

Power Electronics Market Expected Growth from USD 26.6 Billion in 2023 to USD 39.6 Billion by 2030, with CAGR of 5.1%

According to a research report published by Exactitude Consultancy, Companies covered: ABB Group, Fuji Electric Co. LTD, Infineon Technologies AG

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Power Electronics

Power electronics play an important role in electrified vehicle applications that provide compact and highly efficient solutions to power conversion. Power electronics is a circuitry device that transfers power from a source to a load in an efficient, compact, and robust manner to ensure convenient utilization. To manage the flow of electrical energy, power electronics technology entails the effective conversion, supervision, and control of electric power. It can be used for anything from laptop chargers to inverters that run renewable energy systems and electric cars. Its duties include waste reduction, efficiency optimization, and electrical flow regulation.



Rising demand for energy-efficient solutions drives growth in power electronics, with trends in electric vehicles, renewable energy, and industrial automation.”

Exactitude Consultancy

A power module, sometimes referred to as a power electronic module, provides physical confinement for many power components, most often power semiconductors. The power packages offer increased power density and, in

many circumstances, greater reliability when compared to discrete power. Metal oxide semiconductor field effect transistors, or power MOSFETs, are semiconductors with high power that are utilized as electronic switch devices to regulate loads according to specifications. High-frequency switching and incredibly low resistance are achievable with power devices.

This device is used to control the conversion of electric power from one form to another using diodes, transistors, and thyristors. Operations at high voltage or high current can be efficiently executed by utilizing power electronics devices, as they exhibit faster switching rates at higher efficiency. Moreover, power electronics control both unidirectional as well as bidirectional flow of energy, depending upon the usage, and the regenerated energy can be sent back for utility. Power electronics devices are expected to serve as the future key technologies, which help to increase system efficiency and performance in automotive and energy-saving applications.

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ABB Group, Fuji Electric Co. LTD, Infineon Technologies AG, Microsemi Corporation, Mitsubishi Electric Corporation, Renesas Electronics Corporation, and Rockwell Automation, Inc., STMicroelectronics, Texas Instruments Incorporated, and Toshiba Corporation and others.

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June 2024: Renesas Electronics Corporation finalized the acquisition of Transphorm, Inc., a leading global company specializing in gallium nitride (GaN). Following the completion of the acquisition, Renesas promptly introduced GaN-based power products and associated reference designs to address the increasing need for Wide Bandgap (WBG) semiconductor products.

June 2024: Texas Instruments (TI) and Delta Electronics teamed up for a long-term partnership to develop advanced Electric Vehicle (EV) charging and power solutions. This collaboration utilized the R&D expertise of both companies in power management and delivery at a joint innovation lab in Taiwan. The goal of Delta and TI is to enhance the size, performance, and power density and expedite the development of faster-charging, safer, and cost-effective EVs.

May 2023: Texas Instruments introduced a new isolated gate driver, the UCC5880-Q1, which is highly integrated, functional, and complies with safety standards. This gate driver allows engineers to create more efficient traction inverters and optimize the driving range of electric vehicles. Its features assist EV powertrain engineers in boosting the power density, simplifying system design, lowering costs, and meeting safety and performance targets.

In June 2023, Mitsubishi Electric Corporation has introduced an innovative structure for a silicon carbide metal-oxide-semiconductor field-effect transistor (SiC-MOSFET) incorporating a Schottky barrier diode (SBD).

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Consumer demand for power electronics is rising as a result of greater emphasis on energy efficiency, technical improvements, the emergence of smart systems, and the growing use of portable devices and electric vehicles (EVs). It is anticipated that consumers will continue to seek out more eco-friendly, connected, and efficient alternatives. Customers are becoming more aware of how much energy they use and how it affects the environment. A multitude of consumer goods, including lighting, HVAC systems, home appliances, and consumer electronics, benefit greatly from power electronics' ability to increase energy efficiency.

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Leading companies in the power electronics sector are focussing on combining many functionalities onto a single chip, which results in intricate designs. Due to the complexity of the design, particular skill sets, a strong methodology, and a specialized toolset are required, which raises the devices' total cost. Therefore, it is expected that the high cost will hinder the shift to more sophisticated technological equipment. Simultaneously, as technologies progress, there is a growing need for System-on-Chips (SoCs) to incorporate additional functionalities to reduce size and improve efficiency. Reducing power consumption in SoCs is a prominent focus for a variety of products, including wearables, mobile devices, GPUs, and CPUs. However, due to the complex process of combining several Integrated Circuits (ICs) into one device, as well as differences in capabilities, operating modes, and voltages, the growth of the power electronics market is anticipated to be impeded over the projected period.

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SiC devices are becoming more and more popular because of their unique benefits over silicon-based devices. These devices meet the needs of new technologies that require ultra-high performance by operating at significantly faster rates than silicon and having extra characteristics and sensing capabilities. Cooperation between different governmental bodies, businesses, and academic institutions is essential to the advancement of SiC technology.

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Although there are many opportunities due to the growing demand for small and portable gadgets, producers must constantly adapt to the changing needs of consumers for smaller devices. Smaller systems and components are required to meet the demand for lightweight, portable, and multipurpose gadgets while also reducing production costs. The crystals of SiC materials have microscopic pores called micropipes. These flaws have a substantial effect on the devices' electrical properties and efficiency. They are caused by an imbalance in the precursors of silicon and carbon as well as localized instability in pressure or temperature.

Exactitude Consultancy Reports: <https://exactitudeconsultancy.com/reports/13742/power-electronics-market/>

Executive Summary:

The power electronics market is expected to witness significant growth during the forecast period, driven by the increasing demand for energy-efficient solutions across various industries. The Asia Pacific region is anticipated to lead with the highest CAGR, followed by Europe and North America.

In the power electronics market, the Asia Pacific region is anticipated to lead with the greatest compound annual growth rate (CAGR) during the forecast period. The large presence of consumer electronics, information and communication technology (ICT), industrial, and automotive sectors in nations like China, Japan, and South Korea is responsible for the market's expansion in Asia Pacific. The market is fuelled in large part by the rising demand for electricity generation and the government efforts in the Asia Pacific region that support the development of renewable energy infrastructure. It is projected that the growing population in developing nations, especially China and India, will accelerate the construction of communication infrastructure and fuel market expansion for power electronics in the area. The existence of reputable power electronics companies aids the Asia Pacific market.

Europe is expected to register a significant growth rate in the global market during the forecast period. The region's growth is attributed to rapid urbanization, rising renewable energy integration, and an increasing number of electrification projects.

The regional market is expanding due in large part to the increasing use of power electronics to improve vehicle performance and comply with tight safety and pollution standards. Another factor propelling this market's rise has been Europe's emphasis on renewable energy, which is fuelled by the region's growing use of industrial automation.

The Middle East & Africa is expected to register a significant growth rate in the global market during the forecast period. The region's growth is attributed to rapid urbanization, rising renewable energy integration, and an increasing number of electrification projects.

South America is poised for significant growth during the forecast period. This growth is attributed to the strong proliferation of smartphones, digital transformation, and the rise in e-commerce platforms.

Market Segmentation

The power electronics market is segmented into power discrete, power module, and power IC.

Power discrete, power module, and power IC, the market is classified into power discrete, power module, and power IC.

Power modules are becoming more and more popular because of their greater efficiency when

handling high power levels. Power modules combine several power components into a single container. These modules are frequently utilized in industrial automation, electric car systems, and renewable energy systems where high-performance, compact solutions are needed. providing dependable, strong, and small solutions in crucial situations. Power ICs, or integrated circuits, are small,

Power electronics, it is categorized into Power Management, UPS, and Renewable.

This section focuses on materials that maximize power distribution and conversion efficiency, which is important for a variety of electronic devices, such as industrial machines, laptops, and smartphones, where battery life and energy efficiency are major considerations. The UPS segment's materials are designed to provide a steady power supply during disruptions or variations, offering vital backup in industries like data centers, healthcare, and telecommunications where continuous power is crucial. To facilitate the global transition to sustainable energy solutions, materials used in renewable energy applications, such as solar and wind power systems, are made to withstand high power levels and enable effective energy conversion.

Power electronics market, the market is incoherent into Telecommunication, Industrial, Automotive, Consumer Electronics, Aerospace, and others.

Power electronics are critical to the telecommunications industry because they enable smooth and dependable connectivity by controlling the energy needs of large networks, which include base stations, data centers, and communication equipment. To maximize energy efficiency and minimize operating expenses in manufacturing, automation, and processing systems, power electronics play a crucial role in the industrial sector. Power electronics play a major role in the automobile industry's effective power management of electric and hybrid vehicles, which enhances performance, energy efficiency, and vehicle safety. Power electronics are essential to the operation of gadgets like laptops, smartphones, and household appliances in the consumer electronics market. They spur innovation and improve energy efficiency in small form factors. Power electronics are used in aircraft systems by the aerospace industry for enhanced control, energy management, and maintaining the dependability of vital systems in harsh environments.

Power electronics market is a growing market, driven by the increasing demand for power electronics in various applications, such as automotive, industrial, and consumer electronics. The market is expected to continue to grow in the coming years.

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Power Discrete

Power Module

Power IC

Power Management

UPS

Renewable

Consumer Electronics

Industrial

Automotive

Telecommunication

Aerospace

North America

Europe

Asia Pacific

South America

Middle East and Africa

What guidelines are followed by key performers to contest this COVID-19 condition?

What are the important matters drivers, opportunities, challenges, and dangers of the market?

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will face surviving?

Which are the essential market players in the Power Electronics industry?

What is the forecast compound annual growth rate (CAGR) of the global market for the duration of the forecast period (2024-2030)?

What could be the anticipated value of the Power Electronics marketplace during the forecast period?

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The global smart electric drive market size was valued at USD 1,200 million by 2023 and is expected to reach around USD 11,950.00 million by 2030, poised to grow at a compound annual growth rate (CAGR) of 33.28% over the forecast period 2024 to 2030.

<https://exactitudeconsultancy.com/reports/13513/smart-electric-drive-market>

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The global smart airport market was valued at 7.30 billion in 2023 and is projected to reach 9.35 billion by 2030, growing at a CAGR of 3.5% from 2024 to 2030.

<https://exactitudeconsultancy.com/reports/13602/smart-airport-market/>

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The global On-Board Charger Market is estimated to increase at a 15.2% CAGR from 2024 to 2030, from USD 3.99 billion in 2023.

<https://exactitudeconsultancy.com/reports/13661/on-board-charger-market/>

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The global Micro Electric Vehicles Sales market is expected to grow at 12.05% CAGR from 2023 to 2030. It is expected to reach above 20.02 USD billion by 2030 from 8.55 USD billion in 2023.

<https://exactitudeconsultancy.com/reports/13712/micro-electric-vehicles-sales-market/>

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The DC high-power charger market is expected to grow at 13.6% CAGR from 2024 to 2030. It is expected to reach above USD 192.19 Billion by 2030 from USD 61 Billion in 2023.

<https://exactitudeconsultancy.com/reports/13921/dc-high-power-charger-market/>

Exactitude Consultancy Report

The global LiDAR for Automotive market is expected to grow at a CAGR of 17% from 2023 to 2030, from USD 1.12 billion in 2023 to USD 4.60 billion in 2030.

<https://exactitudeconsultancy.com/reports/13896/lidar-for-automotive-market>

Exactitude Consultancy Report

The electric bus charging infrastructure market is expected to grow at 30.9% CAGR from 2023 to 2030. It is expected to reach above USD 16.38 Billion by 2030 from USD 1.9 Billion in 2023.

<https://exactitudeconsultancy.com/reports/14050/electric-bus-charging-infrastructure-market/>

Exactitude Consultancy Report

The global electric outside rearview mirror market was worth USD 7.51 billion in 2023 and is expected to grow at a CAGR of 7.83 % during the forecast period, reaching USD 13.95 billion by 2030.

<https://exactitudeconsultancy.com/reports/14024/electric-outside-rear-view-mirror-market/>

Exactitude Consultancy Report

The global Foldable Electric Bikes Market is expected to grow at 10 % CAGR from 2023 to 2030. It is expected to reach above USD 309.5 million by 2030 from USD 120.6 million in 2023.

<https://exactitudeconsultancy.com/reports/14112/foldable-electric-bikes-market/>

Exactitude Consultancy Report

The global automotive tinting film market size was valued at USD 6.65 billion in 2023 and is anticipated to progress at a compound annual growth rate (CAGR) of 7.4% from 2023 to 2030.

<https://exactitudeconsultancy.com/reports/14158/automotive-tinting-film-market>

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