The information and statistics set out in this section and other sections of this document were extracted from the report prepared by Frost & Sullivan, which was commissioned by us, and from various official government publications and other publicly available publications. We engaged Frost & Sullivan to prepare the Frost & Sullivan Report, an independent industry report, in connection with the [**REDACTED**].

The information from official government sources has not been independently verified by us, the Joint Sponsors, [**REDACTED**]*, any of their respective directors and advisers, or any other persons or parties involved in the* [**REDACTED**]*, and no representation is given as to its accuracy.*

SOURCES OF INFORMATION AND RESEARCH METHODOLOGY

The information and statistics set out in this section and other sections of this document were extracted from different official government publications, available sources from public market research and other sources from independent suppliers. In addition, we engaged Frost & Sullivan for preparing an independent industry report in respect of the [**REDACTED**]. The information from Frost & Sullivan disclosed in the document is extracted from the Frost & Sullivan Report, a report commissioned by us for a fee of RMB450,000, and is disclosed with the consent of Frost & Sullivan. The Frost & Sullivan Report has been prepared by Frost & Sullivan independently without any influence from us or other interested parties.

Frost & Sullivan is an independent global consulting firm founded in 1961 in New York. Its services include, among others, industry consulting, market strategic consulting and corporate training. Frost & Sullivan conducted (i) primary research, which involved discussing the status of the industry with certain leading industry participants, and interviews with industry experts on a best-effort basis to collect information in aiding in-depth analysis; and (ii) secondary research, which involved reviewing company reports, independent research reports and data based on its own research database.

Our Directors have confirmed that there has been no adverse change in the market information since the date of publication of the Frost & Sullivan report, which may qualify, contradict or impact the information in this Industry Overview section. Each of our Directors and the Joint Sponsors has exercised reasonable care in selecting and identifying the named information sources, compiling, extracting and reproducing the information, and ensuring that there has been no material omission of the information in this Industry Overview section.

OVERVIEW OF GLOBAL AND CHINA'S SiC POWER DEVICE MARKET

Introduction of Power Semiconductor Device

Power semiconductor devices are semiconductor devices used as switches or rectifiers in power electronic products. They can be categorized by device type into discrete devices and power modules. These devices are key to power management in electronic systems. For the avoidance of doubt, when discussing power device market, we are referring to the aggregated market of power discrete devices and power modules.

History and Evolution of Semiconductor Materials

The first generation of semiconductors, using materials like silicon (Si) and germanium (Ge), enabled the shift from vacuum tubes to compact electronics, revolutionizing information processing and automation. The second generation, based on compound semiconductors such as gallium arsenide (GaAs) and indium phosphide (InP), offered faster electron mobility and direct bandgap properties, making them suitable for high-frequency transmission and low emission applications like infrared lasers.

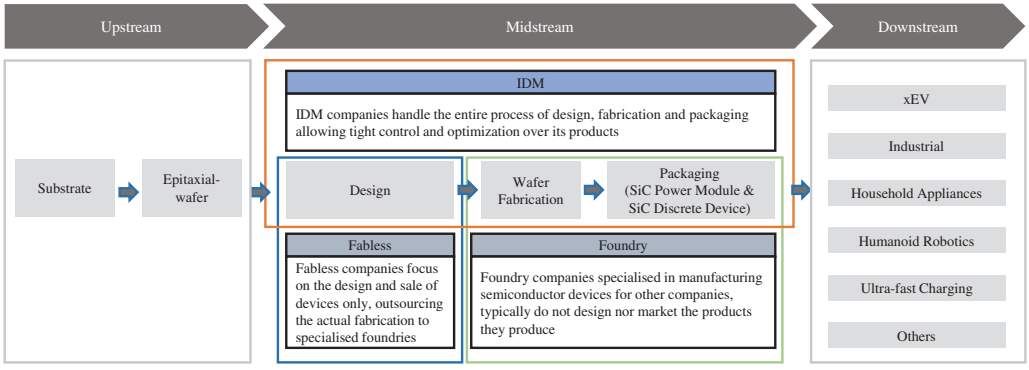
The third generation is also based on compound semiconductors such as SiC and gallium nitride (GaN). SiC stands out with its wide bandgap, high thermal conductivity, and excellent radiation resistance. SiC's enhanced electrical strength and energy efficiency make it ideal for high-power, high-temperature, and high-frequency applications. Usage of SiC would significantly reduce power losses, improve energy conversion efficiency, and operate under

extreme conditions. SiC has been widely adopted in high-voltage and high-current scenarios such as NEV, renewable energy systems, smart grids, and industrial motor drives, gradually replacing conventional silicon-based power semiconductor devices and driving the evolution of power electronics and supporting the transition to more sustainable and efficient technologies. The penetration rate of SiC power devices has grown rapidly from 3.5% in 2020 to 15.1% in 2024, and is expected to grow to 26.3% in 2029, in terms of revenue, gradually taking more market share from the conventional silicon-base devices.

Value Chain and Manufacturing Processes of SiC Power Semiconductor Device

The SiC power semiconductor device value chain starts with upstream substrate and epitaxial-wafer providers. Midstream manufacturers use these epitaxial-wafers to fabricate SiC power devices, IDM is a popular model, which handles the entire process of designing, fabricating, packaging and marketing its own SiC power device products. Under the IDM model, companies typically own and operate their own production and packaging facilities. This vertical integration enables these companies to optimize their products for specific applications and ensure tight integration between design and manufacturing. Finally, downstream applications like NEVs and robotics utilize these SiC power devices, driving technological advancements and efficiency gains across industries.

SiC power semiconductor device market consists of two market segments: SiC power semiconductor discrete device market and SiC power module market.



Source: Frost & Sullivan

Market Size of Global SiC Power Device Industry

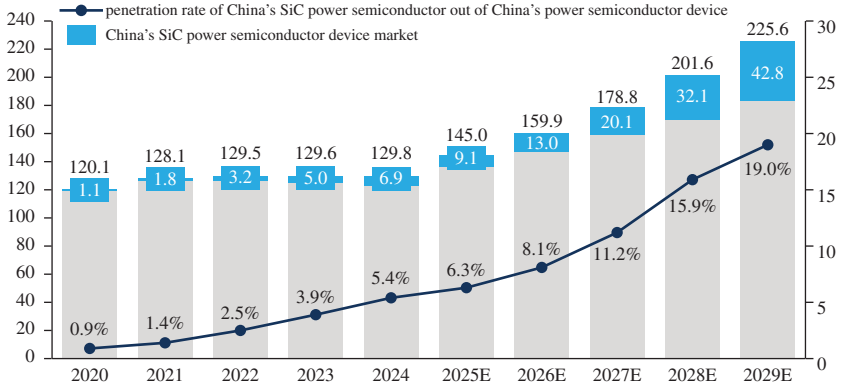
From 2020 to 2024, the global SiC power device industry witnessed remarkable growth. The market size increased from RMB4.5 billion in 2020 to RMB22.7 billion in 2024, with a CAGR of 49.8%. It is expected that from 2025 to 2029, the market size of the global SiC power device industry will continue to rise, with a CAGR of 40.5%. The market size is projected to grow rapidly, reaching approximately RMB110.6 billion in 2029. The penetration rate of SiC in the global power device market has also increased significantly. It rose from 1.4% in 2020 to 6.5% in 2024, and is expected to reach 20.1% by 2029.

Market Size of China's SiC Power Device Industry

From 2020 to 2024, China's SiC power device market increased from RMB1.1 billion in 2020 to RMB6.9 billion in 2024 with a CAGR of 59.7%. Such number is expected to raise at a higher CAGR of 47.1% from 2025 to 2029 and the market size is projected to reach RMB42.8 billion in 2029. The penetration rate of SiC in the China's power device market has also increased significantly from 0.9% in 2020 to 5.4% in 2024, and is expected to reach 19.0% by 2029.

Market Size of China's SiC Power Device Industry, by sales revenue, RMB Billion, 2020-2029E

CAGR	2020-2024	2024-2029E
China's power semiconductor device market	2.0%	15.1%
China's SiC power semiconductor device market	59.7%	47.1%



Source: Frost & Sullivan, Omdia, Yole

Competitive Landscape of China's SiC Power Semiconductor Device Market

In China's SiC power semiconductor device market in 2024, our company was ranked as 8th player with the market share of 2.8%.

Ranking of Major Players in China's SiC Power Semiconductor Device Market (2024)

Ranking	Company	Revenue of SiC Power Semiconductor Device	Market Share
		(Billion RMB)	*(%)*
1	Company A	1.40	20.2%
2	Company B	1.27	18.2%
3	Company C	1.07	15.4%
4	Company E	0.61	8.7%
5	Company F	0.55	7.9%
6	Company K	0.21	3.0%
7	Company G	0.20	2.9%
8	The Group	0.20	2.8%
9	Company D	0.17	2.4%
10	Company L	0.16	2.3%

OVERVIEW OF GLOBAL AND CHINA'S SiC POWER SEMICONDUCTOR DISCRETE DEVICE MARKET

Introduction and Classification of SiC Power Semiconductor Discrete Devices

By device type, SiC power semiconductor devices can be categorized into SiC discrete devices and SiC power modules. A SiC discrete device is a single-chip semiconductor component packaged individually that function as efficient switches or diodes to achieve energy conversion or control. These devices serve as essential building blocks in electronic systems, and are widely employed for amplification, rectification, and regulation tasks. The primary categories of SiC discrete devices include diodes and transistors, each possessing distinct characteristics that make them suitable for a variety of applications.

- ***SiC Discrete Diodes:*** These devices permit current to flow in only one direction, making them highly effective in rectification circuits where they convert AC to DC. SiC diodes excel in power electronics due to their ability to withstand high voltages and temperatures while maintaining efficient switching performance. Their wide

bandgap, results in lower energy losses and faster operation compared to conventional silicon diodes, making them ideal for applications like power supplies, NEVs and renewable energy systems.

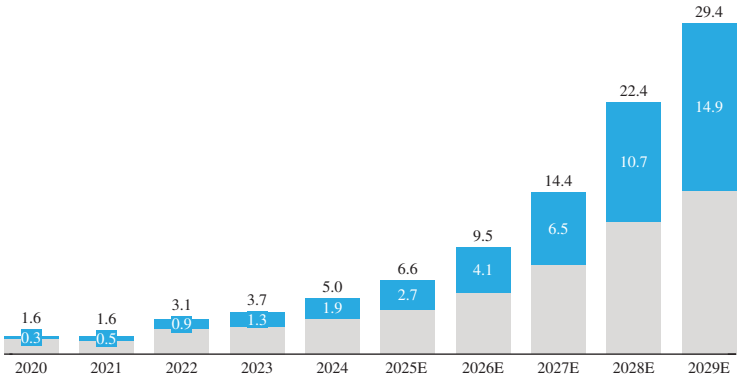
- ***SiC Discrete Transistors:*** By controlling significant current flows with a small input signal, they function effectively as either switches or amplifiers. Among these, MOSFETs are a leading choice in high-efficiency applications due to their low on-state resistance and superior thermal stability.

Market Size of Global and China's SiC Power Semiconductor Discrete Device

The global SiC discrete device market is projected to expand at a CAGR of 45.0% from 2025 to 2029, reaching a sales revenue of RMB29.4 billion in 2029. China's market grew at a CAGR of 65.4%, with sales revenue increasing from RMB0.3 billion in 2020 to RMB1.9 billion in 2024, contributing 38.4% to the global market in 2024, and is expected to reach RMB14.9 billion in 2029, contributing 50.5% to the global market.

Global and China's SiC Power Semiconductor Discrete Device Market, by sales revenue, RMB Billion, 2020-2029E

CAGR	2020-2024	2024-2029E
Global SiC discrete device market	32.3%	45.0%
China SiC discrete device market	65.4%	53.6%



Source: Frost & Sullivan, Yole

Key Drivers of Global and China's Power Semiconductor Discrete Device Industry

Technological Progress, Higher Yields, and Lower Costs Drive the Growth of China's SiC Discrete Devices

China has made significant progress in SiC research and industrialization in recent years. The maturation of 6-inch substrate and epitaxial technologies has enhanced yield rates and cost efficiency. Furthermore, the shift towards larger substrates, such as 8-inch wafers, could theoretically cut manufacturing costs by up to 60%. Advances in domestic equipment and processes have also played a vital role in lowering costs. Together, these factors bolster the market competitiveness of SiC discrete devices, including both SiC MOSFETs and SiC Schottky diodes, driving their adoption across diverse applications.

SiC Power Semiconductors Are Seizing the Silicon-Based Power Semiconductor Market as the Price of SiC Materials Continues to Decrease

The cost reduction is pivotal in enabling SiC power semiconductors to capture market share from conventional silicon-based counterparts. As SiC becomes more price-competitive, its economic benefits in power semiconductor applications become increasingly evident, promoting widespread adoption across industries. With SiC's superior performance gaining recognition and material costs continuing to decline, SiC power semiconductors are set to expand their footprint in both global and China's markets.

Trends of Global and China's Power Semiconductor Discrete Device Market

Larger Substrates Bringing Down the Overall Production Cost of Discrete Devices

As technological capabilities and manufacturing scale improve, transitioning to larger wafer diameters becomes both practical and cost-effective. This shift boosts efficiency by allowing more chips to be produced per wafer, lowering the cost per unit. As a result, the industry benefits from enhanced cost competitiveness, which may hasten SiC discrete device adoption and expand market accessibility by making these high-performance solutions more affordable.

Device Evolution Toward Lower Specific On-Resistance, Smaller Cell Size, Lower Switching Losses and Better Gate Oxide Protection

Lower on-resistance enables SiC power devices to handle higher currents with minimal energy loss, critical for high-power and high-frequency uses. Smaller cell sizes increase power density, allowing more devices to fit within a given space and reducing power module sizes. Reduced switching losses enhance efficiency and thermal management, vital for applications like NEV and renewable energy systems. Enhanced gate oxide protection ensures long-term reliability under challenging conditions. These innovations position SiC discrete devices as a cornerstone of next-generation power electronics, boosting their competitiveness and versatility.

Competitive Landscape of China's SiC Power Semiconductor Discrete Device Market

The SiC power semiconductor discrete device market in China is concentrated, with top ten market players accounting for more than 90% of market shares in terms of revenue in 2024. The Group ranked the ninth among all SiC power semiconductor discrete device providers in China, with a market share of 2.7% in terms of revenue in 2024.

Entry Barriers of Global and China's SiC Power Semiconductor Discrete Device Market

High Capital Requirements. Establishing a competitive presence demands significant upfront investment in advanced equipment, materials sourcing, and ecosystem integration. The capital intensity deters new entrants without deep financial strength or strategic backing.

Technology and Know-How Barriers. Mastery of SiC device design, process optimization, and reliability assurance requires years of accumulated expertise and R&D commitment. The technological gap between incumbents and new entrants is substantial, with long learning cycles and limited access to critical IP.

Customer Qualification. End-users, particularly in automotive and industrial power electronics, impose rigorous qualification cycles and reliability standards. Securing design wins requires years of testing, certifications, and proof of long-term performance, delaying revenue generation for new entrants.

OVERVIEW OF GLOBAL AND CHINA'S SiC POWER MODULE MARKET

Introduction of Power Module

SiC power modules can be understood as an "enhanced performance integrated power management unit", integrating multiple SiC chips into a single, often more complex package. By integrating several discrete chips, they enhance system reliability and integration level, while simplifying circuit design and installation. Power modules are typically used in scenarios that require high power density and complex control, such as NEVs, PV inverters and industrial frequency converters.

Market Size of Global SiC Power Module, by Region

The global SiC power module market is projected to expand significantly from 2020 to 2029. Between 2020 and 2024, in terms of sales revenue, it grew from RMB2.9 billion to RMB17.6 billion at a CAGR of 57.5%, and is expected to reach RMB81.2 billion by 2029 with a CAGR of 39.1% from 2025 to 2029. Geographically, China's market increased from RMB0.8 billion in 2020 to RMB5.0 billion in 2024 at a CAGR of 57.8%, and will likely reach RMB28.0 billion by 2029 at a CAGR of 44.1% from 2025 to 2029 in terms of sales revenue. The U.S. market also saw a CAGR of 51.7% from RMB0.6 billion in 2020 to RMB3.4 billion in 2024, and is projected to reach RMB17.0 billion by 2029 at a CAGR of 41.5% from 2025 to 2029 in terms of sales revenue. Other regions combined are expected to grow from RMB9.2 billion in 2024 to RMB36.2 billion in 2029, with a CAGR of 59.8% from 2020 to 2024 and 34.8% from 2025 to 2029 in terms of sales revenue.

Market Size of Global SiC Power Module, by Application

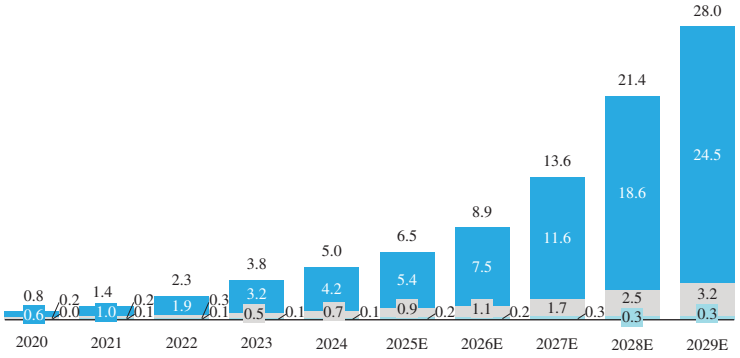
With respect to the downstream application, xEV sector is the major driver of the growth of the global SiC power module market. From 2020 to 2024, the global sales volume of xEV increased from 3.1 million in 2020 to 18.2 million in 2024 with a CAGR of 55.4%. Correspondingly, the xEV penetration rate, calculated as global xEV sales volume over global automotive sales volume, increased from 4.0% in 2020 to 19.1% in 2024. The global SiC power modules applied in xEV segment recorded a CAGR of 65.0% from 2020 to 2024 and is expected to reach a CAGR of 40.3% from 2025 to 2029, in terms of sales revenue, contributing significantly to the overall market expansion. The consistent demand for SiC power modules in industrial applications also plays a crucial role in the growth of the global SiC power module market from 2025 to 2029, with a CAGR of 34.1% supported by the downstream demand. Take photovoltaic (PV) energy as an example, from 2020 to 2024, cumulative global PV installations increased from 772.4 GW to 2.2 TW with a CAGR of 29.9%. Other sectors, including household appliances, ultra-fast chargers, etc., achieved a CAGR of 68.3% from 2020 to 2024 and is expected to arrive a CAGR of 29.6% from 2025 to 2029, in terms of sales revenue, indicating diverse applications and a broad market reach for SiC power modules.

Market Size of China's SiC Power Module, by Application

With a similar development pattern as to the global market, xEV sector is also the key driver of the growth of the China's SiC power module market. The xEV segment is expected to reach a CAGR of 45.9% from 2025 to 2029, arriving RMB24.5 billion in 2029. Demands for SiC power modules in China's industrial applications were consistently strong throughout the period from 2020 to 2024, with a CAGR of 32.9% from 2020 to 2024 and a CAGR of 36.6% from 2025 to 2029.

China's SiC Power Module Market
by sales revenue, by applications, RMB Billion, 2020-2029E

CAGR	2020-2024	2025-2029E
China's SiC power semiconductor module market	57.8%	44.1%
xEV	64.6%	45.9%
Industrial	32.9%	36.6%
Others*	78.1%	15.8%



Notes: Others include household appliances, ultra-fast chargers, eVOTL aircraft, and others

Source: Frost & Sullivan, Yole

Downstream Application Analysis of SiC Power Module

- ***xEV Sector:*** SiC power modules significantly boost efficiency in NEVs. They reduce energy loss by 70-90% in motor drives and over 40% in OBCs compared to silicon IGBTs, enhancing vehicle range and charging speed. In DC/DC converters, SiC power modules cut energy loss by over 80%, improving overall power efficiency.
- ***Industrial Sector:*** Industrial sectors include PV, power grids, rail transportation, telecom and infrastructure. In PV systems, SiC power modules would increase conversion efficiency by 1%-3% and reduce equipment size by 40%-60%; in power grids, SiC power modules would decrease component count and system complexity, improving power quality; in the rail industry, they reduce energy consumption by over 10% and lower noise and temperature; and in telecom and infrastructure, they construct more efficient power supplies, increasing power density and conversion efficiency.
- ***Other Sector:*** Other sectors include eVTOL aircraft, humanoid robotics, household appliances and ultra-fast chargers. In eVTOL aircraft, SiC power module would improve flight efficiency and safety. By usage of SiC power modules, humanoid and miniature robots gain from higher switching frequencies and lower power losses, enabling more precise and agile movements, household appliances benefit from increased power density and reduced heat sinks, leading to smaller, more efficient devices, ultra-fast chargers for NEVs leverage SiC's high stability and wide operating temperature range for faster, more stable charging solutions.

Key Drivers of Global and China's Power Module Market

Conventional silicon-based power modules encounter bottlenecks in performance improvement

Compared with SiC-based power modules, the physical limitations of silicon-based power modules — such as their maximum bandgap energy — restrict their ability to efficiently handle higher voltages, frequencies and temperatures. This leads to greater energy losses and less effective heat dissipation, which are critical issues in high-performance applications like xEV, photovoltaic energy storage and rail transportation. As a result, there is a growing shift toward SiC power semiconductor modules, leveraging superior material properties that enable better performance, higher efficiency and more reliable operation in these demanding downstream environments.

Downstream applications are driving the global SiC power module industry's growth

The rapid development of downstream application markets, represented by xEV and PV, is a key driver of the global SiC power module industry. The increasing adoption of xEVs trend is particularly pronounced in China. Globally, the penetration rate of xEVs, calculated as the ratio of xEV sales volume to total vehicle sales volume, stood at 19.2% in 2024. In comparison, China's xEV penetration rate was 40.9% in 2024. This trend is primarily driven by government incentives, stringent emission regulations, and a growing consumer preference for eco-friendly transportation. These are driving the widespread adoption of xEVs, which in turn is fueling the demand for automotive-grade SiC power module used in NEV power systems to improve efficiency and performance.

The push for renewable energy, along with the need for efficient energy storage and conversion solutions, has made SiC an essential material in the PV industry. Additionally, the expansion of smart grids and the need for more efficient and reliable power distribution systems further bolster the demand for industrial-grade SiC power module.

Policy support

The SiC power device industry is gaining momentum in China, largely propelled by a suite of supportive national policies. The 2025 "Notice on Promoting the Scientific Planning and Construction of High-Power Charging Facilities" issued by the National Development and Reform Commission emphasizes accelerating the domestic substitution of high-voltage SiC modules, aiming to enhance the self-sufficiency of key electronic components. The Ministry of Industry and Information Technology (MIIT) issued policies such as the 'Implementing Opinions on Promoting the Innovative Development of Future Industries' in January 2024. This policy specifically targets the advancement of innovative applications of cutting-edge semiconductor materials, including SiC, positioning advanced semiconductor materials such as SiC as one of the key areas for future global technological innovation and industrial development.

Trends of Global and China's Power Module Market

Rise of the IDM model

By vertically integrating these processes, IDMs can achieve enhanced control over product quality, accelerate development cycles, and manage supply chains more efficiently. This approach is particularly advantageous in the rapidly evolving SiC power module market, where technological innovation and economies of scale are critical for maintaining competitiveness.

Acceleration of the domestication trend

In China, there is a notable trend towards domestic substitution in the SiC power module market, with the localization of production accelerating rapidly. This shift is characterized by a growing preference for domestically produced SiC power modules. Consequently, the Chinese companies' market share in the SiC power module industry is projected to expand significantly, reducing dependence on foreign suppliers and strengthening the domestic industry's resilience.

COMPETITIVE LANDSCAPE OF GLOBAL AND CHINA'S SiC POWER MODULE MARKET

Competitive Landscape of China's SiC Power Module Market (2024)

In the competitive landscape of China's SiC power module market for the year 2024, Company A emerges as the leading player with a substantial revenue of RMB1.2 billion, holding a dominant market share of 24.0%. Company B and Company C follow closely, with revenues of RMB0.9 billion and RMB0.7 billion, respectively, capturing market shares of 17.5% and 13.1%. Among the various competitors, the Group is the sixth largest player among all companies and the third largest Chinese company in the market with a market share of 2.9%.

Ranking of Major Players in China's SiC Power Module Market (2024)

Ranking	Company	Revenue of SiC Power Module	Market Share
		(Billion RMB)	*(%)*
1	Company A	1.20	24.0%
2	Company B	0.88	17.5%
3	Company C	0.66	13.1%
4	Company E	0.56	11.2%
5	Company F	0.55	10.9%
6	the Group	0.15	2.9%
7	Company H	0.08	1.6%
8	Company G	0.07	1.4%
9	Company I	0.04	0.7%
10	Company J	0.03	0.5%
Subtotal		4.21	83.7%

Company A is a public company listed on Euronext Paris, New York Stock Exchange and Borsa Italiana S.p.A. It is founded in 1987 and headquartered in the Netherlands. It is a semiconductor company known for its diverse range of semiconductor solutions.

Company B is a public company listed on NASDAQ, founded in 1999 and headquartered in United States. It is a global semiconductor manufacturer producing a wide array of power and signal management components, logic devices, and discrete components.

Company C is a public company listed on Frankfurt Stock Exchange and in the USA on the over-the-counter market OTCQX International Premier, founded in 1999 and headquartered in German. It is global semiconductor manufacturer with a strong focus on automotive, industrial, communication, and consumer electronics sectors.

Company D is a public company listed on New York Stock Exchange, founded in 1987 and headquartered in United States. It specializes in the development and manufacturing of wide-bandgap semiconductor materials and devices.

Company E is a public company listed on Shanghai Stock Exchange, founded in 2018 and headquartered in China. It dedicates to the research and development and production of SiC power semiconductor modules.

Company F is a private company founded in 2018 and headquartered in China. It is committed to the research and industrialization of SiC power semiconductor devices and modules.

Company G is a public company listed on Shanghai Stock Exchange, founded in 1997 and headquartered in China. It offers a comprehensive range of SiC power semiconductor devices, analog circuits, and sensors.

Company H is a public company listed on Shanghai Stock Exchange, founded in 2005 and headquartered in China. It is a high-tech enterprise specializing in the research, production, and sales of power semiconductors.

Company I is a private company founded in 2004 and headquartered in China. It specializes in SiC power products, including SiC power semiconductor modules for electric vehicles and SiC chips.

Company J is a private company founded in 2017 and headquartered in China. It is a high-tech company committed to providing domestic power semiconductors and new energy vehicle electric drive solutions.

Company K is a subsidiary of a public company listed on Shanghai Stock Exchange. It is founded in 2020 and headquartered in the China. It specializes in the field of power electronics, providing power semiconductor products and manufacturing services.

Company L is a public company listed on Tokyo Stock Exchange. It is founded in 1958 and headquartered in the Japan. It is a global semiconductor and electronic components manufacturer.

Entry Barriers of Global and China's SiC Power Module Market

First-Mover Advantage

Established SiC power module suppliers hold a substantial first-mover advantage due to the lengthy and rigorous customer validation processes required for SiC power modules, particularly in high-performance applications such as NEV. These validation procedures involve multiple rounds of testing and refinement to meet the strict performance and reliability standards. The ongoing collaboration between established SiC power module suppliers and automotive manufacturers also provides valuable feedback loops to iterate the products promptly, further strengthening their market position and product reliability.

Leading Technology

The development of SiC power modules requires advanced technical expertise and sustained innovation to enhance performance, lower costs, and address the evolving needs of applications. Industry leaders have invested significantly in R&D, amassing extensive intellectual property portfolios and mastering the material science and engineering intricacies of SiC technology. This has enabled them to develop proprietary processes that new entrants struggle to replicate without substantial time and financial commitment.

Adequate Resources

Entering the SiC power module market necessitates considerable resources, including financial capital to support R&D, advanced manufacturing facilities, and production scaling. A reliable customer base is equally critical, yet securing one is challenging due to the extensive validation and reliability demonstrations required, especially in high-stakes industries like NEV manufacturing. Additionally, a strong supplier network is essential to ensure the consistent quality and availability of raw materials vital for SiC power module production. Established players benefit from long-standing supplier relationships, which new entrants find difficult to replicate.

Independence from Downstream Customers

By diversifying the customer base and application areas — spanning renewable energy, power electronics, and consumer electronics — companies can secure more stable revenue streams and enhance resilience. This strategic flexibility also supports a proactive approach to R&D, allowing manufacturers to invest in innovative technologies applicable across multiple industries.

OVERVIEW OF GLOBAL AND CHINA'S POWER SEMICONDUCTOR GATE DRIVER MARKET

Introduction and Classification of Power Semiconductor Gate Driver

The driver typically refers to an electronic component or system designed to control and drive other electronic devices or loads. It can be classified into gate driver IC and gate driver board. The drivers mainly include IGBT drivers, SiC MOSFET drivers, IGCT drivers, silicon-based MOSFET drivers and others.

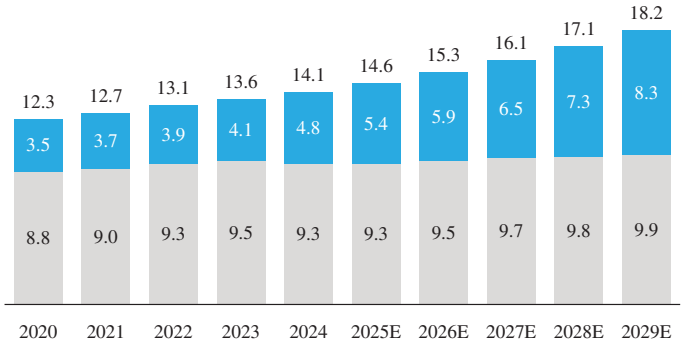
- ***Gate Driver IC:*** specialized control circuit that provides the necessary, precisely-timed electrical signals to rapidly and reliably turn the devices on and off, ensuring optimal performance and efficiency. These gate driver ICs are crucial in applications requiring precise control of power conversion, such as regulating voltage and current in power supplies or converting DC to AC in solar inverters.
- ***Gate Driver Board:*** refers to circuit board that integrate all necessary components to simplify the installation and use of drivers. These gate driver boards typically include power semiconductor devices, protective circuits, and other essential electronic components. They are designed for easy installation and configuration, allowing end-users to quickly integrate them into existing systems without the need for complex wiring or design work.

Market Size of Global and China's Power Semiconductor Gate Driver

The global power semiconductor gate driver market is expected to grow at a CAGR of 5.5% from 2025 to 2029, reaching a size of RMB18.2 billion in 2029. In contrast, the China's power semiconductor gate driver market outpaced the global market with a CAGR of 8.2% from 2020 to 2024, growing from RMB3.5 billion in 2020 to RMB4.8 billion in 2024 and is expected to reach RMB8.3 billion in 2029 with a CAGR of 11.4% from 2025 to 2029.

Global and China's Power Semiconductor Gate Driver Market by sales revenue, RMB Billion, 2020-2029E

CAGR	2020-2024	2025-2029E
Global power semiconductor gate driver market	3.4%	5.5%
China's power semiconductor gate driver market	8.2%	11.4%



Source: Frost & Sullivan, Public Information Collection

Drivers and Trends of Global and China Power Semiconductor Gate Driver Market

SiC Gate Drivers Are Replacing silicon-based IGBT Gate Drivers

This transition is driven by SiC's superior performance characteristics. These advantages make SiC gate drivers particularly well-suited for high-performance applications such as NEVs, renewable energy systems and industrial automation, where energy efficiency and compact design are critical. As SiC technology matures and becomes more cost-competitive, the demand for SiC gate drivers is expected to grow rapidly, accelerating the replacement of IGBT gate drivers across various sectors.

Fast Adoption of SiC Power Devices Accelerates Demand for Drivers

The rapid adoption of SiC power devices is significantly boosting demand for gate drivers, including both gate driver ICs and gate driver boards. As SiC power devices operate at higher switching frequencies and require more precise voltage control and protection functions than conventional silicon-based power devices, demand is increasing not only for high-performance gate driver ICs but also for gate driver boards that provide integrated drive, isolation, monitoring and protection functionalities. SiC gate drivers are compatible with existing silicon-based gate drivers, facilitating a seamless transition for manufacturers. As a result, downstream industries are increasingly adopting SiC gate drivers to meet the need for efficient, compact, and high-performance solutions. With ongoing advancements in SiC technology and declining costs, SiC is gradually replacing conventional silicon-based IGBTs in applications such as motor drives, NEVs and solar power. This transition is expected to expand the addressable market for both gate driver ICs and gate driver boards, as increasing SiC deployment drives demand for complete gate driving solutions at both the component and subsystem levels.

Increasing Domestic Substitution

China's gate driver industry is experiencing a notable trend toward increased domestic production. As the global display panel industry consolidates in Mainland China, the supply chain for gate drivers is also shifting toward local manufacturers. This transition is expected to enhance the domestic production rate of gate drivers, reducing reliance on foreign suppliers and fostering a more self-sufficient and robust domestic industry. The rise in domestic production capabilities is set to strengthen the competitiveness of Chinese gate driver manufacturers globally while meeting the growing demand for advanced gate driver technologies within China.

Competitive Landscape of China's Power Semiconductor Gate Driver Market

The power semiconductor gate driver market in China is concentrated, with top ten market players accounting for more than 90% of market shares in terms of revenue in 2024. The Group ranked the ninth among all power semiconductor gate driver providers in China, with a market share of 1.7% in terms of revenue in 2024.

Entry Barriers of Global and China's Power Semiconductor Gate Driver Market

System-Level Integration Complexity. Gate drivers must seamlessly interface with diverse power devices, control architectures, and end-application requirements. New entrants face challenges in meeting system-level performance needs across multiple use cases such as automotive, industrial automation, and renewable energy.

Application-Specific Customization Demands. Customers increasingly require tailored gate driver solutions optimized for specific switching devices, thermal environments, and protection functions. This customization raises the barrier for newcomers who lack the breadth of design resources and close customer collaboration networks.

Software and Firmware Integration. Increasing digitalization of gate drivers, including embedded control algorithms and diagnostic features, requires multidisciplinary expertise. Entrants must build not only hardware capabilities but also strong embedded software competencies to compete effectively.

COMPARISON ANALYSIS OF PRODUCTS AGAINST MARKET PEERS

SiC Power Semiconductor Discrete Device		Comparable Metrics			
		Breakdown Voltage (V)	On-resistance Rds (mΩ)	Gate Charge - Qg (nC)	Gate-Drain Capacitance - Crss (pF)
The Company		650/1200/1700	5.5-600	46-1320	3-66
Global Company	Company A	650-1700	4-1959	13.3-304	
	Company C	600/650/1200	7-1000	3.2-716	1
	Company B	650-1700	12-960	14-329	11-430
Domestic Company	Company G	1200	13.5-53.5	101-224	
	Company I	750/1200	35-160	15-80	1-11
	Company H	1200	17-29	0.17	0.02-6.25

SiC Power Module		Comparable Metrics				
		Breakdown Voltage (V)	On-resistance Rds (mΩ)	Gate Charge - Qg (nC)	Gate-Drain Capacitance - Crss (pF)	Rth (K/W)
The Company		750-1200	1.8-5.5	520-2470	12-110	0.092-0.18
Global Company	Company C	1600-1800	0.1-0.5			0.03-0.2
	Company B	900-1200	1.7-2.6			
Domestic Company	Company F	1200	2-3			
	Company I	750-1200	2.2-5.4	992	104	0.09
	Company H	750-1200	1.1-9			0.08-0.1

Power Semiconductor Gate Driver		Comparable Metrics						
		Input Supply Voltage (V)	Single Channel Power (W)	Peak Current (A)	Turn-on Voltage (V)	Turn-off Voltage (V)	Maximum Switching Frequency (kHz)	Operating Temperature (°C)
The Company		15	1-4	8-60	15	-10	5-200	-40~85
Global Company	Company A	16-75		0.35-10	2.9-15.5			-40~150
	Company C	12-18		5-9	4-15			
	Company B	5.25						
Domestic Company		5-24	2-6	15-20	15-20	-8.5~-2	30-100	

Note 1: The company's data sources include information provided by the company and publicly available information on its official website; data for other manufacturers includes publicly available information on their official websites and product performance manuals.

Note 2: Silicon carbide discrete devices include single transistors, diodes, MOSFETs, and other products; silicon carbide power modules are primarily automotive-grade, applied in OBCs (On-Board Chargers), DC/DC converters, etc.; gate drivers include driver cores and driver solutions.

Note 3: Some performance indicators have different range values under specific conditions, leading to significant differences in performance indicators, such as on-resistance varying under different rated voltages and rated currents.

PRICE ANALYSIS OF PRODUCTS AGAINST MARKET PEERS

China's ASP for SiC products (RMB/Piece)*	2022	2023	2024	2025E-2027E
SiC power semiconductor discrete device	4-20	3-15	3-10	2-7
SiC power semiconductor module	2,500-4,500	2,000-4,000	1,800-3,600	1500-2800
Power semiconductor gate driver	160-260	130-200	40-100	32-80

*Note: The price of a specific product depends on, among others, brand, voltage, and technology applied.

PRICE ANALYSIS OF RAW MATERIALS

China's average cost of major raw materials of SiC products (thousand RMB/ Piece)*	2022	2023	2024	2025E -2027E
SiC substrate	3.8-5.8	3.6-5.6	2.3-4.3	2.0-4.1
SiC epitaxial wafer	8.0-10.0	7.8-9.8	6.5-7.5	5.5-7.1

*Note: Price is high relevant to brand, voltage, technology maturity, and other factors. The average price of SiC substrate and epitaxial wafer refer to the average price of 4/6/8 inches, does not take the factor of number of chip per substrate/epitaxial wafer into consideration. Although the prices are given in a range, the average prices of SiC substrate and epitaxial wafer in China are expected to decline during the expected periods from 2025 to 2027.