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產品規格書 (Specification)

產 品 類 別 (ITEM)	SSD / STORAGE
品 名 規 格 (DESCRIPTION)	M.2 2280 PCIE GEN3 x 4 SSD
凌 航 型 號 (Goldkey Model)	NSP095 H06 (J0) Series
規 格 書 版 本 (Specification Rev.)	00

Prepared by	Approved by
Peter	Willy

Total Pages	Product Rev.	Date
14	00	2024/03/29

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NSP095 H06 (J0) Series	Rev: A		



Revision History

Specification Rev.	Date	Revised Description	Author
00	2024/03/29	Initial	Peter

Specifications Overview:

Summary	Solution	MAP1202 + 3D TLC NAND FLASH HYNIX V7
	Interface	PCIe Gen 3 x4 Protocol NVMe 1.3 certified
Connector Type	75 pin M.2 Edge (M notched) connector	
Form Factor	NGFF M.2	M.2 2280 PCIe M Key (single side)
Characteristic	Capacity	512GB
	Sequence read *1 (MB/s) (min)	3400
	Sequence write *1 (MB/s) (min)	2600
Storage medium	3D TLC NAND FLASH HYNIX V7	
Electrical Specifications	Input voltage	3.3V ± 5%
	Average Active mode Power	< 5W
	Average Idle mode power	< 0.7W
FLASH Management	TRIM command 、 Global Wear leveling 、 S.M.A.R.T. 、 Bad block management 、 NCQ	
Reliability	MTBF (hours)	2,000,000
	Endurance (TBW)	320
Temperature Range	Working temperature	0~+70°C
	Storage temperature	-40~85°C
Mechanical Characteristics	Height (mm)	1.35 mm (Max.)
	Width (mm)	22.00 mm ± 0.15mm
	Length (mm)	80.00 mm ±0.15mm
	Weight	8g (Max.)

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Note:

*1 Measured by CrystalDiskMark V8.0.4 (x64) at empty disk with PCIE GEN3 *4 host.

*2 Performance may differ according to flash configuration, SDR configuration, and platform.

*3 The table above is for reference only. The criteria for MP (mass production) and for accepting goods shall be discussed based on different flash configuration.

Ordering Information for Compliant Products

Part Number	Description	Solution	Capacity
NSP095P3451-H06Q2J0	M.2 2280 PCIE SSD	MAP1202 + HYNIX V7	512GB

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1. General Descriptions

1.1. Introduction

Neo Forza's M.2 2280 PCIe SSD (Solid State Drive) is a high performance and high reliability storage device based on New 3D TLC NAND Flash technology that is designed to solve the bottleneck of computing system by traditional hard disk drives (HDD). Neo Forza's M.2 2280 PCIe SSD is fully compliant with the standard M.2 2280 form factor. With a high performance and low power consumption, Neo Forza's M.2 2280 PCIe SSD is a great choice of storage device for NB and PC.

1.2. Performance

Table 1-1 Performance Specifications

Capacity	Sequence	
	Read (MB/s) min.	Write (MB/s) min.
512GB	3400	2600

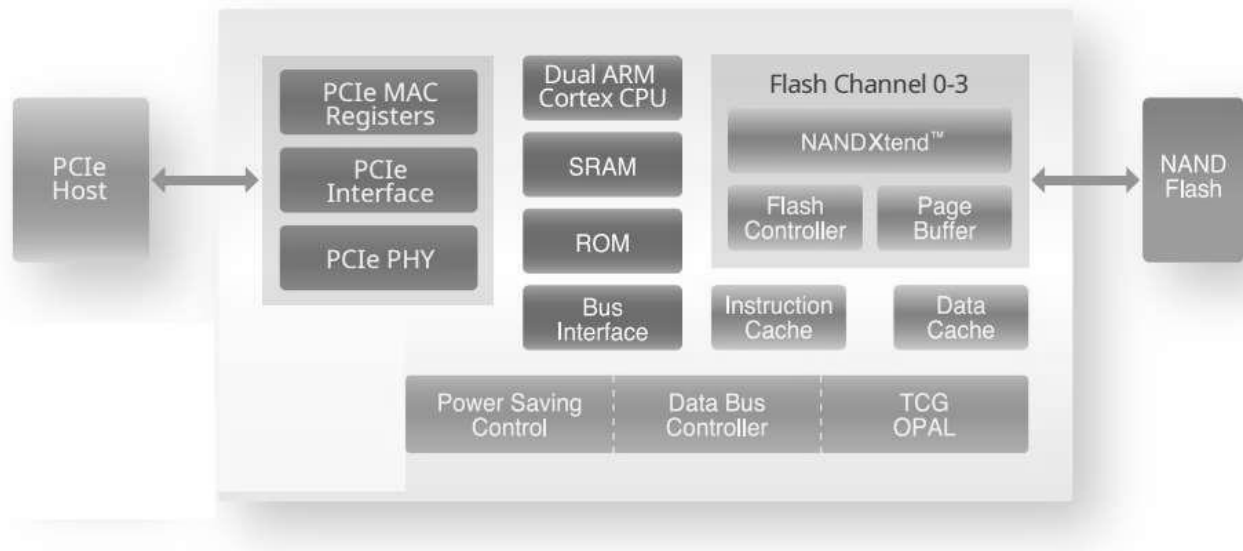
Note:

*1 Measured by CrystalDiskMark V8.0.4 (x64) at empty disk with PCIe GEN3 *4 host.

*2 Performance may differ according to flash configuration, SDR configuration, and platform.

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2. Block Diagram



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3. Product Specifications

- **Capacity**

512GB

- **Compatibility**

- ◆ NVMe/PCIe Gen3 x4 Interface
- ◆ PCI Express Base Specification Rev. 3.0
- ◆ NVM Express Specification Rev.1.3

- **Additional Capabilities**

- ◆ S.M.A.R.T. (Self-Monitoring, analysis and reporting Technology) feature set support
- ◆ Data Set Management command (TRIM)
- ◆ Static wear-leveling algorithm
- ◆ Native Command Queuing (NCQ) up to 32 commands support
- ◆ Support Global Wear Leveling extends SSD lifespan
- ◆ Support the Host Memory Buffer (HMB) architecture
- ◆ End to end data protection
- ◆ SRAM ECC
- ◆ 2KB codeword LDPC
- ◆ Power Consumption (Maximum) : <5W
- ◆ Operating Temperature Range: 0°C ~ 70°C
- ◆ Storage Temperature Range: -40°C ~ 85°C

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4. Interface Description

4.1. Pin Assignment and Descriptions

There are a total of 75 pins. 12 pin locations are used for mechanical key locations; this allows such a module to plug into M Key connectors.

Table 4-1: M.2 Pin Definitions

1	GND		
3	GND	2	3.3V
5	PETn3	4	3.3V
7	PETp3	6	Not Used
9	GND	8	Not Used
11	PERn3	10	LED1#
13	PERp3	12	3.3V
15	GND	14	3.3V
17	PETn2	16	3.3V
19	PETp2	18	3.3V
21	GND	20	Not Used
23	PERn2	22	Not Used
25	PERp2	24	Not Used
27	GND	26	Not Used
29	PETn1	28	Not Used
31	PETp1	30	Not Used
33	GND	32	Not Used
35	PERn1	34	Not Used
37	PERp1	36	Not Used
39	GND	38	Not Used
41	PETn0	40	SMCLK
43	PETp0	42	SMDAT
45	GND	44	ALERT#
47	PERn0	46	Not Used
49	PERp0	48	Not Used
51	GND	50	PERST#
53	REFCLKn	52	CLKREQ#
55	REFCLKp	54	PEWAKE#
57	GND	56	Not Used
59	Module Key	58	Not Used
61	Module Key	60	Module Key
63	Module Key	62	Module Key
65	Module Key	64	Module Key
67	Not Used	66	Module Key
69	PEDET(NC-PCIe)	68	SUSCLK
71	GND	70	3.3V
73	GND	72	3.3V
75	GND	74	3.3V

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5. Electrical Specification

5.1. Operating Voltage

Table 5-1 List of the supply voltage

- Table 5-1 Operating Voltage

Item	Range
Supply Voltage	3.3V $\pm$ 5% (3.135V to 3.465V)

5.2. Power Consumption

Table 5-2 List of the power consumption

- Table 5-2 Power Consumption

Mode	512GB	Unit
Average Active mode Power	5	W
Average Idle mode power	700	mW

Note:

1. All values are typical and may vary depending on flash configurations or host system setting.
2. Active power is an average power measurement performed using CrystalDiskMark with 128KB sequential read/write transfer.

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6. Performance Testing

SSD Review Test System Specifications:

Chipset:	MSI B250 GAMING PRO CARBON / Intel i5-7400
System OS:	Microsoft Windows 10 (64Bit)

6.1. Crystal Disk Mark

Rev: 8.0.4(x64)

Empty Disk

Test Item	CrystalDiskMark
Capacity	512GB
Sequential Q32 Read (MB/s) (Min.)	3400
Sequential Q32 Write (MB/s) (Min.)	2600

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7. Reliability Specifications

7.1. Environmental

Environmental specifications are shown in Table 7-1

Table 7-1 Environmental Specifications

Environmental	Specifications
Temperature	0°C to 70°C (Working)
	-40°C to 85°C (Storage)

Result: No any abnormality is detected when power on

7.2. Mean Time Between Failures (MTBF)

Mean Time Between Failures (MTBF) is predicted based on reliability data for the individual components in SSD is more than 2,000,000 hours (Predicted data)

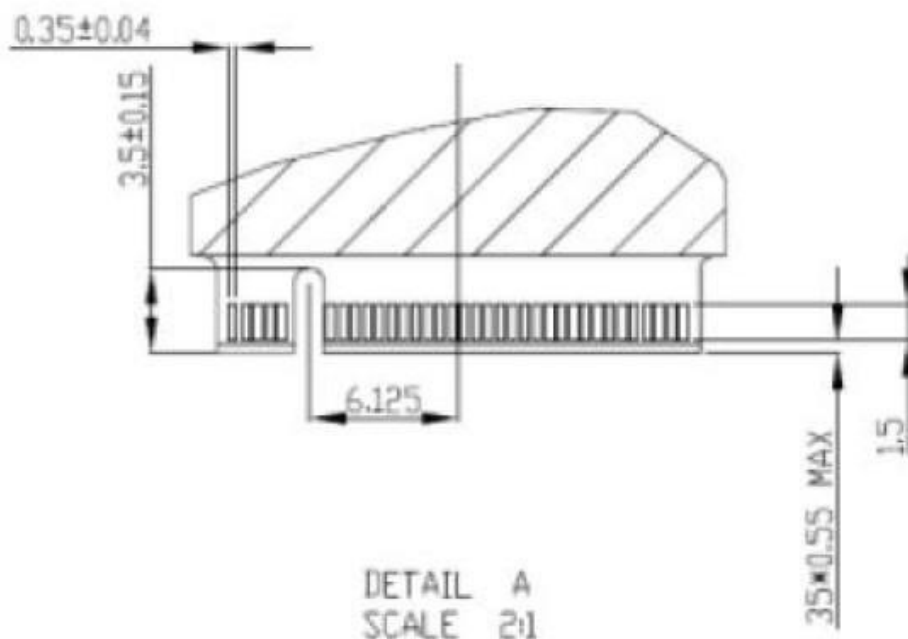
7.3. Endurance

The endurance of a storage device is predicted by TeraBytes Written based on several factors related to usage, such as the amount of data written into the drive, block management conditions, and daily workload for the drive. Thus, key factors, such as Write Amplifications(WAF) and the number of P/E cycles, can influence the lifespan of the drive.

Table 7-2 Endurance Specifications

Total Byte Written (TBW)	512GB
	320

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Identificação interna do documento 21MY5K77A9-WNQOP51



Nome do arquivo:

Neo_forza_M2_2280_PCIE_GEN3X4_SSD_NSP095P3451-H06Q2J0
_202405081843489410586.pdf

Data de vinculação à solicitação: 08/05/2024 21:43

Aplicativo: 16746