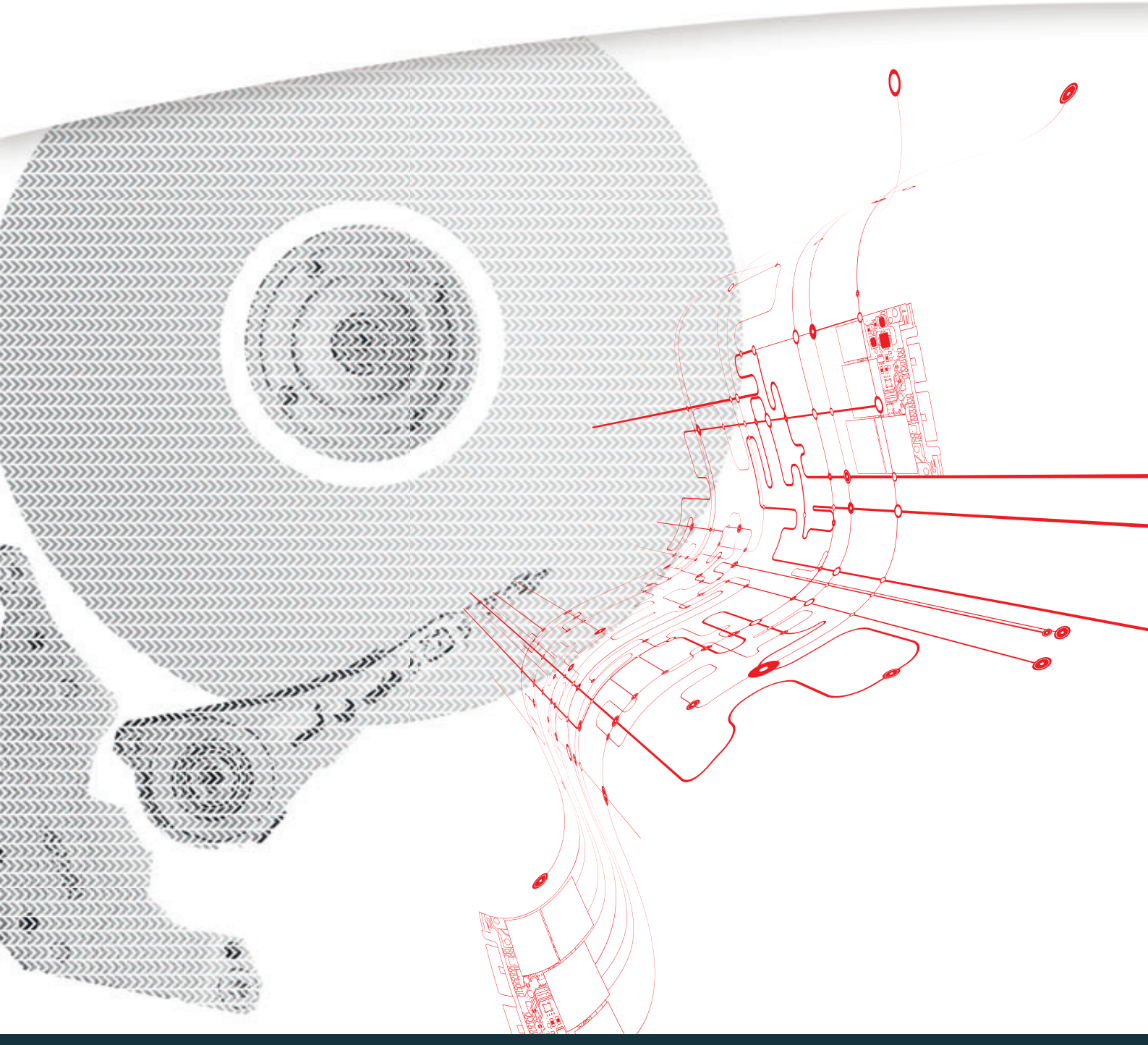
TOSHIBA

Leading Innovation

Product Catalog Mar. 2016

SSD/SSHD/HDD

# Storage Products



SEMICONDUCTOR & STORAGE PRODUCTS

http://toshiba.semicon-storage.com/

# TOSHIBA Storage Products

Toshiba Corporation (Toshiba) offers the comprehensive range of storage technologies, from hard disk drives **(HDDs)**, solid state hybrid drives **(SSHDs)**, and solid state drives **(SSDs)** to NAND flash memories **(NAND)**[*1] which are for the applications spanning such as the enterprise, mobile, factory automation, consumer environments.

## Enterprise SSD > p.4

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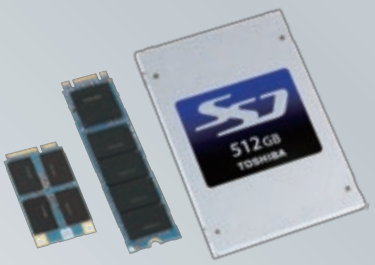
- **Enterprise Mid Endurance SSD**
- **Enterprise Value Endurance SSD**
- **Enterprise Read Intensive SSD**

## Enterprise HDD > p.7

- **Enterprise Performance HDD**
- **Enterprise Capacity HDD**
- **Enterprise Cloud HDD**




## Client SSD > p.10

- **Non-SED model**
- **SED model**

## SSD (Solid State Drive)

SSD is a storage product that uses semiconductor memory (NAND flash memory, NAND) as a storage element. Since SSDs have no mechanical moving parts, they are superior to HDDs in terms of: **1) read performance, 2) resistance to shock and vibration and 3) quiet operation.**
Additionally, Toshiba's SSDs feature low power consumption in standby mode.

**Interface Connector**
Toshiba's Enterprise SSDs provide SAS, SATA, and PCIe[*2] interfaces, and client SSDs have SATA, mSATA, M.2, and PCIe interfaces.

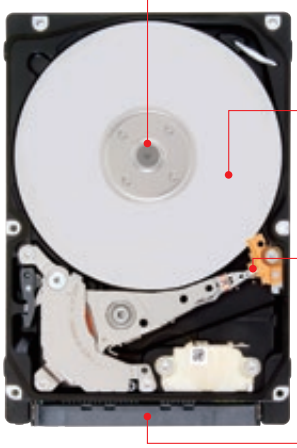
**Controller**
The heart of an SSD that delivers fast read and write performance, prolonged write and erase cycle life and enhanced reliability.

**NAND Flash Memory**
Data is stored in a NAND flash memory array, which features Toshiba's MLC (multi-level cell) NAND technology to achieve high storage capacities.

(The photo shows an example of a double-sided client SSD M.2 module.)

## HDD (Hard Disk Drive)

HDD is a storage product that magnetically stores data in a disk (recording medium platter). Data is written to and read from a disk, which rotates at high speeds, via a magnetic head that operates very close to the disk surface. Compared to SSDs, increasing storage capacities is easier for HDDs.
Additionally, Toshiba's **HDDs provide higher cost performance (lower price per gigabyte) than SSDs.**



**Spindle Motor**
A key part for rotating a disk at high speed. Toshiba's Enterprise HDDs feature an rpm of 15,000, and 3.5- and 2.5-inch[*3] client HDDs typically have rpm's of 7,200 and 5,400 respectively.

**Disk (Medium Platter)**
Storage media that holds data. In Toshiba's HDD, 2.5-inch HDDs have a capacity of up to 750 GB[*4] per disk, and 3.5-inch HDDs have a capacity as high as 1 TB[*4] per disk.

**Magnetic Head**
Data is read from and written to a disk via magnetic head.

**Interface Connector**
Toshiba's Enterprise HDDs provide SAS and SATA interfaces. Client HDDs have SATA interface.

(The photo shows an example of 2.5-inch client HDD.)

## Client SSHD > p.12

- Mobile SSHD
- Mobile Thin SSHD

## Client HDD > p.13

- Mobile HDD
- Mobile Thin HDD
- Desktop HDD
- Generic Data Storage HDD

## Specialty > p.15

- Video Stream HDD
- Large Capacity HDD for External Storage
- Surveillance HDD
- Automotive HDD

# Invention

### ▶ NAND Flash Memory

In 1984, Toshiba developed a new type of semiconductor memory called flash memory, leading the industry into the next generation ahead of its competitors. Some time later in 1987, NAND flash memory (NAND) was developed, and this has since been used in a variety of memory cards and electronic equipment. The NAND market has grown rapidly, with flash memory becoming an internationally standardized memory device. Toshiba, the inventor of flash memory, has carved out a path to a new era in which we are all able to carry videos, music and data with us wherever we go.

INVENTOR OF FLASH MEMORY

# Environment

### ▶ Halogen-Free

The built-in type SSD, SSHD, and HDD products in this catalog are classified as Halogen-Free. For the avoidance of doubt, Halogen-Free SSD, SSHD or HDD products may not be entirely free of bromine and chlorine, and may contain any other element of the halogen family. For the definitions of Halogen-Free of Toshiba Semiconductor & Storage Products Company, and details in each product series, please contact your TOSHIBA sales representative in the last page of this catalog.

### ▶ RoHS

**Restriction of the use of certain Hazardous Substances**
(2011/65/EU)

The directive adopted by the European Union (EU) that restricts the use of six hazardous materials, lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls (PBB) and polybrominated diphenyl ether (PBDE), in the manufacture of computers, telecommunication equipment, home appliances, etc. The RoHS directive was recast in 2011 and has been enforced in January 2013. All the SSDs, SSHDs, and HDDs listed in this catalog are compatible with the RoHS directive. For the definitions of RoHS compatibility of Toshiba Semiconductor & Storage Products Company, and details in each product series, please contact your TOSHIBA sales representative in the last page of this catalog.

*1: NAND flash memory (NAND) is a nonvolatile semiconductor memory. *2: PCIe is a registered trademark of PCI-SIG. *3: “2.5-inch” and “3.5-inch” mean the form factors of HDDs or SSDs. They do not indicate drive's physical size. *4: 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 = $2^{30}$ = 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.

# Enterprise SSD (eSSD)

Enterprise SSDs are suitable for high-performance Tier 0 computing, server and storage systems that require high level of performance and reliability. Toshiba Enterprise SSDs equip the NAND flash memory (NAND) and controller developed by Toshiba and offer high reliability, data protection incorporating power-loss-protection and encryption technology to support enterprise environments and applications. Light weight and low power consumption will make the systems more energy efficient.

## Enterprise High Endurance SSD

High performance enterprise-class solid state storage providing higher level of endurance for write-intensive applications and systems, such as write caching, acceleration and OLTP (On-Line Transaction Process) services.

| Model Number | Formatted Capacity | DWPD*5 | NAND Type | Interface | Sustained 64 KiB*6 *7 *8 | | Sustained 4 KiB*6 *7 *8 *9 | | Power Consumption (Ready) | Power Loss Protection | Environmental Temperature (Operating) | Security Function (Option)*10 | Dimensions Height/ Width/ Length | Weight | Power Supply Voltage |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sequential Read | Sequential Write | Random Read | Random Write | | | | | | | |
| **PX04SHB*** Series** | | | | | | | | | | | | | | | |
| **PX04SHB160** | 1,600 GB | 25 | MLC | SAS-3.0 | 1,500 MiB/s | 750 MiB/s | 270,000 IOPS | 120,000 IOPS | 3.2 W Typ. | PLP | 0 to 55 °C | SIE | 15.0 mm/ 69.85 mm/ 100.45 mm | 150 g Max | 5 V/ 12 V |
| **PX04SHB080** | 800 GB | | | | 1,900 MiB/s | 850 MiB/s | | 125,000 IOPS | | | | | | | |
| **PX04SHB040** | 400 GB | | | | | | | | | | | | | | |
| **PX04SHB020** | 200 GB | | | | | | | | | | | | | | |
| **PX04SHQ*** Series** | | | | | | | | | | | | | | | |
| **PX04SHQ160** | 1,600 GB | 25 | MLC | SAS-3.0 | 1,500 MiB/s | 750 MiB/s | 270,000 IOPS | 120,000 IOPS | 3.2 W Typ. | PLP | 0 to 55 °C | SED FIPS | 15.0 mm/ 69.85 mm/ 100.45 mm | 150 g Max | 5 V/ 12 V |
| **PX04SHQ080** | 800 GB | | | | 1,900 MiB/s | 850 MiB/s | | 125,000 IOPS | | | | | | | |
| **PX04SHQ040** | 400 GB | | | | | | | | | | | | | | |
| **PX04SHQ020** | 200 GB | | | | | | | | | | | | | | |

## Enterprise Mid Endurance SSD

High performance enterprise-class solid state storage with better random write performance and endurance for general OLTP (On-Line Transaction Process) services.

| Model Number | Formatted Capacity | DWPD*5 | NAND Type | Interface | Sustained 128 KiB*6 *7 *8 | | Sustained 4 KiB*6 *7 *8 *9 | | Power Consumption (Ready) | Power Loss Protection | Environmental Temperature (Operating) | Security Function (Option)*10 | Dimensions Height/ Width/ Length | Weight | Power Supply Voltage |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sequential Read | Sequential Write | Random Read | Random Write | | | | | | | |
| **PX04PMB*** Series (PCIe, 2.5-inch form factor)** | | | | | | | | | | | | | | | |
| **PX04PMB320** | 3,200 GB | 10 | MLC | PCIe 3.0 | 3,100 MiB/s | 2,350 MiB/s | 660,000 IOPS | 185,000 IOPS | 6 W Typ. | | 0 to 40 °C | | 15.0 mm/ 69.85 mm/ 100.45 mm | 150 g Max | 3.3 V (Standby) /12 V |
| **PX04PMB160** | 1,600 GB | | | | | | | | | | | | | | |
| **PX04PMB080** | 800 GB | | | | | | | | | | | | | | |
| **PX04PMC*** Series (PCIe, Add-in card type)** | | | | | | | | | | | | | | | |
| **PX04PMC320** | 3,200 GB | 10 | MLC | PCIe 3.0 | 3,100 MiB/s | 2,350 MiB/s | 660,000 IOPS | 185,000 IOPS | 6 W Typ. | | 0 to 50 °C | | 68.77 mm/ 18.73 mm/ 167.52 mm | 220 g Max | 12 V |
| **PX04PMC160** | 1,600 GB | | | | | | | | | | | | | | |
| **PX04PMC080** | 800 GB | | | | | | | | | | | | | | |

| Model Number | Formatted Capacity | DWPD*5 | NAND Type | Interface | Sustained 64 KiB*6 *7 *8 | | Sustained 4 KiB*6 *7 *8 *9 | | Power Consumption (Ready) | Power Loss Protection | Environmental Temperature (Operating) | Security Function (Option)*10 | Dimensions Height/ Width/ Length | Weight | Power Supply Voltage |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sequential Read | Sequential Write | Random Read | Random Write | | | | | | | |
| **PX04SMB*** Series** | | | | | | | | | | | | | | | |
| **PX04SMB320** | 3,200 GB | 10 | MLC | SAS-3.0 | 1,500 MiB/s | 750 MiB/s | 270,000 IOPS | 85,000 IOPS | 3.2 W Typ. | PLP | 0 to 55 °C | SIE | 15.0 mm/ 69.85 mm/ 100.45 mm | 150 g Max | 5 V/ 12 V |
| **PX04SMB160** | 1,600 GB | | | | 1,900 MiB/s | 850 MiB/s | | 90,000 IOPS | | | | | | | |
| **PX04SMB080** | 800 GB | | | | | | | | | | | | | | |
| **PX04SMB040** | 400 GB | | | | | | | | | | | | | | |
| **PX04SMQ*** Series** | | | | | | | | | | | | | | | |
| **PX04SMQ320** | 3,200 GB | 10 | MLC | SAS-3.0 | 1,500 MiB/s | 750 MiB/s | 270,000 IOPS | 85,000 IOPS | 3.2 W Typ. | PLP | 0 to 55 °C | SED FIPS | 15.0 mm/ 69.85 mm/ 100.45 mm | 150 g Max | 5 V/ 12 V |
| **PX04SMQ160** | 1,600 GB | | | | 1,900 MiB/s | 850 MiB/s | | 90,000 IOPS | | | | | | | |
| **PX04SMQ080** | 800 GB | | | | | | | | | | | | | | |
| **PX04SMQ040** | 400 GB | | | | | | | | | | | | | | |

## Enterprise Value Endurance SSD

High performance enterprise-class solid state storage with balanced random write performance and endurance for virtualized server and storage applications and generic enterprise applications.

| Model Number | Formatted Capacity | DWPD*5 | NAND Type | Interface | Sustained 64 KiB*6 *7 *8 | | Sustained 4 KiB*6 *7 *8 *9 | | Power Consumption (Ready) | Power Loss Protection | Environmental Temperature (Operating) | Security Function (Option)*10 | Dimensions Height/ Width/ Length | Weight | Power Supply Voltage |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sequential Read | Sequential Write | Random Read | Random Write | | | | | | | |
| **PX04SVB*** Series** | | | | | | | | | | | | | | | |
| **PX04SVB384** | 3,840 GB | 3 | MLC | SAS-3.0 | 1,500 MiB/s | 750 MiB/s | 270,000 IOPS | 55,000 IOPS | 3.2 W Typ. | PLP | 0 to 55 °C | SIE | 15.0 mm/ 69.85 mm/ 100.45 mm | 150 g Max | 5 V/ 12 V |
| **PX04SVB192** | 1,920 GB | | | | 1,900 MiB/s | 850 MiB/s | | 60,000 IOPS | | | | | | | |
| **PX04SVB096** | 960 GB | | | | | | | | | | | | | | |
| **PX04SVB048** | 480 GB | | | | | | | | | | | | | | |
| **PX04SVQ*** Series** | | | | | | | | | | | | | | | |
| **PX04SVQ384** | 3,840 GB | 3 | MLC | SAS-3.0 | 1,500 MiB/s | 750 MiB/s | 270,000 IOPS | 55,000 IOPS | 3.2 W Typ. | PLP | 0 to 55 °C | SED FIPS | 15.0 mm/ 69.85 mm/ 100.45 mm | 150 g Max | 5 V/ 12 V |
| **PX04SVQ192** | 1,920 GB | | | | 1,900 MiB/s | 850 MiB/s | | 60,000 IOPS | | | | | | | |
| **PX04SVQ096** | 960 GB | | | | | | | | | | | | | | |
| **PX04SVQ048** | 480 GB | | | | | | | | | | | | | | |
| **HK4E Series** | | | | | | | | | | | | | | | |
| **THNSN81Q60CSE** | 1,600 GB | 3 | MLC | SATA-3.2 | 500 MiB/s | 480 MiB/s | 75,000 IOPS | 30,000 IOPS | 1.2 W Typ. | PLP | 0 to 55 °C | | 7.0 mm/ 69.85 mm/ 100.45 mm | 60 g Max | 5 V |
| **THNSN8800PCSE** | 800 GB | | | | | | | | | | | | | | |
| **THNSN8400PCSE** | 400 GB | | | | | | | | | | | | | | |
| **THNSN8200PCSE** | 200 GB | | | | | 270 MiB/s | | 20,000 IOPS | | | | | | | |
| **HK3E2 Series** | | | | | | | | | | | | | | | |
| **THNSNJ800PCSZ** | 800 GB | 3 | MLC | SATA-3.2 | 500 MiB/s | 400 MiB/s | 75,000 IOPS | 30,000 IOPS | 1.0 W Typ. | PLP | 0 to 55 °C | | 7.0 mm/ 69.85 mm/ 100.45 mm | 60 g Max | 5 V |
| **THNSNJ400PCSZ** | 400 GB | | | | | | | | | | | | | | |
| **THNSNJ200PCSZ** | 200 GB | | | | | 270 MiB/s | | 20,000 IOPS | | | | | | | |

Column

### PLP (Power Loss Protection)···Protection against data loss in the event of unexpected power loss

Some of Toshiba Storage Products equip **Power Loss Protection (PLP)** technology to help protect against data loss in the event of unexpected power loss.

- PLP on SSD products supports to record data in buffer memory to NAND flash memory utilizing back up power of solid large-capacitance capacitor in case of unexpected supply shut down.
- PLP on HDD products supports to record data in buffer memory to hard disk utilizing back electromotive force along with disk rotation inertia in case of unexpected supply shut down. Persistent Write Cache (PWC) feature with PLP is a function to handle the write data that the drive reports "Normal completion" to the host but not being stored to disk media yet. The write data may be written to the commanded LBA on the disk media. The un-written data to disk media is stored to flash memory using back up power by PLP when the power supply to the drive unexpectedly 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.

*5: DWPD: Drive Write Per Day. One full drive write per day means the drive can be written and re-written to full capacity once a day every day for five years, the stated product warranty period. Actual results may vary due to system configuration, usage and other factors.
*6: A kibibyte (KiB) means $2^{10}$, or 1,024 bytes, a mebibyte (MiB) means $2^{20}$, or 1,048,576 bytes, and a gibibyte (GiB) means $2^{30}$, or 1,073,741,824 bytes.
*7: 12.0 Gbit/s interface speed by dual port (SAS model). 6.0 Gbit /s interface speed (SATA model).
*8: Read and write speed may vary depending on the host device, read and write conditions, and file size.
*9: IOPS: Input Output Per Second (or the number of I/O operations per second)
*10: Please refer to the column "Optional Security Feature on Toshiba Storage Products" on the page 9.

# Enterprise SSD (eSSD)

## Enterprise Read Intensive SSD

High performance enterprise-class solid state storage with balanced sequential read & write performance and write endurance for archiving systems and lower workload services (E-mail, file share, etc) at cloud data center.

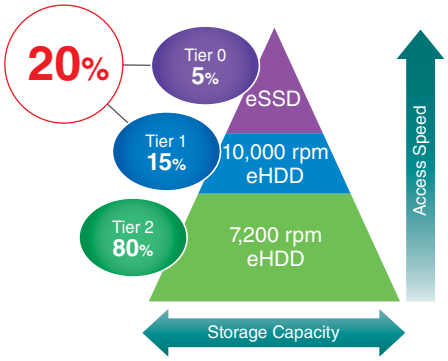
| Model Number | Formatted Capacity | DWPD*5 | NAND Type | Interface | Sustained 64 KiB*6 *7 *8 | | Sustained 4 KiB*6 *7 *8 *9 | | Power Consumption (Ready) | Power Loss Protection | Environmental Temperature (Operating) | Security Function (Option)*10 | Dimensions Height/ Width/ Length | Weight | Power Supply Voltage |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sequential Read | Sequential Write | Random Read | Random Write | | | | | | | |
| **PX04SLB*** Series** | | | | | | | | | | | | | | | |
| **PX04SLB400** | 4,000 GB | 0.5 | MLC | SAS-3.0 | 1,500 MiB/s | 750 MiB/s | 270,000 IOPS | 19,000 IOPS | 3.2 W Typ. | | 0 to 55 °C | | 15.0 mm/ 69.85 mm/ 100.45 mm | 150 g Max | 5 V/ 12 V |
| **PX04SLB200** | 2,000 GB | | | | 1,900 MiB/s | 850 MiB/s | | | | | | | | | |
| **PX04SLQ*** Series** | | | | | | | | | | | | | | | |
| **PX04SLQ400** | 4,000 GB | 0.5 | MLC | SAS-3.0 | 1,500 MiB/s | 750 MiB/s | 270,000 IOPS | 19,000 IOPS | 3.2 W Typ. | | 0 to 55 °C | SED | 15.0 mm/ 69.85 mm/ 100.45 mm | 150 g Max | 5 V/ 12 V |
| **PX04SLQ200** | 2,000 GB | | | | 1,900 MiB/s | 850 MiB/s | | | | | | | | | |
| **PX04SRB*** Series** | | | | | | | | | | | | | | | |
| **PX04SRB384** | 3,840 GB | 1 | MLC | SAS-3.0 | 1,500 MiB/s | 750 MiB/s | 270,000 IOPS | 22,000 IOPS | 3.2 W Typ. | PLP | 0 to 55 °C | SIE | 15.0 mm/ 69.85 mm/ 100.45 mm | 150 g Max | 5 V/ 12 V |
| **PX04SRB192** | 1,920 GB | | | | 1,900 MiB/s | 850 MiB/s | | | | | | | | | |
| **PX04SRB096** | 960 GB | | | | | | | | | | | | | | |
| **PX04SRB048** | 480 GB | | | | | | | | | | | | | | |
| **PX04SRQ*** Series** | | | | | | | | | | | | | | | |
| **PX04SRQ384** | 3,840 GB | 1 | MLC | SAS-3.0 | 1,500 MiB/s | 750 MiB/s | 270,000 IOPS | 22,000 IOPS | 3.2 W Typ. | PLP | 0 to 55 °C | SED FIPS | 15.0 mm/ 69.85 mm/ 100.45 mm | 150 g Max | 5 V/ 12 V |
| **PX04SRQ192** | 1,920 GB | | | | 1,900 MiB/s | 850 MiB/s | | | | | | | | | |
| **PX04SRQ096** | 960 GB | | | | | | | | | | | | | | |
| **PX04SRQ048** | 480 GB | | | | | | | | | | | | | | |
| **HK4R Series** | | | | | | | | | | | | | | | |
| **THNSN81Q92CSE** | 1,920 GB | 1 | MLC | SATA-3.2 | 500 MiB/s | 480 MiB/s | 75,000 IOPS | 14,000 IOPS | 1.2 W Typ. | PLP | 0 to 55 °C | | 7.0 mm/ 69.85 mm/ 100.45 mm | 60 g Max | 5 V |
| **THNSN8960PCSE** | 960 GB | | | | | | | 12,000 IOPS | | | | | | | |
| **THNSN8480PCSE** | 480 GB | | | | | | | 10,000 IOPS | | | | | | | |
| **THNSN8240PCSE** | 240 GB | | | | | 270 MiB/s | | | | | | | | | |
| **THNSN8120PCSE** | 120 GB | | | | | 120 MiB/s | | 4,000 IOPS | | | | | | | |
| **HK3R2 Series** | | | | | | | | | | | | | | | |
| **THNSNJ960PCSZ** | 960 GB | 1 | MLC | SATA-3.2 | 500 MiB/s | 400 MiB/s | 75,000 IOPS | 14,000 IOPS | 1.0 W Typ. | PLP | 0 to 55 °C | | 7.0 mm / 69.85 mm / 100.45 mm | 60 g Max | 5 V |
| **THNSNJ480PCSZ** | 480 GB | | | | | | | 12,000 IOPS | | | | | | | |
| **THNSNJ240PCSZ** | 240 GB | | | | | 270 MiB/s | | 10,000 IOPS | | | | | | | |
| **THNSNJ120PCSZ** | 120 GB | | | | | 120 MiB/s | | 4,000 IOPS | | | | | | | |

Column

## Benefits of a Tiered Storage System

Tiered storage system combines high-speed enterprise SSDs and low-cost, high-capacity HDDs, as opposed to conventional system that consists of only enterprise HDDs. Compared to the conventional storage system, **a tiered storage system improves access performance by approx. 7 times, eliminating I/O bottlenecks**. Compared with the conventional storage system, the tiered storage system cuts the number of drives by approx. 68% and cuts power consumption by approx. 62%. The tiered storage system greatly reduces the total cost of ownership (TCO) and contributes to a reduction in environmental impact. (Estimates by Toshiba, based on sample 1,600-TB storage system described below.) Toshiba offers a suitable portfolio of enterprise SSDs and HDDs needed to build tiered storage systems. You can select storage products that best fit your needs.

### Tiered Storage System




According to an access model of a typical enterprise storage system, 80% of all accesses are made to 20% of data. By storing the 20% most frequently accessed data in eSSDs with fast access times and high-speed HDDs, you can dramatically reduce the overall drive count and power consumption while increasing data throughput.

### Benefits of a Tiered Storage System Using eSSDs

(Example Estimated for a 1,600-TB Storage System)

**Conventional Non-Tiered HDD Storage System**

10,000 rpm eHDD

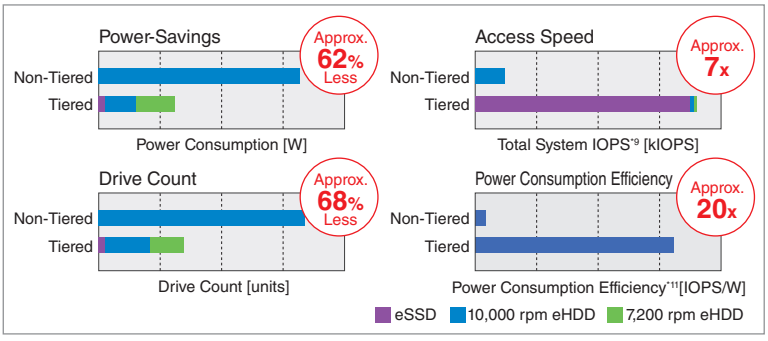
▶ Storage Composition

| Drive | Capacity | #Units | Capacity Ratio |
|---|---|---|---|
| 10,000 rpm eHDD | 900 GB | 1780 | 100% |

**Tiered Storage System Using eSSDs**


▶ Storage Composition

| Drive | Capacity | #Units | Capacity Ratio |
|---|---|---|---|
| eSSD | 1.6 TB | 52 | 5% |
| 10,000 rpm eHDD | 900 GB | 266 | 15% |
| 7,200 rpm eHDD | 5TB | 256 | 80% |



# Enterprise HDD (eHDD)

Enterprise Performance HDDs for high-performance server and storage systems that require quick response and rapid data transfer. Enterprise Capacity HDDs have large capacity and are used in storage systems and data centers which require large amount of data storage capacity.Toshiba provides several classes of enterprise HDDs to support both mission and business critical applications that demand reliable performance in 24x7 operating environments.

## Enterprise Performance HDD

High Performance Disk Storage for Mission Critical Applications, such as Tier 1 enterprise servers hosting transaction oriented applications.

| Model Number | Formatted Capacity | Rotation Speed | Interface | Interface Speed | Power Consumption Idle-B | Logical Data Block Length | | Average Latency Time | Buffer Size*5 | Environmental Temperature (Operating) | Security Function*10 | Dimensions Height/ Width/ Length | Weight | Power Supply Voltage |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | HOST | DISK | | | | | | | |
| **AL13SXB**E* Series** *12 *13 | | | | | | | | | | | | | | |
| AL13SXB60EA | 600 GB | 15,000 rpm | SAS-3.0 | 12.0 Gbit/s 6.0 Gbit/s 3.0 Gbit/s 1.5 Gbit/s | 4.5 W Typ. | 4,096 B 4,160 B 4,192 B 4,224 B | 4,096 B 4,160 B 4,192 B 4,224 B | 2.0 ms | 128 MiB | 5 to 55 °C | | 15.0 mm/ 69.85 mm/ 100.45 mm | 230 g Max | 5 V/ 12 V |
| AL13SXB45EA | 450 GB | | | | | | | | | | | | | |
| AL13SXB30EA | 300 GB | | | | | | | | | | | | | |
| AL13SXB60EE | 600 GB | 15,000 rpm | SAS-3.0 | 12.0 Gbit/s 6.0 Gbit/s 3.0 Gbit/s 1.5 Gbit/s | 4.5 W Typ. | 512 B 520 B 524 B 528 B | | 2.0 ms | 128 MiB | 5 to 55 °C | | 15.0 mm/ 69.85 mm/ 100.45 mm | 230 g Max | 5 V/ 12 V |
| AL13SXB45EE | 450 GB | | | | | | | | | | | | | |
| AL13SXB30EE | 300 GB | | | | | | | | | | | | | |
| AL13SXB60EN | 600 GB | 15,000 rpm | SAS-3.0 | 12.0 Gbit/s 6.0 Gbit/s 3.0 Gbit/s 1.5 Gbit/s | 4.5 W Typ. | | 512 B 520 B 524 B 528 B | 2.0 ms | 128 MiB | 5 to 55 °C | | 15.0 mm/ 69.85 mm/ 100.45 mm | 230 g Max | 5 V/ 12 V |
| AL13SXB45EN | 450 GB | | | | | | | | | | | | | |
| AL13SXB30EN | 300 GB | | | | | | | | | | | | | |
| **AL13SXB**0N Series** | | | | | | | | | | | | | | |
| AL13SXB600N | 600 GB | 15,000 rpm | SAS-2.0 | 6.0 Gbit/s 3.0 Gbit/s 1.5 Gbit/s | 5.0 W Typ. | 512 B 520 B 528 B | 512 B 520 B 528 B | 2.0 ms | 64 MiB | 5 to 55 °C | | 15.0 mm/ 69.85 mm/ 100.45 mm | 230 g Max | 5 V/ 12 V |
| AL13SXB450N | 450 GB | | | | | | | | | | | | | |
| AL13SXB300N | 300 GB | | | | | | | | | | | | | |
| **AL14SEB***N Series** | | | | | | | | | | | | | | |
| AL14SEB120N | 1.2 TB | 10,500 rpm | SAS-3.0 | 12.0 Gbit/s 6.0 Gbit/s 3.0 Gbit/s 1.5 Gbit/s | 4.0 W Typ. | 512 B 520 B 524 B 528 B | 512 B 520 B 524 B 528 B | 2.86 ms | 128 MiB | 5 to 55 °C | SIE (Option) | 15.0 mm/ 69.85 mm/ 100.45 mm | 230 g Max | 5 V/ 12 V |
| AL14SEB090N | 900 GB | | | | | | | | | | | | | |
| AL14SEB060N | 600 GB | | | | | | | | | | | | | |
| AL14SEB045N | 450 GB | | | | | | | | | | | | | |
| AL14SEB030N | 300 GB | | | | | | | | | | | | | |
| **AL14SEQ***N Series** | | | | | | | | | | | | | | |
| AL14SEQ120N | 1.2 TB | 10,500 rpm | SAS-3.0 | 12.0 Gbit/s 6.0 Gbit/s 3.0 Gbit/s 1.5 Gbit/s | 4.0 W Typ. | 512 B 520 B 524 B 528 B | 512 B 520 B 524 B 528 B | 2.86 ms | 128 MiB | 5 to 55 °C | SED | 15.0 mm/ 69.85 mm/ 100.45 mm | 230 g Max | 5 V/ 12 V |
| AL14SEQ090N | 900 GB | | | | | | | | | | | | | |
| AL14SEQ060N | 600 GB | | | | | | | | | | | | | |
| AL14SEQ045N | 450 GB | | | | | | | | | | | | | |
| AL14SEQ030N | 300 GB | | | | | | | | | | | | | |
| **AL13SEB*** Series** | | | | | | | | | | | | | | |
| AL13SEB900 | 900 GB | 10,500 rpm | SAS-2.0 | 6.0 Gbit/s 3.0 Gbit/s 1.5 Gbit/s | 3.9 W Typ. | 512 to 528 B (fixed length) | 512 to 528 B (fixed length) | 2.86 ms | 64 MiB | 5 to 55 °C | | 15.0 mm/ 69.85 mm/ 100.45 mm | 240 g Max | 5 V/ 12 V |
| AL13SEB600 | 600 GB | | | | | | | | | | | | | |
| AL13SEB450 | 450 GB | | | | | | | | | | | | | |
| AL13SEB300 | 300 GB | | | | | | | | | | | | | |

*11: Power Consumption Efficiency (IOPS/W): IOPS per watt consumed.

*12: =Advanced Format Technology. (512 emulation, 512e). Please refer to the column "Advanced Format" on the page 14.

*13: =Advanced Format Technology (4K native, 4Kn). Please refer to the column "Advanced Format" on the page 14.

# Enterprise HDD (eHDD)

## Enterprise Capacity HDD

Capacity-Optimized Enterprise Disk Storage for external networked storage arrays, enterprise backup and restore infrastructure, and access intensive bulk-storage systems and applications.

| Model Number | Formatted Capacity | Rotation Speed | Interface | Interface Speed | Power Consumption Idle-B | Logical Data Block Length | | Average Latency Time | Buffer Size*6 | Environmental Temperature (Operating) | Security Function*10 | Dimensions Height/ Width/ Length | Weight | Power Supply Voltage |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | HOST | DISK | | | | | | | |
| **MG04SCA**E* Series** *12 *13 | | | | | | | | | | | | | | |
| MG04SCA60EE | 6 TB | 7,200 rpm | SAS-3.0 | 12.0 Gbit/s 6.0 Gbit/s 3.0 Gbit/s 1.5 Gbit/s | 6.1 W Typ. | 512 B 520 B 528 B (emulation) | 4,096 B 4,160 B 4,224 B | 4.17 ms | 128 MiB | 5 to 55 °C | SIE (Option) | 26.1 mm/ 101.6 mm/ 147 mm | 770 g Max | 5 V/ 12 V |
| MG04SCA50EE | 5 TB | | | | | | | | | | | | 720 g Max | |
| MG04SCA40EE | 4 TB | | | | | | | | | | | | | |
| MG04SCA20EE | 2 TB | | | | | | | | | | | | | |
| MG04SCA60EA | 6 TB | 7,200 rpm | SAS-3.0 | 12.0 Gbit/s 6.0 Gbit/s 3.0 Gbit/s 1.5 Gbit/s | 6.1 W Typ. | 4,096 B 4,160 B 4,224 B | 4,096 B 4,160 B 4,224 B | 4.17 ms | 128 MiB | 5 to 55 °C | SIE (Option) | 26.1 mm/ 101.6 mm/ 147 mm | 770 g Max | 5 V/ 12 V |
| MG04SCA50EA | 5 TB | | | | | | | | | | | | 720 g Max | |
| MG04SCA40EA | 4 TB | | | | | | | | | | | | | |
| MG04SCA20EA | 2 TB | | | | | | | | | | | | | |
| **MG04SCA**0* Series** | | | | | | | | | | | | | | |
| MG04SCA500E | 5 TB | 7,200 rpm | SAS-2.0 | 6.0 Gbit/s 3.0 Gbit/s 1.5 Gbit/s | 6.2 W Typ. | 512 B 520 B 528 B (emulation) | 4,096 B 4,160 B 4,224 B | 4.17 ms | 64 MiB | 5 to 55 °C | | 26.1 mm/ 101.6 mm/ 147 mm | 720 g Max | 5 V/ 12 V |
| MG04SCA400E | 4 TB | | | | | | | | | | | | | |
| MG04SCA300E | 3 TB | | | | | | | | | | | | | |
| MG04SCA200E | 2 TB | | | | | | | | | | | | | |
| MG04SCA500A | 5 TB | 7,200 rpm | SAS-2.0 | 6.0 Gbit/s 3.0 Gbit/s 1.5 Gbit/s | 6.2 W Typ. | 4,096 B 4,160 B 4,224 B | 4,096 B 4,160 B 4,224 B | 4.17 ms | 64 MiB | 5 to 55 °C | | 26.1 mm/ 101.6 mm/ 147 mm | 720 g Max | 5 V/ 12 V |
| MG04SCA400A | 4 TB | | | | | | | | | | | | | |
| MG04SCA300A | 3 TB | | | | | | | | | | | | | |
| MG04SCA200A | 2 TB | | | | | | | | | | | | | |
| **MG04ACA**** Series** | | | | | | | | | | | | | | |
| MG04ACA600E | 6 TB | 7,200 rpm | SATA-2.6 /3.0 | 6.0 Gbit/s 3.0 Gbit/s 1.5 Gbit/s | 6.0 W Typ. (Low Power Idle) | 512 B (emulation) | 4,096 B | 4.17 ms | 128 MiB | 5 to 55 °C | | 26.1 mm/ 101.6 mm/ 147 mm | 770 g Max | 5 V/ 12 V |
| MG04ACA50DE | 5 TB | | | | | | | | | | | | | |
| MG04ACA500E | | | | | | | | | | | | | 720 g Max | |
| MG04ACA400E | 4 TB | | | | | | | | | | | | | |
| MG04ACA300E | 3 TB | | | | | | | | | | | | | |
| MG04ACA200E | 2 TB | | | | | | | | | | | | | |
| MG04ACA600A | 6 TB | 7,200 rpm | SATA-2.6 /3.0 | 6.0 Gbit/s 3.0 Gbit/s 1.5 Gbit/s | 6.0 W Typ. (Low Power Idle) | 4,096 B | 4,096 B | 4.17 ms | 128 MiB | 5 to 55 °C | | 26.1 mm/ 101.6 mm/ 147 mm | 770 g Max | 5 V/ 12 V |
| MG04ACA50DA | 5 TB | | | | | | | | | | | | | |
| MG04ACA500A | | | | | | | | | | | | | 720 g Max | |
| MG04ACA400A | 4 TB | | | | | | | | | | | | | |
| MG04ACA300A | 3 TB | | | | | | | | | | | | | |
| MG04ACA200A | 2 TB | | | | | | | | | | | | | |
| **MG03SCA*** Series** | | | | | | | | | | | | | | |
| MG03SCA400 | 4 TB | 7,200 rpm | SAS-2.0 | 6.0 Gbit/s 3.0 Gbit/s 1.5 Gbit/s | 6.0 W Typ. | 512 B to 528 B (fixed length) | 512 B to 528 B (fixed length) | 4.17 ms | 64 MiB | 5 to 55 °C | | 26.1 mm/ 101.6 mm/ 147 mm | 720 g Max | 5 V/ 12 V |
| MG03SCA300 | 3 TB | | | | | | | | | | | | | |
| MG03SCA200 | 2 TB | | | | | | | | | | | | | |
| MG03SCA100 | 1 TB | | | | | | | | | | | | | |
| **MG03ACA*** Series** | | | | | | | | | | | | | | |
| MG03ACA400 | 4 TB | 7,200 rpm | SATA-2.6 /3.0 | 6.0 Gbit/s 3.0 Gbit/s 1.5 Gbit/s | 6.0 W Typ. (Low Power Idle) | 512 B (fixed length) | 512 B (fixed length) | 4.17 ms | 64 MiB | 5 to 55 °C | | 26.1 mm/ 101.6 mm/ 147 mm | 720 g Max | 5 V/ 12 V |
| MG03ACA300 | 3 TB | | | | | | | | | | | | | |
| MG03ACA200 | 2 TB | | | | | | | | | | | | | |
| MG03ACA100 | 1 TB | | | | | | | | | | | | | |

## ▸Enterprise Cloud HDD

High Capacity Disk Storage for Tier 2 and Tier 3 scale-out bulk storage systems, and storage for Cloud-based back-end server applications.

| Model Number | Formatted Capacity | Rotation Speed | Interface | Interface Speed | Power Consumption Idle-B | Logical Data Block Length | | Average Latency Time | Buffer Size*6 | Environmental Temperature (Operating) | Security Function*10, | Dimensions Height/ Width/ Length | Weight | Power Supply Voltage |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | HOST | DISK | | | | | | | |
| **MC04ACA***E Series** *12 | | | | | | | | | | | | | | |
| **MC04ACA600E** | 6 TB | 7,200 rpm | SATA-2.6/3.0 | 6.0 Gbit/s 3.0 Gbit/s 1.5 Gbit/s | 6.0 W Typ. (Low Power Idle) | 512 B | 4,096 B | 4.17 ms | 128 MiB | 5 to 55 °C | | 26.1 mm/ 101.6 mm/ 147 mm | 770 g Max | 5 V/ 12 V |
| **MC04ACA500E** | 5 TB | | | | | | | | | | | | | |
| **MC04ACA400E** | 4 TB | | | | | | | | | | | | 720 g Max | |
| **MC04ACA300E** | 3 TB | | | | | | | | | | | | | |
| **MC04ACA200E** | 2 TB | | | | | | | | | | | | | |

Column

### Optional Security Feature on Toshiba Storage Products

There are some models of Toshiba Storage Products which deliver various security functions as optional feature.

- Self Encrypting Drive (SED) supports AES 256 bit cryptographic algorithm as one of the measurers to protect data confidentiality and safety in case of system theft or system asset disposal.
- Sanitize Instant Erase (SIE) is useful to reduce time and cost for the case of system repurposing and disposal. SIE is compatible with Sanitize Device Feature Set. Sanitize Device Feature Set is the standard prescribed by T10 (SAS) and T13 (SATA) committees of American National Standards Association (ANSI), which makes it possible to invalidate the data recorded on the magnetic disks at a blink.
- Wipe technology is Toshiba's unique technology which automatically erases data when a drive is accessed by an unregistered system.
- FIPS-validated models support AES 256 bit cryptographic algorithm. They are designed along with the TCG (Trusted Computing Group) standard, and have achieved validation to U.S. Federal Information Processing Standard 140-2 (FIPS 140-2).
- Secure Pairing is one of the mutual authentication functions and generally utilized on devices which are for Set Top Box (STB) applications.

# Client SSD (cSSD)

Client SSDs offer fast transfer rates, high durability against shock and vibration, and light weight and low power comparing with Client HDDs. Toshiba Client SSDs equip the NAND flash memory (NAND) and SSD controller developed by Toshiba, and can be applied to a wide range of applications from mobile computing to entry level servers including security-required systems with SED models with the product line up of various form factors and interfaces.

| Form Factor | Model Number | Formatted Capacity | NAND Type | Interface/ Connector Type | Data Transfer Speed[*6 *8] | | Shock (Operating) | Environmental Temperature (Operating) | Dimensions Height/ Width/ Length | Weight | Power Supply Voltage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sequential Read | Sequential Write | | | | | |
| **SG5 Series (Non-SED model)** | | | | | | | | | | | |
| 2.5-inch[*3] 7.0mm height case | **THNSNK1T02CS8** | 1,024 GB | TLC | ACS-3, SATA revision 3.2 /Standard SATA | Up to 520 MiB/s | Up to 370 MiB/s | 14.7 km/s² {1500 G} (0.5 ms) | 0 to 70 °C (case temperature) | 7.0 mm/ 69.85 mm/ 100.0 mm | 48 to 51 g Typ. | 5.0 V |
| | **THNSNK512GCS8** | 512 GB | | | | Up to 250 MiB/s | | | | | |
| | **THNSNK256GCS8** | 256 GB | | | | | | | | | |
| | **THNSNK128GCS8** | 128 GB | | | | Up to 130 MiB/s | | | | | |
| M.2 2280-D2 Double-sided module | **THNSNK1T02DN8** | 1,024 GB | TLC | ACS-3, SATA revision 3.2 / M.2 B-M | Up to 520 MiB/s | Up to 370 MiB/s | 14.7 km/s² {1500 G} (0.5 ms) | 0 to 80 °C (component temperature) | 3.58 mm/ 22.0 mm/ 80.0 mm | 8.7 g Typ. | 3.3 V |
| M.2 2280-S2 Single-sided module | **THNSNK512GVN8** | 512 GB | | | | Up to 250 MiB/s | | | 2.23 mm/ 22.0 mm/ 80.0 mm | 7.0 g Typ. | |
| | **THNSNK256GVN8** | 256 GB | | | | | | | | | |
| | **THNSNK128GVN8** | 128 GB | | | | Up to 130 MiB/s | | | | | |
| **HG6 Series (Non-SED model)** | | | | | | | | | | | |
| 2.5-inch[*3] 9.5mm height case | **THNSNJ512GBSU** | 512 GB | MLC | ACS-2, SATA revision 3.1 /Standard SATA | Up to 510 MiB/s | Up to 460 MiB/s | 14.7 km/s² {1500 G} (0.5 ms) | 0 to 70 °C (case temperature) | 9.5 mm/ 69.85 mm/ 100.0 mm | 51 to 55 g Typ. | 5.0 V |
| | **THNSNJ256GBSU** | 256 GB | | | | Up to 450 MiB/s | | | | | |
| | **THNSNJ128GBSU** | 128 GB | | | | | | | | | |
| | **THNSNJ060GBSU** | 60 GB | | | | Up to 430 MiB/s | | | | | |
| 2.5-inch[*3] 7.0mm height case | **THNSNJ512GCSU** | 512 GB | MLC | ACS-2, SATA revision 3.1 /Standard SATA | Up to 510 MiB/s | Up to 460 MiB/s | 14.7 km/s² {1500 G} (0.5 ms) | 0 to 70 °C (case temperature) | 7.0 mm/ 69.85 mm/ 100.0 mm | 49 to 53 g Typ. | 5.0 V |
| | **THNSNJ256GCSU** | 256 GB | | | | Up to 450 MiB/s | | | | | |
| | **THNSNJ128GCSU** | 128 GB | | | | | | | | | |
| | **THNSNJ060GCSU** | 60 GB | | | | Up to 430 MiB/s | | | | | |
| mSATA module | **THNSNJ512GACU** | 512 GB | MLC | ACS-2, SATA revision 3.1 /mSATA | Up to 510 MiB/s | Up to 460 MiB/s | 14.7 km/s² {1500 G} (0.5 ms) | 0 to 80 °C (component temperature) | 3.95 mm/ 30.0 mm/ 50.95 mm | 7.3 to 7.7 g Typ. | 3.3 V |
| | **THNSNJ256GMCU** | 256 GB | | | | Up to 450 MiB/s | | | | | |
| | **THNSNJ128GMCU** | 128 GB | | | | | | | | | |
| | **THNSNJ060GMCU** | 60 GB | | | | Up to 430 MiB/s | | | | | |
| M.2 2280-D2 Double-sided module | **THNSNJ512GDNU** | 512 GB | MLC | ACS-2, SATA revision 3.1 /M.2 B-M | Up to 510 MiB/s | Up to 460 MiB/s | 14.7 km/s² {1500 G} (0.5 ms) | 0 to 80 °C (component temperature) | 3.58 mm/ 22.0 mm/ 80.0 mm | 7.0 to 9.3 g Typ | 3.3 V |
| | **THNSNJ256G8NU** | 256 GB | | | | Up to 450 MiB/s | | | | | |
| | **THNSNJ128G8NU** | 128 GB | | | | | | | | | |
| | **THNSNJ060G8NU** | 60 GB | | | | Up to 430 MiB/s | | | | | |
| M.2 2280-S2 Single-sided module | **THNSNJ256GVNU** | 256 GB | MLC | ACS-2, SATA revision 3.1 /M.2 B-M | Up to 510 MiB/s | Up to 450 MiB/s | 14.7 km/s² {1500 G} (0.5 ms) | 0 to 80 °C (component temperature) | 2.23 mm/ 22.0 mm/ 80.0 mm | 6.4 to 6.6 g Typ. | 3.3 V |
| | **THNSNJ128GVNU** | 128 GB | | | | | | | | | |
| **HG6 Series (SED model with TCG opal)** | | | | | | | | | | | |
| 2.5-inch[*3] 9.5mm height case | **THNSFJ512GBSU** | 512 GB | MLC | ACS-2, SATA revision 3.1 /Standard SATA | Up to 510 MiB/s | Up to 460 MiB/s | 14.7 km/s² {1500 G} (0.5 ms) | 0 to 70 °C (case temperature) | 9.5 mm/ 69.85 mm/ 100.0 mm | 51 to 55 g Typ. | 5.0 V |
| | **THNSFJ256GBSU** | 256 GB | | | | Up to 450 MiB/s | | | | | |
| | **THNSFJ128GBSU** | 128 GB | | | | | | | | | |
| | **THNSFJ060GBSU** | 60 GB | | | | Up to 430 MiB/s | | | | | |
| 2.5-inch[*3] 7.0mm height case | **THNSFJ512GCSU** | 512 GB | MLC | ACS-2, SATA revision 3.1 /Standard SATA | Up to 510 MiB/s | Up to 460 MiB/s | 14.7 km/s² {1500 G} (0.5 ms) | 0 to 70 °C (case temperature) | 7.0 mm/ 69.85 mm/ 100.0 mm | 49 to 53 g Typ. | 5.0 V |
| | **THNSFJ256GCSU** | 256 GB | | | | Up to 450 MiB/s | | | | | |
| | **THNSFJ128GCSU** | 128 GB | | | | | | | | | |
| | **THNSFJ060GCSU** | 60 GB | | | | Up to 430 MiB/s | | | | | |
| mSATA module | **THNSFJ512GACU** | 512 GB | MLC | ACS-2, SATA revision 3.1 /mSATA | Up to 510 MiB/s | Up to 460 MiB/s | 14.7 km/s² {1500 G} (0.5 ms) | 0 to 80 °C (component temperature) | 3.95 mm/ 30.0 mm/ 50.95 mm | 7.3 to 7.7 g Typ. | 3.3 V |
| | **THNSFJ256GMCU** | 256 GB | | | | Up to 450 MiB/s | | | | | |
| | **THNSFJ128GMCU** | 128 GB | | | | | | | | | |
| | **THNSFJ060GMCU** | 60 GB | | | | Up to 430 MiB/s | | | | | |
| M.2 2280-D2 Double-sided module | **THNSFJ512GDNU** | 512 GB | MLC | ACS-2, SATA revision 3.1 /M.2 B-M | Up to 510 MiB/s | Up to 460 MiB/s | 14.7 km/s² {1500 G} (0.5 ms) | 0 to 80 °C (component temperature) | 3.58 mm/ 22.0 mm/ 80.0 mm | 7.0 to 9.3 g Typ. | 3.3 V |
| | **THNSFJ256G8NU** | 256 GB | | | | Up to 450 MiB/s | | | | | |
| | **THNSFJ128G8NU** | 128 GB | | | | | | | | | |
| | **THNSFJ060G8NU** | 60 GB | | | | Up to 430 MiB/s | | | | | |
| M.2 2280-S2 Single-sided module | **THNSFJ256GVNU** | 256 GB | MLC | ACS-2, SATA revision 3.1 /M.2 B-M | Up to 510 MiB/s | Up to 510 MiB/s | 14.7 km/s² {1500 G} (0.5 ms) | 0 to 80 °C (component temperature) | 2.23 mm/ 22.0 mm/ 80.0 mm | 6.4 to 6.6 g Typ. | 3.3 V |
| | **THNSFJ128GVNU** | 128 GB | | | | | | | | | |

| Form Factor | Model Number | Formatted Capacity | NAND Type | Interface/ Connector Type | Data Transfer Speed*6 *8 | | Shock (Operating) | Environmental Temperature (Operating) | Dimensions Height/ Width/ Length | Weight | Power Supply Voltage |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Sequential Read | Sequential Write | | | | | |
| **XG3 Series (Non-SED model with TCG Pyrite)** | | | | | | | | | | | |
| M.2 2280-D2 Double-sided module | **THNSN51T02DU7** | 1,024 GB | MLC | PCIe 3.1, NVMe™ 1.1b*14 / M.2 M | Up to 2,400 MiB/s | Up to 1,500 MiB/s | 14.7 km/s² {1500 G} (0.5 ms) | 0 to 80 °C (component temperature) | 3.58 mm/ 22.0 mm/ 80.0 mm | 6.8 to 8.6 g Typ. | 3.3 V |
| M.2 2280-S2 Single-sided module | **THNSN5512GPU7** | 512 GB | | | | | | | 2.23 mm/ 22.0 mm/ 80.0 mm | | |
| | **THNSN5256GPU7** | 256 GB | | | | Up to 1,100 MiB/s | | | | | |
| | **THNSN5128GPU7** | 128 GB | | | Up to 2,100 MiB/s | Up to 600 MiB/s | | | | | |
| **XG3 Series (SED model with TCG Opal)** | | | | | | | | | | | |
| M.2 2280-D2 Double-sided module | **THNSF51T02DU7** | 1,024 GB | MLC | PCIe 3.1, NVMe™ 1.1b*14 / M.2 M | Up to 2,400 MiB/s | Up to 1,500 MiB/s | 14.7 km/s² {1500 G} (0.5 ms) | 0 to 80 °C (component temperature) | 3.58 mm/ 22.0 mm/ 80.0 mm | 6.8 to 8.6 g Typ. | 3.3 V |
| M.2 2280-S2 Single-sided module | **THNSF5512GPU7** | 512 GB | | | | | | | 2.23 mm/ 22.0 mm/ 80.0 mm | | |
| | **THNSF5256GPU7** | 256 GB | | | | Up to 1,100 MiB/s | | | | | |
| | **THNSF5128GPU7** | 128 GB | | | Up to 2,100 MiB/s | Up to 590 MiB/s | | | | | |
| **BG1 Series (Non-SED model with TCG Opal)** | | | | | | | | | | | |
| M.2 1620 Single Package | **THNSNN256GTY7** | 256 GB | MLC | PCIe 3.0, NVMe™ 1.1a*14 | Up to 750 MiB/s | Up to 170 MiB/s | 14.7 km/s² {1500 G} (0.5 ms) | 0 to 80 °C (component temperature) | 1.65 mm (256 GB), 1.4 mm (128 GB)/ 16.0 mm/ 20.0 mm | 1.0 g Typ. | 3.3 V/ 1.8 V/ 1.2 V |
| | **THNSNN128GTY7** | 128 GB | | | Up to 730 MiB/s | Up to 260 MiB/s | | | | 0.9 g Typ. | |
| M.2 2230-S4 M.2 2230-S3 Single-sided module | **THNSNN256GSX7** | 256 GB | MLC | PCIe 3.0, NVMe™ 1.1a*14 M.2 B-M | Up to 750 MiB/s | Up to 170 MiB/s | 14.7 km/s² {1500 G} (0.5 ms) | 0 to 80 °C (component temperature) | 2.63 mm (256 GB), 2.38 mm (128 GB)/ 22.0 mm/ 30.0 mm | 2.5 g Typ. | 3.3 V |
| | **THNSNN128GSX7** | 128 GB | | | Up to 730 MiB/s | Up to 260 MiB/s | | | | 2.3 g Typ. | |
| M.2 2280-S4 M.2 2280-S3 Single-sided module | **THNSNN256GVX7** | 256 GB | MLC | PCIe 3.0, NVMe™ 1.1a*14 M.2 B-M | Up to 750 MiB/s | Up to 170 MiB/s | 14.7 km/s² {1500 G} (0.5 ms) | 0 to 80 °C (component temperature) | 2.63 mm (256 GB), 2.38 mm (128 GB)/ 22.0 mm/ 80.0 mm | 5.0 g Typ. | 3.3 V |
| | **THNSNN128GVX7** | 128 GB | | | Up to 730 MiB/s | Up to 260 MiB/s | | | | 4.7 g Typ. | |

Column

## Toshiba SSD's Technology include Technology Geared Towards Life Time Expansion

As a result of repeating read/write i.e. electron injection into a floating gate of NAND memory cell, the oxide layer is degraded and this degradation causes limitation of read/write endurance shortening a life time of SSD. Various technologies have been applied to overcome this limitation and to extend the life time of SSD, there are three major techniques widely employed with current SSDs, "Wear Leveling", "Over Provisioning" and "ECC & Refresh".
Wear Leveling is managed through the flash controller algorithms which monitor and reassign data blocks that are frequently accessed and have met a predefined access threshold to maintain performance. Over Provisioning method - by which the number of logical blocks assigned to the device - exceeds the marketed capacity to provide the required life expectancy through re-assignment using the Wear Leveling technique. With regard to the adoption of Error correction codes (ECC) and Refresh, ECC is redundant codes added to user data to correct errors and Refresh is a mechanism which relocates data to prevent an error before the limit of error correction by ECC is exceeded. Error rates of NAND memory increase when Erase/Write cycle increases. ECC and Refresh techniques are intended to prevent error rates getting worse and help SSDs to expand their life time.

*14: NVMe is a trademark of NVM Express, Inc.

# Client SSHD (cSSHD)

Toshiba Solid State Hybrid Drives (SSHD) offers both performance and capacity for PCs and consumer systems. Toshiba as the inventor of flash memory accumulated well-proven technologies through years of development of NAND flash memory, SSD and HDD.

## Mobile SSHD / Mobile Thin SSHD

High performance storage delivering performance and capacity for mobile applications.

| Model Number | Formatted Capacity | Interface | Logical Data Block Length | | NAND Type /Size*6 | Buffer Size*6 | Rotation Speed | Power Supply Voltage | Power Consumption Low Power Idle | Dimensions Height/ Width/ Length | Weight | Environmental Temperature (Operating) | Shock (Operating) | Acoustics (Idle) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | HOST | DISK | | | | | | | | | | |
| **MQ02ABD***H Series** *12 | | | | | | | | | | | | | | |
| **MQ02ABD100H** | 1 TB | SATA-3.0 /ATA-8 | 512 B | 4,096 B | MLC /8 GiB | 64 MiB | 5,400 rpm | 5 V | 0.75 W Typ. | 9.5 mm/ 69.85 mm/ 100.0 mm | 117 g Max | 0 to 60 °C | 3,920 m/s² {400 G} (2 ms half sine wave) | 25 dB |
| **MQ02ABF***H Series** | | | | | | | | | | | | | | |
| **MQ02ABF050H** | 500 GB | SATA-3.0 /ATA-8 | 512 B | 4,096 B | MLC /8 GiB | 64 MiB | 5,400 rpm | 5 V | 0.75 W Typ. | 7.0 mm/ 69.85 mm/ 100.0 mm | 92 g Max | 0 to 60 °C | 3,920 m/s² {400 G} (2 ms half sine wave) | 19 dB |

Column

### Toshiba's SSHD (Solid State Hybrid Drive)

~Hybrid technology ··· using our combined in-house expertise in NAND flash memory, HDD, and SSD technologies~

SSHD (Solid State Hybrid Drive) is an HDD which also has NAND flash memory (NAND) on it. It is also called as "Hybrid Drive" or "Hybrid HDD". This column describes the features (advantages and technologies) of SSHD.

The most essential features of the conventional HDD are "high capacity" and "cost performance". Toshiba's SSHD improved the speed of data read and write, by using NAND as the secondary cache. NAND is the storage device that is used on such as SSDs. The capacity of the data storage per one piece of NAND is very small comparing to one unit in an HDD, however access speed is much faster than an HDD that reads and writes data on the rotational magnetic media.

SSD is a storage device that uses NAND as its main memory. Its key feature is high speed of data reading and writing. Due to the higher cost of SSDs in comparison to HDDs, SSDs become more expensive if a user wants high storage capacity. SSHD utilizing NAND on a high capacity HDD improves performance over a conventional high capacity HDD.

Toshiba's SSHD dynamically learns the access pattern in each system and directs data to the appropriate tiers that are DRAM, NAND and disk media. High speed access is achieved by storing frequently-accessed data to NAND.

Toshiba also develops leading-edge microscopic memory technology in NAND. This experience enables Toshiba to boost the NAND technologies, such as defective blocks management, ECC (Error Correction Code), conversion of logical block address, and wear-leveling.

# Client HDD (cHDD)

Client hard disk drives (HDD) deliver performance, capacity and power efficiency, and are the solution of choice for desktop and notebook PCs and other client systems applications. Toshiba client HDDs are available in a range of capacities in standard form factors (2.5 inch and 3.5 inch) suitable for a broad range of applications. Self-encrypting drives (SEDs), wipe technology models, and FIPS certified models are also available.

## ▶Mobile HDD

Capacity and performance optimized storage for mobile computing applications.

| Model Number | Formatted Capacity | Rotation Speed | Interface | Interface Speed | Logical Data Block Length | | Buffer Size*6 | Power Supply Voltage | Power Consumption | | Dimensions Height/ Width/ Length | Weight | Environmental Temperature (Operating) | Shock (Operating) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | HOST | DISK | | | Read /Write | Low Power Idle | | | | | |
| **MQ01ABD*** Series** AF *12 | | | | | | | | | | | | | | | |
| **MQ01ABD100** | 1 TB | 5,400 rpm | SATA-2.6 /ATA-8 | 3.0 Gbit/s 1.5 Gbit/s | 512 B | 4,096 B | 8 MiB | 5 V | 1.5 W Typ. | 0.55 W Typ. | 9.5 mm/ 69.85 mm/ 100.0 mm | 117 g Max | 5 to 55 °C | 3,920 m/s² {400 G} (2 ms half sine) | |
| **MQ01ABD050** | 500 GB | | | | | | | | | | | 107 g Max | | | |
| **MQ01ABD032** | 320 GB | | | | | | | | | | | | | | |

## ▶Mobile Thin HDD

Capacity and performance optimized storage for mobile and space constrained applications.

| Model Number | Formatted Capacity | Rotation Speed | Interface | Interface Speed | Logical Data Block Length | | Buffer Size*6 | Power Supply Voltage | Power Consumption | | Dimensions Height/ Width/ Length | Weight | Environmental Temperature (Operating) | Shock (Operating) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | HOST | DISK | | | Read /Write | Low Power Idle | | | | | |
| **MQ01ACF*** Series** AF *12 | | | | | | | | | | | | | | | |
| **MQ01ACF050** | 500 GB | 7,278 rpm | SATA-3.0 /ATA8 | 6.0 Gbit/s 3.0 Gbit/s 1.5 Gbit/s | 512 B | 4,096 B | 16 MiB | 5 V | 2.1 W Typ. | 0.80 W Typ. | 7.0 mm/ 69.85 mm/ 100.0 mm | 92 g Max | 5 to 55 °C | 3,430 m/s² {350 G} (2 ms half sine) | |
| **MQ01ACF032** | 320 GB | | | | | | | | | | | | | | |
| **MQ01ABF*** Series** AF | | | | | | | | | | | | | | | |
| **MQ01ABF050** | 500 GB | 5,400 rpm | SATA-3.0 /ATA8 | 6.0 Gbit/s 3.0 Gbit/s 1.5 Gbit/s | 512 B | 4,096 B | 8 MiB | 5 V | 1.5 W Typ. | 0.55 W Typ. | 7.0 mm/ 69.85 mm/ 100.0 mm | 92 g Max | 5 to 55 °C | 3,920 m/s² {400 G} (2 ms half sine) | |
| **MQ01ABF032** | 320 GB | | | | | | | | | | | | | | |
| **MQ01ABF025** | 250 GB | | | | | | | | | | | | | | |
| **MQ01ABU***W Series** AF | | | | | | | | | | | | | | | |
| **MQ01ABU050W** | 500 GB | 5,400 rpm | SATA-3.0 /ATA8 | 6.0 Gbit/s 3.0 Gbit/s 1.5 Gbit/s | 512 B | 4,096 B | 8 MiB | 5 V | 1.5 W Typ. | 0.55 W Typ. | 7.0 mm/ 69.85 mm/ 100.0 mm | 92 g Max | 5 to 55 °C | 3,920 m/s² {400 G} (2 ms half sine) | Self encryption Wipe technology |
| **MQ01ABU032W** | 320 GB | | | | | | | | | | | | | | |
| **MQ01ABU***BW Series** AF | | | | | | | | | | | | | | | |
| **MQ01ABU050BW** | 500 GB | 5,400 rpm | SATA-3.0 /ATA8 | 6.0 Gbit/s 3.0 Gbit/s 1.5 Gbit/s | 512 B | 4,096 B | 8 MiB | 5 V | 1.5 W Typ. | 0.55 W Typ. | 7.0 mm/ 69.85 mm/ 100.0 mm | 92 g Max | 5 to 55 °C | 3,920 m/s² {400 G} (2 ms half sine) | Self encryption FIPS, Wipe technology |
| **MQ01ABU032BW** | 320 GB | | | | | | | | | | | | | | |

# Client HDD (cHDD)

## Desktop HDD

Disk storage for traditional PC and external storage applications.

| Model Number | Formatted Capacity | Rotation Speed | Interface | Interface Speed | Logical Data Block Length | | Buffer Size*6 | Power Supply Voltage | Power Consumption | | Dimensions Height/ Width/ Length | Weight | Environmental Temperature (Operating) | Shock (Operating) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | HOST | DISK | | | Read /Write | Low Power Idle | | | | | |
| **DT01ACA*** Series** AF*12 | | | | | | | | | | | | | | | |
| **DT01ACA300** | 3 TB | 7,200 rpm | SATA-3.0 /ATA-8 | 6.0 Gbit/s 3.0 Gbit/s 1.5 Gbit/s | 512 B | 4,096 B | 64 MiB | 5 V/ 12 V | 6.4 W Typ. | 5.2 W Typ. | 26.1 mm/ 101.6 mm/ 147 mm | 680 g Max | 0 to 60 °C | 686 m/s² {70 G} (2 ms half sine) | |
| **DT01ACA200** | 2 TB | | | | | | | | | | | | | | |
| **DT01ACA100** | 1 TB | | | | | | 32 MiB | | | 3.7 W Typ. | | 450 g Max | | | |
| **DT01ACA050** | 500 GB | | | | | | | | | | | | | | |

## Generic Data Storage HDD

High-Capacity disk storage for desktop PC and external storage applications.

| Model Number | Formatted Capacity | Rotation Speed | Interface | Interface Speed | Logical Data Block Length | | Buffer Size*6 | Power Supply Voltage | Power Consumption | | Dimensions Height/ Width/ Length | Weight | Environmental Temperature (Operating) | Shock (Operating) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | HOST | DISK | | | Read /Write | Low Power Idle | | | | | |
| **MD04ACA*** Series** AF*12 | | | | | | | | | | | | | | | |
| **MD04ACA600** | 6 TB | 7,200 rpm | SATA-3.0 /ATA-8 | 6.0 Gbit/s 3.0 Gbit/s 1.5 Gbit/s | 512 B | 4,096 B | 128 MiB | 5 V/ 12 V | 11.3 W Typ. | 6.0 W Typ. | 26.1 mm/ 101.6 mm/ 147 mm | 770 g Max | 5 to 55 °C | 686 m/s² {70 G} (2 ms half sine) | |
| **MD04ACA50D** | 5 TB | | | | | | | | | | | | | | |
| **MD04ACA500** | 5 TB | | | | | | | | | | | 720 g Max | | | |
| **MD04ACA400** | 4 TB | | | | | | | | | | | | | | |

Column

### Advanced Format

Advanced Format (AF) is the standard that improves formatting efficiency by increasing the length of HDD data sectors to be longer than their traditional size of 512 bytes. The Advanced Format standard was formulated by the International Disk Drive Equipment and Materials Association (IDEMA) in which Toshiba and other HDD manufacturers participate. By establishing the Advanced Format standard, IDEMA aims to ensure that the storage devices supplied by various companies will be compatible with file systems and operating systems (OS) generations that support AF sector technology.
Advanced Format improves formatting efficiency and the reliability of recorded data by increasing the length of data sectors and relative strength of the error detection and correction algorithms. The generation one Advanced Format standards stipulate a physical sector size of 4,096 bytes and includes the ability to logically emulate the older 512-byte sectors (sometimes called “512e”) in order to maintain compatibility with applications or hardware which demand conventional 512-byte sector technology. During emulation, when the host sends the disk drive data to be stored in increments of 512 bytes, the disk drive places the emulated 512-byte sector at an appropriate position within a larger physical 4,096 KB sector and then writes the 4,096-byte sector to the disk media.
Some file systems and operating systems generations have advanced to support the physical 4,096-byte sector as the logical sector size. Such host systems are called “4K native (4Kn)” capable. Since both the physical and logical sector length are 4,096 bytes, emulation of the older 512-byte sectors is no longer required, allowing the 4Kn host to use the available 4Kn disk storage more efficiently.
Toshiba has made available HDDs of the 512-byte emulation type, the 4Kn type, and the 512 native type, to provide the sector technology that will fit the host systems’ specification.

#### Examples of Advanced Format Icons recommended by IDEMA

The symbols below are not necessarily printed on the products with the described features.

- 512-byte emulation (512e)

  The “Advanced Format AF” and “AF” symbols generally means the disk drive supports 512-byte emulation; but it may also be used on disk drives capable of both 512e and 4Kn operation.

- 4K native (4Kn)

  The “Advanced Format 4Kn” and “4Kn” symbols mean the disk drive supports 4K byte sector length only.

# Specialty

Specialty hard disk drives (HDD) are optimized for use in a broad range of commercial / industrial applications, such as video streaming, automotive in-cabin systems. Toshiba Specialty HDD models are available in a variety of standard form factors and specifications providing specific features and operating characteristics designed for commercial and industrial use case.

## Video Stream HDD

High-capacity storage optimized for digital video recorder (DVR), audio/visual (AV), surveillance, and set-top-box (STB) applications.

| Model Number | Formatted Capacity | Rotation Speed | Interface | Interface Speed | Logical Data Block Length | | Buffer Size*6 | Power Supply Voltage | Power Consumption | | Dimensions Height/ Width/ Length | Weight | Environmental Temperature (Operating) | Shock (Operating) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | HOST | DISK | | | Read /Write | Low Power Idle | | | | | |
| **MQ01ABD***V Series** *12 | | | | | | | | | | | | | | | |
| MQ01ABD100V | 1 TB | 5,400 rpm | SATA-2.6 /ATA8 | 3.0 Gbit/s 1.5 Gbit/s | 512 B | 4,096 B | 16 MiB /8 MiB | 5 V | 1.5 W Typ. | 0.55 W Typ. | 9.5 mm/ 69.85 mm/ 100.0 mm | 117 g Max | 0 to 55 °C | 3,920 m/s² {400 G} (2 ms half sine) | |
| MQ01ABD050V | 500 GB | | | | | | | | | | | 107 g Max | | | |
| MQ01ABD032V | 320 GB | | | | | | | | | | | | | | |
| MQ01ABD025V | 250 GB | | | | | | | | | | | | | | |
| **MQ01ABD***VS Series** | | | | | | | | | | | | | | | |
| MQ01ABD100VS | 1 TB | 5,400 rpm | SATA-2.6 /ATA8 | 3.0 Gbit/s 1.5 Gbit/s | 512 B | 4,096 B | 16 MiB /8 MiB | 5 V | 1.5 W Typ. | 0.55 W Typ. | 9.5 mm/ 69.85 mm/ 100.0 mm | 117 g Max | 0 to 55 °C | 3,920 m/s² {400 G} (2 ms half sine) | Secure Pairing |
| MQ01ABD050VS | 500 GB | | | | | | | | | | | 107 g Max | | | |
| MQ01ABD032VS | 320 GB | | | | | | | | | | | | | | |
| MQ01ABD025VS | 250 GB | | | | | | | | | | | | | | |
| **DT01ABA***V Series** | | | | | | | | | | | | | | | |
| DT01ABA300V | 3 TB | 5,940 rpm | SATA-3.0 /ATA8 | 6.0 Gbit/s 3.0 Gbit/s 1.5 Gbit/s | 512 B | 4,096 B | 32 MiB | 5 V/ 12 V | 5.4 W | 4.2 W | 26.1 mm/ 101.6 mm/ 147 mm | 680 g Max | 0 to 60 °C | 686 m/s² {70 G} (2 ms half sine) | |
| DT01ABA200V | 2 TB | 5,700 rpm | | | | | | | 4.7 W | 3.3 W | | | | | |
| DT01ABA100V | 1 TB | | | | | | | | 5.7 W | 3.0 W | | 450 g Max | | | |
| DT01ABA050V | 500 GB | | | | | | | | | | | | | | |

## Large Capacity HDD for External Storage

Large Capacity HDD suitable for Portable Hard Disk.

| Model Number | Formatted Capacity | Rotation Speed | Interface | Interface Speed | Logical Data Block Length | | Buffer Size*6 | Power Supply Voltage | Power Consumption | | Dimensions Height/ Width/ Length | Weight | Environmental Temperature (Operating) | Shock (Operating) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | HOST | DISK | | | Read /Write | Low Power Idle | | | | | |
| **MQ03ABB*** Series** *12 | | | | | | | | | | | | | | | |
| MQ03ABB300 | 3 TB | 5,400 rpm | SATA-3.0 /ATA8 | 6.0 Gbit/s 3.0 Gbit/s 1.5 Gbit/s | 512 B | 4,096 B | 16 MiB | 5 V | 1.70 W Typ. | 0.70 W Typ. | 15.0 mm/ 69.85 mm/ 100.0 mm | 180 g Max | 0 to 60 °C | 2,940 m/s² {300 G} (2 ms half sine) | |
| MQ03ABB200 | 2 TB | | | | | | | | | | | | | | |

## Surveillance HDD

High-capacity storage optimized for surveillance applications.

| Model Number | Formatted Capacity | Rotation Speed | Interface | Interface Speed | Logical Data Block Length | | Buffer Size*6 | Power Supply Voltage | Power Consumption | | Dimensions Height/ Width/ Length | Weight | Environmental Temperature (Operating) | Shock (Operating) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | HOST | DISK | | | Read /Write | Low Power Idle | | | | | |
| **MD04ABA***V Series** *12 | | | | | | | | | | | | | | | |
| MD04ABA500V | 5 TB | Low spin | SATA-2.6 /3.0 | 6.0 Gbit/s 3.0 Gbit/s 1.5 Gbit/s | 512 B | 4,096 B | 128 MiB | 5 V/ 12 V | 6.5 W Typ. | 3.5 W Typ. | 26.1 mm/ 101.6 mm/ 147 mm | 720 g Max | 0 to 70 °C | 686 m/s² {70 G}(2 ms half sine) | |
| MD04ABA400V | 4 TB | | | | | | | | | | | | | | |
| **MD03ACA***V Series** | | | | | | | | | | | | | | | |
| MD03ACA400V | 4 TB | 7,200 rpm | SATA-2.6 /3.0 | 6.0 Gbit/s 3.0 Gbit/s 1.5 Gbit/s | 512 B | 512 B | 64 MiB | 5 V/ 12 V | 11.3 W Typ. | 6.0 W Typ. | 26.1 mm/ 101.6 mm/ 147 mm | 720 g Max | 0 to 70 °C | 686 m/s² {70 G}(2 ms half sine) | |
| MD03ACA300V | 3 TB | | | | | | | | | | | | | | |
| MD03ACA200V | 2 TB | | | | | | | | | | | | | | |

## Automotive HDD

Ruggedized small form factor storage solutions for extreme environmental (temperature, vibration and altitude) applications.

| Model Number | Formatted Capacity | Rotation Speed | Interface | Interface Speed | Logical Data Block Length | | Buffer Size*6 | Power Supply Voltage | Power Consumption | | Dimensions Height/ Width/ Length | Weight | Environmental Temperature (Operating) | Shock (Operating) | Remarks |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | HOST | DISK | | | Read /Write | Low Power Idle | | | | | |
| **MQ01AAD***C Series** *12 | | | | | | | | | | | | | | | |
| MQ01AAD032C | 320 GB | 4,200 rpm | SATA-2.6 /ATA8 | 3.0 Gbit/s 1.5 Gbit/s | 512 B | 4,096 B | 8 MiB | 5 V | 2.0 W Typ. | 0.8 W Typ. | 9.5 mm/ 69.85 mm/ 100.0 mm | 109 g Max | -30 to 85 °C | 2,940 m/s² {300 G} (2 ms half sine) | |
| MQ01AAD020C | 200 GB | | | | | | | | | | | | | | |
| MQ01AAD010C | 100 GB | | | | | | | | | | | | | | |

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