臻鼎科技控股
Zhen Ding Tech. Holding

IC Heterogeneous Integration and Advanced Packaging Zhen Ding Drives AI-Powered Digital Transformation

Driven by the surging demand for computing power fueled by AI, the semiconductor and PCB industries are forging closer integration, expanding their ecosystems, and pursuing shared growth. PCB has already become another NT$ trillion-dollar industry in Taiwan, growing in tandem with the semiconductor sector.

At SEMICON Taiwan 2025's High-Tech Smart Manufacturing Forum, President of Zhen Ding Technology Holding Limited (Stock Code: 4958), Chen-Fu Chien, delivered the opening keynote. He reviewed how wafer manufacturing has long advanced under Moore's Law, with continuous process scaling enabling flourishing development across various application fields. However, as scaling approaches physical limits and economic considerations of cost-effectiveness intensify, heterogeneous integration and advanced packaging technologies have emerged as new growth drivers to realize the vision of "More than Moore."

Chien noted that with the rise of semiconductor innovations in AIoT, high-performance computing (HPC), 5G communications, smart vehicles, smart healthcare, and humanoid robots, the demand for high density, high-speed transmission, and low latency in chip packaging interconnects has accelerated the development of heterogeneous integration and advanced packaging technologies. In particular, IC substrates are moving toward designs featuring higher layer counts, greater density, finer pitch, and larger sizes, driving new breakthroughs.

PCB has evolved beyond its conventional role in signal transmission to become a critical determinant of system performance and reliability. To keep pace with semiconductor manufacturers, PCB makers must advance smart manufacturing and strengthen capabilities in micron-level circuit patterning, microvia processing, copper thickness and line width uniformity control, yield improvement, and electrostatic discharge protection. These advancements are essential to ensure signal integrity, planarity, and overall reliability.

Over the past two decades, the size of IC substrates has increased nearly 20 times, the number of layers has grown more than fourfold, and the number of interconnects has expanded by over 300 times—a combined improvement exceeding 24,000 times. Advancing at a pace comparable to Moore's Law, these developments have supported the progress of heterogeneous integration and advanced packaging, driving the semiconductor industry forward.

To meet the requirements of semiconductor process upgrades, Zhen Ding took the lead in 2019 by adopting the SECS/GEM international standard, linking thousands of pieces of equipment with MES, EAP, WMS, and AMHS systems. This established a highly automated and digitalized production model. As the first PCB manufacturer worldwide to implement the SECS standard, Zhen Ding pioneered equipment communication and data integration, laying a strong foundation for smart factories. The company's automation journey has advanced from manual handling, to station-to-station automated transport, and now to

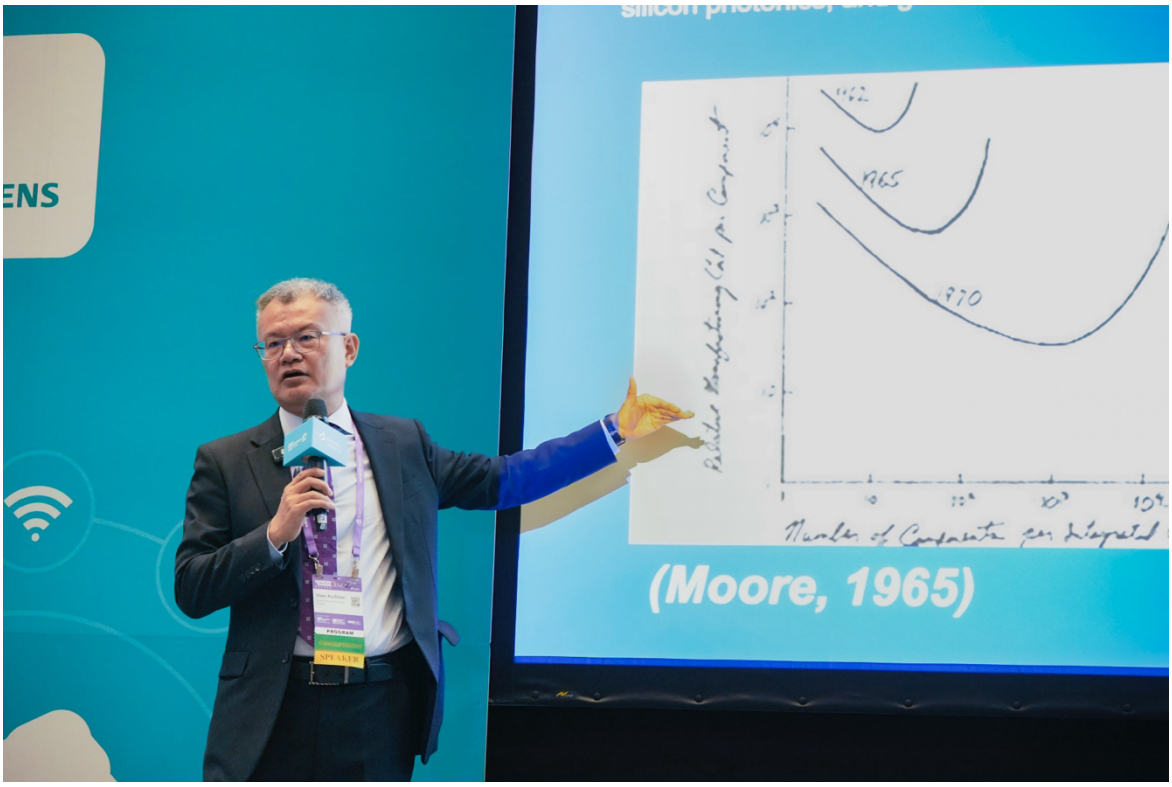
machine-to-machine full automation. In this highly automated production environment, human intervention has been significantly reduced, ensuring not only enhanced process stability but also continuous improvements in product quality.

Chien emphasized that Zhen Ding Technology Group has long been committed to developing smart factories while driving intelligent manufacturing and digital transformation. By leveraging AI, the company has advanced capabilities in image recognition, advanced quality control (AQC), advanced equipment control (AEC), and advanced process control (APC) to ensure process robustness, improve yield rates, and enhance production flexibility. In addition, Zhen Ding has built high-standard cleanroom environments, giving the company a distinctive competitive edge in collaborating with customers on advanced process development.

Under the leadership of Chairman and Group Chief Strategy Officer Shen Ching-Fang, Zhen Ding has established the Kaohsiung AI Campus and a global network of smart factories, providing stable and on-time advanced production capacity. With these forward-looking investments and comprehensive process capabilities, Zhen Ding not only fulfills diverse customer needs but also seizes the vast opportunities brought by PCB process upgrades, continuing to lead collaborative innovation between the PCB and semiconductor industries toward broader growth horizons.

▲Zhen Ding Technology President Chien Chen-Fu was invited to deliver the opening keynote at the SEMICON Taiwan 2025 High-Tech Smart Manufacturing

Forum.



▲Zhen Ding Technology President Chien Chen-Fu noted that as wafer manufacturing continues to advance with process scaling, coupled with cost-effectiveness considerations, heterogeneous integration and advanced packaging technologies have become new growth drivers in realizing the vision of ‘More than Moore.’

About Zhen Ding Technology Holding Limited

Zhen Ding Technology Holding Limited (Taiwan Stock Exchange: 4958) specializes in the research, development, production, and sales of a diversified range of products, including flexible printed circuit board (FPC) and surface mount assembly (SMA), substrate-likes PCBs (SLP), high-density interconnect (HDI) PCBs, high-layer-count and high-density (HLC-HDI) boards, multilayer rigid printed circuit boards (RPCB) and IC substrates (ICS). These products are widely used in end products such as computer information, consumer electronics, communications networks, automotive electronics, AI server high-speed computing, optical module and medical applications. The company offers professional one-stop shopping, full-solution services to customer worldwide. According to Prismark’s global PCB industry rankings by revenue, Zhen Ding has been ranked the world’s largest PCB manufacturer for eight consecutive years, from 2017 to 2024. For more detailed information, please visit the company website: www.zdtco.com.

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