

## Foldable smartphones

### Foldable smartphone growth to benefit hinge suppliers

#### Key message

1. We expect global foldable smartphone shipments to grow 55-57% YoY in 2024-25F, outperforming the overall market, at 4-5%, due to brands launching new models with affordable prices.
2. Flexible displays and hinges account for 30-40% of the cost of foldable smartphones. Taiwanese manufacturers will benefit from Chinese and US brands' market share expansion. The ASP of foldable smartphone hinges is much higher than those for NB, driving Taiwan hinge plays' sales and profit growth on growing demand.
3. The main beneficiaries of the foldable smartphone trend include Jarlylytec (3548 TT, NT\$212, NR), Fositek (6805 TT, NT\$403, NR) and SZS (3376 TT, NT\$121, N).

#### Event

While we estimate global smartphone demand will grow 4% YoY in 2024, we anticipate global foldable smartphones will see solid shipment growth of 55% YoY in 2024F after 57% YoY growth in 2023F, as brands will launch several models, with more affordable price points, in this niche market.

#### Impact

**Foldable smartphones to be niche growth product in 2022-25F.** Global foldable smartphone shipments grew 80% YoY to 14.1mn units in 2022, achieving a penetration rate of 1.1%, and 170% YoY to 10.7mn units in 1H23, at a penetration rate of only 1.9%. We forecast foldable smartphone shipments will show strong growth of 57% YoY, to 22.1mn units in 2023F, and 55% YoY to 34.3mn units in 2024F. China (31% market share) and Europe (27%) account for the bulk of the global foldable smartphone market (Figure 7) in terms of shipments by region. According to Gartner, Samsung (KR) was the market leader in foldable smartphones in 1H23, with a global market share of 71%, followed by Huawei (12%; CN), Oppo (CN), Honor (CN), and Vivo (CN). Samsung dominates most overseas markets, while Chinese brands comprise most of the China market at around 92% in 1H23, but Samsung is a relatively small player in China, with market share of only 8% (Figure 8). Huawei's global foldable smartphone market share rose from 9.4% in 2022 to 11.9% in 1H23, while its shipments increased 418% YoY to 1.28mn units in 1H23, boosted by the Mate X3 launched in March 2023. In 2024-25, we anticipate Huawei will expand its sales in overseas markets, and Chinese brands, such as Huawei, Oppo, Vivo, and Xiaomi, as well as US brands, such as Motorola and Google, will launch new models. Therefore, Samsung has seen its market share decline on more competition, from 79% in 2022 to 71% in 1H23, and may decline further in 2024-25F. We expect foldable smartphone demand to increase, and the rising market share of Chinese brands will generate more business opportunities for Taiwan's hinge suppliers.

**Foldable smartphones to benefit Taiwan's hinge makers.** Flexible displays and hinges are key components for foldable smartphones, comprising 30-40% of total BOM cost. With technological breakthroughs in recent years, the retail prices of foldable smartphones have fallen, from over US\$3,000 to US\$1,400-2,000, with some models below US\$1,000. Samsung, LG (KR), BOE (CN), and Visionox (CN) are key flexible display suppliers, while KHVatec (KR), Fositek (6805 TT, NT\$403, NR), Jarlylytec (3548 TT, NT\$212, NR), Amphenol (US), and Kunshan Kersen Science (CN) are the main hinge makers for foldable smartphones. As Samsung's foldable smartphones are mainly supplied by Korean vendors, we believe Taiwan's hinge suppliers will benefit from market share expansion for Chinese foldable smartphone brands. A foldable smartphone can have a clamshell design (i.e. Samsung Z Flip 5), fold inward (i.e. Huawei X5), or fold outward (i.e. Huawei XS). Currently, clamshell and inward folding designs each account for the majority of market share at 45-50%, while outward folding designs only account for single-digit market share as their displays are easier to scratch. Considering large screen demand, we believe that foldable smartphones with inward folding hinges will become the mainstream. As the number of mechanical parts of foldable smartphone bearings are generally more than 100, the size and assembly accuracy requirements are much higher than that of NB, and a foldable smartphone's need to open and close at an angle of 180° and be reliable for more than 150-250k times, the ASP of inward folding hinges is around US\$90-100, while the ASP of clamshell hinges is around US\$60-70, much higher than NB hinge ASP. This trend should benefit hinge plays, with rising foldable smartphone demand due to more affordable of retail prices, and steady gross margin of 20-25% will bring solid sales and earnings growth for hinge manufacturers in Taiwan. SZS (3376 TT, NT\$121, N) also aims to gain foldable smartphone orders from Chinese brands in 2024-25, which would be a catalyst for earnings upside from our current forecast.

#### Stocks for Action

Consensus 2023-24 EPS for Fositek and Jarlylytec is a respective NT\$9.83 and NT\$18.16, and NT\$7.77 and NT\$10.97. A respective 70-80% and 40% of Fositek's and Jarlylytec's sales are derived from foldable smartphones, and they will benefit from growing demand for Huawei's foldable smartphones, while Fositek will gain more clients from the US foldable smartphone market in 2024F. Fositek and Jarlylytec are currently trading at 22x and 19x 2024F EPS, respectively, while SZS is at 19x, with a valuation factoring in growth opportunities.

#### Risks

Weaker-than-expected foldable smartphone demand; competition in hinge supply.

**Fositek**

- 2022 product mix: smartphones 77.6%, NB 20.4%, and others 2%.
- 1Q-3Q23 sales grew 2% YoY, recovering from a 15% YoY fall in 1H23, driven by Huawei's Mate X5 (folds inward) launch and solid demand for Motorola's (US) new foldable smartphone. Thanks to gross and operating margin expansion, up 1.6-1.7ppts YoY, 1Q-3Q23 EPS grew 9% YoY to NT\$7.48.
- Fositek's overall sales surged 157% YoY to NT\$2.2bn in 2020 and 126% YoY to NT\$5.0bn in 2021, on rising foldable smartphone sales. In 2022, its overall sales were flat YoY at NT\$5.0bn, while smartphone sales grew 9% YoY, offsetting the shrinkage of other sales (down 78% YoY) due to a client changing suppliers for some components.
- Fositek began supplying foldable smartphone hinges to Huawei in 2019 (Mate X; folds outward), and the following generations, including the Mate Xs (folds outward) in 2020, Mate X2 (folds inward) in 2021 and Mate Xs2 (folds outward). Fositek's foldable smartphone sales grew 251% YoY to NT\$3.57bn in 2021 and 9% YoY to NT\$3.9bn in 2022, mostly from Huawei.
- During the peak season, in 3Q23, smartphone sales can contribute monthly sales of NT\$400-500mn for Fositek (80-85% of total sales), higher than Jarllytec's NT\$400-450mn (50% of total sales), due to additional sales to Motorola since June. Both Fositek and Jarllytec supply hinges for clamshell and inwardly-foldable models, while only Fositek and another Chinese play supply hinges for outwardly-foldable models. Overall, we estimate Fositek's allocation to Huawei may be 50-60%, higher than the 40-50% of Jarllytec, as Fositek jointly designs new products with its clients, allowing them to begin shipments earlier.
- Huawei will launch new foldable clamshell and outwardly-foldable models in 2024F. Fositek penetrated Motorola's foldable smartphone in 2023 as a major supplier, and will add another US smartphone brand in 2024F, in order to diversify its client portfolio. Consensus forecasts Fositek sales to grow 61% YoY in 2024F, driven by foldable smartphone sales, outperforming Jarllytec's YoY growth of 18% on additional sales contributions from Huawei's outwardly-foldable model, and contributions from Motorola's new model and a new US client in 2024F.
- Consensus forecasts Fositek's EPS to grow 5% YoY to NT\$9.83 in 2023, and 85% YoY to NT\$18.16 in 2024. Shares are trading at 22x 2024F EPS.

**Jarllytec**

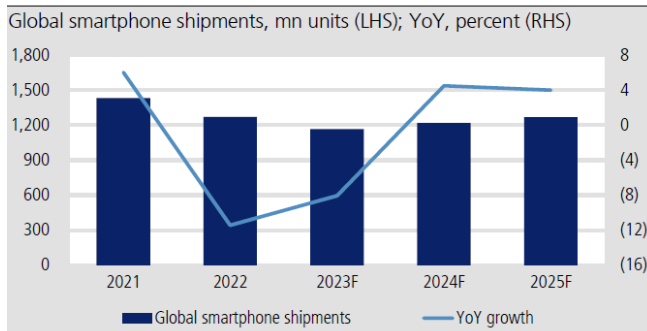
- 1Q-3Q23 sales mix: NB 19%, LCD 35%, 3C 43%, and others 3%.
- 1Q-3Q23 sales rose 10% YoY on 3C sales growth from the launch of the Mate X3 (folds inward) and X5 (folds inward), up 85% YoY, offsetting weakness in sales of NB, down 20% YoY, and LCD, down 8% YoY. Due to weak operating margin, down 0.3ppts YoY, and lower non-op income, 1Q-3Q23 EPS fell 15% YoY to NT\$5.86.
- Management guides 4Q23 monitor shipments (flat or up slightly QoQ) to outperform NB shipments (down QoQ).
- Jarllytec is also one of Huawei's foldable smartphone suppliers, with 40-50% market share. 3C (mainly foldable smartphones) was a key sales driver in 2021-22, with a sales weighting up from 16% in 2021 to 30% in 2022. Overall sales declined 6% YoY in 2022, due to sluggish NB and monitor sales, which were down 20% YoY, despite 3C sales growing 77% YoY, on a lower base in 2021 due to yield issues.
- Huawei may launch a new foldable clamshell model in 4Q23-1H24F. Jarllytec would benefit from the new model launch, which will boost sales and margins in 2024F. However, Huawei's outwardly-foldable model, scheduled to launch in 2024F, will be not supplied by Jarllytec.

- Consensus believes Jarlytec’s EPS will fall 1% YoY to NT\$7.77 in 2023. With a smartphone hinge sales expansion and NB demand recovery, consensus forecasts its sales to grow 18% YoY, and EPS to grow 41% YoY to NT\$10.97, in 2024F with margins expansions thanks to a higher 3C sales weighting. Shares are trading at 19x 2024F EPS.

**SZS**

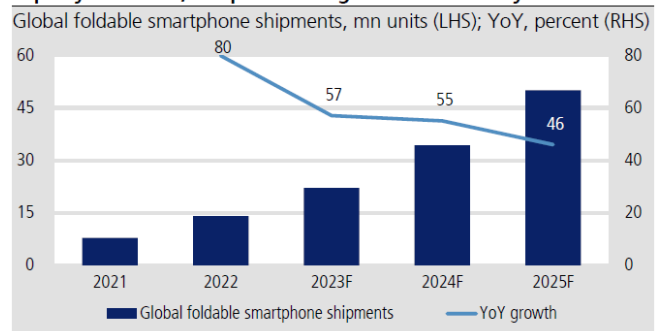
- 1Q-3Q23 sales mix: NB hinges 21%, LCD/monitors 24%, 3C 6%, other hinges 45%, and MIM 4%.
- 1Q-3Q23 sales fell 25% YoY as NB, LCD/monitor, and 3C hinge sales dropped 35-40% YoY, despite other hinge sales growing 17% YoY. Due to margin deterioration on lower sales contribution of high-margin NB (21% in 1Q-3Q23, versus 26% in 1Q-3Q22), 1Q-3Q23 EPS declined 58% YoY to NT\$3.32.
- The firm expects 4Q23 sales to grow only moderately QoQ, versus our forecast of 3% QoQ growth, given no new products this year and labor constraints in Taiwan.
- We expect SZS to benefit from NB demand recovery in 2024, while AirPods sales will also grow YoY. We forecast sales growth of 17% YoY in 2024.
- Due to its footprint expansion target in foldable smartphones, SZS may penetrate foldable smartphones for non-Huawei Chinese smartphone brands in 2H24F at the earliest, and will see more significant sales contribution in 2025F. Assuming a 50% allocation to its new client, this will contribute an additional EPS, of NT\$1-2, to SZS annually. In addition, on its tight relationship with Apple (US), SZS will have a good opportunity to supply the firm with foldable smartphones or tablets in the future.
- We forecast EPS will fall 43% YoY to NT\$4.94, but recover 31% YoY to NT\$6.45 in 2024. Shares are trading at 19x 2024F EPS.

**Figure 1: We expect global smartphone shipments to grow 4% YoY in 2024F**



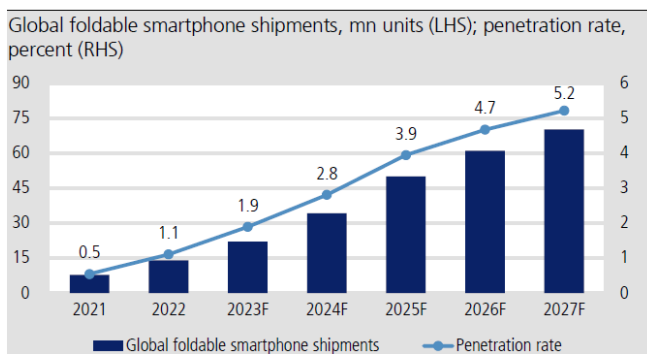
Source: Gartner, KGI Research estimates

**Figure 2: Global foldable smartphone shipments to grow rapidly in 2024F, outperforming overall industry**



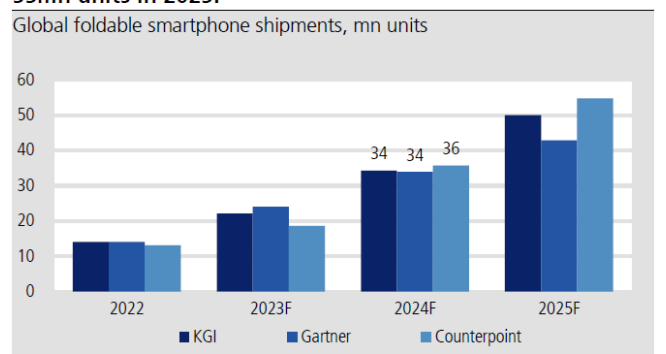
Source: Gartner, KGI Research

**Figure 3: Foldable smartphone penetration rate is gradually increasing and will reach 5.2% in 2027F**

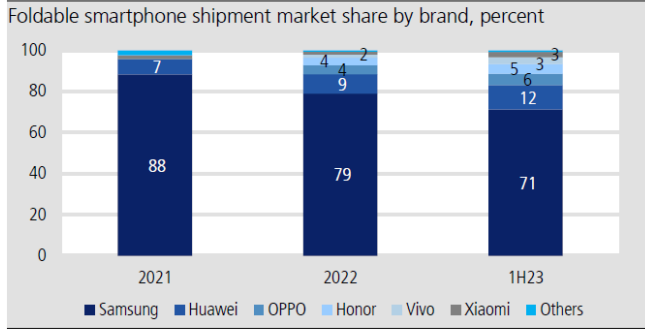


Source: Gartner, KGI Research estimates

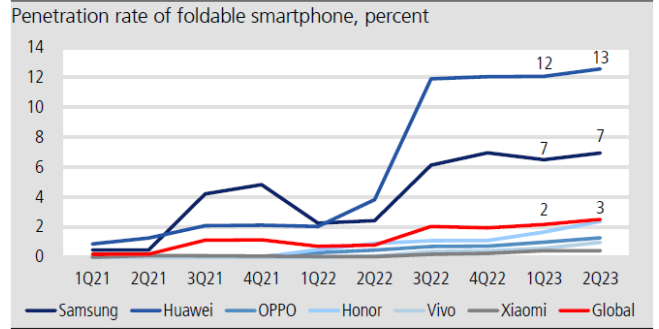
**Figure 4: Consensus expects global foldable smartphone shipments to be 34-36mn units in 2024F, growing to 43-55mn units in 2025F**



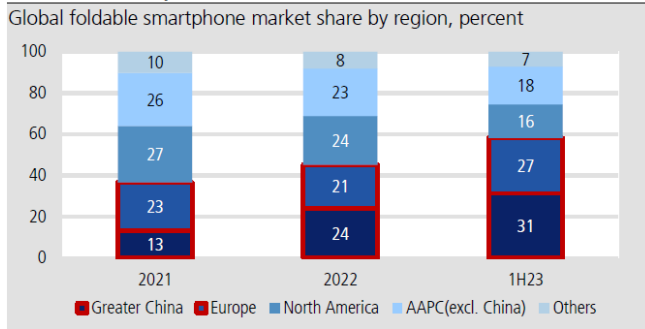
Source: Gartner, Counterpoint; KGI Research

**Figure 5: Samsung's foldable smartphones dominated the market in 1H23**


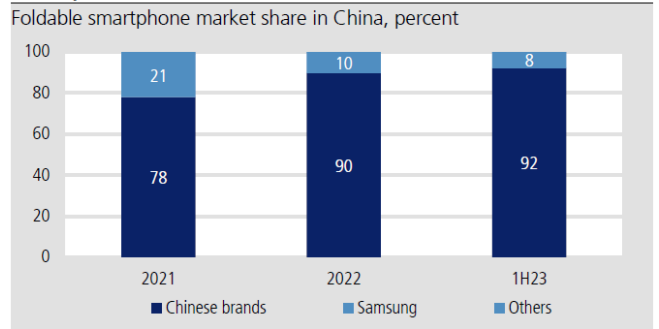
Source: Gartner, KGI Research

**Figure 6: Huawei and Samsung aggressively launch foldable smartphone models**


Source: Gartner, KGI Research

**Figure 7: China & Europe account for the bulk of global foldable smartphone market**


Source: Gartner, KGI Research

**Figure 8: Chinese brands comprise most of China's foldable smartphone market**


Source: Gartner, KGI Research

**Figure 9: Foldable clamshell smartphones are mainstream models**

Product	Samsung Galaxy Z Flip 5	Huawei Pocket S	Oppo Find N3 Flip	VIVO X Flip	motorola razr 40 ultra
Launch Date	2023/7/26	2022/11/2	2023/8/29	2023/4/20	2023/6/1
Launch Price	US\$999	RMB 5,988	RMB 6,799	RMB 5,999	US\$999
Hinge Type	Clamshell	Clamshell	Clamshell	Clamshell	Clamshell
Hinge Supplier	KH-Vatec, S-Connect	Fositek, Jarlytec	Amphenol	Amphenol	Fositek, ZCW
CPU	Snapdragon 8 Gen 2	Snapdragon 778G 4G	MediaTek Dimensity 9200	Snapdragon 8+ Gen1	Snapdragon 8+ Gen 1
Battery	3700mAh	4000mAh	4300mAh	4400mAh	3800mAh
Connectivity	5G	4G	5G	5G	5G
Main Display Dimension	6.7 inch	6.9 inch	6.8 inch	6.74 inch	6.9 inch
Cover Display Dimension	3.4 inch	1.04 inch	3.26 inch	3 inch	3.6 inch

Source: Company data, KGI Research

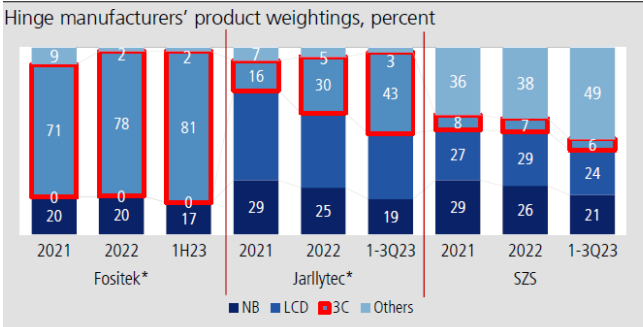


**Figure 10: More inwardly-foldable smartphone models launched; large screens are more popular recently**

Product	Galaxy Z Fold5	Huawei Mate X3	Huawei Mate X5	Oppo Find N3 Fold	Honor Magic V2	Xiaomi MIX Fold	Google Pixel Fold
Launch Date	2023/8/11	2023/3/1	2023/9/25	2023/10/19	2023/10/17	2023/8/14	2023/6/27
Launch Price	USD\$1,799	RMB 12,999	RMB 12,999	RMB 9,999	RMB 8,999	RMB 8,999	USD\$1,799
Hinge Type	Inward	Inward	Inward	Inward	Inward	Inward	Inward
Hinge Supplier	KH-Vatec, S-Connect	Fositek, Jarlyltec	Fositek, Jarlyltec	Amphenol	Amphenol	Amphenol, China supplier	Amphenol
CPU	Snapdragon 8 Gen 2	Snapdragon 8+ 4G Mobile Platfor	Kirin 9000s	Snapdragon 8 Gen 2	Snapdragon 8 Gen 2	Snapdragon 8 Gen 2	Google Tensor G2
Battery	4400mAh	4800mAh	5060mAh	4805mAh	5000mAh	4800mAh	4821mAh
Connectivity	5G	4G	5G	5G	5G	5G	5G
Main Display Dimension	7.6 inch	7.85 inch	7.85 inch	7.82 inch	7.92 inch	8.03 inch	7.6 inch
Cover Display Dimension	6.2 inch	6.4 inch	6.4 inch	6.31 inch	6.43 inch	6.56 inch	5.8 inch

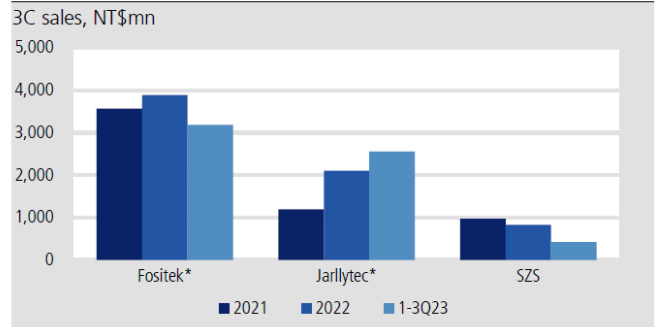
Source: Company data, KGI Research

**Figure 11: 3C sales contribute most of Fositek and Jarlyltec sales**



Source: Company data, KGI Research

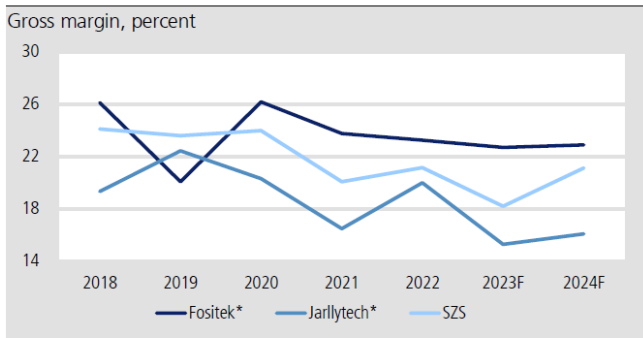
**Figure 12: Fositek has the highest foldable smartphone sales with a more diverse client portfolio**



\*Bloomberg Consensus

Source: Company data, Bloomberg, KGI Research

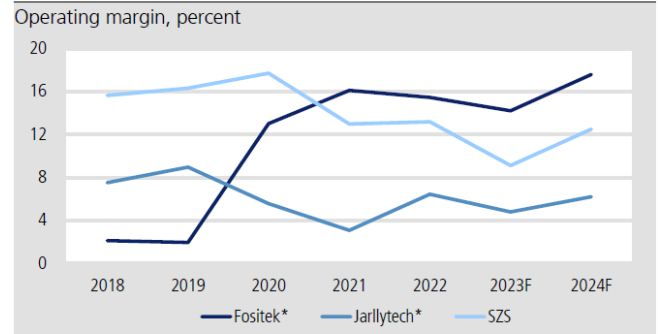
**Figure 13: Fositek's gross margin outperforming peers.**



\*Bloomberg Consensus

Source: Company data, Bloomberg, KGI Research estimates

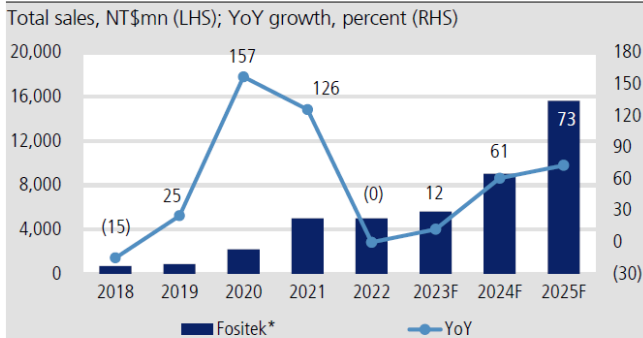
**Figure 14: Hinge manufacturers' operating margin will recover YoY in 2024F**



\*Bloomberg Consensus

Source: Company data, Bloomberg, KGI Research estimates

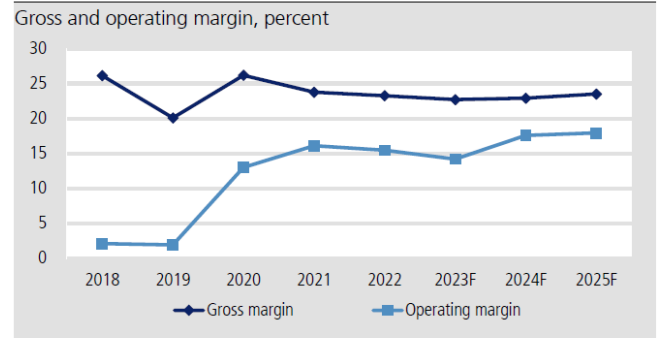
**Figure 15: New Huawei foldable smartphone model launches will boost Fositek's sales in 2024-25F**



\*Bloomberg Consensus

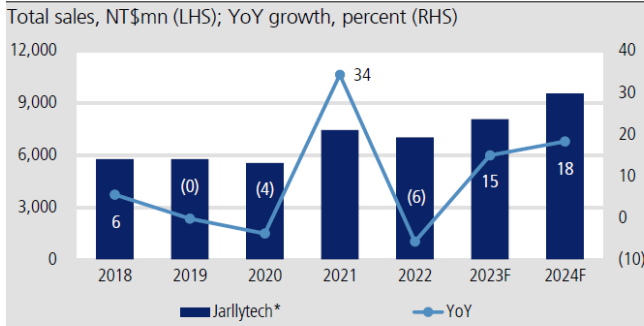
Source: Company data, Bloomberg, KGI Research

**Figure 16: Fositek's operating margin will expand YoY in 2024F, on booming foldable smartphone sales**

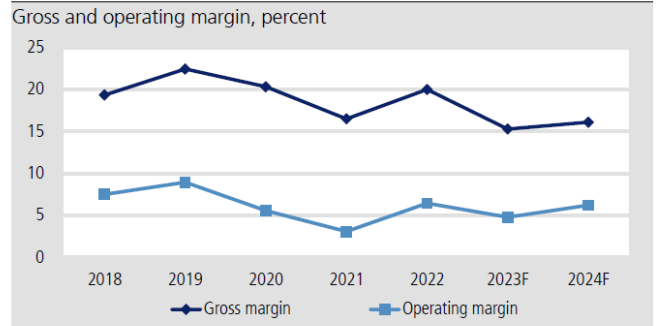


\*Bloomberg Consensus

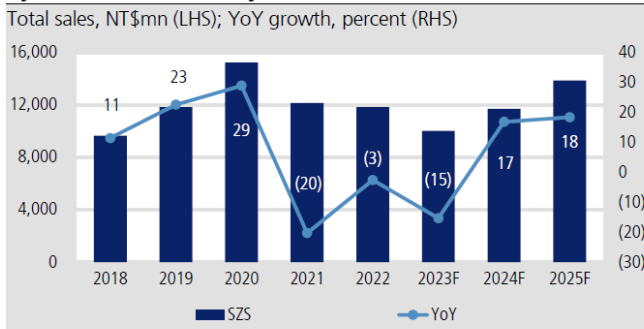
Source: Company data, Bloomberg, KGI Research

**Figure 17: Jarlytec's sales will grow in double-digits YoY in 2024F, boosted by new Huawei foldable smartphone launch and NB demand recovery**


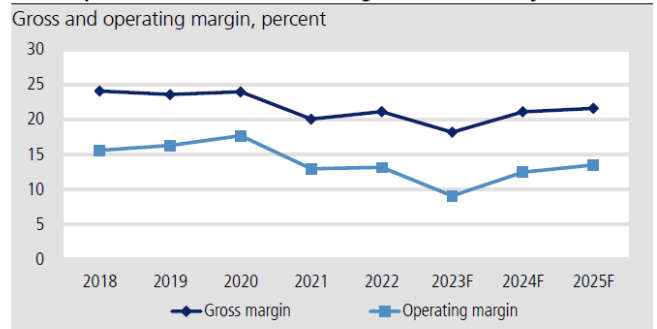
\*Bloomberg Consensus  
 Source: Company data, Bloomberg, KGI Research

**Figure 18: Foldable smartphone sales expansion will boost Jarlytec's gross and operating margins in 2024F**


\*Bloomberg Consensus  
 Source: Company data, Bloomberg, KGI Research

**Figure 19: SZS revenue will grow 17% YoY in 2024F, driven by NB demand recovery**


Source: Company data, KGI Research estimates

**Figure 20: SZS's margins will improve YoY in 2024F, on a better product mix, and a NB hinge sales recovery**


Source: Company data, KGI Research estimates

**Figure 21: Peers comparison – Valuation**

Company	Ticker	Market cap. (US\$m)	Share price (LCY)	Rating	Target Price (LCY)	EPS (LCY)			EPS YoY (%)			PE (x)			PB (x)			ROE (%)			Cash yield (%)	
						2023F	2024F	2025F	2023F	2024F	2025F	2023F	2024F	2025F	2023F	2024F	2025F	2023F	2024F	2025F	2023F	2024F
Shin Zu Shing	3376 TT	719	121.0	Neutral	97.0	4.94	6.45	7.76	(43.1)	30.6	20.3	24.5	18.8	15.6	1.4	1.4	1.4	5.8	7.4	8.8	3.1	4.0
Jarlytec*	3548 TT	403	212.0	Not rated	N.A.	7.77	10.97	N.M.	(1.4)	41.2	N.A.	27.3	19.3	N.A.	N.A.	N.A.	N.A.	8.2	9.1	N.M.	N.A.	N.A.
Fositek Corp*	6805 TT	874	403.0	Not rated	N.A.	9.83	18.16	30.59	5.4	84.7	68.5	41.0	22.2	13.2	6.4	5.1	4.0	16.1	26.0	30.4	1.1	2.3

\* Bloomberg consensus  
 Source: Bloomberg, KGI Research estimates

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