

SiC Device Market Size to Exceed USD 15.82 Billion by 2032, at 23.6% CAGR | SNS Insider

The SiC (Silicon Carbide) Device Market is expanding with demand for high-efficiency power electronics in EVs, renewable energy, and industrial applications.

AUSTIN, TX, UNITED STATES, February 12, 2025 /EINPresswire.com/ -- Market Size & Industry Insights

As Per the SNS Insider, "The [SiC Device Market](#) size was valued at USD 2.35 billion in 2023 and is expected to reach USD 15.82 billion by 2032 and grow at a CAGR of 23.6% over the forecast period 2024-2032."



SiC Device Market Size & Growth Analysis

This growth is driven by the increasing demand for high-efficiency power electronics across sectors such as automotive, renewable energy, and industrial applications. The rapid adoption of electric vehicles (EVs) is a significant driver, as SiC devices enhance battery performance and energy efficiency. Additionally, the expansion of renewable energy projects, particularly in solar and wind power, is accelerating the demand for SiC-based inverters. Industrial automation and the rising need for energy-efficient power semiconductors further fuel market expansion. Government initiatives supporting carbon neutrality and advancements in SiC manufacturing processes also contribute to growth. As industries shift toward higher power density and efficiency, SiC devices are expected to become integral to next-generation power applications.

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SWOT Analysis of Key Players as follows:

- Coherent Corp.
- Fuji Electric Co. Ltd
- Infineon Technologies AG
- Microchip Technology Inc.
- Mitsubishi Electric Corporation

- ON Semiconductor Corp
- Renesas Electronics Corporation
- ROHM Co. Ltd
- Toshiba Electronic Devices & Storage Corporation
- WOLFSPEED INC

SiC Device Market Segmentation

By Type, power semiconductor Dominating and optoelectronic devices Fastest Growing

In 2023, the power semiconductor segment led the SiC Device Market, driven by silicon carbide's wide band gap. This key property enhances efficiency, minimizes equipment size, and improves reliability for high-voltage and high-frequency applications. The demand for SiC power semiconductors is rising due to their superior performance in power electronics, making them essential for industries requiring energy-efficient and compact solutions, such as electric vehicles, renewable energy, and industrial automation.

Meanwhile, the optoelectronic devices segment is expected to register the fastest CAGR during the forecast period, fueled by the increasing use of SiC in high-energy lighting and laser applications. Silicon carbide's superior thermal stability makes it a preferred choice for optoelectronic devices such as LEDs, solar cells, photodetectors, and telescopes. The growing demand for energy-efficient and high-performance electronic components is further accelerating the adoption of SiC-based optoelectronic solutions across various industries.

By Component, power module Dominating and FET/MOSFET transistors Fastest Growing

In 2023, the power module segment dominated the SiC Device Market, accounting for over 30% of the share, driven by its use in high-power applications. Unlike traditional silicon modules, SiC power modules feature a wider bandgap, enabling higher heat resistance, voltage capacity, and switching efficiency while minimizing energy loss. These benefits make them ideal for electric vehicles, renewable energy systems, and other demanding applications.

The FET/MOSFET transistors segment is projected to witness significant growth from 2024 to 2032. Silicon carbide FET/MOSFETs offer superior thermal conductivity, a higher critical breakdown field, and a wider bandgap, enhancing current density and reducing device thickness. Additionally, they lower on-state resistance and power loss, improving efficiency and performance in high-temperature operating environments.

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By, 1-inch to 4-inch wafer Dominating and 10-inch and above Fastest Growing

In 2023, the 1-inch to 4-inch wafer segment led the SiC Device Market with over 44% share,

driven by large-scale manufacturability, cost-effectiveness, and strong demand in industrial applications. These wafers help reduce equipment size and noise, creating significant growth opportunities.

The 10-inch and above segment is projected to register the fastest CAGR during the forecast period, fueled by the commercial-scale production of SiC wafers. These larger wafers support the fabrication of Gallium Nitride-based power devices and LEDs, enhancing market expansion.

By End User, Automotive Dominating and Fastest Growing

The automotive segment is dominating and fastest-growing segment in the SiC Device Market, driven by the increasing adoption of electric vehicles (EVs). SiC devices play a crucial role in EV powertrains and charging systems, enhancing power efficiency, minimizing energy loss, and improving thermal performance. Their ability to handle higher voltages and switching frequencies makes them essential for boosting vehicle range and performance. As EV demand surges globally, automakers and power electronics manufacturers are integrating SiC technology to optimize battery efficiency and overall system reliability. This strong demand positions the automotive sector as the key driver of SiC market expansion, with rapid growth expected in the coming years.

Regional Analysis: Asia Pacific Leads, North America to Witness Fastest Growth

In 2023, Asia Pacific dominated the SiC Device Market with a 44.23% share, driven by strong adoption across consumer electronics, automotive, and medical industries. The region's numerous power device manufacturers and high import rates of discrete devices further fuel market growth.

North America is expected to grow at the fastest CAGR from 2024 to 2032, supported by key players like GeneSiC Semiconductor and an established customer base. The presence of leading companies fosters innovation and accelerates the adoption of advanced, high-efficiency SiC devices in power electronics. Additionally, strategic initiatives by regional players further drive market expansion, positioning North America as a key growth hub in the coming years.

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