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SiC-on-insulator (SiCOI) Film Market Forecasts to 2032 – Global Analysis By Substrate (Silicon (Si) Substrate, Silicon Carbide (SiC) Substrate, Sapphire Substrate and Other Substrates), Wafer Size, Technology, Application and By Geography

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Abstracts

According to Stratistics MRC, the Global SiC-on-insulator (SiCOI) Film Market is accounted for $90.8 million in 2025 and is expected to reach $8,032.9 million by 2032 growing at a CAGR of 89.7% during the forecast period. SiC-on-insulator (SiCOI) film is a layered semiconductor structure where a thin silicon carbide (SiC) film is deposited on an insulating layer, typically silicon dioxide (SiO?), which itself rests on a silicon substrate. This configuration combines SiC's exceptional properties—such as high thermal conductivity, chemical stability, and wide bandgap—with the electrical isolation provided by the insulator. SiCOI films are used to enhance device performance in high-power, high-frequency, and harsh-environment electronics by reducing parasitic capacitance and improving thermal management. They enable advanced applications in power electronics, RF devices, and sensors by integrating SiC's robustness with the benefits of insulation.

Market Dynamics:

Driver:

High-Performance Semiconductor Demand

The growing demand for high-performance semiconductors is significantly boosting the SiC-on-Insulator (SiCOI) film market. SiCOI films offer superior thermal conductivity, high breakdown voltage, and enhanced efficiency, making them ideal for advanced

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power electronics and RF applications. This demand drives innovation and large-scale adoption, leading to increased production capacity and cost reductions. As industries like automotive, aerospace, and telecommunications prioritize energy-efficient, high-speed devices, SiCOI films gain traction, positively impacting market growth and technological advancement.

Restraint:

High Production Costs

High production costs stymie the expansion of the SiC-on-insulator (SiCOI) film sector, preventing widespread acceptance and scalability. Price increases brought on by costly raw materials and intricate fabrication procedures make alternative technologies less competitive. Smaller producers are unable to enter this market, and research and development expenditure is deterred. As a result, innovation is hindered, market growth slows, and SiCOI films' overall commercialization potential is still limited.

Opportunity:

Growth in Electric Vehicles (EVs)

The demand for SiC-on-insulator (SiCOI) films, which are necessary for high-performance power electronics in EVs, is rising significantly due to the EV industry's explosive growth. SiCOI films promote market expansion by enabling EV power devices to operate more reliably, efficiently, and with improved thermal control. Manufacturers are depending more and more on SiCOI technology to enhance battery life and vehicle performance as EV adoption picks up speed worldwide. This creates a positive feedback loop that spurs innovation and quickly grows the SiCOI film industry.

Threat:

Complex Manufacturing Processes

Complex manufacturing procedures considerably impede the SiC-on-insulator (SiCOI) film industry by increasing production costs and time, limiting scalability, and resulting in increased defect rates. These issues hinder market expansion and lower yield efficiency, making it harder for producers to satisfy consumer demand. Furthermore, mass production is made more difficult by the requirement for specialized machinery and trained staff, which deters new competitors and restricts the broad use of SiCOI

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technology.

Covid-19 Impact

The Covid-19 pandemic disrupted the SiC-on-insulator (SiCOI) film market by causing supply chain delays and reduced manufacturing activities worldwide. Demand fluctuated as industries like automotive and electronics faced slowdowns. However, increased focus on remote work and digital infrastructure accelerated semiconductor needs, partially offsetting losses. Overall, the market experienced short-term setbacks but is expected to recover steadily as production stabilizes and demand for advanced materials grows post-pandemic.

The power electronics segment is expected to be the largest during the forecast period

The power electronics segment is expected to account for the largest market share during the forecast period, due to its demand for high-efficiency, high-temperature, and high-power applications. SiCOI films enhance device performance by reducing power loss and improving thermal management, making them ideal for electric vehicles, renewable energy systems, and industrial power supplies. This segment's push for miniaturization and energy-efficient solutions accelerates SiCOI adoption, boosting market expansion and technological advancements in semiconductor industries globally.

The silicon (si) substrate segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the silicon (si) substrate segment is predicted to witness the highest growth rate because Si substrates enable superior thermal management and electrical insulation in SiCOI structures, boosting efficiency in power electronics and high-frequency applications. Their compatibility with existing semiconductor manufacturing processes accelerates adoption, reducing production costs and time-to-market. Consequently, the Si substrate segment fuels innovation and market growth by enabling high-quality, reliable SiCOI films tailored for advanced electronic devices.

Region with largest share:

During the forecast period, the Asia Pacific region is expected to hold the largest market share since it promotes developments in industrial automation, renewable energy, and electric vehicles, fostering regional technical growth and sustainability. The growth of

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the market boosts local economies by drawing investment and producing high-value jobs. SiCOI technology also lowers carbon footprints and energy losses, which supports Asia Pacific's drive for smarter, greener infrastructure and speeds up the shift to clean energy.

Region with highest CAGR:

Over the forecast period, the North America region is anticipated to exhibit the highest CAGR, because the region's leadership in high-performance electronics, renewable energy, and electric cars is supported by this technology. SiCOI films encourage sustainability and innovation by enhancing device performance and lowering energy loss. North America's competitive advantage in next-generation power electronics is being reinforced by rising adoption and investments in sectors like telecom, aerospace, and automotive, which are also speeding up economic growth.

Key players in the market

Some of the key players profiled in the SiC-on-insulator (SiCOI) Film Market include Soitec, Wolfspeed, GlobalWafers, SICC Co., Ltd., MTI Corporation, NGK Insulators, Ltd., SK Siltron, Ceramicforum Co., Ltd., Homray Material Technology, Precision Micro-optics Inc., Xiamen Powerway Advanced Material Co., Ltd., Coherent Corp., ASM International, Disco Corporation, TYSiC, SiCrystal AG, Transphorm, United Silicon Carbide Inc., Renesas Electronics Corporation and Fuji Electric Co., Ltd.

Key Developments:

In November 2023, DISCO has entered into a long-term licensing agreement with vLex, a global legal intelligence platform, to integrate vLex’s comprehensive U.S. primary law library into DISCO’s legal technology suite. This collaboration is a significant step toward DISCO’s goal of creating an end-to-end platform for the practice of law.

In May 2023, Mitsubishi Electric and Coherent Corp. have entered into a strategic collaboration to scale the manufacturing of silicon carbide (SiC) power electronics on a 200 mm technology platform. This partnership aims to meet the growing global demand for SiC power devices, which are integral to the development of electric vehicles (EVs) and other energy-efficient technologies.

Substrates Covered:

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Silicon (Si) Substrate

Silicon Carbide (SiC) Substrate

Sapphire Substrate

Other Substrates

Wafer Sizes Covered:

100 mm (4-Inch) Wafers

150 mm (6-Inch) Wafers

200 mm (8-Inch) Wafers

300 mm (12-Inch) Wafers

Technologies Covered:

Smart Cut Technology

Grinding/Polishing/Bonding Technology

Applications Covered:

Power Electronics

Aerospace and Defense

Automotive

Consumer Electronics

Other Application

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Regions Covered:

- North America
  - US
  - Canada
  - Mexico
- Europe
  - Germany
  - UK
  - Italy
  - France
  - Spain
  - Rest of Europe
- Asia Pacific
  - Japan
  - China
  - India
  - Australia
  - New Zealand
  - South Korea
  - Rest of Asia Pacific

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South America

Argentina

Brazil

Chile

Rest of South America

Middle East & Africa

Saudi Arabia

UAE

Qatar

South Africa

Rest of Middle East & Africa

What our report offers:
- Market share assessments for the regional and country-level segments
- Strategic recommendations for the new entrants
- Covers Market data for the years 2022, 2023, 2024, 2026, and 2030
- Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)
- Strategic recommendations in key business segments based on the market estimations
- Competitive landscaping mapping the key common trends
- Company profiling with detailed strategies, financials, and recent developments
- Supply chain trends mapping the latest technological advancements

Free Customization Offerings:

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customization options:

- Company Profiling
  - Comprehensive profiling of additional market players (up to 3)
  - SWOT Analysis of key players (up to 3)
- Regional Segmentation
  - Market estimations, Forecasts and CAGR of any prominent country as per the client's interest (Note: Depends on feasibility check)
- Competitive Benchmarking
  - Benchmarking of key players based on product portfolio, geographical presence, and strategic alliances

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