Semiconductor Industry Landscape - Growth, Trends, Covid-19 Impact, and Forecasts (2023 - 2028)

Market Report | 2023-01-23 | 342 pages | Mordor Intelligence

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Report description:

The major segments of the semiconductor industry, semiconductor devices, semiconductor equipment market, and the semiconductor materials market, are expected to register a CAGR of 8.19%, 4.08%, and 4.63%, respectively, over the forecast period (2022-2027).

Key Highlights
The semiconductor industry is estimated to continue its robust growth during the forecast period to accommodate the increasing demand for semiconductor materials in emerging technologies, such as artificial intelligence (AI), autonomous driving, the Internet of Things, and 5G, coupled with competition among key players and consistent spending on research and development.
Furthermore, industrial automation, continuous developments in consumer electronics, and the use of sensors in vehicles are growing semiconductor applications and demand in practically all industry verticals. An increased emphasis on consumer electronics is a key factor driving market expansion. Another factor contributing to gaining a competitive edge is the rising use of smartphones and other consumer goods, which leads to higher expenditure on process equipment.
By employing materials such as silicon (Si), germanium (Ge), and gallium arsenide (GaAs), electronics manufacturers have been able to replace traditional thermionic devices that made electronic items heavy and non-portable. Since the inception of semiconductor elements, there has been a high degree of miniaturization, making electronic equipment more compact and mobile. Silicon is considered the best among all the semiconductor elements available in the current market scenario.
The development of smart factories for semiconductor manufacturing equipment faces several difficulties, including those related to energy supply and availability, worker productivity, and the availability of the technological infrastructure required to make the transition to smart factories. However, these factories will negatively affect current employment and may raise unemployment rates.
The COVID-19 pandemic has increased the demand for semiconductors across the consumer electronics and automotive sectors,

mainly due to the growing adoption of EVs post-pandemic.

Semiconductor Market Trends

Increased Deployment of 5G and Rising Demand for 5G Smartphones to Drive the Market

Semiconductors are crucial for economic competitiveness and national security. Semiconductor innovation is essential to advance the global economy into the digital transformation era, artificial intelligence, and 5Gcommunications. The economic viability of revolutionary applications like augmented and virtual reality, the Internet of Things, Industry 4.0 technology, and self-driving automobiles is rapidly approaching.
5G, or the fifth generation of wireless technology for digital cellular, is driving huge potential for high-tech companies developing connected devices and smart products, as well as the semiconductor fabs producing the chips utilized in the devices that enable 5G.
As per the GSM association, by 2025, 5Gnetworks are expected to cover one-third of the world's population. The organization also predicted that the number of 5Gconnections would surpass 1 billion by the end of 2022 and 2 billion by 2025, making up over a fifth of mobile connections. The increasing pace of 5Gwireless network rollouts across many regions benefits telecommunications equipment suppliers and makers of 5G-enabled phones. This momentum also promises to provide a profitable new market for chipmakers in the coming years.
The rising commercialization of applications like AI and 5G is also fueling advancements in packaging platforms, like Fan-Out Packaging and the 3D Flip Chip technology, to address the high-power consumption need and provide benefits such as greater chip connectivity. This forces many companies to collaborate with OSATvendors; hence, many OSATs, such as ASE/ SPIL, Amkor, and JCET, invest in various advanced SiPsand fan-out technology to gauge their competition.
The fan-Out Packaging market has grown significantly recently and increased CapEx, and R&D spending enable new Fan-Out Packaging adoption in 5Gand HPC applications. Suppliers heavily depend on these manufacturers to fuel strong growth in Fan-Out Packaging. Most of the Asian OSATsare well-positioned to invest progressively in Fan-Out Packaging.

Sensor Segment is Expected to Drive the Market

The segment includes semiconductors whose electrical properties correlate to temperature, pressure, displacement, velocity, acceleration, stress, strain, or any other physical, chemical, or biological property. The segment covers temperature & other sensors, pressure, acceleration, and yaw rate, magnetic field, and actuators.
Owing to factors like surging demand for smart sensors in IoT-based devices and consumer electronics, increasing use of sensors in improving industrial processes, rising demand by automobile manufacturers to deliver enhanced safety and comfort, and accelerated use of wireless technology to monitor and control security devices equipped with smart sensors, the segment is expected to register one of the fastest growth rates in the forecast period.
Investments in Industry 4.0 are rising globally. Organizations have started adopting Industry 4.0 smart solutions owing to the positive impact these solutions have on their businesses, including increased productivity. For instance, as per a report by the National Association of Software and Services Companies (NASSCOM), and Capgemini, it is expected that by 2025, more than two-thirds of the Indian manufacturing sector will embrace Industry 4.0.
Sensors are a key part of factory automation and Industry 4.0. Motion, environmental, and vibration sensors are used to monitor the health of equipment, ranging from linear or angular positioning, tilt sensing, leveling, and shock to fall detection.
Dedicated industrial motion sensors based on micromachined sensing (MEMS) elements are available for Industry 4.0 applications. These have a wide mechanical frequency sensing bandwidth, high reliability, and accurate operation up to 105□C.

Semiconductor Market Competitor Analysis

The semiconductor industry landscape is competitive and consists of several players. Brand identity plays a major role, considering the importance of quality that the end-users expect from a semiconductor manufacturing player. With large market incumbents, such as Kyocera Corporation, Qualcomm Technologies Inc., and STMicroelectronics NV, market penetration levels are also high.

August 2022 - Samsung Electronics Co. Ltd, the global company in advanced memory technology, announced the 990 PRO, the company's high-performance NVMe SSD based on PCIe 4.0. Delivering lightning-fast speeds and superior power efficiency, the new SSD is optimized for graphically demanding games and other intensive tasks, including 3D rendering, 4K video editing, and data analysis.
March 2022 - Intel issued the first phase of its investment plans of approximately EUR 80 billion in the European Union over the next decade across the semiconductor value chain, including research and development (R&D), manufacturing, and packaging technologies. In this investment, the company plans to invest approximately EUR 17 billion in establishing a semiconductor fab mega-site in Germany, along with the development of a new research and development and design facility in France, and to invest in research and development, manufacturing, and foundry services in Italy, Ireland, Poland, and Spain.

Additional Benefits:

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

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