

Please visit our official website: www.maximustek.com/en



MUS-INDCF50XXXXX

Maximus Industrial Compact Flash Solid State Drive

Data Sheet

Version 1.1

Aug, 2013



Revision History

Revision	Date	Description
1.1	Aug, 2013	Release

Confidential

Table of Contents

1.	Overview.....	1
1.1	Product Description.....	1
1.2	Key Features.....	1
2.	Product Specifications.....	2
2.1	Capacity.....	2
2.2	Cache Size.....	2
2.3	Physical Specification.....	2
2.4	Environmental Specification.....	2
2.5	Performance.....	3
2.6	Reliability.....	4
2.7	Temperature Sensor.....	4
2.8	Product Ecological Compliance.....	4
2.9	Certifications.....	4
3.	Mechanical Information.....	5
3.1	Dimensions.....	5
3.2	Pin Locations.....	6
3.3	Signal Descriptions.....	6
4.	Model Name Rules.....	7
5.	Contact Information.....	8

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 Compact Flash Card supports Over Load Protect and Power Failure Protect, with a fully compliant with defense selected & tested standards. Maximus Compact Flash Card products have high stability and reliability and can do perfectly well under lots of applications which involves severe environments. Maximus Compact Flash Card has a capacity range from 512MB~128GB and can be adapted to applications such as Panel PC, High-end Digital Camera, Industrial PC with CF 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 Compact Flash Card
- Capacity 512MB~128GB
- Enhanced endurance by dynamic/static wear-leveling^①
- Support dynamic power management
- Enhanced Power Failure Protect Function
- 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-INDCF50XX512MBS/M	512MB/SLC
MUS-INDCF50XX01S/M	1GB/SLC/MLC
MUS-INDCF50XX02S/M	2GB/SLC/MLC
MUS-INDCF50XX04S/M	4GB/SLC/MLC
MUS-INDCF50XX08S/M	8GB/SLC/MLC
MUS-INDCF50XX16S/M	16GB/SLC/MLC
MUS-INDCF50XX32S/M	32GB/SLC/MLC
MUS-INDCF50XX64M	64GB/MLC
MUS-INDCF50XX128M	128GB/MLC

Notes:

① 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	Compact Flash Card
Connector	50PIN CF Connector
Dimensions (mm)	42.9mm±0.2×36.5mm±0.2×3.3mm±0.2
Weight	<20g
Input Voltage	3.0V~5.5V

2.4 Environmental Specification

Operating Temperature		Standard Grade (0℃ ~+70℃) Wide Grade (-20℃ ~+70℃) Extended Grade (-40℃ ~+85℃)
Storage Temperature		-55℃ to 95℃
Humidity	Operating	95% (Non-condensing)
	Non-Operating	95% (Non-condensing)
Vibration		20G (40 to 2000Hz)
Shock		2000G at 0.3ms half sine wave
Average Access Time		0.1ms

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
512MB	MLC	/	/	/	/
	SLC	40	25	2,400	2,100
1GB	MLC	41	30	2,400	2,100
	SLC	42	34	2,500	2,200
2GB	MLC	45	39	2,600	2,300
	SLC	48	40	2,700	2,300
4GB	MLC	53	43	3,000	2,400
	SLC	59	45	3,200	2,600
8GB	MLC	67	49	3,500	2,700
	SLC	71	52	3,700	2,800
16GB	MLC	76	55	4,000	3,000
	SLC	80	58	4,200	3,100
32GB	MLC	82	61	4,600	3,300
	SLC	87	69	4,700	3,500
64GB	MLC	91	71	4,800	4,000
	SLC	/	/	/	/
128GB	MLC	100	79	5,000	4,200
	SLC	/	/	/	/

Note:

① Test platform: ASUS P8H67-M, CPU i3-2100, DDR III 2GB, Windows® 7 32bit with AHCI mode.

Flash mode: Synchronous.

② Tested base on Crystal Disk Mark (Version 3.1.1), default test data(Random), copied file 2000MB, unit MB/s.

③ 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
	512MB	/	20TB
	1GB	1TB	40TB
	2GB	2TB	81TB
	4GB	5TB	162TB
	8GB	10TB	325TB
	16GB	20TB	650TB
	32GB	40TB	1300TB
	64GB	80TB	/
	128GB	160TB	/

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

The capacity refers to raw capacity

2.7 Temperature Sensor

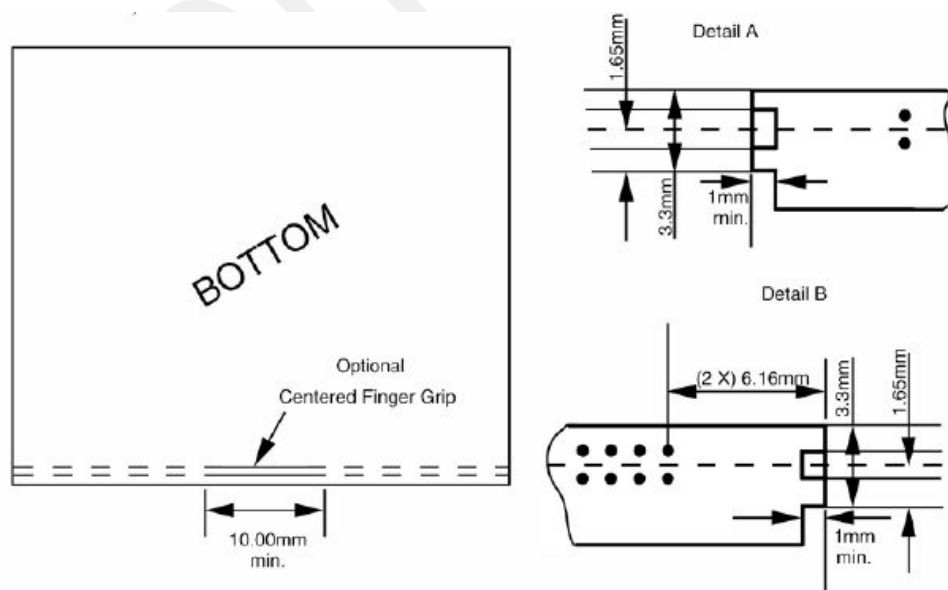
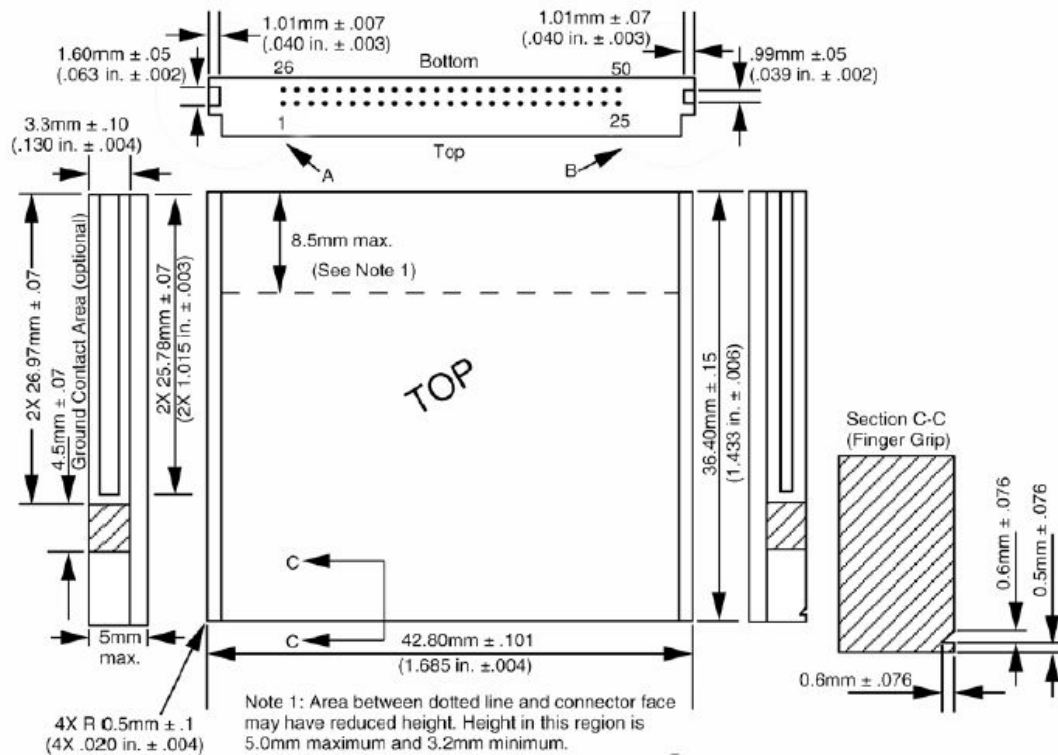
Temperature sensor	Yes	No
	Support	/

2.8 /2.9 Product Ecological Compliance & Certificate



3. Mechanical Information

3.1 Dimensions



3.1 Pin Description

PC Card Memory Mode			PC Card I/O Mode			True IDE Mode		
Pin #	Signal Name	Pin Type	Pin #	Signal Name	Pin Type	Pin #	Signal Name	Pin Type
1	GND		1	GND		1	GND	I/O
2	D03	I/O	2	D03	I/O	2	D03	I/O
3	D04	I/O	3	D04	I/O	3	D04	I/O
4	D05	I/O	4	D05	I/O	4	D05	I/O
5	D06	I/O	5	D06	I/O	5	D06	I/O
6	D07	I/O	6	D07	I/O	6	D07	I
7	-CE1	I	7	-CE1	I	7	-CS0	I
8	A10	I	8	A10	I	8	A10	I
9	-OE	I	9	-OE	I	9	-ATA SEL	I
10	A09	I	10	A09	I	10	A09	I
11	A08	I	11	A08	I	11	A08	I
12	A07	I	12	A07	I	12	A07	
13	VCC		13	VCC		13	VCC	I
14	A06	I	14	A06	I	14	A06	I
15	A05	I	15	A05	I	15	A05	I
16	A04	I	16	A04	I	16	A04	I
17	A03	I	17	A03	I	17	A03	I
18	A02	I	18	A02	I	18	A02	I
19	A01	I	19	A01	I	19	A01	I
20	A00	I	20	A00	I	20	A00	I/O
21	D00	I/O	21	D00	I/O	21	D00	I/O
22	D01	I/O	22	D01	I/O	22	D01	I/O
23	D02	I/O	23	D02	I/O	23	D02	O
24	WP	O	24	-IOIS16	O	24	-IOIS16	O
25	-CD2	O	25	-CD2	O	25	-CD2	O
26	-CD1	O	26	-CD1	O	26	-CD1	I/O
27	D11	I/O	27	D11	I/O	27	D11	I/O
28	D12	I/O	28	D12	I/O	28	D12	I/O
29	D13	I/O	29	D13	I/O	29	D13	I/O
30	D14	I/O	30	D14	I/O	30	D14	I/O

PC Card Memory Mode			PC Card I/O Mode			True IDE Mode		
Pin #	Signal Name	Pin Type	Pin #	Signal Name	Pin Type	Pin #	Signal Name	Pin Type
31	D15	I/O	31	D15	I/O	31	D15	I
32	-CE2	I	32	-CE2	I	32	-CS1	O
33	-VS1	O	33	-VS1	O	33	-VS1	I
34	-IORD	I	34	-IORD	I	34	-IORD	I
35	-IOWR	I	35	-IOWR	I	35	-IOWR	I
36	-WE	I	36	-WE	I	36	-WE	I
37	RDY/BSY	O	37	IREQ	O	37	INTRQ	
38	VCC		38	VCC		38	VCC	I
39	-CSEL	I	39	-CSEL	I	39	-CSEL	I
40	-VS2	O	40	-VS2	O	40	-VS2	I
41	RESET	I	41	RESET	I	41	RESET	O
42	-WAIT	O	42	-WAIT	O	42	IORDY	O
43	-INPACK	O	43	-INPACK	O	43	-INPACK	I
44	-REG	I	44	-REG	I	44	-REG	I/O
45	BVD2	I/O	45	-SPKR	I/O	45	-DASP	I/O
46	BVD1	I/O	46	-STSCHG	I/O	46	-PDIAG	I/O
47	D08	I/O	47	D08	I/O	47	D08	I/O
48	D09	I/O	48	D09	I/O	48	D09	I/O
49	D10	I/O	49	D10	I/O	49	D10	
50	GND		50	GND		50	GND	

4. Model Name Rules

MUS-IND CF 50 XX XX X

Abbreviation	Referring to
MUS	Maximus Brand Name
IND	Advanced Industrial Series
CF	Compact Flash Card
50	50PIN
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



Headquarter:

Maximus Technology(Shenzhen) Co., Ltd

Address: A1403, #1086 East Shennan Rd, Dongmen Block, Luohu District Shenzhen City, People's Republic of China

Telephone: +86.13699784622 Fax: +86 (0755) 82579281

Sales support: sales@maximustek.com

Technical support: support@maximustek.com

Please visit our official website: www.maximustek.com/en