# Integrated Power Supply and Independent Power Supply

## Overview

Dive into the pros and cons of using integrated versus modular power supplies for a system in this training module.

## Key Takeaways

Independent power supplies operate separately from the main circuit, while integrated power supplies are built into the device, providing compact, self-sufficient power to isolated sections.Independent Power Supply

An independent power supply is a standalone unit that provides power to a circuit or device without relying on internal integration. In digital isolators or multi-switch systems, independent supplies are often required for high-side and low-side MOSFETs or isolated circuit sections to ensure proper operation and electrical isolation . Key characteristics include:

• Separate power rails: Each section of the circuit may require its own voltage and ground, with no direct electrical connection between them .

• Flexibility: Designers can select voltage levels and power ratings tailored to specific components or loads.

• Complexity and size: Requires additional components like transformers, discrete DC/DC converters, or bootstrap circuits, which can increase board space and design complexity .

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• Applications: Common in high-voltage systems, multi-channel converters, and circuits requiring strict isolation for safety or performance.
Integrated Power Supply

An integrated power supply combines the power conversion functionality directly within a device, such as a digital isolator . This approach offers several advantages:

• Self-sufficiency: The isolated side of the device receives power internally, eliminating the need for external power sources .

• Compact design: Integration reduces the number of external components, saving board space and simplifying layout .

• Improved efficiency and performance: Advanced power conversion techniques within the device reduce energy loss and enhance reliability .

• Simplified design: Reduces the complexity of routing and managing multiple power rails, making it easier to meet system insulation and electromagnetic compatibility requirements .

• Applications: Ideal for digital isolators, intelligent power supplies, and embedded systems where space, efficiency, and ease of certification are critical .
ComparisonFeatureIndependent Power SupplyIntegrated Power SupplyPower sourceExternal, separate from deviceBuilt into the deviceDesign complexityHigher, requires additional componentsLower, fewer external componentsBoard spaceLarger footprintCompact, saves spaceFlexibilityHigh, can choose voltage and currentLimited to device specificationsEfficiencyCan be optimized externallyOptimized internally, often more efficientApplicationsHigh-voltage isolation, multi-channel systemsDigital isolators, embedded systems, compact designsSummary

Independent power supplies are suitable for systems requiring multiple isolated rails or high flexibility, but they increase design complexity and board space. Integrated power supplies simplify design, save space, and improve efficiency by embedding the power source within the device, making them ideal for compact, self-contained applications such as digital isolators and intelligent power supply solutions .

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## Article Content

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Figure 1 shows a switched-tank converter (STC), where an auxiliary power supply can be shared for the three LS-FETs on the right

Isolated DC-DC Power Supplies: Module or Discrete Design?

When is a fully integrated module the better option, and when does a discrete design offer the greater advantage?

Choosing The Right Internal and External Power Supplies

This article explains how internal and external power supplies work, compares their strengths and limitations, and explores factors to

Off-Grid Photovoltaics: How Independent Power Supply Works

An off-grid photovoltaic system, also known as an off-grid system or island system, is a form of power supply that

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This article explores how to design multiple independent auxiliary power supplies and wireless power transmission systems to

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Designing Multiple Independent Auxiliary Power Supplies

In a modular multilevel converter (MMC), many independent power supplies are required to supply power to the gate-level driver

Internal PSUs Explained: Choosing the Right Supply

Learn what an internal PSU is, how internal power supplies work, and what to consider when choosing the

Introduction

Non-Integrated Solutions: Conventionally, the isolated side of the digital isolators typically need independent, and external power

Integrated Power Designs AC-DC & DC-DC Power Supplies

Industrial Applications AC-DC Power Supplies With output power ratings available between 25-400W, IPD offers a wide range of AC

Isolated vs Non-Isolated Power Supplies: The Right Choice ...

An understanding of isolated vs. non-isolated power supplies is all about designer and user safety. Here, we''re not

Revolutionizing Power Supplies: The Advantages of Integrated

This article explores the numerous advantages of using integrated power modules over traditional discrete DC/DC power supplies.

Why Can''t Industrial PCs Have an Integrated AC Power Supply?

But a desktop isn''t built to just be able to have an integrated AC supply, it also needs a different kind of power supply –

Integrated Power Supply (IPS) System as per RDSO Specification

The Integrated Power Supply (IPS) system, as per the RDSO Specification RDSO/SPN/165/2023 VER 04, plays a pivotal role in

Intelligent Power Supply Design Solutions

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The integrated Core Independent Peripherals (CIPs) provide signal generation, custom logic and signal conditioning to augment

Isolated Power Supply Architectures

The power supply''s close proximity to the gate driver circuits helps reduce power losses caused by long trace lengths, resulting in

Isolated vs Non-Isolated Power Supply

Isolated power supplies are safer, quieter, and capable of providing multiple output voltages since they provide

Comparing the Merits of Integrated Power Modules versus

Clearly, the design effort behind using a fully integrated power module is less than that of a discrete supply. But within the discrete

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Integrated power systems

Eaton offers integrated and engineered solutions to deliver electrical power precisely the way your application requires. These

Integrated Power System with Internal Batteries

The Integrated Power System (IPS) is a unique multifunction power supply which incorporates built-in battery back-up and numerous

Integrated Power Supply System

Caliber''s Integrated Power Supply System (IPS) offers a tailored solution that is customizable to meet your unique power

Integrated Energy System

Integrated energy systems (IES) refer to interdependent and interacting energy sources, supply networks, and demand organized for

Question

And using IPSU to refer to integrated power supply isn''t the correct terminology, hence the confusion. When it comes to

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The 2 Key Advantages of an Integrated Power Supply | TEGUAR

Let''s explore the key benefits. Benefits of an Integrated Power Supply Improved Durability and Safety Medical-grade

Internal vs External Power Supplies: Pick the Right One for You!

A power supply integrated into an AV receiver or game console like PlayStation or Xbox, for example, matches the

Switched-Mode Power Supply (SMPS): Complete Design Guide

What Is an SMPS? A switched-mode power supply (SMPS) — also referred to as a switching-mode power supply,

Understanding IPS and UPS: Definitions, Usage, and Key Differences

An Instant Power Supply (IPS) and an Uninterruptible Power Supply (UPS) are essential devices that ensure continuous power to

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