Global PCB / CCL: TAM raised by 38% / 18% in 2027E; triple digit growth through 2028E on strong AI; Backplane scenario analysis introduced

We raise our global AI PCB/ CCL TAM to reflect the ramp-up of AI server racks (Global Server TAM), **and PCB/ CCL specification upgrade with the adoption of next-generation high-end AI servers.** We refresh our forecasts for (1) GPU/ ASIC AI servers, (2) PCB/ CCL dollar content per system, (3) PCB/ CCL capacity expansion, and (4) PCB/ CCL vendor allocation. We raise Global AI PCB TAM by 35%/ 38% in 2026E/ 27E, Global AI CCL TAM by 20%/ 18% in 2026/ 27E, and introduce 2028E estimates.

Overall, we expect the global PCB/ CCL market for AI servers to reach US$38bn/ 22bn by 2027E (from US$27bn/ 19bn), then US$84/ 48bn by 2028E, implying a 148%/161% 2026-28E CAGR for AI PCB/CCL TAM. The significant value growth is driven by both volume and ASP growth: (1) **Shipment:** PCB shipment will increase by 85% CAGR in 2026-28E to 4.5m square meters by 2028E and CCL shipment will grow by 77% CAGR in 2026-28E to 131m sheets in 2027E. (2) **ASP** of PCB/ CCL are growing by 34%/ 48% CAGR, given specification upgrade and more PCB usage per AI server rack. With continuous capacity expansion and utilization rate maintaining at high level given AI infrastructure ramp up, we remain constructive on AI PCB/ CCL.

Buy: Shengyi Technology (600183.SS, on CL), Victory Giant (300476.SZ), WUS (002463.SZ), Panasonic HD (6752.T), Mitsui Kinzoku (5706.T), Nittobo (3110.T), Shennan (002916.SZ), GCE (2368.TW), EMC (2383.TW), Zhen Ding (4958.TW), and TUC (6274.TWO).

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Exhibit 1: Global PCB TAM revision

Total PCB TAM (US$m)	2025	2026E	2027E	2028E
New				
Total	**4,981**	**13,560**	**37,529**	**83,645**
GPU PCB TAM	2,247	4,728	18,803	42,568
ASIC PCB TAM	2,734	8,832	18,726	41,077
Old				
Total	**4,706**	**10,017**	**27,122**	**-**
GPU PCB TAM	2,242	4,493	15,887	-
ASIC PCB TAM	2,463	5,524	11,235	-
Change				
Total	**6%**	**35%**	**38%**	
GPU PCB TAM	0%	5%	18%	
ASIC PCB TAM	11%	60%	67%	

Source: Company data, Goldman Sachs Global Investment Research

Exhibit 2: Global CCL TAM revision

Total CCL TAM (US$m)	2025	2026E	2027E	2028E
New				
Total	**2,477**	**6,956**	**22,066**	**47,546**
GPU CCL TAM	1,256	2,775	12,005	25,640
ASIC CCL TAM	1,221	4,181	10,061	21,906
Old				
Total	**2,402**	**5,804**	**18,701**	**-**
GPU PCB TAM	1,253	2,728	11,727	-
ASIC PCB TAM	1,149	3,076	6,974	-
Change				
Total	**3%**	**20%**	**18%**	
GPU PCB TAM	0%	2%	2%	
ASIC PCB TAM	6%	36%	44%	

Source: Company data, Goldman Sachs Global Investment Research

Related reports:

Global Server: ASIC servers expanding; AI full racks see diversifying chip platform (Jan 5, 2026)

Global PCB: Introducing TAM; AI PCB / CCL value to grow at +140% / +179% CAGR in 2025-27E; toward M9 CCL, 30+ layer PCB and 6L HDI (Jan 6, 2026)

Global PCB: Allocation breakdown; FAQs on cost, competition, and revenue recognition (Jan 30, 2026)

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

Global AI server PCB/ CCL market to reach US$38bn/ 22bn by 2027E; US$84bn/ 48bn by 2028E

Global AI server PCB and CCL market opportunity

PCB TAM (US$m) - By application	2025	2026E	2027E	2028E
Total	**4,981**	**13,560**	**37,529**	**83,645**
GPU server total	**2,247**	**4,728**	**18,803**	**42,568**
OAM	966	2,132	9,343	24,168
UBB	555	628	1,183	784
Mainboard	208	221	223	116
Midplane	0	185	2,451	5,787
Backplane	0	0	225	900
Switch board	439	1,094	3,964	9,010
Others	79	468	1,415	1,803
ASIC total	**2,734**	**8,832**	**18,726**	**41,077**
YoY growth		**172%**	**177%**	**123%**
GPU server total		**110%**	**298%**	**126%**
OAM		121%	338%	159%
UBB		13%	88%	-34%
Mainboard		6%	1%	-48%
Switch board		149%	262%	127%
ASIC total		**223%**	**112%**	**119%**
Mix	**100%**	**100%**	**100%**	**100%**
GPU server total	45%	35%	50%	51%
ASIC total	55%	65%	50%	49%

CCL TAM (US$m) - By application	2025	2026E	2027E	2028E
Total	**2,477**	**6,956**	**22,066**	**47,546**
GPU server total	**1,256**	**2,775**	**12,005**	**25,640**
OAM	458	1,137	5,473	13,828
UBB	387	489	888	566
Mainboard	114	135	152	80
Midplane	0	189	1,930	3,138
Backplane	0	0	205	828
Switch board	265	711	3,112	6,825
Others	32	114	245	376
ASIC total	**1,221**	**4,181**	**10,061**	**21,906**
Total		**181%**	**217%**	**115%**
GPU server total		**121%**	**333%**	**114%**
OAM		148%	381%	153%
UBB		26%	82%	-36%
Mainboard		19%	13%	-47%
Switch board		169%	337%	119%
ASIC total		**242%**	**141%**	**118%**
Total	**100%**	**100%**	**100%**	
GPU server total	52%	47%	63%	
ASIC total	48%	53%	37%	

PCB TAM (US$m) - By spec	2025	2026E	2027E	2028E
Total	**4,981**	**13,560**	**37,529**	**83,645**
Multilayer PCB	**2,960**	**7,864**	**19,609**	**40,673**
Below 20 layers	509	1,277	2,190	4,980
20-30 layers	2,087	5,171	8,474	16,451
Above 30 layers	364	1,417	8,946	19,241
HDI	**2,021**	**5,695**	**17,920**	**42,973**
4+N+4	79	468	1,415	1,803
5+N+5	1,730	3,508	10,195	12,783
6+N+6 or above	212	1,719	6,310	28,386
YoY growth		**172%**	**177%**	**123%**
Multilayer PCB		166%	149%	107%
HDI		151%	71%	127%
Mix				
Multilayer PCB	**100%**	**100%**	**100%**	**100%**
Below 20 layers	17%	16%	11%	12%
20-30 layers	71%	66%	43%	40%
Above 30 layers	12%	18%	46%	47%
HDI	**100%**	**100%**	**100%**	**100%**
4+N+4	4%	8%	8%	4%
5+N+5	86%	62%	57%	30%
6+N+6 or above	10%	30%	35%	66%

CCL TAM (US$m) - By spec	2025	2026E	2027E	2028E
Total	**2,477**	**6,956**	**22,066**	**47,546**
Lower	66	57	122	188
M6	1,060	1,664	2,745	4,797
M7	1,233	1,785	3,183	5,281
M8	118	2,994	6,970	9,503
M9 and above	0	456	9,046	27,777
YoY growth		**181%**	**217%**	**115%**
Lower		-14%	115%	54%
M6		57%	65%	75%
M7		45%	78%	66%
M8		2431%	133%	36%
M9 and above			1883%	207%
Mix	**100%**	**100%**	**100%**	**100%**
Lower	3%	1%	1%	0%
M6	43%	24%	12%	10%
M7	50%	26%	14%	11%
M8	5%	43%	32%	20%
M9 and above	0%	7%	41%	58%

PCB shipment (m meter^2)	2025	2026E	2027E	2028E
Total	**0.9**	**1.3**	**2.6**	**4.5**
Multilayer PCB	**0.4**	**0.7**	**1.3**	**2.7**
Below 20 layers	0.1	0.2	0.4	0.8
20-30 layers	0.3	0.4	0.5	1.1
Above 30 layers	0.0	0.1	0.4	0.8
HDI	**0.4**	**0.7**	**1.3**	**1.8**
4+N+4	0.0	0.1	0.3	0.3
5+N+5	0.4	0.4	0.7	0.7
6+N+6	0.0	0.1	0.3	0.8
YoY		**55%**	**97%**	**73%**
Multilayer PCB		56%	106%	100%
HDI		54%	88%	44%

CCL shipment (m sheets)	2025	2026E	2027E	2028E
Total	**27**	**42**	**78**	**131**
Lower	1	1	1	2
M6	14	15	22	36
M7	11	12	18	29
M8	1	13	25	31
M9 and above	0	1	12	34
YoY		**58%**	**86%**	**68%**
M8		1980%	94%	24%
M9 and above			1553%	179%

ASP (US$/m2)	2025	2026E	2027E	2028E
Total	**5,833**	**10,258**	**14,405**	**18,549**
Multilayer PCB	7,080	12,065	14,571	15,075
HDI	4,638	8,500	14,228	23,725
YoY growth		**76%**	**40%**	**29%**
Multilayer PCB		70%	21%	3%
HDI		83%	67%	67%

ASP (US$/ sheet)	2025	2026E	2027E	2028E
Total	**93**	**165**	**282**	**362**
YoY growth		**77%**	**70%**	**29%**

Source: Company data, Goldman Sachs Global Investment Research

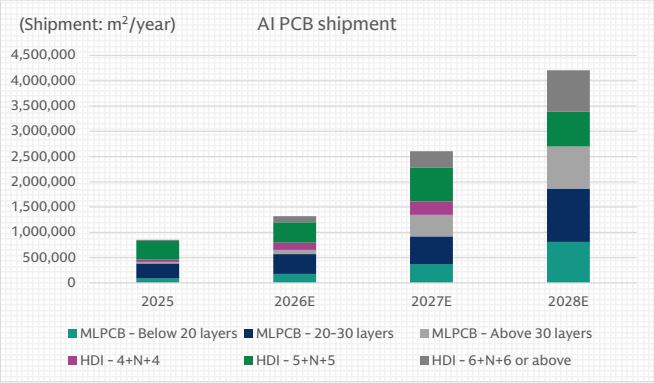
PCB/ CCL TAM estimate revisions

PCB/ CCL specification: We continue to expect specification upgrades to drive rising dollar content on surging demand and technology advancements, including M9 materials and the adoption of 7L/ 8L HDI and 30+ layer PCBs. Overall, we expect 6L and above HDI to account for 35%/ 66% of total HDI PCB TAM in 2027/ 28E (vs. previously at 34% in 2027E), and M9 above CCL to account for 41%/ 58% of total CCL TAM in 2027/ 28E (vs. previously at 45% in 2027E).

AI server racks: We recently raised our forecast for AI server racks powered by NVIDIA to 92k / 148k in 2027 / 28E, and AI server (8-GPU) equivalent shipment at 1.9m / 2.4m / 2.6m in 2026-28E driven by rising ASIC-based AI server demand. We factor in higher AI server estimates, and refresh the Rubin Ultra architecture by (1) NVL72 Rubin Ultra, (2) NVL144 Rubin Ultra, and (3) NVL576 Rubin Ultra, and expect to see the adoption of backplane on the NVL144 Rubin Ultra architecture.

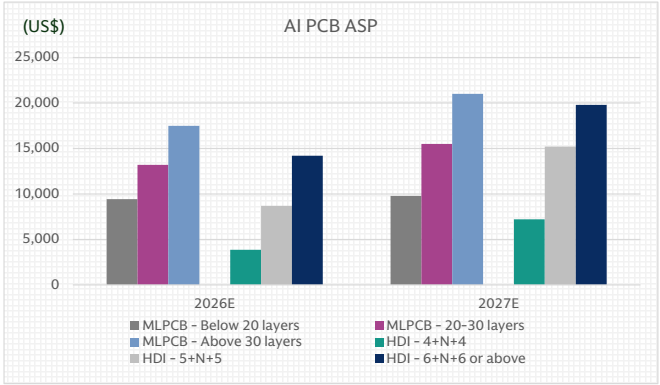
Capacity expansion riding on demand volume growth: Demand for AI server PCBs will grow from 1.3m square meters to 4.5m square meters in 2026-28E, or an 85% CAGR, and the demand for AI server CCL will increase from 42m sheets in 2026E to 131m sheets in 2028E, or a 77% CAGR. Despite notable capacity expansion plans announced by major players, we expect UT rates to stay high in the next two years given the effective capacity will not ramp up linearly considering the larger capacity consumption of higher layer products and the lower yield rate on high end products.

Exhibit 3: AI PCB shipment to grow in 2026-28E



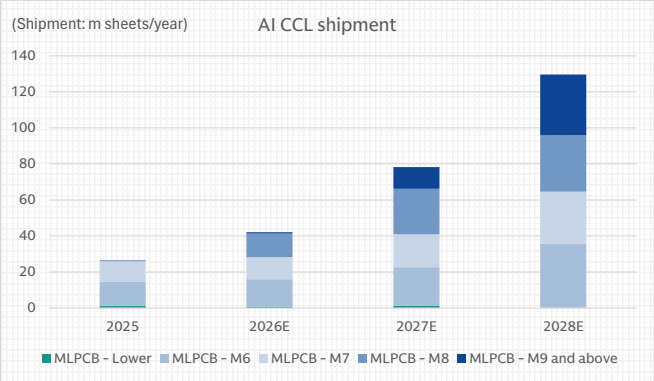
Source: Company data, Goldman Sachs Global Investment Research

Exhibit 4: AI PCB ASP increase on specification upgrade



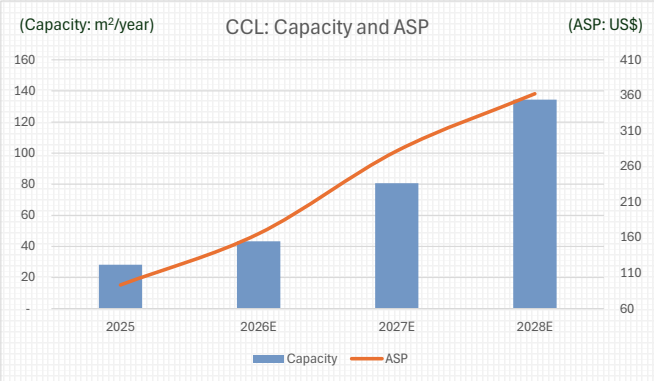
Source: Company data, Goldman Sachs Global Investment Research

Exhibit 5: AI CCL shipment to ramp up in 2026-28E



Source: Company data, Goldman Sachs Global Investment Research

Exhibit 6: AI CCL pricing increase with capacity expansion



Source: Company data, Goldman Sachs Global Investment Research

PCB/ CCL Scenario analysis on backplane

We see rising investor debates on the qualification of M9 material with quartz glass for the next generation of platform, and conduct a scenario analysis. Our PCB CCL scenario analysis is based on the material used by the backplane. In different scenarios, we assume backplane shipment unchanged, starting from 2027E, with Base case using M9, Bull case using PTFE, and Bear case using M8. If the M9 qualification is slower than expected, we think clients may adopt M8 without quartz glass as mainstream solution; on the other hand, we see some clients are developing PTFE material with higher dollar content as the complement to M9 solution with higher dollar content. We assume the NVL144 Rubin Ultra architecture adopts backplane, with chipset shipment at 2k/ 8k units in 2027/ 28E.

- **Bull case:** We assume backplane uses PTFE in the Bull case, and the backplane PCB/ CCL ASP is 25%/ 30% higher than base case in 2027/ 28E, driven by higher dollar content, resulting in total GPU PCB/ CCL TAM at US$42.8bn/ 25.9bn in 2028E (vs. base case at US$42.6bn/ 25.6bn).
- **Bear case:** We assume backplane uses M8 in the Bear case, and the Backplane PCB/ CCL ASP is 40%/ 40% lower than base case in 2027/ 28E, due to lower dollar content of M8 products, resulting in total GPU PCB/ CCL TAM at US$42.2bn/ 25.3bn in 2028E (vs. base case at US$42.6bn/ 25.6bn).

Exhibit 7: Scenario analysis on backplane CCL

	2027E	2028E
NVL144 Rubin Ultra chips (k units)	2	8
Base case: M9		
Backplane PCB dollar content (US$k)	113	113
Backplane CCL dollar content (US$k)	60	60
Backplane PCB TAM (US$m)	**225**	**900**
Total GPU PCB TAM (US$m)	18,803	42,568
Backplane CCL TAM (US$m)	**205**	**828**
Total GPU CCL TAM (US$m)	12,005	25,640
Bull case: PTFE		
Backplane PCB dollar content (US$k)	141	146
Backplane CCL dollar content (US$k)	75	78
Backplane PCB TAM (US$m)	**281**	**1,170**
vs. Base case	**25%**	**30%**
Total GPU PCB TAM (US$m)	18,859	42,838
Backplane CCL TAM (US$m)	**256**	**1,076**
vs. Base case	**25%**	**30%**
Total GPU CCL TAM (US$m)	12,056	25,888
Bear case: M8		
Backplane PCB dollar content (US$k)	68	68
Backplane CCL dollar content (US$k)	36	36
Backplane PCB TAM (US$m)	**135**	**540**
vs. Base case	**-40%**	**-40%**
Total GPU PCB TAM (US$m)	18,713	42,208
Backplane CCL TAM (US$m)	**123**	**497**
vs. Base case	**-40%**	**-40%**
Total GPU CCL TAM (US$m)	11,923	25,309

Source: Company data, Goldman Sachs Global Investment Research

Implications to PCB/ CCL supply chain

Shengyi Technology (600183.SS, on CL, covered by Allen Chang): Shengyi Tech is a major CCL (Copper Clad Laminate) supplier, providing high speed CCLs for products across server, network communication, automotive electronics, consumer electronics, and industrial etc. The company is a key supplier of global leading GPU AI server racks, migrating to M9 grade CCL from 2026-27E to achieve lower signal loss, lower CTE (Coefficient of Thermal Expansion) and better heat dissipation. We believe Shengyi Tech is a key beneficiary of the AI infrastructure cycle and the combination of strong end demand, spec upgrades, price increases and customer expansion from GPU AI servers to ASIC AI servers will drive strong net income growth of 104% / 73% YoY in 2026 / 27E. We expect AI server PCB revenue contribution to reach ~40% in 2027E and further expand to 50%+ in the long run, with OPM expanding from 15% in 2025 to 20% in 2027E.

Victory Giant (300476.SZ, Buy, covered by Allen Chang): We remain positive on Victory Giant's growth ahead, considering (1) AI infrastructure ramp up globally, (2) AI PCB specification upgrades towards higher layer counts driving dollar content increase, (3) rising PCB usage in AI servers replacing copper cables, (4) customer expansion towards ASIC AI server PCB, (5) R&D and Capex commitments, and (6) highly automated production lines and warehouse management. On capacity diversification, Victory Giant has three Thailand factory sites: A1, A2, and A3. A1 is already in mass production, and

A2 is under construction, with the company aiming to start mass production in 3Q26. The production value of A1 is around 26% of 2025 revenues, and A2 & A3 production value is 40-100% higher each vs. A1, per the company. Around 20% of production value for A1 is for automotive PCBs, and the remainder is prepared for AI PCBs, which are currently under customer qualification.

Panasonic Holdings (6752.T, Buy, covered by Ryo Harada) is gradually transitioning from its previous structural reform phase into a growth phase. Although the company's CCL (MEGTRON series) and conductive capacitors possess extremely high performance capabilities, the negative effects of delayed decision-making regarding timely and appropriate capacity expansion—an issue typical of conglomerates—had been conspicuous. Panasonic HD is aware of these challenges and intends to accelerate growth investments, particularly for data center-related products (BBU, CCL, and conductive capacitors), which are experiencing remarkable growth.

Regarding the MEGTRON 9 CCL, the small volume production for customer verification has already begun in preparation for full-scale mass production from FY3/28. Currently, the production ratio between MEGTRON 6 and below, and MEGTRON 7 and above (high-performance) is roughly half and half. However, the high-performance share is expected to reach about 60% in FY3/27, with plans to further increase the high-performance ratio from FY3/28 onwards. The production lines are shared and can be flexibly switched according to orders. As for capacity expansion investment, while expansions at the Guangzhou, Suzhou, and Ayutthaya plants have already been publicly announced, additional expansions are currently under internal discussion. Also, MEGTRON adoption is expanding in the semiconductor testing area, in addition to motherboards/substrates.

Mitsui Kinzoku (5706.T, Buy, covered by Atsushi Ikeda): Electrolytic copper foil used in PCB wiring layers plays a critical role in forming the conductive patterns that connect electronic components and enable high-speed signals to be transmitted accurately with minimal loss. In essence, it can be viewed as the "highway" of electronic devices, with its surface smoothness and purity serving as the foundation that determines the limits of communication speed and power efficiency.

VSP™ (Very Smooth Profile; ultra-low roughness double-sided smooth copper foil), developed by Mitsui Kinzoku, is a product family created to solve a fundamental trade-off in high-speed server substrates: while minimizing transmission loss requires the copper foil surface to be as smooth as possible, sufficient adhesion to the substrate must also be maintained. In particular, the company is a key player in the ultra-high-end segment (HVLP4 and above), where it maintains an estimated global market share of around 80%. Through collaboration with major CCL manufacturers from the early stages of development, the company has worked on matching its products with a wide range of substrate resin materials. The vast amount of data and know-how accumulated through this process has become a key differentiating factor that competitors have been unable to replicate. In addition, given the overwhelmingly high quality of its products, the company is believed to enjoy high levels of trust from end customers such as NVIDIA and Google. As a result, we believe that its competitive advantage in high-end CCL applications above M8 is unlikely to be challenged for the foreseeable future.

We expect the expansion of PCB/CCL demand driven by AI servers to serve as a tailwind for the company and forecast high top-line growth for VSP™, with a CAGR of +56% over

FY26/3-FY29/3. At the same time, supply-demand conditions have become increasingly tight, particularly for HVLP4-and-above electrolytic copper foil, and investors should take note of the potential for further upside should price increases gain traction. Furthermore, based on our outlook for CCL demand growth, the company's production capacity could become a bottleneck. As such, we will closely monitor any future large-scale capacity expansion plans.

Nittobo (3110.T, Buy, covered by Atsushi Ikeda): In addition to copper foil, low-dielectric glass is also an essential substrate material for servers handling high-frequency signals. Nittobo remains the market leader, having pioneered the commercial introduction of low-dielectric glass cloth in 1998.

While NE Glass, the first generation of low-dielectric glass, has become a relatively competitive market, demand for AI server CCLs has recently expanded beyond market expectations, leading us to believe that supply-demand conditions have once again tightened. Asahi Kasei also commented that it successfully implemented price increases in its April-June 2026 quarter. Although Nittobo has clearly articulated its strategy of shifting away from NE Glass and focusing on second-generation NER Glass, performance trends in NE Glass remain worth monitoring.

Nittobo holds an overwhelmingly dominant market share in NER Glass, with competitors such as Asahi Kasei following behind. However, the technological gap between Nittobo and its peers is believed to be substantial. Meanwhile, the likelihood is increasing that quartz cloth adoption in CCL applications will remain limited due to factors such as yield and cost considerations. As a result, strong NER glass growth is expected for the foreseeable future, particularly in applications such as network switches. Nittobo is currently expanding NER Glass production capacity, and further earnings growth is likely from 2027 onward as these new facilities ramp up in earnest. We forecast NER Glass top-line CAGR of 60% over FY26/3-FY29/3.

In addition, as a response to quartz cloth, Nittobo is developing third-generation NEZ Glass, which is designed to maximize both low-dielectric performance and thermal expansion characteristics. If the company is able to launch the product in a timely manner after 2028, we believe this could further improve investor perceptions regarding the growth potential of its PCB/CCL glass cloth business.

Allocation

Exhibit 8: PCB/ CCL allocation by supplier

PCB Allocation

2025

%	Victory Giant	Unimicron	GCE	WUS	Shennan	Shengyi	ZDT	Others	Total
Nvidia	35-40%	20-25%	<5%	20%	-	-	-	15-20%	100%
AMD	30%	-	5-10%	20-25%	20-25%	10-15%	-	5%	100%
Other GPU	25-30%	15%	10%	30-35%	-	-	-	10-15%	100%
Amazon AWS	-	-	55%	5%	-	25%	-	15%	100%
Google TPU	-	-	10-15%	20%	-	-	-	65-70%	100%
Meta ASIC	-	-	50%	25%	-	-	-	25%	100%
Microsoft ASIC							-		100%
Tesla ASIC	-	-	-	30%	-	-	-	70%	100%
Huawei	-	-	-	20%	40%	20%	-	20%	100%
Other Chinese ASIC	-	-	-	25%	35%	20%	-	20%	100%

2026

%	Victory Giant	Unimicron	GCE	WUS	Shennan	Shengyi	ZDT	Others	Total
Nvidia	40-45%	15-20%	<5%	20%	-	-	<5%	10-15%	100%
AMD	30-35%	-	5-10%	20-25%	20-25%	10-15%	-	5-10%	100%
Other GPU	25-30%	15%	10%	30-35%	-	-	-	10-15%	100%
Amazon AWS	-	-	70-75%	<5%	-	10-15%	<5%	10%	100%
Google TPU	5%	-	20%	15-20%	5%	-	5%	45-50%	100%
Meta ASIC	-	-	80%	10%	-	-	-	10%	100%
Microsoft ASIC	-	-	50%	15%	-	-	-	35%	100%
Tesla ASIC	-	-	-	30%	-	-	-	70%	100%
Huawei	-	-	-	20%	40%	20%	-	20%	100%
Other Chinese ASIC	-	-	-	25%	35%	20%	-	20%	100%

2027

%	Victory Giant	Unimicron	GCE	WUS	Shennan	Shengyi	ZDT	Others	Total
Nvidia	40-45%	10-15%	0%	20%	-	-	5-10%	10-15%	100%
AMD	30-35%	-	5-10%	20%	20%	10-15%	-	5-10%	100%
Other GPU	25-30%	15%	10%	30-35%	-	-	-	10-15%	100%
Amazon AWS	-	-	70%	-	-	10%	10%	10%	100%
Google TPU	10%	-	20-25%	10%	5%	-	5%	45-50%	100%
Meta ASIC	-	-	90%	5%	-	-	-	5%	100%
Microsoft ASIC	-	-	60%	15%	-	-	-	25%	100%
Tesla ASIC	-	-	-	30%	-	-	-	70%	100%
Huawei	-	-	-	20%	40%	20%	-	20%	100%
Other Chinese ASIC	-	-	-	25%	35%	20%	-	20%	100%

CCL Allocation

2025

%	EMC	TUC	ITEQ	Shengyi	Others	Total
Nvidia	30-35%	<5%	<5%	<5%	55-60%	100%
AMD	45%	15%	5%	-	35-40%	100%
Other GPU	85%	5%	5%	-	5%	100%
Amazon AWS	90%	10%	-	-	-	100%
Google TPU	25-30%	<5%	-	-	70%	100%
Meta ASIC	100%	-	-	-	-	100%
Microsoft ASIC					-	100%
Tesla ASIC	100%	-	-	-	-	100%
Huawei	-	-	-	35%	65%	100%
Other Chinese ASIC	20%	15%	-	60%	5%	100%

2026

%	EMC	TUC	ITEQ	Shengyi	Others	Total
Nvidia	30-35%	<5%	<5%	<5%	55-60%	100%
AMD	70-75%	5%	<5%	5-10%	10-15%	100%
Other GPU	85-90%	5%	5%	-	<5%	100%
Amazon AWS	70-75%	25-30%	-	-	-	100%
Google TPU	70-75%	5-10%	-	-	15-20%	100%
Meta ASIC	95%	5%	-	-	-	100%
Microsoft ASIC	80%	10%	-	-	10%	100%
Tesla ASIC	100%	-	-	-	-	100%
Huawei	-	-	-	35%	65%	100%
Other Chinese ASIC	15%	20%	-	60%	5%	100%

2027

%	EMC	TUC	ITEQ	Shengyi	Others	Total
Nvidia	35-40%	<5%	<5%	5-10%	45%	100%
AMD	65-70%	<5%	<5%	10-15%	10-15%	100%
Other GPU	85-90%	5%	5%	-	<5%	100%
Amazon AWS	60%	40%	-	-	-	100%
Google TPU	60%	25%	-	-	15%	100%
Meta ASIC	70%	30%	-	-	-	100%
Microsoft ASIC	50%	20%	-	-	30%	100%
Tesla ASIC	100%	-	-	-	-	100%
Huawei	-	-	-	35%	65%	100%
Other Chinese ASIC	5%	30%	-	60%	5%	100%

Source: Company data, Goldman Sachs Global Investment Research

Servers: AI server racks +190%/+89%/+56% YoY in 2026-28E; General server volume +14%/ +6%/ +6% YoY in 2026-28E

Global Server market opportunity

(Shipments in k units/ k racks)

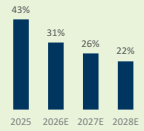
Our Bottom up method

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

General server

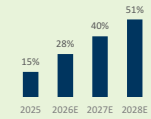
General server shipments = shipments of Top 6 server brands + ODM direct + others
General server revenues = shipments of each company x ASP of each company

General servers revenues mix

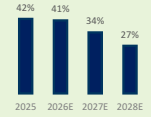


AI server
AI server shipments = shipments of Top 6 server brands + ODM direct + others
AI server revenue = shipments x ASP

AI server racks revenues mix



AI server (8-GPU) revenues mix



Revenues by type		1Q25	2Q25	3Q25	4Q25	1Q26	2Q26E	3Q26E	4Q26E	2025	2026E	2027E	2028E
Global server revenues	**US$ m**	**62,164**	**84,687**	**85,680**	**115,382**	**128,512**	**155,238**	**149,935**	**170,432**	**347,913**	**604,117**	**849,860**	**1,102,109**
General servers	US$ m	32,801	38,085	37,231	39,854	44,533	49,666	48,165	46,767	147,970	189,132	221,573	245,210
AI server racks (NVL72)	US$ m	4,268	8,464	15,804	25,380	26,983	44,831	37,867	56,993	53,916	166,673	336,140	561,402
AI server training (8-GPU)	US$ m	19,792	32,860	27,316	43,286	47,134	51,440	52,727	53,865	123,255	205,166	215,799	219,395
AI server inferencing (8-GPU)	US$ m	5,304	5,278	5,329	6,862	9,862	9,301	11,175	12,807	22,772	43,146	76,347	76,102
Mix		**1Q25**	**2Q25**	**3Q25**	**4Q25**	**1Q26**	**2Q26E**	**3Q26E**	**4Q26E**	**2025**	**2026E**	**2027E**	**2028E**
Total	**%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
General servers	%	53%	45%	43%	35%	35%	32%	32%	27%	43%	31%	26%	22%
AI server racks (NVL72)	%	7%	10%	18%	22%	21%	29%	25%	33%	15%	28%	40%	51%
AI server training (8-GPU)	%	32%	39%	32%	38%	37%	33%	35%	32%	35%	34%	25%	20%
AI server inferencing (8-GPU)	%	9%	6%	6%	6%	8%	6%	7%	8%	7%	7%	9%	7%
Revenues YoY		**1Q25**	**2Q25**	**3Q25**	**4Q25**	**1Q26**	**2Q26E**	**3Q26E**	**4Q26E**	**2025**	**2026E**	**2027E**	**2028E**
Total	**%**					**107%**	**83%**	**75%**	**48%**		**74%**	**41%**	**30%**
General servers	%					36%	30%	29%	17%		28%	17%	11%
AI server racks (NVL72)	%					532%	430%	140%	125%		209%	102%	67%
AI server training (8-GPU)	%					138%	57%	93%	24%		66%	5%	2%
AI server inferencing (8-GPU)	%					86%	76%	110%	87%		89%	77%	0%
Revenues QoQ		**1Q25**	**2Q25**	**3Q25**	**4Q25**	**1Q26**	**2Q26E**	**3Q26E**	**4Q26E**	**2025**	**2026E**	**2027E**	**2028E**
Total	**%**		**36%**	**1%**	**35%**	**11%**	**21%**	**-3%**	**14%**				
General servers	%		16%	-2%	7%	12%	12%	-3%	-3%				
AI server racks (NVL72)	%		98%	87%	61%	6%	66%	-16%	51%				
AI server training (8-GPU)	%		66%	-17%	58%	9%	9%	3%	2%				
AI server inferencing (8-GPU)	%		0%	1%	29%	44%	-6%	20%	15%				
Shipments by type	**Units**	**1Q25**	**2Q25**	**3Q25**	**4Q25**	**1Q26**	**2Q26E**	**3Q26E**	**4Q26E**	**2025**	**2026E**	**2027E**	**2028E**
Global server shipments													
General servers	k units	3,619	3,887	3,642	3,904	4,158	4,345	4,326	4,260	15,053	17,088	18,053	19,053
AI server racks (NVL72)	k racks	2	3	6	9	9	15	12	19	19	55	105	163
AI server training (8-GPU)	k units	156	221	209	268	289	313	325	338	855	1,264	1,419	1,406
AI server inferencing (8-GPU)	k units	71	78	78	97	132	127	161	174	323	593	984	1,152
Shipments YoY		**1Q25**	**2Q25**	**3Q25**	**4Q25**	**1Q26**	**2Q26E**	**3Q26E**	**4Q26E**	**2025**	**2026E**	**2027E**	**2028E**
General servers	**%**					15%	12%	19%	9%		14%	6%	6%
AI server racks (NVL72)	%					511%	393%	121%	111%		190%	89%	56%
AI server training (8-GPU)	%					85%	41%	55%	26%		48%	12%	-1%
AI server inferencing (8-GPU)	%					87%	63%	107%	79%		84%	66%	17%
Shipments QoQ		**1Q25**	**2Q25**	**3Q25**	**4Q25**	**1Q26**	**2Q26E**	**3Q26E**	**4Q26E**	**2025**	**2026E**	**2027E**	**2028E**
General servers	**%**		7%	-6%	7%	6%	5%	0%	-2%				
AI server racks (NVL72)	%		100%	87%	61%	2%	61%	-16%	53%				
AI server training (8-GPU)	%		42%	-6%	28%	8%	8%	4%	4%				
AI server inferencing (8-GPU)	%		10%	0%	25%	37%	-4%	26%	8%				
Shipments by vendor		**1Q25**	**2Q25**	**3Q25**	**4Q25**	**1Q26**	**2Q26E**	**3Q26E**	**4Q26E**	**2025**	**2026E**	**2027E**	**2028E**
General server shipments	**k units**	**3,619**	**3,887**	**3,642**	**3,904**	**4,158**	**4,345**	**4,326**	**4,260**	**15,053**	**17,088**	**18,053**	**19,053**
Dell	k units	334	307	299	355	417	400	323	372	1,295	1,512	1,587	1,619
HP	k units	165	161	161	182	173	177	180	201	669	730	770	785
Super Micro	k units	156	173	134	130	165	135	135	142	592	578	557	579
Lenovo	k units	174	187	213	263	226	233	234	289	837	983	1,032	1,084
Gigabyte	k units	24	31	23	21	29	31	31	28	99	119	137	144
Quanta - ODM direct	k units	576	650	483	541	639	747	579	649	2,249	2,615	2,694	2,748
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	606	834	588	2,166	2,666	2,986	3,404
Others	k units	1,527	1,596	1,514	1,614	1,651	1,762	1,781	1,748	6,252	6,942	7,320	7,721
AI server - 8-GPU	**k units**	**227**	**299**	**287**	**365**	**421**	**440**	**485**	**512**	**1,178**	**1,858**	**2,403**	**2,558**
Dell	k units	9	33	28	44	65	77	72	73	113	285	377	432
HP	k units	3	6	4	3	3	8	10	7	16	27	29	34
Super Micro	k units	9	12	12	29	29	30	31	33	62	123	146	168
Lenovo	k units	16	10	11	13	34	18	25	27	51	104	190	278
Gigabyte	k units	4	9	5	5	7	10	6	7	23	30	34	37
Quanta - ODM direct	k units	19	20	24	34	29	28	41	39	97	137	141	145
Hon Hai- ODM direct	k units	51	60	56	57	90	91	96	96	224	373	504	431
Wiwynn- ODM direct	k units	21	41	52	54	45	45	46	57	168	193	231	277
Others	k units	94	109	95	127	120	134	158	174	425	586	750	756
AI server - full racks	**k racks ****	**2**	**3**	**6**	**9**	**9**	**15**	**12**	**19**	**19**	**55**	**105**	**163**
Dell	k racks	0	1	1	0	1	1	1	1	2	5	6	8
HP	k racks	0	0	0	0	0	0	0	0	0	0	0	0
Super Micro	k racks	0	0	0	0	0	0	0	0	1	2	4	5
Lenovo	k racks	-	-	-	-	0	0	0	0	-	0	2	3
Gigabyte	k racks	-	0	0	0	0	0	0	0	0	1	2	2
Quanta - ODM direct	k racks	1	1	1	1	3	6	2	3	4	13	17	22
Hon Hai- ODM direct	k racks	0	1	4	6	5	7	8	11	11	30	65	113
Wiwynn- ODM direct	k racks	-	-	-	-	-	-	-	2	-	2	8	7
Others	k racks	0	0	0	1	0	0	0	1	1	2	2	3

Source: Company data, Goldman Sachs Global Investment Research

Price target risks and methodology

Shengyi Tech: We derive our 12-month target price of Rmb247 on a target P/E multiple of 50.4x 2027E EPS. Our target P/E of 50.4x is derived from the correlation between P/E and EPS growth of Shengyi Tech's peers, based on the company's 2027-28E EPS YoY growth. Key risks: Lower-than-expected AI infrastructure investment, Lower-than-expected allocation, Change in the direction of technology.

Victory Giant: We derive our 12-month target price of Rmb550 on a target P/E multiple of 26.3x applied to our 2027E EPS. Our target P/E of 26.3x is derived from the correlation between P/E and EPS growth of Victory Giant's peers, based on the company's 2028E EPS YoY growth. Key risks: Slower-than-expected AI server shipment ramp up pace; Slower-than-expected AI server PCB specification upgrade; Fiercer-than-expected market competition.

Panasonic HD: Our 12-month target price is ¥5,100. We apply an EV/EBITDA multiple of 9.0X (FY3/28E base year, based on the historical correlation between EV/EBITDA and EBITDA margin). Risks: Companywide: (1) Weaker-than-expected progress with fixed-cost reductions or insufficiently realized benefits from business reforms across the company as a whole, (2) weaker growth prospects due to the loss of key personnel during the fixed-cost reduction process, (3) slower-than-expected progress in revamping the business portfolio as a result of delays selecting buyers, (4) additional investment and depreciation burdens arising due to increased demand for cylindrical batteries, and (5) forex trends (we estimate that every ¥1 appreciation vs. the USD/EUR/CNY impacts annual adjusted operating profits by -¥0.9 bn/-¥1.0 bn/+¥4.7 bn, respectively). Lifestyle updates business: Weaker demand for residential/commercial air conditioners due to a downturn in the global economy, or the loss of market share to more popular or cheaper products at competitors. Panasonic Connect: (1) A slump in the company's aircraft services business if the "bring your own devices" trend were to become more common for in-flight entertainment on commercial aircraft, (2) weaker-than-expected sales growth at acquired company Blue Yonder (standalone basis), (3) major impairment losses on Blue Yonder if the calculation of its present value were to require a higher WACC due to rising interest rates, softer demand or other factors (indication of impairment is checked every quarter), and (4) a longer-than-anticipated decline in demand for various mounting systems used in process automation, such as the manufacture of PCs and smartphones. Panasonic Energy: Tesla opting to increase its use of batteries made by other companies, leading to stronger pricing pressures, a further slowdown in the EV market, or increased competition in the generative AI-related battery backup unit (BBU) business. Panasonic Industry: Weaker-than-expected factory automation-related demand, stiffer competition in the generative AI-related hybrid capacitor and circuit board material businesses, or a longer-than-expected downturn in demand for smartphones and other consumer electronics.

Mitsui Kinzohu: Our 12-month target price of ¥62,600 is based on the correlation between the materials sector's EV/GCI and our FY3/28E CROCI/WACC forecast (cash return multiple of 0.7X plus a 60% premium to the sector average). Key risks include slowdown in AI server demand, yen appreciation, and decline in prices for zinc and other metals.

Nittobo: Our 12-month target price of ¥4,820 is based on the correlation between the materials sector's EV/GCI and the FY3/28E CROCI/WACC forecast (cash-return multiple of 0.7x plus a 60% premium to the sector average). Key risks include fluctuations in semiconductor demand, currency volatility, and changes in the competitive landscape for specialty glass.

Disclosure Appendix

Reg AC

We, Allen Chang, Verena Jeng, Chao Wang, Atsushi Ikeda, Ryo Harada, Ting Song, Daiki Takayama, James Schneider, Ph.D., Mark Delaney, CFA, Anmol Makkar, Yuri Izumikawa, Hiroki Muramatsu and Yifan Hu, 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.

Unless otherwise stated, the individuals listed on the cover page of this report are analysts in Goldman Sachs' Global Investment Research division.

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Unless otherwise stated, the individuals listed in the Contributing Authors disclosure of this report are analysts in Goldman Sachs' Global Investment Research division.

GS Factor Profile

The Goldman Sachs Factor Profile provides investment context for a stock by comparing key attributes to the market (i.e. our universe of rated stocks) and its sector peers. The four key attributes depicted are: Growth, Financial Returns, Multiple (e.g. valuation) and Integrated (a composite of Growth, Financial Returns and Multiple). Growth, Financial Returns and Multiple are calculated by using normalized ranks for specific metrics for each stock. The normalized ranks for the metrics are then averaged and converted into percentiles for the relevant attribute. The precise calculation of each metric may vary depending on the fiscal year, industry and region, but the standard approach is as follows:

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).

Financial Returns and Multiple use the Goldman Sachs analyst forecasts at the fiscal year-end at least three quarters in the future. Growth uses inputs for the fiscal year at least seven quarters in the future compared with the year at least three quarters in the future (on a per-share basis for all metrics).

For a more detailed description of how we calculate the GS Factor Profile, please contact your GS representative.

M&A Rank

Across our global coverage, we examine stocks using an M&A framework, considering both qualitative factors and quantitative factors (which may vary across sectors and regions) to incorporate the potential that certain companies could be acquired. We then assign a M&A rank as a means of scoring companies under our rated coverage from 1 to 3, with 1 representing high (30%-50%) probability of the company becoming an acquisition target, 2 representing medium (15%-30%) probability and 3 representing low (0%-15%) probability. For companies ranked 1 or 2, in line with our standard departmental guidelines we incorporate an M&A component into our target price. M&A rank of 3 is considered immaterial and therefore does not factor into our price target, and may or may not be discussed in research.

Quantum

Quantum is Goldman Sachs' proprietary database providing access to detailed financial statement histories, forecasts and ratios. It can be used for in-depth analysis of a single company, or to make comparisons between companies in different sectors and markets.

Disclosures

Rating and pricing information

Elite Material (Buy, NT$5,140.00), GCE (Buy, NT$897.00), Shennan Circuits (Buy, Rmb332.54), Taiwan Union Technology Corp. (Buy, NT$1,340.00), WUS (Buy, Rmb111.77) and Zhen Ding Technology Holding (Buy, NT$444.00)

The rating(s) for Mitsui Kinzoku Co. and Nitto Boseki Co is/are relative to the other companies in its/their coverage universe: Asahi Kasei, Daicel, Denka, Fujimi Inc., JX Advanced Metals Corp., Kuraray, Mitsubishi Gas Chemical, Mitsui Chemicals Inc., Mitsui Kinzoku Co., Nippon Paint Holdings, Nitto Boseki Co, Resonac Holdings, SUMCO, Shin-Etsu Chemical, Tokyo Ohka Kogyo, Toray Industries, Tri Chemical Laboratories Inc., Zeon

The rating(s) for Panasonic Holdings is/are relative to the other companies in its/their coverage universe: Anritsu, Daihen, Fuji Electric Co., Fujikura, Furukawa Electric, Hitachi, Meidensha, Mitsubishi Electric, Panasonic Holdings, SWCC, Sumitomo Electric Industries

The rating(s) for Shengyi Tech and Victory Giant is/are relative to the other companies in its/their coverage universe: AAC, ACM Research, AMEC, ASMPT, AVC, AccoTest, Anji Micro, Asus, Auras, BOE, BYDE, Biren, CR Micro, Cambricon, Chenbro, China Mobile (HK), China Telecom, China Tower Corp., China Unicom, Chinasoft Intl, Compal, Desay SV, E Ink, E-Town Semis, EHang, Empyrean, Eoptolink, FOCI, Fositek, Foxconn Industrial Internet, Gigabyte, Gigadevice, Glodon Co., HTC Corp., Hikvision, Hon Hai, Horizon Robotics, Hua Hong, Huace Navigation, Huaqin Co.(A), Huaqin Co.(H), Hwatsing, Iluvatar, InnoScience, Inspur, Insta360, Inventec, JCET, Kematek, King Slide, Kingdee, Kingsoft Office, LandMark, Largan, Lenovo, Lingyi, Maxscend, Meitu, MetaX, Mitac, Montage (A), Montage (H), NAURA, NSIG, Nexchip, OmniVision, Pegatron, Pony AI Inc. (ADR), Pony AI Inc. (H), Quanta, RoboTechnik, Ruijie Networks, SG Micro, SICC, SMIC (A), SMIC (H), SZS, Sangfor, SenseTime, Shengyi Tech, Shennan Circuits, StarPower, Sunny Optical, TFC Optical, Thundersoft, Tongyu Communication, Transsion, UMT, UNIS, VPEC, Vanchip, VeriSilicon, Victory Giant, WNC, WUS, WeRide, Wistron, Wiwynn, YJ Semitech, YOFC, Yonyou, ZTE (A), ZTE (H), iFlytek

Company-specific regulatory disclosures

The following disclosures relate to relationships between The Goldman Sachs Group, Inc. (with its affiliates, "Goldman Sachs") and companies covered by Goldman Sachs Global Investment Research and referred to in this research.

Goldman Sachs beneficially owned 1% or more of common equity (excluding positions managed by affiliates and business units not required to be aggregated under US securities law) as of the second most recent month end: Mitsui Kinzoku Co. (¥35,320), Nitto Boseki Co (¥3,490), Panasonic Corp.

($7.24), Panasonic Holdings (¥4,502) and Victory Giant (Rmb236.35)

Goldman Sachs has received compensation for investment banking services in the past 12 months: Panasonic Corp. ($7.24) and Panasonic Holdings (¥4,502)

Goldman Sachs expects to receive or intends to seek compensation for investment banking services in the next 3 months: Panasonic Corp. ($7.24), Panasonic Holdings (¥4,502) and Shengyi Tech (Rmb122.79)

Goldman Sachs had an investment banking services client relationship during the past 12 months with: Panasonic Corp. ($7.24), Panasonic Holdings (¥4,502) and Shengyi Tech (Rmb122.79)

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Goldman Sachs had a non-securities services client relationship during the past 12 months with: Mitsui Kinzoku Co. (¥35,320), Panasonic Corp. ($7.24) and Panasonic Holdings (¥4,502)

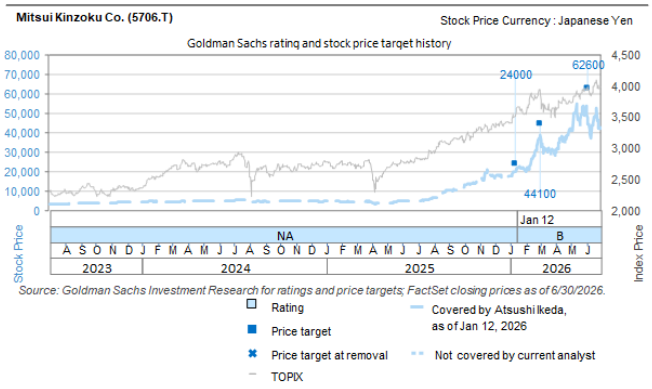
Distribution of ratings/investment banking relationships

Goldman Sachs Investment Research global Equity coverage universe

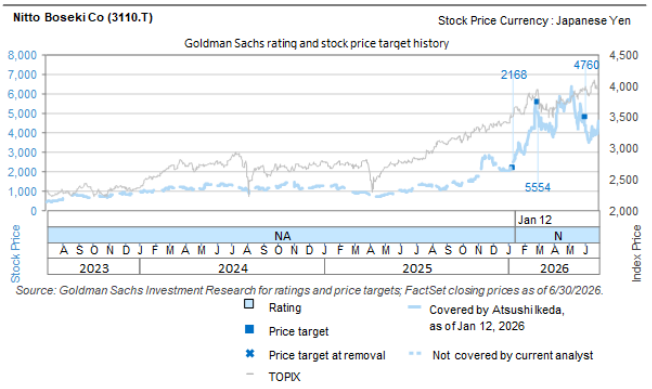
	Rating Distribution			Investment Banking Relationships		
	Buy	Hold	Sell	Buy	Hold	Sell
Global	50%	34%	16%	65%	59%	43%

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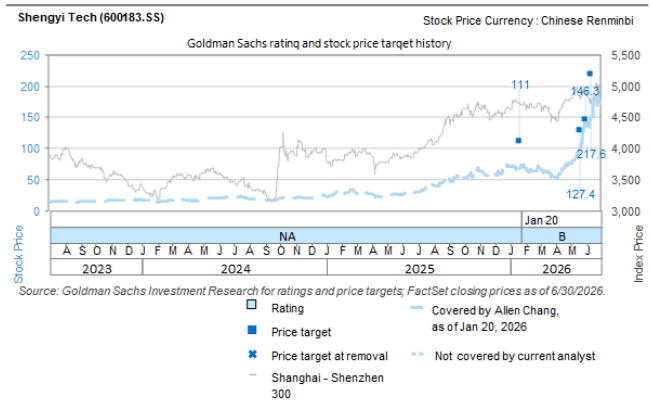
Price target and rating history chart(s)



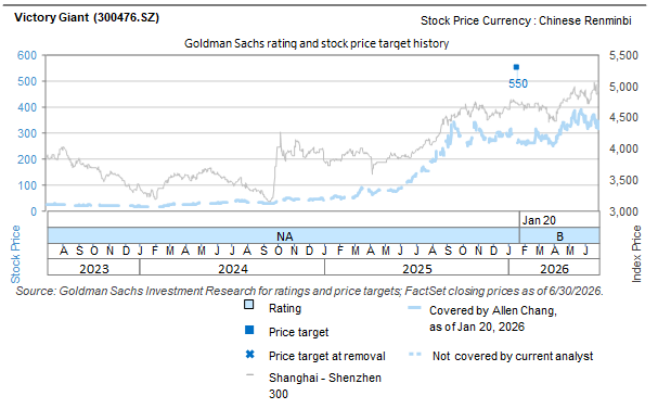
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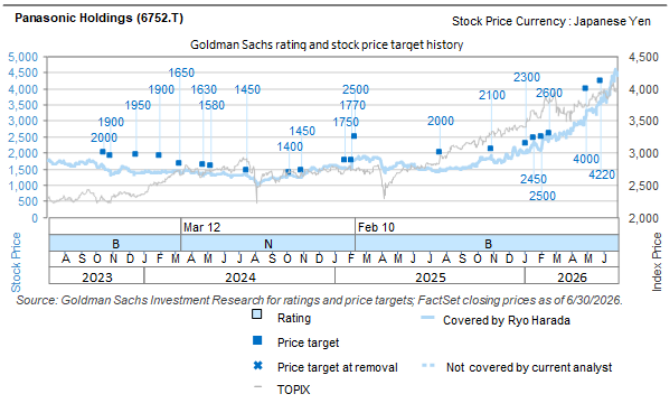
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Target price history table(s)

Panasonic Holdings (6752.T)

Date of report	Target price (¥)	Closing price (¥)
30-Jul-26	5,100	3,584
07-Jul-26	5,000	4,400
29-May-26	4,220	3,700
30-Apr-26	4,000	3,203
19-Feb-26	2,600	2,525
04-Feb-26	2,500	2,194
19-Jan-26	2,450	2,351
05-Jan-26	2,300	2,079
30-Oct-25	2,100	1,924
23-Jul-25	2,000	1,506
10-Feb-25	2,500	1,784
04-Feb-25	1,770	1,530
23-Jan-25	1,750	1,548
31-Oct-24	1,450	1,238
07-Oct-24	1,400	1,318
18-Jul-24	1,450	1,318
09-May-24	1,580	1,387
24-Apr-24	1,630	1,393
12-Mar-24	1,650	1,394
02-Feb-24	1,900	1,383
19-Dec-23	1,950	1,370
30-Oct-23	1,900	1,437
17-Oct-23	2,000	1,585

Mitsui Kinzoku Co. (5706.T)

Date of report	Target price (¥)	Closing price (¥)
05-Jun-26	62,600	44,490
01-Mar-26	44,100	36,910
12-Jan-26	24,000	19,900

Shengyi Tech (600183.SS)

Date of report	Target price (Rmb)	Closing price (Rmb)
14-Jul-26	247.00	147.90
11-Jun-26	217.60	149.73
30-May-26	146.30	140.62
22-May-26	127.40	108.01
20-Jan-26	111.00	68.00

Victory Giant (300476.SZ)

Date of report	Target price (Rmb)	Closing price (Rmb)
20-Jan-26	550.00	261.50

Nitto Boseki Co (3110.T)

Date of report	Target price (¥)	Closing price (¥)
06-Jul-26	4,820	3,515
05-Jun-26	23,800	4,050
01-Mar-26	27,770	5,040
12-Jan-26	10,840	2,508

Price targets shown in table(s) are unadjusted for corporate actions.

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