SSD520 –

SATA II 3Gb/s SSD

Compatible with SATA II 3.0Gb/s standard, due to smaller size, high speed, low power consumption, and great reliability, Transcend's Due to slimmer size, 7mm in height (fit the standard dimensions of 2.5" SATA Hard Disk Drives), low power consumption,SATA Solid State Disk is the perfect storage device for tablet PC, laptop, and industrial PC.

Features

- Fully compatible with devices and OS that support the SATA II 3.0Gb/s standard.

- Non-Volatile Flash Memory (SLC) for outstanding data retention and reliability.

- Global Wear-Leveling and Block management for reliability.

- Built-in ECC (Error Correction Code) functionality.

- Shock resistance Support.

- Security Command.

- Ultra-slim, thickness is only 7mm.

- RoHS compliant.

Specifications

Physical Specification			
Form Factor	2.5 inch HDD		
Storage Capacities	8GB to 32GB		
Dimensions	**Length**	100.00 ± 0.25 mm	3.937 ± 0.01 inch
	Width	69.85 ± 0.25 mm	2.750 ± 0.01 inch
	Height	6.8 ± 0.2 mm	0.268 ± 0.008 inch
Input Voltage	5V ± 5%		
Weight	59 ± 2 g		
Connector	SATA 22 pins connector		

Environmental Specifications		
Operating Temperature	0 ºC to 70 ºC	
Storage Temperature	− 40 ºC to 85 ºC	
Humidity	**Operating**	0 % to 95 % (Non-condensing)
	Non-Operating	0 % to 95 % (Non-condensing)

Performance								
Model P/N	**ATTO**		**CrystalDiskMark**				**IOmeter**	
	Max. Read *	**Max. Write** *	**Sequential Read** **	**Sequential Write** **	**Random Read** (4KB QD32) **	**Random Write** (4KB QD32) **	**IOPS Random Read** (4KB QD32) ***	**IOPS Random Write** (4KB QD32) ***
TS8GSSD520	TBD							
TS16GSSD520	TBD							
TS32GSSD520	170	85	125	85	15	2.1	4000	440

Note: Maximum transfer speed recorded

* 25 ºC, test on ASUS P8Z68-M PRO, 4 GB, Windows® 7 Professional with AHCI mode, benchmark utility ATTO (version 2.41), unit MB/s

** 25 ºC, test on ASUS P8Z68-M PRO, 4 GB, Windows® 7 Professional with AHCI mode, benchmark utility CrystalDiskMark (version 3.0.1), copied file 1000MB, unit MB/s

*** 25 ºC, test on ASUS P8Z68-M PRO, 4 GB, Windows® 7 Professional with AHCI mode, benchmark utility IOmeter2006 with 4K file size and queue depth of 32, unit IOPs

**** The recorded performance is obtained while the SSD is not operating as an OS disk

Actual Capacity

Model P/N	LBA	Cylinder	Head	Sector
TS8GSSD520	15,649,200	15,525	16	63
TS16GSSD520	31,277,232	16,383	16	63
TS32GSSD520	62,533,296	16,383	16	63

Power Requirements

Input Voltage		5V ± 5% @ 25 ºC
Mode P/N / Power Consumption		**Typical (mA)**
TS8GSSD520	Max Write*	TBD
	Max Read*	
	Idle*	
TS16GSSD520	Max Write*	TBD
	Max Read*	
	Idle*	
TS32GSSD520	Max Write*	353
	Max Read*	250
	Idle*	73

*Tested with IOmeter running sequential reads/writes and idle mode

Reliability

Data Reliability		Supports BCH ECC 1 bit per 528-byte
MTBF		1,000,000 hours
Endurance (Terabytes Written)	8 GB	TBD
	16 GB	TBD
	32 GB	TBD

*Tested under JESD218A endurance test method and JESD219A endurance workloads specification.

Vibration	
Operating	3 G (peak-to-peak), 5 - 800 Hz
Non-Operating	5 G (peak-to-peak), 5 - 800 Hz

* Note: Reference to the IEC 60068-2-6 Testing procedures; Operating-Sine wave, 5-800Hz/1 oct., 1.5mm, 3g, 0.5 hr./axis, total 1.5 hrs.
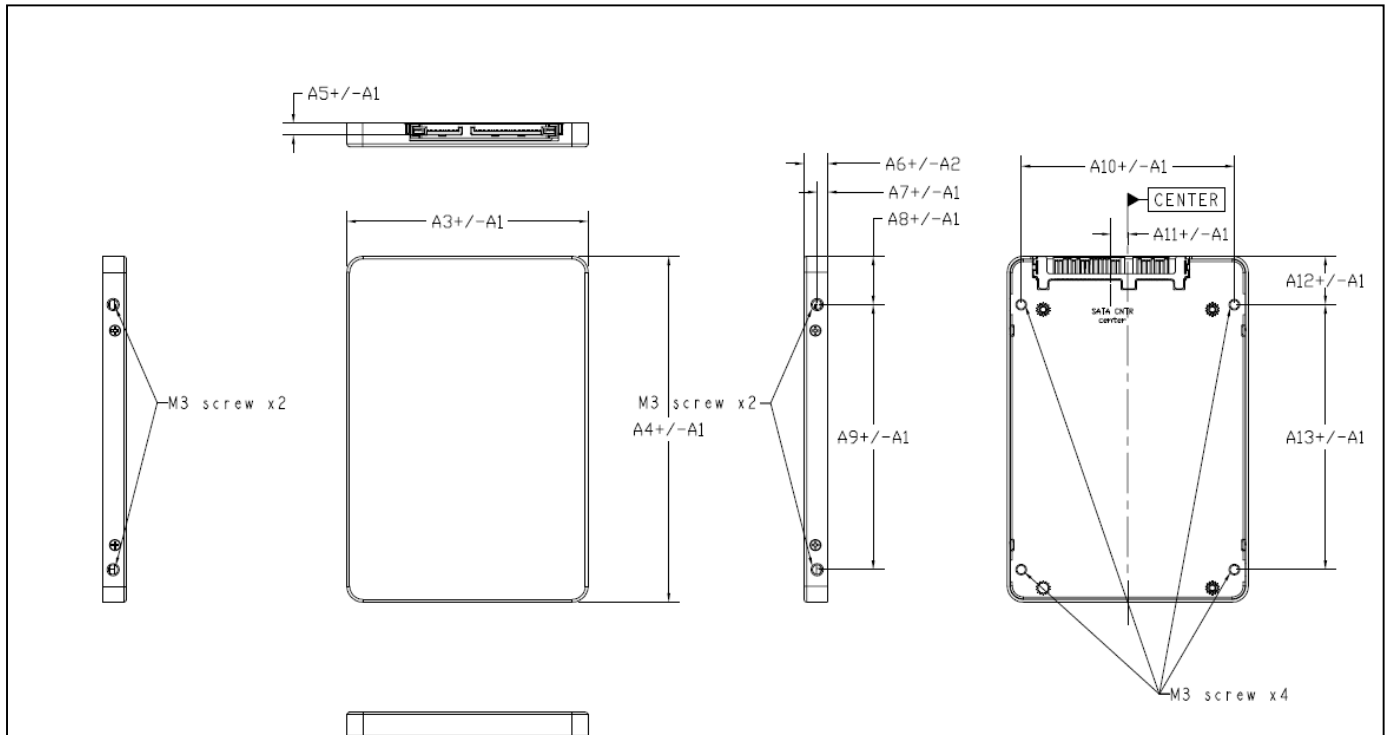
Shock	
Operating	1500 G, 0.5 ms
Non-Operating	1500 G, 0.5 ms

* Reference to IEC 60068-2-27 Testing procedures; Operating-Half-sine wave, 1500g, 0.5ms, 3 times/dir., total 18 times.

Regulations	
Compliance	TBD

Package Dimensions

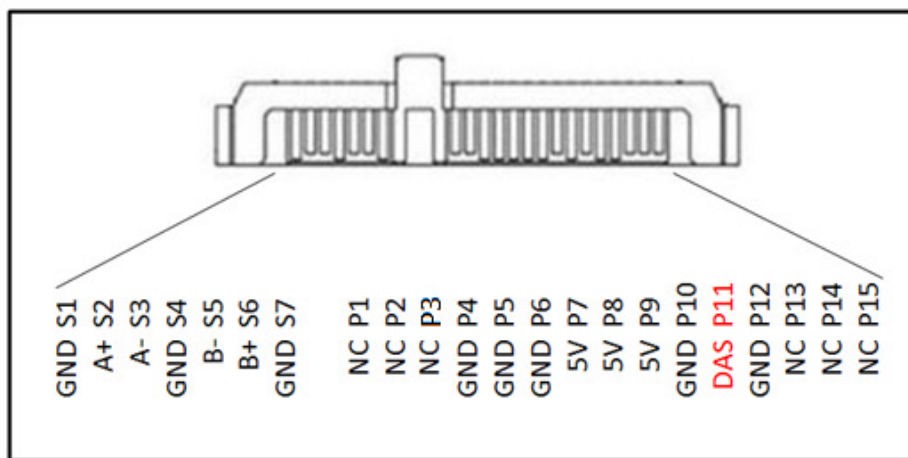The figure below illustrates the Transcend 2.5" SATA Solid State Drive. All dimensions are in mm.

Item	Milimeter	Item	Milimeter
A1	0.25	A11	4.8
A2	0.2	A12	14.0
A3	69.85	A13	76.6
A4	100.0		
A5	3.5		
A6	6.8		
A7	3.0		
A8	14.0		
A9	76.6		
A10	61.72		

*Note: Tighten mounting screws with no more than 2 Kgf-cm of torque.

Pin Assignments

Pin No.	Pin Name	Pin No.	Pin Name
S1	GND	S2	A+
S3	A-	S4	GND
S5	B-	S6	B+
S7	GND	P1	NC
P2	NC	P3	NC
P4	GND	P5	GND
P6	GND	P7	5V
P8	5V	P9	5V
P10	GND	P11	DAS
P12	GND	P13	NC
P14	NC	P15	NC

Pin Layout

Block Diagram

SATA Host

SATA Interface

SSD Controller

Flash Interface

NAND Flash	NAND Flash	NAND Flash	NAND Flash
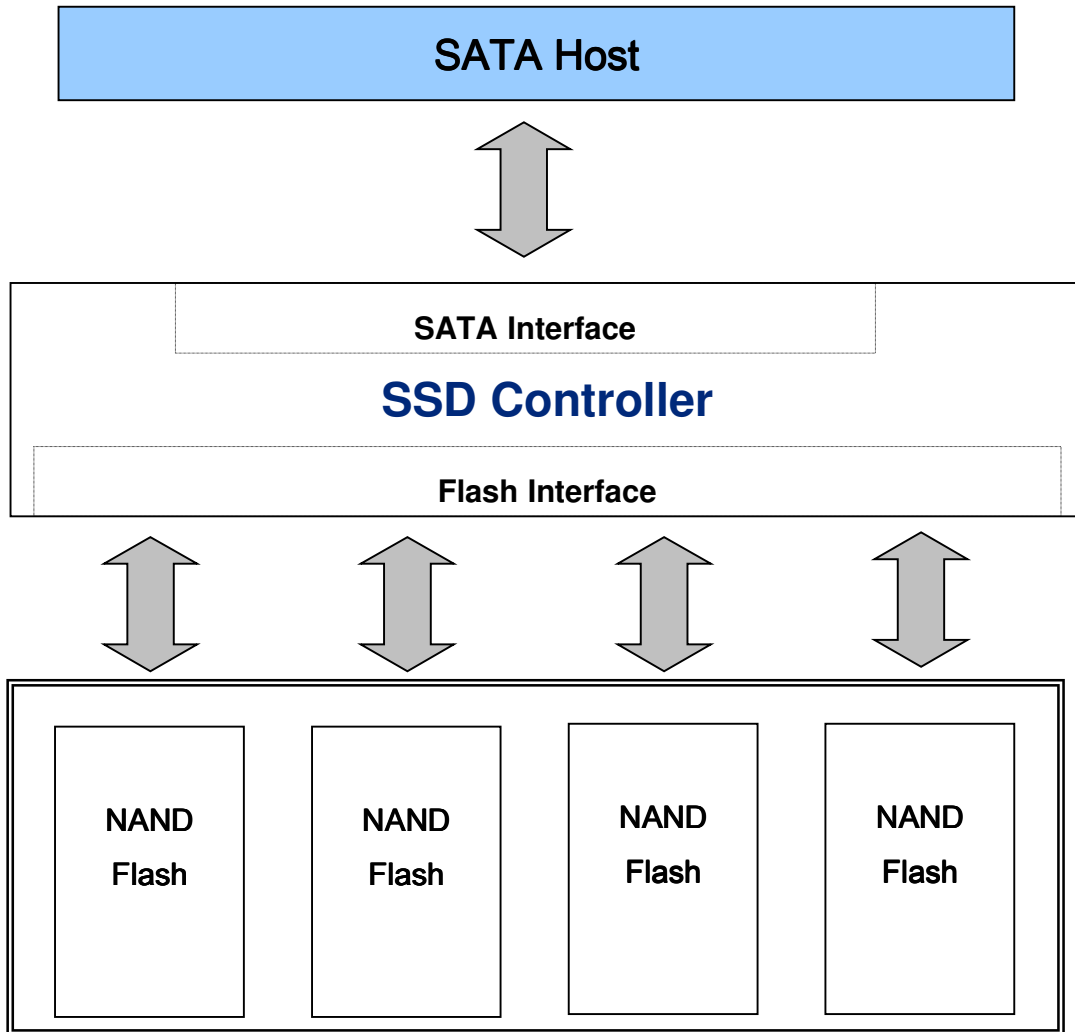
*The quantity of NAND flash varies by capacity.

Features

Wear-Leveling algorithm

The controller supports static/dynamic wear leveling. When the host writes data, the controller will find and use the block with the lowest erase count among the free blocks. This is known as dynamic wear leveling. When the free blocks' erase count is higher than a threshold value plus data blocks', it will activate the static wear leveling, replacing the not so frequently used user blocks with the high erase count free blocks.

ECC algorithm

Using 66 bit BCH Error Correction Code with each channel, the controller can correct 1 random bit per 528 byte data sector for MLC NAND flash. The hardware executes parity generation and error detection/correction features.

Bad-block management

When the flash encounters ECC failed, program fail or erase fail, the controller will mark the block as bad block to prevent the used of this block and caused data lost later on.

Power Sequence

Below figure illustrates the Transcend SSD520 power sequence.

1. Shut down the input power.

2. Power on reset pull low.

3. Wait for the drive to static state.

4. Turn on the input power.

5. Power on to ready pull high.

5V input

500ms

90%

0V

0.5s

200ms

Measured from 90% VCC to power on to ready
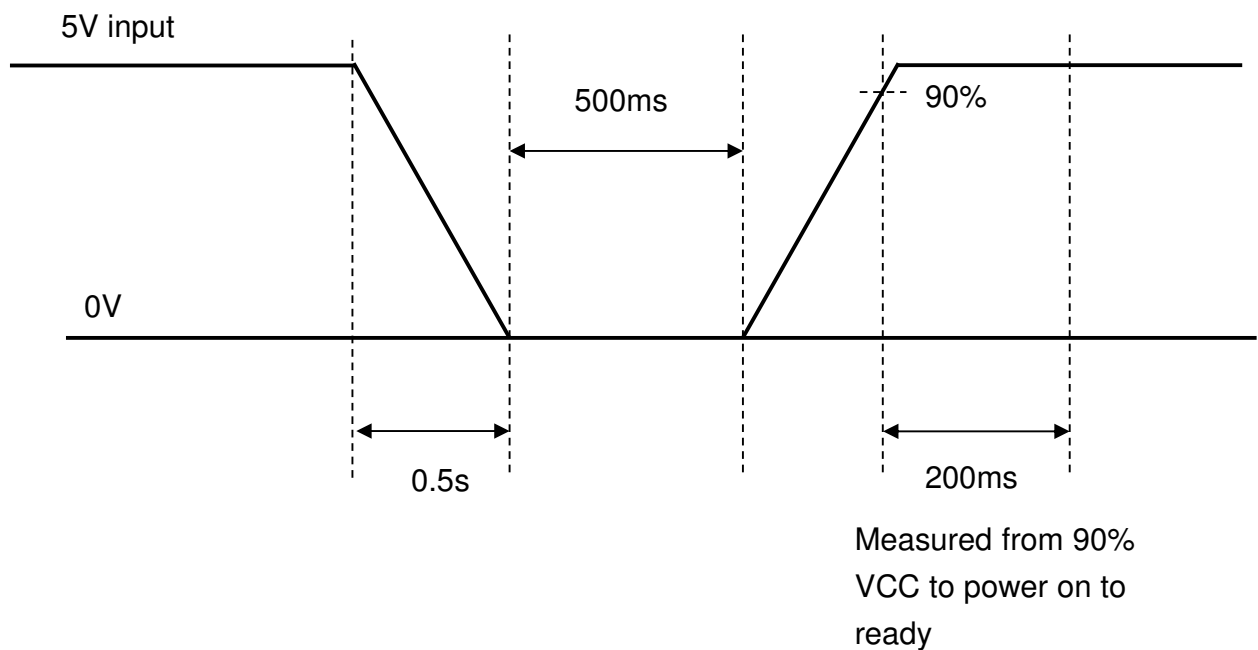
*The actual value may vary depend on device capacity and system environment.

ATA Command Register

This table with the following paragraphs summarizes the ATA command set.

Command Table

Support ATA/ATAPI Command	Code	Protocol
General Feature Set		
EXECUTE DIAGNOSTICS	90h	Device diagnostic
FLUSH CACHE	E7h	Non-data
IDENTIFY DEVICE	ECh	PIO data-In
READ DMA	C8h	DMA
READ MULTIPLE	C4h	PIO data-In
READ SECTOR(S)	20h	PIO data-In
READ VERIFY SECTOR(S)	40h or 41h	Non-data
SET FEATURES	EFh	Non-data
SET MULTIPLE MODE	C6h	Non-data
WRITE DMA	CAh	DMA
WRITE MULTIPLE	C5h	PIO data-out
WRITE SECTOR(S)	30h	PIO data-out
NOP	00h	Non-data
READ BUFFER	E4h	PIO data-In
WRITE BUFFER	E8h	PIO data-out
Power Management Feature Set		
CHECK POWER MODE	E5h or 98h	Non-data
IDLE	E3h or 97h	Non-data
IDLE IMMEDIATE	E1h or 95h	Non-data
SLEEP	E6h or 99h	Non-data
STANDBY	E2h or 96h	Non-data
STANDBY IMMEDIATE	E0h or 94h	Non-data
Security Mode Feature Set		
SECURITY SET PASSWORD	F1h	PIO data-out
SECURITY UNLOCK	F2h	PIO data-out
SECURITY ERASE PREPARE	F3h	Non-data
SECURITY ERASE UNIT	F4h	PIO data-out
SECURITY FREEZE LOCK	F5h	Non-data
SECURITY DISABLE PASSWORD	F6h	PIO data-out
SMART Feature Set		
SMART Disable Operations	B0h	Non-data
SMART Enable/Disable Autosave	B0h	Non-data
SMART Enable Operations	B0h	Non-data
SMART Return Status	B0h	Non-data
SMART Execute Off-Line Immediate	B0h	Non-data
SMART Read Data	B0h	PIO data-In
Host Protected Area Feature Set		
Read Native Max Address	F8h	Non-data
Set Max Address	F9h	Non-data
Set Max Set Password	F9h	PIO data-out
Set Max Lock	F9h	Non-data
Set Max Freeze Lock	F9h	Non-data

Set Max Unlock	F9h	PIO data-out
48-bit Address Feature Set		
Flush Cache Ext	EAh	Non-data
Read Sector(s) EXt	24h	PIO data-In
Read DMA Ext	25h	DMA
Read Multiple Ext	29h	PIO data-In
Read Native Max Address Ext	27h	Non-data
Read Verify Sector(s) Ext	42h	Non-data
Set Max Address Ext	37h	Non-data
Write DMA Ext	35h	DMA
Write DMA FUA Ext	3Dh	DMA
Write Multiple Ext	39h	PIO data-out
Write Multiple FUA Ext	CEh	PIO data-out
Write Sector(s) Ext	34h	PIO data-out

ATA Command Specifications

FLUSH CACHE (E7h)

This command is used by the host to request the device to flush the write cache. If there is data in the write cache, that data shall be written to the media. The BSY bit shall remain set to one until all data has been successfully written or an error occurs.

IDENTIFY DEVICE (ECh)

This commands read out 512Bytes of drive parameter information. Parameter Information consists of the arrangement and value as shown in the following table. This command enables the host to receive the Identify Drive Information from the device.

READ DMA (C8h)

Read data from sectors during Ultra DMA and Multiword DMA transfer. Use the SET FEATURES command to specify the mode value. A sector count of zero requests 256 sectors.

READ MULTIPLE (C4h)

This command performs similarly to the Read Sectors command. Interrupts are not generated on each sector, but on the transfer of a block which contains the number of sectors defined by a Set Multiple command.

READ SECTOR(S) (20h)

This command reads 1 to 256 sectors as specified in the Sector Count register from sectors which is set by Sector number register. A sector count of 0 requests 256 sectors. The transfer beings specified in the Sector Number register.

READ VERIFY SECTOR(S) (40h/41h)

This command verifies one or more sectors on the drive by transferring data from the flash media to the data buffer in the drive and verifying that the ECC is correct. This command is identical to the Read Sectors command, except that DRQ is never set and no data is transferred to the host.

SET FEATURES (EFh)

This command set parameter to Features register and set drive's operation. For transfer mode, parameter is set to Sector Count register. This command is used by the host to establish or select certain features.

SET MULTIPLE MODE (C6h)

This command enables the device to perform READ MULTIPLE and WRITE MULTIPLE operations and establishes the block count for these commands.

WRITE DMA (CAh)

Write data to sectors during Ultra DMA and Multiword DMA transfer. Use the SET FEATURES command to specify the mode value.

WRITE MULTIPLE (C5h)

This command is similar to the Write Sectors command. Interrupts are not presented on each sector, but on the transfer of a block which contains the number of sectors defined by Set Multiple command.

WRITE SECTOR(S) (30h)

Write data to a specified number of sectors (1 to 256, as specified with the Sector Count register) from the specified address. Specify "00h" to write 256 sectors.

NOP (00h)

The device shall respond with command aborted. For devices implementing the Overlapped feature set, subcommand code 00h in the Features register shall abort any outstanding queue. Subcommand codes 01h through FFh in the Features register shall not affect the status of any outstanding queue.

READ BUFFER (E4h)

The READ BUFFER command enables the host to read a 512-byte block of data.

WRITE BUFFER (E8h)

This command enables the host to write the contents of one 512-byte block of data to the device's buffer.

Power Management Feature Set

CHECK POWER MODE (E5h or 98h)
The host can use this command to determine the current power management mode.

IDLE (E3h or 97h)

This command causes the device to set BSY, enter the Idle mode, clear BSY and generate an interrupt. If sector count is non-zero, the automatic power down mode is enabled. If the sector count is zero, the automatic power mode is disabled.

IDLE IMMEDIATE (E1h or 95h)
This command causes the device to set BSY, enter the Idle(Read) mode, clear BSY and generate an interrupt.

SLEEP (E6h or 99h)
This command causes the device to set BSY, enter the Sleep mode, clear BSY and generate an interrupt.

STANDBY (E2h or 96h)
This command causes the device to set BSY, enter the Sleep mode (which corresponds to the ATA "Standby" Mode), clear BSY and return the interrupt immediately.

STANDBY IMMEDIATE (E0h or 94h)

This command causes the drive to set BSY, enter the Sleep mode (which corresponds to the ATA "Standby" Mode), clear

BSY and return the interrupt immediately.

Security Mode Feature Set

SECURITY SET PASSWORD (F1h)

This command set user password or master password. The host outputs sector data with PIO data-out protocol to indicate the information defined in the following table.

Security set Password data content1

Word	Content		
0	Control word		
	Bit 0	Identifier	0=set user password 1=set master password
	Bits 1-7	Reserved	
	Bit 8	Security level	0=High 1=Maximum
	Bits 9-15	Reserved	
1-16	Password (32 bytes)		
17-255	Reserved		

SECURITY UNLOCK (F2h)

This command disables LOCKED MODE of the device. This command transfers 512 bytes of data from the host with PIO data-out protocol. The following table defines the content of this information

Security Unlock information2

Word	Content		
0	Control word		
	Bit 0	Identifier	0=compare user password 1=compare master password
	Bits 1-15	Reserved	
1-16	Password (32 bytes)		
17-255	Reserved		

SECURITY DISABLE PASSWORD (F6h)

Disables any previously set user password and cancels the lock. The host transfers 512 bytes of data, as shown in the following table, to the drive. The transferred data contains a user or master password, which the drive compares with the saved password. If they match, the drive cancels the lock. The master password is still saved. It is re-enabled by issuing the SECURITY SET PASSWORD command to re-set a user password.

SECURITY ERASE PREPARE (F3h)

This command shall be issued immediately before the Security Erase Unit command to enable erasing and unlocking. This command prevents accidental loss of data on the drive.

SECURITY ERASE UNIT (F4h)

The host uses this command to transfer 512 bytes of data, as shown in the following table, to the drive. The transferred data contains a user or master password, which the drive compares with the saved password. If they match, the drive deletes user data, disables the user password, and cancels the lock. The master password is still saved. It is re-enabled by issuing the SECURITY SET PASSWORD command to re-set a user password.

SECURITY FREEZE LOCK (F5h)

Causes the drive to enter Frozen mode. Once this command has been executed, the following commands to update a lock result in the Aborted Command error:

• SECURITY SET PASSWORD

• SECURITY UNLOCK

• SECURITY DISABLE PASSWORD

• SECURITY ERASE PREPARE

• SECURITY ERASE UNIT

The drive exits from Frozen mode upon a power-off or hard reset. If the SECURITY FREEZE LOCK command is issued when the drive is placed in Frozen mode, the drive executes the command, staying in Frozen mode.

Identify Device Information Default Value

Word Address	Default Value	Total Bytes	Data Field Type Information
0	044Ah	2	General configuration
1	3FFFh	2	Obsolete
2	C837h	2	Specific configuration
3	0010h	2	Obsolete
4	0000h	2	Retired
5	0240h	2	Retired
6	003Fh	2	Obsolete
7	03BAh	2	Reserved for CFA
8	2EB0h	2	Reserved for CFA
9	0000h	2	Retired
10-19	XXXXh	20	Serial number in ASCII (Right Justified)
20	0002h	2	Retired
21	0002h	2	Retired
22	0000h	2	Obsolete
23-26	XXXXh	8	Firmware revision in ASCII. Big Endian Byte Order in Word
27-46	XXXXh	40	Model number in ASCII (Left Justified) Big Endian Byte Order in Word
47	8001h	2	Number of sectors on Read/Write Multiple command
48	0000h	2	Trusted Computing feature set options
49	0F00h	2	Capabilities
50	4000h	2	Capabilities
51	0200h	2	Obsolete
52	0000h	2	Obsolete
53	0007h	2	Field validity
54	3FFFh	2	Obsolete
55	0010h	2	Obsolete
56	003Fh	2	Obsolete
57	00FBh	2	Obsolete
58	FC10h	2	Obsolete
59	0100h	2	Multiple sector setting
60	XXXXh	2	Total number of user addressable logical sectors for 28-bit command
61	XXXXh	2	Total number of user addressable logical sectors for 28-bit command
62	0000h	2	Obsolete
63	0007h	2	Multiword DMA transfer. Supports MDMA Mode 0,1,and 2
64	0003h	2	Advanced PIO modes supported
65	0078h	2	Minimum Multiword DMA transfer cycle time per word. In PC Card modes this value shall be 0h

66	0078h	2	Recommended Multiword DMA transfer cycle time. In PC Card modes this value shall be 0h
67	0078h	2	Minimum PIO transfer cycle time without flow control
68	0078h	2	Minimum PIO transfer cycle time with IORDY flow control
69	0000h	2	Reserved
70-74	0000h	10	Reserved
75	0000h	2	Queue depth
76	0006h	2	Serial ATA capacities
77	0002h	2	Reserved for future Serial ATA definition
78	0008h	2	Serial ATA features supported
79	0000h	2	Serial ATA features enabled
80	01FCh	2	Major version number (ATA8-ACS)
81	0000h	2	Minor version number
82	7429h	2	Command sets supported 0
83	7D00h	2	Command sets supported 1
84	4002h	2	Command sets supported 2
85-87	XXXXh	6	Features/command sets enabled
88	407Fh	2	Ultra DMA Mode Supported and Selected
89	0000h	2	Time required for Security erase unit completion
90	0000h	2	Time required for Enhanced security erase unit completion
91	0000h	2	Current Advanced power management value
92	0000h	2	Master Password Revision Code
93	0000h	2	Hardware reset result
94	0000h	2	Current automatic acoustic management value
95	0000h	2	Stream Minimum Request Size
96	0000h	2	Streaming Transfer Time - DMA
97	0000h	2	Streaming Access Latency - DMA and PIO
98-99	0000h	2	Streaming Performance Granularity(DWord)
100-103	XXXXh	8	Total number of user addressable logical sectors for 48-bit commands (QWord)
104	0000h	2	Streaming Transfer Time - PIO
105	0001h	2	Maximum number of 512-byte data blocks of LBA Range Entries per DATA SET MANAGEMENT command
106	0000h	2	Physical sector size / logical sector size
107	0000h	2	Inter-seek delay for ISO 7779 standard acoustic testing
108-111	0000h	8	World wide name
112-115	0000h	8	Reserved
116	0000h	2	Reserved for TLC
117-118	0000h	4	Logical Sector size(Dword)

119	0000h	2	Command and feature sets supports
120	0000h	2	Commands and feature sets supported and enabled settings
121-126	0000h	12	Reserved for expanded supported and enabled settings
127	0000h	2	Obselete
128	0000h	2	Security status
129-159	XXXXh	62	Vendor specific
160	0000h	2	CFA Power mode
161-167	0000h	14	Reserved for CFA
168	0000h	2	Reserved
169	0001h	2	Data Set Management is Supported
170-173	0000h	8	Additional Product Identifier (ATA String)
174-175	0000h	4	Reserved
176-205	0000h	60	Current media serial number (ATA String)
206	0000h	2	SCT Command Transport
207-208	0000h	4	Reserved for CE-ATA
209	0000h	2	Alignment of logical blocks within a physical block
210-211	0000h	4	Wrute-Read-Verify Sector Count mode 3
212-213	0000h	4	Wrute-Read-Verify Sector Count mode 2
214-216	0000h	6	Obsolete
217	0001h	2	Nominal media rotation rate
218	0000h	2	Reserved
219	0000h	2	Obsolete
220-255	0000h	72	Reserved

SMART Command Support

Value	Command	Value	Command
D0h	Read Data	D5h	Reserved
D1h	Read Attribute Threshold	D6h	Reserved
D2h	Enable/Disable Autosave	D8h	Enable SMART Operations
D3h	Save Attribute Values	D9h	Disable SMART Operations
D4h	Execute OFF-Line Immediate	DAh	Return Status

If the reserved size is below a threshold, status can be read from the Cylinder Register using the Return Status command (DAh).

SMART DATA Structure

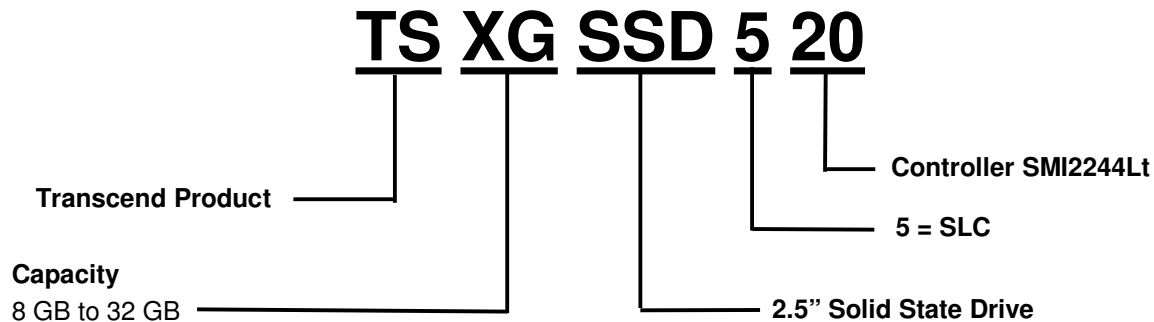| BYTE	F / V	Description
0-1	X	Revision code
2-361	X	Vendor specific
362	V	Off-line data collection status
363	X	Self-test execution status byte
364-365	V	Total time in seconds to complete off-line data collection activity
366	X	Vendor specific
367	F	Off-line data collection capability
368-369	F	SMART 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
396-397	F	Reserved
398-399	F	Reserved
400-406	F	'SMI2244LT'
407-415	X	Vendor specific
416	F	Reserved
417	F	Program/write the strong page only
418-419	V	Number of spare block
420-423	V	Average Erase Count
424-510	X	Vendor specific
511	V	Data structure checksum

F=the content of the byte is fixed and does not change.

V=the content of the byte is variable and may change depending on the state of the device or the commands executed by the device.

X=the content of the byte is vendor specific and may be fixed or variable.

R=the content of the byte is reserved and shall be zero.

* 4 Byte value : [MSB] [2] [1] [LSB]

SMART Attributes

Attribute ID (hex)	Raw Attribute Value						Attribute Name
01	MSB	00	00	00	00	00	Read Error Rate
05	LSB	MSB	00	00	00	00	Reallocated sectors count
09	LSB	MSB	00	00	00	00	Reserved
0C	LSB	MSB	00	00	00	00	Power Cycle Count
A0	LSB			MSB	00	00	Uncorrectable sectors count when read/write
A1	LSB	MSB	00	00	00	00	Number of valid spare blocks
A2	LSB	MSB	00	00	00	00	Number of Child pair
A3	LSB	MSB	00	00	00	00	Number of initial invalid blocks
A4	LSB			MSB	00	00	Total erase count
A5	LSB			MSB	00	00	Maximum erase count
A6	LSB			MSB	00	00	Minimum erase count
A7	LSB			MSB	00	00	Average erase count
C0	LSB			MSB	00	00	Power-off retract Count
C2	MSB	00	00	00	00	00	Controlled temperature
C3	LSB			MSB	00	00	Hardware ECC recovered
C4	LSB			MSB	00	00	Reallocation event count
C6	LSB			MSB	00	00	Reserved
C7	LSB	MSB	00	00	00	00	UltraDMA CRC Error Count
F1	LSB			MSB	00	00	Total LBA written (each write unit = 32MB)
F2	LSB			MSB	00	00	Total LBA read (each read unit = 32MB)

Ordering Information

TS XG SSD 5 20

- Transcend Product
- Capacity — 8 GB to 32 GB
- 2.5" Solid State Drive
- 5 = SLC
- Controller SMI2244Lt

The technical information above is based on industry standard data and has been tested to be reliable. However, Transcend makes no warranty, either expressed or implied, as to its accuracy and assumes no liability in connection with the use of this product. Transcend reserves the right to make changes to the specifications at any time without prior notice.

Transcend®
good memories start here

TAIWAN
No.70, XingZhong Rd., NeiHu Dist., Taipei, Taiwan, R.O.C
TEL +886-2-2792-8000
Fax +886-2-2793-2222
E-mail: sales-tw@transcend-info.com
http://tw.transcend-info.com

USA
Los Angeles:
E-mail:sales-us@transcend-info.com
Maryland:
E-mail:sales-us@transcend-info.com
Florida:
E-mail:sales-us@transcend-info.com
Silicon Valley:
E-mail:sales-us@transcend-info.com
http://www.transcend-info.com

CHINA
Shanghai:
E-mail: sales-cn@transcendchina.com
Beijing:
E-mail: sales-cn@transcendchina.com
Shenzhen:
E-mail:sales-cn@transcendchina.com
http://cn.transcend-info.com

GERMANY
E-mail:vertrieb-de@transcend-info.com
http://de.transcend-info.com

HONG KONG
E-mail: sales-hk@transcend-info.com
http://hk.transcend-info.com

JAPAN
E-mail: sales-jp@transcend-info.com
http://jp.transcend-info.com

THE NETHERLANDS
E-mail: sales-nl@transcend-info.com
http://nl.transcend-info.com

United Kingdom
E-mail: sales-uk@transcend-info.com
http://uk.transcend-info.com

KOREA
E-mail: sales-kr@transcend-info.com
http://kr.transcend-info.com

Revision History		
Version	**Date**	**Modification Content**
0.1	2015/09/21	Initial release