Asian Hardware Technology

Demand outlook strengthens across AI and general servers; supply constraints the key swing factor

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Asia tech valuations

Company	Ticker	Analyst	Price (LC)	Price target (LC)	Mkt. cap ($, mn)	Rating	YTD return %	P/E		P/B		ROE (%)		EPS (LC$)	
								FY26E	FY27E	FY26E	FY27E	FY26E	FY27E	FY26E	FY27E
Delta	2308 TT	Albert Hung	1745.00	2500.00	141,900	OW	81%	40.5	26.4	13.7	10.3	37%	45%	43.1	66.1
Lenovo	992 HK	Albert Hung	29.72	50.00	47,008	OW	221%	12.1	10.8	4.2	3.0	28%	38%	2.4	2.8
Quanta	2382 TT	Albert Hung	327.0	400.0	39,542	OW	20%	12.4	11.2	4.9	4.5	41%	42%	26.4	29.1
Asus	2357 TT	Albert Hung	913.0	880.0	21,230	N	67%	11.1	12.9	2.2	2.2	21%	17%	82.0	70.5
Pegatron	4938 TT	Albert Hung	89.7	90.0	7,532	N	31%	15.9	11.7	1.1	1.1	7%	9%	5.6	7.6
Wiwynn	6669 TT	Albert Hung	6325.0	7500.0	36,798	OW	41%	18.4	14.4	5.3	4.2	35%	33%	343.8	438.1
MSI	2377 TT	Albert Hung	140.0	145.0	3,703	N	46%	11.1	13.4	2.0	2.0	19%	15%	12.7	10.5
Compal	2324 TT	Albert Hung	38.5	40.0	5,312	N	27%	18.9	13.4	1.3	1.3	7%	10%	2.0	2.9
Inventec	2356 TT	Albert Hung	64.50	58.00	7,244	N	50%	17.3	16.4	3.2	3.1	18%	19%	3.7	3.9
ASPEED	5274 TT	Albert Hung	15750	23000	20,503	OW	139%	72.6	43.1	44.4	28.5	78%	81%	217.0	365.3
Wistron	3231 TT	Albert Hung	180.00	260.00	17,920	OW	20%	11.4	9.0	2.4	2.1	23%	25%	15.8	20.1
21Vianet	VNET US	Albert Hung	6.72	15.00	1,914	OW	-21%	NM	33.3	3.0	1.8	-44%	7%	(1.2)	0.2
Accton	2345 TT	Albert Hung	2105.0	3700.0	36,977	OW	78%	23.2	17.5	13.5	9.0	70%	62%	90.5	120.0
Lotes	3533 TT	Albert Hung	1610.0	2500.0	5,672	OW	24%	19.2	13.0	4.0	3.3	22%	28%	83.7	123.5
TSMC	2330 TT	Gokul Hariharan	2375.0	3200.0	1,928,100	OW	53%	22.0	16.8	8.0	5.9	43%	40%	108.1	141.4
Hon Hai	2317 TT	Gokul Hariharan	246.5	330.0	108,257	OW	7%	13.7	11.3	1.5	1.4	13%	13%	17.9	21.8
Mediatek	2454 TT	Gokul Hariharan	3700.0	5300.0	185,781	OW	159%	52.0	26.8	13.3	10.3	27%	43%	71.1	137.9
UMC	2303 TT	Gokul Hariharan	115.5	130.0	45,451	N	135%	15.0	17.8	3.2	3.2	23%	18%	7.7	6.5
ASE Holding	3711 TT	Gokul Hariharan	590.0	700.0	82,573	OW	136%	28.9	18.5	6.4	5.2	24%	31%	20.4	31.8
Novatek	3034 TT	Gokul Hariharan	527.0	500.0	10,039	N	41%	15.2	14.1	3.5	3.3	26%	24%	34.6	37.3
Powerchip	6770 TT	Gokul Hariharan	67.3	100.0	9,928	OW	70%	10.2	9.4	2.0	1.9	27%	22%	6.6	7.2
Vanguard	5347 TT	Gokul Hariharan	153.5	220.0	9,026	OW	67%	24.2	21.6	4.8	4.6	19%	22%	6.3	7.1
GDS	GDS US	Gokul Hariharan	33.29	NA	6,671	NR	-5%	NA	NA	NA	NA	N/A	N/A	-	-
Chipbond	6147 TT	Gokul Hariharan	163.50	225.00	3,811	N	203%	32.9	20.7	2.5	2.4	8%	12%	5.0	7.9
Alchip	3661 TT	Gokul Hariharan	3750.00	6750.00	10,120	OW	7%	21.9	17.2	4.3	3.9	25%	24%	171.1	218.6
GUC	3443 TT	Gokul Hariharan	5630.00	5500.00	23,620	OW	165%	99.8	46.5	42.3	25.9	49%	69%	56.4	121.1
Nanya Tech	2408 TT	Jay Kwon	517.0	850.0	55,842	OW	168%	6.7	3.5	3.5	2.0	77%	71%	77.5	146.0

Source: Bloomberg Finance L.P., J.P. Morgan estimates, Company data. Note: Market data as of Aug 21, 2026 close

Asia tech valuations

Company	Ticker	Analyst	Price (LC)	Price target (LC)	Mkt. cap ($, mn)	Rating	YTD return %	P/E		P/B		ROE (%)		EPS (LC$)	
								FY26E	FY27E	FY26E	FY27E	FY26E	FY27E	FY26E	FY27E
Unimicron	3037 TT	Jerry Tsai	1140.00	1225.00	56,705	OW	418%	58.9	25.6	13.4	9.6	26%	44%	19.4	44.5
Yageo	2327 TT	Jerry Tsai	562.00	1030.00	36,221	OW	143%	30.8	17.7	6.4	5.0	21%	32%	18.2	31.8
Win Semi	3105 TT	Jerry Tsai	379.00	373.00	5,030	OW	107%	47.3	35.0	3.6	3.3	8%	10%	8.0	10.8
EMC	2383 TT	Jerry Tsai	5985.00	7200.00	67,137	OW	264%	53.1	27.9	29.2	16.9	65%	77%	112.6	214.6
Chroma	2360 TT	Jerry Tsai	2140.00	3160.00	28,489	OW	176%	51.1	30.8	22.8	16.8	50%	63%	41.9	69.5
Tripod	3044 TT	Jerry Tsai	485.50	720.00	7,989	OW	53%	15.6	12.1	3.8	3.3	27%	29%	31.0	40.2
Radiant	6176 TT	Jerry Tsai	81.30	174.00	1,184	N	-34%	NA	NA	NA	NA	N/A	N/A	N/A	N/A
Flexium	6269 TT	Jerry Tsai	63.60	70.00	645	N	8%	NA	NA	NA	NA	N/A	N/A	N/A	N/A
TSMT	6278 TT	Jerry Tsai	180.00	196.00	1,648	OW	89%	16.2	9.0	2.1	1.8	13%	21%	11.1	20.0
Chicony Power	6412 TT	Jerry Tsai	78.40	97.00	984	OW	-15%	14.6	11.4	2.0	1.9	14%	17%	5.4	6.9
CHPT	6510 TT	Jerry Tsai	2760.00	4200.00	2,833	OW	21%	43.0	23.8	8.4	6.3	22%	30%	64.2	115.8
Sunonwealth	2421 TT	Jerry Tsai	144.00	214.00	1,294	OW	-10%	12.8	11.3	3.7	3.3	31%	31%	11.3	12.7
E Ink	8069 TT	Jerry Tsai	163.00	263.00	5,891	OW	-18%	13.6	11.4	2.8	2.5	20%	23%	12.0	14.3
Advantech	2395 TT	William Yang	673	405	18,293	N	134%	47.0	41.5	10.5	10.0	22%	25%	14.3	16.2
Silergy Corp	6415 TT	William Yang	448	700	5,462	OW	134%	48.5	28.8	4.3	3.9	9%	14%	9.2	15.5
Largan	3008 TT	William Yang	5515	5000	22,582	OW	121%	29.0	26.8	3.8	3.4	13%	13%	190.0	205.7
Asia Vital Compon	3017 TT	William Yang	2985	4000	36,682	OW	98%	27.9	18.3	15.0	9.4	65%	63%	106.8	162.8
Auras	3324 TT	William Yang	993	1200	2,893	N	-2%	18.3	14.8	5.5	4.4	36%	33%	54.4	67.2
Andes	6533 TT	William Yang	246	460	428	N	2%	27.2	NA	2.3	NA	9%	N/A	9.0	N/A
Realtek	2379 TT	William Yang	703	660	11,345	N	44%	22.2	17.5	8.2	7.1	34%	43%	31.7	40.2
AES	6781 TT	William Yang	1075	1285	2,875	N	-19%	21.7	20.9	4.6	4.2	23%	21%	49.5	51.4
ASMedia	5269 TT	William Yang	1425	2100	3,308	OW	18%	14.9	12.0	2.8	2.6	19%	22%	95.5	118.3
Simplo	6121 TT	William Yang	395	440	2,287	OW	10%	11.8	10.8	1.5	1.4	13%	14%	33.6	36.7
AP Memory	6531 TT	William Yang	882	1600	4,496	OW	97%	48.7	26.2	10.0	8.4	22%	35%	18.1	33.7
Genius	3406 TT	William Yang	650	700	2,294	OW	45%	17.0	15.2	2.5	2.3	15%	15%	38.3	42.7
Speed Tech	5457 TT	William Yang	27	78	167	OW	-32%	NA	NA	NA	NA	N/A	N/A	N/A	N/A
Parade	4966 TT	William Yang	567	570	1,402	N	-3%	17.2	13.0	1.9	1.8	11%	14%	33.0	43.5
Kinik	1560 TT	William Yang	698	850	3,254	OW	76%	47.0	32.0	10.8	8.9	24%	31%	14.8	21.8
Fositek	6805 TT	William Yang	1850	2600	3,970	OW	14%	30.2	17.7	12.9	8.3	49%	57%	61.2	104.2
Innostar	7828 TT	William Yang	1650	4000	2,092	OW	206%	109.2	25.7	43.3	18.4	43%	100%	15.1	64.1
GlobalWafers	6488 TT	Jimmy Huang	993.00	800.00	14,863	N	145%	51.4	49.1	5.2	4.8	10%	10%	19.3	20.2
Winbond	2344 TT	Jimmy Huang	176.50	360.00	24,865	OW	114%	6.2	2.9	3.4	1.7	75%	77%	28.6	60.1
Macronix	2337 TT	Jimmy Huang	122.00	205.00	7,569	OW	209%	6.6	3.0	2.8	1.5	55%	66%	18.6	40.4
GPTC	3131 TT	Jimmy Huang	2320.00	4400.00	2,125	OW	49%	33.1	21.6	14.9	11.1	44%	59%	70.0	107.2
All Ring	6187 TT	Jimmy Huang	1265.00	1500.00	3,889	OW	248%	42.3	27.6	11.8	9.7	32%	39%	29.9	45.9
Hon Precision	7769 TT	Jimmy Huang	6455.00	8350.00	36,360	OW	88%	50.2	29.4	15.9	11.9	35%	46%	128.5	219.8
Scientech	3583 TT	Jimmy Huang	713.00	1100.00	1,793	OW	113%	35.5	22.3	6.6	5.5	21%	27%	20.1	32.0

Source: Bloomberg Finance L.P., J.P. Morgan estimates, Company data. Note: Market data as of Aug 21, 2026 close

J.P.Morgan

AI server: Robust demand outlook, Rubin generation ramp on schedule

J.P.Morgan

Robust AI server demand outlook supported by strong Capex spending

- We model 45% AI chip shipment CAGR in 2025-28.
  - GPU server demand remains robust this year on resilient US CSP AI spending and pent-up Neocloud/enterprise demand.
  - We see longer demand visibility into next year on strong demand outlook and sustained U.S. CSP capex spending growth.
  - We forecast a 60% CAGR for AI ASIC chip shipments in 2025-28, driven by strong AWS Trainium/Google TPU demand.

AI server shipment forecast

k units	2022	2023	2024	2025	2026E	2027E	2028E	25-28E CAGR
Total datacenter AI chip volumes	**2,153**	**3,632**	**7,815**	**10,320**	**15,895**	**25,631**	**31,173**	*45%*
YoY growth		*69%*	*115%*	*32%*	*54%*	*61%*	*22%*	
High end datacenter GPU volumes	**800**	**1,931**	**4,950**	**6,150**	**8,225**	**10,781**	**12,673**	*27%*
YoY growth		*141%*	*156%*	*24%*	*34%*	*31%*	*18%*	
Nvidia	**775**	**1,911**	**4,500**	**5,500**	**7,425**	**9,281**	**10,673**	*25%*
YoY growth		*147%*	*135%*	*22%*	*35%*	*25%*	*15%*	
Arm-based			126	3,575	5,940	7,889	9,606	
Arm-based %			3%	65%	80%	85%	90%	
x86-based	775	1,911	4,374	1,925	1,485	1,392	1,067	
AMD	**25**	**20**	**450**	**650**	**800**	**1,500**	**2,000**	*45%*
YoY growth		*-20%*	*2150%*	*44%*	*23%*	*88%*	*33%*	
Oberon-like server					80	750	1,400	
Oberon-like %					10%	50%	70%	
8-way GPU server					*720*	*750*	*600*	
AI GPU peripheral cards					***300***	***1,000***	***1,300***	
Nvidia LPU					**300**	**1,000**	**1,300**	
ASIC chip volume	**1,353**	**1,701**	**2,865**	**4,170**	**7,370**	**13,850**	**17,200**	*60%*
YoY growth		*26%*	*68%*	*46%*	*77%*	*88%*	*24%*	
Chip per server								
AI chip per ASIC server	5	5	7	7	7	6	7	
GPU per server								
GB structure			4	4	4	4	4	
HGX structure	8	8	8	8	8	8	8	
LPU structure	16	16	16	16	16	16	16	
Total AI server volumes	**401**	**577**	**1,066**	**1,820**	**2,900**	**4,657**	**5,670**	*46%*
YoY growth		*44%*	*85%*	*71%*	*59%*	*61%*	*22%*	
High end GPU AI server shipment	100	241	635	1,216	1,799	2,490	3,041	*36%*
YoY growth		*141%*	*163%*	*92%*	*48%*	*38%*	*22%*	
AI ASIC server shipment	301	336	432	605	1,101	2,167	2,628	*63%*
YoY growth		*12%*	*28%*	*40%*	*82%*	*97%*	*21%*	

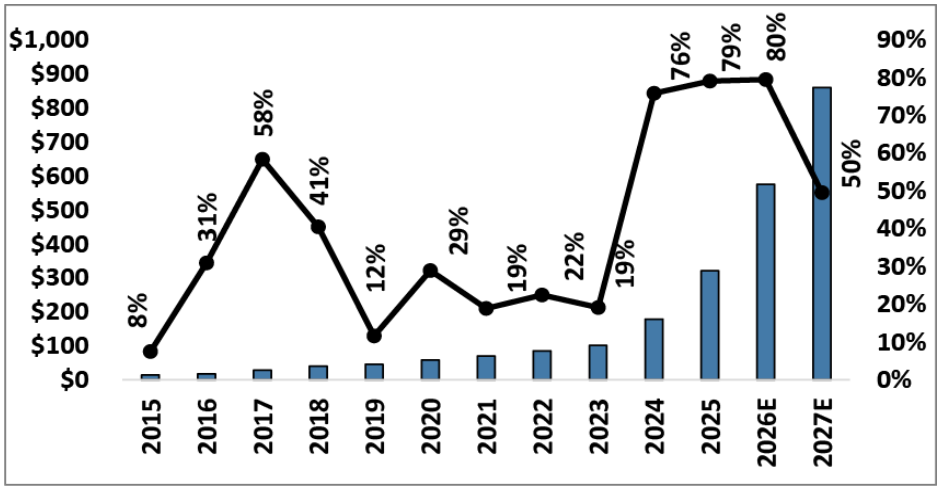
Source: J.P. Morgan estimates for all years, including historical. Note: Total AI server includes AI ASIC + high-end GPU AI servers.

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Upbeat 2026 AI capex outlook, extended visibility into 2027

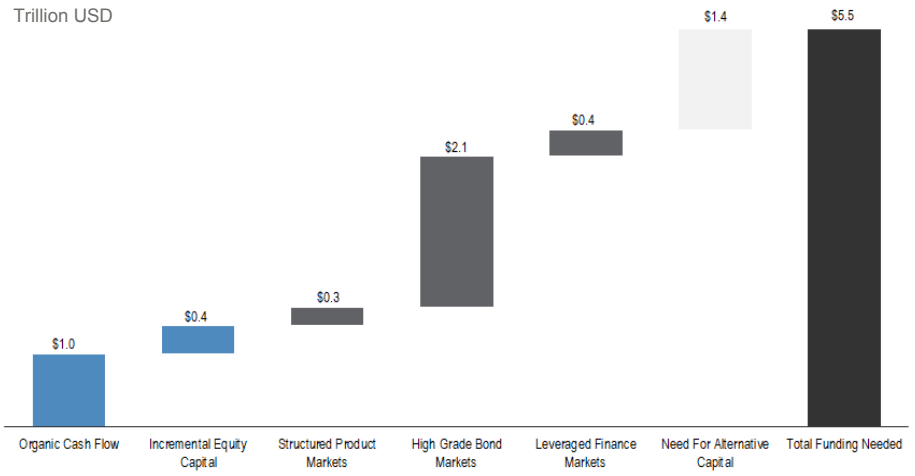
- U.S. hyperscalers raised 2026 capex outlook and provided positive commentary on 2027.
  - JPM U.S. hardware team now forecast +80%/+50% YoY growth of datacenter capex in 2026/27, vs. previous estimates of +63%/+40% YoY, which is the third raise this year. We see ~10% upside to the estimates after the recent updated outlook for leading hyperscalers.
- While negative FCF among leading hyperscalers over the next few quarters is inevitable, we see a few positive indicators to support continued AI investments, including robust core businesses, strong AI demand indicators, and decent returns of AI businesses with continued improvement.
- Datacenter capex from Tier 2 providers (e.g. emerging neocloud and other data center-related companies) is now becoming a much more significant cohort.
  - We expect the group to grow capex by 65%/39% YoY to US$90bn/US$130bn in 2026/2027.
- We estimate US$5.5tn of AI capex over 2026-30, with US$4.1tn funded through debt. We expect the IG corporate debt market to finance more than US$2.1tn of data center investments over the next five years

Top 4 US CSP/ISP cloud capex trend



Source: 650 Group and J.P. Morgan U.S. team estimates. Units in US$bn.

Anticipated AI Capex Funding Sources (2026-2030 total)

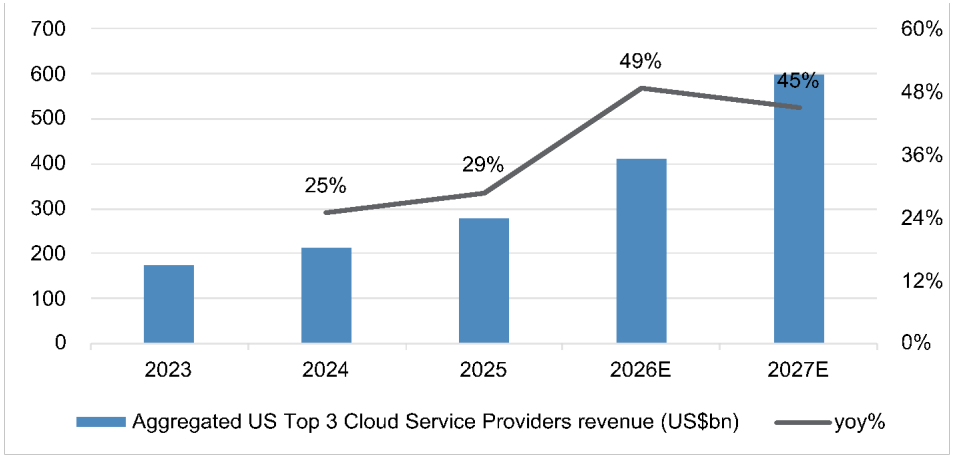


Source: J.P. Morgan U.S. team estimates.

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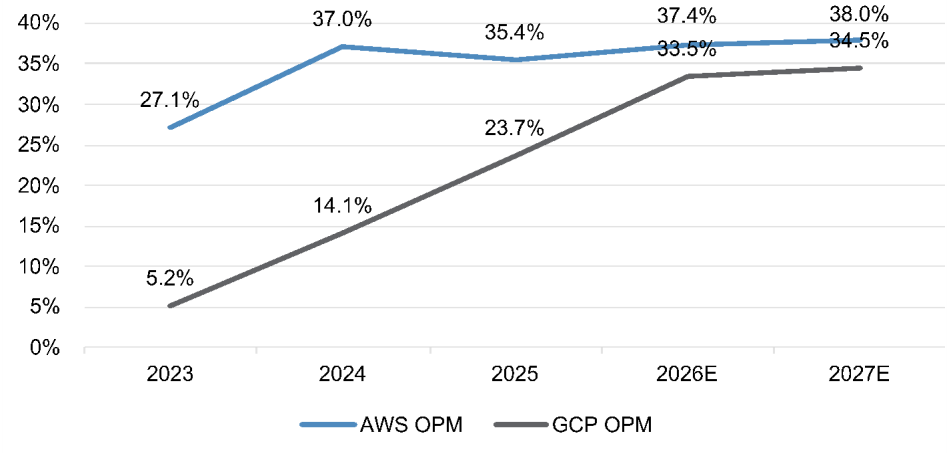
AI-led accelerating cloud revenue growth with margin expansion despite capex hikes

Accelerating aggregated U.S. top 3 CSPs' cloud revenue growth



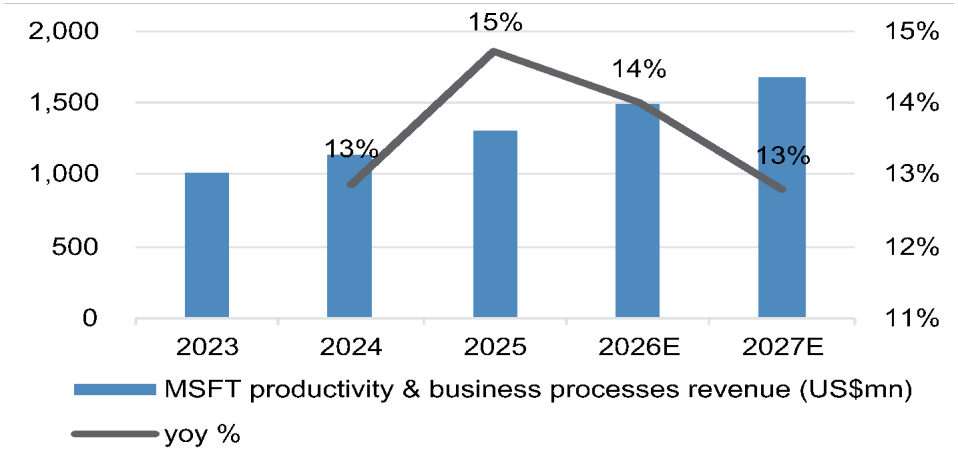
Source: Company data, J.P. Morgan estimates.

Continued CSPs' cloud OPM improvement despite capex hikes



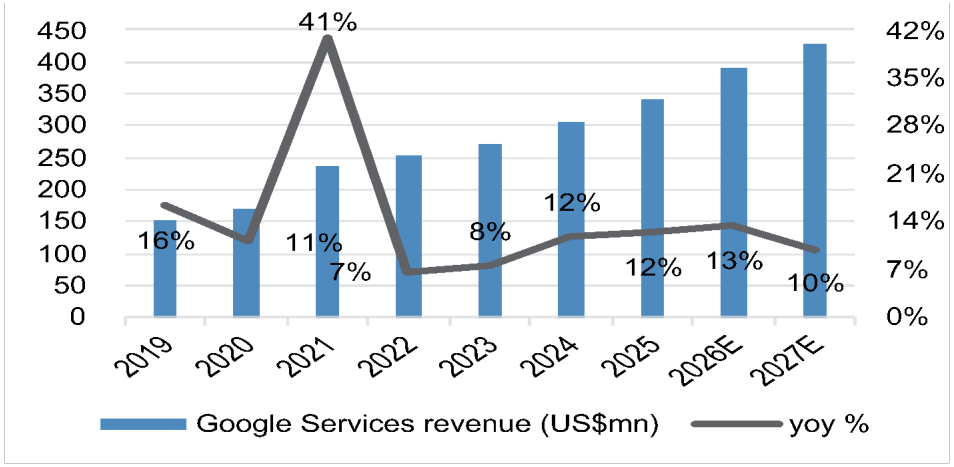
Source: Company data, J.P. Morgan estimates.

MSFT Office product and cloud services revenue



Source: Company data, J.P. Morgan estimates.

Google Services revenue



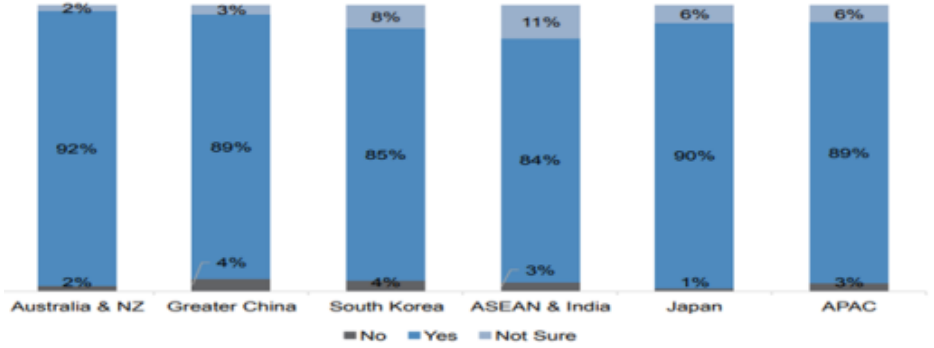
Source: Company data, J.P. Morgan estimates.

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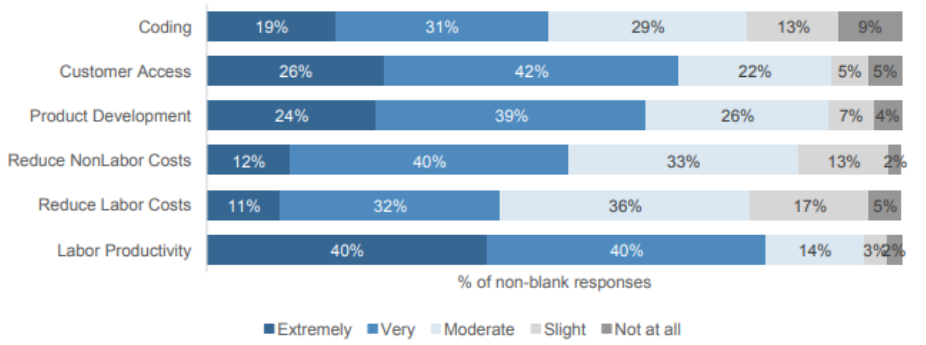
90% of APAC respondents on board with AI, with upside in spending in the near future

- JPM Asia Pacific Artificial Intelligence Implementation Survey 2026 (link) suggests that AI investment is already mainstream, with 88% of APAC respondents reporting AI expenditure over the last 12 months, while only ~3% said they had not invested and ~7% were unsure. Key findings include:
  - AI investment is mainstream and growing fast, but leadership is uneven.
  - AI stated value case is productivity-led but with a growth mindset; so far cost reduction is secondary.
  - Execution capability will increasingly separate AI winners; most respondents were optimistic about profit implications.
  - Average AI spend is expected to rise from 4.5% of expenses plus capex over the last 12 months to 5.8% over the next 12 months.

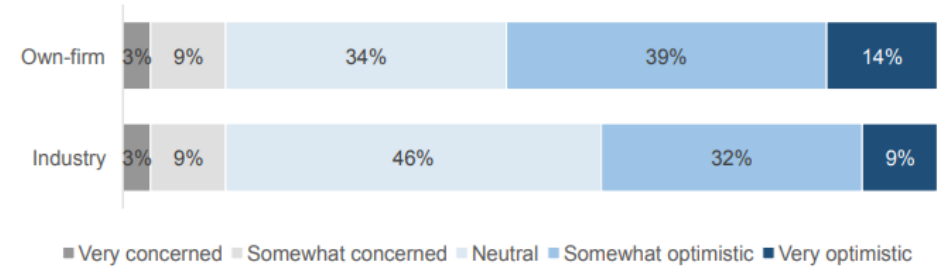
AI expenditure/investment (last 12 months) by region



Motivations for AI expenditure/investment



Impact on industry vs. own firm profitability



Source: JPM Asia Pacific Artificial Intelligence Implementation Survey 2026 (link).

AI expenditure/investment intensity



Source: JPM Asia Pacific Artificial Intelligence Implementation Survey 2026 (link).

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Nvidia GPU roadmap: Rubin on schedule, Kyber architecture facing challenges

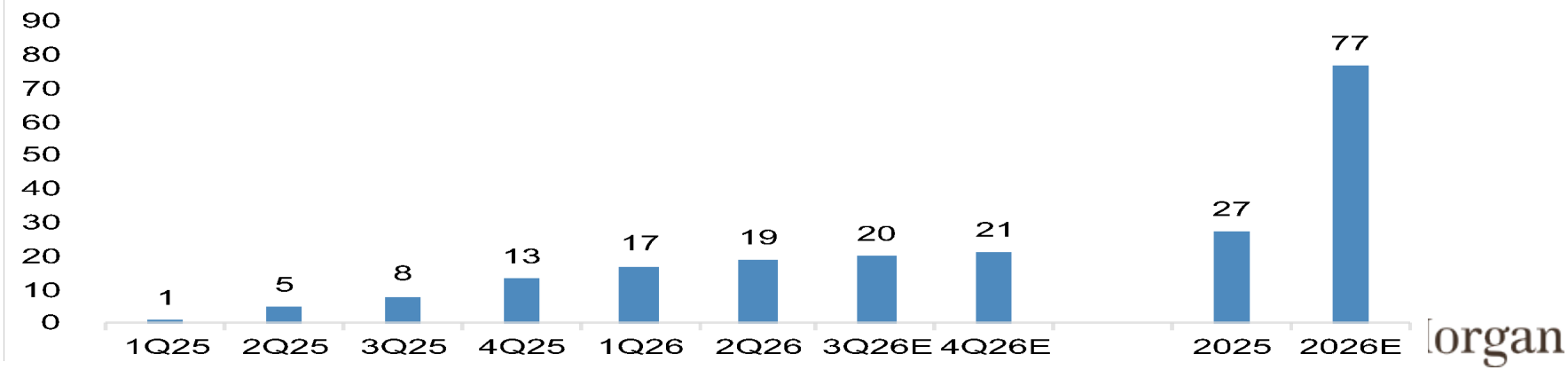
- Vera Rubin system ramps up on schedule in late 3Q to 4Q26
  - Our research indicates limited impact on the Vera Rubin ramp schedule from the recent leading PCB maker yield issue.
- We estimate 70-80k NVL72 rack shipments this year, comprising 60-65k GB300 rack shipments and ~10k VR rack shipments.
  - We continue to forecast ~1.5mn Rubin chip production this year (board level output), but expect only ~10k VR NVL72 rack shipments due to production cycle time and component shortages.
- We expect 85-95k NVL72 rack shipments in 2027, with VR200 rack being the majority.

Nvidia GPU server roadmap

	2H24	1H25	2H25	2H26		2H27	2H28
Arm-based		**GB200 NVL72** GPU: HBM3e: 192GB, TDP: 1.2kW CX7 400G	**GB300 NVL72** GPU: HBM3e: 288GB, TDP: up to 1.4kW CX8 800G 1.5x FP4 performance	**Vera-Rubin NVL72** GPU: HBM4: 288GB, TDP: up to 2.3kW Dual CX9 1.6T	**Vera-Rubin CPX** 180-220kW CX9 per CPX, 800G	**Vera-Rubin Ultra NVL72/576** GPU: HBM: TBD., TDP: up to 2.6kW 4*CX9, 3.2T	**Feynman generation** CX10
x86-based	**4/8-way H200** GPU: HBM: 141GB, TDP: 0.7kW CX7 400G	**8-way B200** GPU: HBM: 192GB, TDP: 1kW CX7 400G	**8-way B300** GPU: HBM: 288GB, TDP: 1.2kW CX8 800G 1.5x FP4 performance	**8-way Rubin** HBM; System power at 20-25kW CX9 800G		**8-way Rubin Ultra** HBM; System power: TBD CX9 800G	

Source: J.P. Morgan, Company data.

NVL72 ODM rack quarterly shipments (k units)



Deep dive into NVL72 BOM cost: GPU and Memory to be the key cost driver

- We estimate the ODM price of the GB300/VR200 rack to be ~US$4.1/6.5mn, ~20%/90% higher than that of the GB200 server, primarily driven by GPU and memory price increases and content upgrades in the networking components and power and thermal systems.
- We expect AI server ODM GMs to decline to 3.6%/2.7% of GB300/VR200 vs. 4.2% in GB200.
- However, we see MVA dollars (GP dollars per rack) increasing in VR200, due to a more complex server architecture and longer testing time.
  - We estimate ~US$148k/ $175k for the MVA of GB300/VR200 vs. ~US$145k for GB200.

NVL72 BoM - Summary table

In US$	GB200	GB300	VR200
NVL72 ODM BoM	3,261,618	3,934,640	6,300,268
MVA fees	144,527	148,114	174,883
NVL72 ODM prices	3,406,145	4,082,754	6,475,151
ODM margin	*4.2%*	*3.6%*	*2.7%*
Price increase vs. GB200		*20%*	*90%*
BoM breakdown			
Compute tray	2,781,108	3,450,132	5,480,100
Switch tray	187,686	187,704	485,964
Power supply system	36,384	43,364	81,764
Other rack-level components	256,440	253,440	252,440
Mix %			
Compute tray	85%	88%	87%
Switch tray	6%	5%	8%
Power supply system	1%	1%	1%
Other rack-level components	8%	6%	4%

BoM breakdown by key components	GB200	GB300	VR200
GPU+CPU (Superchip)	**71.9%**	**74.9%**	**69.5%**
Total memory	**10.1%**	**18.6%**	**18.3%**
HBM	6.1%	7.6%	7.0%
NAND	1.4%	2.5%	2.7%
DRAM (LPDDR)	2.5%	8.5%	8.5%
Power supply system (power shelf/power whip/busbar)	**1.2%**	**1.1%**	**1.3%**
Thermal (coldplate/manifold/QD)	**1.4%**	**1.2%**	**1.1%**
Mechanical (chassis/ slide rail)	**0.6%**	**0.5%**	**0.3%**
MVA	**4.2%**	**3.6%**	**2.7%**
Others (compute tray contents excl. superchip, switch tray, etc.)	**19.3%**	**16.1%**	**22.3%**

Source: J.P. Morgan estimates.

J.P.Morgan

Secular ASIC server demand

- We forecast AI ASIC chips to grow 77%/88% YoY in 2026/2027, mainly driven by strong AWS Trainium and Google TPU demand.
- As AI inference activities scale, we expect more end customers to develop its own AI inference ASIC solutions, which could further expand the AI ASIC server TAM.

JPM ASIC chip/server estimates

	Chip forecast (k)						Chip units per server	Implied server units (k)					
	2023	2024	2025	2026	2027	2028		2023	2024	2025	2026	2027	2028
Google													
TPU - inference	1,020	900	1,500	2,600	4,600	5,200	1/4/8	255	225	375	650	1150	1300
TPU - training	285	900	700	1,400	3,900	4,800	8	36	113	88	175	488	600
Total	**1,305**	**1,800**	**2,200**	**4,000**	**8,500**	**10,000**		**291**	**338**	**463**	**825**	**1638**	**1900**
Amazon													
Inferentia	300	420	100	0	0	0	1/6/12	38	53	13	0	0	0
Trainium	30	300	1,500	2,300	3,000	3,500	8/16/32	4	19	94	142	177	199
Total	**330**	**720**	**1,600**	**2,300**	**3,000**	**3,500**		**41**	**71**	**106**	**142**	**177**	**199**
Microsoft													
Maia - training		**5**	**50**	**200**	**800**	**1,200**	4		**1**	**13**	**50**	**200**	**300**
Meta													
MTIA		**150**	**200**	**300**	**500**	**1,000**	24		**6**	**8**	**13**	**21**	**42**
OpenAI													
AI ASIC chip				**50**	**300**	**500**	8				**6**	**38**	**63**
Apple													
AI ASIC chip				**500**	**750**	**1,000**	8				**63**	**94**	**125**
Grand total	**1,701**	**2,865**	**4,170**	**7,370**	**13,850**	**17,200**		**336**	**432**	**605**	**1,101**	**2,167**	**2,628**
YoY		*68%*	*46%*	*77%*	*88%*	*24%*			*28%*	*40%*	*82%*	*97%*	*21%*

Source: J.P. Morgan estimates.

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Consolidated market landscape in AI server ODM space

- Hon Hai and Quanta stand out as preferred picks in the NVL72 supply chain, while Celestica and Wiwynn lead among ASIC plays.
- While we see tier-2 ODMs (e.g. Pegatron, Compal) managing to break into the space, complex design capabilities, frequent product upgrades, and high working capital requirements should keep the competitive landscape concentrated among a few major players.

AI server ODM matrix - Nvidia's GPU system

	Nvidia NVL72					
	GB200		GB300		VR200	
	Major	Secondary	Major	Secondary	Major	Secondary
Microsoft	Hon Hai	Quanta	Hon Hai	Quanta	Hon Hai	Quanta
Meta	Quanta	Hon Hai	Quanta	Hon Hai	Quanta	Hon Hai, (Wiwynn)
Amazon	Quanta	Hon Hai	Quanta	Hon Hai, Jabil	Quanta	Hon Hai, Jabil
Google	Quanta		Quanta		Hon Hai	Quanta
Oracle	Hon Hai	Quanta, Wiwynn, SMCI, Dell	Hon Hai	Quanta, SMCI	Quanta	Hon Hai, Wiwynn, (SMCI), (Dell), (Inventec)
Dell	Wistron (L10)		Wistron (L10)		Wistron (L10)	(Compal)

AI server ODM matrix - AMD's GPU system

	AMD GPU servers			
	MI300		MI400	
	Major	Secondary	Major	Secondary
Microsoft	ZT Systems		Quanta	
Meta	Wiwynn		Wiwynn	
Oracle	Hon Hai		Hon Hai	

AI server ODM matrix - AMD's GPU system

	ASIC servers	
	AI	CPU
Microsoft	Quanta	Hon Hai
Meta	Quanta	
Amazon	T2: Wiwynn T3: Wiwynn, Jabil, (Hon Hai)	Hon Hai, Jabil, Inventec (board)
Google	Celestica (L6-L11), Flex (L6-L11), Hon Hai (L10.5), Inventec (L6)	Hon Hai (L10), Inventec (CPU board)
OpenAI	Celestica	

Source: J.P. Morgan estimates. Note: Flex/ Inventec also supplies CPU boards for the MI300/400 system.

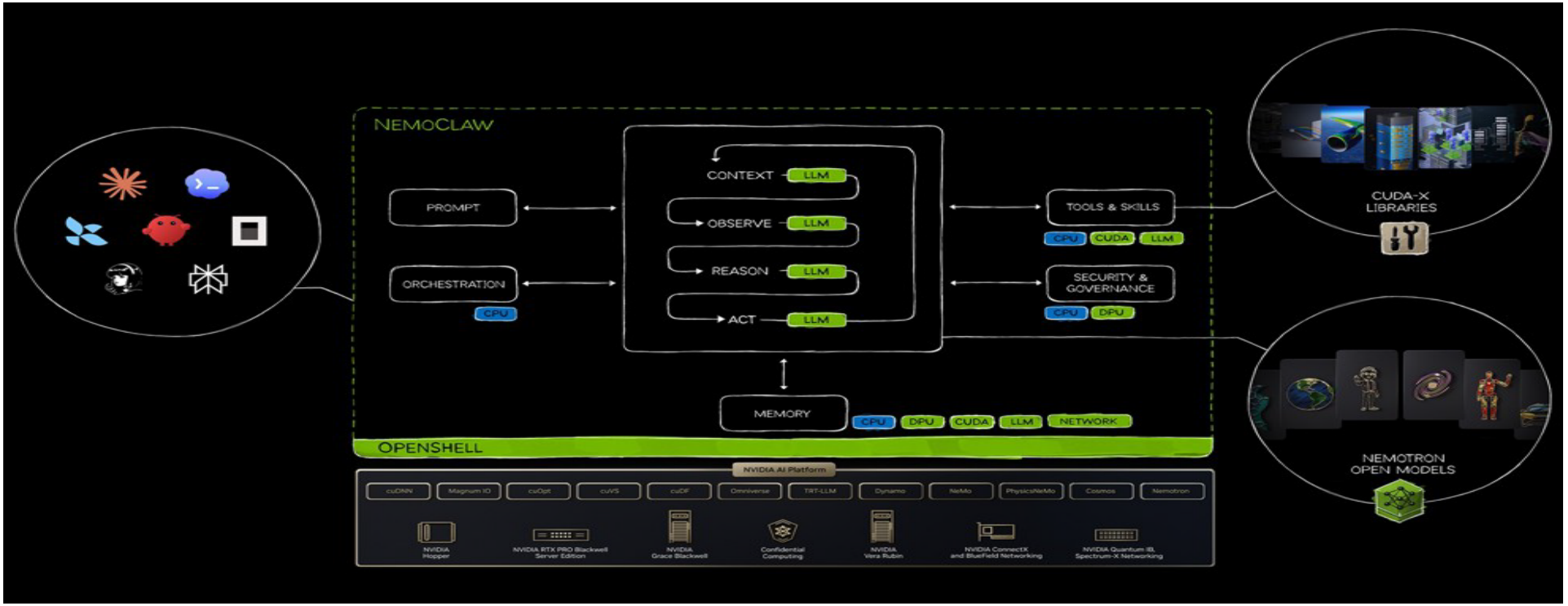
General Servers: Multi-year strong demand driven by AI, key swing factor on supply constraints

J.P.Morgan

Agentic AI CPUs becoming a new driver for server CPU demand

- As we migrate towards the era of agentic AI, focusing on test-time scaling (i.e. long thinking), CPUs are playing an increasingly important role in orchestration, running tools and skills, storage, and security.
  - For example, the Vera CPU not only sits in the NVL72 rack systems, but also serves as a standalone CPU across the entire Vera Rubin platform, including storage servers and CPU servers.
- We attribute the strong general server demand this year (30-40% YoY growth on our estimates) primarily to the emerging demand for agentic AI.

Agent = LLM + Harness; CPU plays a critical role in the agentic AI ecosystem



Source: Nvidia.

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Accelerating server CPU growth cycle on AI inference cycle

- We segment CPU demand into three buckets—(1) AI server headnode CPUs, (2) regular server CPUs, and (3) agentic-AI CPUs.
  - As AI applications transition from training toward inference, we expect agentic-AI and AI headnode CPU demand to drive a "super" general server CPU cycle.
- We forecast total server CPU shipments to grow from 26mn units in 2025 to 68mn by 2028 (38% CAGR) based on a top-down methodology, triangulated with bottom-up estimates.
  - We forecast a 74%/5%/155% CAGR of AI server headnode CPU/ regular server CPU/ agentic AI server CPU demand in 2025-28.
- We forecast a 53% CAGR of server CPU revenue TAM in 2025-2028, driven by the fast-growing server CPU demand and a ~10% CAGR of server CPU ASP expansion.

JPM server CPU forecast - top-down methodology

Unit in millions	2024	2025	2026E	2027E	2028E	2025-28 CAGR
1. AI SERVER HEADNODE						
Global AI accelerator Shipments (mn)	**7.6**	**9.6**	**16.1**	**25.2**	**32.5**	*50%*
YoY		*27%*	*67%*	*56%*	*29%*	
Avg accelerators per CPU in headnodes	*4.1*	*3.0*	*2.3*	*2.2*	*1.9*	
Headnode Server CPUs Needed (mn)	**1.8**	**3.2**	**7.1**	**11.3**	**16.8**	*74%*
YoY		*73%*	*124%*	*59%*	*48%*	
2. REGULAR SERVER GROWTH (non AI workloads)						
Traditional server unit for non AI workload (mn)	11.6	11.9	12.5	13.1	13.8	
YoY	*2%*	*3%*	*5%*	*5%*	*5%*	
CPU per server	1.8	1.8	1.8	1.8	1.8	
non AI workload CPU (mn)	**20.3**	**20.9**	**21.9**	**23.0**	**24.2**	*5%*
YoY		*3%*	*5%*	*5%*	*5%*	
3. AGENTIC AI CPU CLUSTERS						
CPU per accelerator ratio	0.0	0.17	0.45	0.68	0.83	
TOTAL AGENTIC AI CPUs (mn)	**0.0**	**1.6**	**7.3**	**17.1**	**27.0**	*155%*
YoY			*352%*	*134%*	*58%*	
Total server CPU shipment (mn)						
Total server CPU shipment	**22.1**	**25.7**	**36.3**	**51.4**	**67.9**	*38%*
YoY		*16%*	*42%*	*42%*	*32%*	
Total server CPU shipment excl. AI server headnodes serv	20.3	22.5	29.2	40.1	51.1	*31%*
YoY		*11%*	*30%*	*37%*	*27%*	

Source: J.P. Morgan estimates. Gartner® data for 2024 total server CPU shipments. Global AI accelerator shipments are based on our CoWoS estimates by the semi team.

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Fast-growing AI accelerator shipments fueling the AI headnode CPU demand

- Strong accelerator demand + Rising CPU attach rate = Exponential AI server headnode CPU growth.

AI server headnode CPU forecast

AI accelerator unit (mn)	2024	2025	2026E	2027E	2028E	Note
NVDA	4.5	6.2	8.9	10.0	11.6	
HGX (x86 base)	4.3	2.6	3.0	2.1	2.0	
NVL72 (ARM base)	0.1	3.6	5.9	7.9	9.6	
AMD	0.5	0.7	0.7	1.5	2.3	
TPU	1.7	1.8	4.4	8.9	11.6	
v4/5/6/7	1.7	1.7	2.7	1.7	-	
v8	-	0.1	1.7	7.2	8.6	
v9	-	-	-	-	3.0	
AWS	0.8	1.5	1.9	3.5	3.5	
Inferentia 2	0.5	0.1	-	-	-	
Trn 2	0.3	1.5	0.6	-	-	
Trn 3	-	-	1.3	3.5	-	
Trn 4	-	-	-	-	3.5	
Meta	-	-	0.3	0.5	1.1	
Microsoft	-	-	0.2	0.8	0.8	
Others			0.2	0.4	0.8	
Total AI accelerator units (mn)	**7.4**	**10.1**	**16.5**	**25.6**	**31.7**	

Avg number of accelerators per CPU	2024	2025	2026E	2027E	2028E	
NVDA	**3.9**	**2.5**	**2.4**	**2.4**	**2.3**	8 GPU to 2 CPU
HGX (x86 base)	*4.0*	*4.0*	*4.0*	*8.0*	*8.0*	2 GPU to 1 CPU; R200 changed to 8:1 GPU/CPU ratio
NVL72 (ARM base)	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	
AMD	**4.0**	**4.0**	**4.0**	**4.0**	**4.0**	
TPU	**4.0**	**3.8**	**1.5**	**1.5**	**1.3**	
v4/5/6/7	*4.0*	*4.0*	*1.5*	*1.5*	*1.5*	Assume v4/v5 4:1 & v6/7 2:1
v8	*1.5*	*1.5*	*1.5*	*1.5*	*1.5*	v8 has two versions, 1:1 or 2:1
v9	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*	
AWS	**5.3**	**14.5**	**14.3**	**10.0**	**2.0**	Assume average 8 Inferentia to 2 CPUs
Inferentia 2	*4.0*	*4.0*	*4.0*	*4.0*	*4.0*	
Trn 2	*16.0*	*16.0*	*16.0*	*16.0*	*16.0*	
Trn 3	*13.6*	*13.6*	*13.6*	*10.0*	*6.4*	80% air cooling (16:1) and 20% liquid cooling (4:1), 50%/50% and 20%/80% AC/LC ratio in 2027/28
Trn 4	*2.0*	*2.0*	*2.0*	*2.0*	*2.0*	JPMe
Meta	**4.0**	**4.0**	**4.0**	**4.0**	**4.0**	
Microsoft	**4.0**	**4.0**	**4.0**	**4.0**	**4.0**	
Others	**4.0**	**4.0**	**4.0**	**4.0**	**4.0**	
Blended ratio	**4.0**	**3.2**	**2.3**	**2.3**	**1.9**	

AI headnode CPU units (mn)	2024	2025	2026E	2027E	2028E
NVDA	1.1	2.4	3.7	4.2	5.1
AMD	0.1	0.2	0.2	0.4	0.6
TPU	0.4	0.5	2.9	5.9	8.7
AWS	0.1	0.1	0.1	0.4	1.7
Meta	-	-	0.1	0.1	0.3
Microsoft	-	-	0.1	0.2	0.2
Others	-	-	0.1	0.1	0.2
Total	**1.8**	**3.2**	**7.1**	**11.3**	**16.8**

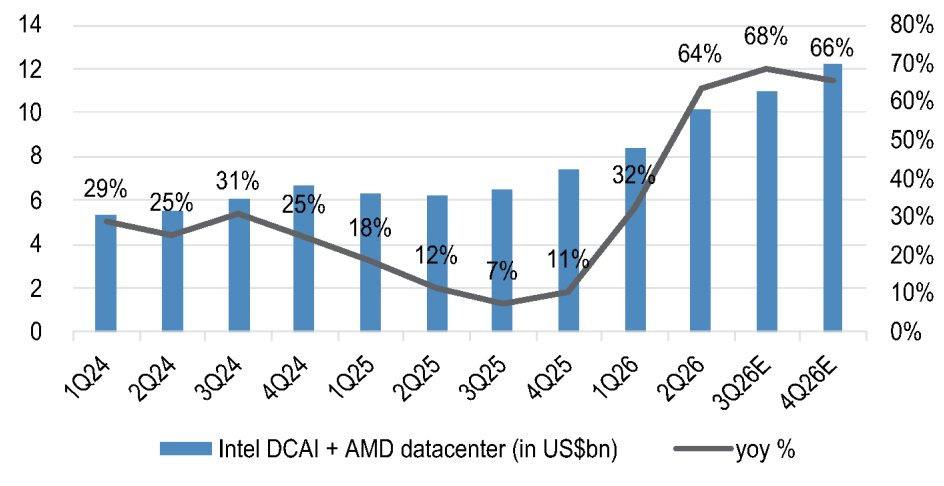
Source: J.P. Morgan estimates for all years, including historical. AI accelerator unit estimates are based on our CoWoS estimates by the semi team.

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Super server cycle underpinned by the recent uptick in x86 CPU vendor revenue growth

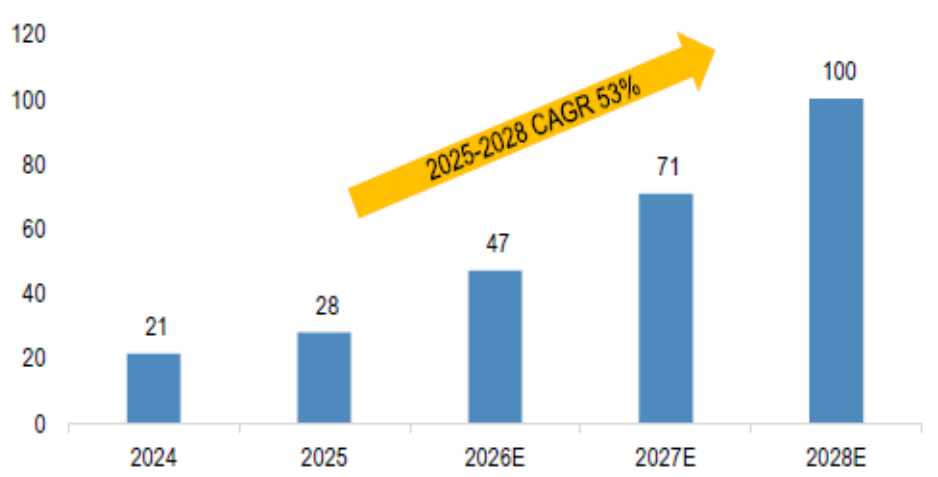
- We have seen accelerating growth in Intel/AMD server datacenter CPU revenue growth in the past three quarters, driven by strong server demand.
- AMD also cast an upbeat long-term outlook for server CPU TAM (US$220bn by 2030 or ~50%+ CAGR in 2025-2030), which underpins our research of the multi-year super server cycle across hyperscalers and the positive demand signals across the supply chain.

Intel/AMD's quarterly datacenter revenues and yoy trends



Source: J.P. Morgan U.S. semi team estimates, Company data. Note: AMD's datacenter revenue excludes GPU revenue.

Server CPU revenue TAM forecast and CAGR



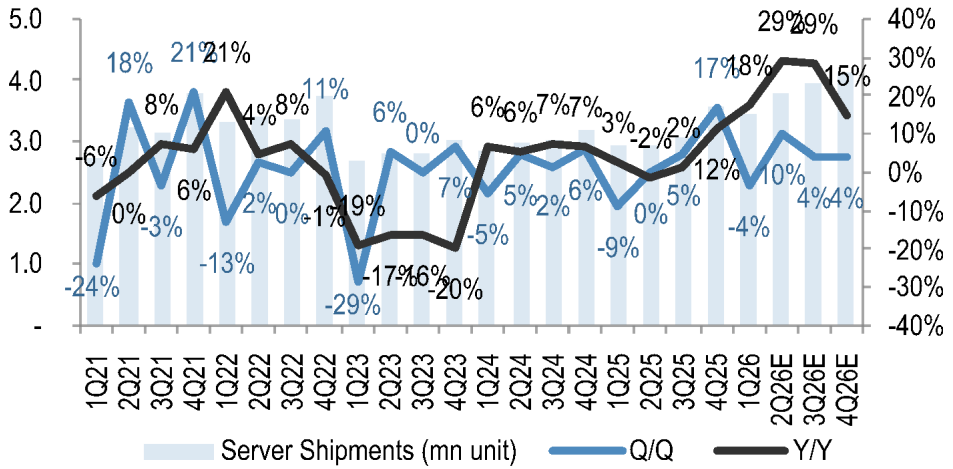
Source: Gartner®, J.P. Morgan estimates.

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An AI-led multi-year general server upcycle

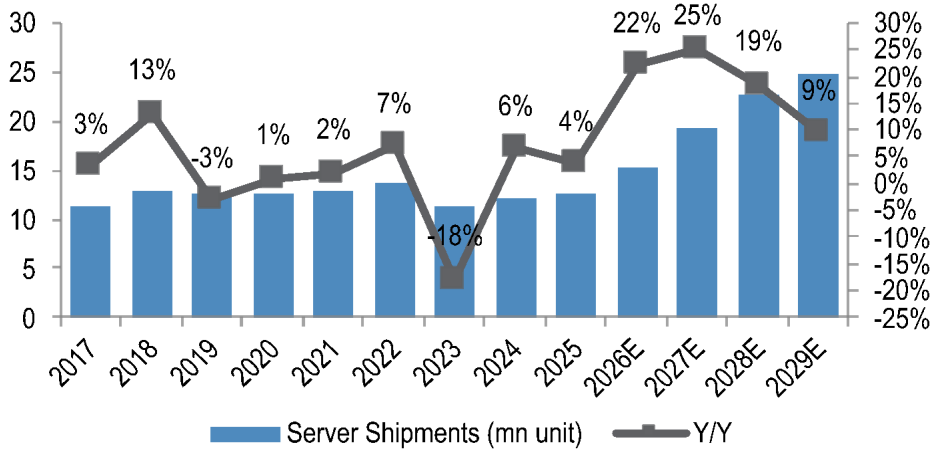
- 1Q26 U.S. CSP server shipments were better-than-seasonal at up QoQ and the overall server shipments appear to have grown double-digit QoQ in 2Q26.
  - Initial outlook indicates server shipments should continue to grow into 2H26, led by U.S. CSP server demand.
- We have picked up incremental positive signs in server demand over the past 3-6 months with order visibility extended into next year.
  - Lotes and ASPEED's order visibility has already extended into 2027. Memory vendors also collected 50-80% demand growth feedback from the U.S. CSPs for next year. The key swing factor is supply chain constraints.
- We anticipate an accelerating shipment growth of 25% YoY next year, driven by accumulated backlog from this year and strong server demand.
  - By customer type, we forecast 40-50% growth/ single digit decline to flattish for CSPs/enterprise server shipments in 2026/27, respectively.
- In the longer run, we expect server shipments to sustain at double digit growth in 2028-29, driven by the multi-year AI-led server demand.

Server quarterly shipments, QoQ and YoY trend



Source: Gartner®, J.P. Morgan estimates.

Server annual shipments and YoY trend



Source: Gartner®, J.P. Morgan estimates.

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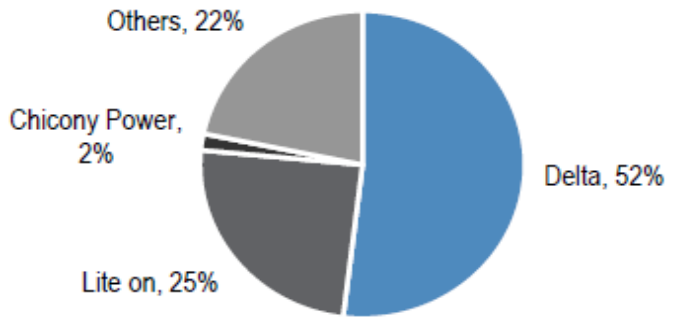
Datacenter Power: Secular TAM expansion in AI datacenters

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Datacenter Power TAM reaches US$50bn by 2028E, growing at 80% CAGR

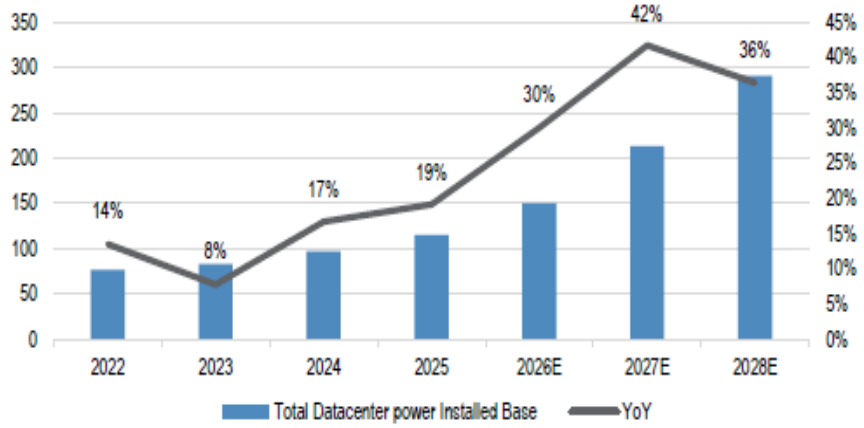
- We forecast Delta's AC/DC server power revenue to grow at 75-80% CAGR in 2025-28, largely in line with our server power supply TAM CAGR at 80%.
- Our datacenter power TAM is driven by three compounders:
  - **Accelerator shipment growth:** 40-50% CAGR in 2025-28E based on our latest CoWoS updates
  - **TDP growth:** 30-50% CAGR on continued spec upgrades
  - **Power architectural change:** Rising power rack adoption (JPMe 20% in Vera Rubin and 50%+ in VR Ultra cycle)

Server power supply market landscape



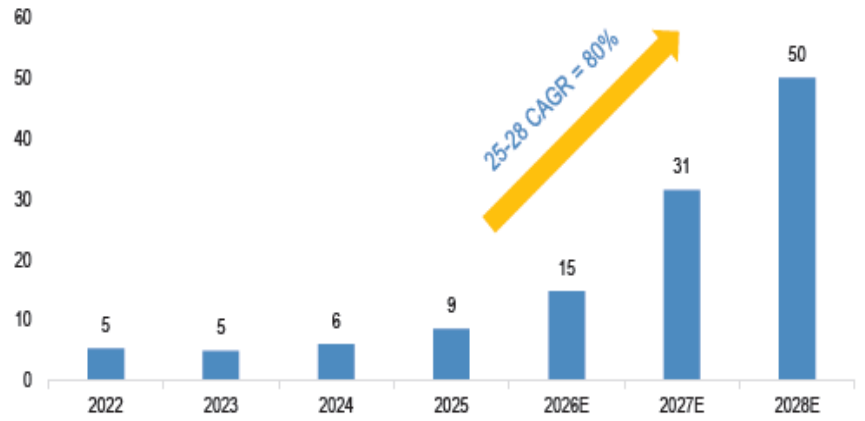
Source: Company data, J.P. Morgan estimates. Note: Lite on's server PSU revenue is based on company guidance. Chicony's implied market share based on J.P. Morgan coverage analyst Jerry Tsai's revenue estimates for the company (3412 TT, OW).

Datacenter new power installed and YoY growth (GW)



Source: IEA, J.P. Morgan estimates.

Delta's server power supply TAM (US$bn)



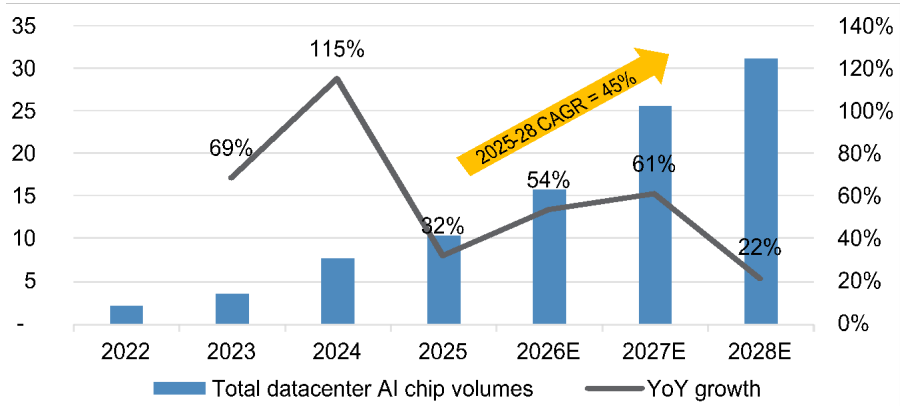
Source: J.P. Morgan estimates for all years, including historical.

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Datacenter Power growth driver 1 and 2: Accelerator shipment growth + TDP expansion

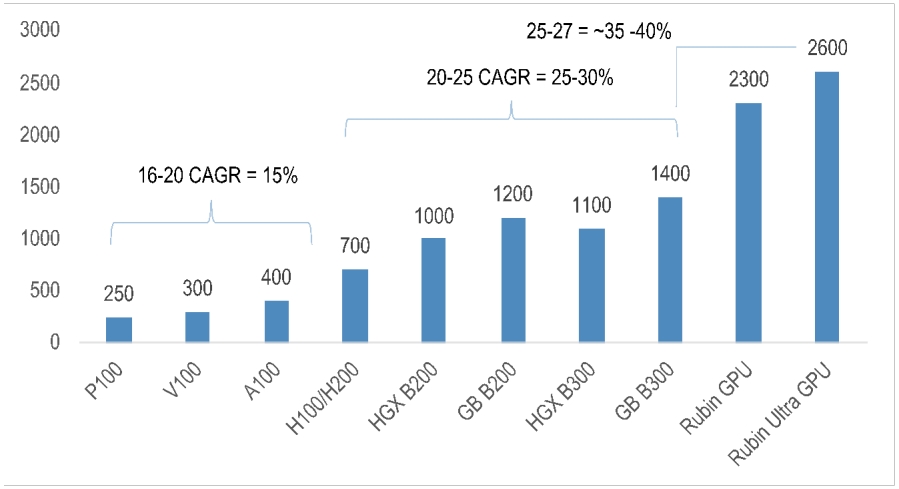
- We forecast ~45% CAGR for AI accelerator shipments based on the latest CoWoS update (link) (up from our prior estimate of ~30% CAGR).
- We expect a ~30% CAGR for AI accelerators' TDP expansion, driven by continued spec upgrades to address training and inference workloads.
  - We see a faster TDP expansion for AI ASIC chips as hyperscalers start to leverage their ASIC solutions for AI training/inference tasks.

Datacenter AI chip shipment growth (mn units for volume)



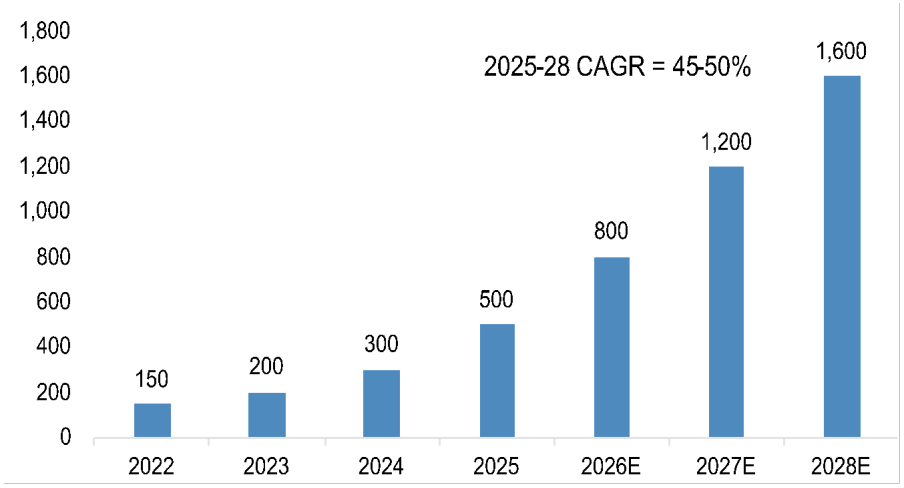
Source: J.P. Morgan estimates for all years, including historical.

Nvidia's high-end GPU TDP



Source: Company data, J.P. Morgan estimates.

AI ASIC blended TDP trend (Watt)



Source: J.P. Morgan estimates for all years, including historical.

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Datacenter Power growth driver 3: Power supply configuration change

Nvidia's AI server rack power roadmap and estimated power content changes

	DGX A100	DGX H100/H200	H20	DGX B200/B300	GB200 NVL72	GB300 NVL72	VR200 Power shelf	VR Ultra
Real server Power consumption excl. redundancy (kw	7	10	5	14	120	140	210	900
Design power capacity per rack	13	20	9	20	198	288	444	1500
PSU form factor	In-server PSU	In-server PSU	In-server PSU	In-server PSU	Power shelf	Power shelf	Power shelf	800V HVDC power rack
Power spec	4*3.3kw	6*3.3kw	6*1.5kw	6*3.3kw	6*33kw	4*72kw	4*111kw	10*150kw
Redundancy spec	N +1 (3+1)	N+2 (4+2)	N+2 (4+2)	N+1 (5+1)	N+2 (4+2)	N+2 (4+2)	N+2 (4+2)	N+2 (4+2)
PSU specification (kw)	3.3	3.3	1.5	3.3	5.5	12	18.5	25
PSU ASP (US$)	350	350	150	350	700	1,500	2,600	3,750
Number of PSUs per rack	**4**	**6**	**6**	**6**	**36**	**24**	**24**	**60**
Number of power shelves	*NA*	*NA*	*NA*	*NA*	*6*	*4*	*4*	*10*
Number of PSUs per power shelf	*NA*	*NA*	*NA*	*NA*	*6*	*6*	*6*	*6*
Total power content (US$k)	***6***	***8***	***4***	***8***	***37***	***53***	***92***	***673***
PSU content per rack	6	8	4	8	25	36	62	225
Number of server per racks	*4*	*4*	*4*	*4*	*18*	*18*	*18*	*18*
Other components within power shelf	NA	NA	NA	NA	12	17	29	448
Dollar content per watt (US$)								
Dollar/watt - PSU	0.11	0.11	0.10	0.11	0.13	0.13	0.14	0.15
Dollar/watt - Power shlef/rack	0.11	0.11	0.10	0.11	0.19	0.18	0.21	0.45

Power rack BoM cost breakdown (800V 660kw)

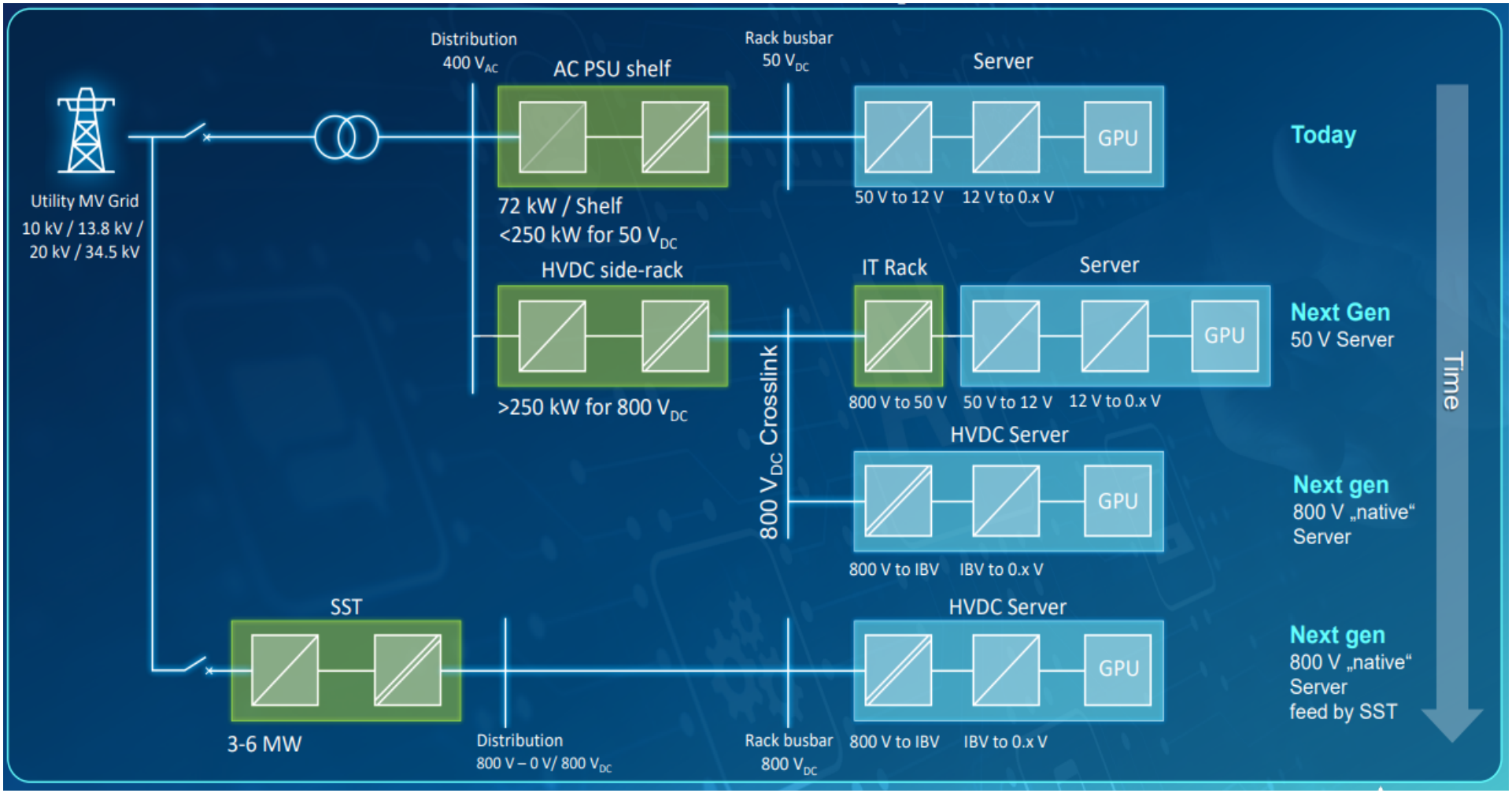
Components	Unit price ($)	Volume	Content ($)	% of total cost	Note
110kW power shelf (18.3kW PSU*6)	19,200	6	115,200	45%	JPMe PSU ASP at $2600 ($0.14/W), PMC ASP at $300, and power shelf ASP at $3000
80kW BBU (20kW*4)	15,000	6	90,000	35%	Assume $0.15/W ratio for BBU, shelf cost at $3000
Rack chassis	10,000	1	10,000	4%	
Liquid cooling busbar	3,000	1	3,000	1%	JPMe Busbar ASP at $3000, liquid cooling component ASP at $500
Power whip	600	12	7,200	3%	100A
DC/DC cross link cable	600	6	3,600	1%	125A
Others			2,313	1%	mgmt switch, etc.
Power vendor assembly and testing			26,445	10%	assume 40% GM for the outsourcing components and $20k assembly cost
Total cost for end customers			**257,758**	100%	

Source: Nvidia, J.P. Morgan estimates. Note: 1 660kW power rack can support 2 Vera Rubin NVL72 racks.

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Long-term driver: HVDC power rack and SST adoption

Power architecture migration in AI servers



Source: Delta Electronics.

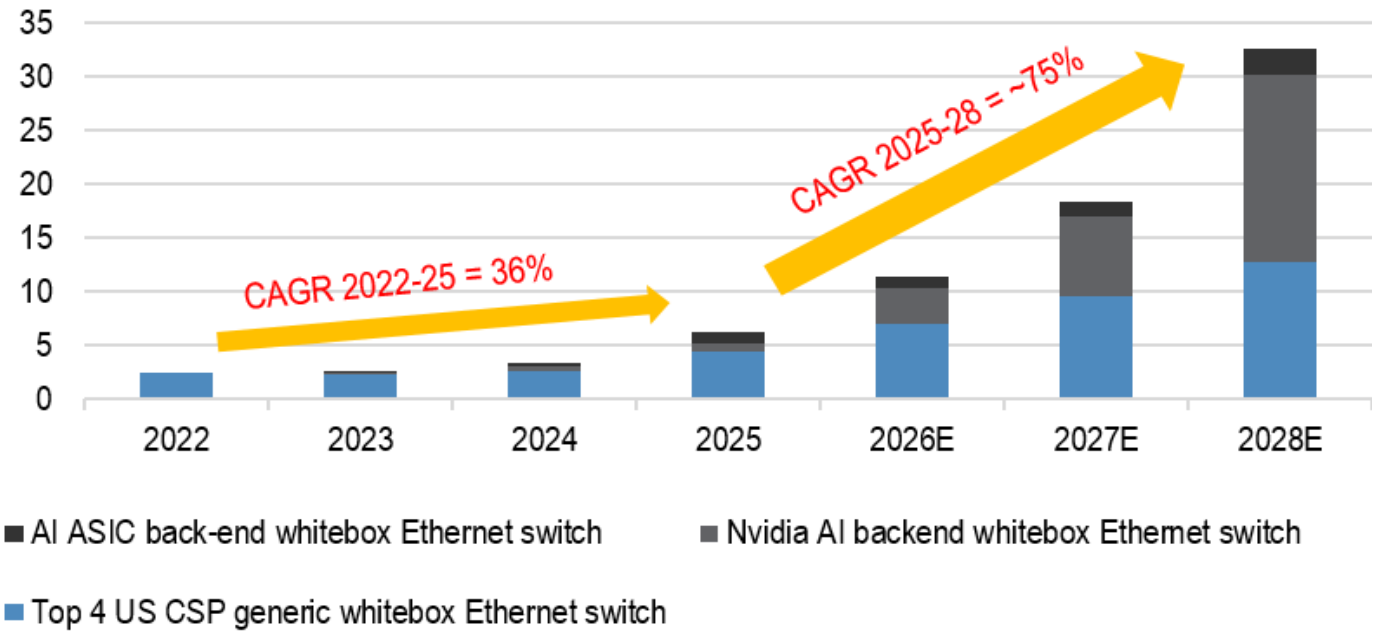
Datacenter Networking: Whitebox Switching Enters a New Growth Cycle

J.P.Morgan

AI-driven Networking upgrades expand whitebox switching market opportunity

- We estimate ~US$6bn datacenter networking serviceable addressable market (SAM including generic ethernet switch, AI back-end and front-end networking) for the top 4 CSPs for Accton in 2025 and expect the market to grow at a ~75% CAGR to reach ~ $33bn by 2028, driven by
  - Strong AI-driven general purpose server demand
  - AI front-end and back-end networking upgrades
  - AI-led accelerating network upgrade cycles

Accton's datacenter switch revenue SAM and YoY growth



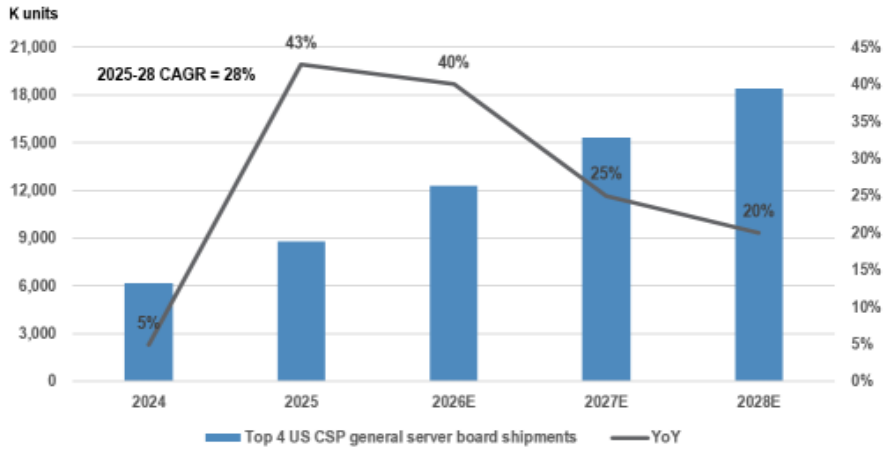
Source: J.P. Morgan estimates, Gartner®. Note: Calculation of Accton's datacenter switch SAM only includes whitebox ToR switches for scale-out fabrics. AI ASIC scale-out networking switch SAM only includes AWS ASIC back-end ToR switch TAM, while we include AI front-end scale-out SAM into generic whitebox Ethernet switch categories..

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AI-driven general purpose server demand sets the stage for switching growth

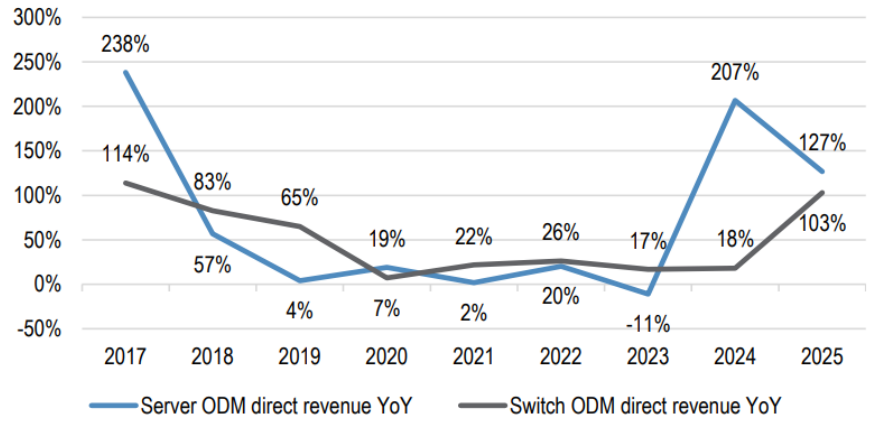
- We expect general server shipments to accelerate over the next few years on AI-driven inference demand.
  - We estimate CSP's general server shipment growth of 40%/25%/20% in 2026/27/28.
  - There could be upside risks to our general server shipment assumptions driven by fast-growing agentic AI demand.
- Over the past 2–3 years, CSPs have prioritized AI server investment and data center build-outs, while networking has lagged.
  - Gartner® data shows ODM-direct server spending increased 207% / 127% in 2024/25 versus ODM direct switch spending growth of 18%/103% over the same period.
  - **We expect CSPs to step up networking spending to reduce latency and improve data transmission rates, presenting huge growth opportunities for whitebox Ethernet switches.**

CSP General server shipment trend and CAGR



Source: Gartner®, J.P. Morgan estimates.

Switch ODM-direct vs. server ODM-direct spending growth



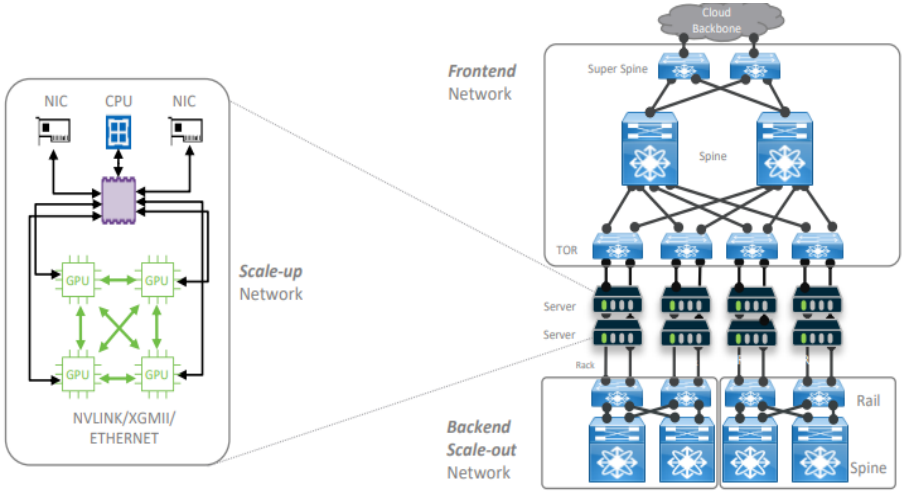
Source: Gartner®.

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AI/ML drives both front-end and back-end networking upgrades

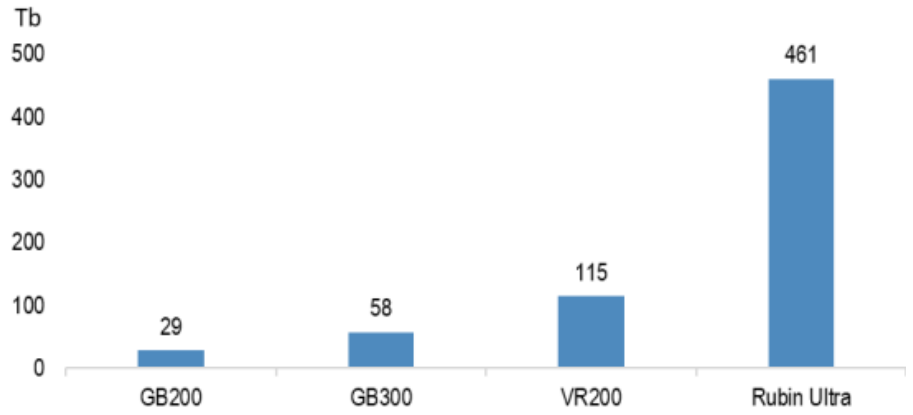
- Higher bandwidth requirements and data volumes in AI datacenters will drive continued upgrades in the traditional front-end networks and create an incremental back-end GPU fabric.
  - Exponential growth of Nvidia's GPU scale-out bandwidth.
  - We forecast a ~164% CAGR for the GPU back-end Ethernet ToR switch TAM over 2025–28.
  - Examples of front-end network upgrades:
    - BlueField 3 400G in GB200/300 moving to BlueField 4 800G in VR200
    - CSP's in-house NICs moving from 200G to 400G

Front-end network and back-end network



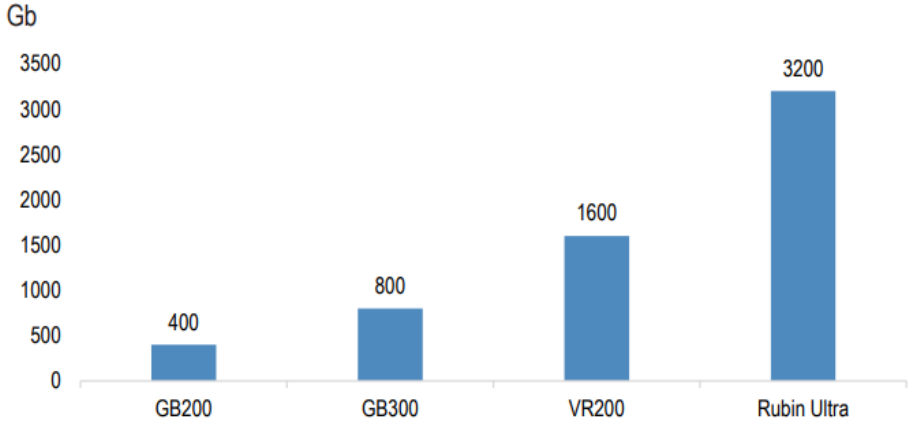
Source: Cisco

Nvidia's GPU scale out bandwidth - NVL72/144 rack



Source: J.P. Morgan estimates, Company data

Nvidia GPU scale out bandwidth - per chip



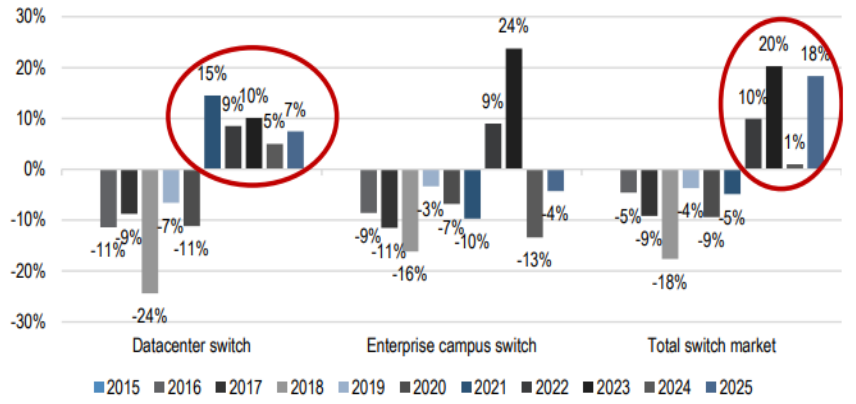
Source: J.P. Morgan estimates, Company data

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Port ASP expansion driven by AI-led accelerating network upgrade cycles

- A shortening network bandwidth upgrade cadence is supportive of data center switch ASP expansion.
  - 7 years for 100G/200G transition versus <2 years for 800G to 1.6T
  - Rising mix of higher-speed ports supports ASP expansion
- We see Accton as a key beneficiary, given its strong positioning in whitebox data center switches. (JPMe ~40% of total revenue in 3Q26).
- We forecast a ~20% CAGR in Accton's switch port ASP over 2025-28, primarily driven by the 800G/1.6T upgrade cycle.

Switch port ASP growth by customer type



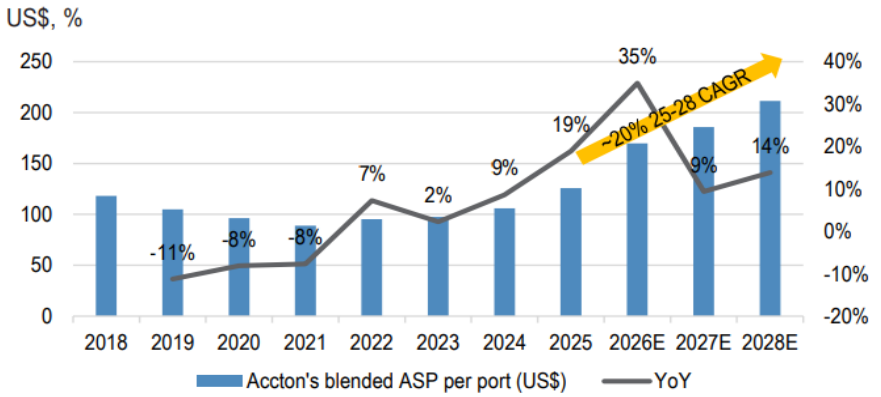
Source: Gartner®.

Datacenter switch technology roadmap

Speed	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025E	2026E	2027E
100G													
200G / 400G													
800G													
1.6T													

Source: 650 Group, J.P. Morgan estimates

Blended ASP of Accton's datacenter switch port



Source: J.P. Morgan estimates, Company data

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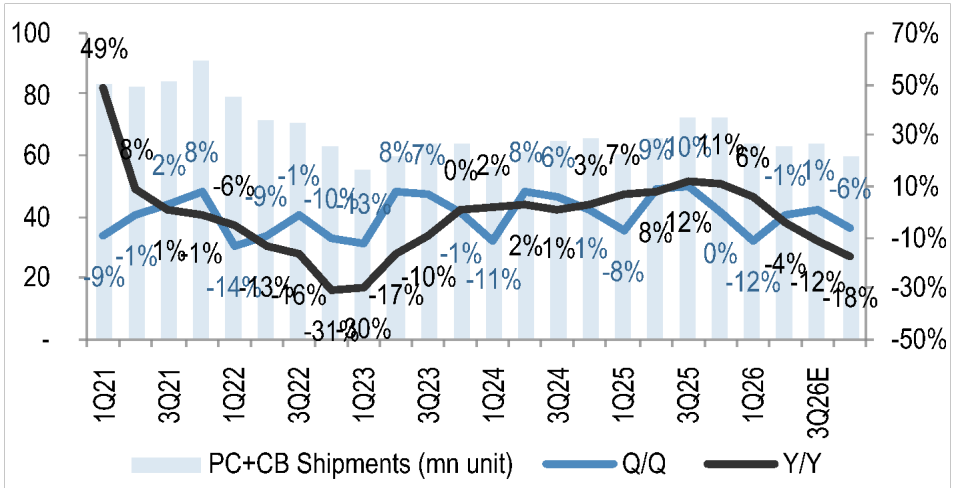
PCs: Unit downside in sight, but margin/value better than feared

J.P.Morgan

Better-than-feared PC demand in 1H26 likely driven by pull-in orders, cautious on 2H26 PC demand

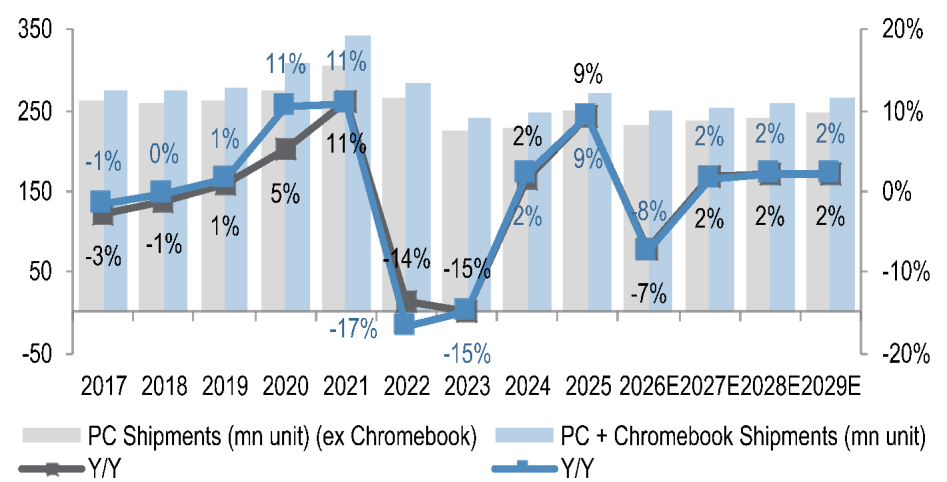
- 1H26 PC shipments appear better-than-expected, likely due to continued Win10 replacement demand and the pull-in of orders ahead of the memory price hikes.
- We are cautious on PC end demand in 2H26 due to pull-forward demand in 1H26, the negative price elasticity from key component cost hikes, and late cycle of Win10 PC replacement.
  - We anticipate a sub-seasonal shipment trend in 2H26 and forecast a 3% HoH decline for PC shipments.
- We forecast an 8% PC shipment decline this year, comprising 14%/4% consumer/commercial PC shipment decline.

PC + Chromebook quarterly shipments and QoQ/YoY trend



Source: Gartner®, J.P. Morgan estimates.

PC incl./excl. Chromebook annual shipments and YoY trend

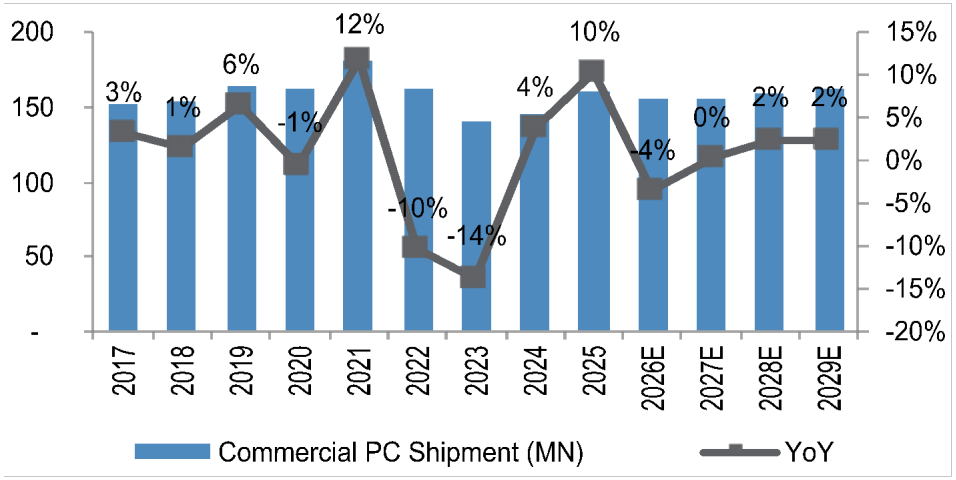


Source: Gartner®, J.P. Morgan estimates.

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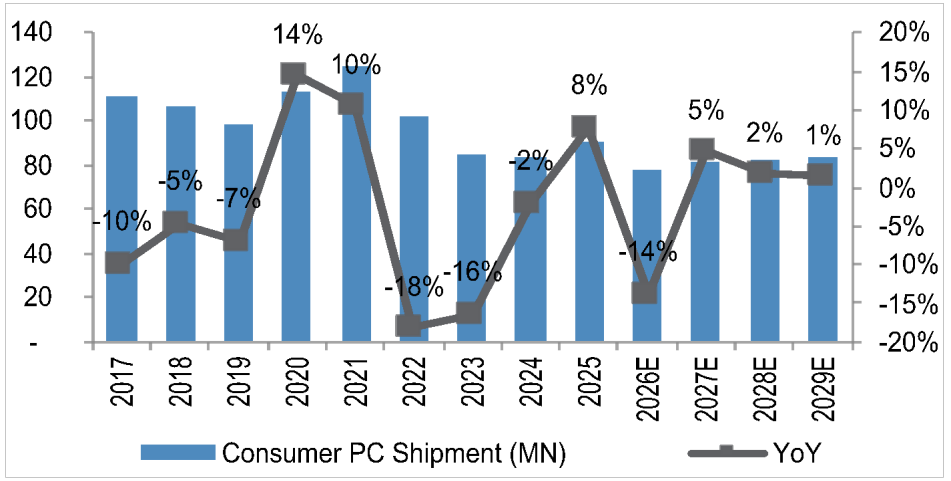
Commercial PC demand more resilient driven by Windows 10 expiry and lower price sensitivity from memory-led product price hikes

Consumer PC annual shipments and YoY trend



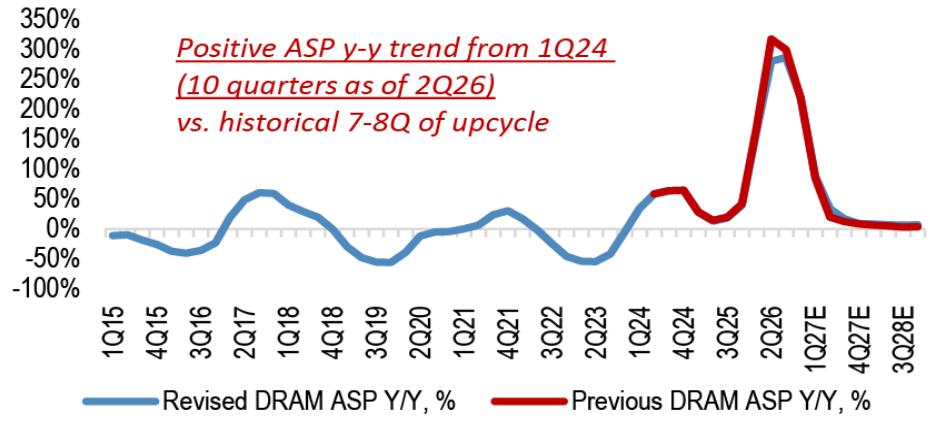
Source: Gartner®, J.P. Morgan estimates.

Commercial PC annual shipments and YoY trend



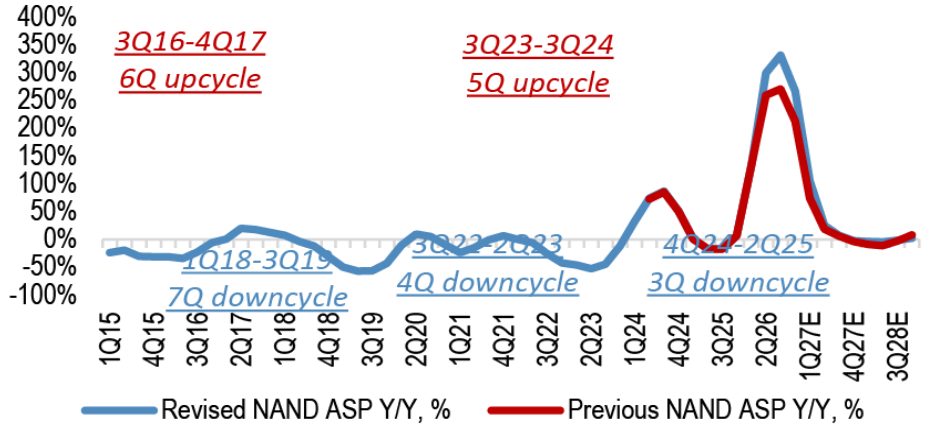
Source: Gartner®, J.P. Morgan estimates.

DRAM ASP Y/Y% change vs previous assumptions



Source: WSTS, J.P. Morgan estimates.

NAND ASP Y/Y% change vs previous assumptions



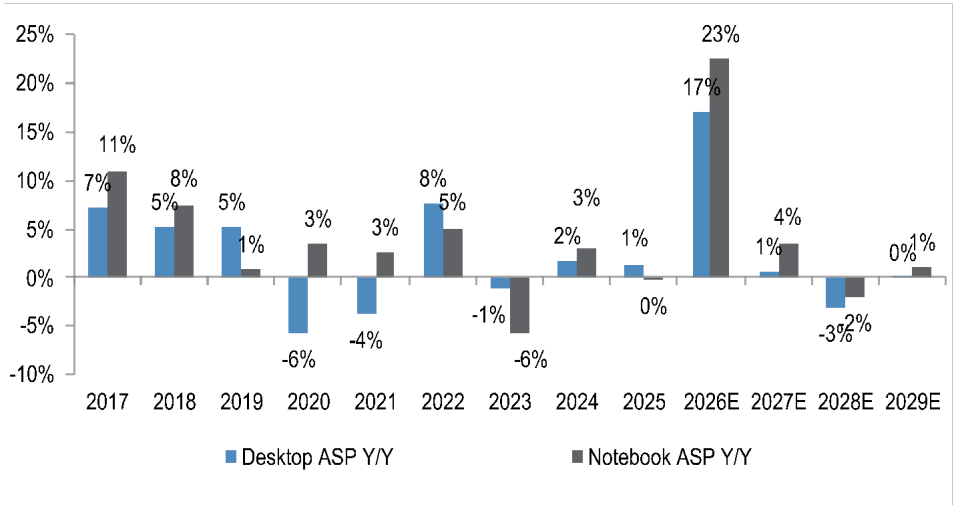
Source: WSTS, J.P. Morgan estimates.

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Unit downside in sight, but PC brands' margin/value better than feared

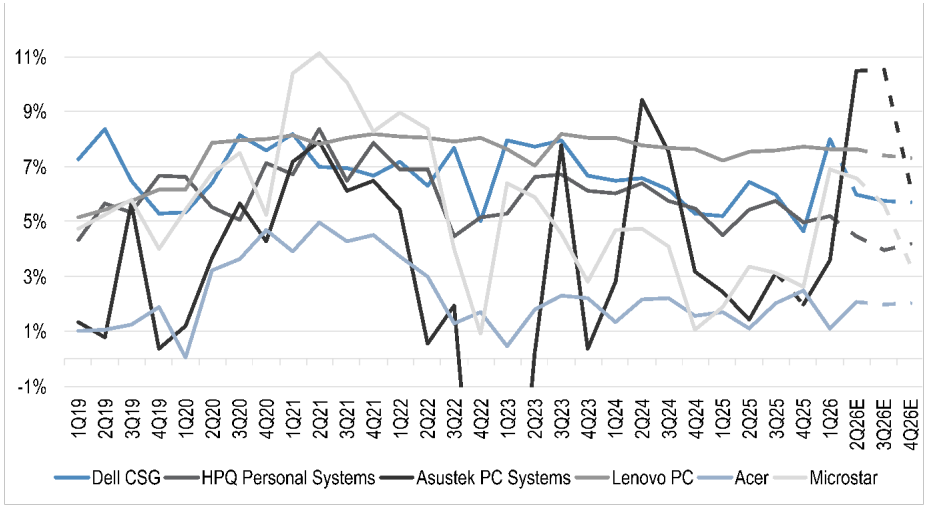
- Asian PC brands delivered better-than-expected PC margins in 1H26, driven by better-than-feared PC demand, continued product price hikes, and product mix adjustments.
  - Our research indicates 20-30% YoY growth of PC ASP in 1H26. This, along with the lower-cost PC inventory at hand, drove meaningful margin expansion for brands.
  - In contrast, we saw PC ODM margin dilution in 1H26 due to the ASP hikes, while profit dollars remain intact.
- Looking ahead, while we have seen weakening PC demand in 2H26, we expect PC brands margin trend likely to be better than feared due to continued product mix adjustments with pricing actions.
  - We expect tier one PC brands' margins to be more resilient in 2H26 due to better supply chain capability.

Blended PC ASP and YoY trend



Source: Gartner®, J.P. Morgan estimates.

PC brands PC OPM trend



Source: Company data. J.P. Morgan estimates. Acer's 2Q-4Q26 data is based on Bloomberg consensus estimates.

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NB BoM analysis supports a 20-30% PC product price hikes by brands in 1H26

- We estimate that the BoM cost of high-end NBs has increased by ~30% over the past year, mainly driven by the price hikes in memory, non-key semis (analog ICs), software license fees, and other components (e.g. passive components, PCBs).
  - We estimate memory cost to increase by US$200-250 after 3-5x DRAM/NAND price hikes over the past year, driving the memory as % of total NB BoM to rise to 20-30% vs. HSD % a year ago.
  - We also assume a 5% price hike for other components & non-key semis.
- The BoM cost increases have also driven PC brands to implement 20–30% price hikes in 1H26 to protect margins
- We believe mid to low range PCs could have a higher sensitivity to the memory BoM % increase given the lower PC price band.
  - PC brands have mitigated the impact through spec downgrades and product mix adjustments.

NB BoM analysis

	2Q25	% of BoM	Note	2Q26	% of BoM	Note
CPU	**250**	**26%**	Raptor Lake	**300**	**24%**	Arrow Lake
Memory total	**75**	**8%**		**310**	**25%**	
SSD	35	4%	512G	125	10%	512G
DRAM	40	4%	LPDDR5 16G	185	15%	LPDDR5 16G, JPMe $11.6/GB
Mechanical component & non-key semis	**400**	**42%**		**407**	**32%**	
Carcass	50	5%		50	4%	
Camera	20	2%		20	2%	
Panel	45	5%	13.4"	43	3%	13.4", assume 5% decline
Battery	40	4%	55Whr	40	3%	55Whr
Keyboard	25	3%		25	2%	
Type C connector	25	3%	60W	25	2%	60W
Dongle	7	1%		7	1%	
Other components	188	20%		197	16%	assume 5% growth driven by passive/logic IC price hikes
Software & Miscellaneous	**230**	**24%**		**237**	**19%**	
Software	85	9%		92	7%	MSFT lincense fee cost hike by 5-10%
Warranty	45	5%		45	4%	
Others	100	10%	MVA, logistics etc.	100	8%	MVA, logistics etc.
Total cost	**955**	**100%**		**1254**	**100%**	
Change				*31%*		

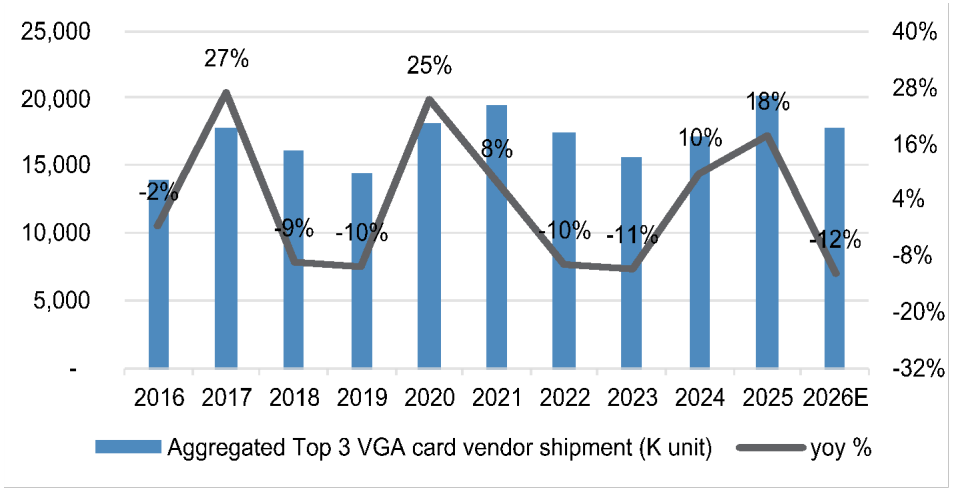
Source: Gartner®, J.P. Morgan estimates.

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Graphics/Motherboards – Soft end demand in the absence of new product ramps

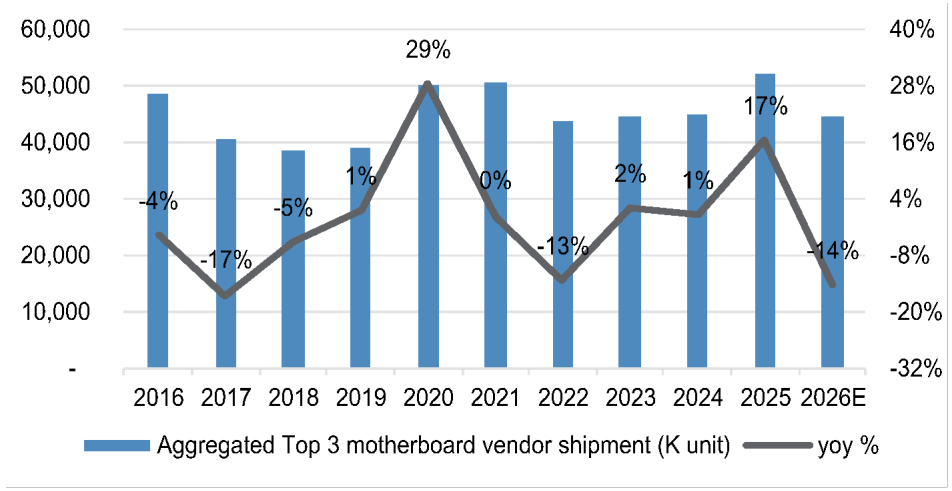
- We have seen weakening end demand for PC motherboard and VGA in 1H26 due to memory supply shortage and negative price elasticity from product price hikes.
- Looking ahead, we expect a sub-seasonal shipment growth (~5% QoQ growth) for the top 3 MB/VGA vendor shipments in 3Q26 and continue to forecast a double-digit shipment decline for the full year MB/VGA shipments.
- We see limited catalysts for the market given the lack of new product launches in the next six months.
  - This, coupled with the memory-led end demand weakness, implies potential margin pressure for PC component brands.

Aggregated Top 3 VGA vendor QoQ trend



Source: J.P. Morgan estimates, Company data.

Aggregated Top 3 MB vendor QoQ trend



Source: J.P. Morgan estimates, Company data.

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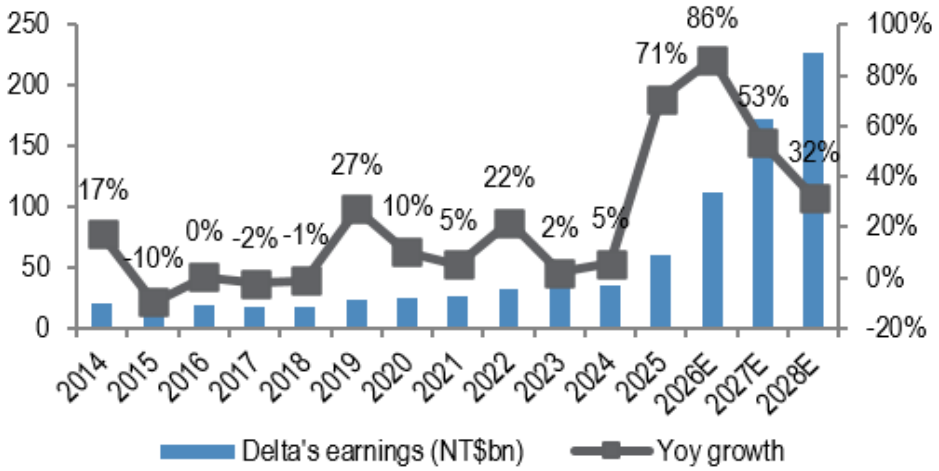
Individual stock one-pager – Albert Hung

J.P.Morgan

Delta: Key beneficiary of secular AI datacenter power and thermal trend

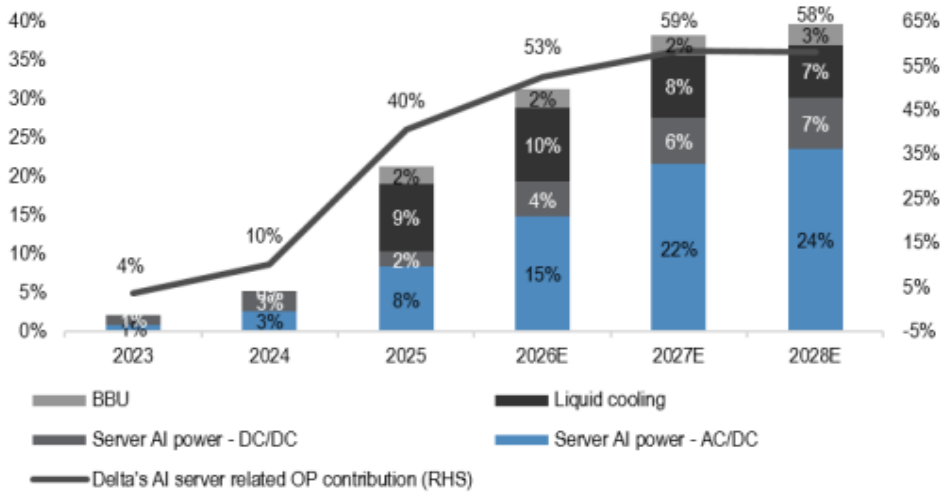
- We believe Delta will be a major beneficiary of the fast-growing datacenter power supply TAM (JPMe +80% CAGR in 2025-28), driven by
  - Rising power consumption of AI servers
  - Non-PSU content increase from power rack adoption and HVDC material upgrades
- Delta possesses the leading position (40%+) in datacenter power (esp. in high-end market) and liquid cooling space.
- We model above-seasonal revenue growth in 3Q/4Q at +16%/+14% QoQ respectively, driven by order push-out from 2Q26, new AI ASIC project ramp in 2H, 110kW power shelf / HVDC product ramp in 4Q, and product price hikes in late 3Q26.
- We anticipate a gradual margin recovery helped by product price hikes and favorable pricing terms for new products.
- We expect the stock to regain momentum over the next three months as datacenter related revenues re-accelerate. Stay OW.

Delta's earnings and yoy trend



Source: Company data, J.P. Morgan estimates.

Delta's AI server revenue by product and total OP contribution



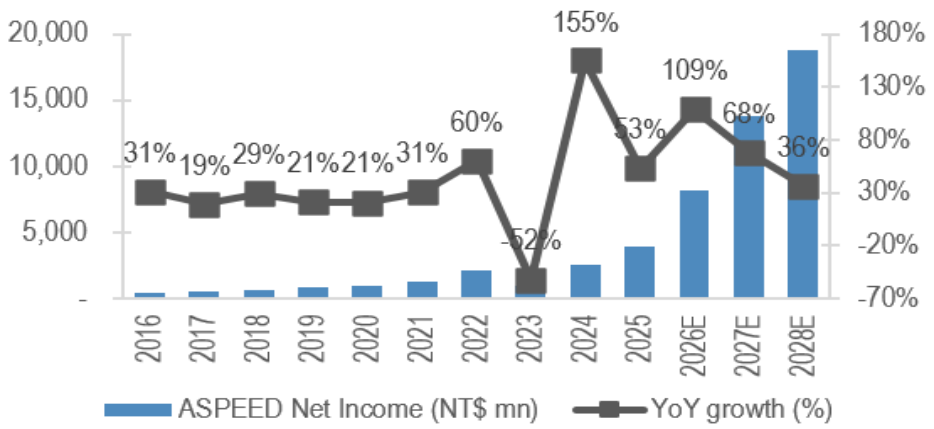
Source: Company data, J.P. Morgan estimates.

J.P.Morgan

ASPEED: Supply unlock in 2H26 drives revenue upsides

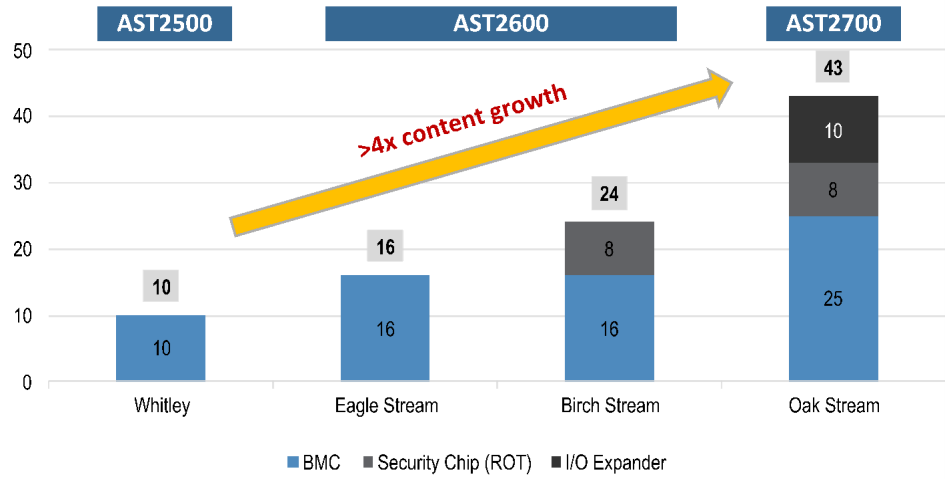
- We have seen potential revenue upside near term, driven by robust general server demand, new AI server product cycles, and better supply in 2H26.
  - We forecast 19%/33% QoQ revenue growth in 3Q26/4Q26, and early feedback suggests momentum could extend into 1H27.
- We estimate ~38% shipment CAGR for ASPEED's regular BMC over 2025–28, broadly in line with our server CPU shipment growth forecast.
- ASPEED's BMC shipments should outgrow CPU volumes due to higher exposure to U.S. CSPs, market share gains, and expanding applications.
- We expect AST2700 penetration to accelerate in 2027 (JPMe ~25%/50% in 27/28). From the meaningful ASP premium for AST2700, the ramp should be a clear tailwind for ASPEED's top-line growth.
- ASPEED remains a key beneficiary of the secular server CPU upcycle in our coverage. Stay OW.

ASPEED's earnings and yoy trend



Source: Company data, J.P. Morgan estimates.

ASPEED's server TAM expansion from gen to gen



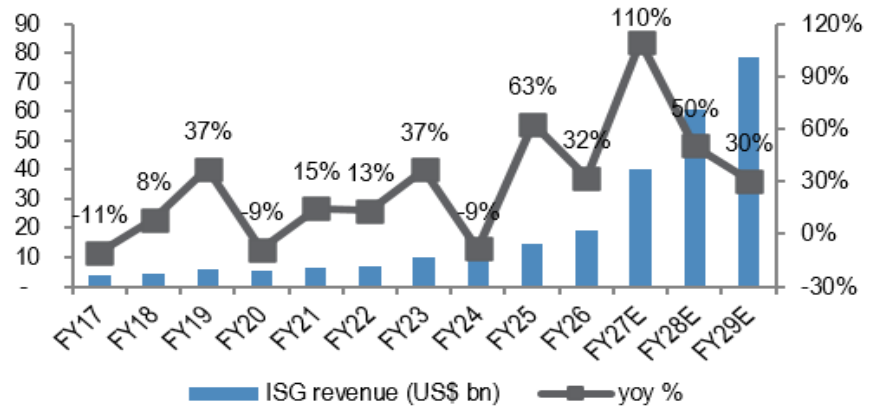
Source: Company data, J.P. Morgan estimates.

J.P.Morgan

Lenovo: ISG margin inflection confirmed; AI pipeline doubles

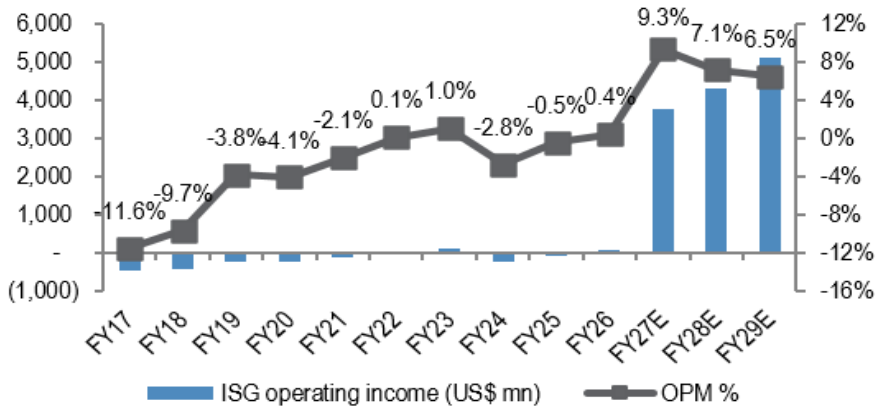
- Lenovo's AI server pipeline more than doubled to US$54bn exiting Jun-Q (vs. US$21bn last Q). Management expects meaningful revenue conversion in 2HFY27.
  - We estimate110%/50% YoY ISG revenue growth in FY27/28.
- We expect a significant OPM improvement for ISG business to 9.3% in FY27 from 0.4% in FY26, driven by favorable pricing and OP leverage.
  - Beyond FY27, we anticipate a sustained ISG growth momentum on the multi-year server cycle with continued margin improvement on better scale.
- IDG profitability also appears better than feared, as Lenovo has been able to outgrow its peers through better supply chain management and scale.
- Looking ahead, we expect continued growth in 2QFY27 as strong ISG/SSG momentum more than offsets seasonal IDG softness.
  - We expect ISG to become a key earnings driver over the medium term. IDG profitability also appears better than feared. Stay OW

Lenovo's ISG revenue and YoY Trend



Source: Company data, J.P. Morgan estimates.

Lenovo's ISG operating income & OPM trend



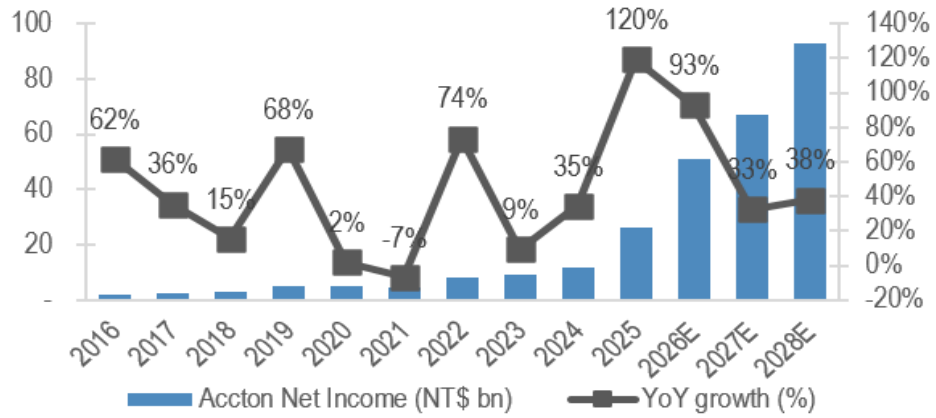
Source: Company data, J.P. Morgan estimates.

J.P.Morgan

Accton: Riding AI-driven networking upgrade and unlocking new TAM in server racks

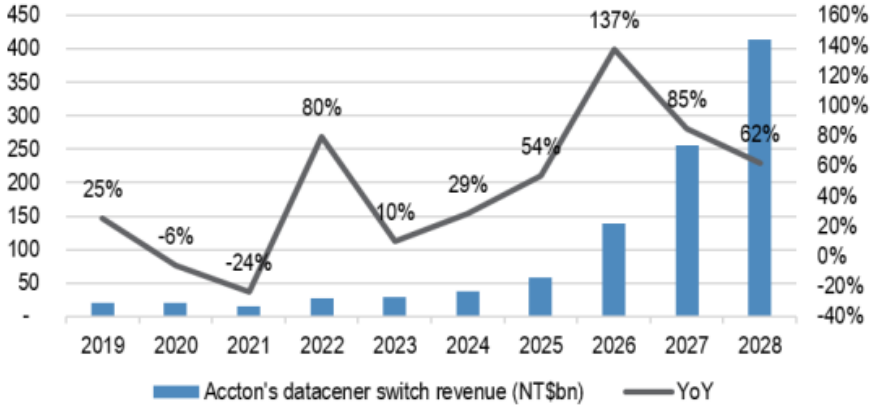
- We forecast Accton to outgrow the whitebox switch market, with a 2025–28 datacenter switch revenue CAGR of ~92% versus an industry TAM CAGR of ~75%, supported by
  - Better-positioned in high-end datacenter switch market (400G+)
  - Consolidated switch ODM market & Accton's market share rebound in Meta 800G projects
- Amazon and Meta raised capex guidance for this year and the implied 2H26 capex uptick indicates sustained revenue momentum for Accton.
- We believe market expectations on AWS T3 supply chain remain undemanding and anticipate the stock to ride on T3 ramp up in 2H26.
- Beyond 2026, Accton plans to expand its capacity by 30%+ next year, which could help sustain Accton's growth momentum in the next 1-2 years.OW.

Accton's earnings and yoy trend



Source: Company data, J.P. Morgan estimates.

Accton to outgrow datacenter switch market with 92% rev CAGR



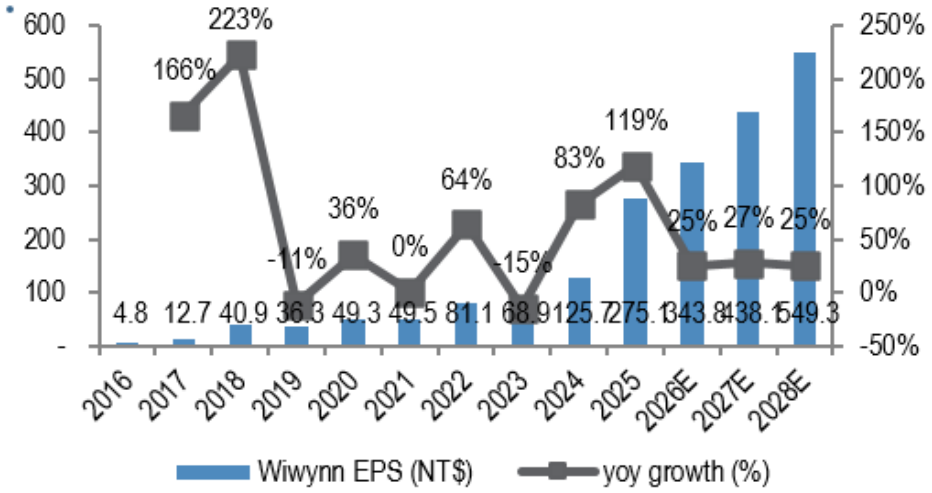
Source: Company data, J.P. Morgan estimates.

J.P.Morgan

Wiwynn: Well positioned across GPU, AI ASIC, and general servers

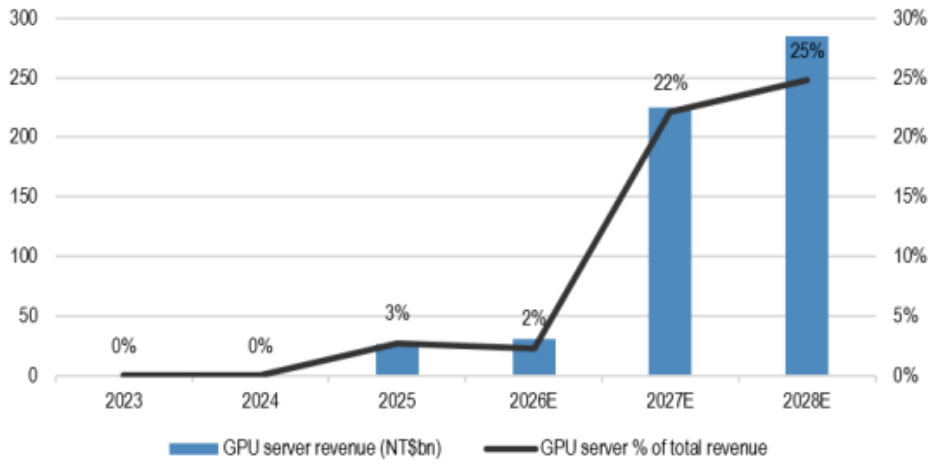
- We expect Wiwynn to outperform on new AI server ramps (both ASIC and GPU projects) and a multi-year general server upcycle.
- There could be a re-rating opportunity on the new U.S. CSP ASIC project ramp.
- We expect GPU server to re-accelerate in 4Q26, supported by the initial ramp of Nvidia/AMD GPU servers.
  - Overall, we forecast AI server revenue growth of ~73%/~110% in 2026/27.
- Importantly, our industry research suggests Wiwynn is participating in the bidding process for Google's TPU v8/v9 projects (TPU trays).
- We model a 26% CAGR in Wiwynn's general server shipments over 2026–28, supported by inference-driven server demand.
- We expect the stock to continue outperforming over the next 3–6 months on new AI server ramps and a multi-year general server upcycle. Stay OW.

Wiwynn's EPS and yoy trend



Source: Company data, J.P. Morgan estimates.

Wiwynn's GPU server revenue (NV+AMD) and contribution



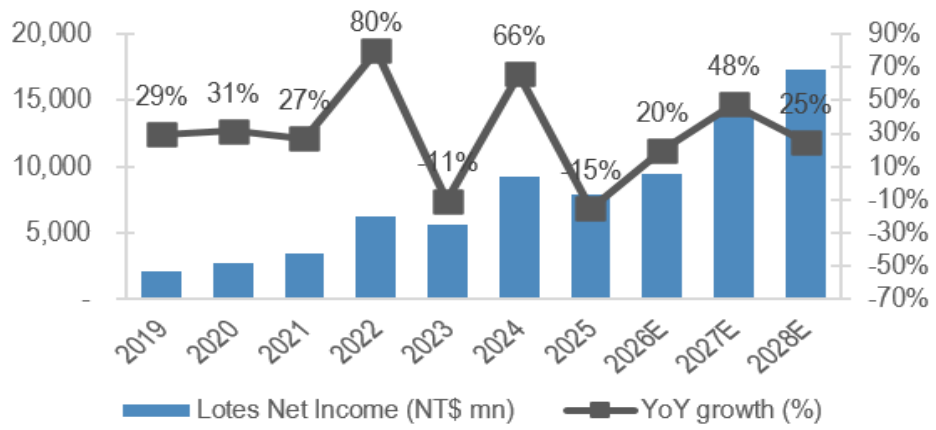
Source: Company data. J.P. Morgan estimates.

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Lotes: Near-term GM headwind, eyes on strong server demand and AI optionality

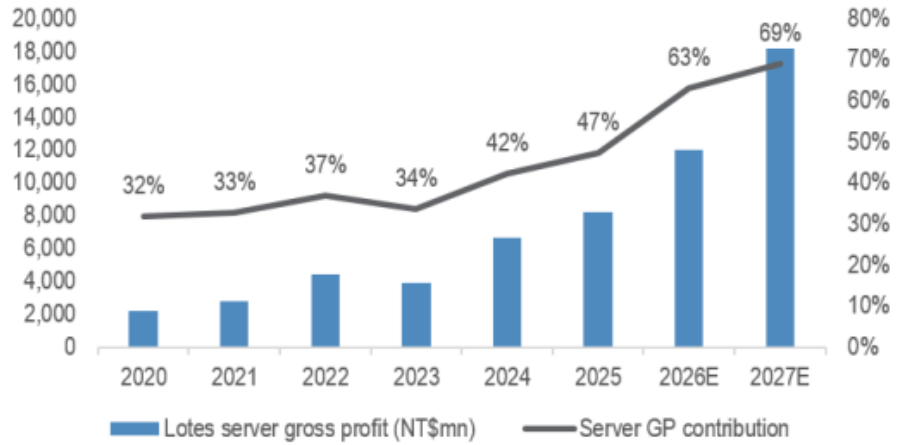
- Near-term margin weighed down by raw material price increases, depletion of low-cost inventory, and ramp-up costs for new products.
- We expect stable GMs and a mild OPM rebound in 3Q26, with a more meaningful margin recovery in 1H27 as new product cycles ramp.
- We view general server demand intact and keep our forecast of 20–30% server shipment growth over 2025–28, despite near-term supply uncertainty.
  - 2027 order outlook remains strong with new platform penetration rates likely to reach 30%+
- Lotes has gained market share in the existing Intel/AMD server platforms due to its competitive pricing strategy.
  - Looking ahead, management expects 35-40% m/s in the next-gen Intel/AMD server platforms.
- We believe AI products could bring potential upside to Lotes' business, driven by SOCAMM / QD ramp and mass production of OE socket in 2H27.

Lotes's earnings and yoy trend



Source: Company data, J.P. Morgan estimates.

Lotes's server gross profit and server GP contribution %



Source: Company data, J.P. Morgan estimates.

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Apple Supply Chain

J.P.Morgan

iPhone EMS build plan

(mn units)	1Q23	2Q23	3Q23	4Q23	1Q24	2Q24	3Q24	4Q24	1Q25	2Q25	3Q25	4Q25	1Q26	2Q26E	3Q26E	4Q26E	2021	2022	2023	2024	2025	2026E
iPhone EMS build (LHS)	**60**	**40**	**50**	**88**	**49**	**46**	**58**	**83**	**56**	**48**	**52**	**94**	**58**	**55**	**52**	**85**	**232**	**243**	**238**	**236**	**250**	**250**
YoY (RHS)	*1%*	*-17%*	*-10%*	*11%*	*-17%*	*15%*	*15%*	*-5%*	*14%*	*4%*	*-10%*	*13%*	*3%*	*16%*	*0%*	*-10%*	*7%*	*5%*	*-2%*	*-1%*	*6%*	*0%*
(mn units)																						
iPhone 13 mini - 2021	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	6	2	0	0	0
iPhone 13 - 2021	8	6	7	7	6	5	6	5	5	3	3	2	0	0	0	0	36	53	28	22	12	0
iPhone SE3	3	2	2	2	2	1	2	1	0	0	0	0	0	0	0	0		14	10	7	0	0
iPhone 14 - 2022	10	8	9	6	6	4	4	3	2	2	1	1	0	0	0	0		15	33	18	6	0
iPhone 14 Plus - 2022	3	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0		15	8	1	0	0
iPhone 15 - 2023			7	17	10	10	10	6	5	6	4	3	4	3	2	1			23	37	18	9
iPhone 15 Plus - 2023			2	6	2	3	2	1	0	0	0	0	0	0	0	0			8	8	1	0
iPhone 16 - 2024							7	15	10	11	9	6	4	3	3	1				22	36	11
iPhone 16 Plus - 2024							2	4	2	2	1	1	0	0	0	0				6	6	0
iPhone 16 Pro -2024							9	20	11	10	4	1	0	0	0	0				29	26	0
iPhone 16 Pro Max - 2024							9	28	14	9	4	0	0	0	0	0				36	27	0
iPhone 16e									7	5	4	4	3	1	1	0					21	5
iPhone 17 - 2025											4	19	19	15	14	13					23	61
iPhone 17 Air - 2025											3	3	0	1	0	0					6	1
iPhone 17 Pro - 2025											7	22	8	11	4	1					29	24
iPhone 17 Pro Max - 2025											6	33	16	18	4	1					39	38
iPhone 17e													4	5	4	2						14
Foldable iPhone - 2026															2	6						8
iPhone 18 Pro - 2026															9	26						35
iPhone 18 Pro Max - 2026															9	36						45
Mix (%)																						
iPhone 13 mini - 2021	1%	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	3%	1%	0%	0%	0%
iPhone 13 - 2021	13%	15%	14%	8%	12%	12%	10%	6%	8%	7%	6%	2%	1%	0%	0%	0%	15%	22%	12%	9%	5%	0%
iPhone SE3	5%	5%	5%	3%	4%	3%	3%	2%	0%	0%	0%	0%	0%	0%	0%	0%		6%	4%	3%	0%	0%
iPhone 14 - 2022	17%	20%	18%	7%	12%	10%	7%	4%	3%	4%	3%	1%	0%	0%	0%	0%		6%	14%	7%	2%	0%
iPhone 14 Plus - 2022	5%	4%	3%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%		6%	3%	0%	0%	0%
iPhone 15 - 2023			14%	19%	20%	23%	18%	7%	9%	12%	8%	4%	6%	5%	4%	1%			10%	15%	7%	4%
iPhone 15 Plus - 2023			4%	7%	4%	7%	3%	1%	1%	1%	0%	0%	0%	0%	0%	0%			3%	3%	0%	0%
iPhone 16 - 2024							12%	18%	18%	23%	18%	6%	6%	5%	6%	1%				9%	14%	4%
iPhone 16 Plus - 2024							3%	5%	4%	4%	3%	1%	0%	0%	0%	0%				2%	3%	0%
iPhone 16 Pro -2024							16%	24%	19%	21%	8%	1%	0%	0%	0%	0%				12%	10%	0%
iPhone 16 Pro Max - 2024							15%	33%	25%	18%	8%	0%	0%	0%	0%	0%				15%	11%	0%
iPhone 16e									13%	11%	8%	5%	5%	2%	2%	0%					8%	2%
iPhone 17 - 2025											7%	21%	32%	27%	27%	15%					9%	24%
iPhone 17 Air - 2025											7%	3%	1%	1%	0%	0%					2%	0%
iPhone 17 Pro -2025											13%	23%	14%	20%	8%	1%					11%	10%
iPhone 17 Pro Max - 2025											12%	34%	28%	32%	8%	1%					16%	15%
iPhone 17e													6%	8%	8%	2%						5%
Foldable iPhone - 2026															4%	7%						3%
iPhone 18 Pro - 2026															17%	31%						14%
iPhone 18 Pro Max - 2026															17%	42%						18%
New model (mn units)																						
2021 - 13 series	9	7	7	7	6	5	6	5	5	3	3	2	0	0	0	0	90	108	29	22	12	0
2022 - SE3	3	2	2	2	2	1	2	1	0	0	0	0	0	0	0	0		14	10	7	0	0
2022 - 14 series	43	27	17	8	7	4	4	3	2	2	1	1	0	0	0	0		80	94	19	6	0
2023 - 15 series			20	68	32	32	19	7	6	6	4	3	4	3	2	1			89	91	19	9
2024 - 16 series							26	67	37	31	19	8	4	3	3	1				93	95	11
2025 - 16e									7	5	4	4	3	1	1	0					21	5
2025 - 17 series											20	77	44	44	22	14					97	124
2026 - 17e													4	5	4	2						14
2026 - 18 series															20	68						88

Source: J.P. Morgan estimates. Note: As this data is based on our channel checks, both actuals and forecasts are from J.P. Morgan.

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iPhone 17, 18, 20 series roadmap, with continued lens spec migrations

- Expect more iPhones to be launched in 2026E and 2027E:
  - 4 models in 2026E: iPhone 17e in 1H26 + 1st foldable iPhone / 18 Pro / 18 Pro Max in 2H26
  - 6 models in 2027E & onwards: iPhone 18e / 18 Air / 18 (base model) in 1H27 + next-gen foldable iPhone / 20 Pro / 20 Pro Max in 2H27
- Gradual lens spec improvements in iPhone 17-20 series:
  - 17 series in 2H25: 1) front-end selfie camera will upgrade to 24MP (from 12 MP) for all 4 models, 2) folded camera (periscope) of Pro models will upgrade to 48 MP (from 24 MP in 16 Pro models).
  - 18 series in 2H26E: 1) wide cam of Pro models will become 7P "variable aperture", 2) foldable model will have dual front cam with underdisplay.
  - 20 series in 2H27E: 1) wide camera of Pro models will remain at 7P with 48 MP resolution, but upgrading to a much larger lens size, 2) ultra wide cameras of Pro models will remain at 6P with 48 MP resolution, but upgrading to a larger aperture.

Launch time	2H25				1H26	2H26E			1H27E			2H27E		
Model	**iPhone 17**	**iPhone 17 Air**	**iPhone 17 Pro**	**iPhone 17 Pro Max**	**17e**	**iPhone 18 Pro**	**iPhone 18 Pro Max**	**Foldable iPhone**	**18e**	**iPhone 18**	**iPhone 18 Air**	**iPhone 20 Pro**	**iPhone 20 Pro Max**	**Foldable iPhone**
Front camera	*Face ID + Selfie cam*				*Face ID + Selfie cam*	*Face ID + Selfie cam*		*Dual cam*	*Face ID + Selfie cam*			*Face ID + Selfie cam*		*Dual cam*
Face ID (Rx)	**Face ID (Rx+Tx)**	**Face ID (Rx+Tx)**	**Face ID (Rx+Tx)**	**Face ID (Rx+Tx)**	**Face ID (Rx+Tx)**	**Face ID (Rx+Tx)**	**Face ID (Rx+Tx)**		**Face ID (Rx+Tx)**	**Face ID (Rx+Tx)**	**Face ID (Rx+Tx)**	**Face ID (Rx+Tx)**	**Face ID (Rx+Tx)**	
- Resolution	HD	HD	HD	HD	HD	HD	HD	N/A	HD	HD	HD	HD	HD	N/A
- Elements	Plastic & Metalens	Plastic & Metalens	Plastic & Metalens	Plastic & Metalens	Plastic lens	Plastic & Metalens	Plastic & Metalens		Plastic lens	Metalens	Plastic & Metalens	Metalens	Metalens	
Selfie	**Selfie**	**Selfie**	**Selfie**	**Selfie**	**Selfie**	**Selfie**	**Selfie**	**Selfie**	**Selfie**	**Selfie**	**Selfie**	**Selfie**	**Selfie**	**Selfie**
- Resolution	**18MPx**	**18MPx**	**18MPx**	**18MPx**	**12MPx**	**24MPx**	**24MPx**	**24MPx**	**12MPx**	**24MPx**	**24MPx**	**24MPx**	**24MPx**	**24MPx**
- Elements	6P	6P	6P	6P	6P	6P	6P	6P	6P	6P	6P	6P	6P	6P
Second Selfie								**Underdisplay**						**Underdisplay**
- Resolution								**24MPx**						**24MPx**
- Elements								6P						6P
Rear camera	*Dual cam*	*Single cam*	*Triple cam + ToF*	*Triple cam + ToF*	*Single cam*	*Triple cam + ToF*	*Triple cam + ToF*	*Dual cam*	*Single cam*	*Single cam*	*Single cam*	*Triple cam + ToF*	*Triple cam + ToF*	*Dual cam*
Wide	**Wide**	**Wide**	**Wide**	**Wide**	**Wide**	**Wide**	**Wide**	**Wide**	**Wide**	**Wide**	**Wide**	**Wide**	**Wide**	**Wide**
- Resolution	48MPx	48MPx	48MPx	48MPx	48MPx	48MPx	48MPx	48MPx	48MPx	48MPx	48MPx	48MPx, 7P unchanged, but a much larger lens size		48MPx
- Elements	7P	7P	7P	7P	6P	7P (Variable aperture)	7P (Variable aperture)	7P	6P	7P	7P			7P
- OIS	Sensor shift	Sensor shift	Sensor shift	Sensor shift	No sensor shift	Sensor shift	Sensor shift	No sensor shift	No sensor shift	Sensor shift	Sensor shift	Sensor shift	Sensor shift	No sensor shift
Telephoto	**N/A**	**N/A**	**Folded**	**Folded**	**N/A**	**Folded**	**Folded**	**N/A**	**N/A**	**N/A**	**N/A**	**Folded**	**Folded**	**N/A**
- Resolution			**48MPx**	**48MPx**		**48MPx**	**48MPx**					**48MPx**	**48MPx**	
- Elements			1G3P + 1 prism	1G3P + 1 prism		1G3P + 1 prism	1G3P + 1 prism					1G3P + 1 prism	1G3P + 1 prism	
Ultra wide	**Ultra wide**	**N/A**	**Ultra wide**	**Ultra wide**	**N/A**	**Ultra wide**	**Ultra wide**	**Ultra wide**	**N/A**	**Ultra wide**	**N/A**	**Ultra wide**	**Ultra wide**	**Ultra wide**
- Resolution	**48MPx**		**48MPx**	**48MPx**		**48MPx**	**48MPx**	**48MPx**		**12MPx**		48MPx, 6P unchanged, but larger aperture		**48MPx**
- Elements	6P		6P	6P		6P	6P	6P		6P				6P
ToF	**N/A**	**N/A**	**ToF**	**ToF**	**N/A**	**ToF**	**ToF**	**N/A**	**N/A**	**N/A**	**N/A**	**ToF**	**ToF**	**N/A**
- Resolution			2MPx	2MPx		2MPx	2MPx					2MPx	2MPx	
- Elements			2P*2	2P*2		2P*2	2P*2					2P*2	2P*2	

Source: J.P. Morgan estimates, Company data. Note: Red-colored text refers to spec upgrades.

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Liquid cooling components

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Liquid cooling component overview – take GB-series rack for example

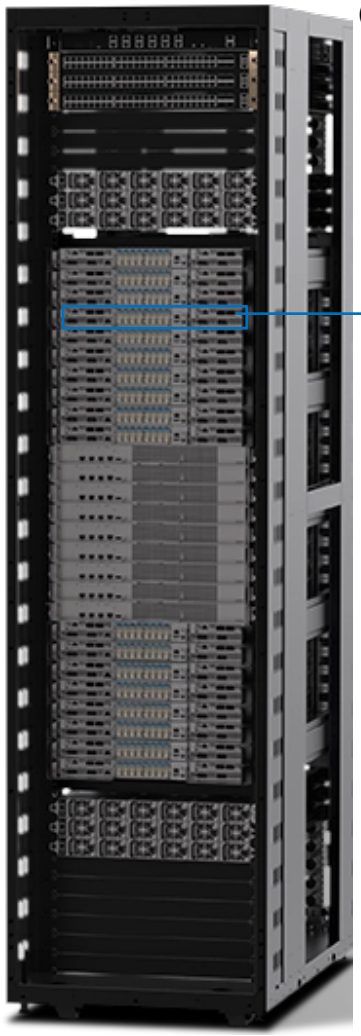


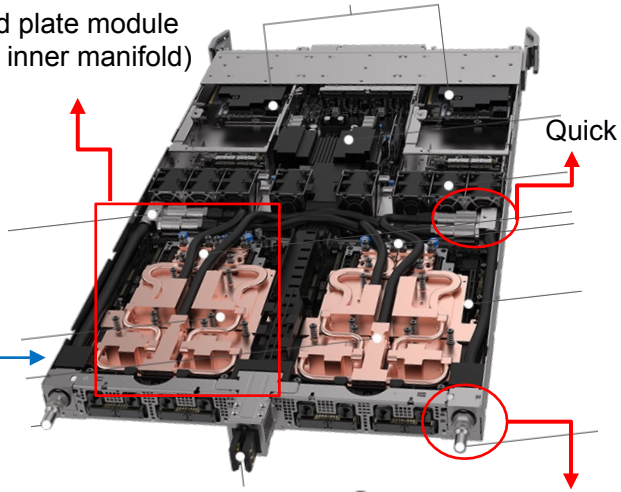
In-row liquid-to-liquid CDU



In-row liquid-to-air sidecar

Fan door
(incl.16-20 units of big fans for air cooling)





Cold plate module
(with inner manifold)

Quick Disconnect
(QD)

QD (could add floating mount)

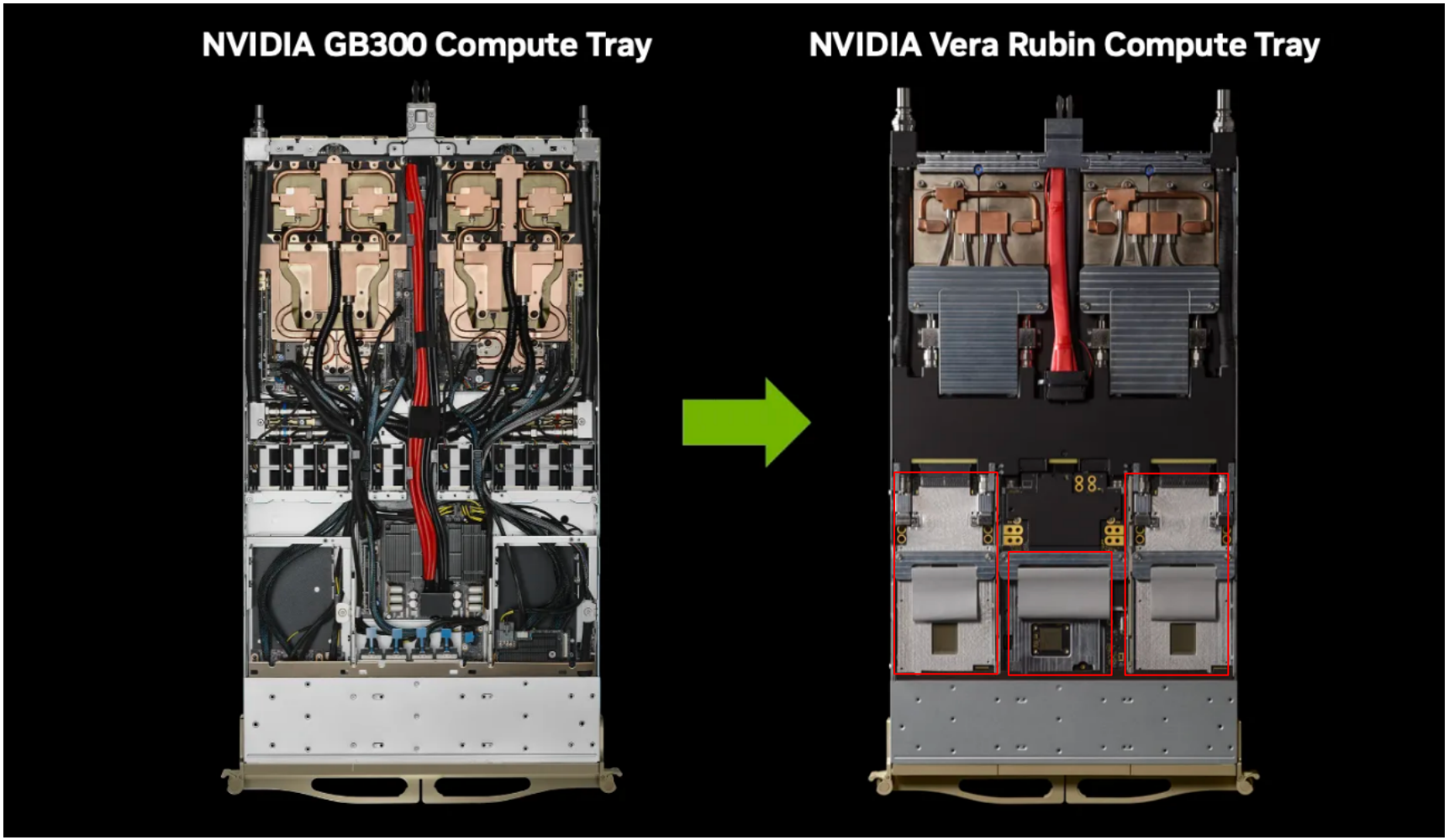


Rack manifold

Source: Auras, Asus company reports, websites.

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Vera Rubin compute tray – will have additional 3 cold plate modules given fanless design



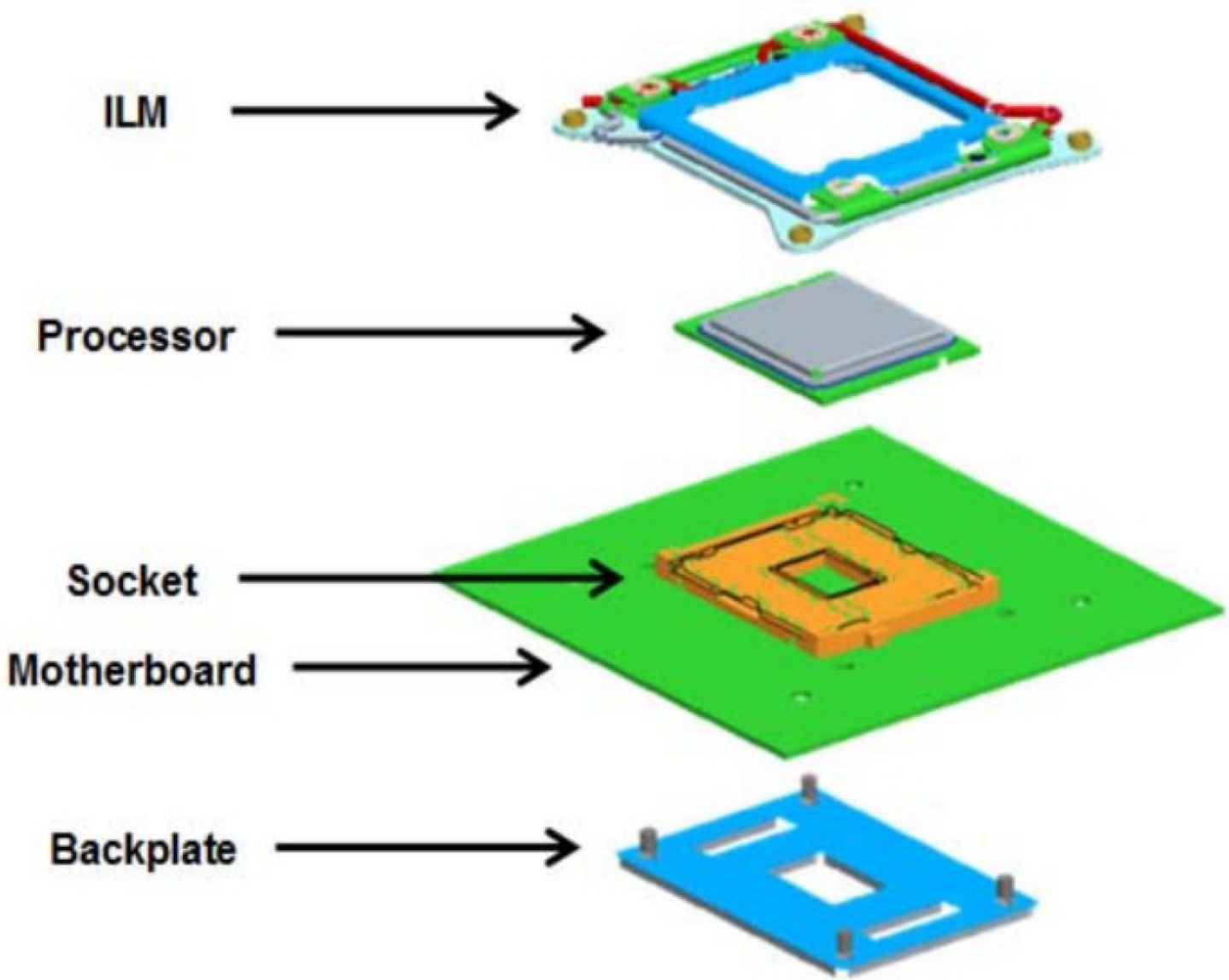
Source: Computex event.

Liquid cooling content in GPU vs ASIC compute tray & suppliers

	Nvidia VR200	CSP ASICs
Heat spreader/Lid (packaging level)	Rubin GPU: 1-piece lid, US$50	ASICs: stiffener, US$15-20
	Sole supplier of Rubin GPU lid: Jentech	Jentech ~80% m/s in CSP ASIC stiffener I-Chuan ~20%
Liquid cooling content per tray (system/tray level)	US$2,400-2,500 (incl. cold plates, internal manifold, QDs)	>US$3,000 (incl. cold plates, internal manifold, QDs)
	Qualified suppliers: AVC, Cooler Master, Jentech, BYDE, etc	Google TPU: Furukawa, AVC, Boyd, Cooler Master AWS Trainium: AVC, Cooler Master, Microloop, Auras, etc

Source: Company data, J.P. Morgan estimates.

Lid/Heat spreader (Socket, ILM (Independent Loading Mechanism))



Source: Jentech initiation report (link).

Appendix

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NB ODM capacity breakdown and market landscape

- We believe NB ODMs will continue to expand the non-China NB capacity based on customer requests. We expect non-China NB capacity to reach 30%+ by end of this year.
  - Among NB ODMs, Hon Hai has the highest non-China NB capacity exposure (50% in Vietnam), followed by Wistron/Compal/Inventec at 30-40% non-China capacity.
  - In contrast, Pegatron and Quanta have slower capacity relocation, which could lead to potential market share losses.
  - There could be some margin impact from production relocation costs in the mid to longer term.

NB ODM matrix

	Compal	Quanta	Wistron	Inventec	Huaqin	Hon Hai	Pegatron	Wingtech/ Luxshare	Others/ in-house
Lenovo	10-15%		15-20%		10-15%				60%
HP	10%	55-60%	5-10%	20-30%					
Dell	55-60%		40-45%						
ASUS	<5%	40-45%		5-10%	10-15%		35-40%		
Acer	40-45%	35-40%			10-15%				10-15%
Apple		45%				45%		10%	

Source: J.P. Morgan estimates.

NB ODM/OEM capacity breakdown by region

	China	Vietnam	India	Other Asia	Mexico	U.S.	Europe	RoW
Quanta	80%	10%		10%				
Compal	68%	30%						2%
Wistron (excl. Wiwynn)	70%	30%						
Inventec	60%			30%	10%			
Hon Hai	50%	50%						
Pegatron (excl. subsidiaries)	90%	10%						
ASUSTek	70-80%	10-20%		5-10%				
MSI	85-95%			5-15%				
Lenovo	50-80%	10-20%	5%				5%	5%

Source: J.P. Morgan estimates, Company data. Note: PC brand capacity breakdown includes both in-house and outsourcing capacity. Other Asia includes Taiwan, Thailand, India, etc.

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CoWoS forecast

CoWoS allocation breakdown

							% Revision vs prior ests		
CoWoS Consumption by customer (k wafer per year)	**2023**	**2024**	**2025**	**2026E**	**2027E**	**2028E**	**2026E**	**2027E**	**JPM Comments**
NVIDIA	70	192	400	725	1196	1735	*1%*	*7%*	Mild uptick in 2026 and meaningful uptick in 2027 from Vera CPU. 2028 includes upside from Feynman (4-die), LPX, Rosa CPU and Spectrum X ramp. Likely to see upside from NVLink Switch CPO. No CoPoS in 2028.
At TSMC	*70*	*127*	*385*	*685*	*1076*	*1385*	*1%*	*8%*	2026 CoWoS-L at TSMC, others at OSAT, 2027 Rubin Ultra assuming 2-die-on-interposer solution.
CoWoS-S / R	*70*	*97*	*30*	*10*	*40*	*105*	*100%*		TSMC adding some CoWoS-R to support Vera and future LPX projects now.
CoWoS-L	*0*	*30*	*355*	*675*	*1036*	*1280*	*0%*	*4%*	Majority of CoWoS to migrate to CoWoS-L by 2H25. Rubin Ultra likely to remain on CoWoS-L. Feynman likely to be still on CoWoS, given slower progress for CoPoS - likely to need 9-10x reticle size package.
Outside TSMC (CoWoS-S/R)	*0*	*65*	*15*	*40*	*120*	*350*	*0%*	*-4%*	Outsourcing ratio picking up in 2026 again as Vera outsourcing to Amkor starts to pick up more momentum in 2027, followed by ASE/SPIL. LPU40 on CoWoS-R could also be outsourced to OSATs in 2028.
AMD	10	45	52	95	355	540	*19%*	*97%*	MI450 ramp in late 2026, moving to CoWoS-L for MI450 onwards, forecasts incl. Xilinx. Meaningful upside forecasts to 2027 due to MI400 and Venice CPU demand. Venice in ASE from 2027, continued upside in 2028.
CoWoS-S	10	45	52	25	0	0	*0%*	*-100%*	MI350 and Xilinx - main CoWoS-S customer. AMD also has non-AI projects migrating to 2.5D packaging in 2H26, likely to be mostly at ASE but not captured in these forecasts.
CoWoS-L	0	0	0	55	160	230	*0%*	*-6%*	CoWoS-L move likely only for MI400 family and beyond, Venice family of CPUs also to use CoWoS-L.
Outside TSMC (CoWoS-L/ FoCoS / EFB)	0	0	0	15	195	310			Mostly Venice CPU, but several PC, Gaming and Xbox chips also using Wafer-Level Fan-Out from 2027 - we are modeling only the server CPU parts.
Broadcom	40	70	96	250	425	580	*0%*	*0%*	TPU v7 (Ironwood) and v8i most of the volume in 2026 and 2027, v8 family likely to extend to 2028 as well. MTIA CoWoS ramp seems slower, OpenAI in 2027. Tomahawk 6 also using CoWoS-S.
CoWoS-S at TSMC	40	70	91	220	260	130	*0%*	*0%*	CoWoS-S is still mainstream in 2026, but more adoption of CoWoS-L from 2027 for Meta, OpenAI and future versions of TPU starting late 2027.
CoWoS-S outside TSMC	0	0	5	10	70	130	*0%*	*0%*	Outsourcing starting to pick up - trialling ASE and Amkor for Networking projects in 2027. OSAT qualification slower than expected.
CoWoS-L	0	0	0	20	95	320	*0%*	*0%*	Starting to use CoWoS-L for some projects including advanced TPU models; also likely to incorporate SoIC for some advanced ASICs for TPUv10, MTIA 450/500 and OpenAI Titan2 in 2028.
Alchip + AWS	7	14	5	65	175	250	*0%*	*6%*	Trn2 upside in 1H26, Trn3 ramp in mid 2026, upside to lifetime volumes for Trn3. Most Trn3 CoWoS allocation through AWS or Alchip. Small overflow to other vendors like Marvell due to excess demand.
Marvell (incl AWS for Trn2)	2	13	75	35	40	80	*0%*	*33%*	Near-term upside to Trn2. Minor Trn3 CoWoS or OSAT allocation. MSFT MAIA 3 to ramp in 2027. Not seeing a big ramp for other CoWoS projects in 2027. In 2028, expect some allocation for Trn4 (for NVLink fusion versions).
MediaTek	0	0	0	30	150	75	*0%*	*20%*	2026 TPUv8t volume strengthening in 2026/27. TPUv9 Humufish now firmly on Intel EMIB-T - hence lower 2028 allocation.
Others	5	16	24	40	40	60	*14%*	*-20%*	Includes Cisco, Microsoft, GUC, Socionext, other ASIC design houses and smaller startup customers etc.; some non-AI chips also using CoWoS (Networking chips for various vendors, some small volume server CPUs etc.).
Overall Total CoWoS Consumption	**134**	**350**	**652**	**1,240**	**2,381**	**3,320**	***2%***	***14%***	
yoy		*161%*	*86%*	*90%*	*92%*	*39%*			
CoWoS Consumption by customer (k wafer per year)	**2023**	**2024**	**2025**	**2026E**	**2027E**	**2028E**	**2026E**	**2027E**	**JPM Comments**
Total TSMC	**134**	**290**	**592**	**1,140**	**1,956**	**2,490**	***0%***	***8%***	TSMC includes sub-contracting of oS to ASE/SPIL from 2025 and sub-contracting of Interposer to Vanguard.
Total Others (OSATs)	0	60	60	100	425	830	*43%*	*52%*	Mainly ASE/SPIL and Amkor, non-TSMC utilization uneven in 2025, given move to CoWoS-L; more full-stack CoWoS from 2H26. Intel EMIB not modeled here, but main volume ramp only in 2028.
Overall Total CoWoS Consumption	**134**	**350**	**652**	**1240**	**2381**	**3320**	***2%***	***14%***	

Source: J.P. Morgan estimates.

GB300 server BoM analysis

Compute tray

	ASP ($)	Unit	Content ($)	Mix of total BoM	Note/Assumption
GB300 Superchip	**85,000**	**2**	**170,000**	**86.0%**	*Each Bianca module has 2 GB200 Superchip*
SSD	**960**	**6**	**5,760**	**2.9%**	
Main SSD drives	1,152	4	4,608	2.3%	*Each compute tray has 4 E1.S SSD drives, each SSD containing 3.84TB storage, $0.3 per GB from Korea memory team*
Boot drives	576	2	1,152	0.6%	*Each compute tray has 1 M.2 SSD boot drives, each having 1.92TB storage, $0.3 per GB from Korea memory team*
Fans	**20**	**10**	**200**	**0.1%**	*Each tray has 8-10 fans with each at $20 ASP.*
BMC	**16**	**4**	**64**	**0.0%**	DC-SCM and HMC board; two for two DPUs
PDB	**300**	**1**	**300**	**5.0%**	
Busbar	**200**	**1**	**200**	**3.3%**	
HMC	**700**	**1**	**700**	**11.6%**	
DC-SCM	**300**	**1**	**300**	**5.0%**	
Networking cards	**2,500**	**4**	**10,000**	**5.1%**	
BlueField 3	3,000	2	6,000	3.0%	*Assuming adoption of Nvidia's DPU*
CX7/8	2,000	2	4,000	2.0%	*2 in each compute tray*
Thermal module			**1,500**	**0.8%**	
Cold plate	250	2	500	0.3%	*D2C Liquid cool cold plate.*
Manifold - GB300 server	200	4	800	0.4%	*Two pairs per server; JPMe $200 each pair*
Universal Quick Disconnect	25	8	200	0.1%	
Chassis	**200**	**1**	**200**	**0.1%**	
Cables/Connectors	**750**	**1**	**750**	**0.4%**	*MCIO, PCIe, etc. Based on FIT comments $500-1000 total content value.*
Slide rail	**200**	**1**	**200**	**0.1%**	
Others	**1,500**	**1**	**1,500**	**0.8%**	*2 I/O board, power cord, cables/connectors*
Compute tray BoM ($)			**191,674**	**96.9%**	
MVA/ Assembly fees			6,049	3.1%	*Assume 10% annual working capital fees for GB300 Superchip and memory, 2.5 month cycle time and 15% margin for other non-GPU parts*
Total compute tray BoM cost ($)			**197,723**	**100.0%**	

NVLink switch tray

	ASP ($)	Unit	Content ($)	Mix of total BoM	Note/Assumption
NVLink Switch chip	**8,000**	**2**	**16,000**	**73%**	*Two chips for each tray.*
CPU	**500**	**1**	**500**	**2%**	*AMD EPYC 3151*
Switch board	**2,000**	**1**	**2,000**	**9%**	*Assuming $1.2k for PCB value*
Fans	**20**	**8**	**160**	**1%**	*Each tray has 6-8 fans with each at $20 ASP*
Thermal module			**1,380**	**6%**	*Liquid cooling*
Cold plate	250	2	500	2%	*Two cold plates for two NVLink switch chips*
Manifold	200	4	800	4%	*Two pairs per tray; JPMe $200 each pair*
Universal Quick Disconnect	20	4	80	0%	
BMC	**16**	**1**	**16**	**0%**	*AST2600 at $14 each*
Chassis	**300**	**1**	**300**	**1%**	*Assuming similar to general server*
Others	**500**	**1**	**500**	**2%**	*Connectors, cables, etc.*
Switch tray BoM ($)			**20,856**	**95%**	
MVA/ Assembly fees			1062	4.8%	*Assume 10% annual working capital fees for main chip, 2 month cycle time and 15% margin for other non-chip parts*
Total compute tray BoM cost ($)			**21,918**	**100%**	

GB300 (10-9-8) Rack BoM cost analysis

	ASP ($)	Unit	Content ($)	Mix of total BoM	Note/Assumption
Compute tray	**191,674**	**18**	**3,450,132**	**84.5%**	*2RU, 2C4G, Bianca form factor. 9 compute trays per rack*
Switch tray	**20,856**	**9**	**187,704**	**4.6%**	*9 switch trays per rack*
Power supply system			**43,364**	**1.1%**	
Power shelf	10,300	4	41,200	1.0%	*12kW*6 units per shelf, power shelf layout*
Power whip	150	4	600	0.0%	*Bizlink's comments NVL36 BoM for Busbar+powerwhip is ~$4000-5000*
Bus bar	1,500	1	1,500	0.0%	
BMC	16	4	64	0.0%	*Each RU has one BMC*
Thermal module (rack level)			**8,000**	**0.2%**	
Manifold	4,000	2	8,000	0.2%	*One pair per rack. Liquid to air solution.*
Chassis (rack level)	**10,000**	**1**	**10,000**	**0.2%**	
NVLink cables / connectors	**35**	**5184**	**181,440**	**4.4%**	*DACs ASP at ~$35 each: 2 coonectors * $10-15 ASP +one copper cable at $15; Unit: 72 GPU * 72 ports*
Top of rack (ToR) front-end switch	**4,000**	**1**	**4,000**	**0.1%**	*JPMe for ASP*
Others	**50,000**	**1**	**50,000**	**1.2%**	*mgmt server, cable cartrdge, etc.*
GB300 Rack total BoM without MVA (US$)			**3,934,640**	**96.4%**	
MVA/ Assembly fees			148,114	3.6%	*Sum of MVA for computing/switch tray + 10% margins of other parts*
GB300 Rack total BoM (US$)			**4,082,754**	**100.0%**	

Source: Company data, J.P. Morgan estimates.

VR200 server BoM analysis

Compute tray

	ASP ($)	Unit	Content ($)	Mix of total BoM	Note/Assumption
VR200 Superchip - Strata board	**125,000**	**2**	**250,000**	**80.3%**	*Each Strata module has 2 Rubin GPUs and 1 Vera CPU, 768GB LPDDR5 per board*
SSD	**1,958**	**5**	**9,792**	**3.1%**	
Main SSD drives	2,304	4	9,216	3.0%	*Each compute tray has 4 E1.S SSD drives, 8T per drive, $0.3 per GB from Korea memory team*
Boot drives	576	1	576	0.2%	*Each compute tray has 1 E1.S SSD boot drive, 2T per drive, $0.3 per GB from Korea memory team*
BMC	**16**	**3**	**48**	**0.0%**	DC-SCM and HMC board; one for DPU
Midplane	**5,000**	**1**	**5,000**	**1.6%**	11 Paladin connectors, M8+ PCB ~$1000, Connector content $500-1000, Amphenol margin
PDB	**300**	**1**	**300**	**0.1%**	
Busbar	**200**	**1**	**200**	**0.1%**	
HMC	**700**	**1**	**700**	**0.2%**	
DC-SCM	**300**	**1**	**300**	**0.1%**	
Networking cards	**6,800**	**5**	**34,000**	**10.9%**	
BlueField 4	4,000	1	4,000	1.3%	*Assuming adoption of Nvidia's DPU*
CX9 I/O board	7,500	4	30,000	9.6%	*4 in each compute tray, each I/O board contains 2 CX9 chips (800G)*
Thermal module			**2,610**	**0.8%**	
Cold plate	250	5	1,250	0.4%	*D2C Liquid cool cold plate.*
Inner manifold	1,000	1	1,000	0.3%	*1000 manifold content per VR tray by AVC*
Universal Quick Disconnect	20	18	360	0.1%	
Chassis	**300**	**1**	**300**	**0.1%**	
Slide rail	**200**	**1**	**200**	**0.1%**	
Others	**1,000**	**1**	**1,000**	**0.3%**	*power cable, other cable/connector, mechanical parts, etc.*
Compute tray BoM ($)			**304,450**	**97.7%**	
MVA/ Assembly fees			7,009	2.3%	*Assume 10% annual working capital fees for VR Superchip and memory, 2 month cycle time and 6% margin for other non-GPU parts*
Total compute tray BoM cost ($)			**311,459**	**100.0%**	

NVLink switch tray

	ASP ($)	Unit	Content ($)	Mix of total BoM	Note/Assumption
NVLink Switch chip	**12,000**	**4**	**48,000**	**86%**	*Four chips for each tray. NVLink 6th chip.*
CPU	**500**	**1**	**500**	**1%**	*AMD EPYC 3151*
Switch board	**2,500**	**1**	**2,500**	**4%**	*Assuming $1.6k for PCB value*
Thermal module			**1,680**	**3%**	*Liquid cooling*
Cold plate	200	4	800	1%	*4 cold plates for 4 NVLink switch chips*
Manifold	400	2	800	1%	*Two pairs per tray; JPMe $200 each pair*
Universal Quick Disconnect	20	4	80	0%	
BMC	**16**	**1**	**16**	**0%**	*AST2600 at $16 each*
Chassis	**300**	**1**	**300**	**1%**	*Assuming similar to general server*
Others	**1,000**	**1**	**1000**	**2%**	*Connectors, cables, mgmt module, sliderail, etc.*
Switch tray BoM ($)			**53,996**	**97%**	
MVA/ Assembly fees			1,699	3.1%	*Assume 10% annual working capital fees for main chip, 2 month cycle time and 15% margin for other non-chip parts*
Total compute tray BoM cost ($)			**55,695**	**100%**	

NVL72 Oberon (10-9-8) Rack BoM cost analysis

	ASP ($)	Unit	Content ($)	Mix of total BoM	Note/Assumption
Compute tray	**304,450**	**18**	**5,480,100**	**84.6%**	*2RU, 2C4G, Bianca form factor. 9 compute trays per rack*
Switch tray	**53,996**	**9**	**485,964**	**7.5%**	*9 switch trays per rack*
Power supply system			**81,764**	**1.3%**	
110kw power shelf	19,400	4	77,600	1.2%	*18.5kW*6 units*3RU per shelf, power shelf layout. PMC card ~300, power shelf shell ~3200*
Power whip	200	8	1,600	0.0%	*120A per power whip, 2 whip per shelf*
Bus bar	2,500	1	2,500	0.0%	*Liquid cooled*
BMC	16	4	64	0.0%	*Each RU has one BMC*
Rack manifold	**8,000**	**1**	**8,000**	**0.1%**	1 pair
Chassis (rack level)	**10,000**	**1**	**10,000**	**0.2%**	
NVLink cables / connectors	**35**	**5184**	**181,440**	**2.8%**	*DACs ASP at ~$35 each: 2 coonectors * $10-15 ASP +one copper cable at $15; Unit: 72 GPU * 72 ports*
Cable cartridge	**6,000**	**4**	**24,000**	**0.4%**	
Top of rack (ToR) front-end switch	**4,000**	**1**	**4,000**	**0.1%**	*Two ToR 400G 32 port switch, one mgmt 1G switch*
Others	**25,000**	**1**	**25,000**	**0.4%**	*mgmt server, fiber patch panel, etc.*
NVL72 Rack total BoM without MVA (US$)			**6,300,268**	**97.3%**	
MVA/ Assembly fees			174,883	2.7%	*Sum of MVA for computing/switch tray + 10% margins of other parts*
NVL72 Rack total BoM (US$)			**6,475,151**	**100.0%**	

Source: Company data, J.P. Morgan estimates.

Quantifying the TAM for generic whitebox Ethernet ToR switch (including AI Front-end)

- Overall, we forecast a ~43% CAGR over 2025–28 for the general-purpose white-box Ethernet ToR switch revenue TAM, driven by (1) stronger general server demand, (2) rapid build-out of AI front-end network fabrics, and (3) ASP uplift from ongoing speed migration.

JPM bottom-up generic whitebox Ethernet ToR switch TAM

k units	2022	2023	2024	2025	2026E	2027E	2028E	25-28 CAGR
Top 4 US CSP general server board shipments	**7,167**	**5,857**	**6,144**	**8,767**	**12,274**	**15,342**	**18,411**	*28%*
YoY		*-18%*	*5%*	*43%*	*40%*	*25%*	*20%*	
Number of networking interface cards (NICs) per server	2.3	2.5	2.5	2.5	2.6	2.6	2.6	
Port per NICs	2.0	2.0	2.0	2.0	2.0	2.0	2.0	
Oversubscription ratio	0.66	0.64	0.64	0.64	0.63	0.63	0.62	
Top 4 US CSP datacenter ToR switch port demand	**49,952**	**45,758**	**48,000**	**68,492**	**101,308**	**126,634**	**154,412**	*31%*
Whitebox ToR switch penetration rate	47%	46%	50%	60%	62%	64%	66%	
Top 4 US CSP whitebox datacenter ToR switch port demand	**23,477**	**21,049**	**24,000**	**41,095**	**62,811**	**81,046**	**101,912**	*35%*
YoY		*-10%*	*14%*	*71%*	*53%*	*29%*	*26%*	
Top 4 US CSP datacenter ToR switch port shipment mix by speed								
1Gbps	1%	1%	0%	0%	0%	0%	0%	
10Gbps	3%	2%	1%	1%	1%	0%	0%	
40Gbps	0%	0%	0%	0%	0%	0%	0%	
25/50Gbps	11%	6%	4%	4%	3%	2%	1%	
100Gbps	85%	90%	92%	92%	87%	82%	74%	
200/400Gbps	0%	1%	3%	4%	8%	13%	20%	
800Gbps	0%	0%	0%	0%	1%	3%	5%	
	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	
Top 4 US CSP datacenter ToR switch port shipment by speed								
1Gbps	235	105	72	82	63	0	0	
10Gbps	704	421	240	329	314	243	102	
40Gbps	47	21	0	0	0	0	0	
25/50Gbps	2,536	1,347	888	1,438	1,884	1,621	1,019	
100Gbps	19,956	18,944	22,080	37,602	54,897	66,215	75,313	
200/400Gbps	0	210	720	1,644	5,025	10,536	20,382	
800Gbps	0	0	0	0	628	2,431	5,096	
Total	**23,477**	**21,049**	**24,000**	**41,095**	**62,811**	**81,046**	**101,912**	*35%*
ASP per whitebox switch port by speed (US$)								
1Gbps	21	21	20	19	19	19	18	**-2%**
10Gbps	46	45	55	52	51	50	49	**-2%**
40Gbps	83	80	0	0	0	0	0	
25/50Gbps	48	47	47	45	44	43	42	**-2%**
100Gbps	115	115	108	102	99	96	93	**-3%**
200/400Gbps	354	341	298	268	241	229	218	**-7%**
800Gbps	422	379	341	306	289	264	239	**-8%**
Blended ASP per port ($)	**105**	**111**	**110**	**106**	**110**	**117**	**125**	*6%*
Whitebox Ethernet switch revenue by speed (US$mn)								
1Gbps	5	2	1	2	1	0	0	
10Gbps	32	19	13	17	16	12	5	
40Gbps	4	2	0	0	0	0	0	
25/50Gbps	122	63	42	64	82	69	43	
100Gbps	2,302	2,173	2,375	3,843	5,442	6,367	7,024	
200/400Gbps	0	72	214	440	1,212	2,413	4,435	
800Gbps	0	0	0	0	182	642	1,218	
Total TAM (US$mn)	**2,466**	**2,330**	**2,646**	**4,366**	**6,935**	**9,504**	**12,726**	*43%*
YoY		*-5%*	*14%*	*65%*	*59%*	*37%*	*34%*	

Source:650 Group, Gartner®, J.P. Morgan estimates.

J.P.Morgan

Quantifying GPU back-end Ethernet networking TAM

Nvidia's GPU ToR switch TAM estimates

	2023	2024	2025	2026E	2027E	2028E	25-28 CAGR
AI server shipment estimates (k racks)							
GB200			20	5			
GB300			5	60	10		
VR200				5	60	10	
Kyber NVL144					3	40	
HGX							
Hopper	30	70	6	3			
Blackwell			25	31	6		
Rubin				5	38	44	
800G eqv. port demand per rack							
GB200	72	72	72	72	72	72	
GB300	144	144	144	144	144	144	
VR200	288	288	288	288	288	288	
Kyber NVL144	1,152	1,152	1,152	1,152	1,152	1,152	
HGX							
Hopper	64	64	64	64	64	64	
Blackwell	128	128	128	128	128	128	
Rubin	128	128	128	128	128	128	
800G eqv. port demand (k)							
GB200	0	0	1,440	360	0	0	
GB300	0	0	720	8,640	1,440	0	
VR200	0	0	0	1,440	17,280	2,880	
Kyber NVL144	0	0	0	0	2,880	46,080	
HGX							
Hopper	1,920	4,480	400	160	0	0	
Blackwell	0	0	3,200	4,000	800	0	
Rubin	0	0	0	640	4,800	5,600	
Total port demand (k, 800G eqv.)	**1,920**	**4,480**	**5,760**	**15,240**	**27,200**	**54,560**	*112%*
ASP per 800G eqv. port (US$)	564	506	455	487	521	557	
						7%	
Nvidia's GPU networking TAM (US$mn)	**1,082**	**2,269**	**2,621**	**7,420**	**14,169**	**30,411**	*126%*
YoY		*110%*	*16%*	*183%*	*91%*	*115%*	
Ethernet adoption rate	20%	32%	55%	75%	82%	87%	
Nvidia's GPU networking Ethernet TAM (US$mn)	**216**	**733**	**1,441**	**5,565**	**11,619**	**26,458**	*164%*
YoY		*239%*	*97%*	*286%*	*109%*	*128%*	

Source: J.P. Morgan estimates, Company data

J.P.Morgan

What drives the ASP expansion of high-end datacenter switch?

- We estimate a ~150% ASP increase for 800G switches versus 400G switches, driven by
  - 2-3x higher Switch ASIC cost (Contributing ~70% of the total ASP increase)
  - PCB / CCL Materials upgrade to M8 from M6+, 3-4x CCL content growth
- CPO adoption could also significantly increase the switch BoM and bodes well for ODM margins given the high complexity of component integration (FAU, OE, shuffle box, etc.).

Switch BoM comparison - 400G vs. 800G bare-metal switch

400G switch

	Unit price ($)	Volume	Total cost	% of BoM	Note
CPU	146	1	146	2%	Intel® Xeon® Processor D-1527
Switch chip	4000	1	4,000	52%	Tomohawk 4
Fans	20	8	160	2%	7+1
PSU	160	2	320	4%	1600W, N+N redundancy
Chassis	300	1	300	4%	
PCB	800	1	800	10%	
NAND	0.3	256	77	1%	
DRAM	2.5	34	85	1%	Management + control pane
Others			310	4%	Cables, connectors, others
Subtotal			6,198	80%	
MVA			1,550	20%	Assume 20% GM for ODM
Total			**7,748**	100%	

800G switch

	Unit price ($)	Volume	Total cost	% of BoM	Note
CPU	219	1	219	1%	Intel® Xeon® Processor D-1527
Switch chip	12000	1	12,000	62%	Tomohawk 5
Fans	23	8	184	1%	7+1, assume some spec upgrades for fans to dissipate more heats
PSU	360	2	720	4%	Assuming 20% power consumption increase vs. 400G. 3000W PSU 1+1 spec
Chassis	300	1	300	2%	2U
PCB	1500	1	1,500	8%	CCL content growth 3-4x (layer count +20-30%; M6+ to M8 migration +3x material ASP expansion)
NAND	0.3	240	72	0%	240G
DRAM	2.5	32	80	0%	Management + control pane. 32GB DDR4 SODIMM.
Others			466	2%	Cables, connectors, other analog ICs and peripheral components
Subtotal			15,541	80%	
MVA			3,885	20%	Assume 20% GM for ODM
Total			**19,427**	100%	

Source: J.P. Morgan estimates, NAND/DRAM volume is on a per GB basis

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