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MUS-INDCFS2XXXXX

Maximus Industrial CFast Solid State Drive

Data Sheet

Version 1.1

Aug, 2013



Revision History

Revision	Date	Description
1.1	Aug, 2013	Release

Confidential

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1. Overview

1.1 Product Description

This series of products are designed for industrial applications, goes through three proofing tests and high reliability environmental tests such as Wide Temperature Test and Shock/Vibration test. Maximus CFast Card supports Over Load Protect and Power Failure Protect, with a fully compliant with defense selected & tested standards. Maximus CFast Card products have high stability and reliability and can do perfectly well under applications which involve severe environments. Maximus CFast Card has a capacity range from 1GB~128GB and can be adapted to applications such as Panel PC, High-end Digital Camera, Industrial PC with SATAII slot, Video Recording etc. All of this series are manufactured with best-class components under strict tests and technologies, and are 100% proven by series of complicated and complete and long term tests.

1.2 Key Features

- Standard SATAII Interface for 3.0Gbp/s
- Capacity 1GB~128GB
- Enhanced endurance by dynamic/static wear-leveling^①
- Support dynamic power management
- Built-in ECC (Error Correction Code) functionality
- Support S.M.A.R.T function
- Automatic Bad-block management^②
- Support Trim and NCQ (Native Command Queuing) command
- Support BCH ECC 12 64-bits in 1024 bytes

Notes:

- ① The controller supports static/dynamic wear leveling. When the host writes data, the controller will find and use the block with the lowest erase count among the free blocks. When the free blocks' erase count is higher than the data blocks', it will activate the static wear leveling, replacing the not so frequently used user blocks with the high erase count free blocks.
- ② When the flash encounters ECC failed, program fail or erase fail, the controller will mark the block as bad block to prevent the used of this block and caused data lost later on.

2. Product Specifications

2.1 Capacity

Model Name	Raw Capacity ^①
MUS-INDCFS2XX01S	01GB/SLC
MUS-INDCFS2XX02S	02GB/SLC
MUS-INDCFS2XX04S/M	4GB/SLC/MLC
MUS-INDCFS2XX08S/M	8GB/SLC/MLC
MUS-INDCFS2XX16S/M	16GB/SLC/MLC
MUS-INDCFS2XX32S/M	32GB/SLC/MLC
MUS-INDCFS2XX64S/M	64GB/SLC/MLC
MUS-INDCFS2XX128M	128GB/MLC

Notes:

1 GB = 1,000,000,000 bytes; 1 sector = 512 bytes.

2.2 Cache Size

Cache Size: No Cache

2.3 Physical Specification

Form Factor	CFast Card
Connector	SATA 7PIN+17PIN
Dimensions (mm)	42.8mm±0.2×36.5mm±0.2×3.3mm±0.2
Weight	<20g
Input Voltage	3.3V±5%, 1.8V±5% available

2.4 Environmental Specification

Operating Temperature		Standard Grade (0°C ~+70°C) Wide Grade (-20°C ~+70°C) Extended Grade (-40°C ~+85°C)
Storage Temperature		-55°C to 95°C
Humidity	Operating	95% (Non-condensing)
	Non-Operating	95% (Non-condensing)
Vibration		20G (40 to 2000Hz)
Shock		2000G at 0.3ms half sine wave
Flash Type		Industrial NAND MLC or SLC
Burn-IN test		36 Hours
Temperature Test		18 Hours
Average Access Time		0.1ms
Falling Test		1.5 meters free fall

2.5 Performance^①

Capacity	Flash type	Sequential Read ^②	Sequential Write ^②	IOPS Random Read (4KB QD32) ^③	IOPS Random Write (4KB QD32) ^③
1GB	MLC	/	/	/	/
	SLC	105	68	5,000	4,400
2GB	MLC	/	/	/	/
	SLC	110	70	5,100	4,500
4GB	MLC	112	70	5,100	4,500
	SLC	115	72	5,200	4,600
8GB	MLC	120	77	5,500	4,700
	SLC	122	78	5500	4,700
16GB	MLC	137	87	6,000	5,000
	SLC	152	95	6,200	5,100
32GB	MLC	165	101	7,200	5,300
	SLC	171	109	7,700	5,500
64GB	MLC	182	122	8,000	6,000
	SLC	183	123	8,100	6,100
128GB	MLC	184	124	8,200	6,200
	SLC	/	/	/	/

Note:

- ③ Test platform: ASUS P8H67-M, CPU i3-2100, DDR III 2GB, Windows® 7 32bit with AHCI mode.
- ④ Tested base on Crystal Disk Mark (Version 3.1.1), default test data(Random), copied file 2000MB, unit MB/s.
- ⑤ Tested base on IOMeter 2009, unit IOPS.

2.6 Reliability

Data Retention	15 years at 25°C		
MTBF	2,000,000 hours		
Write Endurance	Capacity	MLC	SLC
	1GB	/	40TB
	2GB	/	81TB
	4GB	5TB	162TB
	8GB	10TB	325TB
	16GB	20TB	650TB
	32GB	40TB	1300TB
	64GB	80TB	2600TB
	128GB	160TB	/

Notes: Endurance=Capacity*P/E cycle/WAI

The capacity refers to raw capacity

2.7 Temperature Sensor

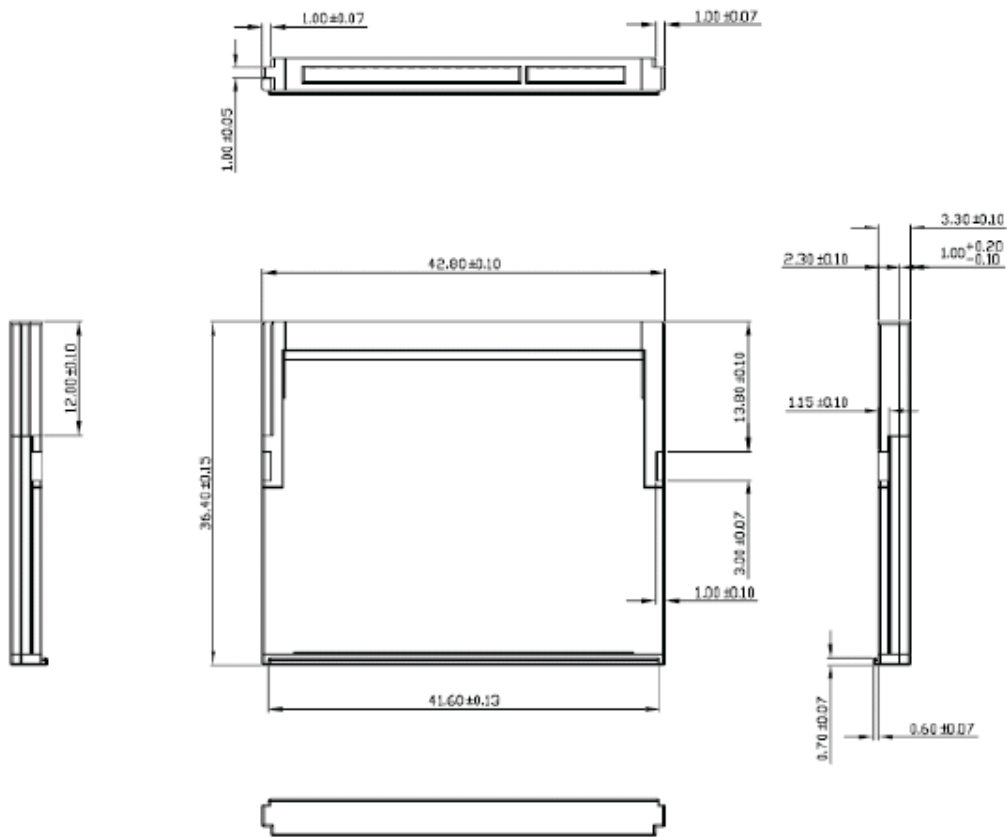
Temperature sensor	Yes	No
	Support	/

2.8 /2.9 Product Ecological Compliance & Certificate

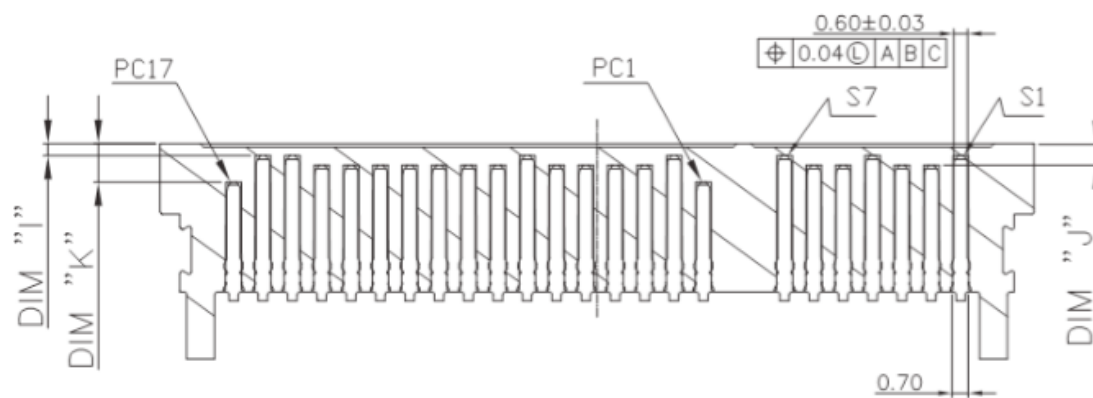


3. Mechanical Information

3.1 Dimensions



3.2 Pin Locations



3.2 Signal Description

Pin#	Assignment	Pin#	Assignment
Signal		Power	
S1	GND	P1	LX (Device Sleep Function Optional)
S2	RX+	P2	GND
S3	RX-	P3	NC
S4	GND	P4	NC
S5	TX-	P5	NC
S6	TX+	P6	NC
S7	GND	P7	GND
		P8	NC (LED Function Optional)
		P9	NC
		P10	NC (Write Protect Function Optional)
		P11	NC (Write Protect Function Optional)
		P12	NC (Write Protect Function Optional)
		P13	D3V3
		P14	D3V3
		P15	GND
		P16	GND
		P17	LX1

4. Model Name Rules

MUS-IND CF S2 XX XX X

Abbreviation	Referring to
MUS	Maximus Brand Name
IND	Advanced Industrial Series
CF	CFast
S2	SATAII
XX	Temperature Range. "ST" for Standard Grade, "WT" for Wide Grade, "ET" for Extended Grade
XX	Capacity
X	NAND Flash Type. "M" for MLC, "S" for SLC

Note: The Abbreviations in the form are corresponded under an order of "from left to the right" in the Model Name above.

The capacity refers to raw capacity not practical capacity.

5. Contact Information



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