

Semiconductor sector

More applications to adopt advanced packaging in 2026F

Key message

1. More clients to adopt CoWoS-L and SoIC from 2026F.
2. MediaTek (2454 TT, NT\$ 1,535, OP) and Alchip Technologies (3661 TT, NT\$ 3,520, OP) are key to watch in TSMC's (2330 TT, NT\$1,100, OP) CoWoS 2026 client mix.
3. Implications of non-AI chips adopting CoWoS-L and SoIC.

Event

According to our channel checks, we expect AMD's (US) next-generation server CPU (Venice) to adopt N2, CoWoS-L, and SoIC simultaneously. We expect this move will lead to investment sentiment improvement for equipment vendors.

Impact

More clients to adopt CoWoS-L & SoIC from 2026F. We expect AMD's (US) next-generation server CPU (Venice) to adopt N2, CoWoS-L, and SoIC simultaneously for better performance. With 40% global server CPU market share, we anticipate the potential TAM for TSMC (2330 TT, NT\$1,100, OP) could be up to 300k CoWoS wafer capacity. However, considering the cost and the introduction of a new platform, we forecast that only about 10% of AMD's CPUs will adopt CoWoS-L in 2026, but room for growth is sizable. Additionally, we believe AI clients may consider non-TSMC supply chains once the bottleneck for RDL interposer is resolved or when FOPLP becomes mature.

MediaTek & Alchip are key to watch in TSMC's CoWoS 2026 client mix. We estimate TSMC's CoWoS annual capacity will grow from 670k wafers in 2025 to 1.0mn wafers in 2026, up 49% YoY. Nvidia (US) will account for 65% of TSMC's capacity, followed by Broadcom (US) and AMD. Alchip Technologies (3661 TT, NT\$3,520, OP) will see a significant jump from 8k in 2025F to 90k in 2026F, anticipating that Annapurna Labs (US) and Alchip will jointly take on Amazon Web Services' (AWS; US) Trainium 3 project in 2026F. MediaTek (2454 TT, NT\$ 1,535, OP) is new to the list as they will see their AI ASIC project for Google's (US) TPU kick-off in 2026F. Marvell (US) will see a meaningful drop in 2026F for CoWoS due to projects shifting to Annapurna Labs and Alchip.

Implications of non-AI chips adopting CoWoS-L & SoIC. CoWoS and SoIC are currently mainly used in AI applications, and the adoption will expand to other applications, such as smartphones, servers, and PC/NB. We think AMD's server CPU will adopt CoWoS-L and SoIC, and Apple's (US) iPhone AP will adopt wafer-level multi-chip modules (WMCM) in 2026, which will be another milestone for advanced packaging. We believe semiconductor equipment makers will benefit from this trend as more applications adopt CoWoS and SoIC, but we don't expect these two chips adopting advanced packaging to significantly drive advanced packaging-related equipment demand. The impact on our 2025-26F earnings forecasts for semiconductor equipment makers will be limited, but we believe this will lead to investment sentiment improvement for select firms, including Grand Process Technology (GPTC; 3131 TT, NT\$1,315, OP), All Ring Tech (6187 TT, NT\$422, OP), C Sun Manufacturing (2467 TT, NT\$186, OP), and Scientech (3583 TT, NT\$367.5, OP).

Stocks for Action

Semiconductor equipment maker shares have underperformed the Taiex by 10-14% year-to-date due to GPU demand concerns and the impact of DeepSeek. However, we believe more applications adopting advanced packaging will lead to investment sentiment improvement for those firms. In the semiconductor equipment sector, GPTC remains our top pick, as the firm will continue to benefit from strong expansion of advanced packaging capacity (CoWoS, FOPLP & HBM), which will boost equipment and chemical demand for the firm. In addition, we believe chemical demand will continue to rise as capacity expands, unlike that for equipment, which requires observing how much production capacity increases. Therefore, this business will continue to provide downside protection for the company and become a key factor supporting its valuation, as capex YoY growth may peak in 1H25. Meanwhile, we believe AI ASIC (MediaTek and Alchip) demand will outperform that of general GPU (Nvidia), and thus we remain upbeat about the outlook for MediaTek and Alchip. MPI (6223 TT, NT\$875, OP) will benefit from robust demand for AI ASIC, which could boost its probe card sales. ASEH (3711 TT, NT\$179, N) might see potential CoW outsourcing opportunities from 2027, but we see limited contribution in 2025/2026F.

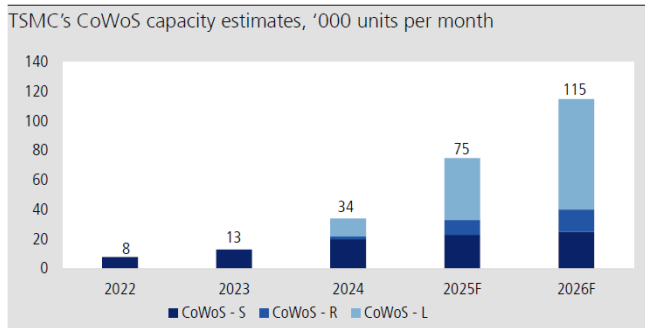
Risks

Slowing of AI spending and demand; economic recession.

After Nvidia, more clients likely adopt CoWoS-L. Based on our industry checks, we believe AMD's next-generation server CPU, Venice, will likely be the first TSMC N2 product and will also adopt CoWoS-L at the same time. Unlike Nvidia, AMD's Venice will not use HBM, but will continue to use DDR5 (R-DIMM). We attribute the adoption of CoWoS-L to: (1) better performance; and (2) preparation for future products once cost is significantly reduced by the introduction of FOPLP. With AMD's move, we believe more HPC and AI clients will consider adopting CoWoS-L. Additionally, from a cost perspective and considering the development of FOPLP, AI clients may consider non-TSMC suppliers. However, currently, interposers for CoWoS-L remain the bottleneck.

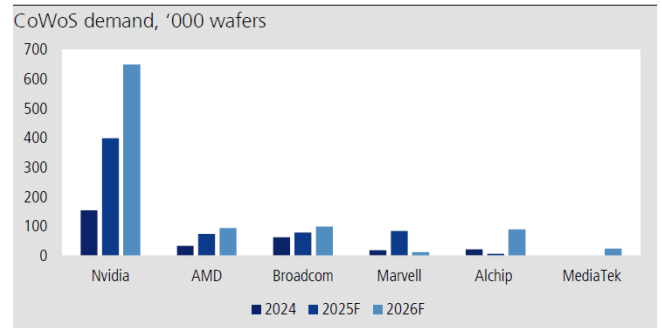
Nvidia still accounts for most of TSMC's CoWoS capacity; MediaTek & Alchip will be key to watch in 2026. Our forecast for TSMC's CoWoS expansion remains intact despite concerns about DeepSeek. We forecast TSMC will expand CoWoS capacity from the current 38kwpm to 70-75kwpm by end-2025, and to 110-120kwpm by end-2026. With changes in demand and client forecasts, we revise up CoWoS-L capacity from 35kwpm to 43kwpm by end-2025F. We also update our forecast for TSMC's CoWoS client mix in 2026. We estimate TSMC's CoWoS annual capacity will grow from 670k wafers in 2025 to 1.0mn wafers in 2026, up 49% YoY. Nvidia will account for 65% of TSMC's capacity, followed by Broadcom and AMD. Alchip will see a significant jump from 8k in 2025 to 90k in 2026F, anticipating that Annapurna Labs and Alchip will jointly take on AWS' Trainium 3 project in 2026. MediaTek is new to the list as they will see their AI ASIC project for Google's TPU kick-off in 2026. Marvell will see a meaningful drop in 2026F for CoWoS due to projects shifting to Annapurna Labs and Alchip.

Figure 1: Estimates for TSMC's CoWoS capacity by 2026



Source: KGI estimates

Figure 2: Estimates for client demand for CoWoS in 2024-26



Source: KGI estimates

Limited impact on equipment makers' 2026F earnings, but sentiment to improve. We forecast AMD's server CPU will require around 30k CoWoS in 2026, so it won't lead to significant upside for CoWoS capacity, and therefore the impact on equipment makers' 2026F earnings will be limited. However, we think potential growth beyond 2026 is still sizable, and this move will lead to near-term investment sentiment improvement for equipment makers, despite capex YoY growth could peak in 1H25. In terms of facilities for advanced packaging, we believe the current bottleneck for CoWoS remains facilities instead of equipment supply issues, and we expect equipment makers to resume shipments in late-1Q25 to early-2Q25. We maintain our 2025-26 CoWoS capacity forecasts as CoWoS monthly capacity will reach a respective 70-75k and 110-120k at end-2025F and end-2026F.

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