Global Automotive Semiconductor Market Forecast 2024-2032

Market Report | 2024-09-27 | 295 pages | Inkwood Research

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Report description:

KEY FINDINGS
The global automotive semiconductor market is expected to register a CAGR of 9.84% during the forecast period, 2024-2032. The market study has also analyzed the impact of COVID-19 on the automotive semiconductor industry qualitatively as well as quantitatively.
Automotive semiconductors refer to electronic components or automotive semiconductor chips designed specifically for use in vehicles. These semiconductors play a crucial role in the functioning of various automotive systems, including engine control units, safety systems, infotainment, navigation, and other electronic components.
They enable the integration of advanced technologies such as advanced driver-assistance systems (ADAS), electric powertrains, connectivity features, and more. Automotive semiconductors are tailored to meet the unique requirements and challenges of the automotive environment, contributing to the overall performance, safety, and innovation in modern vehicles.
MARKET INSIGHTS
Key growth enablers of the global automotive semiconductor market:
- Increasing demand for electric vehicles (EVs) and hybrid electric vehicles (HEVs)
o Electric vehicles (EVs) rely heavily on advanced semiconductor technology to enhance their safety, intelligence, and efficiency. Although traditional semiconductor technologies limit the performance of typical EV batteries, newer materials like silicon carbide (SiC) and gallium nitride (GaN) allow EV batteries to operate at higher voltages, significantly improving their performance. Semiconductors also play a crucial role in powering key features such as blind-spot sensors, emergency braking systems, and backup cameras, making vehicles safer and more intelligent.
o Although semiconductor chips can be costly and have a limited lifespan, advancements in this technology are paving the way for longer-lasting, more efficient batteries. These innovations are expected to drive the growth of the global automotive semiconductor market, supporting the continued expansion of EV technology.
- Growing focus on connected cars
- Increasing autonomous features in cars
- Demand for more functions in electronic control unit (ECU)
Key restraining factors of the global automotive semiconductor market growth:
- High development costs and longer design cycles
o The cost of inputs for vehicle manufacturing is steadily increasing, with raw materials such as steel for bodywork, gear

components, and frames, as well as plastic for bumpers and door trimmings, making up a significant portion of production expenses.
o As the demand for advanced features like Advanced Driver Assistance Systems (ADAS) and connected vehicle technologies grows, more powerful and complex semiconductors are required, which is driving up their prices. This rise in semiconductor costs leads to higher production expenses for car manufacturers. In turn, these increased costs are frequently passed on to consumers, resulting in higher vehicle prices.
- Stringent automotive safety and quality standards
- Supply chain disruptions and semiconductor shortages
Global Automotive Semiconductor Market | Top Trends
- The increasing prevalence of advanced driver assistance systems (ADAS) in the automotive industry has driven demand for powerful processors, specialized sensors, and high-performance semiconductors. These components are utilized for critical functions such as cameras, LiDAR, and radars. Furthermore, they also process data from GPS and high-definition maps.
- The growing complexity of car electronics, with features like connected car technology and autonomous driving, creates a larger attack surface for hackers. This heightened vulnerability is driving the need for robust automotive cybersecurity solutions to protect vehicles from unauthorized access, manipulation, and potential safety hazards.
SEGMENTATION ANALYSIS
Market Segmentation - Vehicle Type, Fuel Type, Application, and Component -
Market by Vehicle Type:
- Passenger Cars
- Light Commercial Vehicles (LCVs)
- Heavy Commercial Vehicles (HCVs)
Market by Fuel Type:
- Gasoline
- Diesel
- Electric/Hybrid
o An electric motor takes the place of the internal combustion engine in all-electric vehicles (EVs), also referred to as battery electric cars. Electric vehicle supply equipment (EVSE) or an outlet must be connected to these vehicles since the electric motor is powered by a sizable traction battery pack.
o Electric vehicles (EVs) produce no exhaust emissions and lack conventional liquid fuel components, such as fuel pumps, fuel lines, or fuel tanks, since they operate entirely on electricity. Connectivity is a critical feature in modern EVs, enabling manufacturers to provide essential software updates for key systems like braking and powertrain through the car's firmware.
o As EVs become more advanced, the demand for semiconductor chips increases, as these chips are vital for various functionalities. The number of semiconductor components in EVs is growing rapidly, especially with features like blind-spot detectors and backup cameras now standard in many vehicles. This increasing integration of advanced technologies drives up demand for the valuable metals used in semiconductor manufacturing.
Market by Application:
- Advanced Driver Assistance Systems
- Body Electronics
o Body electronics encompass the electronic systems and components responsible for controlling various functions related to a vehicle's body and interior, contributing significantly to overall safety, comfort, and convenience. They involve a distributed network of Electronic Control Units (ECUs), each overseeing specific functions, which, in turn, increases the demand for semiconductors compared to other applications.
o While body electronics features enhance convenience and comfort, they are often considered less critical for safety when compared to certain advanced driver assistance systems (ADAS) features. This perspective tends to prioritize cost-effectiveness, potentially driving the utilization of a larger number of semiconductors, albeit at a lower cost.
- Infotainment
- Powertrain

- Safety Systems
Market by Component:
- Processors
- Analog ICs
- Discrete Power Devices
- Sensors
o LED
o Image Sensor
o Position Sensor
o Temperature Sensor
o Pressure Sensor
o Other Sensor Types
- Memory Type
o Dram
o Flash
- Lighting Devices
REGIONAL ANALYSIS
Geographical Study Based on Four Major Regions:
- North America: The United States and Canada
- Europe: The United Kingdom, Germany, France, Italy, Spain, Belgium, Poland, and Rest of Europe
- Asia-Pacific: China, Japan, India, South Korea, Indonesia, Thailand, Vietnam, Australia & New Zealand, and Rest of Asia-Pacific
o The Asia-Pacific region is home to some of the world's largest and most advanced semiconductor fabrication facilities, particularly in countries like China, Taiwan, and South Korea. A significant portion of the global supply of automotive-grade chips is produced in these facilities.
o Rapid urbanization and development in the region are driving increased demand for vehicles equipped with cutting-edge technologies such as connected car systems, infotainment, and advanced driver assistance systems (ADAS), all of which require semiconductors.
o Additionally, the growing adoption of electric vehicles (EVs) in the Asia-Pacific is further contributing to this demand. The region's EV market is expected to see substantial growth, fueled by the need for specialized semiconductors for electric motor control, power electronics, and battery management.
- Rest of World: Latin America, the Middle East & Africa
Our market research reports offer an in-depth analysis of individual country-level market size and growth statistics. We cover the segmentation analysis, key growth factors, and macro-economic trends within the automotive semiconductor market, providing detailed insights into -
- United States Automotive Semiconductor Market
- India Automotive Semiconductor Market
- Germany Automotive Semiconductor Market
COMPETITIVE INSIGHTS
Major players in the global automotive semiconductor market:
- Analog Devices Inc
- Infineon Technologies AG
- Intel Corporation
- Toshiba Corporation
- Renesas Electronics Corporation
- Robert Bosch GmbH
Key strategies adopted by some of these companies;
- In October 2023, Toshiba introduced the TLP3475W, a thin, compact WSON4 package that houses a photorelay. It works

effectively for semiconductor testers' pin electronics, lowers insertion loss, and suppresses power attenuation in high-frequency signals.
- In February 2024, Honda and Infineon worked together to develop automotive semiconductor solutions that made Honda's vehicles more advanced and competitive.
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Frequently Asked Questions (FAQs):
- What role do semiconductors play in electric vehicles (EVs)?
A: Semiconductors play a crucial role in the electrification of the automotive industry by powering electric vehicles (EVs). They are essential for power electronics, battery management systems, and other components crucial for EV performance and efficiency.
- What challenges does the automotive semiconductor market face?
A: The automotive semiconductor market faces challenges such as disruptions in the semiconductor supply chain, leading to production delays and increased competition for essential components.

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