

Semiconductors - Asia-Pacific

Together stronger – a giant step with JASM opening

Industry Overview

TSMC enhances leadership with impressive JASM progress

We are impressed by TSMC's outstanding progress in Japan and strong support from the ecosystem (government, JV partners, and clients). We believe TSMC should benefit from the tighter collaborations with Japan semiconductor clusters (including equipment makers, key component suppliers, and clients) and better access to Japan's technology talent pool. On Feb 24, TSMC held an opening ceremony for its 1st Japan fab in Kumamoto (set to begin mass production by the end of 2024), following the recent announcement of 2nd fab construction. We attribute the impressive progress to strong support from Japan's government and supply chain partners, reflected by 1) Japan Prime Minister's video presentation and government subsidy of 1.2 trillion JPY (~40% of the JASM investment amount, with the better-than-expected newly announced 732bn JPY for the 2nd fab) along with favorable regulations and tax incentives; 2) JASM's shareholder structure and attendance of Sony's CEO as well as Toyota's chairman. Analog Devices recently also announced it would secure long-term wafer supply through JASM. Founder of TSMC Dr. Morris Chang attended the event and expects the project to improve supply resiliency of chips and hopefully lead a chip renaissance in Japan. In addition, he indicate that AI demand will consume likely a significant capacity measured by foundry fabs. As part of ongoing global expansion, TSMC celebrated a "topping out" milestone of its Fab21 P2 construction in Arizona (N3), and states its P1 is on track to start production in 1H25. TSMC should re-rate as it can utilize the opportunity to remove a potential bottleneck of talent pool and reduce geopolitical risks with its increasing global presence.

Sony is a beneficiary of Kumamoto Fab

Sony has retained No.1 share in the CMOS image sensor market by closely working with TSMC. While Sony produces sensor parts of CMOS image sensors, TSMC provides logic semiconductors that processes information from sensors. We believe the new fab in Kumamoto will enhance security for Sony in procurement of logic semiconductors. Sony is one of three minority shareholders of JASM, an operating company of Kumamoto Fab, and other two companies (Toyota and Denso) also will be able to secure semiconductor chips for their auto parts. Japanese semiconductor capital equipment companies should also benefit. However, incremental benefits would be limited since they have high market share globally, and they provide equipment wherever TSMC builds a fab.

Japan package industry benefits

The Japan package industry has worked with TSMC at the Tsukuba R&D facility as advanced packaging technology will be more and more important to make full use of chip function. Ibiden (4062) has been one of TSMC's core partners. The second fab of JASM, focusing on leading edge nodes, should be more beneficial for the Japanese IC package industry.

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Refer to important disclosures on page 5 to 9. Analyst Certification on page 2. Price Objective Basis/Risk on page 2.

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JASM: Japan Advanced
Semiconductor Manufacturing

Stocks mentioned

Prices and ratings for stocks mentioned in this report

BofA Ticker	Bloomberg ticker	Company name	Price	Rating
SNEJF	6758 JP	Sony Group Corp	¥ 13310	B-1-7
TSM	TSM US	Taiwan Semi Mfg Co	US\$ 129.53	B-1-7
TSMWF	2330 TT	Taiwan Semi Mfg Co	NT\$ 697	B-1-7

Source: BofA Global Research

Price objective basis & risk**Sony Group Corporation (6758 / SNEJF)**

We base our ¥16,500 PO (\$117.86/ADR) on a SOTP approach using peer-based segment EV/EBITDA multiples and our FY3/25 EBITDA forecasts for each segment. Multiple of 10x is applied to game business reflecting the delay in first party software development. Our music multiple of 18x is in line with a competitor. Our pictures multiple of 14x applies a discount of around 2pt versus a peer to reflect IP competitiveness. Our ET&S multiple of 6x adds a 1-2pt premium to competitors, taking a positive view of Sony's competitiveness in mirrorless cameras. Our I&SS multiple of 7x adds a 1pt premium to a competitor, considering Sony's competitiveness in large sensors.

Downside risks to our PO are (1) a slowdown in the CMOS image sensors (CIS) business owing to weak smartphone demand, (2) price decline in the TV and smartphone owing to tough competition, (3) a strengthening of the dollar against the euro, and (4) worse-than-expected impact of the COVID-19 outbreak. Upside risks are (1) a rapid increase in the use of multiple rear-camera lenses on smartphones contributing to earnings from CIS, (2) an earlier-than-expected launch of the market for on-board automotive CIS raising Sony's share of that market, and (3) greater-than-expected growth in the delivery of content over networks.

Taiwan Semiconductor Manufacturing Co. (TSMWF / TSM)

We value TSMC at NT\$760 per share (US\$130 per ADR), based on 18x 2H24-1H25E P/E, or slightly above its five-year average P/E and SOX index's ten-year average P/E, given the structural long-term opportunities. We expect the valuation to be underpinned by its stronger industry position especially in leading edge technology, improved earnings quality, and subsequently FCF/dividend upside.

Downside risks are (1) greater-than-expected slowdown in global smartphone/consumer electronics demand, (2) Intel's potential insourcing strategy and ambitions in foundry service, and (3) execution risks on advanced nodes.

Analyst Certification

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APR - Semiconductor Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
BUY				
	Alchip	ALCPF	3661 TT	Mike Yang
	ASE Technology Holding	XSRIF	3711 TT	Brad Lin
	ASE Technology Holding -ADR	ASX	ASX US	Brad Lin
	ASMP	ASMPF	522 HK	Simon Woo, CFA
	Crystal Clear	XPPTF	300655 CH	Dai Shen
	eMemory	XYLWF	3529 TT	Mike Yang
	Faraday	FDYTF	3035 TT	Mike Yang
	Global Unichip Corp.	GBUHF	3443 TT	Mike Yang
	GlobalWafers	XWLF	6488 TT	Brad Lin
	Hwatsing Technology	XSNIF	688120 CH	Dai Shen
	JCET Group Co Ltd	XJIEF	600584 CH	Mike Yang
	King Yuan Electronics Corp.	KYUFF	2449 TT	Angela Huang
	Kingsemi	XKSQF	688037 CH	Dai Shen
	LX Semicon	XLXSF	108320 KS	Simon Woo, CFA
	Maxscend	XMVSF	300782 CH	Daley Li, CFA
	MediaTek	MDTKF	2454 TT	Brad Lin
	Montage Technology	XRDF	688008 CH	Daley Li, CFA
	Nanya Technology	NNYAF	2408 TT	Simon Woo, CFA
	Novatek	NVKMF	3034 TT	Brad Lin
	Parade	PRDWF	4966 TT	Mike Yang
	Realtek	RLTKF	2379 TT	Brad Lin
	Samsung Elec -G	SSNHZ	SMSN LI	Simon Woo, CFA
	Samsung Electronics	SSNLF	005930 KS	Simon Woo, CFA
	Samsung Electronics Preferred	SSNNF	005935 KS	Simon Woo, CFA
	Silicon Motion	SIMO	SIMO US	Simon Woo, CFA
	SK Hynix	HXSCF	000660 KS	Simon Woo, CFA
	Taiwan Semiconductor Manufacturing Co.	TSM	TSM US	Brad Lin
	Taiwan Semiconductor Manufacturing Co.	TSMWF	2330 TT	Brad Lin
	United Microelectronics Corp.	XUMIF	2303 TT	Brad Lin
	United Microelectronics Corp.	UMC	UMC US	Brad Lin
	Will Semiconductor	XXHQF	603501 CH	Dai Shen
	Winbond Electronics	WBEKF	2344 TT	Dai Shen
	Wonik IPS	XRHQF	240810 KS	Simon Woo, CFA
NEUTRAL				
	ASMedia Technology Inc.	XZSFF	5269 TT	Mike Yang
	Aspeed	XLKMF	5274 TT	Mike Yang
	Macronix International	MXICF	2337 TT	Dai Shen
	Powertech Technology	XPPZF	6239 TT	Simon Woo, CFA
	Soulbrain	XSBOF	357780 KS	Simon Woo, CFA
	Vanguard International Semiconductor Co	VGILF	5347 TT	Mike Yang
UNDERPERFORM				
	GigaDevice	XGXIF	603986 CH	Daley Li, CFA
	Hangzhou Silan Microelectronics	XDFRF	600460 CH	Mike Yang
	Hua Hong Semi	HHUSF	1347 HK	Mike Yang
	Ingenic	XISCF	300223 CH	Dai Shen
	Lion Electronics	XDHFF	605358 CH	Dai Shen
	Phison Electronics	PISNF	8299 TT	Simon Woo, CFA
	Powerchip Semiconductor Manufacturing Co	XCHPF	6770 TT	Mike Yang
	Shenzhen Goodix	XQPLF	603160 CH	Mike Yang
	Silegy Corp.	SLEGF	6415 TT	Brad Lin
	VeriSilicon	XMLZF	688521 CH	Mike Yang
	Win Semiconductors	XWIF	3105 TT	Brad Lin

Japan - Technology Hardware Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
BUY				
	Advantest	ADTTF	6857 JP	Mikio Hirakawa
	BayCurrent Consulting	BYCRF	6532 JP	Yuki Kaneko
	Fujitsu	FJTJF	6702 JP	Yuki Kaneko

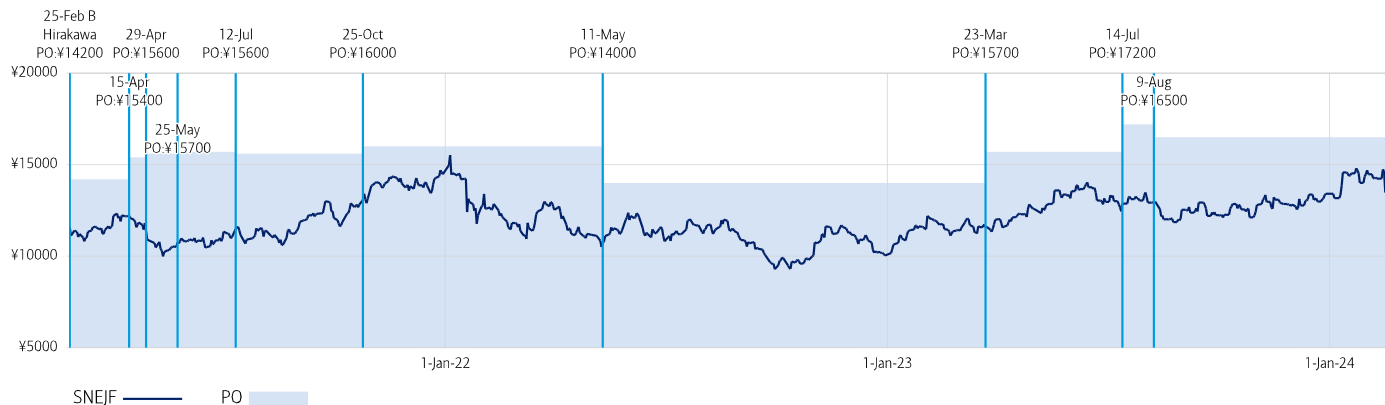
Japan - Technology Hardware Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
	Hirose Electric	HRSEF	6806 JP	Masashi Kubota
	Hitachi	HTHIF	6501 JP	Mikio Hirakawa
	Hitachi	HTHIY	HTHIY US	Mikio Hirakawa
	HOYA	HOCPF	7741 JP	Masashi Kubota
	HOYA	HOCPY	HOCPY US	Masashi Kubota
	Ibiden	IBIDF	4062 JP	Masashi Kubota
	Iriso Electronics	IREEF	6908 JP	Masashi Kubota
	JEOL	XJEOF	6951 JP	Mayako Ouchi
	JEOL	JELLF	JELLF US	Mayako Ouchi
	Kyocera	KYOCF	6971 JP	Masashi Kubota
	Kyocera	KYOCY	KYOCY US	Masashi Kubota
	Lasertec	LSRCF	6920 JP	Mikio Hirakawa
	MinebeaMitsumi	MNBEF	6479 JP	Masashi Kubota
	Mitsubishi Electric	MIELF	6503 JP	Mikio Hirakawa
	NEC	NIPNF	6701 JP	Yuki Kaneko
	Net One Systems	NONEF	7518 JP	Yuki Kaneko
	Nidec	NNDNF	6594 JP	Masashi Kubota
	NIDEC	NJDCY	NJDCY US	Masashi Kubota
	Nitto Denko	NDEKF	6988 JP	Masashi Kubota
	NRI	NURAF	4307 JP	Yuki Kaneko
	Obic Business Consultants	OBIBF	4733 JP	Yuki Kaneko
	Oracle Japan	OCLCF	4716 JP	Yuki Kaneko
	Panasonic	PCRFF	6752 JP	Mikio Hirakawa
	Panasonic	PCRFY	PCRFY US	Mikio Hirakawa
	Renesas Electronics	RNECF	6723 JP	Mikio Hirakawa
	Rohm	ROHCF	6963 JP	Masashi Kubota
	SCREEN Holdings	DINRF	7735 JP	Mikio Hirakawa
	SHIFT	SFTTF	3697 JP	Yuki Kaneko
	Sony Group Corporation	SONY	SONY US	Mikio Hirakawa
	Sony Group Corporation	SNEJF	6758 JP	Mikio Hirakawa
	TDK	TTDKY	TTDKY US	Masashi Kubota
	TDK	TTDKF	6762 JP	Masashi Kubota
	TIS	TISNF	3626 JP	Yuki Kaneko
	Tokyo Electron	TOELF	8035 JP	Mikio Hirakawa
NEUTRAL				
	DISCO	DISPF	6146 JP	Mikio Hirakawa
	Japan Aviation	JPAVF	6807 JP	Masashi Kubota
	Murata Mfg	MRAAF	6981 JP	Masashi Kubota
	Niterra	NGKSF	5334 JP	Masashi Kubota
	NTT DATA	NTTDF	9613 JP	Yuki Kaneko
	Otsuka Corporation	OSUKF	4768 JP	Yuki Kaneko
UNDERPERFORM				
	Alps Alpine	APELF	6770 JP	Masashi Kubota
	Alps Alpine	APELY	APELY US	Masashi Kubota
	Anritsu	AITUF	6754 JP	Mikio Hirakawa
	Fuji Electric	FELTF	6504 JP	Mikio Hirakawa
	Mabuchi Motor	MBUMF	6592 JP	Masashi Kubota
	Obic	OBIIF	4684 JP	Yuki Kaneko
	Sharp	SHCAF	6753 JP	Mikio Hirakawa
	Taiyo Yuden	TYOYF	6976 JP	Masashi Kubota
	Trend Micro	TMICF	4704 JP	Yuki Kaneko
	Trend Micro	TMICY	TMICY US	Yuki Kaneko
RSTR				
	Shinko Electric Industries	SHEGF	6967 JP	Masashi Kubota

Disclosures

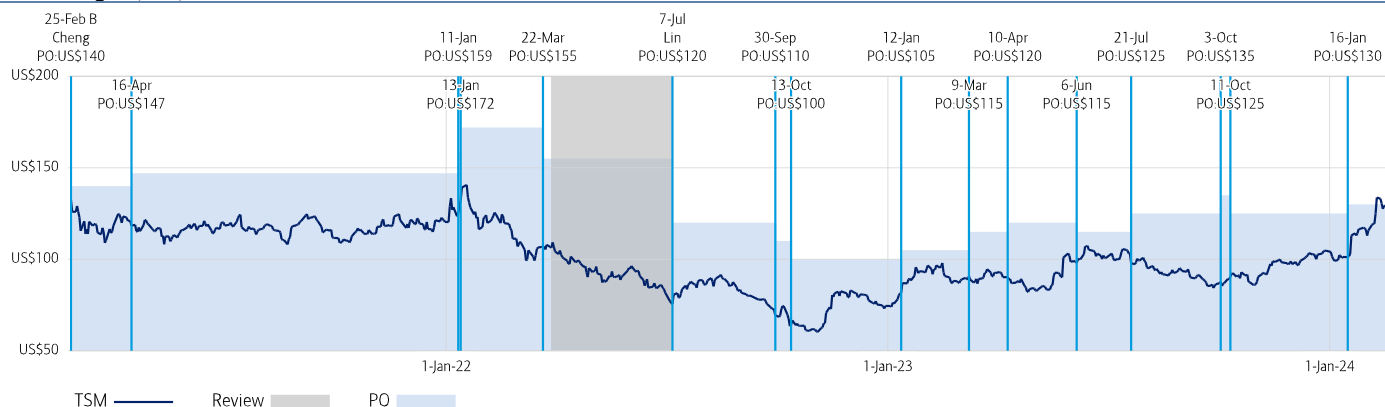
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Sony Group Corp (SNEJF) Price Chart

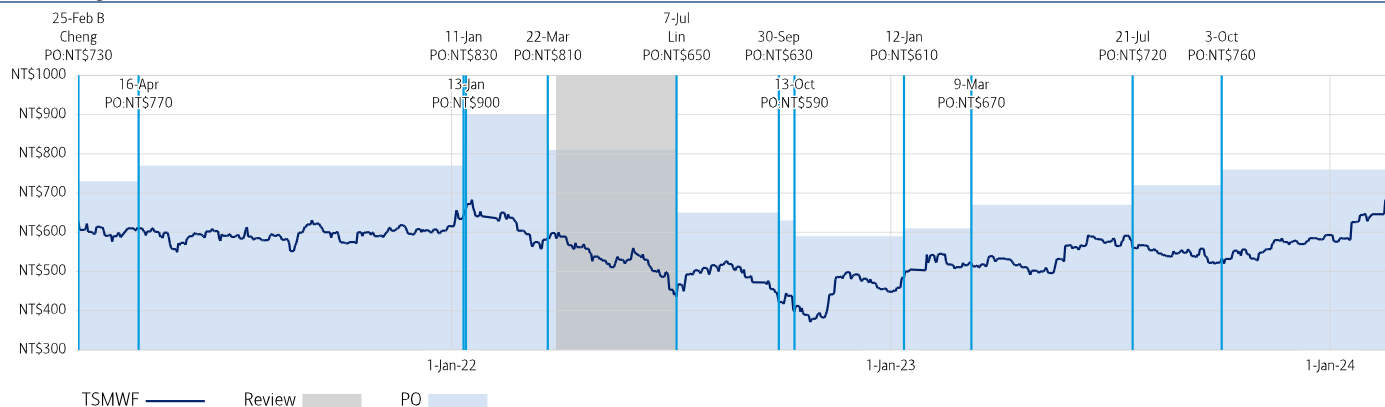
B: Buy, N: Neutral, U: Underperform, PO: Price Objective, NA: No longer valid, NR: No Rating

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Taiwan Semi Mfg Co (TSM) Price Chart

B: Buy, N: Neutral, U: Underperform, PO: Price Objective, NA: No longer valid, NR: No Rating

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Taiwan Semi Mfg Co (TSMWF) Price Chart

B: Buy, N: Neutral, U: Underperform, PO: Price Objective, NA: No longer valid, NR: No Rating

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Equity Investment Rating Distribution: Electronics Group (as of 31 Dec 2023)

Coverage Universe	Count	Percent	Inv. Banking Relationships ^{R1}	Count	Percent
Buy	32	54.24%	Buy	13	40.63%
Hold	11	18.64%	Hold	3	27.27%
Sell	16	27.12%	Sell	4	25.00%

Equity Investment Rating Distribution: Technology Group (as of 31 Dec 2023)

Coverage Universe	Count	Percent	Inv. Banking Relationships ^{R1}	Count	Percent
Buy	215	53.09%	Buy	111	51.63%
Hold	97	23.95%	Hold	45	46.39%
Sell	93	22.96%	Sell	24	25.81%

Equity Investment Rating Distribution: Global Group (as of 31 Dec 2023)

Coverage Universe	Count	Percent	Inv. Banking Relationships ^{R1}	Count	Percent
Buy	1895	53.62%	Buy	1083	57.15%
Hold	832	23.54%	Hold	454	54.57%
Sell	807	22.84%	Sell	383	47.46%

^{R1} Issuers that were investment banking clients of BofA Securities or one of its affiliates within the past 12 months. For purposes of this Investment Rating Distribution, the coverage universe includes only stocks. A stock rated Neutral is included as a Hold, and a stock rated Underperform is included as a Sell.

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Investment rating	Total return expectation (within 12-month period of date of initial rating)	Ratings dispersion guidelines for coverage cluster ^{R2}
Buy	≥ 10%	≤ 70%
Neutral	≥ 0%	≤ 30%
Underperform	N/A	≥ 20%

^{R2} Ratings dispersions may vary from time to time where BofA Global Research believes it better reflects the investment prospects of stocks in a Coverage Cluster.

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