Maintain consistent performance with SSDs made by an industry leader in data center memory solutions.

Keep your data center running smoothly with reliable, high-performance Samsung SSDs.

In order for data centers to operate efficiently, they must deliver exceptional, consistent performance with low latency. Because they handle various read and write workloads and must operate 24/7, it is critical that data centers maintain high stability.

And most importantly, data centers are continually exposed to risk of data corruption or deletion caused by unforeseen power outages. In order to keep data centers up and running efficiently, IT and executives are continually seeking high-performing and reliable memory solutions.

As a global leader in memory technology, Samsung is able to offer data centers superb solid state drives (SSDs) that deliver exceptional performance with high dependability, for uninterrupted operation regardless of power losses. Using its vast expertise and experience in cutting-edge SSD technology, Samsung memory solutions help data centers operate at a high performance level, 24/7, 365 days a year. Plus, Samsung provides end-to-end integration as the sole manufacturer of all the SSD components, for quality assurance and the utmost compatibility. In fact, Samsung has developed the 845DC EVO to be specifically tailored to the needs of data centers.

Samsung 845DC EVO SSD delivers:

- **Exceptional performance.** Low latency rate and consistently high performance using NAND flash memory and integration of an optimized controller.
- **Outstanding reliability.** Enterprise-grade power-loss protection architecture, advanced signal processing algorithms for integrity assurance, SMART technology monitoring for failure detection.
- **End-to-end integration.** Single-source component manufacturing for synergistic performance, compatibility and quality.

Obtain superb performance with low latency in both read and write operations.

To be well-suited for a data center environment, an SSD must maintain sustained performance over extended periods of time and provide mixed performance for the various workloads that simultaneously access the device. Plus, the SSD must deliver performance consistency to satisfy Quality of Service (QoS) requirements.

Maintain a high-level of sustained performance using the best quality components.

The Samsung 845DC EVO is specifically designed and optimized to excel in virtually any data center scenario, performing best when it matters the most. This enterprise-level, high-performance SSD offers sustained random and sequential read/write performance for diverse RAID configurations. When compared to the industry standard, the 845DC EVO delivers two to three times faster performance, making it the ideal device for data center environments.

The NAND chips used in the 845DC EVO are carefully selected from the highest-quality 3-bit MLC NAND flash wafers, tuned for high endurance and then tested at both the component and system level before they are determined appropriate for use in the SSD.

![Figure 1. Performance comparison of 845DC EVO versus the industry standard SSD](image-url)
Optimize your data center operations with enterprise-level performance and dependability.

Designed for read intensive data centers.

Because data center SSDs have to serve requests from diverse applications, such as web applications, email services, search engines and databases with numerous kinds of services, mixed workload input/output (IO) performance is extremely important. The I/O workloads generated involve a combination of various read/write ratios, request sizes and Native Command Queuing (NCQ) queue depths (QDs), depending on the type of service. Plus, the SSDs must do so in multiple virtual machines (VMs) on multi-core processors.

The 845DC EVO is especially designed to answer these needs by providing outstanding performance for the various mixed workloads that access a server simultaneously. For various read/write ratios, the 845DC EVO presents overall superior performances over the industry standard SSD. The 845DC EVO delivers up to 26 percent superior performance over the industry standard, which contributes greatly to a data center’s total performance.

Deliver consistent performance with low latency.

Also important in data center storage is the QoS, which is determined by the percentage of response times falling below a given value. In other words, the QoS is measured by the consistency of steady performance the device delivers. Low latency is also necessary to satisfy QoS requirements. Storage QoS is particularly important in cloud data center environments, which are expected to provide a guaranteed Service Level Agreement (SLA) through parallel and realtime processing.

The following figure illustrates a scenario where multiple VMs share one SSD. Each VM is allocated to a different customer with the same SLA and is expected to deliver identical performance. If a particular VM accesses the SSD while it is undergoing internal SSD functions, such as garbage collection (GC), the VM will show unexpected performance degradations. This degradation violates the SLA and negatively impacts the user experience, and exemplifies why consistent performance is mandatory for data center SSDs.

By combining the 3-bit MLC NAND flash memory with Samsung’s optimized SSD controller, the 845DC EVO delivers improved performance and consistent I/O latency.
Experience outstanding reliability you can truly depend on.

The Samsung 3-bit MLC NAND flash technology also improves lifetime reliability with its included proprietary advanced Error-Correcting Code (ECC) and NAND flash management.

Features include:
**Advanced ECC engine and end-to-end data protection.**

Another key feature of the 845DC EVO is its advanced signal processing algorithms.

One of the most critical algorithms in the 845DC EVO is the ECC engine, which detects signal discrepancies and proactively remedies them in real time. This process significantly improves the reliability of the SSD, so you can ensure the integrity of the data read from each NAND chip.

End-to-end data protection extends error detection through the entire path from host interface to the NAND flash memory in the SSD.

Other specific algorithms monitor every endurance cycle and adaptively tune each cell for higher endurance. At the same time, wear leveling and block replacements are managed proactively by periodic monitoring of the effective endurance level of the NAND.

**SMART technology.**

Self-Monitoring, Analysis and Reporting Technology (SMART) monitors the computer drives to detect and report on various reliability indicators. When a failure is anticipated, the SMART technology warns the user of impending driver failure, providing the user time to replace the ailing drive, and thereby avoiding data loss or unexpected outages. However, SMART can only warn of predictable errors such as mechanical problems, but not ones that result from unpredictable failures such as electrical surges, which have no measurable variables to track and analyze.

In addition, SMART-enabled drives are capable of reporting SMART status, indicating that the drive will not perform within the manufacturer’s specifications. So rather than complete data loss, the drive may simply begin to run slower.

**Dynamic Thermal Guard protection.**

The 845DC EVO is equipped with the Dynamic Thermal Guard protection mechanism that automatically regulates the SSD’s temperature internally and protects it from overheating. When the temperature exceeds a safe threshold, the 845DC EVO internally delays the handling of requests to enable the temperature to drop back down to normal operating levels, thereby protecting both the user’s data and the hardware.

**Power loss protection.**

In normal power off conditions, the host server allocates time to preserve data integrity by transmitting standby commands to the devices. However, in the event of an unexpected power loss, the cached data in the device’s internal buffers (DRAM) can be lost. Unexpected power loss can result from users unplugging the power from the system without prior notice, sudden battery loss, unexpected power outages or users unplugging devices from the system.

To prevent data loss, the 845DC EVO has been designed with power loss protection architecture. Upon immediate detection of an external power failure, the SSD uses the electricity from a tantalum capacitor to provide enough time to transfer the cached data in DRAM to the flash memory, ensuring no data loss.
Choose one end-to-end solution to ensure seamless integration.

The three most crucial components of any SSD are the NAND flash memory, the controller and the firmware.

The NAND flash memory performs the critical task of storing your valuable data. And the controller and the firmware work together to accomplish the complex and essential tasks of managing data storage and maintaining the performance and lifespan of the SSD. Integration of each component is critically important in creating a high-quality, dependable SSD you can trust.

Samsung is one of the few manufacturers that actually designs all three of these components in-house.

And among those who do design all the components themselves, Samsung has the most experience in the SSD market. Because Samsung has intimate knowledge of every component and its parts, it can fine-tune them at each stage of development to ensure they work together perfectly.

While generic controller manufacturers must optimize their chips to work with both ONFI and Toggle NAND, Samsung engineers pour their design know-how into making Toggle NAND work perfectly with its own proprietary controller technology.

This means Samsung engineers can focus all their efforts toward one common specification and goal: performing the crucial task of storing and protecting your precious data. That’s why integration matters.

Entrust your data center to the experts in memory for more than 20 years.

As demand for quality of service (QoS) in performance and enhanced storage security increases in the data center environment, it is vitally important that your SSDs can handle the task. Plus, your SSDs must do so 365 days a year without interruption to ensure not one single megabyte of data is lost. With consistent performance, power loss protection and secure AES data encryption, you can count on the 845DC EVO SSD to keep your data center up and running, efficiently, reliably, safely and continually.

And because Samsung manufactures each component, from the NAND and controller to the DRAM and firmware, our engineers can ensure the components all work together seamlessly. As a major player in the worldwide memory market for more than 20 years, Samsung has a wealth of knowledge and expertise in NAND manufacturing.

So it makes perfect sense to partner with an experienced memory technology leader. In the end, after all, it’s your priceless data that’s at stake.
## Specifications

<table>
<thead>
<tr>
<th>Specifications</th>
<th>845DC EVO</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Capacity</strong></td>
<td>240GB, 480GB, 960GB is Available</td>
</tr>
<tr>
<td><strong>Application</strong></td>
<td>Mixed and Read-centric Usages are Recommended</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>Max. 63g (960GB)</td>
</tr>
<tr>
<td><strong>Dimensions (L x W x H)</strong></td>
<td>100.00 ± 0.25 x 69.85 ± 0.25 x 6.80 ± 0.20 mm</td>
</tr>
</tbody>
</table>
| **Interface**           | Serial ATA 6Gb/s (Compatible with SATA 3Gb/s and SATA 1.5Gb/s)  
                           | Fully Complies with ATA/ATAPI-7 Standard (Partially Complies with ATA/ATAPI-8)  
                           | Support Native Command Queuing (NCQ): Up to 32 depth  
                           | Asynchronous Signal Recovery |
| **Form Factor**         | 2.5" Type |
| **Performance**         | Samsung 19 nm Toggle 3-bit MLC NAND  
                           | Sequential Read: Up to 530 Mbps  
                           | Sequential Write: Up to 410 Mbps  
                           | Random Read: Max. 87,000 IOPS (4 KB, QD 32)  
                           | Random Write: Max. 14,000 IOPS (480 GB, 960 GB)  
                           | 99.90% Quality of Service (4 KB, QD 32)  
                           | Read: 0.6 ms / Write: 7 ms  
                           | Max Quality of Service: Read: 3 ms / Write: 8 ms  
                           | Random (4 KB) Read: 55 us / Write: 45 us  
                           | Random (4 KB) Read: 115 us / Write: 55 us  
                           | Sequential (4 KB) Read: 6 ms / Write: 7 ms  
                           | Sequential (4 KB) Read: 3 ms / Write: 8 ms  
                           | Sequential (4 KB) Read: 55 us / Write: 45 us  
                           | Sequential (4 KB) Read: 115 us / Write: 55 us  
                           | **Reliability**          | 2,000,000 hours Mean Time Between Failures (MTBF)  
                           | **Terabytes Written (TBW)** | 240 GB: 150 TBW / 480 GB: 300 TBW / 960 GB: 600 TBW  
                           | **Power Consumption**     | Active Read / Write: 2.7 Watt / 3.8 Watt / Idle: 1.2 Watt  
                           | **Temperature**          | Operating: 0°C to 60°C (32°F to 140°F) / Non-operating: -45°C to 85°C (-49°F to 185°F)  
                           | **Humidity**             | 5% to 95%, Non-condensing  
                           | **Vibration**            | Non-operating: 20 - 2,000 Hz, 20 G  
                           | **Shock**                | Non-operating: 1,500 G, Duration 0.5 ms sec, 3 Axis  
                           | **Certification**        | CE, KCC, BSMI, VCCI, C-Tick, FCC, IC, cTUV, CB  
                           | **RoHS Compliance**      | RoHS2 |

Actual performance may vary depending on use conditions and environment. Performance measured using FIO with queue depth 32. Measurements are performed on the whole logical block address (LBA) range. Write cache enabled. 1 MB/sec = 1,048,576 bytes/sec was used in sequential.

---

**SAMSUNG**

For complete product information and accessories, visit samsung.com/business or samsung.com/ssd  
Product Support: 1-800-SAMSUNG or 1-866-SAM4BIZ  
Follow Us: [youtube.com/samsungbizusa](https://youtube.com/samsungbizusa) | [@SamsungBizUSA](https://twitter.com/SamsungBizUSA)

---

Samsung Electronics has been named 2013 ENERGY STAR Partner of the Year in the product manufacturing category by the U.S. Environmental Protection Agency (EPA).

---

©2014 Samsung Electronics America, Inc. Samsung is a registered trademark of Samsung Electronics Corp., Ltd. Specifications and designs are subject to change without notice. Non-metric weights and measurements are approximate. Intel, the Intel logo, Intel Core and Core Inside are all trademarks of Intel Corporation in the U.S. and other countries. All brands, product, service names and logos are trademarks and/or registered trademarks of their respective manufacturers and companies. See samsung.com for detailed information. SSD-845DC/EV080G-JUL14T