Semiconductor sector

Design services – AI chips shift to split sourcing, volume upside ahead

Key message

1. Hyperscaler in-house chips are entering volume production; custom chip market to remain on a high growth trajectory in 2027-28F.
2. Advanced nodes & packaging upgrade in tandem, raising chip value & design complexity.
3. Customers shift from full-service buying to split sourcing, moving value to customers & multiple partners.
4. Revenue scales up as gross margin falls; evaluate firms on operating profit & EPS.
5. Capacity & capital open the door to large projects.

Event

We believe AI custom chips are shifting from "buying whole chips from full-service vendors" to "customer split sourcing", moving value to customers and multiple partners. A higher turnkey mix lowers gross margin, but operating leverage from larger volumes should maintain operating profit and EPS growth. Taiwanese ASIC suppliers will be among the main beneficiaries of AI infrastructure in 2027-28F.

Impact

Hyperscaler in-house chips enter volume production; custom chip market to remain on a high growth trajectory in 2027-28F. The four largest hyperscalers guide 2026 capex at US$720-740bn combined, and cloud chips are expanding from internal use to external sales. MediaTek (2454 TT, NT$3,830, OP) expects a 2027F data center ASIC SAM of US$80bn, and Marvell (US) a 2030F custom silicon TAM of about US$235bn. We believe the custom chip market will grow at a CAGR of 25% or more in 2027-28F.

Advanced nodes & packaging upgrade in tandem, raising chip value & design complexity. TSMC (2330 TT, NT$2,285, R) expanded CoWoS production to a 5x reticle size in volume production in 2026F, and will scale to 9.5x, then 14x, in 2028F. SoW-X production, from 2029 onward, will reach reticle sizes of 40x. More dies and HBM stacks per package raise the turnkey value of each chip, and sharply increase the workload in back-end physical design and packaging integration.

Customers shift from full-service buying to split sourcing, moving value to customers & multiple partners. For its eighth-generation training TPU (TPU v8t), Google (US) designed the entire compute die and bought HBM directly to avoid vendor markup, handing the I/O die, packaging integration and production management entirely to MediaTek. Most other customers lack back-end engineers and need partners for back-end physical design, packaging integration and production management. We believe that once full-service vendors set a minimum project size, smaller projects could be "passed up" to design service firms.

Revenue scales up as gross margin falls; evaluate firms on operating profit & EPS. A higher turnkey mix and memory cost pass-through lower gross margin, but operating leverage at larger volumes lifts operating profit and EPS. Global Unichip's (GUC; 3443 TT, NT$7,170, OP), 3Q26 revenue rose by 117.7% YoY and gross margin fell from 24.2% to 20.6%, but opex rose by 26.9% and operating profit by 141.9%, while operating margin rose from 12.2% to 13.6% and EPS from NT$6.47 to NT$16.95.

Capacity & capital open the door to large projects. AI accelerator wafer, CoWoS and HBM costs have risen sharply, and turnkey work requires prepaying for wafers, packaging and carrying inventory. MediaTek priced US$3.9bn of zero-coupon overseas CBs, GUC's board approved an NT$40bn syndicated loan and up to US$800mn of overseas CBs, and Alchip (3661 TT, NT$3,420, OP) completed a US$510mn GDS offering. Suppliers with close TSMC ties and ample funding are better placed for next-generation projects.

Stocks for Action

We are positive on Taiwanese ASIC suppliers' 2027-28F earnings growth, and recommend MediaTek, GUC and Alchip. MediaTek handles I/O dies, packaging integration and production management for Google's TPU, and expects related revenue of US$2.5bn in 4Q26F, as well as the high end of its roughly US$16bn target range in 2027F, which makes up about 20% of the AI accelerator ASIC market. GUC benefits from volume production of cloud AI chips such as custom CPUs, with turnkey revenue scaling up fast. GUC's sales growth engines in automotive and memory interfaces, plus interface IP for memory control, die-to-die interconnect and 3D integration, diversify its revenue growth. Alchip has benefitted from the ramp up of a US CSP 3nm AI accelerator; we expect record profits in 2027F, and a 2nm project taping-out in 4Q26, to drive revenue growth in 2028F.

Risks

For MediaTek, weaker smartphone shipments and a slower than expected AI chip ramp up; for GUC and Alchip, operating profit failing to keep pace with revenue and rising competition; for all three, customer concentration and a slowdown in cloud capex.

Figure 1: Valuation

Ticker	Company	Market cap (US$mn)	Share price (NT$)	Rating	Target PER (x)	New TP (NT$)	Previous TP (NT$)	Valuation base	Upside/ (downside) (%)	EPS (NT$) 2026F	EPS (NT$) 2027F	EPS (NT$) 2028F	PER (x) 2026F	PER (x) 2027F	PER (x) 2028F
2454 TT	MediaTek	186,741	3,830	OP	25	6,250	5,500	2028F EPS	63.2	73.57	150.48	254.20	52.1	25.5	15.1
3443 TT	GUC	29,290	7,170	OP	40	9,900	5,870	2H27-1H28F EPS	38.1	62.97	175.43	302.59	113.9	40.9	23.7
3661 TT	Alchip	9,002	3,420	OP	30	6,600	6,180	2027F EPS	93.0	124.20	219.12	409.40	27.5	15.6	8.4

Source: Bloomberg; KGI Research estimates

Investment summary

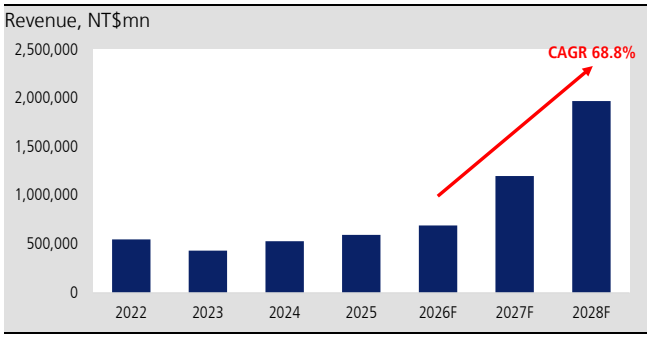
We believe AI custom chips are shifting from "buying the whole chip from a full-service vendor" to "customer split sourcing". This structural change will move value from full-service vendors to customers and multiple partners, making Taiwanese ASIC suppliers among the main beneficiaries of AI infrastructure spending in 2027-28F.

The four largest US hyperscalers guide 2026F capex at a combined US$720-740bn and consensus expects more than US$1.1tn in 2027F, while hyperscalers' in-house chips have moved from trial runs into mass production. MediaTek expects a US$80bn data center ASIC SAM in 2027F, and Marvell a custom silicon TAM of about US$235bn in 2030F. For TPU v8t, Google designed the entire compute die and bought HBM directly to avoid vendor markup, handing the I/O die, packaging integration and production management entirely to MediaTek. This is an example of large customers starting to avoid full-service vendors' markups, yet even the most capable customer still relies on partners for packaging integration and production management, the core strength of Taiwanese ASIC suppliers. On profitability, growing turnkey revenue dilutes gross margin, but at larger volumes opex grows more slowly than gross profit, and operating leverage will lift operating profit and EPS.

We are positive on Taiwanese ASIC suppliers' earnings growth in 2027-28F and recommend MediaTek, GUC and Alchip. MediaTek handles the I/O die, packaging integration and production management for Google's TPU, and its first AI accelerator began shipping in September. At its 3Q26 earnings call the company guided related revenue of US$2.5bn in 4Q26 and the high end of its roughly US$16bn revenue target range in 2027, about 20% of the AI accelerator ASIC market. The second-generation product is due for volume production in 1Q28, and a second AI ASIC customer will start to contribute revenue in 2028. We estimate AI accelerator ASICs at about 60-65% of MediaTek's revenue in 2028, and the TPU business could reshape the firm's revenue mix. GUC benefits from volume production of cloud AI chips such as custom CPUs, with turnkey revenue scaling up fast. Revenue rose by 102.8% YoY in the first three quarters of 2026, 3Q26 wafer product revenue rose by 189.7% YoY, cloud applications reached a weighting of 86% of revenue, and contract liabilities rose from NT$7.34bn at end-2025 to NT$15.48bn at end-3Q26, implying a growing pipeline of volume production projects. Sales growth engines in automotive and memory interfaces, plus interface IP for memory control, die-to-die interconnects and 3D integration, diversify the firm's revenue growth. Alchip has benefitted from the ramp up of a US CSP 3nm AI accelerator since 2Q26. We expect record profits for Alchip in 2027F, and its 2nm AI accelerator should complete first tape-out by end-2026, and be the main sales growth driver in 2028F. Among Taiwanese design service firms, Alchip has the highest exposure to volume production of North American AI accelerators.

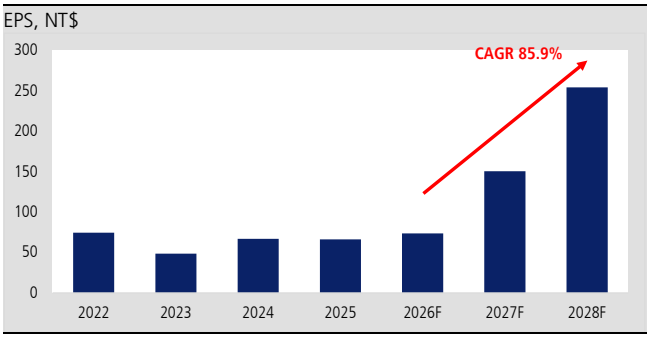
The main risks for MediaTek are weaker smartphone shipments, a slower than expected AI chip ramp up and AI ASIC revenue concentrated in a single customer. For Taiwanese design service firms such as GUC and Alchip, the main risks are revenue swings from customer concentration and product transitions, smaller than expected volumes that keep operating profit from growing with revenue, competition for new projects from MediaTek, Arm (UK) and other ASIC vendors, advanced process and packaging capacity allocations falling short of expectations, and changes in the cloud capex cycle.

Figure 2: MediaTek revenue to grow at a 68.8% CAGR in 2026-28F



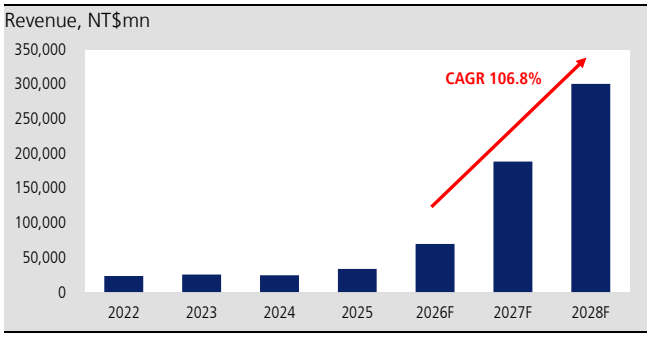
Source: Company data; KGI Research estimates

Figure 3: MediaTek EPS to grow at an 85.9% CAGR in 2026-28F



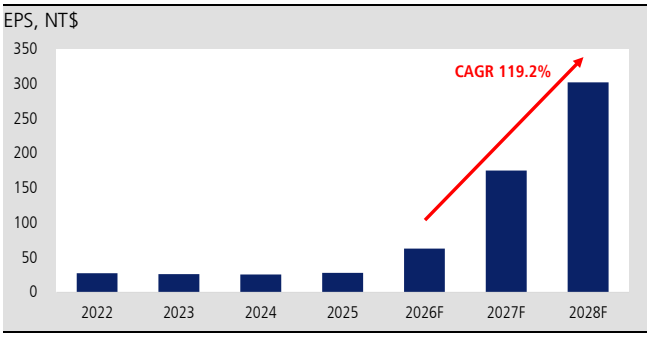
Source: Company data; KGI Research estimates

Figure 4: GUC revenue to grow at a 106.8% CAGR in 2026-28F



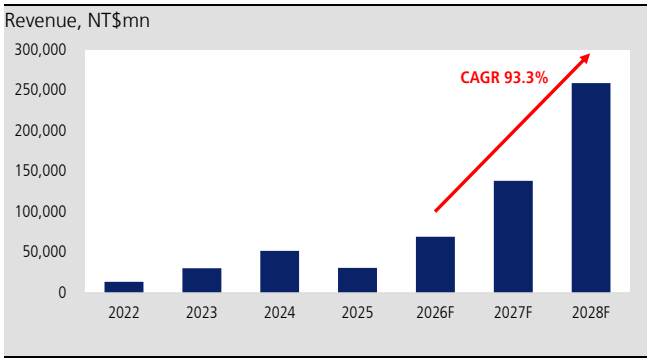
Source: Company data; KGI Research estimates

Figure 5: GUC EPS to grow at a 119.2% CAGR in 2026-28F



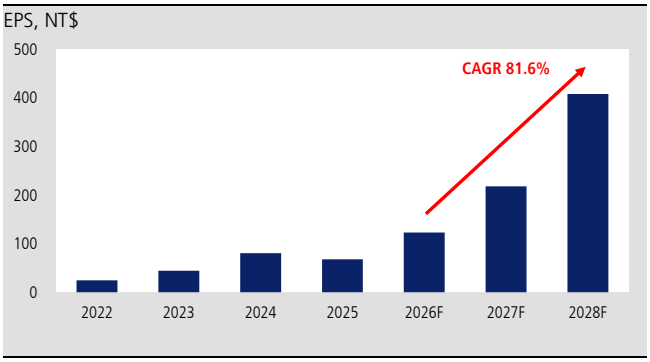
Source: Company data; KGI Research estimates

Figure 6: Alchip revenue to grow at a 93.3% CAGR in 2026-28F



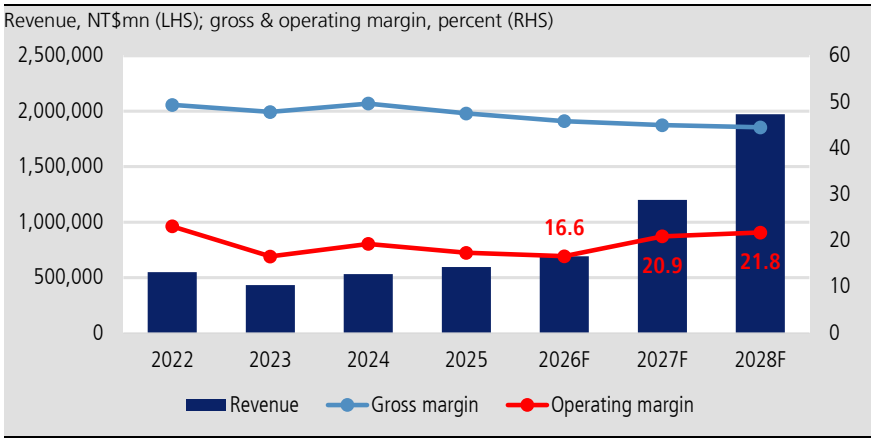
Source: Company data; KGI Research estimates

Figure 7: Alchip EPS to grow at an 81.6% CAGR in 2026-28F



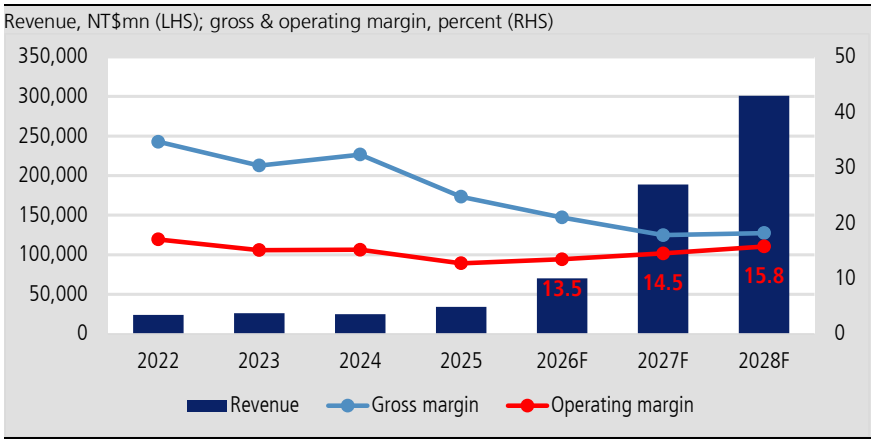
Source: Company data; KGI Research estimates

Figure 8: MediaTek revenue, gross & operating margin



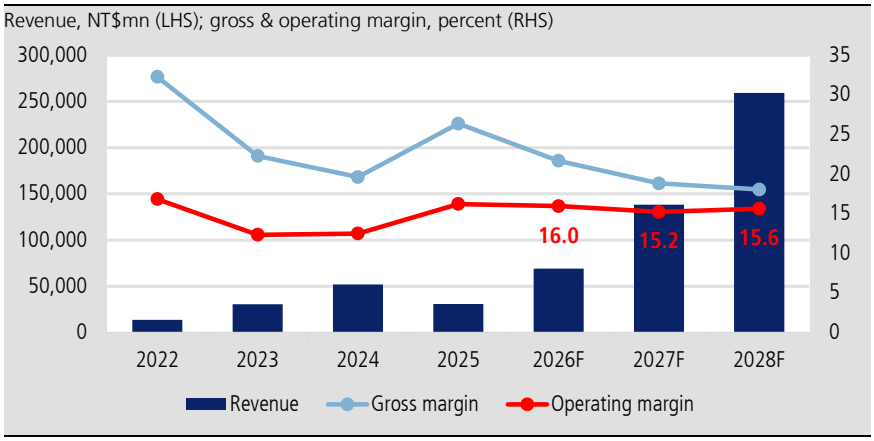
Source: Company data; KGI Research estimates

Figure 9: GUC revenue, gross & operating margin



Source: Company data; KGI Research estimates

Figure 10: Alchip revenue, gross & operating margin



Source: Company data; KGI Research estimates

Figure 11: Hyperscaler ASIC shipment forecast

Shipments (k units)	2023	2024	2025	2026F	2027F
ASIC	**2,259**	**3,984**	**4,827**	**7,333**	**13,794**
YoY (%)	N.M.	76	21	52	88
Amazon/ AWS (Trainium)	495	1,225	1,600	2,432	3,060
Google (TPU)	**1,464**	**2,099**	**2,527**	**3,641**	**7,876**
- Ironwood					1,770
- Sunfish					2,528
- Whalefish					158
- Merope					
- Zebrafish					3,420
- Humufish/ Triggerfish					
- Icefish					
Meta (MTIA)	0	300	300	350	853
Microsoft (Maia)	0	60	100	350	955
OpenAI	0	0	0	60	550
Others	300	300	300	500	500
AI Accelerator	**3,904**	**8,714**	**11,580**	**17,131**	**25,080**
YoY (%)	N.M.	123.2	32.9	47.9	46.4
YoY (%)					
Amazon/ AWS (Trainium)	-	147	31	52	26
Google (TPU)	-	43	20	44	116

Source: KGI Research estimates

Figure 12: Hyperscaler ASIC product roadmap

Time	Company/ CSP	Product/ chip	Design service partner	Process node	Memory type	Memory capacity	APT type	Hybrid bonding/ SoIC
4Q25	**Google**	TPU v7 Ironwood (Ghostfish)	Broadcom	TSMC N3	HBM3E	192GB	CoWoS-S	N
4Q26	**Google**	TPU v8i (Sunfish)	Broadcom	TSMC N3	HBM3E	288GB	CoWoS-S	N
4Q26	**Google**	TPU v8t (Zebrafish/ A5921)	Google+MediaTek	TSMC N3	HBM3E	216GB	CoWoS-S	N
1H28	**Google**	TPU v9t (Humufish/ A5922)	Google+MediaTek	TSMC N2	HBM4E	288GB	EMIB-T	N
1H28	**Google**	TPU v9t plus (Triggerfish/ A5922)	Google+MediaTek	TSMC N2	HBM4E	384GB	EMIB-T	N
1H28	**Google**	TPU v9i (Whalefish)	Broadcom	TSMC N3	HBM4E	384GB	CoWoS-S	N
4Q28	**Google**	TPU v10t (Icefish/ A5923)	Google+MediaTek	TSMC A14	HBM5	512GB	EMIB-T	Y
3Q24	**Amazon/ AWS**	Trainium2 (Cayman)	Marvell	TSMC N5	HBM3	96GB	CoWoS-R	N
4Q25	**Amazon/ AWS**	Trainium2.5 (Cayman)	Marvell	TSMC N5	HBM3E	144GB	CoWoS-R	N
2Q26	**Amazon/ AWS**	Trainium3 (Mariana)	Annapurna Labs+Alchip	TSMC N3	HBM3E	216GB	CoWoS-R	N
2Q26	**Amazon/ AWS**	Trainium3 lite (Mariana)	Annapurna Labs+Marvell	TSMC N3	HBM3E	216GB	CoWoS-R	N
4Q27-1Q28	**Amazon/ AWS**	Trainium4 (Maverick)	Annapurna Labs+Alchip	TSMC N2	HBM4	288GB	CoWoS-L	N
1H26	**Meta**	MTIA 300 (Athena)	Broadcom	TSMC N3	HBM3E	216GB	CoWoS-S	N
2H26	**Meta**	MTIA 400 (Iris)	Broadcom	TSMC N3	HBM3E	216GB	CoWoS-L	N
1H27	**Meta**	MTIA 450 (Arke)	Broadcom	TSMC N2	HBM4	288GB	CoWoS-L	N
2H27	**Meta**	MTIA 500 (Astrid)	Broadcom	TSMC N2	HBM4	384GB	CoWoS-L	N
2Q24	**Microsoft**	Maia 100 (Athena)	Microsoft+GUC	TSMC N5	HBM2E	64GB	CoWoS-S	N
1H26	**Microsoft**	Maia 200 (Braga)	Microsoft+GUC	TSMC N3	HBM3E	216GB	CoWoS-S	N
2H27	**Microsoft**	Maia 300 (Griffin)	Marvell	TSMC N2	HBM4	288GB	CoWoS-L	N
2H26	**OpenAI**	Jalapeño	Broadcom	TSMC N3	HBM4	216GB	CoWoS-L	N

Source: KGI Research estimates

ASIC design services evolve from contract execution to AI system partnership

ASIC design service firms turn product specifications into chips that can be mass produced, for customers that lack complete chip design or manufacturing management teams. Revenue comes in two types. The first is non-recurring engineering (NRE) fees, charged during design and recognized by development milestone, which are relatively small but carry high margins. The second is turnkey revenue from volume production, where the firm orders from foundries and OSATs on the customer's behalf, and sells the finished chips to the customer for significant revenue but at low margins.

The industry has developed in three stages. The first centered on consumer electronics and networking ASICs, with most customers being system makers lacking chip teams. In 2002 Cisco (US) moved high-volume products to the customer-owned tooling (COT) model, working directly with TSMC, and leaving only low-volume products to ASIC vendors. The second began with hyperscalers developing their own AI accelerators, led by full-service ASIC vendors such as Broadcom (US), because the chips are large and need high-speed interface IP and advanced packaging. The third has taken shape since 2025. As shipments per chip

platform grow, customers take control of architecture, front-end design and memory procurement, and outsource back-end physical design, the I/O die, packaging integration and production management according to their own capabilities, and the compute die and I/O die can even be handled by the customer and different vendors (see Figure 13). We believe this third-stage model turns design service firms from contract executors into key partners in the AI system division of labor. Taiwan's MediaTek, GUC and Alchip are all major beneficiaries, with MediaTek handling the I/O die, packaging integration and production management for Google's TPU, and GUC and Alchip handling back-end physical design, packaging integration and production management for other customers.

Figure 13: Task allocations in custom chip development under three sourcing models

Step	What it involves	Full-service ASIC	Design service	Customer-owned tooling (COT)
1. Architecture definition	Application, clock & TDP	Customer-led	Customer	Customer
2. Front-end design	Turn the architecture into logic and verify it	Mostly vendor	**Mostly CSP customers, smaller customers may outsource**	Customer
3. Key IP	SerDes, memory interfaces, die-to-die links	Vendor IP	Design service firm or third party	**Customer licenses or partner-supplied**
4. Back-end physical design	Transistor placement, timing & power	Vendor	Design service firm	**Customer or subcontractor**
5. Tape-out	Send the final design to the foundry for masks	Vendor	Design service firm	Customer deals directly with the foundry
6. Memory procurement	Sourcing HBM	Vendor buys and marks up	**Customer supplies or firm sources**	Customer buys directly
7. Advanced packaging	Combine several dies and HBM into one package	Vendor	Design service firm coordinates with OSATs	**Customer-led, split with partners**
8. Test and production management	Manage yield, capacity and inventory	Vendor	Design service firm	**Customer-led, partners assist**
Pricing and examples		Customer pays the full chip price e.g. Broadcom's traditional model	NRE plus turnkey e.g. GUC, Alchip, Socionext	Paid by work package e.g. Google's v8t TPU

Source: KGI Research

Hyperscaler in-house chips enter mass production, custom chip market to continue rapid growth in 2027-28F

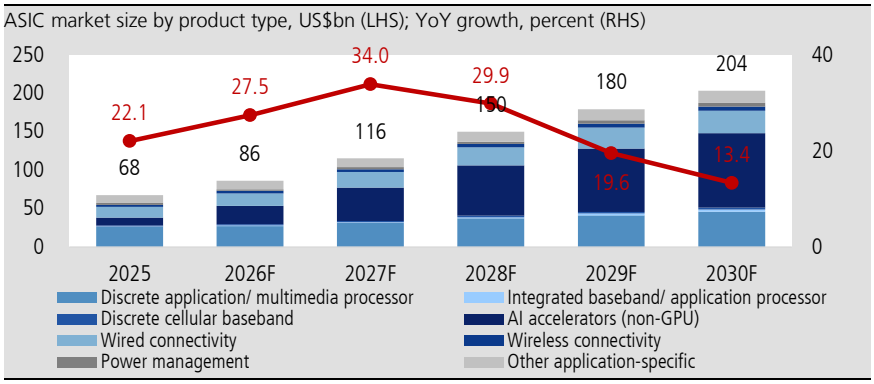
Market size estimates for custom chips vary widely because each source defines the market differently. MediaTek expects a US$80bn data center ASIC SAM in 2027F and said at its 3Q26 earnings call that the firm's 2027F revenue target is approximately 20% of the AI accelerator ASIC market. At a 2026 investor day, Marvell raised its 2030F custom silicon TAM to approximately US$235bn, for a 2025-30F CAGR of about 55%, though its definition includes XPU-attach chips such as NICs, memory expansion and storage controllers. Alchip expects the AI ASIC market to grow from US$13bn in 2024 to more than US$150bn in 2030F, and Gartner data show the ASIC market, covering all custom chips, including handsets, automotive and networking, growing from US$67.7bn in 2025 to US$203.6bn in 2030F, a CAGR of close to 25%. The differences come mainly from whether the HBM in the chip and full-rack systems are included, whether attach chips are included, serviceable versus total markets, and when the forecast was published. We believe that under any definition, the custom chip market can sustain a CAGR of 25% or more in 2027-28F, with AI accelerators as the main revenue growth engine, supporting MediaTek, GUC and Alchip over the long term.

Figure 14: Custom silicon market size estimates by company & research firm, and what each covers

Source	What is estimated	Size (US$bn)	Scope
MediaTek	2027 data center ASIC serviceable market	US$80bn	Only the part MediaTek itself can address (SAM)
Marvell	2030 custom silicon TAM	US$235bn	Includes XPU-attach chips, 55% CAGR
Alchip	2030 AI ASIC market	>US$150bn	Up from US$13bn in 2024
Broadcom	FY2028 AI revenue target	US$230bn	One company, incl. HBM in the package, networking and some full racks; US$115bn in FY2027
Gartner	2030 ASIC market	US$203.6bn	All custom chips incl. handset, auto and networking; US$67.7bn in 2025

Source: MediaTek; Marvell; Alchip; Broadcom; Gartner; KGI Research estimates

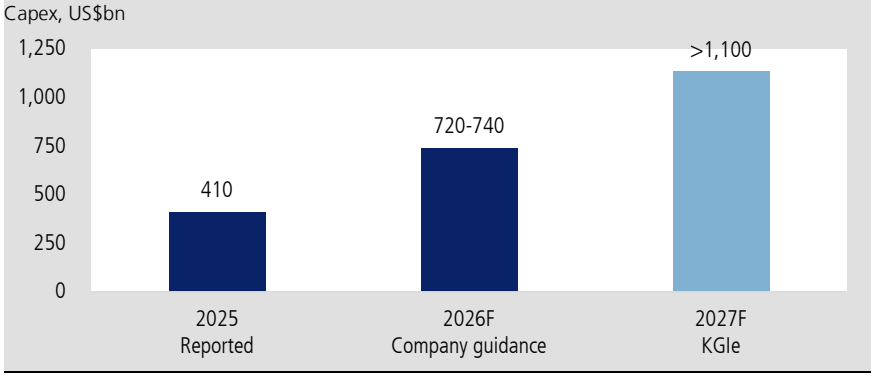
Figure 15: Gartner expects the ASIC market to reach US$203.6bn in 2030F, with AI accelerators the largest product type



Source: Gartner; KGI Research estimates

On the demand side, hyperscaler capex and in-house chips are scaling up in tandem. The four largest hyperscalers spent about US$410bn on capex in 2025, their latest 2026 guidance totals US$720-740bn, and consensus expects more than US$1.1tn in 2027F (see Figure 16). Amazon (US) has an in-house chip business with annualized revenue above US$25bn, Trainium revenue commitments above US$225bn and Trainium3 almost fully booked, and OpenAI (US) will use 2GW of Trainium compute from 2027. Google began delivering TPU systems to customers' own data centers in 2Q26, with most of the related revenue recognized in 2027F, and formed a TPU cloud with Blackstone (US) that is set to bring 500MW online in 2027. We estimate shipments of Google's TPU will rise from close to 3.64mn units in 2026F to nearly 7.88mn in 2027F. Meta (US) has launched four generations of MTIA in two years, and Microsoft (US) has launched Maia 200 and Cobalt 200. Broadcom also expects AI lab Anthropic (US) to become its largest XPU customer in 2027F. We believe the expansion of cloud chips from internal use to external sales will keep raising the ceiling on custom chip volume production revenue.

Figure 16: Capex of the four largest US hyperscalers

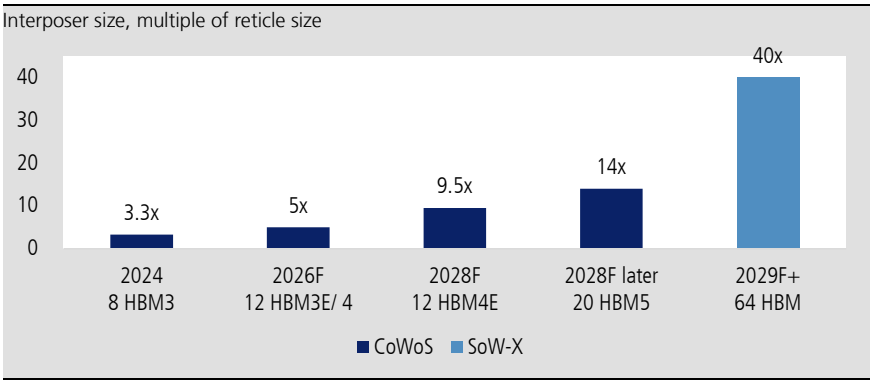


Source: Amazon; Alphabet; Microsoft; Meta; Bloomberg; KGI Research estimates

Advanced nodes & advanced packaging upgrade in tandem, raising chip value & design complexity

At a 3Q26 earnings call, TSMC guided 44% revenue growth in 2026F, and its chairman said the 2024-29F AI accelerator revenue CAGR may exceed its earlier target of 55% to nearly 60%. The firm maintained 2026 capex guidance at US$60-64bn and expects 2026-28F capex to be substantially higher than over the past three years. On process, more than 20 customers have taped out chips produced on the N2 node, with more than 70 in the planning stages. A16 volume production has been delayed to 2027F, and A14 is slated for 2028F. For packaging, CoWoS packaging reached a 5x reticle size in volume production in 2026F, and will scale to 9.5x, then 14x, in 2028F. SoW-X production, from 2029 on, will reach reticle sizes of 40x (see Figure 17). Marvell notes that new XPU packages already hold more than 10 dies, with substrates growing from 100mm to 150mm per side. Academic research shows that for a large 5nm, 800mm² die, defect costs exceed half of the manufacturing cost, so splitting it into two or three chiplets is usually most efficient, though enough volume is needed to amortize the mask and design costs of multiple dies. We believe smaller nodes and larger packages raise the turnkey value of each chip, while sharply increasing the workload in back-end physical design, die-to-die interconnect, power and thermal design, and multi-die packaging integration. This favors MediaTek, which handles packaging integration and production management, GUC, with die-to-die interconnect and packaging integration IP, and Alchip, with advanced-node physical design experience. We estimate Alchip's 2nm AI accelerator ASP at more than 2x that of 3nm, an example of rising content value per chip.

Figure 17: TSMC CoWoS & SoW-X package size roadmap



Source: TSMC 2026 North America Technology Symposium; TSMC 3Q26 earnings call; KGI Research estimates
**Second line of each label shows the number and type of HBM stacks that can be integrated*

At scale, customers shift to split sourcing, moving value from full-service vendors to customers & multiple partners

We believe the most important structural change in the ASIC design service industry in 2027-28F will be large customers shifting from full-service buying to split sourcing. At low volumes, handing the whole chip to a full-service vendor is the simplest option, but when a single customer buys hundreds of thousands to millions of chips per year, the vendor's markup on logic and memory reaches billions of US dollars per year. Starting with TPU v8t, Google will design the entire compute die in house and has taken control of HBM procurement, saving the vendor's HBM markup of 5-20%, while handing the I/O die, packaging integration and production management entirely to MediaTek (see Figure 18). Notably, how much customers take control of depends on their own capabilities. Google is one of a few customers with the most complete design capability, while most customers take charge of only architecture, front-end design and memory procurement, and still need design service firms and other partners for back-end physical design, packaging integration, test and production management. Value once captured by a single full-service vendor is thus redistributed to customers and multiple partners, which is exactly how MediaTek won the I/O die, packaging integration and production management for the TPU, making it a direct beneficiary of split sourcing.

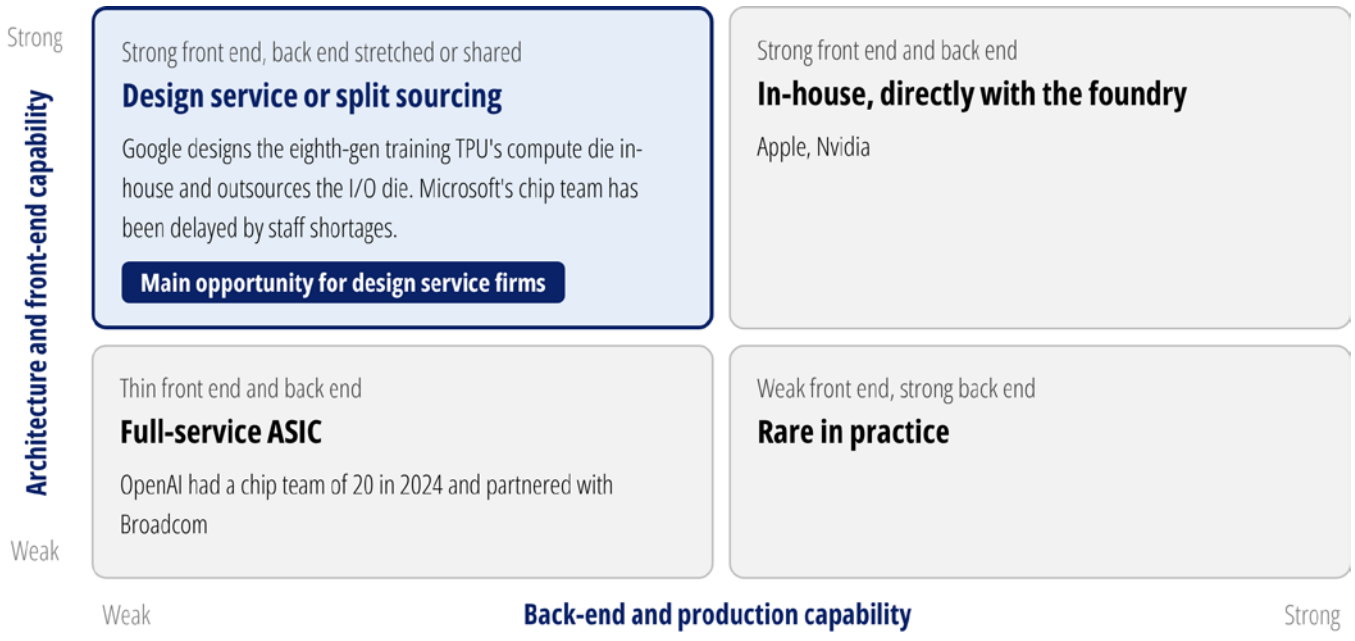
Figure 18: How the work is split on Google's eighth-generation training TPU (TPU v8t)

Item	Traditional full-service model	Eighth-gen training TPU
Compute die	Designed by the vendor	Designed by Google
I/O die	Vendor	**MediaTek**
HBM	Bought by the vendor and marked up	Bought directly by Google
Overall	The vendor handles design, IP, memory buying and production, and the customer pays the full chip price.	Per Counterpoint, Google avoids the vendor's 5-20% markup on HBM.

Source: Counterpoint; KGI Research

For design service firms, split sourcing means less revenue per chip but more projects and larger volumes to take part in. Alchip noted in a February press release that AI has raised the importance of production management in the ASIC value chain, and positioned itself as a more flexible option than the large merchant chip vendors entering the ASIC market. Meanwhile, customers cannot build teams fast enough to keep up with the workload. Microsoft's next-generation Maia was delayed by at least six months due to design changes and staff turnover, and Meta strengthened its chip team by acquiring Rivos (US). Separately, CSPs are increasing their in-house ASIC content while also qualifying a second ASIC vendor. We believe customers with strong front-end capability but too few back-end engineers, or a need to share back-end teams, are best suited to outsource back-end work and production to design service firms, or split it among several partners. GUC, with interface IP and packaging integration, and Alchip, with advanced-node physical design and production management, each fit this trend.

Figure 19: A customer's front-end & back-end capabilities decide the best outsourcing model



Source: Counterpoint; DatacenterDynamics; KGI Research

External cloud chip sales & the move to systems in a package expand volumes & integration needs

Two other structural changes also help design service firms to grow revenue. First, cloud chips are moving from internal use to external sales. Google is delivering TPU systems to customer data centers, and formed a TPU cloud with Blackstone. Amazon supplies Trainium to AI labs such as OpenAI and Anthropic, increasing shipments per chip platform and extending product lifecycles. Second, chips are becoming systems in a package, with more compute dies, I/O dies and HBM stacks in each package, making die-to-die interconnect, HBM interfaces and 2.5D/3D packaging new design priorities. However, volume ramp ups on single platforms also concentrate buyers, and Nvidia (US) is connecting custom chips to its own racks through NVLink Fusion, making competition and cooperation more complex.

Capacity & capital become the entry ticket; revenue scales up as gross margin falls

As wafer, CoWoS and HBM costs for AI accelerators rise sharply, the turnkey business requires prepaying for wafers and packaging and carrying inventory, making access to capacity and financial strength the threshold for large projects. Alchip notes that substrate and packaging capacity is being prioritized for CSPs, limiting automotive and consumer shipments; without this constraint, 3Q26 revenue would have been approximately US$100mn higher. We also see wafer allocations as the key swing factor for upside revisions to GUC's revenue. MediaTek priced US$3.9bn of zero-coupon overseas convertible bonds in August to secure supply chain capacity, GUC's board approved an NT$40bn syndicated loan and up to US$800mn of overseas convertible bonds in August, and Alchip completed a US$510mn GDS offering in June. Customers have also begun securing supply through equity, with Google receiving warrants for 58.97mn Marvell shares. We believe firms with close TSMC ties, capacity coordination experience and ample funding are better placed to win the next generation of large projects, though share dilution from fundraising also needs to be considered.

Meanwhile, a higher turnkey mix and memory cost pass-through mean revenue is growing while gross margin falls across the industry, full-service vendors included. Broadcom expects FY 4Q26 (August-October; fiscal year ends October) consolidated gross margin of 73%, down from 78% a year earlier, mainly because memory makes up a larger share of its XPUs. The effect is more pronounced for design service firms. We forecast Alchip's gross margin to fall from 21.7% in 2026 to 18.0% in 2028, even as the firm's operating margin remains stable at 15-16%. GUC's 3Q26 results show the same trend, with revenue up 117.7% YoY to NT$18.8bn and gross margin down from 24.2% to 20.6%, but opex up only 26.9% YoY, operating profit up by 141.9% YoY to NT$2.55bn, operating margin up from 12.2% to 13.6% and EPS up from NT$6.47 to NT$16.95. We believe design service firms should be judged mainly on operating profit and EPS. The key to earnings growth is the operating leverage that comes when opex grows more slowly than gross profit, as volumes scale. A falling gross margin is not a negative signal in itself, but a simultaneous fall in operating profit would be.

Training & inference split; hyperscalers add chip models; NRE growth is structural

The rising number of hyperscaler chip models is an established trend driven by three forces. First, training and inference needs are diverging. Google split its eighth-generation TPU into the training TPU v8t and the inference TPU v8i, Meta's MTIA 400, 450 and 500 focus on generative AI inference, Microsoft designed Maia 200 for inference, and OpenAI's first in-house chip, Jalapeño, also targets inference. Second, refresh cycles are shortening. Meta uses a modular, reusable design and launched four generations of MTIA in two years, with a new chip every six months or less, far faster than the industry's one-to-two-year pace. Third, once chips are split into multiple dies, derivative models are easier to launch. We believe more models will drive growth in tape-outs and NRE. However, the added models are

concentrated in the top four or five hyperscalers and AI labs, many are derivatives, and shipments are concentrated in flagship platforms, so total NRE may grow more slowly than tape-outs. Because quarterly NRE varies with project milestones, and is often recognized at year-end, it is best viewed as an annual trend. We forecast GUC's NRE and IP revenue to grow by 18.4%, 15.5% and 12.8% YoY in 2026-28F, respectively, and Alchip's NRE revenue to grow by 10.5%, 10.0% and 9.6% in the same period.

Figure 20: Hyperscaler ASIC product roadmap

Time	Company/ CSP	Product/ chip	Design service partner	Process node	Memory type	Memory capacity	APT type	Hybrid bonding/ SoIC
4Q25	**Google**	TPU v7 Ironwood (Ghostfish)	Broadcom	TSMC N3	HBM3E	192GB	CoWoS-S	N
4Q26	**Google**	TPU v8i (Sunfish)	Broadcom	TSMC N3	HBM3E	288GB	CoWoS-S	N
4Q26	**Google**	TPU v8t (Zebrafish/ A5921)	Google+MediaTek	TSMC N3	HBM3E	216GB	CoWoS-S	N
1H28	**Google**	TPU v9t (Humufish/ A5922)	Google+MediaTek	TSMC N2	HBM4E	288GB	EMIB-T	N
1H28	**Google**	TPU v9t plus (Triggerfish/ A5922)	Google+MediaTek	TSMC N2	HBM4E	384GB	EMIB-T	N
1H28	**Google**	TPU v9i (Whalefish)	Broadcom	TSMC N3	HBM4E	384GB	CoWoS-S	N
4Q28	**Google**	TPU v10t (Icefish/ A5923)	Google+MediaTek	TSMC A14	HBM5	512GB	EMIB-T	Y
3Q24	**Amazon/ AWS**	Trainium2 (Cayman)	Marvell	TSMC N5	HBM3	96GB	CoWoS-R	N
4Q25	**Amazon/ AWS**	Trainium2.5 (Cayman)	Marvell	TSMC N5	HBM3E	144GB	CoWoS-R	N
2Q26	**Amazon/ AWS**	Trainium3 (Mariana)	Annapurna Labs+Alchip	TSMC N3	HBM3E	216GB	CoWoS-R	N
2Q26	**Amazon/ AWS**	Trainium3 lite (Mariana)	Annapurna Labs+Marvell	TSMC N3	HBM3E	216GB	CoWoS-R	N
4Q27-1Q28	**Amazon/ AWS**	Trainium4 (Maverick)	Annapurna Labs+Alchip	TSMC N2	HBM4	288GB	CoWoS-L	N
1H26	**Meta**	MTIA 300 (Athena)	Broadcom	TSMC N3	HBM3E	216GB	CoWoS-S	N
2H26	**Meta**	MTIA 400 (Iris)	Broadcom	TSMC N3	HBM3E	216GB	CoWoS-L	N
1H27	**Meta**	MTIA 450 (Arke)	Broadcom	TSMC N2	HBM4	288GB	CoWoS-L	N
2H27	**Meta**	MTIA 500 (Astrid)	Broadcom	TSMC N2	HBM4	384GB	CoWoS-L	N
2Q24	**Microsoft**	Maia 100 (Athena)	Microsoft+GUC	TSMC N5	HBM2E	64GB	CoWoS-S	N
1H26	**Microsoft**	Maia 200 (Braga)	Microsoft+GUC	TSMC N3	HBM3E	216GB	CoWoS-S	N
2H27	**Microsoft**	Maia 300 (Griffin)	Marvell	TSMC N2	HBM4	288GB	CoWoS-L	N
2H26	**OpenAI**	Jalapeño	Broadcom	TSMC N3	HBM4	216GB	CoWoS-L	N

Source: KGI Research estimates

Customers broaden to AI labs, automakers & non-hyperscalers; custom CPUs & memory bring new projects

AI ASIC volume budgets are concentrated in a few hyperscalers. Marvell notes that the four largest US hyperscalers account for more than half of data center capex, and Counterpoint expects AI server ASIC shipments to the top ten hyperscalers to triple over 2024-27F. AI labs, automakers and large enterprises are also developing their own chips, and two of Broadcom's six XPU customers are AI labs. In automotive, Tesla (US) taped out AI5 in April, with volume production expected in mid-2027F at TSMC and Samsung (KR), Rivian (US) expects to ship its in-house 5nm RAP1 with the R2 at end-2026, and Li Auto (CN) put its in-house M100 into vehicles in 2026. We believe a broader customer base will help design service firms to reduce reliance on any single cloud customer, and non-hyperscaler customers mostly lack complete back-end and production teams, so their demand for design services is higher. At its 3Q26 earnings call, Alchip announced a US$1bn-scale HPC design win with a new US-based customer, expected to contribute volume production revenue from 2Q27F. Management also flagged an industry-wide engineering talent shortage, with many projects needing physical design support. GUC's China auto ADAS project should start recognizing revenue in 4Q26F, with a US EV project slated for 2H27F volume production. Alchip also sees steady China auto ADAS demand, with a next-gen design taping out in 4Q26F. Both companies stand to benefit.

Custom CPUs and custom memory are two additional sources of new projects. Agentic AI is reviving CPU demand. More than half of the new compute capacity at Amazon Web Services (AWS; US) already runs on its in-house Graviton. Counterpoint expects 90% of the CPUs in AI ASIC servers to be Arm-based by 2029, and Microsoft's Cobalt 200 consists of two 66-core dies, showing that custom CPUs are also moving to multi-die designs. GUC's next-gen CPU project also uses a two-die chiplet architecture, with ASP close to 2x the current generation. In memory, Micron (US) plans volume production of HBM4E in 2027F

with custom versions whose base logic die is made by TSMC, Nvidia has introduced NVHBM, which moves the memory controller into the HBM base die, and the high bandwidth flash (HBF) promoted by Sandisk (US) and SK hynix (KR) is expected to sample in early 2027. Firms with memory interface IP and advanced-node design capability should benefit, and GUC's HBM4 controller and PHY IP is one example.

Figure 21: Major ASIC products by vendor & customer

	AWS (Annapurna Labs)	AWS (Lab126)	Google	Microsoft	Meta	OpenAI	Tesla/ xAI	Li Auto	Sony	Intel - Habana Labs
MediaTek			TPUv8t (Zebrafish) TPUv9t (Humufish) TPUv9t plus (Triggerfish) TPUv10t (Icefish)	Azure IoT Xbox Blu-ray	Oculus ASIC		Data center ASIC		PS5 south bridge	
Alchip	Trainium1/ Inferentia2 Trainium3 Trainium4 Trainium5	Kindle processor			Oculus ASIC		Dojo interface processor	M100 M200 M300	TV ASIC Smartphone ISP PS5 Pro south bridge	Gaudi1 Gaudi2/ Goya2 Gaudi3/ Goya3
GUC		Echo processor	Security chip Axion 2 CPU Axion 3 CPU	Maia 100/ Cobalt 100 Maia 200/ Cobalt 200			AI 5 AI 6		DSC ASIC	Goya1
Broadcom			TPUv1-v5 TPUv6 (Trillium) TPUv7 (Ironwood) TPUv8i (Sunfish) TPUv9i (Whalefish)		MTIA 300 (Athena) MTIA 400 (Iris) MTIA 450 (Arke) MTIA 500 (Astrid)	Jalapeño				
Marvell	Trainium2 Trainium2.5 Trainium3 lite			Maia 300/ Cobalt 300						
TSMC-direct	Graviton v1-v6 Nitro networking chip		Axion 1 CPU Tensor (3nm)				D1/ Dojo (7nm) D2/ Dojo (5nm)			
Samsung-direct			Tensor (7nm) Tensor (5nm)				HW3 (AI3) HW4 (AI4) AI 5 AI 6			

Source: KGI Research estimates

Division of labor gives each player its own segment, with design service firms gaining from compute die back-end work, production management & projects that big vendors pass up

We believe no single vendor will take the whole custom chip market. Instead, work is divided by customer capability and project size. Full-service vendors take the largest projects with their own IP, such as SerDes, and their advantages of scale. Counterpoint estimates that Broadcom will hold about 60% and Marvell about 8% of the top ten hyperscalers' AI ASIC shipments in 2027. Broadcom focuses on a few very large customers, with its XPU customers rising from three at end-2024 to six in 2026, and has started selling full racks and arranging financing for AI labs. At its 2026 investor day, Marvell said it is not an ASIC supplier and shifted its custom business toward IP-based semi-custom and XPU-attach chips. The more than 50 opportunities it tracked in 2025 add up to about US$75bn of lifetime revenue, or about US$1.5bn per project, showing the size threshold for projects that large vendors take on. Alchip, meanwhile, notes that a US CSP customer has raised its 3nm project allocation to the company, and that on the 2nm project, Alchip handles physical design for all dies, including the I/O die. The customer has also committed that only itself and Alchip will place 2nm wafer orders. MediaTek is ramping up quickly on I/O dies, packaging integration and production management for Google's TPU, and we estimate AI accelerator ASICs to make up 60-65% of the firm's revenue in 2028F. MediaTek is both a direct beneficiary of split sourcing and potentially the most direct rival of design service firms. They compete on I/O dies, packaging integration and production management, but serve different customers and project sizes, so holding MediaTek, GUC and Alchip together covers projects of different customers and sizes under split sourcing.

In this landscape, design service firms' opportunities come mainly from three areas. The first is back-end physical design and production management, outsourced by customers that design their own compute dies but lack back-end staff. The second is projects below the big vendors' thresholds, where customers find their own design partners. The third is new projects that require multi-die integration and advanced packaging design. We believe design services may also see spillover, but in a different form from packaging and testing. Spillover in packaging and testing comes from a capacity shortfall in the same process, and the customer still belongs to TSMC. Design projects, by contrast, are tied to IP, multi-generation roadmaps and customer relationships, so big vendors will not subcontract projects to design service firms. The more likely pattern is that big vendors set thresholds and take projects selectively, and customers may commission projects below the threshold directly from design service firms, work that is "passed up" rather than "farmed out". However, design service firms are not the only ones competing for these projects. MediaTek, Qualcomm (US) and Arm are all pursuing them, and independent high-speed SerDes IP suppliers have dwindled since Qualcomm acquired Alphawave (UK). Design service firms taking on I/O dies must rely on Synopsys (US), Cadence (US) or their own IP, giving GUC, with its own interface IP, an edge.

Scale & operating leverage, not gross margin, turn industry growth into profit

Industry changes map onto a design service firm's P&L through five line items. NRE revenue depends on the number of tape-outs and the fee per project, and benefits from node migration, rising design complexity, more chip models and a broader customer base. Turnkey revenue depends on units shipped, the pass-through value per unit, benefits from cloud capex, the move from 3nm to 2nm and A16, and larger packages. Gross profit should be estimated separately for NRE and turnkey, as split sourcing lowers revenue per chip and a higher volume of production mix lowers gross margin. Opex is driven by engineer headcount, EDA and compute costs, and should be modeled by headcount rather than as a share of revenue to capture operating leverage. Share count and funding reflect dilution from fundraising and prepayments for wafers and packaging.

We believe design service firms' earnings growth in 2027-28F will come mainly from larger production volumes, driven by higher turnkey shipments and prices, and from the operating leverage of opex growing more slowly than gross profit, while NRE, which rises with the number of tape-outs, provides a stable base. In GUC's 3Q26 results, revenue rose by 117.7% YoY while R&D expenses rose by only 27.7% YoY, and opex fell from 12.0% to 7.0% of revenue, a clear example of operating leverage.

We forecast GUC's revenue to grow by 168.5% and 59.3% YoY in 2027-28F, with gross margin falling from 21.0% in 2026 to 18.2% in 2028, but operating margin rising from 13.5% to 15.8%, with EPS of NT$175.43 and NT$302.59, respectively. For Alchip, we forecast revenue growth of 100.0% and 87.3% YoY in 2027-28F, respectively, gross margin falling from 21.7% in 2026 to 18.0% in 2028, operating margin remaining stable at 15-16%, and EPS of NT$219.12 and NT$409.40. Although both companies' gross margins keep falling, opex is rising more slowly than gross profit, so operating margin and EPS still rise with production volumes, showing that operating leverage will be the main source of earnings growth in 2027-28F.

Figure 22: How industry changes map to a design service firm's P&L

P&L line	How to build it	Industry shift behind it
NRE	Tape-outs × fee per project	Node migration; rising design complexity; more chip variants; more customer types
Turnkey	By project, units shipped × pass-through value per unit	Hyperscaler capex; migration to N2 and A16; larger packages
Gross profit	Separate margins for NRE and turnkey	Unbundled buying lowers revenue per unit; and a higher production mix dilutes margin
Opex	Engineers × cost per head, plus EDA and compute	Back-end talent shortage; AI design tools
Shares and funding	Equity dilution; pre-payments for wafers and packaging	Capacity and capital become the price of entry

Source: KGI Research

Market concerns center on split sourcing, customer concentration, gross margin & competition; we see trackable indicators for each

The market has four main concerns about the design service industry. The first is whether split sourcing will let customers bypass design service firms altogether. Google, for example, designs the entire compute die itself and hands the I/O die, packaging integration and production management to MediaTek without design service firms, showing that the most capable customers can indeed bypass them. However, we believe most customers are short of back-end engineers and still need to outsource back-end physical design, packaging integration and production management, so the role of design service firms is actually growing. If more customers follow Google in designing the entire compute die themselves, or build their own back-end teams and work directly with foundries, this view would need revising. The second is customer concentration and product transitions. We note that Alchip kept operating profit at NT$1.15bn during its last trough, its 2nm project should complete its first tape-out by end-2026, and the company expects earnings growth to last at least three to four years. If the 2nm tape-out is delayed or the next generation of bids is not won, expectations would need to come down. MediaTek's AI ASIC revenue is now concentrated in Google's TPU, and a second AI ASIC customer due to contribute revenue from 2028F should reduce that concentration.

The third is a continued decline in gross margin. We believe firms should be judged on operating profit and EPS, as operating leverage from larger volumes can offset lower gross margin, which GUC's higher 3Q26 operating margin shows. However, two consecutive quarters of QoQ decline in operating profit would mean new revenue is not contributing enough profit. The fourth concern is competition from MediaTek, full-service vendors and Arm. We believe the division of labor gives each player its own segment. MediaTek handles the I/O die, packaging integration and production management for Google's TPU, design service firms take projects from other customers and those below the big vendors' thresholds, and large hyperscalers are developing their own CPUs and moving to multi-die designs. If cloud customers switch to Arm's own CPUs, competitive pressure would rise markedly, and it would also rise if full-service vendors lowered their thresholds to pursue mid-size projects. In addition, the cloud capex cycle is a shared industry risk, and if capital markets lose patience with returns on AI investment, volume production orders would be hit first.

Investment recommendation

We are positive on Taiwanese ASIC suppliers' earnings growth in 2027-28F and recommend MediaTek, GUC and Alchip. We believe three changes, the volume ramp of hyperscalers' in-house chips, customers' shift from full-service buying to split sourcing, and the move of chips to multi-die packaged systems, will move industry value from full-service vendors to customers and multiple partners, benefiting Taiwanese ASIC suppliers. MediaTek benefits from the I/O die, packaging integration and production management for Google's TPU, and GUC and Alchip from back-end physical design, packaging integration and production management for other customers. Although a higher turnkey mix lowers gross margin, operating leverage from larger volumes will keep operating profit and EPS growing.

Global Unichip

(3443.TW/3443 TT)

CPU & automotive growth engines; operating leverage to boost EPS

Outperform · Maintained

Price as of November 10 (NT$)	7,170
12M target price (NT$)	9,900
Previous target price (NT$)	5,870
Revised up (%)	68.7
Upside (%)	38.1

Key message

1. More financial room to support greater wafer allocation.
2. US automotive project to start mass production in 2H27F, with TK1 model to lift earnings.
3. Upside from China ADAS project; GUC better positioned than peers in automotive market.
4. New client wins, but AI inference project sustainability remains to be seen.
5. Operating leverage emerging; gross margin dilution will not affect earnings growth.

Trading data

Mkt cap (NT$bn/US$mn)	961 / 29,290
Outstanding shares (mn)	134.0
Foreign ownership (mn)	35
3M avg. daily trading (mn)	1.30
52-week trading range (NT$)	1,850 –8,600

Performance	3M	6M	12M
Absolute (%)	58.3	37.6	279.4
Relative (%)	63.2	34.9	226.1

Quarterly EPS

NT$	1Q	2Q	3Q	4Q
2025	7.17A	5.83A	6.47A	8.65A
2026	12.28A	11.61A	16.95F	22.12F
2027	27.77F	35.75F	47.84F	64.07F

Share price chart



Source: TEJ

Event

We raise our 2027 earnings forecast for Global Unichip (GUC) and introduce 2028 estimates, mainly on: (1) 2027 CPU client demand more than twice the 2026 level, with next-gen CPU ASP about double; (2) new financing to secure more wafer allocation; (3) the US EV project will enter mass production in 2H27F and contribute fully from 2028F; and (4) operating leverage on higher production scale.

Impact

More financial room to support greater wafer allocation. We expect 2027 CPU client demand to be more than twice the 2026 level. GUC has secured a next-gen CPU project, which is a two-die chiplet design with ASP about double that of the current generation, with tape-out around end-2026F or early-2027F, with mass production to begin in late-2027F to early-2028F. We view wafer allocation as the key variable for sales upside, with GUC having an advantage over peers on: (1) board-approved convertible bond of up to US$800mn and a syndicated loan of NT$40bn, likely sufficient though 2028, allowing GUC to commit quickly and prepay for wafers when capacity is released; and (2) its close relationship with the leading foundry, to which GUC can communicate client demand. The fulfillment rate has gradually improved since early-2026, and the reallocated capacity secured by GUC and its clients is better than average. We forecast the US CSP CPU project will account for 48-50% of 2027 sales.

US automotive project to start mass production in 2H27F, with TK1 model to lift earnings. GUC is providing design services for a US EV client, and has secured its next-gen project. Mass production will likely start in 2H27F, which will boost 2027-28F earnings as: (1) shipments will ramp-up quickly; (2) wafer orders will start in early-2027F, leaving time to coordinate capacity, with financial room to help raise the fulfillment rate; and (3) the project is under GUC's TK1 model, with higher gross margin than the CPU project under TK3. We expect auto sales to rise from a single-digit percent of total sales in 2026F to double-digits in 2027F.

Upside from China ADAS project; GUC better positioned than peers in automotive market. The China ADAS project utilizes 5nm, with a wafer fulfillment rate that beats some 3nm products. It should contribute turnkey sales from 4Q26 and for the entirety of 2027F, with the next-gen 3nm product to tape-out by end-2026F. GUC is better positioned than peers for automotive projects, as its China ADAS client can sell into multiple OEM ecosystems. Management notes large fabless firms often share back-end teams across product lines, and those short of resources outsource, echoing our sector report view that clients that are strong in front-end design, but short of back-end engineers will drive segmented outsourcing.

Valuation & Action

Our sector report is positive on Taiwan ASIC players' 2027-28F earnings growth and notes that GUC has diversified growth engines, driven by cloud AI chip mass production, automotive, and memory interface projects. Thus, we raise our 2027 EPS forecast to NT$175.43, up 178.6% YoY, and add our 2028 EPS forecast of NT$302.59, up 72.5% YoY. We maintain Outperform and raise our target price from NT$5,870 (45x 2027F EPS) to NT$9,900 (40x 2H27-1H28F EPS; five-year average).

Risks

Intensifying competition; weakening demand; high client concentration; wafer allocation below expectations.

Key financials and valuations

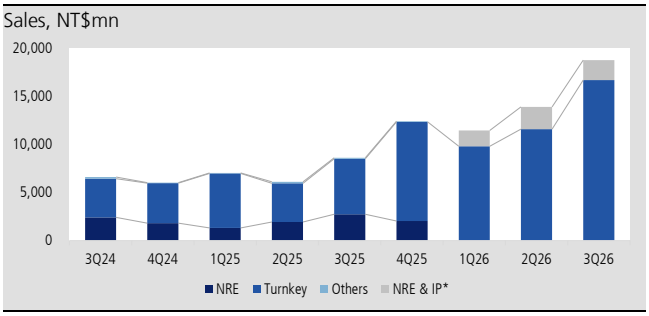
	Dec-24A	Dec-25A	Dec-26F	Dec-27F	Dec-28F
Revenue (NT$mn)	25,044	34,141	70,320	188,818	300,836
Gross profit (NT$mn)	8,108	8,454	14,776	33,666	54,770
Operating profit (NT$mn)	3,803	4,350	9,472	27,420	47,452
Net profit (NT$mn)	3,451	3,770	8,438	23,510	40,551
EPS (NT$)	25.75	28.13	62.97	175.43	302.59
Cash DPS (NT$)	16.00	20.00	44.80	124.70	215.10
EPS growth (%)	(1.6)	9.2	123.9	178.6	72.5
PE (x)	278.5	254.9	113.9	40.9	23.7
PB (x)	85.1	74.4	51.4	26.5	16.0
EV/EBITDA (x)	214.8	189.9	92.4	32.9	18.9
Net debt to equity (%)	Net cash	Net cash	Net cash	Net cash	Net cash
Dividend yield (%)	0.2	0.3	0.6	1.7	3.0
Return on average equity (%)	32.9	31.1	53.4	85.6	84.3

Source: Company data; KGI Research estimates

New client wins, but AI inference project sustainability remains to be seen. The AI inference project ramped-up in 3Q26, posting the fastest QoQ growth among all applications, and the client has become a top five customer of GUC. However, given the product's unique specs, its sales contribution can look sizable in a single quarter, but shipments may fall quickly after peaking. We therefore view it as a short-term sales boost rather than a long-term growth driver. BMC project shipments were in line with expectations, and the BMC client is also among the top five, while the HBF project is progressing as planned, with mass production contribution likely from 2028F. In addition, as CSPs raise their in-house design ratio and bring in second ASIC suppliers, management is using die-to-die IP, such as SoIC, 3DIC, and UCIe, to get their foot in the door to actively pursue other AI ASIC, CPU, and AI accelerator projects from the four major CSPs. Wins there would further reduce reliance on a single cloud client.

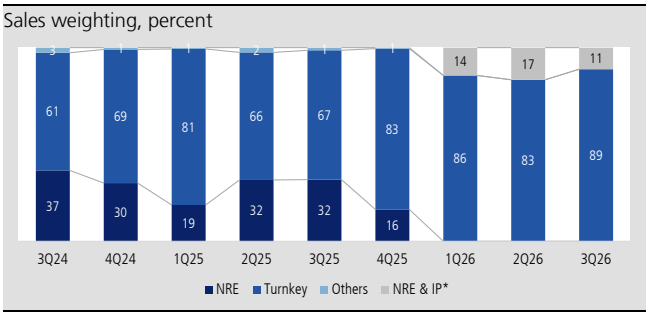
Operating leverage emerging; gross margin dilution will not affect earnings growth. 3Q26 sales rose 117.7% YoY, and gross margin fell from 24.2% in 3Q25 to 20.6%, but opex rose only 26.9% YoY. Operating profit grew 141.9% YoY, and operating margin rose from 12.2% in 3Q25 to 13.6%. Compared with 2Q26, 3Q26 gross margin was roughly flat, while operating margin improved further. The CPU project falls under the TK3 model, which carries lower gross margin, but requires less additional headcount and R&D, so high-volume shipments generate operating leverage on a fixed cost basis. Depreciation of the Turing computing center drove double-digit opex growth in 2026F, but the increase should narrow significantly in 2027F. As noted in our sector report, design service providers should be evaluated mainly on operating profit and EPS. We forecast 2026-28 sales will rise a respective 106.0%, 168.5%, and 59.3% YoY, while opex will rise 29.2%, 17.8%, and 17.2% YoY. Although a rising turnkey weighting will dilute gross margin, we estimate 2027 operating margin will still rise to 14.5%.

Figure 1: Sales by solution



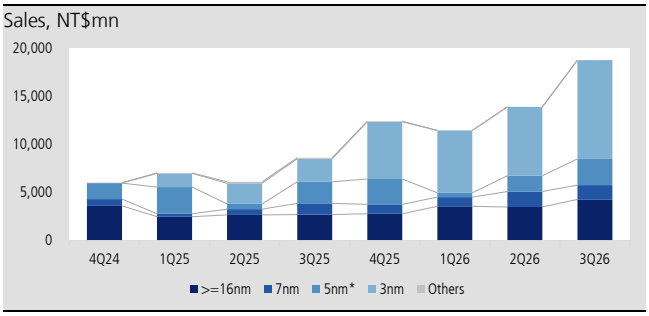
Source: Company data; KGI Research
**Consolidated into NRE & IP after 1Q26*

Figure 2: Sales weighting by solution



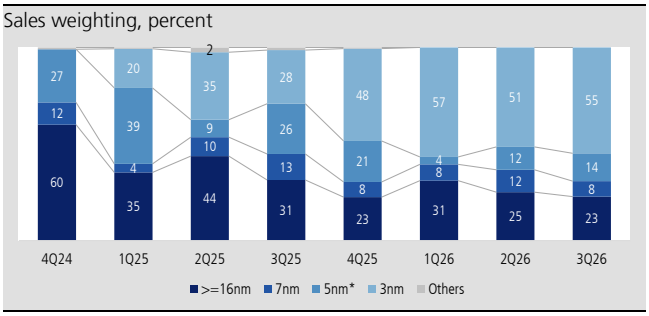
Source: Company data; KGI Research
**Consolidated into NRE & IP after 1Q26*

Figure 3: Sales by node



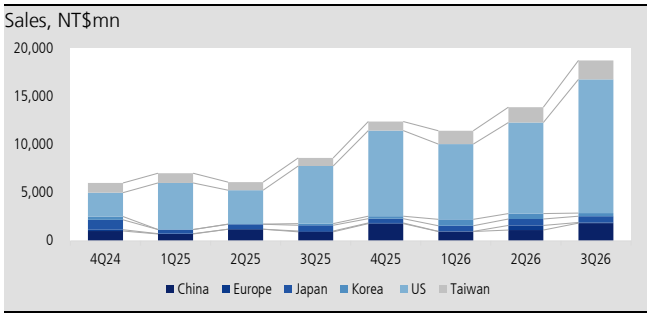
Source: Company data; KGI Research
**5nm can also refer to sales below 5nm before 4Q24*

Figure 4: Sales weighting by node



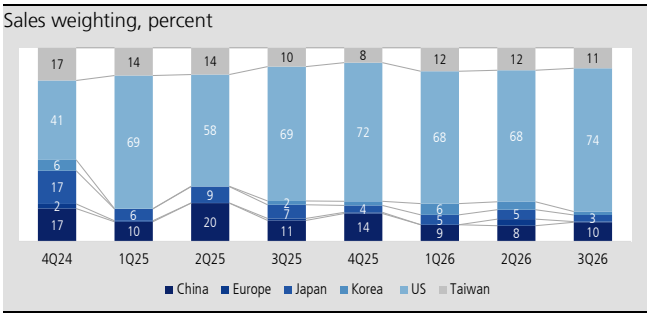
Source: Company data; KGI Research
**5nm can also refer to sales below 5nm before 4Q24*

Figure 5: Sales by region



Source: Company data; KGI Research

Figure 6: Sales weighting by region



Source: Company data; KGI Research

Figure 7: Breakdown of 3Q26 results & 4Q26 forecast revisions vs. consensus

	3Q26							4Q26F						
NT$mn	Actual	KGI forecast	Diff. (%)	QoQ (%)	YoY (%)	Consensus	Diff. (%)	Revision	Previous	Chg. (%)	QoQ (%)	YoY (%)	Consensus	Diff. (%)
Revenue	18,755	15,848	18.3	35.0	117.7	15,787	18.8	26,221	20,410	28.5	39.8	111.5	21,183	23.8
Gross profit	3,860	3,205	20.5	28.9	85.1	3,266	18.2	4,808	3,630	32.5	24.6	103.6	4,253	13.1
Operating profit	2,551	1,889	35.0	52.2	141.9	1,920	32.9	3,420	2,307	48.2	34.1	172.2	2,835	20.7
Net profit	2,272	1,642	38.4	46.1	162.1	1,685	34.8	2,965	1,997	48.4	30.5	155.7	2,491	19.0
EPS (NT$)	16.95	12.25	38.4	46.1	162.1	12.39	36.8	22.12	14.90	48.4	30.5	155.7	18.64	18.7
Gross margin (%)	20.6	20.2	0.4 ppts	(1.0)ppts	(3.6)ppts	20.7	(0.1)ppts	18.3	17.8	0.6 ppts	(2.2)ppts	(0.7)ppts	20.1	(1.7)ppts
OP margin (%)	13.6	11.9	1.7 ppts	1.5 ppts	1.4 ppts	12.2	1.4 ppts	13.0	11.3	1.7 ppts	(0.6)ppts	2.9 ppts	13.4	(0.3)ppts
Net margin (%)	12.1	10.4	1.8 ppts	0.9 ppts	2.0 ppts	10.7	1.4 ppts	11.3	9.8	1.5 ppts	(0.8)ppts	2.0 ppts	11.8	(0.5)ppts

Source: Company data; Bloomberg; KGI Research estimates

Figure 8: Breakdown of 2026-27 forecast revisions & 2028 forecasts vs. consensus

	2026F						2027F						2028F			
NT$mn	Revision	Previous	Chg. (%)	YoY (%)	Consensus	Diff. (%)	Revision	Previous	Chg. (%)	YoY (%)	Consensus	Diff. (%)	KGI forecast	YoY (%)	Consensus	Diff. (%)
Revenue	70,320	61,602	14.2	106.0	63,463	10.8	188,818	129,834	45.4	168.5	162,287	16.3	300,836	59.3	299,796	0.3
Gross profit	14,776	12,942	14.2	74.8	13,886	6.4	33,666	26,440	27.3	127.8	31,347	7.4	54,770	62.7	55,250	(0.9)
Operating profit	9,472	7,729	22.5	117.8	8,483	11.7	27,420	20,388	34.5	189.5	23,391	17.2	47,452	73.1	43,249	9.7
Net profit	8,438	6,834	23.5	123.9	7,587	11.2	23,510	17,475	34.5	178.6	20,395	15.3	40,551	72.5	38,837	4.4
EPS (NT$)	62.97	50.99	23.5	123.9	56.83	10.8	175.43	130.40	34.5	178.6	155.46	12.8	302.59	72.5	279.83	8.1
Gross margin (%)	21.0	21.0	0.0 ppts	(3.7)ppts	21.9	(0.9)ppts	17.8	20.4	(2.5)ppts	(3.2)ppts	19.3	(1.5)ppts	18.2	0.4 ppts	18.4	(0.2)ppts
OP margin (%)	13.5	12.5	0.9 ppts	0.7 ppts	13.4	0.1 ppts	14.5	15.7	(1.2)ppts	1.1 ppts	14.4	0.1 ppts	15.8	1.3 ppts	14.4	1.3 ppts
Net margin (%)	12.0	11.1	0.9 ppts	1.0 ppts	12.0	0.0 ppts	12.5	13.5	(1.0)ppts	0.5 ppts	12.6	(0.1)ppts	13.5	1.0 ppts	13.0	0.5 ppts

Source: Bloomberg; KGI Research estimates

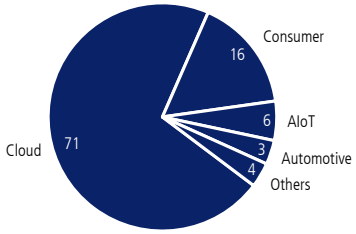
Figure 9: Company profile

Established in 1998, Global Unichip is an IC design service affiliate of TSMC (biggest shareholder at 34.84% in 3Q26), specializing in advanced application-specific integrated circuit (ASIC) services. The company's design services incorporate spec-in and system-on-chip (SoC) integration, physical implementation, advanced packaging technologies, turnkey manufacturing, and cutting-edge technologies, such as world-class high-bandwidth memory (HBM) and die-to-die interconnect IP. Headquartered in Hsinchu, Taiwan, GUC has offices in North America, China, Europe, South Korea, and Japan.

Source: Company data; KGI Research

Figure 10: 2025 sales mix by application

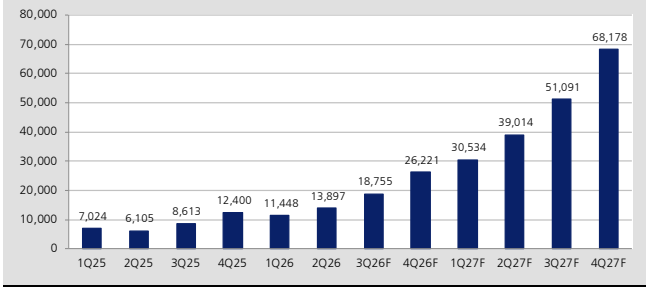
Sales weighting, percent



Source: Company data; KGI Research

Figure 11: Sales

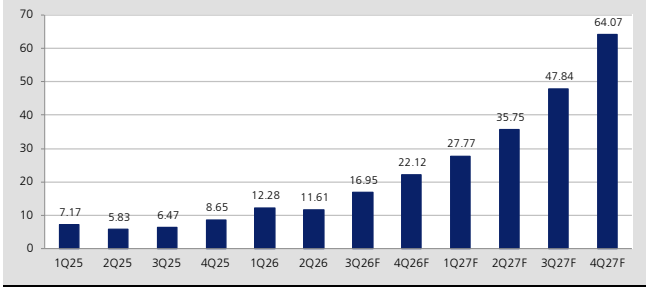
Sales, NT$mn



Source: KGI Research

Figure 12: EPS

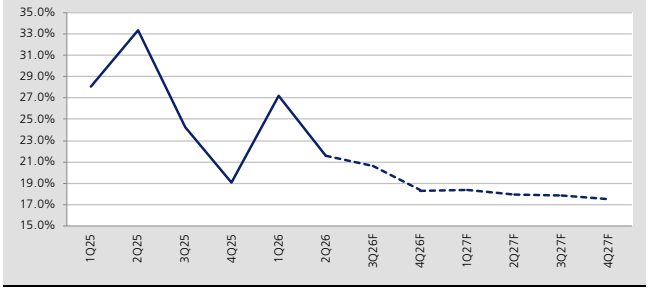
EPS, NT$



Source: KGI Research

Figure 13: Gross Margin

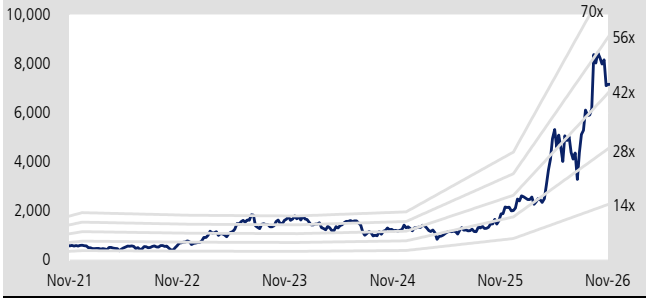
Gross margin, percent



Source: KGI Research

Figure 14: 12M forward PE band

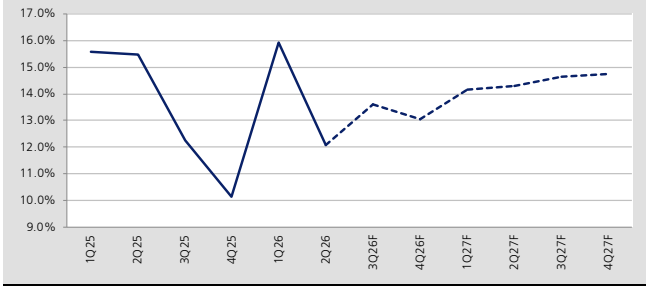
Share price, NT$ (LHS); PE ratio, x (RHS)



Source: TEJ; KGI Research estimates

Figure 15: Operating Margin

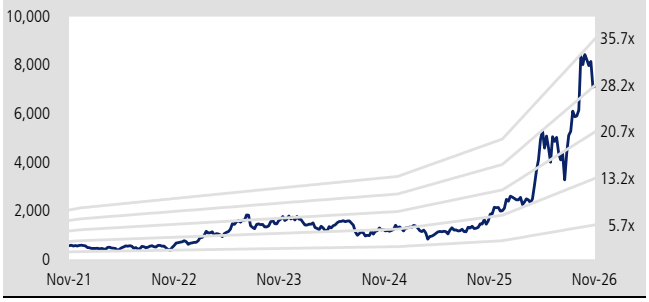
Operating margin, percent



Source: KGI Research

Figure 16: 12M forward PB band

Share price, NT$ (LHS); PB ratio, x (RHS)



Source: TEJ; KGI Research estimates

Income statement

	Quarterly								Annually		
	Mar-26A	Jun-26A	Sep-26F	Dec-26F	Mar-27F	Jun-27F	Sep-27F	Dec-27F	Dec-26F	Dec-27F	Dec-28F
Income statement (NT$mn)											
Revenue	**11,448**	**13,897**	**18,755**	**26,221**	**30,534**	**39,014**	**51,091**	**68,178**	**70,320**	**188,818**	**300,836**
Cost of goods sold	(8,335)	(10,903)	(14,894)	(21,413)	(24,934)	(32,012)	(41,976)	(56,231)	(55,544)	(155,152)	(246,065)
Gross profit	**3,113**	**2,994**	**3,860**	**4,808**	**5,600**	**7,002**	**9,116**	**11,947**	**14,776**	**33,666**	**54,770**
Operating expenses	(1,289)	(1,318)	(1,309)	(1,388)	(1,282)	(1,425)	(1,633)	(1,905)	(5,304)	(6,246)	(7,319)
Operating profit	**1,824**	**1,676**	**2,551**	**3,420**	**4,318**	**5,577**	**7,483**	**10,042**	**9,472**	**27,420**	**47,452**
Depreciation of fixed assets	(77)	(103)	(100)	(119)	(177)	(177)	(177)	(177)	(399)	(710)	(1,326)
Amortisation of intangible assets	(110)	(115)	(104)	(86)	(99)	(99)	(99)	(99)	(415)	(394)	(393)
EBITDA	**2,011**	**1,894**	**2,755**	**3,626**	**4,594**	**5,853**	**7,759**	**10,318**	**10,286**	**28,524**	**49,170**
Interest income	51	56	70	60	60	60	60	60	237	240	240
Investment income	-	-	-	-	-	-	-	-	-	-	-
Other non-op income	2	21	2	2	2	2	2	2	27	8	8
Non-operating income	**53**	**77**	**72**	**62**	**62**	**62**	**62**	**62**	**264**	**248**	**248**
Interest expense	(2)	(2)	(3)	(3)	(3)	(3)	(3)	(3)	(9)	(10)	(10)
Investment loss	-	-	-	-	-	-	-	-	-	-	-
Other non-op expenses	49	4	5	0	0	0	0	0	59	2	2
Non-operating expenses	**48**	**2**	**2**	**(2)**	**(2)**	**(2)**	**(2)**	**(2)**	**50**	**(9)**	**(9)**
Pre-tax profit	**1,925**	**1,756**	**2,626**	**3,480**	**4,378**	**5,636**	**7,543**	**10,102**	**9,786**	**27,659**	**47,691**
Current taxation	(278)	(201)	(354)	(515)	(657)	(845)	(1,131)	(1,515)	(1,348)	(4,149)	(7,140)
Minorities	-	-	-	-	-	-	-	-	-	-	-
Normalised net profit	**1,646**	**1,555**	**2,272**	**2,965**	**3,721**	**4,791**	**6,411**	**8,587**	**8,438**	**23,510**	**40,551**
Extraordinary items	0	0	0	0	0	0	0	0	-	0	0
Net profit	**1,646**	**1,555**	**2,272**	**2,965**	**3,721**	**4,791**	**6,411**	**8,587**	**8,438**	**23,510**	**40,551**
EPS (NT$)	12.28	11.61	16.95	22.12	27.77	35.75	47.84	64.07	62.97	175.43	302.59
Margins (%)											
Gross profit margin	27.2	21.5	20.6	18.3	18.3	17.9	17.8	17.5	21.0	17.8	18.2
Operating margin	15.9	12.1	13.6	13.0	14.1	14.3	14.6	14.7	13.5	14.5	15.8
EBITDA margin	17.6	13.6	14.7	13.8	15.0	15.0	15.2	15.1	14.6	15.1	16.3
Pretax profit margin	16.8	12.6	14.0	13.3	14.3	14.4	14.8	14.8	13.9	14.6	15.9
Net profit margin	14.4	11.2	12.1	11.3	12.2	12.3	12.5	12.6	12.0	12.5	13.5
Sequential growth (%)											
Revenue growth	(7.7)	21.4	35.0	39.8	16.4	27.8	31.0	33.4			
Gross profit growth	31.9	(3.8)	28.9	24.6	16.5	25.0	30.2	31.1			
Operating profit growth	45.2	(8.1)	52.2	34.1	26.2	29.1	34.2	34.2			
EBITDA growth	40.6	(5.8)	45.4	31.6	26.7	27.4	32.6	33.0			
Pretax profit growth	42.0	(8.8)	49.5	32.5	25.8	28.7	33.8	33.9			
Net profit growth	42.0	(5.5)	46.1	30.5	25.5	28.7	33.8	33.9			
YoY growth (%)											
Revenue growth	63.0	127.6	117.7	111.5	166.7	180.7	172.4	160.0	106.0	168.5	59.3
Gross profit growth	57.8	47.2	85.1	103.6	79.9	133.9	136.1	148.5	74.8	127.8	62.7
Operating profit growth	66.6	77.6	141.9	172.2	136.7	232.7	193.3	193.6	117.8	189.5	73.1
EBITDA growth	60.1	70.1	124.5	153.4	128.4	208.9	181.7	184.6	104.6	177.3	72.4
Pretax profit growth	68.4	89.0	158.6	156.7	127.4	221.0	187.3	190.3	120.3	182.6	72.4
Net profit growth	71.2	99.0	162.1	155.7	126.0	208.0	182.2	189.6	123.9	178.6	72.5

Source: Company data; KGI Research estimates

Balance sheet

NT$mn	Dec-24A	Dec-25A	Dec-26F	Dec-27F	Dec-28F
Total assets	**26,309**	**28,443**	**49,209**	**89,043**	**121,105**
Current assets	**24,480**	**25,737**	**44,535**	**78,932**	**102,508**
Cash & ST securities	13,407	8,732	10,584	23,421	31,684
Inventory	2,794	10,148	20,556	28,790	38,904
Accounts receivable	2,007	3,417	8,366	21,692	26,891
Other current assets	6,271	3,440	5,029	5,029	5,029
Non-current assets	**1,829**	**2,706**	**4,674**	**10,111**	**18,597**
LT investments	-	-	-	-	-
Net fixed assets	942	1,347	3,378	8,816	17,301
Other assets	887	1,359	1,296	1,296	1,296
Total liabilities	**15,015**	**15,530**	**30,506**	**52,835**	**61,057**
Current liabilities	**14,669**	**15,033**	**29,973**	**52,301**	**60,523**
Accounts payable	1,691	4,126	13,178	35,506	43,728
Interest bearing ST liabilities	-	-	-	-	-
Other current liabilities	12,977	10,907	16,795	16,795	16,795
Non-current liabilities	**346**	**497**	**534**	**534**	**534**
Long-term debt	73	169	169	169	169
Other L-T liabilities	164	138	346	346	346
Total equity	**11,294**	**12,913**	**18,702**	**36,208**	**60,048**
Share capital	1,340	1,340	1,340	1,340	1,340
Retained earnings reserve	8,111	9,427	14,795	32,302	56,141
Minority interests	-	-	-	-	-
Preferred shareholders funds	-	-	-	-	-

Key ratios

	Dec-24A	Dec-25A	Dec-26F	Dec-27F	Dec-28F
Growth					
Revenue growth	(4.6%)	36.3%	106.0%	168.5%	59.3%
Operating profit growth	(4.2%)	14.4%	117.8%	189.5%	73.1%
EBITDA growth	(3.4%)	13.6%	104.6%	177.3%	72.4%
Net profit growth	(1.6%)	9.2%	123.9%	178.6%	72.5%
EPS growth	(1.6%)	9.2%	123.9%	178.6%	72.5%
Profitability					
Gross profit margin	32.4%	24.8%	21.0%	17.8%	18.2%
Operating margin	15.2%	12.7%	13.5%	14.5%	15.8%
EBITDA margin	17.7%	14.7%	14.6%	15.1%	16.3%
Net profit margin	13.8%	11.0%	12.0%	12.5%	13.5%
Return on average assets	14.6%	13.8%	21.7%	34.0%	38.6%
Return on average equity	32.9%	31.1%	53.4%	85.6%	84.3%
Stability					
Gross debt to equity	0.6%	1.3%	0.9%	0.5%	0.3%
Net debt to equity	Net cash	Net cash	Net cash	Net cash	Net cash
Interest coverage (x)	971.2	1,066.1	1,150.1	2,635.7	4,543.9
Interest & ST debt coverage (x)	1.0	1.0	1.0	1.0	1.0
Cash flow interest coverage(x)	1,490.9	(274.1)	822.6	2,417.9	3,351.0
Cash flow/int. & ST debt (x)	1,490.9	(274.1)	822.6	2,417.9	3,351.0
Current ratio (x)	1.7	1.7	1.5	1.5	1.7
Quick ratio (x)	1.5	1.0	0.8	1.0	1.1
Net debt (NT$mn)	(10,354)	(6,481)	(10,077)	(22,914)	(31,177)
Per share data					
EPS (NT$)	25.75	28.13	62.97	175.43	302.59
CFPS (NT$)	46.58	(8.53)	52.28	189.41	262.50
BVPS (NT$)	84.28	96.36	139.56	270.19	448.08
Adj BVPS (NT$)	84.28	96.36	139.56	270.19	448.08
SPS (NT$)	186.88	254.76	524.73	1,408.97	2,244.86
EBITDA/share (NT$)	33.03	37.51	76.75	212.84	366.91
Cash DPS (NT$)	16.00	20.00	44.80	124.70	215.10
Activity					
Sales / avg assets	1.06	1.25	1.81	2.73	2.86
Days receivable	29.3	36.5	43.4	41.9	32.7
Days inventory	60.4	144.2	135.1	67.7	57.9
Days payable	36.5	58.6	86.6	83.5	65.0
Cash cycle	53.2	122.1	91.9	26.1	25.5

Source: Company data; KGI Research estimates

Profit & loss

NT$mn	Dec-24A	Dec-25A	Dec-26F	Dec-27F	Dec-28F
Revenue	**25,044**	**34,141**	**70,320**	**188,818**	**300,836**
Cost of goods sold	(16,937)	(25,687)	(55,544)	(155,152)	(246,065)
Gross profit	**8,108**	**8,454**	**14,776**	**33,666**	**54,770**
Operating expenses	(4,305)	(4,104)	(5,304)	(6,246)	(7,319)
Operating profit	**3,803**	**4,350**	**9,472**	**27,420**	**47,452**
Non-operating income	**166**	**211**	**264**	**248**	**248**
Interest income	154	182	237	240	240
Investment income	-	-	-	-	-
Other non-op income	12	30	27	8	8
Non-operating expenses	**94**	**(118)**	**50**	**(9)**	**(9)**
Interest expense	(4)	(4)	(9)	(10)	(10)
Investment loss	-	-	-	-	-
Other non-op expenses	98	(114)	59	2	2
Pre-tax profit	**4,062**	**4,443**	**9,786**	**27,659**	**47,691**
Current taxation	(612)	(673)	(1,348)	(4,149)	(7,140)
Minorities	-	-	-	-	-
Extraordinary items	-	(0)	0	0	0
Net profit	**3,451**	**3,770**	**8,438**	**23,510**	**40,551**
EBITDA	**4,426**	**5,027**	**10,286**	**28,524**	**49,170**
EPS (NT$)	25.75	28.13	62.97	175.43	302.59

Cash flow

NT$mn	Dec-24A	Dec-25A	Dec-26F	Dec-27F	Dec-28F
Operations cash flow	**6,242**	**(1,143)**	**7,006**	**25,382**	**35,178**
Net profit	3,451	3,770	8,438	23,510	40,551
Depreciation & amortisation	623	677	814	1,104	1,719
Decrease in working capital	1,871	(6,739)	(6,306)	769	(7,091)
Other operating cash flow	298	1,149	4,059	(0)	-
Investing cash flow	**(1,522)**	**(398)**	**(711)**	**(6,542)**	**(10,204)**
Sale of ST investment	(850)	688	2,008	-	-
New investments	-	-	-	-	-
Capital expenditure	(471)	(839)	(2,229)	(6,147)	(9,811)
Others investing cashflow	(201)	(247)	(491)	(394)	(393)
Free cash flow	**4,878**	**(3,614)**	**32**	**18,637**	**24,771**
Financing cash flow	**(1,962)**	**(2,227)**	**(2,730)**	**(6,004)**	**(16,711)**
Increase in short term debt	-	-	-	-	-
Increase in long term loans	-	-	-	-	-
New ordinary shares issued	-	-	-	-	-
Ordinary dividends paid	(1,876)	(2,144)	(2,680)	(6,004)	(16,711)
Other financing cashflow	(86)	(82)	(50)	-	-
Forex effects	**31**	**(10)**	**32**	**-**	**-**
Total cash generated	**2,790**	**(3,778)**	**3,597**	**12,837**	**8,263**

ROIC

	Dec-24A	Dec-25A	Dec-26F	Dec-27F	Dec-28F
1 - COGS/revenue					
- Operating exp./revenue	17.2%	12.0%	7.5%	3.3%	2.4%
= Operating margin	**15.2%**	**12.7%**	**13.5%**	**14.5%**	**15.8%**
1 / (Working capital/revenue	(0.1)	0.1	0.1	0.0	0.0
+ Net PPE/revenue	0.0	0.0	0.0	0.0	0.1
+ Other assets/revenue)	0.0	0.0	0.0	0.0	0.0
= Capital turnover	**(10.4)**	**8.9**	**8.9**	**15.1**	**10.7**
Operating margin	15.2%	12.7%	13.5%	14.5%	15.8%
x Capital turnover	(10.4)	8.9	8.9	15.1	10.7
x (1 - tax rate)	84.9%	84.8%	86.2%	85.0%	85.0%
= After-tax ROIC	**(133.8%)**	**96.4%**	**103.8%**	**185.9%**	**143.5%**

Source: Company data; KGI Research estimates

Alchip Technologies

(3661.TW/3661 TT)

Outperform · Maintained

Price as of November 10 (NT$)	3,420
12M target price (NT$)	6,600
Previous target price (NT$)	6,180
Revised up (%)	6.8
Upside (%)	93.0

Key message

1. Higher supplier allocation for US hyperscaler's 3nm project.
2. 2nm project on track, with a stronger position than 3nm.
3. New US$1.0bn-scale design win to contribute mass-production sales from 2Q27F.
4. Other projects on track; supply bottlenecks gradually easing.
5. Gross margin dilution is not a negative, as operating leverage supports earnings.

Trading data

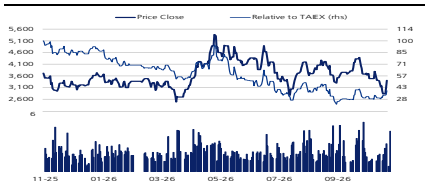
Mkt cap (NT$bn/US$mn)	295.3 / 9,002
Outstanding shares (mn)	86.35
Foreign ownership (mn)	42
3M avg. daily trading (mn)	1.46
52-week trading range (NT$)	2,485 –5,375

Performance	3M	6M	12M
Absolute (%)	-10.0	-30.1	-8.0
Relative (%)	-5.1	-32.8	-61.3

Quarterly EPS

NT$	1Q	2Q	3Q	4Q
2025	18.13A	16.37A	16.40A	18.33A
2026	17.55A	20.01A	39.97F	46.54F
2027	46.30F	51.71F	57.32F	63.78F

Share price chart



Source: TEJ

2027F sales to double; 2nm to drive 2028F growth

Event

Alchip Technologies' 3Q26 EPS hit a record high, and the firm announced another US$1.0bn-scale design win. Management guides record-high 4Q26 sales and triple-digit YoY sales growth in 2027, with the 2nm project on track to begin tape-out in 4Q26. We think the growth outlook for 2027-28 has improved significantly.

Impact

Higher supplier allocation for US hyperscaler's 3nm project. The 3nm AI accelerator project has entered volume production smoothly, meeting all test criteria with reasonable yield. Management guides 2027 sales will grow by triple-digits YoY, above prior guidance, mainly as the client raised its supplier allocation for Alchip. Management also said 3nm will stay in mass production for about two years before the next generation takes over. With cloud chips moving into external sales and extending platform life cycles, we expect 3nm shipments to continue in 2028 and transition to 2nm mass production.

2nm project on track, with a stronger position than 3nm. The next-gen 2nm AI accelerator project has entered final implementation, with a series of tape-outs from 4Q26, targeting low-volume production in 4Q27 and high-volume production in early 2028. Adopting a chiplet architecture and GAA process, the 2nm chip carries much higher design value-add than 3nm. Alchip handles the physical design and integration of all dies, including the I/O die, and the client has currently committed that only itself and Alchip will place 2nm wafer orders, so Alchip's production share should exceed that of 3nm. We estimate ASP will be more than double that of the 3nm project. In addition, we expect NRE from the A14 project to start contributing in 2027, and estimate turnkey sales from the US hyperscaler's project to account for 68-70% of 2027 total sales.

New US$1.0bn-scale design win to contribute mass-production sales from 2Q27F. The contract has been signed with a first-time US client for an HPC chip. Management expects mass production sales from 2Q27 and quarterly thereafter, with reasonable gross margin, which would make it the second largest revenue source in 2027F under a sustainable new business model. Management notes an industry-wide engineer shortage, with many projects needing physical design support, which Alchip addresses with its engineering capability. As we stated in our design service sector report, clients' in-house teams cannot keep up with workloads, and those that are strong in front-end design, but short of back-end engineers are best suited to outsource back-end physical design and mass production. This project reflects that segmented outsourcing trend.

Valuation & Action

The market's biggest concerns about Alchip are overconcentration in a large client and revenue volatility from generation transitions. Both were addressed positively at the earnings call, and the key now is how much sales the balance sheet can support. Management notes the industry's continued shift toward the COT model, a long-term structural trend favoring Alchip and consistent with our sector report view that clients are moving from full-service to segmented outsourcing. We revise our 2026-27 EPS forecasts to a respective NT$124.20 and NT$219.12, and forecast 2028 EPS of NT$409.40. We maintain Outperform with a target price of NT$6,600, based on 30x 2027F EPS (five-year average). With the stock now trading at 16x 2027F EPS, we think valuation is attractive.

Risks

Weakening demand for AI ASIC from US hyperscalers; delays in 2nm tape-out or mass production; slower ramp-up for the new client; prolonged supply chain bottlenecks; intense competitive dynamics.

Key financials and valuations

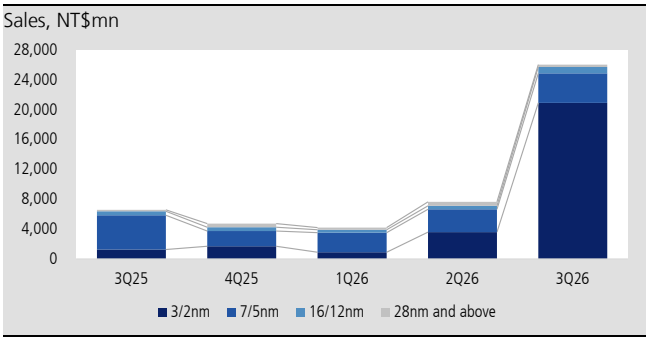
	Dec-24A	Dec-25A	Dec-26F	Dec-27F	Dec-28F
Revenue (NT$mn)	51,969	30,926	69,213	138,422	259,250
Gross profit (NT$mn)	10,201	8,154	14,995	26,050	46,788
Operating profit (NT$mn)	6,496	5,017	11,042	21,071	40,540
Net profit (NT$mn)	6,446	5,598	10,103	17,823	33,300
EPS (NT$)	81.34	69.18	124.20	219.12	409.40
Cash DPS (NT$)	40.05	34.41	62.10	109.56	204.70
EPS growth (%)	78.9	(14.9)	79.5	76.4	86.8
PE (x)	42.0	49.4	27.5	15.6	8.4
PB (x)	7.0	6.8	4.4	3.7	2.8
EV/EBITDA (x)	25.6	28.4	16.2	8.6	5.1
Net debt to equity (%)	Net cash	Net cash	Net cash	Net cash	Net cash
Dividend yield (%)	1.2	1.0	1.8	3.2	6.0
Return on average equity (%)	22.4	14.0	18.7	24.2	36.1

Source: Company data; KGI Research estimates

Other projects on track; supply bottlenecks gradually easing. Networking and CPU projects are progressing as planned. We expect the 3nm networking project to enter mass production in 2027, followed by 2nm tape-out, with revenue contribution from 2028. Demand for the China automotive OEM ADAS project remains solid, and its next-gen design will tape-out on schedule in 4Q26F, which we expect to adopt a 5nm automotive process. However, substrate and packaging capacity is prioritized for CSP business, limiting shipments of automotive and consumer projects. Management estimates 3Q26 sales could have been about US$100mn higher without these constraints, and the situation is gradually improving.

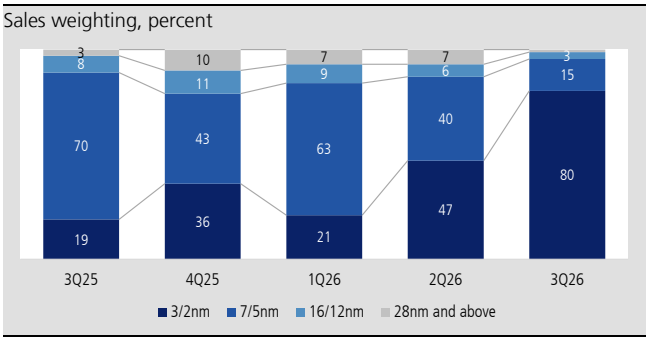
Gross margin dilution is not a negative, as operating leverage supports earnings. Compared with 1Q26, 3Q26 gross margin fell below 20% due to the high 3nm sales weighting, supply constraints for high-margin production projects, and deferred NRE recognition, but operating margin declined only modestly thanks to operating leverage. Management believes 3Q26 gross margin is close to the worst case under the current sales mix and expects 4Q26 to be similar to 3Q26, with a long-term operating margin target in the high teens. As noted in our sector report, design service providers should be evaluated mainly on operating profit and EPS. We forecast 2027 sales will grow 100.0% YoY to NT$138bn. Although gross margin will be diluted to 18.8%, we expect operating profit to rise 90.8% YoY and operating margin to decline 0.7ppts YoY.

Figure 1: Alchip sales by node



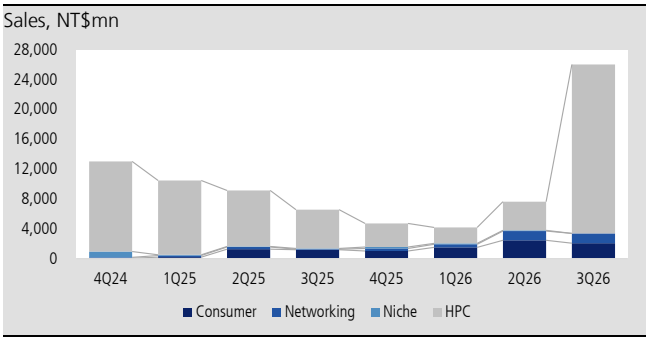
Source: Company data; KGI Research

Figure 2: Alchip sales weighting by node



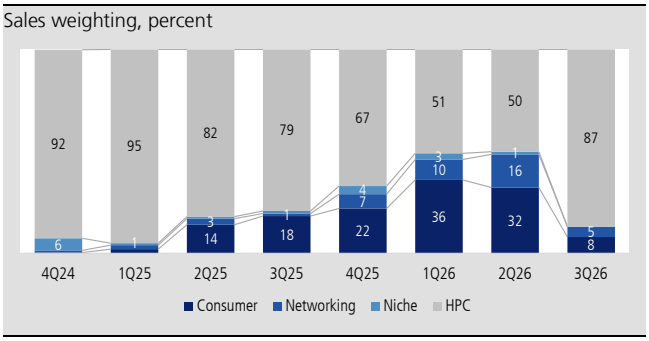
Source: Company data; KGI Research

Figure 3: Alchip sales by application



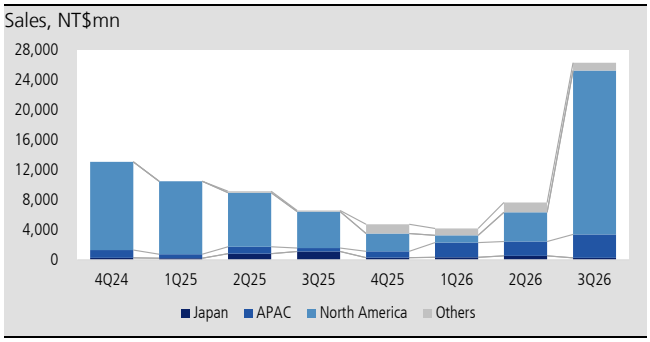
Source: Company data; KGI Research

Figure 4: Alchip sales weighting by application



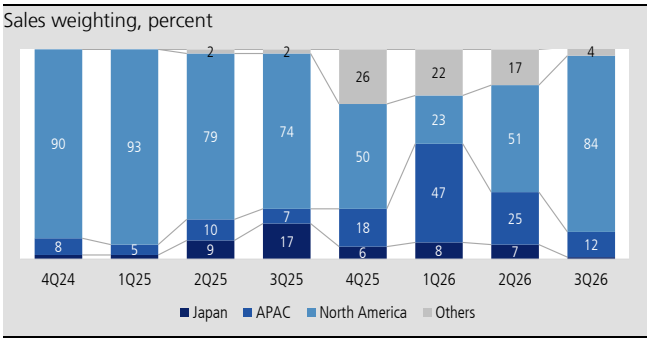
Source: Company data; KGI Research

Figure 5: Alchip sales by region



Source: Company data; KGI Research

Figure 6: Alchip sales weighting by region



Source: Company data; KGI Research

Figure 7: Breakdown of 3Q26 results & 4Q26 forecast revisions vs. consensus

	3Q26							4Q26F						
NT$mn	Actual	KGI forecast	Diff. (%)	QoQ (%)	YoY (%)	Consensus	Diff. (%)	Revision	Previous	Chg. (%)	QoQ (%)	YoY (%)	Consensus	Diff. (%)
Revenue	26,051	28,395	(8.3)	241.0	296.5	25,597	1.8	31,335	32,510	(3.6)	20.3	562.8	31,772	(1.4)
Gross profit	4,699	5,406	(13.1)	76.5	155.3	5,205	(9.7)	5,533	5,420	2.1	17.7	177.0	5,846	(5.4)
Operating profit	3,629	4,169	(12.9)	120.4	213.6	4,114	(11.8)	4,399	4,130	6.5	21.2	262.0	4,674	(5.9)
Net profit	3,251	3,609	(9.9)	98.4	144.8	3,583	(9.3)	3,785	3,572	6.0	16.4	155.2	4,228	(10.5)
EPS (NT$)	39.97	44.36	(9.9)	99.8	143.8	43.43	(8.0)	46.54	43.92	6.0	16.4	153.9	49.81	(6.6)
Gross margin (%)	18.0	19.0	(1.0)ppts	(16.8)ppts	(10.0)ppts	20.3	(2.3)ppts	17.7	16.7	1.0 ppts	(0.4)ppts	(24.6)ppts	18.4	(0.7)ppts
OP margin (%)	13.9	14.7	(0.8)ppts	(7.6)ppts	(3.7)ppts	16.1	(2.1)ppts	14.0	12.7	1.3 ppts	0.1 ppts	(11.7)ppts	14.7	(0.7)ppts
Net margin (%)	12.5	12.7	(0.2)ppts	(9.0)ppts	(7.7)ppts	14.0	(1.5)ppts	12.1	11.0	1.1 ppts	(0.4)ppts	(19.3)ppts	13.3	(1.2)ppts

Source: Company data; Bloomberg; KGI Research estimates

Figure 8: Breakdown of 2026-27 forecast revisions & 2028 forecasts vs. consensus

	2026F						2027F						2028F			
NT$mn	Revision	Previous	Chg. (%)	YoY (%)	Consensus	Diff. (%)	Revision	Previous	Chg. (%)	YoY (%)	Consensus	Diff. (%)	KGI forecast	YoY (%)	Consensus	Diff. (%)
Revenue	69,213	72,732	(4.8)	123.8	70,201	(1.4)	138,422	108,256	27.9	100.0	133,289	3.9	259,250	87.3	209,013	24.0
Gross profit	14,995	16,008	(6.3)	83.9	15,631	(4.1)	26,050	21,006	24.0	73.7	25,222	3.3	46,788	79.6	38,665	21.0
Operating profit	11,042	11,862	(6.9)	120.1	11,707	(5.7)	21,071	16,094	30.9	90.8	20,169	4.5	40,540	92.4	30,900	31.2
Net profit	10,103	10,623	(4.9)	80.5	10,721	(5.8)	17,823	13,960	27.7	76.4	17,292	3.1	33,300	86.8	26,073	27.7
EPS (NT$)	124.20	130.60	(4.9)	79.5	128.57	(3.4)	219.12	171.62	27.7	76.4	205.83	6.5	409.40	86.8	307.29	33.2
Gross margin (%)	21.7	22.0	(0.3)ppts	(4.7)ppts	22.3	(0.6)ppts	18.8	19.4	(0.6)ppts	(2.8)ppts	18.9	(0.1)ppts	18.0	(0.8)ppts	18.5	(0.5)ppts
OP margin (%)	16.0	16.3	(0.4)ppts	(0.3)ppts	16.7	(0.7)ppts	15.2	14.9	0.4 ppts	(0.7)ppts	15.1	0.1 ppts	15.6	0.4 ppts	14.8	0.9 ppts
Net margin (%)	14.6	14.6	(0.0)ppts	(3.5)ppts	15.3	(0.7)ppts	12.9	12.9	(0.0)ppts	(1.7)ppts	13.0	(0.1)ppts	12.8	(0.0)ppts	12.5	0.4 ppts

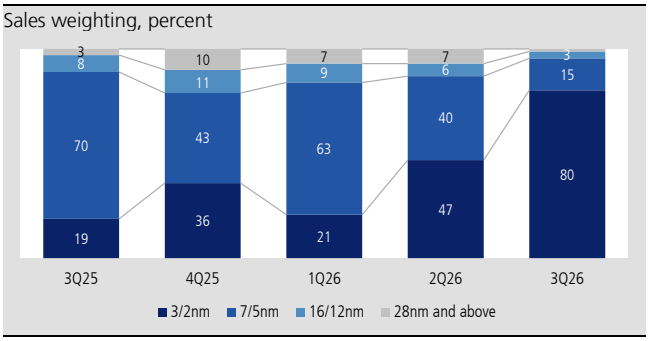
Source: Bloomberg; KGI Research estimates

Figure 9: Company profile

Founded in 2003, Alchip Technologies specializes in providing high-complexity ASIC/SoC design, especially back-end design, and manufacturing services. The firm has been a major player in the IC design service market for years, with a team mainly composed of IC design experts from Silicon Valley in the US and Japan. The firm is headquartered in Taipei, with an ASIC manufacturing center in Hsinchu. In keeping with a global deployment strategy, the company has established subsidiaries in China, Japan, and the US.

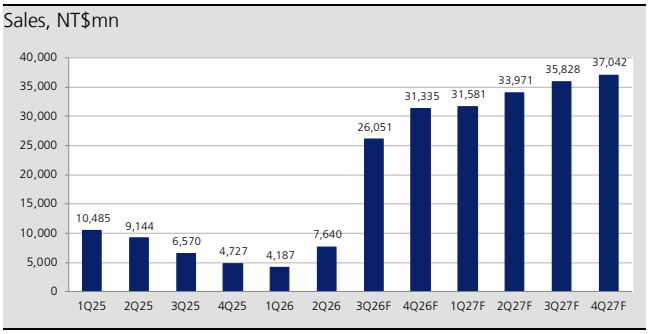
Source: Company data; KGI Research

Figure 10: Sales by node



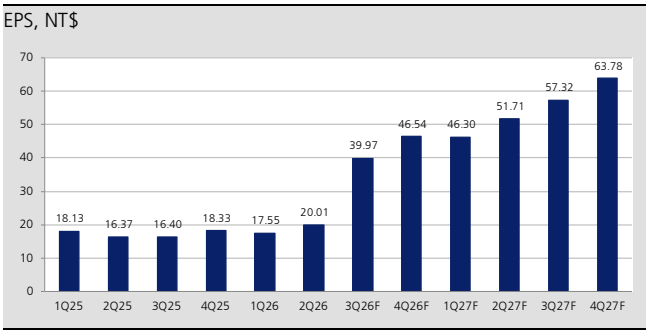
Source: Company data; KGI Research

Figure 11: Sales



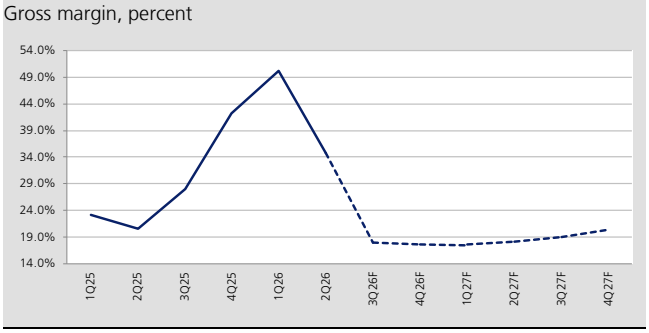
Source: KGI Research

Figure 12: EPS



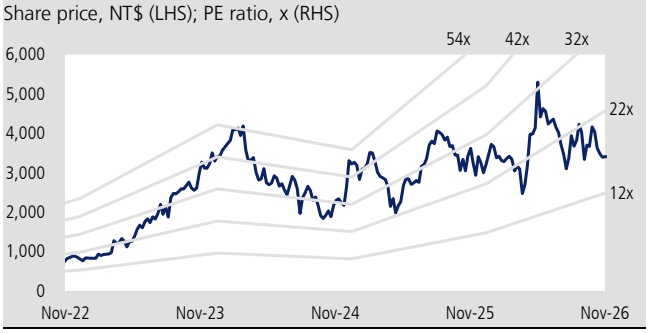
Source: KGI Research

Figure 13: Gross Margin



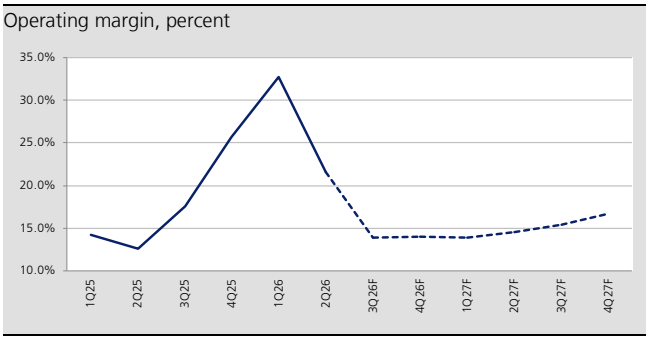
Source: KGI Research

Figure 14: 12M forward PE band



Source: TEJ; KGI Research estimates

Figure 15: Operating Margin



Source: KGI Research

Figure 16: 12M forward PB band



Source: TEJ; KGI Research estimates

Income statement

	Quarterly								Annually		
	Mar-26A	Jun-26A	Sep-26F	Dec-26F	Mar-27F	Jun-27F	Sep-27F	Dec-27F	Dec-26F	Dec-27F	Dec-28F
Income statement (NT$mn)											
Revenue	**4,187**	**7,640**	**26,051**	**31,335**	**31,581**	**33,971**	**35,828**	**37,042**	**69,213**	**138,422**	**259,250**
Cost of goods sold	(2,086)	(4,978)	(21,352)	(25,803)	(26,016)	(27,803)	(29,041)	(29,510)	(54,218)	(112,371)	(212,462)
Gross profit	**2,101**	**2,662**	**4,699**	**5,533**	**5,565**	**6,168**	**6,786**	**7,531**	**14,995**	**26,050**	**46,788**
Operating expenses	(733)	(1,015)	(1,070)	(1,134)	(1,166)	(1,215)	(1,260)	(1,338)	(3,952)	(4,979)	(6,248)
Operating profit	**1,368**	**1,647**	**3,629**	**4,399**	**4,399**	**4,953**	**5,526**	**6,193**	**11,042**	**21,071**	**40,540**
Depreciation of fixed assets	(558)	(644)	(702)	(903)	(1,139)	(1,139)	(1,139)	(1,139)	(2,806)	(4,555)	(7,076)
Amortisation of intangible assets	(134)	(122)	(128)	(129)	(138)	(138)	(138)	(138)	(513)	(553)	(551)
EBITDA	**2,060**	**2,412**	**4,459**	**5,431**	**5,676**	**6,230**	**6,803**	**7,470**	**14,362**	**26,179**	**48,166**
Interest income	369	377	340	340	340	340	340	340	1,426	1,360	1,360
Investment income	4	-	-	-	-	-	-	-	4	-	-
Other non-op income	27	14	-	-	-	-	-	-	41	-	-
Non-operating income	**400**	**391**	**340**	**340**	**340**	**340**	**340**	**340**	**1,471**	**1,360**	**1,360**
Interest expense	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(3)	(12)	(11)	(11)
Investment loss	-	-	-	-	-	-	-	-	-	-	-
Other non-op expenses	19	(0)	115	-	-	-	-	-	135	-	-
Non-operating expenses	**16**	**(3)**	**113**	**(3)**	**(3)**	**(3)**	**(3)**	**(3)**	**123**	**(11)**	**(11)**
Pre-tax profit	**1,784**	**2,035**	**4,082**	**4,736**	**4,737**	**5,290**	**5,863**	**6,530**	**12,637**	**22,420**	**41,888**
Current taxation	(357)	(397)	(832)	(947)	(971)	(1,084)	(1,202)	(1,339)	(2,533)	(4,596)	(8,587)
Minorities	1	1	1	(3)	1	1	1	(3)	(1)	(1)	(1)
Normalised net profit	**1,428**	**1,639**	**3,251**	**3,785**	**3,766**	**4,206**	**4,663**	**5,188**	**10,103**	**17,823**	**33,300**
Extraordinary items	(0)	0	(0)	0	(0)	0	(0)	0	-	(0)	(0)
Net profit	**1,428**	**1,639**	**3,251**	**3,785**	**3,766**	**4,206**	**4,663**	**5,188**	**10,103**	**17,823**	**33,300**
EPS (NT$)	17.55	20.01	39.97	46.54	46.30	51.71	57.32	63.78	124.20	219.12	409.40
Margins (%)											
Gross profit margin	50.2	34.8	18.0	17.7	17.6	18.2	18.9	20.3	21.7	18.8	18.0
Operating margin	32.7	21.6	13.9	14.0	13.9	14.6	15.4	16.7	16.0	15.2	15.6
EBITDA margin	49.2	31.6	17.1	17.3	18.0	18.3	19.0	20.2	20.8	18.9	18.6
Pretax profit margin	42.6	26.6	15.7	15.1	15.0	15.6	16.4	17.6	18.3	16.2	16.2
Net profit margin	34.1	21.4	12.5	12.1	11.9	12.4	13.0	14.0	14.6	12.9	12.8
Sequential growth (%)											
Revenue growth	(11.4)	82.5	241.0	20.3	0.8	7.6	5.5	3.4			
Gross profit growth	5.2	26.7	76.5	17.7	0.6	10.8	10.0	11.0			
Operating profit growth	12.6	20.4	120.4	21.2	0.0	12.6	11.6	12.1			
EBITDA growth	1.6	17.1	84.9	21.8	4.5	9.7	9.2	9.8			
Pretax profit growth	2.7	14.1	100.6	16.0	0.0	11.7	10.8	11.4			
Net profit growth	(3.7)	14.8	98.4	16.4	(0.5)	11.7	10.9	11.3			
YoY growth (%)											
Revenue growth	(60.1)	(16.5)	296.5	562.8	654.3	344.7	37.5	18.2	123.8	100.0	87.3
Gross profit growth	(13.5)	41.1	155.3	177.0	164.9	131.7	44.4	36.1	83.9	73.7	79.6
Operating profit growth	(8.5)	43.2	213.6	262.0	221.7	200.8	52.3	40.8	120.1	90.8	92.4
EBITDA growth	(13.6)	32.9	140.8	168.0	175.6	158.2	52.6	37.6	77.8	82.3	84.0
Pretax profit growth	(0.5)	27.2	156.6	172.7	165.5	160.0	43.6	37.9	88.0	77.4	86.8
Net profit growth	(2.4)	23.8	144.8	155.2	163.8	156.7	43.4	37.1	80.5	76.4	86.8

Source: Company data; KGI Research estimates

Balance sheet

NT$mn	Dec-24A	Dec-25A	Dec-26F	Dec-27F	Dec-28F
Total assets	**50,309**	**58,039**	**107,869**	**125,110**	**195,843**
Current assets	**46,184**	**53,057**	**100,305**	**111,712**	**170,178**
Cash & ST securities	29,428	38,882	49,636	58,089	41,536
Inventory	8,661	6,945	29,931	29,510	68,043
Accounts receivable	5,730	3,011	18,785	22,160	58,648
Other current assets	2,366	4,219	1,952	1,952	1,952
Non-current assets	**4,125**	**4,982**	**7,564**	**13,398**	**25,665**
LT investments	1,600	2,204	2,872	2,872	2,872
Net fixed assets	1,775	1,680	3,780	9,613	21,880
Other assets	750	1,098	912	912	912
Total liabilities	**10,833**	**17,214**	**40,487**	**44,956**	**91,299**
Current liabilities	**10,672**	**16,975**	**40,271**	**44,740**	**91,083**
Accounts payable	1,826	1,986	21,780	26,248	72,592
Interest bearing ST liabilities	-	-	-	-	-
Other current liabilities	8,845	14,988	18,491	18,491	18,491
Non-current liabilities	**161**	**240**	**216**	**216**	**216**
Long-term debt	-	-	-	-	-
Other L-T liabilities	29	30	27	27	27
Total equity	**39,477**	**40,824**	**67,382**	**80,154**	**104,544**
Share capital	806	813	862	862	862
Retained earnings reserve	10,685	13,337	20,662	33,434	57,823
Minority interests	21	19	20	21	21
Preferred shareholders funds	-	-	-	-	-

Key ratios

	Dec-24A	Dec-25A	Dec-26F	Dec-27F	Dec-28F
Growth					
Revenue growth	70.5%	(40.5%)	123.8%	100.0%	87.3%
Operating profit growth	72.7%	(22.8%)	120.1%	90.8%	92.4%
EBITDA growth	58.1%	(11.6%)	77.8%	82.3%	84.0%
Net profit growth	93.8%	(13.1%)	80.5%	76.4%	86.8%
EPS growth	78.9%	(14.9%)	79.5%	76.4%	86.8%
Profitability					
Gross profit margin	19.6%	26.4%	21.7%	18.8%	18.0%
Operating margin	12.5%	16.2%	16.0%	15.2%	15.6%
EBITDA margin	17.6%	26.1%	20.8%	18.9%	18.6%
Net profit margin	12.4%	18.1%	14.6%	12.9%	12.8%
Return on average assets	15.6%	10.3%	12.2%	15.3%	20.8%
Return on average equity	22.4%	14.0%	18.7%	24.2%	36.1%
Stability					
Gross debt to equity	0.0%	0.0%	0.0%	0.0%	0.0%
Net debt to equity	Net cash	Net cash	Net cash	Net cash	Net cash
Interest coverage (x)	870.5	751.7	1,084.4	1,973.6	3,686.4
Interest & ST debt coverage (x)	1.0	1.0	1.0	1.0	1.0
Cash flow interest coverage(x)	373.9	1,706.0	(11.2)	2,150.8	1,077.9
Cash flow/int. & ST debt (x)	373.9	1,706.0	(11.2)	2,150.8	1,077.9
Current ratio (x)	4.3	3.1	2.5	2.5	1.9
Quick ratio (x)	3.5	2.7	1.7	1.8	1.1
Net debt (NT$mn)	(27,044)	(32,627)	(35,954)	(44,407)	(27,854)
Per share data					
EPS (NT$)	81.34	69.18	124.20	219.12	409.40
CFPS (NT$)	42.37	188.72	(1.61)	300.54	150.62
BVPS (NT$)	489.23	502.01	781.42	929.57	1,212.49
Adj BVPS (NT$)	497.91	504.26	828.15	985.17	1,285.01
SPS (NT$)	655.81	382.18	850.91	1,701.77	3,187.24
EBITDA/share (NT$)	115.34	99.82	176.57	321.85	592.16
Cash DPS (NT$)	40.05	34.41	62.10	109.56	204.70
Activity					
Sales / avg assets	1.26	0.57	0.83	1.19	1.62
Days receivable	40.4	35.5	99.1	58.4	82.8
Days inventory	75.9	111.3	201.5	95.9	117.2
Days payable	16.0	31.8	146.6	85.3	125.1
Cash cycle	100.2	115.0	153.9	69.0	75.0

Source: Company data; KGI Research estimates

Profit & loss

NT$mn	Dec-24A	Dec-25A	Dec-26F	Dec-27F	Dec-28F
Revenue	**51,969**	**30,926**	**69,213**	**138,422**	**259,250**
Cost of goods sold	(41,768)	(22,772)	(54,218)	(112,371)	(212,462)
Gross profit	**10,201**	**8,154**	**14,995**	**26,050**	**46,788**
Operating expenses	(3,705)	(3,138)	(3,952)	(4,979)	(6,248)
Operating profit	**6,496**	**5,017**	**11,042**	**21,071**	**40,540**
Non-operating income	**1,372**	**1,714**	**1,471**	**1,360**	**1,360**
Interest income	1,203	1,592	1,426	1,360	1,360
Investment income	-	-	4	-	-
Other non-op income	169	122	41	-	-
Non-operating expenses	**(60)**	**(11)**	**123**	**(11)**	**(11)**
Interest expense	(9)	(9)	(12)	(11)	(11)
Investment loss	(29)	(48)	-	-	-
Other non-op expenses	(22)	45	135	-	-
Pre-tax profit	**7,808**	**6,720**	**12,637**	**22,420**	**41,888**
Current taxation	(1,362)	(1,124)	(2,533)	(4,596)	(8,587)
Minorities	(1)	2	(1)	(1)	(1)
Extraordinary items	-	0	(0)	(0)	(0)
Net profit	**6,446**	**5,598**	**10,103**	**17,823**	**33,300**
EBITDA	**9,140**	**8,077**	**14,362**	**26,179**	**48,166**
EPS (NT$)	81.34	69.18	124.20	219.12	409.40

Cash flow

NT$mn	Dec-24A	Dec-25A	Dec-26F	Dec-27F	Dec-28F
Operations cash flow	**3,358**	**15,272**	**(131)**	**24,446**	**12,251**
Net profit	6,446	5,598	10,103	17,823	33,300
Depreciation & amortisation	2,644	3,061	3,320	5,107	7,626
Decrease in working capital	99	2,663	(18,967)	1,514	(28,676)
Other operating cash flow	(5,830)	3,950	5,414	1	1
Investing cash flow	**(676)**	**(5,828)**	**(12,687)**	**(10,941)**	**(19,893)**
Sale of ST investment	795	(4,630)	(7,885)	-	-
New investments	(67)	-	-	-	-
Capital expenditure	(1,998)	(2,287)	(5,088)	(10,388)	(19,343)
Others investing cashflow	594	1,089	287	(553)	(551)
Free cash flow	**5,594**	**7,298**	**(12,420)**	**12,432**	**(8,714)**
Financing cash flow	**12,855**	**(2,653)**	**15,716**	**(5,051)**	**(8,912)**
Increase in short term debt	-	-	-	-	-
Increase in long term loans	-	-	-	-	-
New ordinary shares issued	14,330	-	18,418	-	-
Ordinary dividends paid	(1,818)	(2,946)	(2,799)	(5,051)	(8,912)
Other financing cashflow	343	293	97	-	-
Forex effects	**1,348**	**(1,208)**	**429**	**-**	**-**
Total cash generated	**16,885**	**5,583**	**3,327**	**8,453**	**(16,554)**

ROIC

	Dec-24A	Dec-25A	Dec-26F	Dec-27F	Dec-28F
1 - COGS/revenue					
- Operating exp./revenue	7.1%	10.1%	5.7%	3.6%	2.4%
= Operating margin	**12.5%**	**16.2%**	**16.0%**	**15.2%**	**15.6%**
1 / (Working capital/revenue	0.1	(0.1)	0.2	0.1	0.1
+ Net PPE/revenue	0.0	0.1	0.1	0.1	0.1
+ Other assets/revenue)	0.0	0.0	0.0	0.0	0.0
= Capital turnover	**6.5**	**(30.5)**	**4.8**	**7.4**	**4.4**
Operating margin	12.5%	16.2%	16.0%	15.2%	15.6%
x Capital turnover	6.5	(30.5)	4.8	7.4	4.4
x (1 - tax rate)	82.6%	83.3%	80.0%	79.5%	79.5%
= After-tax ROIC	**67.4%**	**(411.9%)**	**61.8%**	**90.1%**	**54.1%**

Source: Company data; KGI Research estimates

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