Automotive Power Electronics Market by Device Type, Application, Vehicle Type and Region - Global Forecast to 2025

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Automotive Power Electronics Market by Device Type (Power IC, Module & Discrete), Application, Component (Sensor & Microcontroller), Material, Vehicle Type (Passenger Vehicle, LCV & HCV), Electric Vehicle Type, and Region - Global Forecast to 2025

Pune, India -- (SBWire) -- 07/16/2020 -- The global Automotive Power Electronics Market is projected to reach USD 4.7 billion by 2025, from USD 3.8 billion in 2020, at a CAGR of 4.7%. The growth of the market is driven by the growing demand for added infotainment, telematics, convenient features and stringent safety mandates for a safer driving experience. The automotive power electronics market has promising growth potential due to several factors, including increasing use of mechatronics devices inside the vehicle, increasing consumer demand for added safety and entertainment features, vehicle electrification, improving vehicle connectivity and vehicle management.

Use of modern inverters also can create new revenue pockets for Tier I and Tier II suppliers in the context of electric vehicles. Traction inverters are crucial components of the modern electrified automotive powertrain. Advances in power electronics have enabled lower-cost inverters with high reliability, efficiency, and power density, suitable for mass consumer automotive applications. Most electrified powertrain traction inverters contain a multichip-semiconductor power module. It can comprise IGBTs, diodes, or MOSFET dies, while the typical circuit topologies are half-bridge or six-pack. The ongoing trend toward mechatronic integration of power electronic components and mechanical assemblies requires more compact and mechanically robust power modules. The design of the power modules becomes a core element in achieving higher levels of power density and fulfilling increasingly stringent requirements. Tier I and II companies are coming up with modern traction inverter solutions. In September 2019, Delphi Technologies introduced 800-volt SiC Inverter for fast EV charging. Delphi Technologies is the first in the industry with volume production of an 800-volt silicon carbide (SiC) inverter, one of the key components of highly efficient next-generation electric and hybrid vehicles. Swedish startup, Ascatron, develops silicon carbide (SiC)-powered semiconductor devices, which find its application in EV inverters. SiC-based inverters theoretically reduce energy losses by 90%. Less heat is generated during the power transfer at a lower cost due to the smaller size of SiC compared to Si-based devices.

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Power module/discrete segment of the automotive power electronics market by device type is projected to grow at the highest growth rate. In recent years, power module manufacturers have developed dedicated products to meet automotive requirements, especially with respect to traceability, life cycle management, and high-quality customer service. One such example is the HybridPACK power module family developed by Infineon for electrical power conversion in an electric vehicle. Infineon has developed two such modules. One of them is an
indirectly cooled IGBT power module for a power range up to 20-30 kW. Another is for applications from a power range up to 100 kW continuous power. The package design has been optimized for high compactness and low stray inductance, thereby allowing a reduction of power loss, especially at inverter maximum ratings. This has created revenue generating opportunities for Infineon Technologies. Similar innovation and modifications for various versions of such solutions can create new revenue pockets for automotive semiconductor manufacturers.

ADAS & safety segment of the automotive power electronics market by application type is projected to grow at the highest growth rate. The segment comprise of number of trending automotive systems such as ADAS, electric power steering (EPS), anti-lock braking system (ABS). These systems / sub-applications are important from vehicle and passenger safety point of view. In the presence, these active safety features are getting installed in a vehicle at the backdrop of consumer demand and OEMs offerings. But in the future these features are seen as a standard fit in every category of the vehicle. Government mandates will play a crucial role in its fitment in a vehicle in future. Fitment of such features will force semiconductor companies to innovate and develop power electronics solutions suitable for these features. Tier I and Tier II companies need to keep an eye on the mandates that revolves around such applications. Developing countries will try to impose mandates related to such applications in near future.

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Power electronics is necessary in multiple in-vehicle applications. Wherever, electric power inside the vehicle is required to manage various applications, there will be requirement of power electronics solutions. There are more than one application where there is a requirement of power electronics devices. This creates opportunities for Tier I and II suppliers to develop application specific power electronics solutions. This also varies with the OEMs demand, region, vehicle type, etc.

Key Market Players

The global automotive power electronics market is dominated by major players such as Robert Bosch (Germany), Continental AG (Germany), Infineon (Germany), ON semiconductor (US), STMicroelectronics (Switzerland), Danfoss (Denmark). These companies have secure distribution networks at a global level and offer a wide range of power electronics products for traditional as well as electric vehicle. The key strategies adopted by these companies to sustain their market position are new product developments, acquisitions, etc.

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