TOSHIBA

HDD

MG07SCA SERIES
ENTERPRISE CAPACITY HDD

Product image may represent a design model.

The MG07SCA Enterprise Capacity HDD series provide capacities up to 14 TB[1] and 7,200 rpm performance, in a robust design engineered for nearline business-critical workloads.

The MG07SCA series utilize industry-standard 3.5-inch[2] 26.1 mm height form factor and Advanced Format sector technologies for optimum capacity and data reliability. Toshiba Persistent Write Cache technology[3] helps enhance performance while also maintaining data integrity in the event of a sudden loss of power. Equipped with 12 Gbit/s[4] SAS interface, the Enterprise Capacity MG07SCA series help save rack space and reduce the footprint and operational burden of business critical servers and storage systems.

512e or 4Kn Advanced Format sector technology models are available. 4Kn models (MG07SCAxxxA/AY) offer optimum performance and compatibility with 4K-capable applications and operating environments. 512e models (MG07SCAxxxE/EY) are broadly supported today and also help provide support for legacy applications and operating environments that require 512 B sector lengths.

KEY FEATURES

- Industry Standard 3.5-inch 26.1 mm Height Form Factor
- Large Capacity (14 TB and 12 TB Models)
- 7,200 rpm Performance
- Dual-Port 12 Gbit/s SAS Interface
- MTTF of 2,500,00M hours
- 550 total TB Transferred per Year Workload Rating[5]
- 4Kn or 512e Advanced Format Sector Technology
- Toshiba Persistent Write Cache Technology to help Maintain Data Integrity during Power-Loss Events
- Sanitize Instant Erase (SIE) option model

APPLICATIONS

- Engineered for Mid-line / Nearline Business Critical Workloads
- Tier 2 Business-Critical Servers and Storage Systems
- Servers Supporting Application Workloads that Benefit from High Capacity per Spindle
- Capacity-Optimized Data Center Storage Systems
- Object and File Storage Solutions
- Enterprise Data Protection and Tiered Storage Infrastructure

SPECIFICATIONS

Item		MG07SCA14T	MG07SCA12T
Interface		SAS-3	
Formatted Capacity[1]		14 TB	12 TB
Performance	Interface Speed [6]	12.0 Gbit/s, 6.0 Gbit/s, 3.0 Gbit/s, 1.5 Gbit/s	
	Rotation Speed	7,200 rpm	
	Buffer Size	256 MiB [7]	
	Maximum Sustained Data Transfer Speed [6] (Typ.)	248 MiB/s	242 MiB/s
Logical Data Block Length	MG07SCAxxxA/AY (fixed length)	4,096 B / 4,160 B / 4,224 B	
	MG07SCAxxxE/EY (emulation) [8]	Host:512 B, Disk:4,096 B Host:520 B, Disk:4,160 B Host:528 B, Disk:4,224 B	
Supply Voltage	Allowable Voltage	12 V [9] ± 10 % / 5 V [9] + 10% / -7% [10]	
Power Consumption	Random Write / Read 4KB Q1 (Typ.)	8.28 W	7.80 W
	Active Idle (Idle-A)	4.73 W	4.36 W
Acoustics[11]	Active Idle (Typ.)	20 dB	

ENVIRONMENTAL LIMITS

Item		Specification
Ambient temperature	Operating	5 °C to 55 °C
	Non-Operating [12] [13]	-40 °C to 70 °C
Relative Humidity	Operating	5 % to 90 % R.H. (No condensation)
	Non-Operating	5 % to 95 % R.H. (No condensation)
Altitude	Operating	- 305 m to 3,048 m
	Non-Operating [12] [13]	- 305 m to 12,192 m
Shock [14]	Operating	686 m/s^2 { 70 G } (2 ms duration)
	Non-Operating	2,450 m/s^2 { 250 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)

[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] PWC (Persistent Write Cache) with PLP (Power Loss Protection) : PWC with PLP is a function to handle the write data that the drive reports "Normal completion" to the host but not being stored to hard disk media yet. The write data may be written to the commanded LBA on the hard disk media. The un-written data to hard disk media is stored to Flash memory using back up power by PLP when the power supply to the drive suddenly is shut down. And, after PLP operation, it may be required more time to start up the drive than in case of normal shutdown. 1) PLP does not secure data in the mode of all the power shutdowns. When power supplies other than recommended procedure are intercepted, data might be lost. 2) In the power shutdown before it reports on the Write completion, data not anticipated might be lost.
[4] Read and write speed may vary depending on the host device, read and write conditions, and file size.
[5] Workload is defined as the amount of data written, read or verified by commands from host system.
[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 -0.3V DC (less than -0.6V, 0.1ms) 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 3,048 m or less. Up to 55°C at 7,620m. Up to 40°C at 12,192m.
[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

RELIABILITY

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

[17] 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.

MODEL NUMBERS

Model Number	Interface	Formatted Capacity	Sector Format	Optional Security Function
MG07SCA14TA	SAS-3.0	14 TB	4Kn	
MG07SCA14TE	SAS-3.0	14 TB	512e	
MG07SCA12TA	SAS-3.0	12 TB	4Kn	
MG07SCA12TE	SAS-3.0	12 TB	512e	
MG07SCA14TAY	SAS-3.0	14 TB	4Kn	SIE
MG07SCA14TEY	SAS-3.0	14 TB	512e	SIE
MG07SCA12TAY	SAS-3.0	12 TB	4Kn	SIE
MG07SCA12TEY	SAS-3.0	12 TB	512e	SIE

MARKING

1) WEEE

Following information is only for EU-member states:

The use of the symbol indicates that this product may not be treated as household waste. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences for the environment and human health, which could otherwise be caused by inappropriate waste handling of this product. For more detailed information about recycling of this product, please contact your local city office, your household waste disposal service or the shop where you purchased the product.

2) Names and Contents of Hazardous Substances or Elements in Products

产品中有害物质的名称及含量

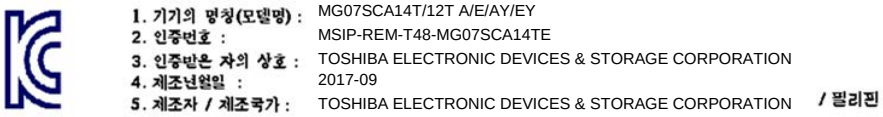
部件名称	有害物质					
	铅（Pb）	汞（Hg）	镉（Cd）	六价铬（Cr(VI)）	多溴联苯（PBB）	多溴二苯醚（PBDE）
HDD(硬盘驱动器)	×	○	○	○	○	○

本表格依据 SJ/T 11364 的规定编制。
○：表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下。
×：表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 规定的限量要求。

中华人民共和国环保使用期限

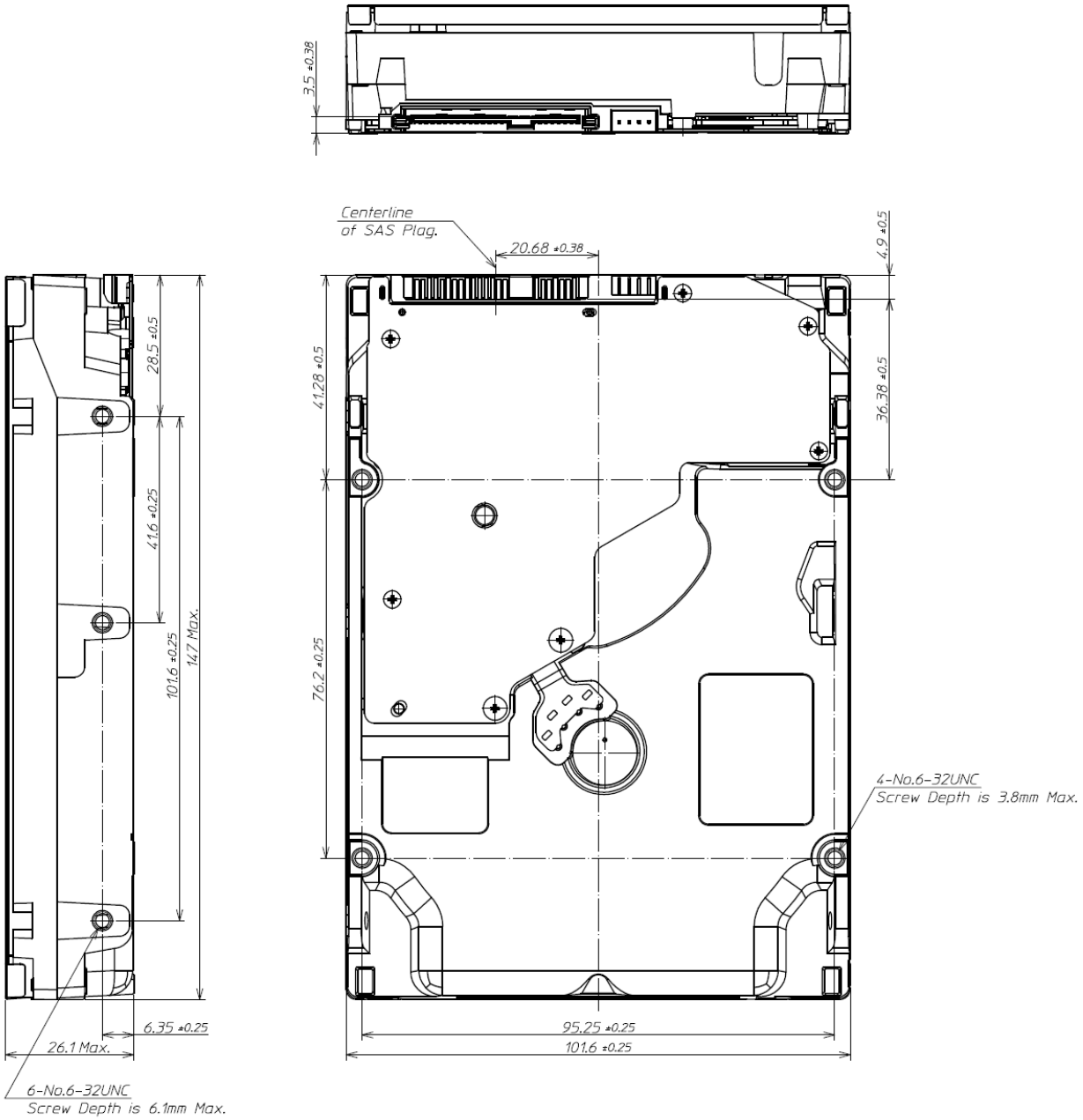
SAFETY / EMC STANDARDS

Title	Region
UL (Underwriters Laboratories)	USA
CSA (Canadian Standard Association)	Canada
TÜV (Technischer Überwachungs Verein)	Germany
BSMI (Bureau of Standards, Metrology and Inspection)	Taiwan
KC (Korea Certification)	Korea
ACMA (Australian Communications and Media Authority)	Australia

(Note) Marks of KC	
Made in Japan	
Made in Philippines	

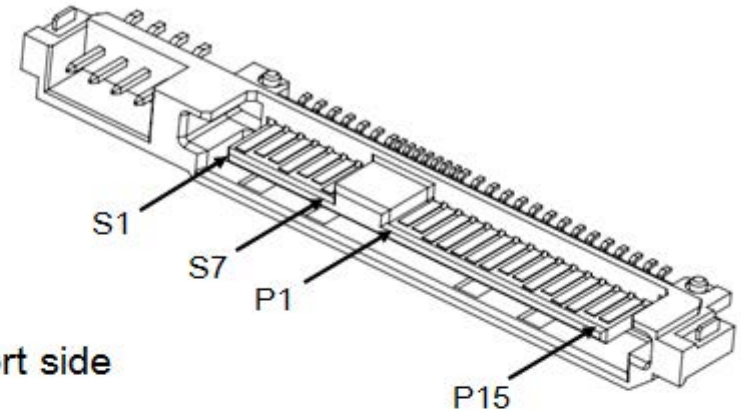
MECHANICAL SPECIFICATIONS

Item	Specification
Width (Max)	101.85 mm
Height (Max)	26.1 mm
Length (Max)	147.0 mm
Weight (Max.(Typ.))	720 g (694 g)

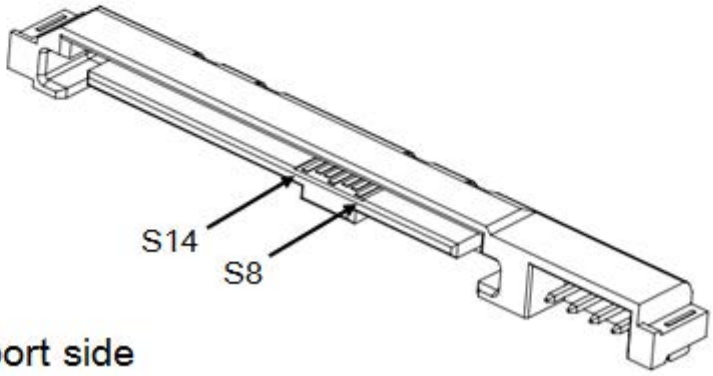


[Unit: mm]

INTERFACE CONNECTOR



Primary port side



Secondary port side

INTERFACE CONNECTOR (SAS plug) SIGNAL ALLOCATION

Segment	Pin No.	Pin Definition	
Signal Segment	S1	GND	GND for SAS Primary Port
	S2	RP+	SAS Primary Port Receive (positive) signal
	S3	RP-	SAS Primary Port Receive (negative) signal
	S4	GND	GND for SAS Primary Port
	S5	TP-	SAS Primary Port Transmit (negative) signal
	S6	TP+	SAS Primary Port Transmit (positive) signal
	S7	GND	GND for SAS Primary Port
	S8	GND	GND for SAS Secondary Port
	S9	RS+	SAS Secondary Port Receive (positive) signal
	S10	RS-	SAS Secondary Port Receive (negative) signal
	S11	GND	GND for SAS Secondary Port
	S12	TS-	SAS Secondary Port Transmit (negative) signal
	S13	TS+	SAS Secondary Port Transmit (positive) signal
	S14	GND	GND for SAS Secondary Port
Power Segment	P1 (*1)	Reserved	Do not supply 3.3V power if POWER DISABLE Function is used.
	P2 (*1)	Reserved	
	P3 (*2)	POWER DISABLE	Power Disable Control input signal
	P4	GND	GROUND
	P5	GND	GROUND
	P6	GND	GROUND
	P7	+5V-Charge	Pre-charge pin for +5V
	P8	+5V	+5V power supply input
	P9	+5V	+5V power supply input
	P10	GND	GROUND
	P11	READY LED	READY LED output
	P12	GND	GROUND
	P13	+12V-Charge	Pre-charge pin for +12V
	P14	+12V	+12V power supply input
	P15	+12V	+12V power supply input

(*1) Do not supply 3.3V power if POWER DISABLE feature is used.
(*2) The terminal P3 is used as POWER DISABLE control signal in SAS-3. This terminal connects with the GROUND or is an OPENED thing on the host side when the POWER DISABLE function is not used.

COMMAND TABLE (Part 1)

Op-Code	Command Name
00h	TEST UNIT READY
12h	INQUIRY
25h	READ CAPACITY (10)
9Eh/10h	READ CAPACITY (16)
15h	MODE SELECT (6)
55h	MODE SELECT (10)
1Ah	MODE SENSE (6)
5Ah	MODE SENSE (10)
01h	REZERO UNIT
1Bh	START/STOP UNIT
16h	RESERVE (6)
56h	RESERVE (10)
17h	RELEASE (6)
57h	RELEASE (10)
03h	REQUEST SENSE
4Ch	LOG SELECT
4Dh	LOG SENSE
5Eh	PERSISTENT RESERVE IN
5Fh	PERSISTENT RESERVE OUT
A0h	REPORT LUNS
A3h/05h	REPORT IDENTIFYING INFORMATION
A3h/0Ch	REPORT SUPPORTED OPERATION CODES
A3h/0Dh	REPORT SUPPORTED TASK MANAGEMENT FUNCTIONS
A4h/06h	SET IDENTIFYING INFORMATION
A3h/0Fh	REPORT TIMESTAMP
A4h/0Fh	SET TIMESTAMP

COMMAND TABLE (Part 2)

Op-Code	Command Name
08h	READ (6)
28h	READ (10)
A8h	READ (12)
88h	READ (16)
0Ah	WRITE (6)
2Ah	WRITE (10)
AAh	WRITE (12)
8Ah	WRITE (16)
2Eh	WRITE AND VERIFY (10)
AEh	WRITE AND VERIFY (12)
8Eh	WRITE AND VERIFY (16)
2Fh	VERIFY (10)
AFh	VERIFY (12)
8Fh	VERIFY (16)
0Bh	SEEK (6)
2Bh	SEEK (10)
35h	SYNCHRONIZE CACHE (10)
91h	SYNCHRONIZE CACHE (16)
04h	FORMAT UNIT
07h	REASSIGN BLOCKS
37h	READ DEFECT DATA (10)
B7h	READ DEFECT DATA (12)
1Dh	SEND DIAGNOSTIC
1Ch	RECEIVE DIAGNOSTIC RESULTS
3Bh	WRITE BUFFER
3Ch	READ BUFFER (10)
9Bh	READ BUFFER (16)
3Eh	READ LONG (10)
9Eh/11h	READ LONG (16)
3Fh	WRITE LONG (10)
9Fh/11h	WRITE LONG (16)
41h	WRITE SAME (10)
93h	WRITE SAME (16)
48h	SANITIZE (10)

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