Silicon Epitaxial Wafer - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2025 - 2030)

Market Report | 2025-04-28 | 100 pages | Mordor Intelligence

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Report description:

The Silicon Epitaxial Wafer Market is expected to register a CAGR of 4.42% during the forecast period.

Key Highlights
- Semiconductor silicon wafer remains the core component of many microelectronic devices and forms the cornerstone of the electronics industry. With digitization and electronic mobility being the current trends in technology, these products are finding applications in many devices.
- Currently, the demand for silicon wafers in the market exceeds the supply in the industry. This factor creates considerable scope for expansion, as the companies utilize this trend to expand their market shares by ramping up production.
- In addition, the demand for small-sized gadgets has increased the requirement for more functionalities from a single device. This means that an IC chip should now house more transistors to support more functionalities. Thus, the advancements in wireless computing devices, such as smartphones and tablets, have helped increase semiconductor designers' design activities. Further, the growing need for miniaturization in electronics (due to the demand for thinner wafers that consume low power) is expected to drive some advancements in the silicon epitaxial wafer market over the forecast period.
- The average prices in the industry are increasing. For instance, the Japanese company, Shin -Etsu Chemical Co . , which holds most of the market share, announced a price hike on all silicon wafer products to rise from 10 % -20 % from April 2021 onwards. The companies are taking advantage of the growing demand, further impacting the revenue accrued. GlobalWafer Co . , the second largest silicon wafer supplier, said that their silicon wafer production lines are fully loaded, coupled with the price hike, which led to an increase in revenue in March, which reached a 12 .99 % yearly increase.
- Consumer-centric end-user industries, such as consumer electronics, have robust demand for silicon wafers, forcing vendors in the industry to expand production facilities while investing in research to innovate.
- Due to COVID-19, China disrupted the country's supply chain and production. Major semiconductor manufacturing industries

have been significantly affected due to China becoming a world production center over the past two to three decades.

Silicon Epitaxial Wafer Market Trends

Power Electronics is Expected to Significant Share

- The growing need for power-efficient products is one of the major factors driving the demand for the epitaxial wafer for power electronics products across all the end-user industries. Therefore, the market vendors are targeting a wide range of industries to mitigate risk and expand their customer base.
- The IGBT and MOSFET markets may continue to increase, but a part of the market is expected to go to SiC, especially when discussing modules for EV/ HEV. Moreover, the demand for power MOSFET is supported by its growing use in replacing insulated-gate, bipolar transistors, and thyristors. Additionally, the significant advantage of using power MOSFET in reinforcing the power efficiency of devices at low voltages further drives the demand for the global power MOSFET market.
- The increasing usage of power electronics in consumer devices also fuels the demand. The growing penetration of smartphones and smart devices, increasing the adoption of IoT devices, and increasing industrial usage are also developing markets for power electronics. The high demand for power electronics devices has also resulted in a shortage of 200 mm wafers in 2018 and 2019. The customer demand is falling because major customers still have vast equipment inventory. The long-term growth in the power electronics market is also driving 300 mm wafer-based production. More than seven global power electronics vendors have announced an investment in new fabrication capabilities to be in production from 2021.
- Imec and Qromis have collaborated for the developed enhancement-mode, p-GaN discrete, and IC power devices on 200 mm QST substrates, with epitaxy layers grown in Aixtron's G5+ C 200 mm MOVCD platform. Both companies have been working on device fabrication, developing GaN power devices, indiscreet and monolithically-integrated ICs forms, and 200 mm QST substrates in an advanced CMOS silicon pilot line. Imec and Qromis have collaborated with Germany-based GaN MOCVD equipment manufacturer, Aixtron on GaN-on-QST epitaxy development. Many industrial experts claim that the number of integrated circuits (IC) semiconductor fabrication plants processing 300 mm wafers worldwide are expected to grow from 15 in 2002 to 138 by 2023.

Asia Pacific is Expected to Hold Major Share

- The semiconductor wafer market is expected to ramp up 200 mm manufacturing between 2021-2022. The demand for 300 mm wafers is expected to grow by 2025; the market studied may also witness advancement and innovation. Due to their dominance in semiconductor manufacturing, Asia-Pacific is also dominating the market looked. The high market price of the SiC substrate and the growing LED demand forced many Asian manufacturers to GaN wafers. However, in 2019-2020, many Chinese LED manufacturers overproduced GaN wafers. The Metalorganic Chemical Vapour Deposition (MOCVD) market is also witnessing a significant overcapacity for GaN LED production compared to what is produced.
- The semiconductor industry of China has been showing an upward trend for the past ten years. According to China's Ministry of Industry and Information Technology, semiconductor sales by Chinese manufacturers reached USD 97.3 billion in 2018, which is around 20% of the global semiconductor revenue for the year. The country aims to produce 40% of the semiconductors it uses by 2020 and 70% by 2025.
- The Chinese government's Made in China 2025 national strategic plan has also been a significant factor in the publications' rise. The central aim of the plan is the growth of the semiconductor industry. Further, China's National Intellectual Property Administration (CNIP) 2021 budget anticipates 2 million filings per year till 2023, which is expected to drive the growth of the studied market.

- Moreover, TSMC cited its interest and finalized its plan to build an advanced 5-nanometer wafer plant in Arizona. The company's board of directors had also approved investing USD 3.5 billion in a wholly-owned foundry in Arizona. It also stated to spend a total of USD 12 billion from 2021 to 2029 to build a 12-inch wafer plant to produce chips using the advanced 5nm process.

Silicon Epitaxial Wafer Industry Overview

The Silicon Epitaxial Wafer Market is moderately competitive and consists of many significant players SweGaN, GlobalWafers Japan CO. Ltd, Siltronic AG, II-VI Incorporated, and Sumco Corporation. None of the major players currently dominate the market in terms of market share. Along with an increased focus on product innovation, the companies also engage in mergers and acquisitions to stay competitive.

- August 2022 - II-VI Incorporated has invested in a USD 100 Million Contract to Supply Tianyu with Silicon Carbide Substrates for Power Electronics to meet the requirements of Tianyu's supply with long-term customers.
- June 2022 - SK Siltron Corporation. Ltd. announced a plan to spend USD 810 million on expanding its domestic capacity by the first half of 2024, from which it plans to ramp up output.

Additional Benefits:

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

Table of Contents:

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