

Myung Solid State Drive
HALF-SLIM MITS Series

Product Specification

Sep / 2012
Rev. 0.3



MYUNG INFO.TECH.
Myung Information Technologies Co., Ltd.

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1. Revision History

- Rev. 0.1 (2010.10.29) : Preliminary Specification.
- Rev. 0.2 (2012.05.16) : Image Design & Specification Modified.
Add capacity information and Block Diagram.
- Rev. 0.3 (2012.09.18) : Datasheet reconfirm.

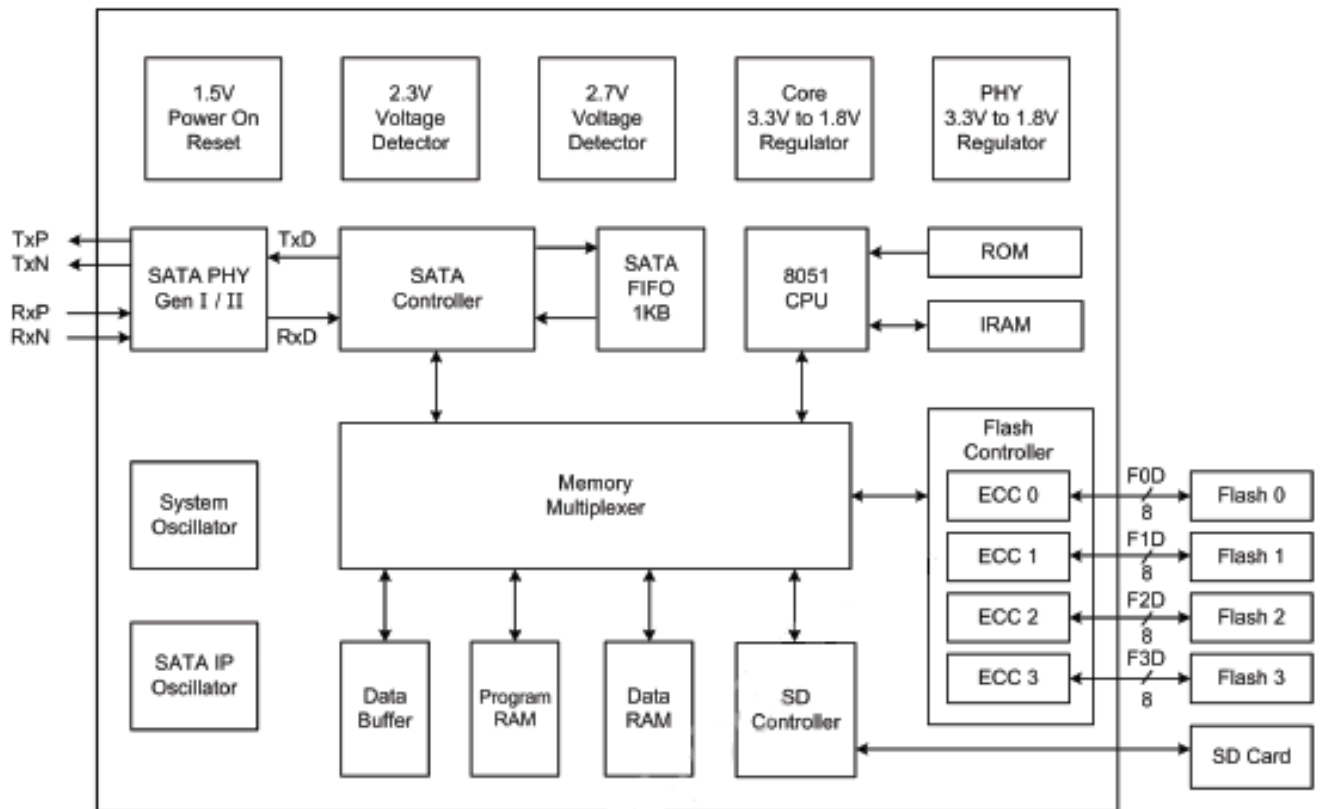
2. General Description

Since Myung SSD is composed of semiconductor chips, it is resistive on a external shock and does not produce any heat or noise. Since it does not have any moving parts, it is designed to minimize total electricity consumption. It is strongly resistive on dusts and other small particles. We are adopting latest technology of wear-leveling and which increased endurance of our product. Embedded error correction code(ECC) engine of the products also guaranty integrity of data stored on the SSD. Myung SSD has an exceeding reading and writing speed and it is fully compatible with other storage devices in a gaming systems, laptops and PCs.

3. Features

- **Compliant with Serial ATA Revision 2.6 specification**
- **Compliant with ATA-7 V3 specification**
- **Supports PIO Mode 0-4**
- **Supports Multi-Word DMA Mode 0-2**
- **Supports Ultra DMA Mode 0-6**
- **Supports partial and slumber mode**
- **Uses NAND flash memory**
 - Single Level Cell (SLC)
 - Supports 8 chip enable pins per channel and a total of up to 32 chip enable pins
 - Supports external bus switch to reduce bus loading
- **Supports advanced 8/15 bit hardware BCH ECC engine**
- **EDO mode supported**
- **Storage Capacity**
 - 2GB / 4GB / 8GB / 16GB
- **Temperature**
 - Industrial : - 40°C ~ 85°C
 - Storage : -40°C ~ 95°C
- **Ordering Information**
 - MITSH002GS2-S : Half-Slim SLC 2GB
 - MITSH004GS2-S : Half-Slim SLC 4GB
 - MITSH008GS2-S : Half-Slim SLC 8GB
 - MITSH016GS2-S : Half-Slim SLC 16GB

4. Block Diagram



5. Specifications

Mechanical Specifications

Form Factor	Module Type	
Dimensions (mm)	Length	40
	Width	54
	Height	5.73
Connector	SATA 7+15 pins combo connector	

Electrical Specifications

Parameter	Symbol	MIN	TYP	MAX	UNIT
Voltage Input	VCC	4.0	5.0	5.25	V

Weight of Capacities

Capacity	2GB	4GB	8GB	16GB
Weight	8g	8g	8g	9g

Performance of Capacities

Model Number	Capacity	Sequential Read	Sequential Write	Memory Type & Tech
MITSH002GS2-S	2GB	Max 63MB/s	Max 51MB/s	SLC
MITSH004GS2-S	4GB	Max 116MB/s	Max 85MB/s	SLC
MITSH008GS2-S	8GB	Max 116MB/s	Max 85MB/s	SLC
MITSH016GS2-S	16GB	Max 116MB/s	Max 85MB/s	SLC

User Addressable Sectors

Unformatted Capacity	Total User Addressable Sectors in LBA Mode
2GB	3,605,616
4GB	7,212,240
8GB	14,945,616
16GB	29,892,608

Power Consumption

Capacity	Idle	Active Read	Active Write
2GB	110mA	233mA	217mA
4GB	110mA	233mA	217mA
8GB	110mA	233mA	217mA
16GB	110mA	233mA	217mA

6. Reliability Characteristics

Temperature	
Operating (Industrial type)	-40°C ~ 85°C
Non-operation	- 40°C ~ 95 °C
Humidity	
Operating	60°C, 93%R.H
Altitude	
Non-Operating	80,000 feet
Random Vibration	
Non-Operating	15Hz ~ 2,000Hz
Shock	
Non-Operating	1,500g / 0.5ms

Wear-Leveling algorithm

Myung's SSD 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. This is known as dynamic wear leveling. 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.

ECC algorithm

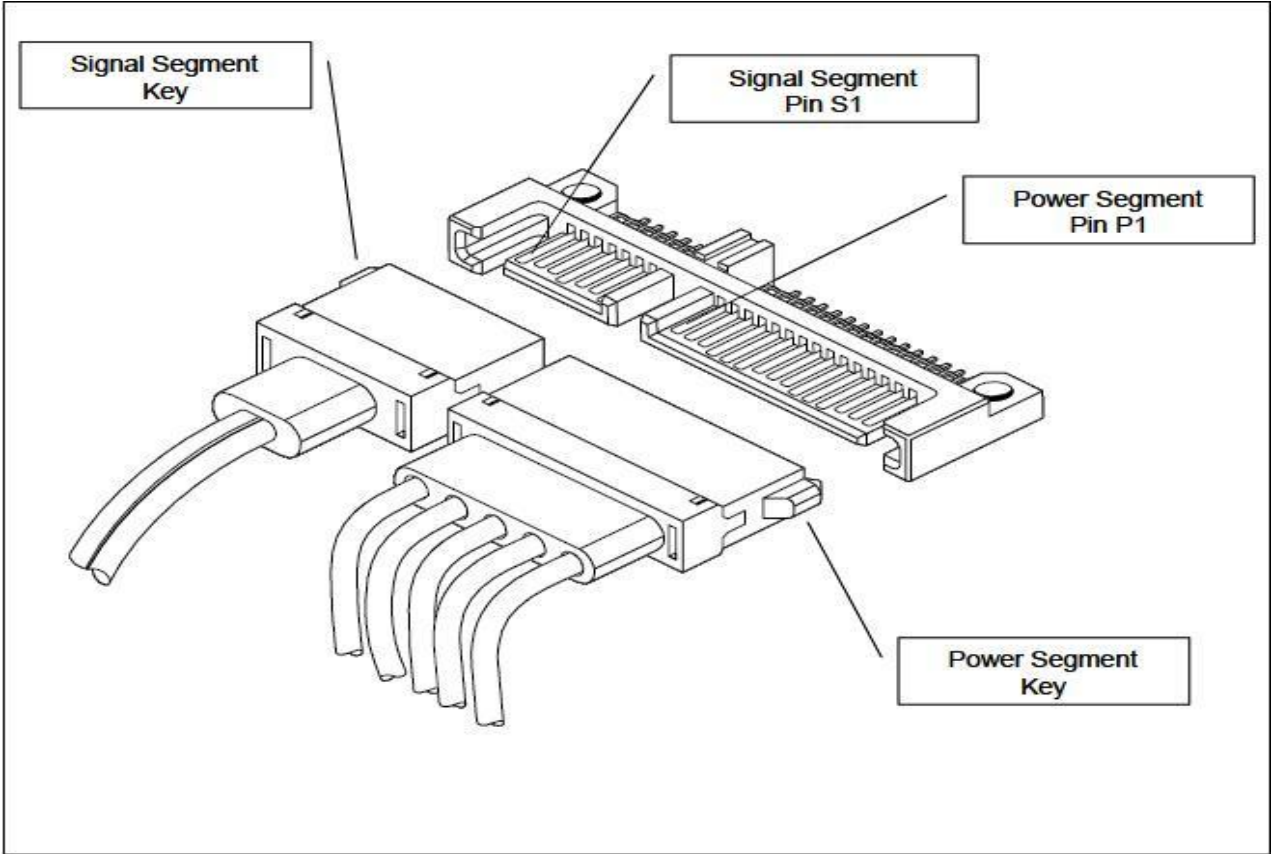
The controller use BCH code option
 BCH: Max 55 bits/512B sector

Bad-block management

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.

7. Connector Descriptions

7-1 Connector locations



7-2 SATA Pin out Data

Segment	Pin No.	Signal Name	Signal Description
Signal segment	S1	GND	2nd mate
	S2	A+	Differential signal pair A From phy
	S3	A-	
	S4	GND	2nd mate
	S5	B-	Differential signal pair B From phy
	S6	B+	
	S7	GND	2nd mate

7-3 SATA Pin out Power

Power segment	P1	V33	3.3V POWER (Not used)
	P2	V33	3.3V POWER (Not used)
	P3	V33	3.3V power, pre-charge, 2nd mate
	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	Reserved	-
	P12	GND	1st mate
	P13	V12	12V power, pre-charged, 2nd mate
	P14	V12	12V (Not used)
	P15	V12	12V (Not used)

► Note

- All pins are in a single row, with a 1.27 mm (.050") pitch.
- There are total of 7pins in the signal segment and 15pins in the power segment.

8. Supports Command List

COMMAND NAME	COMMAND CODE (HEX)
General Feature Set	
1. Execute Drive Diagnostic	90h
2. Flush Cache	E7h
3. Identify Device	ECh
4. Read DMA	C8h
5. Read Multiple	C4h
6. Read Sector(s)	20h
7. Read Verify Sector(s)	40h/41h
8. Set Feature	EFh
9. Set Multiple Mode	C6h
10. Write DMA	CAh
11. Write Multiple	C5h
12. Write Sector(s)	30h
13. NOP	00h
14. Read Buffer	E4h
15. Write Buffer	E8h
Power Management Feature Set	
16. Check Power Mode	E5h/98h
17. Idle	E3h/97h
18. Idle Immediate	E1h/95h
19. Sleep	E6h/99h
20. Standby	E2h/96h
21. Standby Immediate	E0h/94h
Security Mode Feature Set	
22. Security Set Password	F1h
23. Security Unlock	F2h
24. Security Erase Prepare	F3h
25. Security Erase Unit	F4h
26. Security Freeze Lock	F5h
27. Security Disable Password	F6h
SMART Feature Set	
28. SMART Disable Operations	B0h
29. SMART Enable/Disable Autosave	B0h
30. SMART Enable Operations	B0h
31. SMART Return Status	B0h
32. SMART Execute Off-Line Immediate	B0h
33. SMART Read Data	B0h

COMMAND NAME	COMMAND CODE (HEX)
Host Protected Area Feature Set	
34. Read Native Max Address	F8h
35. Set Max Address	F9h
36. Set Max Set Password	F9h
37. Set Max Lock	F9h
38. Set Max Freeze Lock	F9h
39. Set Max Unlock	F9h
CFA Feature Set	
40. CFA Request Extended Error Code	03h
41. CFA Write Sectors Without Erase	38h
42. CFA Erase Sectors	C0h
43. CFA Writer Multiple Without Erase	CDh
44. CFA Translate Sector	87h
45. Set Features Enable/Disable 8-bit Transfer	EFh

9. SMART

9-1 SMART subcommand sets

In order to select a subcommand the host must write the subcommand code to the device's Features Register before issuing the SMART Function Set command. The subcommands are listed below.

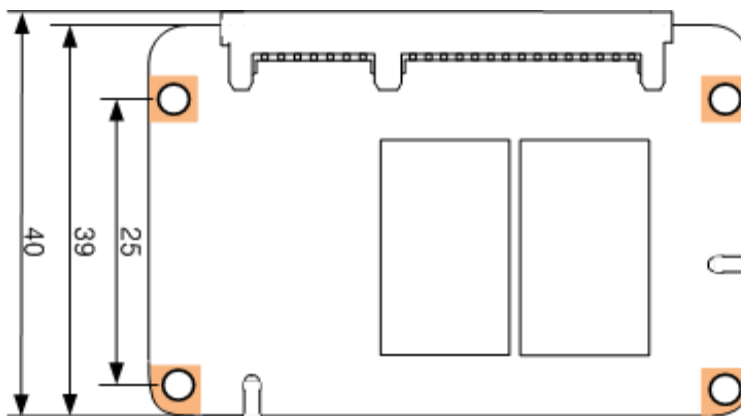
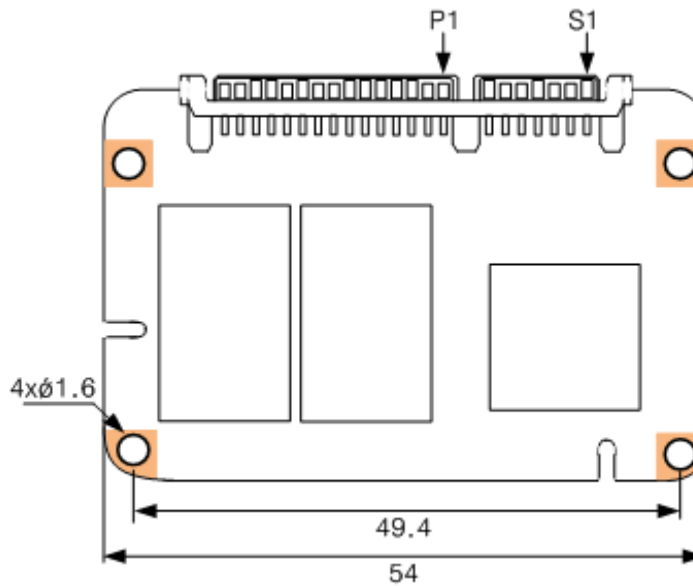
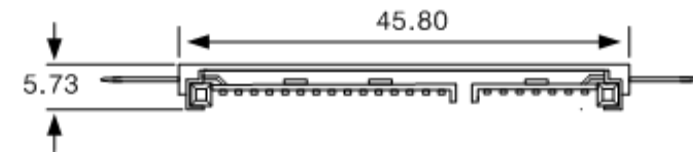
Command	Command Code (Hex)
SMART Read Data	D0h
SMART Read Attribute Threshold	D1h
SMART Enable/Disable Auto save	D2h
SMART Save Attribute Values	D3h
SMART Execute OFF-LINE Immediate	D4h
SMART Read Log	D5h
SMART Write Log	D6h
Enable SMART Operations	D8h
Disable SMART Operations	D9h
SMART Return Status	DAh

9-2 SMART Data Structure (READ DATA (D0h))

If the reserved size is below a threshold, status can be read from the Cylinder Register using the Return Status command (DAh).

Byte	Description
0 ~ 1	Revision code
2 ~ 361	Vendor Specific
362	Off-line data collection status
363	Self-test execution status byte
364 ~ 365	Total time in seconds to complete off-line data collection activity
366	Vendor Specific
367	Off-line data collection capability
368 ~ 369	SMART capability
370	Error logging capability * 7-1 Reserved * 0 1=Device error logging supported
371	Vendor Specific
372	Short self-test routine recommended polling time (in minutes)
373	Extended self-test routine recommended polling time (in minutes)
374	Conveyance self-test routine recommended polling time (in minutes)
375 ~ 385	Reserved
386 ~ 395	Firmware Version / Date Code
396 ~ 397	Number of initial invalid block (396 = MSB, 397 = LSB)
398 ~ 399	Number of run time bad block (398 = MSB, 399 = LSB)
400	Number of spare block
511	Data structure checksum

10. Mechanical Specifications



➤Note : All Dimensions are in Millimeters.

11. Ordering Information

MIT S H 016G S 2 - S

1 2 3 4 5 6 7

1. MIT : Myung Info. Tech

2. S : SSD

3. Form factor

Form factor	Content
H	Half-Slim

4. Capacity

Capacity	Content
002G	2Gbyte
004G	4Gbyte
008G	8Gbyte
016G	16Gbyte

5. Bus Architecture

Interface	Content
S	SATA

6. Product Generation

Generation	Content
2	SMI

7. Product Memory Type

Memory	Content
S	SLC

Sample)

MITSH004GS2-S

Product Spec

Form factor : Half-Slim

Capacity : 4 GB

Interface : SATA

Controller : SMI

Memory : SLC

12. Contact

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Thanks you.

