

WHY OPTICAL MODULES ARE CHANGING PCB DESIGN

As AI and optical networking push bandwidth higher, PCB manufacturers are being asked to do more with less. The rapid growth of AI infrastructure, hyperscale data centers, high-speed networking, and silicon photonics is changing the requirements for the PCBs inside today's most advanced electronic systems.

THE PCB CHALLENGE

The transition to 800G and emerging 1.6T optical architectures is increasing the demands placed on the electronics supporting optical networking. Applications involving optical modules, optical interconnects, silicon photonics, and next-generation Ethernet optics can require a combination of:

- Higher routing density
- Finer trace widths & spacing
- Low latency
- Thermal management
- Smaller footprints
- Advanced packaging
- Greater bandwidth density
- High-speed signal integrity

APPLICATIONS

MSAP is particularly valuable for advanced electronic applications, including:

- Artificial Intelligence (AI) Infrastructure
- High-Performance Computing (HPC)
- Aerospace & Defense Electronics
- RF & Microwave Applications
- High-Speed Networking
- Silicon Photonics
- Medical Devices
- Optical Networking
- Wearable Technology
- Data Center Equipment

MCL'S APPROACH

MCL doesn't start by recommending MSAP. We start by understanding what you're trying to build. Our team evaluates your engineering requirements, reviews manufacturability early, and works with qualified manufacturing partners to determine the technology best suited for the application.

The goal is to give your engineering team more design freedom — and keep your program moving.

BENEFITS OF MSAP

Modified Semi-Additive Process (MSAP) is an advanced PCB manufacturing process that enables finer trace widths and spacing than conventional subtractive etching — it selectively builds copper where it is needed, instead of removing it.

Finer Trace Widths and Spacing

Significantly finer geometries, allowing more circuitry to fit within the same area.

Higher Routing Density

More available routing space to help address congestion as designs grow more complex.

High-Speed Signal Integrity

Additional routing flexibility for controlled impedance and high-speed applications.

Greater Design Flexibility

More options when balancing bandwidth, routing, layer count, and board size.

Smaller Footprints

More circuitry in the same footprint room to shrink boards or add functionality.

Contact MCL today

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