廣發証券(香港)經紀有限公司
GF SECURITIES (HONG KONG) BROKERAGE LIMITED

Overseas Technology

Sept Edition: Cautious Market, Intact AI Cycle

Jeff Pu, CFA
SFC CE No. BNO719
jeffpu@gfgroup.com.hk

Henry Huang
SFC CE No. BYA749
henryhuang@gfgroup.com.hk

Moderate rebound, yet trading tough: July was a difficult month, followed by a mild recovery through Aug/1H-Sept that still felt challenging. Market positioning remains cautious, despite still-robust AI-infrastructure demand. Sentiment is anchored to worst-case capex and monetization concerns (FAQ: what's the next driver after coding?) rather than underlying tech fundamentals. We continue to believe the worst of the pullback is behind us, as positioning has largely cleaned up, the Sept interest rate hike is well-expected, and recent tech-CEO commentary reinforced confidence in AI. We expect the current moderate rebound to extend. In our preferred list, based on reports, we added UMC, MU and Lenovo, while removing TXN, AMD, and LITE.

L-T AI/capex debates: Per our report of *Addressing 2028 Capex on Aug 6*, we forecast U.S. CSP capex to be +85%/+45%/+20% YoY in 2026/2027/2028. Despite growing debt issuance, CSPs' balance sheet (ex. Oracle) will remain very healthy, backed by net leverage of 0.5x and the net debt-to-equity of only 18% by 2029. One additional trend is the Neoclouds (our report: *SpaceX's Move Into Neocloud on June 22*), and Nvidia's balance-sheet backstop ($530bn of off-balance-sheet) suggests Nvidia wins if demand holds and remains protected if weakens.

GPT-6 a step-up, debates on pacing the frontier: GPT-6 launched on Sept 3, a leap toward AGI. It boosts agentic capability, accelerates experiment velocity, and strengthens the RSI. The agentic unlocks monetizable automation across knowledge work, vertical enterprise agents, DevOps/security, and synthetic-data/RL. Yet on Sept 12, Anthropic's CEO urged pacing the Frontier, echoed by OpenAI and SpaceX. While coordinated deceleration appears tidy, market dynamics (i.e., Prisoner's Dilemma) limit feasibility. We see scaling and inferencing demand continues.

Our recent tech tour suggests robust demand: Our recent supply tour, along with SEMICON 2026, suggests a uniformly bullish tone on AI infrastructure demand, with companies highlighting tight supply across wafer fabrication, advanced packaging, memory, LPS (land/power/shell), substrate, DSP, etc. This is also consistent with the recent announcements of strong backlogs at SMCI/DELL, muti-year visibility (i.e. AVGO, LITE), etc. Based on our recent reports, we also like DRAM/HBM, thermal, interconnect/optics (Credo, SMTC), PCB, etc.

August monthly sales/data: TSMC sales +10% MoM, tracking inline. Neoclouds momentum to benefit OEMs. Substrate upcycle intact and CCL on margin expansion. Aspeed +118% YoY with solid 4Q guide/likely BMC price hike. Details on page 5.

GFHK Tech Most Read: 1) Michelle Jing on **PCB and PTFE**; 2) Jeff Pu on **Thermals**; 3) Jeff Pu on **DRAMs**; 4) Alicia Xia on **MRVL earnings**; 5) Jeff Pu on **NVDA earnings**.

Figure 1: Cyclical Indicators

	Short-term	Mid-term
DRAM	↗	↗
NAND	↗	→
Analog	↗	↗
Optical	↗	↗
iPhone	→	→
Android	↘	↘
PC	↘	↘
AI Server	↗	↗

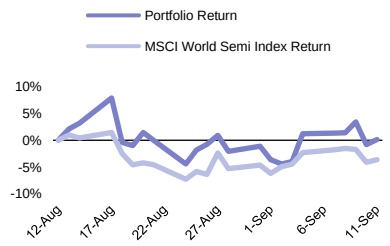
Sources: GF Securities (Hong Kong) Brokerage

Figure 2: Our preferred picks

	Ticker	Rating	CY26 P/E	CY27 P/E
Nvidia	NVDA US	Buy	23.5x	13.7x
Intel	INTC US	Buy	64.3x	36.8x
Credo	CRDO US	Buy	25.1x	14.2x
ASE	3711 TT	Buy	33.2x	20.5x
Hon Hai	2317 TT	Buy	12.4x	8.4x
ZDT	4958 TT	Buy	25.4x	13.6x
UMC	2303 TT	Buy	19.0x	17.8x
Micron	MU US	Buy	13.3x	6.4x
Lenovo	00992 HK	Buy	12.2x	8.6x
Marvell	MRVL US	Buy	53.7x	29.5x
Semtech	SMTC US	Buy	46.5x	22.6x

Sources: GF Securities (Hong Kong) Brokerage

Figure 3: Preferred picks performance



Sources: BBG, GF Securities (Hong Kong) Brokerage

Risks

1) Alternative technologies;
2) AI demand slowdown;
3) IT demand slowdown;
4) Product delays.

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GFHK Tech Important Stock Calls

In the past one month, our key reports and stock calls are:

Michelle Jing on PCB and PTFE, reported date on Sept 9: We expect PCB content value to increase from ~US$440 per GPU for GB300 to ~US$750 for VR200 and potentially ~US$1,000–1,500 for VR300, driven by higher-end CCL, increasing layers, and the potential PTFE adoption. For VR300 NVL576 Oberon Rack, we see an upgrade in both switch board design (increasing to 18 switch boards) and CCL. Multiple solutions are under consideration, based on 16+16L designs and centered on hybrid PTFE. Potential configurations include PTFE + M9 (Low-DK2/Q-glass) or M10 (Q-glass), while the use of glass-fiber cloth versus glass-free prepreg for the PTFE layers remains under consideration.

Jeff Pu on Thermals, reported date on Sept 8: We expect cold plate content to be driven by double-sided and copper diamond. For VR300 (Rubin Ultra), we expect the content value to further increase by 58%, vs. that of VR200 NVL72, driven by: 1) double-sized cold plate for GPU, 2) copper diamond powder/material for GPU's cold plate; 3) doubled units of switch ASICs (for one NVL72). Meanwhile, we also expect QD content to rise into Rubin platform. We estimate VR200 NVL72 to utilize 22 QDs in each compute tray and 6 QDs in switch tray, resulting in content per rack of ~$10,760, 77% increase from GB300 NVL72. For VR300, we expect the content value to further increase by 103% vs. VR200 NVL72, thanks to upgrade to ZQD and doubled usage per switch tray (due to 2 boards per tray).

Jeff Pu on DRAMs, reported date on Sept 6: We turn positive on DRAM sector. Our supply chain research indicates U.S. hyperscaler inventories are low and is likely to be reduced further by end 3Q26 on improving CPU availability. We therefore expect blended DRAM pricing at ~10% QoQ in 4Q26, versus high teens QoQ in 3Q26. For NAND, we maintain our high teen QoQ NAND price expectation for 3Q26 but expect softening in 4Q26 to low single digit QoQ, pressured by weaker mobile demand and elevated mobile/PC inventories. Hyperscaler NAND inventory remains healthy at ~14 weeks (vs. ~15 week normal), but the softer pricing outlook could slow pull ins.

Alicia Xia on MRVL earnings, reported date on Aug 28: F2Q results were largely inline, while elevated expectations into the print sent shares down 7.8% after-hours. F2Q revenue of $2.74bn vs Cons of $2.7bn, and non-GAAP EPS of $0.94 vs Cons of $0.93. For F3Q, mgmt. guided revenue of $3.15bn, with GM to decline QoQ driven by mix as ASIC ramps. The company raised FY27E revenue to $12bn and FY28E to $18bn, driven by robust data center outlook. We forecast $16bn+ AI ASIC Revenue vs guidacne at $10bn, and expect more details on investor Day on Oct 6.

Jeff Pu on NVDA earnings, reported date on Aug 27: Nvidia stock rose 4% during dafter-hours on robust prints, ~70% FY28 YoY guide (100% unconstrained), increasing revenue/GW and clarity (a bit) the $500bn financing framework, offsetting softer margin outlook. The earnings call underscored Nvidia's: 1) full stack AI platform, with Vera Rubin's $40bn/GW value vs. Blackwell's $25bn; 2) neutral positioning for fast growing neoclouds who need full solutions; 3) supply chain; 4) dual tailwinds from closed and open models, the latter a bigger driver; and 5) GPU which is fungible. Moreover, product cycle stays constructive for Vera Rubin, driven by share gains vs. ASICs and neocloud build-out, with portfolio spans LPX, CPU, and networking including the better ramp of CPO Spectrum X. A good problem to have remain the supply bottlenecks across memory, wafer fabrication, plus LPS (land power shell).

Coverage Summary

Figure 4: Coverage summary

Company	Ticker	Rating	TP	Mkt Cap	EPS		P/E		ROE (%)		P/B	
				US mn	2026E	2027E	2026E	2027E	2026E	2027E	2026E	2027E
TSMC	2330 TT	Hold	NT$2,700	1,975,004	NT$ 108.2	NT$ 138.3	22.3x	17.4x	39.7	38.3	8.8x	6.7x
UMC	2303 TT	Buy	NT$160	55,811	NT$ 7.4	NT$ 7.9	19.0x	17.8x	21.2	21.5	4.0x	3.8x
INTC	INTC US	Buy	US$150.0	544,045	US$1.60	US$2.80	64.3x	36.8x	5.7	9.1	3.4x	3.1x
ASE	3711 TT	Buy	NT$754	87,309	NT$ 18.6	NT$ 30.1	33.2x	20.5x	19.0	26.0	6.3x	5.3x
Nvidia	NVDA US	Buy	US$345	5,260,789	US$9.30	US$15.90	23.5x	13.7x	81.2	75.0	19.2x	10.3x
Qualcomm	QCOM US	Hold	US$186	191,069	US$10.60	US$11.60	17.2x	15.7x	60.4	47.5	10.4x	7.4x
AMD	AMD US	Buy	US$700	842,569	US$8.40	US$15.70	61.4x	32.9x	18.6	27.3	11.4x	7.0x
MTK	2454 TT	Buy	NT$6,420	232,547	NT$ 69.8	NT$ 143.4	65.7x	32.0x	28.0	58.0	18.2x	18.0x
BYDE	00285 HK	Hold	HK$30.0	6,855	CNY 1.00	CNY 1.70	23.4x	13.8x	6.5	10.2	1.5x	1.3x
Broadcom	AVGO US	Buy	US$447	1,728,006	US$11.70	US$19.50	30.9x	18.6x	53.9	61.5	16.8x	11.5x
Marvell	MRVL US	Buy	US$290	207,036	US$4.40	US$8.00	53.7x	29.5x	20.1	24.4	10.5x	7.2x
Semtech	SMTC US	Buy	US$162	15,608	US$3.60	US$7.40	46.5x	22.6x	28.6	45.5	28.0x	16.1x
TI	TXN US	Buy	US$326	245,390	US$8.70	US$10.90	30.9x	24.7x	31.6	31.6	9.8x	7.8x
Tower	TSEM US	Buy	US$260	23,908	US$4.50	US$10.00	47.0x	21.2x	14.1	24.6	7.1x	5.4x
Coreweave	CRWV US	Buy	US$172	49,734	-US$3.64	-US$1.32	N/A	N/A	-10.2	-1.6	2.3x	0.7x
Apple	AAPL US	Hold	US$369	4,849,208	US$8.90	US$10.50	37.3x	31.6x	142.6	119.0	45.5x	34.3x
Hon Hai	2317 TT	Buy	NT$372	71,150	NT$ 20.1	NT$ 29.6	12.4x	8.4x	14.4	18.5	1.6x	1.3x
Dell	DELL US	Hold	US$497	361,096	US$26.10	US$29.20	21.7x	19.4x	N/A	N/A	N/A	N/A
Super Micro	SMCI US	Buy	US$54	26,344	US$4.50	US$5.80	8.9x	6.9x	19.8	20.4	3.5x	3.0x
Lenovo	00992 HK	Buy	HK$48	49,545	HK$2.56	HK$3.66	12.2x	8.6x	41.3	85.4	52.2x	39.1x
Xiaomi	01810 HK	Buy	HK$39.5	86,576	CNY 0.90	CNY 1.10	28.7x	23.5x	8.3	9.2	2.5x	2.3x
BizLink	3665 TT	Buy	NT$3,140	11,826	NT$ 68.3	NT$ 112.2	27.5x	16.7x	23.3	28.7	6.4x	4.8x
EMC	2383 TT	Buy	NT$6,538	60,751	NT$ 114.9	NT$ 261.5	46.7x	20.5x	26.3	24.7	12.3x	5.4x
Co-Tech	8358 TT	Buy	NT$480	3,871	NT$ 10.0	NT$ 24.0	48.6x	20.2x	19.0	25.0	9.1x	5.1x
Zhen Ding	4958 TT	Buy	NT$729	17,481	NT$ 19.5	NT$ 36.5	25.4x	13.6x	10.8	18.2	2.2x	1.7x
KBLaminates	01888 HK	Buy	HK$62.6	19,247	HK$3.12	HK$6.75	15.4x	7.1x	24.8	27.4	3.8x	1.9x
Celestica	CLS US	Hold	US$370	43,516	US$11.00	US$24.60	31.5x	14.1x	37.8	45.4	11.9x	6.4x
Arista	ANET US	Buy	US$170	251,728	US$3.89	US$4.81	51.4x	41.5x	24.4	21.7	12.6x	9.0x
Coherent	COHR US	Hold	US$415	59,801	US$5.60	US$12.10	54.5x	25.2x	9.7	13.1	4.8x	4.4x
Lumentum	LITE US	Buy	US$961	83,155	US$7.70	US$24.50	120.4x	37.8x	16.8	33.4	20.2x	12.6x
Fabrinet	FN US	Hold	US$615	14,856	US$13.52	US$15.00	30.7x	27.6x	21.6	49.5	7.2x	13.6x
FIT	06088 HK	Buy	HK$9.0	4,912	US$0.04	US$0.08	16.8x	8.9x	18.4	22.4	1.3x	1.1x
Credo	CRDO US	Buy	US$227	30,627	US$6.50	US$11.44	25.1x	14.2x	38.8	40.5	9.6x	5.8x
MPS	MPWR US	Buy	US$1,706	60,665	US$28.00	US$48.70	44.1x	25.3x	32.3	38.7	12.1x	8.2x
Horizon Robotics	09660 HK	Buy	HK$9.5	8,561	CNY 0.00	CNY 0.01	N/A	441.3x	N/A	N/A	1.8x	7.4x

Sources: Company data, GF Securities (Hong Kong) Brokerage

August Monthly Data

TSMC August sales reached another record high of NT$514.8bn, up 10.1% MoM and 53.3% YoY, largely in line with expectations (tracking at 67% of quarterly revenue). The strong performance was well supported by Nvidia Rubin, Apple A20 Pro, and AI ASIC demand. For 3Q26, we expect sales to grow 15% QoQ in USD terms. Although gross margin may have peaked in 2Q due to the N2 ramp, we believe near-term momentum remains robust and expect investors to shift focus toward next-gen technologies (A14/A12/A13), overseas fab progress, and Intel's competition across both front-end and advanced packaging (EMIB).

OEMs Momentum/Profitability to Accelerate driven by Neoclouds: Hon Hai revenue last month was NT$921.8bn, -2.6% MoM, +52% YoY, driven by solid AI products sales. Quanta reported +16% MoM on AI/general server strength. Of note, Wistron delivered 49% MoM and 166.5% YoY growth, reflecting the AI server demand from Neoclouds, alongside Wiwynn's +22% MoM. We believe Neoclouds are now accelerating their AI infrastructure buildout, which is in turn expanding OEMs margin/sales. For instance, ASUS and Gigabyte both reported 2Q earnings beats, with monthly sales up another 13% and 7%, respectively, bolstered by Nebius' GW-level builds.

PC slowing down: NB shipments from top 5 ODMs dropped by 0.9mn to 7.3m, consistent with our prior view that ODM builds continue to slow down post stronger than expected 1H26. We expect CPU and memory price adjustments to push up device pricing further in 2H26 along with new product launch. We expect a >20% YoY decline for PC shipments in 2H26, with forecast of -11% YoY for the full year. That said, we believe premium/commercial models' demand to remain resilient.

Smartphone vendors on new topics: MediaTek's August sales were NT$64.2bn, +32% MoM, driven by flagship SoC and smart edge business. Despite weakening overall smartphone demand, NVDA's $3.5bn investments strengthen Mediatek's AI/ASIC outlook. That said, TPU v8i (Zebrafish) tape-out in Oct-Nov remains worth-watching. On the other hand, Largan (FA/PMLA for CPO/NPO) and Genius (3M's EBO) saw their share price surge on optics-related AI adoption, yet we do not expect meaningful revenue contribution until 2028.

Substrate Upcycle Intact: Despite country-of-origin probes, Unimicron posted another all-time high sales with +9% MoM and 56% YoY. Supported by upward pricing and higher volumes of high-end substrates, amid peak season with ongoing supply-demand gap, we expect Unimicron's momentum to accelerate QoQ in 2H26. Meanwhile, ZengDing's revenue rose 17% MoM and 41% YoY on multiple drivers, including AI server wins (Rubin's HDI), opticals (1.6T mSAP), and its ramping substrate business. On the CCL front, ITEC revenue grew 6% MoM and 98% YoY, with pricing power and margins improvement expected to persist.

Figure 5: Taiwan region upstream tech monthly sales

TWD m		Aug-26	MoM	YoY	July-26	MoM	YoY	June-26	MoM	YoY
Foundry										
TSMC	2330.TW	514,805	10.1%	53.3%	467,581	5.6%	44.7%	442,680	6.2%	67.9%
UMC	2303.TW	25,045	5.0%	30.7%	23,844	3.1%	19.0%	23,125	0.8%	22.9%
Vanguard	5347.TW	5,093	8.2%	40.5%	4,706	-21.3%	30.3%	5,977	40.9%	33.6%
OSAT/Testing										
ASE	3711.TW	82,247	11.5%	45.7%	73,784	12.2%	28.2%	65,783	4.4%	32.9%
Powertech	6239.TW	8,558	3.5%	24.5%	8,270	8.5%	29.4%	7,623	-3.7%	21.7%
KING YUAN	2449.TW	4,080	2.2%	31.6%	3,991	10.2%	36.7%	3,622	-4.1%	28.6%
Chipmos	8150.TW	2,786	-1.3%	33.3%	2,823	18.4%	43.6%	2,384	0.0%	28.9%
Chipbond	6147.TW	2,620	3.8%	43.6%	2,523	10.2%	39.2%	2,288	6.0%	27.1%
Chroma	2360.TW	5,632	3.6%	156.3%	5,434	32.1%	175.3%	4,114	-9.6%	73.0%
Probe Card										
MPI	6223.TW	2,048	13.4%	69.9%	1,805	-1.5%	66.5%	1,833	-3.9%	65.1%
WinWay	6515.TW	1,706	6.6%	233.4%	1,600	9.6%	155.6%	1,460	36.0%	287.9%
CHPT	6510.TW	638	3.9%	54.3%	615	7.1%	49.9%	574	5.8%	40.2%
Equipment										
GPTC	3131.TW	681	-14.1%	43.3%	793	25.6%	42.4%	631	12.9%	15.2%
Scientech	3583.TW	1,068	9.8%	18.1%	973	-6.0%	6.6%	1,035	6.6%	-2.7%
ALL RING	6187.TW	1,109	5.1%	103.1%	1,055	4.2%	73.4%	1,012	38.9%	87.1%
IC Design										
MediaTek	2454.TW	64,183	32.4%	44.1%	48,475	-16.4%	12.2%	58,002	22.3%	2.8%
Novatek	3034.TW	10,327	0.3%	26.3%	10,296	2.7%	26.8%	10,023	6.5%	19.0%
Realtek	2379.TW	12,459	-3.4%	28.1%	12,895	4.7%	32.5%	12,311	-1.7%	20.6%
Aspeed	5274.TW	1,626	6.7%	118.4%	1,524	16.3%	97.6%	1,310	2.2%	67.5%
ASMedia	5269.TW	882	12.7%	-32.5%	783	-9.7%	-38.0%	867	-3.3%	-22.4%
Parade	4966.TW	1,327	-2.0%	0.2%	1,353	-19.1%	-4.3%	1,672	27.9%	12.2%
Silergy	6415.TW	2,417	2.5%	52.5%	2,357	13.1%	58.5%	2,084	9.1%	37.8%
Design Service										
Alchip	3661.TW	8,776	18.1%	273.6%	7,433	108.1%	181.8%	3,572	84.6%	15.4%
GUC	3443.TW	5,840	1.2%	111.0%	5,769	17.1%	158.4%	4,929	5.4%	103.7%
GaAs										
WIN SEMI	3105.TW	1,937	2.4%	30.6%	1,892	7.0%	31.2%	1,768	0.7%	29.6%
AWSC	8086.TW	422	0.7%	12.6%	419	2.7%	18.4%	408	-7.9%	16.1%
VPEC	2455.TW	471	11.6%	71.2%	422	29.5%	45.1%	326	1.6%	23.6%
MLCC										
Yageo	2327.TW	16,332	1.2%	51.8%	16,131	5.0%	51.5%	15,359	2.0%	38.9%
Walsin	2492.TW	4,569	2.8%	45.5%	4,444	12.2%	42.0%	3,961	7.1%	25.8%
Optics										
LandMark	3081.TW	520	3.8%	180.9%	501	19.2%	176.5%	421	3.7%	128.1%
FOCI	3363.TW	204	19.7%	13.2%	171	8.5%	12.1%	157	9.5%	-15.7%
GCS	4991.TW	262	80.3%	45.6%	145	-55.4%	-6.9%	326	62.9%	55.1%
Browave	3163.TW	205	-2.4%	9.7%	210	15.9%	28.7%	181	-14.3%	-11.5%
Ezconn	6442.TW	1,628	32.4%	152.2%	1,229	15.0%	49.3%	1,069	-38.0%	1.6%
LuxNet	4979.TW	546	7.3%	37.4%	509	11.8%	31.0%	455	8.0%	27.7%
Memory										
Nanya	2408.TW	44,690	1.9%	560.9%	43,868	49.3%	719.6%	29,388	6.2%	621.3%
Winbond	2344.TW	27,309	2.0%	289.4%	26,773	30.0%	291.5%	20,597	3.0%	189.9%
Macronix	2337.TW	8,145	5.4%	218.5%	7,725	11.0%	180.5%	6,956	11.2%	216.1%

Sources: Company data, GF Securities (Hong Kong) Brokerage

Figure 6: Taiwan region downstream tech monthly sales

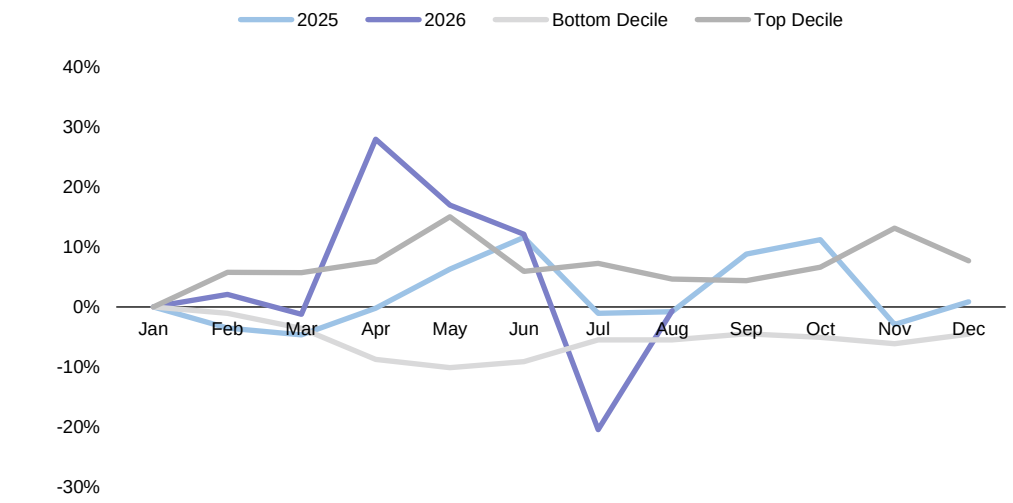
TWD m		Aug-26	MoM	YoY	July-26	MoM	YoY	June-26	MoM	YoY
ODM										
Hon Hai	2317.TW	921,766	-2.6%	52.0%	946,513	15.2%	54.2%	821,763	-4.4%	52.1%
Pegatron	4938.TW	88,305	2.7%	34.1%	86,015	-5.8%	11.6%	91,296	-4.9%	15.9%
Quanta	2382.TW	423,971	15.8%	177.5%	366,274	-4.9%	131.3%	385,191	23.7%	102.9%
Wistron	3231.TW	460,065	49.3%	166.5%	308,219	-4.2%	60.8%	321,822	10.9%	53.8%
Compal	2324.TW	67,337	-16.9%	14.5%	81,006	-15.5%	38.3%	95,854	36.0%	58.4%
Inventec	2356.TW	83,268	-7.7%	35.8%	90,190	-11.8%	65.7%	102,262	23.5%	61.6%
Wiwynn	6669.TW	144,312	22.6%	50.4%	117,686	5.7%	39.2%	111,371	32.5%	29.8%
PC Brand										
ASUS	2357.TW	94,956	12.9%	51.2%	84,131	-21.2%	53.3%	106,723	54.5%	55.6%
Acer	2353.TW	30,180	12.2%	38.4%	26,904	-3.3%	21.9%	27,818	6.3%	-3.0%
Graphics Card										
MSI	2377.TW	17,694	-8.5%	-6.1%	19,342	8.9%	0.0%	17,756	12.4%	-9.2%
Gigabyte	2376.TW	47,401	7.2%	98.4%	44,213	3.1%	59.7%	42,892	-12.6%	68.6%
PCB/CCL										
Co-tech	8358.TW	1,056	4.7%	59.7%	1,009	4.8%	54.9%	962	2.2%	43.4%
EMC	2383.TW	20,146	4.9%	129.8%	19,207	8.3%	129.4%	17,733	13.5%	120.7%
TUC	6274.TW	5,915	0.1%	132.5%	5,908	20.7%	121.5%	4,895	2.1%	107.7%
Unimicron	3037.TW	17,746	9.2%	56.3%	16,254	9.1%	43.7%	14,897	6.0%	36.3%
Zhen Ding	4958.TW	20,666	17.4%	41.1%	17,601	3.3%	31.8%	17,033	5.1%	32.8%
GCE	2368.TW	10,384	3.7%	76.4%	10,015	21.3%	77.4%	8,255	-5.9%	78.2%
Compeq	2313.TW	7,012	0.8%	6.9%	6,955	0.6%	16.0%	6,915	2.3%	21.0%
Flexium	6269.TW	1,997	-2.3%	1.3%	2,045	19.2%	4.0%	1,716	2.0%	-1.0%
Lens										
Largan	3008.TW	5,012	2.8%	-16.0%	4,877	31.4%	-9.9%	3,712	-19.2%	-10.5%
Genius	3406.TW	2,719	12.3%	0.7%	2,422	39.3%	1.6%	1,739	6.8%	4.5%
Acoustics										
Merry	2439.TW	4,118	12.9%	-6.7%	3,648	5.4%	-0.3%	3,460	-7.5%	0.1%
Primax	4915.TW	6,127	4.6%	20.4%	5,857	-6.9%	9.3%	6,289	15.3%	27.6%
Components										
Catcher	2474.TW	1,003	-5.0%	-40.5%	1,056	31.3%	-34.3%	805	-12.3%	-55.1%
SZS	3376.TW	830	2.3%	-10.0%	811	-12.0%	-10.3%	922	14.9%	-4.8%
Server										
AVC	3017.TW	19,481	4.8%	54.3%	18,590	5.5%	57.4%	17,618	11.0%	66.1%
Auras	3324.TW	3,141	-16.6%	67.2%	3,765	38.5%	116.7%	2,718	-13.4%	62.1%
Accton	2345.TW	40,873	3.5%	59.4%	39,473	-0.2%	71.7%	39,555	38.2%	61.2%
Jentech	3653.TW	3,226	0.4%	90.9%	3,213	21.3%	91.0%	2,650	14.5%	57.6%
LOTES	3533.TW	3,198	-5.1%	19.6%	3,369	8.9%	18.6%	3,094	1.7%	17.3%
BizLink	3665.TW	8,892	-7.7%	54.0%	9,630	13.1%	59.6%	8,518	15.9%	63.8%
Chen Bro	8210.TW	2,457	-0.2%	40.5%	2,462	-23.9%	41.5%	3,238	28.6%	98.0%
King Slide	2059.TW	6,466	0.9%	344.4%	6,407	44.2%	355.5%	4,443	17.2%	220.5%
Power										
Delta	2308.TW	64,586	-3.7%	34.9%	67,073	2.2%	47.7%	65,603	11.3%	55.4%
Lite-On	2301.TW	19,592	3.1%	25.2%	19,006	1.9%	37.6%	18,656	7.5%	37.0%
Dynapack	3211.TW	1,677	36.5%	17.3%	1,229	-3.1%	20.9%	1,268	9.0%	20.6%
Display										
AUO	2409.TW	23,102	13.4%	-5.9%	20,370	-18.4%	-2.6%	24,952	4.7%	13.8%
Innolux	3481.TW	18,697	-1.0%	0.0%	18,890	-13.0%	-1.9%	21,703	5.1%	17.2%
Networking										
Sercomm	5388.TW	7,044	-11.7%	45.1%	7,980	9.7%	51.3%	7,271	12.2%	70.8%
Wistron NeWeb	6285.TW	15,704	-7.1%	81.2%	16,913	6.6%	89.8%	15,870	30.4%	84.4%

Sources: Company data, GF Securities (Hong Kong) Brokerage

Tech Valuation in major markets

Due to the pullback after 2Q26 rally, relative performance in June-July period for the Philadelphia Semiconductor Index (SOX) versus S&P 500 hit a decade-low of -20%, marking the worst relative returns observed over the past 15 years, while narrowed to -1% followed by a mild recovery through Aug.

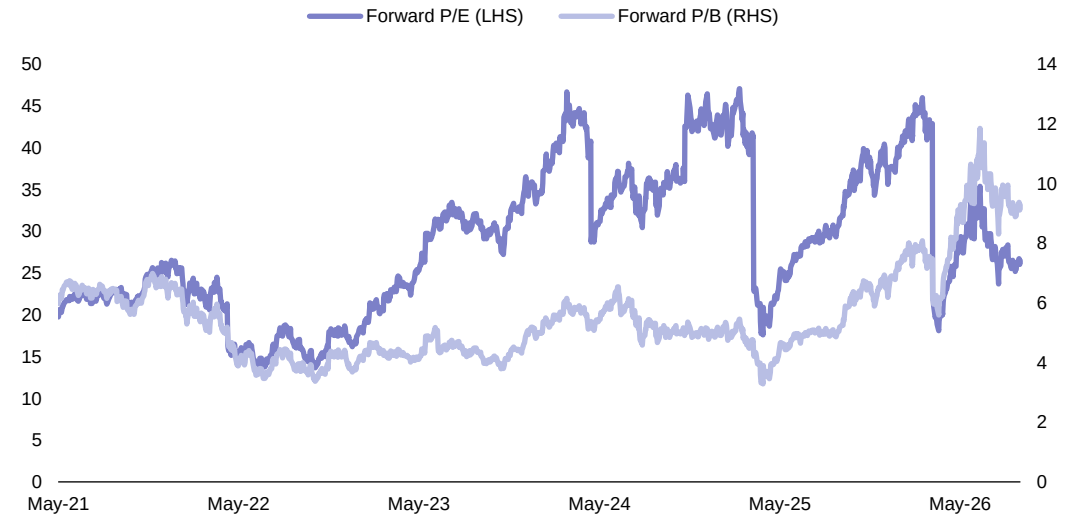
Figure 7: SOX vs. S&P500 return since 2012



Sources: Bloomberg, GF Securities (Hong Kong) Brokerage

Philadelphia Semiconductor Index (SOX) forward P/E remained around 27x last month, and forward P/B stayed ~9.5x, given the pullback after the 2Q26 rally.

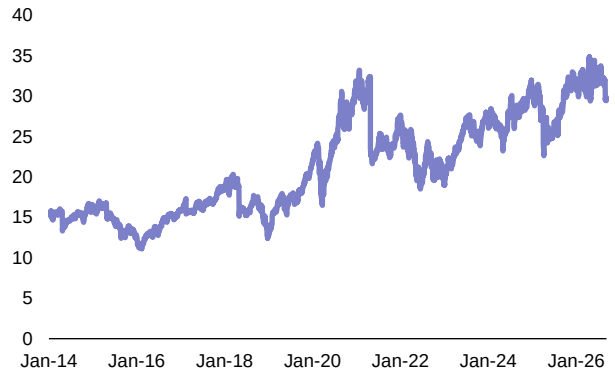
Figure 8: SOX Index's P/E, P/B



Sources: Bloomberg, GF Securities (Hong Kong) Brokerage

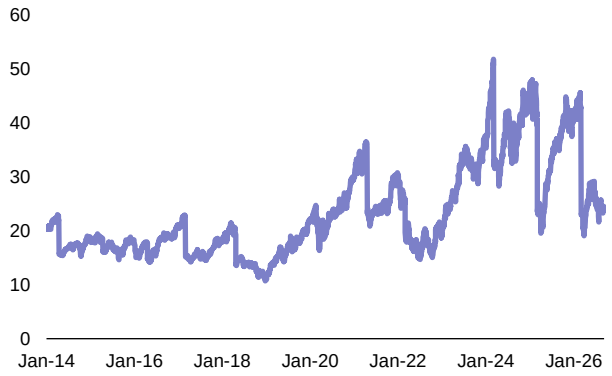
Meanwhile, global semi forward P/E fell to 23.9x from 25.2x, and global hardware forward P/E went down to 29.8x from 32.2x. In terms of P/B, the global semi forward P/B slightly decreased to 11.5x from 12x.

Figure 9: MSCI World Tech Hardware P/E



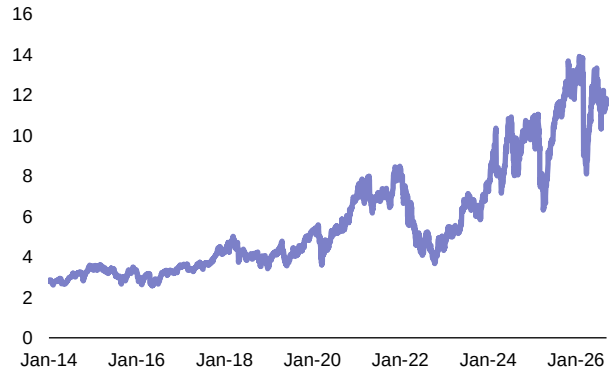
Sources: Bloomberg, GF Securities (Hong Kong) Brokerage

Figure 10: MSCI World Semi P/E



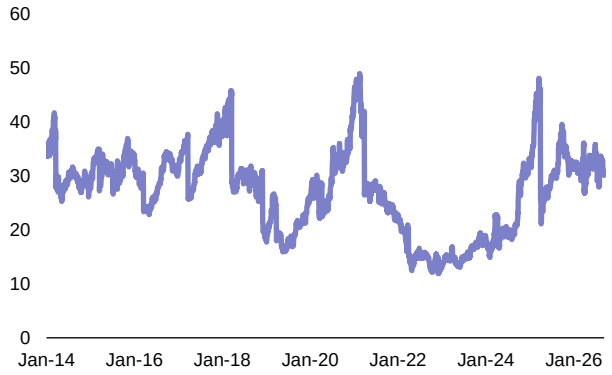
Sources: Bloomberg, GF Securities (Hong Kong) Brokerage

Figure 11: MSCI World Semi P/B



Sources: Bloomberg, GF Securities (Hong Kong) Brokerage

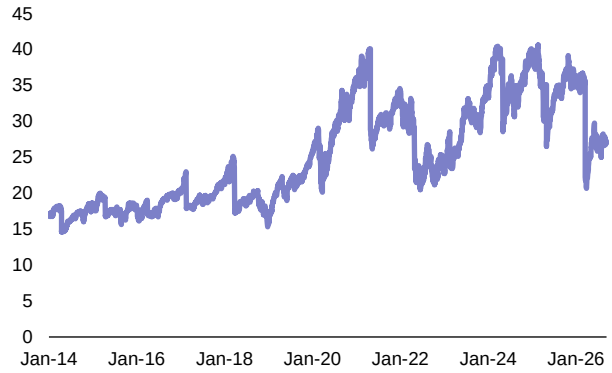
Figure 12: MSCI China IT P/E



Sources: Bloomberg, GF Securities (Hong Kong) Brokerage

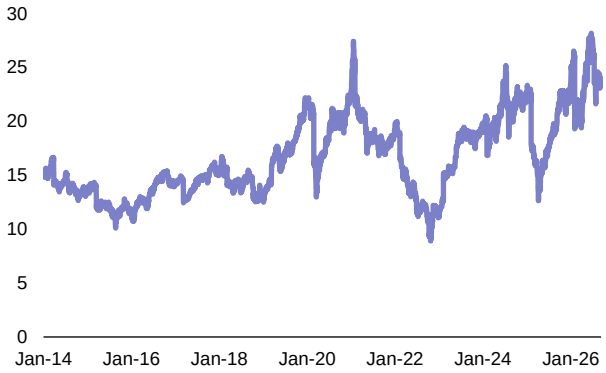
China IT sector forward P/E slightly declined from 31x to 30x, still above the upper end of historical average of 20-30x, while US IT sector forward P/E slightly went down to 27x from 28x.

Figure 13: MSCI US IT P/E



Sources: Bloomberg, GF Securities (Hong Kong) Brokerage

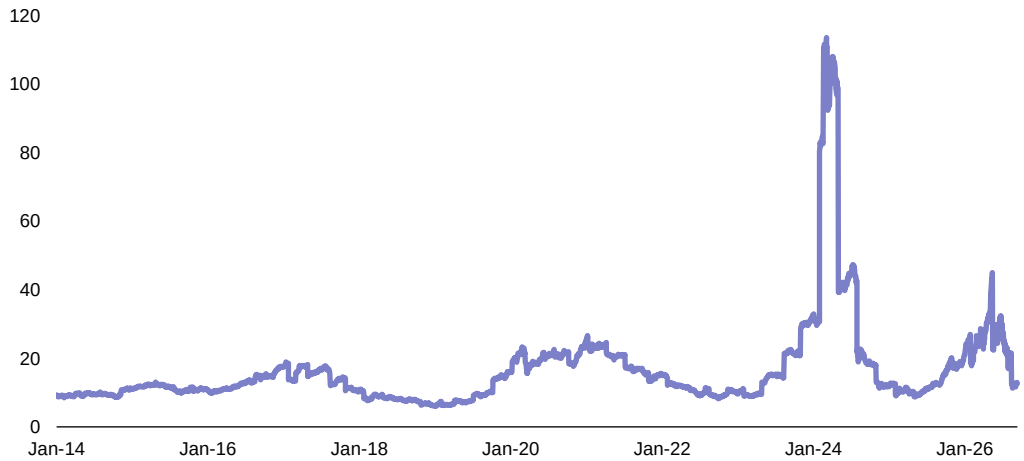
Figure 14: MSCI Taiwan region IT P/E



Sources: Bloomberg, GF Securities (Hong Kong) Brokerage

The Taiwan region IT sector forward P/E remained around 23.9x, higher than the high end of the historical average of 10-20x, and Korean IT sector forward P/E stayed about 20x.

Figure 15: MSCI Korea IT Forward P/E



Sources: Bloomberg, GF Securities (Hong Kong) Brokerage

Downstream tech – Smartphone & Apple

Global smartphone forecast up slightly to -14% in 2026

According to IDC, the preliminary 2Q26 smartphone data points to a still-soft market with uneven regional dynamics, and their commentary continues to emphasize structural rather than cyclical headwinds. Smartphone shipments remain under pressure from weak replacement cycles, cautious consumer spending, and limited breakthrough features. IDC typically highlights that "growth is concentrated in the premium tier," driven by ecosystem lock-in, while the mass market remains challenged by price sensitivity. They also tend to note that China and parts of emerging markets show only modest stabilization, not a full recovery, and that vendors are prioritizing margin discipline over volume.

Overall, by factoring in higher iPhone 17/17 Pro volume, we fine tune our global smartphone shipment forecast to -14% YoY from -15% YoY.

For 2027, we expect global smartphone shipments to be flattish YoY. That said, 2026-2027 will be one of the most challenging periods for the industry, driven primarily by sharply higher memory prices, which have already pushed OEMs to reduce shipments and raise device prices.

Figure 16: Global Smartphone shipment forecast

Shipments (mn)	1Q24	2Q24	3Q24	4Q24	1Q25	2Q25	3Q25	4Q25	1Q26	2Q26		2024	YoY	2025	YoY	2026E	YoY
Global smartphone	300	292	316	332	305	295	323	336	290	278		1240		1259		1080	
YoY	11.9%	8.9%	4.0%	2.3%	1.5%	1.1%	2.1%	1.4%	-5.0%	-6.0%		6.5%		1.5%		-14.2%	
By OEMs																	
Samsung	60.1	53.8	57.8	51.7	60.6	58.0	61.4	61.2	62.8	62.7		223	-1%	241	8%	241	0%
Apple	52.6	45.7	56.0	76.9	57.9	48.0	58.6	81.3	61.1	55.8		231	-1%	246	6%	257	4%
Huawei	12.5	13.7	11.2	12.9	13.5	12.8	10.4	15.0	9.8	11.5		50	44%	52	4%	52	0%
New Honor	16.8	15.3	15.0	17.6	16.4	16.0	18.5	20.0	19.0	12.1		65	5%	71	9%	65	-8%
OPPO/Realme	36.2	38.6	42.6	37.0	34.1	34.9	38.5	39.7	41.2	41.2		154	7%	147	-5%	131	-11%
Vivo	21.3	25.9	27.0	27.1	22.7	26.3	28.8	27.0	28.5	21.2		101	15%	105	4%	94	-10%
Xiaomi	40.8	42.3	42.8	42.7	41.8	42.4	43.5	37.8	33.8	31.2		169	15%	165	-2%	127	-23%
Share %																	
Samsung	20%	18%	18%	16%	20%	20%	19%	18%	22%	23%		18%		19%		22%	
Apple	18%	16%	18%	23%	19%	16%	18%	24%	21%	20%		19%		20%		24%	
Huawei	4%	5%	4%	4%	4%	4%	3%	4%	3%	4%		4%		4%		5%	
New Honor	6%	5%	5%	5%	5%	5%	6%	6%	7%	4%		5%		6%		6%	
OPPO/Realme	12%	13%	13%	11%	11%	12%	12%	12%	14%	15%		12%		12%		12%	
Vivo	7%	9%	9%	8%	7%	9%	9%	8%	10%	8%		8%		8%		9%	
Xiaomi	14%	14%	14%	13%	14%	14%	13%	11%	12%	11%		14%		13%		12%	

Sources: Company data, IDC, GF Securities (Hong Kong) Brokerage

Lower iPhone 18 Pro/18 PM/Duo build plan, but raise iPhone 17s

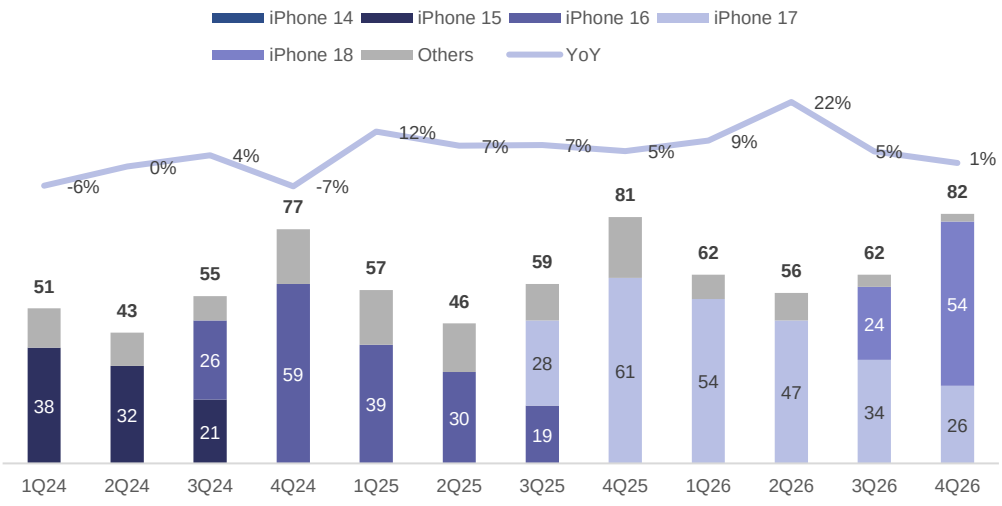
According to IDC, Apple shipped 55.8m iPhones in June-Q. For Sept-Q and Dec-Q, we raised total iPhone builds to 62m/82m, from earlier 60m/76m, primarily driven by iPhone 17 series. On the other hand, we lowered the new models build plan to 78m from prior 82m, due to lower volume of iPhone 18 Pro and iPhone Duo, both were impacted by the component learning curve.

Apple Event recap on iPhone 18 Pro, iPhone 18 Pro Max and iPhone Duo

Apple raised iPhone 18 Pro/Pro Max pricing by $100 vs. iPhone 17 series, which is better than market expectations for a $200–250 hike, while the upgrades are largely inline with our expectations with much-needed advancements on variable aperture camera, memory (12GB DRAM), longer battery life (up to 43 hours), a smaller dynamic Island design, and frontier AI features limitation in China and EU markets. Meanwhile, iPhone Duo starts at $1,999, broadly at the low end of market expectations of $2,000-2,500. However, with higher A20 Pro (~$20 vs. A19 Pro), LPDDR5X (up by ~4x), and NAND (up by ~3x) costs, we expect the iPhone 18 series to likely face margin pressure, alongside limited hardware upgrades such that we remain cautious on the iPhone 18 Pro product cycle. On the other hand, the higher storage models were announced at higher magnitude of price hikes.

Due to lower than expected pricing, we see uncertainty around the impact on margin. Demand wise, consumer interest in iPhone Duo appears strong, driven by Apple's first major form-factor innovation in years and a differentiated large-screen experience, thus we view iPhone Duo as a key demand driver for the iPhone 18 family and see post-launch order lead time and supply-chain build revisions as key indicators to watch.

Figure 17: Apple iPhone build plan and YoY forecast (m units)

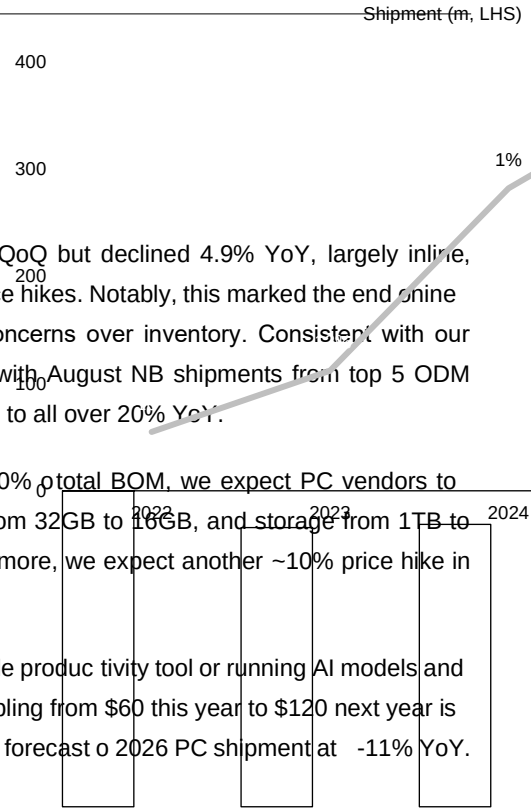


Sources: Company data, IDC, GF Securities (Hong Kong) Brokerage

Figure 18: 2H26's iPhone 18 series spec expectations

	iPhone 18 Pro	iPhone 18 Pro Max	iPhone Duo	iPhone Air 2	iPhone 18e	iPhone 18
Launch	Sep-26	Sep-26	Oct-26	1Q27	1Q27	1Q27
Display	6.3"	6.9"	7.6", Sub 5.4"	6.55"	6.1"	6.3"
Processor	A20 Pro, N2, WMCM	A20 Pro, N2, WMCM	A20 Pro, N2, WMCM	A20 Pro, N2, WMCM	A20, N2, WMCM	A20, N2, WMCM
DRAM	LPD5X 12GB	LPD5X 12GB	LPD5X 12GB	LPD5X 12GB	LPD5X 9GB	LPD5X 12GB
Front camera	18MP, 6P	18MP, 6P	12MP, 6P	18MP, 6P	12MP, 6P	18MP, 6P
Rear camera	48MP VA, 48MP UW 48MP Tele	48MP VA, 48MP UW 48MP Tele	48MP Main, 48MP UW	48MP 7P, 48MP 6P	48MP 7P	48MP 7P, 48MP 6P
Face ID	Structured light, smaller Dynamic Island	Structured light, smaller Dynamic Island	None (but has touch ID)	Structured light, smaller Dynamic Island	Structured light, Dynamic Island	Structured light, smaller Dynamic Island
Casing	Aluminum	Aluminum	Titanium	Titanium	Aluminum	Aluminum
BB	Apple C2	Apple C2 + QCOM X85 (US)	Apple C2	Apple C2	Apple C2	Apple C2
mmWave	Apple C2	Apple C2 + QCOM X85 (US)	Apple C2	None	None	None

Sources: Company data, GF Securities (Hong Kong) Brokerage



Downstream tech – PC

Global PC units of -11% in 2026

According to IDC, 2Q26 PC shipments increased 5% QoQ but declined 4.9% YoY, largely inline, driven by continued commercial refreshment despite price hikes. Notably, this marked the end ofnine consecutive quarters of YoY growth, with channels' concerns over inventory. Consistent with our previous view, PC builds at ODMs continued to slow, with August NB shipments from top 5 ODM declining 11% MoM. We expect the 2H26 PC shipments to all over 20% YoY.

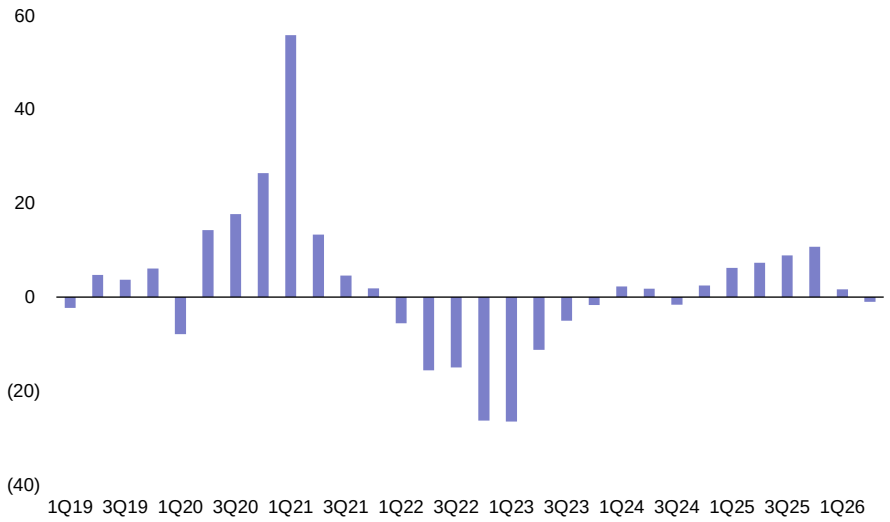
With Memory (DRAM + SSD) now accounting or 30-40% o total BOM, we expect PC vendors to sustain de-spec strategies (e.g., downgrading DRAM from 32GB to 16GB, and storage from 1TB to 512GB/256GB) for upcoming product launches. Furthermore, we expect another ~10% price hike in the 2H26, following a 15-20% price hike in 1Q26.

Despite these headwinds, we view PC as a more avorable produc tivity tool or running AI models and functionalities. Onote, Win 10 extended support fee doubling from $60 this year to $120 next year is serving as a catalyst o the migration. In all, we revise our forecast o 2026 PC shipment at -11% YoY.

Figure 19: Global PC shipment orecast (m units)

Sources: Company data, IDC, GF Securities (Hong Kong) Brokerage

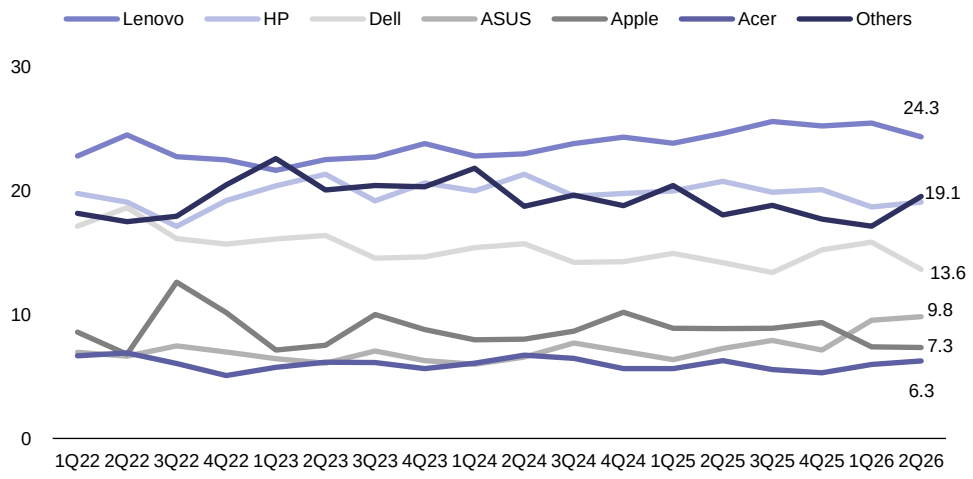
Figure 20: Global PC shipment YoY (%)



Sources: Company data, IDC, GF Securities (Hong Kong) Brokerage

Apple is gaining traction via its MacNeo series and M5 chip, with its market share expanding to 9.9% (up 40 bps QoQ and 140 bps YoY). However, following recent price increases of over $100, we expect Apple's market share gains to normalize. On the other hand, HPQ regained some share back to be 19.1% in 2Q26 (down 80bps YoY but up 60bps), mainly driven by gains in North America. Overall, we believe OEMs like Apple, Dell, and Lenovo, who have higher priority to secure components, are better positioned in the chain to navigate the ongoing supply shortages (e.g., CPU, DRAM, NAND).

Figure 21: Global PC market share (%) by brands



Sources: Company data, IDC, GF Securities (Hong Kong) Brokerage

Figure 22: Monthly Notebook PC ODM shipment (m units)

Unit mn	Aug-25	Sep-25	Oct-25	Nov-25	Dec-25	Jan-26	Feb-26	Mar-26	Apr-26	May-26	Jun-26	Jul-26	Aug-26
Quanta	4.1	4.6	3.5	3.5	3.9	2.7	2.0	5.3	3.5	3.5	4.5	2.8	2.6
Compal	2.3	2.5	2.1	2.3	2.4	1.6	1.5	2.8	1.8	2.0	2.4	1.8	1.4
Wistron	2.2	2.2	2.1	2.2	2.6	1.7	1.6	2.8	1.8	1.7	2.0	1.6	1.4
Pegatron	0.8	0.8	0.8	0.7	0.9	0.7	0.4	0.7	0.5	0.6	0.7	0.4	0.4
Inventec	1.8	1.9	1.6	1.7	2.0	1.7	1.5	2.2	1.5	1.5	2.4	1.6	1.5
Total	**11.2**	**12.0**	**10.1**	**10.4**	**11.8**	**8.4**	**7.0**	**13.8**	**9.1**	**9.3**	**12.0**	**8.2**	**7.3**
YoY	**-2%**	**-2%**	**0%**	**1%**	**8%**	**0%**	**-28%**	**12%**	**-4%**	**-12%**	**-8%**	**-24%**	**-35%**
MoM	**4%**	**7%**	**-16%**	**3%**	**14%**	**-29%**	**-16%**	**96%**	**-34%**	**2%**	**29%**	**-31%**	**-11%**

Sources: Company data, IDC, GF Securities (Hong Kong) Brokerage

Upstream tech – AI Semi & Supply Chain

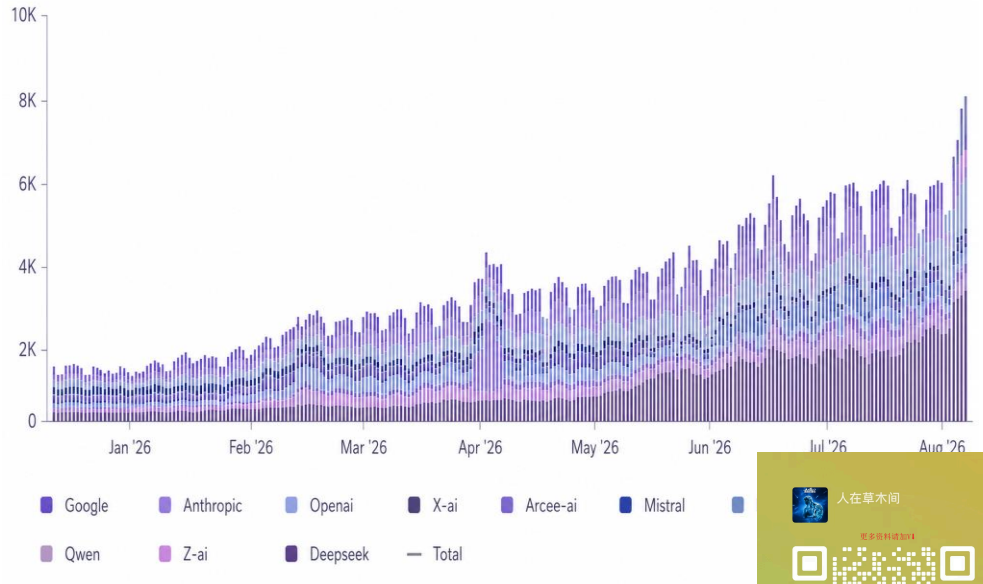
U.S. CSP capex to be +85%/+45%/+20% in 2026/2027/2028

Most CSPs raised 2026 capex guidance in recent earnings except Microsoft - Amazon to $220bn from $200bn; Google to $195–205bn from $180–190bn; Meta from $125–145bn to $130–145bn; Oracle guided FY27 capex to $90–95bn, up from $55.7bn in FY26 (+62% YoY). CSPs are investing aggressively to meet AI infrastructure needs, while record revenue and backlog growth of cloud business reinforce the conviction to revise up capex. Meanwhile, CoWoS capacity also reflects the strong demand, where we revised up TSMC and OSAT capacity in our earlier reports. As such, based on the guidance in recent CSPs earnings call, we now forecast Top 5 CSPs capex of $823bn/1190bn in 2026E/2027E, representing +85%/45% YoY.

Given capex expands further into 2027, CSPs free cash flow are undergoing significant pressure and turning negative except Microsoft, such that shifting to debt financing for their massive capex. In 2025, Top 5 CSPs' total debt issuance reached $108bn, or 24% of total capex. Per our *Addressing 2028 Capex and AI Platform Value Shift* report on Aug 6, we forecast Top 5 CSPs' debt issuance to reach $257bn/$419bn in 2026/2027, or 31%/35% of total capex. Assuming debt issuance to grow in 2028/2029 at a mild pace, we believe U.S. CSPs' balance sheet (except Oracle) to remain very healthy, due to net leverage (EBITDA basis) of only 0.5 and the net debt-to-equity ratio of only 18% by 2029.

Despite healthy balance sheet for most CSPs, we expect most to safeguard balance sheets beyond 2027 amid widening spreads and FCF profiles, with the focus shifting to returns. Together with a swing factor of competition from Chinese LLMs, we expect U.S. CSPs to decelerate capex expansion. We forecast Top 5 CSPs capex of $1,428bn/1,642bn in 2028/2029, or +20%/15% YoY, down from +45% in 2027.

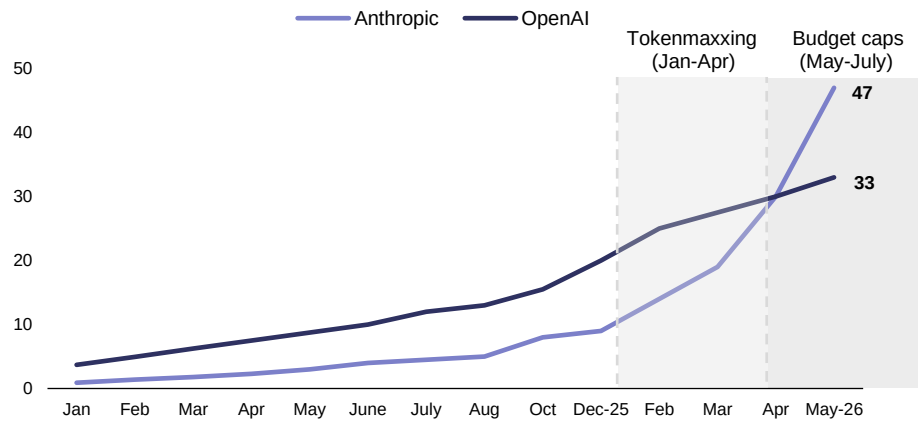
Figure 23: Global Token consumption (bn)



Sources: OpenRouter, MacroMicro, GF Securities (Hong Kong) Brokerage

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Figure 24: AI ARR (USD bn)



Sources: Company data, IDC, GF Securities (Hong Kong) Brokerage

Figure 25: U.S. Top-5 CSP capex (USD bn)

	2023	2024	2025	2026E	2027E	2028E
MSFT	41	76	118	195	253	304
AMZN	53	83	132	220	308	370
Google	32	53	91	205	322	386
Meta	28	39	69	141	206	247
Oracle	7	11	35	67	101	121
Top 5	**161**	**261**	**446**	**823**	**1,190**	**1,428**
YoY	**0%**	**62%**	**71%**	**85%**	**45%**	**20%**

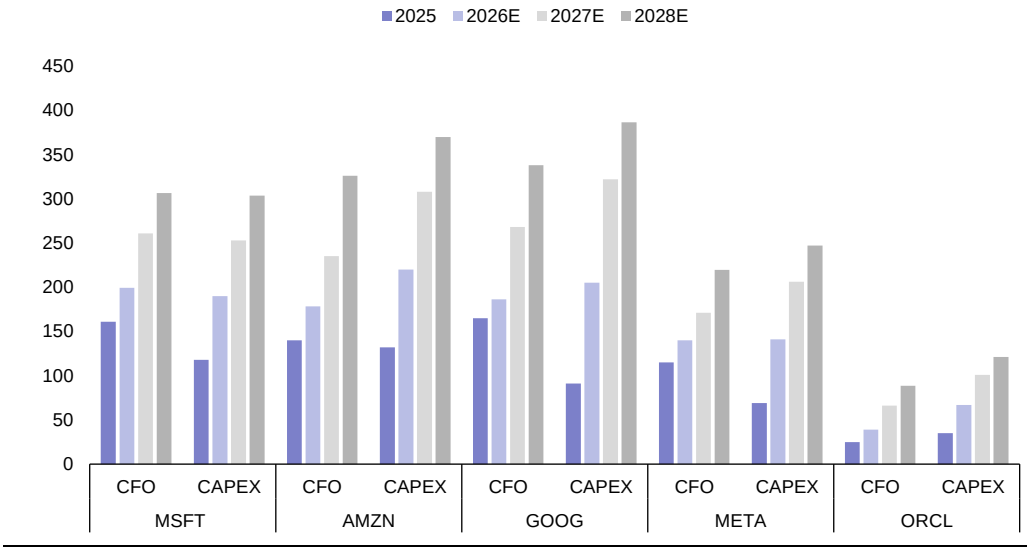
Sources: Company data, Bloomberg, GF Securities (Hong Kong) Brokerage

Figure 26: Major Neoclouds Capex (USD bn)

	2025	2026E	2027E
Coreweave	28	58	96
xAI	13	80	400
Nebius	9	22	40
IREN	4	18	35
Crusoe (inc. JV)	8	35	35
Top 5	**62**	**212**	**606**
YoY		**244%**	**185%**

Sources: Company data, Bloomberg, GF Securities (Hong Kong) Brokerage

Figure 27: U.S. Top-5 CSP operating cash flow and capex in recent 3 years (USD bn)



Sources: Company data, Bloomberg, GF Securities (Hong Kong) Brokerage

GPT-6 reinforces compute growth outlook

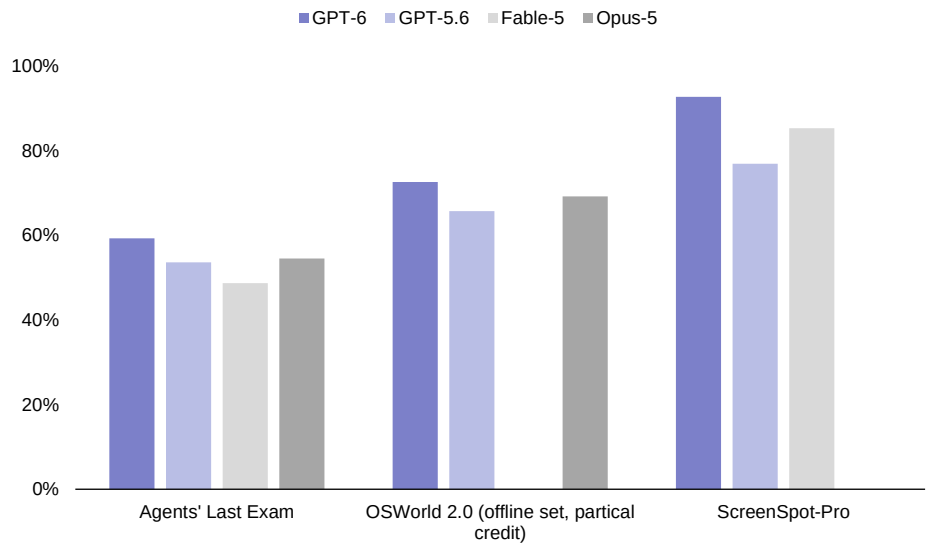
GPT-6 brings a meaningful step-up in computer use, extending agentic AI from coding toward broader knowledge work by directly operating professional software and executing multi-step workflows, representing a significant leap in agentic capabilities. Meanwhile, GPT-6 is OpenAI's first flagship model with substantial contribution from an earlier model during development, suggesting AI is beginning to accelerate AI research itself and reinforcing the RSI trajectory. The capability leap has further fueled the AGI narrative, with Nvidia CEO Jensen Huang declaring that "AGI has arrived" following GPT-6' launch.

We expect compute demand to continue scaling, with GPT-6's advances in agentic capabilities and AI-led research reinforcing our view that scaling remains intact across both inference and training. On inference, GPT-6's computer use extends agentic AI beyond coding into broader knowledge work such as financial modeling, BI, design and scientific workflows, unlocking a substantially larger application market and driving incremental inference demand. Meanwhile, the emerging RSI loop enables stronger models to accelerate their successors through more experiments, RL and synthetic-data generation, further lifting training compute.

GPT-6 is estimated to use ~10x the training compute of GPT-5, while the hero run representing only part of total development compute, with experiments, RL, and synthetic-data generation potentially consuming several times more. Jensen Huang also stated that "The progress in frontier AI is accelerating, and 400k more GPUs are coming online soon as we push the boundaries of what is possible together." Meanwhile, according to OpenAI, the experiments per researcher reached record high in August, while median/top-decile researchers now consume over $600/$7,000 of inference tokens per day. Hence, in addition to market's bullish stance on the acceleration of AI inference (*see our On-chip Memory: Growing but Niche on May 28*), with the RSI characteristic and GPT-6's parameters still below 10tn, we also see substantial headroom for further compute demand driven by pre-training scaling as Vera Rubin ramp into 2027.

As such, we see GPT-6's important implications on: 1) CPU, as stronger agentic capabilities drive more computer use and multi-step workloads, increasing CPU demand for orchestration and complex tasks; 2) GPU, as AI-led research drives pre-training scaling that requires much larger GPU clusters, where we expect $1tn TAM of AI accelerators by 2028; 3) interconnect and optics, as larger training clusters and increasing parallelism drive higher connectivity requirements, where NVL576 is expected to adopt scale-up NPO (*see our CPO/NPO Accelerates report on Aug 17*) and TPU's potential 6D torus architecture could significantly increase optical port density and content value. In sum, we therefore see GPT-6 as another validation that AI scaling remains intact, pointing to higher CPU and AI accelerator demand, alongside structurally rising interconnect and optical content value as future model generations drive more agentic workloads, larger clusters and greater connectivity intensity.

Figure 28: Computer use benchmark (OpenAI vs. Anthropic)



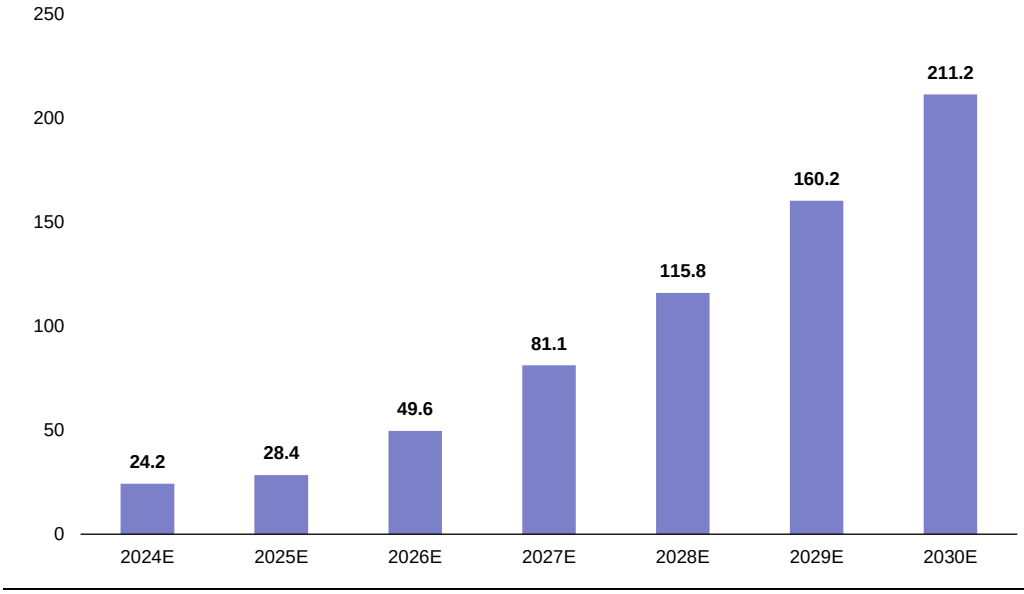
Sources: OpenAI, GF Securities (Hong Kong) Brokerage

Server CPU TAM to grow at 49% CAGR by 2030

As the orchestration core of AI infrastructure buildouts, the Server CPU has gained significant traction over the past few months. This is driven by the Agentic AI/inference trend, fueled by the breakthrough of OpenClaw and Anthropic's ARR surging to $44bn in April. For instance, in latest earnings calls, AMD projected a >35% CAGR for Server CPU TAM by 2030, and Intel said the shift toward agentic AI is driving a structural demand for CPU, where the GPU-to-CPU ratio is tightening from 8:1 in training to 4:1 in inference. Based on our estimates, assuming inference accounts for 90% of AI workloads and GPU-to-CPU ratio for AI servers to reach 2:1 in 2030, we now expect Server CPU TAM to grow 75%/63% in 2026/2027, reaching $211bn by 2030 from $28bn in 2025, with a 5-yr CAGR of 49%.

According to AMD's Advancing AI Event on July 23, AMD raised TAM for server CPU: The company now forecasts server CPU market to reach over $220bn by 2030, driven by agentic AI (~50% of TAM) where CPU:GPU ratio potentially tightening toward 1:1, datacenter upgrade to high-density CPUs to free up power and rack space, and enterprise AI adoption to deploy cost-effective computing.

Figure 29: Server CPU TAM forecast (USD bn)



Sources: Company data, GF Securities (Hong Kong) Brokerage

CoWoS tracker: fine tuning upwardly for total capacity, Nvidia's and CPU's

Following our earlier raise in *May Edition on May 12* in which we revised up TSMC's CoWoS capacity from 175KPM to 195KPM by end-2027, the Street has moved up to our numbers, and we now fine tune our estimate to 200KPM by end-2027.

For OSAT, we maintain our earlier view for Amkor's capacity of 15KPM/25KPM/40KPM by end of 2026/2027/2028, and ASE's CoWoS capacity of 15KPM/45KPM/55KPM by end 2026/2027/2028.

For fabless, we keep our CoWoS estimates largely unchanged for AI GPU/ASIC; however, we slightly lifted our Nvidia's CoWoS to 1.08m from 1.04m in 2027, and AMD's Venice CoWoS to 326k from 310k in 2027, driven by aggressive ramp-up amid the secular CPU trend.

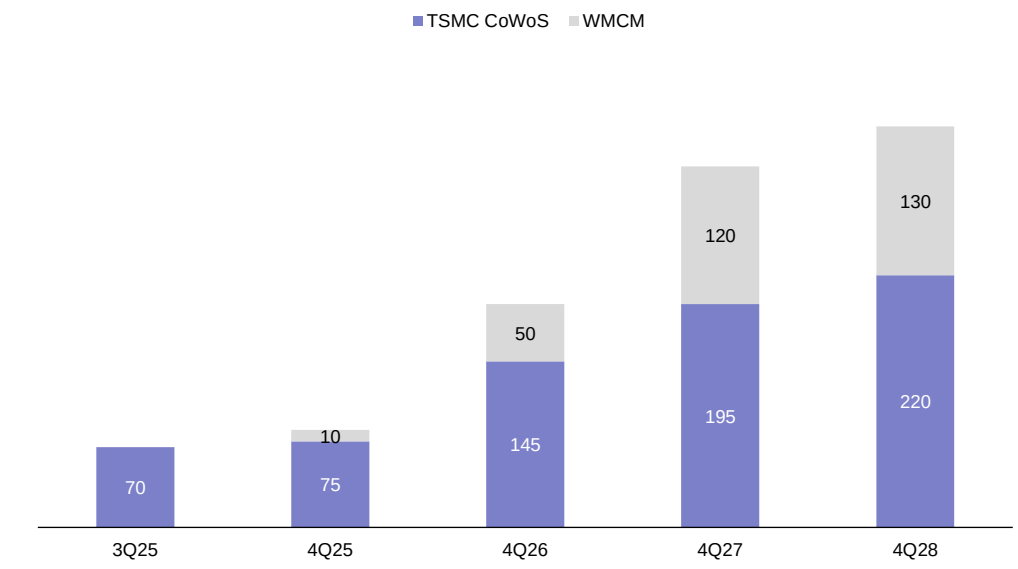
For our accelerator model, we maintain +98% YoY 2027E, and for 2028E, we now expect it to be +52% YoY, driven by higher GPU/ASIC's ASPs, reaching the TAM of $1,000bn.

Figure 30: Global AI accelerator market forecast

	2024	2025E	2026E	2027E	2028E
GPGPU (Units m)					
NVIDIA	3.9	5.8	8.1	11.3	12.6
AMD	0.5	0.5	0.8	1.1	1.3
Others	0.5	1.2	1.5	3.0	4.0
Total	**4.9**	**7.5**	**10.4**	**15.4**	**17.9**
YoY	151%	54%	38%	47%	16%
ASIC (Units m)					
Google	2.8	2.8	4.5	8.8	11.3
AWS	0.9	1.6	2.4	2.9	2.6
Meta	0.2	0.2	0.3	0.6	0.6
MSFT	0.1	0.1	0.2	0.3	0.6
Other ASICs	0.3	0.8	1.0	1.5	2.5
Total	**4.2**	**5.4**	**8.4**	**14.2**	**17.6**
YoY	-39%	29%	54%	69%	23%
Market (USD bn)					
NVIDIA	88	159	280	527	774
Total GPGPU	97	173	306	583	857
Total ASIC	20	27	50	124	217
Total Market	**117**	**200**	**357**	**707**	**1073**
YoY	269%	72%	78%	98%	52%

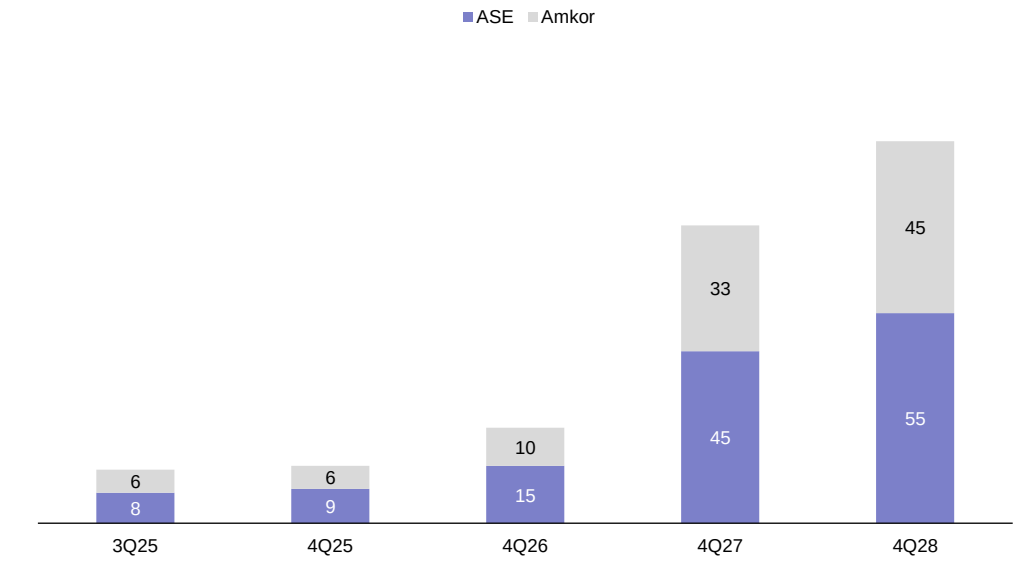
Sources: Company data, GF Securities (Hong Kong) Brokerage

Figure 31: TSMC's quarterly CoWoS + WMCM capacity (kwpm) trend



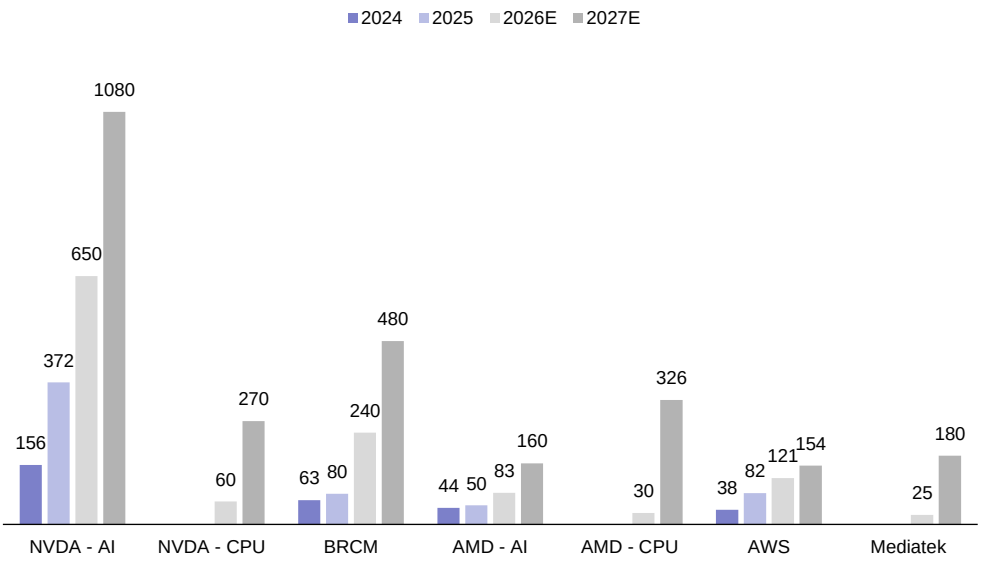
Sources: Company data, IDC, GF Securities (Hong Kong) Brokerage

Figure 32: Amkor and ASE's quarterly CoWoS (kwpm) forecast



Sources: Company data, GF Securities (Hong Kong) Brokerage

Figure 33: Major fabless CoWoS build plan (k wafers)



Sources: Company data, GF Securities (Hong Kong) Brokerage

Figure 34: Top-15 fabless Days of Inventory

Company	2Q22	3Q22	4Q22	1Q23	2Q23	3Q23	4Q23	1Q24	2Q24	3Q24	4Q24	1Q25	2Q25	3Q25	4Q25	1Q26	2Q26
Qualcomm	102	119	156	150	159	151	132	135	131	131	111	114	125	118	109	137	163
Broadcom	60	58	59	66	62	60	38	36	37	32	36	38	38	36	44	58	
Nvidia	93	147	225	165	97	92	90	95	81	78	86	59	106	119	115	115	
MediaTek	105	105	118	126	106	100	61	69	75	77	74	62	70	67	74	96	109
AMD	70	96	108	129	143	132	122	145	153	144	138	158	131	149	154	160	152
Marvell	114	115	130	122	113	99	103	119	109	67	104	103	96	92	118	110	
Qorvo	117	124	164	140	198	125	96	116	119	108	114	116	119	98	91	124	144
Novatek	103	133	82	69	53	49	51	57	58	52	51	53	53	53	55	69	73
Realtek	117	147	190	173	108	85	89	85	83	92	89	81	99	102	129	106	
Skyworks	154	149	168	183	185	138	121	122	138	120	102	110	114	105	115	144	165
Himax	174	272	185	174	147	144	125	125	114	112	88	79	83	90	98	100	90
Will Semi	308	400	327	299	231	140	128	149	136	133	129	150	139	135	163	189	
MPS	172	176	212	204	201	171	172	176	171	140	138	146	150	139	153	157	140
Infineon	124	118	141	147	151	150	193	179	181	157	186	184	185	155	187	174	164
NXP	95	99	116	137	138	130	136	145	149	148	150	168	158	161	163	166	157
Total	**102**	**117**	**138**	**138**	**126**	**115**	**103**	**107**	**104**	**97**	**99**	**88**	**107**	**109**	**112**	**118**	**148**

Sources: Company data, Bloomberg, GF Securities (Hong Kong) Brokerage

Upstream tech – Optical

Strong demand for pluggable through 2028.

We expect that the total demand for 800G/1.6T will reach 90mn/80mn in 2027, increased by 80%/167%+, mainly driven by: 1) Nvidia, Google and AWS and other ASIC's Accelerators' demand are ramping up; 2) GPU/ASIC scale-out bandwidth continuously increase drives increasing GPU/ASIC-to-optical module ratio; 3) We expect that TPU for 2027 will be 9.8m and Google fully transitions to large-scale clusters in 2026 and the scale-up layer will adopt optical interconnects. In addition, as we expect that CPO/NPO will start since 2H27, represents a pure incremental opportunity for optical interconnects supply chain, benefiting FAU, laser, shuffle box, connector and OE players, including LITE, GLW, TSEM, Sumitomo and Browave. We also like Marvell and SMTC, for the TIA/Driver used in NPO OE.

Scale-out bandwidth increase driving optical-module deployment

For NVIDIA, each Rubin GPU is equipped with two CX9 NIC chips, doubling the scale-out bandwidth compared with Blackwell. We further estimate that Rubin Ultra will adopt four CX9 chips per GPU, leading to another 2 times increase in scale-out bandwidth, continuing NVIDIA's consistent bandwidth-doubling trajectory. Accordingly, we expect the ratio of 1.6T optical modules has risen from 1:2.5 to 1:5 in Rubin. From CoWoS perspective, we expect 5m/2m Blackwell/Rubin and 20m 1.6T in 2026. For **Google**, we believe that Google fully transition to large-scale clusters in 2026 and the scale-up layer will adopt optical interconnects. We believe that in the scale-up domain, the ratio of TPU to 1.6T optical modules is approximately 1:1.5; In the scale-out domain, the ratio is around 1:2.5, suggesting the overall TPU-to-optics ratio is approximately 1:4 (1.6T equivalent).

Nvidia/CSPs' Scale-out/up CPO/NPO

Within NVIDIA's next-gen NVL576 and broader CSPs' AI infrastructure plans, CPO and NPO are developed side-by-side to expand GPU/ASIC interconnect bandwidth: CPO is the ideal long-term design for lower power and latency yet faces headwinds from complicated advanced packaging, and yield risks, while NPO could deliver most short-reach optical performance gains with far better manufacturability and deployment flexibility, making NPO a reliable near-term scaling path and CPO the ultimate end-state architecture. NPO partially removes module-side DSP and shifts signal conditioning and equalization to system designs, greatly lifting the value of TIAs and laser drivers that take over part of traditional DSP functions; we estimate each 3.2T optical engine contains tens of dollars worth of combined TIA and driver chips, a clear improvement over standard pluggable optics. Our shipment forecasts at 12m/38m NPO optical engines in CY27/28.

Scale-up domain to increase by NVL576 to compensate lower memory: With lower memory spec, we expect Nvidia to increase the scale-up domain by optics to enhance performance. According to Nvidia's GTC 2026, the optical scale-up fabric allows Nvidia to expand Rubin Ultra to an NVL576 scale-up. Regarding CPO and NPO which are being parallelly developed, we expect NPO to be a high reliability scaling path for NPO. We now expect its scale-up to adopt NPO in Rubin Ultra and Feynman platform and estimate OE shipments of Nvidia's platform to be 5.8m/8.1m in 2027/2028.

Nvidia's NPO OE to be 5.8m/8.1m in 2027/2028

For Nvidia, we now expect its scale up to adopt NPO in Rubin Ultra and Feynman platform and estimate OE shipments of Nvidia's platform to be 5.8m/8.1m in 2027/2028, based on 20% NPO adoption in 2027. Coupled with other CSP's platform, we estimate total OE market to be 11m/40m in 2027/2028.

TIA/Driver to benefit from NPO

NPO partially removes module-side DSP and shifts signal conditioning and equalization to system designs, greatly lifting the value of TIAs and laser drivers that take over part of traditional DSP functions; we estimate each 3.2T optical engine contains tens of dollars worth of combined TIA and driver chips, a clear improvement over standard pluggable optics.

A key architectural shift under NPO is the partial removal of DSP functionality at the module level, with signal conditioning and equalization increasingly redistributed into system-level design. This significantly elevates the importance of TIA (transimpedance amplifier) and laser driver components, which effectively replace a portion of traditional DSP value. We estimate that each 3.2T optical engine will embed high tens of dollars of combined TIA and driver content, representing a meaningful step-up versus traditional pluggable optics architectures.

From a competitive standpoint, we expect Marvell to remain the primary beneficiary of both NPO OE given its stronger positioning high speed TIA/Driver. Semtech is well positioned as a secondary beneficiary through its exposure to high-speed analog signal chain components, particularly TIAs and laser drivers, which scale directly with optical engine proliferation under NPO. We forecast 11.3mn/40mn NPO OE shipments in CY27/28. Based on our estimated front-end content per OE and a 30% market share assumption for Semtech, we estimate its NPO revenue of $205/926mn.

Stock Implication

Generally speaking, scale-up CPO/NPO is an incremental opportunity for optical interconnect supply chain, as it aims to replace copper and has no impact on scale-out side. Additionally, scale up and scale out CPO solution share the similar suppliers. That said, we expect the key beneficiaries to be components such as FAU, CW laser, ELSFP, shuffle, PIC, TIA and Driver. We: 1) prefer Lumentum/ COHR due to the demand upside for CW laser, and also like local cw laser players; 2) expect Browave (3163 TT) to benefit, given the sizable contribution of CPO's shuffle box considering ~55% market share, $5-6k ASP and a volume ramp in 2H26; 3) we also like TSEM, given CSP preferring NPO solution for their ASICs scale up interconnection. 4) expect GLW to benefit, given the second supplier of shuffle box and main supplier of MMC connector/fiber. 5) Marvell/Semtech will also benefit from CSP/Nvidia's NPO solution, since TIA and driver will upgrade in the NPO Optical Engine.

Figure 35: 800G/1.6T optical module demand forecast by customer

Shipment(m)	2019	2020	2021	2022	2023	2024E	2025E	2026E	2027E
800G			**0.0**	**0.1**	**2.0**	**10.0**	**22.0**	**50.0**	**90.0**
Google			0.0	0.1	1.0	3.5	4.0	6.0	7.0
AWS							4.0	9.0	6.0
Meta					0.2		4.0	9.0	6.0
NVDA					0.8	6.0	3.0	4.0	3.0
MSFT							2.5	4.0	6.0
Alibaba								2.0	8.0
Tencent								2.0	8.0
Huawei							0.5	4.0	12.0
Others						0.5	4.5	10.0	34.0
1600G						**0.2**	**2.0**	**30.0**	**80.0**
Google						0.1	0.5	10.0	22.0
AWS									6.0
Meta									5.0
NVDA						0.1	1.5	20.0	24.0
MSFT									2.0
Tencent									0.5
Huawei									0.5
Others									10.0

Sources: Company data, GF Securities (Hong Kong) Brokerage.

Figure 36: Nvidia's NPO unit forecast

	2026	2027	2028
Market for Nvidia's scale up NPO(k units)			
NVL72	75	90	60
NVL144 (6 NVSwitch blades)	0	0	35
Number NVSwitch trays/blades			
NVL72	9	9	9
NVL144 (6 NVSwitch blades)			12
Adoption of NPO			
NVL72	0%	20%	30%
NVL144 (6 NVSwitch blades)	0%	0%	15%
NPO NVSwitch trays/blades (k)			
NVL72	0	162	162
NVL144 (6 NVSwitch blades)	0	0	63
Nvidia NPO OE(k)			
Shipments (m units)		5.8	8.1
YoY			39%
Nvidia's TIA/Driver (k,USD)			
TIA & Driver ASP per OE (USD)		65	65
TAM for TIA/Driver (m USD)		379	527
TAM yoy			39%
Market for CSP's scale up NPO(m units)			
OE shipment (m units)		5.5	32
TIA & Driver ASP per OE (USD)		80	80
TAM for TIA/Driver (m USD)		440	2,560
TAM yoy			482%
Total			
Shipments (m units)		11.3	40
TAM for TIA/Driver (m USD)		819	3,087
TAM yoy			277%

Sources: Company data, GF Securities (Hong Kong) Brokerage.

Google's 6D Torus & Beneficiaries.

We expect Google will migrate its TPU interconnect from 3D to 6D torus, re-organizing the 64-chip elemental block from 4×4×4 to 2×2×2×2×2×2. External optical links per block rise from 96 to 384, with optical ports per chip scaling increase from 1:1.5 to 1:6, driving 4x coherent lite transceivers and OCS demand. The trajectory aligns with NVIDIA's CPO/NPO move. Both are interconnect scaling that expands direct chip-to-chip bandwidth and reduces hop count, with TPU via a 6D torus and NVIDIA via CPO/NPO for Scale-up.

Google's migration from 3D to 6D Torus: We expect Google to migrate its TPU interconnect from a 3D to a 6D torus topology, re-organizing the elemental 64-chip building block from a 4×4×4 3D Torus cube into a 2×2×2×2×2×2 hyper-cube. In the current 3D design, each chip connects to 6 nearest neighbors across X/Y/Z axes and the cube exposes 16 optical ICI links on each of its 6 faces, totaling 96 external optical links per cube (~1.5 optical ports per chip). Under the 6D design, each dimension has 64 external optical links (2^6 chips, one outward link per chip per dimension), for a total of 6 × 64 = 384 external optical links (~6 optical ports per chip). The per-chip optical port count thus scales from 1.5 to 6. Combined with Scale-out at an estimated 1:2.5, this brings the aggregate TPU-to-port ratio to 1:8.5.

Lower latency and closer to non-blocking Scale-up: For a 4,096-chip superpod, a 3D torus (4×4×4) carries a worst-case diameter of 24 hops, whereas a 6D torus (2×2×2×2×2×2) halves that to 12 hops (2×6), directly compressing collective-operation and latency. Higher dimensionality also spreads traffic across 6 orthogonal paths, improving bisection bandwidth and moving closer to non-blocking chip-to-chip communication. Critically, shortening each edge from 4 to 2 nodes eliminates deep multi-hop electrical paths inside the block: the architecture deliberately reduces intra-cube copper communication and pushes a far larger share of traffic onto optical fiber.

Key beneficiaries: The exact TPU generation for the adoption of 6D torus and initial penetration rate remain unclear. That said, whether NVIDIA moves toward CPO/NPO or Google expands from 3D to 6D, both are Scale-up strategies aimed at enabling greater inter-chip communication. Key beneficiaries include the 2.4T Coherent Lite module and the OCS supply chain, such as MEMS-based optical switch vendors, PIC/laser/DSP suppliers, and fiber/cabling vendors supporting the larger reconfigurable lightwave fabric.

Risks

1) Alternative technologies; 2) AI demand and capex slowdown; 3) IT demand slowdown; 4) product delays.

Rating definitions Benchmark: Hang Seng Index (Hong Kong)

Company ratings	**Buy**	Stock expected to outperform benchmark by more than 10%
	Hold	Expected stock relative performance ranges between -10% and 10%
	Underperform	Stock expected to underperform benchmark by more than 10%

Sector ratings	**Positive**	Sector expected to outperform benchmark by more than 10%
	Neutral	Expected sector relative performance ranges between -10% and 10%
	Cautious	Sector expected to underperform benchmark by more than 10%

Hong Kong	**Company**	GF Securities (Hong Kong) Brokerage Limited
	Address	27/F, GF Tower, 81 Lockhart Road, Wan Chai, Hong Kong
	Telephone	(852) 37191111
	Email	evanlee@gfgroup.com.hk

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