

Automotive Semiconductor - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2024 - 2029)

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Abstracts

The Automotive Semiconductor Market is expected to register a CAGR of 14.43% during the forecast period.

The automotive semiconductor market size is expected to grow from USD 71.62 billion in 2023 to USD 140.52 billion by 2028, at a CAGR of 14.43 percent during the forecast period (2023-2028). The market was evaluated by analyzing the sizes of components used in the automotive industry, including processors, sensors, memory devices, integrated circuits, and discrete power devices. The report's scope comprises analyzing various vehicle types, like light commercial vehicles, heavy commercial vehicles, and passenger vehicles, around the world.

Key Highlights

A semiconductor is a substance, such as germanium or silicon, with electrical conductivity intermediate between a conductor and an insulator. The application of semiconductors in vehicles ranges from chassis, power electronics safety, body electronics, and comfort or entertainment units.

Automobiles are an essential element of people's lives because they are the primary form of transportation today. The automotive safety and security system technologies have undergone a significant change in recent years, from seat headrests to adaptive cruise control systems. The rising wave of advanced technologies, such as blind-spot detection, drowsiness monitoring systems, lane departure warning systems, head-up display, night vision systems, park assist, e-call telematics, and tire-pressure-monitoring system technologies, are creating a significant potential for safety and security systems

to protect the driver and passengers from severe injuries during a vehicle crash. The increasing adoption of autonomous vehicles is expected to drive the growth of the studied market. For instance, according to Intel, global car sales are estimated to reach more than 101.4 million units in 2030, and autonomous vehicles are anticipated to account for approximately 12 percent of car registrations by 2030.

A growing number of affordable vehicles feature advanced infotainment, safety, performance, and fuel efficiency. Such features lead to the inclusion of various components, leading to an increase in the price raise of the overall vehicle. Thousands of semiconductor chips are at the core of automobiles today, acting as the vehicle's eyes, ears, and brain, monitoring the environment, making choices, and regulating actions. According to the Semiconductor Industry Association, modern automobiles may have 8,000 or more semiconductor chips and over 100 electronic control units, which account for more than 35 percent of total vehicle cost and are predicted to exceed 50 percent by 2025 to 2030.

The increase in automotive production is also estimated to offer lucrative opportunities for the studied market. For instance, according to OICA, in 2022, around 85 million automobiles will be produced worldwide. It represents an increase of around 6 percent over the previous year. Further, according to the China Association of Automobile Manufacturers(CAAM), in January 2022, approximately 345,000 commercial vehicles and 2.08 million passenger cars were manufactured in China. The industry, in total, produced 2.42 million vehicles in January 2022.

Moreover, according to the Society of Motor Manufacturers and Traders, British commercial vehicle production grew by 39.3 percent (as compared to 2021) to 101,600 units in 2022. The output for the domestic market in 2022 rose by 14.0 percent year-on-year to 40,409 units, with 101,600 vans, trucks, taxis, buses, and coaches leaving factory lines. The increased automotive manufacturing activities would aid the growth of the studied market during the forecast period.

COVID-19 caused an immediate halt in existing manufacturing, impacting supply chains worldwide. China, which was initially afflicted by the pandemic, lost over two-thirds of its vehicle manufacturing due to the statewide lockdown, significantly damaging the supply chain. Auto supply chains are frequently geographically dispersed; with each country imposing its protocol following the pandemic, supply chain management took a significant hit, emerging as one of the most critical challenges confronting the automotive industry during COVID-19.

The high costs associated with developing and deploying automotive semiconductors are anticipated to significantly restrain the studied market.

Automotive Semiconductor Market Trends

Heavy Commercial Vehicle Segment to Register Significant Growth

The heavy commercial vehicle market is expected to register a significant CAGR during the projected period. With the introduction of modern technology, such as accident prevention systems, ADAS, efficient driving and engine systems, and a focus on environmental sustainability and emission reduction, the demand for these large commercial vehicles will likely increase.

Top manufacturers' technological advancements in heavy commercial vehicles are set to surge worldwide. A prominent trend characterizing the market's success has concentrated on accident prevention systems, automatic emergency braking systems, driver assistance, and blind-spot monitoring. Installing automated emergency braking systems and forward-collision warnings on heavy-duty vehicles may save more than 40 percent of rear-end incidents involving large trucks, according to research led by the Insurance Institute for Highway Safety (IIHS).

According to the research, heavy-duty vehicles with front-crash prevention systems, such as automated emergency braking (AEB), had 12 percent fewer collisions, and forward-collision warning (FCW) had 22 percent fewer collisions, compared to vehicles without front-crash prevention systems. Consequently, the increasing demand for integrated ICs to make efficient automatic braking and driving systems significantly drives the automotive semiconductor market worldwide.

Under the new scrappage policy, governments in Asia-Pacific countries, like India, South Korea, and China, seek to push heavy-duty truck owners to acquire new heavy-duty trucks and other commercial vehicles, discouraging the use of old, polluting ones. The program would reduce pollution levels and promote the advancements of the heavy trucks segment in adopting integrated ICs, sensors, advanced microcontrollers, ADAS, and motor driver ICs, significantly influencing the market's growth.

Several heavy-duty truck manufacturers in Europe have been investing in integrating novel technology to meet the zero-emission objective from 2025 onwards to avoid paying high penalties for non-compliance with EU norms. The European Union has established carbon-neutrality goals and criteria for heavy-duty vehicles. These include a

15 percent decrease beginning in 2025 and increasing to 30 percent by 2030, with zero emissions by 2050.

According to OICA, in 2022, China produced the highest number of commercial vehicles in the Asia-Pacific region, with around 3.18 million units. In the same year, Japan produced approximately 1.27 million commercial vehicles.

Asia-Pacific to be the Fastest Growing Region

The Asia-Pacific automotive semiconductor market is fueled by increased automotive manufacturing and continued partnerships between automotive OEMs and semiconductor manufacturers. Cost and fuel efficiency are no longer the most important factors to consider when buying an automobile; instead, the comfort and luxury offered by the vehicle are more important.

This may be attributed to the fact that global automobile manufacturers are seeing strong demand for luxury and semi-luxury vehicles, which is pressuring them to install more electronic components, pushing the Asia-Pacific automotive semiconductors market. As a result of this reason, the Asia-Pacific automotive semiconductor industry offers a potential market area.

The rapid expansion of the Asia-Pacific automotive semiconductor industry is expected to be fueled by the rising demand for electric vehicles. Automobile manufacturers must continue to innovate, create, and develop self-driving cars, which have already attracted a significant number of customers in key automotive manufacturing countries.

The growth trajectory of fully autonomous automobiles is expected to be heavily influenced by several factors, including technology advancements, consumer willingness to accept fully automated vehicles, pricing, and suppliers' and OEMs' capacity to address major concerns about vehicle safety.

According to the automobile industry, two-wheelers, three-wheelers, and tractors are in great demand across the country. In addition, India has a strong semiconductor R&D infrastructure, which may open up new potentials for the automotive semiconductor market in India in the future. Further, the government is taking various initiatives to boost the supply of semiconductor chips in the country. For instance, in September 2022, the Indian government announced to provide uniform fiscal support of 50 percent

of the project cost for setting up semiconductor fabrication plants to boost semiconductor manufacturing in the country.

Automotive Semiconductor Industry Overview

The automotive semiconductor market is highly fragmented due to the presence of major players like NXP Semiconductor NV, Infineon Technologies AG, Renesas Electronics Corporation, STMicroelectronics NV, and Toshiba Electronic Devices & Storage Corporation (Toshiba Corporation), among others. Players in the market are adopting strategies such as partnerships, mergers, collaborations, innovations, and acquisitions to enhance their product offerings and gain sustainable competitive advantage.

In July 2023, Renesas Electronics Corporation announced a development board for automotive gateway systems. The R-Car S4 Starter Kit is a low-cost, readily available development board for building software using the Renesas R-Car S4 system on a chip (SoC).

In June 2023, Intellias announced its partnership with Elmos Semiconductor to reinforce Elmos with software engineering expertise and support development processes to create software for lighting, ranging, and optical sensors used in the most modern vehicles.

In August 2022, Onsemi opened a silicon carbide (SiC) facility in Hudson, New Hampshire. The facility is expected to increase the company's production capacity by five times yearly and almost quadruple the number of employees in Hudson by the end of 2022.

In July 2022, NXP Semiconductors NV collaborated with Foxconn for a new generation of intelligent connected vehicles. The primary focus of the collaboration is aimed at Foxconn's efforts in electric vehicle platforms, leveraging the company's system expertise and comprehensive portfolio. The collaboration would leverage NXP's portfolio of automotive technologies and its expertise in safety and security to enable architectural innovation and platforms for electrification, connectivity, and safe automated driving.

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