Taiwan - Upholding the world's most important supply chains

Renowned as an economic 'miracle,' Taiwan's export-led trade strategy, adopted after World War II, saw it achieve massive economic expansion and rapid industrialisation in the decades leading up to the 21st century. Today, Taiwan plays a critical role in building resiliency and redundancy into global supply chains and is set to benefit massively from the US-led tailwind of companies realigning their supply chains away from the People's Republic of China (PRC). Taiwan's proximity, open economy, and strategic location as a hub for international trade and shipping have attracted substantial interest from the global business community, with the IMF predicting a 3% rise in the export volume of goods and services this year.

Beginning in 2019, Taiwan's government has implemented a series of reforms to capture the global business community's diversification effort. Recently, the government announced an extension of its highly successful 2019 reshoring initiative until 2024. The initiative encourages Taiwanese companies to shift production back to the island from the PRC with favourable loans and access to factory sites and skilled labour. Hailed as a success, the scheme contributed to the 19% year-over-year increase in domestic private investment in 2021, according to the U.S. Department of State, and a record-high annual budget surplus of almost NTD 300 billion the same year. "The stability of our public finances has, in turn, given us more resources to invest in infrastructure, boost scientific research…Through effective policies and government spending, we will boost our investments in next-generation infrastructure and talent cultivation, creating more job opportunities and upholding our economic growth momentum," said Taiwan's president, Tsai Ing-wen, in her 2022 National Day speech.

Still, because a self-imposed debt ceiling limits Taiwan's economic policy, public spending remains limited, giving rise to a government-led campaign for inward FDI and a welcoming, dynamic investment climate. Business registration was streamlined almost a decade ago to shorten the application review time to two days. And in February 2018, Taiwan passed the Foreign Talent Retention Act, relaxing visa, work, and residency requirements. By December 2021, 3,927 foreign professionals received the Taiwan Employment Gold Card, according to official figures. Taiwan also offers favourable tariff exemptions, tax incentives, and low-interest loans to bolster activity within its network of science and industrial parks, alongside free trade, technology, and industry zones, particularly for its manufacturing sector.

Moreover, the government has taken massive steps towards supercharging the business environment for start-ups, aimed at transforming the island into Asia's start-up capital. Taiwan's entrepreneur visa programme permits foreign entrepreneurs to remain on the island if they meet incentivised conditions, including operating in an innovation park or raising at least NTD 2 million (about USD 65 thousand). Taiwan was subsequently ranked as the 15th easiest place to do business in the 2020 World Bank Doing Business Report and has accumulated the world's highest number of R&D personnel per capita on the IMD's 2022 World Competitiveness Yearbook.


Tsai Ing-wen
President of Taiwan

Taiwan's services sector contributes the largest share of its overall GDP (62%), followed by industry (35%), according to Statista. But since 2016, its government has prioritised future-readiness and global competitiveness in key growth sectors like information and digital technology, cybersecurity, biotech and MedTech, and green and renewable energy. Under its 2016 New Model for Economic Development, intended to deepen global and regional links, Taiwan has successfully positioned itself as a trusted FDI hub for finance, retail, electronics, ICT, and technology-intensive R&D industries. Taiwan ranked 3rd for profit opportunity recommendation, according to the May 2022 Business Environment Risk Intelligence (BERI) report.

Ultimately, Taiwan's economic superstar is its semiconductor industry, now firmly a keystone in the global electronics supply chain. This year, Taiwan's semiconductor industry is set to hit NTD 5 trillion, according to the Industrial Technology Research Institute (ITRI), presenting a wealth of reshoring and diversification opportunities for businesses. "I am very optimistic. In the future, we will see more applications for semiconductors, particularly in life-changing scientific advances," says the vice chairman and president of the award-winning semiconductor testing company Ardentec Corporation, Dr. Chi-Ming Chang.

According to the Semiconductor Industrial Association, Taiwan's market share of global semiconductor sales stood at 32% in 2022, whilst exports of integrated circuits amounted to USD 184 billion – almost 25% of the island's GDP. In her 2022 National Day Speech, President Tsai Ing-wen applauded the industry as having an undeniably positive impact on the island's investment attractiveness and business climate. "The concentration of the semiconductor sector in Taiwan is not a risk but the key to the reorganisation of the global semiconductor industry. We will continue to maintain Taiwan's advantages and capacity in leading-edge semiconductor manufacturing processes and help optimise the worldwide restructuring of the semiconductor supply chain," she said.

Looking ahead, Taiwan's GDP is projected to pass USD 1 trillion by 2027, according to Statista, and its government has shown clear signs of achieving this. Besides a breakthrough in deregulating its financial markets, Taiwan is working to normalise cross-strait economic and trade relations and eliminate barriers to business expansion. The island also welcomes international investment in its climate change agenda, with initiatives like its 'Smart City Project,' intended to be achieved through Public-Private Partnerships (PPPs), an open goal for FDI and ESG agendas worldwide.

Sinon Corporation

Spearheading progress in Taiwan's agricultural industry

Since the 'Taiwan Miracle' in the late twentieth century, Taiwan's rapid industrialisation and globalisation have continued to shape the island's upwards trajectory on the world stage. Taiwan ranked 5th in the world for its foreign exchange reserves in 2021, holding USD 548.4 billion, according to the Taiwan Stock Exchange (TWSE), and has positioned itself as a central hub for East Asia's extensive shipping and logistics network, attracting international investors through a well-established banking sector and world-leading regulatory system.

One of the top beneficiaries of Taiwan's economic miracle has been its agricultural industry, characterised by high yields, fertiliser, and advanced technology. In 2021, Taiwan's Council of Agriculture (COA) highlighted biotech agriculture as one of three priority areas for its 'Smart Agriculture 4.0' project and its phalaenopsis industry as having a high growth potential within European markets and emerging markets such as Brazil. Still, according to the Food and Fertilizer Technology for the Asia and Pacific Region (FFTC-AP), not enough small-scaled farmers in Taiwan can deploy smart agricultural techniques or benefit from the COA's agenda.

Founded in 1955, Sinon Corporation is Asia's leading distributor of agrochemicals, fertilisers, seeds, and agricultural equipment and a household name in Taiwan through its Taiwan supermarket chain. Sinon has 4,000 employees and has partnered with the world's leading multinationals to bring high-quality products to farmers globally and in Taiwan.

Two major milestones mark Sinon's long history. The first, during the 1980s, comprised a period of rapid diversification, including plastics and pharmaceutical intermediates manufacturing, food processing and distribution. Then, in the early 2000s, Sinon established subsidiaries in Australia, Brazil, China, Germany, Thailand, and the USA, which protected the company's growth throughout the Covid-19 pandemic. "Sinon began as a crop protection business through regional agrochemical sales. Gradually, we learnt how to manufacture the active ingredients in crop protection itself, and today we have our own direct sales system with 280 shops across Taiwan," says Sinon Corporation's chairman, Po-Yen Horng, who has been with the company for over 40 years.

Going forward, Sinon is looking to accelerate its growth in the microbial, biochemical, and biotechnological fields. Sinon has spent the past decade refining its award-winning biological products and is now keen to cooperate with national institutions and governments to bring

Po-Yen Horng
Chairman

them to market. "Biological pesticides are currently the number one issue in our industry, but there's still a lack of bioproducts on the market - they need to be promoted alongside conventional products. We understand their potential, and how they perform, we want to share that knowledge," says Horng. Biotechnology is crucial to the world's fight against climate change, and Sinon's venture reflects the high environmental standards it holds itself to - especially as a supplier of active ingredients to regulation-heavy tier-one customers in Japan and German.

Indeed, more than half of Sinon's revenue comes from overseas markets, and the company has been working with multinationals (MNCs) since the beginning - from being a professional foundry for several MNCs in Europe to a low-cost, high-quality production base for a leading British MNC and big-name Japanese MNCs. Sinon was recently chosen by a major MNC to oversee its distribution in Taiwan and is currently open to joint ventures and strategic partnerships. As the only company in Taiwan producing at its capacity, and with such a deep knowledge of Taiwanese and international environmental regulations, Sinon is the ideal partner for MNCs worldwide. "We specialise in markets with high-entrance thresholds. By aligning with us, companies gain access to our global supply and distribution network and a loyal customer base across multiple value-added markets," says Horng.

But MNCs are not the sole beneficiaries of Sinon's accumulated industry experience. Sinon is deeply committed to supporting Taiwan's farmers in achieving long-term, stable growth. Aside from supplying farmers with top-quality products, Sinon provides access to new technology and regularly holds agronomical training seminars on eco-friendly farming, such as in correctly using fertiliser and pesticides, and demonstrations on new techniques.

Sinon is listed on the TWSE and, thanks to its consistently strong financial performance, has provided cash dividends for over 20 years with a reliable dividend policy. In 2022, Sinon registered an operating revenue of NTD 23.0 billion and a net profit of NTD 1.65 billion - representing a year-over-year increase of 23.6% and 79.2%, respectively - and earnings per share of NTD 3.92- representing a year-over-year increase of 79.0%. Additionally, as a testament to its outstanding corporate governance, Sinon has been ranked amongst the top 5% of Taiwan's listed companies in the Corporate Governance Evaluation conducted by the TWSE for the past two years.

Based in Taiwan, Sinon's international growth story embodies the island's strengths in global trade and ease of doing business. "Taiwan's location is a born advantage for international trading as a hub for intercontinental travel and cargo transportation. Plus, our population is highly educated and incredibly diligent, able to provide huge R&D momentum for international investors," says Horng.

sinon

WIN Semiconductors

Leading the way as the world's largest III-V compound semiconductor foundry

Following a meteoric rise up the global rankings, Taiwan is now classified as a high-income economy by the World Bank and ranked as the 3rd best destination for investment worldwide and 1st in Asia in the 2022 Business Environment Risk Intelligence (BERI) report. Taiwan's competitive edge stems from a winning combination of geographical and industry strengths, with the island's pivotal location in the Indo-Pacific and as a hub for international trade – Taiwan's surrounding waters are home to one of the world's busiest shipping lanes – indicative of its importance in global supply chains. According to the Ministry of Economic Affairs, Taiwan became the world's sixteenth-largest trading economy in 2021, exceeding USD 800 billion for the first time in its history.

Taiwan's semiconductor manufacturing industry plays a vital role in the global economy. Over forty decades of focused R&D and IP protection and more than 1,000 companies comprise Taiwan's unparalleled semiconductor supply chain, which is centred around its global foundry dominance – Taiwan occupied a 63% share of the global market for semiconductor foundries last year, according to the Ministry of Economic Affairs. Semiconductors form a fundamental element in a wide variety of future transformative technologies, including 5G and autonomous driving, and Taiwan's semiconductor industry is on track to be worth NTD 5 trillion by the end of this year, according to the Taiwan-based Industrial Technology Research Institute (ITRII), which highlighted innovative applications related to the metaverse and automotive chips as key drivers of future growth.

Taiwan is home to the largest III-V compound semiconductor solutions provider and wafer foundry in the world, WIN Semiconductors. Founded in 1999, WIN was the world's first pure-play 6-inch GaAs foundry and stands for the markets it leads in – wireless, information, and network.

Between 2007-2011, WIN rode both the Wi-Fi and 3G cellular waves to sustain a 46% market share in the global wafer foundry industry in 2009 and become the world's largest gallium arsenide foundry. Then, in 2011, WIN began manufacturing the semiconductors used by its customers to supply successive generations of the most talked about smartphones in the past decade, which inevitably led to a massive surge in demand for WIN's products. WIN soon diversified into the non-handset market between 2012-2016 to generate a second pillar of growth, by which point its wafer foundry global market share stood at 68%. WIN soon entered the optical devices market in 2017 before making its foundry smarter through integrated AI systems and data mining, enabling the company to fulfil more than 50% of the global GaAs foundry demand in 2018. By 2021, WIN's presence in the wafer foundry industry occupied 75% of the global market, with three non-stop fabrication plants manufacturing the 6 billion chips it shipped that year, mainly for use in smartphones, satellites, cars, infrastructure, space stations, and Wi-Fi.

Dennis Chen
Chairman & President

Today, WIN's core business comprises compound semiconductors. Unlike traditional silicon semiconductors, WIN's III-V compound semiconductors – so-called because they are composed of elements from group III and group V of the periodic table – cover the entire electromagnetic spectrum, from radio frequency (RF) to light waves, meaning they can be used in high-speed wireless communications and for high-power wireless data transmission and operate at a superior efficiency. III-V compound semiconductors are now preferred by smartphone manufacturers over silicon, and WIN's compound semiconductor can be found in at least half of the world's smartphones – WIN's wafers are used in the power amplifiers and VCSEL which support face ID technology.

As a pure-play foundry service provider, WIN's integrated device manufacture (IDM) customers, including suppliers to global tech brands, benefit from access to cutting-edge technological solutions and, importantly, can be assured of no direct product competition. "We don't compete with our customers on a product level. Instead, we offer them access to our multi-application portfolio – from Wi-Fi amplifiers and satellite communications to fiber optics and autonomous driver assistance systems (ADAS) – and remove their need to set up a costly semiconductor fabrication plant themselves," say WIN Semiconductors' chairman and president, Dennis Chen.

Going forward, WIN has positioned its portfolio to take full advantage of emerging trends through its III-V compound semiconductors. From 3D sensing, augmented reality (AR), virtual reality (VR), smart cities, biometrics, and the IoT, WIN is giving its customers a competitive edge in the everyday technologies, like sensing

systems, powering the global economy. "We've developed a leading product for 5G and beyond to embrace the coming era, which includes satellite applications. Approximately 90% of the earth's surface is not covered by any cellular network, and satellite communication can complement cellular networks to help achieve 100% coverage – this will be the future. Our semiconductors are already in SpaceX's Starlink satellites. And with biometrics, we're looking into glucose detection – these kinds of applications are coming. We're just in the initial stages," says Chen.

WIN's 3D sensing LiDAR technology for ADAS, which depends on high-precision light and laser detectors, is already being supplied to companies in the autonomous driving industry, including drive and occupant monitoring systems (DMS and OMS) customers. Chen predicts the initial implementation of this technology will be in self-driving buses, and the company's international track record of working with global tech brands, including the likes of Samsung and many of its competitors, makes it the ideal partner of choice for future industry leaders. "ADAS systems in cars will be a huge market for us. We currently supply laser lights for autonomous driving vehicles, which automatically detect moving cars, people, or animals, and automatically stop the vehicle to prevent an accident," says Chen, who also adds, "whilst we primarily want to remain a supplier, we're open to all possibilities, including partnerships."

When it comes to customer relations, WIN's own growth strategy is built around ensuring the success of its customers, and the company prides itself on maintaining an exceptional level of customer service. WIN understands that swift and responsive decision-making is crucial in its customers' fast-paced environments. Alongside providing access to a 24-hour customer support service, WIN has offices in all time zones worldwide, and customers can even call Chen personally on urgent matters. More importantly, with many of the original creators of WIN's technology still with the company – including the vice chairman, Dr. Yui-Chi Wang and Dennis Chen – customers can be sure of WIN's unparalleled knowledge of its own technologies and excellent corporate governance. As a testament to both value propositions: in 2021, for the seventh year running, WIN was ranked amongst the top 5% of TPEx-listed companies in TPEx's annual Corporate Governance Evaluation, and last year won the 'Gold Award' at the 15th Taiwan Corporate Sustainability Awards.

As a frontrunner with its own technology in the booming market for semiconductor applications, WIN constitutes an excellent investment proposition. In 2021, WIN registered a consolidated revenue of NTD 26.182 billion in 2021, an increase of 2.49% from 2020, and a net profit of NTD 5.12 billion. Most importantly, WIN's III-V compound semiconductors and the addition of 3D sensing to its portfolio perfectly align it with the long-term development of AI and big data, the evolution from augmented reality (AV) and virtual reality (VR) to extended reality (XR) and the metaverse, the IoT, and 5G, in addition to the construction of satellite communication infrastructure.

WIN's success ultimately reflects Taiwan's tremendous progress in and through its semiconductor industry, having produced some of the world's finest semiconductor engineers and technological innovations along the way. For Chen, knowing that WIN has the complete backing of Taiwan's government not only ensures its long-term financial stability but gives the company the confidence to enter new growth phases and stay ahead of the curve. "Taiwan is a one-stop shop island for semiconductors. From packaging to testing, Taiwan is a specialist in turnkey solutions, and our education system produces the world's best semiconductor engineers. This industry is the backbone of Taiwan's economy, and the government is giving everything it can to maximise its achievements," he says.

win SEMICONDUCTORS

Ardentec

A Partner For Global Semiconductor Heavyweights

"One of the most competitive places in the region for doing business", Taiwan "punches above its weight in the global economy", according to global professional services firm PWC. The country is one of the world's 25 biggest economies, and is the 18th largest goods exporter, despite its relatively modest size.

Taiwan is particularly dominant in the semiconductor industry, in which it is the world's largest exporter, and still growing strongly. Exports of integrated circuit chips rose for the seventh consecutive year in 2022, according to government figures, rising a striking 18.4%.

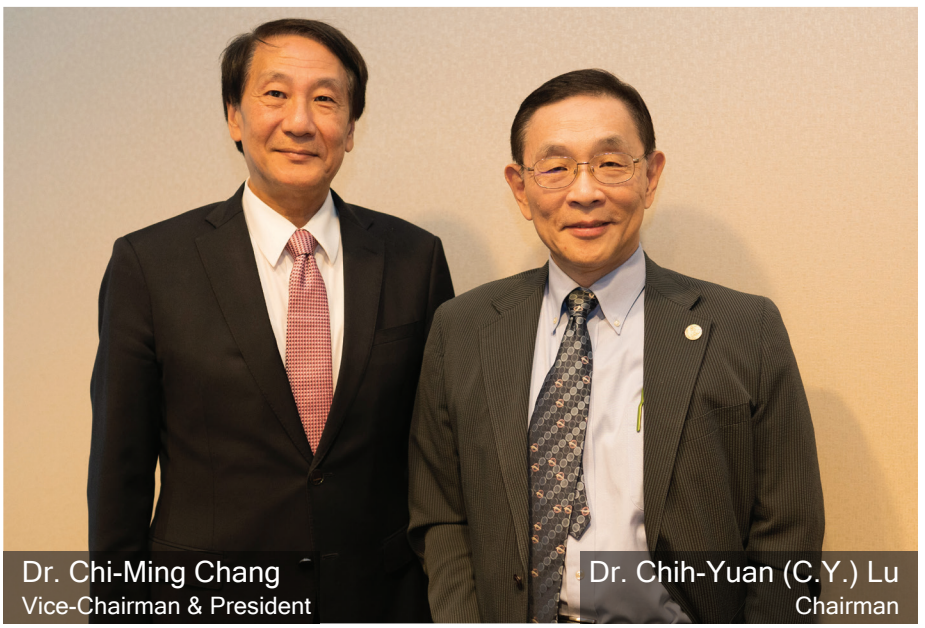
Ardentec Corporation is at the heart of this thriving industry, not just in Taiwan, but at global level, as one of the world's leading outsourced semiconductor assembly and test (OSAT) businesses. The company provides semiconductor testing in memory, logic, and mixed-signal integrated circuits to integrated device manufacturers (IDMs), pure-play wafer foundry companies, and fabless design companies, with a focus on wafer testing.

"We're a testing partner you can trust to global industry heavyweights," says Dr. Chi-Ming Chang, Ardentec Corporation's vice chairman and president. "We strive for the most innovative testing technologies to help our global customers achieve the best quality and efficiency. We're a company that listens to its customers' needs and delivers quality, and we expect to have many more opportunities to do so in the future. We have an energetic, passionate, and motivated team and have won many appreciation awards for our work."

The company was established in 1999 by four co-founders, including Dr. Chang and chairman Dr. Chih-Yuan (C.Y.) Lu, with a passion for technology development and a commitment to quality. The founders recruited people with a similar mindset, and from the very beginning developed the company's own test process analysis system, an IT system which helps its engineers monitor product test and identify any deviations from specifications. This system provides a powerful backbone to Ardentec's offering to its customers.

"We've continued to advance our technology, and have developed capabilities in specific areas to help our customers with their distinctive needs, for example in introducing new products," says Dr. Chang. "We've introduced AI into our production lines to check for any defects, which has greatly increased productivity as well as quality assurance. We continuously, persistently help our customers speed up their product development cycles and reduce their time to market. That's how we've become a major test hub for big international customers in many areas of semiconductor parts."

Ardentec's timeline is testament to its growth path – an IPO on the Taipei Exchange in 2005; a first overseas subsidiary established, in Singapore, the following year; a Korean subsidiary added in 2011; and a third, in Nanjing in the People's Republic of China, in 2017. In its international expansion, the company has always focused on being close to wafer producers such as pure-play wafer foundries. Throughout the covid pandemic, the company kept its production lines running and ensured delivery on time, to high quality standards, for its customers, at a time of global disruption in the semiconductor industry.



Dr. Chi-Ming Chang
Vice-Chairman & President

Dr. Chih-Yuan (C.Y.) Lu
Chairman

In June 2022, Ardentec broke ground on a new factory in Longtan, Northern Taiwan, that will increase its capacity in its home market by 30%, as the business continues to grow. In recent years, the company has seen growing demand from segments including automotive microcontrollers (MCUs) and advanced driver assistance systems (ADAS). Ardentec entered the automotive chip market in 2010 and has since become a major supplier, with general MCUs altogether accounting for nearly 34% of revenue. Over the longer term, the company aims to deploy a "dual engine" strategy, building capacity in two factories simultaneously, to boost its ability to meet client needs.

Its international footprint sets Ardentec apart from its competitors, allowing it flexibility and the ability to pivot to demand. Combined with the company's commitment to innovation, quality, and customer service, it is a factor that has helped it become a partner for leading international companies.

Ardentec is also open to partnerships with financial investors. The company has a market capitalisation of more than $900m and achieved revenues of around $485m in 2022. Its revenues have grown at a CAGR of 18.4% between 2001 and 2022, and topped 20% growth each of the past three years. Dr. Chang sees ample scope to build on this.

"We're outperforming our competitors, and there are huge opportunities in the manufacturing of wafers, semiconductors, and MCUs, so our sector is only going to be in more demand," he says. "We know how to grow consistently; we don't just have spikes of growth like some businesses. We'll continue to thrive."

And as Ardentec thrives, so will its home country, which is realising its huge economic potential, particularly in technology.

"Taiwan has a very strong semiconductor industry – it's a huge player in the sector," says Dr. Chang. "And the country is going to have even more opportunities in different sectors over the next 8-10 years: AI in medicine, tech in elderly care; utilising data to become more efficient, technology savvy, and innovative across a range of industries. Taiwan has the data, it has the technology, and it knows how to apply it across the board."

Ardentec
A testing partner you can trust

Alchip Technologies

Driver of a Computing Power Future

Taiwan's thriving semiconductor sector demonstrates its economic strengths. The country produces more than 60% of global chip supply, and more than 90% of the most advanced ICs. In total, the semiconductor industry accounts for 15% of the country's GDP.

Celebrating its 20th anniversary in 2023, Alchip Technologies epitomises Taiwan's global semiconductor industry leadership. It is one of the world's leading designers and manufacturers of application-specific integrated circuits (ASICs), that are custom-made to perform very specific electronic functions. With an international presence in markets including Taiwan, the US, Japan, and China, the company is eyeing further international expansion.

"We are doing really well in greater Asia – when someone wants to make a complicated ASIC chip, they come to us," says Alchip Technologies president and CEO Johnny Shen. "We have a lot of potential to grow in the US, and are open to broad international partnerships. We always deliver. When companies need computing power, they need a large-scale design with the most leading process and advanced package technologies, and that is where we come into conversation. We've designed more than 500 ASICs. All of the largest suppliers work with us, because we have the field's most proven track record. When it comes to high-end integrated circuit companies, there are perhaps five in the world – and we are one of them."

Alchip planted its root in the Asian market, then expanded into a strong position in the consumer electronic market in Japan. Its focus has been increasingly on higher-value products, driven by its relentless pursuit of advanced designs, with a focus on leading edge technology. Shen says that an important tipping point came around 2019, when discussions over the need for computing power became more prevalent. There was a growing realisation that greater computing power was necessary to extract data in order to process it, and that this could not rely solely on software, but also required serious specialised hardware. Alchip has successfully leveraged this expertise, having built a supercomputer

Johnny Shen
CEO

chip for Tokyo University as early as 2009. This shift raised Alchip's international profile, putting it on the radar of global supercomputer companies; the company's partnership with IBM had a similar impact.

Alchip manufactures high-quality ASICs developed for some of the world's leading companies, including manufacturers of 4K televisions and hyperscalers. Alchip is also the leading ASIC developer for cryptocurrency mining, with demand growing as algorithms have become more complex.

A talented team is an essential component. Alchip's leading-edge technology attracts highly-skilled engineers, who in turn, keep the company at the forefront of this knowledge-intensive industry. Consistency and dedication across the leadership team is another crucial factor.

"Our employees are our investment and, for the past 20 years, our top executive team has remained in place," says Shen. "We want our people to be invested in the company; that way they deliver the best results. Furthermore, the majority of our executives are globally educated and have an international mindset."

In 2014, Alchip was listed on the Taiwan Stock Exchange. Investors know they are buying into a highly credible, reputable business. The company prides itself on its transparency and openness to its partners, with regular conference calls, as well as detailed discussions with institutional investors, and a commitment to delivering on promises. Alchip also sets high risk management standards. No less importantly, it remains a lean, efficient, and highly-competitive company – one with a bright future.

"It is a fact: we are the best in high-performance computing design," says Shen. "Over the last 4-5 years, a lot of hot market trends have appeared, like AI, chatGPT, and cloud computing. If you look at these technologies, what's behind them is computing power. All major service enterprises require high-performance computing to power their services, or to make their enterprises more efficient. ASICs are the proven way to accomplish that."

Looking to the future, Shen is optimistic about the long-term outlook for the global semiconductor industry.

"The majority of companies in our industry are highly profitable and have good fundamental businesses," he says. "In the semiconductor industry, we have a very sophisticated supply chain that provides complete technology solutions to some of society's most pressing needs. From a local perspective, our service industries are flexible and have quick turnaround times. Taiwanese people are smart, well educated, and hard working. Taiwan is positioned in a very unique place: we have so many options, and are open to do business with everyone. For Alchip, this an excellent environment in which we can provide high performance turkey solutions to international ASIC markets."

ASPEED Technology

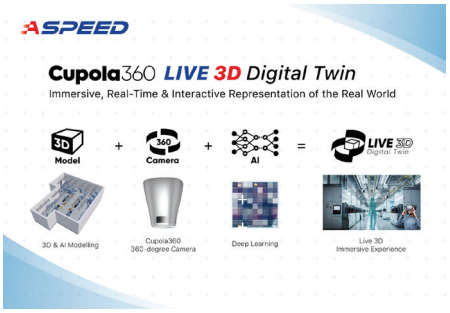
Championing Taiwan's world-class technology industry

Taiwan's GDP grew by 2.45% in 2022, according to Statista, and the island has cemented itself as the "centre of regional high-technology supply chains," according to KPMG.

Taiwan is one of the world's leading manufacturers of ICT products, according to the Industrial Technology Research Institute (ITRI), and the government's Smart Taiwan 2030 vision for a digital nation is set to boost innovation across the industry's leading sub-sectors.

Founded in 2004, ASPEED Technology is Taiwan's leading fabless IC design company, with an influential market position in cloud and enterprise solutions and a market cap of USD 4 billion. ASPEED is the world's largest baseboard management control (BMC) SoC provider and has appeared in Forbes Asia's 'Best Under a Billion' list for the past nine consecutive years.

ASPEED's chairman and founder, Chris Lin, attributes much of its success to its "vision of what the next paradigm-shifting electronic device would be – which wasn't easy in 2004." In 2005, ASPEED launched its 1st Generation Server Management Processor and achieved breakeven in eight quarters. ASPEED's next milestone came in 2013 when successive years



of award-winning innovation led to its listing on the Taipei Exchange (TPEx), followed by a decade of exceptional financial performance. ASPEED registered record revenue (NTD 5.21 billion) and net profit (NTD 2.105 billion) for 2022, up by 43.23% and 60.38% on 2021 levels, respectively. Meanwhile, ASPEED's earnings per share rose to NTD 55.72 in 2022, up 45.48% from the previous year.

As the world's reliance on digital technology increases, notably with smart cities and smart factories, ASPEED is expanding its total solutions portfolio. In 2018, the company launched its multi-application Cupola360 family of spherical image processors for live streaming audio-visual content. ASPEED utilises an innovative camera image-stitching SoC to provide real-time 360-degree camera solutions for use in video conferencing. Moreover, the Cupola360 360-degree camera can be combined with 3D & AI modelling technology to create a Live 3D Digital Twin for immersive applications such as virtual factory tours, inspections and audits, and in smart cities. "ASPEED will continue to grow. Cloud computing is still in its infancy, and we want to continue being number one," says Lin.

ASPEED is open to international partnerships and offers bespoke chip solutions to several large multinationals. ASPEED stands for Accountability and Speed, and its professionalism and focus on talent cultivation make it the ideal partner. "The way we work is geared towards a zero-error policy and reflects Taiwan's excellent education system," says Lin.

As Taiwan continues to profit from its diversity and global reach, companies like ASPEED are undoubtedly its greatest assets. "The world needs the kind of technologies that Taiwan is producing, and the potential for more growth is huge," says Lin.

ASPEED

Personal Genomics & Quark Biosciences

Redefining the medical world's high-tech diagnostics and prognostics toolkit

Taiwan ranks amongst the top 25 countries in the world based on GDP and has established itself as a global R&D hub through development schemes like the '5+2 Innovative Industries' initiative – which seeks to harness the island's core ICT strengths. In 2021, Taiwanese companies ranked 3rd globally in terms of R&D expenditure investment, according to KPMG.

One industry leveraging Taiwan's ICT strengths is the biomedical industry. Between 2010-2019, the industry's combined export value more than tripled to reach USD 6 billion, whilst the number of biomedical companies in Taiwan jumped from 1,355 to 2,143, according to the BBC, which highlighted the island's leadership in the global semiconductor industry as a catalyst.

Founded in 2010 and 2012 by the former president of Taiwan's Industrial Technology Research Institute (ITRI) and the person responsible for its biomedical division, Dr. Johnsee Lee, Personal Genomics and Quark Biosciences (QuarkBio) belong to the quartet of MedTech companies under the Personal Genomics Group umbrella.

Acting as the pre-commercial technology developer and research counterpart to QuarkBio, Personal Genomics has just unveiled its latest ground-breaking contribution to genome sequencing, OES-D1: a small, low-cost, decentralised 3rd generation DNA

sequencer capable of long-reading 7,000 base pairs within two hours. As a comparison, the industry standard 2nd generation sequencers can take up to a full day to analyse just 300 base pairs. "Currently, clinics have to send samples to a central lab for sequencing and can wait weeks for their results. Our sequencer decentralises that system – we want every lab to have one," says Dr. Lee, Chairman and CEO of Personal Genomics and QuarkBio.

QuarkBio's new diagnostics platform NextAmp is the fruition of Personal Genomics' scientific advances, designed to analyse up to 100 biomarkers using amplification in under two hours with minimal hands-on time. NextAmp gives clinicians the tools they need for making rapid, precise cancer diagnoses and prognoses – allowing them to select a suitable treatment pathway – and can also raise the success rate of in vitro fertilisation (IVF).

With its sequencing prototype ready, Personal Genomics is seeking global partners to help commercialise their technologies and enhance their access to international markets – whether in joint ventures or through financial, manufacturing, or business integration. QuarkBio and Personal Genomics have an internationally proven track record of working with leading industry players from Japan, Europe, and the USA, and offer future partners access to Taiwan's national health insurance database.

Each company is on a mission to make high-tech healthcare affordable and accessible to everyone, and Dr. Lee believes the key to achieving this lies in Taiwan's world-class semiconductor industry. "Biotechnology plays to Taiwan's strengths. Our OES-D1 sequencer uses semiconductor and optoelectronics technology, and we believe our MedTech has the highest potential for applications," he says.

QUARKBIO PERSONAL GENOMICS