

TerabitTM

Industrial 7PIN SATA Disk On Module

Data Sheet

Terabit Technology

Revision History

Version	Date	Changes	Note
V001	2013-06-28	Release	

Terabit Technology

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1. Product Features

Interface	7PIN
Form Factor	SATA DOM
Dimension	180D: 39.3 x 22.0 x 7.1 ±0.2(mm) 90D/270D: 31.3 x 22.0 x 14.0 ±0.2(mm)
Capacity	NAND MLC: 2~128GB NAND SLC: 1~32GB
Performance	Read up to 168MB/s Write up to 93MB/s
Power Supply	D/C 5.0V± 5%
Operating Temperature	Standard: 0~+70°C Industrial: -20~+70°C Extended: -40~+85°C
Weight	<20g
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	1.1 meter free falling
Max. Power Consumption	Sequential Reading 0.48W Sequential Writing 0.65W 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
Data Retention	@25°C: 10 years
Certification	CE/FCC/RoHS

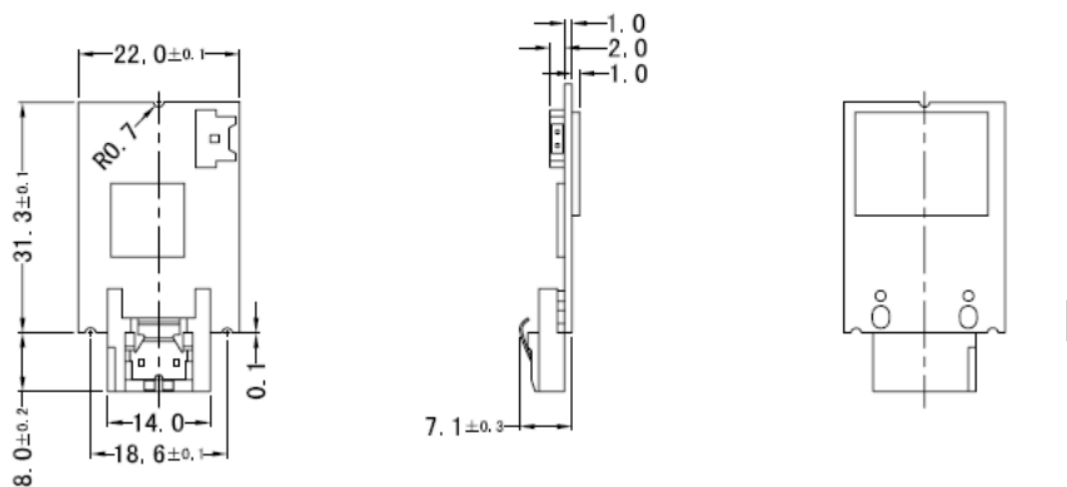
2. Overview

Terabit 7PIN SATA Disk On Module fully consists of semiconductor devices using original NAND Flash and Industrial Controller that provide high reliability and high performance for data storage. Terabit 7PIN SATA Disk On Module has 7PIN SATA interfaces, fully conform to the same mechanical and mounting requirements as rotating DOMs. This series of products are designed for premium industrial applications that require strong reliability or as supplementary capacity such as Industrial Computer, Gaming Machine, Industrial Systems, Industrial Server, Embedded Systems, Board PC, Panel PC and Hand-Devices. With up to 128GB capacity, Terabit 7PIN SATA DOM totally goes through a variety of proofing tests such as Shock Test, Vibration Test and Burn-in 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 7PIN SATA Disk On Module complies SATA2.0 Standard.

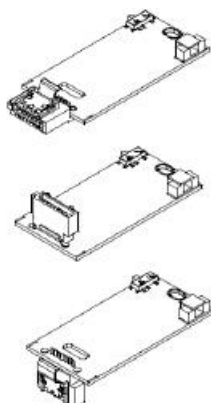
4. Physical Dimension



180D version

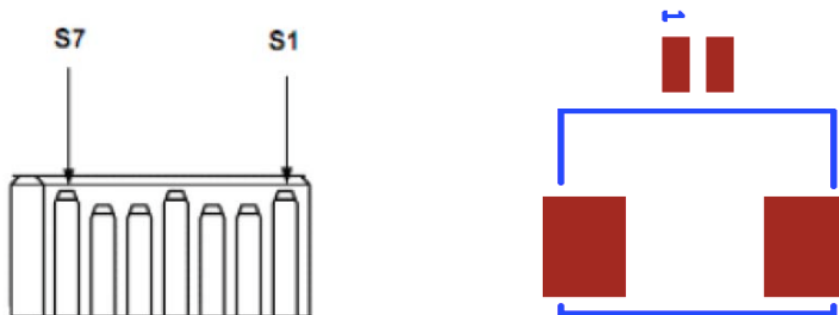
Parameter	Value	Unit
Length	31.3	mm
Width	22.0	mm
Height	7.1	mm

- All of the values are $\pm 0.2\text{mm}$
- 90D and 270D optional



5. PIN Description

5.1 PIN Location



5.2 Signal Description

PIN#	PIN Name	PIN Definition
Signal		
S1	GND	
S2	A+	Differential signal pair A From physical layer electronics
S3	A1	
S4	GND	
S5	B-	Differential signal pair B From physical layer electronics
S6	B+	
S7	GND	
Power		
P1	GND	
P2	VCC5	5.0V power
P3	NC	
P4	NC	

6. Power Consumption

Capacity	Idle	Read	Write	Unit
01GB	0.18	0.27	0.36	W
02GB	0.18	0.30	0.41	W
04GB	0.18	0.32	0.45	W
08GB	0.20	0.36	0.47	W
16GB	0.20	0.39	0.52	W
32GB	0.22	0.45	0.58	W
64GB	0.22	0.48	0.65	W

7. Product Reliability

NAND MLC Flash:

Capacity	Endurance Total Bytes Written	Data Retention	MTBF	Warranty
02GB	Up to 4TB	@25°C >10 Years	2 Million Hours	3 Years Limited
04GB	Up to 8TB			
08GB	Up to 16TB			
16GB	Up to 32TB			
32GB	Up to 65TB			
64GB	Up to 130TB			

NAND SLC Flash:

Capacity	Endurance Total Bytes Written	Data Retention	MTBF	Warranty
01GB	Up to 55TB	@25°C >10 Years	2 Million Hours	5 Years Limited
02GB	Up to 110TB			
04GB	Up to 220TB			
08GB	Up to 450TB			
16GB	Up to 900TB			
32GB	Up to 1800TB			

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

7.1 Wear-Leveling

Terabit 7PIN SATA Disk On Module 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 7PIN SATA DOM implements the BCH ECC Algorithm, which is one of the most powerful ECC algorithms in the industry. This algorithm can correct up to 32 random bit errors in each 512 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 7PIN SATA DOM 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 TRIM function, it helps locate 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	IOPS Write
01GB	25 MB/s	13 MB/s	1900	1400
02GB	45 MB/s	18 MB/s	2000	1600
04GB	58 MB/s	21 MB/s	2100	1900
08GB	84 MB/s	39 MB/s	2300	2100
16GB	101 MB/s	48 MB/s	2600	2400
32GB	142 MB/s	61 MB/s	2900	2500
64GB	168 MB/s	93 MB/s	3000	2700

9. Cache

Cache	DDR2	DDR3	Capacity
/	/	/	/

10. Thermal Sensor

Temperature Sensor	Yes	No
	Support	/

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	Type*
7PIN SATA DOM	T07DOMXTMLC-02G	02GB	NAND MLC	Optional
	T07DOMXTMLC-04G	04GB	NAND MLC	Optional
	T07DOMXTMLC-08G	08GB	NAND MLC	Optional
	T07DOMXTMLC-16G	16GB	NAND MLC	Optional
	T07DOMXTMLC-32G	32GB	NAND MLC	Optional
	T07DOMXTMLC-64G	64GB	NAND MLC	Optional

Series	Model Name	Capacity	Flash	Type
7PIN SATA DOM	T07DOMXTSLC-01G	01GB	NAND SLC	Optional
	T07DOMXTSLC-02G	02GB	NAND SLC	Optional
	T07DOMXTSLC-04G	04GB	NAND SLC	Optional
	T07DOMXTSLC-08G	08GB	NAND SLC	Optional
	T07DOMXTSLC-16G	16GB	NAND SLC	Optional
	T07DOMXTSLC-32G	32GB	NAND SLC	Optional

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

*90D, 180D, 270D for selections.

*Delivery with power cable.

13. Contact Information

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