

# **Automotive Magneto Resistive Market Forecasts to 2034 – Global Analysis By Product Type (AMR Sensors, GMR Sensors, TMR Sensors, Magnetoresistive ICs, and Other Products), Application, Vehicle Type, End Use, and By Geography**

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## **Abstracts**

According to Statistics MRC, the Global Automotive Magneto Resistive Market is accounted for \$1.6 billion in 2026 and is expected to reach \$3.2 billion by 2034 growing at a CAGR of 8.7% during the forecast period. Magneto resistive sensors detect changes in magnetic fields to measure position, speed, angle, and current across various automotive systems. These sensors leverage anisotropic magnetoresistance (AMR), giant magnetoresistance (GMR), and tunneling magnetoresistance (TMR) technologies to deliver high precision, temperature stability, and durability in harsh under-hood environments. The increasing electrification of vehicles, demand for advanced driver assistance systems (ADAS), and the shift toward autonomous driving are accelerating the adoption of magneto resistive solutions. This market encompasses sensors, integrated circuits, and supporting electronics deployed in powertrain, chassis, braking, and electric motor control applications worldwide.

### **Market Dynamics:**

Driver:

Rising vehicle electrification and demand for precise motor control

Electric and hybrid vehicles require highly accurate current and position sensing for

efficient motor control, battery management, and regenerative braking systems. Magneto resistive sensors offer superior sensitivity and low offset drift compared to Hall-effect alternatives, making them essential for measuring rotor position in permanent magnet synchronous motors and detecting high currents in power inverters. As global automakers commit to electrified lineups and governments enforce stricter emission norms, the number of electric motors per vehicle increases, directly boosting the demand for AMR, GMR, and TMR sensors. This trend is further amplified by the need for contactless, wear-free sensing solutions that improve overall vehicle reliability and energy efficiency.

#### Restraint:

High manufacturing complexity and cost compared to Hall sensors

Magneto resistive sensors, particularly TMR and GMR, involve multi-layer thin-film deposition and precise lithography processes, resulting in higher production costs relative to conventional Hall-effect sensors. Automakers operating under tight profit margins in mass-market vehicle segments often hesitate to adopt premium sensing technologies unless mandated by performance requirements. Additionally, integration of magneto resistive elements with signal conditioning circuits requires specialized packaging and calibration, further increasing the bill of materials. This cost differential slows adoption in entry-level vehicles and price-sensitive emerging markets, limiting the market's penetration despite clear technical advantages.

#### Opportunity:

Integration with advanced driver assistance systems and autonomous driving

The proliferation of ADAS features such as electric power steering, electronic stability control, and automated braking creates new use cases for high-accuracy magnetic sensing. Angle sensors based on TMR technology provide the resolution needed for steering wheel position detection and throttle pedal monitoring, while speed sensors enable precise wheel rotation measurement for anti-lock braking systems. As vehicles progress toward higher levels of automation, the redundancy and fail-safe requirements favor magneto resistive sensors over optical or inductive alternatives due to their immunity to dirt, vibration, and temperature extremes. This opens substantial opportunities for sensor suppliers to collaborate with tier-1 automotive electronics manufacturers.

### Threat:

#### Intense competition from alternative sensing technologies

Optical encoders, inductive sensors, and capacitive solutions compete directly with magneto resistive sensors in several automotive applications. Optical sensors offer high resolution for position feedback but suffer from contamination sensitivity; inductive sensors are robust and low-cost but have lower sensitivity at air gaps. Meanwhile, Hall-effect sensors continue to improve in noise immunity and temperature stability, narrowing the performance gap. This competitive landscape puts pressure on magneto resistive sensor manufacturers to continuously innovate while managing costs. Any breakthrough in competing technologies that offers comparable performance at lower prices could erode the market share of AMR, GMR, and TMR products in the coming years.

### Covid-19 Impact:

The COVID-19 pandemic caused severe disruptions in automotive production and supply chains, leading to a temporary decline in magneto resistive sensor shipments during 2020–2021. Factory shutdowns, semiconductor shortages, and reduced consumer demand for new vehicles delayed many sensor integration programs. However, the crisis also accelerated long-term trends toward vehicle electrification and contactless technologies as consumers prioritized health, safety, and cleaner transportation. Post-pandemic recovery has been robust, with governments introducing stimulus measures for electric vehicle adoption. The semiconductor shortage paradoxically encouraged automakers to adopt more integrated and efficient sensing solutions, benefiting advanced magneto resistive technologies that reduce component counts while delivering superior performance.

The TMR Sensors segment is expected to be the largest during the forecast period

The TMR Sensors segment is expected to account for the largest market share during the forecast period, owing to their exceptional sensitivity, low power consumption, and high signal-to-noise ratio. Tunneling magnetoresistance sensors detect minute magnetic field changes with output several times greater than GMR or AMR, making them ideal for angle measurement in steering systems, current sensing in battery management, and position detection in transmission controls. Their ability to operate over wide temperature ranges and withstand high vibration levels aligns perfectly with automotive reliability standards. As vehicle electronics become more complex and power budgets

tighten, engineers increasingly prefer TMR for its combination of precision and efficiency, cementing its dominant market position.

The Current Sensing segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the Current Sensing segment is predicted to witness the highest growth rate, driven by the rapid expansion of electric vehicle powertrains and onboard chargers. Accurate current measurement is critical for battery state-of-charge estimation, overcurrent protection, and torque control in traction inverters. Magneto resistive current sensors offer non-contact measurement, low insertion loss, and wide bandwidth, outperforming shunt resistors and Hall-effect sensors in high-voltage applications. With EV battery packs exceeding 800V and charging currents reaching hundreds of amperes, the demand for isolated, high-precision sensing grows exponentially. This segment benefits directly from the global transition to electrified mobility and the proliferation of fast-charging infrastructure.

#### **Region with largest share:**

During the forecast period, the Asia Pacific region is expected to hold the largest market share, reflecting its dominance in global automotive production, particularly in China, Japan, South Korea, and India. The region hosts major vehicle manufacturers, electric vehicle battery suppliers, and semiconductor fabs, creating a complete ecosystem for magneto resistive sensor design and assembly. Government policies promoting new energy vehicles and stricter fuel efficiency standards accelerate local adoption. Additionally, the concentration of electronics manufacturing in Taiwan and Southeast Asia ensures cost-competitive component supply. As Asia Pacific leads both conventional vehicle output and electric vehicle innovation, it remains the primary market for automotive magnetic sensing technologies throughout the forecast timeline.

#### **Region with highest CAGR:**

Over the forecast period, the North America region is anticipated to exhibit the highest CAGR, driven by aggressive electric vehicle ramp-ups from traditional automakers and the strong presence of sensor technology startups. The United States Inflation Reduction Act and state-level zero-emission vehicle mandates create sustained demand for advanced sensing in EVs and charging infrastructure. Furthermore, North America is a hub for autonomous driving development, with silicon valley companies and Detroit automakers integrating redundant sensing architectures that favor high-

performance magneto resistive solutions. Supply chain reshoring efforts encourage local sensor fabrication, reducing import dependencies. These factors combine to deliver the fastest market expansion in North America.

### **Key players in the market**

Some of the key players in Automotive Magneto Resistive Market include TDK Corporation, Infineon Technologies AG, Allegro MicroSystems, Inc., NVE Corporation, Honeywell International Inc., ams-OSRAM AG, Robert Bosch GmbH, STMicroelectronics N.V., NXP Semiconductors N.V., Renesas Electronics Corporation, Texas Instruments Incorporated, TE Connectivity Ltd., Sensata Technologies Holding plc, onsemi and Murata Manufacturing Co., Ltd.

### **Key Developments:**

In March 2026, TDK Corporation announced its participation in the Embedded World 2026 exposition, showcasing its expanded automotive portfolio, which highlights its next-generation AMR and TMR magnetic position sensors designed to manage stray-field interference in highly electrified vehicles.

In February 2026, Allegro MicroSystems expanded its power conversion and EV battery infrastructure leadership by introducing the ACS37017 Hall-effect and MR-aligned isolation systems, delivering the market's highest accuracy metrics for high-voltage automotive propulsion.

In January 2026, at CES 2026, Infineon heavily showcased its XENSIV series, demonstrating automated driving safety applications using integrated magnetic switches and TMR sensors that monitor physical control knobs and steering mechanisms.

### **Product Types Covered:**

AMR Sensors

GMR Sensors

TMR Sensors

Magneto resistive ICs

## Other Products

### Applications Covered:

Position Sensing

Speed Sensing

Current Sensing

Angle Sensing

Gear Detection

Magnetic Field Detection

Other Applications

### Vehicles Types Covered:

Passenger Cars

Light Commercial Vehicles

Heavy Commercial Vehicles

Electric Vehicles

Autonomous and ADAS-Enabled Vehicles

### End Uses Covered:

Powertrain

Chassis

Safety Systems

Infotainment and Body Electronics

Battery and EV Management

Regions Covered:

North America

United States

Canada

Mexico

Europe

United Kingdom

Germany

France

Italy

Spain

Netherlands

Belgium

Sweden

Switzerland

Poland

Rest of Europe

Asia Pacific

China

Japan

India

South Korea

Australia

Indonesia

Thailand

Malaysia

Singapore

Vietnam

Rest of Asia Pacific

South America

Brazil

Argentina

Colombia

Chile

Peru

Rest of South America

## Rest of the World (RoW)

### Middle East

Saudi Arabia

United Arab Emirates

Qatar

Israel

Rest of Middle East

### Africa

South Africa

Egypt

Morocco

Rest of Africa

### **What our report offers:**

- Market share assessments for the regional and country-level segments
- Strategic recommendations for the new entrants
- Covers Market data for the years 2023, 2024, 2025, 2026, 2027, 2028, 2030, 2032 and 2034
- Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment Opportunities, and recommendations)
- Strategic recommendations in key business segments based on the market estimations
- Competitive landscaping mapping the key common trends
- Company profiling with detailed strategies, financials, and recent developments
- Supply chain trends mapping the latest technological advancements

## Free Customization Offerings:

All the customers of this report will be entitled to receive one of the following free customization options:

### Company Profiling

Comprehensive profiling of additional market players (up to 3)

SWOT Analysis of key players (up to 3)

### Regional Segmentation

Market estimations, Forecasts and CAGR of any prominent country as per the client's interest (Note: Depends on feasibility check)

### Competitive Benchmarking

Benchmarking of key players based on product portfolio, geographical presence, and strategic alliances

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