

Ultra High Density Interconnects (UHDI)

Beyond Ultra HDI: The Future of PCB Technology

The future of PCB technology is closely tied to two key drivers: the widespread use of AI and the blurring of boundaries between PCBs and semiconductors. Historically, PCB technology has followed trends in semiconductor development: right now, we are at the point where semiconductor technology was 20 years ago. The gap is closing between these two fields.

Where are we heading in the next 10 years? The industry will push forward with even smaller features.

Today, PCB features are around 25 microns and IC substrates are at 10 microns.

By 2026, feature sizes will shrink to 12-15 microns, with the potential to reach 5-6 microns by 2030. The push to 3-nanometer semiconductor processes will significantly impact PCB design - particularly interposers, packaging, and line spacing. The shift to domestic semiconductor manufacturing in the U.S. may further accelerate these trends.

Will PCBs continue to follow microprocessors? Chip manufacturers in Asia are nearing 3-nanometer technology, but advancing further will require new materials and manufacturing techniques.

Photolithography innovations are being used in 5-6micron production at some boutique manufacturers, and we are investigating them now for their applicability to PCB fabrication. New materials, including permanent photoresist films and wet benches (used in semiconductor processes), are being explored to improve adhesion and fine features.

New Materials and Equipment Unlock Designs

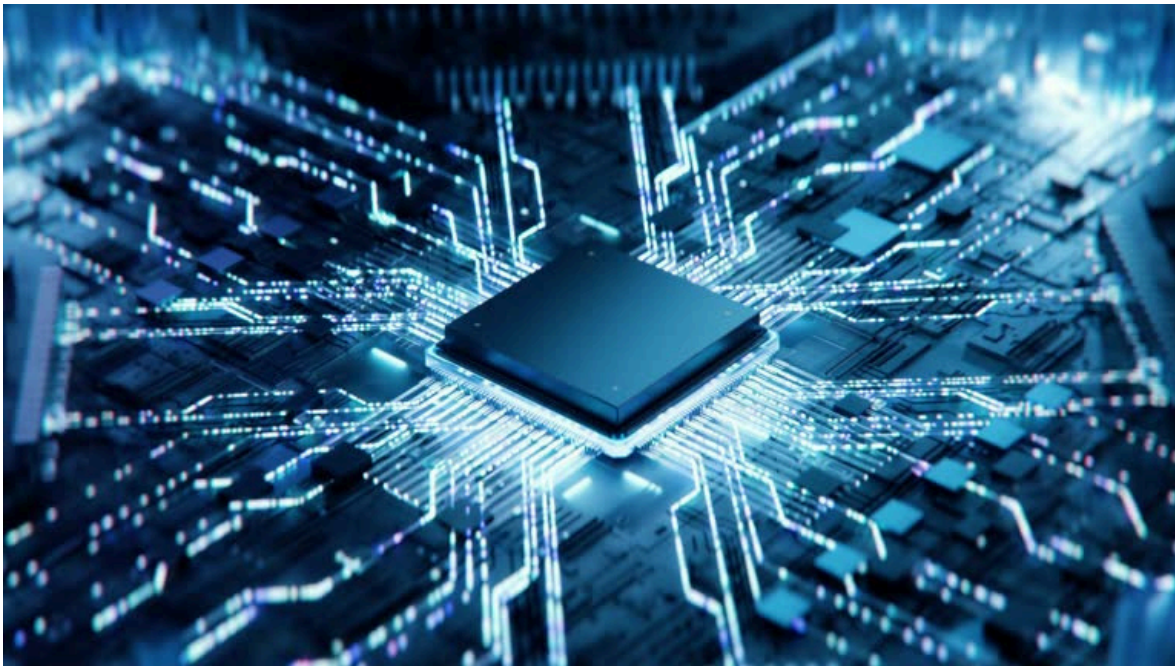
So Ultra HDI PCBs can meet the demands of even smaller features, the focus is on thinner substrate materials and improved equipment, such as advanced lithography and lasers. For example, our LDI Systems: current setups at ASC achieve 25 μm trace widths, soon approaching 10 μm with LED-based exposure. We are testing these new methodologies in several ongoing projects, starting with simple passives and advancing to embedding active components.

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ASC has made major investments in manufacturing, test, and inspection equipment to provide our customers with options that align with their program goals.

Will PCBs eventually disappear? No, but they will evolve - morphing closer to semiconductor-like forms, becoming even smaller and more integrated in the future.



ADDITIONAL RESOURCES FOR YOU

[ASC WEBSITE](#)

[UHDI NEWSLETTERS](#)

[UHDI TECHNOLOGY, ADVANTAGES, DESIGN PARAMETERS AND FAQs IN A BROCHURE](#)