MG10 SERIES

CLOUD-SCALE CAPACITY HDD

Product image may represent a design model.

The MG10 Series provides 20 TB [1] of conventional magnetic recording (CMR) capacity.

The industry-standard 3.5-inch [2] form-factor provides 7200 rpm performance, and integrates easily into cloud-scale storage infrastructure, business-critical servers and storage, and File and Object storage solutions.

Toshiba's leadership in precision industrial laser welding technology is put to use to permanently seal helium inside the 10-disk mechanics. The helium-sealed design reduces aerodynamic drag to significantly lower the drive's operational power profile, which helps deliver critical TCO benefits for data center infrastructures. The sealed design and corrosion resistant electronics also mitigate against life-time failure modes due to air bourn pollutants and other environmental factors.

The massive 20 TB CMR capacity is delivered using Toshiba's innovative Flux Control Microwave Assisted Magnetic Recording (FC-MAMR) technology. These advances help the MG10 Series to achieve optimum storage capacity and application compatibility, with unsurpassed data reliability. Available the MG10 Series models either a SATA 6.0 Gbit/s or a SAS 12.0 Gbit/s interface [3], integrate easily into standard 3.5-inch drive bays to help reduce the footprint and operational burden of cloud-scale storage infrastructure, File and Object storage systems, and business critical servers and storage systems.

KEY FEATURES

- 20 / 18 TB capacity
- Conventional Magnetic Recording (CMR) for broad compatibility
- Toshiba Flux Control Microwave-assisted Magnetic Recording (FC-MAMR) Technology
- 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]
- 512e or 4Kn Advanced Format Sector Technology; (512e Model) Includes Toshiba Persistent Write Cache Technology for Data-Loss Protection in Sudden Power-Loss Events
- Sustained transfer rate and power efficiency improvements vs. prior MG Series generations
- Sanitize Instant Erase (SIE) option mode and Self Encrypting Drive (SED) option model [5]

APPLICATIONS

- Cloud-scale Sever and Storage Infrastructure
- Software-defined data center infrastructure
- File- and Object-based storage infrastructure
- Tiered Storage Infrastructure Solutions
- Workloads and Use-Cases that Benefit from High Capacity per Spindle disk drives
- Capacity-Optimized Cloud-scale and Rack-Scale Storage Systems
- Compliance Data Archives and Data Life-Cycle Management Storage Systems
- Data Center Data-Protection and Data Back-up Infrastructure

SPECIFICATION

Item		MG10ACA20T MG10ACP20T	MG10ACA18T MG10ACP18T
Interface		SATA-3.3	
Formatted Capacity		20 TB	18 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.)	268 MiB/s	
Logical Data Block Length	MG10ACAxxxA/AY MG10ACPxxxA (fixed length)	4096 B	
	MG10ACAxxxE/EY [8] MG10ACPxxxE [8] (emulation)	HOST 512 B, DISK 4096 B	
Supply Voltage	Allowable Voltage	12 V [9] ±10 % / 5 V [9] +10 % / -7 % [10]	
Power Consumption	Write / Read (4KB Q1) (Typ.)	8.11 W	7.86 W
	Active Idle (Typ.)	4.38 W	4.17 W
Acoustics [11] (Sound Power)	Idle (Typ.)	20 dB	
	Seek (Typ.)	32 dB	

Item		MG10SCA20T MG10SCP20T	MG10SCA18T MG10SCP18T
Interface		SAS-3.0	
Formatted Capacity		20 TB	18 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.)	268 MiB/s	
Logical Data Block Length	MG10SCAxxxA/AY MG10SCPxxxA (fixed length)	4096 B / 4160 B / 4224 B	
	MG10SCAxxxE/EY [8] MG10SCPxxxE [8] (emulation)	HOST 512 B, DISK 4096 B HOST 520 B, DISK 4160 B HOST 528 B, DISK 4224 B	
Supply Voltage	Allowable Voltage	12 V [9] ±10 % / 5 V [9] +10 % / -7 % [10]	
Power Consumption	Write / Read (4KB Q1) (Typ.)	8.46 W	8.16 W
	Active Idle (Typ.)	4.74 W	4.52 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

[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
MG10ACA20TA	SATA-3.3	20 TB	4Kn	
MG10ACA18TA	SATA-3.3	18 TB	4Kn	
MG10ACA20TE	SATA-3.3	20 TB	512e	
MG10ACA18TE	SATA-3.3	18 TB	512e	
MG10ACA20TAY	SATA-3.3	20 TB	4Kn	SIE
MG10ACA18TAY	SATA-3.3	18 TB	4Kn	SIE
MG10ACA20TEY	SATA-3.3	20 TB	512e	SIE
MG10ACA18TEY	SATA-3.3	18 TB	512e	SIE
MG10ACP20TA	SATA-3.3	20 TB	4Kn	SED
MG10ACP18TA	SATA-3.3	18 TB	4Kn	SED
MG10ACP20TE	SATA-3.3	20 TB	512e	SED
MG10ACP18TE	SATA-3.3	18 TB	512e	SED

Model Number	Interface	Capacity	Sector Format	Optional Security
MG10SCA20TA	SAS-3.0	20 TB	4Kn	
MG10SCA18TA	SAS-3.0	18 TB	4Kn	
MG10SCA20TE	SAS-3.0	20 TB	512e	
MG10SCA18TE	SAS-3.0	18 TB	512e	
MG10SCA20TAY	SAS-3.0	20 TB	4Kn	SIE
MG10SCA18TAY	SAS-3.0	18 TB	4Kn	SIE
MG10SCA20TEY	SAS-3.0	20 TB	512e	SIE
MG10SCA18TEY	SAS-3.0	18 TB	512e	SIE
MG10SCP20TA	SAS-3.0	20 TB	4Kn	SED
MG10SCP18TA	SAS-3.0	18 TB	4Kn	SED
MG10SCP20TE	SAS-3.0	20 TB	512e	SED
MG10SCP18TE	SAS-3.0	18 TB	512e	SED