



# ADVANCED ATE PCB HDI TECHNOLOGY AND HIGH ASPECT RATIO THRU HOLES

*ATE (Automatic Test Equipment) PCBs can be some of the most challenging PCBs to design and fabricate, with stringent signal integrity specifications, combined with high pin counts and aggressive fan-out requirements.*

## THE CHALLENGES

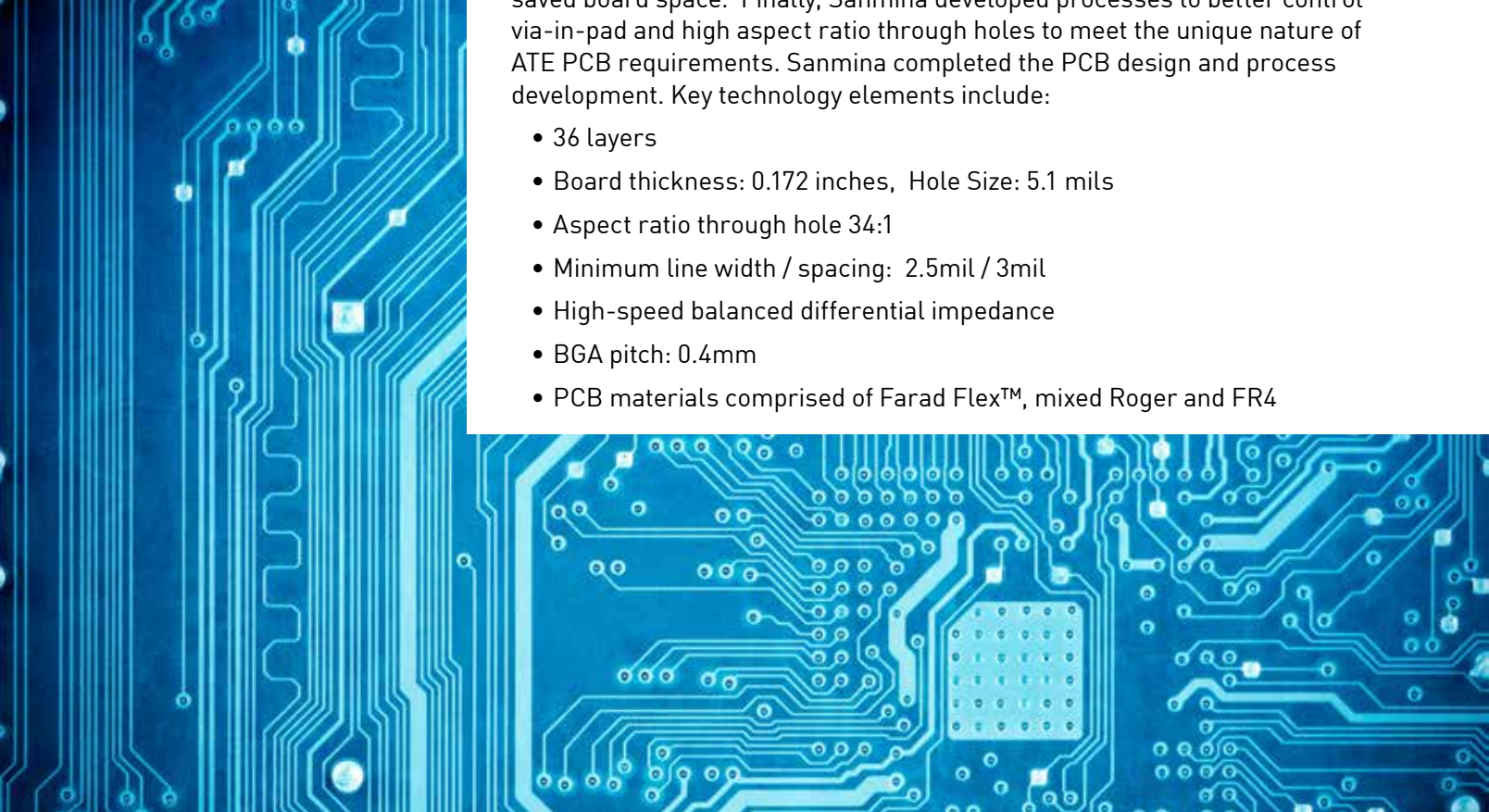
A leading semiconductor company needed a quick turn design solution for an ATE PCB for their next generation, high performance System-on-Chip (SOC), 1000-Ball, 0.4mm pitch BGA. High-density, fine-pitch, and fast I/O data rates challenged the design and materials selection for this PCB. The design of via escape structures and signal integrity were particularly challenging. Also, advanced high-performance PCB testing capability is a vital requirement to ensure that PCB performance variations do not influence parametric data for the chip being tested.

This semiconductor company needed a PCB provider with proven experience in high speed PCBs. They turned to Sanmina.

## SOLUTIONS

By leveraging its high speed telecommunications PCB and backplane expertise, Sanmina was able to provide a high speed technology, along with end to end design, layout, simulation and design rules checking services. Sanmina's large selection of high speed, fully qualified laminate materials allowed the customer to pick the most cost effective hybrid materials combination – minimizing process development risks and saving time in prototyping and qualification. Sanmina's broad range of embedded passives saved board space. Finally, Sanmina developed processes to better control via-in-pad and high aspect ratio through holes to meet the unique nature of ATE PCB requirements. Sanmina completed the PCB design and process development. Key technology elements include:

- 36 layers
- Board thickness: 0.172 inches, Hole Size: 5.1 mils
- Aspect ratio through hole 34:1
- Minimum line width / spacing: 2.5mil / 3mil
- High-speed balanced differential impedance
- BGA pitch: 0.4mm
- PCB materials comprised of Farad Flex™, mixed Roger and FR4



## RESULTS

While meeting the customer's deadline was crucial, achieving the necessary performance and quality standards was equally important – Sanmina enabled its customer to accomplish both. Sanmina's complete end-to-end PCB capability produced innovative solutions to problems that other companies had been unable to solve. Consequently, Sanmina provided a high speed, cost effective PCB with excellent signal integrity.

## SANMINA'S ABILITY TO DELIVER

From the in house qualification of advanced laminate materials, comprehensive signal integrity analysis, DfX and global manufacturing, Sanmina is the recognized leader for advanced printed circuit boards. With a focus on both high speed and high reliability PCBs, Sanmina will work with you to develop advanced PCBs with unique requirements. Our complete global footprint, experienced team and advanced technologies help you reduce costs and improve performance.

- PCB Design, Layout, Signal Integrity and Rules Checking
- Design for Manufacturability and Cost (DfX)
- Quick-turn Prototyping
- Global Capability and High-volume Production
- Advanced Technology



## ABOUT SANMINA

Sanmina makes some of the most complex and innovative optical, electronic and mechanical products in the world. Recognized as a technology leader, Sanmina provides end-to-end design, manufacturing and logistics solutions, delivering superior quality and support to Original Equipment Manufacturers (OEMs) primarily in the communications networks, computing and storage, medical, defense and aerospace, industrial and semiconductor, multimedia, automotive and clean technology sectors.

More information regarding the company is available at <http://www.sanmina.com>.