

Automotive Electronics – A Global Market Overview

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Abstracts

Global Automotive Electronics Market Trends and Outlook

Over the past four decades, the greatest shift in automotive technology has been the integration of electrical and electronic systems into nearly every aspect of a vehicle's functionality. While early electrification, such as electric ignition, lighting, and starting, dates back much further, the exponential increase in electronic control and operating systems is a more recent phenomenon. Automotive Electronics encompasses electronic components and software systems designed to enhance comfort, safety, and entertainment. These systems have grown significantly in complexity, with key components like Electronic Control Units (ECUs), Current Carrying Devices, and Sensors playing a crucial role in Advanced Driver Assistance Systems (ADAS), Body Electronics, Infotainment, Powertrain, and Safety & Security Systems. For optimal performance, these subsystems must be interconnected through structured communication methods, such as wiring harnesses, bus systems (CAN, LIN, FlexRay), gateway modules, Ethernet for high-bandwidth applications, and wireless technologies like Bluetooth.

Technological advancements in artificial intelligence (AI), connectivity, and miniaturization have transformed the Automotive Electronics market, making modern vehicles more efficient, intelligent, and autonomous. AI-powered algorithms process vast amounts of sensor and camera data, enabling real-time decision-making for driver assistance and autonomous driving functions. Connectivity innovations, including 5G and vehicle-to-everything (V2X) communication, facilitate real-time interaction between vehicles, infrastructure, and pedestrians, enhancing road safety and efficiency. Cloud-based features further enable remote diagnostics, software updates, and personalized driver settings, making vehicles more adaptive and 'smart.' These developments ensure that today's automobiles are equipped with cutting-edge electronic systems that enhance both driver experience and safety.

The global market for Automotive Electronics is estimated at US\$300.1 billion in 2024 and is projected to reach US\$494.9 billion by 2030, growing at a CAGR of 8.7%. Key factors driving this growth include increasing consumer demand for safety and convenience, rising production and sales of electric and autonomous vehicles, and stringent regulations aimed at reducing emissions and enhancing safety. Modern vehicles are increasingly equipped with ADAS, infotainment systems, and connectivity features, making advanced safety and convenience a priority. Technologies such as automatic emergency braking, lane-keeping assist, and adaptive headlights are becoming standard, while infotainment systems integrate smartphones, GPS navigation, and media streaming. Though these features are well established in North America and Europe, demand is rapidly rising in Asia-Pacific and South America.

The surge in electric and autonomous vehicle sales has significantly contributed to the growing demand for advanced electronic systems. Electric vehicles rely on specialized electronics for battery management, energy storage, and motor control, optimizing efficiency and range. Autonomous vehicles, on the other hand, depend on sophisticated sensors, cameras, and AI-driven algorithms to navigate, detect obstacles, and make real-time decisions for safe, driverless operation. As these technologies continue to evolve, Automotive Electronics will play a crucial role in shaping the future of mobility.

Automotive Electronics Regional Market Analysis

Asia-Pacific leads the global demand for Automotive Electronics and is also expected to register the fastest CAGR in excess of 10% during the 2024-2030 analysis period. China, Japan, South Korea and India are home to some of the largest global automakers and the robust growth of the automotive industry in these countries is being fueled by rising disposable incomes, urbanization and infrastructure development. Increase in consumer awareness regarding safety and convenience features provided by auto electronics in modern vehicles is bolstering demand, to which manufacturers are also responding in a positive manner. China has now become the global auto manufacturing hub, outpacing even established regions, such as the United States and Germany. Moreover, Asia-Pacific also has a highly developed electronics industry, with constant innovations being undertaken by companies to introduce highly sophisticated components that can enhance vehicle efficiency and performance. Environmental regulations in place are limiting the levels of vehicular emissions drastically, prompting a shift towards electric and hybrid vehicles, all of which contribute to the growing market for Automotive Electronics in the region.

Automotive Electronics Market Analysis by Component

By component, Current Carrying Devices account for the largest share of the global Automotive Electronics market, estimated at about 41% in 2024. As a rule, these components, such as connectors, switches, fuses and wiring harnesses, which are extensively utilized in the latest vehicles, are quite costly and essential for transmitting electrical power and signals all through a vehicle's electrical network. However, the demand for Electronic Control Units (ECUs) is likely to record the fastest CAGR during the 2024-2030 analysis period. These devices are used for monitoring and adjusting engine operations, such as fuel injection timing, ignition timing & air-fuel ratio, which maximize fuel efficiency and ensure that regulatory emission standards are adhered to. In electric vehicles, ECUs play a critical role in managing and optimizing the powertrain and energy management systems, such as battery control, motor control and regenerative braking.

Automotive Electronics Market Analysis by Application

Application-wise, the global market for Automotive Electronics in Powertrain Systems is the largest, as these can cover all types of powertrains, such as internal combustion engine (ICE), electric and hybrid vehicles. A vehicle's powertrain comprises all the components that generate power and deliver it to the vehicle for smooth operation. The heavy demand for Automotive Electronics in this area can be attributed to the ongoing transition to electric and hybrid vehicles that need sophisticated electronics for efficient power management, battery control and energy recovery systems. Further impetus to the demand is being provided by innovations in powertrain technology with the target of improving fuel efficiency and reducing emissions. As regards growth, though, the worldwide market for Automotive Electronics in Advanced Driver Assistance Systems (ADAS) will be the fastest. This system typically comprises advanced electronic components, such as cameras, radars and sensors used for monitoring road conditions, alerting drivers and also autonomously managing braking and steering in some cases. The implementation of stringent safety regulations by governments and regulatory bodies aimed at minimizing accidents and enhancing road safety has speeded up the adoption of ADAS in vehicles of all varieties.

Automotive Electronics Market Analysis by Vehicle Type

The global Automotive Electronics demand by vehicle type is dominated by Passenger Cars, which will also clock the fastest growth over the analysis period. This can be attributed to the increasing incorporation of advanced electronic systems in passenger

vehicles with the goal of improving safety, efficiency and comfort. Consumers of today need a car equipped with connectivity, infotainment and advanced driver assistance systems (ADAS), apart from complying with stringent regulatory standards for safety and emissions. Electric and hybrid passenger cars are now becoming the norm, which further require these highly complex electronic control and battery management systems for efficient functioning.

Automotive Electronics Market Analysis by Fitting Type

OEM Fitted Automotive Electronics corner the larger share of the global demand, estimated at nearly 73% in 2024, and will also maintain the fastest growth. The primary reason for this is that a major proportion of the electronic components in a vehicle are included in the production stage itself to provide greater durability and longer life. The demand for advanced components is being driven by ongoing innovations by OEMs in electronic technologies for providing systems that can improve vehicle performance, safety and user experience. Aftermarket fitting of electronics in vehicles extends functionality and offers retrofitting options, hence its lower share. This segment, too, is crucial in offering upgrades, replacements and enhancements for existing vehicles, such as advanced infotainment systems, ADAS upgrades and electric vehicle conversion kits.

Automotive Electronics Market Report Scope

This global report on Automotive Electronics analyzes the global and regional markets based on component, application, vehicle type and fitting type for the period 2021-2030 with projections from 2024 to 2030 in terms of value in US\$. In addition to providing profiles of major companies operating in this space, the latest corporate and industrial developments have been covered to offer a clear panorama of how and where the market is progressing.

Key Metrics

Historical Period: 2021-2023

Base Year: 2024

Forecast Period: 2024-2030

Units: Value market in US\$

Companies Mentioned: 40+

Automotive Electronics Market by Geographic Region

North America (The United States, Canada and Mexico)

Europe (France, Germany, Italy, Russia, Spain, The United Kingdom and Rest of Europe)

Asia-Pacific (China, Japan, India, South Korea and Rest of Asia-Pacific)

South America (Argentina, Brazil and Rest of South America)

Middle East & Africa

Automotive Electronics Market by Component

Current Carrying Devices

Electronic Control Units (ECUs)

Sensors

Other Components (Incl. Actuators, Controls, Displays, Integrated Circuits, Harnesses & Switches)

Automotive Electronics Market by Application

Advanced Driver Assistance Systems (ADAS)

Body Electronics

Infotainment

Powertrain Systems

Safety & Security

Other Applications (Fuel Injection, HVAC, Lighting & Tire Pressure Monitoring)

Automotive Electronics Market by Vehicle Type

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Alpine Electronics, Inc.

Altera Corporation

Analog Devices, Inc.

Aptiv PLC

Atmel Corporation

Atotech Deutschland GmbH

Audiovox

Autoliv, Inc.

Avago Technologies

BorgWarner, Inc.
Broadcom, Inc.
Continental AG
Daicel Corp
Delphi Automotive
Delta Electronics, Inc.
Denso Corporation
Faurecia SA
Harman International Industries, Inc.
Hella GmbH & Co. KgaA
HGM Automotive Electronics
Hitachi Automotive Systems Ltd.
Hyundai Mobis Co Ltd.
Infineon Technologies AG
Lear Corporation
Magna International, Inc.
Marelli Holdings Co Ltd
Microchip Technology, Inc.
Mitsubishi Electric Corporation
NVIDIA Corp
NXP Semiconductors NV
Omron Corp
Panasonic Corp
Philips NV
Pioneer Corp
REDARC Electronics
Renesas Electronics Corp
Robert Bosch GmbH
Sony Corp
STMicroelectronics NV
Texas Instruments, Inc.
Tokai Rika Co Ltd
Toyoda Gosei Co Ltd
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Sensors

Other Components (Incl. Actuators, Controls, Displays, Integrated Circuits, Harnesses & Switches)

Automotive Electronics Market by Application

Advanced Driver Assistance Systems (ADAS)

Body Electronics Systems

Infotainment Systems

Powertrain Systems

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