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MUS-INDDOM22XXXXX

Maximus 22PIN SATA DOM Solid State Drive

Data Sheet

Version 1.1

Aug, 2013

Revision History

Revision	Date	Description
1.1	Aug, 2013	Release

Table of Contents

1. Overview

1.1 Product Description

This series of products are designed for industrial applications which have requirements in size and speed, goes through three proofing tests and high reliability environmental tests such as Wide Temperature Test and Shock\Vibration test. Maximus 22PIN SATA DOM supports Over Load Protect and Power Failure Protect, with a fully compliant with defense selected & tested standards. Maximus 22PIN SATA DOM products have high stability and reliability and can do perfectly well under lots of applications which involve severe environments. Maximus 22PIN SATA DOM has a capacity range from 2GB~64GB and can be adapted to applications such as Rugged Computer, Panel PC, POS Machine, Systems Integration, Embedded Systems, Surveillance, Server, ATM, Ticket Machine, 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

- Industrial 22PIN SATA Disk on Module
- Capacity 2GB~64GB
- Enhanced endurance by dynamic/static wear-leveling①
- Support dynamic power management
- Enhanced Power Failure Protect Function
- Built-in ECC (Error Correction Code) functionality
- Support S.M.A.R.T. and RAID
- Automatic Bad-block management②
- 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 Capacity①
MUS-INDDOM22ST02S/M	02GB/SLC/MLC
MUS-INDDOM22ST04S/M	04GB/SLC/MLC
MUS-INDDOM22ST08S/M	08GB/SLC/MLC
MUS-INDDOM22ST16S/M	16GB/SLC/MLC
MUS-INDDOM22ST32S/M	32GB/SLC/MLC
MUS-INDDOM22ST64M	64GB/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	SATA DOM
Connector	7PIN+15PIN Male
Dimensions (mm)	44.0mm±0.2×30.5mm±0.2×2.1mm±0.2
Weight	<20g
Input Voltage	3.3V±5%

2.4 Environmental Specification

Operating Temperature		Standard Grade (0℃～+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 Performance①

Capacity	Flash type	Sequential Read②	Sequential Write②	IOPS Random Read (4KB QD32)③	IOPS Random Write (4KB QD32)③
2GB	MLC	87	40	4000	2400
	SLC	95	44	4200	2500
4GB	MLC	99	47	4400	2600
	SLC	101	52	4500	2700
8GB	MLC	104	55	4700	2800
	SLC	120	57	5000	3000
16GB	MLC	145	59	5200	3000
	SLC	150	62	5500	3200
32GB	MLC	160	66	5800	3200
	SLC	175	72	6000	4000
64GB	MLC	186	79	6700	4000
	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	>1,500,000 hours		
Write Endurance	**Capacity**	**MLC**	**SLC**
	2GB	3TB	60TB
	4GB	5TB	100TB
	8GB	10TB	300TB
	16GB	20TB	600TB
	32GB	40TB	800TB
	64GB	80TB	/

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

The capacity refers to raw capacity

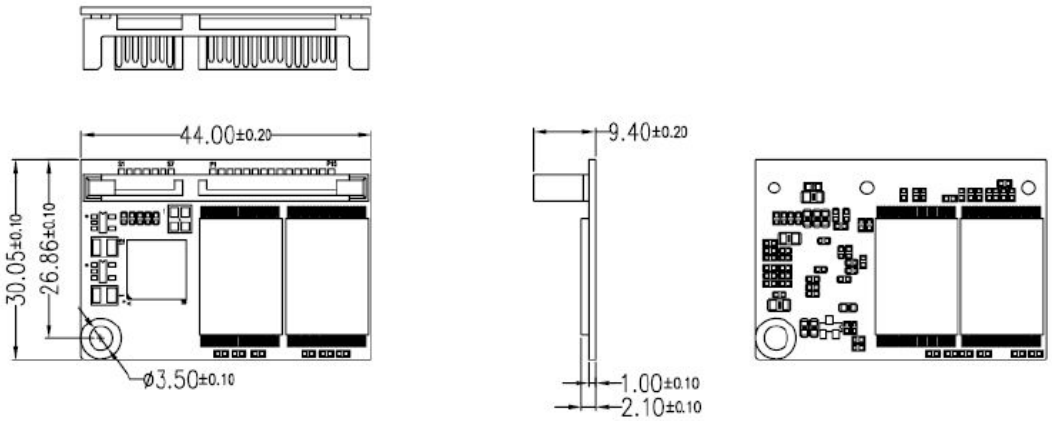
2.7 Temperature Sensor

Temperature sensor	**Yes**	**No**
	Support	/

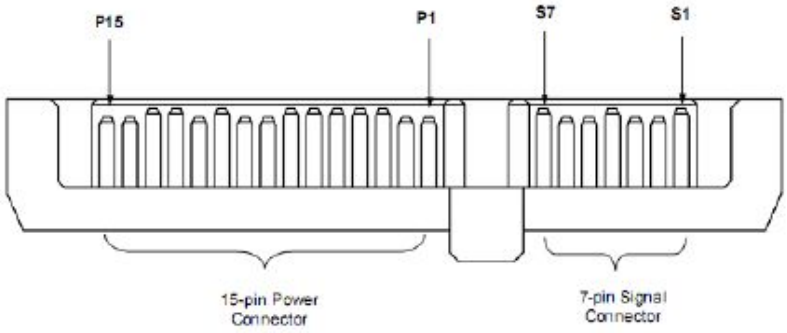
2.8 /2.9 Product Ecological Compliance & Certificate

3. Mechanical Information

3.1 Dimensions



3.2 Pin Locations



3.3 Signal Descriptions

S1	GND	2nd mate
S2	A+	Differential signal pair A From physical layer electronics
S3	A-	
S4	GND	2nd mate
S5	B-	Differential signal pair B From physical layer electronics
S6	B+	
S7	GND	2nd mate
Power		
P1	V33	3.3V power (Unused)
P2	V33	3.3V power (Unused)
P3	V33	3.3V power (Unused)
P4	GND	1st mate
P5	GND	2nd mate
P6	GND	2nd mate
P7	V5	5V power, pre-charge, 2nd mate
P8	V5	5V power
P9	V5	5V power
P10	GND	2nd mate
P11	DAS/DSS	NC
P12	GND	2nd mate
P13	V12	12V power, pre-charge, 2nd mate (Unused)
P14	V12	12V power (Unused)
P15	V12	12V power (Unused)

4. Model Name Rules

MUS-IND DOM 22 XX XX X

Abbreviation	Referring to
MUS	Maximus Brand Name
IND	Advanced Industrial Series
DOM	Disk on Module
22	22PIN
XX	Temperature Range. "ST" for Standard 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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