Apacer

RoHS Compliant

PCI Express Flash Drive

Industrial PT250-M280 BiCS5 Product Specifications (Commercial Extended Temperature)



September 25, 2025

Version 1.2

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Specifications Overview:

- **PCIe Interface**
  - Compliant with PCI Express 4.0
  - Compliant with NVMe 2.0
  - Compatible with PCIe Gen4 x4 interface
- **Capacity**
  - 64, 128, 256, 512 GB
  - 1, 2, 4 TB
- **Performance**[1]
  - Interface burst read/write: 8 GB/sec
  - Sequential read: up to 3,675 MB/sec
  - Sequential write: up to 3,215 MB/sec
  - Random read (4K): up to 565,000 IOPS
  - Random write (4K): up to 560,000 IOPS
- **Flash Management**
  - Error Correction/Detection
  - Bad Block Management
  - Global Wear Leveling
  - DataDefender™
  - TRIM
  - Flash Translation Layer: Page Mapping
  - Hyper Cache Technology
  - Smart Read Refresh™
  - S.M.A.R.T.
- **NAND Flash Type:** 3D TLC (BiCS5)
- **MTBF:** >3,000,000 hours
- **Endurance (in drive writes per day: DWPD)**
  - 64 GB: 2.36 DWPD
  - 128 GB: 2.10 DWPD
  - 256 GB: 2.07 DWPD
  - 512 GB: 2.12 DWPD
  - 1 TB: 1.80 DWPD
  - 2 TB: 1.66 DWPD
  - 4 TB: 1.55 DWPD
- **Temperature Range**
  - Operating (Tc): -25°C to 85°C
  - Storage (Ta): -55°C to 100°C
- **Supply Voltage**
  - 3.3V ± 5%
- **Power Consumption**[1]
  - Active mode (Max.): 1,595 mA
  - Idle mode: 300 mA
- **Power Management**
  - Supports APST
  - Supports ASPM L1.2
- **NVMe Features**
  - NVMe Secure Erase
  - Supports HMB (Host Memory Buffer)[2]
- **Security**
  - AES 256-bit hardware encryption
  - Trusted Computing Group (TCG) Opal 2.0 (optional)
- **Reliability**
  - Thermal Sensor
  - Thermal Throttling
  - Sidefill
  - End-to-End Data Protection
  - CoreGlacier™
- **Connector Type**
  - 75-pin M.2 module pinout
- **Physical Characteristics**
  - Form factor: Double-sided M.2 2280-M
  - Dimensions: 22.00 x 80.00 x 4.08(max.), unit: mm
  - Net weight: 7.33g ± 5%
- **LED Indicator for Drive Behavior**
- **RoHS Compliant**

Notes:
1. Varies from capacities. The values for performance and power consumption presented are typical and may vary depending on flash configurations or platform settings.
2. Windows 10 (version 1703) onwards supports the HMB (Host Memory Buffer) function.

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2. Product Specifications

2.1 Capacity

Table 2-1 Capacity Specifications

Capacity	Total bytes	Total LBA
64 GB	60,022,480,896	117,231,408
128 GB	120,034,123,776	234,441,648
256 GB	240,057,409,536	468,862,128
512 GB	480,103,981,056	937,703,088
1 TB	960,197,124,096	1,875,385,008
2 TB	1,920,383,410,176	3,750,748,848
4 TB	3,840,755,982,336	7,501,476,528

Notes:
- Display of total bytes varies from operating systems.
- 1 GB = 1,000,000,000 bytes; 1 sector = 512 bytes.
- LBA count addressed in the table above indicates total user storage capacity and will remain the same throughout the lifespan of the device. However, the total usable capacity of the SSD is most likely to be less than the total physical capacity because a small portion of the capacity is reserved for device maintenance usages.

2.2 Performance

Table 2-2 Performance Specifications

Capacity / Performance	64 GB	128 GB	256 GB	512 GB	1 TB	2 TB	4 TB
Sequential Read (MB/s)	750	1,560	3,100	3,200	3,300	3,325	3,675
Sequential Write (MB/s)	400	890	1,600	2,825	3,000	3,020	3,215
4K Random Read (IOPS)	25,000	51,000	100,000	380,000	559,000	510,000	565,000
4K Random Write (IOPS)	95,000	180,000	340,000	549,000	558,000	559,000	560,000

Notes:
- Results may differ from various flash configurations or host system setting.
- Sequential read/write is based on CrystalDiskMark 8.0.4 with file size 1,000MB.
- Random read/write is measured using IOMeter with Queue Depth 128.

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3. Product Ordering Information

3.1 Product Code Designations

Apacer's PT250-M280 SSD is available in different configurations and densities. See the chart below for a comprehensive list of options for the PT250-M280 series devices.

Code	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	B	9	2	.	X	X	C	X	2	U	.	0	0	1	X	X

Code 1-3 (Product Line & Form Factor)	PCIe M.2 2280
Code 5-6 (Model/Solution)	25: PT250-M280 A7: PT250-M280 with TCG Opal
Code 7-8 (Product Capacity)	CG: 64GB CH: 128GB CJ: 256GB CK: 512GB CL: 1TB CM: 2TB CN: 4TB
Code 9 (Flash Type & Product Temp)	3D TLC Commercial Extended Temperature
Code 10 (Product Spec)	Double-sided M key with graphene sheet
Code 12-14 (Version Number)	Random numbers generated by system
Code 15-16 (Firmware Version)	9D: Thermal Sensor 9J: Thermal Sensor(4TB) 9E: Thermal Sensor with TCG Opal 9K: Thermal Sensor with TCG Opal (4TB)

3.2 Valid Combinations

The following table lists the available models of the PT250-M280 series which are in mass production or will be in mass production. Consult your Apacer sales representative to confirm availability of valid combinations and to determine availability of new combinations.

Capacity	Without TCG Opal	With TCG Opal
64GB	B92.25CG2U.0019D	B92.A7CG2U.0019E
128GB	B92.25CH2U.0029D	B92.A7CH2U.0029E
256GB	B92.25CJ2U.0029D	B92.A7CJ2U.0029E
512GB	B92.25CK2U.0029D	B92.A7CK2U.0029E
1TB	B92.25CL2U.0029D	B92.A7CL2U.0029E
2TB	B92.25CM2U.0029D	B92.A7CM2U.0029E
4TB	B92.25CN2U.0019J	B92.A7CN2U.0019K

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