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Greater China Semiconductors | Asia Pacific

# CPO Supply Chain Updates; More on GlassBridge

GlassBridge appears to be a strong solution, but remains far from mass production. We see TSMC scaling PIC capacity to 25kwpm in 2028, with Ins2 test efficiency improving. We remain OW on CPO enablers as investor expectations are already low.

**Further thoughts on GlassBridge impact on FAU:** We do not rule out GlassBridge hampering Fiber Array Units' (FAU) TAM in the long run (link), but we have yet see any projects in TSMC's COUPE platform adopt this technology. On the other hand, GlassBridge mainly serves edge coupling and can currently support only one-dimension fiber layouts. However, TSMC's mainstream COUPE platform and key customer (NVIDIA, AMD, Ayar Labs) solutions for the next few years should still stick to grating coupling, as it is easier to achieve mass production, which we expect to see soon in 2H26. In addition, CPO requires integrated design and discussion across the entire ecosystem—including foundry (OE), chip designer, FAU, laser, and even system integrator—so it is difficult to change a design overnight.

**Latest developments on PIC capacity:** Although several difficulties remain (link), we continue to see green shoots. TSMC plans to ramp PIC capacity from 10kwpm in 2Q26 to 15kwpm in 4Q26, and to at least 25kwpm in 2028. Reflecting limited resources, we believe key COUPE MP customers in 2026–27 could be NVIDIA, Broadcom, and AMD. With more capacity seen for 2028, other customers such as MediaTek, Marvell, and Ayar Labs could mass produce their CPO projects at TSMC.

**What about the progress in CPO insertion tests?** CPO insertion tests are one of the key bottlenecks to mass production. However, Insertion 2 EPIC wafer test time has improved from a wafer a day in 2H25 to a wafer in six hours now, making the 3–4 hour target in the next 6–12 months no longer a distant dream. Many investors ask whether Insertion 2 could be a skipped process, but we regard this as less likely as it is the first stop/time to conduct simultaneous optical-electrical signal testing.

**FOCI – CPO mass production to start in 3Q:** We expect CPO MP revenue to begin in July and continue scaling to 2027, mainly for the Spectrum CPO switch. Besides NVIDIA, we expect its FAU shipments to AMD's MI500 series to start from 2H27, along with more MP customers in 2028.

**Stock implications:** We remain optimistic about CPO development in the long run, and think investor expectations are very low for CPO stocks. We are OW on Asia CPO enablers such as TSMC, ASE , FOCI, AllRing, MPI, Winway, and Hon Precision. We think TFC has a competitive edge in high-end FAU, and is less likely to face disruption from GlassBridge as it is more likely to replace low-end FAU at the initial stage. We believe Largan could face more competition if V-Groove is the major product, but if it is making the entire FAU, it needs to show competitiveness vs. existing players. In this report, we revise estimates for FOCI and AllRing.

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# What Is GlassBridge, and How Does It Differ from Traditional V-Groove FAU?

Traditional FAU is a mature, high-precision fiber-array assembly: fibers are placed into V-grooves on a glass/silicon/quartz substrate, fixed with a cover and adhesive, polished, and then aligned to a PIC or optical engine. It is proven, customizable, and very low-loss, but assembly becomes more difficult as channel count and density rise. Key FAU suppliers for CPO include vendors such as TFC Communication, FOCI, Senko, Browave and Sumitomo Electric. Corning has also said it is keen to develop several FAU solutions for CPO and NPO.

**Exhibit 1:** Corning's FAU/CPO demonstration

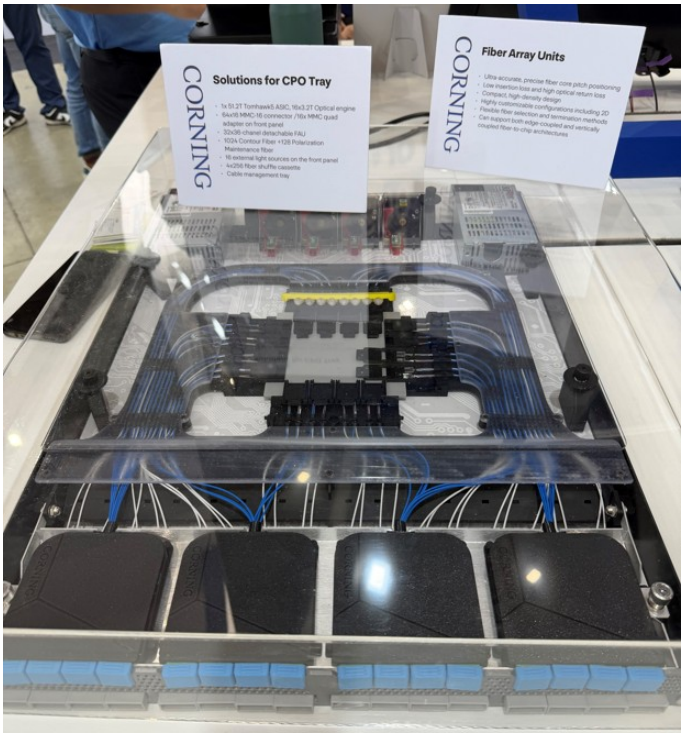
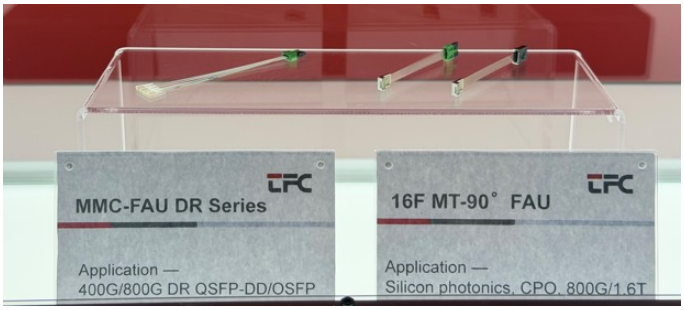



**Exhibit 2:** FAU demonstration at Computex for Ayar Labs scale-up solution



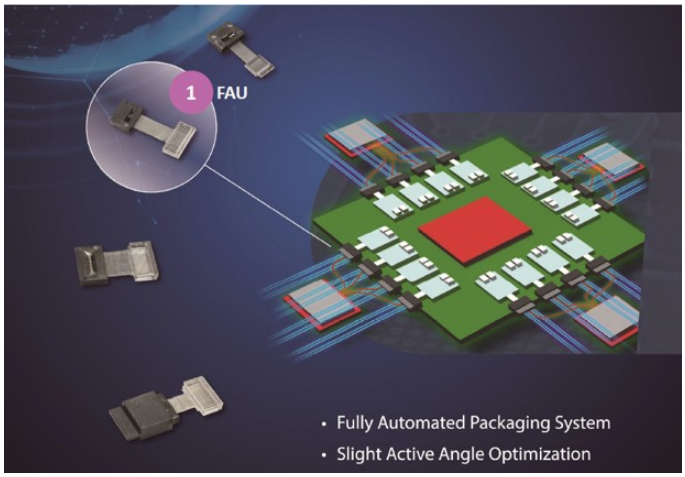

Source: Wiwynn

**Exhibit 3:** TFC's FAU




Source: TFC

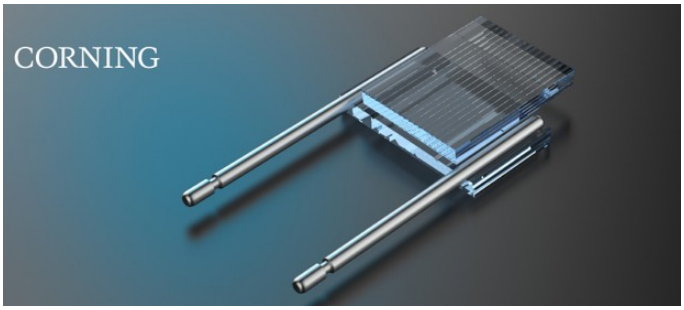
**Exhibit 4:** FOCI's FAU solution for CPO




Source: FOCI

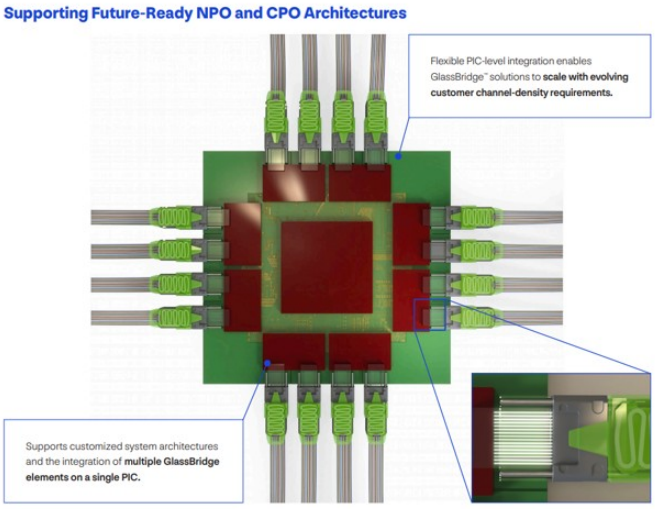
Corning GlassBridge is a newer wafer-based glass interposer / connector approach. Instead of directly presenting a fiber array to the PIC edge, it uses glass ion-exchange waveguides and a detachable, passively aligned connector interface to bridge fiber to PIC. Corning positions it for NPO, CPO, and high-density photonic modules where manufacturability, reworkability, and density become major constraints.

**Exhibit 5:** GlassBridge Fiber-to-PIC Connector




Source: Corning

**Exhibit 6:** Corning cites wafer-based high-volume manufacturing, customizable pitches, detachable solutions and passive alignments as the key advantages of GlassBridge




Source: Corning

The main difference is not simply "new FAU vs old FAU." It is connectorized glass waveguide bridge vs. direct fiber-array attach.

A traditional FAU tries to solve the alignment problem by making the fiber array itself extremely accurate. The fibers are held in V-grooves, polished, and aligned to the optical chip. This is a direct and proven method. FOCI describes the fiber array as a carrier using V-grooves to fix multi-core fiber, with optical-path positioning determined by the precision

V-groove and packaging/polishing process.

GlassBridge inserts a glass waveguide connector layer between the fiber side and the PIC side. That gives Corning more design freedom for pitch conversion, compact connector geometry, passive alignment, and detachability. Corning describes GlassBridge as using wafer-based glass ion-exchange waveguides for passive fiber-to-PIC coupling, and as an alternative that improves scalability and system integration at high fiber counts.

GlassBridge may not automatically be "lower loss" than a conventional FAU. Corning's brochure cites 1.5 dB O-band fiber-to-PIC coupling for GlassBridge, while traditional FAU component insertion loss can be far lower, although the final fiber-to-PIC coupling loss depends on the full assembly.

For today's conventional transceivers, PLC/PIC coupling, coherent optics, and many datacenter modules, traditional FAU from suppliers such as TFC, FOCI, Senko and others remains the mainstream solution. For next-generation CPO/NPO optical engines, where hundreds of optical lanes, tight PIC shoreline density, reflow-compatible assembly, testability, and field/service rework become critical, GlassBridge is a more system-level, connectorized architecture rather than just another FAU. It seems better viewed as a way to reduce the scaling pain of FAU-style direct attach, not as a universal replacement for every FAU use case.

**Exhibit 7:** Side-by-side comparison: Corning GlassBridge vs. Traditional FAU

| Dimension | Corning GlassBridge | Traditional FAU (TFC / FOCI style) | Implication |
|---|---|---|---|
| Basic concept | Wafer-based glass connector/interposer using glass waveguides between fiber interface and PIC. | Direct fiber array: fibers fixed into precision V-grooves, bonded with cover/adhesive, and polished. | GlassBridge is more of a connectorized optical bridge; FAU is direct physical fiber positioning. |
| Coupling model | Fiber-to-PIC coupling through glass waveguides and passive alignment features. | Fiber cores are positioned mechanically by V-groove geometry and then aligned to chip/waveguide facets. | GlassBridge shifts some coupling complexity into a designed glass-waveguide interface. |
| Support | Edge Coupling | Could support both Grating and Edge Coupling | Traditional FAU could support both solution, which Grating coupling is the mainstream solution that TSMC's COUPE is adopting. |
| Manufacturing approach | Wafer-based glass processing with ion-exchange waveguides and scalable connector fabrication. | Precision dicing/cutting of substrate, fiber placement, adhesive bonding, cover attachment, polishing, and inspection. | GlassBridge is designed for scalable module assembly; FAU is mature but labor/process intensive at high counts, but now also migrating to automation. |
| Pitch flexibility | Supports pitch conversion between fiber pitch and fine PIC waveguide pitch, e.g., 40/80/127/165 µm classes. | Highly customizable pitches such as 127/250 µm or reduced-clad options, but physical fiber pitch limits remain important. | GlassBridge can act like an optical redistribution layer between fiber and PIC. |
| Optical loss | Published positioning emphasizes system-level fiber-to-PIC coupling; cited example around 1.5 dB O-band fiber-to-PIC coupling. | FAU component insertion loss can be very low; final fiber-to-PIC loss depends heavily on PIC facet, mode converter, gap, angle, and alignment. | Traditional FAU may win on component-level loss, while GlassBridge targets integration yield and density. |
| Thermal / assembly compatibility | Marketed as compatible with advanced module assembly including solder-reflow-compatible workflows. | Reliability depends on substrate, adhesive, fiber, and package process; many FAUs are qualified for telecom/datacom environments. | GlassBridge is attractive when optical attach must fit electronics-like assembly flows. |
| Customization | Likely more standardized around connector/PIC interface architectures and Corning's glass process platform. | Very customizable: fiber type, pitch, channel count, polishing angle, PM fiber, substrate material, termination, and packaging. | FAU remains strong for custom optical modules and specialized fiber-array needs. |
| Supply-chain maturity | Newer architecture; adoption tied to next-generation PIC/CPO ecosystems. | Long-established supplier base and manufacturing know-how across telecom/datacom/CPO. | FAU is lower adoption risk today; GlassBridge may offer more future scalability. |
| Best application fit | CPO/NPO optical engines, dense PIC shoreline coupling, testable/reworkable modules, and pitch-conversion-heavy designs. | Transceivers, coherent modules, PLC/AWG/WSS/ROADM, silicon photonics attach, and permanent fiber coupling. | Choose based on whether the priority is integration scalability or mature direct attach. |

# Key Charts for CPO Development

For 2026, we expect total CPO switch shipments to be 23k units, mostly 100T switches, with NVIDIA's Spectrum switch taking the lion's share.

Looking to 2027, we expect total CPO switch shipments to reach 59k units, growing further to 200k units in total in 2030; this implies a 144% CAGR over 2024-30.

Our supply chain checks suggest that TSMC currently has ~500 wafers per month of PIC capacity. TSMC plans to ramp PIC capacity from 10kwpm in 2Q26 to 15kwpm in 4Q26 and to at least 25kwpm in 2028. Reflecting limited resources, we believe key COUPE MP customers in 2026–27 could be NVIDIA, Broadcom, and AMD. With more capacity in 2028, other customers such as MediaTek, Marvell, and Ayar Labs should also be able to mass-produce their CPO projects at TSMC.

**Exhibit 8:** TSMC's PIC capacity: likely to reach 25 kwpm in 2027

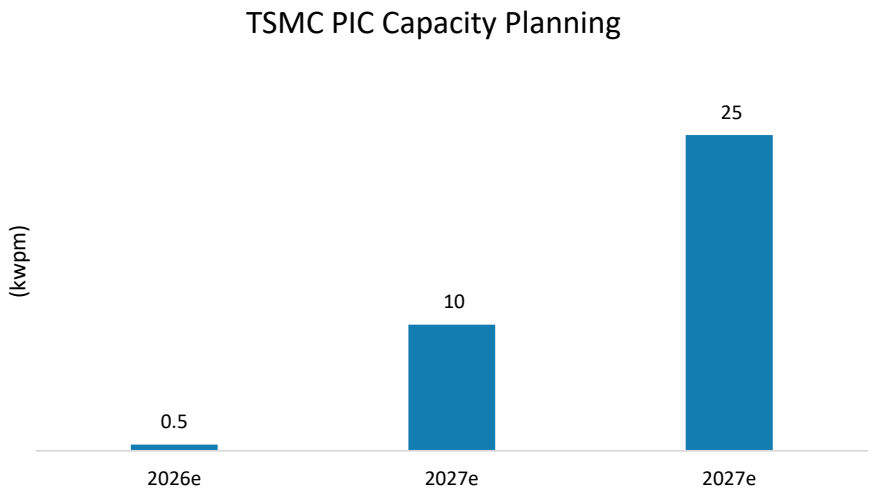



**Exhibit 9:** Annual optical engine output from PIC capacity planning; we think this is likely to increase over time as yield rate ramps

| | 2026e | 2027e | 2027e |
|---|---|---|---|
| TSMC PIC capacity (kwpm) | 0.5 | 10 | 25 |
| Die per wafer | 648 | 648 | 648 |
| Annual PIC production (mn) | 4 | 78 | 194 |
| SoIC yield rate | 50% | 50% | 50% |
| Optical engine production (mn) | 2 | 39 | 97 |
| Downstream assembly yield rate | 20% | 20% | 50% |
| Actual Optical engine shipment (mn) | 0.39 | 7.78 | 48.60 |

**Exhibit 10:** CPO Insertion Test Flow

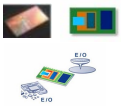
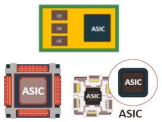
| Test Insertion | Insertion 1 (wafer-level) | Insertion 2 (wafer-level) | Insertion 3 (die-level)/3.5 (package-level) | Insertion 4 (module-level) | | Insertion 5 (potential) |
|---|---|---|---|---|---|---|
| | | | | Insertion 4O | Insertion 4E | |
| Test content | Electronic IC (EIC) & Photonic IC (PIC) | EIC die to PIC wafer (after SoIC) | Optical engine (die-to-die) | CPO package (ASIC+OE) Optical Testing | CPO package (ASIC+OE) Electrical Testing (2025-2026) Optical+Electrical Testing (starting | CPO package (ASIC+OE) SLT? |
| Testing surface |  |  |  |  | | |
| Key Product timeline | 2025-2026 Scale-out CPO switch (Spectrum+Quantum) products<br>2027e onward: Scale-out CPO switch (Spectrum+Quantum) + Scale-up CPO switch products | | | | | |
| Testing details | El. & opt. DC, (power, loss, dark current etc.) | E/O, O/E, O/O, high speed, S-parameters | Full calibration/DC, high-speed functional, optical loopback, alternatively: S-parameters | Optical Light Transmission Testing, optical loopback | BER testing, signal testing | Full system functional validation |
| Testing service provider | Foundry (Wafer-level) TSMC | Foundry (Wafer-level) TSMC | OSAT (Die/chip level) SPIL (ASE Group) | OSAT (Die/package level) SPIL (ASE Group) | OSAT (Die/package level) SPIL (ASE Group) | OSAT (Die/package level) SPIL (ASE Group) |
| Equipment and Consumable Vendor | PIC ATE tester: 1) Advantest + TEL + Formfactor 2) Chroma (underqualification)<br><br>EIC tester: 1) Teradyne + TEL<br><br>EIC Probe card: FormFactor | Wafer level testing: 1)Ficontec +Formfactor +Teradyne 2) Advantest+ **MPI** | Die-to-die prober: 1. TEL 2. MPI<br><br>Optical engine E/O tester+laser reliability test+ELS source test head: Chroma<br><br>**Optical and Electrical Test Socket: Winway** | CPO switch tester: Chroma<br><br>**Hypersocket: Winway** | ATE tester: 1) Advantest (under qualification) 2)Teradyne<br><br>**FT Handler+ELS source test head+optical alignmnet stage : Hon Precision**<br><br>**Hypersocket: Winway** | CPO SLT tester: Chroma (under qualification)<br><br>**Coaxial socket/Hypersocket: Winway** |

**Exhibit 11:** We expect scale-out CPO switch to grow rapidly, from 5k units in 2025 to 200k units in 2030, implying a 144% CAGR over 2023-30

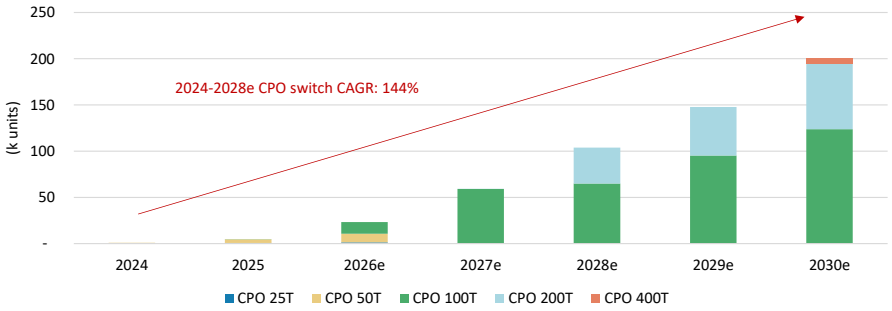
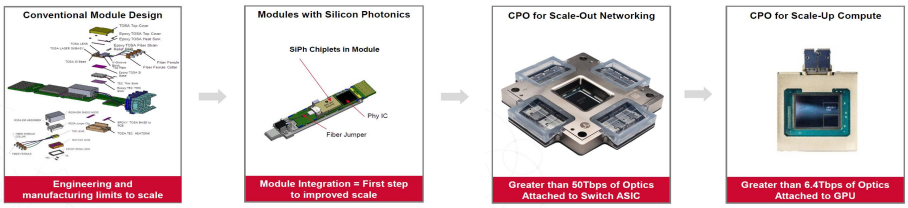
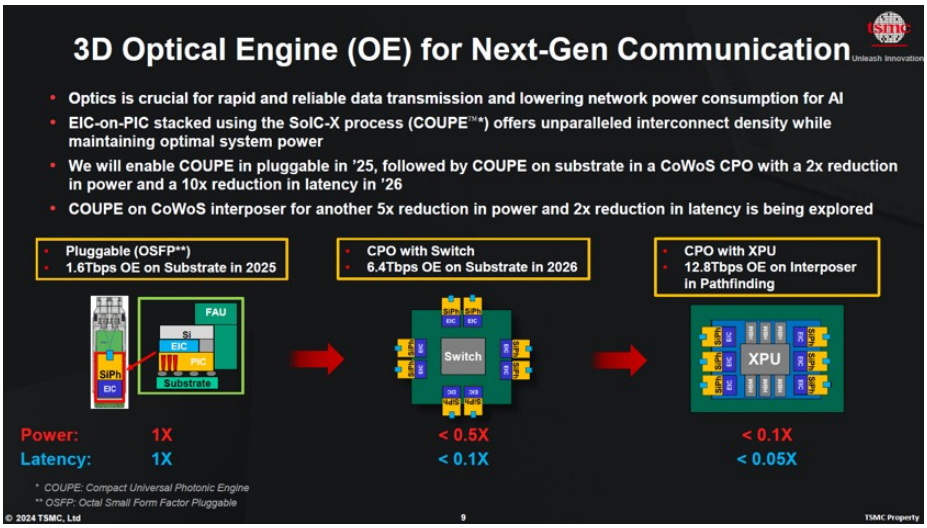



**Exhibit 12:** CPO helps to reach scale-out networking and scale-up computing goal for AI/HPC applications




Source: Broadcom

**Exhibit 13:** TSMC's COUPE technology: Across SiPh pluggables to 3DIC




Source: TSMC

**Exhibit 14:** Broadcom's CPO platform




Source: Broadcom

# FOCI business – Bottom-up analysis and capacity plan

## FOCI's revenue bottom-up plan

For 2026, we expect Spectrum-X to be the mainstream scale-out CPO switch product, with the optical engine production number being 600k-1mn units, and total switch shipments being ~20k units given production lead time. We expect TFC, FOCI and Senko to be the major FAU suppliers, with FOCI taking around 40% of total market share. Thus, we expect NVIDIA's contribution to FOCI's total revenue to be around 18% in 2026.

Looking to 2027, our industry checks suggest that NVIDIA could introduce a CPO version of the Kyber alternative rack, leveraging two NVL72 architecture, with the launch time likely in 2H27. As a result, we assume 5k and 28k units of CPO Rubin Ultra rack shipments in 2027 and 2028, respectively, with FOCI having around 40% market share. Thus, we expect NVIDIA's total revenue to contribute around 42% and 80% of FOCI's total revenue in 2027 and 2028, respectively.

However, there are more than 10 customers that are doing prototypes and could recognize NRE revenue in 2026, with mass production starting in 2027 and 2028, according to our supply chain checks. We have not fully baked this into our model, and view it as only a bull case scenario as we await additional product launch and shipment signs in the supply chain.

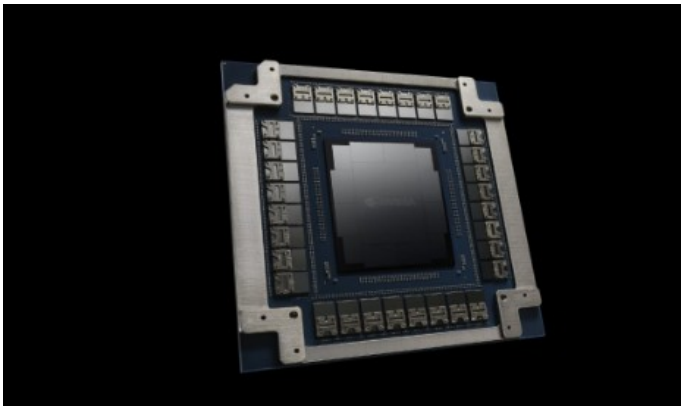
**Exhibit 15:** Upcoming key CPO projects FAU vendors

| CPO project | FAU Vendor | Introduced Timeline |
|---|---|---|
| NVIDIA Scale-out (Spectrum/Quantum) | TFC, FOCI, Senko? | 2H26 |
| NVIDIA Scale-up (OIO) | FOCI, Senko | 2029 (Feynman Ultra) |
| Broadcom scale-out (Tomahawk) | Twinstar, Senko | 2H24 |
| AMD scale-up (MI series) | FOCI, Senko, Teramount? | 2H27-2028 (MI500 small scale; MI600 mainstream) |
| Ayar Labs | FOCI, Senko | 2H27-2028 (standard solution); AWS Trainium 5 (2H28-2029) |
| Marvell (COUPE version) | FOCI, Senko | 2028 |
| MediaTek | | 2028? |

**Exhibit 16:** Bottom-up analysis: NVIDIA's revenue contribution to FOCI in 2026-28e

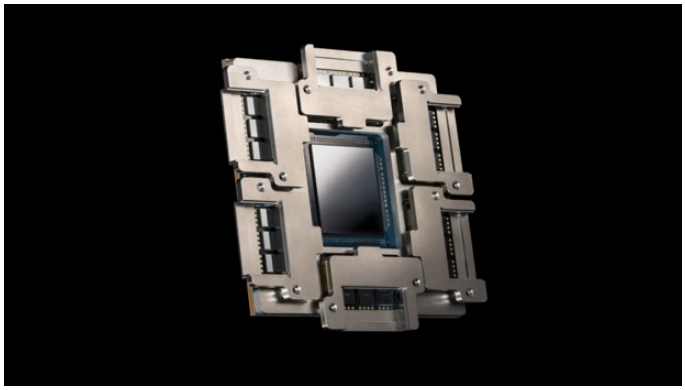
| | 2026e | 2027e | 2028e |
|---|---|---|---|
| Rubin Ultra rack unit (k units) | | 5 | 20 |
| Optical Engine content per Rubin Ultra rack | | 792 | 792 |
| Scale-Up (NVLink switch/Quantum) | | 648 | 648 |
| Scale-out (CX10) | | 144 | 144 |
| | | | |
| Other scale-out switch optical engine consumption | | | |
| Spectrum-X (k units) | 800 | 1,000 | 2,112 |
| Quantum-X (k units) | | 1,000 | 1,408 |
| | | | |
| **Market Share Assumptions** | | | |
| FOCI | 35% | 35% | 35% |
| Others (TFC, Senko) | 65% | 65% | 65% |
| | | | |
| **FAU ASP Assumptions** | | | |
| FAU ASP (6.4T; US$) | 180 | 180 | 180 |
| FAU ASP (3.2T; US$) | 90 | 90 | 90 |
| FAU ASP (1.6T; US$) | 45 | 45 | 45 |
| | | | |
| **FOCI Revenue contribution from NVIDIA** | | | |
| Revenue contribution (US$mn) | 19 | 219 | 721 |
| Revenue contribution (NT$mn) | 567 | 6,577 | 21,622 |
| FOCI CY Revenue (NT$mn) | 1,985 | 8,694 | 23,559 |
| % of total revenue | 29% | 76% | 92% |

**Exhibit 17:** Spectrum-X CPO Switch



Source: NVIDIA

**Exhibit 18:** Quantum-X CPO Switch



Source: NVIDIA

For Optical I/O or optical engine on interposer adoption plans, we see NVIDIA exploring multiple solutions for the next generation Feyman and Feyman Ultra's platform, but whether there would be introduction or not still takes time. For other solutions, we see AMD targeting a scale-up CPO version for its MI550 or MI650 rack system in 2027/2028, based on its development progress. We also see ASIC vendors exploring CPO on GPU.

Our supply chain checks suggest that FOCI could see over 10 customers contributing to its Silicon Photonic/CPO revenue in 2026, besides some mass production revenue starting

from 1Q26.

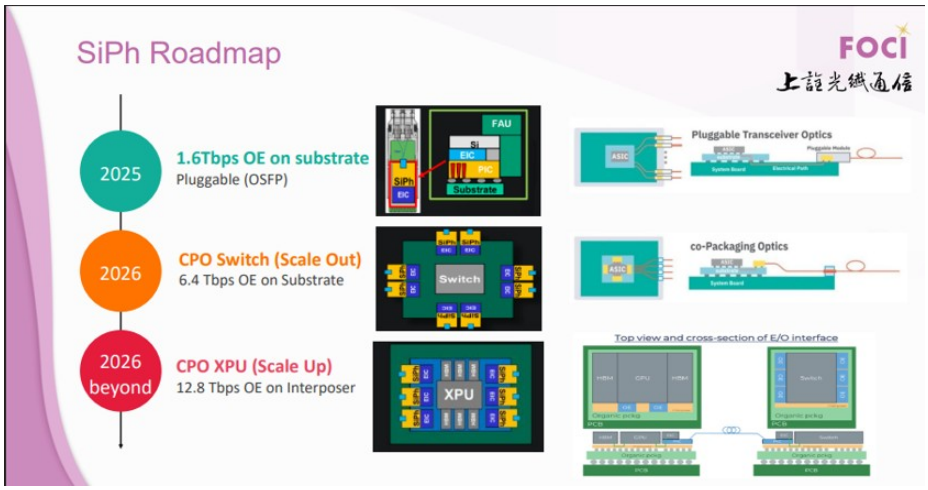
## What are FOCI's current plans for capacity?

In its recent public offering disclosure for the SEO, FOCI disclosed its projected revenue and profitability for the NT$1.538bn capex spent ( Exhibit 19 ). The company completed its SEO plan in early February, with total acquired capital of NT$3.1bn. It also announced a new private equity plan on Feb 26, with maximum new share issuance of 10mn units. We expect it to utilize all of the capital for R&D purposes (12.8T research) and further building and expanding its FAU capacity.

**Exhibit 19:** FOCI's projected revenue and profitability from NT$1.538bn capex spent

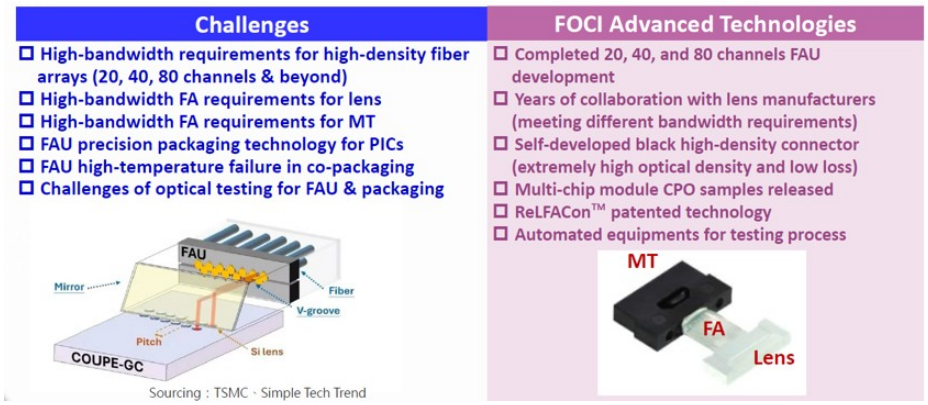
| Year (NT$mn) | 2026 | 2027 | 2028 |
|---|---|---|---|
| Sales Revenue | 518 | 2,398 | 3,980 |
| Gross Profit | 198 | 906 | 1,598 |
| Gross margin | 38.2% | 37.8% | 40.1% |
| Operating Profit | 38 | 483 | 1,012 |
| Operating margin | 7.3% | 20.1% | 25.4% |

**Exhibit 20:** FOCI's SiPh Roadmap



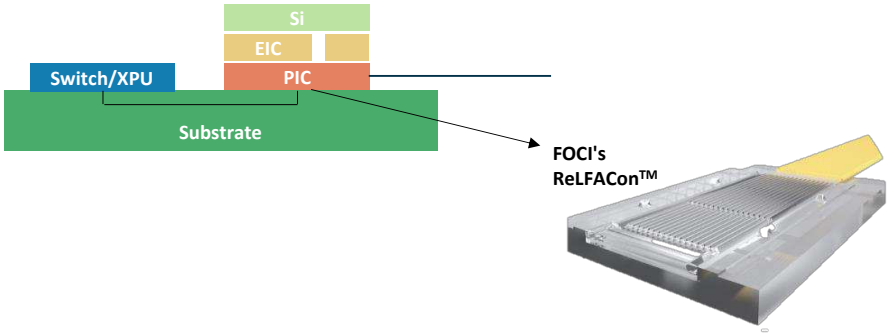

Source: FOCI

**Exhibit 21:** FOCI's solutions for CPO




Source: FOCI

**Exhibit 22:** ReLFACon enables direct transmission of external photonic signals with MCM modules to achieve reliable signal transmission




Source: FOCI

# AllRing Business – Bottom-up Analysis

We expect CoWoS-related revenue to account for 79% of AllRing's total revenue in 2026, with AllRing focusing on oS equipment supply to TSMC and ASE/SPIL. On the other hand, our checks indicate that TSMC's CoWoS capacity is likely to extend to 130kwpm in 2026 year end, with a view to meet strong customer demand. However, we see more non-TSMC 2.5 packaging solution vendors qualifying more Taiwanese CoWoS equipment vendors, creating a new TAM for AllRing, including FoPLP and Intel's EMIB. We expect AllRing's 2027 CoWoS revenue to rise 53% Y/Y (TSMC's CoWoS seen at 200kwpm for 2027), and see it beginning to prepare equipment for CoPoS (if the trial round goes smoothly in 2026) and its AP fab in Arizona (MP likely starting in 2028).

For CPO, AllRing has penetrated the CPO supply chain of NVIDIA for FAU-optical engine coupling and FAU AOI equipment. Our latest supply chain checks suggest that AllRing may have also won the dispensing step after insertion 3, where the optical engine will be mounted onto the CPO package substrate. We expect more clarity from the company on CPO-related revenue in 2H26, and expect it to account for 11%, 19%, and 26% of AllRing's total revenue in 2026, 2027, and 2028, respectively.

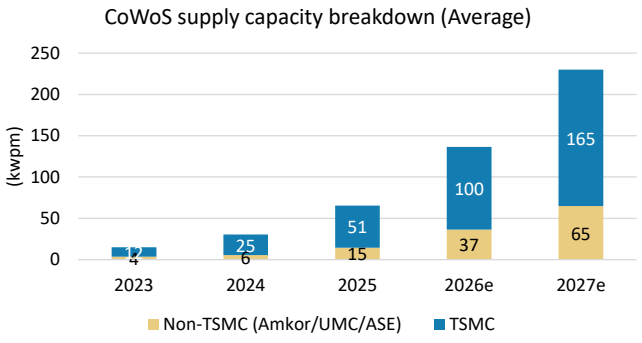
For SoIC, we expect 2026 SoIC capacity to reach 14kwpm. TSMC further expanding its CoWoS capacity in AP7 could cause slightly delays in equipment pull-in. Our latest supply chain checks suggest that TSMC has revised 2027e capacity to 40kwpm (from 45kwpm) and 2028e to 70kwpm (from 75kwpm). AllRing is the sole WoW dispenser supplier for SoIC; we expect the delay in SoIC to be more than offset by the strong build in CoWoS. In the long run, we still expect it to be the key growth driver for AllRing. SoIC is one of the key advanced packaging nodes for TSMC in the coming years, as we see more and more customers adopting this technology to realize chiplet design, including AMD, NVIDIA, Apple, and Broadcom.

**Exhibit 23:** Bottom-up analysis for AllRing's revenue

| (NT$mn) | 2024 | 2025 | 2026e | 2027e | 2028e | 2025 Y/Y | 2026 Y/Y | 2027 Y/Y | 2028 Y/Y |
|---|---|---|---|---|---|---|---|---|---|
| CoWoS | 3,530 | 4,771 | 7,405 | 11,305 | 11,305 | 35% | 55% | 53% | 0% |
| CPO | 0 | 150 | 1,050 | 3,000 | 4,500 | NA | 600% | 186% | 50% |
| Flip Chip | 200 | 0 | 700 | 200 | 0 | -100% | NA | -71% | -100% |
| SoIC | | 120 | 150 | 600 | 700 | | 25% | 300% | 17% |
| Others | 1,804 | 325 | 100 | 500 | 800 | -82% | -69% | 400% | 60% |
| **Total Revenue** | **5,535** | **5,366** | **9,405** | **15,605** | **17,305** | **-3%** | **75%** | **66%** | **11%** |

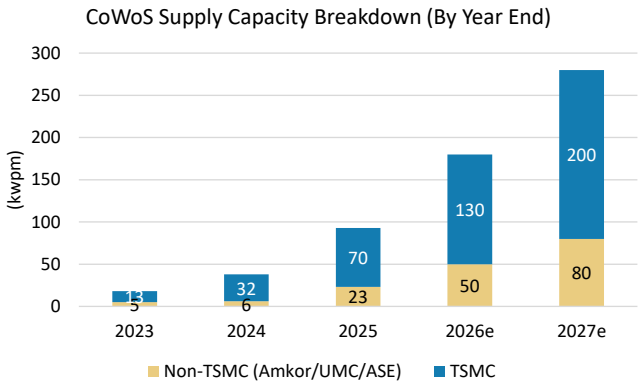
| Revenue mix | 2024 | 2025e | 2026e | 2027e | 2028e |
|---|---|---|---|---|---|
| CoWoS | 64% | 89% | 79% | 72% | 65% |
| CPO | 0% | 3% | 11% | 19% | 26% |
| Flip Chip | 4% | 0% | 7% | 1% | 0% |
| SoIC | 0% | 2% | 2% | 4% | 4% |
| Others | 33% | 6% | 1% | 3% | 5% |
| **Total Revenue** | **100%** | **100%** | **100%** | **100%** | **100%** |

**Exhibit 24:** CoWoS supply capacity breakdown (average)



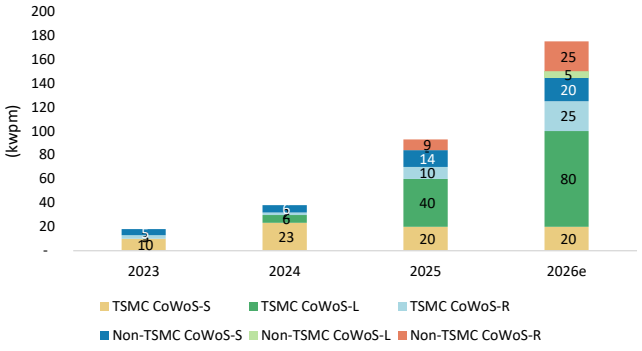

supply chain checks.

**Exhibit 25:** CoWoS supply capacity breakdown (by year-end)



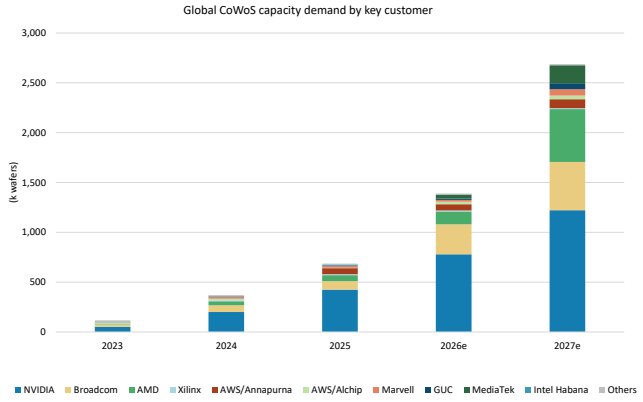

supply chain checks.

**Exhibit 26:** Detailed CoWoS capacity expansion by year end and by vendor




supply chain checks.

**Exhibit 27:** CoWoS demand breakdown by customer




supply chain checks.

**Exhibit 28:**

TSMC's advanced packaging fab planning

| Advanced Packaging Plant | Location | Focused Technology |
|---|---|---|
| AP1 | Hsinchu | R&D |
| AP2 | Tainan | Bumping |
| AP3 | Taoyuan | InFO and WMCM |
| AP5 | Taichung | CoWoS |
| AP6 | Miaoli | SoIC |
| AP7 | Chiayi | WMCM, CoWoS, SoIC, CoPoS |
| AP8 | Tainan | CoWoS |
| AP9 and AP10 | Arizona | SoIC/CoWoS/CoPoS/WMCM/R&D |

# AllRing: Estimate Revisions

**We lift our EPS estimates by 15% for 2026 and 2% for 2027, and fine-tune 2028 forecasts:** We lift our 2026 and 2027 revenue estimates to reflect ongoing advanced packaging capacity opportunities, including CoPoS and CoWoS, and also CPO, with CoWoS capacity continue to see upside. We expect AllRing to win more advanced packaging opportunities from the non-TSMC camp. Gross margin is likely to be better than many fear, driven by a better product mix, as CPO equipment's GM is margin accretive at the 55-60% level.

**Exhibit 29:** AllRing: Estimate revisions

| NTD mn | New '2026 | Old '2026E | Diff. | New '2027e | Old '2027E | Diff. | New '2028e | Old '2028E | Diff. |
|---|---|---|---|---|---|---|---|---|---|
| Net sales | 9,405 | 8,350 | 13% | 14,955 | 14,410 | 4% | 16,655 | 16,110 | 3% |
| Gross profit | 4,877 | 4,329 | 13% | 7,766 | 7,626 | 2% | 8,749 | 8,686 | 1% |
| Operating profit | 2,739 | 2,347 | 17% | 4,385 | 4,310 | 2% | 4,944 | 4,952 | 0% |
| Pretax Income | 2,930 | 2,539 | 15% | 4,561 | 4,486 | 2% | 5,145 | 5,154 | 0% |
| Net income | 2,454 | 2,125 | 15% | 3,831 | 3,768 | 2% | 4,322 | 4,329 | 0% |
| **EPS for consensus** | **25.48** | **22.07** | **15%** | **39.79** | **39.13** | **2%** | **44.89** | **44.96** | **0%** |
| | | | | | | | | | |
| **Margins** | | | | | | | | | |
| Gross margin | 51.9% | 51.8% | | 51.9% | 52.9% | | 52.5% | 53.9% | |
| Operating margin | 29.1% | 28.1% | | 29.3% | 29.9% | | 29.7% | 30.7% | |
| Pretax margin | 31.2% | 30.4% | | 30.5% | 31.1% | | 30.9% | 32.0% | |
| Net margin | 26.1% | 25.5% | | 25.6% | 26.1% | | 25.9% | 26.9% | |
| Opex % | 22.7% | 23.7% | | 22.6% | 23.0% | | 22.8% | 23.2% | |

**Exhibit 30:** AllRing: Quarterly financials

| (NT$ mn) | 1Q26 | 2Q26E | 3Q26E | 4Q26E | 1Q27E | 2Q27E | 3Q27E | 4Q27E | 2024 | 2025E | 2026E | 2027E | 2028E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total revenues** | 1,411 | 2,241 | 2,996 | 2,757 | 2,719 | 3,394 | 4,112 | 4,730 | 5,535 | 5,366 | 9,405 | 14,955 | 16,655 |
| *Q/Q Change* | *59%* | *59%* | *34%* | *-8%* | *-1%* | *25%* | *21%* | *15%* | *359%* | *-3%* | *75%* | *59%* | *11%* |
| *Y/Y Change* | *13%* | *47%* | *75%* | *211%* | *93%* | *51%* | *37%* | *72%* | *359%* | *-3%* | *75%* | *59%* | *11%* |
| **Cost of Sales** | 681 | 1,079 | 1,441 | 1,327 | 1,307 | 1,632 | 1,976 | 2,273 | 2,818 | 2,453 | 4,528 | 7,188 | 7,906 |
| *Percent of Revenues* | *48%* | *48%* | *48%* | *48%* | *48%* | *48%* | *48%* | *48%* | *51%* | *46%* | *48%* | *48%* | *47%* |
| **Gross Profit** | 731 | 1,162 | 1,554 | 1,430 | 1,411 | 1,762 | 2,136 | 2,457 | 2,717 | 2,913 | 4,877 | 7,766 | 8,749 |
| *Gross Margin* | *52%* | *52%* | *52%* | *52%* | *52%* | *52%* | *52%* | *52%* | *49%* | *54%* | *52%* | *52%* | *53%* |
| **Total Opex** | 403 | 513 | 628 | 595 | 835 | 773 | 852 | 920 | 1,284 | 1,304 | 2,139 | 3,381 | 3,805 |
| *Percent of Revenues* | *29%* | *23%* | *21%* | *22%* | *31%* | *23%* | *21%* | *19%* | *23%* | *24%* | *23%* | *23%* | *23%* |
| R&D | 192 | 200 | 210 | 210 | 400 | 400 | 400 | 400 | 775 | 767 | 812 | 1,600 | 1,640 |
| *Percent of Revenues* | *14%* | *9%* | *7%* | *8%* | *15%* | *12%* | *10%* | *8%* | *14%* | *14%* | *9%* | *11%* | *10%* |
| General & Adm Exp. | 112 | 178 | 238 | 219 | 218 | 204 | 247 | 284 | 276 | 275 | 748 | 952 | 1,166 |
| *Percent of Revenues* | *8%* | *8%* | *8%* | *8%* | *8%* | *6%* | *6%* | *6%* | *5%* | *5%* | *8%* | *6%* | *7%* |
| Selling Expenses | 99 | 134 | 180 | 165 | 218 | 170 | 206 | 236 | 233 | 262 | 579 | 829 | 999 |
| *Percent of Revenues* | *7%* | *6%* | *6%* | *6%* | *8%* | *5%* | *5%* | *5%* | *4%* | *5%* | *6%* | *6%* | *6%* |
| **Operating Income** | 327 | 649 | 926 | 835 | 576 | 989 | 1,283 | 1,536 | 1,433 | 1,610 | 2,739 | 4,385 | 4,944 |
| *Operating Margin* | *23%* | *29%* | *31%* | *30%* | *21%* | *29%* | *31%* | *32%* | *26%* | *30%* | *29%* | *29%* | *30%* |
| **Total Non-operating Income (** | -60 | -44 | -44 | -44 | -44 | -44 | -44 | -44 | -133 | -12 | -14 | -14 | 0 |
| **Profit Before Taxes** | 387 | 693 | 970 | 879 | 620 | 1,033 | 1,327 | 1,580 | 1,566 | 1,813 | 2,930 | 4,561 | 5,145 |
| *Percent of Revenues* | *27%* | *31%* | *32%* | *32%* | *23%* | *30%* | *32%* | *33%* | *28%* | *34%* | *31%* | *30%* | *31%* |
| **Taxes** | 67 | 118 | 155 | 141 | 99 | 165 | 212 | 253 | 255 | 316 | 481 | 730 | 823 |
| Tax Rate | *17%* | *17%* | *16%* | *16%* | *16%* | *16%* | *16%* | *16%* | *16%* | *17%* | *16%* | *16%* | *16%* |
| **Total Net Income to Parent** | 325 | 575 | 815 | 739 | 521 | 868 | 1,115 | 1,327 | 1,311 | 1,485 | 2,454 | 3,831 | 4,322 |
| *Percent of Revenues* | *23%* | *26%* | *27%* | *27%* | *19%* | *26%* | *27%* | *28%* | *24%* | *28%* | *26%* | *26%* | *26%* |
| **EPS (NT$)** | 3.37 | 5.98 | 8.46 | 7.67 | 5.41 | 9.01 | 11.58 | 13.79 | 15.25 | 15.46 | 25.48 | 39.79 | 44.89 |
| *Change vs Year Ago* | *-6%* | *44%* | *94%* | *128%* | *61%* | *51%* | *37%* | *80%* | *794%* | *1%* | *65%* | *56%* | *13%* |
| **EPS for consensus (NT$)** | 3.37 | 5.98 | 8.46 | 7.67 | 5.41 | 9.01 | 11.58 | 13.79 | 15.25 | 15.46 | 25.48 | 39.79 | 44.89 |
| *Change vs Year Ago* | *-6%* | *44%* | *94%* | *128%* | *61%* | *51%* | *37%* | *80%* | *794%* | *1%* | *65%* | *56%* | *13%* |

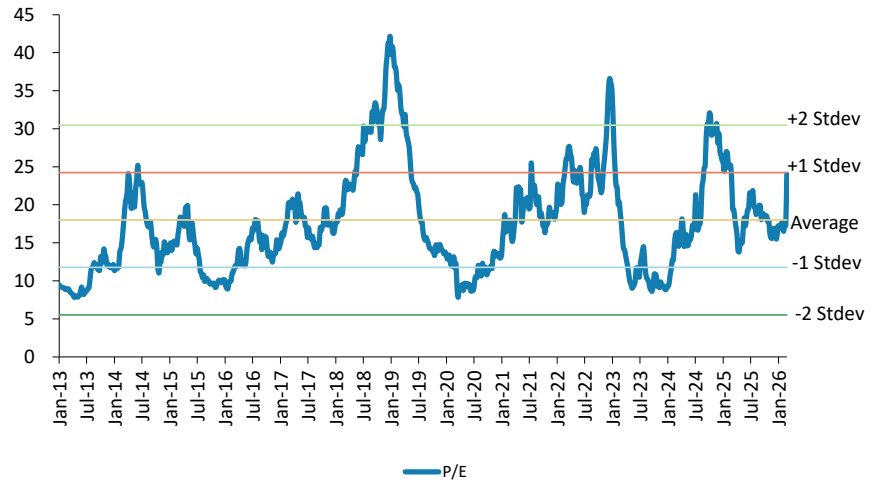
# AllRing: Valuation Methodology

**We keep our RI-based price target (base case scenario value) at NT$1,580,** reflecting our minor estimate changes for 2027 and 2028. Our other key assumptions are unchanged, including a cost of equity (CoE) at 8%, derived from a risk-free rate of 2.0%, beta of 1.0 and market risk premium of 6%, intermediate growth rate of 16% and terminal growth rate of 4.5%.

**Exhibit 31:** AllRing: RI model

| NT$ million | 2026E | 2027E | 2028E | 2029E | 2030E | 2031E | 2032E | 2033E | 2034E | 2035E | 2036E | 2037E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total Equity** | 8,539 | 11,160 | 13,584 | 15,323 | 17,341 | 19,682 | 22,398 | 25,548 | 29,202 | 33,440 | 38,357 | 44,060 |
| **Net Profit** | 2,454 | 3,831 | 4,322 | 5,013 | 5,816 | 6,746 | 7,825 | 9,078 | 10,530 | 12,215 | 14,169 | 16,436 |
| **ROAE** | **30.6%** | **38.9%** | **34.9%** | **34.7%** | **35.6%** | **36.4%** | **37.2%** | **37.9%** | **38.5%** | **39.0%** | **39.5%** | **39.9%** |
| **Residual Income** | 1,694 | 2,638 | 3,006 | 3,625 | 4,230 | 4,932 | 5,746 | 6,689 | 7,783 | 9,052 | 10,524 | 12,230 |
| **Spread** | **22.6%** | **30.9%** | **26.9%** | **26.7%** | **27.6%** | **28.4%** | **29.2%** | **29.9%** | **30.5%** | **31.0%** | **31.5%** | **31.9%** |
| Ending Equity Capital | 8,539 | | | | | | | | | | | |
| PV of Forecast Period | 35,496 | | | | | | | | | | | |
| PV of Continuing Value | 108,054 | | | | | | | | | | | |
| **Equity Value** | **152,089** | | | | | | | | | | | |
| No. of Shares | 96 | | | | | | | | | | | |
| **Price Target** | **1,580** | | | | | | | | | | | |

**Exhibit 32:** AllRing: NTM P/E



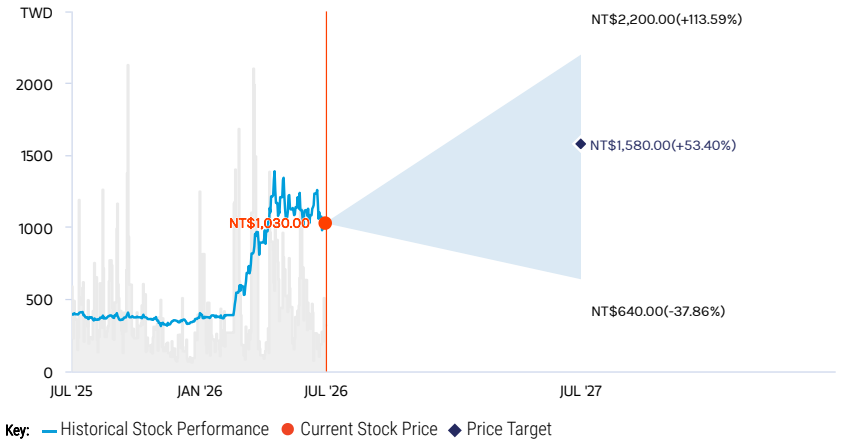
# Risk Reward – AllRing Tech Co. (6187.TWO)

CPO, SoIC, and CoPoS Help to Extend Revenue Momentum; OW

## PRICE TARGET NT$1,580.00

Base case, residual income model. Our key assumptions are:
- Cost of equity (CoE) of 8%, derived from a risk-free rate of 2.0%, beta of 1.0, and a market risk premium of 6.0%.
- Intermediate growth rate of 16%.
- Cash dividend payout of 65%
- Terminal growth rate of 4.5%.

### RISK REWARD CHART




## OVERWEIGHT THESIS

- NVIDIA's next-generation GPU Rubin will stick with graphene for heat sink attachment, reducing concerns about competition for Allring.
- We expect AllRing to be a key beneficiary of the multi-year advanced packaging trend, including CoPoS and SoIC, but large-scale revenue contributions will likely take time.
- It is the sole WoW (Wafer-on-Wafer) dispenser supplier for SoIC, which we expect to be the next growth driver, contributing at least 2% of total revenue in 2026 and 4% in 2027.
- Our implied 2027e target P/E is 40x, similar to its SoIC peer and lower than CPO peers. We expect new advanced packaging opportunities including CPO, CoWoP, and CoPoS to benefit the company in the long run.

**Consensus Rating Distribution**

| | |
|---|---|
| 100% | Overweight |
| 0% | Equal-weight |
| 0% | Underweight |

MS Rating

**Risk Reward Themes**

**Secular Growth:** *Positive*
**Technology Diffusion:** *Positive*

View descriptions of Risk Rewards Themes here

## BULL CASE NT$2,200.00

**55x 2027e EPS**

We assume: 1) 60% revenue CAGR over 2025-28, thanks to stronger-than-expected capacity expansion plans for TSMC's CoWoS, CPO and SoIC; 2) gross margin expands to more than 55% in 2025-28, due to stronger-than-expected operating leverage resulting from the equipment production outsourcing strategy; 3) new product launches exceed expectations and AllRing increases its market share in other processes such as "CoW."

## BASE CASE NT$1,580.00

**40x 2027e EPS**

We expect: 1) 46% revenue CAGR in 2025-28e after strong CoWoS capacity expansion for TSMC in 2024-25; 2) gross margin to be maintained at 48-53% from 2024-28 thanks to high operating leverage resulting from the equipment production outsourcing strategy; and 3) with new equipment launches, we expect AllRing to expand its market share in other processes. CPO, SoIC and other applications continue to bear fruit.

## BEAR CASE NT$640.00

**16x 2027e EPS**

We assume: 1) -30% revenue CAGR in 2024-28 due to slower-than-expected CoWoS capacity expansion plans by TSMC; 2) gross margin falls below 40% owing to the high bargaining power of its customers; 3) market share loss in "WoS" process amid rising peer competition.

# Risk Reward – AllRing Tech Co. (6187.TWO)

## KEY EARNINGS INPUTS

| Drivers | Dec 2025 | Dec 2026e | Dec 2027e | Dec 2028e |
|---|---|---|---|---|
| Semi revenue (NT$, mn) | 5,215 | 9,294 | 14,871 | 16,563 |
| Passive revenue (NT$, mn) | 52 | 56 | 43 | 47 |

## INVESTMENT DRIVERS

- CoWoS capacity expansion from TSMC
- New technology migration such as SoIC and silicon photonics
- Strong operating leverage, given equipment production outsourcing strategy

## GLOBAL REVENUE EXPOSURE



100% APAC, ex Japan, Mainland China and India

View explanation of regional hierarchies here

## MS ALPHA MODELS

3/5 MOST — 3 Month Horizon

the highest favored Quintile and 5 is the least favored Quintile

## RISKS TO PT/RATING

**RISKS TO UPSIDE**

- Stronger-than-expected CoWoS capacity expansion
- Faster-than-expected adoption of silicon photonics
- Market share gains from peers, led by continuous R&D and China's localization trend

**RISKS TO DOWNSIDE**

- Slowdown in CoWoS capacity expansion
- Allring's "WoS" market share declining
- Slowdown in technology migration such as SoIC and silicon photonics adoption

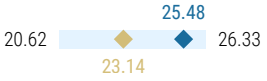
## OWNERSHIP POSITIONING

**Inst. Owners, % Active** 76.4%

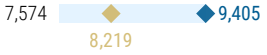
## MS ESTIMATES VS. CONSENSUS

*FY Dec 2026e*

**EPS** (NT$)




**Sales / Revenue** (NT$, mn)




**ROE** (%)




*Note: There are not sufficient brokers supplying consensus data for this metric*

Mean

# AllRing: Financial Summary

## Income Statement

| NT$mn (Years End Dec ) | 2024 | 2025 | 2026E | 2027E | 2028E |
|---|---|---|---|---|---|
| Net sales | 5,535 | 5,366 | 9,405 | 14,955 | 16,655 |
| COGS | 2,818 | 2,453 | 4,528 | 7,188 | 7,906 |
| Gross profit | 2,717 | 2,913 | 4,877 | 7,766 | 8,749 |
| Operating expenses | 1,284 | 1,304 | 2,139 | 3,381 | 3,805 |
| **Operating income** | **1,433** | **1,610** | **2,739** | **4,385** | **4,944** |
| Non-operating income | (133) | (203) | (191) | (176) | (202) |
| Pre-tax income | 1,566 | 1,813 | 2,930 | 4,561 | 5,145 |
| Income tax | 255 | 316 | 481 | 730 | 823 |
| Minority Interest | 1,311 | 1,496 | 2,449 | 3,831 | 4,322 |
| **Reported net Income** | **1,311** | **1,485** | **2,454** | **3,831** | **4,322** |
| Adj.wtd.avg.shrs( m) | 90 | 96 | 96 | 96 | 96 |
| **Reported EPS (NT$)** | **15.25** | **15.46** | **25.48** | **39.79** | **44.89** |
| **EPS for consensus (NT$)** | **15.25** | **15.46** | **25.48** | **39.79** | **44.89** |

## Balance Sheet

| NT$mn (Years End Dec ) | 2024 | 2025 | 2026E | 2027E | 2028E |
|---|---|---|---|---|---|
| Cash | 3,536 | 4,182 | 4,461 | 5,835 | 7,814 |
| Mkt Securities | 0 | 53 | 0 | 0 | 0 |
| AR/NR | 1,552 | 806 | 1,782 | 2,834 | 3,156 |
| Inventory | 949 | 1,114 | 1,631 | 2,590 | 2,848 |
| Other | 293 | 180 | 180 | 180 | 180 |
| **Current Assets** | **6,330** | **6,335** | **8,054** | **11,438** | **13,997** |
| Long-term investments | 36 | 0 | 0 | 0 | 0 |
| Fixed assets | 1,298 | 1,879 | 1,979 | 2,079 | 2,179 |
| Deffered assets | 50 | 76 | 76 | 76 | 76 |
| Other assets | 1,056 | 1,288 | 1,288 | 1,288 | 1,288 |
| **Total Assets** | **8,796** | **9,609** | **11,429** | **14,912** | **17,572** |
| S/T borrowings | 0 | 0 | 0 | 0 | 0 |
| AP/NP | 888 | 564 | 1,288 | 2,045 | 2,249 |
| Other ST liabilities | 865 | 943 | 943 | 943 | 943 |
| LT debt | 290 | 339 | 339 | 339 | 339 |
| Other LT liabilities | 131 | 142 | 142 | 142 | 142 |
| **Total Liabilities** | **2,279** | **2,121** | **2,889** | **3,751** | **3,988** |
| Common shares | 969 | 971 | 971 | 971 | 971 |
| Additional capital | 2,919 | 3,017 | 3,017 | 3,017 | 3,017 |
| Retained earning | 2,347 | 2,941 | 3,991 | 6,596 | 9,002 |
| Other shareholders' equity | 282 | 559 | 559 | 576 | 593 |
| **Total Equity** | **6,517** | **7,488** | **8,539** | **11,160** | **13,584** |
| **Total Liab. & Shrhldr's Equity** | **8,796** | **9,609** | **11,429** | **14,912** | **17,571** |

E = Morgan Stanley Research Estimates

Source: Morgan Stanley Research, Company Data

## Cash Flow Statement

| NT$mn (Years End Dec ) | 2024 | 2025 | 2026E | 2027E | 2028E |
|---|---|---|---|---|---|
| **Cashflow from Operations** | **1,079** | **1,958** | **1,797** | **2,752** | **4,046** |
| Net profits | 1,311 | 1,485 | 2,454 | 3,831 | 4,322 |
| Depreciation | 47 | 59 | 59 | 59 | 59 |
| Working Capital Change | (130) | 476 | (725) | (1,148) | (344) |
| Other adjustments | (157) | (71) | 0 | 0 | 0 |
| **Cashflow from Investing** | **(359)** | **(666)** | **(98)** | **(151)** | **(151)** |
| Capex | (372) | (581) | (100) | (100) | (100) |
| Change of LT Investment | (36) | 36 | 0 | 0 | 0 |
| Other adjustments | 50 | (68) | (51) | (51) | (51) |
| **Cashflow from financing** | **1,851** | **(645)** | **(1,403)** | **(1,227)** | **(1,916)** |
| Increase in L/T debt | (563) | 49 | 0 | 0 | 0 |
| Increase in S/T debt | 0 | 0 | 0 | 0 | 0 |
| Cash Dividend Paid | (131) | (980) | (1,403) | (1,227) | (1,916) |
| **Net change in cash** | **2,601** | **646** | **279** | **1,373** | **1,979** |

## Financial Ratios

| | 2024 | 2025 | 2026E | 2027E | 2028E |
|---|---|---|---|---|---|
| **Growth(%)** | | | | | |
| Turnover | 359.2 | -3.0 | 75.3 | 59.0 | 11.4 |
| Operating profits | 1623.8 | 12.3 | 70.1 | 60.1 | 12.7 |
| Pretax profits | 873.5 | 15.8 | 61.6 | 55.7 | 12.8 |
| Net profits | 848.5 | 13.3 | 65.2 | 56.1 | 12.8 |
| EPS | 793.9 | 1.4 | 64.8 | 56.1 | 12.8 |
| **Margins (%)** | | | | | |
| Gross Margin | 49.1 | 54.3 | 51.9 | 51.9 | 52.5 |
| Operating Margin | 25.9 | 30.0 | 29.1 | 29.3 | 29.7 |
| Pretax Margin | 28.3 | 33.8 | 31.2 | 30.5 | 30.9 |
| Net Profit | 23.7 | 27.7 | 26.1 | 25.6 | 25.9 |
| **Return (%)** | | | | | |
| ROAE | 29.1 | 21.2 | 30.6 | 38.9 | 34.9 |
| ROAA | 19.7 | 16.1 | 23.3 | 29.1 | 26.6 |
| **Gearing (%)** | | | | | |
| Net Debt/Equity | (49.8) | (51.3) | (48.3) | (49.2) | (55.0) |
| Liabilities/Equity | 35.0 | 28.3 | 33.8 | 33.6 | 29.4 |
| **Ratios (X)** | | | | | |
| Current ratio | 3.6 | 4.2 | 3.6 | 3.8 | 4.4 |
| Quick ratio | 2.9 | 3.3 | 2.8 | 2.9 | 3.4 |
| **Others** | | | | | |
| AR/NR Turnover (days) | 180 | 69 | 69 | 69 | 69 |
| Inventory Turnover (days) | 563 | 131 | 131 | 131 | 131 |
| AP Turnover (days) | 337 | 104 | 104 | 104 | 104 |
| Cash Conversion (days) | 406 | 97 | 97 | 97 | 97 |

# FOCI: Estimate Revisions and Quarterly Financials

**Factoring in actual 1Q26 results, we revise our 2026 EPS estimate to a loss, reduce 2027 by 2%, and cut 2028 fractionally.** Weaker-than-expected 1Q26 and 2Q26 results were mainly due to ongoing capacity transition from the Hsinchu fab to the new Thailand fab as the company prioritizes its SiPh/CPO development. The SiPh/CPO new capacity line will also take some time, and pre-mass production preparation such as destructive testing conducted could also affect its gross margin, followed by gradual recovery. We also reflect the one-off expense from new share issuance impact on gross and operating profit in 1H26, as well as the impact on EPS from new share issuance.

We slightly lower our 2027-28 revenue assumptions for the traditional business, as the company will focus on CPO development and let go some low-margin business. However, our supply-chain checks indicate more than 10 customers are currently prototyping, with potential NRE revenue recognition in 2026 and mass production beginning in 2027 and 2028. We have not fully incorporated this upside into our model yet as we look for clearer evidence of product launches and shipment momentum – developments that would push our outlook toward the bull-case scenario.

**Exhibit 33:** FOCI: Estimate revisions

| NT$ mn | New '26E | Old '26E | Diff. | New '27E | Old '27E | Diff. | New '28E | Old '28E | Diff. |
|---|---|---|---|---|---|---|---|---|---|
| Net sales | 1,985 | 2,795 | -29% | 8,694 | 9,764 | -11% | 23,559 | 24,437 | -4% |
| Gross profit | 370 | 599 | -38% | 3,194 | 3,245 | -2% | 9,044 | 8,925 | 1% |
| Operating profit | (129) | 72 | | 2,184 | 2,219 | -2% | 6,443 | 6,429 | 0% |
| Pretax Income | (58) | 94 | | 2,214 | 2,241 | -1% | 6,454 | 6,457 | 0% |
| Net income | (45) | 80 | | 1,794 | 1,905 | -6% | 5,228 | 5,424 | -4% |
| Reported EPS (NT$) | **(0.41)** | **0.70** | | **16.36** | **16.76** | **-2%** | **47.68** | **47.72** | **0%** |
| | | | | | | | | | |
| **Margins** | | | | | | | | | |
| Gross margin | 18.7% | 21.4% | | 36.7% | 33.2% | | 38.4% | 36.5% | |
| Operating margin | -6.5% | 2.6% | | 25.1% | 22.7% | | 27.3% | 26.3% | |
| Pretax margin | -2.9% | 3.4% | | 25.5% | 23.0% | | 27.4% | 26.4% | |
| Net margin | -2.3% | 2.9% | | 20.6% | 19.5% | | 22.2% | 22.2% | |

**Exhibit 34:** FOCI: Quarterly financials

| *NT$ in million* | 1Q26 | 2Q26E | 3Q26E | 4Q26E | 1Q27E | 2Q27E | 3Q27E | 4Q27E | 1Q28E | 2Q28E | 3Q28E | 4Q28E | 2024 | 2025 | 2026E | 2027E | 2028E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Revenues | 382 | 400 | 496 | 718 | 934 | 1,392 | 2,311 | 4,058 | 4,400 | 5,239 | 6,241 | 7,680 | 1,364 | 1,892 | 1,985 | 8,694 | 23,559 |
| *Sequential Change* | *-2.2%* | *4.8%* | *23.9%* | *44.9%* | *30.1%* | *49.0%* | *66.0%* | *75.6%* | *8.4%* | *19.1%* | *19.1%* | *23.0%* | | | | | |
| *Change vs Year Ago* | *-6.7%* | *-31.5%* | *-2.4%* | *83.9%* | *144.6%* | *247.8%* | *366.3%* | *464.9%* | *370.9%* | *276.4%* | *170.1%* | *89.3%* | *7.2%* | *38.7%* | *4.9%* | *338.1%* | *171.0%* |
| Cost of Sales | 375 | 363 | 372 | 516 | 639 | 920 | 1,462 | 2,479 | 2,759 | 3,254 | 3,838 | 4,665 | 1,185 | 1,537 | 1,614 | 5,500 | 14,515 |
| *Percent of Revenues* | *98%* | *91%* | *75%* | *72%* | *68%* | *66%* | *63%* | *61%* | *63%* | *62%* | *61%* | *61%* | *87%* | *81%* | *81%* | *63%* | *62%* |
| Gross Profit | 7 | 37 | 123 | 203 | 295 | 472 | 849 | 1,578 | 1,641 | 1,985 | 2,404 | 3,015 | 179 | 355 | 370 | 3,194 | 9,044 |
| *Percent of Revenues* | *1.9%* | *9.2%* | *24.9%* | *28.2%* | *31.6%* | *33.9%* | *36.7%* | *38.9%* | *37.3%* | *37.9%* | *38.5%* | *39.3%* | *13.1%* | *18.8%* | *18.7%* | *36.7%* | *38.4%* |
| *Incremental Margin* | *NM* | *163%* | *91%* | *36%* | *43%* | *39%* | *41%* | *42%* | *18%* | *41%* | *42%* | *42%* | *1%* | *33%* | *17%* | *42%* | *39%* |
| Total Opex | 163 | 101 | 111 | 124 | 164 | 231 | 255 | 361 | 446 | 559 | 786 | 811 | 273 | 354 | 500 | 1,010 | 2,601 |
| *Percent of Revenues* | *42.8%* | *25.3%* | *22.4%* | *17.3%* | *17.6%* | *16.6%* | *11.0%* | *8.9%* | *10.1%* | *10.7%* | *12.6%* | *10.6%* | *20.0%* | *18.7%* | *25.2%* | *11.6%* | *11.0%* |
| R&D | 72 | 77 | 82 | 87 | 100 | 150 | 150 | 200 | 260 | 310 | 460 | 460 | 147 | 212 | 317 | 600 | 1,490 |
| *Percent of Revenues* | *18.8%* | *19.2%* | *16.5%* | *12.1%* | *10.7%* | *10.8%* | *6.5%* | *4.9%* | *5.9%* | *5.9%* | *7.4%* | *6.0%* | *10.8%* | *11.2%* | *16.0%* | *6.9%* | *6.3%* |
| General & administrative | 73 | 13 | 15 | 17 | 50 | 60 | 70 | 100 | 120 | 170 | 220 | 220 | 96 | 110 | 117 | 280 | 730 |
| *Percent of Revenues* | *19.1%* | *3.2%* | *3.0%* | *2.3%* | *5.4%* | *4.3%* | *3.0%* | *2.5%* | *2.7%* | *3.2%* | *3.5%* | *2.9%* | *7.1%* | *5.8%* | *5.9%* | *3.2%* | *3.1%* |
| Selling & marketing | 19 | 12 | 14 | 21 | 14 | 21 | 35 | 61 | 66 | 79 | 106 | 131 | 29 | 32 | 65 | 130 | 381 |
| *Percent of Revenues* | *4.9%* | *2.9%* | *2.9%* | *2.9%* | *1.5%* | *1.5%* | *1.5%* | *1.5%* | *1.5%* | *1.5%* | *1.7%* | *1.7%* | *2.2%* | *1.7%* | *3.3%* | *1.5%* | *1.6%* |
| Operating Income | (156) | (64) | 12 | 78 | 131 | 241 | 594 | 1,218 | 1,195 | 1,426 | 1,617 | 2,204 | (93) | 0 | (129) | 2,184 | 6,443 |
| *Percent of Revenues* | *-40.9%* | *-16.1%* | *2.5%* | *10.9%* | *14.1%* | *17.3%* | *25.7%* | *30.0%* | *27.2%* | *27.2%* | *25.9%* | *28.7%* | *-6.8%* | *0.0%* | *-6.5%* | *25.1%* | *27.3%* |
| *Change vs Year Ago* | *n.a.* | *n.a.* | *n.a.* | *n.a.* | *n.a.* | *n.a.* | *n.a.* | *n.a.* | *n.a.* | *n.a.* | *n.a.* | *n.a.* | *n.a.* | *n.a.* | *n.a.* | *n.a.* | *n.a.* |
| Total Non-operating Income(Loss) | 22 | 17 | 17 | 17 | 8 | 8 | 8 | 8 | 3 | 3 | 3 | 3 | 37 | 22 | 72 | 30 | 12 |
| Profit Before Taxes | (135) | (48) | 29 | 95 | 139 | 249 | 601 | 1,225 | 1,198 | 1,429 | 1,620 | 2,207 | (57) | 23 | (58) | 2,214 | 6,454 |
| *Percent of Revenues* | *-35%* | *-12%* | *6%* | *13%* | *15%* | *18%* | *26%* | *30%* | *27%* | *27%* | *26%* | *29%* | *-4%* | *1%* | *-3%* | *25%* | *27%* |
| Taxes | (28) | (10) | 6 | 19 | 26 | 47 | 114 | 233 | 228 | 272 | 308 | 419 | (8) | 7 | (12) | 421 | 1,226 |
| *Tax Rate* | *20.5%* | *20.0%* | *20.0%* | *20.0%* | *19.0%* | *19.0%* | *19.0%* | *19.0%* | *19.0%* | *19.0%* | *19.0%* | *19.0%* | *14.6%* | *29.0%* | *21.2%* | *19.0%* | *19.0%* |
| **Reported Income (TW GAAP)** | **(107)** | **(38)** | **23** | **76** | **113** | **201** | **487** | **992** | **970** | **1,157** | **1,312** | **1,788** | **(48)** | **16** | **(45)** | **1,794** | **5,228** |
| *Percent of Revenues* | *-28%* | *-10%* | *5%* | *11%* | *12%* | *14%* | *21%* | *24%* | *22%* | *22%* | *21%* | *23%* | *-4%* | *1%* | *-2%* | *21%* | *22%* |
| *Change vs Year Ago* | *0%* | *0%* | *0%* | *0%* | *0%* | *0%* | *0%* | *0%* | *0%* | *0%* | *0%* | *0%* | *NM* | *NM* | *NM* | *NM* | *191%* |
| **Reported EPS (NT$, TW GAAP)** | **(0.98)** | **(0.35)** | **0.21** | **0.69** | **1.03** | **1.84** | **4.44** | **9.05** | **8.85** | **10.56** | **11.97** | **16.30** | **(0.47)** | **0.16** | **(0.41)** | **16.36** | **47.68** |
| *Change vs Year Ago* | *-9215%* | *-317%* | *7%* | *-421%* | *n.a.* | *n.a.* | *1997%* | *1205%* | *762%* | *475%* | *169%* | *80%* | *NM* | *NM* | *NM* | *NM* | *191%* |

# FOCI: Valuation Methodology

**Our price target (base case scenario value) remains NT$708** as we essentially maintain our 2028 EPS forecast and RI parameters.

We keep our medium-term growth rate at 16%, in line with Asia optics peers (e.g., Landmark) at 15-16%, to reflect rapid development in CPO and silicon-photonics technology. We maintain our other assumptions: cost of equity of 12.9% (risk-free rate 2.0%, risk premium 6.9%), payout ratio of 61%, and terminal growth rate of 4.0%.

**Exhibit 35:** FOCI: RI base

| NT$million | 2026E | 2027E | 2028E | 2029E | 2030E | 2031E | 2032E | 2033E | 2034E | 2035E | 2036E | 2037E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Total Equity** | **2,420** | **4,104** | **9,201** | **11,934** | **15,104** | **18,780** | **23,042** | **27,983** | **33,713** | **40,356** | **48,059** | **56,991** |
| **Net Profit** | **(45)** | **1,794** | **5,228** | **6,062** | **7,029** | **8,150** | **9,450** | **10,957** | **12,704** | **14,731** | **17,080** | **19,805** |
| **ROAE** | **NM** | **55.0%** | **78.6%** | **57.4%** | **52.0%** | **48.1%** | **45.2%** | **42.9%** | **41.2%** | **39.8%** | **38.6%** | **37.7%** |
| **Residual Income** | | 1,018 | 2,695 | 4,088 | 4,661 | 5,312 | 6,058 | 6,916 | 8,745 | 11,409 | 13,198 | 15,269 |
| **Spread** | | **42.0%** | **65.7%** | **44.4%** | **39.1%** | **35.2%** | **32.3%** | **30.0%** | **28.3%** | **26.8%** | **25.7%** | **24.8%** |
| Ending Equity Capital | 2,420 | | | | | | | | | | | |
| PV of Forecast Period | 28,517 | | | | | | | | | | | |
| PV of Continuing Value | 46,652 | | | | | | | | | | | |
| **Equity Value** | **77,588** | | | | | | | | | | | |
| No. of Shares | 110 | | | | | | | | | | | |
| **Projected Price** | **708** | | | | | | | | | | | |

**Exhibit 36:** FOCI: P/B

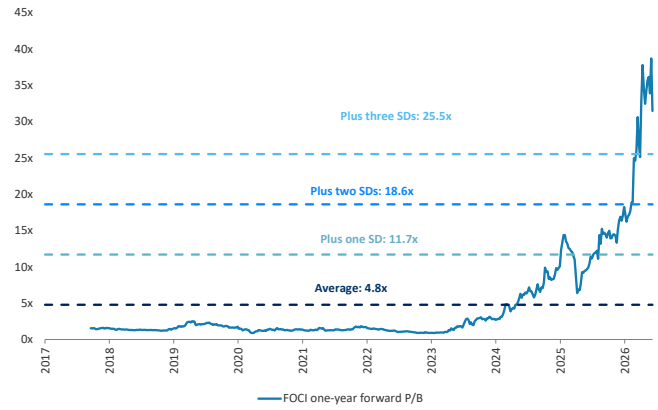
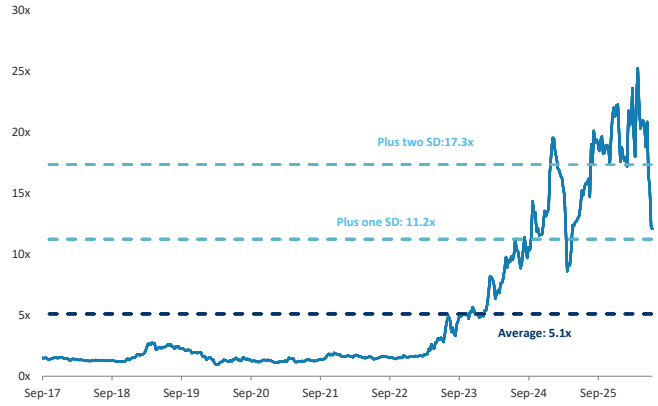



**Exhibit 37:** FOCI: P/S



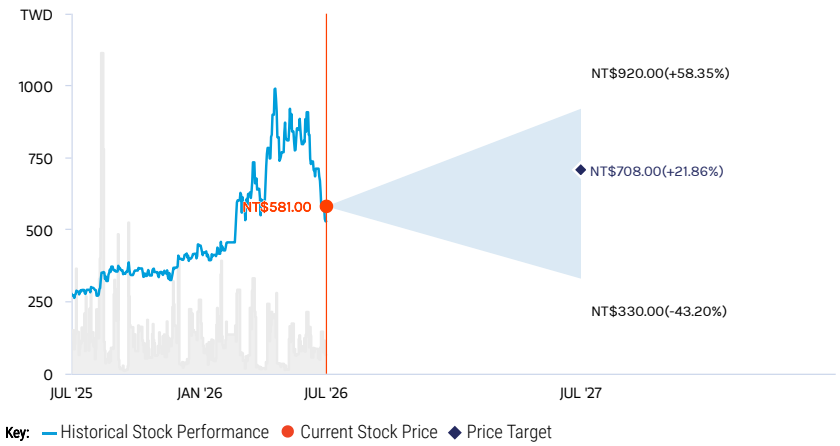
# Risk Reward – FOCI Fiber Optic Communications Inc (3363.TWO)

New page for networking market; OW

## PRICE TARGET NT$708.00

Base case, residual income model. Key assumptions: cost of equity of 12.9% (risk-free rate 2.0% and risk premium 6.9%), a payout ratio of 61%, a medium-term growth rate of 16%, and a terminal growth rate of 4.0%.

### RISK REWARD CHART




## OVERWEIGHT THESIS

- Co-packaged optics (CPO) is an advanced silicon photonics (SiPh) method that integrates optics and silicon on a single packaged substrate, aiming to reduce signal loss, power consumption, and cost.
- Given geopolitical benefits and close partnership with TSMC, we think FOCI is well positioned to provide CPO's fiber array units (FAU) and related services, leveraging its ReLFACon technology.
- SiPh/CPO technology is expected to be FOCI's main growth driver in the future. We see its sales contribution expanding from 7% in 2024 to 92% in 2028.
- The company is still growing at a fast pace and in transition. Thus, we expect FOCI stock to trade at 43x 2027e P/E vs. an EPS CAGR of 231% over 2023-27e.

**Risk Reward Themes**

| | |
|---|---|
| **Disruption:** | *Positive* |
| **Secular Growth:** | *Positive* |
| **Technology Diffusion:** | *Positive* |

View descriptions of Risk Rewards Themes here

### BULL CASE NT$920.00

**56x 2027e EPS**

We assume: 1) 200% revenue CAGR, 2023-27e, from stronger-than-expected CPO development; 2) faster-than-expected CPO introduction; 3) gross margin improving to over 50% in 2027e thanks to scale effects and the company's technology competitiveness; and 4) >400% EPS CAGR, 2023-27e.

### BASE CASE NT$708.00

**43x 2027e P/E**

We project: 1) 107% revenue CAGR, 2023-27e, on fast CPO development; 2) gross margin improves to over 37% in 2027e thanks to scale effects and the company's technology competitiveness; 3) 231% EPS CAGR, 2023-27e.

### BEAR CASE NT$330.00

**20x 2027e P/E**

We assume: 1) 50% revenue CAGR, 2023-27e, given slower-than-expected CPO development; 2) slower-than-expected CPO introduction; and 3) gross margin falling below 10% in 2027 owing to the high bargaining power of customers.

# Risk Reward – FOCI Fiber Optic Communications Inc (3363.TWO)

## KEY EARNINGS INPUTS

| Drivers | Dec 2025 | Dec 2026e | Dec 2027e | Dec 2028e |
|---|---|---|---|---|
| Revenue from computing segment (NT$, mn) | 1,198 | 1,108 | 1,313 | 1,454 |
| Revenue from communication segment (NT$, mn) | 326 | 215 | 329 | 356 |
| Revenue from battery segment (NT$, mn) | 109 | 650 | 7,032 | 21,724 |

## INVESTMENT DRIVERS

- Silicon photonics and CPO

## GLOBAL REVENUE EXPOSURE




View explanation of regional hierarchies here

## RISKS TO PT/RATING

**RISKS TO UPSIDE**

- Faster-than-expected CPO introduction
- More intense geopolitical tension
- Significant AI/cloud capex increase

**RISKS TO DOWNSIDE**

- Slower-than-expected CPO introduction slower than expected
- Easing geopolitical tension
- Significant AI/cloud capex cuts

## OWNERSHIP POSITIONING

**Inst. Owners, % Active** 75.6%

## MS ESTIMATES VS. CONSENSUS

*FY Dec 2026e*

**EPS** (NT$)
◆ (0.41)
*Note: There are not sufficient brokers supplying consensus data for this metric*

**Sales / Revenue** (NT$, mn)
◆ 1,985
*Note: There are not sufficient brokers supplying consensus data for this metric*

**EBITDA** (NT$, mn)
◆ 32
*Note: There are not sufficient brokers supplying consensus data for this metric*

**Net income** (NT$, mn)
◆ (45)
*Note: There are not sufficient brokers supplying consensus data for this metric*

**ROE** (%)
◆ (1.8)
*Note: There are not sufficient brokers supplying consensus data for this metric*

◆ Mean ◆

# FOCI: Financial Summary

## Income Statement

| NT$mn (Years End Dec ) | 2024 | 2025 | 2026E | 2027E | 2028E |
|---|---|---|---|---|---|
| Net sales | 1,364 | 1,892 | 1,985 | 8,694 | 23,559 |
| COGS | (1,185) | (1,537) | (1,614) | (5,500) | (14,515) |
| Gross profit | 179 | 355 | 370 | 3,194 | 9,044 |
| Operating expenses | (273) | (354) | (500) | (1,010) | (2,601) |
| **Operating income** | **(93)** | **0** | **(129)** | **2,184** | **6,443** |
| Non-operating income | 37 | 22 | 72 | 30 | 12 |
| Pre-tax income | (57) | 23 | (58) | 2,214 | 6,454 |
| Income tax | (8) | 7 | (12) | 421 | 1,226 |
| **Reported net income** | **(48)** | **16** | **(45)** | **1,794** | **5,228** |
| Adj.wtd.avg.shrs( m) | 88 | 88 | 110 | 110 | 110 |
| **Reported EPS (NT$)** | **(0.47)** | **0.16** | **(0.41)** | **16.36** | **47.68** |
| **Modelware EPS (NT$)** | **(0.47)** | **0.16** | **(0.41)** | **16.36** | **47.68** |

## Balance Sheet

| NT$mn (Years End Dec ) | 2024 | NT$ 2,025 | 2026E | 2027E | 2028E |
|---|---|---|---|---|---|
| Cash | 1,470 | 1,412 | 2,251 | 5,106 | 9,932 |
| Mkt Securities | 43 | 20 | 20 | 20 | 20 |
| AR/NR | 285 | 276 | 294 | 1,290 | 3,495 |
| Inventory | 288 | 409 | 366 | 1,246 | 3,289 |
| Other | 56 | 91 | 91 | 91 | 91 |
| **Current Assets** | **2,141** | **2,207** | **3,022** | **7,752** | **16,826** |
| Long-term investments | 0 | 0 | 0 | 0 | 0 |
| Fixed assets | 485 | 647 | 2,024 | 4,090 | 6,496 |
| Deffered assets | 51 | 56 | 56 | 56 | 56 |
| Other assets | 290 | 247 | 247 | 247 | 247 |
| **Total Assets** | **2,967** | **3,157** | **5,349** | **12,145** | **23,625** |
| S/T borrowings | 0 | 153 | 459 | 1,072 | 2,297 |
| AP/NP | 202 | 194 | 208 | 707 | 1,866 |
| Other ST liabilities | 146 | 175 | 175 | 175 | 175 |
| LT debt | 89 | 86 | 2,086 | 6,086 | 10,086 |
| Other LT liabilities | 0 | 0 | 0 | 0 | 0 |
| Common shares | 1,036 | 1,036 | 1,036 | 1,036 | 1,036 |
| **Total Liabilities** | **437** | **608** | **2,928** | **8,040** | **14,424** |
| Additional capital | 1,440 | 1,464 | 1,464 | 1,464 | 1,464 |
| Retained earning | 276 | 273 | 145 | 1,829 | 6,925 |
| Other shareholders' equity | (222) | (225) | (225) | (225) | (225) |
| **Total Equity** | **2,531** | **2,549** | **2,420** | **4,104** | **9,201** |
| **Total Liab. & Shrhldr's Equity** | **2,967** | **3,157** | **5,349** | **12,145** | **23,625** |

## Cash Flow Statement

| NT$mn (Years End Dec ) | 2024 | 2025 | 2026E | 2027E | 2028E |
|---|---|---|---|---|---|
| **Cashflow from Operations** | **70** | **(17)** | **154** | **659** | **2,501** |
| Net profits | (48) | 16 | (45) | 1,794 | 5,228 |
| Depreciation | 100 | 107 | 161 | 241 | 362 |
| Working Capital Change | (71) | (154) | 39 | (1,376) | (3,089) |
| Other adjustments | 88 | 13 | 0 | 0 | 0 |
| **Cashflow from Investing** | **19** | **(165)** | **(1,538)** | **(2,307)** | **(2,768)** |
| Capex | (55) | (55) | (1,538) | (2,307) | (2,768) |
| Change of LT Investment | 170 | 43 | 0 | 0 | 0 |
| Change of ST Investment | 0 | 0 | 0 | 0 | 0 |
| Other adjustments | (95) | (153) | 0 | 0 | 0 |
| **Cashflow from financing** | **453** | **122** | **2,223** | **4,503** | **5,093** |
| Increase in L/T debt | 2 | (3) | 2,000 | 4,000 | 4,000 |
| Increase in S/T debt | 0 | 153 | 306 | 613 | 1,225 |
| Cash Dividend Paid | (49) | 0 | (83) | (110) | (132) |
| Issuance of stock | 522 | 0 | 0 | 0 | 0 |
| Other adjustments | (21) | (28) | 0 | 0 | 0 |
| Exchange rate adjustment | 15 | 3 | 0 | 0 | 0 |
| **Net change in cash** | **557** | **-58** | **839** | **2,855** | **4,826** |

## Financial Ratios

| | 2024 | NT$ 2,025 | 2026E | 2027E | 2028E |
|---|---|---|---|---|---|
| **Growth(%)** | | | | | |
| Turnover | 7.2 | 38.7 | 4.9 | 338.1 | 171.0 |
| Operating profits | 60.3 | -100.5 | -26622.3 | -1787.3 | 195.0 |
| Pretax profits | -1091.4 | -140.4 | -353.0 | -3937.1 | 191.5 |
| Net profits | -500.3 | -133.5 | -380.8 | -4044.4 | 191.5 |
| EPS | -441.3 | -133.4 | -366.6 | -4044.4 | 191.5 |
| **Margins (%)** | | | | | |
| Gross Margin | 13.1 | 18.8 | 18.7 | 36.7 | 38.4 |
| Operating Margin | -6.8 | 0.0 | -6.5 | 25.1 | 27.3 |
| Pretax Margin | -4.1 | 1.2 | -2.9 | 25.5 | 27.4 |
| Net Profit | -3.5 | 0.9 | -2.3 | 20.6 | 22.2 |
| **Return (%)** | | | | | |
| ROAE | (2.1) | 0.6 | (1.8) | 55.0 | 78.6 |
| ROAA | (1.8) | 0.5 | (1.1) | 20.5 | 29.2 |
| **Gearing (%)** | | | | | |
| Net Debt/Equity | (58.1) | (49.4) | (74.0) | (98.3) | (83.0) |
| Liabilities/Equity | 17.3 | 23.9 | 121.0 | 195.9 | 156.8 |
| **Ratios (X)** | | | | | |
| Current ratio | 6.2 | 4.2 | 3.6 | 4.0 | 3.9 |
| Quick ratio | 5.1 | 3.2 | 3.0 | 3.3 | 3.1 |
| **Others** | | | | | |
| AR/NR Turnover (days) | 75 | 54 | 54 | 54 | 54 |
| Inventory Turnover (days) | 82 | 83 | 83 | 83 | 83 |
| AP Turnover (days) | 49 | 47 | 47 | 47 | 47 |
| Cash Conversion (days) | 108 | 90 | 90 | 90 | 90 |

# Risk Reward Reference links

1. View explanation of Options Probabilities methodology - Options_Probabilities_Exhibit_Link.pdf

2. View descriptions of Risk Rewards Themes - RR_Themes_Exhibit_Link.pdf

3. View explanation of regional hierarchies - GEG_Exhibit_Link.pdf

4. View explanation of Theme/Exposure methodology - ESG_Sustainable_Solutions_External_Link.pdf

5. View explanation of HERS methodology - ESG_HERS_External_Link.pdf

