Global Server: Raising both AI and General servers; better mix and higher memory costs drive CSP spending

We raise our global servers TAM by 31% / 45% in 2027 / 28E across general servers and AI servers to reflect the ongoing generative AI infrastructure investments and specification upgrades:

(1) General servers: raised value by 17% / 11% in 2027 / 28E with both shipment and ASP raised. We expect general servers shipment to grow at 20% / 12% / 8% YoY in 2026-28E.

(2) AI servers (NVL72, powered by NV & AMD): shipment raised by 5% / 1% to 110k / 164k racks in 2027 / 28E.

(3) AI servers (8-GPU, powered by GPU & ASIC): shipment raised by 10% / 29% to 2.7m / 3.3m servers in 2027 / 28E. Our new AI servers shipment forecasts imply AI chip demand of 18m / 29m / 38m in 2026-28E, or a ~60% / ~50% ASIC penetration rate globally / global-tier in 2028E. We continue to see a rise across CSP capex, fabless shipment, and foundry capacity, driving an AI infrastructure upcycle.

AI servers supply chain: Buy Hon Hai / FII (ODM), Wiwynn / Wistron (ODM), Innolight (Optical module), Eoptolink (Optical module), Shengyi Tech (CCL), Victory Giant (PCB), FOCI (FAU), Largan (FAU), LandMark (Silicon photonics), VPEC (Silicon photonics), AVC / Fositek (liquid cooling), Auras (liquid cooling), King Slide (rail kits), EMC (CCL), GCE (PCB), TSMC (foundry), MPI (probe cards), WinWay (sockets), Aspeed (fabless), and Hon Precision (FT handler).

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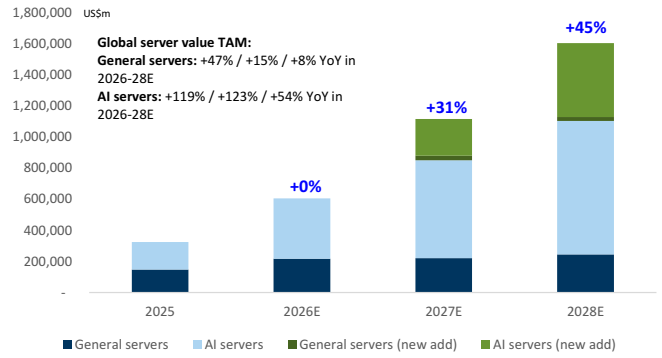
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Exhibit 1: Raising our global servers TAM by 31% / 45% in 2027 / 28E on both higher General servers and AI servers
Global server value TAM revision



Source: Company data, Goldman Sachs Global Investment Research

Related reports:

Global Tech: PCs, smartphones, servers: Quantifying market opportunities (launching Global TAMs on Oct 3, 2023)

Global Tech: Server TAM: Introducing rack-level AI server forecasts (Oct 29, 2024)

Global Tech: Server TAM updates: AI server shipment timeframe recalibrating (Feb 9, 2025)

Global Tech: Server TAM updates: Revising down AI Training Server outlook (Mar 24, 2025)

Global Tech: ASIC AI server TAM introduced; Server TAM update and baseboard-based AI servers raised (June 28, 2025)

Global Server: 2027E estimates introduced; Raising baseboard-based AI servers with rising ASIC penetration (Sep 27, 2025)

Global Server: ASIC servers expanding; AI full racks see diversifying chip platform (Jan 4, 2026)

Global Server: Higher mix of rack-level AI servers; Introducing 2028 forecasts (Apr 17, 2026)

Global Server: Raising both AI and General servers; better mix and higher memory costs drive CSP spending (Jun 24, 2026)

Servers: AI server rack shipments +238%/+75%/+49% YoY in 2026-28E

Global Server market opportunity

(Shipments in k units/ k racks)

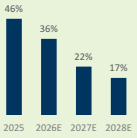
Our Bottom up method

Global server TAM =
General server + **AI** server racks (NVL72) + AI server (8-GPU)

General server

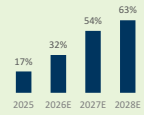
General server shipments = shipments of Top 6 server brands + ODM direct + others
General server revenues = shipments of each company x ASP of each company

General servers revenues mix

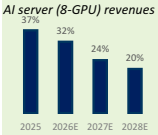


AI server
AI server shipments = shipments of Top 6 server brands + ODM direct + others
AI server revenue = shipments x ASP

AI server racks revenues mix



AI server (8-GPU) revenues mix



Revenues by type		1Q25	2Q25	3Q25	4Q25	1Q26	2Q26	3Q26E	4Q26E	2025	2026E	2027E	2028E
Global server revenues	**US$ m**	**64,889**	**81,309**	**80,639**	**98,133**	**109,179**	**147,792**	**172,900**	**175,105**	**324,969**	**604,976**	**1,114,623**	**1,602,489**
General servers	US$ m	32,860	36,618	38,001	40,581	43,837	56,047	62,915	54,293	148,061	217,092	250,293	271,114
AI server racks (NVL72)	US$ m	5,655	10,325	12,015	27,750	37,695	46,676	49,980	59,319	55,745	193,670	598,899	1,012,945
AI server training (8-GPU)	US$ m	19,910	29,172	24,935	25,296	22,446	35,501	49,143	49,415	99,313	156,505	203,276	237,482
AI server inferencing (8-GPU)	US$ m	6,463	5,194	5,688	4,505	5,201	9,568	10,862	12,079	21,850	37,710	62,155	80,948
Mix		**1Q25**	**2Q25**	**3Q25**	**4Q25**	**1Q26**	**2Q26**	**3Q26E**	**4Q26E**	**2025**	**2026E**	**2027E**	**2028E**
Total	**%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
General servers	%	51%	45%	47%	41%	40%	38%	36%	31%	46%	36%	22%	17%
AI server racks (NVL72)	%	9%	13%	15%	28%	35%	32%	29%	34%	17%	32%	54%	63%
AI server training (8-GPU)	%	31%	36%	31%	26%	21%	24%	28%	28%	31%	26%	18%	15%
AI server inferencing (8-GPU)	%	10%	6%	7%	5%	5%	6%	6%	7%	7%	6%	6%	5%
Revenues YoY		**1Q25**	**2Q25**	**3Q25**	**4Q25**	**1Q26**	**2Q26**	**3Q26E**	**4Q26E**	**2025**	**2026E**	**2027E**	**2028E**
Total	**%**					**68%**	**82%**	**114%**	**78%**		**86%**	**84%**	**44%**
General servers	%					33%	53%	66%	34%		47%	15%	8%
AI server racks (NVL72)	%					567%	352%	316%	114%		247%	209%	69%
AI server training (8-GPU)	%					13%	22%	97%	95%		58%	30%	17%
AI server inferencing (8-GPU)	%					-20%	84%	91%	168%		73%	65%	30%
Revenues QoQ		**1Q25**	**2Q25**	**3Q25**	**4Q25**	**1Q26**	**2Q26**	**3Q26E**	**4Q26E**	**2025**	**2026E**	**2027E**	**2028E**
Total	**%**		**25%**	**-1%**	**22%**	**11%**	**35%**	**17%**	**1%**				
General servers	%		11%	4%	7%	8%	28%	12%	-14%				
AI server racks (NVL72)	%		83%	16%	131%	36%	24%	7%	19%				
AI server training (8-GPU)	%		47%	-15%	1%	-11%	58%	38%	1%				
AI server inferencing (8-GPU)	%		-20%	10%	-21%	15%	84%	14%	11%				
Shipments by type	**Units**	**1Q25**	**2Q25**	**3Q25**	**4Q25**	**1Q26**	**2Q26**	**3Q26E**	**4Q26E**	**2025**	**2026E**	**2027E**	**2028E**
Global server shipments													
General servers	k units	3,619	3,901	3,648	3,966	3,851	4,585	5,122	4,550	15,134	18,107	20,321	21,917
AI server racks (NVL72)	k racks	2	3	4	9	13	16	17	18	19	63	110	164
AI server training (8-GPU)	k units	154	162	170	174	176	240	329	337	660	1,082	1,533	1,858
AI server inferencing (8-GPU)	k units	141	91	111	74	81	146	213	208	417	648	1,122	1,447
Shipments YoY		**1Q25**	**2Q25**	**3Q25**	**4Q25**	**1Q26**	**2Q26**	**3Q26E**	**4Q26E**	**2025**	**2026E**	**2027E**	**2028E**
General servers	%					6%	18%	40%	15%		20%	12%	8%
AI server racks (NVL72)	%					567%	352%	318%	94%		238%	75%	49%
AI server training (8-GPU)	%					14%	48%	94%	94%		64%	42%	21%
AI server inferencing (8-GPU)	%					-43%	60%	93%	180%		55%	73%	29%
Shipments QoQ		**1Q25**	**2Q25**	**3Q25**	**4Q25**	**1Q26**	**2Q26**	**3Q26E**	**4Q26E**	**2025**	**2026E**	**2027E**	**2028E**
General servers	%		8%	-6%	9%	-3%	19%	12%	-11%				
AI server racks (NVL72)	%		83%	16%	131%	36%	24%	8%	7%				
AI server training (8-GPU)	%		5%	5%	3%	1%	36%	38%	2%				
AI server inferencing (8-GPU)	%		-36%	21%	-33%	9%	80%	46%	-2%				
Shipments by vendor		**1Q25**	**2Q25**	**3Q25**	**4Q25**	**1Q26**	**2Q26**	**3Q26E**	**4Q26E**	**2025**	**2026E**	**2027E**	**2028E**
General server shipments	**k units**	**3,619**	**3,901**	**3,648**	**3,966**	**3,851**	**4,585**	**5,122**	**4,550**	**15,134**	**18,107**	**20,321**	**21,917**
Dell	k units	334	307	299	395	414	446	448	500	1,335	1,808	2,050	2,255
HP	k units	165	161	161	182	161	154	169	191	669	675	703	717
Super Micro	k units	156	173	134	130	165	135	135	142	592	578	557	579
Lenovo	k units	174	187	213	263	226	280	287	289	837	1,083	1,137	1,194
Gigabyte	k units	24	41	27	30	34	44	53	31	123	162	187	196
Quanta - ODM direct	k units	576	650	483	541	639	747	627	703	2,249	2,717	2,826	2,882
Hon Hai- ODM direct	k units	207	256	221	211	218	255	229	242	895	944	971	971
Wiwynn- ODM direct	k units	455	527	596	588	638	895	1,353	823	2,166	3,709	4,724	5,432
Others	k units	1,527	1,599	1,516	1,627	1,356	1,628	1,820	1,628	6,269	6,432	7,168	7,691
AI server - 8-GPU	**k units**	**296**	**253**	**280**	**248**	**257**	**385**	**543**	**545**	**1,077**	**1,730**	**2,655**	**3,305**
Dell	k units	9	33	28	44	77	83	94	110	113	364	437	491
HP	k units	2	4	2	1	3	6	6	5	9	21	12	12
Super Micro	k units	10	13	12	22	9	8	16	14	57	48	42	39
Lenovo	k units	16	10	11	13	34	19	27	27	50	107	196	294
Gigabyte	k units	2	4	2	2	3	5	5	6	10	18	22	25
Quanta - ODM direct	k units	19	20	24	10	10	28	46	39	73	123	156	166
Hon Hai- ODM direct	k units	51	60	56	20	20	91	50	50	187	211	200	200
Wiwynn- ODM direct	k units	21	41	52	54	45	45	52	66	168	207	287	362
Others	k units	166	68	93	83	56	100	247	228	410	631	1,302	1,716
AI server - full racks	**k racks ****	**2**	**3**	**4**	**9**	**13**	**16**	**17**	**18**	**19**	**63**	**110**	**164**
Dell	k racks	0	1	1	1	3	3	4	4	3	13	15	18
HP	k racks	0	0	0	0	0	0	1	0	1	1	2	2
Super Micro	k racks	0	0	0	2	2	2	3	3	3	10	13	15
Lenovo	k racks	-	-	-	-	0	0	0	0	-	0	2	3
Gigabyte	k racks	-	0	0	0	0	0	0	0	0	1	1	1
Quanta - ODM direct	k racks	1	1	1	1	3	5	2	1	4	11	13	17
Hon Hai- ODM direct	k racks	0	1	2	4	5	6	7	7	7	25	59	101
Wiwynn- ODM direct	k racks	-	-	-	-	-	-	-	1	-	1	5	5
Others	k racks	0	0	0	0	-	0	0	1	1	2	2	2

Source: Company data, Goldman Sachs Global Investment Research

Exhibit 2: ASIC penetration rate up to ~60% / ~50% in 2028E globally / global-tier 1 hyperscalers

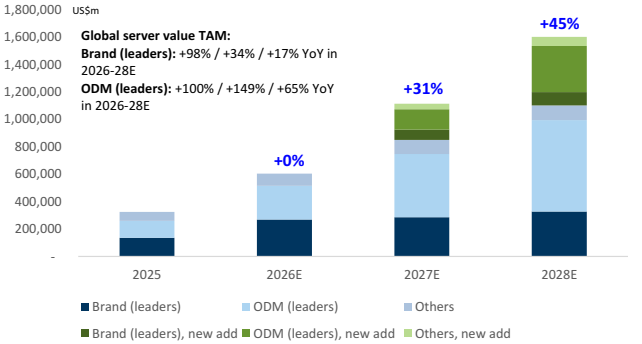
AI server shipment implied AI chips and ASIC penetration rate

	2026E	2027E	2028E
NEW			
AI server shipment (k units)			
Rack-level (NVL72)	63	110	164
8-GPU	1,730	2,655	3,305
Implied AI chips	18,361	29,171	38,275
YoY	*84%*	*59%*	*31%*
ASIC penetration rate	55%	57%	58%
Global-tier	47%	48%	49%
Chinese	92%	92%	92%
CHG			
AI server shipment (k units)			
Rack-level (NVL72)	13%	5%	1%
8-GPU	-7%	10%	29%
Implied AI chips	-3%	9%	19%

Source: Company data, Goldman Sachs Global Investment Research

Exhibit 3: Raising both our forecasts for Brand makers and ODM in 2027 / 28E

Global server value TAM revision



Source: Company data, Goldman Sachs Global Investment Research

AI servers ecosystem

Exhibit 4: AI servers ecosystem: revenues exposure to different chipset platforms / customers

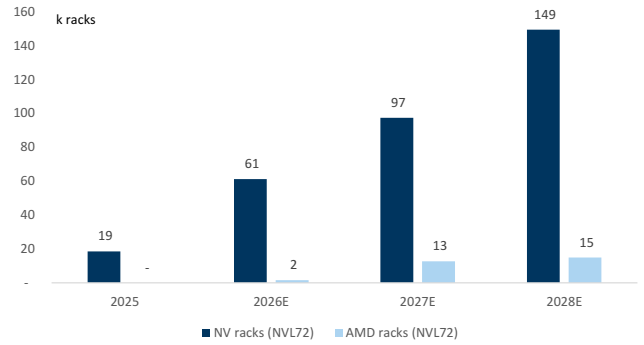
Company name	Ticker	Analyst	Rev exposures % to selected supply chain (2026E)							
			Nvidia GPU	AMD GPU	Google TPU	Amazon Trainium	Meta MTIA	Chinese GPUs/ ASICs	Oracle	Company product focus
ODM										
Hon Hai	2317.TW	Allen Chang	30-35%	5-10%	5-10%	0%	0%	<5%	<10%	AI server ODM
Inspur	000977.SZ	Allen Chang	<10%	<10%	0%	0%	0%	60-65%	0%	AI server brand/ ODM
Ruijie Networks	301165.SZ	Allen Chang	0%	0%	0%	0%	0%	55-60%	0%	Data center switch
Wiwynn	6669.TW	Allen Chang	5-10%	5-10%	<5%	25-35%	<5%	0%	10-20%	AI server ODM
Quanta	2382.TW	Allen Chang	60-70%	<5%	<5%	0%	<5%	0%	<5%	AI server ODM
Huaqin Technology	603296.SS	Verena Jeng	<10%	<5%	0%	0%	0%	30-35%	0%	AI server ODM, Data center switch ODM
FII	601138.SS	Verena Jeng	45-50%	<10%	<10%	0%	0%	<10%	10-20%	AI server ODM
Mitac	3706.TW	Verena Jeng	<5%	5-10%	0%	0%	0%	0%	60-65%	Data center switch ODM, AI server ODM
Wistron	3231.TW	Verena Jeng	45-55%	<5%	0%	5-15%	<5%	<5%	5-10%	AI server ODM
Inventec	2356.TW	Verena Jeng	15-20%	<5%	<5%	0%	0%	0%	0%	AI server ODM
UNIS	000938.SZ	Verena Jeng	<5%	<5%	0%	0%	0%	40-50%	0%	AI server brand/ ODM
Lenovo	0992.HK	Verena Jeng	<10%	<10%	0%	0%	0%	<10%	0%	AI server brand/ ODM
Brands										
Asus	2357.TW	Allen Chang	25-35%	<10%	0%	0%	0%	0%	0%	AI server brand
Gigabyte	2376.TW	Allen Chang	65-75%	<10%	0%	0%	0%	0%	0%	AI server brand
ZTE	000063.SZ/ 0763.HK	Allen Chang	0%	0%	0%	0%	0%	<10%	0%	AI server brand
Components										
AVC	3017.TW	Allen Chang	40-50%	<10%	<5%	15-20%	5-10%	<5%	<5%	Liquid cooling components, chassis
Auras	3324.TWO	Verena Jeng	40-50%	<10%	<10%	<20%	<10%	0%	<10%	Coldplate, CDU, manifold, QD
Chenbro	8210.TW	Verena Jeng	30-35%	<5%	0%	30-35%	0%	10-15%	<10%	Chassis
Fositek	6805.TW	Verena Jeng	40-50%	<5%	<5%	5-10%	<5%	<5%	<5%	QD, rail kits
King Slide	2059.TW	Verena Jeng	50-55%	<10%	<10%	<10%	<10%	<10%	<10%	Rial kits
Delta Electronics	2308.TW	Chao Wang	20-25%	<5%	<10%	<10%	<5%	0%	<5%	PSU & DC/DC converter & CDU
PCB/ CCL										
Shennan Circuits	002916.SZ	Ting Song	<5%	5-10%	0%	0%	0%	20-25%	0%	PCB
NYPCB	8046.TW	Chao Wang	0%	0%	<1%	<1%	<1%	<1%	0%	ABF substrate
Elite Material	2383.TW	Chao Wang	10-15%	<5%	15-20%	10-15%	5-10%	<1%	<1%	CCL
GCE	2368.TW	Chao Wang	<5%	<5%	10-15%	30-35%	20-25%	0%	0%	PCB
TUC	6274.TWO	Chao Wang	<5%	<5%	5-10%	10-15%	<5%	<1%	0%	CCL
ZDT	4958.TW	Chao Wang	<5%	0%	<5%	<5%	0%	<5%	0%	PCB & ABF substrates
Kinsus	3189.TW	Chao Wang	<5%	<1%	<1%	0%	0%	0%	0%	ABF substrates
Unimicron	3037.TW	Chao Wang	5-10%	<5%	5-10%	<5%	<5%	0%	0%	ABF substrate / HDI
Optical modules, Lasers										
Innolight	300308.SZ	Verena Jeng	30-35%	<5%	25-35%	10-15%	10-15%	<5%	<10%	Optical transceivers
Eoptolink	300502.SZ	Ting Song	30-35%	<5%	10-15%	25-30%	5-10%	<5%	0%	Optical transceiver
LandMark	3081.TWO	Allen Chang	30-35%	<5%	30-35%	10-15%	10-15%	<5%	<10%	InP laser diode/ EPI wafer
YJ Semi	688498.SS	Verena Jeng	30-35%	<5%	25-35%	10-15%	10-15%	<5%	<10%	InP laser diode/ EPI wafer
VPEC	2455.TW	Verena Jeng	15-20%	<5%	10-15%	<5%	<5%	<5%	<5%	InP EPI wafer

Source: Goldman Sachs Global Investment Research

Server TAM estimate revisions

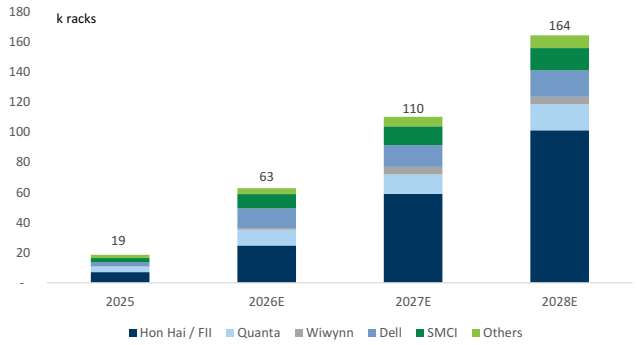
AI server racks: We raise our forecast for AI server racks powered by NVIDIA to 61k / 97k / 149k in 2026 - 28E (vs. 50k / 92k / 148k previously), reflecting the increase in our forecasts for brand makers (Dell, SuperMicro, HP), leading to higher US CSP capex by 4% / 17% / 22% in 2026-28E, and NVIDIA chipset shipments (raised by 9% / 15% in 2027 / 28E), showing the ongoing upcycle of AI infrastructure. Overall, we expect the AI server rack global value TAM to grow at 163% CAGR in 2025-28E to US$1tn, or 63% of the global server value TAM by 2028E. By vendor, we continue to expect global leading CSPs to be the major customers, with leading ODM direct players as the major suppliers. We expect Hon Hai / FII to maintain the leading market position among ODMs and with continuous specification upgrade driving its global market share expansion.

Exhibit 5: AI server racks global shipment by chipset platforms



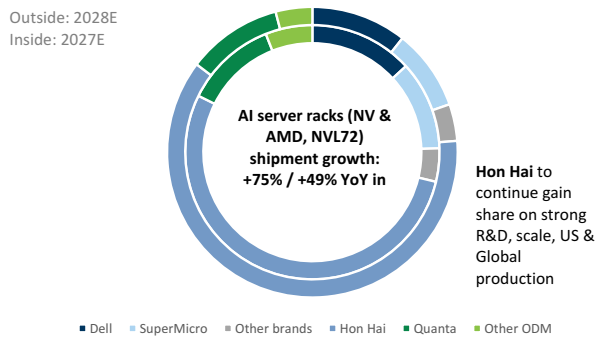
Source: Goldman Sachs Global Investment Research

Exhibit 6: AI server rack shipments by ODM / OEMs



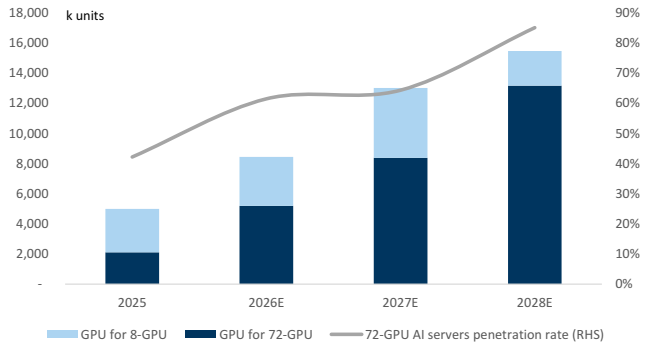
Source: Goldman Sachs Global Investment Research

Exhibit 7: AI server racks global shipment market share by vendors



Source: Goldman Sachs Global Investment Research

Exhibit 8: GPU for rack-level (72-GPU) vs for server-level (8-GPU)

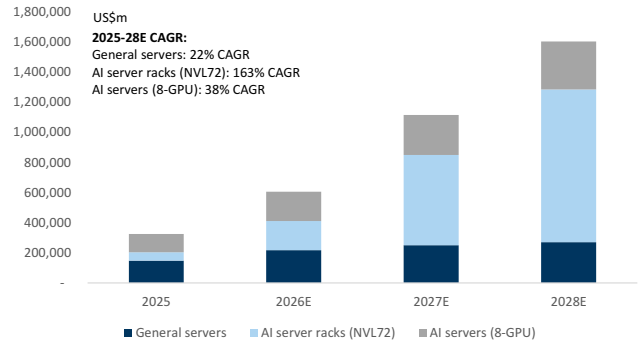


Source: Goldman Sachs Global Investment Research

AI servers: We raise AI server (8-GPU) equivalent shipment by 10% / 29% in 2027-28E to 2.7m / 3.3m in 2027-28E, mainly driven by rising ASIC-based AI server demand. The custom-design provides ASIC-based AI servers optimized for AI computation with better efficiency, such as lower latency, or memory savings via reduced expensive read/write cycles. We continue to see new generation ASICs launched by global leading CSPs, supporting AI server growth: we expect the AI servers (8-GPU) global value TAM to grow

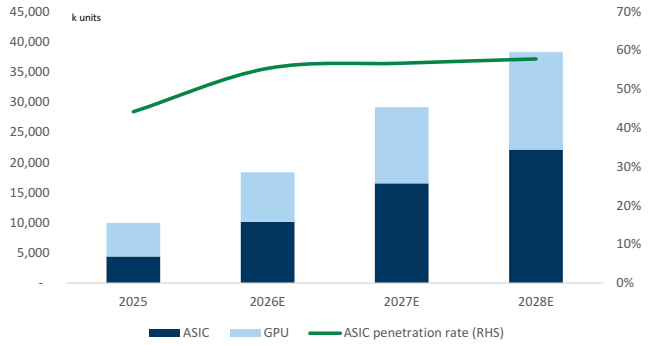
at 38% CAGR in 2025-28E to US$318bn, or 20% of global server value TAM by 2028E. We reduce 2026E shipment by 7% to 1.7m, reflecting a shift toward higher density AI server racks driven by leading US CSPs.

Exhibit 9: Global server value TAM



Source: Goldman Sachs Global Investment Research

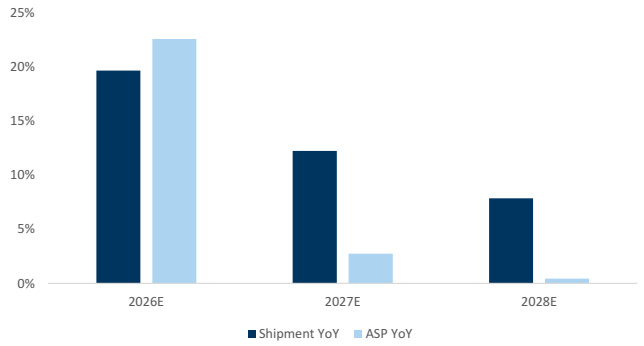
Exhibit 10: AI servers (8-GPU and NVL72) implied AI chips



Source: Goldman Sachs Global Investment Research

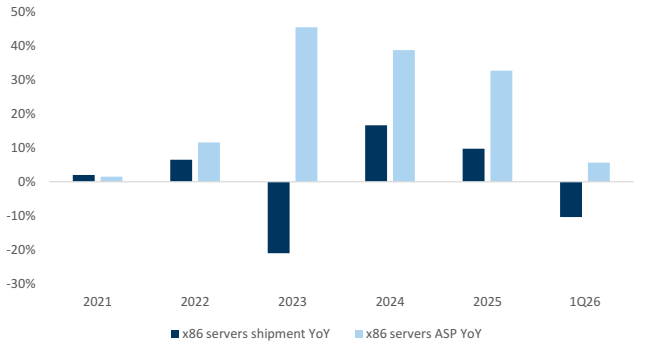
General servers: We raise general server revenue by 15% / 13% / 11% in 2026-28E driven by high memory costs and ongoing specification upgrades driving AI workloads. Intel launched its Intel Xeon 6+ processors at Computex 2026 (link) to facilitate Agentic AI workloads, positioning: CPU servers as the control plane, driving system-level performance and efficiency under rising agentic AI workloads, while supporting data movement and sustained inferencing. Intel presented Xeon 7 Diamond Rapids in Aug 2026 (link), with architectures for Agentic AI and Enterprise scale workloads, empowering efficient inference and edge computing. AMD has begun production ramp of its 6th Gen AMD EPYC CPUs (Venice) in May (link), which powers agentic AI and diverse workloads - running the agents, AI host nodes, and general purposes that turns intelligence into action with optimized TCO (total cost of ownership). We expect general servers' global value TAM to grow at 22% CAGR in 2025-28E to US$271bn, or 17% of global server value TAM by 2028E.

Exhibit 11: General server shipment vs. ASP YoY in 2026-28E



Source: Goldman Sachs Global Investment Research

Exhibit 12: x86 server shipment vs. ASP YoY in 2021-25A and 1Q26A



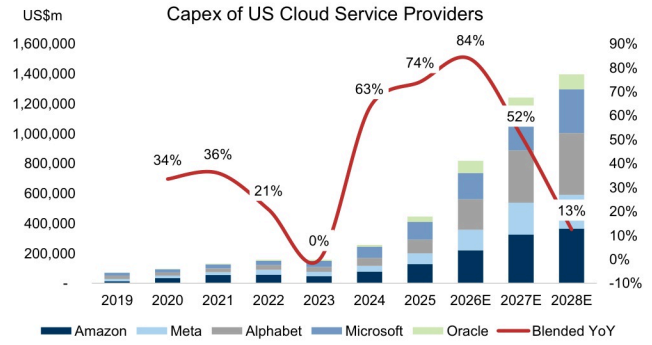
Source: IDC

CSP capex: Regarding customer spending, our US internet team forecasts that leading US cloud service providers (CSPs) in aggregate will grow their capex budgets by 84%/ 52%/ 13% YoY in 2026-28E, with our estimates being raised by 4% / 17% / 22% in 2026-28E to US$1,397bn by 2028E. Within the China internet space, we expect leading

Chinese cloud platforms to grow capex by 105%/ 21%/ 14% YoY in 2026-28E, with our estimates being raised by 14% / 15% / 11% in 2026-28E. The strong increase in CSP capex reflects the high memory costs and growing demand on AI workloads. In terms of capex structure, we estimate chipsets (GPU, ASIC, CPU) remain the major contributors, along with memory (HBM), and followed by networking and other components (e.g. cooling, power, chassis, rail kits, etc.). Compared to global CSPs, we estimate China CSP spending on chipsets would be more diversified across GPU and ASICs considering various local fabless suppliers and customers' varying demand on AI scenarios / tasks. *Read more: Microsoft, Amazon, Meta, Alphabet, Oracle, Baba, Tencent, Baidu.*

Key highlights on the recent Maia 300 announcement from MSFT: (1) Microsoft to expand its Azure Maia system to multi-gigawatt deployments, making Maia the primary inference system for Microsoft products and services, and (2) Microsoft plans to have multi-gigawatt Maia deployment beginning in 2027, with reports indicating a potential plan to deploy >1M Maia 300 chips in 2027 (Microsoft is covered by Gabriela Borges).

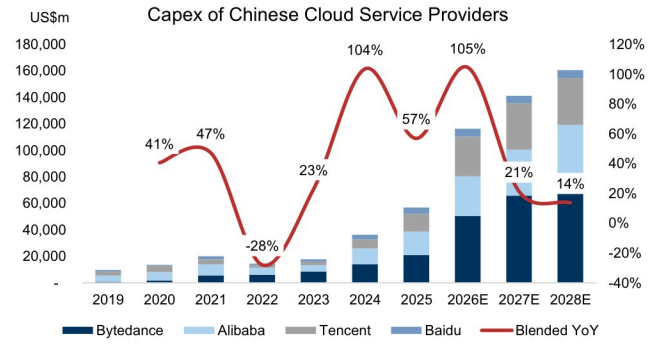
Exhibit 13: US CSP Capex trend



Data include Microsoft, Amazon, Meta, Alphabet and Oracle. For Microsoft, we use capex incl. financial lease. In FY24, 50% of the capex of Microsoft was spent on land and 50% on AI/Cloud.

Source: Company data, Goldman Sachs Global Investment Research

Exhibit 14: China CSP capex trend

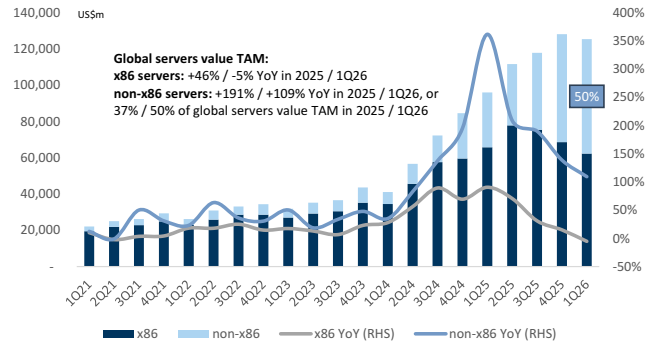


Data include Bytedance, Tencent, Alibaba, Baidu. We calculate Bytedance's (private) relevant operating metrics by analyzing the industry and companies that our China Internet team cover, and then extrapolating them to Bytedance.

Source: Company data, Goldman Sachs Global Investment Research

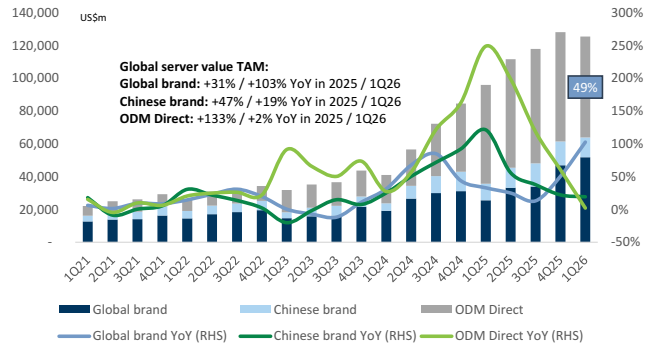
Server TAM historical trend

Exhibit 15: Global servers value TAM: x86 vs non-x86



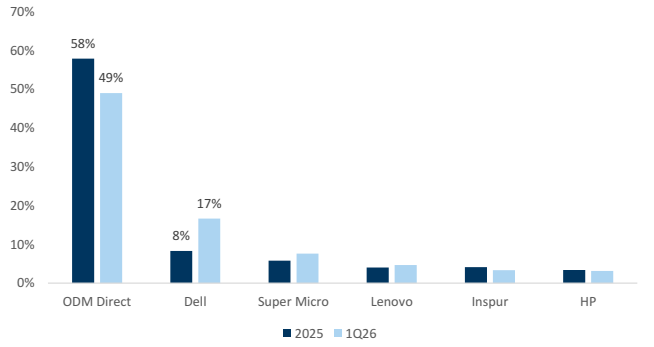
Source: IDC, Bloomberg

Exhibit 16: Global server value TAM: ODM Direct vs Global brand vs Chinese brand



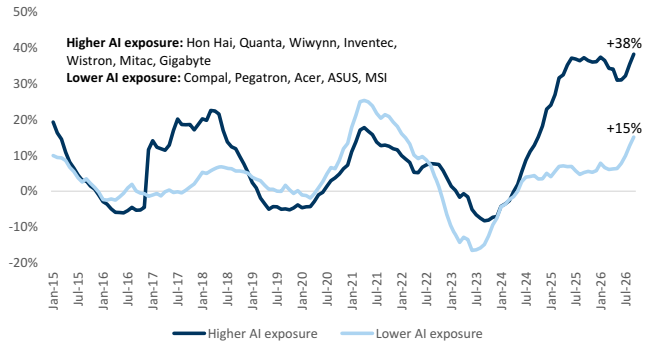
Source: IDC, Bloomberg

Exhibit 17: Global servers value TAM: top six market share in 2025 / 1Q26



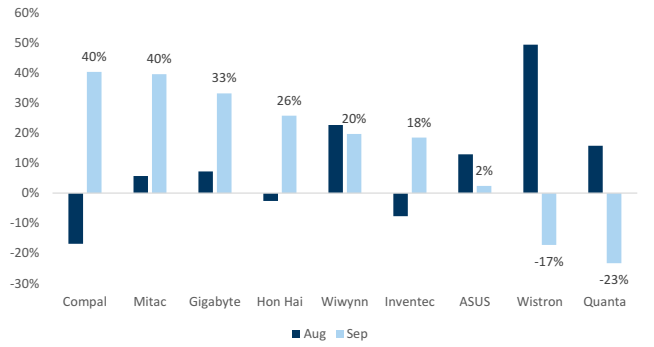
Source: IDC, Bloomberg

Exhibit 18: Taiwan ODM and Brand makers: last 12 months revenues YoY



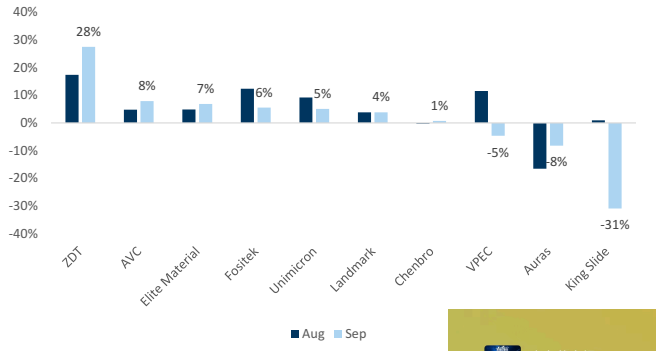
Source: TEJ

Exhibit 19: Taiwan ODM and Brand makers revenues MoM: Aug 2026 vs Sep 2026



Source: TEJ

Exhibit 20: Taiwan AI component suppliers revenues MoM: Aug 2026 vs Sep 2026



Source: TEJ

PCs: Shipments -14% / -5%/ 0% YoY in 2026E-28E

Global PCs market opportunity

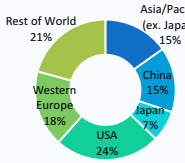
(Shipments in m units)

Our Bottom up method

Global PCs shipments = sum of shipments by brands

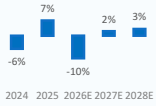
Global PCs revenues = **Desktops** ASP x shipments + **Notebooks** ASP x shipments + **Workstations** ASP x shipments

PCs shipments by region (2025)

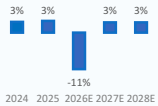


PCs shipments growth by region

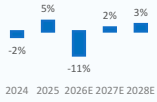
Asia/Pacific (ex. Japan) YoY



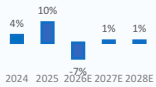
US YoY



China YoY



Western Europe YoY



Shipments by product	1Q25	2Q25	3Q25	4Q25	1Q26	2Q26E	3Q26E	4Q26E	2023	2024	2025	2026E	2027E	2028E
Global PCs shipments (m units)	**66**	**72**	**79**	**81**	**68**	**61**	**63**	**63**	**260**	**269**	**297**	**255**	**243**	**244**
Desktops	18	19	22	23	18	16	17	17	72	72	84	69	62	61
Notebooks	46	50	54	55	47	43	44	44	181	188	205	178	173	176
Workstations	2	2	2	2	2	2	2	2	7	8	8	8	7	7
YoY	**8%**	**10%**	**11%**	**12%**	**3%**	**-15%**	**-19%**	**-22%**	**-14%**	**3%**	**10%**	**-14%**	**-5%**	**0%**
Desktops	10%	12%	19%	19%	-2%	-16%	-23%	-26%	-16%	0%	15%	-18%	-10%	-3%
Notebooks	9%	9%	8%	10%	4%	-15%	-18%	-20%	-13%	4%	9%	-13%	-3%	2%
Workstations	-28%	5%	4%	11%	21%	4%	-14%	-24%	-9%	21%	-4%	-4%	-11%	0%
Mix	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Desktops	28%	27%	28%	29%	27%	27%	27%	27%	28%	27%	28%	27%	26%	25%
Notebooks	69%	70%	69%	68%	70%	70%	70%	70%	70%	70%	69%	70%	71%	72%
Workstations	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Revenues by product	**1Q25**	**2Q25**	**3Q25**	**4Q25**	**1Q26**	**2Q26E**	**3Q26E**	**4Q26E**	**2023**	**2024**	**2025**	**2026E**	**2027E**	**2028E**
Global PCs revenues (US$ m)	**60,032**	**65,945**	**73,876**	**76,757**	**68,768**	**61,822**	**65,214**	**65,622**	**222,164**	**240,238**	**276,610**	**261,426**	**255,904**	**262,519**
Desktops	13,251	13,959	15,930	16,602	14,152	12,775	13,421	13,302	49,894	50,658	59,742	53,650	50,004	51,745
Notebooks	42,735	47,789	53,513	55,107	48,862	44,275	47,659	48,126	157,767	173,821	199,144	188,922	188,852	193,513
Workstations	4,046	4,197	4,433	5,048	5,753	4,772	4,135	4,195	14,503	15,759	17,724	18,855	17,048	17,261
YoY	**15%**	**17%**	**13%**	**15%**	**15%**	**-6%**	**-12%**	**-15%**	**-16%**	**8%**	**15%**	**-5%**	**-2%**	**3%**
Shipments by vendor	**1Q25**	**2Q25**	**3Q25**	**4Q25**	**1Q26**	**2Q26E**	**3Q26E**	**4Q26E**	**2023**	**2024**	**2025**	**2026E**	**2027E**	**2028E**
Global PCs shipments (m units)	**66**	**72**	**79**	**81**	**68**	**61**	**63**	**63**	**260**	**269**	**297**	**255**	**243**	**244**
Lenovo	15	17	19	19	16	16	18	18	59	62	70	68	73	76
HP	13	14	14	15	12	12	11	12	54	54	56	47	46	47
Dell	10	9	9	11	9	9	8	8	37	39	39	34	31	31
Apple	6	6	7	7	6	7	8	8	22	23	26	29	33	34
ASUS	4	5	6	5	4	4	5	4	17	18	19	18	19	19
Samsung	2	2	2	2	2	2	2	2	8	8	8	6	7	7
Microsoft	0	0	0	0	0	0	0	0	2	1	1	1	1	1
LG	0	0	0	0	0	0	0	0	1	1	1	1	1	1
Xiaomi	0	0	0	0	0	0	0	0	1	1	1	1	1	1
Others	16	18	22	21	18	10	11	11	60	62	77	50	32	27
YoY	**8%**	**10%**	**11%**	**12%**	**3%**	**-15%**	**-19%**	**-22%**	**-14%**	**3%**	**10%**	**-14%**	**-5%**	**0%**
Global market share	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Lenovo	23%	24%	24%	23%	23%	27%	29%	28%	23%	23%	24%	27%	30%	31%
HP	20%	19%	17%	19%	17%	20%	18%	19%	21%	20%	19%	19%	19%	19%
Dell	14%	12%	12%	13%	14%	14%	13%	12%	14%	15%	13%	13%	13%	13%
Apple	9%	9%	9%	9%	9%	11%	12%	13%	8%	9%	9%	11%	14%	14%
ASUS	6%	6%	7%	6%	6%	7%	8%	7%	6%	7%	6%	7%	8%	8%
Samsung	3%	3%	3%	2%	2%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Microsoft	1%	0%	0%	0%	0%	1%	0%	1%	1%	1%	0%	0%	0%	0%
LG	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Xiaomi	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Others	24%	26%	28%	26%	27%	16%	17%	17%	23%	23%	26%	20%	13%	11%
ASP	**1Q25**	**2Q25**	**3Q25**	**4Q25**	**1Q26**	**2Q26E**	**3Q26E**	**4Q26E**	**2023**	**2024**	**2025**	**2026E**	**2027E**	**2028E**
Global PC ASP (US$)	**911**	**919**	**941**	**953**	**1,013**	**1,011**	**1,031**	**1,044**	**854**	**893**	**933**	**1,025**	**1,055**	**1,077**
YoY	7%	7%	3%	2%	11%	10%	10%	9%	-2%	5%	4%	10%	3%	2%
AI PCs	**1Q25**	**2Q25**	**3Q25**	**4Q25**	**1Q26**	**2Q26E**	**3Q26E**	**4Q26E**	**2023**	**2024**	**2025**	**2026E**	**2027E**	**2028E**
AI PC shipment (m units)	**18**	**23**	**30**	**37**	**35**	**36**	**39**	**40**		**52**	**108**	**150**	**175**	**199**
YoY		89%	67%	71%	93%	58%	29%	9%			109%	39%	17%	14%
Penetration	27%	32%	39%	46%	51%	59%	62%	64%		19%	36%	59%	72%	82%
AI PC revenues (US$ m)	**20,591**	**26,573**	**31,586**	**40,062**	**39,660**	**40,592**	**43,532**	**45,044**		**62,898**	**118,811**	**168,828**	**194,672**	**220,737**
YoY		68%	50%	53%	93%	53%	38%	12%			89%	42%	15%	13%
Penetration	34%	40%	43%	52%	58%	66%	67%	69%		26%	43%	65%	76%	84%
Gaming PCs	**1Q25**	**2Q25**	**3Q25**	**4Q25**	**1Q26**	**2Q26E**	**3Q26E**	**4Q26E**	**2023**	**2024**	**2025**	**2026E**	**2027E**	**2028E**
Gaming PC shipment (m units)	**7**	**8**	**9**	**8**	**7**	**6**	**7**	**6**		**28**	**31**	**26**	**27**	**28**
YoY	9%	16%	13%	15%	0%	-18%	-22%	-25%			13%	-17%	2%	6%
Penetration	10%	11%	11%	11%	10%	10%	11%	10%		10%	11%	10%	11%	12%
Gaming PC revenues (US$ m)	**10,531**	**12,131**	**13,521**	**13,219**	**12,073**	**11,139**	**11,693**	**10,964**		**40,518**	**49,401**	**45,869**	**48,470**	**52,186**
YoY	19%	27%	20%	23%	15%	-8%	-14%	-17%			22%	-7%	6%	8%
Penetration	18%	18%	18%	17%	18%	18%	18%	17%		17%	18%	18%	19%	20%
Shipments by markets	**1Q25**	**2Q25**	**3Q25**	**4Q25**	**1Q26**	**2Q26E**	**3Q26E**	**4Q26E**	**2023**	**2024**	**2025**	**2026E**	**2027E**	**2028E**
Global PCs shipments (m units)	**62**	**67**	**77**	**78**	**66**	**59**	**62**	**61**	**253**	**256**	**284**	**247**	**236**	**237**
Consumer PCs	27	29	36	35	24	26	31	31	118	118	127	111	114	117
Commercial PCs	35	38	41	43	42	33	30	30	135	137	157	136	122	120
YoY	**6%**	**7%**	**13%**	**16%**	**6%**	**-12%**	**-20%**	**-22%**	**-14%**	**1%**	**11%**	**-13%**	**-5%**	**0%**
Consumer PCs	4%	9%	8%	7%	-12%	-12%	-12%	-12%	-15%	0%	7%	-12%	3%	3%
Commercial PCs	8%	6%	18%	24%	20%	-11%	-26%	-30%	-13%	2%	14%	-13%	-11%	-2%
Mix	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Consumer PCs	43%	44%	47%	45%	36%	43%	51%	50%	47%	46%	45%	45%	48%	49%
Commercial PCs	57%	56%	53%	55%	64%	57%	49%	50%	53%	54%	55%	55%	52%	51%
Shipments by region	**1Q25**	**2Q25**	**3Q25**	**4Q25**	**1Q26**	**2Q26E**	**3Q26E**	**4Q26E**	**2023**	**2024**	**2025**	**2026E**	**2027E**	**2028E**
Asia/Pacific (ex. Japan)	9	10	13	10	9	9	12	9	42	40	43	38	39	40
China	9	10	11	12	8	9	10	10	41	40	42	38	38	39
Japan	5	5	5	6	4	4	5	5	12	14	20	19	19	19
USA	16	18	17	17	15	15	15	15	64	66	68	61	63	65
Western Europe	11	12	13	14	11	10	12	13	44	45	49	46	46	47
Rest of World	12	13	14	19	18	11	9	9	50	51	58	46	30	26
YoY														
Asia/Pacific (ex. Japan)	-5%	2%	14%	16%	-3%	-12%	-12%	-12%	-21%	-6%	7%	-10%	2%	3%
China	6%	12%	2%	1%	-5%	-11%	-13%	-13%	-15%	-2%	5%	-11%	2%	3%
Japan	36%	55%	47%	50%	-3%	-10%	-8%	-8%	-3%	14%	47%	-7%	2%	2%
USA	15%	1%	0%	0%	-3%	-15%	-12%	-12%	-13%	3%	3%	-11%	3%	3%
Western Europe	3%	8%	11%	15%	-3%	-10%	-8%	-8%	-14%	4%	10%	-7%	1%	1%
Rest of World	0%	6%	9%	41%	42%	-9%	-39%	-55%	-9%	1%	15%	-21%	-34%	-13%

Shipments by markets do not include workstations.

Source: Company data, Goldman Sachs Global Investment Research

Smartphones: Shipments -10% / +2%/ +2% YoY in 2026-28E

Global Smartphone market opportunity

(Shipments in m units)
(Revenues in m USD)

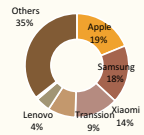
Our Bottom up method

Global smartphone shipments = sum of shipment by brand

Global smartphone revenues = sum of revenues by brand

Global smartphone revenues = shipments x ASP

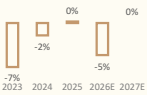
Smartphone shipments by brands (2024)



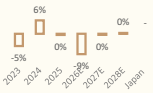
Developed markets YoY



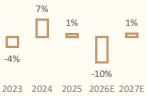
US YoY



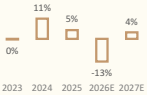
China YoY



BRICs YoY



Rest of emerging mkt YoY



Shipments by vendor	1Q25	2Q25	3Q25	4Q25	1Q26	2Q26	3Q26E	4Q26E	2023	2024	2025	2026E	2027E	2028E
Global shipments	**303**	**297**	**326**	**338**	**294**	**276**	**281**	**288**	**1,164**	**1,237**	**1,264**	**1,140**	**1,162**	**1,182**
Apple	59	48	60	85	61	56	54	71	234	233	252	242	242	247
Samsung	61	58	61	61	62	63	64	61	226	224	242	250	255	260
Xiaomi	42	42	43	38	34	31	31	28	146	168	165	124	124	128
Transsion	21	25	29	23	21	19	20	21	95	107	98	81	100	113
Lenovo	13	14	16	16	14	13	14	12	47	56	59	53	47	47
ZTE	3	3	3	3	3	3	3	3	6	7	12	12	12	12
Sony	0	0	0	0	0	0	0	0	2	1	1	1	1	1
HTC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0	0	0	0
Asus	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0	0	0	0	0	0
Others	103	106	114	112	98	91	95	93	409	440	435	377	381	374
Shipments YoY	**1Q25**	**2Q25**	**3Q25**	**4Q25**	**1Q26**	**2Q26**	**3Q26E**	**4Q26E**	**2023**	**2024**	**2025**	**2026E**	**2027E**	**2028E**
Global	**1%**	**2%**	**4%**	**3%**	**-3%**	**-7%**	**-14%**	**-15%**	**-3%**	**6%**	**2%**	**-10%**	**2%**	**2%**
Apple	12%	6%	4%	9%	3%	15%	-9%	-17%	4%	-1%	8%	-4%	0%	2%
Samsung	2%	7%	7%	18%	2%	8%	5%	-1%	-14%	-1%	8%	4%	2%	2%
Xiaomi	3%	0%	1%	-12%	-19%	-26%	-29%	-25%	-5%	16%	-2%	-25%	0%	3%
Transsion	-26%	-2%	13%	-16%	-1%	-24%	-31%	-8%	31%	13%	-8%	-18%	24%	13%
Lenovo	2%	2%	5%	12%	6%	-4%	-12%	-28%	4%	20%	5%	-10%	-12%	1%
ZTE	102%	97%	37%	46%	0%	0%	0%	0%	3%	28%	65%	0%	0%	0%
Sony	-42%	-22%	-66%	-15%	-21%	-41%	-21%	-21%	-38%	-32%	-38%	-28%	-5%	0%
HTC	69%	-6%	-50%	-44%	-62%	-60%	141%	128%	27%	-45%	-13%	3%	36%	0%
Asus	-30%	-45%	-51%	-75%	-36%	9%	116%	199%	-33%	-18%	-48%	26%	1%	0%
Others	-1%	-3%	0%	-1%	-4%	-14%	-17%	-17%	-7%	8%	-1%	-13%	1%	-2%
Shipments market share	**1Q25**	**2Q25**	**3Q25**	**4Q25**	**1Q26**	**2Q26**	**3Q26E**	**4Q26E**	**2023**	**2024**	**2025**	**2026E**	**2027E**	**2028E**
Apple	20%	16%	18%	25%	21%	20%	19%	24%	20%	19%	20%	21%	21%	21%
Samsung	20%	20%	19%	18%	21%	23%	23%	21%	19%	18%	19%	22%	22%	22%
Xiaomi	14%	14%	13%	11%	12%	11%	11%	10%	13%	14%	13%	11%	11%	11%
Transsion	7%	8%	9%	7%	7%	7%	7%	7%	8%	9%	8%	7%	9%	10%
Lenovo	4%	5%	5%	5%	5%	5%	5%	4%	4%	5%	5%	5%	4%	4%
ZTE	1%	1%	1%	1%	1%	1%	1%	1%	0%	1%	1%	1%	1%	1%
Sony	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
HTC	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Asus	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Others	34%	36%	35%	33%	34%	33%	34%	32%	35%	36%	34%	33%	33%	32%
Shipments by price band	**1Q25**	**2Q25**	**3Q25**	**4Q25**	**1Q26**	**2Q26**	**3Q26E**	**4Q26E**	**2023**	**2024**	**2025**	**2026E**	**2027E**	**2028E**
Premium (Above US$600)	29%	24%	28%	34%	30%	25%	32%	40%	28%	27%	29%	32%	33%	34%
Mid-end (US$200-600)	30%	33%	29%	27%	31%	32%	22%	18%	31%	29%	29%	26%	26%	24%
Entry level (Below US$200)	42%	44%	43%	39%	39%	43%	45%	42%	42%	44%	42%	42%	42%	42%
Revenus by vendor	**1Q25**	**2Q25**	**3Q25**	**4Q25**	**1Q26**	**2Q26**	**3Q26E**	**4Q26E**	**2023**	**2024**	**2025**	**2026E**	**2027E**	**2028E**
Global revenues	**135,893**	**121,581**	**143,664**	**174,953**	**152,488**	**139,378**	**155,386**	**176,335**	**520,767**	**537,641**	**576,091**	**623,588**	**655,274**	**674,090**
Apple	59,982	49,179	61,539	98,704	69,436	62,294	72,151	101,157	244,908	245,107	269,403	305,038	327,871	337,358
Samsung	28,658	24,514	29,064	23,470	31,337	27,435	31,133	23,667	102,181	97,604	105,705	113,572	112,765	117,727
Xiaomi	9,398	8,727	9,411	9,078	8,546	7,943	8,844	8,540	32,183	36,477	36,614	33,874	35,899	37,793
Transsion	2,451	2,950	3,424	2,648	2,864	2,905	2,609	2,715	11,493	12,615	11,472	11,093	14,115	16,348
Lenovo	3,187	3,469	3,725	4,193	3,916	4,041	4,860	3,974	11,608	13,661	14,574	16,791	15,939	17,520
ZTE	450	466	497	441	408	376	492	436	1,089	1,110	1,854	1,711	1,694	1,694
Sony	116	265	107	128	79	194	89	107	1,219	893	617	469	446	460
HTC	4	4	2	2	2	1	5	5	27	16	13	13	17	16
Asus	69	40	20	18	42	42	42	51	317	283	148	176	170	161
Others	31,579	31,967	35,875	36,271	35,859	34,148	35,162	35,682	115,741	129,876	135,692	140,851	146,358	145,011
Revenues by price band	**1Q25**	**2Q25**	**3Q25**	**4Q25**	**1Q26**	**2Q26**	**3Q26E**	**4Q26E**	**2023**	**2024**	**2025**	**2026E**	**2027E**	**2028E**
Premium (Above US$600)	67%	60%	66%	71%	63%	55%	64%	74%	65%	65%	66%	64%	66%	70%
Mid-end (US$200-600)	21%	27%	22%	20%	28%	34%	26%	18%	22%	22%	22%	26%	25%	21%
Entry level (Below US$200)	12%	13%	12%	9%	10%	11%	10%	8%	12%	13%	11%	10%	9%	9%
Shipments by region	**1Q25**	**2Q25**	**3Q25**	**4Q25**	**1Q26**	**2Q26**	**3Q26E**	**4Q26E**	**2023**	**2024**	**2025**	**2026E**	**2027E**	**2028E**
Global shipments	**303**	**297**	**326**	**338**	**294**	**276**	**281**	**288**	**1,164**	**1,237**	**1,264**	**1,140**	**1,162**	**1,182**
Developed markets	**62**	**56**	**67**	**82**	**60**	**54**	**64**	**78**	**276**	**270**	**268**	**256**	**257**	**259**
USA	30	25	33	41	28	23	31	39	131	128	128	122	122	122
Western Europe	24	23	24	29	23	22	23	28	106	102	100	96	97	98
BRICs	**124**	**125**	**135**	**135**	**115**	**113**	**119**	**120**	**479**	**512**	**518**	**467**	**473**	**475**
India	33	38	48	38	28	32	41	35	146	151	156	136	142	142
China	72	69	68	76	69	65	61	65	271	286	285	261	259	260
Rest of emerging markets	**116**	**117**	**124**	**121**	**120**	**110**	**98**	**90**	**409**	**456**	**478**	**417**	**432**	**448**
Shipments YoY	**1Q25**	**2Q25**	**3Q25**	**4Q25**	**1Q26**	**2Q26**	**3Q26E**	**4Q26E**	**2023**	**2024**	**2025**	**2026E**	**2027E**	**2028E**
Global	**1%**	**2%**	**4%**	**3%**	**-3%**	**-7%**	**-14%**	**-15%**	**-3%**	**6%**	**2%**	**-10%**	**2%**	**2%**
Developed markets	**-4%**	**-2%**	**1%**	**1%**	**-4%**	**-4%**	**-4%**	**-5%**	**-7%**	**-2%**	**-1%**	**-4%**	**1%**	**1%**
USA	-3%	-1%	2%	2%	-5%	-5%	-5%	-5%	-7%	-2%	0%	-5%	0%	0%
Western Europe	-5%	-3%	-1%	-1%	-4%	-4%	-4%	-4%	-6%	-3%	-2%	-4%	1%	1%
BRICs	**0%**	**1%**	**3%**	**1%**	**-7%**	**-9%**	**-12%**	**-11%**	**-4%**	**7%**	**1%**	**-10%**	**1%**	**0%**
India	-5%	8%	6%	3%	-15%	-15%	-15%	-8%	1%	4%	3%	-13%	4%	0%
China	3%	-4%	0%	-1%	-4%	-6%	-11%	-14%	-5%	6%	0%	-9%	0%	0%
Rest of emerging markets	**3%**	**4%**	**6%**	**6%**	**3%**	**-6%**	**-21%**	**-26%**	**0%**	**11%**	**5%**	**-13%**	**4%**	**4%**
Shipments market share	**1Q25**	**2Q25**	**3Q25**	**4Q25**	**1Q26**	**2Q26**	**3Q26E**	**4Q26E**	**2023**	**2024**	**2025**	**2026E**	**2027E**	**2028E**
Global	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Developed markets	**21%**	**19%**	**21%**	**24%**	**20%**	**19%**	**23%**	**27%**	**24%**	**22%**	**21%**	**22%**	**22%**	**22%**
USA	10%	8%	10%	12%	10%	8%	11%	14%	11%	10%	10%	11%	10%	10%
Western Europe	8%	8%	7%	9%	8%	8%	8%	10%	9%	8%	8%	8%	8%	8%
BRICs	**41%**	**42%**	**41%**	**40%**	**39%**	**41%**	**42%**	**42%**	**41%**	**41%**	**41%**	**41%**	**41%**	**40%**
India	11%	13%	15%	11%	9%	12%	14%	12%	12%	12%	12%	12%	12%	12%
China	24%	23%	21%	22%	23%	24%	22%	23%	23%	23%	23%	23%	22%	22%
Rest of emerging markets	**38%**	**39%**	**38%**	**36%**	**41%**	**40%**	**35%**	**31%**	**35%**	**37%**	**38%**	**37%**	**37%**	**38%**
Foldable phones	**1Q25**	**2Q25**	**3Q25**	**4Q25**	**1Q26**	**2Q26**	**3Q26E**	**4Q26E**	**2023**	**2024**	**2025**	**2026E**	**2027E**	**2028E**
Shipment	**4.2**	**3.3**	**8.0**	**4.7**	**3.5**	**3.0**	**13.2**	**15.4**	**18.2**	**18.7**	**20.2**	**35.0**	**66.1**	**76.6**
Penetration rate	1.4%	1.1%	2.4%	1.4%	1.2%	1.1%	4.7%	5.3%	1.6%	1.5%	1.6%	3.1%	5.7%	6.5%
Xiaomi	0.1	0.1	0.1	0.1	0.1	0.0	0.2	0.1	0.3	0.8	0.5	0.5	0.8	1.0
Transsion	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	1.5	1.9
Lenovo	0.8	0.6	0.6	0.7	0.5	0.5	0.9	0.7	1.2	2.7	2.7	2.7	4.6	7.7
Samsung	0.5	0.4	4.8	1.4	0.8	0.5	4.0	1.8	10.0	6.4	7.0	7.1	8.3	10.0
Apple	-	-	-	-	-	-	4.5	8.8	-	-	-	13.3	32.6	36.1
Others	2.8	2.2	2.5	2.5	2.0	1.9	3.5	3.9	6.5	8.7	10.0	11.3	18.3	19.9

Source: Company data, Goldman Sachs Global Investment Research

Disclosure Appendix

Reg AC

We, Allen Chang, Verena Jeng, James Schneider, Ph.D., Michael Ng, CFA, Katherine Murphy, Ronald Keung, CFA, Gabriela Borges, CFA, Giuni Lee, Anmol Makkar, Daiki Takayama, Ting Song and Selina Zhang, hereby certify that all of the views expressed in this report accurately reflect our personal views about the subject company or companies and its or their securities. We also certify that no part of our compensation was, is or will be, directly or indirectly, related to the specific recommendations or views expressed in this report.

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Growth is based on a stock's forward-looking sales growth, EBITDA growth and EPS growth (for financial stocks, only EPS and sales growth), with a higher percentile indicating a higher growth company. **Financial Returns** is based on a stock's forward-looking ROE, ROCE and CROCI (for financial stocks, only ROE), with a higher percentile indicating a company with higher financial returns. **Multiple** is based on a stock's forward-looking P/E, P/B, price/dividend (P/D), EV/EBITDA, EV/FCF and EV/Debt Adjusted Cash Flow (DACF) (for financial stocks, only P/E, P/B and P/D), with a higher percentile indicating a stock trading at a higher multiple. The **Integrated** percentile is calculated as the average of the Growth percentile, Financial Returns percentile and (100% - Multiple percentile).

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AVC (Buy, NT$4,513.00), Aspeed (Buy, NT$15,945.00), Auras (Buy, NT$1,410.00), Chenbro (Neutral, NT$833.00), Elite Material (Buy, NT$5,120.00), Eoptolink (Buy, Rmb306.01), Fositek (Buy, NT$2,115.00), Foxconn Industrial Internet (Buy, Rmb46.90), GCE (Buy, NT$1,190.00), Hon Hai (Buy, NT$239.50), King Slide (Buy, NT$9,720.00), LandMark (Buy, NT$2,640.00), MPI Corp. (Buy, NT$5,300.00), TSMC (Buy, NT$2,440.00), TSMC (ADR) (Buy, $422.25), VPEC (Buy, NT$483.50), Winway Technology Co. (Buy, NT$5,055.00), Wistron (Buy, NT$176.00) and Wiwynn (Buy, NT$1,905.00)

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