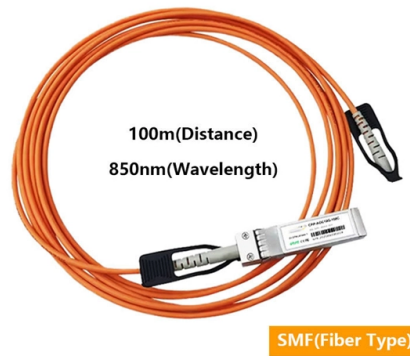


New Materials for AI Servers



Overview

Amidst the intensifying competition for AI computing power, five critical types of PCBs within AI servers—featuring up to 44 layers and necessitating specialised M9 materials—are increasingly becoming the foundational hardware supporting the training of large models like ChatGPT. PCB stands for Printed Circuit Board. It is often called the “Mother of Electronic Products.” It is a carrier where conductive circuits and connection holes are etched onto an insulating substrate, like a copper clad laminate. Its core functions go far beyond physical support: Electrical. In the AI era, the PCB is a dielectric waveguide. Selecting between M6, M7, and M8 is a balancing act of decibels per inch versus the total bill of materials. Mainstream materials include high-Tg FR-4, modified PPO, hydrocarbon resin and PTFE (Teflon). 56G and 112G PAM4 signaling demand ultra-low loss laminates, while 18-30+ layer counts and 700 W+ thermal loads introduce reliability challenges that standard FR-4 cannot meet. This guide identifies the material. AI server PCB manufacturers commonly use high-performance, thermally stable, low-loss dielectric materials to support high-speed signals, high power density, and long-term reliability.



Article Content

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Dell reported a 44% sequential surge in ISG revenue, driven by 69% growth in AI-optimized servers, despite product gross margins declining 3.3 percentage points due to the AI mix

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\$2383.TW Elite Material -- this one is the materials layer, not the board. But every high-layer AI server PCB needs low-loss CCL. Elite's M9-grade material passed NVIDIA certification. Potential

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