Integrated power DC module



Overview

Reduce design time and effort with the STPOWER portfolio of highly integrated, high-efficiency power modules for flexible, compact, and robust solutions ranging from tens of watts to several kilowatts.

Key Takeaways

Integrated power DC modules combine controllers, power switches, inductors, and passive components into a compact, high-efficiency package, simplifying power supply design and improving performance.

Overview

Integrated power DC modules are all-in-one switching power supply solutions that integrate key components such as controllers, MOSFETs, inductors, and passive elements into a single package. This high level of integration reduces the number of external components, minimizes board space, and accelerates time-to-market for electronic designs. These modules are designed for high power density, thermal efficiency, and electromagnetic interference (EMI) compliance, making them suitable for applications ranging from industrial systems to automotive and data center power management.

Key Features

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Compact and High-Density Design: Modules use advanced packaging technologies, such as 3D integration and inductor-on-top designs, to reduce solution size by up to 40% while maintaining high efficiency. Integrated Components: Controllers, power switches, inductors, and passive components are pre-characterized and tested for EMI and DC performance, simplifying design and reducing engineering effort. Thermal Management: Proprietary packaging and optimized layouts improve heat dissipation, enabling higher safe operating areas and reliable operation under high current loads.

Efficiency Optimization: Features like HyperLight Load® mode and multi-phase operation improve efficiency across light and heavy load conditions, reducing energy loss and operational costs. Digital Control and Configurability: Some modules offer integrated digital control, I2C configurability, and multi-load configurators for precise performance tuning and system optimization.

Applications

Integrated D

C power modules are widely used in: Industrial and Motor Drives: Compact modules like STPOWER SLLIMM and ACEPACK drive motors efficiently from a few watts to several kilowatts. Automotive Systems: DC-DC converters for HEV/BEV, charging stations, and auxiliary power systems.

Data Centers and High-

Performance Computing: Multi-phase modules provide high current (>2000 A) and high efficiency for GPUs and CPUs, reducing power loss and energy costs at scale. Consumer Electronics: Space-constrained designs benefit from small form factors and high efficiency.

Benefits

Reduced Design Complexity: Pre-integrated modules eliminate the need for external component sourcing and complex layout design.

Faster Time-to-

Market: Ready-to-use modules simplify prototyping and production. Improved Reliability: Integrated and pre-tested components ensure consistent performance and reduce the risk of design errors. Energy Savings: High-efficiency designs lower operational costs and thermal load, particularly in large-scale deployments like data centers.

Integrated power DC modules represent a modern solution for efficient, compact, and reliable power management, enabling designers to meet demanding performance requirements while reducing engineering effort and system complexity.

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Article Content

DC/DC power modules

In this training series, we discuss the high level of integration of our power modules and the significant implications that this has on power-supply design with respect to solution size, EMI, design time and

Power modules (integrated inductor) | TI

In this training series, we discuss the high level of integration of our power modules and the significant implications that this has on power-supply design with respect to solution size, EMI, design time and

DC-DC Integrated Switching Power Modules

Our highly integrated power modules contain a controller, power switches and the necessary passive components—all of which are fully tested and pre-characterized for EMI and DC performance—to

Power Modules | MPS | Monolithic Power Systems

Module of the Month 16V, 100A, Scalable, DC/DC Power Module with PMBus The MPM3695-100 is a 100A, scalable, fully integrated power module with a PMBus

DC/DC Power Module

Renesas DC/DC power modules provide complete power solutions capable of handling up to 80A. With over a decade of expertise in power module innovation, we deliver fully integrated modules that

Intelligent Power Module (IPM) Devices

Reduce design time and effort with the STPOWER portfolio of highly integrated, high-efficiency power modules for flexible, compact, and robust solutions ranging from tens of watts to several kilowatts.

Power Modules | High-efficiency DC/DC Converters | Flex

Our board-mounted DC/DC modules Flex offers a broad range of standard and custom embedded power solutions, including isolated and non-isolated, digital

Comprehensive Guide to Integrated Power Modules: DC-DC Power

Discover the advantages of integrated power modules, including DC-DC power modules and power converter modules. Explore product options, voltage ranges, and key applications for

High density power modules

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Infineon''s high-power density dual-phase power modules ensure best-in-class total cost of ownership for datacenter, telecom, and AI applications.

Revolutionizing Power Supplies: The Advantages of

Power modules with integrated inductors offer numerous advantages, including simplified design, reduced board space, faster development times, and EMI

INTEGRATED POWER DEVICES SIMPLIFY AN EMBEDDED DC-DC POWER

Abstract A new class of integrated power devices has been developed to simplify embedded dc-dc power supply designs. The paper includes comparison with existing discrete/co-package solutions

Revolutionizing Power Supplies: The Advantages of Integrated Power Modules

This article explores the numerous advantages of using integrated power modules over traditional discrete DC/DC power supplies. Simplified Design and Reduced Board Space By integrating the

Integrated Step-Down DC/DC Module Benefits | DigiKey

Use integrated step-down DC/DC modules to develop high density and efficient low EMI multi-rail power solutions.

What is a Power Module? | Renesas

What is a Power Module? To meet the challenge of designing power sub-systems, many designers are considering using power modules instead of traditional discrete POL designs, with time to market,

Power modules (integrated inductor) product selection | TI

Select from TI''s Power modules (integrated inductor) family of devices. Power modules (integrated inductor) parameters, data sheets, and design resources.

Integrated POL voltage regulators | Infineon Technologies

IPOL power module is a fully integrated buck converter with an integrated inductor and other passive components. It is easy to design and offers a high-efficiency

“Power Supply in a Module” Integrates Transformer Tech

TI leverages its integrated transformer technology in its latest isolated DC-DC power module, which is claimed to be close to 90% more compact than comparable solutions.

Isolated DC/DC Converters & Modules

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Isolated DC/DC Converters & Modules MPS''s isolated DC/DC converters & modules provide engineers with a superior isolation barrier that more easily meets design

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North American project location: Research Triangle Park, North Carolina, United States

This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

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