (Password Locker 4



Password Locker 4



Product lineun 2 GB to 128 GB "xx" shows the pro-

Renewal license (1-year guarantee)

Renewal license + hardware guarantee (1-year guarantee)

2. Some of the following functions will not operate: software automatic update, log save/output/viewing, Autorun.inf automatic deletion, option setting, copy guard, security USB manager

3. Part of the memory capacity of this product is used as a management domain, hence the actual usable capacity will be smaller than that shown

4. Please confirm on our website the support periods for Windows 2000 and Windows XP

10Key Security USB

Operating system-independent Data Breach Safeguard USB Flash Drive

Use the numerical keypad on the flash drive to release the password lock! This USB flash drive contains automatic AES 256-bit hardware encryption.



10KEY SECURITY USB

Product lineup 8 GB

HUD-PUTK308GA1

Usable on devices supporting USB flash

Access restricted with password authentication and automatic AES 256-bit encryption

Highly water- and dust-proof aluminum





Password input Input the password using the numerical keypad on the product. * We cannot guarantee it will work with all devices



devices, independent of the operating system of the device.

Connect to the USB port

The USB flash drive has a physical numerical keypad on it. Use this to enter the password and unlock it. This allows it

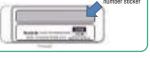
to be used with special devices such as machine tools that have no keyboard. There is no need for password authentication by software, allowing this USB flash drive with security features to be used across a wide range of



The software is not used for password authentication, so it does not exist in the operating system of the device.

We deliver our Security USB administrators with settings

Delivered with a printed sticker



Custom menu

Manager software for applied for you.

showing the information you specify. Also works for printing serial numbers.

We can submit a list of data linking the serial number and the USB's internal serial on the nameplate

You can customize part of the USB's

Security Products

35 Security Products

Operation management server software and services for virus check tools / security USB memories

INFO BANKER

Collection of log information for the relevant products allows early countermeasures and tracking of operation management, virus infections, lost data and so on.

Provided in two ways

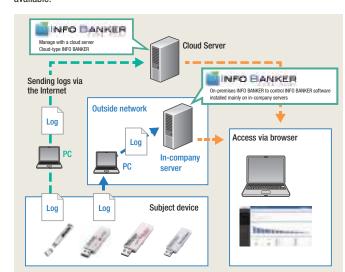
On-premises type

This model is used by installing INFO BANKER on the customer's server. (Compatible operating systems: Windows Server 2008/2008 R2/2012/2012 R2)

Cloud-type

This model manages the operating status on a cloud server.

Can check the operating status via a browser without having to have server available.



Function

Information on the subject devices / Operation management function

Information on devices (e.g. computers) that used the subject devices Information on the subject devices

Virus check results

License information

History of file operations (e.g. copying, deletion, etc.) in security USB flash drive

Report function

Total number of viruses detected in units of days. List of subject devices with high numbers of viruses detected (top 5)

List of devices (e.g. computers) with high numbers of viruses detected (top 5) List of subject devices used very few times

List of subject devices where files were used frequently

List of subject devices with licenses due to expire within a month

Inventory of subject devices, etc.

* The on-premises version only provides a report on information for viruses detected in units of months

Remote use stop function

Prohibits use of specified security USB flash drives

Email notification function when a virus is detected

When a log of a virus detected from the subject device is received, automatically an alert email is sent to the specified address

Reception for Cloud-type evaluation version

URL https://www.infobankercloud.com



Product name	License period Number of licenses On-premises model n		On-premises model number	Cloud-type model number
INFO BANKER (*1)	-	-	HUD-IF100H	HUD-IFC1A
Annual support license	1 year	-	HUD-IF100H1S	HUD-IFC1S
Annual device license (For Security USB) (*2)	1 year	10 license	HUD-IFH0010LS	HUD-IFC0010LS
	1 year	50 license	HUD-IFH0050LS	HUD-IFC0050LS
	1 year	100 license	HUD-IFH0100LS	HUD-IFC100LS
Annual device license (For Vaccine USB2 / Litmus USB2) (*2)	1 year	10 license	HUD-IFH0010LV	HUD-IFC0010LV
	1 year	50 license	HUD-IFH0050LV	HUD-IFC0050LV
	1 year	100 license	HUD-IFH0100LV	HUD-IFC0100LV

(*1) The cloud account is for account creation expenses. Purchase of the required number of accounts is necessary.

(*2) Purchase of yearly device licenses for the number of devices to be managed by INFO BANKER is required at the start of the license.

Optional software for administrators allows the settings of the security USB flash drives to be customized according to corporate security policies.

Security USB Manager



Customize the password authentication function

Setting a password policy

Users can customize their password policies e.g. the number of digits or number of

Data rescue function

If you forget the password of the security USB flash drive, and even if are locked out by exceeding the number of allowed retries, your precious data saved inside the flash drive can still be retrieved.

Enforces operating rules with various types of restrictions

Make the security USB flash drive only usable on a specific computer

Conditions such as the availability of certain files and folders can be set, to limit use to computers meeting the said conditions.

Set the usable period

The usable period can be set in units of days, allowing the administrator to lend out the security USB flash drive for use.

Copy guard function enabling secure editing of files on computers outside your company

When the copy guard function is enabled, users can edit files saved on security USB flash drives on a computer outside their company, but cannot save them on that computer. Other restrictions can be placed prohibiting printout, Internet access, screen captures and so on, helping prevent data breaches.



Can be used as authentication device and dedicated data delivery/receiving tool

UDRW G5

The UDRW G5 is a special USB flash drive with a secure area not recognized by the CD-ROM area or operating system. Using a software development kit (SDK) allows development of software linked to UDRW G5.

UDRW G5 function

CD-ROM

CD-ROM area





AES 256-bit encryption
Protects customer data by
automatically encrypting data in

the memory.



The USB flash device contains areas the user cannot see.
Authentication keys, logs, and other items you do not wish the user to see can be saved.

Secure area



Rewrite product life
Equipped with MLC NAND flash
memory, which has a long
rewrite product life.

Product lineup

There are 3 models of UDRW G5 devices.

Product lineup 4 GB to 32 GB "xx" shows the product's capacity

Product name	Product number	Drive configuration		
UDRW G5 boot CD model	UDG5-xxGCUCJ	CD-ROM + secure area (boot compatible)		
UDRW G5 CD model	UDG5-xxGCUCHJ	CD-ROM + secure area		
UDRW G5 CD + memory model	UDG5-xxGCUCRHJ	CD-ROM area + removable + secure area		

Main examples of use

Commercialized as an access key

UDRW is used as an access key for safe remote operation of company computers from outside the company. By storing the viewer program set to auto-run in the CD-ROM area and storing an authentication key unique to the device in the secret area, just by simply inserting the UDRW into the computer's USB port automatically displays the viewer program authentication screen. If the user enters the correct password, the authentication key in the secure area is recognized and secure communication is established by connecting to an authentication server.



UDRW G5 SDK (development kit)

A software development kit (library) is available for UDRW G5, adding functions to control UDRW G5 in software. By using the development kit, you can access the secure area of UDRW G5, write data to the CD-ROM area, and build your own dedicated software and systems.

UDRW G5 SDK has a lineup for Windows, Mac OS X, and Linux.

Items	UDRW G5 SDK Windows	UDRW G5 SDK Mac OS X	UDRW G5 SDK Linux
Library-supporting operating system	Windows XP SP3 (32bit) Windows 8 (32bit/64bit) Windows Vista SP2 (32bit/64bit) Windows 7 SP1 (32bit/64bit) Windows 7 SP1 (32bit/64bit) Windows 10 (32bit/64bit)	• Max0SX10.7.5 • Max0SX10.8.5 • Max0SX10.9.3	Ubuntu 12.04 (32bit) Kernel Version: 3.2.0/3.8.0 Knoppix 7.0.2 Kernel Version: 3.3.2
Supported language	C++, C++.NET, C#.NET, VB.NET	C, C++, Objective C++	C, C++
Development environment	Visual Studio 6 Visual Studio 2005 or later	Xcode 3.1.2 or later	gcc
Supported device	CD-ROM area + RAM area + secure area CD-ROM area + secure area CD-ROM area + secure area (boot CD model)	CD-ROM area + secure area	CD-ROM area + secure area (boot CD model)

Read-only USB flash drive able to be used as a CD-ROM

CDMemory2

This is a special USB flash drive that is recognized as a CD-ROM and can only be written with dedicated writing software.

Using the properties of CD-ROMs, it erases data tampering or errors and prevent virus infections, yet has a file transfer rate faster than a CD-ROM. It can also be used as an alternative to a physical CD-ROM for devices that cannot otherwise incorporate one.

Product lineup 4 GB to 32 GB "xx" shows the product's capacity.

Model Capacity Product number USB 2.0 model 4 GB HUD-CDM2-xxGU2A USB 3.0 model 8 GB/16 GB/32 GB HUD-CDM2-xxGU3A

Dedicated writing software

The lineup includes CDM2 Writer, which can be obtained by downloading and can write data in single units, and CDM2 Kitting Tool, an optional app that can save write logs.

Product name	Product number
CDM2 Kitting Tool	HUD-CDM2-KT100A

* The "xx" part of the product model number shows its capacity

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Secure SD







SD card for industrial equipment equipped with a smart card chip

Allows easily adding reliable hardware key function to IIoT equipment and industrial control systems. Accessing the smart card chip through SD card interface allows to implement hardware-based system security through trusted routes.

In development

Secure SD Product Summary

		Premium Edition		Data Protect Edition	
Built-in S	martCard	•		-	
Secret	region	• •			
NAND		MLC	SLC	MLC	SLC
Volume	SD	8 GB / 16 GB	4 GB / 32 GB	8 GB to 64 GB	4 GB / 32 GB
	microSD	8 GB / 16 GB	512 MB / 2 GB	8 GB to 32 GB	512 MB / 2 GB
Operating	g voltage	2.7V to 3.6V			
Operating to	emperature	-25°C to 85°C			
Inter	face	SD 3.01 / Class 10 / UHS-I			

Comparison with SD card

Function		Secure SD	SD Card	Merit of Secure SD
Security control method		API	SD command (CMD42)	API functions only SDA specification confirmation not required
Password Lock	Password Lock	0	\triangle	Separate password setting for each partition
Write Protect function	Wite	0	(WPSW/registers)	API functions only
Read Protect function	Read Protect	0	×	File can be written Reading requires password
Secret Region	Secure Area	0	×	Encryption key and LOG can be stored in the region invisible to users
H/W Encryption(AES256)	AES 256-bit Encryption 101100 1001100	0	×	Encryption-based data protection Fast data erase

Secure SD SDK Summary

We offer two SDKs (purchased separately) to control the security function of Secure SD



SDK		Secure SD SDK Windows Secure SD SDK Linux
Secure SD SDK Windows	Supported OS	Windows7, Windows8.1, Windows10, Windows10 loT
Secure 3D 3DK Williams	Supported CPU	x86 CPU (32bit 64bit)
Secure SD SDK	Supported OS	Linux
Linux	Supported CPU	x86 CPU (32bit 64bit) / ARM
Examples of API included in SDK		 Password lock control API Secret region control API Fast erase API Cloud authentication API License information management API

Details of feature/function icons

Static wear leveling

Patrol function

Prolongs the rewrite product life by preventing concentrated access to specific areas (blocks) and writing data evenly in the memory area.

This function operates in the background to re-arrange the blocks with degraded

data to maintain retention. It suppresses the frequency of corrupted data from



Refresh function

Even if data retention is lowered due to repeated reading of data at a specific area (block), the data will be automatically relocated to another block before data corruption occurs, preventing data miscompare.



Read retry function

Outputs data correctly even as the memory data retention capacity diminishes and read errors occur, by repeated access during reading.



Powerloss Alart function

long-term operation and prevents system shutdown.

To cope with power outages, memory access during a sudden power outage will be prevented on receiving a power shutdown notification signal from the host. This function prevents device breakdown and minimizes data loss.



Fixed specifications

Parts, controllers, and firmware are fixed, to realize stable operation.



TCG Opal2.0

The high security functions of preboot authentication, security area segmentation, and centralized storage via remote are realized in the combination of application software compatible with Opal specifications.



Allows drive failure prediction and checking of drive information when a failure does occur. Used together with LiveMonitor, the life diagnostics monitoring software, it allows users to check the status of the drive in real time and predict



Life-indicating LED

The red LED lights up when the remaining number of writes is limited. This allows users to visually see the SSD's life from the exterior.



DevSleep function

This function greatly reduces power consumption while the system is on standby.



Wide temperature

We provide products that have passed strict testing in order to realize stable functioning under harsh environments.



Recovery for power failure

Our original recovery functions for sudden power interruptions or outages prevent damage to your devices.



Complies with LiveMonitor life diagnostics monitoring software.



LiveMonitor(Drive Monitor)

In addition to life diagnostics monitoring software (LiveMonitor), the products also support drive monitoring tools that visualize the internal state of the drive and enable access analysis.



Thermal Sensor

The flash memory temperature can be obtained in a digital form in real-time as SMART information.



Fixed product and parts specifications allow submitting the AIS document containing environmental data.



RoHS compliant

This product complies with the European Union's RoHS Directive, which limits the use of hazardous substances.



AIS available

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