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Power Electronic Testing Market Forecasts to 2030 – Global Analysis By Type of Testing (Functional Testing, Reliability Testing, Performance Testing and Other Type of Testings), Testing Equipment, Component Type, Voltage Level, End User and By Geography

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Abstracts

According to Stratistics MRC, the Global Power Electronic Testing Market is accounted for $6.3 billion in 2024 and is expected to reach $12.05 billion by 2030 growing at a CAGR of 11.3% during the forecast period. Power electronic testing refers to the process of evaluating and verifying the performance, functionality, and safety of power electronic devices and systems. These devices, such as converters, inverters, and controllers, are used to manage electrical energy in applications like renewable energy systems, electric vehicles, and industrial automation. Testing ensures proper operation under various conditions, checks for efficiency, reliability, and thermal performance, and identifies potential issues such as overvoltage, short circuits, or overheating, ensuring safe and efficient operation in real-world applications.

Market Dynamics:

Driver:

Growing demand for renewable energy solutions

The growing demand for renewable energy solutions like solar, wind, and hydroelectric power become more widespread, the need for efficient energy conversion and storage systems increases. Power electronics are essential for managing these energy

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systems, ensuring optimal performance and reliability. Testing these components becomes critical to guarantee their efficiency, durability, and compliance with safety standards. The rising investments in clean energy infrastructure have spurred advancements in power electronics technology. This, in turn, demands more robust and sophisticated testing solutions.

Restraint:

Technological challenges in testing

Highly precise and dependable testing techniques are necessary for advanced power electronics systems, yet they are frequently challenging to create. Testing techniques find it more difficult to stay up to date with new developments due to the quick evolution of technology. The requirement for specialised equipment and high testing expenses further restrict market expansion. Furthermore, it might be difficult to obtain consistent performance assessments in power electronic systems due to the integration of many components. Consequently, these testing challenges cause delays in product development and impede the progress of the industry as a whole.

Opportunity:

Increased investment in electric mobility infrastructure

The need for dependable power electronic components has increased as EV use has increased. To guarantee their effectiveness and safety, these parts—which include inverters, chargers, and batteries—need to be thoroughly tested. Power electrical testing is becoming more and more necessary as public and private entities invest in EV charging networks. The ability of these systems to manage the rising power needs and function well under a variety of circumstances is ensured via testing. The need for sophisticated testing apparatus is further increased by the growth of EV infrastructure. As a result, the market for power electronic testing services and goods is expanding due to the increased emphasis on electric mobility.

Threat:

Competition from alternative testing methods

Competition from alternative testing methods such as simulation-based testing, reduce the need for traditional hardware-based testing, making them more attractive for cost-

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conscious companies. Furthermore, improvements in software tools enable quicker and more effective testing, which cuts down on the time and effort required for physical tests. Manufacturers may choose to use these substitutes in order to save testing costs. Additionally, the requirement for traditional power electronic testing services may be further reduced by the increased flexibility and scalability that alternative testing techniques may provide.

Covid-19 Impact

The COVID-19 pandemic significantly impacted the Power Electronics Testing Market, causing disruptions in supply chains and delaying production. With manufacturing plants shutting down or operating at reduced capacity, there was a slowdown in the development of power electronic devices. However, the increased demand for renewable energy and electric vehicles during the pandemic drove growth in power electronics. Remote working also accelerated the need for advanced testing solutions, leading to a shift in demand for automated and efficient testing technologies. The market showed resilience as it adapted to these changes, with a steady recovery expected post-pandemic.

The functional testing segment is expected to be the largest during the forecast period

The functional testing segment is expected to account for the largest market share during the forecast period by ensuring that power electronic devices meet required performance standards. This testing segment verifies the correct operation of components such as inverters, converters, and power supplies. As power electronics are integral in industries like renewable energy, automotive, and telecommunications, functional testing ensures reliability and efficiency. The increasing demand for electric vehicles and renewable energy systems drives the need for comprehensive functional testing.

The medical devices segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the medical devices segment is predicted to witness the highest growth rate, due to the increasing demand for precise and reliable electronic components in healthcare technologies. Medical devices, such as imaging systems, pacemakers, and diagnostic equipment, require power electronics for optimal performance and safety. Testing ensures that these devices meet strict regulatory standards for electrical efficiency, durability, and safety. With advancements in medical

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technology, the need for high-quality power electronics in devices is growing, thereby driving the testing market.

Region with largest share:

During the forecast period, the Asia Pacific region is expected to hold the largest market share by rapid advancements in industrial automation and energy-efficient technologies. With countries such as China, India, and Japan leading the way, the region accounts for a significant share of global production and consumption of power electronics. The growing adoption of electric vehicles (EVs) and renewable energy sources is increasing the need for efficient power conversion systems, thereby driving the demand for power electronic testing. Moreover, increasing investments in research and development activities are fostering innovation in power electronic testing solutions. As a result, the Asia Pacific market is expected to witness continued expansion, with technological advancements enhancing the testing capabilities and reliability of power electronics.

Region with highest CAGR:

Over the forecast period, the North America region is anticipated to exhibit the highest CAGR, owing to the increasing demand for energy-efficient devices and renewable energy integration. Major industries such as automotive, aerospace, and industrial automation are driving the need for advanced power electronics testing solutions. The rise of electric vehicles (EVs) and the adoption of renewable energy sources like solar and wind are key contributors to market expansion. Companies in North America are investing heavily in R&D to develop more efficient testing tools and equipment. Furthermore, government regulations and initiatives to promote green energy are fostering the growth of the market. as power electronics technologies evolve, the demand for high-precision testing solutions will continue to rise in the region.

Key players in the market

Some of the key players profiled in the Power Electronic Testing Market include SGS SA, Bureau Veritas, Intertek Group plc, Advantest Corporation, Teradyne Inc., DEKRA, TUV SUD, National Instruments Corp., TUV Rheinland, TUV NORD Group, UL LLC, Cohu, Inc., Rohde & Schwarz, Keysight Technologies, Chroma ATE Inc., Megger Group Limited, Littelfuse and Chroma ATE Inc.

Key Developments:

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In October 2024, SGS SA signed a partnership agreement with GCC Lab in the Kingdom of Saudi Arabia. This collaboration aims to kick-start the global new energy testing and certification sector in the Middle East and North Africa. The agreement enables SGS to leverage GCC Lab’s platform strengths to provide manufacturers, installers, and service providers of new energy products with tailored services in testing, inspection, and certification, facilitating easier access to Middle East and North African markets.

In September 2024, Bureau Veritas announced the acquisition of ArcVera Renewables, a specialized provider of finance-grade consulting and technical services for wind, solar, and battery storage projects worldwide. This acquisition aligns with Bureau Veritas's LEAP | 28 strategy to strengthen its position in the renewables sector, particularly in North America.

In April 2023, Bureau Veritas India and Mitsui Chemicals India signed an agreement to offer onsite and laboratory testing of solar photovoltaic (PV) modules. This collaboration aims to enhance the quality and reliability of solar PV modules in the Indian market, supporting the country's growing renewable energy sector.

Type of Testings Covered:

- Functional Testing
- Reliability Testing
- Performance Testing
- Thermal Testing
- Efficiency Testing
- Durability Testing
- Safety Testing
- Other Type of Testings

Testing Equipments Covered:

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- Power Analyzers
- Oscilloscopes
- Multimeters
- Load Banks
- Programmable AC/DC Power Sources
- Electronic Load Testers
- Signal Generators
- Other Testing Equipments

Component Types Covered:

- Power ICs (Integrated Circuits)
- Power Modules
- Power Transistors
- Diodes and Rectifiers
- Capacitors and Inductors
- Power Drivers and Inverters
- Other Component Types

Voltage Levels Covered:

- Low Voltage (Up to 1kV)
- Medium Voltage (1kV to 36kV)

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High Voltage (Above 36kV)

End Users Covered:

Automotive

Consumer Electronics

Industrial

Energy

Aerospace and Defense

Telecommunications

Medical Devices

Other End Users

Regions Covered:

North America

US

Canada

Mexico

Europe

Germany

UK

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- Italy
- France
- Spain
- Rest of Europe

Asia Pacific

- Japan
- China
- India
- Australia
- New Zealand
- South Korea
- Rest of Asia Pacific

South America

- Argentina
- Brazil
- Chile
- Rest of South America

Middle East & Africa

- Saudi Arabia
- UAE

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Qatar

South Africa

Rest of Middle East & 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 2022, 2023, 2024, 2026, and 2030
- 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)

Competitive Benchmarking

Benchmarking of key players based on product portfolio, geographical

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presence, and strategic alliances

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Note: Tables for North America, Europe, APAC, South America, and Middle East & Africa Regions are also represented in the same manner as above.

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