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Investor Presentation | Asia Pacific

2026 Outlook: Prefer AI to Non-AI; Both Logic and Memory Are Attractive

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GREATER CHINA TECHNOLOGY SEMICONDUCTORS

Asia Pacific
Industry View **Attractive**

Refreshed AI Semi Outlook

- Top ideas:
  - **OW:**
    - **AI:** TSMC (Top Pick), SMIC, Aspeed, MediaTek, Alchip, GUC, KYEC, ASE, FOCI, ASMPT, AllRing
    - **Memory (AI rippling effect):** Winbond (Top Pick), Phison, Nanya Tech, APMemory, GigaDevice, Macronix
    - **Non-AI:**
      - Smartphone/Glasses: Realtek, USI
      - China WFE: NAURA Tech, AMEC,
    - **EW/UW:** UMC, Hua Hong, Vanguard, WIN Semi, OmniVision, ASMedia
- Long-term demand drivers:
  - **Tech inflation:** We expect 'price elasticity' to impact demand for tech products. Rising wafer, OSAT and memory costs create more margin headwinds for chip designers into 2026.
  - **AI cannibalization:** Besides demand weakness (AI to replace some human jobs), semi supply chain also prioritizing AI semis over non-AI semis, e.g. T-Glass and memory shortage.
  - **Tech diffusion:** AI semi demand reacceleration – thanks to generative AI – which is proliferating to different verticals such as robotics and AI glasses. Edge AI compute in smartphone and PC remains to be seen.
  - **China AI: DeepSeek triggering inferencing AI demand, but are domestic GPUs sufficient?** DeepSeek has demonstrated cheaper inferencing. However, shipments of Nvidia H200, if any, could dilute the domestic GPU supply chain.

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

Ticker	Company	Price 1/7/2026	Currency	Price Target	Upside/ Downside	Rating	Dividend Yield (%)	FCF Yield (%)	Market Cap (US$M)	3M Avg. Daily Trading (US$M)	P/E Ratio (x) 2025e	P/E Ratio (x) 2026e	P/E Ratio (x) 2027e	EPS Growth 2025e	EPS Growth 2026e	EPS Growth 2027e	ROAE 2025e	ROAE 2026e	ROAE 2027e	P/B Ratio (x) 2025e	P/B Ratio (x) 2026e	P/B Ratio (x) 2027e
Foundry																						
2330.TW	TSMC	1,695.0	TWD	1,888.0	11%	O	1.4%	1.8%	1,387,726	1,641.5	26.1	19.7	16.3	44%	32%	21%	35%	36%	34%	8.2	6.3	4.9
2303.TW	UMC	52.4	TWD	52.5	0%	E	5.1%	5.3%	20,888	73.0	15.9	15.6	13.8	-12%	2%	13%	11%	11%	12%	1.8	1.7	1.7
0981.HK	SMIC	76.0	HKD	80.0	5%	O	0.0%	-5.0%	63,145	828.6	NM	NM	NM	71%	136%	30%	4%	9%	10%	NM	NM	NM
5347.TWO	Vanguard	110.0	TWD	82.5	-25%	U	5.1%	3.1%	6,455	22.0	26.5	26.9	21.1	9%	-2%	28%	11%	11%	14%	3.0	3.0	2.9
1347.HK	Hua Hong	92.5	HKD	60.0	-35%	U	0.1%	-4.6%	20,327	427.3	NM	NM	NM	48%	334%	19%	1%	6%	7%	NM	NM	NM
6770.TW	PSMC	48.8	TWD	41.0	-16%	O	0.0%	5.6%	6,422	306.5	NM	NM	NM	35%	-94%	-663%	-13%	-1%	4%	2.5	2.5	2.4
3105.TWO	WIN Semi	196.5	TWD	115.0	-41%	U	0.5%	-3.8%	2,264	69.2	73.3	51.1	38.5	49%	43%	33%	3%	4%	5%	2.1	2.1	2.1
8086.TWO	AWSC	109.5	TWD	85.0	-22%	U	1.1%	-3.9%	679	9.0	35.6	33.6	31.4	16%	6%	7%	8%	8%	8%	2.6	2.5	2.4
Mean:							**1.7%**	**-0.2%**			**45.1**	**37.2**	**30.3**	**32%**	**57%**	**-64%**	**8%**	**11%**	**12%**	**3.4**	**3.0**	**2.7**
Median:							**0.8%**	**-1.0%**			**26.5**	**26.9**	**21.1**	**39%**	**19%**	**20%**	**6%**	**8%**	**9%**	**2.6**	**2.5**	**2.4**
Memory																						
603986.SS	Giga Device	261.2	CNY	255.0	-2%	O	0.4%	4.1%	24,099	1,071.3	93.4	50.9	40.3	69%	84%	26%	11%	17%	19%	9.5	8.2	7.1
2408.TW	Nanya Tech	244.5	TWD	198.0	-19%	O	0.0%	13.6%	23,795	697.5	NM	16.0	19.5	-176%	NM	NM	1%	26%	17%	4.6	3.6	3.0
2344.TW	Winbond	109.0	TWD	88.0	-19%	O	0.0%	16.6%	15,488	508.5	93.4	18.4	12.8	1635%	NM	NM	5%	23%	27%	4.7	3.9	3.0
8299.TWO	Phison	1,700.0	TWD	1,000.0	-41%	O	0.9%	1.6%	11,048	261.8	73.0	36.8	30.6	-35%	98%	20%	10%	19%	20%	7.0	6.1	5.4
SIMO.O	Silicon Motion	121.1	USD	105.0	-13%	O	1.1%	2.1%	4,070	39.3	35.4	22.8	17.1	14%	55%	33%	14%	20%	22%	4.8	4.1	3.5
2337.TW	Macronix	61.4	TWD	48.0	-22%	O	4.6%	17.2%	3,594	173.9	NM	NM	NM	25%	-133%	167%	-9%	3%	8%	2.7	2.9	2.6
Mean:							**1.2%**	**9.2%**			**73.8**	**29.0**	**24.0**	**255%**	**26%**	**62%**	**5%**	**18%**	**19%**	**5.5**	**4.8**	**4.1**
Median:							**0.6%**	**8.8%**			**83.2**	**22.8**	**19.5**	**19%**	**70%**	**30%**	**8%**	**19%**	**19%**	**4.8**	**4.0**	**3.3**
Backend																						
3711.TW	ASEH	271.0	TWD	308.0	14%	O	2.1%	6.0%	37,131	184.0	30.5	18.7	13.1	20%	63%	42%	11%	17%	21%	3.2	2.9	2.6
600584.SS	JCET	39.3	CNY	23.5	-40%	U	0.4%	5.7%	9,767	293.9	37.0	27.9	20.8	17%	33%	34%	6%	8%	10%	2.3	2.1	1.9
601231.SS	USI	29.5	CNY	28.3	-4%	O	0.9%	-7.4%	9,049	119.7	38.9	21.2	17.0	1%	83%	25%	9%	15%	17%	3.4	3.0	2.7
2449.TW	KYEC	262.5	TWD	308.0	17%	O	1.8%	1.6%	10,135	211.6	29.2	26.3	18.2	42%	11%	44%	24%	23%	29%	6.5	5.7	4.7
Mean:							**1.3%**	**1.5%**			**34.1**	**23.7**	**17.6**	**20%**	**48%**	**36%**	**13%**	**16%**	**19%**	**3.8**	**3.4**	**3.0**
Median:							**1.4%**	**3.7%**			**34.1**	**23.7**	**17.6**	**19%**	**48%**	**38%**	**10%**	**16%**	**19%**	**3.3**	**3.0**	**2.6**
Power Semis/ IDM																						
688396.SS	CR Micro	59.2	CNY	40.0	-32%	E	0.1%	1.6%	10,796	106.5	51.4	38.0	29.0	84%	35%	31%	6%	8%	9%	3.0	2.8	2.6
600460.SS	Silan Micro	29.6	CNY	20.0	-33%	U	0.1%	2.1%	6,850	198.5	77.2	34.6	23.5	190%	123%	47%	5%	9%	12%	3.4	3.1	2.8
603290.SS	StarPower	100.6	CNY	105.0	4%	O	0.6%	0.0%	3,346	82.4	39.5	30.6	26.5	12%	29%	15%	9%	10%	11%	3.3	3.1	2.8
300373.SZ	Yangjie	70.9	CNY	88.0	24%	O	0.6%	-2.8%	5,330	140.4	28.8	21.8	16.6	33%	32%	32%	14%	16%	18%	3.7	3.3	2.8
Mean:							**0.4%**	**0.2%**			**49.2**	**31.3**	**23.9**	**80%**	**55%**	**31%**	**8%**	**11%**	**13%**	**3.4**	**3.1**	**2.7**
Median:							**0.4%**	**0.8%**			**45.4**	**32.6**	**25.0**	**59%**	**34%**	**31%**	**7%**	**10%**	**12%**	**3.4**	**3.1**	**2.8**
Semicap / Equipment/ Materials/ Supply Chain																						
002371.SZ	NAURA	508.6	CNY	480.0	-6%	O	0.6%	-0.9%	50,904	503.5	45.1	37.0	30.4	7%	22%	22%	20%	24%	24%	9.7	8.1	6.7
688012.SS	AMEC	349.9	CNY	320.0	-9%	O	0.0%	11.8%	30,529	609.3	113.6	68.4	55.0	19%	66%	24%	9%	14%	15%	10.1	8.8	7.5
6488.TWO	GlobalWafers	455.5	TWD	588.0	29%	O	4.3%	1.7%	6,877	51.9	29.9	15.7	11.3	-26%	90%	39%	8%	16%	20%	2.6	2.4	2.2
0522.HK	ASM Pacific	88.9	HKD	100.0	13%	O	0.2%	6.5%	4,518	30.9	NM	23.5	15.4	-64%	1164%	52%	1%	10%	14%	2.3	2.1	1.9
3702.TW	WPG	61.8	TWD	52.0	-16%	U	6.6%	-27.2%	3,277	27.3	12.0	12.5	12.4	20%	-5%	1%	10%	10%	9%	1.2	1.1	1.1
688234.SS	SICC	93.3	CNY	67.1	-28%	E	0.0%	NA	5,568	113.8	NM	NM	NM	NM	NM	NM	0%	2%	3%	7.5	7.4	7.2
ACMR.O	ACM Research	47.6	USD	40.0	-16%	O	1.2%	-0.7%	2,997	47.6	25.5	20.2	16.5	20%	26%	23%	11%	13%	14%	2.5	2.3	2.0
3680.TWO	Gudeng Precision	426.0	USD	380.0	-11%	O	0.9%	-6.1%	1,289	16.4	58.2	20.3	16.1	-41%	187%	26%	6%	16%	17%	3.4	3.0	2.6
6187.TWO	AllRing Tech	392.0	USD	450.0	15%	O	1.9%	1.1%	1,186	17.9	27.9	23.7	19.9	-4%	18%	19%	20%	21%	22%	5.2	4.6	4.1
3363.TWO	FOCI	429.0	TWD	415.0	-3%	O	0.2%	4.8%	1,404	48.6	NM	NM	NM	NM	NM	NM	3%	11%	70%	NM	NM	NM
Mean:							**1.6%**	**-1.0%**			**44.6**	**27.7**	**22.1**	**-9%**	**196%**	**26%**	**9%**	**13%**	**21%**	**5.0**	**4.4**	**3.9**
Median:							**0.7%**	**1.1%**			**29.9**	**21.9**	**16.3**	**2%**	**46%**	**24%**	**9%**	**13%**	**16%**	**3.4**	**3.0**	**2.6**

Source: Company data, Morgan Stanley Research. E = Morgan Stanley Research estimates. Note: Data as of Jan 7, 2026.

Valuation Comparison: Fabless, Power Semis, FPGA and Analog

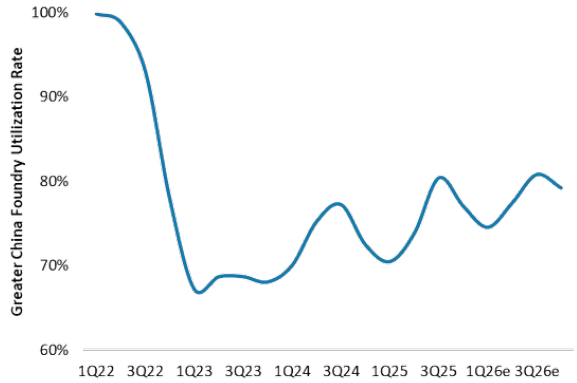
Ticker	Company	Price 1/7/2026	Curr ency	Price Target	Upside/ Downside	Rating	Dividend Yield (%)	FCF Yield (%)	Market Cap (US$M)	3M Avg. Daily Trading (US$M)	P/E Ratio (x) 2025e	P/E Ratio (x) 2026e	P/E Ratio (x) 2027e	EPS Growth 2025e	EPS Growth 2026e	EPS Growth 2027e	ROAE 2025e	ROAE 2026e	ROAE 2027e	P/B Ratio (x) 2025e	P/B Ratio (x) 2026e	P/B Ratio (x) 2027e
Fabless																						
Smartphone/Wireless Semis																						
2454.TW	MediaTek	1,465.0	TWD	1,588.0	8%	O	6.0%	0.9%	72,405	334.7	21.9	22.5	13.6	0%	-3%	65%	26%	24%	34%	5.6	5.1	4.1
603501.SS	OmniVision	130.7	CNY	130.0	0%	E	0.6%	2.1%	21,739	270.3	36.8	30.7	22.9	30%	20%	34%	17%	17%	20%	5.6	4.9	4.1
300782.SZ	Maxscend	80.8	CNY	48.00	-41%	U	0.1%	-2.2%	5,993	95.7	NM	78.5	42.5	-136%	-485%	85%	-1%	5%	9%	4.3	4.1	3.8
603160.SS	Goodix	81.3	CNY	62.0	-24%	U	0.8%	-1.4%	5,178	83.7	40.8	58.2	51.7	51%	-30%	13%	10%	7%	7%	3.9	3.8	3.6
6462.TWO	Egis	114.5	TWD	148.0	29%	O	1.0%	-16.3%	330	12.2	NM	39.1	16.2	-48%	-144%	141%	-6%	3%	6%	1.1	1.1	1.0
IP/Design Service																						
3661.TW	Alchip	3,685.0	TWD	4,388.0	19%	O	1.5%	5.1%	9,473	233.2	56.1	22.6	19.8	-17%	149%	14%	14%	30%	29%	NM	NM	NM
301269.SZ	Empyrean Technology	113.0	CNY	115.0	2%	E	0.1%	NA	8,526	110.8	NM	NM	NM	184%	102%	42%	6%	11%	14%	NM	NM	NM
3443.TW	GUC	2,465.0	TWD	2,288.0	-7%	O	0.7%	4.7%	10,431	251.2	95.8	55.3	37.0	0%	73%	50%	29%	40%	45%	NM	NM	NM
6531.TW	AP Memory	456.0	TWD	475.0	4%	O	0.4%	4.1%	2,330	65.8	NM	29.9	20.8	-73%	474%	44%	4%	23%	28%	7.6	6.2	5.3
6533.TW	Andes	262.5	TWD	601.4	129%	O	NA	NA	420	4.6	NM	NM	NM	NA	NA	NA	-2%	10%	20%	2.8	2.5	2.2
PC/Cloud/Display Semis																						
3034.TW	Novatek	383.0	TWD	380.0	-1%	E	5.8%	14.3%	7,359	34.9	14.7	15.6	13.6	-22%	-6%	15%	24%	22%	24%	3.5	3.4	3.2
2379.TW	Realtek	529.0	TWD	580.0	10%	O	3.6%	5.0%	8,567	40.1	18.3	16.9	14.8	-3%	8%	14%	27%	26%	26%	4.6	4.1	3.6
5269.TW	ASMedia	1,330.0	TWD	1,380.0	4%	U	2.9%	0.9%	3,134	26.2	18.8	17.0	15.2	37%	11%	12%	15%	15%	15%	2.7	2.4	2.1
5274.TWO	Aspeed	7,740.0	TWD	7,500.0	-3%	O	1.2%	1.3%	9,237	84.8	76.6	49.9	40.7	49%	53%	23%	59%	68%	65%	NM	NM	NM
4966.TWO	Parade	647.0	TWD	780.0	21%	O	3.2%	1.6%	1,595	19.0	17.2	15.4	11.6	16%	12%	32%	13%	13%	16%	2.1	2.0	1.8
2458.TW	Elan Micro	119.0	TWD	145.0	22%	O	5.2%	9.6%	1,076	6.8	15.4	14.3	13.4	-19%	8%	7%	23%	24%	24%	3.5	3.3	3.1
HIMX.O	Himax	8.3	TWD	8.0	-3%	O	2.8%	8.3%	1,420	8.9	32.8	25.5	11.7	-44%	29%	118%	5%	7%	14%	1.7	1.7	1.6
Analog IC																						
6415.TW	Silergy	228.0	TWD	258.0	13%	O	0.4%	1.3%	2,779	28.9	34.5	20.9	14.5	12%	65%	44%	7%	11%	14%	2.4	2.2	1.9
300661.SZ	SG Micro	73.4	CNY	80.0	9%	E	0.3%	1.1%	6,273	149.2	81.6	50.8	38.5	-13%	61%	32%	11%	17%	19%	NM	NM	NM
MCU																						
4919.TW	Nuvoton	56.3	TWD	48.0	-15%	U	0.8%	14.5%	746	3.3	NM	66.9	14.3	-413%	-151%	368%	-5%	2%	11%	1.7	1.6	1.5
688018.SS	Espressif	174.9	CNY	220.0	26%	O	1.1%	20.3%	3,740	102.7	55.6	38.8	31.7	45%	43%	23%	21%	26%	27%	NM	NM	NM
300327.SZ	Sino Wealth	29.8	CNY	17.7	-41%	U	1.0%	6.6%	1,407	71.7	53.7	35.7	33.1	41%	50%	8%	10%	14%	14%	5.3	4.8	4.5
FPGA																						
002049.SZ	Unigroup Guoxin	78.8	CNY	57.0	-28%	U	0.3%	1.5%	9,302	239.5	35.2	27.7	23.3	61%	27%	19%	14%	16%	16%	4.7	4.1	3.5
1385.HK	Shanghai Fudan	51.3	HKD	47.3	-8%	O	0.2%	0.1%	6,905	31.3	81.5	37.2	32.7	-10%	119%	14%	8%	16%	16%	6.5	5.6	4.8
688107.SS	Anlogic	28.5	CNY	32.4	14%	E	0.0%	-1.0%	1,584	19.5	NM	NM	NM	-66%	-133%	-342%	-6%	2%	-5%	NM	NM	NM
Mean:							**1.6%**	**3.3%**			**45.7**	**35.1**	**24.6**	**-14%**	**19%**	**35%**	**13%**	**18%**	**20%**	**4.0**	**3.6**	**3.2**
Median:							**0.8%**	**1.5%**			**36.8**	**30.7**	**20.8**	**-3%**	**27%**	**23%**	**11%**	**16%**	**16%**	**3.9**	**3.8**	**3.5**

Source: Company data, Morgan Stanley Research. E = Morgan Stanley Research estimates. Note: Data as of Jan 7, 2026.

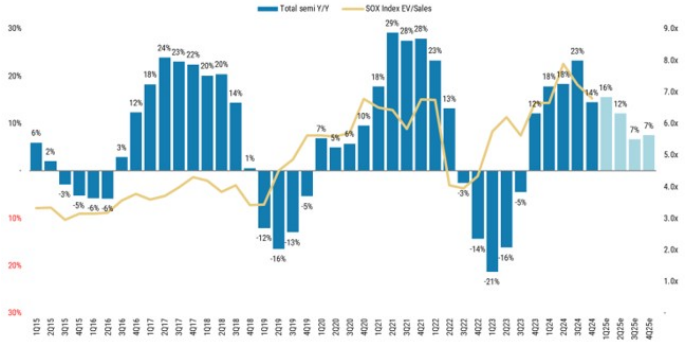
Semi Cycle: AI vs. Broader Semis

Semiconductor Cycle

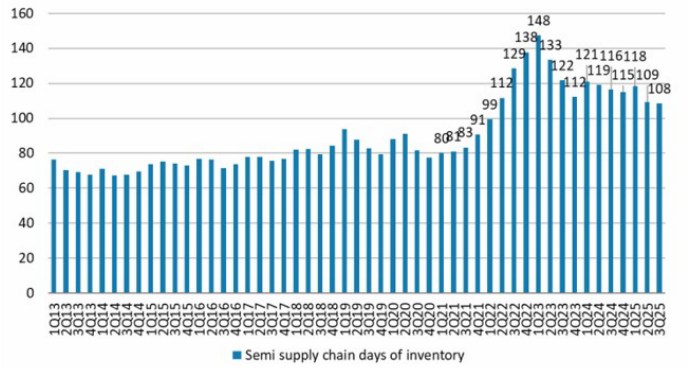
Logic semi foundry utilization at 70-80% in 1H26 – still not fully recovered



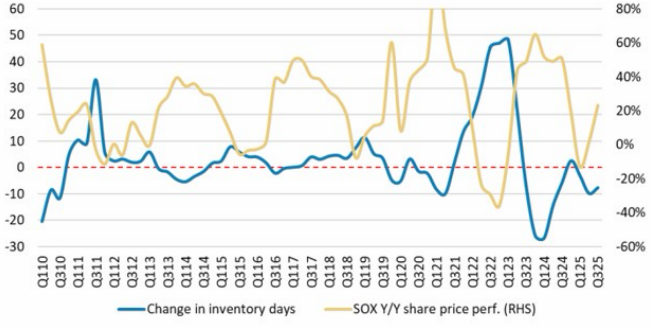
Excluding NVIDIA's AI GPU revenue, non-AI semi growth was slow at only 10% Y/Y in 2024



Semi supply chain days of inventory declined in 3Q25



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

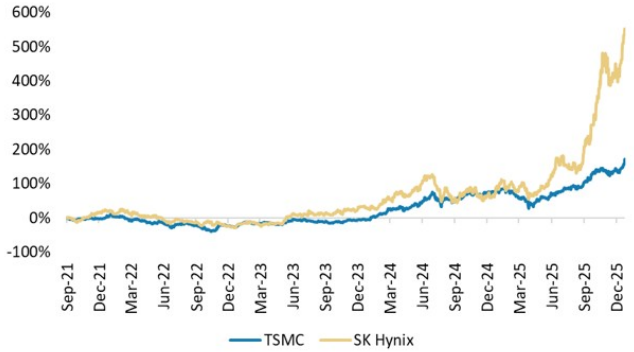


Source: SIA, FactSet, company data, Morgan Stanley Research. E = Morgan Stanley Research estimates.

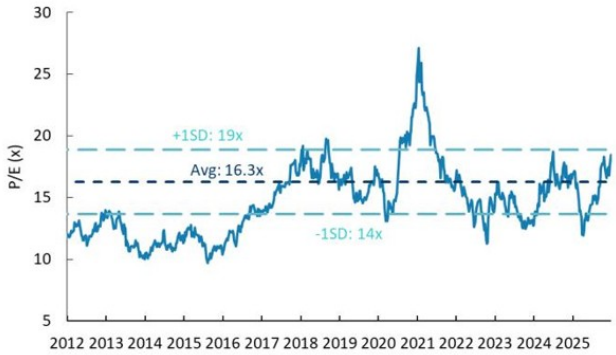
Memory Stock Prices Are a Leading Indicator for Logic Semis; We Have an Attractive Industry View on GC Tech Semis

Memory share price YoY peak leads logic semis

Share price performance over the past three years (TSMC vs. SK hynix)



TSMC: One-year forward P/E chart



Source: FactSet, company data, Morgan Stanley Research. E = Morgan Stanley Research estimates. Note: Past performance is no guarantee of future results. Results shown do not include transaction costs.

Key Investment Thesis: Whether AI GPU or AI ASIC Wins, TSMC (major foundry supplier) Can Win

P/E multiple – NVIDIA re-rated in 2023

P/E multiple – ASIC group once exceeded NVIDIA, and then de-rated with NVIDIA

Source: Company data, Morgan Stanley Research. Note: Alternative AI semis group: AMD, Alchip, GUC, Andes, Marvell, Broadcom. AI semi enablers group: TSMC, Synopsys, Cadence, ASML, BESI, ASMPT, Ibiden, KYEC, Advantest.

TSMC 4Q25 Earnings Preview (scheduled for January 15th)

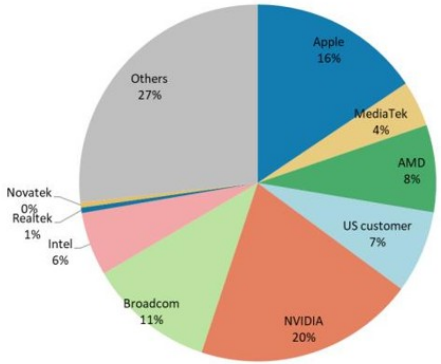
Details of the scenario	Scenario 1	Scenario 2	Scenario 3
Probabilities	15%	60%	25%
2026 full-year USD revenue growth	High-20% Y/Y	Mid-20% Y/Y	Low-20% Y/Y
AI semiconductor foundry revenue CAGR	75%	60%	45%
2026 full-year Capex in USD	50-55bn	48-50bn	43-48bn
1Q26 Revenue growth/margin	Up 5% Q/Q, 62%	Flat Q/Q, 60%	Down 5% Q/Q, 58%
Potential change in stock price (%)	Up 4-5%	Up 2-3%	Down 3-4%
Corresponding projected stock price	NT$1,736-1,753	NT$1,703-1,720	NT$1,619-1,603

	4Q25				1Q26		
(NT$ bn)	Guidance	Preliminary	MS Est.	Consensus	Guidance	MS Est.	Consensus
Revenue	US$32.2 - 33.4bn		1,029	1,016		1,049	1,011
Q/Q	*-1% at mid-point in USD*		*3.9%*	*2.6%*		*2.0%*	*-0.5%*
Y/Y			*18.5%*	*17.0%*		*25.0%*	*20.5%*
GM (%)	59% - 61%		60.2%	59.7%		60.2%	58.6%
OpM (%)	49% - 51%		51.2%	50.1%		50.8%	48.7%
EPS (NT$)			**18.25**	**17.61**		**18.23**	**16.91**

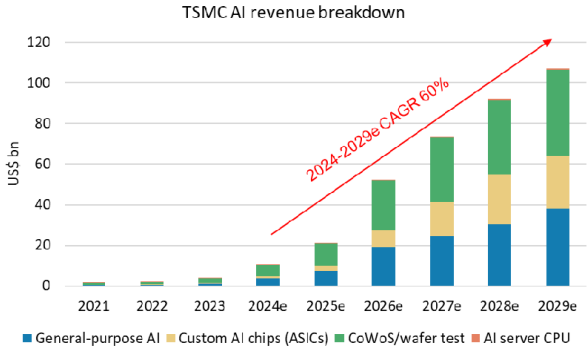
Source: Company data, Morgan Stanley Research. E = Morgan Stanley Research estimates.

Apple's A20 Processors to Adopt TSMC N2 and WMCM Packaging in 2H26

TSMC 2026e customer breakdown



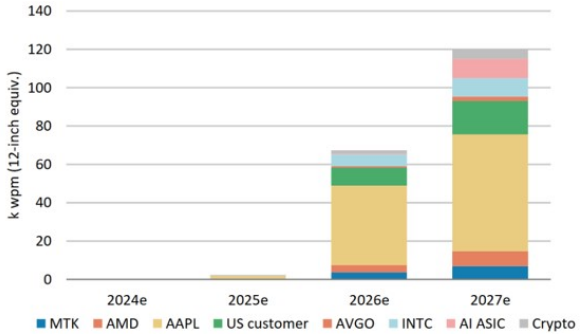
We estimate TSMC AI semis revenue CAGR to reach 60% from 2024e to 2029e



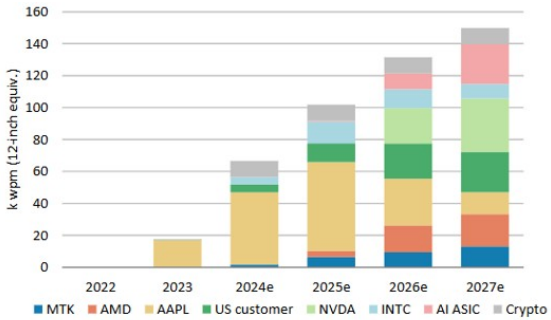
Source: TSMC, Morgan Stanley Research. E = Morgan Stanley Research estimates.

TSMC's Wafer Demand by Customers

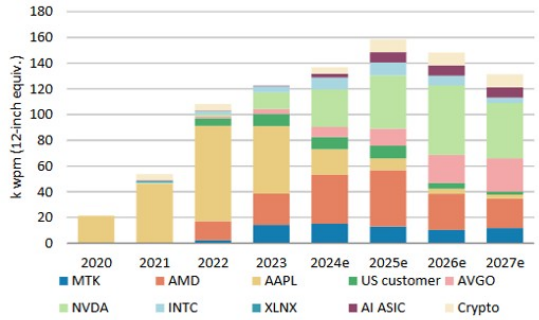
Wafer demand for TSMC 2nm – Apple the major customer



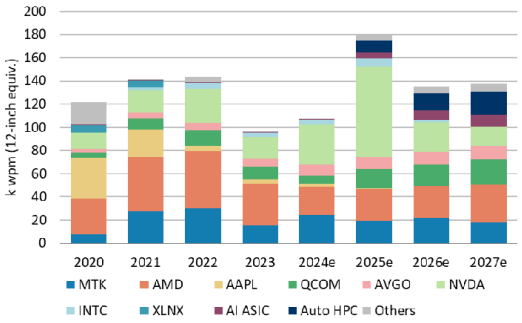
Wafer demand for TSMC 3nm – Nvidia Rubin to ramp in 2026



Wafer demand for TSMC 4/5nm – Consumer/AI Glasses may show upside in 2026

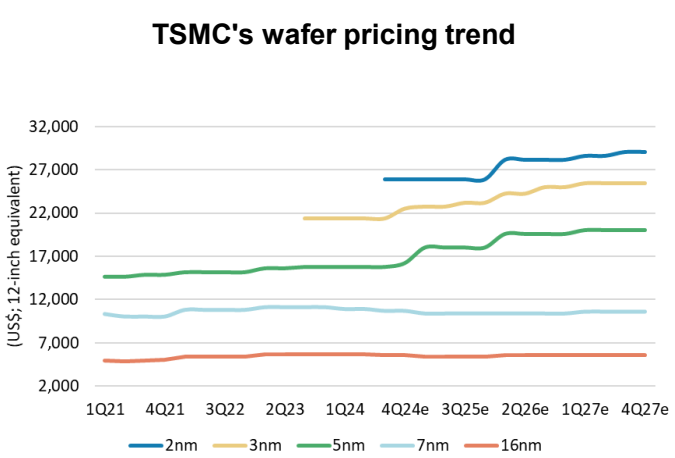


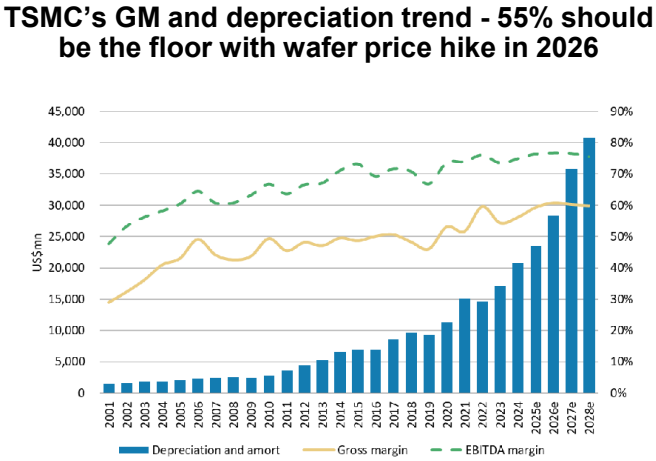
Wafer demand for TSMC 7nm – some are used to share Nvidia's 4nm AI GPU production



Source: Morgan Stanley Research estimates.

TSMC Wafer Price and Gross Margin Trend

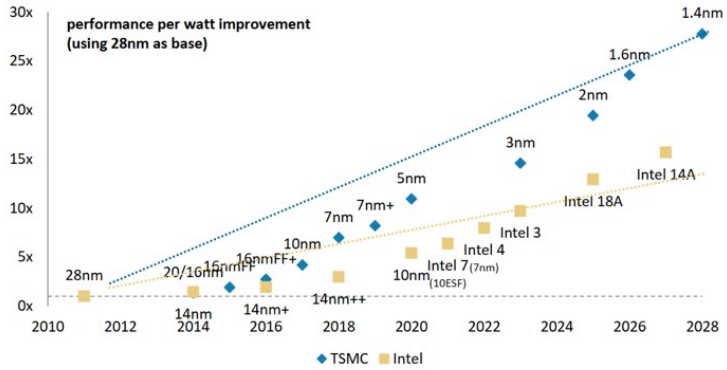




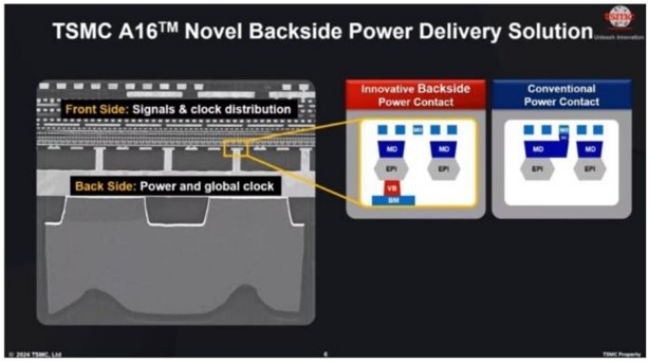
Source: Company data, Morgan Stanley Research. E = Morgan Stanley Research estimates.

Moore's Law 2.0 – Energy Efficiency Is the Key Feature

TSMC performance per watt (power efficiency) could be improved by 15-20% for each node migration



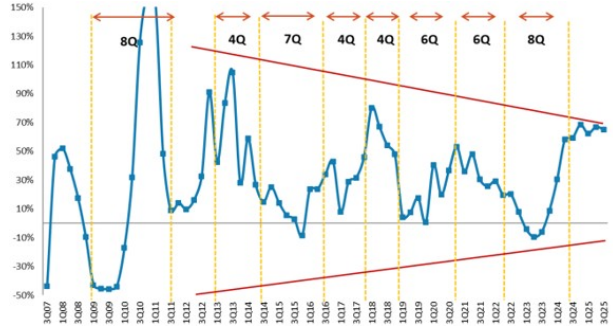
TSMC A16 Novel Backside Power Delivery Solution – Nvidia the major adopter



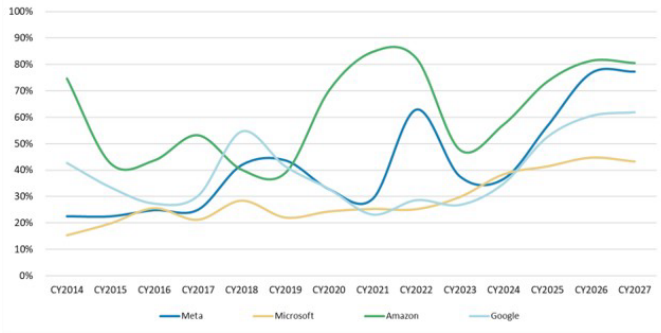
Source: TSMC, Morgan Stanley Research.

Cloud Semis: Brighter Outlook

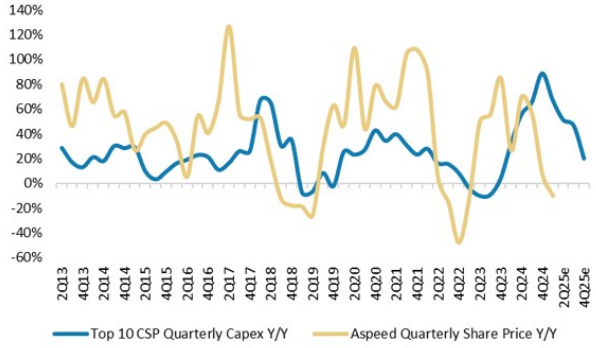
Top 4 CSPs (Amazon, Google, Microsoft and Meta) capex was up 65% Y/Y in 3Q25CY



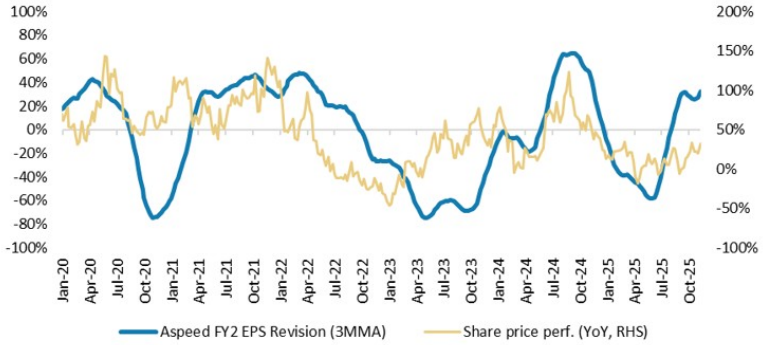
Capex-to-EBITDA ratio should remain stable at around 50%



Top 10 CSP capex Y/Y vs. Aspeed share price



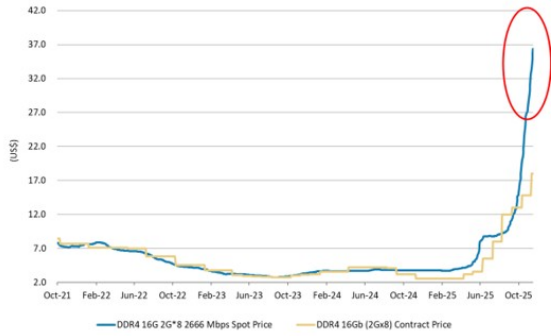
Aspeed earnings revision breadth



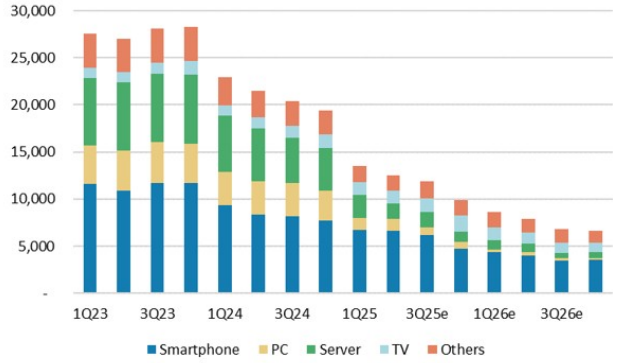
Source: Company data, Morgan Stanley Research. E = Morgan Stanley Research estimates.

DDR4 Shortage Persisting into 2H26

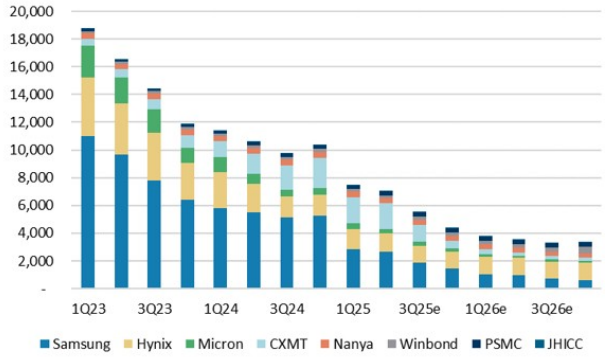
DDR4 16Gb spot vs. contract price



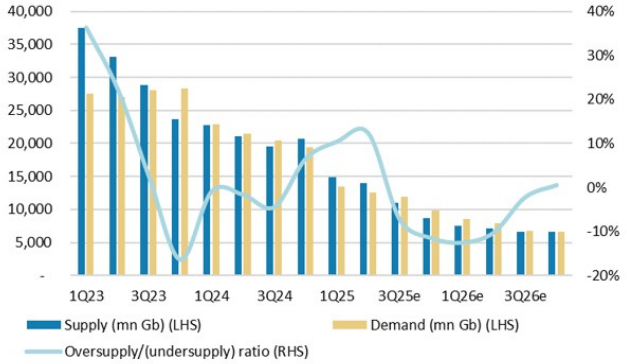
Quarterly demand breakdown by product (mn Gb)



Quarterly supply breakdown (mn Gb)



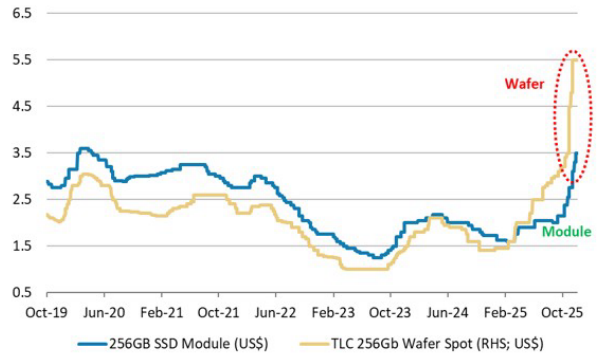
Quarterly supply and demand summary



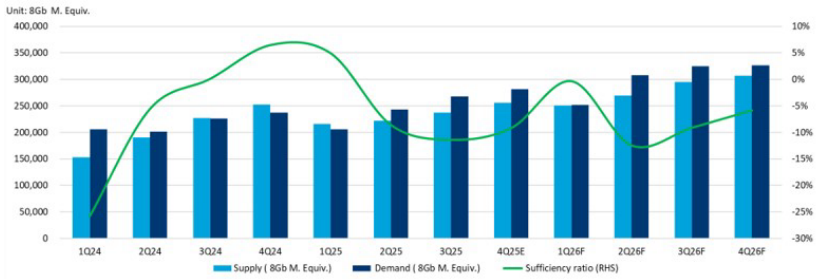
Source: Company data, Morgan Stanley Research. E = Morgan Stanley Research estimates.

AI Storage leads to NAND shortage; we also expect NOR flash undersupply into 2026

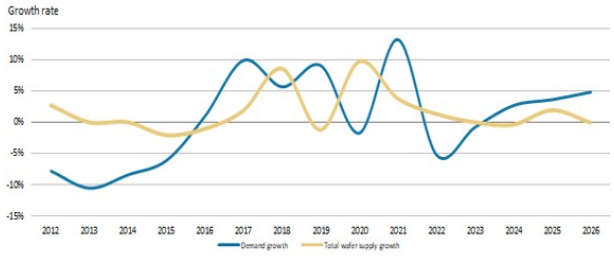
NAND wafer spot pricing and module prices



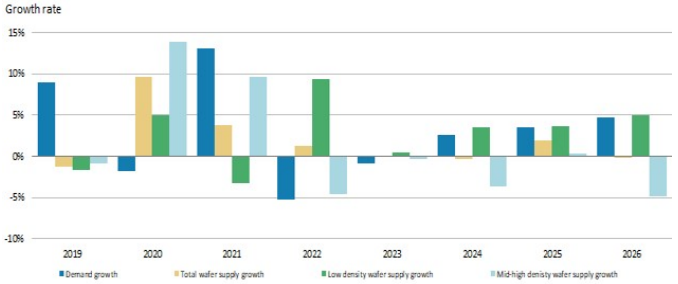
NAND supply and demand model



NOR flash demand and supply growth rates



NOR flash demand and supply growth rates



Source: ChinaFlashMarket, Morgan Stanley Research. E = Morgan Stanley Research estimates.

TSMC CoWoS and CPO

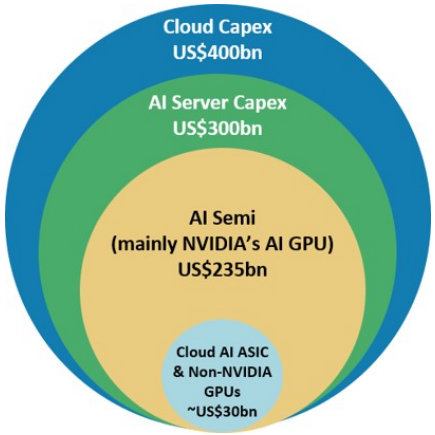
AI Semi Supply Leading Indicator

AI Semis: Now and the future – "Prompts"

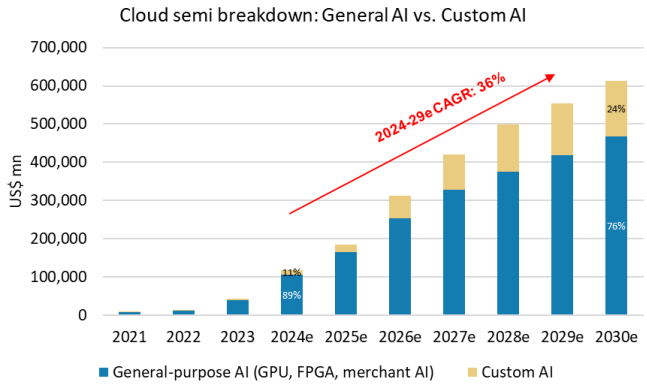
- Generative AI Demand Driver:
  - Killer apps
  - Competition
  - Sovereign
- Growth limitations:
  1. Budget
  2. Energy -> in the US
  3. Chip Capacity -> in China
  4. Regulation
- Semiconductor solutions:
  - Moore's Law
  - CoWoS/ SoIC
  - HBM
  - CPO
  - Custom chip
  - GaN HVDC 800V
- Growth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

Thanks to Cloud AI, the Global Semi Industry Market Size May Reach US$1 trillion in 2030

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



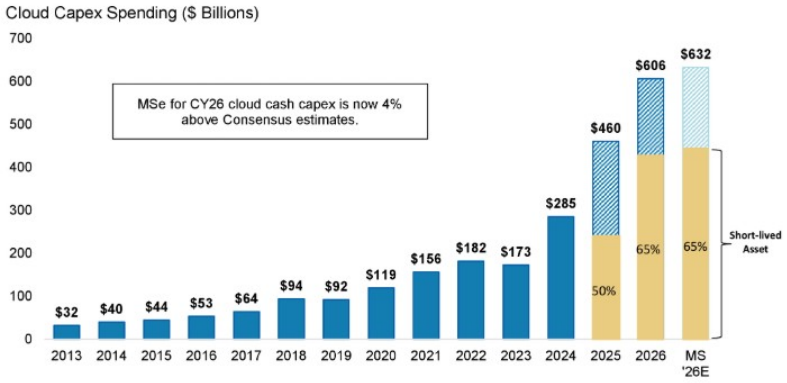
AI semi is major growth driver



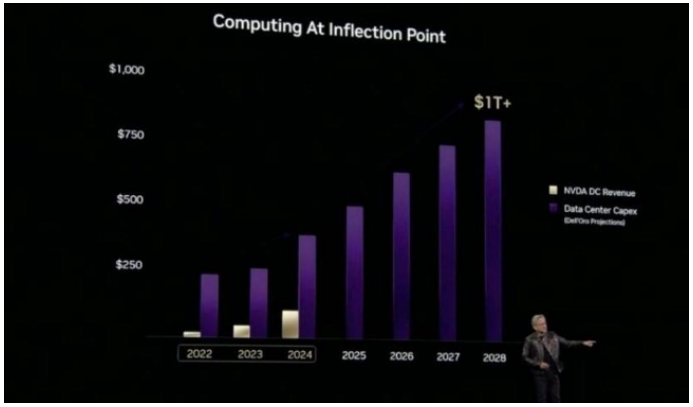
Source: Nvidia, Morgan Stanley Research. e = Morgan Stanley Research estimates. Note: From our Asia Pacific tech team's downstream estimates.

Cloud Capex Remains Robust From Major CSPs

Morgan Stanley cloud capex tracker estimates nearly US$632bn of cloud capex spending in 2026 (Purely Top 10 listed global CSPs; no sovereign AI)



Nvidia CEO shared the estimate of global cloud capex to reach US$1 trillion in 2028 (including sovereign AI)



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

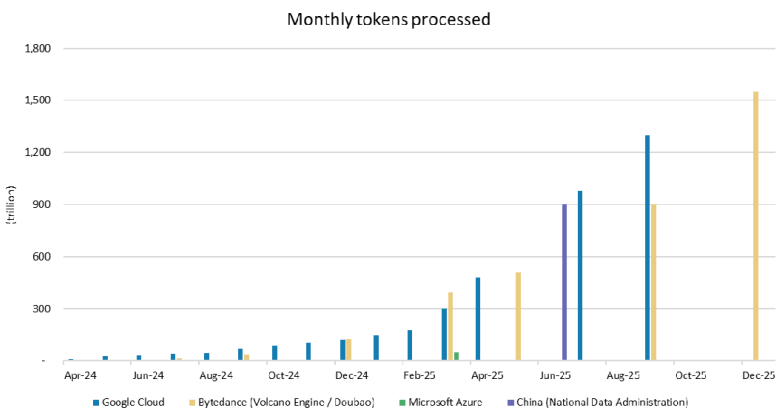
Calculating power project deployment demand for TSMC CoWoS capacity and wafer capacity

	Announced Power Deployment Implication for TSMC		
GPU/ASIC Vendor	NVIDIA (Open AI)	AMD (Open AI)	Broadcom (Anthropic)
Power Deployed (GW)	10	6	1
Rack name	Vera Rubin NVL144	Helios	TPU
Power consumption per Rack (kW)	220	260	60
Rack Number (k units)	45	23	17
Chip Name	Rubin GPU	MI455 GPU	TPUv7 (Ironwood)
Chip Volume (k units)	3,273	1,662	1,067
Implied CoWoS Volume (k wafers)	409	166	53
2027 annual CoWoS demand (k wafers)	136	55	53
Implied 2/3nm wafer Volume (k wafers)	260	81	70

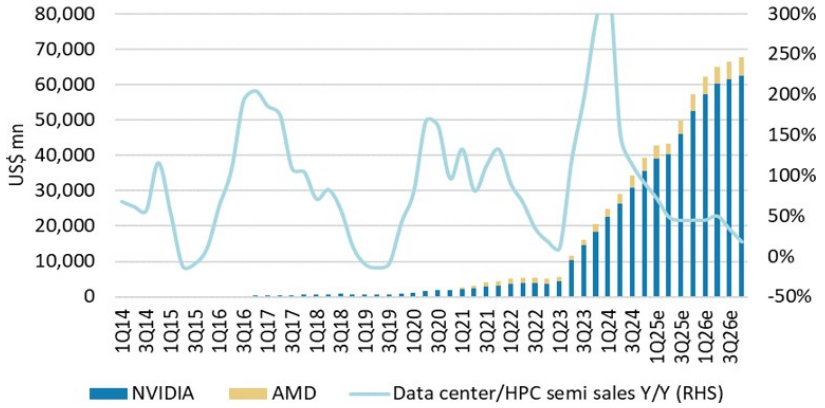
Source: Company data, Morgan Stanley Research

Monthly Tokens Processed by Major CSPs Suggest that AI Inference Demand is Growing

Monthly tokens processed



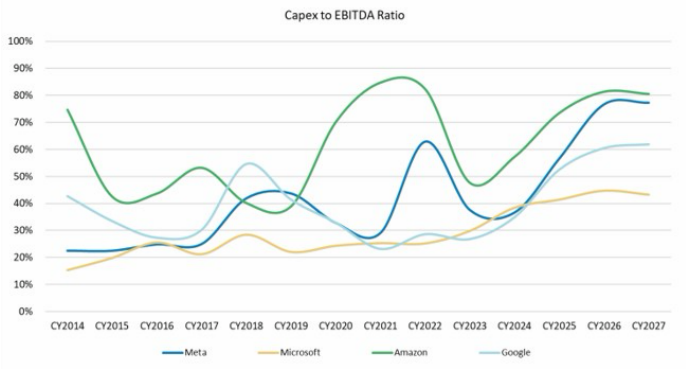
Datacenter/HPC semi revenue from NVIDIA and AMD



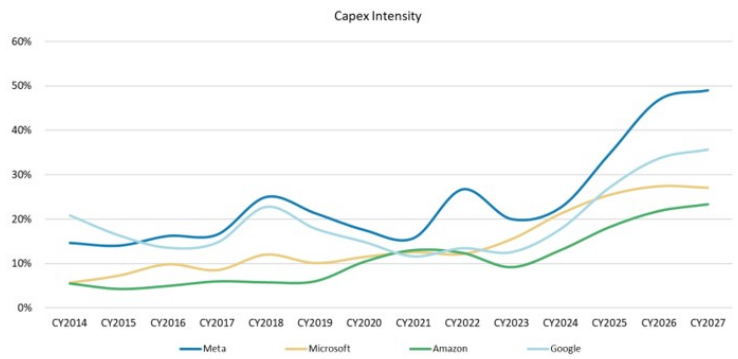
Source: Company information, Morgan Stanley Research. E = Morgan Stanley Research estimates. Note: ByteDance numbers represent monthly token use run-rate based on end-of-month daily tokens.

CSP AI Capex Health Checks – Cash Flow Analysis

Capex to EBITDA ratio has risen since 2024



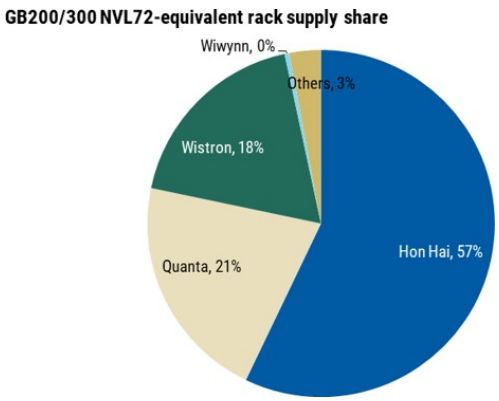
Capex intensity is also set to increase rapidly



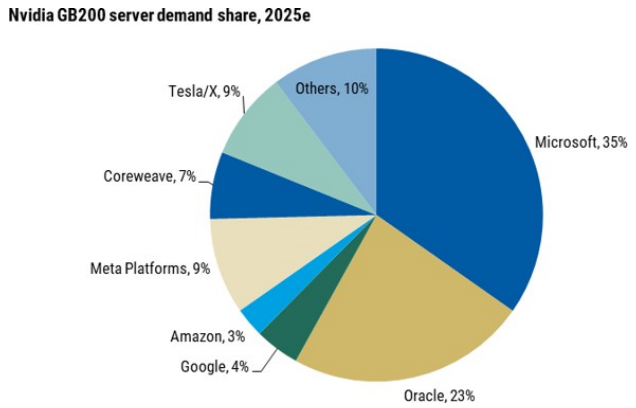
Source: Company data, Morgan Stanley Research. E = Morgan Stanley Research estimates. Note: Estimates are from our US tech team.

NVIDIA GB200/300 Sever Racks Supply/Demand Assumptions

NVIDIA GB200/300 rack supply share (2025)



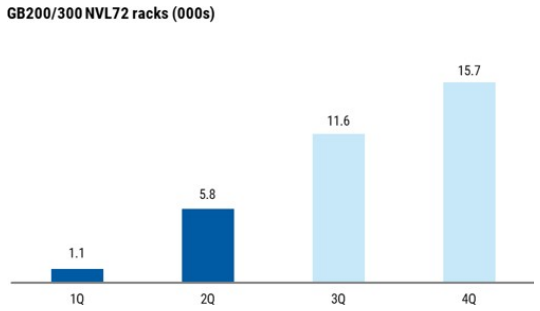
NVIDIA GB200/300 rack demand share (2025)



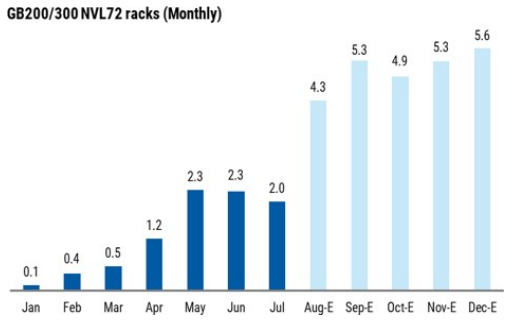
Source: Morgan Stanley Research. E = Morgan Stanley Research estimates. Note: Estimates are from our Asia Pacific tech team's downstream estimates.

NVIDIA GB200/300 Rack Output Estimates

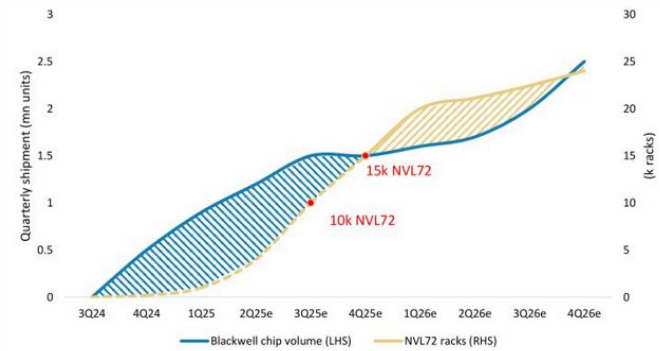
GB200/300 NVL72 Rack Ramp Quarterly Trajectory



Industry-wide GB200 NVL72 Rack Monthly Output



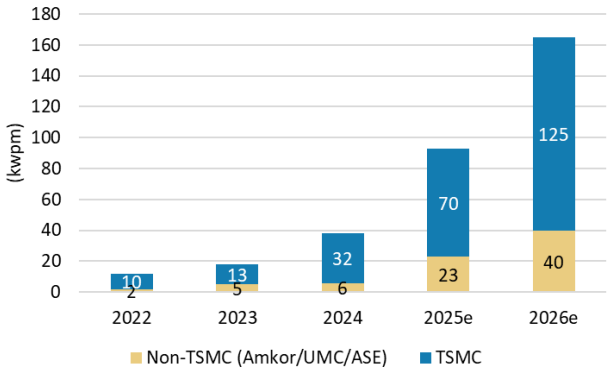
TSMC expected to produce 5.1mn chips in 2025, with full-year GB200 NVL72 shipments expected to reach 30k



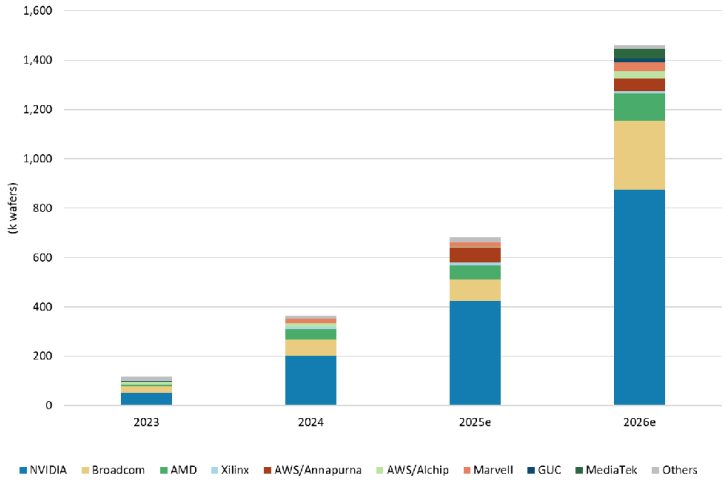
Source: Morgan Stanley Research. E = Morgan Stanley Research estimates. Note: We think the actual rack deliveries to end-customers are lower than the numbers we have here because we include Wistron's computing tray (L10) rack equivalent number (without accounting for rack assembly and test times for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

TSMC May Expand CoWoS Capacity to 125kwpm By 2026 Given Continual Strong AI Demand

Global CoWoS capacity expansion by year-end and by vendor



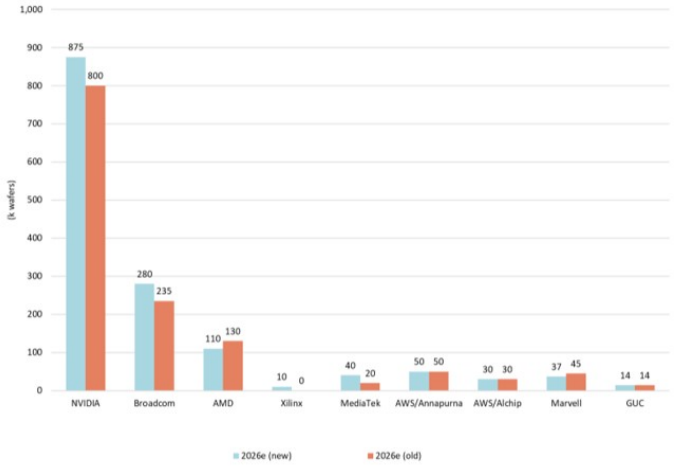
Global CoWoS consumption, by customer



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

TSMC to Double CoWoS and SoIC Capacity in 2025, and We Expect It to Continue into 2026

Key changes for 2026 CoWoS allocation in a chart



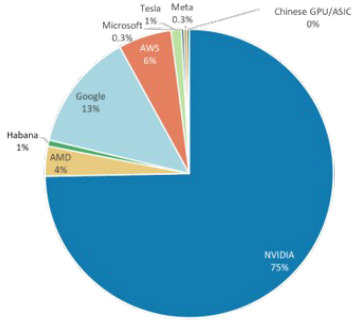
Key changes on 2026 CoWoS allocation in a table (see numbers marked in red)

(k wafer)	2023	2024	2025e	2026e	2023	2024	2025e	2026e
Xilinx	3	10	10	10	3%	3%	1%	1%
MediaTek				40				3%
TSMC				30				
CoWoS-S				30				
Amkor				10				
CoWoS-S				10				
AWS/Annapurna			60	50				
TSMC			60	30				
CoWoS-R			60	30				
ASE/SPIL				20				
CoWoS-R				20				
AWS/Alchip	9	16	5	30	8%	4%	1%	2%
Marvell	1	18	15	37	1%	5%	2%	3%
TSMC				17				1%
CoWoS-L				5				
CoWoS-R			15	12				
ASE/SPIL				20				
CoWoS-R				20				
GUC	1	1	2	14	1%	0%	0%	1%
Others	20	10	19	15	17%	3%	3%	1%
Total demand	**117**	**370**	**690**	**1,461**	**100%**	**100%**	**91%**	**98%**

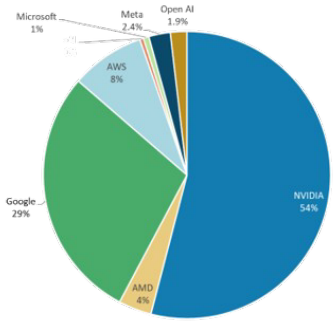
Source: Company data, Morgan Stanley Research. E = Morgan Stanley Research estimates.

AI Computing Wafer Consumption Could Be Up To US$26bn in 2026, NVIDIA Accounting for the Majority

AI semi wafer consumption, by customer, 2025e



AI semi wafer consumption, by customer, 2026e

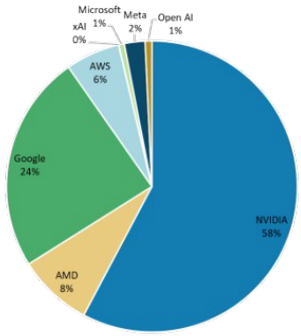


AI chip vendor	Product name	CoWoS capacity allocation (k wafers)	Chips per CoWoS wafer	Implied shipments (k)	Compute die size	Geometry	Compute die units	Wafer consumption (k wafers)	Wafer price (US$)	Wafer revenue TAM (US$ mn)
AI GPU (2026e)										
NVIDIA	B300	390	14	5,460	850	4nm	2	433	21,945	9,510
	Rubin R200	260	8	2,080	850	3nm	2	165	26,000	4,292
	H200	75	27	2,025	814	4nm	1	57	21,945	1,243
AMD	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)	120	16	1,920	700	3nm	2	125	26,000	3,263
	TPU v7e (Sunfish; AVGO)	80	16	1,280	800	3nm	2	96	26,000	2,486
	TPU v8 (Zebrafish;MediaTek)	40	20	800	800	3nm	2	60	26,000	1,554
AWS	Trainium 2.5	20	16	320	600	5nm	2	12	20,000	237
	Trainium 3	80	17	1,360	700	3nm	2	73	26,000	1,886
xAI		10	20	200	645	4nm	1	5	21,945	107
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
Meta	MTIA 3 (Iris)	30	10	300	850	3nm	2	23.8	26,000	619
Open AI	Nexus (Titan 1)	10	13	130	750	3nm	4	18.2	26,000	473
Total		**1,434**						**1,108**		**26,799**

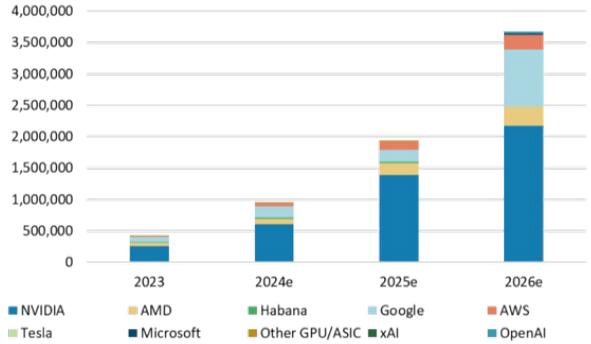
Source: Company data, Morgan Stanley Research. E = Morgan Stanley Research estimates. Note: Estimates are compiled using our supply-chain checks.

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
	Rubin R200	260	8	2,080	36	8	288	HBM4	Hynix/Micron/Samsung?	599,040
	H200	75	27	2,025	24	6	141	HBM3e 8hi	Hynix	285,525
AMD	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)	120	16	1,920	24	8	192	HBM3e 8hi	Hynix/Samsung	368,640
	TPU v7e (Sunfish; AVGO)	80	16	1,280	36	8	288	HBM3e 12hi	Hynix/Samsung/Micron	368,640
	TPU v8 (Zebrafish;MediaTek)	40	20	800	36	6	216	HBM3e 12hi	Hynix/Micron	172,800
AWS	Trainium 2.5	20	16	320	24	4	96	HBM3e 8hi	Hynix/Samsung/Micron	30,720
	Trainium 3	80	17	1,360	36	4	144	HBM3e 12hi	Hynix/Samsung/Micron	195,840
xAI		10	20	200	24	6	144	HBM3e 8hi	Samsung?	1,152
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
Meta	MTIA 3 (Iris)	30	10	300	36	8	288	HBM3e 12hi	Hynix/Samsung	86,400
Open AI	Nexus (Titan 1)	10	13	130	36	6	216	HBM4	Hynix	28,080
Total		**1,434**								**4,044,485**
								Total HBM demand (mn Gb)		**32,356**

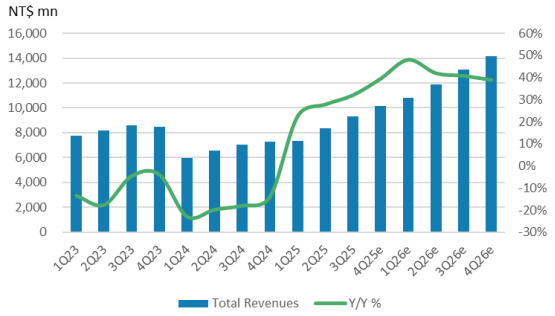
Source: Company data, Morgan Stanley Research. E = Morgan Stanley Research estimates.

KYEC (2449.TW; OW) – Testing Revenue From the Largest Customer Could Be Around 28% of the Total

NVIDIA testing demand – Revenue contribution to KYEC

	1Q25	2Q25	3Q25	4Q25	1Q26e	2Q26e	3Q26e	4Q26e		2024	2025	2026e
Units (k)												
H-series	650	200	250	500	400	400	600	600		4,400	1,600	2,000
B-series with GDDR7	-	-	300	500	250	250	250	250		-	800	1,000
B-series with HBM	1,000	1,100	1,400	1,500	1,500	1,500	1,400	1,050		400	5,000	5,450
R-series							800	1,200				2,000
Test time (assume Hopper testing time for ~6 mins)												
Per chip test time												
H-series test time (seconds)	350	350	350	350	350	350	350	350		350	350	350
B-series with GDDR7 test time (seconds)			350	350	350	350	350	350			350	350
B-series with HBM test time (seconds)	700	750	900	1,000	1,000	1,000	1,000	1,000		700	1,000	1,000
R-series test time (seconds)				1,200	1,200	1,200	1,200	1,200				1,200
Total test demand												
H-series (k hrs)	63	19	24	49	39	39	58	58		428	156	194
B-series with GDDR7 (k hrs)			29	49	24	24	24	24		-	78	97
B-series with HBM (k hrs)	194	229	350	417	417	417	389	292		78	1,190	1,514
R-series (k hrs)					-	-	267	400				667
Test hour rate (for the largest customer including burn-in)	***190***	***180***	***180***	***180***	***180***	***169***	***180***	***190***				
Largest customer revenue to KYEC (US$ mn)	49.0	44.8	72.6	92.5	86.4	81.1	132.9	147.1		92.9	258.8	447.5
% of KYEC MSe Revenue	21%	16%	24%	28%	25%	21%	31%	32%		11%	23%	28%

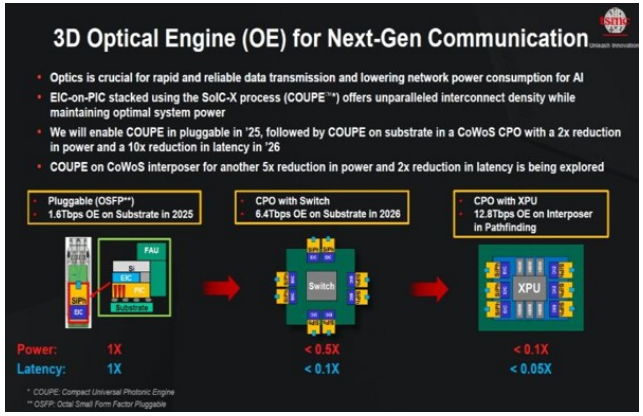
KYEC revenue may increase significantly in 2025/26e



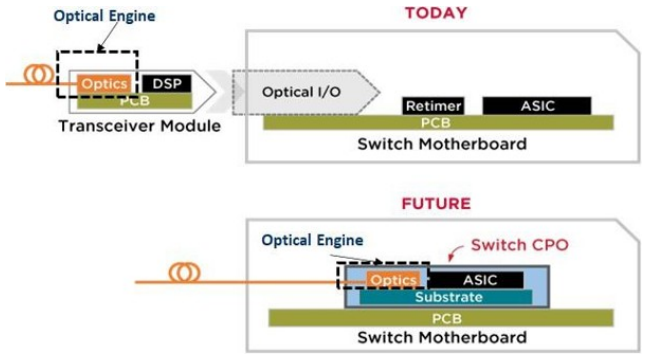
KYEC: 12-month forward P/E

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

CPO Could Help Enhance Data Transmission Speeds and Reduce Power Consumption



Migration from transceivers to CPO architecture



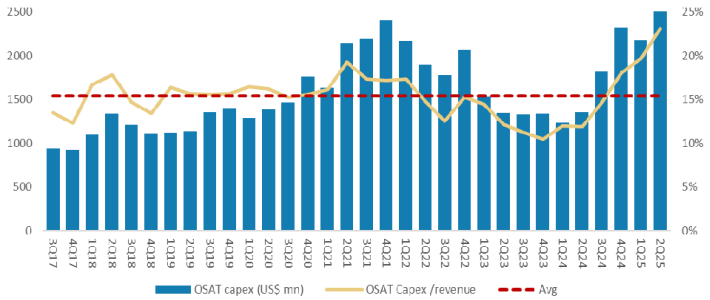
CPO is the most power saving solution

CPO form factor

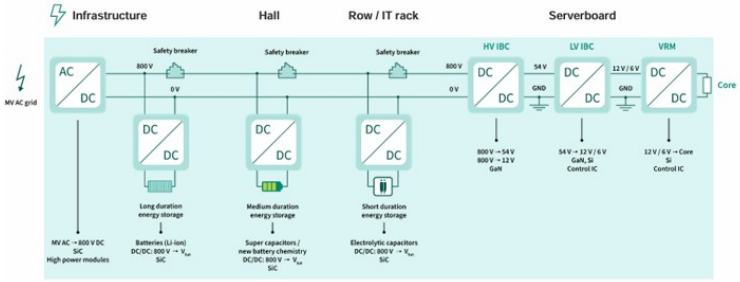
Source: Broadcom, ASE, Morgan Stanley Research.

Positive on Back-end Equipment (ASMPT), While Cautious on China OSAT

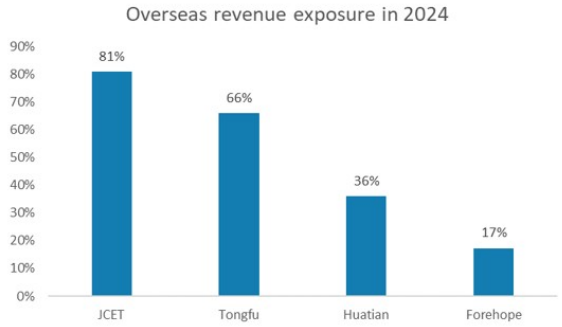
OSAT capex as % of sales back to historical high level driven by advanced packaging



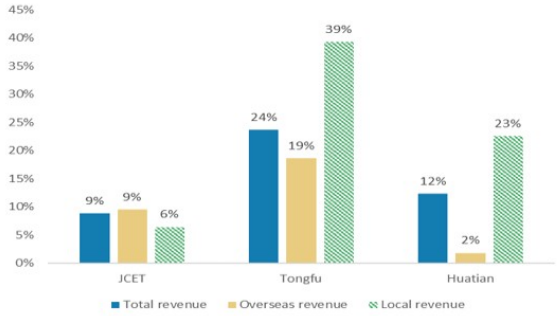
Future GW-scale data center requires higher reliability power discrete



JCET has highest overseas revenue exposure among China



JCET local revenue growth lower vs. its peers in past five years



Source: SIA, company data, Morgan Stanley Research.

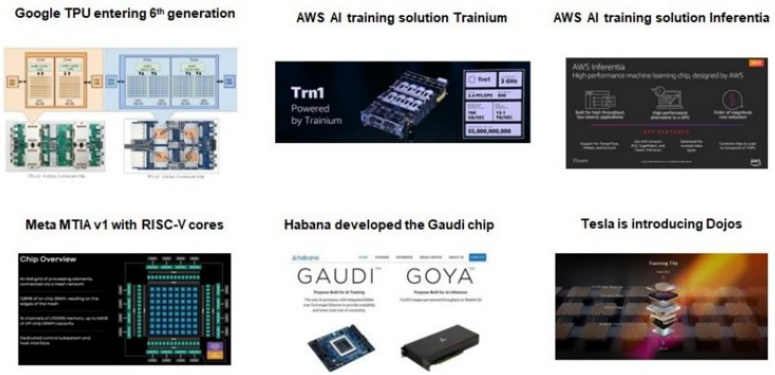
Design Service: Custom Chip Projects Mapping Table

	Alchip	Global Unichip	Broadcomm	Marvell	TSMC direct	Samsung direct	SMIC direct	MediaTek	Socionext	Intel direct	VeriSilicon
AWS – Annapurna	Inferentia2/Tranium1 (7nm) Trainium3 (3nm)			Trainium2/Trainium2.5 (5nm)	Graviton 1 (16nm) Graviton 2 (7nm) Graviton 3 Nitro Networking Chip					AI fabric chips (18A) Xeon 6 (3nm)	
Amazon – Lab 126	Kindle processor Echo processor (12nm)	Echo processor (5nm)									
Google		Security Chip *Axion2 CPU (3nm)* *Axion3 CPU (IP Only)*	TPU v1/TPU v2 TPU v3/TPU v4 TPU v5/TPU v6e *(Trillium)* *TPU v7p (Ironwood; 3nm)* *TPU v7e (3nm)*	Maple CPU (5nm) *Axion3 CPU (?nm)*	Axion1 CPU (5nm) Tensor (3nm)	Tensor (7nm) Tensor (5nm)		TPU v3 *TPU v8p (3nm)* *TPU v8e (3nm)*			
Microsoft		Maia 100 (5nm) *Cobalt 100 (5nm)* Maia 200 (3nm)		Maia 200 enhancement (3nm)				Azure IoT XBox Bluray			
Meta	Oculus ASIC MTIA v4?	MTIA v4 (CoWoS) MTIA v5 (SoW)	MTIA v1 MTIA v2 MTIA v3 MTIA v3.5 MTIA v4?	Switch Networking AI Networking MTIA v4?				Oculus ASIC MTIA v4?	CPU (3nm)?		
Apple			Custom Networking Chip								
Sony	TV ASIC Smartphone ISP	DSC ASIC						PS5 South Bridge			
Tesla/xAI	D1/Dojo (7nm)	AI accelerator xAI (5nm) xAI (3nm)			D1/Dojo (7nm) D2/Dojo (5nm) AI5 (3nm)	Autopilot 3.0/FSD 1 (14nm) Autopilot 4.0/FSD 2 (7nm) AI6 (2nm)					
Li Auto	ADAS High-end (5nm) ADAS Low-end (5nm)										ADAS
GM – Cruise									5nm		
Intel – Habana	Gaudi 1 (16nm) Gaudi 2/Goya 2 (7nm) Gaudi 3/Goya 3 (5nm)	Goya 1 (16nm)									
OpenAI			AI Custom Chip								
Baidu					Kunlun 2 (7nm)	Kunlun 1 (14nm) Kunlun 3 (5nm)					
Alibaba – T-head		Generation 1			Hanguan						
Tencent					Zixiao (12nm)						
ByteDance			AI accelerator (7nm) *5nm?*					AI accelerator (3nm)			AI accelerator
Nvidia								GB10 N1X		x86 CPU	

Source: Company data, Morgan Stanley Research.

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
Trainium1/Inferentia2	300	600	30			
Trainium2		300	1,200	320		
Trainium3			20	1,360	1,200	-
Trainium4					600	2,000
Total	**300**	**900**	**1,250**	**1,680**	**1,800**	**2,000**

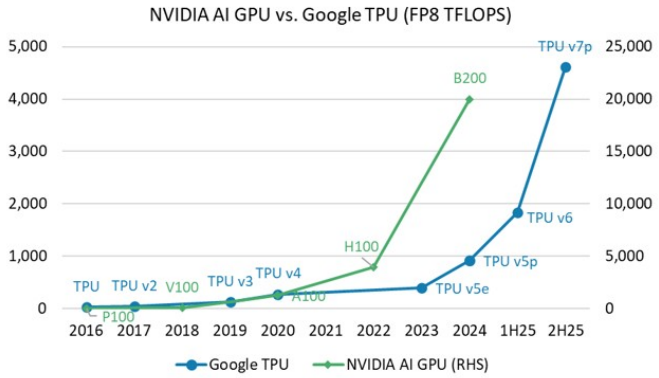
Source: AWS, Google, Meta, Intel, Tesla, Morgan Stanley Research estimates.

More ASIC Projects Are Coming, According to Each CSP Plan

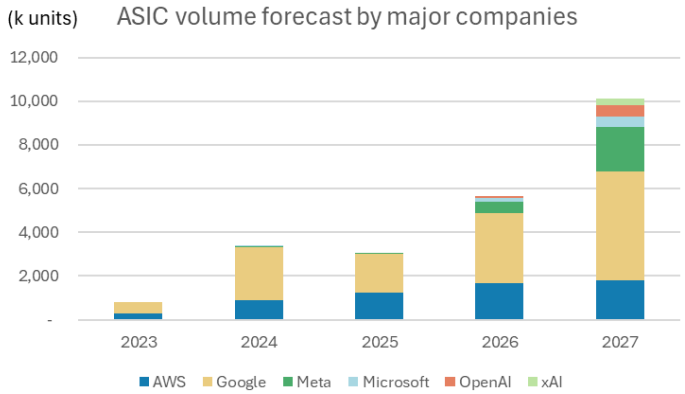
TPU Forecasts from MS Asia Research team

k Units	2023	2024	2025e	2026e	2027e	2028e
v5	500	2,400	250			
v6 (Trillium)			1,000	300		
v7 (Ironwood, by Broadcom)			500	2,500	1,200	
v8 (N; 3nm, by MediaTek)				400	2,000	1,800
N+1 (2nm)					1,800	4,400
N+2 (2nm)						800
Total	**500**	**2,400**	**1,750**	**3,200**	**5,000**	**7,000**

Google TPU keeping pace with Nvidia GPU



ASIC volume forecast by major companies

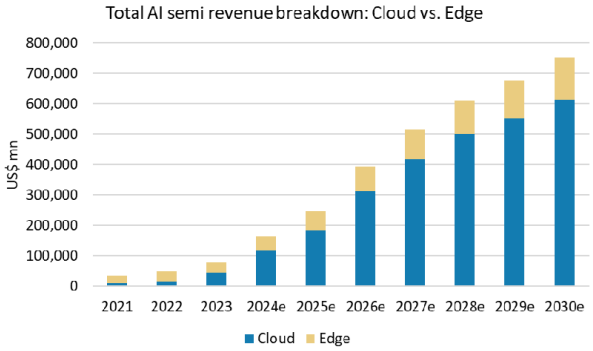


Source: Company data, Morgan Stanley Research.

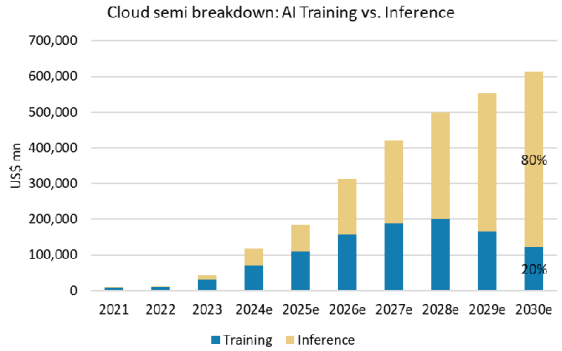
2026 Update: Our Forecasts for AI Semis Toward 2029e and 2030e

- Growth perspective:
  1. Edge AI semis: 22% CAGR, 2023-30
  2. Inference AI semis: 68% CAGR, 2023-30
  3. **Custom AI semis: 65% CAGR**, 2023-30

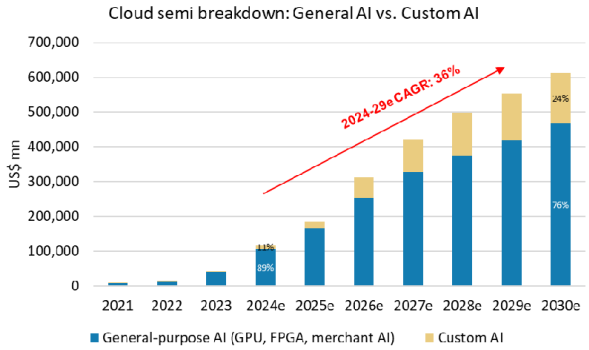
Edge AI semis could grow slightly faster than cloud



Within Cloud AI, Inference AI chips to outgrow training…



… and Custom AI chips to outgrow general purpose

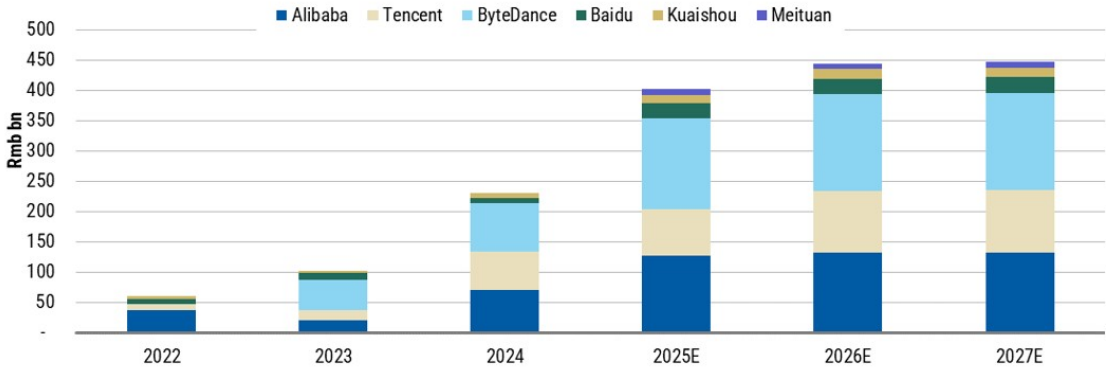


Source: Company data, Gartner, Morgan Stanley Research. E = Morgan Stanley Research estimates.

China AI and Domestic GPU Supply

China DeepSeek: Inference Demand Is the Key Driver of Future Capex

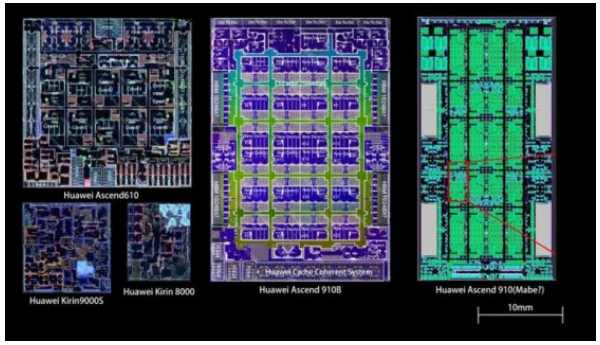
We forecast the top 6 companies' capex to grow 11%YoY to Rmb445bn in 2026e



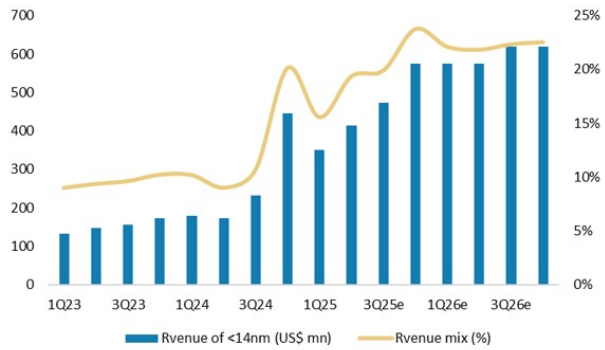
Source: Company data, Morgan Stanley Research. E = Morgan Stanley Research estimates.

China – Domestic GPU Updates

Huawei chip



SMIC 7nm and 10nm/14nm revenue mix



China GPU performance comparison table

	China									
Brand	Huawei			Cambricon		Hygon	Iluvatar	Enflame	Alibaba	MooreThread
Product	Ascend 910B	Ascend 910C	Ascend 950 PR	MLU370	MLU590	Deep Compute III	Big Island	I20	T-Head	MTT S4000
Node	SMIC 7nm (n+2)	SMIC 7nm (n+2)	SMIC 7nm (n+2)	7nm	7nm	7nm	TSMC 7nm	TSMC 7nm	5nm	7nm
FP16 (TFLOPS)	320	800	500	72	256	192	147	128	205	100
FP8/Int8 (TFLOPS)	640	1,600	1,000	192	512	392	256	256	825	200
DRAM interface	HBM2e	HBM2e	HBM2e	HBM2	HBM2e	HBM2e	HBM2	HBM2	HBM	HBM
Memory size (GB)	64	128	128	24	NA	NA	32	32	48	48
Memory bandwidth (GB/s)	1,600	3,200	1,600	NA	NA	NA	1,200	300	1382	768
GPU-GPU networking bandwidth	PCIe Gen5	PCIe Gen5	UBLink: 2000GB/s	PCIe Gen4: 200GB/s	PCIe Gen5	PCIe Gen5	PCIE Gen4	64GB/s	NA	MTLink 1.0: 240GB/s
TDP (W)	400W	310W	NA	70/150W	NA	350	300W	300W	NA	250W

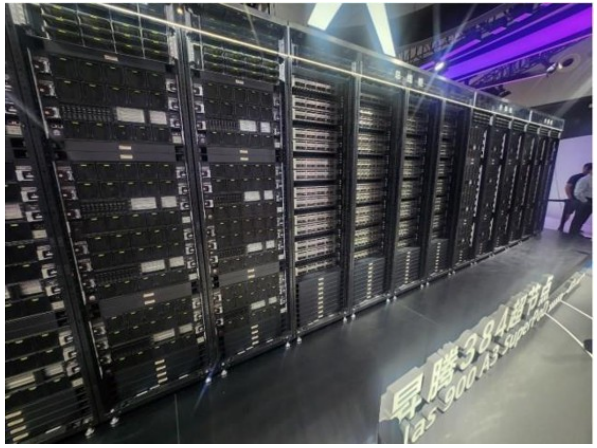
Source: Tom's Hardware, FactSet, company data, Morgan Stanley Research. E = Morgan Stanley Research estimates.

Comparison Between NVIDIA's NVL72 and Huawei's CM384

Comparison between NVL72 and CloudMatrix 384

	Nvidia	Huawei
	NVL72	CloudMatrix 384
AI processor	GB200	Ascend 910C
CPU	Nvidia Grace	Huawei Kunpeng 920
FP16/BF16 (PFLOPS)	180	215-307
FP8/Int8 (PFLOPS)	360	430-614
FP4 (TFLOPS)	720	NA
Total memory size (TB)	30	49
Total memory bandwidth (TB/s)	576	1229
Interconnection	NVLink Gen5: 1.8TB/s	UBLink: 784GB/s
Launch date	March 2024	April 2025

Huawei CloudMatrix 384 A3 SuperPod

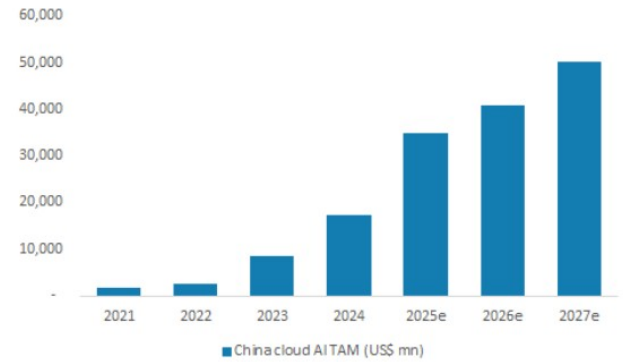


Racks of CloudMatrix 384

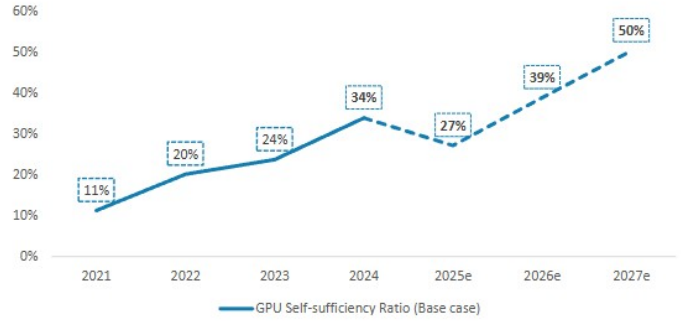
Source: Company data, Morgan Stanley Research.

China GPU Self-sufficiency Ratio Was 34% in 2024; We Expect It to Reach 50% by 2027

We expect China cloud AI TAM to be US$48bn in 2027



We expect China local GPU can almost fulfill China AI demand by 2027e



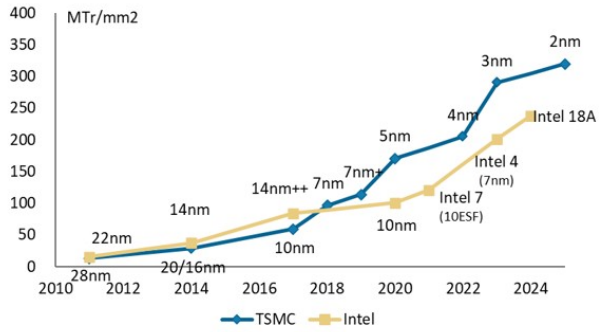
Source: Gartner, Morgan Stanley Research. E = Morgan Stanley Research estimates.

Local GPU revenue could grow to Rmb136bn in 2027e, enabled by SMIC's leading node capacity

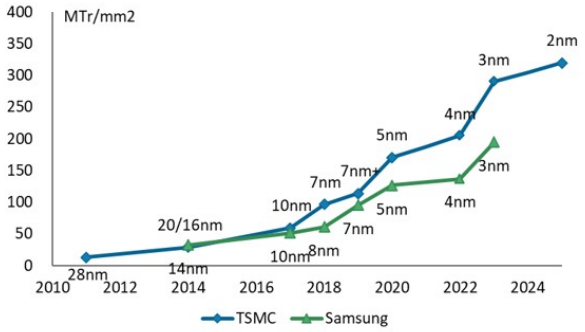
	2024	2025e	2026e	2027e	2028e
SMIC capacity for Local GPU(kwpm)	**2**	**8**	**14**	**20**	**26**
910B capacity (kwpm)	2	3	0	0	0
910C capacity (kwpm)	0	2	2	0	0
950 capacity (kwpm)	0	0	7	3	0
960 capacity (kwpm)	0	0	0	11	4
970 capacity (kwpm)	0	0	0	0	14
Other GPU capacity	0	3	5	6	8
Average yield rate of 910B (%)	30%	30%	50%	70%	0%
Average yield rate of 910C (%)	0%	10%	30%	50%	0%
Average yield rate of 950 (%)	0%	0%	20%	50%	0%
Average yield rate of 960 (%)	0%	0%	0%	20%	50%
Average yield rate of 970 (%)	0%	0%	0%	0%	30%
Wafer inventory from previous year (k)	150				
910B Die annual production (k)	562	842	0	0	0
910C Die annual production (k)	0	94	281	0	0
950 Die annual production (k)	0	0	655	702	0
960 Die annual production (k)	0	0	0	924	840
970 Die annual production (k)	0	0	0	0	1,512
910B price (Rmb th)	50	50	0	0	0
910C price (Rmb th)	0	110	70	40	0
950 price (Rmb th)	0	0	110	70	40
960 price (Rmb th)	0	0	0	110	70
970 price (Rmb th)	0	0	0	0	110
Revenue from 910B (Rmb mn)	35,580	42,120	0	0	0
Revenue from 910C (Rmb mn)	0	10,296	19,656	0	0
Revenue from 950 (Rmb mn)	0	0	72,072	49,140	0
Revenue from 960 (Rmb mn)	0	0	0	101,640	58,800
Revenue from 970 (Rmb mn)	0	0	0	0	166,320
Other GPU revenue (Rmb mn)	6,941	14,507	21,005	29,430	35,976
Total GPU revenue (Rmb mn)	**42,521**	**66,923**	**112,733**	**180,210**	**261,096**
Y/Y (%)		**57%**	**68%**	**60%**	**45%**

Foundry Process Roadmap and Performance Gap: TSMC vs. Intel vs. Samsung vs. SMIC

Logic density comparison: TSMC vs. Intel



Logic density comparison: TSMC vs. Samsung



Foundry process road map

CY	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025e	2026e
Intel					10nm FinFET		Intel 7 FinFET		Intel 4 (EUV)	Intel 3	Intel 20A GAA	Intel 18A GAA
					10nm				7nm		5nm	
TSMC	16nm FinFET		10nm FinFET	7nm	7nm Pro	5nm	5nm Pro		3nm FinFET		2nm GAA	
	16nm+ FinFET		12nm	22nm	7nm+ (EUV)	6nm		4nm	N3e			
Samsung	14nm FinFET		10nm FinFET	8nm	7nm (EUV)	5nm	4nm		3nm GAA			
		28FDS		28FDS-RF	14nm LPU	28FDS-eMRAM	18FDS					
SMIC	40nm		28nm HKC	28nm HKC+	14nm FinFET	N+1			N+2			N+3

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

RTX Pro 6000D, the B40 Chip for China?

RTX Pro 6000 Blackwell GPU at Computex

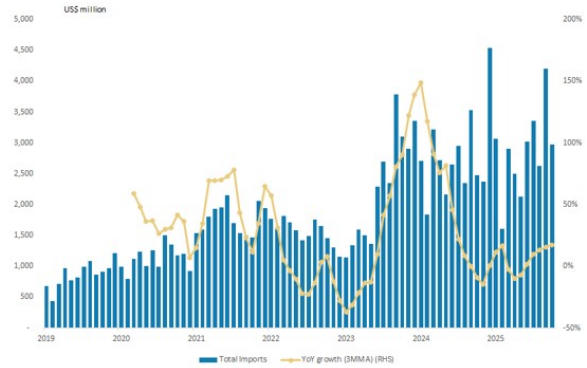
ConnectX-8 with Built-in PCIe Gen6 Switch

	Nvidia				Huawei	Huawei
Product	L40S	RTX 6000 Ada	H20	RTX Pro 6000	Ascend 910B	Ascend 910C
Node	TSMC N4	TSMC N4	TSMC N4	TSMC N4	SMIC 7nm (n+2)	SMIC 7nm (n+2)
FP16 (TFLOPS)	362	364	148	250	320	800
FP8/Int8 (TFLOPS)	733	729	296	500	640	1,600
FP4 (TFLOPS)	NA	NA	NA	1,001	NA	NA
DRAM interface	GDDR6	GDDR6	HBM3	GDDR7	HBM2e	HBM2e
Memory size (GB)	48	24	96	96	64	128
Memory bandwidth (GB/s)	864	672	4,000	1,792	1,600	3,200
GPU-GPU networking bandwidth	PCIe Gen4: 64GB/s	NVLink: 100GB/s	NVLink: 900GB/s	PCIe Gen5: 128GB/s	PCIe Gen5	PCIe Gen5
TDP (W)	350w	300W	400W	600W	400W	310W
Launch date	Aug 2023	Sep 2022	Q1 2024	Mar 2025	Q3 2023	Q2 2025

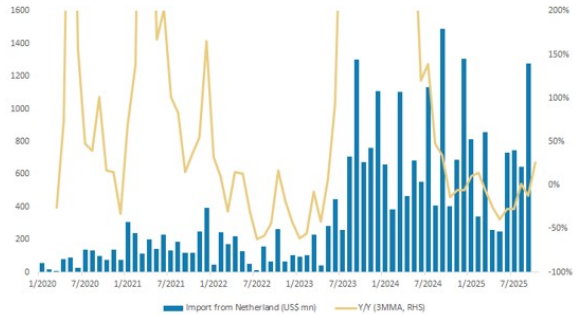
Source: Foxconn, Morgan Stanley Research.

Tracking China Semi Equipment Imports

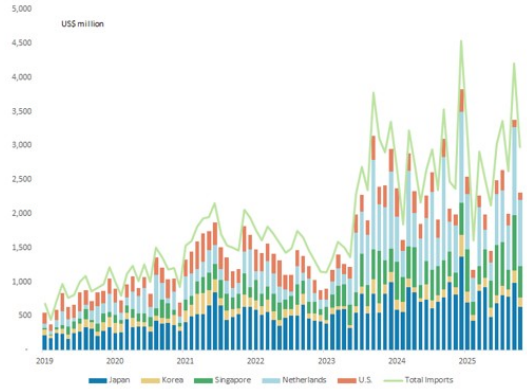
China semi equipment imports growth rebounded to +17% yoy (3MMA) in Oct-25



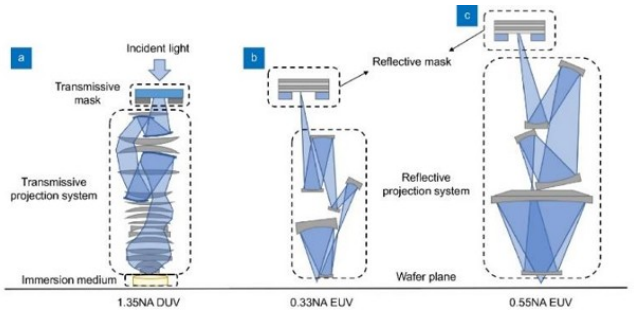
Semi lithography equipment from the Netherlands (mostly DUV tools) rose Y/Y in Oct 2025 (3MMA)



The Netherlands, Japan, and the US are down y/y; Singapore and Korea are up y/y (Jan-Oct 2025)



Projection system for DUV and EUV

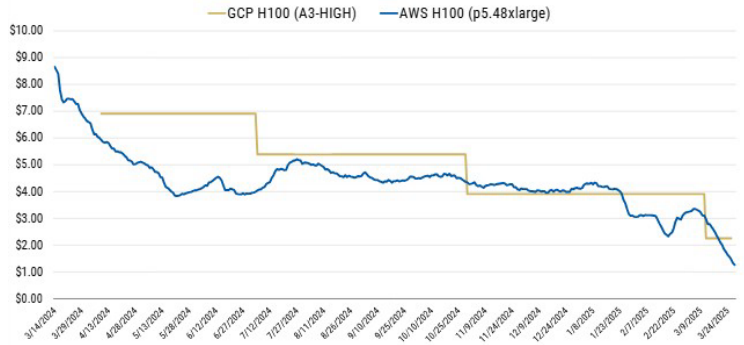


Source: China's General Administration of Customs, Morgan Stanley Research.

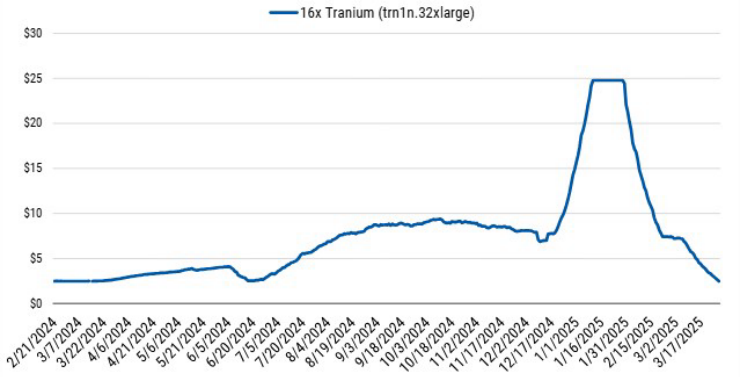
China GPU Spot Price vs. US GPU Spot Price

Retail price of NVIDIA 4090 and 5090 graphic cards in China

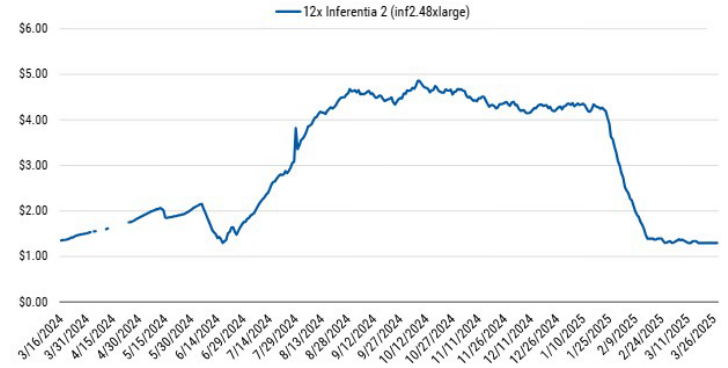
H100 per GPU per hour



16x Trainium per hour



12x Inferentia per hour



Source: Company data for US east 2b, 2c, and US central 1, Morgan Stanley Research.

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(as of December 31, 2025)

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	Coverage Universe		Investment Banking Clients (IBC)			Other Material Investment Services Clients (MISC)	
Stock Rating Category	Count	% of Total	Count	% of Total IBC	% of Rating Category	Count	% of Total Other MISC
Overweight/Buy	1519	41%	415	48%	27%	674	42%
Equal-weight/Hold	1583	43%	362	42%	23%	720	45%
Not-Rated/Hold	4	0%	1	0%	25%	1	0%
Underweight/Sell	564	15%	87	10%	15%	216	13%
Total	3,670		865			1611	

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.

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INDUSTRY COVERAGE: Greater China Technology Semiconductors

COMPANY (TICKER)	RATING (AS OF)	PRICE* (01/08/2026)
Charlie Chan		
ACM Research Inc (ACMR.O)	O (03/07/2023)	US$47.60
Advanced Micro-Fabrication Equipment Inc (688012.SS)	O (11/06/2023)	Rmb352.34
Advanced Wireless Semiconductor Co (8086.TWO)	U (07/14/2025)	NT$109.00
Alchip Technologies Ltd (3661.TW)	O (05/14/2021)	NT$3,600.00
Andes Technology Corp (6533.TW)	O (08/04/2022)	NT$254.50
ASE Technology Holding Co. Ltd. (3711.TW)	O (09/15/2024)	NT$273.50
Global Unichip Corp (3443.TW)	O (07/27/2024)	NT$2,450.00
GlobalWafers Co Ltd (6488.TWO)	O (09/19/2025)	NT$470.00
Gudeng Precision (3680.TWO)	O (11/25/2025)	NT$419.00
Hua Hong Semiconductor Ltd (1347.HK)	U (10/21/2025)	HK$89.30
King Yuan Electronics Co Ltd (2449.TW)	O (03/03/2023)	NT$263.00
Maxscend Microelectronics Co Ltd (300782.SZ)	U (01/11/2021)	Rmb80.38
MediaTek (2454.TW)	O (11/28/2025)	NT$1,445.00
Nanya Technology Corp. (2408.TW)	O (09/18/2025)	NT$241.50
NAURA Technology Group Co Ltd (002371.SZ)	O (11/06/2023)	Rmb515.42
OmniVision Integrated Circuits Group Inc (603501.SS)	E (11/17/2025)	Rmb129.52
Phison Electronics Corp (8299.TWO)	O (03/11/2025)	NT$1,675.00
SG Micro Corp. (300661.SZ)	E (11/03/2025)	Rmb73.89
Silergy Corp. (6415.TW)	O (02/13/2025)	NT$221.00
SMIC (0981.HK)	O (10/21/2025)	HK$74.70
TSMC (2330.TW)	O (02/07/2022)	NT$1,685.00
UMC (2303.TW)	E (10/28/2024)	NT$52.80
Vanguard International Semiconductor (5347.TWO)	U (08/05/2024)	NT$103.50
WIN Semiconductors Corp (3105.TWO)	U (07/14/2025)	NT$186.00
Daisy Dai, CFA		
ASMPT Ltd (0522.HK)	O (07/24/2025)	HK$90.50
China Resources Microelectronics Limited (688396.SS)	E (06/19/2025)	Rmb60.51
Elan Microelectronics Corp (2458.TW)	O (10/03/2025)	NT$118.00
Empyrean Technology Co Ltd (301269.SZ)	E (01/17/2025)	Rmb112.00
Hangzhou Silan Microelectronics Co. Ltd. (600460.SS)	U (08/25/2025)	Rmb29.64
Innoscience (2577.HK)	E (10/13/2025)	HK$69.95
JCET Group Co Ltd (600584.SS)	U (09/25/2024)	Rmb39.08

Shanghai Anlogic Infotech Co Ltd (688107.SS)	E (05/14/2024)	Rmb27.95
Shanghai Fudan Microelectronics (1385.HK)	O (03/07/2025)	HK$50.30
SICC Co Ltd (688234.SS)	E (09/03/2025)	Rmb94.05
StarPower Semiconductor Ltd (603290.SS)	O (03/01/2022)	Rmb100.99
Unigroup Guoxin Microelectronics Co Ltd (002049.SZ)	U (01/10/2023)	Rmb78.81
Universal Scientific Ind. (Shanghai) (601231.SS)	O (11/05/2025)	Rmb29.71
Yangjie Technology (300373.SZ)	O (06/10/2022)	Rmb71.51
Daniel Yen, CFA		
AP Memory Technology Corp (6531.TW)	O (07/11/2025)	NT$455.00
ASMedia Technology Inc (5269.TW)	U (10/03/2025)	NT$1,275.00
Aspeed Technology (5274.TWO)	O (06/09/2025)	NT$7,380.00
Egis Technology Inc (6462.TWO)	O (10/21/2025)	NT$112.00
Espressif Systems (688018.SS)	O (05/15/2023)	Rmb173.35
GigaDevice Semiconductor Beijing Inc (603986.SS)	O (05/15/2025)	Rmb262.50
Macronix International Co Ltd (2337.TW)	O (09/18/2025)	NT$63.30
Montage Technology Co Ltd (688008.SS)		Rmb135.70
Novatek (3034.TW)	E (11/10/2025)	NT$385.00
Nuvoton Technology Corporation (4919.TW)	U (11/10/2025)	NT$55.50
Parade Technologies Ltd (4966.TWO)	O (10/03/2025)	NT$617.00
Powerchip Semiconductor Manufacturing Co (6770.TW)	O (10/27/2025)	NT$49.65
Realtek Semiconductor (2379.TW)	O (06/19/2025)	NT$529.00
Shenzhen Goodix Technology Co Ltd (603160.SS)	U (07/14/2025)	Rmb81.20
Sino Wealth Electronic (300327.SZ)	U (03/31/2025)	Rmb29.74
Winbond Electronics Corp (2344.TW)	O (03/11/2025)	NT$108.50
WPG Holdings (3702.TW)	U (11/10/2025)	NT$63.50
Duan Liu		
Dosilicon Co Ltd (688110.SS)	U (09/06/2024)	Rmb134.33
Shenzhen Longsys Electronics Co Ltd (301308.SZ)	O (03/11/2025)	Rmb292.95
Tiffany Yeh		
AllRing Tech Co. (6187.TWO)	O (09/23/2025)	NT$394.00
FOCI Fiber Optic Communications Inc (3363.TWO)	O (01/15/2025)	NT$419.50
Himax Technologies Inc (HIMX.O)	O (05/09/2025)	US$8.28
Silicon Motion (SIMO.O)	O (05/06/2024)	US$121.13

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* Historical prices are not split adjusted.