

### > MG06ACA SERIES ENTERPRISE CAPACITY HDD

The MG06ACA Enterprise Capacity HDD models provides up to 10TB<sup>[1]</sup> of capacity and 7,200 rpm performance, in a robust design engineered for nearline business-critical workloads.

The MG06ACA model generation utilizes industry-standard 3.5-inch<sup>[2]</sup> 26.1 mm height form factor and Advanced Format sector technologies for optimum capacity and data reliability. Models support Toshiba Persistent Write Cache technology<sup>[3]</sup> which helps enhance performance while assuring the consistency of write operations in the event of a sudden loss of power. Equipped with SATA 6.0 Gbit/s<sup>[4]</sup> interface, the Enterprise Capacity MG06ACA models help to save rack space and reduce the footprint and operational burden of business critical servers and storage systems.

The MG06ACA Series improves sustained transfer rate performance to 237 MiB/s<sup>[5]</sup> and increases MTTF<sup>[6]</sup> by 25% when compared to the prior MG05ACA series. 4Kn or 512e Advanced Format sector technology models are available. 4Kn sector models (MG06ACAxxxA) offer suitable performance and compatibility with the 4Kn-capable applications and operating environments. 512e sector models (MG06ACAxxxE) provide support for legacy applications and operating environments that require 512 byte sector lengths.



#### > KEY FEATURES

- Industry Standard 3.5-inch 26.1 mm Height Form Factor
- Large 10TB Capacity; plus 8TB and 6TB MG06 Series models
- 7,200 rpm Performance
- SATA 6.0 Gbit/s Interface
- MTTF 2.5 M hours
- 550 Total TB Transferred per Year Workload Rating<sup>[7]</sup>
- 4Kn or 512e Advanced Format Sector Technology
- Toshiba Persistent Write Cache Technology for Data-Loss Protection in Sudden Power-Loss Events
- Improved sustained transfer rate
- Sanitize Instant Erase (SIE<sup>[8]</sup>) option model available

#### > APPLICATIONS

- Mid-line / Nearline Business Critical Workloads
- Tier 2 Business-Critical Servers and Storage Systems
- Workloads and Use-Cases that Benefit from High Capacity per Spindle
- Capacity-Optimized Storage Systems
- Cloud-scale Storage Infrastructure
- Data Archive and Back-up Infrastructure

#### > SPECIFICATIONS

Model Number	MG06ACA10TA MG06ACA10TE	MG06ACA800A MG06ACA800E	MG06ACA600A MG06ACA600E	
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	7,200 rpm		
	Buffer Size	256 MiB		
	Data Transfer Speed ( Sustained )	237 MiB/s Typ.	230 MiB/s Typ.	
Logical Data Block Length	MG06ACAxxxA (fixed length)	4,096 B		
	MG06ACAxxxE (emulation)	Host 512B Disk 4,096B <sup>[9]</sup>		
Supply Voltage	Allowable Voltage 12 V <sup>[10]</sup> ± 10% / 5 V <sup>[10]</sup> +10/-7% <sup>[11]</sup>			
Power Consumption	Random Read/Write (4KB Q1)	10.0 W Typ.	9.1 W Typ.	8.3 W Typ.
	Active Idle ( Idle-A )	7.3 W Typ.	6.4 W Typ.	5.6 W Typ.
Acoustics (Sound Power)	Idle <sup>[12]</sup>	34 dB Typ.		

## > ENVIRONMENTAL LIMITS

Item		Specification
Ambient temperature	Operating	5 °C to 55 °C
	Non-Operating	- 40 °C to 70 °C
Humidity	Operating	5 % to 90 % R.H.
	Non-Operating	5 % to 95 % R.H.
Shock	Operating	686 m/s <sup>2</sup> { 70 G } ( 2 ms duration )
	Non-Operating	2,450 m/s <sup>2</sup> { 250 G } ( 2 ms duration )
Vibration <sup>[13]</sup>	Operating <sup>[14]</sup>	7.35 m/s <sup>2</sup> { 0.75 G } ( 5- 300Hz ) 2.45 m/s <sup>2</sup> { 0.25 G } ( 300- 500Hz )
	Non-Operating <sup>[15]</sup>	29.4 m/s <sup>2</sup> { 3.0 G } ( 5- 500Hz )
Altitude	Operating	- 305 m to 3,048 m
	Non-Operating	- 305 m to 12,192 m

[1] Definition of capacity: Toshiba defines a megabyte (MB) as 1,000,000 bytes, a gigabyte (GB) as 1,000,000,000 bytes and 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 1GB = 2<sup>30</sup> = 1,073,741,824 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] "2.5-inch" and "3.5-inch" mean the form factor of HDDs or SSDs. They do not indicate drive's physical size.

[3] 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] A kibibyte (KiB) means 2<sup>10</sup>, or 1,024 bytes, a mebibyte (MiB) means 2<sup>20</sup>, or 1,048,576 bytes, and a gibibyte (GiB) means 2<sup>30</sup>, or 1,073,741,824 bytes.

[6] 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.

[7] Workload is defined as the amount of data written, read or verified by commands from host system.

[8] SIE: Sanitize Instant Erase. SIE is a function to invalidate the data recorded on the magnetic disks at a blink.

[9] Read-modify-write is supported.

[10] Input voltages are specified at the HDD connector side, during HDD ready state.

[11] Make sure the value is not less than -0.3V DC (less than -0.6V, 0.1ms) when turning on or off the power.

[12] The measuring method is based on ISO 7779. Idle is active idle mode

[13] Vibration applied to the HDD is measured at near the mounting screw hole on the frame as much as possible.

[14] At random seek write/read and default on retry setting with log sweep vibration.

[15] At power-off state after installation

## > RELIABILITY

Item	Specification
MTTF	2,500,000 h
Non-recoverable Error Rate	10 error per 10 <sup>16</sup> 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/year

## > MODEL NUMBERS

Model Number	Interface	Formatted Capacity	Sector Format	Optional Security Function
MG06ACA10TA	SATA-3.3	10 TB	4 Kn	
MG06ACA800A	SATA-3.3	8 TB	4 Kn	
MG06ACA600A	SATA-3.3	6 TB	4 Kn	
MG06ACA10TE	SATA-3.3	10 TB	512e	
MG06ACA800E	SATA-3.3	8 TB	512e	
MG06ACA600E	SATA-3.3	6 TB	512e	
MG06ACA10TEY	SATA-3.3	10 TB	512e	SIE
MG06ACA800EY	SATA-3.3	8 TB	512e	SIE
MG06ACA600EY	SATA-3.3	6 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 / EMI STANDARDS

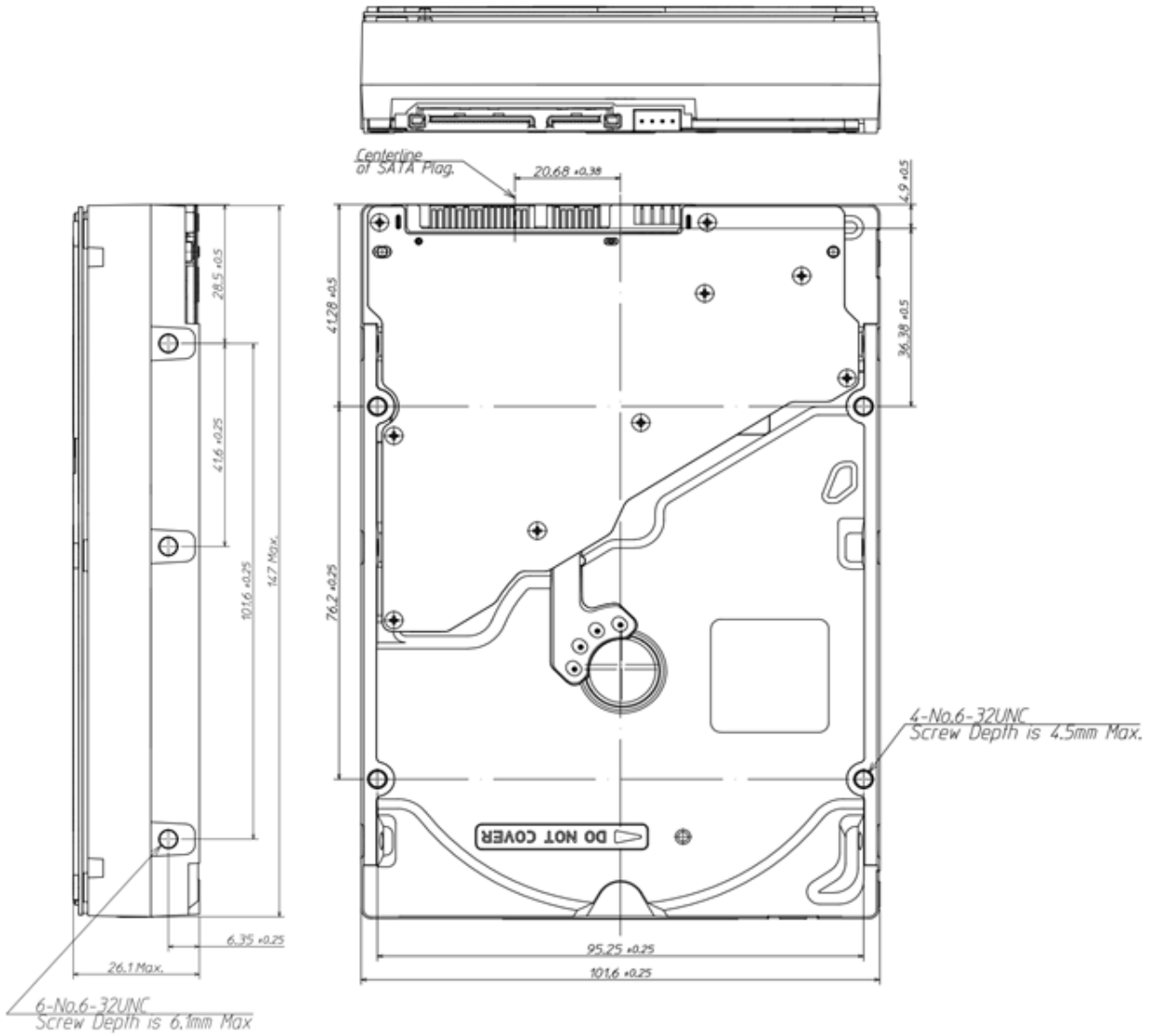
Title	Region
UL (Underwriters Laboratories)	USA
CSA (Canadian Standard Association)	Canada
TÜV (Technischer Überwachungs Verein)	Germany
BSMI (Bureau of Standards, Metrology and Inspection)	Taiwan
MSIP (Ministry of Science, ICT & Future Planning)	Korea
ACMA (Australian Communications and Media Authority)	Australia

### (Note) Marks of KC

Made in Japan	 <ul style="list-style-type: none"> <li>1. 기기의 명칭(모델명) : MG06ACA10T/800/600A/E/AY/EY / MG06ACP10T/800E</li> <li>2. 인증번호 : MSIP-REM-TSD-MG06ACA10TE</li> <li>3. 인증받은 자의 상호 : TOSHIBA ELECTRONIC DEVICES &amp; STORAGE CORPORATION</li> <li>4. 제조년월일 : 2016-12</li> <li>5. 제조자 / 제조국가 : TOSHIBA ELECTRONIC DEVICES &amp; STORAGE CORPORATION / 일본</li> </ul>
Made in Philippines	 <ul style="list-style-type: none"> <li>1. 기기의 명칭(모델명) : MG06ACA10T/800/600A/E/AY/EY / MG06ACP10T/800E</li> <li>2. 인증번호 : MSIP-REM-TSD-MG06ACA10TE</li> <li>3. 인증받은 자의 상호 : TOSHIBA ELECTRONIC DEVICES &amp; STORAGE CORPORATION</li> <li>4. 제조년월일 : 2016-12</li> <li>5. 제조자 / 제조국가 : TOSHIBA ELECTRONIC DEVICES &amp; STORAGE CORPORATION / 필리핀</li> </ul>

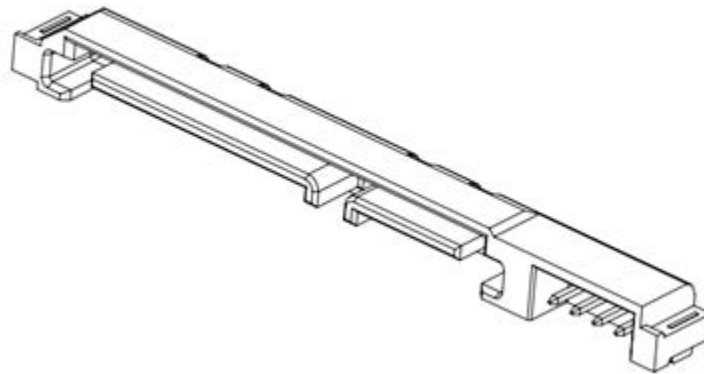
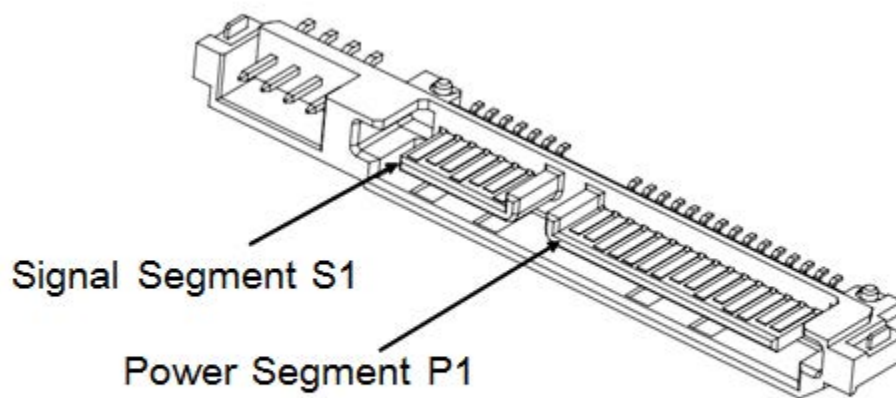
## > MECHANICAL SPECIFICATIONS

Item	Specification
Width	101.85 mm Max
Height	26.1 mm Max
Length	147.0 mm Max
Weight	750 g Typ. (770 g Max)



[Unit: mm]  
(Reference)

## > INTERFACE CONNECTOR



## > INTERFACE CONNECTOR (SATA plug) SIGNAL ALLOCATION

Segment	Pin No.	Pin Definition	
Signal Segment	S1	GND	2 <sup>nd</sup> Mate
	S2	A+	Differential Pair A from PHY (Device Rx+)
	S3	A-	Differential Pair A from PHY (Device Rx-)
	S4	GND	2 <sup>nd</sup> Mate
	S5	B-	Differential Pair B from PHY (Device Tx-)
	S6	B+	Differential Pair B from PHY (Device Tx+)
	S7	GND	2 <sup>nd</sup> Mate
Power Segment	P1	V33	3.3 V Power (Unused)
	P2	V33	3.3 V Power (Unused)
	P3	V33	3.3 V Power Pre-Charge 2 <sup>nd</sup> Mate (Unused)
	P4	GND	1 <sup>st</sup> Mate
	P5	GND	2 <sup>nd</sup> Mate
	P6	GND	2 <sup>nd</sup> Mate
	P7	V5	5 V Power Pre-Charge 2 <sup>nd</sup> Mate
	P8	V5	5 V Power
	P9	V5	5 V Power
	P10	GND	2 <sup>nd</sup> Mate
	P11	Spin	Staggered Spin-up Mode Detect (Input)
		ACT	Activity LED Drive (Output)
	P12	GND	1 <sup>st</sup> Mate
	P13	V12	12 V Power Pre-Charge 2 <sup>nd</sup> Mate
	P14	V12	12 V Power
P15	V12	12 V Power	

Notice: This drive uses 5V and 12V power. 3.3V power is not used.  
HDA (Head Disk Assembly) and DC ground (ground pins on interface) are connected electrically each other.



## > COMMAND TABLE (Part 1)

Op-Code	Command Name
78h	ACCESSIBLE MAX ADDRESS CONFIGURATION
E5h/98h	CHECK POWER MODE
92h/93h	DOWNLOAD MICROCODE (DMA)
90h	EXECUTE DIAGNOSTICS
E7h	FLUSH CACHE
EAh	FLUSH CACHE EXT
ECh	IDENTIFY DEVICE
E3h/97h	IDLE
E1h/95h	IDLE IMMEDIATE
91h	INITIALIZE DEVICE PARAMETERS
00h	NOP
E4h	READ BUFFER
C8h	READ DMA
25h	READ DMA EXT
60h	READ FPDMA QUEUED
2Fh	READ LOG EXT
47h	READ LOG DMA EXT
C4h	READ MULTIPLE
29h	READ MULTIPLE EXT
20h	READ SECTOR(S)
24h	READ SECTOR(S) EXT
40h	READ VERIFY SECTOR(S)
42h	READ VERIFY SECTOR(S) EXT

## > COMMAND TABLE (Part 2)

Op-Code	Command Name
1xh	RECALIBRATE
0Bh	REQUEST SENSE DATA EXT
B4h	SANITIZE DEVICE
F1h	SECURITY SET PASSWORD
F2h	SECURITY UNLOCK
F3h	SECURITY ERASE PREPARE
F4h	SECURITY ERASE UNIT
F5h	SECURITY FREEZE LOCK
F6h	SECURITY DISABLE PASSWORD
70h – 76h, 79h – 7Fh	SEEK
77h	SET DATE & TIME EXT
EFh	SET FEATURES
C6h	SET MULTIPLE MODE
E6h/99h	SLEEP
B0h	SMART
E2h/96h	STANDBY
E0h/94h	STANDBY IMMEDIATE
E8h	WRITE BUFFER
CAh	WRITE DMA
35h	WRITE DMA EXT
3Dh	WRITE DMA FUA EXT
61h	WRITE FPDMA QUEUED
3Fh	WRITE LOG EXT
57h	WRITE LOG DMA EXT
C5h	WRITE MULTIPLE
39h	WRITE MULTIPLE EXT
CEh	WRITE MULTIPLE FUA EXT
30h	WRITE SECTOR(S)
34h	WRITE SECTOR(S) EXT
45h	WRITE UNCORRECTABLE EXT
3Ch	WRITE VERIFY

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