

Semiconductor Back-End Equipment - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2025 - 2030)

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Report description:

The Semiconductor Back-End Equipment Market size is estimated at USD 20.48 billion in 2025, and is expected to reach USD 31.15 billion by 2030, at a CAGR of 8.75% during the forecast period (2025-2030).

Key Highlights

- Incorporating technologies such as energy transition, electrification, and AI has been at the forefront of reshaping the demand for semiconductors in the global market. For instance, integrating artificial intelligence (AI) into the semiconductor industry signals a new era of innovation, efficiency, and opportunity. In the past, the industry primarily served as an enabler for other high-tech sectors.
- However, with AI, semiconductors are at the forefront of transforming technology development, reshaping the industry's economic landscape. For instance, AI-powered chips are used in self-driving cars. This enables them to make real-time decisions based on their surroundings. AI-powered chips are also used in the healthcare industry for real-time monitoring of patients and detecting health issues. These innovations can transform the way of living and working, making lives more accessible and efficient.
- Furthermore, the world is increasingly shifting toward renewable energy sources to reduce reliance on non-renewable fuels and combat climate change. Electrification is a key strategy for achieving this transition, and semiconductors are playing a central role in revolutionizing how energy is generated, stored, and consumed.
- Semiconductors, particularly analog and embedded processing products, are well positioned to enable electrification through smarter, more reliable, and accessible solar-energy storage and electric-vehicle charging systems. Thus, companies are playing a significant role in addressing the changing dynamics of semiconductors in various end-user markets by focusing on four critical areas, namely high-voltage power, current and voltage sensing, edge processing, and connectivity products, thus driving the role of back-end equipment for advanced semiconductor wafers, packaging, and assembly process.

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- The semiconductor industry has been expanding rapidly, and the demand for semiconductor manufacturing equipment has also surged. However, the price of these machines has turned out to be a crucial factor in the industry. The equipment cost can have a noteworthy impact on the production cost of semiconductors, affecting the final product's price. This is expected to restrain the market's growth.
- Factors such as macroeconomic uncertainty, decreased consumer spending, and fluctuations in the global economy are expected to hamper chip demand. Consumer spending typically decreases during an economic downturn, reducing demand for consumer electronics like smartphones, tablets, and laptops, which rely heavily on semiconductors. Suppose the global economy continues to deteriorate and consumer demand weakens further. In that case, these factors are anticipated to have a detrimental effect on the semiconductor market in the upcoming years.

Semiconductor Back-End Equipment Market Trends

Assembly and Packaging Segment is Expected to Witness Significant Growth

- The segment's growth is expected to be driven by the increasing acceptance of cutting-edge packaging techniques such as fan-out wafer-level packaging (FOWLP), wafer-level packaging (WLP), and system-in-package (SiP). Furthermore, recent advancements have led to the emergence of packaging technologies like stacked WLCSPs, which enable the integration of multiple integrated circuits in a single package. These advancements encompass a combination of logic and memory chips, as well as stacked memory chips. As a result, the demand for advanced packaging is anticipated to surge, necessitating the acquisition of corresponding equipment.
- The surge in the utilization of semiconductor ICs in various sectors has led to a rise in the requirement for semiconductor packaging and assembly equipment. An example is the electronics industry's expanding necessity for such equipment, driven by the widespread use of electronic devices and their applications. This is anticipated to be a significant factor contributing to the increased demand. Likewise, the growing need for smaller, faster, and more efficient semiconductors is propelling the demand for advanced packaging technologies, fueling the demand for semiconductor packaging equipment.
- The increasing global need for semiconductors in different industries has led to an expansion in their production capacity, consequently fueling the growth of the semiconductor back-end equipment market. In August 2023, TSMC, a prominent semiconductor foundry, initiated new orders with multiple suppliers of state-of-the-art packaging equipment. Gudeng Precision Industrial, Apic Yamada, Disco, and Scientech are among the suppliers working closely with the company. TSMC's decision to engage with equipment suppliers reflects its ongoing commitment to enhancing its advanced packaging capabilities.
- The significant growth in the utilization and production of semiconductor chips is a key driver behind the expansion of the semiconductor packaging and assembly equipment sector. Moreover, a recent industry forecast by WSTS, supported by SIA, predicts a 9.4% decline in global sales for 2023, followed by a 13.1% increase in 2024. The forecast anticipates that global sales will amount to USD 520 billion in 2023, a decrease from the USD 574.1 billion recorded in 2022. By 2024, global sales are expected to rise to USD 588.4 billion. These positive industry trends will enable packaging equipment vendors to capitalize on market opportunities.
- The market is anticipated to be driven by the investments made by prominent vendors such as Micron, TSMC, and ASE in packaging technologies, along with other vendors capitalizing on the advantages offered by these technologies. Apple, Samsung, and Intel are among the companies that utilize advanced chip packaging (ACP) to enhance device performance and efficiency by consolidating multiple components onto a single substrate. Such adoption by the companies will enhance the growth of ATP equipment.

Asia-Pacific Expected to Witness Significant Growth in the Market

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- China is pursuing an ambitious semiconductor agenda with the support of USD 150 billion in funding. The country aims to enhance its domestic IC industry and increase its chip production. The ongoing US-China trade war has intensified tensions in this crucial sector, where the most advanced process technology is concentrated, leading many Chinese companies to invest in semiconductor foundries. China has unveiled various initiatives to strengthen its semiconductor sector, such as a substantial expansion campaign in the foundry, gallium-nitride (GaN), and silicon carbide (SiC) markets.
- The growing semiconductor business and increasing chip production capabilities in the region are expected to drive the demand for back-end equipment. China's tech industry aims to ascend the global technology value chain by capitalizing on its strong presence in telecommunications, renewables, and electric vehicles (EVs).
- In addition to these sectors, the industry is now focusing on advanced semiconductors. This transition is primarily driven by advancements in advanced node manufacturing, the expansion of the memory market, active involvement in the silicon carbide (SiC) race, and strategic investments in advanced packaging and manufacturing equipment. The growing foundry business and investments in fabs throughout China are anticipated to stimulate the market.
- South Korea has seen notable growth in its semiconductor industry over the past few years, with a substantial increase in both production and shipments. This surge indicates a resurgence in technological advancement, which bodes well for the country's economy and the global tech sector. Leading South Korean semiconductor companies like Samsung and SK Hynix have established themselves as key players in the global semiconductor industry. The expanding chip production capabilities in the region will further boost the market for back-end equipment.
- The surge in chip demand across various markets in the region has brought attention to the back-end semiconductor business. Companies specializing in back-end processes are anticipated to persist in making aggressive investments and technological advancements in the upcoming years.

Semiconductor Back-End Equipment Industry Overview

The semiconductor back-end equipment market is semi-consolidated due to the presence of both global players and small and medium-sized enterprises. Some of the major players in the market are ASML Holding NV, Applied Materials Inc., LAM Research Corporation, Tokyo Electron Limited, and KLA Corporation. Players in the market are adopting strategies such as partnerships, expansions, and acquisitions to enhance their product offerings and gain sustainable competitive advantage.

- December 2023: Applied Materials and CEA-Leti have expanded their collaboration with a joint lab focusing on materials engineering solutions for specialty semiconductor applications, catering to ICAPS markets (IoT, communications, automotive, power, and sensors). The lab aims to accelerate innovation for next-gen devices by addressing demands from IoT, electric vehicles, and smart grid infrastructure. Projects will tackle materials engineering challenges to enhance ICAPS device performance, reduce power consumption, and achieve faster time to market.
- November 2023: Samsung Electronics and ASML Holding have inked a preliminary agreement to invest 1 trillion WON (USD 760 million) in a joint research and development facility in South Korea. The collaboration, outlined in a memorandum of understanding signed at ASML's headquarters, focuses on advancing memory chips using ASML's cutting-edge extreme ultraviolet (EUV) equipment. As the exclusive EUV scanner manufacturer globally, ASML's technology is pivotal for intricate semiconductor patterning, streamlining manufacturing, and enhancing production yields. The R&D center, the first overseas facility jointly established by ASML, will concentrate on developing ultra-fine semiconductor manufacturing processes based on next-generation EUV technology.

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

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