

Greater China Semiconductors | Asia Pacific

Build for Future AI Infrastructure – CPU, GPU, ASIC, Optical, and China Chips

MORGAN STANLEY TAIWAN LIMITED+

Charlie Chan

Equity Analyst

Charlie.Chan@morganstanley.com

+886 2 2730-1725

Daniel Yen, CFA

Equity Analyst

Daniel.Yen@morganstanley.com

+886 2 2730-2863

MORGAN STANLEY ASIA LIMITED+

Daisy Dai, CFA

Equity Analyst

Daisy.Dai@morganstanley.com

+852 2848-7310

MORGAN STANLEY TAIWAN LIMITED+

Tiffany Yeh

Equity Analyst

Tiffany.Yeh@morganstanley.com

+886 2 7712-3032

Lucas Wang

Research Associate

Lucas.Wang@morganstanley.com

+886 2 2730-2875

MORGAN STANLEY ASIA LIMITED+

Ethan Jia

Research Associate

Ethan.Jia@morganstanley.com

+852 3963-2287

Henry Zhao

Research Associate

Henry.Zhao@morganstanley.com

+852 2239-7731



GREATER CHINA TECHNOLOGY SEMICONDUCTORS

Asia Pacific
Industry View

Attractive

Morgan Stanley does and seeks to do business with companies covered in Morgan Stanley Research. As a result, investors should be aware that the firm may have a conflict of interest that could affect the objectivity of Morgan Stanley Research. Investors should consider Morgan Stanley Research as only a single factor in making their investment decision.

For analyst certification and other important disclosures, refer to the Disclosure Section, located at the end of this report.

+ = Analysts employed by non-U.S. affiliates are not registered with FINRA, may not be associated persons of the member and may not be subject to FINRA restrictions on communications with a subject company, public appearances and trading securities held by a research analyst account.

Strong AI Semi Outlook

- Top ideas:
 - **OW:**
 - **AI:** MediaTek(Top Pick), TSMC, SMIC, Aspeed, Alchip, KYEC, ASE, FOCI, ASMPT, AllRing
 - **Memory:** Macronix (Top Pick), AP Memory, Nanya Tech, Winbond, GigaDevice
 - **China AI/ Semis/WFE:** Iluvatar, Cambricon, NAURA Tech, AMEC, USI
 - **Testing Equipment and Consumables:** Winway, MPI, Hon Precision, Gudeng
 - **Mature nodes:** UMC
 - **EW:** GUC, OmniVision, Phison, MetaX, Realtek
 - **UW:**, WIN Semi, Silergy, GlobalWafers, ASMedia,

Long-term demand drivers:

- **Chip inflation:** We expect “price elasticity” to affect demand for tech products. Rising wafer, OSAT and memory costs create more margin headwinds for chip designers in 2026.
- **AI cannibalization:** Besides demand weakness (AI to replace some human jobs), we see the semi supply chain also prioritizing AI semis over non-AI semis, e.g., T-Glass and memory shortage.
- **China AI: DeepSeek is triggering inferencing AI demand:** DeepSeek has demonstrated cheaper inferencing. Local foundry supply chain also getting more capable for AI GPU production.

Valuation Comparison: Foundry, Back-end, Memory, IDM and Semi Cap

Ticker	Company	Price 6/4/2026	Currency	Price Target	Upside/Downside	Rating	Dividend Yield (%)	FCF Yield (%)	Market Cap (US\$M)	3M Avg. Daily Trading (US\$M)	P/E Ratio (x)			EPS Growth			ROAE			P/B Ratio (x)		
											2025e	2026e	2027e	2025e	2026e	2027e	2025e	2026e	2027e	2025e	2026e	2027e
Foundry																						
2330.TW	TSMC	2,385.0	TWD	2,588.0	9%	O	1.4%	1.8%	1,952,607	2,841.8	36.0	23.1	18.5	46%	56%	25%	35%	41%	38%	11.4	8.2	6.1
2303.TW	UMC	125.0	TWD	138.0	10%	O	5.1%	5.3%	49,829	513.1	37.6	27.8	22.0	-12%	35%	26%	11%	14%	17%	4.2	3.8	3.6
0981.HK	SMC	81.5	HKD	85.0	4%	O	0.0%	-5.0%	53,817	837.7	NM	NM	NM	39%	142%	45%	3%	7%	10%	NM	NM	NM
5347.TWO	Vanguard	163.0	TWD	180.0	10%	E	4.9%	3.1%	9,565	142.6	39.0	29.8	24.1	10%	31%	24%	10%	12%	14%	3.6	3.5	3.3
1347.HK	Hua Hong	156.5	HKD	118.0	-25%	E	0.1%	-4.6%	34,774	420.2	NM	NM	NM	-6%	584%	55%	1%	5%	7%	NM	NM	NM
6770.TW	PSMC	81.0	TWD	88.0	9%	O	0.0%	5.6%	10,803	444.4	NM	NM	NM	40%	-136%	259%	-13%	3%	8%	4.2	1.7	1.4
3105.TWO	WIN Semi	487.5	TWD	300.0	-38%	U	0.5%	-3.8%	2,264	439.3	NM	NM	54.8	121%	59%	40%	4%	6%	9%	5.0	4.8	4.7
8086.TWO	AWSC	159.0	TWD	130.0	-18%	U	1.1%	-3.9%	987	39.1	47.4	25.1	22.3	27%	89%	13%	8%	14%	14%	3.8	3.4	3.0
Mean:							1.6%	-0.2%			43.2	27.5	33.7	33%	108%	61%	7%	13%	14%	5.4	4.3	3.7
Median:							0.8%	-1.0%			38.3	26.5	22.3	33%	58%	33%	6%	10%	12%	4.2	3.7	3.5
Memory																						
603986.SS	Giga Device	529.3	CNY	585.0	11%	O	0.3%	4.1%	49,110	2,051.9	NM	41.3	25.6	50%	417%	62%	9%	37%	42%	NM	12.9	9.2
2408.TW	Nanya Tech	395.0	TWD	380.0	-4%	O	0.0%	13.6%	38,442	1,046.1	NM	6.4	4.9	-359%	NM	NM	4%	74%	53%	7.1	3.3	1.9
2344.TW	Winbond	179.5	TWD	222.0	24%	O	0.0%	16.6%	25,506	743.1	NM	8.8	5.5	523%	NM	NM	4%	64%	59%	7.5	4.6	2.5
8299.TWO	Plison	2,580.0	TWD	2,248.0	-13%	E	1.5%	1.6%	17,757	543.9	65.0	12.9	22.0	11%	402%	-41%	16%	55%	25%	9.4	5.6	5.5
SIMO.O	Silicon Motion	306.6	USD	155.0	-49%	O	1.1%	2.1%	10,300	155.1	96.5	46.9	28.2	6%	106%	66%	13%	24%	32%	12.0	10.1	8.0
2337.TW	Macronix	156.5	TWD	202.0	29%	O	4.6%	17.2%	9,169	663.8	NM	NM	NM	3%	-133%	183%	-7%	28%	53%	6.3	5.1	3.0
Mean:							1.3%	9.2%			80.7	23.3	17.2	39%	103%	67%	7%	47%	44%	8.5	7.0	5.0
Median:							0.7%	8.8%			80.7	12.9	22.0	9%	254%	64%	7%	46%	47%	7.5	5.4	4.2
Backend																						
3711.TW	ASEH	593.0	TWD	558.0	-6%	O	2.2%	6.0%	81,701	348.7	64.3	35.2	22.0	24%	83%	60%	11%	19%	26%	6.9	6.1	5.2
600584.SS	JCET	80.1	CNY	50.0	-38%	E	0.3%	5.7%	19,908	969.5	91.6	55.4	40.1	-3%	65%	38%	5%	8%	11%	4.8	4.5	4.1
601231.SS	USI	45.8	CNY	45.4	-1%	O	1.4%	-7.4%	13,926	288.2	54.8	38.5	26.0	12%	42%	48%	10%	13%	17%	4.8	4.5	3.9
2449.TW	KYEC	322.0	TWD	338.0	5%	O	1.8%	1.6%	12,432	318.2	35.9	32.7	22.3	41%	10%	47%	24%	22%	28%	7.8	6.9	5.7
3363.TWO	FOCI	840.0	TWD	708.0	-16%	O	0.2%	4.8%	2,789	76.8	NM	NM	NM	NM	NM	NM	1%	3%	56%	NM	NM	NM
Mean:							1.4%	1.5%			45.4	35.6	24.1	19%	50%	48%	12%	16%	20%	6.1	5.5	4.7
Median:							1.6%	3.7%			45.4	35.6	24.1	18%	54%	48%	10%	16%	21%	5.9	5.3	4.6
Power Semis/ IDM																						
688396.SS	CR Micro	72.6	CNY	43.0	-41%	U	0.2%	1.6%	13,238	217.3	NM	66.3	46.5	-20%	119%	43%	3%	6%	8%	3.8	3.6	3.4
600460.SS	Silan Micro	35.3	CNY	20.0	-43%	U	0.5%	2.1%	8,165	232.2	147.5	44.4	30.4	81%	232%	46%	3%	10%	13%	4.6	4.2	3.7
603290.SS	StarPower	121.3	CNY	120.0	-1%	E	1.0%	0.0%	#N/A	148.1	71.8	77.5	45.5	-26%	-7%	70%	6%	5%	8%	NA	NA	NA
300373.SZ	Yangjie	105.5	CNY	91.0	-14%	O	1.4%	-2.8%	7,914	227.6	45.5	37.1	27.2	26%	23%	36%	13%	15%	17%	5.8	5.1	4.4
Mean:							0.8%	0.2%			88.3	56.3	37.4	15%	92%	49%	6%	9%	12%	4.7	4.3	3.8
Median:							0.7%	0.8%			71.8	55.4	38.0	3%	71%	44%	4%	8%	11%	4.6	4.2	3.7
Semicap/ Equipment/ Materials/ Supply Chain																						
002371.SZ	NAURA	627.0	CNY	818.0	30%	O	0.6%	-0.9%	63,118	832.1	71.3	49.3	33.7	-17%	45%	46%	15%	19%	24%	10.3	8.8	7.3
688012.SS	AMEC	289.4	CNY	550.0	90%	O	0.0%	11.8%	25,251	827.1	NM	47.4	34.7	24%	90%	37%	9%	16%	18%	NM	6.8	5.7
7769.TW	Hon Precision	7,385.0	TWD	10,008.0	36%	O	2.5%	NA	41,952	203.7	NM	57.2	33.2	NA	69%	72%	NA	37%	53%	NM	NM	15.4
6223.TWO	MPI	6,070.0	TWD	7,500.0	24%	O	0.0%	-5.4%	18,780	196.0	NM	88.5	42.3	34%	109%	109%	27%	38%	54%	NM	NM	NM
6515.TW	Winway	8,650.0	TWD	15,000.0	73%	O	0.9%	1.3%	9,765	112.7	NM	NM	42.2	40%	104%	116%	28%	45%	67%	NM	NM	NM
6488.TWO	GlobalWafers	870.0	TWD	750.0	-14%	E	2.7%	1.7%	13,135	129.3	56.9	39.0	26.0	-26%	46%	50%	8%	11%	15%	4.5	4.2	3.8
0522.HK	ASM Pacific	184.0	HKD	188.0	2%	O	1.8%	6.5%	9,355	64.4	NM	50.1	30.0	161%	69%	67%	6%	9%	14%	4.3	4.1	3.8
688234.SS	SICC	139.1	CNY	112.1	-19%	O	0.6%	NA	9,365	218.8	NM	NM	NM	NM	NM	NM	-3%	1%	3%	9.4	9.3	9.1
ACMR.O	ACM Research	88.9	USD	90.0	1%	O	1.1%	-0.7%	5,830	77.1	64.0	31.3	21.5	-11%	104%	46%	6%	10%	13%	3.0	2.8	2.5
3680.TWO	Gudeng Precision	537.0	TWD	648.0	21%	O	0.0%	-6.1%	1,629	41.0	57.0	27.6	19.5	-24%	106%	42%	8%	15%	19%	4.5	4.0	3.4
6187.TWO	AllRing Tech	1,115.0	TWD	1,580.0	42%	O	2.8%	1.1%	3,388	113.4	72.1	50.6	28.5	6%	42%	78%	21%	27%	39%	NM	NM	NM
Mean:							1.2%	1.0%			64.3	49.0	31.2	21%	78%	66%	12%	21%	29%	6.0	5.7	6.4
Median:							0.9%	1.1%			64.0	49.3	31.6	6%	80%	58%	9%	16%	19%	4.5	4.2	4.7

Source: Company data, Morgan Stanley Research. E = Morgan Stanley Research estimates. Note: Data as of June 4, 2026.

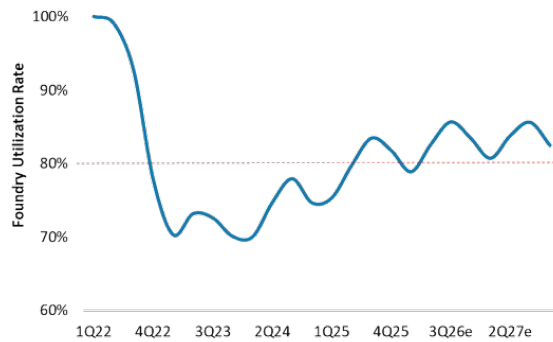
Valuation Comparison: Fabless, Power Semis, FPGA and Analog

Ticker	Company	Price 6/4/2026	Curr ency	Price Target	Upside/ Downside	Rating	Dividend Yield (%)	FCF Yield (%)	Market Cap (US\$M)	3M Avg. Daily Trading (US\$M)	P/E Ratio (x)			EPS Growth			ROAE			P/B Ratio (x)		
											2025e	2026e	2027e	2025e	2026e	2027e	2025e	2026e	2027e	2025e	2026e	2027e
Fabless																						
AI accelerators																						
688256.SS	Cambricon	1,358.9	RMB	1,342.3	-1%	O	0.0%	NA	79,601	1,952.2	279.0	113.0	77.9	NA	147%	45%	24%	46%	48%	48.4	31.3	20.6
9903.HK	Iluvatar	430.2	HKD	600.0	39%	O	NA	NA	0	52.5	NM	NM	75.5	NA	-81%	-653%	-66%	-7%	24%	0.0	0.0	0.0
688802.SS	MetaX	724.3	RMB	758.0	5%	E	0.0%	NA	40,260	232.0	NM	NM	522.1	NA	-103%	2214%	-11%	0%	4%	22.0	22.0	21.1
Smartphone/Wireless Semis																						
2454.TW	MediaTek	4,430.0	TWD	5,088.0	15%	O	15.7%	0.9%	218,945	996.4	70.7	63.3	33.2	-6%	12%	91%	25%	25%	37%	16.9	14.5	10.2
603501.SS	OmniVision	98.9	CNY	111.0	12%	E	0.5%	2.1%	16,561	358.8	29.7	29.7	20.4	22%	0%	45%	15%	14%	18%	4.2	3.8	3.2
300782.SZ	Maxscend	104.9	CNY	48.00	-54%	U	0.1%	-2.2%	7,776	391.8	NM	NM	55.2	-136%	-485%	85%	-1%	5%	9%	5.6	5.3	4.9
603160.SS	Goodix	55.6	CNY	58.0	4%	U	0.7%	-1.4%	3,557	58.3	30.4	46.6	41.2	39%	-35%	13%	9%	6%	6%	2.7	2.6	2.5
6462.TWO	Egis	118.0	TWD	105.0	-11%	E	1.0%	-16.3%	340	9.2	NM	NM	22.0	-6%	-88%	-462%	-11%	-1%	5%	1.2	1.2	1.1
IP/Design Service																						
3661.TW	Alchip	4,340.0	TWD	5,088.0	17%	O	1.0%	5.1%	11,157	287.2	64.1	28.6	24.1	-14%	124%	19%	14%	28%	28%	NM	NM	NM
301269.SZ	Empyrean Technology	103.6	CNY	95.0	-8%	E	0.1%	NA	7,817	144.1	NM	NM	NM	-44%	283%	136%	1%	4%	10%	NM	NM	NM
3443.TW	GUC	4,400.0	TWD	4,888.0	11%	E	0.8%	4.7%	18,619	288.6	NM	75.7	43.6	9%	108%	73%	31%	50%	58%	NM	NM	NM
6531.TW	AP Memory	1,055.0	TWD	1,555.0	47%	O	1.2%	4.1%	5,391	170.1	NM	59.8	30.7	-20%	128%	95%	10%	22%	35%	13.9	12.0	9.5
PC/Cloud/Display Semis																						
3034.TW	Novatek	489.0	TWD	414.0	-15%	U	6.1%	14.3%	9,396	74.5	18.2	14.1	13.8	-20%	29%	2%	24%	30%	28%	4.4	4.0	3.8
2379.TW	Realtek	624.0	TWD	570.0	-9%	E	4.8%	5.0%	10,053	74.0	21.7	17.6	19.1	-4%	23%	-8%	28%	33%	28%	6.1	5.5	5.3
5269.TW	ASMedia	1,570.0	TWD	1,482.0	-6%	U	4.1%	0.9%	3,701	73.5	21.4	17.1	17.6	43%	25%	-3%	16%	18%	16%	3.2	2.9	2.6
5274.TWO	Aspeed	18,265.0	TWD	23,456.0	28%	O	1.2%	1.3%	21,803	140.3	NM	78.7	55.7	53%	123%	41%	59%	85%	79%	NM	NM	NM
4966.TWO	Parade	756.0	TWD	1,000.0	32%	O	2.9%	1.6%	1,864	47.6	22.1	24.8	15.0	5%	-11%	66%	12%	11%	16%	2.7	2.6	2.3
2458.TW	Elan Micro	162.0	TWD	160.0	-1%	O	4.8%	9.6%	1,465	19.0	19.1	17.9	16.5	-11%	7%	8%	24%	24%	24%	4.5	4.1	3.8
HIMX.O	Himax	24.2	TWD	17.4	-28%	E	2.7%	8.3%	4,124	61.2	100.1	60.8	33.4	-47%	65%	82%	5%	8%	14%	5.1	4.9	4.6
Analog IC																						
6415.TW	Silergy	570.0	TWD	388.0	-32%	U	1.4%	4.8%	6,985	91.3	89.6	56.2	34.6	8%	59%	62%	7%	10%	15%	5.9	5.4	4.8
300661.SZ	SG Micro	113.3	CNY	82.0	-28%	E	0.3%	1.1%	9,757	374.4	123.6	83.1	58.2	-12%	49%	43%	11%	15%	18%	NM	NM	NM
MCU																						
4919.TW	Nuvoton	194.0	TWD	98.0	-49%	U	0.8%	14.5%	2,571	95.4	NM	NM	44.0	-857%	-69%	-457%	-12%	-4%	14%	6.2	6.5	5.6
688018.SS	Espressif	168.6	CNY	175.0	4%	O	1.0%	20.3%	3,896	105.8	53.1	49.1	39.6	47%	8%	24%	15%	12%	14%	NM	NM	NM
FPGA																						
002049.SZ	Unigroup Guoxin	77.3	CNY	57.0	-26%	U	0.4%	1.5%	9,120	286.6	45.7	31.7	24.4	22%	44%	30%	11%	14%	16%	4.8	4.2	3.6
1385.HK	Shanghai Fudan	30.2	HKD	47.3	57%	O	0.1%	0.1%	6,905	30.6	NM	23.4	19.3	-59%	353%	22%	4%	16%	16%	4.0	3.4	2.9
IC distributor																						
3702.TW	WPG	116.5	TWD	160.0	37%	O	7.2%	-27.2%	6,177	53.8	19.6	9.1	9.3	38%	115%	-2%	12%	24%	21%	2.3	1.9	1.8
3036.TW	WT Micro	282.0	TWD	349.0	24%	O	4.4%	-21.4%	11,268	95.1	NM	11.4	10.0	43%	107%	13%	12%	25%	25%	NM	2.7	2.3

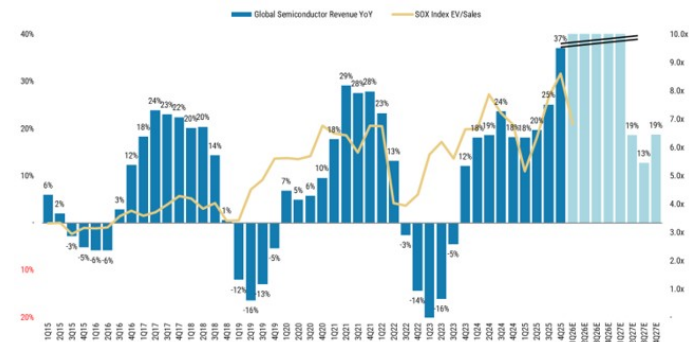
Source: Company data, Morgan Stanley Research. e = Morgan Stanley Research estimates. Note: Data as of June 4, 2026.

Broader Semiconductor Cycle

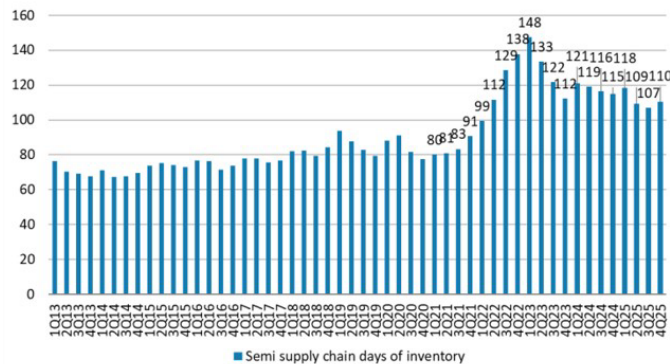
Logic semi foundry utilization could reach 80% in 2H26



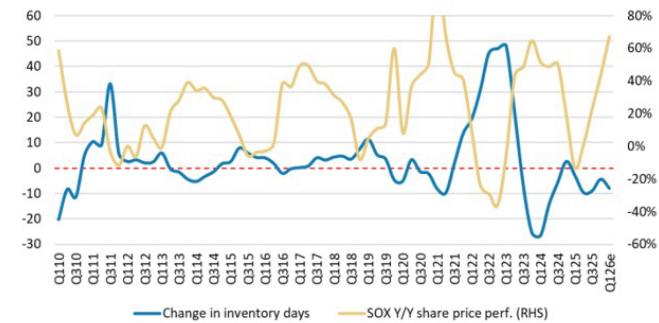
Excluding memory and NVIDIA's AI GPU revenue, non-AI semi growth is expected to decline in 2026



Semi supply chain days of inventory as of 4Q25



Historically, when inventory days went down, semi stock index went up



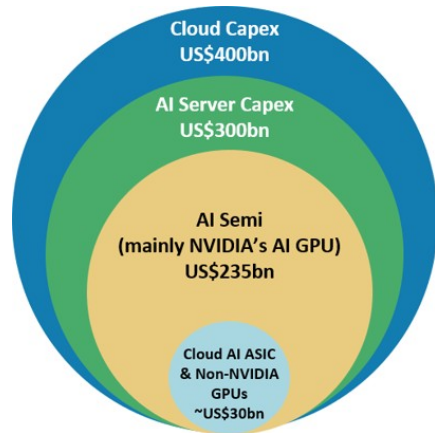
Source: SIA, FactSet, company data, Morgan Stanley Research. e = Morgan Stanley Research estimates.

Morgan Stanley

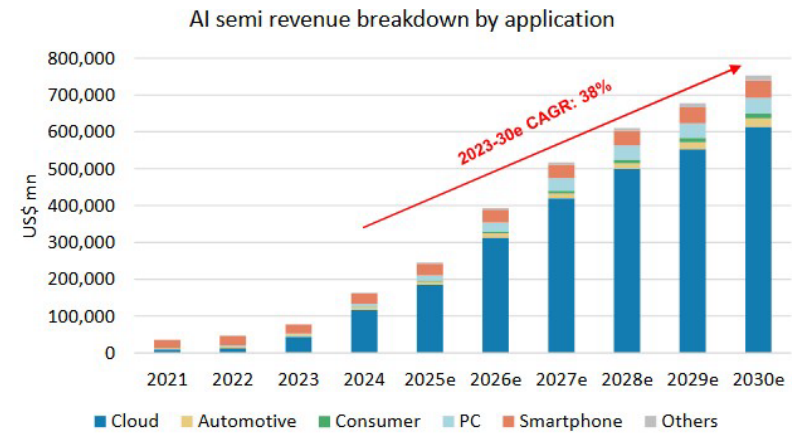
AI Semi Supply Chain and Niche Memory

The Global Semi Industry Market Size May Reach US\$1.5 trillion in 2030, Half from AI Semis

Our supply chain data-driven bull case assumption is that cloud AI Semi TAM may have grown to US\$235bn in 2025e



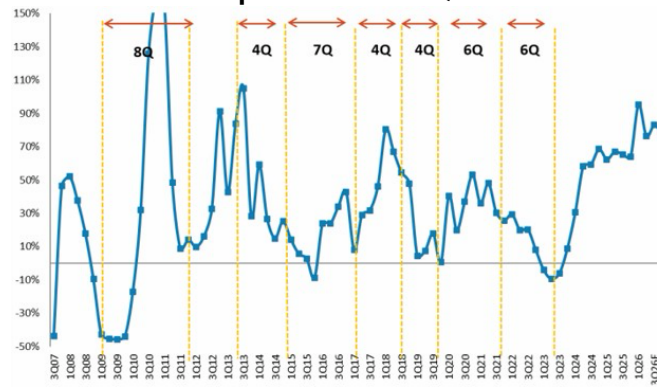
We expect the AI semi TAM to reach nearly US\$753bn by 2030



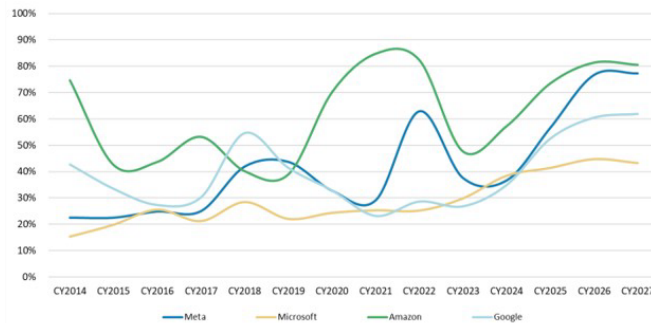
Source: Nvidia, Morgan Stanley Research. e = Morgan Stanley Research estimates. Note: From our Asia Pacific tech team's downstream estimates.

Cloud Semis: Brighter Outlook

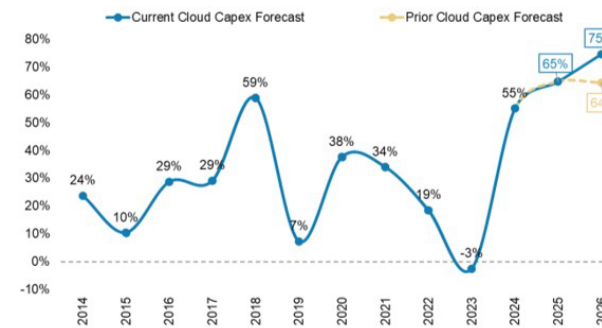
Top 4 CSPs (Amazon, Google, Microsoft and Meta) capex was up 95% Y/Y in 1Q26CY



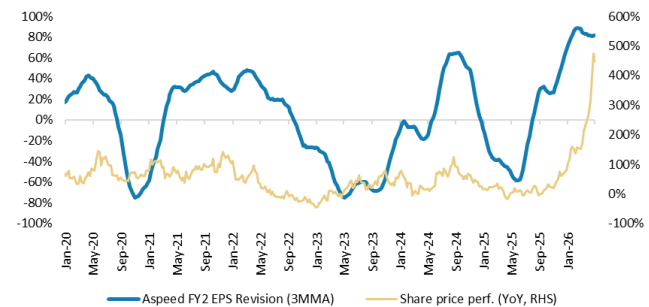
Capex-to-EBITDA ratio should remain stable at around 50%



Top 4 Cloud Providers: Cloud Capex Y/Y Growth



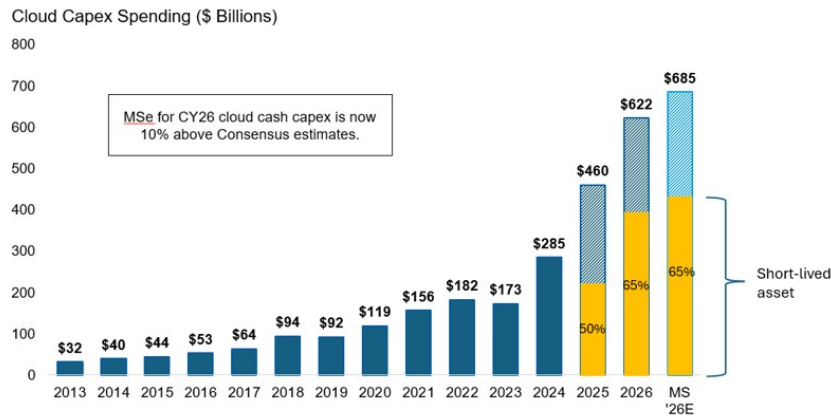
Aspeed earnings revision breadth



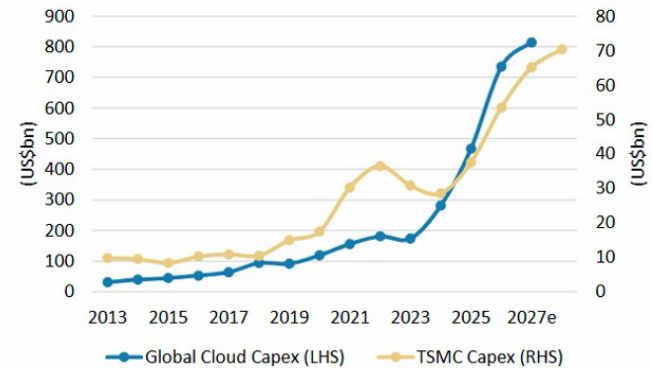
Source: Company data, Morgan Stanley Research. e = Morgan Stanley Research estimates.

Cloud Capex Remains Robust From Major CSPs

Morgan Stanley cloud capex tracker estimates nearly US\$685bn of cloud capex spending in 2026 (Purely Top 10 listed global CSPs; no sovereign AI)



Global Cloud Capex vs. TSMC capex



Source: FactSet, company data, Morgan Stanley Research. E = Morgan Stanley Research estimates. Note: Estimates are top-down and from our US tech team.

Morgan Stanley

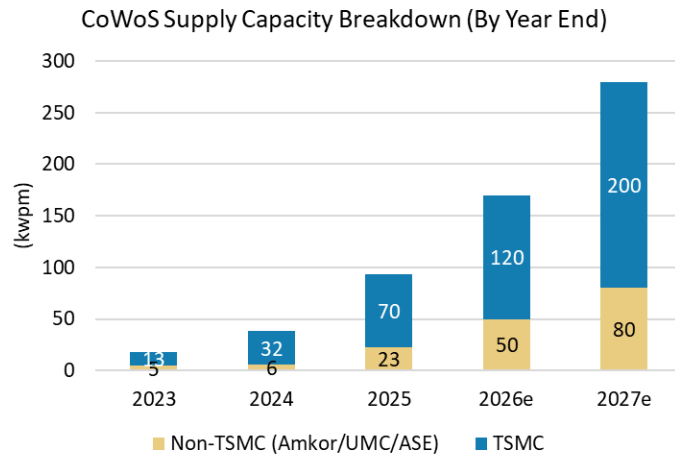
Announced Power Deployment Implications for TSMC

Announced Power Deployment Implication for TSMC				
GPU/ASIC Vendor	NVIDIA (Top US AI firm)	AMD (Top US AI firm)	Broadcom	AWS (Top US AI firm)
Power Deployed (GW)	10	6	3.5	2
Rack name	Vera Rubin NVL144	Helios	TPU	Trainium3 UltraServers
Power consumption per Rack (kW)	220	220	63	144
Rack Number (k units)	45	27	56	14
Chip Name	Rubin GPU	MI455 GPU	TPUv7 (Ironwood) TPUv8i (Sunfish)	Trainium3 (4)
Chip Volume (k units)	3,273	1,964	3,571	2,000
Life Cycle for the project	3	3	5	8
Implied life-cycle CoWoS Volume (k wafers)	409	166	260	118
Implied life-cycle 2/3nm wafer Volume (k wafers)	260	95	190	107
2027 annual CoWoS demand (k wafers)	136	55	52	15

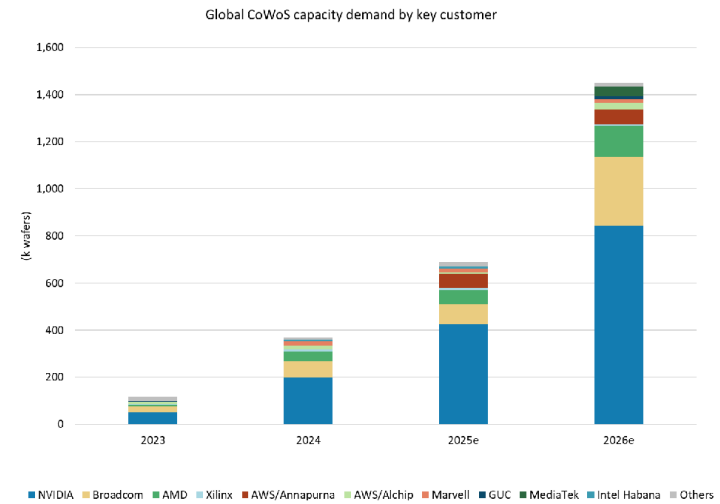
Source: Company data, Morgan Stanley Research; Note: Estimates are compiled using our Asia supply-chain checks. Note: We assume 64 units of TPU chips per rack with TPUv7 and v8i per chip TDP being ~980W.

TSMC May Expand CoWoS Capacity to 200kwpm by 2027 Given Continual Strong AI Demand

Global CoWoS capacity expansion by year-end and by vendor

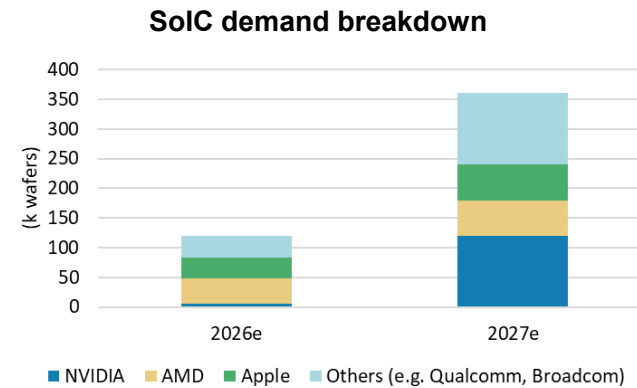
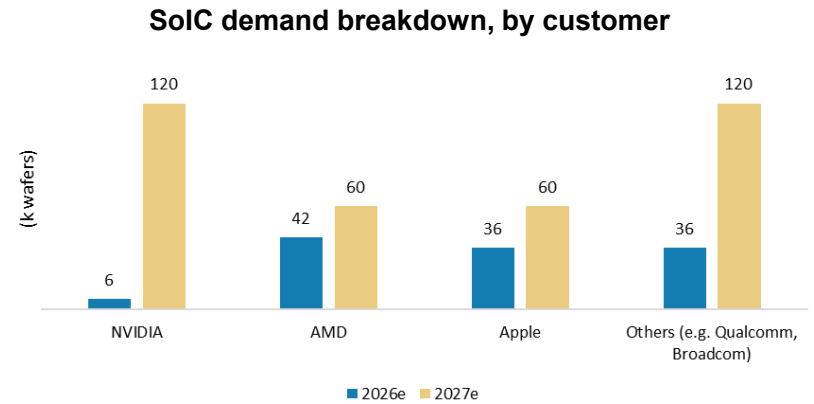
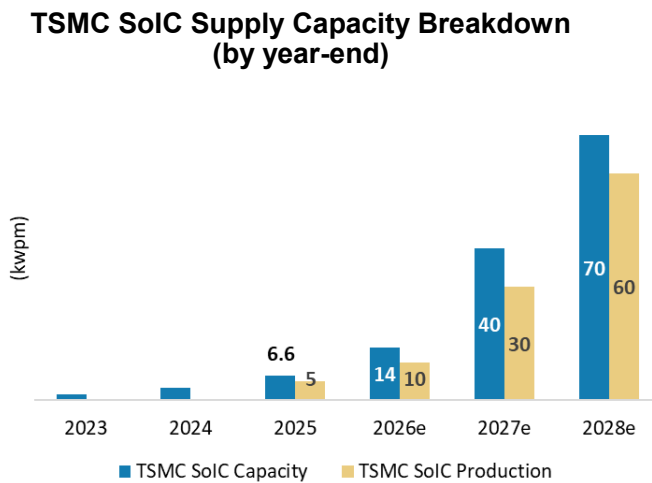


Global CoWoS consumption, by customer



Source: Company data, Morgan Stanley Research. E = Morgan Stanley Research estimates.

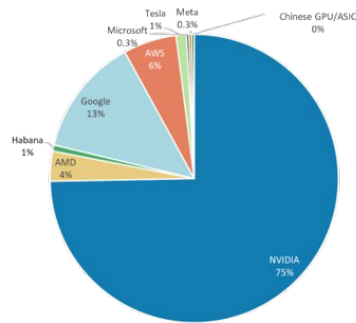
SoIC Expansion Expected to Be a Key Focus Area for TSMC in the Coming Years



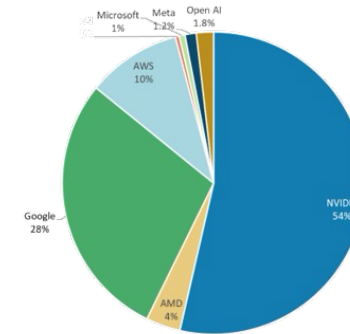
Source: Company data, Morgan Stanley Research. e = Morgan Stanley Research estimates.

AI Computing Wafer Consumption Could Reach US\$27bn in 2026, with NVIDIA Accounting for the Majority

AI semi wafer consumption, by customer, 2025e



AI semi wafer consumption, by customer, 2026e

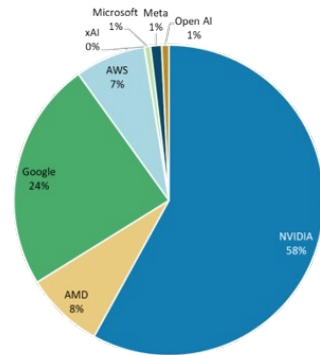


AI chip vendor	Product name	CoWoS capacity allocation (k wafers)	Chips per CoWoS wafer	Implied shipments (k)	Compute die size	Geometry	Compute die units	Wafer consumption (k wafers)	Wafer price (US\$)	Wafer revenue TAM (US\$ mn)
AI GPU (2026e)										
NVIDIA	B300	390	14	5,460	850	4nm	2	433	21,945	9,510
	Vera CPU	90	23	2,070		3nm				
	Spectrum/CPX	60		-						
	Rubin R200	260	8	2,080	850	3nm	2	165	26,000	4,292
AMD	H200	75	27	2,025	814	4nm	1	57	21,945	1,243
	MI300	3	12	36	110	5nm	8	1	18,000	19
	MI350/375	7	12	84	110	3nm	8	2	26,000	64
	MI400	65	10	650	110	2nm	8	32	28,125	886
AI ASIC (2026e)										
Google	TPU v7p (Ironwood; AVGO)	145	16	2,320	700	3nm	2	152	26,000	3,942
	TPU v8i (Sunfish; AVGO)	80	12	960	800	3nm	2	72	26,000	1,864
	TPU v8t (Zebrafish; MediaTek)	40	20	800	800	3nm	2	60	26,000	1,554
AWS	Trainium 3	100	17	1,700	700	3nm	2	91	26,000	2,357
Microsoft	Maia 200	4	29	116	700	3nm	1	3.0	26,000	79
	Maia 300	5	11	55	850	2nm	1	2.9	28,125	82
Open AI	Nexus (Titan 1)	10	13	130	750	3nm	4	18.2	26,000	473
Total		1,479						1,117		27,019

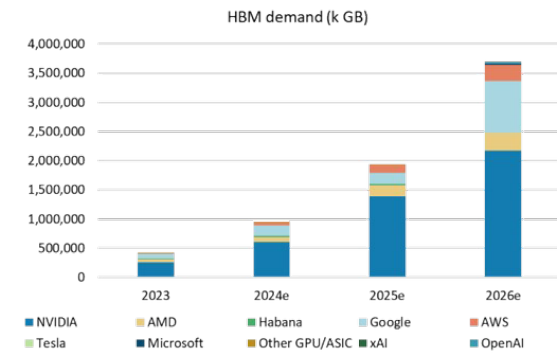
Source: Company data, Morgan Stanley Research. E = Morgan Stanley Research estimates. Note: Estimates are compiled using our supply-chain checks.

HBM Consumption in 2026e – Up to 32bn Gb

HBM consumption by customer in 2026e



NVIDIA still consumes most HBM supply in 2026e



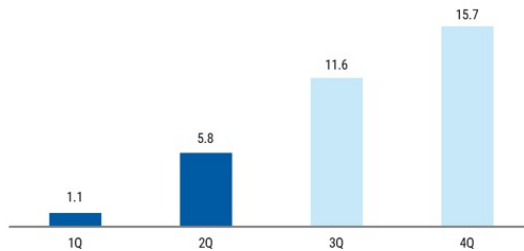
AI chip vendor	Product name	CoWoS capacity allocation (k wafers)	Chips per CoWoS wafer	Implied shipments (k)	HBM chip density (GB)	HBM chip units	Total HBM size (GB)	HBM generation	HBM vendor	Total HBM demand (k GB)
AI GPU (2026e)										
NVIDIA	B300	390	14	5,460	36	8	288	HBM3e 12hi	Hynix/Micron/Samsung	1,572,480
	Vera CPU	90	23	2,070	-	-	-	-	-	-
	Spectrum/CPX	60	-	-	-	-	-	-	-	-
	Rubin R200	260	8	2,080	36	8	288	HBM4	Hynix/Micron/Samsung?	599,040
AMD	H200	75	27	2,025	24	6	141	HBM3e 8hi	Hynix	285,525
	MI300	3	12	36	24	8	192	HBM3	Samsung	6,912
	MI350/375	7	12	84	36	8	288	HBM3e 12hi	Samsung/Micron	24,192
	MI400	65	10	650	36	12	432	HBM4	Samsung/Micron	280,800
AI ASIC (2026e)										
Google	TPU v7p (Ironwood; AVGO)	145	16	2,320	24	8	192	HBM3e 8hi	Hynix/Samsung	445,440
	TPU v8i (Sunfish; AVGO)	80	12	960	36	8	288	HBM3e 12hi	Hynix/Samsung/Micron	276,480
	TPU v8t (Zebrafish; MediaTek)	40	20	800	36	6	216	HBM3e 12hi	Hynix/Micron	172,800
AWS	Trainium 3	100	17	1,700	36	4	144	HBM3e 12hi	Hynix/Samsung/Micron	244,800
Microsoft	Maia 200	4	29	116	16	4	64	HBM3	Samsung	7,424
	Maia 300	5	11	55	36	8	288	HBM4	Samsung	15,840
Open AI	Nexus (Titan 1)	10	13	130	36	6	216	HBM4	Hynix	28,080
Total		1,479								4,034,885
Total HBM demand (mn Gb)										32,279

Source: Company data, Morgan Stanley Research. e = Morgan Stanley Research estimates.

NVIDIA GB200/300 Rack Output Estimates

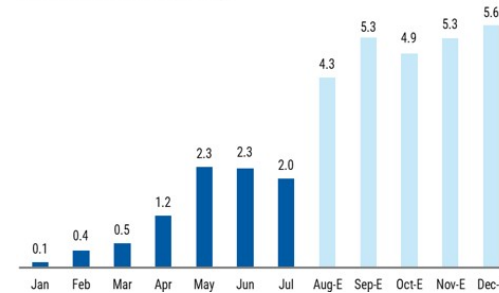
GB200/300 NVL72 Rack Ramp Quarterly Trajectory

GB200/300 NVL72 racks (000s)

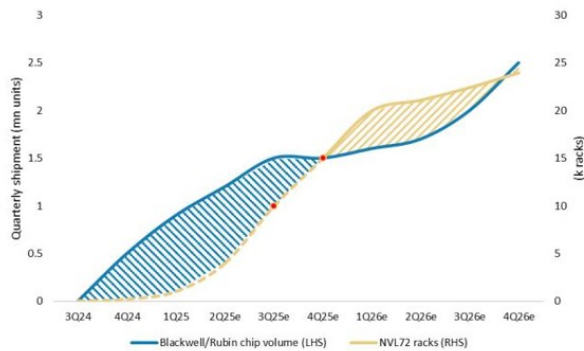


Industry-wide GB200 NVL72 Rack Monthly Output

GB200/300 NVL72 racks (Monthly)



We estimate TSMC produced 5.1mn chips in 2025, with full-year GB200 NVL72 shipments seen reaching 30k

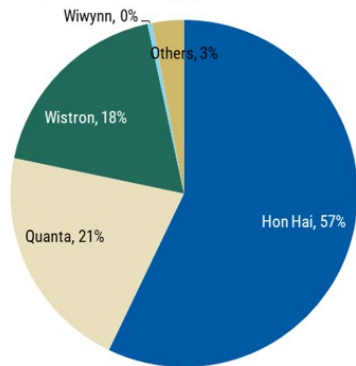


Source: Morgan Stanley Research. E = Morgan Stanley Research estimates. Note: We think the actual rack deliveries to end-customers are lower than the numbers we have here because we include Wistron's computing tray (L10) rack equivalent number (without accounting for rack assembly and test times for L11). Estimates are from our Asia Pacific tech team's downstream estimates.

NVIDIA GB200/300 Server Racks Supply/Demand Assumptions

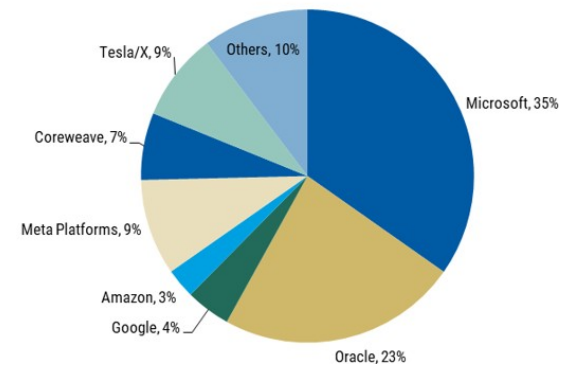
NVIDIA GB200/300 rack supply share (2025)

GB200/300 NVL72-equivalent rack supply share



NVIDIA GB200/300 rack demand share (2025)

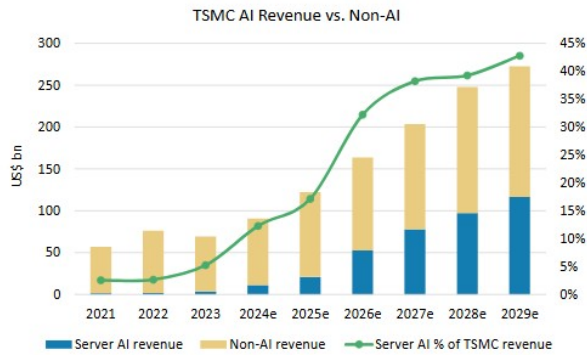
Nvidia GB200 server demand share, 2025e



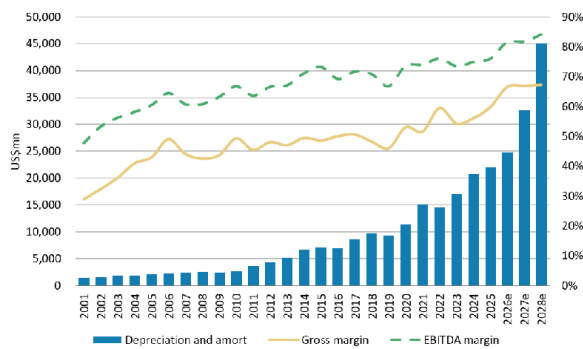
Source: Morgan Stanley Research. E = Morgan Stanley Research estimates. Note: Estimates are from our Asia Pacific tech team's downstream estimates.

TSMC AI Semis Revenue Could Reach 60% from 2024 to 2029e

TSMC – AI semis revenue could account for >30% of 2026e revenue

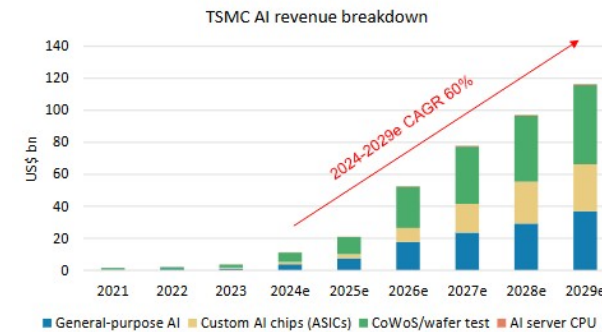


TSMC – margin expansion

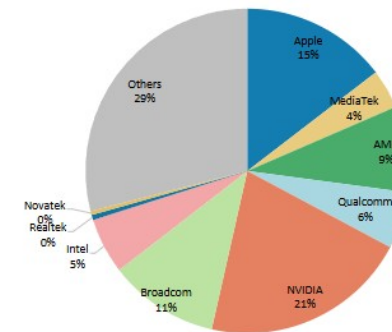


Source: Company data, Morgan Stanley Research (e) estimates

TSMC – AI semis revenue breakdown

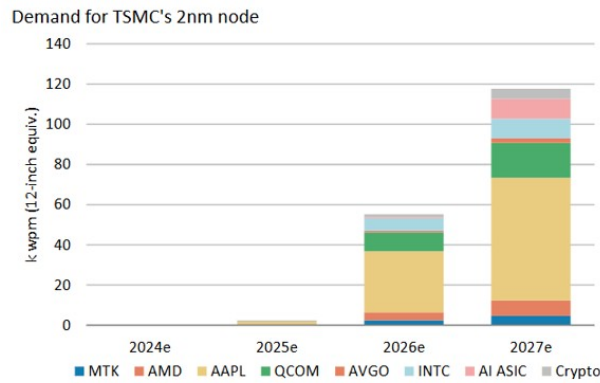


TSMC – 2026e revenue breakdown by customer

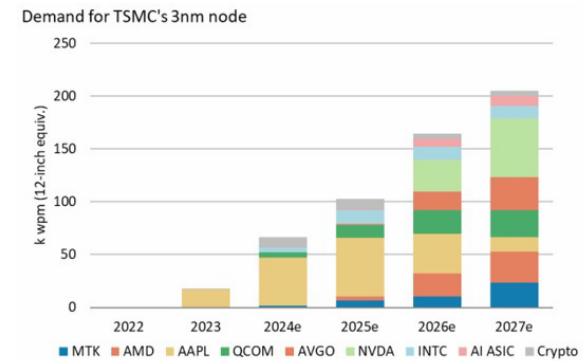


TSMC Leading-edge Wafer Demand Breakdown

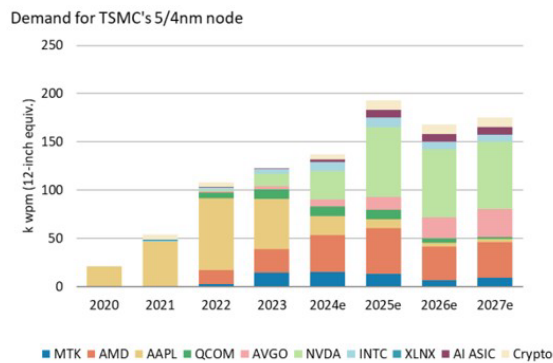
TSMC – 2nm customer demand breakdown



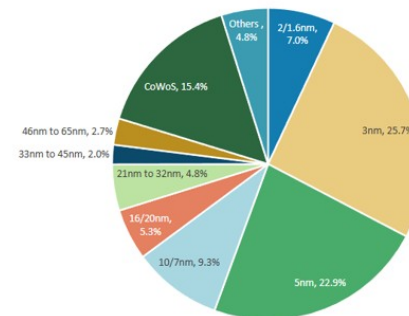
TSMC – 3nm customer demand breakdown



TSMC – 4/5nm customer demand breakdown



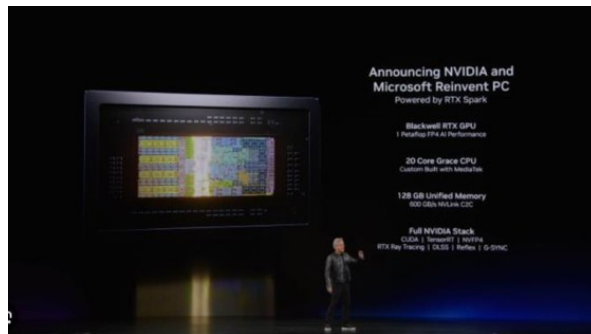
TSMC – 2026e revenue breakdown by nodes and CoWoS



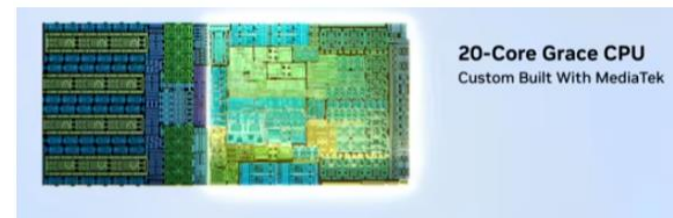
Source: Company data, Morgan Stanley Research (e) estimates

Nvidia/MediaTek New AI PC (RTX Spark) Could Trigger Potential Edge Device Replacement

New AI PC announced by Nvidia (N1X)



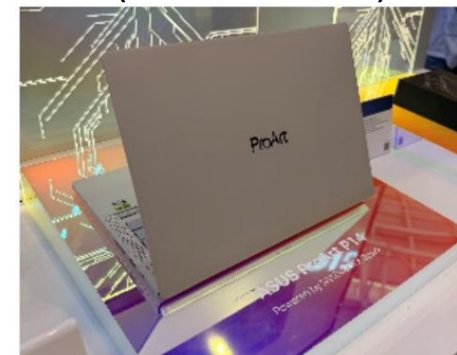
MediaTek provides 20-core customized Grace CPU for N1X



RTX Spark (N1X) provided by MSI (available in 3Q26)



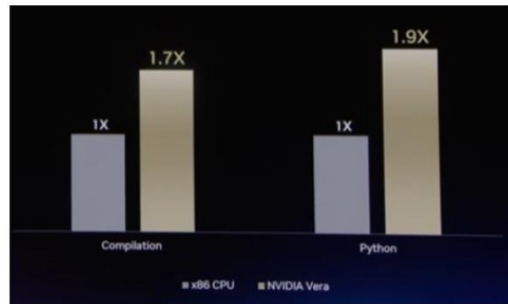
RTX Spark (N1X) provided by ASUS (available in 3Q26)



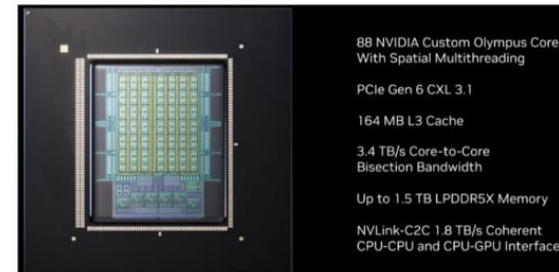
Source: Nvidia, MSI, ASUS

Nvidia Latest Vera CPU Could Support Robust Agentic CPU Demand

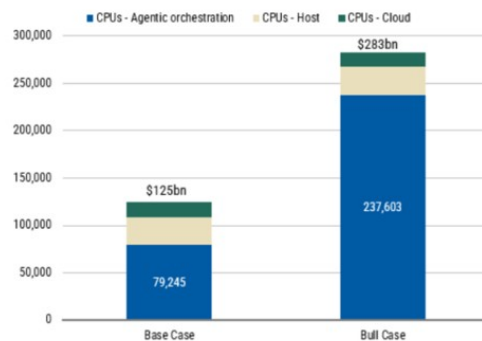
Vera performance could be 1.8x that of highest-performance x86 CPU



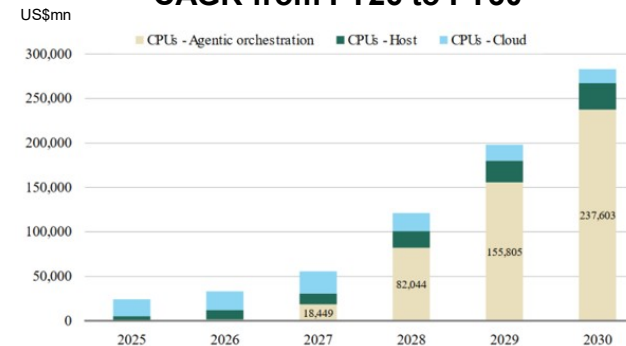
Vera CPU cores are not split across chiplets, enabling faster core-to-core connection



MS bull case implies a \$238bn CPU orchestration TAM



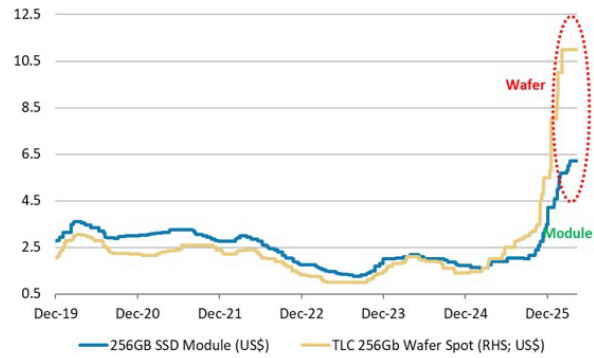
In MS top-down model, we estimate the Agentic CPU TAM will grow at a 251% CAGR from FY26 to FY30



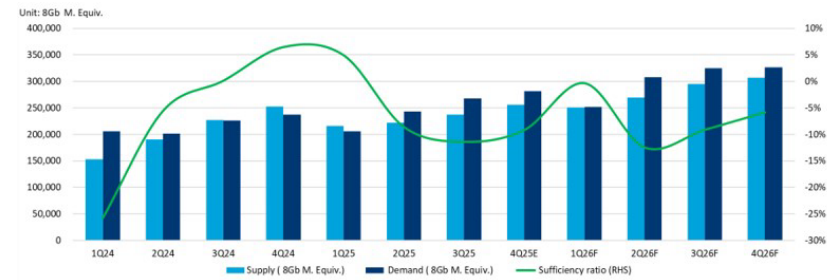
Source: Nvidia, Morgan Stanley Research (e) estimates

AI Storage Leads to NAND Shortage; We Also Expect NOR Flash Undersupply into 2026

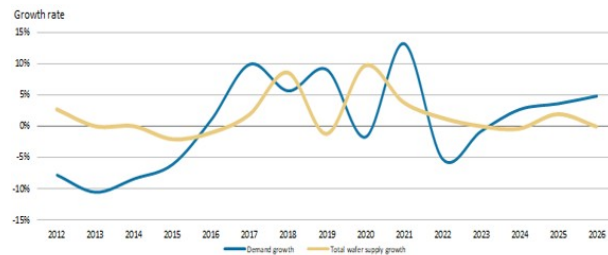
NAND wafer spot pricing and module prices



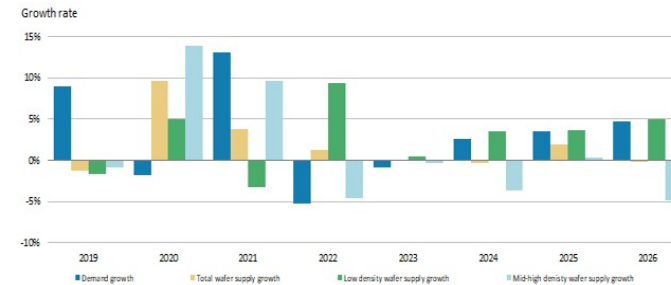
NAND supply and demand model



NOR flash demand and supply growth rates



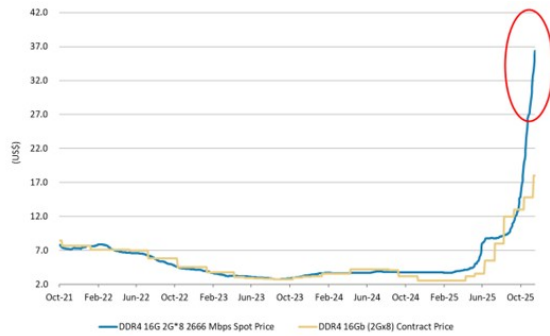
NOR flash demand and supply growth rates



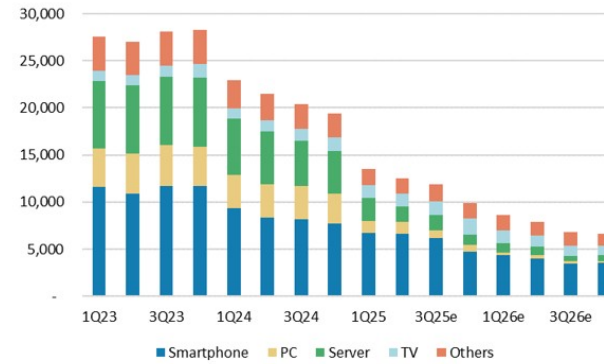
Source: ChinaFlashMarket, Morgan Stanley Research estimates.

DDR4 Shortage to Persist into 2H26; Spot Price Capped

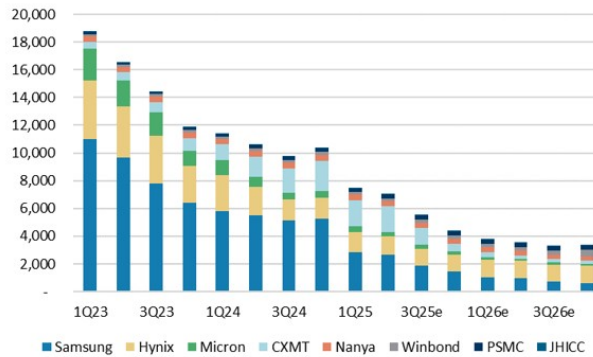
DDR4 16Gb spot vs. contract price



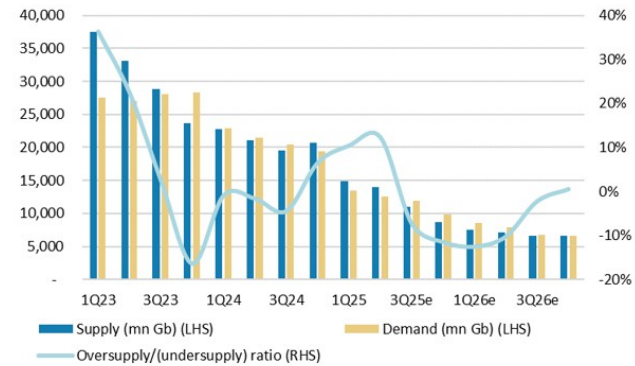
Quarterly demand breakdown, by product (mn Gb)



Quarterly supply breakdown (mn Gb)



Quarterly supply and demand summary



Source: Company data, Morgan Stanley Research. E = Morgan Stanley Research estimates.

Morgan Stanley

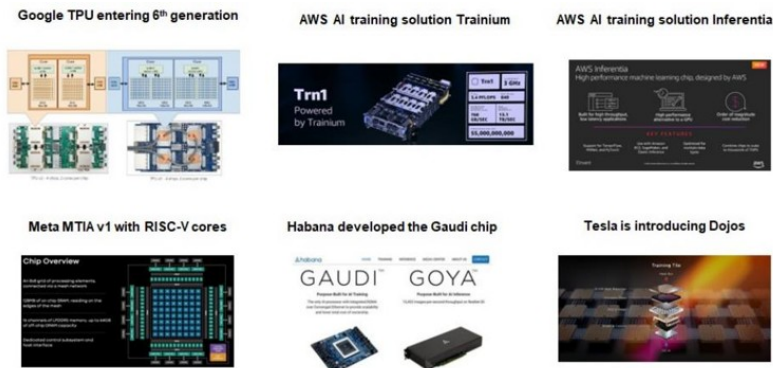
AI ASIC, CPO and Chip Testing

AI Semis: Now and the future – “Prompts”

- Generative AI Demand Driver:
 - Killer apps
 - Competition
 - Sovereign
- Growth limitations:
 1. Budget
 2. Energy -> in the US
 3. Chip Capacity -> in China
 4. Regulation
- Semiconductor solutions:
 - Moore's Law
 - CoWoS/ SolC
 - HBM
 - CPO
 - Custom chip
 - GaN HVDC 800V
- Growth perspective:
 1. Inference vs. Training AI semis
 2. Edge vs. Cloud AI semis
 3. Custom ASIC vs. AI GPU

CSPs Still Need Custom Chips Even with NVIDIA Providing Powerful AI GPUs

Global CSP cloud AI custom chips



Latest evidence of AI ASIC: AWS Trainium3



Trainium Forecasts from MS Asia Research team

k Units	2023	2024	2025e	2026e	2027e	2028e
Trainium 1/Inferentia 2	300	600	30			
Trainium 2		300	1,520			
Trainium 3			20	1,600	1,200	-
Trainium 4					600	2,000
Total	300	900	1,570	1,600	1,800	2,000

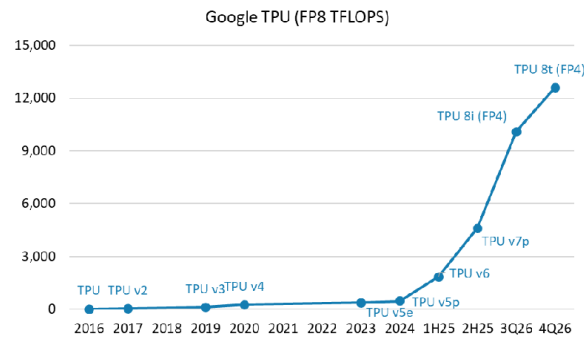
Source: AWS, Google, Meta, Intel, Tesla, Morgan Stanley Research (e) estimates.

More ASIC Projects Are Coming, According to Each CSP Plan

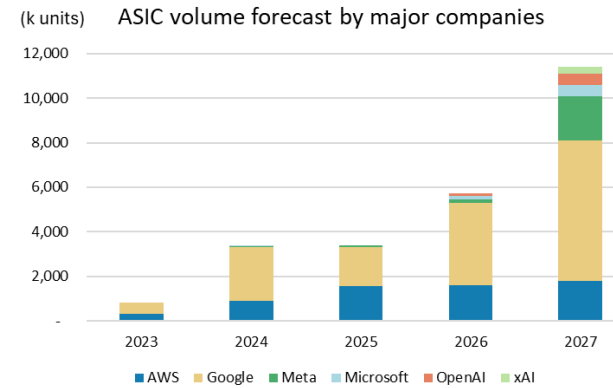
TPU Forecasts from MS Asia Research team

k Units	2023	2024	2025e	2026e	2027e	2028e
v5	500	2,400	250			
v6 (Trillium)			1,000			
v7 (Ironwood, by Broadcom)			500	2,300	500	
v8i (Sunfish; 3nm, by Broadcom)				900	3,000	2,500
v8t (Zebrafish; 3nm, by MediaTek)				500	2,500	1,000
v9 (Humufish; 2nm, by MediaTek)					150	2,500
v9a (Merope; 2nm, by US design service)						unknown
v10 (Icefish; 1.4nm, by MediaTek)						unknown
Total	500	2,400	1,750	3,700	6,150	>6000

Google TPU performance is growing rapidly



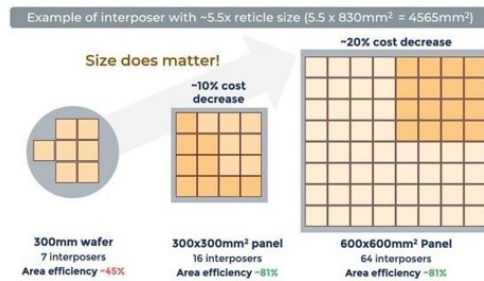
ASIC volume forecast by major companies



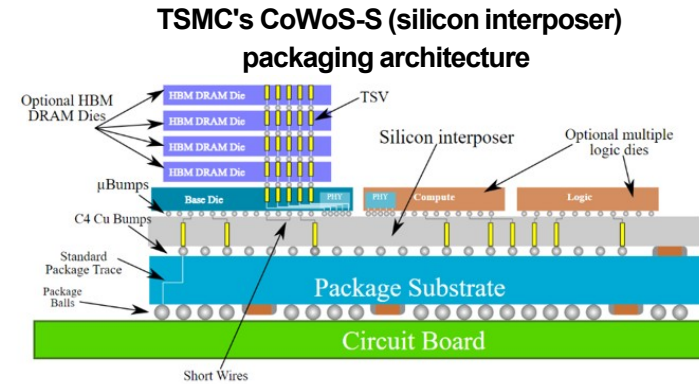
Source: Company data, Morgan Stanley Research (e) estimates

What About the Competition Between TSMC CoWoS and Intel EMIB?

TSMC CoWoS can support up to 9.5x reticles, or four chips per wafer

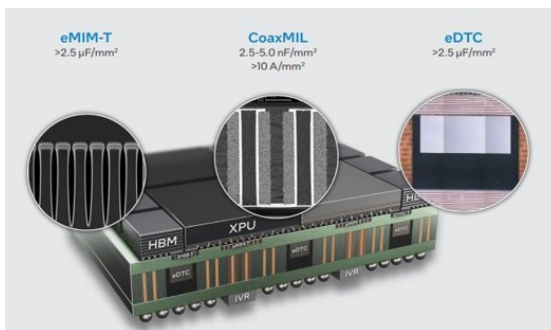


www.yolegroup.com | ©Yole Group 2025

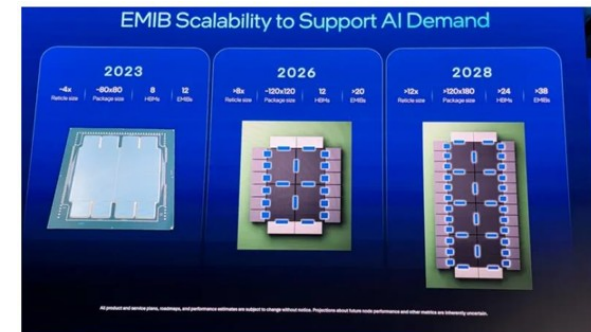


Intel's EMIB can easily support larger chips with more reticles (>12) if its supply chain can execute well

Intel EMIB eDTC: APMemory's technology



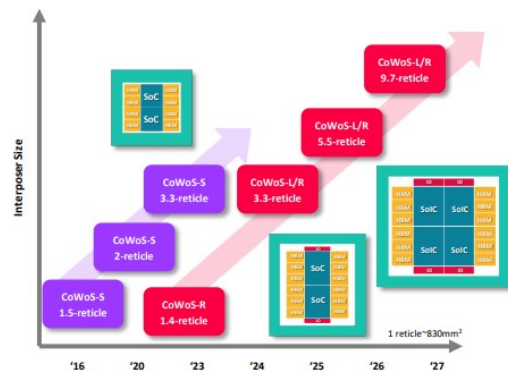
Source: Intel, Yole, Morgan Stanley Research



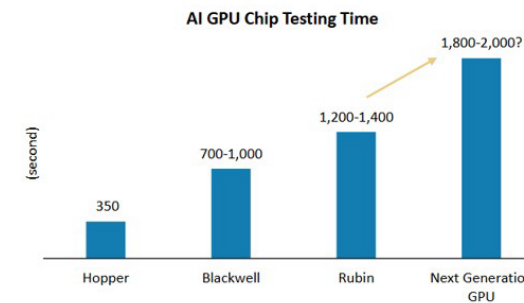
26

Larger Package Sizes Are Emerging as a Key Industry Trend

TSMC's roadmap for interposer size



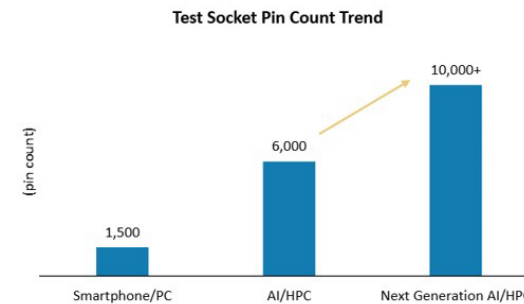
Chip testing time continuing to trend up



Testing equipment market is expected to grow at 35% CAGR during 2024-27e

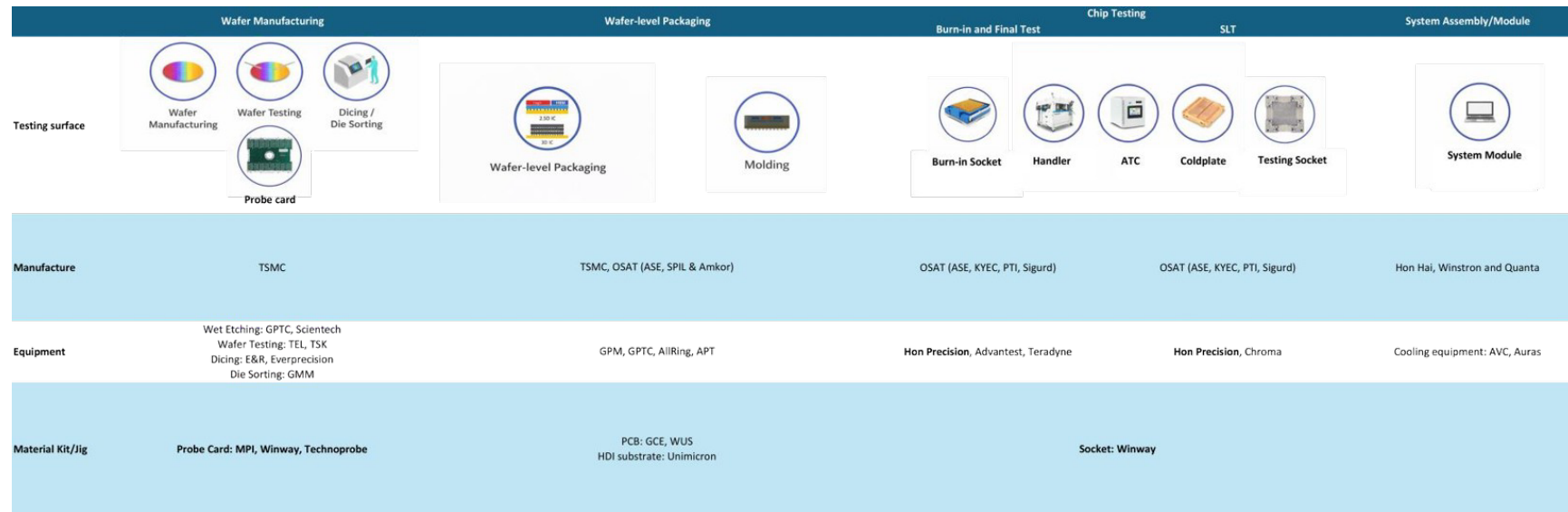


AI/HPC test socket needs higher pin counts vs. traditional consumer tech applications





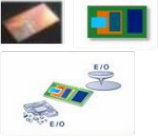
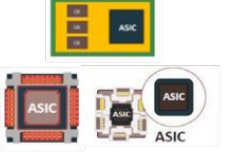
Source: Company data, Morgan Stanley Research (e) estimates

Mapping the Roles of Hon Precision, WinWay and MPI in the Semi Supply Chain



Source : Company data, Morgan Stanley Research

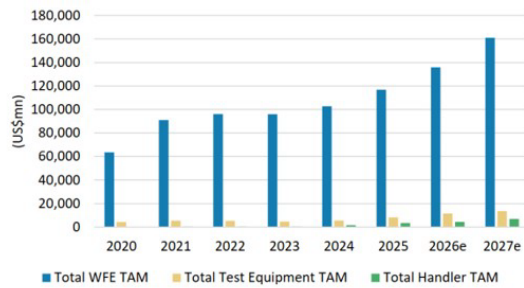
New Evolution for Testing Equipment and Components: CPO

Test Insertion	Insertion 1	Insertion 2	Insertion 3	Insertion 4		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 2027e)	CPO package (ASIC+OE) SLT?
Testing surface						
Key Product timeline	2025-2026 Scale-out CPO switch (Spectrum+Quantum) products 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) SPIIL (ASE Group)	OSAT (Die/package level) SPIIL (ASE Group)	OSAT (Die/package level) SPIIL (ASE Group)	OSAT (Die/package level) SPIIL (ASE Group)
Equipment and Consumable Vendor	PIC ATE tester: 1) Advantest + TEL + Formfactor 2) Chroma (underqualification) EIC tester: 1) Teradyne + TEL EIC Probe card: FormFactor	Wafer level testing: 1)Ficontec +Formfactor +Teradyne 2) Advantest+ MPI	Die-to-die probe: 1. TEL 2. MPI Optical engine E/O tester+laser reliability test+ELS source test head: Chroma Optical and Electrical Test Socket: Winway	CPO switch tester: Chroma Coaxial socket/Hypersocket: Winway	ATE tester: 1) Advantest (under qualification) 2)Teradyne FT Handler+ELS source test head+optical alignmnet stage : Hon Precision Coaxial socket/Hypersocket: Winway	CPO SLT tester: Chroma (under qualification) Coaxial socket/Hypersocket: Winway

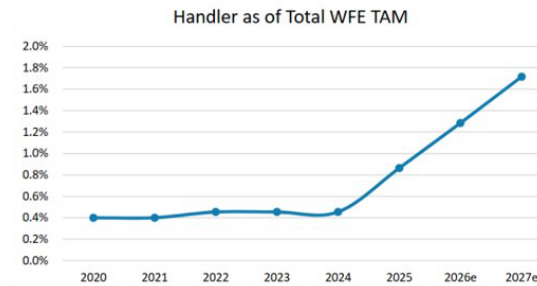
Source : Company data, Morgan Stanley Research

Hon Precision: Key Beneficiary of the Structural Trend Toward Longer Testing Times; OW

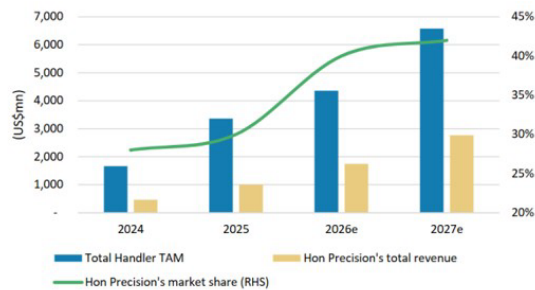
We expect the overall handler market to increase from US\$436mn in 2023 to US\$6.6bn in 2027e



We expect handlers to account for 1.7% of global WFE TAM in 2027e, vs 0.4% in 2020



Hon Precision to grow its total handler market share from 28% in 2024 to 42% by 2027e



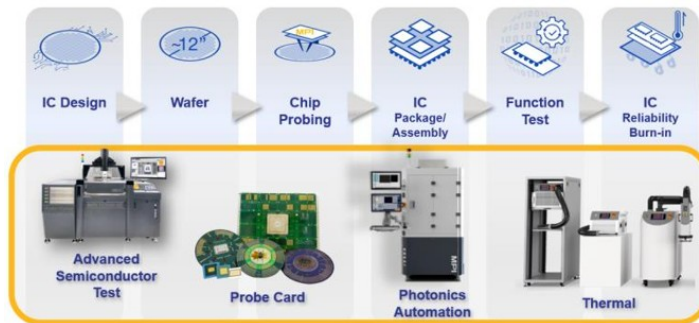
We expect Hon Precision's revenue to expand at a 67% CAGR, 2025-28e



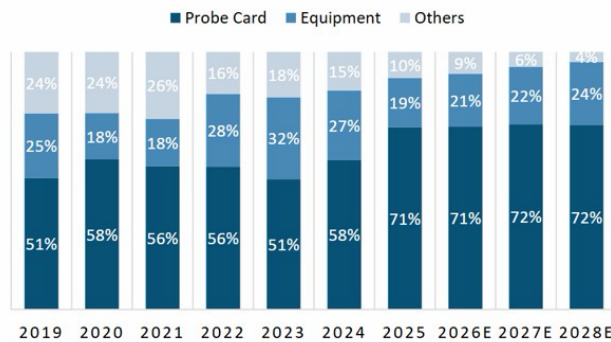
Source: Company data, Morgan Stanley Research. e = Morgan Stanley Research estimates.

MPI: Probe Card Technology Leader with CPO Optionality; OW

MPI's product in chip manufacturing and test process

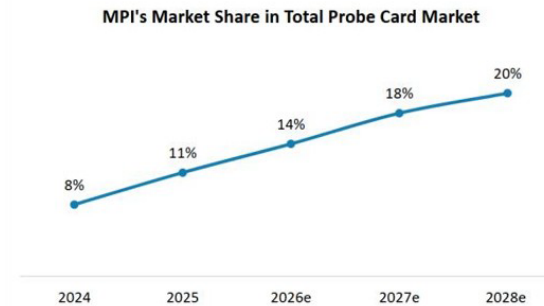


Probe card to remain the key focus, with CPO equipment acting as driving force

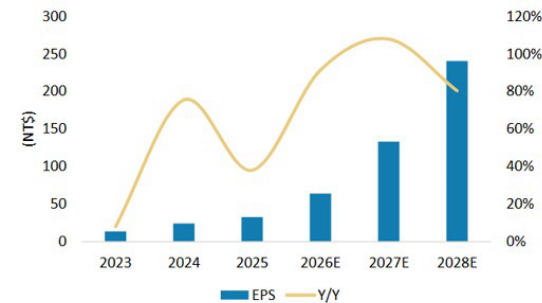


Source: Company data, Morgan Stanley Research. e = Morgan Stanley Research estimates.

We expect MPI's probe card market share to grow from 8% in 2024 to 20% by 2028e



We expect MPI's EPS to rise at a 94% CAGR, 2025-28e

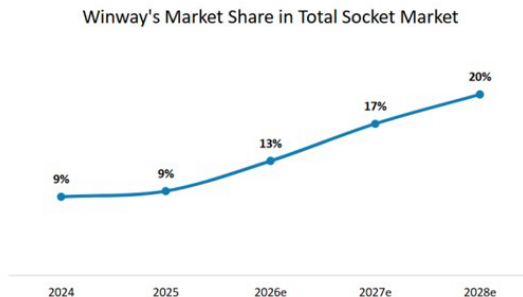


WinWay: Socket Leader Leveraging AI Packaging Complexity; OW

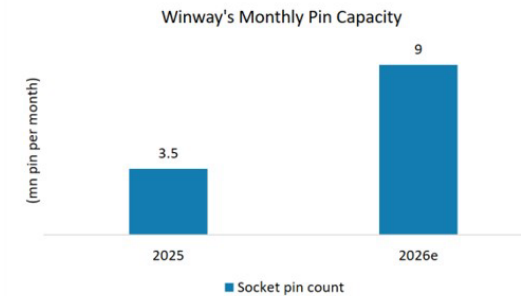
WinWay's total solution of probe card and socket enables vertical integration strategy



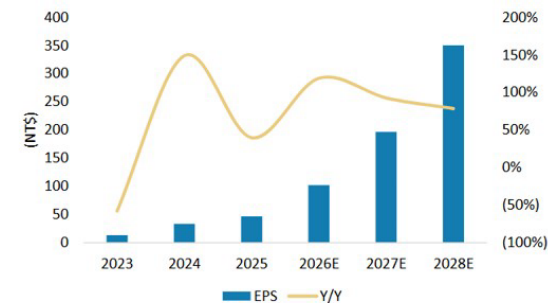
We expect WinWay's market share to grow from 8.6% in 2024 to 20% in 2028e



WinWay to expand its pin capacity from 3.5mn per month in 2025 to 9mn per month in 2026



We expect WinWay's EPS to rise at 95% CAGR, 2025-28e



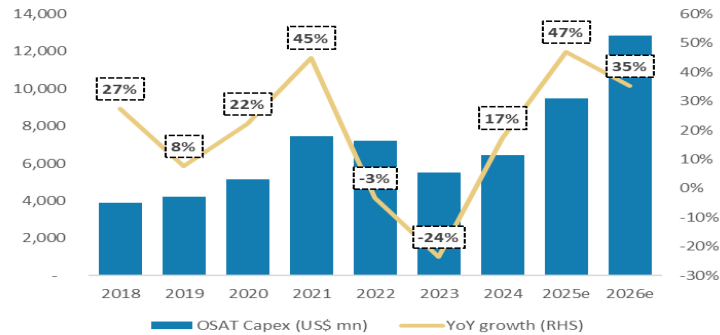
Source: Company data, Morgan Stanley Research. e = Morgan Stanley Research estimates.

Morgan Stanley

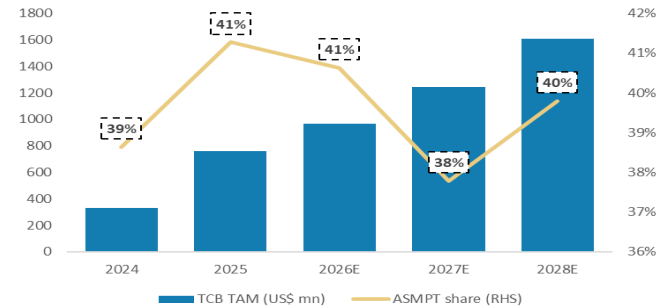
China Semis: OSAT, Compound, MCU, and AI GPU

Positive on back-end equipment (ASMPT) while Neutral on China OSAT

OSAT capex expected to grow ~35% in 2026 driven by both mainstream semi and advanced packaging



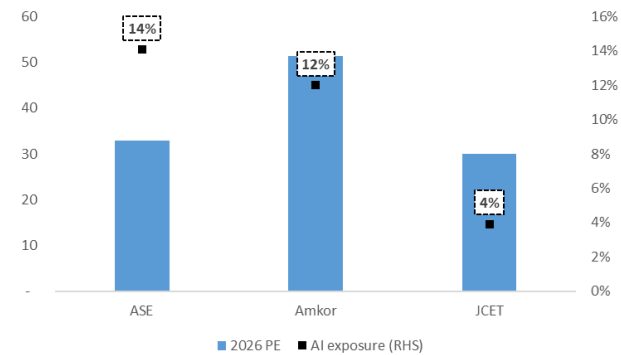
We expect ASMPT's share in TCB to be ~40% in 2028



ASMPT Equipment Matrix – CPO Assembly Flow

CPO Assembly Step	Process Technology	ASMPT Equipment	Precision
LD on PIC (Laser Diode Attach)	Eutectic Bonding	NANO	< 0.5 μm
μLens on PIC (Microlens Attach)	C2W (Chip to Wafer)	NANO	0.2 μm
EIC on PIC (Electronic IC Attach)	TCB / Mass Reflow / Hybrid Bonding	FIREBIRD / NOVA Pro / LITHOBOLT	0.2 – 1 μm
FAU on PIC (Fiber Array Unit Attach)	High-Precision Bonding	NOVA / NANO	< 1 μm
OE on Substrate (Optical Engine Attach)	TCB / Mass Reflow	FIREBIRD XD / NUCLEUS XD	1 μm

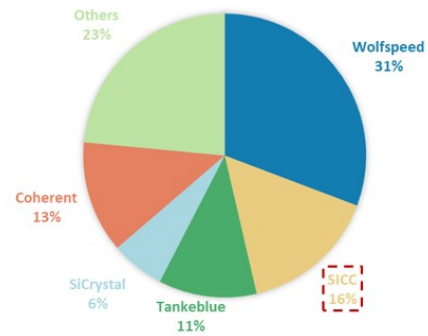
JCET's AI exposure the lowest vs. its peers



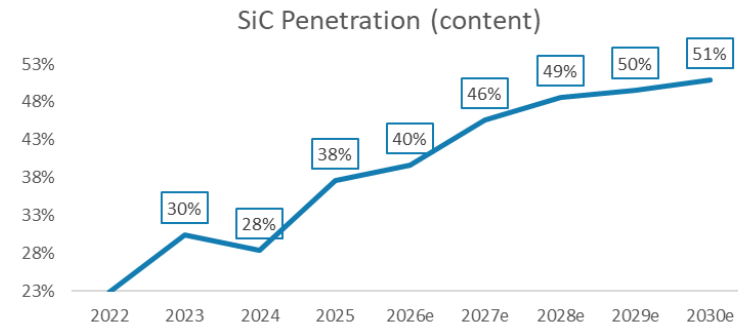
Source: Bloomberg, Company data, Morgan Stanley Research estimate

Prefer SiC over GaN: SICC (OW) and InnoScience (EW)

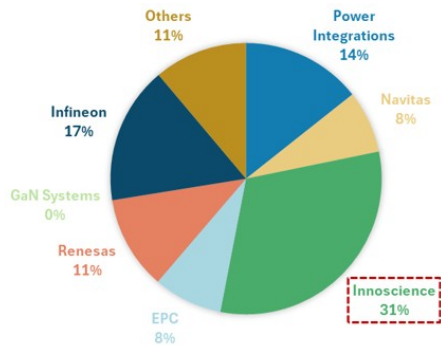
SICC market share rise in SiC substrate market (2025)



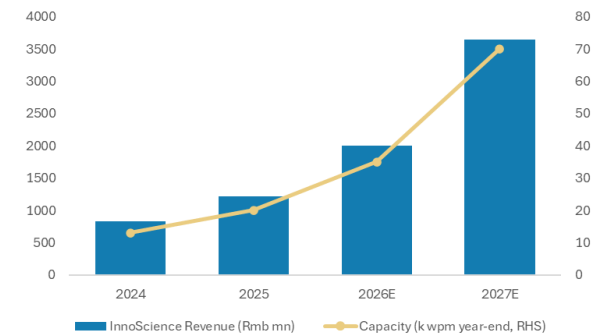
We expect SiC penetration to exceed 50% by 2030



InnoScience dominate the GaN market with TAM ~US\$584mn in 2025



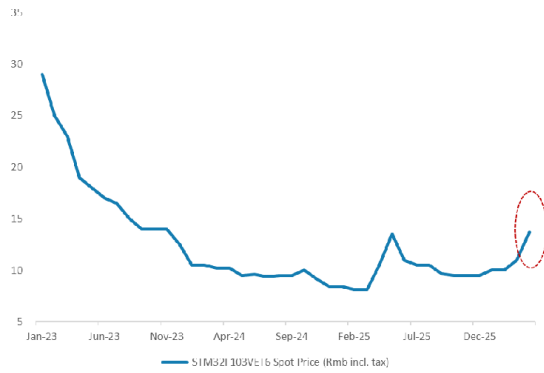
Significant capacity expansion to support strong revenue growth but depreciation may weigh on profitability



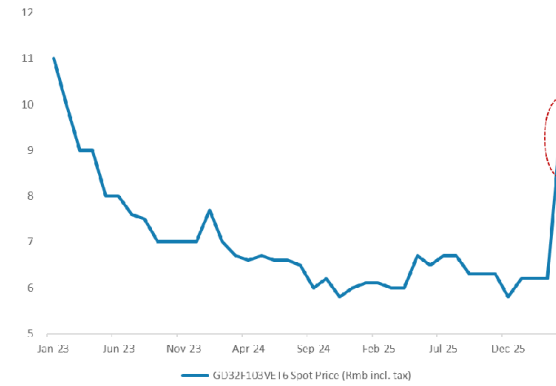
Source: Yole, Company data, Morgan Stanley Research estimate (e) estimates

MCU: Bottoming but Not Out

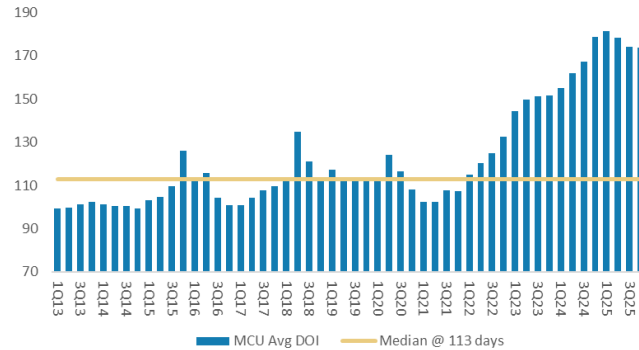
STM32F103VET6 spot market price trend



GD32F103VET6 spot market price trend

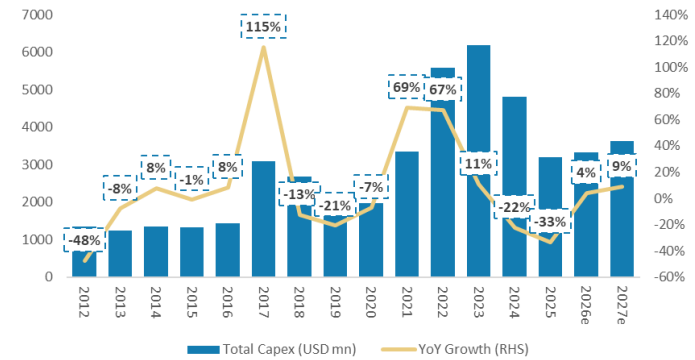


Inventory days for producers peaked in 1Q25 and was flat in 4Q25



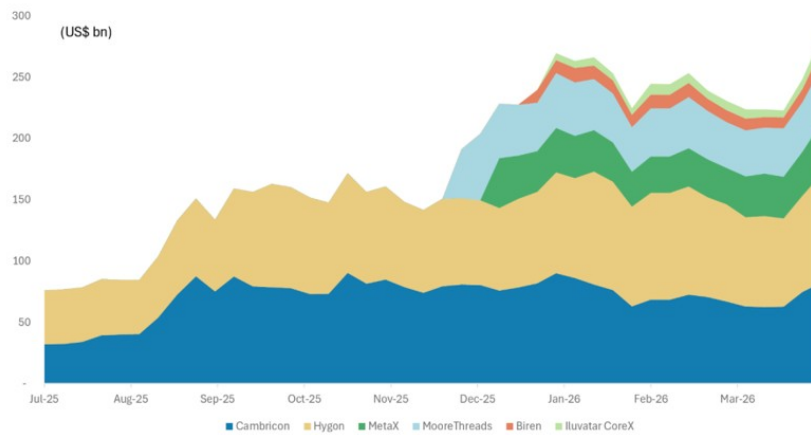
Source: Bom.ai, Bloomberg, Morgan Stanley Research

Leading MCU companies' capex declined for 2 years and is showing slight growth in 2026

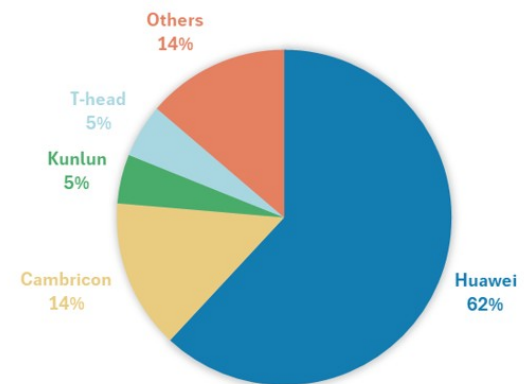


Growing Market Size and Share of Domestic AI Semis

China AI GPU market cap growing, with more IPOs to come



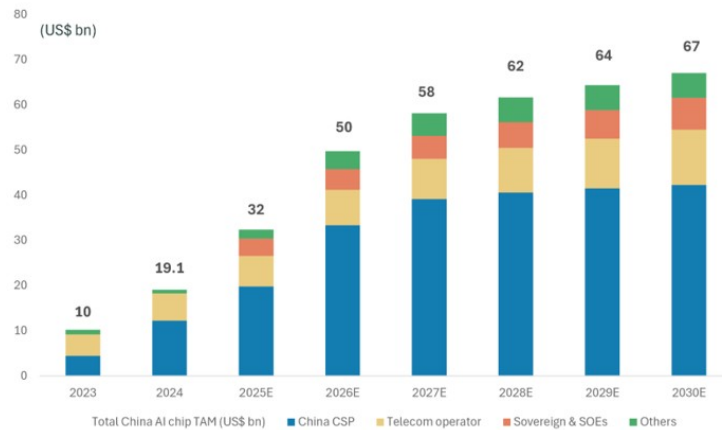
Domestic AI accelerator market share in 2026e



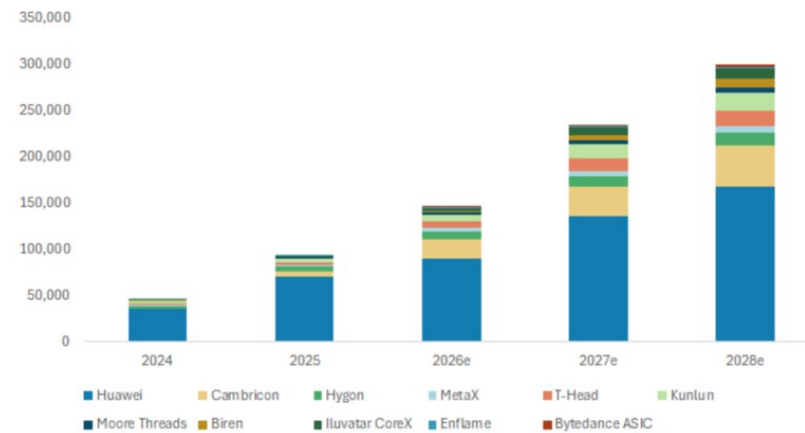
Source: Bloomberg, company data, Morgan Stanley Research. E = Morgan Stanley Research estimates.

We Expect China AI GPU TAM to Grow to US\$67bn by 2030e

We expect China AI chip TAM to grow to US\$67bn by 2030



AI accelerators' revenue trend



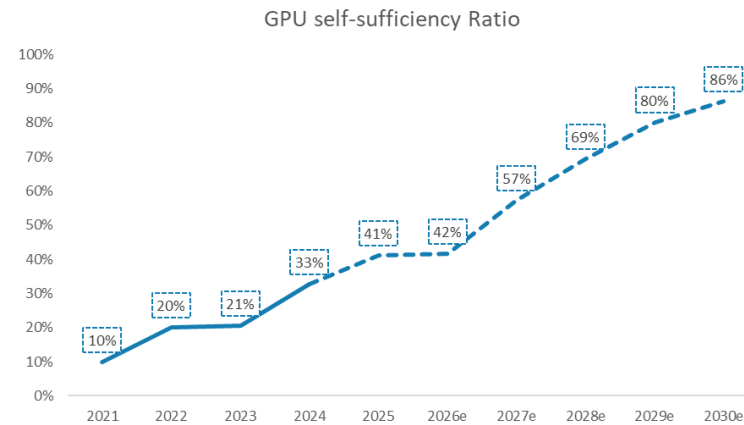
Source: Company data, Morgan Stanley Research. E = Morgan Stanley Research estimates.

China's Advanced Node Capacity Expansion to Fulfill Local AI GPU Production Demand

Chinese advanced node capacity may support US\$58 AI accelerator revenue in 2030



We expect China AI chip self-sufficiency to reach 86% in 2030e (US\$58bn / US\$67bn)



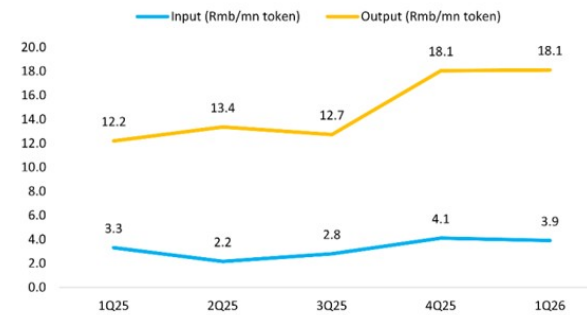
Source: Company data, Morgan Stanley Research (e) estimates.

Near-term market tracker for China AI GPU demand

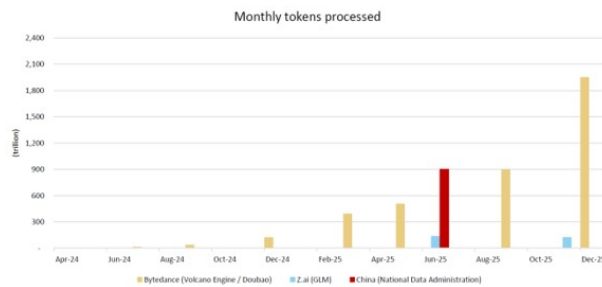
Nvidia's 5090 price keeps rising in China



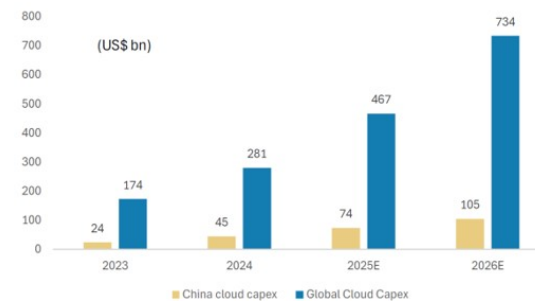
Average token price for China's mainstream AI LLMs



Surge in ByteDance (Volcano Engine/Doubao) tokens indicates high AI demand

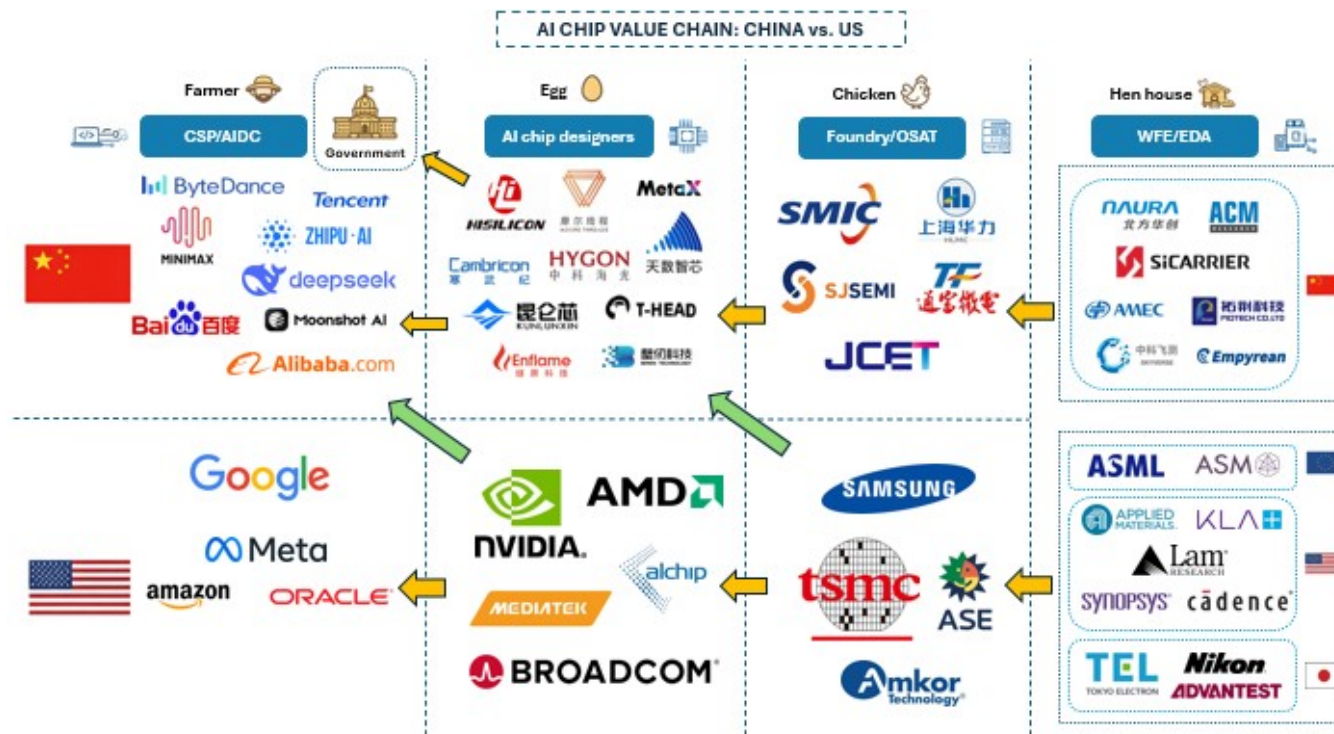


China cloud vs. global cloud capex trend



Source: Company data, Taobao, Morgan Stanley Research.

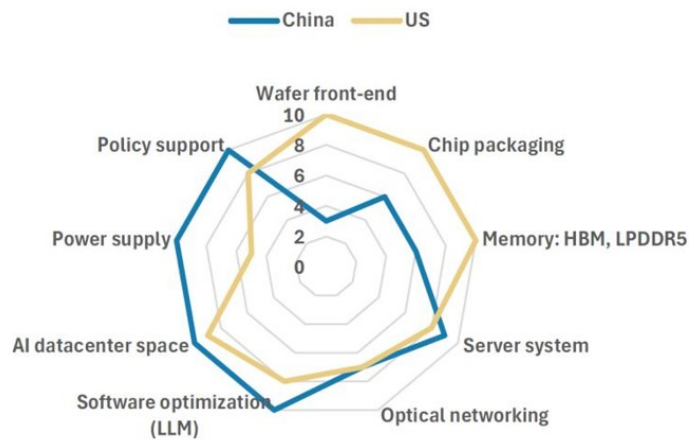
AI Chip Value Chain – China vs. the US – a Decoupling of AI Compute



Source: Morgan Stanley Research.

China's Infrastructure Strength Narrows Perceived Technology Gap

Nine factors comparison between US and China AI – Chip, System, Infrastructure



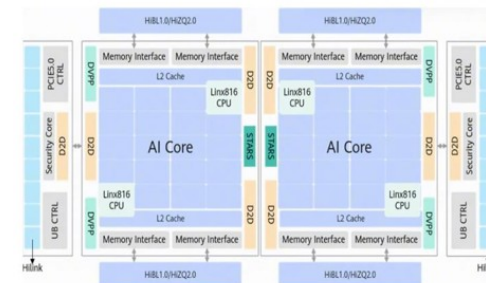
Step 1: If one compute die is not powerful, package more dies into a single chip.

Step 2: If one chip is not powerful enough, build larger racks and clusters.

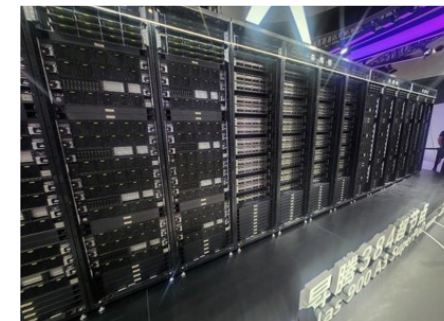
Step 3: If one fab is not sufficient, expand manufacturing capacity.

Source: Morgan Stanley Research.

Die shot of Ascend 950

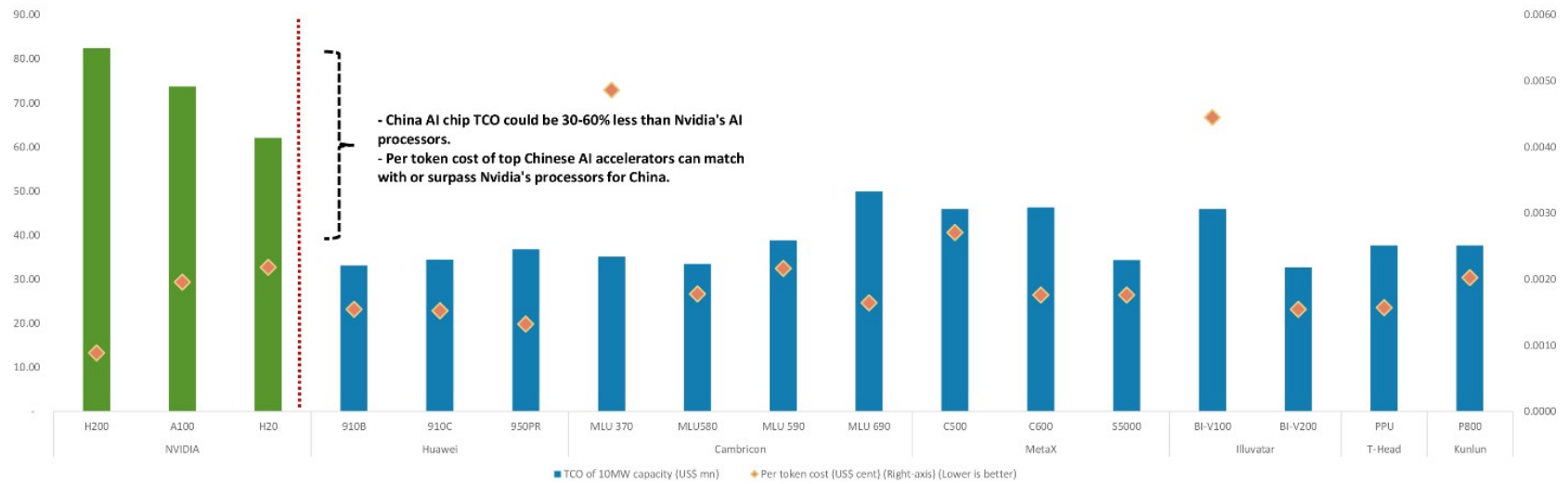


Huawei CloudMatrix 384 A3 SuperPod



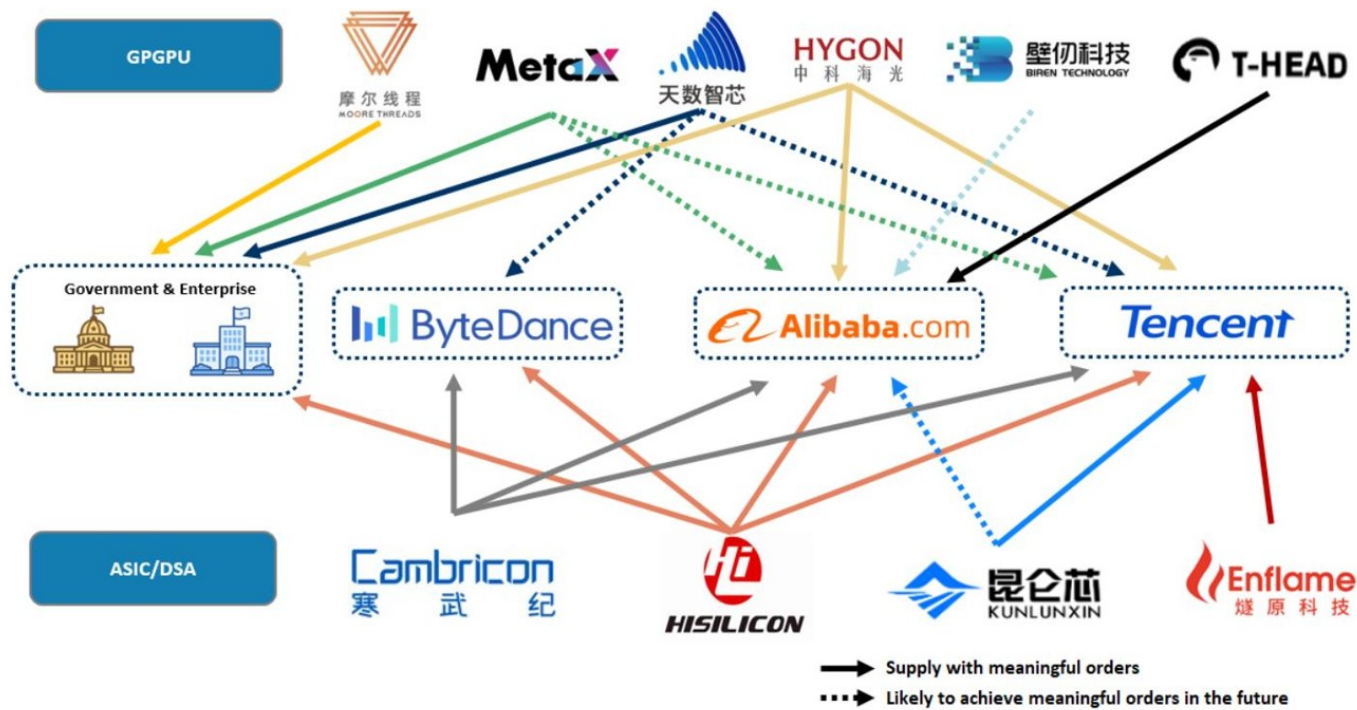
Inference Economics: TCO and Cost per Token

Domestic chips have lower TCO and comparable per token cost (AI LLM inference) vs. NVIDIA's processors for China



Source : Company data, Morgan Stanley Research estimates.

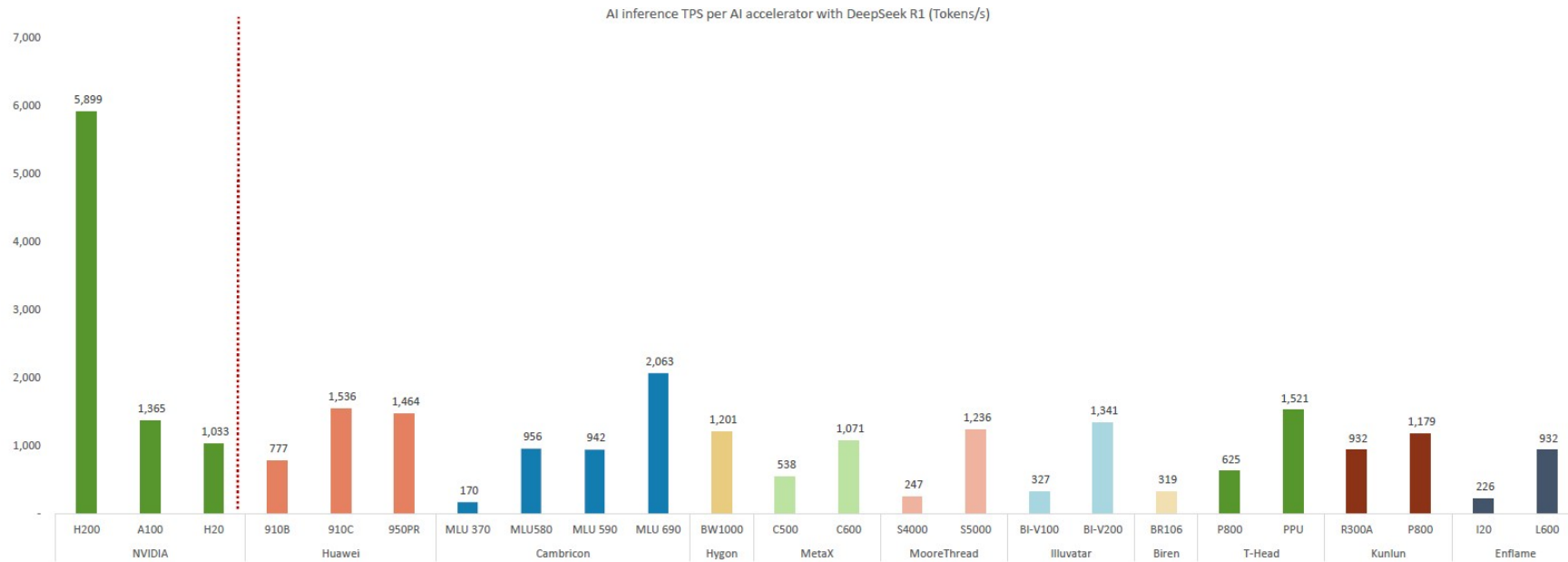
Order placement and potential orders for domestic AI accelerators developers



Source : Morgan Stanley Research

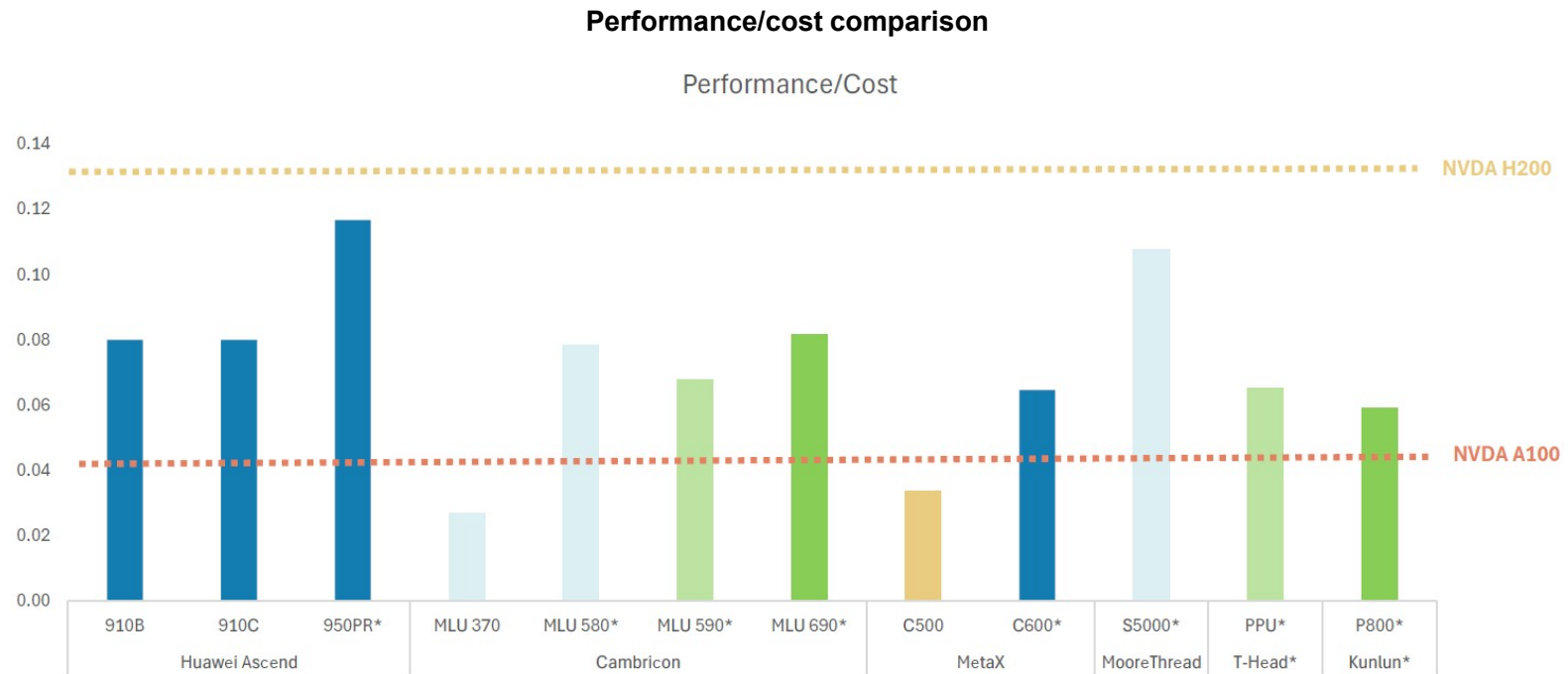
TPS (Tokens Output per Second) – Performance Analysis

TPS (tokens per second) analysis for China AI accelerators












Source: Company data, Morgan Stanley Research estimates (*Our assumptions include: AI LLM: DeepSeek R1; Input token: 1,024; Output token: 1,024; Number of active experts: 9 out of 257; Model size: 671GB; Model layer: 61; Batch size: 1; Computing power: FP8, and if FP8 is not available, we will use FP16).

Domestic Chips Deliver Stronger Performance per Dollar due to Materially Lower Pricing









* = Based on Morgan Stanley estimates. Source : Company data, Morgan Stanley Research.

"10 Dragons" of Chinese AI GPGPU vendors. We focus on Cambricon, MetaX , Iluvatar

Company	Ticker	GPU Product	Node	GPGPU/ASIC	Foundry sourcing viability	Sovereign background	Affiliated design house	AI inference performance
 HUAWEI	Private	950, 910C, 910B	7nm	ASIC	✓	✓	X	↗
 Cambricon 寒武纪	688256-SS	MLU series	7nm	ASIC	✓	X	X	↗
HYGON	688041-SS	DCU	7nm	GPGPU	✓	✓	X	→
 META X 沐曦	688802-SH	MXC series; MXG series	7nm/12nm	GPGPU	✓	X	X	→
 摩尔线程 MOORE THREADS	688795-SH	MUSA MTT S5000, S4000	7nm/12nm	GPGPU	▲	X	X	→
 壁仞科技 BIREN TECHNOLOGY	6082-HK	BR100	7nm/12nm	GPGPU	▲	X	X	→
 天数智芯 Iluvatar CoreX	9903-HK	TianGai-100 series, Zhikai-100 Series	7nm	GPGPU	✓	X	X	→
 T-HEAD	Currently under H-share listing counseling process	Hangguang 800, PPU	12nm	GPGPU	✓	X	✓	↗
 昆仑芯 KUNLUNXIN	Currently under H-share listing counseling process	R and P series	6nm	ASIC	▲	X	✓	→
 Enflame 燧原科技	Currently under A-share listing counseling process	S60, I20, L600	12nm	ASIC	▲	X	✓	↘

Source: Company data, Morgan Stanley Research.

Comparison among Cambricon, MetaX and Iluvatar

			
Ticker	688256-SH	688802-SH	9903-HK
Product	MLU 220/270/370/580/590/690 (AI Training + inference)	C Series (AI training + inference) N Series (AI Inference) G Series (Graphic rendering)	Tiangai 100/150/200/300 (AI training + inference) Zhikai 100 (AI inference)
GPGPU/ASIC	ASIC	GPGPU	GPGPU
Chip suppliers			
Process node for latest products	7nm/N+2	12nm/N+1	7nm
Secured orders from major CSPs	✓	✗	✓
Sovereign fund as major shareholder	✗	✓	✗
Per token cost performance	↑	→	→
2025 Revenue (Rmb mn)	CNY 6,497	CNY 1,644	CNY 1,034
Profitability	✓	✗	✗

Source: Company data, Morgan Stanley Research.

Cambricon: Leading in inference performance and customer anchoring; OW

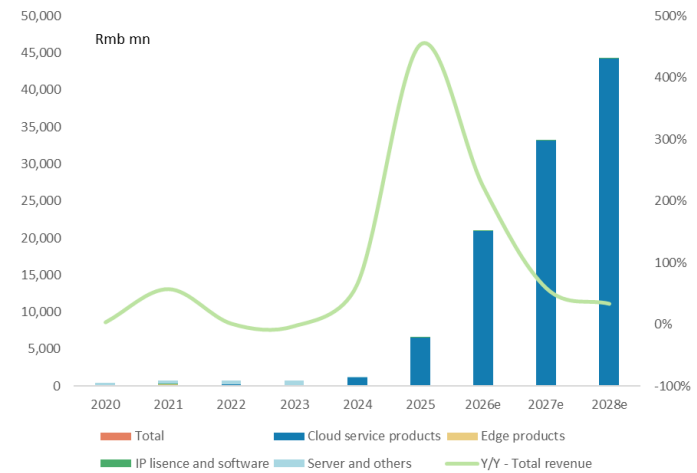
Cambricon's products and specs

	Product	Type	Manufacture	Node	Computing power (TFLOPS/TOPS)			Memory type	Memory size (GB)	Memory bandwidth (GB/s)	Chip-to-chip networking bandwidth (GB/s)	TDP (W)	
					FP16 (TFLOPS)	FP8 (TFLOPS)	Int8 (TOPS)						
AI Training	MLU 370	DSA	TSMC	7nm	96		X	X	LPDDR5	48	614	200	250
	MLU 580*	DSA	SMIC	12nm	280		560	X	HBM3	96	1,600	425	560
	MLU 590*	DSA	TSMC	7nm	315		630	X	HBM3	96	1,600	425	580
	MLU 690*	DSA	SMIC	7nm	700		1,400	X	HBM3	96	2,400	1,200	750
Edge AI	MLU 220	DSA	TSMC	16nm			X	X	LPDDR4	8	400	X	15

Cambricon's supply chain and customers



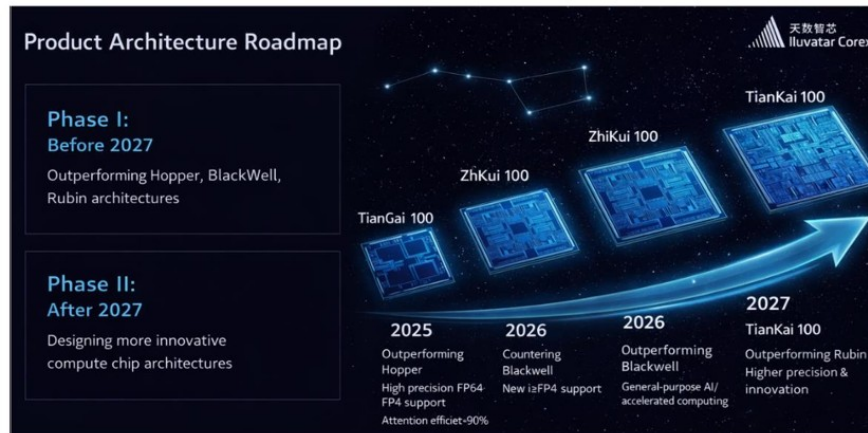
We expect Cambricon's revenue to expand at a 90% CAGR, 2025-28e



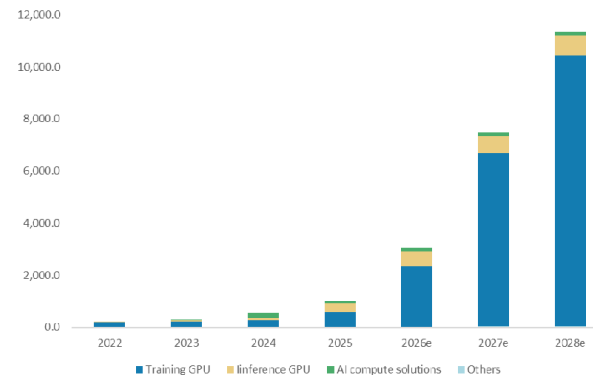
Source: Company data, Morgan Stanley Research. e = Morgan Stanley Research estimates.

Iluvatar: Leveraging supply chain resilience with strong order visibility; OW

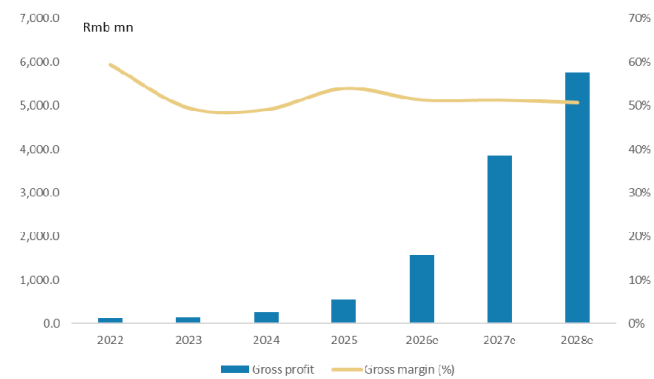
Aggressive product roadmap for Iluvatar



We expect Iluvatar's revenue to expand at a 122% CAGR, 2025-28e



We expect Iluvatar's GM to be mild



Source: Company data, Morgan Stanley Research. e = Morgan Stanley Research estimates.

Morgan Stanley Asia Limited ("Morgan Stanley") is currently acting as exclusive financial advisor to ASMPT Limited ("ASMPT") in relation to its assessment of strategic options for its SMT Solutions Segment (the "Assessment"), as announced on January 21, 2026. There is no assurance that the Assessment will result in a transaction, nor as to the timing or terms thereof. ASMPT has agreed to pay fees to Morgan Stanley for its financial services. Please refer to the notes at the end of the report.

This report references U.S. Executive Order 14032 and/or entities or securities that are designated thereunder. U.S. persons may be prohibited from buying certain securities of entities named in this report. Readers are solely responsible for ensuring that their investment activities are carried out in compliance with applicable laws.

This report references export controls and/or entities that may be subject to export control restrictions. Readers are solely responsible for ensuring that their investment or trade activities are carried out in compliance with applicable laws.

This report references U.S. Executive Order 14105 and/or entities that may be in scope of such order. U.S. persons may be prohibited from engaging in certain transactions or otherwise require certain other transactions be notified to the U.S. Department of Treasury. Readers are solely responsible for ensuring that their investment or trade activities are carried out in compliance with applicable laws.

Disclosure Section

The information and opinions in Morgan Stanley Research were prepared or are disseminated by Morgan Stanley Asia Limited (which accepts the responsibility for its contents) and/or Morgan Stanley Asia (Singapore) Pte. (Registration number 199206298Z) and/or Morgan Stanley Asia (Singapore) Securities Pte Ltd (Registration number 200008434H), regulated by the Monetary Authority of Singapore (which accepts legal responsibility for its contents and should be contacted with respect to any matters arising from, or in connection with, Morgan Stanley Research), and/or Morgan Stanley Taiwan Limited and/or Morgan Stanley & Co International plc, Seoul Branch, and/or Morgan Stanley Australia Limited (A.B.N. 67 003 734 576, holder of Australian financial services license No. 233742, which accepts responsibility for its contents), and/or Morgan Stanley Wealth Management Australia Pty Ltd (A.B.N. 19 009 145 555, holder of Australian financial services license No. 240813, which accepts responsibility for its contents), and/or Morgan Stanley India Company Private Limited having Corporate Identification No (CIN) U22990MH1998PTC115305, regulated by the Securities and Exchange Board of India ("SEBI") and holder of licenses as a Research Analyst (SEBI Registration No. INH000001105); Stock Broker (SEBI Stock Broker Registration No. INZ000244438), Merchant Banker (SEBI Registration No. INM000011203), and depository participant with National Securities Depository Limited (SEBI Registration No. IN-DP-NSDL-567-2021) having registered office at Altimus, Level 39 & 40, Pandurang Budhkar Marg, Worli, Mumbai 400018, India; Telephone no. +91-22-61181000; Compliance Officer Details: Mr. Tejarshi Hardas, Tel. No.: +91-22-61181000 or Email: tejarshi.hardas@morganstanley.com; Grievance officer details: Mr. Tejarshi Hardas, Tel. No.: +91-22-61181000 or Email: msic-compliance@morganstanley.com which accepts the responsibility for its contents and should be contacted with respect to any matters arising from, or in connection with, Morgan Stanley Research, and their affiliates (collectively, "Morgan Stanley"). Morgan Stanley India Company Private Limited (MSICPL) may use AI tools in providing research services. All recommendations contained herein are made by the duly qualified research analysts.

For important disclosures, stock price charts and equity rating histories regarding companies that are the subject of this report, please see the Morgan Stanley Research Disclosure Website at www.morganstanley.com/eqr/disclosures/webapp/generalresearch, or contact your investment representative or Morgan Stanley Research at 1585 Broadway, (Attention: Research Management), New York, NY, 10036 USA.

For valuation methodology and risks associated with any recommendation, rating or price target referenced in this research report, please contact the Client Support Team as follows: US/Canada +1 800 303-2495; Hong Kong +852 2848-5999; Latin America +1 718 754-5444 (U.S.); London +44 (0)20-7425-8169; Singapore +65 6834-6860; Sydney +61 (0)2-9770-1505; Tokyo +81 (0)3-6836-9000. Alternatively you may contact your investment representative or Morgan Stanley Research at 1585 Broadway, (Attention: Research Management), New York, NY 10036 USA.

Analyst Certification

The following analysts hereby certify that their views about the companies and their securities discussed in this report are accurately expressed and that they have not received and will not receive direct or indirect compensation in exchange for expressing specific recommendations or views in this report: Charlie Chan, Daisy Dai, CFA; Tiffany Yeh; Daniel Yen, CFA.

Global Research Conflict Management Policy

Morgan Stanley Research has been published in accordance with our conflict management policy, which is available at www.morganstanley.com/institutional/research/conflictolicies. A Portuguese version of the policy can be found at www.morganstanley.com.br

Important Regulatory Disclosures on Subject Companies

As of April 30, 2026, Morgan Stanley beneficially owned 1% or more of a class of common equity securities of the following companies covered in Morgan Stanley Research: ACM Research Inc, Advanced Micro-Fabrication Equipment Inc, Advanced Wireless Semiconductor Co, Advantest, Alchip Technologies Ltd, AllRing Tech Co., AP Memory Technology Corp, ASE Technology Holding Co. Ltd., Asia Vital Components Co. Ltd., ASMPPT Ltd, Aspeed Technology, Auras Technology Co Ltd, Broadcom Inc., Cambricon Technology Corporation, Chroma Ate Inc., Global Unichip Corp, GlobalWafers Co Ltd, Gudeng Precision, Hon Precision, Hua Hong Semiconductor Ltd, JCET Group Co Ltd, King Yuan Electronics Co Ltd, Macronix International Co Ltd, Marvell Technology Group Ltd, Montage Technology Co Ltd, MPI Corporation, Nanya Technology Corp., NAURA Technology Group Co Ltd, Novatek, Nuvoton Technology Corporation, Phison Electronics Corp, Qualcomm Inc., Realtek Semiconductor, SG Micro Corp., Shanghai Fudan Microelectronics, Silergy Corp., Silicon Motion, Teradyne Inc, TSMC, UMC, Vanguard International Semiconductor, WIN Semiconductors Corp, Winbond Electronics Corp, Wistron Corporation, Wiwynn Corp, WPG Holdings, WT Microelectronics Co. Ltd.

Within the last 12 months, Morgan Stanley managed or co-managed a public offering (or 144A offering) of securities of Broadcom Inc., Montage Technology Co Ltd, Wistron Corporation, Wiwynn Corp.

Within the last 12 months, Morgan Stanley has received compensation for investment banking services from Amkor Technology Inc, ASMPPT Ltd, Broadcom Inc., Montage Technology Co Ltd, Wistron Corporation, Wiwynn Corp.

In the next 3 months, Morgan Stanley expects to receive or intends to seek compensation for investment banking services from Advanced Micro-Fabrication Equipment Inc, Advantest, Alchip Technologies Ltd, Amkor Technology Inc, AP Memory Technology Corp, ASE Technology Holding Co. Ltd., Asia Vital Components Co. Ltd., ASMedia Technology Inc, ASMPPT Ltd, Aspeed Technology, Broadcom Inc., Espressif Systems, GigaDevice Semiconductor Beijing Inc, GlobalWafers Co Ltd, Gudeng Precision, Himax Technologies Inc, Hon Hai Precision, Hua Hong Semiconductor Ltd, Iluvatar CoreX Semiconductor Co., Ltd., Innoscience, King Yuan Electronics Co Ltd, Macronix International Co Ltd, Marvell Technology Group Ltd, MediaTek, Montage Technology Co Ltd, Novatek, Phison Electronics Corp, Powerchip Semiconductor Manufacturing Co, Qualcomm Inc., Quanta Computer Inc., Realtek Semiconductor, Shenzhen Longsys Electronics Co Ltd, Silergy Corp., Silicon Motion, Teradyne Inc, TSMC, UMC, Vanguard International Semiconductor, Winbond Electronics Corp, WinWay Technology Co Ltd, Wistron Corporation, Wiwynn Corp, WPG Holdings, WT Microelectronics Co. Ltd.

Within the last 12 months, Morgan Stanley has received compensation for products and services other than investment banking services from Amkor Technology Inc, ASE Technology Holding Co. Ltd., Broadcom Inc., Hon Hai Precision, King Yuan Electronics Co Ltd, Marvell Technology Group Ltd, MediaTek, Nanya Technology Corp., Novatek, Nuvoton Technology Corporation, Qualcomm Inc., Quanta Computer Inc., Realtek Semiconductor, Silicon Motion, SMIC, TSMC, UMC, Universal Scientific Ind. (Shanghai), Winbond Electronics Corp, WT Microelectronics Co. Ltd.

Within the last 12 months, Morgan Stanley has provided or is providing investment banking services to, or has an investment banking client relationship with, the following company: Advanced Micro-Fabrication Equipment Inc, Advantest, Alchip Technologies Ltd, Amkor Technology Inc, AP Memory Technology Corp, ASE Technology Holding Co. Ltd., Asia Vital Components Co. Ltd., ASMedia Technology Inc, ASMPPT Ltd, Aspeed Technology, Broadcom Inc., Espressif Systems, GigaDevice Semiconductor Beijing Inc, GlobalWafers Co Ltd, Gudeng Precision, Himax Technologies Inc, Hon Hai Precision, Hua Hong Semiconductor Ltd, Iluvatar CoreX Semiconductor Co., Ltd., Innoscience, King Yuan Electronics Co Ltd, Macronix International Co Ltd, Marvell Technology Group Ltd, MediaTek, Montage Technology Co Ltd, Novatek, Phison Electronics Corp, Powerchip Semiconductor Manufacturing Co, Qualcomm Inc., Quanta Computer Inc., Realtek Semiconductor, Shenzhen Longsys Electronics Co Ltd, Silergy Corp., Silicon Motion, Teradyne Inc, TSMC, UMC, Vanguard International Semiconductor, Winbond Electronics Corp, WinWay Technology Co Ltd, Wistron Corporation, Wiwynn Corp, WPG Holdings, WT Microelectronics Co. Ltd.

Within the last 12 months, Morgan Stanley has either provided or is providing non-investment banking, securities-related services to and/or in the past has entered into an agreement to provide services or has a client relationship with the following company: Amkor Technology Inc, ASE Technology Holding Co. Ltd., Broadcom Inc., Hon Hai Precision, King Yuan Electronics Co Ltd, Marvell Technology Group Ltd, MediaTek, Montage Technology Co Ltd, Nanya Technology Corp., Novatek, Nuvoton Technology Corporation, Qualcomm Inc., Quanta Computer Inc., Realtek

Semiconductor, Silicon Motion, SMIC, TSMC, UMC, Universal Scientific Ind. (Shanghai), Winbond Electronics Corp, WT Microelectronics Co. Ltd.

Morgan Stanley & Co. LLC makes a market in the securities of ACM Research Inc, Himax Technologies Inc, Silicon Motion.

The equity research analysts or strategists principally responsible for the preparation of Morgan Stanley Research have received compensation based upon various factors, including quality of research, investor client feedback, stock picking, competitive factors, firm revenues and overall investment banking revenues. Equity Research analysts' or strategists' compensation is not linked to investment banking or capital markets transactions performed by Morgan Stanley or the profitability or revenues of particular trading desks.

Morgan Stanley and its affiliates do business that relates to companies/instruments covered in Morgan Stanley Research, including market making, providing liquidity, fund management, commercial banking, extension of credit, investment services and investment banking. Morgan Stanley sells to and buys from customers the securities/instruments of companies covered in Morgan Stanley Research on a principal basis. Morgan Stanley may have a position in the debt of the Company or instruments discussed in this report. Morgan Stanley trades or may trade as principal in the debt securities (or in related derivatives) that are the subject of the debt research report.

Certain disclosures listed above are also for compliance with applicable regulations in non-US jurisdictions.

STOCK RATINGS

Morgan Stanley uses a relative rating system using terms such as Overweight, Equal-weight, Not-Rated or Underweight (see definitions below). Morgan Stanley does not assign ratings of Buy, Hold or Sell to the stocks we cover. Overweight, Equal-weight, Not-Rated and Underweight are not the equivalent of buy, hold and sell. Investors should carefully read the definitions of all ratings used in Morgan Stanley Research. In addition, since Morgan Stanley Research contains more complete information concerning the analyst's views, investors should carefully read Morgan Stanley Research, in its entirety, and not infer the contents from the rating alone. In any case, ratings (or research) should not be used or relied upon as investment advice. An investor's decision to buy or sell a stock should depend on individual circumstances (such as the investor's existing holdings) and other considerations.

Global Stock Ratings Distribution

(as of May 31, 2026)

The Stock Ratings described below apply to Morgan Stanley's Fundamental Equity Research and do not apply to Debt Research produced by the Firm.

For disclosure purposes only (in accordance with FINRA requirements), we include the category headings of Buy, Hold, and Sell alongside our ratings of Overweight, Equal-weight, Not-Rated and Underweight. Morgan Stanley does not assign ratings of Buy, Hold or Sell to the stocks we cover. Overweight, Equal-weight, Not-Rated and Underweight are not the equivalent of buy, hold, and sell but represent recommended relative weightings (see definitions below). To satisfy regulatory requirements, we correspond Overweight, our most positive stock rating, with a buy recommendation; we correspond Equal-weight and Not-Rated to hold and Underweight to sell recommendations, respectively.

Stock Rating Category	Coverage Universe		Investment Banking Clients (IBC)			Other Material Investment Services Clients (MISC)	
	Count	% of Total	Count	% of Total IBC	% of Rating Category	Count	% of Total Other MISC
Overweight/Buy	1542	42%	465	51%	30%	707	43%
Equal-weight/Hold	1571	43%	369	40%	23%	723	44%
Not-Rated/Hold	3	0%	0	0%	0%	1	0%
Underweight/Sell	551	15%	86	9%	16%	201	12%
Total	3,667		920			1632	

Data include common stock and ADRs currently assigned ratings. Investment Banking Clients are companies from whom Morgan Stanley received investment banking compensation in the last 12 months. Due to rounding off of decimals, the percentages provided in the "% of total" column may not add up to exactly 100 percent.

Analyst Stock Ratings

Overweight (O). The stock's total return is expected to exceed the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis, over the next 12-18 months.

Equal-weight (E). The stock's total return is expected to be in line with the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis, over the next 12-18 months.

Not-Rated (NR). Currently the analyst does not have adequate conviction about the stock's total return relative to the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis, over the next 12-18 months.

Underweight (U). The stock's total return is expected to be below the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis, over the next 12-18 months.

Unless otherwise specified, the time frame for price targets included in Morgan Stanley Research is 12 to 18 months.

Analyst Industry Views

Attractive (A). The analyst expects the performance of his or her industry coverage universe over the next 12-18 months to be attractive vs. the relevant broad market benchmark, as indicated below.

In-Line (I). The analyst expects the performance of his or her industry coverage universe over the next 12-18 months to be in line with the relevant broad market benchmark, as indicated below.

Cautious (C). The analyst views the performance of his or her industry coverage universe over the next 12-18 months with caution vs. the relevant broad market benchmark, as indicated below. Benchmarks for each region are as follows: North America - S&P 500; Latin America - relevant MSCI country index or MSCI Latin America Index; Europe - MSCI Europe; Japan - TOPIX; Asia - relevant MSCI country index or MSCI sub-regional index or MSCI AC Asia Pacific ex Japan Index.

Important Disclosures for Morgan Stanley Smith Barney LLC Customers

Important disclosures regarding any material conflict of interest that can reasonably be expected to have influenced Morgan Stanley Smith Barney LLC's choice of a third-party research provider or the subject company of a third-party research report, are available on the Morgan Stanley Wealth Management disclosure website at www.morganstanley.com/online/researchdisclosures.

For Morgan Stanley specific disclosures, you may refer to <https://www.morganstanley.com/eqr/disclosures/webapp/generalresearch>.

Each Morgan Stanley research report is reviewed and approved on behalf of Morgan Stanley Smith Barney LLC. This review and approval is conducted by the same person who reviews the research report on behalf of Morgan Stanley. This could create a conflict of interest.

Other Important Disclosures

Morgan Stanley Research policy is to update research reports as and when the Research Analyst and Research Management deem appropriate, based on developments with the issuer, the sector, or the market that may have a material impact on the research views or opinions stated therein. In addition, certain Research publications are intended to be updated on a regular periodic basis (weekly/monthly/quarterly/annual) and will ordinarily be updated with that frequency, unless the Research Analyst and Research Management determine that a different publication schedule is appropriate based on current conditions.

Morgan Stanley is not acting as a municipal advisor and the opinions or views contained herein are not intended to be, and do not constitute, advice within the meaning of Section 975 of the Dodd-Frank Wall Street Reform and Consumer Protection Act.

Morgan Stanley produces an equity research product called a "Tactical Idea." Views contained in a "Tactical Idea" on a particular stock may be contrary to the recommendations or views expressed in research on the same stock. This may be the result of differing time horizons, methodologies, market events, or other factors. For all research available on a particular stock, please contact your sales representative or go to Matrix at <http://www.morganstanley.com/matrix>.

Morgan Stanley Research is provided to our clients through our proprietary research portal on Matrix and also distributed electronically by Morgan Stanley to clients. Certain, but not all, Morgan Stanley Research products are also made available to clients through third-party vendors or redistributed to clients through alternate electronic means as a convenience. For access to all available Morgan Stanley Research, please contact your sales representative or go to Matrix at <http://www.morganstanley.com/matrix>.

Any access and/or use of Morgan Stanley Research is subject to Morgan Stanley's Terms of Use (<http://www.morganstanley.com/terms.html>). In addition you consent to Morgan Stanley processing your personal data and using cookies in accordance with our Privacy Policy and our Global Cookies Policy (http://www.morganstanley.com/privacy_pledge.html), including for the purposes of setting your preferences and to collect readership data so that we can deliver better and more personalized service and products to you. To find out more information about how Morgan Stanley processes personal data, how we use cookies and how to reject cookies see our Privacy Policy and our Global Cookies Policy (http://www.morganstanley.com/privacy_pledge.html). Please use the provided link to review the Terms and Conditions and Most Important Terms and Conditions for Morgan Stanley India Company Private Limited (https://www.morganstanley.com/assets/pdfs/about-us-global-offices/india/Terms_and_conditions.pdf) and the following link to review the audit report (https://ny.matrix.ms.com/eqr/research/webapp/researchdocs/MSICPL_Morgan_Stanley_Research_Audit_Report.pdf).

If you do not agree to our Terms of Use and/or if you do not wish to provide your consent to Morgan Stanley processing your personal data or using cookies please do not access our research. Morgan Stanley Research does not provide individually tailored investment advice. Morgan Stanley Research has been prepared without regard to the circumstances and objectives of those who receive it. Morgan Stanley recommends that investors independently evaluate particular investments and strategies, and encourages investors to seek the advice of a financial adviser. The appropriateness of an investment or strategy will depend on an investor's circumstances and objectives. The securities, instruments, or strategies discussed in Morgan Stanley Research may not be suitable for all investors, and certain investors may not be eligible to purchase or participate in some or all of them. Morgan Stanley Research is not an offer to buy or sell or the solicitation of an offer to buy or sell any security/instrument or to participate in any particular trading strategy. The value of and income from your investments may vary because of changes in interest rates, foreign exchange rates, default rates, prepayment rates, securities/instruments prices, market indexes, operational or financial conditions of companies or other factors. There may be time limitations on the exercise of options or other rights in securities/instruments transactions. Past performance is not necessarily a guide to future performance. Estimates of future performance are based on assumptions that may not be realized. If provided, and unless otherwise stated, the closing price on the cover page is that of the primary exchange for the subject company's securities/instruments.

The fixed income research analysts, strategists or economists principally responsible for the preparation of Morgan Stanley Research have received compensation based upon various factors, including quality, accuracy and value of research, firm profitability or revenues (which include fixed income trading and capital markets profitability or revenues), client feedback and competitive factors. Fixed Income Research analysts', strategists' or economists' compensation is not linked to investment banking or capital markets transactions performed by Morgan Stanley or the profitability or revenues of particular trading desks.

The "Important Regulatory Disclosures on Subject Companies" section in Morgan Stanley Research lists all companies mentioned where Morgan Stanley owns 1% or more of a class of common equity securities of the companies. For all other companies mentioned in Morgan Stanley Research, Morgan Stanley may have an investment of less than 1% in securities/instruments or derivatives of securities/instruments of companies and may trade them in ways different from those discussed in Morgan Stanley Research. Employees of Morgan Stanley not involved in the preparation of Morgan Stanley Research may have investments in securities/instruments or derivatives of securities/instruments of companies mentioned and may trade them in ways different from those discussed in Morgan Stanley Research. Derivatives may be issued by Morgan Stanley or associated persons.

With the exception of information regarding Morgan Stanley, Morgan Stanley Research is based on public information. Morgan Stanley makes every effort to use reliable, comprehensive information, but we make no representation that it is accurate or complete. We have no obligation to tell you when opinions or information in Morgan Stanley Research change apart from when we intend to discontinue equity research coverage of a subject company. Facts and views presented in Morgan Stanley Research have not been reviewed by, and may not reflect information known to, professionals in other Morgan Stanley business areas, including investment banking personnel.

Morgan Stanley Research personnel may participate in company events such as site visits and are generally prohibited from accepting payment by the company of associated expenses unless pre-approved by authorized members of Research management.

Morgan Stanley may make investment decisions that are inconsistent with the recommendations or views in this report.

To our readers based in Taiwan or trading in Taiwan securities/instruments: Information on securities/instruments that trade in Taiwan is distributed by Morgan Stanley Taiwan Limited ("MSTL"). Such information is for your reference only. The reader should independently evaluate the investment risks and is solely responsible for their investment decisions. Morgan Stanley Research may not be distributed to the public media or quoted or used by the public media without the express written consent of Morgan Stanley. Any non-customer reader within the scope of Article 7-1 of the Taiwan Stock Exchange Recommendation Regulations accessing and/or receiving Morgan Stanley Research is not permitted to provide Morgan Stanley Research to any third party (including but not limited to related parties, affiliated companies and any other third parties) or engage in any activities regarding Morgan Stanley Research which may create or give the appearance of creating a conflict of interest. Information on securities/instruments that do not trade in Taiwan is for informational purposes only and is not to be construed as a recommendation or a solicitation to trade in such securities/instruments. MSTL may not execute transactions for clients in these securities/instruments.

Certain information in Morgan Stanley Research was sourced by employees of the Shanghai Representative Office of Morgan Stanley Asia Limited for the use of Morgan Stanley Asia Limited. Morgan Stanley is not incorporated under PRC law and the research in relation to this report is conducted outside the PRC. Morgan Stanley Research does not constitute an offer to sell or the solicitation of an offer to buy any securities in the PRC. PRC investors shall have the relevant qualifications to invest in such securities and shall be responsible for obtaining all relevant

approvals, licenses, verifications and/or registrations from the relevant governmental authorities themselves. Neither this report nor any part of it is intended as, or shall constitute, provision of any consultancy or advisory service of securities investment as defined under PRC law. Such information is provided for your reference only.

Morgan Stanley Research is disseminated in Brazil by Morgan Stanley C.T.V.M. S.A. located at Av. Brigadeiro Faria Lima, 3600, 6th floor, São Paulo - SP, Brazil; and is regulated by the Comissão de Valores Mobiliários; in Mexico by Morgan Stanley México, Casa de Bolsa, S.A. de C.V. which is regulated by Comisión Nacional Bancaria y de Valores. Paseo de los Tamarindos 90, Torre 1, Col. Bosques de las Lomas Floor 29, 05120 Mexico City; in Japan by Morgan Stanley MUFG Securities Co., Ltd. and, for Commodities related research reports only, Morgan Stanley Capital Group Japan Co., Ltd; in Hong Kong by Morgan Stanley Asia Limited (which accepts responsibility for its contents) and by Morgan Stanley Bank Asia Limited; in Singapore by Morgan Stanley Asia (Singapore) Pte. (Registration number 199206298Z) and/or Morgan Stanley Asia (Singapore) Securities Pte Ltd (Registration number 200008434H), regulated by the Monetary Authority of Singapore (which accepts legal responsibility for its contents and should be contacted with respect to any matters arising from, or in connection with, Morgan Stanley Research) and by Morgan Stanley Bank Asia Limited, Singapore Branch (Registration number T14FC0118); in Australia to "wholesale clients" within the meaning of the Australian Corporations Act by Morgan Stanley Australia Limited A.B.N. 67 003 734 576, holder of Australian financial services license No. 233742, which accepts responsibility for its contents; in Australia to "wholesale clients" and "retail clients" within the meaning of the Australian Corporations Act by Morgan Stanley Wealth Management Australia Pty Ltd (A.B.N. 19 009 145 555, holder of Australian financial services license No. 240813, which accepts responsibility for its contents; in Korea by Morgan Stanley & Co International plc, Seoul Branch; in India by Morgan Stanley India Company Private Limited having Corporate Identification No (CIN) U22990MH1998PTC115305, regulated by the Securities and Exchange Board of India ("SEBI") and holder of licenses as a Research Analyst (SEBI Registration No. INH000001105); Stock Broker (SEBI Stock Broker Registration No. INZ000244438), Merchant Banker (SEBI Registration No. INM000011203), and depository participant with National Securities Depository Limited (SEBI Registration No. IN-DP-NSDL-567-2021) having registered office at Altimus, Level 39 & 40, Pandurang Budhkar Marg, Worli, Mumbai 400018, India; Telephone no. +91-22-61181000; Compliance Officer Details: Mr. Tejarshi Hardas, Tel. No.: +91-22-61181000 or Email: tejarshi.hardas@morganstanley.com; Grievance officer details: Mr. Tejarshi Hardas, Tel. No.: +91-22-61181000 or Email: msic-compliance@morganstanley.com. Morgan Stanley India Company Private Limited (MSICPL) may use AI tools in providing research services. All recommendations contained herein are made by the duly qualified research analysts; in Canada by Morgan Stanley Canada Limited; in Germany and the European Economic Area where required by Morgan Stanley Europe S.E., authorised and regulated by Bundesanstalt fuer Finanzdienstleistungsaufsicht (BaFin) under the reference number 149169; in the US by Morgan Stanley & Co. LLC, which accepts responsibility for its contents. Morgan Stanley & Co. International plc, authorized by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority, disseminates in the UK research that it has prepared, and research which has been prepared by any of its affiliates, only to persons who (i) are investment professionals falling within Article 19(5) of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005 (as amended, the "Order"); (ii) are persons who are high net worth entities falling within Article 49(2)(a) to (d) of the Order; or (iii) are persons to whom an invitation or inducement to engage in investment activity (within the meaning of section 21 of the Financial Services and Markets Act 2000, as amended) may otherwise lawfully be communicated or caused to be communicated. RMB Morgan Stanley Proprietary Limited is a member of the JSE Limited and A2X (Pty) Ltd. RMB Morgan Stanley Proprietary Limited is a joint venture owned equally by Morgan Stanley International Holdings Inc. and RMB Investment Advisory (Proprietary) Limited, which is wholly owned by FirstRand Limited. The information in Morgan Stanley Research is being disseminated by Morgan Stanley Saudi Arabia, regulated by the Capital Market Authority in the Kingdom of Saudi Arabia, and is directed at Sophisticated investors only.

Morgan Stanley Hong Kong Securities Limited is the liquidity provider/market maker for securities of ASMP Ltd, Hon Hai Precision, Hua Hong Semiconductor Ltd listed on the Stock Exchange of Hong Kong Limited. An updated list can be found on HKEx website: <http://www.hkex.com.hk>.

The information in Morgan Stanley Research is being communicated by Morgan Stanley & Co. International plc (DIFC Branch), regulated by the Dubai Financial Services Authority (the DFSA) or by Morgan Stanley & Co. International plc (ADGM Branch), regulated by the Financial Services Regulatory Authority Abu Dhabi (the FSRA), and is directed at Professional Clients only, as defined by the DFSA or the FSRA, respectively. The financial products or financial services to which this research relates will only be made available to a customer who we are satisfied meets the regulatory criteria of a Professional Client. A distribution of the different MS Research ratings or recommendations, in percentage terms for Investments in each sector covered, is available upon request from your sales representative.

The information in Morgan Stanley Research is being communicated by Morgan Stanley & Co. International plc (QFC Branch), regulated by the Qatar Financial Centre Regulatory Authority (the QFCRA), and is directed at business customers and market counterparties only and is not intended for Retail Customers as defined by the QFCRA.

As required by the Capital Markets Board of Turkey, investment information, comments and recommendations stated here, are not within the scope of investment advisory activity. Investment advisory service is provided exclusively to persons based on their risk and income preferences by the authorized firms. Comments and recommendations stated here are general in nature. These opinions may not fit to your financial status, risk and return preferences. For this reason, to make an investment decision by relying solely to this information stated here may not bring about outcomes that fit your expectations.

The trademarks and service marks contained in Morgan Stanley Research are the property of their respective owners. Third-party data providers make no warranties or representations relating to the accuracy, completeness, or timeliness of the data they provide and shall not have liability for any damages relating to such data. The Global Industry Classification Standard (GICS) was developed by and is the exclusive property of MSCI and S&P.

Morgan Stanley Research, or any portion thereof may not be reprinted, sold or redistributed without the written consent of Morgan Stanley.

Indicators and trackers referenced in Morgan Stanley Research may not be used as, or treated as, a benchmark under Regulation EU 2016/1011, or any other similar framework.

The issuers and/or fixed income products recommended or discussed in certain fixed income research reports may not be continuously followed. Accordingly, investors should regard those fixed income research reports as providing stand-alone analysis and should not expect continuing analysis or additional reports relating to such issuers and/or individual fixed income products. Morgan Stanley may hold, from time to time, material financial and commercial interests regarding the company subject to the Research report.

Registration granted by SEBI and certification from the National Institute of Securities Markets (NISM) in no way guarantee performance of the intermediary or provide any assurance of returns to investors. Investment in securities market are subject to market risks. Read all the related documents carefully before investing.

INDUSTRY COVERAGE: Greater China Technology Semiconductors

COMPANY (TICKER)	RATING (AS OF)	PRICE* (06/04/2026)
Charlie Chan		
ACM Research Inc (ACMR.O)	O (03/07/2023)	US\$88.86
Advanced Micro-Fabrication Equipment Inc (688012.SS)	O (11/06/2023)	Rmb289.39
Advanced Wireless Semiconductor Co (8086.TWO)	U (07/14/2025)	NT\$159.00

Alchip Technologies Ltd (3661.TW)	O (05/14/2021)	NT\$4,340.00
ASE Technology Holding Co. Ltd. (3711.TW)	O (09/15/2024)	NT\$593.00
Cambricon Technology Corporation (688256.SS)	O (04/27/2026)	Rmb1,358.90
Global Unichip Corp (3443.TW)	E (05/28/2026)	NT\$4,400.00
GlobalWafers Co Ltd (6488.TWO)	E (05/19/2026)	NT\$870.00
Gudeng Precision (3680.TWO)	O (11/25/2025)	NT\$537.00
Hua Hong Semiconductor Ltd (1347.HK)	E (03/12/2026)	HK\$156.50
Iluvatar CoreX Semiconductor Co., Ltd. (9903.HK)	O (04/27/2026)	HK\$430.20
King Yuan Electronics Co Ltd (2449.TW)	O (03/03/2023)	NT\$322.00
Maxscend Microelectronics Co Ltd (300782.SZ)	U (01/11/2021)	Rmb104.85
MediaTek (2454.TW)	O (11/28/2025)	NT\$4,430.00
MetaX Integrated Circuits (688802.SS)	E (04/27/2026)	Rmb724.30
Nanya Technology Corp. (2408.TW)	O (05/28/2026)	NT\$395.00
NAURA Technology Group Co Ltd (002371.SZ)	O (11/06/2023)	Rmb627.00
OmniVision Integrated Circuits Group Inc (603501.SS)	E (11/17/2025)	Rmb98.86
Phison Electronics Corp (8299.TWO)	E (02/25/2026)	NT\$2,580.00
SG Micro Corp. (300661.SZ)	E (11/03/2025)	Rmb113.25
Silergy Corp. (6415.TW)	U (05/19/2026)	NT\$570.00
SMIC (0981.HK)	O (10/21/2025)	HK\$81.50
TSMC (2330.TW)	O (02/07/2022)	NT\$2,385.00
UMC (2303.TW)	O (05/19/2026)	NT\$125.00
Vanguard International Semiconductor (5347.TWO)	E (01/14/2026)	NT\$163.00
WIN Semiconductors Corp (3105.TWO)	U (07/14/2025)	NT\$487.50
Daisy Dai, CFA		
ASMPT Ltd (0522.HK)	O (07/24/2025)	HK\$184.00
China Resources Microelectronics Limited (688396.SS)	U (03/02/2026)	Rmb72.59
Elan Microelectronics Corp (2458.TW)	O (10/03/2025)	NT\$162.00
Empyrean Technology Co Ltd (301269.SZ)	E (01/17/2025)	Rmb103.63
Hangzhou Silan Microelectronics Co. Ltd. (600460.SS)	U (08/25/2025)	Rmb35.32
Innoscence (2577.HK)	E (10/13/2025)	HK\$75.15
JCET Group Co Ltd (600584.SS)	E (01/16/2026)	Rmb80.08
Shanghai Fudan Microelectronics (1385.HK)	O (03/07/2025)	HK\$30.20
SICC Co Ltd (688234.SS)	O (03/20/2026)	Rmb139.10
StarPower Semiconductor Ltd (603290.SS)	E (05/14/2026)	Rmb121.33
Unigroup Guoxin Microelectronics Co Ltd (002049.SZ)	U (01/10/2023)	Rmb77.27
Universal Scientific Ind. (Shanghai) (601231.SS)	O (11/05/2025)	Rmb45.76
Yangjie Technology (300373.SZ)	O (06/10/2022)	Rmb105.50
Daniel Yen, CFA		
AP Memory Technology Corp (6531.TW)	O (07/11/2025)	NT\$1,055.00
ASMedia Technology Inc (5269.TW)	U (10/03/2025)	NT\$1,570.00
Aspeed Technology (5274.TWO)	O (06/09/2025)	NT\$18,265.00
Egis Technology Inc (6462.TWO)	E (01/28/2026)	NT\$118.00
Espressif Systems (688018.SS)	O (05/15/2023)	Rmb168.60
GigaDevice Semiconductor Beijing Inc (603986.SS)	O (05/15/2025)	Rmb529.31
Macronix International Co Ltd (2337.TW)	O (09/18/2025)	NT\$156.50
Montage Technology Co Ltd (6809.HK)	O (03/18/2026)	HK\$406.20
Montage Technology Co Ltd (688008.SS)	O (03/18/2026)	Rmb259.67
Novatek (3034.TW)	U (02/04/2026)	NT\$489.00
Nuvoton Technology Corporation (4919.TW)	U (11/10/2025)	NT\$194.00
Parade Technologies Ltd (4966.TWO)	O (05/27/2026)	NT\$756.00
Powerchip Semiconductor Manufacturing Co (6770.TW)	O (10/27/2025)	NT\$81.00
Realtek Semiconductor (2379.TW)	E (01/30/2026)	NT\$624.00
Shenzhen Goodix Technology Co Ltd (603160.SS)	U (07/14/2025)	Rmb55.60
Winbond Electronics Corp (2344.TW)	O (05/28/2026)	NT\$179.50
WPG Holdings (3702.TW)	O (03/16/2026)	NT\$116.50

WT Microelectronics Co. Ltd. (3036.TW)	O (01/27/2026)	NT\$282.00
Duan Liu		
Dosilicon Co Ltd (688110.SS)	U (09/06/2024)	Rmb132.01
Shenzhen Longsys Electronics Co Ltd (301308.SZ)	E (02/25/2026)	Rmb568.48
Tiffany Yeh		
AllRing Tech Co. (6187.TWO)	O (09/23/2025)	NT\$1,115.00
FOCI Fiber Optic Communications Inc (3363.TWO)	O (01/15/2025)	NT\$840.00
Himax Technologies Inc (HIMX.O)	E (02/04/2026)	US\$24.19
Hon Precision (7769.TW)	O (04/17/2026)	NT\$7,385.00
MPI Corporation (6223.TWO)	O (04/17/2026)	NT\$6,070.00
Silicon Motion (SIMO.O)	O (05/06/2024)	US\$306.57
WinWay Technology Co Ltd (6515.TW)	O (04/17/2026)	NT\$8,650.00

Stock Ratings are subject to change. Please see latest research for each company.

* Historical prices are not split adjusted.