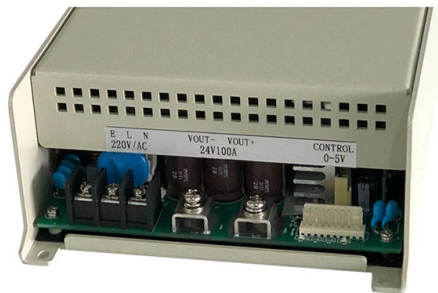


Trends in Integrated Power Supply Development



AI Overview

Integrated power supplies are evolving toward higher efficiency, compactness, digital control, and wide adoption of advanced semiconductor technologies, with strong market growth projected globally. Technological Trends

- 1. Increased Integration and Miniaturization** Integrated power supplies are moving toward higher levels of integration, combining active and passive components, sensors, and control electronics into compact modules. This reduces circuit parasitics, lowers component count, and simplifies manufacturing, while improving power density, efficiency, and reliability. Heterogeneous integration and system-in-package (SiP) approaches allow multiple functions to coexist in a single module, enabling multifunctional power solutions for industrial, automotive, and consumer applications.
- 2. Digital Power and Smart Control** Digital control is becoming a key trend, allowing real-time monitoring, adaptive optimization, and predictive maintenance. AI and machine learning are increasingly applied to optimize performance, reduce energy losses, and enhance reliability. Digital power supplies also facilitate modular and configurable designs, enabling easier upgrades and customization for specific applications.
- 3. Wide-Bandgap Semiconductors** The adoption of silicon carbide (SiC) and gallium nitride (GaN) devices is revolutionizing power supply design. These materials allow higher switching frequencies, improved efficiency, reduced heat dissipation, and smaller form factors, which are critical for modern integrated power systems.
- 4. Advanced Switching and EMI Reduction** Resonant and soft-switching technologies are increasingly used to minimize switching losses and electromagnetic interference (EMI). EMC pre-compliance testing and advanced simulation frameworks are becoming standard to ensure regulatory compliance and reduce development cycle...

Article Content

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