

TG128GS3S-KSPHIN2S MSATA Drive Datasheet

Version: 1.1

Revision History

Version	Date	Description
V1.0	15/1/2026	First release.
V1.1	24/2/2026	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 MSATA Solid State Drive SSD with SATA III interface.

Type	Capacity	Flash	Interface	Firmware
TG128GS3S- KSPHIN2S	128GB	Intel 3D TLC	MSATA	SBFQBB.3

Table 1 Capacity Specifications

Capacity	Available Capacity	R / W(MB/s)	Random R/W(IOPS)
128GB	119.24GB	550/350	36824/78374

2. Outline

Table 2 outline of the driver

Based spec	Interface		MSATA
	Dimension		50*30*0.8 mm
	Weight ①		11.2g
	Capacity		128GB
	Controller		Tai Wan Phison S3111
	Flash type		3D TLC NAND Flash
Read/Write Performance ②	CDM Sequential Read		Up to 550MB/s
	CDM Sequential Write		Up to 350MB/s
	ATTO Sequential Read		Up to 500MB/s
	ATTO Sequential Write		Up to 350MB/s
Power Consumption	Power Supply		5V±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°C		
	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 °C		
	Operation temperature: 0~70°C		
	Humidity: 5%~95%		
	Vibration	15G (10 to 2000Hz)	
	Shock	350G at 0.5ms	
Warranty	3 years		

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: PS3111,SATA III,128GB SSD
 Test program: ATTO Disk BenchMark ; CrystalDiskMark
 Test Drive: TG128GS3S-KSPHIN2S (3D TLC)

3. Block Diagram

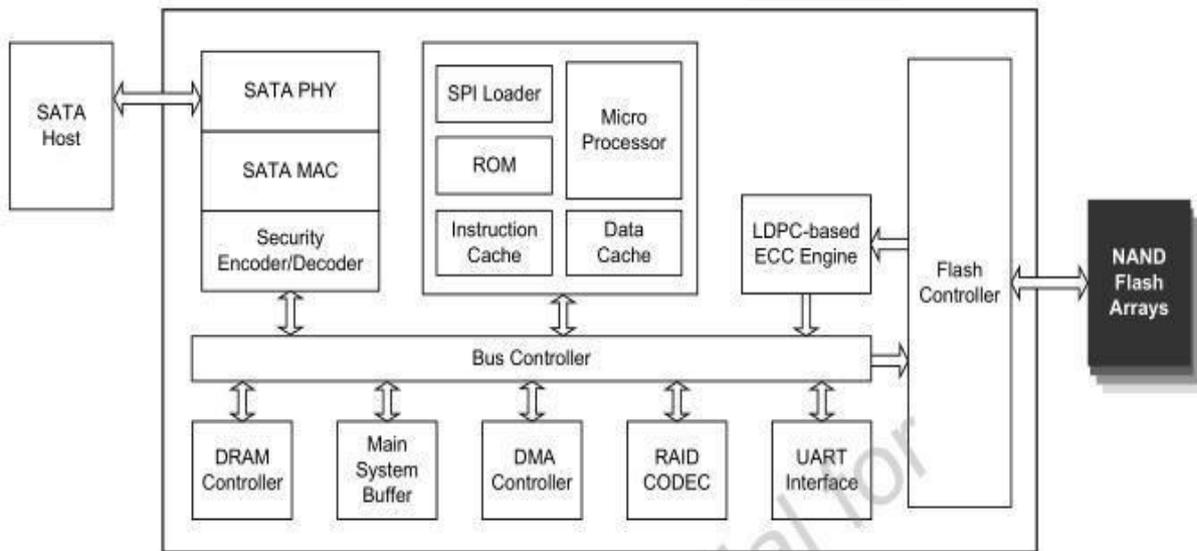


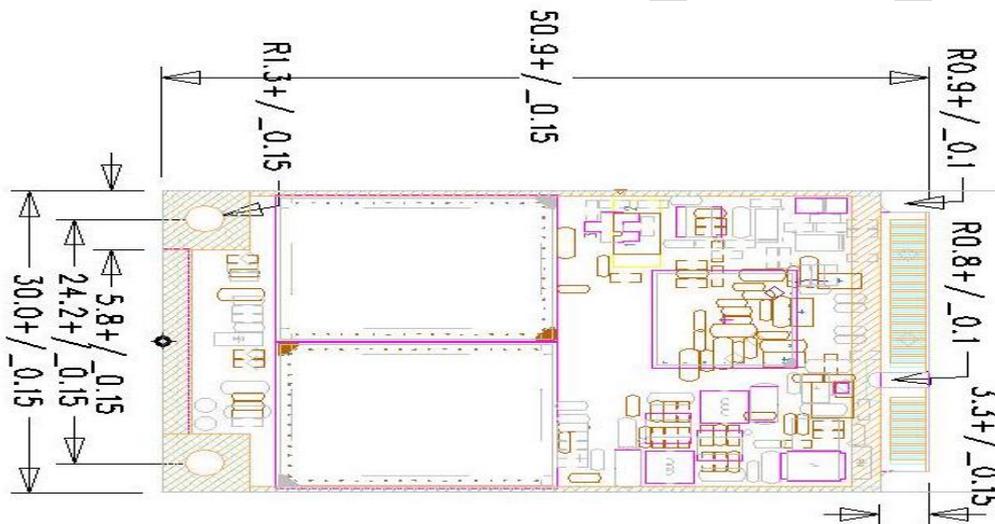
Figure 1 PS3111 Block Diagram

4. Product Specifications

4.1 Physical Dimensions

Parameter	Value
Length	50 ± 0.15 mm
width	30 ± 0.15 mm
PCB height	0.8 ± 0.1 mm
Max PCB height	2.43 ± 0.1 mm

Table 3 Physical dimensions of the driver



5. Reliability

5.1 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 PS3111 can enhance the endurance and retention of 3D TLC Nand Flash and extends the SSD lifespan.

5.2 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.

5.3 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.

6. Ordering Information

Model	Capacity	PN
TG128GS3S-KSPHIN2S	128GB	TG128GS3S-KSPHIN2S

7. Attachment

7.1. Performance

Test platform:

System :Windows10

CPU: Intel (R) Core(TM) CPU G3930@2.90GHz

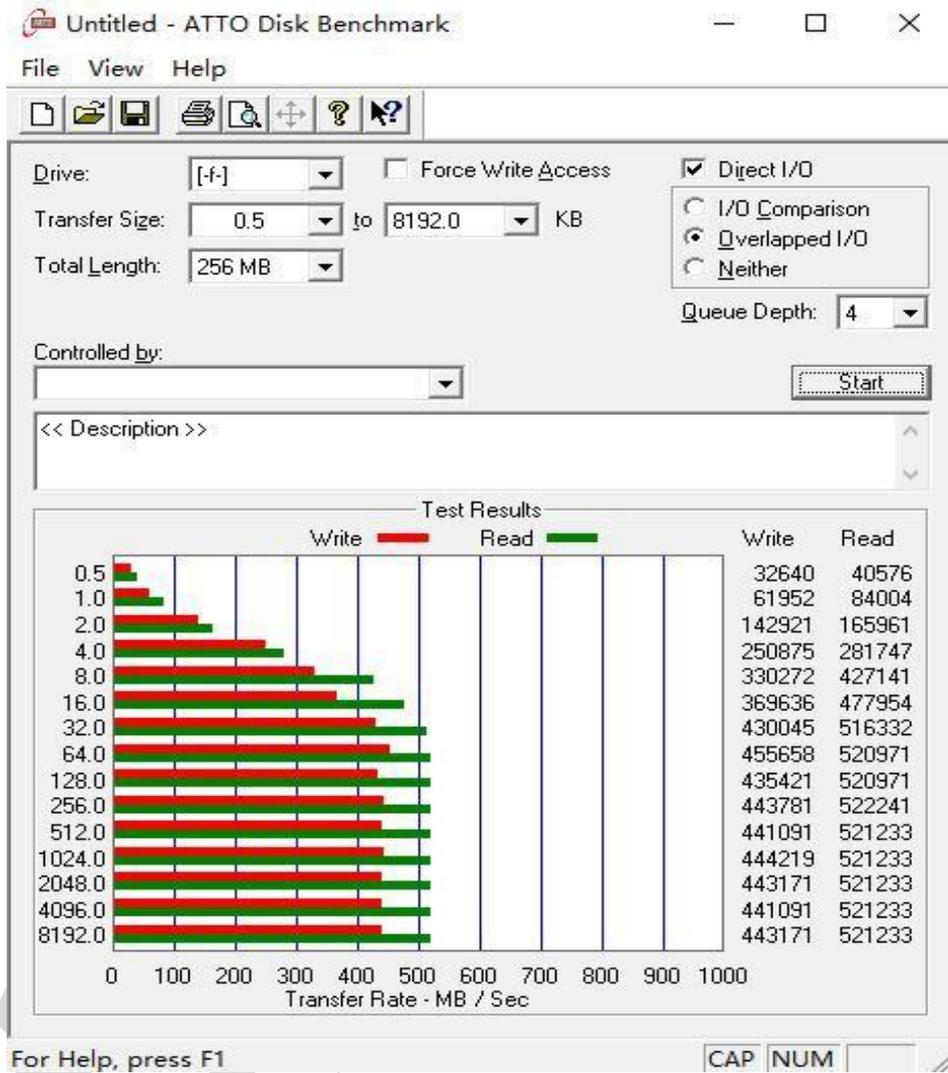
Memory : 4GB

Mother Board: Controller:PS3111,SATA III,128GB

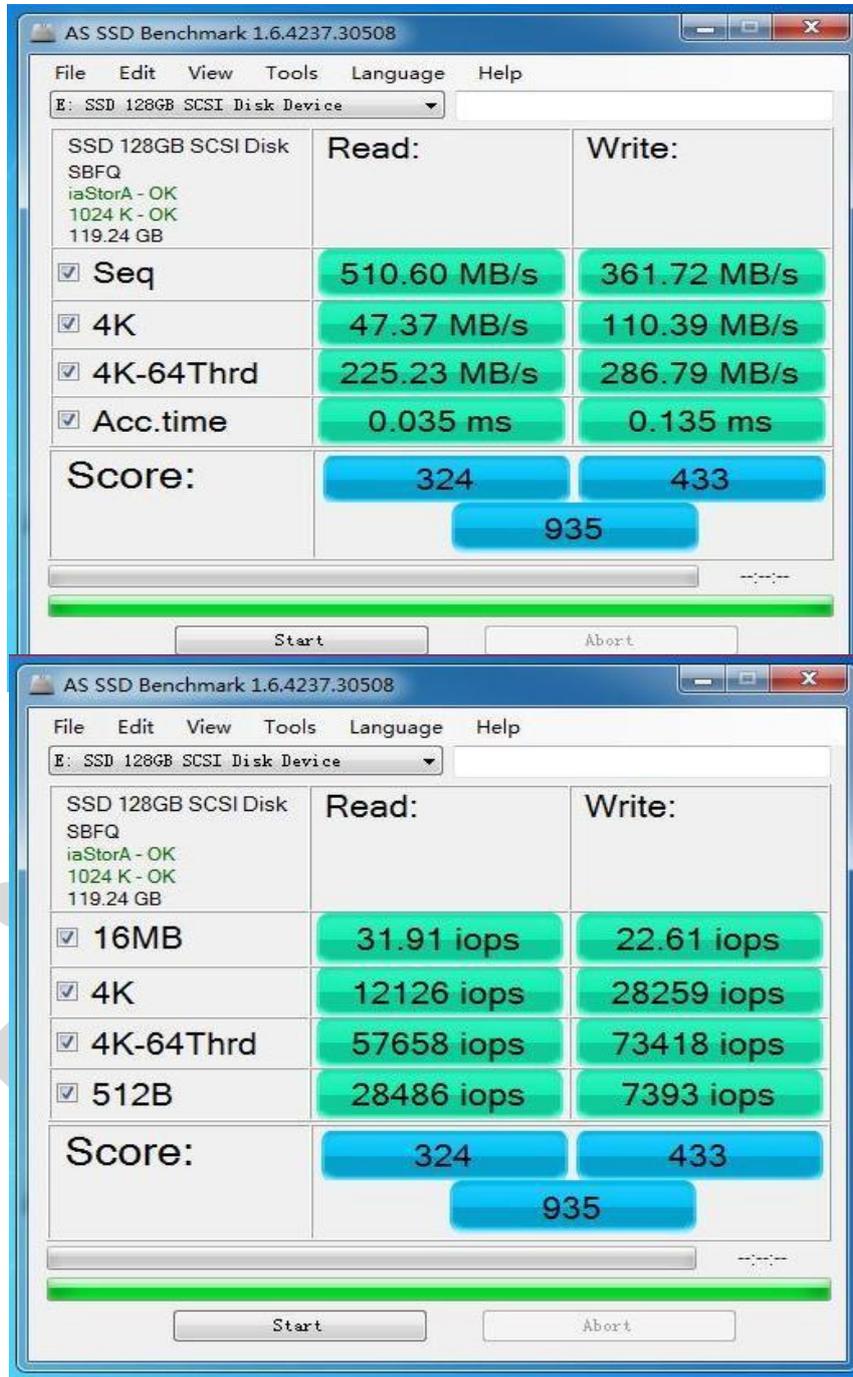
Test SSD:Controller:PS3111,MSATA III,TG128GS3S-KSPHIN2

Test performance picture:

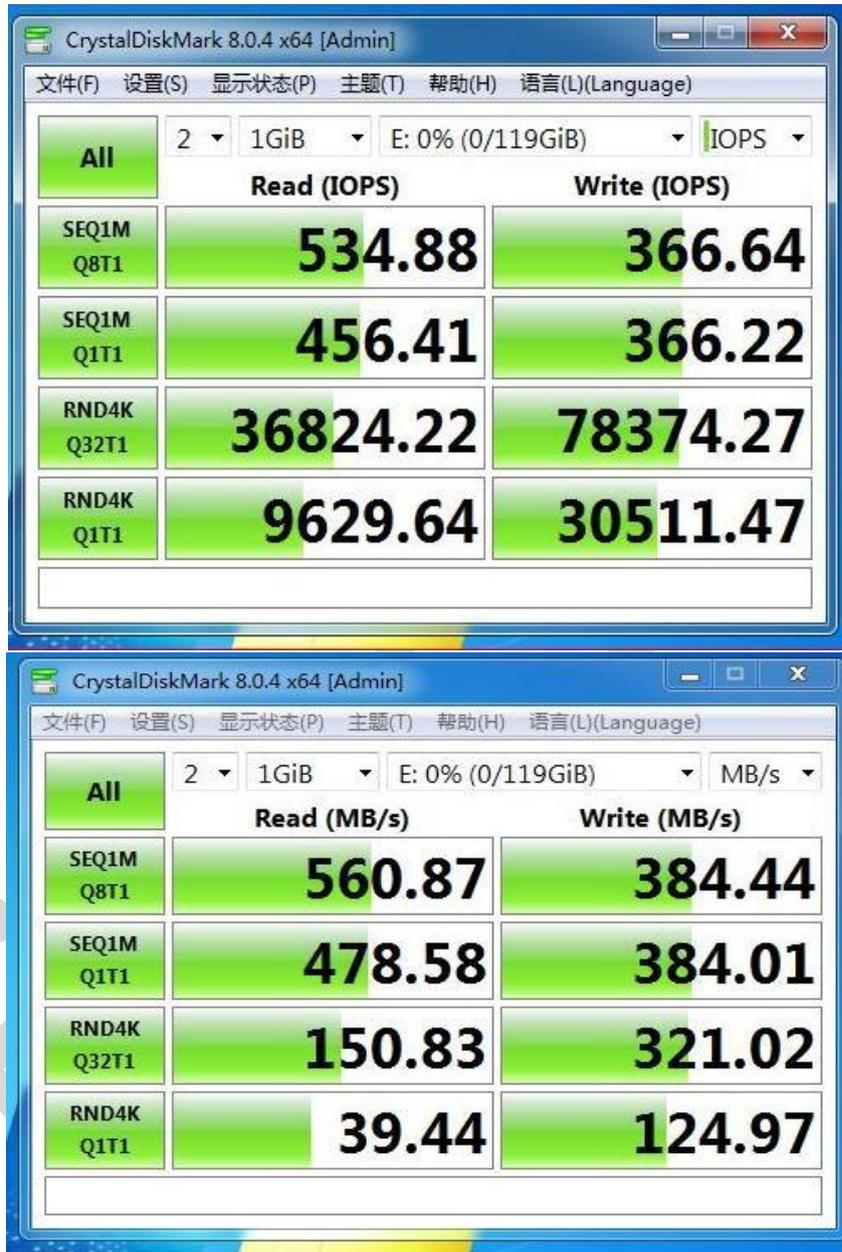
① ATTO Disk Benchmark



② AS SSD Benchmark



③ CrystalDiskMark



8. Label Information

