# TG256GS3M-KSYSTS1S

## M.2 2280 NGFF Drive Datasheet

**Version: 1.2**

**Revision History**

| Version | Date | Description |
|---|---|---|
| V1.0 | 4/12/2025 | First release. |
| V1.1 | 21/1/2026 | Add TBW. |
| V1.2 | 24/2/2026 | Update FW fixed CrystalDiskInfo bug.And add PCBA physical dimension. |



**Note:**

Company will not give any notice for change of products specifications. This product manual is only for reference. Please contact with tinyGo for more detail technical parameters and information.

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# 1. Introduction

## 1.1. Overview

tinyGO SATA SSD (Solid State Drive) is a high performance and high reliability storage device based on NAND Flash technology that designed to solve the bottleneck of computing system by traditional hard disk drives. Our SATA SSD doesn't have a moving parts and it has a same host interface and same physical dimension with Hard Disk Drive, so it can be drop-in replaced with the hard disk drives without anything. With a high performance and low power consumption, Our SATA SSD can be a good storage device for NB and Tabletop PC.

tinyGO SATA SSD purely consists of semiconductor devices and NAND flash memories, which give rugged features against shock and vibration, used in extreme environment such as industrial PC to increase MTBF. Furthermore, Our SATA SSD has highly advanced flash memory management algorithm to guarantee

## 1.2. Part Type Introduction

This chapter is about the specifications of the M.2 NGFF SATA Solid State Drive SSD with SATA III interface.

| Type | Capacity | Flash | Interface | Firmware |
|---|---|---|---|---|
| TG256GS3M-KSYSTS1S | 256GB | Toshiba 8T23 TLC | SATA III | FW110226 |

Table 1 Capacity Specifications

| Capacity | Available Capacity | R / W(MB/s) | Random R/W IOPS | TBW |
|---|---|---|---|---|
| 256GB | 238.47GB | 550/450MB/S | 43258/68315 | 128TB |

## 1.3. Outline

| | | |
|---|---|---|
| **Based spec** | Interface | SATAIII |
| | Dimension | 80*22*0.8 mm |
| | Weight ① | 5.6g |
| | Capacity | 256GB |
| | Controller | YS9082 |
| | Flash type | 3D TLC NAND Flash |
| **Read/Write Performance** ② | CDM Sequential Read | Up to 550MB/s |
| | CDM Sequential Write | Up to 450MB/s |
| | ATTO Sequential Read | Up to 500MB/s |
| | ATTO Sequential Write | Up to 450MB/s |
| **Power Consumption** | Power Supply | 3.3V±5% |
| | Standby | 0.3W |
| | Maximum Ripple | 70 mV(peak to peak) |
| | 4KB Random Write | 2.5W |
| **Reliability** | Write endurance:3years @ 100G write/day | |
| | Read endurance: unlimited | |
| | MTBF: >2,000,000 hours | |
| | Data retention: >20years @ 25℃ | |
| | Data destroy do not support | |
| | Sudden power-off recovery support | |
| | S.M.A.R.T,NCQ,Trim and dynamic power management support | |
| | Static and dynamic wear-leveling | |
| | Bad block management algorithm | |
| | ECC: LDPC ECC | |
| **Environment** | Storage temperature: -20~85 ℃ | |
| | Operation temperature: 0~75℃ | |
| | Humidity: 5%~95% | |
| | Vibration | 15G (10 to 2000Hz) |
| | Shock | 350G at 0.5ms |
| **Warranty** | 3 years | |

Table 2 outline of the driver

①, ②: The Read/Write performance and weight vary with different capacity of products.
The testing environment is below:
OS: Windows 7 Ultimate
CPU: Intel (R) Core(TM) i3-2100T CPU @2.50GHz
Memory: 4GB

Motherboard: Controller:YS9082,SATA III,256GB SSD
Test program: ATTO Disk Benchmark ;CrystalDiskMark
Test Drive: TG256GS3M-KSYSTS1S (3D TLC)

## 2. Block Diagram

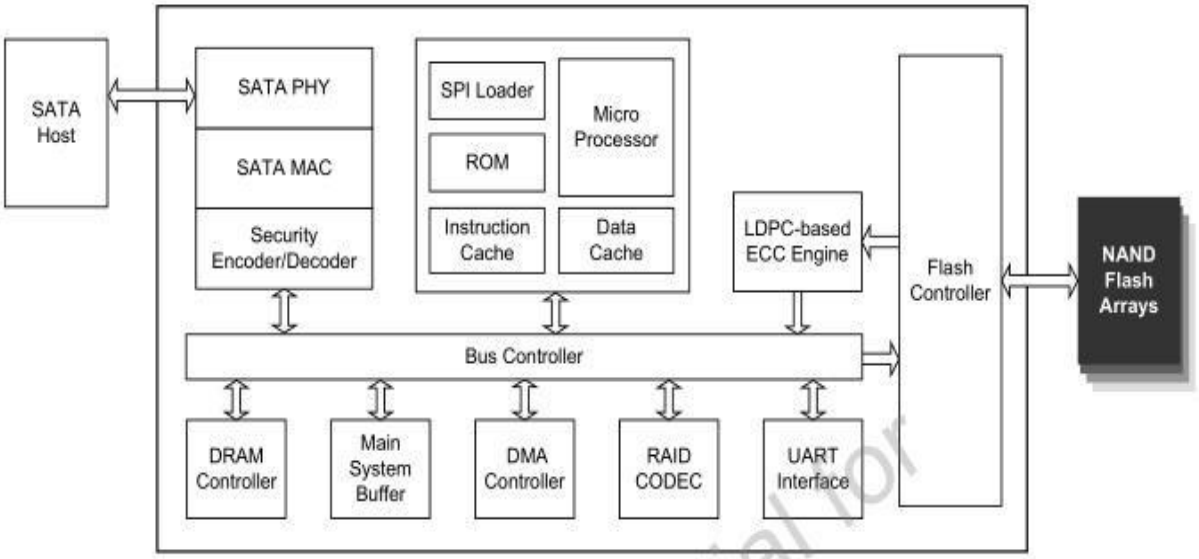



Figure 1 YS9082 Block Diagram

# 3. Product Specifications

## 3.1. Physical Dimensions

| Parameter | Value |
|---|---|
| Length | 80±0.1 mm |
| width | 22±0.1 mm |
| PCB height | 0.8±0.1 mm |
| Max PCBA height | 2.15±0.1 mm |

Table 3 Physical dimensions of the driver

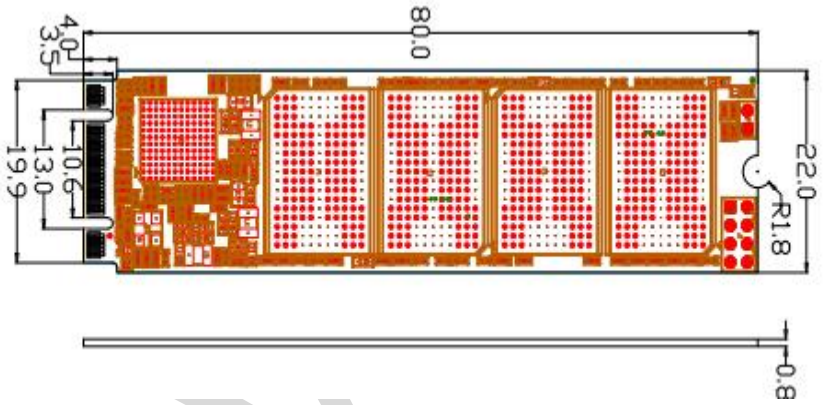



Figure 2 Physical dimensions

## 3.2. Interface Specification

### 3.2.1.Interface Mode

The interface of the M.2 NGFF SSD complies with the standard Serial ATA version 3.1:

①Host Transfer Rate is 600MB/s(6.0Gb/s)

②PIO mode 0,1,2,3,4

③DMA mode 0,1,2

④UDMA mode 0,1,2,3,4,5,6

# 4. Reliability

## 4.1. ECC Descriptions

The LDPC ECC engine executes parity generation and error detection/correction features, and enhances decoding throughput and data reliability. With LDPC of correction capacity 1e-2 RBER,

the hard and soft decoding mechanism provides powerful error correction. Hence the YS9082 can enhance the endurance and retention of 3D TLC Nand Flash and extends the SSD lifespan.

### 4.2. Advance Wear-Leveling Algorithm

The NAND flash devices are limited by a certain number of write cycles. When using a file system, frequent file table updates is mandatory. If some area on the flash wears out faster than others, it would significantly reduce the lifetime of the whole device, even if the erase counts of others are far from the write cycle limit. Thus, if the write cycles can be distributed evenly across the media, the lifetime of the media can be prolonged significantly. The scheme is achieved both via buffer management and specific advanced wear leveling to ensure that the lifetime of the flash media can be increased, and the disk access performance is optimized as well.

### 4.3. S.M.A.R.T Function

S.M.A.R.T. is an acronym for Self-Monitoring, Analysis and Reporting Technology, an open standard allowing disk drives to automatically monitor their own health and report potential problems. It protects the user from unscheduled downtime by monitoring and storing critical drive performance and calibration parameters. Ideally, this should allow taking proactive actions to prevent impending drive failure. SMART feature adopts the standard SMART command B0h to read data from the drive. When the SMART Utility running on the host, it analyzes and reports the disk status to the host before the device is in critical condition.

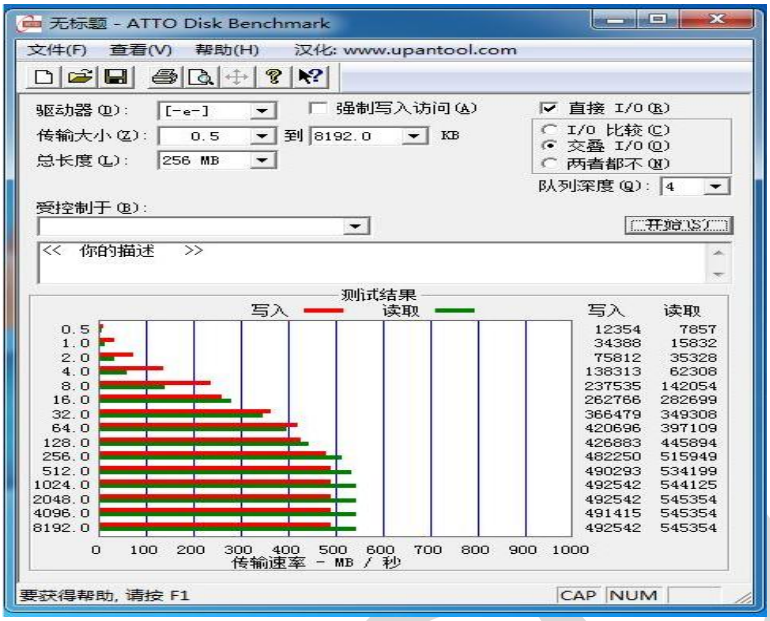
## 5. Ordering Information

| Model | Capacity | PN |
|---|---|---|
| TG256GS3M-KSYSTS1S | 256GB | TG256GS3M-KSYSTS1S |

## 6. Attachment

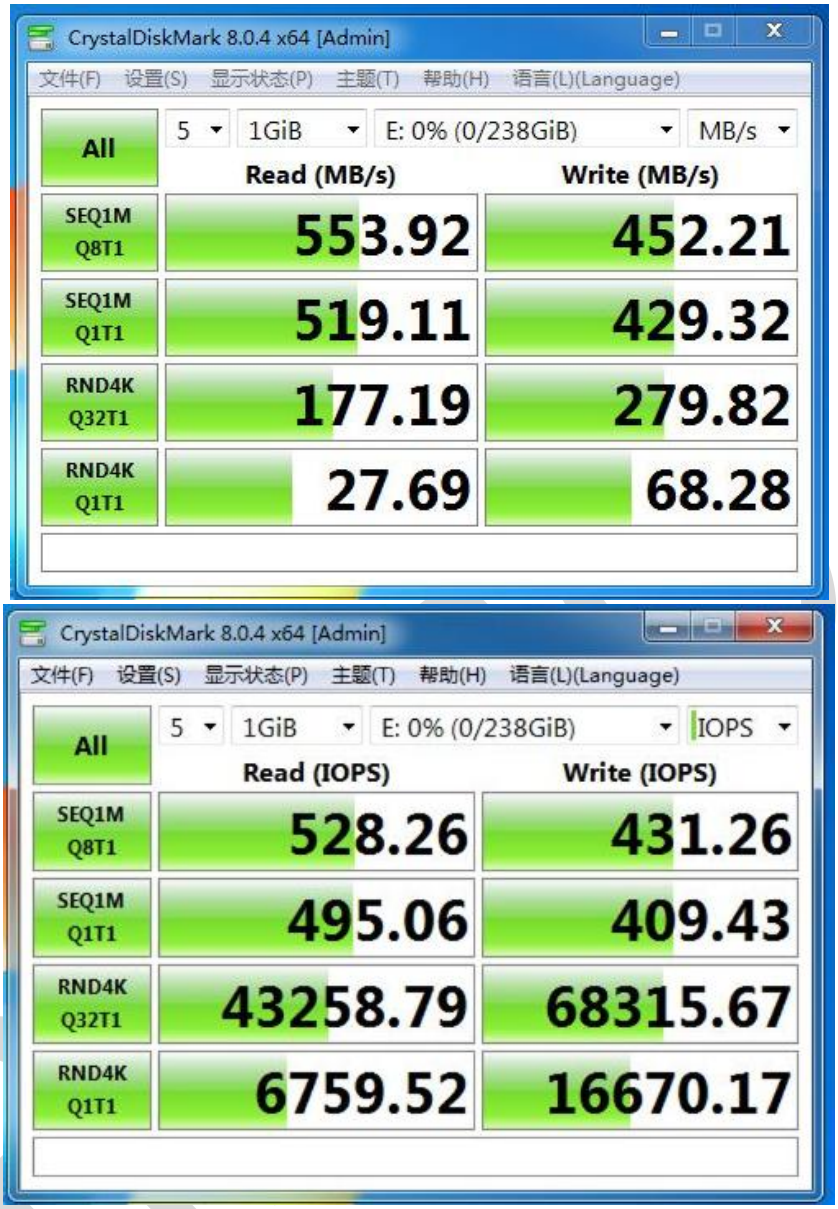
### 6.1. Performance

Test platform：
System : Windows 10
CPU: Intel (R) Core(TM) CPU G3930@2.90GHz
Memory : 4GB
Mother Board: Controller:YS9082,SATA III,256GB
Test SSD:Controller:YS9082,SATA III,TG256GS3M-KSYSTS1S
Test performance picture:
① ATTO Disk Benchmark




② AS SSD Benchmark


③ Crystal Disk Mark




## 6.2. Label Information