SMART **RUGGED**™

T6EN | PCIe/NVMe U.2, M.2 and E1.S

SMART's RUGGED™ T6EN U.2, M.2 2280 and E1.S PCIe/NVMe Gen4x4 solid state drives (SSDs) deliver high performance, high capacity storage solutions optimized for defense, aerospace and other applications requiring durable, rugged and secure storage.

Powered by a flexible, custom flash controller, T6EN SSDs provide sustained read/write performance to meet the needs of high throughput applications such as flight data recorders and sensor data capture. T6EN SSDs are also well suited for high-reliability telemetry, surveillance, and mission critical applications.

T6EN U.2 SSDs provide capacities up to 15360GB and the M.2 & E1.S up to 7680GB. They are more reliable, offer superior performance, and require less power and cooling than traditional hard disk drives (HDDs). T5EN drives provide power fail protection (U.2 and E1.S only).

Applications

- Defense
- Aerospace
- Flight Data Recorders
- Sensor Capture
- Telemetry
- Surveillance

Features & Benefits

- AES-XTS 256-bit encryption automatically protects all data written to the drive
- OPAL 2.0 compliant
- True industrial grade storage solution for "no-compromise" applications
- Advanced flash management for enhanced reliability and durability
- Self-Monitoring Analysis and Reporting Technology (S.M.A.R.T.) support
- 100% 8 hour burn-in over Temperature (-40°C to +85°C, I-Temp Version)
- SafeDATA™ technology is a standard feature that safeguards the integrity, functionality and data of the SSD in the event of sudden power loss

Product Family Overview

Capacity	Sequential Performance	Random Performance
960GB to 15360GB	Up to 3,500 MB/s Read	390,000 IOPS Read
	Up to 3,000 MB/s Write	55,000 IOPS Write

One gigabyte, or GB, equals one billion bytes when referring to drive capacity. Accessible capacity may vary based on the operating environment and drive formatting.

Specifications

	U.2 PCIe/NVMe		
NAND Type	TLC		
Compliance			
PCIe	Gen 4 x 4		
NCQ:	Up to 32 Queue Depth		
Performance			
Sequential Read MB/s	Up to 3,500	Up to 3,500	Up to 3,200
Sequential Write MB/s	Up to 3,000	Up to 3,000	Up to 3,200
Random Read (4KB) IOPS	Up to 390,000	Up to 390,000	Up to 390,000
Random Write (4KB) IOPS	Up to 55,000	Up to 55,000	Up to 50,000
Capacity			
3D-TLC[1]	U.2: 960GB, 1920GB, 3840GB, 7680GB, 15360GB M.2, E1.S: 480GB, 960GB, 1920GB, 3840GB, 7680GB		
Reliability			
MTBF[2]	> 2M hours, Telcordia 25°C		
Data Reliability	1 in 10^{17} bits read		
Data Retention	> 10 years @ 25°C		
Endurance[3]	C-Temp: 16,800 TBW (with 15,360GB) I-Temp: 9,600 TBW (with 15,360GB)		
Warranty	1 Year		
Power			
Input Voltage	U.2: 12.0V +/- 5% M.2: 3.3V ± 5%		
Idle (typical)	< 1.5 W		
Operational (typical)	< 9.0 W		
Environmental			
Operating Shock	50G, (11ms duration, half sine wave)		
Vibration	10G(Peak, 10~2000Hz)		
Altitude[4]	24,384m [80,000 ft.]		
Relative Humidity[4]	5% to 95% non-condensing		
Conformal Coating	Optional		
Operating Temp	Industrial (-40° C to 85° C)[5]		
Storage Temp	-55° C to 90° C		
Mechanical			
Length	100mm		
Width	69.85mm		
Height	7mm		
Connector	U.2		

(1) One gigabyte, or GB, equals one billion bytes when referring to drive capacity. Accessible capacity may vary based on the operating environment and drive formatting
(2) Based on 480GB drive
(3) Under typical conditions
(4) Based on MIL-STD-810G
(5) 7680GB TLC and 2560GB pSLC models may have limitations in certain cross-temp applications

Data Security Features

	U.2 PCIe/NVMe
Encryption	AES-XTS 256-bit (FIPS 197 compliant)
Key Management	TCG Opal 2.0
Elimination	ATA-8 Security Erase DoD NISPOM 5220.22-M DoD NISPOM 5220.22-M-Sup 1 NSA/CSS Manual 130-2 NSA/CSS Manual 9-12 Army AR 380-19 Navy NAVSO P-5239-26 Air Force AFSSI-5020 External trigger
Write Protect	Hardware Write Protect

U.2 Ordering Information

Part Number	Density
I-Temp TLC	
HRCN7P15360ME001*[5]	15360GB
HRCN7P7680ME001*[5]	7680GB
HRCN7P3840HI001*	3840GB
HRCN7P1920HI001*	1920GB
HRCN7P0960HI001*	960GB
HRCN7P0480HI001*	480GB

*Conformal Coat Option Replace "001" with "CC1"

M.2 2280 Ordering Information

Part Number	Density
I-Temp TLC	
HRCN3P7680MI001*	7680GB
HRCN3P3840MI001*	3840GB
HRCN3P1920HI001*	1920GB
HRCN3P0960HI001*	960GB
HRCN3P0480HI001*	480GB

*Conformal Coat Option Replace "001" with "CC1"

E1.S Ordering Information

Part Number	Density
I-Temp TLC	
HRCN3P7680MI001*	7680GB
HRCN3P3840MI001*	3840GB
HRCN3P1920HI001*	1920GB
HRCN3P0960HI001*	960GB
HRCN3P0480HI001*	480GB

*Conformal Coat Option Replace "001" with "CC1"

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For more information, please visit: **www.smartm.com**

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