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Power Electronic Testing Market – Global Industry Size, Share, Trends, Opportunity, and Forecast, Segmented By Device Type (Power Discrete Devices, Power Modules, Others), By Application (Consumer Electronics, Power, Industrial, Automotive, Aerospace & Defense, Others), By Offering (Testing Equipment, Testing Service), By Region, By Competition, 2020-2030F

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Abstracts

Market Overview

The Global Power Electronic Testing Market was valued at USD 3.3 billion in 2024 and is projected to reach USD 4.9 billion by 2030, growing at a CAGR of 6.7% during the forecast period. Market expansion is fueled by rising demand for high-performance power electronic components, particularly in the electric vehicle (EV) sector, where efficient and reliable energy conversion is critical. The growth of renewable energy sources such as solar and wind also necessitates robust testing to ensure seamless grid integration and power conversion. Additionally, the proliferation of wide-bandgap semiconductor technologies like Silicon Carbide (SiC) and Gallium Nitride (GaN) has introduced new testing complexities, driving the need for advanced validation systems. Increasing industrial automation and the rollout of 5G infrastructure further elevate the importance of power electronics testing. Globally, regulatory compliance and safety standards continue to enforce stringent testing protocols, collectively creating a dynamic and innovation-driven market landscape.

Key Market Drivers

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Surge in Electric Vehicle (EV) Adoption Driving Demand for Power Electronic Testing

The rapid rise in global electric vehicle (EV) adoption is a major catalyst for the power electronic testing market. EVs rely heavily on complex power electronic systems such as inverters, converters, and battery management units that must meet rigorous performance and safety standards. As governments and industries accelerate EV production to reduce carbon emissions, the need for comprehensive and reliable testing grows substantially. In March 2025, Germany's dSPACE introduced the XSG Power Electronics Systems software, supporting simulations at high switching frequencies up to 500 kHz, a development that underscores the rising sophistication in power electronics. These systems must endure fluctuating loads and extreme conditions, necessitating robust testing to validate efficiency, reliability, and compliance before deployment.

Key Market Challenges

Complexity and High Cost of Testing Advanced Power Electronic Components

A significant challenge for the market is the complexity and high cost associated with testing modern power electronics, especially those utilizing wide-bandgap materials like SiC and GaN. These components offer enhanced performance but demand specialized testing environments capable of handling higher frequencies, voltages, and thermal variations. Building and operating such advanced testing infrastructure involves substantial investment in equipment, automation, and skilled labor. For smaller firms and those in developing regions, this creates financial and technical barriers to entry. Without sufficient capital or access to cutting-edge tools, these entities may struggle to adopt high-end testing solutions, thereby limiting their market competitiveness.

Key Market Trends

Increasing Adoption of Automation and AI-Driven Testing Solutions

Automation and AI integration are reshaping the power electronic testing market, offering faster, more accurate, and more efficient testing workflows. As components grow more advanced, traditional testing methods fall short in terms of precision and scalability. Automated test equipment (ATE) and AI-powered systems are now being employed to streamline testing cycles, reduce human error, and enhance throughput. These technologies allow real-time data collection, pattern recognition, and adaptive

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testing, helping manufacturers optimize product quality and reliability. Additionally, predictive analytics and condition-based maintenance powered by machine learning are gaining traction, minimizing unplanned failures and extending equipment lifespan, particularly in sectors like EVs and renewable energy.

Key Market Players

Keysight Technologies, Inc.

Tektronix, Inc.

Rohde & Schwarz GmbH & Co KG

National Instruments Corporation

Microtest Group

Advantest Corporation

Teradyne, Inc.

Infineon Technologies AG

Report Scope:

In this report, the Global Power Electronic Testing Market has been segmented into the following categories, in addition to the industry trends which have also been detailed below:

Power Electronic Testing Market, By Device Type:

Power Discrete Devices

Power Modules

Others

Power Electronic Testing Market, By Application:

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- Consumer Electronics
- Power
- Industrial
- Automotive
- Aerospace & Defense
- Others

Power Electronic Testing Market, By Offering:

- Testing Equipment
- Testing Service

Power Electronic Testing Market, By Region:

- North America
  - United States
  - Canada
  - Mexico
- Europe
  - Germany
  - France
  - United Kingdom
  - Italy

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Spain

Asia Pacific

China

India

Japan

South Korea

Australia

South America

Brazil

Colombia

Argentina

Middle East & Africa

Saudi Arabia

UAE

South Africa

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in the Global Power Electronic Testing Market.

Available Customizations:

Global Power Electronic Testing Market report with the given market data, TechSci

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Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional market players (up to five).

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