

ShenZhen Renice Technology Co., Ltd

X5A SATAIII CFast Card

Datasheet



V1.0

2018-4-20

CATALOGUE

1. INTRODUCTION.....	2
1.1 PRODUCT OVERVIEW	2
1.2 FEATURE	2
1.3 FUNCTIONAL BLOCK DIAGRAM.....	3
1.4 FORM SIZE WITHOUT WRITE PROTECT SWITCH.....	3
2. PINOUT INFORMATION	4
2.1 PIN ASSIGNMENT	4
2.2 CONNECTOR PIN SIGNAL DEFINITIONS.....	4
3. POWER SPECIFICATION	5
3.1 OPERATING VOLTAGE	5
3.2 POWER SUPPLY VOLTAGE.....	5
3.3 POWER CONSUMPTION (TYPICAL)	5
4. RELIABILITY SPECIFICATION	6
4.1 ENVIRONMENTAL SPECIFICATIONS.....	6
4.2 POWER FAILURE PROTECTION.....	6
4.3 OVER VOLTAGE PROTECTION.....	6
5. SATA INTERFACE FEATURES	6
6. ATA COMMAND.....	7
6.1 ATA COMMAND SET	7
6.2 ATA COMMAND DESCRIPTION: IDENTIFY DEVICE (ECH).....	8
6.3 ATA COMMAND DESCRIPTION: SET FEATURES (EFH).....	14
7. S.M.A.R.T	15
8. ELECTRICAL CHARACTERISTICS.....	16
8.1 ABSOLUTE MAXIMUM RATING.....	16
8.2 RECOMMENDED OPERATION CONDITION.....	16
8.3 DC CHARACTERISTICS.....	17
9. SECURITY FUNCTION (OPTIONAL).....	17
10. WRITE PROTECT FUNCTION (OPTIONAL).....	17
11. ORDERING INFORMATION	18
12. PART NUMBER NAMING RULE	19

1. Introduction

1.1 Product Overview

RENICE X5A CFast is a compact storage card with SATAIII 6.0Gbps interface, compliant with the CFast 2.0 standard and ATA protocol. Designed with high performance, reliability and low power consumption, Renice X5A CFast can be a good storage device to next generation embedded applications.

1.2 Feature

- Performance:
 - Sequential Data Read : 520MB/s
 - Sequential Data Write : 450MB/s
 - 4Kb Random Read/Write IOPS: 34,000 / 20,000
 - Access Time: 0.1ms
- Form factor: 42.8mmX36.4mmX3.6mm (LxWxH)
- Weight:<10g
- Interface standard: 7+17pin SATAIII 6.0Gb/s
- Density: 16GB~512GB (MLC)
8GB~256GB (SLC)
- Input voltage: 3.3V (±5%)
- Operation Temp.: -40°C ~ +85°C (Industrial)
Storage Temp.: -55°C to +95°C
- Flash management algorithm: static and dynamic wear-leveling, bad block management algorithm
- Supports dynamic power management and SMART (Self-Monitoring, Analysis and Reporting Technology)
- Supports BCH ECC up to 66bits in 1Kbytes
- Supports NCQ,
- Supports Trim
- Supports Power Failure Protect function
- Supports Overvoltage protect function
- **Support Write Protect Function (Optional)**
- **Support Quick Erase (Optional)**
- Data retention: JESD47 compliant
- MTBF: >3,000,000 Hours

1.3 Functional Block Diagram

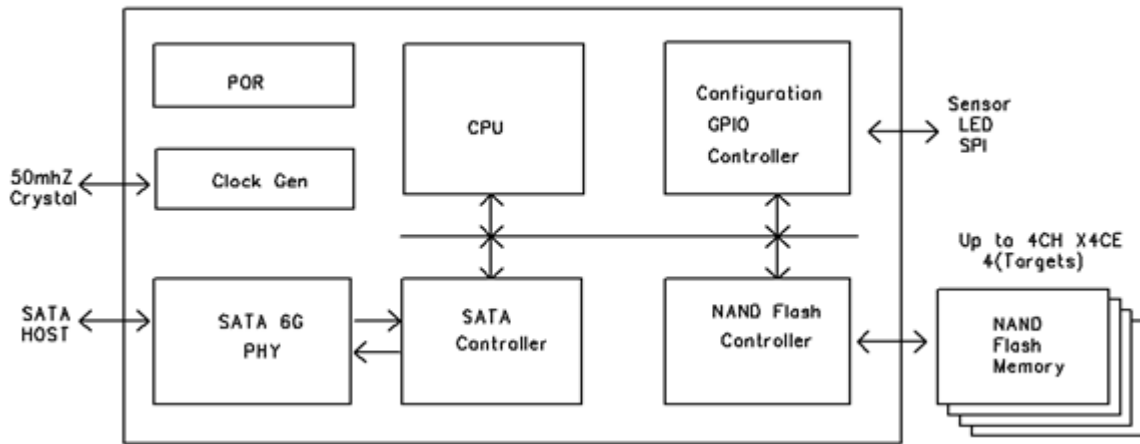


Figure 1: Functional Block Diagram

1.4 Form Size without Write Protect Switch

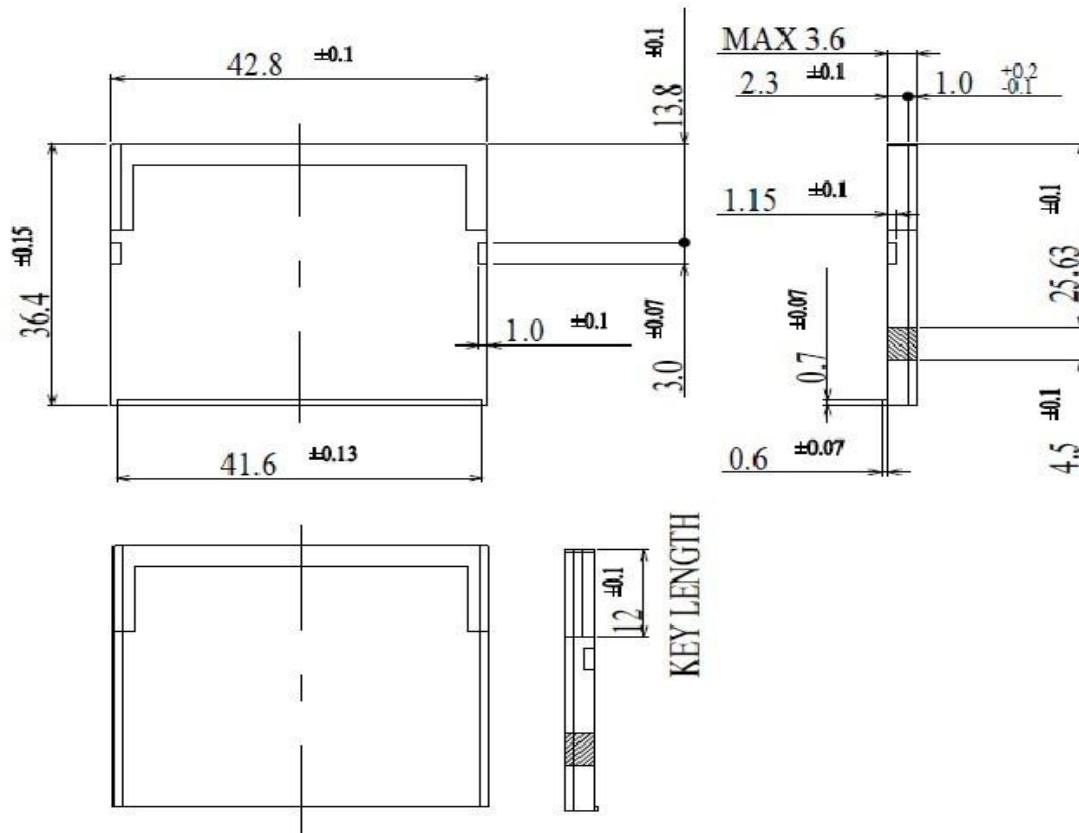


Figure 2: Form size without write protect switch

2. Pinout Information

2.1 Pin Assignment

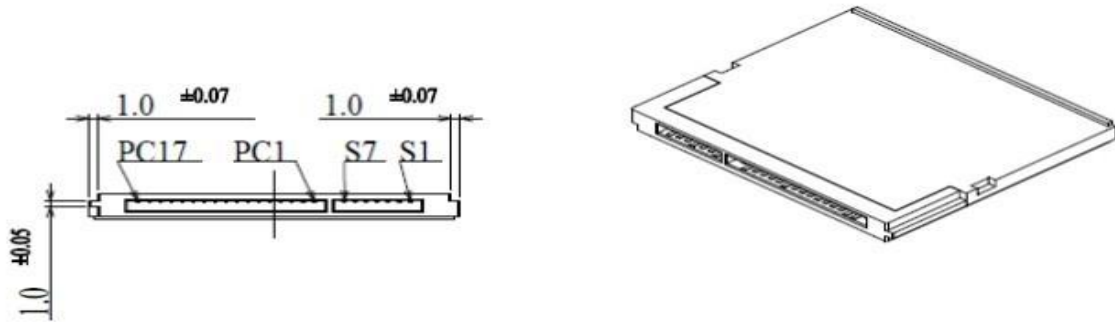


Figure 3: Pin Assignment

2.2 Connector Pin Signal Definitions

Table 1: Connector Pin Signal Definitions

Pin	Segment	Name	Type	Description	Mate Sequence
S1	SATA	SGND	Signal GND	Vss, Ground for signal integrity	1st
S2	SATA	A+	SATA Differential	HOST, Signal Pair A	2nd
S3	SATA	A-	SATA Differential		2nd
S4	SATA	SGND	Signal GND	Vss, Ground for signal integrity	1st
S5	SATA	B-	SATA Differential	HOST, Signal Pair B	2nd
S6	SATA	B+	SATA Differential		2nd
S7	SATA	SGND	Signal GND	Vss, Ground for signal integrity	1st
	Key				
	Key				
PC1	PWR/CTL	CDI	CMOS Iutput ¹	Card Detect In (CDI)	3rd
PC2	PWR/CTL	GND	Device GND	Vss	1st
PC3	PWR/CTL	TBD	Do not use	Do not use	
PC4	PWR/CTL	TBD	No Connect	(reserved)	
PC5	PWR/CTL	TBD	Quick Erase	Quick Erase	
PC6	PWR/CTL	TBD	No Connect	(reserved)	
PC7	PWR/CTL	GND	Device GND	Vss	1st
PC8	PWR/CTL	IO11	No Connect	Reserved Input/ Output	2nd

PC9	PWR/CTL	IO12	DAS	DAS	2nd
PC10	PWR/CTL	IO1	Write Protect	Write Protect	
PC11	PWR/CTL	IO2	No Connect	Reserved Input/ Output	
PC12	PWR/CTL	IO3	No Connect	Reserved Input/ Output	
PC13	PWR/CTL	PWR	3.3V	Device Power (3.3V)	3rd
PC14	PWR/CTL	PWR	3.3V	Device Power (3.3V)	3rd
PC15	PWR/CTL	PGND	Device GND	Vss	1st
PC16	PWR/CTL	PGND	Device GND	Vss	1st
PC17	PWR/CTL	CDO	CMOS Output ¹	Card Detect In (CDO)	3rd

3. Power Specification

3.1 Operating Voltage

Operating voltage: 3.3V (±5%)
 Support Hot Plug/ Removal Function

3.2 Power Supply Voltage

1.2V for Core, 3.3V for NAND and IO

3.3 Power Consumption (typical)

Active (Read) –1.2W
 Active (Write) –2.5W
 Idle - 0.245W
 Slumber - 0.12W

4. Reliability Specification

4.1 Environmental Specifications

Table 2: Reliability Specification

Item	Features	
Temperature	Operation	-40°C ~+85°C
	Storage	-55°C ~+95°C
Humidity	5-95%	
Vibration	10Hz-2000Hz, 16.4 G (X, Y, Z axis, 1 hour /axis)	
Shock	Peak Acceleration: 1,500 G, 0.5ms(Half-sine wave, ±X,±Y,±Z axis, 1 time/axis) Peak Acceleration: 50 G, 11ms(Half-sine wave, ±X,±Y,±Z axis, 3 times/axis)	

4.2 Power Failure Protection

Renice X5A CFast adopts Voltage Detector Circuit to detect current voltage status, when current voltage is detected abnormal, the controller will stop the data to be written into the disk, and ensure the existed data integrity upon sudden power loss.

4.3 Over voltage Protection

The over voltage protection mechanism of Renice X5A CFast is designed to be a protect circuitry on Device Power In. Once the voltage is exceeded, it will be pull down to the normal value in very short time to protect the drive.

5. SATA Interface Features

- . Compliant with Serial ATA International Organization: Serial ATA Revision 3.1.
- . Supports 1-port 1.5/3.0/6.0Gbps (SATA I/II/III interface)
- . Supports ATA-8 command set
- . Supports Partial/Slumber/Device Sleep and dynamic power management
- . Native Command Queuing (NCQ) support
- . S.M.A.R.T. command transport (SCT) technology

6. ATA Command

6.1 ATA Command Set

This table with the following paragraphs summarizes the ATA command set.

Table 3: ATA Command List

Command Name	Code	PARAMETERS USED					
		SC	SN	CY	DR	HD	FT
CHECK POWER MODE	E5h	X	X	X	O	X	X
EXECUTE DIAGNOSTICS	90h	X	X	X	O	X	X
FLUSH CACHE	E7h	X	X	X	O	O	X
IDENTIFY DEVICE	ECh	X	X	X	O	X	X
IDLE	E3h	O	X	X	O	X	X
IDLE IMMEDIATE	E1h	X	X	X	O	X	X
INITIALIZE DEVICE PARAMETERS	91h	O	X	X	O	O	X
READ DMA	C8h	O	O	O	O	O	X
READ DMA EXT	25h	O	O	O	O	O	X
READ FPDMA QUEUED	60h	O	O	O	O	O	X
READ LOG DMA EXT	47h	O	O	O	O	O	X
READ LOG EXT	2Fh	O	O	O	O	O	X
READ MULTIPLE	C4h	O	O	O	O	O	X
READ SECTOR(S)	20h or 21h	O	O	O	O	O	X
READ VERIFY SECTOR(S)	40h or 41h	O	O	O	O	O	X
RECALIBRATE	10h	X	X	X	O	X	X
SECURITY DISABLE PASSWORD	F6h	X	X	X	O	X	X
SECURITY ERASE PREPARE	F3h	X	X	X	O	X	X
SECURITY ERASE UNIT	F4h	X	X	X	O	X	X
SECURITY FREEZE LOCK	F5h	X	X	X	O	X	X
SECURITY SET PASSWORD	F1h	X	X	X	O	X	X
SECURITY UNLOCK	F2h	X	X	X	O	X	X
SEEK	7xh	X	X	O	O	O	X
SET FEATURES	EFh	O	X	X	O	X	O
SET MULTIPLE MODE	C6h	O	X	X	O	X	X
SLEEP	E6h	X	X	X	O	X	X
SMART	B0h	X	X	O	O	X	O
STANDBY	E2h	X	X	X	O	X	X
STANDBY IMMEDIATE	E0h	X	X	X	O	X	X
WRITE DMA	CAh	O	O	O	O	O	X
WRITE DMA EXT	35h	O	O	O	O	O	X
WRITE FPDMA QUEUED	61h	O	O	O	O	O	X
WRITE LOG DMA EXT	57h	O	O	O	O	O	X
WRITE LOG EXT	3Fh	O	O	O	O	O	X
WRITE MULTIPLE	C5h	O	O	O	O	O	X
WRITE SECTOR(S)	30h or 31h	O	O	O	O	O	X

Note: O = Valid, X = Don't care; SC = Sector Count Register; SN = Sector Number Register;

CY = Cylinder Low/High Register; DR = DEVICE SELECT Bit (DEVICE/HEAD Register Bit 4);
 HD = HEAD SELECT Bit (DEVICE/HEAD Register Bit 3-0); FT = Features Register.

6.2 ATA Command Description: IDENTIFY DEVICE (ECh)

This commands read out 512Bytes of drive parameter information. Parameter Information consists of the arrangement and value as shown in the following table. This command enables the host to receive the Identify Drive Information from the device.

Table 4 IDENTIFY DEVICE (ECh) information default value

Word	Value	F/V	Description
0	0040h	F X F X X F X F	General configuration bit-significant information: 15 0 = ATA device 14-8 Retired 7 1 = removable media device 6 Obsolete 5-3 Retired 2 Reserved 1 Retired 0 Reserved
1	XXXXh	X	Number of logical cylinders
2	C837h	V	Specific configuration
3	00XXh	X	Number of logical heads
4-5	XXXXh	X	Retired
6	XXXXh	X	Number of logical sector per logical track
7-8	XXXXh	V	Reserved for assignment by the CompactFlash_ Association
9	000Eh	X	Retired
10-19	XXXXh	F	Serial number (20 ASCII characters)
20-21	XXXXh	X	Retired
22	003Fh	X	Obsolete
23-26	XXXXh	F	Firmware revision (8 ASCII characters)
27-46	XXXXh	F	Model number (40 ASCII characters)

Word	Value	F/V	Description
47	8000h	F F F	15-8 80h 7-0 00h = Reserved 01h = Maximum number of 1 sectors on READ/WRITE MULTIPLE commands
48	4000h	F	Reserved
49	2F00h	F F F F F F F X	Capabilities 15-14 Reserved for the IDENTIFY PACKET DEVICE command. 13 1 = Standby timer values as specified in this standard are supported 0 = Standby timer values shall be managed by the device 12 Reserved for the IDENTIFY PACKET DEVICE command. 11 1 = IORDY supported 0 = IORDY may be supported 10 1 = IORDY may be disabled 9 1 = LBA supported 8 1 = DMA supported. 7-0 Retired
50	4000h	F F F X F	Capabilities 15 Shall be cleared to zero. 14 Shall be set to one. 13-2 Reserved. 1 Obsolete 0 Shall be set to one to indicate a device specific Standby timer value minimum.
51-52	0000h	X	Obsolete
53	0007h	F F F X	15-3 Reserved 2 1 = the fields reported in word 88 are valid 0 = the fields reported in word 88 are not valid 1 1 = the fields reported in words 70:64 are valid 0 = the fields reported in words 70:64 are not valid 0 1 = the fields reported in words 58:54 are valid 0 = the fields reported in words 58:54 are not valid
54-58	XXXXh	X	Obsolete
59	0000h	F V V	15-9 Reserved 8 1 = Multiple sector setting is valid 7-0 xxh = Setting for number of sectors that shall be transferred per interrupt on R/W Multiple command
60-61	XXXXh	F	Total number of user addressable sectors
62	0000h	X	Obsolete
63	0007h	F V V V F	15-11 Reserved 10 1 = Multiword DMA mode 2 is selected 0 = Multiword DMA mode 2 is not selected 9 1 = Multiword DMA mode 1 is selected 0 = Multiword DMA mode 1 is not selected 8 1 = Multiword DMA mode 0 is selected 0 = Multiword DMA mode 0 is not selected 7-3 Reserved

Word	Value	F/V	Description
		F	2 1 = Multiword DMA mode 2 and below are supported
		F	1 1 = Multiword DMA mode 1 and below are supported
		F	0 1 = Multiword DMA mode 0 is supported
64	0003h	F	15-8 Reserved
		F	7-0 Advanced PIO modes supported
65	0078h	F	Minimum Multiword DMA transfer cycle time per word
66	0078h	F	Manufacturer's recommended Multiword DMA transfer cycle time
67	0078h	F	Minimum PIO transfer cycle time without flow control
68	0078h	F	Minimum PIO transfer cycle time with IORDY flow control
69-74	0000h	F	Reserved (for future command overlap and queuing)
75	0000h	F	Queue depth
			15:5 Reserved
			4:0 Maximum queue depth - 1
76	xh	F	Serial ATA Capabilities
			15:13 Reserved for Serial ATA
			12 1 = Supports NCQ priority information
			11 1 = Supports Unload while NCQ commands are outstanding
			10 1 = Supports the SATA Phy Event Counters log
			9 1 = Supports receipt of host initiated power management requests
			8 1 = Supports the NCQ feature set
			7:4 Reserved for Serial ATA
			3 1 = Supports SATA Gen3 Signaling Speed (6.0Gb/s)
			2 1 = Supports SATA Gen2 Signaling Speed (3.0Gb/s)
			1 1 = Supports SATA Gen1 Signaling Speed (1.5Gb/s)
			0 Shall be cleared to zero
77			Reserved
78	xh		Serial ATA features supported
			15:7 Reserved for Serial ATA
			6 1 = Device supports Software Settings Preservation
			5 Reserved for Serial ATA
			4 1 = Device supports in-order data delivery
			3 1 = Device supports initiating power management
			2 1 = Device supports DMA Setup auto-activation

Word	Value	F/V	Description
			1 1 = Device supports non-zero buffer offsets 0 Shall be cleared to zero
79	xh		Serial ATA features enabled 15:7 Reserved for Serial ATA 6 1 = Software Settings Preservation enabled 5 Reserved for Serial ATA 4 1 = In-order data delivery enabled 3 1 = Device initiated power management enabled 2 1 = DMA Setup auto-activation enabled 1 1 = Non-zero buffer offsets enabled F 0 Shall be cleared to zero
80	01FEh	F F F F F F F F F F F F F X X F	Major version number 0000h or FFFFh = device does not report version 15 Reserved 14 Reserved for ATA/ATAPI-14 13 Reserved for ATA/ATAPI-13 12 Reserved for ATA/ATAPI-12 11 Reserved for ATA/ATAPI-11 10 Reserved for ATA/ATAPI-10 9 Reserved for ATA/ATAPI-9 8 Reserved for ATA/ATAPI-8 7 1 = supports ATA/ATAPI-7 6 1 = supports ATA/ATAPI-6 5 1 = supports ATA/ATAPI-5 4 1 = supports ATA/ATAPI-4 3 Obsolete 2 Obsolete 1 Obsolete 0 Reserved
81	0021h	F	Minor version number
82	0068h	X F F F X F F F F F F F	Command set supported. 15 Obsolete 14 1 = NOP command supported 13 1 = READ BUFFER command supported 12 1 = WRITE BUFFER command supported 11 Obsolete 10 1 = Host Protected Area feature set supported 9 1 = DEVICE RESET command supported 8 1 = SERVICE interrupt supported 7 1 = release interrupt supported 6 1 = look-ahead supported 5 1 = write cache supported

Word	Value	F/V	Description
		F F F F F 0	4 Shall be cleared to zero to indicate that the PACKET Command feature set is not supported. 3 1 = mandatory Power Management feature set supported 2 1 = Removable Media feature set supported 1 1 = Security Mode feature set supported 0 1 = SMART feature set supported
83	5000h	F F F F F F F F F F F	Command sets supported. 15 Shall be cleared to zero 14 Shall be set to one 13-9 Reserved 8 1 = SET MAX security extension supported 7 Reserved 6 1 = SET FEATURES subcommand required to spinup after power-up 5 1 = Power-Up In Standby feature set supported 4 1 = Removable Media Status Notification feature set supported 3 1 = Advanced Power Management feature set supported 2 1 = CFA feature set supported 1 1 = READ/WRITE DMA QUEUED supported 0 1 = DOWNLOAD MICROCODE command supported
84	4000h	F F F F F	Command set/feature supported extension. 15 Shall be cleared to zero 14 Shall be set to one 13-2 Reserved 1 1 = SMART self-test supported 0 1 = SMART error logging supported
85	0008h	X F F F X V F V V V V F F F V V 0	Command set/feature enabled. 15 Obsolete 14 1 = NOP command enabled 13 1 = READ BUFFER command enabled 12 1 = WRITE BUFFER command enabled 11 Obsolete 10 1 = Host Protected Area feature set enabled 9 1 = DEVICE RESET command enabled 8 1 = SERVICE interrupt enabled 7 1 = release interrupt enabled 6 1 = look-ahead enabled 5 1 = write cache enabled 4 Shall be cleared to zero to indicate that the PACKET Command feature set is not supported. 3 1 = Power Management feature set enabled 2 1 = Removable Media feature set enabled 1 1 = Security Mode feature set enabled 0 1 = SMART feature set enabled
86	5000h	F F F	Command set/feature enabled. 15-9 Reserved 8 1 = SET MAX security extension enabled by SET MAX SET PASSWORD 7 See Address Offset Reserved Area Boot, INCITS TR27:2001

Word	Value	F/V	Description
		F	6 1 = SET FEATURES subcommand required to spin-up after power-up
		V	5 1 = Power-Up In Standby feature set enabled
		V	4 1 = Removable Media Status Notification feature set enabled
		V	3-1 1 = Advanced Power Management feature set enabled
		F	0 1 = DOWNLOAD MICROCODE command supported
87	4000h		Command set/feature default.
		F	15 Shall be cleared to zero
		F	14 Shall be set to one
		F	13-2 Reserved
		F	1 1 = SMART self-test supported
		F	0 1 = SMART error logging supported
88	xh		15-14 Reserved
		V	13 1 = Ultra DMA mode 5 is selected 0 = Ultra DMA mode 5 is not selected
		V	12 1 = Ultra DMA mode 4 is selected 0 = Ultra DMA mode 4 is not selected
		V	11 1 = Ultra DMA mode 3 is selected 0 = Ultra DMA mode 3 is not selected
		V	10 1 = Ultra DMA mode 2 is selected 0 = Ultra DMA mode 2 is not selected
		V	9 1 = Ultra DMA mode 1 is selected 0 = Ultra DMA mode 1 is not selected
		F	8 1 = Ultra DMA mode 0 is selected
		F	0 = Ultra DMA mode 0 is not selected
		F	7-6 Reserved
		F	5 1 = Ultra DMA mode 5 and below are supported
		F	4 1 = Ultra DMA mode 4 and below are supported
		F	3 1 = Ultra DMA mode 3 and below are supported
			2 1 = Ultra DMA mode 2 and below are supported
			1 1 = Ultra DMA mode 1 and below are supported
			0 1 = Ultra DMA mode 0 is supported
89	0000h	F	Time required for security erase unit completion
90	0000h	F	Time required for Enhanced security erase completion
91	0000h	V	Current advanced power management value
92	0000h	V	Master Password Revision Code
93	0000h	X	Hardware reset result
94-126	0000h	V	Reserved
127	0000h		Removable Media Status Notification feature set support
		F	15-2 Reserved
		F	1-0 00 = Removable Media Status Notification feature set not supported 01 = Removable Media Status Notification feature supported 10 = Reserved 11 = Reserved

Word	Value	F/V	Description
128	0001h	F	15-9 Reserved
		V	8 Security level 0 = High, 1 = Maximum
		F	7-6 Reserved
		F	5 1 = Enhanced security erase supported
		V	4 1 = Security count expired
		V	3 1 = Security frozen
		V	2 1 = Security locked
		V	1 1 = Security enabled
		F	0 1 = Security supported
129-159	0000h	X	Vendor specific
160-254	0000h	X	Reserved
255	0000h	X	Integrity word
			15-8 Checksum 7-0 Signature
Note: F/V = Fixed/variable content F = the content of the word is fixed and does not change. For removable media devices, these values may change when media is removed or changed. V = the contents of the word is variable and may change depending on the state of the device or the commands executed by the device. X = the content of the word may be fixed or variable.			

6.3 ATA Command Description: SET FEATURES (EFh)

This command set parameter to Features register and set drive's operation.

For transfer mode, parameter is set to Sector Count Register. This command is used by the host to establish or select certain features.

Table 5 Features Register value and available operating mode

Value	Function
02h	Enable write cache
03h	Set transfer mode based on value in Sector Count register.
55h	Disable read look-ahead feature
82h	Disable write cache
90h	Disable use of SATA feature
AAh	Enable read look-ahead feature

7. S.M.A.R.T

Table 6: SMART Command Set

Value(Hex)	Command
01	Read Error Rate
05	Re-allocated Sector Count
09	Power-on Hours Count
0C	Drive Power Cycle Count
A0	Uncorrectable sector count when read/write
A1	Number of valid spare block
A3	Number of initial invalid block
A4	Total erase count
A5	Maxmum erase count
A6	Minimum erase count
A7	Average erase count
A8	Max erase count of spec
A9	Remain Life(percentage)
C0	Unexpected Power Loss Count
C2	Temperature
C3	Hardware ECC recovered
C4	Reallocation event count
C7	Ultra DMA CRC error count
F1	Total LBA written
F2	Total LBA read

8. Electrical Characteristics

8.1 Absolute Maximum Rating

Table 7: Absolute Maximum Rating

Parameter	Symbol	Condition	Min	Max	Unit
Analog power supply	AS3V3		-0.4	3.96	V
Analog power supply	AS1V2		-0.4	1.6	V
Digital core power supply	C1V2		-0.4	1.6	V
Digital I/O power supply	G3V3		-0.4	3.96	V
Flash I/O power supply	FVDD		-0.4	3.96	V
Digital I/O input voltage	$V_{I(D)}$		-0.4	G3V3+0.4	V
Storage temperature	$T_{STORAGE}$		-40	130	°C

8.2 Recommended Operation Condition

Table 8: Recommended Operation Condition

Parameter	Symbol	Condition	Min	Typical	Max	Unit
Analog power supply	AS3V3		2.97	3.3	3.63	V
Analog power supply	A1V2		1.14	1.2	1.32	V
Digital core power supply	C1V2		1.14	1.2	1.32	V
Digital I/O power supply	G3V3		2.97	3.3	3.63	V
Flash I/O power supply at 1.8V	FVDD		1.7	1.8	1.95	V
Flash I/O power supply at 3.3V	FVDD		2.97	3.3	3.63	V
Flash I/O reference voltage	FVREF	1/2 FVDD		0.9		V
Ambient operation temperature	T_A	Commercial Spec.	0	-	70	°C
Ambient operation temperature	T_A	Industrial Spec.	-40	-	85	°C
Junction temperature	T_J				125	°C
Package Surface Temperature	T_C	Commercial Spec.			85	°C
Package Surface Temperature	T_C	Industrial Spec.			100	°C
Thermal Resistance	θ_{JC}			14.53		°C/W

8.3 DC Characteristics

Table 9: DC Characteristics

Parameter	Symbol	Condition	Min	Typical	Max	Unit
Digital I/O Output High Voltage	V _{OH}		2.4			V
Digital I/O Output Low Voltage	V _{OL}				0.4	V
Digital I/O Input High Voltage	V _{IH}	G3V3 = 3.63V	2.2			V
Digital I/O Input Low Voltage	V _{IL}	G3V3 = 2.97V			1.3	V
Weak pull high R value				75.0		kΩ
Weak pull low R value				75.0		kΩ
Power Consumption SATA Active Toshiba NAND flash run at READ: 150MHz, WRITE: 100MHz	AS3V3	AS3V3 = 3.3V		26		mA
	AS1V2	AS1V2 = 1.2V		90		mA
	G3V3	G3V3 = 3.3V		16		mA
	C1V2	C1V2 = 1.2V		235		mA
	FVDD	FVDD = 1.8V		110		mA

9. Security Function (Optional)

Renice X5A CFast supports Quick Erase function by a signal pin (On *Renice X5A CFast cards*, pin PC8 can be used as Quick Erase signal pin, when PC8 is pulled down, the QE function could be triggered.) for emergency data erasure based on customers' request. Either Renice X5A CFast is acting as master Drive or slave drive, once Quick Erase function is triggered QE will be carried out immediately whether the SSD is in idle mode(no read/write), or work (read/write) mode. After QE is finished, the SSD turns into uninitialized drive and can be used again after formatting.

10. Write Protect Function (Optional)

Renice X5A CFast supports Write Protect function based on customers' request by either a mechanical write protect switch or a signal pin (On *Renice X5A CFast cards*, pin PC10 could be used as the write protect signal pin. If PC10 is pulled down, WP could be triggered.) Once write protect function is enabled, Write-protected data in the disk could only be read, and thus users could not write/edit/delete it, or append data to the disk.

Note: The Write Protect function could only be enabled before power on the disk.

11. Ordering Information

Table 10: Valid Combinations

Capacities/Flash type	Industrial Temp
8GB/SLC	RIS008-SX5AC
16GB/SLC	RIS016-SX5AC
32GB/SLC	RIS032-SX5AC
64GB/SLC	RIS064-SX5AC
128GB/SLC	RIS128-SX5AC
256GB/SLC	RIS256-SX5AC
16GB/MLC	RIM016-SX5AC
32GB/MLC	RIM032-SX5AC
64GB/MLC	RIM064-SX5AC
128GB/MLC	RIM128-SX5AC
256GB/MLC	RIM256-SX5AC
512GB/MLC	RIM512-SX5AC

12. Part Number Naming Rule

