

TDK FLASH STORAGE CATALOGUE 2020





MEDICAL

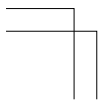


ENERGY



LIFE
ENT

SMART I



SMART STORAGE

TDK has developed the NAND-type flash memory controllers “GBDriver” series realizing high speed while securing data reliability. TDK has also developed Solid State Drives (SSDs) combining GBDriver series inside, ideal solution for embedded systems.

CONTENTS

03

GBDriver

07

Product Features

GBDriver

2003

RA3



2004

XR



2005

RA4



2006

RA6



2007

RA7



03

Flash Memory Controller IC GBDriver series

Product NAME	HOST INTERFACE					Access Cycle	2K Page SLC	4K Page SLC	8K Page SLC
	PCMCIA ATA	Compact Flash	IDE	Direct Bus Connect	Inter-face				
RA8  TQFP 128pin (pitch 0.40mm) VFBGA 121ball (pitch 0.65mm)	<input type="radio"/>	4.1	PIO6 — MDMA4 — UDMA6	<input type="radio"/>	133 MByte/sec	30ns	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
RA9  TQFP 128pin (pitch 0.40mm) VFBGA 121ball (pitch 0.65mm)	<input type="radio"/>	4.1	PIO6 — MDMA4 — UDMA6	<input type="radio"/>	133 MByte/sec	30ns	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
RS2  TQFP 120pin (pitch 0.40mm) VFBGA 144ball (pitch 0.80mm)					SATA 1.5Gbps/3.0Gbps	30ns	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
RS3  VFBGA 144ball (pitch 0.80mm)					SATA 1.5Gbps/3.0Gbps	30ns	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
RS4  VFBGA 144ball (pitch 0.80mm)					SATA 1.5Gbps/3.0Gbps	30ns	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
GS1  TFBGA 225ball (pitch 0.90mm)					SATA 1.5Gbps/3.0Gbps/6.0Gbps	30ns	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Download compatibility list of Flash Memories. <http://tdk.jp/fs-compatibility>

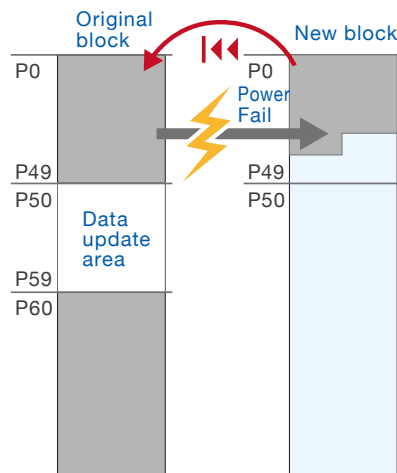
Power fault tolerance

If power fail occurs in writing a new data, SSDs will lose not only the new data itself but also other data when coping preceding and succeeding data .

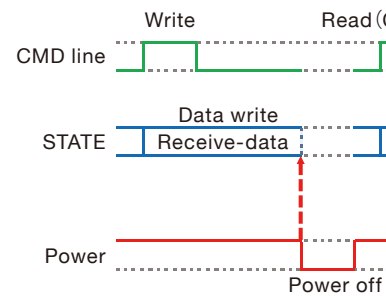
TDK SSDs have 2 countermeasures.

Countermeasures No.1

First by GBDriver algorithm. GBDriver keeps the original data until coping is completed and will not employ any data of incomplete copy.



Power shutdown test

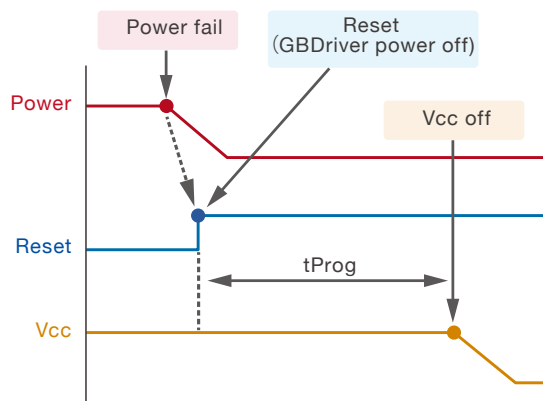


① SD Memory Cards, Power shutdown test results

	TDK	
Writing data sectors	166,049,542	27,2
Power off cycles	15,989	7
Data errors	0 (0.00%)	2 (0.00%)

Countermeasures No.2

Second, TDK SSDs (except for SD memory cards/microSD memory cards/eSSDs) employ power back up circuit inside, they are free from ECC errors.

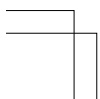


② SSDs, Power shutdown test results

	TDK	
Writing data sectors	2837558584	3966
Power off cycles	677	9
Data errors	0 (0.00%)	859



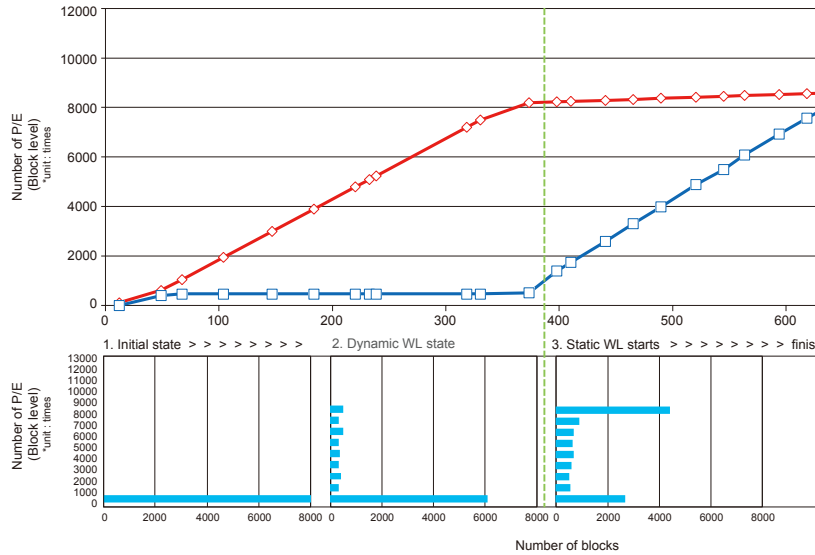
TDK SSDs secure data in sudden power



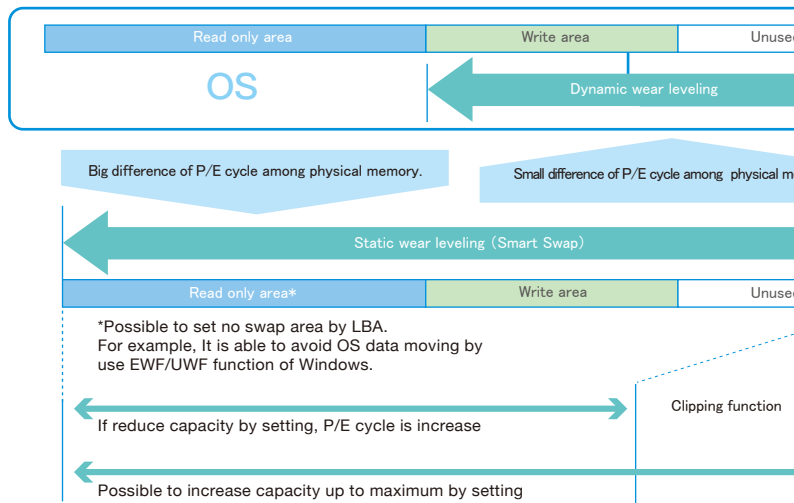
TDK SMART SWAP

Longevity and ECO Friendly

In order to extend the longevity, our products execute "TDK global static wear leveling (TDK SMART SWAP)" and level P/E count of NAND flash cells(blocks) efficiently. Storages replacement is Low frequency and it is Lower TCO (Total Cost of Ownership).

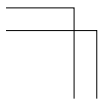


TDK global static wear leveling function (TDK SMART SWAP)




Clipping function (Number of sector setting)

Possible to adjust number of sector for user data area in unit of a sector.





GENERAL INFORMATION

TYPE	CompactFlash™	2.5 inch PATA SSD
INTERFACE	PCMCIA/IDE	IDE
DATA TRANSFER MODE	UDMA0-6, MDMA0-4 & PIO0-6	UDMA0-6, MDMA0-4 & PIO0-6
CONNECTOR	CFC Type I	44PIN
OUTLINE DIMENSIONS	36.4 x 42.8 x 3.3 mm	100 x 69.85 x 9.5 mm
SERIES	CFE9D	SDE9D
CONTROLLER TYPE	 TDK GBDriver	TDK GBDriver RA9
FLASH TYPE	SLC	SLC
DENSITY RANGE	128 MB - 32 GB	1 GB - 64 GB
DATA RETENTION	10 years @ life begin-10% 1 year @ life end	
ENDURANCE ENTERPRISE WL	128 MB ~ 4 GB: 50,000 P/E Cycles 8 GB ~ 32 GB: 100,000 P/E Cycles *Flash Block Level	1 GB ~ 4 GB: 50,000 P/E Cycles 8 GB ~ 32 GB: 100,000 P/E Cycles *Flash Block Level

TEMPERATURE

OPERATING TEMPERATURE	Commercial: 0°C to +70°C Industrial: -40°C to +85°C
STORAGE TEMPERATURE	Commercial: -25°C to +85°C Industrial: -40°C to +85°C

PERFORMANCE

Read (max.)	50 MByte/sec
Write (max.)	35 MByte/sec

ROBUSTNESS

MTBF	≥ 2,500,000 hours	≥ 2,000,000 hours
SHOCK	1000G, 0.5ms	1500G, 1.0ms
VIBRATION	15G, 10-500Hz	20G, 10-2000Hz
HUMIDITY	0 to 90 % RH (No condensation)	

ELECTRICAL DATA


VOLTAGE	3.3 V ± 5 % / 5 V ± 10 %	5 V ± 10 %
POWER CONSUMPTION	- Single mode UDMA Read Write: 145mA @ 3.3V / 85mA @ 5.0V - 2ch mode UDMA Read Write: 220mA @ 3.3V / 130mA @ 5.0V - Stand-by: 10mA @ 3.3V / 10mA @ 5.0V	- Single mode UDMA Read Write: 80mA @ 5.0V - 2ch mode UDMA Read Write: 135mA @ 5.0V - Stand-by: 5mA

FEATURE LIST

FEATURES & TOOLS	- In-House Designed Controller (HW/FW) - Power Fail Data Safety - Power Back-up Circuit - Global static wear leveling - SMART - TRIM	- In-House Designed Controller (HW/FW) - Power Fail Data Safety - Power Back-up Circuit - Global static wear leveling - SMART - TRIM
PART NUMBER	CFE9DxxxxTxxxB00EAA0	SDE9DxxxxTxxxB00EAA0



GENERAL INFORMATION

TYPE	2.5 inch SATA SSD (9mm)		2.5 inch S
INTERFACE	Serial ATA Revision 3.1		
DATA TRANSFER MODE	SATA 1.5Gbps, 3.0Gbps, 6.0Gbps		
CONNECTOR	15 + 7 pin Serial ATA		
OUTLINE DIMENSIONS	100.0 x 69.84 x 9.5 mm		100.0 x
SERIES	SDE1B		
CONTROLLER TYPE	 TDK GBDriver GS1		
FLASH TYPE	SLC	pSLC/MLC	SLC
DENSITY RANGE	16 GB - 128 GB	pSLC:16GB-256GB MLC:32GB-512GB	16 GB - 128 GB
DATA RETENTION	10 years @ life begin-10% 1 year @ life end		
ENDURANCE ENTERPRISE WL	100,000 P/E Cycles *Flash Block Level	pSLC:20,000P/ECycles MLC:3,000P/ECycles *Flash Block Level	100,000 P/E Cycle *Flash Block Level

TEMPERATURE

OPERATING TEMPERATURE	Commercial:0°C to +70°C Industrial:-40°C to +85°C
STORAGE TEMPERATURE	Commercial: -25°C to +85°C Industrial: -40°C to +85°C

PERFORMANCE

Read (max.)	420 MByte/sec	pSLC:430MByte/sec MLC:365MByte/sec	420 MByte/sec
Write (max.)	305 MByte/sec	pSLC:325MByte/sec MLC:235MByte/sec	305 MByte/sec

ROBUSTNESS

MTBF	≥ 2,000,000 hours
SHOCK	1,000G,1.0ms
VIBRATION	20G,10-2000Hz
HUMIDITY	0 to 90 % RH (No condensation)

ELECTRICAL DATA


VOLTAGE	5 V ± 10 %
POWER CONSUMPTION	<ul style="list-style-type: none"> - Read: 320mA max. - Write: 600mA max. - Slumber: less than 100mA

FEATURE LIST

FEATURES & TOOLS	<ul style="list-style-type: none"> - In-House Designed Controller (HW/FW) - Power Fail Data Safety - Power Back-up Circuit - Global static wear leveling <ul style="list-style-type: none"> - SMART - NCQ, TRIM - AES 128/256bit encryption 			
PART NUMBER	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">SDE1BxxxxTXxxB00ESA0</td> <td style="width: 33%;">SDE1BxxxxTxxxB00ESA0</td> <td style="width: 33%;">SDE1BxxxxTXxxBA0ES</td> </tr> </table>	SDE1BxxxxTXxxB00ESA0	SDE1BxxxxTxxxB00ESA0	SDE1BxxxxTXxxBA0ES
SDE1BxxxxTXxxB00ESA0	SDE1BxxxxTxxxB00ESA0	SDE1BxxxxTXxxBA0ES		



GENERAL INFORMATION

TYPE	mSATA		
INTERFACE	Serial ATA Revision 2.6	Serial ATA Revision 2.6	
DATA TRANSFER MODE	SATA 1.5Gbps, 3.0Gbps	SATA 1.5Gbps, 3.0Gbps	
CONNECTOR	52 pin. Edge		
OUTLINE DIMENSIONS	50.8 x 29.85 mm		
SERIES	SME3B	SME1B	
CONTROLLER TYPE	 TDK GBDriver RS3	TDK GBDriver RS3	
FLASH TYPE	SLC	SLC	
DENSITY RANGE	512 MB - 8 GB	16 GB - 64 GB	
DATA RETENTION	10 years @ life begin-10% 1 year @ life end		
ENDURANCE ENTERPRISE WL	512 MB ~ 8 GB: 50,000 P/E Cycles *Flash Block Level	100,000 P/E Cycles *Flash Block Level	

TEMPERATURE

OPERATING TEMPERATURE	Commercial: 0°C to +70°C Industrial: -40°C to +85°C
STORAGE TEMPERATURE	Commercial: -25°C to +85°C Industrial: -40°C to +85°C

PERFORMANCE

Read (max.)	105 MByte/sec	340 MByte/sec
Write (max.)	60 MByte/sec	105 MByte/sec

ROBUSTNESS

MTBF	≥ 2,000,000 hours	≥ 2,000,000 hours
SHOCK	1500G, 0.5ms	
VIBRATION	20G, 10-2000Hz	
HUMIDITY	0 to 90 % RH (No condensation)	

ELECTRICAL DATA

VOLTAGE	3.3 V ± 5 %	
POWER CONSUMPTION	<ul style="list-style-type: none"> - Single mode Read Write: 125mA max. - 2ch mode Read Write: 215mA max. - 4ch mode Read Write: 365mA max. - Slumber: less than 50mA 	<ul style="list-style-type: none"> - Read: 385mA - Write: 370mA - Slumber: less than 50mA


FEATURE LIST

FEATURES & TOOLS	<ul style="list-style-type: none"> - In-House Designed Controller (HW/FW) - Power Fail Data Safety - Global static wear levelin - SMART - NCQ, TRIM - AES 128bit encryption 	<ul style="list-style-type: none"> - In-House Designed Controller (HW/FW) - Power Fail Data Safety - Power Back - Global static wear levelin - SMART - NCQ, TRIM - AES 128/256bit encryption
PART NUMBER	SME3BxxxxTxxxB00SAA0	SME1BxxxxTXDxB00SAA0

MMRD4



GENERAL INFORMATION

TYPE	SD MEMORY CARD (SD / SDHC)		microSD MEMO
INTERFACE	SD 3.0, UHS-I/Class 10 (SDHC) , Class 6 (SD)		
DATA TRANSFER MODE			
CONNECTOR	SD		
OUTLINE DIMENSIONS	32 x 24 x 2.1 mm		15 x 11
SERIES	MMRD4		
CONTROLLER TYPE	 TDK GBDriver RD4		
FLASH TYPE	SLC	pSLC	SLC
DENSITY RANGE	512 MB - 32 GB	4 GB - 32 GB	512 MB - 2 GB
DATA RETENTION	10 years @ life begin-10% 1 year @ life end		
ENDURANCE ENTERPRISE WL	512 MB ~ 2 GB:50,000 P/E Cycles 4 GB ~ 32 GB:100,000 P/E Cycles *Flash Block Level	20,000 P/E Cycles *Flash Block Level	50,000 P/E Cycles *Flash Block Level

TEMPERATURE

OPERATING TEMPERATURE	Commercial: -25°C to +85°C Industrial: -40°C to +85°C
STORAGE TEMPERATURE	-40°C to +85°C

PERFORMANCE

Read (max.)	75 MByte/sec	70 MByte/sec	75 MByte/sec
Write (max.)	50 MByte/sec	67 MByte/sec	50 MByte/sec

ROBUSTNESS

MTBF	≥ 3,000,000 hours	≥ 3,000,000 hours
SHOCK	1000G,0.5ms	
VIBRATION	15G,10-2000Hz	
HUMIDITY	0 to 90 % RH (No condensation)	

ELECTRICAL DATA

VOLTAGE	2.7 ~ 3.6 V
POWER CONSUMPTION	<ul style="list-style-type: none"> - Read: 100mA max. - Write: 100mA max. - Stand-by: 0.4mA

FEATURE LIST

FEATURES & TOOLS	<ul style="list-style-type: none"> - In-House Designed Controller - Power Fail Data Safety - Global static wear leveling - SMART 	
PART NUMBER	MMRD4xxxxVxxxA00ABA0	MURD4xxxxVxxx



TDK Corporation
Flash Memory Applied Device Business Div.
<https://product.tdk.com/en/>