

Semiconductor Devices Market For Electric Vehicles - Growth, Trends, Covid-19 Impact, and Forecasts (2023 - 2028)

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Report description:

The semiconductor devices market for electric vehicles is expected to grow at a CAGR of 30.2% over the forecast period. The growing initiatives by the government for the adoption of electric vehicles and the rising demand for the longer driving range and faster charging time in EVs drive the need for electric vehicles' semiconductor devices.

Key Highlights

The automobile manufacturing industry has been hit hard by semiconductor chip shortages globally. Leading carmakers reported a reduction in production by as much as about 40% due to these shortages. Owing to this, various initiatives were taken by regions to boost chip production. For instance, in August 2022, the United States passed the CHIPS act (Creating Helpful Incentives to Produce Semiconductors). The division received funding of USD 52.7 billion, which is expected to be used for the research, development, and production of semiconductors.

Furthermore, in September 2022, Vedanta Ltd and Taiwan's Foxconn signed an MoU with the Gujarat government for a USD 1.54 trillion investment for setting up a semiconductor and display FAB manufacturing unit. Vedanta Displays Ltd. will set up the display FAB unit at an investment of INR 94,500 crore (USD 945,000 million) .

The changing government requirements regarding the reduction of CO2 emissions, coupled with the electrification of passenger vehicles by various major automakers, are contributing to the growth of demand for SiC-based semiconductors in the market. Moreover, SiC is used for applications in EV batteries. As a result of its use in batteries, it extends the driving range per charge, reduces the time it takes to charge the battery, and increases battery efficiency by requiring less battery capacity and weight. The market is witnessing significant investments from various carmakers to produce Electric Vehicles. For instance, in April 2022, Honda Motor Co. Ltd. announced its plans to invest USD 63 billion in electric vehicle development over the next decade. The auto manufacturer plans to budget approximately JPY 8 trillion (USD 61 Billion) for its research and development expenses, with approximately JPY 5 trillion (USD 38 billion) focused on electrification and software.

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The COVID-19 pandemic influenced the overall semiconductor manufacturing market from the demand and supply sides. Additionally, the global lockdowns and closure of semiconductor plants further fueled the supply shortage. However, many of these effects are to be short-term effects. Precautions and safeguards by governments globally to support automotive and semiconductor sectors could help revive industry growth.

According to the Korea Automotive Technology Institute or Katech, the global shortage of automotive semiconductors that started around 2020 will continue to affect the global car industry over a couple of years. Even after 2023, some companies may still be affected. Until September 2021, major global automakers such as Volkswagen, GM Motors, Stellantis, and Honda witnessed their accumulated production volume fall by around 30% from the same period in 2019, according to Katech. However, Hyundai Motor and Kia, Korea's two leading automotive firms under Hyundai Motor Group, produced only 14% fewer vehicles during the first three quarters of 2021 compared to 2019.

Electric Vehicles Semiconductor Devices Market Trends

Increased Use of Sensors, ICs and Automated Systems in Electric Vehicles is Expected to Drive the Market Growth

The shift towards smaller nodes (approximately 10 nm) in the EV market will give semiconductor companies a competitive advantage by offering increased power and performance.

The extensive use of ADAS systems in electric vehicles is a significant driver for the semiconductor device market. In this regard, introducing advanced mobility solutions, such as autonomous driving technology, is a significant growth driver for the APAC automotive semiconductor market. Autonomous vehicles are equipped with advanced driver-assistance systems, such as adaptive cruise control (ACC), blind spot monitor, glare-free high beam and pixel light, automatic parking system, automotive night vision system, automatic braking system, crosswind stabilizer, driver drowsiness detection system, lane change assistance system, and others. These advanced driving systems are stimulated with the help of semiconductors.

In July 2022, Sony announced its next step in its electric vehicle and autonomous driving efforts, preparing a new sensor for autonomous driving that could slash the power used by a vehicle's onboard systems by as much as 70%. Furthermore, in 2022, Sony has been seen as more active in this area, launching an EV division and partnership with Honda and setting a goal to supply autonomous driving image sensors. These factors in the EV market, therefore, drive the automotive semiconductor market globally.

Infineon Technologies targets five key areas within the electrified vehicle with solutions to optimize power efficiency and microcontrollers, ranging from high-power modules and power semiconductors to sensors and discrete components. These steps are expected to impact the studied market and help in its growth positively.

Every top automaker continues to make electric cars more accessible. For instance, BMW is pushing for electric vehicles to make up 15-25% of overall sales over the coming years, while Honda is striving for two-thirds of its overall sales to be electric cars by 2030. These goals will extensively drive the semiconductor devices in the EV market.

In June 2022, extending the broad line of inductive position sensors into the EV motor control market, Microchip Technology announced the LX34070 IC purpose-built for EV motor control applications. The LX34070 IC includes differential outputs, fast sample rates, and features that make it functional-safety-ready for ISO 26262 compliance in the Automotive Safety Integrity Level-C (ASIL-C) classification. These innovations from leading market players are continuously driving the studied market toward growth.

Asia-Pacific to Hold Significant Market Share

The region is witnessing an increased production of Electric Vehicles owing to the significant customer demand. According to the

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China Association of Automobile Manufacturers, China produced 2.9 million battery-electric vehicles in 2021, up 166% from 2020. Around 601,000 plug-in hybrid vehicles were produced in China in the same year, up by 131% from 2020. Demand for high-power, energy-efficient compound semiconductors, such as silicon carbide (SiC)-based components, gallium nitride (GaN) chips, and components is rising as more electric vehicles (EVs) are being used. SiC-based devices are also available to improve the power efficiency of EVs, lengthen charge times, increase speed, and boost towing capacity. Various governments are taking initiatives to boost the production of automotive chips. For instance, in March 2021, the South Korean government declared it would invest USD 176.8 billion in the domestic automotive semiconductor market over the next two years. To counteract potential long-term impacts, the government is taking measures in response to the global chip shortage. Furthermore, the region is witnessing strategic collaborations from various vendors, propelling the demand for semiconductor devices. For instance, in March 2022, Sony Corporation and Honda Motor Co. Ltd. announced their partnership to develop and sell battery-powered electric vehicles. The company will form a joint venture this year and aim to begin selling the first model in 2025. Moreover, in June 2022, Renesas Electronics, a Japan-based chipmaker, partnered with Tata Motors to design, develop and make semiconductor solutions. Areas of collaboration eyed by the firms include a non-exclusive partnership on emerging automotive technologies, such as advanced driver-assistance systems (ADAS) and wireless network solutions, including 5G.

Electric Vehicles Semiconductor Devices Market Competitor Analysis

The semiconductor devices market for electric vehicles is highly competitive, with many local and international players active. With the market expected to broaden and yield more opportunities, more players are expected to enter the market soon. The key players in the market studied include STMicroelectronics, Renesas Electronics, and Texas Instruments, among others. These major players have adopted various growth strategies, such as new product launches, mergers and acquisitions, expansions, partnerships, joint ventures, and others, to strengthen their position in this market.

October 2022 - STMicroelectronics released new microcontrollers (MCUs) for electrified vehicles that utilize domain-oriented, over-the-air updatable systems and electrified drivetrains.

May 2022 - Hitachi Energy announced the launch of RoadPak, its pioneering power semiconductor module for electric vehicles. It is a compact module that uses silicon carbide (SiC) technology to achieve exceptional power density levels for faster charging, reliability over the vehicle's lifetime, and least power losses for the longest possible driving range.

Additional Benefits:

The market estimate (ME) sheet in Excel format
3 months of analyst support

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