

Function of AC-DC power supply module



Article Overview

An AC-DC power supply module converts alternating current (AC) from the mains into stable direct current (DC) using rectification, filtering, and voltage regulation stages.

Working Principle

1. AC Input: The module receives AC voltage from the mains, typically 110V or 220V at a fixed frequency. This AC input is the standard form of electricity supplied to homes and industrial equipment . 2. Rectification: The AC voltage is converted into DC voltage using a rectifier circuit, commonly a bridge rectifier composed of four diodes. This process transforms both the positive and negative halves of the AC waveform into a unidirectional current, producing a pulsating DC . 3. Filtering: The rectified DC contains ripples and noise. Capacitors and sometimes inductors are used to smooth the voltage, reducing fluctuations and providing a more stable DC output . 4. Voltage Regulation: To maintain a constant output voltage regardless of input variations or load changes, the module employs a voltage regulator. This can be a linear regulator, which dissipates excess energy as heat, or a switching regulator, which rapidly switches the current on and off to efficiently control voltage levels . Feedback circuits monitor the output and adjust the conduction of transistors or MOSFETs to stabilize the voltage . 5. Output Stage: The regulated DC voltage is delivered to the load, ensuring electronic devices receive the required power for proper operation. In isolated modules, the input and output grounds are separated to prevent interference and protect against surges .

Types of AC-DC Power Supplies

- Linear Power Supplies: Convert AC to DC directly with linear regulation. They are simple but bulky due to large transformers and less efficient at high power .

Article Content

Power Module : Working Principle, Structural Features, and Process

A power module is an electronic device used to convert one form of electrical energy into another for supply to specific

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Power Supplies are available at Mouser Electronics. Mouser offers inventory, pricing, & datasheets for Power Supplies.

Switched-mode power supply

In contrast, a linear power supply regulates the output voltage by continually dissipating power in the pass transistor. The switched

DC/DC power modules

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Power Supply: Definition, Functions & Components

AC (Alternating Current) power supplies provide electrical energy that periodically changes direction, while DC (Direct Current)

Understanding AC/DC Power Supplies

Traditional linear AC/DC power supply design has evolved over the years, improving in terms of efficiency, power range, and size —

AC-DC Power Module

Compact Power Modules for Embedded and Industrial Systems Cosel AC-DC power modules offer space-efficient conversion for

Understanding AC/DC Power Supply | Article | MPS

The main job of an AC/DC power supply is to transform the alternating current (AC) into a stable direct current (DC) voltage, which

Power Supply: Definition, Functions & Components

Key components of a power supply include transformers, rectifiers, filters, voltage regulators, and protection circuits. Understanding

Contact Us

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