Advanced IC Substrates - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts 2019 - 2029

Market Report | 2024-02-17 | 125 pages | Mordor Intelligence

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Report description:

The Advanced IC Substrates Market size is estimated at USD 18.11 billion in 2024, and is expected to reach USD 31.54 billion by 2029, growing at a CAGR of 11.73% during the forecast period (2024-2029).

Players are continuously advancing their packaging technologies to cater to stringent requirements with a smaller footprint, higher performances, and lower power consumption. The demand for consumer electronics and mobile communication devices drives electronics manufacturers to deliver more compact and portable products.

The increasing trend of miniaturization is driving the demand for advanced packaging. The advent of 5G, which influenced the demand over the past few years, is expected to continue as the use of FCBGA in 5G base stations and HPCs is increasing in countries adopting communication technology.

FCBGA is expected to hold a significant share of the market demand, owing to its routing density availability, as it can be tuned for maximum electrical performance. The key players in the market are Unimicron, ASE Group, IBIDEN, and SCC. For instance, Unimicron and Kinsus are expanding their substrate capacities. Unimicron has announced that it would be investing a total of TWD 20 billion in R&D and expansion of its production capacity for advanced flip-chip substrates through 2022.

Apart from this, the global demand for IoT, in both the consumer and industrial spaces, is expected to add to the increasing demand for the IC substrate. According to the Internet and Television Association, the global number of IoT devices by 2020 is expected to reach 50.1 billion, and industrial IoT demand is expected to exceed consumer demand over the coming years. Such developments are expected to influence the market positively.

The advanced substrate industry follows miniaturization trends, greater integration, and higher performance. Owing to this, several players across the ongoing ED and SLP packaging are making huge investments and showing an increased interest in such technologies.

The higher power density and board integration result in thermal benefits, thereby enabling further improvements in system reliability. Such technologies bring massive value to the market due to extended adoption across automotive applications.

They also drive the telecom and infrastructure segment, where ED is a suitable substrate solution for increased hardware efficiency. Due to this, players are investing huge amounts in new plants where ED is expected to be the main product constituent.

Despite the potential of IC substrates, changing preferences are likely to slow down market growth. For instance, some companies utilize a silicon interposer with multiple RDLs for a better connection between logic and HBM. Others use fan-out-on-substrate with RDLs. FCBGA needs a substrate supplier, wafer bumps, and wafer fab capacity for RDLs and assembly and testing. But FO WLP only requires assembly and wafer fabs for RDLs and wafer bumps and testing. Hence, the industry is witnessing a shift toward FOWLP.

Changes in business/enterprise working style and consumer behavior during the COVID-19 pandemic have fuelled demand for some types of products, and it is expected to open both new markets and routes to market. For instance, demand for semiconductors used in wired communication is still growing as more enterprises are upgrading their security and increasing cloud activities. Video streaming across many networks has also increased fixed broadband usage.

Advanced IC Substrate Market Trends

Mobile Devices and Consumer Electronics to Hold Major Market Share

- The demand for mobile communication devices and consumer electronics is pushing manufacturers of mobile and consumer electronics to create products that are smaller and more portable. The growing trend of miniaturization is driving demand for advanced packaging.
- The increasing functionality of mobile devices and consumer electronics products, as well as the growing popularity of smart devices and smart wearables, are some of the major factors anticipated to drive the adoption of advanced IC substrates during the forecast period. The increasing adoption of cutting-edge technologies like AI and HPC and high-performance mobile devices (including 5G) drives demand for advanced IC substrates.
- Furthermore, smartphones command a significant share of the market, and with the advent of 5G smartphones, the demand is expected to increase even further. Global companies, like Samsung, are increasingly investing in the semiconductor business to become prominent smartphone vendors in the 5G smartphone space. In January 2022, China's shipments of smartphones compatible with 5G networks increased by 63.5% to 266 million in 2021 as falling prices boosted demand, according to the report by the China Academy of Information and Communications (CAICT). The report also stated that 5G smartphone shipments accounted for 75.9% of Chinese shipments, higher than the global average of 40.7%.
- The increasing adoption of smart wearables, like smartwatches and fitness bands, and their increasing functionality are also expanding the growth of the mobile and consumer segments. For instance, in April 2021, Fitbit announced its new Luxe fitness tracker, a buttonless tracker. It is supported on Android and iOS devices. It also supports Google Fast Pair for pairing more quickly with Android devices and supports connected GPS while paired to the phone. These advancements are expected to further develop the need for FC CSP.
- Besides this, smart appliances are expected to see significant applications and observe growth in their sales during the forecast period, owing to the increasing penetration of smart homes. Many consumer electronic companies are also increasing their

investments in the market studied to develop more energy-efficient ICs.

China to Witness Significant Growth

- China's IC industry is expected to witness rapid growth in the coming few years while calling for increasing R&D input and strengthening independent innovation as part of the broader objective to establish a relatively complete semiconductor industry chain system.
- As per the China Semiconductor Industry Association, the revenue of China's integrated circuit industry reached CNY 685.86 billion (USD 108.4 billion) during the January-September 2021 period, up 16.1% on a yearly basis. The country also scaled up its production capacities in the IC industry. According to the National Bureau of Statistics, China produced 359.4 billion units of ICs in 2021, up 33.3% year-on-year, doubling the growth rate in 2020.
- Moreover, as per a report by CNBC in December 2022, China was working on a more than CNY 1 trillion (USD 143 billion) support package for its semiconductor industry, in a major step towards self-sufficiency in chips and to counter the United States' moves aimed at slowing its technological advances. Beijing has planned to roll out what is expected to be one of its most significant fiscal incentive packages, allocated over five years, mainly as subsidies and tax credits, to strengthen semiconductor production and research activities at home.
- Moreover, in March 2023, Thinktrans, a China-based manufacturer of IC substrates, was seeking to raise CNY 500 million to CNY 1 billion (USD 72.45 million to USD 144.9 million) in Series A funds. Thinktrans designs and manufactures IC substrates in-house and sells them directly to three groups of clients: IDMs, OSATs, and design houses. While most of the company's clients are based in Greater China, the CEO has also identified the US, Japan, and South Korea as potential markets for continued expansion.
- The growing emphasis on the semiconductor industry by the government of China is leading to an increase in demand for advanced IC substrates. The country has an aggressive growth strategy to meet 70% of China's semiconductor demand with domestic production by 2025. Additionally, the government's 14th Five-Year Plan (2021-2025) for technology independence also supports the objective.

Advanced IC Substrate Industry Overview

The advanced IC substrates market is moderately competitive and consists of a few major players. The players dominating the market are ASE Group, TTM Technologies Inc., Kyocera Corporation, Siliconware Precision Industries Co. Ltd., and Ibiden Co. Ltd. The existing players in the market are striving to maintain a competitive edge by catering to newer technologies such as 5G telecommunication, high-performance data centers, compact electronic devices, etc.

In February 2023, South Korea-based LG Innotek announced that it acclerated its business activities on a full scale to target the Flip-Chip Ball Grid Array (FC-BGA) substrate market. The company recently unveiled the latest FC-BGA for the first time at 'CES 2023'. For the development of FC-BGA, the company is actively utilizing technologies such as the ultra-fine circuit, high-integration array, high-multi-layer substrate matching, and coreless technologies.

In January 2023, LG Innotek celebrated at the brand-new Gumi plant, which will manufacture FC-BGA. LG Innotek is building the newest FC-BGA production lines in the Gumi No. 4 factory, which was purchased in June 2022 and had a total gross area of about 220,000 square meters. Innotek LG intends to accelerate the development of FC-BGA. By the first half of this year, the new plant is expected to have a sophisticated production system in place, and in the second half of 2023, full-scale production will begin.

Additional Benefits:

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

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