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PCB INDUSTRY NEWS

How Flexible Circuits are Revolutionising Electronics.

Flex PCBs are enabling smaller, lighter and more reliable electronic systems by improving packaging efficiency, mechanical durability and electrical performance.

In today's fast-changing electronics industry, new technologies play an important role in improving performance and functionality. One major advancement is the flex circuit board, which has transformed modern electronic design. Flex circuit boards not only save space and reduce weight but also provide exceptional design flexibility, expanding what electronic devices can achieve. That's why flex circuit boards are widely used today, as their unique features support smaller, lighter and more efficient products.

Figure 1. Flexible circuit boards enable compact, lightweight electronic designs by allowing circuits to bend, fold and conform to complex product geometries., The use of flex circuit boards in electronic design is growing due to their many benefits, such as lightweight structure, the ability to fit complex shapes and improved heat management. As industries move toward smaller, multi-functional devices, flex PCBs are changing traditional manufacturing methods and supporting new design solutions across sectors.

Knowing the main benefits of flex printed circuit boards helps engineers and designers use them effectively to meet modern electronics requirements. The following are the key advantages of flex circuits that are helping transform the electronics industry.

Figure 2. Flex PCBs reduce connectors and wiring complexity, improving mechanical efficiency and reliability in compact electronic assemblies. Space optimization and compact product design. One of the most significant benefits of flex PCBs is their ability to dramatically reduce the space required for electronic interconnections. Traditional rigid PCBs rely heavily on connectors, cables and mechanical fasteners to link multiple boards within a system. These interconnects consume valuable space and impose constraints on

enclosure design. Flex PCBs eliminate or reduce the need for such components by directly connecting circuit sections through flexible conductors.

Weight reduction and mechanical efficiency. Weight reduction is a critical factor in many electronic systems, particularly in portable, wearable and aerospace applications. Flex circuit boards help reduce weight and size, allowing designers to create small and lightweight devices without losing performance. Unlike rigid boards, flex circuits can bend to fit tight spaces and complex shapes.

Additionally, the elimination of connectors, cables and metal fasteners further reduces system weight. This reduction in mass improves not only portability but also mechanical efficiency. Lighter assemblies experience lower inertial forces during movement and vibration, reducing stress on solder joints and interconnections. In applications such as drones, satellites and wearable electronics, even small weight savings can result in improved performance, longer battery life and enhanced user comfort.

Improved reliability and reduced interconnect failures. Electronic system reliability is often limited by interconnect failures rather than component defects. Connectors and cables are common sources of failure due to wear, corrosion, vibration and mechanical shock. Flex PCBs address this issue by replacing multiple discrete interconnects with continuous copper traces embedded in a flexible substrate.

Enhanced signal integrity and electrical performance. Flex offers clear advantages over traditional rigid boards in signal integrity and layout precision. Rigid materials, made from resin and fiberglass, can suffer from glass-weave skew, which affects trace consistency, whereas polyimide-based flex materials avoid these issues and provide stable dielectric properties.

Shorter interconnection paths in flex circuits reduce parasitic inductance and capacitance, while eliminating connectors minimizes impedance discontinuities. Polyimide also ensures uniform traces and controlled impedance, making flex PCBs ideal for high-speed, high-frequency applications like high-resolution displays, camera modules and RF systems.

Resistance to vibration, shock and mechanical stress. Flex PCBs are inherently more resistant to vibration and mechanical shock than rigid boards. Their ability to flex and absorb energy allows them to withstand dynamic stresses without cracking or delaminating. This characteristic is particularly valuable in environments where electronics are exposed to continuous motion or impact.

In automotive electronics, flex circuits are commonly used in dashboards, sensors and control modules that experience constant vibration. In aerospace and defense applications, their resilience under extreme mechanical conditions contributes to long-term reliability and mission-critical performance. This mechanical robustness makes flex PCBs a preferred choice for demanding operating environments.

Thermal performance and heat management. Thermal management is becoming more critical in compact electronic systems. Flex PCBs help improve heat control by spreading heat more evenly across the assembly. Their thin structure allows heat to dissipate efficiently, especially when combined with proper thermal paths and materials. To further enhance thermal conductivity, fillers such as aluminum oxide (AlO), boron nitride (BN) or aluminum nitride (AlN) are added to the flex PCB substrate.

In some designs, flex circuits also allow direct contact between heat-generating components and metal housings or heat spreaders. This reduces thermal resistance and improves overall system reliability. As power levels continue to increase, the thermal benefits of flex are becoming even more important in system design.

Cost considerations and long-term value. Although flex PCBs typically have higher initial design and fabrication costs than rigid PCBs, their overall system-level cost can be lower over the product lifecycle. The reduction in connectors, cables, and assembly steps often leads to savings in materials, labor and warranty-related costs.

Additionally, the improved reliability of flex circuits reduces field failures and maintenance requirements. In applications where downtime or repair costs are high, such as medical equipment or industrial systems, the long-term value of flex PCBs outweighs their higher upfront investment. As manufacturing processes continue to mature, the cost gap between flexible and rigid circuits is steadily narrowing.

The benefits of flex PCBs have driven their adoption across a wide range of industries. Consumer electronics rely on flexible circuits to achieve slim designs and advanced functionality. Medical devices benefit from their reliability, biocompatibility, and compact form factors. Automotive systems use flex for sensors, lighting and control modules, while aerospace and defence applications depend on their durability and weight savings.

Wearable technology represents one of the fastest-growing application areas for flex circuits. Devices such as smartwatches, fitness trackers and health monitors require electronics that conform to the human body while maintaining reliability and comfort. Flex PCBs uniquely address these requirements, making them indispensable in wearable design.

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NEWS FROM SWEDEN

NCAB Group released May 2026 PCB Supply Chain Outlook warning of accelerating seller's market with copper above US$13,300/t and 40-week MCU lead times in Sweden

NCAB Group released its May 2026 PCB Supply Chain Outlook, warning of an accelerating seller's market with copper above US$13,300 per tonne, glass fibre quotas, and 40-week MCU lead times forcing procurement teams to rethink strategies. NCAB characterised the PCB industry as undergoing a seismic reset rather than a temporary disruption.

The Outlook stated that the Iran-Saudi Arabia conflict has triggered the most severe PCB supply chain disruption since COVID-19, with prices soaring 40% in April after SABIC's Jubail petrochemical complex - supplier of 70% of global high-purity PPE resin - was forced offline. For

PCB manufacturers, copper represents 25-40% of material costs, and a 30% copper price increase translates to 10-15% board cost increases even before other factors are considered.

NCAB published the May 2026 PCB Supply Chain Outlook through its Investor Relations website, covering global PCB market conditions, supply chain conditions, and future outlook. The Outlook is consistent with NCAB's 1Q'26 Interim Report, which previously documented tightening conditions in raw materials and lead times.

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NEWS FROM TAIWAN

Zhen Ding expects AI Demand to Drive PCB Growth in 2026, shared Five-Year Expansion Plan at Annual General Meeting

Zhen Ding Technology Holding Limited, a global leading PCB manufacturer, held its 2026 Annual General Meeting. During the meeting, Chairman Charles Shen stated that the rapid advancement of artificial intelligence is driving structural transformation across the electronics industry and creating an unprecedented growth opportunity for the PCB sector. According to Prismark, global PCB production value is expected to increase by 12.5% YoY to US$95.6 billion in 2026, with the market projected to expand at a CAGR of 7.7% from 2025 to 2030 and exceed US$123.0 billion by 2030. Driven by continued expansion in AI-related demand, Zhen Ding delivered another record-high consolidated revenue in 2025. Building on its long-standing investments in high-end products, critical process technologies, and global manufacturing footprint, the company aims to outpace industry growth over the next five years, while further enhancing profitability and creating long-term value for shareholders.

Chairman Shen noted that AI is redefining the role of PCBs, **elevating them from traditional signal-interconnection components to critical system carriers for high-performance computing and system integration.** To capture this structural trend, Zhen Ding has established comprehensive product and process capabilities across cloud, network infrastructure, and edge applications. The company expects 2026 to mark the beginning of accelerated growth in both cloud and network infrastructure applications. Key highlights include:

AI Servers: Zhen Ding's Intelligent HDI (iHDI) and high-layer-count (HLC) products for GPU and ASIC customers are expected to gradually move into mass production.

Optical Modules: Customers' transition toward next-generation 1.6T products is driving rising demand for high-end PCBs using MSAP technology.

IC Substrates: The rapid growth of AI computing demand is expected to further strengthen momentum for high-end ABF substrates.

Zhen Ding expects server/optical module revenue to more than double in 2026, while IC substrate revenue is targeted to grow by over 70%, reflecting the company's accelerating business mix upgrade toward high-end AI applications.

Facing a new era shaped by both the AI megatrend and the realignment of global supply chains, Chairman Shen emphasized that Zhen Ding is accelerating its global build-out of high-end capacity and further strengthening its technology leadership. The company is currently undergoing the largest capacity expansion phase since its establishment, with key developments across three regions:

Huai'an, China: Zhen Ding officially broke ground on the HD Campus at Huai'an Tech City in April 2026, where new HDI/MSAP and HLC facilities will be constructed. Upon completion, Huai'an Tech City will comprise 23 factory buildings across four campuses, with the goal of becoming the world's largest and most technologically advanced PCB manufacturing base.

Thailand: Fab 1 is ramping smoothly; Fab 2 is scheduled to enter mass production in 2027; Fab 3, Fab 5, and a mechanical drilling center are also under construction.

Kaohsiung AI Park: Focused on high-end ABF substrates and advanced PCB capacity, positioning it as an important base for advanced processes and high-end products.

Chairman Shen further stated that "One ZDT" is Zhen Ding's core strategy for navigating the rapid evolution of the technology industry and the accelerating adoption of AI applications. Through its industry-leading "one-stop shopping" platform, Zhen Ding provides global customers with integrated solutions across product categories, regions, and technologies, spanning its four major product lines: FPCs, RPCBs, HDI, and IC substrates. In 2025, Zhen Ding's number of granted patents officially surpassed 2,000, underscoring its long-term commitment to technology R&D and process innovation.

Beyond operational growth, Zhen Ding has continued to deepen its commitment to sustainability and corporate governance, earning recognition from leading global third-party sustainability assessments:

Dow Jones Sustainability Index: Selected for the first time as a constituent of both the Dow Jones Best-in-Class World Index and the Dow Jones Best-in-Class Emerging Markets Index - the only Taiwan-based PCB company included in both.

CDP Assessment (2025): Received the highest "A" rating in both climate change and water security.

Business Weekly: Named among the "2025 Top 100 Carbon Competitive Enterprises."

Looking ahead, Chairman Shen stated that AI applications are expanding from cloud-based computing power and high-speed transmission to a wide range of smart devices, which will continue to drive demand for high-end PCBs and IC substrates. Anchored by its "One ZDT" strategy, Zhen Ding is confident in its ability to further expand revenue scale, optimize its product mix, and enhance profitability, while creating long-term and sustainable value for customers, employees, shareholders, and society

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NEWS FROM THE UK

Electronics for extreme Environments Conference 30 June - 1 July 2026

Churchill College, Cambridge, UK

Learn about sensors, semiconductors, components, energy sources, packaging and assemblies that must perform reliably under extreme conditions, including high and low temperatures, high electromagnetic and radiation field strengths, severe mechanical and environmental conditions and ultra-long life electronics.

Looking for High/Low Temperature, Radiation Hard Memory and Logic with Low Power?

Attend the Workshop on Nanomechanical Relays on Thursday 2nd July 2026 after the Electronics for Extreme Environments Conference.

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News from
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NEWS FROM THE TPCA

Taiwan PCB output could top NT$1 trillion in 2026, but risks remain

Taiwan's printed circuit board (PCB) makers are expected to see domestic and overseas output rise 15.1% year-over-year to NT$1.05 trillion (approx. US$33.5 billion) in 2026, according to the Taiwan Printed Circuit Board Association (TPCA), as AI demand and advanced packaging continue to drive double-digit growth. But the sector is also confronting rising risks that could affect costs, supply chains, and expansion plans.

Geopolitics is the most immediate concern, TPCA said. Although the war between the US and Iran has not directly affected Taiwan's PCB production, energy, raw materials, and logistics costs are already climbing, and some materials are showing signs of shortage.

TPCA said rebuilding energy infrastructure will take time, and even if the conflict eases, high energy prices, shipping pressure, and longer lead times are likely to remain. That, the group said, is making external uncertainty a more permanent operating condition for the industry**.**

AI is also reshaping the supply chain. During the current growth phase, hardware demand is outpacing supply, and resources are being redistributed across the electronics ecosystem. Strong demand for computing power is supporting growth in high-end PCBs, equipment, and materials, but it is also concentrating capacity on AI-related products.
That shift is leaving non-AI products with weaker demand, tighter capacity, and inflationary cost pressures, creating what TPCA described as a K-shaped split in the industry. The association said companies should pursue AI opportunities while closely assessing product mix and customer concentration.

TPCA also warned firms to prepare for potential depreciation and financial pressure if demand cools, and to strengthen balance-sheet resilience and investment discipline while market conditions remain favourable.

Decarbonization and capacity constraints

On sustainability, TPCA said carbon fees are encouraging older PCB plants to cut emissions through equipment replacement and process improvements. But the wave of new AI-driven capacity is leading many new plants to be built to higher-efficiency standards, which could limit future room for self-driven carbon cuts.

The association said the industry may eventually face a "nothing left to cut" bottleneck as cleaner facilities reduce the scope for further emissions improvement. At the same time, companies are

relying more heavily on green power to meet international supply-chain requirements such as RE100, but that is also raising concerns about tighter green electricity supply and higher prices.

Production pressures are not limited to energy. TPCA said the simultaneous expansion of AI and semiconductors is intensifying competition for engineers and cross-disciplinary talent. Land, water, and power constraints are also limiting expansion in Taiwan, and without sufficient talent and infrastructure, industrial upgrading will slow.

TPCA said these structural issues cannot be solved by individual companies alone, and that the government needs to address weaknesses in industrial development with stronger policy action.

Compliance and intellectual property risks rise

Compliance risk is also growing, according to TPCA. Forced-labor audits are a high priority for international customers, and companies need to respond early at both domestic and overseas sites to requirements covering working hours, labor conditions, migrant-worker hiring, and zero recruitment fees.

International supply chains are also placing greater emphasis on human rights due diligence, while related legislation in Taiwan and abroad continues to advance. TPCA said companies will need a more systematic governance approach to meet both customer and regulatory demands.

Intellectual property issues remain another pressure point. The US Special 301 review continues to raise concerns, and TPCA said that unlicensed software at overseas sites can pose a compliance risk.

For high-end or special-purpose PCBs, companies also need to pay attention to US export rules, including the International Traffic in Arms Regulations and the Export Administration Regulations, and tighten controls over end users, end use, and product flow.

TPCA's Sustainability and Risk Governance Committee said PCB companies should deepen risk management and keep the discipline of "saving for a rainy day" to prepare for future market opportunities. In the near term, it said firms should review risks tied to raw-material supply, green-power shortages, forced labor, and export controls. Over the medium to long term, it said companies should focus on AI governance, cybersecurity resilience, financial discipline, and workforce transformation.

Article translated by Jingyue Hsiao and edited by Jack Wu

International Diary

2026

EIPC Summer Conference Vilnius
9 & 10 June
Vilnius, Lithuania
Visit TLT PCB

JPCA
10-12 June
Tokyo, Japan

FED Austrian Electronics Day
18 June
Salzburg, Austria

IPCA
29-31 July
New Delhi, India

KPCA
9-11 September
Incheon, Korea

EIPC @ FED Conference
23 & 24 September
Bamberg, Germany

EIPC @ EFX 2026
6-8 October
Stuttgart, Germany

TPCA
20-22 October
Taipei, Taiwan

EIPC @ Electronica 2026
10-13 November
Munchen, Germany

FED Austrian Electronics Day
26 November
Dornbirn, Austria

HKPCA
2-4 December
Shenzhen, Hong Kong