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Power Electronic Testing Market by Power Discrete (Diode, Transistor, Thyristor), Power Module, Power Integrated Circuit (IC); Electromagnetic Compatibility (EMC) Testing, Radio Frequency (RF) Testing, Energy Efficiency Testing - Global Forecast to 2029

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Abstracts

The global power electronics testing was valued at USD 5.7 billion in 2024 and is projected to reach USD 9.3 billion by 2029; it is expected to register a CAGR of 10.2% during the forecast period. Due to the development of electric vehicles and the potential for renewable energy, power electronics will undergo more testing due to the need for powerful conversion devices for optimum performance and reliability. Additionally, wide-bandgap semiconductors require much more sophisticated testing methods since they can operate at higher switching frequencies and have good thermal resistance. With a growing demand for consumer electronics to be assimilated with automotive components and energy-efficient, testing rules become all the more tight. In smart grids, 5G networks, and industrial automation, reliable and efficient power electronics become the need of the hour.

“The testing equipment segment of power electronics testing market is expected to have significant market share during the forecast period.”

During the forecast period, the demand for precise and efficient testing in areas like automotive and telecommunication (ICT) is likely to boost growth in the power electronics testing market segment. In evaluating power electronics systems crucial tools include Automated Test Equipment (ATE) for optimizing testing workflows and oscilloscopes for studying waveforms. Network analyzers evaluate signal quality in RF and microwave devices; multimeters obtain vital electrical assessments; and signal generators create actual waveforms to verify circuit reactions. As electric vehicles and

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wide-bandgap semiconductors enhance the complexity of power electronics systems testing tools become key to ensuring compliance and performance.

“The Power IC device type to account for largest markete share during the forecast period”

A substantial percentage of more than 50% belongs to the power IC category in the power electronics testing field as it is essential in controlling and distributing electrical power across several industries including telecommunications and automotive. With the rise of electric vehicles and energy-efficient equipment the need for thorough testing of power ICs has grown. The growing compactness and complexity of devices elevates the significance of power ICs. In addition to developing wide-bandgap materials in semiconductors advancements necessitate specific testing methods for enhanced performance in high-stress environments. Smart devices and IoT applications depend greatly on power management systems and enhance the ongoing need for power ICs beyond doubt.

“The North America is likely to grow at the significant CAGR during the forecast period.”

The power electronics testing market in North America is expected to show strong growth over the forecast period. Electric vehicles (EVs), developments in renewable energy technologies and an ongoing digital change across diverse industries are contributing to this advancement. The automotive industry in this area generates considerable demand for power electronics testing to maintain the performance and dependability of vital modules like battery management systems and chargers. North America focuses on shifting to cleaner energy forms like wind and solar which necessitates strong power electronics testing for solar inverters and grid combination. Enforcement of safe practices and energy efficient regulations heighten the necessity for thorough testing solutions. Major technological firms and testing organizations exist in this area like National Instruments and Keysight Technologies that are creating testing tools to address the changing needs of industries such as telecoms aerospace and defense. As 5G networks expand and data centers and cloud solutions gain importance,the requirement for efficient power electronics rises exponentially and necessitates sophisticated testing for reliable operations. These elements put North America forward as a major area for advancement in the power electronics testing sector.

Breakdown of primaries

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The study contains insights from various industry experts, ranging from component suppliers to Tier 1 companies and OEMs. The break-up of the primaries is as follows:

By Company Type - Tier 1 – 55%, Tier 2 – 25%, Tier 3 – 20%

By Designation—Directors - 50%, Managers - 30%, Others - 20%

By Region— Asia Pacific - 40%, Europe - 35%, , North America - 20%, RoW - 5%

The power electronics testing market is dominated by a few globally established players such as SGS SA (Switzerland), Bureau Veritas (France), Intertek Group plc (UK), Advantest Corporation (Japan), Teradyne Inc., (US), DEKRA (Germany), T?V S?D (Germany), National Instruments Corp. (US), T?V RHEINLAND (Germany), T?V NORD Group (Germany), UL LLC (US), Cohu, Inc. (US), Rohde & Schwarz (Germany), Keysight Technologies (US), and Chroma ATE Inc. (Taiwan). The study includes an in-depth competitive analysis of these key players in the power electronics testing market, with their company profiles, recent developments, and key market strategies.

Research Coverage:

The report segments the power electronics testing market and forecasts its size by offering, device type, and verticals. The report also discusses the drivers, restraints, opportunities, and challenges pertaining to the market. It gives a detailed view of the market across four main regions—North America, Europe, Asia Pacific, and RoW. Supply chain analysis has been included in the report, along with the key players and their competitive analysis in the power electronics testing ecosystem.

Key Benefits to Buy the Report:

Analysis of key drivers (The surge in EV adoption, increasing the need for testing services; widespread adoption and expansion of renewable resources; regulatory policies and industry demand for energy-efficiency power systems have driven the need of rigorous testing), restraint (The rapid evolution of semiconductor materials like SiC and GaN increases the complexity of testing), opportunity (Increasing reliance on high-efficiency power electronics for avionics and defense systems; power electronics in telecom systems need testing for reliability under continuous operation, driving demand for specialized testing

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services), challenges (Adhering to various global safety, efficiency, and quality standards can be complex and resource-intensive for manufacturers)

Service Development/Innovation: Detailed insights on upcoming technologies, research and development activities, and new product launches in the power electronics testing market.

Market Development: Comprehensive information about lucrative markets – the report analyses the power electronics testing market across varied regions

Market Diversification: Exhaustive information about new products and services, untapped geographies, recent developments, and investments in the power electronics testing market.

Competitive Assessment: In-depth assessment of market shares, growth strategies, and service offerings of leading players like SGS SA (Switzerland), Bureau Veritas (France), Intertek Group plc (UK), Advantest Corporation (Japan), Teradyne Inc., (US), DEKRA (Germany), T?V S?D (Germany), National Instruments Corp. (US), T?V RHEINLAND (Germany), T?V NORD Group (Germany), UL LLC (US), Cohu, Inc. (US), Rohde & Schwarz (Germany), Keysight Technologies (US), and Chroma ATE Inc. (Taiwan).

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