

Silicon Carbide MOSFETs Market Opportunity, Growth Drivers, Industry Trend Analysis, and Forecast 2024–2032

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Abstracts

The Global Silicon Carbide MOSFETs Market reached USD 2 billion in 2023 and is projected to grow at a 30.1% CAGR from 2024 to 2032. This remarkable growth is primarily driven by the increasing global adoption of electric vehicles (EVs). Silicon carbide MOSFETs are essential components in EV powertrains and charging infrastructures, providing enhanced efficiency and minimizing power loss compared to conventional silicon-based devices. As governments and automotive manufacturers accelerate efforts to electrify transportation and cut carbon emissions, the demand for silicon carbide MOSFETs is expected to soar, particularly as the need for improved performance and extended driving range in EVs becomes more critical. The market for silicon carbide MOSFETs can be segmented by device type into discrete SiC MOSFETs and module SiC MOSFETs.

The module SiC MOSFET segment is anticipated to achieve a CAGR of 31% during the forecast period. These modules integrate multiple devices with additional components like gate drivers and thermal management systems, providing a compact and ready-to-use solution that enhances performance in high-power applications. This integration simplifies the implementation of silicon carbide technology, making it more accessible for various applications. In terms of technology nodes, the market is divided into 150mm wafer technology and 200mm wafer technology.

The 150mm wafer technology segment is expected to reach USD 10.3 billion by 2032. This technology involves 150mm diameter silicon wafers for manufacturing SiC MOSFETs, typically utilized in niche applications where cost and production volume are manageable. Although 150mm wafers offer certain advantages in material handling and manufacturing flexibility, larger wafer sizes are gradually becoming the standard in the



industry. The U.S. silicon carbide MOSFETs market accounts for a substantial 67.8% share in 2023. The growth in this market segment is fueled by robust demand from the electric vehicle industry, the renewable energy sector, and advanced power electronics applications. The U.S. government's commitment to reducing carbon emissions and fostering clean energy technologies has resulted in increased utilization of silicon carbide MOSFETs in various applications, including EVs and renewable energy systems.

Furthermore, the rapid rollout of 5G infrastructure and the nation's leadership in semiconductor innovation continue to drive the demand for SiC MOSFETs, positioning the market for sustained growth in the coming years.



Contents

Report Content

CHAPTER 1 METHODOLOGY & SCOPE

- 1.1 Market scope & definitions
- 1.2 Base estimates & calculations
- 1.3 Forecast calculations
- 1.4 Data sources
- 1.4.1 Primary
- 1.4.2 Secondary
 - 1.4.2.1 Paid sources
 - 1.4.2.2 Public sources

CHAPTER 2 EXECUTIVE SUMMARY

2.1 Industry synopsis, 2021-2032

CHAPTER 3 INDUSTRY INSIGHTS

- 3.1 Industry ecosystem analysis
 - 3.1.1 Factor affecting the value chain
 - 3.1.2 Profit margin analysis
 - 3.1.3 Disruptions
 - 3.1.4 Future outlook
 - 3.1.5 Manufacturers
 - 3.1.6 Distributors
- 3.2 Supplier landscape
- 3.3 Profit margin analysis
- 3.4 Key news & initiatives
- 3.5 Regulatory landscape
- 3.6 Impact forces
 - 3.6.1 Growth drivers
 - 3.6.1.1 Increasing demand for electric vehicles (EVs)
 - 3.6.1.2 Growth of renewable energy sector
 - 3.6.1.3 Increased adoption in aerospace and defense
 - 3.6.1.4 Government support and investment
 - 3.6.2 Industry pitfalls & challenges



- 3.6.2.1 High production costs
- 3.6.2.2 Technical challenges in integration
- 3.7 Growth potential analysis
- 3.8 Porter's analysis
- 3.9 PESTEL analysis

CHAPTER 4 COMPETITIVE LANDSCAPE, 2023

- 4.1 Introduction
- 4.2 Company market share analysis
- 4.3 Competitive positioning matrix
- 4.4 Strategic outlook matrix

CHAPTER 5 MARKET ESTIMATES & FORECAST, BY DEVICE TYPE, 2021-2032 (USD MILLION) (VOLUME UNITS)

- 5.1 Key trends
- 5.2 Discrete SiC MOSFETs
- 5.3 Module SiC MOSFETs

CHAPTER 6 MARKET ESTIMATES & FORECAST, BY VOLTAGE RANGE, 2021-2032 (USD MILLION) (VOLUME UNITS)

6.1 Key trends
6.2 650V
6.3 900V
6.4 1200V
6.5 1700V
6.6 3300V and above

CHAPTER 7 MARKET ESTIMATES & FORECAST, BY APPLICATION, 2021-2032 (USD MILLION) (VOLUME UNITS)

- 7.1 Key trends
- 7.2 Power supplies
- 7.3 Inverters
- 7.4 Electric vehicles (EVs)
- 7.5 Industrial equipment
- 7.6 Others



CHAPTER 8 MARKET ESTIMATES & FORECAST, BY TECHNOLOGY, 2021-2032 (USD MILLION) (VOLUME UNITS)

8.1 Key trends

- 8.2 150mm wafer technology
- 8.3 200mm wafer technology

CHAPTER 9 MARKET ESTIMATES & FORECAST, BY END-USE INDUSTRY, 2021-2032 (USD MILLION) (VOLUME UNITS)

9.1 Key trends

- 9.2 Automotive
- 9.3 Industrial
- 9.4 Consumer electronics
- 9.5 Telecommunications
- 9.6 Others

CHAPTER 10 MARKET ESTIMATES & FORECAST, BY REGION, 2021-2032 (USD MILLION) (VOLUME UNITS)

10.1 Key trends 10.2 North America 10.2.1 U.S. 10.2.2 Canada 10.3 Europe 10.3.1 UK 10.3.2 Germany 10.3.3 France 10.3.4 Italy 10.3.5 Spain 10.3.6 Russia 10.4 Asia Pacific 10.4.1 China 10.4.2 India 10.4.3 Japan 10.4.4 South Korea 10.4.5 Australia 10.5 Latin America

Silicon Carbide MOSFETs Market Opportunity, Growth Drivers, Industry Trend Analysis, and Forecast 2024–2032



10.5.1 Brazil 10.5.2 Mexico 10.6 MEA 10.6.1 South Africa 10.6.2 Saudi Arabia 10.6.3 UAE

CHAPTER 11 COMPANY PROFILES

- 11.1 Alpha & Omega Semiconductor
- 11.2 CISSOID SA
- 11.3 Danfoss Silicon Power GmbH
- 11.4 Dynex Semiconductor Ltd.
- 11.5 Fuji Electric Co., Ltd.
- 11.6 GeneSiC Semiconductor
- 11.7 Global Power Technologies Group (GPTG)
- 11.8 Hitachi Power Semiconductor Device, Ltd.
- 11.9 II-VI Incorporated (now Coherent Corp.)
- 11.10 Infineon Technologies AG
- 11.11 Littelfuse, Inc.
- 11.12 Microchip Technology Inc.
- 11.13 Mitsubishi Electric Corporation
- 11.14 ON Semiconductor
- 11.15 Renesas Electronics Corporation
- 11.16 ROHM Semiconductor
- 11.17 STARCHIP
- 11.18 STMicroelectronics
- 11.19 Toshiba Corporation
- 11.20 TT Electronics
- 11.21 UnitedSiC (now part of Qorvo)
- 11.22 Vishay Intertechnology
- 11.23 Wolfspeed (Cree Inc.)
- 11.24 X-FAB Silicon Foundries



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