

Aircraft Power Electronics Market Forecasts to 2034 – Global Analysis By Component (Inverters, Rectifiers, Converters, Power Controllers and Other Components), Semiconductor Material, Voltage Range, Application, Aircraft Type and Geography

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Abstracts

According to Statistics MRC, the Global Aircraft Power Electronics Market is accounted for \$5.2 billion in 2026 and is expected to reach \$21.5 billion by 2034 growing at a CAGR of 19.4% during the forecast period. Aircraft power electronics refer to electronic devices and systems that control, convert, regulate, and distribute electrical power within aircraft. These technologies include power converters, inverters, rectifiers, motor drives, and power management units that support avionics, propulsion systems, energy storage, and auxiliary equipment. Modern aircraft increasingly rely on advanced power electronics to improve energy efficiency, reduce weight, and support electrification initiatives. Power electronics play a critical role in hybrid-electric and all-electric aircraft architectures. Rising investment in sustainable aviation and electric propulsion technologies is accelerating adoption of advanced aircraft power electronics worldwide.

Market Dynamics:

Driver:

Increasing adoption of electric aircraft

Electrification programs are creating strong demand for advanced power conversion and distribution technologies capable of supporting next-generation aircraft architectures. Aircraft manufacturers are investing in systems that improve energy efficiency while reducing emissions and operational costs. Power electronics play a

critical role in managing electrical loads across propulsion, avionics, and onboard systems. Growing interest in hybrid-electric and fully electric aircraft is expanding the need for high-performance electronic components. Research initiatives focused on sustainable aviation are further accelerating technology development. The transition toward aircraft electrification is reshaping future aerospace system designs.

Restraint:

Thermal management design challenges

Heat dissipation requirements become increasingly demanding as power density levels rise within modern aerospace electrical systems. Aircraft power electronics must operate reliably under extreme environmental and operational conditions. Inefficient thermal control can reduce component performance and shorten system lifespan. Designers are required to balance cooling efficiency with aircraft weight and space constraints. Development of advanced thermal management solutions often increases engineering complexity and costs. These technical challenges continue to influence system integration and certification activities.

Opportunity:

Wide-bandgap semiconductor integration

Silicon carbide and gallium nitride technologies enable higher switching frequencies and improved energy efficiency compared with conventional semiconductor materials. These advanced components support lighter and more compact power electronic systems. Aerospace manufacturers are evaluating wide-bandgap devices to enhance aircraft electrical performance and reduce energy losses. Improved thermal characteristics further contribute to system reliability in demanding flight environments. Ongoing innovation is expanding the commercial viability of these semiconductor technologies across aviation applications. Adoption of wide-bandgap devices is expected to transform future aircraft power architectures.

Threat:

Semiconductor supply chain disruptions

Production delays affecting critical electronic components can interrupt aerospace manufacturing schedules and technology deployment programs. Aircraft systems

require highly specialized semiconductors that often have limited sourcing options. Supply shortages can increase procurement costs and extend lead times for equipment manufacturers. Geopolitical tensions and trade restrictions may further impact component availability. Aerospace companies are exploring supply diversification strategies to reduce dependency on concentrated manufacturing regions. Supply chain instability remains a key concern for industry stakeholders.

Covid-19 Impact:

The COVID-19 pandemic affected the Aircraft Power Electronics market through disruptions in aerospace production and development activities. Temporary reductions in aircraft manufacturing created short-term declines in demand for power electronic systems and components. Supply chain interruptions delayed deliveries of critical electronic parts and engineering equipment. Several aviation electrification projects experienced schedule adjustments due to investment uncertainties during the pandemic period. Despite these challenges, long-term interest in sustainable aviation technologies remained strong. Recovery in commercial aviation and renewed focus on emissions reduction supported market stabilization.

The converters segment is expected to be the largest during the forecast period

The converters segment is expected to account for the largest market share during the forecast period as power conversion functions are essential for managing electrical energy flow between aircraft subsystems and onboard equipment. Converters support voltage regulation and energy distribution across propulsion, avionics, lighting, and auxiliary systems. Modern aircraft increasingly rely on electrical architectures that require efficient conversion technologies. Demand for advanced converters is rising alongside the adoption of more-electric aircraft designs. Manufacturers are developing lightweight and highly efficient converter solutions to meet aerospace performance requirements. Continuous improvements in semiconductor technologies are enhancing converter capabilities.

The electric propulsion segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the electric propulsion segment is predicted to witness the highest growth rate due to accelerating investments in low-emission aircraft technologies designed to improve sustainability and operational efficiency. Electric propulsion systems depend heavily on advanced power electronics for energy control

and motor operation. Aerospace companies are pursuing innovative propulsion concepts to reduce fuel consumption and environmental impact. Demonstration programs and prototype developments are increasing across both commercial and urban air mobility applications. Progress in battery technologies is further supporting propulsion system advancements. Government funding initiatives aimed at sustainable aviation are encouraging continued innovation.

Region with largest share:

During the forecast period, the North America region is expected to hold the largest market share owing to strong aerospace innovation capabilities supported by extensive investments in aircraft electrification and advanced aviation technologies. The region hosts leading aircraft manufacturers, component suppliers, and research organizations involved in power electronics development. Significant funding is being directed toward sustainable aviation initiatives and electric aircraft programs. Government agencies and industry participants are collaborating on projects that accelerate technology commercialization. Advanced manufacturing capabilities support large-scale production of aerospace electronic systems. Continuous research activity contributes to ongoing performance improvements and product innovation.

Region with highest CAGR:

Over the forecast period, the Asia Pacific region is anticipated to exhibit the highest CAGR driven by increasing investments in next-generation aviation technologies. Several countries are strengthening domestic aerospace capabilities through industrial development programs and strategic partnerships. Demand for advanced aircraft systems is rising alongside growth in regional air transportation networks. Research initiatives focused on electric mobility and sustainable aviation are gaining momentum across the region. Local manufacturers are increasing participation in aerospace electronics supply chains. Government support for technology innovation continues to encourage industry expansion.

Key players in the market

Some of the key players in Aircraft Power Electronics Market include Infineon Technologies AG, STMicroelectronics N.V., ON Semiconductor Corporation, ABB Ltd., Eaton Corporation plc, Honeywell International Inc., GE Aerospace, Safran S.A., RTX Corporation, Mitsubishi Electric Corporation, Hitachi, Ltd., Thales S.A., Rolls-Royce Holdings plc, Airbus SE and The Boeing Company.

Key Developments:

In March 2026, Safran and Helicopteres Guimbal entered into an exclusive technical partnership to develop the propulsion system for the newly launched GrandCabri G5 helicopter. This tactical propulsion alignment integrates Safran's newly developed, 450-shaft-horsepower Arrius 2D turboshaft engine into the light-helicopter airframe, deploying automated digital engine controls (FADEC) to maximize fuel efficiency, reduce thermal signatures, and scale operational safety parameters during complex low-altitude maneuvers.

In August 2025, Airbus SE achieved a major technical milestone under its ZEROe electrification program by completing the initial phase of successful flight testing for its lithium-ion-powered hybrid aircraft demonstrators. This aerospace research expansion integrates ultra-high-density energy storage blocks directly with hybrid-electric engine configurations, establishing a validated operational baseline to scale low-carbon auxiliary and secondary propulsion power architectures across future regional commercial fleets.

Components Covered:

Inverters

Rectifiers

Converters

Power Controllers

Other Components

Semiconductor Materials Covered:

Silicon

Silicon Carbide

Gallium Nitride

Hybrid Materials

Other Semiconductor Materials

Voltage Ranges Covered:

Low Voltage

Medium Voltage

High Voltage

Ultra-High Voltage

Other Voltage Ranges

Applications Covered:

Flight Controls

Power Distribution

Electric Propulsion

Avionics

Other Applications

Aircraft Types Covered:

Commercial Aircraft

Military Aircraft

Business Jets

Unmanned Aircraft

Other Aircraft Types

Regions Covered:

North America

United States

Canada

Mexico

Europe

United Kingdom

Germany

France

Italy

Spain

Netherlands

Belgium

Sweden

Switzerland

Poland

Rest of Europe

Asia Pacific

China

Japan

India

South Korea

Australia

Indonesia

Thailand

Malaysia

Singapore

Vietnam

Rest of Asia Pacific

South America

Brazil

Argentina

Colombia

Chile

Peru

Rest of South America

Rest of the World (RoW)

Middle East

Saudi Arabia

United Arab Emirates

Qatar

Israel

Rest of Middle East

Africa

South Africa

Egypt

Morocco

Rest of 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 2023, 2024, 2025, 2026, 2027, 2028, 2030, 2032 and 2034

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

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