SATA III 6Gb/s SSD

SSD460K-VS1

Datasheet

Products	Product Description
TS2TSSD460K-VS1	2.5" SSD, SATA3, 3D TLC, DRAM-less, PE: 3K
TS1TSSD460K-VS1	
TS512GSSD460K-VS1	**Datasheet version**
TS256GSSD460K-VS1	1.1
TS128GSSD460K-VS1	
TS64GSSD460K-VS1	

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Revision History

Revision No.	History	Released Date	Editor by
1.0	First version (WD BICS5)	2024/05/21	PM
1.1	Update SMART define	2025/02/25	PM

Transcend SSD460K-VS1 Features

Part Name	Capacity
TS2TSSD460K-VS1	2TB
TS1TSSD460K-VS1	1TB
TS512GSSD460K-VS1	512GB
TS256GSSD460K-VS1	256GB
TS128GSSD460K-VS1	128GB
TS64GSSD460K-VS1	64GB

FEATURES

- SATA 6Gbps
- 3D TLC NAND Flash
- Global wear-leveling function
- Enhance Bad block management
- Power shield function
- LDPC ECC (Error correction code) functionality
- TRIM and NCQ command function
- Advanced Garbage Collection
- Supports S.M.A.R.T. Function
- Dynamic Thermal Throttling (Default)
- Supports DEVSLP mode (Optional)
- Anti-sulfur resistor

PERFORMANCE[1)]

- Data Transfer Rate
  - Sequential Read 560 MB/s
  - Sequential Write 500 MB/s

RELIABILITY[1)]

- TBW
  - 2TB 4376 TB
  - 1TB 2188 TB
  - 512GB 1094 TB
  - 256GB 514 TB
  - 128GB 245 TB
  - 64GB 122 TB
- UBER 10^{-15}
- DWPD up to 1.95 DWPD
- MTBF 3,000,000 hours
- Data Retention 1 year
- Warranty 3 years

ENVIRONMENTAL SPECIFICATIONS[1)]

- Temperature
  - Operating -20°C to 75°C
  - Non-operating -55°C to 85°C
- Humidity(non-condensing) 5%~95%
- Shock 1500G, 0.5ms
- Vibration 20G, 7~2000Hz

POWER REQUIREMENTS[1)]

- Supply voltage / Tolerance 5V±5%
- Active (max) 1.9 W
- Idle (max) 0.3 W

PHYSICAL DIMENSION

- Width 69.85±0.25mm
- Length 100.00±0.25mm
- Height(max) 6.8±0.2mm
- Weight Max 54g

Note:

1) For detail information, please refer to document content

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1. Introduction

1.1 General Feature Information

Hardware Feature

- SATA 6Gbps
- Controller SM2259XT
- 3D TLC NAND Flash
- Temperature operation from -20°C to 75°C
- Power shield function
- Anti-sulfur resistor

Firmware Feature

- Global wear-leveling function
- Early Move function
- Read Retry function
- Enhance Bad block management function
- LDPC ECC(Error Correction Code) function
- TRIM Command function
- Advanced Garbage Collection function
- StaticDataRefresh function
- S.M.A.R.T. Function
- Dynamic Thermal Throttling (Default)
- Supports DEVSLP mode (Optional)

Software Feature

- Transcend Scope Pro
- Transcend Control Center
- Transcend One Touch Recovery

1.2 Product List

Form Factor	Part Name	Capacity
2.5 inch	TS2TSSD460K-VS1	2TB
	TS1TSSD460K-VS1	1TB
	TS512GSSD460K-VS1	512GB
	TS256GSSD460K-VS1	256GB
	TS128GSSD460K-VS1	128GB
	TS64GSSD460K-VS1	64GB

1.3 Ordering Information

TS XXX G SSD 460K - VS1

1 2 3 4 5 6

1 – Transcend

2 – SSD Density

3 – G: Gigabyte; T: Terabyte

4 – 2.5” SATA device

5 – 3D TLC NAND flash

Default Dynamic Thermal Throttling

Without DRAM Chip

Temperature operation from -20°C to 75°C

Anti-sulfur resistor

6 – New Version

2. Product Specifications

2.1 Interface and Compliance

- SATA3, compatible to SATA2 and SATA1
- Compatible with ATA/ATAPI-7 Standard
- Native Command Queuing(NCQ) Command Set
- RoHS Compliance
- CE, UKCA, FCC and BSMI Compliance

2.2 Drive Capacity

[Table 1] User Capacity and Addressable Sectors

	64GB	128GB	256GB
User-Addressable Sectors	125,045,424	250,069,680	500,118,192
Byte per Sector	512 Byte		

	512GB	1TB	2TB
User-Addressable Sectors	1,000,215,216	2,000,409,264	4,000,797,360
Byte per Sector	512 Byte		

2.3 System Performance

[Table 2] Sequential Read / Write Performance

Read / Write	64GB	128GB	256GB	512GB	1TB	2TB
Sequential Read	330MB/s	560MB/s	560MB/s	560MB/s	560MB/s	560MB/s
Sequential Write	270MB/s	490MB/s	490MB/s	500MB/s	500MB/s	500MB/s

Note: Maximum transfer speed recorded

1) 25°C, test on GIGABYTE GA-Z87X-D3H, 4GB, Windows® 7 Professional with AHCI mode, benchmark utility CrystalDiskMark (version 6.0.2), copied file 1000MB.

2) The recorded performance is obtained while the SSD is not operated as an OS disk Physical Specification.

[Table 3] Random Read / Write Performance

Read / Write	64GB	128GB	256GB	512GB	1TB	2TB
Random Read IOPS	24K	30K	30K	45K	45K	55K
Random Write IOPS	60K	80K	80K	80K	80K	80K

Note: Maximum transfer speed recorded

1) 25°C, test on GIGABYTE GA-Z87X-D3H, 4GB, Windows® 7 Professional with AHCI mode, benchmark utility IOmeter2006 with 4K file size and queue depth of 32, unit IOPs

2) The recorded performance is obtained while the SSD is not operated as an OS disk Physical Specification.

2.4 Supply Voltage

[Table 4] Supply Voltage

Item	Requirements
Allowable voltage	5V±5%
Allowable noise / ripple	100 mV p-p or less

2.5 System Power Consumption

[Table 5] Power Consumption

Read / Write	64GB	128GB	256GB	512GB	1TB	2TB
Active Write (Max.)[1)]	1.1W	1.5W	1.5W	1.7W	1.7W	1.9W
Active Read (Max.)[1)]	1.1W	1.4W	1.4W	1.5W	1.5W	1.5W
Idle	0.3W	0.3W	0.3W	0.3W	0.3W	0.3W
DEVSLP	5mW					

Note:

1) The power consumption is measured under SSD operation at maximum performance. The value is affected by system operation performance and workload.

2.6 Environment Specifications

[Table 6] Environment Specification

Features	Operating[1)]	Non-Operating[2)]
Temperature	-20°C to +75°C	-55°C to 85°C
Temperature Gradient	60°C/Hr	60°C/Hr
Humidity	5% to 95%, non-condensing	
Shock	1500G, duration 0.5 ms, 3 axis[3)]	
Vibration	20G, 7~2000Hz, 3 axis[4)]	

Note:

1) The operating specification is regarded as Ambient Temperature. Extended grade (-20°C to +75°C) and Industrial grade (-40°C to +85°C) indicate the temperature conditions for testing devices on programmable temperature and humidity chamber room.

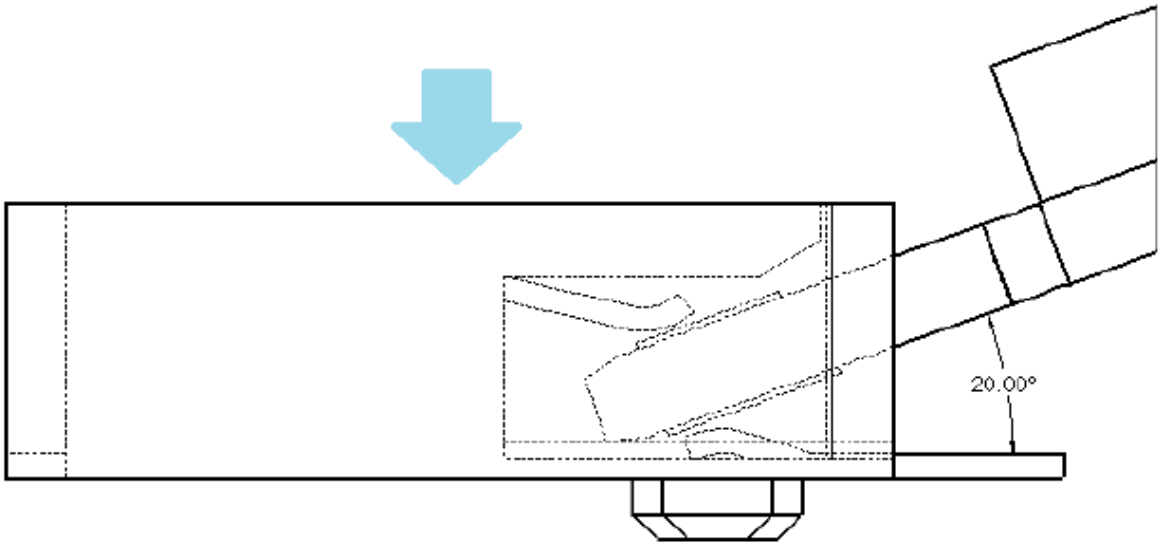
2) The non-operating specification is regarded as storage specification.

3) Refer IEC 68-2-27 standard.

4) Refer IEC 68-2-6 standard.

Recommended Measurement Point

Recommended temperature measurement point is in the center of the connector inserted by the device. Sufficient airflow is recommended for proper operation on heavier workloads within the device operating temperature.



2.7System Reliability

[Table 7] Telcordia SR332 issue 4 MTBF Specifications

Parameter	64GB	128GB	256GB	512GB	1TB	2TB
MTBF	3,000,000 hours					

Note:

1) The calculation is based on 25°C.

[Table 8] UBER Specifications

Parameter	64GB	128GB	256GB	512GB	1TB	2TB
UBER	10^{-15}					

Note:

1) Uncorrectable Bit Error Rate (UBER) is a metric for the rate of occurrence of data errors, equal to the number of data errors per bits read as specified in the JESD218 document of JEDEC standard. For the client application, JEDEC recommends that UBER shall be below 10^{-15}.

[Table 9] TBW (Terabytes Written) Specifications

Parameter	64GB	128GB	256GB	512GB	1TB	2TB
TBW	122 TB	245 TB	514 TB	1094 TB	2188 TB	4376 TB

Note:

1) TBW specification follows JESD219A Client workload.

[Table 10] Drive Write Per Day (DWPD) Specifications

Parameter	64GB	128GB	256GB	512GB	1TB	2TB
DWPD[1)]	1.74	1.75	1.83	1.95	1.95	1.95

Note:

1) DWPD is based on [Table 13] Warranty year to calculate.

[Table 11] Data Retention Specifications

Parameter	64GB	128GB	256GB	512GB	1TB	2TB
Data Retention	1 year					

Note:

1) Data retention was measured by assuming that SSD reaches the maximum rated endurance at 30°C under power-off state.

2) The data retention is defined in JESD218 Requirements for standard classes of SSDs.

[Table 12] Power On to Ready

Parameter	64GB	128GB	256GB	512GB	1TB	2TB
Setup time	0.23 s					

[Table 13] Warranty

Parameter	64GB	128GB	256GB	512GB	1TB	2TB
Warranty	3 years limited					

[Table 14] Regulations

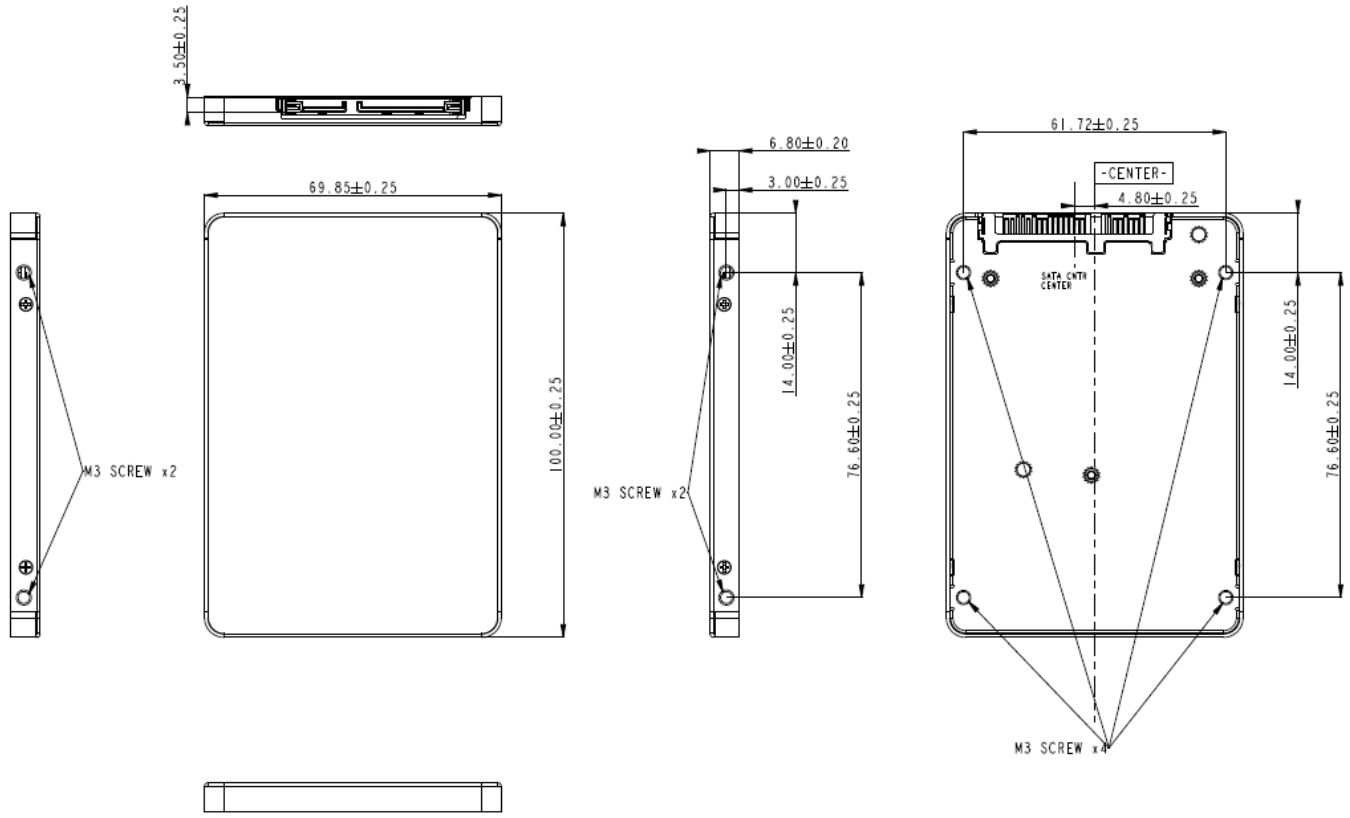
Parameter	64GB	128GB	256GB	512GB	1TB	2TB
Compliance	CE, UKCA, FCC and BSMI					

3. Mechanical Specification

The figure below illustrates the Transcend 2.5 inch Solid State Drive.

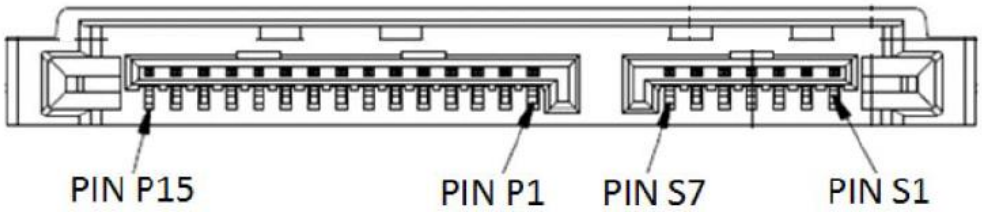
[Table 15] Physical Dimensions and Weight

Model	Height (mm)	Width (mm)	Length (mm)	Weight (gram)
64GB/128GB/256GB/512GB/1TB/2TB	6.8±0.2	69.85±0.25	100.00±0.25	Max 54 g



4. Pin Assignments

4.1 Serial ATA Interface Connector



4.2 Pin Assignments

[Table 16] Pin Assignments

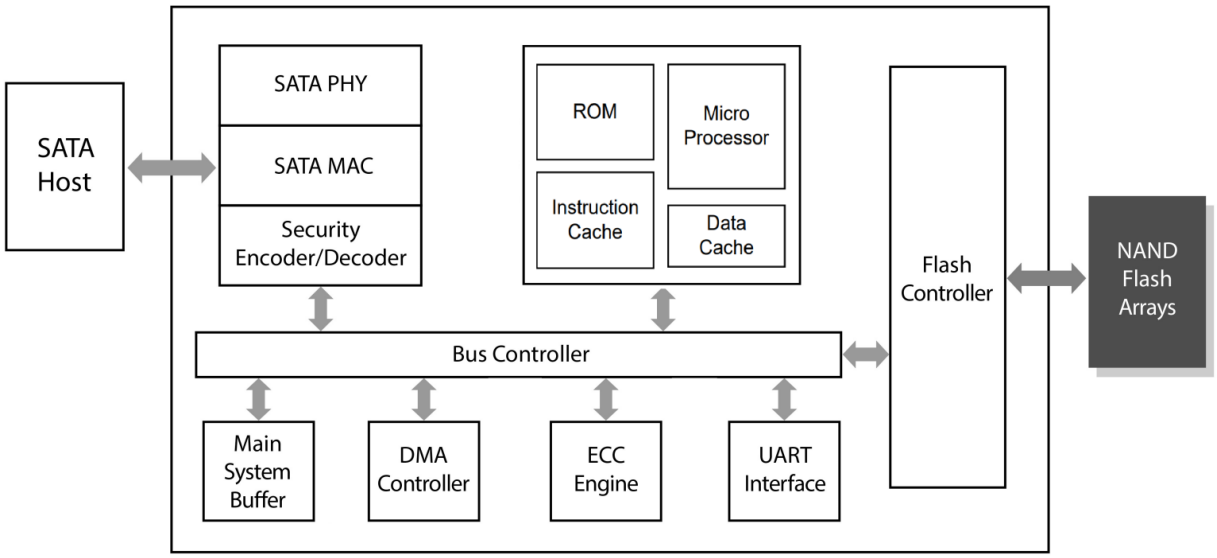
Word.	No.	Plug Connector Pin Definition	
Signal	S1	GND[1)]	2nd mate / Ground
	S2	A +	Differential Signal A from Phy
	S3	A -	
	S4	GND[1)]	2nd mate / Ground
	S5	B -	Differential Signal B from Phy
	S6	B +	
	S7	GND[1)]	2nd mate / Ground
Power	P1	NC[4)]	
	P2	NC[4)]	
	P3	DEVSLP[3)]	Device Activity Signal
	P4	GND[1)]	1st mate / Ground
	P5	GND[1)]	2nd mate / Ground
	P6	GND[1)]	2nd mate / Ground
	P7	5V	5V Power
	P8	5V	5V Power
	P9	5V	5V Power
	P10	GND[1)]	2nd mate / Ground
	P11	DAS[2)]	Device Activity Signal
	P12	GND[1)]	1st mate / Ground
	P13	NC[4)]	
	P14	NC[4)]	
	P15	NC[4)]	

Note:

1) For SATA 2.5 inch SSD, these pins are connected to GND internally.
2) Device Activity Signal / Disable Staggered Spin-up
3) Device Sleep is an input pin. If driven high, the host is informing the SSD to enter a low power state.
4) NC means the SSD does not connect to these pins internally.

5. Block Diagram and Function Explanations

5.1 Block Diagram



5.2 Function Explanations

5.2.1 Global Wear Leveling Function

Global wear leveling ensures that every block has an even erase count. This helps to extend the life expectancy of an SSD.

There are three main processes in global wear leveling:

(1) Record the block erase count and save this in the wear-leveling table.

(2) Find the static-block and save this in the wear-leveling pointer.

(3) Check the erase count when a block is pulled from the pool of spare blocks. If the block erase count is larger than WEARCNT, then swap the static-block and the over-count-block.

5.2.2 Bad Block Management Function

When the flash encounters ECC fail, program fail or erase fail, the controller will mark the block as a bad block. This will prevent the usage of bad blocks which may result in data loss in the future.

5.2.3 Enhanced S.M.A.R.T. function

Transcend SSD supports S.M.A.R.T. command (Self-Monitoring, Analysis, and Reporting Technology) that allows users to read the health information of the SSD. Transcend also define some innovated S.M.A.R.T. features which allows the user to evaluate the status of the SSD in a much more efficient way.

5.2.4 DEVSLP Function(Optional)

DevSlp or DevSleep (regarded as device sleep or SATA DEVSLP) is a feature in SATA SSD which allows them to go into a low power "device sleep" mode when sent the appropriate signal, which uses one or two orders of magnitude less power than a traditional idle (about 5 mW). This function can help save more battery power in platform idle, so that the user can operate the platform for longer time.

5.2.5 StaticDataRefresh Technology

Normally, ECC engine corrections are taken place without affecting the host normal operations. As time passes by, the number of error bits accumulated in the read transaction exceeds the correcting capability of the ECC engine, resulting in corrupted data being sent to the host. In order to prevent such occurrence, the controller monitors the error bit levels at each read operation; when it reaches the preset threshold value, the controller automatically performs data refresh to “restore” the correct charge levels in the cell. This implementation practically restores the data to its original, error-free state, and hence lengthening data life.

5.2.6 PS(Power shield) Function

Power Shield (PS) is a basic technology supported by all Transcend's embedded SSDs to prevent internal NAND flash data loss in event of a sudden power outage. The internal voltage detection circuit (VDT) of the controller monitors the external power supply. When the external voltage drops from 5V to 4V or from 3.3V to 2.7V, the VDT activates the PS detection mechanism. When a sudden power outage occurs, the internal power shield circuit would trigger the PS function so that the controller will stop accepting new write commands. The write operation is terminated to ensure that the firmware and the data in the NAND flash are undamaged.

When the external voltage drops to a certain level, the internal voltage detection circuit (VDT) of the controller activates the PS mechanism. The SSD controller then stops accepting new write commands from the host, ensuring the integrity of existing data for the NAND flash.

The PS function ensures the safety of the data which has already been written into the flash before sudden power outage.

5.2.7 Dynamic Thermal Throttling(Default)

For 3D TLC SSD applications, when operation temperature increases, system CLK will decrease to protect the SSD and controller with dynamic thermal throttling algorithm. The read/write speeds of the SSD will change at different temperature levels in order to extend its lifespan.

5.2.8 Transcend Scope Pro

Transcend’s Scope Pro is a convenient software package that helps users monitor and manage SSD status via an intuitive interface. It offers various useful features, including drive information and S.M.A.R.T. status monitoring, diagnostic scan, secure erase, health indication, system clone, and monitoring. For more information, please refer the website link. https://us.transcend-info.com/Embedded/Essay-20

5.2.9 Early Move Function

Early move detects and corrects potential data errors. If error bits in a block reach upper limit, then the data should be moved to another block and the original block should be erased.

5.2.10 Read Retry Function

Read retry is designed for flash memory to adjust the read reference voltage and eliminate the read error

5.2.11 Anti-sulfur resistor

To prevent sulfurization, resistors should be made sulfur-resistant. Transcend`s anti-sulfur approach is to cover and therefore isolate the electrode, thus preventing hydrogen sulfide from coming into contact with the silver. Atmospheric sulfur is on the rise due to increasing levels of pollution, and the applications for anti-sulfur components are increasing. Transcend's anti-sulfur SSD modules all meet level G2 of ISA Standard S71.04-2013 and ASTM B809-95 standard, suitable for the Industrial Revolution 4.0, the Internet of Things, and the Internet of Vehicles, where the use of anti-sulfur technology is highly required.

5.2.12 Other Functions

Transcend SSD embedded a lot of cutting-edge technology. Should you have any technical request, please contact the local support team or send us an e-mail.

6. Technology Term Explanations

6.1 TBW

Terabytes Written (TBW) directly measures how much you can write cumulatively into the drive over its lifetime. Essentially, it just includes the multiplication conducted above in the measurement itself.
For example, if your drive is rated for 365 TBW, that means you can write 365 TB into it before a replacement is required.
If its warranty period is 5 years, that works out to 365 TB ÷ (5 years × 365 days/year) = 200 GB of writes per day. If your drive was 200 GB in size, that's equivalent to 1 DWPD. Correspondingly, if your drive was rated for 3.65 PBW = 3,650 TBW, that works out to 2 TB of writes per day, or 10 DWPD.
As you can see, if you know the drive's size and warranty period, you can always calculate TBW from DWPD and vice-versa with simple multiplications or divisions. The two measurements are very similar.

6.2 DWPD

Drive Writes Per Day (DWPD) measures how many times you could overwrite the drive's entire size each day of its life. For example, suppose your drive is 200 GB and its warranty period is 5 years. If its DWPD is 1, that means you can write 200 GB (its size, one time) into it every single day for the next five years.
If you multiply that out, that's 200 GB per day × 365 days/year × 5 years = 365 TB of cumulative writes before you may need to replace it.
If the DWPD is 10 instead of 1, that means you can write 10 × 200 GB = 2 TB (its size, ten times) into it every day. Correspondingly, that's 3,650 TB = 3.65 PB of cumulative writes over 5 years.

6.3 MTBF – Telcordia SR-332

MTBF (mean time between failures) is a measure of how reliable a hardware product or component is. For most components, the measurement is typically in thousands or even tens of thousands of hours between failures. For example, a SSD may have a mean time between failures of 200,000 hours. A desired MTBF can be used as a quantifiable objective when designing a new product. The MTBF figure can be developed as the result of intensive testing, based on actual product experience, or predicted by analyzing known factors. The manufacturer may provide it as an index of a product's or component's reliability and, in some cases, to give customers an idea of how much service to plan for. In Transcend MTBF data, we use Telcordia SR-332 Issue 4 method to do estimated calculation.

7. Installation Requirements

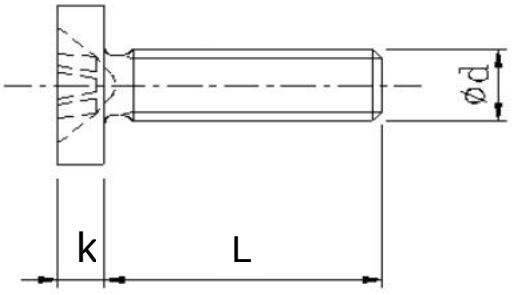
7.1 SSD Installation

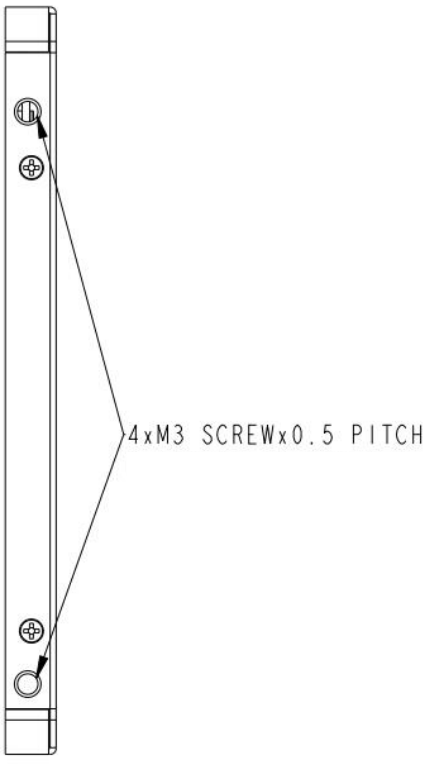
Regarding the system assembling, for SATA cable connection, the cable should not longer than 1 meter and well-connected is necessary to avoid signal transmission error. The standard 2.5 inch SATA interface has a separated connector for power connection. For the connection detail, please refer chapter 4.

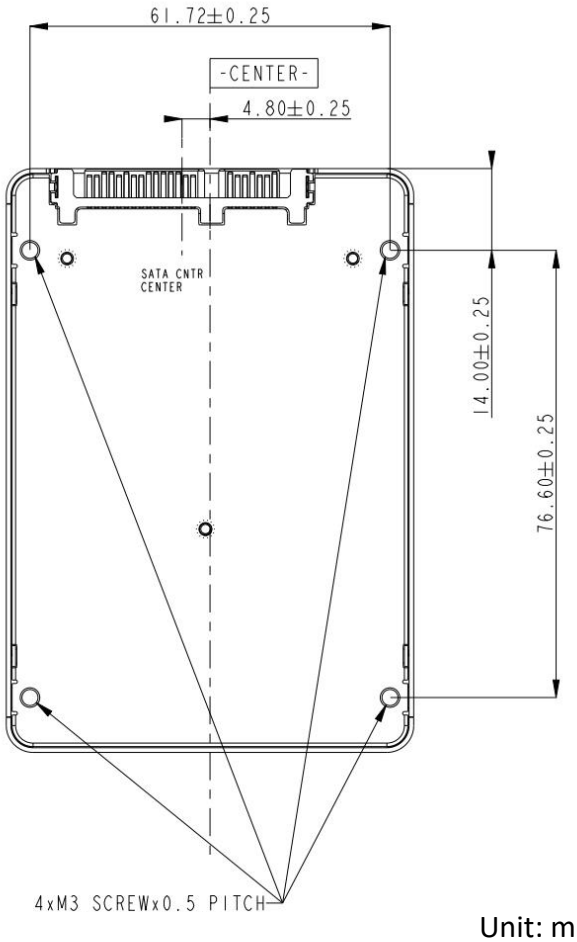
2.5" SSD Screw Selection Suggestion: (Reference Only)

- M3 screw pitch: 0.5 mm
- M3 screw length(L): Max 5 mm
- Screw Tightening Torques: 2.0 ~ 4.5 kgf-cm

k	1.4 - 1.6 mm
L	1.5 - 5.0 mm
Ød	2.88 - 2.98 mm







Unit: mm

8. Command Descriptions

8.1 Support ATA Commands

This table and the following paragraphs summarize the ATA command set.
[Table 17] ATA Command Table

Support ATA/ATAPI Command	Code	Subcode / Page
NOP	00h	
Data Set Management	06h	
Trim		01h
Recalibrate	1Xh	
Read Sectors	20h	
Read Sectors (w/o retry)	21h	
Read Sectors Ext	24h	
Read DMA Ext	25h	
Read Native Max Address Ext	27h	
Read Multiple Ext	29h	
Read Log Ext	2Fh	
Log Directory		00h
Extended Comprehensive SMART Error Log		03h
Device Statistics Logs		04h
List of supported log pages		00h
General Statistics		01h
General Errors Statistics		04h
Transport Statistics		06h
SSD Statistics		07h
Extended SMART Self-test Log		07h
NCQ Error Log		10h
SATA Phy Event Counters Log		11h
Identify Device Data Log		30h
List of Supported Pages		00h
Copy of IDENTIFY DEVICE Data		01h
Capacity		02h
Supported Capabilities		03h
Current Settings		04h
ATA Strings		05h
Security		06h
Serial ATA		08h
Write Sectors	30h	
Write Sectors Ext	34h	

Write DMA Ext	35h	
Set Max Address Ext	37h	
Write Multiple Ext	39h	
Write DMA FUA Ext	3Dh	
Write Log Ext	3Fh	
Selective Self-Test log(SMART)		09h
Host Specific(SMART)		80h~9Fh
SCT Command/Status(SCT)		E0h
SCT Data Transfer(SCT)		E1h
Read Verify Sectors	40h	
Read Verify Sectors (w/o retry)	41h	
Read Verify Sectors Ext	42h	
Write Uncorrectable Ext	45h	
Pseudo-UECC with logging		55h
Read FPDMA Queued	60h	
Write FPDMA Queued	61h	
Seek	7Xh	
Execute Device Diagnostic	90h	
Initialize Drive Parameters	91h	
Download Microcode	92h	
Download with offsets and save microcode for immediate and future use.		03h
Download (without offsets) and save microcode		07h
Download with offsets and save microcode for future use / Activate downloaded microcode		0Eh/0Fh
SMART	B0h	
Read Data		D0h
Read Thresholds		D1h
Enable/Disable Attr Autosave		D2h
Exec Off-line Immediate		D4h
Execute Off-Line routine		00h
Execute Short Self-test routine (Off-Line)		01h
Execute Extended Self-test routine (Off-Line)		02h
Abort Off-Line Self-test routine		7Fh
Execute Short Self-test routine (Captive)		81h
Execute Extended Self-test routine (Captive)		82h
Read Log Sector		D5h
Write Log Sector		D6h
Enable Operations		D8h
Disable Operations		D9h

Return Status		Dah
Sanitize Device	B4h	
Sanitize Status Ext		00h
Block Erase Ext		12h
Sanitize Freeze Lock Ext		20h
Read Multiple	C4h	
Write Multiple	C5h	
Set Multiple Mode	C6h	
Read DMA	C8h	
Read DMA (w/o retry)	C9h	
Write DMA	CAh	
Write DMA (w/o retry)	CBh	
Write Multiple FUA Ext	CEh	
Standby Immediate	E0h	
Idle Immediate	E1h	
Standby	E2h	
Idle	E3h	
Read Buffer	E4h	
Check Power Mode	E5h	
Sleep	E6h	
Flush Cache	E7h	
Write Buffer	E8h	
Flush Cache Ext	EAh	
Identify Device	ECh	
Set Features	EFh	
Security Set Password	F1h	
Security Unlock	F2h	
Security Erase Prepare	F3h	
Security Erase Unit	F4h	
Security Freeze Lock	F5h	
Security Disable Password	F6h	
Read Native Max Address	F8h	
Set Max Address	F9h	
Set Max Set Password		01h
Set Max Lock		02h
Set Max Unlock		03h
Set Max Freeze Lock		04h
Set Max Set Password DMA		05h
Set Max Unlock DMA		06h

8.2 SMART Data Structure

[Table 18] SMART Data Structure

BYTE	F / V	Description
0-1	X	Revision code
2-361	X	Vendor specific
362	V	Off-line data collection status
363	X	Self-test execution status byte
364-365	V	Total time in seconds to complete off-line data collection activity
366	X	Vendor specific
367	F	Off-line data collection capability
368-369	F	SMART capability
370	F	Error logging capability 7-1 Reserved 0 1=Device error logging supported
371	X	Vendor specific
372	F	Short self-test routine recommended polling time (in minutes)
373	F	Extended self-test routine recommended polling time (in minutes)
374	F	Conveyance self-test routine recommended polling time (in minutes)
375-385	R	Reserved
386-395	F	Firmware Version/Date Code
396-399	F	Reserved
400-409	V	SMI2259XT
410-510	X	Vendor specific
511	V	Data structure checksum

Note:

1) F = content (byte) is fixed and does not change.
2) V= content (byte) is variable and may change depending on the state of the device or the commands executed by the device.
3) X= content (byte) is vendor specific and may be fixed or variable.
4) R= content (byte) is reserved and shall be zero.

8.3SMART Attributes

The following table shows the vendor specific data in byte 2 to 361 of 512-byte SMART data.

[Table 19] SMART Attributes

Attribute ID (hex)	Raw Attribute Value							Attribute Name
01	MSB	00	00	00	00	00	00	Read Error Rate
05	LSB	MSB	00	00	00	00	00	Reallocated sectors count
09	LSB	-	-	MSB	00	00	00	Power-on hours
0C	LSB	-	-	MSB	00	00	00	Power Cycle Count
A0	LSB	-	-	MSB	00	00	00	Uncorrectable sectors count when read/write
A1	LSB	MSB	00	00	00	00	00	Number of valid spare blocks
A3	LSB	MSB	00	00	00	00	00	Number of initial invalid blocks
A4	LSB	-	-	MSB	00	00	00	Total erase count
A5	LSB	-	-	MSB	00	00	00	Maximum erase count
A6	LSB	-	-	MSB	00	00	00	Minimum erase count
A7	LSB	-	-	MSB	00	00	00	Average erase count
A8	LSB	-	-	MSB	00	00	00	Max Erase count of spec
A9	LSB	-	-	MSB	00	00	00	Remain Life (percentage)
AF	LSB	MSB	00	00	00	00	00	Worst Component Program Fail Count
B0	LSB	MSB	00	00	00	00	00	Worst Component Erase Fail Count
B1	LSB	-	-	MSB	00	00	00	Undefined
B2	LSB	MSB	00	00	00	00	00	Grown Bad Block Count
B5	LSB	-	-	MSB	00	00	00	Total program fail count
B6	LSB	MSB	00	00	00	00	00	Total erase fail count
C0	LSB	MSB	00	00	00	00	00	Sudden Power Count
C2	MSB	00	00	00	00	00	00	Enclosure temperature
C3	LSB	-	-	MSB	00	00	00	Hardware ECC recovered
C4	LSB	-	-	MSB	00	00	00	Reallocation event count
C5	LSB	MSB	00	00	00	00	00	Current Pending Sector Count
C6	LSB	-	-	MSB	00	00	00	Reported Uncorrectable Errors
C7	LSB	MSB	00	00	00	00	00	CRC Error Count
E8	LSB	MSB	00	00	00	00	00	Available reserved space
F1	LSB	-	-	-	-	-	MSB	Host 32MB/unit Written
F2	LSB	-	-	-	-	-	MSB	Host 32MB/unit Read
F5	LSB	-	-	-	-	-	MSB	NAND 32MB/unit Written

Note:

1) Controller temperature is only presented as a positive value.

9. Contact Information

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