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Solid State Drive Market Assessment, By Form Factor [2.5”, M.2, mSATA, U.2], By Interface [SATA, SAS, NVMe], By Capacity [Below 500 GB, 500 GB - 1 TB, 1 TB - 4 TB, Above 4 TB], By Industry [Automotive, Healthcare, Telecommunication, Media & Entertainment, Surveillance & Security, Geoscience & Energy, Others], By Region, Opportunities and Forecast, 2016-2030F

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Abstracts

Global solid-state drive market has experienced significant growth in recent years and is expected to maintain a strong pace of expansion in the coming years. With projected revenue of approximately USD 40.31 billion in 2022, the market is forecasted to reach a value of USD 125 billion by 2030, displaying a robust CAGR of 15.2% from 2023 to 2030.

Solid-state Drives (SSDs) provide several benefits over traditional Hard Disk Drives (HDDs). They are extremely fast, leading to quick boot times and program loading. SSDs have increased durability due to the lack of moving components and have higher energy efficiency, prolonging the life of laptop batteries.

The solid-state drive market is expanding rapidly, propelled by rising demand for quicker data access in laptops and servers. Also, lowering SSD prices makes them more affordable to customers. Consequently, the development in SSD technology, such as NVMe, are improving performance and propelling market growth.

Due to their outstanding performance, NVMe SSDs have greatly increased the solid-

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state drive (SSD) market. NVMe (Non-Volatile Memory Express) SSDs provide ultra-low latency and high bandwidth when compared to regular SSDs, leading to new storage system advancements. For example, SpanDB, an LSM-tree-based KV store, uses NVMe SSDs for selective deployment. The method increases data processing speed and decreases latency, as demonstrated by an 8.8 throughput increase and a 9.5-58.3% reduction in latency in RocksDB, a popular KV system. These benefits make NVMe SSDs a crucial driver in the SSD market's growth, as they offer more efficient and cost-effective storage and processing of data solutions for a variety of applications and services.

For instance, in June 2023, ADATA Technology unveiled the LEGEND 970 SSD, which leverages PCIe 5.0 technology for maximum speeds of 10,000MB/s and has a unique aluminum alloy heatsink with a micro-fan for effective cooling, intending to set new norms in high-speed storage solutions .

Decreasing Cost of SSDs Promoting the Market’s Growth

The solid-state drive market is expanding rapidly, owing mostly to the falling cost per gigabyte. SSD prices have steadily decreased due to improved manufacturing techniques, making them more accessible for individuals and enterprises alike. SSDs are quickly replacing conventional hard disk drives as a preferred storage option in various applications due to their improved performance, durability, and energy economy. The trend is projected to continue as SSD technology progresses, making it a standard in laptops, data centers, gaming systems, and a variety of other devices, consolidating its storage market domination.

For example, in April 2023, The SE880 external SSD from ADATA Technology has USB 3.2 Gen2 x2, a Type-C interface, and speeds of up to 2000 MB/s in a highly compact form suitable for video makers and console gamers.

AI and Machine Learning are Reshaping the Solid-State Drive Market

The global solid-state drive market is expanding significantly, propelled by the increasing use of AI and machine learning. These workloads demand swift data access and processing, making SSDs crucial for organizations in these fields. SSDs offer high-speed data retrieval and low-latency performance required for tasks like AI model training and inference. As AI and machine learning become more widespread across industries, the SSD market is set to grow, with organizations recognizing the speed and efficiency benefits of SSD technology to meet the computational needs of these

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advanced applications.

For example, in May 2023, Micron introduced the Crucial Pro Series, which includes high-performance memory and storage systems aimed at gamers, content producers, and professionals. The Crucial T700 Gen5 SSD has sequential read/write speeds of up to 12,400MB/s and 11,800MB/s, respectively, and Crucial Pro DRAM boosts system performance, bandwidth, and responsiveness.

Dominance of M.2 Form Factor in Solid-State Drive Market

The M.2 form factor has become dominant in the global solid-state drive market owing to its compact size and exceptional performance. Its slim and small design allows for easy integration into laptops, ultrabooks, and compact desktops, making it highly versatile. M.2 SSDs use the NVMe protocol, offering faster data transfer speeds compared to traditional SATA SSDs. Subsequently, they have become the preferred choice for both consumers & manufacturers, establishing their supremacy in the SSD market, particularly in devices where space constraints & high-speed storage are crucial.

For instance, in April 2023, The MP600 MINI and MP600 CORE XT are two new PCIe Gen4 M.2 Solid State Drives from CORSAIR. The MP600 MINI delivers high-performance storage in a small M.2 2230 form factor, whilst the MP600 CORE XT offers great performance and storage choices in a larger M.2 2280 form factor. Both drives are PCIe Gen3 compliant, allowing for adaptable upgrades.

Asia-Pacific Dominates Solid-State Drive Market

Asia-Pacific is leading with the highest share in the global solid-state drive market. The region houses key manufacturers like Samsung, SK Hynix, and Toshiba Memory, providing a robust supply chain. Rapid urbanization in Asia-Pacific and the growing middle class have resulted in strong demand for consumer electronics and laptops with SSDs. Furthermore, the region's growing e-commerce and cloud computing sectors have accelerated the use of enterprise-grade SSDs. Government initiatives and investments in technical infrastructure, notably in China and South Korea, are consolidating Asia-Pacific's position as the leading force in the global solid-state drive market.

For instance, in January 2023, Micron unveiled the 9400 NVMe SSD, which provides over 30TB of storage, higher performance, and increased power efficiency for

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demanding data center workloads. This high-density drive has redefined PCIe Gen4 storage by outperforming mixed IO and real-world workloads.

Government Initiatives Acting as a Catalyst

The United States Department of Energy is actively boosting the solid-state drive market through its solid-state lighting program. These government initiatives support scientific capabilities, encourage private investment, share trusted information globally, and promote innovative and efficient lighting products that enhance well-being, productivity, and health. Department of Energy estimates indicate that if their efficiency, controls, and connected lighting targets are met, advanced lighting systems could save 6.9 trillion kWh of electricity by 2035. This translates to USD 710 billion in energy cost savings and a 2.1 billion metric tons of carbon dioxide emissions reduction, making it a pivotal driver for the global solid-state drive market.

For example, in August 2023, The CD8P Series data center-class SSDs from KIOXIA America are tuned for PCIe 5.0 performance. They provide better sequential read speed and low latency for data center scenarios and are available in sizes up to 30.72TB and numerous form factors.

Impact of COVID-19

The COVID-19 pandemic had a huge influence on the global solid-state drive market. Before the pandemic, the market expanded due to increased consumer and business demand for high-performance storage systems. However, COVID-19 impacted global supply chains and manufacturing processes. There were shortages of essential components, resulting in temporary price rises and supply limits for SSDs. The global solid-state drive market recovered in the post-pandemic environment. The growth in remote work and online activities raised demand for laptops and data center storage, resulting in a faster rate of SSD adoption. SSD costs steadied as supply chain difficulties resolved, making them more affordable. The pandemic highlighted the crucial role of quick and reliable storage, strengthening SSDs' commercial relevance.

Future Market Scenario

> The rise of edge computing will increase demand for high-performance, dependable SSDs in edge devices, allowing for speedier data processing closer to the source.

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SSDs with quad-level cell (QLC) and penta-level cell (PLC) cells are predicted to gain popularity as they provide better storage densities at lower costs, albeit with certain trade-offs in endurance.

Enterprise-class SSDs will continue to gain traction in data centers and server farms, fueling innovation in terms of durability, reliability, and power economy.

Firmware upgrades, such as fail-in-place (FIP) technologies, will increase SSD lifetime and dependability.

Key Players Landscape and Outlook

The global solid-state drive market is highly competitive, with significant players such as Intel Corporation, Kingston Technology Company, Inc., Seagate Technology LLC, ADATA Technology Co., Ltd., and Samsung Electronics Co., Ltd. The market forecast is positive due to expanding demand for high-performance storage solutions, greater data center deployment, and an ongoing fall in SSD pricing. With advances in NAND technology, firmware breakthroughs, and the dominance of interfaces like as NVMe and PCIe, the SSD market is projected to grow further, delivering greater capacities, increased cost-efficiency, and enhanced performance to meet a wide range of consumer and corporate applications.

In May 2023, KIOXIA America unveiled the BG6 Series PCIe 4.0 SSDs, which featured the company's 6th generation BiCS FLASH 3D flash memory. These SSDs provide better performance and capacity, making them perfect for business and consumer laptops and desktop computers .

In August 2023, Transcend unveiled the ESD300 super-mini portable SSD, which features a USB 10Gbps transfer rate, a small footprint, 2TB capacity, and USB Type-C connection. It provides quick data access and interoperability with a wide range of devices and operating systems .

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