TOSHIBA

MG10F SERIES
CLOUD-SCALE CAPACITY HDD

The MG10F Series provides 22 TB [1] of conventional magnetic recording (CMR) capacity. The drive feature a 550 TB per year workload rating with 7200 rpm performance in a 10-disk helium-sealed, industry-standard 3.5-inch[2] form factor. The MG10F integrates easily into existing drive bays to help reduce the footprint and operational burden of cloud-scale storage infrastructure. The MG10F supports File, Object and Block storage making it an excellent choice for business critical servers and storage systems. The MG10F Series delivers optimum storage capacity and application compatibility, with unsurpassed data reliability.

Product image may represent a design model.

KEY FEATURES

- 22 / 20 TB capacity
- Conventional Magnetic Recording (CMR) for broad compatibility
- Industry-leading 10-disk helium-sealed design for superior storage density
- Industry Standard 3.5-inch 26.1 mm height Form Factor
- 7200 rpm Performance
- Lower operational power profile, providing excellent power efficiency (W/TB) for better TCO
- 550 Total TB Transferred per Year Workload Rating [4]
- Toshiba Persistent Write Cache Technology for Data-Loss Protection in Sudden Power-Loss Events
- Sanitize Instant Erase (SIE) option model and Self Encrypting Drive (SED) option model [5]
- Support FFMT (Fast Format) for SAS

APPLICATIONS

- Cloud-scale Sever and Storage Infrastructure
- Tiered Storage Infrastructure Solutions
- Scale-out File and Object Storage Infrastructure
- Distributed files systems
- OLTP(Online Transaction Processing) and HPC (High Performance Computing) applications
- High Capacity RAID storage
- Secure Enterprise Backup and Restore
- Data Retention and Compliance Data Archives
- Data Analytics
- Centralized Surveillance

SPECIFICATION

Item		MG10AFA22T	MG10AFA20T
Interface		SATA-3.3	
Formatted Capacity		22 TB	20 TB
Performance	Interface Speed [3]	6.0 Gbit/s, 3.0 Gbit/s, 1.5 Gbit/s	
	Rotation Speed	7200 rpm	
	Buffer Size [7]	512 MiB	
	Maximum Sustained Data Transfer Speed [6] (Typ.)	271 MiB/s	
Logical Data Block Length	MG10AFAxxxE/EY [8]	HOST 512 B, DISK 4096 B	
	MG10AFPxxxE [8]		
Supply Voltage	Allowable Voltage	12 V [9] ±10 % / 5 V [9] +10 % / -7 % [10]	
Power Consumption	Write / Read (4KB Q1) (Typ.)	8.38 W	
	Active Idle (Typ.)	4.35 W	
Acoustics [11] (Sound Power)	Idle (Typ.)	20 dB	
	Seek (Typ.)	32 dB	

Item		MG10SFA22T	MG10SFA20T
Interface		SAS-3.0	
Formatted Capacity		22 TB	20 TB
Performance	Interface Speed [3]	12.0 Gbit/s, 6.0 Gbit/s, 3.0 Gbit/s, 1.5 Gbit/s	
	Rotation Speed	7200 rpm	
	Buffer Size [7]	512 MiB	
	Maximum Sustained Data Transfer Speed [6] (Typ.)	271 MiB/s	
Logical Data Block Length	MG10SFAxxxE/EY [8]	HOST 512 B, DISK 4096 B HOST 520 B, DISK 4160 B HOST 528 B, DISK 4224 B	
	MG10SFPxxxE [8]		
Supply Voltage	Allowable Voltage	12 V [9] ±10 % / 5 V [9] +10 % / -7 % [10]	
Power Consumption	Write / Read (4KB Q1) (Typ.)	8.86 W	
	Active Idle (Typ.)	4.82 W	
Acoustics [11] (Sound Power)	Idle (Typ.)	20 dB	
	Seek (typ.)	32 dB	

ENVIRONMENTAL LIMITS

Item		Specification
Ambient Temperature	Operating	5 °C to 55 °C (No condensation)
	Non-Operating [12] [13]	-40 °C to 70 °C (No condensation)
Enclosure surface temperature	Operating	5 °C to 60 °C (No condensation)
Relative Humidity	Operating	5 % to 90 % R.H. (No condensation)
	Non-Operating	5 % to 95 % R.H. (No condensation)
Altitude	Operating	-305 m to +3048 m
	Non-Operating [12][13]	-305 m to +12 192 m
Shock [14]	Operating	490 m/s^2 { 50 G } (2 ms duration)
	Non-Operating	1960 m/s^2 { 200 G } (2 ms duration)
Vibration [14]	Operating [15]	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 [16]	29.4 m/s^2 { 3.0 G } (5 to 500 Hz)

RELIABILITY

Item	Specification
MTTF / MTBF (AFR) [17]	2 500 000 hours (0.35 %)
Non-recoverable Error Rate	10 per 10^{16} bits read
Load / Unload	600 000 times
Availability	24 hours/day, 7 days/week
Rated Annual Workload	550 TB per year

MECHANICAL SPECIFICATIONS

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

[1] 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.
[2] "3.5-inch" mean the form factor of HDDs. They do not indicate drive's physical size.
[3] Read and write speed may vary depending on the host device, read and write conditions, and file size.
[4] Workload is defined as the amount of data written, read or verified by commands from host system.
[5] SED supports TCG Enterprise SSCs. And the HDDs which have any security function may not be available in the countries where the use of such HDDs is prohibited or limited due to export control and local regulations.
[6] 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
[7] A mebibyte (MiB) means 2^{20}, or 1 048 576 bytes.
[8] Read–modify-write is supported.
[9] Input voltages are specified at the HDD connector side, during HDD ready state.
[10] 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.
[11] The measuring method is based on ISO 7779.
[12] Non-operating condition (except storage condition) assumes short term transportation.
[13] The range of altitude is 3048 m or less. Up to 55 °C at 7620 m. Up to 40 °C at 12 192 m.
[14] Vibration applied to the HDD is measured at near the mounting screw hole on the frame as much as possible.
[15] At random seek write/read and default on retry setting with log sweep vibration.
[16] At power-off state after installation
[17] MTTF / MTBF (Mean Time to Failure / Mean Time Between Failure) of the HDDs during its life time is 2 500 000 hours and AFR (Annualized Failure Rate) is 0.35 %. (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: 550 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.

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MODEL NUMBER

Model Number	Interface	Capacity	Sector Format *	Optional Security
MG10AFA22TE	SATA-3.3	22 TB	512e	
MG10AFA20TE	SATA-3.3	20 TB	512e	
MG10AFA22TEY	SATA-3.3	22 TB	512e	SIE
MG10AFA20TEY	SATA-3.3	20 TB	512e	SIE
MG10AFP22TE	SATA-3.3	22 TB	512e	SED
MG10AFP20TE	SATA-3.3	20 TB	512e	SED

* Default configuration is 512e. Convert between 512 and 4096 byte logical size formats.

Model Number	Interface	Capacity	Sector Format *	Optional Security
MG10SFA22TE	SAS-3.0	22 TB	512e	
MG10SFA20TE	SAS-3.0	20 TB	512e	
MG10SFA22TEY	SAS-3.0	22 TB	512e	SIE
MG10SFA20TEY	SAS-3.0	20 TB	512e	SIE
MG10SFP22TE	SAS-3.0	22 TB	512e	SED
MG10SFP20TE	SAS-3.0	20 TB	512e	SED

* Default configuration is 512e. Convert between 512 and 4096 byte logical size formats.

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