

# **Power Electronics for EVs Market Forecasts to 2034 – Global Analysis By Component (Inverters, Converters (DC-DC), On-Board Chargers and Power Control Units), Semiconductor Material, Vehicle Type, Voltage Type, Integration Level, Application, End User and By Geography**

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## **Abstracts**

According to Statistics MRC, the Global Power Electronics for EVs Market is accounted for \$28.3 billion in 2026 and is expected to reach \$89.4 billion by 2034 growing at a CAGR of 15.4% during the forecast period. Power electronics for electric vehicles refers to the ensemble of semiconductor-based systems and components, including high-voltage traction inverters, bidirectional DC-DC converters, on-board battery chargers, power distribution units, and motor control electronics that manage the conversion, control, and distribution of electrical energy between battery packs, electric drive motors, auxiliary systems, and external charging infrastructure in battery electric, plug-in hybrid, and hybrid electric vehicles. These systems employ wide-bandgap semiconductor materials, including silicon carbide and gallium nitride, alongside advanced gate driver circuits and thermal management solutions to achieve the high switching frequencies, power densities, and conversion efficiencies required for competitive electric vehicle range and performance specifications.

Market Dynamics:

Driver:

Global EV fleet electrification

Accelerating electric vehicle adoption driven by government zero-emission vehicle mandates across Europe, China, and North America, combined with declining battery costs and expanding charging infrastructure, is generating rapidly growing production volumes for all electric vehicle power electronics systems at scale. Automotive OEMs

announcing complete ICE phase-out timelines are redesigning powertrain architectures around advanced power electronics platforms requiring significant supplier investment in silicon carbide inverter manufacturing capacity. The transition to 800-volt EV architectures delivering faster charging and higher efficiency is driving complete power electronics platform redesigns that generate replacement demand across the entire traction inverter, DC-DC converter, and on-board charger component ecosystem.

Restraint:

Silicon carbide supply constraints

Transition to silicon carbide power semiconductor technology for high-voltage EV traction inverters is constrained by limited global production capacity for high-quality SiC wafers, with crystal growth cycle times of weeks and specialized substrate manufacturing infrastructure that cannot be rapidly scaled to meet accelerating automotive demand. SiC wafer supply shortfalls are creating procurement competition among automotive OEMs and tier-one power electronics suppliers, driving long-term supply agreements and vertical integration investments that increase working capital requirements and supply chain complexity for power electronics manufacturers dependent on reliable SiC substrate availability.

Opportunity:

800V platform technology adoption

Rapid industry transition to 800-volt EV powertrain architectures enabling 350-kilowatt DC fast charging, reduced copper wiring harness weight, and improved system efficiency is creating large technology refresh demand for new-generation high-voltage silicon carbide power electronics platforms across the automotive supply chain. EV manufacturers adopting 800V architecture, including Porsche, Hyundai, and Kia, are creating structured demand for SiC traction inverters, bidirectional DC-DC converters, and ultra-fast on-board chargers that operate at significantly higher switching frequencies than incumbent 400V silicon technology, generating premium revenue opportunities for advanced power electronics suppliers.

Threat:

In-house OEM semiconductor development

Increasing automotive OEM investment in proprietary power electronics and semiconductor development programs aimed at reducing component costs and strategic supply chain dependency is threatening tier-one power electronics supplier market positions. Tesla's proven ability to develop and manufacture custom power semiconductor solutions internally, combined with announced insourcing programs from Volkswagen and other major OEMs, creates a structural risk that captive production will displace independent supplier volumes across key EV power electronics product categories over the medium-term forecast horizon.

Covid-19 Impact:

The pandemic severely disrupted automotive production and EV program timelines through factory shutdowns and semiconductor supply chain failures that affected power electronics component availability across all vehicle segments. The global semiconductor shortage that emerged during the pandemic disproportionately impacted automotive power electronics supply, accelerating OEM recognition of strategic supply chain vulnerability. Post-pandemic, automotive OEM investment in EV platform development accelerated substantially as governments intensified zero-emission vehicle mandates, creating stronger structural demand for EV power electronics than pre-pandemic trajectories had projected.

The power control units segment is expected to be the largest during the forecast period. The power control units segment is expected to account for the largest market share during the forecast period, due to the central role of integrated power distribution and control architecture in coordinating energy flow across complex multi-mode EV powertrains encompassing traction motors, regenerative braking, auxiliary battery systems, and bi-directional charging functions. OEMs developing next-generation integrated power control platforms that consolidate multiple discrete power electronics functions into unified thermal management architectures are generating premium revenue per vehicle compared to individual component sales. The complexity and safety criticality of power control unit validation create high switching costs that support sustained supplier relationships.

The silicon (Si) segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the silicon (Si) segment is predicted to witness the highest growth rate, driven by continued high-volume deployment of silicon-based power electronics in lower-cost entry-level BEVs, hybrid vehicles, and two- and three-wheeler EV segments where the cost premium of SiC technology cannot be economically justified by available efficiency and range improvements. Developing market EV adoption in India, Southeast Asia, and Latin America is expanding production volumes of silicon-based EV power electronics across affordable vehicle segments, representing the largest unit volume growth opportunity. Advanced silicon device technologies, including super-junction MOSFETs, are extending competitive performance envelopes for silicon power electronics.

Region with largest share:

During the forecast period, the Europe region is expected to hold the largest market share, due to the most stringent fleet CO<sub>2</sub> emission regulations globally mandating rapid EV adoption, combined with the concentration of premium automotive OEMs, including BMW, Mercedes-Benz, Audi, and Porsche, developing advanced 800-volt EV platforms requiring cutting-edge power electronics systems. European automotive semiconductor suppliers, including Infineon, STMicroelectronics, and NXP, hold leading

global positions in EV power electronics technology. EU policy frameworks providing EV purchase subsidies and carbon compliance penalties are maintaining the world's fastest regulatory-driven EV adoption rates.

Region with highest CAGR:

Over the forecast period, the Asia Pacific region is anticipated to exhibit the highest CAGR, due to China's position as the world's largest EV production and sales market continuing to expand with government purchase incentives and local content requirements that drive domestic power electronics supply chain development. South Korean OEMs Hyundai and Kia, launching advanced 800V EV platforms globally, are driving regional SiC power electronics demand growth. India's rapidly growing EV market, supported by production-linked incentive programs for EV components, is creating new domestic power electronics manufacturing investment.

Key players in the market

Some of the key players in Power Electronics for EVs Market include Infineon Technologies AG, STMicroelectronics N.V., ON Semiconductor Corporation, Texas Instruments Inc., NXP Semiconductors N.V., Renesas Electronics Corporation, Mitsubishi Electric Corporation, Toshiba Corporation, ABB Ltd., Siemens AG, Rohm Semiconductor, Vishay Intertechnology Inc., Semikron Danfoss, Delta Electronics Inc., Littelfuse Inc., Hitachi Ltd., and Fuji Electric Co. Ltd..

Key Developments:

In April 2026, STMicroelectronics N.V. secured a major supply agreement with a leading EV manufacturer for silicon carbide MOSFET devices supporting high-volume 800-volt electric vehicle powertrain production ramp.

In February 2026, Bosch GmbH introduced a fully integrated power electronics system combining traction inverter, DC-DC converter, and on-board charger in a single compact unit for next-generation electric vehicle platforms.

In December 2025, Wolfspeed Inc. announced capacity expansion at its Mohawk Valley silicon carbide fabrication facility to meet growing automotive EV power electronics demand from major OEM long-term supply agreements.

Components Covered:

Inverters

Converters (DC-DC)

On-Board Chargers

Power Control Units

**Semiconductor Materials Covered:**

Silicon (Si)

Silicon Carbide (SiC)

Gallium Nitride (GaN)

**Vehicle Types Covered:**

Battery Electric Vehicles (BEVs)

Plug-in Hybrid Electric Vehicles (PHEVs)

Hybrid Electric Vehicles (HEVs)x

**Voltage Types Covered:**

Low Voltage (Below 400V)

High Voltage (Above 400V)

**Integration Levels Covered:**

Discrete Components

Integrated Power Modules

System-on-Chip Solutions

**Applications Covered:**

Powertrain Systems

Battery Management Systems

Charging Infrastructure

Energy Recovery Systems

End Users Covered:

Passenger Vehicles

Commercial Vehicles

Two & Three Wheelers

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)

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