

99 Series PCIe Gen4x4 M.2 2280 SSD Datasheet

No PLP PN:

TMS99128GP480Tx-00N0

TMS99256GP480Tx-00N0

TMS99512GP480Tx-00N0

TMS99001TP480Tx-00N0

TMS99002TP480Tx-00N0

With PLP PN:

TMS99128GP480Tx-P0N0

TMS99256GP480Tx-P0N0

TMS99512GP480Tx-P0N0

TMS99001TP480Tx-P0N0

TMS99002TP480Tx-P0N0

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Key Features

Capacity

- 128GB/256GB/512GB/1TB/2TB

Form Factor

- M.2 2280

Features

- PCIe Gen 4 16Gb/s interface with up to 4 lanes
- Compliant with NVMe Revision 2.0
- Supporting host memory buffer
- Supporting initial data acceleration
- Supporting fast block acceleration
- Supporting ATA security
- Supporting SRAM ECC
- Supporting deep recovery mode for user data
- Supporting read-only mode for critical errors
- Supporting SM4(Optional)
- Supporting TCG opal(Optional)
- Supporting PLP(Optional)

Performance

128GB

- Read: Up to 3,000MB/s
- Write: Up to 1,500MB/s

256GB

- Read: Up to 6,600MB/s
- Write: Up to 3,300MB/s

512GB

- Read: Up to 7,000MB/s
- Write: Up to 6,400MB/s

1TB

- Read: Up to 7,000MB/s
- Write: Up to 6,400MB/s

2TB

- Read: Up to 7,000MB/s
- Write: Up to 6,500MB/s

TBW*

- 128GB: 384TB
- 256GB: 768TB
- 512GB: 1536TB
- 1TB: 3000TB
- 2TB: 6000TB

*(WAF=1)

Power Consumption

- Active read: 5,700 mW
- Active write: 5,800 mW

Temperatures

- Operating :
 - A99M8/A99M8-P: -40°C~+85°C
 - K99M8/K99M8-P: -25°C~+85°C
 - S99M8/S99M8-P: -10°C~+70°C
- Non-operating : -55°C~+95°C

Shock & Vibration

- Shock: 1,500G, duration 0.5ms, Half Sine Wave
 - Vibration: 10~2,000Hz, 20G
- * Applicable only for cased product

MTBF

- 3,000,000 hours

UBER

- < 1 sector per 10¹⁵ bits read

Weight

- No PLP: Max 8g
- With PLP: Max 10g

Certification

- Rohs/Reach/CE/FCC

Power

- L1.2: 5mW

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1 Introduction

1.1 General Description

This document describes the specifications of Industrial 99 Series M.2 2280 SSDs.

Industrial SSDs use NAND Flash Memory and provide high reliability in a small form factor. It supports the PCIe 4.0 interface standard with up to four lanes, showing a much better performance than SATA SSDs.

Industrial SSDs come in different capacities: 128GB, 256GB, 512GB, 1TB and 2TB. With four lanes, their sequential performance is up to 7,000MB/s for read operation and 6,500MB/s for write operation, and their random performance is up to 1100k IOPS for read operation and 1050k IOPS for write operation. They also provide rugged features, delivering a high MTBF.

1.2 Product Line-up

Table 1-1 Product Line-up A99M8

Type	Capacity	Model	Part Number
PCIe M.2 2280 SSD	128GB	TIMAR A99M8 128GB SSD	TMS99128GP480TW-00N0
PCIe M.2 2280 SSD	256GB	TIMAR A99M8 256GB SSD	TMS99256GP480TW-00N0
PCIe M.2 2280 SSD	512GB	TIMAR A99M8 512GB SSD	TMS99512GP480TW-00N0
PCIe M.2 2280 SSD	1TB	TIMAR A99M8 1TB SSD	TMS99001TP480TW-00N0
PCIe M.2 2280 SSD	2TB	TIMAR A99M8 2TB SSD	TMS99002TP480TW-00N0

Table 1-2 Product Line-up A99M8-P

Type	Capacity	Model	Part Number
PCIe M.2 2280 SSD	128GB	TIMAR A99M8-P 128GB SSD	TMS99128GP480TW-P0N0
PCIe M.2 2280 SSD	256GB	TIMAR A99M8-P 256GB SSD	TMS99256GP480TW-P0N0
PCIe M.2 2280 SSD	512GB	TIMAR A99M8-P 512GB SSD	TMS99512GP480TW-P0N0
PCIe M.2 2280 SSD	1TB	TIMAR A99M8-P 1TB SSD	TMS99001TP480TW-P0N0
PCIe M.2 2280 SSD	2TB	TIMAR A99M8-P 2TB SSD	TMS99002TP480TW-P0N0

Table 1-3 Product Line-up K99M8

Type	Capacity	Model	Part Number
PCIe M.2 2280 SSD	128GB	TIMAR K99M8 128GB SSD	TMS99128GP480TM-00N0
PCIe M.2 2280 SSD	256GB	TIMAR K99M8 256GB SSD	TMS99256GP480TM-00N0
PCIe M.2 2280 SSD	512GB	TIMAR K99M8 512GB SSD	TMS99512GP480TM-00N0
PCIe M.2 2280 SSD	1TB	TIMAR K99M8 1TB SSD	TMS99001TP480TM-00N0
PCIe M.2 2280 SSD	2TB	TIMAR K99M8 2TB SSD	TMS99002TP480TM-00N0

Table 1-4 Product Line-up K99M8-P

Type	Capacity	Model	Part Number
PCIe M.2 2280 SSD	128GB	TIMAR K99M8-P 128GB SSD	TMS99128GP480TM-P0N0
PCIe M.2 2280 SSD	256GB	TIMAR K99M8-P 256GB SSD	TMS99256GP480TM-P0N0
PCIe M.2 2280 SSD	512GB	TIMAR K99M8-P 512GB SSD	TMS99512GP480TM-P0N0
PCIe M.2 2280 SSD	1TB	TIMAR K99M8-P 1TB SSD	TMS99001TP480TM-P0N0
PCIe M.2 2280 SSD	2TB	TIMAR K99M8-P 2TB SSD	TMS99002TP480TM-P0N0

Table 1-5 Product Line-up S99M8

Type	Capacity	Model	Part Number
PCIe M.2 2280 SSD	128GB	TIMAR S99M8 128GB SSD	TMS99128GP480TS-00N0
PCIe M.2 2280 SSD	256GB	TIMAR S99M8 256GB SSD	TMS99256GP480TS-00N0
PCIe M.2 2280 SSD	512GB	TIMAR S99M8 512GB SSD	TMS99512GP480TS-00N0
PCIe M.2 2280 SSD	1TB	TIMAR S99M8 1TB SSD	TMS99001TP480TS-00N0
PCIe M.2 2280 SSD	2TB	TIMAR S99M8 2TB SSD	TMS99002TP480TS-00N0

Table 1-6 Product Line-up S99M8-P

Type	Capacity	Model	Part Number
PCIe M.2 2280 SSD	128GB	TIMAR S99M8-P 128GB SSD	TMS99128GP480TS-P0N0
PCIe M.2 2280 SSD	256GB	TIMAR S99M8-P 256GB SSD	TMS99256GP480TS-P0N0
PCIe M.2 2280 SSD	512GB	TIMAR S99M8-P 512GB SSD	TMS99512GP480TS-P0N0
PCIe M.2 2280 SSD	1TB	TIMAR S99M8-P 1TB SSD	TMS99001TP480TS-P0N0
PCIe M.2 2280 SSD	2TB	TIMAR S99M8-P 2TB SSD	TMS99002TP480TS-P0N0

1.3 SSD Function Block Diagram

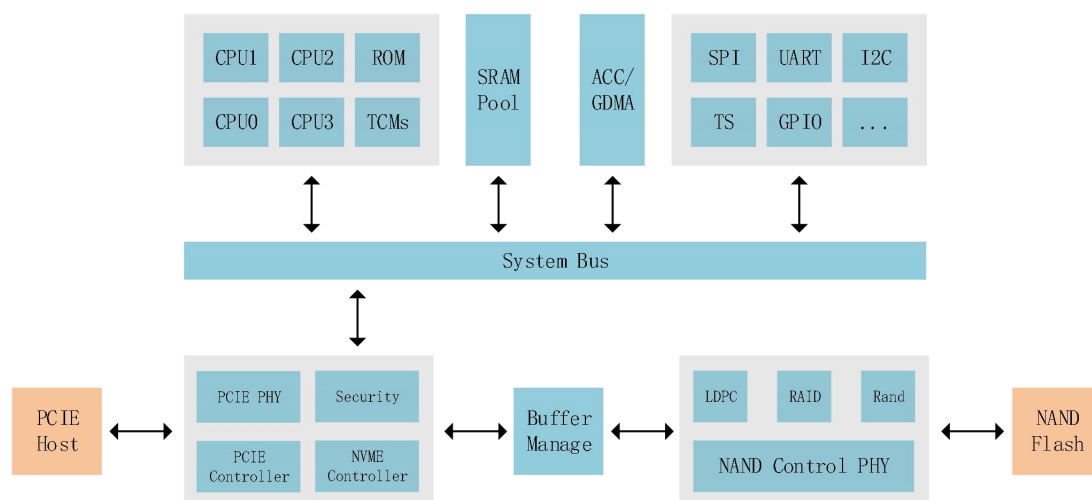
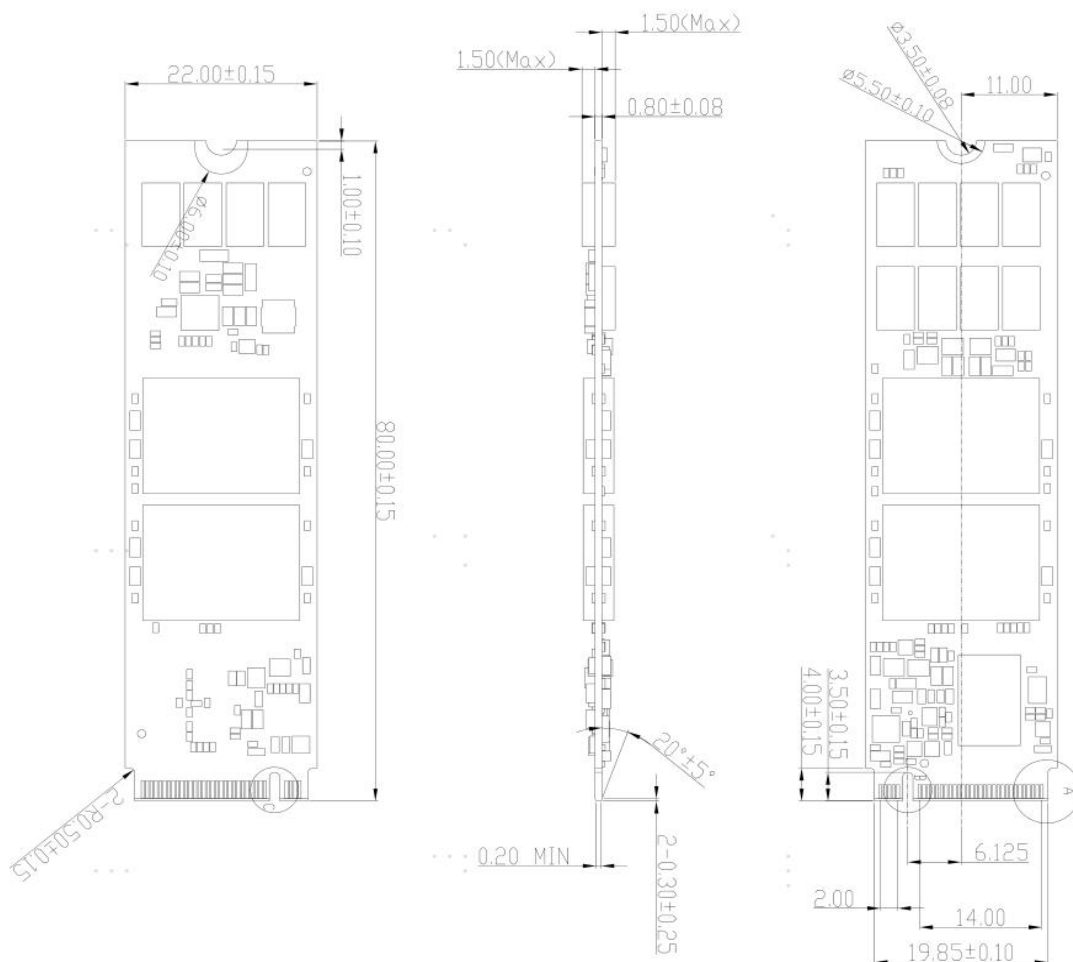


Figure 1 Function Block Diagram

2 Mechanical Specifications

Table 2 M.2 2280 SSD Physical Dimensions and Weight

Series	Height (mm) ¹	Width (mm)	Length (mm)	Weight (gram)
No PLP	MAX 3.60	22.00±0.15	80.00±0.15	MAX 8
With PLP	MAX 4.00	22.00±0.15	80.00±0.15	MAX 10



Note: ¹Thickness data does not include label thickness.

Figure 2 M.2 2280 Physical Dimension

3 Electrical Interface Specifications

3.1 Connector Pin Location



Figure 3 M.2 2280 Signal and Power pins

3.2 M.2 2280 Pin Assignments and Definition

Table 3 M.2 2280 Connector Pin Assignment

Pin #	Assignment	Description	Pin #	Assignment	Description
1	GND	Ground	2	3.3V	3.3V source
3	GND	Ground	4	3.3V	3.3V source
5	PETn3	PCIe TX based on SSD	6	N/C	N/C
7	PETp3	PCIe TX based on SSD	8	PLN#	Power Loss Notification
9	GND	Ground	10	LED_1#	Device Active Signal
11	PERn3	PCIe RX based on SSD	12	3.3V	3.3V source
13	PERp3	PCIe RX based on SSD	14	3.3V	3.3V source
15	GND	Ground	16	3.3V	3.3V source
17	PETn2	PCIe TX based on SSD	18	3.3V	3.3V source
19	PETp2	PCIe TX based on SSD	20	N/C	N/C
21	GND	Ground	22	N/C	N/C
23	PERn2	PCIe RX based on SSD	24	N/C	N/C
25	PERp2	PCIe RX based on SSD	26	N/C	N/C
27	GND	Ground	28	N/C	N/C
29	PETn1	PCIe TX based on SSD	30	PLA_S3#	Power Loss Acknowledge
31	PETp1	PCIe TX based on SSD	32	GND	Ground
33	GND	Ground	34	N/C	N/C
35	PERn1	PCIe RX based on SSD	36	N/C	N/C
37	PERp1	PCIe RX based on SSD	38	GND	Ground
39	GND	Ground	40	SMB_CLK	SMBus Clock
41	PETn0	PCIe TX based on SSD	42	SMB_DATA	SMBus Data
43	PETp0	PCIe TX based on SSD	44	ALERT#	SMBus Alert
45	GND	Ground	46	N/C	N/C
47	PERn0	PCIe RX based on SSD	48	N/C	N/C
49	PERp0	PCIe RX based on SSD	50	PERST#	PCIe Reset
51	GND	Ground	52	CLKREQ#	PCIe Device Clock Request
53	REFCLKN	PCIe Reference Clock	54	N/C	N/C
55	REFCLKP	PCIe Reference Clock	56	N/C	N/C

Pin #	Assignment	Description	Pin #	Assignment	Description
57	GND	Ground	58	N/C	N/C
59	N/C	Mechanical Notch	60	N/C	Mechanical Notch
61	N/C	Mechanical Notch	62	N/C	Mechanical Notch
63	N/C	Mechanical Notch	64	N/C	Mechanical Notch
65	N/C	Mechanical Notch	66	N/C	Mechanical Notch
67	N/C	N/C	68	N/C	N/C
69	N/C	N/C	70	3.3V	3.3V source
71	GND	Ground	72	3.3V	3.3V source
73	VIO_CFG	N/C	74	3.3V	3.3V source
75	GND	Ground			

Table 4 Simple Indicator Protocol for SSD LED States (Optional)

ASPM		LED Status
Active State (Host sends CMD to SSD)		Blinking
Idle	Low Power standby	Off
Deep Sleep	Deep Sleep Power savings	Off

Note: ASPM (Active State Power Management)

4 Contact information

Tel: 13524737042

Email: Sean.li@shtimar.com

Website: www.shtimar.com

Address: Room 1208, No. 999 West Zhongshan Road, Changning District, Shanghai, China

Revision History

Version	Date	Changes
1.0	2025.09	Initial release Draft version.
1.1	2025.10.20	Update vibration & shock testing methods and standards