TOSHIBA

MN SERIES (Conventional Air design)
NAS HDD

Toshiba MN series of 3.5-inch[1] 7200 rpm hard disk drives (HDD) deliver up to 10 TB[2] of storage capacity, making it suitable storage solution for home and SOHO NAS applications. To address the demanding requirements, these HDDs provide enterprise class 1 000 000 hour MTTF[3], 180 TB/year[4] workload rating and support for 24/7 power-on operation. The MN series also feature rotational vibration (RV) sensors which automatically detect and compensate for transient vibrations to deliver consistent performance in multi-bay storage enclosures.

Product image may represent a design model.

KEY FEATURES

- Up to 10 TB Capacity (model line-up also includes 8 TB, 6 TB and 4 TB)
- 7200 rpm Performance
- SATA 6.0 Gbit/s[5][6] Interface
- MTTF of 1 000 000 hours
- 180 total TB Transferred per Year Workload Rating
- 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

SPECIFICATIONS

Item		MN08ADA800	MN08ADA600	MN08ADA400E(512e) MN08ADA400N(512n)
Interface		SATA-3.3		
Formatted Capacity		8 TB	6 TB	4 TB
Performance	Interface Speed	6.0 Gbit/s, 3.0 Gbit/s, 1.5 Gbit/s		
	Rotation Speed	7200 rpm		
	Buffer Size	256 MiB[6]		
	Max Data Transfer Speed (Sustained) (Typ.)	248 MiB/s	239 MiB/s	243 MiB/s (512e) 222 MiB/s (512n)
Logical Data Block Length		Host 512 B, Disk 4096 B[7]		Host 512 B, Disk 4096 B[7] (512e) Host 512 B, Disk 512 B (512n)
Supply Voltage	Allowable Voltage	DC +12 V[8] ± 10 % DC +5 V[8] ± 5 %[9]		
Power Consumption	Operating[10] (Typ.)	8.41 W	7.72 W	6.84 W
	Active Idle (Typ.)	5.61 W	4.93 W	4.04 W
Acoustics[11] (Sound Power)	Active Idle (Typ.)	31 dB		
	Seek (Typ.)	35 dB		

Item		MN06ACA10T	MN06ACA800	MN06ACA600
Interface		SATA-3.3		
Formatted Capacity		10 TB	8 TB	6 TB
Performance	Interface Speed	6.0 Gbit/s, 3.0 Gbit/s, 1.5 Gbit/s		
	Rotation Speed	7200 rpm		
	Buffer Size	256 MiB[6]		
	Max Data Transfer Speed (Sustained) (Typ.)	211 to 237 MiB/s	211 to 230 MiB/s	
Logical Data Block Length		HOST: 512 B, DISK: 4096 B[7]		
Supply Voltage	Allowable Voltage	DC + 12 V[8] ± 10 % DC + 5 V[8] + 10 % / - 5 %[9]		
Power Consumption	Operating[10] (Typ.)	9.48 W	8.61 W	7.88 W
	Active Idle (Typ.)	7.15 W	6.33 W	5.59 W
Acoustics[11] (Sound Power)	Active Idle (Typ.)	34 dB		
	Seek (Typ.)	35 dB		

Item		MN04ACA400 (512e/512n)
Interface		SATA-2.6/3.0
Formatted Capacity		4 TB
Performance	Interface Speed	6.0 Gbit/s, 3.0 Gbit/s, 1.5 Gbit/s
	Rotation Speed	7200 rpm
	Buffer Size	128 MiB[6]
	Max Data Transfer Speed (Sustained) (Typ.)	185 to 195 MiB/s
Logical Data Block Length		Host 512 B, Disk 4096 B[7] (512e) Host 512 B, Disk 512 B (512n)
Supply Voltage	Allowable Voltage	DC + 12 V[8] ± 10 % DC + 5 V[8] ± 5 %[9]
Power Consumption	Operating[10] (Typ.)	9.6 W
	Active Idle (Typ.)	5.2 W
Acoustics[11] (Sound Power)	Active Idle (Typ.)	30 dB
	Seek (Typ.)	34 dB

ENVIRONMENTAL LIMITS

Item		MN08ADA800 MN08ADA600 MN08ADA400E/N
Temperature	Operating (surface)	5 to 65 °C (no condensation)
	Non-Operating (ambient)	-40 to 70 °C[15] (no condensation)
Humidity	Operating	5 to 90 %RH (no condensation)
	Non-Operating	5 to 95 %RH (no condensation)
Shock	Operating	686 m/s^2 {70 G} (2 ms duration)
	Non-Operating	2450 m/s^2 {250 G} (2 ms duration)
Vibration[12]	Operating[13]	7.35 m/s^2 {0.75 G} (2 to 300 Hz) 4.90 m/s^2 {0.50 G} (300 to 350 Hz) 2.45 m/s^2 {0.25 G} (350 to 500 Hz)
	Non-Operating[14]	29.4 m/s^2 {3.0 G} (5 to 500 Hz)
Altitude	Operating	–305 to +3048 m (5 to 55 °C Ambient)
	Non-Operating	–305 to +12192 m

Item		MN06ACA10T MN06ACA800 MN06ACA600	MN04ACA400
Temperature	Operating (ambient)	0 to 60 °C	
	Operating (surface)	0 to 65 °C	
	Non-Operating (ambient)	- 40 to 70 °C[15]	
Humidity	Operating	5 to 90 % RH (No condensation)	
	Non-Operating	5 to 95 % RH (No condensation)	
Shock	Operating	686 m/s^2 {70 G} (2 ms duration)	
	Non-Operating	2450 m/s^2 {250 G} (2 ms duration)	
Vibration[12]	Operating[13]	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[14]	29.4 m/s^2 {3.0 G} (5 to 500 Hz)	49 m/s^2 {5 G} (5 to 500 Hz)
Altitude	Operating	- 305 to +3048 m	
	Non-Operating	- 305 to +12192 m	

RELIABILITY

Item	MN08ADA800 MN08ADA600 MN08ADA400E/N	MN06ACA10T MN06ACA800 MN06ACA600	MN04ACA400
MTTF / AFR[18]	1 000 000 h[16] / 0.88 %[17]		1 000 000 h[16]
Non-recoverable Error Rate	1 error per 10^{15} bits read	1 error per 10^{14} bits read	
Load / Unload (Max)	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

MN08ADA800 / MN08ADA600

Item	MN08ADA800	MN08ADA600
Width (Max)	101.85 mm	
Height (Max)	26.1 mm	
Length (Max)	147 mm	
Weight (Max)	720 g	700 g

MN08ADA400E/N

Item	MN08ADA400E/N
Width (Max)	101.85 mm
Height (Max)	26.1 mm
Length (Max)	147 mm
Weight (Max)	693 g

MN06ACA10T / MN06ACA800 / MN06ACA600

Item	MN06ACA10T MN06ACA800 MN06ACA600
Width (Max)	101.85 mm
Height (Max)	26.1 mm
Length (Max)	147 mm
Weight (Max)	770 g

MN04ACA400

Item	MN04ACA400
Width (Max)	101.85 mm
Height (Max)	26.1 mm
Length (Max)	147 mm
Weight (Max)	720 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] 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^{20}, or 1 048 576 bytes, and a gibibyte (GiB) means 2^{30}, 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 DC -0.3 V (less than -0.6 V, 0.1 ms) 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 3 048 m or less.
Up to 55 °C at 7620 m. Up to 40 °C at 12 192 m.
[16] MTTF of the HDDs during its life time is 1 000 000 hours.
[17] AFR (Annual Failure Rate) of the HDDs is 0.88 %.
[18] MTTF and AFR are defined under the following condition.
24 hours/day, 7 days/week, average HDA surface temperature:40 °C or less, workloads: 180 TB/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.