

Discrete Semiconductor - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts 2019 - 2029

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Report description:

The Discrete Semiconductor Market size is estimated at USD 45.72 billion in 2024, and is expected to reach USD 68.46 billion by 2029, growing at a CAGR of 8.41% during the forecast period (2024-2029).

The discrete semiconductor market is driven by the increasing need to manage power across electronics and miniaturization. The reduction in package size is inversely proportional to power dissipation. For instance, NXP semiconductors achieved a 55% reduction in packaging size for their transistors range by retaining the same power performance. Additionally, Diodes Incorporated launched 40V-rated DMTH4008LFDFWQ and 60V-rated DMTH6016LFDFWQ automotive-compliant MOSFETs packaged in DFN2020.

Key Highlights

- Moreover, characteristics like safety, infotainment, navigation, and fuel efficiency in the automotive components, and security, automation, solid-state lighting, transportation, and energy management in industrial components are expected to fuel the market studied. For instance, an insulated gate bipolar transistor (IGBT) is an integral component in the EV power electronics system. IGBTs are expected to witness significant demand due to increasing sales of EVs globally. As per the IEA report, sales of electric cars globally reached 6.6 million in 2021. Electric cars accounted for 9% of global car sales.
- Commercialization of these electric vehicles is on the rise. Volvo is aiming for 50% of its sales to be made up of fully electric cars by 2025. BMW has also dropped its i5 plans and will now focus on electrification of other series models like the X3 and 4 Series GT. The latter will directly compete with Tesla's Model 3 and Model y.
- Furthermore, companies are developing new solutions in the power module segment to expand their presence and increase market share. For instance, In December 2021, STMicroelectronics, a prominent semiconductor company serving customers across the spectrum of electronics applications, has announced the release of its third generation of STPOWER silicon-carbide (SiC) MOSFETs¹, advancing the state-of-the-art in power devices for electric-vehicle (EV) powertrains and other applications where

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power density, energy efficiency, and reliability are key target criteria.

-In contrast, the COVID-19 outbreak has had an enormous impact on the global and national economies. Many end-user industries have been affected, including discrete semiconductors. A large part of the manufacturing of electronic components includes work on the factory floor, where people are in close contact as they collaborate to boost productivity. Currently, companies in the market are quickly evaluating the impacts on three fronts: market demand, supply chain, and workforce. Demand for the product is shifting across ASICs, memory, sensors, etc., while consumer behavior changes rapidly and with future volatility. Also, many companies have delayed their hardware upgrades and other long-term migration projects. For instance, the rollout of the 5G plan has been delayed in many countries, such as India, Japan, Poland, and Israel, which, in turn, caused uncertainty for the launch of commercial 5G services.

-The global supply chains are disrupted as the virus spreads across the world, as still there is uncertainty over quarantine durations. Many manufacturing factories were shut down across the world to contain the deadly virus. For instance, most of the manufacturing facilities of On Semiconductors were shut down due to government mandates in countries like Malaysia, China, Malaysia, and the Philippines, which impacted its ability to supply products to its clients and created a gap in demand and supply.

Discrete Semiconductor Market Trends

The Automotive Segment is Expected to Drive the Market's Growth

- Automotive applications are driving a majority of the demand for discretes, especially for power transistors and rectifiers. Conventional cars have been using 12-V battery systems since the 1950s, but in the current scenario, they cannot handle the heavier electronic loads of next-generation vehicles, thus creating the need for power-efficiency.
- Autonomous driving and fully electric vehicles are demanding higher-performance microcontrollers and microprocessors, with more efficient, high-power MOSFETS, for power management and battery monitoring systems.
- Discrete semiconductors find widespread use in electric vehicles. Space limitations and high-efficiency requirements demand a device that can carry high power and switch at higher frequencies. They can have high currents with very low losses and at a very high frequency, creating significant demand for these devices for EV applications.
- Moreover, with the acceleration of the EV market, many car makers are now embracing 800-V drive systems to increase efficiency, achieve faster charging, and expand the range of such vehicles, all while reducing weight and cost. Wide-bandgap devices, such as SiCMOSFETs, are helping automakers advance state-of-the-art power devices for EV powertrains and other applications where such factors are important.
- In December 2022, STMicroelectronics launched new silicon-carbide (SiC) high-power modules designed to increase electric vehicles' performance and driving range. Five new SiC MOSFET-based power modules have been selected by Hyundai for use in the E-GMP electric vehicle platform shared by the KIA EV6 and multiple models.
- In August 2022, Renesas Electronics Corporation announced the development of a new generation of Si-IGBTs. Through this launch, the company aimed at next-generation EV inverters, AE5-generation IGBTs were expected to be mass-produced starting in the first half of 2023 on Renesas' 200- and 300-mm wafer lines at the company's factory in Naka, Japan.
- The EVs market is highly competitive, and new manufacturers are pushing the envelope for innovation. For instance, Porsche equipped its Taycan with an 800 V system, while many contemporary electric cars operate with 400 V batteries. This led traditional automotive component manufacturers to develop their discrete semiconductor lineup for the automotive sector.

The Americas is Expected to Hold a Major Market Share

- The proliferating consumer electronics industry in the region is one of the primary factors driving the growth of the market. For

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instance, according to the Consumer Technology Association (CTA), U.S. technology retail revenues are expected to reach USD 485 billion in 2023. Though it is slightly down from the record-breaking USD 512 billion in 2021, the revenues will still remain above pre-pandemic levels, as per the organization.

- Further, emerging technologies like the Internet of Things (IoT) have created a new wave of innovation in the semiconductor industry. An increasing number of electronic devices, ranging from laptops to thermostats, are becoming connected each year in the region, allowing for more sophisticated communication and coordination between them and their users. For instance, as per the CTA, 23% of U.S. homes had smart or connected health monitoring devices in 2021, and 19% had connected sports or fitness equipment (up seven points from the previous year). The expanding IoT market is expected to positively influence the region's demand for discrete semiconductors.

- The automotive sector in the United States is a crucial component of economic growth and has historically contributed 3 - 3.5% to the overall Gross Domestic Product (GDP), as per the Center for Automotive Research. The industry also contributes to a significant portion of the region's total demand for semiconductor components.

- The automotive industry's transformation toward electrification is also fueling the demand for sophisticated semiconductor components. For instance, as per IEA's annual Global Electric Vehicle Outlook 2023, the United States is the third largest electric vehicle market, with strong sales growth of 55%.

- Moreover, according to Argonne National Laboratory, in FY2023, 97,972 HEVs were sold in the United States, up 36.4% from the sales in April 2022. Toyota accounted for a 44.3% share of total HEV sales this month.

- The growing renewable energy sector in Canada is also expected to support market growth. According to the Canadian Renewable Energy Association (CanREA), Canada's wind and solar energy sectors grew significantly in 2022. As per the organization, solar is growing particularly quickly, with more than one-quarter of all the installed capacity in Canada being added in 2022 alone.

Discrete Semiconductor Industry Overview

The global discrete semiconductor market is highly fragmented, with numerous semiconductor manufacturers providing the product. The companies are continuously investing in product and technology to promote sustainable environmental growth and prevent environmental hazards. The companies are also acquiring other companies that specifically deal with these products to boost the market's share. Some of the recent developments in the market are:

- In January 2023, Hitachi Astemo, Ltd., a renowned Japanese manufacturer of automotive components, announced that its electric vehicle inverters would use ROHM Semiconductor's new fourth-generation SiCMOSFETs and gate driver ICs. The newest fourth-generation SiCMOSFETs from ROHM offer the lowest ON-resistance in the industry and improved short-circuit withstand time, allowing for an increase in the cruising range of electric vehicles by 6% when compared to IGBTs.

- In January 2023, Renesas Electronics Corporation announced the introduction of a new gate driver IC designed to drive high-voltage power devices such as IGBTs and SiC MOSFETs for electric vehicle (EV) inverters.

Additional Benefits:

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

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