97 Series PCIe Gen4x4 M.2 2242 SSD Datasheet

Single-sided Adhesive PN:
TMS97256GP442Tx-Y0N0
TMS97512GP442Tx-Y0N0
TMS97001TP442Tx-Y0N0
TMS97002TP442Tx-Y0N0

Key Features

Capacity
- 256G/512G/1TB/2TB

Form Factor
- M.2 2242

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)

Performance

256GB
- Read: Up to 3,100MB/s
- Write: Up to 1,100MB/s

512GB
- Read: Up to 6,500MB/s
- Write: Up to 2,400MB/s

1TB
- Read: Up to 7,100MB/s
- Write: Up to 4,800MB/s

2TB
- Read: Up to 7,100MB/s
- Write: Up to 6,500MB/s

TBW*
- 256GB: 768TB
- 512GB: 1500TB
- 1TB: 3000TB
- 2TB: 6000TB

*(WAF=1)

Power Consumption
- Active read: 5,200 mW
- Active write: 5,500 mW

Temperatures
- Operating :
  A97M4-Y: -40°C~+85°C
  K97M4-Y: -25°C~+85°C
  S97M4-Y: -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 10^15 bits read

Weight
- Max 7g

Certification
- Rohs/Reach/CE/FCC

Power
- L1.2: 5mW

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Tables

1 Introduction

1.1 General Description

This document describes the specifications of Industrial 97 Series M.2 2242 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: 256GB, 512GB, 1TB and 2TB. With four lanes, their sequential performance is up to 7,100MB/s for read operation and 6,500MB/s for write operation, and their random performance is up to 970k IOPS for read operation and 1000k IOPS for write operation. They also provide rugged features, delivering a high MTBF.

1.2 Product Line-up

Table 1-1 Product Line-up A97M4-Y

Type	Capacity	Model	Part Number
PCIe M.2 2242 SSD	256GB	TIMAR A97M4-Y 256GB SSD	TMS97256GP442TW-Y0N0
PCIe M.2 2242 SSD	512GB	TIMAR A97M4-Y 512GB SSD	TMS97512GP442TW-Y0N0
PCIe M.2 2242 SSD	1TB	TIMAR A97M4-Y 1TB SSD	TMS97001TP442TW-Y0N0
PCIe M.2 2242 SSD	2TB	TIMAR A97M4-Y 2TB SSD	TMS97002TP442TW-Y0N0

Table 1-2 Product Line-up K99M4-Y

Type	Capacity	Model	Part Number
PCIe M.2 2242 SSD	256GB	TIMAR K97M4-Y 256GB SSD	TMS97256GP442TM-Y0N0
PCIe M.2 2242 SSD	512GB	TIMAR K97M4-Y 512GB SSD	TMS97512GP442TM-Y0N0
PCIe M.2 2242 SSD	1TB	TIMAR K97M4-Y 1TB SSD	TMS97001TP442TM-Y0N0
PCIe M.2 2242 SSD	2TB	TIMAR K97M4-Y 2TB SSD	TMS97002TP442TM-Y0N0

Table 1-3 Product Line-up S99M4-Y

Type	Capacity	Model	Part Number
PCIe M.2 2242 SSD	256GB	TIMAR S97M4-Y 256GB SSD	TMS97256GP442TS-Y0N0
PCIe M.2 2242 SSD	512GB	TIMAR S97M4-Y 512GB SSD	TMS97512GP442TS-Y0N0
PCIe M.2 2242 SSD	1TB	TIMAR S97M4-Y 1TB SSD	TMS97001TP442TS-Y0N0
PCIe M.2 2242 SSD	2TB	TIMAR S97M4-Y 2TB SSD	TMS97002TP442TS-Y0N0

1.3 SSD Function Block Diagram

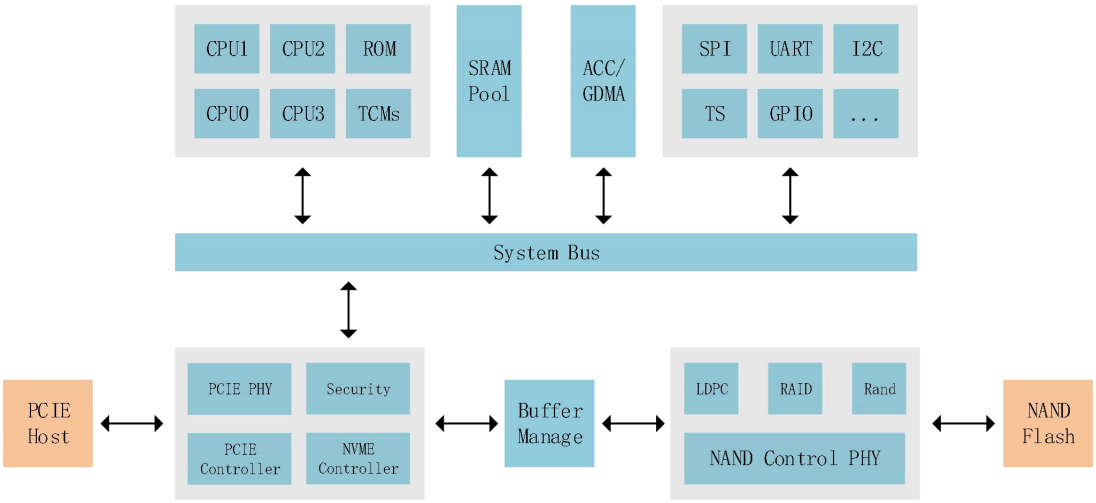
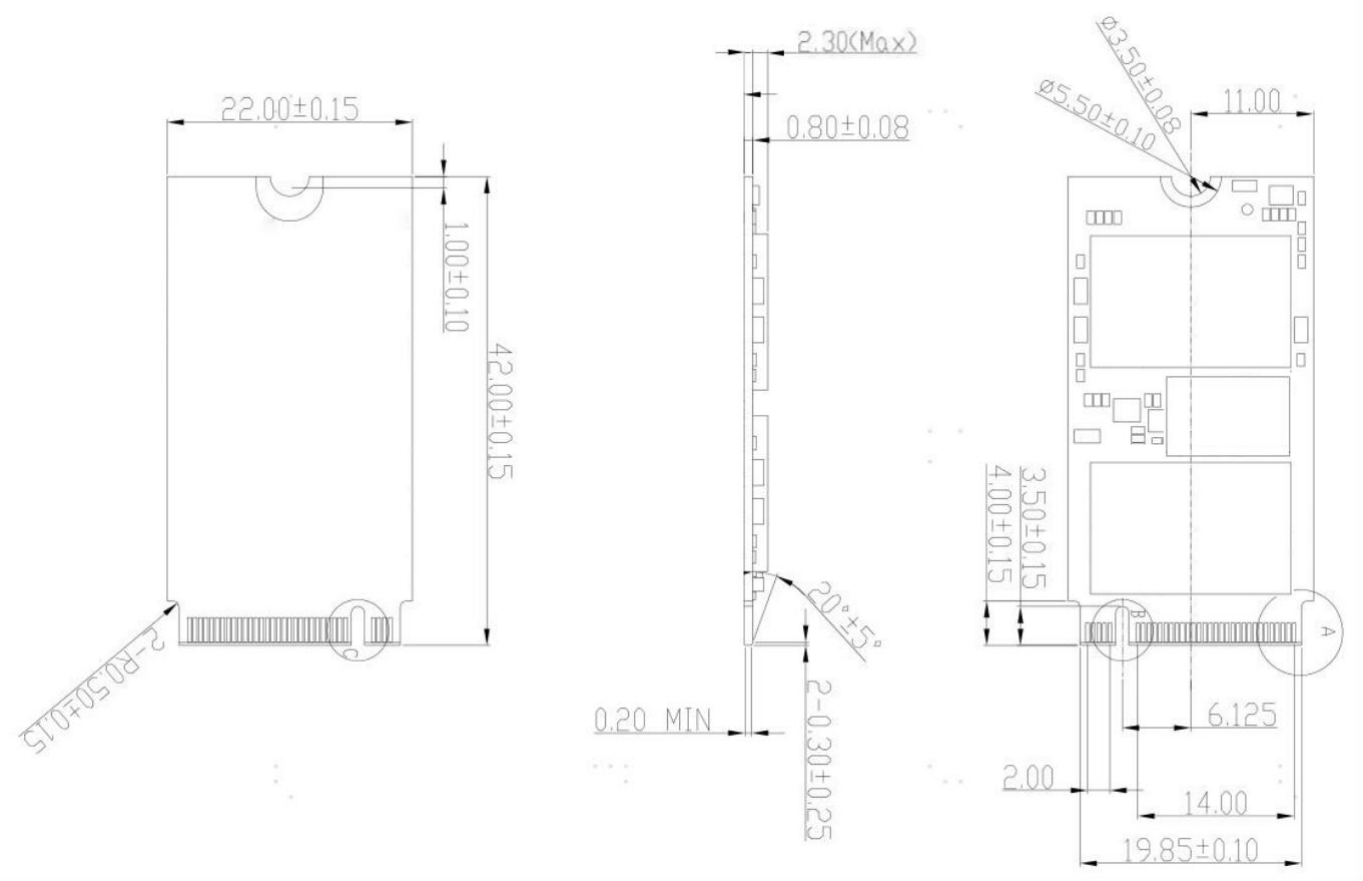


Figure 1 Function Block Diagram

2 Mechanical Specifications

Table 2 M.2 2242 SSD Physical Dimensions and Weight

Series	Height (mm)[1]	Width (mm)	Length (mm)	Weight (gram)
All	MAX 2.30	22.00±0.15	42.00±0.15	MAX 7



Note: [1]Thickness data does not include label thickness.

Figure 2 M.2 2242 Physical Dimension

3 Electrical Interface Specifications

3.1 Connector Pin Location

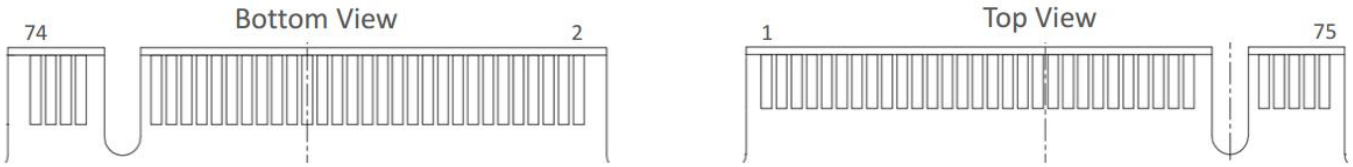


Figure 3 M.2 2242 Signal and Power pins

3.2 M.2 2242 Pin Assignments and Definition

Table 3 M.2 2242 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#	Reserved for PLN#
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#	Reserved for PLA_S3#
31	PETp1	PCIe TX based on SSD	32	N/C	N/C
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	N/C	N/C
39	GND	Ground	40	SMB_CLK	Reserved for SMBUS
41	PETn0	PCIe TX based on SSD	42	SMB_DATA	Reserved for SMBUS
43	PETp0	PCIe TX based on SSD	44	ALERT#	Reserved for SMBUS
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

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Revision History

Version	Date	Changes
1.0	2025.12	Initial release