Embedded Temperature Sensor Market is Estimated to Witness High Growth by 2030 |NXP Semiconductors,Panasonic Corporation

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Embedded Temperature Sensor Market12

Embedded temperature sensors are widely used in automotive, industrial and consumer electronics applications to measure temperature in various parts and help take necessary actions. They are suitable for applications requiring precision in harsh operating conditions and compact size. These sensors help optimize product performance and safety in areas like engine management, air-conditioning, medical equipment and appliances.

Market Dynamics:

Rising adoption of temperature sensors in automotive industry for engine management, battery monitoring and ADAS applications is a major driver for market growth. Embedded temperature sensors help improve fuel efficiency, reduce emissions and enhance vehicle and passenger safety. There is also increasing demand from industrial sector for temperature monitoring in manufacturing processes, data centers, HVAC systems and smart homes. Further, rapid development of IoT-enabled devices and wearables is expanding application scope of embedded temperature sensors. Growing need for energy monitoring and efficiency in industries is another factor fueling demand. However, availability of substitutes like thermistors and low-cost discrete sensors may hinder market growth to some extent over the forecast period.

The global embedded temperature sensor market was valued at US$ 6,492.34 Mn in 2019 and is expected to reach US$ 9,876.32 Mn by 2027 at a CAGR of 7.2% between 2020 and 2027.

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Increasing adoption of IoT technology is boosting the demand for embedded temperature sensors

The rapid adoption of Internet of Things (IoT) and the proliferation of connected devices are driving significant growth in the embedded temperature sensor market. IoT devices require precise temperature monitoring to function properly and ensure safety and reliability. Many IoT applications such as environmental monitoring, wearables, automotive components, and consumer electronics incorporate embedded temperature sensors to continuously track temperature changes. IoT technology is also finding increasing usage in various industrial sectors like manufacturing, oil & gas, healthcare etc. where temperature control and monitoring play a vital role. This growing dependence of IoT applications on temperature sensing is propelling the need for low-cost, miniaturized and high-precision embedded temperature sensors.

Growing automotive electronics content per vehicle acts as a key driver

The automotive industry has emerged as a major end-user of embedded temperature sensors due to the rising electronic content in modern automobiles. Advanced driver-assistance systems, infotainment systems, electric vehicles and other electronic components require embedded temperature monitoring to ensure optimum performance, efficiency, safety and reliability. The increasing need for overheat protection in automotive powertrain, battery packs, electronic control units and various other applications is fueling demand. Additionally, stringent emission norms mandate temperature monitoring of automotive exhaust systems, which is positively impacting the market. The growing sales of electric and hybrid vehicles along with the rising electronic and software-defined content per vehicle worldwide are some of the key factors augmenting the automotive segment.

Top Key Players:

Honeywell International Inc., NXP Semiconductors, Panasonic Corporation, Delphi Technologies, Siemens, ABB, STMicroelectronics, Emerson Electric Co., Microchip Technology Inc., Fluke Process Instruments, Mouser Electronics, Inc., Robert Bosch GmbH, TE Connectivity, DENSO CORPORATION, OMRON Corporation, FLIR Systems, Inc., Amphenol Advanced Sensors, Maxim Integrated, KONGSBERG, Yokogawa India Ltd., Infineon Technologies AG, TDK-Micronas GmbH, Amphenol Corporation, OMEGA Engineering inc., ON Semiconductor, CODICO GmbH, Sensata Technologies, Inc., VINCI, and Digi-Key Electronics.

Detailed Segmentation:

Global Embedded Temperature Sensor Market, By Type:
Non-contact
Infrared
Fiber Optic

Contact
Bimetallic
Temperature Sensor IC
Thermistor
Resistive Temperature Detector
Thermocouple

Global Embedded Temperature Sensor Market, End-use Industry:
Chemicals
Oil & Gas
Energy & Power
Healthcare
Food & Beverages
Consumer Electronics
Aerospace & Defense
Metals & Mining
Regional Analysis:

 North America: United States, Canada, and Mexico

 South & Central America: Argentina, Chile, Brazil and Others

 Middle East & Africa: Saudi Arabia, UAE, Israel, Turkey, Egypt, South Africa & Rest of MEA.

 Europe: UK, France, Italy, Germany, Spain, BeNeLux, Russia, NORDIC Nations and Rest of Europe.

 Asia-Pacific: India, China, Japan, South Korea, Indonesia, Thailand, Singapore, Australia and Rest of APAC.

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High initial investment requirement poses a challenge

The embedded temperature sensor manufacturing process demands high capital expenditure for setting up production facilities involving semiconductor fabrication equipment. This hinders the entry of new players, especially small and medium enterprises, which pose financial constraints. The multi-stage microfabrication process also involves advanced manufacturing capabilities at cleanroom conditions, further raising production costs. These high initial investments coupled with relatively low production volumes lead to high unit costs. This acts as a restraint, especially for cost-sensitive low-end applications. However, manufacturers are trying to offset this by leveraging latest technologies to achieve optimum production efficiencies and

economies of scale over the long term.

Rising demand for temperature monitoring in green energy technologies opens up opportunities

The rising global focus on clean and renewable energy is fueling growth opportunities for embedded temperature sensors. Technologies like solar panels, fuel cells, battery packs for energy storage, power generation equipment and power electronic devices require built-in temperature monitoring for safety, efficiency and reliability. As the green technology sector expands rapidly with supportive government policies and initiatives, opportunities will emerge for sensor manufacturers. The demand is also increasing from thermal management applications in data centers that need real-time temperature monitoring to optimize power usage effectiveness. All these present immense scope for embedded temperature sensor providers to cater to the emerging needs of green industries.

Integration of MEMS technology driving miniaturization and boosting functionality

The integration of microelectromechanical systems (MEMS) technology in embedded temperature sensors is a major trend, allowing miniaturization while enhancing capabilities. MEMS temperature sensors offer numerous advantages like reduced size, weight and cost. These tiny sensors can be easily embedded in miniature IoT devices, portable electronics, medical devices, wearables and industrial equipment without compromising on functionality. Leading players are developing novel MEMS-based temperature sensing solutions utilizing innovative materials and fabrication techniques like thin-film deposition. They are integrating additional functionalities like humidity sensing, pressure sensing and signal processing capabilities. Design innovations are enabling multi-sensor system-on-chip solutions as well. This trend towards smart miniaturized MEMS temperature sensors will continue to transform applications and gain widespread acceptance across diverse end-use sectors.

Key Questions Addressed in the Market Report:

What is the expected size, share, and CAGR of the Embedded Temperature Sensor Market over the forecast period?
What are the key trends expected to influence the Embedded Temperature Sensor Market between 2023 and 2030?
What is the expected demand for various types of products/services in the Embedded Temperature Sensor Market?
What long-term impact will strategic advancements have on the Embedded Temperature Sensor Market?
Who are the key players and stakeholders in the Embedded Temperature Sensor Market?
What are the different segments and sub-segments considered in the Embedded Temperature Sensor Market research study?

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Strategic Points Covered in Table of Content of Global Embedded Temperature Sensor Market:

Chapter 1 : Introduction, market driving forces, and product The study and research objectives are to investigate the Embedded Temperature Sensor market.

Chapter 2: Exclusive Summary - Embedded Temperature Sensor Market Fundamentals.

Chapter 3: The Changing Impact on Market Dynamics- Drivers, Trends, and the Challenges and Opportunities of Process Spectroscopy

Chapter 4: Embedded Temperature Sensor Market Factor Analysis, Porter's Five Forces Analysis, Supply/Value Chain, SWOT Analysis, Market Entropy, and Patent/Trademark Analysis are all presented in this chapter

Chapter 5: 2017-2022 Forecast by Type, End User, and Region/Country

Chapter 6: Evaluating the key players in the Embedded Temperature Sensor market, including the Competitive Landscape, Peer Group Analysis, BCG Matrix, and Company Profile.

Chapter 7: To evaluate the market by segments, countries, and manufacturers/companies, as well as revenue share and sales by major countries in these regions (2023-2030).

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