

UK-APAC Tech Growth Programme

# Southeast Asia's semiconductor market – opportunities for UK companies

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# Contents

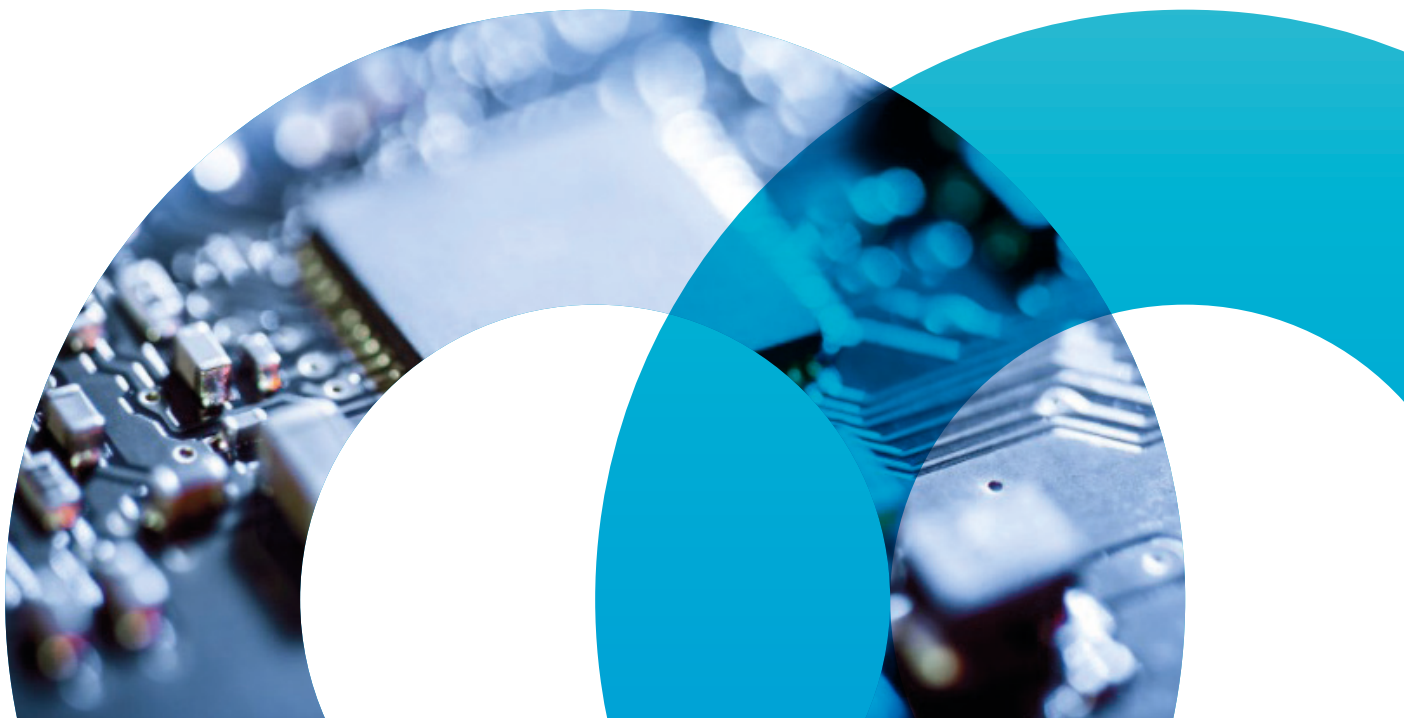
<b>Executive summary</b>	<b>3</b>
<b>Singapore's semiconductor market overview</b>	<b>8</b>
<b>Malaysia's semiconductor market overview</b>	<b>14</b>
<b>Vietnam's semiconductor market overview</b>	<b>22</b>
<b>Thailand's semiconductor market overview</b>	<b>28</b>
<b>The Philippines semiconductor market overview</b>	<b>34</b>
<b>Indonesia's semiconductor market overview</b>	<b>40</b>
<b>Routes to market</b>	<b>47</b>

# Executive summary

**Southeast Asia's semiconductor industry has traditionally focused on providing a low-cost location for global back-end assembly, test & packaging firms to set up shop, with Singapore being the exception to this, having a history of high-end front-end fabrication and a strong semiconductor design industry.**

However, a combination of geopolitics and the need to move up the manufacturing value chain is resulting in countries throughout the region competing to attract more advanced semiconductor investment from leading global companies, and in the process gradually achieve tech transfer. Southeast Asia accounts for 22.5 percent of global semiconductor exports with Singapore and Malaysia accounting for 11 percent and 7 percent of the global semiconductor market respectively.

This report will briefly describe the semiconductor market in each country (Singapore, Malaysia, Vietnam, Thailand, the Philippines, and Indonesia), describe government initiatives, highlight key players, explain the opportunities for British companies, and discuss routes to market.



## Market highlights

- **Singapore:** Despite being a city state, Singapore has the largest, most influential, and most complete semiconductor industry in Southeast Asia, ranging from design, to fabrication, packaging, and device assembly
- **Malaysia:** Traditionally a location for assembly, test, and packaging services, Malaysia is now expanding into frontend fabrication and IC design. Its location next to Singapore means it can collaborate easily with Singaporean and international companies across the border with ease. Penang has now grown to be one of the world's key semiconductor hubs and Sarawak in Borneo is now growing into an IC design centre
- **Vietnam:** Growing as an electronics contract manufacturing hub for large corporations such as Apple and Samsung means Vietnam has a growing assembly, test, and packaging industry. It also has a nascent design industry, and an automotive industry
- **Thailand:** Growing as an electronics contract manufacturing hub, Thailand's traditional assembly, test, and packaging industry is set for continued growth. It is also looking to grow in other areas driven by government incentives (Thailand 4.0) and US diversification of semiconductor production. For example, it has a nascent IC design industry and a growing automotive sector
- **The Philippines:** It is particularly strong in the test, packaging, and assembly of semiconductors but still smaller than other Southeast Asian peers and has established a dedicated centre to support IC design. It also wants to become a home for IC design companies serving customers worldwide
- **Indonesia:** As the largest economy and largest population in ASEAN it has huge potential as an end market for consumer electronics sales and manufacturing. While its semiconductor industry is small, it has the potential to become a location for packaging operations and electronics assembly due to low-cost labour and proximity to Singapore and Malaysia



## Market opportunities

### ○ Singapore:

- Sustainability technologies can help Singapore's semiconductor manufacturing expansion become greener
- UK companies can collaborate with research institutions and companies in Singapore to develop next-generation semiconductor technologies
- UK companies can offer advanced design services, EDA tools, and especially semiconductor IP. Alternatively, UK IC design companies can work with fabs to manufacture chips in Singapore and feed into Southeast Asia's packaging industry and on to electronics manufacturers
- UK companies specialising in compound semiconductor technologies may find suitable manufacturing and R&D partners in Singapore
- Although the UK is not a leader in semiconductor manufacturing equipment, it does have niche equipment companies that can offer specialist tools to this market
- With the growing design and fabrication industries, especially around compound semiconductors some niche UK companies could find opportunities

### ○ Malaysia

- UK companies with technologies for advanced packaging solutions could find a market in Malaysia as it grows to become a key advanced packaging centre for the world
- UK semiconductor IP companies are well placed to help Malaysia's demand to design complex chips. Malaysian IC design service companies could also represent low-cost outsourcing partners
- UK companies that supply high-purity chemicals, silicon wafers, or advanced manufacturing equipment can capitalise on the expanding semiconductor production in Malaysia
- UK companies can help by offering training programmes, internships, and working with Malaysian universities and technical institutes

### ○ Vietnam

- UK companies with technologies for advanced packaging solutions could find a market in Vietnam as it grows to become a key advanced packaging centre for the world
- Vietnam needs to increase its green energy credentials to attract more global manufacturing investment. The UK is well positioned to help Vietnam with its green transition
- The UK leads the world when it comes to semiconductor IP. Vietnam's IC design industry is in the very early stages so any IP companies should look at Vietnam as part of a regional strategy
- UK companies and universities can work with the Vietnam government to train new engineers, especially in semiconductor design, where the UK excels
- Vietnam has a small EV industry. Its leading company, Vinfast, sells EVs globally and has announced it will provide incentives to foreign automotive semiconductor companies willing to invest in the country

## ○ Thailand

- Thailand's push towards electric vehicles (EVs) and advanced automotive technologies demands sophisticated electronic components, including sensors, microcontrollers, and power semiconductors. UK semiconductor companies that design or manufacture automotive semiconductors should consider Thailand. It is the largest EV producing country in ASEAN with large Chinese EV brands such as BYD, SAIC, Great Wall, and Chery having plants there
- Increasing amounts of compound semiconductors are required for a growing EV industry. UK companies specialising in compound semiconductor technologies may find opportunities in this space
- Thailand is quickly developing in fields like smart cities and the Internet of Things (IoT), covering everything from advanced farming to automating factories. UK companies with capabilities in sensor technology, artificial intelligence chips, and IoT solutions may find opportunities this emerging market
- Another significant gap is in R&D capabilities within Thailand's semiconductor industry. UK companies with strong R&D backgrounds can collaborate with Thai educational institutions and research centres to foster innovation and develop new technologies tailored to the local market

- As part of Thailand 4.0, Thailand has accelerated the rollout of 5G technologies, which has in turn driven the growth of the semiconductor industry. UK companies with wireless infrastructure semiconductor solutions should consider exploring the Thai market
- As back-end supply chains move away from China and into ASEAN, these countries, including Thailand, will be key markets for advanced packaging technology and know-how. This is a strong trend that follows the shift of electronics manufacturing away from China

## ○ The Philippines

- As the Philippines becomes more important over the coming years in back-end packaging the need for these facilities to install advanced packaging capabilities will increase
- Local companies require assistance in how to mine and process raw materials used in the semiconductor industry
- The Philippines represents a low-cost, English-speaking alternative to other countries in the region. This means training talent in IC design or production may be easier than other countries. There is potential for it to become a low-cost design services base to add to its status as an ATP base

## ○ Indonesia

- Indonesia will need assistance in how to mine and process raw materials used in the semiconductor industry
- Indonesia has the potential to become a strong player in the ATP/OSAT space. Any UK company with expertise here, be it in software or equipment, may see Indonesia as growing market over the next decade
- There is room for British companies to work with Indonesian research institutes and universities to help train the next generation of semiconductor industry experts

### Regional strengths in the semiconductor supply chain

	IC Design	EDA/IP	IDM	Foundry	Memory	Assembly/Test	Equipment/Material
SEA	●	○	●	●	●	●●●	●
Taiwan	●●	●●	●	●●●	●	●●●	●
US	●●●	●●●	●●●	●●	●●	●	●●●
Europe	●	●	●●	●	○	●	●●●
Japan	●	●●	●●	●	●●	●	●●●
Korea	●	○	●●	●●	●●●	●	●●
China	●●	●	●	●●	●	●●	●●

○ 0 points

● 0.5 points

● 1 point

### Regional strengths in the Southeast Asian semiconductor supply chain

	IC Design	EDA/IP	IDM	Foundry	Memory	Assembly/Test	Equipment/Material
Singapore	●●	●	●●	●●	●	●●	●
Malaysia	●	○	●●	●	●	●●●	●
Vietnam	●	○	●	○	○	●●	○
Thailand	●	○	●	○	○	●●	○
Philippines	○	○	●	○	●	●●	○
Indonesia	○	○	●	○	○	●	○

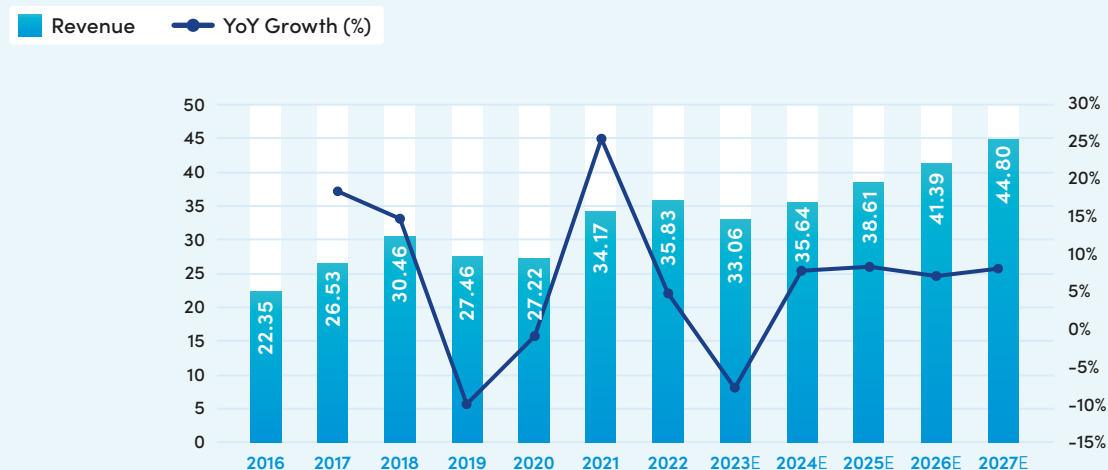
# Singapore's semiconductor market overview

## Market size

Singapore is a hub for semiconductor manufacturing and export, accounting for 7 percent of the country's GDP. Singapore accounts for about 11 percent of global semiconductor market share, and about 20 percent of global semiconductor equipment is manufactured in Singapore. Singapore's ecosystem offers access to a pool of highly educated and trained talent and strong intellectual property protection, which makes it a preferred choice for chipmakers. Singapore plans to expand its manufacturing sector 50 percent by 2030. The country's semiconductor chip sales revenue is expected to reach GBP 35.64bn in 2024 and grow to GBP 44.8bn by 2027, at an average rate of 7.85 percent. ICs make up GBP 33.29bn, or 93.4 percent of chip sales in Singapore.

This is of course only semiconductor device revenue and does not include upstream revenues. Singapore's industry is quite complete, ranging from design to fabrication to packaging.

Singapore semiconductor industry revenue (GBP bn, YoY)



Source: Statista

Singapore semiconductor revenue by type (GBP bn, 2024 est.)



Source: Statista

## Market segments

Unlike some other countries in Southeast Asia, Singapore attracts companies from across the entire semiconductor value chain from upstream EDA tool, equipment, and IP companies to midstream design firms and foundries, to downstream OSATs, and even electronics assembly.

Regarding actual chip sales, ICs dominate the market with a projected market volume of GBP 33.29bn in 2024. Singapore has also carved out a niche in specialty chips, which are used in everyday devices – such as Radiofrequency (RF) Chips and Silicon III-V chips.

### Singapore semiconductor industry ecosystem



## Foundry

Singapore houses several of the world's largest semiconductor foundries and integrated device manufacturers (IDMs) including Micron, Taiwan Semiconductor Manufacturing Company (TSMC), Marvell Technology, GlobalFoundries, Vanguard, and United Microelectronics Corporation (UMC). Additionally, Singapore's domestic market is supported by a network of small and medium-sized enterprises (SMEs) that specialise in the design, prototyping, production, and testing of semiconductor components.

In 2023, GlobalFoundries opened its newly expanded manufacturing base (GBP 3.14bn microchip fabrication plant), UMC is building a new GBP 3.94bn wafer fab facility expected to be completed in 2024, and Taiwanese fab Vanguard will invest GBP 6.15bn in a new 12-inch fab in Singapore in partnership with NXP. Also, French semiconductor materials supplier, Soitec, has invested GBP 337.79m to expand its wafer fabrication plant in Singapore.

## Compound

Singapore is at the forefront of innovation and leveraging compound materials with a new technology centre for Gallium Nitride (GaN), an emerging material used in semiconductor chips set to be operational by 2025. Singapore's Agency for Science, Technology and Research's (A\*STAR) Institute of Microelectronics has dedicated research for Silicon Carbide (SiC) and GaN.

In December 2023, A\*STAR announced a partnership with Centrotherm International AG (Centrotherm) to advance 200mm SiC technology. A\*STAR's Institute of Microelectronics and Soitec also has a research collaboration to develop next-generation SiC semiconductor devices to power electric vehicles and advanced high-voltage electronic devices.

## Photonics

Photonics is a crucial technology for Singapore, highlighted as one of the country's four main national priorities in R&D for lasers and optics. The Green Data Centre initiative pushes Singapore to investigate advanced photonic technology to conserve power. The LUX Photonics Consortium was set up in 2015 with government support to encourage collaboration and have held the inaugural Asia Photonics Expo in Singapore. Advanced Micro Foundry (AMF) is the first dedicated Si Photonics foundry in Singapore.

## IC design

Singapore has a mature IC design market with over 40 chip design companies including Broadcom, Texas Instruments, Espressif, and MediaTek setting up R&D centres and operation facilities there. There are also local firms such as Silicon InMedia and Sible which both provide IC design services. To consolidate its strength in this area, Singapore has announced a new 6-month training programme specifically for integrated circuit design. This will be launched in August 2024 to train up to 150 people over the next five years.

## Market trends

- Singapore is in a strategic position to benefit from increased global demand for more advanced semiconductor technologies (5G, EV, AI)
- Heavy investment in R&D by the Singapore government
- Low-cost back-end packaging moving to low-cost neighbours

## Challenges

- Increasing competition from mature semiconductor markets such as South Korea, the US, Taiwan, and China – it is impossible for Singapore to outbid larger countries at the level of subsidies they are offering
- Increasing competition from upcoming players such as Vietnam and Thailand, given their cost competitiveness and resources (i.e. land infrastructure, natural resources as materials for manufacturing)
- Supply chain vulnerabilities due to its dependence on international markets for raw materials and components
- Rising labour and land cost
- Dependence on the US and Europe for EDA tools and semiconductor IP

## Government initiatives

The Singapore government has invested heavily in the semiconductor sector, committing GBP 14.14bn between 2021 and 2025 to support R&D and innovation, according to the Economic Development Board (EDB). The National Research Foundation's 'Research, Innovation, and Enterprise 2025 Plan' (RIE2025), stipulates the government will maintain investment in research, innovation, and enterprise at 1 percent of Singapore's GDP (about GBP 19.64bn) between 2021 and 2025 to support the electronics and semiconductor industry seize new growth opportunities. This puts Singapore in a strategic position for companies looking towards advanced semiconductor technologies.

## Policies

The EDB of Singapore offers a range of incentives to attract foreign investment into the semiconductor sector. These include tax holidays, grants for capital expenditure, and customised solutions depending on the specific needs of the investing company. Such incentives make Singapore an attractive destination for UK semiconductor companies looking to expand their footprint in Asia. For instance, to encourage TSMC to reconsider building a 12-inch foundry locally, the Singapore government has offered substantial subsidies, such as subsidised land, water, and electricity, as well as tax breaks and manpower.

Recognising the need for skilled semiconductor professionals, Singapore has implemented several initiatives to develop a robust talent pool. Programs such as the SkillsFuture initiative and partnerships with universities ensure ongoing training, mid-career re-skilling, and education in semiconductor-related fields. UK companies can benefit from this well-trained workforce to staff Singaporean operations effectively. As previously mentioned, Singapore has launched a new 6-month training programme specifically for IC design, which was developed by the Singapore Semiconductor Industry Association (SSIA), Nanyang Technological University, and the EDB as part of an effort to provide more work-study training, immersion, and internship opportunities.

## Key players

Selection of key players in Singapore (local companies in blue)

Company	Category
Advantest	Equipment
<a href="#">AEM</a>	<a href="#">OSAT</a>
AMD	IDM
Amkor Technology Singapore Holding	OSAT
Ardentec	OSAT
ASE	OSAT
Broadcom	Chip Design
FTDI Chip	Chip Design
GlobalFoundries	Foundry
Infineon	IDM
Intel	IDM
JCET	OSAT
Lam Research	Equipment
Marvell Technology	Chip Design
MediaTek	Chip Design
Micron Technology	IDM
NXP Semiconductors	IDM
Qorvo	R&D
Qualcomm	Chip Design
Realtek	Chip Design
ROHM Semiconductor	Sales Office
<a href="#">Silicon Box</a>	<a href="#">Advanced Packaging</a>
Silicon Labs	Chip Design
Siltronic	Foundry
<a href="#">SiNBLE Technology</a>	<a href="#">Chip Design</a>
<a href="#">SixSense</a>	<a href="#">EDA</a>
Skyworks	IDM
<a href="#">Soitec</a>	<a href="#">Foundry</a>
<a href="#">SSMC</a>	<a href="#">Foundry</a>
STATS ChipPAC	OSAT
STMicroelectronics	IDM
Tessolve	Chip Design
Texas Instruments	Chip Design
UMS	Equipment
United Microelectronics Corporation (UMC)	Foundry
<a href="#">UTAC</a>	<a href="#">OSAT</a>
Vanguard International Semiconductor (VIS)	Foundry



## Opportunities for UK companies (Singapore)

Singapore is a pivotal market for UK companies expanding their footprint in Southeast Asia. Singapore's complete semiconductor ecosystem, strategic location, English speaking population, and business-friendly policies make it an attractive destination for foreign companies. Singapore is mainly driven by its advanced manufacturing capabilities.

- **Sustainability:** With Singapore's Green Plan 2030, Singapore has green energy targets to hit. UK companies with advanced sustainability technologies can help Singapore's semiconductor manufacturing expansion become greener, and compound technologies can also help make future devices more efficient
- **R&D Collaboration:** Singapore invests heavily in R&D to maintain its competitive position. UK companies can collaborate with research institutions (A\*STAR, NTU's Centre for Integrated Circuits and Systems, Singapore Hybrid-Integrated Next-Generation  $\mu$ -Electronics (SHINE) Centre) and companies in Singapore to develop next-generation semiconductor technologies
- **IC Design and Development:** Singapore is investing in and training more talent in the IC design space to stay ahead. UK companies with expertise in this area can offer advanced design services, EDA tools, and especially semiconductor IP. Alternatively, UK IC design companies can work with fabs to manufacture chips in Singapore and feed into Southeast Asia's packaging industry and on to electronics manufacturers
- **Advanced Materials:** With the push towards smaller, more efficient, and more powerful semiconductors, there is a growing need for advanced materials. UK companies specialising in compound semiconductor technologies may find suitable manufacturing and R&D partners in Singapore
- **Semiconductor Equipment:** Singapore has a large and growing ecosystem of foundries. Although the UK is not a leader in semiconductor manufacturing equipment, it does have niche equipment companies that can offer specialist tools to this market
- **EDA Tools:** Singapore relies on imported tools, but recently startups like Singapore's SixSense, which has an AI defect classification solution for fabs, are making inroads. With the growing design and fabrication industries, especially around compound semiconductors some niche UK companies could find opportunities

"Singapore has over 55 years of history in the semiconductor industry and excels due to its robust manufacturing capabilities, a strong emphasis on R&D, and a skilled workforce that drives innovation. As a hub for global semiconductor companies, it offers a conducive business environment and advanced infrastructure, supporting both production and supply chain excellence. Singapore will always have opportunities to collaborate with other countries, including the UK, to further enhance the resilience of the global semiconductor supply chain."

Ang Wee Seng – SMD Executive Director, Singapore Semiconductor Industry Association CEO

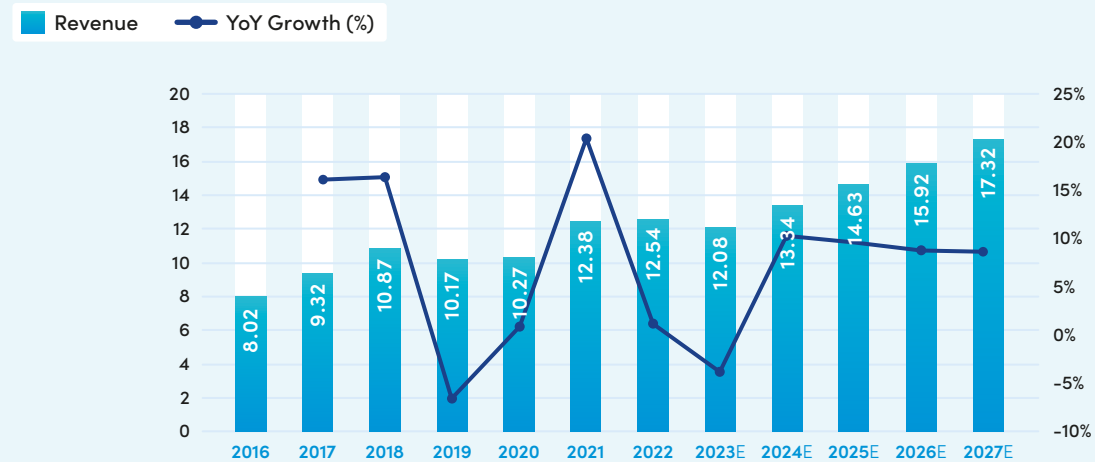
# Malaysia's semiconductor market overview

## Market size

Malaysia plays a significant role in the global semiconductor supply chain, accounting for about 13 percent of the global market for packaging, assembly, and testing services and is the world's sixth-largest exporter of semiconductors. It now accounts for approximately 7 percent of global semiconductor trade, and semiconductors contribute 25 percent of Malaysia's GDP. This is highly linked to its increasingly prominent role in electronics manufacturing. The country exported GBP 94.65bn worth of electronic products in 2023, mostly for export to the US and EU. Malaysia's ecosystem offers a strategic geographic location, and a competitive cost structure for manufacturing operations, including lower labour costs compared to Singapore. Malaysia's semiconductor chip sales revenue is expected to reach GBP 13.34bn in 2024 and to grow at an average rate of 9.1 percent up until 2027 when market volume will reach GBP 17.32bn. ICs make up GBP 11.65bn, or 93.4 percent of chip sales in Malaysia.

This is only semiconductor device revenue and does not include upstream revenues, which includes foreign IDM packaging operations, R&D for foreign IDMs, fabless firms, and design services.

Malaysia semiconductor industry revenue (GBP bn, YoY)



Source: Statista

Malaysia semiconductor revenue by type (GBP bn, 2024 est.)



Source: Statista

## Market segments

Malaysia has carved out a niche with outsourced semiconductor assembly and test companies (OSATs) and IDMs. Notably, Intel has announced a substantial investment of GBP 5.5bn and Texas Instruments GBP 2.44bn to enhance manufacturing capabilities within Malaysia.

Additionally, Malaysia is looking to move up the value chain, so is making small inroads into foundries, IC design, and compound semiconductors. According to SEMI, Penang contributes approximately 8 percent of the global back-end semiconductor output, making it among the world's leading location for microelectronics assembly, test and packaging.

Unlike other countries in SEA, Malaysia also has many local semiconductor companies and is looking to establish more.

### Malaysia semiconductor industry ecosystem



## OSAT/ATP

Malaysia is one of the world's leading locations for semiconductor test and packaging, attracting investments from major global IDM players (Intel, Infineon, Texas Instruments) and nurturing a network of local companies (Inari Amertron, MPI, Vitrox) that excel in these services. Malaysia's OSAT segment is also expected to see continued growth and investment. Malaysia accounts for approximately 7 percent of the world's semiconductor trade, and 13 percent of the global chip assembly, test and packaging market. One of the world's largest OSATs, Amkor has factory in Malaysia for packaging power discrete and wafer probe & test. Other key players include ASE, UTAC, and Unisem.

## Foundry

Malaysia's foundry segment, though smaller compared to giants like Taiwan, South Korea, China, and Singapore, is steadily growing. It offers cost-effective solutions primarily focused on providing fabrication services for small to medium-scale production runs, catering to specialised markets that require niche technologies and flexible manufacturing capabilities.

One of the key players in this segment is local foundry SilTerra Malaysia, a pure-play semiconductor foundry ranked 17th globally. Also, German company Infineon, an IDM, doesn't just run a back-end packaging operation in Malaysia, but undertakes fully integrated manufacturing from front to back-end, covering wafer fabrication and chip assembly.

It now actually employs more people in Malaysia than in Germany. Another German company, X-Fab, has had operations in Sarawak since 2006, producing CMOS semiconductors from 200mm wafers, this operation will increase from 30,000 wafers per month today, to 40-50,000 per month by 2030. In 2022, DNeX and Foxconn inked an MOU to set up a JV to build and operate a new 12-inch wafer fabrication plant in Malaysia.

Overall, although not at the bleeding edge, we see a growing, government backed, frontend semiconductor fabrication industry in Malaysia that benefits from its close connections with Singapore while providing a lower cost workforce.

## Compound

Malaysia's compound semiconductor market is a growing part of its larger semiconductor industry. Global demand for better performance and efficiency in communication technology, power electronics, and the automotive industry is boosting demand. IGSS GaN (IGaN), a Singapore-based specialist in GaN-on-silicon technology, and SilTerra Malaysia, a Malaysian wafer foundry, have cooperated to bring leading technology to mass production. Sarawak's SMD Semiconductor, a fabless chip design house specialising in designing analogue and mixed-signal integrated circuits, signed an MOU with the UK's Compound Semiconductor Catapult to work together in designing, prototyping, and manufacturing compound semiconductor chips for the automotive and space industries.

Infineon is also set to build world's largest 200mm SiC fab in Kulim. All of which shows Malaysia's growing compound semiconductor market.

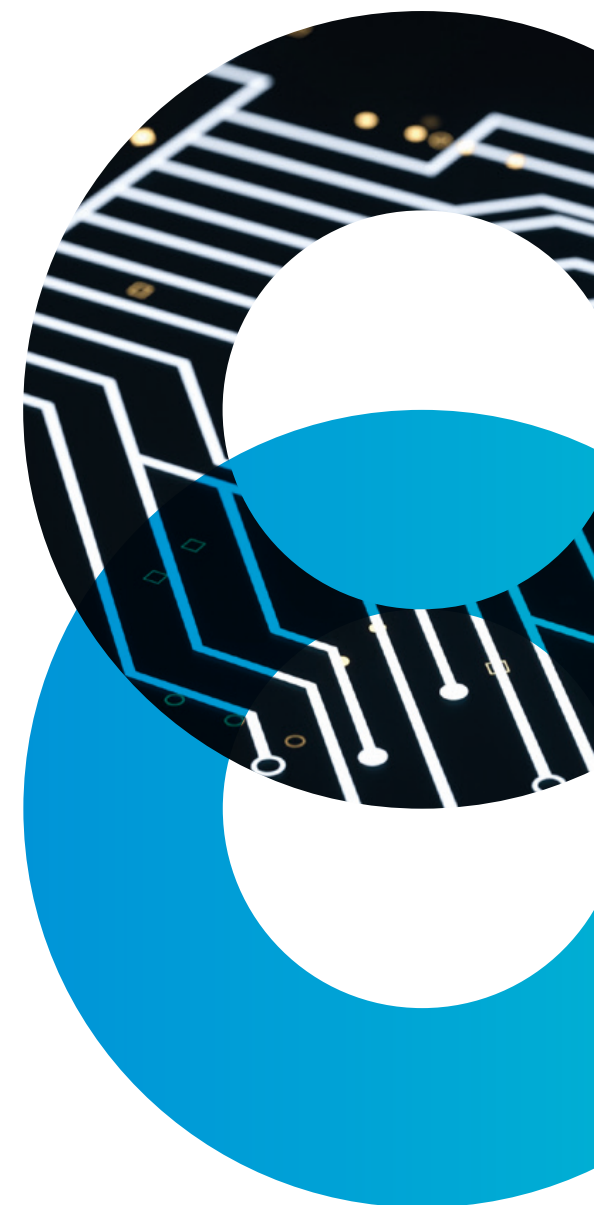
## IC design

Malaysia is placing more emphasis in the IC design sector as it shifts towards higher value-added activities, supported by government initiatives aimed at boosting local talent and attracting foreign investment. With one key action plan to create global IC design champions from Malaysia as part of the New Industrial Master Plan 2030. Malaysia is planning to build the largest IC design park in Southeast Asia. Penang already houses several homegrown IC design corporations, such as SkyeChip, Oppstar Technology, and Infinecs Systems, providing IC design services and on advanced process nodes such as 7nm. Global key players such as AMD and Broadcom also have offices in Malaysia.

However, Sarawak, on the other side of Malaysia in Borneo, is trying to build itself into the IC design centre of Malaysia. SMD Semiconductor, is partnering with British companies such as Riverbeck to develop advanced radio frequency integrated circuit technology for satellite applications, and Big Innovation Centre, a London think tank, to work on developing a more sustainable approach to semiconductor manufacturing in Sarawak. This is in addition to its MOU with the UK's Compound Semiconductor Catapult, mentioned in the Compound section of this report (p.22).

**"Our partnership with the UK is a testament to our commitment to leveraging global knowledge and resources. The MoU between CSA Catapult and SMD Semiconductor paves the way for designing, prototyping, and manufacturing next-gen compound semiconductors and chips for the automotive and space sectors. The MoU also signals SMD's intention to set up an office in the UK to facilitate the co-creation of ideas and product development. This collaboration aims to engage with academia, industry, and government in both the UK and Sarawak/Malaysia, fostering a talent pipeline and driving innovation."**

Shariman Jamil – SMD Semiconductor CEO



## Market trends

- IC design is gaining momentum in Malaysia with the government investing to train and develop talent and attract foreign firms e.g., Taiwanese electronics storage IDM, Phison, plans to establish an IC design hub in Malaysia
- Continuous influx of FDI (Intel, Infineon, GF), coupled with an increasing number of companies focusing on advanced packaging, is driving demand in Malaysia
- Chinese companies are diversifying production to Malaysia to avoid restrictions
- Malaysia is moving away from simply providing low-cost back-end packaging services, to expanding front-end foundry operations, establishing IC design hubs, and working with compound semiconductor partners
- Increasing awareness of the environmental impact the semiconductor industry has on Malaysia's environment

## Challenges

- Accessing skilled labour and talent in Malaysia can be intense, with demand often outstripping supply, especially for specialised roles. The country also experiences a brain drain with the most highly skilled engineers opting for careers in Singapore or further afield where they can demand higher salaries
- Highly competitive semiconductor market with both established local and foreign players
- Moving away from low-end back-end manufacturing into foundry, IC design, and advanced packaging is highly capital intensive and not guaranteed to succeed
- Balancing the influx of Chinese firms with geopolitical considerations
- Malaysia struggles to raise VC money, only GBP 86.41m in 2023, 1 percent of Southeast Asia's total. Malaysian VC Blue Chip Venture Capital recently announced a GBP 164.17m fund to invest in local semiconductor startups

## Government initiatives

As parts of its New Industrial Master Plan 2030, The Malaysian government plans to establish a national semiconductor strategic task force and lay out a comprehensive framework to attract FDI, stimulate innovation, and enhance its global competitiveness. Malaysia's Free Trade Zone is a significant hub for the semiconductor industry, attracting FDI. Most notably, Penang's Bayan Lepas Free Trade Zone houses multinational companies like Infineon, Intel, and Broadcom.

Recently the government announced it would invest GBP 4.16bn into Malaysia's semiconductor industry. It hopes to move up the value chain, establishing local IC design and advanced packaging companies as well as attracting front-end fab investment. It hopes to attract GBP 84.05bn in total and plans to build Southeast Asia's largest IC design park and will offer incentives including tax breaks, subsidies and visa exemption fees.

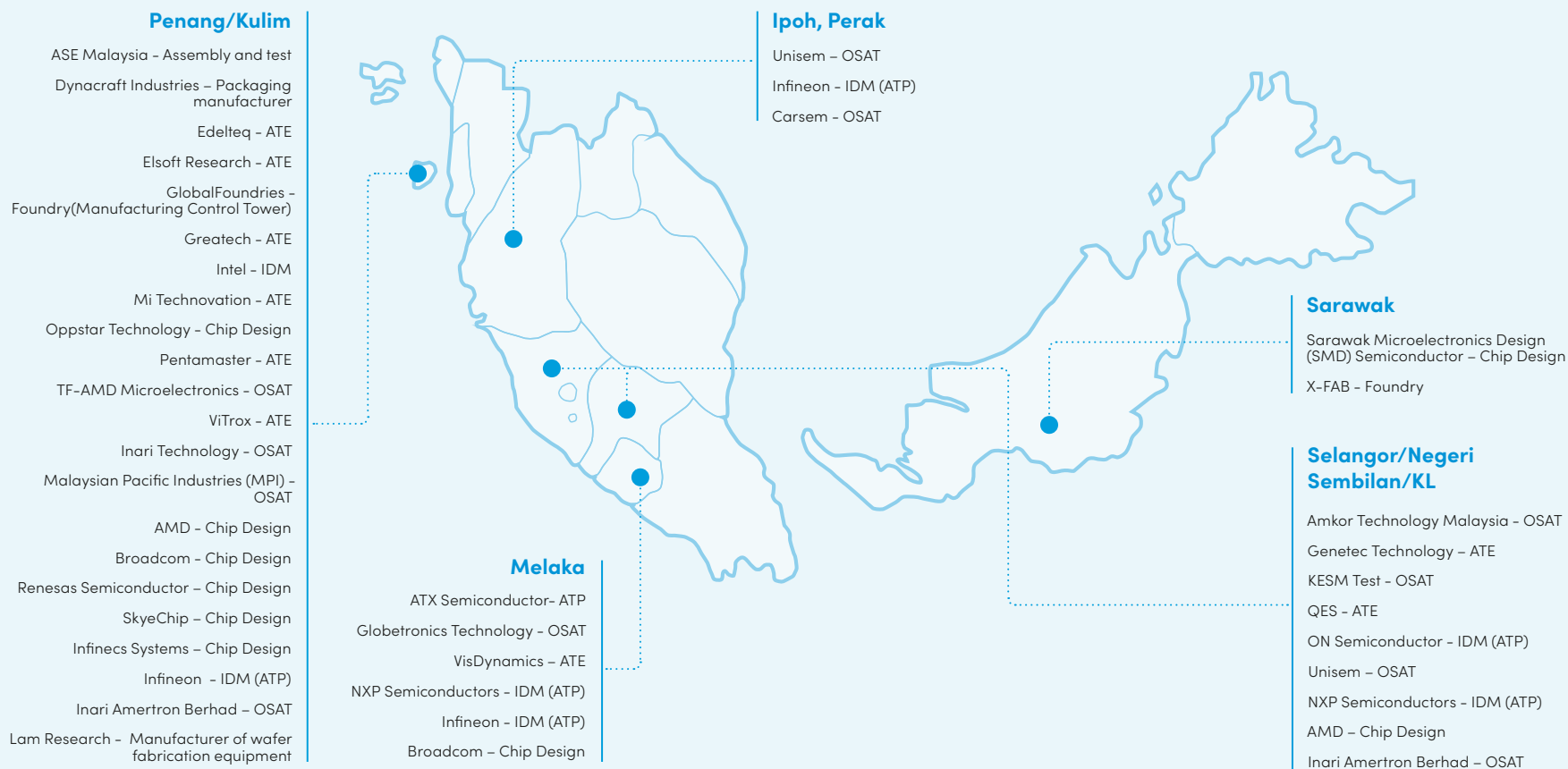
## Key players

Selection of key players in Malaysia (local companies in blue)

Company	Location	Category
AMD	Penang, KL	Chip Design
Amkor Technology Malaysia	Selangor	OSAT
ASE Malaysia	Penang	OSAT
ATX Semiconductor	Melaka	ATP
Carsem	Ipoh	OSAT
Broadcom	Penang, Melaka	Chip Design
Dynacraft Industries	Penang	Manufacturing and assembly
Edeltec	Penang	ATE
Elsoft Research	Penang	ATE
Genetec Technology	Selangor	ATE
GlobalFoundries	Penang	Foundry (Manufacturing Control Tower)
Globetronics Technology	Melaka	OSAT
Greatech	Penang	ATE
Inari Amertron Berhad	Penang, Negeri Sembilan	OSAT
Inari Technology	Penang, Johor	OSAT
Infinecs Systems	Penang	Chip Design
Infineon	Penang, Melaka, Kulim, Ipoh	IDM (ATP)
Intel	Penang	IDM
KESM Test	Selangor	OSAT
Lam Research	Kulim, Penang	Equipment
Malaysian Pacific Industries (MPI)	Penang, Johor	OSAT
Mi Technovation	Penang	ATE
NXP Semiconductors	Melaka, Seremban	IDM (ATP)
ON Semiconductor	Seremban	IDM (ATP)
Oppstar Technology	Penang	Chip Design
Pentamaster	Penang	ATE
QES	Selangor	ATE
Renesas Semiconductor	Penang	Chip Design
ROHM Semiconductor	Selangor	Sales office
Sarawak Microelectronics Design (SMD)	Sarawak	Chip Design
SilTerra	Kulim, Kedah	Foundry
SkyeChip	Penang	Chip Design
STMicroelectronics	Johor	IDM (ATP)
SymmId Corporation	KL	Chip Design
TF-AMD Microelectronics	Penang	OSAT
Unisem (M) Berhad	Ipoh, KL	OSAT
VisDynamics	Melaka	ATE
ViTrox	Penang	ATE
X-FAB	Sarawak	Foundry

Source: Intralink Research

## Location of key semiconductor operations in Malaysia



## Opportunities for UK companies (Malaysia)

The Malaysian semiconductor industry presents significant opportunities for UK companies, particularly in advanced packaging, IC design, compound semiconductors, and equipment supply. UK companies can fill gaps in technology, research, and skilled workers in Malaysia's growing semiconductor industry, establishing a strong presence by introducing new technologies, collaborating on R&D, and helping develop the workforce. What's more, Malaysia boasts many local companies that could be customers or partners, unlike some other countries in the region.

- **Advanced packaging solutions:** Driven by the miniaturisation of electronic devices, there is significant opportunity for UK companies with expertise in this area (3D packaging)
- **IC Design:** With the increasing complexity of semiconductor devices, there is a growing demand innovation. Malaysia aims to move to higher value-added services means it is looking to design ever more complex semiconductors. UK semiconductor IP companies are well placed to meet this demand. Malaysian IC design service companies could also represent low-cost outsourcing partners for UK fabless companies
- **Materials and Equipment Supply:** Malaysia relies heavily on imports for raw materials and sub-components. UK companies that supply high-purity chemicals, silicon wafers, or advanced manufacturing equipment can capitalise on the expanding semiconductor production in Malaysia
- **Skilled Workforce and R&D:** The fast-growing semiconductor industry needs many skilled workers, and UK companies can help by offering training programmes, internships, and working with Malaysian universities and technical institutes. The Malaysian government is placing more emphasis on R&D to keep up with competition and innovation. UK companies with strong R&D can collaborate with Malaysian universities or create their own centres to develop new semiconductor technologies



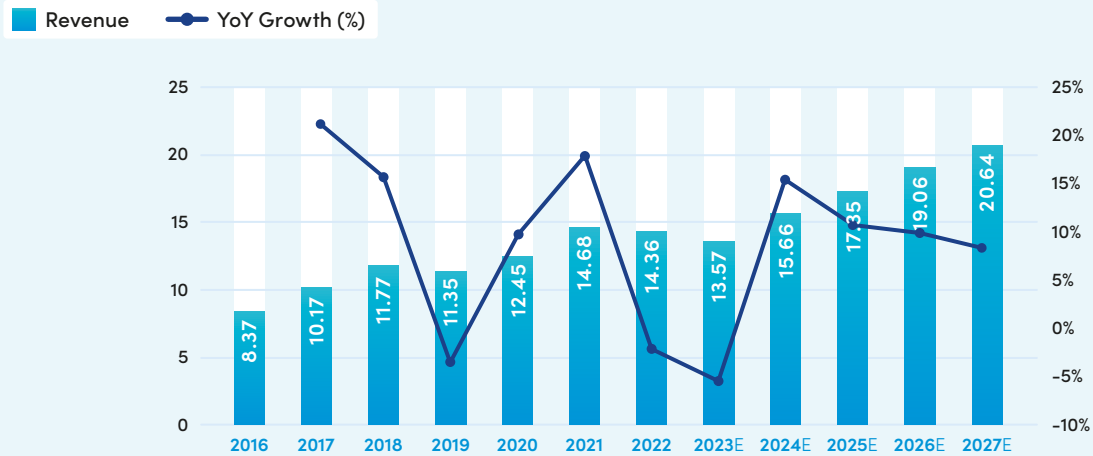
# Vietnam's semiconductor market overview

## Market size

Vietnam is becoming an increasingly important player in the global semiconductor industry. The country places third in Southeast Asia behind Singapore and Malaysia when it comes to semiconductor device exports and imports, as well as semiconductor equipment export and imports. Semiconductor device imports reached GBP 3.22bn in 2022, only GBP 235.67m behind Malaysia. Like other countries in the region, Vietnam is focused on attracting foreign firms, with a long-term view of carrying out a degree of tech transfer so it can build up its own expertise. Vietnam semiconductor industry revenue is expected to reach GBP 15.66bn in 2024. This is expected to grow at an average rate of 9.62 percent up until 2027, when total revenues will reach GBP 20.64bn. ICs make up GBP 12.8bn, or 81.7 percent of semiconductor chip revenue in Vietnam.

This is of course only semiconductor device revenue and does not include upstream revenues, which includes foreign IDM packaging operations, R&D for foreign IDMs, fabless firms, and design services.

Vietnam semiconductor industry revenue (GBP bn, YoY)



Source: Statista

Vietnam semiconductor revenue by type (GBP bn, 2024 est.)



Source: Statista

## Market segments

Vietnam's electronics manufacturing industry has grown significantly since Samsung began moving manufacturing away from China and has the potential for continued growth, with Apple also moving some production to the country. This, along with its close land proximity to China means it is well placed to not just take contract manufacturing work away from China but also back-end packaging. Vietnam is already strong in back-end packaging, but weak in all other areas. It has a nascent semiconductor design industry and plans to have a foundry for less advanced chips by 2030.

### OSAT/ATP

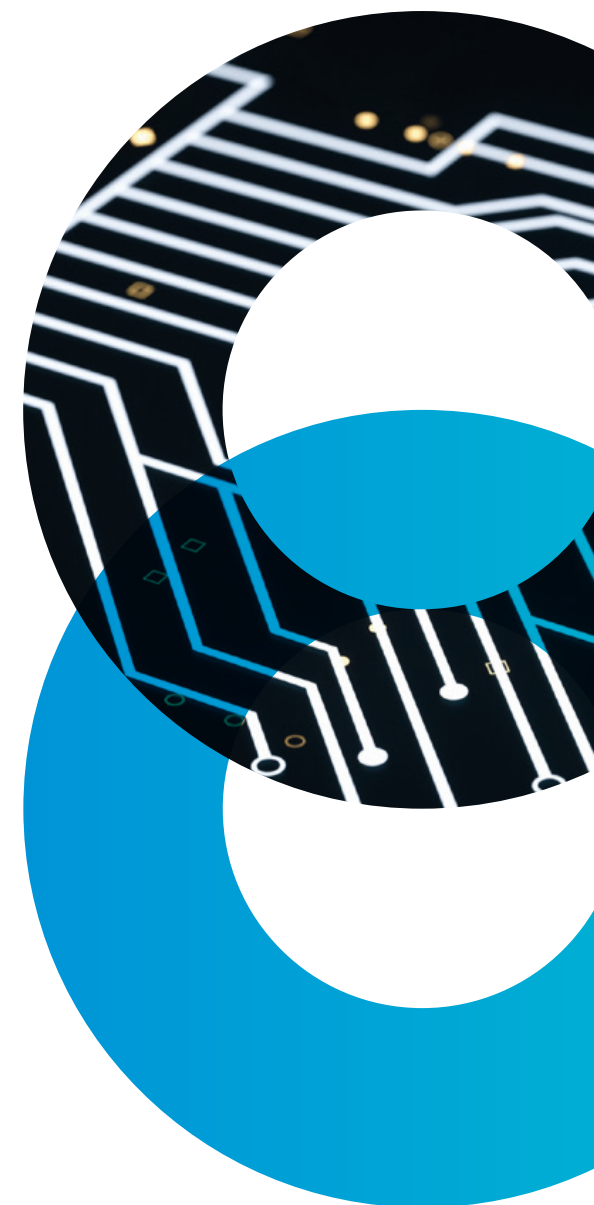
Amkor, Intel, and Hana Micron all have assembly, test & packaging operations in Vietnam. Intel's operation is its largest globally. USI, a subsidiary of the world's largest OSAT, Taiwan's ASE, also has a System in Package (SiP) plant in Haiphong. With approximately 65 percent of the world's ATP capacity in China or Taiwan there is an opportunity for Vietnam to build on its strong ATP-base to help with derisking efforts.

## IC design

Vietnam is trying to expand into chip design. Its only true semiconductor design company is FPT Semiconductor, which provides digital, analogue, and FPGA design services, focusing on power ICs and IoT ICs. Vietnam is looking to grow its IC design expertise by attracting investment from fabless companies like Nvidia, and EDA players like Synopsys. These companies can help train a new generation of talent. They will start with designing lower end chips for basic consumer devices but over time this could change. Viettel, a state-owned corporation, recently designed its own 5G chip using Synopsys tools. This shows Vietnam has the capability to design more complex chips.

### Foundry

Vietnam currently has no front-end foundries but wants to build one for less advanced chips used in cars or telecom applications. The Vietnamese government wants to build its first plant by the end of this decade and will provide the 'highest incentives available in Vietnam' to do so. It is already meeting with US companies to discuss this plan.



## Market trends

- The US sees Vietnam as a key partner. President Biden visited in September 2023. Intel, Amkor, Marvell, and GlobalFoundries all accompanied joined visit, and Nvidia recently invested GBP 196.37m in the country
- Foreign-invested companies will drive Vietnam's semiconductor growth and most products will be exported
- Advanced packaging represents an opportunity for Vietnam to become a more important player in the value chain

## Challenges

- Not enough green energy for foreign companies, which usually have green KPIs to invest
- Attracting talent is difficult and a dearth of advanced skills has limited a broader march up the electronics supply chain. Vietnam has approximately 6000 semiconductor engineers and aims to train up to 50,000 over the decade
- It relies on foreign companies for most its semiconductor industry, and competes with neighbours for investment
- Vietnam is experiencing a surge in semiconductor and electronics manufacturing companies moving in, leading to electricity and labour constraints, making nearby countries an attractive alternative

## Government initiatives

In recent years the Vietnamese government has placed ever growing importance on semiconductor industry development. Its national semiconductor strategy includes industry grants through a science fund under the Ministry of Science & Technology (MoST), and research projects in partnership with private companies such as FPT. Along with industry grants the government will also provide tax incentives and other benefits to companies which set up in the country. Its goal is to achieve a level of tech transfer and for foreign firms to help train its work force. Vingroup, an EV manufacturer, is also looking at ways to attract automotive chip companies to set up in Vietnam, and Danang Software Park is rolling out incentives to attract FDI with a focus on the semiconductor industry.

## Key players

Most key players in Vietnam are foreign firms, but there is a nascent design industry. Most companies are either in counties around Hanoi, Ho Chi Minh, and Danang.

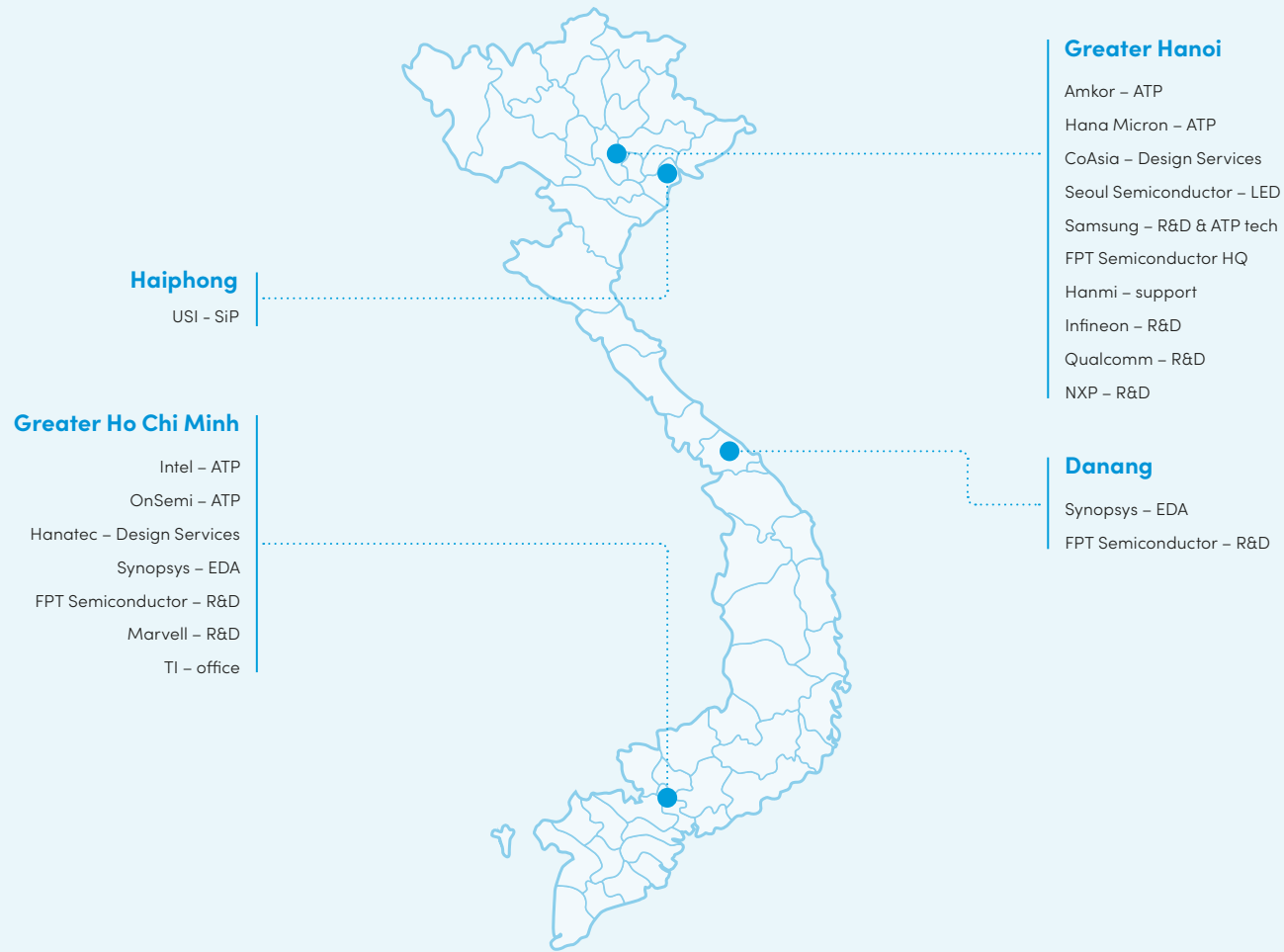
### Selection of key players in Malaysia (local companies in blue)

Company	Location	Category
Amkor	Hanoi	ATP
CoAsia	Hanoi	Design Services
FPT Semiconductor	Hanoi / Da Nang / Ho Chi Minh	Chip Design
Hana Micron	Hanoi	ATP
Hanatec	Ho Chi Minh	Design Services
Hanmi	Hanoi	Support
Infineon	Hanoi	R&D
Intel	Ho Chi Minh	ATP
Marvell	Ho Chi Minh	R&D
Nvidia	N/A	Chip Design
NXP	Hanoi	R&D
OnSemi	Ho Chi Minh	ATP
Qualcomm	Hanoi	R&D
Renesas	Ho Chi Minh / Danang	Chip Design
Samsung	Hanoi	R&D
Sannei Hytechs	Danang	Design Services
Savarti	Ho Chi Minh / Danang	Design Services
Seoul Semiconductor	Hanoi	LED
Synopsys	Ho Chi Minh / Danang	EDA
Synpase	Ho Chi Minh / Danang	Design Services
Texas Instruments	Ho Chi Minh	Sales
Uniquify	Ho Chi Minh / Danang	Design Services
USI	Haiphong	SiP
VNChip	Ho Chi Minh	Design Services

Source: Intralink Research



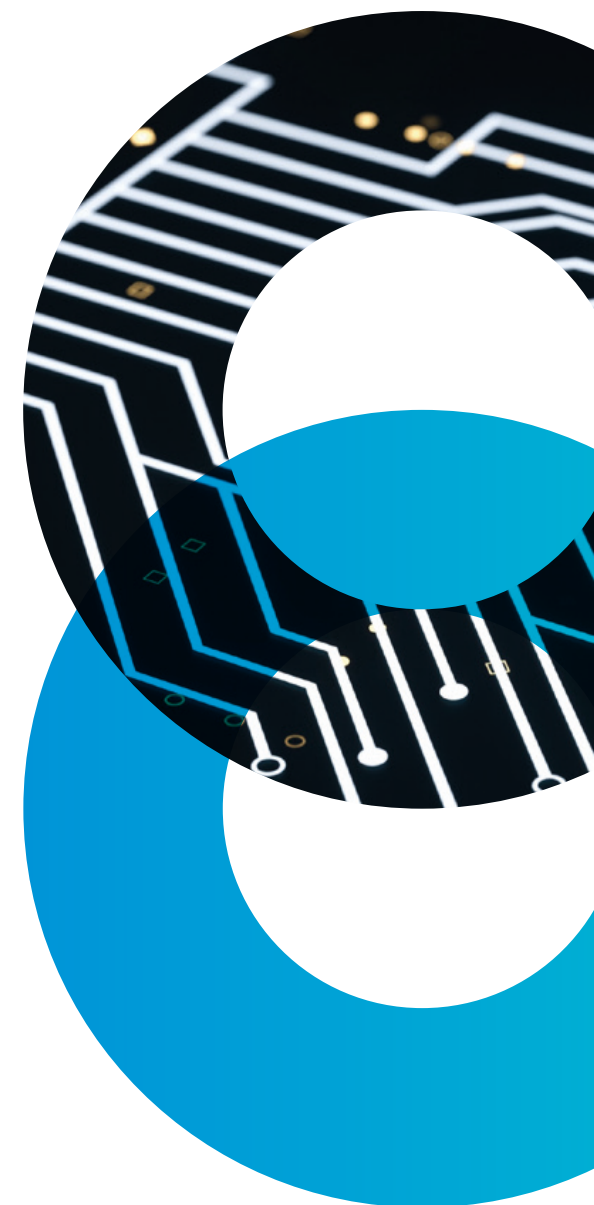
## Location of key semiconductor operations in Vietnam



Source: Intralink Research

## Opportunities for UK companies (Vietnam)

- **Advanced packaging:** As advanced packaging becomes ever more important to semiconductor design, Vietnam's packaging industry will have a need for enabling technologies, which Vietnam cannot provide itself
- **Green energy:** Vietnam needs to increase its green energy credentials to attract more global manufacturing investment. The UK is well positioned to help Vietnam with its green transition
- **Semiconductor training:** UK companies and universities can work with the Vietnam government to train new engineers, especially in semiconductor design where the UK excels. Synopsys is already providing EDA training, Qualcomm has an 'Innovation Challenge' in the country, and Samsung works with universities
- **IP:** The UK leads the world when it comes to semiconductor IP. Vietnam's IC design industry is in the very early stages so any IP companies should look at Vietnam as part of a regional strategy
- **Automotive:** Vietnam has a small EV industry. It's leading company, Vinfast, sells EVs globally and has announced it will provide incentives to foreign automotive semiconductor companies willing to invest in the country



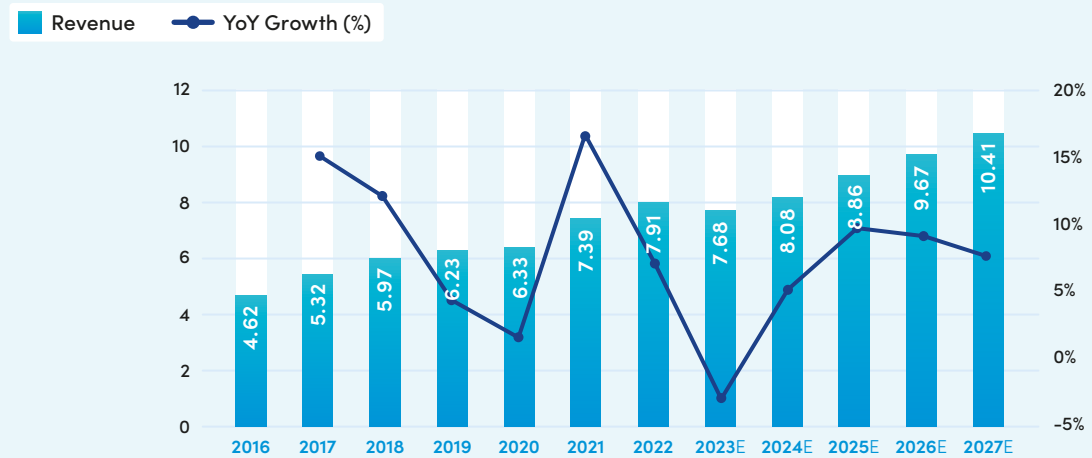
# Thailand's semiconductor market overview

## Market size

Thailand is an emerging player within the region's electronics industry and has been gradually building its presence in the semiconductor sector, largely focused on assembly and testing services. The country is a production base for several multinational electronics companies, which contributes to the semiconductor market's expansion through both direct and indirect consumption of semiconductor devices. Thailand's semiconductor industry revenue is expected to reach GBP 8.08bn in 2024. This is expected to grow at a rate of 8.88 percent up until 2027 where market volume will reach GBP 10.41bn. ICs make up most sales at GBP 6.76bn.

These numbers represent semiconductor chip sales revenue and do not include the entire semiconductor industry for example upstream tools, IP, and equipment.

Thailand's semiconductor industry revenue (GBP bn YoY)



Source: Statista

Thailand semiconductor revenue by type (GBP bn, 2024 est.)



Source: Statista

## Market segments

Thailand is a major player in Southeast Asia's semiconductor industry, though not as large as Singapore and Malaysia, and has seen significant growth in recent years driven by government incentives (Thailand 4.0) and US diversification of semiconductor production.

### Foundry

Thailand's foundry industry is still small. It has no pureplay foundries but does have some IDMs. These include Rohm, Lite-On, and in February 2024 Sony established a new GBP 51.85m semiconductor fab producing image sensors for the automotive industry. Currently, Thailand has two local foundries – EIC, which produces discrete semiconductors, and NTP Semiconductor (TMEC), which produces MEMS and sensory chips. Thailand has no logic foundries.

### OSAT/ATP

Thailand is strong in the OSAT and ATP segment, with several local and international firms operating facilities such as Stars Microelectronics, HANA Semiconductor, and NXP Semiconductors. In 2020, Thailand accounted for roughly 7.5 percent share of the global OSAT market, ranking 12th globally. Thailand's developed back-end segment, strategic geographic advantage, and lower labour costs make it an attractive location for expanding OSAT facilities.

## IC design

IC design in Thailand is still emerging, with a focus on smaller scale operations and specialised applications such as RFID, sensors, and embedded systems. One of the key players is Silicon Craft Technology, the first privately held Thai semiconductor design company. It provides ASIC design services as well as RFID and NFC chips. There is considerable room for growth in this area, supported by government incentives aimed at boosting local chip design capabilities. The Thai government is investing in IC design as part of its plans to foster innovation in EV technology.



## Market trends

- The Thai government's initiative to promote Industry 4.0 has created opportunities in industrial automation, IoT, and smart factories. There's push for industrial efficiency and connectivity
- Thailand's automotive industry is rapidly transitioning towards EVs and smart automotive technologies, driving up the demand for semiconductors in this sector. For example, Sony began operations at its new GBP 51.85m semiconductor fab for driver-assist image sensors in Thailand
- US production investment into Thailand as part of the Indo-Pacific Economic Framework (IPEF) to diversify production
- R&D collaboration to develop talent and stay competitive
- PCB and electronic manufacturing service companies are moving to SEA from China, this includes Thailand

## Challenges

The future development of Thailand's semiconductor sector faces significant challenges. These primarily stem from:

- Technological limitations, including a scarcity of local expertise in advanced semiconductor processes and the need for considerable investment to upgrade infrastructure and capabilities
- Stiff competition from well-established semiconductor hubs in Southeast Asia, notably Singapore and Malaysia, which already possess advanced technological infrastructure and skilled talent pools
- Lacking the level of development seen in more mature markets. Issues such as fluctuating economic policies, political instability, and infrastructural constraints could impact the operations of high-tech industries
- The risk of IP infringement can be higher than in some other countries, which could deter investment in high-tech industries like semiconductors where IP is a critical asset

## Government initiatives

The Thai government has recognised the strategic importance of the semiconductor industry as a driver of technological advancement and economic growth. It has launched several initiatives under the 'Thailand 4.0' policy, with the semiconductor industry being identified as a critical focus area. The initiative supports the semiconductor industry through R&D funding, tax incentives – Board of Investment (BOI), and infrastructure support – and the Eastern Economic Corridor (EEC), aiming to foster innovation and enhance production capabilities.

To develop the workforce and enhance Thailand's competitiveness in the global semiconductor industry, the Thai government collaborates with 17 universities together with 7 private sector companies (Delta Thailand, Infineon Technology Thailand, PTT, Hana Micro Electronics, Hana Semiconductor, Analog Device Thailand, and Silicon Craft Technology) to launch the 'Semiconductor and Advanced Electronics' workforce development project as part of 'the Sandbox Project'. This project is a collaboration between the Office of the National Higher Education, the Science, Research and Innovation Policy Council, the Thai Cooperative Education Association (TCEA), and private sector organisations in the semiconductor industry cluster. The initiative aims to develop a skilled talent pool to meet the semiconductor industry needs in Thailand. In addition, Thailand's government provides R&D and HR incentives such as exemption of Thailand's 20 percent corporate income tax rate up to 13 years and 8 years respectively.

## Key players

Selection of key players in Thailand (local companies in blue)

Company	Location	Business
Analog Devices Thailand	Chon Buri	OSAT
EIC	Bangkok	Foundry
HANA Semiconductor (Ayutthaya)	Ayutthaya	OSAT
Infineon Technologies	Nonthaburi	IDM
KEC	Lamphun	Foundry
Microchip Technology	Chachoengsao	OSAT
Nisshinbo Micro Devices	Lamphun	IDM
NTP Semiconductor	Bangkok	Foundry
NXP Semiconductors	Bangkok	OSAT
ROHM Integrated Systems	Pathum Thani	IDM
<b>Silicon Craft Technology (SICT)</b>	<b>Bangkok</b>	<b>IC Design</b>
Sony Device Technology	Pathum Thani	OSAT
<b>Stars Microelectronics</b>	<b>Ayutthaya</b>	<b>OSAT</b>
STMicroelectronics	Bangkok	Sales
Toshiba Semiconductor	Prachin Buri	OSAT
UTAC	Bangkok, Chachoengsao	OSAT

Source: Intralink Research



Location of key semiconductor operations in Thailand



**Bangkok/Central Thailand**

- EIC – Foundry
- NTP Semiconductor – Specialty Foundry
- NXP Semiconductors – OSAT
- Silicon Craft Technology – IC Design
- STMicroelectronics – Sales
- UTAC – OSAT
- Infineon Technologies – IDM
- ROHM Integrated Systems – Foundry
- Sony Device Technology – OSAT
- Toshiba Semiconductor – OSAT

**Lamphun**

- KEC
- Nisshinbo Micro Devices – IDM
- Analog Devices – OSAT

**Chachoengsao/Chon Buri**

- UTAC – OSAT
- Microchip Technology – OSAT
- Analog Devices – OSAT

Source: Intralink Research

## Opportunities for UK companies (Thailand)

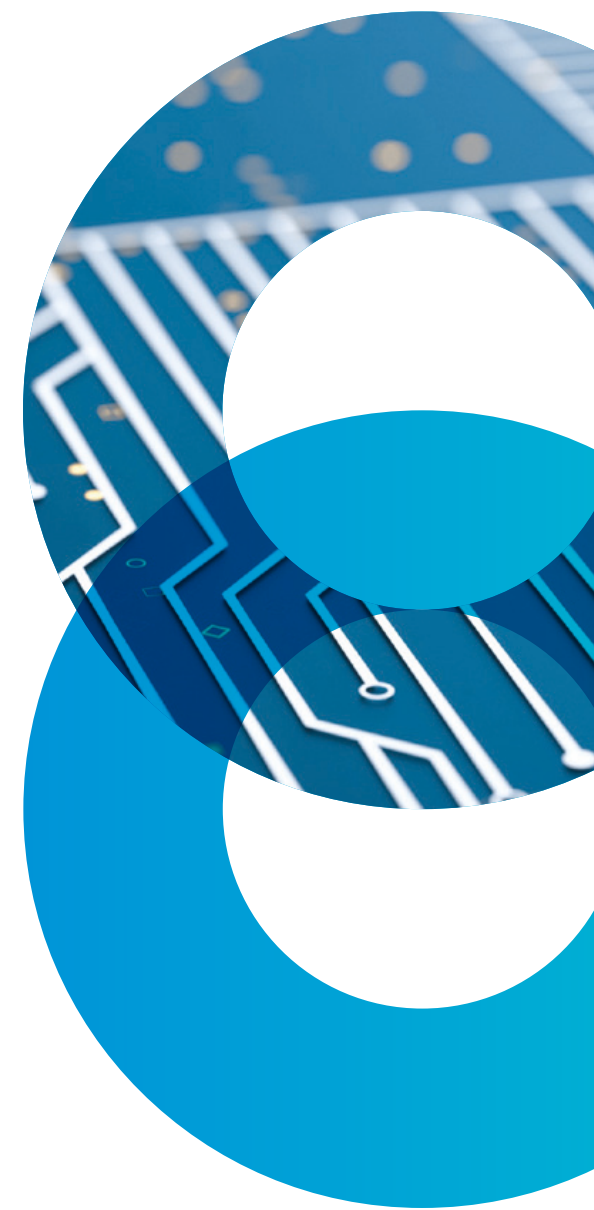
The Thai government has designated the wafer fabrication and IC design industries as strategic. With the Thai government's recognition of the importance of the semiconductor industry and support policies, there are opportunities in Thailand's semiconductor industry for UK companies, particularly in the following segments:

### ○ **Automotive & Consumer Electronics:**

Thailand's push towards EVs and advanced automotive technologies demands sophisticated electronic components, including sensors, microcontrollers, and power semiconductors. The Thai government's incentives for EV production and related technologies help drive the sector. UK automotive semiconductor companies should consider Thailand. It is the largest EV producing country in ASEAN with large Chinese EV brands such as BYD, SAIC, Great Wall, and Chery having plants there

- **Compound:** With a growing EV industry Thailand will require increasing amounts of compound semiconductors

- **ATP:** As some back-end supply chains move away from China and into ASEAN, Thailand, will be key market for advanced packaging technology and know-how
- **Industrial Automation:** Thailand is quickly developing in fields like smart cities and IoT, covering everything from advanced farming to automating factories. This growth requires ICs, sensors, and connectivity modules. UK companies with capabilities in sensor technology, AI chips, and IoT solutions may find opportunities here
- **R&D:** Thailand's semiconductor industry struggles with R&D. UK companies with strong R&D backgrounds can collaborate with Thai educational institutions and research centres or take part in the 'Semiconductor and Advanced Electronics workforce' development project
- **Expansion of 5G Infrastructure:** As part of Thailand 4.0, Thailand has accelerated the rollout of 5G technologies, which has in turn drive the growth of the semiconductor industry. UK companies with wireless infrastructure semiconductor solutions should consider exploring the Thai market



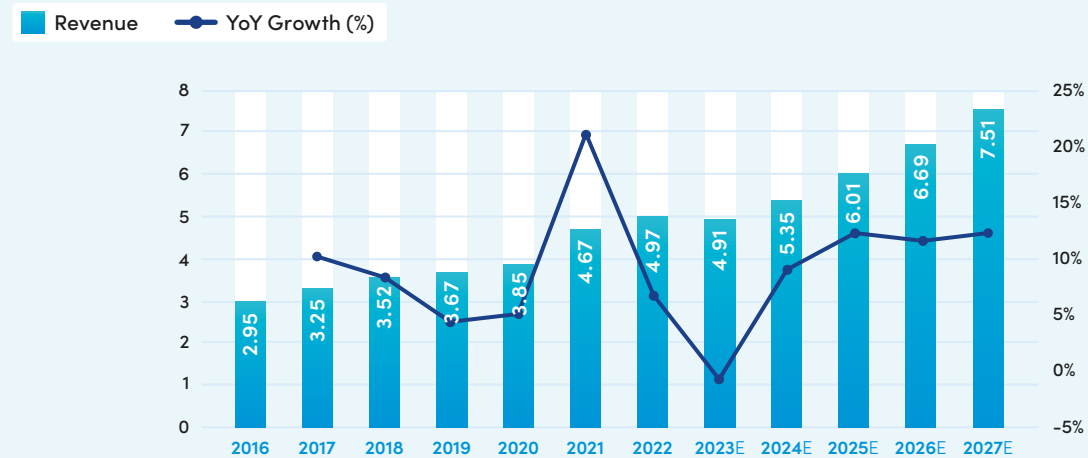
# The Philippines semiconductor market overview

## Market size

The Philippines places fifth in Southeast Asia when it comes to semiconductor device exports and imports as well as semiconductor equipment export and imports. Semiconductor device imports reached nearly GBP 1.67bn in 2022, GBP 600.91m behind Thailand. Like other countries in the region, the Philippines is focused on attracting foreign firms, with a long-term view of carrying out a degree of tech transfer so it can build up its own expertise. The Philippines' semiconductors industry revenue is expected to reach GBP 5,35bn in 2024. This is expected to grow at a rate of 11.91 percent up until 2027 when total revenues will reach GBP 7.51bn. ICs make up GBP 4.61bn of semiconductor chip sales in the Philippines, or 86 percent.

This is only semiconductor device revenue and does not include upstream revenues. The semiconductor and electronics industry accounts for approximately 60 percent of its exports. Its focus is on the assembly, test, and packaging sector.

The Philippines' semiconductor industry revenue (GBP bn YoY)



Source: Statista

The Philippines' semiconductor revenue by type (GBP bn, 2024 est.)



Source: Statista

## Market segments

The Philippines is home to about 500 semiconductor and electronics companies, including Texas Instruments, Philips, Fairchild, Analog Devices, Sanyo, On Semi, and Rohm; as well as the largest producers of hard drives, Hitachi, Toshiba, Fujitsu, and NEC. It is particularly strong in the test, packaging, and assembly of semiconductors, has established a dedicated centre to support IC design, and wants to become a home for IC design companies serving customers worldwide.

### OSAT/ATP

Currently, the Philippines has 13 semiconductor assembly, test, and packaging facilities. The ICs processed in these facilities mainly come from Taiwan, the USA, and Japan, with finished products primarily exported to Singapore, China, and Japan for installation into electronic devices.

### Foundry

The Philippines currently has no foundries but is looking into the establishment of a lab-scale wafer fabrication plant. The wafer fab lab will aim to train and upskill the local workforce and enable the local industry to do prototyping and some tape outs of semiconductor chip designs domestically instead of sending them to Taiwan.

## Other

The Philippines is preparing a work plan for critical minerals. It sees this as a possible area it can help allies move away from minerals from China. The country also hopes to move into IC design but requires training and the ability to attract foreign design firms.

## Market trends

- Increased investment from the US
- Expansion of ATP capacity
- No strong growth in local firms, focus is on investment from international companies, especially in assembly, test, and packaging

## Challenges

- The Philippines needs to work with international partners to help train its workforce if it wants to move up the value chain
- Despite strong foreign investment the Philippines is struggling to diversify away from being a location for back-end packaging processes. It needs to find ways to move into design and perhaps foundry services
- The Philippines lacks any strong domestic semiconductor companies



## Government initiatives

Recently, US Secretary of Commerce Gina Raimondo expressed a desire to assist the Philippines in doubling its semiconductor facilities to lessen the geographic concentration of the global chip supply chain. She also announced a plan to invest GBP 790m in the country. The Philippines is among the six countries that will be supported under the US CHIPS Act, with assistance focused on assembly, test, and packaging. This means funding of GBP 78.55m per year over the next 5 years. While the US would like to onshore much of its semiconductor industry, some parts, like ATP, do not make sense economically, and so the US is looking for allies like the Philippines to work with.

Key Philippines' government agencies include the Board of Investments (BOI), the Department of Science and Technology (DOST), the National Economic and Development Authority (NEDA), the Department of Information and Communications Technology (DICT), the Strategic Trade Management Office (STMO), the Department of Trade & Industry (DTI), and the Semiconductor and Electronics Industries in the Philippines Foundation, Inc. (SEIPI).

Although it doesn't address semiconductors directly, DTI's 'Inclusive Innovation Industrial Strategy' (I3S) aims to create globally competitive and innovative industries in the Philippines through (1) building an innovation and entrepreneurship ecosystem that will help form new industry clusters; (2) removing obstacles to growth to help the Philippines attract more investment; (3) strengthening the domestic supply chain to encourage inclusivity and promote self-sufficiency; and (4) deepening the participation of the industries in global and regional value chains to maximize economic benefits.



## Key players

Most key players in the Philippines are in Metro Manila, Calabarzon, Northern/Central Luzon, and Cebu. Manila is the standout hub, hosting companies such as Amkor, Onsemi, and Toshiba. There are key companies like TI and OnSemi elsewhere. Laguna has been a key location for the HDD industry for many years.

### Selection of key players in Malaysia (local companies in blue)

Company	Location	Business
Amkor	Metro Manila	OSAT
Analog Devices	Metro Manila	Analog Design
ATEC	Metro Manila	OSAT
Fastech Synergy Philippines	Metro Manila	IDM Power/RF
Fujitsu	Laguna	HDD
Hitachi	Laguna	HDD
Nexperia	Metro Manila	IDM (ATP)
OnSemi	Metro Manila / Tarlac / Cebu	IDM (ATP)
SEIPI	Metro Manila	Association
SFA Semicon	Pampanga	OSAT
SPI/Semicon	Metro Manila	Plastic parts
Rohm	Metro Manila	IDM (ATP)
TI	Baguio / Pampanga	IDM (ATP)
Toshiba	Laguna	HDD
XiNYX	Metro Manila	Design Services

Source: Intralink Research



## Location of key semiconductor operations in the Philippines



## Opportunities for UK companies (The Philippines)

- **Advanced packaging:** the Philippines is home to 13 assembly, test, and packaging facilities run by international corporations. As the Philippines becomes more important over the coming years in this space the need for these facilities to install advanced packaging capabilities will increase
- **Raw materials:** the Philippines will need assistance in how to mine and process raw materials used in the semiconductor industry
- **Expansion & Education:** the Philippines represents a low-cost, English-speaking alternative to other countries in the region. This means training talent in IC design or production may be easier than other countries. There is potential for it to become a low-cost design services base to add to its status as an ATP base

The Philippines represents a low-cost, English-speaking alternative to other countries in the region. This means training talent in IC design or production may be easier than other countries.

# Indonesia's semiconductor market overview

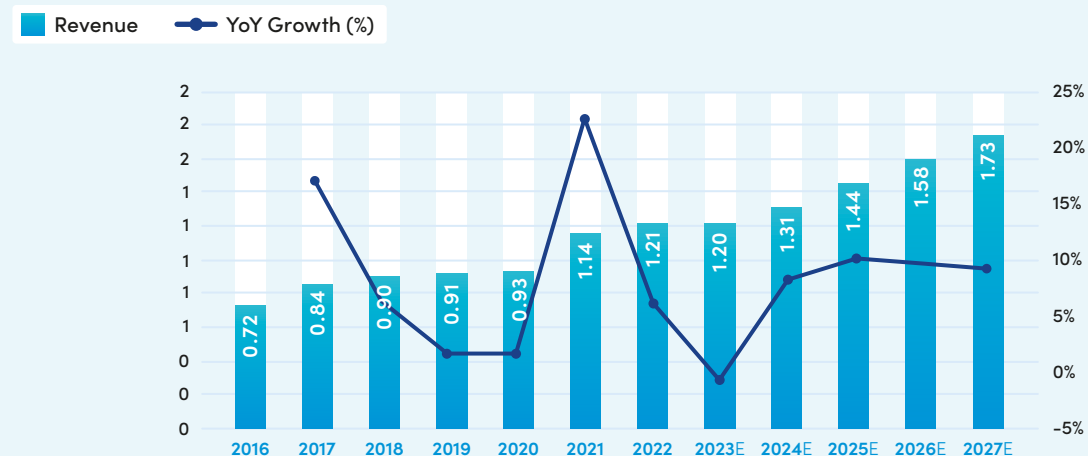
## Market size

Indonesia aims to become an important player in the global semiconductor industry and wants to partner with the US but is still at a very nascent stage. The country places sixth in Southeast Asia among countries covered by the TGP when it comes to semiconductor device exports and imports as well as semiconductor equipment exports and imports. Semiconductor device imports reached nearly GBP 940m in 2022, GBP 790m behind the Philippines. Like other countries in the region, Indonesia is focused on attracting foreign companies, with a long-term view of carrying out a degree of tech transfer so it can build up its own expertise. Indonesia's semiconductor industry revenue is expected to reach GBP 1.31bn in 2024. This is expected to grow at a rate of 9.93 percent up until 2027 when total revenues will reach GBP 1.73bn. ICs make up the majority of semiconductor sales at GBP 1.02bn, or 79 percent.



With 270m+ people Indonesia has the fourth largest population in the world and is the largest economy in ASEAN. As such it is also one of the largest consumer electronics markets in the world, and so a large market for end devices containing semiconductors. This, along with low labour costs, gives it potential to increase its capacity in the back-end ATP/OSAT industry and electronics contract manufacturing.

### Indonesia's semiconductor industry revenue (GBP bn YoY)



Source: Statista

### Indonesia's semiconductor revenue by type (GBP bn, 2024 est.)



Source: Statista

## Market segments

Indonesia only has one strong example of an international IDM undertaking back-end manufacturing in the country but does have a growing materials industry, and some low-end semiconductor and electronics manufacturing.

### OSAT/ATP

Infineon has had a facility in Batam, Riau Islands since 1996, serving the automotive industry. It is a back-end packaging facility and was recently expanded to be double the original size. Production in the expanded facility began in 2024 and it employs 1000s of people.

## Materials

Indonesia possesses critical resources for the semiconductor industry e.g., abundant silica reserves, the world's largest nickel deposits, as well as an abundance of tin, copper, and gallium. It has the potential to be a supplier of many raw materials, which are currently sourced from China.

### Other

Japanese firms such as NEC and Sharp have lower-end semiconductor manufacturing facilities in Jakarta and Samsung manufactures some handsets in the country. The Samsung facility was established in 2015 and manufactures around 800,000 phones a year for the domestic market.

**"In view of increasing demand for automotive semiconductors and to the benefit of our customers, this purchase is allowing us to add back-end capacities faster than with the greenfield construction of a new site."**

Dr. Thomas Kaufmann – Executive Vice President and COO of Infineon's Automotive Division



## Market trends

- Electronics manufacturing increasing year-on-year
- Growing end market for electronic devices due to large population
- Increased government support and focus
- Increased investment from the USA

## Challenges

- Neighbouring countries like Malaysia and Vietnam often seen as more favourable to foreign companies
- Regulations can be unstable, changing from one year to the next
- Lack of skilled labour
- Limited R&D capabilities and investment
- Lack of local suppliers
- Lack of infrastructure

## Government initiatives

Indonesia's Ministry of Industry will complete its semiconductor roadmap by the end of 2024. This will be a plan for the coming decade, 2025 to 2035. The country is keen to follow Vietnam as a partner for the US's semiconductor supply chain, with the US already announcing Indonesia will also be part of its International Technology Security and Innovation (ITSI) Fund under the CHIPS Act. A review of Indonesia's current semiconductor ecosystem, regulatory framework, infrastructure, and workforce will be carried out before any specific announcements and plans are made.

The Batam government and Indonesia's Ministry of Economic Affairs, are trying to make Batam the centre of semiconductors in Indonesia. With a free-trade zone conveniently located near Singapore and Malaysia, the local government is looking to attract foreign investment, especially from the US as a low-cost option for plants looking for a new location away from China. Infineon is already located here and Powin, a US energy storage company, also plans to invest in a semiconductor plant there. The government is also offering tax incentives and subsidies to semiconductor companies setting up in the country.

The government provides a 100 percent tax holiday for up to 20 years for some semiconductor investments, and a 100 percent import duty exemption for equipment and raw materials used in semiconductor manufacturing.

The government is also looking to solve its talent problem, so set up a semiconductor training centre in Bandung. The centre aims to train 1,000 semiconductor design and manufacturing students per year.

## Key players

Indonesia does not have any strong local semiconductor companies. It needs to attract more foreign companies, gain local knowledge, and enact some form of tech transfer to begin building up local companies.

### Selection of key players in Malaysia (local companies in blue)

Company	Location	Business
Infineon	Batam	IDM (ATP)
National Research & Innovation Agency	Jakarta	R&D
NEC	Jakarta	Signal Transistors
Samsung	Jakarta	Electronics
Semiconductor Training Centre	Bandung	Training
Sharp	Jakarta	LED, Laser

Source: Intralink Research



## Location of key semiconductor operations in Indonesia



## Opportunities for UK companies (Indonesia)

Opportunities for UK companies remain limited. Indonesia represents a huge end market for consumer electronic device companies and a potential low-cost alternative to other ASEAN countries. The west of the country is very close to Singapore and Malaysia, making it convenient for companies that wish to have experts in Singapore and manufacturing in Indonesia, for example in Batam, where Infineon has a packaging factory within a short boat ride from downtown Singapore.

- **Raw materials:** Indonesia will need assistance in how to mine and process raw materials used in the semiconductor industry
- **ATP:** Indonesia has the potential to become a strong player in the ATP/OSAT space, any UK company with expertise here, be it in software or equipment may see Indonesia as growing market over the next decade
- **Education:** there is room for British companies to work with Indonesian research institutes and universities to help train the next generation of semiconductor industry experts

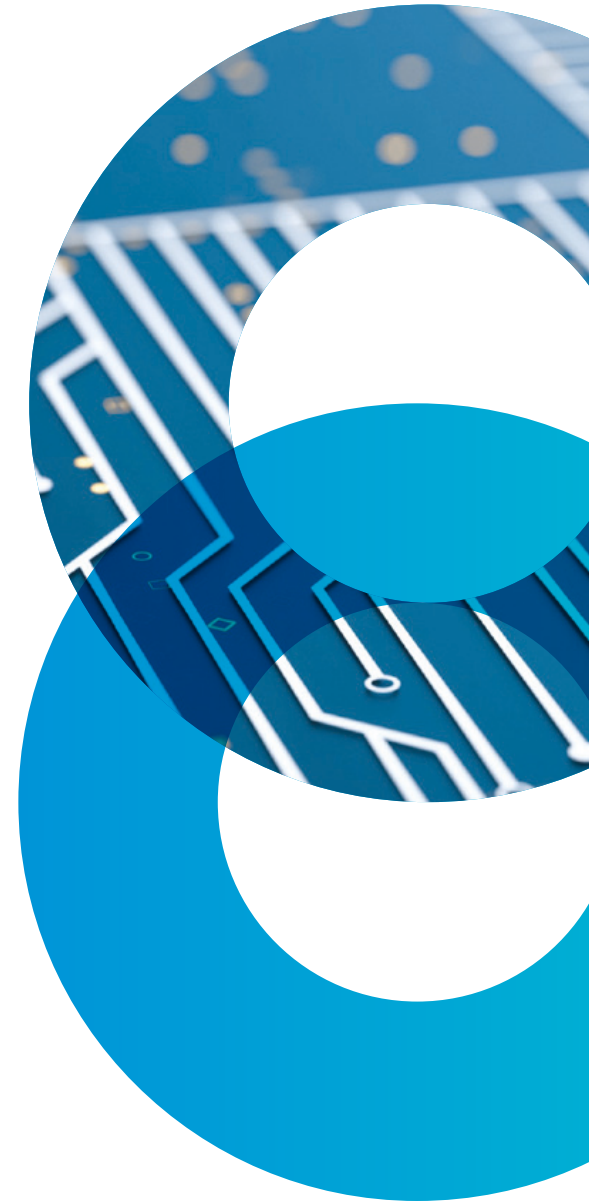


# Routes to market

**It is essential for companies to conduct comprehensive market research before entering any of these markets. A strategic approach involving partnerships, understanding local regulations, and integrating into the supply chain is essential for success.**

It is essential to choose the right entry strategy, utilise government incentives, and attend/participate in trade shows. With careful planning and local partnerships, UK firms can greatly increase their chance of success.

- **Representative:** A local representative is a low-cost option to act as your salesperson on the ground. They are good at getting in front of people within their network but may often struggle outside of this. They can also be difficult to find, personal introductions are usually the only way
- **Business development consultant:** A business development consultant acts in a similar manner to a representative but can work outside of their immediate relationships and bring technologies to new contacts. They can also help with market research and strategy and help manage distributors and JVs
- **Distributors:** Using a distributor in Singapore can accelerate UK companies go-to-market time. With Singapore being a regional hub, distributors in Singapore are mostly familiar with distribution regulations and channels within the region. UK companies can leverage on that to expand their presence not only in Singapore but also the region. There is no language barrier in Singapore, the Philippines, or Malaysia, but this may be the case in other countries
- **Joint ventures or Partnerships:** Collaborating with local companies can provide UK companies with essential local knowledge, facilitate easier market entry, and share risks. These can be especially useful in the manufacturing sector. Participation in trade associations and industry clusters can facilitate connections with potential suppliers and customers, e.g. SSIA, MSIA, etc.
- **Direct investment:** Establishing a manufacturing or assembly facility in Singapore offers direct access to the SEA markets. The Singaporean government offers various incentives for foreign investment in high-tech sectors, including semiconductors. As a start, companies can reach out to EDB Singapore



## ○ Setting up a company:

- **Singapore:** Establishing a company in Singapore is straightforward and easy. UK companies can either open a representative office, branch office, or incorporate a business in Singapore with the Accounting and Corporate Regulatory Authority (ACRA). It takes 1-3 working days. Singapore is known for its business-friendly laws, attractive tax system as well as good IP protection
- **Malaysia:** In Malaysia, UK companies can either open a representative office, branch office or incorporate business with the Companies Commission of Malaysia (Malay: Suruhanjaya Syarikat Malaysia, abbreviated SSM). A Private Limited Company allows 100 percent foreign ownership. However, specific sectors, such as agriculture, banking, education, and oil and gas, mandate 50 percent Malaysian ownership. It takes 5-10 working days
- **Vietnam:** There are several types of corporate structure foreign companies can consider in Vietnam, more common options are a representative office, branch office or an LLC, which allows 100 percent foreign ownership. For an LLC, it generally takes 3 to 4 months to set up
- **Thailand:** There are several types of company structure foreigner can set up in Thailand – partnership, representative office, branch office, Thai limited office. However, all of which require minimally a 51 percent Thai ownership. Thailand's BOI can approve 100 percent ownership, but the application process can take 1-2 months
- **The Philippines:** Setting up a company in The Philippines as a foreigner can be done through domestic corporation which is equivalent to a PLC or LLC. 100 percent foreign ownership is allowed in The Philippines. Generally, with a company of more than 40 percent foreign shares, a start-up capital of GBP 158,000 is required. This process can take 2-3months.
- **Indonesia:** There are two main ways to set up a company in Indonesia as a foreigner. First is a Perseroan Terbatas (PT), which is like an LLC, however this does not allow 100 percent foreign ownership. The other option would be to set up a PT PMA (Perseroan Terbatas Penanaman Modal Asing), which is an LLC with foreign investment. The minimum capital requirement for PT PMA is GBP 549,000 and takes about 10 weeks to complete



## Tradeshows

Some key semiconductor related trade shows in each country can be found below.

### Semiconductor events in Singapore

Event	Date	Website
<b>IEEE International Symposium on the Physical and Failure Analysis of Integrated Circuits (IPFA 2025)</b>	15-18 Jul	<a href="http://www.ipfa-ieee.org/2024">www.ipfa-ieee.org/2024</a>
<b>SSIA Business Connect 2025</b>	23 Jul	<a href="http://ssia.org.sg/semiconductor-business-connect/">ssia.org.sg/semiconductor-business-connect/</a>
<b>SSIA Flagship Event: Summit 2025</b>	18 Sept	<a href="http://ssia.org.sg/ssia-summit-semiconductor-dinner/">ssia.org.sg/ssia-summit-semiconductor-dinner/</a>
<b>Industrial Transformation APAC</b>	14-16 Oct	<a href="http://www.industrial-transformation.com/sg">www.industrial-transformation.com/sg</a>
<b>SEMICON SEA</b>	20-22 May 2025	<a href="http://www.semiconsea.org">www.semiconsea.org</a>
<b>Electronics Packaging Technology Conference (EPTC) 2024</b>	3-6 Dec	<a href="http://www.eptc-ieee.net">www.eptc-ieee.net</a>



## Semiconductor events in Malaysia

Event	Date	Website
IEEE International Symposium on the Physical and Failure Analysis of Integrated Circuits (IPFA 2025)	15-18 Jul	<a href="http://www.ipfa-ieee.org/2024">www.ipfa-ieee.org/2024</a>
Electronics Manufacturing Expo Asia (EMAX) 2025	24-26 Jul	<a href="http://www.emaxasia.com">www.emaxasia.com</a>
17th IEEE International Symposium on Embedded Multi-core/Many-core Systems-on-Chip (MCSoc-2024)	16-19 Dec	<a href="http://www.mcsoc-forum.org">www.mcsoc-forum.org</a>

## Semiconductor events in Vietnam

Event	Date	Website
Vietnam Manufacturing Expo	6-8 Aug 2025	<a href="http://www.vme-expo.com">www.vme-expo.com</a>
Nepcon Vietnam	10-12 Sept 2025	<a href="http://www.nepconvietnam.com">www.nepconvietnam.com</a>
Vietnam International Electronic Fair (Middle Chapter)	11-13 Sept	<a href="http://www.vietronicsfair.com/en">www.vietronicsfair.com/en</a>
Vietnam Semiconductor Summit	28 Oct	<a href="http://www.mpi.gov.vn/en/">www.mpi.gov.vn/en/</a>
Vietnam International Innovation Expo	28 Oct	<a href="http://www.expo.nic.gov.vn">www.expo.nic.gov.vn</a>
Vietnam International Electronic Fair (Northern Chapter)	6-8 Nov	<a href="http://www.vietronicsfair.com/en">www.vietronicsfair.com/en</a>
Vietnam Business Summit – Connecting Vietnam to the SEA Semiconductor Ecosystem	7-8 Nov	<a href="http://www.semi.org/en/sea/events/vbs2024">www.semi.org/en/sea/events/vbs2024</a>



### Semiconductor events in Thailand

Event	Date	Website
Future Mobility Asia	7-9 May 2025	<a href="http://www.future-mobility.asia">www.future-mobility.asia</a>
NEPCON Thailand 2024	18-21 June 2025	<a href="http://www.nepconthailand.com">www.nepconthailand.com</a>

### Semiconductor events in Philippines

Event	Date	Website
The 19th Philippine Semiconductor & Electronics Convention and Exhibition 2025	24-26 July	<a href="http://www.psece.wordpress.com/about-us">www.psece.wordpress.com/about-us</a>
World of Consumer Electronics Expo 2025	7-10 Aug	<a href="http://www.wocee.ph">www.wocee.ph</a>

### Semiconductor events in Indonesia

Event	Date	Website
Inatronics	23-25 April 2025	<a href="http://www.inatronics-exhibition.net">www.inatronics-exhibition.net</a>
Manufacturing Indonesia	4-7 Dec	<a href="http://www.manufacturingindonesia.com">www.manufacturingindonesia.com</a>

Source: Intralink Research



# About this report

This report is prepared as part of the UK-APAC Tech Growth Programme by Intralink Limited.

## Exchange rates used in the report

GBP 1 = USD 1.27

GBP 1 = SGD 1.72

GBP 1 = MYR 6.00

GBP 1 = VND 32,263.06

GBP 1 = THB 46.70

GBP 1 = PHP 74.75

GBP 1 = IDR 20,803.30

## About Intralink

Intralink is an international business development consultancy specialising in Asia. Its mission is to accelerate companies' growth, innovation, and green transition through cost-effective, results-driven global engagement.

The firm has 140+ multilingual employees across 15 offices in Japan, South Korea, China, Taiwan, Singapore, the US, the UK, France, Poland, and Israel.

Its teams on the ground in Asia – immersed in the business practices, cultures, and customs of their markets – enable western companies to grow sales and forge partnerships in the region. They also help Asian corporates to harness the power of global innovation and governments to grow their exports and attract foreign investment.



**Nicole Oon**

Project Coordinator,  
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**Stewart Randall**

VP, Head of Electronics

Intralink is different from other consultancies in not just developing the right strategies for its clients but taking a hands-on approach to generating commercial outcomes.

Intralink's clients range from startups to multinationals in the medical, energy, automotive, semiconductor, digital media, aerospace, software, and other high-growth sectors, as well as government bodies. Many of these organisations are addressing the world's most pressing social and environmental challenges – and Intralink believes that cross-border collaboration will deliver a more prosperous, sustainable society.

## About the UK-APAC Tech Growth Programme

The UK-APAC Tech Growth Programme is a government-backed initiative to support the UK's most innovative tech companies' expansion in the Asia Pacific region.

It spans 11 territories: Japan, Korea, Taiwan, Singapore, Vietnam, Malaysia, the Philippines, Thailand, Indonesia, Australia, and New Zealand.

Any UK-headquartered technology startups and scaleups keen to develop opportunities in APAC are eligible for the programme. The goal is to set the companies up for APAC success by helping them:

- Understand if there is an opportunity – and learn how to approach the region
- Validate which potential customers and partners will be interested in their technology – and get the customers' eyes on their product
- Accelerate in-market opportunities, secure partnerships and lay the foundations for commercial success in the target market(s)

Depending on the participants' readiness level, they can be selected for a wide range of free or subsidised activities – from business matching with major corporates to overseas missions, pitch events, and bespoke in-market business development initiatives.

The programme is a joint initiative led by the Department for Business and Trade; the Department for Science, Innovation and Technology; and Intralink.



## Glossary

A*STAR	Agency for Science, Technology and Research	ITSI	International Technology Security and Innovation
ACRA	Accounting and Corporate Regulatory Authority	JV	Joint Venture
AI	Artificial Intelligence	LLC	Limited Liability Companies
AMF	Advanced Micro Foundry	MEMS	Micro Electro Mechanical Systems
ASEAN	Association of Southeast Asian Nations	MIDA	Malaysian Investment Development Authority
ASIC	Application-Specific Integrated Circuits	MOU	Memorandum of Understanding
ATP	Assembly, Test, and Packaging	MoST	Ministry of Science and Technology
APAC	Asia-Pacific	NEDA	National Economic and Development Authority
BOI	Board of Investment	NFC	Near-Field Communication
CIT	Corporate Income Tax	OSAT	Outsourced Semiconductor Assembly and Test
CMOS	Complementary Metal-Oxide-Semiconductor	PCB	Printed Circuit Board
DICT	Department of Information and Communications Technology	PLC	Private Limited Company
DOST	Department of Science and Technology	R&D	Research and Development
DTI	Department of Trade & Industry	RF	Radiofrequency
EDA	Electronic Design Automation	RFID	Radio Frequency Identification
EDB	Economic Development Board	RIIE2025	Research, Innovation, and Enterprise 2025 Plan
EEC	Eastern Economic Corridor	RIS©	Research and Innovation Scheme for Companies
EV	Electric Vehicles	SEA	Southeast Asia
FDI	Foreign Direct Investment	SEIPI	Semiconductor and Electronics Industries in the Philippines Foundation, Inc
FPGA	Field Programmable Gate Array	Si	Silicon
FPT	The Corporation for Financing and Promoting Technology	SiC	Silicon Carbide
GaN	Gallium Nitride	SiP	System in Package
HDD	Hard Disk Drive	SME	Semiconductor Manufacturing Equipment
HR	Human Resource	SSIA	Singapore Semiconductor Industry Association
IC	Integrated Circuit	STMO	Strategic Trade Management Office
IDM	Integrated Device Manufacturer	TCEA	Thai Cooperative Education Association
IoT	Internet Of Things	TSMC	Taiwan Semiconductor Manufacturing Company
IP	Intellectual Property	UMC	United Microelectronics Corporation
IPEF	Indo-Pacific Economic Framework		

# Southeast Asia's semiconductor market - opportunities for UK companies

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The information contained herein has been obtained from sources believed to be reliable, but is not guaranteed as to its accuracy or completeness. An effort has been made to go beyond simple data collection in this report: responses have been interpreted to elucidate the underlying processes, motives and relationships involved in the dynamics of the situations under investigation.

All references to factual data and properties should be recognised as respondents' perceptions of reality unless otherwise stated.

This report is not intended for, and should not be used as, an investment recommendation.