Current Sensor - Market Share Analysis, Industry Trends & Statistics, Growth Forecasts (2025 - 2030)

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Report description:

The Current Sensor Market is expected to register a CAGR of 9.1% during the forecast period.

Key Highlights
- In recent years, the demand for low-cost, accurate, and small-size current sensor solutions has increased across the industrial, automotive, commercial, and communications systems. New design concepts and the systematic utilization of advanced technology have entitled further improvements in IC performance. It has also opened the path to new product approaches by supporting integrating additional functions, such as power protection, in the same current sensor IC.
- For instance, in May 2022, Continental AG launched its high-voltage Current Sensor Module (CSM) and the Battery Impact Detection (BID) system to make EV batteries safe. To support strict functional safety requirements, the CSM is available as a two-channel sensor, measuring current independently by integrating shunt technology and hall technology in a compact, single unit.
- The increasing smartphone penetration is expected to drive the demand for current sensors over the forecast period. For instance, according to Ericsson, smartphone subscriptions are expected to surpass 1.2 billion by 2026. 5G is expected to become a key driving factor, with 26 percent of mobile subscriptions by 2026.
- Further, the Industry 4.0 revolution, in which machines are becoming more intelligent and intuitive, is increasing the need for the industrial applications of sensors. The new devices are designed to be more efficient, safe, and flexible, with the ability to monitor their performance, usage, and failure autonomously. Therefore, these applications spur the demand for current sensors. According to the IFR forecasts, international adoption is anticipated to increase significantly to 518,000 industrial robots operating across plants all around the globe by 2024. The favorable growth trajectory of the industrial robots demand is expected to drive the market for sensors during the same period.
- Furthermore, with the growing concerns about the global demand for energy and the overall augmentation of environmental

awareness, designers for power electronics applications are under constant pressure to improve efficiency. The advent of the smart grid, grid-tied photovoltaic (PV), and some other grid-tied renewable energy systems require the growth of high-efficiency power inverters. According to the International Energy Agency's Net Zero Emissions by 2050 Scenario, 300 million electric automobiles will be on the road by 2030, accounting for more than 60 percent of new automobile sales. Because of the widespread usage of current sensors in EVs and HEVs, the automotive end-user is projected to continue to be one of the significator factors for the growth of the current sensor market.
- Large-scale commercialization of IoT and IIoT is bolstering the market. According to Ericsson, the number of cellular IoT links is predicted to reach 3.5 billion in 2023. With the traditional manufacturing sector witnessing a digital transformation, IoT is fueling intelligent connectivity's next industrial revolution. This is transforming the way enterprises approach increasingly complicated systems and machines to enhance efficiency and reduce downtime, creating a good scenario for the growth of the current sensor market.
- However, high cost and technical limitations associated with product development and integration of current sensors integration, along with the rules of current sensors in case of high voltage spikes, high temperature, and current conditions, are some of the major factors challenging the growth of the studied market.
- However, the Russia-Ukraine war is impacting the supply chain of semiconductors, being a major supplier of natural gas and raw materials in producing semiconductors. Additionally, the semiconductor shortage had several impacts on the current sensors market. The shortage of semiconductors could result in delayed production of sensor components, leading to increased costs for current sensor manufacturers, as they may need to pay more increased prices for the limited supply of semiconductors available.
- Moreover, in April 2023, Maruti Suzuki India said that the uncertainties in the electronic component supplies might affect production in FY 24. The shortage of electronic components had some impact on the company's production in FY 2023. Such instances will continue to hamper the growth of the market.

Current Sensor Market Trends

Automotive Industry to Hold Considerable Market Share

- With increased automotive technology advancements, the trends toward electric vehicle production are highly recommended in various countries. A complex architectural diagram of an electric car generally incorporates multiple current sensors. Besides this, current sensors are also needed for brushless (BLDC) electric motor control. The EVs (electronic vehicles) of companies like BMW, Volkswagen, etc. use this motor-control-current device.
- Typically, current sensors are found in battery current monitoring, solar power inverters, and power inverters that drive traction motors in mid and full hybrid electric vehicles. CMOS Hall-effect-based magnetic sensors integrate advanced features and provide high-level output signal functionality. Sophisticated magnetic sensors hold programmable memory, and even microcontroller logic allows for a fully custom-calibrated output. Additionally, it is possible to implement standard interfaces that simplify communication with other circuits in EVs.
- Furthermore, the hybrid electric vehicle (HEV) is quickly becoming the most popular green car and employs complex electronic circuitry to control the flow of electric energy through the vehicle. In a single-motor HEV, the motor acts as a drive motor in parallel with the internal combustion engine or as a generator to charge the battery during regenerative braking. A typical HEV includes multiple systems that require electrical current detectors for maximally efficient operation, including AC motor and DC-DC converter applications. According to the European Alternative Fuels Observatory (EAFO), Germany recorded 823,900 new registrations of plug-in electric cars in the passenger car segment in 2022, with battery electric vehicle (BEV) sales accounting for about 56.36 percent.
- Players like Allegro MicroSystems have developed a broad family of current sensor integrated circuits (ICs) that are ideally suited for hybrid electric vehicles (HEV) applications. The features include signal processing and package design innovations enabling 120 kHz output bandwidth, high current resolution, low noise spectral density, reduced power loss through-hole

compliance, and low-resistance integrated conductor packages. Further, in November 2022, Infineon launched an automotive current sensor IC (TLE4971), available in four pre-programmed current ranges: 25, 50, 75, or 120 A. The TLE4971 is intended for onboard chargers, high-voltage auxiliary drives, and charging applications. Moreover, the sensor is also suitable for industrial applications like DC chargers for electric vehicles, industrial drives, servo drives, and photovoltaic inverters.
- Favorable government regulations are also playing an integral role in the growth of the EV industry, which has emerged as a leading consumer of current sensors. For instance, in early 2022, the European Union announced a unique EUR 750 billion (USD 770.5 billion) stimulus package, which includes EUR 20 billion (USD 20.5 billion) to boost the sales of clean vehicles and to install about 1 million electric and hydrogen cars charging stations by 2025.
- To stimulate the growth of the Chinese automotive industry, several initiatives are also being taken by the government. For instance, in September 2022, the State Taxation Administration (STA), the Ministry of Finance (MOF), and the Ministry of Industry and Information Technology (MIIT) jointly announced the continuation of tax exemptions on purchases of new energy vehicles. Hence, with the sales of EVs expected to sustain a similar growth pattern, the demand for current sensors across the country's automotive industry is also expected to grow further during the forecast period.
- Additionally, in October 2022, The BMW Group confirmed the investment of USD 1.7 billion in its American facilities to produce electric automobiles and batteries. The project will consist of USD 700 million for a planned high-voltage battery-assembly plant in the neighboring Woodruff and USD 1 billion to equip the automaker's current Spartanburg manufacturing in South Carolina for the manufacturing of EVs. By 2030, the German manufacturer plans to manufacture at least six all-electric vehicles in the United States.

Asia-Pacific is Expected to Register Significant Growth

- Asia-Pacific is anticipated to account for significant growth. The population growth and rapid urbanization in developing economies, such as India, China, and Japan, have initiated the speedy expansion in the region, which will increase the need for the current sensor from end-users such as energy, automotive, telecom and networking, industrial, and healthcare. According to IEA, an estimated 270 million people will likely be added to India's urban population by 2040. As urbanization leads to a rise in the ownership of consumer appliances, the share of energy demand taken by electricity is expected to grow further.
- According to the Consumer Electronics and Appliances Manufacturers Association, India's appliances and consumer electronics industry is projected to double by INR 1.48 lakh crore (USD 17.9 Billion) by 2024 - 25. As players are manufacturing fully integrated and programmable current sensors based on BiCMOS or CMOS technology, the demand for these current sensors will increase effectively with the increasing production of consumer electronics.
- The Japanese government is also investing significantly in developing renewable industry infrastructure. To achieve its net zero by 2050 plans, the government has launched several initiatives worth multiple billions. Hence, the growing investment in renewable energy infrastructure will drive the demand for current sensors in the country during the forecast period.
- Furthermore, China, responsible for a large portion of global car consumption, pledged to control its carbon emissions by 2030. It has been streamlining the production cuts and sale of cars that run on fossil fuels to meet the emission goals. This is anticipated to increase the demand for electric vehicles, thereby driving market growth. According to the International Council on Clean Transportation (ICCT), throughout the first six months of 2022, electric vehicles in China constituted almost one-fourth of all unique passenger car registrations, with BEVs accounting for 19 percent and PHEVs an additional 5 percent.
- The Australian government has started taking several initiatives to expand the production of renewable power in the country. The government seeks to achieve net zero carbon emissions by 2050, which is expected to create significant opportunities for the studied market vendors. For instance, in October 2022, the Australian government allocated a budget of AUD 25 billion (USD 16.7 billion) for cleaning energy spending and renewable energy projects. Furthermore, the government also launched an AUD 20 billion (USD 13.4 billion), rewiring the Nation's plan to modernize the country's electricity grids.
- Furthermore, in recent years, Taiwan has emerged as the leading semiconductor chip manufacturer and has even outpaced China in some categories. Driven by the semiconductor industry's growth, the consumer electronics industry of the country has

also started to gain traction, with companies like Asus and HTC making their place in the global consumer electronics industry.

Current Sensor Industry Overview

The current sensor market is fragmented, with several companies operating in the segment. Significant players are currently focusing on providing customers with cost-competitive products, catering to an intense rivalry in the Market. Key players are Allegro MicroSystems, LLC, TDK Corporation, Infineon Technologies AG, etc.

In August 2023, Texas Instruments introduced new current sensing solutions designed to offer more accuracy and higher integration while simplifying designs, which includes a Hall-effect current sensor that offers the lowest drift in TI's portfolio and new current shunt monitors with a built-in shunt resistor.

In July 2023, Littelfuse Inc. announced the launch of its new Current Sensing Resistor (CSR) family that offers a more cost-effective solution for measuring current within circuits, enabling voltage monitoring, control, and power management of functions such as battery charging and motor speed, while also providing overcurrent protection.

Additional Benefits:

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

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