

> MD06ACA-V SERIES SURVEILLANCE HDD

Toshiba's MD06ACA-V series of surveillance HDDs deliver up to 10 TB^[1] of storage capacity and support for up to 64 high definition cameras^[2]. The MD06ACA-V is designed for demanding 24/7 surveillance environments with industry-standard 3.5-inch^[3] form factor. For great reliability and scalability in RAID and multi-disk enclosures, MD06ACA-V models utilize RV sensor technology to compensate for the effects of vibration from adjacent drives or cooling fans. With a range of available large capacities and great performance Toshiba's MD06ACA-V series HDDs are a great match for high resolution camera feeds and longer retention periods for surveillance data sets.



> KEY FEATURES

- Choice of 10TB, 8TB and 6TB storage capacity
- Support for up to 64 Cameras High-Definition Streams
- Rotational vibration compensation technology
- MTTF^[4] 1M hours (@40°C operating temperature)
- 180 Total TB Transferred per Year Workload Rating^[5]
- Designed for 24/7 operation and up to 600,000 load/unload cycles
- 256 MiB^[6] Buffer
- Cover surface temperature range: from 0°C to 70°C

> APPLICATIONS

- Surveillance Network Video Recorders (sNVR)
- Surveillance Digital Video Recorders (sDVR)
- Hybrid sDVR (analog and IP)
- RAID Storage Arrays for Surveillance Solutions

> SPECIFICATIONS

Model Number		MD06ACA10TV	MD06ACA800V	MD06ACA600V
Interface		SATA-3.3		
Formatted Capacity		10 TB	8 TB	6 TB
Performance ^[7]	Interface Speed	6.0 Gbit/s, 3.0 Gbit/s, 1.5 Gbit/s		
	Rotation Speed	7,200 rpm		
	Buffer Size	256 MiB		
	Max Data Transfer Speed (Sustained)	237 MiB/s Typ.	230 MiB/s Typ.	
Logical Data Block Length		Host 512B Disk 4,096B ^[8]		
Supply Voltage	Allowable Voltage	12 V ^[9] ± 10% / 5 V ^[9] +6/-5% ^[10]		
Power Consumption	Operating ^[11]	9.48 W Typ.	8.61 W Typ.	7.88 W Typ.
	Active Idle	7.15 W Typ.	6.33 W Typ.	5.59 W Typ.
Acoustics (Sound Power)	Idle ^[12]	34 dB Typ.		

➤ ENVIRONMENTAL LIMITS

Item		Specification
Temperature	Operating	0 °C to 70 °C (Cover surface) ^[16]
	Non-Operating	- 40 °C to 70 °C (Ambient)
Humidity	Operating	5 % to 90 % R.H.
	Non-Operating	5 % to 95 % R.H.
Shock ^[13]	Operating	686 m/s ² { 70 G } (2 ms duration)
	Non-Operating	2,450 m/s ² { 250 G } (2 ms duration)
Vibration ^[13]	Operating ^[14]	7.35 m/s ² { 0.75 G } (5 to 300Hz) 2.45 m/s ² { 0.25 G } (300 to 500Hz)
	Non-Operating ^[15]	29.4 m/s ² { 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 = 2³⁰ = 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] Number of surveillance cameras support capability is defined by performance simulation with High Definition cameras at 10Mbit/s rate. Actual results may vary based on various factors, including the types of cameras installed, the system's hardware and software capabilities, and the video compression technology used, as well as system variables such as resolution, frames per second, and other settings.
- [3] "3.5-inch" means the form factor of HDDs. They do not indicate drive's physical size.
- [4] 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.
- [5] Workload is defined as the amount of data written, read or verified by commands from host system.
- [6] A kibibyte (KiB) means 2¹⁰, or 1,024 bytes, a mebibyte (MiB) means 2²⁰, or 1,048,576 bytes, and a gibibyte (GiB) means 2³⁰, or 1,073,741,824 bytes.
- [7] Read and write speed may vary depending on the host device, read and write conditions, and file size.
- [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] Operating watt is measured using 80% random read/write and 20% performance idle.
- [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
- [16] Operation of high surface temperature will be shortened of the drives useful life. The recommendation operating condition of surface temperature is less than 60°C.

> RELIABILITY

Item	Specification
MTTF	1,000,000 hours (Cover surface temperature:40°C or less)
Non-recoverable Error Rate	1 error per 10 ¹⁴ bits read
Load / Unload	600,000 times
Availability	24 hours/day, 7 days/week
Rated Annual Workload (Total TB Transferred per Year, R/W)	180 TB/year

> MODEL NUMBERS

Model Number	Interface	Formatted Capacity	Sector Format
MG06ACA10TV	SATA-3.3	10 TB	512 e
MG06ACA800V	SATA-3.3	8 TB	512 e
MG06ACA600V	SATA-3.3	6 TB	512 e

> 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

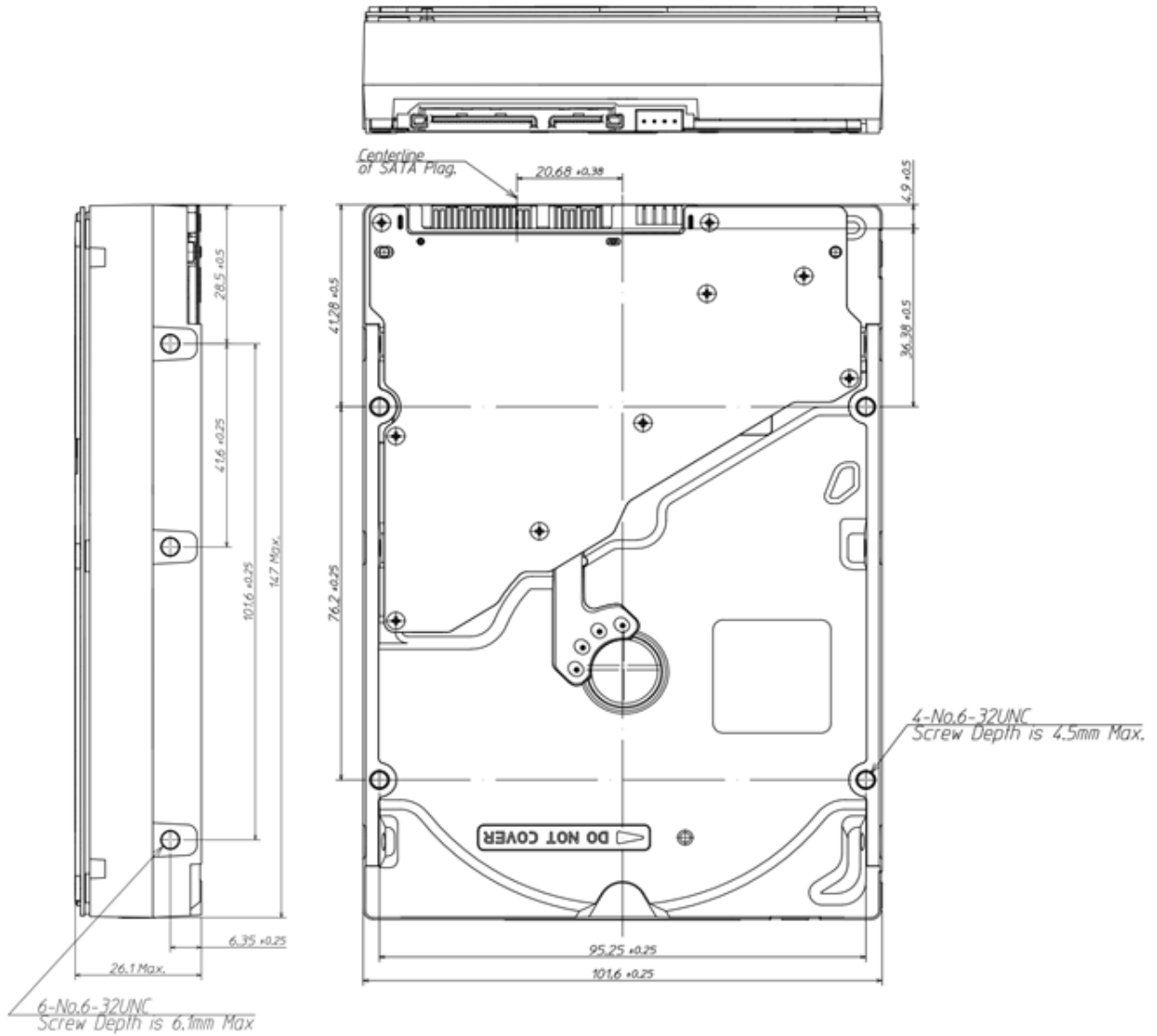
Title	Region
UL (Underwriters Laboratories)	USA
CSA (Canadian Standard Association)	Canada
TÜV (Technischer Überwachungs Verein)	Germany
BSMI (Bureau of Standards, Metrology and Inspection)	Taiwan
MSIP (Ministry of Science, ICT & Future Planning)	Korea
ACMA (Australian Communications and Media Authority)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

(Note) Marks of KC

Made in Japan	 <ul style="list-style-type: none"> 1. 기기의 명칭(모델명) : MD06ACA10TV, MD06ACA800V, MD06ACA600V 2. 인증번호 : MSIP-REM-TSD-MG06ACA10TE 3. 인증받은 자의 상호 : TOSHIBA ELECTRONIC DEVICES & STORAGE CORPORATION 4. 제조년월일 : 2016-12 5. 제조자 / 제조국가 : TOSHIBA ELECTRONIC DEVICES & STORAGE CORPORATION / 일본
Made in Philippines	 <ul style="list-style-type: none"> 1. 기기의 명칭(모델명) : MD06ACA10TV, MD06ACA800V, MD06ACA600V 2. 인증번호 : MSIP-REM-TSD-MG06ACA10TE 3. 인증받은 자의 상호 : TOSHIBA ELECTRONIC DEVICES & STORAGE CORPORATION 4. 제조년월일 : 2016-12 5. 제조자 / 제조국가 : TOSHIBA ELECTRONIC DEVICES & STORAGE CORPORATION / 필리핀

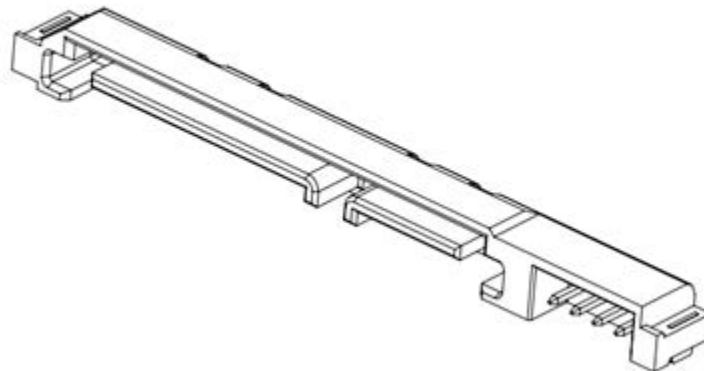
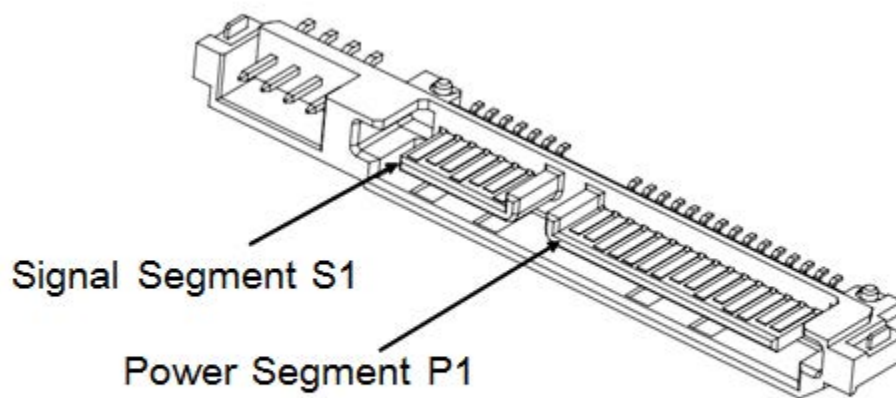
> MECHANICAL SPECIFICATIONS

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 nd Mate
	S2	A+	Differential Pair A from PHY (Device Rx+)
	S3	A-	Differential Pair A from PHY (Device Rx-)
	S4	GND	2 nd Mate
	S5	B-	Differential Pair B from PHY (Device Tx-)
	S6	B+	Differential Pair B from PHY (Device Tx+)
	S7	GND	2 nd 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 nd Mate (Unused)
	P4	GND	1 st Mate
	P5	GND	2 nd Mate
	P6	GND	2 nd Mate
	P7	V5	5 V Power Pre-Charge 2 nd Mate
	P8	V5	5 V Power
	P9	V5	5 V Power
	P10	GND	2 nd Mate
	P11	Spin	Staggered Spin-up Mode Detect (Input)
		ACT	Activity LED Drive (Output)
	P12	GND	1 st Mate
	P13	V12	12 V Power Pre-Charge 2 nd 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
E5h/98h	CHECK POWER MODE
92h	DOWNLOAD MICROCODE
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
F8h	READ NATIVE MAX ADDRESS
27h	READ NATIVE MAX ADDRESS 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 ^[18]	SET DATE & TIME EXT
EFh	SET FEATURES
F9h	SET MAX
37h	SET MAX ADDRESS EXT
C6h	SET MULTIPLE MODE
E6h/99h	SLEEP
B0h	SMART Function Set
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

> RESTRICTIONS ON PRODUCT USE

Toshiba Corporation and its subsidiaries and affiliates are collectively referred to as "TOSHIBA". Hardware, software and systems described in this document are collectively referred to as "Product".

- TOSHIBA reserves the right to make changes to the information in this document and related Product without notice.
- This document and any information herein may not be reproduced without prior written permission from TOSHIBA. Even with TOSHIBA's written permission, reproduction is permissible only if reproduction is without alteration/omission.
- Though TOSHIBA works continually to improve Product's quality and reliability, Product can malfunction or fail. Customers are responsible for complying with safety standards and for providing adequate designs and safeguards for their hardware, software and systems which minimize risk and avoid situations in which a malfunction or failure of Product could cause loss of human life, bodily injury or damage to property, including data loss or corruption. Before creating and producing designs and using, customers must also refer to and comply with (a) the latest versions of all relevant TOSHIBA information, including without limitation, this document, the specifications, the data sheets and application notes for Product and (b) the instructions for the application that Product will be used with or for. Customers are solely responsible for all aspects of their own product design or applications, including but not limited to (a) determining the appropriateness of the use of this Product in such design or applications; (b) evaluating and determining the applicability of any information contained in this document, or in charts, diagrams, programs, algorithms, sample application circuits, or any other referenced documents; and (c) validating all operating parameters for such designs and applications. **TOSHIBA ASSUMES NO LIABILITY FOR CUSTOMERS' PRODUCT DESIGN OR APPLICATIONS.**
- **PRODUCT IS NEITHER INTENDED NOR WARRANTED FOR USE IN EQUIPMENTS OR SYSTEMS THAT REQUIRE EXTRAORDINARILY HIGH LEVELS OF QUALITY AND/OR RELIABILITY, AND/OR A MALFUNCTION OR FAILURE OF WHICH MAY CAUSE LOSS OF HUMAN LIFE, BODILY INJURY, SERIOUS PROPERTY DAMAGE AND/OR SERIOUS PUBLIC IMPACT ("UNINTENDED USE").** Except for specific applications as expressly stated in this document, Unintended Use includes, without limitation, equipment used in nuclear facilities, equipment used in the aerospace industry, medical equipment, equipment used for automobiles, trains, ships and other transportation, traffic signaling equipment, equipment used to control combustions or explosions, safety devices, elevators and escalators, devices related to electric power, and equipment used in finance-related fields. **IF YOU USE PRODUCT FOR UNINTENDED USE, TOSHIBA ASSUMES NO LIABILITY FOR PRODUCT.** For details, please contact your TOSHIBA sales representative.
- Do not disassemble, analyze, reverse-engineer, alter, modify, translate or copy Product, whether in whole or in part.
- Product shall not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any applicable laws or regulations.
- The information contained herein is presented only as guidance for Product use. No responsibility is assumed by TOSHIBA for any infringement of patents or any other intellectual property rights of third parties that may result from the use of Product. No license to any intellectual property right is granted by this document, whether express or implied, by estoppel or otherwise.
- **ABSENT A WRITTEN SIGNED AGREEMENT, EXCEPT AS PROVIDED IN THE RELEVANT TERMS AND CONDITIONS OF SALE FOR PRODUCT, AND TO THE MAXIMUM EXTENT ALLOWABLE BY LAW, TOSHIBA (1) ASSUMES NO LIABILITY WHATSOEVER, INCLUDING WITHOUT LIMITATION, INDIRECT, CONSEQUENTIAL, SPECIAL, OR INCIDENTAL DAMAGES OR LOSS, INCLUDING WITHOUT LIMITATION, LOSS OF PROFITS, LOSS OF OPPORTUNITIES, BUSINESS INTERRUPTION AND LOSS OF DATA, AND (2) DISCLAIMS ANY AND ALL EXPRESS OR IMPLIED WARRANTIES AND CONDITIONS RELATED TO SALE, USE OF PRODUCT, OR INFORMATION, INCLUDING WARRANTIES OR CONDITIONS OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, ACCURACY OF INFORMATION, OR NONINFRINGEMENT.**
- Do not use or otherwise make available Product or related software or technology for any military purposes, including without limitation, for the design, development, use, stockpiling or manufacturing of nuclear, chemical, or biological weapons or missile technology products (mass destruction weapons). Product and related software and technology may be controlled under the Japanese Foreign Exchange and Foreign Trade Law and the U.S. Export Administration Regulations. Export and re-export of Product or related software or technology are strictly prohibited except in compliance with all applicable export laws and regulations.
- Product may include products subject to foreign exchange and foreign trade control laws.
- Please contact your TOSHIBA sales representative for details as to environmental matters such as the RoHS compatibility of Product. Please use Product in compliance with all applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive. TOSHIBA assumes no liability for damages or losses occurring as a result of noncompliance with applicable laws and regulations.