

# Power Electronics Market worth \$69.02 billion by 2030, growing at a CAGR of 5.54% - Exclusive Report by 360iResearch

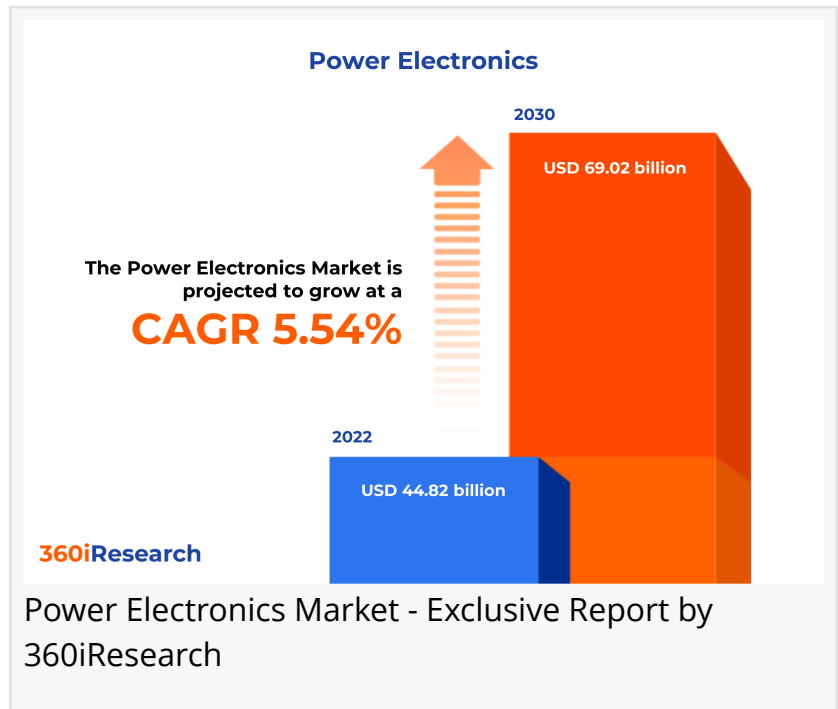
*The Global Power Electronics Market to grow from USD 44.82 billion in 2022 to USD 69.02 billion by 2030, at a CAGR of 5.54%.*

PUNE, MAHARASHTRA, INDIA ,  
December 6, 2023 /EINPresswire.com/  
-- The "[Power Electronics Market](#) by Device Type (Discrete, IC, Module), Material (Gallium Nitride, Sapphire, Silicon), Voltage, Current Level, Wafer Size, Application - Global Forecast 2023-2030" report has been added to 360iResearch.com's offering.

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Power electronics is a component of electrical engineering that deals with converting, controlling, and managing electrical power. It involves studying and applying electronic devices and systems for the control and transformation of electric power. Power electronics is crucial in various applications, including power conversion, motor drives, renewable energy systems, and electric vehicles. The growth of the power electronics market is influenced by multiple factors, including the global push for energy efficiency and carbon footprint reduction, advancements in technology leading to higher power density, and the robust growth of electric vehicles and renewable energy systems. Increased investments in smart grids and the need for high-efficiency power solutions in consumer electronics are also key drivers. Moreover, government initiatives and policies favoring energy-saving technologies provide a conducive environment for the market's expansion. Despite the prospects for growth, the market faces limitations and



challenging factors, such as the high initial cost of advanced power electronic systems and the complexity involved in integrating these systems into existing frameworks, which further hamper its growth in the market. Innovation in semiconductor materials that offer higher efficiency and the power to operate at higher frequencies and temperatures. Integration of AI and IoT for smart power management systems, inductive wireless power transfer for electric vehicle charging, and advancement in battery management systems for better energy storage solutions represent potential avenues for market expansion.

**Device Type:** Significant adoption of discrete devices for their customization potential

Discrete power devices are individual transistors, diodes, thyristors, and other components used in power electronic applications. They are known for their ability to handle high voltages and currents and provide design flexibility as they can be used in various configurations. Diodes are fundamental semiconductor devices that allow current to flow in one direction only and are used in power electronics for rectification, over-voltage protection, and as freewheeling diodes in inverter circuits. Thyristors are solid-state semiconductor devices with four layers of alternating N and P-type material. Transistors are critical to power electronics as they provide the function of switching and amplification. ICs in power electronics integrate multiple components into a single chip that can perform complex functions. Application-specific ICs (ASICs) are designed for particular applications within power electronics. These integrated circuits are customized for specific uses, which might be in communication devices, automotive systems, or consumer electronics that require high performance and reliability. Power management ICs (PMICs) are used to manage the power requirements of the host system. They integrate multiple power controls into a single chip to improve energy efficiency and prolong battery life. Modules in power electronics incorporate multiple semiconductor devices into a single package, optimizing performance and simplifying design and manufacturing processes. Intelligent power modules (IPM) are advanced modules that integrate power devices, gate drivers, and protection features into a single product designed to improve performance and reliability. Standard and power-integrated modules are designed to achieve higher power density and are commonly used in applications ranging from traction to power supplies and converters.

**Voltage:** High voltage systems prioritize transmission efficiency over long distances and high-power applications

High-voltage power electronics are critical in power transmission, industrial motors, and renewable energy systems. They are preferred in situations that demand high power efficiency and long-distance transmission. Deployments include HVDC (High Voltage Direct Current) power transmission systems and high-power converters for wind turbines. Low-voltage power electronics are devices that function at low voltages and are widely used in consumer electronics, automotive applications, and low-power control systems. Their preference stems from their affordability and suitability for low-power applications that require compact size and energy conservation. Medium Voltage power electronics are essential in industrial drives, commercial electric vehicles, and photovoltaic inverters. These systems balance high power capacity and efficient energy use, making them suitable for industrial applications requiring high performance and energy efficiency.

**Application:** High demand for power electronics in the aerospace & defense sector

In the Aerospace & defense segment, power electronics are integral for applications such as power generation, conversion systems, and electronic warfare. The need here emphasizes high reliability, durability in extreme conditions, and advanced thermal management solutions. Automotive's pivot towards electric vehicles (EVs) and hybrid systems places power electronics at the forefront. These are used in powertrain systems, battery management, and charging infrastructure. Energy efficiency and compact design are preferred attributes. Consumer electronics include mobile devices, computers, and home appliances, where power electronics ensure user safety and energy savings and enhance product longevity. In information and communication technology (ICT), power electronics are pivotal in data centers, networking equipment, and communication devices. The focus here is on reliability, high power density, and energy efficiency. The Industrial sector utilizes power electronics in motor drives, automation, power supplies, and renewable energy systems. Needs-based preferences include robustness, scalability, and compatibility with various industrial environments. Electronics are vital for energy generation, transmission, and distribution within the Power sector. This segment requires excellent thermal performance, high efficiency, and the ability to handle high power levels.

**Material:** Gallium nitride offers high-efficiency performance in high-frequency and high-power applications

Gallium nitride is a wide-bandgap semiconductor material recognized for its high electron mobility, thermal stability, and ability to work at more elevated voltages and frequencies than silicon. This makes GaN suitable for high-efficiency, compact power converters, and rapid charging solutions. This material is chosen for applications requiring high power density and efficiency, including RF communications and satellite technologies. Sapphire is an alumina-based crystal used in power electronics for its durability, high melting point, and excellent electrical insulating properties. These materials are ideal for harsh environments and applications that require a robust material that can sustain high temperatures and resist corrosion. Silicon remains the backbone of the semiconductor industry due to its well-established manufacturing ecosystem and excellent electrical properties, and it is predominant in lower-power and microelectronic applications. Silicon Carbide is another wide-bandgap semiconductor material that provides superior thermal conductivity, higher temperature tolerance, and increased power efficiency compared to silicon. It is particularly advantageous in high-voltage and high-temperature applications.

**Regional Insights:**

The Americas has a significant power electronics market with a strong emphasis on technological advancements and high-quality products. The regional consumers show a growing interest in home automation and smart appliances, which drives the need for advanced power electronic solutions. The landscape is shaped by numerous governmental initiatives to promote energy efficiency and is supported by a robust investment atmosphere for tech start-ups and research endeavors. Stringent regulations regarding energy consumption and high environmental awareness among consumers characterize the European power electronics market. EU initiatives

aim to make Europe the first climate-neutral continent by driving innovation in green technology, including power electronics. The EU's focus on sustainability influences customer purchasing behavior towards efficient and long-lasting electronics. European countries have numerous power electronics companies engaged in high-level research and development. The Asia Pacific has a significant landscape in power electronics, largely driven by its substantial investments in renewable energy and electric vehicles (EVs). As part of its pollution reduction and energy security strategies, the government's support for EVs has catalyzed local market growth. The country's power electronics market is burgeoning due to the government's push for renewable energy and the rapid expansion of its industrial sector.

#### FPNV Positioning Matrix:

The FPNV Positioning Matrix is essential for assessing the Power Electronics Market. It provides a comprehensive evaluation of vendors by examining key metrics within Business Strategy and Product Satisfaction, allowing users to make informed decisions based on their specific needs. This advanced analysis then organizes these vendors into four distinct quadrants, which represent varying levels of success: Forefront (F), Pathfinder (P), Niche (N), or Vital(V).

#### Market Share Analysis:

The Market Share Analysis offers an insightful look at the current state of vendors in the Power Electronics Market. By comparing vendor contributions to overall revenue, customer base, and other key metrics, we can give companies a greater understanding of their performance and what they are up against when competing for market share. The analysis also sheds light on just how competitive any given sector is about accumulation, fragmentation dominance, and amalgamation traits over the base year period studied.

#### Key Company Profiles:

The report delves into recent significant developments in the Power Electronics Market, highlighting leading vendors and their innovative profiles. These include ABB Ltd., BorgWarner Inc., Delta Electronics, Inc., Fuji Electric Co., Ltd., Heraeus Group, imperix power electronics, Infineon Technologies AG, Liebherr-International Deutschland GmbH, Littelfuse, Inc., Maxim Integrated Products, Inc., Microchip Technology Inc., Mitsubishi Electric Corp., Murata Manufacturing Co., Ltd., NXP Semiconductor N.V, ON Semiconductor Corp., Proterial, Ltd., Qualcomm, Inc., Renesas Electronics Corp., Semikron Danfoss Elektronik GmbH & Co. KG, STMicroelectronics N.V., Texas Instruments, Inc., Toshiba Corporation, Vitesco Technologies, and ZF Friedrichshafen AG.

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#### Market Segmentation & Coverage:

This research report categorizes the Power Electronics Market in order to forecast the revenues and analyze trends in each of following sub-markets:

Based on Device Type, market is studied across Discrete, IC, and Module. The Discrete is further studied across Diode, Thyristor, and Transistors. The IC is further studied across Application Specific IC and Power Management IC. The Module is further studied across Intelligent Power Module and Standard and Power Integrated Module. The Module is projected to witness significant market share during forecast period.

Based on Material, market is studied across Gallium Nitride, Sapphire, Silicon, and Silicon Carbide. The Silicon is projected to witness significant market share during forecast period.

Based on Voltage, market is studied across High Voltage, Low Voltage, and Medium Voltage. The High Voltage is projected to witness significant market share during forecast period.

Based on Current Level, market is studied across 25A to 40A, Above 40A, and Up to 25A. The Above 40A is projected to witness significant market share during forecast period.

Based on Wafer Size, market is studied across 200 mm, Above 200 mm, and Less than 200 mm. The Less than 200 mm is projected to witness significant market share during forecast period.

Based on Application, market is studied across Aerospace & Defense, Automotive, Consumer Electronics, ICT, Industrial, and Power. The ICT is projected to witness significant market share during forecast period.

Based on Region, market is studied across Americas, Asia-Pacific, and Europe, Middle East & Africa. The Americas is further studied across Argentina, Brazil, Canada, Mexico, and United States. The United States is further studied across California, Florida, Illinois, New York, Ohio, Pennsylvania, and Texas. The Asia-Pacific is further studied across Australia, China, India, Indonesia, Japan, Malaysia, Philippines, Singapore, South Korea, Taiwan, Thailand, and Vietnam. The Europe, Middle East & Africa is further studied across Denmark, Egypt, Finland, France, Germany, Israel, Italy, Netherlands, Nigeria, Norway, Poland, Qatar, Russia, Saudi Arabia, South Africa, Spain, Sweden, Switzerland, Turkey, United Arab Emirates, and United Kingdom. The Europe, Middle East & Africa commanded largest market share of 37.27% in 2022, followed by Asia-Pacific.

Key Topics Covered:

1. Preface
2. Research Methodology
3. Executive Summary
4. Market Overview

5. Market Insights
6. Power Electronics Market, by Device Type
7. Power Electronics Market, by Material
8. Power Electronics Market, by Voltage
9. Power Electronics Market, by Current Level
10. Power Electronics Market, by Wafer Size
11. Power Electronics Market, by Application
12. Americas Power Electronics Market
13. Asia-Pacific Power Electronics Market
14. Europe, Middle East & Africa Power Electronics Market
15. Competitive Landscape
16. Competitive Portfolio
17. Appendix

The report provides insights on the following pointers:

1. Market Penetration: Provides comprehensive information on the market offered by the key players
2. Market Development: Provides in-depth information about lucrative emerging markets and analyzes penetration across mature segments of the markets
3. Market Diversification: Provides detailed information about new product launches, untapped geographies, recent developments, and investments
4. Competitive Assessment & Intelligence: Provides an exhaustive assessment of market shares, strategies, products, certification, regulatory approvals, patent landscape, and manufacturing capabilities of the leading players
5. Product Development & Innovation: Provides intelligent insights on future technologies, R&D activities, and breakthrough product developments

The report answers questions such as:

1. What is the market size and forecast of the Power Electronics Market?
2. Which are the products/segments/applications/areas to invest in over the forecast period in the Power Electronics Market?
3. What is the competitive strategic window for opportunities in the Power Electronics Market?
4. What are the technology trends and regulatory frameworks in the Power Electronics Market?
5. What is the market share of the leading vendors in the Power Electronics Market?
6. What modes and strategic moves are considered suitable for entering the Power Electronics Market?

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