

Silicon Motion

Recovery/growth on track exceeding guidance; Buy

Reiterate Rating: BUY | PO: 80.00 USD | Price: 64.93 USD

2024 sales/OPM likely to exceed guidance

We slightly cut 2024/25 EPS estimate (-7%/-2%) due to 3%/6% lower sales assumptions (impact of higher China demand risk). That said, our 2024 GAAP forecast shows near upcycle level of earnings: sales US\$822mn (vs guidance US\$765-800mn); GM 46.5% (44.9-46.9%); OPM 14.2% (10.4-12.8%); EPS US\$3.05 (GAAP/non-GAAP consensus US\$2.7/3.4). We are more positive on SSD and eMMC/UFS demand vs management's view. Two reasons: AI theme (upside to memory chip demand) and NAND chipmakers' increasing outsourcing (including SIMO's controller ICs). Our PO of US\$80, derived from 3.4x 2024-25E P/B (vs 3.2x previously; BVPS adjusted following EPS estimate cut), still presents 20%+ stock upside even after +6% YTD. Our target P/B is higher than historical average of 3.0x (due to strong earnings turnaround/growth) but lower than peak of 4.0x (due to macro risk and MaxLinear-related dispute expenses).

4Q upbeat but 1Q softens; MaxLinear dispute continues

SIMO reported upbeat 4Q23 sales of US\$202mn (guidance US\$190-198mn; previous upturn: US\$200-260mn) and GAAP GM 43.7% (42.4-43.4%). Better-than-seasonal controller sales for SSD (for PC) and eMMC/UFS (for China smartphone) should be the key contributor. However, OPM (8.7%; non-GAAP 13.8%) appears lower than guided (7.8-10.6% / 13.5-15.5%) due to ~10% higher than normal trend of R&D expenses. That said, EPS (GAAP US\$0.63, non-GAAP US\$0.93) exceeded consensus and our estimate by 10-20% with almost zero effective tax rate (vs normal low-20%). 4Q balance sheet also shows a record-high net cash (US\$0.33bn; 15% of market cap) and manageable level of inventories (US\$0.22bn). We assume softening 1Q24 sales (US\$182mn – close to upper range of 1Q guidance) and GM (44.5% - guidance 44.9-46.9%) due to high base of 4Q23 (customers' controller IC inventory restocking). The reciprocal termination fee sought by SIMO from MaxLinear (US\$160mn) or MaxLinear asking SIMO to pay US\$132mn should also be a swing factor but legal dispute seems to continue even for the rest of 2024.

Estimates (Dec) (US\$)	2022A	2023A	2024E	2025E	2026E
Net Income (Adjusted - mn)	173	53	102	112	138
EPS	5.19	1.57	3.05	3.33	4.10
EPS Change (YoY)	-8.9%	-69.7%	93.7%	9.1%	23.2%
Dividend / Share	1.50	0.50	2.00	2.00	2.00
Free Cash Flow / Share	1.54	3.03	3.59	2.12	2.46
Valuation (Dec)					
P/E	12.5x	41.2x	21.3x	19.5x	15.8x
Dividend Yield	2.3%	0.8%	3.1%	3.1%	3.1%
EV / EBITDA*	7.9x	29.9x	13.3x	11.8x	9.7x
Free Cash Flow Yield*	2.4%	4.7%	5.6%	3.3%	3.8%

* For full definitions of *IQmethod*SM measures, see page 17.

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Refer to important disclosures on page 18 to 20. Analyst Certification on page 15. Price Objective Basis/Risk on page 15.

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Equity

Key Changes

(US\$)	Previous	Current
Inv. Opinion	B-1-9	B-1-7
2024E EPS	3.27	3.05
2025E EPS	3.41	3.33
2026E EPS	NA	4.10
2024E EBITDA (m)	154.1	138.5
2025E EBITDA (m)	166.1	156.7
2026E EBITDA (m)	NA	190.5

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Stock Data

Price	64.93 USD
Price Objective	80.00 USD
Date Established	2-Nov-2023
Investment Opinion	B-1-7
52-Week Range	49.50 USD-95.33 USD
Mrkt Val / Shares Out (mn)	2,146 USD / 33.1
Average Daily Value (mn)	35.48 USD
Free Float	94.8%
BofA Ticker / Exchange	SIMO / NAS
Bloomberg / Reuters	SIMO US / SIMO.OQ
ROE (2024E)	13.6%
Net Dbt to Eqty (Dec-2023A)	-42.78%

NAND: Not-AND memory; permanently stores data

eMMC: Embedded multi-media card

UFS: Universal flash storage; superior to eMMC

SSD: Solid state drive based on NAND chip

AI: Artificial intelligence

IC: Integrated circuit

OEMs: Original equipment manufacturers

GM: Gross margin

OPM: Operating profit margin

iQprofileSM Silicon Motion

Key Income Statement Data (Dec)

(US\$ Millions)

	2022A	2023A	2024E	2025E	2026E
Sales	946	639	822	874	963
Gross Profit	466	270	382	413	460
Sell General & Admin Expense	(189)	(174)	(203)	(213)	(224)
Operating Profit	214	40	116	134	167
Net Interest & Other Income	(1)	21	12	9	9
Associates	NA	NA	NA	NA	NA
Pretax Income	213	61	128	143	177
Tax (expense) / Benefit	(40)	(8)	(26)	(32)	(39)
Net Income (Adjusted)	173	53	102	112	138
Average Fully Diluted Shares Outstanding	33	34	34	34	34

Key Cash Flow Statement Data

Net Income	173	53	102	112	138
Depreciation & Amortization	19	22	22	23	23
Change in Working Capital	(195)	106	30	(26)	(40)
Deferred Taxation Charge	NA	NA	NA	NA	NA
Other Adjustments, Net	88	(29)	0	0	0
Cash Flow from Operations	84	151	155	109	121
Capital Expenditure	(33)	(50)	(35)	(38)	(39)
(Acquisition) / Disposal of Investments	NA	NA	NA	NA	NA
Other Cash Inflow / (Outflow)	0	0	0	0	0
Cash Flow from Investing	(33)	(50)	(35)	(38)	(39)
Shares Issue / (Repurchase)	0	0	0	0	0
Cost of Dividends Paid	(50)	(17)	(67)	(67)	(67)
Cash Flow from Financing	(183)	(17)	(72)	(72)	(72)
Free Cash Flow	51	101	120	71	82
Net Debt	(232)	(314)	(362)	(361)	(371)
Change in Net Debt	132	(84)	(48)	1	(10)

Key Balance Sheet Data

Property, Plant & Equipment	139	167	185	204	224
Other Non-Current Assets	34	47	49	52	54
Trade Receivables	206	195	198	212	227
Cash & Equivalents	232	314	362	361	371
Other Current Assets	350	284	276	281	272
Total Assets	961	1,008	1,071	1,110	1,147
Long-Term Debt	0	0	0	0	0
Other Non-Current Liabilities	45	60	62	63	64
Short-Term Debt	0	0	0	0	0
Other Current Liabilities	184	213	239	232	197
Total Liabilities	229	273	300	295	261
Total Equity	733	735	770	815	886
Total Equity & Liabilities	961	1,008	1,071	1,110	1,147

iQmethodSM - Bus Performance*

Return On Capital Employed	24.0%	5.7%	12.9%	13.3%	15.3%
Return On Equity	24.8%	7.2%	13.6%	14.1%	16.2%
Operating Margin	22.6%	6.2%	14.2%	15.3%	17.4%
EBITDA Margin	24.6%	9.7%	16.9%	17.9%	19.8%

iQmethodSM - Quality of Earnings*

Cash Realization Ratio	0.5x	2.9x	1.5x	1.0x	0.9x
Asset Replacement Ratio	1.7x	2.3x	1.6x	1.7x	1.7x
Tax Rate (Reported)	18.8%	13.4%	20.0%	22.0%	22.0%
Net Debt-to-Equity Ratio	-31.7%	-42.8%	-47.0%	-44.3%	-41.8%
Interest Cover	NA	NA	NA	NA	NA

Key Metrics

* For full definitions of iQmethodSM measures, see page 17.

Company Sector

Semiconductors

Company Description

Silicon Motion is a Taiwan-based fabless company focusing on NAND controller IC. The chip is manufactured by TSMC. Most sales/profits are generated by SSD controller and solutions - eMMC, flash card and USB are no longer growing applications. Management owns less than 10% stake vs the rest held by public (free float). Key customers are not only memory chipmakers but also various OEMs that promote SSD product and solutions using controller IC. The company is listed on the NASDAQ.

Investment Rationale

Our Buy rating is based on cyclical earnings turnaround/growth (2024-26). We also expect new growth opportunities with AI (stronger replacement demand and memory content increase per box) and memory chipmakers' increasing outsourcing (e.g., SIMO's controller).

Stock Data

Price to Book Value

2.8x

Key tables/charts after 4Q23 results

Exhibit 1: Silicon Motion (SIMO) – Consensus vs our estimates

SIMO reported upbeat 4Q23 sales (US\$202mn; +17% QoQ, +1% YoY) with good margins (GM 43.7%, OPM 8.7%; non-GAAP OPM 13.8%); management's 1Q24 guidance indicated moderate decline in 1Q24 sales (US\$172-182mn; -15-10% QoQ) but still good margins (GM 43.9-44.9%, OPM 6.4-8.2%; non-GAAP OPM 10.5-11.5%)

GAAP, US\$mn	1Q23	2Q23	3Q23	4Q23	1Q24E			2Q24E			2023E			2024E		
	Actual	Actual	Actual	Actual	Our est	Cons	Diff	Our est	Cons	Diff	Our est	Cons	Diff	Our est	Cons	Diff
Sales	124.1	140.4	172.3	202.4	181.6	170.4	7%	189.3	183.0	3%	639.1	630.4	1%	821.6	767.7	7%
GP	52.3	56.4	73.1	88.5	80.8	74.0	9%	85.2	81.2	5%	270.4	269.3	0%	382.3	345.8	11%
GPM	42.2%	40.2%	42.4%	43.7%	44.5%	43.4%	1.1%	45.0%	44.4%	0.6%	42.3%	42.7%	-0.4%	46.5%	45.1%	1.5%
OP	5.5	1.8	15.0	17.6	15.8	17.9	-12%	20.2	24.4	-17%	39.9	79.2	-50%	116.3	128.0	-9%
OPM	4.4%	1.3%	8.7%	8.7%	8.7%	10.5%	-1.8%	10.7%	13.3%	-2.7%	6.2%	12.6%	-6.3%	14.2%	16.7%	-2.5%
Net non-opex	6.8	10.1	1.2	3.1	3.3	2.9	15%	3.3	3.1	6%	21.2	11.2	89%	11.7	13.3	-12%
Pretax profit	12.3	11.9	16.2	20.6	19.1	20.8	-8%	23.5	27.5	-15%	61.0	90.5	-33%	128.0	141.3	-9%
Effective tax rate	17%	7%	35%	-2%	20%	19%	1%	20%	20%	0%	13%	21%	-7%	20%	20%	0%
Net Income - GAAP	10.2	11.0	10.6	21.1	15.3	16.8	-9%	18.8	22.1	-15%	52.9	71.9	-26%	102.4	113.6	-10%
EPS (US\$) - GAAP	0.30	0.33	0.32	0.63	0.45	0.54	-16%	0.56	0.71	-21%	1.57	2.14	-26%	3.05	3.36	-9%

Source: Company, Bloomberg, BofA Global Research estimates

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Exhibit 2: SIMO – Sales mix estimate revision summary

In accordance with management's cautious 2024 annual guidance, we revise down our 2024-26E sales assumptions due to adverse impact of higher China demand risk; however, our overall 2024 earnings forecasts still higher than guidance

US\$mn	1Q23	2Q23	3Q23	4Q23	1Q24E	2Q24E	3Q24E	4Q24E	2018	2019	2020	2021	2022	2023	2024E	2025E
New est																
eMMC/UFS	17	25	51	66	58	60	69	74	140	108	148	300	343	160	262	274
SSD controller	98	105	113	133	120	126	142	156	232	291	344	631	562	449	543	578
SSD solutions	17	16	15	14	13	13	14	15	111	54	73	66	87	62	55	58
Others & adj	-8	-6	-7	-10	-10	-10	-9	-9	48	4	-26	-75	-46	-31	-38	-37
Total sales	124	140	172	202	182	189	215	235	530	457	540	922	946	639	822	874
Old est																
eMMC/UFS	17	25	51	62	58	61	70	72	140	108	148	300	343	156	261	293
SSD controller	98	105	113	125	119	134	149	152	232	291	344	631	562	441	554	605
SSD solutions	17	16	15	15	13	14	15	16	111	54	73	66	87	63	58	61
Others & adj	-8	-6	-7	-7	-7	-7	-7	-7	48	4	-26	-75	-46	-28	-27	-26
Total sales	124	140	172	195	183	202	227	233	530	457	540	922	946	632	845	933
Difference																
eMMC/UFS	n/a	n/a	n/a	3	0	-1	-1	2	n/a	n/a	n/a	n/a	n/a	3	1	-19
SSD controller	n/a	n/a	n/a	8	1	-9	-7	4	n/a	n/a	n/a	n/a	n/a	8	-11	-27
SSD solutions	n/a	n/a	n/a	-1	0	0	-1	-1	n/a	n/a	n/a	n/a	n/a	-1	-3	-3
Others & adj	n/a	n/a	n/a	-3	-3	-3	-3	-3	n/a	n/a	n/a	n/a	n/a	-3	-11	-11
Total sales	n/a	n/a	n/a	7	-1	-12	-12	2	n/a	n/a	n/a	n/a	n/a	7	-23	-59
% revision																
eMMC/UFS	n/a	n/a	n/a	5%	1%	-1%	-1%	3%	n/a	n/a	n/a	n/a	n/a	2%	0%	-6%
SSD controller	n/a	n/a	n/a	6%	1%	-6%	-5%	3%	n/a	n/a	n/a	n/a	n/a	2%	-2%	-4%
SSD solutions	n/a	n/a	n/a	-7%	1%	-3%	-8%	-8%	n/a	n/a	n/a	n/a	n/a	-2%	-5%	-4%
Others & adj	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Total sales	n/a	n/a	n/a	4%	-1%	-6%	-5%	1%	n/a	n/a	n/a	n/a	n/a	1%	-3%	-6%

Source: Company, BofA Global Research estimates

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Exhibit 3: SIMO – Earnings revisions

We revise down our 2024-25E EPS estimates due to more conservative sales and OP margin assumptions amid higher China demand risk; however, our 2024 forecast still shows near upcycle level of earnings (sales US\$822mn, OPM 14.2% vs management's guidance US\$765-800mn, OPM 10.4-12.8%) due to continuously strong memory cycle turnaround (AI theme-driven)

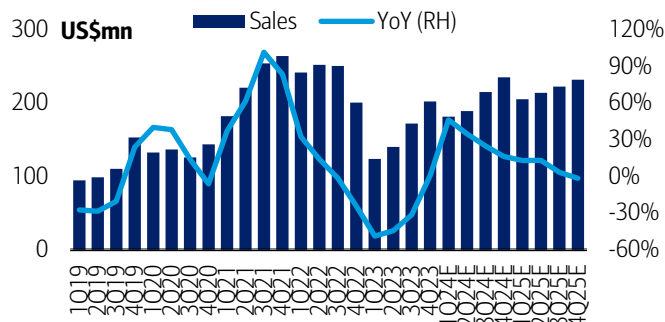
GAAP, US\$, US\$mn	1Q23	2Q23	3Q23	4Q23	1Q24E	2Q24E	3Q24E	4Q24E	2018	2019	2020	2021	2022	2023	2024E	2025E
EPS - fully diluted																
New	0.30	0.33	0.32	0.63	0.45	0.56	0.93	1.10	2.78	1.82	2.28	5.70	5.19	1.57	3.05	3.33
Old	0.30	0.33	0.32	0.52	0.58	0.75	0.95	0.99	2.78	1.82	2.28	5.70	5.19	1.47	3.27	3.41
Difference	n/a	n/a	n/a	20%	-22%	-25%	-2%	11%	nm	nm	nm	nm	nm	7%	-7%	-2%
Dividend/share																
New	0.00	0.00	0.00	0.50	0.50	0.50	0.50	0.50	1.20	1.25	1.40	1.55	1.50	0.50	2.00	2.00
Old	0.00	0.00	0.00	0.50	0.50	0.50	0.50	0.50	1.20	1.25	1.40	1.55	1.50	0.50	2.00	2.00
Difference	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	nm	nm	nm	nm	nm	n/a	n/a	n/a
Sales																
New	124	140	172	202	182	189	215	235	530	457	540	922	946	639	822	874
Old	124	140	172	195	183	202	227	233	530	457	540	922	946	632	845	933
Difference	n/a	n/a	n/a	4%	-1%	-6%	-5%	1%	nm	nm	nm	nm	nm	1%	-3%	-6%
Gross margin																
New	42.2%	40.2%	42.4%	43.7%	44.5%	45.0%	48.0%	48.0%	49.2%	48.6%	48.2%	50.0%	49.2%	42.3%	46.5%	47.3%
Old	42.2%	40.2%	42.4%	43.0%	43.0%	45.0%	46.0%	46.0%	49.2%	48.6%	48.2%	50.0%	49.2%	42.1%	45.1%	46.0%
Difference	n/a	n/a	n/a	0.7%	1.5%	0.0%	2.0%	2.0%	nm	nm	nm	nm	nm	0.2%	1.4%	1.2%
OP																
New	5	2	15	18	16	20	36	44	108	52	81	246	214	40	116	134
Old	5	2	15	20	23	30	38	40	108	52	81	246	214	42	131	143
Difference	n/a	n/a	n/a	-10%	-30%	-32%	-5%	9%	nm	nm	nm	nm	nm	-5%	-11%	-6%
OP margin																
New	4.4%	1.3%	8.7%	8.7%	8.7%	10.7%	16.9%	18.7%	20.4%	11.5%	14.9%	26.7%	22.6%	6.2%	14.2%	15.3%
Old	4.4%	1.3%	8.7%	10.0%	12.4%	14.8%	16.9%	17.3%	20.4%	11.5%	14.9%	26.7%	22.6%	6.6%	15.5%	15.3%
Difference	n/a	n/a	n/a	-1.3%	-3.7%	-4.1%	0.0%	1.4%	nm	nm	nm	nm	nm	-0.4%	-1.4%	0.1%
Pre-tax income																
New	12	12	16	21	19	23	39	46	112	72	86	247	213	61	128	143
Old	12	12	16	22	25	32	41	43	112	72	86	247	213	62	140	146
Difference	n/a	n/a	n/a	-5%	-23%	-27%	-4%	9%	nm	nm	nm	nm	nm	-2%	-9%	-2%
Tax rate - effective																
New	17.3%	7.3%	34.8%	-2.2%	20.0%	20.0%	20.0%	20.0%	10.5%	10.6%	6.8%	19.1%	18.8%	13.4%	20.0%	22.0%
Old	17.3%	7.3%	34.8%	20.0%	22.0%	22.0%	22.0%	22.0%	10.5%	10.6%	6.8%	19.1%	18.8%	20.9%	22.0%	22.0%
Difference	n/a	n/a	n/a	-22.2%	-2.0%	-2.0%	-2.0%	-2.0%	nm	nm	nm	nm	nm	-7.5%	-2.0%	0.0%
NP ex minority int																
New	10	11	11	21	15	19	31	37	100	64	80	200	173	53	102	112
Old	10	11	11	17	19	25	32	33	100	64	80	200	173	49	109	114
Difference	n/a	n/a	n/a	21%	-22%	-25%	-1%	12%	nm	nm	nm	nm	nm	7%	-6%	-2%
ROE - annualized																
New	5.5%	5.9%	5.5%	11.2%	8.3%	10.2%	16.9%	19.5%	19.5%	12.0%	14.6%	32.9%	24.8%	7.2%	13.6%	14.1%
Old	5.5%	5.9%	5.5%	9.0%	10.0%	12.8%	16.0%	16.4%	19.5%	12.0%	14.6%	32.9%	24.8%	6.5%	13.7%	13.6%
Difference	n/a	n/a	n/a	2.2%	-1.7%	-2.6%	0.9%	3.1%	nm	nm	nm	nm	nm	0.7%	-0.1%	0.5%
EBITDA																
New	11	7	20	23	21	26	42	50	122	66	94	263	233	62	139	157
Old	11	7	23	25	28	36	44	46	122	66	94	263	233	67	154	166
Difference	n/a	n/a	n/a	-9%	-25%	-28%	-5%	8%	nm	nm	nm	nm	nm	-7%	-10%	-6%
Capex spend																
New	14	10	17	10	10	10	7	8	12	75	10	19	27	33	50	35
Old	14	10	17	10	6	10	7	8	12	75	10	19	27	33	51	31
Difference	n/a	n/a	n/a	-5%	67%	0%	0%	0%	nm	nm	nm	nm	nm	0%	-1%	13%
Net debt																
New	-225	-250	-295	-314	-331	-332	-345	-362	-289	-325	-343	-360	-232	-314	-362	-361
Old	-225	-250	-295	-324	-343	-353	-369	-397	-289	-325	-343	-360	-232	-324	-397	-438
Difference	n/a	n/a	n/a	-3%	-4%	-6%	-6%	-9%	nm	nm	nm	nm	nm	-3%	-9%	-18%
BVPS - O/S shr based																
New	22.6	22.7	23.2	22.0	21.9	22.0	22.4	23.1	15.2	15.3	16.1	18.9	22.2	22.0	23.1	24.4
Old	22.6	22.7	23.2	23.2	23.3	23.5	24.0	24.5	15.2	15.3	16.1	18.9	22.2	23.2	24.5	25.9
Difference	n/a	n/a	n/a	-5%	-6%	-6%	-6%	-6%	nm	nm	nm	nm	nm	-5%	-6%	-6%

Source: Company, BofA Global Research estimates

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Exhibit 4: SIMO – Sales and YoY growth trend

4Q23 sales (US\$202mn) was better-than-expected; we assume mild setback in 1Q24 sales (US\$182mn; -10% QoQ), but likely to recover well into 2H24-2025E

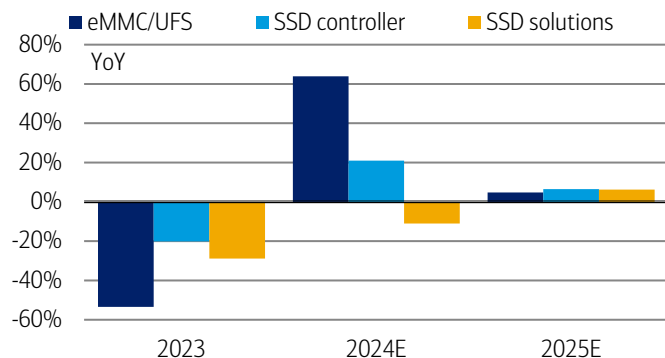


Source: Company, BofA Global Research estimates

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Exhibit 6: SIMO – YoY sales growth by segment

eMMC/UFS (smartphone) and SSD controller sales likely to recover well in 2024 on the back of memory cycle recovery after 2023 slowdown

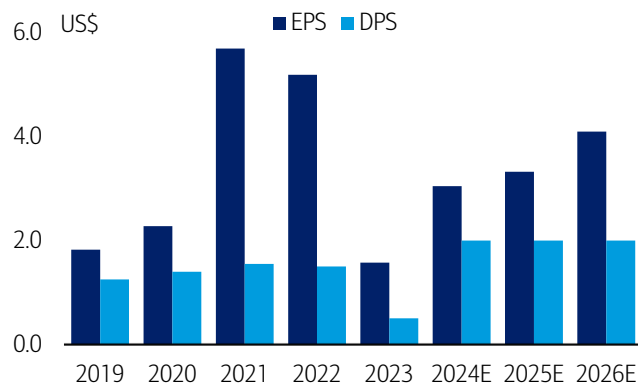


Source: Company, BofA Global Research estimates

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Exhibit 8: SIMO – EPS and DPS trend

SIMO announced resumption of annual dividend payment of US\$2.0 (paid in four quarterly installments of US\$0.5 in 4Q23-3Q24) after cancellation since Max Linear merger announcement in May-2022

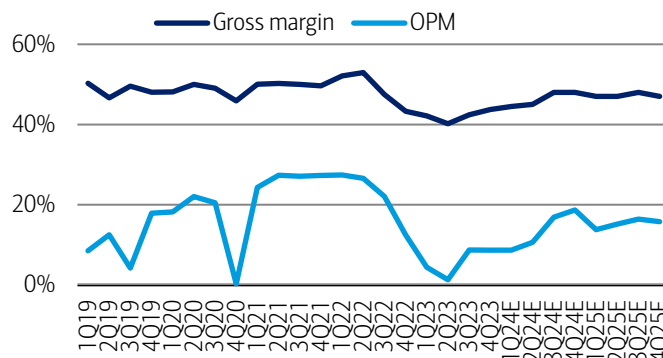


Source: Company, BofA Global Research estimates

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Exhibit 5: SIMO – Gross/OP margin trend

Good margins seen in 4Q23 (GM 44%, OPM 9%); we assume gradual recovery in 1H24-2025E

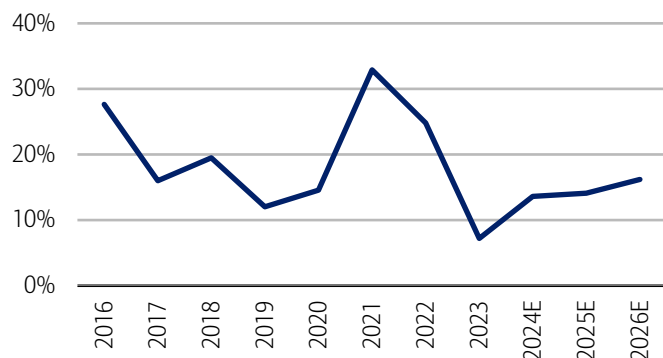


Source: Company, BofA Global Research estimates

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Exhibit 7: SIMO – ROE turnaround well expected in 2024-26

ROE improved from 7% in 2023 to 14-16% in 2024-26

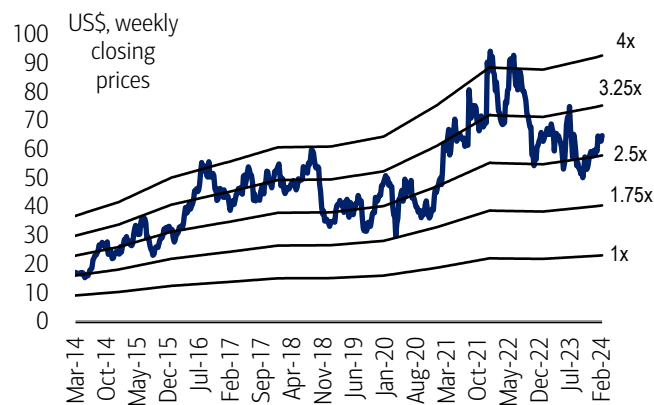


Source: Company, BofA Global Research estimates

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Exhibit 9: SIMO – P/B band

Currently high-2.0x vs May-22 peak (4.5x; M&A theme driven); our target 2024-25 P/B of 3.4x is just 12% higher than historical average of 3.0x



Source: Company, Bloomberg, BofA Global Research estimates

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Exhibit 10: SIMO – Specific developments and news check

SIMO filed a lawsuit against MaxLinear for US\$160mn deal breakup fee in October-2023; separately newly upgraded NAND controller IC likely to come more actively through 2024 (to meet AI related demand, etc)

Date	Major developments and news
Oct-23	SIMO filed an arbitration against MaxLinear for breaching its merger agreement and "seeks payment of the termination fee of US\$160mn and further substantial damages, interest and costs." The claim was filed in the Singapore International Arbitration Centre (SIAC)
Aug-23	SIMO revealed various new PCIe SSD controller platforms for Enterprise Servers and Datacenter at the Flash Memory Summit 2023
Jul-23	MaxLinear terminated the merger even after China government's (SAMR) conditional approval
Aug-22	SIMO' shareholders voted to approve the previously announced merger with MXL
Aug-22	Announces SM8366 PCIe Gen 5 SSD controller and SM2271 SATA 6Gb/s for datacenter applications
Jul-22	Announces MonTitan, a PCIe Gen5 SSD solution platform for datacenter and enterprise applications
May-22	MaxLinear confirmed that it would acquire SIMO for \$3.8bn in a stock and cash deal. SIMO shareholders would likely receive \$93.54 in cash and 0.388 shares of MaxLinear common stock per ADS
Feb-22	Plans to launch its first PCIe Gen 5 SSD controllers for enterprise (SM8366) and high-end SSD (SM2508) in 2022-23. And later launch mainstream SM2507 for consumer SSD in 2024
Nov-21	Showcased enterprise PCIe Gen 4 SSD controllers (SM8266/SM8208) as well as Ferri SSD solutions
Aug-21	Launches SM2320, the world's fastest controller for SSDs, with sequential read/write speed up to 2,100/2,000 MBs using ultra-low power
Mar-21	Announces SM2708, the world's first merchant SD express controller solution that supports the latest SD 8.0 specification
Feb-21	Preps PCIe Gen 5.0 SSD controllers with 2x transfer speed of PCIe Gen 4; expected to launch in 2022
Feb-21	Demonstrated automotive storage (for infotainment, ADAS), embedded boot SSD and graphics display SoC solutions
Nov-20	Launches 16 channel PCIe 4 controller solution SM8266; supports 16TB QLC 3D NAND
Oct-20	Launches PCIe 4.0 NVMe 1.4 controller solutions, SM2264/SM2267/SM2267XT, offering 7,400/6,800 MB/s data transfer speed
Sep-20	Joins automotive edge computing consortium (AECC) to improve storage in connected vehicles
Jun-20	Launches SM768 with InstantView technology, that simplifies the process of setting up devices for monitor displays
May-20	Introduces new SSD controllers, SM2270 - PCIe Gen3 x8 NVMe 1.3 and SM2271 - SATA 6Gb/s, along with SSDs and AFA solutions for data center
Feb-20	Demonstrates new product line of Ferri SSD/UFS/eMMC solutions for embedded and graphics
Oct-19	3Q SSD solutions restructuring charge US\$16mn confirmed; mostly Shannon goodwill related
Aug-19	Introduces varied range of SSD controllers and solutions for enterprise/data center, mobile and industrial/automotive markets
May-19	Completed the sale of its mobile communications product line FCI, to Dialog Semiconductor
May-19	Launched an high performance and low power consumption controller solution with an on-chip USB 3.2 interface for SSDs
Mar-19	Sells the WiFi/TV SoC business to Dialog Semiconductor
Jan-19	Intel 3D Xpoint-NAND hybrid SSD, H10, adopts SIMO controller

Source: Company, BofA Global Research

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Exhibit 11: Controllers for SSD applications

PCIe Gen 5 platform well used among high-end CPUs/GPUs (Sapphire Rapids, Alder Lake, H100, etc); SIMO well introduced its own PCIe Gen 5 controllers in 2H22

Company	Controller IC name	Target SSD/applications	What controller IC supports
Silicon Motion	SM2508	High-end SSD controller	PCIe Gen 5 platform
	SM8366	Controller For Enterprise	PCIe Gen 5x4 NVMe 2.0; 16 channel interface
	SM2507	Consumer SSD controller	PCIe Gen 5 platform; expected in 2024
	SM2320	Crucial X9 and X10	PCIe 3.0 x4 NVMe; 2,100/2,000MB/s RW speeds
	SM8266	Controller For Enterprise	PCIe 4.0 x4, NVMe 1.4; 16 channel interface
	SM2269XT	High performance	PCIe 4.0 x4, NVMe 1.4; up to 16TB
	SM2267	ADATA Pearl	PCIe 4.0 x4, NVMe 1.4
	SM2267XT	DRAM-less client SSDs	PCIe 4.0 x4 NVMe 1.4
	SM2264	ADATA Indigo	PCIe 4.0 x4, NVMe 1.4
	SM8108	Enterprise/Datacenter	PCIe Gen3 x4 NVMe, Optimized QoS
	SM2270	Intel and Micron SSD	PCIe Gen3x8; supports 96-layer TLC & QLC 3D NAND
	SM2262	Intel's 760p, ADATA XPG SX8200	PCIe Gen3x4 lanes NVMe 1.3 controller; 3D NAND support
	SM2262EN	Mushkin Pilot-E	PCIe Gen3x4; Ultra-high performance SSD controller
	SM2263EN	Mainstream SSD	PCIe Gen3x4 lanes NVMe 1.3 controller; 3D NAND support
	SM2263XT	Mushkin Helix-L	PCIe Gen3x4 lanes NVMe 1.3 controller; DRAM-less controller
Phison	SM2246EN	Starway M600, Ramsta R680	SATA 6Gb/s
	SM2246XT	SanDisk Z400s, Transcend SSD360	SATA 6Gb/s
	PS5031-E31T	Read/write speed of up to 10,800 MB/s	PCIe Gen 5 platform
	PS5026-E26	Read/write speed of up to 14,000 MB/s	PCIe Gen 5 platform
	PS5027-E27T	Read/write speed of up to 7,400 MB/s	PCIe 4.0x4 NVMe 1.4
	PS5018-E18	Mushkin Gamma	PCIe 4.0 x4, NVMe 1.4
	PS5016-E16	Seagate FireCuda, Corsair Force, Sabrent, TeamForce	PCIe 4.0 x4, NVMe 1.4
	PS5019-E19T	Xbox Series X SSD	PCIe 4.0 x4, NVMe 1.4
	PS5013-E13T	Patriot PXD	PCIe 3x4 lanes NVMe 1.3
	PS5012-E12C	MyDigitalSSD BPX Pro	PCIe 3x4 lanes NVMe 1.3
Marvell	PS5012-E12	MyDigital SSD	PCIe 3x4 lanes NVMe 1.3
	PS5007-E7	MyDigital SSD, Corsair	PCIe 3x4 lanes NVMe 1.2
	PS5008-E8	MyDigital SSD, Phison	PCIe Gen3 x2 NVMe 1.2
	Bravera SC5	Under development expected in 2022	PCIe Gen 5.0 (NVMe 1.4b standard)
	88SS1321	Micron and Toshiba SSD for cloud, gaming and storage	PCIe 4.0 x4, NVMe 1.4; 3D QLC NAND
	88SS1322	Micron and Toshiba SSD for cloud, gaming and storage	PCIe 4.0 x4, NVMe 1.4; 3D QLC NAND
	88SS1323	Micron and Toshiba SSD for cloud, gaming and storage	PCIe 4.0 x4, NVMe 1.4; 3D QLC NAND
	88SS1084	High-performance SSDs	PCIe Gen3x4 NVMe controller; supports 96-layer QLC/TLC 3D NAND
	88SS1100	Client SSDs	Supports 96-layer QLC/TLC 3D NAND; PCIe Gen 3x4
	88SS1098	Enterprise and data center SSDs	PCIe Gen3x4 (with dual port support)
Samsung	88SS1088	Enterprise and data center SSDs	PCIe Gen3x4 (with dual port support)
	88NV1160	Tablets, Ultrabooks	DRAM-less controller; PCIe 3x2 lanes NVMe 1.3
	88NV1140	Chrome devices, Tablets	DRAM-less controller; PCIe 3x1 lanes NVMe 1.3 controller
	PM1743	Demoed on Intel Alder Lake CPU platform	PCIe Gen 5 platform; 14GB/s speed
	Elpis	Samsung 980 Pro	PCIe 4.0 x4, NVMe 1.3c
InnoGrit	Phoenix	Samsung 970 Pro/Evo, 983 ZET	PCIe Gen 3.0 x4, NVMe 1.3 controller
	Polaris	Samsung 960 Pro/Evo	PCIe Gen3x4 lanes NVMe 1.2 controller; 3D NAND support
	Tacoma IG5669	SSD controller	PCIe 5.0 x4/NVMe2.0 with speed 7.4GB/s
SK Hynix	in-house	Hynix PE8000 SSDs	PCIe 4.0 x4, NVMe 1.4
	in-house	Hynix gold P31 SSD	PCIe Gen 3.0 x4, NVMe 1.3 controller
Intel	CH29AE41AB0	Intel 750	PCIe Gen3x4 lanes NVMe controller
	SLL 3D (EAU01D76)	Intel 900p	PCIe Gen3x4 lanes NVMe controller; 3D NAND support
	SLL 3D (EAT39099)	DC P4800X	PCIe Gen3x4 lanes NVMe controller; 3D NAND support
Seagate	SF3524	Seagate, ADATA	PCIe 2.0 x2 (NVMe)
	SF3504	Seagate, ADATA	PCIe 2.0 x2 (NVMe)

*Most Silicon Motion high-end controller ICs are fabricated by TSMC

Source: Company, press releases, BofA Global Research

Exhibit 12: PCIe Gen 4 SSD controller comparison

Both Phison and SIMO are outstanding in terms of NAND storage capacity and data-speed spec upgrade

Company	Model	Node process	Capacity	Read/Write speed
Phison	PS5027-E27T	12nm	Up to 8TB	7,400/6,700 MB/s
	PS5018-E18	12nm	512GB ~ 8/16TB	7,400/7,000 MB/s
	PS5016-E16	28nm	512GB ~ 4TB	5,000/4,400 MB/s
	PS5019-E19T	28nm	512GB ~ 2TB	3,600/3,000 MB/s
SIMO	SM8266	12nm	up to 16TB	6,550/3,100 MB/s
	SM2264	12nm	up to 16TB	7,400/6,800 MB/s
	SM2267	28nm	up to 8TB	3,900/3,500 MB/s
	SM2267XT	28nm	n/a	3,900/3,500 MB/s
Marvell	88SS1321	12nm	n/a	up to 3,900 MB/s
	88SS1322	12nm	n/a	up to 3,900 MB/s
	88SS1323	12nm	n/a	up to 3,500 MB/s
Samsung	Elpis	8nm	n/a	7,000/3,500 MB/s
SK Hynix	in-house	n/a	n/a	6,500/3,700 MB/s
Kioxia	in-house	n/a	n/a	5,500/4,000 MB/s

*Silicon Motion's controller chips are adopted by YMTC's in-house brand SSDs, e.g. PC005 model adopts Silicon Motion PCIe Gen3 controller. YMTC also uses other controller makers' chips, including Phison and China local brand Maxio, etc.

Source: Company, press releases, BofA Global Research

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Exhibit 13: PCIe Gen 5 SSD controller comparison

PCIe Gen 5 SSD controllers' penetration minimal in 2023; PCIe Gen 5 has transfer speed up to 14 GB/s

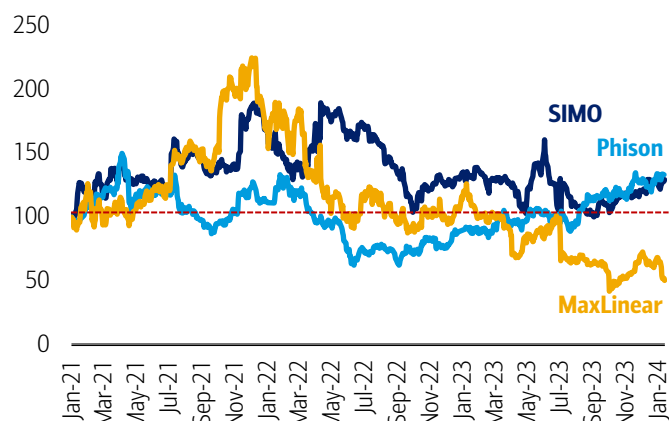
Company	Model	Speed	Specifications
Marvell	Bravera SC5	14 GB/s	8/16 NAND channels; Bravera partners including Kioxia, SK Hynix, AMD, Intel
Phison	E31T	10.8 GB/s	4-channel configuration, ARM Cortex R5 CPU, AES 256 encryption
Phison	E26	10 GB/s	Powers Corsair, Gigabyte, MSI, Patriot, Sabrent, and Seagate SSDs
SIMO	SM8366 & SM2508	12 GB/s	SM2508 expected late-2022 in Adata's upcoming SSDs; SM8366 for enterprise SSD
Samsung	PM1743	14 GB/s	Demoed on Intel's Alder Lake desktop CPU platform; exp mid-2022

Source: Company, press releases, BofA Global Research

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Exhibit 14: Share price performance – SIMO, Phison, MaxLinear

SIMO and Phison share price outperforming MaxLinear as of early-Feb



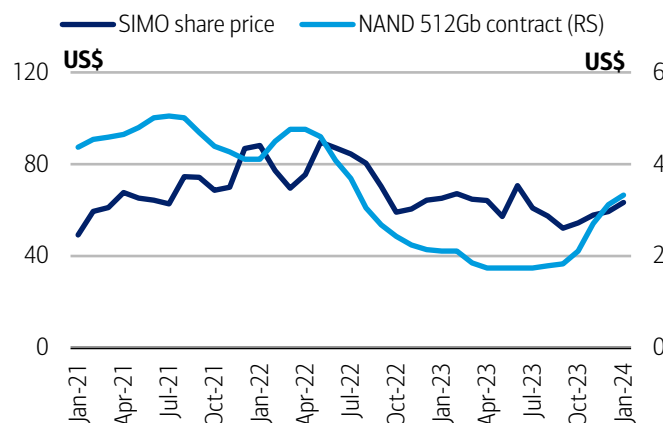
*Prices indexed to 100 in Jan-2021

Source: Bloomberg, BofA Global Research

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Exhibit 15: SIMO share price vs NAND 512Gb wafer contract price

Time to see SIMO's share price hike on the back of NAND wafer contract price rebound



Source: DRAmeXchange, BofA Global Research

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Valuation

Exhibit 16: SIMO – Valuation multiples at current price and PO

Our PO of US\$80 is based on 3.4x 2024-25E P/B

(x)	2020	2021	2022	2023E	2024E	2025E	2024-25 Avg
Current shr price based							
P/E	28.5	11.4	12.5	41.2	21.3	19.5	20.4
PBR	4.0	3.4	2.9	3.0	2.8	2.7	2.7
EV/EBITDA	19.7	7.1	8.0	30.1	13.4	11.8	12.6
EV/Sales	3.4	2.0	2.0	2.9	2.3	2.1	2.2
PO based multiples							
P/E	35.1	14.0	15.4	50.8	26.2	24.0	25.1
PBR	5.0	4.2	3.6	3.6	3.5	3.3	3.4
EV/EBITDA	25.1	9.0	10.1	38.2	17.0	15.1	16.0
EV/Sales	4.4	2.6	2.5	3.7	2.9	2.7	2.8

Source: Company, BofA Global Research estimates

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Exhibit 17: SIMO – Multiples based on historical share price

4/7/10-year average P/B shows 3.0x

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	4-Yr avg 2020-23	7-Yr avg 2017-23	10-Yr avg 2014-23
Based on year-avg shr price													
P/E	15.9	17.0	13.8	22.0	17.0	21.7	18.5	10.8	14.5	38.7	20.6	20.5	19.0
P/BV	2.3	2.8	3.4	3.3	3.1	2.6	2.6	3.3	3.4	2.8	3.0	3.0	3.0
EV/EBITDA	7.6	9.5	8.6	12.3	11.7	16.9	11.3	6.4	7.8	28.2	13.4	13.5	12.0
EV/Sales	1.7	2.2	2.3	2.5	2.7	2.4	2.0	1.8	1.9	2.7	2.1	2.3	2.2
Based on year-high shr price													
P/E	22.1	21.5	17.8	26.0	21.5	27.8	23.1	12.7	18.3	51.2	26.3	25.8	24.2
P/BV	3.2	3.6	4.4	3.9	3.9	3.3	3.3	3.8	4.3	3.7	3.8	3.7	3.7
EV/EBITDA	11.8	12.6	11.7	15.1	15.4	23.1	15.0	7.8	9.4	34.2	16.6	17.2	15.6
EV/Sales	2.7	3.0	3.1	3.1	3.6	3.3	2.6	2.2	2.3	3.3	2.6	2.9	2.9
Based on year-low shr price													
P/E	10.2	12.8	8.7	18.1	11.6	17.3	13.1	8.3	10.0	31.9	15.8	15.8	14.2
P/BV	1.5	2.1	2.2	2.7	2.1	2.1	1.9	2.5	2.4	2.3	2.2	2.3	2.2
EV/EBITDA	3.8	6.6	4.7	9.5	7.1	12.5	7.0	4.6	5.8	20.5	9.5	9.6	8.2
EV/Sales	0.9	1.6	1.2	2.0	1.6	1.8	1.2	1.3	1.4	2.0	1.5	1.6	1.5

Source: Company, BofA Global Research estimates

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Exhibit 19: SIMO – Valuation comparison among memory stocks

SIMO's higher multiples justified by resilient 2023 earnings, strong 2024 turnaround and high 2024-25 ROE

	Ticker	Rating	Price (Local)	Mcap (\$bn)	P/E			P/Book			EV/EBITDA			EV/Sales			ROE		
					FY23	FY24E	FY25E	FY23	FY24E	FY25E	FY23	FY24E	FY25E	FY23	FY24E	FY25E	FY23	FY24E	FY25E
Silicon Motion	SIMO	B-1-8	64.93	2.1	41.2	21.3	19.5	2.9	2.8	2.6	29.9	13.3	11.8	2.9	2.2	2.1	7.2%	13.6%	14.1%
Phison	PISNF	B-3-8	537.00	3.5	40.9	30.0	23.7	2.6	2.5	2.4	21.0	17.3	14.2	2.1	1.7	1.5	6.7%	8.6%	10.4%
SK Hynix	HXSCF	B-1-8	138,000	75.7	NM	13.1	7.3	1.9	1.7	1.4	22.2	5.3	3.9	3.7	2.3	2.0	-15.6%	13.1%	20.0%
Micron	MU	B-1-7	84.60	93.4	NM	NM	14.2	2.1	2.1	1.8	34.5	17.6	13.4	6.5	4.5	3.2	-10.3%	-1.3%	14.1%
Nanya Tech	NNYAF	B-1-9	68.20	6.7	NM	137.7	16.8	1.3	1.3	1.2	174.5	10.1	5.2	5.2	2.9	2.3	-4.3%	0.9%	7.2%
Powertech	XPPZF	B-2-8	147.50	3.6	13.8	14.4	12.7	2.0	1.9	1.7	5.6	4.8	4.5	1.7	1.5	1.5	14.9%	13.2%	13.8%
Samsung	SSNLF	A-1-7	75,000	337.2	35.2	18.9	10.8	1.4	1.4	1.2	9.8	6.1	4.5	1.7	1.5	1.4	4.1%	7.4%	11.9%
Western Digital	WDC	C-1-9	58.45	19.0	NM	NM	8.5	1.6	1.7	1.4	106.9	21.9	5.8	2.0	2.0	1.6	-9.5%	-3.1%	18.8%
Marvell	MRVL	C-1-7	67.08	58.0	44.4	35.9	26.8	2.9	2.7	2.4	22.3	18.8	14.7	7.7	7.1	5.9	8.4%	10.1%	12.4%
Seagate	STX	B-1-8	86.20	18.1	453.7	87.1	14.0	NM	NM	NM	24.7	25.2	11.0	3.1	3.4	2.5	NM	NM	NM
TSMC	TSMWF	B-1-7	646.00	534.6	20.0	16.5	13.4	4.8	4.1	3.4	11.2	8.9	7.3	7.5	6.1	5.1	26.2%	27.0%	28.1%
Mediatek	MDTKF	B-1-7	937.00	47.8	19.3	12.7	9.7	4.0	3.6	2.9	15.1	9.6	7.3	3.1	2.4	1.8	18.9%	29.6%	32.8%

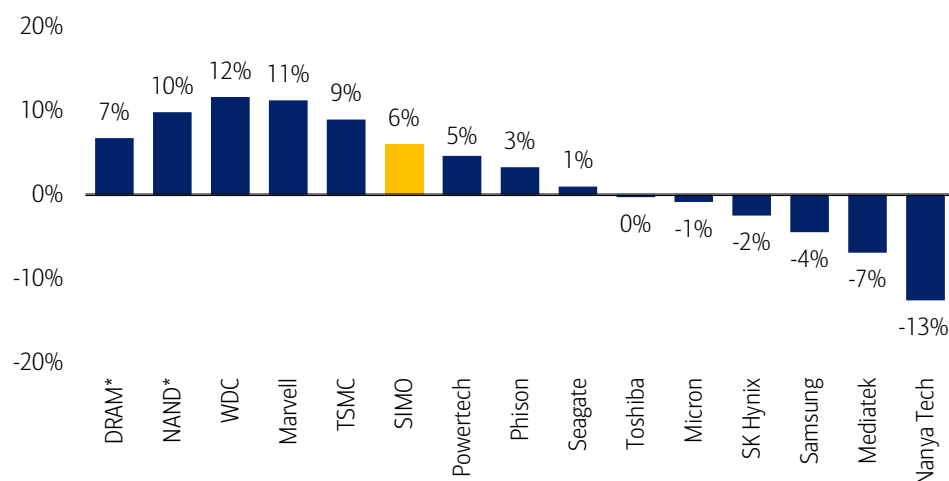
Source: Company, BofA Global Research estimates

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Exhibit 20: 2024 YTD price performance comparison

SIMO outperformed vs memory chipmakers (Samsung, Hynix, Nanya Tech) due to proven high margin profile (GM 40%+ even in 2023)



*DRAM: 8Gb DDR4, NAND: 256Gb 3D TLC

Source: Bloomberg, DRAMeXchange, BofA Global Research

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Exhibit 21: SIMO – Discounted cash flow (DCF) valuation

Fair value US\$80; LT assumptions – sales US\$1bn+, OPM 20%+, FCF US\$200mn+, WACC 10%

(US\$mn)	2022	2023	2024E	2025E	2026E	2027E	2028E	2029E
Sales	946	639	822	874	963	1,060	1,166	1,282
Sales growth	3%	-32%	29%	6%	10%	10%	10%	10%
OP	214	40	116	134	167	204	233	282
OPM	23%	6%	14%	15%	17%	19%	20%	22%
EBITDA	233	62	139	157	190	229	261	313
Depreciation	19	22	22	23	23	25	28	31
Capex	33	50	35	38	39	35	35	35
Increase in NWC	195	-106	-30	26	40	5	5	5
Net working capital	372	266	236	261	301	306	311	316
Taxes	40	8	26	32	39	37	42	51
FCF	-35	109	108	62	73	153	179	222
Discount factor at 10% WACC			0.91	0.83	0.75	0.68	0.62	0.56
Present value of FCF			98	51	55	104	111	125
Sum of PV FCF (a)		545						
Terminal value								
PV of TV (b)		1,800						3,193
Fair EV/EBITDA		10						3,128
Perpetual growth		3.0%						3,258
Biz value total (A = a+b)		2,345						
Net debt (2023-end, B)		-331						
Shareholder value total (A-B)		2,676						
Per share value (US\$)		80.09						
BofA PO		80.00						
Current share price		64.93						
PO over share price		23%						

Note: Net debt includes long-term investments

Source: Company, BofA Global Research estimates

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Exhibit 22: SIMO - Perpetual FCF/growth-based valuations

Annual FCF US\$187mn; \$2.3bn business value + net cash US\$0.35bn assumed

US\$m, US\$	Assumptions
FCF	187.0
WACC	10.0%
Stock beta	1.3
Growth	2.0%
Business value	2,318
Net debt	-350
Shareholder value	2,668
No of shares (mn)	33.2
Per share FV	80.3
PO	80.0
FV vs PO	0%
FV vs current shr price	24%

Source: Company data, BofA Global Research estimates

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Exhibit 23: SIMO – Sales mix forecast

Robust growth seen for eMMC/UFS and SSD controller in 4Q23; management expects QoQ decline in 1Q24 sales (US\$172-182mn), but expects 2024 sales to improve YoY (US\$765-800mn); we expect back to near upcycle level of total sales in '24-26E (US\$0.8-1.0bn)

US\$m	1Q23	2Q23	3Q23	4Q23	1Q24E	2Q24E	3Q24E	4Q24E	2019	2020	2021	2022	2023	2024E	2025E	2026E
Sales by application																
eMMC/UFS	17.2	25.4	51.5	65.6	58.4	60.1	69.2	74.0	108.1	148.1	299.6	342.8	159.7	261.7	274.2	293.2
SSD controller	97.8	105.2	113.1	132.9	119.6	125.5	141.9	156.1	290.9	344.2	631.1	562.5	448.9	543.0	578.4	643.8
SSD solutions	17.3	16.0	14.8	13.7	13.3	13.2	13.8	14.8	54.2	73.2	66.3	87.0	61.8	55.0	58.5	61.5
Others & adj	-8.3	-6.2	-7.0	-9.8	-9.7	-9.6	-9.5	-9.4	4.0	-25.9	-74.8	-46.3	-31.3	-38.1	-36.6	-35.2
Total sales	124.1	140.4	172.3	202.4	181.6	189.3	215.4	235.4	457.3	539.5	922.1	945.9	639.1	821.6	874.4	963.3
Sales mix																
eMMC/UFS	14%	18%	30%	32%	32%	32%	32%	31%	24%	27%	32%	36%	25%	32%	31%	30%
SSD controller	79%	75%	66%	66%	66%	66%	66%	66%	64%	64%	68%	59%	70%	66%	66%	67%
SSD solutions	14%	11%	9%	7%	7%	7%	6%	6%	12%	14%	7%	9%	10%	7%	7%	6%
Others & adj	-7%	-4%	-4%	-5%	-5%	-5%	-4%	-4%	1%	-5%	-8%	-5%	-5%	-5%	-4%	-4%
Total sales	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
QoQ																
eMMC/UFS	-73%	48%	103%	28%	-11%	3%	15%	7%								
SSD controller	-23%	8%	8%	18%	-10%	5%	13%	10%								
SSD solutions	-33%	-8%	-8%	-8%	-3%	-1%	5%	7%								
Total sales	-38%	13%	23%	17%	-10%	4%	14%	9%								
YoY																
eMMC/UFS	-80%	-73%	-49%	5%	239%	137%	34%	13%	-23%	37%	102%	14%	-53%	64%	5%	7%
SSD controller	-38%	-31%	-10%	5%	22%	19%	25%	17%	26%	18%	83%	-11%	-20%	21%	7%	11%
SSD solutions	-2%	-29%	-29%	-47%	-23%	-18%	-7%	8%	-51%	35%	-9%	31%	-29%	-11%	6%	5%
Total sales	-49%	-44%	-31%	1%	46%	35%	25%	16%	-14%	18%	71%	3%	-32%	29%	6%	10%

Source: Company data, BofA Global Research estimates

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Exhibit 24: SIMO – Income statement

Weak 2023 sales (only US\$0.6bn vs ~US\$1bn in 2021-22) mostly due to 1H23 downturn; but likely to recover in 2024-25E; mid to upcycle GM/OPM also assumed for 2024-25 (45%+ / 15%+); 4Q23 earnings turnaround (near upcycle) well confirmed

(FY Dec, US\$mn)	1Q23	2Q23	3Q23	4Q23	1Q24E	2Q24E	3Q24E	4Q24E	2019	2020	2021	2022	2023	2024E	2025E	2026E
Sales	124.1	140.4	172.3	202.4	181.6	189.3	215.4	235.4	457.3	539.5	922.1	945.9	639.1	821.6	874.4	963.3
Cost of sales	71.8	83.9	99.2	113.9	100.8	104.1	112.0	122.4	235.1	279.4	461.3	480.1	368.8	439.3	461.2	503.0
Gross profit	52.3	56.4	73.1	88.5	80.8	85.2	103.4	113.0	222.2	260.2	460.8	465.8	270.4	382.3	413.2	460.3
Operating expenses	46.8	54.6	58.1	71.0	65.0	65.0	67.0	69.0	169.7	179.6	214.9	251.9	230.5	266.0	279.1	292.9
R&D	34.9	41.3	41.7	56.4	50.0	50.0	51.0	52.0	110.1	121.7	164.3	188.5	174.4	203.0	213.2	223.8
SG&A	12.0	13.3	15.8	13.8	14.0	14.0	15.0	16.0	42.8	40.4	50.6	63.0	54.8	59.0	62.0	65.0
Others	0.0	0.0	0.6	0.7	1.0	1.0	1.0	1.0	16.7	17.5	0.0	0.4	1.3	4.0	4.0	4.0
Operating income	5.5	1.8	15.0	17.6	15.8	20.2	36.4	44.0	52.5	80.6	245.9	213.9	39.9	116.3	134.1	167.4
Non-OP income	6.8	10.1	1.2	3.1	3.3	3.3	2.8	2.3	19.6	5.0	1.4	-1.3	21.2	11.7	9.2	9.2
Pretax income	12.3	11.9	16.2	20.6	19.1	23.5	39.2	46.3	72.1	85.6	247.3	212.6	61.0	128.0	143.3	176.6
Tax	2.1	0.9	5.6	-0.5	3.8	4.7	7.8	9.3	7.7	5.8	47.3	40.1	8.2	25.6	31.5	38.9
Effective tax rate	17%	7%	35%	-2%	20%	20%	20%	20%	11%	7%	19%	19%	13%	20%	22%	22%
Net income	10.2	11.0	10.6	21.1	15.3	18.8	31.3	37.0	64.4	79.7	200.0	172.5	52.9	102.4	111.8	137.7
EPS (FD)	0.30	0.33	0.32	0.63	0.45	0.56	0.93	1.10	1.82	2.28	5.70	5.19	1.57	3.05	3.33	4.10
ROE (Annualized)	5%	6%	6%	11%	8%	10%	17%	19%	12%	15%	33%	25%	7%	14%	14%	16%
DPS	0.00	0.00	0.00	0.50	0.50	0.50	0.50	0.50	1.25	1.40	1.55	1.50	0.50	2.00	2.00	2.00
Margins (%)																
GP margin	42.2%	40.2%	42.4%	43.7%	44.5%	45.0%	48.0%	48.0%	48.6%	48.2%	50.0%	49.2%	42.3%	46.5%	47.3%	47.8%
OP margin	4.4%	1.3%	8.7%	8.7%	8.7%	10.7%	16.9%	18.7%	11.5%	14.9%	26.7%	22.6%	6.2%	14.2%	15.3%	17.4%
RP margin	9.9%	8.5%	9.4%	10.2%	10.5%	12.4%	18.2%	19.7%	15.8%	15.9%	26.8%	22.5%	9.6%	15.6%	16.4%	18.3%
NP margin	8.2%	7.9%	6.1%	10.4%	8.4%	9.9%	14.6%	15.7%	14.1%	14.8%	21.7%	18.2%	8.3%	12.5%	12.8%	14.3%

Source: Company data, BofA Global Research estimates

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Exhibit 25: SIMO – Balance sheet

Clean balance sheet - 4Q23 net cash US\$0.3bn accounts for 15% of market cap; US\$200mn+/- inventory amount also manageable to meet 2024 demand

(FY Dec, US\$mn)	1Q23	2Q23	3Q23	4Q23	1Q24E	2Q24E	3Q24E	4Q24E	2019	2020	2021	2022	2023	2024E	2025E	2026E
Assets total	928	947	967	1,008	1,018	1,025	1,045	1,071	698	742	971	961	1,008	1,071	1,110	1,147
Current assets total	742	738	754	793	797	798	815	836	565	607	818	788	793	836	854	869
Cash & ST investments	225	250	295	314	331	332	345	362	325	343	360	232	314	362	361	371
A/R	146	166	193	195	185	189	194	198	109	116	209	206	195	198	212	227
Inventories	308	251	199	217	213	208	206	206	88	110	163	288	217	206	208	196
Others	64	71	66	67	68	69	69	70	43	38	86	62	67	70	73	76
Non-current assets total	186	209	213	215	221	227	230	234	133	135	153	173	215	234	256	278
LT investments	14	20	17	17	17	17	18	18	3	5	9	9	17	18	19	19
Fixed assets	147	157	162	167	173	179	181	185	98	105	124	139	167	185	204	224
Others	25	32	34	30	31	31	31	32	14	25	20	25	30	32	33	35
Liabilities total	180	187	193	273	285	289	295	300	161	184	314	229	273	300	295	261
Current liabilities total	135	123	131	213	224	228	234	239	126	159	282	184	213	239	232	197
ST debts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
A/P	35	13	27	56	65	68	72	75	31	45	81	36	56	75	80	80
Others	99	110	104	157	159	160	162	164	95	114	201	148	157	164	152	117
Non-current liabilities	45	65	62	60	61	61	61	62	35	26	32	45	60	62	63	64
LT liabilities	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Others	45	65	62	60	61	61	61	62	35	26	32	45	60	62	63	64
Equity total	748	759	774	735	733	735	750	770	537	558	658	733	735	770	815	886
D/E Analysis																
Cash	225	250	295	314	331	332	345	362	325	343	360	232	314	362	361	371
Gross debts	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Net debts	-225	-250	-295	-314	-331	-332	-345	-362	-325	-343	-360	-232	-314	-362	-361	-371
Net D/E ratio	-30%	-33%	-38%	-43%	-45%	-45%	-46%	-47%	-61%	-61%	-55%	-32%	-43%	-47%	-44%	-42%
Gross D/E ratio	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
BVPS	22.55	22.73	23.17	21.99	21.94	22.01	22.44	23.05	15.28	16.15	18.86	22.16	21.99	23.05	24.40	26.52
ROE	5%	6%	6%	11%	8%	10%	17%	19%	12%	15%	33%	25%	7%	14%	14%	16%

Source: Company data, BofA Global Research estimates

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Exhibit 26: SIMO – Cash flow statement

Strong cash flow backed by high margin and limited capex spend

(FY Dec, US\$m)	1Q23	2Q23	3Q23	4Q23	1Q24E	2Q24E	3Q24E	4Q24E	2019	2020	2021	2022	2023	2024E	2025E	2026E
I. Cash flows from operation	7.0	36.0	64.9	43.4	45.2	28.8	38.2	42.8	86.9	115.9	176.9	83.7	151.3	155.0	108.9	121.0
Net Income	10.2	11.0	10.6	21.1	15.3	18.8	31.3	37.0	64.4	79.7	200.0	172.5	52.9	102.4	111.8	137.7
Depreciation and amortization	5.6	5.4	5.5	5.4	5.5	5.5	5.6	5.6	13.6	13.6	17.2	18.9	21.8	22.2	22.6	23.1
Changes in net working capital	-10.5	17.0	37.4	61.8	24.4	4.5	1.3	0.2	-18.0	9.0	-71.2	-195.4	105.7	30.4	-25.5	-39.8
Others	1.7	2.6	11.5	-44.9	0.0	0.0	0.0	0.0	26.9	13.6	31.0	87.7	-29.1	0.0	0.0	0.0
II. Cash flows from investments	-13.6	-10.1	-17.1	-9.5	-10.0	-10.0	-7.0	-8.0	35.4	-20.8	-30.3	-32.8	-50.2	-35.0	-38.0	-39.0
Capex	-13.6	-10.1	-17.1	-9.5	-10.0	-10.0	-7.0	-8.0	-10.3	-18.8	-26.8	-32.8	-50.2	-35.0	-38.0	-39.0
Others	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.7	-2.0	-3.5	0.0	0.0	0.0	0.0	0.0
III. Cash flows from financing	0.0	0.0	0.0	-16.7	-18.1	-18.1	-18.1	-18.0	-80.2	-73.9	-99.7	-183.1	-16.7	-72.2	-72.1	-72.0
Net change in debt	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Share repurchases, etc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-25.0	-25.0	-45.7	-133.2	0.0	0.0	0.0	0.0
Stock buyback	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dividend payments	0.0	0.0	0.0	-16.7	-16.7	-16.7	-16.7	-16.7	-44.0	-48.9	-54.0	-49.9	-16.7	-66.8	-66.8	-66.8
Other financing activities	0.0	0.0	0.0	0.0	-1.4	-1.3	-1.3	-1.3	-9.1	0.0	0.0	0.0	0.0	-5.4	-5.3	-5.2
IV. FX impact	-0.2	-1.3	-2.5	1.5	0.0	0.0	0.0	0.0	-1.0	-0.2	-0.5	3.7	-2.5	0.0	0.0	0.0
V. Cash flows (I+II+III+IV)	-6.8	24.7	45.3	18.7	17.1	0.7	13.2	16.8	41.1	21.0	46.3	-128.5	81.9	47.8	-1.3	10.0
Cash at the beginning	232.2	225.4	249.8	295.4	314.3	331.4	332.1	345.3	285.0	323.2	343.0	360.1	232.2	314.3	362.1	360.8
Net change in cash	0.0	0.2	-0.2	-0.2	0.0	0.0	0.0	0.0	2.9	1.2	29.2	-0.6	-0.2	0.0	0.0	0.0
Cash at the end	225.4	249.8	295.4	314.3	331.4	332.1	345.3	362.1	323.2	343.0	360.1	232.2	314.3	362.1	360.8	370.8

Source: Company data, BofA Global Research estimates

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Exhibit 27: SIMO – Free-cash flow (FCF) analysis

Strong FCF generation observed in 2023 (US\$100mn+; working capital reduction driven) despite memory industry downturn; we expect stable trend to continue in 2024-26E thanks to continuous EBITDA improvement and disciplined capex

(FY Dec, US\$m)	1Q23	2Q23	3Q23	4Q23	1Q24E	2Q24E	3Q24E	4Q24E	2019	2020	2021	2022	2023	2024E	2025E	2026E
Sales	124.1	140.4	172.3	202.4	181.6	189.3	215.4	235.4	457.3	539.5	922.1	945.9	639.1	821.6	874.4	963.3
Operating income	5.5	1.8	15.0	17.6	15.8	20.2	36.4	44.0	52.5	80.6	245.9	213.9	39.9	116.3	134.1	167.4
Depreciation & amortization	5.6	5.4	5.5	5.4	5.5	5.5	5.6	5.6	13.6	13.6	17.2	18.9	21.8	22.2	22.6	23.1
EBITDA	11.1	7.2	20.5	22.9	21.3	25.7	41.9	49.6	66.1	94.1	263.0	232.9	61.7	138.5	156.7	190.5
Capex	13.6	10.1	17.1	9.5	10.0	10.0	7.0	8.0	10.3	18.8	26.8	32.8	50.2	35.0	38.0	39.0
Increase of NWC	10.5	-17.0	-37.4	-61.8	-24.4	-4.5	-1.3	-0.2	18.0	-9.0	71.2	195.4	-105.7	-30.4	25.5	39.8
Net working capital (NWC)	382.3	365.4	328.0	266.1	241.7	237.3	235.9	235.7	114.3	105.3	176.5	371.9	266.1	235.7	261.3	301.0
Ex-cash current assets	517.0	487.9	458.7	478.9	465.5	465.7	469.9	474.3	240.0	264.0	458.0	555.7	478.9	474.3	493.0	498.1
Ex-debts current liabilities	134.7	122.6	130.8	212.8	223.8	228.4	234.0	238.6	125.8	158.7	281.6	183.9	212.8	238.6	231.7	197.1
Taxes	2.1	0.9	5.6	-0.5	3.8	4.7	7.8	9.3	7.7	5.8	47.3	40.1	8.2	25.6	31.5	38.9
Free cash flow (FCF)	-15.0	13.2	35.2	75.7	31.9	15.5	28.4	32.5	30.1	78.5	117.7	-35.4	109.0	108.3	61.7	72.8
FCF without NWC changes	-4.6	-3.8	-2.2	13.9	7.5	11.0	27.1	32.3	48.1	69.5	188.9	160.0	3.3	77.9	87.2	112.6

Source: Company data, BofA Global Research estimates

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Price objective basis & risk

Silicon Motion (SIMO)

Our PO of US\$80 is derived from 3.4x 2024-25E P/B. We believe stock performance will be more dependent on not only 2024 quarterly earnings momentum but also 2025 memory cycle outlook. Our target multiple is 12% higher than the historical average (3.0x) but lower than 2020-21 peak (4.0x). Our long-term DCF cross check with 10.0% WACC also presents a fair value near US\$80.

Upside risks: M&A deal breakup fee (paid by MaxLinear), stronger NAND industry turnaround, market share gains, and new orders (even from Samsung).

Downside risks: Breakup fee (to be paid to MaxLinear), deeper memory industry downturn, and Samsung's potential market share gains using in-house NAND controller chips.

Analyst Certification

I, Simon Woo, CFA, hereby certify that the views expressed in this research report accurately reflect my personal views about the subject securities and issuers. I also certify that no part of my compensation was, is, or will be, directly or indirectly, related to the specific recommendations or view expressed in this research report.

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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
	ASMPT	ASMVF	522 HK	Simon Woo, CFA
	Crystal Clear	XPPTF	300655 CH	Dai Shen
	eMemory	XYLWF	3529 TT	Mike Yang
	Faraday	FDYTF	3035 TT	Mike Yang



APR - Semiconductor Coverage Cluster

Investment rating	Company	BofA Ticker	Bloomberg symbol	Analyst
	Global Unichip Corp.	GBUHF	3443 TT	Mike Yang
	GlobalWafers	XWLFF	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	MXSXF	300782 CH	Daley Li, CFA
	MediaTek	MDTKF	2454 TT	Brad Lin
	Montage Technology	XRDFE	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
	Silergy Corp.	SLEGF	6415 TT	Brad Lin
	VeriSilicon	XMLZF	688521 CH	Mike Yang
	Win Semiconductors	XWIIF	3105 TT	Brad Lin

iQmethodSM Measures Definitions

Business Performance

Return On Capital Employed

Return On Equity

Operating Margin

Earnings Growth

Free Cash Flow

Numerator

NOPAT = (EBIT + Interest Income) × (1 – Tax Rate) + Goodwill Amortization

Net Income

Operating Profit

Expected 5 Year CAGR From Latest Actual

Cash Flow From Operations – Total Capex

Denominator

Total Assets – Current Liabilities + ST Debt + Accumulated Goodwill Amortization

Shareholders' Equity

Sales

N/A

N/A

Quality of Earnings

Cash Realization Ratio

Asset Replacement Ratio

Tax Rate

Net Debt-To-Equity Ratio

Interest Cover

Numerator

Cash Flow From Operations

Capex

Tax Charge

Net Debt = Total Debt – Cash & Equivalents

EBIT

Denominator

Net Income

Depreciation

Pre-Tax Income

Total Equity

Interest Expense

Valuation Toolkit

Price / Earnings Ratio

Price / Book Value

Dividend Yield

Free Cash Flow Yield

Enterprise Value / Sales

Numerator

Current Share Price

Current Share Price

Annualised Declared Cash Dividend

Cash Flow From Operations – Total Capex

EV = Current Share Price × Current Shares + Minority Equity + Net Debt +

Other LT Liabilities

Enterprise Value

Denominator

Diluted Earnings Per Share (Basis As Specified)

Shareholders' Equity / Current Basic Shares

Current Share Price

Market Cap = Current Share Price × Current Basic Shares

Sales

Basic EBIT + Depreciation + Amortization

iQmethodSM is the set of BofA Global Research standard measures that serve to maintain global consistency under three broad headings: Business Performance, Quality of Earnings, and validations. The key features of iQmethod are: A consistently structured, detailed, and transparent methodology. Guidelines to maximize the effectiveness of the comparative valuation process, and to identify some common pitfalls.

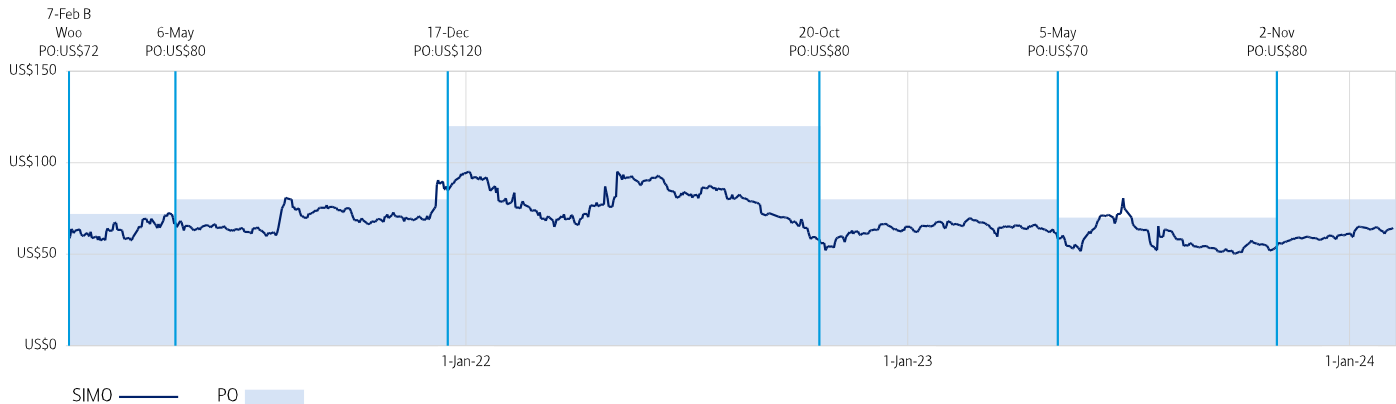
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Silicon Motion (SIMO) Price Chart



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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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