ZEPLIN PLATNIUM 2.5” SATA-III DATASHEET

2.5” SATA SOLID STATE DRIVE

TABLE OF CONTENTS

TABLE OF FIGURES

TABLE OF TABLES

1.0 PRODUCT DESCRIPTION

1.1 PRODUCT OVERVIEW

A Solid State Disk (SSD) is a storage device that is based on semiconductors rather than rotating magnetic platters. Most SSDs, including Super Talent’s offerings, are based on NAND Flash chips because they are fast, highly reliable, widely available and are non-volatile.

SSDs are 100% compatible with standard hard disk drives, using both industry standard dimensions and a standard hard drive interface. While typical spinning HDDs are the weakest point when it comes to withstanding extremes, an SSD drive is an asset. Along with its durability and reliability, the SSD brings unparalleled performance.

- Casino Gaming
- Embedded/Industrial Systems
- Enterprise Computing
- Notebook
- Medical Industry
- Military and Aerospace

1.2 PRODUCT FEATURES

- Capacity: 256GB,512GB,1TB
- 1G~8G bits external Cache
- Form Factor: 2.5"
- Supports 1-port 1.5/3.0/6.0Gbps SATA I/II/III interface.
- SMART feature set and 48-bit Address feature set
- Compatibility: Full SATA hard disk compatible
- Ultra rugged and reliable
- High-speed performance
- Silent, no moving parts
- Proprietary wear leveling algorithms
- 100% tested hardware and software

1.3 SYSTEM REQUIREMENTS

Operating Voltage Requirement: V_{cc} =5V ±10%

Operating System: Supported by all operating systems

Interface: SATA 6.0Gbps (SATA-III) or SATA 3.0Gbps (SATA-II) or SATA 1.5Gbps (SATA-I) **Installation Requirements:**

- System Hardware which supports SATA-II/SATA-III standards
- System Hardware includes SATA socket or transfer board

2.0 PRODUCT ORDERING PART NUMBERS

2.1 ORDERING PART STRUCTURE

Table 1: Ordering Part Structure

Series X	Product XX	Interface X	Density XXX	Version X
P - Platnium	25 - 2.5"SSD	S - SATA	256 - 256GByte 512 - 512GByte 001 -1024GByte	Z - first Version

2.2 VALID ORDERING PART NUMBERS

Table 2: Valid Ordering Part Numbers

Product Family	Form Factor	Interface	Capacity	Part Number
Platnium	2.5”	SATA	256GB	P25S256Z
			512GB	P25S512Z
			1TB	P25S001Z

3.0 PHYSICAL SPECIFICATIONS

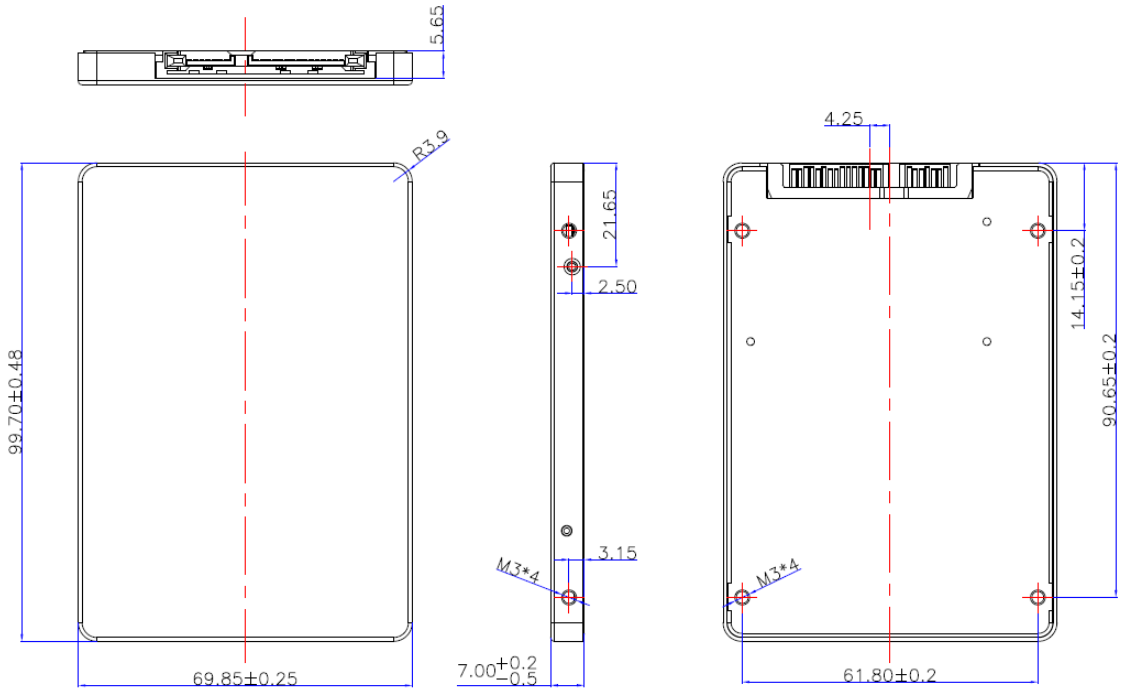
3.1 MECHANICAL SPECIFICATIONS(PCBA)

Length: 99.70 ± 0.20 mm

Width: 69.85± 0.25 mm

Thickness: 7.0 + 0.20-0.5 mm

Figure 1: 2.5" SATAIII SSD Outline Drawing



4.0 ELECTRICAL SPECIFICATIONS

Operating Voltage: V_{cc} = 5V ±10%

Modes: SATA 6.0Gbps (SATA-III) or SATA 3.0Gbps (SATA-II) or SATA 1.5Gbps (SATA-I) standards

4.1 PERFORMANCE SPECIFICATIONS

Access Time: 0.1 ms

Seek Time: 0 ms

Mount Time: Dependent on system HW and SW

Power on to Ready: Dependent on system HW and SW

Data Transfer Time: Rated Data Transfer Speeds are maximums based on Crystal Disk Mark

* 2.5" SATA-III SSD Port and the installation of an enhanced driver required for maximum speed

Table 3: Data Transfer Time Specifications

Device	Sequential Read Max (MB/Sec)	Sequential Write Max (MB/Sec)
P25S256Z	510	460
P25S512Z	560	500
P25S001Z	560	500

4.2 ABSOLUTE MAXIMUM RATINGS

Table 4: Absolute Maximum Ratings

Symbol	Rating	Value	Unit
V_{IN}	Input Voltage	5V ±10%	V
T_{STG}	Storage Temperature	-40 to 85	°C
T_{OPR}	Commercial Grade	0 to +70	°C

4.3 POWER CONSUMPTION TEST FOR RESULT

Table 5: Power Consumption

Capacity	Product Status (W)		
	Idle	Read	Write
256GB	0.43	1.63	1.99
512GB	0.46	1.67	2.12
1TB	0.47	1.7	2.02

4.4 TOTAL BYTES WRITTEN

Table 6:TBW and Daily Usage Guideline results

Capacity	TBW
256GB	250TB
512GB	500TB
1TB	1PB

TBW: Total Bytes Written (TBW according to flash)

Definition and conditions of TBW are based on JEDEC standard

5.0 ENVIRONMENTAL SPECIFICATIONS

Operating Temperature: Commercial Grade: 0°C to +70

Humidity: humidity at 60%, at 50 °C for 48 hours.

Operating Vibration:

Frequency/Displacement: 20~80Hz/1.52mm.
Frequency/Acceleration: 80~2000Hz/20G.
Axis: X, Y, Z axis. 60min/Axis.

6.0 QUALITY AND RELIABILITY SPECIFICATIONS

Data Retention: JESD47 compliant

Wear Leveling: Static and dynamic wear-leveling algorithm.

Bad Block Management: Failed Blocks of Flash will be replaced with new ones by the SSD.

ECC/EDC (Error Correction Code/Error Detection Code):

- Hardware ECC engine: LDPC ECC engine On-the-fly operation

- 16bit CRC to ensure storage-data integrity between controller and NAND Flash device

MTBF: >1,000,000 hours

Power Cycle: 1000 times

Abnormal power shutdown – run burn-in test 80 sec > power off 10 sec > reboot to system, total use 130 sec pre-cycle.

Table 7:Compatibility Test Config

Test Platform: Compatibility Test Config			
Test Items	Total Times	PASS Times	Fail Times
Cycles	1000 times	1000 times	0 times
Random	1000 times	1000 times	0 times

7.0 COMPLIANCE SPECIFICATIONS

All 2.5" SATA-III SSD are compliant with the following standards and regulations:

- RoHS
- CE
- FCC

8.0 PIN DESCRIPTIONS

8.1 DATA PIN ASSIGNMENTS

Table 8: Data Pin Signal Assignment

Pin	Signal Name	Description
S1	GND	2nd mate
S2	PxP	Differential Signal Pair for Receiver
S3	RxN	Differential Signal Pair for Receiver
S4	GND	2nd mate
S5	B-	Differential Signal Pair for Receiver
S6	B+	Differential Signal Pair for Receiver
S7	GND	2nd mate

8.2 CONFIGURATION DESCRIPTIONS

Table 9: Configuration Description

Pin	Symbol	Description
P1	Not Used(3.3V)	N/A
P2	Not Used(3.3V)	N/A
P3	Not Used(3.3V Precharge)	
P4	GND	1st mate
P5	GND	2nd mate

P6	GND	
P7	5V Precharge	5V Power
P8	5V Precharge	5V Power
P9	5V Precharge	
P10	GND	
P11	Reserved	
P12	GND	
P13	Not Used(12V Precharge)	N/A
P14	Not Used(12V)	
P15	Not Used(12V)	

9.0 SUPPORTED ATA COMMAND SET

9.1 ATA COMMAND REGISTER

2.5" SATA-III SSD supports the command show in the following tables.

Table 10: ATA Command table

Command Name	Code (Hex)	Protocol
General Feature Set		
Execute Device Diagnostic	90h	Execute device diagnostic
Flush Cache	E7h	Non-data
Identify Device	ECh	PIO data-in
Initialize Drive Parameters	91h	Non-data
Read DMA	C8h	DMA
Read Log Ext	2Fh	PIO data-in
Read Multiple	C4h	PIO data-in
Read Sector(s)	20h	PIO data-in
Read Verify Sector(s)	40h	Non-data
Set Feature	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/D9h	Non-data
SMART Enable/Disable Autosave	B0h/D2h	Non-data
SMART Enable Operations	B0h/D8h	Non-data
SMART Execute OFF-LINE Immediate	B0h/D4h	Non-data
SMART Read Log	B0h/D5h	PIO data-in
SMART Read Data	B0h/D0h	PIO data-in
SMART Return Status	B0h/DAh	Non-data
SMART Write Log	B0h/D6h	PIO data-out
Host Protected Area Feature Set		
Read Native Max Address	F8h	Non-data
Set Max Address	F9h	Non-data
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 Multiple Ext	39h	PIO data-out
Write Sector(s) Ext	34h	PIO data-out
NCQ Feature Set		
Read FPDMA Queued	60h	DMA Queued
Write FPDMA Queued	61h	DMA Queued
Others		
Data Set Management	06h	DMA
Seek	70h	Non-data

Table 11: Set Features Register Values

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

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

10.0 INSTALLATION

BEFORE GETTING STARTED

1. Back Up Your Data

VISUAL INSPECTION

1. Before unpacking and handling the SSD, discharge the static electricity by touching the metal chassis of your computer or by using an anti-static wrist strap

2. Inspect the box and device for the following

a. Box is damaged or water-stained

b. Any damage to the SSD

HANDLING THE SSD

1. Be cautious when unpacking, installing, and handling the SSD drive. Misuse of the SSD voids all warranty. Follow the succeeding instructions when managing the SSD
2. Follow all ESD pre-cautions
3. Always operate the SSD within environmental conditions
4. Never switch DC power to the drive by plugging an electrically live source cable into the drive’s power connector

INSTALLATION

System Requirements

To install the SSD in your computer, ensure that you have the following items:

1. Mounting Screws (If needed)

Install the SSD

Follow these steps to install the SSD

1. Power down the PC
2. Remove the computer system outside cover
3. Insert the SSD to the connector on motherboard
4. Replace the PC cover
5. Power on the PC
6. A BIOS sign-on message appears and displays a key sequence to enter the BIOS setup. Set up the BIOS to recognize the SSD.
7. Installation is Complete

USING THE SSD IN A MS-DOS OS

The SSD is already partitioned and formatted by NTFS, so if you want to install MS-DOS O/S on the SSD, it should be re-partitioned and re-formatted. After installing the SSD, it must be installed as a disk drive under DOS. Run the DOS commands as listed below and follow the instructions displayed for each command.

1. Run the DOS FDISK program to partition the SSD

2. Verify that the partition is active and ready for formatting

3. Run the DOS FORMAT command to high-level format the SSD

USING THE SSD IN A WINDOWS OS

No modifications need to be made to use the SSD in a Windows OS platform.

USING THE SSD IN A LINUX O/S

Port driver is needed to be made to use the SSD in Linux OS platforms.

USING THE SSD IN OTHER O/S

Port driver is needed to be made to use the SSD in other OS platforms.

FOR MORE INFORMATION

For Technical Support:

If additional support is needed, please visit the ZEPLIN ELECTRONICS Web site at www.zeplinelectronics.com for the following topics:

- **Warranty Services:** Includes the warranty service policy and the RMA request forms.
- **Technical Information:** Includes product data sheets and various USB whitepapers.
- **Tools Section:** Includes frequently asked questions (FAQs).

For More Information or Further Technical Support Please Contact:

ZEPLIN ELECTRONICS Co., Ltd.

Support: Support@zeplinelectronics.com

CHANGE RECORD

Table 12: Change Record

Version	Release Date	Changes
1.0	Mar, 29, 2020	Initial Release in new template