

DATA CENTER DC500 ENTERPRISE SOLID-STATE DRIVES (SSDS)

Performance, Reliability and Consistency

Data Center 500 Series

Kingston's Data Center 500 (DC500R / DC500M) Series of solid-state drives are high performance 6Gbps SATA SSDs using 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 productivities within 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, 7.68TB.[1]

Enterprise Data Center SSD

Delivering on business demands for 24/7 uptime and reliability, Kingston Enterprise SSDs offer performance storage that combines performance predictability as well as rigorously tested reliability. Kingston's DC500 Series SSDs offer features that enable data centers to select the most cost effective SSD for their workload(s). Businesses require results as they deliver on products, solutions and service level agreements (SLA's). Kingston's DC500 Series SSDs are designed to deliver on these expectations.

DC500R: Read-centric SSD

DC500R is a highly optimized SSD designed for read-centric workloads enabling data centers 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 center 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 requiring real-time results. Serving large amounts of data, 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 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 all while maintaining the strict performance consistency requirements designed into all of Kingston's Data center SSDs. Data centers hosting 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. DC500R / DC500M both include on-board (PLP) power loss protection (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 for data loss and ensure that the drive will successfully re-initialize 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 SLA's promised to customers. The DC500 series efficiency produces the reliability for web server applications requiring 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: • Virtualization • 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.[5]

- 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 (PLP) power loss

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FEATURES / BENEFITS

Optimized for read-intensive applications (DC500R) — Responsiveness from low latency and consistent I/O performance delivers businesses the QoS needed in demanding read-centric workloads.

Optimized 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 center's hosting 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 (PLP) Power Loss Protection — Reduce the possibility of data loss and/or corruption on ungraceful power-fails 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, 7.68TB

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
7.68TB – 545MBs/490MBs

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
7.68TB – 99,000/25,000 IOPS

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

Steady-state 4k 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 Leveling

Enterprise SMART tools
reliability tracking, usage statistics, life remaining, wear leveling, temperature

Power Loss Protection
Tantalum Capacitors

Endurance
DC500R:
480GB — 438TBW[5] (0.5 DWPD/5yrs)[6] (0.8 DWPD/3yrs)[6]
960GB — 876TBW[5] (0.5 DWPD/5yrs)[6] (0.8 DWPD/3yrs)[6]
1.92TB — 1752TBW[5] (0.5 DWPD/5yrs)[6] (0.8 DWPD/3yrs)[6]
3.84TB — 3504TBW[5] (0.5 DWPD/5yrs)[6] (0.8 DWPD/3yrs)[6]
7.68TB — 9345TBW[5] (0.6 DWPD/5yrs)[6] (1.1 DWPD/3yrs)[6]

DC500M:
480GB — 1139TBW[5] (1.3 DWPD/5yrs)[6] (2.1 DWPD/3yrs)[6]
960GB — 2278TBW[5] (1.3 DWPD/5yrs)[6] (2.1 DWPD/3yrs)[6]
1.92TB — 4555TBW[5] (1.3 DWPD/5yrs)[6] (2.1 DWPD/3yrs)[6]
3.84TB — 9110TBW[5] (1.3 DWPD/5yrs)[6] (2.1 DWPD/3yrs)[6]

Power consumption
Idle: 1.3W
Average Read: 1.45W
Max Read: 1.65W
Average Write: 4.5W
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





KINGSTON PART NUMBERS

DC500R (Read-Centric)	DC500M (Mixed-Use)
SEDC500R/480G	SEDC500M/480G
SEDC500R/960G	SEDC500M/960G
SEDC500R/1920G	SEDC500M/1920G
SEDC500R/3840G	SEDC500M/3840G
SEDC500R/7680G	

1. Some of the listed capacity on a Flash storage device is used for formatting and other functions and thus is 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 percentile of commands to finish the round-trip from host to drive and to host.
3. Measurement taken once the workload has reached 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 when the usage of an NVME SSD as indicated by Kingston's implementation of the Health attribute "Percentage Used" reaches or exceeds a normalized value of one hundred (100) as indicated by the Kingston SSD Manager (kingston.com/SSDManager). For NVMe SSDs, a new unused product will show a Percentage Used value of 0, whereas a product that reaches it warranty limit will show a Percentage Used value of greater than or equal to one hundred (100).

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