

MG11 SERIES

CLOUD-SCALE CAPACITY HDD

Built on 50 years of Toshiba's HDD innovation, the MG11 Series delivers new levels of capacity, performance, and quality. Packing up to 24 TB ^[1] into a standard 3.5-inch ^[2] conventional magnetic recording (CMR) HDD, the MG11 Series enables cloud-scale infrastructure to build higher storage densities at lower TCO. The MG11 Series features up to a 10-disk helium-sealed 3.5-inch design, which leverages Toshiba's innovative Flux Control Microwave Assisted Magnetic Recording (FC-MAMR™) technology to achieve 2.4 TB per disk. Built to meet growing data storage demands, the MG11 Series has a high workload rating of 550 TB with 7200 rpm, and is available in 6 Gbps SATA and 12 Gbps SAS interfaces. Engineered for 24/7 quality and enterprise reliability, the MG11 Series has an MTTF of 2.5 million hours. SED and SIE options are available to secure data and deliver peace of mind. In addition to 24 TB, the MG11 is available in 22 TB, 20 TB, 18 TB, 16 TB, and 14 TB in both SAS and SATA interfaces with SIE and SED options.



Product image may represent a design model.

KEY FEATURES

- Up to 24 TB capacity
- Conventional Magnetic Recording (CMR) for broad compatibility
- Toshiba 2nd generation 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]
- Sanitize Instant Erase (SIE) option model and Self Encrypting Drive (SED) option model ^[5]

APPLICATIONS

- Data Center Applications
- Big Data
- Video Surveillance
- Capacity-Optimized Cloud-scale and Rack-Scale Storage Systems
- Compliance Data Archives and Data Life-Cycle Management Storage Systems
- Data Back-up Infrastructure

SPECIFICATION

| Item | | MG11ACA24T MG11ACP24T | MG11ACA22T MG11ACP22T | MG11ACA20T MG11ACP20T | MG11ACA18T MG11ACP18T | MG11ACA16T MG11ACP16T | MG11ACA14T MG11ACP14T |
|--|---|--|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Interface | | SATA-3.5a | | | | | |
| Formatted Capacity | | 24 TB | 22 TB | 20 TB | 18 TB | 16 TB | 14 TB |
| Performance | Interface Speed ^[3] | 6.0 Gbit/s, 3.0 Gbit/s, 1.5 Gbit/s | | | | | |
| | Rotation Speed | 7200 rpm | | | | | |
| | Buffer Size ^[7] | 1 GiB | | | | | |
| | Maximum Sustained Data Transfer Speed ^[6] (Typ.) | 295 MiB/s | 285 MiB/s | 281 MiB/s | | | |
| Logical Data Block Length | MG11ACAxxxE/EY ^[8] MG11ACPxxxE ^[8] | 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 | | | 7.89 W | 7.41 W | |
| | Active Idle (Typ.) | 4.35 W | | | 4.16 W | 3.66 W | |
| Acoustics ^[11] (Sound Power) | Idle (Typ.) | 20 dB | | | | | |
| | Seek (Typ.) | 32 dB | | | | | |

| Item | | MG11SCA24T MG11SCP24T | MG11SCA22T MG11SCP22T | MG11SCA20T MG11SCP20T | MG11SCA18T MG11SCP18T | MG11SCA16T MG11SCP16T | MG11SCA14T MG11SCP14T |
|--|---|---|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Interface | | SAS-3 and later | | | | | |
| Formatted Capacity | | 24 TB | 22 TB | 20 TB | 18 TB | 16 TB | 14 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] | 1 GiB | | | | | |
| | Maximum Sustained Data Transfer Speed ^[6] (Typ.) | 295 MiB/s | 285 MiB/s | 281 MiB/s | | | |
| Logical Data Block Length | MG11SCAxxxE/EY ^[8] MG11SCPxxxE ^[8] | 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.) | 8.57 W | | | 8.36 W | 7.90 W | |
| | Active Idle (Typ.) | 4.83 W | | | 4.62 W | 4.16 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 ^[12] | 5 % to 95 % R.H. (No condensation) |
| Altitude | Operating | -305 m to +3048 m (No condensation) |
| | Non-Operating ^[12] | -305 m to +12 192 m (No condensation) |
| Shock | Operating | 490 m/s ² { 50 G } (2 ms duration) |
| | Non-Operating ^[12] | 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 ^{[12][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) | 730 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 = 2⁴⁰ = 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] 1 GiB (gibibyte) = 1 073 741 824 bytes. 1 MiB (mebibyte) = 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.

MODEL NUMBER

| Model Number | Interface | Capacity | Sector Format | Optional Security |
|--------------|-----------|----------|---------------|-------------------|
| MG11ACA24TE | SATA-3.5a | 24 TB | 512e | |
| MG11ACA22TE | SATA-3.5a | 22 TB | 512e | |
| MG11ACA20TE | SATA-3.5a | 20 TB | 512e | |
| MG11ACA18TE | SATA-3.5a | 18 TB | 512e | |
| MG11ACA16TE | SATA-3.5a | 16 TB | 512e | |
| MG11ACA14TE | SATA-3.5a | 14 TB | 512e | |
| MG11ACA24TEY | SATA-3.5a | 24 TB | 512e | SIE |
| MG11ACA22TEY | SATA-3.5a | 22 TB | 512e | SIE |
| MG11ACA20TEY | SATA-3.5a | 20 TB | 512e | SIE |
| MG11ACA18TEY | SATA-3.5a | 18 TB | 512e | SIE |
| MG11ACA16TEY | SATA-3.5a | 16 TB | 512e | SIE |
| MG11ACA14TEY | SATA-3.5a | 14 TB | 512e | SIE |
| MG11ACP24TE | SATA-3.5a | 24 TB | 512e | SED |
| MG11ACP22TE | SATA-3.5a | 22 TB | 512e | SED |
| MG11ACP20TE | SATA-3.5a | 20 TB | 512e | SED |
| MG11ACP18TE | SATA-3.5a | 18 TB | 512e | SED |
| MG11ACP16TE | SATA-3.5a | 16 TB | 512e | SED |
| MG11ACP14TE | SATA-3.5a | 14 TB | 512e | SED |

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

| Model Number | Interface | Capacity | Sector Format | Optional Security |
|--------------|-----------|----------|---------------|-------------------|
| MG11SCA24TE | SAS-3.0 | 24 TB | 512e | |
| MG11SCA22TE | SAS-3.0 | 22 TB | 512e | |
| MG11SCA20TE | SAS-3.0 | 20 TB | 512e | |
| MG11SCA18TE | SAS-3.0 | 18 TB | 512e | |
| MG11SCA16TE | SAS-3.0 | 16 TB | 512e | |
| MG11SCA14TE | SAS-3.0 | 14 TB | 512e | |
| MG11SCA24TEY | SAS-3.0 | 24 TB | 512e | SIE |
| MG11SCA22TEY | SAS-3.0 | 22 TB | 512e | SIE |
| MG11SCA20TEY | SAS-3.0 | 20 TB | 512e | SIE |
| MG11SCA18TEY | SAS-3.0 | 18 TB | 512e | SIE |
| MG11SCA16TEY | SAS-3.0 | 16 TB | 512e | SIE |
| MG11SCA14TEY | SAS-3.0 | 14 TB | 512e | SIE |
| MG11SCP24TE | SAS-3.0 | 24 TB | 512e | SED |
| MG11SCP22TE | SAS-3.0 | 22 TB | 512e | SED |
| MG11SCP20TE | SAS-3.0 | 20 TB | 512e | SED |
| MG11SCP18TE | SAS-3.0 | 18 TB | 512e | SED |
| MG11SCP16TE | SAS-3.0 | 16 TB | 512e | SED |
| MG11SCP14TE | SAS-3.0 | 14 TB | 512e | SED |

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

- Before creating and producing designs and using, customers must also refer to and comply with the latest versions of all relevant TOSHIBA information and the instructions for the application that Product will be used with or for.
- Company names, product names, and service names may be trademarks of their respective companies.