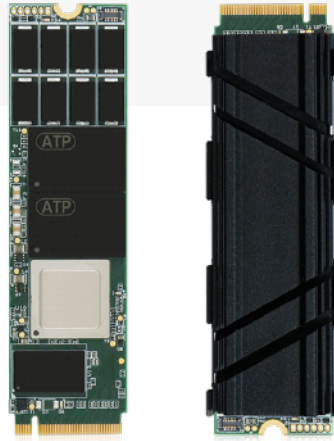




PCIe® Gen 4 NVMe M.2 2280 SSD

The Global Leader in Specialized Storage and Memory Solutions



KEY FEATURES

- Superior Read/Write performance
- MCU-based Power Loss Protection Design with Level 4 (data-in-flight) protection*
- Self-Encrypting Drive (SED) with AES 256-bit Encryption, TCG Opal 2.0*
- Thermal Heatsink Solutions**
- End-to-End Data Path Protection
- Anti-sulfuric resistor support*

* May vary by product and project support
 ** Customization available on a project basis.

ATP NVMe™ M.2 2280 SSDs with the PCI Express® (PCIe®) Gen 4 x4 interface meet the growing need for high-speed data transfer in today's demanding applications.

Up to 3.84 TB capacity, support for I-Temp (40°C to 85°C: N651Si) or C-Temp (0°C to 70°C: N601Sc) operation, plus AES 256-bit encryption and TCG Opal 2.0 security make these SSDs ideal for read/write-intensive mission-critical applications, such as data logging, surveillance, and imaging systems.

With twice the bandwidth of the previous generation (8 GT/s), PCIe Gen 4's 16 GT/s data rate translates to a bandwidth of 2 GB/s for every PCIe lane, enabling these SSDs to transfer data faster. ATP's PCIe Gen 4 SSDs use x4 lanes for a maximum bandwidth of 8 GB/s.

Thermal management options for optimal heat dissipation include a nickel-coated copper heat spreader on controller and a 4 mm or 8 mm fin-type heatsink design.

| Technologies & Add-On Services | S.M.A.R.T. | Firmware-based Power Loss Protection | Hardware-based Power Loss Protection | AutoRefresh | Advanced Wear Leveling | Dynamic Data Refresh | End-to-End Data Path Protection | Auto-Read Calibration | Secure Erase | TCG Opal 2.0 | Industrial Temperature | Anti-Sulfur Resistors | Conformal Coating | Joint Validation |
|--------------------------------|------------|--------------------------------------|--------------------------------------|-------------|------------------------|----------------------|---------------------------------|-----------------------|--------------|--------------|------------------------|-----------------------|-------------------|------------------|
| Premium | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ▲ | ▲ | ○ | ▲ | ▲ | ▲ |
| Superior | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ▲ | ▲ | ○ | ▲ | ▲ | ▲ |
| Value | ○ | ○ | — | ○ | ○ | ○ | ○ | ○ | — | ▲ | ○ | ▲ | ▲ | — |

▲: Customization option available on a project basis.

Specifications

| PCIe® Gen4 NVMe M.2 2280 SSD | | | | |
|------------------------------------|---|---|--|---|
| Product Line | Premium | | Premium | |
| | N751Pi (150K P/E cycle configuration drive available on a project basis) | | N751Pi | |
| Interface | PCIe G4 x4 | | | |
| Flash Type | 3D TLC (pSLC mode) | | | |
| Form Factor | M.2 2280-D6-M ¹ | M.2 2280-D2-M | M.2 2280-D6-M ¹ | M.2 2280-D2-M |
| Operating Temperature | -40°C to 85°C | | -40°C to 85°C | |
| Power Loss Protection Options | Hardware + Firmware Based | Firmware Based | Hardware + Firmware Based | Firmware Based |
| Optional SED Features | AES 256-bit Encryption, TCG Opal 2.0 | | | |
| Capacity | 80 GB to 640 GB | 1.28 TB | 80 GB to 640 GB | 1.28 TB |
| Performance | | | | |
| Sequential Read (MB/s) up to | 6,450 | | | |
| Sequential Write (MB/s) up to | 6,050 | 6,100 | 6,050 | 6,100 |
| Random Reads IOPS up to | 1,090,000 | 1,050,000 | 1,090,000 | 1,050,000 |
| Random Writes IOPS up to | 1,107,000 | 1,200,000 | 1,107,000 | 1,200,000 |
| Endurance and Reliability | | | | |
| Endurance (TBW) ² up to | 90,000 TB | 180,000 TB | 60,000 TB | 120,000 TB |
| Reliability MTBF @ 25°C | >2,000,000 hours | | | |
| Others | | | | |
| Dimensions (mm) | 80.0 x 22.0 x 3.85 80.0 x 24.4 x 12.5 (with 8 mm heatsink) | 80.0 x 22.0 x 3.6 80.0 x 24.4 x 12.5 (with 8 mm heatsink) | 80.0 x 22.0 x 3.85 80.0 x 24.4 x 12.5 (with 8 mm heatsink) | 80.0 x 22.0 x 3.6 80.0 x 24.4 x 12.5 (with 8 mm heatsink) |
| Certifications | CE, FCC, BSMI, UKCA, RoHS, REACH | | | |
| Warranty | 5 years | | | |

| PCIe® Gen4 NVMe M.2 2280 SSD | | | |
|------------------------------------|--|---|---|
| Product Line | Superior | | Value |
| | N651Si / N651Sc | N601Sc | N601Vi / N601Vc |
| Interface | PCIe G4 x4 | | |
| Flash Type | 3D TLC | | |
| Form Factor | M.2 2280-D6-M ¹ | M.2 2280-D2-M | M.2 2280-S3-M |
| Operating Temperature | -40°C to 85°C / 0°C to 70°C | | 0°C to 70°C / -40°C to 85°C / 0°C to 70°C |
| Power Loss Protection Options | Hardware + Firmware Based | Firmware Based | |
| Optional SED Features | AES 256-bit Encryption, TCG Opal 2.0 | | |
| Capacity | 240 GB to 1.92 TB | 240 GB to 3.84 TB | 240 GB to 1.92 TB |
| Performance | | | |
| Sequential Read (MB/s) up to | 6,450 | | 5,000 |
| Sequential Write (MB/s) up to | 6,050 | | 4,300 |
| Random Reads IOPS up to | 1,091,000 | 1,095,000 | 800,000 |
| Random Writes IOPS up to | 1,245,000 | 1,244,000 | 1,100,000 |
| Endurance and Reliability | | | |
| Endurance (TBW) ² up to | 9,230 TB | 17,930 TB | 5,700 TB / 4,175 TB |
| Reliability MTBF @ 25°C | >2,000,000 hours | | |
| Others | | | |
| Dimensions (mm) | 80.0 x 22.0 x 3.85 80.0 x 24.4 x 12.5 (with 8 mm heatsink) | 80.0 x 22.0 x 3.6 80.0 x 24.4 x 12.5 (with 8 mm heatsink) | 80.0 x 22.0 x 2.4 |
| Certifications | CE, FCC, BSMI, UKCA, RoHS, REACH, UL | | |
| Warranty | 2 years | | |

1. M.2 2280-D6-M form factor (max height: 3.85mm), offers Hardware Based Power Loss Protection. M.2 2280-D2-M form factor (max height: 3.6mm), provides Firmware Based Power Loss Protection.

2. Under highest Sequential write value. May vary by density, configuration and applications.

| Hot Items Ordering Information | | | | | |
|--------------------------------|-----------------------|------------------------------------|------------------------------------|------------------|-----------------|
| Product Line | Capacity ₁ | Operating Temperature ₂ | Power Loss Protection ₃ | SED ₄ | P/N |
| N651Si | 240GB | -40°C to 85°C | Hardware + Firmware Based | - | FT240GP48APHBPI |
| N651Si | 480GB | -40°C to 85°C | Hardware + Firmware Based | - | FT480GP48APHBPI |
| N651Si | 960GB | -40°C to 85°C | Hardware + Firmware Based | - | FT960GP48APHBPI |
| N651Si | 1920GB | -40°C to 85°C | Hardware + Firmware Based | - | FT1T92P48APHBPI |
| N651Si | 240GB | -40°C to 85°C | Hardware + Firmware Based | √ | FT240GP48APHBSI |
| N651Si | 480GB | -40°C to 85°C | Hardware + Firmware Based | √ | FT480GP48APHBSI |
| N651Si | 960GB | -40°C to 85°C | Hardware + Firmware Based | √ | FT960GP48APHBSI |
| N651Si | 1920GB | -40°C to 85°C | Hardware + Firmware Based | √ | FT1T92P48APHBSI |

Hot Items Ordering Information

| Product Line | Capacity ₁ | Operating Temperature ₂ | Power Loss Protection ₃ | SED ₄ | P/N |
|--------------|-----------------------|------------------------------------|------------------------------------|------------------|------------------|
| N651Sc | 240GB | 0°C to 70°C | Hardware + Firmware Based | - | FT240GP48APHBPC |
| N651Sc | 480GB | 0°C to 70°C | Hardware + Firmware Based | - | FT480GP48APHBPC |
| N651Sc | 960GB | 0°C to 70°C | Hardware + Firmware Based | - | FT960GP48APHBPC |
| N651Sc | 1920GB | 0°C to 70°C | Hardware + Firmware Based | - | FT1T92P48APHBPC |
| N651Sc | 240GB | 0°C to 70°C | Hardware + Firmware Based | √ | FT240GP48APHBSC |
| N651Sc | 480GB | 0°C to 70°C | Hardware + Firmware Based | √ | FT480GP48APHBSC |
| N651Sc | 960GB | 0°C to 70°C | Hardware + Firmware Based | √ | FT960GP48APHBSC |
| N651Sc | 1920GB | 0°C to 70°C | Hardware + Firmware Based | √ | FT1T92P48APHBSC |
| N651Si | 240GB | -40°C to 85°C | Firmware Based | - | FT240GP48APHBFI |
| N651Si | 480GB | -40°C to 85°C | Firmware Based | - | FT480GP48APHBFI |
| N651Si | 960GB | -40°C to 85°C | Firmware Based | - | FT960GP48APHBFI |
| N651Si | 1920GB | -40°C to 85°C | Firmware Based | - | FT1T92P48APHBFI |
| N651Si | 3840GB | -40°C to 85°C | Firmware Based | - | FT3T84P48APHBFI |
| N651Si | 240GB | -40°C to 85°C | Firmware Based | √ | FT240GP48APHBYI |
| N651Si | 480GB | -40°C to 85°C | Firmware Based | √ | FT480GP48APHBYI |
| N651Si | 960GB | -40°C to 85°C | Firmware Based | √ | FT960GP48APHBYI |
| N651Si | 1920GB | -40°C to 85°C | Firmware Based | √ | FT1T92P48APHBYI |
| N651Si | 3840GB | -40°C to 85°C | Firmware Based | √ | FT3T84P48APHBYI |
| N651Sc | 240GB | 0°C to 70°C | Firmware Based | - | FT240GP48APHBFC |
| N651Sc | 480GB | 0°C to 70°C | Firmware Based | - | FT480GP48APHBFC |
| N651Sc | 960GB | 0°C to 70°C | Firmware Based | - | FT960GP48APHBFC |
| N651Sc | 1920GB | 0°C to 70°C | Firmware Based | - | FT1T92P48APHBFC |
| N651Sc | 3840GB | 0°C to 70°C | Firmware Based | - | FT3T84P48APHBFC |
| N651Sc | 240GB | 0°C to 70°C | Firmware Based | √ | FT240GP48APHBYC |
| N651Sc | 480GB | 0°C to 70°C | Firmware Based | √ | FT480GP48APHBYC |
| N651Sc | 960GB | 0°C to 70°C | Firmware Based | √ | FT960GP48APHBYC |
| N651Sc | 1920GB | 0°C to 70°C | Firmware Based | √ | FT1T92P48APHBYC |
| N651Sc | 3840GB | 0°C to 70°C | Firmware Based | √ | FT3T84P48APHBYC |
| N601Sc | 240GB | 0°C to 70°C | Firmware Based | - | AF240GSTJA-HBAXX |
| N601Sc | 480GB | 0°C to 70°C | Firmware Based | - | AF480GSTJA-HBAXX |
| N601Sc | 960GB | 0°C to 70°C | Firmware Based | - | AF960GSTJA-HBAXX |
| N601Sc | 1920GB | 0°C to 70°C | Firmware Based | - | AF1T92STJA-HBAXX |
| N601Sc | 240GB | 0°C to 70°C | Firmware Based | √ | AF240GSTJA-HBBXX |
| N601Sc | 480GB | 0°C to 70°C | Firmware Based | √ | AF480GSTJA-HBBXX |
| N601Sc | 960GB | 0°C to 70°C | Firmware Based | √ | AF960GSTJA-HBBXX |
| N601Sc | 1920GB | 0°C to 70°C | Firmware Based | √ | AF1T92STJA-HBBXX |

1 Amount of actual usable storage that can be utilized.

2 Refers to Case Temperature range during device operation, as indicated by SMART temperature attributes.

3 Hardware + Firmware-based power loss protection design with Level 4 (data-in-flight) protection; Firmware-based power loss protection design with Level 1 (data-at-rest) protection.

4 Allows data written to and read from the SSD to be constantly and automatically encrypted and decrypted. Conforms to TCG Opal 2.0 and uses AES 256-bit HW encryption.

Product spec and its related information are subject to change without advance notice.
Please refer to www.atpinc.com for latest information



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