Terabit™

Industrial Half Slim SATAIII Solid State Drive

Data Sheet

Revision History

Version	Date	Changes	Note
V001	2015-06-28	Release	

Contents

1. Product Features

Interface	7PIN+15PIN
Form Factor	Half Slim SATAIII 6.0Gbps
Dimension	54.0 x 39.8 x 4.0 ±0.2(mm)
Capacity	NAND MLC: 8GB~128GB NAND SLC: 4GB~64GB
Performance	Read up to 505MB/s Write up to 190MB/s
Power Supply	D/C 5.0V± 5%
Operating Temperature	Standard: 0~+70°C Industrial: -20~+70°C Extended: -40~+85°C
Weight	<50g
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	72 Hours
Falling Test	80cm free falling
Max. Power Consumption	Sequential Reading 0.94W Sequential Writing 1.58W Idle 0.22W
MTBF	2,000,000 Hours
Features	- Enhanced endurance by dynamic/static wear-leveling - Support dynamic power management - Support S.M.A.R.T function - Automatic Bad-block Management - Support TRIM and NCQ (Native Command Queuing) Command - Support BCH ECC 66bits/1024bytes - Garbage Collection Function - On-board UPS optional
Data Retention	@25°C: 10 years
Certification	CE/FCC/RoHS

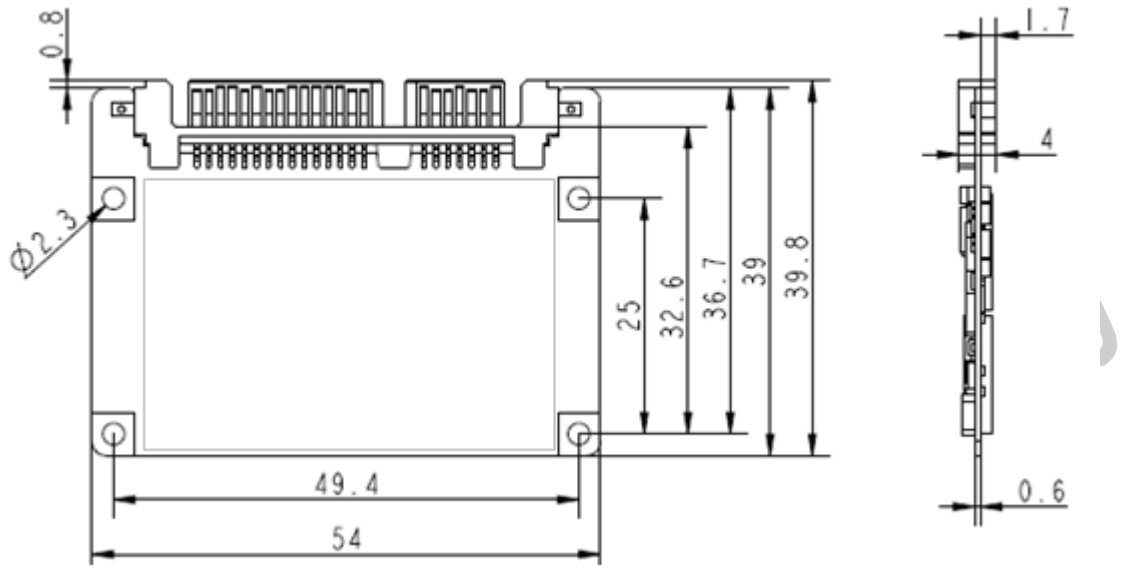
2. Overview

Terabit Half Slim SATAIII SSD fully consists of semiconductor devices using original NAND Flash and Industrial controller, which provide high reliability and high performance for data storage. Terabit Half Slim SATAIII SSD has standard 22PIN interfaces, fully conform to the same mechanical and mounting requirements as standard rotating disk drives. This series of products are designed for premium industrial applications that require both strong reliability and high capacity such as Industrial Computer, Rugged Computer, Industrial Systems, Industrial Server, Embedded Systems, Workstations, RAID and Defense. With up to 128GB capacity on NAND MLC Flash and 64GB on SLC Flash, Terabit Half Slim SATAIII SSD totally goes through a variety of proofing tests such as Shock Test, Vibration Test, Burn-in Test, and Twisting Test. Well proved under -40~+85°C wide temperature and equipped with Power Failure Protect and Over Load Protect, this series of products can work smoothly under severe environments.

3. Interface

Terabit Half Slim SATAIII Solid State Drive complies SATA3.0 Standard.
Compliant with SATA2.0 Standard.

4. Physical Dimension

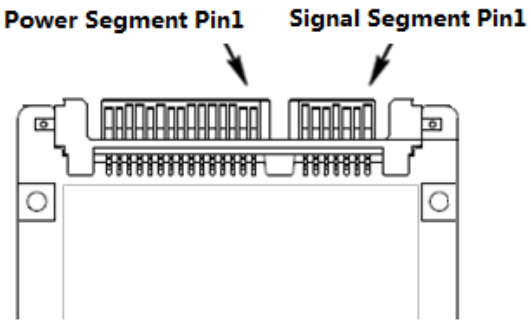


Parameter	Value	Unit
Length	54.0	mm
Width	39.8	mm
Height	4.0	mm

- All of the values are ±0.2mm

5. PIN Description

5.1 PIN Location



5.2 Signal Description

PIN#	PIN Name	PIN Definition
Signal		
S1	GND	2nd mate
S2	A+	Differential signal pair A
S3	A1	From physical layer electronics
S4	GND	2nd mate
S5	B-	Differential signal pair B
S6	B+	From physical layer electronics
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 (unused)
P14	V12	12V power (unused)
P15	V12	12V power (unused)

6. Power Consumption

Capacity	Idle	Read	Write	Unit
04GB	0.22	0.70	0.78	W
08GB	0.22	0.74	0.81	W
16GB	0.22	0.76	0.97	W
32GB	0.27	0.80	1.12	W
64GB	0.27	0.88	1.33	W
128GB	0.28	0.94	1.58	W

7. Product Reliability

NAND MLC Flash：

Capacity	Endurance Total Bytes Written	Data Retention	MTBF	Warranty
08GB	Up to 16TB	@25°C >10 Years	2 Million Hours	3 Years Limited
16GB	Up to 33TB			
32GB	Up to 65TB			
64GB	Up to 130TB			
128GB	Up to 260TB			

NAND SLC Flash：

Capacity	Endurance Total Bytes Written	Data Retention	MTBF	Warranty
04GB	Up to 225TB	@25°C >10 Years	2 Million Hours	5 Years Limited
08GB	Up to 450TB			
16GB	Up to 900TB			
32GB	Up to 1800TB			
64GB	Up to 3600TB			

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

7.1 Wear-Leveling

Terabit Half Slim SATAIII SSD support 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 Half Slim SATAIII Industrial 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 2,000,000 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 S.M.A.R.T Function

S.M.A.R.T stands for Self-Monitoring, Analysis and Reporting Technology. This technology enables the PC to predict the future failure of hard disk drives. Through the S.M.A.R.T. system, Terabit Half Slim SSD incorporates a suite of advanced diagnostics that monitor the internal operation of the drive and provide an early warning for many types of potential problems. When a potential problem is detected, the SSD can be repaired or replaced before any data is lost or damaged.

7.6 TRIM Function

Terabit Solid State Drive equips built-in Garbage Collection and 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)
04GB	104MB/s	73MB/s	5000	4300
08GB	172MB/s	95MB/s	5800	4400
16GB	259MB/s	122MB/s	6900	5700
32GB	368MB/s	145MB/s	7700	6000
64GB	476MB/s	175MB/s	8500	6200
128GB	505MB/s	190MB/s	9000	6600

*Performance will vary due to different software or platforms

9. Cache

Cache	DDR2	DDR3	Capacity
Support	/	/	/

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
Half Slim SATAIII SSD	T25HS3XTMLC-008G	08GB	NAND MLC	/
	T25HS3XTMLC-016G	16GB	NAND MLC	/
	T25HS3XTMLC-032G	32GB	NAND MLC	/
	T25HS3XTMLC-064G	64GB	NAND MLC	/
	T25HS3XTMLC-128G	128GB	NAND MLC	/

Series	Model Name	Capacity	Flash	Case
Half Slim SATAIII SSD	T25HS3XTSLC-004G	04GB	NAND SLC	/
	T25HS3XTSLC-008G	08GB	NAND SLC	/
	T25HS3XTSLC-016G	16GB	NAND SLC	/
	T25HS3XTSLC-032G	32GB	NAND SLC	/
	T25HS3XTSLC-064G	64GB	NAND SLC	/

*XT refers to temperature range，ST refers to standard temperature，CT refers to industrial temperature，KT refers to extended temperature.

13. Contact Information

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