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PRISMARK DISCOVERY SERIES

DSC

MAY 2025

GLOBAL LEADING PCB COMPANIES

- The global PCB industry faced challenges in 2024 but showed signs of recovery, driven by robust demand from AI servers and high-speed networking applications. Additional support came from ongoing growth in military and aerospace electronics, as well as a rebound in smartphone and PC shipments. As a result, global bare-board PCB production rose by 5.8%, reaching $73.6Bn, compared to $63.5Bn in 2023.

- China retained its position as the world's leading PCB producer by value after reaching the top spot in 2023. Despite facing challenges from oversupply and significant price erosion in 2024, Chinese PCB manufacturers outperformed other Asian competitors, driven by their cost advantages, aggressive capacity expansion, and advancements in products and technologies.

- Following a surge in capital investment during 2021 and 2022, PCB industry spending began to cool in 2024. Total capex among the top forty publicly listed PCB manufacturers declined by 7.4%. Investments were directed partly toward expansion in Southeast Asia and partly toward ongoing technology development of advanced substrate and HDI capacities.

- This report provides a snapshot of the industry, with a focus on the world’s leading PCB suppliers, their profitability, and investments.

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CONSULTANTS TO THE ELECTRONICS INDUSTRY
BUSINESS OPPORTUNITIES FROM TECHNOLOGY AND MARKET CHANGES

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Introduction

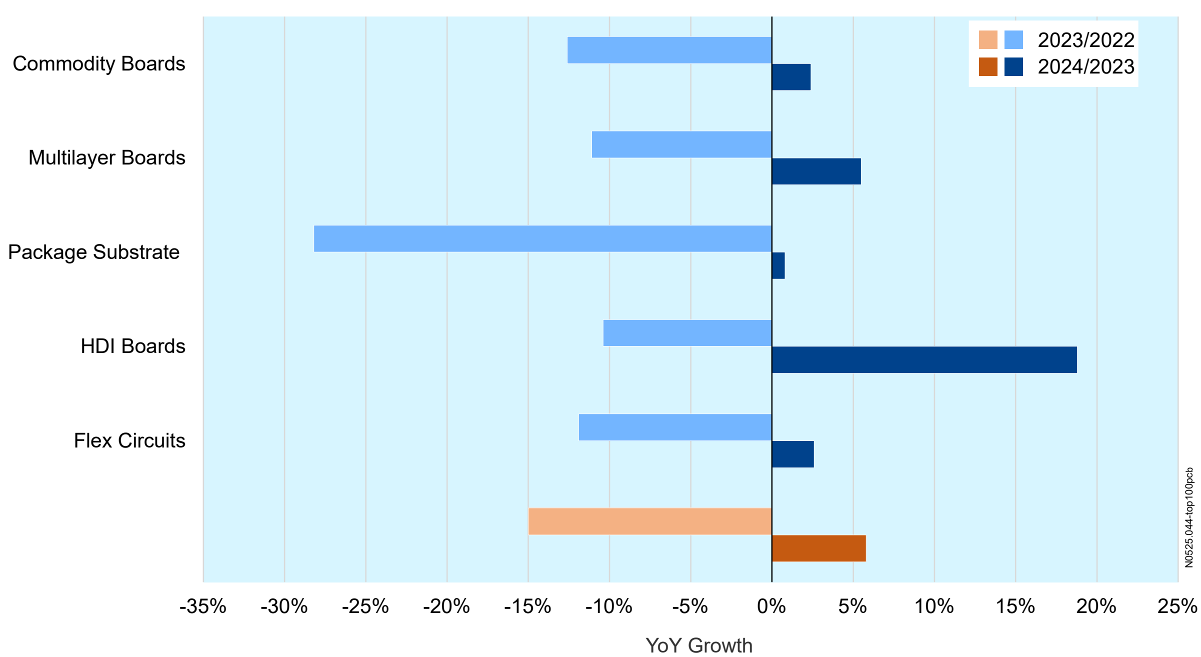
2024 proved to be a challenging year but also of recovery for the PCB industry. Weak end-market demand and ongoing inventory corrections weighed heavily on performance, particularly during the first half of the year. Persistently high inflation and interest rates, combined with broader macroeconomic headwinds in China, Europe, Japan, and other key regions, further constrained growth. Geopolitical tensions, US export controls on semiconductor technologies, and a global supply chain realignment added to the uncertainty.

Amid the turbulence, pockets of resilience and/or high growth emerged—chiefly driven by accelerating investments in AI-related infrastructure. Growth was concentrated in servers, HPC, data center networking, advanced packaging, and high-speed circuit boards utilizing low-D_k materials. Recovery in the smartphone market and increased demand in military and aerospace sectors also provided incremental support. Significant new PCB and substrate capacity expansions in Southeast Asia, particularly in Thailand, Malaysia, and Vietnam, marked a strategic inflection point for the electronics manufacturing landscape.

2024 PCB Market Overview

Despite the headwinds, the global PCB market grew by 5.8% in 2024. The HDI segment was a standout, expanding by 18.8% on robust demand from AI servers, optical modules, satellite systems, automotive electronics, and other high-performance applications. In contrast, the package substrate segment showed only a modest recovery of 0.8% from its sharp decline in 2023, with FCBGA suffering further setbacks due to steep ASP erosion. Rigid and flexible board segments posted moderate growth in the 3% to 5% range. Additionally, ongoing efforts to diversify supply chains and reduce dependency on China are expected to accelerate production shifts toward Southeast Asia.

PCB MARKET GROWTH BY TECHNOLOGY



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From a product perspective, the 2024 PCB market can be summarized as follows:

- **Multilayer Board:** In 2024, the multilayer board market saw overall growth of 5.5% in value and 7.8% in area. 18+ layer multilayer boards emerged as the fastest-growing segment, with a 40% increase in value and a 59% rise in area. This growth is partly attributed to the smaller size of this segment, but it also reflects the strong demand for equipment essential for data center networking and AI servers.
- **HDI:** The HDI segment experienced significant growth in 2024, rising 18.8% in value and 21.5% in area. It was the fastest-growing category after 18+ layer multilayer boards. This strong performance was largely driven by demand for HLC+HDI boards used in AI servers, high-speed networking, satellite communications, and other advanced applications.
- **Package Substrate:** Package substrates were the weakest-performing PCB segment in 2023, impacted by soft demand and significant price erosion. Although the segment saw a modest recovery in 2024, growth was limited to just 0.8%, with the ABF substrate market value remaining sluggish due to oversupply and price erosion.
- **FPC:** The FPC market grew by 2.6% in value and 6.7% in area in 2024, marking a moderate rebound from its weak performance the previous year. This growth was primarily driven by a recovery in the mobile phone sector and sustained demand from automotive, display, medical, and military applications.
- **Commodity Boards:** Commodity board production value grew by 2.4% amid ongoing price erosion and cratering demand for consumer electronics.

In the remaining sections of this special Discovery Series report, Prismark provides a detailed analysis of the 2024 performances of the top 100 leading PCB companies, including their sales, profitability, and capex, and considers the various challenges and opportunities shaping the industry.

Top 100 PCB Fabricators

The following pages provide Prismark's list of the world's largest PCB fabricators, ranked by their 2024 total revenues. The list is based on information from interviews conducted by Prismark, as well as extensive open-source research. For all public companies, audited sales and profitability figures are used, and the yearly average exchange rate is applied to convert local currencies to US dollars. For private companies, especially when direct interview inputs are lacking, Prismark uses its best estimates based on indirect inputs, such as material consumption, product mix, production capacities, and number of employees. Prismark is open to discussion to further improve this list. Ultimately, this effort aims to help all PCB industry participants better understand the business dynamics of the leading global players.

Note: *The revenue figures reported in the top 100 list may differ from figures included in the total PCB market analysis shown in Prismark's quarterly PCB Reports — Prismark's total PCB market analysis refers exclusively to bare board shipments, whereas the company revenues included in the top 100 list in some cases include additional services and activities. For most substrate and rigid board suppliers, these two figures are very similar, if not identical, but most flexible circuit suppliers also provide assembly services. These value-added services are always counted in the FPC companies' total sales, so the top 100 list overstates the contributions of these companies to Prismark's total PCB bare board market assessment.*

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TOP 100 PCB COMPANIES IN 2024

Rank	Company ($M)	HQ	2023	2024	2024/2023 Growth	Comments
1	Zhen Ding	Taiwan	$4,835	$5,341	10.5%	One-stop shop for rigid PCBs, FPCs, HDI, and IC substrates, with ongoing expansions in Taiwan, China, and Thailand. Phase I plant in Thailand began trial production in May 2025. China and Taiwan operations will expand capacities for substrates, HDI, and FPCs. Growth drivers in 2025 include server/ADAS/optical communications PCBs and IC substrates.
2	Unimicron (inc. Subtron)	Taiwan	$3,342	$3,594	7.5%	A leading supplier of IC substrates and HDI, with ongoing expansions in China, Taiwan, and Thailand. The new plant in Thailand could begin production in 2H 2025 for auto/gaming/module PCBs. Taiwan operations will focus on expanding capacity for advanced substrates and HDI. China operations will expand capacities for substrates and HDI/PCB. Growth drivers in 2025 include AI & satellite PCBs and substrates.
3	Dongshan Precision (inc MFLEX & Multek)	China	$3,276	$3,451	5.3%	A leading supplier of rigid PCBs, FPCs, and rigid-flex growing through acquisitions. Expansions large focus on FPC and advanced PCBs such as embedded components and ultra fine pitch PCBs at Suzhou and Yancheng sites. A new plant has been set up in Thailand which could begin production in 2025 or 2026
4	Mektec (formerly Nippon Mektron)	Japan	$2,479	$2,504	1.0%	Sales of smartphone FPCs decreased YoY while EV FPC sales grew YoY in FY 2024. FPC sales in FY 2025 are expected to decline 14% YoY due to decreasing revenues for both smartphone and auto FPCs, despite continued growth in EV FPC sales.
5	Shennan Circuits	China	$1,909	$2,492	30.5%	PCB sales in 2024 grew 30% YoY, fueled by demand for high-speed communications, AI server/data center, and automotive PCBs. Expansions in 2025 will focus on advanced substrates in Guangzhou and high-end PCBs in Nantong. A new plant is being set up in Thailand for PCB manufacturing.
6	TTM	US	$2,233	$2,443	9.4%	Sales from data center and military PCBs have been growing in recent years. The new advanced PCB plant in Penang, Malaysia is ramping up production and could reach annual sales of $200M. The new ultra-HDI PCB facility in Syracuse, New York is under construction and could begin initial low-volume production for aerospace/defense PCBs in 2026
7	Compeq	Taiwan	$2,146	$2,256	5.1%	Growth drivers in 2025 include satellite communications PCBs and high-end HDIs. Its new Thailand plant will enter volume production in 2025 for satellite PCB Near-term expansion will focus on Thailand plant.
8	Tripod	Taiwan	$1,919	$2,050	6.8%	AI PCB sales will grow steadily in 2025. A new plant in Vietnam is being set up, which could begin production in late 2025 or early 2026 for server PCBs. Capex in 2025 will be higher than in 2024. New product development focuses on advanced HDI and AI server & high-end communications PCBs.
9	WUS Group	Taiwan	$1,373	$1,960	42.7%	Strong growth in AI/HPC and high-speed network switch & other communications PCB sales in 2024. Its new Thailand plant will ramp up production in 2025. Additional expansion may include acquisition of a PCB entity, partial stake acquisition, or a JV establishment.
10	Kinwong	China	$1,519	$1,761	15.9%	Continue to strengthen PCB businesses for AI server, smart driving/ADAS, and AI computing applications. Shipments for AI server PCBs have begun recently. Shipments for ADAS HDI and high layercount auto PCBs increased in 2024. A new plant in Thailand is under construction and production could follow in 2026. Its Ji'Shui site in Jiangxi province completed Phase III expansion within 2024 and trial production has begun. A new plant in Xifeng, Jiangxi Province began Phase I trial production in early 2025 for HLC.
11	AT&S	Austria	$1,631	$1,669	2.3%	Posted net losses in 2023 and 2024 with more severe loss in 2024. Capex in 2025 decreased 45% YoY. It sold off Korea-based FPC subsidiary AT&S Korea to SOMACIS in early 2025. Recent expansions focus on IC substrate operation in Austria and Malaysia. Its new FCBGA substrate plant in Malaysia could begin volume production within 2024. The new Malaysia plant will ramp up production throughout 2025.
12	Kingboard Group	China	$1,488	$1,552	4.3%	Moderate growth was recorded for 2024's sales. Growth drivers in 2025 include AI server, advanced communications, and auto PCBs. New PCB facilities are being set up in Thailand and Vietnam, which could begin production in 2026; each is designed to have a monthly capacity of more than 100,000 m² per month.
13	Victory Giant Technology	China	$1,120	$1,493	33.3%	Significant sales growth in 2024 due to recent acquisitions MFS Technology and APCB Thailand and strong shipments for AI computing and data center PCBs. Product development focuses on high-end HDI and HLC. A new AI HDI facility is being set up in Vietnam, which could begin production in 2026. A new HLC facility is being set up in Thailand.
14	Samsung Electro-Mechanics	Korea	$1,315	$1,492	13.4%	Sales grew double-digit in 2024 fueled by strong shipments for FCBGA substrates for server, automotive, and other advanced applications. The company will continue to ramp up production at its new FCBGA substrate plant in Vietnam. Demand from the PC and smartphone market will improve in 2025.

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Rank	Company ($M)	HQ	2023	2024	2024/2023 Growth	Comments
15	Meiko	Japan	$1,250	$1,306	4.5%	Significant sales growth for satellite/telecommunications PCBs in 2024. Expansions will focus on EV/auto PCBs and HDI at Vietnam and Japan operations. The company will invest about $680M (¥80.0Bn) over the next few years to expand its auto PCB capacity.
16	HannStar Board	Taiwan	$1,380	$1,297	-6.1%	A leading MLB supplier for PC/NB and networking PCBs. Business strategy focuses on developing advanced PCBs for servers and high-end communications and eliminating bottleneck operations. The new PCB facility (under subsidiary Elna) in Malaysia began production in 2H 2024 for auto and consumer PCBs. Subsidiary GBM acquired Lincstech in April 2025
17	BH Co	Korea	$1,218	$1,284	5.5%	Sales in 2024 recovered to 2022's level following a decline in 2023. Growth drivers include demand from North American and Chinese markets for smartphone, OLED, tablet/NB, and wearable PCBs. Expansion for FPC will be continuous. New product development includes fine pitch thin film FPCs, embedded components FPCs, and RF build-up ML FPCs.
18	Ibiden	Japan	$1,450	$1,242	-14.4%	The Electronics/PCB business experienced a decline in revenues during 2024 due to weak market demand. Expansion for advanced FCBGA substrates (for AI servers and others) is ongoing in Japan. The new Ono plant will begin production in 2H 2025. Growth drivers in 2025 include server substrates.
19	Gold Circuit	Taiwan	$964	$1,208	25.4%	Sales grew more than 25% YoY in 2024 fueled by strong shipments for server PCBs, which accounted for 68% of total sales. Capacities for AI server and communications PCBs will be expanded. The new Thailand plant could begin production in 2025 for server/communications PCBs.
20	Young Poong Group	Korea	$1,489	$1,123	-24.6%	Sales in 2024 declined considerably YoY due to weak demand. Annual capacity in 2024 exceeded 5.7M m^2, of which about 66% were for FPC and 34% for PCB. PCB subsidiaries are Korea Circuit and Terranics.
21	AKM Meadville	China	$1,039	$1,113	7.2%	A leading supplier of HDI/mSAP, SLP, substrate, FPC, and rigid-flex. A new plant in Thailand is being set up for auto HDI and PCB manufacturing. IC substrate production sites are in Xiamen, Shanghai, and Suzhou. HDI and FPC production lines are located in Guangzhou, Shanghai, and Suzhou.
22	Nan Ya PCB	Taiwan	$1,360	$1,005	-26.1%	Will develop large-size multilayer IC substrates for AI server processor and high-speed switch applications. ABF substrates account for 50% of total sales, BT substrates 30-35%, and PCBs 15-20%. Expansion of ABF substrates will continue at Taiwan and Kunshan, China operations.
23	Kinsus	Taiwan	$862	$951	10.3%	IC substrate sales accounted for 81.5% of total sales in 2024. Segment loss has been recorded for substrate business for 2023 and 2024. Plan to sell off its Suzhou BT substrate subsidiary within 2025 and focus on expanding ABF substrate capacity in Taiwan.
24	LG Innotek	Korea	$876	$939	7.2%	Sales from package substrates grew moderately in 2024 thanks to strong demand from the mobile markets. Production for FCBGA substrates will increase in 2025 and advanced substrates and manufacturing technologies will be developed.
25	Simmtech	Korea	$797	$904	13.4%	Leading supplier producing HDI module PCBs and package substrates. Capacity for high-end IC substrates will be expanded.
26	Suntak	China	$817	$873	7.0%	A well-rounded PCB shop offering PCB, HDI, HLC, FPC/rigid-flex, and IC substrate products. New product development includes high-end any-layer HDI for AI chips, PCBs for ADAS, AI server UBB mainboard, 112G communications, and RF & 12µm/12µm ultra fine pitch substrates. Expansions for all types of PCBs will be in China and Thailand.
27	Nitto Denko	Japan	$725	$862	18.9%	FPC sales grew considerably in FY 2024 due to demand from AI/data center and high-capacity HDD. Sales for smartphone FPCs remained strong. Focus on serving existing customers in new product development.
28	Shinko Electric	Japan	$959	$857	-10.6%	Sales declined further in 2024 due to weak substrate demand. Its substrate products include FC, PBGA/PBGA thin (coreless), and 2.3D package substrates. Construction of new facility for plastic BGA substrates began at its Arai plant located in Myoko City, Niigata Prefecture.
29	FLEXium	Taiwan	$1,051	$824	-21.6%	Sales in 2024 declined more than 20% YoY and incurred operating and net losses. Sales in Q1 2025 continued to decline YoY and operating and net profits remained negative. Focus on developing 25µm/25µm fine pitch substrates, 4-8L rigid-flex, multilayer FPCs, LED backlight module FPCs, and laser blind microvia FPCs. Long-term development includes smart TV/automotive, IoT, computing, high-speed/high-frequency, and AR/VR.
30	Shenzhen Fastprint Circuit	China	$758	$809	6.8%	Sales grew moderately in 2024. FCBGA substrate capacity will be expanded at Guangzhou site while advanced PCB capacity for servers and communications will be expanded at Yixing plant. New product development includes LEO satellite PCBs, advanced HDI, and server/data center PCBs.

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Rank	Company ($M)	HQ	2023	2024	2024/2023 Growth	Comments
31	Sumitomo Electric Printed Circuits	Japan	$633	$700	10.5%	FPC sales grew double-digit in FY 2024. Strive to increase sales for automotive and medical FPCs while developing new FPCs for high-frequency applications.
32	Olympic Circuit	China	$639	$699	9.4%	Customer orders increased and capacity utilization improved in 2024. Production for advanced PCBs for AI, robotic, and new energy/auto applications will increase. The new plant in Thailand will begin production within 2025. Phase II expansion at Heshan site will be completed and start production in 2025.
33	Daeduck Electronics	Korea	$697	$655	-6.0%	Continue to expand FPC capacity in Korea while strengthening cooperation with local Korean customers. Product development focuses on high-layercount substrates and ultra-fine/ultra-thin PCBs.
34	Fujikura	Japan	$626	$652	4.3%	FPC sales in FY 2024 grew 15% YoY fueled by strong demand from data center HDD segment and increased of high profit margin products. FPC sales in FY 2025, however, will decline 20% YoY due to oversupply
35	Shengyi Electronics	China	$463	$652	40.9%	Sales in 2024 grew more than 40% YoY fueled by strong shipments for server and other advanced PCBs. A new HDI facility will be set up at its Jiangxi site. Capacity for 5G high-speed PCBs is being expanded at Dongcheng plant as part of Phase 4 expansion. A new PCB plant in Thailand will begin production in 2026 for server and computer related PCBs.
36	Aoshikang Technology	China	$612	$635	3.8%	Growth drivers in 2024 included PCBs for data center/server, AI server/AI PC, and automotive applications. Has developed through-hole PCBs and HDI boards for AI PC. Other new products in development include 50/50µm L/S PCBs and ultra-thin fine pitch boards. The new plant Thailand started trial production in late 2024.
37	CMK	Japan	$628	$623	-0.8%	Auto PCBs accounted for 85.5% of total revenue in 2024. The new Thailand plant began production in 2H 2024 for auto PCBs and it will undergo Phase II expansion in the near future.
38	ISU Petasys	Korea	$518	$614	18.6%	Focusing on developing HLCs for telecommunication and networking systems and AI PCBs. 2024 sales grew considerably. Production bases are located in Daegu, Korea and Hunan Province, China
39	Unitech	Taiwan	$480	$577	20.1%	2024 sales grew 20% YoY thanks to increased satellite and auto PCB shipments. Growth drivers in 2025 include satellite, AI PC, and NB PCBs. The new plant in Thailand could begin trial production in Q3 2025 for satellite and auto PCBs and NB/PC rigid-flex.
40	TPT	Taiwan	$608	$570	-6.3%	A large-volume PCB supplier for NB/PC and LCD markets with production bases in Taiwan, China, and Vietnam. The new plant in Vietnam began production in 2024. New product development includes PCBs for high-speed networking, AI PC, ADAS, wearable, and consumer electronics applications.
41	Dynamic	Taiwan	$505	$552	9.3%	Sales in 2024 grew 9% YoY following a decline in 2023. Growth in 2025 will be fueled by strong demand from communications, server, and ADAS markets. A new PCB plant has been established in Thailand, which will begin trial production in Q3 2024 and production will ramp up.
42	Shenzhen Sun & Lynn Circuits	China	$492	$537	9.1%	A supplier of through-hole, metal-core, rigid-flex, and HDI PCBs for communications, power supply, industrial control, auto, and medical markets. Focus on expanding capacities in Jiangxi and Guangdong provinces. The new facility in Zhuhai could begin production in 2025 for HLC, any-layer HDI, high-frequency PCB, and rigid-flex. A new PCB plant will be set up in Thailand.
43	Delton Technology (Guangzhou)	China	$378	$520	37.5%	Sales in 2024 grew nearly 40% YoY fueled by server PCB demand. Its new plant in Thailand is now under equipment installation and could begin production soon. Growth drivers in 2025 include AI server and automotive PCBs.
44	Chin Poon	Taiwan	$538	$510	-5.1%	Sales in 2024 declined due to weak market demand. In 2025, sales could grow 4% YoY. In Thailand, existing operations are going through technological upgrades to enhance capability for auto and industrial PCBs. A new facility will be set up in Thailand to produce auto and satellite PCBs.
45	Ellington	China	$450	$488	8.5%	Growth drivers in 2024 included ADAS and communications PCBs. It will expand capacities for advanced PCBs and HDIs. Construction for a new plant in Thailand began in late 2024.
46	Founder Technology	China	$445	$484	9.0%	Sales in 2024 grew 9% YoY powered by demand for data center and AI-related PCBs. In 2025, sales from AI server, optical module, and switch PCBs will increase. Phase II HDI expansion in Zhuhai entered trial production in 2024. A new plant in Thailand is being set up.
47	Guangdong Kingshine Electronic	China	$418	$472	12.9%	Sales in 2024 grew double-digit YoY fueled by strong growth in communications/auto PCB and advanced HDI revenues. New product/technology development includes 14L any-layer, 800G optical module PCBs, high-speed PCBs, and skip via 200µm microvia filling technology.

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48	Shenzhen Jialichuang Technology*	China	$435	$470	7.9%	A supplier of SS/DS, MLB, metal-core, thick copper & high-frequency PCB and FPC capable of providing both customized/small volume and large-volume production. Annual capacity exceeds 10M m². Capacity expansion will focus on HLC.
49	Bomin Electronics	China	$412	$454	10.3%	A supplier of HDI, high-speed/high-frequency PCBs, MLB, rigid-flex, and specialty PCBs (metal-core, thick copper, ultra-long boards). Sales in 2024 grew double-digit YoY thanks to growth in HDI and rigid-flex revenues. Its Yancheng site will continue to ramp up production for AI server, optical module, and switch PCBs.
50	Si Flex	Korea	$440	$434	-1.4%	A Korea-based FPC supplier serving mobile phone, display, and other consumer electronics markets.
51	Xiamen Hongxin Electronics (FPC only)	China	$409	$431	5.2%	FPC sales in 2024 grew moderately YoY as shipments increased. New product development includes rigid-flex with inner copper thickness greater than 70μm, rigid-flex greater than 20L, 9L any-layer rigid-flex, and other advanced rigid-flex PCBs. Its FPC/rigid-flex production bases are located in Xiamen, Jingmen, Yingtan, and Suzhou in China.
52	KCE	Thailand	$470	$431	-8.4%	Sales in 2024 declined YoY due to weak demand auto PCBs and net income declined 5% YoY. Capacity for advanced HDI will be expanded. Has postponed construction of a new facility in Ayutthaya, Thailand to late 2025.
53	Huizhou CEE/China Eagle Electronic	China	$371	$408	10.0%	Strengthened HLC, advanced HDI, any-layer HDI, and rigid-flex businesses in 2024 in response to increased demand from network communications, new energy/auto, AI, data center, and IoT sectors. Will enhance HDI business.
54	Lincstech	Japan	$340	$408	19.8%	Focus on producing high layercount MLBs for IC testing, high-speed switches, and mobile phone modules. It was acquired by GBM, a subsidiary of HannStar Board, in April 2025 from Lincstech's parent company Polaris Capital Group Co. (PCG).
55	Kyoden*	Japan	$391	$394	0.8%	Was acquired by Global investment firm Carlyle in late 2024. Will focus on enhancing HDI and HLC businesses going forward. The company operates on a small-volume, customized business model, serving industrial, semiconductor, communications, and auto markets. Its production sites are located in Japan and Thailand.
56	Apex PCB	Taiwan	$406	$392	-3.6%	A leading supplier of consumer electronics PCBs in Thailand. Sales declined moderately YoY and net loss was $56M in 2024, more severe than net loss of $26M incurred in 2023. It plans to form a JV with ISU Petasys in Thailand to enhance its server PCB production capability.
57	CCTC	China	$361	$386	7.1%	Has developed manufacturing technologies for high-speed/high-frequency PCBs, any-layer HDI boards, and automotive radar PCBs. In 2025, the company expects its total sales to grow 5% from 2024. It plans to establish a PCB JV with Thailand-based EMS provider SVI Public in Thailand with CCTC owning 75% of the stake.
58	Red Board	China	$332	$376	13.1%	A well-rounded PCB supplier offering PCB products, including HDI, MLB, FPC, rigid-flex, and IC substrates. It began construction of a new PCB plant in Jiangxi Province in late 2024 (Phase 4 expansion). The plant will have annual capacity of 1.2M m² for mini-LED, new energy/auto, and server PCBs.
59	DAP	Korea	$309	$359	16.1%	A PCB supplier in the fields of mobile communications, automotive, and wearable devices. Annual capacity is about 1M m². Will continue to enhance cooperation with overseas customers.
60	NCAB	Europe	$386	$342	-11.4%	A PCB supplier that grew through acquisitions of small PCB shops in Europe, as well as expansion of trading activities. Completed acquisition of DVS Global based in Italy in Q4 2024. Other companies it acquired during 2024 included Cumatrix BV, Belgium; ICOM Industrial Components, Switzerland; EPI Components PCB division (trading); and Print Production A/S, Denmark.
61	Guangdong Champion Asia	China	$342	$327	-4.6%	Both PCB sales and shipment volume declined moderately in 2024. The Longnan, Jiangxi site is undergoing Phase II expansion for MLB and FPC/rigid-flex; production could begin in 2026. Construction for a new plant in Vietnam began in March 2025; it will produce MLB and HLC.
62	Gul Technologies	Singapore	$377	$322	-14.6%	Focus on producing PCBs for auto, PC & peripheral, consumer, communications, and medical markets. Expanding capacities in China to enhance its market competitiveness in automotive and industrial markets.
63	Kyocera	Japan	$431	$319	-26.0%	Sales in FY2024 declined substantially due to weak demand for its FCBGA substrates for data center and networking. As a result, the company plans to postpone capital investment projects and reduce workforce. Production at the new factory in Sendai, Kagoshima Prefecture has been delayed.

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64	Sanmina*	US	$300	$318	6.0%	Quick-turn prototyping for high-tech PCBs, backplanes, and FPCs. High-volume manufacturing capacities in US and Asia.
65	Ichia	Taiwan	$275	$297	8.0%	Experience strong FPC demand from auto and consumer sectors in recent months. Sales in April 2025 were record-high. A new facility is being set up in Penang, Malaysia, which could start production within 2025.
66	Summit	US	$238	$279	17.2%	Leading US-based PCB manufacturer, supplying PCB, HDI, FPC, and rigid-flex for aerospace/defense, computing/datacom, consumer, medical, and semiconductor applications.
67	Murata Mfg*	Japan	$370	$275	-25.7%	A Japan-based FPC supplier. Recently rolled out a new stretchable printed circuit (SPC) technology for substrate development, which is suitable for advanced medical device applications.
68	TOPPAN	Japan	$308	$273	-11.5%	Produce FCBGA substrates for PC, server, game player, network device, and auto applications. Other substrate products include glass substrates and RDL Embedded Coreless Substrates. Substrate production site is located in Niigata, Japan. It plans to set up an FCBGA substrate factory in Singapore which could begin production in late 2026.
69	APCT*	US	$244	$264	7.8%	Produce PCBs for aerospace/defense, industrial, auto, telecom, and computing/storage applications. Acquired Advanced Circuit (ACI) and San Diego PCB Design in 2023.
70	Onpress*	China	$235	$259	10.0%	Produce double-sided, multilayer boards, and FPC/rigid-flex for consumer electronics, automotive, communications, and computer applications.
71	ASE Material	Taiwan	$261	$255	-2.2%	Subsidiary of ASE Group. Provides BT substrates to Taiwan and Shanghai plants.
72	Zhuhai Access	China	$252	$252	0.1%	Phase II expansion for FCBGA substrate is ongoing at its Nantong site with an investment of about $300M. Its other substrate products include SiP and embedded components substrates.
73	Somacis	Italy	$240	$230	-4.1%	Recent growth strategy focused on acquisitions. In 2H 2024, it acquired AT&S Korea, an FPC subsidiary of AT&S and DYCONEX AG, a Swiss-based PCB shop serving medical and other advanced markets. The acquisitions help strengthen SOMACIS's manufacturing capabilities for FPC, rigid-flex, and ultra-thin PCBs.
74	Career Technology	Taiwan	$316	$227	-28.1%	Sales in 2024 decreased substantially due to weak FPC demand. It incurred substantial net losses in 2023 and 2024. New product development includes advanced FPCs (fine pitch, high-speed, etc.) for AI smartphone, NB, and auto applications.
75	Camelot Electronics	China	$188	$223	18.4%	Sales in 2024 grew double-digit YoY and net income increased more than 80% YOY. New products development includes 77G mmWave high-frequency radar PCBs and 5G base station 12L any-layer HDI boards. Annual capacity is about 4M m² at two production bases in Qingyuan, Guangdong Province and Anlu, Hubei Province for rigid PCB, HDI, rigid-flex, and other PCBs. During 2025, the Qingyuan plant will undergo expansion.
76	Zhiboxin Technology	China	$140	$220	57.1%	Sales in 2024 grew more than 50% YoY and sales in 2025 are expected to grow considerably. Produce HDI, MLB, and FPC/rigid-flex for PC, smart device, auto, consumer, and industrial markets. Capacities for HDI and PCB will be expanded at the Nanchang and Huangshi sites.
77	Sunshine Global Circuits	China	$229	$217	-5.4%	Sales in 2024 declined due to higher prices for raw materials and intense competition. It has developed HLC rigid-flex, high-speed PCB and high-end HDI. Small-volume production has begun for high-speed server and AI accelerator PCBs. A new facility is being set up in Jiangxi for high-frequency/high-speed PCBs. A new plant will be set up in Zhuhai for new energy auto PCB production.
78	Shenzhen Jove Enterprise	China	$176	$202	15.2%	Sales in 2024 grew double-digit YoY fueled by demand for communications, data center, auto, and industrial PCBs. The new PCB plant in Thailand began trial production in 2024 and serves communications, industrial controls, medical, and auto markets.
79	Palwonn	Taiwan	$174	$200	14.6%	Taiwan-based PCB supplier produces PCBs for computer, consumer electronics, automotive, and industrial applications.
80	Sihui Fuji Electronics Technology	China	$186	$197	5.8%	Produce MLB, HDI, thick copper, metal-core, rigid-flex, and high-speed/high-frequency PCBs for industrial control, auto/ADAS/new energy, communications, medical, and consumer markets. Auto and industrial controls PCBs accounted for over 80% of sales. Its new plant in Rayong, Thailand began trial production in 2H 2024.
81	ICAPE	Europe	$194	$196	1.2%	Continue to grow through acquisitions. It acquired ALR Services and Jiva Materials in UK to strengthen its PCB business.
82	Tai Hong Circuit Industrial	Taiwan	$221	$189	-14.1%	Produces PCB, HDI, PBGA, and wire bond CSP substrates, embedded substrate for communications, automotive, semiconductor, and other applications.

**Prismark Estimate*

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May 2025

Rank	Company ($M)	HQ	2023	2024	2024/2023 Growth	Comments
83	Jiangxi Union Gain Electronics	China	$181	$189	4.3%	China-based PCB shop produces DS and MLB for auto, industrial, communications, consumer, and medical markets. Its production base is located in Jiangxi Province. It is undergoing Phase II expansion, which could begin production n in 2026.
84	STARTEAM	Germany	$218	$188	-13.8%	A PCB supplier founded in Germany in 1988 and operates three production bases in Jiangyou, China; Prachinburi, Thailand; and Flero, Italy. It produces PCB, HDI, FPC/rigid-flex for auto, industrial/automation, telecom, consumer, medical, and railway applications.
85	Wurth Elektronik	Germany	$221	$188	-15.2%	Experienced weak demand for its PCBs in 2024, particularly from the European market. To improve production efficiency, the company has recently shut down production at its Schopfheim, Germany plant. Capacities are being consolidated into other sites.
86	FICT	Japan	$197	$184	-6.8%	Japan-based PCB supplier producing MLB, HDI, probe cards, and package substrates for communications, server, semiconductor equipment, Sold FICT Vietnam Co. Ltd to Taiwanese PCB manufacturer Tripod in Q2 2023.
87	Forewin Flex	China	$128	$182	42.3%	An FPC/rigid-flex PCB supplier based in Suzhou, China. Sales in 2024 grew substantially YoY. Its products are used in smartphone, smart home, and communications applications.
88	Changzhou Aohong Electronics	China	$153	$180	17.5%	Growth drivers in 2024 included auto/new energy PCBs and expanded capacity. Its PCB products include PCB and HDI for smart home, auto, new energy, power supply, industrial, medical, and consumer applications. It will set up a plant in Thailand.
89	Yiyang MZH Electronics	China	$150	$179	19.7%	Produce DS and MLB for auto, communications, server, medical, industrial, and consumer applications. Based in Yiyang, Hunan Province, the company has a monthly capacity of 250,000 m².
90	Ji'an Mankun Technology	China	$172	$176	2.6%	Focus on producing consumer electronics and auto PCBs, which accounted for over 70% of total PCB sales in 2024. Volume production for advanced HDI has begun. Product development includes HDI for ADAS and other advanced applications. A new facility entered production in late 2024 for HLC and HDI.
91	Leader-Tech Electronics	China	$226	$175	-22.8%	Produce HDI, FPC, and rigid-flex for tablet, smartphone, industrial controls, LCD, wearable, medical, and automotive markets.
92	Shirai Electronics	Japan	$202	$174	-13.9%	Japan-based PCB supplier focused on producing automotive, home appliance, and entertainment PCBs.
93	Kyosha	Japan	$179	$168	-5.6%	Expect strong demand from the automotive sector in 2025. Auto PCB shipments will increase steadily at its Vietnam plant, where production lines were expanded in FY2023. In China, Kyosha anticipates increased sales for high-value-added metal substrates, while the assembly business in Japan is expected to perform steadily. The Vietnam plant completed Phase II expansion in 2023.
94	Glorysky	China	$156	$164	5.6%	Produce SS, DS, MLB and specialty PCBs for industrial, new energy, consumer communications, and LED lighting applications. A new plant is being set up in Anqing, Anhui Province for HDI and MLB for consumer and auto applications. The company has two existing production sites in Huai'an and Huizhou cities. Phase II expansion at Huai'an site is planned for the future.
95	CETC POTEVIO/formerly GCI Science&Technology (PCB only)	China	$156	$160	2.5%	Operate on a customized, quick-turn on a small- and mid-volume production model, offering HDI, rigid-flex, and PCBs for RF, passive components, and communications applications. PCB sales accounted for 23% of total company sales.
96	APCB	Taiwan	$192	$160	-16.8%	Sales in 2024 decreased YoY due to weak demand for conventional PCBs. More than half of its sales come from memory module, PC/NB, and networking PCBs. Its Thailand subsidiary was sold to Victory Giant in Q3 2024.
97	Tianjin Printronics	China	$91	$157	72.0%	A PCB supplier producing SS, DS, MLB, HLC, HDI, high-speed/high-frequency PCB, and thick copper PCB for industrial, medical, auto, aerospace, and consumer markets. It acquired fellow PCB shop Techigh Circuit (Huizhou), which helped boost sales in 2024.
98	Schweizer Electronic	Germany	$151	$156	3.8%	Sales from auto PCBs increased in 2024 while sales from industrial PCBs decreased due to a slow economy in Germany. Going forward, the company will strive to expand its customer base, upgrade technologies, and lower production costs at its production sites to improve its financial performances.
99	Konka Circuit	China	$155	$156	0.6%	It is the PCB unit of Konka Group, producing metal-core, thick copper, HLC, HDI, rigid-flex PCBs for auto, communications, data center, and advanced consumer markets.
100	Synopex	Korea	$180	$154	-14.0%	Korea-based FPC supplier serving the mobile phone market. Stable handset demand from Samsung in 2023. FPC production capacities are concentrating in Vietnam.
	Total		**$70,574**	**$74,512**	**5.6%**	

**Prismark Estimate*

Headquarters Location

China | Taiwan | Japan | Korea | Rest of World

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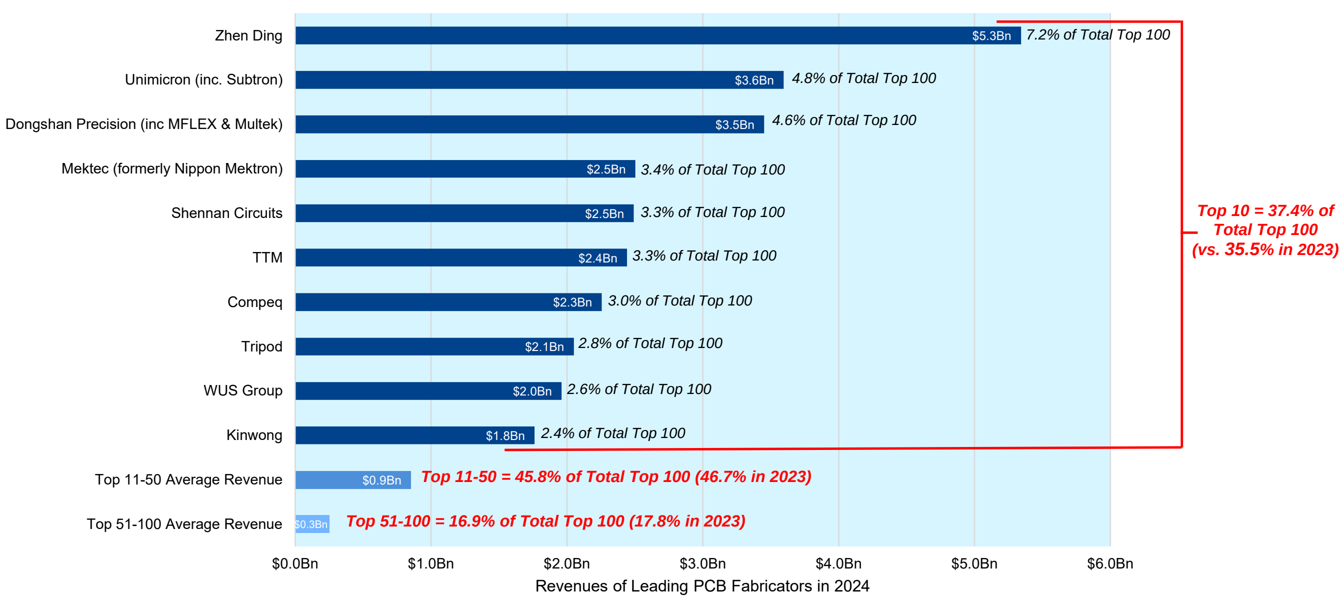
According to Prismark's analysis, the 100 largest PCB companies produced aggregate sales of $74.5Bn in 2024, up from $70.6Bn in 2023. As mentioned above, the revenue figures listed in Prismark's top 100 list include assembly services and non-PCB sales in addition to bare board sales. Assembly services and non-PCB business accounted for an estimated $11.5Bn, or 15.4%, of the $74.5Bn in aggregated revenues generated by the top 100 PCB companies in 2024. The total bare-board shipment value of the top 100 PCB suppliers was, therefore, about $63.1Bn in 2024. This is about 86% of the total global bare-board PCB shipment value ($73.6Bn) as reported by Prismark. The remaining 14% ($10.5Bn) in global bare-board production was contributed by companies outside the top 100.

2024 TOP 100 PCB COMPANIES' REVENUES SHARE



As a whole, the largest companies on the top 100 list generally outperformed in 2024. The fifty largest PCB fabricators, which include many of the leading high layercount ML and HDI suppliers, generated just over 83% of the top 100 aggregate revenues in 2024, up from 82% in 2023. Meanwhile, the bottom fifty companies decreased their share of total top 100 revenues by 0.9% to 16.9%.

There were a few changes at the top-end of the list. Zhen Ding maintained a commanding lead as the #1 ranked company and regained its PCB sales above $5Bn in 2024. Meanwhile, substrate-maker Unimicron just managed to hold on to the #2 spot with 7.5% sales increase in 2024. Dongshan Precision and Nippon Mektron also defended their rankings at #3 and #4, respectively. In 2024, Shennan Circuits increased its sales substantially to $2.5Bn and thus moved up its ranking to #5. Altogether, eight companies crossed the $2Bn revenue threshold in 2024 (up from six in 2023), while 22 companies reported sales of $1Bn or greater (22 in 2023). Minimum revenues of $154M were needed to make it onto the top 100 list in 2024, compared to $153M in 2023.

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2024 PCB Market: Noteworthy Performances

A closer look at some of the noteworthy performers reveals the key themes that defined the PCB market in 2024. Only eighteen of the top 100 PCB companies managed to post positive growth in 2024. Generally, these companies benefitted from one or more of the following factors:

1. **Capacity Expansion/Company Acquisition**

   - More than 50 PCB companies have started or planned their capacity expansions in SEA, including Vietnam, Thailand, and Malaysia.
   - Victory Giant acquired MFS, headquartered in Singapore, With operations in Malaysia and China, and APCB Thailand.
   - Global Brands Manufacturing (GBM), a subsidiary of HannStar Board, reached an agreement to acquire Lincstech in December 2024.
   - Somacis acquired Dyconex in Switzerland and AT&S FPC operation in S. Korea.
   - Tianjin Printronics acquired Techigh Circuit (Huizhou) that helped boost its sales in 2024.

2. **Strong Demand from AI Data Center Applications**

   - Leading AI server PCB suppliers have all enjoyed outstanding growth in 2024. Top performers such as WUS, Shennan, Shengyi, and Gold Circuit achieved 42.7%, 30.5%, 40.9%, and 25.4% yearly growth in 2024.
   - Victory Giant gained 33.3% growth by acquisition and AI server HDI board sales.
   - Delton gained 37.5% growth by offering high layercount ML boards for regular and AI server applications.

3. **Exposure to a Strong-Performing Niche Market or End-Customer**

   - Zhiboxin achieved very strong growth in HDI sales due to aggressive expansion, increased smartphone HDI market share, and refreshed low-end HDI pricing.
   - Forewin had a strong sales rebound due to improved market position in rigid-flex market and expanded business in module substrates.
   - Nitto Denko managed to gain 18.9% growth by offering specialty and fine-pitch FPC products.

COMPANIES FROM TOP 100 WITH POSITIVE 2024/2023 GROWTH

Company ($M)	HQ	2023	2024	2024/2023 Growth
Shennan Circuits	China	$1,909	$2,492	30.5%
WUS Group	Taiwan	$1,373	$1,960	42.7%
Victory Giant Technology	China	$1,120	$1,493	33.3%
Shengyi Electronics	China	$463	$652	40.9%
Delton Technology (Guangzhou)	China	$378	$520	37.5%
Zhiboxin Technology	China	$140	$220	57.1%
Forewin Flex	China	$128	$182	42.3%
Tianjin Printronics	China	$91	$157	72.0%

The companies that faced the most severe challenges in 2024 generally had high exposure to either the package substrate or FPC markets. Capacity oversupply and price erosion hammered

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substrate makers like Nan Ya PCB (-26.1%) and Kyocera (-26%). A few FPC suppliers, like FLEXium, Career Technology, Murata, and Leader-Tech, also suffered from weak demand, price erosion, and difficult operation conditions and thus resulted in severe revenue declines.

COMPANIES FROM TOP 100 WITH MORE THAN 20% DECLINE IN 2024/2023 GROWTH

Company ($M)	HQ	2023	2024	2024/2023 Growth
Nan Ya PCB	Taiwan	$1,360	$1,005	-26.1%
FLEXium	Taiwan	$1,051	$824	-21.6%
Kyocera	Japan	$431	$319	-26.0%
Murata Mfg*	Japan	$370	$275	-25.7%
Career Technology	Taiwan	$316	$227	-28.1%
Leader-Tech Electronics	China	$226	$175	-22.8%

Regional Analysis

Eighty-nine of the top 100 PCB companies in 2024 are located in Asia, led again by China (40 companies), Taiwan (21), Japan (16), Korea (10), and SEA (2).

US AND EUROPE 2024 TOP 100 PCB PRODUCTION VALUE BY HEADQUARTERS LOCATION ($Bn)

HQ	2024 Top 100 PCB Companies (#)	Top 100 PCB Production Value ($Bn)
US	4	$3.3Bn
Austria	1	$1.7Bn
Germany	3	$0.6Bn
Sweden	1	$0.3Bn
France	1	$0.2Bn
Italy	1	$0.2Bn

Eleven of the top 100 PCB manufacturers in 2024 are headquartered in the US and Europe. US-based TTM was once again the top ranked company in the region. TTM managed to outperform the broader PCB market in 2024 thanks in part to growing demand from data center and the military and aerospace sectors. The company ranked #6 in Prismark's global top 100 PCB list of suppliers based on 2024 total sales.

Austria-based AT&S is ranked #11 with an incremental 2.3% annual revenue growth. AT&S has been among the most active investors in the substrate industry in recent years and started

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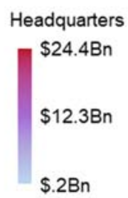
additional substrate operations at its new plants in Malaysia (FCBGA) and Leoben, Austria (ABF) in 2024.

Outside of these two companies, no other US- or Europe-based PCB supplier earned more than $400M in revenue in 2024. The US PCB market is likely to become increasingly dominated by large military suppliers over the coming years. Smaller defense-oriented suppliers lack the technical capabilities required to meet the US military's demand for increasingly complex boards. At the same time, consumer-facing and quick-turn merchant suppliers in non-security-related segments are rapidly losing business to lower-cost Asia PCB suppliers. New tariffs imposed by the US government might help US PCB fabricators to stabilize their operations, but the cost structure in the US is still much higher than Asian operations.

Europe's PCB makers typically underperformed in 2024 due to weak demand from automotive and industrial electronics markets. On the other hand, European PCB makers for the medical, aerospace, and military segments had better performance. However, as in the US, consumer-oriented and other non-security-related suppliers face continued pressure due to their inability to compete with Asia-based suppliers on cost.

ASIA 2024 TOP 100 PCB PRODUCTION VALUE BY HEADQUARTERS LOCATION ($Bn)



HQ	2024 Top 100 PCB Companies (#)	Top 100 PCB Production Value ($Bn)
Taiwan	21	$24.4Bn
China	40	$24.2Bn
Japan	16	$10.9Bn
Korea	10	$8.0Bn
Thailand	1	$0.4Bn
Singapore	1	$0.3Bn

China was home to the largest number of top 100 PCB suppliers again in 2024. The 40 ranked Chinese companies generated a total PCB production value of $24.2Bn. While Taiwan only fielded 21 top 100 companies, it continued to dominate at the high-end of the list. Taiwan accounted for 5 of the top 10 PCB suppliers in 2024, including the top two suppliers, Zhen Ding and Unimicron. As a result, Taiwan's 21 ranked companies produced more aggregate revenue than the 40 listed Chinese companies in 2024. Japan and Korea respectively ranked third and fourth in both total companies ranked and production value.

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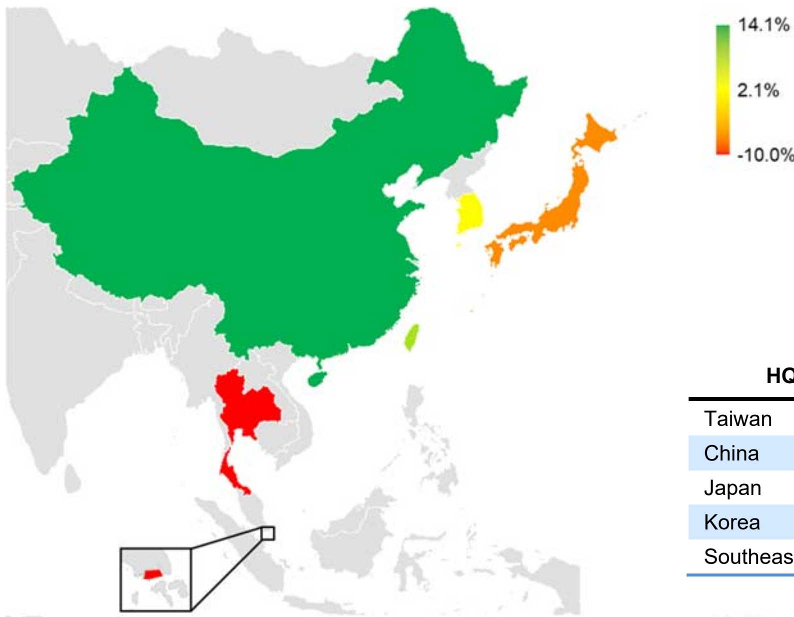
Southeast Asia's current representation in the top 100 is limited to Thailand's KCE and Singapore's Gul Technologies. However, with over $10Bn in PCB capacity investments committed to the region within the past two years, Southeast Asia is expected to become a new focal point for PCB manufacturing. In the near-term, nearly all of the growth in Southeast Asian PCB production will be driven by foreign manufacturers.

ASIA TOTAL PCB PRODUCTION VALUE GROWTH BY HEADQUARTERS LOCATION: 2024/2023 (%)



HQ	2024 Top 100 PCB Production Value Growth (%)
Taiwan	6.3%
China	14.1%
Japan	-3.4%
Korea	2.2%
Southeast Asia	-10.0%

The above figure presents the aggregate PCB production value growth by the top 100 with headquarters location in various Asian countries in 2024. Note that this is not equivalent to regional output growth, as many companies have production capacities outside of their headquarters location. For example, Taiwan's 6.3% growth rate includes all PCB production by Taiwanese companies at their plants in Taiwan, China, Southeast Asia, and elsewhere.

China's PCB production increased by 14.1% in value terms in 2024. China's strong growth in PCB production illustrates its continued share gains in substrates and rigid and flex circuit markets, and its improved position in the server, networking, and semiconductor market segments. The production value of South Korea (2.2%) and Japan (-3.4%) changed slightly in 2024. For both countries, package substrates account for a relatively large share of their PCB production.

PCB PRODUCTION BY COUNTRY ORIGIN

Headquarters	China	Taiwan	Japan	Korea	US	Europe	SEA/ ROW	Total
Companies of Top 100 in 2024	40	21	16	10	4	7	2	**100**
Additional PCB Shops	>9,00	~160	~150	~140	~260	~180	~200	**>2,000**
Estimated Total PCB Production Value ($Bn)	$24.7	$20.9	$9.6	$7.7	$5.2	$4.0	$1.4	**$73.6**
Share	33.6%	28.4%	13.1%	10.5%	7.1%	5.4%	1.9%	**100%**

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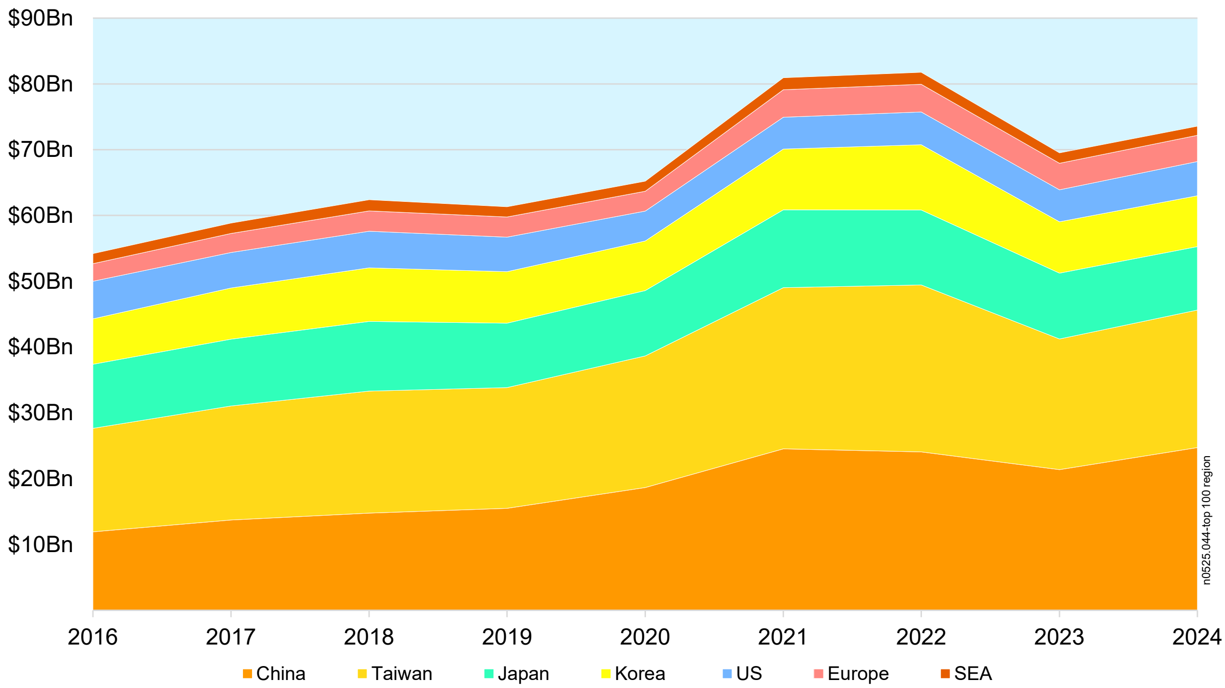
The global PCB market is highly fragmented. In addition to the leading companies highlighted in this report, there are many medium- and small-sized PCB shops that serve a broad range of customers and markets. Prismark estimates that, outside of the top 100, there were an additional 2,000+ PCB shops operating worldwide in 2024. Altogether, these 2,000+ unranked companies contributed an additional $10.5Bn in global bare-board sales. Adding these sales to the $63.1Bn in bare-board production reported by the global top 100 brings the total 2024 bare-board market value to $73.6Bn.

PCB PRODUCTION GROWTH BY COMPANY HEADQUARTER



The above figure presents the evolution of PCB value production by company headquarters location for the entire global PCB market since 2016. In 2024, China remained the largest PCB production group in value terms for the second time. While the PCB industry in China struggled with the impact of overcapacity and price erosion in 2024, the country significantly outperformed its Asian competitors due to its competitive cost structure, aggressive expansion, and continued technology upgrades. Taiwan, which had consistently led the world in PCB production value for more than a decade prior to 2023, registered 5.2% in PCB output value in 2024. Thanks to the contribution by hundreds of medium and small players, China’s PCB output, on the other hand, increased 15.7%.

The historical trend suggests that China is likely to build upon its lead in the near future. Since 2013, Chinese PCB shops have more than doubled their total PCB production value, raising their share of global production from 18% in 2013 to 31.5% in 2023 and 33.6% in 2024. Meanwhile, Taiwan’s share of global production in 2024 (28.4%) and 2023 (28.6%) is effectively the same as it was in 2013 (28.4%). While the supply chain diversification movement is raising some headwinds, China’s PCB industry is likely to maintain growth momentum over the coming years through domestic and overseas expansions.

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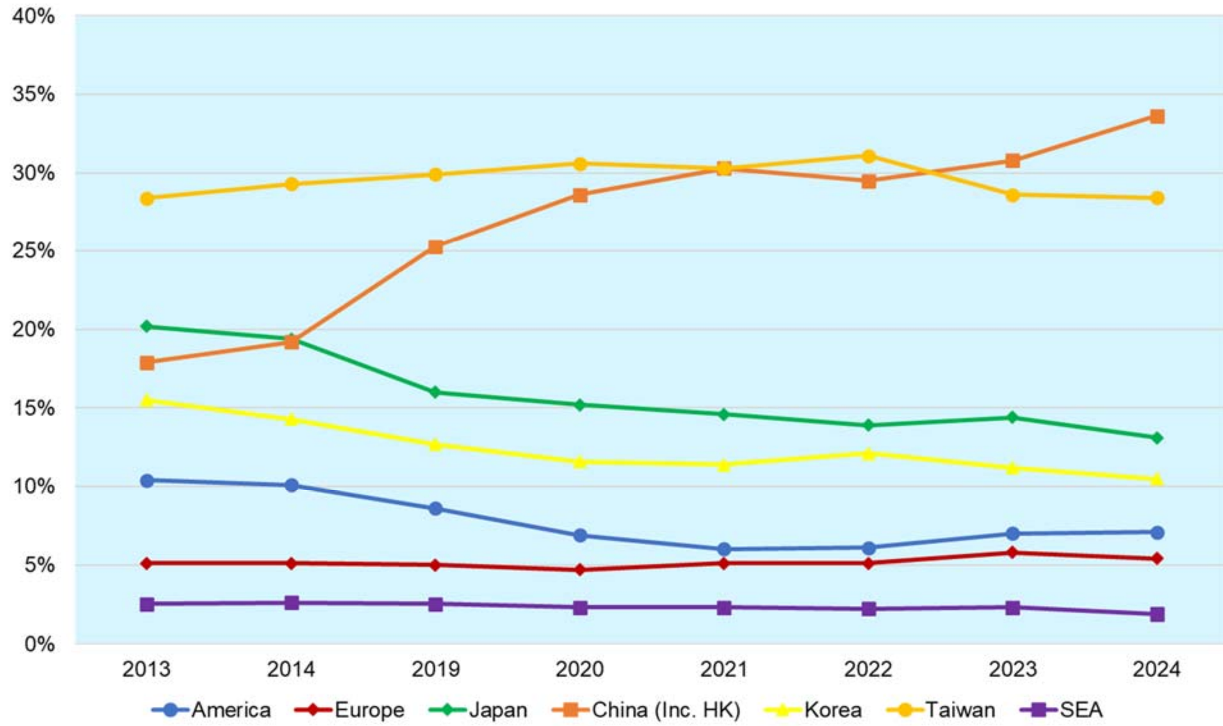
PCB PRODUCTION BY COMPANY HEADQUARTERS



Note: All companies headquartered in particular region; bare-board value excluding assembly

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Top 40 Profitability Metrics

The following tables analyze various performance metrics for the forty leading public PCB fabricators for which such information is in the public domain. This is a subset of the top 100 companies discussed above, and the same data is sorted by different metrics to allow for easier comparisons.

PROFITABILITY PERFORMANCE OF THE LEADING 40 PUBLIC PCB SUPPLIERS (2023-2024) BY 2024 SALES

		Sales			*Total Company Net Profit Margin*		*Total Company Net Profit*			*Total Company Capex*			*Total Company Return on Equity (ROE)*		*Total Company Return on Assets (ROA)*	
Company ($M)	**HQ**	**2023**	**2024**	**Growth YoY**	**2023**	**2024**	**2023**	**2024**	**Growth YoY**	**2023**	**2024**	**Growth YoY**	**2023**	**2024**	**2023**	**2024**
Zhen Ding	TW	$4,835	$5,341	10.5%	6.2%	7.6%	$299	$407	36.2%	$829	$507	-38.8%	7.0%	8.6%	3.9%	4.9%
Unimicron	TW	$3,342	$3,594	7.5%	11.8%	4.8%	$394	$174	-55.7%	$736	$814	10.7%	12.7%	5.6%	5.7%	2.4%
Dongshan Precision (PCB/FPC only)	CN	$3,276	$3,451	5.3%	5.8%	3.0%	$277	$151	-45.5%	$493	$528	7.1%	10.8%	5.7%	4.4%	2.4%
Shennan Circuits	CN	$1,909	$2,492	30.5%	10.3%	10.5%	$196	$261	33.1%	$460	$352	-23.6%	10.6%	12.8%	6.2%	7.4%
TTM	US	$2,233	$2,443	9.4%	-0.8%	2.3%	-$19	$56	400.8%	$160	$182	14.2%	-1.2%	3.6%	-0.6%	1.6%
Compeq	TW	$2,146	$2,256	5.1%	6.2%	7.7%	$133	$175	32.0%	$213	$177	-16.9%	10.6%	12.6%	5.3%	6.6%
Tripod	TW	$1,919	$2,050	6.8%	10.3%	12.7%	$194	$261	34.5%	$108	$72	-32.9%	13.9%	16.7%	7.9%	9.6%
WUS Kunshan	CN	$1,261	$1,857	47.3%	16.7%	19.2%	$209	$357	70.8%	$114	$299	162.0%	15.1%	21.6%	9.3%	12.1%
Kinwong	CN	$1,519	$1,761	15.9%	8.5%	9.2%	$129	$161	25.5%	$205	$257	25.6%	10.2%	10.1%	5.3%	6.0%
AT&S	AT	$1,630	$1,669	2.4%	-5.2%	-9.0%	-$84	-$148	-76.9%	$965	$527	-45.4%	-7.7%	-13.8%	-1.9%	-2.9%
Victory Giant	CN	$1,120	$1,493	33.3%	8.5%	10.8%	$95	$161	69.4%	$91	$116	27.1%	8.8%	6.1%	3.9%	6.0%
Meiko	JP	$1,250	$1,306	4.5%	5.4%	8.3%	$67	$108	60.0%	$147	$160	8.9%	10.0%	15.5%	4.1%	6.1%
HannStar Board	TW	$1,380	$1,297	-6.1%	10.6%	11.0%	$146	$142	-2.4%	$42	$109	157.2%	10.2%	9.6%	5.8%	5.1%
BH Co.	KR	$1,218	$1,284	5.5%	5.3%	4.4%	$65	$57	-11.9%	$50	$57	14.6%	13.0%	10.5%	7.8%	5.9%
Ibiden (Electronics Division)	JP	$1,450	$1,242	-14.4%	9.4%	8.0%	$254	$191	-24.9%	$847	$1,087	28.3%	9.5%	7.2%	3.9%	2.6%
Gold Circuit	TW	$964	$1,208	25.4%	11.7%	14.4%	$113	$175	55.1%	$52	$159	207.5%	21.0%	26.3%	10.7%	12.6%
Nan Ya PCB	TW	$1,360	$1,005	-26.1%	13.8%	0.6%	$188	$6	-96.7%	$381	$74	-80.5%	12.1%	0.4%	8.3%	0.3%
Kinsus	TW	$862	$951	10.3%	4.4%	4.4%	$37	$42	11.0%	$326	$326	0.2%	3.0%	3.3%	1.5%	1.7%
Simmtech	KR	$797	$904	13.4%	-11.1%	-2.5%	-$88	-$23	74.4%	$107	$75	-29.5%	-24.5%	-6.9%	-9.8%	-2.2%
Suntak	CN	$817	$873	7.0%	7.3%	4.8%	$60	$42	-30.0%	$193	$144	-25.5%	5.6%	3.9%	3.5%	2.5%
FLEXium	TW	$1,051	$824	-21.6%	6.3%	-3.1%	$66	-$25	-138.6%	$110	$30	-72.8%	7.6%	-3.2%	5.1%	-2.1%
Shenzhen Fastprint	CN	$758	$809	6.8%	2.3%	-9.1%	$17	-$74	-531.0%	$265	$157	-40.8%	2.0%	-9.5%	0.8%	-3.9%
Olympic Circuit	CN	$639	$699	9.4%	10.3%	12.7%	$66	$89	35.1%	$33	$41	26.6%	13.2%	9.5%	7.4%	7.1%
Daeduck Electronics	KR	$697	$655	-6.0%	2.8%	2.7%	$20	$17	-11.2%	$90	$44	-51.2%	2.9%	2.7%	2.3%	2.2%
Shengyi Electronics	CN	$463	$652	40.9%	-0.8%	7.1%	-$3	$46	1346.5%	$88	$59	-32.8%	-0.6%	7.8%	-0.4%	4.3%
Aoshikang	CN	$612	$635	3.8%	12.0%	7.8%	$73	$49	-33.1%	$87	$95	8.5%	12.6%	8.1%	7.1%	4.4%
CMK	JP	$628	$623	-0.8%	2.0%	7.1%	$12	$44	275.3%	$90	$136	50.7%	4.1%	7.5%	1.7%	3.3%
ISU Petasys	KR	$517	$614	18.6%	7.1%	8.8%	$37	$54	48.0%	$50	$44	-12.1%	17.9%	22.6%	7.6%	9.4%
Unitech	TW	$480	$577	20.1%	-2.3%	8.6%	-$11	$49	545.0%	$37	$61	66.9%	-3.5%	12.5%	-1.6%	6.8%
TPT	TW	$608	$570	-6.3%	6.0%	4.1%	$36	$22	-37.9%	$49	$27	-45.0%	7.3%	4.4%	3.8%	2.4%
Dynamic	TW	$505	$552	9.3%	6.6%	6.1%	$33	$34	2.7%	$99	$162	64.3%	14.9%	13.3%	4.6%	3.5%
Delton	CN	$378	$520	37.6%	15.5%	18.1%	$58	$94	61.3%	$57	$115	101.5%	22.7%	22.0%	10.9%	11.9%
Chin Poon	TW	$538	$510	-5.1%	4.6%	6.9%	$24	$35	45.4%	$9	$20	117.4%	4.7%	6.6%	3.4%	4.8%
Ellington PCB	CN	$450	$488	8.5%	11.2%	12.7%	$50	$61	21.1%	$54	$41	-24.4%	9.4%	10.8%	7.1%	7.9%
Founder Tech	CN	$445	$484	9.0%	4.3%	7.4%	$19	$36	87.6%	$97	$155	59.6%	3.5%	6.3%	2.4%	3.6%
Guangdong Kingshine	CN	$418	$472	12.9%	-5.8%	-10.7%	-$24	-$51	-108.8%	$113	$66	-41.5%	-7.7%	-19.4%	-2.6%	-4.9%
Bomin Electronics	CN	$412	$454	10.3%	-19.4%	-7.2%	-$78	-$33	58.0%	$142	$153	7.8%	-12.4%	-5.5%	-7.1%	-2.6%
KCE	TH	$470	$431	-8.4%	10.7%	11.3%	$50	$48	-5.1%	$13	$12	-8.3%	12.7%	12.1%	9.1%	9.1%
Huizhou CEE	CN	$371	$408	10.0%	-5.2%	-3.2%	-$19	-$13	32.1%	$43	$15	-65.7%	-5.0%	-3.6%	-2.1%	-1.5%
Apex	TW	$406	$392	-3.6%	-6.3%	-14.4%	-$26	-$56	-119.6%	$41	$31	-23.0%	-11.5%	-26.5%	-4.4%	-9.2%
Total		**$46,132**	**$49,848**	**8.1%**	**6.3%**	**6.0%**	**$3,064**	**$3,184**	**3.9%**	**$8,085**	**$7,488**	**-7.4%**	**7.6%**	**7.2%**	**3.8%**	**3.6%**

Notes:
1. Total sales are used for most of the companies, except for Dongshan Precision and Ibiden; only their PCB segment revenues are used
2. Profit margins in percentage, and net profit values were company total figures
3. Leading 40 company's total profit margins were calculated based on the total group company sales and profits

Headquarters Location

China | Taiwan | Japan | Korea | Rest of World

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Of these forty leading public companies, 17 generated PCB/PCBA revenues in excess of $1Bn in 2023, with seven above $2Bn, three over $3Bn, and one over $5Bn. China leads the list with 16 companies, followed by Taiwan with fourteen, Korea with four, Japan with three, and the US, Europe, and Thailand with one each. In aggregate, the revenues of these leading 40 PCB fabricators increased by 8.1% in 2024.

The 2024 PCB market recovery did not help profitability much. Aggregate net profits for the 40 leading public PCB suppliers increased by merely $120M, and raised the net profits from $3,064M in 2023 to $3,184M in 2024. The average net profit margin for this group of companies declined slightly from 6.3% to 6.0%. A variety of additional profitability metrics revealed similar trends. For example, average return on equity (ROE) for these forty companies dropped from 7.6% in 2023 to 7.2% in 2024, while return on assets (ROA) fell from 3.8% to 3.6%.

In addition to this decline in profitability, overall capex spending only dropped by 7.4% from $8.1Bn to $7.5Bn in 2024. This relatively small decline was due to continued high capital investment in the package substrate market and new operations in SEA.

PROFITABILITY PERFORMANCE OF THE LEADING PUBLIC PCB SUPPLIERS (2023-2024) BY 2024 NET PROFIT

		Sales			*Total Company Net Profit*		
Company ($M)	**HQ**	**2023**	**2024**	**Growth YoY**	**2023**	**2024**	**Growth YoY**
Zhen Ding	TW	$4,835	$5,341	10.5%	$299	$407	36.2%
WUS Kunshan	CN	$1,261	$1,857	47.3%	$209	$357	70.8%
Shennan Circuits	CN	$1,909	$2,492	30.5%	$196	$261	33.1%
Tripod	TW	$1,919	$2,050	6.8%	$194	$261	34.5%
Ibiden (Electronics Division)	JP	$1,450	$1,242	-14.4%	$254	$191	-24.9%
Compeq	TW	$2,146	$2,256	5.1%	$133	$175	32.0%
Gold Circuit	TW	$964	$1,208	25.4%	$113	$175	55.1%
Unimicron	TW	$3,342	$3,594	7.5%	$394	$174	-55.7%
Kinwong	CN	$1,519	$1,761	15.9%	$129	$161	25.5%
Victory Giant	CN	$1,120	$1,493	33.3%	$95	$161	69.4%
Dongshan Precision (PCB/FPC only)	CN	$3,276	$3,451	5.3%	$277	$151	-45.5%
HannStar Board	TW	$1,380	$1,297	-6.1%	$146	$142	-2.4%

Notes: see previous footnotes on page 16

While the aggregate net profits merely increased by 3.9%, eight companies had net losses in 2024 and several of them had more than 50% decline in profits. On the other hand, Zhen Ding, TTM, WUS, Shennan, Tripod, Victory Giant, Meiko, and a few others had significant growth in net profits.

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PROFITABILITY PERFORMANCE OF THE LEADING PUBLIC PCB SUPPLIERS (2023-2024) BY 2024 NET MARGIN

		Sales			*Total Company Net Profit Margin*	
Company ($M)	**HQ**	**2023**	**2024**	**Growth YoY**	**2023**	**2024**
WUS Kunshan	CN	$1,261	$1,857	47.3%	16.7%	19.2%
Delton	CN	$378	$520	37.6%	15.5%	18.1%
Gold Circuit	TW	$964	$1,208	25.4%	11.7%	14.4%
Tripod	TW	$1,919	$2,050	6.8%	10.3%	12.7%
Olympic Circuit	CN	$639	$699	9.4%	10.3%	12.7%
Ellington PCB	CN	$450	$488	8.5%	11.2%	12.7%
KCE	TH	$470	$431	-8.4%	10.7%	11.3%
HannStar Board	TW	$1,380	$1,297	-6.1%	10.6%	11.0%
Victory Giant	CN	$1,120	$1,493	33.3%	8.5%	10.8%
Shennan Circuits	CN	$1,909	$2,492	30.5%	10.3%	10.5%

Notes: see previous footnotes on page 16

Ten companies reported net profit margins of at least 10%, compared to twelve in 2023. Of these ten companies, 6 are headquartered in China, 3 in Taiwan, and 1 in Thailand. Notably, none of the leading Korean or Japanese suppliers posted a net profit margin of 10% or more in 2024, reflecting the heavy toll the substrate market collapse has had on profitability in those markets.

CAPEX OF THE LEADING PUBLIC PCB SUPPLIERS (2023-2024) BY 2024 CAPEX

		Sales			*Total Company Capex*		
	HQ	**2023**	**2024**	**Growth YoY**	**2023**	**2024**	**Growth YoY**
Ibiden (Electronics Division)	JP	$1,450	$1,242	-14.4%	$847	$1,087	28.3%
Unimicron	TW	$3,342	$3,594	7.5%	$736	$814	10.7%
Dongshan Precision (PCB/FPC only)	CN	$3,276	$3,451	5.3%	$493	$528	7.1%
AT&S	AT	$1,630	$1,669	2.4%	$965	$527	-45.4%
Zhen Ding	TW	$4,835	$5,341	10.5%	$829	$507	-38.8%
Shennan Circuits	CN	$1,909	$2,492	30.5%	$460	$352	-23.6%
Kinsus	TW	$862	$951	10.3%	$326	$326	0.2%
WUS Kunshan	CN	$1,261	$1,857	47.3%	$114	$299	162.0%
Kinwong	CN	$1,519	$1,761	15.9%	$205	$257	25.6%
TTM	US	$2,233	$2,443	9.4%	$160	$182	14.2%
Compeq	TW	$2,146	$2,256	5.1%	$213	$177	-16.9%
Dynamic	TW	$505	$552	9.3%	$99	$162	64.3%
Meiko	JP	$1,250	$1,306	4.5%	$147	$160	8.9%
Gold Circuit	TW	$964	$1,208	25.4%	$52	$159	207.5%
Shenzhen Fastprint	CN	$758	$809	6.8%	$265	$157	-40.8%

Notes: see previous footnotes on page 16

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CAPEX OF THE LEADING PUBLIC PCB SUPPLIERS (2023-2024) BY 2024 CAPEX GROWTH

		Sales			*Total Company Capex*		
	HQ	**2023**	**2024**	**Growth YoY**	**2023**	**2024**	**Growth YoY**
Gold Circuit	TW	$964	$1,208	25.4%	$52	$159	207.5%
WUS Kunshan	CN	$1,261	$1,857	47.3%	$114	$299	162.0%
HannStar Board	TW	$1,380	$1,297	-6.1%	$42	$109	157.2%
Chin Poon	TW	$538	$510	-5.1%	$9	$20	117.4%
Delton	CN	$378	$520	37.6%	$57	$115	101.5%
Unitech	TW	$480	$577	20.1%	$37	$61	66.9%
Dynamic	TW	$505	$552	9.3%	$99	$162	64.3%
Founder Tech	CN	$445	$484	9.0%	$97	$155	59.6%
CMK	JP	$628	$623	-0.8%	$90	$136	50.7%
Ibiden (Electronics/PCB only)	JP	$1,450	$1,242	-14.4%	$847	$1,087	28.3%
Victory Giant	CN	$1,120	$1,493	33.3%	$91	$116	27.1%
Olympic Circuit	CN	$639	$699	9.4%	$33	$41	26.6%
Kinwong	CN	$1,519	$1,761	15.9%	$205	$257	25.6%
BH Co.	KR	$1,218	$1,284	5.5%	$50	$57	14.6%
TTM	US	$2,233	$2,443	9.4%	$160	$182	14.2%
Unimicron	TW	$3,342	$3,594	7.5%	$736	$814	10.7%

Notes: see previous footnotes on page 16

PCB investment has started to moderate following a two-year period of torrid capex expansion in 2021 and 2022 — aggregate capex for the leading forty public PCB producers fell by 7.4% in 2024. Nevertheless, several leading companies increased their capex significantly compared to 2023. As shown above, sixteen top 100 suppliers reported capex growth of more than 10%. Gold Circuit, WUS, HannStar, Chin Poon, Delton, Unitech, Dynamic, Founder, and CMK led the pack with capex increases of more than 50% in 2023.

In gross value terms, most of the leading capex spenders in 2024 were either substrate producers or ML/HDI suppliers. The combined annual capex of substrate makers Ibiden, AT&S, Unimicron, Kinsus, Zhen Ding, and others was still over $3Bn, which was much less than previous but still substantially higher than typical investments in other PCB market segments. Looking forward, substrate capex is likely to scale down over the next few years as the market digests the impact of recent capacity expansions.

In 2024, a significant portion of the capex went to Southeast Asia (SEA). SEA has been one of the key beneficiaries of the recent capex wave in the PCB industry. Prismark estimates that the global PCB industry has committed to more than $10Bn in capacity investments in Thailand, Vietnam, and Malaysia over this expansion cycle, and many new projects have already begun to enter production. As these projects continue to move forward, Prismark expects PCB capital investments to continue in Southeast Asia in 2025 and 2026.

Prismark's consultants have decades of experience helping companies capitalize on promising investment opportunities in the PCB industry. From business and product development to supply chain analysis and acquisition support, we can provide you with the information and support you need to make the right strategic decisions for your company. Let's talk!

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A Company Profile

Prismark is an electronics industry consulting firm. We are consulted by many of the leading systems houses, semiconductor companies, and the materials, components, and tool companies that enable electronic equipment to be manufactured. These companies use Prismark to plan their tactics and set their strategies in an industry that continues to undergo complex technological and structural change.

Prismark works in all market sectors:

- Wireless Communications
- Computing
- Data Communications
- Automotive
- Military
- Medical
- Instrumentation &
- Control Electronics

Prismark's consultants have expertise in:

- Semiconductor Processing
- Device Level Packaging
- Interconnection
- Assembly
- Test
- Displays
- Optoelectronics
- MEMS

Prismark performs:

- Customized Research
- Retained Consulting
- Publications – narrowly focused reports to serve core portions of the Prismark client base
  - Electronic Materials Reporter
  - Electronics Supply Chain Reporter
  - Printed Circuit Report
  - Semiconductor and Packaging Report
  - Prismark Discovery Series

Prismark has developed a global reputation for providing clients with an extremely clear understanding of the complex dynamics that drive the electronics industry. Clients use Prismark's knowledge and interpretation to make confident business decisions about uncertain technology and market developments. Prismark's clients include some of the largest electronics companies as well as much smaller innovators, and financial institutions.

Prismark focuses on providing very personal and highly specific research recommendations to the relatively few companies that are becoming leaders at every tier of the electronics industry. Our consultants operate globally and are based in our main office in Cold Spring Harbor, New York.

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