Semiconductor Foundry Market - Growth, Trends, Covid-19 Impact, and Forecasts (2023 - 2028)

Market Report | 2023-01-23 | 100 pages | Mordor Intelligence

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Report description:

The Semiconductor Foundry Market is expected to register a CAGR of 7.54% over the forecast period. Favorable government initiatives and the increasing demand for semiconductor chips are among the key factors driving the growth of the market. With the growing revenues of fabless businesses and the proliferation of 5G and IoT in the industry, the global demand for foundries is expected to accelerate over the forecast period.

Key Highlights
The semiconductor foundry market witnessed strong revenue growth recently. Despite the effects of the pandemic, major vendors operating in this space observed significant revenue growth during the year, which further increased, owing to the growing demand for 5G smartphones and High-performance Computing (HPC) products such as PCs, tablets, game consoles, servers, and 5G base station.
Different business models work together in the semiconductor manufacturing industry, such as processors from Intel and AMD. Intel is an IDM (integrated device manufacturer). Hence, it designs, produces, and assembles its processors by itself. In contrast, AMD processors are designed by AMD (fabless), produced in TSMC's foundry in Taiwan, and then packaged by SPIL (outsourced semiconductor assembly and test - OSAT).
When it comes to chip design, the United States has the dominant share of the market, and in terms of manufacturing, South Korea and Taiwan lead the global market. Fabless vendors such as Qualcomm and Nvidia only engage in the designing of chips and sales, outsourcing the production of chips to other companies such as TSMC.
The rise of East Asia, especially China, is credited to various incentives and subsidies offered by the governments of multiple countries. Some semiconductor firms that design and manufacture in the United States have also established fabrication facilities overseas. Similarly, US design firms that do not operate or own their fabrication facilities contract with overseas companies to manufacture their designs.

Foundries are increasingly focusing on adopting automation, ML, and analytics. The benefits offered by these technologies, such as optimizing the production process and increasing the yield without compromising the quality, are driving their demand. With the high production capacities and reduced costs, vendors are expected to take up higher production contracts, resulting in significantly higher supplies and covering the shortages in various industries.
The cost of building state-of-the-art chip foundries has increased exponentially, which puts pressure on the industry. Performance boosts are slowing down, making specialized chips increasingly attractive. The design decisions that help make chips universal may be sub-optimal for some computing tasks.
Moreover, governments in countries, such as the United States, South Korea, Taiwan, and other major hubs for foundries, are also increasingly investing and incentivizing to expand the industry presence of their respective countries. For instance, the South Korean government recently announced that it plans to invest about USD 451 billion in tax benefits to boost chipmakers' competitiveness amid a critical global shortage of key components. Such trends are expected to propel the respective countries' position in the worldwide market.
Despite the effects of the pandemic, the global semiconductor market observed robust growth in 2020, a trend that continued in recent years. The industry was riddled with a high deficit and increasing demand, leading to a significant supply chain gap primarily attributed to the COVID-19 pandemic. Furthermore, the global shortage of semiconductors led by the COVID-19 pandemic has encouraged players to focus on increasing production capacity. For instance, Semiconductor Manufacturing International Corp (SMIC) indulged in aggressive plans to double its production capacity by 2025 by constructing new chip fabrication plants in different cities, including its recent announcement to establish a new factory in Shanghai's free trade zone.

Semiconductor Foundry Market Trends

Automotive Industry to Hold Significant Market Share

Semiconductors are primary parts of automotive electronic components such as ECUs, Infotainment Systems, and Sensors. The automotive industry has been recovering, driven by the increased demand for safer personal transportation. In addition, the growth in electric and autonomous vehicles has been driving the need for semiconductors.
The European Commission seeks to have at least 30 million electric vehicles on the regions' roads by the end of the decade, i.e., 2030. With the adoption of electric vehicles led by governmental efforts, the demand for semiconductors has also been increasing rapidly for features such as blind-spot detection, backup camera, and essential connectivity features.
The growth in the development of Advanced Driver Assistance Systems (ADAS) also contributes to the development of autonomous vehicles leading to the growth of the market studied. The Indian Ministry of Road and Highway Transport announced that it has been working toward a mandate that brings ADAS into all cars by 2022.
However, various automotive manufacturers face hardships in maintaining production schedules due to the lack of semiconductor-based electronics components. Furthermore, the limited capacity expansion of 8-inch semiconductor production has intensified the shortage in the past few years. In the short term, this has led to price increases. This scenario, coupled with a significant decline in demand for commercial and passenger vehicles globally, negatively impacted the revenues from the automotive segment.
For instance, in April 2022, Ford announced that its Flat Rock assembly plant near Detroit would go idle due to the semiconductor shortage. General Motors also announced that it would be idling a major pickup truck manufacturing plant near Fort Wayne, Indiana, for two weeks in April.

Asia Pacific to Witness Significant Growth

The Asia-Pacific region has the most prominent share of semiconductor foundries globally, with major companies such as TSMC, Samsung Electronics, among others. Taiwan, South Korea, Japan, and China are major countries in the region having a significant market share.
China has a very ambitious semiconductor agenda. Backed by USD 150 billion in funding, the country is developing its domestic IC industry and plans to make more of its chips. Greater China, which encompasses Hong Kong, China, and Taiwan, is a geopolitical hotspot. The US-China trade war is compounding tensions in an area where all the leading process technology is located, forcing many Chinese companies to invest in semiconductor foundries.
China's new five-year plan for 2021-25, recently announced, establishes boosting basic research as a critical priority. Central government spending on basic research has increased by 11% lately, well above the 7% planned for the overall R&D investment and the 6% target for GDP growth. Semiconductors have been designated as one of the seven areas that will be given priority in terms of funding and resources. Firms involved in the design develop nanometer-scale integrated circuits that perform the critical tasks that make electronic devices work, such as computing, storage, network connectivity, and power management.
The number of newly registered chip-related companies in China more than tripled in the first five months of the year, indicating that China is sparing no effort in its pursuit of self-sufficiency in semiconductors. The country relies heavily on imports and US technologies to satisfy its domestic demand. According to the Qichacha, from January 2021 through May 2021, China saw 15,700 new companies involved in everything from designing to manufacturing chips.
China is moving significantly closer to self-reliance in 7nm chip production. China has made breakthroughs in its 7nm chip-making process, reportedly developing tools and know-how for several segments of the manufacturing process amid efforts to reduce reliance on foreign equipment and material vendors.

Semiconductor Foundry Market Competitor Analysis

The Semiconductor Foundry Market is very competitive. The market is highly concentrated due to the presence of various small and large players. All the major players account for a large market share and are focusing on expanding their consumer base worldwide. Some of the significant players in the market are Taiwan Semiconductor Manufacturing Company (TSMC) Limited, Globalfoundries Inc., United Microelectronics Corporation (UMC), Semiconductor Manufacturing International Corporation, Samsung Electronics Co. Ltd (Samsung Foundry), Dongbu Hitek Co. Ltd Overview, and many more.

In March 2022, TSMC announced that Sony Semiconductor Solutions Corporation and DENSO Corporation declared that DENSO would take a stake in Japan Advanced Semiconductor Manufacturing, Inc., TSMC's majority-owned manufacturing subsidiary in Kumamoto Prefecture, Japan, with a USD 0.35 billion investment. With this investment, DENSO will hold more than a 10% equity stake in JASM.
In January 2022, VIS acquired AUO's Fab L3B building and facilities. These acquisitions have enabled it to increase its production capacities, and the company aims to achieve an approximate monthly production capacity of 40,000 8-inch wafers. This allows the company to cater to the constantly increasing mid-term and long-term demand for semiconductors.

Additional Benefits:

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

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