

Non-Volatile Memory Market - Growth, Trends, Covid-19 Impact, and Forecasts (2023 - 2028)

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Report description:

The non-volatile memory market is expected to register a CAGR of 10.26% during the forecast period. In the last decade, the growth of the portable systems market attracted the interest of the semiconductor industry in non-volatile memory (NVM) technologies for mass storage applications. Demand for greater efficiency, faster memory access, and low-power consumption drive the NVM market growth.

Key Highlights

In the flourishing consumer electronics industry, users expect their devices to continually become more powerful, provide new functionality with incredible speed, and store more movies, pictures, and music. While flash enabled substantial innovation during the past few decades, a new generation of memory is required as flash hits technology roadblocks, preventing it from scaling much further.

The adoption of flash memories in consumer electronics due to their low price and power consumption is significant for the market's growth. NVM is used in smartphones and wearable devices to enable more storage and faster memory access. The increasing research activities in this space are also driving the market's growth. For instance, in March 2021, Infineon Technologies LLC announced the launch of second-generation non-volatile Static RAMs that are qualified for QML-Q and high-reliability industrial specifications to mainly support non-volatile code storage in harsh environments, including aerospace and industrial applications.

Similarly, in early 2021, Samsung announced the improvement of its MRAM's MTJ function and advanced its 14 nm process to support its flash-type embedded MRAM designed to increase the write speed and density. In addition, the company targets the IC emerging NVM's application in wearables, microcontrollers, and IoT devices.

However, troubles with non-volatile memories in the market are often caused by the read/write endurance and data retention characteristics. For instance, Phase-change memories (PCMs) and flash memories are examples of NVM's with limited endurance.

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These NVM's have little endurance because after undergoing several writing cycles (RESET cycles for PCM, program/erase cycles for flash memory), the memory cells wear out and can no longer reliably store information.

The COVID-19 outbreak negatively impacted several end-user industries of non-volatile memories, such as the smartphone industry. Spurred demand for server and PC memory for stay-at-home activities, driven by important megatrends like cloud computing, AI, and the IoT, is expected to support the growth of non-volatile memory during the forecast period.

Non-Volatile Memory Market Trends

Flash Memory is Expected to Hold a Significant Market Share

The growing demand and penetration of consumer electronics led to device flash memory applications. This memory type finds applications in laptops, GPS, electronic musical instruments, digital cameras, cell phones, and many others. Additionally, it is extensively adopted by data center solution vendors. With exponential growth in the adoption of cloud solutions, the demand for data centers is also surging.

Further, with increasing propensity toward AI/ML applications and IoT devices that require high low latency and high throughput cloud storage, flash storage and enterprise data centers are optimized to train deep neural networks. The growing number and size of data centers are expected to augment demand further.

To cater to the growing demand, vendors operating in the market focus on developing new solutions with better capabilities. For instance, in February 2021, Kioxia Corporation and Western Digital Corp. announced the development of a sixth-generation, 162-layer 3D flash memory technology. This was the company's highest density and most advanced 3D flash memory technology that utilizes many technology and manufacturing innovations.

Furthermore, NOR Flash memory is also gaining traction due to ultra-low-power needs. For instance, in January 2022, Infineon Technologies announced additional development tools to support its family of SEMPER NOR Flash devices. It will further help developers to quickly design safety-critical and inherently secure automotive, industrial, and communication systems.

Similarly, in November 2021, Macronix International Co., Ltd. announced itself as the industry's first Serial NOR Flash memory manufacturer to bring 1.2V devices to mass production. According to the company, the ultra-low-power (ULP), high-speed 120MHz MX25S Serial NOR Flash memories are poised to usher in a new generation of products targeted at applications that include Internet of Things (IoT), wireless communications technologies, WiFi, and Narrowband IoT systems, hand-held and Bluetooth devices, and consumer applications.

Asia Pacific is Expected to Account for a Significant Market Share

The construction of new infrastructure, including data centers, has been growing across various countries of the Asia Pacific region, owing to a surge in demand for online entertainment, telecommuting, and video and voice call services. With the fast development of the digital economy, building large big data centers in countries such as China and India is becoming necessary. China has emerged as the leading country owing to its aggressive approach to the NAND memory business. For instance, Yangtze Memory Technologies Co. Ltd (YMTC), one of China's major memory companies, had shipped 64 layers of NAND domestically in low volumes, including SSDs, with 128-layer production in development and shipments in 2021.

Furthermore, startups in the region that are engaged in developing technologies related to non-volatile memory are receiving several investments. For instance, in April 2021, InnoStar Semiconductor (Shanghai) Co. Ltd raised around USD 100 million in a pre-series A financing round. The funding round was led by Shanghai Lianhe Investment, and new investors who joined the round included state-backed Atlas Capital and KQ Capital. The company aims to use the investment to produce resistive random-access memory (ReRAM) chips and other chips for storage applications.

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Companies in the region are utilizing non-volatile memory for various industrial applications. In November 2021, Floadia Corporation, a provider of Non-Volatile Memory (NVM) technology, announced the availability of its high-quality eNVM (embedded Non-volatile Memory), with product name ZT, supporting 150 degrees C retention of 10 years, in Shanghai Huahong Grace Semiconductor Manufacturing Corporation 180BCD (Z8) platform. Furthermore, the region is also witnessing an increase in R&D activities in Non-Volatile Memory (NVM). In January 2022, Samsung Electronics announced the demonstration of one of the world's first in-memory computing based on MRAM (Magnetoresistive Random Access Memory). Such trends are expected to drive the growth of the studied market in the Asia Pacific region during the forecast period.

Non-Volatile Memory Market Competitor Analysis

The non-volatile memory market is competitive and consists of several major players. The competitive rivalry in this industry is primarily dependent on sustainable competitive advantage through innovation, levels of market penetration, and power of competitive strategy. Since the market is capital intensive, the barriers to exit are high as well. Some of the major players operating in the market include Rohm Co. Ltd, STMicroelectronics NV, Fujitsu Ltd, and Intel Corporation. Some of the recent developments in the market are:

January 2022 - SK Hynix Inc. announced the completion of the first phase of the transaction to acquire Intel's NAND and solid-state drive (SSD) business. According to the company, it has closed the first phase of the transaction by acquiring Intel's SSD business and the Dalian NAND flash manufacturing facility in China.

October 2021 - NSCore Inc. introduced OTP+, One-Time-Programmable Plus, a non-volatile memory solution for IoT technology applications. According to the company, the 40 nm Ultra-Low-Power OTP NVM IP Solution can minimize the need to re-spin the fabrication of an IoT chip, which is critical in the emerging market. In addition, the NSCore OTP+ solution can be reprogrammed and modified, unlike standard OTP Ip solutions.

July 2021 - Micron Technology announced that it began mass shipping the world's first 176-layer NAND Universal Flash Storage (UFS) 3.1 mobile solution. Designed for high-end and flagship phones, Micron's UFS 3.1 discrete mobile NAND memory unlocks the potential of 5G with sequential write and random read speeds of up to 75% compared to previous generations.

Additional Benefits:

The market estimate (ME) sheet in Excel format
3 months of analyst support

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