# M.2 2280 NVMe PCIe3.0 SSD DATASHEET

## PSP3H7M10M8-256G

Plusetech Technology (SHENZHEN) CO., LIMITED

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# 1.General Description

| Feature | Description |
|---|---|
| Capacity | 256GB |
| Controller | MAP1202 |
| Nand Flash | 3DV7 3D Nand |
| Interface | PCIe Gen3x4 (NVMe) |
| Compliance | NVMe 1.4 |
| Form Factor | M.2 2280 |
| Power Management | 3.3V ± 5% |
| Performance | Read: up to 3200 MB/s<br>Write: up to 2400 MB/s |
| Power Consumption | Active write:2900mW(256GB)<br>Active read:3100mW(256GB) |
| MTBF | 1,500,000 Hours |
| Features | Bad Block Management<br>Static and Dynamic Wear Leveling<br>Advanced hardware LDPC ECC Technology<br>Supports SLC Caching for improved performance<br>Supports S.M.A.R.T., TRIM Command<br>Supports Modern Standby<br>3μ gold-plated gold fingers |
| Temperature Range | Operation: 0°C ~ 70°C<br>Storage: -40°C ~ 85°C |

## Controller Block Diagram

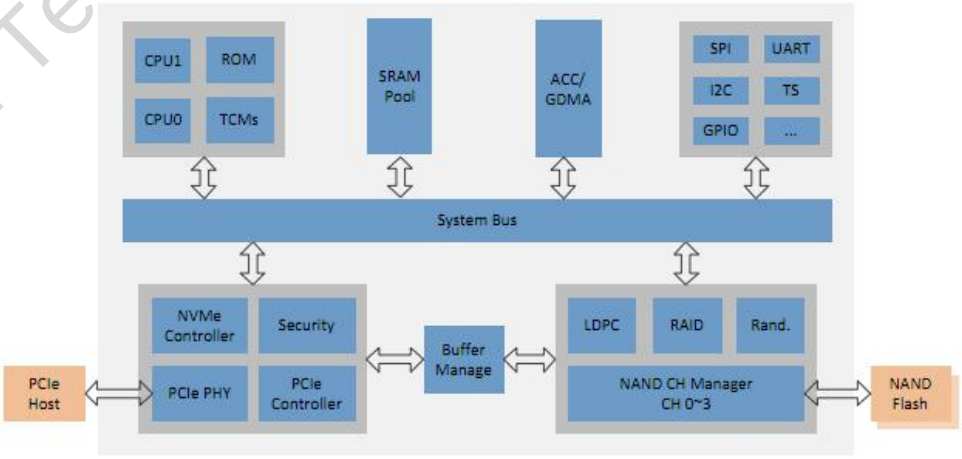
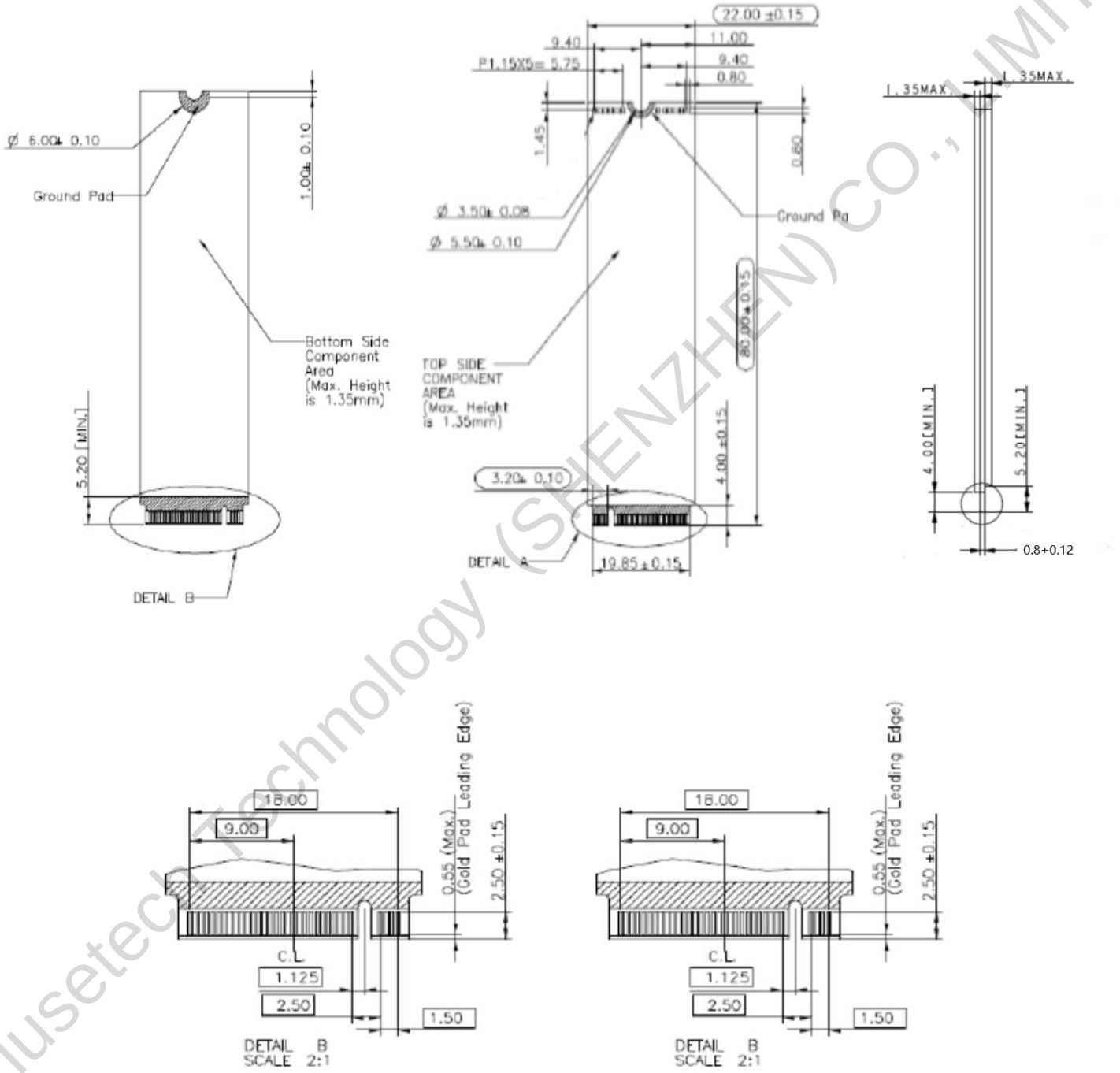



Figure 1-1 Controller Block Diagram

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## 2.Physical Specifications

| | | |
|---|---|---|
| Dimensions | Length（mm） | 80±0.15mm |
| | Width（mm） | 22±0.15mm |
| | Height（mm） | 3.65±0.25mm |
| Weight | | 7g |







[Figure 2-1] M.2 2280 Physical dimension

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TOP SIDE




BOTTOM SIDE

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# 3.Product Specifications

## 3.1 Drive Capacity

| Nominal Capacity | 256GB | | | | |
|---|---|---|---|---|---|
| OS Capacity | 238.47GB | | | | |

*For Flash Media Devices, 1 megabyte = 1 million bytes; 1 gigabyte = 1 billion bytes. Actual usable capacity may vary.

## 3.2 System Performance

-CPU： AMD Ryzen 5 5600x6
-DRAM： 16GB DDR4 3200MHz
-Chipset： ASUS B550M-PLUS
-OS： Windows 10 x64 21H2
-Test Tool： CrystalDiskMark 8.0.4
-The system conditions and test environment may affect test result;

### 3.2.1 Crystal Disk Mark Test

| Capacity | Sequential Read(max) | Sequential Write(max) | 4KB Random Read(Q32T16) | 4KB Random Write(Q32T16) | Unit |
|---|---|---|---|---|---|
| 256GB | 3200 | 2300 | 1800 | 1500 | MB/s |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Note: Performance is based on CrysalDiskMark8.0.4 with file size 1000MB

### 3.2.2 AS SSD Benchmark Test

| Capacity | Sequential Read(max) | Sequential Write(max) | 4K-64Thrd Read | 4K-64Thrd Write | Unit |
|---|---|---|---|---|---|
| 256GB | 2700 | 1800 | 1000 | 1200 | MB/s |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Note: Performance is based on AS SSD Benchmark2.0.7316.34247with file size 1000MB

## 3.3 Power consumption

| Capacity | Parameter | | |
|---|---|---|---|
| | Idle(mW) | Read(mW) | Write(mW) |
| 256GB | 640 | 3300 | 2900 |
| | | | |
| | | | |
| | | | |
| | | | |

Note: Input Voltage 3.3V±5%

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## 3.4 MTBF

MTBF, an acronym for Mean Time Between Failures, is a measure of a device's reliability. Its value represents the average time between a repair and the next failure. The measure is typically in units of hours. The higher the MTBF value, the higher the reliability of the device.

| MTBF | 1,500,000 Hours |
|---|---|

## 3.5 Endurance

| Capacity | 256GB | | | | |
|---|---|---|---|---|---|
| TBW | 200 | | | | |

## 3.6 Environmental Specifications

**Temperature:**
Storage: -40°C to 85°C
Operational: 0°C to 70°C
**Humidity: RH 90% under 40°C (operational)**
**Shock: 1500G duration 0.5ms, Half Sine Wave**

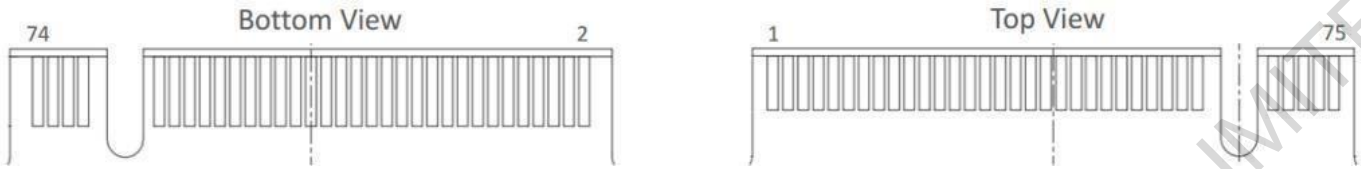
Notes:

- ◆Temperature specification is following JEDEC standard; Expressed temperature must be measured right on the case
- ◆Humidity is measured in non-condensing
- ◆Test condition for shock: 0.5ms duration with half sine wave

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# 4.Interface Description

## 4.1 Pin Assignment




[Figure 3-1]Pin Assignments

## 4.2 Pin Description

| Pin | Type | Description |
|---|---|---|
| 1 | GND | CONFIG_3 = GND |
| 2 | 3.3V | 3.3V source |
| 3 | GND | Ground |
| 4 | 3.3V | 3.3V source |
| 5 | PETn3 | PCIe TX Differential signal defined by the PCI Express M.2 spec |
| 6 | N/C | No connect |
| 7 | PETp3 | PCIe TX Differential signal defined by the PCI Express M.2 spec |
| 8 | N/C | No connect |
| 9 | GND | Ground |
| 10 | LED1# | Open drain, active low signal. These signals are used to allow the add-in card to provide status indicators via LED devices that will be provided by the system. |
| 11 | PERn3 | PCIe RX Differential signal defined by the PCI Express M.2 spec |
| 12 | 3.3V | 3.3V source |
| 13 | PERp3 | PCIe RX Differential signal defined by the PCI Express M.2 spec |
| 14 | 3.3V | 3.3V source |
| 15 | GND | Ground |
| 16 | 3.3V | 3.3V source |
| 17 | PETn2 | PCIe TX Differential signal defined by the PCI Express M.2 spec |
| 18 | 3.3V | 3.3V source |
| 19 | PETp2 | PCIe TX Differential signal defined by the PCI Express M.2 spec |
| 20 | N/C | No connect |
| 21 | GND | Ground |
| 22 | N/C | No connect |
| 23 | PERn2 | PCIe RX Differential signal defined by the PCI Express M.2 spec |
| 24 | N/C | No connect |
| 25 | PERp2 | PCIe RX Differential signal defined by the PCI Express M.2 spec |
| 26 | N/C | No connect |
| 27 | GND | Ground |
| 28 | N/C | No connect |

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| | | |
|---|---|---|
| 29 | PETn1 | PCIe TX Differential signal defined by the PCI Express M.2 spec |
| 30 | N/C | No connect |
| 31 | PETp1 | PCIe TX Differential signal defined by the PCI Express M.2 spec |
| 32 | N/C | No connect |
| 33 | GND | Ground |
| 34 | N/C | No connect |
| 35 | PERn1 | PCIe RX Differential signal defined by the PCI Express M.2 spec |
| 36 | N/C | No connect |
| 37 | PERp1 | PCIe RX Differential signal defined by the PCI Express M.2 spec |
| 38 | N/C | No connect |
| 39 | GND | Ground |
| 40 | N/C | No connect |
| 41 | PETn0 | PCIe TX Differential signal defined by the PCI Express M.2 spec |
| 42 | N/C | No connect |
| 43 | PETp0 | PCIe TX Differential signal defined by the PCI Express M.2 spec |
| 44 | N/C | No connect |
| 45 | GND | Ground |
| 46 | N/C | No connect |
| 47 | PERn0 | PCIe RX Differential signal defined by the PCI Express M.2 spec |
| 48 | N/C | No connect |
| 49 | PERp0 | PCIe RX Differential signal defined by the PCI Express M.2 spec |
| 50 | PERST#(I)(0/3.3V) | PE-Reset is a functional reset to the card as defined by the PCIe Mini CEM specification. |
| 51 | GND | Ground |
| 52 | CLKREQ#(I/O)(0/3.3V) | Clock Request is a reference clock request signal as defined by the PCIe Mini CEM specification; Also used by L1 PM Sub-states. |
| 53 | REFCLKn | PCIe Reference Clock signals (100 MHz) defined by the PCI Express M.2 spec. |
| 54 | N/C | No connect |
| 55 | REFCLKp | PCIe Reference Clock signals (100 MHz) defined by the PCI Express M.2 spec. |
| 56 | Reserved for MFG DATA | Manufacturing Data line. Used for SSD manufacturing only. Not used in normal operation. Pins should be left N/C in platform Socket. |
| 57 | GND | Ground |
| 58 | Reserved for MFG CLOCK | Manufacturing Clock line. Used for SSD manufacturing only. Not used in normal operation. Pins should be left N/C in platform Socket. |
| 59 | N/C | Module Key M |
| 60 | N/C | Module Key M |
| 61 | N/C | Module Key M |
| 62 | N/C | Module Key M |

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| | | |
|---|---|---|
| 63 | N/C | Module Key M |
| 64 | N/C | Module Key M |
| 65 | N/C | Module Key M |
| 66 | N/C | Module Key M |
| 67 | N/C | No connect |
| 68 | N/C | No connect |
| 69 | N/C | No connect |
| 70 | 3.3V | 3.3V source |
| 71 | GND | Ground |
| 72 | 3.3V | 3.3V source |
| 73 | GND | Ground |
| 74 | 3.3V | 3.3V source |
| 75 | GND | Ground |

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# 5.Command Descriptions

## 5.1 Supported Command Lists

| Identifier | O/M | Command Description | Supported |
|---|---|---|---|
| Admin Commands | | | |
| 00h | M | Delete I/O Submission Queue | Supported |
| 01h | M | Create I/O Submission Queue | Supported |
| 02h | M | Get Log Page | Supported |
| 04h | M | Delete I/O Completion Queue | Supported |
| 05h | M | Create I/O Completion Queue | Supported |
| 06h | M | Identify | Supported |
| 08h | M | Abort | Supported |
| 09h | M | Set Feature | Supported |
| 0Ah | M | Get Feature | Supported |
| 0Ch | M | Asynchronous Event Request | Supported |
| 10h | O | Firmware Commit | Supported |
| 11h | O | Firmware Image Download | Supported |
| 14h | O | Device Self-test | Supported |
| 80h | O | Format NVM | Supported |
| 81h | O | Security Send | Supported |
| 82h | O | Security Receive | Supported |
| 84h | O | Sanitize | Supported |
| I/O Commands | | | |
| 00h | O | Flush | Supported |
| 01h | O | Write | Supported |
| 02h | O | Read | Supported |
| 04h | O | Write Uncorrectable | Not Supported |
| 05h | O | Compare | Supported |
| 08h | O | Write Zeroes | Supported |
| 09h | O | Dataset Management | Supported |
| Set Feature Commands | | | |
| 00h | | Reserved | |
| 01h | M | Arbitration | Supported |
| 02h | M | Power Management | Supported |
| 03h | O | LBA Range Type | Not Supported |
| 04h | M | Temperature Threshold | Supported |
| 05h | M | Error Recovery | Supported |
| 06h | O | Volatile Write Cache | Supported |
| 07h | M | Number Of Queues | Supported |
| 08h | M | Interrupt Coalescing | Supported |
| 09h | M | Interrupt Vector Configuration | Supported |
| 0Ah | M | Write Atomicity Normal | Supported |

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| | | | |
|---|---|---|---|
| 0Bh | M | Asynchronous Event Configuration | Supported |
| 0Ch | O | Autonomous Power State Transition | Supported |
| 0Dh | O | Host Memory Buffer | Not Supported |
| 0Eh | O | Timestamp | Supported |
| 10h | O | Host Controlled Thermal Management | Supported |
| 11h | O | Non-Operational Power State Config | Supported |
| 0Eh-7Dh | | Reserved | |
| 80h | O | Software Progress Marker | Supported |
| Get Log Page Commands | | | |
| 00h | | Reserved | |
| 01h | M | Error Information | Supported |
| 02h | M | SMART / Health Information | Supported |
| 03h | M | Firmware Slot Information | Supported |
| 04h | O | Changed Namespace List | Supported |
| 06h | O | Device Self-test | Supported |
| 09h-7Fh | | Reserved | |
| 81h | O | Sanitize Status | Supported |
| 82h-FFh | | Reserved | |

## 5.2 SMART Attributes

**SMART Data Vendor-specific Attributes**

| Bytes Index | Bytes | Description |
|---|---|---|
| [0] | 1 | Critical Warning |
| [2:1] | 2 | Composite Temperature |
| [3] | 1 | Available Spare |
| [4] | 1 | Available Spare Threshold |
| [5] | 1 | Percentage Used |
| [31:6] | 26 | Reserved |
| [47:32] | 16 | Data Units Read |
| [63:48] | 16 | Data Units Written |
| [79:64] | 16 | Host Read Commands |
| [95:80] | 16 | Host Write Commands |
| [111:96] | 16 | Controller Busy Time |
| [127:112] | 16 | Power Cycles |
| [143:128] | 16 | Power On Hours |
| [159:144] | 16 | Unsafe Shutdowns |
| [175:160] | 16 | Media and Data Integrity Errors |
| [191:176] | 16 | Number of Error Information Log Entries |
| [195:192] | 4 | Warning Composite Temperature Time |
| [199:196] | 4 | Critical Composite Temperature Time |
| [201:200] | 2 | Temperature Sensor 1 (Current Temperature) |
| [203:202] | 2 | Temperature Sensor 2 (N/A) |

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| | | |
|---|---|---|
| [205:204] | 2 | Temperature Sensor 3 (N/A) |
| [207:206] | 2 | Temperature Sensor 4 (N/A) |
| [209:208] | 2 | Temperature Sensor 5 (N/A) |
| [211:210] | 2 | Temperature Sensor 6 (N/A) |
| [213:212] | 2 | Temperature Sensor 7 (N/A) |
| [215:214] | 2 | Temperature Sensor 8 (N/A) |
| [511:216] | 296 | Reserved |

# 6.Identify Device Data

The following table details the sector data returned by the IDENTIFY DEVICE command.

| Bytes | O/M | Description | Default Value |
|---|---|---|---|
| 01:00 | M | PCI Vendor ID (VID) | \ |
| 03:02 | M | PCI Subsystem Vendor ID (SSVID) | \ |
| 23:04 | M | Serial Number (SN) | TBD |
| 63:24 | M | Model Number (MN) | TBD |
| 71:64 | M | Firmware Revision (FR) | TBD |
| 72 | M | Recommended Arbitration Burst (RAB) | 0x01 |
| 75:73 | M | IEEE OUI Identifier (IEEE) | 0x6479A7 |
| 76 | O | Controller Multi-Path I/O and Namespace Sharing Capabilities (CMIC) | 0x00 |
| 77 | M | Maximum Data Transfer Size (MDTS) | 0x09 |
| 79:78 | M | Controller ID (CNTLID) | 0x0001 |
| 512 | M | Submission Queue Entry Size (SQES) | 0x66 |
| 513 | M | Completion Queue Entry Size (CQES) | 0x44 |
| 515:514 | M | Maximum Outstanding Commands (maxcmd) | 0x0200 |
| 519:516 | M | Number of Namespaces (NN) | 0x00000001 |
| 521:520 | M | Optional NVM Command Support (ONCS) | 0x005D |
| 523:522 | M | Fused Operation Support (FUSES) | 0x0000 |
| 524 | M | Format NVM Attributes (FNA) | 0x00 |
| 525 | M | Volatile Write Cache (VWC) | 0x07 |
| 527:526 | M | Atomic Write Unit Normal (AWUN) | 0x00FF |
| 529:528 | M | Atomic Write Unit Power Fail (AWUPF) | 0x0000 |
| 1023:768 | M | NVM Subsystem NVMe Qualified Name (subnqn) | 0x00 |
| 2047:1792 | - | Refer to the NVMe over Fabrics specification | 0x00 |

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# 7.Product Line up

| Type | Capacity | MODEL | Part Number |
|---|---|---|---|
| PSP3H7M10M8-256G | 256GB | PCIe 3.0 2280 256G | PCIe 3.0 2280 256G |
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