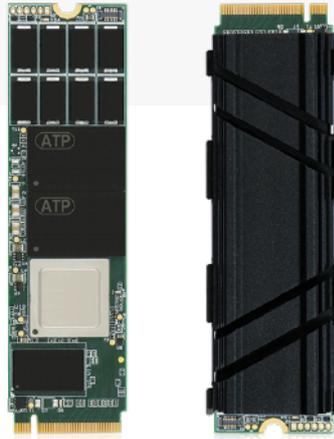# PCIe® Gen 4 NVMe M.2 2280 SSD

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	○	○	○	○	○	○	○	○	▲	▲	○	▲	▲	▲

▲: Customization option available on a project basis.

Specifications

	PCIe® Gen4 NVMe M.2 2280 SSD				
Product Line	Premium		Superior		
	N751Pi		N651Si / N651Sc		N601Sc
Interface	PCIe G4 x4				
Flash Type	3D TLC (pSLC mode)		3D TLC		
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 / 0°C to 70°C		0°C to 70°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	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				
Sequential Write (MB/s) up to	6,050	6,100	6,050		
Random Reads IOPS up to	1,090,000	1,050,000	1,091,000		1,095,000
Random Writes IOPS up to	1,107,000	1,200,000	1,245,000		1,244,000
	Endurance and Reliability				
Endurance (TBW)[2] up to	60,000 TB	120,000 TB	9,230 TB	17,930 TB	5,700 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		CE, FCC, BSMI, UKCA, RoHS, REACH, UL		
Warranty	5 years		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
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

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	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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