Outsourced Semiconductor Assembly and Test Services (Osat) Market - Growth, Trends, Covid-19 Impact, and Forecasts (2023 - 2028)

Market Report | 2023-01-23 | 191 pages | Mordor Intelligence

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Report description:

The outsourced semiconductor assembly and test services (OSAT) market were valued at USD 39.49 billion in 2021, and it is expected to grow at a CAGR of 8.07% from 2022 to 2027.

Key Highlights
The semiconductor industry has been growing, with miniaturization and efficiency being the focus areas and the semiconductors emerging as building blocks of all modern technology. The advancements and innovations in this field have directly impacted all downstream technologies. ?
According to the Semiconductor Industry Association (SIA), global semiconductor industry sales were USD 43.6 billion in May 2021, an increase of 26.2% over May 2020, a total of USD 4.6 billion, and 4.1% more than the April 2021 total of USD 41.9 billion. Furthermore, the sales of semiconductors in April 2021 witnessed an increase of 1.9% from March 2021 at USD 41.0 billion and an increase of 21.7% compared to April 2020 at USD 34.4 billion.?
The semiconductor industry is also highly driven by outsourcing. More than designing, the manufacturing aspect of semiconductor product development relies on the services provided by external vendors. The two significant examples of semiconductor outsourcing are FABs (Pure-Play Foundries) and OSATs.
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 OSAT vendors; hence, many OSATs, such as ASE/SPIL, Amkor, and JCET, invest in various advanced SiPs and fan-out technology to gauge their competition.
The outbreak of COVID-19 globally significantly disrupted the supply chain and production of the studied market in the initial phase of 2020. For circuits and chipmakers, the impact was more severe. Due to labor shortages, many packages and testing plants in the Asian-Pacific region reduced or even suspended operations. This also created a bottleneck for companies that

depend on such back-end packages and testing capacity.???

OSAT Market Trends

Increased Use of Semiconductors in the Automotive Industry

Although the global automotive industry has witnessed recession and fluctuations in demand in recent years, it is still one of the primary drivers and opportunities for semiconductor and OSAT vendors. The increasing number of semiconductor products per vehicle and trends like autonomous and electric vehicles are becoming the primary drivers for semiconductor manufacturers and OSAT vendors.
As more semiconductor components, such as microcontrollers, sensors, and radar chips, are being used in automotive, the scope for OSAT and semiconductor foundries is also expanding.
Semiconductor products form the base for the hardware required to run the software to make electric, hybrid, autonomous, and alternate-fuel vehicles. In 2021-2022, automotive production was expected to be affected by the shortage of semiconductor chips, which shows the automotive industry's dependency on the semiconductor industry.
Additionally, advanced-level semiconductor packaging is required with trends like autonomous vehicles and V2X, further expanding the market scope. For instance, a centralized automotive-specific SoC is needed to achieve level five autonomy or increase hybrid efficiency. The centralized automotive semiconductor-based solution still relies on individual semiconductor components. It leads to innovative work from established automotive firms and the new semiconductor fabless and OSAT companies targeting the automotive market.
Furthermore, evolving infotainment systems are increasingly creating the demand for large displays and touch screens in the automotive industry, fueling the demand among OSAT and semiconductor vendors. This demand is exceptionally high from the electric car manufacturers, as advanced touchscreen displays instead of traditional dials are considered to provide futuristic aesthetics, better response, and facilitate multiple functionalities in a small space, creating a minimalistic design.

The United States is Expected to Hold a Significant Market Share

The United States is one of the most significant markets for the OSAT industry. High investments, technological advancements, and innovation of new applications are some of the major factors driving the country's OSAT market growth.
Though China dominates the global OSAT and semiconductor market, a significant portion of the technology patents is from the United States, which gives the country a strong position. Its healthy innovation rate in the OSAT market has also attracted several Asian vendors in the past.
For instance, in April 2021, Boston Semi Equipment (BSE), a prominent semiconductor test floor services and test automation company, announced that the OSAT provider had successfully purchased its Zeus gravity test handlers. The equipment was purchased post-evaluation based on first-pass yield, jam rate, output, and OEE performance in production. This purchase demonstrates the continued strong market demand for the country's testing equipment, given the handler's ability to achieve cold temperature testing of semiconductors with high uptime, ease of maintenance, and support.
Moreover, when Singapore-based chipmaker Broadcom attempted to acquire the US firm Qualcomm, which amounted to over USD 100 billion, the US administration vetoed the deal citing ties to Chinese firms. Besides Qualcomm, the government cut off a planned acquisition of Oregon-based Lattice Semiconductor by a little-known private equity firm with links to the Chinese government.
The impact of the US-China trade war on US fab equipment vendors is likely minimal due to US fab equipment vendors' leadership capabilities. It is challenging to buy competitive equipment from other country sources.

There is an increasing demand for mobile and internet-connected devices. Increased mobility and connectivity capabilities and growing digital content drive the demand for new broadband wired and wireless networking equipment.

OSAT Market Competitor Analysis

With the growing consolidation, technological advancement, and geopolitical scenarios, the studied market has been witnessing fluctuation. In addition, with the increasing vertical integration of foundries and IDMs, the intense competition in the market studied is expected to continue to rise, considering their ability to invest, which results from their revenues. New competitors in the packaging and assembly space are expected to have an advantage due to their ability to provide OEMs with a one-stop solution. Overall, the intensity of competitive rivalry is moderate and expected to grow.

June 2022 - ASE GROUP could emphasize technological innovation in chips and packaging. The company announced VIPack, an advanced packaging platform that could enable vertically integrated packaging solutions. The VIPack would represent ASE's next-generation 3D heterogeneous integration architecture that expands design rules and delivers ultra-high density and performance.
July 2022 - JCET Group announced that the company realized the packaging of 4 nm chips for cell phones and the integrated packaging of GPU, CPU, and RF chipset. The XDFOI multi-dimensional advanced packaging technology is an innovative solution for an ultra-high-density fan-out packaging solution, which provides cost-effective solutions with high-density interconnection, high integration, and high reliability for the heterogeneous integration of chipsets.

Additional Benefits:

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

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