Terabit™

Enterprise 2.5'' SAS Solid State Drive

Data Sheet

Revision History

Version	Date	Changes	Note
V001	2015-06-28	Release	3rd Generation
	2016-03-18	1TB capacity added	

Contents

1. Product Features

|	
Interface	Standard SAS
Form Factor	2.5 inch
Dimension	100.2 x 69.85 x 9.8 ±0.2(mm)
Capacity	NAND MLC: 128GB~1TB
OS Compatible	Windows XP/7/8.1/2003/2008, DOS, Linux, Unix
Performance	Read up to 490MB/s Write up to 340MB/s
Power Supply	D/C 5.0V± 5%
Operating Temperature	-20~+70°C
Weight	<100g
Storage Temperature	-55~+95°C
Shock	Non-operating 1500G peak, 0.5ms Operating 50G peak, 11ms
Vibration	Jet (Random) Vibration, 10-2000Hz, 16.4G(X, Y, Z)
Burn-in Test	40 Hours
Restart Test	2200 times under Windows 7
Max. Power Consumption	Sequential Reading 2.52W Sequential Writing 3.55W Idle 0.3W
MTBF	1,000,000 Hours
Features	- Enhanced endurance by dynamic/static wear-leveling - ANSI Serial Attached SCSI, Revision 2.0 (SAS-2.0) Specification compliant - Support dynamic power management - Automatic Bad-block Management - Support TRIM and NCQ (Native Command Queuing) Command - Support BCH ECC 66bits/1024bytes - DDRIII 16bit Cache - Support Garbage Collection Function - Over-Provision Setting Supported - Conformal Coating Optional
Data Retention	@25°C: 10 years
Average Access Time	0.23ms
Certification	CE/FCC/ROHS/REACH

2. Overview

Terabit 2.5'' SAS SSD fully consists of semiconductor devices using original NAND Flash and controller that provide high reliability and high performance for data storage. Terabit 2.5'' SAS SSD has standard SAS interface, fully conform to the same mechanical and mounting requirements as standard rotating disk drives. This series of products are designed for premium Enterprise applications that require both strong reliability and high capacity such as Enterprise Computer, Rugged Computer, Enterprise Systems, Enterprise Server, Embedded Systems, Workstations and RAID. With up to 1TB capacity on NAND MLC Flash, Terabit 2.5'' SAS SSD totally goes through a variety of proofing tests such as Shock Test, Vibration Test, Burn-in Test, and Electrical Test. Well proved under -20~+70°C Enterprise temperature, this series of products can work smoothly under enterprise environments.

3. Interface

Terabit 2.5'' Enterprise SAS Solid State Drive complies SAS Standard.
- Support SATA versions 2.6 standard
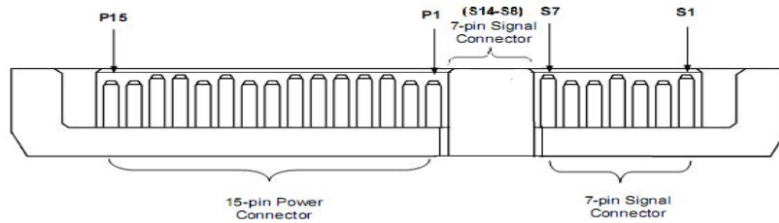- Compatible with SATAI standard

4. Physical Dimension
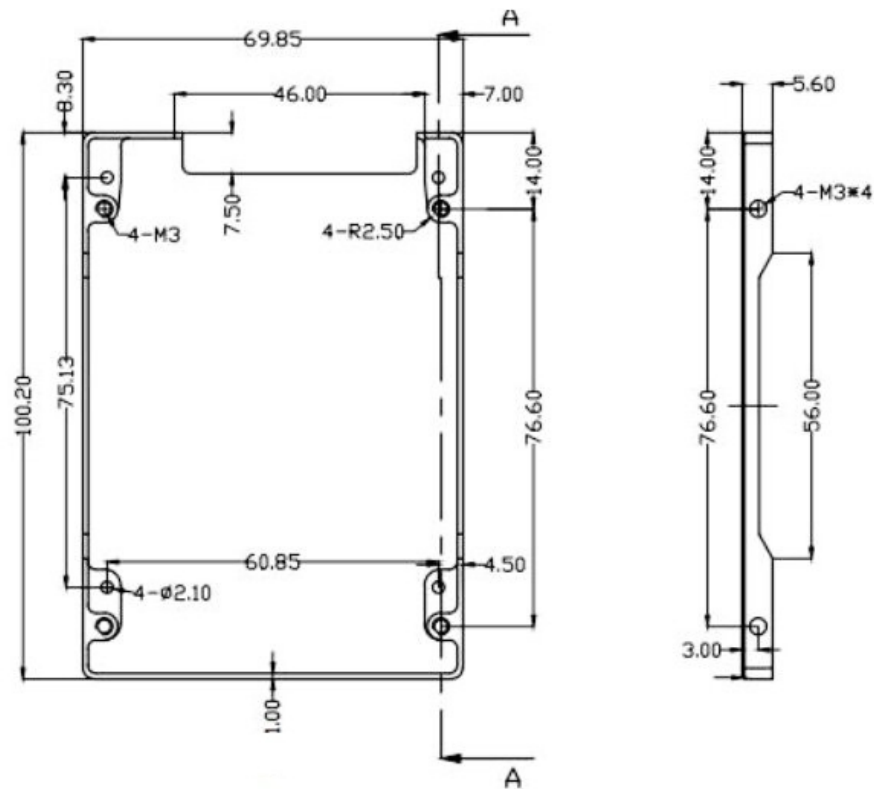
Parameter	Value	Unit
Length	100.2	mm
Width	69.85	mm
Height	9.8	mm

- All of the values are ±0.2mm

5. PIN Description

5.1 PIN Location

5.2 Signal Description

PIN#	PIN Definition	PIN#	PIN Definition
S1	GND	P1	V33
S2	TP+	P2	V33
S3	TP-	P3	V33
S4	GND	P4	GND
S5	RP-	P5	GND
S6	RP+	P6	GND
S7	GND	P7	V5
S8	GND	P8	V5
S9	TS+	P9	V5
S10	TS-	P10	GND
S11	GND	P11	DAS/DSS
S12	RS-	P12	GND
S13	RS+	P13	V12
S14	GND	P14	V12
		P15	V12

6. Power Consumption

Capacity	Idle	Read	Write	Unit
128GB	0.28	1.96	3.00	W
256GB	0.28	2.07	3.05	W
512GB	0.30	2.13	3.22	W
1024GB	0.30	2.25	3.55	W

7. Product Reliability

NAND MLC Flash：

Capacity	Endurance Total Bytes Written	Data Retention	MTBF	Warranty
128GB	Up to 260TB	@25°C >10 Years	1 Million Hours	3 Years Limited
256GB	Up to 520TB			
512GB	Up to 1040TB			
1024GB	Up to 2080TB			

*Total Bytes Written= 【（Flash P/E cycle）x (number of bits in drive)】/WAI
  WAI=1.428704724

7.1 Wear-Leveling

NAND flash devices can only undergo a limited number of program/erase cycles, and in most cases, the flash media are not used evenly. If some areas get updated more frequently than others, the lifetime of the device would be reduced significantly. Thus, Wear Leveling is applied to extend the lifespan of NAND Flash by evenly distributing write and erase cycles across the media. Terabit 2.5'' SAS Enterprise SSD supports both static and dynamic wear-leveling technology. These two algorithms guarantee each block of flash memory at same level of erase cycles to improve lifetime limitation of NAND based storage.

7.2 ECC

ECC (Error Correction Code): Enhanced configurable BCH ECC engine. Terabit 2.5'' Enterprise SAS SSD implements the BCH ECC Algorithm, which is one of the most powerful ECC algorithms in the industry. This algorithm can correct up to 66 random bit errors in each 1024 bytes.

7.3 MTBF

Mean time between failures (MTBFs) for the SSD can be predicted based on the component reliability data using the methods referenced in the SR-332 reliability prediction procedures for electronic equipment, the prediction result for this SSD is more than 1,000,000 hours.

7.4 Bad-block Management

Terabit implements an efficient bad block management algorithm into the SSD to detect factory produced bad blocks as well as those that develop over the lifetime of the device. This process is completely transparent to the user through the use of S.M.A.R.T. command tools, i.e., the user will not be aware of the existence of the bad blocks during operation.

7.5 Over Provision

Over Provision refers to a room that users could not operate. The over provision room is always used for operation optimizing such as wear leveling, garbage collection and bad-block reflection. The over provision room makes the capacity of SSD smaller, but it can effectively reduce write amplification, improve endurance and enhance the performance of Solid State Drive.

7.6 TRIM Function

Terabit 2.5'' Enterprise SAS Solid State Drive equips built-in TRIM function, it helps remark, collect and clean data garbage when the system in an idle situation, which keeps the system in a high performance status even after long-term using.

8. Performance

Capacity	Sequential Read	Sequential Write	IOPS Read (max)	IOPS Write (max)
128GB	425MB/s	270MB/s	37000	19000
256GB	460MB/s	300MB/s	40000	20000
512GB	470MB/s	310MB/s	42000	22000
1024GB	490MB/s	340MB/s	45000	24000

9. Cache

Cache	DDR2	DDR3	Capacity
Support	/	Yes	/

10. Thermal Sensor

Thermal monitors are devices for measuring temperature, and can be found in SSDs in order to issue warnings when SSDs go beyond a certain temperature. The higher temperature the thermal monitor detects, the more power the SSD consumes, causing the SSD to get aging quickly. Hence, the processing speed of a SSD should be under control to prevent temperature from exceeding a certain range. Meanwhile, the SSD can achieve power savings.

11．Certifications

EN 55022:2010

EN: 55024:2010

EN 61000-3-2:2013

EN 61000-3-3:2014

47 CFR, Part2, Part15, CISPR PUB.22

With reference to RoHS Directive 2011/65/EU recasting 2002/95/EC

12．Ordering information

Series	Model Name	Capacity	Flash	Case
2.5'' SAS Enterprise	E25SASCTMLC-128G	128GB	NAND MLC	9.8mm
	E25SASCTMLC-256G	256GB	NAND MLC	9.8mm
	E25SASCTMLC-512G	512GB	NAND MLC	9.8mm
	E25SASCTMLC-1024G	1024GB	NAND MLC	9.8mm

* No EOL Plan

13. Contact Information

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