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

Market Report | 2025-07-01 | 110 pages | Mordor Intelligence

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Report description:

Automotive Temperature Sensor Market Analysis

The automotive temperature sensor market is valued at USD 7.1 billion in 2025 and is forecast to reach USD 9.86 billion by 2030, advancing at a 6.79% CAGR. Growth is anchored by rapid electrification, with battery-electric vehicles (BEVs) installing close to 150 sensing points per car, nearly triple the requirement in combustion platforms. Zonal electronic architectures are compressing wiring looms and pushing demand for multi-point measurement nodes that can report through automotive Ethernet. High-voltage 800 V drivetrains built around silicon-carbide (SiC) inverters need precision sensors that remain stable above 600 C, while EU7 and China VI-b regulations widen exhaust temperature monitoring windows as internal-combustion models sunset. Cabin health features in premium trims, solid-state battery pilots, and the migration to wafer-level sensor packaging are catalyzing additional volume in both OEM and service channels.

Global Automotive Temperature Sensor Market Trends and Insights

Accelerating Adoption of SiC-Based Power Electronics Intensifying Thermal Accuracy Requirements in EV Inverters

SiC switches enable drive modules to sustain junction temperatures near 600 C while boosting conversion efficiency by 30% compared with silicon. Each SiC half-bridge therefore integrates two to three extra temperature sensing points to guard against thermal runaway and to optimise derating curves during 800 V fast charging. Foundry expansions at Onsemi and other suppliers underline how thermal data has become mission-critical for gate-drive calibration and extended inverter warranties.

Rapid Growth of Zonal-Architecture ECUs Driving Multi-Point Temperature Monitoring

Vehicle networks built on zone controllers replace dozens of standalone ECUs, trimming wiring mass by 30% yet raising heat density inside sealed aluminium housings. Designers now distribute small digital sensors on local I3C links so that firmware can balance load, fan speed and redundancy in real time. Early deployments across premium European platforms are demonstrating field reliability that is convincing volume-segment OEMs to transition from 2026 onward.

Price-Erosion from Standardisation of NTC Thermistors among Tier-1s

Tier-1 harness builders have harmonised specifications around 1 k? to 100 k? curves, allowing large volume buys that drive annual price concessions of 3%-5%. Pure-play thermistor vendors are responding by shifting output to higher-value epoxy--coated beads for 250 C zones or by moving up-market into digital ICs that embed calibration tables to secure margins.

Other drivers and restraints analyzed in the detailed report include:

EU7 and China VI-b Emission Norms Mandating Exhaust Gas Sensors with Wider Range / Thermal Management Imperatives in Solid-State Battery Packs / Supply-Chain Volatility of High-Purity Nickel & Platinum Used in RTDs /

For complete list of drivers and restraints, kindly check the Table Of Contents.

Segment Analysis

Thermistors retained a 43% share of the automotive temperature sensor market in 2024 owing to their low cost and proven reliability in coolant, HVAC and entry-level battery modules. Each BEV already deploys more than 100 NTC elements, and the automotive temperature sensor market size attributable to thermistors is on course to rise steadily even as unit prices drift lower. The firm grip of this legacy technology has forced higher-end vehicles to pair NTCs with linearisation algorithms inside zonal compute hubs to reconcile accuracy gaps.

Semiconductor-based IC sensors are advancing at an 8.8% CAGR through 2030. Their ?0.4 C accuracy and direct I3C/I^2C output simplify harnessing in confined zones such as in-wheel power electronics, where every millimetre counts. As system designers phase out bulky compensation tables, the automotive temperature sensor market benefits from simultaneous gains in performance and bill-of-materials efficiency. RTDs continue serving precision exhaust feedback loops despite metal volatility, while thermocouples stay embedded in turbo housings that exceed 900 C.

Passenger cars commanded 68.5% of 2024 revenue and remain the anchor for the automotive temperature sensor market. Sophisticated cabin comfort algorithms in premium trims exploit multiple sensing nodes to modulate micro-jets, seat heaters and zoned HVAC louvers. Continental's factory trials reported a 15% uplift in overall equipment effectiveness after equipping production lines with additional thermal diagnostics - evidence that upstream manufacturing is also a consumption vector for sensors.

BEVs represent the fasting-growing cohort at a 10.3% CAGR. Every battery module clips thermistors to bus bars, embeds thin-film RTDs under cell tabs, and situates infrared die for non-contact monitoring-collectively doubling the automotive temperature sensor market size per vehicle relative to hybrids. Light commercial e-vans now integrate gas-generation detection sensors that relay early warning data to fleet dashboards, aligning thermal safety with asset-availability metrics. Two-wheelers in dense Asian cities add scale, leveraging compact, epoxy-sealed NTC beads resistant to vibration.

Automotive Temperature Sensor Manufacturers and the Market is Segmented by Vehicle Type (Passenger Cars, Light Commercial Vehicles, and More), Application (Powertrain, Body Electronics, Alternative Fuel Vehicles, and More), Sensor Type (Thermistor, Thermocouple, and More), Sales Channel(OEM-Fitted and More) and Geography). The Market Sizes and Forecasts are Provided in Terms of Value in (USD).

Geography Analysis

Asia-Pacific held 41.6% of automotive temperature sensor market share in 2024, reflecting its status as the world's largest vehicle production hub. Chinese assemblers are localising advanced electronic content from 15% to 60% by 2030, funnelling additional design?win opportunities to domestic thermistor and IC fabs. Japan and South Korea continue to invest heavily in solid-state battery pilots, which embed denser sensing arrays and lift the region's contribution to automotive temperature sensor market size through the decade.

Europe ranks second, propelled by stringent EU7 rules that require real-time exhaust gas analytics and by a strong premium vehicle pipeline that emphasises in-cabin climate refinement. German OEMs spearhead zonal architecture rollouts; each new controller cluster carries its own ambient, board-edge, and MOSFET backside die, spreading demand across multiple product families. Suppliers located near the Rhine valley are setting up nickel-film RTD lines to navigate platinum scarcity, reinforcing regional self-sufficiency.

North America maintains a robust position thanks to high uptake of SiC-based drive modules in pickup trucks and SUVs that favour 800 V propulsion for trailer towing. Legislative incentives for local battery manufacturing are steering sensor sourcing toward vertically integrated US facilities. The Middle East, although small today, is forecast to clock a 9.2% CAGR as purpose-built autonomous mobility zones in Riyadh and Dubai standardise L4 shuttles loaded with redundant thermal nodes to safeguard compute clusters against desert heat. South America's incremental growth is linked to flex-fuel powertrains that still need exhaust gas sensors alongside emergent electric buses operating in Brazilian megacities.

List of Companies Covered in this Report:

NXP Semiconductors N.V. / Sensata Technologies, Inc. / Amphenol Advanced Sensors / Robert Bosch GmbH / Continental AG / Texas Instruments Inc. / TE Connectivity Ltd. / Panasonic Holdings Corp. / Murata Manufacturing Co., Ltd. / TDK Corporation / Honeywell International Inc. / Infineon Technologies AG / STMicroelectronics N.V. / Denso Corporation / BorgWarner Inc. (Delphi Technologies) / Vishay Intertechnology, Inc. / Microchip Technology Inc. / Analog Devices, Inc. / Renesas Electronics Corporation / Littelfuse, Inc. /

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