

AI Server Inductor Applications



AI Overview

Inductors in AI servers are critical for power management, signal filtering, and ensuring system stability under high-current, high-frequency, and high-density operating conditions.

Power Management in AI Servers Inductors are essential in AI servers for DC-DC conversion, smoothing input voltage fluctuations, and delivering stable output currents to high-performance GPUs and AI chips. AI servers operate in high-current environments, often requiring inductors with saturation currents of 60–120A, low DC resistance (DCR), and compact sizes under 12mm to maintain efficiency and thermal stability. TLVR (Trans-Inductor Voltage Regulator) designs are commonly used for low-voltage, high-current applications, providing fast transient response, reduced ripple, and improved energy efficiency.

Signal Filtering and Noise Suppression Inductors also play a key role in signal integrity. In AC-DC converters, common-mode chokes, ferrite beads, and differential-mode inductors suppress high-frequency noise. Paired with capacitors, they form low-pass filters to remove ripple and provide cleaner power to sensitive components. High-speed signal lines often use differential-mode or common-mode chokes to reduce electromagnetic interference (EMI).

Thermal and Reliability Considerations AI servers operate under sustained high loads, creating harsh thermal environments. Inductors must exhibit good thermal stability and long-term reliability to prevent overheating and functional failure. High-frequency characteristics are critical to match next-generation DC-DC converters, ensuring energy efficiency and minimizing heat loss.

Types of Inductors Used Common inductor types in AI servers include: High-saturation, high-current inductors (e.g., CSBA, CSBX series) for GPU and CPU power supply. Low-loss molded inductors (e.g., CSAB, CSEB, CSEC) for compact, efficient power delivery. TLVR inductors (e.g., CSFED series) for fast transient response and low ripple. Through-hole common-mode chokes (e.g., TCAB series) for AC-DC systems.

Market and Usage Tre...

Article Content

AI Server & Switch

Cyntec has developed compact, high-efficiency, low-loss power inductors specifically designed for applications such as AI server SXM accelerator cards, UBB motherboards, and Switch.

Inductors for AI servers Market

The Inductors for AI servers Market, valued at USD 2.55B in 2026, is projected to reach USD 8.97B by 2032, growing at a 23% CAGR.

Innovative Voltage-Reduction Inductors for AI Server Core Circuits

07/06/2024 TLVR Choke LVR1005 series, an innovative inductor designed for AI server core power supplies. The TLVR Choke aims to address the voltage drop issues caused by CPU process scaling

From mobile phones to AI servers: Multi-domain

On the other hand, from smartphones to AI servers, the application scenarios for surface-mount inductors are constantly expanding, and their

AI Server & Switch

The innovative TLVR power inductor, with its multi-phase, thin-profile design, has successfully improved dynamic response efficiency and power conversion efficiency, while reducing power design space

Power inductor for ai innovation

AI systems demand compact, high-efficiency power solutions that can handle extreme current and fast load changes. Superworld Electronics provides magnetic components engineered to

AI Server Requirements for Inductor and Selection Recommendations

1- AI Server Requirements for Inductors Compared with traditional servers, AI servers have significantly different requirements in terms of performance, power density, and energy

Inductor Technology Dossier

Application engineering guidance for AI datacenters, EV powertrains, 5G infrastructure, and industrial systems, including real TLVR design examples, derating calculations, and thermal

Power Inductor Considerations for AI Computing and High-Powered ...

In this episode of Chalk Talk, Mariyah Sachak from Vishay and Amelia Dalton explore how various inductor solutions can supply near-instant power to demanding loads at low, core-level

Application of inductors in AI servers and key factors in their ...

The requirements of AI servers for inductors vary depending on the application scenario, and different types of inductors have their own advantages in performance, structure, and applicable

Meet the Next-Gen Inductors Powering AI

Thermal durability • Molded Trans-inductor & Power Bead : • Wide temperature range (up to +155°C) ensures stable performance in extreme AI

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AI Server Requirements for Inductor and Selection Recommendations

As an indispensable core component in AI servers, inductors are widely used in multiple critical modules, with key functions including energy storage, signal filtering, noise suppression, and

AI servers open up new space for the inductor market

The biggest demand growth is for inductors in high-current applications, like PCIe/USB4 filtering and GPU power supplies. As the AI server market heats up, the need for these inductors has

Application of inductors in AI servers and key factors in their ...

As an indispensable key component in AI servers, inductors are widely used in multiple core modules. Their main functions include energy storage, signal filtering, noise suppression, and

Inductors for AI servers Market Disruption Trends and Insights

Explore the booming global market for inductors used in AI servers. Discover market size, CAGR, key drivers like cloud computing and automotive electronics, and dominant segments.

From mobile phones to AI servers: Multi-domain application cases of ...

In this article we will discuss the real-life applications, core technological advantages and future prospect regarding the SMT based inductors. First real-life application is mobile smartphone.

The Inductor Demand In Server Power

Each AI server needs 5–10 additional TLVR inductors, and the ASP of TLVR inductors is 3–5 times that of ordinary inductors. Erocore is focusing on high current application inductor and have successfully

Inductors for AI servers Market – PW Consulting Information ...

Competition in inductors for AI servers stays tight because the market carries high entry barriers: firms must master proprietary material formulas and support long, hands-on technical work

Global MLCC Leader Murata to Raise Prices in April,

Robust demand for high-end MLCCs, fueled by the large-scale deployment of Nvidia's AI servers and cloud giants' in-house chip development,

Taiyo Yuden's Profit Surges 5.4-Fold on AI Server MLCC Demand; US ...

Taiyo Yuden (6976.T) reported a sharp 5.4-fold increase in net profit for fiscal 2025, driven by surging demand for MLCCs used in AI servers. Orders in the January-March 2026 quarter exceeded ¥100

Power Delivery Module (VRM) for GPU and AI Servers

The Power Delivery Module (VRM) for GPU and AI Servers Market worth USD 2.65 billion in 2026 is growing at a CAGR of 18.95% to reach USD

Power Inductor for AI Server PDN: Specifications and Placement

In this comprehensive guide, we will explore the critical specifications for choosing a multiphase power inductor, dive into advanced topologies like TLVR, and outline the strict PCB layout rules required to

Superworld Debuts High-Performance SMD Inductors

In AI applications, where rapid data processing and real-time analytics are paramount, maintaining consistent and efficient power delivery is

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