Terabit

Industrial Flash Memory CFast Card SATAIII

Data Sheet

Revision History

Version	Date	Changes	Note
V001	2015-06-28	Release	2nd Generation

Contents

1. Product Features

Interface	17PIN+7PIN
Form Factor	SATAIII
Dimension	36.4 x 42.8 x 3.3 ±0.2(mm)
Capacity	NAND MLC: 2~256GB NAND SLC: 1~64GB
Performance	Read up to 465MB/s Write up to 160MB/s
Power Supply	D/C 3.3V ± 5%
Operating Temperature	Standard: 0~+70°C Industrial: -20~+70°C Extended: -40~+85°C
Weight	<20g
Storage Temperature	-55~+95°C
Humidity	8%~95%(non-condensing)
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 0.72W Sequential Writing 0.80W Idle 0.21W
MTBF	2,000,000 Hours
Access Time	0.1ms
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

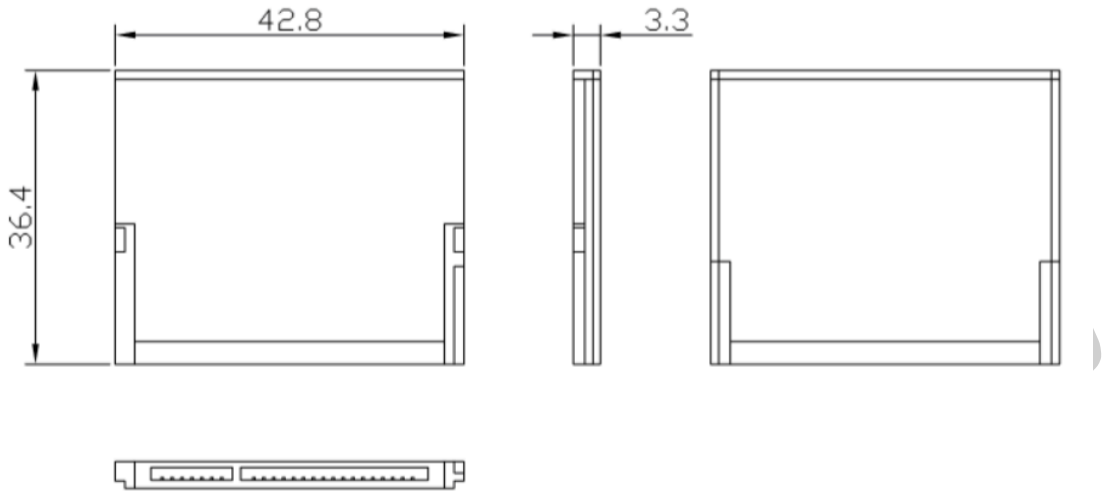
2. Overview

Terabit CFast SATAIII Flash Card fully consists of semiconductor devices using original NAND Flash and Industrial Controller that provide high reliability and high performance for data storage. Terabit CFast SATAIII Card has standard 24PIN 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 performance such as Industrial Camera, Personal Camera, Outdoor Surveillance, Industrial Systems, Data Recording and Embedded Systems. With up to 256GB capacity, Terabit CFast SATAIII Card 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 CFast Card complies SATA3.0 Standard.

4. Physical Dimension

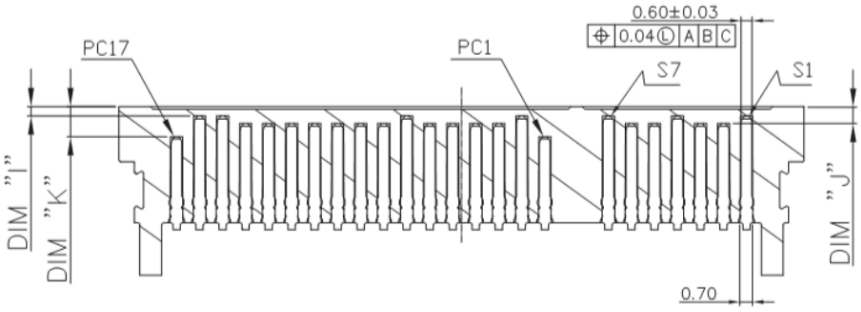


Parameter	Value	Unit
Width	36.4	mm
Length	42.8	mm
Thickness	3.3	mm

- All the values are ±0.2mm

5. PIN Description

5.1 PIN Location



5.2 Signal Description

PIN#	Assignment
Signal	
S1	GND
S2	RX+
S3	RX-
S4	GND
S5	TX-
S6	TX+
S7	GND
Power	
P1	LX (Device Sleep Function Optional)
P2	GND
P3	NC
P4	NC
P5	NC
P6	NC
P7	GND
P8	NC (LED Function Optional)
P9	NC
P10	NC (Write Protect Function Optional)
P11	NC (Write Protect Function Optional)
P12	NC (Write Protect Function Optional)
P13	D3V3
P14	D3V3
P15	GND
P16	GND
P17	LX1

6. Power Consumption

Capacity	Idle	Read	Write	Unit
01GB	0.18	0.43	0.46	W
02GB	0.18	0.43	0.46	W
04GB	0.18	0.45	0.51	W
08GB	0.20	0.47	0.56	W
16GB	0.20	0.53	0.62	W
32GB	0.21	0.62	0.71	W
64GB	0.21	0.68	0.76	W
128GB	0.21	0.70	0.78	W
256GB	0.21	0.72	0.80	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			
128GB	Up to 260TB			
256GB	Up to 520TB			

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 225TB			
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 SATAIII CFast Card 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 SATAIII CFast Card implements the BCH ECC Algorithm, which is one of the most powerful ECC algorithms in the industry. This algorithm can correct up to 12 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 SATAIII CFast Card 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 collects and cleans 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	118 MB/s	30 MB/s	2200	1800
02GB	123 MB/s	38 MB/s	2300	1900
04GB	151 MB/s	52 MB/s	2600	2200
08GB	172 MB/s	60 MB/s	2800	2500
16GB	191 MB/s	77 MB/s	3000	2700
32GB	280 MB/s	94 MB/s	3500	2800
64GB	376 MB/s	109 MB/s	3700	3000
128GB	427 MB/s	127 MB/s	4000	3100
256GB	465 MB/s	170 MB/s	5000	3500

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
SATAIII CFast Card	TCFAST3XTMLC-02G	02GB	NAND MLC
	TCFAST3XTMLC-04G	04GB	NAND MLC
	TCFAST3XTMLC-08G	08GB	NAND MLC
	TCFAST3XTMLC-16G	16GB	NAND MLC
	TCFAST3XTMLC-32G	32GB	NAND MLC
	TCFAST3XTMLC-64G	64GB	NAND MLC
	TCFAST3XTMLC-128G	128GB	NAND MLC
	TCFAST3XTMLC-256G	256GB	NAND MLC

Series	Model Name	Capacity	Flash
SATAIII CFast Card	TCFAST3XTSLC-01G	01GB	NAND SLC
	TCFAST3XTSLC-02G	02GB	NAND SLC
	TCFAST3XTSLC-04G	04GB	NAND SLC
	TCFAST3XTSLC-08G	08GB	NAND SLC
	TCFAST3XTSLC-16G	16GB	NAND SLC
	TCFAST3XTSLC-32G	32GB	NAND SLC
	TCFAST3XTSLC-64G	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

Shanghai Terabit Technology Co., Ltd

Telephone: +86.21.34303488
Fax: +86.21.34303488
Email: sales@terabitsys.com
Website: www.terabitsys.com

Address: #513, No.38 Building, Wanke VMO, No. 2049 Pujin Road, Pujiang Town, Minhang District, Shanghai, 201112 P.R. China