

## MN SERIES (Helium-sealed design) NAS HDD

Toshiba's MN series of 3.5-inch<sup>[1]</sup> 7200 rpm Helium-sealed hard disk drives (HDD) deliver up to 16 TB<sup>[2]</sup> of storage capacity, making it suitable for NAS applications that value high-capacity and optimal power efficiency. To address NAS-class requirements, the MN series provide an up to 1 200 000 hour MTTF<sup>[3]</sup>, 180 TB/year workload<sup>[4]</sup> rating and support 24/7 power-on operation. The MN series also feature vibration compensation technology to help deliver consistent performance in up to 8 drive bay storage enclosures.



Product image may represent a design model.

### KEY FEATURES

- 16 TB Capacity (14 and 12TB model also available)
- 7200 rpm Performance
- SATA 6.0 Gbit/s Interface<sup>[5][6]</sup>
- 180 total TB Transferred per Year Workload Rating
- Rotational Vibration (RV) Sensors for Great Scalability and Good Performance
- 24/7 operation

### APPLICATIONS

- Branch-office / Remote-office Networked File Storage
- File and Object storage solutions
- Archiving and data back-up
- Consumer NAS file storage
- Private cloud storage

### SPECIFICATIONS

Item		MN08ACA16T	MN07ACA14T	MN07ACA12T
Interface		SATA-3.3		
Formatted Capacity		16 TB	14 TB	12 TB
Performance	Interface Speed	6.0 Gbit/s, 3.0 Gbit/s, 1.5 Gbit/s		
	Rotation Speed	7200 rpm		
	Buffer Size	512 MiB <sup>[6]</sup>	256 MiB	
	Max Data Transfer Speed (Sustained) (Typ.)	262 MiB/s	248 MiB/s	242 MiB/s
Logical Data Block Length		HOST: 512 B, DISK: 4096 B <sup>[7]</sup>		
Supply Voltage	Allowable Voltage	12 V <sup>[8]</sup> ± 10 % 5 V <sup>[8]</sup> +10% -7% <sup>[9]</sup>	12 V <sup>[8]</sup> ± 10 % 5 V <sup>[8]</sup> ± 5% <sup>[9]</sup>	
Power Consumption	Operating <sup>[10]</sup> (Typ.)	6.91 W	6.77 W	6.49 W
	Active Idle (Typ.)	4.03 W	4.54 W	4.28 W
Acoustics <sup>[11]</sup> (Sound Power)	Active Idle (Typ.)	20 dB		
	Seek (Typ.)	32 dB	35 dB	

## ENVIRONMENTAL LIMITS

Item		MN08ACA16T	MN07ACA14T MN07ACA12T
Temperature	Operating (surface)	0 °C to 65 °C (No condensation)	5 °C to 60 °C (No condensation)
	Non-Operating (ambient)	- 40 °C to 70 °C <sup>[15]</sup> (No condensation)	- 40 °C to 70 °C <sup>[15]</sup> (No condensation)
	Storage condition & Period	0 °C to 70 °C (No condensation) 6 months within shipping package	
Humidity	Operating	5 % to 90 % R.H. (No condensation)	
	Non-Operating	5 % to 95 % R.H. (No condensation)	
Shock	Operating	686 m/s <sup>2</sup> { 70 G } ( 2 ms duration )	
	Non-Operating	2450 m/s <sup>2</sup> { 250 G } ( 2 ms duration )	
Vibration <sup>[12]</sup>	Operating <sup>[13]</sup>	7.35 m/s <sup>2</sup> { 0.75 G } ( 5 to 300 Hz ) 2.45 m/s <sup>2</sup> { 0.25 G } (300 to 500 Hz)	
	Non-Operating <sup>[14]</sup>	29.4 m/s <sup>2</sup> { 3.0 G } ( 5 to 500 Hz )	
Altitude	Operating	- 305 m to 3048 m (No condensation) (5 °C to 55 °C ambient)	
	Non-Operating	- 305 m to 12 192 m <sup>[15]</sup> (No condensation)	

## RELIABILITY

Item	MN08ACA16T	MN07ACA14T MN07ACA12T
MTTF	1 200 000 h	1 000 000 h
Non-recoverable Error Rate	1 error per 10 <sup>14</sup> bits read	
Load / Unload	300 000 times	
Availability	24 hours/day, 7 days/week	
Rated Annual Workload (Total TB Transferred per Year, R/W)	180 TB/year	

## MECHANICAL SPECIFICATIONS

Item	Specification
Width	101.85 mm Max
Height	26.1 mm Max
Length	147.0 mm Max
Weight	720 g Max

[1] "3.5-inch" mean the form factor of HDDs. They do not indicate drive's physical size.

[2] Definition of capacity: Toshiba defines a terabyte (TB) as 1 000 000 000 000 bytes. A computer operating system, however, reports storage capacity using powers of 2 for the definition of 1TB = 2<sup>40</sup> = 1 099 511 627 776 bytes and therefore shows less storage capacity. Available storage capacity (including examples of various media files) will vary based on file size, formatting, settings, software and operating system, such as Microsoft Operating System and/or pre-installed software applications, or media content. Actual formatted capacity may vary.

[3] MTTF (Mean Time to Failure) is not a guarantee or estimate of product life; it is a statistical value related to mean failure rates for a large number of products which may not accurately reflect actual operation. Actual operating life of the product may be different from the MTTF.

[4] Workload is defined as the amount of data written, read or verified by commands from host system.

[5] Read and write speed may vary depending on the host device, read and write conditions, and file size.

[6] A mebibyte (MiB) means 2<sup>20</sup>, or 1 048 576 bytes, and a gibibyte (GiB) means 2<sup>30</sup>, or 1 073 741 824 bytes.

[7] Read-modify-write is supported.

[8] Input voltages are specified at the HDD connector side, during HDD ready state.

[9] Make sure the value is not less than -0.3V DC (less than -0.6V, 0.1ms) when turning on or off the power.

[10] Operating watt is measured using 80% random read/write and 20% performance idle.

[11] The measuring method is based on ISO 7779.

[12] Vibration applied to the HDD is measured at near the mounting screw hole on the frame as much as possible.

[13] At random seek write/read and default on retry setting with log sweep vibration.

[14] At power-off state after installation.

[15] The range of altitude is 3048 m or less. Up to 55 °C at 7620 m. Up to 40 °C at 12 192 m.

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