

TOSHIBA Storage Products

**Enterprise SSD**

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**Enterprise High Endurance SSD**

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**Enterprise Mid Endurance SSD**

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**Enterprise Value Endurance SSD**

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**Enterprise Read Intensive SSD**

**Client SSD**

**•**

**Non-SED model**

**•**

**SED model**

**Enterprise HDD**

**•**

**Enterprise Performance HDD**

**•**

**Enterprise Capacity HDD**

**•**

**Enterprise Cloud HDD**

**p.7**

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Toshiba Corporation

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Toshiba

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offers the comprehensive range of storage technologies,

from hard disk drives

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HDDs

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, solid state hybrid drives

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SSHDs

)

, and solid state drives

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SSDs

)

to NAND flash memories

(

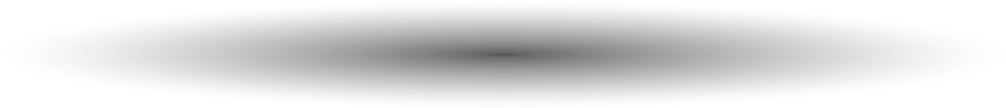
NAND

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\*1

which are for the applications spanning such as the enterprise, mobile, factory

automation, consumer environments.



**SSD**

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Solid State Drive

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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.



**HDD**

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Hard Disk Drive

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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 a double-sided client SSD M.2 module.)

(The photo shows an example of

2.5-inch client HDD.)

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.



Invention

▲

**NAND Flash Memory**

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**Halogen-Free**

Environment

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

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**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 = 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.

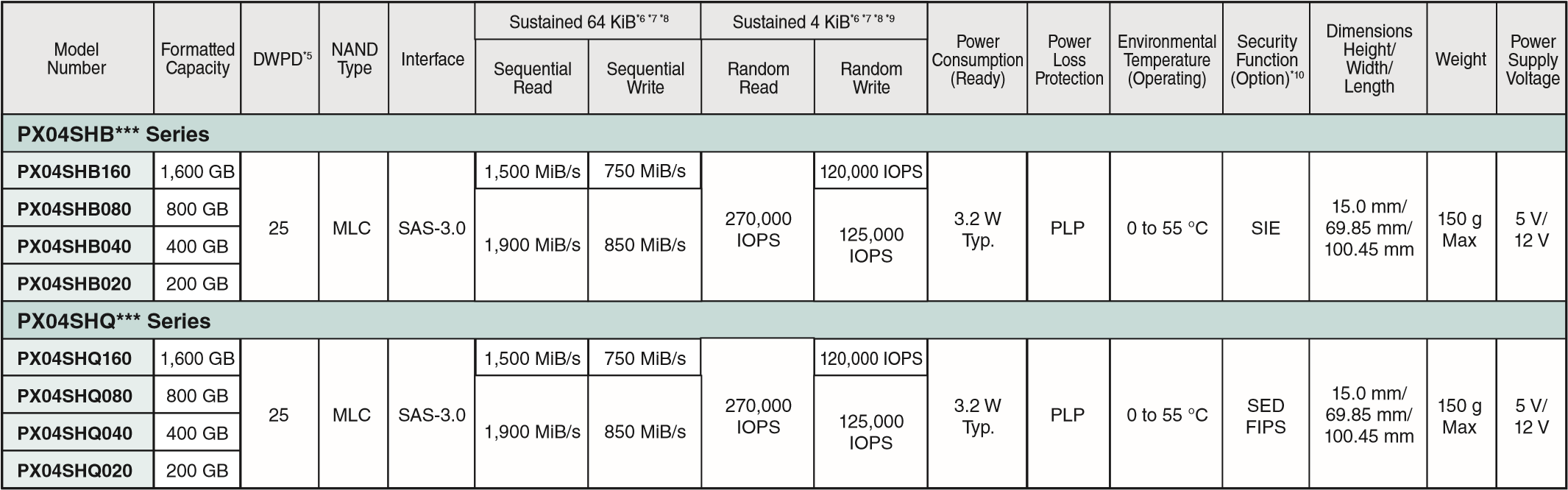
# Enterprise SSD (eSSD)

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

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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.



## Enterprise Mid Endurance SSD

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| High performance enterprise-class solid stat | Formatted Capacity | Rotation Speed | Interface | Interface  Speed | Logical Data | Block Length | Buffer Size\*6 | Power  Supply  Voltage | Power Co | nsumption | 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 | SATA-2.6 | 6.0 Gbit/s | 512 B | 4,096 B | 128 | 5 V/ | 6.5 W | 3.5 W | 26.1 mm/ | 720 g | 0 to | 686 m/s2 |  |
| **MD04ABA400V** | 4 TB | spin | /3.0 | 3.0 Gbit/s  1.5 Gbit/s |  |  | MiB | 12 V | Typ. | Typ. | 101.6 mm/ 147 mm | Max | 70 °C | {70 G}(2 ms half sine) |  |
| **MD03ACA\*\*\*V** | **Series** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **MD03ACA400V** | 4 TB |  |  | 6.0 Gbit/s |  |  |  |  |  |  | 26.1 mm/ |  |  | 686 m/s2 |  |
| **MD03ACA300V** | 3 TB | 7,200 rpm | SATA-2.6 /3.0 | 3.0 Gbit/s | 512 B | 512 B | 64  MiB | 5 V/ 12 V | 11.3 W Typ. | 6.0 W Typ. | 101.6 mm/ | 720 g Max | 0 to 70 °C | {70 G}(2 ms |  |
| **MD03ACA200V** | 2 TB |  |  | 1.5 Gbit/s |  |  |  |  |  |  | 147 mm |  |  | half sine) |  |

## Automotive HDD

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

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Model Number | Formatted Capacity | Rotation Speed | Interface | Interface  Speed | Logical Data | Block Length | Buffer Size\*6 | Power  Supply  Voltage | Power Co | nsumption | 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 |  |  |  |  |  |  |  |  |  | 9.5 mm/ |  |  | 2,940 m/s2 |  |
| **MQ01AAD020C** | 200 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. | 69.85 mm/ | 109 g Max | -30 to 85 °C | {300 G} (2 ms |  |
| **MQ01AAD010C** | 100 GB |  |  |  |  |  |  |  |  |  | 100.0 mm |  |  | half sine) |  |

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**Storage Products**

SSD/SSHD/HDD

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