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# Semiconductor Foundry Market Assessment, By Technology Node [10/7/5 nm, 16/12 nm, 28/22 nm, 40 nm, 65 nm, Others], By Foundry Model [Pure Play Foundry, Integrated Device Manufacturers], By Application [Consumer Electronics, Automotive, Industrial, Networking & Telecommunication, Others], By Region, Opportunities and Forecast, 2016-2030F

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## Abstracts

Global semiconductor foundry market has experienced significant growth in recent years and is expected to maintain a strong pace of expansion in the coming years. With projected revenue of approximately USD 96.34 billion in 2022, the market is forecasted to reach a value of USD 179.38 billion by 2030, displaying a robust CAGR of 8.08% from 2023 to 2030.

The fabrication of semiconductors can be done affordably in semiconductor foundries, and provide access to innovative manufacturing techniques, scalability for large-scale production, and specialist knowledge. Through outsourcing fabrication, lowering capital costs, and accelerating time-to-market, they enable fabless semiconductor companies to concentrate on design while promoting innovation and competitiveness in the market.

Growing demand in key sectors is driving the growth of the semiconductor foundry market. The first factor driving demand for personalized chips is the development of 5G networks and the Internet of Things (IoT). Also, better semiconductor fabrication is necessary for driverless cars and AI technology. Furthermore, the foundry market experiences innovation and expansion due to the rising need for green and energy-efficient technology.

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The semiconductor foundry market benefits significantly from the adoption of autonomous vehicles, which heavily rely on advanced electronics. The CHIPS Act in the United States supports semiconductor manufacturing through a substantial USD 39 billion incentive program and a 25% advanced manufacturing investment tax credit. These initiatives are aimed at stimulating domestic semiconductor production, narrowing the cost gap with international investments, bolstering national security, and reinforcing technological leadership. Various semiconductor companies have already announced multiple projects to expand manufacturing capacity, including the establishment of new fabs and investments in materials. As autonomous vehicle technology continues to advance, the demand for state-of-the-art semiconductor components such as sensors and processors will continue to drive growth in the semiconductor foundry market.

For instance, in September 2023, An innovative 3D imager for LiDAR applications, the FL6031, was unveiled by Tower Semiconductor and Fortsense. Targeting the expanding 3D imaging industry, it uses Tower's 65nm Stacked BSI CIS technology with pixel-level hybrid bonding.

5G Network Expansion Promoting the Market’s Growth

The growth of 5G networks is a key driver for the semiconductor foundries market. To power 5G devices and infrastructure, it is necessary to produce innovative semiconductors. It covers RF chips, high-performance CPUs, and other specialty semiconductor parts. Modern semiconductor manufacturing is required because of the demand for 5G technology and its faster data rates and reduced latency. Semiconductor foundries are essential to supply the demand with the implementation of 5G across several nations and sectors. It is anticipated that the expansion of 5G networks would increase orders for and investments in semiconductor foundries, supporting the market development.

For example, in August 2023, the forefront 9SW RFSOI technology from GlobalFoundries was unveiled; it was created for 5G and wireless communication applications. For better communication and longer battery life, this technology improves performance, decreases power consumption, and shrinks product size.

Rise in Complexity is Reshaping the Semiconductor Foundry Market

Since advanced production techniques are required due to the complexity of semiconductor designs, companies are turning to semiconductor foundries for

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expertise. To produce high-performance chips, foundries with innovative technology and fabrication skills are becoming increasingly important as chip designs get more complex. These foundries provide specialized expertise and infrastructure necessary for complex designs, allowing the manufacturer of advanced chips utilized in a variety of applications such as AI and IoT. The pattern draws businesses in need of innovative production solutions, which drives the expansion of the semiconductor foundry market. Industry projections predict that the need for manufacturing of complicated chips will cause the semiconductor foundry market to expand dramatically over the forecast period.

For example, in August 2023, two technological platforms, 40ESF3 AutoPro175 and 130BCDLite Gen2 ATV125, were introduced by GlobalFoundries to satisfy the needs of connected, electrified, and autonomous automobiles. These developments make it possible to create power-efficient, temperature-tolerant automobile systems .

Dominance of Pure Play in Semiconductor Foundry Market

Pure play foundries offer the latest technologies and knowledge since they manufacture semiconductors. High-quality and economically viable chips produced by this specialization draw many fabless semiconductor companies. The market is dominated by top pure-play foundries like TSMC, GlobalFoundries, and UMC because of their commitment to innovation and economies of scale. They are major participants in the semiconductor sector owing to their capacity to provide innovative technology and customized solutions, which has solidified their leadership in the foundry market.

For instance, in August 2023, Tower Semiconductor and TriEye unveiled a pioneering CMOS-based SWIR sensor for automotive ADAS and industrial applications. The 1.3Mp 7um pixel array provides exceptional SWIR spectrum performance .

Asia-Pacific Dominates Semiconductor Foundry Market

Numerous reasons contribute to Asia-Pacific's dominance in the semiconductor foundry market. The region has a robust ecosystem of semiconductor manufacturers, research facilities, and trained labor. It is home to leading foundries that have helped develop innovative technology, including TSMC (Taiwan Semiconductor Manufacturing Company) and Samsung Foundry. Additionally, Asia-Pacific frequently offers semiconductor manufacturing advantageous for economic and regulatory circumstances. Due to its strategic position and ongoing infrastructural development, Asia-Pacific region will continue to lead the semiconductor foundry market despite the

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rising demand for electronics, particularly in emerging nations.

For instance, in September 2023, increasing its manufacturing footprint dramatically, GlobalFoundries formally unveiled its new USD 4 billion expansion fabrication site in Singapore. The plant will increase the company's supply chain flexibility globally and generate an extra 450,000 wafers each year, supporting 1,000 employments.

Government Initiatives Acting as Catalyst to Semiconductor Foundry Market

On the semiconductor foundry market, government initiatives, like the CHIPS Act of 2022, have a significant effect. The Act's emphasis on enhancing domestic semiconductor production, research, and design improves the economy and national security of the country and revitalizes the semiconductor sector. The government fosters competition and innovation by offering manufacturing grants, research funding, and investment tax advantages. These initiatives are essential for reclaiming a bigger portion of the semiconductor manufacturing capacity, promoting R&D, and increasing the competitiveness of the United States in the global semiconductor foundry market. Such assistance promotes expansion and sustainability in the crucial sector.

For example, in August 2023, the CD8P Series data center-class SSDs from KIOXIA America were tuned for PCIe 5.0 performance. They provide better sequential read speed and low latency for data center scenarios and are available in sizes up to 30.72TB and numerous form factors.

Impact of COVID-19

The COVID-19 pandemic had major influence on the semiconductor foundry market, causing demand changes and supply chain disruptions. The pandemic initially caused a decline in manufacturing and demand for semiconductors. The demand for semiconductors, however, soared by Q3 2020, notably in personal computers, mobile devices, vehicles, and wireless communications, as remote work and increasing technology usage became the norm. In particular, the 28-nanometer chip scarcity lingered into 2022. Major automakers had to reduce output, while smartphone OEMs had trouble finding parts. To improve capacity and manage the persistent problems of supply chain interruptions, the semiconductor industry responded by investing in new fabrication facilities.

Impact of Russia-Ukraine War

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The Russia and Ukraine war raised possible issues for the market for semiconductor foundries, with an emphasis on the accessibility of important raw materials like neon and palladium, which are essential parts of the production of semiconductors. The uncertainties around changes in raw material pricing and supply chain interruptions are a cause for concern. Notably, Ukraine plays a key role in the supply chain for neon, and the interruptions might have a significant impact on the semiconductor market. To maintain long-term resilience, this might involve looking into alternate material sources and considering investments in neon recycling systems.

Key Players Landscape and Outlook

Major players like Taiwan Semiconductor Manufacturing Company Limited, United Microelectronics Corporation, Samsung Electronics Co., Ltd., Semiconductor Manufacturing International Corporation, and Powerchip Semiconductor Manufacturing Corporation compete intensely in the semiconductor foundry market. Growing demand for innovative semiconductor solutions across varied sectors is driving the competitive environment. With a growing reliance on semiconductor foundries for state-of-the-art production capabilities, the market outlook is positive. The worldwide drive for semiconductor self-sufficiency, the advent of IoT and 5G technologies, and the shift toward lower process nodes are important themes. Players are ready to innovate, grow, and form strategic alliances to keep their competitive share high.

In September 2023, Together, MediaTek and TSMC announced the successful development of MediaTek's flagship Dimensity SoC, which will improve the performance and power efficiency of a variety of devices and go into production in the second half of 2024 .

In March 2023, Tower Semiconductor and Teramount partnered to simplify high-speed data applications by connecting optical fibers to silicon chips. The collaboration enhances scalable silicon photonics packaging for various industries.

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