

Can high-frequency communication boards be used in AI servers

Article Overview

Yes, high-frequency communication boards are not only compatible but essential for AI servers, enabling stable high-speed data transfer and efficient GPU acceleration.

Role of High-Frequency Boards in AI Servers

High-frequency PCBs are critical in AI servers because they handle ultra-high-speed data transmission between GPUs, CPUs, memory, and networking components. AI workloads, such as training large neural networks, require continuous, massive matrix operations and data exchange at hundreds of gigabits per second, which demands boards with low-loss materials and precise signal integrity management. These boards act as the “neural network” and “power artery” of the server, ensuring that high-speed signals are transmitted with minimal attenuation, reflection, or crosstalk, which is crucial for maintaining computational efficiency and reducing error rates.

Design Considerations

- **Material Selection:** AI server PCBs often use low-loss or ultra-low-loss laminates ($D_f \leq 0.002$ – 0.004) to minimize signal degradation at high frequencies, unlike standard FR4 boards used in conventional electronics.
- **High-Density Interconnects (HDI):** HDI technology allows for fine-pitch BGAs, smaller vias, and dense routing, which is essential for compact GPU accelerator boards and high-bandwidth memory integration.
- **Power Delivery:** High-frequency boards must support multi-phase voltage regulat...

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HDI boards employ advanced techniques such as micro blind vias and buried vias, offering higher routing density and slim profiles to

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High Frequency and HDI PCBs for Devices in AI Applications

A: High-frequency PCBs are optimized for high-speed signal transmission, crucial in AI applications. HDI PCBs, on

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AI servers trigger PCB demand

AI servers mainly involve three products: the GPU substrate requires a high-layer board with more than 20 layers; small AI

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The Complete Guide to High Frequency PCB Communication Circuits

1. Introduction to High-Frequency PCBs High-Frequency PCBs are specially designed circuit boards used for

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GIGABYTE Technology, an industry leader in AI and high-performance computing (HPC) server solutions, has put

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In-Depth Analysis of High-Frequency Circuit Boards: The Cornerstone

To understand high-frequency circuit boards, we must first recognize the limitations of conventional PCBs in high

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It exists silently within every piece of high-end communication equipment and every AI server, yet with its exceptional performance, it

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Building the AI Server

Powering Advanced Workloads with AI Servers Artificial intelligence (AI) is being adopted across all industry sectors

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High-speed Digital PCB for AI Server and High-speed Network

Their PCBs require high-density, large-format BGA-packaged chips, such as GPUs, FPGAs, and ASICs, and

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From a reliability-engineering perspective, this article breaks down the core challenges and solutions for AI server backplane PCBs

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AI Server PCB Hardware Breakdown Complete Guide: Core

These multi-layered circuit boards aren't just for routing traces; they must handle high-power currents, high-frequency

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