Data Centre DC500 Enterprise Solid-State Drives (SSDs)

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Performance, Reliability and Consistency

Data Centre 500 Series
Kingston's Data Centre 500 (DC500R / DC500M) series of solid-state drives are high-performance 6Gbps SATA SSDs that use the latest 3D TLC NAND, designed for read-centric and mixed-use server workloads. They implement Kingston's strict QoS requirements to ensure predictable random I/O performance as well as predictable low latencies over a wide range of read and write workloads. They can increase productivity for AI, machine learning, big data analytics, cloud computing, software-defined storage, operational databases (ODB), database applications and data warehousing. Capacities from 480GB, 960GB, 1.92TB, 3.84TB[1]

Enterprise Data Centre SSD
Delivering on business demands for 24/7 uptime and reliability, Kingston Enterprise SSDs offer high-performing storage that combines predictable performance with rigorously tested reliability. Kingston's DC500 Series SSDs offer features that enable data centres to select the most cost-effective SSD for their workload(s). Businesses require results in order to deliver on products, solutions and service level agreements (SLAs). Kingston's DC500 Series SSDs are designed to deliver on these expectations.

DC500R: Read-centric SSD
DC500R is a highly optimised SSD designed for read-centric workloads, enabling data centres to select SSDs tailored for workloads without overspending on more expensive write-intensive SSDs. It delivers I/O speeds and response times (latency) that a data centre can deploy with confidence to ensure high levels of performance in the working application and downstream at the user interface. These are typically defined by applications that require real-time results. Serving large amounts of data and delivering responsive results from a variety of databases and web-based applications can leverage the receptive performance of the DC500R.

DC500M: Mixed-use SSD
DC500M is a powerful SSD designed for mixed-use workload applications where the demand has a more balanced mix of read and write operations. It delivers greater write endurance over a wide range of workloads while maintaining the strict performance consistency requirements designed into all of Kingston's data centre SSDs. Data centres that host databases and various web-based applications can leverage the predictable I/O and latency performance while controlling infrastructure costs.

End-to-end Protection
The DC500 series SSDs incorporate end-to-end data path protection to help guarantee that all user data transferred into the SSD is protected against transient errors. The DC500R and DC500M both include on-board power-loss protection (PLP) via power capacitors and firmware. This ensures data-in-flight is written to the NAND Flash memory in the event of unexpected power loss. Additionally, PLP ensures that the drives' mapping table (FTL) is updated prior to power being removed from the drive. These power loss safeguards reduce the chance of data loss and ensure that the drive will successfully re-initialise on the next power-up of the system.

Quality of Service (QoS)
The DC500 Series delivers on QoS ([2],[3],[4]) with consistency, predictability of latency (response time) and IOPS (IOs per Second) performance while servicing balanced read and write workloads. Performance predictability is essential for web hosting applications that must deliver on SLAs promised to customers. The DC500 series efficiency produces the reliability needed for web server applications that require read-centric drives or mixed-use intensive workloads where uptime is mission critical.

Application use cases
Designed for service providers running a wide range of customer applications including:
- Virtualisation
- High-speed databases
- High-bandwidth media streaming
- SQL server reporting services (SSRS)
- SAP
- BI, ERP, CRM, GL, OLAP, OLTP, ERM and EDW workloads
- Cloud service providers

Both DC500R and DC500M feature enterprise-class reliability with end-to-end data path protection, SMART health monitoring and strong ECC. They are backed by legendary pre and post-sales support along with a five-year limited warranty.[7]

- Predictable random I/O performance and latencies over a wide range of workloads
- Read-centric design for performance in high read-intensive workloads (DC500R)
- Mixed-use design for balanced performance in high read/write-intensive workloads (DC500M)
- Configurable over-provisioning
- On-board power loss protection (PLP)

Features/specs on reverse ››

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FEATURES/BENEFITS

> **Optimised for read-intensive applications (DC500R)** — The responsiveness that results from low latency and consistent I/O performance delivers the QoS that businesses need for demanding read-centric workloads.

> **Optimised for mixed-use applications (DC500M)** — An exceptional balance of consistent I/O delivery and high read and write IOPS performance to manage a wide range of transactional workloads.

> **Reduce application latencies** — Data centres that host databases and various web-based applications can leverage the predictable I/O and latency performance.

> **Data Integrity Protection** — ECC protection with advanced read/disturb management safeguards against data corruption for end-to-end data protection.

> **On-board Power Loss Protection (PLP)** — Reduce the possibility of data loss and/or corruption upon ungraceful power-failure via power capacitors and firmware.

SPECIFICATIONS

> **Form Factor** 2.5 Inch

> **Interface** SATA Rev. 3.0 (6Gb/s) – with backwards compatibility to SATA Rev. 2.0 (3Gb/s)

> **Capacities**[1] 480GB, 960GB, 1.92TB, 3.84TB

> **NAND** 3D TLC

> **Self-Encrypting Drive (SED)** AES 256-bit encryption

> **Sequential read/write: (DC500R)**
480GB – 555MBs/500MBs 960GB – 555MBs/525MBs
1.92TB – 555MBs/525MBs 3.84TB – 555MBs/520MBs

> **Steady-state 4k read/write: (DC500R)**
480GB – 98,000/12,000 IOPS 960GB – 98,000/20,000 IOPS
1.92TB – 98,000/24,000 IOPS 3.84TB – 98,000/28,000 IOPS

> **Sequential read/write: (DC500M)**
480GB – 555MBs/520MBs 960GB – 555MBs/520MBs
1.92TB – 555MBs/520MBs 3.84TB – 555MBs/520MBs

> **Steady-state 4k random read/write: (DC500M)**
480GB – 98,000/58,000 IOPS 960GB – 98,000/70,000 IOPS
1.92TB – 98,000/75,000 IOPS 3.84TB – 98,000/75,000 IOPS

> **Quality of service (latency)**[2, 3, 4] - TYP read/write: <500 µs / <2 ms

> **Hot-plug capable**

> **Static and dynamic wear levelling**

> **Enterprise SMART tools** reliability tracking, usage statistics, life remaining, wear levelling, temperature

> **Power loss protection** tantalum capacitors

> **Endurance**
DC500R:
480GB – 438TBW[5] (0.5 DWPD)[6] 960GB – 876TBW[5] (0.5 DWPD)[6]
1.92TB – 1752TBW[5] (0.5 DWPD)[6] 3.84TB – 3504TBW[5] (0.5 DWPD)[6]
DC500M:
480GB – 1139TBW[5] (1.3 DWPD)[6] 960GB – 2278TBW[5] (1.3 DWPD)[6]
1.92TB – 4555TBW[5] (1.3 DWPD)[6] 3.84TB – 9110TBW[5] (1.3 DWPD)[6]

> **Power consumption**
Idle: 1.56W Average: 1.6W Max read: 1.8W Max write: 7.5W

> **Storage temperature** -40°C ~ 85°C

> **Operating temperature** 0°C ~ 70°C

> **Dimensions** 69.9mm x 100mm x 7mm

> **Weight** 92.34g

> **Vibration operating** 2.17G peak (7–800Hz)

> **Vibration non-operating** 20G peak (10–2000Hz)

> **MTBF** 2 million hours

> **Warranty/support**[7] limited 5-year warranty with free technical support

PART NUMBERS

DC500R (Read-Centric)

SEDC500R/480G
SEDC500R/960G
SEDC500R/1920G
SEDC500R/3840G

DC500M (Mixed-Use)

SEDC500M/480G
SEDC500M/960G
SEDC500M/1920G
SEDC500M/3840G

The cryptographic functions mentioned in this section are implemented in the firmware of the product. The cryptographic functions of the firmware can be changed only during the manufacturing process and cannot be changed by a standard user. The product is designed for installation by the user in accordance with the step-by-step instructions in the installation user guide supplied with the product. It can therefore be used without further substantial support from the supplier.

1. Some of the listed capacity on a Flash storage device is used for formatting and other functions and is thus not available for data storage. As such, the actual available capacity for data storage is less than what is listed on the products. For more information, go to Kingston's Flash Guide at kingston.com/flashguide.
2. Workload based on FIO, random 4KB QD=1 workload, measured as the time taken for 99.9% of commands to finish the round-trip from host to drive and to host.
3. Measurement taken once the workload has reached a steady state but including all background activities required for normal operation and data reliability.
4. Based on 960GB capacity.
5. Total Bytes Written (TBW) is derived from the JEDEC Enterprise Workload (JESD219A).
6. Drives Writes Per Day (DWPD).
7. Limited warranty based on 5 years or SSD "Life Remaining", which can be found using the Kingston SSD Manager (kingston.com/SSDManager). A new, unused product will show a wear indicator value of one hundred (100), whereas a product that has reached its endurance limit of program erase cycles will show a wear indicator value of one (1). See kingston.com/wa for details.