

SMARTRUGGED[™] T6CN | PCIe/NVMe E1.S, U.2 and M.2 2280

SMART's RUGGED T6CN PCIe/NVMe Gen 4 x4 solid state drives (SSDs) deliver high performance, high-capacity storage solutions optimized for defense, aerospace and other applications requiring durable, rugged and secure storage.

The RUGGED T6CN PCIe/NVMe data storage drives integrate high-speed PCIe Gen4 x4 interface with 3D NAND flash memory technology, delivering capacities up to 15360GB*, delivering a high-performance solution for a wide range of applications. The T6CN drives are available in EDSFF E1.S. U.2 and M.2 2280 form factors.

Features & Benefits

- AES-XTS 256-bit encryption automatically protects all data written to the drive
- True industrial grade storage solution for "no-compromise" applications
- Advanced LDPC error correction
- 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 in U.2 and E1.S and 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	500,000 IOPS Read
90000 10 1000000	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



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

Specifications

Random Write (4KB) IOPS Up to 55,000 Up to 55,000 Up to 50,000 Capacity		E1.S	U.2	M.2 2280
PCIC Gen 4 x4 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 500,000 Up to 400,000 Random Read (4KB) IOPS Up to 55,000 Up to 55,000 Up to 50,000 Random Write (4KB) IOPS Up to 55,000 Up to 55,000 Up to 50,000 Capacity 3D-TLC 960GB-7680GB 960GB-15360GB 960GB-3840G Reliability MTBF > 2M hours, Telcordia 20°C Data Reliability 1 in 10¹¹² bits read Data Reliability 1 in 10¹¹² bits read Data Retention > 10 years @ 25°C Endurance C-Temp: 16,800 TBW (with 15,360GB) Harring Power 1 Year Input Voltage 12.0V ± 10% 12.0V ± 10% 3.3V ± 5% Idle (typical) < 1.0 W < 1.0 W < 1.0 W Operational (typical) < 12 W < 12 W < 12 W Environmental C-Temp: -40°C - 85°C I-Temp: -40°C - 85°C	NAND Type		TLC	
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 500,000 Up to 500,000 Up to 400,000 Random Write (4KB) IOPS Up to 55,000 Up to 55,000 Up to 50,000 Capacity 3D-TLC 960GB-7680GB 960GB-15360GB 960GB-3840G Reliability MTBF > 2M hours, Telcordia 20°C Data Reliability 1 in 10¹¹ bits read Data Retention > 10 years @ 25°C Endurance C-Temp: 16,800 TBW (with 15,360GB) I-Temp: 9,600 TBW (with 15,360GB) I-Temp: 9,600 TBW (with 15,360GB) Warranty 1 Year Power Input Voltage 12.0V ± 10% 12.0V ± 10% 3.3V ± 5% Idle (typical) < 1.0 W	Compliance			
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Sequential Write MB/s Up to 3,000 Up to 400,000 Random Read (4KB) IOPS Up to 500,000 Up to 500,000 Up to 50,000 Up to 50	Performance			
Random Read (4KB) IOPS Up to 500,000 Up to 500,000 Up to 400,000 Random Write (4KB) IOPS Up to 55,000 Up to 55,000 Up to 50,000 Capacity 3D-TLC 960GB-7680GB 960GB-15360GB 960GB-3840G Reliability MTBF > 2M hours, Telcordia 20°C Data Reliability 1 in 10¹7 bits read Data Retention > 10 years @ 25°C Endurance C-Temp: 16,800 TBW (with 15,360GB) I-Temp: 9,600 TBW (with 15,360GB) Warranty 1 Year Power Input Voltage 12.0V ± 10% 12.0V ± 10% 3.3V ± 5% Idle (typical) < 1.0 W	Sequential Read MB/s	Up to 3,500	Up to 3,500	Up to 3,200
Random Write (4KB) IOPS	Sequential Write MB/s	Up to 3,000	Up to 3,000	Up to 3,200
Capacity 3D-TLC 960GB-7680GB 960GB-15360GB 960GB-3840G Reliability MTBF > 2M hours, Telcordia 20°C Data Reliability 1 in 10¹¹ bits read Data Retention > 10 years @ 25°C Endurance C-Temp: 16,800 TBW (with 15,360GB) I-Temp: 9,600 TBW (with 15,360GB) Warranty 1 Year Power Input Voltage 12.0V ± 10% 12.0V ± 10% 3.3V ± 5% Idle (typical) < 1.0 W	Random Read (4KB) IOPS	Up to 500,000	Up to 500,000	Up to 400,000
Section Sect	Random Write (4KB) IOPS	Up to 55,000	Up to 55,000	Up to 50,000
Reliability MTBF > 2M hours, Telcordia 20°C Data Reliability 1 in 10¹¹ bits read Data Retention > 10 years @ 25°C Endurance C-Temp: 16,800 TBW (with 15,360GB) I-Temp: 9,600 TBW (with 15,360GB) Warranty 1 Year Power Input Voltage 12.0V ± 10% 12.0V ± 10% 3.3V ± 5% Idle (typical) < 1.0 W	Capacity			
MTBF > 2M hours, Telcordia 20°C Data Reliability 1 in 10¹¹ bits read Data Retention > 10 years @ 25°C Endurance C-Temp: 16,800 TBW (with 15,360GB) I-Temp: 9,600 TBW (with 15,360GB) Warranty 1 Year Power Input Voltage 12.0V ± 10% 12.0V ± 10% 3.3V ± 5% Idle (typical) < 1.0 W	3D-TLC	960GB-7680GB	960GB-15360GB	960GB-3840GE
Data Reliability 1 in 10¹¹² bits read Data Retention > 10 years @ 25°C Endurance C-Temp: 16,800 TBW (with 15,360GB) I-Temp: 9,600 TBW (with 15,360GB) Warranty 1 Year Power Input Voltage 12.0V ± 10% 12.0V ± 10% 3.3V ± 5% Idle (typical) < 1.0 W < 1.0 W < 1.0 W Operational (typical) < 12 W < 12 W < 12 W Environmental Relative Humidity 5% to 95% non-condensing Conformal Condensing Optional Conformal Coating Optional Optional C-Temp: -40°C - 85°C C-Temp: -40°C - 85°C C-Temp: -50°C - 95°C Mechanical Length 118.75mm 100mm 80mm Modulation Width 9.5mm 69.85mm 11.6mm Height 33.75mm 7.0mm 24mm	Reliability			
Data Retention > 10 years @ 25°C Endurance C-Temp: 16,800 TBW (with 15,360GB) I-Temp: 9,600 TBW (with 15,360GB) Warranty 1 Year Power Input Voltage 12.0V ± 10% 12.0V ± 10% 3.3V ± 5% Idle (typical) < 1.0 W	MTBF	> 2	M hours, Telcordia 2	0°C
Endurance C-Temp: 16,800 TBW (with 15,360GB) I-Temp: 9,600 TBW (with 15,360GB) Warranty 1 Year Power Input Voltage 12.0V ± 10% 12.0V ± 10% 3.3V ± 5% Idle (typical) < 1.0 W	Data Reliability	1 in 10 ¹⁷ bits read		
Temp: 9,600 TBW (with 15,360GB)	Data Retention	> 10 years @ 25°C		
Power Input Voltage 12.0V ± 10% 12.0V ± 10% 3.3V ± 5% Idle (typical) < 1.0 W	Endurance			
Input Voltage 12.0V ± 10% 12.0V ± 10% 3.3V ± 5% Idle (typical) < 1.0 W	Warranty	1 Year		
Idle (typical) < 1.0 W < 1.0 W < 1.0 W Operational (typical) < 12 W	Power			
Operational (typical) < 12 W < 12 W < 12 W Environmental Relative Humidity 5% to 95% non-condensing Conformal Coating Optional Operating Temp C-Temp: 0°C - 70°C I-Temp: -40°C - 85°C Storage Temp C-Temp: -40°C - 85°C I-Temp: -50°C - 95°C Mechanical Length 118.75mm 100mm 80mm Width 9.5mm 69.85mm 11.6mm Height 33.75mm 7.0mm 24mm	Input Voltage	12.0V ± 10%	12.0V ± 10%	3.3V ± 5%
Environmental Relative Humidity 5% to 95% non-condensing Conformal Coating Optional Operating Temp C-Temp: 0°C - 70°C I-Temp: -40°C - 85°C Storage Temp C-Temp: -40°C - 85°C I-Temp: -50°C - 95°C Mechanical Length 118.75mm 100mm 80mm Width 9.5mm 69.85mm 11.6mm Height 33.75mm 7.0mm 24mm	Idle (typical)	< 1.0 W	< 1.0 W	< 1.0 W
Relative Humidity 5% to 95% non-condensing Conformal Coating Optional Operating Temp C-Temp: 0°C - 70°C I-Temp: -40°C - 85°C Storage Temp C-Temp: -40°C - 85°C I-Temp: -50°C - 95°C Mechanical Length 118.75mm 100mm 80mm Width 9.5mm 69.85mm 11.6mm Height 33.75mm 7.0mm 24mm	Operational (typical)	< 12 W	< 12 W	< 12 W
Conformal Coating Optional Operating Temp C-Temp: 0°C - 70°C I-Temp: -40°C - 85°C Storage Temp C-Temp: -40°C - 85°C I-Temp: -50°C - 95°C Mechanical Indeed to the state of	Environmental			
Operating Temp C-Temp: 0°C - 70°C I-Temp: -40°C - 85°C Storage Temp C-Temp: -40°C - 85°C I-Temp: -50°C - 95°C Mechanical Length 118.75mm 100mm 80mm Width 9.5mm 69.85mm 11.6mm Height 33.75mm 7.0mm 24mm	Relative Humidity	5% to 95% non-condensing		
Mechanical 118.75mm 100mm 80mm Width 9.5mm 69.85mm 11.6mm Height 33.75mm 7.0mm 24mm	Conformal Coating		Optional	
Mechanical 118.75mm 100mm 80mm Width 9.5mm 69.85mm 11.6mm Height 33.75mm 7.0mm 24mm			C-Temp: 0°C - 70°C	,
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Storage Lemp I-Temp: -50°C - 95°C Mechanical Length 118.75mm 100mm 80mm Width 9.5mm 69.85mm 11.6mm Height 33.75mm 7.0mm 24mm		C-Temp: -40°C - 85°C		
Mechanical Length 118.75mm 100mm 80mm Width 9.5mm 69.85mm 11.6mm Height 33.75mm 7.0mm 24mm	Storage Temp			
Length 118.75mm 100mm 80mm Width 9.5mm 69.85mm 11.6mm Height 33.75mm 7.0mm 24mm	Mechanical			
Width 9.5mm 69.85mm 11.6mm Height 33.75mm 7.0mm 24mm		118.75mm	100mm	80mm
Height 33.75mm 7.0mm 24mm				
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E1.S and M.2 dimensions include heatsink

Data Security Features

	U.2 PCle/NVMe
Encryption	AES-XTS 256-bit (FIPS 197 compliant)

E1.S Ordering Information

Part Number	Density	
C-Temp TLC	,	
HRMN8X0960LC001/002	960GB	
HRMN8X1920LC001/002	1920GB	
HRMN8X3840LC001/002	3840GB	
HRMN8X7680LC001/002	7680GB	
I-Temp TLC		
HRMN8X0960RI001/002	960GB	
HRMN8X1920RI001/002	1920GB	
HRMN8X3840RI001/002	3840GB	
HRMN8X7680RI001/002 7680GB		
E1.S and M.2 dimensions include heatsink		

U.2 Ordering Information

Part Number	Density
C-Temp TLC	
HRMN7X0960LC001	960GB
HRMN7X1920LC001	1920GB
HRMN7X3840LC001	3840GB
HRMN7X7680LC001	7680GB
HRMN7X016TLC001	15360GB
I-Temp TLC	
HRMN7X0960RI001	960GB
HRMN7X1920RI001	1920GB
HRMN7X3840RI001	3840GB
HRMN7X7680RI001	7680GB
HRMN7X016TRI001	15360GB

M.2 2280 Ordering Information

Part Number	Density
C-Temp TLC	
HRMN3X0960LC001/002	960GB
HRMN3X1920LC001/002	1920GB
HRMN3X3840LC001/002	3840GB
I-Temp TLC	
HRMN3X0960RI001/002	960GB
HRMN3X1920RI001/002	1920GB
HRMN3X3840RI001/002	3840GB

E1.S and M.2 dimensions include heatsink



For more information, please visit: $\ensuremath{\textbf{www.smartm.com}}$

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