Global Dynamic Random Access Memory (Dram) Market - Growth, Trends, Covid-19 Impact, and Forecasts (2023 - 2028)

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Report description:

The dynamic random access memory (DRAM) market will register a CAGR of approximately 3.18 % from 2022-2027. IoT-infused semi-autonomous vehicles take real-time decisions while partly controlling vehicle operations to avoid accidents and reduce the load from the driver. Along with proximity sensors and cameras, cars are integrated with IoT systems to minimize human error and make driving more comfortable and safer. Thus, increasing the demand for DRAM in mobility solutions and the trends like cloud computing AI, IoT, and mobility combined are expected to drive huge demand for DRAM during the forecast.

Key Highlights
The driving factors for the manufacture of DRAM are rising data centers, increasing dependence on artificial intelligence, machine learning, big data, IoT, industrial and consumer electronics, and ICT infrastructure, among others. Some of the short-term demand for DRAM includes rising requirements for educational and gaming notebooks, continued low and mid tired 5G smartphone launches, increasing GPU demand due to boosting cryptocurrency mining, strong gaming console requirements, and strong home entertainment demand such as TV, smart speaker, set-top box due to the rising disposable income globally.
Furthermore, consumer products, such as tablets and cameras, industrial equipment and sensors, automotive systems, and medical devices, rely upon DRAM flash memory, which is integrated alongside their processors that store data and the code they execute. However, data centers find utilization in DRAM flash memory due to its near real-time response to reading/write requests and high data transfer rate. As demand for massive data processing for artificial intelligence and machine learning applications grows, the trend for DRAM storage is likely to continue to evolve.
Moreover, database and machine learning algorithms for identifications, image recognition, and other applications are expected to be loaded across smart cities, including automotive. Such a trend is expected to drive the need for SSD manufactured from 1GB DRAMs. Thus, indicating the demand for the market.
The increasing price sensitivity with ever-growing features in tablets and smartphones is also driving fewer sales for such

electronic devices. This is expected to reduce the requirement for DRAMs in the market. Additionally, the long-life cycle of DRAMS provides one-time investments for memory solutions unless affected by serious damage. Thus, slowing down the manufacturing demand for DRAMs and adding challenges to the suppliers in the market.
The electronics device sector was significantly affected by the COVID-19 outbreak, as China is one of the major suppliers of raw materials and finished products. The industry amid the pandemic faced a reduction in production, disruption in the supply chain, and price fluctuations. Further, the sales of prominent electronic companies were affected during the period. The travel restriction on both people and products hampered the market's growth in the short run.

Dynamic Random Access Memory Market Trends

Smartphones and Tablets to Hold the Largest Market Share

The emerging memory technologies have enhanced the potential of memory by allowing the storage of more data at a lesser cost than the expensive-to-build silicon chips used by popular consumer electronic gadgets, including cell phones and tablets. Moreover, the usage of mobile and tablet segments is increasing daily, which further boosts the studied market.
In November 2021, Micron Technology Inc. announced its low-power double data rate 5X (LPDDR5X) DRAM for MediaTek's new Dimensity 9000 5G flagship chipset for smartphones had been validated by MediaTek Inc. It is designed for high-end and flagship smartphones; Micron announced that LPDDR5X allows the smartphone ecosystem to unlock the next wave of data-intensive applications powered by artificial intelligence (AI) and 5G innovation.
Furthermore, in November 2021, Samsung announced the launch of LPDDR5X DRAM chips for smartphones and other devices. The launch could bring efficiency and performance improvements to the high-performance DRAM chips portfolio of the company. According to the company, the new LPDDR5X DRAM would get 1.3x faster processing speeds while consuming nearly 20% less power than the older LPDDR5 standard.
Furthermore, many vendors in the market are expanding their production facilities which drive the studied market. For instance, in June 2021, Samsung announced the mass production of its new UFS-based LPDDR5 memory module (uMCP). It combines the fastest LPDDR5 DRAM with the latest UFS 3.1 NAND flash in a single chassis, delivering flagship performance for mid-range mobile devices.
In October 2020, Micron Technology announced the launch of uMCP5, the first universal flash storage (UFS) multichip package with low-power DDR5 (LPDDR5) DRAM. Micron's uMCP5 combines high-performance, high-density, and low-power memory and storage in one compact package, equipping smartphones to handle data-intensive 5G workloads with dramatically increased speed and power efficiency. The multichip package uses Micron's LPDDR5 memory to power advanced mobile features previously only seen in costly flagship devices using discrete products, such as stand-alone memory and storage.
In July 2021, Micron Technology developed 176-layer NAND memory, which it incorporates into products such as DRAM and PCIe 4.0 SSDs. It announced that it is also ready to ship new UFS 3.1 storage modules with this property. Its new offerings are intended to be used as the internal storage found in smartphones and, judging by its specs, might be destined for the high-end models of the near future. Micron asserts that its sequential write and random read speeds are 75% greater than its predecessor, and its general mixed workload performance is boosted by 15% compared to the same.
Moreover, in July 2021, SK Hynix announced that its latest "10anm" DRAM modules are nearly ready for inclusion in next-gen smartphones. It has the fastest transfer rate known to the LPDDR4 standard; furthermore, as the first of its kind to be made using the extreme ultraviolet (EUV) lithography technique, making it more economical in terms of silicon use. SK Hynix has a new form of mobile DRAM that they introduced in early 2021. This "1a" (or fourth-gen 10nm) memory might be LPDDR4; however, the OEM asserts that it holds a new record in transfer speeds for this JEDEC standard: 4,266 megabits per second (Mb/s) while consuming up to 20% less power than its 1z predecessor.

United States to Hold Significant Market Share

In the United States, DRAM chip reliance is almost entirely placed on South Korea, which maintains roughly half the production capacity for DRAM chips worldwide. Furthermore, China and Taiwan account for nearly half of global manufacturing.
The country needs more efficient processing systems, rapidly changing technologies, and high data generation across industries. With the advent of mobile and low-power devices, high-end data centers, and large on-chip caches, another high-priority demand has emerged: non-volatile, dense, and low-energy-consuming memories.
In 2022, according to Cloudscene, there may be about 2,751 data centers in the United States. The data center has become the new unit of computing. DPUs (Data Processing Unit) is an essential element of modern and secure accelerated data centers in which CPUs, GPUs, and DPUs can combine into a single computing unit that is fully programmable. Further, Nvidia estimates that data management drains up to 30% of data center central processing cores.
The companies try to stand out from rivals by adding more potent AI to their DPUs. The Santa Clara (California-based company) introduced its line of data processing units or DPUs, that can move more of the infrastructure in data centers into a chip. The DPU combines programmable Arm CPU cores with its high-performance network interface on a single system-on-chip (SoC).?
According to GSMA, 5G will become the leading network technology in the United States by 2025. 5G will enable the transmission of a vast amount of telecommunications data in a short time, which also means devices would need more storage. This would increase the adoption of DRAM. Additionally, Verizon, AT&T, and T-Mobile Network service providers in the country are actively exploring the commercial potential for 5G modems to provide broadband internet access to premises without any cable or xDSL cabling.
Moreover, many investments in semiconductors and electronics are taking place in the country, further boosting the studied market. For instance, in July 2021, GlobalFoundries (GF), the global leader in feature-rich semiconductor manufacturing, announced its expansion plans for its most advanced manufacturing facility in upstate New York over the coming years. These plans include immediate investments to address the global chip shortage at its existing Fab 8 facility and construct a new fab on the same campus that will double the site's capacity.?

Dynamic Random Access Memory Market Competitor Analysis

The dynamic random access memory market is moderately consolidated owing to many key players continually trying to gain maximum market share. Some major players are Samsung Electronics, SK Hynix, Winbond, and many more. Their ability to constantly innovate the products by investing heavily in research and development has enabled them to gain a competitive advantage over their competitors.

August 2022 - SK Hynix developed its first DDR5 DRAM-based CXL (Compute Express Link) memory samples and strengthened its presence in the next-generation memory solutions market. The CXL memory device is a 96GB product composed of 24Gb DDR5 DRAMs based on 1anm.
July 2022 - Micron Technology announced the commercial and industrial channel partner availability of Micron DDR5 server DRAM to support industry qualification of next-generation Intel and AMD DDR5 server and workstation platforms. As per the company, the new server DDR5 memory maximizes performance for AI, HPC, and data-intensive applications that require more CPU compute capacity and higher memory bandwidth than DDR4 technology can support.

Additional Benefits:

The market estimate (ME) sheet in Excel format

3 months of analyst support

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