TOSHIBA

MN09 SERIES

NAS HDD

Toshiba MN09 series of 3.5-inch [1] 7200 rpm hard disk drives (HDD) deliver up to 18 TB [2] of storage capacity, making it higher storage capacities as work-from-home customers need fast access to data and the ability to archive and share data in private cloud environments.

The new 18 TB NAS offering is a 9-platter helium-sealed conventional magnetic recording (CMR) drive, which leverages Toshiba's new innovative Flux Control Microwave-Assisted Magnetic Recording (FC-MAMR) technology. FC-MAMR advances CMR capacity to 18 TB and delivers increased density per platter over previous designs. The MN09 is the 3rd generation to use Toshiba's pioneering 9-platter helium-sealed mechanical design.

Product image may represent a design model.

KEY FEATURES

- Up to 18 TB Capacity
- 7200 rpm Performance
- SATA 6.0 Gbit/s [3] Interface
- MTTF / MTBF [16] of 1 200 000 hours
- 180 total TB Transferred per Year Workload Rating [17]
- Rotational Vibration (RV) Sensors for Great Scalability and Good Performance
- 24/7 operation

APPLICATIONS

- Home and SOHO NAS
- Small business server and storage
- Archiving and data back-up
- Private cloud storage

SPECIFICATION

Item		MN09ACA18T	MN09ACA16T	MN09ACA14T	MN09ACA12T
Interface		SATA-3.3			
Formatted Capacity [2]		18 TB	16 TB	14TB	12 TB
Performance	Interface Speed [3]	6.0 Gbit/s, 3.0 Gbit/s, 1.5 Gbit/s			
	Rotation Speed	7200 rpm			
	Buffer Size [4]	512 MiB			
	Maximum Sustained Data Transfer Speed [6] (Typ.)	268 MiB/s			
Logical Data Block Length [6]		HOST 512 B, DISK 4096 B			
Supply Voltage	Allowable Voltage	12 V [7] ±10 % / 5 V [7] +10 % / -7 % [8]			
Power Consumption	Random R/W [9](Typ.)	7.48 W		7.38 W	6.85 W
	Active Idle (Typ.)	4.14 W		3.77 W	3.30 W
Acoustics [11] (Sound Power)	Active Idle (Typ.)	20 dB			
	Seek (Typ.)	32 dB			

ENVIRONMENTAL LIMITS

Item		Specification
Enclosure surface temperature	Operating	5 °C to 60 °C (No condensation)
Ambient temperature	Non-Operating [11]	-40 °C to 70 °C (No condensation)
Relative Humidity	Operating	5 % to 90 % R.H. (No condensation)
	Non-Operating [11]	5 % to 95 % R.H. (No condensation)
Altitude	Operating	-305 m to 3048 m
	Non-Operating [14]	-305 m to 12 192 m
Shock [12]	Operating	686 m/s^2 { 70 G } (2 ms duration)
	Non-Operating	2450 m/s^2 { 250 G } (2 ms duration)
Vibration [12][13]	Operating	7.35 m/s^2 { 0.75 G } (5 to 300 Hz) 2.45 m/s^2 { 0.25 G } (300 to 500 Hz)
	Non-Operating [15]	29.4 m/s^2 { 3.0 G } (5 to 500 Hz)

RELIABILITY

Item	Specification
MTTF / MTBF (AFR) [16]	1 200 000 hours (0.73 %)
Non-recoverable Error Rate	1 per 10^{14} bits read
Load / Unload	300 000 times
Availability	24 hours/day, 7 days/week
Rated Annual Workload [17]	180 TB per year

MECHANICAL SPECIFICATIONS

Item	MN09ACA18T	MN09ACA16T	MN09ACA14T	MN09ACA12T
Width (Max)	101.85 mm			
Height (Max)	26.1 mm			
Length (Max)	147.0 mm			
Weight (Max)	720 g		705 g	690 g

[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^{40} = 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] Read and write speed may vary depending on the host device, read and write conditions, and file size.
[4] A mebibyte (MiB) means 2^{20}, or 1 048 576 bytes.
[5] The maximum sustained data rate and interface speed may be restricted to the response speed of host system and by transmission characteristics. 1 Gbit/s = 1 000 000 000 bits/s. 1 MiB/s = 1 048 576 bytes/s
[6] Read–modify-write is supported.
[7] Input voltages are specified at the HDD connector side, during HDD ready state.
[8] Make sure the value is not less than -0.3 V DC (less than -0.6 V, 0.1 ms) when turning on or off the power.
[9] Operating watt is measured using 80 % random read / write and 20% performance idle.
[10] The measuring method is based on ISO 7779.
[11] Non-operating condition (except storage condition) assumes short term transportation.
[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] The range of altitude is 3048 m or less. Up to 55 °C at 7620 m. Up to 40 °C at 12 192 m.
[15] At power-off state after installation
[16] MTTF / MTBF (Mean Time to Failure / Mean Time Between Failures) of the HDDs during its life time is 1 200 000 hours and AFR (Annualized Failure Rate) is 1.46 %. (POH: 8760 hours per one year (24 hours per one day, 7 days per one week). Average HDA surface temperature: 40 °C or less, workloads: 180 TB per one year, which is defined as the amount of data written, read or verified by commands from host system). Continual or sustained operation at case HDA surface temperature above 40 °C may degrade product reliability.
[17] Workload is defined as the amount of data written, read or verified by commands from host system.

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